

# REPAIR MANUAL

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## DACIA COMMERCIAL

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**RM 502-1 MECHANICS**

**ENGINE: C3L**

**GERBOX: NG1; NG7**

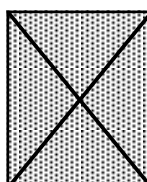
**TAPV: U75B; U75F**

The reparation methods prescribed by the manufacturer in the present document are established subject to technical specifications in force at the document issuing date.

These are subject to modifications brought by the manufacturer at the fabrication of different assemblies, subassemblies or accessories of its vehicles.

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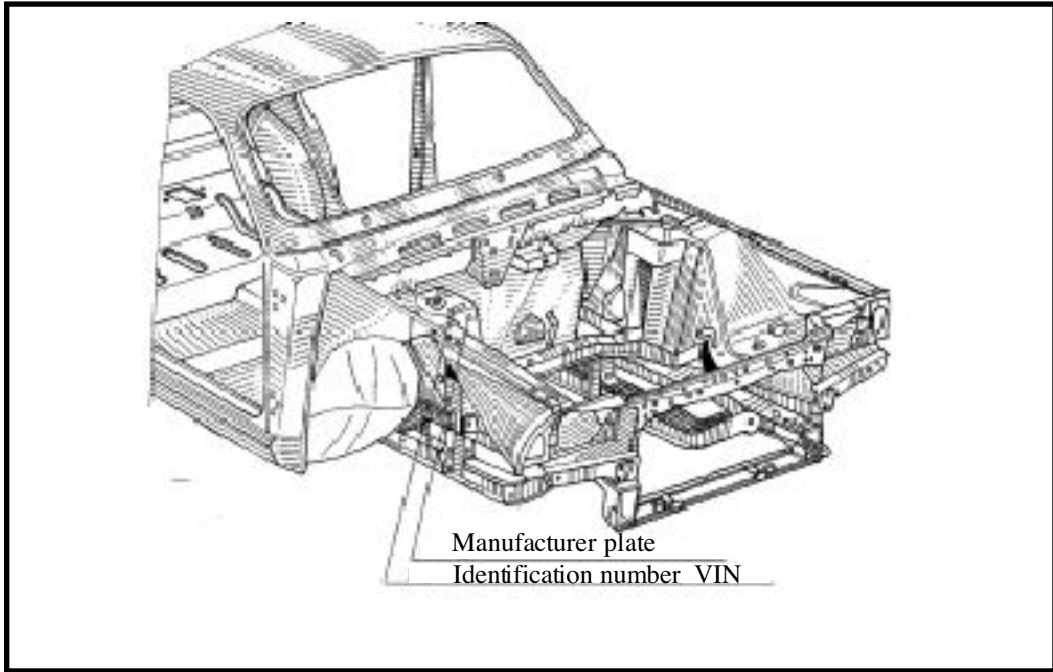
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**SPECIFICATIONS**  
**ENGINE - CLUTCH - GEARBOX**

01

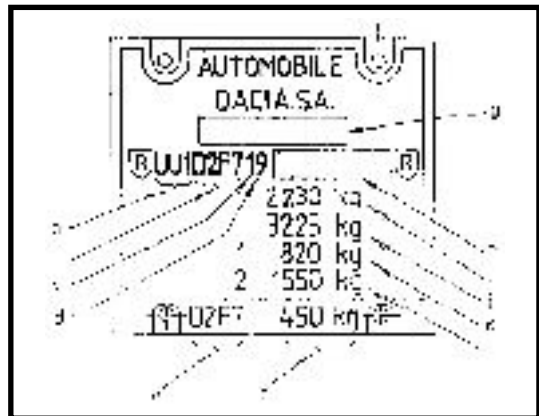
VEHICLE		ENGINE		CLUTCH	GEARBOX
TYPE	CODE	TYPE	CYLINDER CAPACITY (cmc)		
1304 Pick-Up	D 26119	106 -02	1557	200 GR	50 C
	D 46169	106 -10	1557	200 DBR	51 C
1304 Drop-Side	D 27119	106 -02	1557	200 GR	50 C
	D 47169	106 -10	1557	200 DBR	51 C
1304 King-Cab	D 2S119	106 -02	1557	200 GR	50 C
	D 4S169	106 -10	1557	200 DBR	51 C
1305 Pick-Up	D 16119	106 -02 106 -10	1557 1557	200 GR 200 DBR	365
1305 Drop-Side	D 17119	102 -14 106 -02 106 -10	1397 1557 1557	200 GR 200 DBR	365
1305 King-Cab	D 1S119	106 -02 106 -10	1557 1557	200 GR 200 DBR	365
1307	D 2F719	106 -02	1557	200 GR	50 C
	D 1F119		1557	200 GR	365
	D 4F769	106 -10	1557	200 DBR	51 C

