RENAULT

3 Chassis

30A GENERAL INFORMATION

31A FRONT AXLE COMPONENTS

33A REAR AXLE COMPONENTS

35A WHEELS AND TYRES

36A STEERING ASSEMBLY

36B POWER ASSISTED STEERING

37A MECHANICAL COMPONENT CONTROLS

38C ANTI-LOCK BRAKING SYSTEM

X79

NOVEMBER 2009 **EDITION ANGLAISE**

DUSTER - Chapitre 3

Contents

Pages

30A GENERAL INFORMATION

Brake circuit: Operating diagram 30A-1
Brake circuit: Precautions for the repair 30A-2
Braking circuit: Bleed 30A-4
Brake circuit: Tightening torque 30A-6
Rigid brake pipe: Repair 30A-7
Brake fluid: Specifications 30A-12
Brake: Specifications 30A-13
Steering: Tightening torque 30A-14
Axle assemblies: Check 30A-15
Front axle system: Tightening torque 30A-16
Front axle system: Adjustment 30A-18
Rear axle system: Tightening torque 30A-19

31A FRONT AXLE COMPONENTS

Front axle components: Precautions for the repair 31A-1
Front brake pads: Removal - Refitting 31A-3
Front brake hose: Removal - Refitting 31A-5

31A FRONT AXLE COMPONENTS

Front brake calliper: Removal - Refitting 31A-7
Front brake calliper: Repair 31A-9
Front brake calliper mounting: Removal - Refitting 31A-11
Front brake disc protector: Removal - Refitting 31A-13
Front brake disc: Removal - Refitting 31A-15
Front brake disc: Description 31A-18
Hydraulic unit - master cylinder brake pipe: Removal - Refitting 31A-19
Hydraulic unit - underbody union brake pipe: Removal - Refitting 31A-21
Hydraulic unit - front left-hand calliper brake pipe: Removal - Refitting 31A-23
Hydraulic unit - front right-hand calliper brake pipe: Removal - Refitting 31A-25
Front driveshaft hub carrier: Removal - Refitting 31A-27
Front hub carrier bearing: Removal - Refitting 31A-30
Front shock absorber and spring: Removal - Refitting 31A-33

Contents

31A FRONT AXLE COMPONENTS

Filter unit assembly: Removal - Refitting 31A-38

Front driveshaft lower arm: Removal - Refitting 31A-39

Front driveshaft lower arm ball joint: Check 31A-41

Front axle subframe: Removal - Refitting 31A-42

Front anti-roll bar: Removal - Refitting 31A-46

33A REAR AXLE COMPONENTS

Rear axle components: Precautions for the repair 33A-1

Rear brake lining: Removal - Refitting 33A-2

Rear brake cylinder: Removal - Refitting 33A-5

Rear brake drum: Removal - Refitting 33A-7

Rear brake drum: Description 33A-9

Rigid brake pipe: Removal - Refitting 33A-10

Shock absorber: Removal - Refitting 33A-12

Rear suspension spring: Removal - Refitting 33A-14

Rear axle rubber bearing: Removal - Refitting 33A-16

Complete rear axle system: Removal - Refitting 33A-19

35A WHEELS AND TYRES

Wheel: Removal - Refitting 35A-1

Wheel: Balancing 35A-4

35A WHEELS AND TYRES

Tyre: Precautions for the repair 35A-7

Tyres: Identification 35A-8

Tyres: Removal - Refitting 35A-9

Tyre: Repair 35A-11

Wheel rim: Identification 35A-14

Emergency spare wheel carrier: Removal - Refitting 35A-15

36A STEERING ASSEMBLY

Steering: List and location of components 36A-1

Steering: Precautions for the repair 36A-2

Track rod: Removal - Refitting 36A-4

Axial ball joint linkage: Removal - Refitting 36A-5

Steering column: Removal - Refitting 36A-7

Steering box gaiter: Removal - Refitting 36A-9

Bulkhead seal: Removal - Refitting 36A-10

Steering column adjustment handle: Removal - Refitting 36A-11

Steering wheel: Removal - Refitting 36A-13

36B POWER ASSISTED STEERING

Power-assisted steering pump pressure: Check 36B-1

Power-assisted steering pump: Removal - Refitting 36B-5

Contents

36B POWER ASSISTED STEERING

Power-assisted steering pump pulley: Removal - Refitting 36B-12

Power-assisted steering pump assembly: Removal - Refitting 36B-13

Power-assisted steering pipes: Removal - Refitting 36B-15

37A MECHANICAL COMPONENT CONTROLS

Brake mechanism: Precautions for the repair 37A-1

Master cylinder: Removal - Refitting 37A-2

Master cylinder - front right-hand calliper brake pipe: Removal - Refitting 37A-5

Master cylinder - front left-hand calliper brake pipe: Removal - Refitting 37A-7

Brake servo non-return valve: Removal - Refitting 37A-9

Brake servo: Removal - Refitting 37A-11

Vacuum pump: Removal - Refitting 37A-14

Pedal yoke: Removal - Refitting 37A-16

Accelerator pedal: Removal - Refitting 37A-20

Accelerator pedal cable: Removal - Refitting 37A-24

Brake pedal: Removal - Refitting 37A-26

Brake pedal switch: Removal - Refitting 37A-27

Parking brake lever: Removal - Refitting 37A-29

Parking brake lever: Adjustment 37A-30

37A MECHANICAL COMPONENT CONTROLS

Clutch control: List and location of components 37A-31

Clutch pedal: Removal - Refitting 37A-33

Clutch pedal switch: Removal - Refitting 37A-35

Clutch circuit: Bleed 37A-37

Clutch master cylinder: Removal - Refitting 37A-44

Clutch circuit: Removal - Refitting 37A-47

Gear control unit: Removal - Refitting 37A-50

Parking brake cables: Removal - Refitting 37A-53

Brake servo: Check 37A-55

38C ANTI-LOCK BRAKING SYSTEM

ABS: List and location of components 38C-1

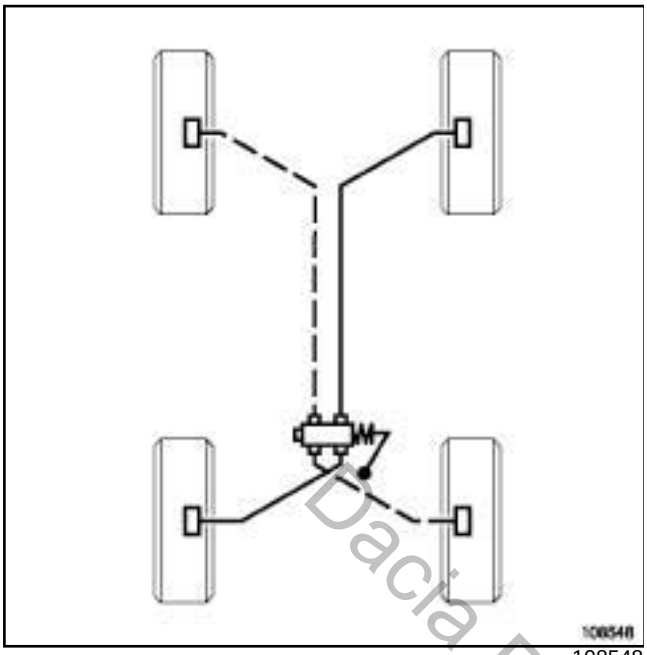
ABS: Precautions for the repair 38C-4

Hydraulic brake unit: Removal - Refitting 38C-5

Front wheel speed sensor: Removal - Refitting 38C-7

Rear wheel speed sensor: Removal - Refitting 38C-9

« X » braking system with load-sensitive compensator

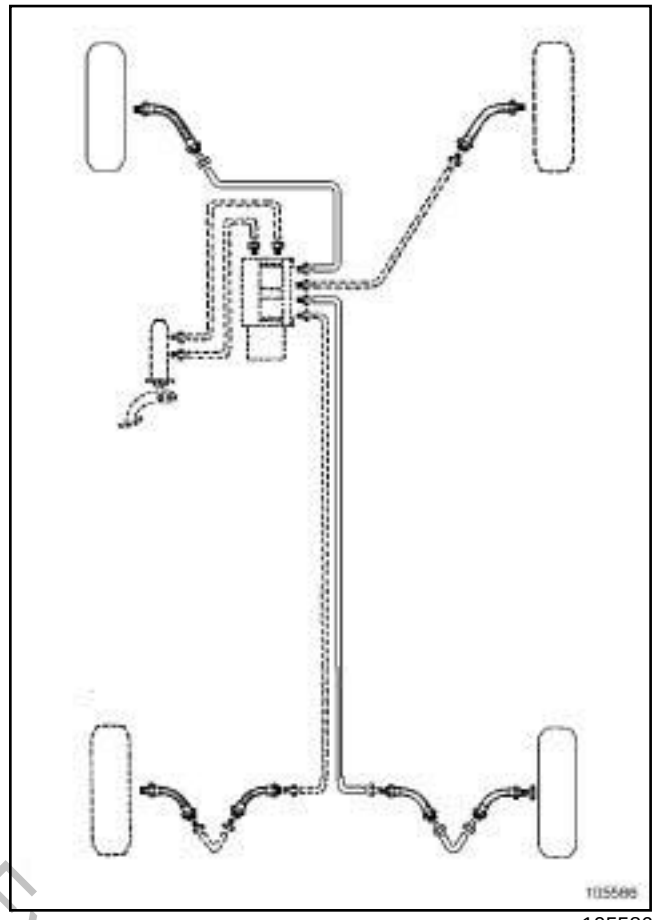


108548

IMPORTANT

This is a diagram of the general principle, do not use it as a reference for take-off points or circuit allocation. When replacing components in a vehicle's braking circuit, always mark the pipes before removing them.

« X » braking system with ABS



105586

IMPORTANT

This is a diagram of the general principle, do not use it as a reference for take-off points or circuit allocation. When replacing components in a vehicle's braking circuit, always mark the pipes before removing them.

I - SAFETY

1 - Advice to be followed before any operation

For an operation requiring the use of a lift, follow the safety advice (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

The brake regulation circuit must be free of all hydraulic and electrical faults.

In case of incorrect handling, the brake fluid can cause serious injury and damage. Follow the manufacturer's instructions for brake fluid.

To prevent dust from entering the master cylinder reservoir and the brake circuit, the plug must be removed just before filling and closed immediately afterwards,

2 - Instructions to be followed during the operation

Do not press on the brake pedal during work on the brake system.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

Brake fluid is highly corrosive. Ensure any brake fluid spilt on parts of the vehicle is cleaned off.

Use brake fluids that comply with the Renault standard (see **Vehicle: Parts and consumables for the repair**) .

Check the brake fluid levels in the braking circuit and the bleeding device.

Check that the pressure of the bleeding device is between **1.5 bar and 2 bar**.

II - CLEANLINESS

1 - Advice to be followed before any operation

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2 - Instructions to be followed during the operation

Fit blanking plugs recommended for the Siemens K9K injection system at the end of each pipe and in all the openings of the disconnected components of the brake circuit.

Clean around the braking system with **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

Do not allow friction materials to come into contact with grease, oil or other lubricants and cleaning products which are mineral oil based.

III - GENERAL RECOMMENDATIONS

When replacing brake pads, always replace the pads on the other side as well.

When replacing a disc, always replace the disc on the opposite side.

When replacing brake discs, you must replace the brake pads.

WARNING

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components, regardless of the position of the wheels.

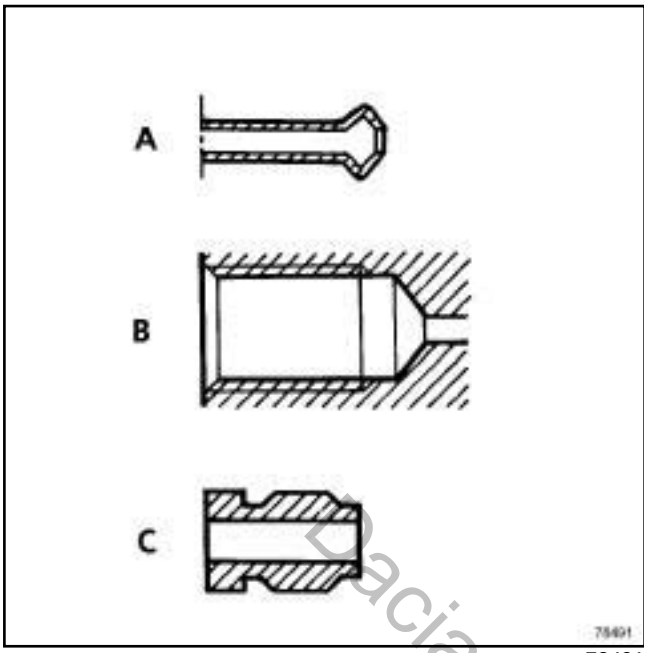
IMPORTANT

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

Always replace the rigid brake pipe clips.

Reminder:

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



78491

Parts identification:

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

Precautions to be taken before and during the brake circuit bleeding operation:

- use brake fluid which conforms to the Renault standard (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- check the brake fluid levels in the brake circuit and the bleeding device,
- the braking regulation circuit must be free from all hydraulic and electrical faults,
- check that the pressure of the bleeding device is between **1.5 bars and 2 bars**.

Equipment required
pedal press
brake circuit bleeding device

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **30A**, **General information**, **Brake circuit: Precautions for the repair**, page **30A-2**) .

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

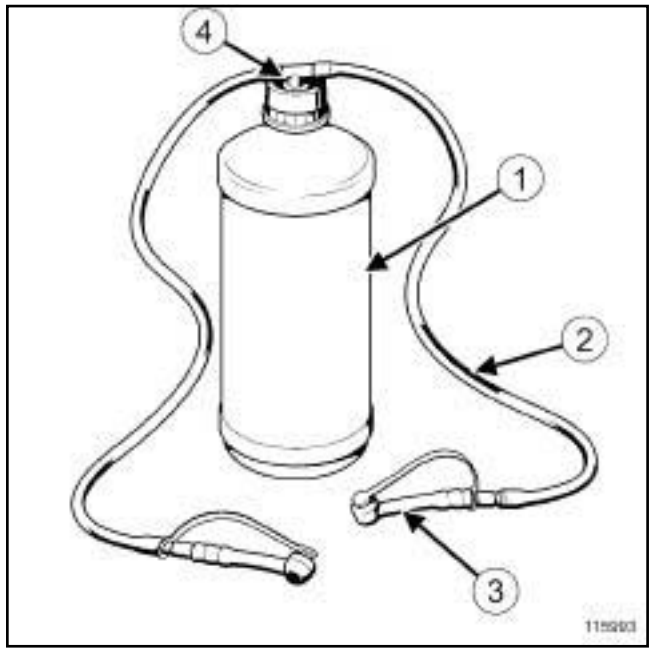
- the master cylinder,
- the brake fluid,
- the hydraulic unit,
- a rigid pipe,
- a hose,
- the reservoir,
- a calliper.

WARNING

Switch off the vehicle ignition so as not to activate the hydraulic unit solenoid valves when bleeding the brake circuit.

WARNING

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



115993

❑ Use locally produced containers to collect the used brake fluid.

Front and rear callipers:

- 2 washer fluid containers (**1**) (1 litre),
- **4 mm** diameter transparent pipes (**2**) ,
- 4 pipettes (**3**) ,
- 2 T-unions (**4**) .

Note:

The new hydraulic unit is pre-filled.

When working on one of the following components, position a **pedal press** to limit the outflow of brake fluid and prevent any air from entering the master cylinder and the circuits downstream of the master cylinder:

- hydraulic unit,
- pipes between the hydraulic unit and brake callipers,
- brake hoses,
- brake calliper.

Remove the **pedal press** before carrying out the braking system bleeding procedure.

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Switch off the vehicle ignition.

❏ Connect the **brake circuit bleeding device** (after having received Renault approval) to the master cylinder reservoir (see the instructions for the equipment).

❏ Pressurise the brake circuit.

❏ Adjust the pressure to between **1.5 bar** < P < **2 bar** for **3 minutes** to stabilise it in the braking circuit.

❏ Close the circuit between the bleed screw and brake fluid reservoir without dumping the pressure.

Note:

The circuit between the bleed screw and brake fluid reservoir is closed in different ways depending on the type of equipment used:

- valve,
- switch.

❏ Fit the bleed containers to the four bleed screws of the callipers.

❏ Undo the calliper bleed screws:

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

❏ Open the circuit between the bleed screw and brake fluid reservoir and allow the liquid to run until all the air bubbles have been released.

❏ Tighten the bleed screws in the following order:

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

❏ Undo the calliper bleed screw:

- front left-hand,
- allow the fluid to run until all the air bubbles have been released,
- tighten the bleed screw on the calliper.

❏ Carry out the previous operation on the callipers:

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

❏ Close the bleed screw to dump the pressure in the brake circuit.

❏ Remove the **brake circuit bleeding device** from the master cylinder reservoir.

❏ Check pedal travel and resistance. If it is not correct, finish bleeding the brake circuit with the help of a second operator. Start the bleed operation by bleeding the calliper that is the furthest away from the master cylinder:

- hold down the brake pedal,
- open the circuit bleed screw to release the air from the brake circuit,
- close the circuit bleed screw,
- release the brake pedal.

❏ Top up the brake fluid level in the reservoir, if necessary. Check the sealing of the front and rear bleed screws and ensure that the sealing covers are in place (see **30A**, **General information**, **Brake circuit: Tightening torque**, page **30A-6**) .

❏ During a road test, trigger braking regulation to confirm that the brake pedal travel is correct.

❏ Clean off any traces of brake fluid on the vehicle using **BRAKE CLEANING PRODUCT** (see **Vehicle: Parts and consumables for the repair**)

I - FRONT AND REAR BRAKES

Description	Tightening torque (N.m)
Front calliper bleed screw	**6**
Rear cylinder bleed screw	**6**
Front calliper inlet brake hose	**17**
Rear cylinder inlet brake pipes	**14**
Brake hose on brake pipe	**14**
Front brake guide pin bolt	**34**
Brake pipe on compensator	**14**
Brake pipe on master cylinder	**14**
Brake pipe on hose	**14**
Disc bolt	**14**
Cylinder bolt on brake back-plate	**14**

Description	Tightening torque (N.m)
Calliper support bolt	**107**

II - BRAKE CONTROL

Description	Tightening torque (N.m)
Brake servo nut	**21**
Master cylinder nuts	**21**
Master cylinder outlet pipe	**14**
Hydraulic unit bolt on its mounting	**8**
Hydraulic unit pipe unions	**14**
Parking brake lever nuts	**21**
Hydraulic unit mounting bolt on body	**21**
Compensator bolt	**12**

Equipment required
compressed air nozzle

Tightening torques ▽	
brake pipe bolts	**8 N.m**
underbody unions (female/male)	**6 N.m**

This procedure applies to copper pipes diameter **4.7 mm.**

Note:

This procedure does not apply to:

- hybrid pipes (pipe + hose),
- pipes with diameters **6 mm** and **8 mm.**

REPAIR

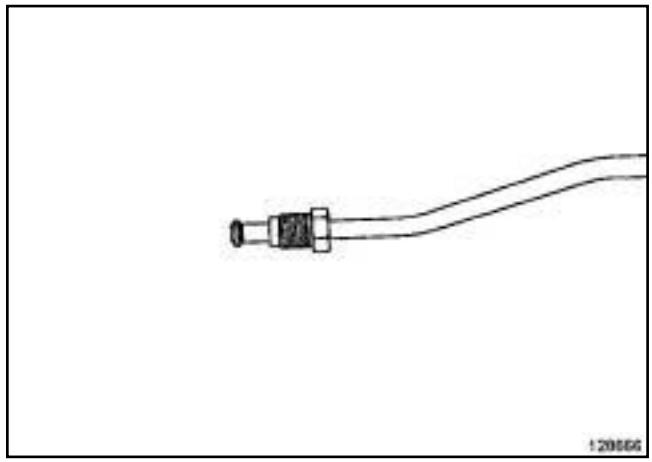
I - PIPE PREPARATION OPERATION

❑

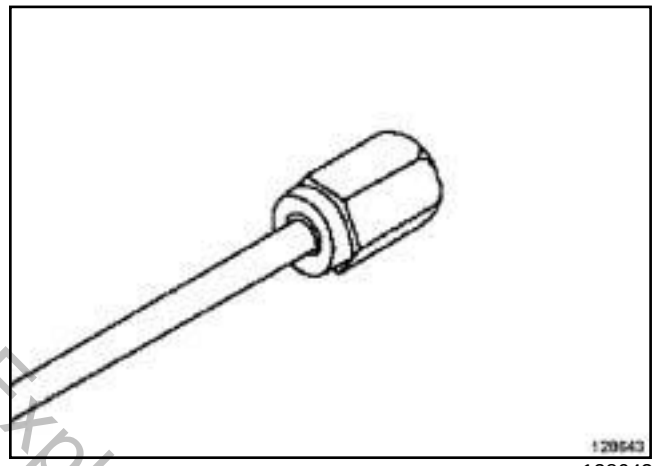
WARNING

To avoid causing a breakdown in hydraulic brake circuit , do not squash or bend the rigid pipe when cutting.

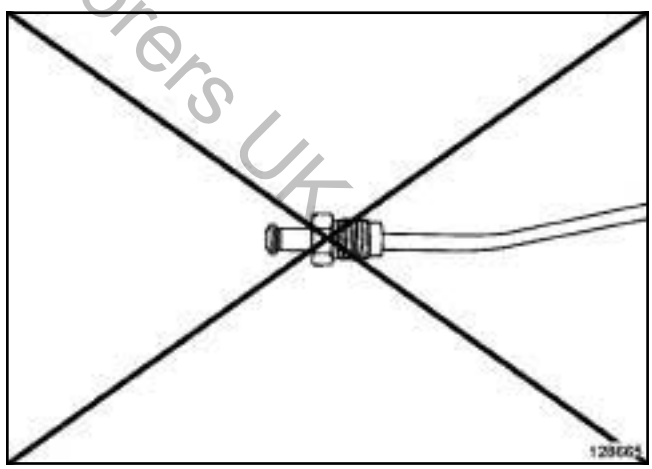
❑ Cut the pipe to the recommended length using a tube cutter (see **Garage equipment catalogue).**



128666



128643



128665

❑ Put the nuts or bolts on the pipe before forming the rivets.

II - MAKING THE RIVETS

❑

Note:

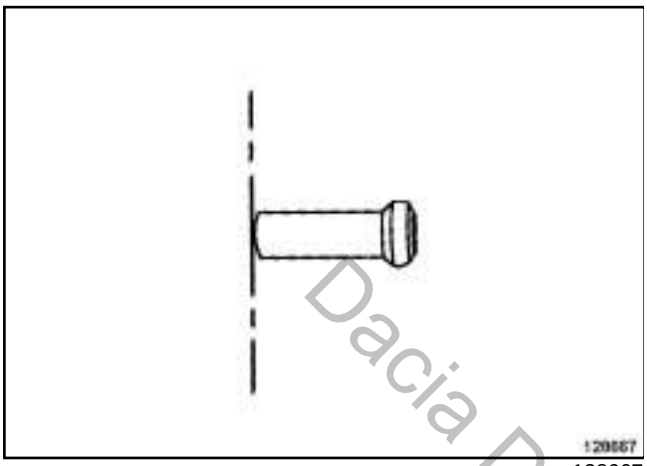
To make the rivets, fit the rivet press in a vice.

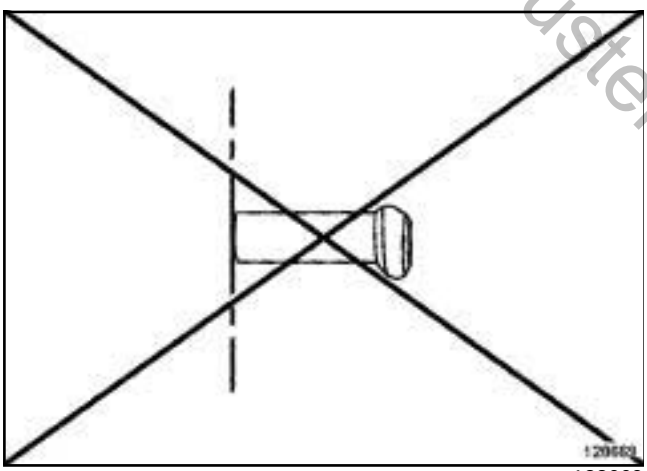
❑ Fit the pipe in the rivet press (see **Garage Equipment Catalogue**).

❑ Adjust the length of the pipe to be shaped.

❑ Torque tighten the press end piece(**40 N.m).**

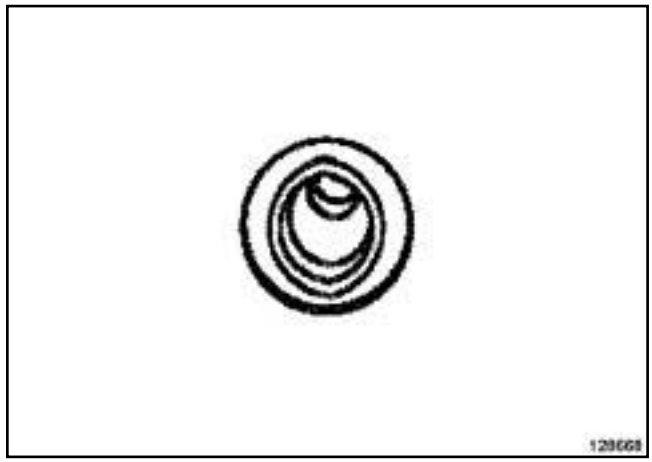
III - CHECKING THE RIVETS


128667

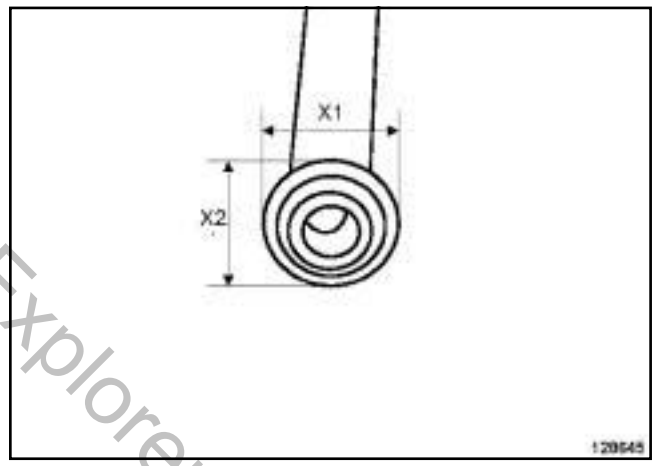

128669

❑ Visually inspect:

- the uniformity of the rivets' diameter,
- the rivet centring in relation to the pipe shaft.


128668

❑ Visually check that the internal diameter of the pipe is not oval-shaped.



128645

❑ Check that the diameter of the end panel is not oval shaped using a sliding calliper.

Correct diameter if (**X1**) = (**X2**)

IV - PREPARATION OF THE PIPE BEFORE BENDING

❑

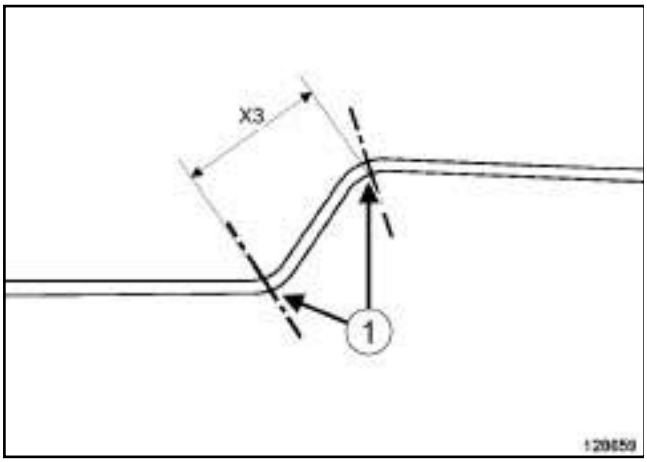
Note:

Impurities may spread inside the pipe while the rivets are being made.

❑ Blow inside the pipe in both directions using a **compressed air nozzle**.

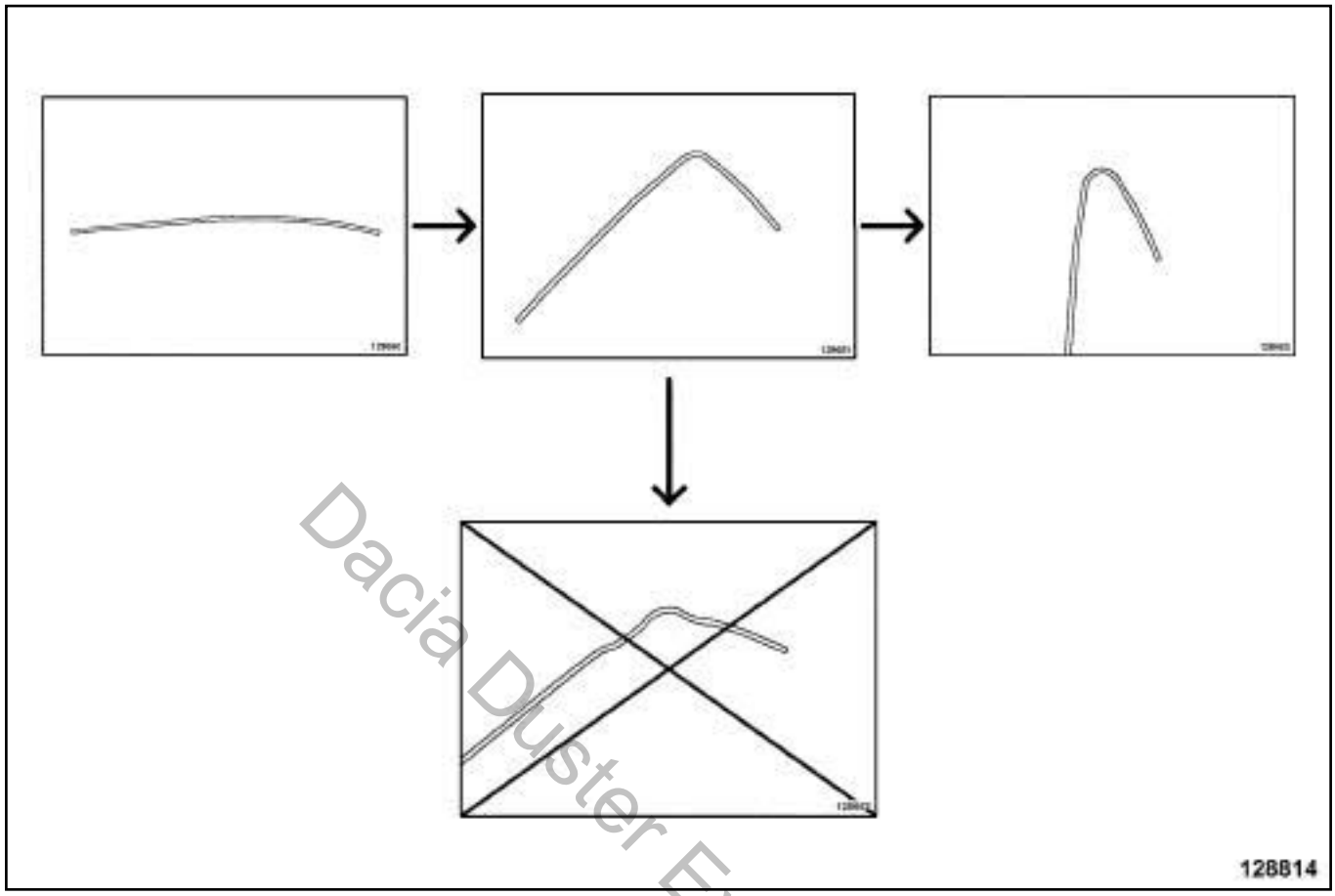
❑ Put plugs on the bolts or nuts at the ends of the pipe.

❑ Put the original pipe on a flat base plate that is the length of the pipe.



128659

❑ Measure the dimensions (**X3**) (in mm) curve after curve, between each curve radius « centre » (**1**) of the old pipe.



128814

❑

WARNING

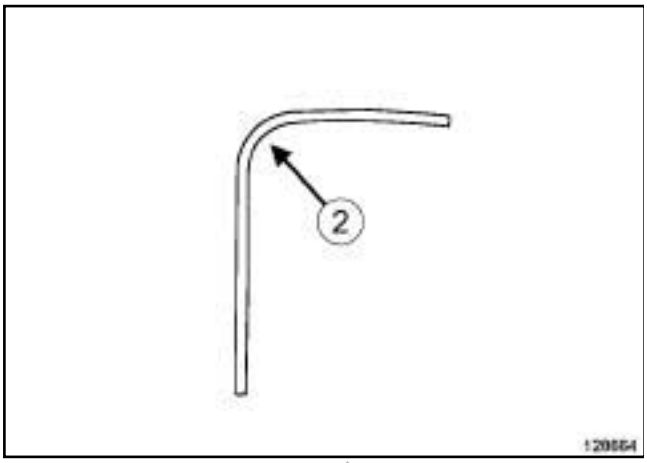
To avoid weakening the pipe, either bend once or bend progressively by increasing the bend (that is, by continually decreasing the curve radius). Do not install a rigid pipe on a vehicle that may have been bended and then unbended alternatively to reach the correct curve radius.

Note:

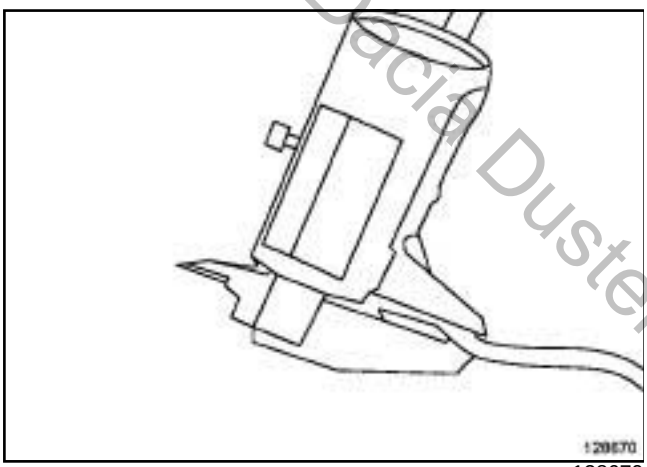
During the bending operation, the required angle should be passed slightly in order to compensate for material elasticity.

❑ Shape the pipe using a bender, curve after curve, while respecting the original shape of the pipe.

V - CHECKING BENDING



128664


128670

❑ Check the out-of-roundness of the outer diameter at the centre of the curve radius (**2**) using a sliding calliper (the out-of-roundness of the outer diameter is correct if it is less than 10% flattening):

- nominal diameter of the pipe: **4.75 mm**,
- minimum diameter after bending: **4.30 mm**.

VI - REFITTING THE PIPE

❑

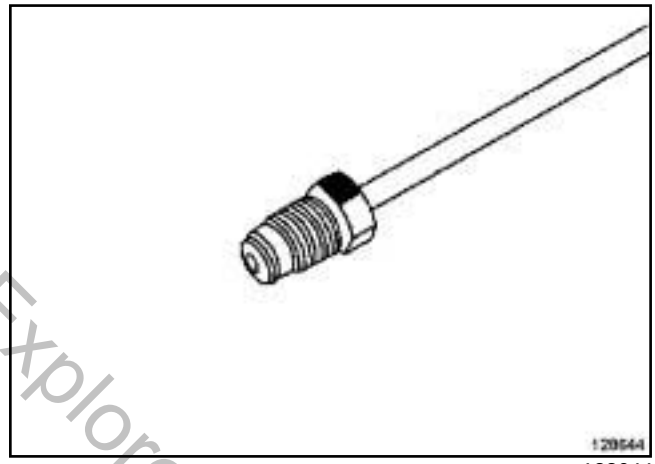
Note:

When refitting the rigid brake pipe:

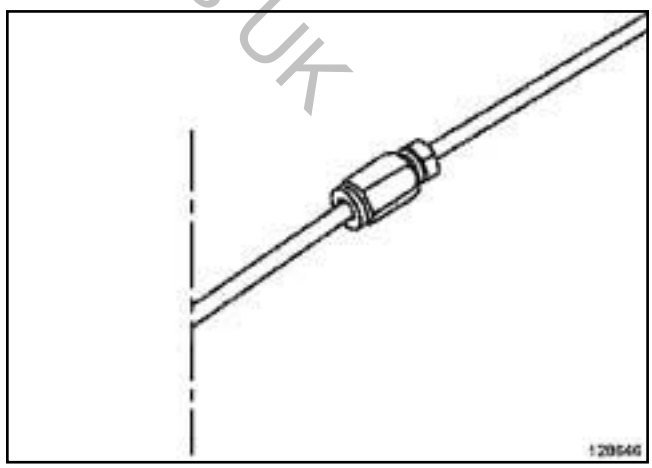
- respect the original routing as much as possible,
- adjust the pipe routing by hand when fitting inside the clips.

WARNING

Contact points between the rigid brake pipe and the surrounding components could cause damage to the pipe. In order to avoid these contacts, adjust the pipe routing by hand.


128644

❑ Torque tighten the **brake pipe bolts (8 N.m)**.


128646

❑ Torque tighten the **underbody unions (female/male) (6 N.m)**.

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 minor 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 **maintenance booklet 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 brake circuit may lead to:

- serious risk of leakage due mainly to deterioration of the cups,
- deterioration in the operation of the ESP system.

To prevent such risks, it is essential to use only brake fluids that comply with the RENAULT standard (see **Vehicle: Parts and consumables for the repair**) .

Front brakes (mm)		
Piston diameter	54	
Disc diameter	280	269
Disc thickness	24	22
Minimum disc thickness (1)	21.8	19.8
Maximum disc run-out	0.07	
Brake lining thickness (including backplate)	17.8	17.4
Minimum brake lining thickness (including backplate)	7.5	8.1
Rear brakes (mm)		
Piston diameter	19	
Drum diameter	228.5	
Maximum drum wear diameter	229.5	
Thickness of primary brake lining	4.9	
Thickness of secondary brake lining	4.9	
Master cylinder (mm)		
Diameter	22.2	
Stroke	36	

(1) Brake discs cannot be reground. If they are too heavily worn or scratched they must be replaced.

Description	Tightening torque (N.m)
Steering column nut	**21**
Universal joint bolt	**21**
Track rod end nut	**37**
Axial ball joint	**34**

Description	Tightening torque (N.m)
Wheel alignment lock nut	**53**
Steering box bolt	**180**

Description	Tightening torque (N.m)
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**
Low pressure pipe bolt on the sub-frame	**21**
Power assisted steering pump bolt on the support	**21**

❏ Lock the slip plates of the lift.

❏ Position the vehicle on a lift (see **Vehicle: Towing and lifting**) .

❏ Check the condition of the following components:

- track rods,
- axial ball joint linkages,
- subframe,
- lower arm rubber bushes,
- lower arm ball joints (see **31A**, **Front axle components**, **Front driveshaft lower arm ball joint: Check**, page **31A-41**) ,
- shock absorbers,
- tyres,

❏ Check:

- the tyre size (see **35A**, **Wheels and tyres**, **Tyres: Identification**, page **35A-8**) ,
- the tyre inflation pressure (see **Tyre pressure: Identification**) .

❏ Put the vehicle in the VODM position (vehicle in running order) (see **Underbody heights: Adjustment value**) :

- tank full,
- vehicle empty (without luggage, etc.).

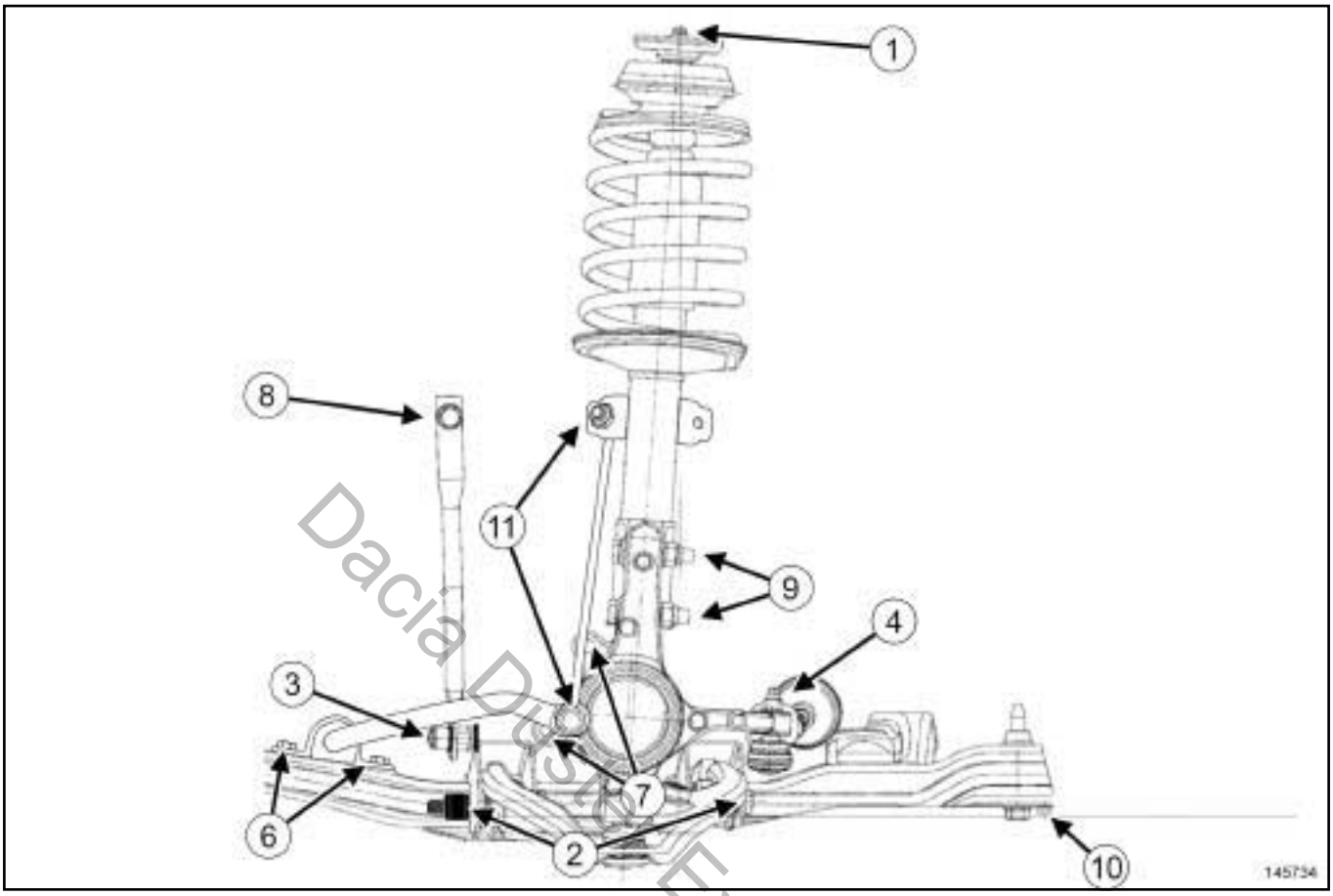
❏ Consult:

- the front axle geometry values (see **Front axle assembly: Adjustment values**) ,
- the rear axle geometry values (see **Rear axle assembly: Adjustment values**) .

❏ Refer to the user manual for the geometry tester.

❏ Check the geometry using the geometry tester.

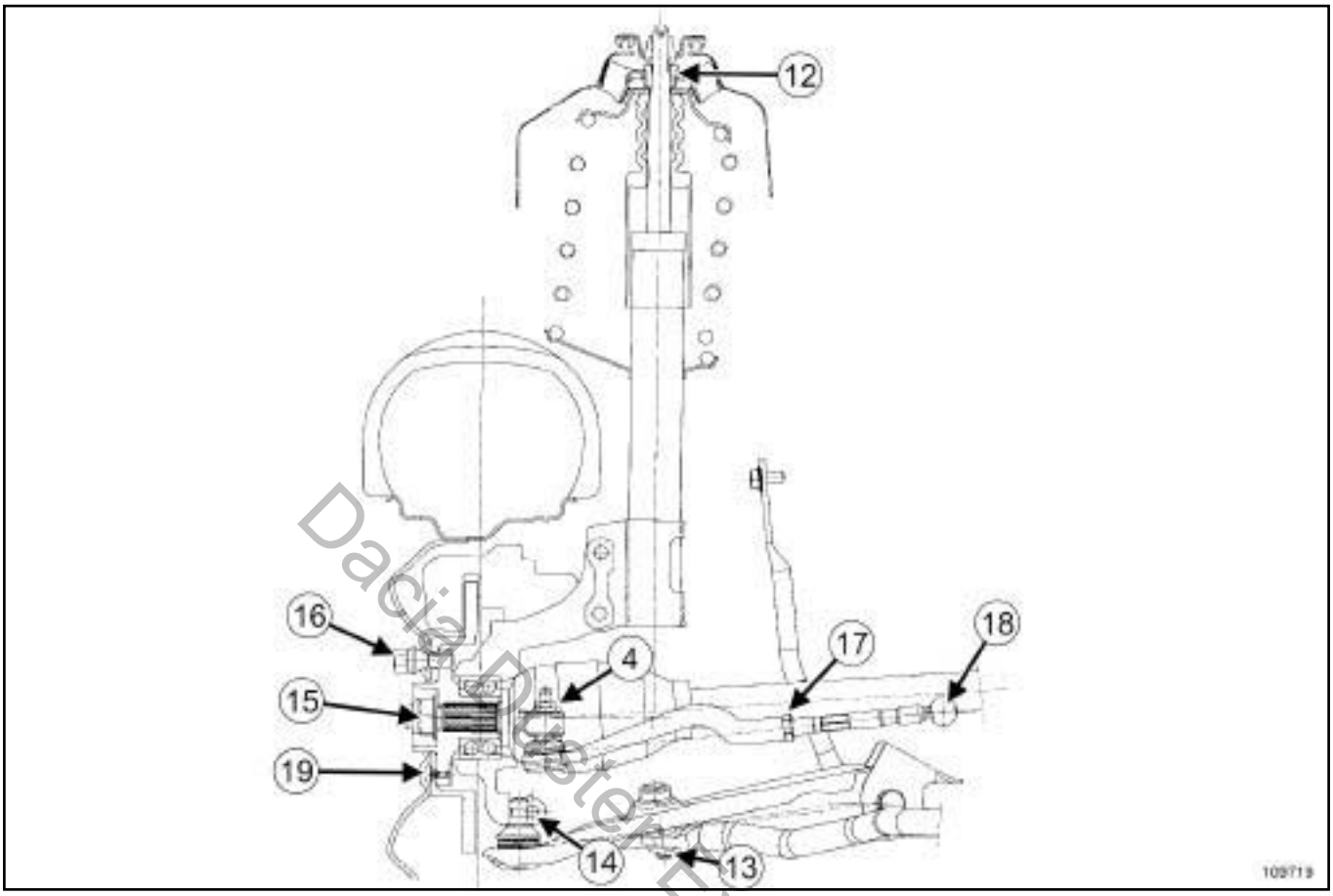
❏ If there is an inconsistency between the manufacturer's values and the measured values:



145734

No.	Description	Tightening torque (N.m
(**2**)	Lower arm bolt	**180**
(**3**)	Subframe tie-rod lower bolt	**21**
(**6**)	Anti-roll bar bearing bolt	**21**
(**7**)	Calliper support bolt	**107**
	Front sub-frame bolt	**110**
	Steering box bolt on the subframe	**180**
(**10**)	Front subframe bracket bolt	**44**

No.	Description	Tightening torque (N.m)
(**1**)	« Spring - shock absorber » assembly nut on the body	**44**
(**4**)	Track rod end nut	**37**
(**8**)	Subframe tie-rod upper bolt on the side member	**21**
(**9**)	Shock absorber bolt on the hub carrier	**105**



109719

No.	Description	Tightening torque (N.m)
(**12**)	Shock absorber nut for spring cup	**62**
(**14**)	Lower arm ball joint bolt or nut	**62**
(**15**)	Driveshaft nut	**280**
(**16**)	Wheel bolts	**105**
(**18**)	Axial ball joint mounting on the steering rack	**34**
(**19**)	Disc bolt	**14**

No.	Description	Tightening torque (N.m)
(**12**)	Anti-roll bar tie-rod nuts	**21**
(**17**)	Wheel alignment lock nut	**53**

Equipment required
flywheel immobiliser

Tightening torques ▽	
wheel alignment adjustment lock nuts	**53 N.m**

I - ADJUSTMENT PREPARATION STAGE

❏ Check the geometry (see **30A**, **General information**, **Axle assemblies: Check**, page **30A-15**) .

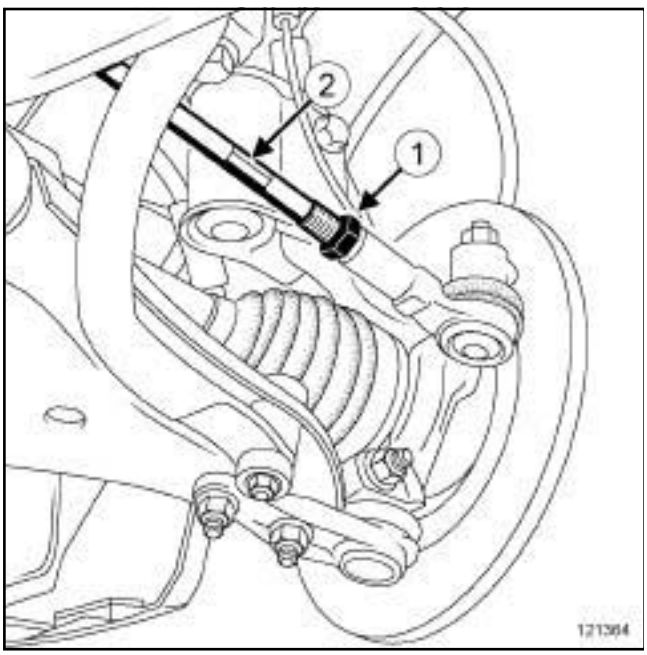
II - ADJUSTMENT OPERATION

1 - Wheel alignment

❏ Set the wheels straight ahead.

❏ Lock the steering wheel using a **flywheel immobiliser**.

❏ Adjust the wheel alignment by rotating the track rod sleeves.



121364

❏ Loosen the wheel alignment adjustment lock nut (**1**) .

❏ Turn the track rod sleeve (**2**) to the required value.

❏ After adjustment, torque tighten the **wheel alignment adjustment lock nuts (53 N.m)**.

2 - Castor angle

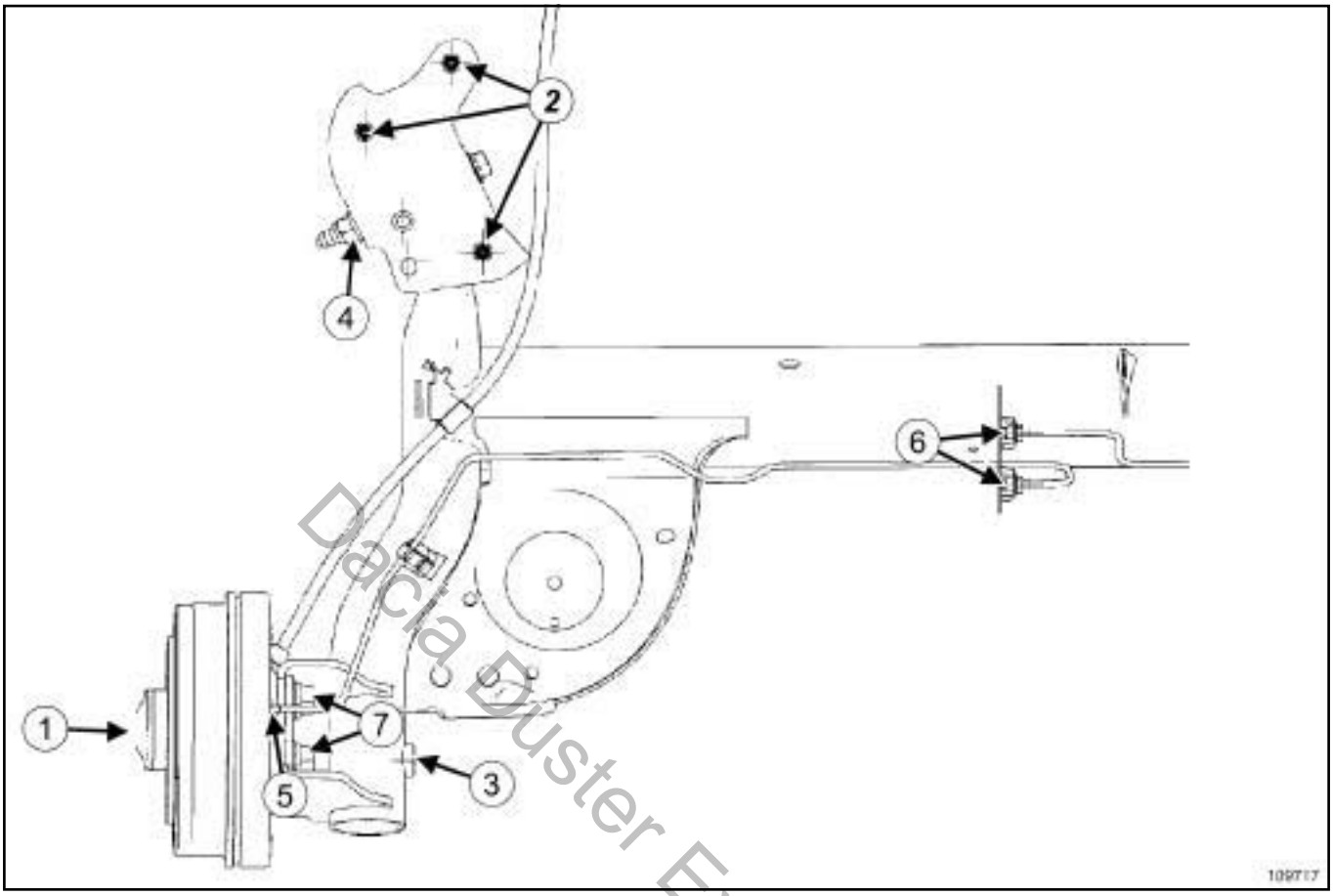
❏ Not adjustable.

3 - Camber

❏ Not adjustable.

4 - Pivot

❏ Not adjustable.



109717

No.	Description	Tightening torque (N.m)
(**4**)	Rubber bush nut	**125**
(**5**)	Rigid brake pipe on brake cylinder	**14**
(**6**)	Rigid pipe union on hose	**14**

No.	Description	Tightening torque (N.m)
(1)	Drum nut	**280**
(2)	Bearing bolt	**105**
(3)	Shock absorber lower bolt	**162**
(7)	Brake back-plate bolts on the rear axle	**105**
	Wheel speed sensor bolt	**6.5**

I - SAFETY

1 - Advice to be followed before any operation

For an operation requiring the use of a lift, follow the safety advice (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

2 - Instructions to be followed during the operation

Do not press on the brake pedal during work on the brake system.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

Brake fluid is highly corrosive. Ensure any brake fluid spilt on parts of the vehicle is cleaned off.

In case of incorrect handling, the brake fluid can cause serious injury and damage. Follow the manufacturer's instructions for brake fluid.

II - CLEANLINESS

1 - Advice to be followed before any operation

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2 - Instructions to be followed during the operation

Clean around the braking system with **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

Do not allow friction materials to come into contact with grease, oil or other lubricants and cleaning products which are mineral oil based.

III - GENERAL RECOMMENDATIONS

1 - Bearing, hub carrier

WARNING

In order to prevent irreversible damage to the front hub bearing:

- Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
- Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

WARNING

To ensure that the wheel speed sensor works properly, do not mark the sensor target on the bearing.

When removing a hub, it is essential to replace the bearing with a new one.

WARNING

Do not press the bearing's internal bush so as to avoid damaging the bearing (very high shrink-fitting force).

It is essential to check the condition of the hub and bearing surface and the hub carrier bore before refitting the bearing.

Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:

- the new bearing's internal and external surfaces which are in contact with the hub carrier and the hub,
- the hub carrier surfaces in contact with the new bearing,
- the hub surfaces in contact with the new bearing.

Always check the surface condition of the hub carrier before refitting the "hub - bearing" assembly.

Clean the surfaces of the hub carrier that are in contact with the "hub - bearing" assembly using **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products)

Replace any component whose contact surfaces have deep scratches or cracks.

2 - Suspension spring

When replacing the spring, ensure that the positioning and orientation of the spring and the tool cups are correct.

When replacing a spring, always replace the spring on the opposite side.

If a shock absorber is replaced, the shock absorber on the opposite side must also be replaced.

Check that the spring compressor tool is operating correctly.

In the interests of safety, do not leave a spring compressed in the spring compressor tool.

During assembly and removing operations, the surface and the protection paint must not be damaged.

There must be no impacts during operations. Any handling hooks and tightening or positioning clamps should be equipped with rubber or plastic in order to avoid damage on the springs.

It is recommended to replace springs if:

- the paint is damaged,

- the spring has dents in it.

They are not usually symmetrical in shape and care should be taken to assemble them the right way round. This can be done using the coloured marking's position.

WARNING
To prevent the suspension spring from prematurely breaking, do not damage the anti-corrosion protection.

3 - Anti-roll bar

During assembly and removing operations, the surface and the protection paint must not be damaged.

There must be no impacts during operations. Any handling hooks, tightening or positioning clamps should be equipped with rubber or plastic parts so as to avoid damaging the anti roll bar.

It is recommended to replace the anti-roll bar if:

- the paint is damaged,

- the anti-roll bar has dents in it.

Note:
the most critical and sensitive zones are in the main elbows.

4 - Front axle

WARNING
To prevent any damage, do not use the lower arm as support for the lifting system.

Check the condition of all the gaiters before refitting. Always replace any damaged components with new ones.

Tightening torques ▽	
guide pin bolt	**34 N.m**

When replacing brake pads, be sure to replace the pads on the opposite side.

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

WARNING

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

REMOVAL

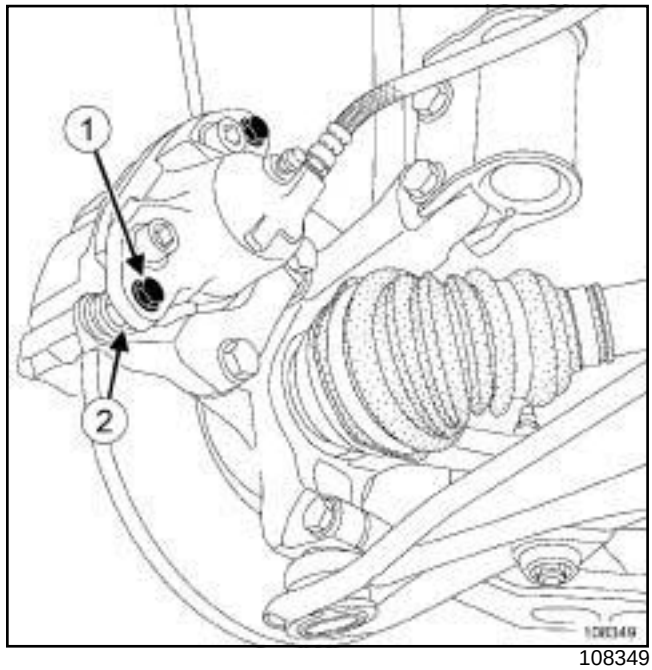
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Unlock the steering column.

❏ Remove the front wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

II - REMOVAL OPERATION

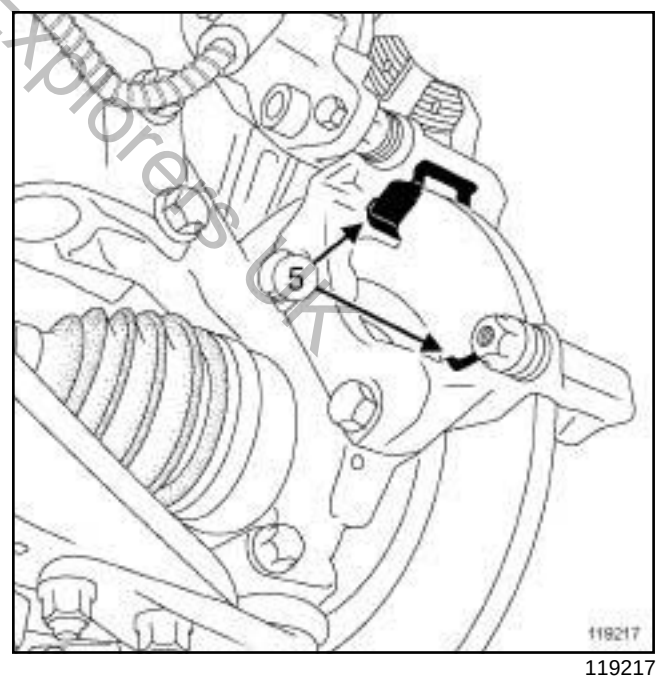


108349

❏ Remove the guide pin lower bolt (**1**) while holding the nut (**2**) .

❏ Pivot the front brake calliper upwards.

❏ Remove the front brake pads.



119217

❏ Remove the noise reducing fins (**5**) .

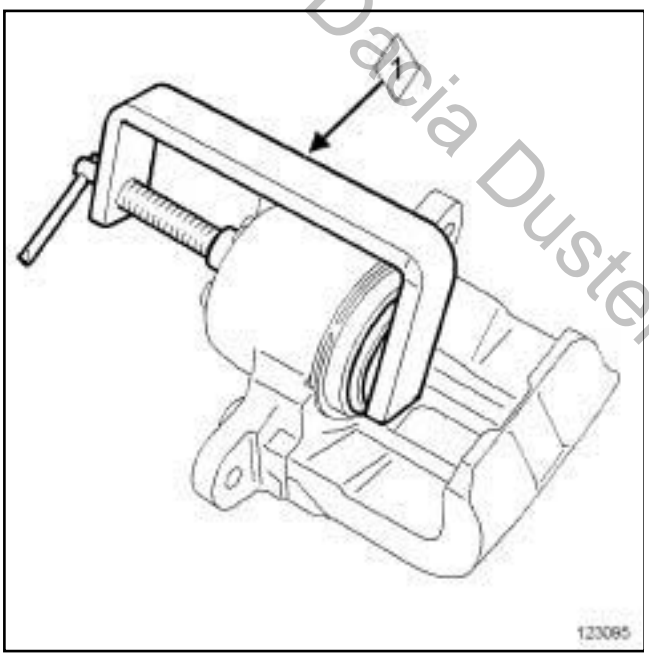
REFITTING

I - REFITTING PREPARATION OPERATION

❑ Check the thickness of the front brake pads (see **30A**, **General information**, **Brake: Specifications**, page **30A-13**) .

❑ Clean using a wire brush and **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products):

- the front brake calliper mountings,
- the front brake callipers,
- the brake discs.



123095

❑ Push the piston (after coating it with grease from the repair kit) using the (**1**) until it is at the end of its bore.

❑ **parts always to be replaced: Front brake calliper guide pin bolt**.

❑ Always replace the noise-reducing fins.

II - REFITTING OPERATION

❑ Refit the noise-reducing fins.

❑ Install the brake pads starting from the inside.

❑ Tilt the calliper downwards to return it to its original position.

❑ Refit a new guide pin bolt.

❑ Torque tighten the **guide pin bolt (34 N.m)**.

III - FINAL OPERATION

❑ Refit the front wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

IMPORTANT
To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

Equipment required
pedal press

IMPORTANT
Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

I - REMOVAL PREPARATION OPERATION

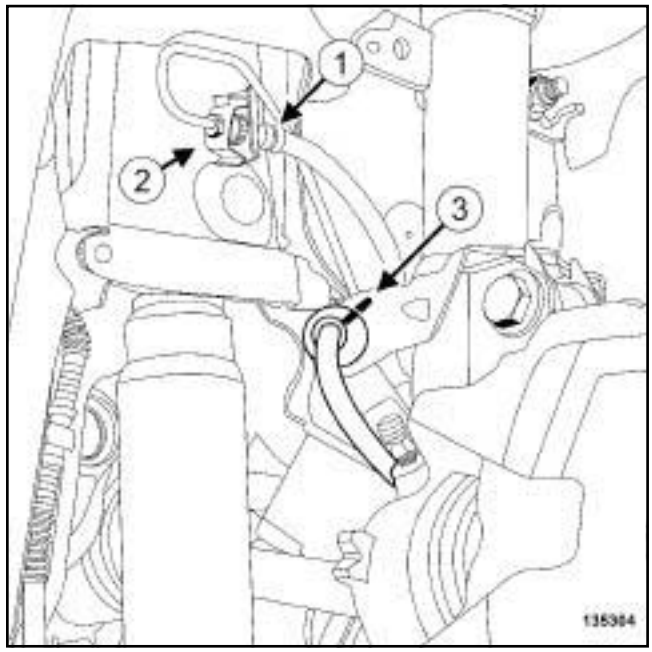
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Set the wheels straight ahead.

❏ Position a **pedal press** on the brake pedal to limit the outflow of brake fluid.

❏ Remove the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



135304

❏ Loosen the hose union (**1**) on the rigid pipe union.

❏ Remove the retaining (**2**) fork from the hose.

❏ To avoid the premature damage of the brake hose by friction, observe the following procedure before unclipping the hose:

❏ Set the wheels straight ahead.

❏ Mark the position of the cap on the base of the shock absorber using a permanent marker.

❏ Unclip the brake hose cap (**3**) from the shock absorber base.

❏ Loosen the hose union on the brake calliper.

❏ Remove the brake hose.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏

WARNING

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

❏ Set the wheels straight ahead.

❏ Refit the brake hose at the calliper end.

❏ Torque tighten the brake hose (see **30A**, **General information**, **Brake circuit: Tightening torque**, page **30A-6**)

❏ Clip the brake hose cap on to the base of the shock absorber, aligning the marks made using a permanent marker.

❏ Refit:

- the brake hose on the rigid pipe union,

- the hose retaining fork.

❏ Torque tighten the brake hose union on the rigid pipe union. (see **30A**, **General information**, **Brake circuit: Tightening torque**, page **30A-6**)

II - FINAL OPERATION

❏ Refit the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Remove the **pedal press** from the brake pedal.

❏ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

Equipment required
pedal press

Tightening torques ▽	
guide pin upper bolt	**34 N.m**
brake hose on the calliper	**17 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

WARNING

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

Note:

The callipers supplied as spare parts are pre-filled with brake fluid.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Fit the **pedal press** to the brake pedal to limit the outflow of brake fluid.

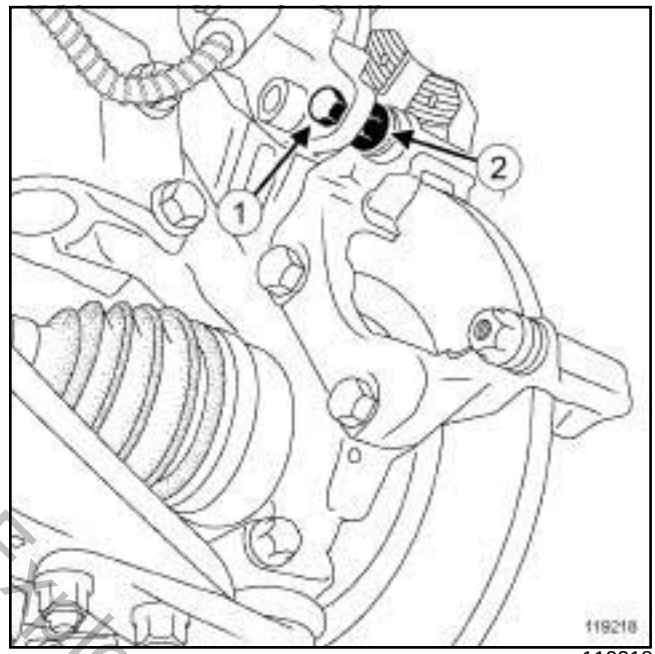
❏ Unlock the steering column.

❏ Remove the front wheel on the side concerned (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

II - REMOVAL OPERATION

❏ Release the brake hose from the front brake calliper.

❏ Remove the brake pads (see **31A**, **Front axle components**, **Front brake pads: Removal - Refitting**, page **31A-3**) .



119218

❏ Remove the guide pin upper bolt (**1**) while holding the nut (**2**) .

❏ Remove:

- the front brake calliper from the hose,
- the front brake calliper.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Check the condition of the gaiter and the calliper piston.

❏ Replace any faulty parts (see **31A**, **Front axle components**, **Front brake calliper: Repair**, page **31A-9**) .

❏ Clean using a wire brush and **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products):

- the calliper supports,
- the callipers.

❏ Always replace the guide pin bolts each time they are removed.

II - REFITTING OPERATION

❏ Without using a tool, screw the calliper to the brake hose as tightly as possible.

❏ Refit the guide pin upper bolt.

❏ Torque tighten the **guide pin upper bolt (34 N.m)**.

❏ Refit the brake pads (see **31A**, **Front axle components**, **Front brake pads: Removal - Refitting**, page **31A-3**) .

❏ Torque tighten the **brake hose on the calliper (17 N.m)**.

III - FINAL OPERATION

❏ Remove the tool **pedal press**.

❏ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

❏ Refit the front wheel on the side concerned (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

IMPORTANT

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

Equipment required
pedal press

IMPORTANT
Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

REPAIR

I - REPAIR PREPARATION OPERATION

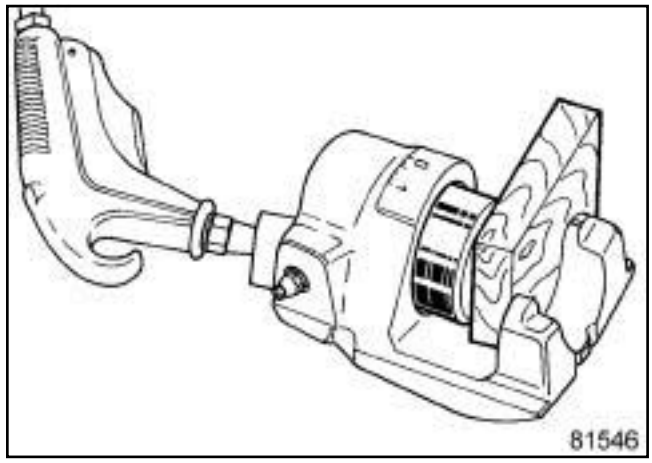
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Position the **pedal press** on the brake pedal to limit the outflow of brake fluid.

❏ Remove:

- the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the front brake calliper (see **31A**, **Front axle components**, **Front brake calliper: Removal - Refitting**, page **31A-7**) .

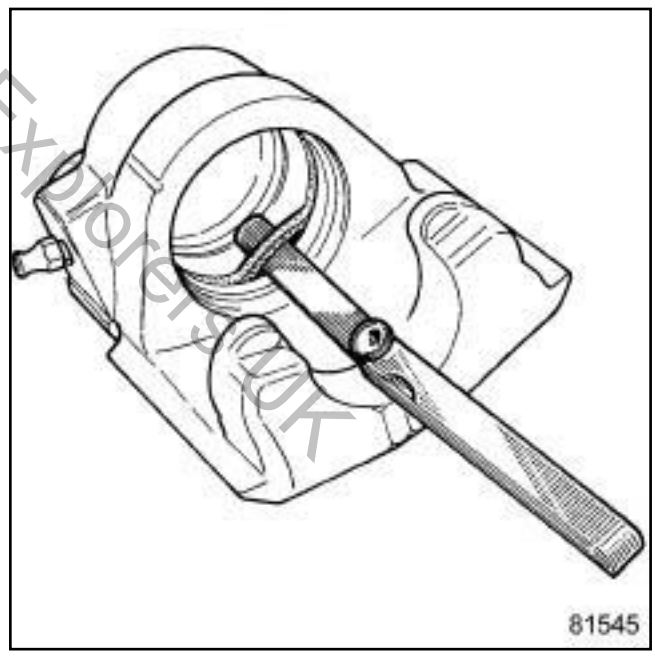
II - REPAIR OPERATION FOR PART CONCERNED



81546

❏ Remove the piston using compressed air, making sure to insert a wooden block between the calliper and the piston to avoid damaging it. Any trace of impact on the end panel will render the piston unfit for use.

