

MANUAL GEARBOX

Ratios

21

PK 5 GEARBOX

| Suffix | Vehicle/engine | Differential ratio | 1 | 2 | 3 | 4 | 5 | Reverse gear |
|---------|----------------|--------------------|-------|-------|-------|-------|-------|--------------|
| PK5-011 | Primastar/F9Q | 16/67 | 11/51 | 17/38 | 31/43 | 41/40 | 41/31 | 27/47 |

PK 6 GEARBOX

| Suffix | Vehicle/engine | Differential ratio | 1 | 2 | 3 | 4 | 5 | 6 | Reverse gear |
|---------|----------------|--------------------|-------|-------|-------|-------|-------|-------|--------------|
| PK6-008 | Primastar/F9Q | 17/67 | 11/51 | 19/40 | 31/40 | 41/37 | 41/29 | 47/30 | 27/47 |

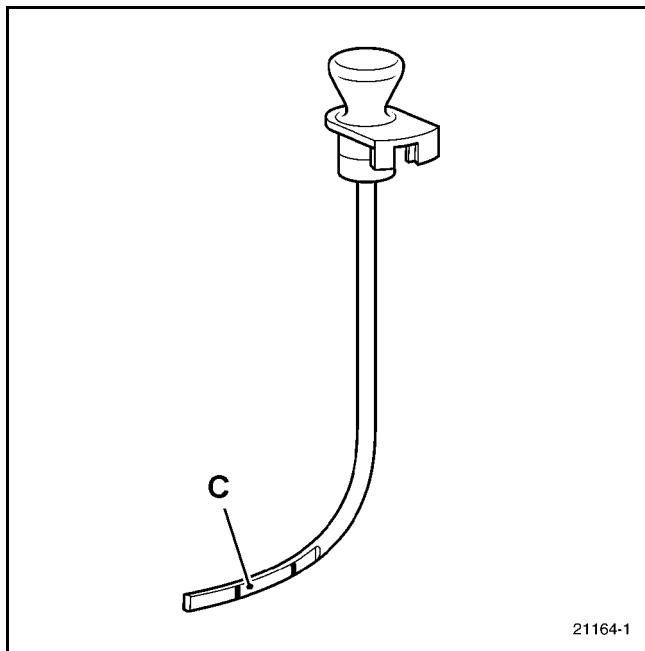
CAPACITY (in litres)

| | |
|------------|-------------|
| PK5 PK6 | 2,70 ± 0,15 |
|------------|-------------|

VISCOSITY GRADE

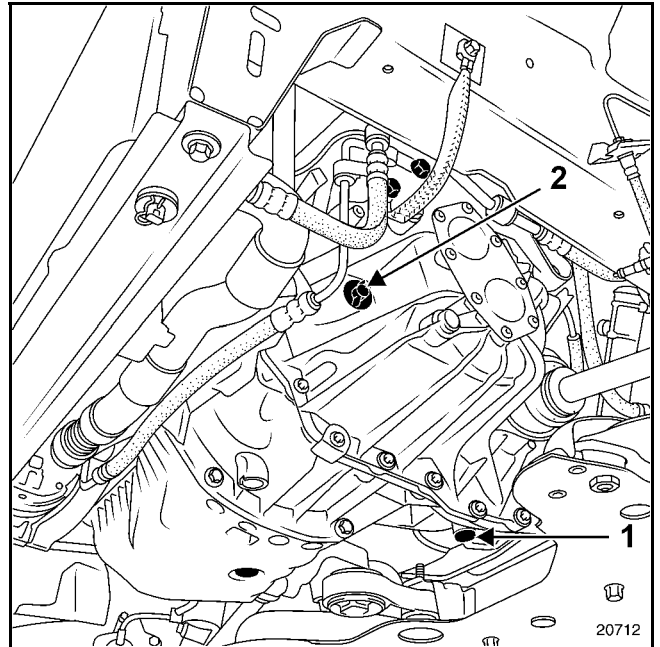
TRANSELF TRP 75 W80W

The check is carried out using dipstick **B. Vi. 1675** (minimum/maximum level mark C).

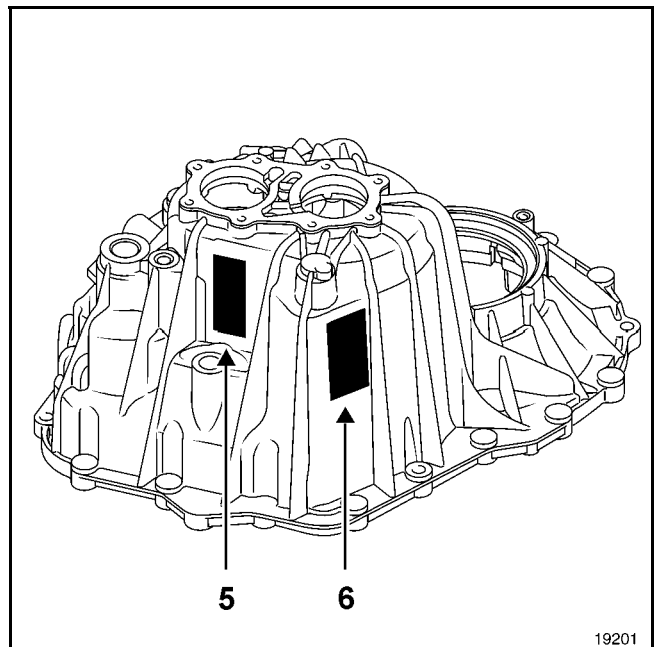


OIL CHANGE FREQUENCY

No oil change



- 1 Drain plug
- 2 Filler plug



- 5 Oil volume
- 6 Gearbox type

PK5/PK6

| Type | Packaging | Component |
|-----------------|------------|-----------------------------|
| MOLYKOTE BR2 | 1 kg tin | Right-hand sunwheel splines |
| RHODORSEAL 5661 | 100 g tube | Threaded plugs and switches |

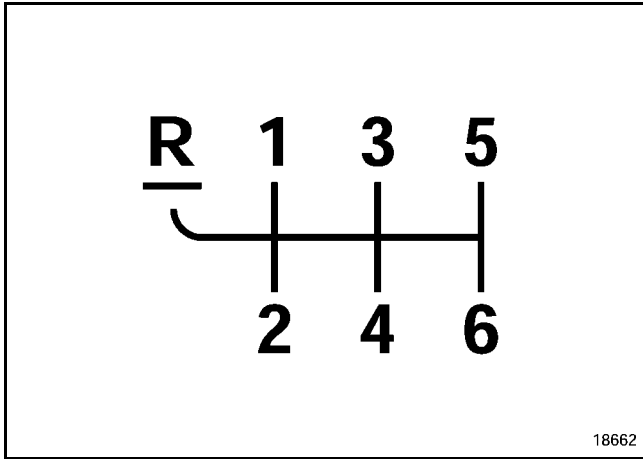
Parts to be replaced systematically

If they have been removed:

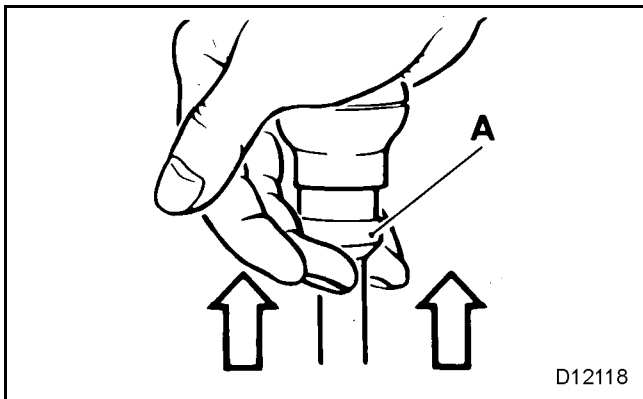
- the lip seals;
- the O-rings.

GEAR SELECTION GRIDS

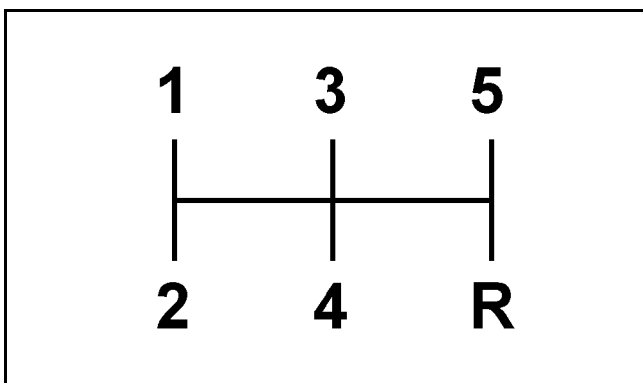
PK6



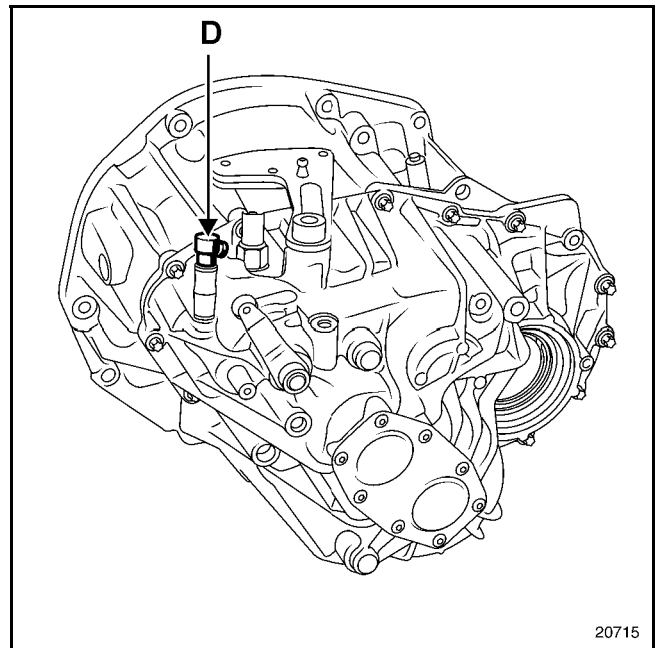
To select reverse gear, lift the collar (A) and shift the lever.



PK5



WARNING: it is FORBIDDEN to remove the breather valve (D) to fill the gearbox with oil.




MANUAL GEARBOX

Removal - Refitting

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| SPECIAL TOOLING REQUIRED | |
|--------------------------|----------------------------|
| Mot. 1453 | Engine retaining device |
| T. Av. 476 | Ball joint extractor |
| B. Vi. 1531 | Tool for centring flywheel |
| EQUIPMENT REQUIRED | |
| Hydraulic jack | |

| TIGHTENING TORQUES (in daNm) |  |
|--------------------------------------|---|
| Wheel bolt | 14.2 |
| Brake caliper column bolt | 3.5 |
| Steering ball joint nut | 3.7 |
| Lower ball joint nut | 10.5 |
| Shock absorber base bolt | 18 |
| Driveshaft nut | 28 |
| Suspended mounting bolt to body | 4.4 |
| Suspended mounting bolt on gearbox | 8.5 |
| Sub-frame front mounting bolt | 10.5 |
| Sub-frame rear mounting bolt | 12 |
| Rear sub-frame tie-rod mounting bolt | 10.5 |
| Engine tie-bar bolt to sub-frame | 18 |
| Engine tie bar bolt to engine | 10.5 |
| Starter motor bolt | 4.4 |
| Bolts around the gearbox | 4.4 |
| Filler plug | 0.4 |
| Drain plug | 2.2 |

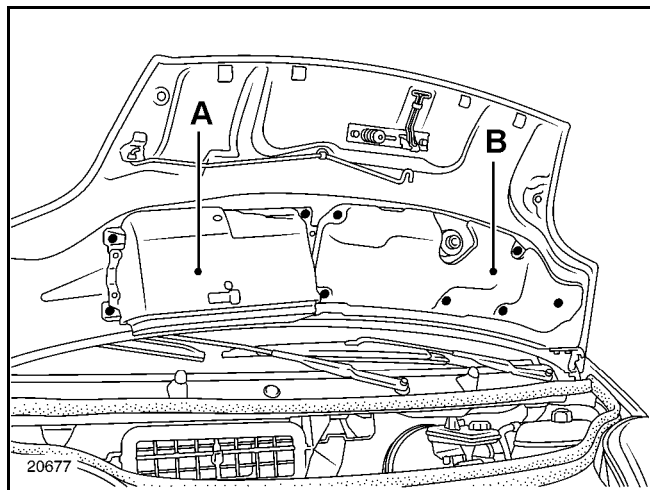
REMOVAL

Put the vehicle on a two-post lift.

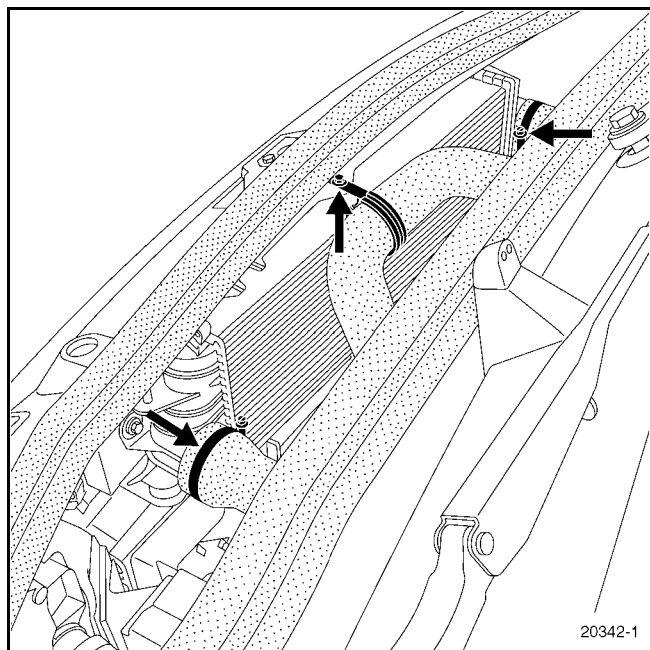
Disconnect the battery.

Open the bonnet and remove:

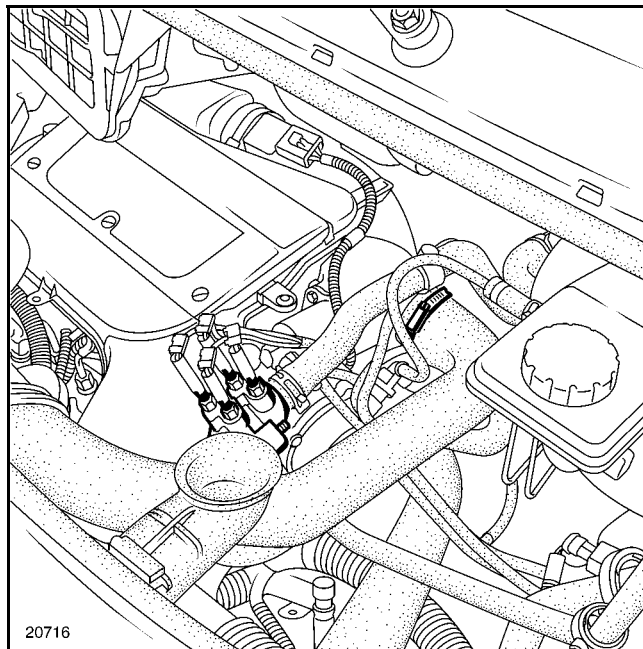
- the particle filter housing (A),
- the coolant unit (B),



- the air-air exchanger hoses,



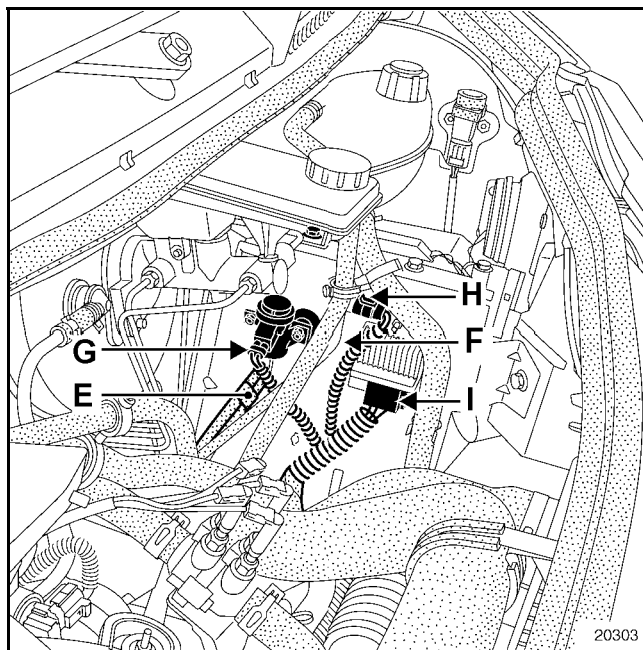
- the preheating unit, without separating the two hoses to free the lifting bracket on the flywheel side,
- the expansion bottle from its mounting (without touching the hoses) keeping it attached but mobile.



Use a syringe to drain the brake fluid reservoir down to the union where the clutch master cylinder pipes connect to it.

Disconnect:

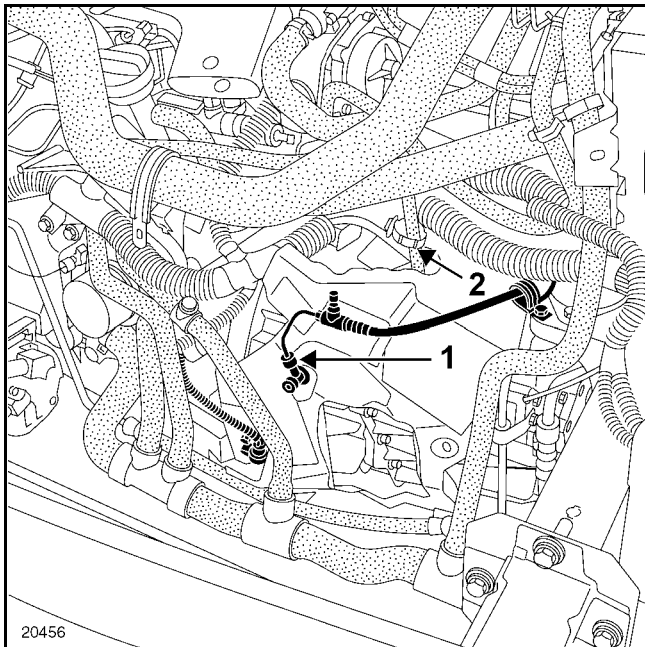
- hoses (E) and (F),
- connectors (G), (H) and (I).



Disengage the air inlet pipe from its filter.

Disconnect the clutch slave cylinder pipe (1).

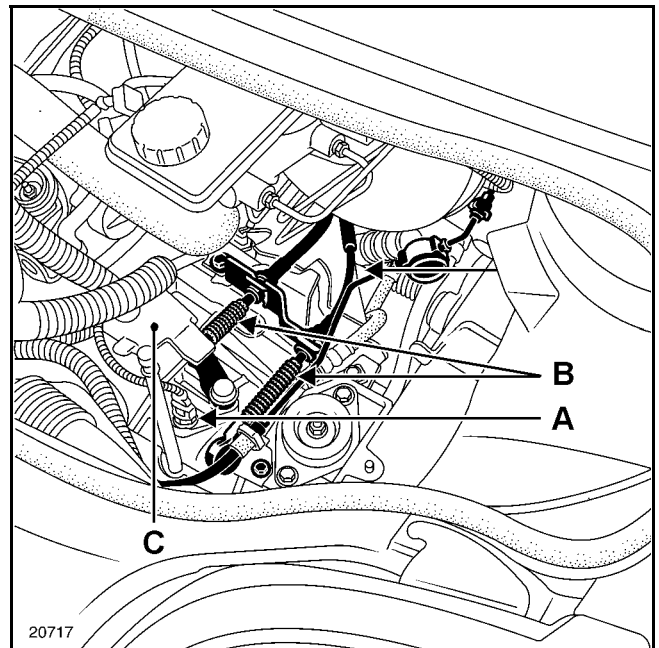
Unclip the breather pipe (2).



Remove:

- the upper soundproofing from the gearbox (**be careful not to disengage the air duct**),
- the reverse gear connector (A),
- the gear control cables (B).

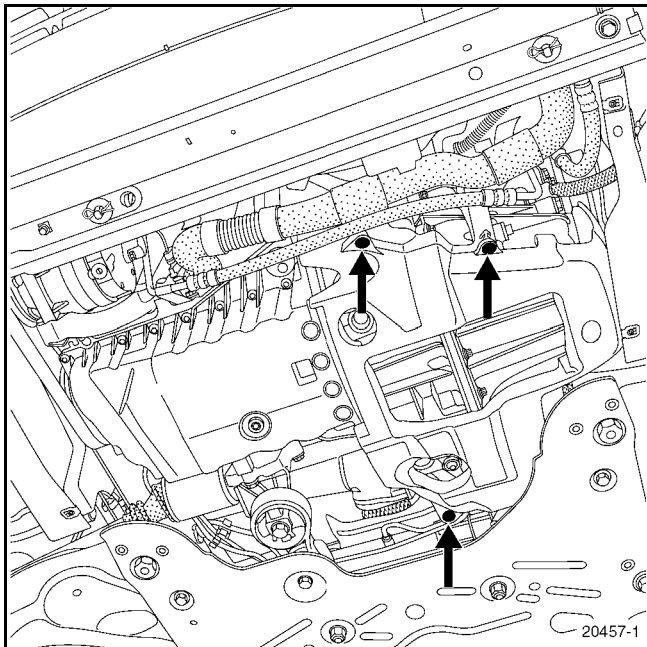
Unclip the two electric wiring harnesses from their gearbox mounting (C).



Attach the two electric wiring harnesses to make it easier to remove the gearbox.

Remove:

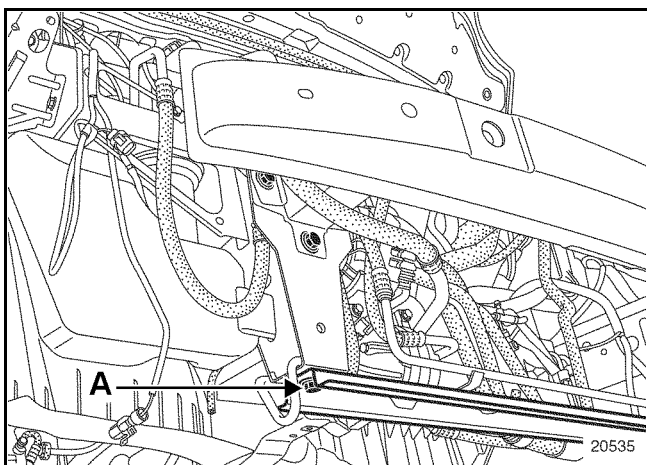
- the front wheels,
- the engine undertray protections (front and centre),
- the gearbox soundproofing housings (inner and rear sections).



Disconnect the fan.

Disconnect the radiator cross member by removing bolt (A), and tilt the assembly towards the front, attach it so that you can remove the gearbox soundproofing housing (front section). Leave the radiator/ventilator assembly on the cross member during the operation.

NOTE: this operation is for vehicles fitted with air conditioning (for the front soundproofing housing).



Drain the gearbox.

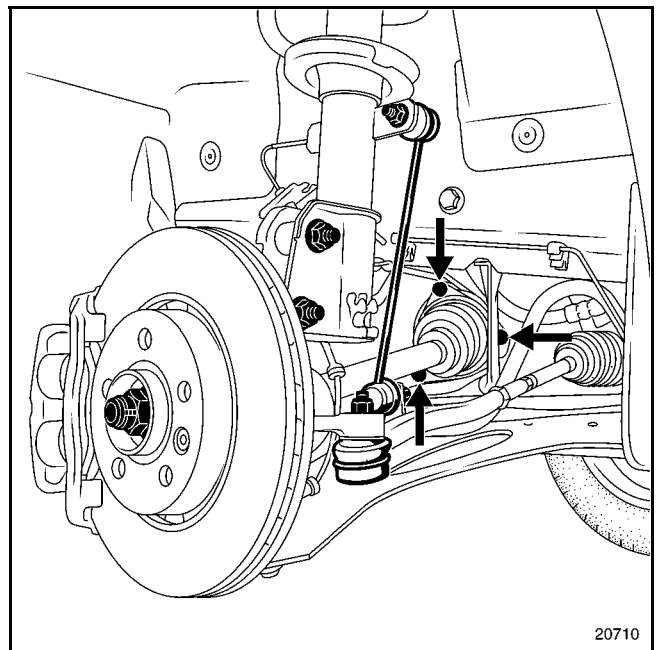
Remove:

- the wheel arch liner left and right side protectors,
- the brake callipers, securing them to the suspension spring to protect the hose,
- the wheel speed sensor wires (ABS components).