UNITL THE DATE OF 26.06.2003



**MANUFACTURERPLATE**

- a. Manufacturer identification code;
- b. Code of the vehicle;
- c. Gear box type code;
- d. Engine type code and driving device location ( according to VIN code structure);
- e. Vehicle code;
- f. Maximum authorized weight without braking system;
- g. Location place of the homologation number for the importer country;
- h. Location place of VIS sign; one character for the year model + 7 characters for the chassis manufacture series ;
- i. Maximum technical admissible weight of the loaded car;
- j. Maximum admissible weight with trailer with braking system;
- k. Maximum technical admissible weight on front axle;
- l. Maximum technical admissible weight on rear axle.



# SPECIFICATIONS

01

## VEHICLE IDENTIFICATION

### UNITL THE DATE OF 26.06.2003 IDENTIFICATION NUMBER VIN

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
COD	U	U	1	D	1	6	1	*	*	*	*	*	*	*	*	*	*
COD	U	U	1	D	1	7	1	*	*	*	*	*	*	*	*	*	*
COD	U	U	1	D	1	S	1	*	*	*	*	*	*	*	*	*	*
COD	U	U	1	D	2	6	1	*	*	*	*	*	*	*	*	*	*
COD	U	U	1	D	2	7	1	*	*	*	*	*	*	*	*	*	*
COD	U	U	1	D	2	S	1	*	*	*	*	*	*	*	*	*	*
COD	U	U	1	D	4	6	1	*	*	*	*	*	*	*	*	*	*
COD	U	U	1	D	4	7	1	*	*	*	*	*	*	*	*	*	*
COD	U	U	1	D	4	S	1	*	*	*	*	*	*	*	*	*	*
COD	U	U	1	D	1	F	7	*	*	*	*	*	*	*	*	*	*
COD	U	U	1	D	2	F	7	*	*	*	*	*	*	*	*	*	*
COD	U	U	1	D	4	F	7	*	*	*	*	*	*	*	*	*	*

POSITION	CHARACTERS EXPLANATION
1 - 3	- manufacturer identification UU1 - AUTOMOBILE DACIA S.A. ROMANIA
4	- vehicle type D - merchandise transportation vehicle
5	- engine-gearbox unit location 1 - longitudinal front engine and front drive 2 - longitudinal front engine and rear drive 4 - longitudinal front engine and integral drive ( optional front coupling)
6	- chassis type - type carrosserie 6 - PICK-UP 7 - DROP - SIDE S - KING CAB F - PICK-UP, doble cabine
7	- payload location 1 - two front places + bed body 7 - 5 front places: 2 fixed rear bench for 3 places + bed body
8	- gearbox type 1 - gearbox with 5 + 1 steps 6 - gearbox with 5 + 1 steps and 4x4 coupling
9	- engine code and car driving location 9 - 1600 cmc engine, spark ignition, left hand drive
10	- year model code - Y - 2000; 1 - 2001; 2 - 2002
11 - 17	- chassis manufacturing series