❏ Remove the dust seal.



81545

❏ Remove the rectangular section seal from the calliper groove with a round edged spring blade (feeler gauge).

WARNING
The whole calliper must systematically be replaced if there are any scratches in the calliper bore.

❏ Clean the parts using methylated spirit.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the new rectangular section seal in the calliper groove,
- the piston (after having smeared it with the grease supplied in the repair kit) using the,
- the dust seal.

II - FINAL OPERATION.

❑ Refit:

- the brake calliper (see **31A**, **Front axle components**, **Front brake calliper: Removal - Refitting**, page **31A-7**) ,
- the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❑ Remove the **pedal press**.

IMPORTANT
To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

❑ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

Tightening torques ▽	
front brake calliper support bolts	**105 N.m**
guide pin upper bolt	**34 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

WARNING

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

REMOVAL

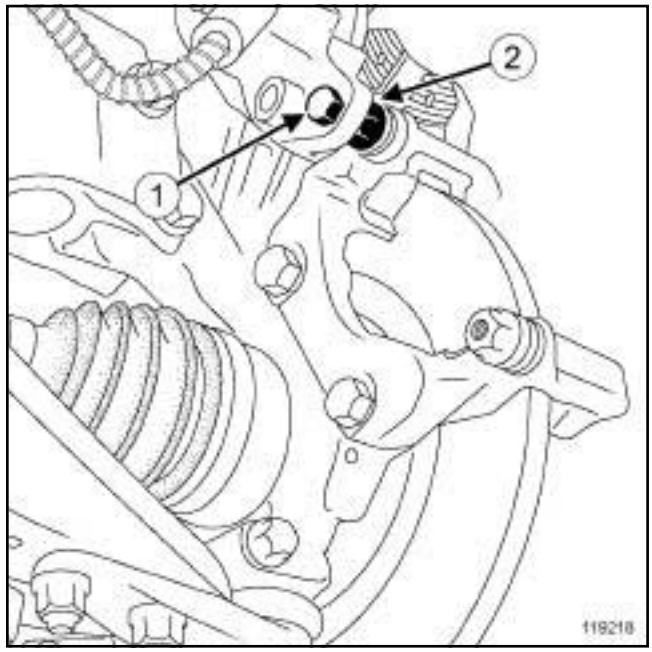
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Unlock the steering column.

❏ Remove:

- the front wheel on the side in question (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the front brake pads (see **31A**, **Front axle components**, **Front brake pads: Removal - Refitting**, page **31A-3**) .

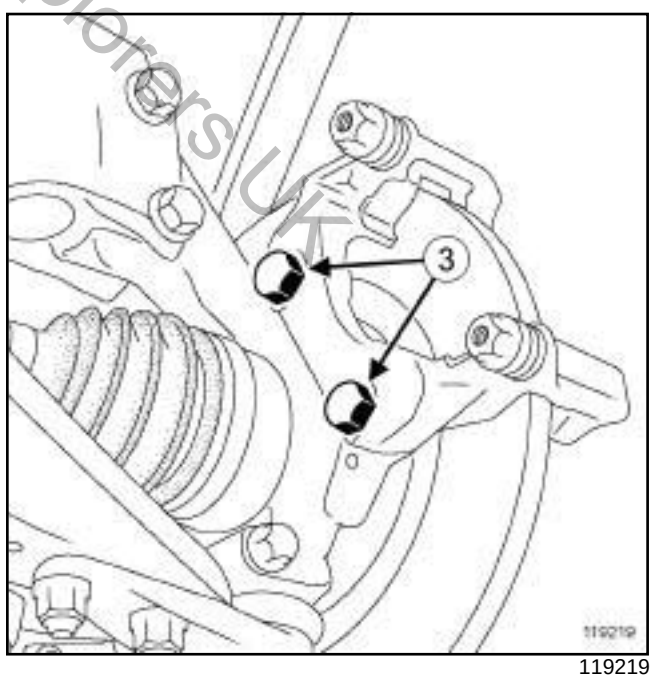


119218

❏ Remove the guide pin upper bolt (**1**) while holding the nut (**2**) .

❏ Suspend the front brake calliper from the suspension spring.

II - REMOVAL OPERATION



119219

❏ Remove:

- the two front brake calliper mounting bolts (**3**) ,
- the front brake calliper mounting.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Clean using a wire brush and **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products):

- the front brake calliper mounting,
- the front brake calliper,
- the hub carrier.

❑ **parts always to be replaced: Front brake calliper mounting bolt**

❑ Coat the calliper mounting bolts with **HIGH STRENGTH THREAD LOCK** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) before fitting them.

❑ **parts always to be replaced: Front brake calliper guide pin bolt**.

II - REFITTING OPERATION

❑ Refit:

- the front brake calliper mounting,
- the front brake calliper mounting bolts.

❑ Torque tighten the **front brake calliper support bolts (105 N.m)**.

III - FINAL OPERATION

❑ Refit the guide pin upper bolt.

❑ Torque tighten the **guide pin upper bolt (34 N.m)**.

❑ Refit:

- the front brake pads (see **31A**, **Front axle components**, **Front brake pads: Removal - Refitting**, page **31A-3**) .
- the front wheel on the side concerned (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**)

IMPORTANT
To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

WHEEL DISC PROTECTOR

Tightening torques ▽	
bolts of the front brake disc protector	7 N.m

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

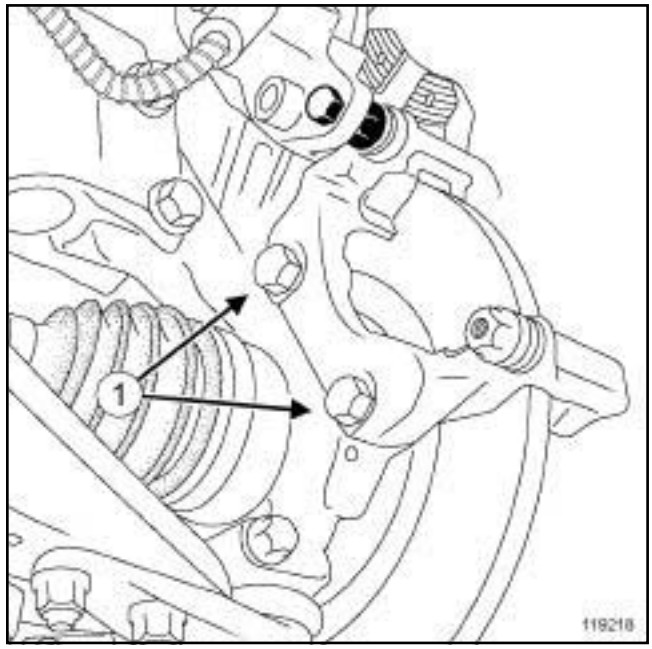
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the front brake pads (see **31A**, **Front axle components**, **Front brake pads: Removal - Refitting**, page **31A-3**) ,
- the front brake disc (see **31A**, **Front axle components**, **Front brake disc: Removal - Refitting**, page **31A-15**) .

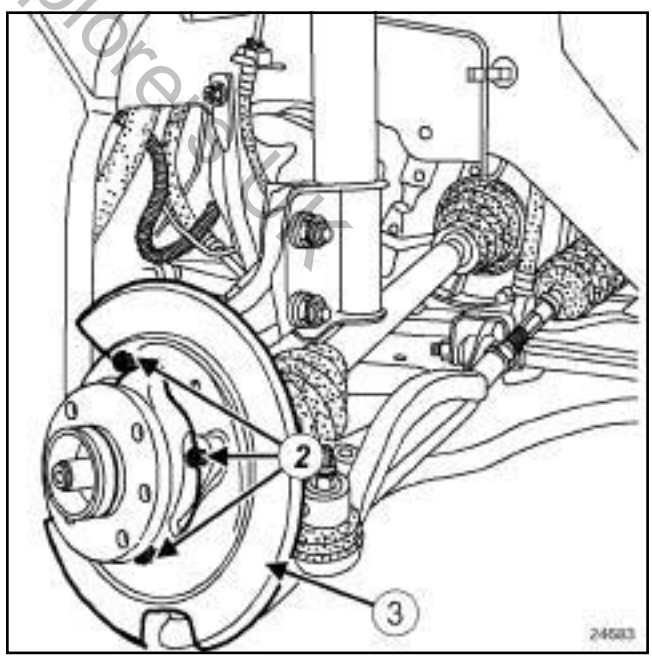


119218

❏ Remove the calliper mounting bolts (**1**) .

❏ Attach the « calliper mounting - brake calliper » assembly to the suspension spring.

II - REMOVAL OPERATION



24683

❏ Remove:

- the front brake disc protector bolts (**2**) ,
- the front brake disc protector (**3**) .

WHEEL DISC PROTECTOR

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Using a wire brush and **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) clean the hub carrier.

II - REFITTING OPERATION

❑ Refit the brake disc protector.

❑ Torque tighten the **bolts of the front brake disc protector (7 N.m)**.

III - FINAL OPERATION

❑ Refit:

- the front brake disc (see **31A**, **Front axle components**, **Front brake disc: Removal - Refitting**, page **31A-15**) ,
- the « calliper mounting - brake calliper » assembly (see **31A**, **Front axle components**, **Front brake calliper mounting: Removal - Refitting**, page **31A-11**) ,
- the front brake pads (see **31A**, **Front axle components**, **Front brake pads: Removal - Refitting**, page **31A-3**) ,
- the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

IMPORTANT
To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

Equipment required
indelible pencil
parts washer

Brake discs cannot be reground. If there is excessive scoring or wear, they will need to be replaced (see **30A**, **General information**, **Brake: Specifications**, page **30A-13**) .

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see **30A**, **General information**, **Brake circuit: Precautions for the repair**, page **30A-2**) (30A, General information),
- (see **Vehicle: Precautions for the repair**) (01D, Mechanical introduction).

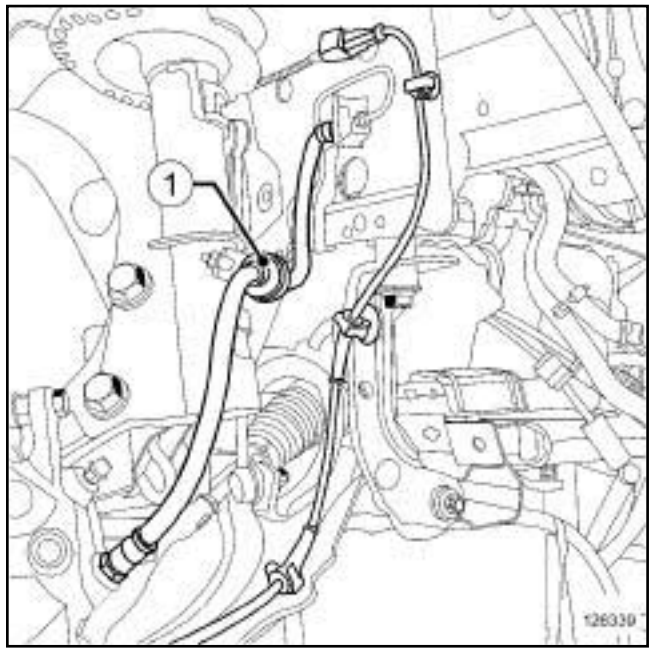
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Set the wheels straight ahead.

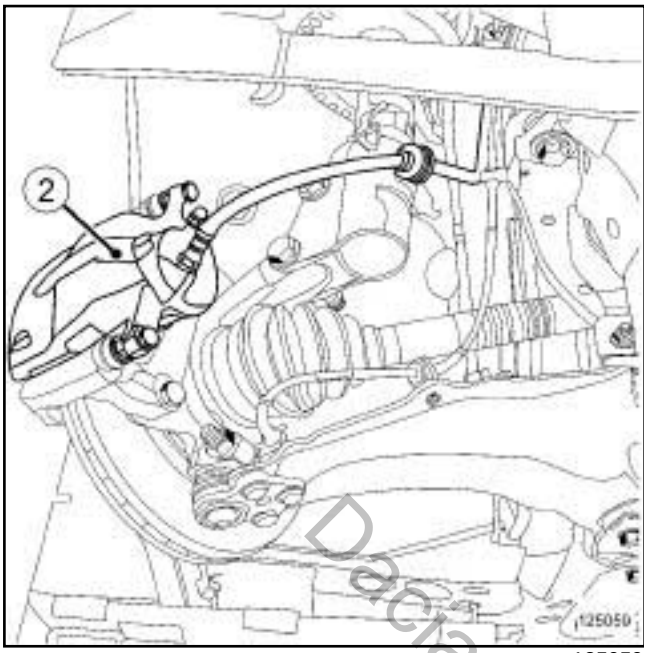
❑ Remove the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .



126339

❑ Mark the position of the cap (**1**) on the base of the shock absorber using a **indelible pencil**.

❑ Unclip the cap (**1**) from the base of the shock absorber.



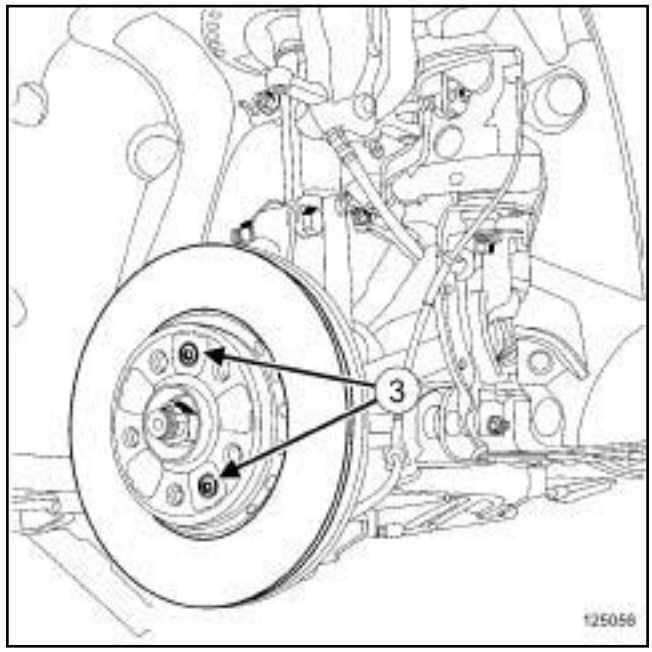
125059

❏ Remove the brake pads (see **31A**, **Front axle components**, **Front brake pads: Removal - Refitting**, page **31A-3**)

❏ Remove the "brake calliper mounting - brake calliper" assembly (**2**) (see **31A**, **Front axle components**, **Front brake calliper mounting: Removal - Refitting**, page **31A-11**) .

❏ Hang the "brake calliper mounting - brake calliper" assembly (**2**) on the suspension spring.

II - OPERATION FOR REMOVAL OF PART CONCERNED



125056

❏ Remove:

- the brake disc bolt or bolts (**3**) ,

- the brake disc.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Clean the brake discs using a **parts washer**.

❏ Dry the surface of the discs.

❏ Clean the mating faces of the disc on the hub using a wire brush and **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❏ **parts always to be replaced: Front brake disc bolt**

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the brake disc with new bolts.

❏ Torque tighten the new disc mounting bolts (see **30A**, **General information**, **Brake circuit: Tightening torque**, page **30A-6**)

III - FINAL OPERATION

❏ Refit the "brake calliper mounting - brake calliper" assembly (see **31A**, **Front axle components**, **Front brake calliper mounting: Removal - Refitting**, page **31A-11**) .

❏ Refit the brake pads (see **31A**, **Front axle components**, **Front brake pads: Removal - Refitting**, page **31A-3**)

❏ Set the wheels straight ahead.

❏ Clip the cap on the base of the shock absorber while aligning the marks made with a **indelible pencil**.

WARNING

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

❏ Refit the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

IMPORTANT

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

❏ Advise the customer to run-in the brake pads (no harsh braking).

I - PREPARATION OPERATION FOR CHECK

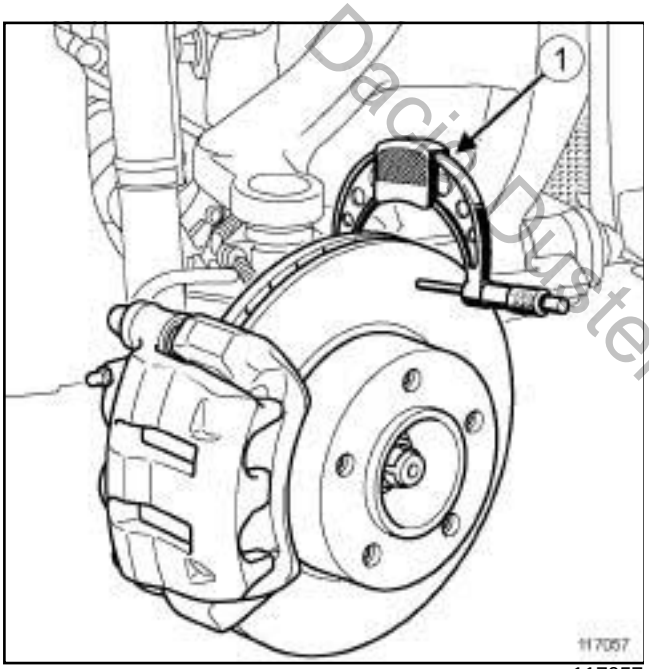
Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

Remove the wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

II - CHECKING OPERATION FOR PART CONCERNED

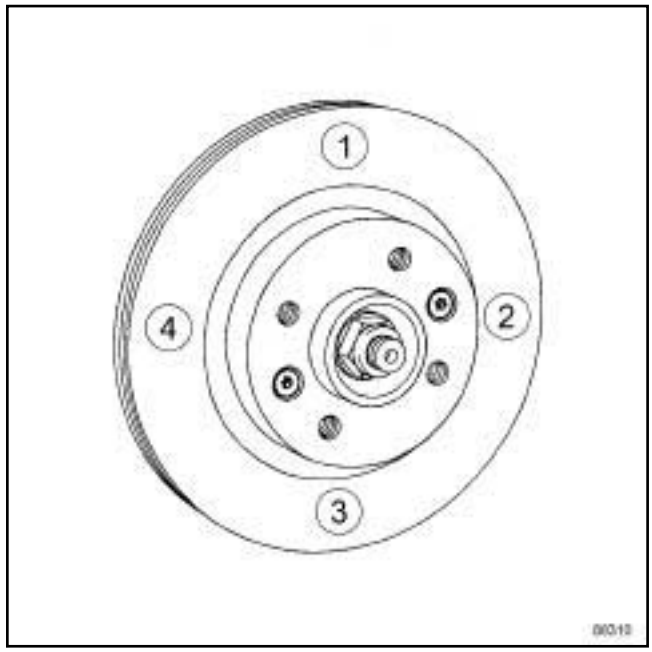
Note:

Use a Palmer type tool to check the thickness of the disc.



117057

Position the Palmer tool (**1**) to measure the disc thickness.



88310

Measure the thickness of the disc at 4 points in order (90˚ apart).

Compare the values with those recommended by the manufacturer (see **30A**, **General information**, **Brake: Specifications**, page **30A-13**) .

III - FINAL OPERATION

Replace the discs if necessary (see **31A**, **Front axle components**, **Front brake disc: Removal - Refitting**, page **31A-15**) .

Refit the wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

Equipment required
pedal press

Tightening torques ▽	
brake pipe unions on the hydraulic unit	**14 N.m**
brake pipe unions on the master cylinder	**14 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

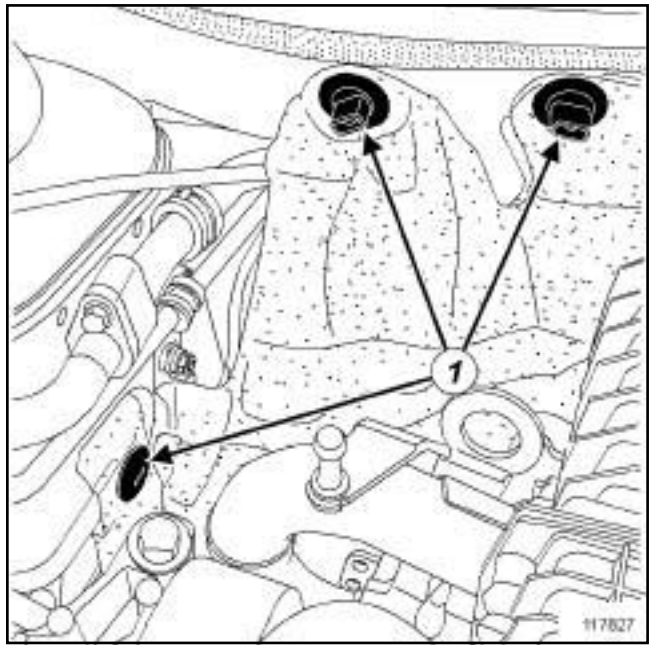
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Position a **pedal press** on the brake pedal to limit the outflow of brake fluid.

❑ Remove the front engine cover (if fitted to the vehicle).

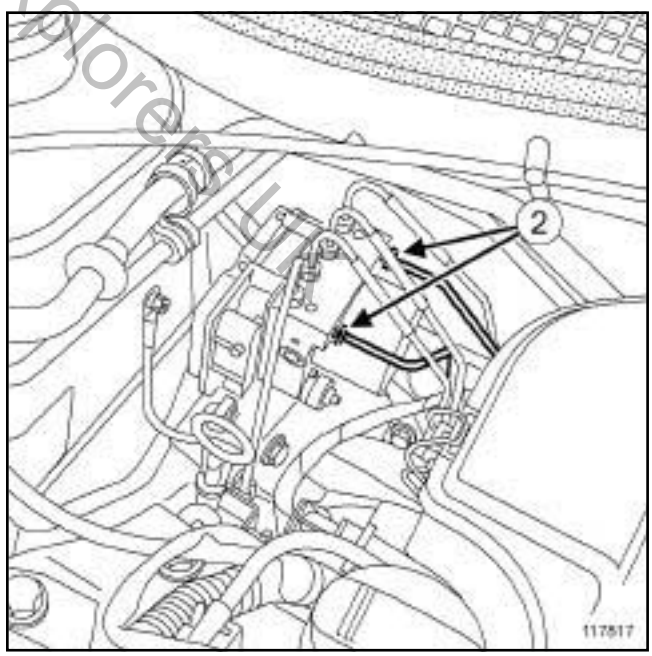


117827

❑ Remove the soundproofing clips (**1**) (if fitted to the vehicle).

❑ Move the soundproofing to one side in order to see the pipes.

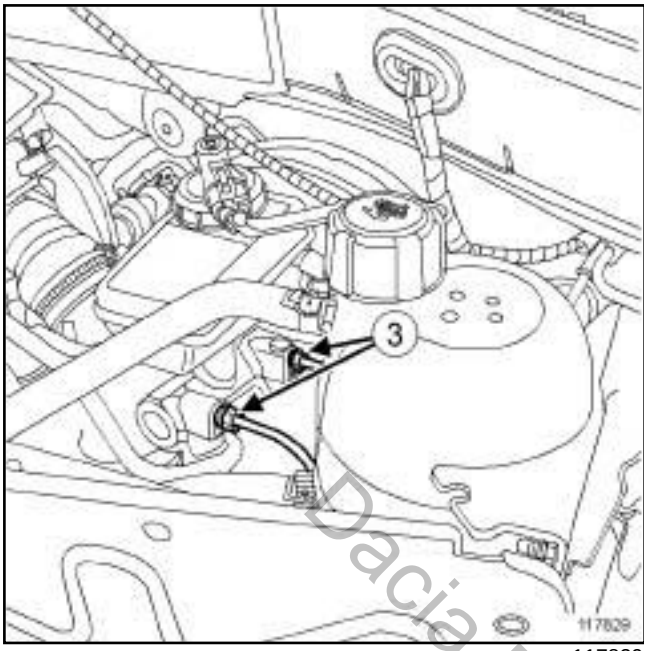
II - REMOVAL OPERATION



117817

❑ Undo the brake pipe unions (**2**) on the hydraulic unit.

❑ Detach the brake pipes.



117829

❏ Undo the brake pipe unions (**3**) on the master cylinder.

❏ Remove the brake pipes between the hydraulic unit and master cylinder.

REFITTING

I - REFITTING OPERATION

❏ Refit the brake pipes between the hydraulic unit and master cylinder.

❏ Clip the brake pipes onto the bulkhead.

❏ Screw on:

- the brake pipe unions on the hydraulic unit,
- the brake pipe unions on the master cylinder.

❏ Torque tighten:

- the **brake pipe unions on the hydraulic unit (14 N.m)**,
- the **brake pipe unions on the master cylinder (14 N.m)**.

II - FINAL OPERATION

❏ Refit:

- the soundproofing on the bulkhead (if fitted to the vehicle),
- the soundproofing mounting clips,
- the front engine cover (if fitted to the vehicle).

❏ Remove the **pedal press**.

❏ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

Equipment required
pedal press

Tightening torques ▽	
brake pipe unions on the hydraulic unit	**14 N.m**
brake pipe unions on the underbody unions	**14 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

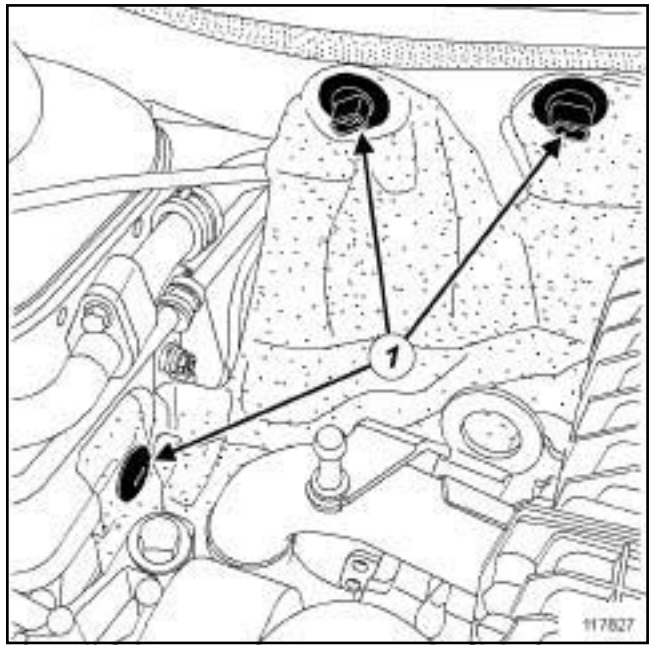
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Position a **pedal press** on the brake pedal to limit the outflow of brake fluid.

❑ Remove the front engine cover (if fitted to the vehicle).

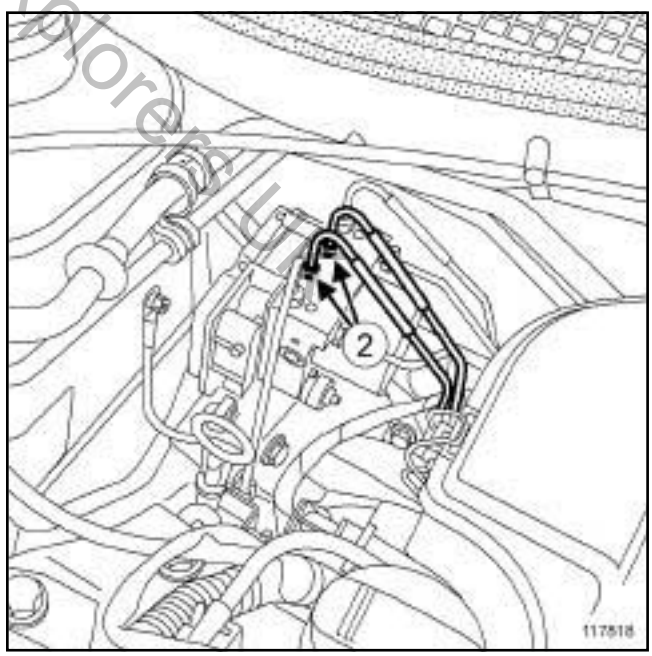


117827

❑ Remove the soundproofing clips (**1**) (if fitted to the vehicle).

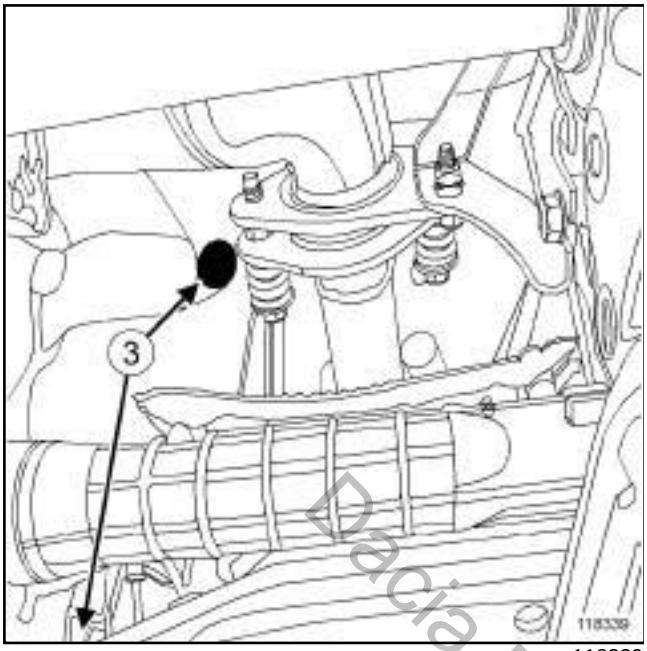
❑ Move the soundproofing to one side in order to see the pipes.

II - REMOVAL OPERATION



117818

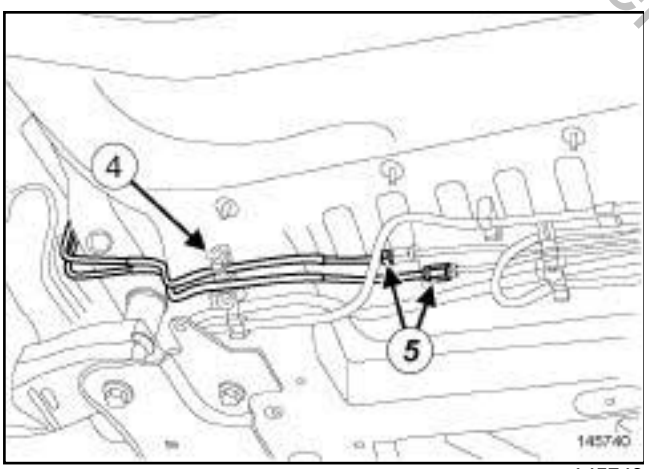
❑ Unscrew the brake pipe unions (**2**) on the hydraulic unit.



118339

❏ Remove the two bulkhead soundproofing clips (**3**) .

❏ Move aside the soundproofing to reveal the underbody pipe unions.



145740

❏ Detach the brake pipes from their clips (**4**) .

❏ Unscrew the pipe unions (**5**) on the hydraulic unit.

❏ Remove the brake pipes between the hydraulic unit and underbody unions.

REFITTING

I - REFITTING OPERATION

❏ Refit the brake pipes between the hydraulic unit and underbody unions.

❏ Screw on:

- the brake pipe unions on the hydraulic unit,
- the brake pipe unions on the underbody unions.

❏ Torque tighten:

- the **brake pipe unions on the hydraulic unit (14 N.m)**,
- the **brake pipe unions on the underbody unions (14 N.m)**.

II - FINAL OPERATION

❏ Fit the bulkhead soundproofing.

❏ Refit:

- the soundproofing mounting clips (if fitted to the vehicle),
- the front engine cover (if fitted to the vehicle).

❏ Remove the **pedal press**.

❏ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

Equipment required
pedal press

Tightening torques ▽	
brake pipe union on the hydraulic unit	**14 N.m**
brake pipe union on the brake hose	**14 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

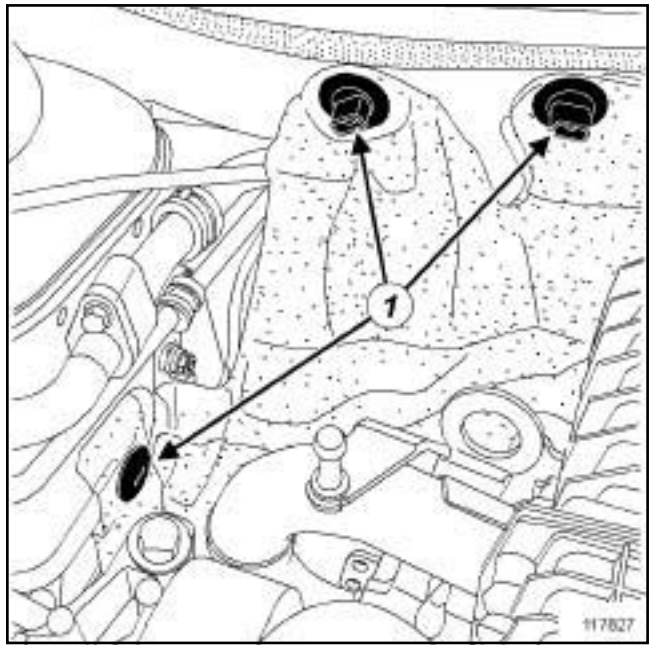
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Position a **pedal press** on the brake pedal to limit the outflow of brake fluid.

❏ Remove:

- the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the front engine cover (if fitted to the vehicle).

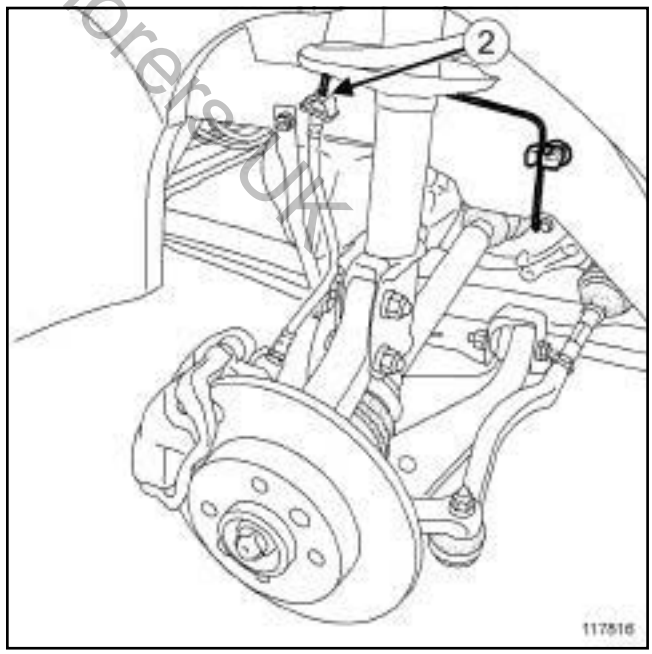


117827

❏ Remove the soundproofing clips (**1**) (if fitted to the vehicle).

❏ Move the soundproofing to one side in order to see the pipes.

II - REMOVAL OPERATION

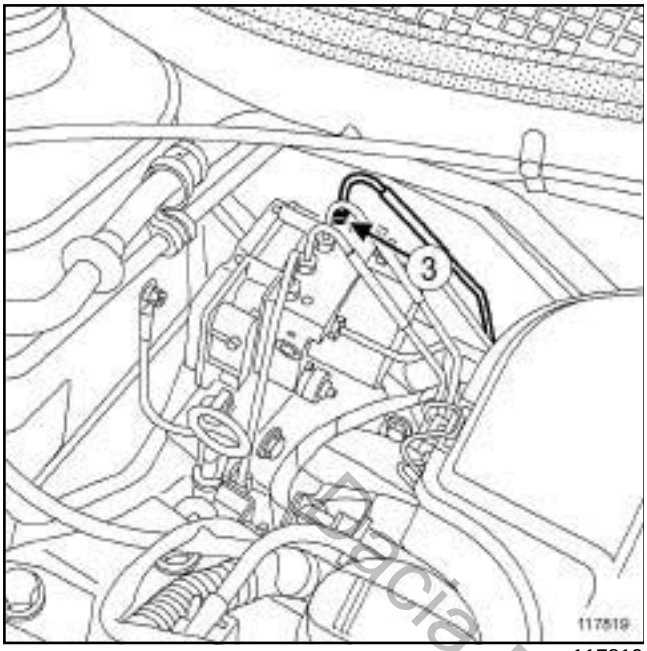


117816

❏ Undo the brake pipe union (**2**) on the brake hose.

❏ Remove the brake pipe from the retaining bracket.

❏ Detach the brake pipe.



117819

❏ Undo the brake pipe union (**3**) on the hydraulic unit.

❏ Remove the brake pipes between the hydraulic unit and front left-hand brake hose.

REFITTING

I - REFITTING OPERATION

❏ Refit the brake pipe between the hydraulic unit and front left-hand brake hose.

❏ Attach the brake pipe.

❏ Refit:

- the brake pipe union on the front left-hand brake hose,
- the brake pipe union on the hydraulic unit.

❏ Torque tighten:

- the **brake pipe union on the hydraulic unit (14 N.m)**,
- the **brake pipe union on the brake hose (14 N.m)**.

II - FINAL OPERATION

❏ Refit the bulkhead soundproofing.

❏ Refit:

- the soundproofing clips (if fitted to the vehicle),
- the front engine cover (if fitted to the vehicle).

❏ Remove the **pedal press**.

❏ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

❏ Refit the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**)

Equipment required
pedal press

Tightening torques ▽	
brake pipe union on the hydraulic unit	**14 N.m**
brake pipe union on the brake hose	**14 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

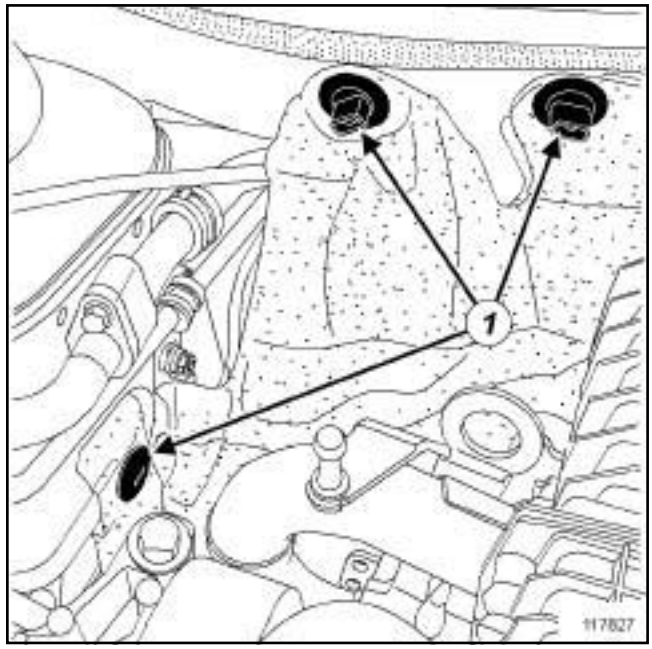
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment.

❏ Fit a **pedal press** in order to limit the outflow of brake fluid.

❏ Remove:

- the front right-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the front engine cover (if fitted to the vehicle).

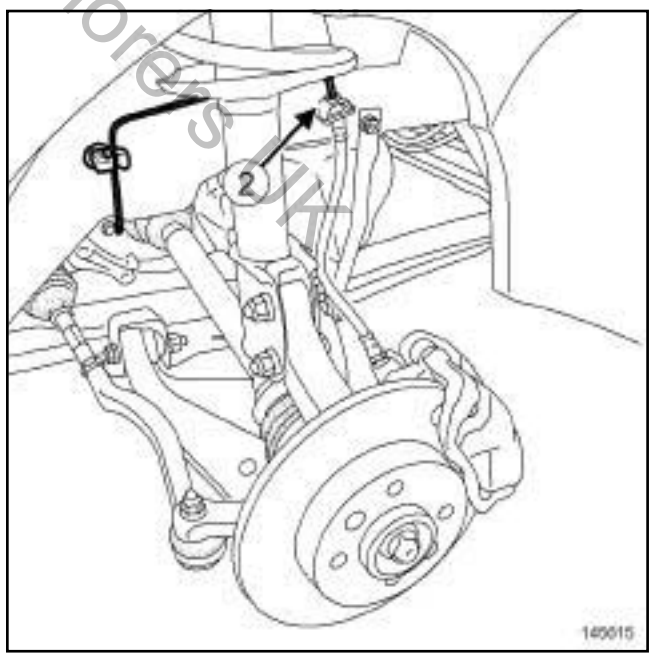


117827

❏ Remove the soundproofing clips (**1**) (if fitted to the vehicle).

❏ Move the soundproofing to one side in order to see the pipes.

II - REMOVAL OPERATION

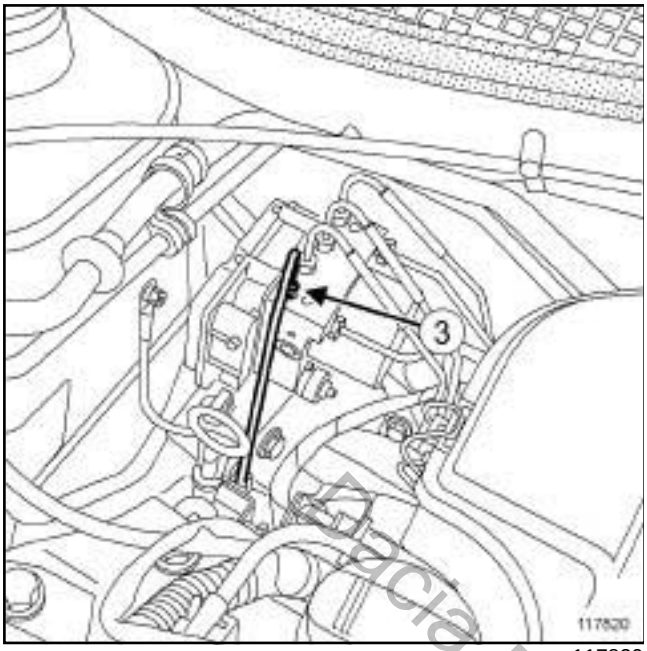


145615

❏ Undo the brake pipe union (**2**) on the brake hose.

❏ Remove the brake pipe from the retaining bracket.

❏ Detach the brake pipe.



117820

❏ Undo the brake pipe union (**3**) on the hydraulic unit.

❏ Remove the brake pipe between the hydraulic unit and front right-hand brake hose.

REFITTING

I - REFITTING OPERATION

❏ Refit the brake pipe between the hydraulic unit and front right-hand brake hose.

❏ Attach the brake pipe.

❏ Refit:

- the brake pipe union on the front right-hand brake hose,
- the brake pipe union on the hydraulic unit.

❏ Torque tighten:

- the **brake pipe union on the hydraulic unit (14 N.m)**,
- the **brake pipe union on the brake hose (14 N.m)**.

II - FINAL OPERATION

❏ Refit the bulkhead soundproofing.

❏ Refit:

- the soundproofing clips (if fitted to the vehicle),
- the front engine cover (if fitted to the vehicle).

❏ Remove the **pedal press**.

❏ Bleed the braking circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

❏ Refit the front right-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

Tightening torques ▽	
shock absorber base bolts	**105 N.m**
nut or bolt of the lower ball joint	**62 N.m**
track rod end nut	**37 N.m**
hub nut	**280 N.m**
brake calliper mounting bolts	**105 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) ,
- (see **Vehicle: Precautions for the repair**) (01D, Mechanical introduction).

WARNING

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

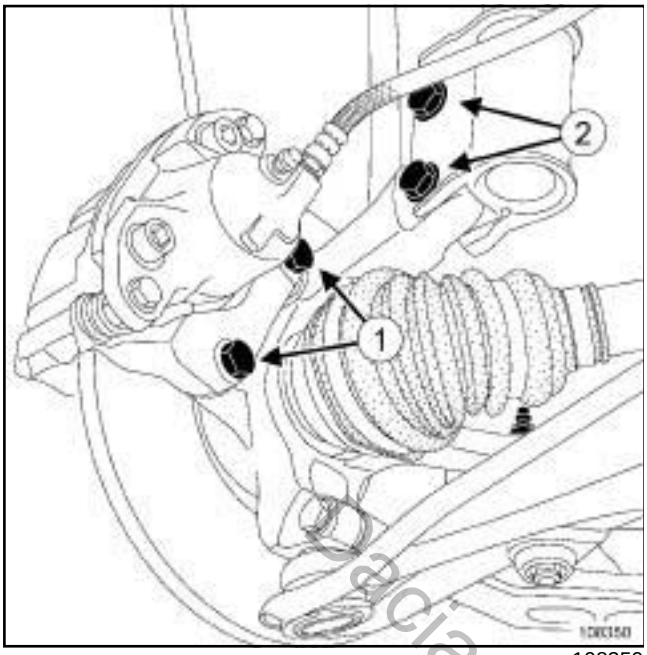
❑ Unlock the steering column.

❑ Remove the front wheel on the side concerned (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

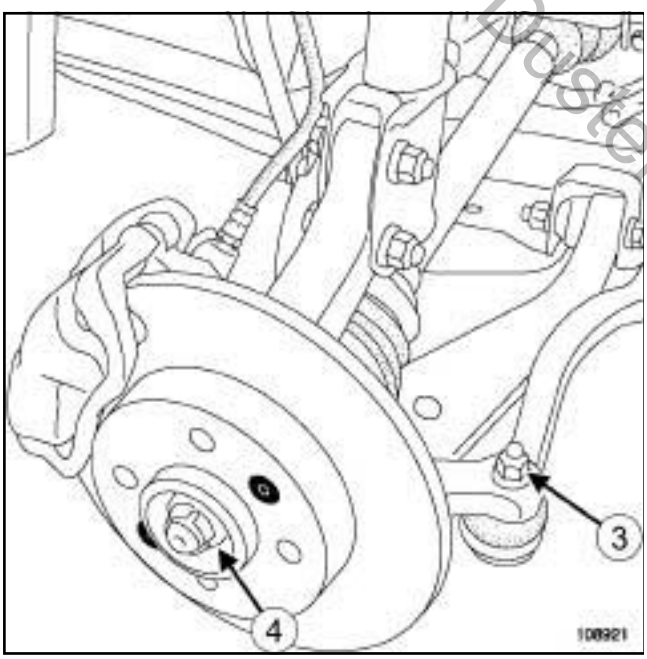
II - REMOVAL OPERATION

ANTI-LOCK BRAKING SYSTEM

❑ Remove the wheel speed sensor (depending on the vehicle equipment) (see **38C**, **Anti-lock braking system**, **Front wheel speed sensor: Removal - Refitting**, page **38C-7**) .



108350



108921

❏ Remove the front brake calliper mounting bolts ***(1)*** .

❏ Suspend the «calliper - front brake calliper mounting » assembly on the suspension spring.

WARNING

In order to prevent irreversible damage to the front hub bearing:

- Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
- Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

❏ Remove:

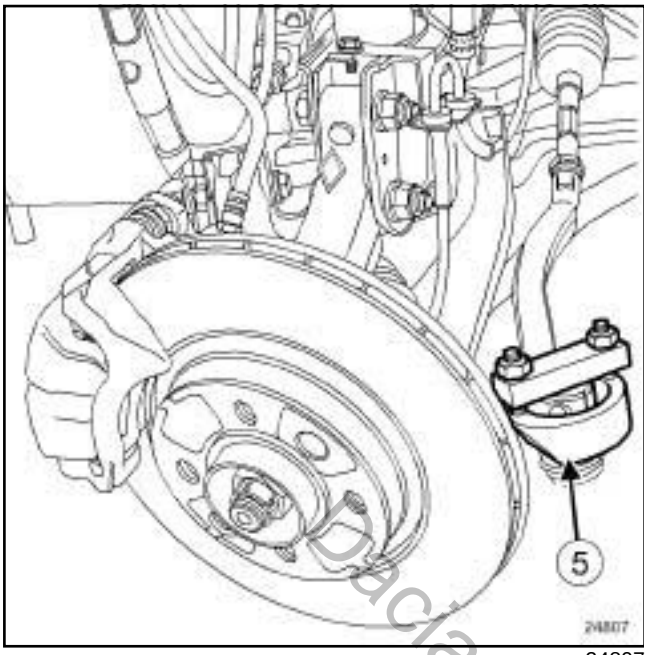
- the hub nut (**4**) using the,
- the front brake disc (see **31A**, **Front axle components**, **Front brake disc: Removal - Refitting**, page **31A-15**) .

WHEEL DISC PROTECTOR

❏ Remove the front brake disc protector (see **31A**, **Front axle components**, **Front brake disc protector: Removal - Refitting**, page **31A-13**) .

❏ Remove:

- the track rod end nut (**3**) ,
- the nut or bolt of the lower ball joint,
- the shock absorber base bolts (**2**) .



24807

❑ Extract the track rod end using the (**5**) .

❑ Push back the front driveshaft from the stub axle carrier using the toolsand.

❑ Remove the front driveshaft hub carrier.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Front wheel hub nut**

❑ **parts always to be replaced: Track rod end nut**

❑ **parts always to be replaced: Front driveshaft lower arm ball joint nut**

❑ **parts always to be replaced: front shock absorber lower nut**

II - REFITTING OPERATION

❑ Refit:

- the front driveshaft hub carrier,
- the track rod end,
- the shock absorber base bolts
- the lower arm ball joint,

WHEEL DISC PROTECTOR

❑ Refit the brake disc protector (see **31A**, **Front axle components**, **Front brake disc protector: Removal - Refitting**, page **31A-13**) .

❑ Refit:

- the brake disc (see **31A**, **Front axle components**, **Front brake disc: Removal - Refitting**, page **31A-15**) ,
- the hub nut.

❑ Use **HIGH STRENGTH THREAD LOCK** (see) (04B, Consumables - Products) to coat the threading of the calliper mounting bolts.

❑ Refit:

- the « calliper - front brake calliper mounting » assembly
- the front brake calliper mounting bolts.

ANTI-LOCK BRAKING SYSTEM

❑ Refit the wheel speed sensor (see **38C**, **Anti-lock braking system**, **Front wheel speed sensor: Removal - Refitting**, page **38C-7**) .

❑ Torque tighten:

- the **shock absorber base bolts (105 N.m)**,
- the **nut or bolt of the lower ball joint (62 N.m)**,
- the **track rod end nut (37 N.m)**,
- the **hub nut (280 N.m)**,
- the **brake calliper mounting bolts (105 N.m)**.

III - FINAL OPERATION

❑ Refit the front wheel on the side concerned (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

IMPORTANT
To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

WARNING

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

WARNING

In order to prevent irreversible damage to the front hub bearing:

- Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
- Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

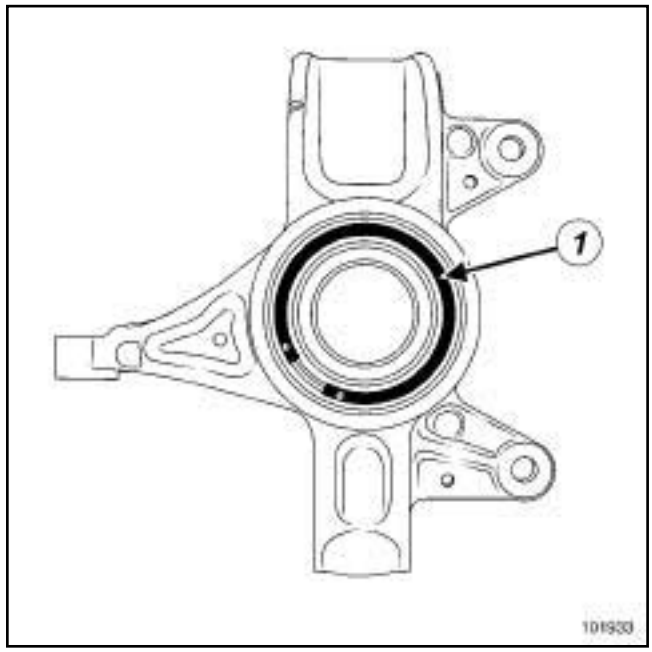
ANTI-LOCK BRAKING SYSTEM

❑ Remove the front wheel speed sensor (see **38C**, **Anti-lock braking system**, **Front wheel speed sensor: Removal - Refitting**, page **38C-7**) .

❑ Remove:

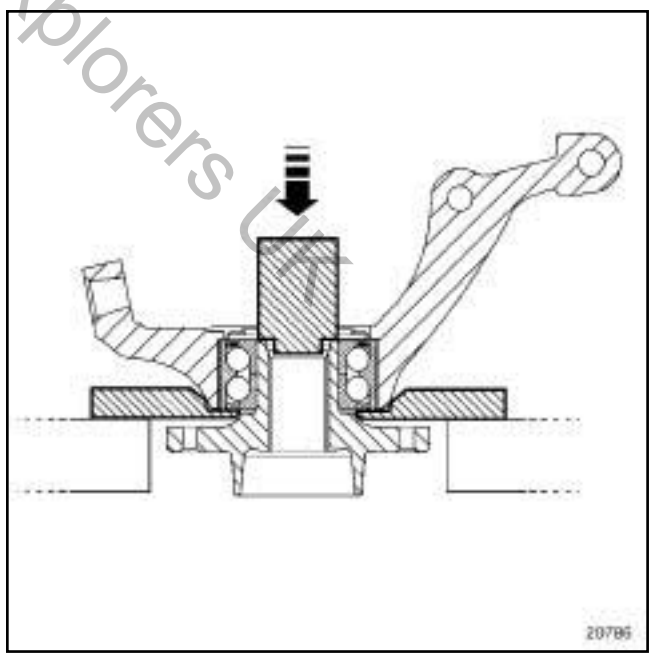
- the front brake disc (see **31A**, **Front axle components**, **Front brake disc: Removal - Refitting**, page **31A-15**) ,
- the front driveshaft hub carrier (see **31A**, **Front axle components**, **Front driveshaft hub carrier: Removal - Refitting**, page **31A-27**) .

II - REMOVAL OPERATION



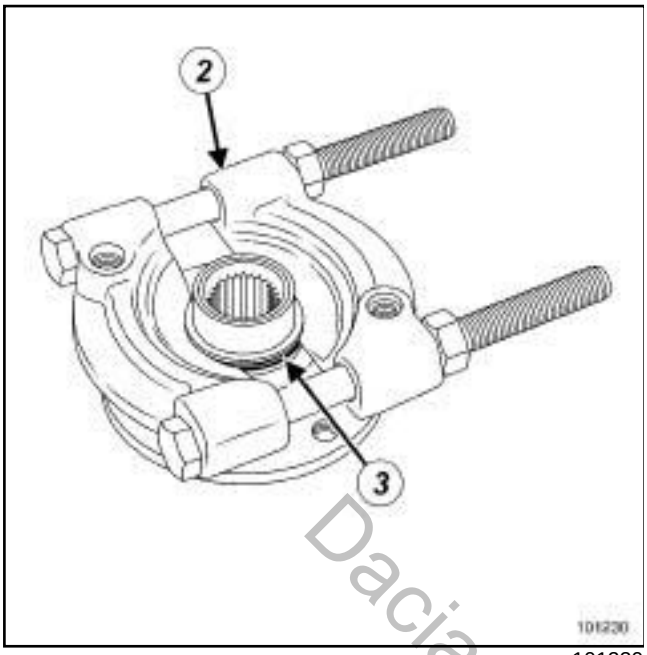
101933

❑ Remove the elastic ring (**1**) from the front driveshaft hub carrier.



20786

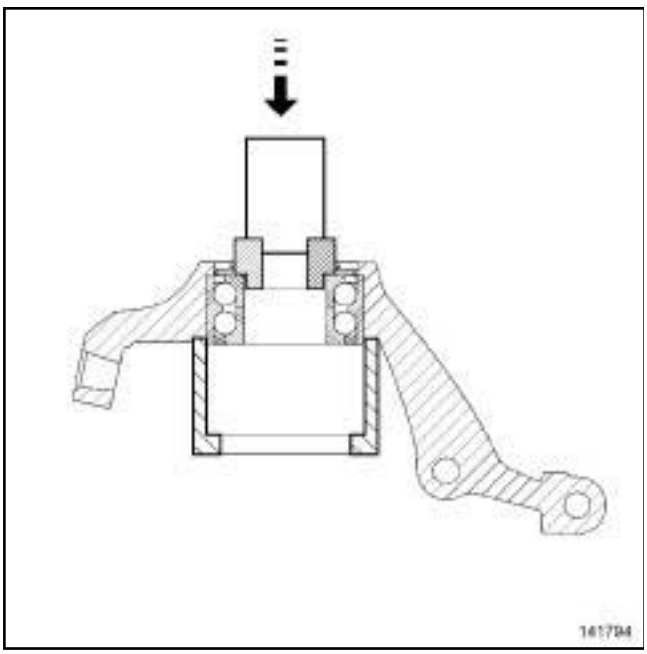
❑ Remove the hub with a press, applying pressure with a tube with an external diameter of **42 mm**.



101230

❑ Place the extractor jaws (**2**) in the groove of the internal bush (**3**) .

❑ Remove the internal bush from the hub, applying pressure on the hub with a tube with an external diameter of **42 mm**.



141794

❑ Remove the bearing from the front hub carrier by applying pressure to the inner bush with a tube with an external diameter of **75 mm**.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Front hub carrier bearing**.

❑ **parts always to be replaced: Front stub axle carrier bearing rubber ring**.

WARNING
To ensure that the wheel speed sensor works properly, do not mark the sensor target on the bearing.

WARNING
Do not press the bearing's internal bush so as to avoid damaging the bearing (very high shrink-fitting force).

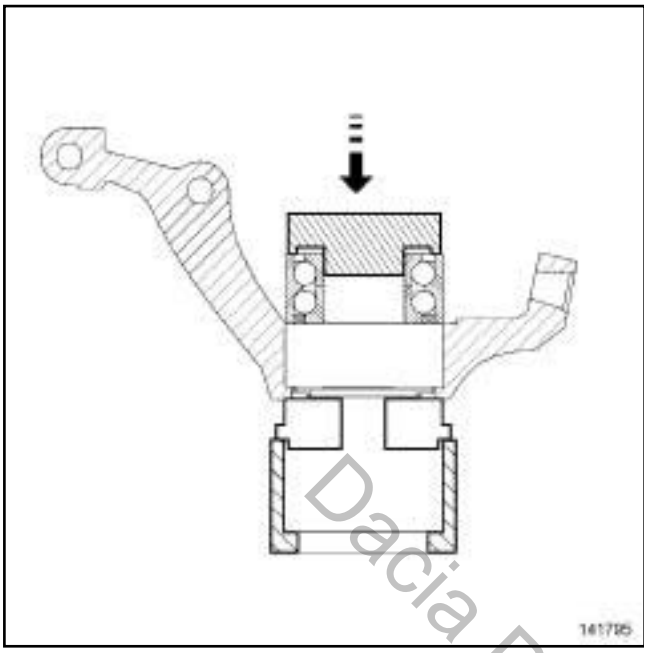
❑ Use **SURFACE CLEANER** (see) (04B, Consumables - Products) to clean:

- the internal and external surfaces of the bearing, in contact with the hub carrier and the hub,
- the hub carrier surfaces in contact with the bearing,
- the hub surfaces in contact with the bearing.

❑ Check the condition of the hub surface and the bore of the hub carrier in contact with the bearing.

❑ Replace any component whose contact surfaces have deep scratches or cracks.

II - REFITTING OPERATION



141795

115568

❑

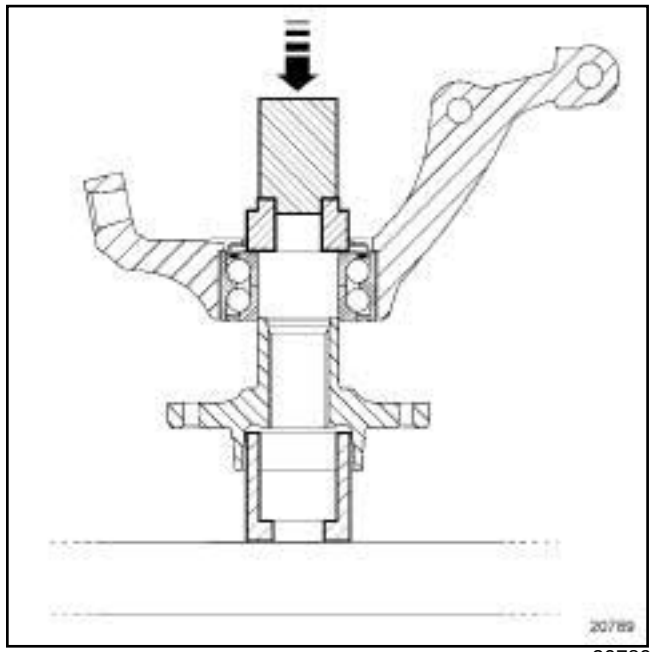
WARNING

To ensure that the wheel speed sensor works properly, do not mark the sensor target (**3**) on the bearing.

❑ Position the sensor target on the bearing towards the vehicle interior.

❑ Apply pressure to the external bush with a tube with an external diameter of **80 mm** and an internal diameter of **75 mm** (old bearing).

❑ Apply a fitting force of **50,000 N** to ensure that the bearing is correctly fitted on the hub carrier shoulder.



20789

❑ Refit:

- the hub using a tube with an external diameter of **55 mm**,
- the elastic ring on the front driveshaft hub carrier.

III - FINAL OPERATION

❑ Proceed in the reverse order to removal.

IMPORTANT

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

Equipment required
indelible pencil
spring compressor

Tightening torques ▽	
internal nut of the shock absorber rod	**62 N.m**
shock absorber nut on the body	**44 N.m**
shock absorber base bolts	**105 N.m**
brake hose mounting bolt	**8 N.m**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

REMOVAL

I - REMOVAL PREPARATION OPERATION

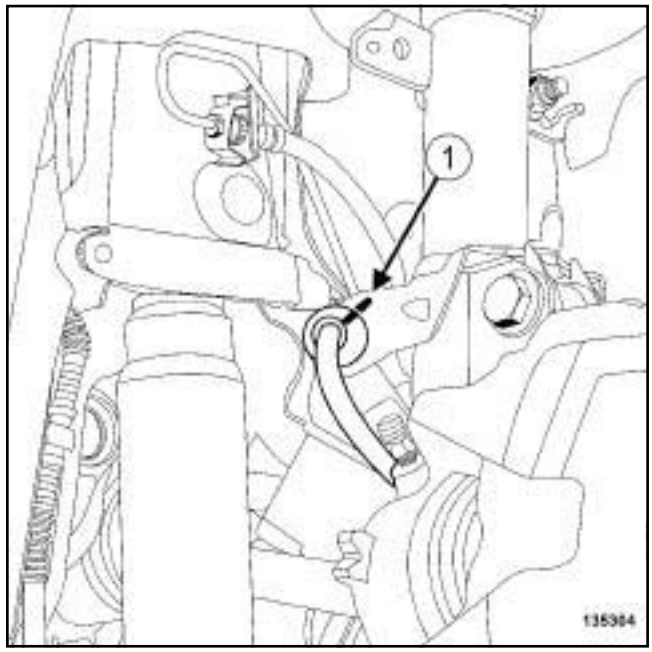
❑ Position the vehicle on a two-post lift (see) (02A, Lifting equipment.

❑ Unlock the steering column.

❑ Remove the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

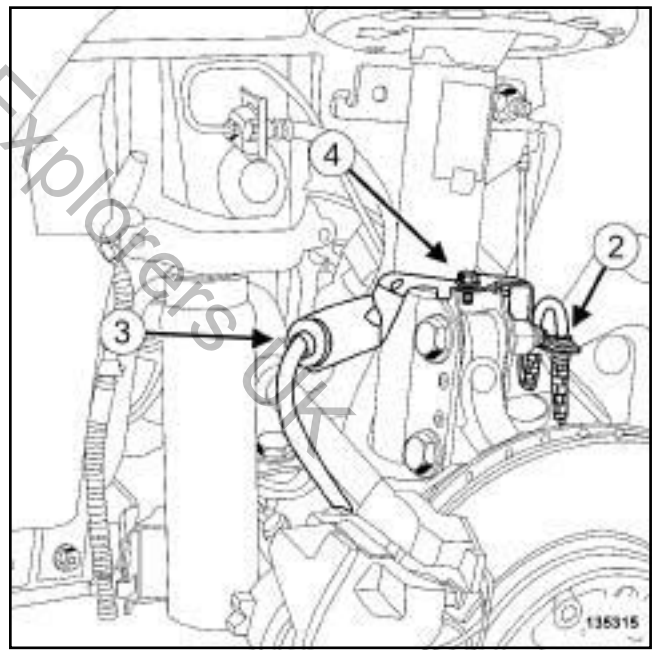
❑

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



135304

❑ Mark the position of the cap on the base of the shock absorber using a **indelible pencil** (**1**) .



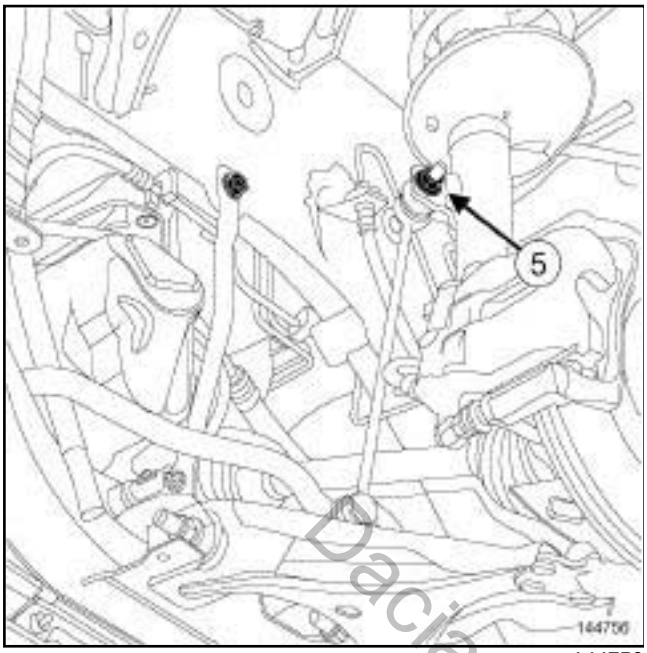
135315

❑ Unclip:

- the wiring (**2**) of the wheel speed sensor from the brake hose mounting,
- the cap (**3**) of the brake hose mounting.

❑ Remove:

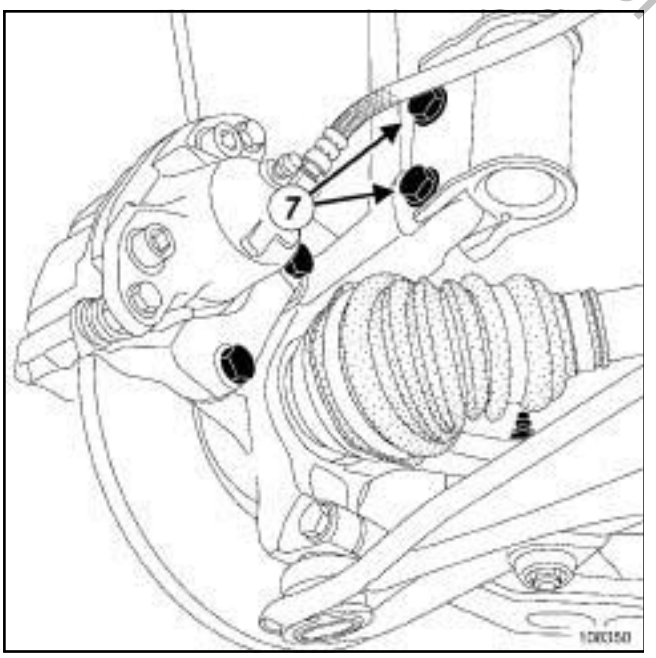
- the bolt (**4**) of the brake hose mounting,
- the brake hose mounting.



144756

❑ Remove the nut (**5**) of the anti-roll bar tie-rod on the shock absorber.

II - REMOVAL OPERATION

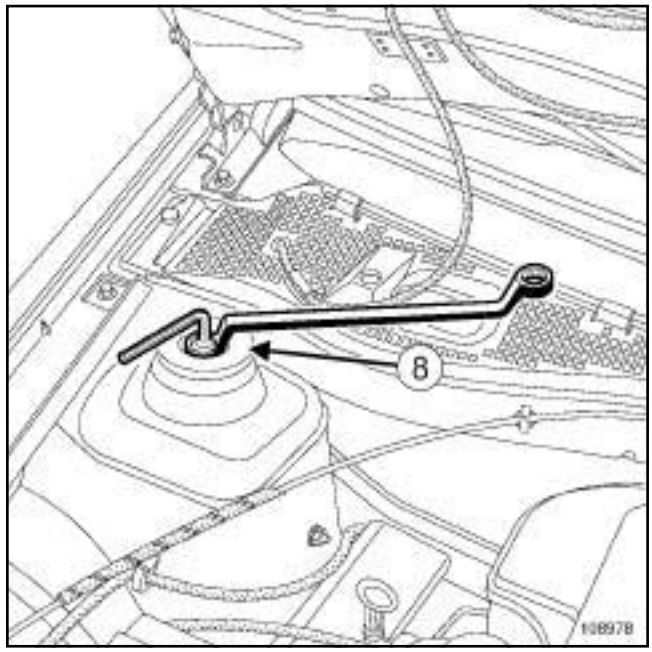


108350

❑ Remove the shock absorber base bolts (**7**) .

❑ Remove the shock absorber base from the stub axle carrier using the hub carrier for support.

❑ Attach the hub carrier to the body.



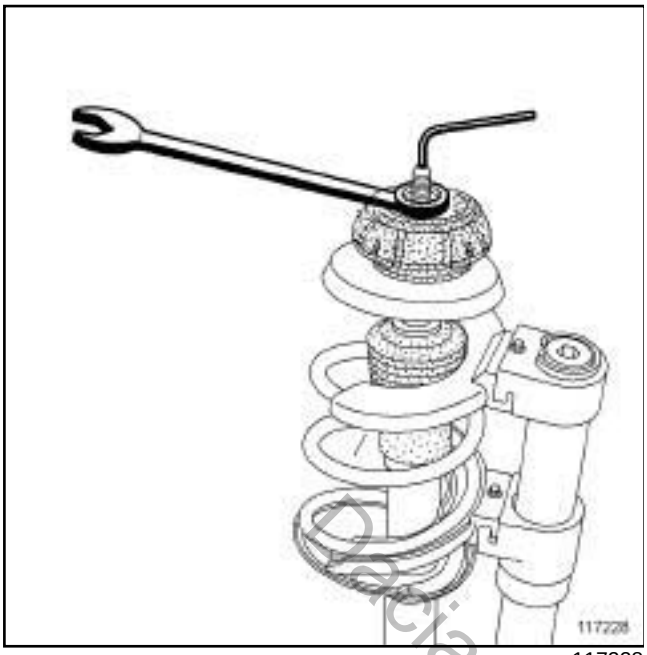
108978

❑ Remove:

- the shock absorber cage with a male Allen key and a ring spanner,
- the cage (**8**) ,
- the « spring - shock absorber » assembly.