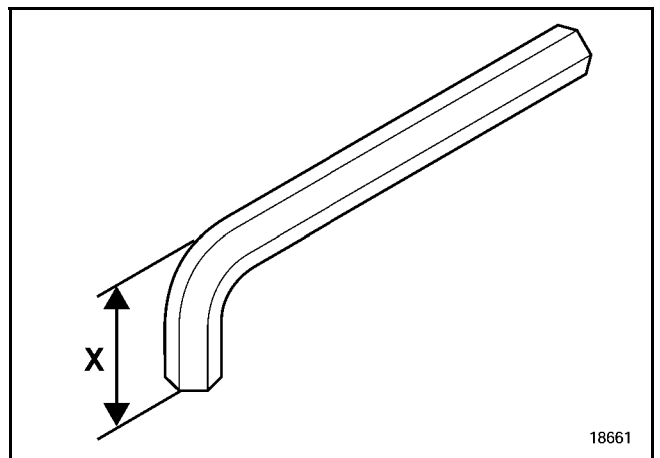
Left-hand side of the vehicle

Remove:

- the driveshaft mountings on the gearbox,



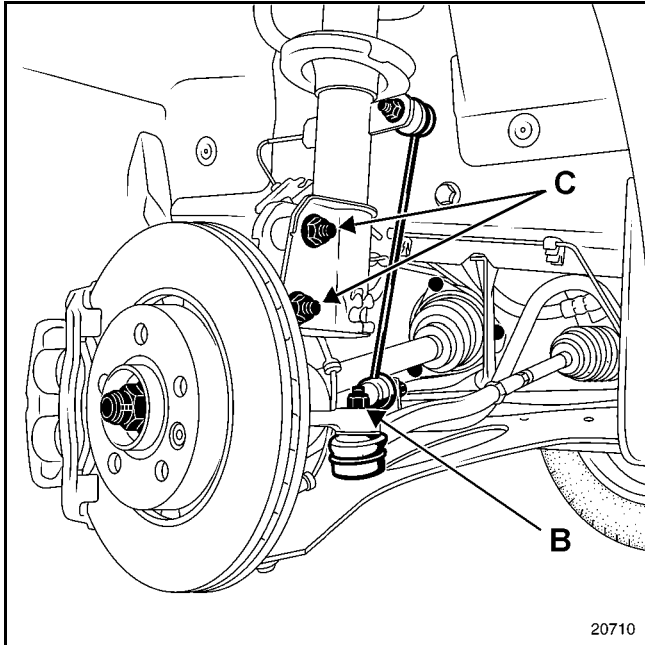
- the lower ball joints using an elbow Allen key if the nut cannot be slackened.



X = 25 mm

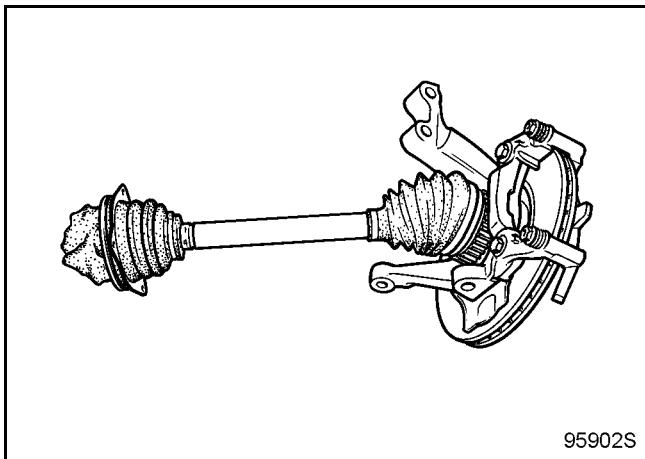
Remove:

- the track rod ends using tool **T. Av. 476**,
- the shock absorber base mountings (C),
- the driveshaft.



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Take care to protect the gaiters.

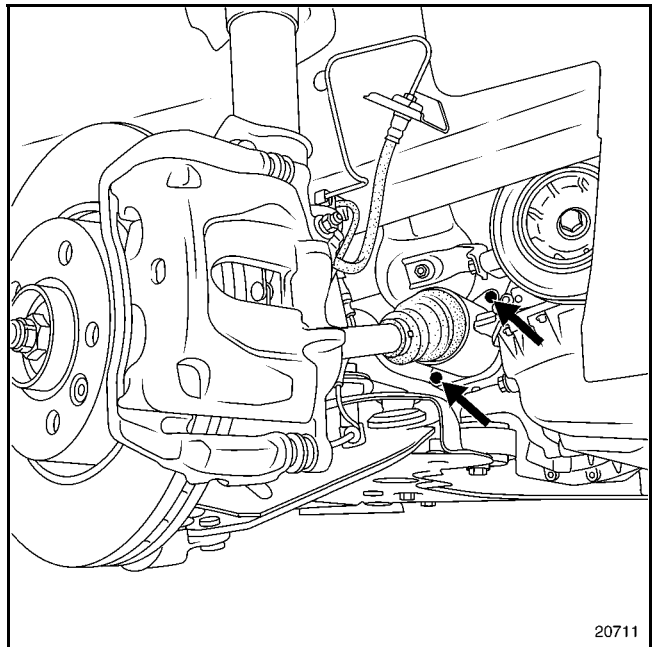


95902S

Right-hand side of the vehicle

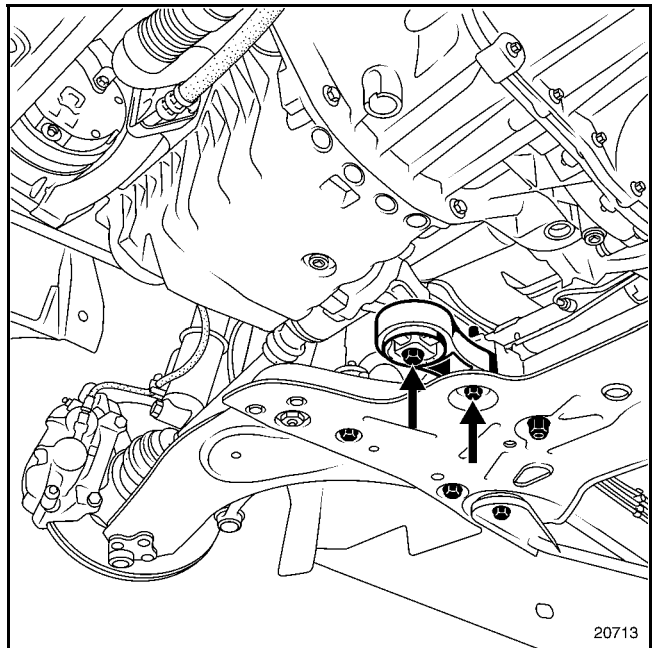
Remove:

- the two bearing bolts (A),
- the intermediate bearing on the motor arm.



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- the lower ball joint,
- the steering ball joint,
- the shock absorber base mountings,
- the driveshaft,
- the torque reaction arm,



20713

- the TDC sensor.

Remove the sub-frame with its lower arms.

Unscrew the rear bolts on the two sub-frame stiffener bars.

Remove:

- the lower nuts on the anti-roll bar return tie-rod,
- the heat shield on the steering rack,
- the steering rack mounting bolts on the sub-frame.

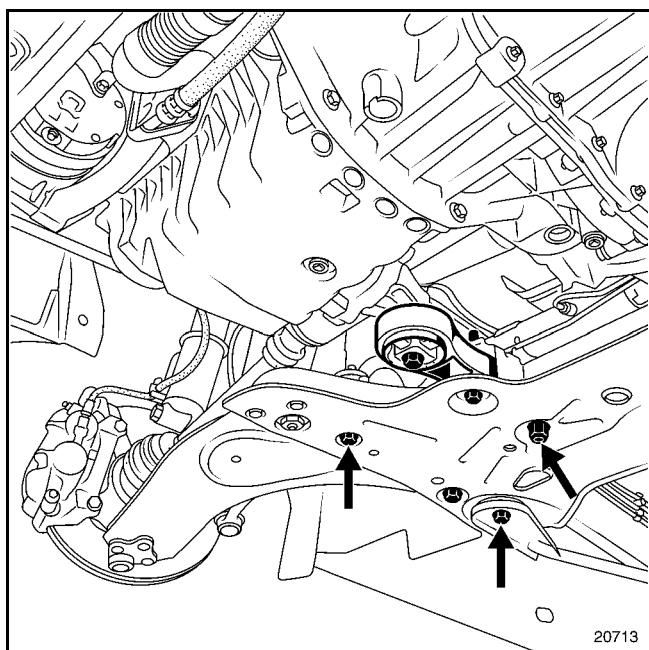
Position a hydraulic jack under the sub-frame.

Remove:

- the two sub-frame front mounting bolts,
- the two sub-frame rear mounting bolts.

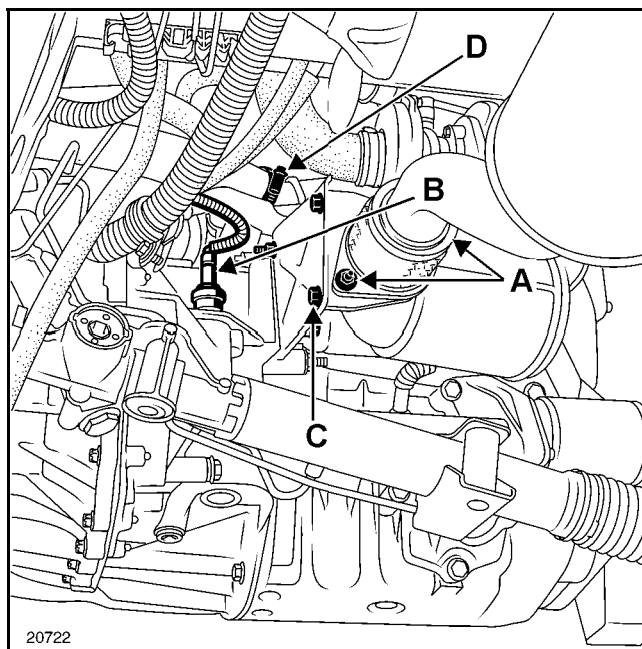
Turn the two sub-frame stiffener bars towards the outside.

Lower the sub-frame, arm and anti-roll bar assembly whilst turning the anti-roll bar to make sure it does not hook on to the steering rack.



Remove:

- the expansion chamber (bolt A) and attach it,
- the tachometer connections (B),
- the electrical harness earth from the oxidation cylinder metal support,

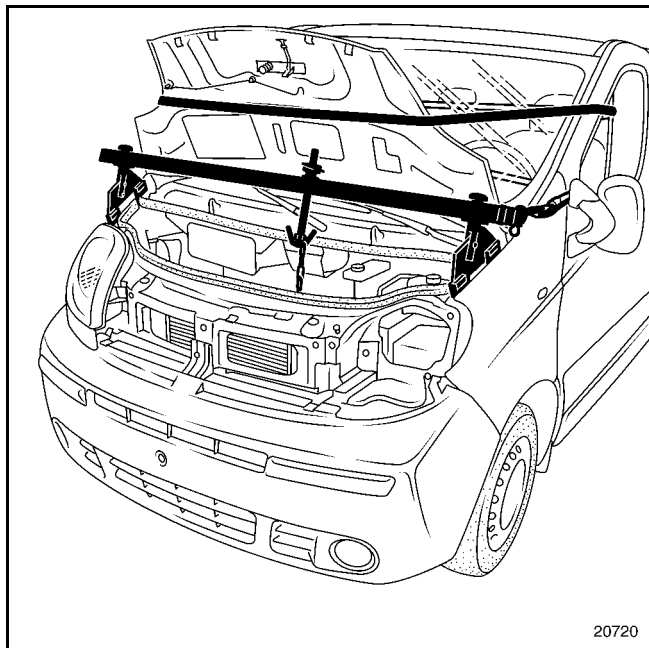


- the oxidation cylinder metal support (C),
- the starter electrical connections,
- the starter mountings,
- the starter motor (slide it back and secure it),
- the turbocharger outlet pipe (D).

Attach the two electric wiring harnesses to make it easier to remove the gearbox.

Fit the bonnet strap.

Fit the engine support **Mot. 1453** using tool **Mot. 1453-01**.



Remove:

- the nut (A),
- the two bolts for the rubber mounting (B),
- the rubber mounting,
- the upper mountings of the gearbox,
- the gearbox mounting.

Tilt the engine and transmission assembly.
Detach the gearbox mounting hydraulic pipes.
Remove the gearbox mounting.
Position the hydraulic jack.

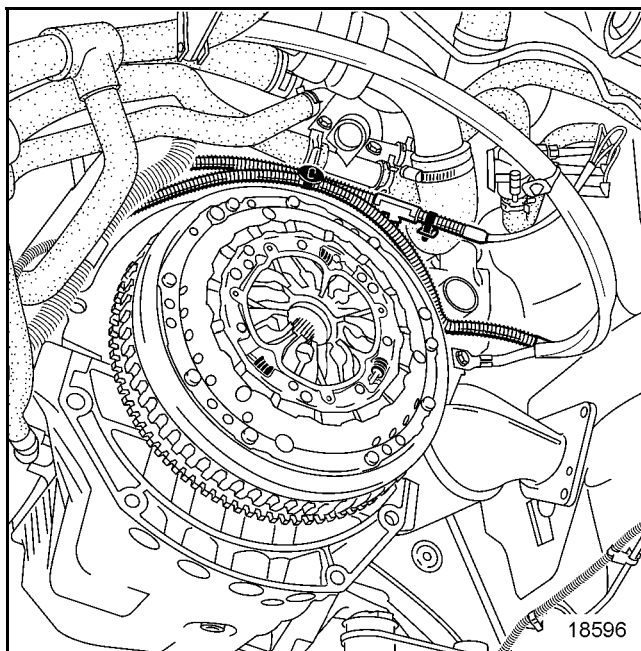
Remove:

- the lower mountings of the gearbox.
- the gearbox.

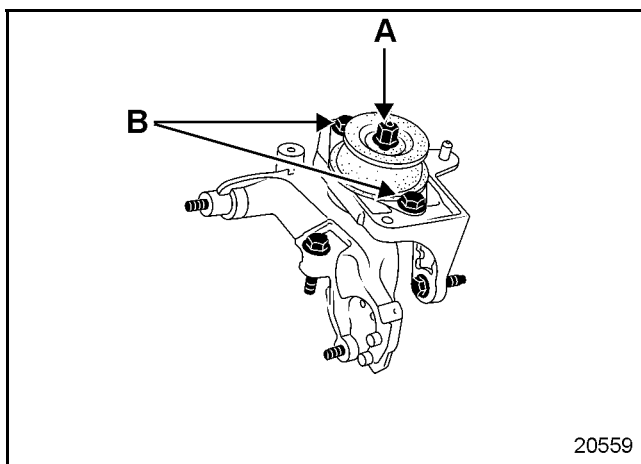
REFITTING

If the clutch has been removed, refer to **Section 20**.
Ensure that the engine/gearbox centring dowels are fitted.

IMPORTANT: do not grease the clutch shaft splines.
Separate the wiring harnesses and remove the harness centring pin from the gearbox.



Refit the gearbox mounting (see the information on **Suspended engine mounting** in **Section 19**).



Proceed in the reverse order to removal to complete the operation.

Refill:

- the gearbox (full volume),
- the brake fluid reservoir.

Bleed the clutch system.

IMPORTANT: attach the brake hoses to the shock absorber base correctly.

REPLACEMENT

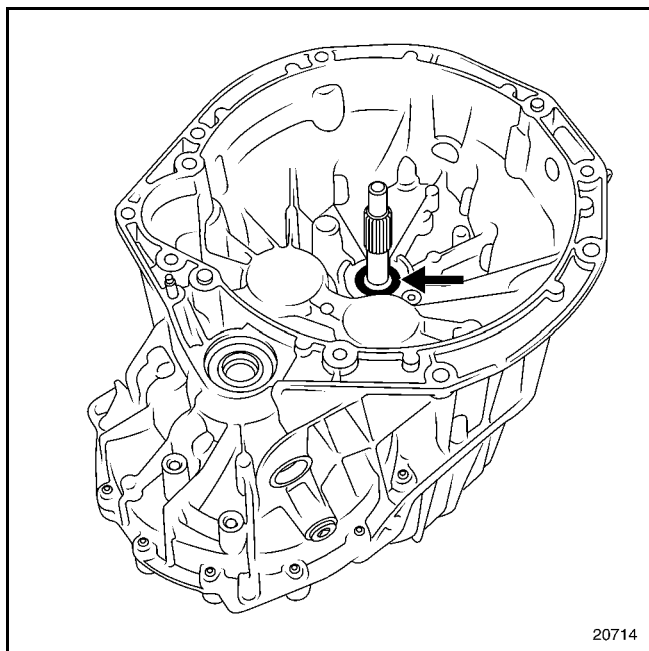
This operation is carried out after the gearbox has been disconnected from the engine.

SPECIAL TOOLING REQUIRED**B. Vi. 1236 Primary shaft oil seal fitting tool****REMOVAL**

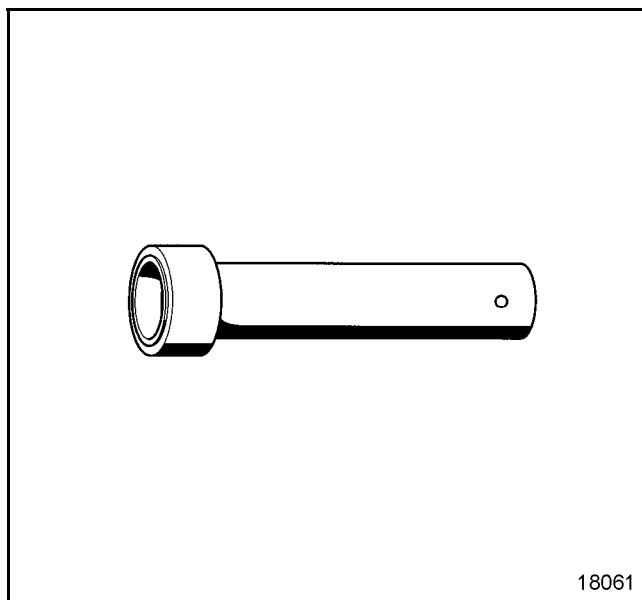
Drill a hole in the seal with a **2.5 mm** diameter drill.

WARNING: DO NOT SCRATCH THE SHAFT OR THE SEAL BEARING SURFACE.

Insert a screw into the seal and extract the seal using a pair of pliers.

**REFITTING**

Fit a new seal along with its protector using tool **B. Vi. 1236**.



Remove the protector.

Refit the guide tube.

MANUAL GEARBOX

Differential output seal

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CONSUMABLES

Loctite FRENBLOC
Brake caliper mounting bolt
MOLYKOTE BR 2
Right-hand sunwheel splines

TIGHTENING TORQUES (in daNm)



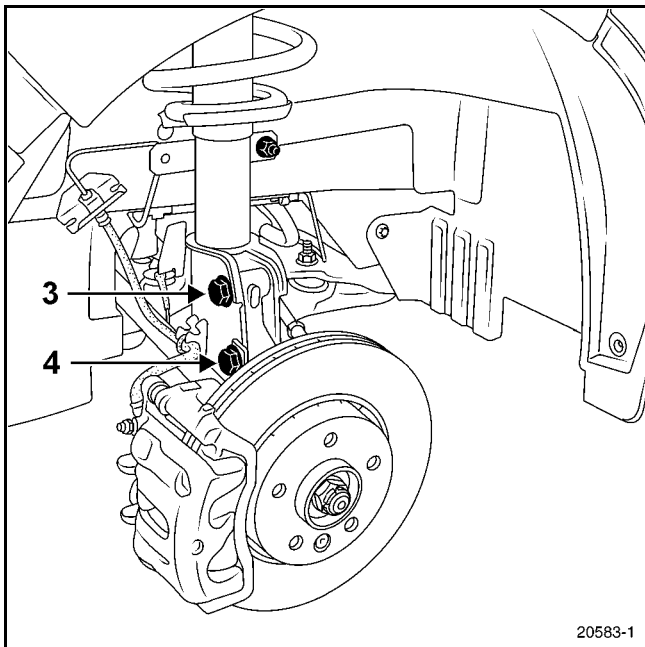
| | |
|------------------------------------|------|
| Shock absorber base mounting bolts | 18 |
| Wheel bolt | 14.2 |

Remove the engine undertray.

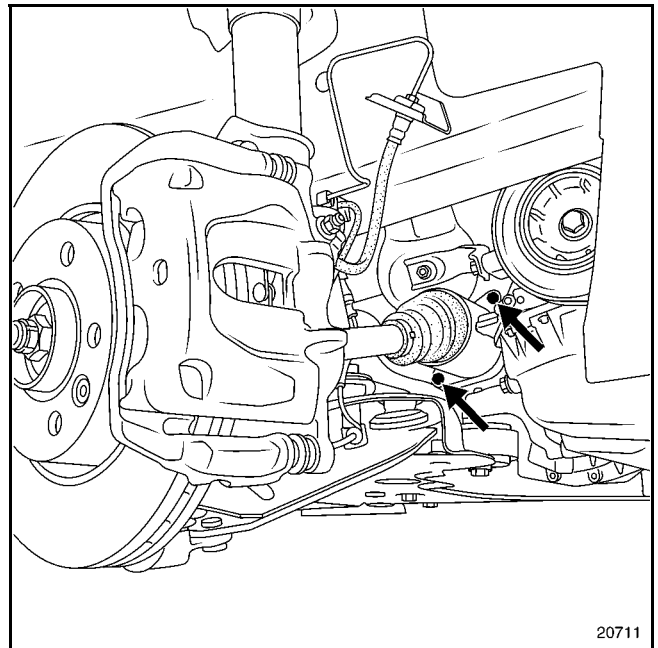
Drain the gearbox.

Remove:

- the wheel arch liner side protectors,
- the front right wheel,
- the upper bolt (3) of the shock absorber base and slacken the lower bolt (4),
- ABS wheel speed sensor.



Remove the flange from the intermediate bearing.



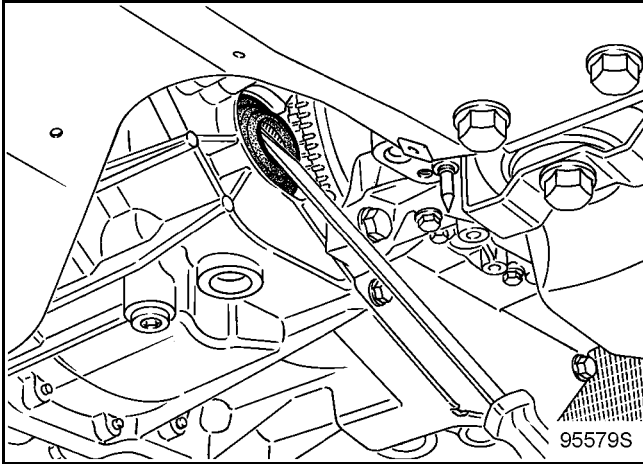
Tilt the stub axle carrier and disconnect the driveshaft (take care not to damage the gaiters during this operation - see **Section 29**).

REPLACING THE SEAL

Remove the O-ring from the sunwheel.

Tap the base of the lip seal using a drift and a small hammer to pivot it in its housing.

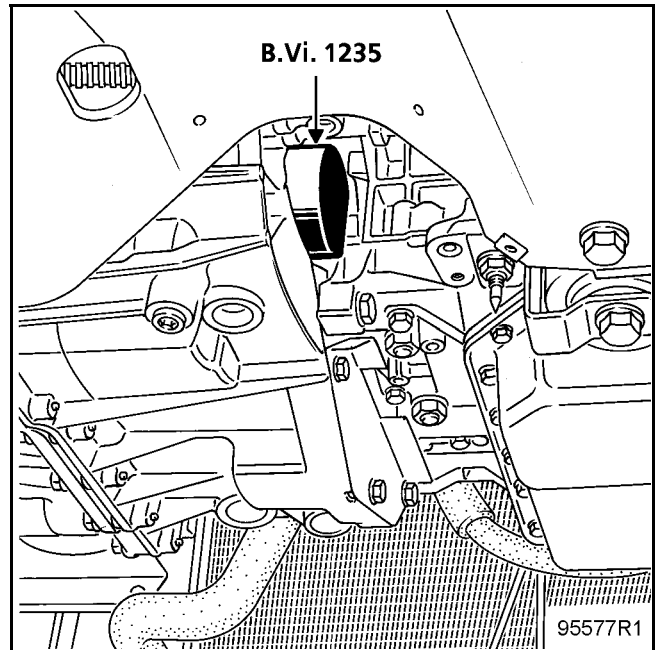
When the seal is dislodged, remove it with pliers taking care not to damage the splines of the sunwheel.



The seal is refitted with tool **B. Vi 1235**.