**SPECIFICATIONS**  
**VEHICLE IDENTIFICATION**

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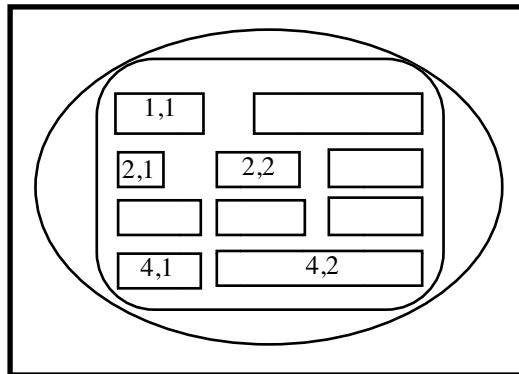
**UNTIL THE DATE OF 26.06.2003**

**OVAL TYPE PLATE LABEL**

The self-adhesive label is applied on the right part side surface of the dashboard. This enable the identification of the vehicle type and its equipment, being used exclusively for the after sale activity.

**OVAL PLATE INSTRUCTIONS**

**THE INTERPRETATION OF THE CODES MARKED ON THE OVAL TYPE PLATE LABEL:**



**Line 1**

1.1 Vehicle type code after sale:

<b>Pick-Up</b>		<b>Drop - Side</b>		<b>King - Cab</b>		<b>Double Cab</b>	
U 75 B	1305 Ri	E 75 B	1305 Ri	M 75 B	1305 Ri	H 75 B	1307 FRi
U 75 C	1304 Ri	E 75 C	1304 Ri	M 75 C	1304 Ri	H 75 C	1307 Ri
U 75 D	1304 4 WD Ri	E 75 D	1304 4 WD Ri	M 75 D	1304 4 WD Ri	H 75 D	1307 4 WD Ri

Note: U,E, M, H = express the carriage body type

B,C,D = express the C type engine, 1557 cmc, front transmission type, rear and consequently 4x4

75 = the code for R12 alternatives

**Line 2**

2.1 Equipping level: **E1,CA** (air conditioning)

2.2 Country code: **ROUM** (Romania, with EU 96).

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**UNITL THE DATE OF 26.06.2003**  
**OVAL TYPE PLATE LABEL**

**Line 4**

4.1 Tehnical definition code, driving post:

**S2:** Left hand drive

4.2 Optional equipping code:

**A:** Normal suspension

**C:** Temperate climate

**E:** Warm climate

**F:** Normal heating

**G:** Air conditioning

**K:** Without pre-filter

**M:** Mechanical steering system

**R:** Without adjustable shock absorber

**T:** Without plate corrector

**V:** Without wheels ABS ( anti-blocking )

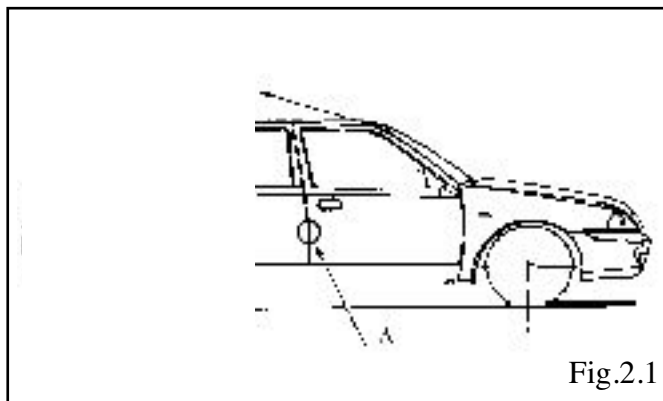
***ATTENTION!***

***Do not unstuck or damage the label of the right side part surface of the dashboard. This label represents the only way of vehicle identification, needed by the after-sale services, for a period of 8 ( eight ) years from the purchasing date.***



