

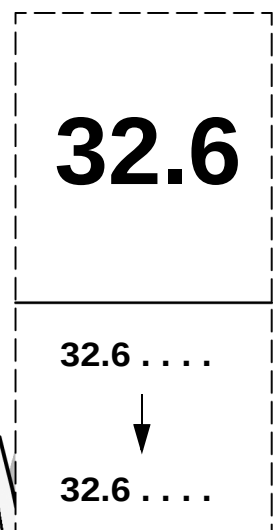
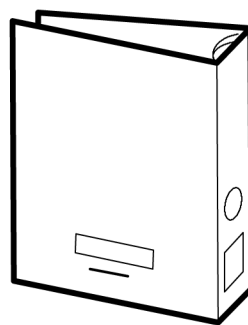
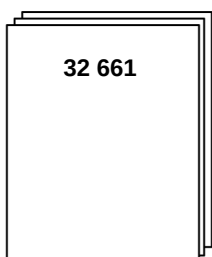
32 661 - GB - 10/2004

GEARBOX OPTIDRIVER 2

RANGE	FAMILY	VARIANT
RENAULT MAGNUM DXi 12 440 - 480	17RD	150FX
	17SD	
	17TD	



The above information may change in the course of time. Only the "Consult" section of the workshop manuals repertory in standard N° 10320 serves as reference.



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GENERALITIES

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Warnings	150FX			31/03/2003	A-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Conventional symbols	150FX			23/05/2002	A-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	General instructions	150FX			07/10/2002	A-6
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Presentation of the gearbox	150FX			28/08/2003	A-7
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Transmission control unit	150FX			28/08/2003	A-8
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Countershaft disc brake	150FX			29/08/2003	A-10
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Power flow diagram	150FX			27/08/2003	A-11
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Lubrication system	150FX			24/06/2003	A-13
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Sensors and electrical connections	150FX			24/06/2003	A-14
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Sensors and compressed air system unions	150FX			24/06/2003	A-15
	17SD						
	17TD						

Warnings

In this document, safety instructions are symbolized as follows:



DANGER! NON-OBSERVANCE OF THE PROCEDURE DESCRIBED OR LACK OF CARE OR ATTENTION, RISK CAUSING SERIOUS INJURY OR EVEN DEATH.



WARNING! Any different or inappropriate working method risks causing damage to the product.



NOTE! *Draws attention to particular or important points of the method.*



Comply without fail with the regulations in force relative to the recovery and treatment of used parts and waste.

Conventional symbols

Fitting

	Tighten to torque (Nm) (left-hand thread)		Tighten by indicated value
	Tighten to torque (Nm) (right-hand thread)		Loosen by indicated value
	Tightening torque with lubricated threaded hardware		

Dimensioning

	Tightening		... Greater than or equal to ...
	Equal to		Wear limit
	... Less than ...		Machining limit or dimension
	... Greater than ...		Maximum out-of-true
	... Less than or equal to ...		Maximum parallelism error

Repair

	Force to be exerted in the direction shown (hammer - press)		Smear or coat (see "Consumables" table)
	Heat or cool: Temperature in degrees Celsius (e.g. + 80 °C)		Fill to level (see "Technical Data" and "Consumables" table)
	Weld bead		Grease or oil (see "Consumables" table)
	Repair time - Heating time		Mark - Assemble according to marking

Adjustment

	Rotating friction torque		Turn anti-clockwise
	Turn in alternate directions		Turn anti-clockwise (the figure shows the number of turns)
	Turn clockwise		Turn clockwise (the figure shows the number of turns)
	Place in contact		Move in the direction shown
	Dimension to be assured (mm)		

Various information

	Exhaust - Outlet		Operation with a sequence
	Intake - Inlet		Involves
	Weight in kg (example: 275 kg)		Return to numbered operation - Connected with numbered operation
	Depending on versions or options		Withdraw - Delete
	Wrong		Direction of disassembly (the arrow shows the direction)
	Correct		Direction of assembly (the arrow shows the direction)
	Injection		... to ...
	Repair dimension		Inspect - Check condition of part
	Part to be replaced		Danger for persons, vehicle or equipment

General instructions

Practical advice

Prior to any work:

- Clean the major unit and its surrounds (See Driving Servicing Handbook, "Vehicle washing").
- Ensure the batteries are disconnected.
- Mark the pipes and wiring harnesses, if necessary.
- Protect all ports to prevent the ingress of foreign matter.
- Before disconnecting an air pipe, drop the circuit pressure.
- If liquid is splashed onto the bodywork, clean quickly with a cleaning product recommended by RENAULT TRUCKS.

Preparation prior to assembly:

Carefully clean and check all the parts.

Do not unpack a new bearing until you are ready to install it. Do not clean off the protective grease on new bearings.

Old seals and lock-plates must be discarded and new ones fitted.

Never force fit parts with copper or brass punches or drifts. Always use a specially adapted driver to prevent ingress of metal particles into the casings and bearings. Always oil parts prior to force fitting.

Always apply grease on the inside of seal ring lips.

Shrink fitted parts are to be heated with a hot air blower or in an oven. etc. Flame heating is strictly forbidden.



When using a torque multiplier, calibrate the torque wrench/multiplier unit at the required torque loading.

Fastening, locking, sealing and adhesive products:

Prior to assembly, carefully clean the product application surfaces of the parts. Old product residue is to be removed. Threaded portions are to be brushed, tapped and, if necessary, cleaned with a suitable product.

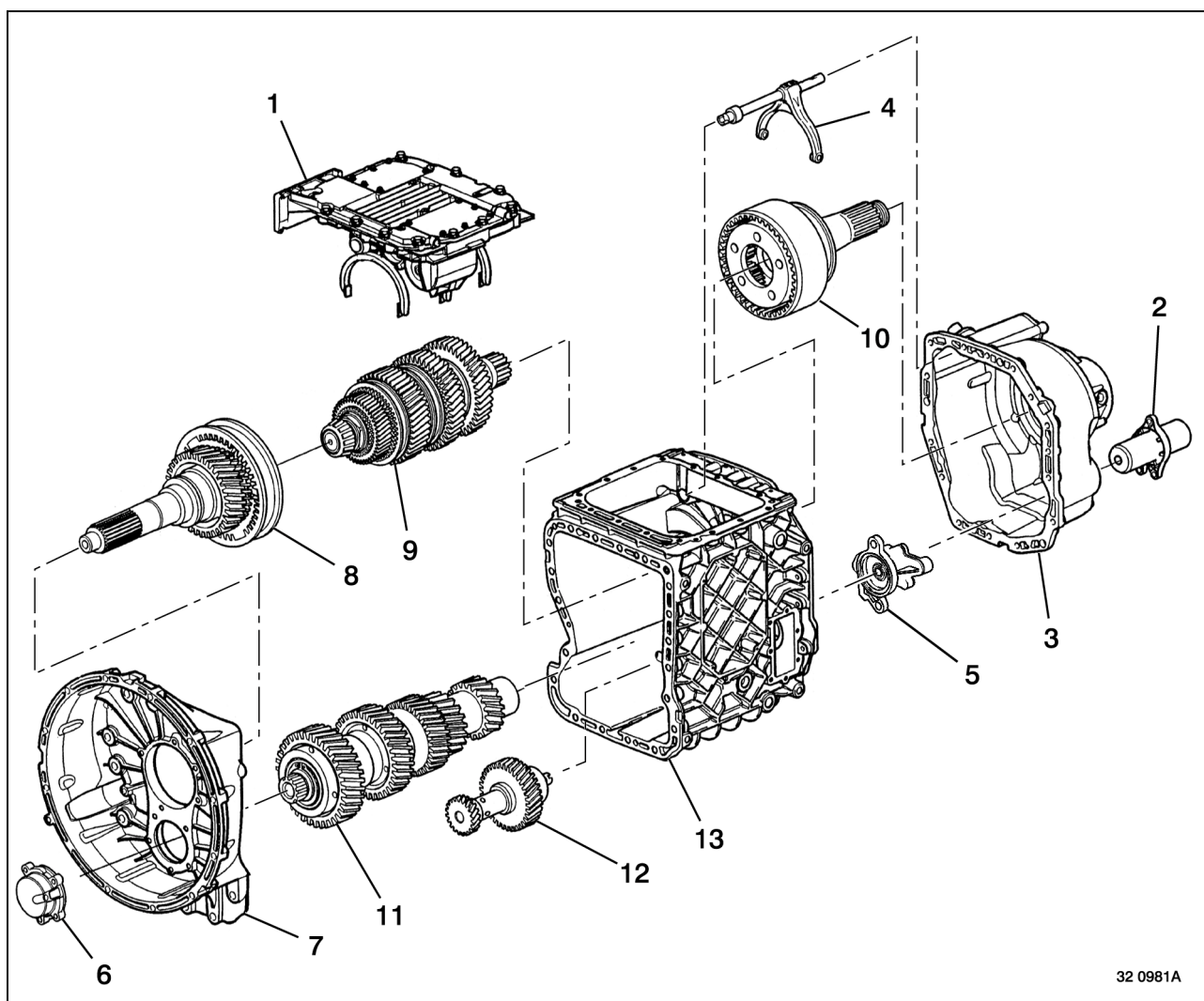
Using the product:

Always adapt the recommended product while observing the utilization conditions appearing on the pack:

- Surface finish,
- Working temperature,
- Reaction, drying, etc. time,
- Shelf life.

Observe the assembly method so as to guarantee the quality of the repair.

Presentation of the gearbox



32 0981A

The gearbox consists of 3 main parts.

- The clutch casing (7), which also serves as front wall for the gearbox.
- The basic gearbox casing (13), which contains the primary shaft, the secondary shaft, the countershaft, the reverse shaft, the selector mechanism integrated in the transmission control unit, together with the range change and the splitter.
- The range change casing (3), which contains the epicyclic gear train for the range change and the output shaft (10).

The principal gearbox parts are:

- Primary shaft (8),
- Secondary shaft (9),
- Range change (10), with selector mechanism (4),
- Intermediate shaft (11), with disc brake (6),
- Reverse shaft (12), with oil pump drive shaft (5),
- Transmission control unit (1), with gear change mechanism.

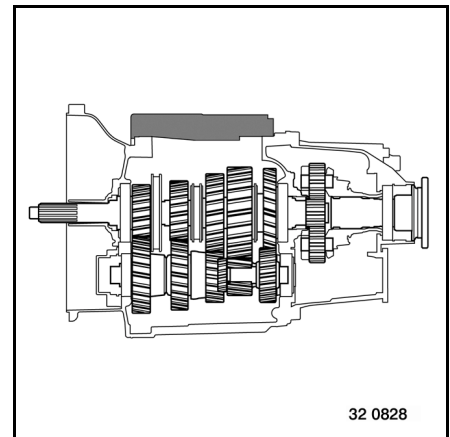
The countershaft and reverse shaft gears and all the basic gears are on the secondary shaft, with the range change sun gear on the secondary shaft. The countershaft gears are fixed.

The range change, which consists of an epicyclic gear train forms integral part of the output shaft.

The oil pump drive shaft forms integral part of the reverse shaft.

Transmission control unit

The transmission control unit is located above the gearbox.

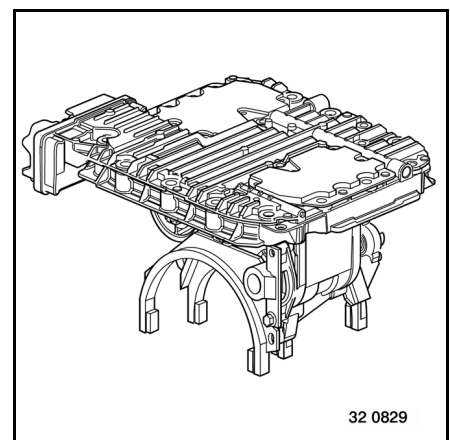


The gears are selected by means of the gear selector. When a gear is selected, the system first of all reduces the engine torque to an acceptable level and the gearbox is put into neutral.

When the gearbox is in neutral, the engine speed is adjusted so as to choose the correct engine speed for the gear selected and the gear is then engaged.

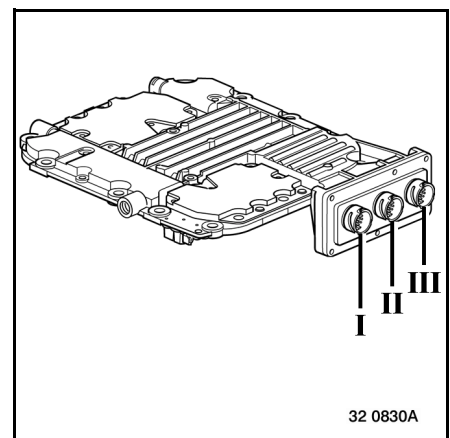
The control unit casing cover serves to house the following components:

- 3 electrical connections,
- 1 transmission control unit (TECU),
- 9 solenoid valves,
- 1 pressure sensor.



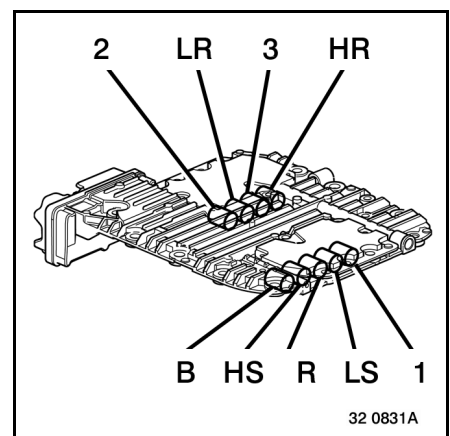
The control unit casing cover includes 3 electrical connections:

- I: vehicle communication ,
- II: retarder,
- III: clutch.



The control unit casing cover serves to house 9 solenoid valves:

- 1: solenoid valve 1st gear,
- 2: solenoid valve 2nd gear,
- 3: solenoid valve 3rd gear,
- R: reverse solenoid valve
- B: disc brake solenoid valve,
- LR: low range solenoid valve,
- HR: high range solenoid valve,
- HS: high split solenoid valve,
- LS: low split solenoid valve.



The following are located in the control unit casing:

- 4 parallel cylinders: splitter, 2/3, 1/R and range change,
- 4 induction sensors for the piston positions,
- 2 speed sensors, one for the secondary shaft and another for the countershaft,
- 1 oil temperature sensor and selector forks for the splitter and basic gearbox casing.

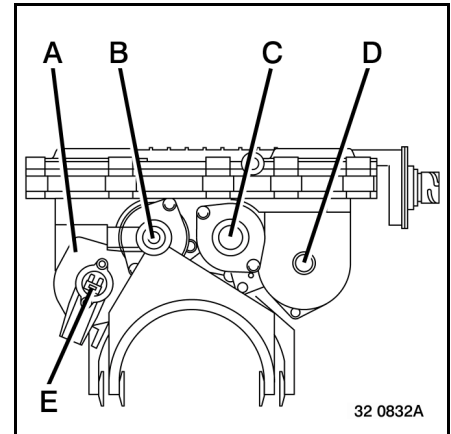
A: splitter cylinder

B: 1/R cylinder

C: 2/3 cylinder

D: range change cylinder

E: splitter cylinder position sensor



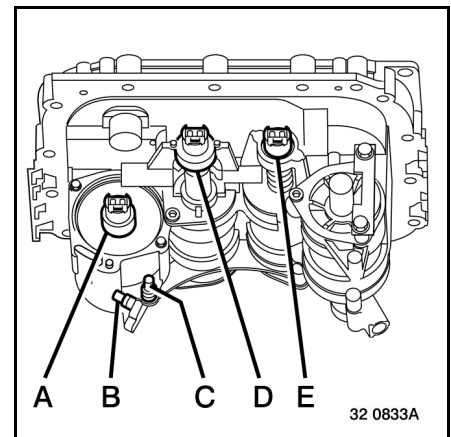
A: range change cylinder position sensor

B: countershaft speed sensor

C: secondary shaft speed sensor

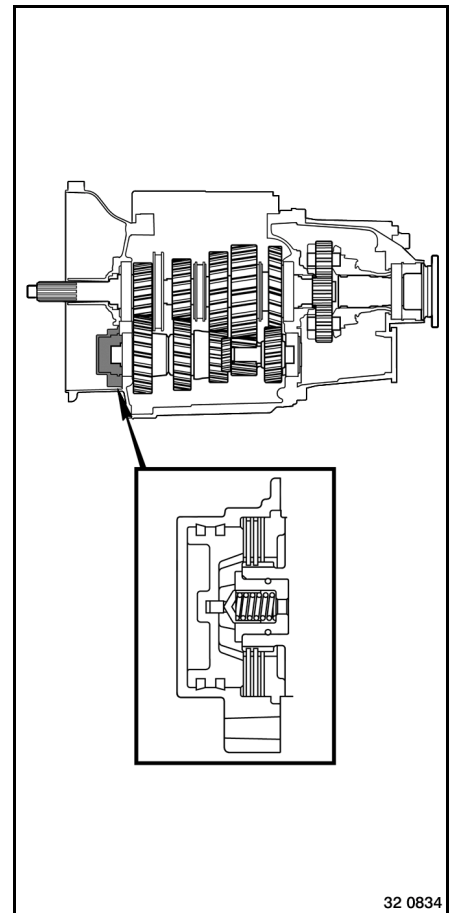
D: 2nd and 3rd gears cylinders position sensor

E: 1st and reverse gears cylinders position sensor



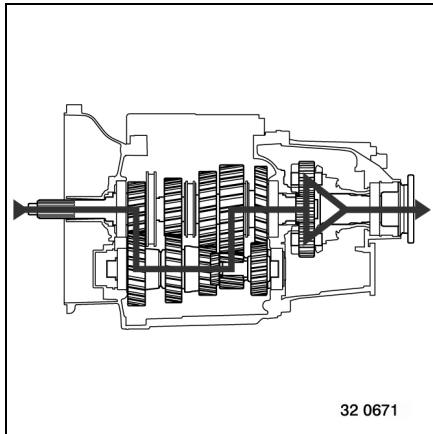
Countershaft disc brake

The countershaft disc brake is placed at the front of the gearbox, on the end of the countershaft. It is designed to brake gearbox rotating components when a moving off gear is activated. This device serves to eliminate wear, noise and friction in the gearbox. The disc brake is activated by an built-in air-operated ram.

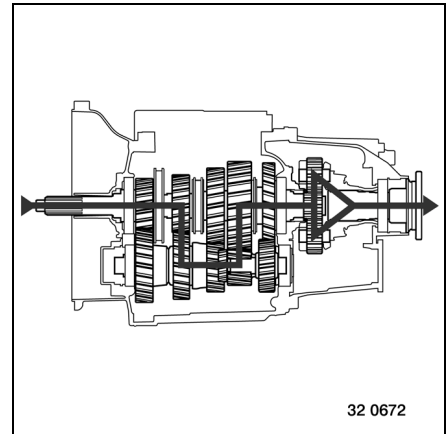


Power flow diagram

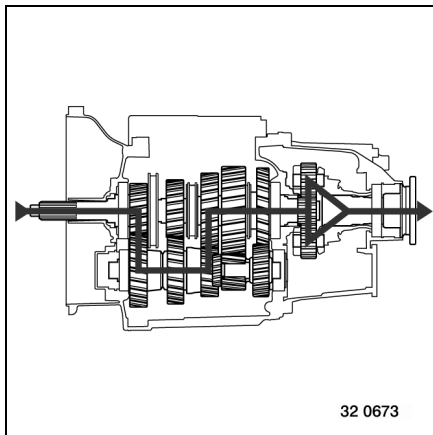
1st gear



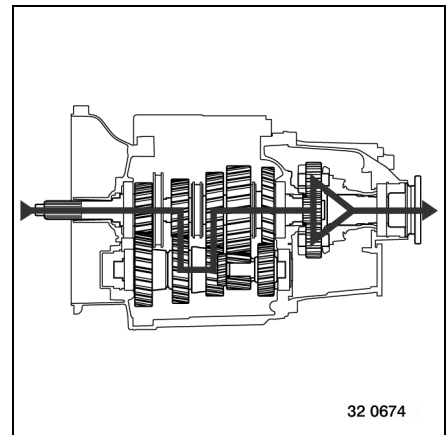
2nd gear



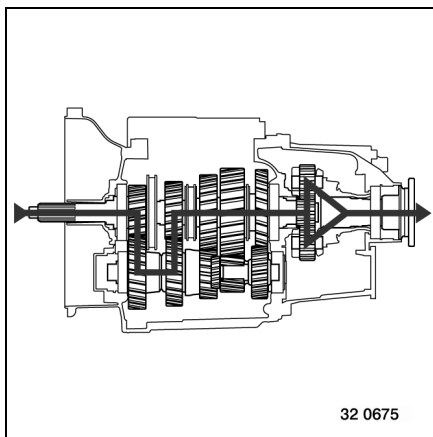
3rd gear



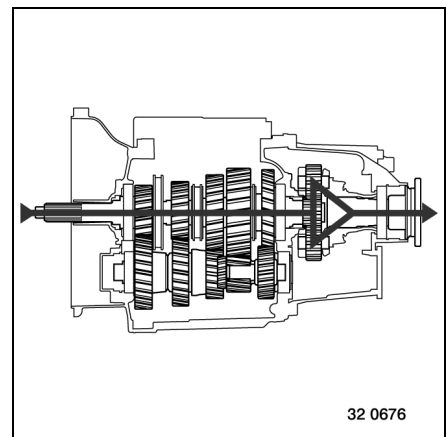
4th gear



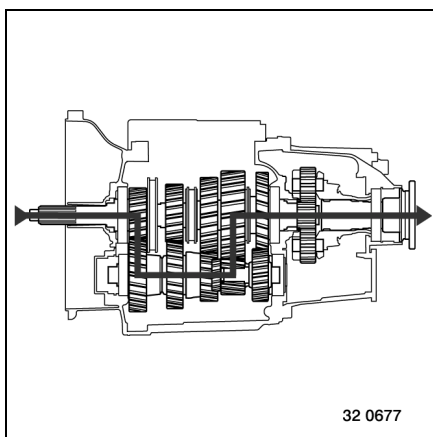
5th gear



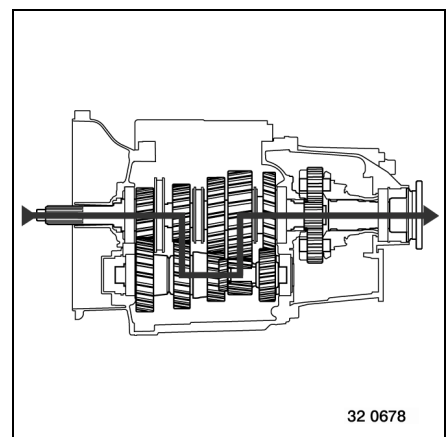
6th gear



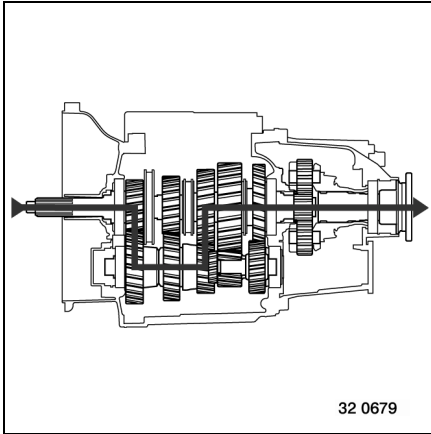
7th gear



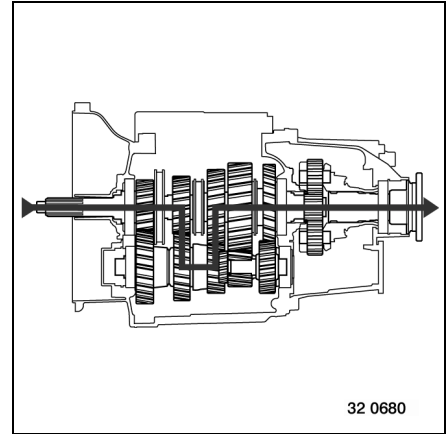
8th gear



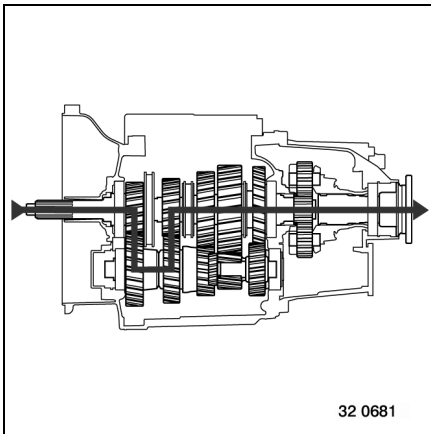
9th gear



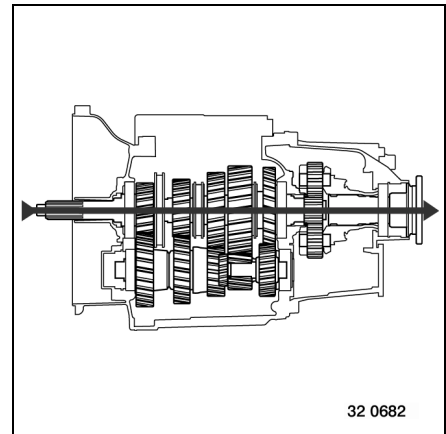
10th gear



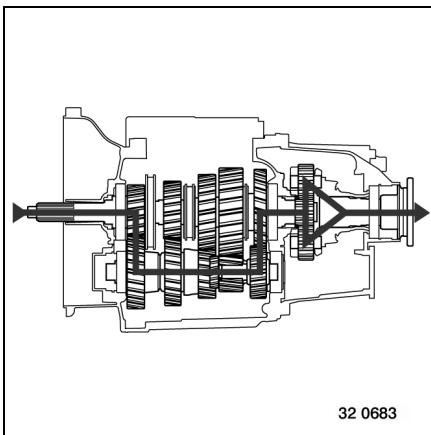
11th gear



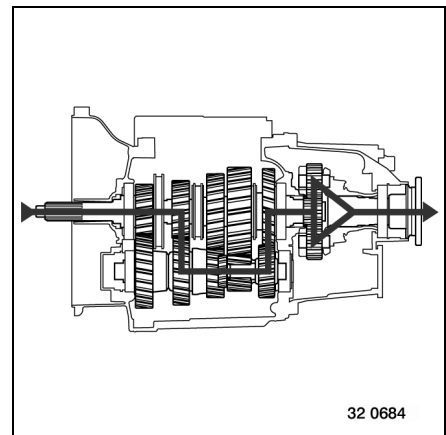
12th gear



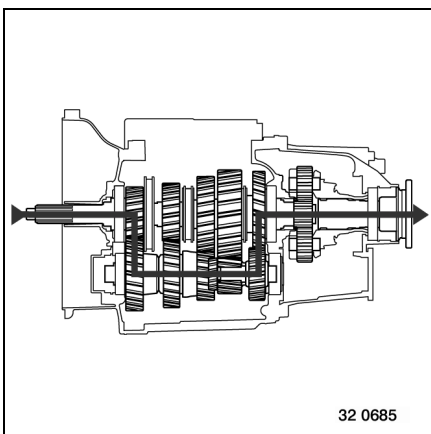
Reverse R1



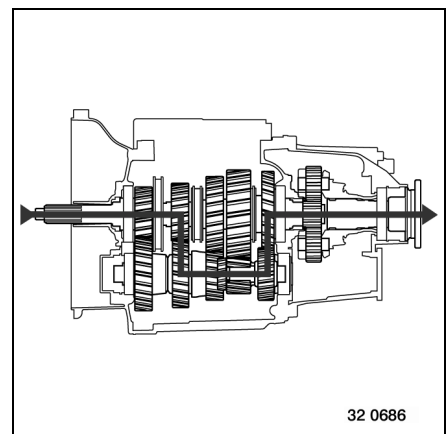
Reverse R2



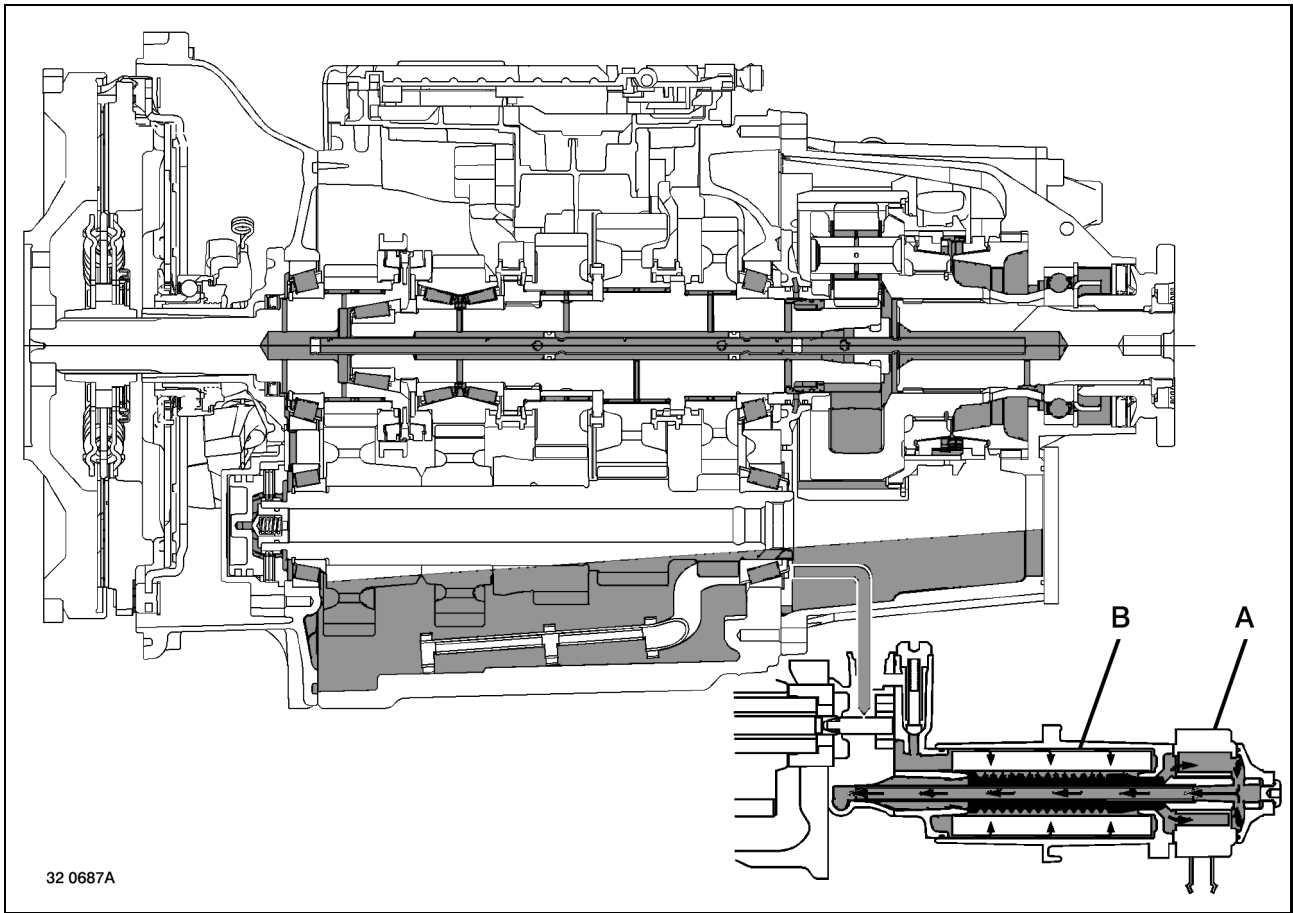
Reverse R3



Reverse R4



Lubrication system



The gearbox is lubricated by a combination of splash (for the countershaft and the reverse shaft) and by an oil pump **(A)** (for the primary shaft, the secondary shaft and the range change).

An oil filter **(B)**, of the cartridge type, is fitted on the delivery side of the oil pump. It is located on the filter housing and is accessible from the outside. The filter is protected by a cover located on the range change casing.

The oil is delivered to the secondary shaft to lubricate and cool the range change gears as well as the primary shaft and secondary shaft bearings.

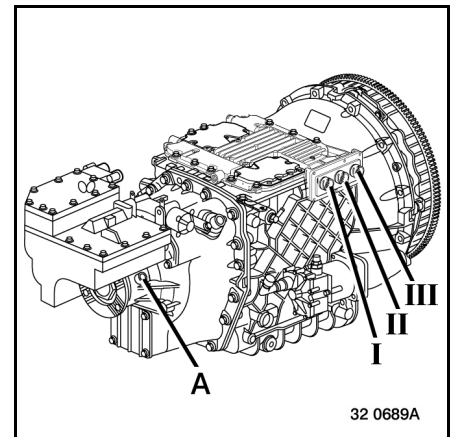
Sensors and electrical connections

I: vehicle communication

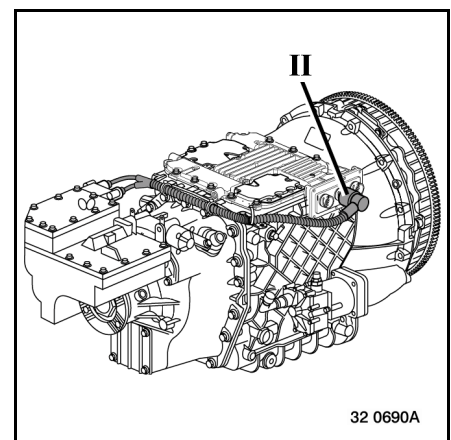
II: retarder

III: clutch servo control

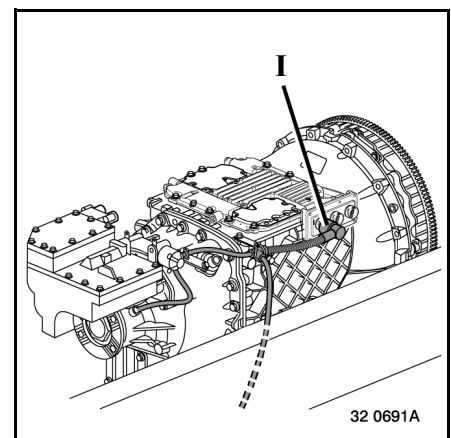
A: speed sensor



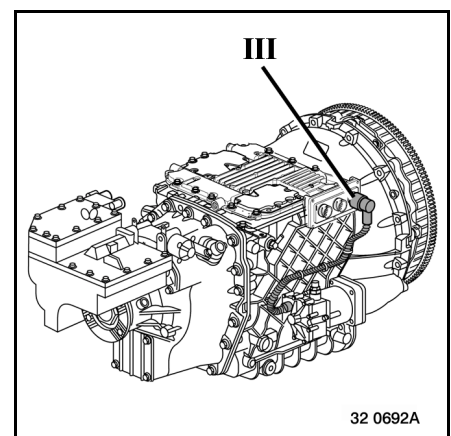
Wiring connecting the control unit connector (II) to the retarder.



Wiring connecting the control unit connector (I) to the speed sensor and to the chassis wiring.

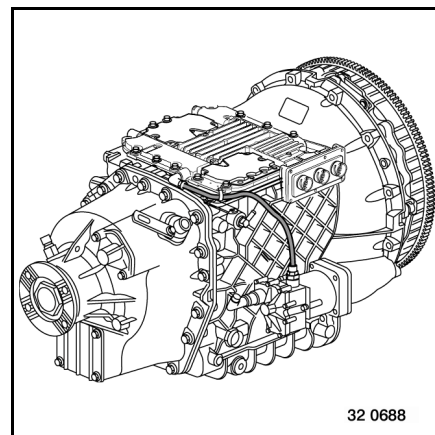


Wiring connecting the control unit connector (III) to the clutch servo control.

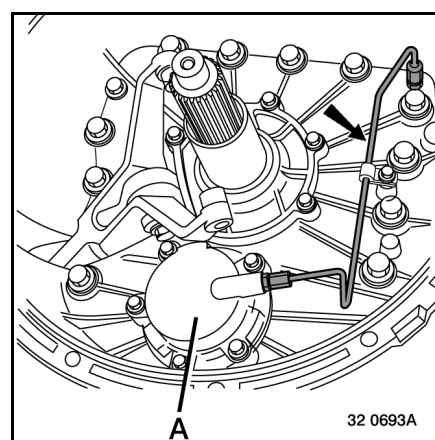


Sensors and compressed air system unions

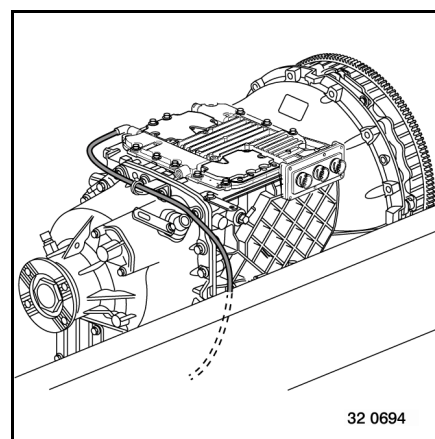
Compressed air connections between the control unit and the clutch servo control.



Compressed air connections between the control unit and the countershaft disc brake .



Compressed air connections between the control unit and the compressed air tank.