❑ Place the appropriate cups on the **spring compressor** and position the assembly on the spring.

❑ Detach the spring from the cups by compressing the spring.



117228

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

❑ Separate the various components which make up the « spring/shock absorber » assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

Note:

When removing or refitting springs, you must not strike the springs, as this could damage their surface treatments.

❑ If necessary, replace any faulty filter unit components (see **31A**, **Front axle components**, **Filter unit assembly: Removal - Refitting**, page **31A-38**) .

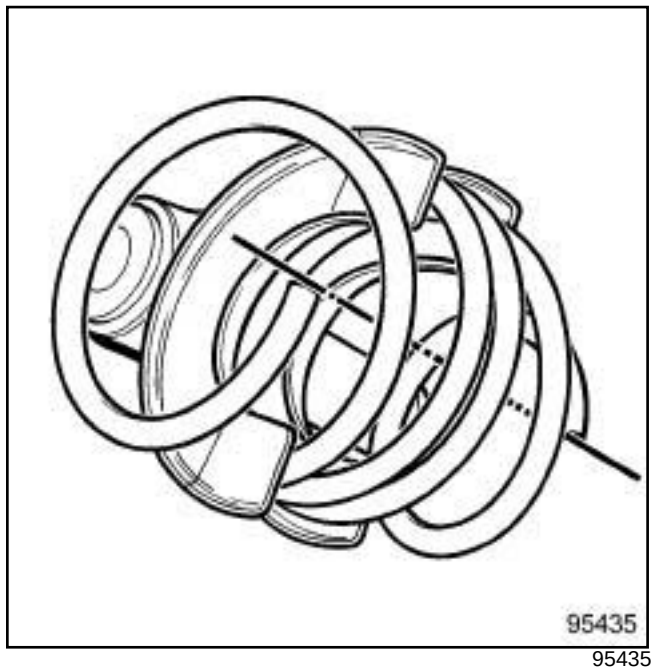
❑ **parts always to be replaced: front shock absorber rod nut**

❑ **parts always to be replaced: Filter unit assembly**

❑ **parts always to be replaced: front anti-roll bar tie-rod nut**

❑ **parts always to be replaced: front shock absorber lower nut**

II - REFITTING OPERATION

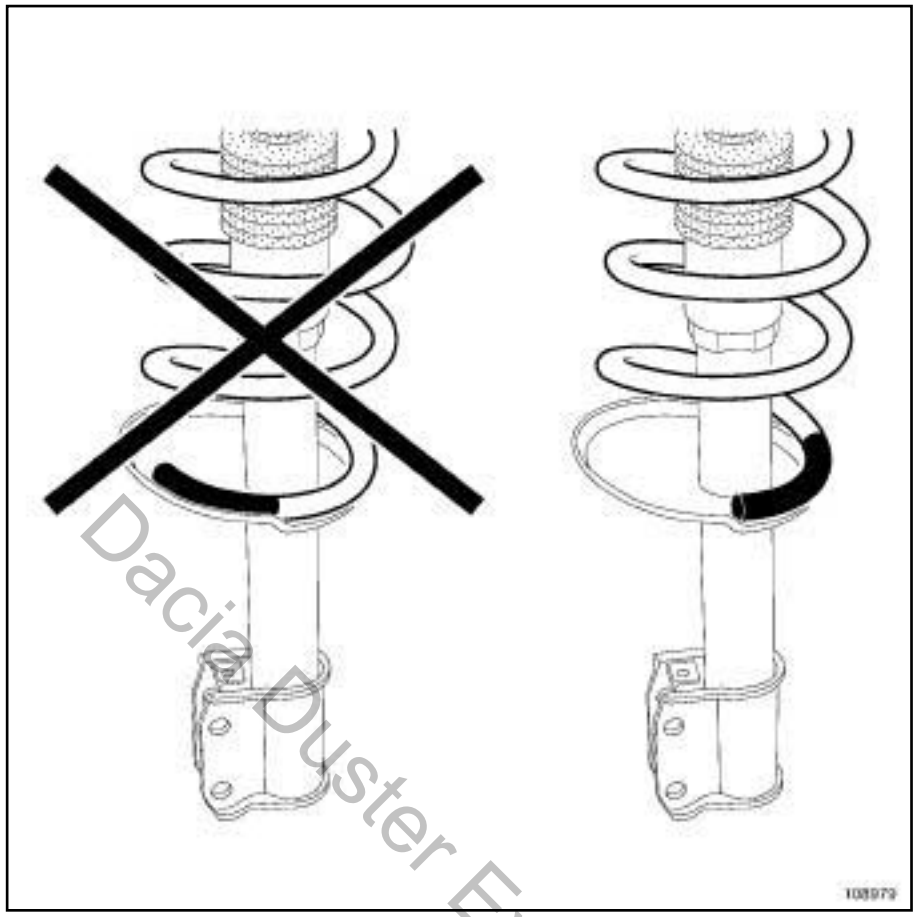


95435

❑ Place the **spring compressor** in a vice.

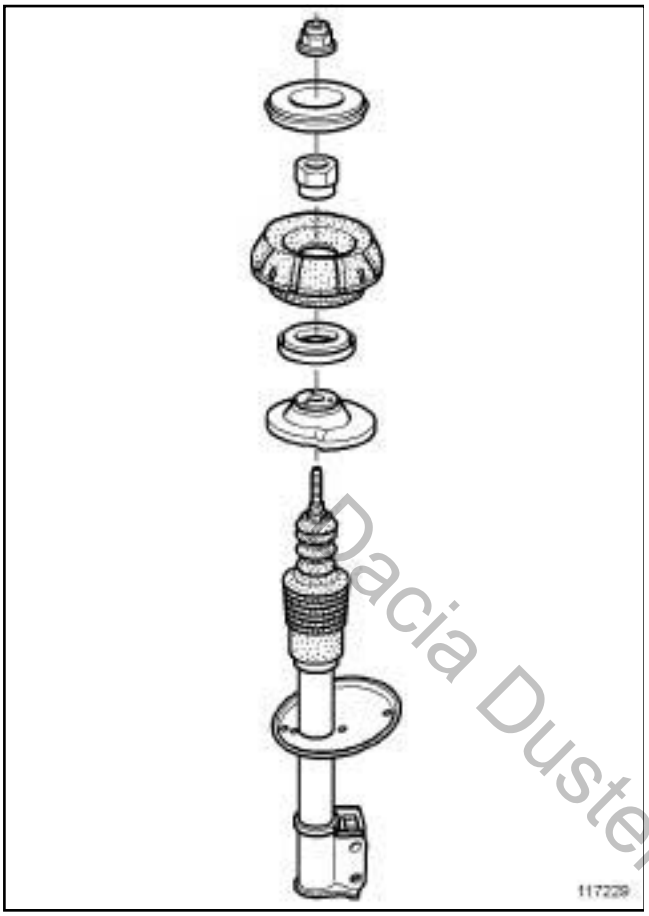
Note:

When replacing the spring for easier fitting, ensure that the positioning and orientation of the spring and the tool cups are correct.



108979

❑ Insert the spring in the neck of the cup.



117229

❏ Respect the order and direction of fitting for the constituent parts.

❏ Torque tighten the **internal nut of the shock absorber rod (62 N.m)**.

❏ Decompress the spring.

❏ Remove the spring compressor.

❏ Refit:

- the « spring/shock absorber » assembly,
- the shock absorber turret ***(8)*** using an Allen key and a ring spanner,
- the shock absorber base on the hub carrier.

❏ Torque tighten:

- the **shock absorber nut on the body (44 N.m)**,
- the **shock absorber base bolts (105 N.m)**.

III - FINAL OPERATION

❏ Refit the brake hose mounting.

❏ Torque tighten the **brake hose mounting bolt (8 N.m)**.

❏ Clip the brake hose cap onto the support.

❏ Clip the speed sensor onto the support.

❏ Refit the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

REMOVAL

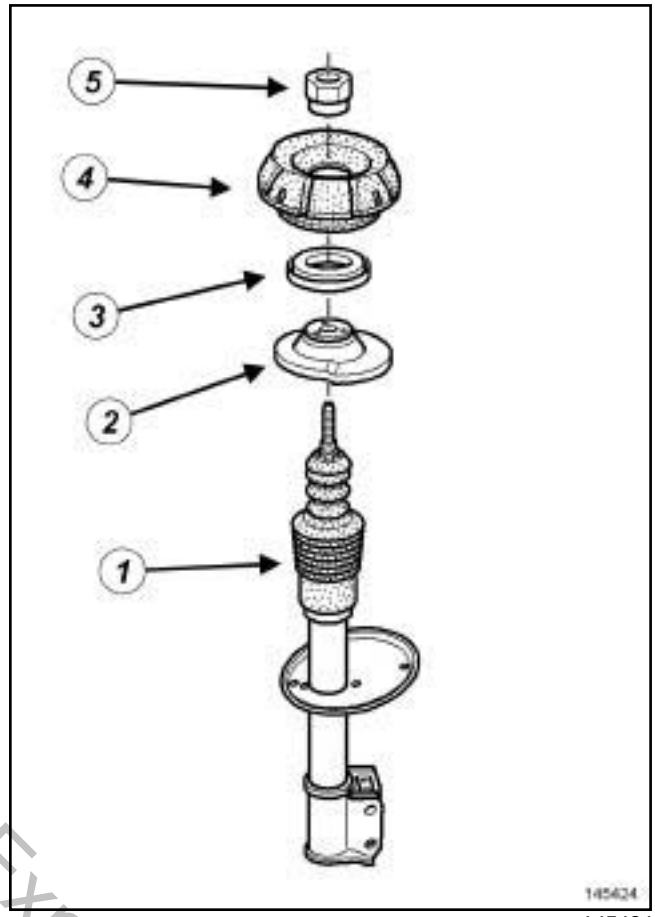
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the front wheel on the side concerned (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the shock absorber (see **31A**, **Front axle components**, **Front shock absorber and spring: Removal - Refitting**, page **31A-33**) .

II - REMOVAL OPERATION



145424

(**1**) Front impact stop
(**2**) Upper cup
(**3**) Shock absorber stop
(**4**) Front filter unit
(**5**) Spacer

❑ Separate the various components of the « spring - shock absorber » assembly.

❑ Visually check the condition of the component parts of the filter unit.

❑ All faulty components must always be replaced.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Fit the components in the order indicated in the illustration.

II - REFITTING OPERATION

❑ Proceed in the reverse order to removal.

Tightening torques ▽	
front and rear bolts mounting the lower arm on the subframe	**180 N.m**
lower arm ball joint nut	**62 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

WARNING

Do not use the lower arm for support with a lifting system.

REMOVAL

I - REMOVAL PREPARATION OPERATION

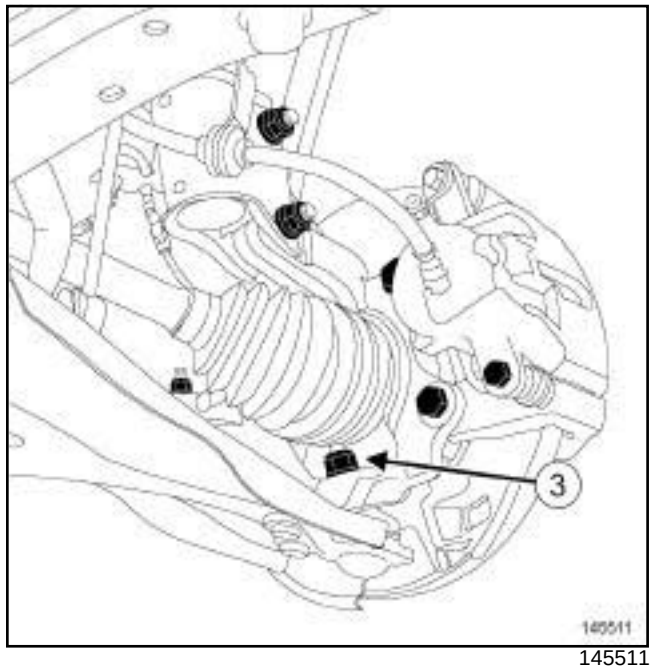
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Unlock the steering column.

❑ Remove:

- the front wheel on the side in question (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the front wheel arch side liner.

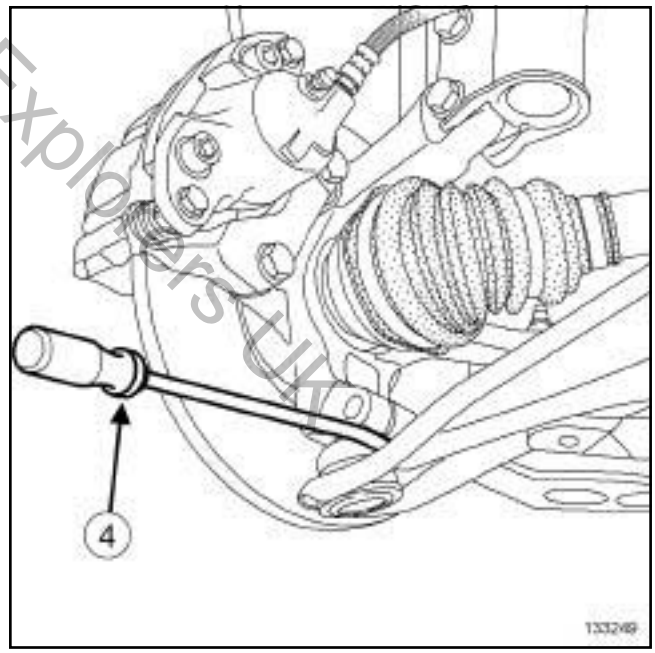
II - REMOVAL OPERATION



145511

❑ Remove the lower arm ball joint nut (**3**) .

❑ Remove the lower arm ball joint.

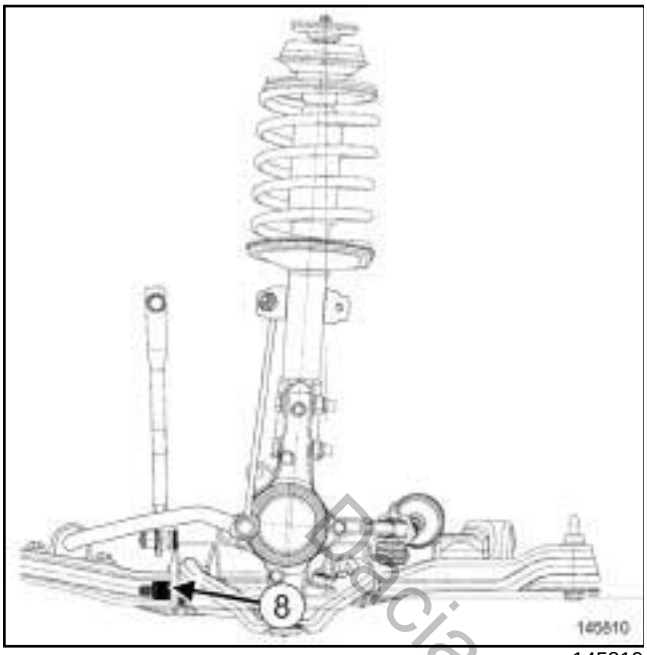


133249

❑

Note:

If the lower ball joint is stuck in the stub axle carrier and it will not come out, extract the ball joint using an angled lever (**4**) as illustrated in the diagram.



145810

❑ Remove:

- the lower arm front and rear bolts (**8**) ,
- the lower arm.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Front driveshaft lower arm bolt**

❑ Always replace the lower arm nuts.

❑ Position the heads of the lower arm bolts so that they face the rear of the vehicle.

II - REFITTING OPERATION

❑ Refit:

- the lower arm,
- the lower arm ball joint in its housing.

❑ Torque tighten:

- the **front and rear bolts mounting the lower arm on the subframe (180 N.m)**,
- the **lower arm ball joint nut (62 N.m)**.

III - FINAL OPERATION

❑ Refit:

- the front wheel arch side liner,
- the front wheel on the side in question (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❑ Check the values of the axle assemblies (see **Front axle assembly: Adjustment values**) .

CHECK

CHECKING THE FRONT DRIVESHAFT LOWER ARM BALL JOINT

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

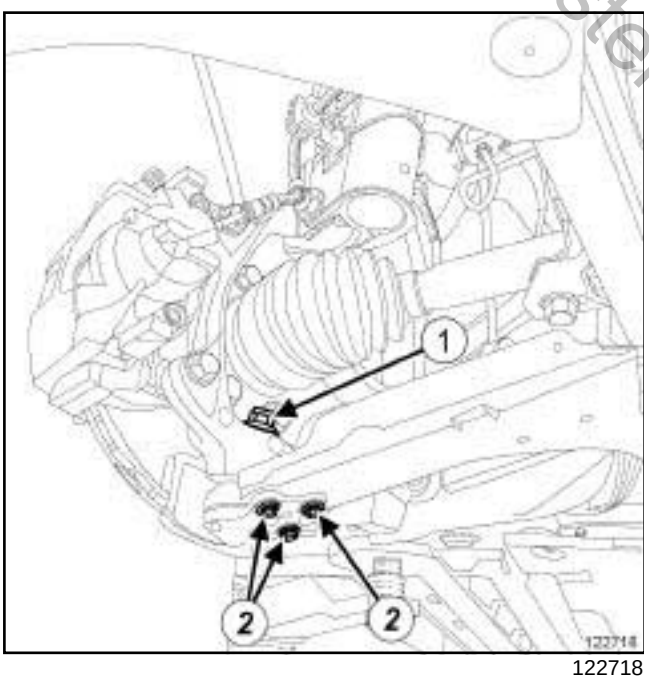
1 - Check the condition of the lower arm ball joint gaiter

❏ Check:

- the gaiter crimping on the front driveshaft lower arm ball joint,
- that the gaiter is not torn.

If the lower arm ball joint gaiter of the front driveshaft is in poor condition or not crimped, replace the lower arm of the front driveshaft (see **31A**, **Front axle components**, **Front driveshaft lower arm: Removal - Refitting**, page **31A-39**) .

2 - Check the fitting of the lower arm ball joint

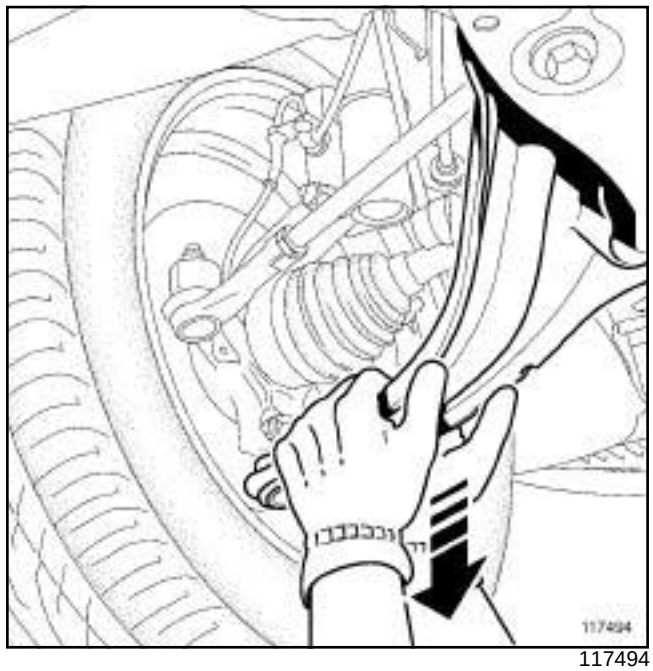


122718

❏ Check:

- the "front driveshaft lower arm ball joint - front driveshaft lower arm bolt - front driveshaft hub carrier" assembly is correctly positioned,
- the tightening torque of the lower arm ball joint nut (**1**) for the front driveshaft (see **30A**, **General information**, **Front axle system: Tightening torque**, page **30A-16**) ,
- that the rivets of the lower arm ball shaft for the front driveshaft are held in place (**2**) .

3 - Checking the play of the lower arm ball joint



117494

❏ Check that there is no play in the front driveshaft lower arm ball joint:

- from a position underneath the vehicle,
- using both hands, hold the front driveshaft lower arm as close as possible to the wheel,
- push downwards several times.

If there is play in the front driveshaft lower arm ball joint, replace the front driveshaft lower arm (see **31A**, **Front axle components**, **Front driveshaft lower arm: Removal - Refitting**, page **31A-39**) .

Special tooling required	
Mot. 1390	Support for removal - refitting of engine - gearbox assembly
Tav. 1747	Threaded rods for carrying out subframe operations.

Equipment required
safety strap(s)

Tightening torques ▽	
subframe bolts	**110 N.m**
bracket bolts	**44 N.m**
steering box bolts	**180 N.m**
steering box heat shield bolts	**21 N.m**
power-assisted steering low pressure pipe bolt on the subframe	**21 N.m**
upper bolt of the subframe tie-rod	**21 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) ,
- (see **Vehicle: Precautions for the repair**) (01D, Mechanical introduction).

WARNING

To prevent any damage, do not use the lower arm as support for the lifting system.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

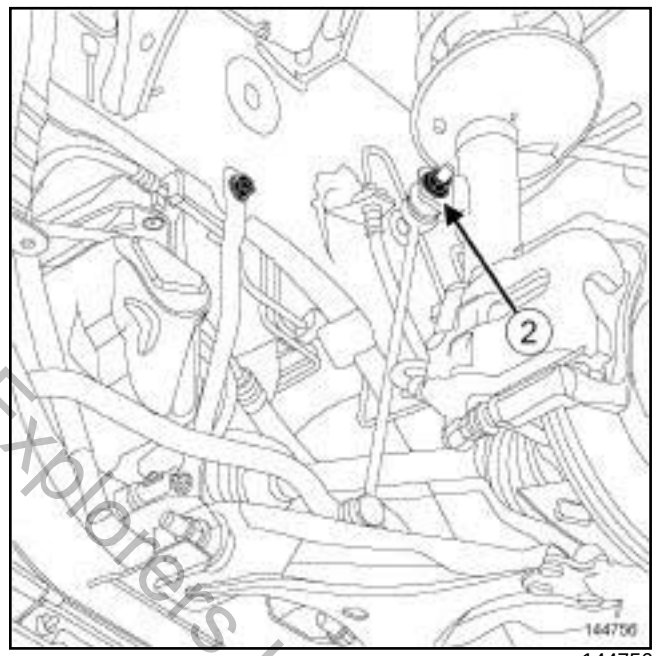
❏ Remove the front wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Strap the cooling radiator on the front upper cross member.

❏ Remove the front bumper (see **Front bumper assembly: Exploded view**) (55A, Exterior protection).

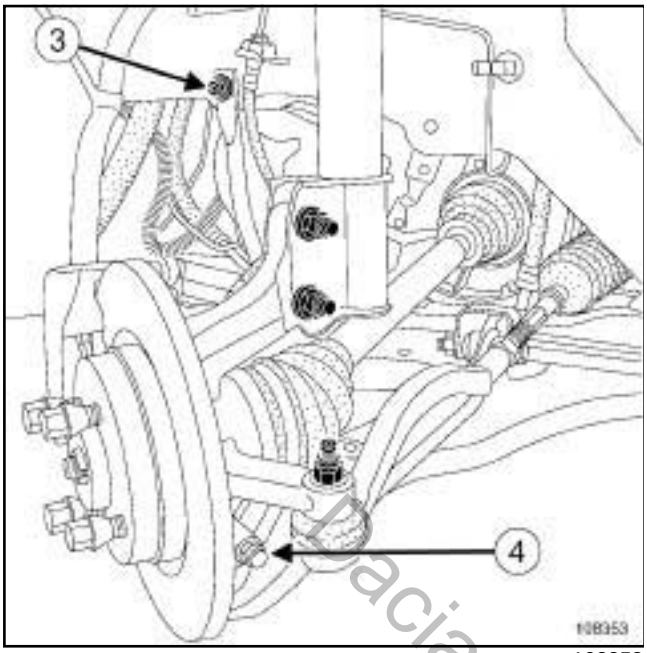
❏ Remove:

- the wheel arch liner clips,
- the wheel arch liners,
- the engine undertray.



144756

❏ Remove the anti-roll bar nuts (**2**) .



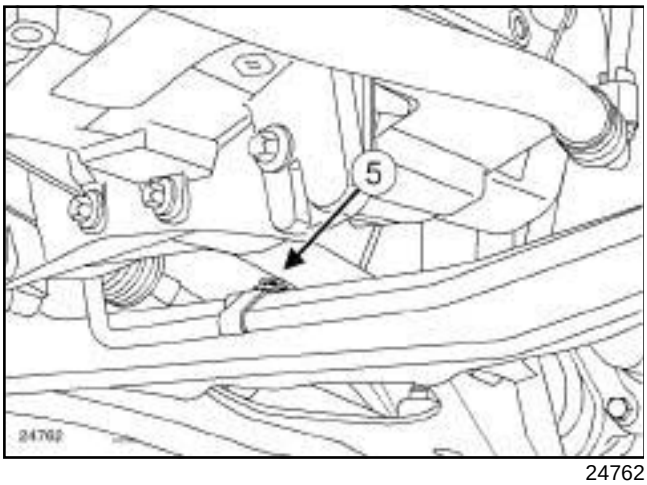
108353

❏ Remove:

- the subframe tie-rod upper bolts (**3**) ,
- the bolts or nuts (**4**) of the lower ball joints.

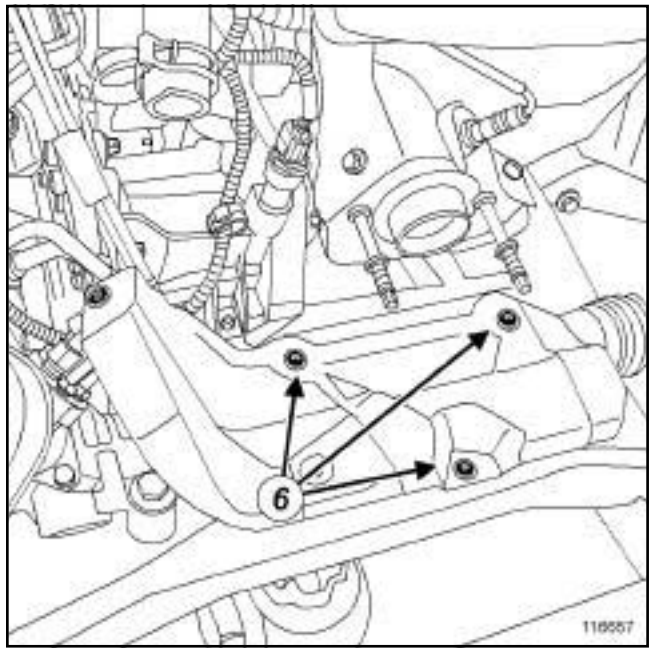
❏ Remove the lower ball joints.

POWER ASSISTED STEERING



24762

❏ Remove the bolt (**5**) of the power-assisted steering low pressure pipe on the subframe.



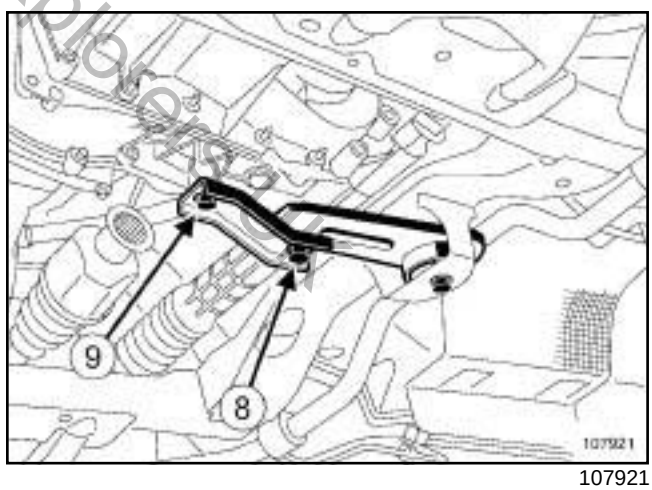
116657

❏ Remove the heat shield bolts (**6**) on the steering box.

❏ Remove:

- the steering box heat shield,
- the steering box bolts on the subframe.

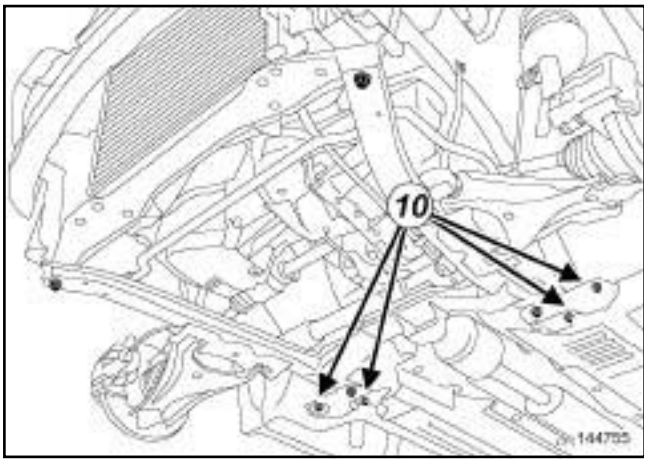
❏ Attach the steering box on the body.



107921

❏ Remove:

- the engine tie-bar bolt (**8**) on the gearbox,
- the engine tie-bar retaining bracket bolt (**9**) ,
- the retaining bracket.



144755

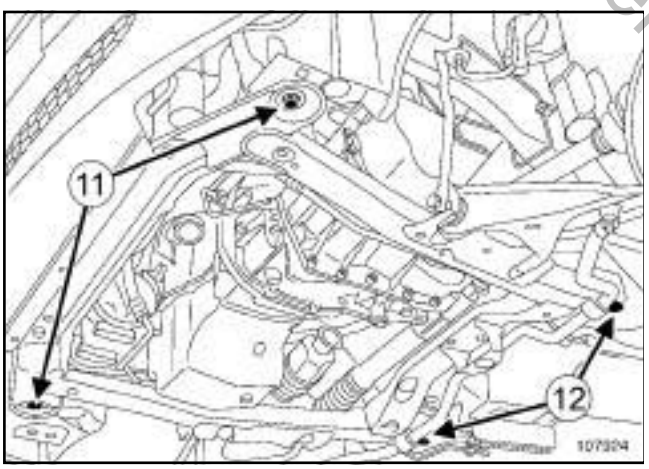
❏ Remove the bolts (**10**) of the front axle subframe brackets.

❏ Unclip the oxygen sensor wiring on the heat shield.

❏ Position the **(Mot. 1390)** under the sub-frame.

❏ Lower the lift and adjust the pads to ensure that the subframe is secure on the tool.

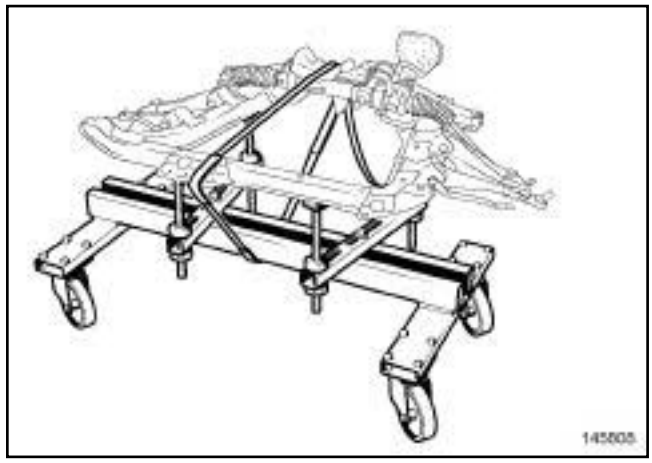
II - REMOVAL OPERATION



107924

❏ Remove bolts (**11**) and (**12**) from the subframe on the body.

❏ Remove the brackets.



145808

❏ Strap the subframe to **(Mot. 1390)**.

❏ Raise the lift to separate the subframe from the body.

❏ Remove the sub-frame fittings.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: Front sub-frame bolt**.

❏ Degrease the contact surface areas of the sub-frame and the body using **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

WARNING

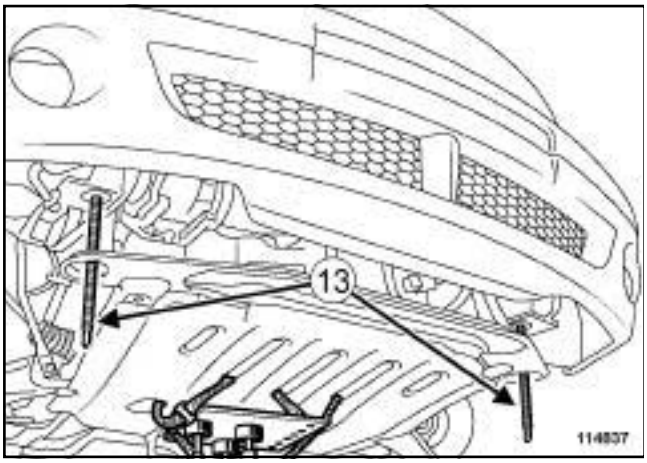
To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

II - REFITTING OPERATION

❏ Refit the subframe equipment.

❏ Position the subframe using **(Mot. 1390)**.

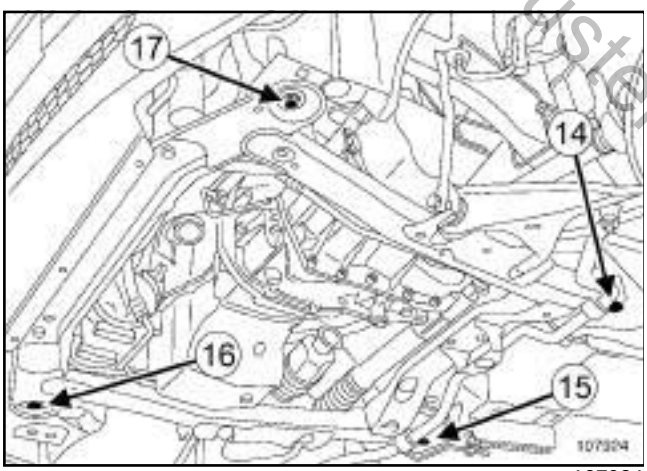


114837

❏ Fit two M12 threaded rods (**13**) of tool **(Tav. 1747)** in the position of the subframe front bolts to guide the subframe when it is being refitted.

❏ Refit the brackets.

❏ Refit the subframe.



107924

❏ Tighten the subframe bolts in order until contact.

❏ Torque tighten in order the **subframe bolts (110 N.m)**.

❏ Torque tighten the **bracket bolts (44 N.m)**.

❏ Remove the **safety strap(s)**.

❏ Raise the lift.

❏ Refit the steering box on the subframe.

❏ Torque tighten the **steering box bolts (180 N.m)**.

❏ Refit the steering box heat-resistant protection.

❏ Torque tighten the **steering box heat shield bolts (21 N.m)**.

❏ Clip the oxygen sensor wiring onto the heat shield.

❏ Refit the rear suspended engine mounting (see **Lower engine tie-bar: Removal - Refitting**) (19D, Engine mounting).

❏ Refit the power-assisted steering low pressure pipe on the subframe.

❏ Torque tighten the **power-assisted steering low pressure pipe bolt on the subframe (21 N.m)**.

❏ Refit:

- the lower ball joints in the hub carrier (see **31A**, **Front axle components**, **Front driveshaft lower arm: Removal - Refitting**, page **31A-39**) ,
- the subframe tie rods.

❏ Torque tighten the **upper bolt of the subframe tie-rod (21 N.m)**.

❏ Refit:

- the engine undertray,
- the wheel arch liners.

❏ Refit the front bumper (see **Front bumper assembly: Exploded view**) (55A, Exterior protection).

III - FINAL OPERATION

❏ Remove the **safety strap(s)** from the cooling radiator.

❏ Refit the front wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Check the values of the axle assemblies (see) .

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Tightening torques ▽	
anti-roll bar tie rod nuts	**44 N.m**
anti-roll bar bearing bolts	**21 N.m**

Anti-roll bar specifications:

No.	Ø of the bar in mm
Black	**20**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **31A**, **Front axle components**, **Front axle components: Precautions for the repair**, page **31A-1**) .

REMOVAL

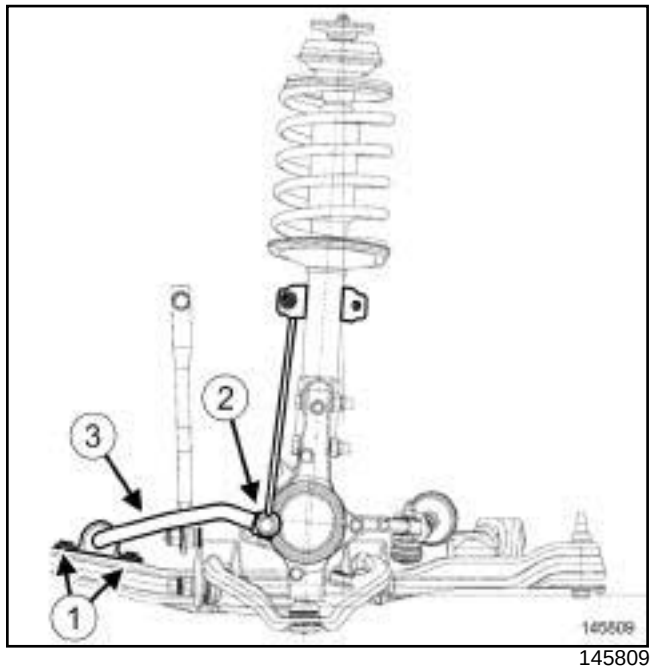
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the front wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the engine undertray,
- the front wheel arch side liners.

II - REMOVAL OPERATION



145809

❏ Remove:

- the anti-roll bar bearing bolts (**1**) ,
- the nuts (**2**) from the anti-roll bar tie rods,
- the anti-roll bar.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Clean the surfaces of the subframe resting against the anti-roll bar bearings using **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❏ **parts always to be replaced: front anti-roll bar tie-rod nut**

II - REFITTING OPERATION

❏ Proceed in the reverse order to removal.

❏ Torque tighten:

- the **anti-roll bar tie rod nuts (44 N.m)**,
- the **anti-roll bar bearing bolts (21 N.m)**

I - SAFETY

For an operation requiring the use of a lift, follow the safety advice (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

Brake fluid is highly corrosive. Ensure any brake fluid spilt on parts of the vehicle is cleaned off.

II - CLEANLINESS

Protect any bodywork components that risk being damaged by brake fluid with a cover.

Clean around the braking system with **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

III - GENERAL RECOMMENDATIONS

1 - Braking

Replace all the brake pads on one axle at the same time. Never mix brake pads of different brands or quality.

Lightly coat the threading on the support linkage with **GREASE BR 2** + (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

The brake mechanism components are different on the left and right-hand sides, so it is essential not to confuse them. On the left-hand brake: the bolt thread has a right-hand thread. On the right-hand brake: the bolt has a left-hand thread.

Adjust the brake pads by depressing the brake pedal repeatedly.

IMPORTANT
To avoid brake imbalance, both drums must be of the same diameter. Regrinding one drum necessitates regrinding of the opposite drum.

2 - Rear brake drums, rear brake pads

Remove all dust from the drums and the backplates using brake cleaner.

To ensure the wheel speed sensor operates correctly, do not mark the sensor target on the drum's magnetic ring gear.

3 - Suspension spring

When replacing the spring, ensure that the positioning and orientation of the spring and the spring compressor tool cups are correct.

Check that the spring compressor tool is operating correctly.

WARNING
To prevent the suspension spring from prematurely breaking, do not damage the anti-corrosion protection.

In the interests of safety, do not leave a spring compressed in the spring compressor tool.

4 - Rear axle

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

Always replace the shock absorber upper mounting nut.

WARNING
To prevent any damage, do not use the rear axle as support for the lifting system.

WARNING
To prevent the components of the rear axle from deteriorating (rubber bushes, brake hoses, etc.) do not remove the two shock absorbers at the same time. Proceed one side at a time.

REAR BRAKE BOSCH: 9 INCHES

Replace all the brake pads on one axle at the same time. Never mix brake pads of different brands or qualities.

IMPORTANT
Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **30A**, **General information**, **Brake circuit: Precautions for the repair**, page **30A-2**) .

REMOVAL

I - REMOVAL PREPARATION OPERATION

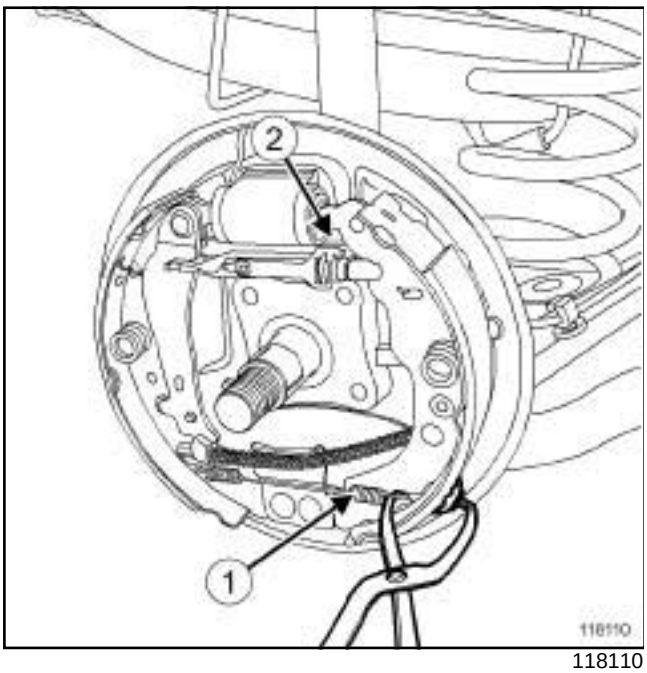
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Release the parking brake.

❏ Remove:

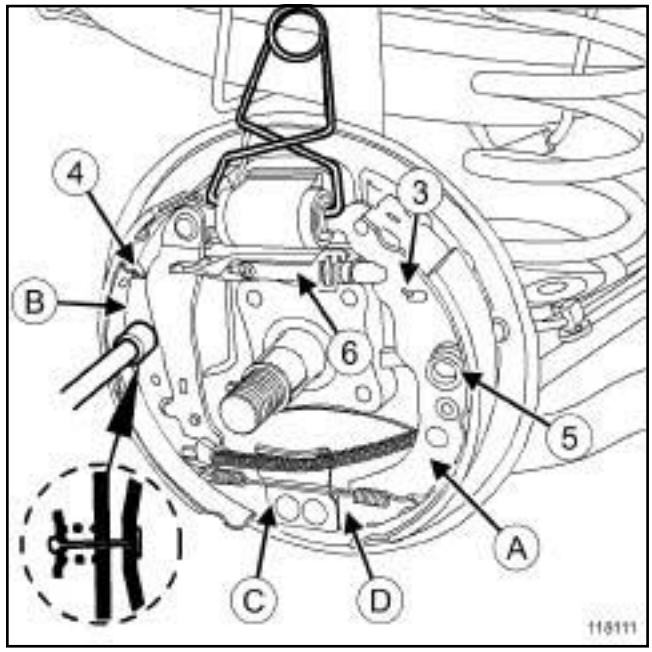
- the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the brake drums (see **33A**, **Rear axle components**, **Rear brake drum: Removal - Refitting**, page **33A-7**) .

II - REMOVAL OPERATION



118110

❏ Remove the lower spring (**1**) then the upper spring (**2**) using brake shoe pliers.



118111

❏ Place pliers on the slave cylinder pistons.

❏ Remove:

- the spring (**3**) on the incremented automatic compensation system,
- the retaining spring (**4**) from the trailing shoe linkage,
- the side retaining springs (**5**) while holding the connecting rod in contact with the brake back-plate,
- the linkage (**6**) .

❏ Alternately remove each shoe base (**D**) from the fixed bridge piece (**C**) .

❏ Remove:

- the leading shoe (**A**) ,
- the trailing shoe (**B**) .

❏ Uncouple the parking brake cable from the parking brake lever.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Remove any dust from the brake drums and back-plates using **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❏ Lightly grease the support linkage thread.

Note:

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

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

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

II - REFITTING OPERATION

❏ Refit:

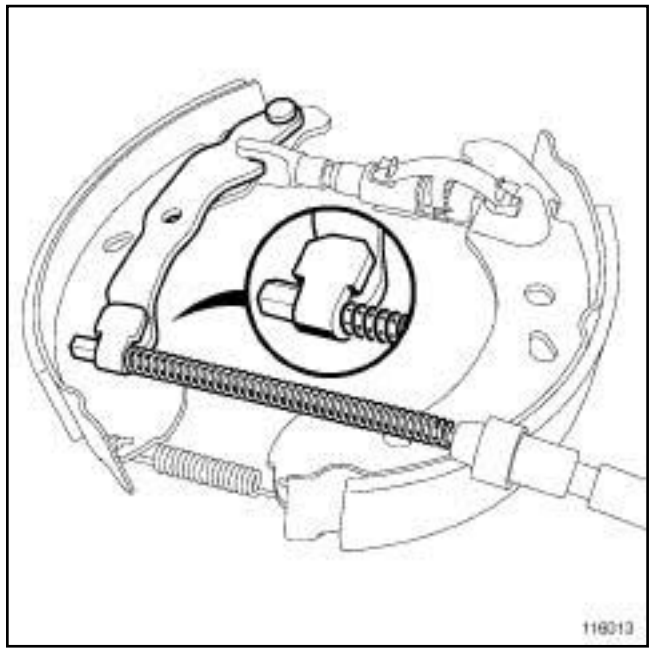
- the linkage to the trailing shoe while holding it together with its spring,
- the incremented automatic compensation system spring to the linkage,
- the parking brake cable to the parking brake lever,
- the leading shoe,
- the incremented automatic compensation system spring to the leading shoe.

❏ Fit the leading shoe/trailing shoe assembly to the back-plate.

❏ Refit:

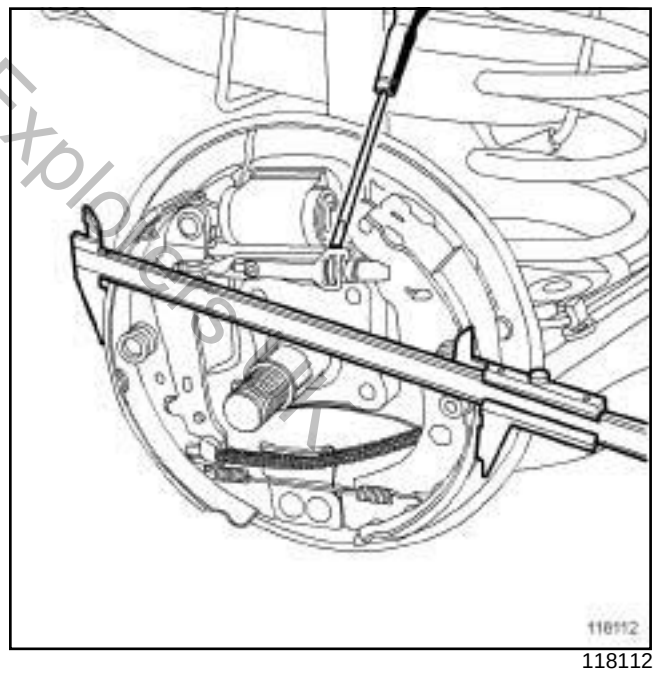
- the upper spring,
- the lower spring,
- the side retaining springs while holding the connecting rod in contact with the brake back-plate.

❏ Remove the pliers from the slave cylinder pistons.



116013

❏ Check that the parking brake cable is correctly positioned on the parking brake lever.



118112

❏ Using a screwdriver, adjust the diameter of the shoes with the linkage to obtain a diameter of **227.5 mm ± 0.1**.

❏ Carry out the same adjustment on the other side.

❏ Adjust the handbrake if the lever stops between the first and second positions of the parking brake lever's travel (see **37A**, **Mechanical component controls**, **Parking brake lever: Adjustment**, page **37A-30**) .

III - FINAL OPERATION

❏ Refit:

- the brake drums (see **33A**, **Rear axle components**, **Rear brake drum: Removal - Refitting**, page **33A-7**) .
- the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Adjust the brake pads by depressing the brake pedal repeatedly.

❏ Check that the incremented compensation system is working properly (characteristic « click » from the drums when the brake pedal is repeatedly depressed).

Equipment required
pedal press
parts washer

Tightening torques ▽	
brake cylinder bolt(s)	**14 N.m**
brake pipe union on the rear brake cylinder	**14 N.m**

IMPORTANT
Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **30A**, **General information**, **Brake circuit: Precautions for the repair**, page **30A-2**) .

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Position a **pedal press** on the brake pedal to limit the outflow of brake fluid.

❏ Release the parking brake.

❏ Remove:

- the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the brake drum (see **33A**, **Rear axle components**, **Rear brake drum: Removal - Refitting**, page **33A-7**) ,
- the side retaining springs while holding the connecting rod in contact with the brake back-plate (see **33A**, **Rear axle components**, **Rear brake lining: Removal - Refitting**, page **33A-2**) ,
- the upper return spring using brake shoe pliers (see **33A**, **Rear axle components**, **Rear brake lining: Removal - Refitting**, page **33A-2**) .

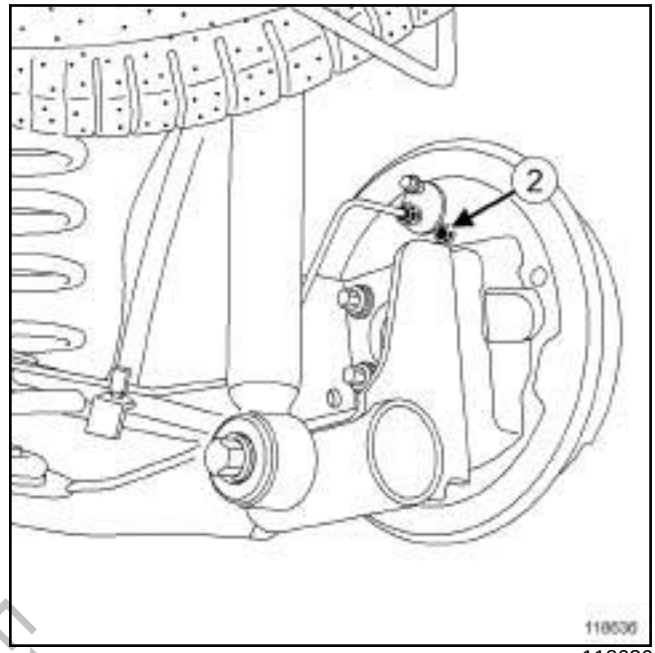
❏ Detach the pin from the spring of the wear compensation system on the leading shoe.

❏ Separate the shoes.

II - REMOVAL OPERATION

❏ Unscrew the rigid pipe union from the slave cylinder (be prepared for brake fluid running out).

❏ Fit a cap on the brake pipe union.



118636

❏ Remove the rear brake cylinder bolt (**2**) on the brake back-plate.

❏ Remove the rear brake cylinder.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Remove any dust from the brake drums and back-plates using a **parts washer**.

II - REFITTING OPERATION

❏ Refit:

- the rear brake cylinder on the brake back-plate,
- the rear brake cylinder bolt(s) on the brake back-plate.

❏ Torque tighten the **brake cylinder bolt(s) (14 N.m)**.

❏ Remove the plug from the brake pipe union.

❏ Refit the brake pipe union on the rear brake cylinder.

❏ Torque tighten the **brake pipe union on the rear brake cylinder (14 N.m)**.

III - FINAL OPERATION

❏ Attach the pin from the spring of the wear compensation system on the leading shoe.

❏ Refit:

- the upper return spring using brake shoe pliers (see **33A**, **Rear axle components**, **Rear brake lining: Removal - Refitting**, page **33A-2**) ,
- the side retaining springs while holding the connecting rod in contact with the brake back-plate (see **33A**, **Rear axle components**, **Rear brake lining: Removal - Refitting**, page **33A-2**) ,
- the brake drum (see **33A**, **Rear axle components**, **Rear brake drum: Removal - Refitting**, page **33A-7**) ,
- the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the **pedal press**.

❏ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

❏ Adjust the rear brake linings by repeatedly depressing the brake pedal.

Equipment required
parts washer

Tightening torques ▽	
rear brake drum nut	**280 N.m**

IMPORTANT

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **30A**, **General information**, **Brake circuit: Precautions for the repair**, page **30A-2**) .

IMPORTANT

The two brake drums should be the same diameter.

Regrinding one drum necessitates regrinding of the opposite drum.

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

When replacing a brake drum, it is essential to replace the brake linings as well.

REMOVAL

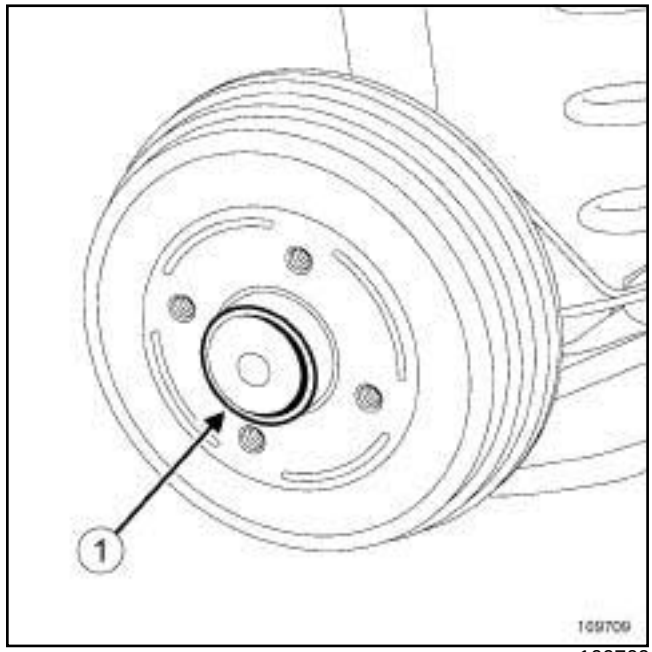
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Release the parking brake.

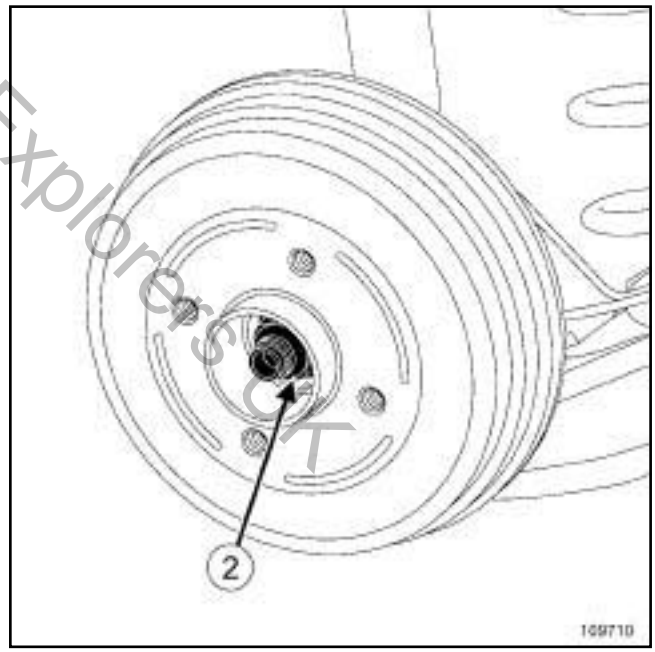
❏ Remove the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

II - REMOVAL OPERATION



109709

❏ Remove the caps from the drums (**1**) .



109710

❏ Remove:

- the rear brake drum nuts (**2**) ,
- the rear brake drums using the toolsand, if necessary.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Check the internal diameter of the drum.

❏ Always replace the brake drum nuts.

❏ **parts always to be replaced: rear drum cap**.

❏ Replace any faulty parts.

❏ Using a **parts washer**, clean:

- the brake drum linings,
- the drum,
- the stub axle.

Note:

Do not apply grease to the following components:

- drum,
- stub axle,
- nut,
- rear drum cap.

II - REFITTING OPERATION

❏ Adjust the parking brake if the lever stops between the first and second positions of the parking brake lever's travel (see **37A**, **Mechanical component controls**, **Parking brake lever: Removal - Refitting**, page **37A-29**) .

❏ Refit:

- the rear brake drums,
- the rear brake drum nuts,
- the drum caps.

❏ Torque tighten the **rear brake drum nut (280 N.m)** by turning the drum while tightening the nut.

III - FINAL OPERATION

❏ Refit the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Adjust the brake linings by repeatedly depressing the brake pedal.

Equipment required
sliding calliper

I - PREPARATION OPERATION FOR CHECK

Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

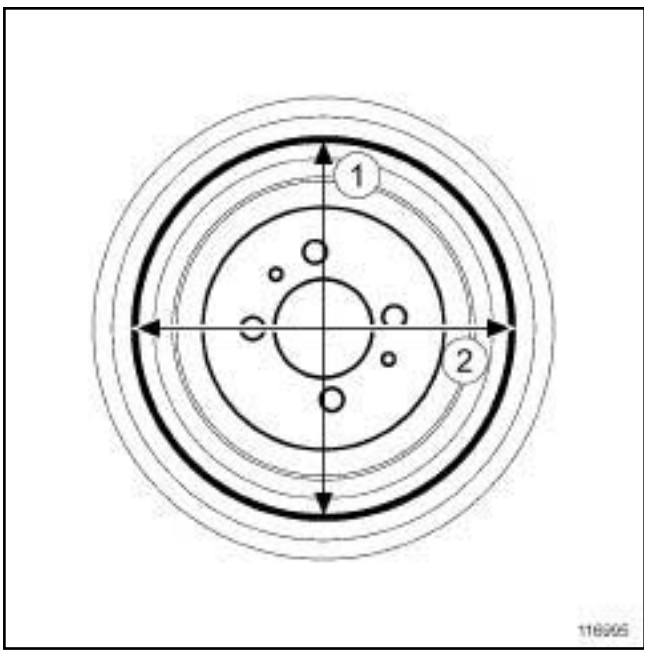
Remove:

- the rear wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the rear brake drum (see **33A**, **Rear axle components**, **Rear brake drum: Removal - Refitting**, page **33A-7**) .

II - TEST OPERATION

Note:

To check the internal diameter of the drum, use a **sliding calliper** type tool for drums.



116995

Position the **sliding calliper** to measure the internal diameters of the brake drum.

Measure the interior diameters of the brake drum on the perpendicular axes (**1**) and (**2**) .

Compare the values with those recommended by the manufacturer (see **30A**, **General information**, **Brake: Specifications**, page **30A-13**) .

III - FINAL OPERATION

Replace the rear drums if necessary (see **33A**, **Rear axle components**, **Rear brake drum: Removal - Refitting**, page **33A-7**) .

Refit the rear wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

Equipment required
pedal press

Tightening torques ▽	
rigid brake pipe unions on the brake cylinders	**14 N.m**
rigid brake pipe unions on the rear brake hoses	**14 N.m**

The pipes have a rigid and a flexible section.

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **33A**, **Rear axle components**, **Rear axle components: Precautions for the repair**, page **33A-1**) .

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

WARNING

To avoid damaging the wheel speed sensor cable:

- Do not tension the cable,
- Do not twist the cable,
- Check that there is no contact with the surrounding components,
- Do not use tools that may damage the cable.

REMOVAL

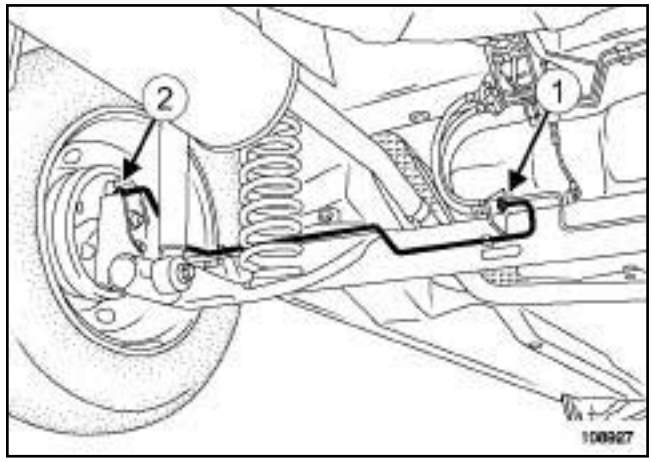
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Fit the **pedal press** to the brake pedal to limit the amount of brake fluid running out.

II - REMOVAL OPERATION

1 -Rear left-hand rigid brake pipe



108927

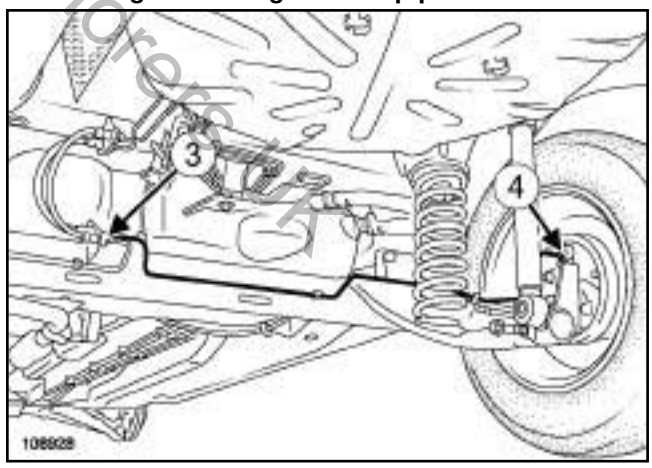
❏ Unscrew:

- the rigid brake pipe union on the rear axle (**1**) ,
- the rigid brake pipe union on the rear brake cylinder (**2**) .

❏ Unclip the rear axle rigid brake pipe.

❏ Remove the rear left-hand rigid brake pipe.

2 - Rear right-hand rigid brake pipe



108928

❏ Unscrew:

- the rigid brake pipe union on the rear axle brake hose (**3**) ,
- the rigid brake pipe union on the rear brake cylinder (**4**) .

❏ Unclip the rear axle rigid brake pipe.

❏ Remove the rear right-hand rigid brake pipe.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the rigid brake pipe mounting clips.

II - REFITTING OPERATION

❏ Refit the rear rigid brake pipes in their original positions.

❏ Clip the rear rigid brake pipes on the rear axle.

❏ Fit without tightening:

- the rigid brake pipe unions on the brake cylinders,
- the rigid brake pipe unions on the rear brake hoses.

❏ Torque tighten:

- the **rigid brake pipe unions on the brake cylinders (14 N.m)**,
- the **rigid brake pipe unions on the rear brake hoses (14 N.m)**.

III - FINAL OPERATION

❏ Remove the tool **pedal press** from the brake pedal to limit the outflow of brake fluid.

❏ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

4X2 TRANSMISSION

Equipment required
component jack

Tightening torques ▽	
shock absorber lower bolt	**162 N.m**
shock absorber upper nut	**14 N.m**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **33A**, **Rear axle components**, **Rear axle components: Precautions for the repair**, page **33A-1**) .

During removal, note the colours of the springs to ensure the conformity of the parts for refitting.

WARNING
To prevent any suspension asymmetry, replace both of the shock absorbers on the same axle.

WARNING
To prevent the components of the rear axle from deteriorating (rubber bushes, brake hoses, etc.) do not remove the two shock absorbers at the same time. Proceed one side at a time.

WARNING
To prevent any damage, do not use the rear axle as support for the lifting system.

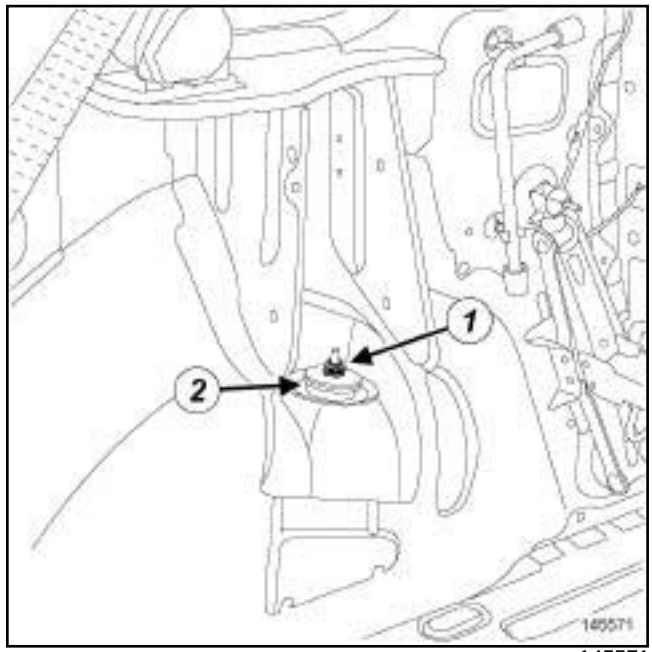
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the rear wheel arch trim (see) (71A, Body internal trim).

II - REMOVAL OPERATION



145571

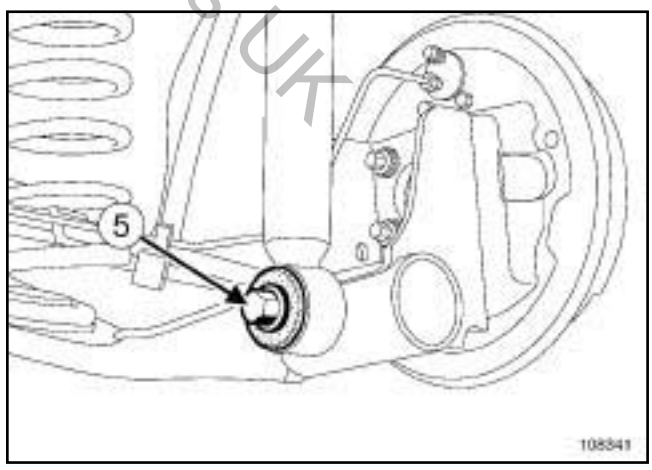
❏ In the luggage compartment, with wheels on the ground, remove:

- the nut (**1**) ,

- the rubber bush (**2**) .

❏ Raise the lift.

❏ Using a block, bring the **component jack** into contact under the rear axle, near the shock absorber.



108341

❏ Remove:

- the shock absorber lower bolt (**5**) ,

- the shock absorber.

❏ Repeat the operation on the opposite side.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the rear shock absorber lower bolt .

parts always to be replaced: Rear shock absorber upper nut.

II - REFITTING OPERATION

❏ Refit:

- the shock absorber, positioning the shock absorber head in its housing,
- the shock absorber lower bolt.

❏ Lower the lift until the wheels touch the ground.

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

❏ Refit:

- the rubber bush,
- the new shock absorber upper nut.

❏ Torque tighten:

- the **shock absorber lower bolt (162 N.m)** with the tool **component jack** in place,
- the **shock absorber upper nut (14 N.m)** whilst holding the bolt head, with the wheels on the ground.

❏ Repeat these operations on the shock absorber on the opposite side.

III - FINAL OPERATION

❏ Refit the rear wheel arch trim (see **Rear wheel arch trim: Removal - Refitting**) (71A, Body internal trim).

Equipment required
component jack

Tightening torques ▽	
shock absorber lower bolt	**162 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **33A**, **Rear axle components**, **Rear axle components: Precautions for the repair**, page **33A-1**) .

WARNING

To prevent the components of the rear axle from deteriorating (rubber bushes, brake hoses, etc.) do not remove the two shock absorbers at the same time. Proceed one side at a time.

WARNING

To prevent any damage, do not use the rear axle as support for the lifting system.

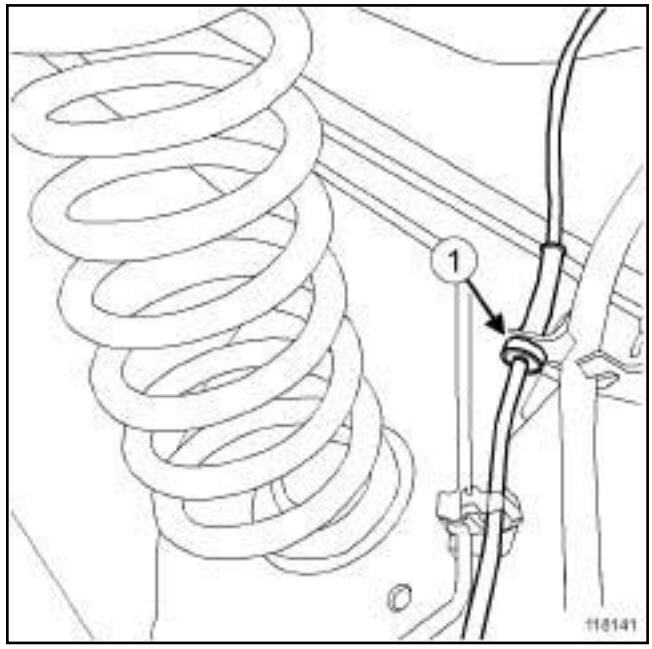
During removal, note the colours of the springs to ensure the conformity of the parts for refitting.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

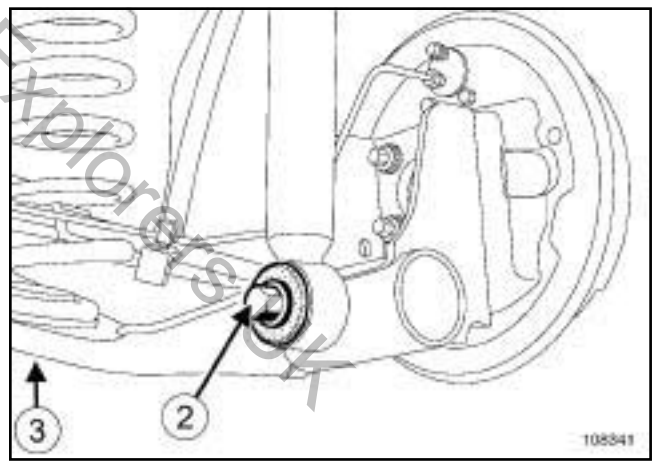
❏ Remove the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .



118141

❏ Unclip the wheel speed sensor wiring at (**1**) .

II - REMOVAL OPERATION

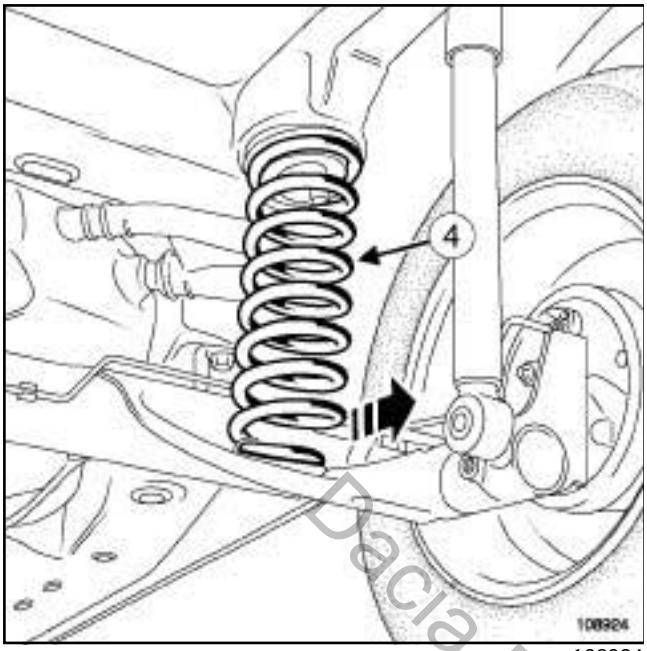


108341

❏ Bring the **component jack** (**3**) into contact, using a shim, under the spring cup, without forcing it.

❏ Mark the position where the spring is fitted.