Oil the tool before inserting it into the splined part of the sunwheel.

Fit the lip seal then the O-ring and coat the splines with **MOLYKOTE BR2** grease.



Position the driveshaft in relation to the sunwheel.

Pivot the stub-axle whilst inserting the driveshaft into the sunwheel.

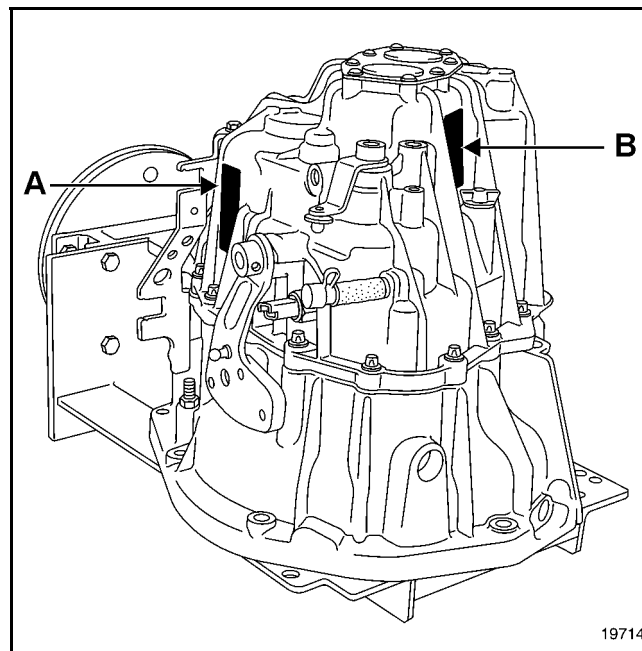
Tighten the nuts, bolts and studs to the recommended torques.

Fill the gearbox.

MANUAL GEARBOX

Identification

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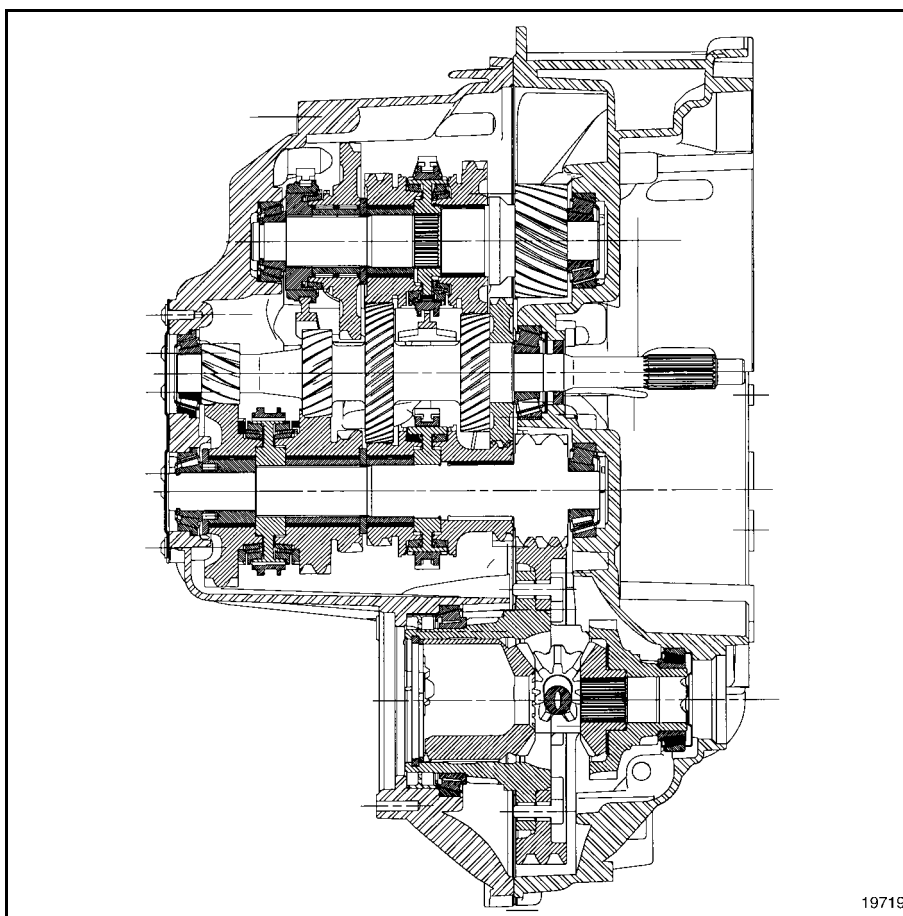


A: the gearbox type.
B: the oil volume.

MANUAL GEARBOX

Section and tightening torques in daNm

21



| Description | Torque in daNm |
|----------------------------|----------------|
| Gearbox casing bolt | 2.40 |
| Differential crownwheel | 13 |
| Reversing switch | 2.3 |
| Cable sleeve stop mounting | 2.3 |
| Switch | 1.5 |
| Concentric stop | 0.8 |
| Rear cover (if fitted) | 0.8 |
| Tachometer (PK5 gearbox) | 2 |

MANUAL GEARBOX

Ratios

21

PK 5 GEARBOX

| Suffix | Vehicle/engine | Torque | 1 st | 2 nd | 3 rd | 4 th | 5 th | Reverse |
|---------|-----------------|--------|-----------------|-----------------|-----------------|-----------------|-----------------|---------|
| PK5-011 | Primastar / F9Q | 16:67 | 11:51 | 17:38 | 31:43 | 41:40 | 41:31 | 27:47 |

PK 6 GEARBOX

| Suffix | Vehicle/engine | Torque | 1 st | 2 nd | 3 rd | 4 th | 5 th | 6 th | Reverse |
|---------|------------------|--------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------|
| PK6-007 | Primastar / G9Ut | 16:67 | 11:43 | 19:40 | 31:43 | 41:40 | 41:31 | 47:28 | 27:47 |
| PK6-008 | Primastar / F9Q | 17:67 | 11:51 | 19:40 | 31:40 | 41:37 | 41:29 | 47:30 | 27:47 |
| PK6-009 | Primastar / F4R | 17:82 | 11:43 | 19:40 | 31:43 | 41:40 | 41:31 | 47:30 | 27:47 |

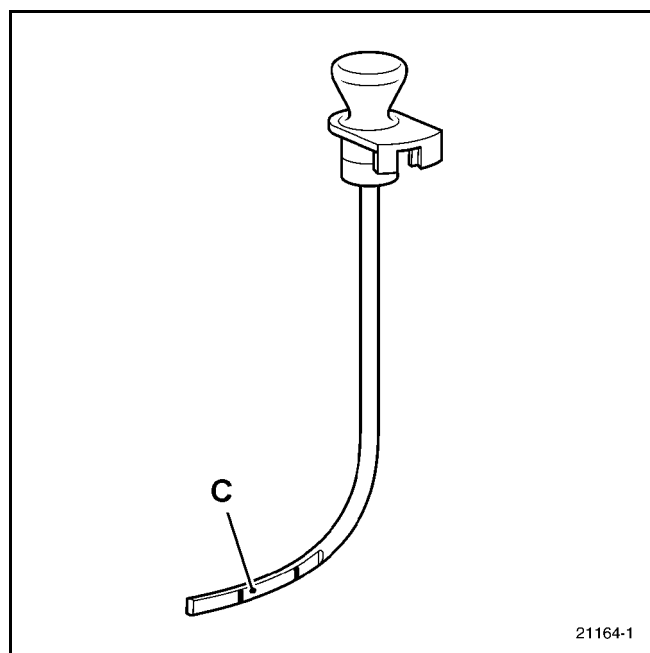
| Types | Packaging | Directions |
|-------------|---|------------------------|
| Gearbox oil | ELF TRP 75W80W or TEXACO ETL 8275 | Immerse all components |
| Rhodorseal | 100g tube | Use on housing |

CAPACITY (in litres)

| | |
|------------|-----------------------------------|
| PK5 PK6 | 2.70 ± 0.15 |
|------------|-----------------------------------|

PK5 - PK6

The check is carried out using dipstick B.Vi. 1675 (min / max level mark C).



Parts always to be replaced

If they have been removed:

- the lip seals,
- the O-rings,
- the bearing circlips,
- the hub springs,
- the roll pins.

| | |
|-----------------------|---|
| B. Vi. 31-01 | Set of punches for roll pins |
| B. Vi. 1235 | Differential oil seal fitting tool |
| B. Vi. 1236 | Primary shaft oil seal fitting tool |
| B. Vi. 1417 | Housing supports and chassis |
| B. Vi. 1418 | Adjustable support for fitting bearing races |
| B. Vi. 1419 | Bearing race positioning tool |
| B. Vi. 1510 | Gearbox repair tool set A - Differential small bearing positioning tool B - Differential bearing race positioning tool H - Differential bearing race positioning tool I - Differential large bearing positioning tool J - Bearing race positioning tool (clutch housing side) |
| B. Vi. 1510-01 | L - Tube for sprocket removal M - Tube for positioning primary shaft bearings N - Tube for positioning idle sprocket rings O - Tube for positioning secondary shaft bearings P - Fork shaft needle bearing positioning tool Q - Fork shaft needle bearing positioning tool R - Control shaft needle bearing positioning tool |

RECOMMENDED TOOLS

General purpose puller \varnothing **42** (example: U49M + U49D8 Facom)

\varnothing **18** (example: U49M + U49D4 Facom)

General purpose claw puller.

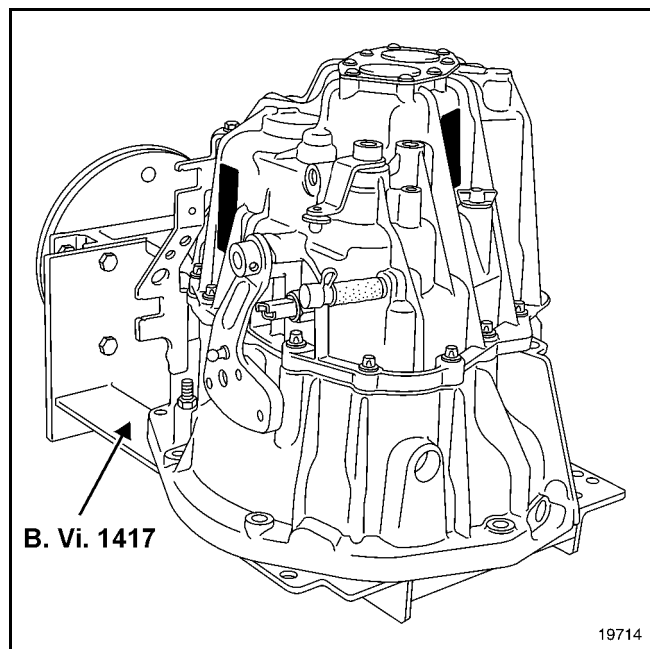
MANUAL GEARBOX

Repairing the gearbox

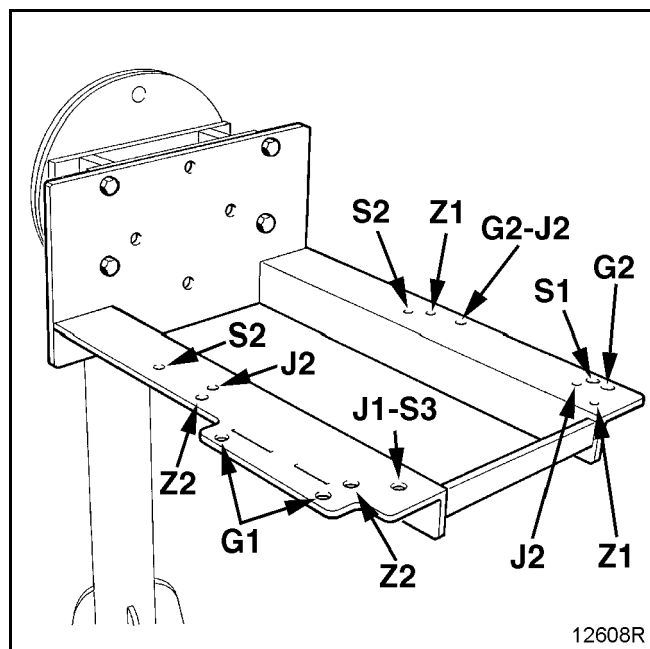
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Fit housing support **B. Vi. 1417** on a Desvil plate.

With housing support **B. Vi. 1417** in a horizontal position, place the engine side of the gearbox against the plate.

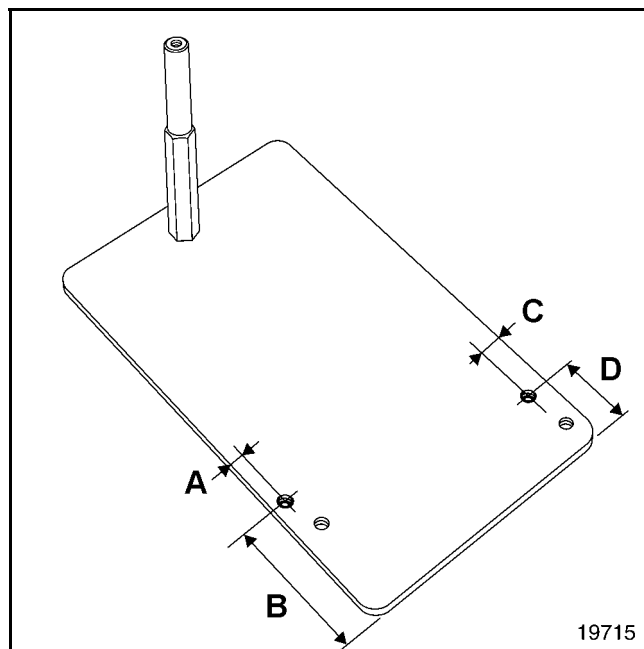


Clamp the gearbox to mounting **B. Vi. 1417** on holes; **G2** and **Z2**.



Modifying the chassis plate for the mechanism housing

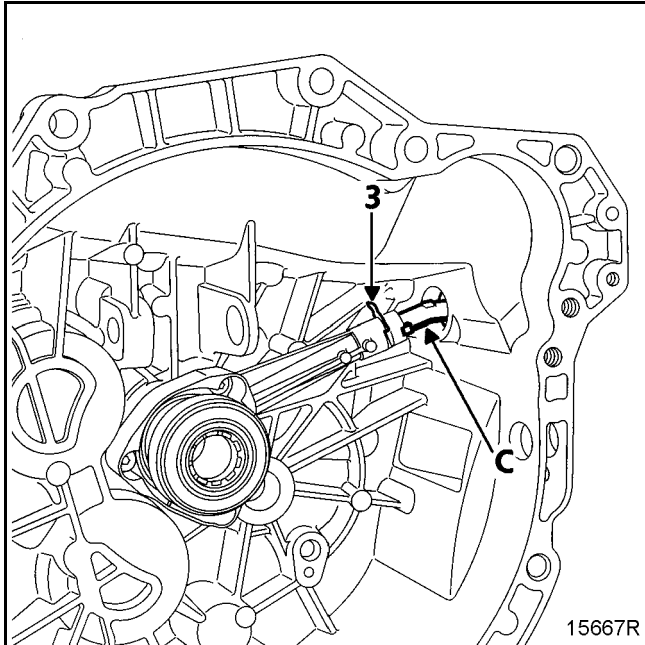
Make two additional $\varnothing 10$ mm holes and thread with $\varnothing M 12 \times 175$ as shown in the diagram.



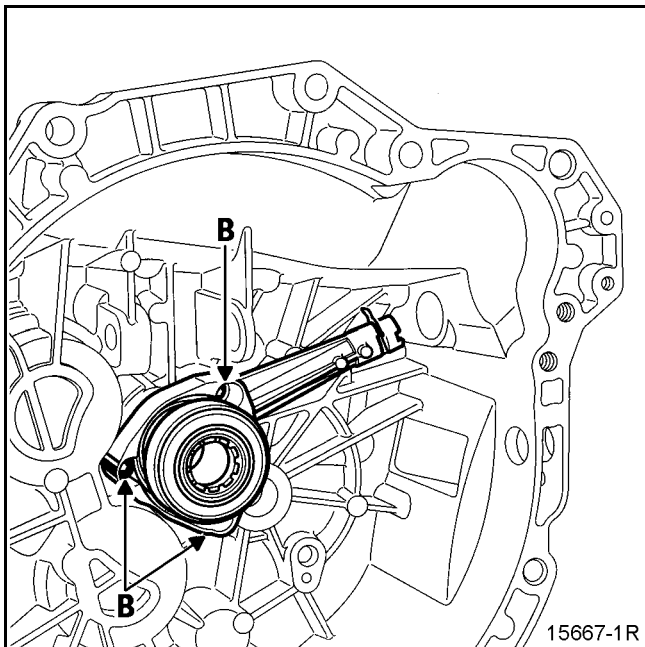
A = 16 mm
B = 144 mm
C = 28 mm
D = 78 mm

OPENING THE GEARBOX

Disconnect clutch slave cylinder union (C) by removing clip (3).

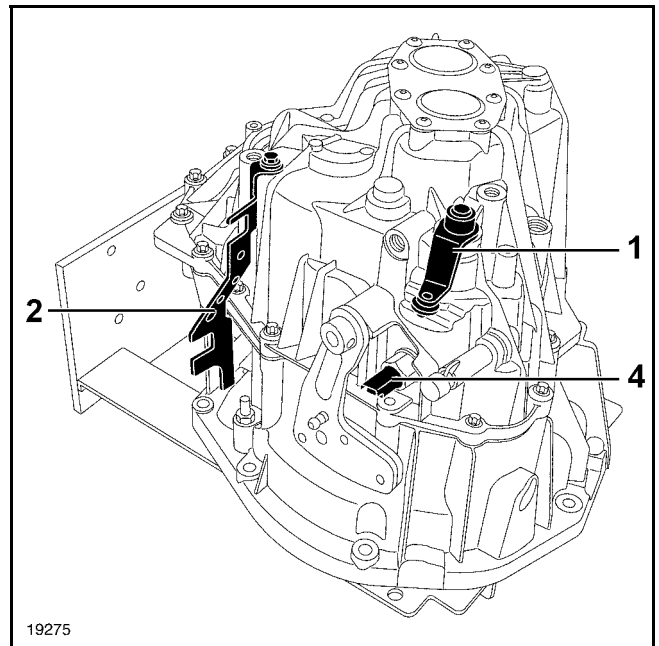


Remove the three slave cylinder mounting bolts (B) then remove the cylinder.



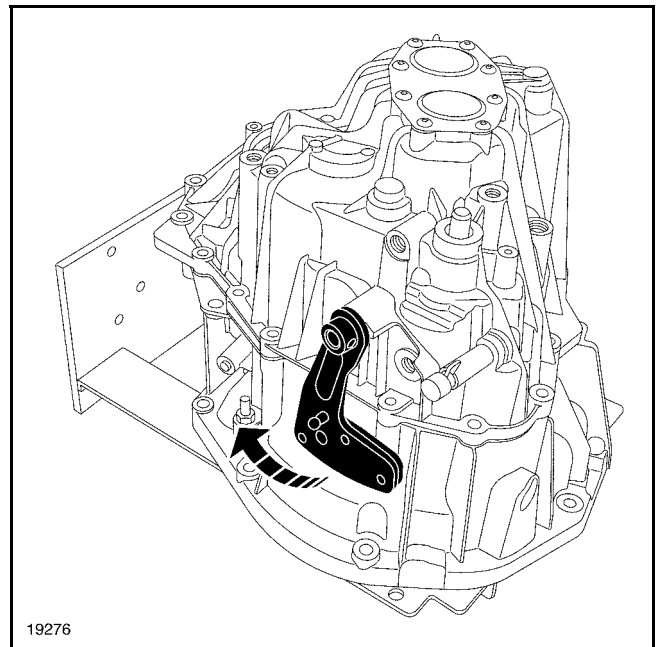
NOTE: never operate the system when the slave cylinder is removed (even if it is connected to the clutch pedal). There is a risk that the hydraulic piston and the slave cylinder stop will be ejected.

Remove the selector finger (1), the control cable mounting (2) and the reversing light switch (4).



Remove the gearbox edge bolts.

Manoeuvre the gear lever at the same time as raising the housing to disengage the control finger. Remove the control finger.



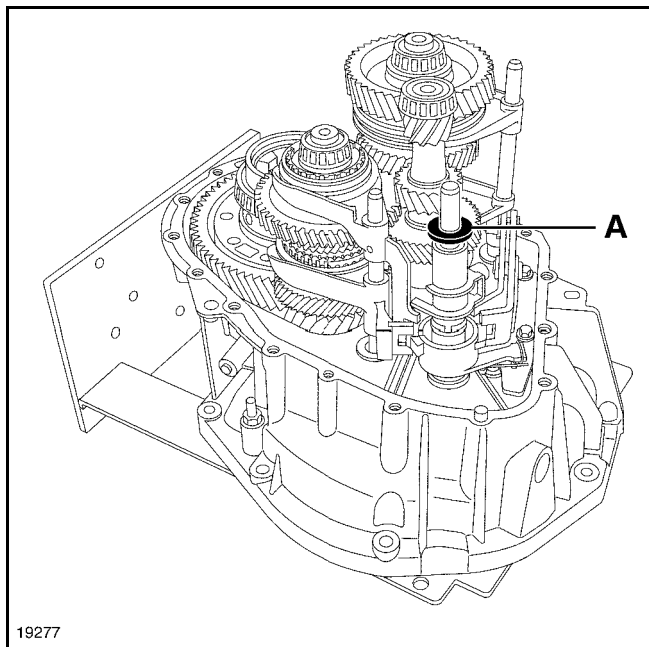
MANUAL GEARBOX

Repairing the gearbox

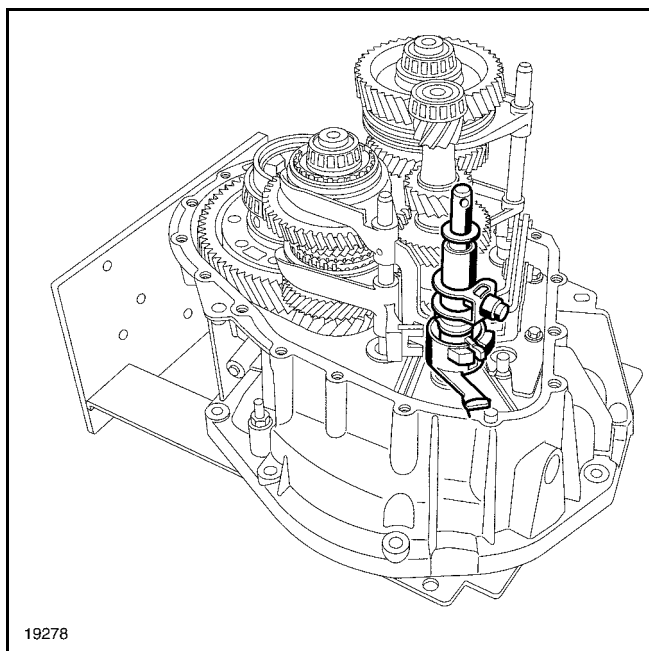
21

IMPORTANT: keep the setting washer (A) from the selector unit.

It is matched to the unit and may remain bonded to the housing.

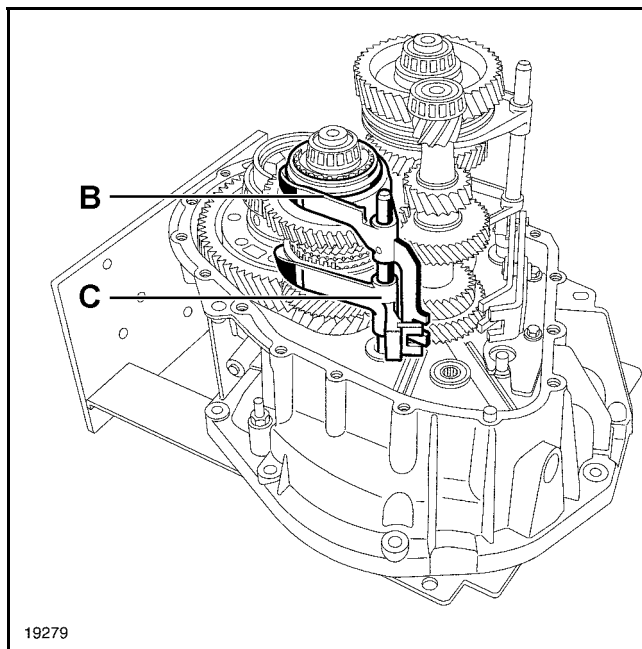


Manoeuvre the control unit while disengaging the spring above the bushing and remove the unit from the top.