TECHNICAL DATA

APPLICABILITY**General features**

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Identification plate	150FX			09/10/2003	B1-5
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Generalities	150FX			19/06/2003	B1-6
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Gearing	150FX			19/06/2003	B1-6
	17SD						
	17TD						

Tightening torques

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Definitions	150FX			08/04/2004	B2-1
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Standard nut and bolt tightening torques table	150FX			08/04/2004	B2-2
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Basic gearbox	150FX			19/06/2003	B2-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Transmission control unit	150FX			19/08/2003	B2-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Range change	150FX			19/08/2003	B2-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Clutch slave cylinder	150FX			22/08/2003	B2-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Retarder	150FX			22/08/2003	B2-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Heat exchanger	150FX			22/08/2003	B2-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Oil pump	150FX			04/03/2004	B2-5
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Oil filter	150FX			11/03/2004	B2-5
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Countershaft	150FX			20/06/2003	B2-5
	17SD						
	17TD						

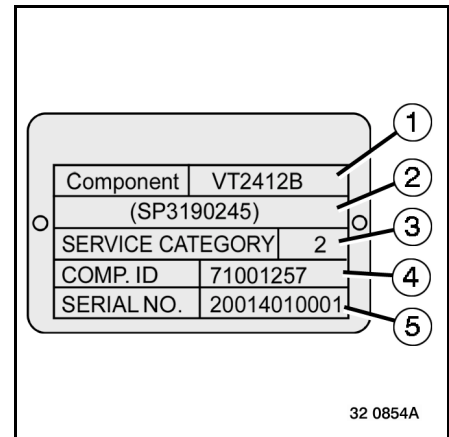
Dimensions and tolerances

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Shafts	150FX			19/06/2003	B3-1
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Oil pump	150FX			08/03/2004	B3-1
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Range change	150FX			08/03/2004	B3-1
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Primary shaft	150FX			08/03/2004	B3-1
	17SD						
	17TD						

General features

Identification plate

- 1: Component designation
- 2: Spare part number
- 3: Service category
- 4: Factory part number
- 5: Gearbox serial number



Component symbolization

V	VOLVO
T	Transmission
24	Maximum torque = 2400 Nm
12	Number of forward speeds
B	Model

Serial number details

2001	Year of manufacture
40	Week of manufacture
1	Day of week
0001	Manufacturing sequence number

Generalities

Make	VOLVO
Type	VT2412BGSS-AGS non synchromesh
Range change	Synchromesh
Splitter	Synchromesh

Number of speeds

Forward	12
Reverse	4
Weight without oil	265 kg
Length	916 mm

Gearing

Gear position	Step-down ratio
1 st	14.94:1
2 nd	11.73:1
3 rd	9.04:1
4 th	7.09:1
5 th	5.54:1
6 th	4.35:1
7 th	3.44:1
8 th	2.70:1
9 th	2.08:1
10 th	1.63:1
11 th	1.27:1
12 th	1.00:1
Reverse R1/R2	17.48/13.73:1
Reverse R3/R4	4.02/3.16:1

Tightening torques

Definitions

Tightening torques

There are several types of tightening:

- Tightening to torque (in **Nm**)
- Tightening to angle (in °)
- Tightening to torque-angle (in **Nm + °**)

Torques given in **Nm** are nominal torques (average value calculated on the basis of the minimum torque and the maximum torque).

The tightening precision class defines the tolerance of this torque in percent as a function of the nominal torque applied.

For standard threaded hardware, use the following table.

For other torques, see the following page(s).



"FIH" type (Nylstop) locknuts must be replaced whenever removed. "DRH" type (oval) locknuts can be re-used. If locknuts (DRH, FIH or other) are re-used, make absolutely certain that the screw-thread of the bolt protrudes least two threads above the top edge of the nut.

Standard nut and bolt tightening torques table

The tightening torque values given in the table are based on standard 01.50.4002 and apply to new nuts and bolts fitted dry and re-used nuts and bolts with oil applied to the screw-threads. If any nuts and bolts are replaced, **it is absolutely essential to use nuts and bolts recommended by the RENAULT TRUCKS Spare Parts Department** (coefficient of friction in compliance with standard 01.50.4002).

Tightening torques for conventional nut and bolt hardware to "metric system" standard 01.504.002 (H: normal and HE: flanged)		
Diameter and pitch of nuts and bolts	Quality class 8.8	Quality class 10.9
6 x 1.00	10 ± 1.5	12 ± 2
8 x 1.25	24 ± 4	30 ± 5
10 x 1.50	48 ± 8	60 ± 10
12 x 1.75	85 ± 15	105 ± 20
14 x 2.00	140 ± 25	175 ± 30
16 x 2.00	220 ± 35	275 ± 45
18 x 2.50	290 ± 45	360 ± 55
20 x 2.50	430 ± 70	540 ± 90
22 x 2.50	580 ± 90	730 ± 120
24 x 3.00	740 ± 120	900 ± 140

Basic gearbox

Oil drain plug	35 ^{±5} Nm
Fan shroud union, oil filler	2 turns min. through 45° upwards
Clutch casing to basic gearbox casing securing bolt (tighten in diametrically opposed sequence). M16, M12.	200 ^{±25} Nm 75 ^{±10} Nm
Oil cooler securing nut	50 ^{±5} Nm
Primary shaft cover securing bolt	50 ^{±5} Nm
Secondary shaft cover securing bolt (tighten in diametrically opposed sequence).	40 ^{±5} Nm
Countershaft cover securing bolt (tighten in diametrically opposed sequence).	40 ^{±5} Nm
Countershaft disc brake cover securing bolt	50 ^{±5} Nm
Countershaft disc brake air pipe union	Tighten by hand then through 3/4 of a turn.
Countershaft disc brake pipe fastener securing bolt	20 ^{±3} Nm
Brake pipe union	25 ^{±4} Nm
Slave cylinder securing stud	8 ^{±1.5} Nm
Reverse gear cover securing bolt	20 ^{±3} Nm
Clutch fork securing bolt	120 ^{+20/-10} Nm
Oil level sight: should not normally be loosened.	35 ^{±5} Nm
Aspiration pipe anchorage securing bolt	40 ^{±5} Nm
Aspiration pipe flange securing bolt	20 ^{±3} Nm
Oil pressure sensor notched plug	25 ^{±5} Nm
Temperature sensor	18 ^{±2} Nm
Isolating plates securing bolt	8 ^{±2} Nm

Transmission control unit

Control unit to basic gearbox casing securing bolt (tighten in diametrically opposed sequence).	75 ^{±10} Nm
Control unit cover securing bolt	24 ^{±4} Nm
Countershaft and secondary shaft speed sensors securing bolts	6 ^{±0.6} Nm
Wiring harness guide securing bolt	6 ^{±0.6} Nm
Gear selection and step-down cylinders securing bolt	18 ^{±1.5} Nm
Gear selection cylinders position sensors securing bolt	7 ^{±0.7} Nm

Range change

Range change to basic gearbox casing securing bolt	75^{±10} Nm
Speed selector fork locking bolt, burred with a centre-punch to lock, then lubricated at the time of tightening.	75^{±7} Nm
Output shaft speed sensor	25^{±5} Nm
Flange nut, burred with a centre-punch to lock	400^{+150/-50} Nm
PTO cover securing bolt (tighten in diametrically opposed sequence).	40^{±5} Nm
Selector fork shaft cover securing bolt	40^{±5} Nm
Range change safety interlock securing bolt	20^{±3} Nm
Range change safety interlock locking plug	30^{±5} Nm

Clutch slave cylinder

Clutch slave cylinder to basic gearbox casing securing nut	24^{±4} Nm
Slave cylinder air plug	22^{±3} Nm
Slave cylinder securing stud	8^{±1.5} Nm

Retarder

Retarder securing bolt.	15^{±5} Nm
Retarder to range change casing securing nut: Tighten using a torque wrench, then tighten to 45 ± 5° angle in 2 passes.	30 Nm
Oil filler plug	70^{±10} Nm

Heat exchanger

Heat exchanger to range change casing securing bolt	80 Nm
Oil drain plug	20 Nm
Oil filler plug	70^{±10} Nm
Coolant drain plug	25^{±3} Nm
Adapter plate to heat exchanger securing bolt	30 Nm

Oil pump

Oil pump to basic gearbox casing securing bolt: the countersunk head bolts is to be tightened first.	40 ^{±5} Nm
Oil pump cover securing bolt	20 ^{±3} Nm
By-pass valve plug	45 ^{±5} Nm
Oil aspiration pipe flange securing bolt	20 ^{±3} Nm
Oil distributor threaded plug	250 ^{±35} Nm

Oil filter

Oil filter cover securing bolt	40 ^{±5} Nm
Relief valve plug	45 ^{±5} Nm

Countershaft

Reverse gear nut	450 ^{±100} Nm
Third gear nut	400 ^{±50} Nm

Dimensions and tolerances

Shafts

Shaft pre-loading

Secondary shaft	0.10 → 0.20 mm
Countershaft	0.10 → 0.20 mm

End play, circlips

Primary shaft	0.05 mm max.
Countershaft	0.10 mm max.
Range change shaft	0.10 mm max.

Pulse wheel buckle

Pulse wheel buckle	≤ 0.4 mm
--------------------	----------

Oil pump

Endplay	< 0.20 mm
Clearance between pumping elements	< 0.20 mm

	Original dimension	Minimum permitted dimension
By-pass valve spring length	28.3 mm	28 mm

Range change

Synchronization	Original dimensions	Minimum dimensions
Low speed range	32.7 ^{±0.3} mm	31.6 mm
High speed range	32.7 ^{±0.3} mm	31.6 mm

Planet gears end play	0.6 → 1.3 mm
-----------------------	--------------

Primary shaft

Synchronization	Original dimension	Minimum dimension
Low speed / High speed	19.5 ^{±0.3} mm	18.4 mm

TOOLS / CONSUMABLES

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Generalities	150FX			29/09/2004	C-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Lubricants	150FX			29/05/2002	C-3
	17SD						
	17TD						

Generalities

RENAULT TRUCKS divides tools into three categories:

- **General-purpose tools:** proprietary tools
 - **50 00 26 reference number** (possibility of purchasing through the RENAULT TRUCKS Spare Parts Department).
 - **4-figure reference number** (tools classified by RENAULT TRUCKS but available from the supplier).
- **Special tools:** specifically created tools distributed by the RENAULT TRUCKS Spare Parts Department
 - **50 00 26and 74 09 99 reference numbers** (possibility of purchasing through the RENAULT TRUCKS Spare Parts Department).
- **Locally manufactured tools:** these tools are classified differently according to their degree of sophistication:
 - **4-figure reference number** (represented by a drawing): tools that are simple to make without need for special qualification.
 - **50 00 26 reference number** (possibility of purchasing through the RENAULT TRUCKS Spare Parts Department): a certain amount of skill is needed to make these tools.

Three levels (or echelons) determine their assignment:

- **Level 1:** tools for servicing, maintenance and minor tasks.
- **Level 2:** tools for major repairs.
- **Level 3:** tools for refurbishment.

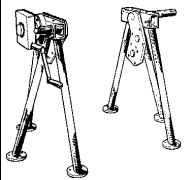
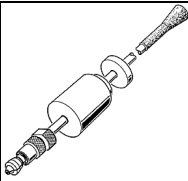
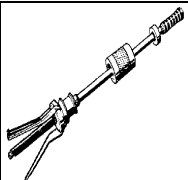
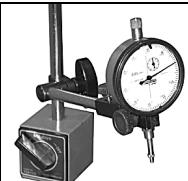
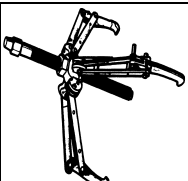
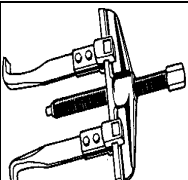
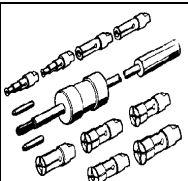


*Proprietary tools mentioned in this manual do not appear in the tools list.
These tools are identified in the standard tools manual (MO) by a 4-figure number.*

Lubricants

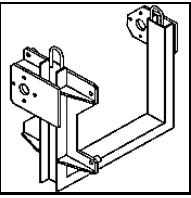
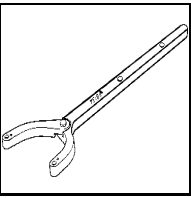
Consumables and oil capacity: (see Driving & Servicing Handbook).

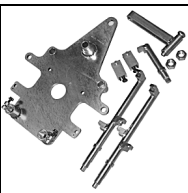
LIST OF TOOLS
General-purpose tools

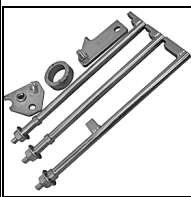
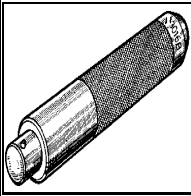
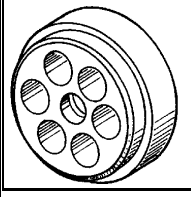
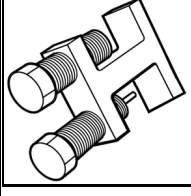
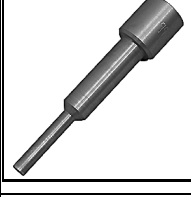
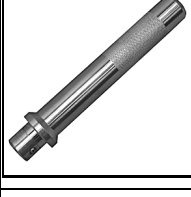
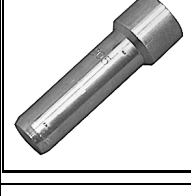
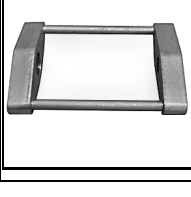
Illustration	RENAULT TRUCKS Ref.	Designation	Manufacturer reference	Manufacturer code	Level	Qty
	5000261000	UNIVERSAL STAND			2	1
	50002600918	PULLER			1	1
	5000260834	PULLER			2	1
	9661	COMPARATOR + MAGNETIC FOOT		AQ	2	1
	5000260821	PULLER			2	1
	5000260842	PULLER			2	1
	5000262740	PULLER			1	1

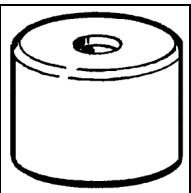
AQ	BROWN SHARP ROCH		
	13-15 avenue Georges de la Tour BP 45		
	54303 LUNEVILLE CEDEX		FRANCE
	 03 83 76 83 76	 03 83 74 13 16	

Special Tools

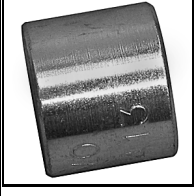
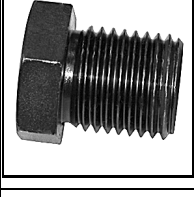
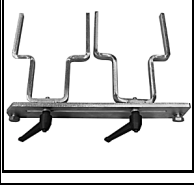
Illustration	RENAULT TRUCKS Ref.	Designation	Manufacturer reference	Manufacturer Code	Level	Qty
	5000262731	G/B SUPPORT			2	1
	7409998590	PUSHER			2	1
	5000269134	HOLDING WRENCH			1	1
	7409998597	PULLER			2	1
	7409996600	RAM			2	1
	7409996222	HYDRAULIC PUMP			2	1
	7409998575	MANDREL			2	1

	7409996315	PIN			2	1
	7409992671	RAM			2	1
	7409992614	MANDREL			2	1
	7409996925	ADAPTER			2	1
	7409996479	LIFTING EYE			2	1
	7409990027	WRENCH			2	1
	7409996917	SCREW			2	1
	7409996910	FASTENING			2	1

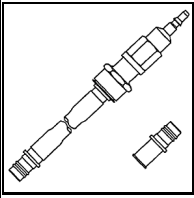
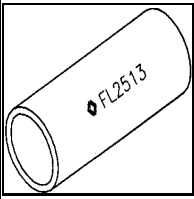
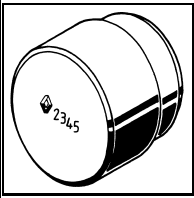
	7409990028	ARMS KIT			2	1
	5000263016	HANDLE			2	1
	5000262363	SET OF PUSHERS			2	1
	7409990266	CRIMPING TOOL			2	1
	7409998588	MANDREL			2	1
	7409992000	MANDREL			2	1
	7409996205	MANDREL			2	1
	7409996673	FORK			2	1

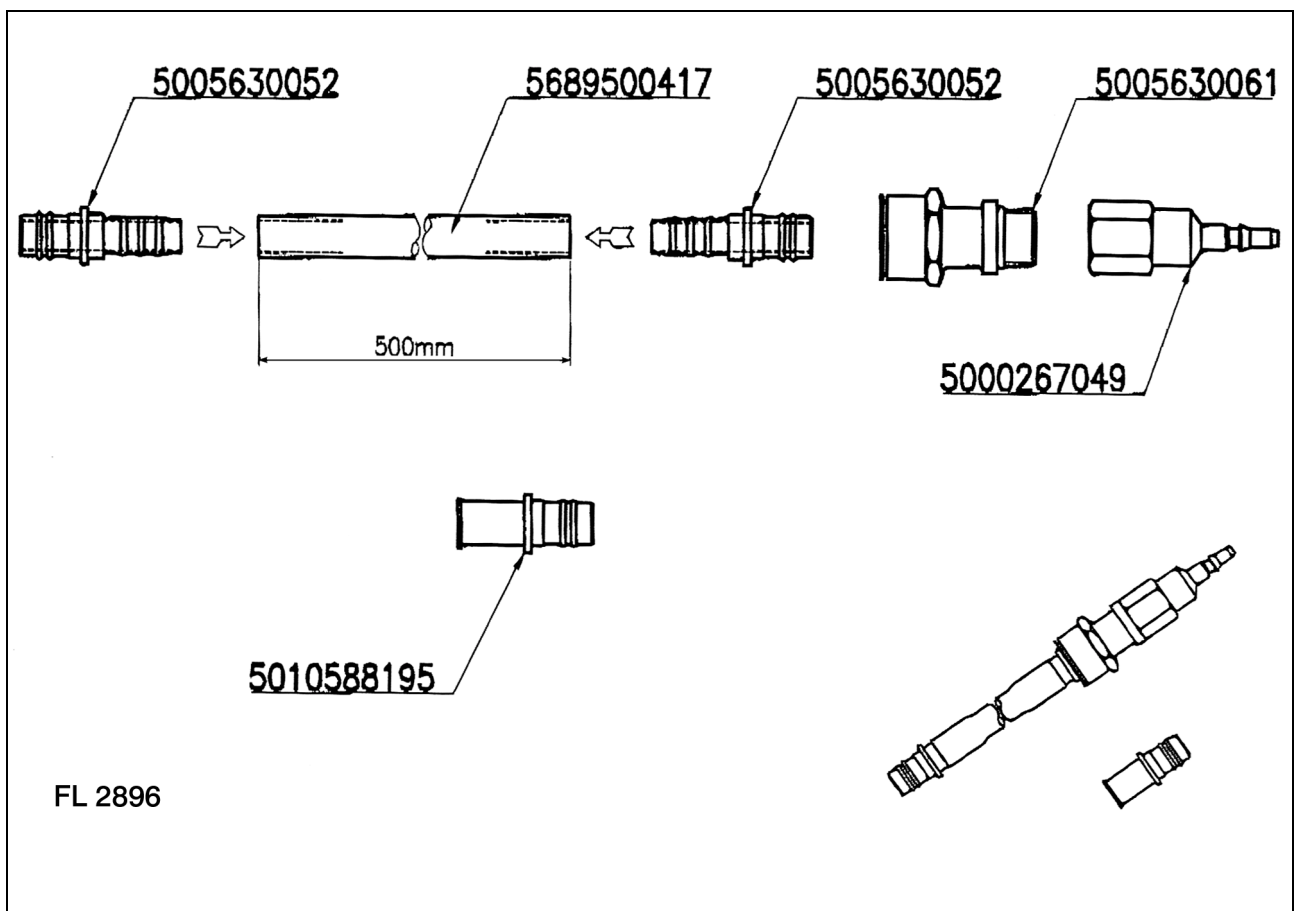
	7409996603	ENDPIECE			2	1
	7409996897	RIVETING MANDREL			2	2
	7409996994	EYE			2	1
	7409996686	PRESSURE GAUGE			2	1
	7409996927	MANDREL			2	1
	7409996737	PRESS TOOL			2	1
	7409996901	PUSHER			2	1
	7409992914	PUSHER			2	1

	7409998022	PULLER			2	1
	7409998215	PULLER			2	1
	7409996454	PUSHER			2	1
	7409996635	PULLER ARM			2	2
	7409996602	HANDLE			2	2
	7409994731	PULLER			2	1
	7409996480	SOCKET WRENCH			2	1
	7409998542	PULLER			2	1

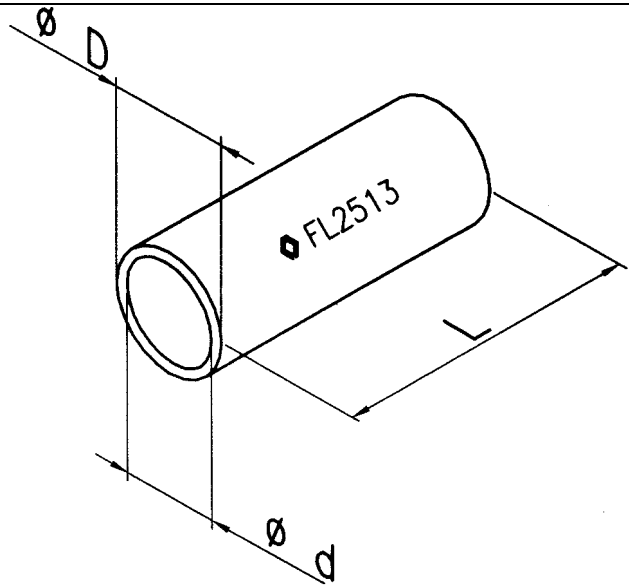
	7409992619	SPINDLE			2	1
	7409990030	PULLER			2	1
	7409996497	SOCKET WRENCH			2	1
	7409996413	MANDREL			2	1
	7409996913	PULLER			2	1
	7409996483	SCREW			2	1
	7409990029	SUPPORT			2	1

Locally manufactured tools

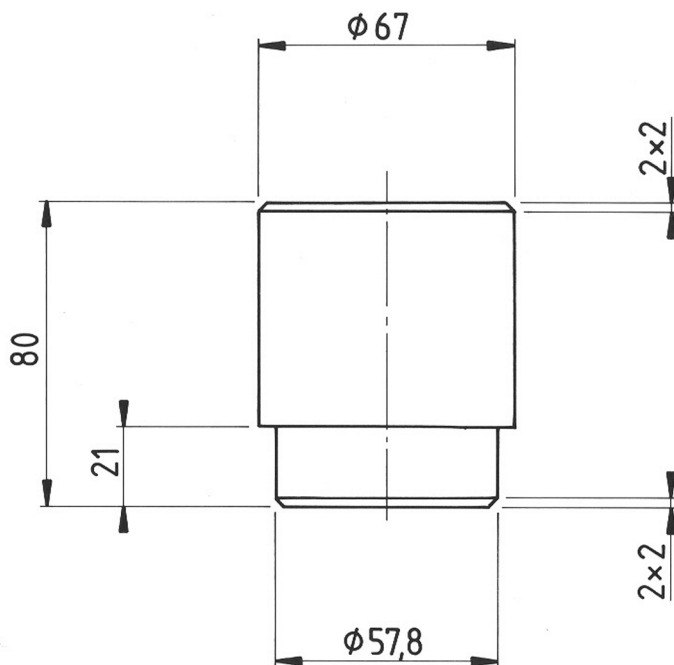
Illustration	RENAULT TRUCKS Ref.	Designation	Manufacturer Reference	Manufacturer Code	Level	Qty
	2896	GEARBOX FLEXIBLE AIR SUPPLY PIPE			1	1
	2513	TUBE			2	1
	2345	PUSHER			2	1



$\emptyset$ D	$\emptyset$ d	L
36	28	200
40	32	200
50	40	200
56	40	200
63	53	250
75	63	250
80	67	250
85	70	250
90	75	250
95	80	250
100	85	250



FL 2513



FL 2345

LIST OF CONSUMABLES

Automotive reference	Industrial reference
GRAISSE GRIPCOTT NF	GRIPKOTE NF GREASE
FORMETANCH 572	THREAD SEALANT 572
LT 549	THREAD LOCKING COMPOUND 549

STRIPPING AND MOUNTING ON STAND

APPLICABILITY**Clutch slave cylinder**

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Removal/fitting	150FX			24/06/2003	D1-3
	17SD						
	17TD						

Mounting on stand N° 1000

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Mounting/Removal	150FX			25/06/2003	D2-1
	17SD						
	17TD						

Stripping the gearbox on stand N° 1000

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Removal of the heat exchanger	150FX			25/08/2003	D3-1
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Fitting of the heat exchanger	150FX			25/08/2003	D3-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Removal of the retarder	150FX			25/08/2003	D3-5
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Fitting of the retarder	150FX			25/08/2003	D3-7
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Clutch operating fork	150FX			25/06/2003	D3-8
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Output shaft speed sensor	150FX			02/04/2004	D3-8
	17SD						
	17TD						

Clutch slave cylinder

Removal/fitting

Removal

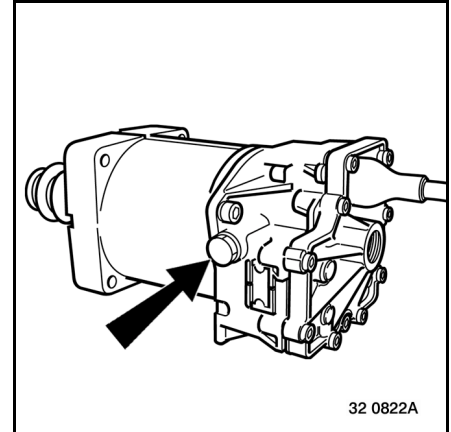


REMOVE THE PLUG TO DISCHARGE THE AIR REMAINING IN THE CLUTCH SLAVE CYLINDER.



The plug may be pressurized.

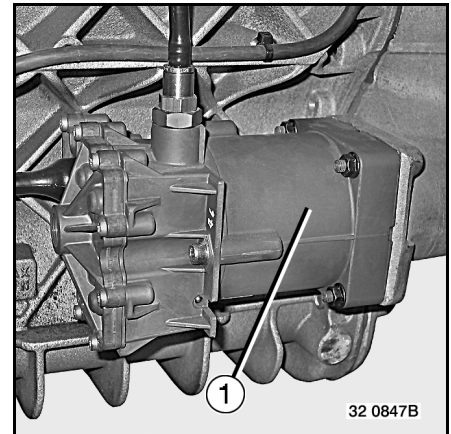
Unplug the connector.
Disconnect air pipe.



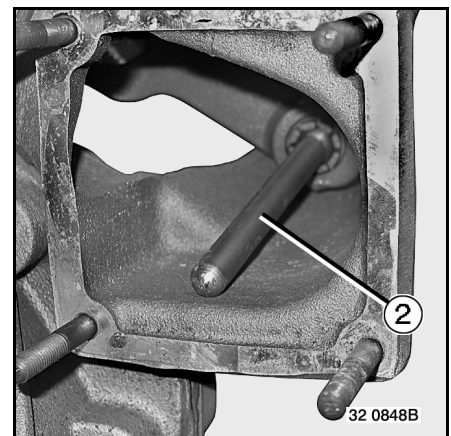
Remove the slave cylinder **(1)**.



SPRING UNDER PRESSURE AT THE TIME OF REMOVAL OF THE CLUTCH SLAVE CYLINDER.



Remove rod **(2)**.



Fitting

Proceed in the reverse sequence to removal.



Ensure that the push rod is correctly fastened in the clutch release fork.

Tighten the nuts at the recommended torque.

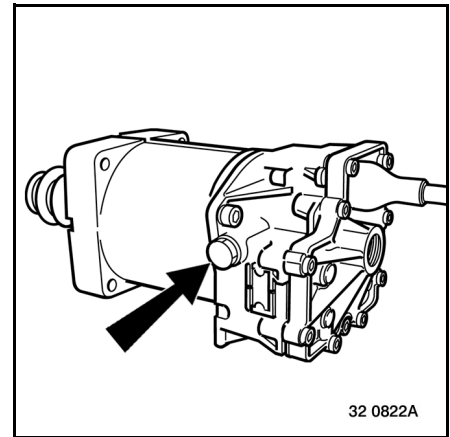
See page(s) B-2-4.

Tighten the plug to torque.

See page(s) B-2-4.

Plug in connector.

Connect up the air pipe.

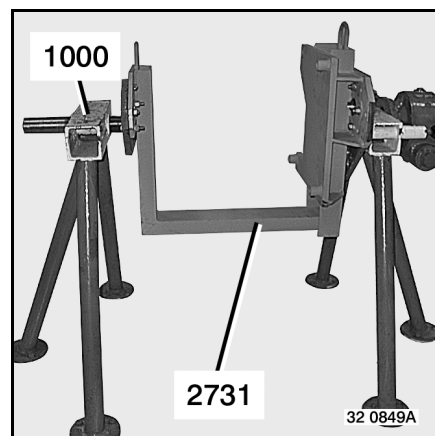


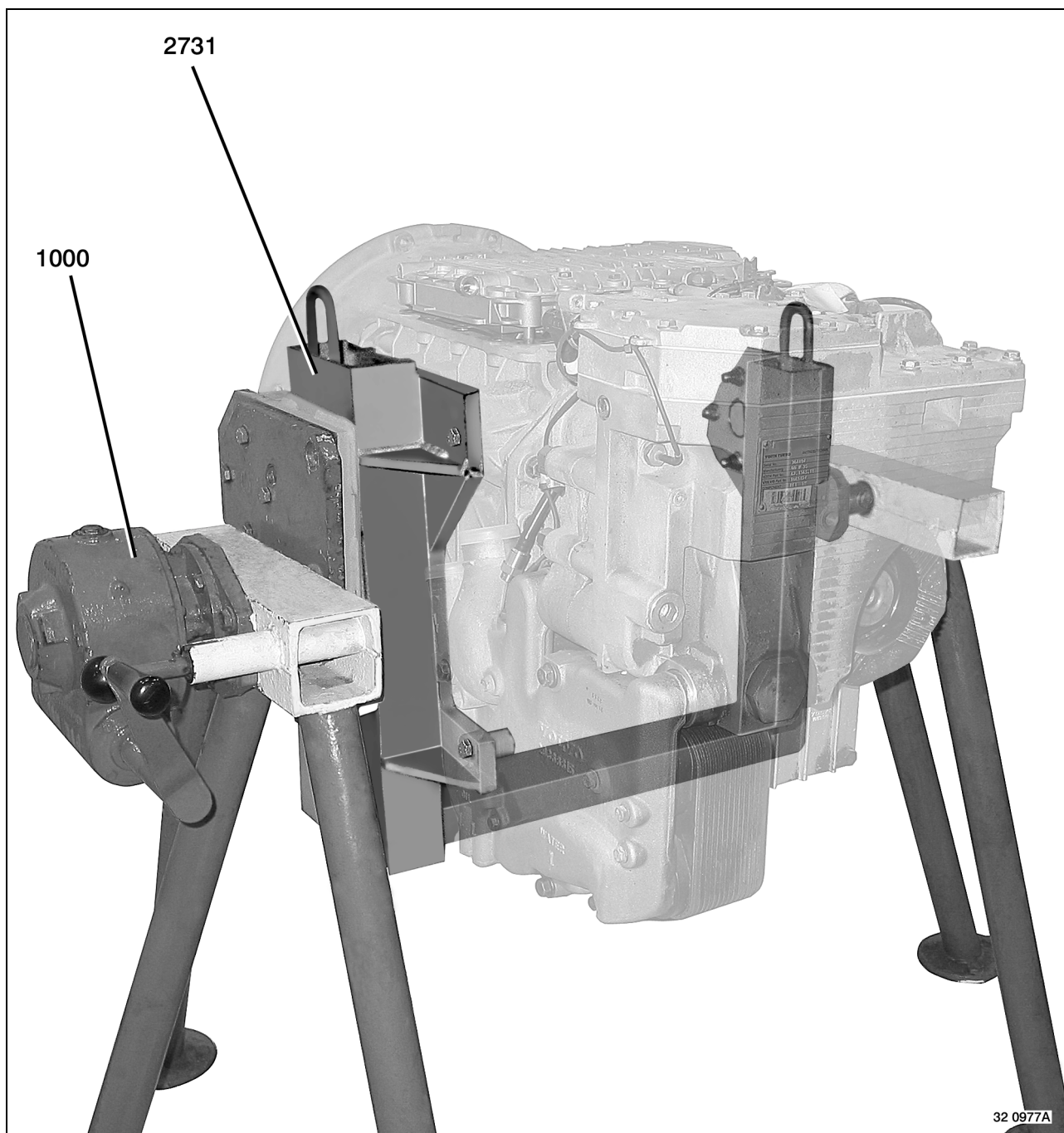
Mounting on stand N° 1000

Mounting/Removal

Mounting

Mount the bracket **2731** to stand N° **1000**.





Install the gearbox to stand N° 1000.

Removal

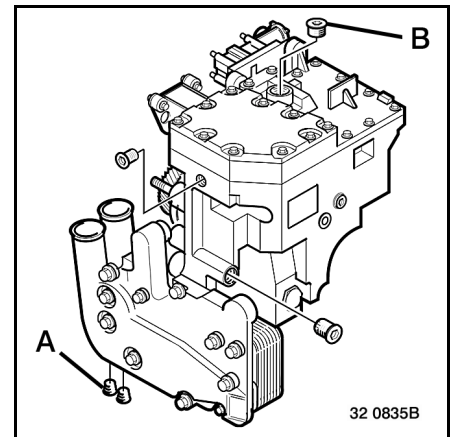
Proceed in the reverse sequence to mounting to the stand.

Stripping the gearbox on stand N° 1000

Removal of the heat exchanger

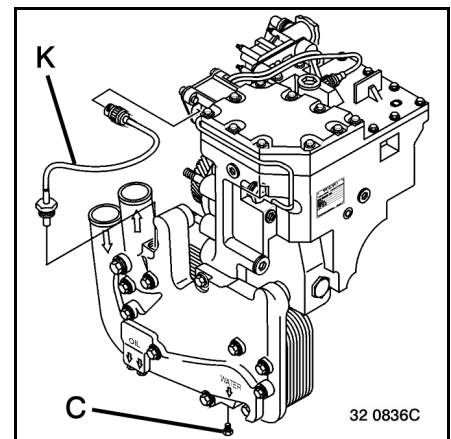
Remove drain plugs **(A)**.

Loosen filler plug **(B)** to drain the oil more quickly.



Remove coolant drain plug **(C)**.

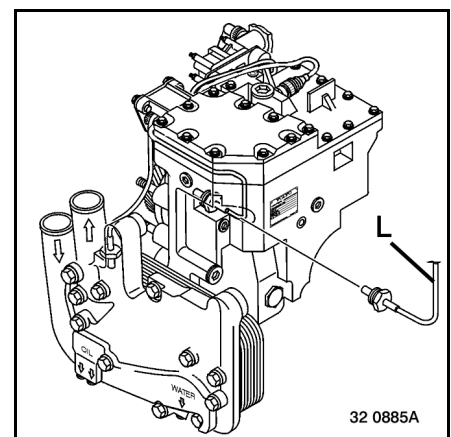
Remove coolant temperature sensor **(K)**.



Unplug the oil temperature sensor from the connector.

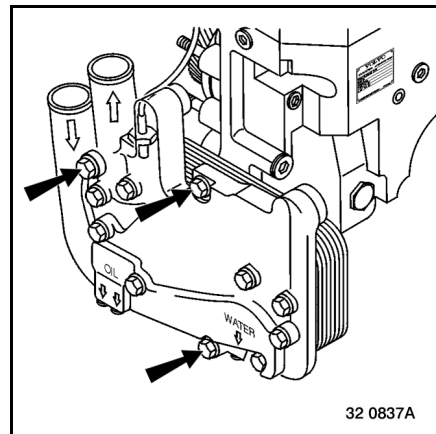
Remove the connector and cut the cable ties.

Remove oil temperature sensor **(L)**.



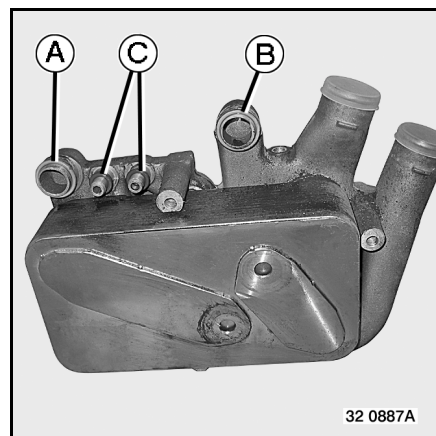
Remove the 3 bolts securing the heat exchanger to the range change casing.

Insert a lever between the range change casing and the heat exchanger to disengage the heat exchanger without placing any strain on the coolant inlet and return manifolds.



Remove the heat exchanger taking care not to damage the coolant inlet and return manifolds.

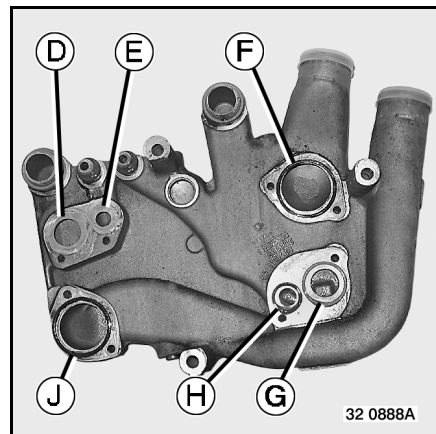
Remove gaskets (A → C).



Remove the adapter plate securing bolts.