❏ Remove the lower bolt (**2**) from the shock absorber.



108924

❑ Remove the spring (**4**) with its lower mounting by removing the **component jack**.

Note:

If the upper mounting is unclipped, replace it.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Always replace the rear shock absorber lower bolt.

II - REFITTING OPERATION

❑ 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.

❑ Bring the **component jack** into contact, using a shim, under the spring cup.

❑ Compress the rear axle so that the shock absorber lower bolt can be refitted.

❑ Refit the shock absorber lower bolt.

❑ Torque tighten the **shock absorber lower bolt (162 N.m)**.

❑ Remove the tool **component jack**.

❑ Refit the wheel speed sensor wiring.

III - FINAL OPERATION

❑ Refit the rear wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❑ Repeat these operations on the opposite side.

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **33A**, **Rear axle components**, **Rear axle components: Precautions for the repair**, page **33A-1**) .

REMOVAL

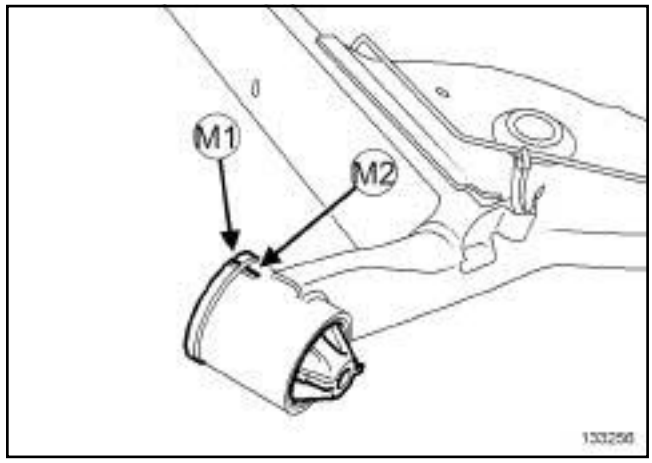
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .
- the rear brake drums (see **33A**, **Rear axle components**, **Rear brake drum: Removal - Refitting**, page **33A-7**) .
- the complete rear axle (see **33A**, **Rear axle components**, **Complete rear axle system: Removal - Refitting**, page **33A-19**) .

II - REMOVAL OPERATION



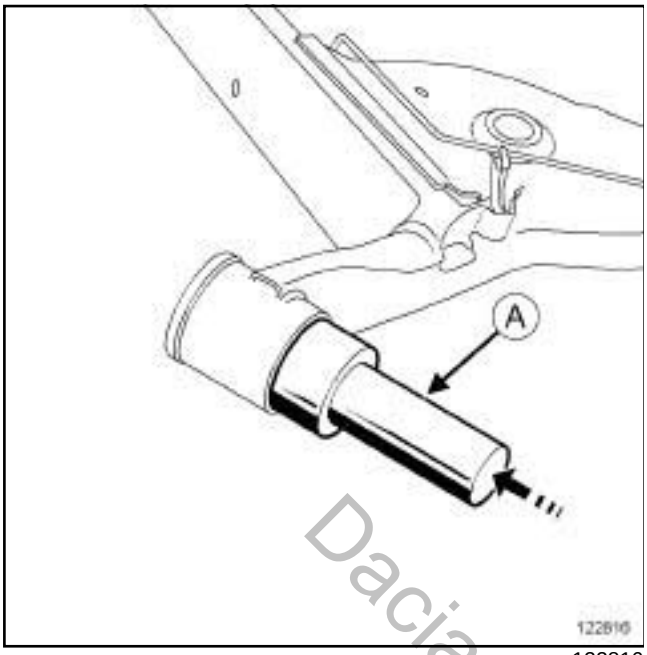
133256

❑ Before removing the rear rubber bearing, mark the position of the rubber bearing in the bore of the rear axle arm bushing:

- make marks (**M1**) and (**M2**) on the rear axle arm bushing and on the rubber bearing,
- copy the mark (**M1**) from the used rubber bearing onto the new one.

Note:

These marks are necessary to ensure correct refitting, and to avoid premature wear of the rubber bearings and good road holding for the vehicle.



122816

❏ Fit the joint castor (**A**) of the.

❏ Remove the rubber bearing from the rear axle by hitting with a hammer on the bush castor (**A**) of the tool.

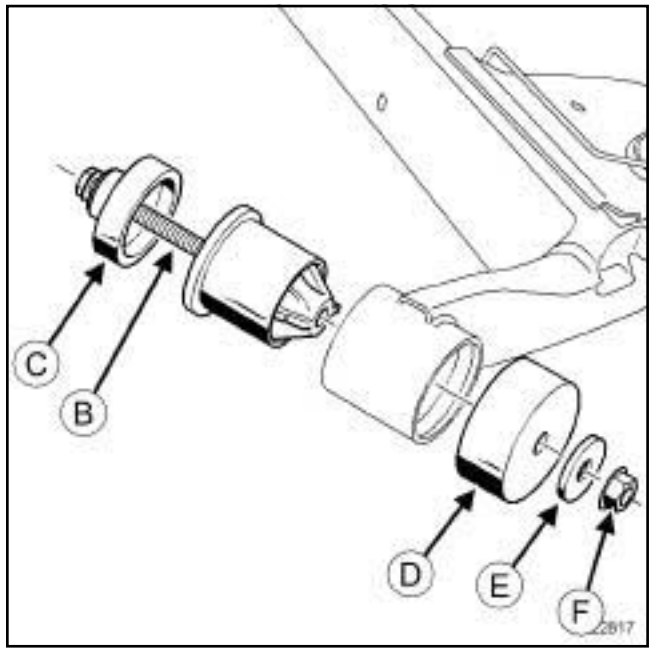
REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: Rear axle rubber bearing**.

II - REFITTING OPERATION

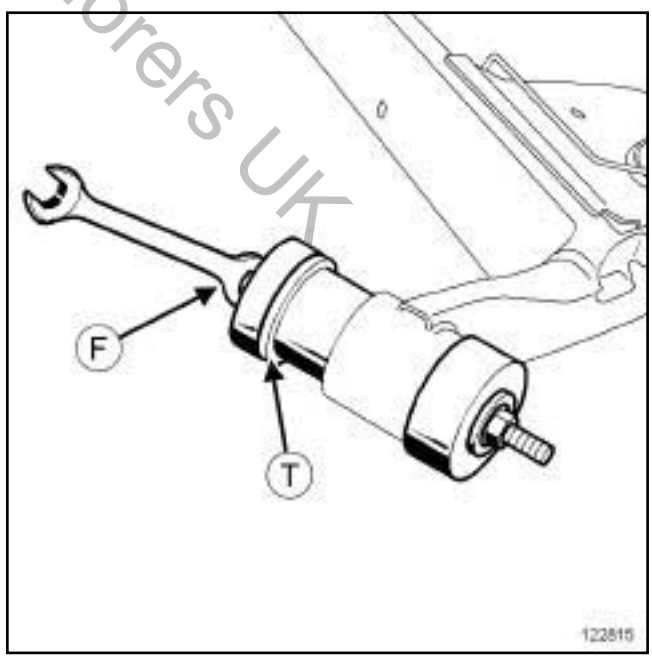
❏ Position the rubber bearing in the bore of the rear axle arm bushing so that the marks ***(M1)*** and ***(M2)*** are aligned.



122817

❏ To refit the rear axle rubber bearings use:

- the threaded rod (**B**) ,
- the cover (**C**) ,
- the cover (**D**) ,
- the anti-friction washer (**E**) ,
- the nut (**F**) , of the



122815

❏ Position theused for refitting.

❏ Tighten the nut ***(F)*** of the tooluntil the rubber bearing face ***(T)*** is set right up against the rear axle arm bushing.

❏ Check that the marks ***(M1)*** and ***(M2)*** are correctly aligned.

❏ Remove the tool.

III - FINAL OPERATION

❏ Refit:

- the complete rear axle (see **33A**, **Rear axle components**, **Complete rear axle system: Removal - Refitting**, page **33A-19**) ,
- the rear brake drums (see **33A**, **Rear axle components**, **Rear brake drum: Removal - Refitting**, page **33A-7**) .

❏ Adjust the rear axle (see **Rear axle system: Adjustment**) .

❏ Refit the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

Equipment required
pedal press
component jack
safety strap(s)

Tightening torques ▽	
bearing bolts	**105 N.m**
rigid pipe unions on the brake cylinders	**14 N.m**
rigid pipe unions on the hoses	**14 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **33A**, **Rear axle components**, **Rear axle components: Precautions for the repair**, page **33A-1**) .

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Release the parking brake.

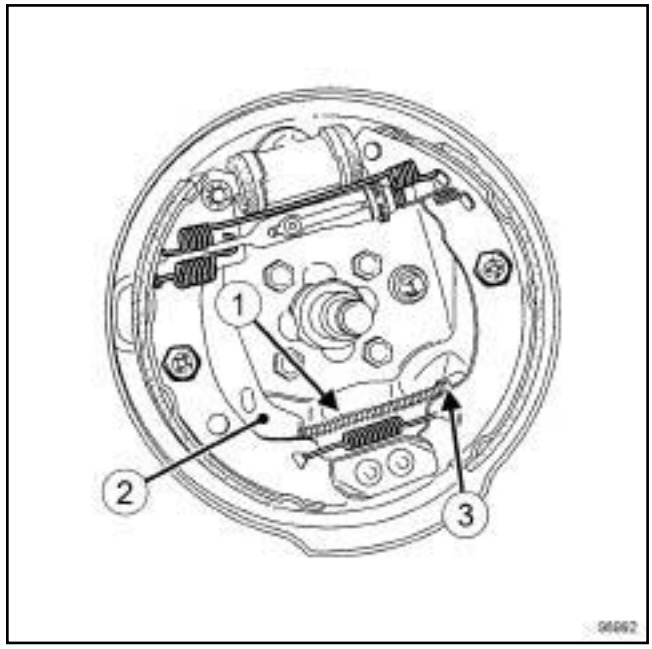
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment.

❏ Remove the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Fit the **pedal press** to the brake pedal to limit the outflow of brake fluid.

II - REMOVAL OPERATION

❏ Remove the brake drums (see **33A**, **Rear axle components**, **Rear brake drum: Removal - Refitting**, page **33A-7**) .



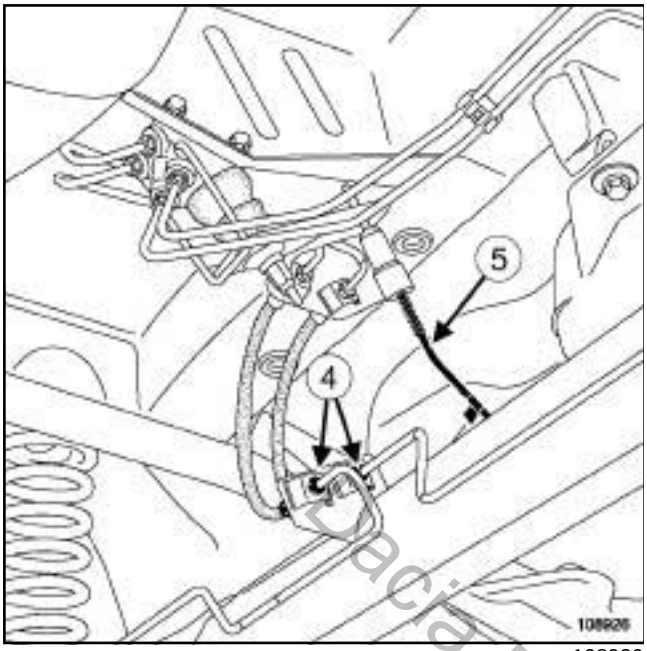
98992

❏ Take out the parking brake cables (**1**) by pushing the lever (**2**) using pliers and a screwdriver.

❏ Unclip:

- the parking brake cable sleeves (**3**) from the brake back-plates,
- the wheel speed sensors (if fitted to the vehicle).

❏ Detach the rear axle wheel speed sensors (if fitted to the vehicle).



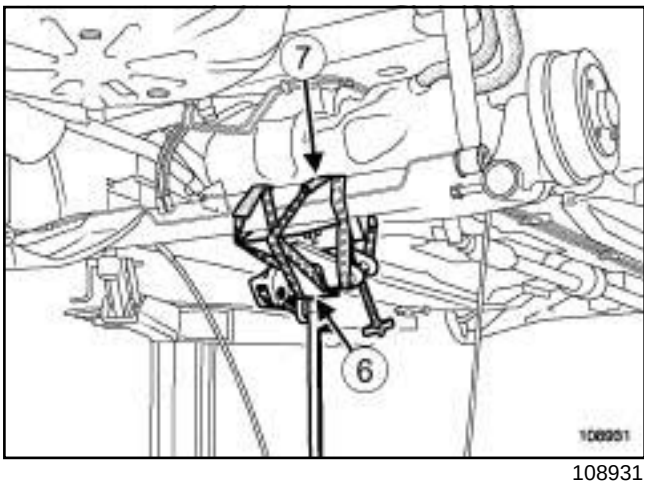
108926

❏ Unscrew the unions of the rigid pipes on the flexible brake pipes (**4**) .

❏ Detach the compensator rod (**5**) from the rear axle (if fitted to vehicle).

❏ Remove the rear suspension springs (see **33A**, **Rear axle components**, **Rear suspension spring: Removal - Refitting**, page **33A-14**) .

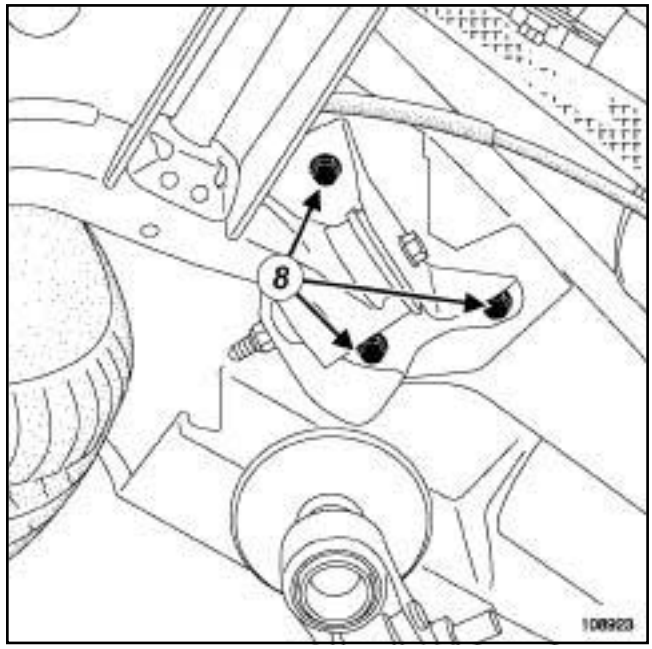
❏ Undo the rigid brake pipe unions on the brake cylinders.



108931

❏ Place the **component jack** (**6**) at the centre of the rear axle.

❏ Lash the rear axle to the **component jack** using a **safety strap(s)** (**7**) .



108923

❏ Loosen the bearing bolts (**8**) .

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

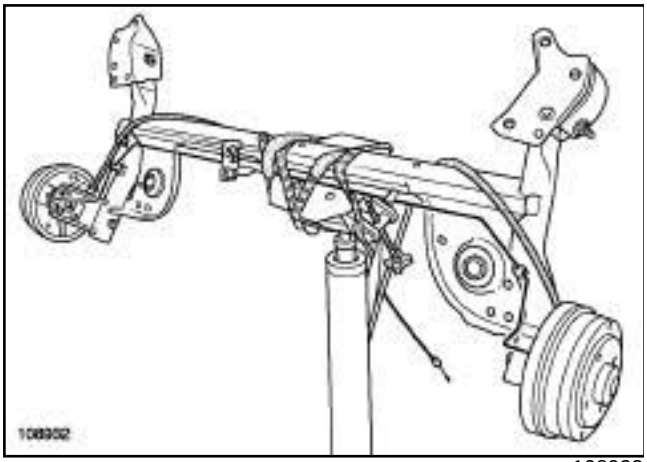
❏ Remove:

- the rear axle from the **component jack**,
- the rear axle equipment.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the bolts of the rubber bearings.


108932

❏ Strap the rear axle onto the **component jack**.

❏ Position the rear axle under the vehicle.

❏ Coat the threads of the bearing bolts with **HIGH STRENGTH THREADLOCK** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

II - REFITTING OPERATION

❏ Position the bearing locators opposite the centring holes.

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

❏ Insert the brake pipes into their housing.

❏ Attach the compensator rod (**5**) to the rear axle (if fitted to the vehicle).

❏ Retighten the rigid brake pipe unions on the hoses.

❏ Remove the **safety strap(s)** and the **component jack**.

❏ Refit the brake back-plates.

❏ Torque tighten the **bearing bolts (105 N.m)**.

❏ Torque tighten:

- the **rigid pipe unions on the brake cylinders (14 N.m)**,
- the **rigid pipe unions on the hoses (14 N.m)**.

❏ Refit:

- the rear suspension springs (see **33A**, **Rear axle components**, **Rear suspension spring: Removal - Refitting**, page **33A-14**) ,
- the parking brake cables.

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

❏ Refit the brake drums (see **33A**, **Rear axle components**, **Rear brake drum: Removal - Refitting**, page **33A-7**) .

❏ Refit the cables and the wheel speed sensors (if fitted to the vehicle).

❏ Connect the parking brake control unit cables to the compensator.

❏ Adjust the rear axle (see **Rear axle system: Adjustment**) .

III - FINAL OPERATION

❏ Refit the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Remove the **pedal press**.

❏ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

The removal - refitting procedure is the same for all wheels.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Release the parking brake.

❏ Remove the trim.

❏ Position the wheel so that the valve is at the top.

❏ Mark the position of the wheel on the hub.

> Note:
>
> This mark is required in order to:
>
> - Note the original position of the wheel on the hub,
> - perform the balancing operation.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Loosen the wheel bolts with the wheel on the ground.

> Note:
>
> Use sockets with protective sheaths in order to avoid scratching the alloy wheel rims.

❏ Raise the lift.

❏ Remove:

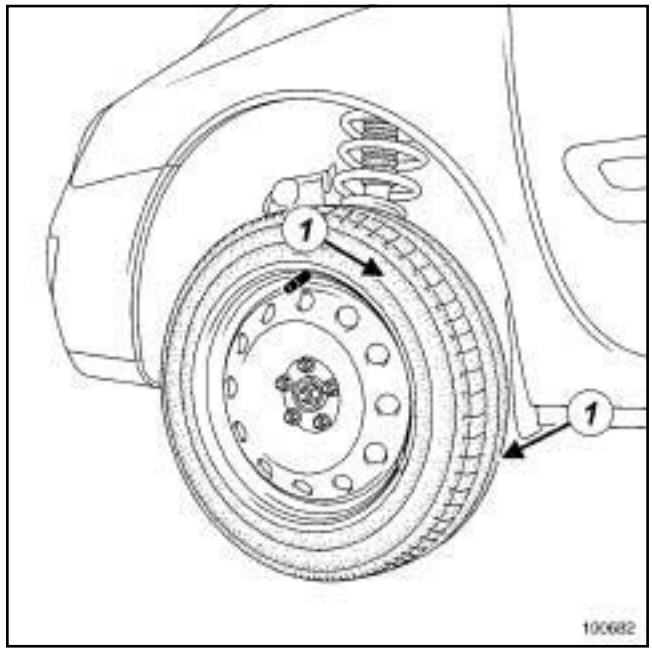
- the wheel bolts,
- the wheel.

If the wheel cannot be removed after the bolt has been undone:

❏ Position all the wheel bolts.

❏ Tighten the wheel bolts to bring all the bolt heads into contact with the wheel.

❏ Undo the wheel bolts by one turn.



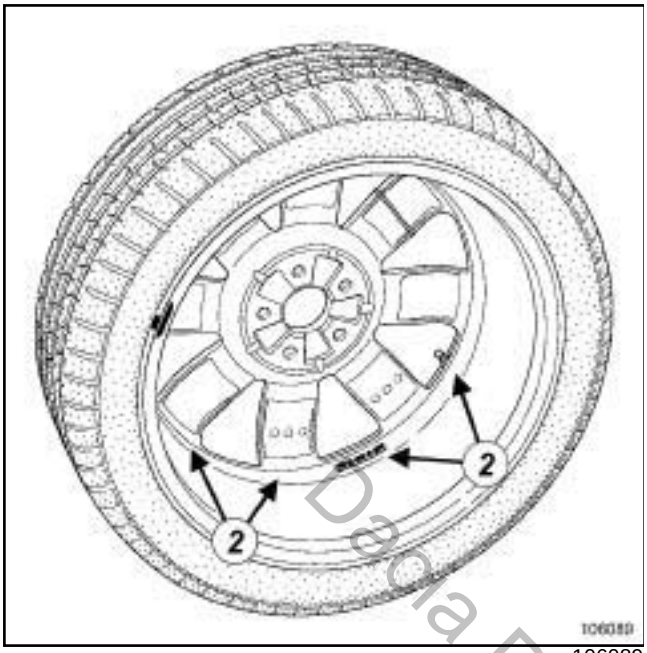
100682

❏ Strike around the edge of the tyre walls (**1**) several times using a mallet on the inner and outer surfaces of the wheel to detach the wheel.

❏ Remove:

- the wheel bolts,
- the wheel.

If this procedure does not work:



106089

❏ Strike the inner surface of the wheel (**2**) using a mallet and a wooden block to detach it.

> Note:
>
> Do not strike the surface of the wheel using excessive force as this may damage it.

❏ Remove:

- the wheel bolts,
- the wheel.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Clean the hub carrier using a wire brush.

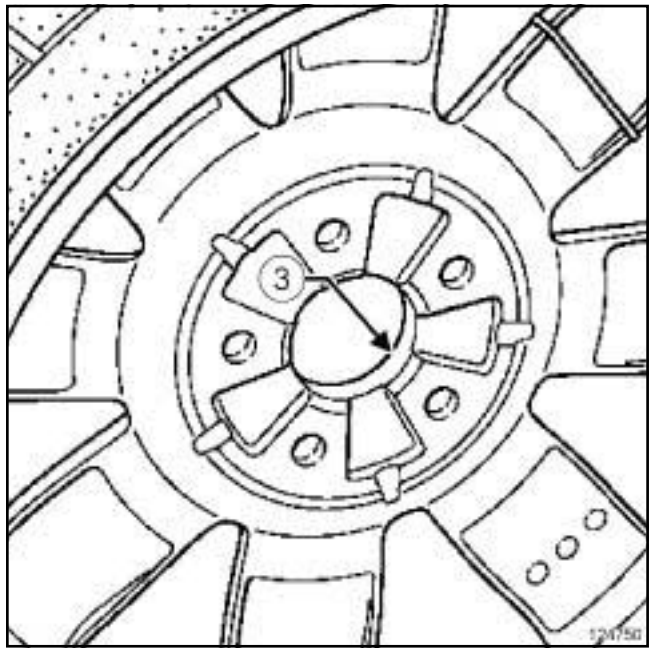
> Note:
>
> there are two types of wheel bolts for alloy and steel wheel rims; do not swap them.

❏ Check the condition of the tyre.

❏ Do not move or remove the balance weights.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Clean the mating surfaces between the wheel and the hub carrier using a wire brush.



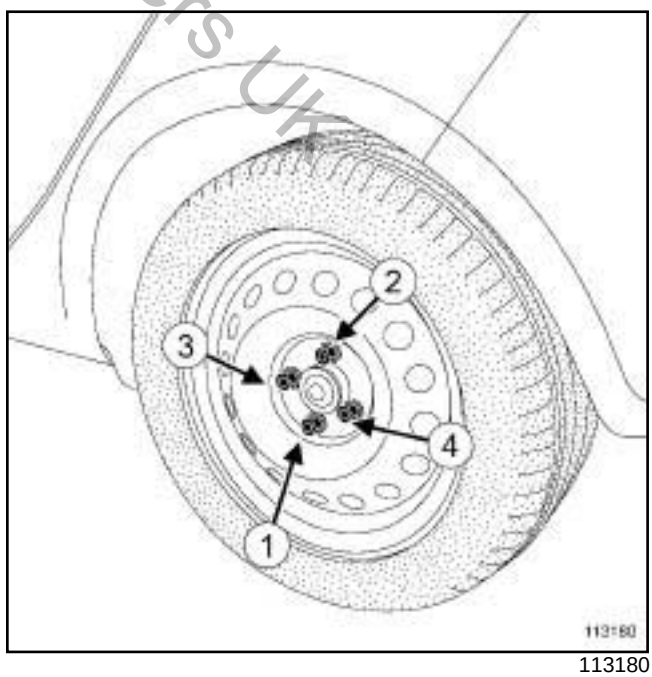
124750

❏ Coat the wheel-mating face (**3**) with **COPPER ANTI-SEIZE AGENT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❏ Align the mark on the wheel with the mark made on the hub when it was removed.

❏ Fit the wheel to the vehicle, positioning the valve at the top.

❏ Insert the wheel bolts.



113180

❏ Tighten the wheel bolts to bring all the bolt heads into contact with the wheel.

- ❏ Pretighten the wheel bolts to **30 N.m**, with the wheel suspended, starting with the bolts at the bottom.
- ❏ Rotate the wheel through **180°** to bring the valve into the bottom position.
- ❏ Position the vehicle on its wheels.

> Note:
>
> Use sockets with protective sheaths in order to avoid scratching the alloy wheel rims.

- ❏ Torque tighten the wheel bolts in order (see **30A**, **General information**, **Front axle system: Tightening torque**, page **30A-16**) (30A, General information).
- ❏ Refit the trim piece.

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.

It is essential to calibrate the balancer according to the frequency recommended by the manufacturer.

Do not 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.

Driver's perception

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

These vibrations appear between **54 mph (90 km/h)** and **90 mph (150 km/h)**.

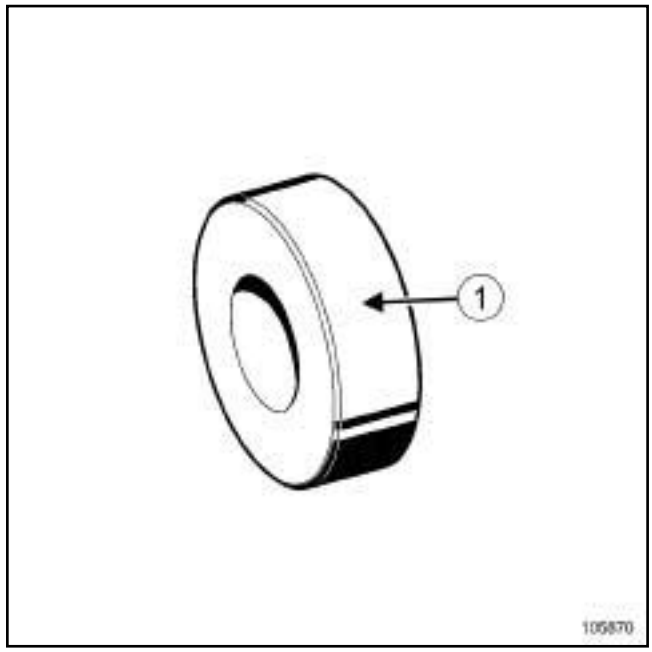
II - BALANCING PREPARATION OPERATION

❏ Adjust the tyre pressure (see **Tyre pressure: Identification**) .

❏ Always carry out a road test for a minimum distance of **1 mile (2 km)** before balancing the wheels, in order to remove any flat spots on the tread caused by the vehicle being immobilised.

❏ Actions to be carried out immediately after the test drive:

- Position the vehicle on a two-post vehicle lift (see **Vehicle: Towing and lifting**) ,
- raise the vehicle,
- leave the four wheels hanging free,
- release the parking brake.



105870

❏

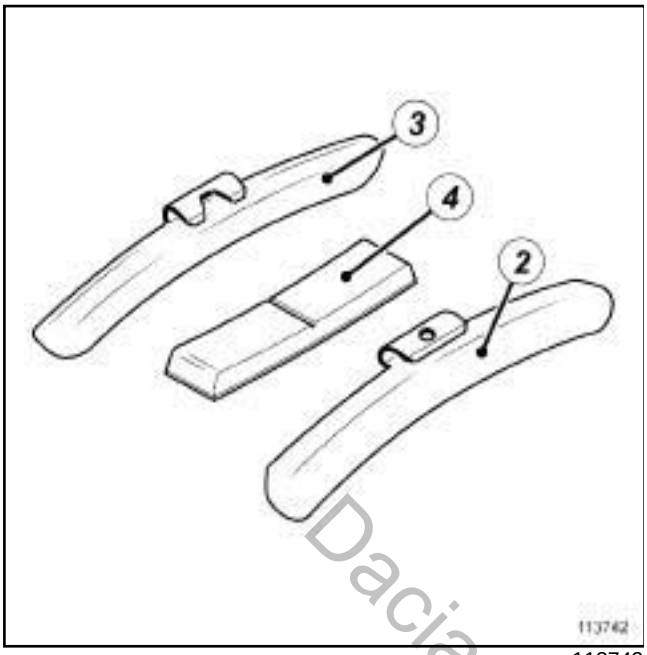
Note:

The ring is available from the supplier of the equipment used.

To reproduce the exact vehicle wheel assembly, use a ring (**1**) of diameter:

❏ **66 mm**

❏ There are three types of weight:



113742

(**2**) Steel wheel with flange

(**3**) Alloy wheel with flange

(**4**) Alloy wheel without flange

❏ In some countries, the use of lead weights is forbidden; in this case it is recommended to use **ZAMAK** weights instead.

Only use weights provided by the Parts Department.

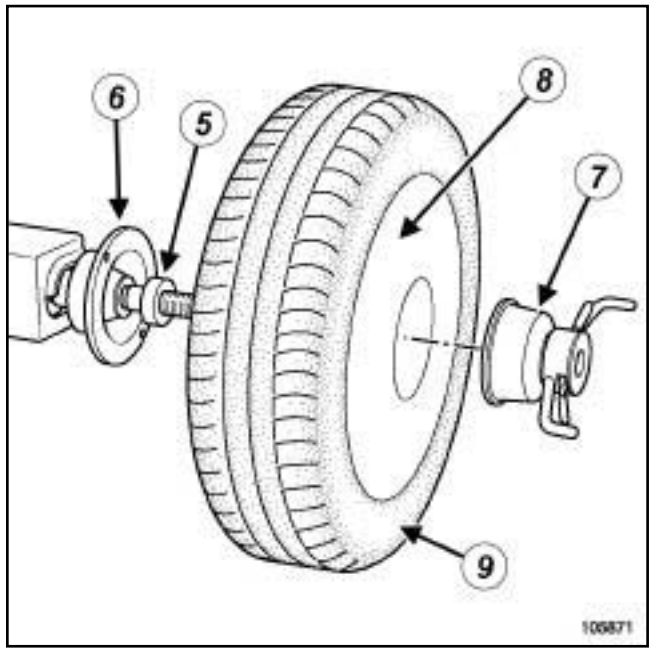
❏ Remove the wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Always clean the wheel, disc, and hub bearing surfaces.

III - PROCEDURE FOR BALANCING THE WHEEL IN QUESTION

❏ Make sure that the wheel balancer bearing surface and all the centring equipment (ring, thrust plate, etc.) are kept clean.

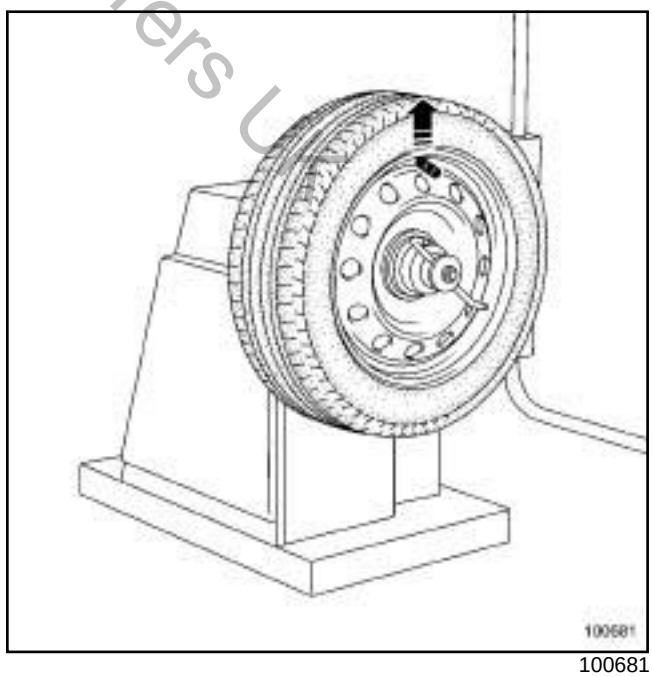
❏ Try not to scratch the (alloy) wheel rim with the wheel tightening device.



105871

❏ The wheel is fitted on the wheel balancer as follows:

- (**5**) ring,
- (**6**) wheel balancer back-plate,
- (**7**) wheel tightening device (certain alloy wheels require a device 200 mm in diameter to ensure that the wheel has been correctly tightened),
- (**8**) outer wheel plane,
- (**9**) wheel.



100681

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

❏ Remove any stones trapped in the tyre tread.

❑ Enter the specific wheel parameters when starting the wheel balancer.

❑ Start the wheel balancer and check the wheel balance, which should be **0 g** on each plane of the wheel.

❑ If this is not the case, remove the old wheel balancing weights and repeat the wheel balancing procedure, checking that the wheel balance equals **0** on each wheel plane.

WARNING

To avoid detachment of the balance weights, use only weights which correspond to the vehicle wheel rims.

IV - FINAL OPERATION

❑ Refit the wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

I - CLEANLINESS

Clean:

- the tyre bead,
- the tyre bead/wheel rim contact surface.

Remove any grit trapped in the tyre treads.

Clean the bearing surfaces on:

- the wheels,
- the discs,
- the hubs.

II - GENERAL RECOMMENDATIONS

WARNING

If checking the pressure when hot, increase the tyre inflation pressure by **0.2** to **0.3** bar above the recommended pressure.

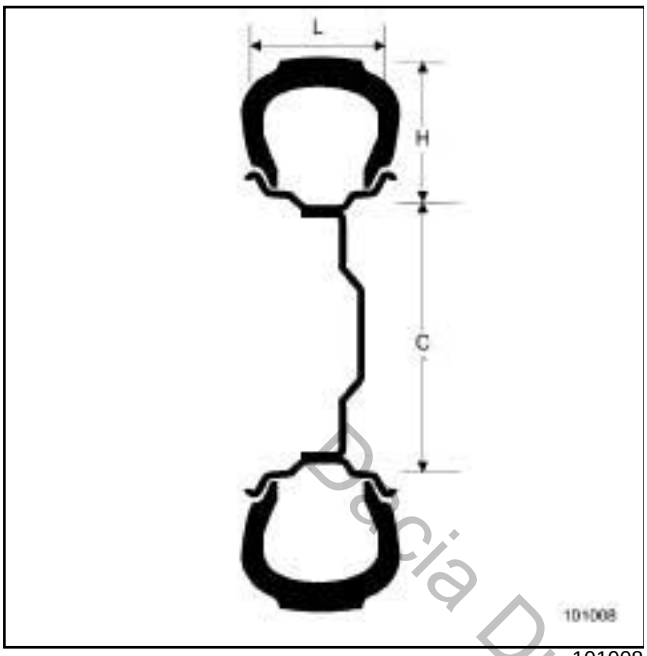
WARNING

In order to remove any flat spots on the tread after the vehicle has stopped, it is essential to carry out a road test for a minimum distance of **1 mile (2 km)** before balancing the wheels.

WARNING

To avoid detachment of the balance weights, use only weights which correspond to the vehicle wheel rims

Example of a tyre identification mark: **205/65 R 15 91 V**.



101008

123448

205	Tyre width in mm (L)
65	Height/width ratio
R	Radial structure
15	Internal diameter in inches (c)
91	Load index
V	Speed code

Speed code table:

Code	Maximum speed in mph (km/h)
R	**170**
S	**180**
T	**190**
U	**200**
H	**210**
V	**240**
ZR	above **240**
W	**270**
Y	**300**

REMOVAL

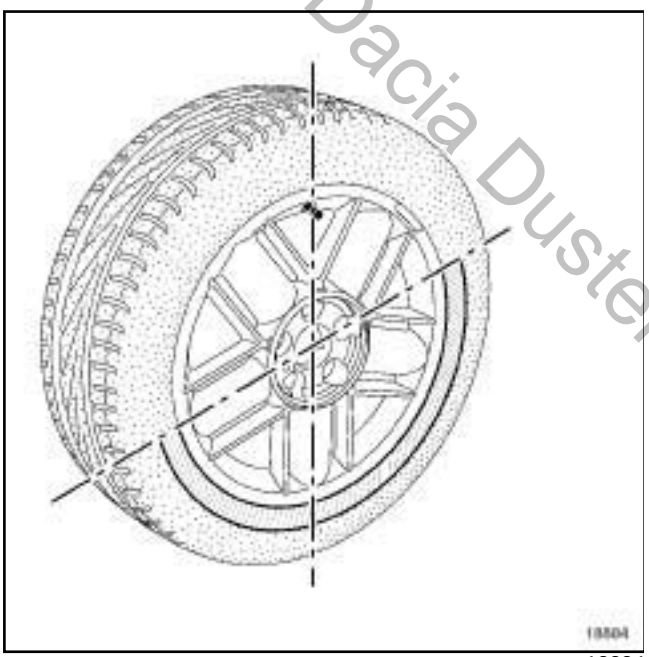
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the wheel in question (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the balance weights,
- the valve mechanism.

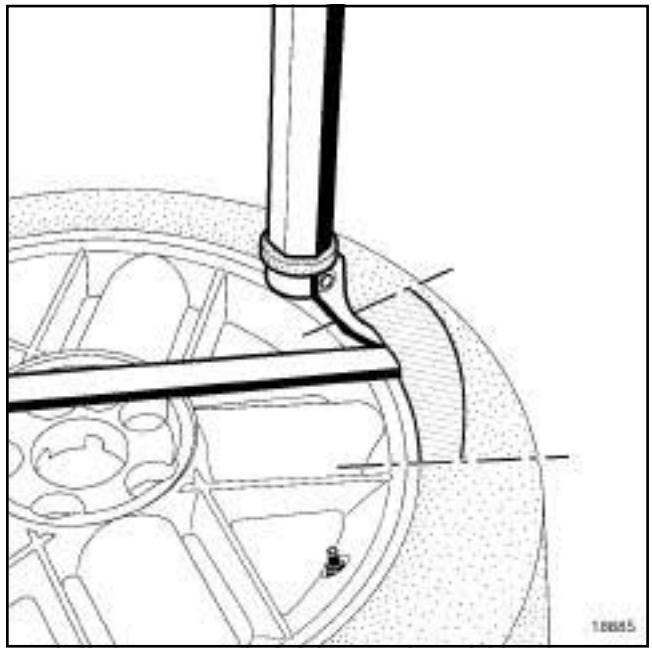
II - OPERATION FOR REMOVAL OF PART CONCERNED



18884

❏ Detach:

- the bead from the outside of the tyre, starting with the side opposite the valve,
- the bead from the inside of the tyre.



18885

❏ Position the tyre lever approximately **15 cm** from the valve on the outside of the wheel rim in order to remove the exterior bead from the tyre.

❏ Remove the exterior bead of the tyre, finishing at the valve.

❏ Position the tyre lever approximately **15 cm** from the valve on the outside of the wheel rim in order to remove the bead from inside the tyre.

❏ Remove the interior bead of the tyre, finishing at the valve.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Lubricate the two tyre beads correctly using the **TYRE PASTE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

II - REFITTING OPERATION FOR PART CONCERNED

❏ Engage the lower tyre bead approximately **15 cm** after the valve.

❏ Finish fitting the tyre at the valve.

❏ Fit the exterior bead approximately **15 cm** after the valve using the tyre lever.

❏ Inflate the tyre to **3.5 bar** to press the tyre beads against the wheel rim.

III - FINAL OPERATION

❏ Refit the valve mechanism.

❏ Inflate the tyre to the recommended pressure (see **Tyre pressure: Identification**) .

> Note:
>
> It is not necessary to drive the vehicle before and after a new wheel is balanced.

❏ Balance the wheel (see **35A**, **Wheels and tyres**, **Wheel: Balancing**, page **35A-4**) .

❏ Refit the wheel in question (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

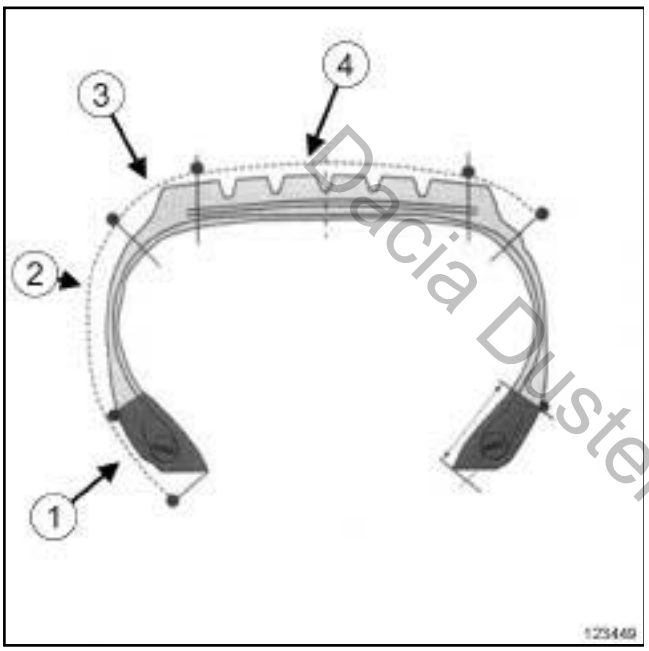
Perforation

There are two types of perforation:

- single perforation: perforation caused by nail etc. not requiring a reinforced tyre boot and which can be repaired when the tyres are cold,
- damage: rubber detachment etc. requiring repair and reinforcement of damaged plies.

This repair method only covers single perforations.

Tyre areas



123449

Areas which cannot be repaired:

- tyre bead (**1**) ,
- shoulder (**3**) .

Areas which can be repaired:

- sidewall (**2**) ,
- crown (**4**) .

Perforation table *

	Area	
	Crown: max Ø in mm	**Sidewall: max Ø in mm**
LV speed rating less than or equal to T	6	3
LV speed rating greater than or equal to H	6	0
LCV load index less than or equal to 121	6	3
HGV load index 122 to 177 (inc.)	10	3

LV: Light Vehicle

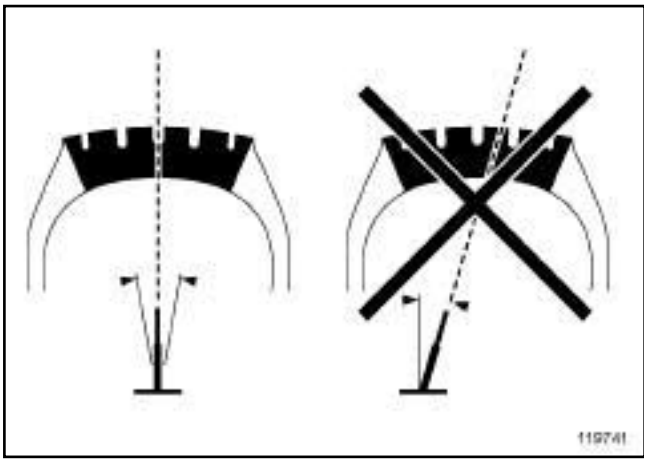
LCV: Light Commercial Vehicle

HGV: Heavy Goods Vehicle

***** If the diameter of the puncture is greater than these figures, replace the tyre.

The tyre cannot be repaired if:

- a compulsory marking has been worn away (see **35A**, **Wheels and tyres**, **Tyres: Identification**, page **35A-8**) ,
- the interior of the tyre shows signs of under-inflation or overloading,
- the rubber shows signs of chemical damage (hydrocarbons and other corrosive substances),
- incorrect and irreversible repairs have previously been made to the tyre,
- the carcass has been damaged,
- cuts or circumferential wear (cracks) are visible on the interior or exterior of the tyre,
- the tyre bead has been damaged (ply visible),
- the tyre's bead wires are visible, damaged or deformed,
- the tyre shows an irregular wear pattern which may impair vehicle handling,
- the repair requires two tyre boots to be overlapped,
- the manufacturer has expressly prohibited any repairs, in writing,
- there is damage to the shoulder area (junction between the sidewall and the crown),
- the angle of the perforation channel (hole) is greater than 15°.



119741

Tyre inflation kit

using the tyre inflation kit, supplied with vehicles or available from retailers, will leave a film on the inner surface of the tyre.

Before carrying out the repair, clean the inner surface of the tyre and the valve with water.

If the tyre cannot be cleaned in this way, contact the tyre supplier for details of cleaning products which can be used.

REPAIR

I - REPAIR PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Inflate the tyre.

❏ Locate the perforation on the exterior of the tyre and mark it with chalk.

❏ Remove the tyre.

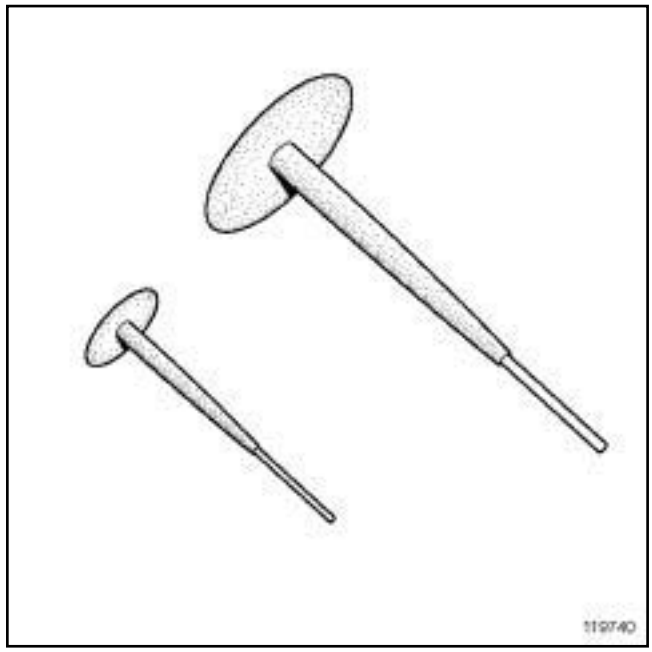
❏ Locate the perforation on the interior of the tyre and mark it with chalk.

❏ Remove the foreign body which caused the puncture.

❏ Determine the direction of the perforation channel.

❏ Determine the size of the hole:

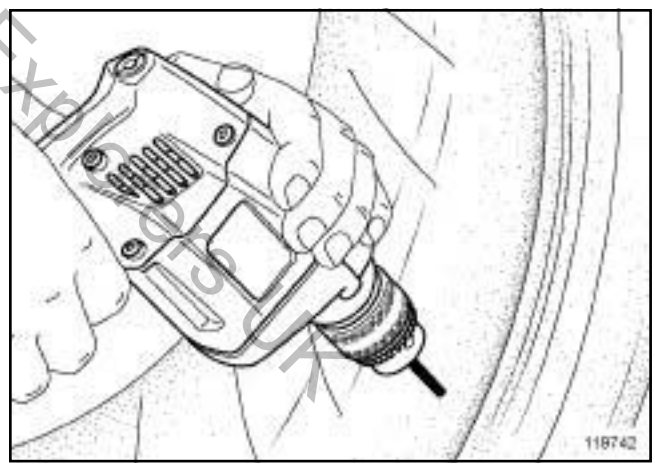
- measure the size of the foreign body,
- measure the extent of the damage to the tyre.



119740

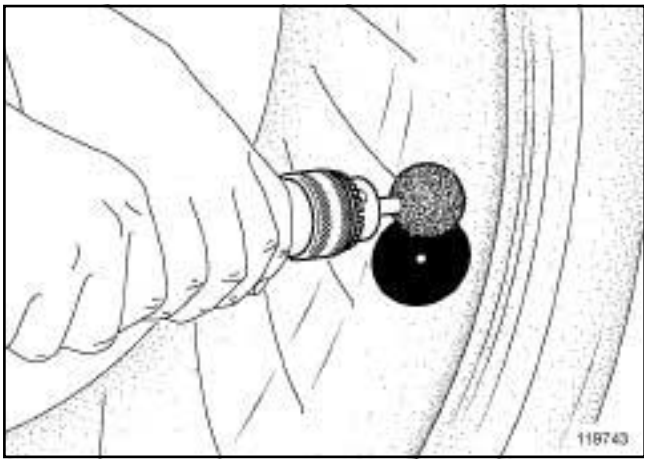
❏ Choose the size of plug (mushroom type plug) depending on the size of the hole.

II - REPAIR OPERATION



119742

❏ Use a drill fitted with a suitable bit, perpendicular to the surface of the tyre, to bore the interior then the exterior of the perforation channel.



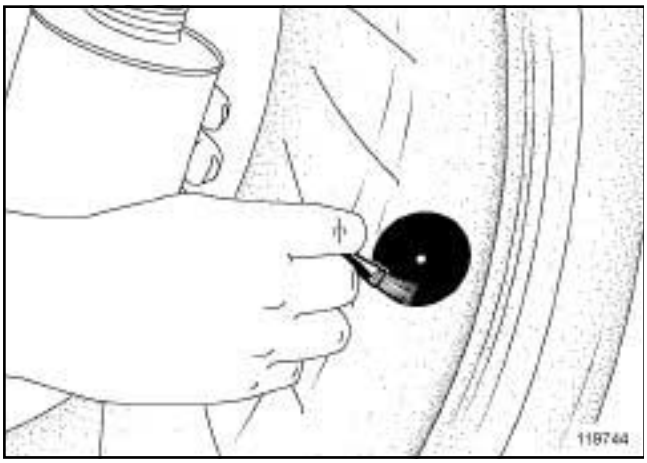
119743

❏ Carefully scrape the rubber seal around the perforation, to the size of the base of the plug (mushroom type plug).

Note:

If the rubber seal is damaged during this operation, replace the tyre.

❏ Remove any dust and remaining particles of rubber using a clean, dry cloth.

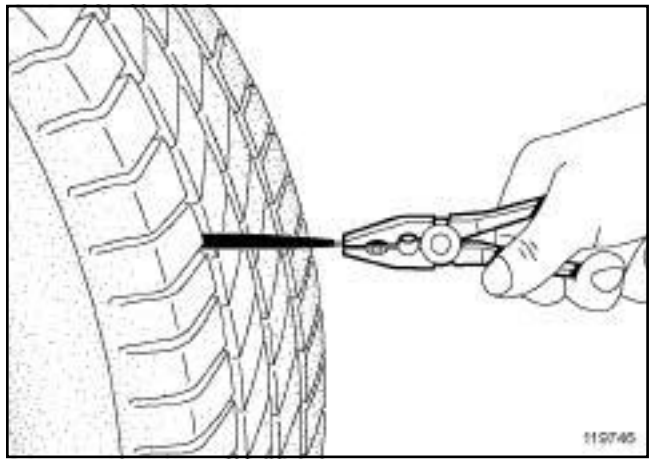


119744

❏ Apply the solution to the scraped surface.

Note:

Respect the required drying time for the solution.



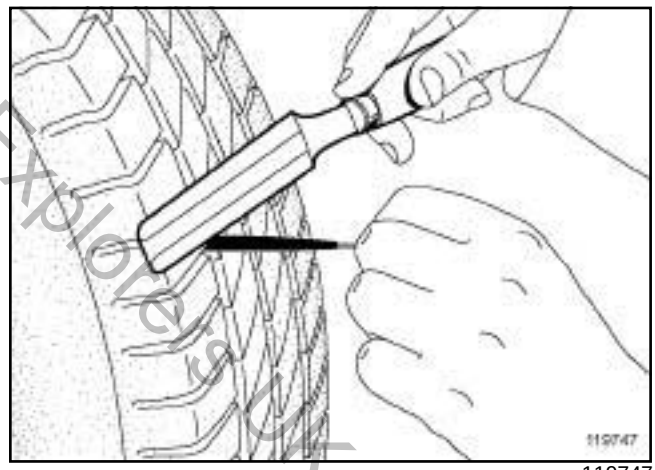
119746

❏ Fit the (mushroom type) plug via the interior of the tyre by pulling on it using pliers.

❏ Press gently on the base of the mushroom plug, inside the tyre.

❏ Refit the tyre.

❏ Inflate the tyre (see **Tyre pressure: Identification**) .



119747

❏ Cut the protruding end of the stalk without pulling on it.

❏ Check the tyre seal.

III - FINAL OPERATION.

❏ Balance the wheel (see **35A**, **Wheels and tyres**, **Wheel: Balancing**, page **35A-4**) .

❏ Refit the wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

IDENTIFICATION

1 - Marking

There are two types of identification marking on the wheel rims:

- engraved marking for steel wheel rims,

- cast marking for alloy wheel rims.

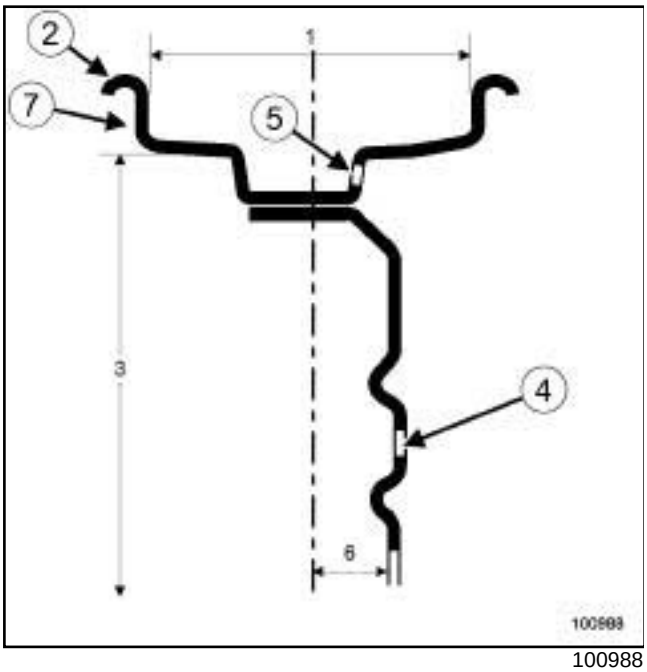
The marking gives the main dimensional specifications of the wheel rim.

This marking may be:

- complete, for example **6 J 15 5 CH 36,**

- simplified, for example **6 J 15**.

	Wheel type	**6 J 15**
1	Width (in inches)	6
2	Rim edge profile	J
3	Nominal diameter (in inches)	15
4	Number of holes	5
5	Anchorage profile of the tyre	CH
6	Offset (in mm)	36



100988

There are 3 types of wheel rim edges (**2**) :

- those with two flat edges,

- those with two raised edges,

- those with one flat edge and one raised edge.

2 - Installation diameter for the wheel bolts

3 - Rim run-out

The maximum run-out is measured at the wheel rim edge ***(7)*** .

4 - Out-of-roundness

The maximum out-of-round value is measured on the tyre bead bearing surface.

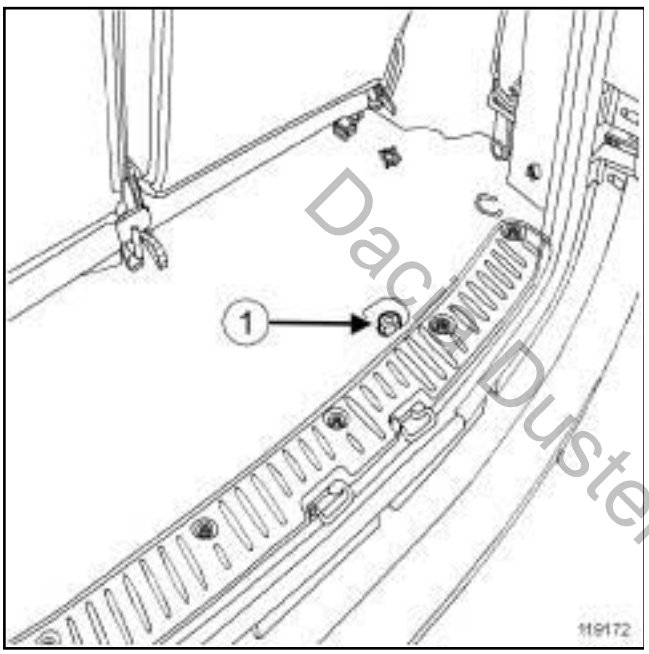
4X2 TRANSMISSION

REMOVAL

I - REMOVAL PREPARATION OPERATION

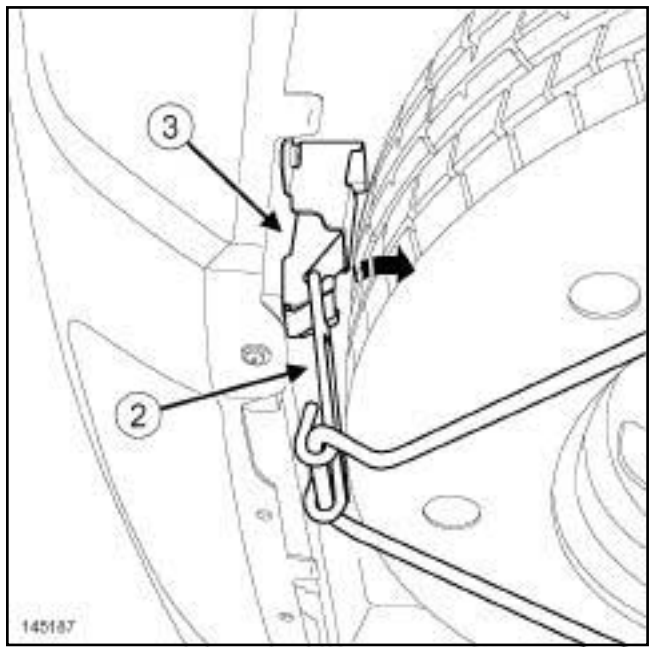
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

II - OPERATION FOR REMOVAL OF PART CONCERNED



119172

❑ In the luggage compartment, loosen the mounting bolt (**1**) on the emergency spare wheel carrier hook.

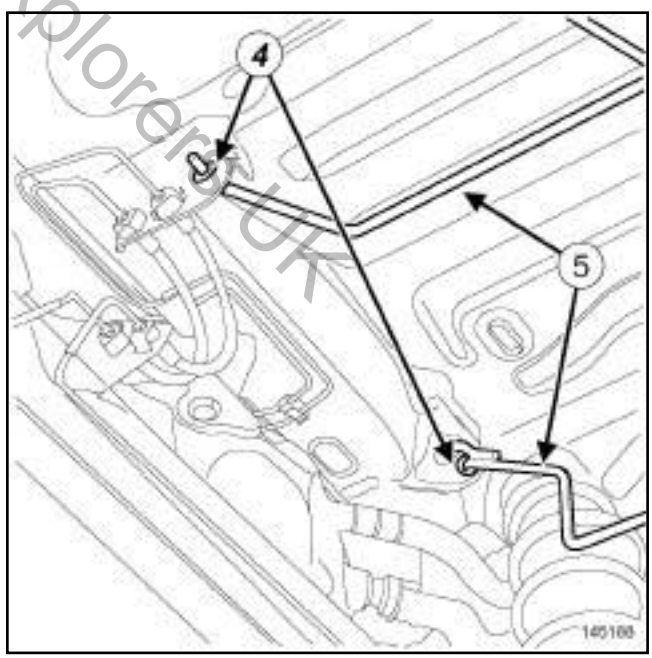


145187

❑ Unhook the handle (**2**) of the emergency spare wheel carrier from the hook (**3**) in the direction of the arrow.

❑ Tilt the emergency spare wheel carrier downwards while holding the emergency spare wheel.

❑ Remove the emergency spare wheel.



145188

❑ Remove:

- the lock washers (**4**)
- the two arms (**5**) of the emergency spare wheel carrier,
- the emergency spare wheel carrier.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the lock washers.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the arms of the emergency spare wheel carrier on the body mountings.

❏ Refit the lock washers ***(4)***

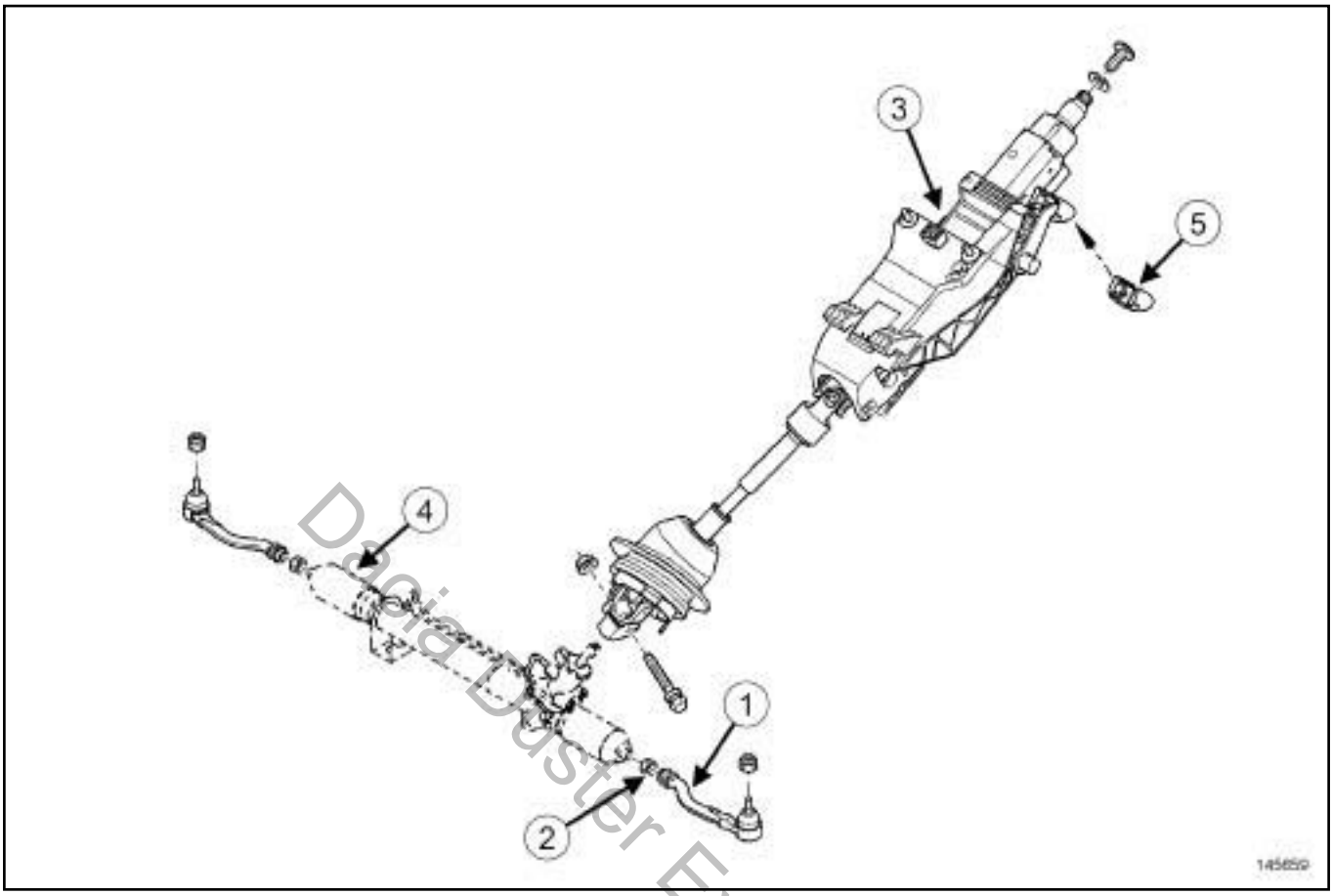
❏ Refit the emergency spare wheel in the carrier.

❏ Tilt the emergency spare wheel carrier upwards.

❏ Clip the handle of the emergency spare wheel carrier onto the hook.

III - FINAL OPERATION

❏ Tighten the mounting bolt on the hook of the emergency spare wheel carrier.



145659

(**1**)	Track rod
(**2**)	Axial ball joint linkage
(**3**)	Steering column
(**4**)	Steering box gaiter
(**5**)	Steering column adjustment lever

I - SAFETY

1 - Advice to be followed before any operation

For an operation requiring the use of a lift, follow the safety advice (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

2 - Instruction to be followed during the operation

IMPORTANT
Wear protective gloves during the operation.

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

II - CLEANLINESS

1 - Advice to be followed before any operation

Use a cover to protect any chassis elements that may be contaminated with power-assisted steering fluid.

2 - Instruction to be followed during the operation

Clean around the power-assisted steering system using **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

III - GENERAL RECOMMENDATIONS

To ensure correct operation and performance of the system, do not attempt to repair any components other than those supplied in After-Sales.

To ensure the quality of the repair, only use the tooling recommended by the manufacturer.

1 - Power assisted steering circuit:

a - Power-assisted steering fluid

Only use the fluid recommended by the manufacturer, in order to ensure correct system performance (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

b - Blanking plugs

To prevent impurities from entering the power assisted steering circuit, use blanking plugs on the various dismantled parts.

2 - Seals

To ensure a sound power-assisted steering circuit seal, replace the power-assisted steering pipe seals each time a pipe is removed.

3 - Steering column

WARNING
In order not to damage the steering wheel or steering column, the steering wheel-column foolproofing devices must be aligned.

Do not rest the steering column on the adjustment handle.

Do not handle the steering column by the adjustment handle or by the wiring.

Manoeuvre the «steering column - intermediate shaft » assembly by holding each section (one hand on the column and the other on the intermediate shaft). If the steering column is not handled correctly, there is a risk that the steering column or intermediate shaft could fall, which could destroy the system.

Always replace the steering column if it is dropped or in the event of an impact.

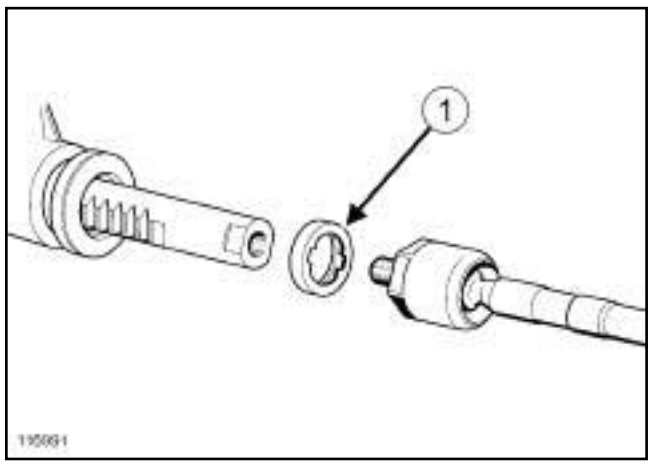
4 - Steering box

The steering box should not be carried by the gaiters or pipes, as this may damage them.

When the vehicle is positioned with the wheels suspended, the steering rack must not be subjected to violent movements from lock to lock.

Risks: Damage to the teeth of the steering rack and pinion may cause a **safety risk** relating to the steering unexpectedly locking.

5 - Axial ball joint



116991

The axial ball joint limiters (**1**) are colour coded for foolproofing purposes. When removing or replacing the axial ball joint, check that the limiter with the correct colour code is refitted.

6 - Power-assisted steering pump

Do not run the engine without steering fluid in the circuit.

7 - Pump assembly

Do not run the engine without steering fluid in the circuit.

8 - Wiring harnesses

Ensure that the electrical wiring is clean and correctly routed.

Tightening torques ▽	
track rod ball joint nut	**37 N.m**
wheel alignment adjusting lock nut	**53 N.m**

IMPORTANT
Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **36A**, **Steering assembly**, **Steering: Precautions for the repair**, page **36A-2**) .

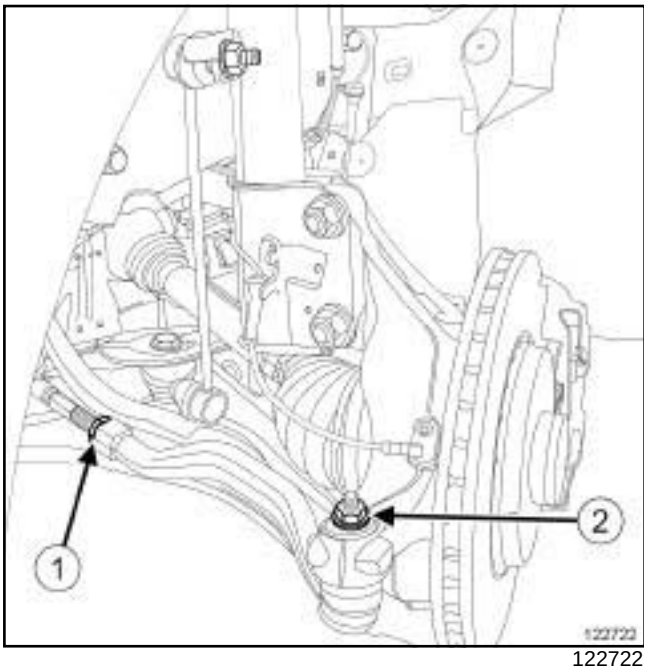
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

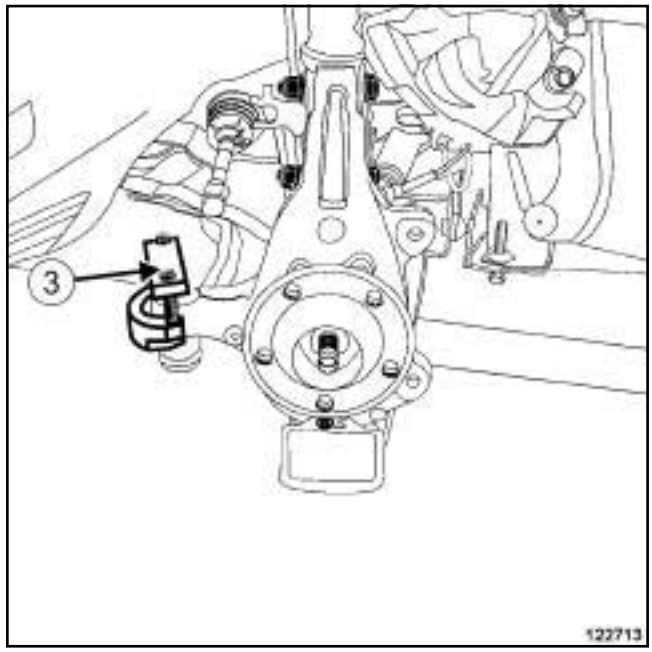
II - OPERATION FOR REMOVAL OF PART CONCERNED



122722

❏ Loosen the wheel alignment adjustment lock nut (**1**) .

❏ Remove the track rod ball joint nut (**2**) .



122713

❏ Extract the ball joint using (**3**) .

❏ Unscrew the track rod anti-clockwise and note the number of turns for refitting.

❏ Remove the track rod.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Screw the track rod back in place by the number of turns noted during removal.

❏ Fit the track rod end in the hub carrier.

❏ Refit the track rod ball joint nut.

❏ Tighten to torque:

- the **track rod ball joint nut (37 N.m)**,
- the **wheel alignment adjusting lock nut (53 N.m)**.

II - FINAL OPERATION

❏ Refit the wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Check the axle geometry (see **30A**, **General information**, **Axle assemblies: Check**, page **30A-15**) .

❏ If necessary, adjust the geometry of the axle assemblies (see **30A**, **General information**, **Front axle system: Adjustment**, page **30A-18**) .