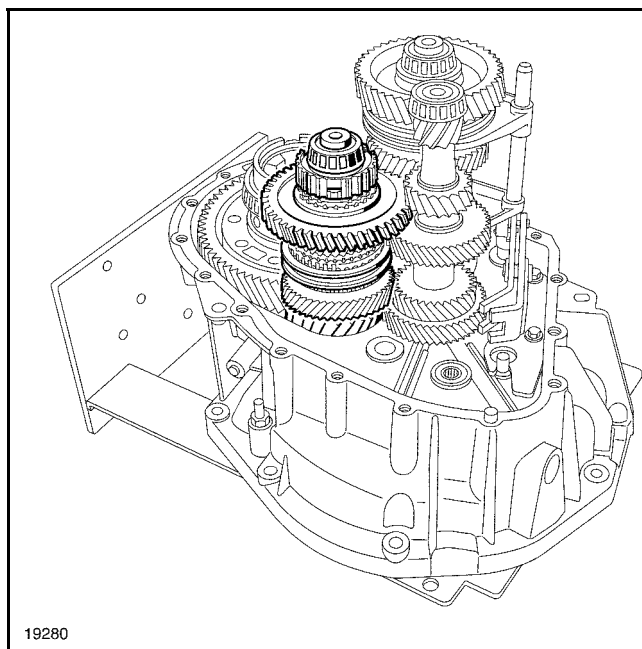


Remove:

- the reverse gear sliding shaft assembly (B),
- the 3rd/4th gear fork (C),



- the 1st/2nd and 5th/6th gear reverse switch, and the short secondary shaft.



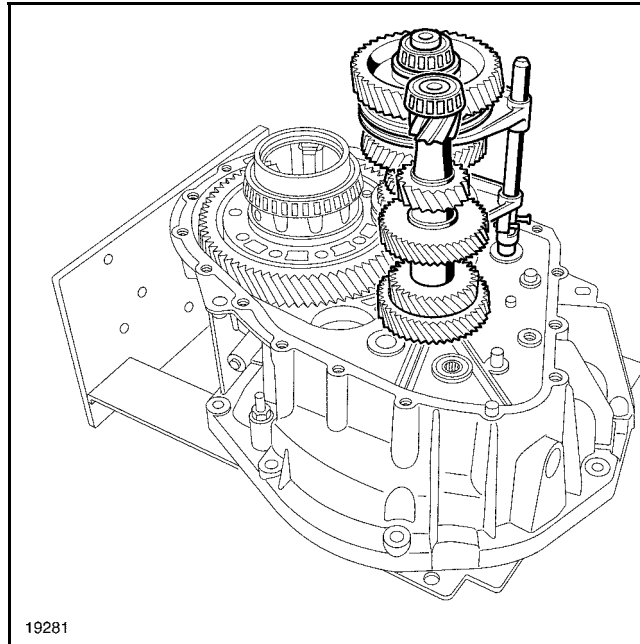
MANUAL GEARBOX

Repairing the gearbox

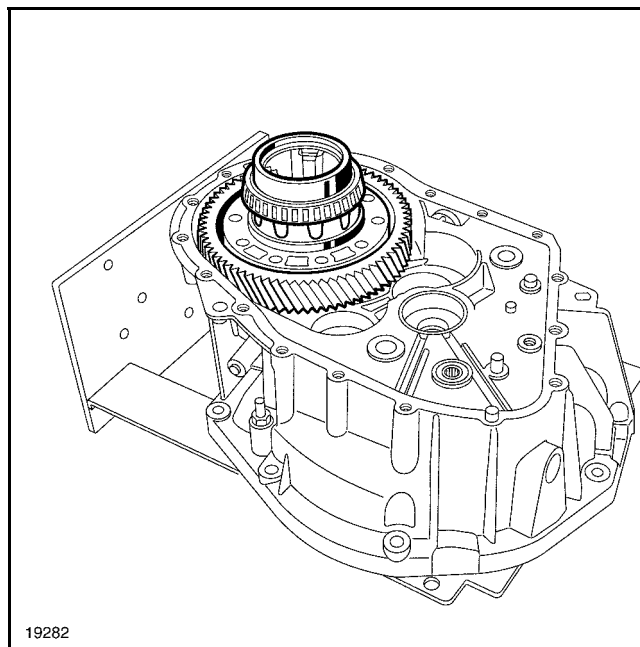
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Remove:

- the long secondary shaft assembly with fork and the primary shaft,



- the crownwheel.



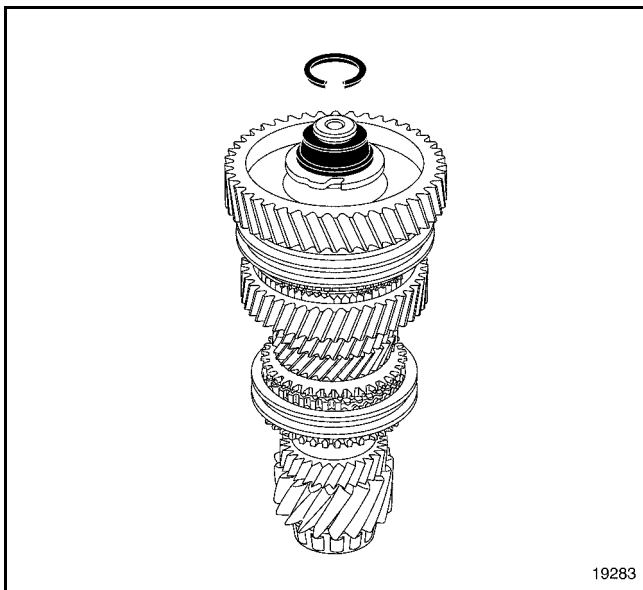
REMOVING THE GEARING

IMPORTANT: the gear supporting rings are fitted so tightly to the shaft that a force between **10 and 15 tonnes** is required to remove them. Ensure you have good equipment available (e.g. a support press).

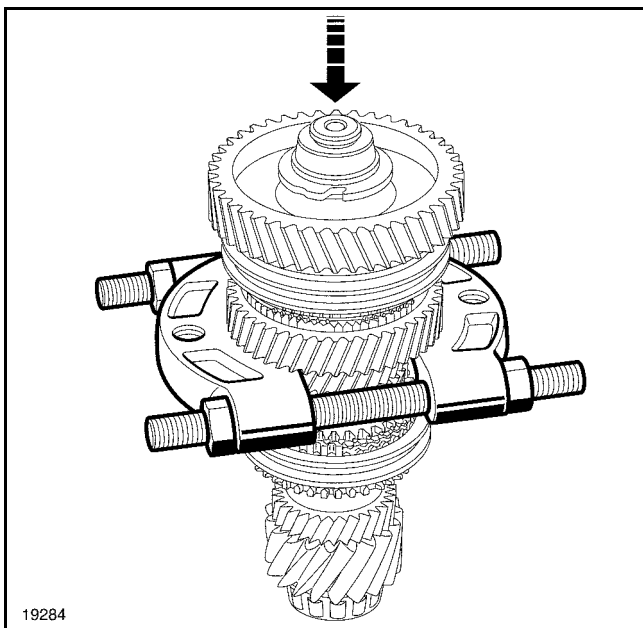
Long secondary shaft

Remove the circlip.

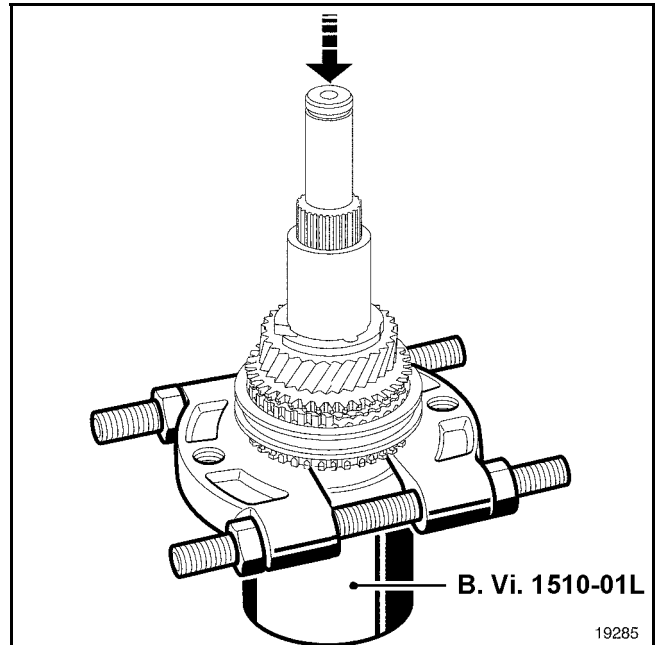
NOTE: break the bearing race to remove the circlip.



Remove from the press the sprocket assembly (rings, pinions, hubs), using a separator to place the weight on the 2nd gear pinion.



Remove from the press the gear assembly (rings, pinions, hubs) taking support under the 6th or 5th gear, depending on the gearbox type, using tool **B. Vi. 1510-01L** and a separator.

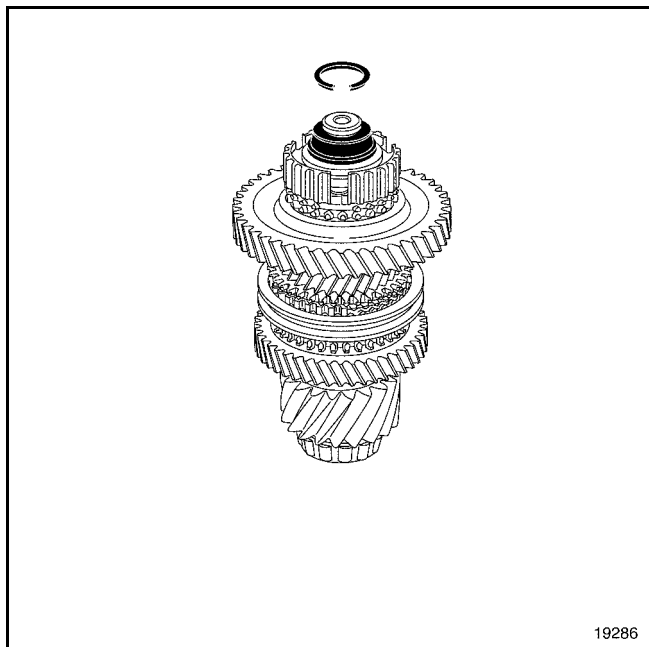


Place a cloth around the bottom of the tool to cushion the shaft when it drops.

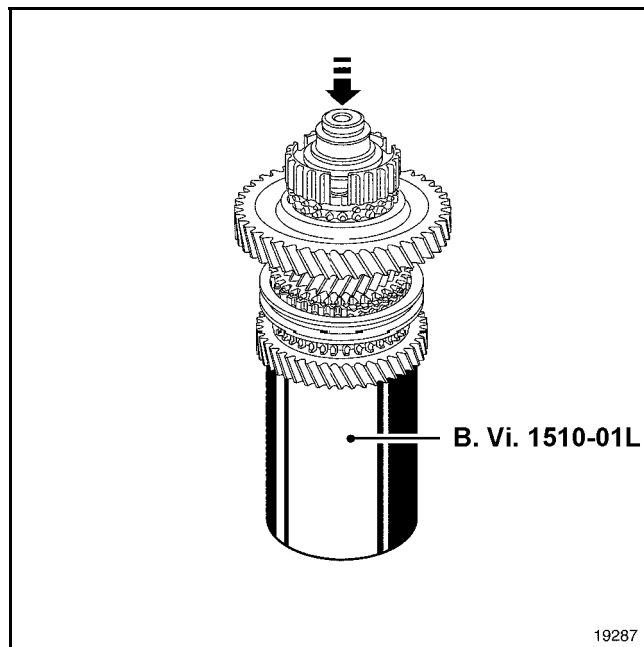
Short secondary shaft

Remove the circlip.

NOTE: break the bearing race to remove the circlip.



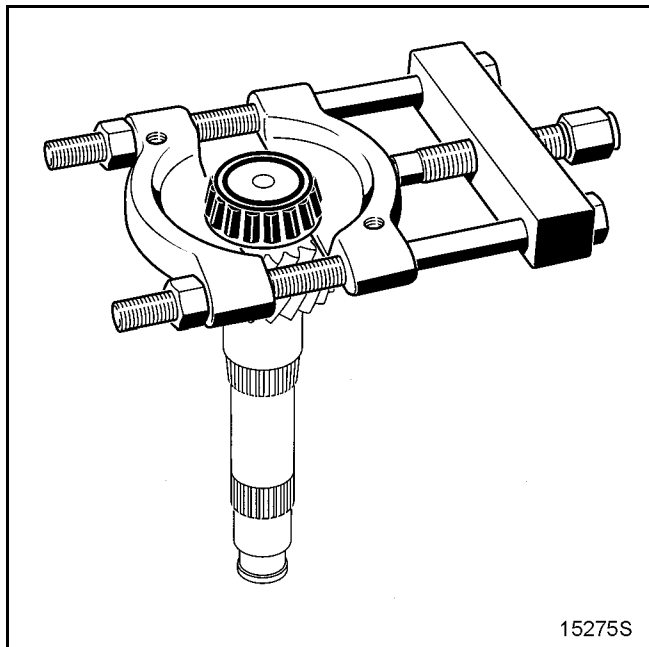
Remove from the press the assembly (rings, pinions, hubs) taking support under the 3rd gear using tool **B. Vi. 1510-01L**.



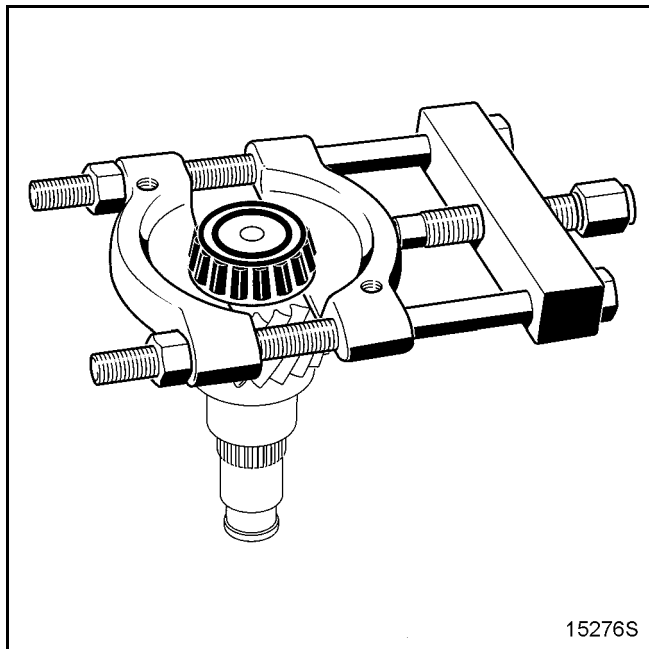
Place a cloth around the bottom of the tool to cushion the shaft when it drops.

REMOVING - REFITTING BEARINGS

Long secondary shaft

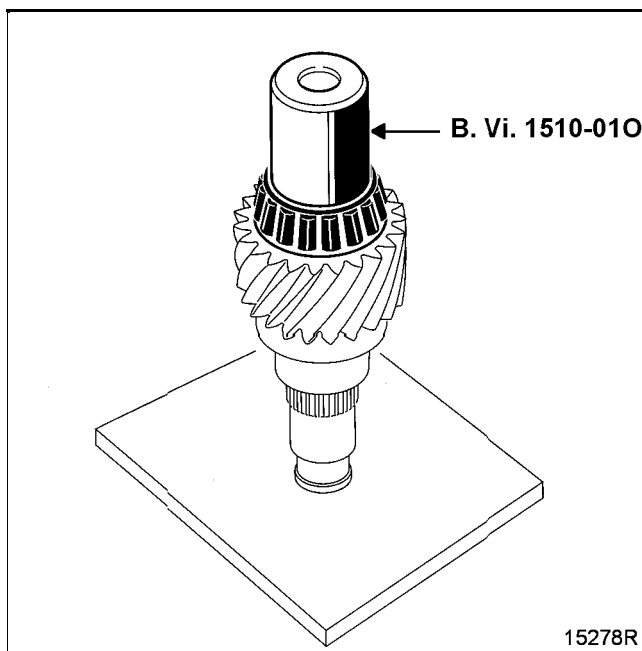
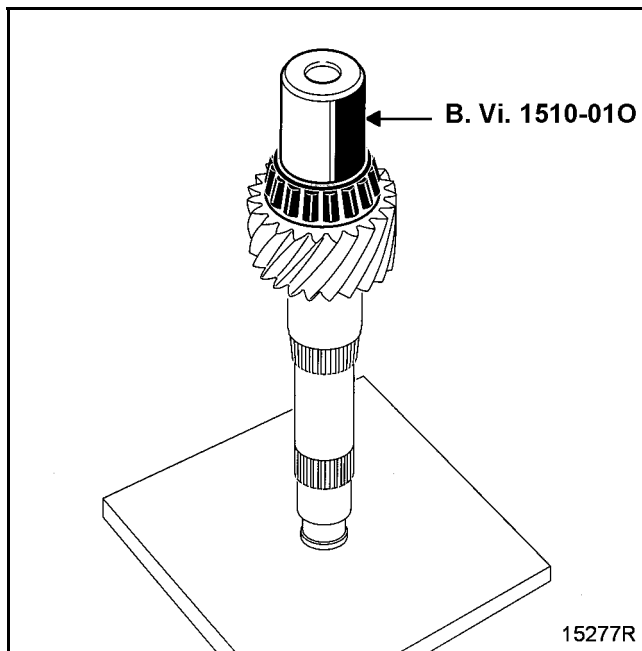


Short secondary shaft



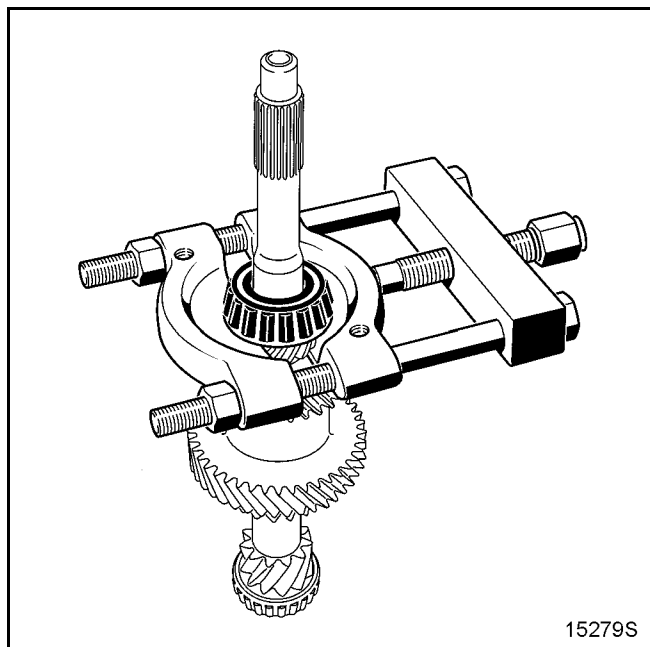
Remove the bearings with the press using the bearing extractor tool.

Refit the bearings using tool **B. Vi. 1510-010**.

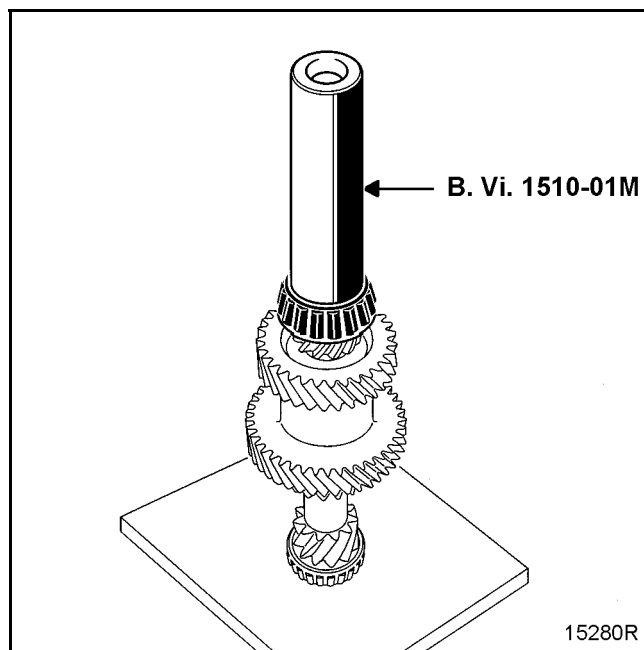


Primary shaft

Use a separator to extract the bearings on the press.



Refit the bearings using tool **B. Vi. 1510-01M**.



CHECKING PARTS

The pinion and claw teeth should not be chipped or excessively worn.

Also make sure that the shaft surfaces and inner pinion surfaces are free from marks and any signs of unusual wear.

SLIDING SHAFT HUBS

We recommend that you mark the position of the sliding shafts in relation to the hubs.

BEARINGS

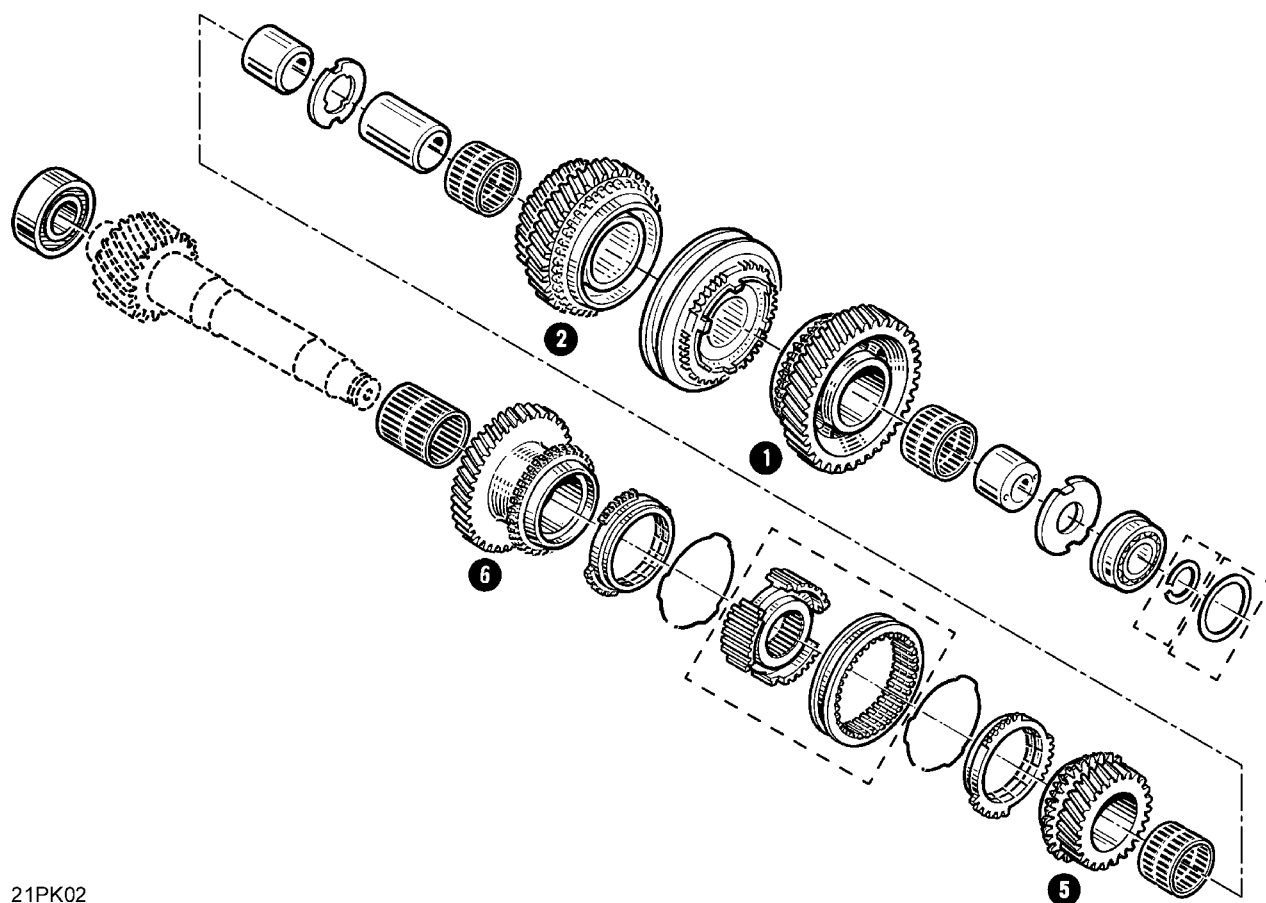
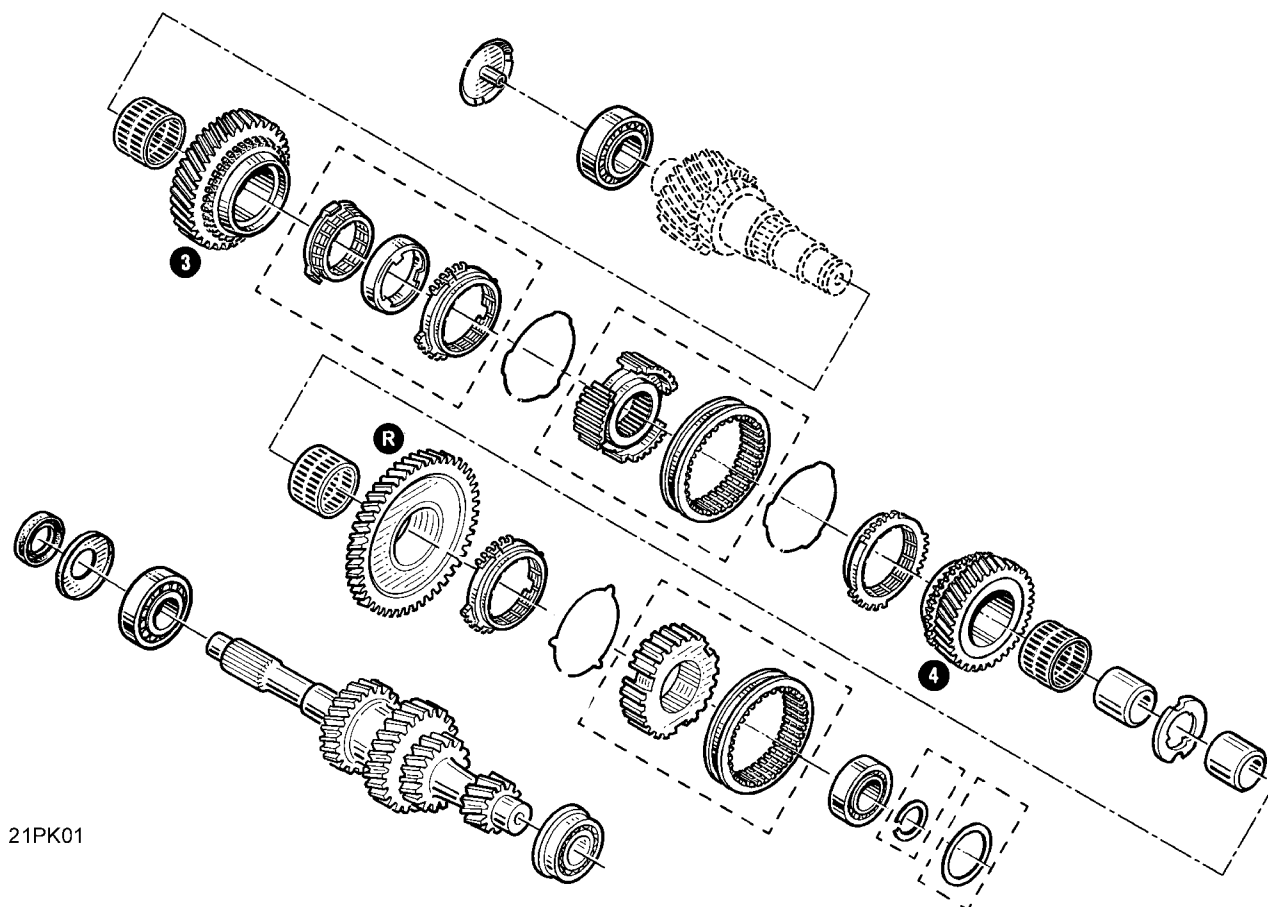
The bearings should be replaced if they show any sign of scratches, scorch marks or excessive wear.