Remove the adapter plate.

Remove gaskets (D → J).



Fitting of the heat exchanger

Fit the retarder.

See page(s) D-3-7.

Clean the adapter plate joint faces.

Smear the new gaskets with grease.

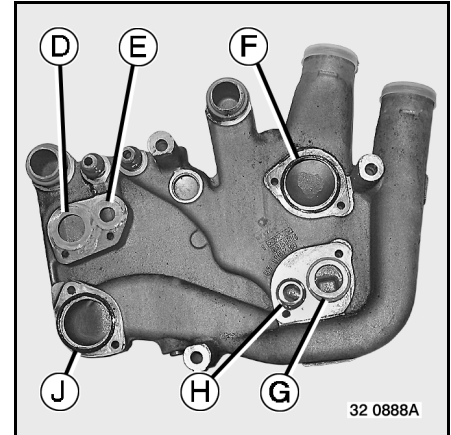
Use silicone-free grease **GRAISSE GRIPCOTT NF**.

Fit gaskets (**D → J**).

Fit the adapter plate.

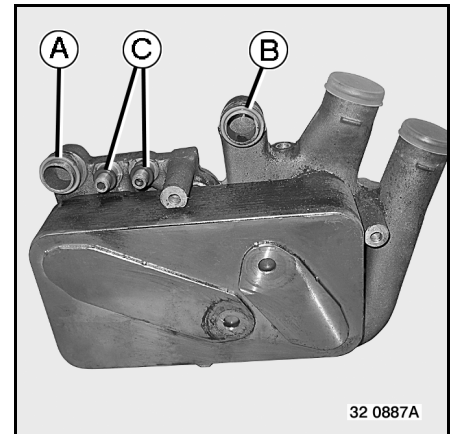
Tighten the bolts to torque.

See page(s) B-2-4.



Fit gaskets (**A → C**).

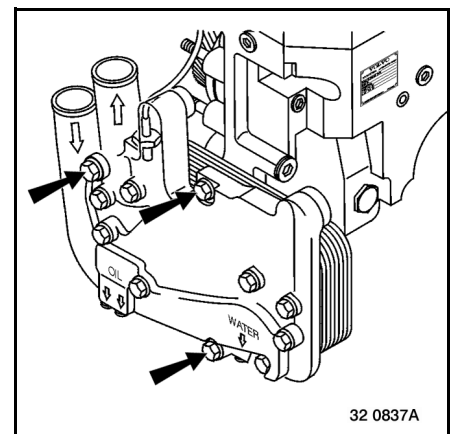
Position the heat exchanger taking care to correctly install the coolant inlet and return manifolds, complete with new O-rings.



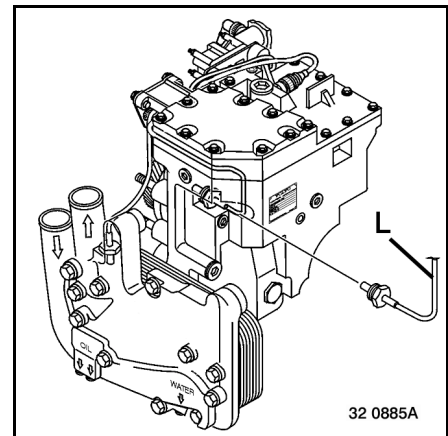
Fit the bolts.

Tighten the bolts to torque.

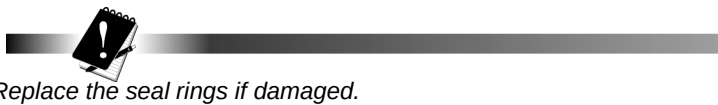
See page(s) B-2-4.



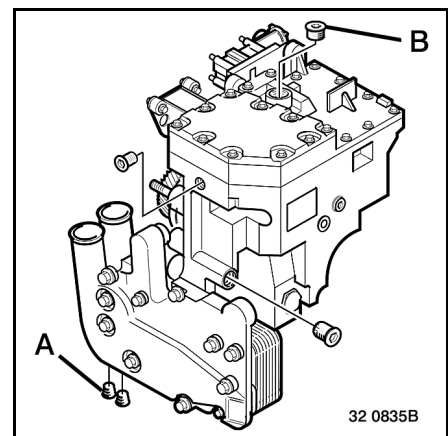
Fit oil temperature sensor **(L)**, complete with a new gasket.



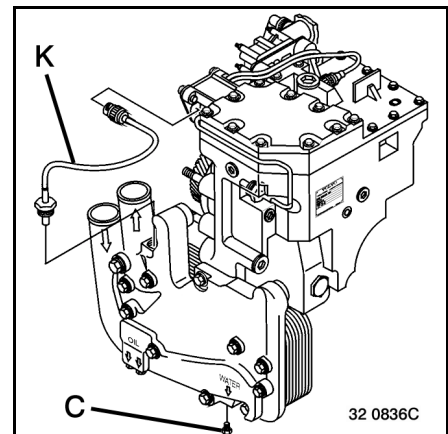
Fit drain plugs **(A)**.
Fit plug **(B)**.



Tighten the plugs to torque.
See page(s) B-2-4.



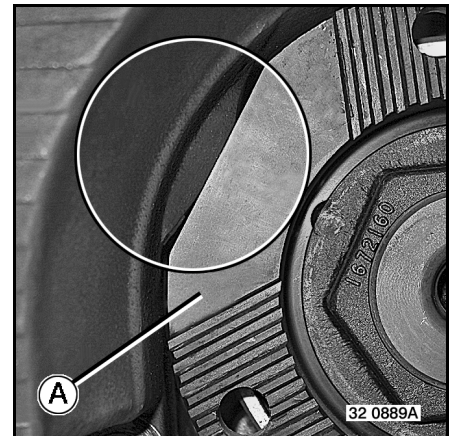
Fit coolant drain plug **(C)**.
Tighten the plug to torque.
See page(s) B-2-4.
Fit coolant temperature sensor **(K)** complete with a new gasket.



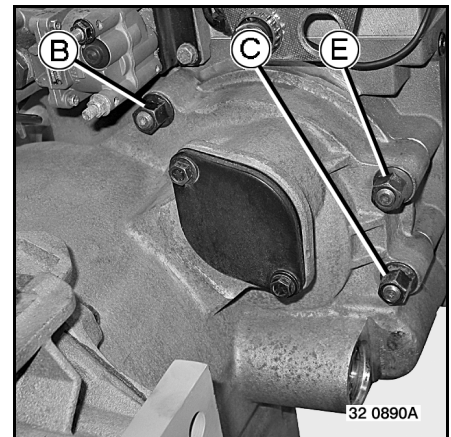
Removal of the retarder

Remove the heat exchanger.
See page(s) D-3-1.

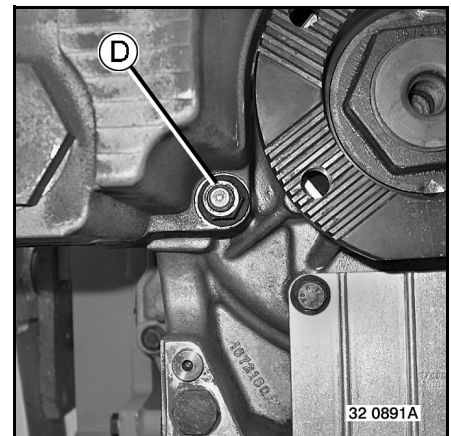
Turn flange **(A)** to allow the retarder to be removed in roughly a 10 o'clock position.



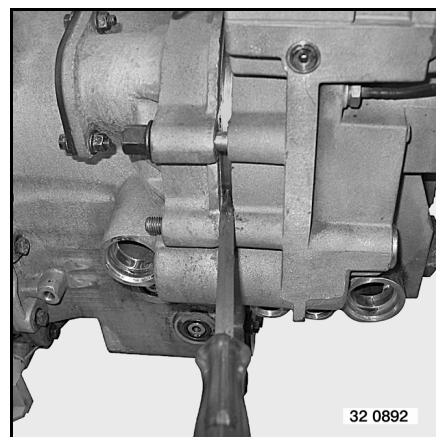
Retarder front view



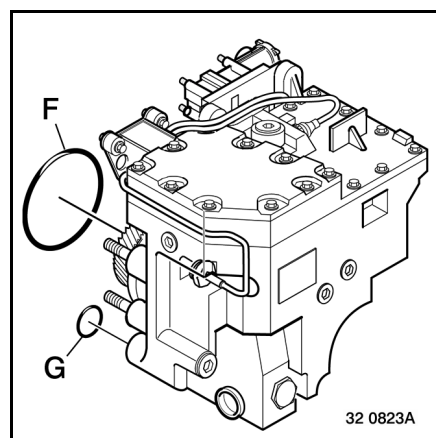
Retarder rear view
Remove nuts **(B → E)**.
Remove the retarder.



If necessary, use a screwdriver to serve as lever and disengage the retarder.



Remove gaskets (**F - G**).

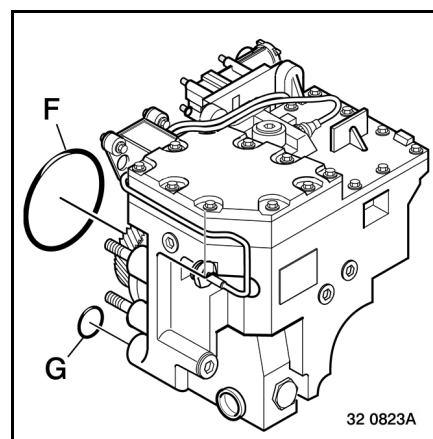


Fitting of the retarder

Smear the new gaskets with grease.

Use silicone-free grease **GRAISSE GRIPCOTT NF**.

Fit gaskets (**F - G**).



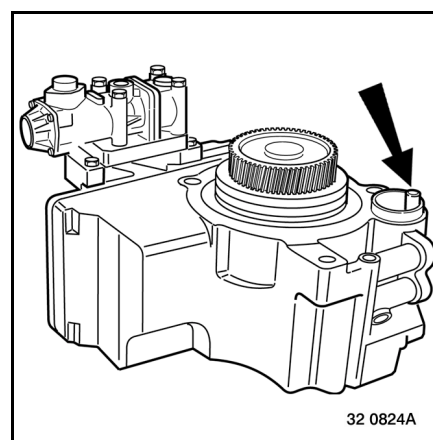
Take care not to damage the torque limiter (shown by an arrow) when fitting the retarder.

Fit the retarder.

Push the retarder as far as possible onto the range change casing.



The retarder must be assembled straight. Make sure the O-rings are correctly guided and centred. Do not strike the range change casing: risk of distortion.



Nut (**D**) on retarder front face.

Nuts (**B - C - E**) on retarder rear face.

Offer up the nuts following the sequence (**B - C - D - E**).



After tightening the retarder nuts, there must be a space between the retarder and the range change casing.

Tighten the nuts following the sequence (**B - C - D - E**).

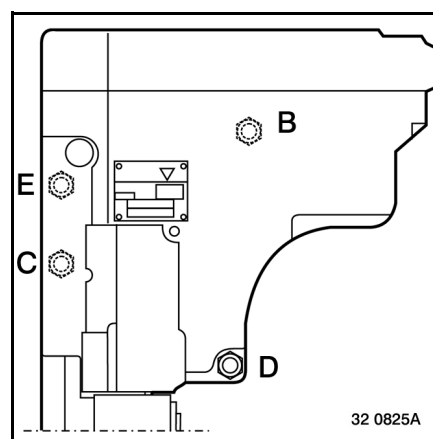
See page(s) B-2-4.

After tightening using a torque wrench, the nuts are to be tightened to an angle of $45^{\pm 5^{\circ}}$ following the sequence (**B - C - D - E**).

A second angular tightening pass to an angle of $45^{\pm 5^{\circ}}$ is necessary, following the sequence (**B - C - D - E**).

Fit the heat exchanger.

See page(s) D-3-3.



Clutch operating fork

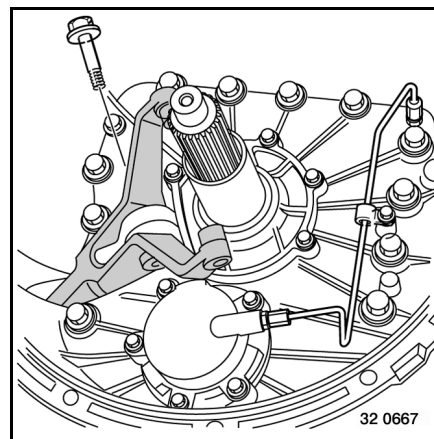
Removal

Remove the slave cylinder.
See page(s) D-1-3.

Remove the operating fork

Fitting

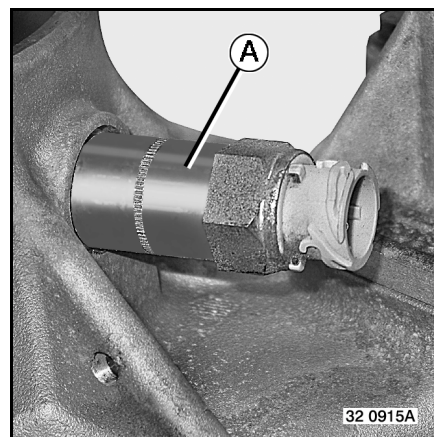
Fit the clutch operating fork.
Tighten the bolt to torque.
See page(s) B-2-3.
Fit the clutch slave cylinder.
See page(s) D-1-3.



Output shaft speed sensor

Removal / Fitting

Unplug the connector.
Remove the lead seals from speed sensor **(A)**.
Remove speed sensor **(A)**.



Get rid of all residual traces of sealing compound still sticking to the sensor screw thread.

Apply sealing compound around the sensor screw thread.

Apply sealant "**FORMETANCH 572**".

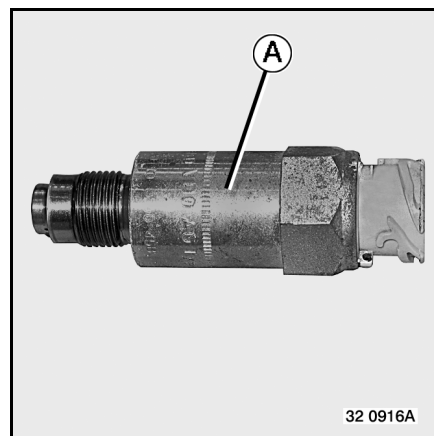
Fit speed sensor **(A)**.

Tighten the sensor to torque.

See page(s) B-2-4.

Get lead seals **(A)** fitted to the speed sensor by an SIM approved workshop .

Plug in connector.



PRIMARY SHAFT AND OUTPUT SHAFT SEALS

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Primary shaft seal	150FX			25/06/2003	E-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Output shaft seal	150FX			27/08/2003	E-5
	17SD						
	17TD						

Primary shaft seal

Removal

Remove the slave cylinder.

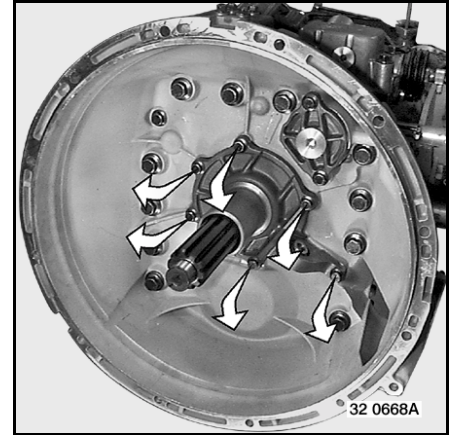
See page(s) D-1-3.

Remove the operating fork

See page(s) D-3-8.

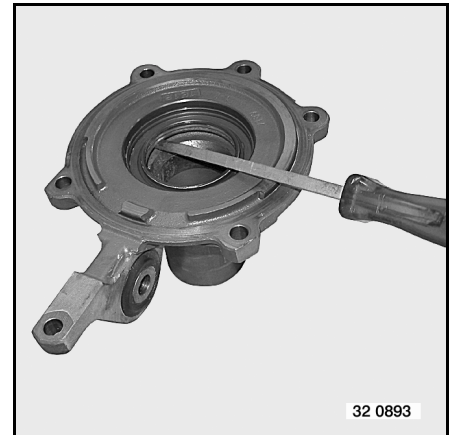
Remove the cover.

Remove the gasket from the cover.



Remove gasket.

Clean the cover.



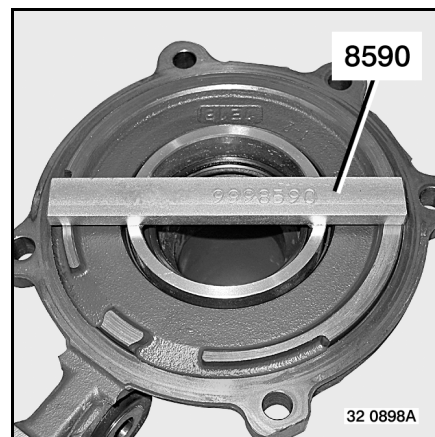
Fitting

Fit a new gasket.

Use tool **8590**.



*Fill the space between the seal lips halfway with **GRAISSE GRIPCOTT NF**. Do not allow any oil or grease to get onto the dust trap.*



Fit the cover gasket.

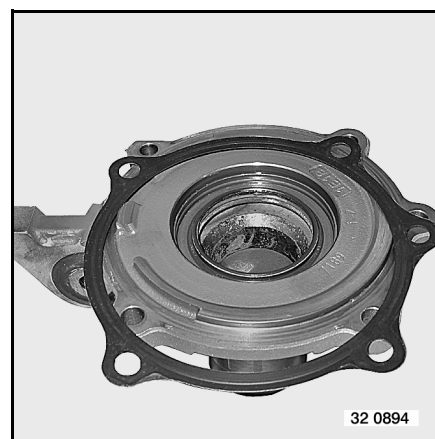
Fit the cover.



The gasket must be free from oil and grease.



Make sure the cover is correctly centred on the primary shaft to avoid damaging the gasket.



Tighten the bolts to torque.

See page(s) B-2-3.

Fit the clutch operating fork.

See page(s) D-3-8.

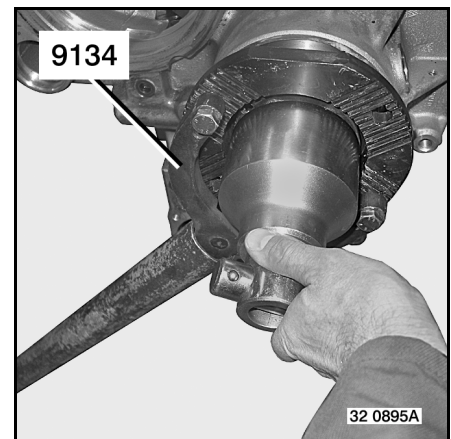
Fit the clutch slave cylinder.

See page(s) D-1-3.

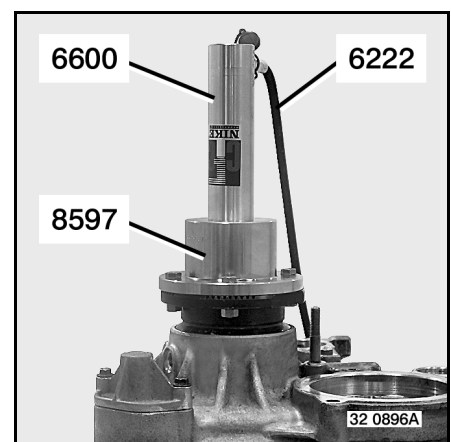
Output shaft seal

Removal

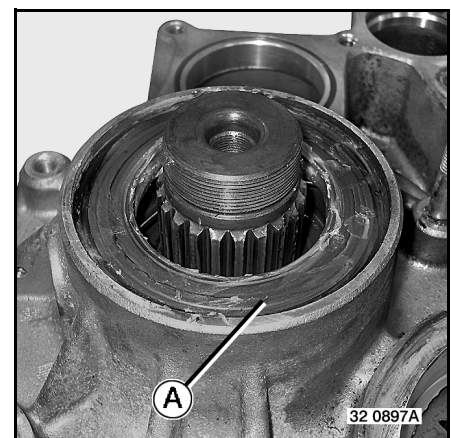
Retain flange against motion.
Use tool **9134**.
Free off.
Remove nut.
Remove gasket.



Extract flange.
Use tool **8597 + 6600 + 6222**.



Remove ring **(A)**.
Clean the output shaft and the ring housing in the range change casing.

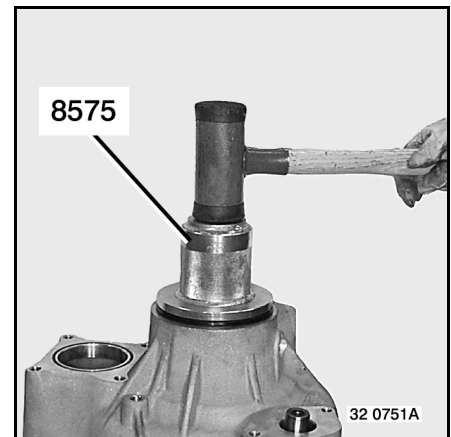


Fitting

Fill the space between the lips of the new seal ring with **GRAISSE GRIPCOTT NF**.

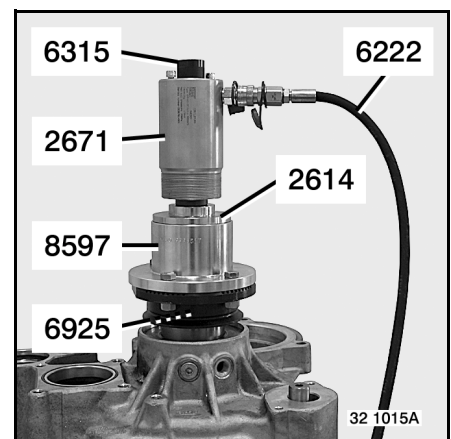
Fit ring.

Use tool **8575**.

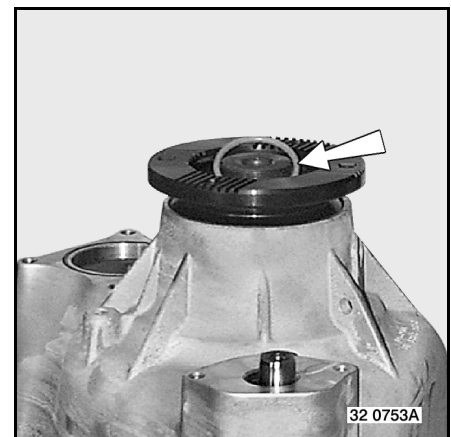


Fit flange.

Use tool **6315 + 2671 + 6222 + 8597 + 2614 + 6925**.

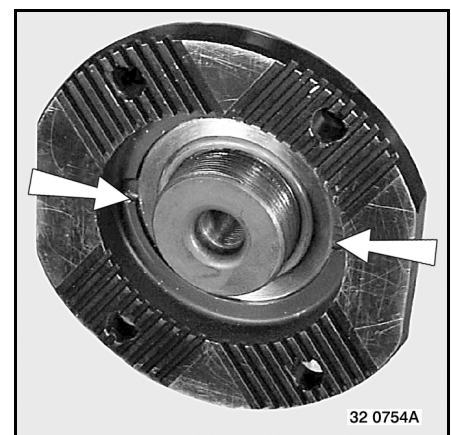


Fit a new gasket.



Mark the notches in the flange for locking the nut.

Fit a new nut.



Retain flange against motion.

Use tool **9134**.

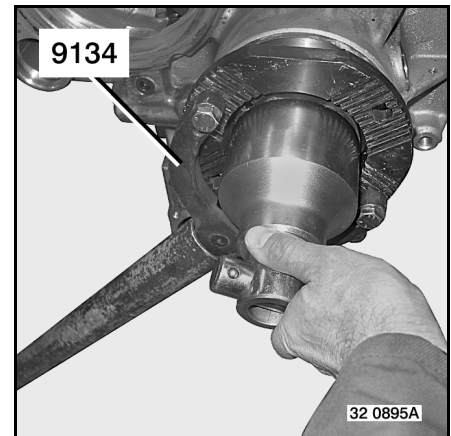
Tighten to torque.

See page(s) B-2-4.

Burr the nut using a centre-punch to lock.



Check there are no splits in the sides of the nut



DISMANTLING OF THE GEARBOX

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Removal of the transmission control unit	150FX			26/06/2003	F-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Removal of the oil filter	150FX			30/06/2003	F-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Removal of the range change	150FX			30/06/2003	F-6
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Removal of the oil pump	150FX			30/06/2003	F-7
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Removal of the countershaft disc brake	150FX			10/03/2004	F-9
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Removal of the clutch casing	150FX			10/03/2004	F-11
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Removal of the set of shafts	150FX			30/06/2003	F-12
	17SD						
	17TD						

Removal of the transmission control unit



The gearbox must be in high split (HS: High Split) and in high range (HR: High Range) or low range (LR = Low Range) in order to be able to remove the control unit.

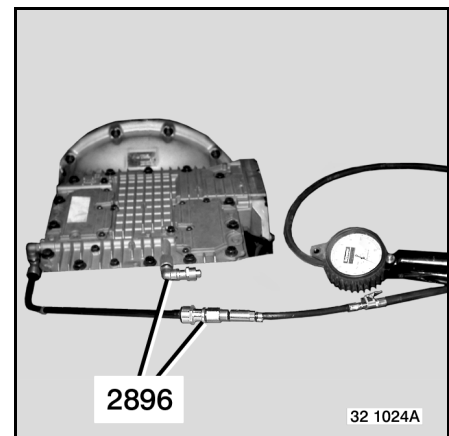
To do so, there are 2 possibilities:

- Before stopping the vehicle, engage one of the following gears: **2 - 4** or **6** with the gear lever, then switch off the ignition.
- After stopping the vehicle (without any gear engaged), use the RENAULT TRUCKS test tool plugged into the gearbox diagnostic socket and engage one of the following gears: **N2 = HS + LR** or **N4 = HS + HR**.

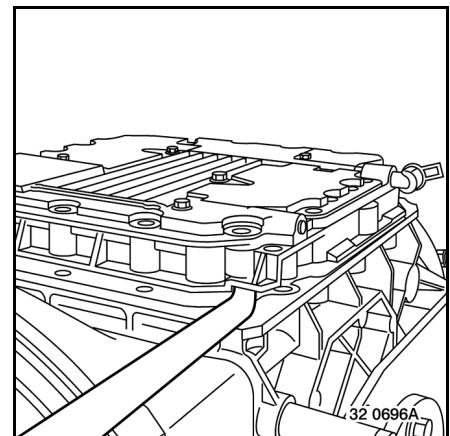


If the gearbox has been removed:

- Blank off the control unit air outlet leading to the clutch slave cylinder (se tool **2896**).
- Connect the control unit air inlet to a compressed air system (pressure required: from 6.5 to 10 bars), (use tool **2896**).
- Plug the RENAULT TRUCKS test tool into the gearbox diagnostic socket (requires a voltage of 24V) and engage one of the following two gears: **N2 = HS + LR** or **N4 = HS + HR**.



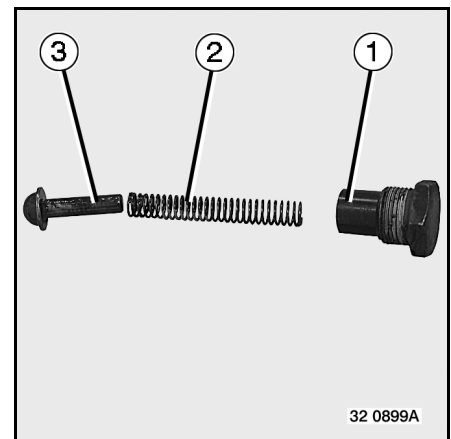
Remove the RENAULT TRUCKS test tool.
 Remove tool **2896**.
 Remove the control unit securing bolts.
 Use a lever to disengage the control unit from its locating dowels.
 Remove the control unit.
 Remove gasket.



Removal of the oil filter

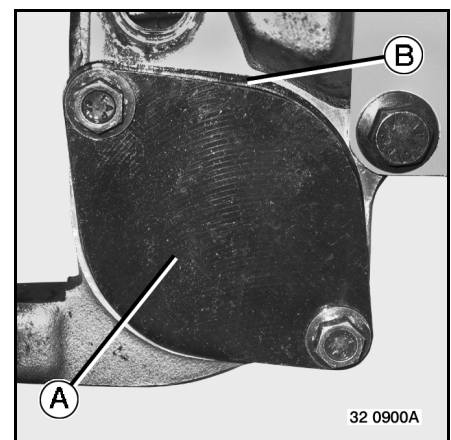
Remove the relief valve, consisting of:

- plug (1),
- spring (2),
- valve (3).



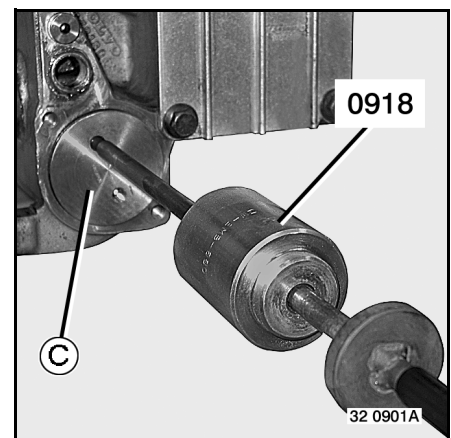
Remove the cover (A).

Remove lip seal (B).

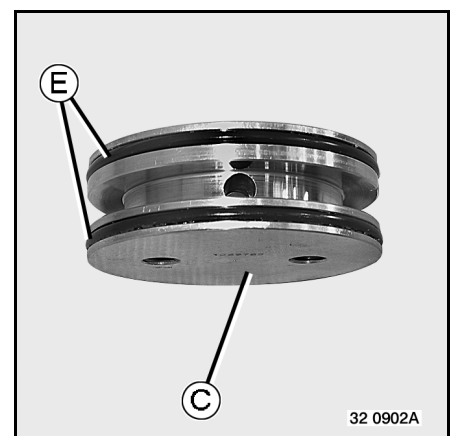


Remove filter support plate (C).

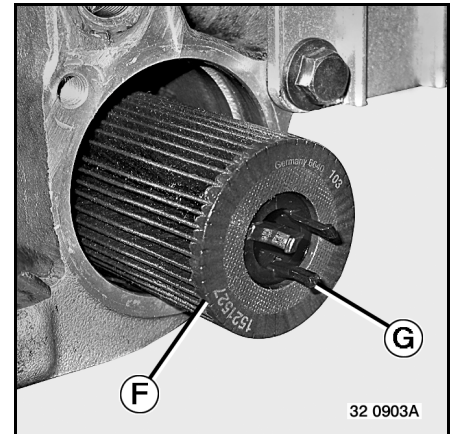
Use tool 0918.



Remove gaskets (E).



Remove oil filter cartridge **(F)**.
Remove shaft **(G)**.

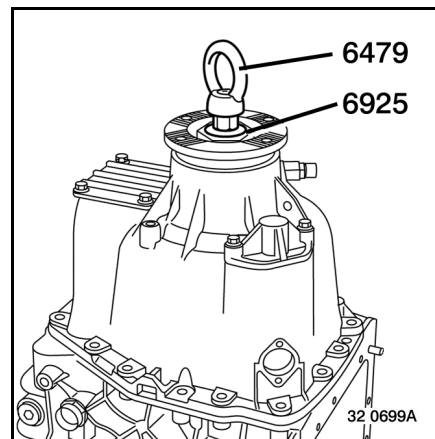


Removal of the range change

Mount the adapter and the lifting eyelet to the output shaft.

Use tool **6925** + **6479**

Place a sling around the range change and lift it out.



Remove the range change casing securing bolts.

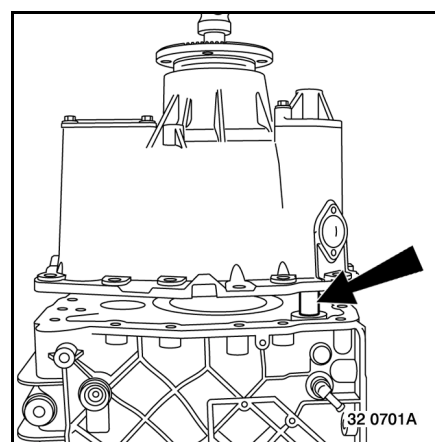
Disassemble the basic gearbox casing and the range change casing.

If necessary, use a screwdriver to serve as lever and disengage the range change.

Carefully remove the range change casing.



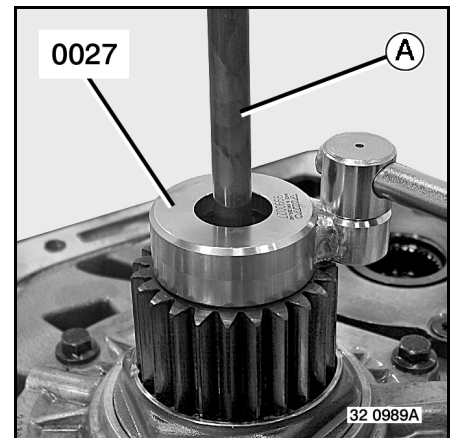
Make sure that the range change ram piston rod is not jammed in the gearbox casing. If so, the shaft might get damaged.



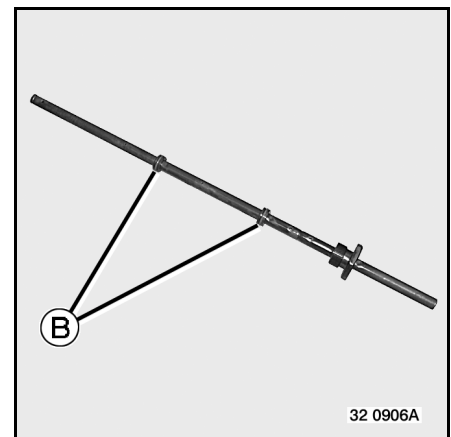
Removal of the oil pump

Remove the range change .
See page(s) F-6.

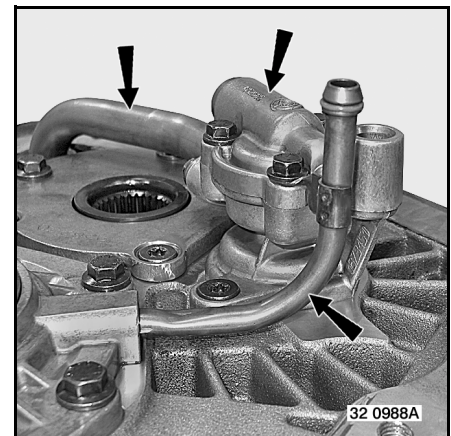
Remove oil distribution pipe (A).
Use tool 0027.



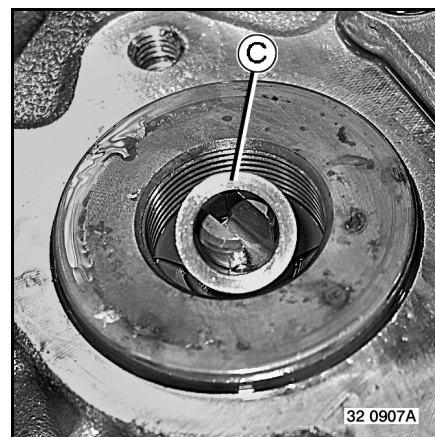
Remove gaskets (B).



Remove the oil pump, complete with pipes.
Remove gaskets.



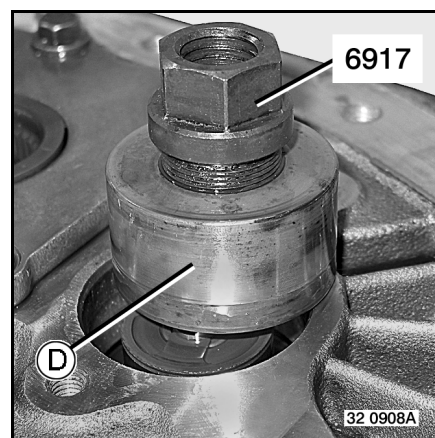
Remove socket **(C)**.



Remove spacer **(D)**.
Use tool **6917**.



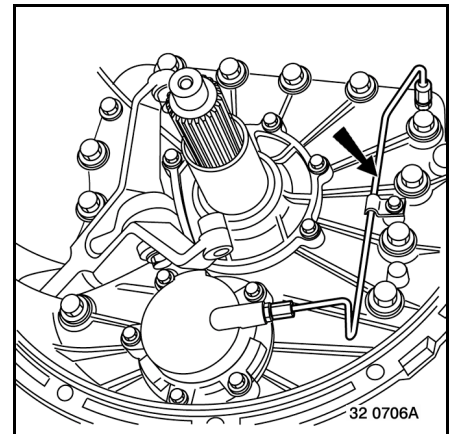
Lubricate (gearbox oil) the screw threads of the puller and the contact surface before using.



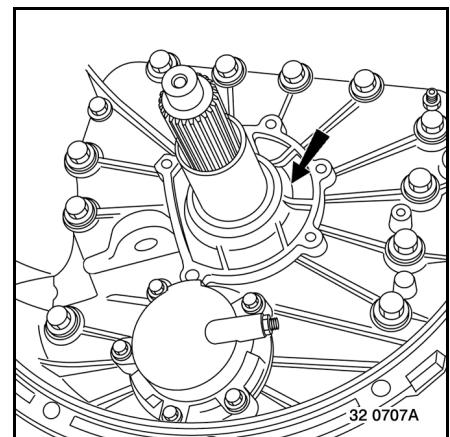
Removal of the countershaft disc brake

Remove the operating fork
See page(s) D-3-8.