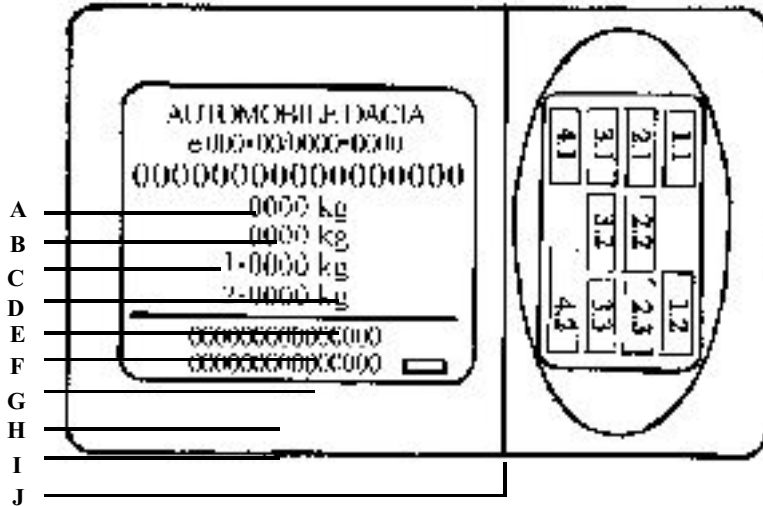
**STARTING WITH THE DATE OF 26.06.2003**

**MANUFACTURER'S PLATED DISPOSAL TYPE SELF-ADHESIVE**



**STARTING WITH THE DATE OF 26.06.2003**

The **MANUFACTURER PLATE**, self-adhesive type, has the bellow presented configuration, with two distinctive areas, presenting : manufacturer's identification data and APV type identification data.



**MANUFACTURER'S IDENTIFICATION DATA**

- A. Manufacturer's name**
- B. Community reception number or homologation number.**
- C. Identification number.**
- D. Total authorized weight of the loaded vehicle.**
- E. Total authorized running weight**
- F. Total weight on front axle.**
- G. Total weight on rear axle.**
- H. Additional inscription.**
- I. Manufacturing date inscription**
- J. Consignment number.**

**APV IDENTIFICATION DATA**

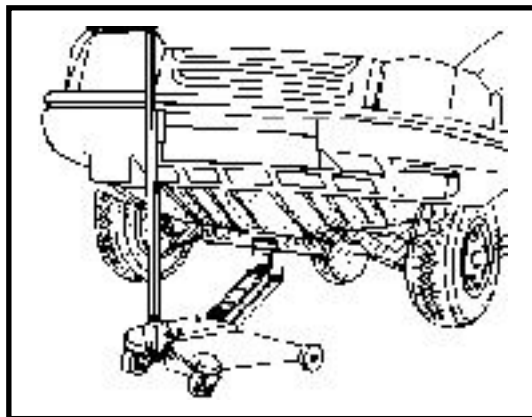
- 1.1 Code type auto APV**
- 1.2 Manufacturing number**
  
- 2.1 Equipping level code**
- 2.2 Additional code for limited serial definition**
- 2.3 Additional code for special serial definition**
  
- 3.1 Carriage body color code**
- 3.2 Seats upholstery code**
- 3.3 Interior matching code.**
  
- 4.1 Technical definition code**
- 4.2 Optional equipping code.**

It is absolutely forbidden to lift the vehicle using the front or rear suspension arms as supporting points.

The mobile jack shall not be used to lift the car in order to perform certain operations under the carriage body.

### **LIFTING THE FRONT PART OF THE CAR**

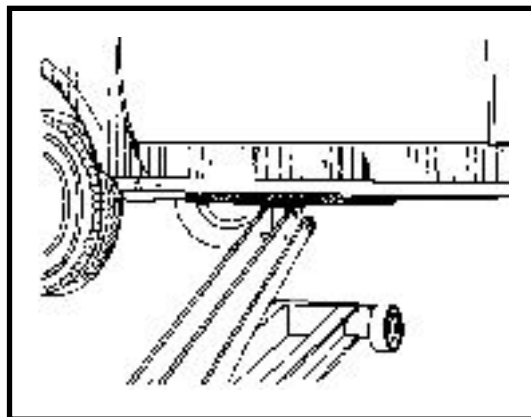
For lifting, the rolling jack and the **CHA 280** hold are used, in order to protect the body and mechanical items of the car, which are placed on longitudinal girders on the wheel axle.