MANUAL GEARBOX

Repairing the gearbox

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PK 6 GEARBOX

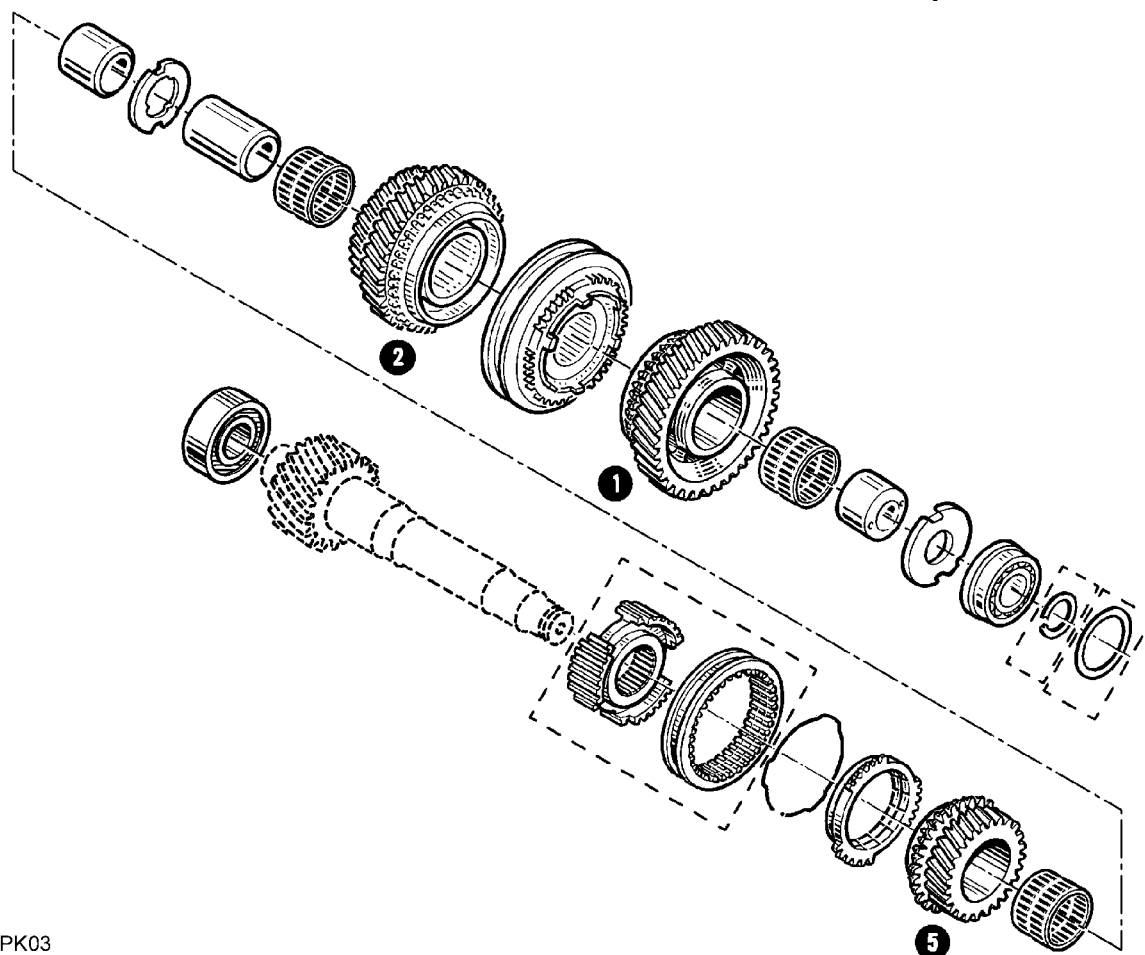
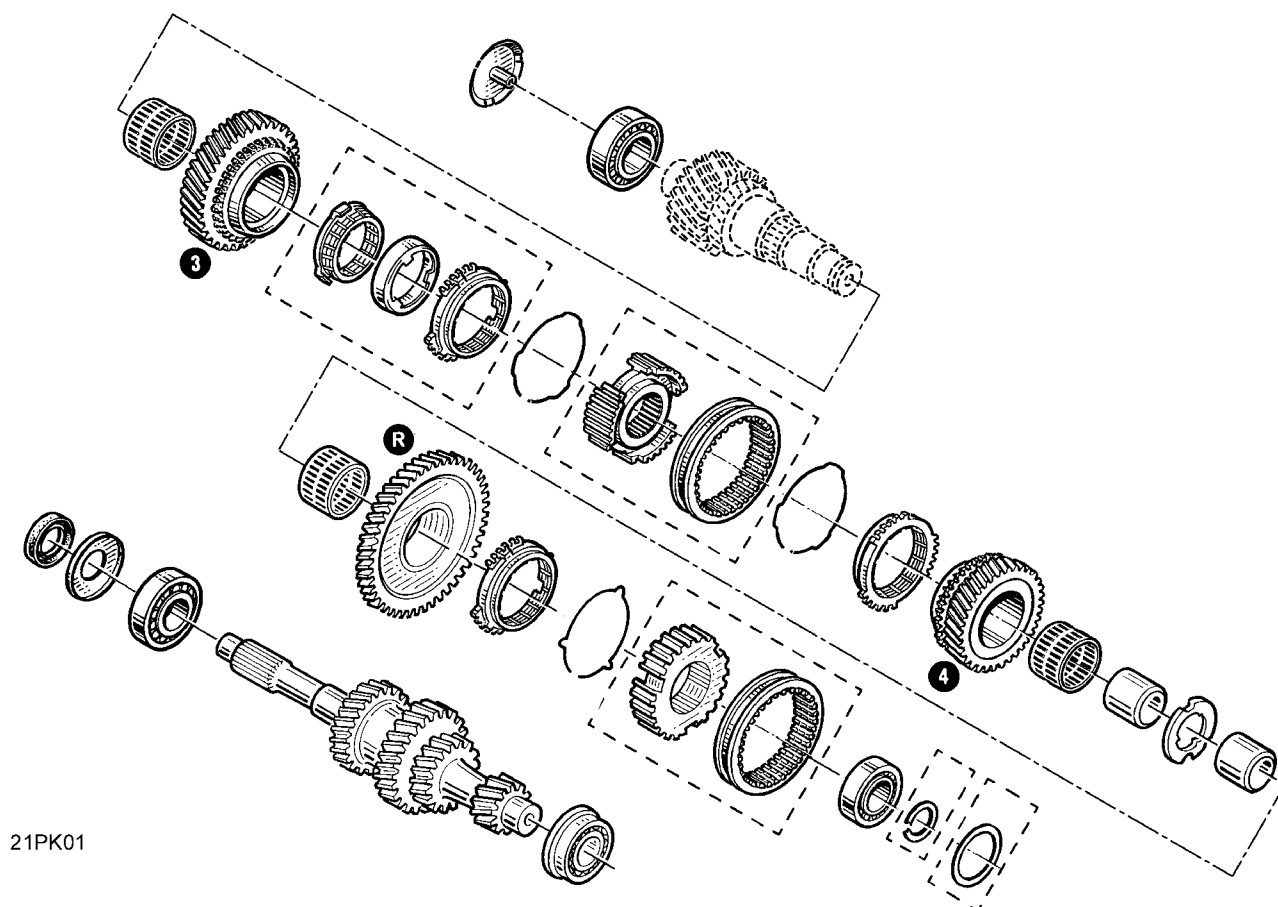


MANUAL GEARBOX

Repairing the gearbox

21

PK 5 GEARBOX



MANUAL GEARBOX

Repairing the gearbox

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REFITTING THE SPROCKETS

IMPORTANT: if you replace parts such as:

- the gear support rings,
- or the hubs

you must modify the settings using the following method:

Method: measure the height of the original part (to be replaced) and the new (replacement) part.

When the gap between the two parts is greater than **0.025 mm**, you must alter the shim setting:

- increase the shim if the new part is smaller than the old part,
- decrease the shim if the new part is bigger than the old part.

The table contains an example of the shim values to be set using the formula after replacing gear support rings or hubs.

Replacing rings or hubs for a long secondary shaft

| Part | Original part | New part |
|-----------------------------------|---------------|---|
| 6 th gear support ring | a | A |
| Hub (5th/6th gear) | b | B |
| 2 nd gear long ring | c | C |
| Hub (1st/2nd gear) | d | D |
| Shim | x | $X = x \pm (a-A) \pm (b-B) \pm (c-C) \pm (d-D)$ |

Replacing rings or hubs for a short secondary shaft

| Part | Original part | New part |
|-----------------------------------|---------------|---|
| 4 th gear support ring | a | A |
| Reverse gear support ring | b | B |
| Hub (3rd-4th gear) | c | C |
| Reverse gear hub | d | D |
| Shim | x | $X = x \pm (A-a) \pm (B-b) \pm (C-c) \pm (D-d)$ |

Example: replacing the reverse gear support ring for a short secondary shaft.

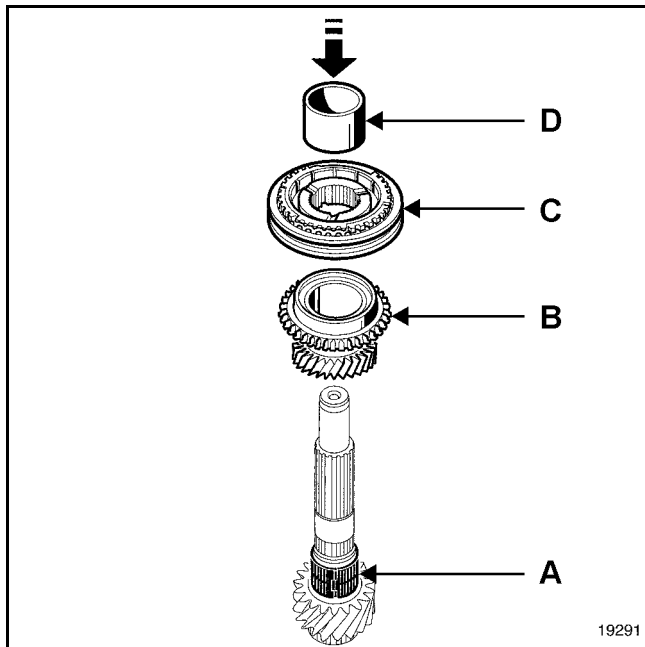
| Part | Original part | New part | Difference |
|-----------------------------------|---------------|---|------------|
| 4 th gear support ring | a | A | |
| Reverse gear support ring | b (30.802) | B (30.830) | |
| Hub (3rd-4th gear) | c | C | +0.028 |
| Reverse gear hub | d | D | |
| Shim | | $X = x \pm (A-a) \pm (B-b) \pm (C-c) \pm (D-d)$ | |
| Result | 2.10 | $x = 2.10 - 0.028 = 2.028$ | |

Knowing that shim size varies between 0.020 and 0.020, you would have to use a 2.02 shim for this example.

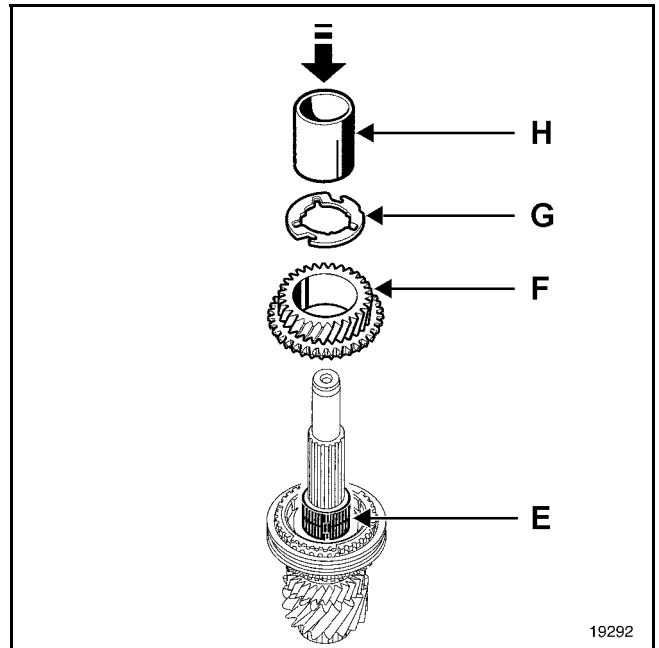
REFITTING THE LONG SECONDARY SHAFT SPROCKET

Fitting

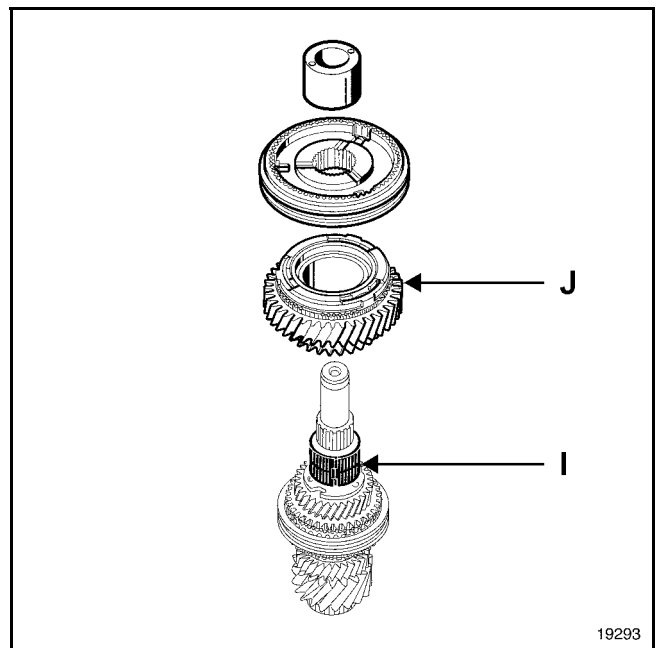
- 1 Fit the needle bearing (A), 6th gear idle sprocket (B) and its blocking ring (PK6).
- 2 Use **B. Vi. 1510-01N** to fit 6/5th gear sliding shaft hub (C) (align the hub notches with those of the blocking ring).
- 3 Use **B. Vi. 1510-01N** to fit the 5th gear idle sprocket ring (D) (apply a pressure of **5 tonnes** when securing).



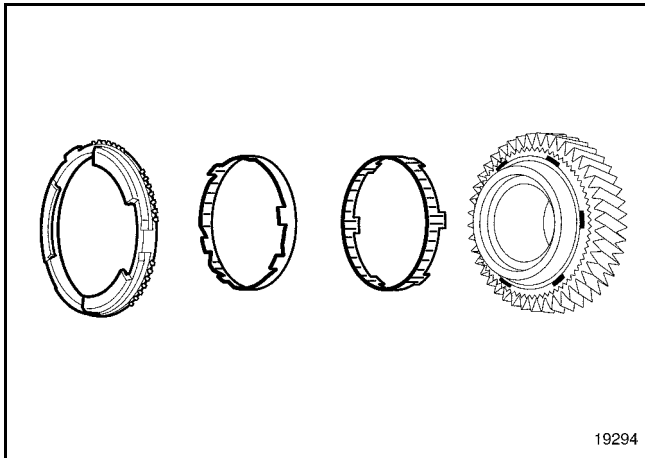
- 4 Fit the needle bearing (E), the 5th gear idle sprocket and its blocking ring (F).
- 5 Fit the grooved washer (G).
- 6 Use **B. Vi. 1510-01N** to fit the 2nd gear idle sprocket ring (H) (apply a pressure of **5 tonnes** when securing).



- 7 Fit the needle bearing (I), the 2nd gear/reverse gear idle sprocket (J) fitted with a three-cone blocking ring.



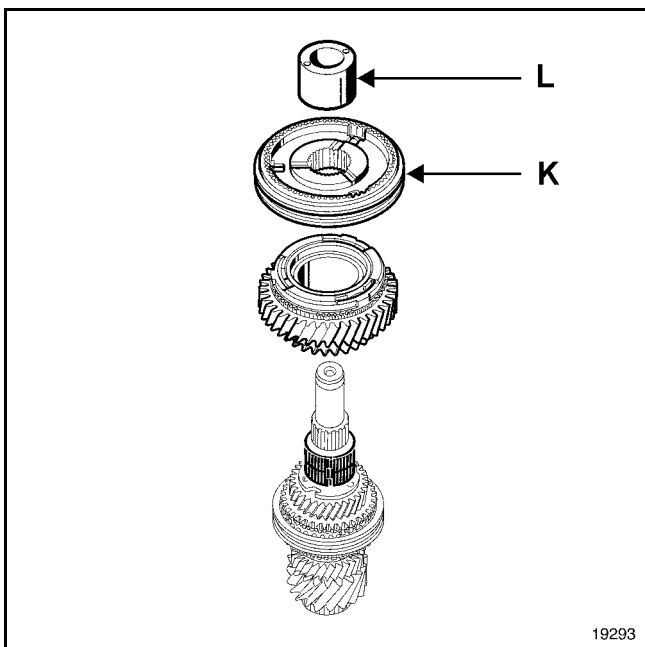
IMPORTANT: make sure that the notches on the three-cone ring are correctly positioned.



- 8 Use **B. Vi. 1510-01N** to fit the 1st/2nd gear sliding shaft hub (K), align the hub notches with those of the blocking ring.

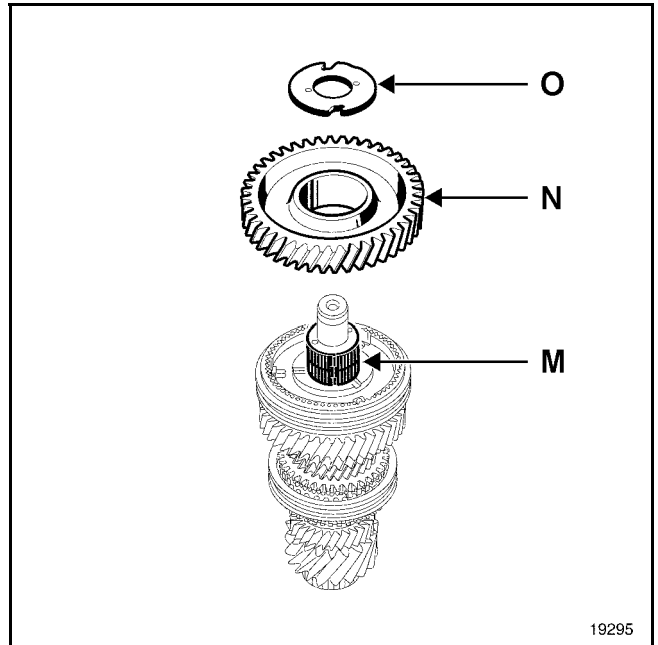
IMPORTANT: the long hub support should be placed on the pinion side of the 2nd gear.

- 9 Use **B. Vi. 1510-01N** to fit the 1st gear idle sprocket ring (L) which has pin holes at the top (apply a pressure of **5 tonnes** when securing).

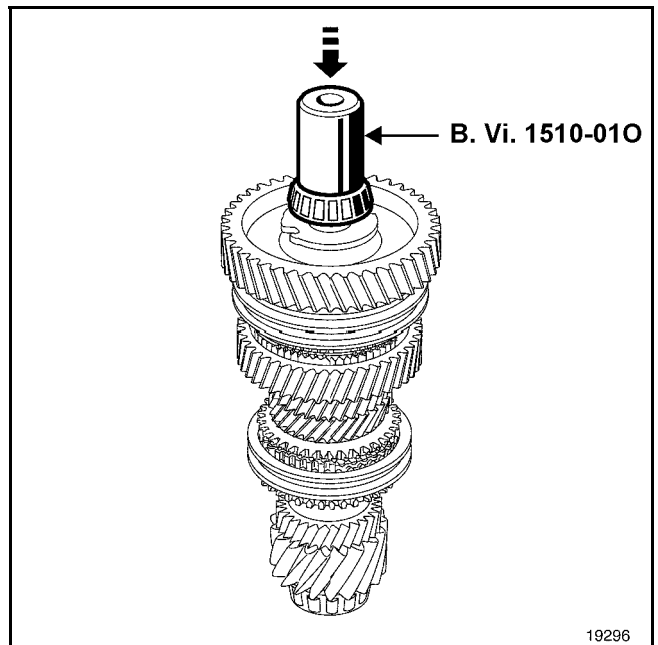


- 10 Fit the needle bearing (M) and the 1st gear idle sprocket (N) fitted with three-cone blocking rings.

- 11 Fit the grooved washer pin (O).



- 12 Fit the bearing using **B. Vi. 1510-01O**.



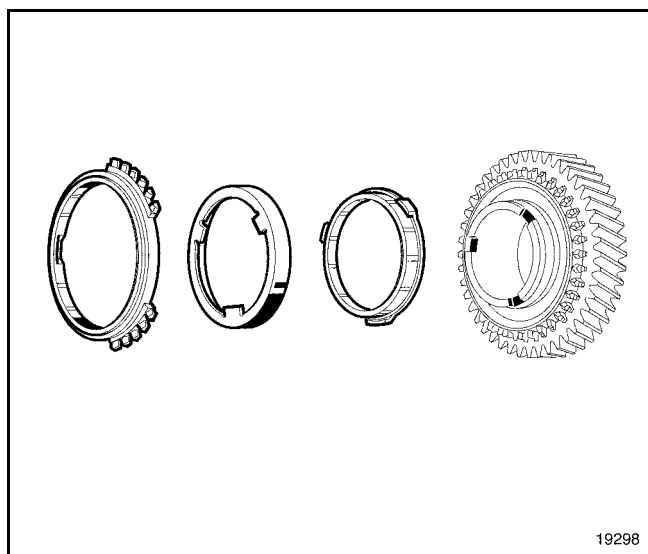
Select and fit a new circlip just inside the neck (it should not be able to move once it has been fitted).