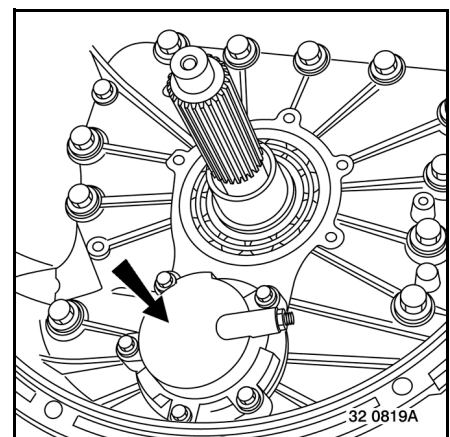
Remove the air tube fastener.
Remove the pipe.



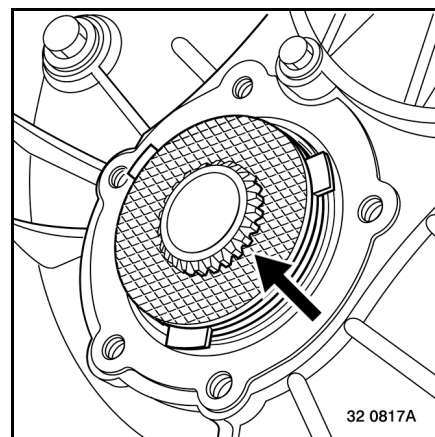
Remove the primary shaft cover.
Remove gasket.



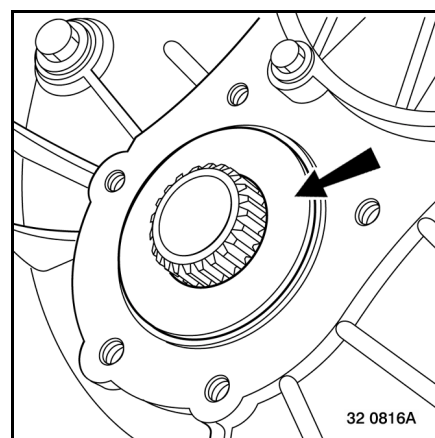
Remove the disc brake cover from the countershaft.



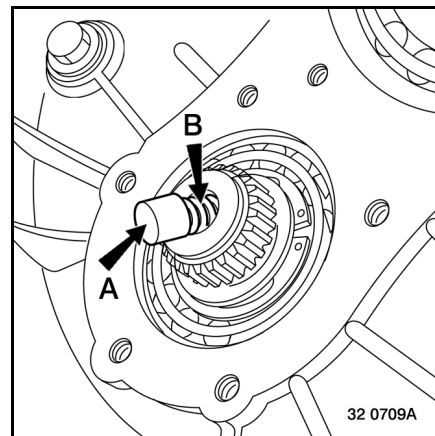
Remove the discs.



Remove washer.
Remove gasket.



Remove the piston (A).
Remove spring (B).



Removal of the clutch casing

Remove the operating fork

See page(s) D-3-8.

Remove the countershaft disc brake.

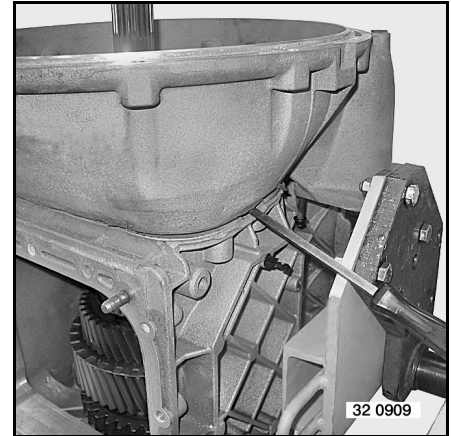
See page(s) F-9.

Remove the primary shaft cover.

See page(s) E-3.

Remove the clutch casing.

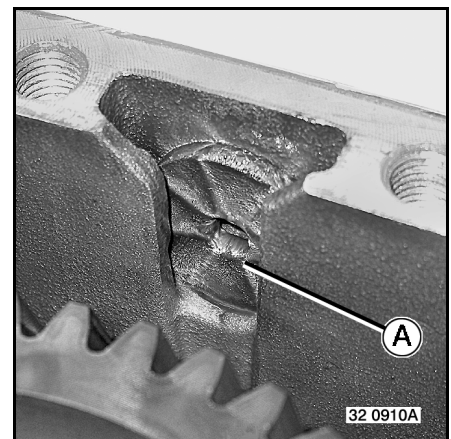
If necessary, use a screwdriver to serve as lever and disengage the cover.



Remove magnet **(A)**.

Clean the magnet.

Clean the contact surfaces thoroughly.



Removal of the set of shafts

Remove the control unit.

See page(s) F-3.

Remove the oil filter.

See page(s) F-4.

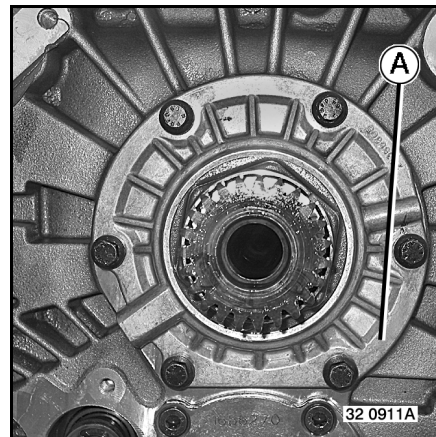
Remove the range change.

See page(s) F-6.

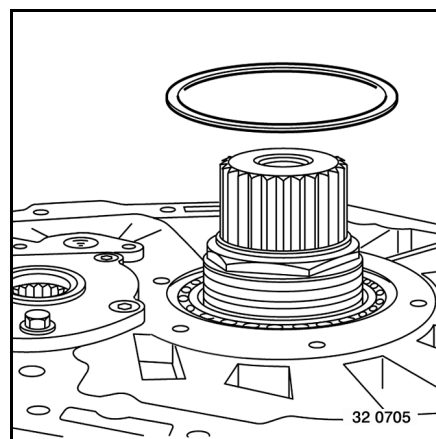
Remove the oil pump.

See page(s) F-7.

Remove the cover **(A)**.



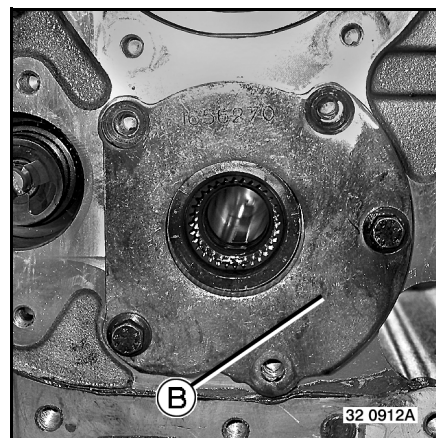
Remove the adjusting washer.



Remove cover securing bolts **(B)**.



Leave one of the bolts screwed in a few turns so that the inner bearing outer ring does not fall out when turning the gearbox over.



Turn the gearbox over.



When turning the gearbox over, the reverse gear shaft needle bearings risk falling out. Pay attention that they do not fall onto the floor as they may get damaged.

Remove the operating fork

See page(s) D-3-8.

Remove the countershaft disc brake.

See page(s) F-9.

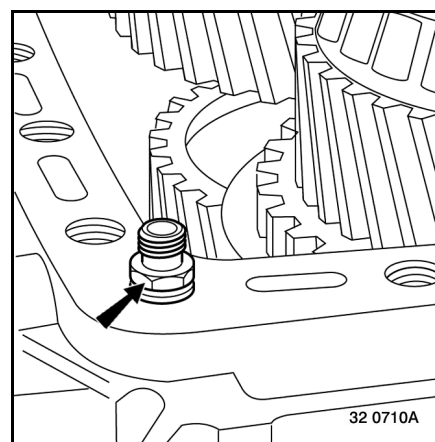
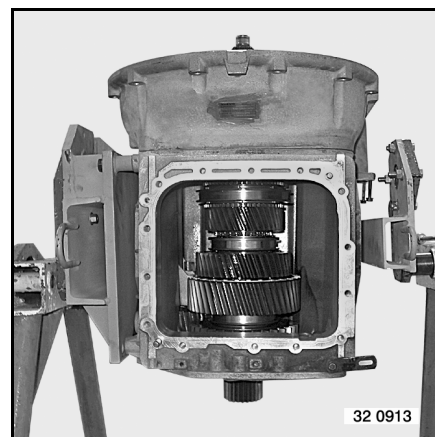
Remove the primary shaft cover.

See page(s) E-3.

Remove the clutch casing.

See page(s) F-11.

Remove the union.



Remove the cover giving access to the reverse gear.

Remove gasket.

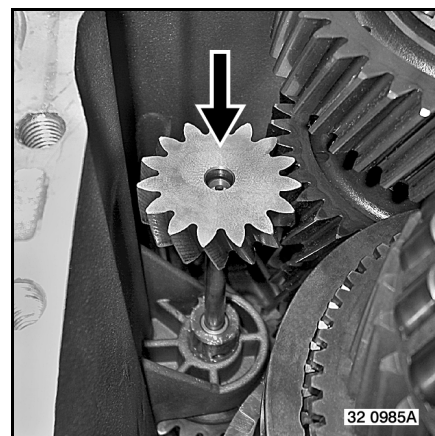


Remove the drive shaft from the oil pump, complete with washer.

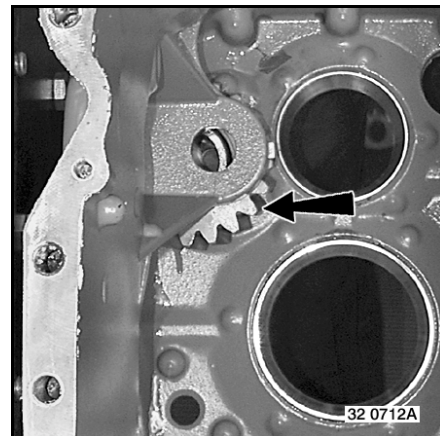
Drive out the reverse gear shaft.



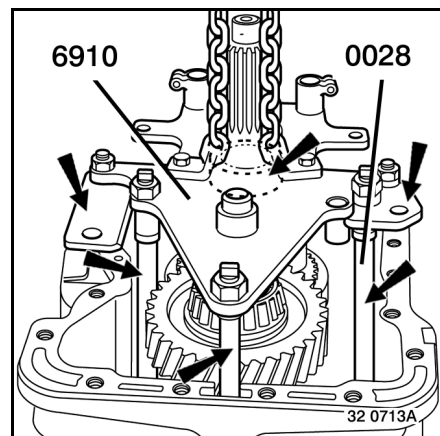
Pay attention that the reverse gear shaft needle bearings do not fall onto the floor as they may get damaged.



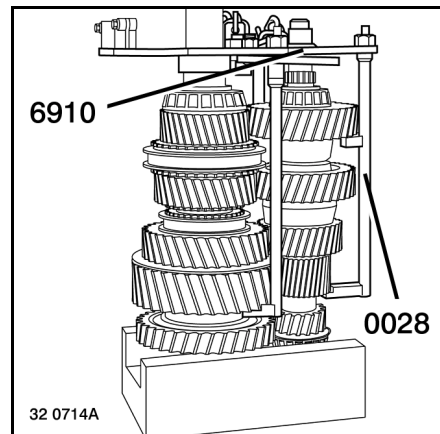
Push the side of the reverse gear into the casing so that it does not catch on the countershaft rear bearing and cause damage.



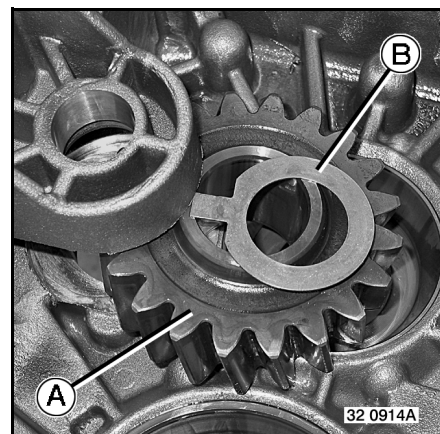
Mount the tools and remove the set of shafts.
Use tool **6910** + **0028**



Remove the set of shafts.



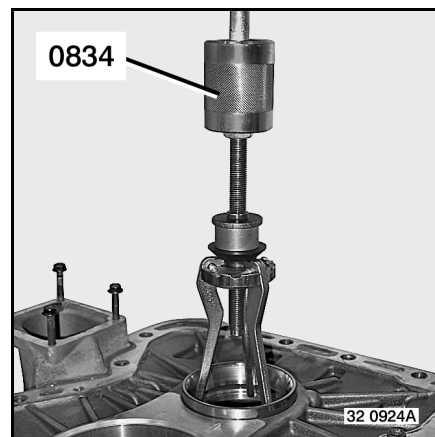
Remove reverse gear **(A)**.
Remove washer **(B)**.



Extract the countershaft front bearing outer ring.
Use tool **0834**.



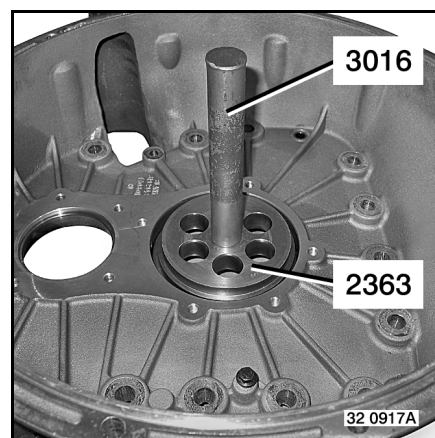
The outer ring is to be removed only if the bearing has to be replaced.



Extract the primary shaft bearing outer ring.
Use tool **3016 + 2363**



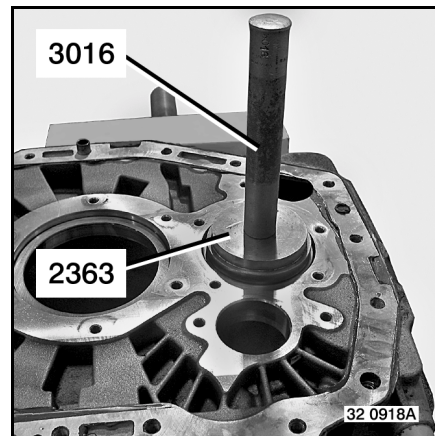
The outer ring is to be removed only if the bearing has to be replaced.



Extract the countershaft rear bearing outer ring.
Use tool **3016 + 2363**



The outer ring is to be removed only if the bearing has to be replaced.

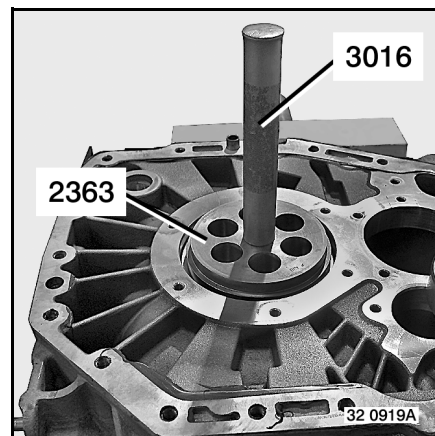


Extract the secondary shaft rear bearing outer ring.
Use tool **3016 + 2363**



The outer ring is to be removed only if the bearing has to be replaced.

Remove the tools and remove the set of shafts.



TRANSMISSION CONTROL UNIT

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Replacement of fork pads	150FX			05/08/2003	G-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Replacement of speed sensors and wiring harness	150FX			03/03/2004	G-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Refurbishment of the speed selection cylinders	150FX			03/03/2004	G-8
	17SD						
	17TD						

Replacement of fork pads

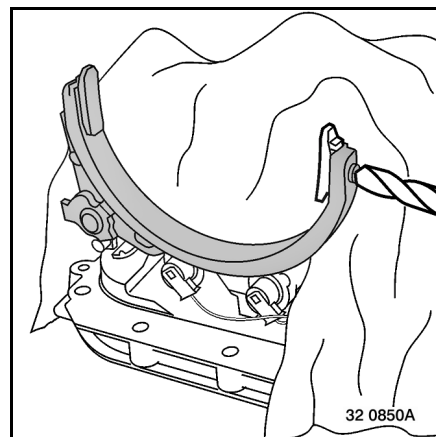
Removal

Remove the control unit.
See page(s) F-3.

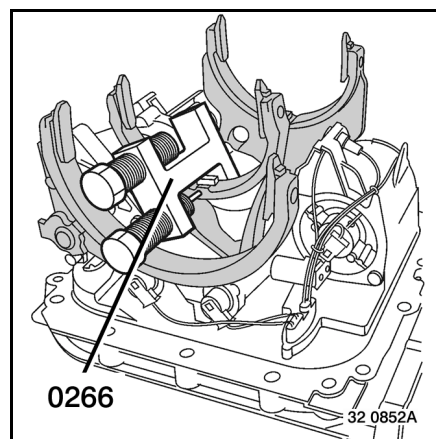
Remove the fork pads.
Use a 12 mm diameter drill bit.



Carefully protect the transmission control unit during the fork pads machining operation.

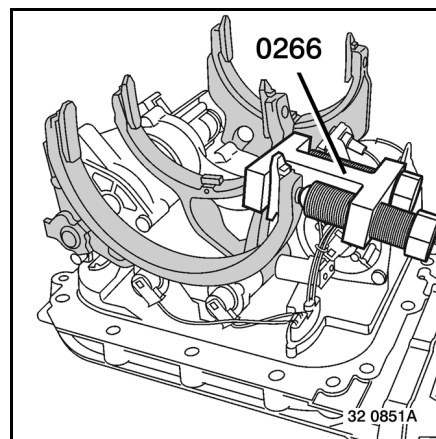


Drive out the central fork pad pins from cylinders **1/R** and **2/3**.
Use tool **0266**.

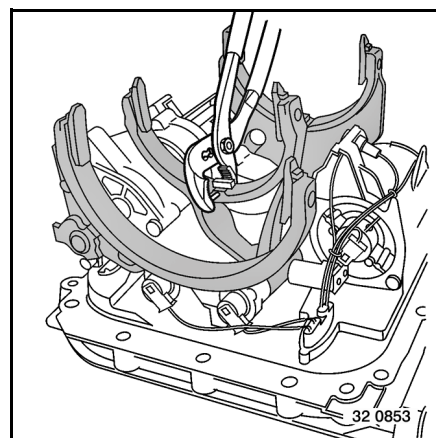


Fitting

Fit new pads.
Crimp the pads.
Use tool **0266**.



Fit new central fork pads to cylinders **1/R** and **2/3**.
Fit the fork pad pins to cylinders **1/R** and **2/3** using pliers.
Fit the control unit.
See page(s) N-19.



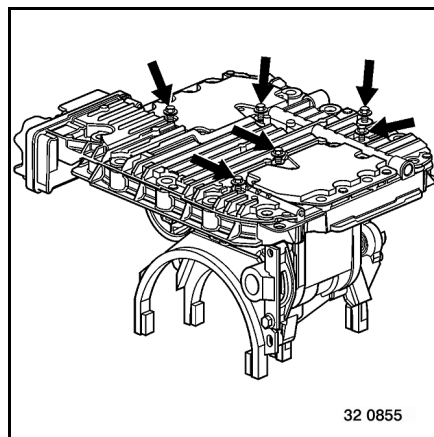
Replacement of speed sensors and wiring harness

Removal

Remove the control unit.

See page(s) F-3.

Remove the bolts securing the cover .



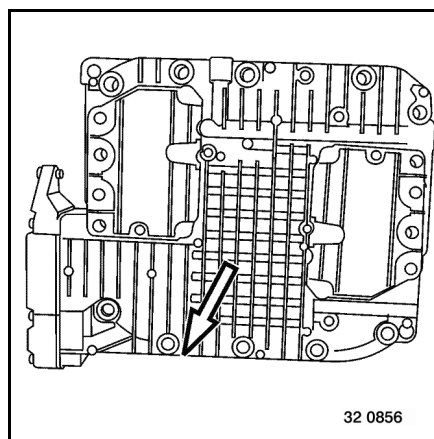
Place the control unit on its side.

Lift up and tilt the cover.

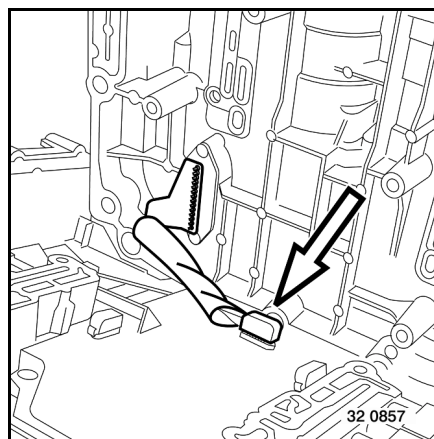
If necessary, use a screwdriver to serve as lever and disengage the cover.



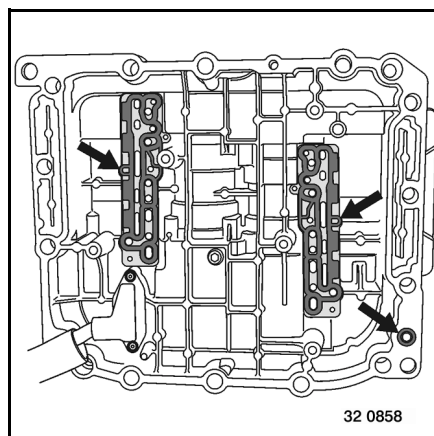
Take all necessary precautions so as to not damage the wiring harness connecting the cover to the control unit.



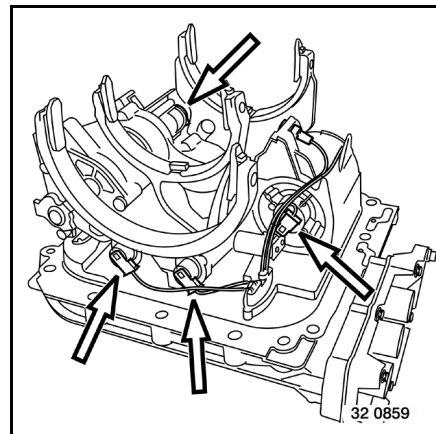
Disconnect the wiring harness at the cover end.



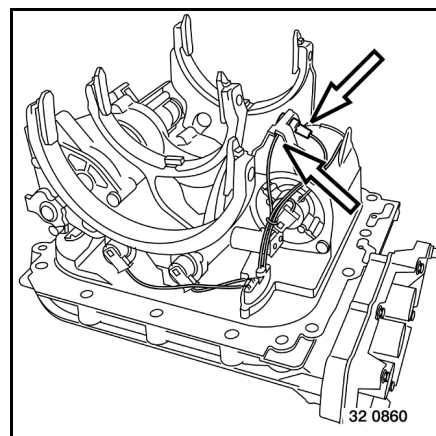
Remove the cover gaskets.



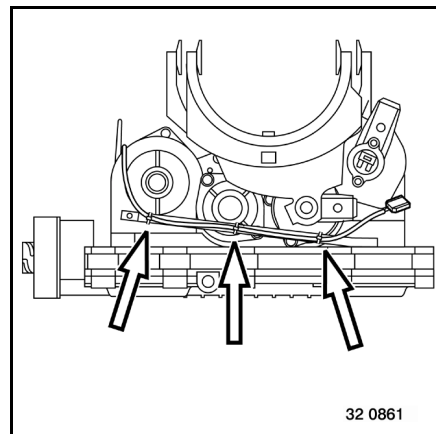
Disconnect the speed selection cylinders position sensors.



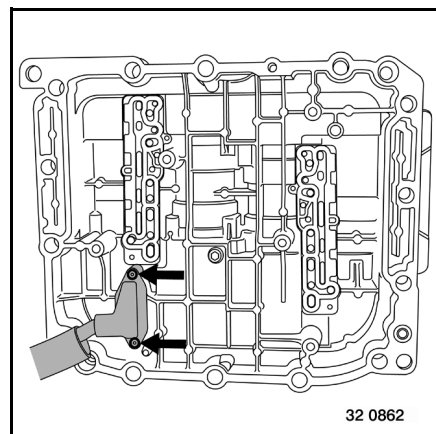
Remove the countershaft and secondary shaft speed sensors.



Cut the cable ties fastening the wiring harness to the guide .

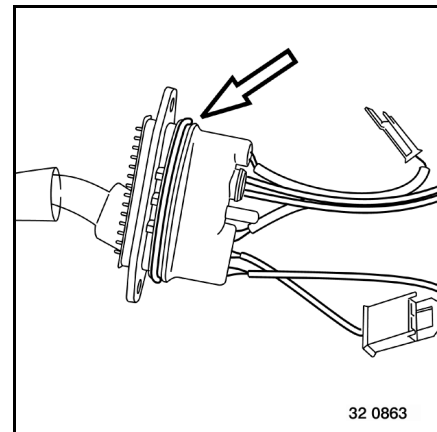


Remove the screws securing the connector to the cover.
Remove the wiring harness, consisting of connector and speed sensors.

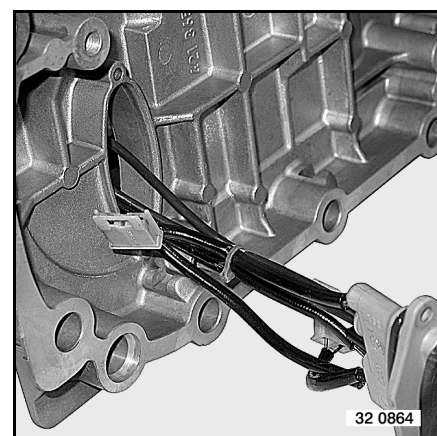


Fitting

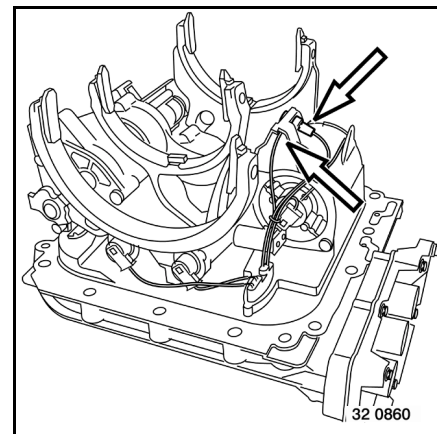
Apply oil (gearbox oil) to the connector gasket .



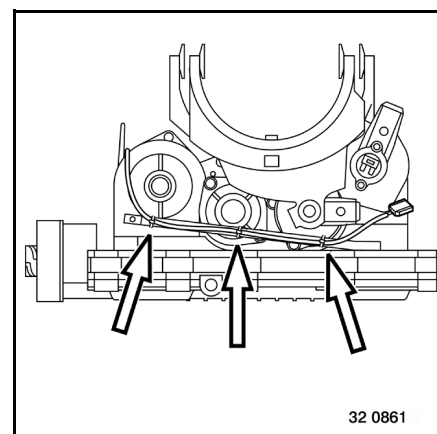
Insert the wiring harness through the control unit.
Fasten the connector to the control unit.



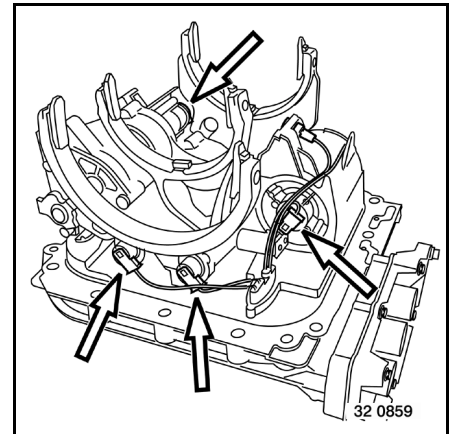
Route the cabled wiring harness.
Fit the countershaft and secondary shaft speed sensors.
Tighten the bolts to torque.
See page(s) B-2-3.



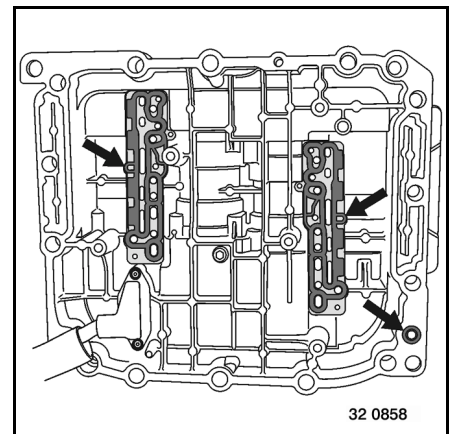
Fit new cable ties fastening the wiring harness to the guide.



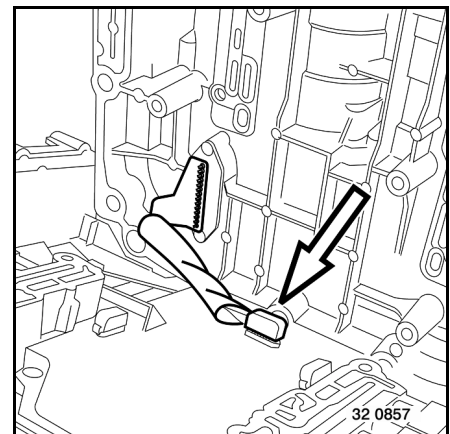
Connect the speed selection cylinders position sensors.



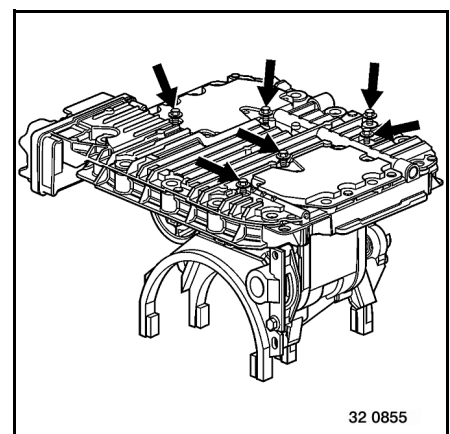
Fit new cover gaskets.



Connect the wiring harness at the cover end.



Fit the cover.
Tighten the bolts to torque.
See page(s) B-2-3.
Fit the control unit.
See page(s) N-19.



Refurbishment of the speed selection cylinders

Remove the control unit.

See page(s) F-3.

Remove the wiring harness.

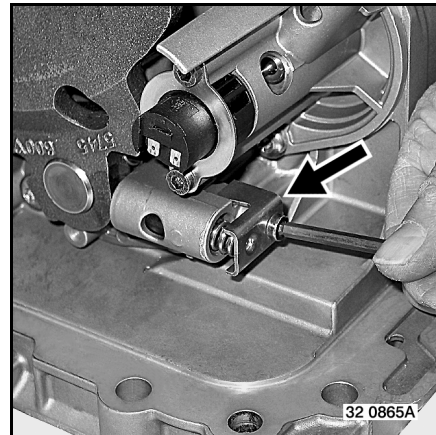
See page(s) G-4.

Remove the wiring harness guide.

Remove the 3 catches.

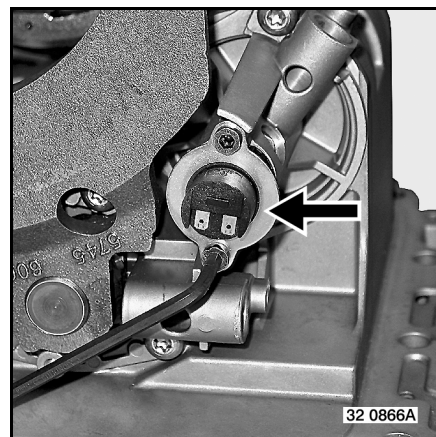


Make sure that the catch springs are tensioned at the time of removal of the retaining bushes.



Remove the 4 cylinder position sensors.

Remove gaskets.

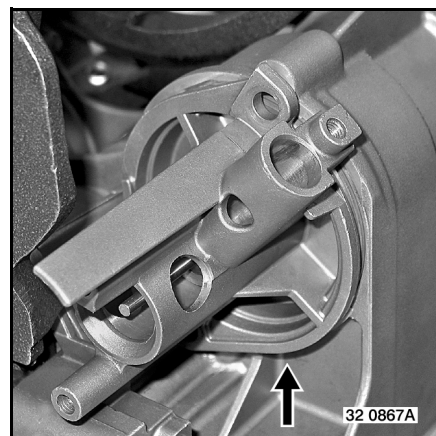


Remove the bolts securing the cover supporting the step-down cylinder position sensor.

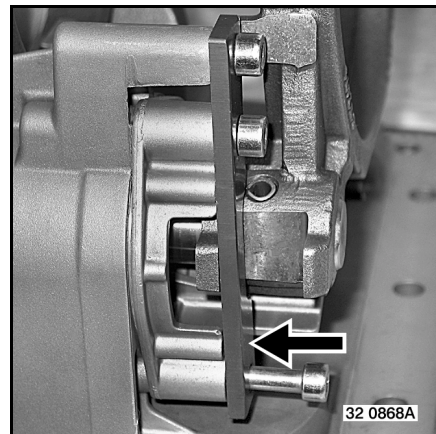
Dislodge the cover.



Use a screwdriver to dislodge the cover.



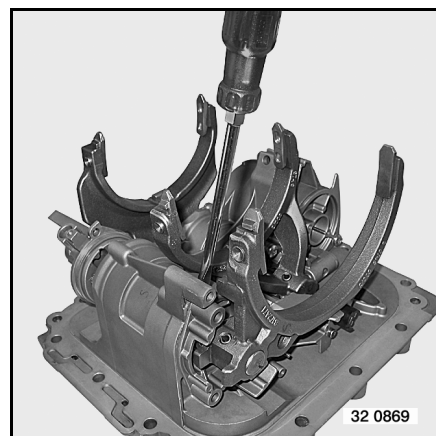
Remove the step-down cylinder travel limitation plate.



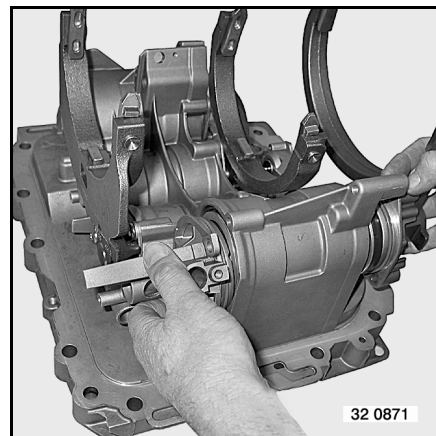
Remove the bolts securing the step-down cylinder covers.
Dislodge the cover complete with step-down cylinder fork.



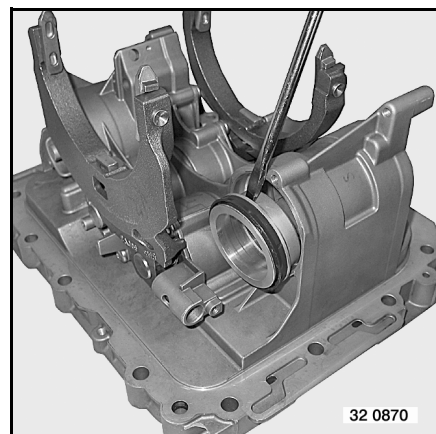
Use a screwdriver to dislodge the cover.



Simultaneously remove the 2 step-down cylinder covers.



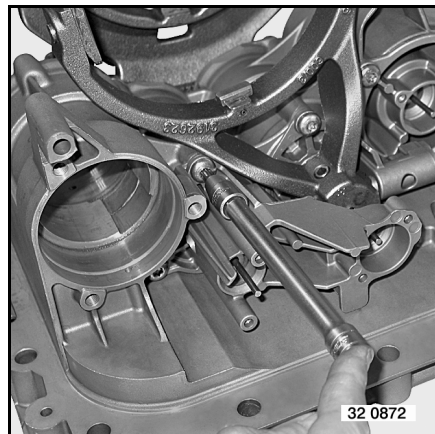
Remove the step-down cylinder piston.



Remove the bolts securing the cover supporting the speed selection cylinder **1/R** position sensor.
Dislodge the cover.



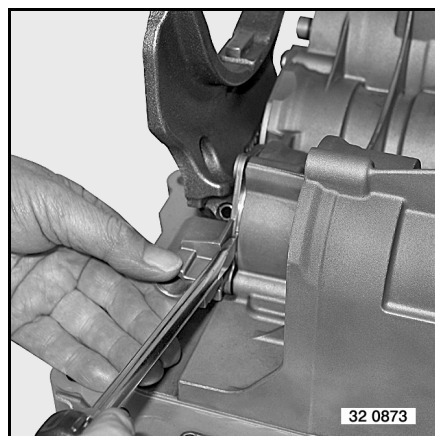
Use a screwdriver to dislodge the cover.



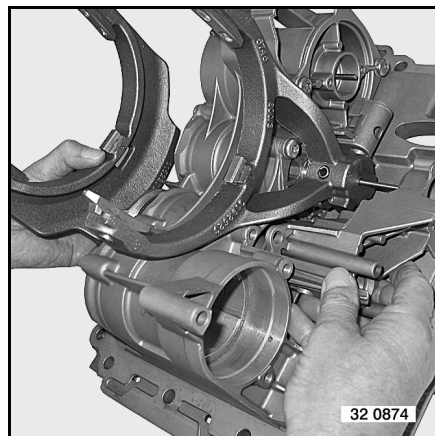
Remove the bolts securing the cover supporting the speed selection cylinder **1/R** covers.
Dislodge the cover complete with speed selection cylinder **1/R** fork.