Tightening torques ▽	
axial ball joint	**80 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

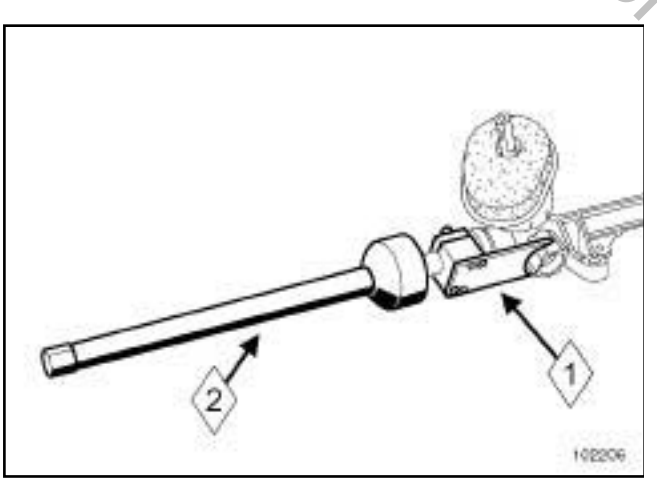
❏ Remove the front wheel on the side concerned (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Remove the track rod (see **36A**, **Steering assembly**, **Track rod: Removal - Refitting**, page **36A-4**) .

❏ Remove the steering box gaiter (see **36A**, **Steering assembly**, **Steering box gaiter: Removal - Refitting**, page **36A-9**)

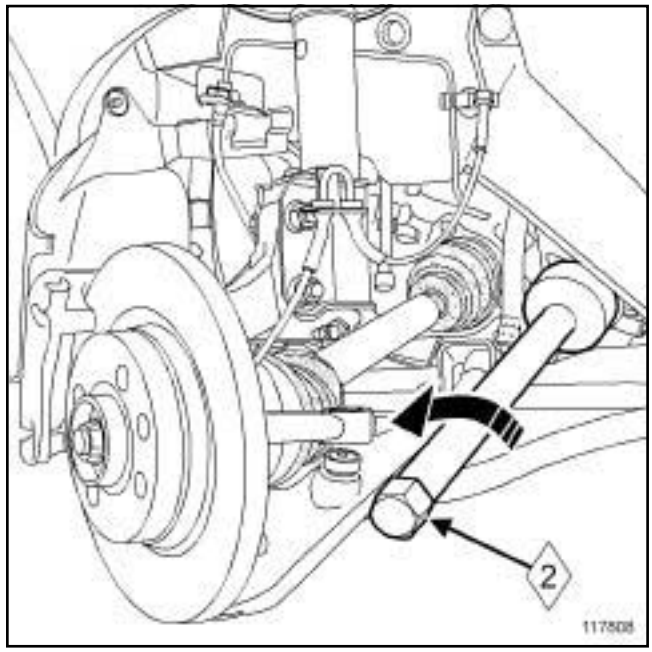
❏ Unlock the steering column.

II - OPERATION FOR REMOVAL OF PART CONCERNED



102206

❏ Set up the (**1**) on the steering rack, at the pinion end.



117808

❏ Unlock the axial ball joint using tool (**2**) .

❏ Remove the axial ball joint.

REFITTING

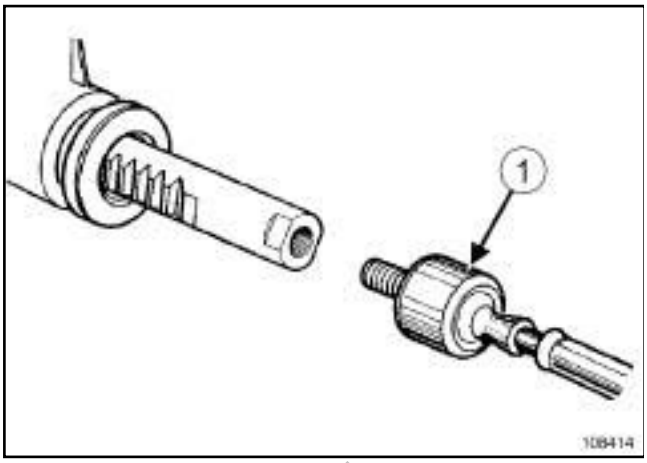
I - REFITTING PREPARATION OPERATION

❏

Note:

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

II - REFITTING OPERATION



108414

❏ Coat the threading of the axial ball joint with **HIGH STRENGTH THREAD LOCK** (see **Vehicle: Parts and consumables for the repair**) .

❏ Refit the axial ball joint (**1**) .

❏ Torque tighten the **axial ball joint (80 N.m)** using the tool.

❏ Remove the

❏ Coat the following with **SILICONE GREASE** (see **Vehicle: Parts and consumables for the repair**) ,

- the steering rack,
- the axial ball joint.

III - FINAL OPERATION

❏ Refit:

- the steering box gaiter (see **36A**, **Steering assembly**, **Steering box gaiter: Removal - Refitting**, page **36A-9**) ,
- the track rod (see **36A**, **Steering assembly**, **Track rod: Removal - Refitting**, page **36A-4**) ,
- the wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Check the front axle geometry (adjust if necessary) (see **Front axle assembly: Adjustment values**) .

Tightening torques ▽	
universal joint bolt	**21 N.m**
steering column nuts	**21 N.m**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **36A**, **Steering assembly**, **Steering: Precautions for the repair**, page **36A-2**) .

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Set the wheels straight ahead.

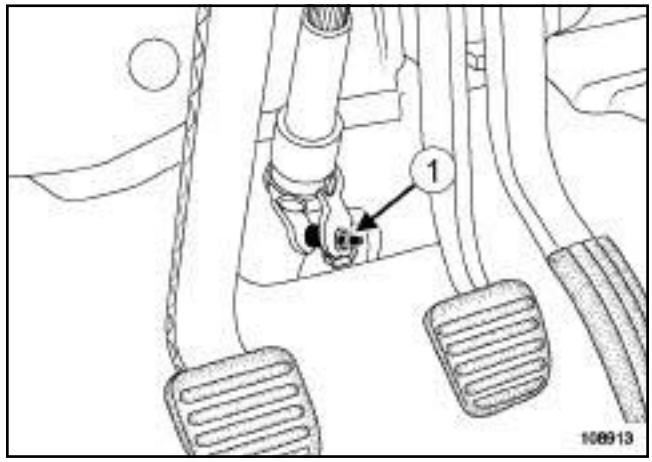
❏ Lock the airbag computer (see **Fault finding - Replacement of components**) (88C, Airbags and pretensioners).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

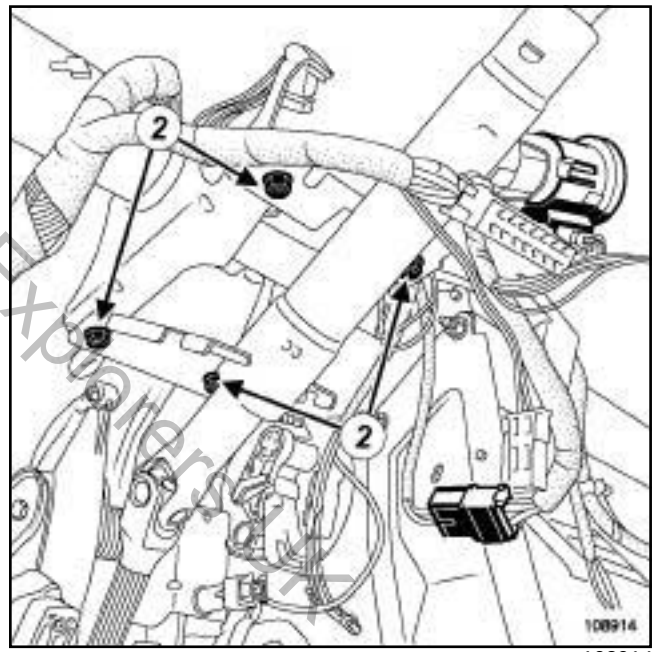
- the driver's front airbag (see **Driver's frontal airbag: Removal - Refitting**) (88C, Airbags and pretensioners),
- the steering wheel (see **36A**, **Steering assembly**, **Steering wheel: Removal - Refitting**, page **36A-13**) ,
- the steering column switch assembly (see **Steering column switch assembly: Removal - Refitting**) (84A, Control - Signals),
- the instrument panel (see **Instrument panel: Removal - Refitting**) (83A, Instrument panel),
- the radio (see **Radio: Removal - Refitting**) (86A, Radio),
- the dashboard (see **Dashboard: Removal - Refitting**) (57A, Interior equipment).

II - OPERATION FOR REMOVAL OF PART CONCERNED



108913

❏ Remove the steering column universal joint bolt (**1**) .



108914

❏ Remove:

- the steering column bolts (**2**) ,
- the steering column.

❏ Remove the ignition switch (see **Ignition switch: Removal - Refitting**) (82A, Immobiliser).

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: Steering shaft yoke boltparts always to be replaced: Steering shaft yoke nutparts always to be replaced: Steering wheel bolt**

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the ignition switch (see **Ignition switch: Removal - Refitting**) . (82A, Immobiliser).

❏ Refit a new cam nut for the universal joint on the steering column

❏ Lock the cam nut in its housing (opening on the universal joint).

❏ Refit:

- the steering column,
- the universal joint bolt,
- the bolts on the steering column.

❏ Torque tighten:

- the **universal joint bolt (21 N.m)**,
- the **steering column nuts (21 N.m)**.

III - FINAL OPERATION

❏ Refit:

- the dashboard (see **Dashboard: Removal - Refitting**) (57A, Interior equipment).
- the radio (see **Radio: Removal - Refitting**) (86A, Radio),
- the instrument panel (see **Instrument panel: Removal - Refitting**) (83A, Instrument panel),
- the steering column switch assembly (see **Steering column switch assembly: Removal - Refitting**) (84A, Control - Signals),
- the steering wheel (see **36A**, **Steering assembly**, **Steering wheel: Removal - Refitting**, page **36A-13**) ,
- the driver's front airbag (see **Driver's frontal airbag: Removal - Refitting**) (88C, Airbags and seat belt pretensioners),

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Unlock the airbag computer (see **Fault finding - Replacement of components**) (88C, Airbag and pretensioners).

REMOVAL

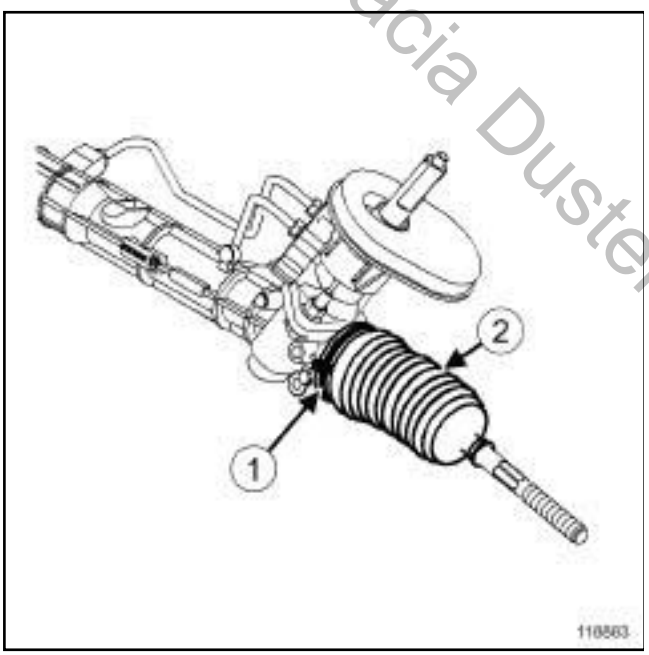
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the track rod (see **36A**, **Steering assembly**, **Track rod: Removal - Refitting**, page **36A-4**) ,
- the wheel alignment adjustment lock nut.

II - OPERATION FOR REMOVAL OF PART CONCERNED



118883

❑

Note:

When removing the steering gaiter, blast the gaiter surfaces with compressed air to eliminate any impurities that could enter the steering box.

❑ Cut the gaiter retaining clip (**1**) .

❑ Remove the gaiter (**2**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Always replace:

- the steering box gaiter,
- the retaining clip.

❑ Clean the contact surfaces between the steering box and the gaiter using **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❑ Use **SILICONE GREASE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to coat the mating face of the gaiter on the axial ball joint to prevent the gaiter from twisting.

Note:

Be sure to centre the steering to ensure the air in the gaiters is equalised.

Note:

Be careful not to damage the gaiters: risk of irreversible damage.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the new steering box gaiter,
- the new retaining clip.

III - FINAL OPERATION

❑ Refit:

- the wheel alignment adjustment lock nut,
- the track rod (see **36A**, **Steering assembly**, **Track rod: Removal - Refitting**, page **36A-4**) ,
- the wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❑ Check the axle geometry (see **30A**, **General information**, **Axle assemblies: Check**, page **30A-15**) .

❑ If necessary, adjust the geometry of the axle assemblies (see **30A**, **General information**, **Front axle system: Adjustment**, page **30A-18**) .

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **36A**, **Steering assembly**, **Steering: Precautions for the repair**, page **36A-2**) .

REMOVAL

I - REMOVAL PREPARATION OPERATION

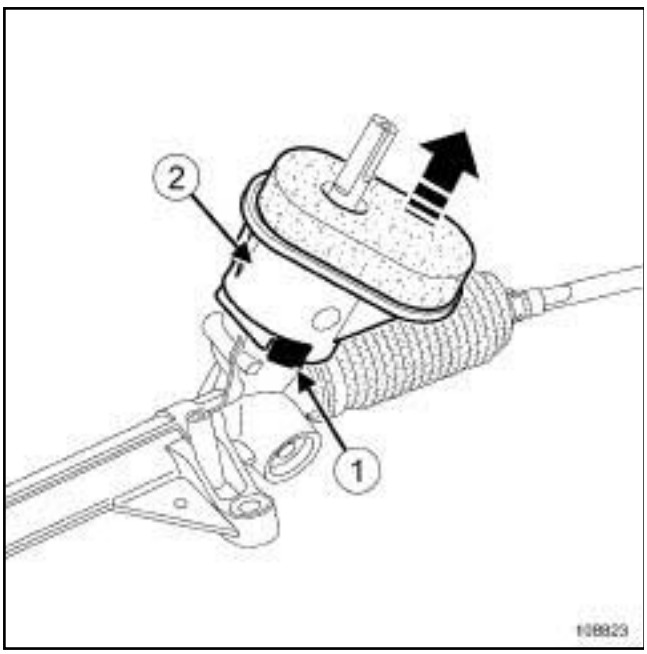
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the front wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the engine undertray.

❏ Remove the steering box (see **Steering box: Removal - Refitting**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



108823

❏ Unclip the bulkhead seal at (**1**) using a flat-blade screwdriver.

❏ Remove the bulkhead seal (**2**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Fit the bulkhead seal in its original position.

❏ Clip the bulkhead seal onto the steering box.

II - FINAL OPERATION

❏ Refit the steering box (see **Steering box: Removal - Refitting**) .

❏ Refit:

- the engine undertray,
- the front wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

REMOVAL

I - REMOVAL PREPARATION OPERATION

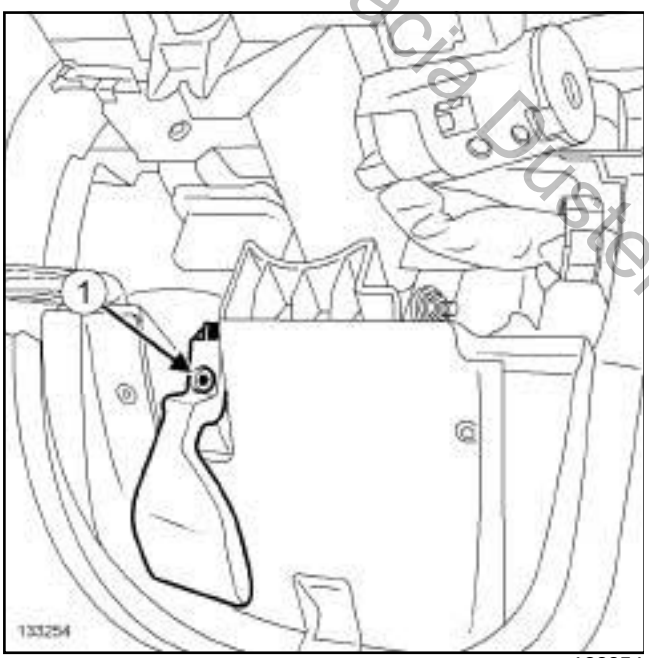
❏ Disconnect the battery (see) (80A, Battery).

❏ Remove:

- the bolts on the steering wheel lower cover,
- the half covers under the steering wheel (see **Instrument panel: Removal - Refitting**) (83A, Instrument panel),
- the immobiliser ring.

❏ Disconnect the various connectors.

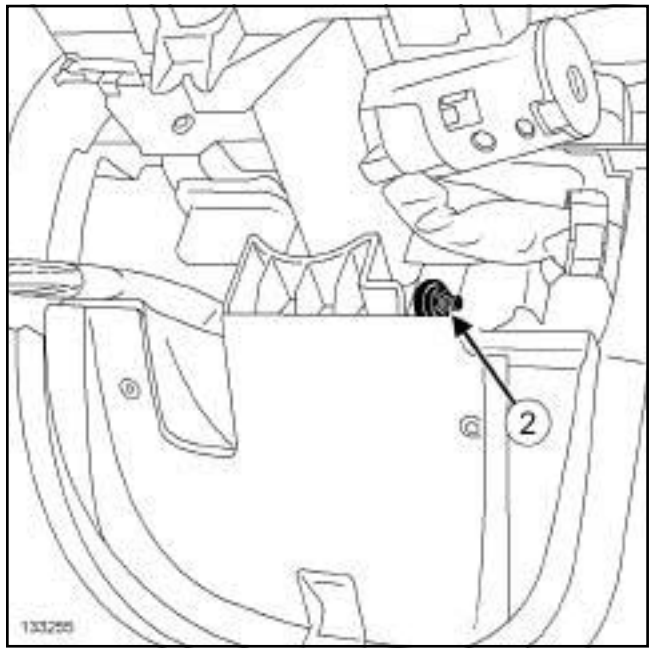
II - OPERATION FOR REMOVAL OF PART CONCERNED



133254

❏ Remove:

- the bolt (**1**) of the adjustment handle,
- the adjustment handle.



133255

❏

Note:

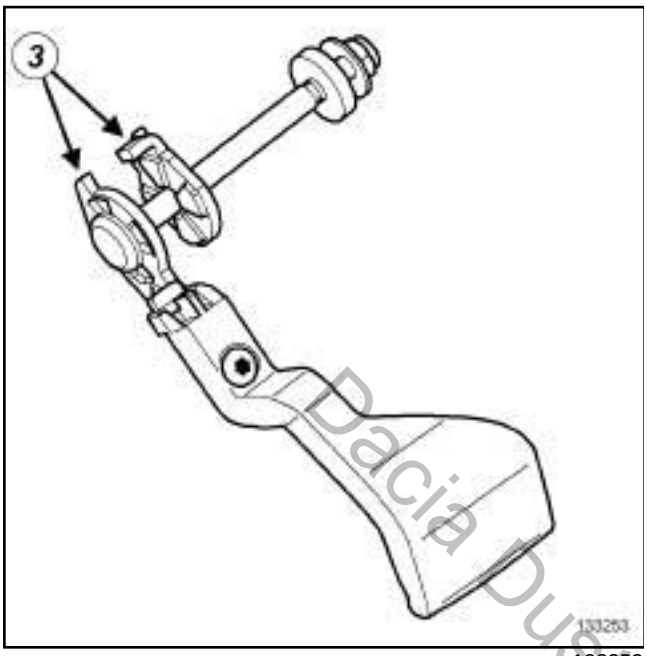
Note the position of the locking mechanism before removal.

❏ Remove:

- the nut (**2**) of the adjustment handle shaft,
- the needle bearing,
- the « adjustment handle shaft - locking mechanism » assembly.

REFITTING

I - REFITTING PREPARATION OPERATION



133253

❑

Note:

When refitting the handle shaft, ensure that the two notched segments (**3**) are correctly positioned.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the «adjustment handle shaft - locking mechanism» assembly,
- the needle bearing,
- the nut of the adjustment handle shaft,
- the adjustment handle,
- the bolt of the adjustment handle.

Note:

The amount of effort required to operate the handle shaft is determined by how much it is tightened. Test to determine the correct tightening.

III - FINAL OPERATION

❑ Connect the various connectors.

❑ Refit:

- the immobiliser ring,
- the half covers under the steering wheel (see **Instrument panel: Removal - Refitting**) (83A, Instrument panel),
- the bolts on the steering wheel lower cover.

❑ Connect the battery (see) (80A, Battery).

Tightening torques ▽	
new steering wheel bolt	**44 N.m**

IMPORTANT
Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **36A**, **Steering assembly**, **Steering: Precautions for the repair**, page **36A-2**) .

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Apply the procedure for deactivating the safety systems. (see **Airbag and pretensioners: Precautions for the repair**)

❑

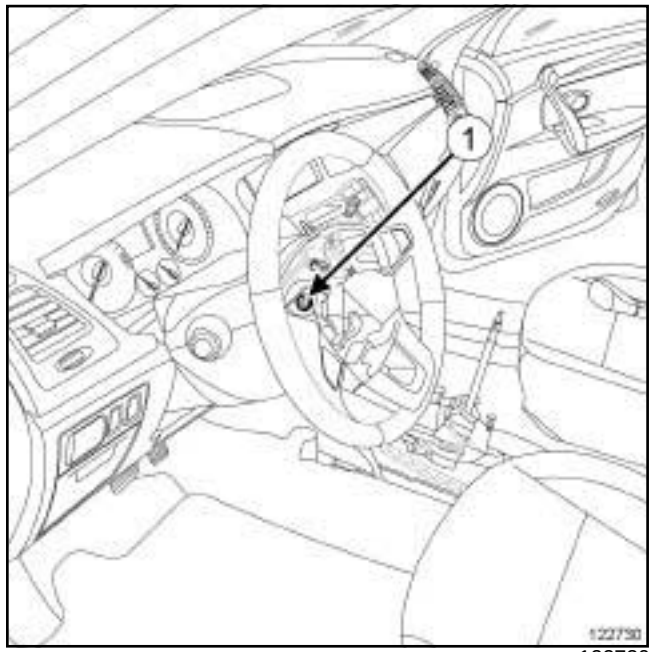
WARNING
Incorrect wheel alignment may damage the rotary switch.

❑ Remove the driver's front airbag (see **Driver's frontal airbag: Removal - Refitting**) .

❑ Set the wheels straight ahead.

❑ Disconnect the connectors.

II - OPERATION FOR REMOVAL OF PART CONCERNED



122730

❑ Remove the steering wheel bolt (**1**) .

WARNING
To ensure that the electronic systems operate correctly, do not damage the locking systems of the connectors.

❑ Remove the steering wheel.

❑

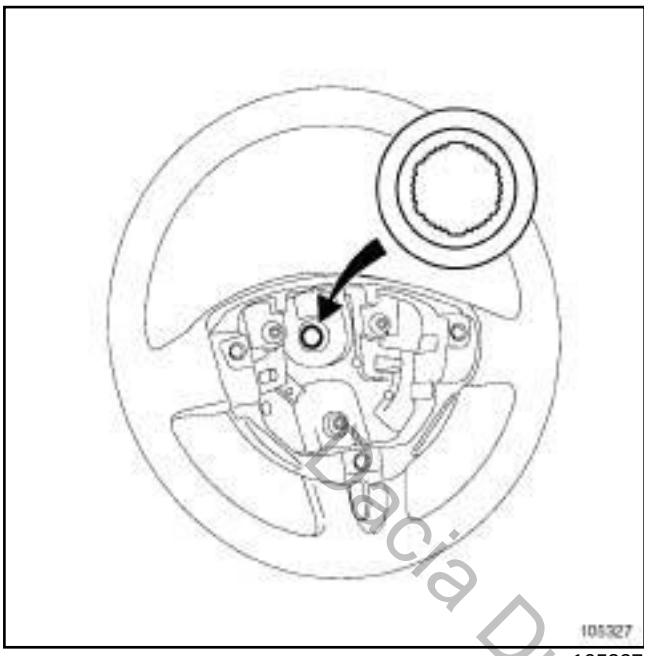
WARNING
To prevent damaging the rotary switch, do not turn the mobile section of the rotary switch.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Steering wheel bolt**.

II - REFITTING OPERATION FOR PART CONCERNED



105327

❑

WARNING
In order not to damage the steering wheel or steering column, the steering wheel-column fool-proofing devices must be aligned.

❑ Refit the steering wheel.

❑ Connect the connectors.

❑ Refit the new steering wheel bolt.

❑ Torque tighten the **new steering wheel bolt (44 N.m)**.

III - FINAL OPERATION

❑ Refit the driver's front airbag (see **Driver's frontal airbag: Removal - Refitting**) .

IV - CHECKING AFTER REPAIR

❑ Switch on the ignition.

❑ Check the operation of the rotary switch:

- turn the steering wheel to the left until it stops,
- turn the steering wheel to the right until it stops,
- check that there are no faults on the instrument panel.

K4M – K9K, and STANDARD HEATING RECIRCULATION

Tightening torques ▽	
pressostat	**12 N.m**
power-assisted steering pump outlet high pressure union	**21 N.m**

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the engine undertray.

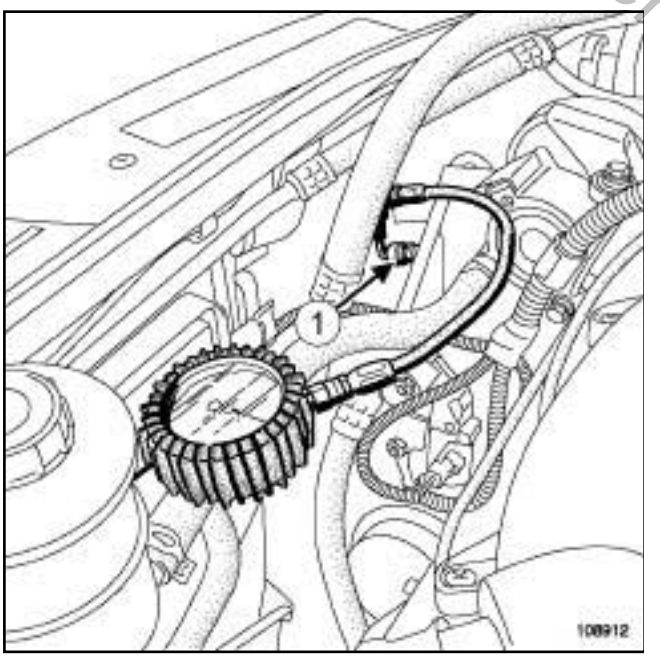
❏ Fit a hose clamp on the power-assisted steering pump oil inlet pipe to restrict the flow.

❏

Note:

Protect the alternator from escaping power assisted steering fluid.

K4M



108912

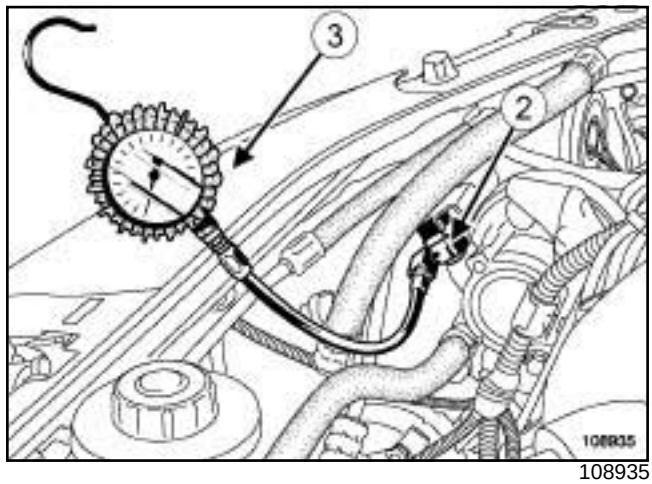
❏ Disconnect the pressure switch connector.

❏ Remove the pressostat.

❏ Fit thein place of the pressostat (**1**) .

❏ Connect theto the.

K9K



108935

❏ Remove the high pressure pipe union mounting from the power-assisted steering pump outlet.

❏ Fit the (**2**) between the power-assisted steering pump and the power-assisted steering pump outlet high pressure union.

❏ Connect the (**3**) and theto the.

❏ Remove the hose clamp.

❏ Lower the vehicle.

❏ Fill the power-assisted steering circuit with **ELF RENAULT MATIC D2** oil (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

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

WARNING

To avoid damaging the power-assisted steering system, do not keep the steering at full lock.

❏ Set the vehicle wheels straight ahead.

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

❏ Top up the fluid in the reservoir.

❏ Remove:

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

K4M – K9K, and STANDARD HEATING RECIRCULATION

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

❏ Switch off the engine.

❏ Raise the vehicle.

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

❏ Remove thethen its adapter.

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

K4M

❏ Remove theand its union.

❏ Refit the pressostat.

❏ Torque tighten the **pressostat (12 N.m)**.

❏ Connect its connector.

K9K

❏ Remove theand its union.

❏ Refit the power-assisted steering pump outlet high pressure pipe union.

❏ Torque tighten the **power-assisted steering pump outlet high pressure union (21 N.m)**.

❏ Remove the hose clamp.

❏ Fill the power-assisted steering circuit with **ELF RENAULT MATIC D2** oil (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

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

❏ Set the vehicle wheels straight ahead.

WARNING
To avoid damaging the power-assisted steering system, do not keep the steering at full lock.

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

❏ Top up the fluid in the reservoir.

❏ Refit:

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Check that there are no leaks.

❏ Refit the engine undertray.

K9K, and AIR CONDITIONING

Tightening torques ▽	
bolt mounting the high pressure pipe union on the power-assisted steering pump assembly	**25 N.m**
bolt mounting the high pressure pipe union on the power-assisted steering pump assembly	**25 N.m**

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the power-assisted steering pump assembly mountings.

❏ Fit a hose clamp on the flexible pipe of the power-assisted steering pump assembly.

❏

Note:

Prepare for oil escaping from the power-assisted steering system.

❏ Remove the bolt mounting the high pressure pipe union on the power-assisted steering pump assembly.

❏ Disconnect the high pressure pipe on the power-assisted steering pump assembly.

❏ Fit thebetween the power-assisted steering pump assembly and the power-assisted steering pump assembly outlet high pressure pipe union.

❏ Refit the high pressure pipe union mounting bolt and of theto the power-assisted steering pump assembly.

❏ Torque tighten the **bolt mounting the high pressure pipe union on the power-assisted steering pump assembly (25 N.m)**.

❏ Connect the pressure gauge of theto theusing union **"C"**.

❏ Remove the hose clamp.

❏ Lower the vehicle.

❏ Fill up the power assisted steering oil circuit (type: **ELF RENAULTMATIC D2**).

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

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

❏ Fill the oil to the correct level in the reservoir (if necessary).

❏ Check the pressure of the power-assisted steering pump assembly with the steering wheel at full lock: the maximum value should be **90 bar**.

❏ Switch off the engine.

❏ Raise the vehicle.

❏ Fit a hose clamp on the flexible pipe of the power-assisted steering pump assembly.

❏

Note:

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

❏ Remove:

- the pressure gauge of theand its union **"C"**,
- the mounting bolt of theand of the high pressure pipe union on the power-assisted steering pump assembly.

❏ Reconnect the high pressure pipe union to the power-assisted steering pump assembly.

❏ Refit the high pressure pipe union mounting bolt to the power assisted steering pump assembly.

❏ Torque tighten the **bolt mounting the high pressure pipe union on the power-assisted steering pump assembly (25 N.m)**.

❏ Remove the hose clamp.

❏ Fill up the power assisted steering oil circuit (type: **ELF RENAULTMATIC D2**).

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

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

❏ Fill the oil to the correct level in the reservoir (if necessary).

❏ Check that there are no leaks.

❏ Refit:

- the power-assisted steering pump assembly mountings,

- the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

K9K, and STANDARD HEATING RECIRCULATION

Special tooling required	
Ms. 583	Pipe clamps.

Tightening torques ▽	
power-assisted steering pump bolts	**21 N.m**
power-assisted steering pump high pressure union	**21 N.m**
power assisted steering pump support bolt on the sump	**21 N.m**
power-assisted steering pump high pressure pipe support mounting bolt	**21 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **02A, Lifting equipment, Vehicle: Towing and lifting**).

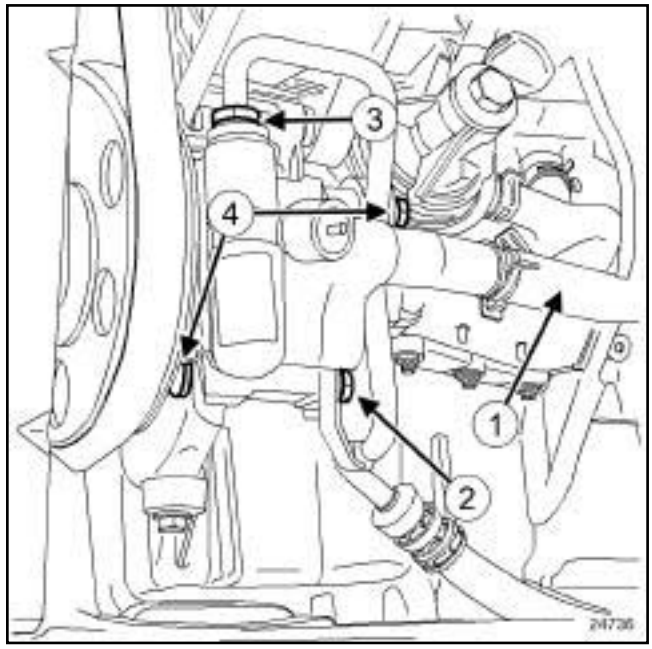
❏ Remove:

- the front right-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the engine undertray,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **Accessories belt: Removal - Refitting**) (11A, Top and front of engine).

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Fit the hose clamps on the hydraulic inlet and outlet pipes of the power assisted steering pump.

❏ Remove the hydraulic input hose clip on the pump using the.



24736

❏ Disconnect the inlet hose (**1**) .

❏ Remove the bolt (**2**) from the high pressure pipe support on the power-assisted steering pump.

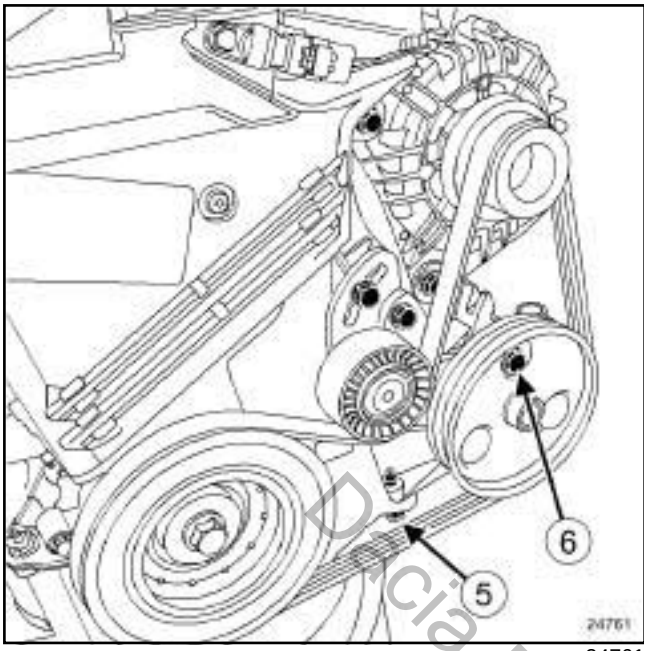
❏ Unscrew the power-assisted steering pump high pressure pipe union (**3**) .

❏ Disconnect the power-assisted steering pump high pressure pipe.

❏ Fit plugs to the pipe and power assisted steering pump openings to prevent impurities from entering.

❏ Remove the power-assisted steering pump bolts (**4**) on the multifunction support.

K9K, and STANDARD HEATING RECIRCULATION



24761

❑ Remove:

- the bolt (**5**) of the power-assisted steering pump support on the sump,
- the power-assisted steering pump bolt (**6**) on the multifunction support,
- the power-assisted steering pump.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

> **WARNING**
> Do not remove the blanking plugs from each component until the last moment.
>
> Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the power-assisted steering pump,
- the power-assisted steering pump support mounting bolt on the sump.

❑ Remove the plugs from the pipe openings.

❑ Screw the high pressure pipe union on the power-assisted steering pump.

❑ Refit the high pressure pipe support bolt on the power-assisted steering pump.

> Note:
> Tighten to torque first the two bolts on the accessories belt side, then the bolts on the other side.

❑ Torque tighten:

- the **power-assisted steering pump bolts (21 N.m)**,
- the **power-assisted steering pump high pressure union (21 N.m)**,
- the **power assisted steering pump support bolt on the sump (21 N.m)**,
- the **power-assisted steering pump high pressure pipe support mounting bolt (21 N.m)**.

❑ Connect the inlet hose on the power-assisted steering pump.

❑ Refit the hydraulic inlet hose clip on the power-assisted steering pump using the.

❑ Remove the hose clamps **(Ms. 583)** on the hydraulic inlet and outlet pipes of the power assisted steering pump.

III - FINAL OPERATION

❑ Refit the accessories belt (11A, Top and front of engine) (see **Accessories belt: Removal - Refitting**) .

❑ Fill the power-assisted steering circuit with **ELF RENAULT MATIC D2** oil (see **Vehicle: Parts and consumables for the repair**) (see 04B, Consumables - Products).

❑ 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 fluid in the reservoir.

❑ Check that there are no leaks.

❑ Refit the engine undertray.

K4M, and AIR CONDITIONING

Special tooling required	
Ms. 583	Pipe clamps.

Tightening torques ▽	
power-assisted steering pump bolts on the multi-function support	**21 N.m**
high pressure union on the power-assisted steering pump	**21 N.m**
high pressure pipe bolt on the cylinder block	**21 N.m**
injector rail protector nuts	**21 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **02A, Lifting equipment, Vehicle: Towing and lifting**).

❏ Remove:

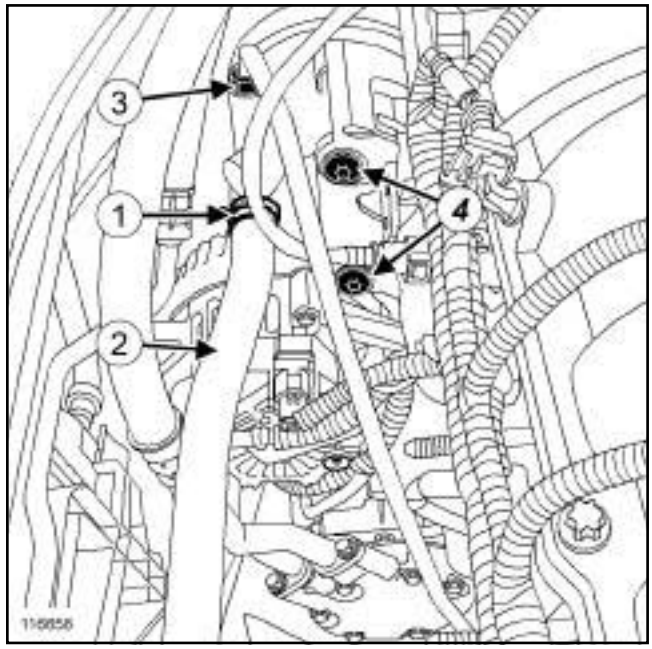
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**),
- the injector rail protector.

WARNING
Protect the alternator from escaping power assisted steering fluid.

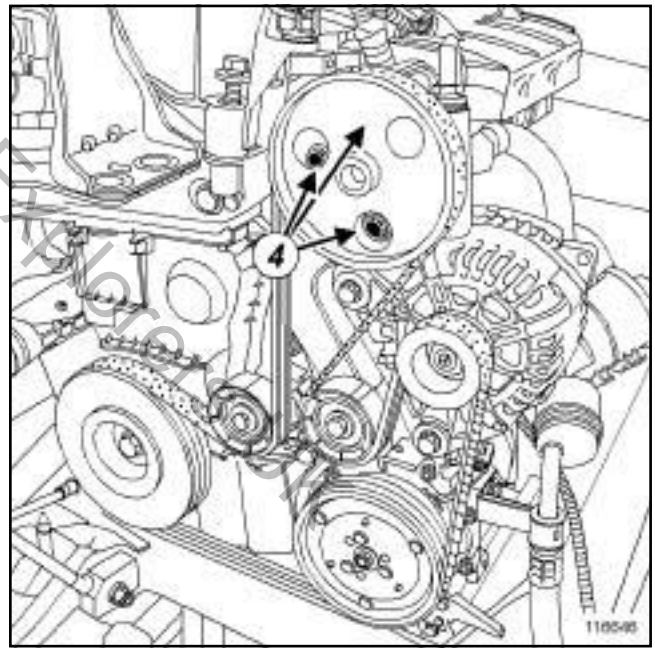
❏ Drain the power-assisted steering fluid reservoir using a syringe.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Fit hose clamps **(Ms. 583)** on the hydraulic inlet and outlet pipes of the power-assisted steering pump.



116658



116646

❏ Remove the hydraulic inlet hose clip (**1**) on the power-assisted steering pump using the tool.

❏ Disconnect the inlet hose (**2**) .

❏ Disconnect the pipe connecting the « dehydrator reservoir and the expansion valve » on the motor-driven fan assembly.

❏ Remove:

- the high pressure pipe bolt on the cylinder block,
- the power-assisted steering pump high pressure pipe union (**3**) .

K4M, and AIR CONDITIONING

❏ Disconnect the power-assisted steering pump high pressure pipe.

❏ Fit plugs to the pipe and power-assisted steering pump openings to prevent impurities from entering.

❏ Remove:

- the bolts ***(4)*** from the power-assisted steering pump on the multifunction support,
- the power-assisted steering pump towards the motor-driven fan assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

❏

WARNING

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the power-assisted steering pump,
- the power-assisted steering pump bolts on the multifunction support.

❏ Remove the plugs from the pipe openings.

❏ Refit:

- the high pressure pipe union on the power-assisted steering pump,
- the high pressure pipe bolt on the cylinder block.

❏ Torque tighten:

Note:

Tighten to torque first the two bolts on the accessories belt side, then the bolts on the other side.

- the **power-assisted steering pump bolts on the multifunction support (21 N.m)**,
- the **high pressure union on the power-assisted steering pump (21 N.m)**,
- the **high pressure pipe bolt on the cylinder block (21 N.m)**.

❏ Clip the pipe connecting the « dehydrator reservoir and the expansion valve » on the motor-driven fan assembly.

❏ Connect the inlet hose on the power-assisted steering pump.

❏ Refit the hydraulic inlet hose clip on the power-assisted steering pump using the.

❏ Remove the hose clamps **(Ms. 583)** from the hydraulic inlet and outlet pipes of the power-assisted steering pump.

K4M, and AIR CONDITIONING

III - FINAL OPERATION

❑ Refit:

- the injector rail protector,
- the accessories belt (see **Accessories belt: Removal - Refitting**) (see 11A, Top and front of engine).

❑ Torque tighten the **injector rail protector nuts (21 N.m)**.

❑ Fill the power-assisted steering circuit with **ELF RENAULT MATIC D2** oil (see **Vehicle: Parts and consumables for the repair**) (see 04B, Consumables - Products).

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

❑ 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.

K4M, and STANDARD HEATING RECIRCULATION

Special tooling required	
Ms. 583	Pipe clamps.

Tightening torques ▽	
power-assisted steering pump bolts on the multi-function support	**21 N.m**
high pressure pipe union on the power-assisted steering pump	**21 N.m**
high pressure pipe bracket bolt on the cylinder block	**21 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

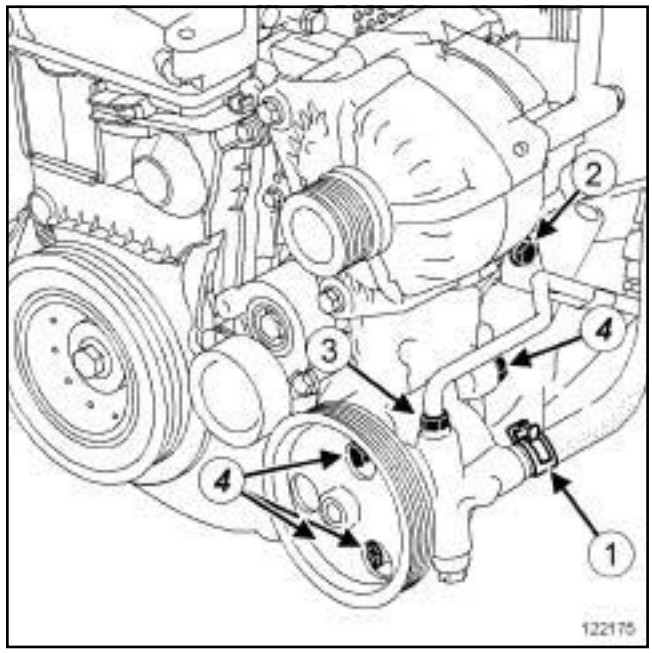
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the front right-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the accessories belt (see **Accessories belt: Removal - Refitting**) (11A, Top and front of engine),
- the engine undertray.

❏ Fit a hose clamp **(Ms. 583)** to the power-assisted steering pump inlet low pressure pipe.

II - OPERATION FOR REMOVAL OF PART CONCERNED



122175

❏ Remove the clip (**1**) from the power-assisted steering pump low pressure pipe using the.

❏ Disconnect the low pressure hydraulic pipe from the power-assisted steering pump.

❏ Remove:

- the high pressure pipe bracket bolt (**2**) on the cylinder block,
- the high pressure pipe union (**3**) from the power-assisted steering pump.

❏ Detach the high pressure pipe from the power-assisted steering pump.

❏ Fit plugs to the pipe and power-assisted steering pump openings to prevent impurities from entering.

❏ Remove:

- the bolts (**4**) from the power-assisted steering pump on the multifunction support,
- the power-assisted steering pump.

K4M, and STANDARD HEATING RECIRCULATION

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING
Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the power-assisted steering pump,
- the power-assisted steering pump bolts on the multifunction support.

❑ Remove the plugs in the pipe openings.

❑ Refit:

- the high pressure pipe union on the power-assisted steering pump,
- the high pressure pipe bracket bolt on the cylinder block.

Note:
Torque tighten the bolts on the accessories belt side first, then the bolt on the other side.

❑ Torque tighten:

- the **power-assisted steering pump bolts on the multifunction support (21 N.m)**,
- the **high pressure pipe union on the power-assisted steering pump (21 N.m)**,
- the **high pressure pipe bracket bolt on the cylinder block (21 N.m)**.

❑ Connect the low pressure pipe to the power-assisted steering pump.

❑ Refit the low pressure pipe clip on the power-assisted steering pump using the.

❑ Remove the hose clamp **(Ms. 583)** from the low pressure hydraulic pipe of the power-assisted steering pump.

III - FINAL OPERATION

❑ Refit:

- the engine undertray,
- the accessories belt (see **Accessories belt: Removal - Refitting**) (11A, Top and front of engine),
- the front right-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❑ Fill the power-assisted steering circuit with **ELF RENAULT MATIC D2** oil (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),

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

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

❑ Top up the fluid in the reservoir.

❑ Check that there are no leaks.

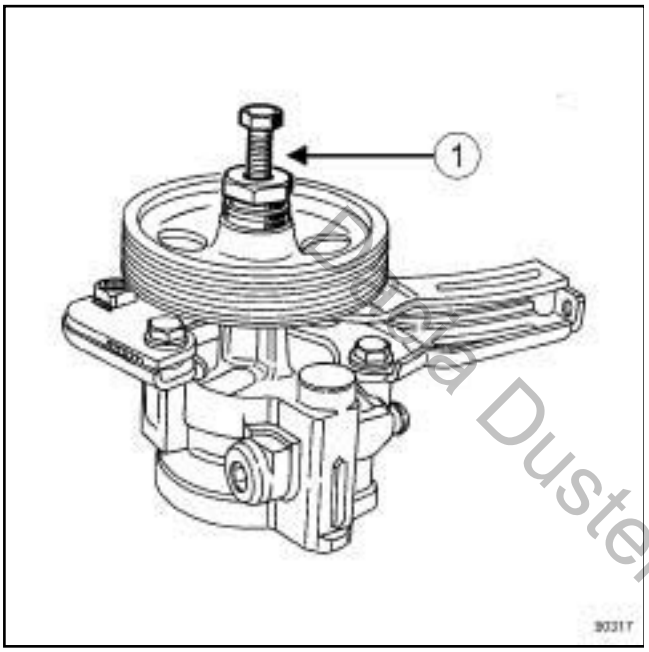
❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

REMOVAL

❑ Remove the power assisted steering pump (see **36B**, **Power assisted steering**, **Power-assisted steering pump: Removal - Refitting**, page **36B-5**) .

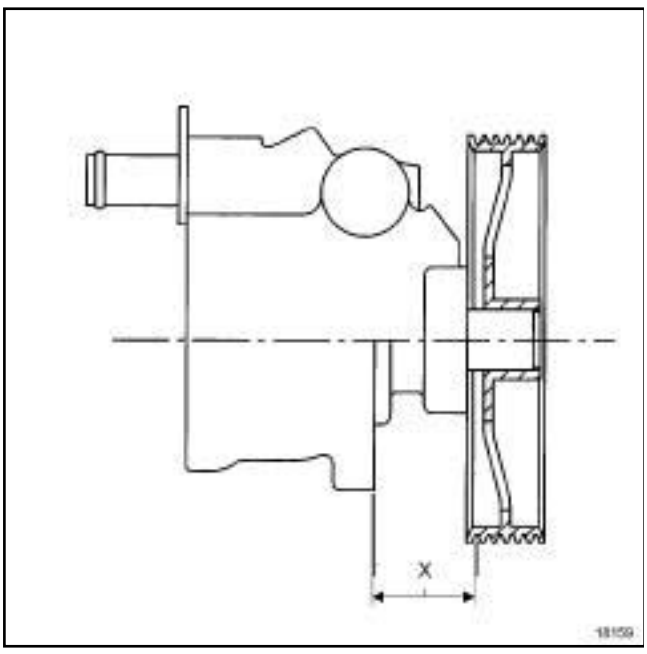
❑ Use the press with a jaw extractor.

REFITTING



90317

❑ Fit the pulley using the (**1**) until you reach the measured fitting dimension (lubricate the threading and the pressure point on the pulley thoroughly).



18159

❑ Follow the pulley fitting dimension measurement, **X=25.4 mm ± 0.4**.

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
pump assembly bolts	**21 N.m**
power-assisted steering pump assembly nut	**21 N.m**
high pressure pipe bracket bolt on the pump assembly	**21 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **36A**, **Steering assembly**, **Steering: Precautions for the repair**, page **36A-2**) .

REMOVAL

I - REMOVAL PREPARATION OPERATION

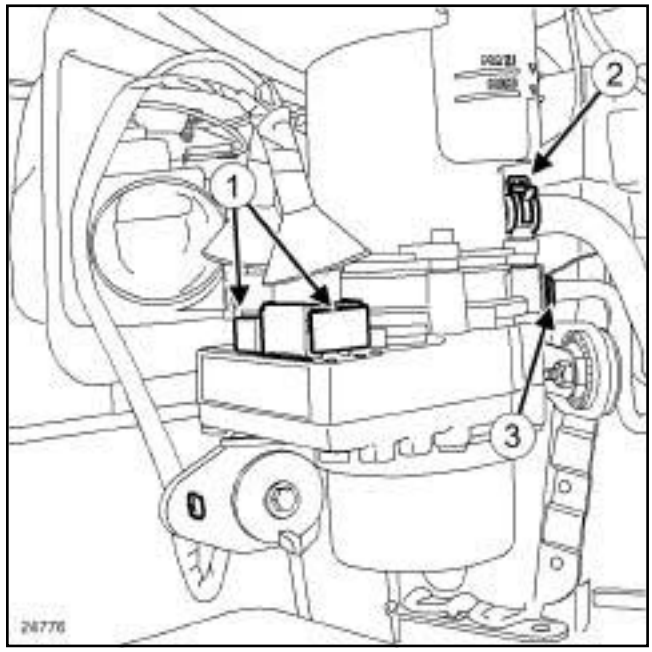
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).

II - REMOVAL OPERATION



24776

❏ Disconnect the pump assembly connectors (**1**) .

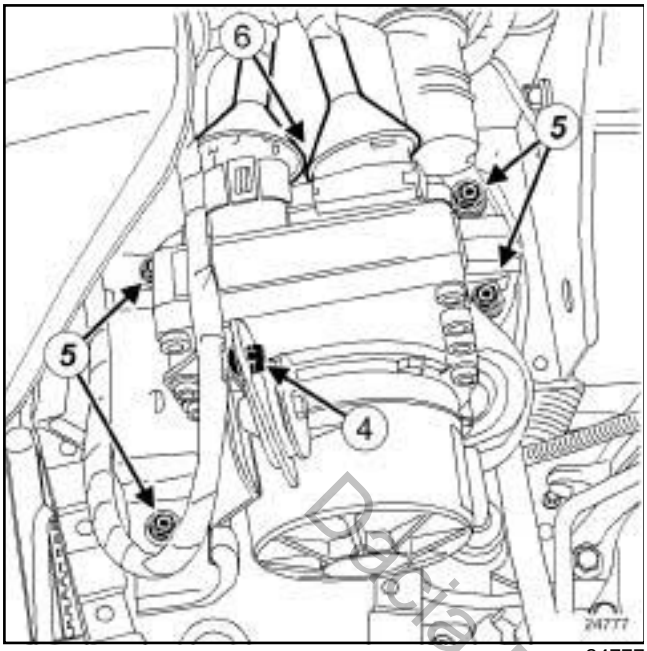
❏ Undo the low pressure pipe clip (**2**) on the pump assembly reservoir using theor **(Mot. 1448)**.

❏ Disconnect the low pressure pipe and drain the pump assembly reservoir.

❏ Remove the high pressure pipe bracket bolt (**3**) from the pump assembly.

❏ Disconnect the high pressure pipe from the pump assembly.

❏ Fit plugs to the pipes and pump assembly openings to prevent any impurities from entering the circuit.



24777

❏ Unclip the power-assisted steering pump assembly wiring at (**4**) .

❏ Remove:

- the bolts (**5**) from the power-assisted steering pump assembly,
- the nut (**6**) ,
- the pump assembly with its mounting.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the O-ring of the high pressure pipe.

> Note:
>
> The power-assisted steering pump assembly is sold with its mounting.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Fit the pump assembly with its mounting.

❏ Refit the power-assisted steering pump assembly mounting nut and bolts.

❏ Torque tighten:

- the **pump assembly bolts (21 N.m)**,
- the **power-assisted steering pump assembly nut (21 N.m)**.

❏ Remove the plugs from the pipes and pump assembly openings.

❏ Connect the high pressure pipe fitted with new seals to the pump assembly.

❏ Refit the bolt securing the high pressure pipe bracket on the pump assembly.

❏ Torque tighten the **high pressure pipe bracket bolt on the pump assembly (21 N.m)**.

❏ Connect the low pressure pipe to the pump assembly reservoir using theor **(Mot. 1448)**.

❏ Clip the pump assembly wiring.

❏ Connect the pump assembly connectors.

III - FINAL OPERATION

❏ Fill the power-assisted steering circuit with **ELF RENAULT MATIC D2** oil (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

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

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

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

❏ Fill the oil to the correct level in the reservoir (if necessary).

❏ Check that there are no leaks.

❏ Refit:

- the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ When replacing the pump assembly, program the power-assisted steering pump assembly computer (see **Fault finding - Replacement of components)** (36B, Power-assisted steering).

K4M

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
low pressure pipe union on the steering box	**21 N.m**
low pressure pipe bracket bolt on the sub-frame	**21 N.m**
high pressure pipe union on the power-assisted steering pump	**21 N.m**
high pressure pipe union on the steering box	**21 N.m**
high pressure pipe bolt on the steering box	**21 N.m**
high pressure pipe bolt on the gearbox suspended mounting	**21 N.m**

❑

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove the engine undertray.

1 - Low pressure pipe between the power-assisted steering pump and the reservoir

❑ Drain the power-assisted steering fluid reservoir using a syringe.

2 - High pressure pipe between the power-assisted steering pump and the steering box

❑ Fit a hose clamp on the power-assisted steering pump supply pipe.

❑ Remove:

- the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,

- the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).

3 - Low pressure pipe between the reservoir and the steering box

❑ Drain the power-assisted steering fluid reservoir using a syringe.

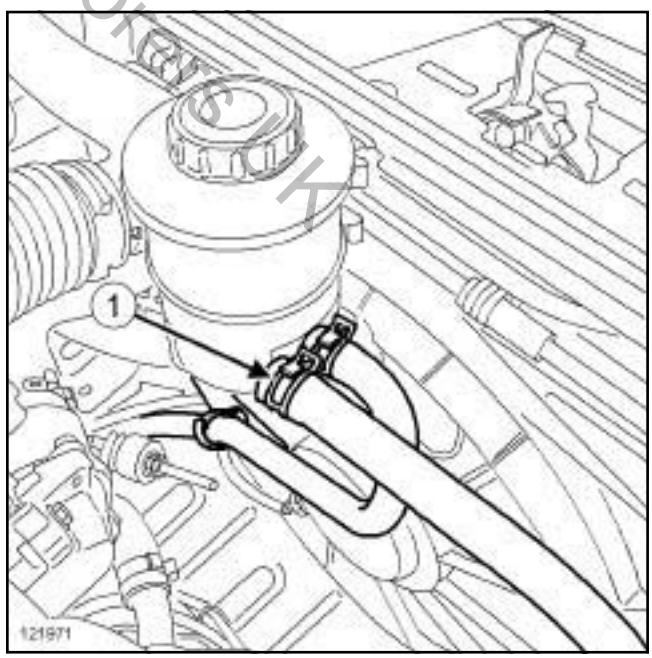
❑ Remove:

- the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,

- the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - Low pressure pipe between the power-assisted steering pump and the reservoir



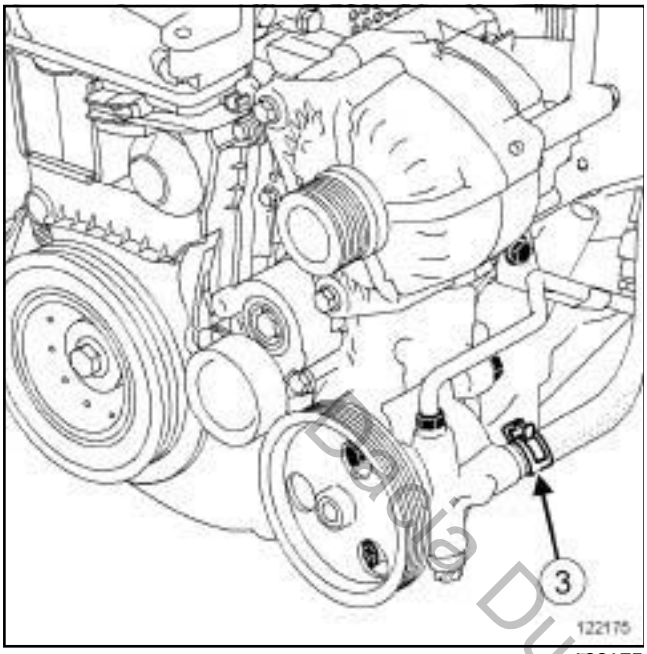
121971

❑ Loosen the low pressure pipe clip (**1**) on the reservoir using tool **(Mot. 1448)**.

❑ Disconnect the low pressure pipe on the reservoir.

K4M

STANDARD HEATING RECIRCULATION

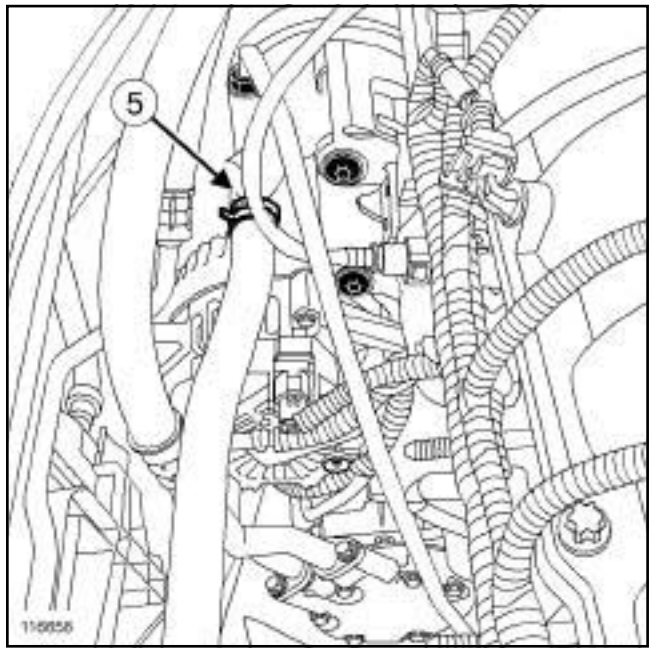


122175

❏ Loosen the clip (**3**) using tool **(Mot. 1448)**,

❏ Disconnect the low pressure pipe on the power-assisted steering pump.

AIR CONDITIONING



116658

❏ Loosen the clip (**5**) using tool **(Mot. 1448)**.

❏ Disconnect the low pressure pipe on the power-assisted steering pump.

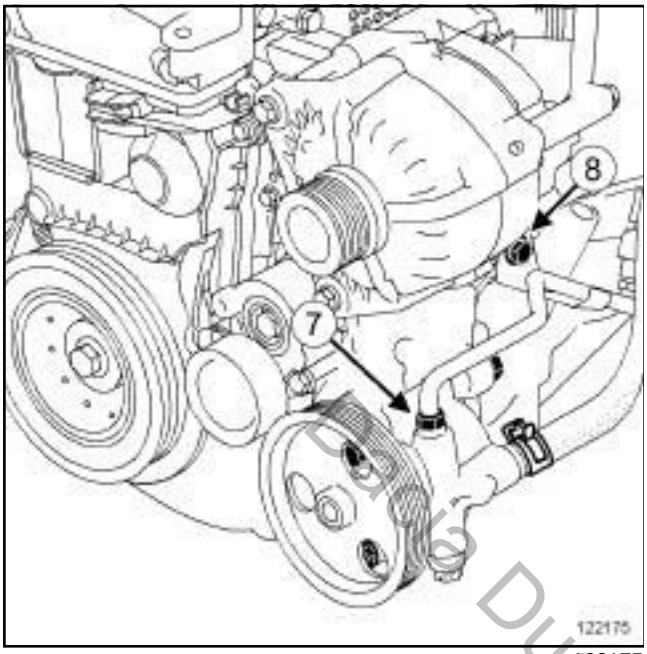
❏ Remove the low pressure pipe between the power-assisted steering pump and the reservoir.

2 - High pressure pipe between the power-assisted steering pump and the steering box

❏ Disconnect the pressure switch connector.

K4M

STANDARD HEATING RECIRCULATION



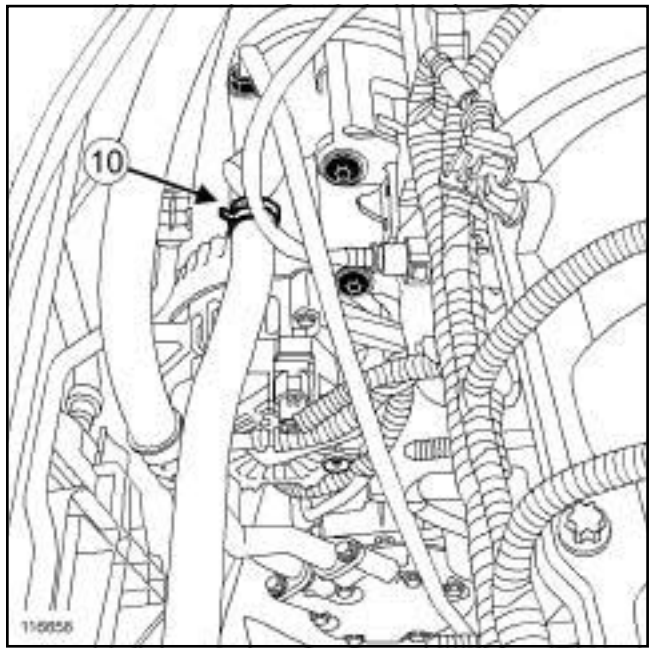
122175

❏ Remove the high pressure pipe bolt (**8**) from the multifunction support.

❏ Remove:

- the high pressure pipe union (**7**) on the power-assisted steering pump,
- the high pressure pipe on the power-assisted steering pump.

AIR CONDITIONING

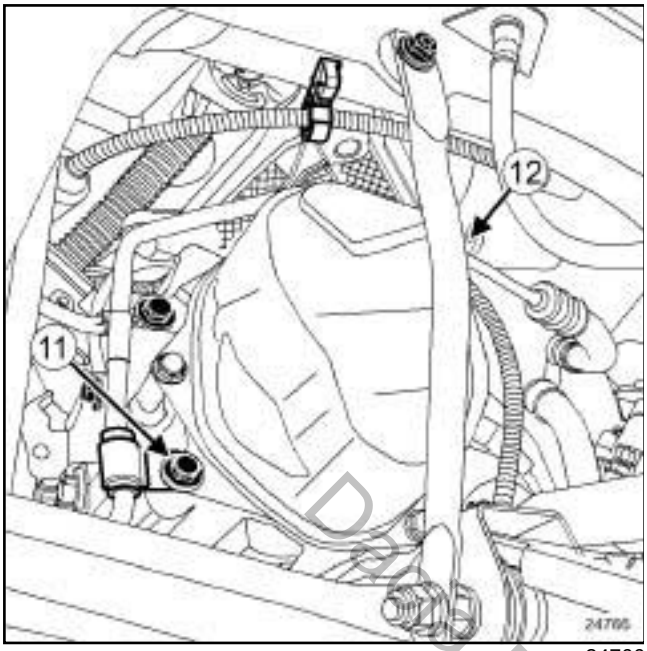


116658

❏ Remove:

- the high pressure pipe union (**10**) on the power-assisted steering pump,
- the high pressure pipe on the power-assisted steering pump.

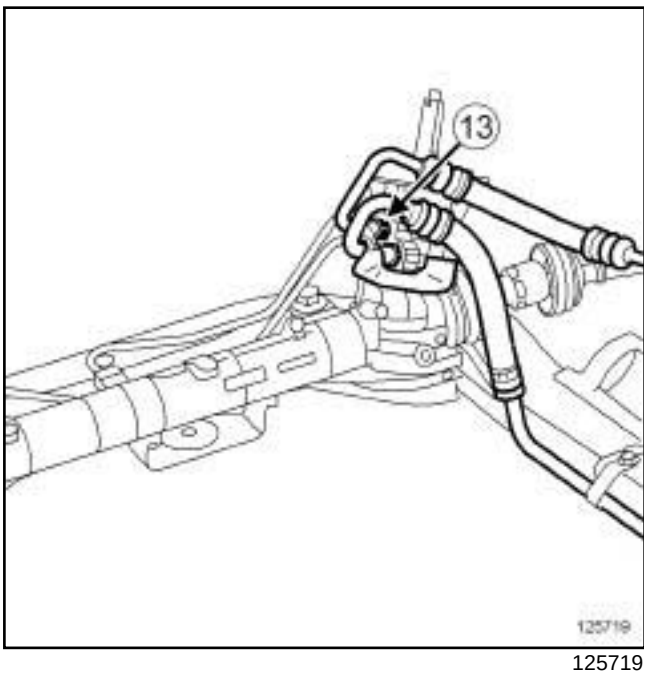
K4M



24766

❏ Remove:

- the bolt (**11**) on the high pressure pipe on the gear-box,
- the bolt (**12**) on the high pressure pipe on the gear-box suspended mounting.

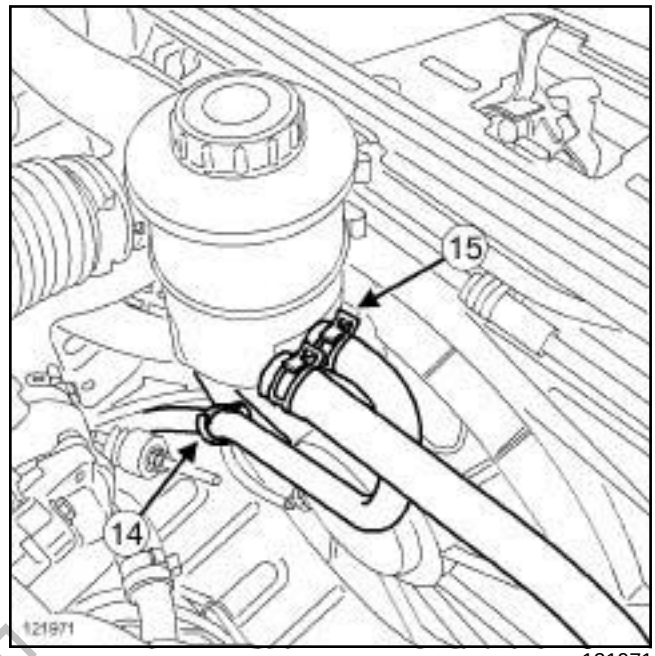


125719

❏ Remove:

- the heat-resistant protector bolts,
- the steering box heat shield,
- the high pressure pipe union (**13**) on the steering box,
- the high pressure pipe on the steering box,
- the power-assisted steering high pressure pipe.

3 - Low pressure pipe between the reservoir and the steering box

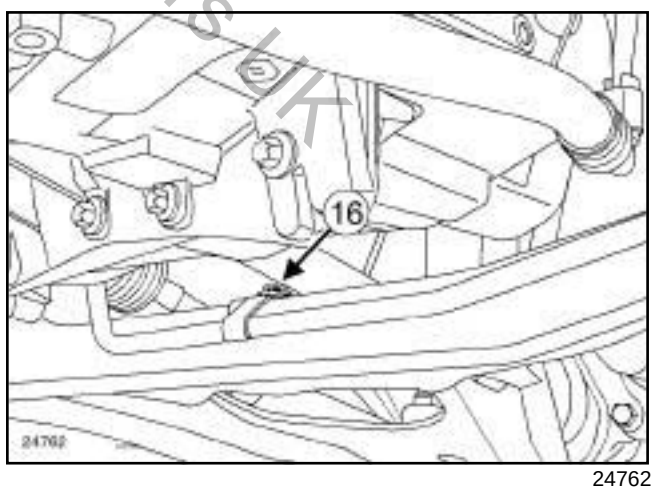


121971

❏ Unclip the low pressure pipe at (**14**) .

❏ Loosen the clip (**15**) using tool **(Mot. 1448)**.

❏ Disconnect the low pressure pipe on the reservoir.