### **LIFTING THE CAR FROM ONE SIDE**

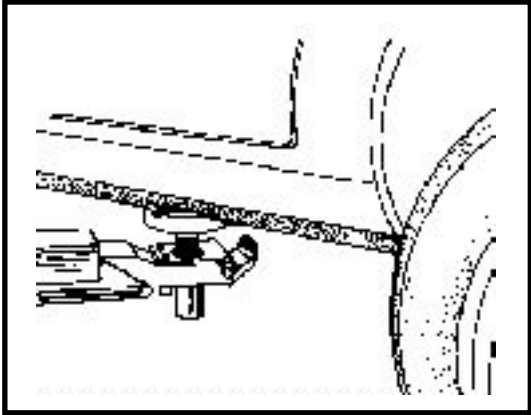
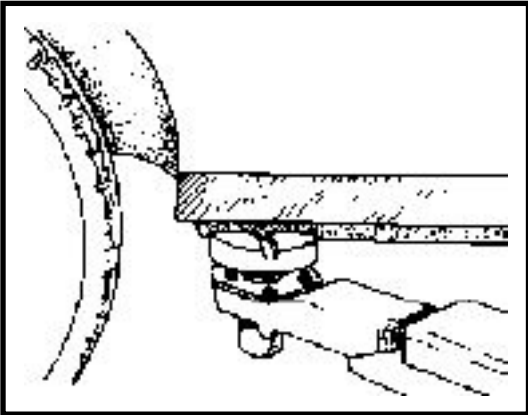
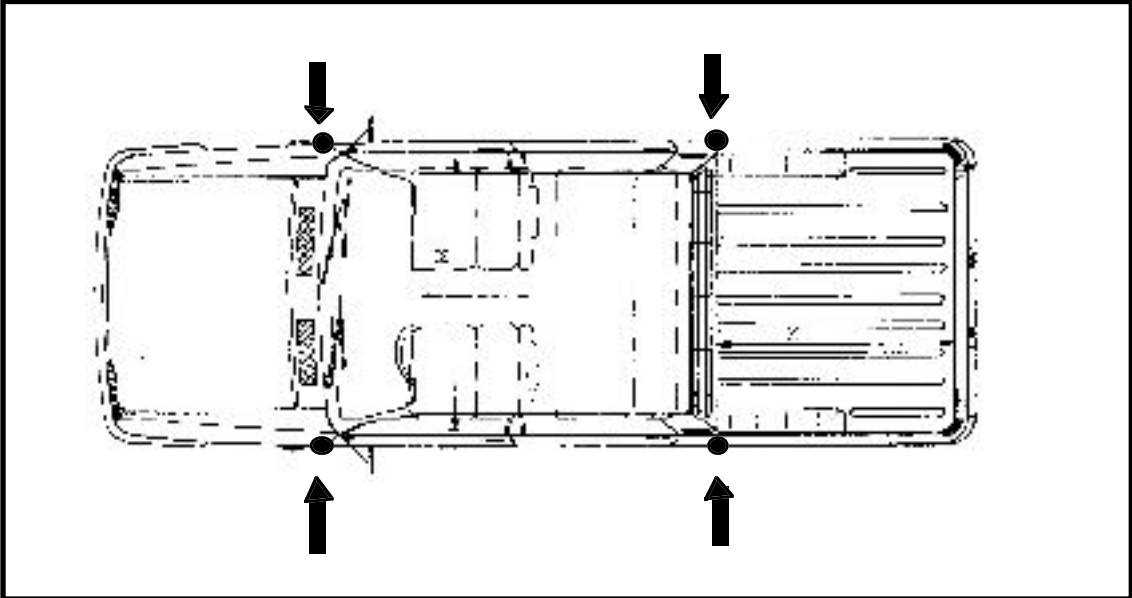
For lifting the car from one side, the rolling jack and the **CHA 280** hold shall be used, which are placed on the threshold on the front door.

The edge of the threshold shall be correctly positioned in the channel of the hold.



For lifting, place the elevator buffers on the same points where the car jack of the vehicle is usually placed.

The edge of the threshold shall be placed correctly in the buffer channel.