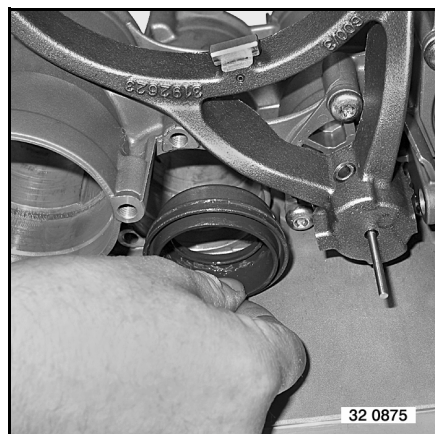
Use a screwdriver to dislodge the cover.



Simultaneously remove the 2 speed selection cylinder **1/R** covers.



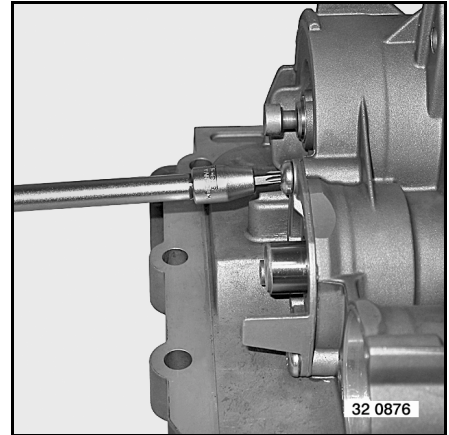
Remove the speed selection cylinder **1/R** piston.



Remove the bolts securing the cover supporting the speed selection cylinder **2/3** position sensor.
Dislodge the cover.



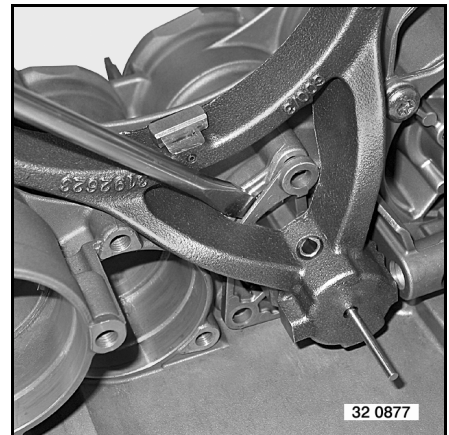
Use a screwdriver to dislodge the cover.



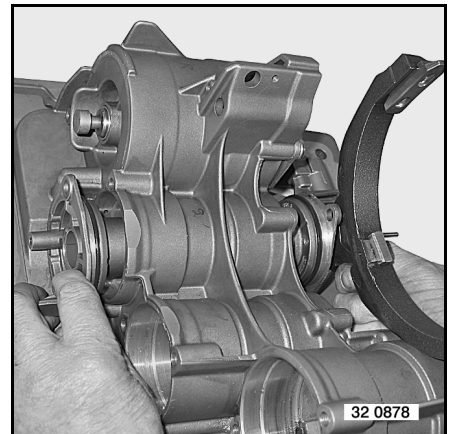
Remove the bolts securing the cover supporting the speed selection cylinder **2/3** covers.
Dislodge the cover complete with speed selection cylinder **2/3** fork.



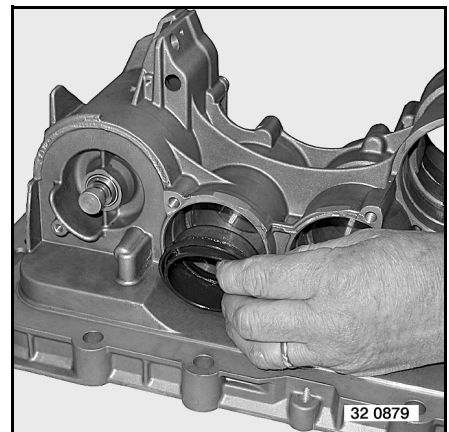
Use a screwdriver to dislodge the cover.



Simultaneously remove the 2 speed selection cylinder **2/3** covers.



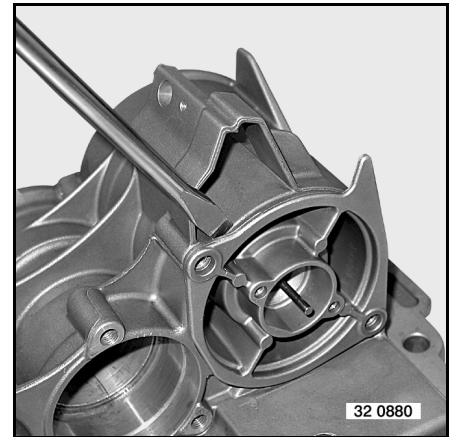
Remove the speed selection cylinder **2/3** piston.



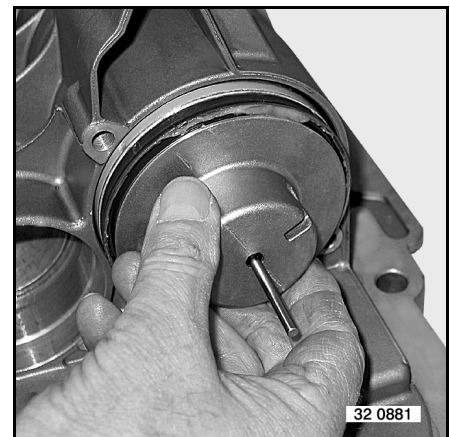
Remove the bolts securing the speed band selection cylinder cover.
Remove the cover.



Use a screwdriver to dislodge the cover.



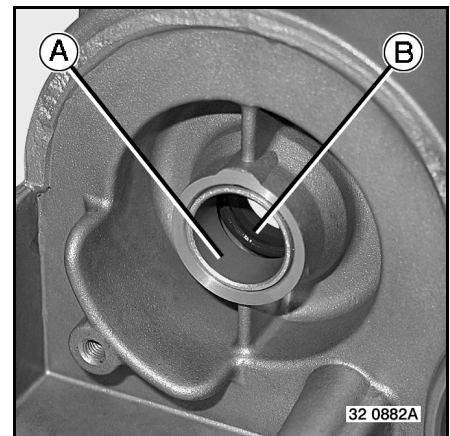
Remove the speed band selection cylinder piston.



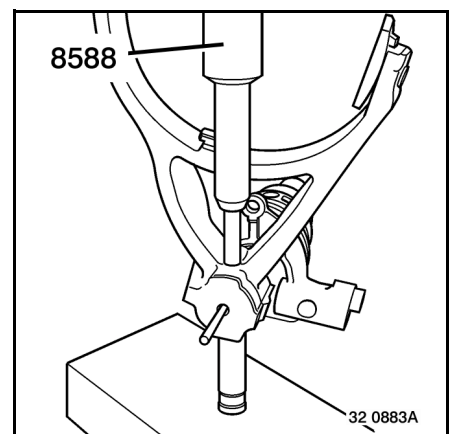
Remove ring (A).
Remove gasket (B).



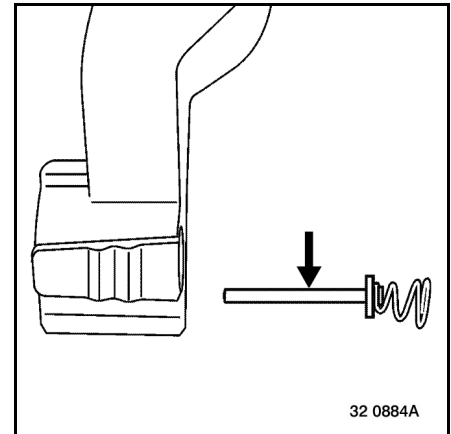
The ring and the gasket are to be replaced simultaneously.



Remove the fork from the piston pin.
Use tool **8588**.



In the fork, remove the piston position pin and spring.



Cleaning

Carefully clean all the parts.

Send compressed air through all the box ports.

Fitting

Proceed in the reverse sequence to removal.

Replace all gaskets on each piston pin. Use the kits provided for that purpose.

Carefully grease the piston gaskets with silicone-free **GRAISSE GRIPCOTT NF**.

Tighten the bolts to torque.

See page(s) B-2-3.

Fit the wiring harness.

See page(s) G-4.

Fit the control unit.

See page(s) N-19.

OIL PUMP

APPLICABILITY

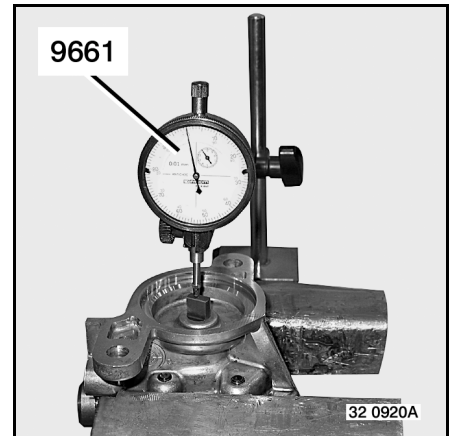
Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Inspection	150FX			06/08/2003	H-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Disassembly	150FX			06/08/2003	H-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Inspection	150FX			27/06/2003	H-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Assembly	150FX			30/06/2003	H-5
	17SD						
	17TD						

Inspection

Measure the shaft end play.
See page(s) B-3-1.
Use tool **9661**.



If the end play is out of tolerance, replace the oil pump.



Turn the oil pump over.
Remove the cover.
Measure the clearance between the pumping elements with
a set of feeler gauges.
See page(s) B-3-1.

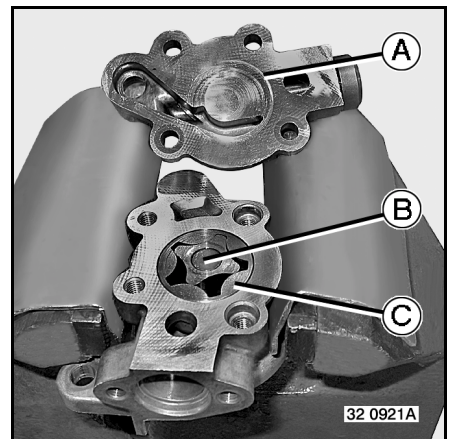


If the end play is out of tolerance, replace the oil pump.



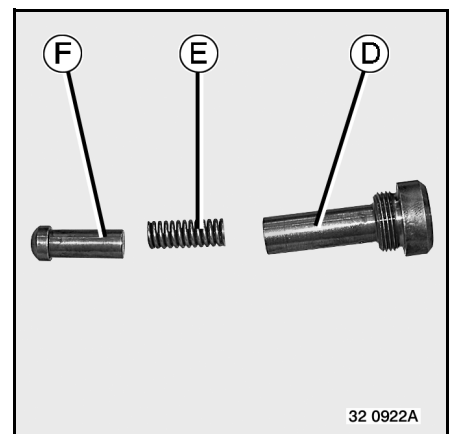
Disassembly

Remove cover **(A)**.
Remove rotor shaft **(B)** from the pump.
Remove rotor **(C)**.



Remove the by-pass valve, consisting of:

- plug **(D)**,
- spring **(E)**,
- valve **(F)**.



Inspection

Clean and inspect the pump body.



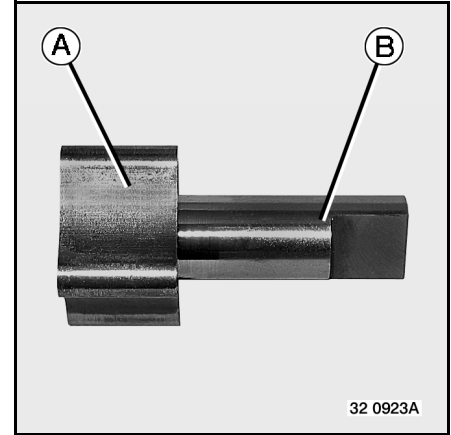
If the pump body is damaged, replace the oil pump.

Check that rotor **(A)** is correctly fastened to shaft **(B)** and that it is not damaged.

Check the by-pass valve seat.

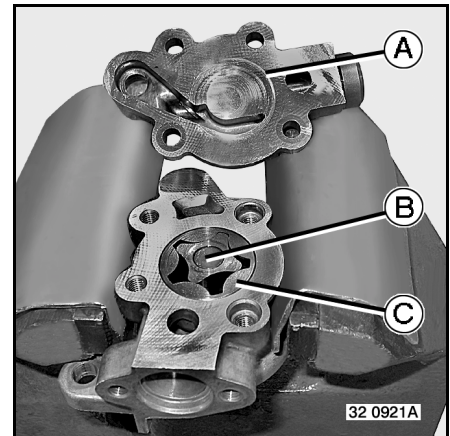
Check the length of the by-pass valve spring.

See page(s) B-3-1.

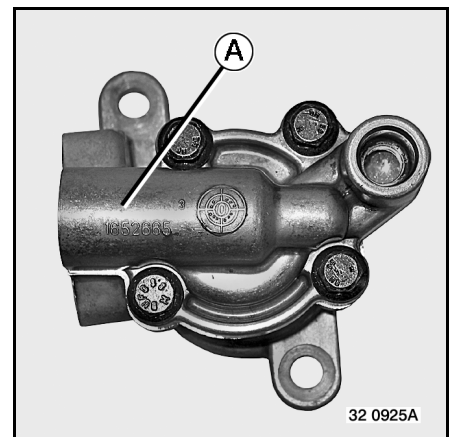


Assembly

Apply oil (gearbox oil) to rotor **(C)** and rotor shaft **(B)** then fit the shaft/rotor in the oil pump body .



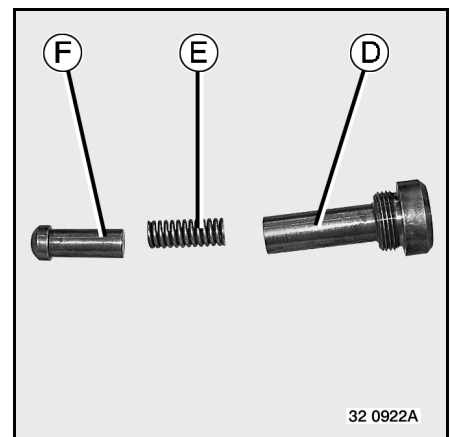
Fit cover **(A)**.
Tighten the bolts to torque.
See page(s) B-2-5.



Apply oil (gearbox oil) and fit the by-pass valve, consisting of:

- valve **(F)**,
- spring **(E)**,
- plug **(D)**.

Tighten the plug to torque.
See page(s) B-2-5.

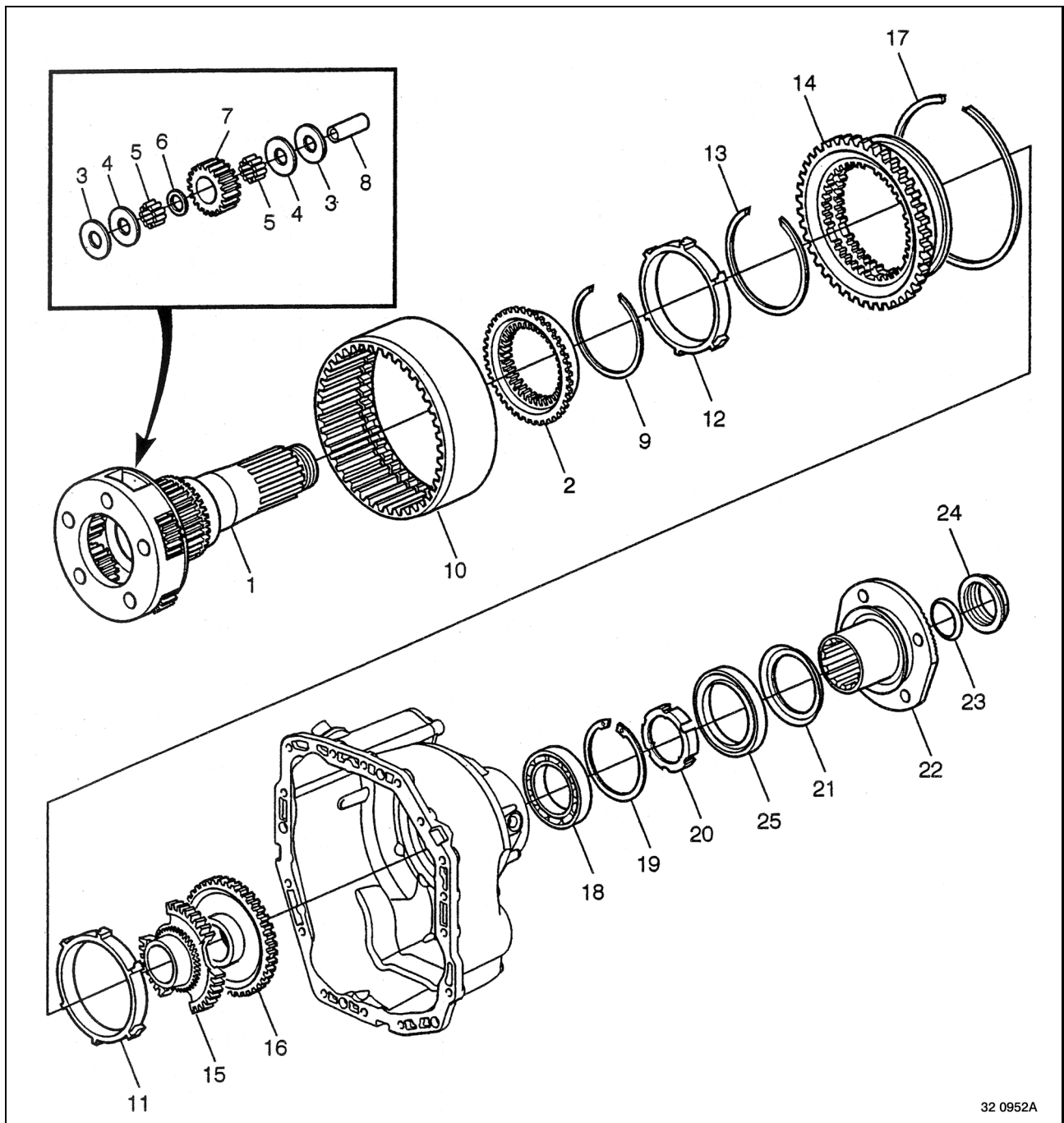


RANGE CHANGE

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Exploded view	150FX			19/04/2004	I-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Disassembly	150FX			01/07/2003	I-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Inspection	150FX			11/08/2003	I-9
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Assembly	150FX			11/08/2003	I-10
	17SD						
	17TD						

Exploded view



32 0952A

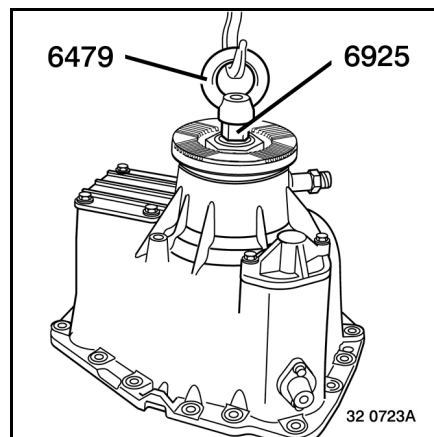
Disassembly

The item numbers indicated in the text refer to the drawing on page I-3.

Remove the range change.

See page(s) F-6.

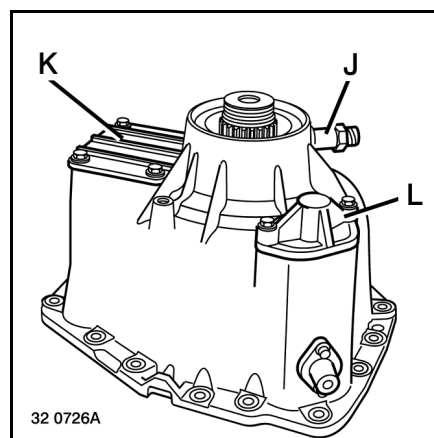
Remove the lifting eyelet and the adapter.



Remove speed sensor (J).

Remove PTO cover (K).

Remove selector fork shaft cover (L).



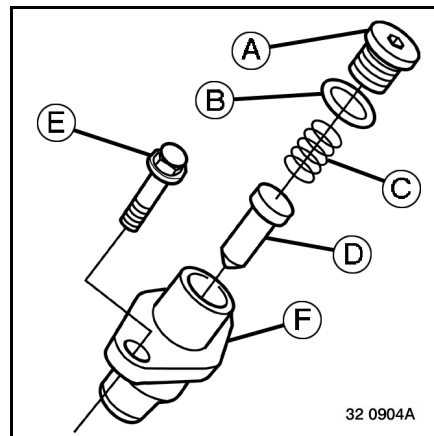
Remove the range change locking valve.

Remove plug (A).

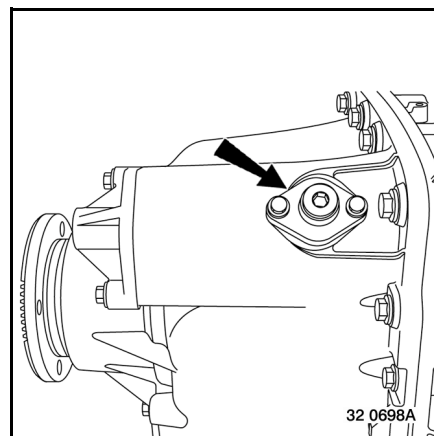
Remove gasket (B).

Remove spring (C).

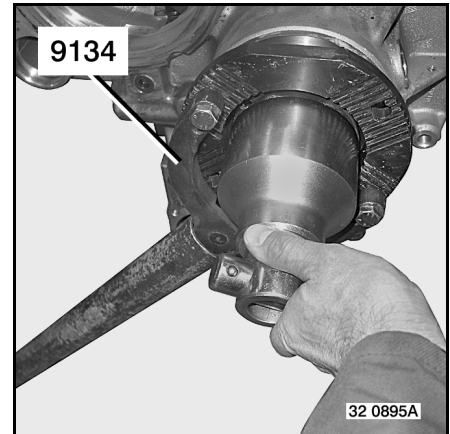
Remove catch (D).



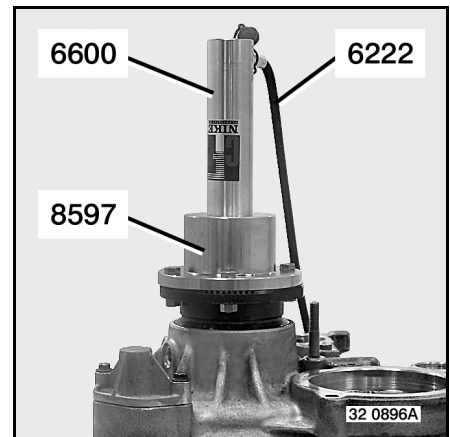
Remove valve body (F).



Retain flange **(22)** against motion.
Use tool **9134**.
Unlock **(24)**.
Remove nut **(24)**.
Remove gasket **(23)**.



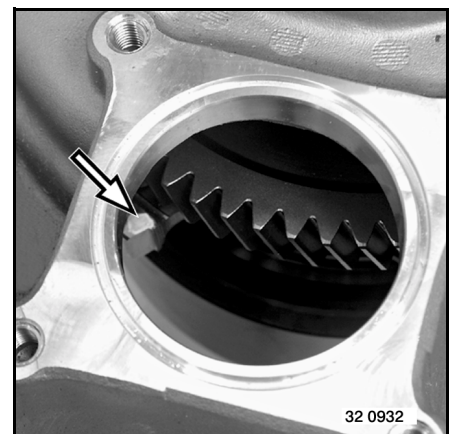
Extract flange **(22)**.
Use tool **8597 + 6600 + 6222**.



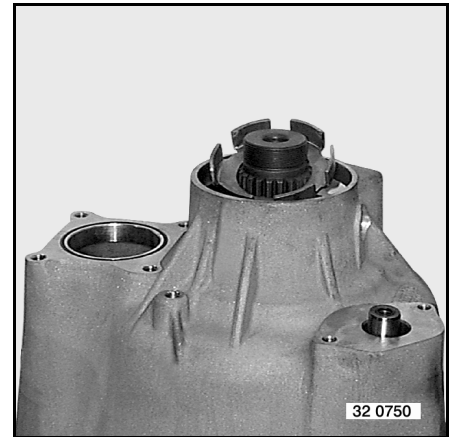
Remove dust guard **(21)**.



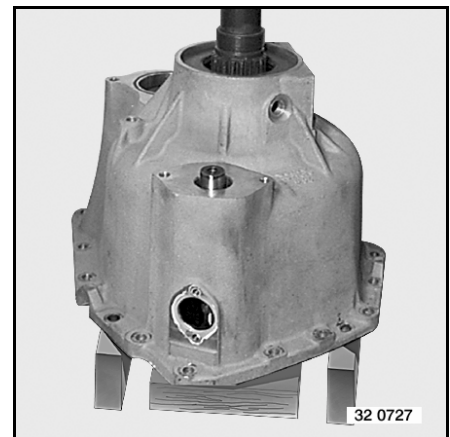
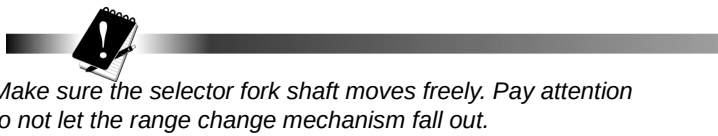
Mark the position of intermediate disc **(15)** through the PTO cover.
Remove ring **(25)**.



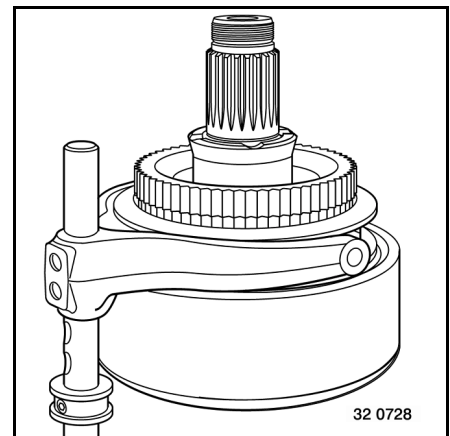
Remove speed sensor pulse ring (20).



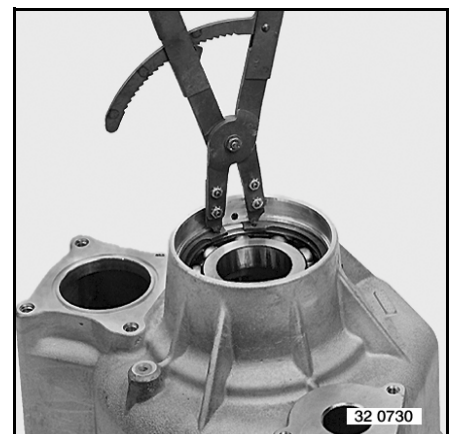
Remove planet wheel carrier shaft (1).
Use a press.



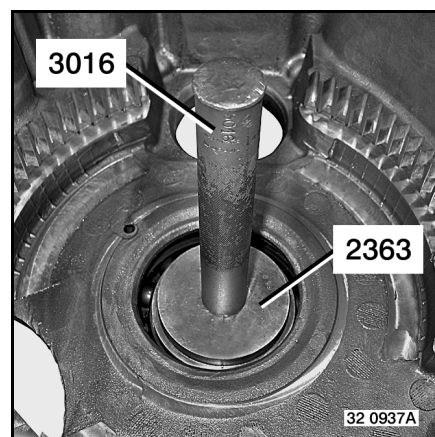
Remove the selector fork.



Remove circlip (19).



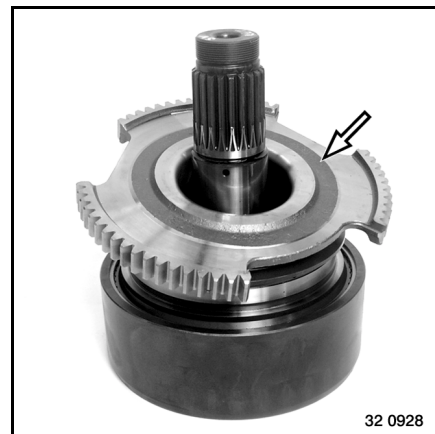
Extract bearing **(18)**.
Use tool **2363 + 3016**



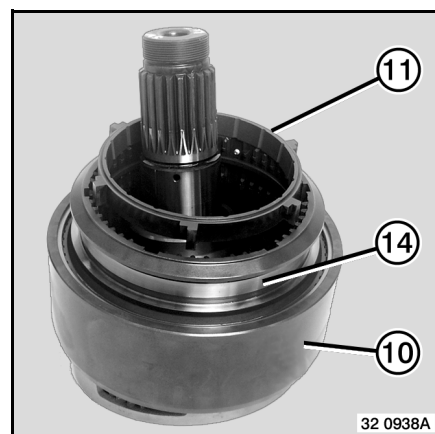
Extract pinion **(16)**.
Use tool **0821**.



Remove intermediate disc **(15)**.

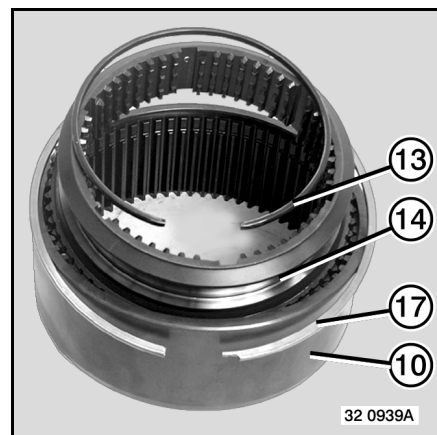


Remove synchronizer cone **(11)**.
Remove baulking ring **(10)**, complete with coupling sleeve **(14)**.



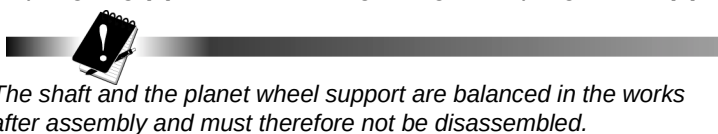
On baulking ring (10), remove:

- circlip (17),
- coupling sleeve (14),
- spring ring (13).



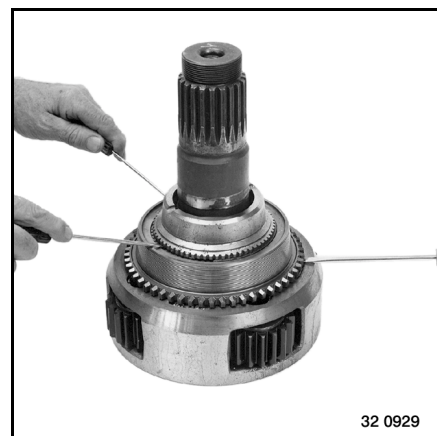
Remove synchronizer cone (12).

Drive in spring ring (9) and remove "high range" coupling sleeve (2).



Inspect planet wheels (7).

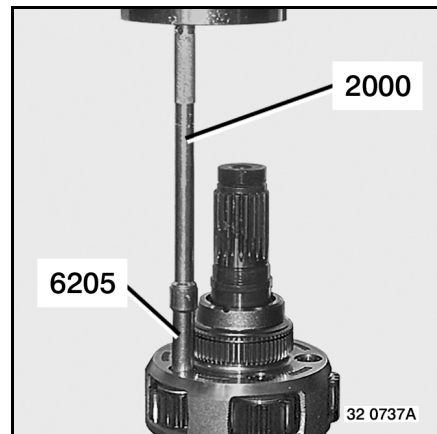
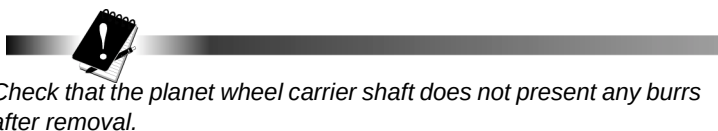
See page(s) I-9.



Remove shafts (8).

Use tool 2000 + 6205

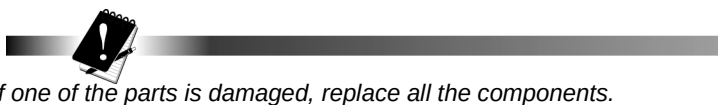
Use a press.



Remove:

- planet wheels (7),
- washers (3 - 4),
- needle bearings (5),
- spacer (6).

Check that all the shaft holes do not present any sharp edges.



Inspection

The item numbers indicated in the text refer to the drawing on page I-3.

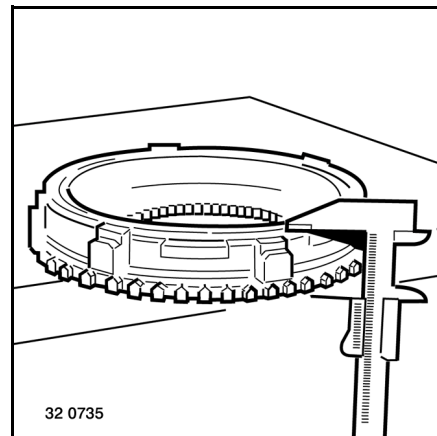
Clean and inspect all the parts.

Check the friction surfaces of coupling sleeves **(2 - 14)** and synchronizer cones **(12 - 11)**. Coupling sleeves **(2 - 14)** that present fully or partially worn grooves, or blued surfaces must be replaced. Synchronizer cones **(12 - 11)** that are blued from the inside to the outside must be replaced.

Check that synchronizer cone **(12)** lies quite flat on coupling sleeve **(2)**. Measure the space between the bottom of coupling sleeve **(2)** and the top of synchronizer cone **(12)** in several places.

Proceed in the same way for synchronizer cone **(11)** and coupling sleeve **(14)**.

See page(s) B-3-1.



Check that planet wheels **(7)** rotate freely, without hard spot.

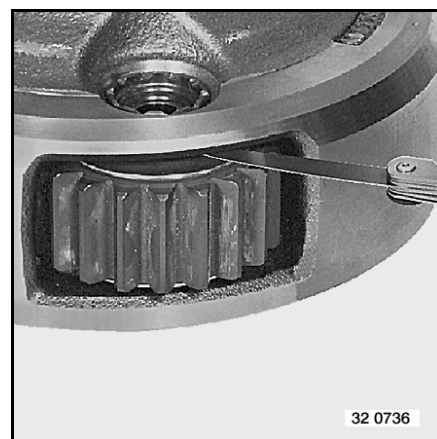
Check the end play of planet wheels **(7)**.

See page(s) B-3-1.

Check the surface finish of baulking ring **(10)**.



*If one planet wheel is damaged and has to be replaced, all planet wheels **(7)**, shafts **(8)**, needle bearings **(5)**, washers **(3 - 4)** and spacers **(6)** will have to be replaced.*



Assembly

The item numbers indicated in the text refer to the drawing on page I-3.

Fit the following to each planet wheel **(7)**:

- needle bearings **(5)**,
- spacer **(6)**.

Use grease to facilitate the operation.

Pack with "**GRAISSE GRIPCOTT NF**".

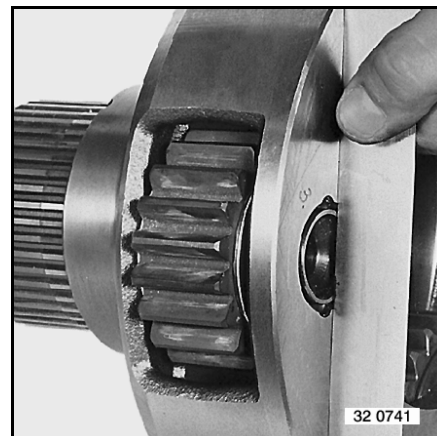
Use a new shaft **(8)** to facilitate installation of needle bearings **(5)**.

Fit thrust washers **(3 - 4)** and planet wheels **(7)** to their supports.

Planet wheel shafts **(8)** must be able to be inserted easily into their support and be flush with the support.



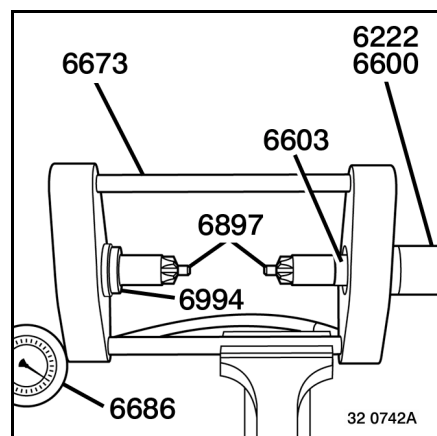
Check that the shafts are not set off from the surface of the support at the moment when pressure is exerted.



Grip the press tool in a vice.

Install the riveting arbour.

Use tool **6673 + 6600 + 6603 + 6897 + 6994 + 6686 + 6222**.



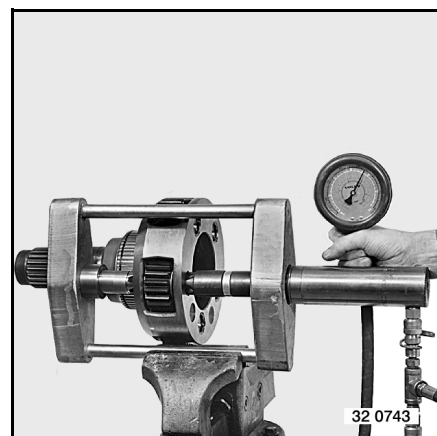
Place planet wheel carrier shaft **(1)** in the press tool.

Crimp shaft **(8)**.

Press until a force of **6 tonnes** is reached.

Turn the riveting arbour so that the next press mark is between the previous marks.