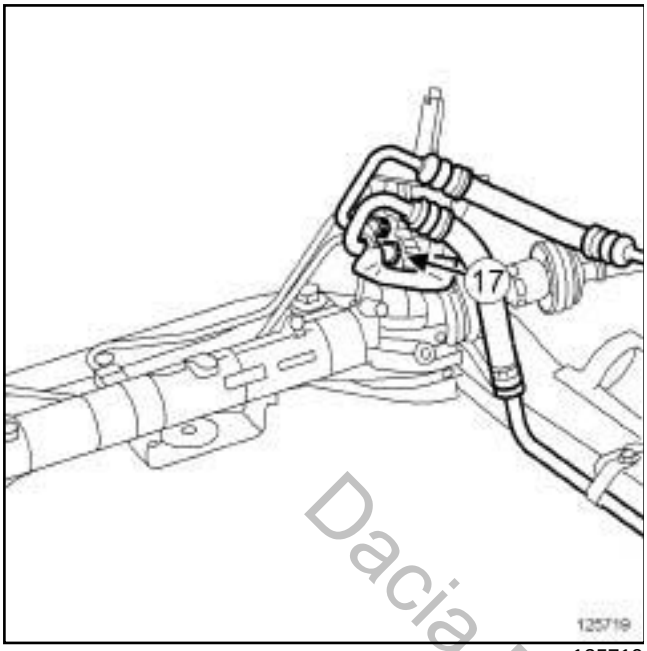


24762

❏ Remove:

- the bolt (**16**) on the low pressure pipe bracket on the sub-frame,
- the heat shield bolts on the steering box,
- the heat shield.

K4M



125719

❑ Remove:

- the low pressure pipe union (**17**) on the steering box,
- the low pressure pipe between the reservoir and the steering box.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Always replace the O-rings on the power-assisted steering pipes.

II - REFITTING OPERATION FOR PART CONCERNED

1 - Low pressure pipe between the reservoir and the steering box

❑ Refit:

- the low pressure pipe between the reservoir and the steering box,
- the low pressure pipe union on the steering box,
- the bolt on the low pressure pipe bracket on the sub-frame,

❑ Torque tighten:

- the **low pressure pipe union on the steering box (21 N.m)**,
- the **low pressure pipe bracket bolt on the sub-frame (21 N.m)**.

❑ Refit:

- the steering box heat shield,
- the heat-resistant protector bolts,
- the low pressure pipe on the reservoir,
- the clip using the **(Mot. 1448)**.

❑ Clip the low pressure pipe onto the fan unit mounting.

2 - High pressure pipe between the power-assisted steering pump and the steering box

❑ Refit:

- the high pressure pipe between the power-assisted steering pump and the steering box,
- the high pressure pipe union on the steering box,
- the high pressure pipe union on the power-assisted steering pump,
- the high pressure pipe bolt on the suspended mounting of the gearbox,
- the high pressure pipe bolt on the gearbox.

❑ Torque tighten:

- the **high pressure pipe union on the power-assisted steering pump (21 N.m)**,
- the **high pressure pipe union on the steering box (21 N.m)**
- the **high pressure pipe bolt on the steering box (21 N.m)**
- the **high pressure pipe bolt on the gearbox suspended mounting (21 N.m)**.

❑ Refit:

- the heat-resistant protector from the steering unit.
- the bolts on the heat shield.

❑ Connect the pressostat connector.

3 - Low pressure pipe between the power-assisted steering pump and the reservoir

❑ Refit:

- the low pressure pipe between the power-assisted steering pump and the reservoir,
- the low pressure pipe to the power-assisted steering pump,
- the low pressure pipe on the reservoir,
- the clips using the **(Mot. 1448)**.

K4M

III - FINAL OPERATION

❑ Refit:

- the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the engine undertray,

❑ Remove the hose clamp.

❑ Fill the power-assisted steering circuit with **ELF RENAULT MATIC D2** oil (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

WARNING
To avoid damaging the power-assisted steering system, do not keep the steering at full lock.

❑ 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 power-assisted steering fluid level if necessary.

❑ Check that there are no leaks.

K9K

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
high pressure pipe union on the steering box	**21 N.m**
high pressure pipe bolts on the gearbox	**21 N.m**
high pressure pipe union on the power-assisted steering pump assembly	**21 N.m**
hi	**gh pressure pipe bolt on the power-assisted steering pump assembly21 N.m**
high pressure pipe union on the power-assisted steering pump	**21 N.m**
high pressure pipe clamp bolt on the power-assisted steering pump	**21 N.m**
low pressure pipe union on the steering box	**21 N.m**

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the engine cover,
- the engine undertray.

1 - Low pressure pipe between the power-assisted steering pump and the reservoir

STANDARD HEATING RECIRCULATION

❑ Drain the power-assisted steering fluid reservoir using a syringe.

2 - High pressure pipe between the power-assisted steering pump and the steering box

STANDARD HEATING RECIRCULATION

❑ Fit a hose clamp on the power-assisted steering pump supply pipe.

AIR CONDITIONING

❑ Drain the power-assisted steering fluid reservoir using a syringe.

❑ Remove the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

❑ Remove:

- the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).

3 - Low pressure pipe between the power-assisted steering pump and the reservoir

STANDARD HEATING RECIRCULATION

❑ Fit a hose clamp on the power-assisted steering pump supply pipe.

K9K

AIR CONDITIONING

❑ Drain the power-assisted steering fluid reservoir using a syringe.

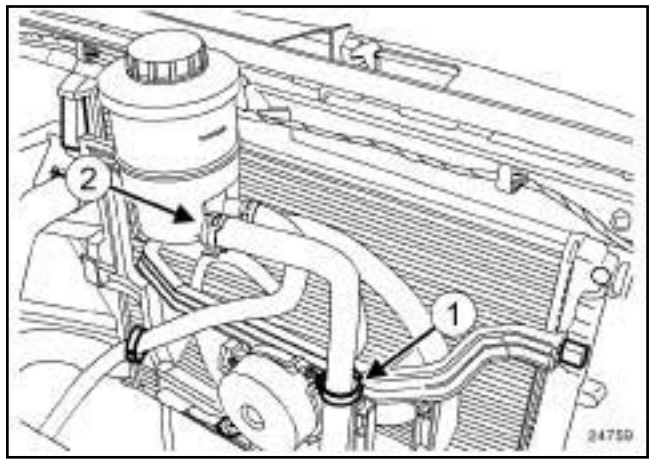
❑ Remove:

- the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),

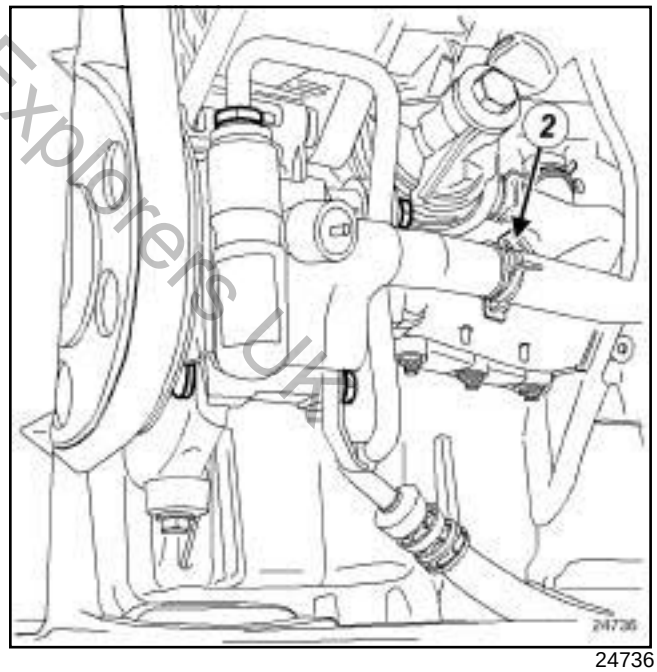
II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - Low pressure pipe between the power-assisted steering pump and the reservoir

STANDARD HEATING RECIRCULATION



24759



24736

❑ Unclip the low pressure pipe at (**1**) .

❑ Loosen the clips (**2**) using tool **(Mot. 1448)**.

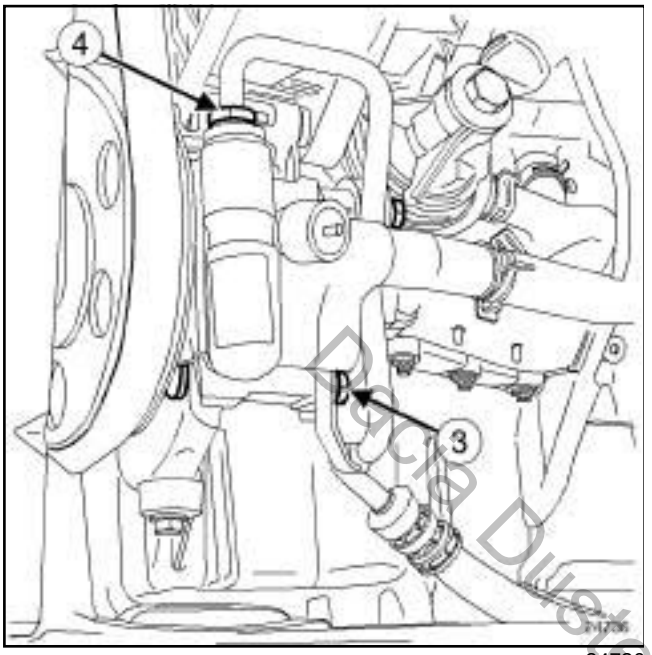
❑ Disconnect the low pressure pipe on the power-assisted steering pump and on the reservoir.

❑ Remove the low pressure pipe.

K9K

2 - High pressure pipe between the power-assisted steering pump and the steering box

STANDARD HEATING RECIRCULATION



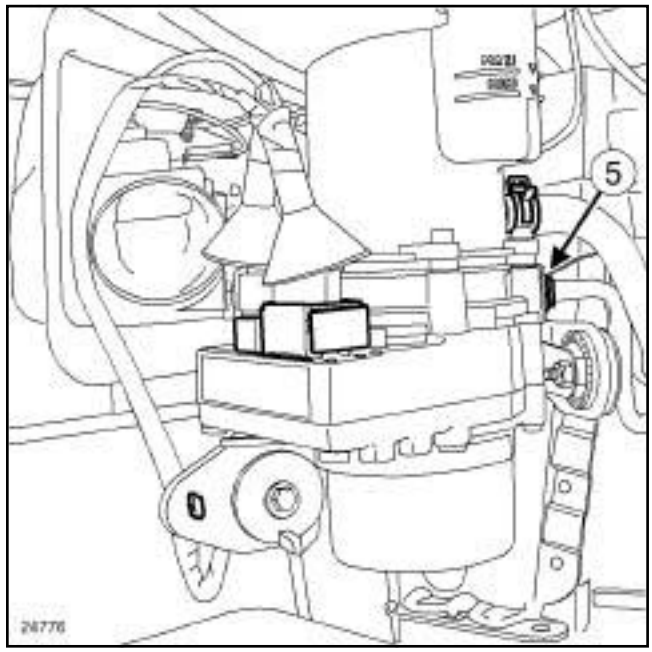
24736

❑ Remove:

- the high pressure pipe clamp bolt (**3**) on the power-assisted steering pump,
- the high pressure pipe union (**4**) .

❑ Disconnect the high pressure pipe on the power-assisted steering pump.

AIR CONDITIONING

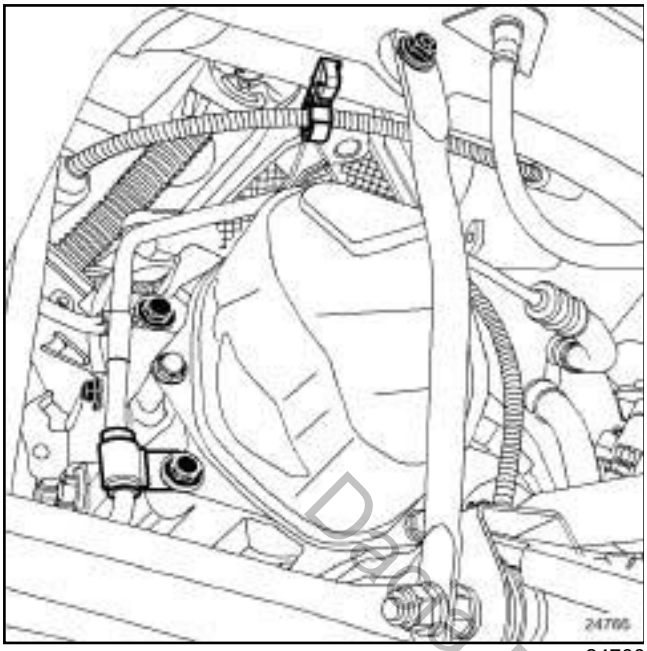


24776

❑ Remove:

- the high pressure pipe bolt (**5**) on the power-assisted steering pump assembly,
- the high pressure pipe on the power-assisted steering pump assembly.

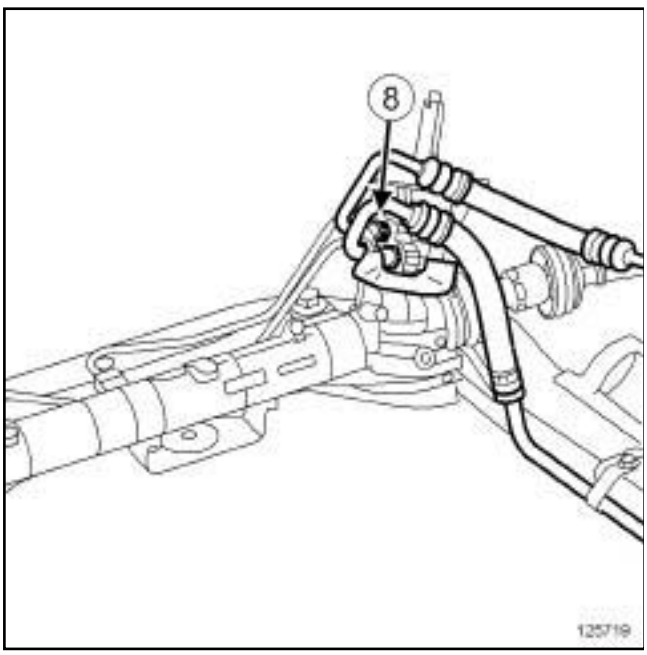
K9K



24766

❏ Remove:

- the high pressure pipe bolt (**6**) on the gearbox suspended mounting,
- the bolt (**7**) on the high pressure pipe on the gearbox,
- the heat shield bolts on the steering box,
- the heat shield.



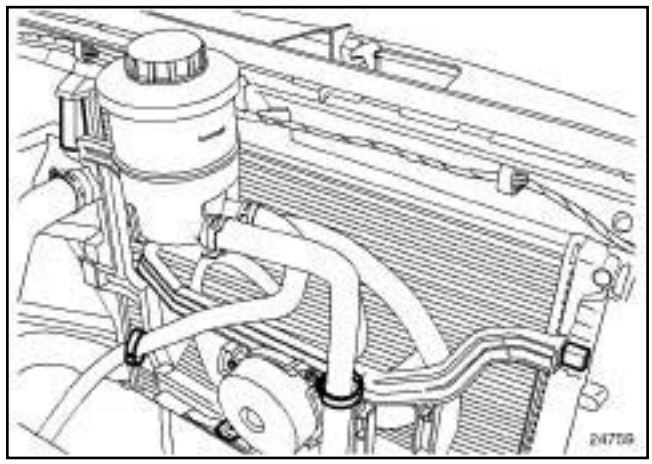
125719

❏ Remove:

- the high pressure pipe union (**8**) on the steering box,
- the high pressure pipe between the power-assisted steering pump and the steering box.

3 - Low pressure pipe between the reservoir and the power-assisted steering box

STANDARD HEATING RECIRCULATION



24759

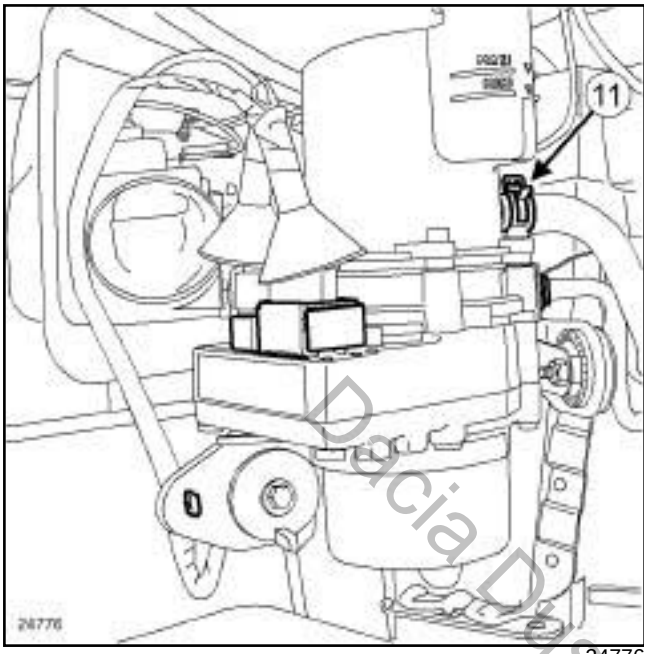
❏ Unclip the low pressure pipe at (**9**) .

❏ Remove:

- the clip (**10**) using the **(Mot. 1448)**,
- the low pressure pipe on the reservoir.

K9K

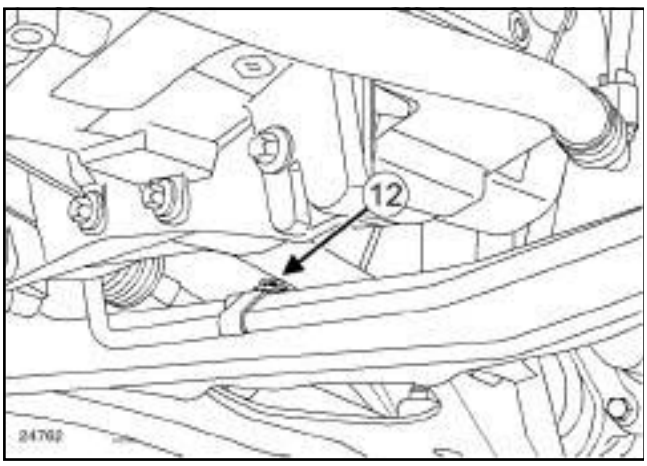
AIR CONDITIONING



24776

❏ Remove:

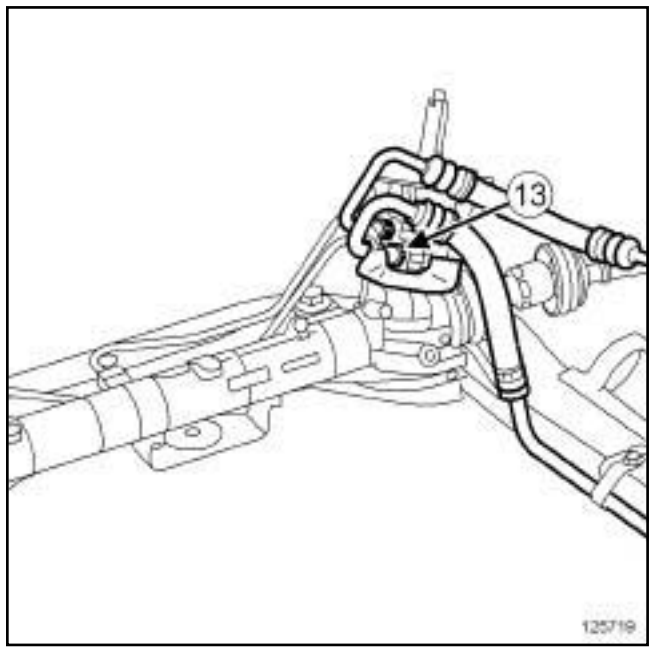
- the clip (**11**) using the **(Mot. 1448)**,
- the low pressure pipe on the reservoir.



24762

❏ Remove:

- the low pressure pipe clamp (**12**) bolt on the sub-frame,
- the heat shield bolts,
- the heat shield.



125719

❏ Remove:

- the low pressure pipe union (**13**) on the steering box,
- the low pressure pipe between the reservoir and the steering box.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the O-rings on the power-assisted steering pipes.

II - REFITTING OPERATION FOR PART CONCERNED

1 - Low pressure pipe between the reservoir and the power-assisted steering box

❏ Refit:

- the low pressure pipe between the power-assisted steering pump and the reservoir,
- the clips using the **(Mot. 1448)**.

❏ Clip the low pressure pipe onto the fan unit mounting.

K9K

2 - High pressure pipe between the power-assisted steering pump and the steering box

❑ Refit:

- the high pressure pipe between the power-assisted steering pump and the steering box,
- the high pressure pipe union on the steering box.

❑ Torque tighten the **high pressure pipe union on the steering box (21 N.m)**.

❑ Refit the high pressure pipe bolts on the gearbox.

❑ Torque tighten the **high pressure pipe bolts on the gearbox (21 N.m)**.

AIR CONDITIONING

❑ Refit:

- the high pressure pipe on the power-assisted steering pump assembly,
- the high pressure pipe bolt on the power-assisted steering pump assembly.

❑ Torque tighten:

- the **high pressure pipe union on the power-assisted steering pump assembly (21 N.m)**,
- the **hi (gh pressure pipe bolt on the power-assisted steering pump assembly21 N.m)**.

STANDARD HEATING RECIRCULATION

❑ Refit:

- the high pressure pipe union on the power-assisted steering pump,
- the high pressure pipe clamp bolt on the power-assisted steering pump.

❑ Torque tighten:

- the **high pressure pipe union on the power-assisted steering pump (21 N.m)**,
- the **high pressure pipe clamp bolt on the power-assisted steering pump (21 N.m)**.

3 - Low pressure pipe between the reservoir and the steering box

❑ Refit:

- the low pressure pipe between the reservoir and the steering box,
- the low pressure pipe union on the steering box,

❑ Torque tighten the **low pressure pipe union on the steering box (21 N.m)**.

❑ Refit:

- the low pressure pipe on the reservoir,
- the clip using the **(Mot. 1448)**.

STANDARD HEATING RECIRCULATION

❑ Clip the low pressure pipe onto the fan unit mounting.

III - FINAL OPERATION

❑ Refit:

- the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the engine undertray,
- the engine cover.

❑ Remove the hose clamp.

❑ Fill the power-assisted steering circuit with **ELF RENAULT MATIC D2** oil (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❑ 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 power-assisted steering fluid level if necessary.

❑ Check that there are no leaks.

I - SAFETY

1 - Advice to be followed before any operation

For an operation requiring the use of a lift, follow the safety advice (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

2 - Instructions to be followed during the operation

Using a mixture of two incompatible brake fluids in the brake circuit may give rise to:

- serious risk of leakage due mainly to deterioration of the cups,

- degradation of the ESP system.

To avoid such risks, only ever use brake fluids which comply with the RENAULT standard (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

WARNING
Switch off the vehicle ignition so as not to activate the hydraulic unit solenoid valves when bleeding the brake circuit.

Reminder:

- The pipes between the master cylinder, the callipers, and the hydraulic unit are connected using threaded unions with a metric thread.

- Therefore, only parts specified in the Parts Catalogue for this vehicle should be used.

IMPORTANT
To ensure that the ABS and ESP systems operate correctly, check that the underbody brake pipes are clipped in place and are not crossed.

IMPORTANT
To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

II - CLEANLINESS

1 - Advice to be followed before any operation

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2 - Instructions to be followed during the operation

To avoid contaminating the brake circuit, do not allow the brake circuit components to drop on the ground.

Clean around the braking system with **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

III - GENERAL RECOMMENDATIONS

1 - Master cylinder - brake servo

Always replace the master cylinder seals.

Check that the brake servo seal is in place. Replace the seal if it is damaged.

Always replace the master cylinder - brake servo assembly when the master cylinder leaks into the brake servo. The brake servo becomes unusable when the rubber diaphragm is contaminated with brake fluid.

IMPORTANT
To avoid breaking the connection between the brake servo pushrod and the brake pedal, check that the safety clevis pin is locked onto the brake servo pushrod by tilting it from the top downwards.

2 - Brake hose

WARNING

In order not to damage the brake hose:

- do not tension the hose,

- do not twist the hose,

- check that there is no contact with the surrounding components.

LEFT-HAND DRIVE

Tightening torques ▽	
nuts on the brake servo	**21 N.m**
rigid brake pipe unions on the master cylinder	**14 N.m**

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

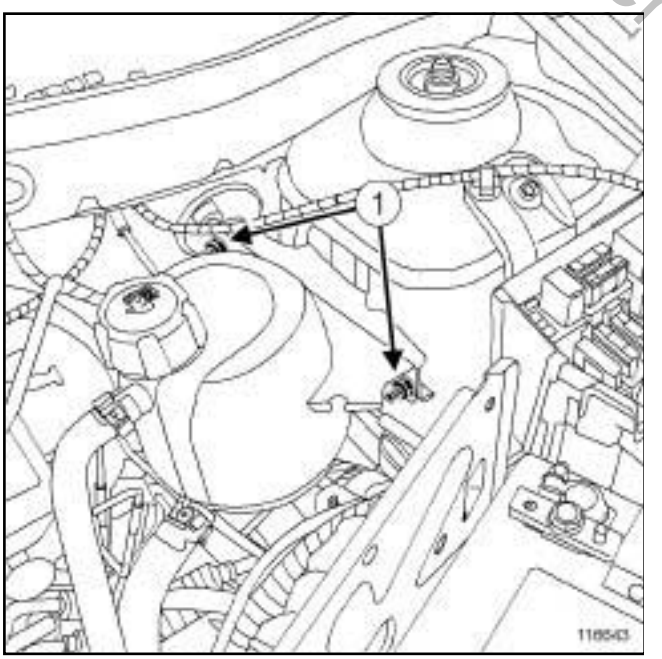
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the front engine cover (if fitted to the vehicle).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).



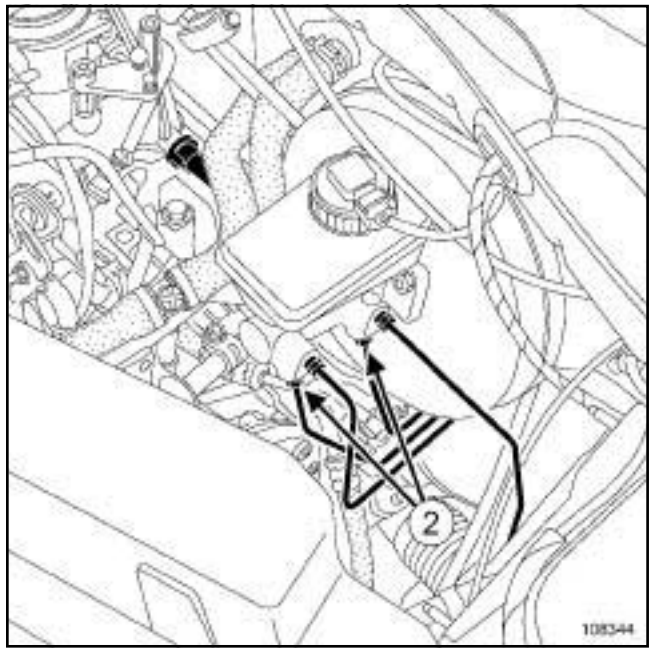
116643

❏ Remove the expansion bottle nuts (**1**) .

❏ Move aside the expansion bottle, without emptying it.

II - REMOVAL OPERATION

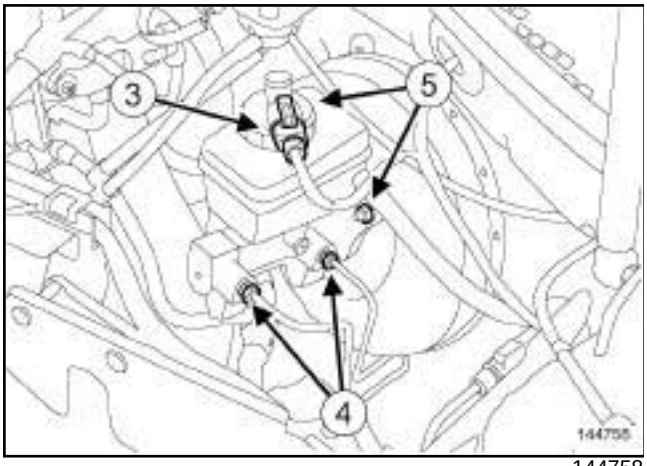
WITHOUT ANTI-LOCK BRAKING SYSTEM



108344

❏ Remove the rigid brake pipe unions at (**2**) and mark their position.

LEFT-HAND DRIVE



144758

❏ Disconnect the brake fluid level sensor connector (**3**) .

❏ Remove the brake fluid filler cap.

❏ Drain the brake fluid reservoir with a syringe.

❏ Place a container under the master cylinder to collect the brake fluid.

❏ Disconnect the supply pipe of the clutch master cylinder.

❏ Remove:

- the brake fluid reservoir,
- the rigid brake pipe unions (**4**) from the master cylinder and mark their position,

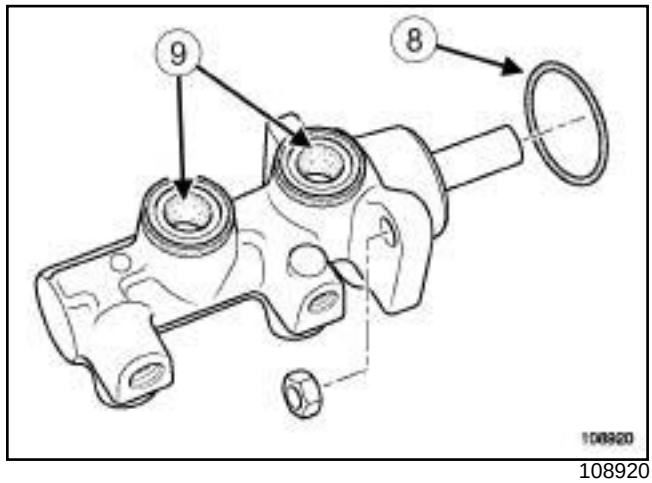
❏ Remove:

- the master cylinder nuts on the brake servo ***(5)*** ,
- the brake master cylinder.

❏ Fit blanking plugs on the openings of the master cylinder and the brake pipes.

REFITTING

I - REFITTING PREPARATION OPERATION



108920

❏ **parts always to be replaced: Master cylinder seal on brake fluid reservoir side** (**9**) .

❏ **parts always to be replaced: Master cylinder seal on brake servo side** (**8**) .

Note:

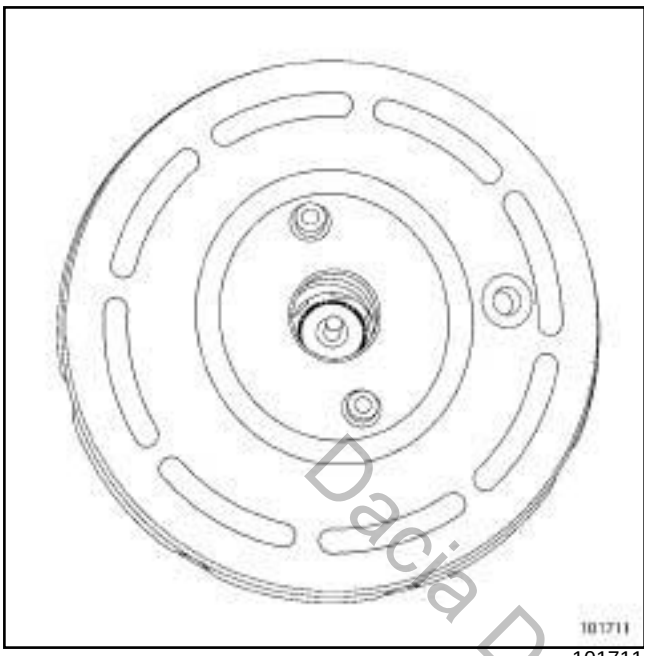
It is essential to replace the master cylinder/ brake servo assembly when the master cylinder leaks into the brake servo.

The brake servo becomes unusable when the rubber membrane is contaminated with brake fluid.

❏ Remove the blanking plugs.

LEFT-HAND DRIVE

II - REFITTING OPERATION



101711

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

❑ Torque tighten the **nuts on the brake servo (21 N.m)**.

❑ Refit the rigid brake pipe unions.

❑ Torque tighten the **rigid brake pipe unions on the master cylinder (14 N.m)**.

❑ Snap the brake fluid reservoir onto the master cylinder correctly at ***(9)*** .

❑ Connect the brake fluid level sensor connector.

III - FINAL OPERATION

❑ Refit the expansion bottle.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Refit the front engine cover (if fitted to the vehicle).

❑ Perform the following operations:

- fill up the brake fluid reservoir,
- bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) ,
- bleed the clutch circuit (see **37A**, **Mechanical component controls**, **Clutch circuit: Bleed**, page **37A-37**) .

LEFT-HAND DRIVE, and WITHOUT ANTI-LOCK BRAKING SYSTEM

Equipment required
pedal press

Tightening torques ▽	
brake pipe union on the master cylinder	**14 N.m**
brake pipe union on the brake hose	**14 N.m**

REMOVAL

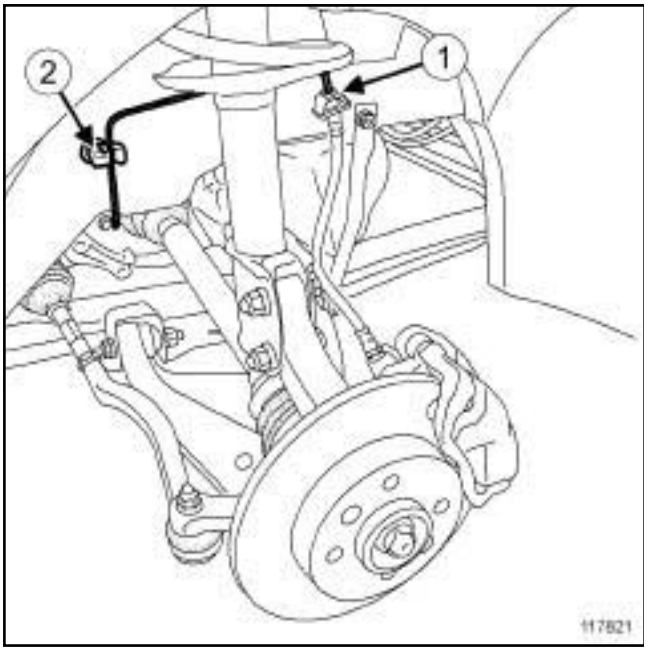
REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Fit a **pedal press** to the brake pedal to limit outflow.

❏ Remove:

- the front right-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .
- the front engine cover (if fitted to the vehicle).

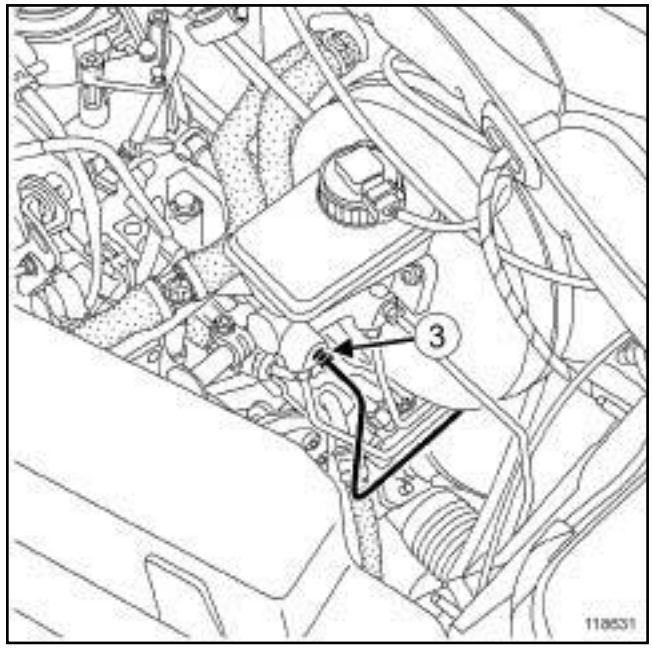


117821

❏ Unscrew the brake pipe union (**1**) on the brake hose.

❏ Remove the brake pipe from the retaining bracket.

❏ Unclip the brake pipe from its clip (**2**) .



118631

❏ Unscrew the brake pipe union (**3**) from the master cylinder.

❏ Remove the soundproofing clips on the bulkhead (if fitted to the vehicle).

❏ Move aside the soundproofing (if fitted to the vehicle).

❏ Unclip the brake pipe from its clip.

❏ Remove the brake pipe between the master cylinder and the front right-hand brake hose.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the brake pipe between the master cylinder and the front right-hand brake hose.

❏ Refit the brake pipe on the retaining bracket.

❏ Clip the brake pipe into its clip.

❏ Screw the brake pipe union on the front right-hand brake hose.

❏ Screw the brake pipe union on the master cylinder.

❏ Torque tighten:

- the **brake pipe union on the master cylinder (14 N.m)**,
- the **brake pipe union on the brake hose (14 N.m)**.

LEFT-HAND DRIVE, and WITHOUT ANTI-LOCK BRAKING SYSTEM

II - FINAL OPERATION

❑ Refit:

- the soundproofing on the bulkhead (if fitted to the vehicle).
- the soundproofing clips,
- the front engine cover (if fitted to the vehicle),
- the front right-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❑ Remove the **pedal press**.

❑ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

LEFT-HAND DRIVE, and WITHOUT ANTI-LOCK BRAKING SYSTEM

Equipment required
pedal press

Tightening torques ▽	
brake pipe union on the master cylinder	**14 N.m**
brake pipe union on the brake hose	**14 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

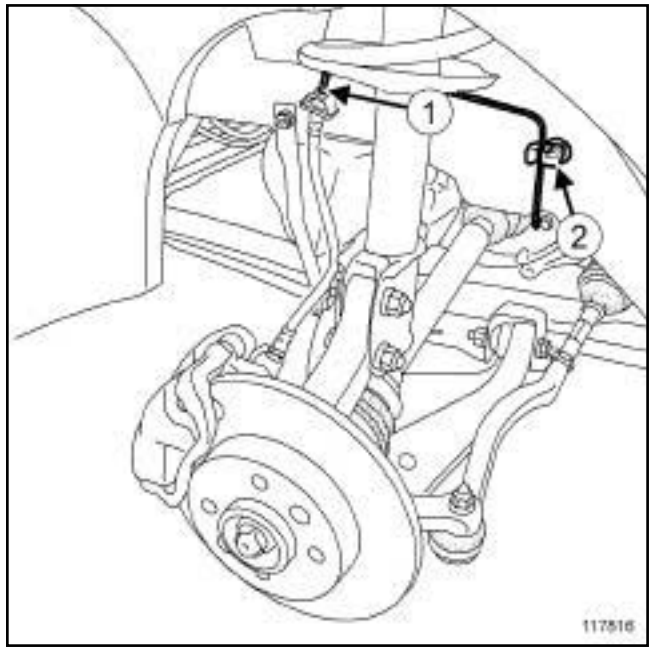
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Fit a **pedal press** to the brake pedal to limit outflow.

❏ Remove:

- the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the front engine cover (if fitted to the vehicle).

II - OPERATION FOR REMOVAL OF PART CONCERNED

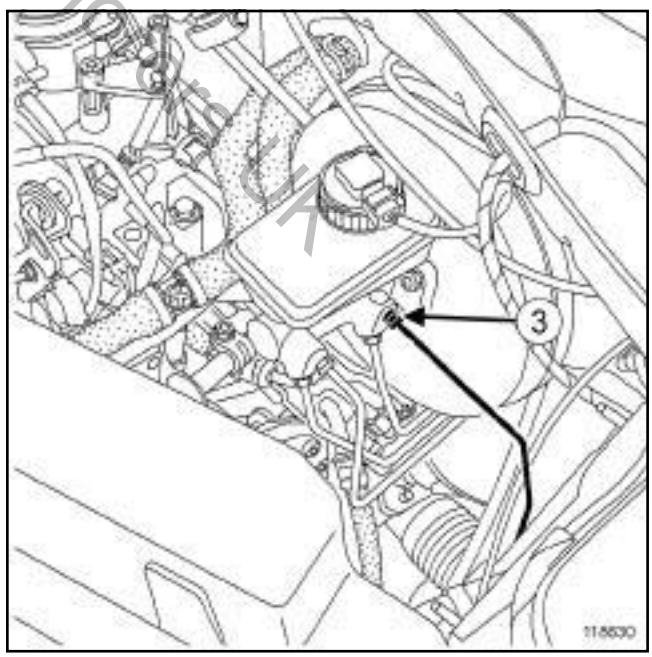


117816

❏ Unscrew the brake pipe union (**1**) from the brake hose.

❏ Remove the brake pipe from the retaining bracket.

❏ Unclip the brake pipe from its clip (**2**) .



118630

❏ Unscrew the brake pipe union (**3**) from the master cylinder.

❏ Remove the brake pipe between the master cylinder and the front left-hand brake hose.

LEFT-HAND DRIVE, and WITHOUT ANTI-LOCK BRAKING SYSTEM

REFITTING

I - REFITTING STAGE FOR THE PART IN QUESTION

❏ Refit the brake pipe between the master cylinder and the front left-hand brake hose.

❏ Refit the brake pipe on the retaining bracket.

❏ Clip the brake pipe into its clip.

❏ Screw the brake pipe union on the front left-hand brake hose.

❏ Screw the brake pipe union on the master cylinder.

❏ Torque tighten:

- the **brake pipe union on the master cylinder (14 N.m)**,
- the **brake pipe union on the brake hose (14 N.m)**.

II - FINAL OPERATION

❏ Refit:

- the front engine cover (if fitted to the vehicle),
- the front left-hand wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

❏ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

LEFT-HAND DRIVE

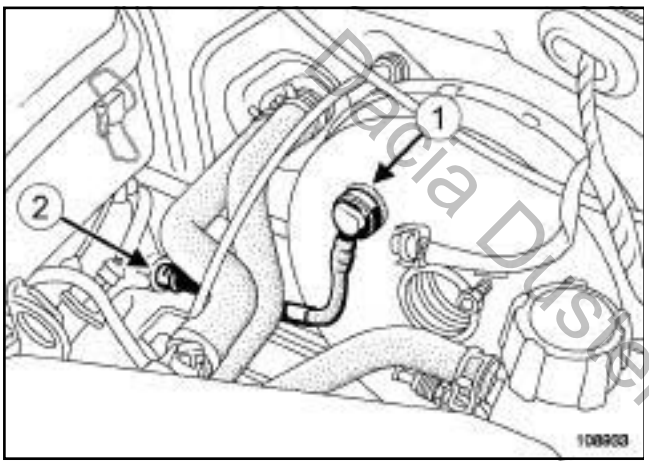
REMOVAL

I - REMOVAL PREPARATION OPERATION

K9K

❑ Remove the engine cover.

II - OPERATION FOR REMOVAL OF PART CONCERNED

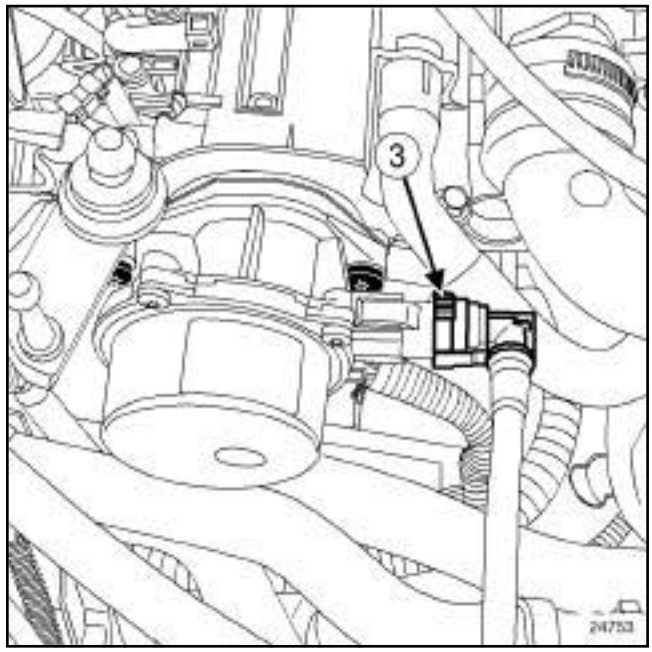


108933

❑ Disconnect the non-return valve at (**1**) on the brake servo.

❑ Pull and turn the non-return valve to release it from the rubber sealing washer.

K9K

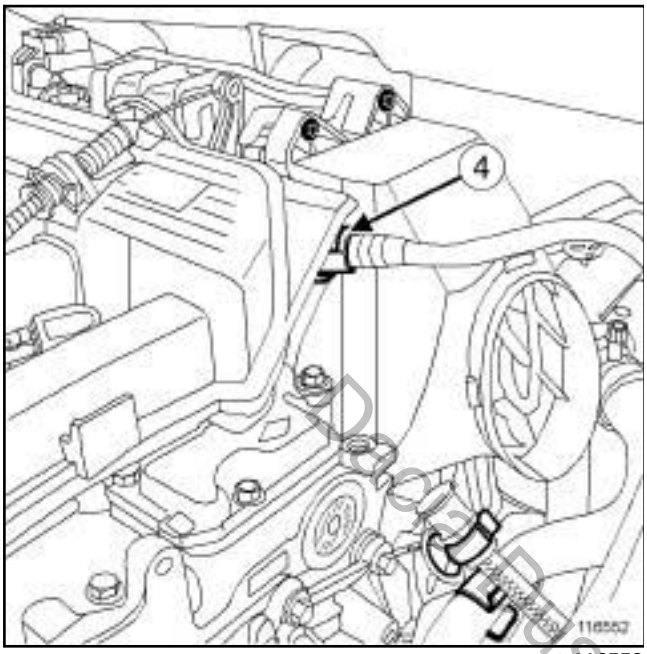


24753

❑ Disconnect the non-return valve at (**3**) on the vacuum pump.

LEFT-HAND DRIVE

K4M



116552

❏ Disconnect the non-return valve at (**4**) on the inlet distributor.

❏ Remove the non-return valve.

REFITTING

I - REFITTING PREPARATION OPERATION

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

❏ Replace any faulty parts.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Fit the non-return valve.

K4M

❏ Connect the non-return valve to the inlet distributor.

K9K

❏ Connect the non-return valve at the vacuum pump,

❏ Connect the non-return valve to the brake servo.

III - FINAL OPERATION

K9K

❏ Refit the engine cover.

LEFT-HAND DRIVE

Tightening torques ▽	
brake servo nuts	**21 N.m**

IMPORTANT
To avoid a loss of braking efficiency, do not bend the brake servo pipe.

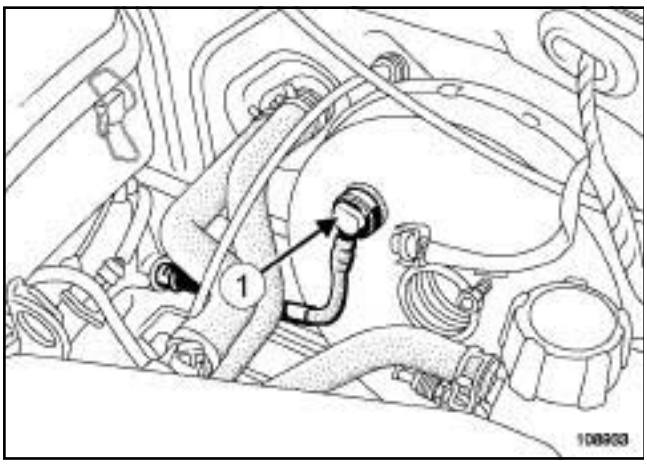
WARNING
Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

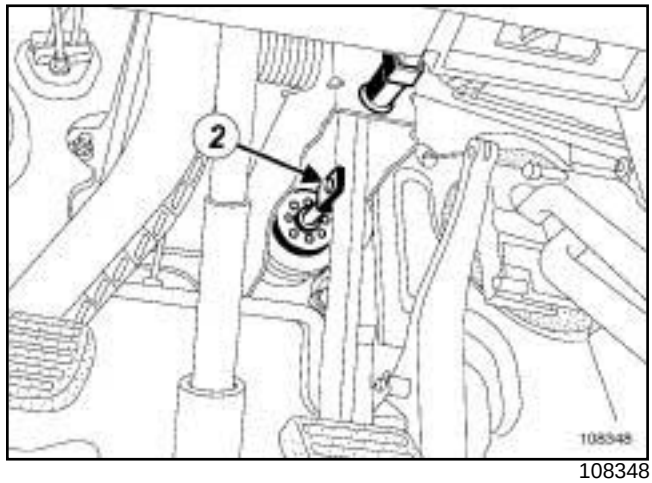


108933

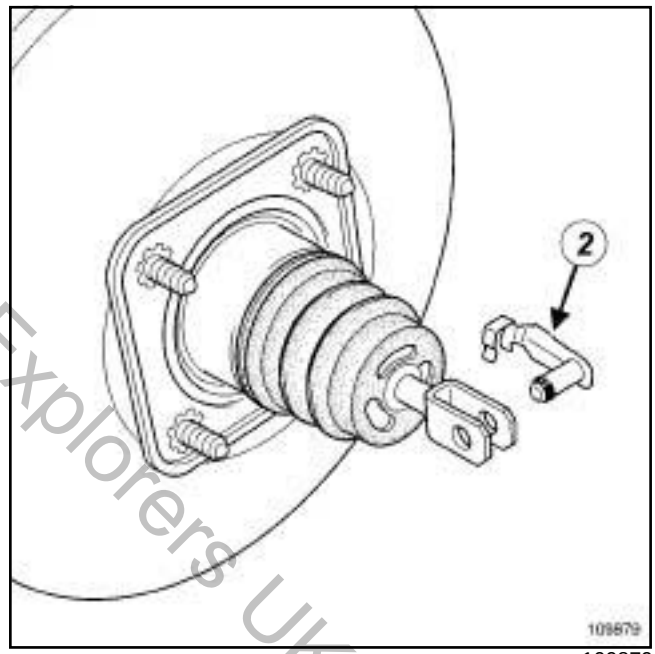
❏ Remove:

- the master cylinder (see **37A**, **Mechanical component controls**, **Master cylinder: Removal - Refitting**, page **37A-2**) ,
- the non-return valve (**1**) at the servo.

II - REMOVAL OPERATION



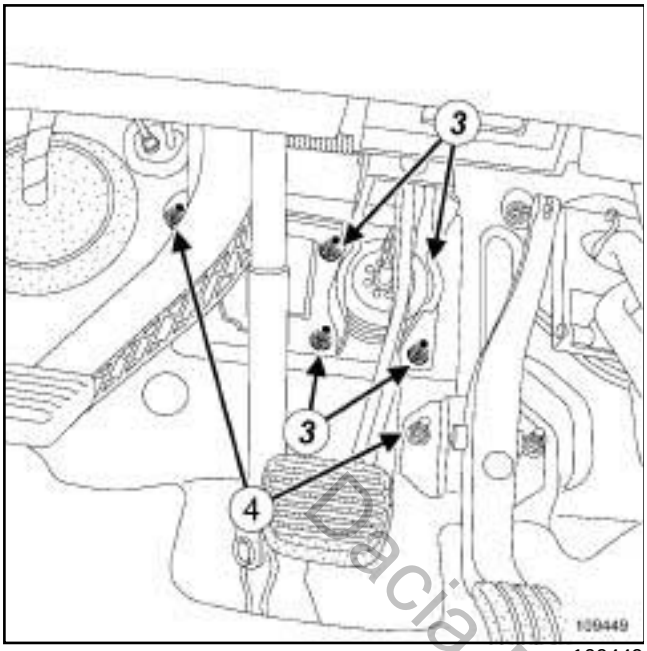
108348



109879

❏ Tilt the connecting piece upwards and remove the safety clevis pin (**2**) between the brake servo push-rod and the brake pedal on the passenger compartment side.

LEFT-HAND DRIVE



109449

❑ Remove the special nuts (**4**) for the insulating foam.

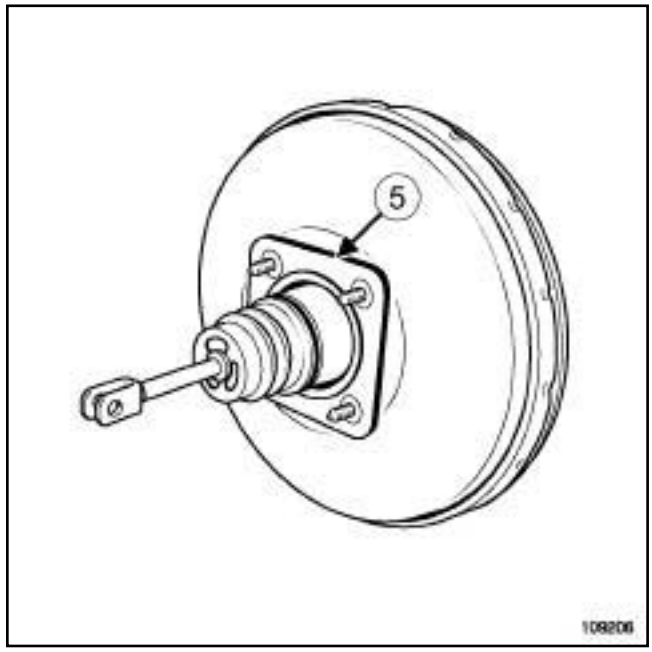
❑ Gently move the insulating foam aside.

❑ Remove:

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

REFITTING

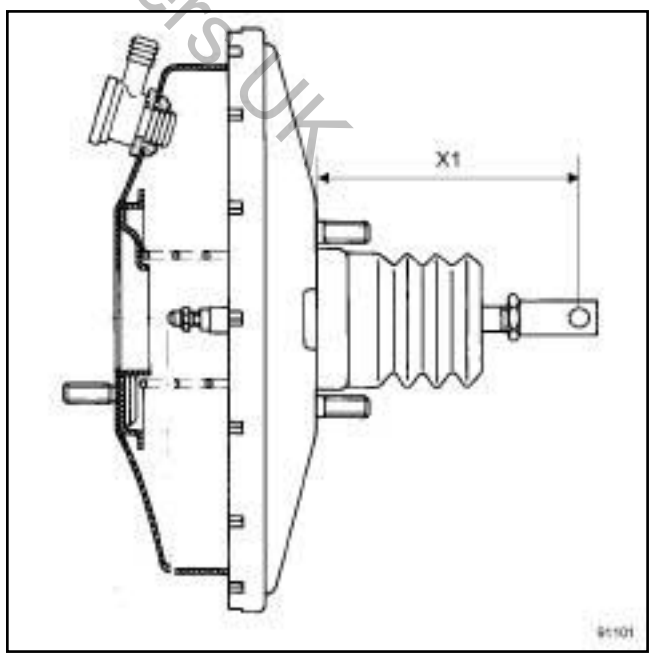
I - REFITTING PREPARATION OPERATION



109206

❑ Check that the brake servo seal (**5**) is present; replace the seal if it is faulty.

❑ **parts always to be replaced: Connecting shaft between the brake pedal and the brake servo pushrod**.



91101

❑ Before refitting, check the following dimension (**X1**) = **144.5 mm ± 0.5**.

LEFT-HAND DRIVE

II - REFITTING OPERATION

❑ Refit the brake servo.

❑ Torque tighten the **brake servo nuts (21 N.m)**.

❑ The shaft connecting the brake servo pushrod and the brake pedal must be refitted from right to left, and from top to bottom.

❑ Refit:

- the insulating foam,
- the special nuts for the insulating foam.

III - FINAL OPERATION

❑ Refit:

- the non-return valve at the brake servo,
- the master cylinder (see **37A**, **Mechanical component controls**, **Master cylinder: Removal - Refitting**, page **37A-2**) .

IMPORTANT

To avoid breaking the connection between the brake servo pushrod and the brake pedal, check that the safety clevis pin is locked onto the brake servo pushrod by tilting it from the top downwards.

❑ Adjust the brake light switch (see **37A**, **Mechanical component controls**, **Brake pedal: Removal - Refitting**, page **37A-26**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K

Tightening torques ▽	
the vacuum pump bolts	**21 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

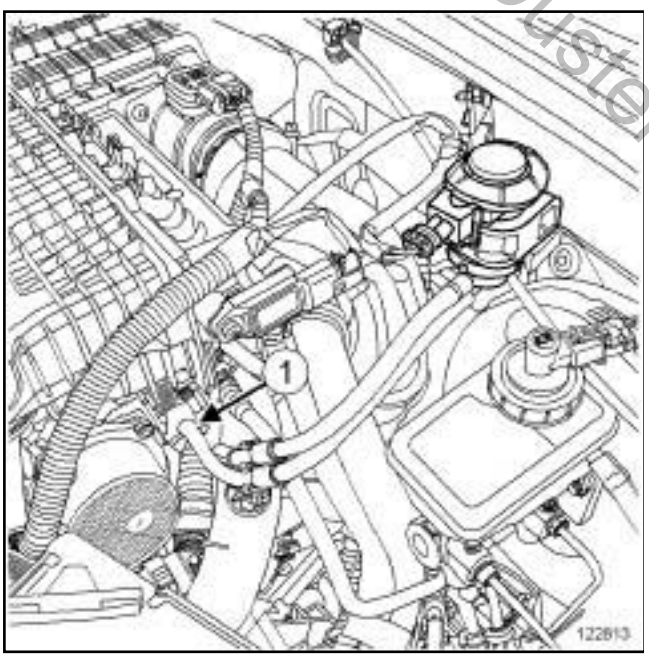
❑ Remove:

- the engine cover
- the air inlet duct.

❑ Gently move the air filter box aside to access the vacuum pump.

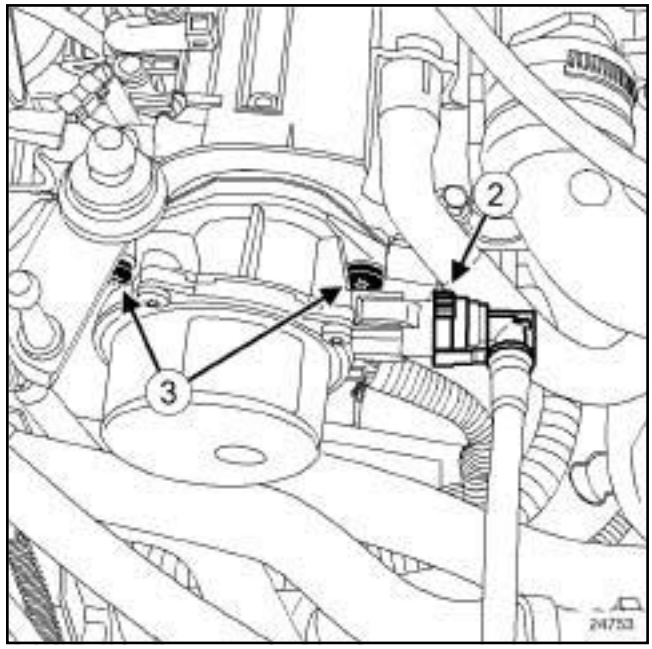
II - REMOVAL OPERATION

K9K, and 796



122813

❑ Disconnect the turbocharger control solenoid valve pipe (**1**) from the vacuum pump.



24753

❑ Disconnect the non-return valve (**2**) from the vacuum pump.

❑ Remove:

- the vacuum pump bolts (**3**) on the cylinder head,
- the vacuum pump.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Clean the vacuum pump bearing surface on the cylinder head.

❑ **parts always to be replaced: Brake servo vacuum pump seal**.

II - REFITTING OPERATION

❑ Refit:

- the vacuum pump fitted with a new seal,
- the vacuum pump bolts.

❑ Torque tighten **the vacuum pump bolts (21 N.m)** on the cylinder head.

❑ Connect the non-return valve to the vacuum pump.

K9K, and 796

❑ Connect the turbocharger control solenoid valve pipe to the vacuum pump.

K9K

III - FINAL OPERATION

❑ Refit:

- the air filter unit,
- the air inlet duct,
- the engine cover.

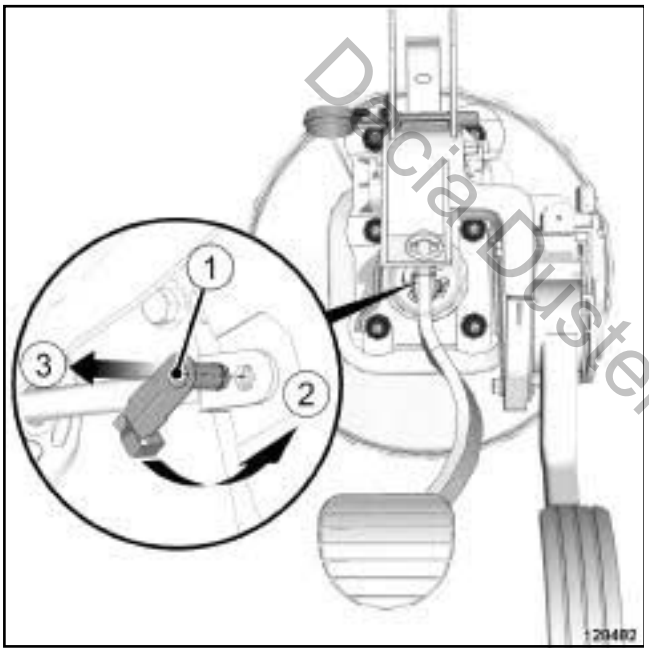
LEFT-HAND DRIVE

Tightening torques ▽	
pedal yoke nuts	**21 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

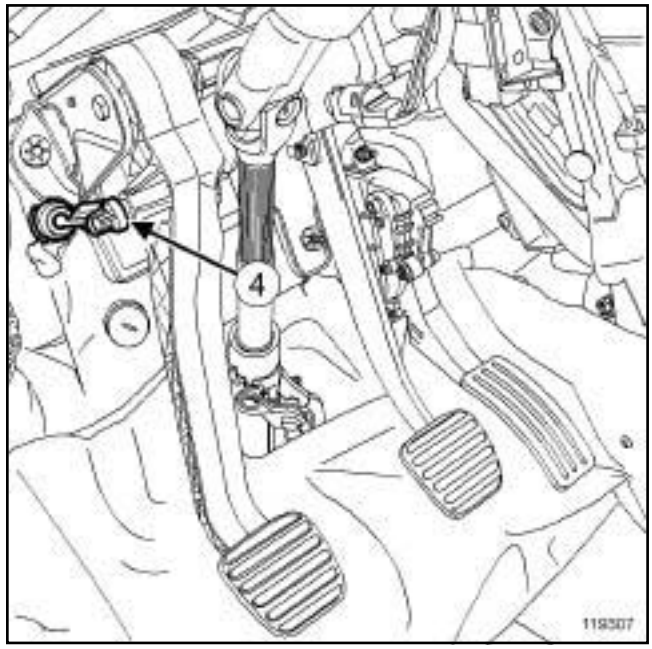
❏ Remove the brake pedal switch (see **37A**, **Mechanical component controls**, **Brake pedal switch: Removal - Refitting**, page **37A-27**) .



128482

❏ Remove the connecting shaft (**1**) between the brake pedal and the brake servo pushrod:

- unlock the shaft in accordance with (**2**) ,
- extract the shaft in accordance with (**3**) .



119307

❏ Uncouple the master cylinder ball joint (**4**) from the clutch pedal.

❏ Remove the two retaining clips from the pedal insulation and the insulating foam.

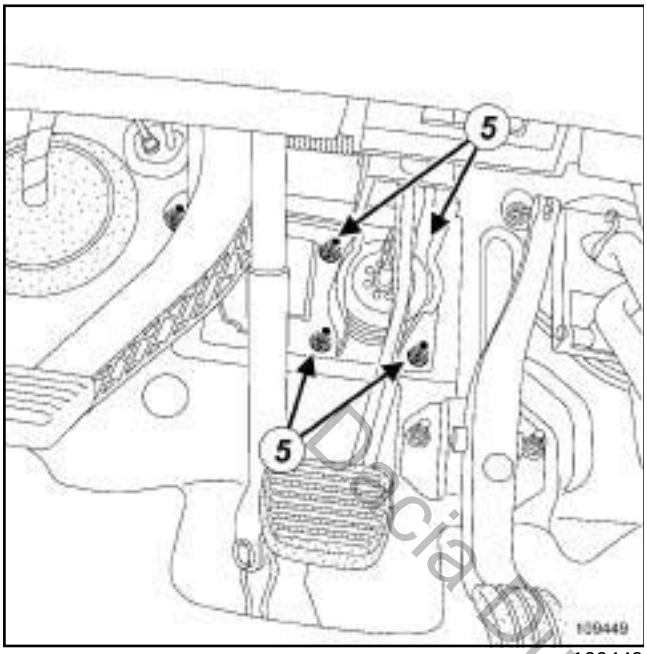
❏ Remove the pedal insulation (if fitted to the vehicle).

❏ Gently move aside the insulating foam.

❏ Disconnect the steering column and the steering box (see **36A**, **Steering assembly**, **Steering column: Removal - Refitting**, page **36A-7**) .

LEFT-HAND DRIVE

II - OPERATION FOR REMOVAL OF PART CONCERNED



109449

❏ Remove the pedal yoke nuts (**5**) .

❏ Cut the insulating foam to extract the pedal yoke, if necessary.

❏ Remove the pedal yoke.

❏ In the event of replacement, remove the brake pedal (see **37A**, **Mechanical component controls**, **Brake pedal: Removal - Refitting**, page **37A-26**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the **parts always to be replaced: Connecting shaft between the brake pedal and the brake servo pushrod**.

❏ Coat the shaft with **MOLYCOTE 33M** grease (see **Vehicle: Parts and consumables for the repair**) (MR 388, 04B, Consumables - Products).

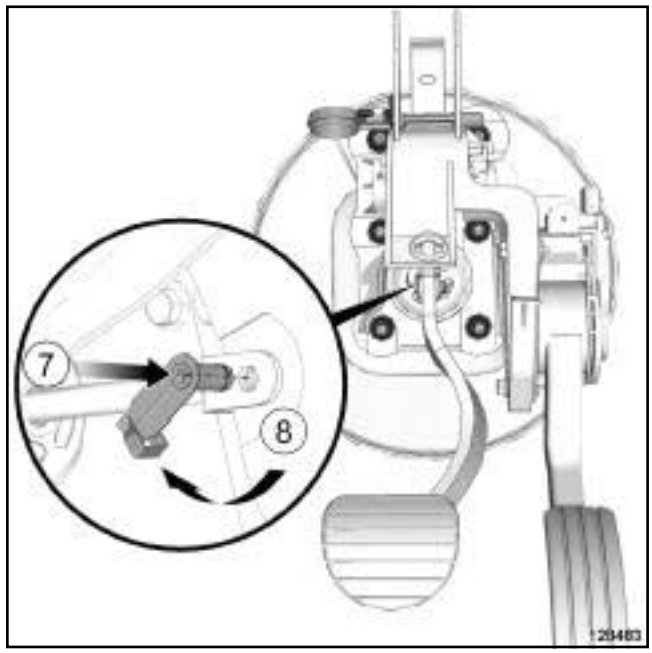
II - REFITTING OPERATION FOR PART CONCERNED

❏ In the event of replacement, refit the brake pedal (see **37A**, **Mechanical component controls**, **Brake pedal: Removal - Refitting**, page **37A-26**) .

❏ Refit the pedal yoke.

❏ Torque tighten the **pedal yoke nuts (21 N.m)**.

❏ Couple the steering column and the steering box (see **36A**, **Steering assembly**, **Steering column: Removal - Refitting**, page **36A-7**) .



128483

❏ Refit a new connecting shaft between the brake pedal and the brake servo pushrod (pre-lubricated):

- insert the shaft in accordance with (**7**) ,
- lock the shaft in accordance with (**8**) .

III - FINAL OPERATION

❏ Refit:

- the pedal insulation (if fitted to the vehicle),
- the brake pedal switch (see **37A**, **Mechanical component controls**, **Brake pedal switch: Removal - Refitting**, page **37A-27**) .

❏ Check that the whole clutch system operates correctly.

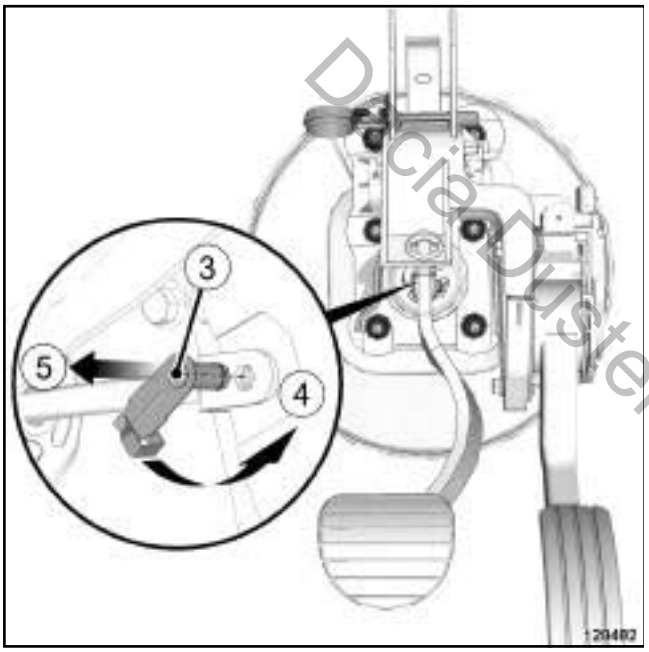
RIGHT-HAND DRIVE

Tightening torques ▽	
pedal yoke nuts	**21 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the brake pedal switch (see **37A**, **Mechanical component controls**, **Brake pedal switch: Removal - Refitting**, page **37A-27**) .

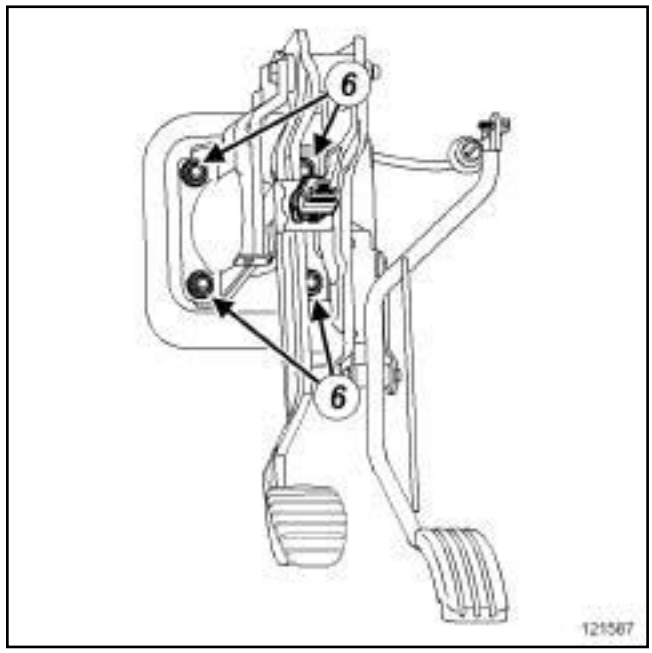


128482

❏ Remove the connecting shaft (**3**) between the brake pedal and the brake servo pushrod:

- unlock the shaft in accordance with (**4**) ,
- extract the shaft in accordance with (**5**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



121587

❏ Remove:

- the nuts (**6**) of the pedal yoke,
- the pedal yoke.

❏ In the event of replacement, remove:

- the brake pedal (see **37A**, **Mechanical component controls**, **Brake pedal: Removal - Refitting**, page **37A-26**) ,
- the accelerator pedal (see **37A**, **Mechanical component controls**, **Accelerator pedal: Removal - Refitting**, page **37A-20**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the **parts always to be replaced: Connecting shaft between the brake pedal and the brake servo pushrod**.

❏ Coat the shaft with **MOLYCOTE 33M** grease (see **Vehicle: Parts and consumables for the repair**) (MR 388, 04B, Consumables - Products).