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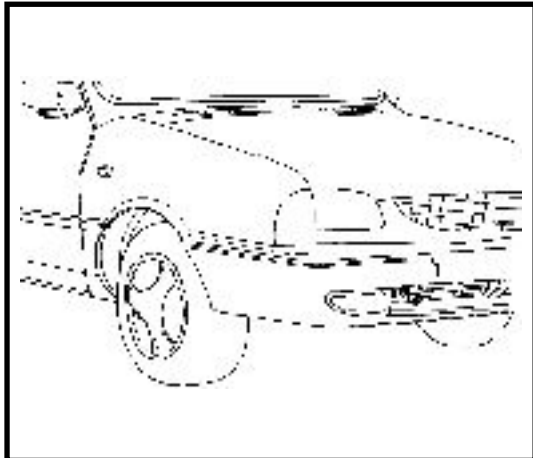
**FOR TOWING OBSERVE THE LAW IN FORCE OF EACH COUNTRY**

**NEVER PERFORM TOWING USING FRONT TRANSMISSION**

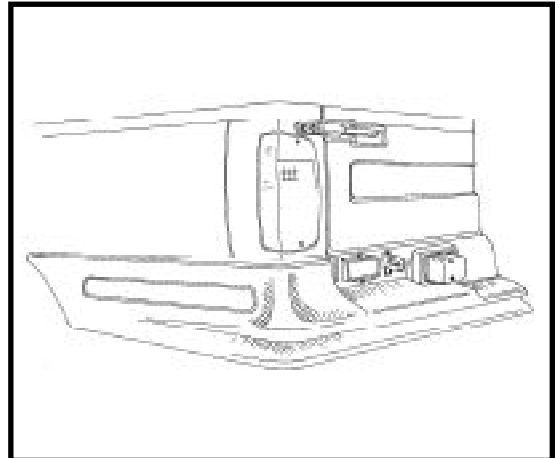
The towing of the cars on wheels must be obligatory done by means of the unique towing points

These points cannot be anyhow used for drawing out the car from a trench ( hole ), for a similar intervention or for direct or indirect lifting of the car.

**FRONT**



**REAR**



**LUBRICANTS CONSUMABLES  
CONDITIONS**

04

PRODUCT	PLACE WHERE IT IS USED
<b>GREASING</b>	
Grease UM 170 Li Ca Pb 2M	Clutchshaftgroves Pinions groves of front transmission Gear box control lever Pressure bearing Cardan flange sealing ring
ELF CARDREXA RNT2 UM 185 Li 2M	Front transmission
Grease UM 185 Li 2M	Front wheel steering stub groves Cardanic transmission Front transmission Front wheel beaing Suspension ball joints Rear axle differential
Grease U 95 Ca 2	Wheels screws
Grease Li Ca Pb type II with MoS2 (or 20 UM Li III)	Steering gear (pinion – rack gear, bearings)
Grease 22	Rubber gaskets of the steering gear
Grease U100 Ca 4-5	Steering rod

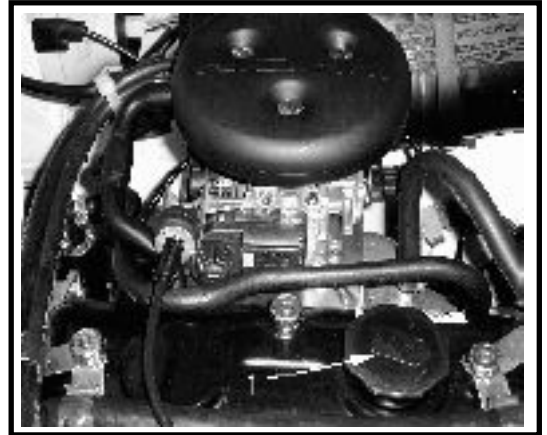
PRODUCT	PLACE WHERE IT IS USED
<b>SEALING</b>	
RHODORSEAL 5661	Inferior crankcase Distribution cover Propeller shaft pins
LOCTITE 518	Half crankcase Clutch crankcase Fuel pump ( with membrane ) Cover palier 1 Rear axle
LOCTITE 577	Thread of the reverse lamp contact. Gear box plug M 16 Rear axle
Mastic 503	Differential rear axle
<b>SOLDERING</b>	
FIXAMED M28	Screws of flywheel fixing Screws of crank shaft pulley
<b>CLEANING</b>	
DECAPJOINT	The surface of cylinder head gasket
S.E. DERO 100	Washing of steel, cast iron, aluminum parts