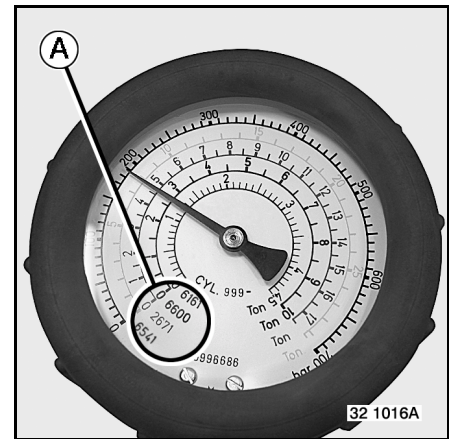
Press until a force of **6.5 tonnes** is reached.



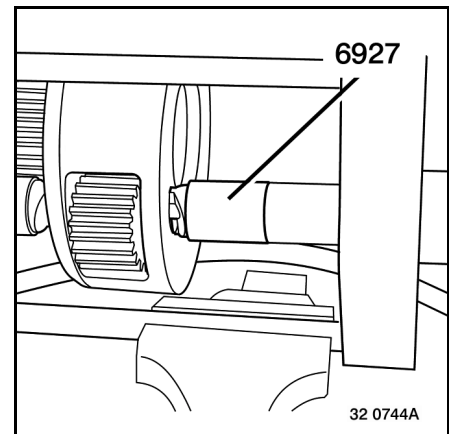
A: ram reference numbers.



Pressure gauge **6686** comprises several scales of graduation, according to the ram used. The ram reference number is noted opposite each scale of graduation.



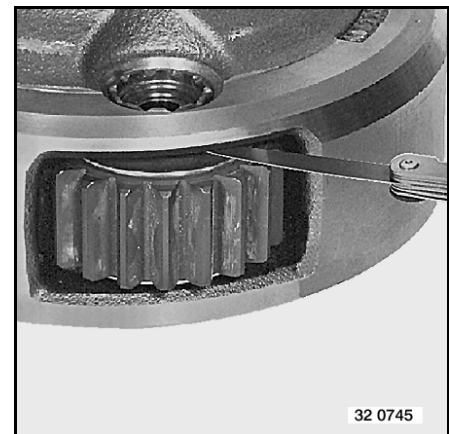
Withdraw the riveting arbor **6897** and mount arbor **6927**.
Press until a force of **6.5 tonnes** is reached.



Check that planet wheel **(7)** turns freely.
Check the end play of planet wheels **(7)**.
See page(s) B-3-1.



At the moment of assembly, lubricate (gearbox oil) bearings, friction surfaces and gaskets.

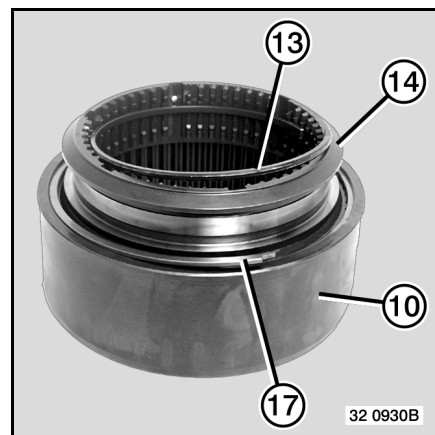


Fit spring ring **(9)**.
Fit coupling sleeve **(2)**.



Assemble baulking ring (10) and coupling sleeve (14) with circlip (17).

To obtain the correct locking force in the synchronizer, replace spring ring (13) whenever the synchronizer is dismantled.



Fit:

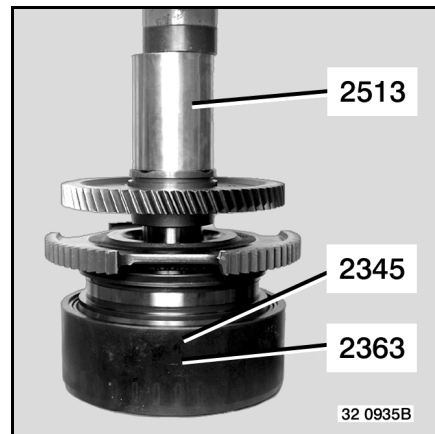
- "high range" synchronizer cone (12),
- baulking ring (10) complete with coupling sleeve (14) and spring ring (13),
- "low range" synchronizer cone (11),
- intermediate disc (15).



Fit pinion (16).

Use tool 2513 + 2345 + 2363.

Use a press.



Drive in bearing (18) to abutment.

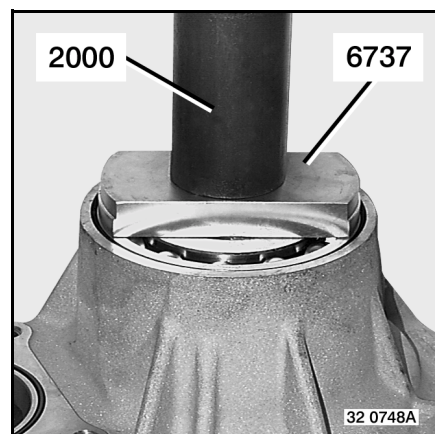
Use tool 6737 + 2000

Use a press.

Fit circlip (19).

Choose the maximum thickness for circlip (19).

Maximum authorized play: 0.10 mm.

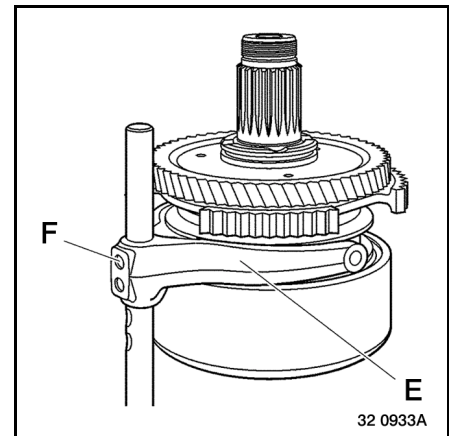


Wedge planet wheel carrier shaft **(1)** on the work bench.
 Use wooden wedges.
 Clean the screw-threads in fork **(E)**.
 Position fork **(E)** with the piston rod in the widest groove of the intermediate disc.

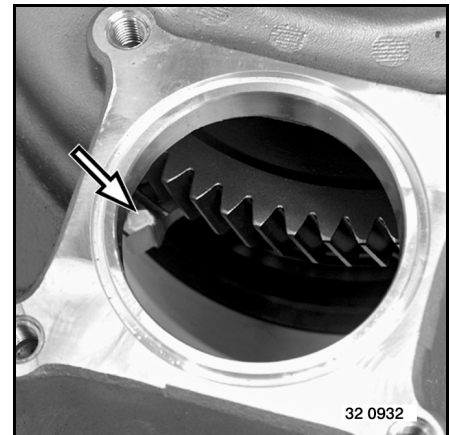


*If the fork and the piston rod have been disassembled, the top bolt **(F)** is to be tightened first. Burr the bolt after tightening using a centre-punch to lock.*

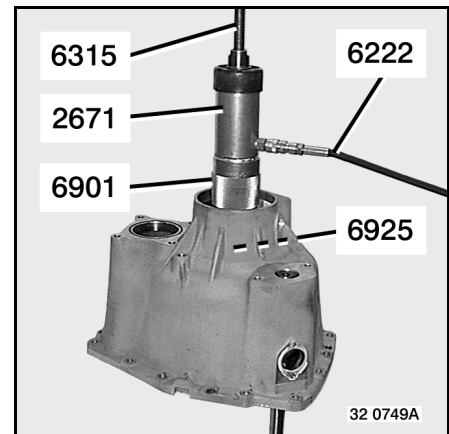
Tighten the bolts to torque.
 See page(s) B-2-4.



Fit the range change casing.
 Position intermediate disc **(15)** lining up the mark made at the time of dismantling.



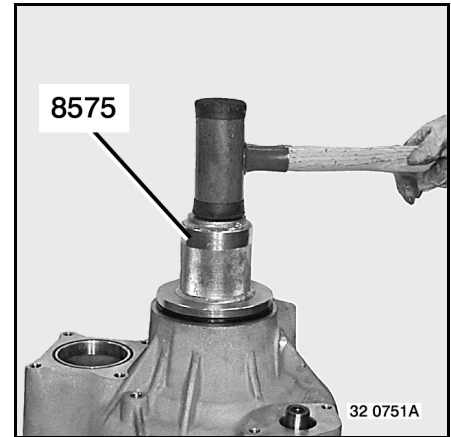
Carefully drive in planet wheel carrier shaft **(1)** and check from below, through the PTO hole, that intermediate disc **(15)** is positioned correctly in, the casing and that it is quite straight.
 Use tool **6315 + 2671 + 6222 + 6901 + 6925**.



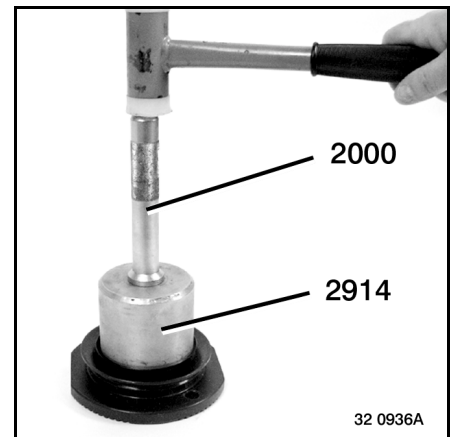
Install speed sensor pulse ring **(20)**.



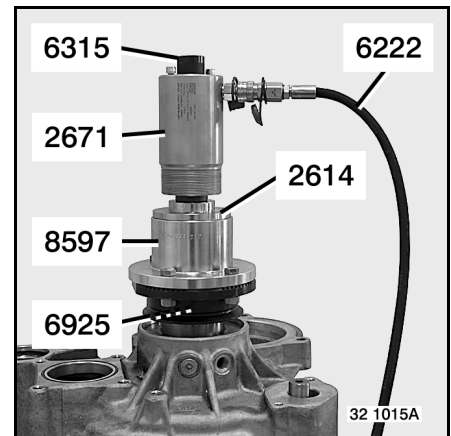
Fill the space between the lips of the new seal ring with **GRAISSE GRIPCOTT NF**.
Fit ring **(25)**.
Use tool **8575**.



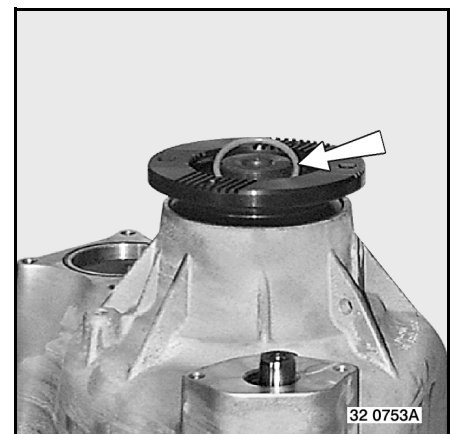
Fit a new dust guard **(21)**.
Use tool **2000 + 2914**



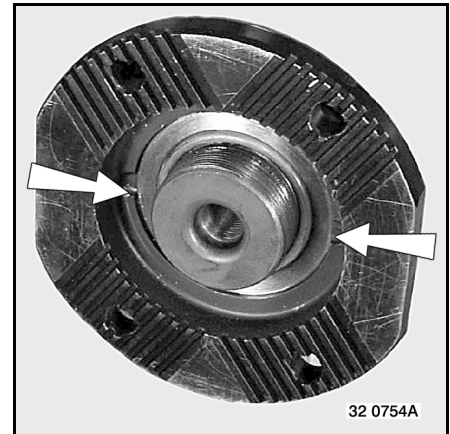
Smear dust guard **(21)** **GRAISSE GRIPCOTT NF**.
Fit flange **(22)**.
Use tool **6315 + 2671 + 8597 + 2614 + 6222 + 6925**.



Fit a new gasket **(23)**.



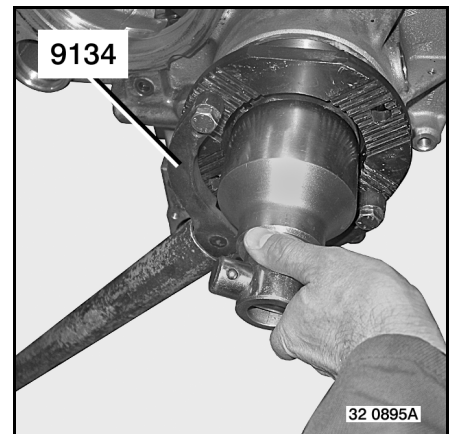
Mark the notches in the flange for locking the nut.



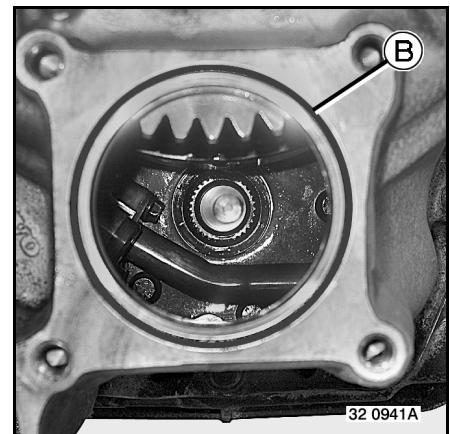
Fit a new nut **(24)**.
Retain flange **(22)** against motion.
Use tool **9134**.
Tighten to torque.
See page(s) B-2-4.
Burr the nut using a centre-punch to lock.



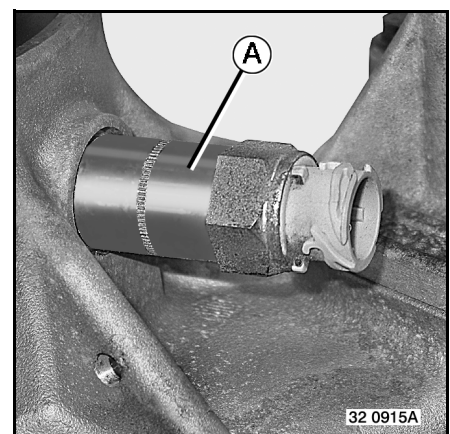
Check there are no splits in the sides of the nut



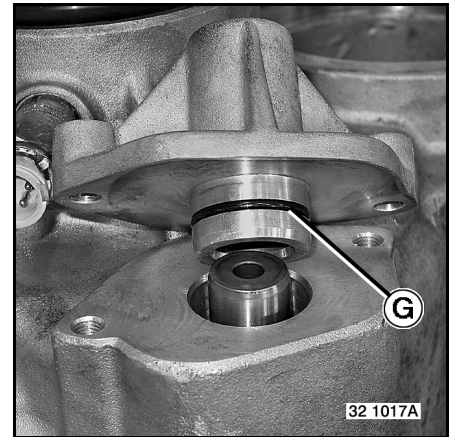
Install a new gasket **(B)**.
Install the PTO cover.
Tighten the bolts to torque.
See page(s) B-2-4.



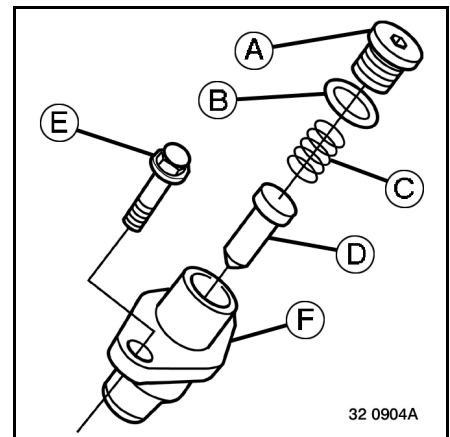
Fit speed sensor **(A)**.
See page(s) D-3-8.



Install a new gasket **(G)**.
 Install the selector fork shaft cover.
 Tighten the bolts to torque.
 See page(s) B-2-4.



Smear range change safety valve body **(F)** sealing compound, then fit.
 Apply sealant "LT 549".
 Tighten the bolts to torque.
 See page(s) B-2-4.
 Fit the interlock **(D)**.
 Install spring **(C)**.
 Fit a new gasket **(B)**.
 Fit plug **(A)**.
 Tighten the plug to torque.
 See page(s) B-2-4.

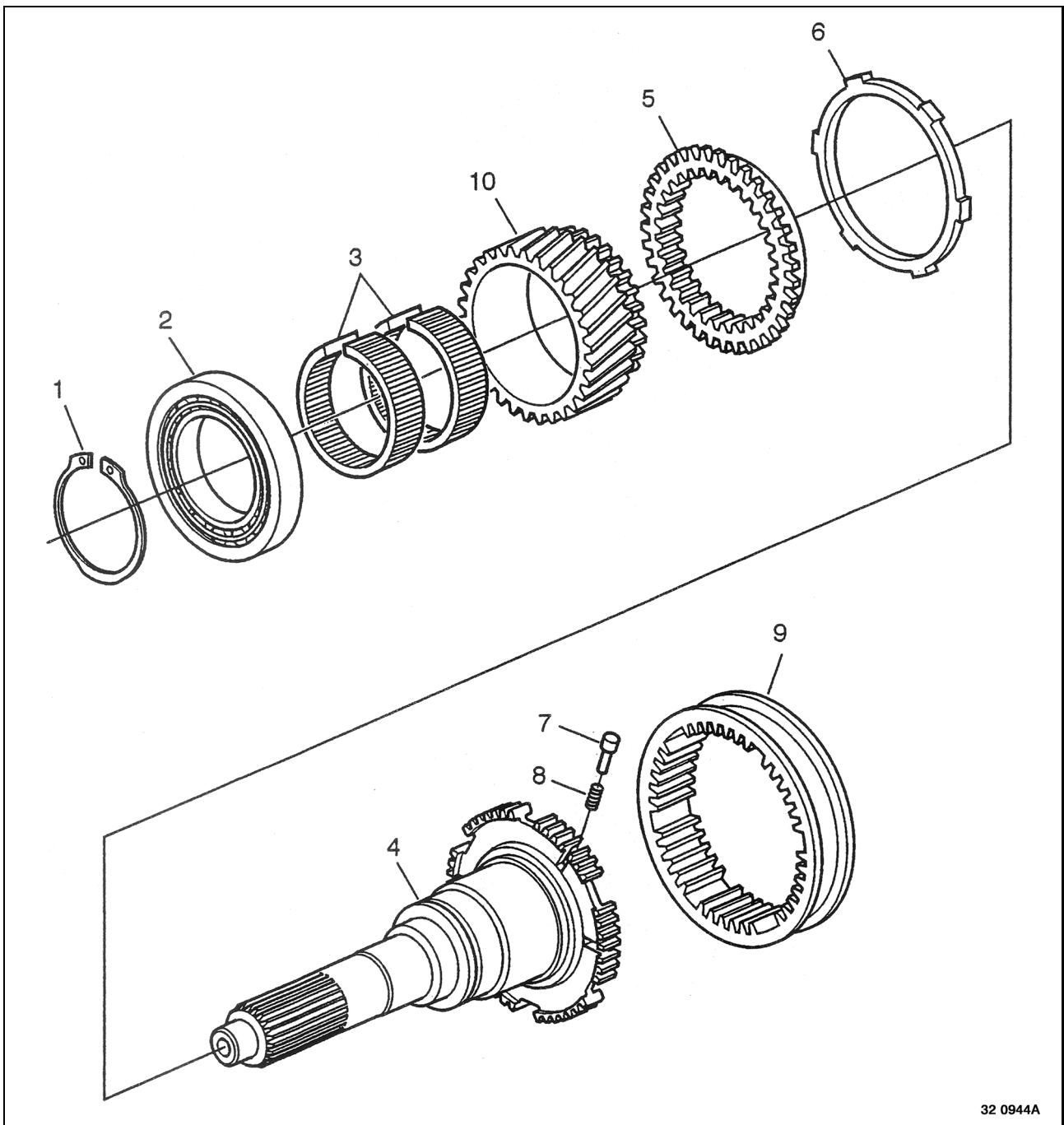


PRIMARY SHAFT

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Exploded view	150FX			15/04/2004	J-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Disassembly	150FX			02/07/2003	J-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Inspection	150FX			11/08/2003	J-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Assembly	150FX			11/08/2003	J-5
	17SD						
	17TD						

Exploded view



Disassembly

The item numbers indicated in the text refer to the drawing on page J-3.

Remove coupling sleeve **(9)**.

Remove locking pins **(7)** and springs **(8)**.

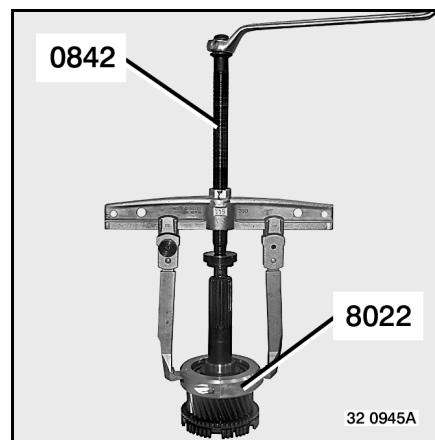
Remove circlip **(1)**.

Extract bearing **(2)**.

Use tool **8022** + **0842**

Remove:

- pinion **(10)**,
- coupling ring **(5)**,
- synchronizer cone **(6)**,
- bearings **(3)**.



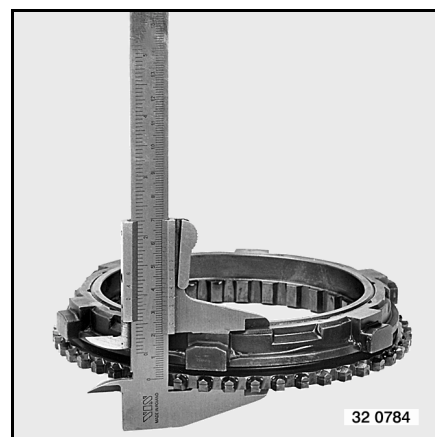
Inspection

The item numbers indicated in the text refer to the drawing on page J-3.

Clean and inspect all the parts.

Check that synchronizer cone **(6)** is placed quite flat on coupling ring **(5)**. Measure the space between the bottom of coupling ring **(5)** and the top of synchronizer cone **(6)** in several places.

See page(s) B-3-1.



Assembly

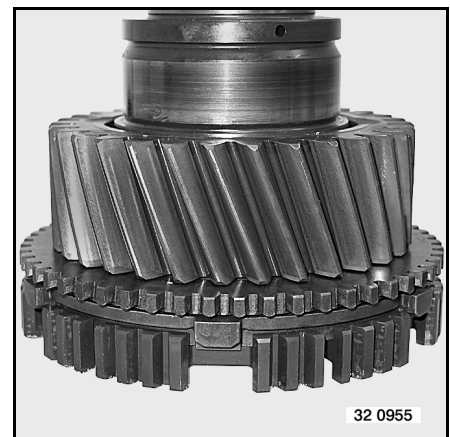
The item numbers indicated in the text refer to the drawing on page J-3.

Place shaft **(4)** in a vertical position on a table.
Lubricate (gearbox oil) bearings **(3)**, synchronizer cone **(6)** and pinion **(10)**.

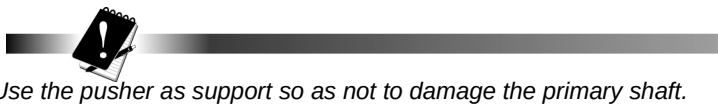


Fit:

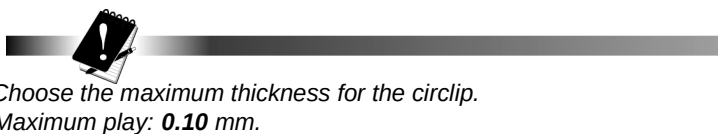
- synchronizer cone **(6)**,
- coupling ring **(5)**,
- pinion **(10)**,
- bearings **(3)**.



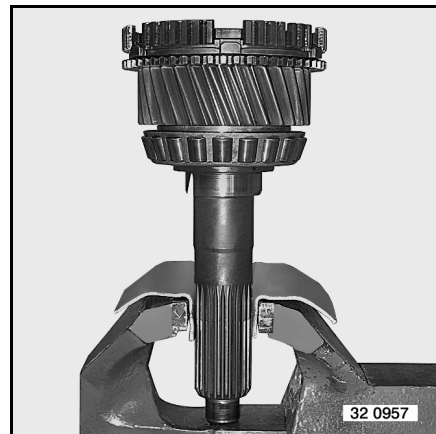
Fit bearing **(2)**.
Use tool **2363** + **2513**
Use a press.



Fit circlip **(1)**.



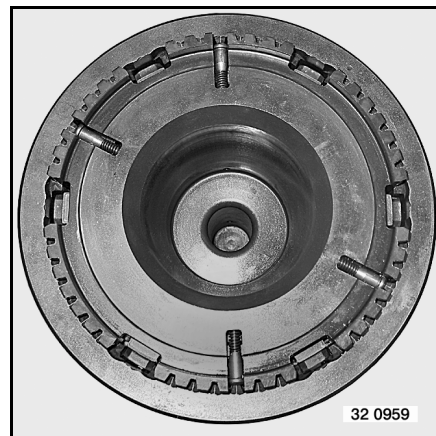
Turn the shaft over and grip it in a vice.



Position coupling sleeve (9) with the chamfered end facing upwards.



Replace the locking pin springs and lubricate (gearbox oil) the new springs prior to assembly.
Fit springs (8) and locking pins (7).



Put the pusher into place and pull coupling sleeve (9) upwards, to the neutral position.
Use tool **2363**.



At the time of installation of the complete primary shaft to the secondary shaft, hold the coupling sleeve to prevent it from working loose.

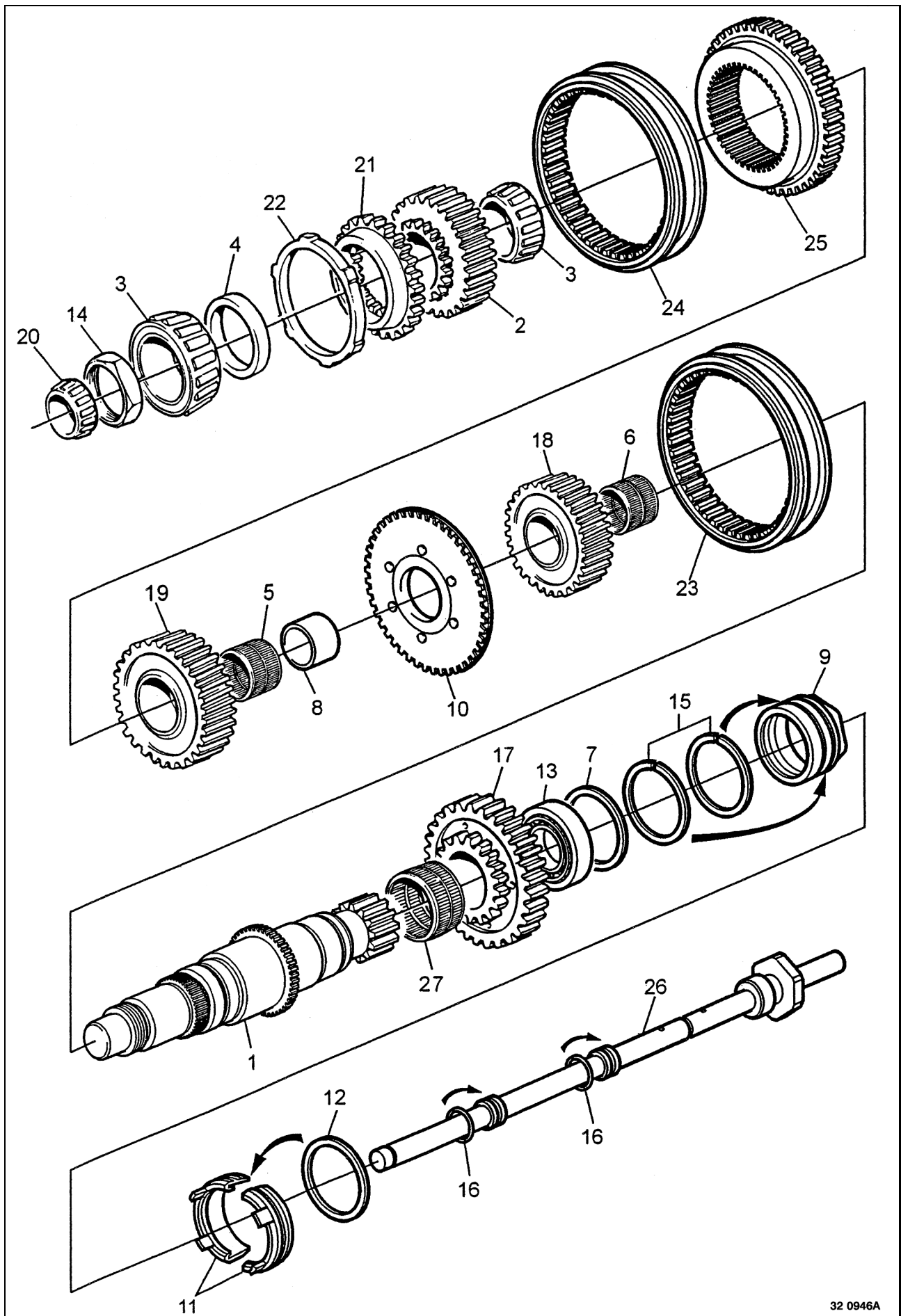


SECONDARY SHAFT

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Exploded view	150FX			15/04/2004	K-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Disassembly	150FX			02/07/2003	K-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Inspection	150FX			11/08/2003	K-7
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Assembly	150FX			11/08/2003	K-7
	17SD						
	17TD						

Exploded view



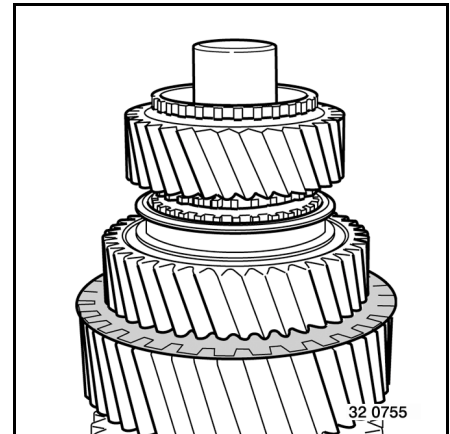
32 0946A

Disassembly

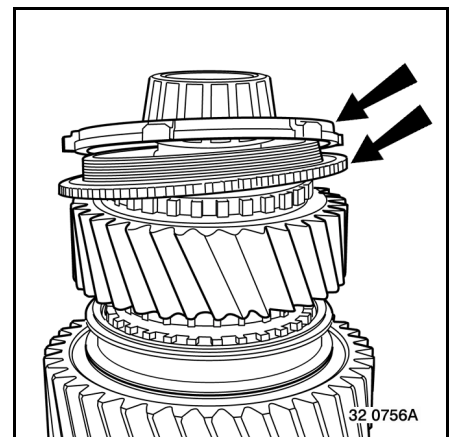
The item numbers indicated in the text refer to the drawing on page K-3.



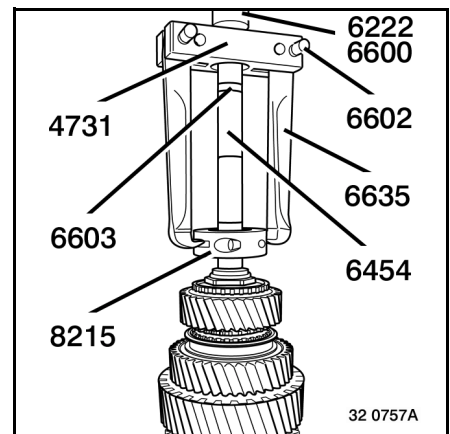
Do not place the secondary shaft on a bench so as not to damage the pulse ring (10). Work must be carried out with the shaft in a vertical position.



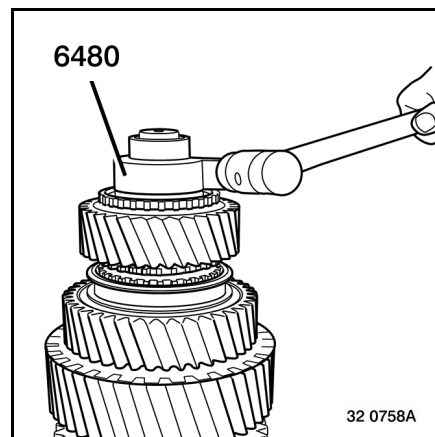
Remove synchronizer cone (22).
Remove synchronizer ring (21).



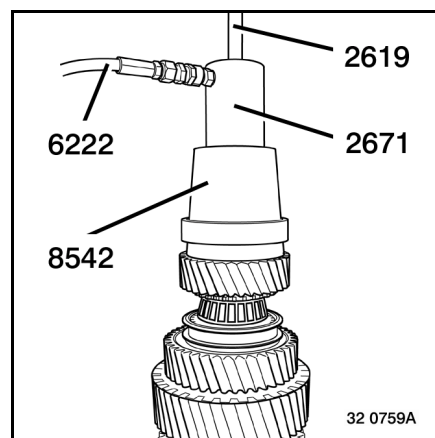
Extract bearing (20).
Use tool 8215 + 6454 + 6635 + 6602 + 6603 + 4731 + 6600 + 6222.



Remove nut **(14)**.
Use tool **6480**.



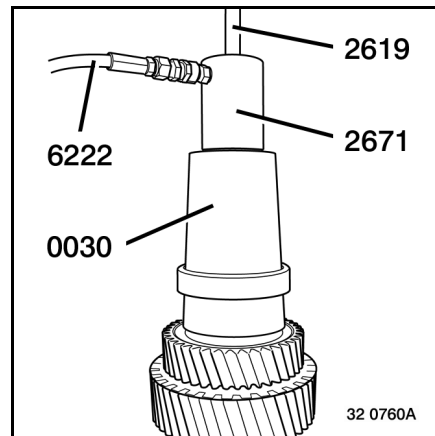
Remove pinion **(2)**.
Use tool **8542 + 2671 + 2619 + 6222**.
On pinion **(2)**, remove front bearing **(3)**.
Remove ring **(4)**.
Remove coupling sleeve **(24)**.
Remove coupling ring **(25)**.



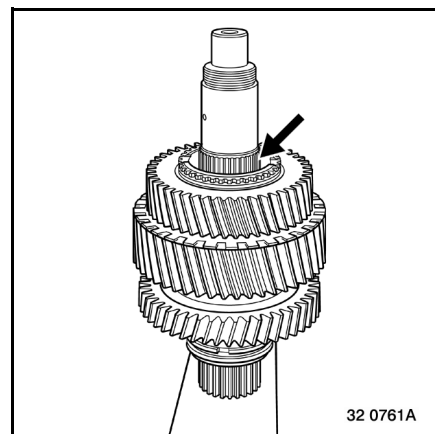
Remove pinion **(19)**.
Use tool **0030 + 2619 + 2671 + 6222**.



*Pinion **(19)** drives rear bearing **(3)** at the time of its removal.*



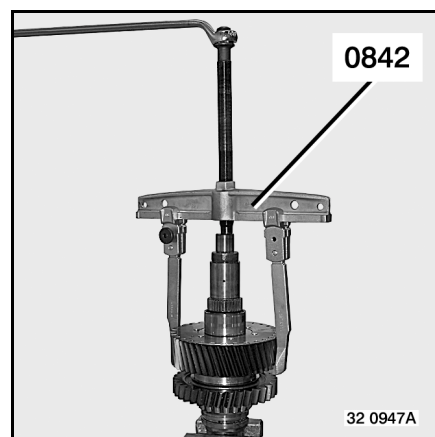
Remove bearing **(5)**.



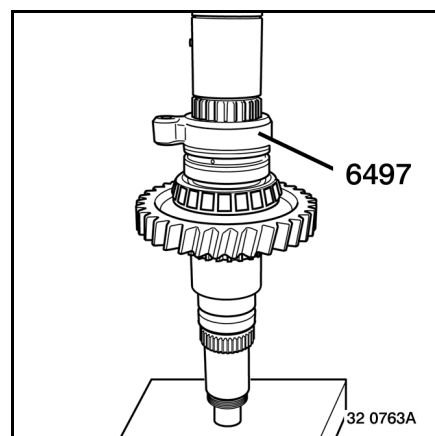
Remove 1st speed pinion **(18)** complete with pulse ring **(10)**.
 Use tool **0842**.
 Remove ring **(8)**.
 Remove bearing **(6)**.
 Remove coupling sleeve **(23)**.



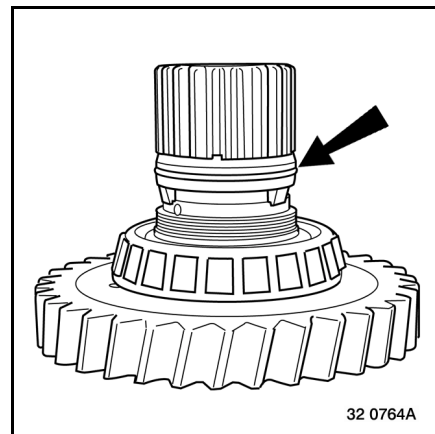
Make sure the puller arms do not damage the pulse ring.



Turn the shaft over and clamp it in a press, capacity 10 tonnes approx.
 Loosen nut **(9)**.
 Use tool **6497**.



Withdraw assembly **(1)** from the press.
 Remove nut **(9)**.
 On nut **(9)**, remove rings **(15)**.
 Remove gasket **(12)** and both halves of oil distributor **(11)**.