RIGHT-HAND DRIVE

II - REFITTING OPERATION FOR PART CONCERNED

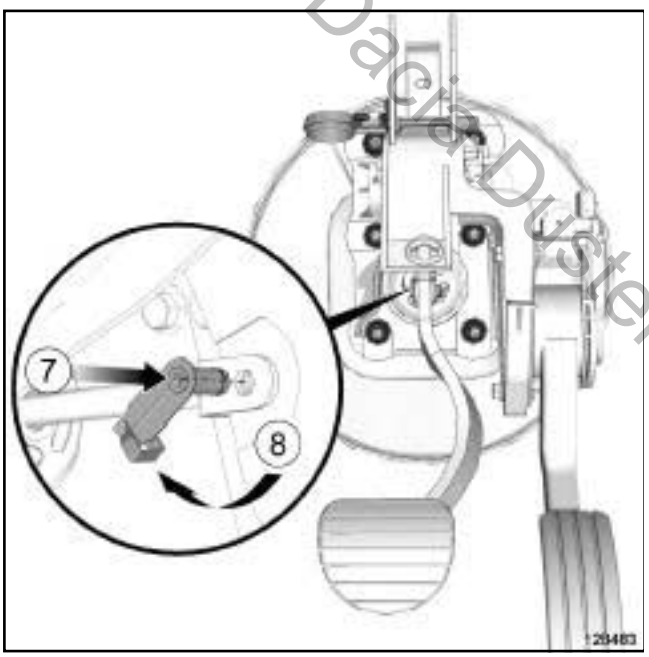
❏ In the event of replacement, refit:

- the accelerator pedal (see **37A**, **Mechanical component controls**, **Accelerator pedal: Removal - Refitting**, page **37A-20**) ,
- the brake pedal (see **37A**, **Mechanical component controls**, **Brake pedal: Removal - Refitting**, page **37A-26**) .

❏ Refit the pedal yoke.

❏ Torque tighten the **pedal yoke nuts (21 N.m)**.

III - FINAL OPERATION



128483

❏ Refit a new connecting shaft between the brake pedal and the brake servo pushrod:

- insert the shaft in accordance with (**7**) ,
- lock the shaft in accordance with (**8**) .

.

❏ Refit the brake pedal switch (see **37A**, **Mechanical component controls**, **Brake pedal switch: Removal - Refitting**, page **37A-27**) .

Equipment required
Diagnostic tool

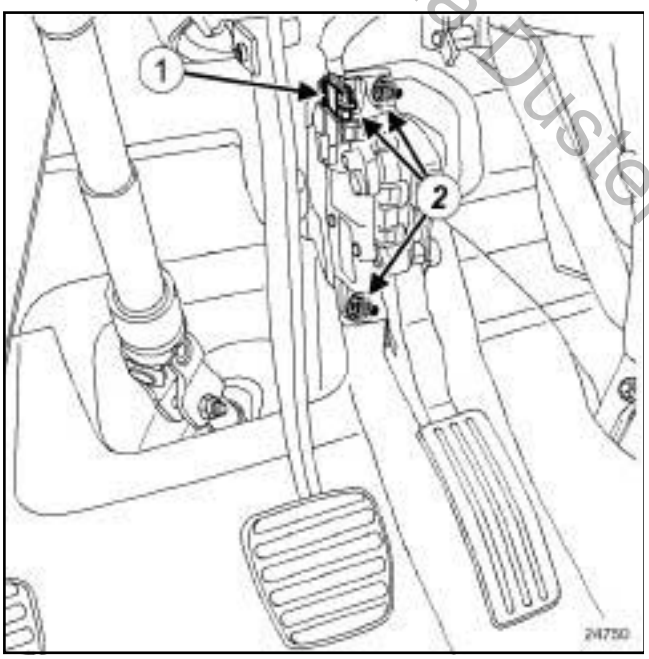
Tightening torques ▽	
accelerator pedal bolts	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Switch off the ignition.

II - OPERATION FOR REMOVAL OF PART CONCERNED



24750

❏ Disconnect the accelerator pedal potentiometer connector (**1**) .

❏ Remove:

- the accelerator pedal bolts (**2**) on the pedal mounting,
- the accelerator pedal.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the accelerator pedal,
- the accelerator pedal bolts on the pedal mounting.

❏ Torque tighten the **accelerator pedal bolts (8 N.m)**.

❏ Connect the accelerator pedal potentiometer connector.

II - FINAL OPERATION

❏ Using the **Diagnostic tool**, check that the accelerator assembly operates correctly.

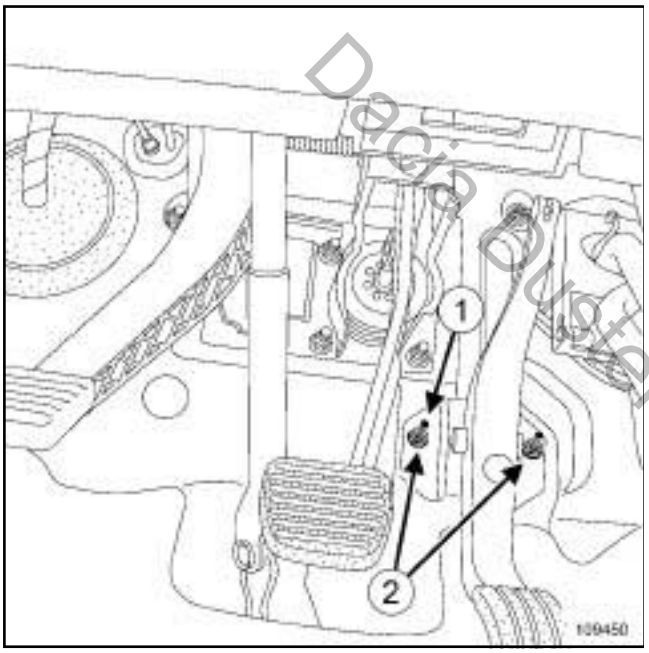
K4M, and 4X2 TRANSMISSION

Tightening torques ▽	
pedal mounting nuts	**21 N.m**

REMOVAL

OPERATION FOR REMOVAL OF PART CONCERNED

LEFT-HAND DRIVE

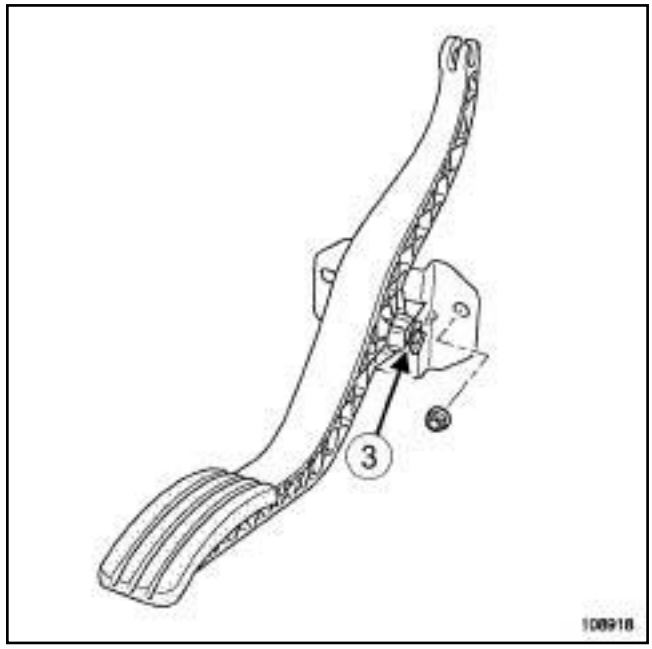


109450

❑ Undo the special nut (**1**) for the insulating foam on the left-hand nut of the accelerator pedal mounting.

❑ Remove:

- the nuts (**2**) of the accelerator pedal mounting,
- the mounting - accelerator pedal assembly.



108918

❑ Remove:

- the accelerator cable on the pedal side by holding it upwards and sliding the end piece of the cable towards the centre console,
- the circlip (**3**) using a screwdriver,

Note:

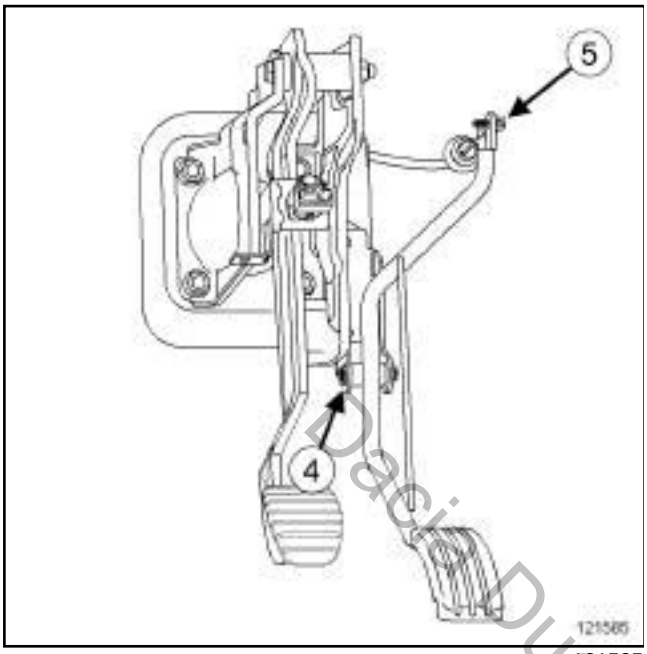
Note the fitting direction of the shaft in relation to the pedal mounting.

❑ Remove:

- the pedal shaft,
- the accelerator pedal.

K4M, and 4X2 TRANSMISSION

RIGHT-HAND DRIVE



121585

❑ Extract the clip (**5**) from the accelerator cable on the pedal.

❑

Note:

Note the fitting direction of the shaft in relation to the pedal mounting.

Remove:

- the circlip (**4**) using a screwdriver,
- the accelerator pedal shaft,
- the accelerator pedal.

REFITTING

REFITTING PREPARATION OPERATION

❑ Coat the shaft with **MOLYCOTE 33M** grease (see **Vehicle: Parts and consumables for the repair**) (MR 388, 04B, Consumables - Products).

Note:

Refit the shaft in relation to the pedal mounting in the position noted during the removal operation.

Note:

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

I - REFITTING OPERATION FOR PART CONCERNED

LEFT-HAND DRIVE

❑ Refit on the accelerator pedal mounting:

- the pedal,
- the pedal shaft,
- the circlip.

❑ Refit the accelerator cable end piece on the hole on top of the accelerator pedal by sliding it from right to left and by guiding the cable into the groove of the pedal.

❑ Position the mounting - accelerator pedal assembly on the centre console.

❑ Refit the accelerator pedal mounting nuts.

❑ Torque tighten the **pedal mounting nuts (21 N.m)**.

❑ Refit:

- the insulating foam,
- the special nut for the insulating foam on the left-hand nut of the accelerator pedal.

RIGHT-HAND DRIVE

❑ Refit the accelerator pedal on its mounting.

❑ Refit:

- the accelerator pedal shaft,
- the circlip on the accelerator pedal shaft,

- the accelerator cable clip on the pedal.

II - FINAL OPERATION

❑ Check that the whole accelerator system operates correctly.

K4M, and 4X2 TRANSMISSION

REMOVAL

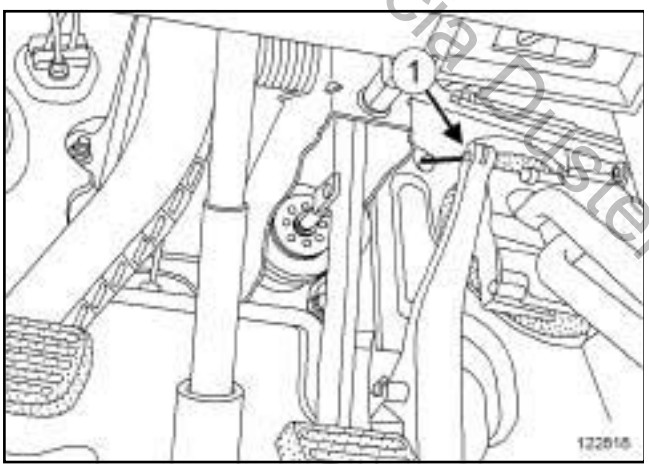
I - REMOVAL PREPARATION OPERATION

RIGHT-HAND DRIVE

❑ Remove the brake fluid reservoir (see **37A**, **Mechanical component controls**, **Master cylinder: Removal - Refitting**, page **37A-2**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

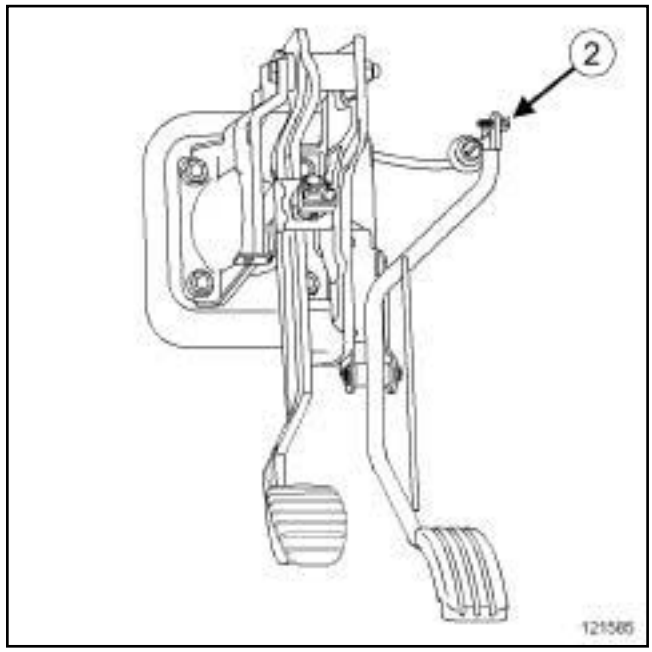
LEFT-HAND DRIVE



122818

❑ Disconnect the accelerator pedal cable at (**1**) .

RIGHT-HAND DRIVE



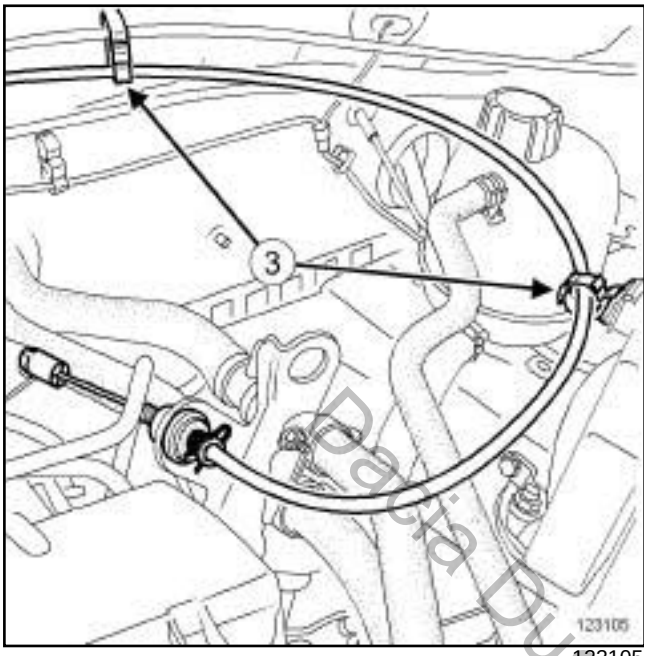
121585

❑ Extract the clip (**2**) from the accelerator cable on the pedal.

❑ Push the accelerator cable sheath stop into the engine compartment.

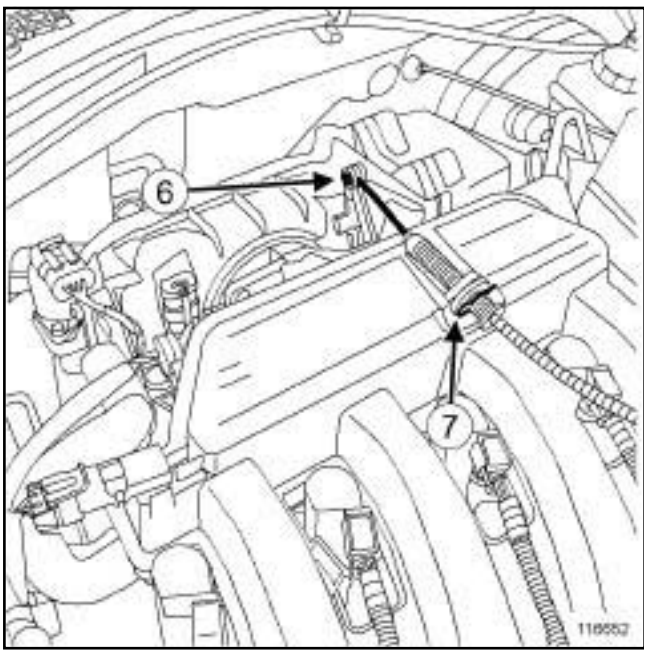
K4M, and 4X2 TRANSMISSION

RIGHT-HAND DRIVE



123105

❏ Unclip the accelerator cable at (**3**) .



116652

❏ Disconnect the throttle valve accelerator cable at (**6**) .

❏ Remove the adjusting clip (**7**) from the accelerator cable.

❏ Remove the accelerator cable from the inlet distributor.

❏ Remove the accelerator pedal cable via the engine compartment.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Pass the accelerator pedal cable into the passenger compartment via the engine compartment.

❏ Clip the accelerator pedal cable sheath stop onto the bulkhead.

LEFT-HAND DRIVE

❏ Position the accelerator pedal cable in the pedal notch.

RIGHT-HAND DRIVE

❏ Refit the accelerator pedal cable clip to the pedal.

❏ Refit the accelerator pedal cable to the inlet distributor.

RIGHT-HAND DRIVE

❏ Clip on the accelerator pedal cable at ***(3)*** .

❏ Refit:

- the accelerator pedal cable on the throttle valve,
- the accelerator cable adjusting clip.

II - FINAL OPERATION

❏ Adjust the accelerator pedal cable by fully depressing the accelerator pedal.

RIGHT-HAND DRIVE

❏ Refit the brake fluid reservoir (see **37A**, **Mechanical component controls**, **Master cylinder: Removal - Refitting**, page **37A-2**) .

❏ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

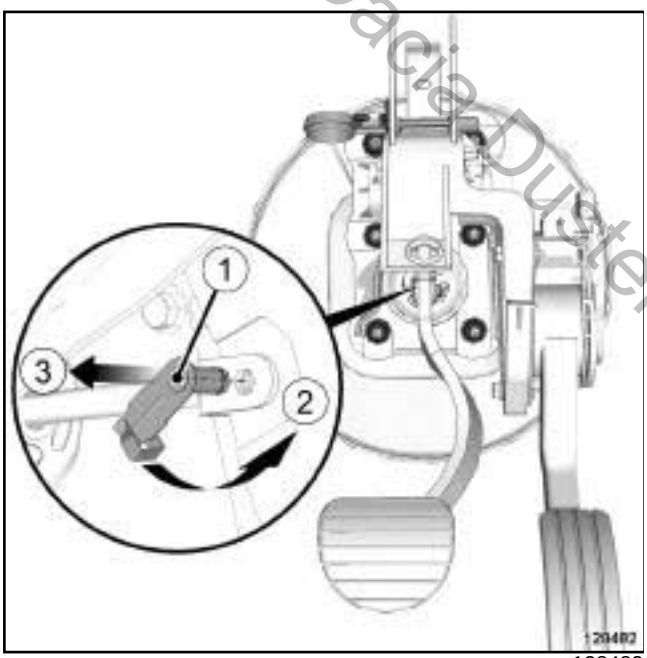
Tightening torques ▽	
brake pedal shaft nut	**16 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the brake pedal brake light switch (see **37A**, **Mechanical component controls**, **Brake pedal switch: Removal - Refitting**, page **37A-27**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



128482

❏ Remove the connecting shaft (**1**) between the brake pedal and the brake servo pushrod:

- unlock the shaft in accordance with (**2**) ,
- extract the shaft in accordance with (**3**) .

❏ Remove the brake pedal.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the **parts always to be replaced: Connecting shaft between the brake pedal and the brake servo pushrod**.

❏ Check the condition of the parts.

❏ Replace any faulty parts.

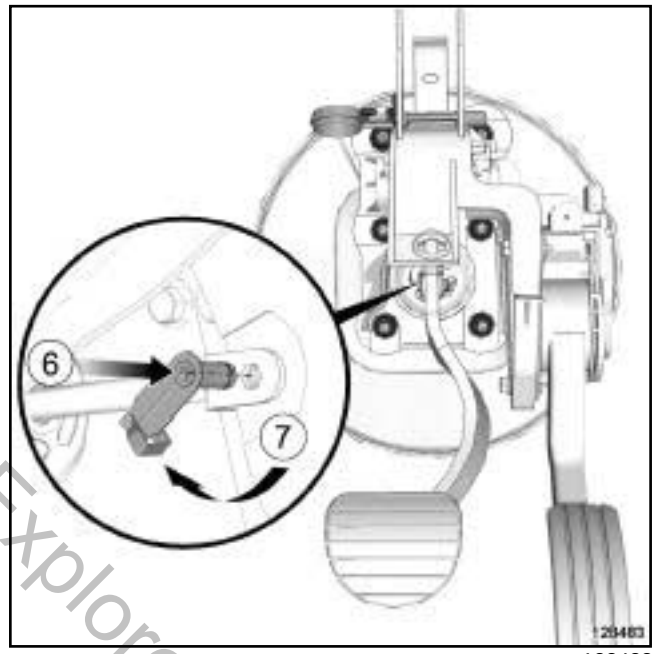
❏ Coat the shaft with **MOLYKOTE 33M** (see **Vehicle: Parts and consumables for the repair**) grease (MR 388, 04B, Consumables - Products).

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the brake pedal,
- the brake pedal shaft.

❏ Torque tighten the **brake pedal shaft nut (16 N.m)**.



128483

❏ Refit a new connecting shaft between the brake pedal and the brake servo pushrod:

- insert the shaft in accordance with (**6**) ,
- lock the shaft in accordance with (**7**) .

III - FINAL OPERATION

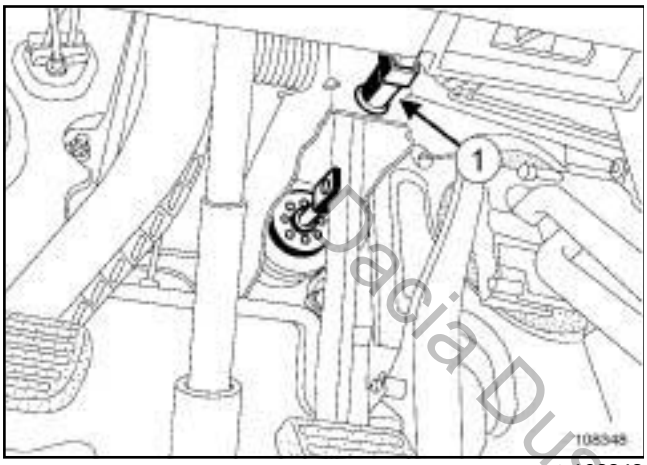
❏ Refit the brake light switch (see **37A**, **Mechanical component controls**, **Brake pedal switch: Removal - Refitting**, page **37A-27**) .

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the dashboard lower trim (depending on the equipment level).

II - OPERATION FOR REMOVAL OF PART CONCERNED



108348

❏ Disconnect the brake light switch connector.

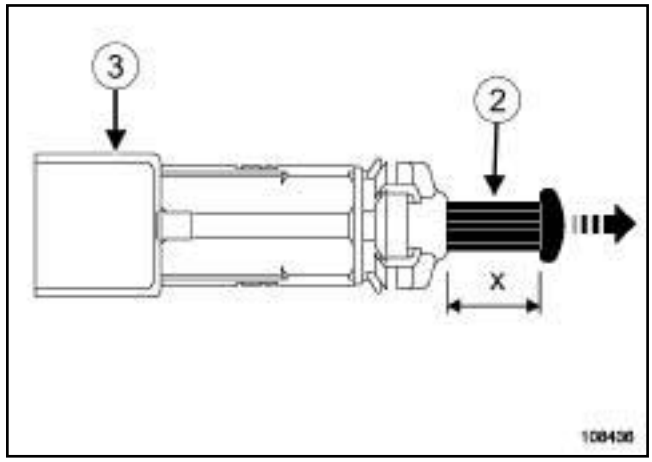
❏ Turn the brake light switch (**1**) a quarter of a turn anti-clockwise.

❏ Remove the brake light switch.

REFITTING

I - REFITTING PREPARATION OPERATION

When removing and refitting or when replacing the brake light switch



108436

❏

WARNING

Handle the switch (**3**) with care.

Only operate the piston (**2**) to adjust the dimension (**x**) .

The switch must be replaced:

- if the piston (**2**) is separated from the switch (**3**) ,
- if more than three adjustments to dimension (**x**) are necessary during the operation.

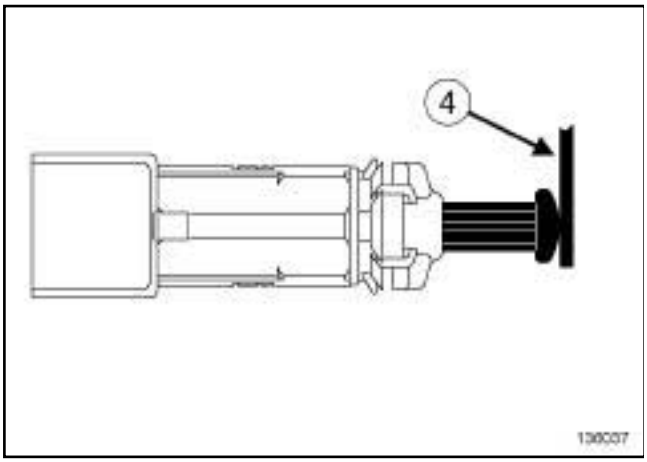
❏ Measure the dimension (**x**) of the piston (**2**) . If dimension (**x**) is less than **13 mm**, carefully pull the end of the piston to adjust dimension (**x**) to between **13 mm** minimum and **14 mm** maximum.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Depress the brake pedal by hand.

❏ Position the brake light switch on the pedal assembly.

❏ Lock the brake light switch by turning it a quarter of a turn clockwise.



136037

❑

Note:

To adjust the position of the piston of the brake light switch, place a **2 mm** thick shim (**4**) between the piston crown of the brake light switch and the brake pedal.

❑ Carefully support the return of the brake pedal (shim in place).

Note:

The brake light switch has an automatic adjustment feature which adapts to the position of the pedal.

The automatic adjustment makes a clicking noise when in operation.

❑ Connect the brake light switch connector.

III - FINAL OPERATION

❑ Check that the brake light switch is operating correctly:

- depress the brake pedal to switch on the lights,
- release the brake pedal to switch off the lights.

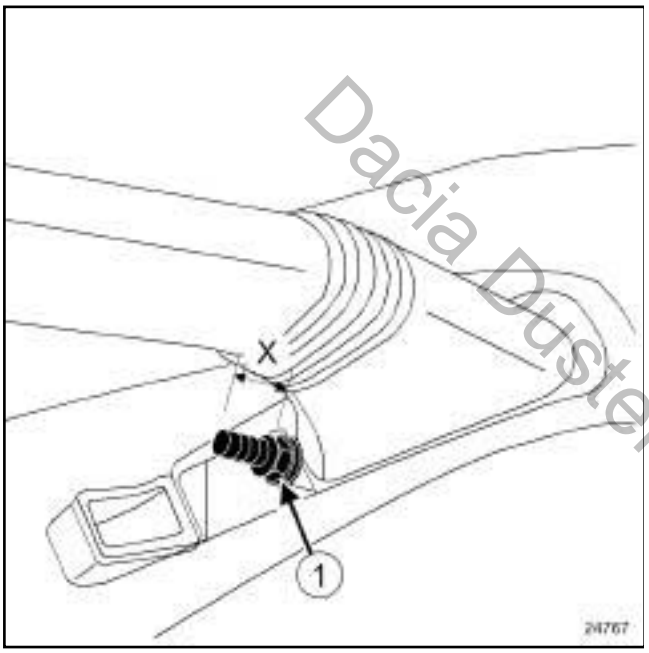
❑ Refit the dashboard lower trim (depending on the equipment level).

Tightening torques ▽	
parking brake lever nuts	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

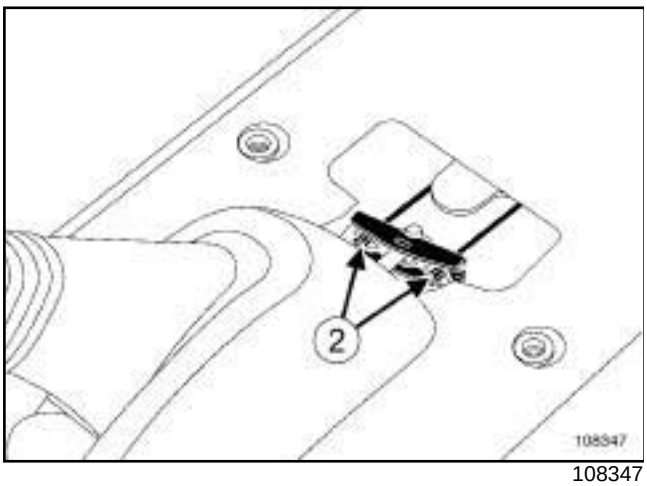
❏ Remove the centre console (see **Centre console: Removal - Refitting**) (57A, Interior equipment).



24767

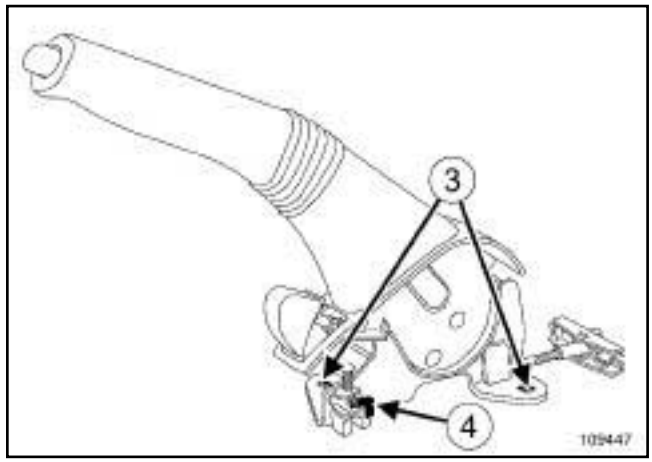
❏ Undo the handbrake adjusting nut (**1**) , marking the dimension (**X**) = **16 mm ± 0.30**, to detach the cables at the compensator.

II - REMOVAL OPERATION



108347

❏ Unclip the two cables (**2**) .



109447

❏ Remove nuts (**3**) .

❏ Lift the parking brake lever slightly to be able to disconnect the parking brake switch connector (**4**) .

❏ Remove the parking brake lever.

REFITTING

I - REFITTING OPERATION

❏ Refit:

- the parking brake lever,
- the two cables at the compensator,
- the parking brake lever nuts.

❏ Connect the connector on the parking brake switch.

❏ Tighten the parking brake adjusting nut, observing the dimension **X = 16 mm ± 0.30**.

❏ Torque tighten the **parking brake lever nuts (8 N.m)**.

II - FINAL OPERATION

❏ Connect the connector on the parking brake switch.

❏ Adjust the parking brake if the lever stops between the first and second positions of the parking brake lever's travel (see **37A**, **Mechanical component controls**, **Parking brake lever: Adjustment**, page **37A-30**) .

❏ Refit the centre console (see **Centre console: Removal - Refitting**) (57A, Interior equipment).

A poorly adjusted parking brake:

- prevents correct operation of the automatic compensation system for the brake shoes,
- causes premature wear of brake shoes.

ADJUSTMENT

I - ADJUSTMENT PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

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

❏ Put the parking brake lever into the released position.

❏ Check that the rear wheels turn freely. If they do not, check the following components and if necessary repair:

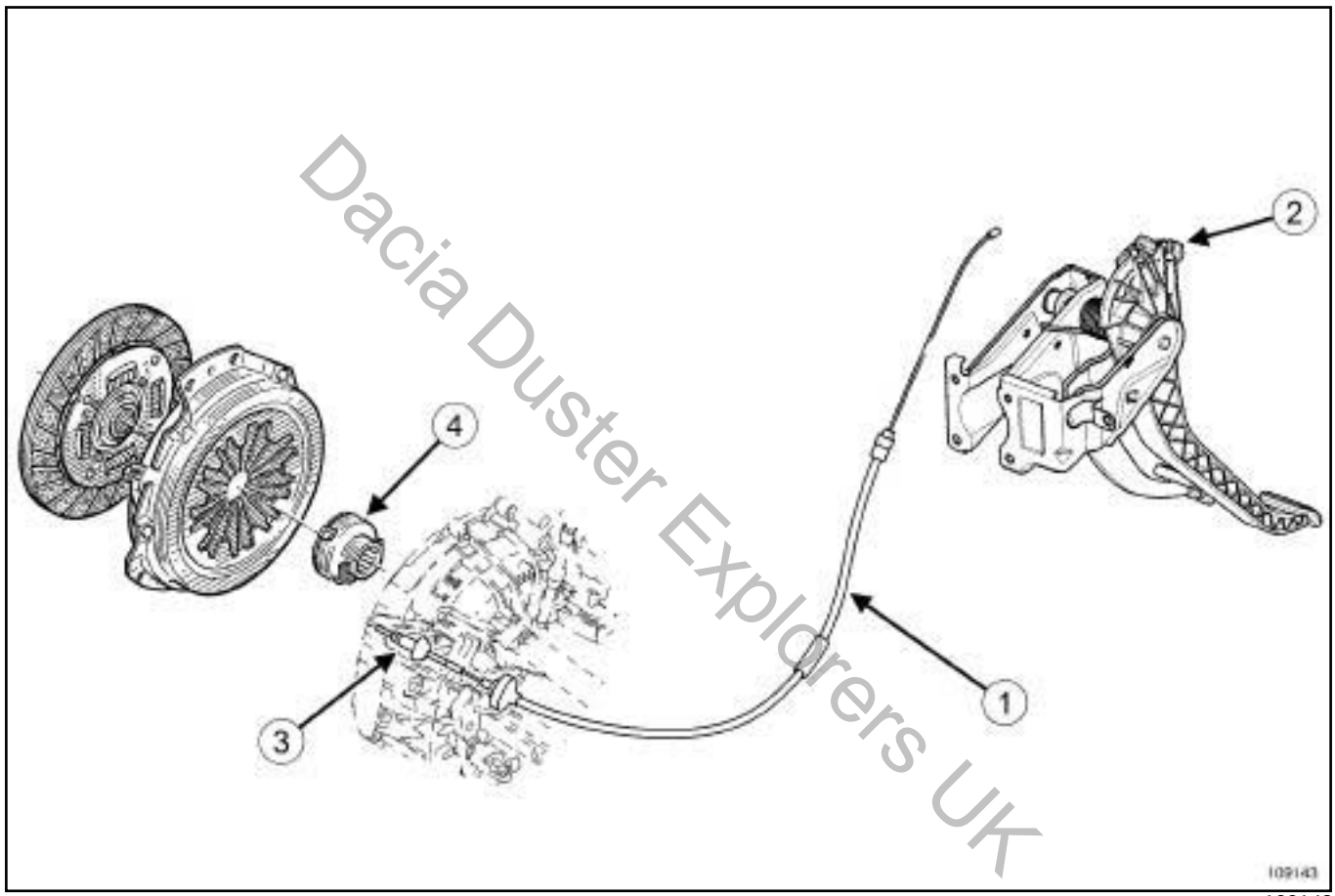
- the parking brake cables,
- the calliper piston,
- the automatic compensation system,
- calliper

❏ Remove the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

II - OPERATION FOR ADJUSTMENT OF PART CONCERNED

1. Cable clutch control

No.	Description
(1)	Clutch cable
(2)	Clutch pedal
(3)	Clutch fork
(4)	Clutch thrust bearing

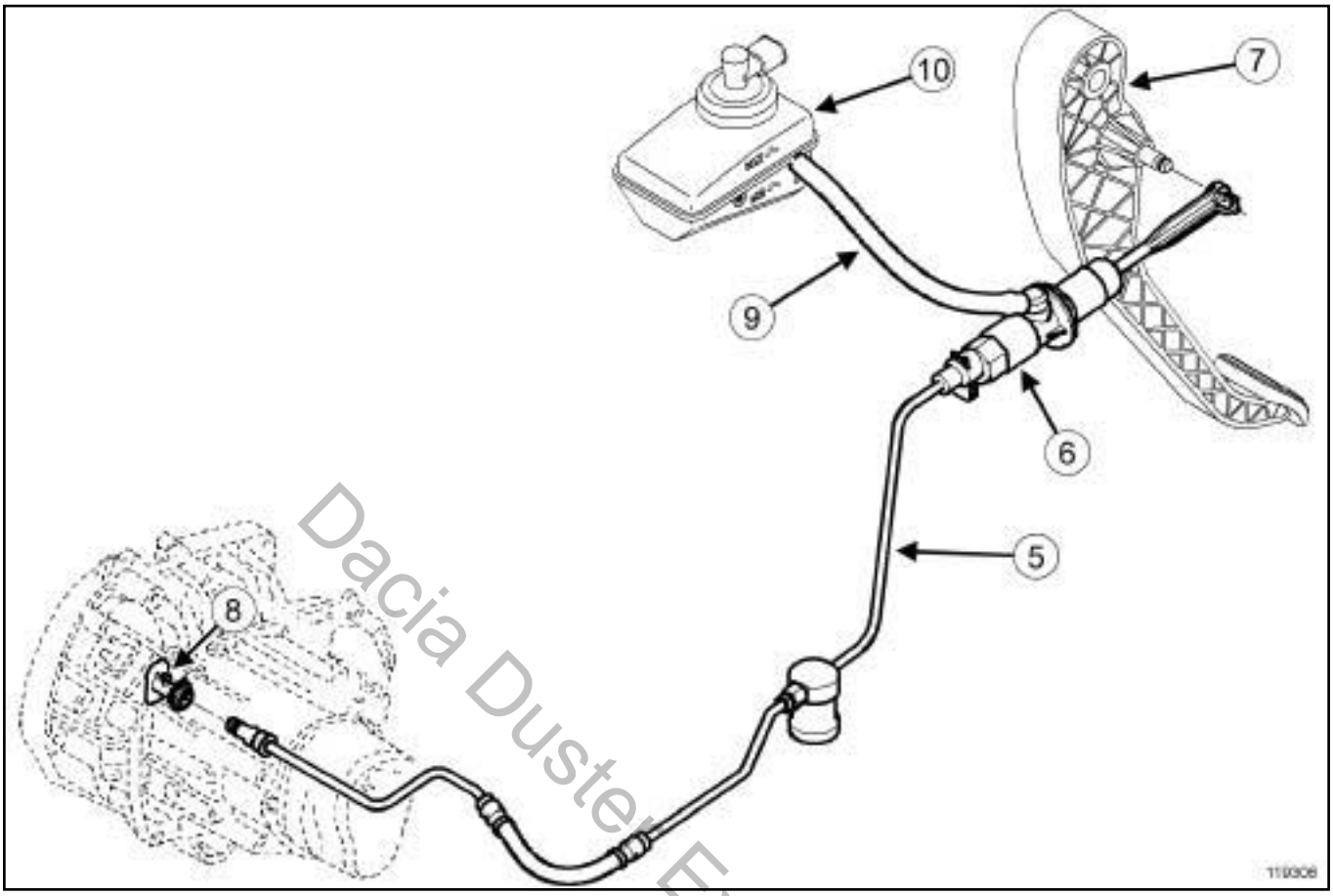


109143

This control has no automatic compensation.

2. Hydraulic clutch control

No.	Description
(5)	Slave cylinder supply pipe (engine compartment)
(6)	Master cylinder (engine compartment/passenger compartment connection)
(7)	Clutch pedal
(8)	Slave cylinder (on gearbox)
(9)	Master cylinder supply pipe (engine compartment)
(10)	Brake fluid reservoir



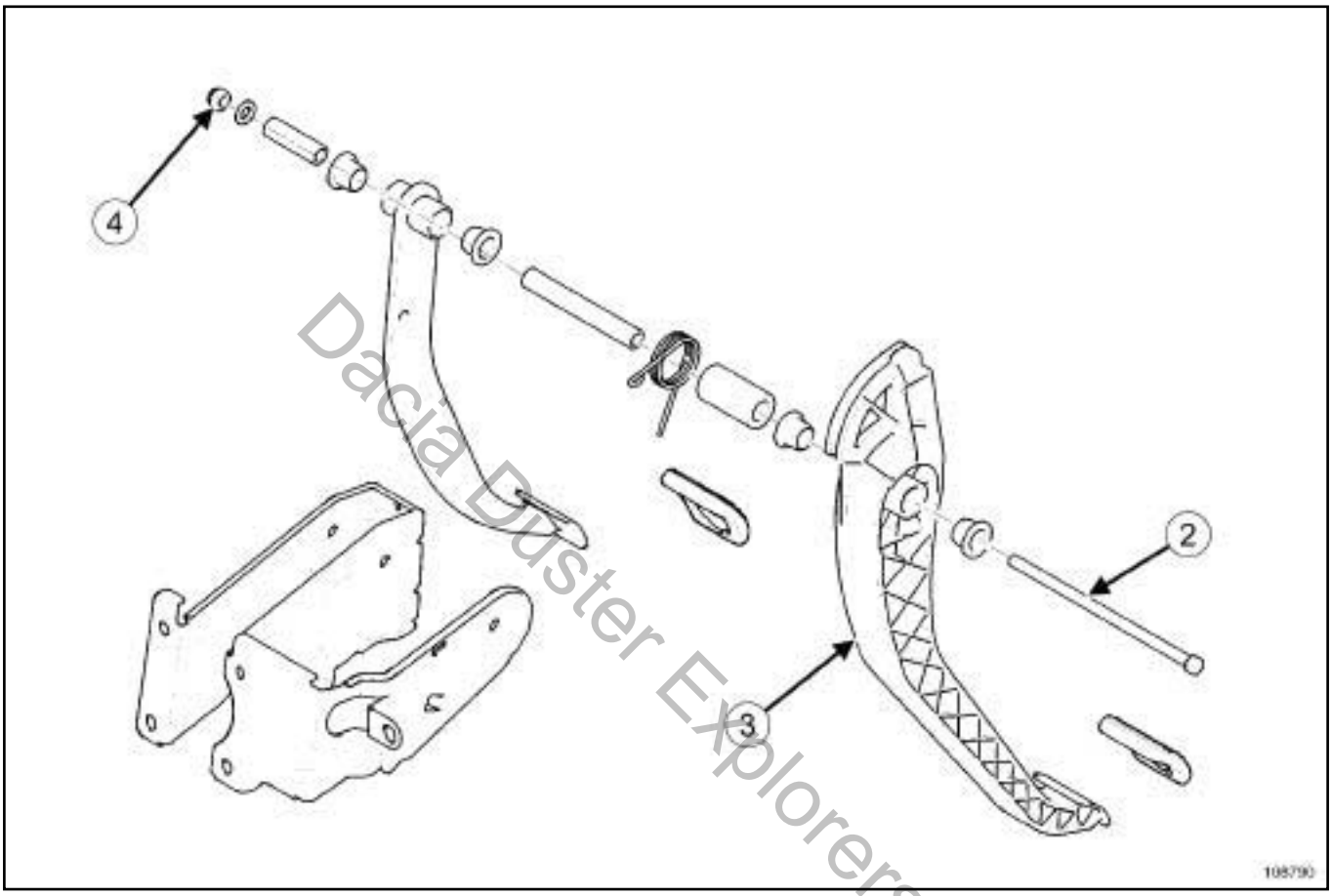
119306

LEFT-HAND DRIVE

Tightening torques ▽	
pedal shaft nut	**21 Nm**

REMOVAL

I - OPERATION FOR REMOVAL OF PART CONCERNED



108790

❏ Remove the nut (**4**) from the pedal shaft (**2**) .

❏ Pull the shaft (**2**) to free the clutch pedal.

❏ Remove the clutch pedal (**3**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Coat the shaft with **MOLYCOTE 33M** grease (see **Vehicle: Parts and consumables for the repair**) (MR 388, 04B, Consumables - Products).

Note:

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

II - REFITTING OPERATION FOR PART CONCERNED

❏ Fit the pedal shaft.

❏ Refit the pedal shaft nut.

❏ Torque tighten the **pedal shaft nut (21 Nm)**.

❏ Check that the whole clutch system operates correctly.

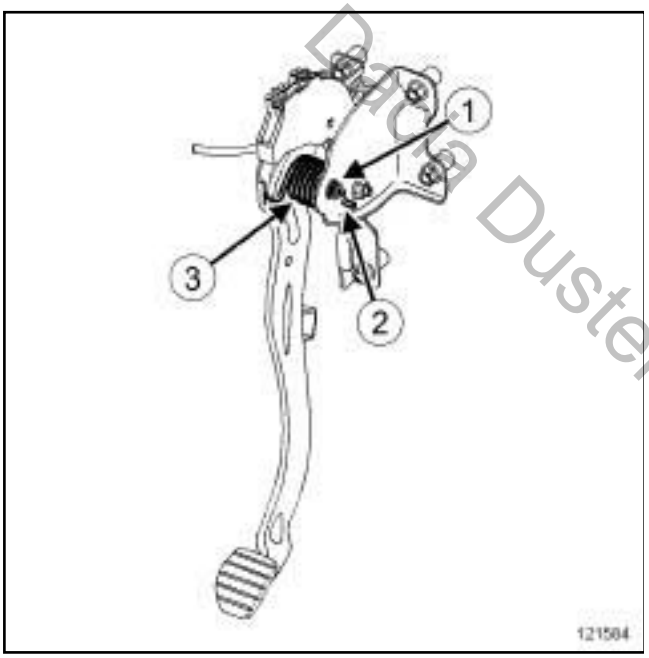
RIGHT-HAND DRIVE

Tightening torques ▽	
clutch shaft nut	**16 Nm**

REMOVAL

OPERATION FOR REMOVAL OF PART CONCERNED

❏ Remove the cable from its slot, lifting the pedal and placing the cable perpendicular to the pedal.



121584

❏ Remove the nut (**1**) from the pedal assembly shaft.

❏ Remove the shaft to release the clutch pedal.

❏ Extract the spring (**3**) from its housing (**2**) on the clutch pedal support.

❏ Remove the clutch pedal.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❏ Check the condition of the components.

❏ Replace any faulty parts.

❏ Coat the shaft with **MOLYCOTE 33M** grease (see **Vehicle: Parts and consumables for the repair**) (MR 388, 04B, Consumables - Products).

II - REFITTING OPERATION FOR PART CONCERNED

❏ Place the clutch pedal in position with its spring.

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

❏ Refit:

- the clutch pedal shaft,
- the clutch pedal shaft nut.

❏ Torque tighten the **clutch shaft nut (16 Nm)**.

❏ Fit the cable in its notch, on the clutch pedal.

III - FINAL OPERATION.

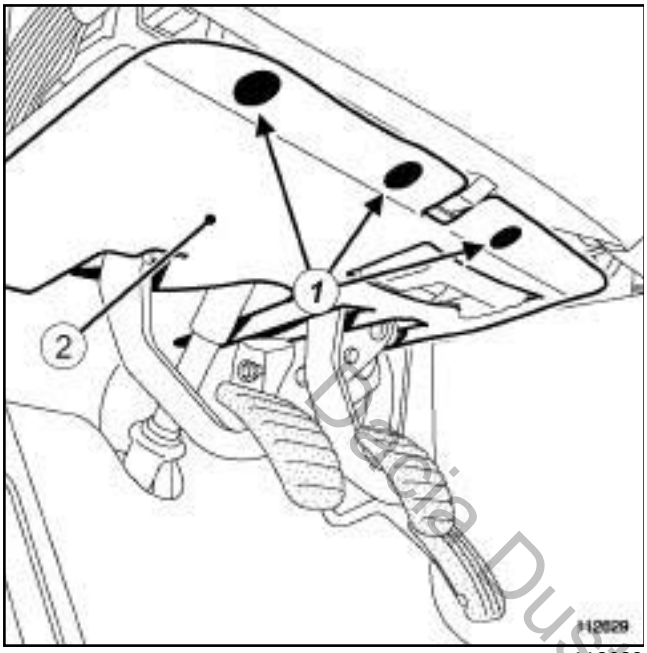
❏ Check that the cable fits perfectly in the groove provided for it on the pedal.

❏ Check and adjust the clutch control cable clearance if necessary (see **Clutch control: Adjustment**) .

❏ Check that the whole clutch system operates correctly.

REMOVAL

I - REMOVAL PREPARATION OPERATION

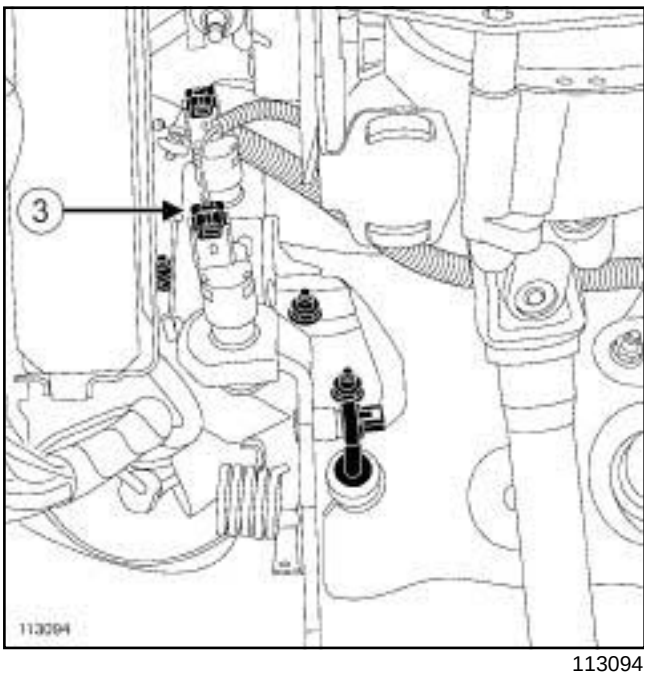


112629

❑ Remove:

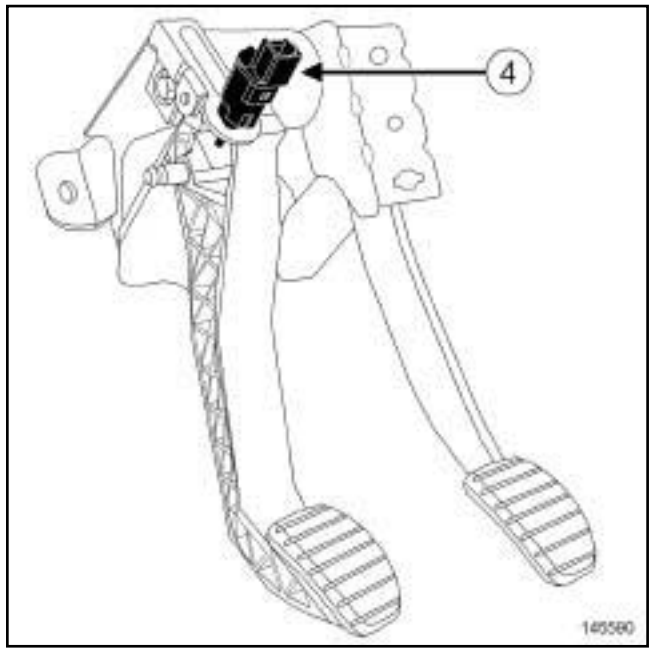
- the driver side dashboard lower trim clips (**1**) ,
- the driver side dashboard lower trim (**2**) .

II - REMOVAL OPERATION



113094

❑ Disconnect the connector (**3**) from the clutch pedal switch.



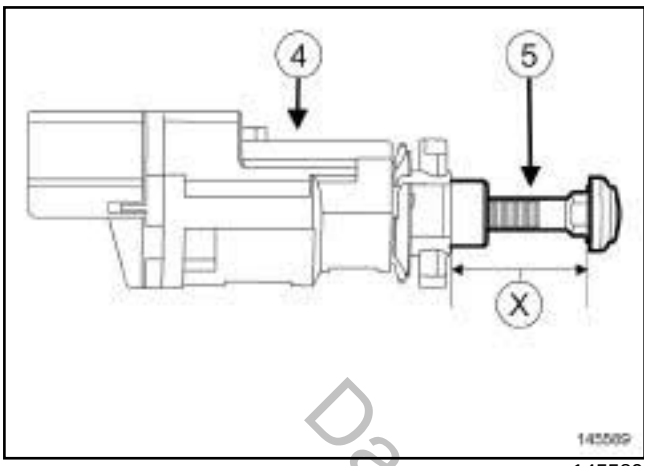
145590

❑ Turn the clutch pedal switch (**4**) one quarter of a turn anti-clockwise.

❑ Remove the clutch pedal switch (**4**) .

REFITTING

I - REFITTING PREPARATION OPERATION



145589

❑

WARNING

To avoid damaging the clutch switch (**4**) :

- handle the switch with care,
- only activate the piston during the adjustment phase,
- do not perform more than 3 adjustments to dimension (X),
- do not separate the piston from the switch.

Replace the switch:

- if the piston is separated from the switch
- if more than 3 consecutive adjustments to dimension (X) have been performed.

❑ Measure dimension (**X**) of the piston (**5**) . If the dimension is less than **20 mm**, carefully pull on the end of the piston to adjust the dimension between **20 mm minimum** and **22 mm maximum**.

II - REFITTING OPERATION

❑ Depress the clutch pedal by hand.

❑ Position the clutch pedal switch on the pedal assembly.

❑ Lock the clutch pedal switch by turning it a quarter of a turn clockwise.

❑ At the same time, carefully return the clutch pedal.

Note:

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

The automatic adjustment makes a clicking noise when in operation.

❑ Connect clutch switch connector.

III - FINAL OPERATION

❑ Refit the driver side dashboard lower trim.

JR5

Equipment required
brake circuit bleeding device
hydraulic circuit bleed syringe

Bleed in the event of:

- dead travel,
- pedal at mid-travel,
- pedal to the floor,
- poor gear changing.

I - PRECAUTIONS DURING REPAIR

Risks relating to contamination.

❑ The hydraulic clutch system is very sensitive to contamination. The risks caused by contamination are:

- impossible to change gears,
- damage to or destruction of the clutch system,
- leaks on the hydraulic circuit.

All the operations on the hydraulic clutch circuit system must be carried out under excellent cleanliness conditions. This ensures that no impurities enter the hydraulic circuit during the operation.

The cleanliness principles apply to all components of the hydraulic clutch circuit.

Items causing contamination are:

- metal or plastic swarf,
- fibres:
  - cardboard,
  - brushes,
  - paper,
  - clothing,
  - cloth,
  - dust and particles in the air,
  - etc.

Cleaning cloths.

❑ Use lint-free cleaning cloths (see **Products recommended for the repair**) (04B, Consumables - Products).

Each cloth must only be used once.

There are two types of equipment used to bleed the clutch circuit:

❑ ARC50 via the brake fluid reservoir.

❑ Syringe via the bleed hole located on the clutch slave cylinder.

There are two procedures used to bleed the clutch circuit:

❑ If no parts of the hydraulic clutch circuit are removed:

- Carry out the bleed operation using the ARC50 via the brake fluid reservoir or using a new syringe via the bleed hole located on the clutch slave cylinder.

❑ If no parts of the hydraulic clutch circuit are removed:

- Only carry out the bleed operation using a new syringe by injecting the brake fluid via the bleed hole on the clutch slave cylinder.

Note:

- Even the tiniest air bubble in the circuit can cause faulty operation (pedal failing to return properly, crunching sound when changing gear, etc.).
- Incorrect bleeding can lead to incorrect detection of faults and unnecessary part replacements.

Consumables required for the repair:

❑ Bleed the clutch circuit using approved (see **Vehicle: Parts and consumables for the repair**) brake fluid (04B, consumables - products).

II - PREPARATION OPERATION

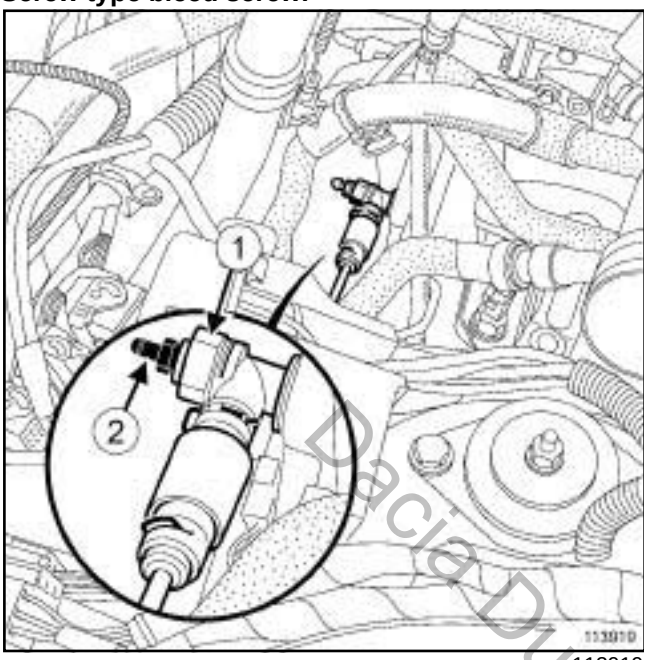
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove the engine undertray.

JR5

There are several versions of bleed screw:

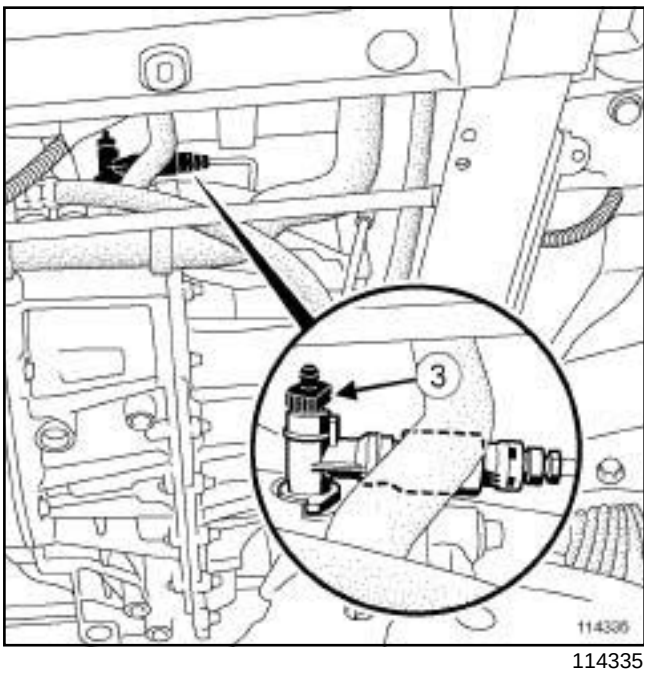
Screw type bleed screw.



113919

❏ To open the bleed screw, hold the plastic union (**1**) using a ring spanner and undo the bleed screw (**2**) .

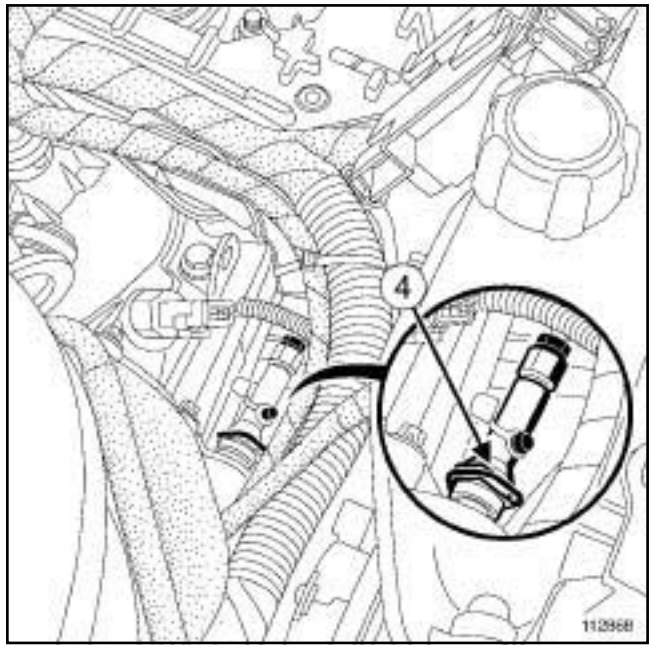
Half-turn bleed screw.



114335

❏ To open the bleed screw, fully turn the bleed screw (**3**) by hand.

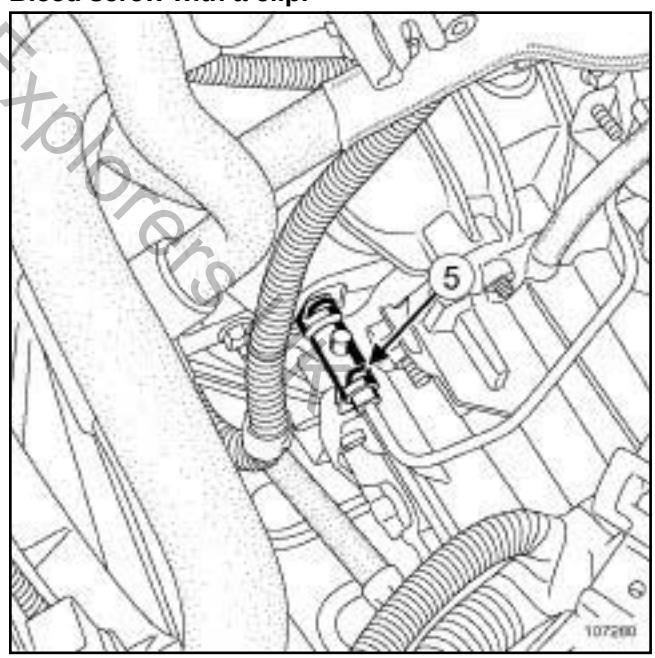
Bleed screw with a clip.



112868

❏ To open the bleed screw, press and hold the clip (**4**) while pulling by one notch.

Bleed screw with a clip.

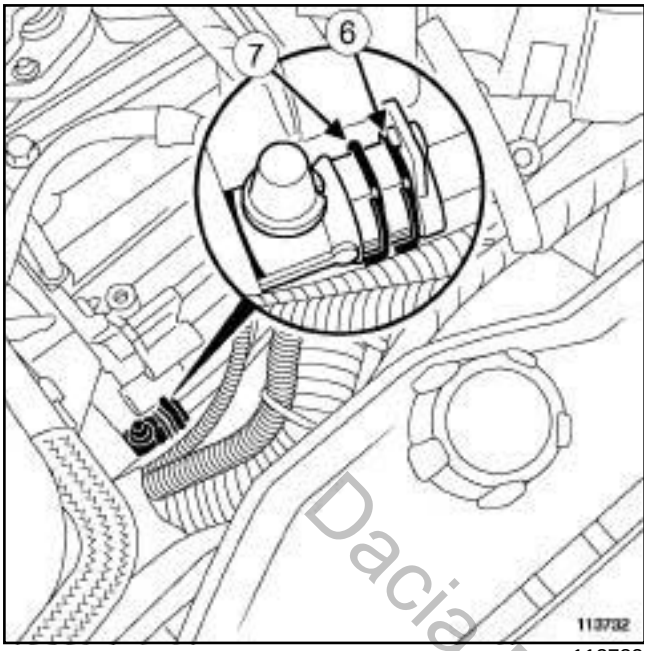


107280

❏ To open the bleed screw, lift the clip (**5**) while pulling by one notch.

JR5

Bleed screw with two clips.



113732

❑ To open the bleed screw, lower the clip (**6**) and lift the clip (**7**) while pulling by one notch.

III - BLEED PROCEDURE IF NO PARTS OF THE HYDRAULIC CIRCUIT ARE REMOVED

1 - Bleed using the ARC50.

❑ Keep the clutch pedal in the upper position using a strap attached to the steering wheel to ensure continuity of the hydraulic circuit during the bleed operation.

Note:

Take care not to disrupt the adjustment of the clutch start of travel switch.

❑ Connect the **brake circuit bleeding device** (after having received Renault approval) to the master cylinder reservoir (see the instructions for the equipment).

❑ Remove the bleed plug from the clutch slave cylinder.

❑ Connect a transparent pipe to the bleed hole running to an empty container placed under the bleed hole.

❑ Open the bleed screw.

❑ Open the circuit between the bleeding device and the brake fluid reservoir.

❑ Let the brake fluid run until all air bubbles have been released.

❑ Stop the bleeding device to dump the pressure in the clutch circuit.

❑ Close the bleed screw.

❑ Remove the transparent pipe from the bleed hole.

❑ Refit the bleed plug.

❑ Top up the brake fluid level in the master cylinder reservoir after disconnecting the bleed device.

❑ Disengage and engage the clutch quickly around twenty times.

❑ Check that the clutch system is operating correctly.

❑ Repeat the bleed operation if necessary.

❑ Check the adjustment of the switch. (see **37A**, **Mechanical component controls**, **Clutch pedal switch: Removal - Refitting**, page **37A-35**) (37A, mechanical control elements).

JR5

2 - Bleed using a new syringe.

❑ Keep the clutch pedal in the upper position using a strap attached to the steering wheel to ensure continuity of the hydraulic circuit during the bleed operation.

Note:

Take care not to disrupt the adjustment of the clutch start of travel switch.

❑ Remove the bleed plug from the clutch slave cylinder.

❑ Connect a transparent pipe of sufficient length to the bleed hole (at least thirty centimetres) in order to place it at the same height as the reservoir.

❑ Open the bleed screw.

❑ Fill the brake fluid master cylinder reservoir until brake fluid flows out of the bleed screw.

Note:

The transparent pipe must remain at the same height as the master cylinder reservoir to prevent air from entering inside the clutch circuit.

❑ Connect a new **hydraulic circuit bleed syringe** filled with a useful volume of **60 ml** of approved brake fluid to the end of the transparent pipe.

❑ Slowly inject the entire contents of the syringe into the hydraulic clutch circuit without injecting any of the air from the top section of the syringe.

❑ Close the bleed screw.

❑ Remove the transparent pipe from the bleed hole.

❑ Refit the bleed plug.

❑ Top up the brake fluid level in the master cylinder reservoir.

❑ Disengage and engage the clutch quickly around twenty times.

❑ Check that the clutch system is operating correctly.

❑ Repeat the bleed operation if necessary.

❑ Check the adjustment of the switch. (see **37A**, **Mechanical component controls**, **Clutch pedal switch: Removal - Refitting**, page **37A-35**) (37A, mechanical control elements).

IV - BLEED PROCEDURE IF PARTS OF THE HYDRAULIC CIRCUIT ARE REMOVED.

❑

WARNING

The master cylinder pipe must be disconnected from its take-off point on the brake fluid reservoir, to avoid any foreign matter penetrating inside the hydraulic brake circuit.

WARNING

Prepare for the flow of fluid and protect the surrounding components.

Note:

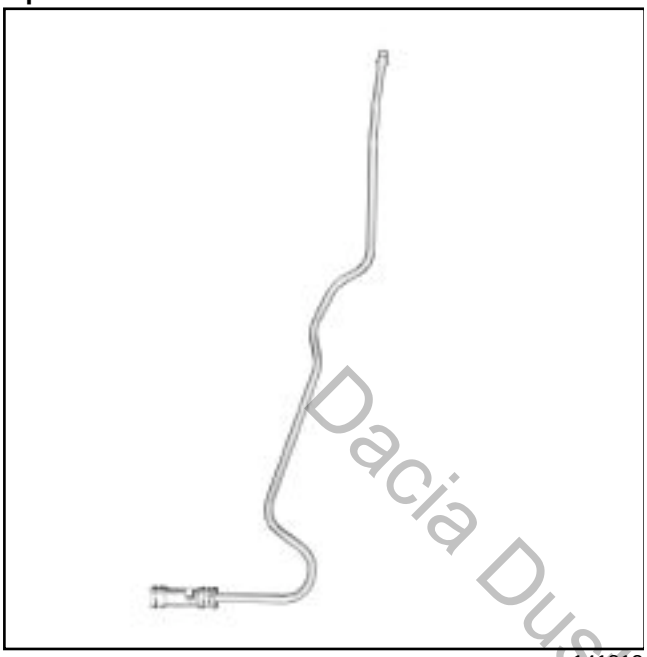
Prefill the hydraulic circuit pipe equipped with a filter.

Position the filter head facing downwards to ensure that it fills.

JR5

There are several versions of pipe with and without a filter:

Pipe without filter.



141812

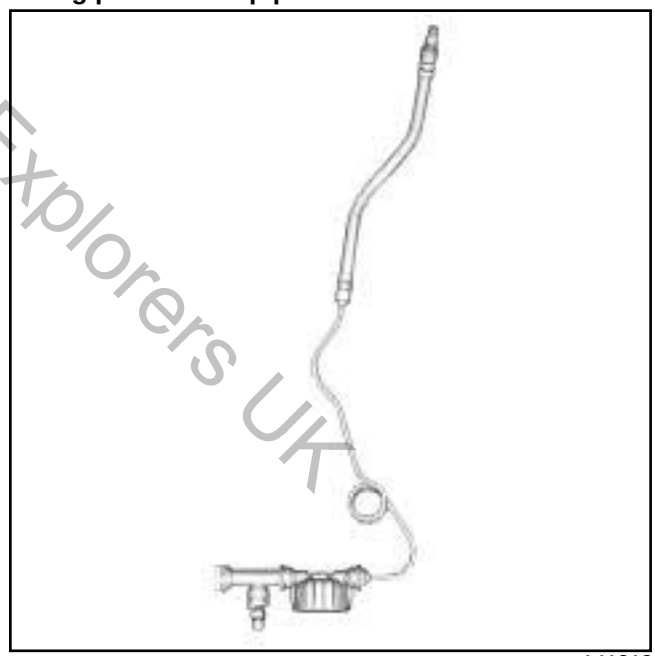
Filling position for pipe with filter.

141811

Filling position for pipe with filter.

141810

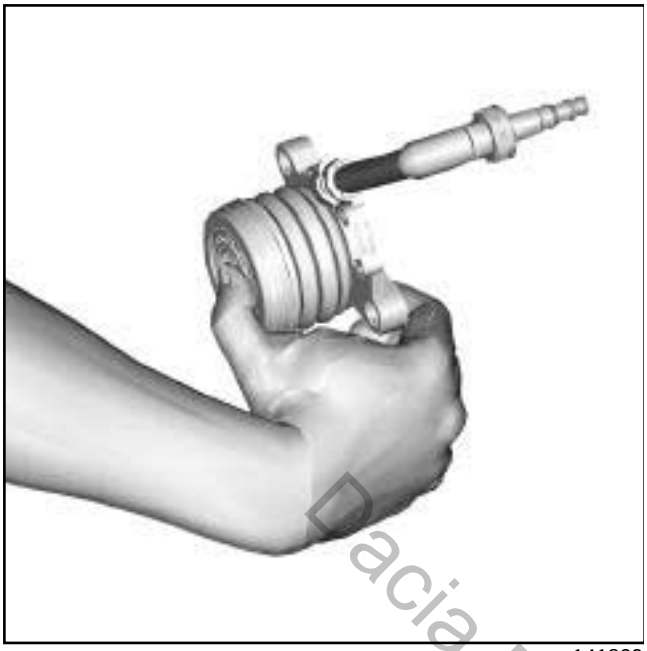
Filling position for pipe with filter.



141813

❏ Prefill the clutch pipe using the syringe.

❏ Plug the prefilled pipe on the master cylinder end to stop any brake fluid from escaping.



141809

❑ Prefill the hydraulic tappet using the new syringe (by gravity).