*Necessary special tools - wrench for draining plug : CV 514*

**Draining plug(2)**

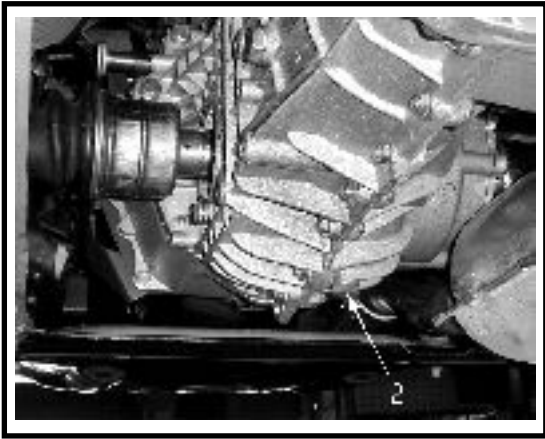


**Filling:plug(1)**

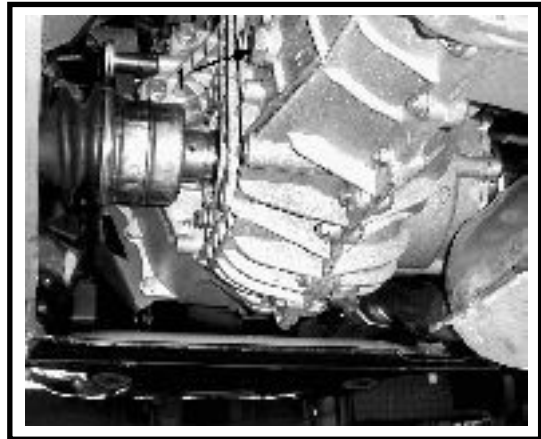




**Draining plug(2)**



**Filling:plug(1)**



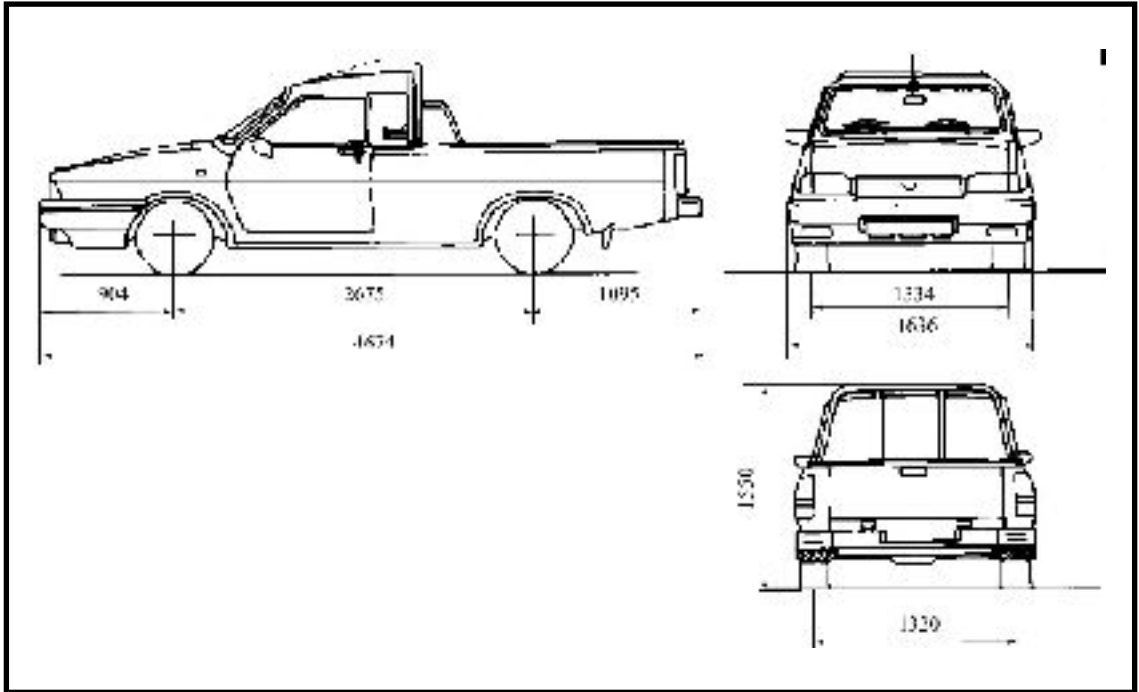
**DRAINING AND FILLING  
REAR AXLE DIFFERENTIAL**