REFITTING THE SHORT SECONDARY SHAFT SPROCKET

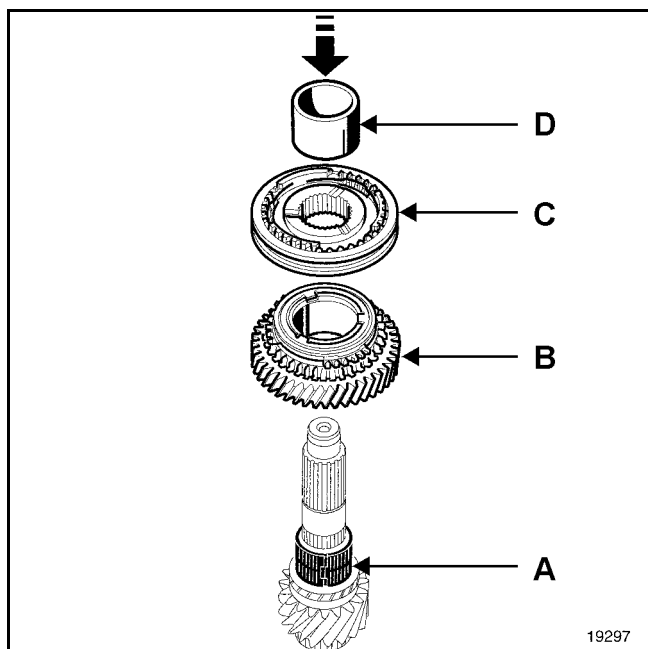
Fitting:

- 1 Fit the needle bearing (A) and the 3rd gear idle sprocket (B) fitted with three-cone blocking rings.
- 2 Use **B. Vi. 1510-01N** to fit the 3/4rd gear sliding shaft hub (C).

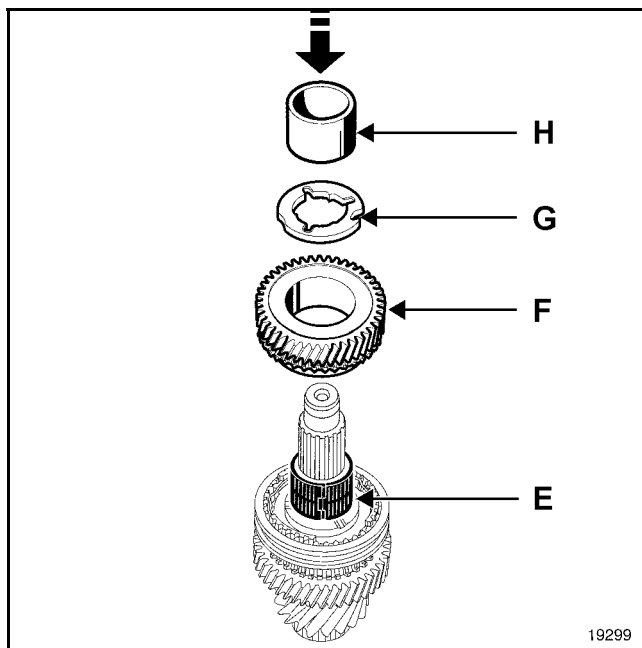
IMPORTANT: make sure that the notches on the three-cone ring are correctly positioned.



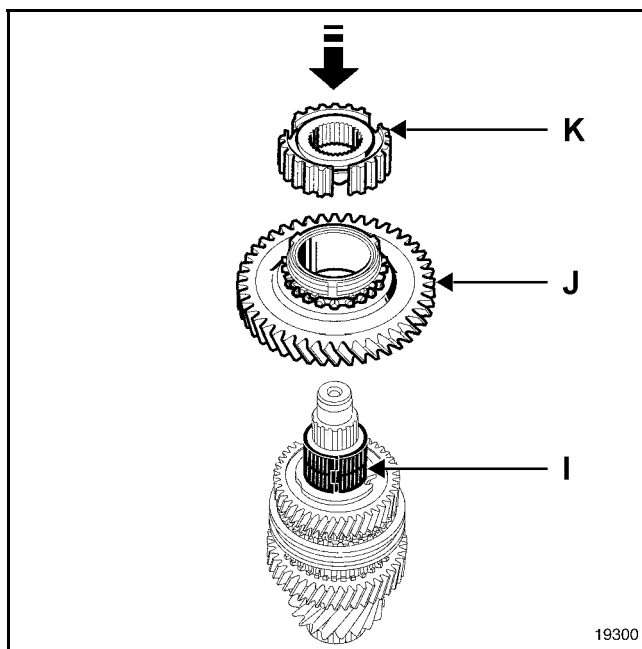
- 3 Use **B. Vi. 1510-01N** to fit the 4th gear idle sprocket ring (D) (apply a pressure of **5 tonnes** when securing).



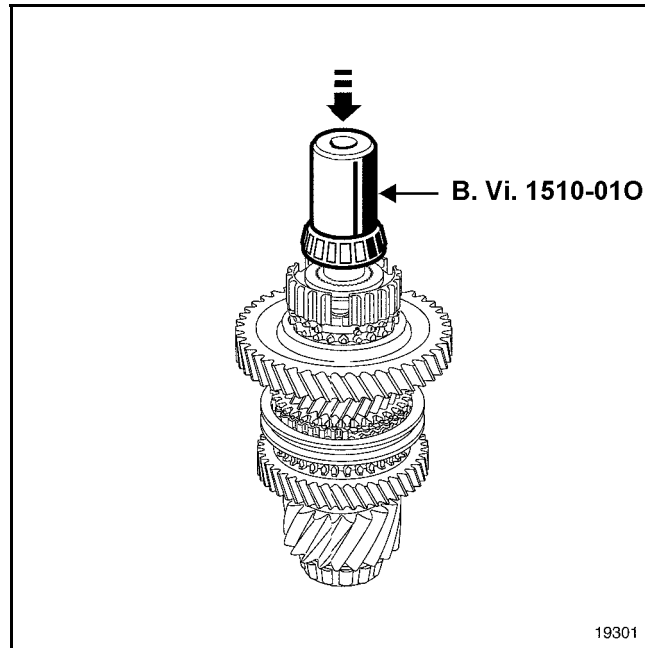
- 4 Fit the needle bearing (E) and the 4th gear idle sprocket and its blocking ring (F).
- 5 Fit the grooved washer (G).
- 6 Use **B. Vi. 1510-01N** to fit the reverse gear idle sprocket ring (H) (apply a pressure of **5 tonnes** when securing).



- 7 Fit the needle bearing (I) and the reverse gear idle sprocket (J) fitted with a blocking ring.
- 8 Use **B. Vi. 1510-01N** to fit the reverse gear sliding shaft hub (K).

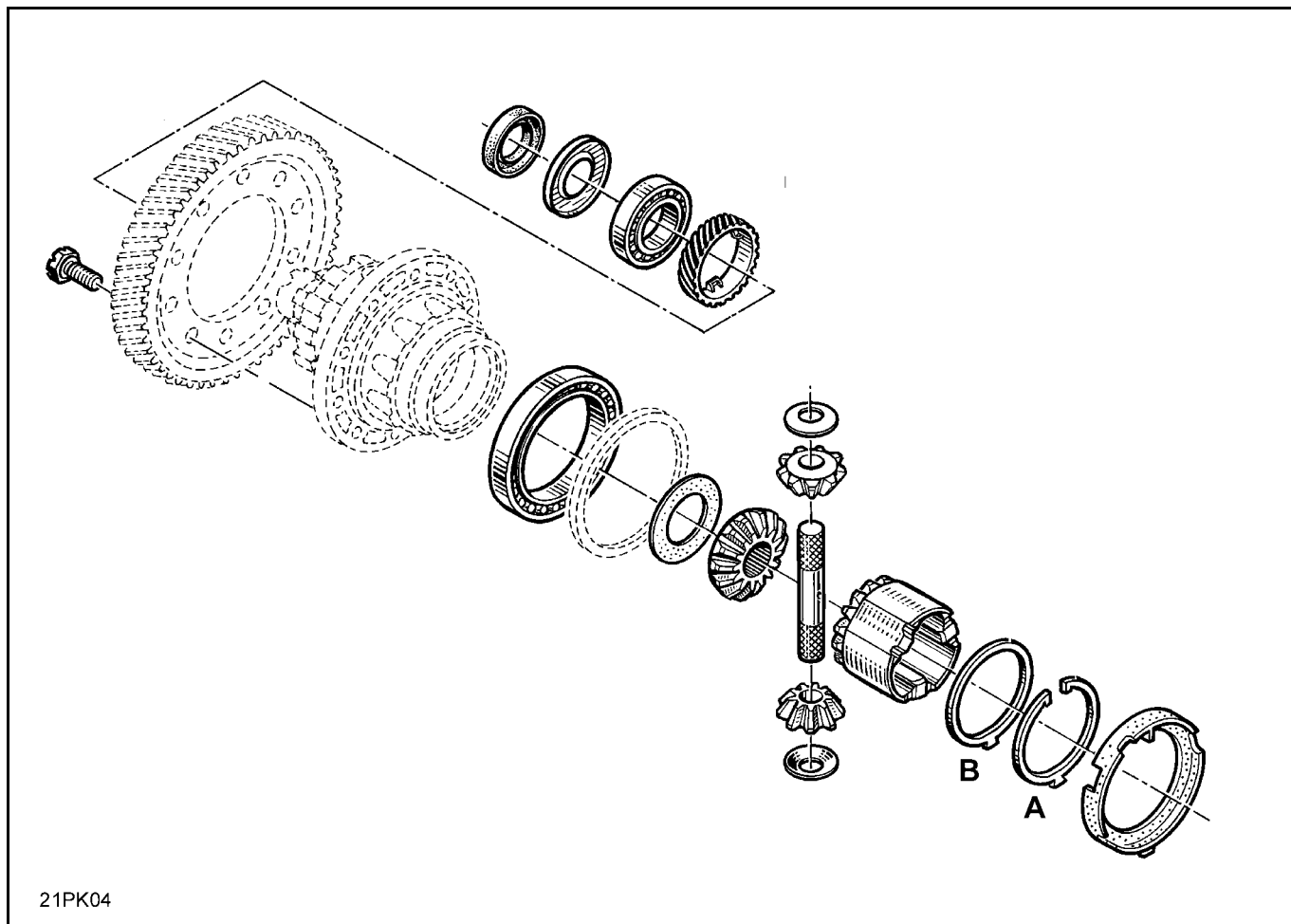


- 9 Fit the bearing using **B. Vi. 1510-010**.



Select and fit a new circlip just inside the neck
(it should not be able to move once it has been fitted).

DIFFERENTIAL



REMOVAL

Remove the tripod sunwheel stop ring (A) and remove the shim (B).

Remove the tripod sunwheel.

Lock the unit in a vice with clamping jaws and remove the crownwheel.

Remove the planet wheels and the sunwheel and attach the support washers to their respective planet wheels.

CHECKING PARTS

Check the condition:

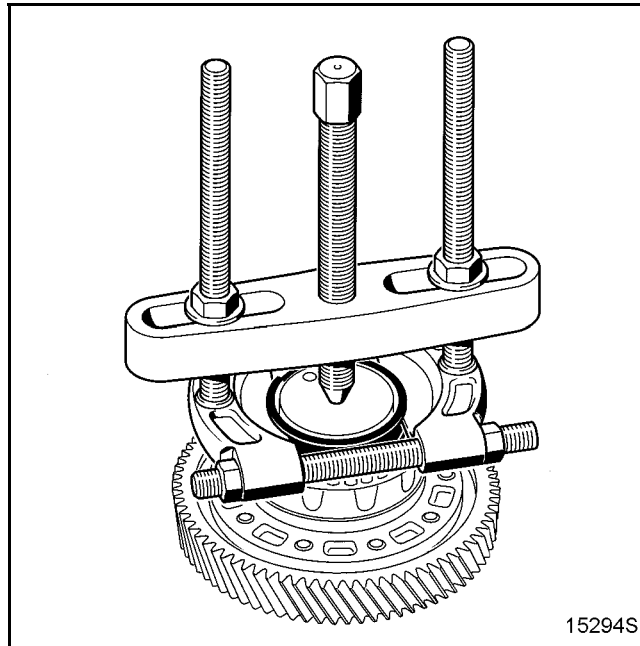
- of the teeth (crownwheel - planet wheels - sunwheels),
- the washers (planet wheels - sunwheels),
- and the unit.

MANUAL GEARBOX

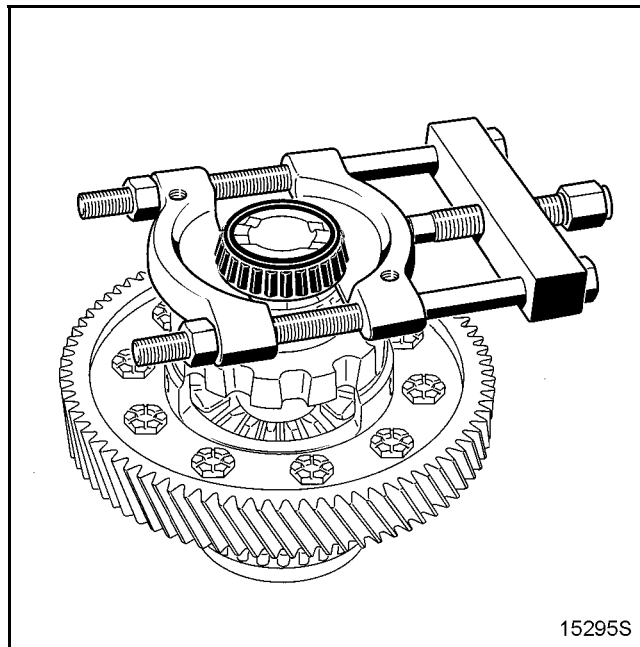
Repairing the gearbox

21

Use a general purpose puller to remove the large bearing.



Use a general purpose puller to remove the small bearing.



DIFFERENTIAL

REFITTING

Refitting is the reverse of removal.

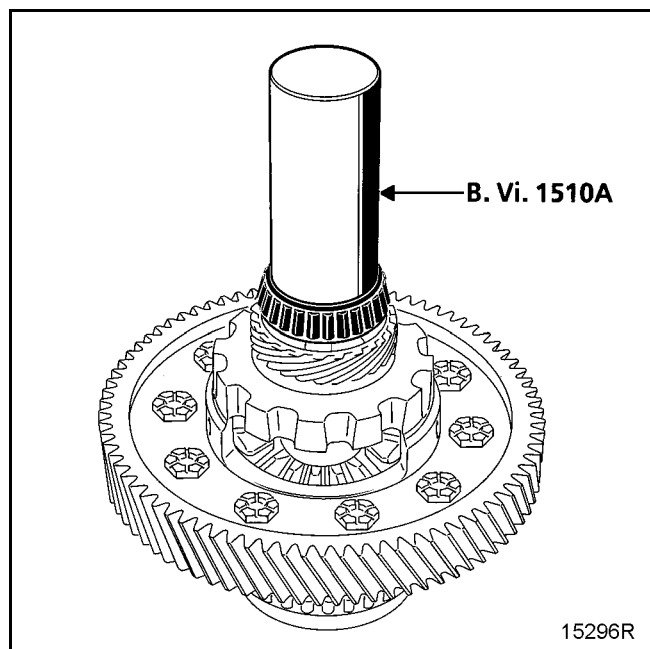
All the cleaned and checked parts should be oiled as they are fitted.

The stop ring is always replaced.

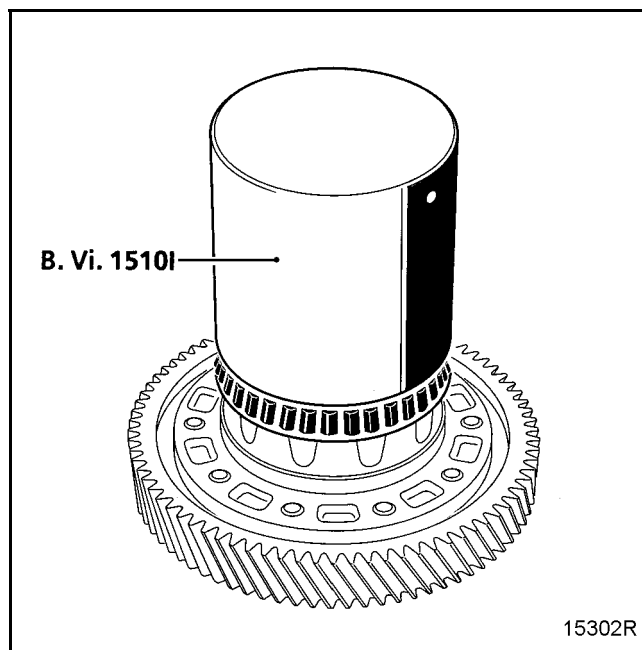
Tighten the crownwheel bolts to a torque of **13 daNm**.

Refit:

- the small bearing using **B. Vi. 1510A**.



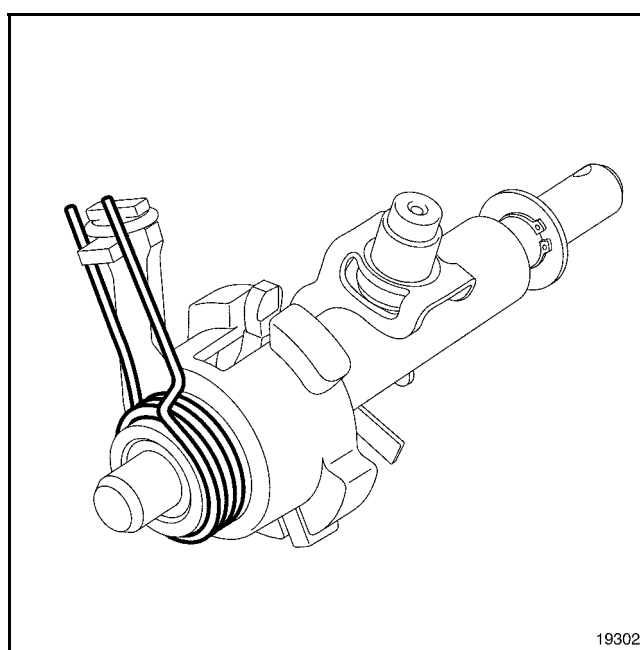
- the large bearing using **B. Vi. 1510I**.



This exploded view diagram illustrates the assembly of a mechanical component, likely a control lever or actuator. The diagram includes the following parts and callouts:

- Callout 1:** A large, L-shaped bracket or housing with mounting holes.
- Callout 2:** A small pin or screw used to secure the lever to the bracket.
- Callout 3:** A small cylindrical pin or bush.
- Callout 4:** A small cylindrical pin or bush.
- Callout 5:** A small cylindrical pin or bush.
- Callout 6:** A small cylindrical pin or bush.
- Callout 7:** A small cylindrical pin or bush.
- Callout 8:** A small cylindrical pin or bush.
- Callout 9:** A small cylindrical pin or bush.
- Callout 10:** A small cylindrical pin or bush.
- Callout 11:** A small cylindrical pin or bush.
- Callout 12:** A small cylindrical pin or bush.

The diagram shows the assembly sequence from the bracket (1) through the various pins (2-12) to the final lever component.

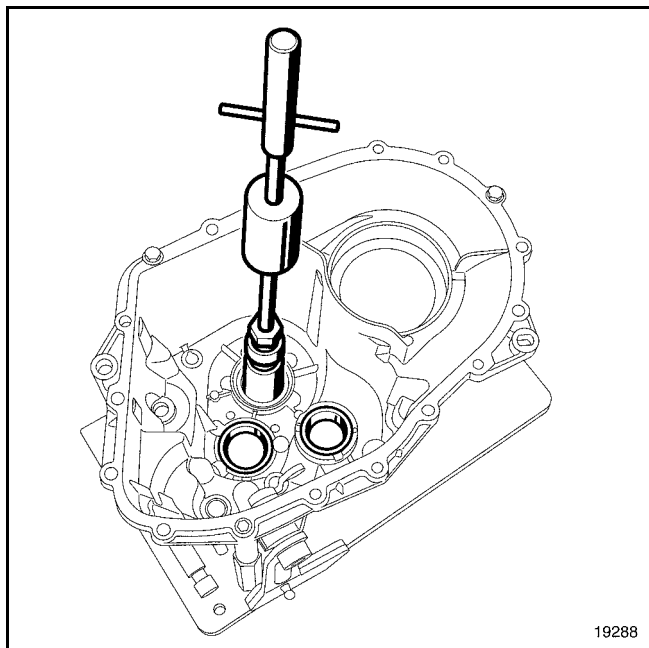


BEARING RACES IN THE MECHANISM HOUSING

REMOVAL

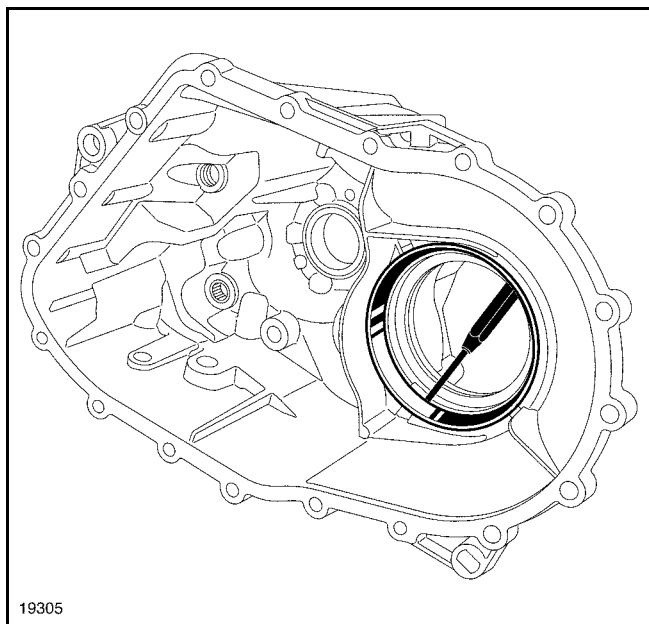
Place the housing on the chassis of **B. Vi. 1417** and secure it with the three bolts.

Use a **42 diameter** general purpose puller and an inertia extractor to remove the shaft bearing races.



WARNING: take care not to mix up these three setting shims.

Use a pin punch to remove the outer race of the large differential bearing.

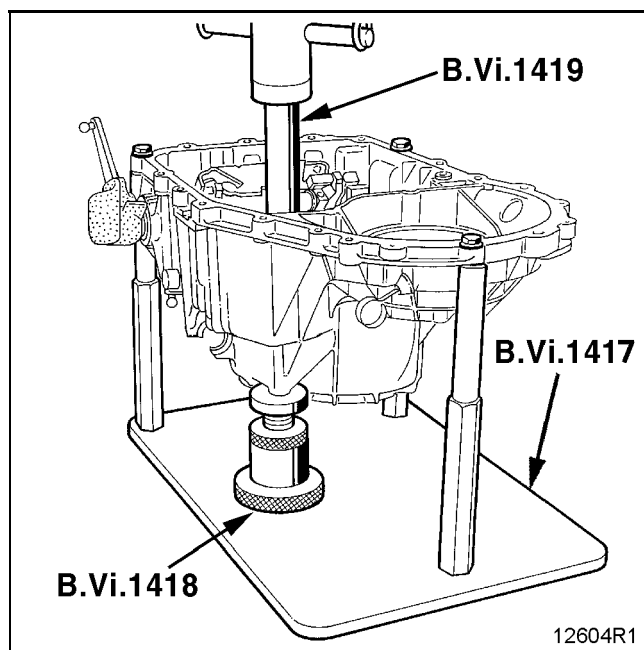


REFITTING

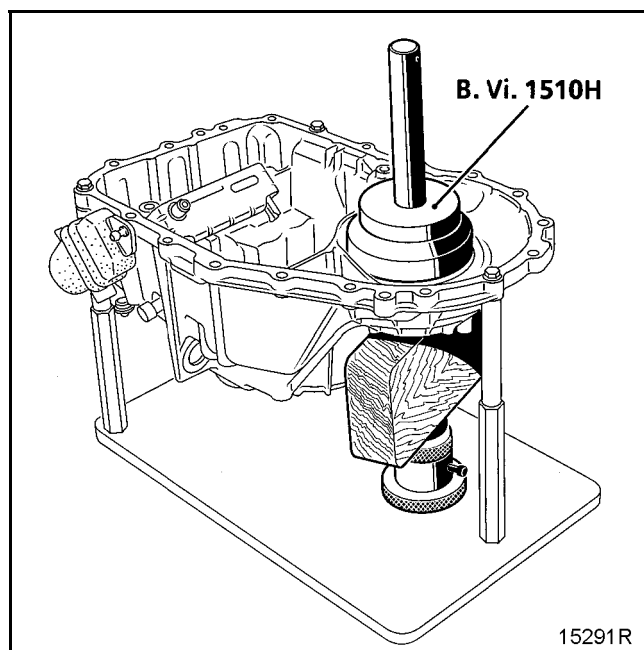
Fit adjustable support **B. Vi. 1418** under the mechanism housing that corresponds to each line.