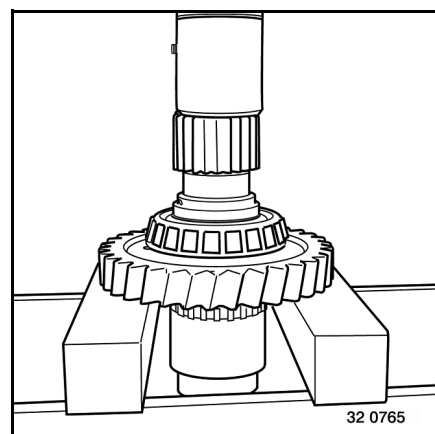


Remove bearing **(13)** and reverse pinion **(17)**.
 Use a press.



Make sure the shaft does not fall onto the floor not fall onto the floor as it may get damaged.

Remove bearing **(27)**.



Inspection

Clean and inspect all the parts.

Assembly

The item numbers indicated in the text refer to the drawing on page K-3.

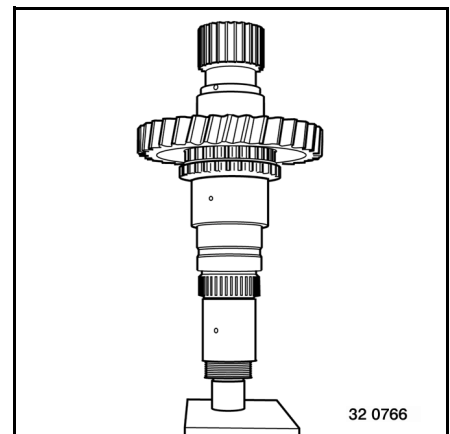
Lubricate (gearbox oil) needle bearings, roller bearings and pinions at the time of assembly.

Place the shaft **(1)** in a vertical position with the sun gear facing upwards.

Fit bearing **(27)**.



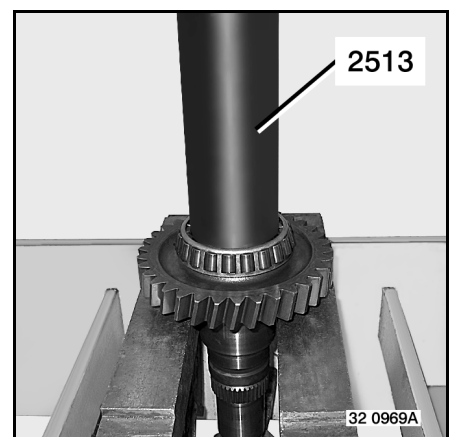
Fit reverse pinion **(17)** with the teeth facing downwards.



Fit bearing **(13)**.

Use tool **2513**.

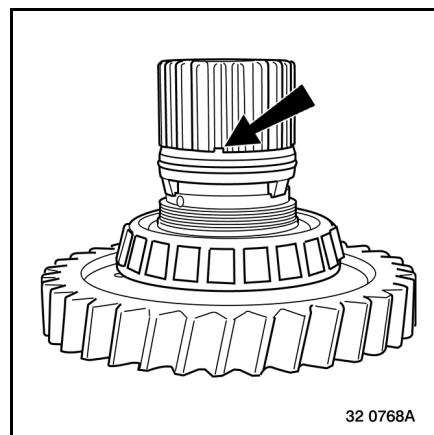
Use a press.



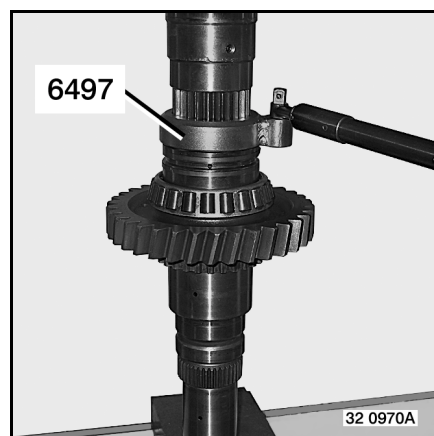
Join the halves of oil distributor **(11)** and fasten them, complete with a new gasket **(12)**.
Lubricate gasket **(12)** (gearbox oil) prior to installation.



The split pin must be inserted in the sun gear.



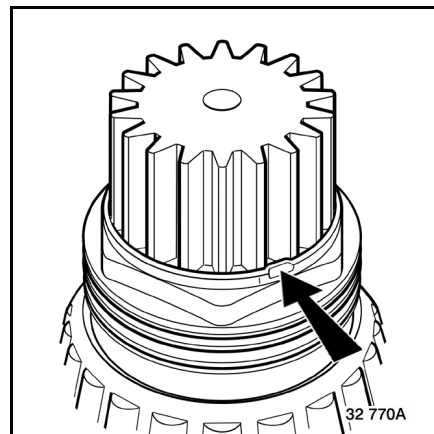
Fit nut **(9)** complete with new rings **(15)**.
Put the socket wrench into place.
Use tool **6497**.
Clamp the shaft in a press, capacity **10 tonnes** approx.
See page(s) B-2-5.



Burr the nut using a centre-punch to lock.



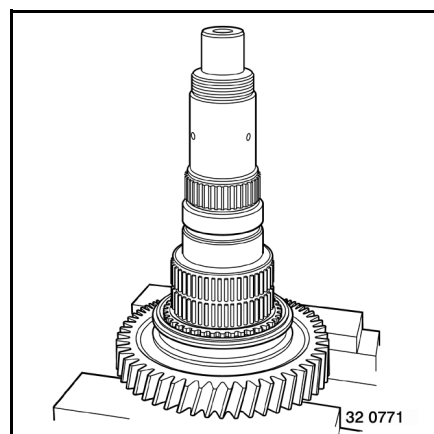
Use a round ended centre-punch. Check that no splits are produced.



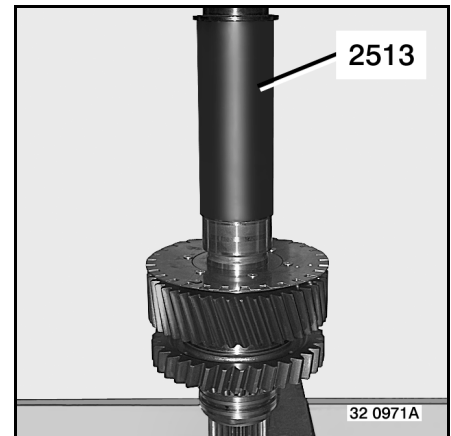
Turn the shaft over.

Fit the following in succession:

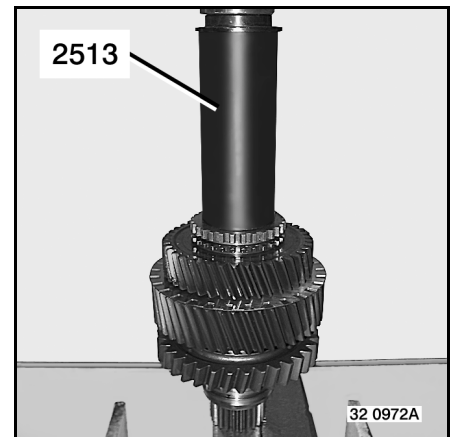
- 1st speed pinion coupling sleeve **(23)**, with the chamfer facing downwards,
- bearing **(6)**,
- 1st speed pinion **(18)**, with the coupling sleeve teeth facing downwards.



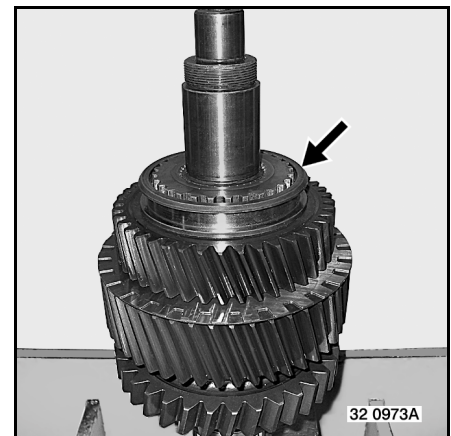
Fit pulse ring **(10)**, with the flange facing downwards.
Fit ring **(8)**.
Use tool **2513**.
Use a press.



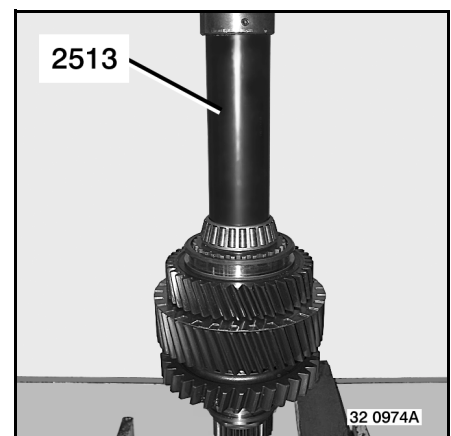
Fit bearing **(5)**.
Fit 2nd speed pinion **(19)**, with the coupling sleeve teeth facing upwards.
Fit coupling ring **(25)**, with the pinion teeth facing upwards.
Use tool **2513**.
Use a press.



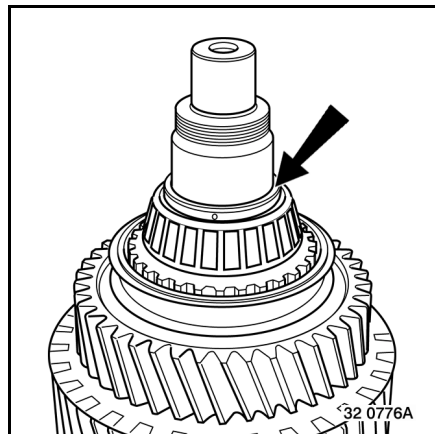
Fit 3rd speed pinion coupling sleeve **(24)**, with the chamfer facing upwards.



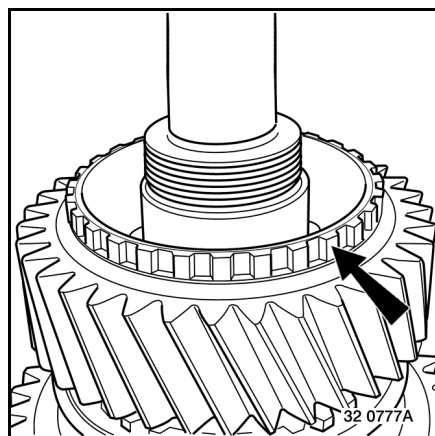
Fit 3rd speed pinion rear bearing **(3)**.
Use tool **2513**.
Use a press.



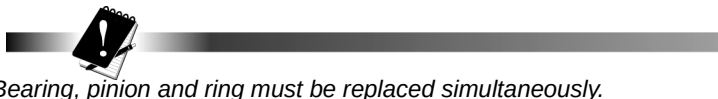
Fit ring **(4)**.



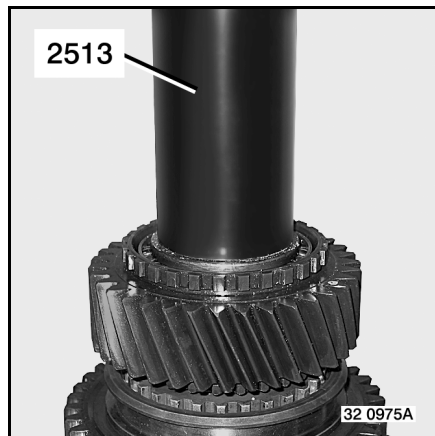
Fit 3rd speed pinion **(2)**, with the largest size gear teeth (reserved for the splitter) facing upwards and the rounded teeth facing downwards.



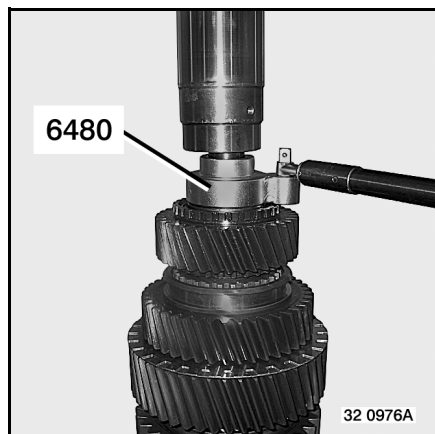
Fit 3rd speed pinion front bearing **(3)**.
Use tool **2513**.
Use a press.



Bearing, pinion and ring must be replaced simultaneously.



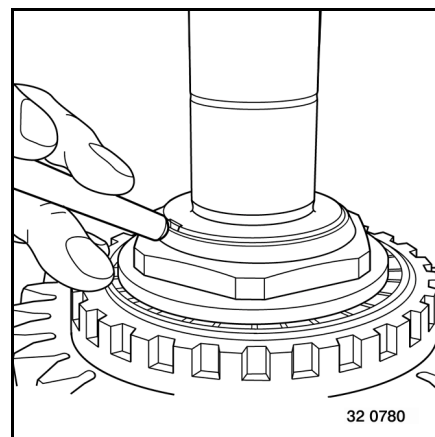
Fit nut **(14)**.
Put the socket wrench into place.
Use tool **6480**.
Clamp the shaft in a press, capacity **10 tonnes** approx.
See page(s) B-2-5.



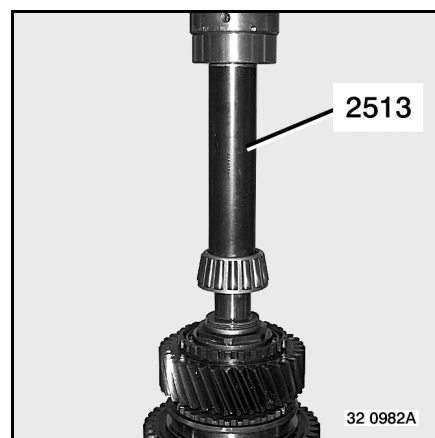
Burr the nut using a centre-punch to lock.



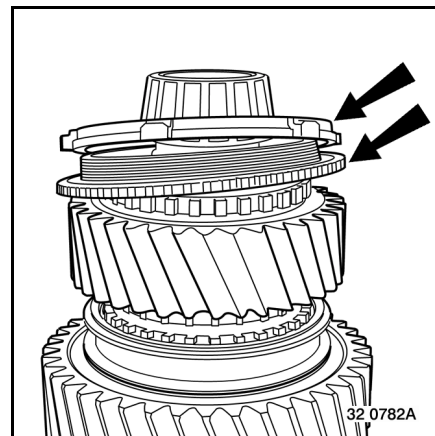
Use a round ended centre-punch. Check that no splits are produced.



Fit bearing (20).
Use tool 2513.
Use a press.



Fit splitter synchronizer ring (21) and synchronizer cone (22).

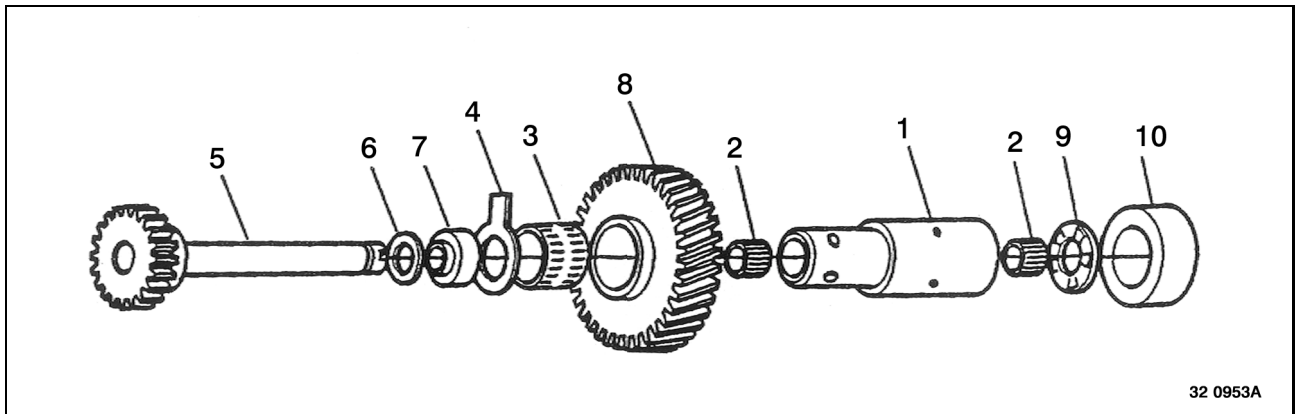


REVERSE SHAFT

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Exploded view	150FX			19/04/2004	L-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Disassembly	150FX			02/07/2003	L-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Inspection	150FX			11/08/2003	L-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Assembly	150FX			11/08/2003	L-4
	17SD						
	17TD						

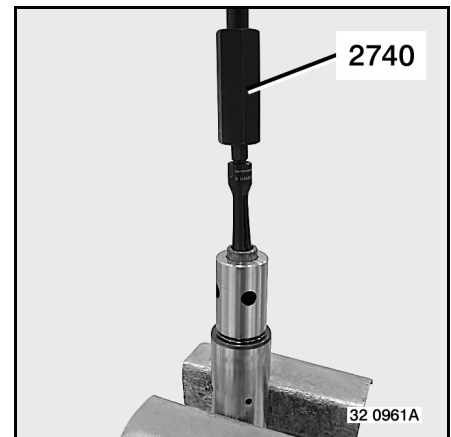
Exploded view



Disassembly

The item numbers indicated in the text refer to the drawing on page L-3.

Remove needle bearings **(2)**.
Use tool **2740**.



Inspection

Clean and inspect all the parts.

Assembly

The item numbers indicated in the text refer to the drawing on page L-3.

Lubricate (gearbox oil) the bearings.
Fit needle bearings **(2)**.
Use a suitable tube.

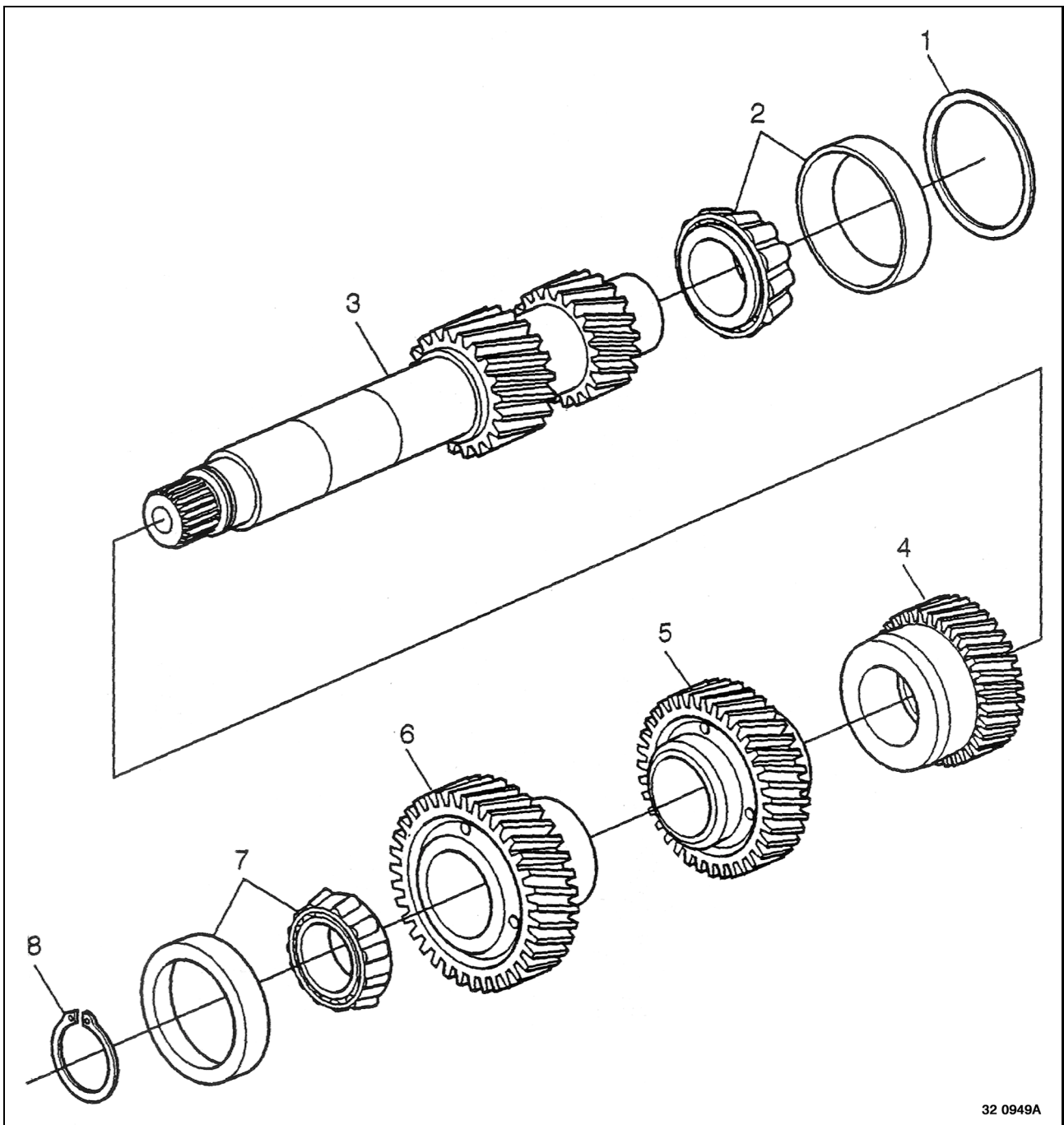


COUNTERSHAFT

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Exploded view	150FX			16/04/2004	M-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Disassembly	150FX			03/07/2003	M-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Inspection	150FX			11/08/2003	M-5
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Assembly	150FX			11/08/2003	M-6
	17SD						
	17TD						

Exploded view



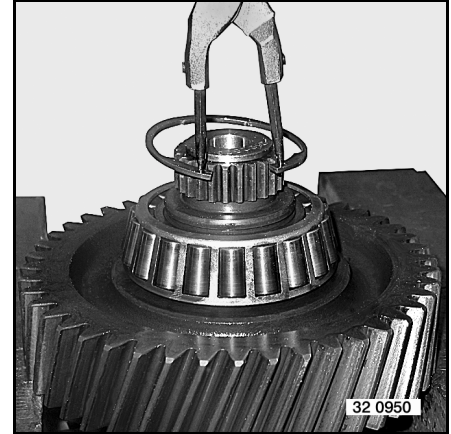
Disassembly

The item numbers indicated in the text refer to the drawing on page M-3.

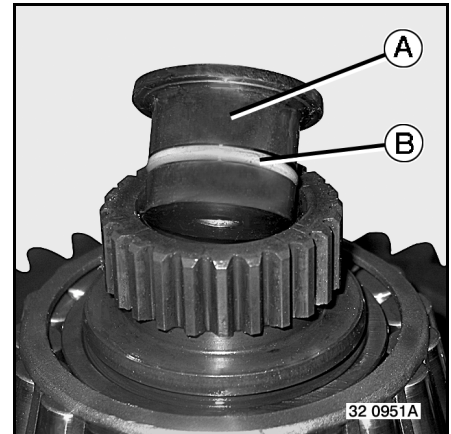


Mark the direction of assembly of the pinions.

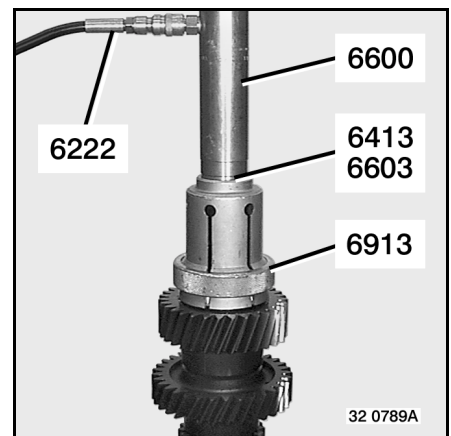
Remove circlip **(8)**.



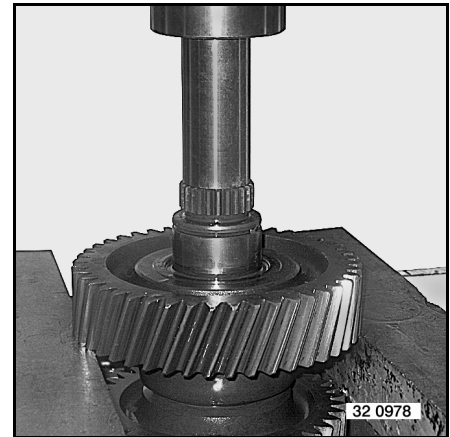
Remove countershaft disc brake ring **(A)**.
Remove gasket **(B)**.



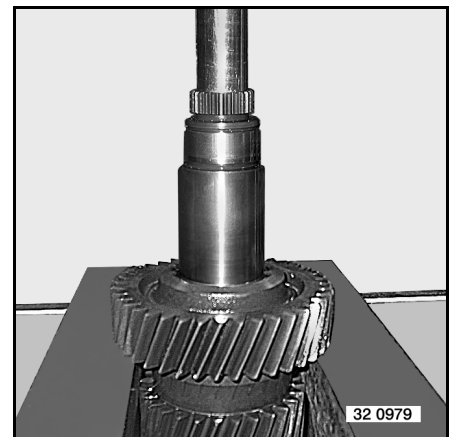
Remove bearings **(2 - 7)**.
Use tool **6222 + 6413 + 6600 + 6603 + 6913**.



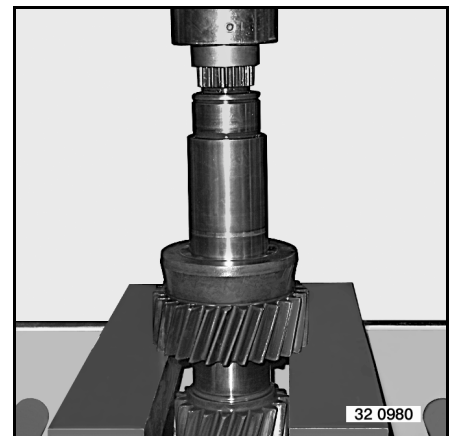
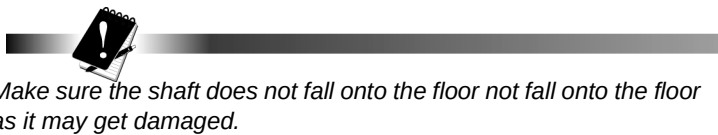
Remove pinion (6).
Use a press.



Remove pinion (5).
Use a press.



Remove pinion (4).
Use a press.



Inspection

Clean and inspect all the parts.
Wipe all the components prior to refitting.

Assembly

The item numbers indicated in the text refer to the drawing on page M-3.



Match the direction of assembly of the pinions (marked at the time of disassembly).

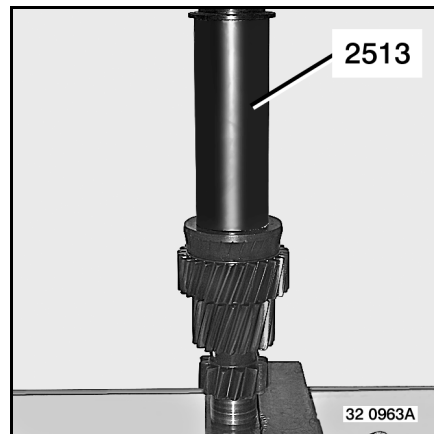
Fit pinion **(4)**.

Use tool **2513**.

Use a press.

Minimum pressure: **17** tonnes,

Maximum pressure: **40** tonnes.



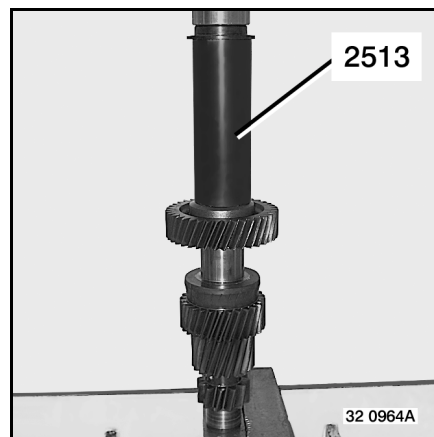
Fit pinion **(5)**.

Use tool **2513**.

Use a press.

Minimum pressure: **21** tonnes,

Maximum pressure: **40** tonnes.



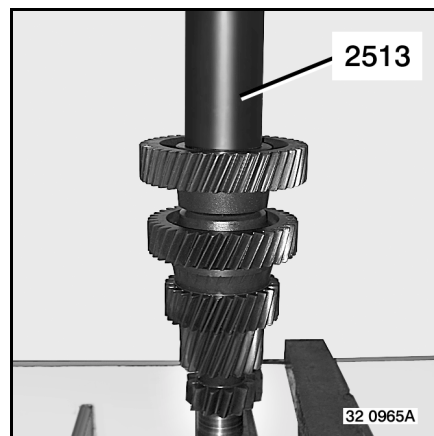
Fit pinion **(6)**.

Use tool **2513**.

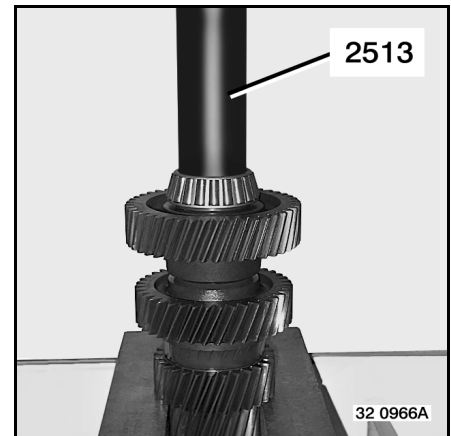
Use a press.

Minimum pressure: **21** tonnes,

Maximum pressure: **40** tonnes.



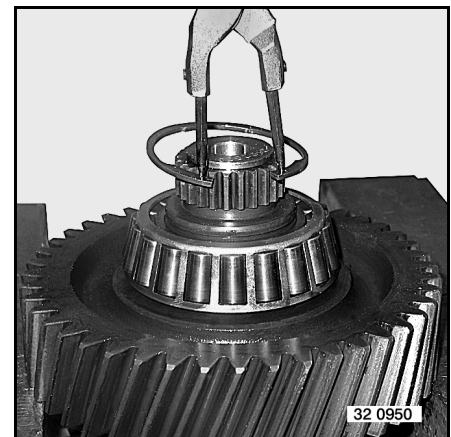
Fit bearings **(2 - 7)** to each end of shaft **(3)**.
Use tool **2513**.
Use a press.
Maximum pressure: **5 tonnes**.



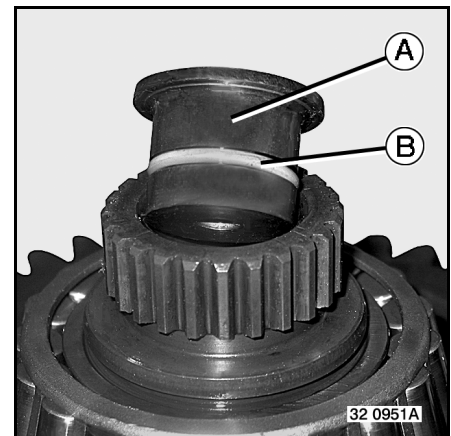
Fit circlip **(8)**.



*Choose the maximum thickness for the circlip.
Maximum play: **0.10 mm**.*



Fit countershaft disc brake ring **(A)** complete with a new O-ring **(B)**.



ASSEMBLY OF THE GEARBOX

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Fitting the set of shafts	150FX			03/07/2003	N-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Fitting the clutch casing	150FX			07/07/2003	N-8
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Inspecting the shaft clearances	150FX			07/07/2003	N-9
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Fitting the countershaft disc brake	150FX			08/07/2003	N-13
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Fitting the oil pump	150FX			07/07/2003	N-15
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Fitting the range change	150FX			08/07/2003	N-16
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Fitting the oil filter	150FX			08/07/2003	N-17
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Checking the pulse ring buckle	150FX			08/07/2003	N-18
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Fitting the control unit	150FX			08/07/2003	N-19
	17SD						
	17TD						

Fitting the set of shafts



Upon assembly, lubricate all the parts (gearbox oil).

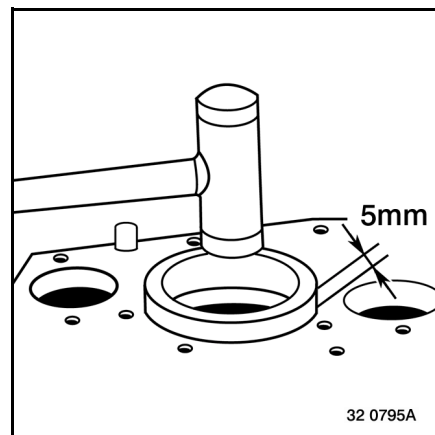
In the gearbox casing, fit secondary shaft rear bearing outer ring. Proceed in the same way with the countershaft rear bearing outer ring.



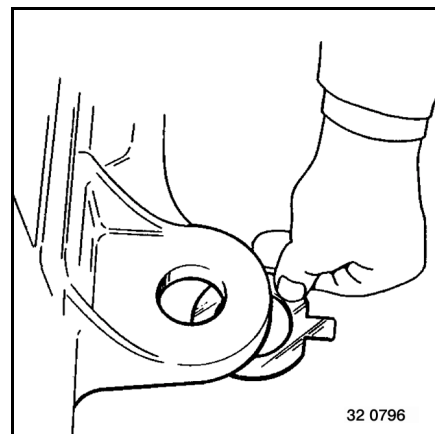
The outer ring must protrude about 5 mm above the surface of the casing.



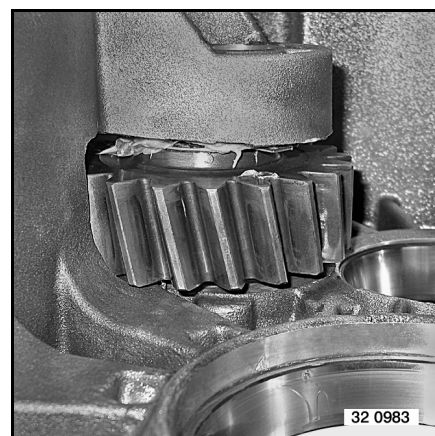
If the outer rings have not been removed, they must be pushed back to protrude about 5 mm above the surface of the casing.



Turn the gearbox over.
Fit the reverse pinion thrust washer with the help of **GRAISSE GRIPCOTT NF**.



Fit the reverse pinion in the gearbox casing.
Push the reverse pinion to one side so that the countershaft bearing is disengaged from the reverse pinion when the shafts are assembled.



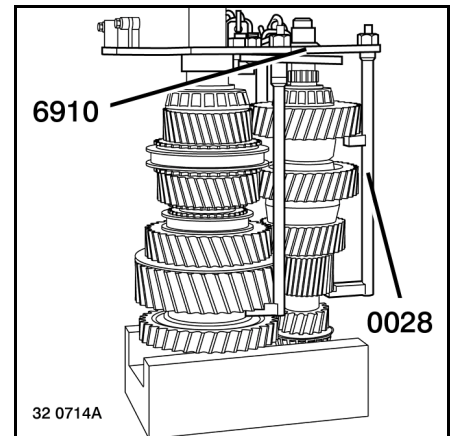
Assemble the shafts.

Use tool **0028 + 6910**

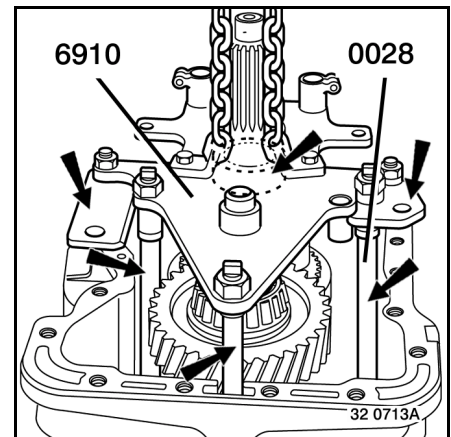
Lubricate all the bearings (gearbox oil).



It is most important to lubricate the bearings (gearbox oil) to give a precise clearance.



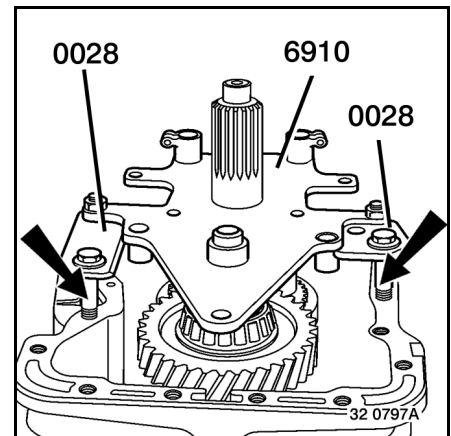
Carefully lift and position all the shafts in the gearbox casing.



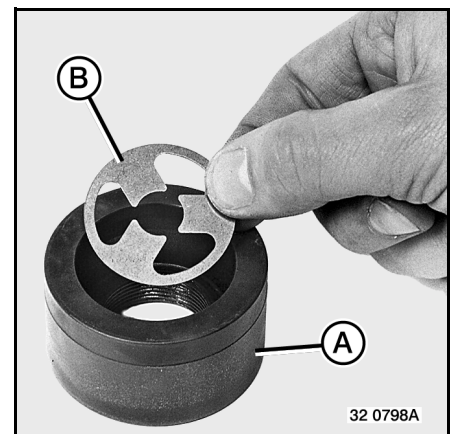
Remove the lifting arms. Screw up the fastening in the gearbox casing.