❑ Refit the part(s) concerned.

V - BLEED PROCEDURE AFTER A REMOVING A COMPONENT OF THE HYDRAULIC CIRCUIT.

❑ Keep the clutch pedal in the upper position using a strap attached to the steering wheel to ensure continuity of the hydraulic circuit during the bleed operation.

Note:

Take care not to disrupt the adjustment of the clutch start of travel switch.

❑ Remove the bleed plug from the clutch slave cylinder.

❑ Connect a transparent pipe of sufficient length to the bleed hole (at least thirty centimetres) in order to place it at the same height as the reservoir.

❑ Open the bleed screw.

❑ Fill the brake fluid master cylinder reservoir until brake fluid flows out of the bleed screw.

Note:

The transparent pipe must remain at the same height as the master cylinder reservoir to prevent air from entering inside the clutch circuit.

❑ Connect a new syringe containing **60 ml** of approved brake fluid to the end of the transparent pipe.

❑ Slowly inject the entire contents of the syringe into the hydraulic clutch circuit without injecting any of the air from the top section of the syringe.

❑ Close the bleed screw.

❑ Remove the transparent pipe from the bleed hole.

❑ Refit the bleed plug.

❑ Top up the brake fluid level in the master cylinder reservoir.

❑ Disengage and engage the clutch quickly around twenty times.

❑ Check that the clutch system is operating correctly.

❑ Repeat the bleed operation if necessary.

❑ Check the adjustment of the switch. (see **37A**, **Mechanical component controls**, **Clutch pedal switch: Removal - Refitting**, page **37A-35**) (37A, mechanical control elements).

JR5

VI - FINAL OPERATION

❑ Refit the engine undertray.

❑ Remove the vehicle from the two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

JR5, and LEFT-HAND DRIVE

Tightening torques ▽	
expansion bottle nuts	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the engine undertray.

❏ Remove the two expansion bottle nuts.

❏ Move aside the expansion bottle.

❏ Disconnect the brake fluid level sensor connector from the reservoir.

❏ Remove the brake fluid filler cap.

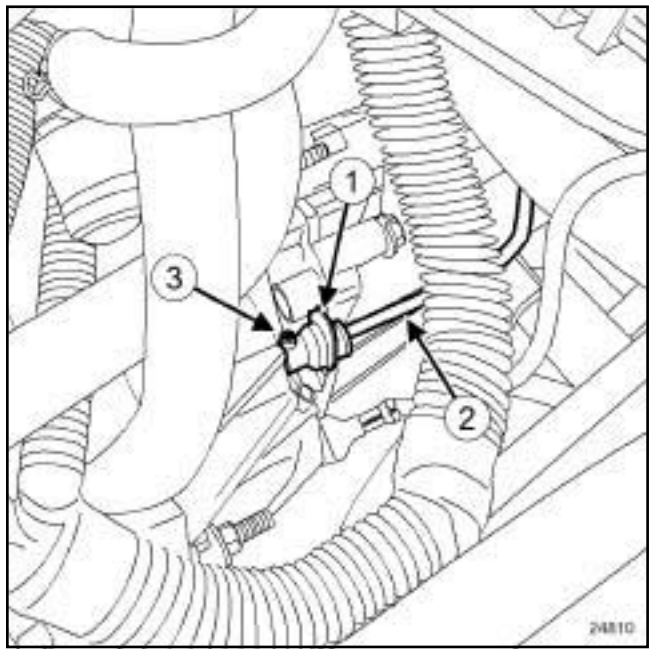
❏ Drain the brake fluid reservoir using a syringe until the fluid level is below the clutch master cylinder supply orifice on the brake fluid reservoir.

❏ Place a cloth under this orifice.

❏ Disconnect the clutch master cylinder supply pipe from the brake fluid reservoir.

❏ Fit plugs into the openings.

II - OPERATION FOR REMOVAL OF PART CONCERNED



24810

❏ Place a cloth under the clutch slave cylinder.

❏ Remove the plug from the bleed hole (**3**) .

❏ Press the clip (**1**) .

WARNING
Do not pull the clip. If it is incorrectly handled in any way, the pipe will need to be replaced.

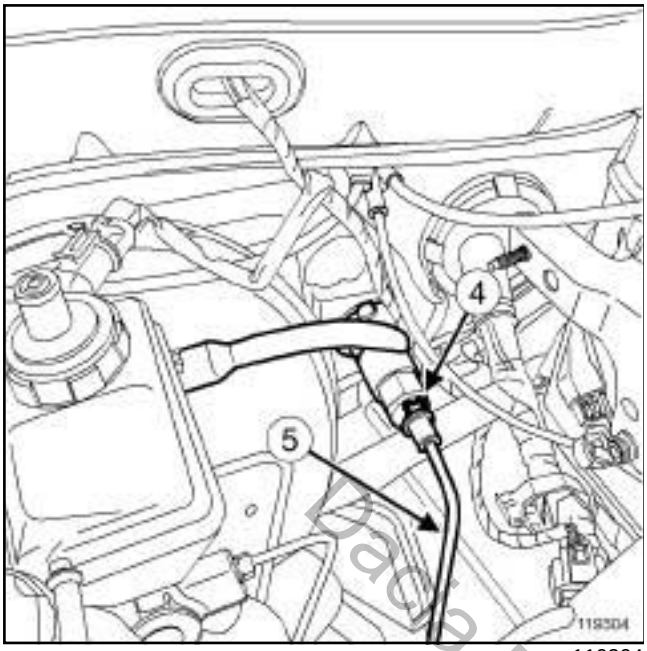
❏ Pull out the clutch control pipe (**2**) one notch to free the bleed hole.

Note:
Expect some brake fluid to run out.

❏ Connect a transparent pipe to the bleed hole (**3**) and place an empty container under the bleed hole.

❏ Depress the clutch pedal with your hand (to drain the clutch master cylinder and the clutch pipe).

JR5, and LEFT-HAND DRIVE



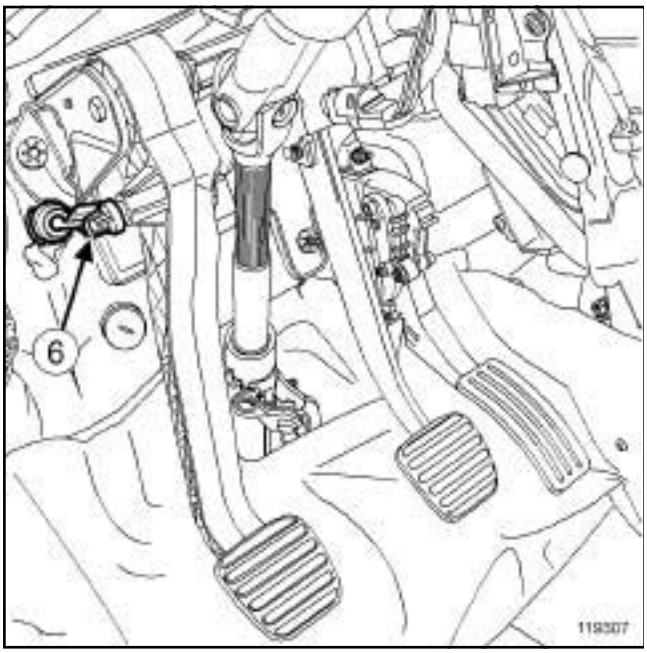
119304

❑ Remove the retaining clip (**4**) of the clutch master cylinder-slave cylinder connecting pipe on the clutch master cylinder.

❑ Place a cloth under the clutch master cylinder.

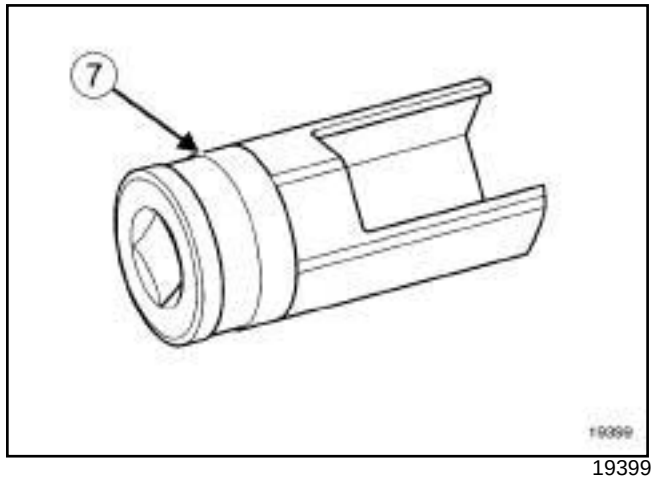
❑ Disconnect the pipe (**5**) from the clutch master cylinder.

❑ Fit plugs into the openings.



119307

❑ Disconnect the clutch master cylinder ball joint (**6**) from the clutch pedal in the passenger compartment.



19399

❑ Remove the clutch master cylinder from the bulkhead by turning it a quarter of a turn clockwise in the engine compartment (bayonet type mounting) using the tool (**7**) or.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Check the condition of the seals.

Note:

The clutch master cylinder has a foolproofing device; it only fits in one position.

WARNING

Do not use the take-off pipes as a support when fitting.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the clutch master cylinder by turning it a quarter of a turn anti-clockwise (bayonet type mounting) using the toolor.

❑ Refit the clutch master cylinder ball joint on the clutch pedal in the passenger compartment.

❑ Remove the plugs from the openings.

❑ Refit the clutch master cylinder-slave cylinder connecting pipe on the clutch master cylinder.

JR5, and LEFT-HAND DRIVE

❑ Press the clutch master cylinder clip.

Note:

Lubricate both ends of the supply pipe with brake fluid to facilitate fitting on the brake fluid reservoir take-off pipe.

❑ Refit the pipe between the clutch master cylinder and the brake fluid reservoir.

Note:

As you lock the clutch control pipe, you should hear a safety click.

❑ Refit the clutch master cylinder-slave cylinder connecting pipe on the slave cylinder.

❑ Remove the transparent tube from the bleed hole.

III - FINAL OPERATION

❑ Remove the plugs from the openings.

❑ Refit the clutch master cylinder supply pipe on the brake fluid reservoir.

❑ Refit the expansion bottle.

❑ Torque tighten the **expansion bottle nuts (8 N.m)**.

❑ Fill the brake fluid reservoir to the correct level.

❑ Bleed the clutch circuit (see **37A**, **Mechanical component controls**, **Clutch circuit: Bleed**, page **37A-37**) .

JR5, and LEFT-HAND DRIVE

Tightening torques ▽	
expansion bottle nuts	**8 N.m**

Note:

Each time an operation is carried out on the hydraulic clutch system, bleed the circuit at the following locations:

- between the reservoir and the bleed hole,
- between the bleed hole and the clutch thrust bearing,
- for long pedal travel.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the engine undertray.

❏ Remove the two expansion bottle nuts.

❏ Move aside the expansion bottle.

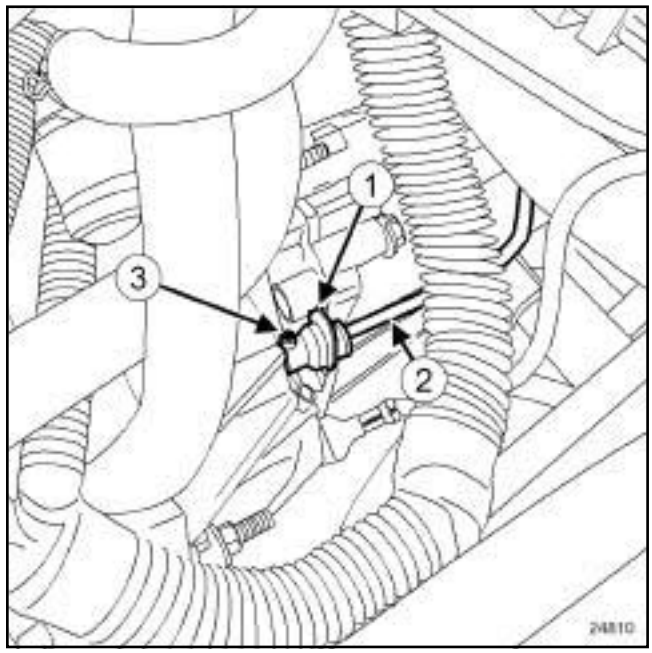
❏ Disconnect the brake fluid level sensor connector from the reservoir.

❏ Remove the brake fluid filler cap.

❏ Drain the brake fluid reservoir until the fluid level is below the master cylinder supply aperture.

❏ Remove the plug from the bleed hole.

II - OPERATION FOR REMOVAL OF PART CONCERNED



24810

❏ Place a cloth under the clutch slave cylinder.

❏ Press the clip (**1**) .

WARNING

Do not pull the clip. If it is incorrectly handled in any way, the pipe will need to be replaced.

❏ Pull out the clutch control pipe (**2**) by one notch to free the bleed hole.

Note:

Expect some brake fluid to run out.

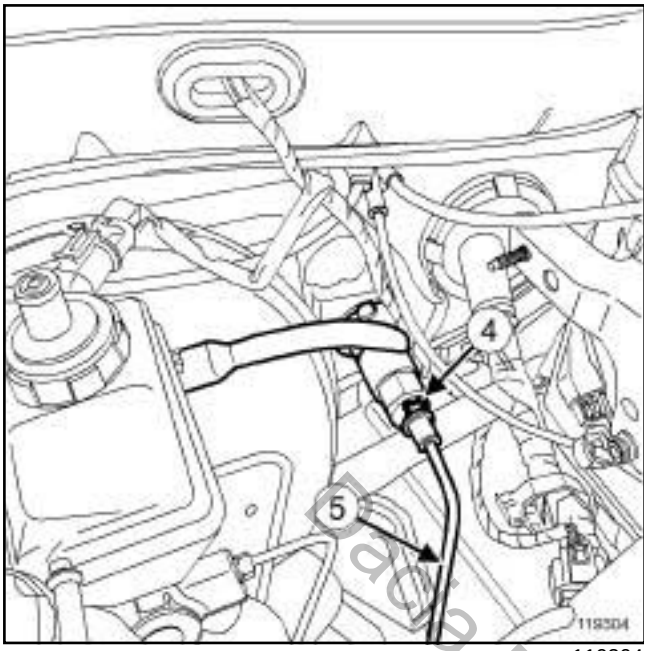
❏ Connect a transparent pipe to the bleed hole (**3**) and place an empty container under the bleed hole.

❏ Depress the clutch pedal with your hand (to drain the master cylinder and the clutch pipe).

❏ Press the slave cylinder clip (**1**) .

❏ Uncouple the pipe (**2**) from the slave cylinder and place plugs on all the openings.

JR5, and LEFT-HAND DRIVE



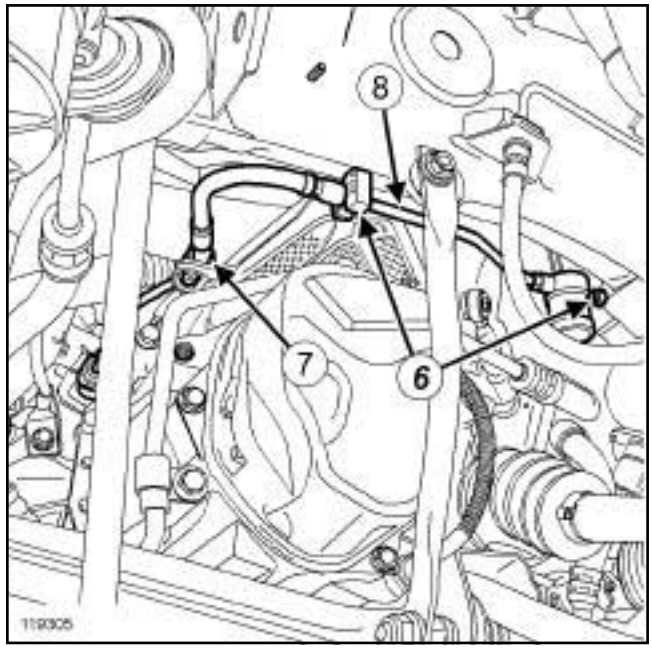
119304

❏ Remove the master cylinder-slave cylinder connecting pipe retaining clip (**4**) on the master cylinder.

❏ Place a cloth under the master cylinder.

❏ Disconnect the pipe (**5**) on the master cylinder in the engine compartment.

❏ Fit plugs into the openings.



119305

❏ Unclip:

- the master cylinder-slave cylinder connecting pipe from the body (**6**) ,

- the master cylinder-slave cylinder connecting pipe from the gearbox at (**7**) .

❏ Remove the master cylinder-slave cylinder connecting pipe (**8**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Check the condition of the seals.

❏ Remove the plugs from the openings.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Fit the master cylinder-slave cylinder connecting pipe.

❏ Clip the master cylinder-slave cylinder connecting pipe:

- on the gearbox,

- on the body.

❏ Connect the pipe to the master cylinder in the engine compartment.

❏ Refit the clip securing the master cylinder-slave cylinder connecting pipe to the master cylinder.

JR5, and LEFT-HAND DRIVE

❑ Connect the pipe to the slave cylinder.

Note:

As you lock the clutch control pipe, you should hear a safety click.

III - FINAL OPERATION

❑ Refit the expansion bottle.

❑ Torque tighten the **expansion bottle nuts (8 N.m)**.

❑ Fill the brake fluid reservoir to the correct level.

❑ Bleed the clutch circuit (see **37A**, **Mechanical component controls**, **Clutch circuit: Bleed**, page **37A-37**) .

❑ Refit the engine undertray.

JR5

Tightening torques ▽	
gear control unit bolts	**21 N.m**
exhaust pipe mountings	**21 N.m**
expansion bottle nuts	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

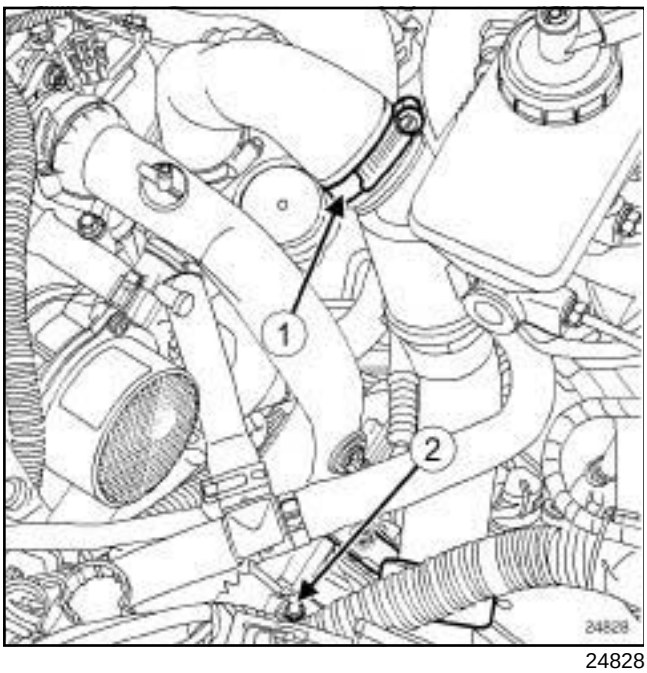
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove the expansion bottle nuts.

❏ Move aside the expansion bottle from its support.

K9K



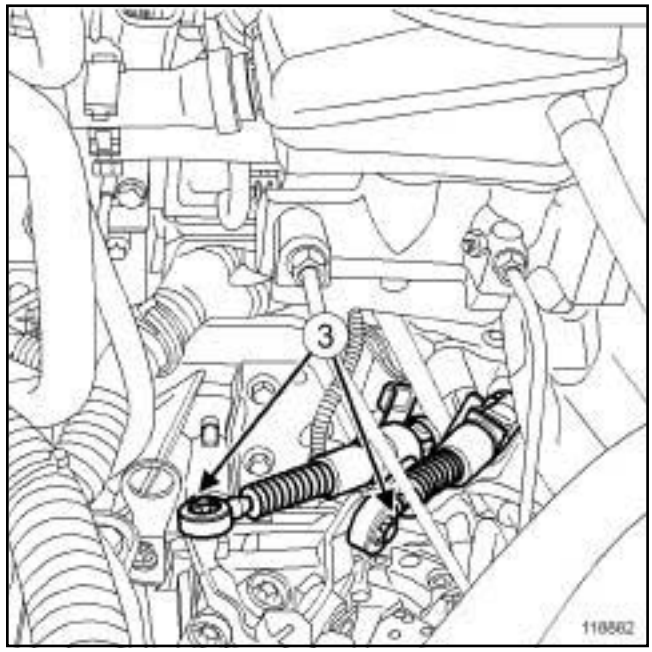
24828

❏ Disconnect the air duct between the turbocharger and the intercooler at (**1**) .

❏ Remove the air duct nut (**2**) on the gearbox.

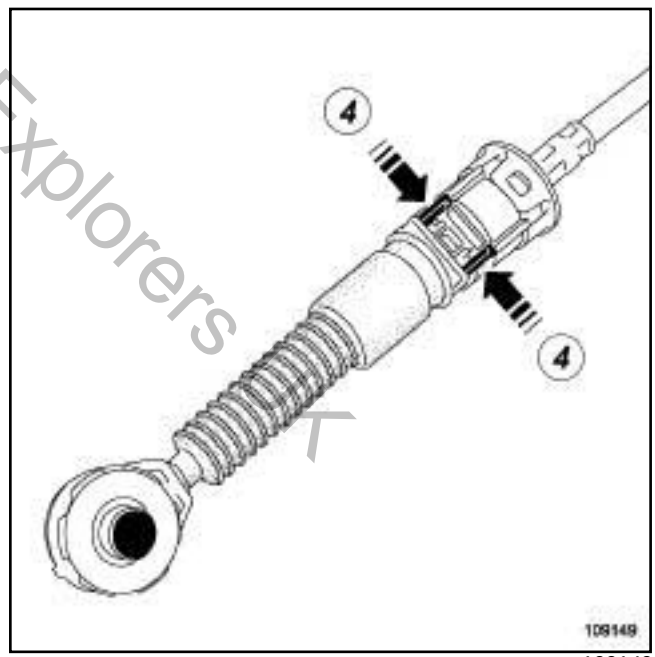
❏ Move aside the air duct.

II - REMOVAL OPERATION



118882

❏ Unclip the gear control cables on the gearbox at (**3**) .

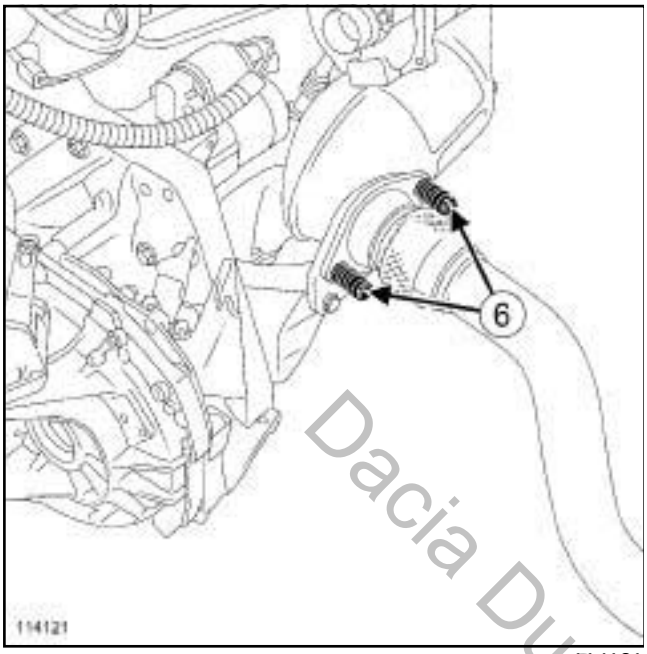


109149

❏ Detach the gear control cable sleeve stops from the gearbox by pressing at (**4**) .

JR5

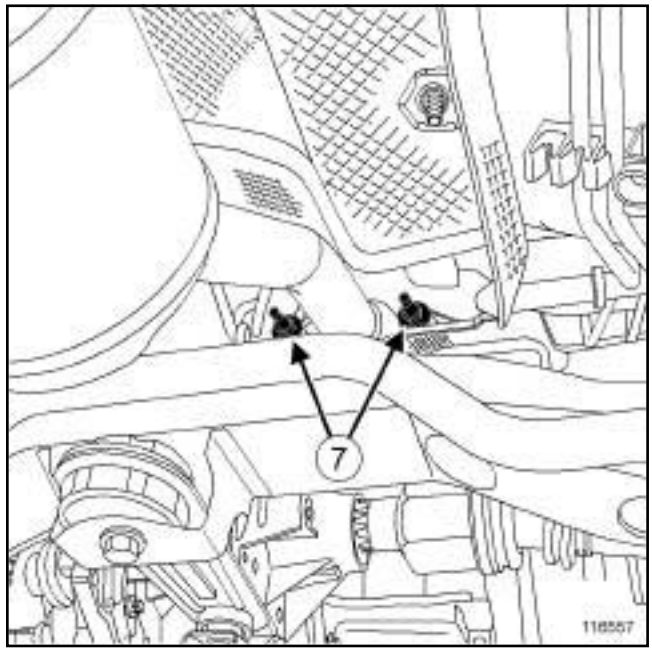
K9K



114121

❑ Remove the exhaust pipe mountings (**6**) from the catalytic converter.

K4M

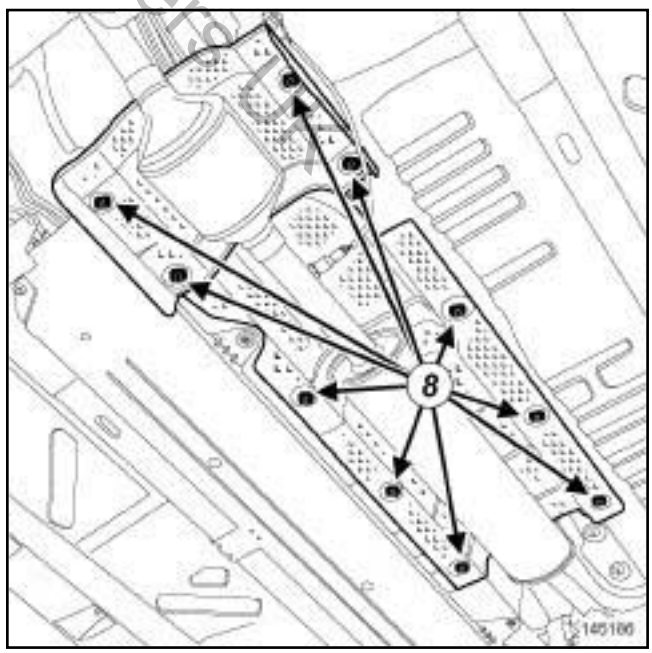


116557

❑ Remove the exhaust pipe mountings (**7**) .

❑ Move aside the exhaust pipe.

K4M



145186

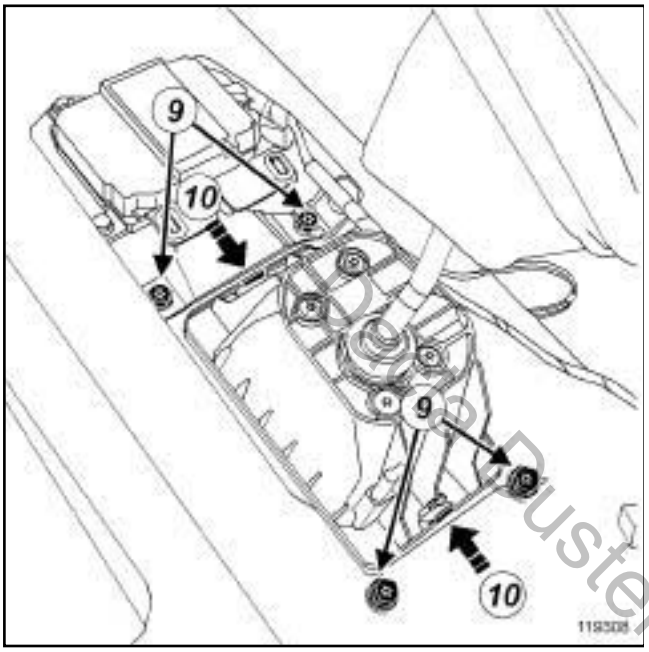
❑ Remove:

- the nuts (**8**) from the heat shield,

JR5

- the heat shield.

❑ Remove the centre console (see **Centre console: Removal - Refitting**) (57A, Interior equipment).



119308

❑ Remove the gear control unit bolts (**9**) .

❑ Unclip the gear selection unit from the floor at (**10**) .

❑ Lower the gearbox control unit so it is resting on the exhaust.

❑ Remove the gear control unit by feeding it out between the exhaust and the tunnel.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

Note:

The external control unit and the control levers on the gearbox must be in the neutral position to facilitate attachment of the control cables to the gearbox.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Position the gear control unit.

❑ Clip the gear control unit onto the floor.

❑ Torque tighten the **gear control unit bolts (21 N.m)**.

❑ Refit the centre console (see **Centre console: Removal - Refitting**) (57A, Interior equipment).

K4M

❑ Refit:

- the heat shield,
- the heat shield nuts,

❑ Refit the exhaust pipe mountings on the catalytic converter.

❑ Torque tighten the **exhaust pipe mountings (21 N.m)**.

❑ Clip:

- the gear control cable sheath stops on the gearbox,
- the control cables to the gearbox.

III - FINAL OPERATION

K9K

❑ Refit the air duct nut on the gearbox.

❑ Connect the air duct between the turbocharger and the intercooler at ***(1)*** .

❑ Refit the expansion bottle on its support.

❑ Torque tighten the **expansion bottle nuts (8 N.m)**.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

REMOVAL

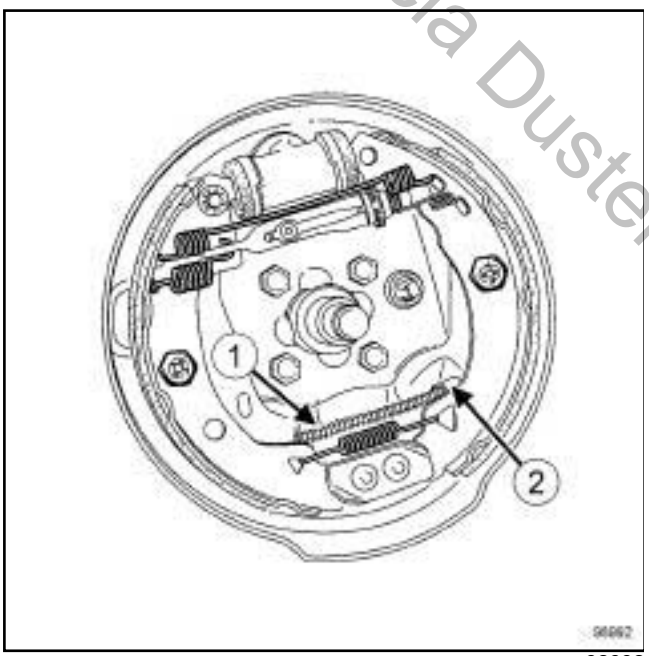
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the central console (see **Centre console: Removal - Refitting**) (57A, Interior equipment),
- the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the rear brake drums (see **33A**, **Rear axle components**, **Rear brake drum: Removal - Refitting**, page **33A-7**) .

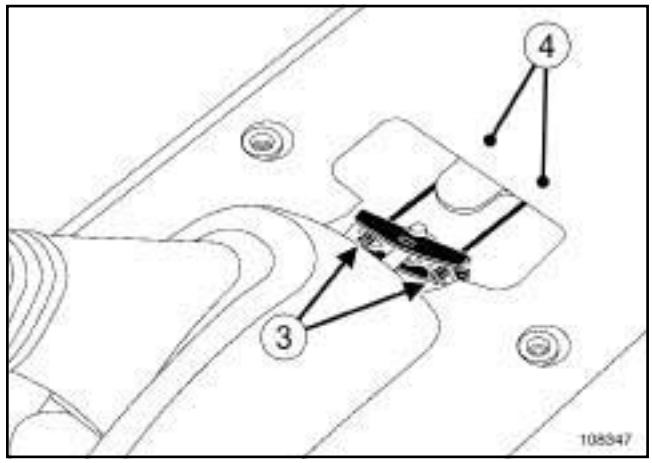
II - OPERATION FOR REMOVAL OF PART CONCERNED



98992

❏ Remove the parking brake cable (**1**) from the lever using pliers and a screwdriver.

❏ Unclip the parking brake cable sheath (**2**) from the drum back-plate.



108347

❏ Unclip:

- the cables (**3**) from their housing,
- the sheaths from their stop on the body (**4**) using pliers,

❏ Unclip the parking brake cables from their guides.

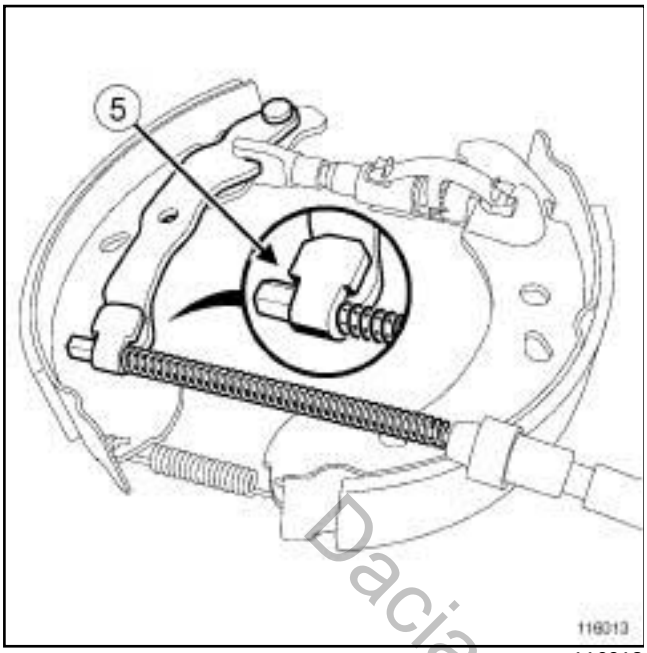
❏ Remove the parking brake cables.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the parking brake cables.

❏ Hook the parking brake cables onto their guides.



116013

❑ Reattach the parking brake cable sheath onto the drum back-plate.

❑ Refit the parking brake cable back into the lever housing using a pair of pliers and a screwdriver.

❑ Check that the cables (**5**) are correctly positioned on the levers.

❑ Reattach the sheath to its stop on the bodywork.

❑ Clip on:

- the cables (**3**) to the control lever,
- the sheaths to their stop on the body (**4**) .

❑ Adjust the parking brake cables (see **37A**, **Mechanical component controls**, **Parking brake lever: Adjustment**, page **37A-30**) .

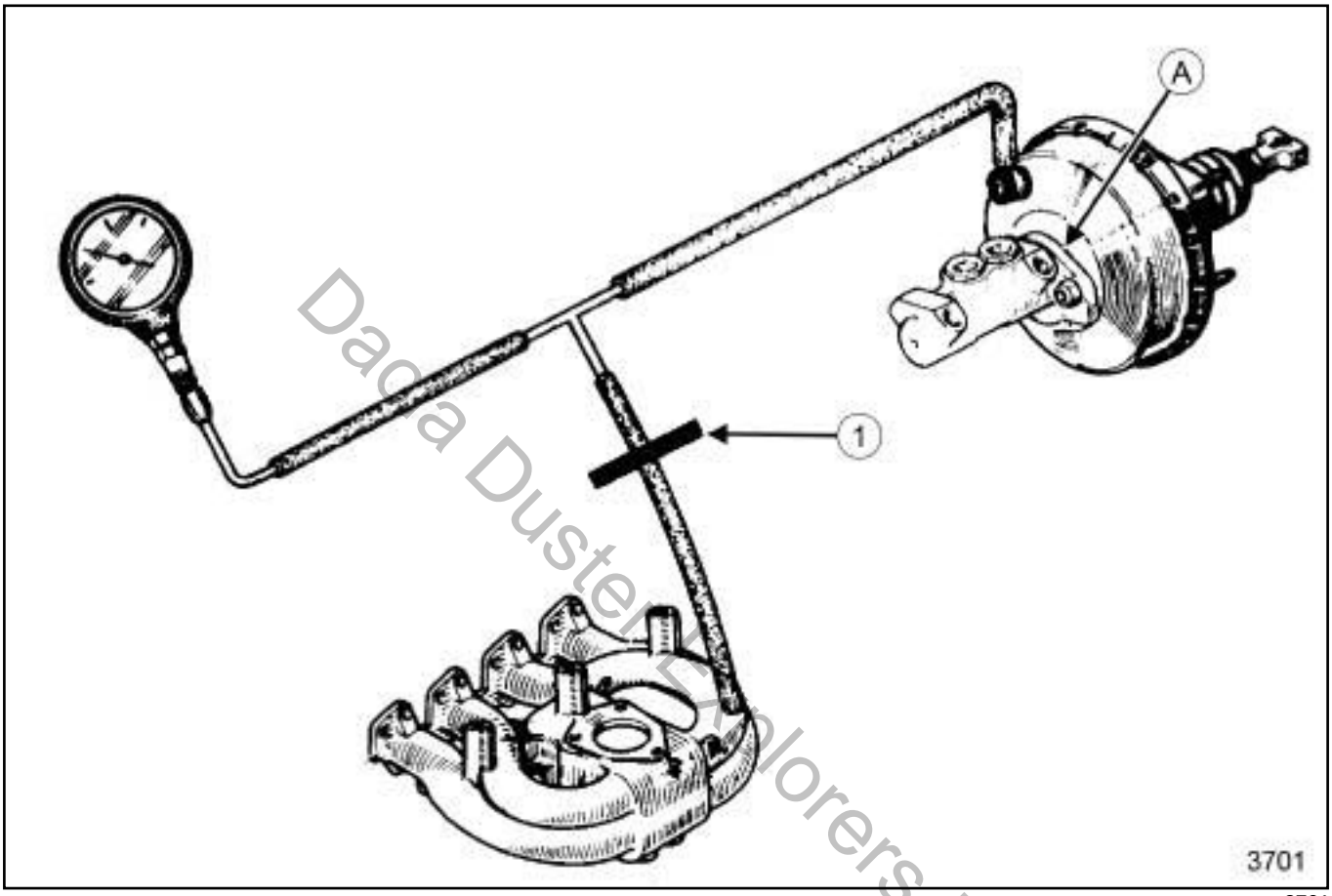
II - FINAL OPERATION

❑ Refit:

- the rear brake drums (see **33A**, **Rear axle components**, **Rear brake drum: Removal - Refitting**, page **33A-7**) ,
- the rear wheels (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the central console (see **Centre console: Removal - Refitting**) (57A, Interior equipment).

Special tooling required	
Ms. 583	Pipe clamps.

CHECKING THE SEALS



3701

❏ When checking the brake servo seals, ensure that there is a perfect seal between this and the master cylinder. If there is a leak here, replace the seal (**A**) .

The brake servo seals must be checked when fitted on the vehicle and when the hydraulic circuit is operational.

❏ Connect thebetween the brake servo and the vacuum source (inlet manifold) with a « T » union and the shortest possible pipe.

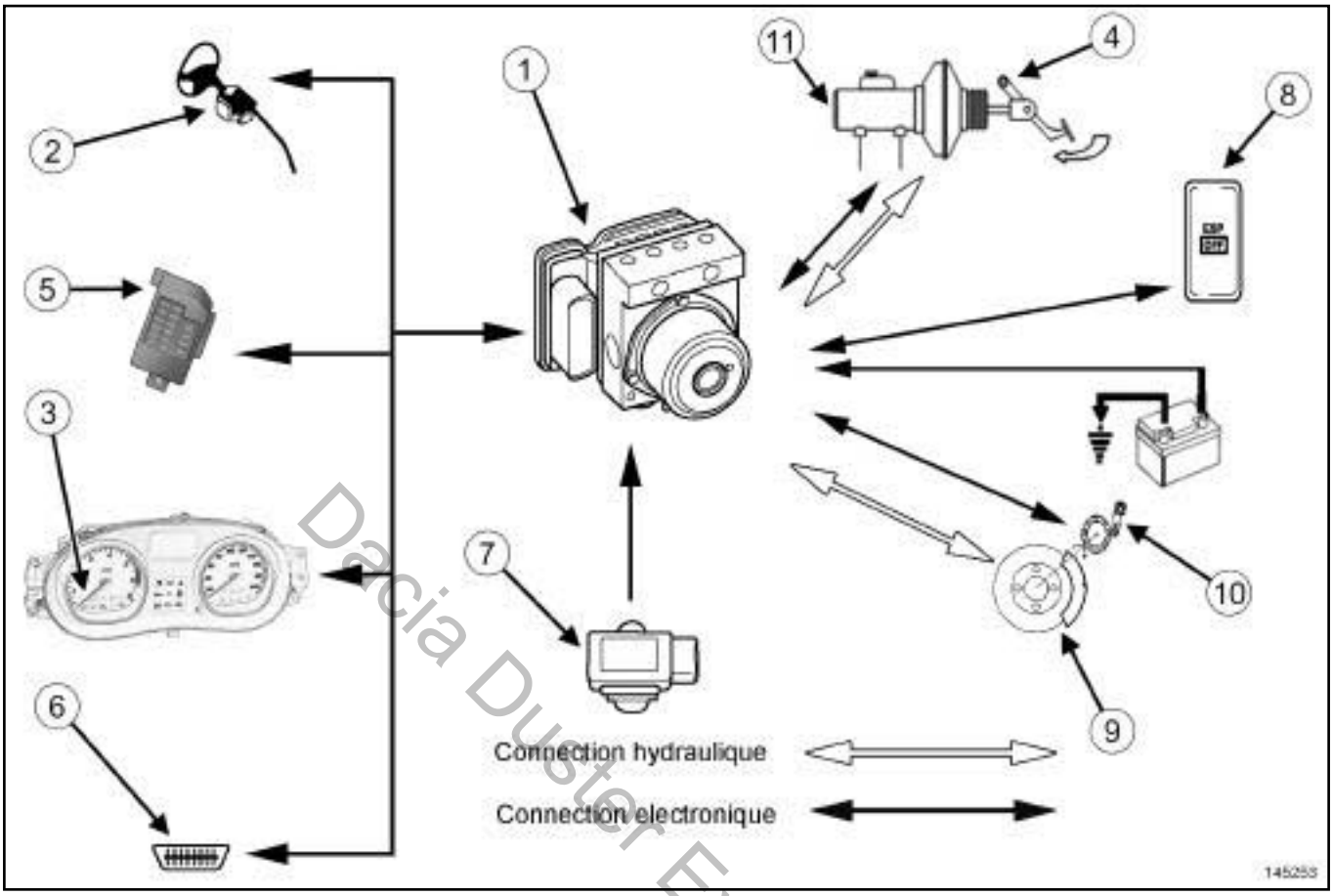
❏ Let the engine idle for approximately 10 minutes.

❏ Press the pipe between the « T » union and the vacuum source using the **(Ms. 583)** (**1**) .

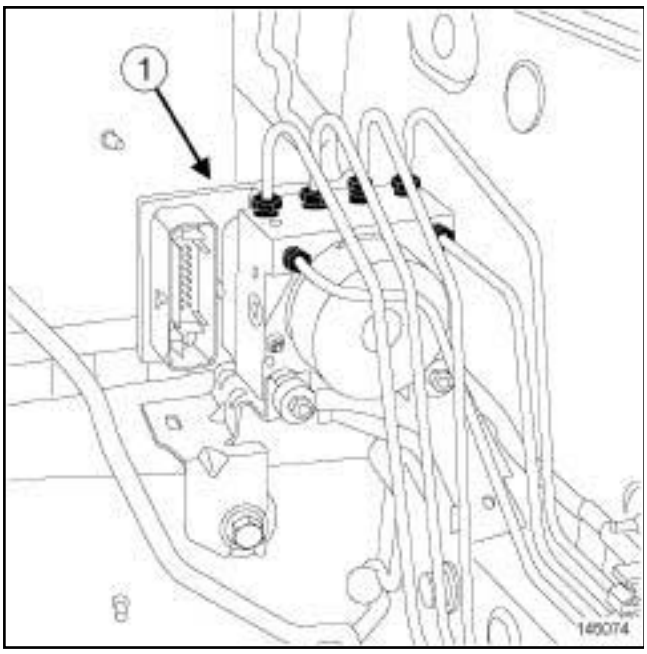
If the vacuum drops by more than **33 mbar** in **15 seconds**, there is a leak either:

- at the non-return valve (replace it),
- at the pushrod diaphragm (if this is the case, you should replace the brake servo).

If the brake servo is not operational, the braking system will operate but the force required at the pedal to obtain the equivalent deceleration as for assisted braking is considerably higher.

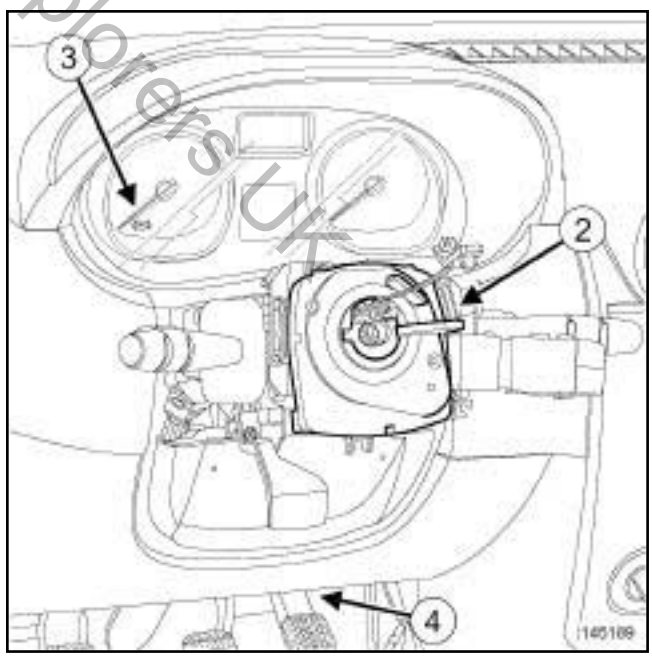


145253



145074

(**1**) Hydraulic unit

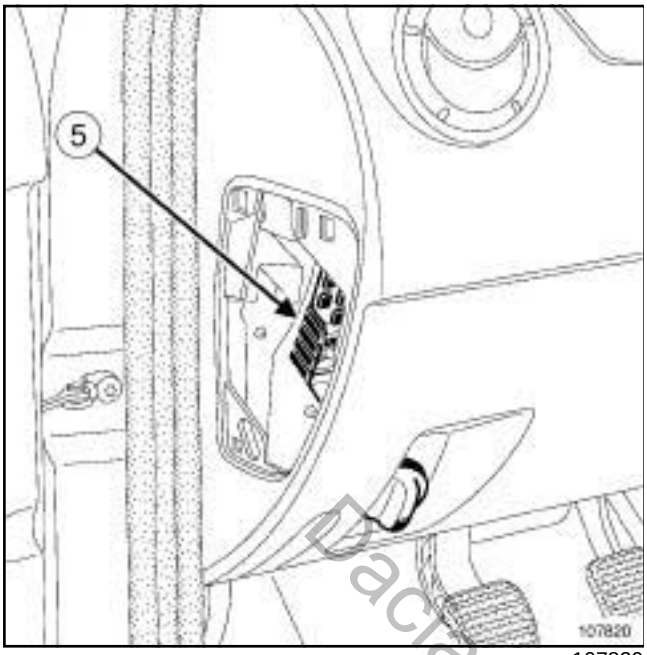


145189

(**2**) Steering wheel angle sensor

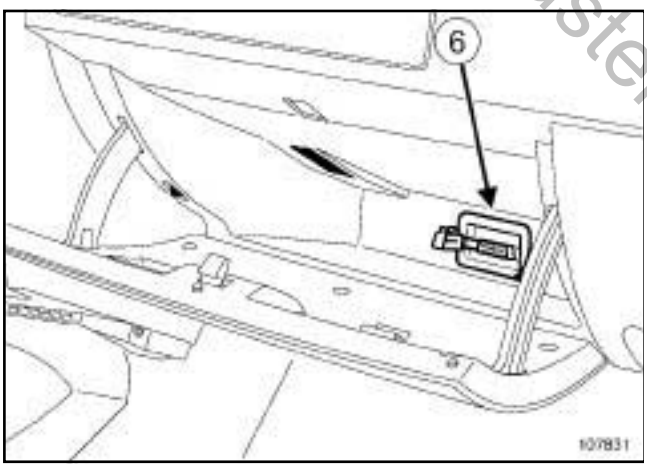
(**3**) ABS warning light on the instrument panel

(**4**) Brake lights switch



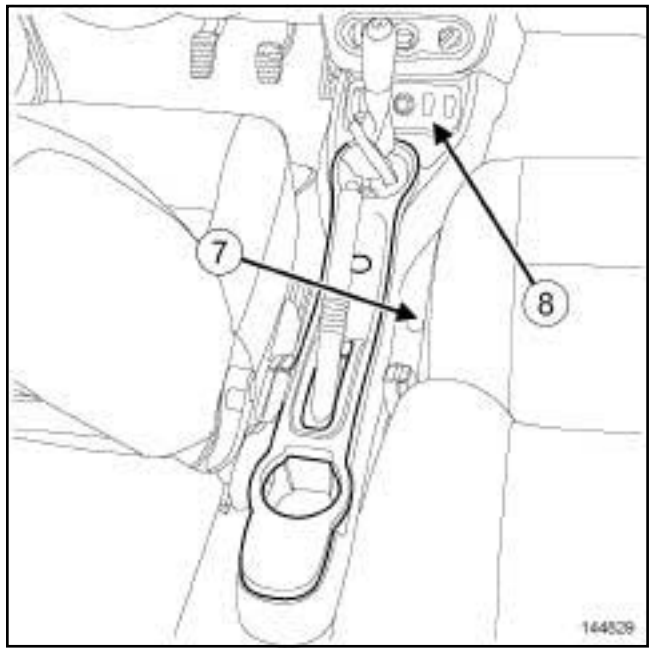
107820

(**5**) Fuse box



107831

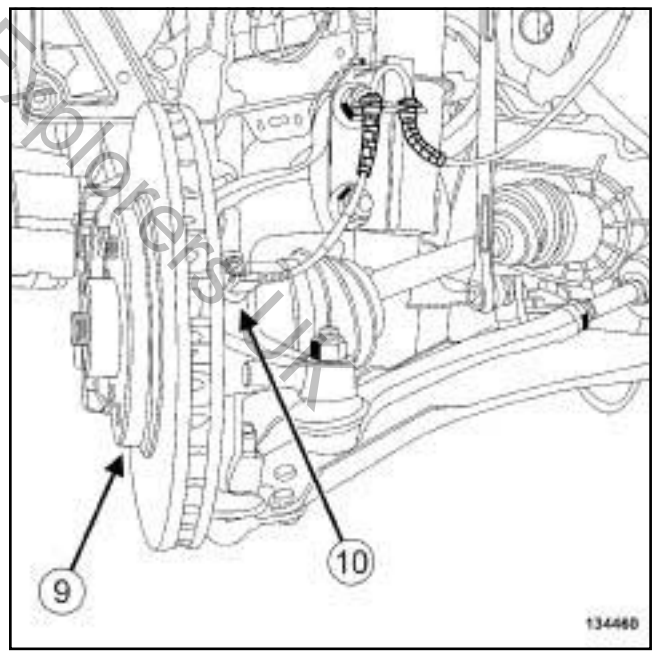
(**6**) Diagnostic socket



144829

(**7**) Lateral acceleration and yaw speed sensor

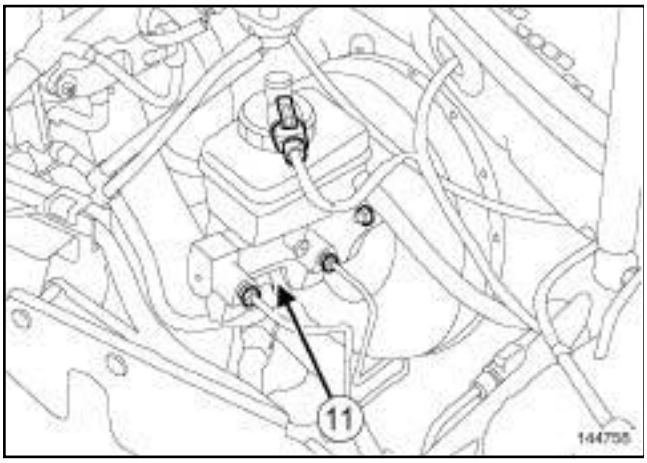
(**8**) ESP deactivation switch



134460

(**9**) Brake disc with instrumented bearing

(**10**) Wheel speed sensor



144758

(**11**) Master cylinder

Equipment required
pedal press
Diagnostic tool

I - SAFETY

- If a lift must be used for an operation, respect the safety instructions (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

- Protect any bodywork components which could be damaged by brake fluid with covers.

- to ensure there is no risk of sparks, do not place any metallic objects on the battery.

- Brake fluid is highly corrosive. Carefully clean any brake fluid spilt on parts of the vehicle.

II - CLEANLINESS

- Clean around the braking system with **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

- If a component is being replaced by a new one, do not remove the new component from its packaging until its is ready to be fitted onto the vehicle.

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

III - GENERAL RECOMMENDATIONS

- During an operation which requires the braking circuit to be opened, position a **pedal press** on the brake pedal to limit the outflow of brake fluid.

- After any operation on the ABS, it is essential to confirm the repair with a road test and a check using the **Diagnostic tool**.

1 - Yaw speed and lateral acceleration sensor

The sensor must be fitted facing the vehicle's direction of travel (as shown by the arrow).

Be sure to replace any sensor which has sustained an impact.

2 - Hydraulic unit

WARNING
Switch off the vehicle ignition so as not to activate the hydraulic unit solenoid valves when bleeding the brake circuit.

3 - Wheel speed sensor

WARNING
To ensure that the wheel speed sensor works properly, do not mark the sensor target on the bearing.

WARNING

In order to prevent irreversible damage to the front hub bearing:

- Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
- Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

4 - Brake servo

IMPORTANT
To avoid breaking the connection between the brake servo pushrod and the brake pedal, check that the safety clevis pin is locked onto the brake servo pushrod by tilting it from the top downwards.

Equipment required
pedal press

Tightening torques ▽	
hydraulic brake unit bolts on the support	**8 N.m**
rigid brake pipe unions on the hydraulic brake unit	**13 N.m**
hydraulic brake unit earth wire nut	**8 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see **38C**, **Anti-lock braking system**, **ABS: Precautions for the repair**, page **38C-4**) ,
- (see) (01D, Mechanical introduction).

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

I - REMOVAL PREPARATION OPERATION

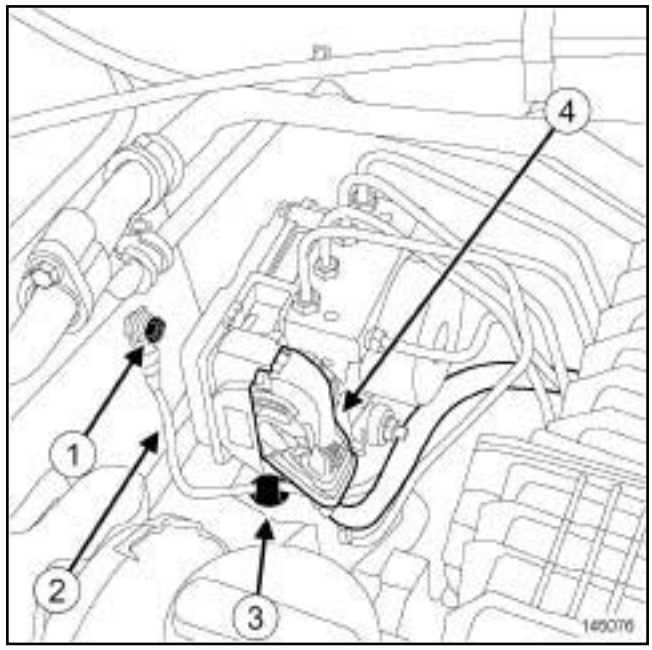
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Position the **pedal press** on the brake pedal to limit the outflow of brake fluid.

❏ Remove the soundproofing clips from the bulkhead.

❏ Move the soundproofing away from the bulkhead to access the hydraulic brake unit.

II - REMOVAL OPERATION



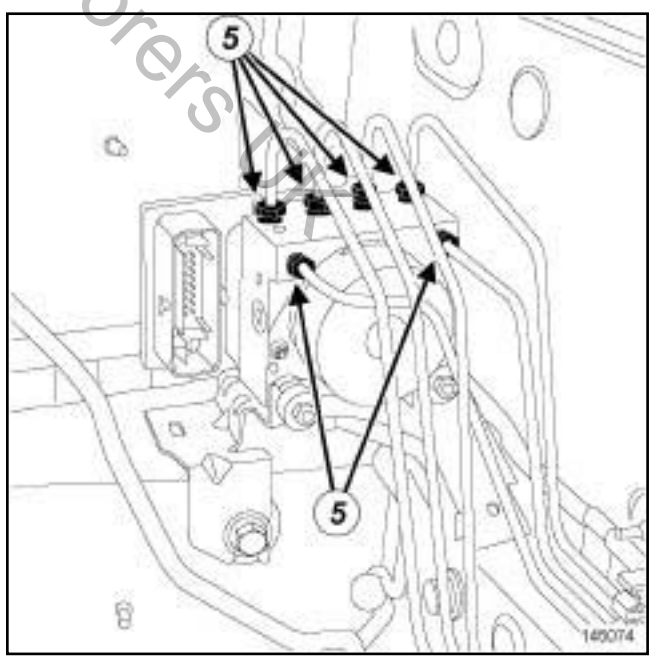
145076

❏ Remove:

- the hydraulic brake unit earth wire nut (**1**) ,
- the hydraulic brake unit earth wire (**2**) .

❏ Unclip the earth wire from the hydraulic brake unit at (**3**) .

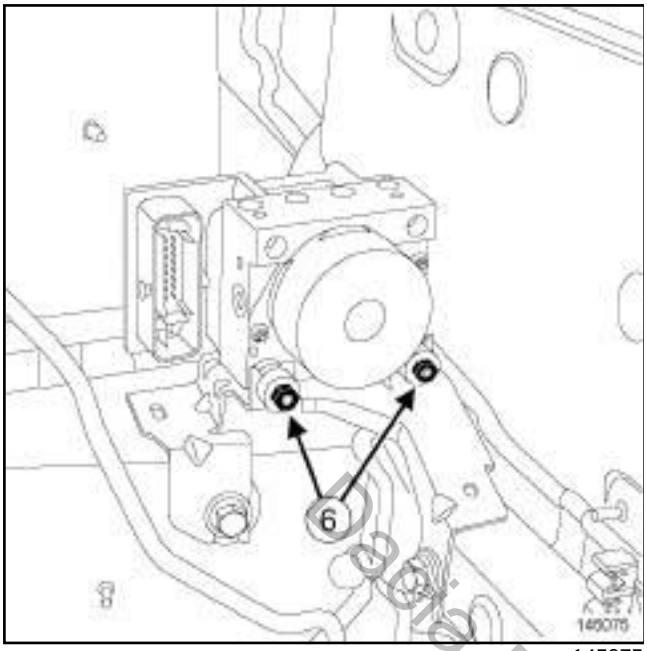
❏ Disconnect the hydraulic brake unit connector (**4**) .



145074

❏ Unscrew the rigid pipe unions (**5**) from the hydraulic brake unit.

❏ Fit blanking plugs on the openings of the hydraulic unit and brake pipes.



145075

❑ Remove:

- the hydraulic brake unit bolts (**6**) from its mounting,
- the hydraulic brake unit.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

WARNING

To prevent any premature wear, ensure that there is no contact between the rigid pipe and the body.

II - REFITTING OPERATION

❑ Proceed in the reverse order to removal.

❑ Torque tighten:

- the **hydraulic brake unit bolts on the support (8 N.m)**,
- the **rigid brake pipe unions on the hydraulic brake unit (13 N.m)**,
- the **hydraulic brake unit earth wire nut (8 N.m)**.

❑ Bleed the brake circuit (see **30A**, **General information**, **Braking circuit: Bleed**, page **30A-4**) .

Tightening torques ▽	
front wheel speed sensor bolt	7 N.m

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **38C**, **Anti-lock braking system**, **ABS: Precautions for the repair**, page **38C-4**) .

REMOVAL

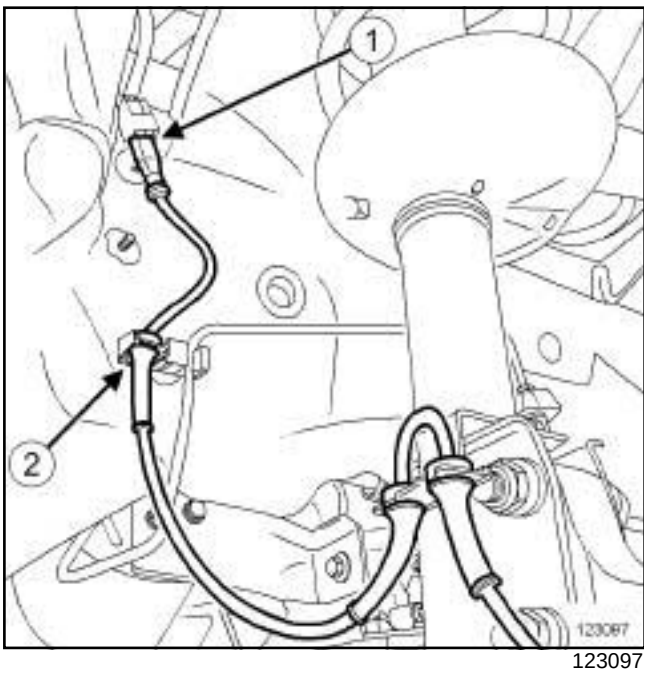
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the front wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) ,
- the front wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).

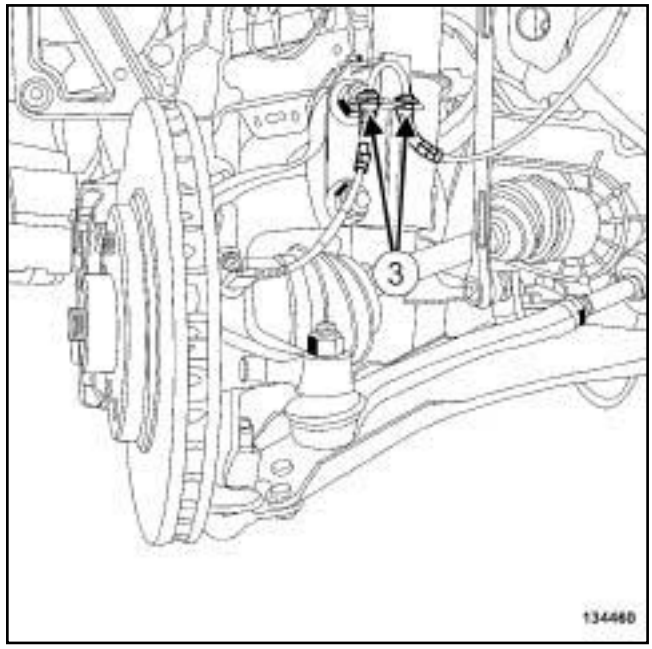
II - REMOVAL OPERATION



123097

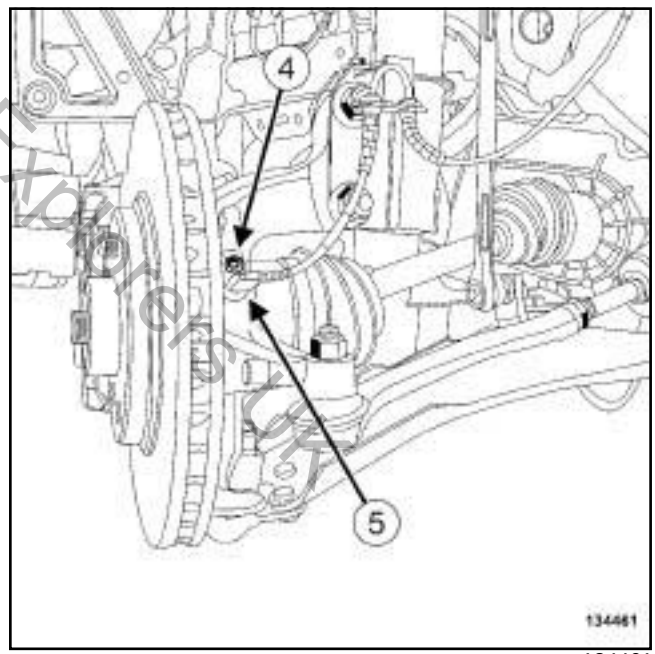
❏ Disconnect the front wheel speed sensor connector (**1**) .

❏ Unclip the front wheel speed sensor wiring at ***(2)*** .



134460

❏ Unclip the front wheel speed sensor wiring at (**3**) .



134461

❏ Remove:

- the front wheel speed sensor bolt (**4**) ,
- the front wheel speed sensor (**5**) .

REFITTING

❑

WARNING

To avoid damaging the wheel speed sensor cable:

- Do not tension the cable,
- Do not twist the cable,
- Check that there is no contact with the surrounding components,
- Do not use tools that may damage the cable.

❑ Proceed in the reverse order to removal.

❑ Torque tighten the **front wheel speed sensor bolt (7 N.m)**.

Tightening torques ▽	
rear wheel speed sensor protective screen nuts	**14 N.m**
wheel speed sensor bolt	**7 N.m**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **38C**, **Anti-lock braking system**, **ABS: Precautions for the repair**, page **38C-4**) .

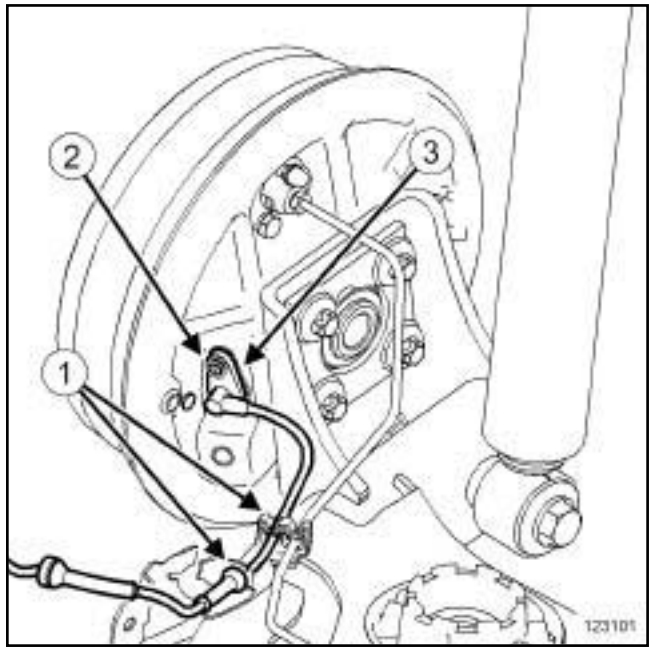
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the rear wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

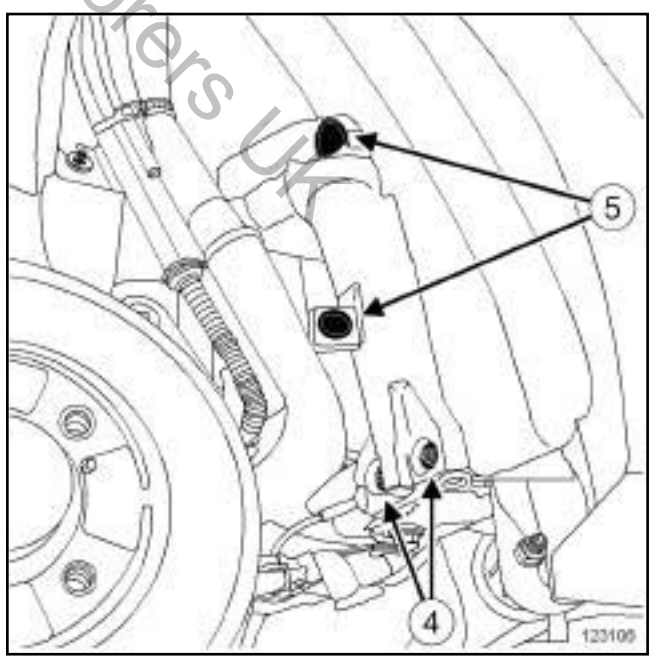


123101

❏ Detach the rear wheel speed sensor at (**1**) .

❏ Remove the rear wheel speed sensor bolt (**2**) on the brake back-plate.

❏ Disconnect the rear wheel speed sensor (**3**) from the brake back-plate retaining bracket.

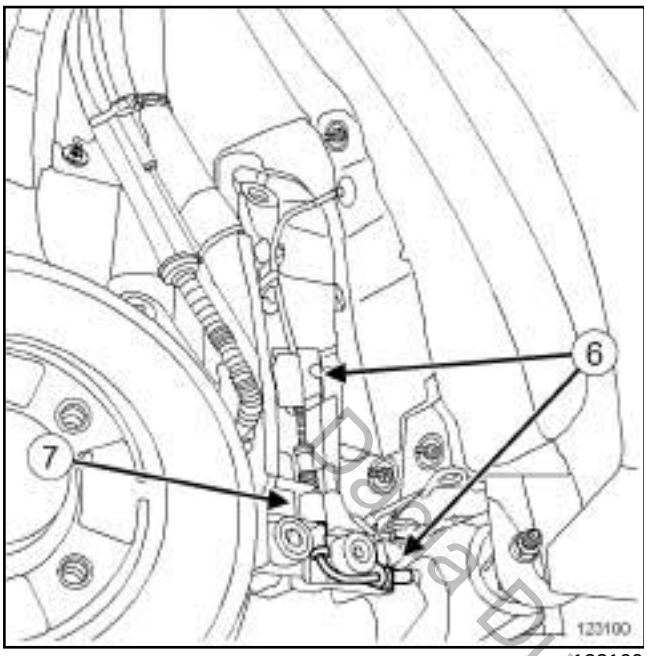


123106

❏ Remove:

- the nuts (**4**) from the rear wheel speed sensor protective screen,

- the clips (**5**) from the rear wheel speed sensor protective screen.



123100

❏ Pull away and slightly fold down the rear wheel speed sensor protective screen.

❏ Detach the rear wheel speed sensor at (**6**) .

❏ Disconnect the wheel speed sensor connector (**7**) on the rear ABS wiring.

❏ Remove the rear wheel speed sensor.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏

WARNING

To avoid damaging the wheel speed sensor cable:

- Do not tension the cable,
- Do not twist the cable,
- Check that there is no contact with the surrounding components,
- Do not use tools that may damage the cable.

❏ Connect the wheel speed sensor connector on the rear ABS wiring.

❏ Clip the wheel speed sensor onto the rear wheel speed sensor protective screen.

❏ Refit:

- the rear wheel speed sensor protective screen on the body,
- the rear wheel speed sensor protective screen nuts,
- the rear wheel speed sensor protective screen clips.

❏ Torque tighten the **rear wheel speed sensor protective screen nuts (14 N.m)**.

❏ Refit the rear wheel speed sensor on the brake back-plate retaining bracket.

❏ Refit the rear wheel speed sensor bolt.

❏ Torque tighten the **wheel speed sensor bolt (7 N.m)**.

❏ Clip on the rear wheel speed sensor.

II - FINAL OPERATION

❏ Refit the rear wheel (see **35A**, **Wheels and tyres**, **Wheel: Removal - Refitting**, page **35A-1**) .