Fit the setting shims corresponding to each line.

Use **B. Vi. 1419** to fit the shaft bearing races.



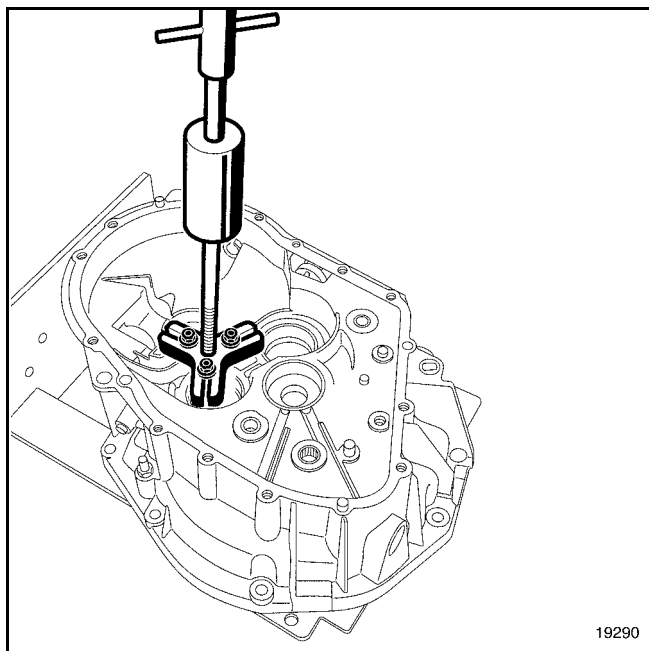
Use **B. Vi. 1510H** to refit the differential bearing race.



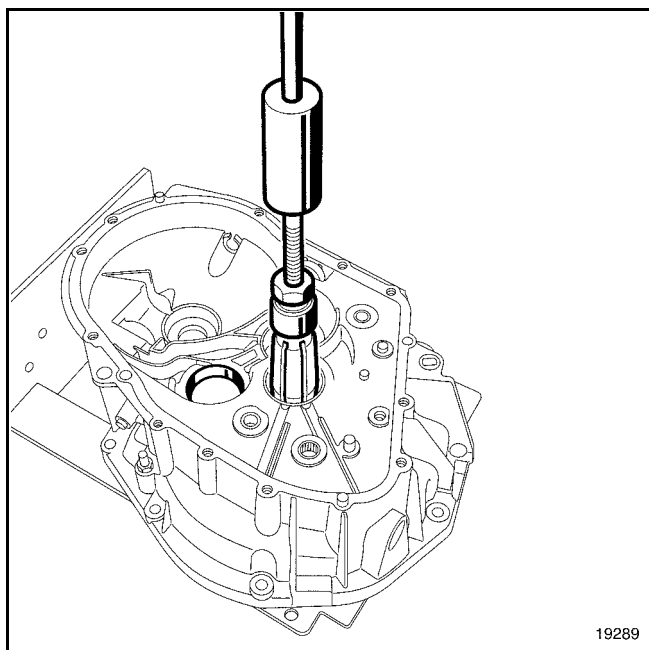
BEARING RACES IN THE CLUTCH HOUSING

REMOVAL

Use a general purpose puller with three claws to remove the secondary shaft bearing races.



Use a **42 diameter** general purpose puller and an inertia extractor to remove the primary shaft and differential bearing races.

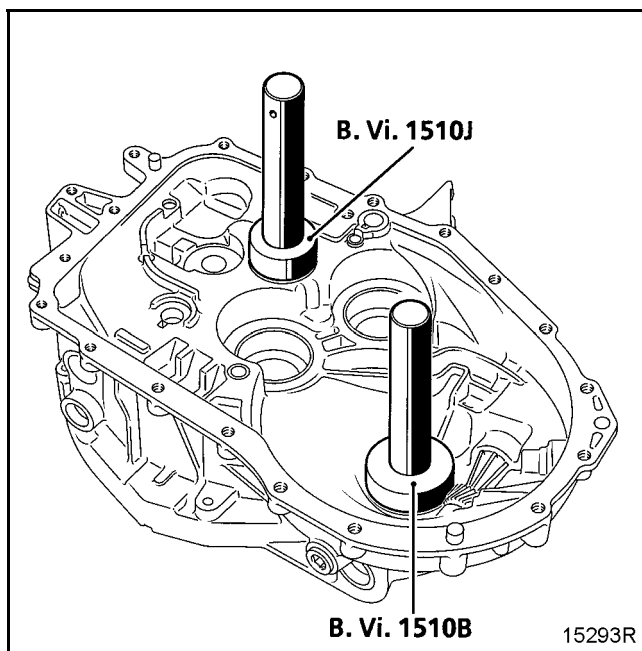


REFITTING

Fit the housing on the press plate.

Fit adjustable support **B. Vi. 1418** under the housing that corresponds to each line.

Use **B. Vi. 1510J** and **B. Vi. 1510B** to fit the shaft bearing races.

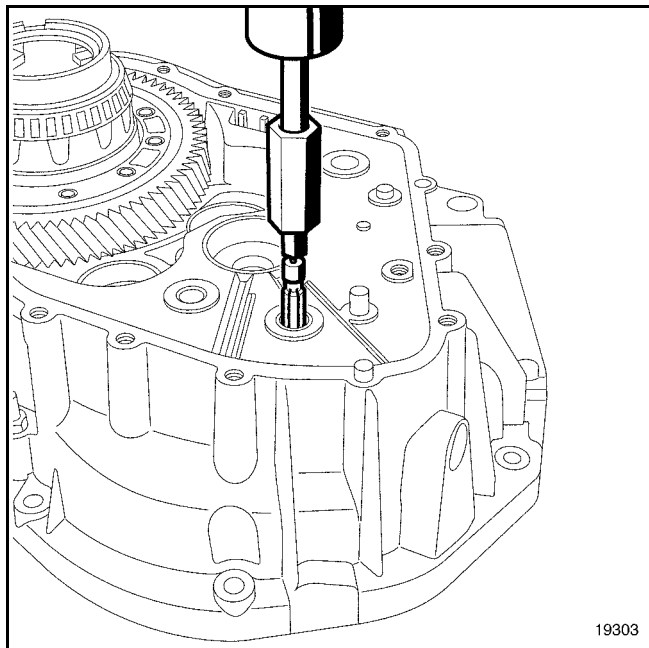


NOTE: remember to fit a new deflector under the small diameter differential bearing race.

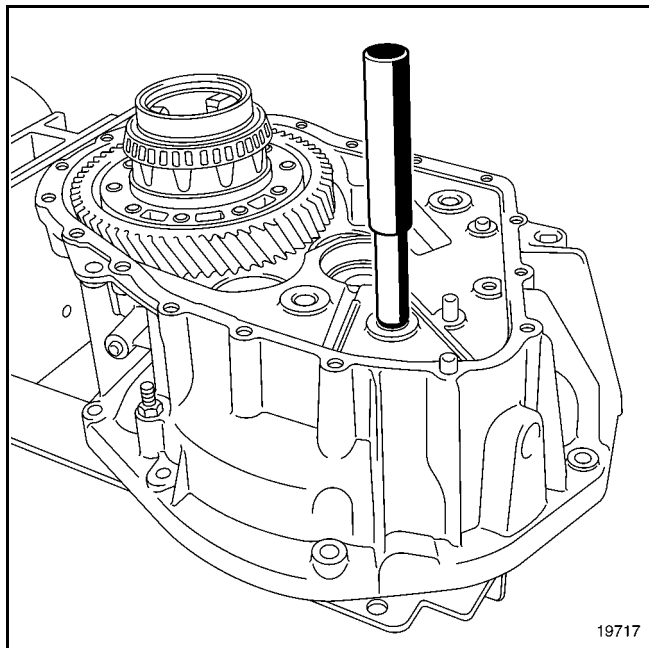
REMOVING THE NEEDLE BUSHINGS ON THE HOUSING

Clutch housing side

Use a **14 diameter** general purpose puller to remove the bushings.

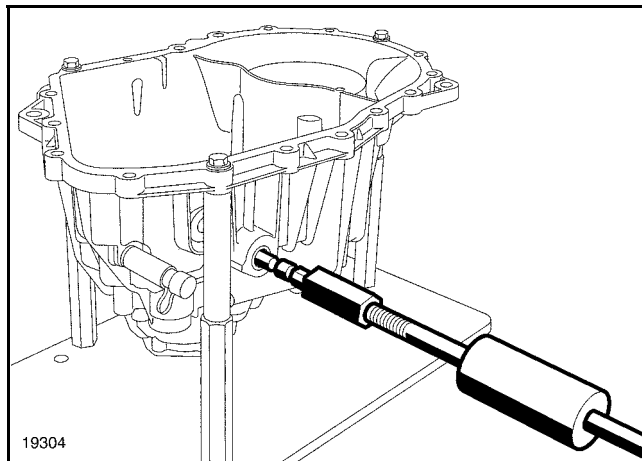


Refit the bushings using **B. Vi. 1510-01Q**.

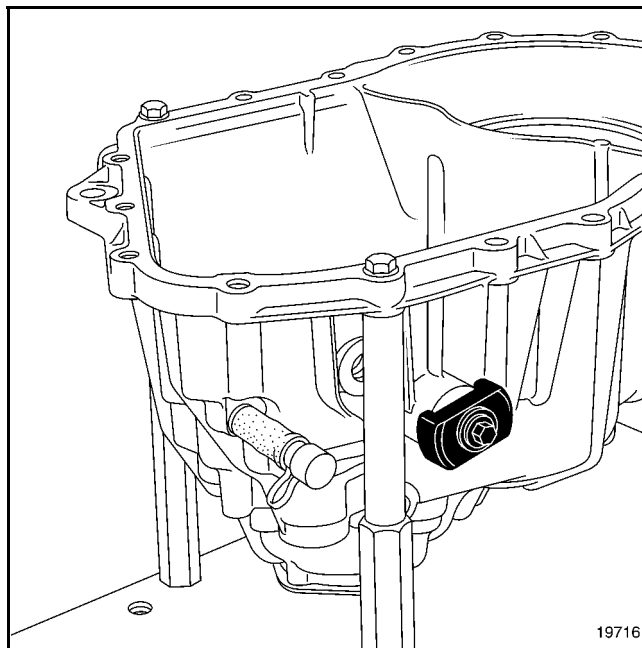


Mechanism housing side

Remove the gear shift finger and use a **14 diameter** general purpose puller to remove the bushings.

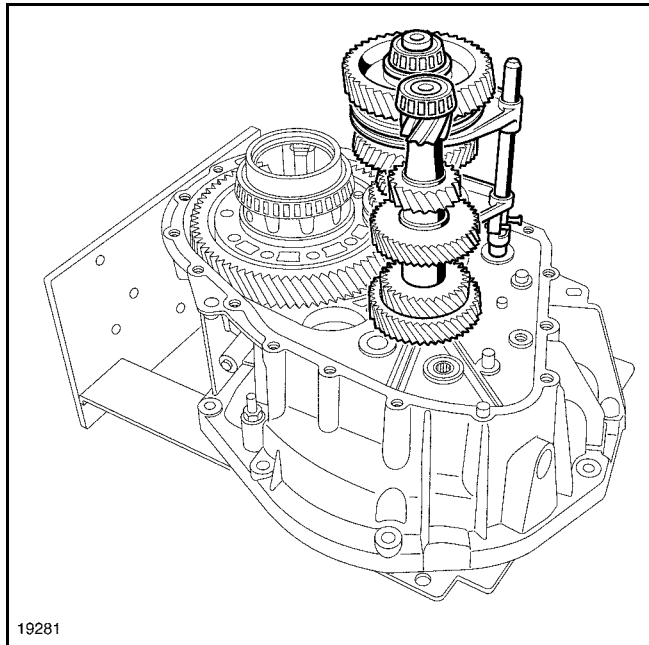


Refit the bushings using **B. Vi. 1510-01R**.

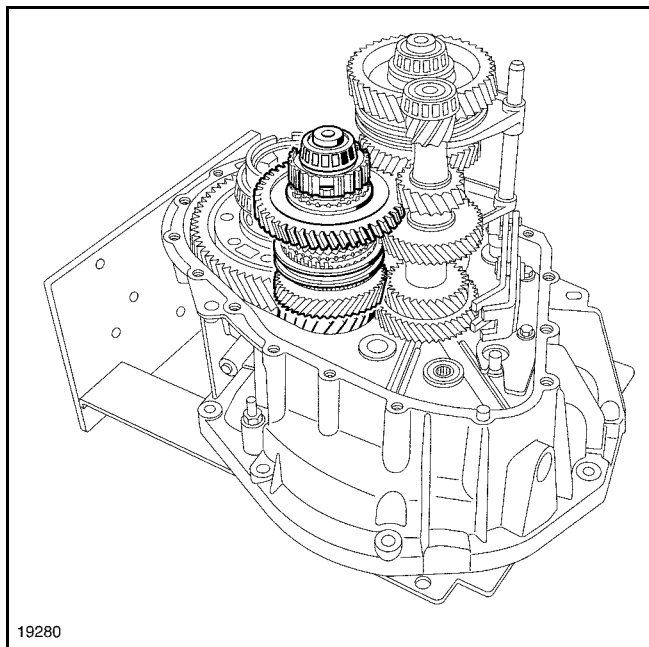


REFITTING THE SHAFTS

Fit the differential and the long secondary shaft - primary shaft with fork assembly.

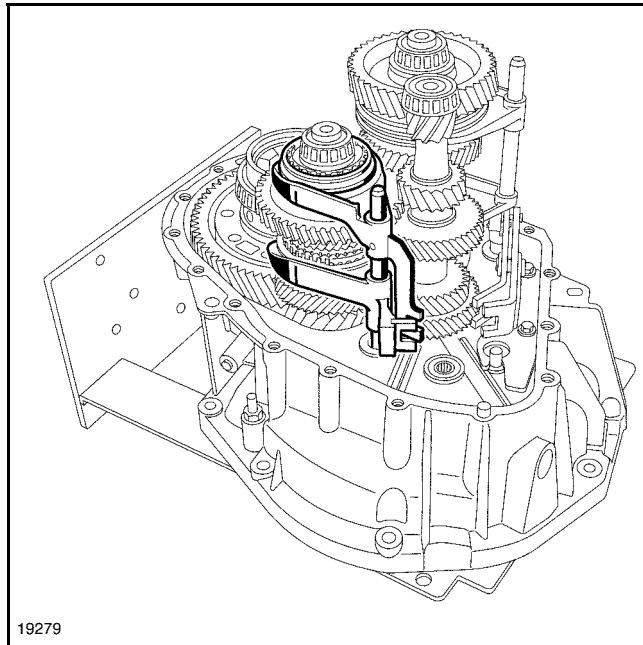


Fit the 1st/2nd and 5th/6th gear reverse switches and the short secondary shaft.

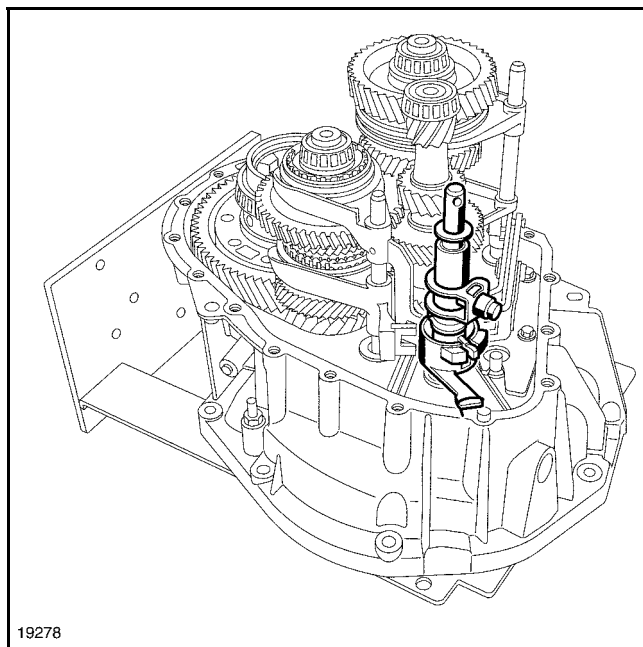


Fit:

- the 3rd/4th gear fork and the sliding shaft - fork - reverse gear shaft assembly,



- the control unit and engage the unit in its housing; then turn it to 3rd/4th gear position and shift the spring above the bushing.



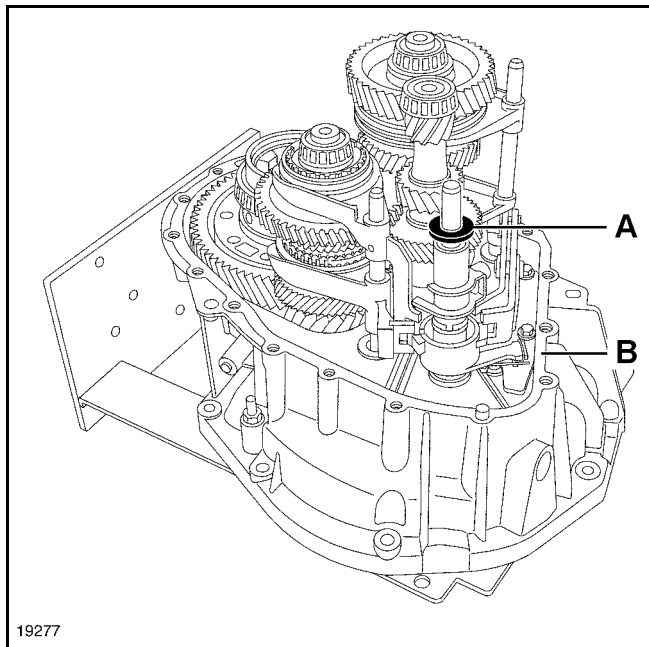
MANUAL GEARBOX

Repairing the gearbox

21

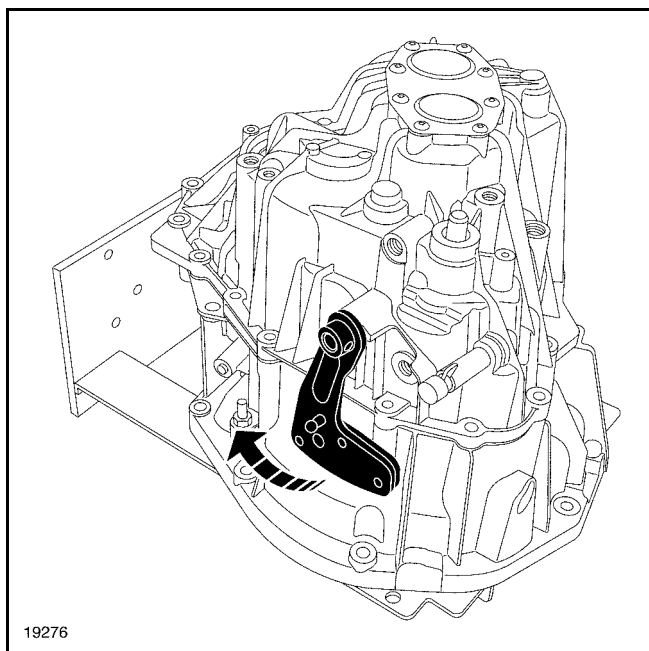
Check that the unit setting washer (A) is correctly fitted.

Apply a line of silicone around the gasket face (B).



Offer up the mechanism housing while moving the gear shift finger towards the front and engage it.

Adjust the controls to engage the finger in the unit fork.

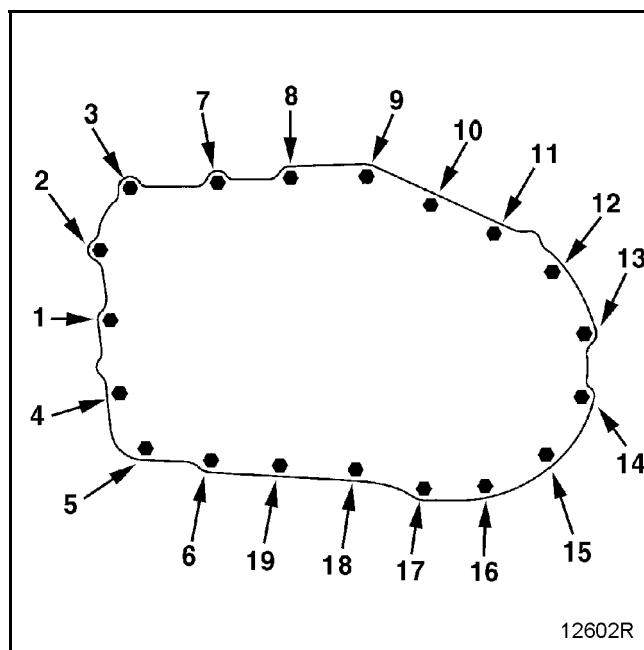


Position the bolts around the unit.

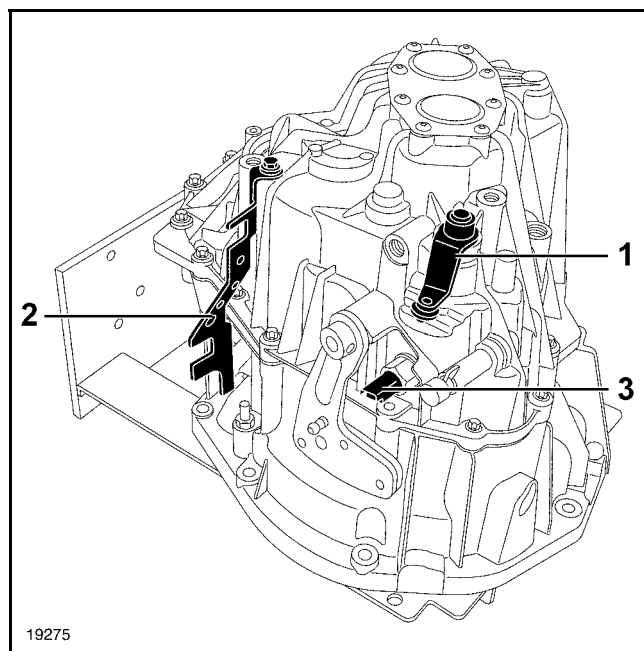
Pretighten bolts (2) and (14) to **1 daNm**.

Turn the primary shaft while shifting the gears.

Tighten all the bolts to **2.4 daNm** in the order shown in the diagram below.

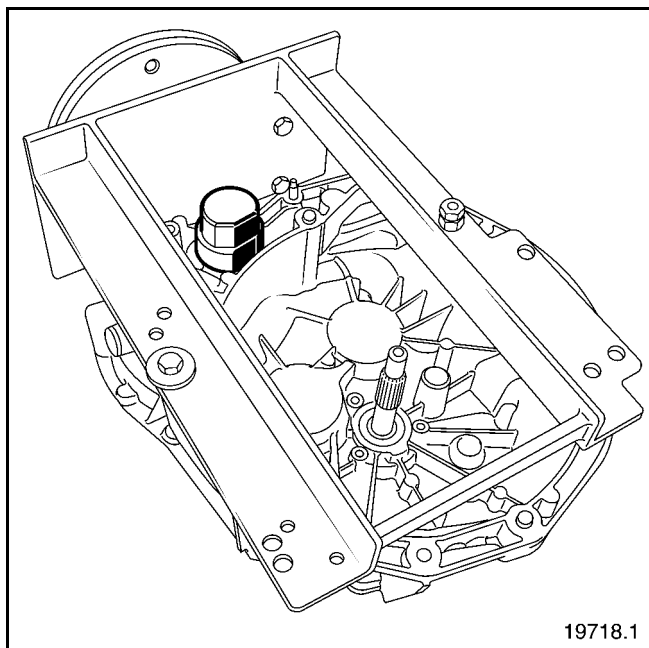


Refit the selector finger (1), the control cable mounting (2) and the reversing light switch (3).