Use tool **0028 + 6910**

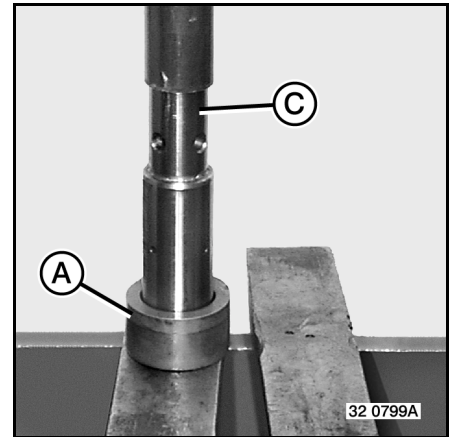
Turn the gearbox over.



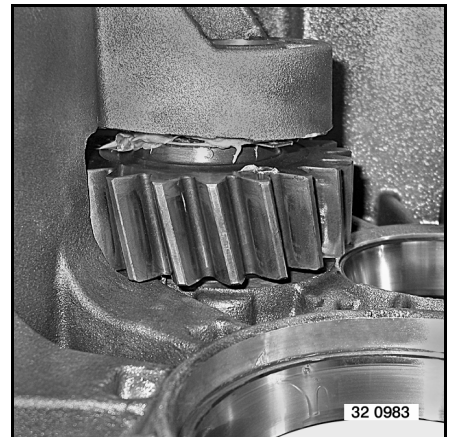
Fit a new retainer **(B)** to the oil pump drive shaft in spacer **(A)**.



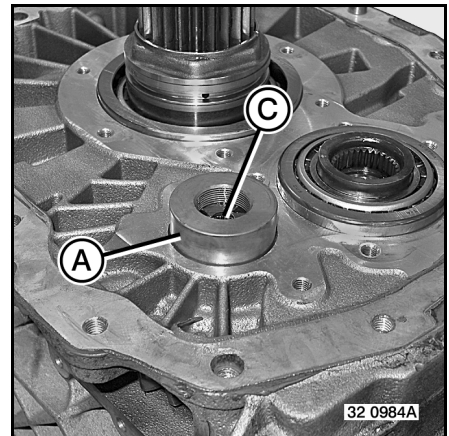
Fit reverse shaft (C) in spacer (A).
Use a press.



Centre the reverse pinion.



Lubricate the oil pump drive shaft needle bearings (gearbox oil).
Fit the needle bearings.
Position reverse shaft (A - C) in the gearbox casing.

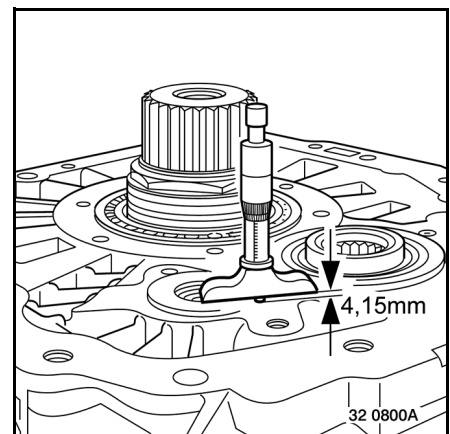


Drive the reverse shaft into the gearbox casing, using a plastic mallet.

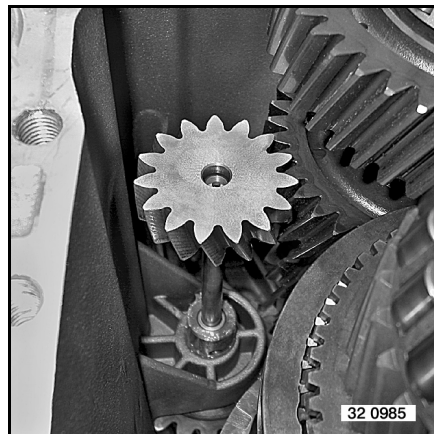


*The top surface of the spacer can protrude above the gearbox casing by a maximum of **4.15** mm.*

Turn the gearbox over.
Remove the fastening for the set of shafts.



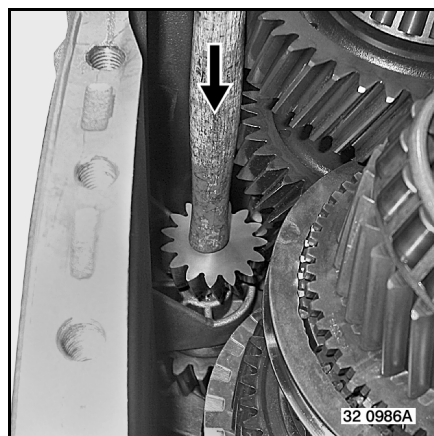
Lubricate the oil pump shaft and the drive pinion (gearbox oil).
Push the countershaft to one side and install the oil pump drive shaft complete with thrust washer.



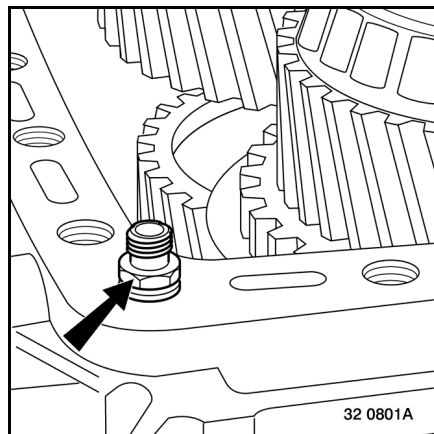
Drive the shaft into the retainer using a brass tool and a plastic mallet.



Lift up the drive pinion to check that the drive shaft is locked.



Fit the countershaft disc brake air pipe union .
Tighten to torque.
See page(s) B-2-3.



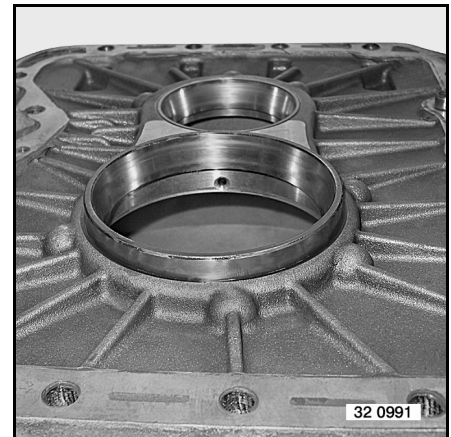
Fit the reverse pinion access cover.
Tighten the bolts to torque.
See page(s) B-2-3.



In case of exchange of the countershaft outer ring, drive in the ring so that it enters into abutment in the clutch casing.



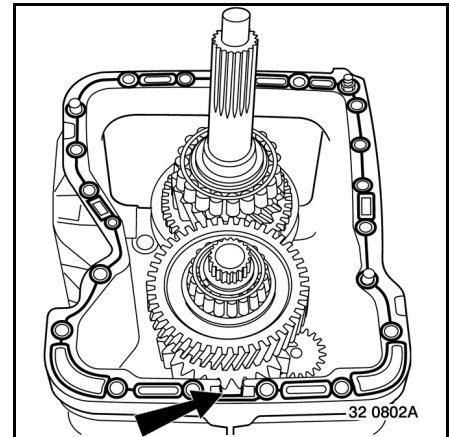
In case of exchange of the secondary shaft outer ring, drive in the ring so that it enters into abutment in the clutch casing.



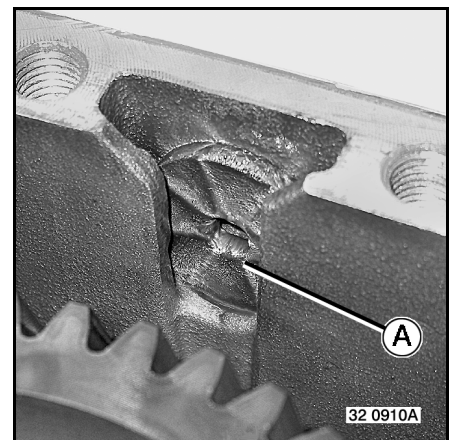
Fit the clutch casing.
See page(s) N-8.
Inspect the shaft clearances.
See page(s) N-9.
Fit the countershaft disc brake.
See page(s) N-13.
Fit the clutch operating fork.
See page(s) D-3-8.
Fit the oil pump.
See page(s) N-15.
Fit the range change.
See page(s) N-16.
Fit the oil filter.
See page(s) N-17.
Check the pulse ring buckle.
See page(s) N-18.
Fit the control unit.
See page(s) N-19.

Fitting the clutch casing

Apply a bead of sealing compound to the gearbox casing joint face.
Apply sealant "**FORMETANCH 572**".



Fit magnet **(A)**.

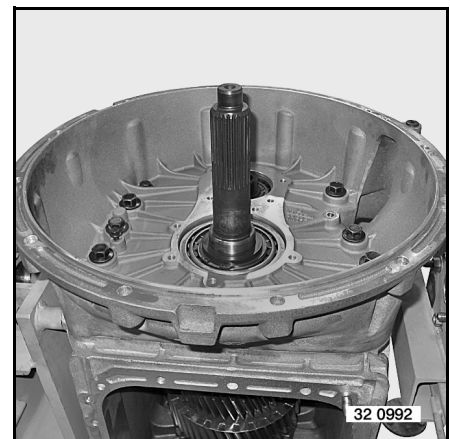


Fit the clutch casing.



Check that the clutch casing is seated correctly on the gearbox casing locating dowels.

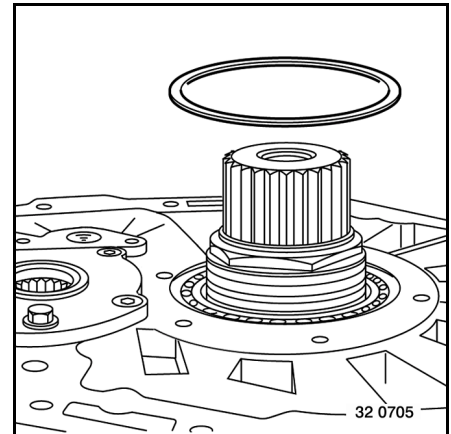
Tighten the bolts to torque.
See page(s) B-2-3.



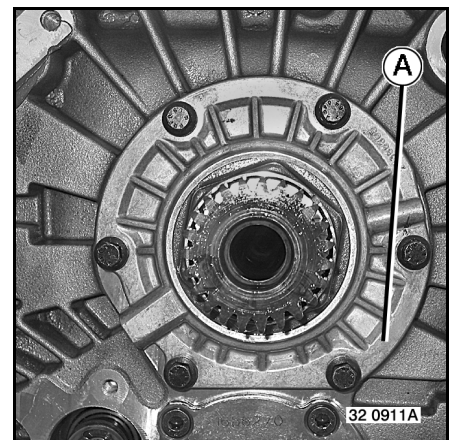
Inspecting the shaft clearances

Turn the gearbox over so that the output shaft is facing upwards.

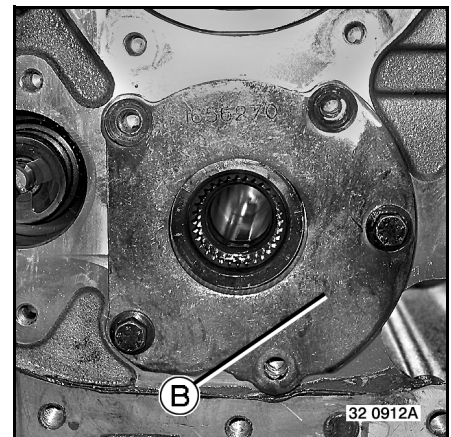
Insert an adjusting shim **0.10** mm thinner than the one removed.



Fit secondary shaft cover **(A)**.
Tighten the bolts to torque.
See page(s) B-2-3.



Insert an adjusting shim **0.10** mm thinner than the one removed.
Fit countershaft cover **(B)**.
Tighten the bolts to torque.
See page(s) B-2-3.



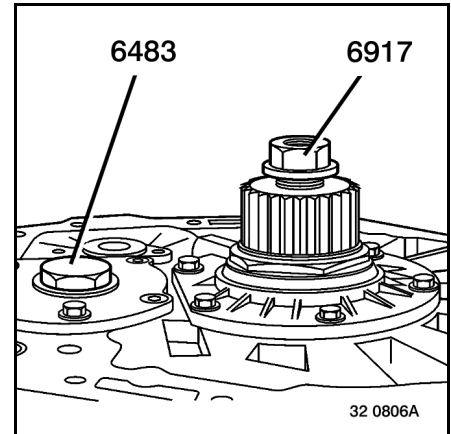


To measure the secondary shaft and countershaft clearances, 2nd gear must be engaged.

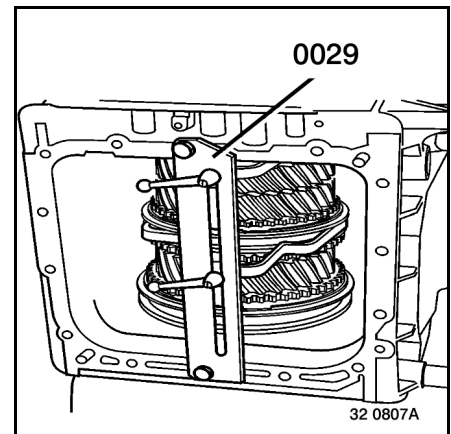


The countershaft disc brake must not be assembled.

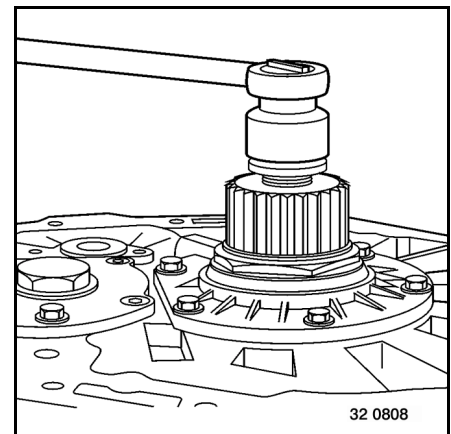
Fit bolt **6483** to the countershaft.
Fit bolt **6917** to the secondary shaft.



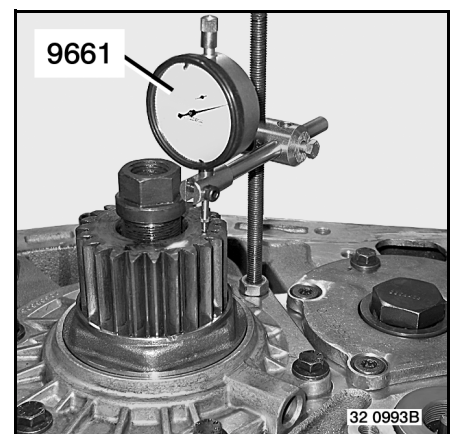
Lock the engaged gear.
Use tool **0029**.



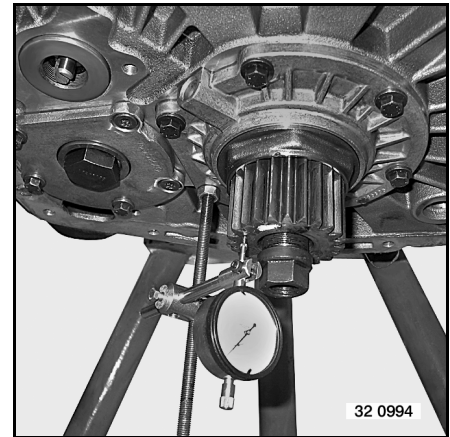
Rotate the shafts through **20** turns.



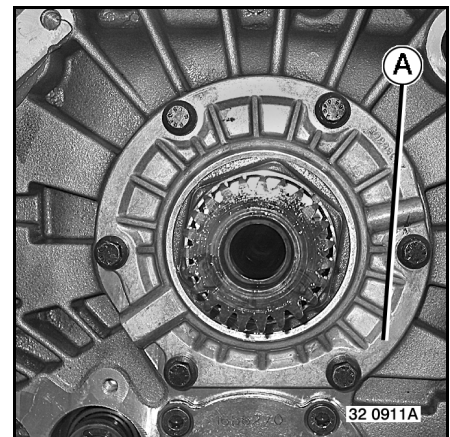
Remove one of the bolts from the cover and install the fastening for the dial gauge.
Replace the dial gauge magnetic support by a threaded rod **M10x250**.
Install a dial gauge.
Use tool **9661**.
The stylus must be in contact with the secondary shaft.
Set the dial gauge to zero and mark the measuring point.



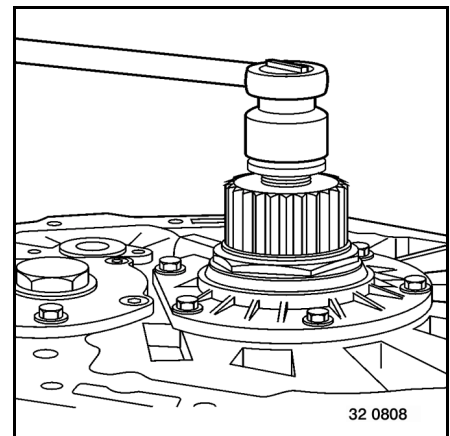
Turn the gearbox over.
Lift up the stylus and rotate the shafts through **20** turns.
Read the clearance at the marked measuring point and note down the value.



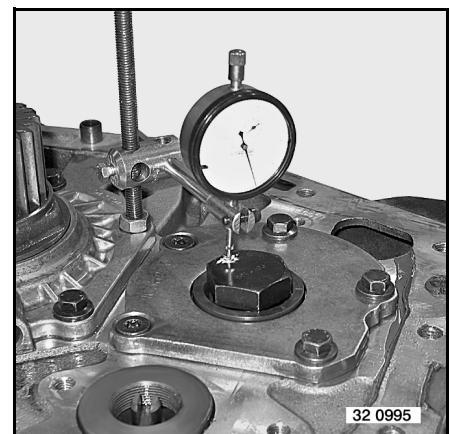
Turn the gearbox over.
Remove the cover **(A)**.
Insert a new adjusting shim with a thickness corresponding to the clearance reading + existing adjusting shim:
i.e. a preload of **0.1 → 0.2** mm.
Tighten the bolts to torque.
See page(s) B-2-3.



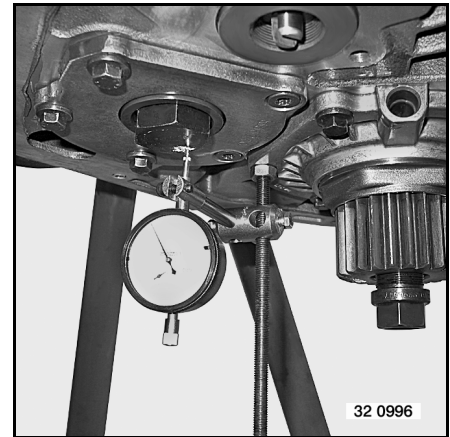
Rotate the shafts through **20** turns.



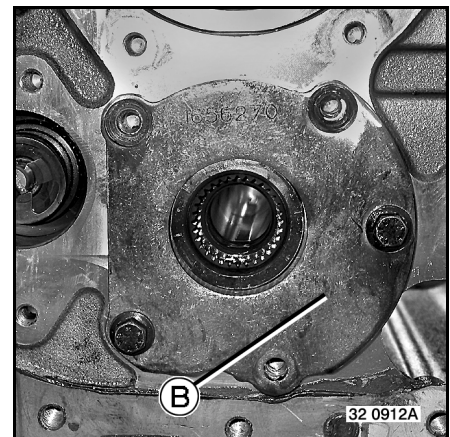
Turn the dial gauge towards the countershaft.
The stylus must be in contact with the countershaft.
Set the dial gauge to zero and mark the measuring point.
Turn the gearbox over.



Lift up the stylus and rotate the shafts through **20** turns.
Read the clearance at the marked measuring point and note down the value.

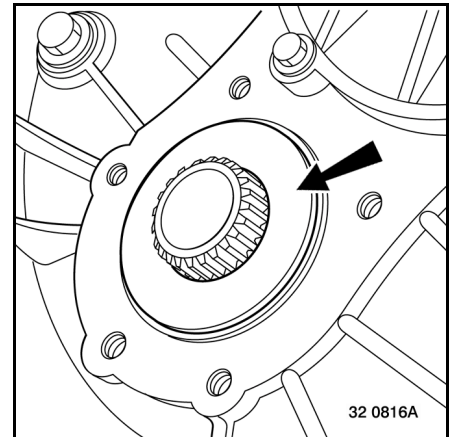


Turn the gearbox over.
Remove the cover **(B)**.
Insert a new adjusting shim with a thickness corresponding to the clearance reading + existing adjusting shim:
i.e. a preload of **0.1 → 0.2** mm.
Tighten the bolts to torque.
See page(s) B-2-3.
Remove tool **9661**.
Remove tool **0029**.
Remove tool **6483**.
Remove tool **6917**.

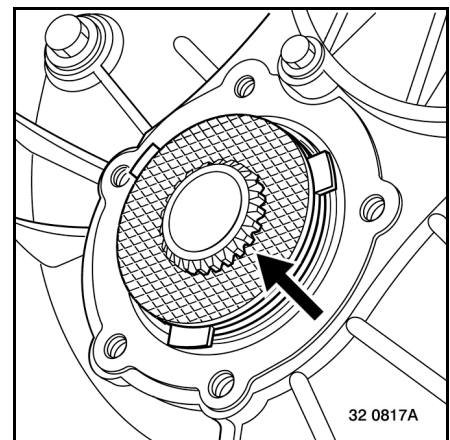


Fitting the countershaft disc brake

Install the washer.



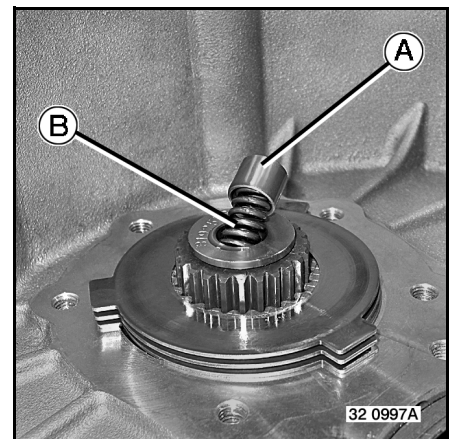
Place the discs in position one after the other, beginning and finishing with a steel disc (2 friction discs and 3 steel discs).



Apply oil.

Fit spring **(B)**.

Fit piston **(A)**.



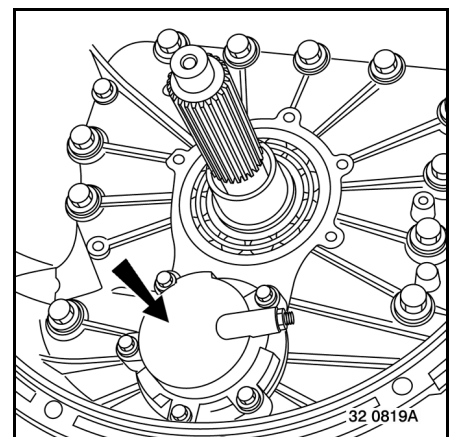
Install a new cover gasket.

See page(s) E-3.

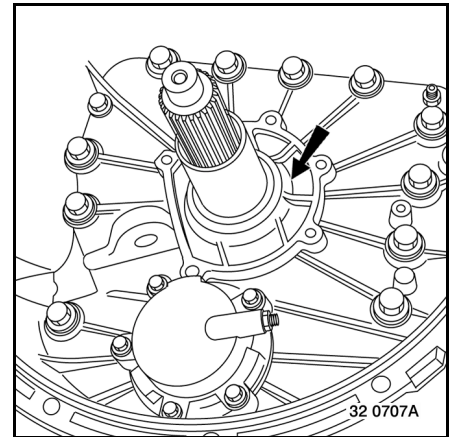
Fit the cover.

Tighten the bolts to torque.

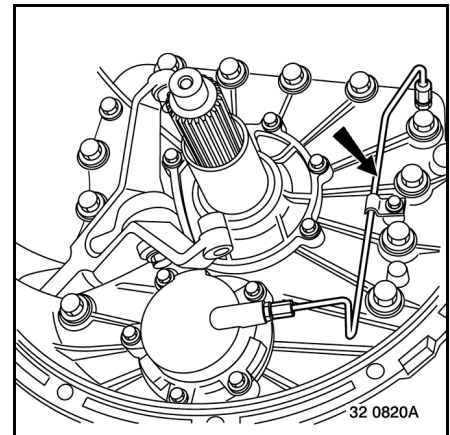
See page(s) B-2-3.



Install a new cover gasket.
See page(s) E-3.
Fit the primary shaft cover.
Tighten the bolts to torque.
See page(s) B-2-3.



Clean the air pipe unions screw-threads.
Fit the air pipe.
Tighten the unions to torque.
See page(s) B-2-3.
Fit the pipe fastener.
Tighten the bolt to torque.
See page(s) B-2-3.
Fit the clutch operating fork.
See page(s) D-3-8.

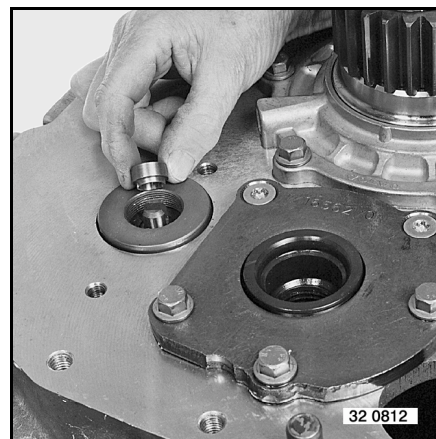


Fitting the oil pump

Fit the socket.



The groove in the socket must be at the bottom.



Replace the gaskets.

Apply oil to the O-rings.

Install the suction pipe.

Install the delivery pipe.

Fit the oil pump.

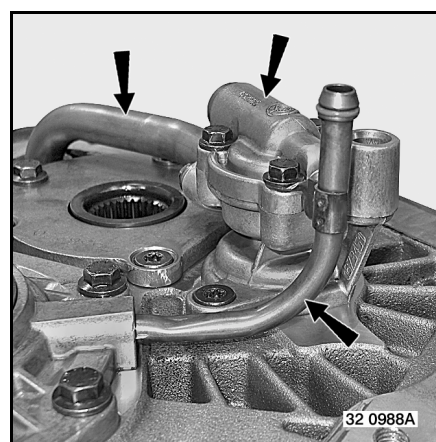
Tighten the bolts securing the oil pump and the bolts securing the suction pipe flange one after the other.

Tighten the bolts to torque.

See page(s) B-2-5.

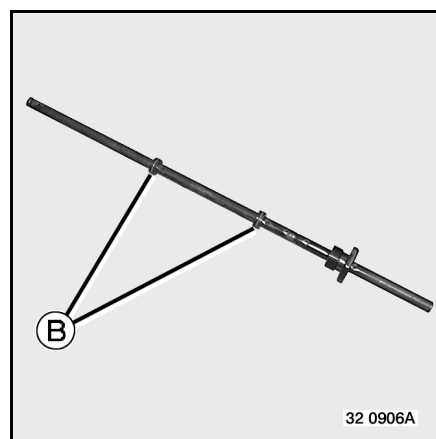


Check that the suction pipe does not touch the countershaft, it may suffer damage.



Apply oil to the O-rings.

Fit new gaskets **(B)**.



Fit oil distribution pipe **(A)**.

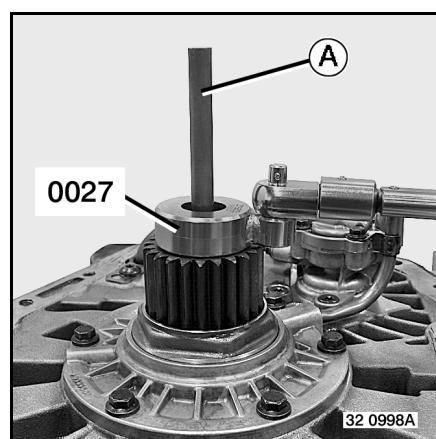
Use tool **0027**.

Tighten to torque.

See page(s) B-2-5.

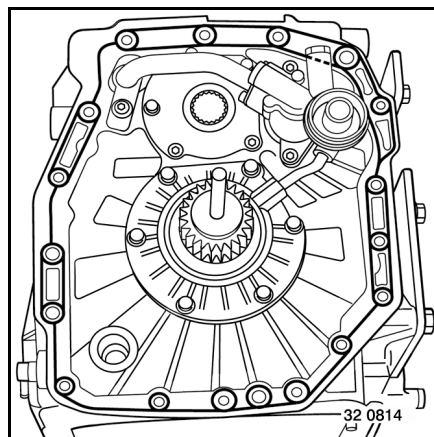
Fit the range change.

See page(s) N-16.

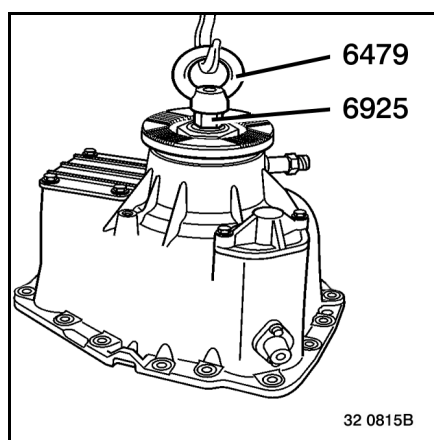


Fitting the range change

Apply a bead of sealing compound to the gearbox casing joint face.
Apply sealant "**FORMETANCH 572**".



Mount the adapter and the lifting eyelet to the output shaft.
Use tool **6925** + **6479**



Fit the range change.



Take care not to damage the oil pump conduit O-rings.

Place the selector fork together with the planet wheels in position.
Position the range change casing on the 3 locating dowels.

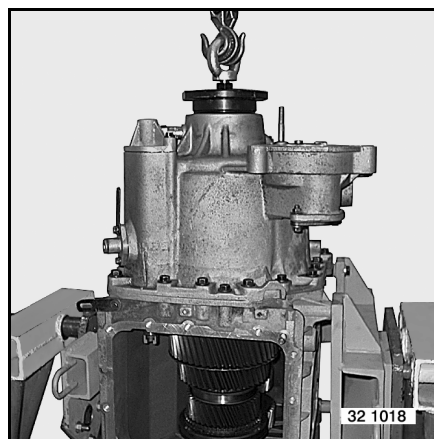
Fit the bolts.

Tighten the bolts to torque.

See page(s) B-2-4.

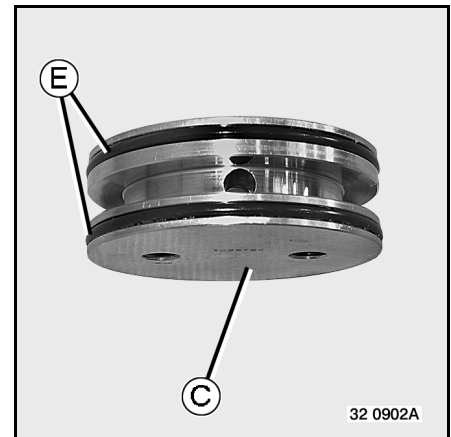
Remove tool **6479**.

Remove tool **6925**.

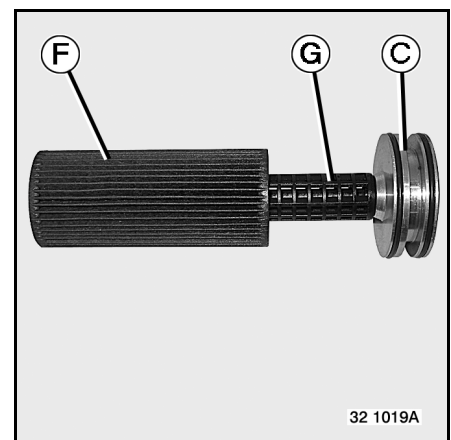


Fitting the oil filter

Fit filter support plate **(C)** with new seals **(E)**.



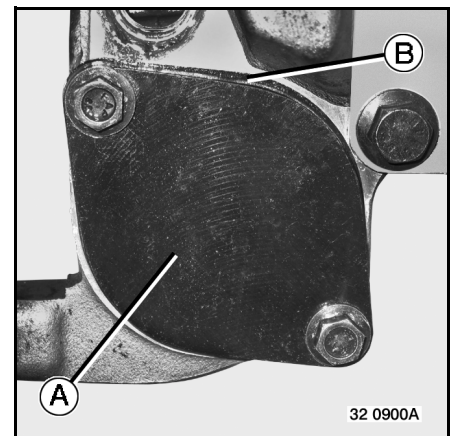
Fit shaft **(G)** to filter support plate **(C)**.
Fit a new filter cartridge **(F)** to shaft **(G)**.



Fit:

- filter support plate **(C)** complete with seals,
- gasket **(B)**,
- cover **(A)**.

Tighten the bolts to torque.
See page(s) B-2-5.



Fit the relief valve, consisting of:

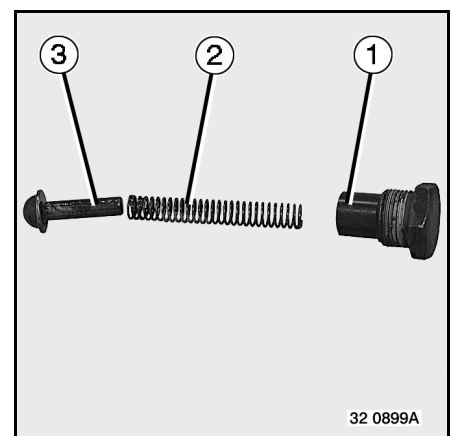
- valve **(3)**,
- spring **(2)**,
- plug **(1)**.

Apply sealing compound to the screw-threads of plug **(1)**.

Apply sealant "**FORMETANCH 572**".

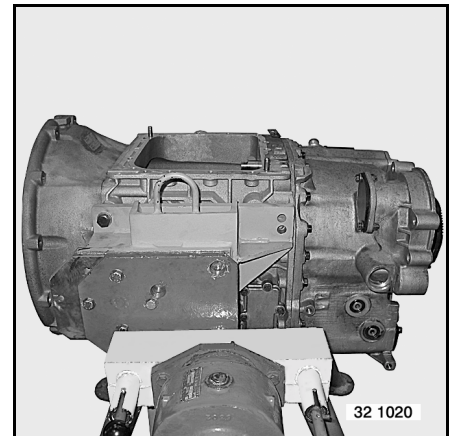
Tighten the plug to torque.

See page(s) B-2-5.

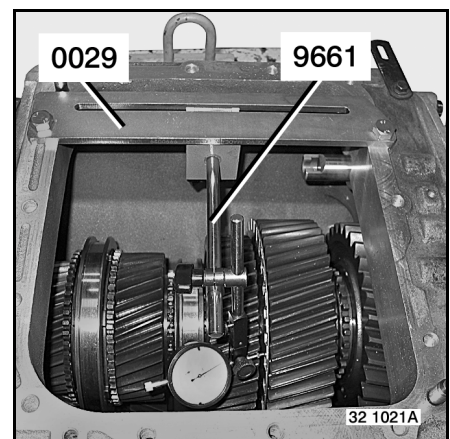


Checking the pulse ring buckle

Turn the gearbox through 1/4 of a turn.



Remove the forks from tool **0029**.
Install tool **0029**.
Install a dial gauge.
Use tool **9661**.



Measure the pulse ring buckle.
The stylus must be positioned **2** mm under the bottom
of the slots in order to be able to make a continuous reading.
See page(s) B-3-1.
Remove tool **9661**.
Remove tool **0029**.



Fitting the control unit

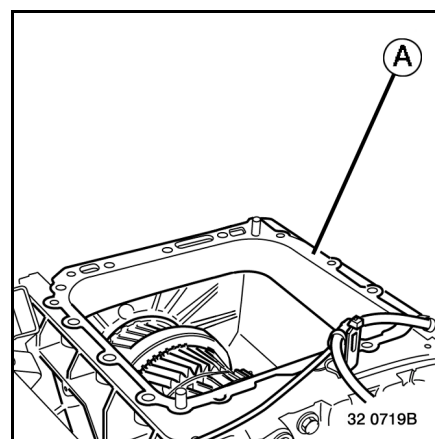
Fit a new gasket (A).

Check that:

- the splitter coupling ring is in the HS (High Split) rear position, with the shaft in the rear position;
- the gearbox is in neutral;
- the range change is in the HR (High Range) position, with the shaft in the front position.



If the range change is in the low range (LR: Low Range) position, shaft in the rear position, move the control unit piston by hand to the rear position.



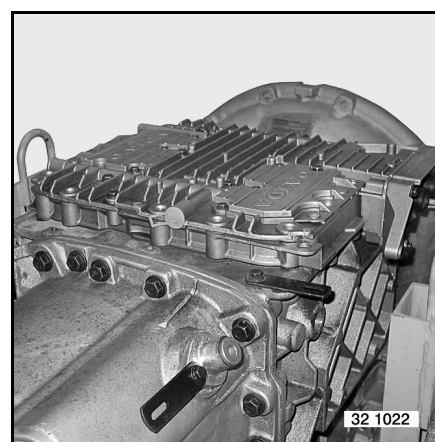
Fit the control unit.



Do not damage the pulse ring and make sure the splitter fork is correctly positioned in the coupling ring.



Pay attention to the correct seating of the control unit on the locating dowels.



Gently tap the control unit to put it into place.

Fit the bolts.

Tighten the bolts to torque.

See page(s) B-2-3.



Replacement of the control unit requires the control unit to be programmed and the clutch to be calibrated. Use the RENAULT TRUCKS test tool plugged into the vehicle diagnostic socket.