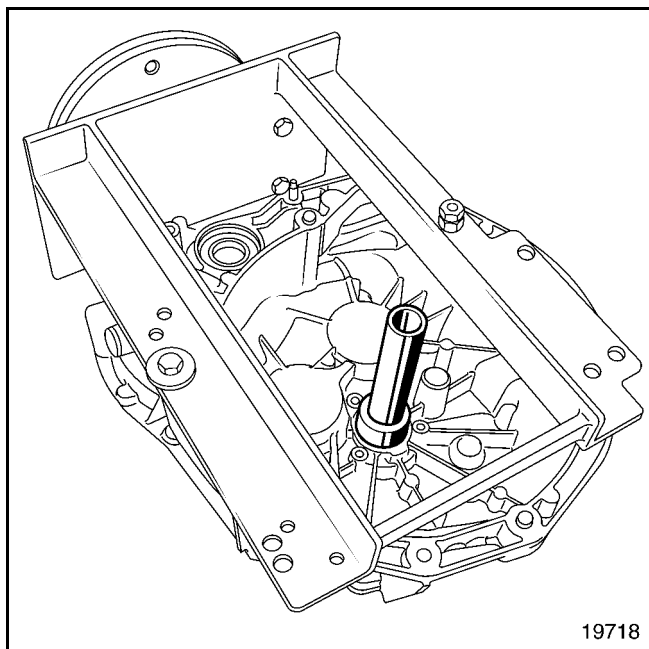


Fit:

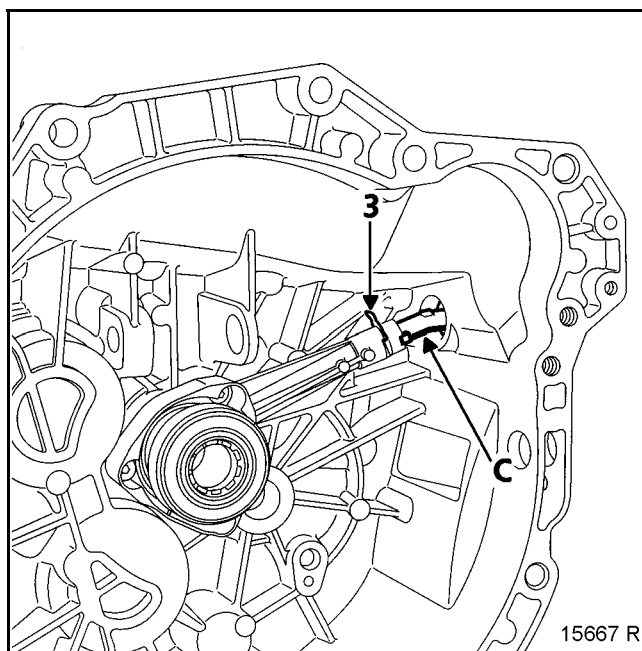
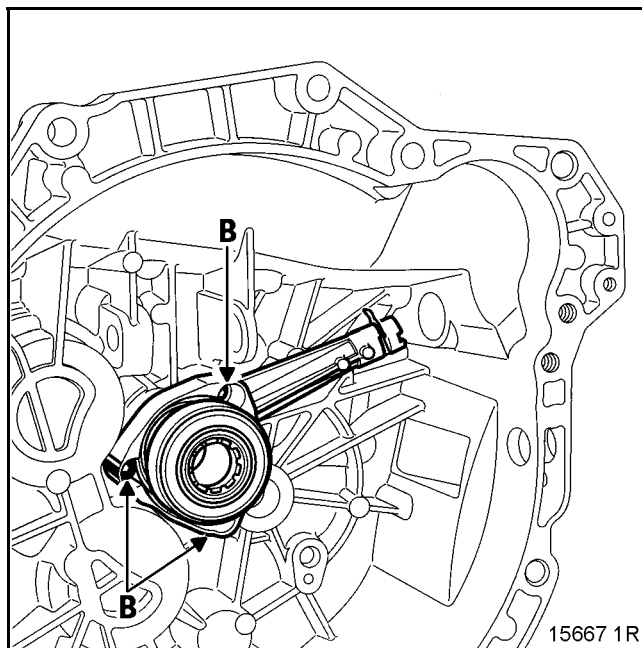
- the differential output lip seals using tool **B. Vi. 1235**,



- the primary shaft output lip seals using tool **B. Vi. 1236**.



Refit the slave cylinder and tighten the three bolts (B) to **0.8 daNm**.



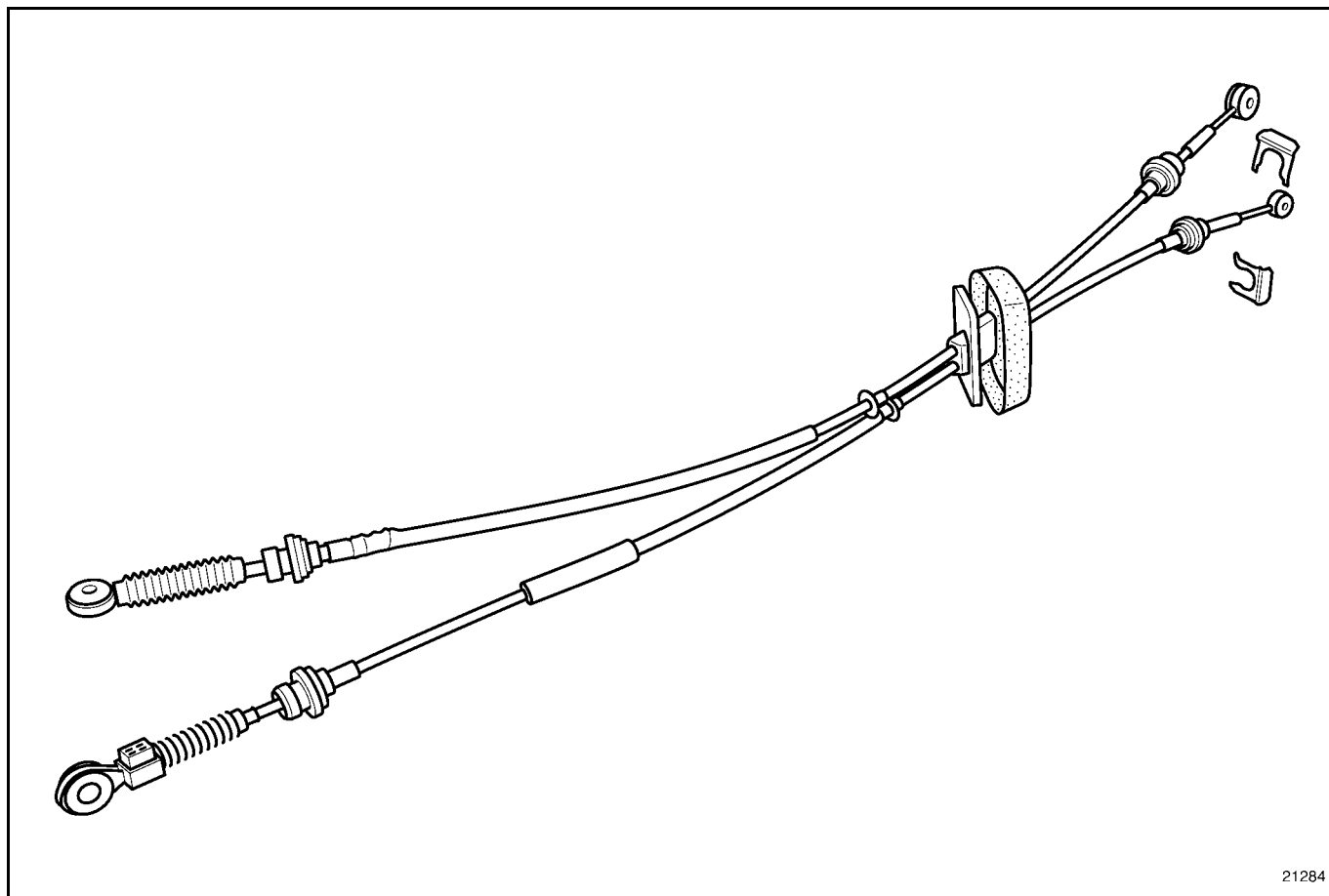
Couple union (C) and the clipper together with clip (3).

MECHANICAL ELEMENT CONTROLS

External control cables


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EXPLODED VIEW



21284

Engine side

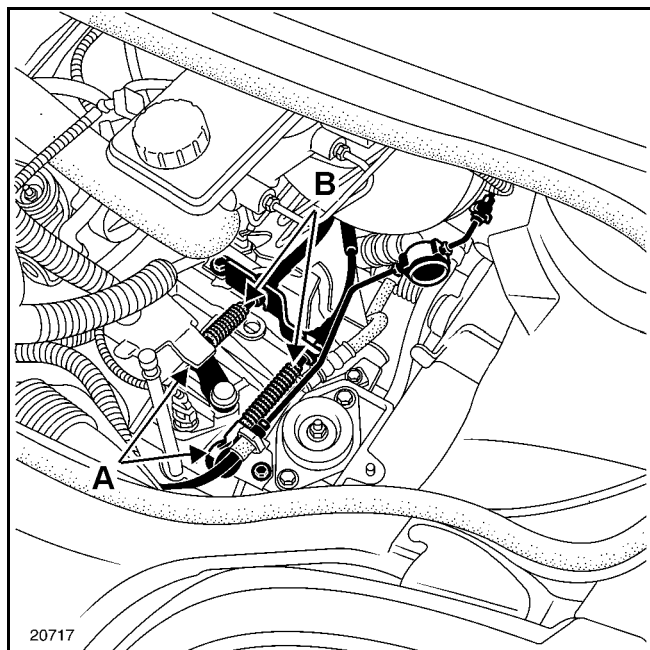
| TIGHTENING TORQUES (in daNm) | |  |
|---|-----|---|
| Unit mounting bolt | 2.1 | |
| Gearbox cable guide plate mounting bolt | 2.1 | |

REMOVAL

Open the bonnet.

Remove:

- the top sound insulation box of the gearbox (where fitted) fixed by a clip,
- the two external gearbox control ball joints (A),
- the two external gearbox control cable clips (B),

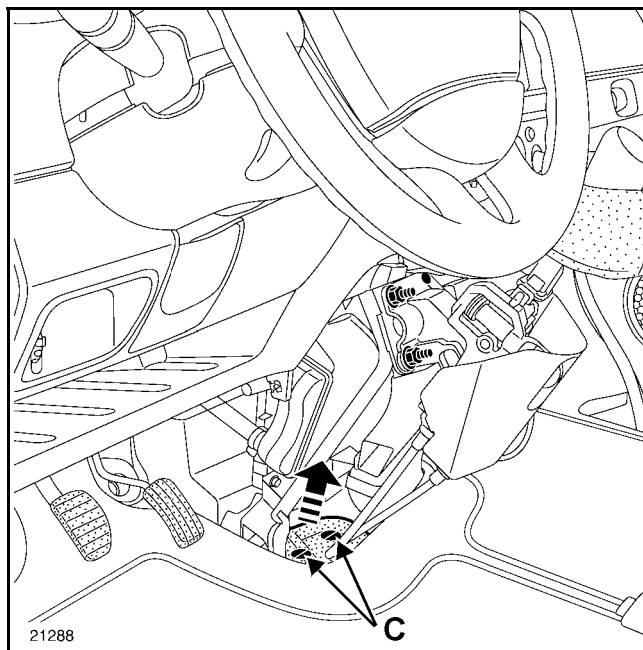


Passenger compartment side

REMOVAL

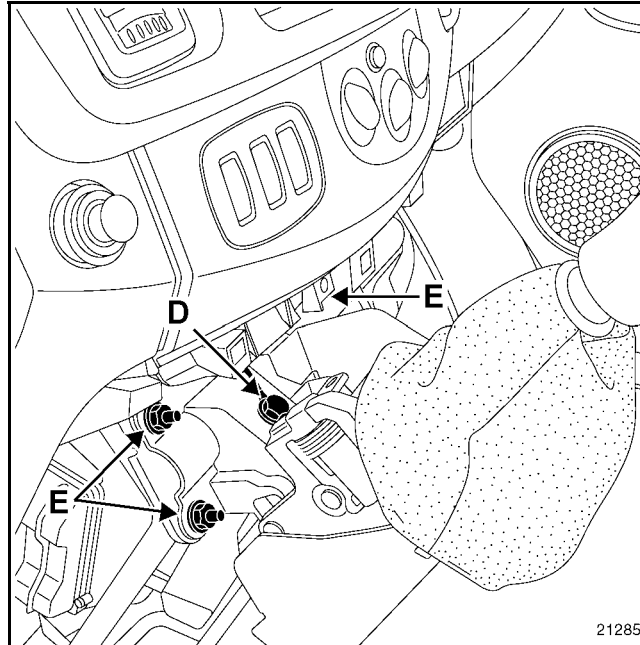
This operation is carried out after having removed the centre console (see relevant chapter).

Lift the protective foam cover from the control cables in order to unscrew the two nuts (C) holding the gearbox cable guide in place.



Remove:

- the earth bolt (D) of the gearbox control unit,
- the three nuts (E) of the gearbox control unit,



- the gear selection control cables and the control unit.

REFITTING

Proceed in the reverse order to removal.

NOTE:

When replacing the top gearbox sound insulation box, check for the presence of the gearbox air duct.

Engine side

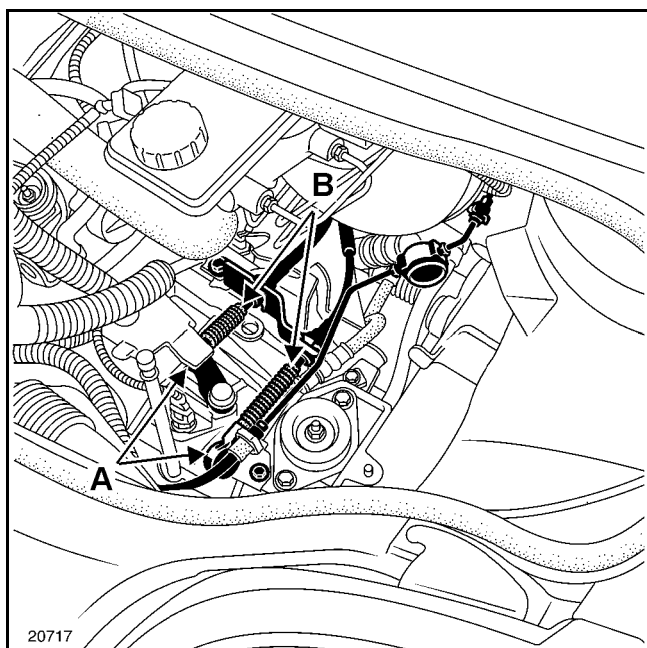
REMOVAL OF THE GEAR CHANGE AND GEAR SELECTION CABLES

REMOVAL

Open the bonnet.

Remove:

- the top sound insulation box of the gearbox (where fitted) fixed by a clip,
- the two external gearbox control ball joints (A),
- the two external gearbox control cable clips (B),

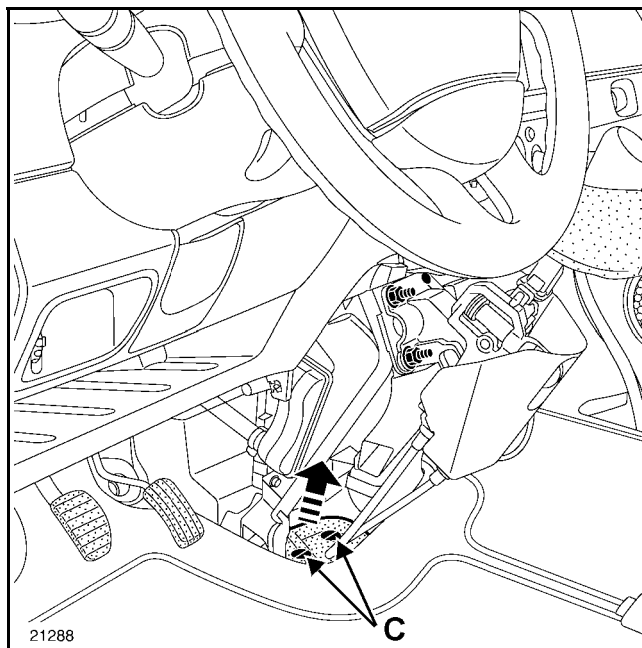


Passenger compartment side

REMOVAL

This operation is carried out after having removed the centre console (see relevant section).

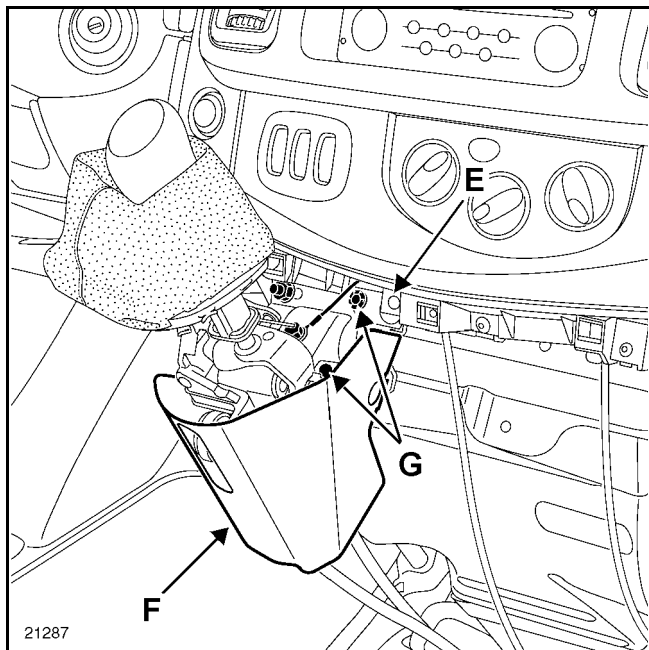
Lift the protective foam cover from the control cables in order to unscrew the two nuts (C) holding the gearbox cable guide plate in place.



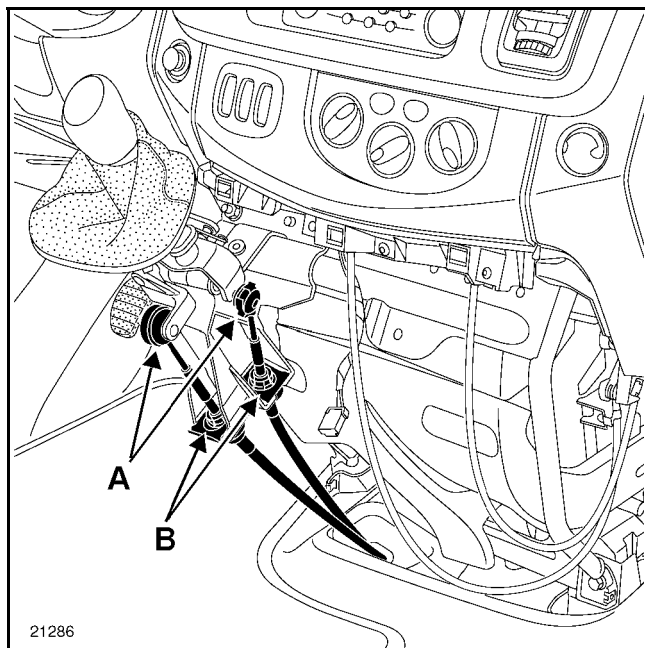
REMOVAL OF THE GEAR LEVER SUPPORT PROTECTIVE PLATE

Remove:

- the nut (E),
- the lower bolt (F),
- the two circlips (G) holding the gear lever support protective plate in place,
- the gear lever support protective plate,



- the two internal gearbox control cable ball joints (A),
- the two internal gearbox control cable clips (B),



Withdraw the two cables completely.

REFITTING

Proceed in the reverse order to removal.

NOTE:

When replacing the top gearbox sound insulation box, check for the presence of the gearbox air duct.

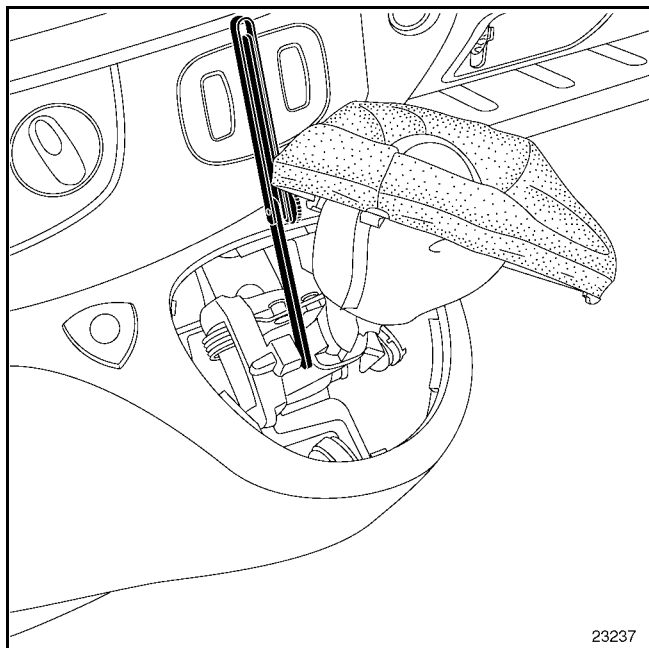
CHECKING

With the lever in neutral, check using a set of shims.

The clearance of line 3/4.

The correct clearance is:

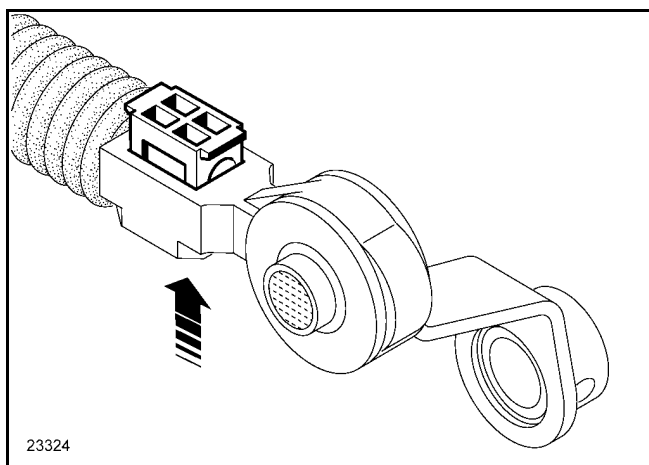
- the **4.35 mm** shim does not clear,
- the **3.30 mm** shim clears.



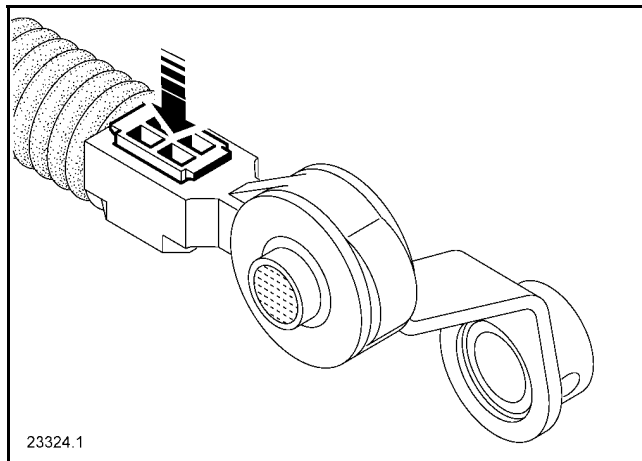
In the opposite case a readjustment is necessary.

ADJUSTMENT

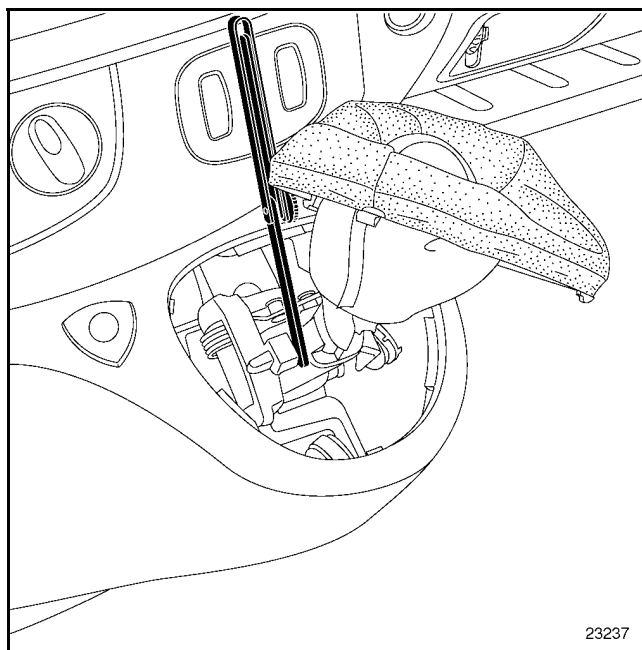
- 1) Unlock the yellow clip from the end piece/cable connection system.



- 2) Position the gear lever in 4th.
- 3) Lock the yellow clip from the end piece/cable connection system.



- 4) Check the clearance:
 - the **4.35 mm** shim does not clear,
 - the **3.30 mm** shim clears.



- 5) If it is not correct: replace the entire control.