**Draining:plug(2)**

**Filling:plug(1)**



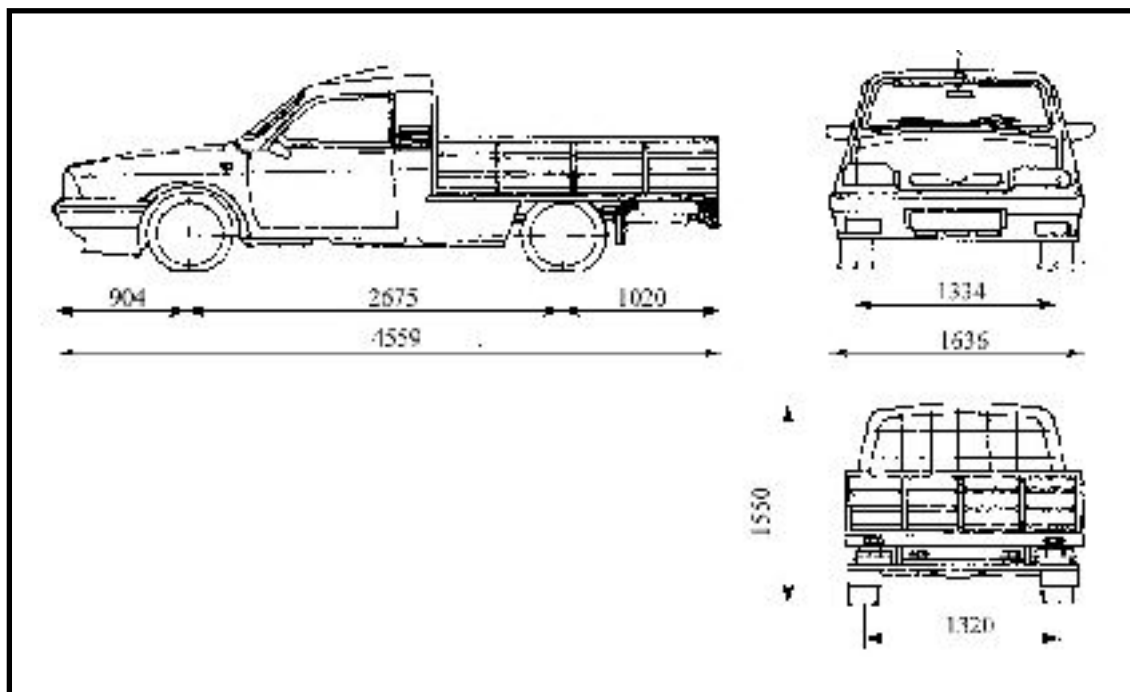
DACIA 1304 PICK - UP  
DACIA 1305 PICK - UP



DIMENSIONS ( mm )		WEIGHT ( kg )	
Total length	4674	Unloaded vehicle weight	
Total width	1636	On the front axle	600
Total height		On the rear axle	480
Empty	1550	Total	1080
Loaded	1450	Maximum authorized load	
Axle base	2675	On the front axle	760
Front wheel track width	1334	On the rear axle	1550
Rear wheel track width	1320	Total	2250
Ground clearance		Authorized payload	1000
Empty	-	Load with trailer with own brake	3225
Loaded	165	Load with trailer without own brake	2630
Turn radius			
Between footways	5600		
Between walls	5800		

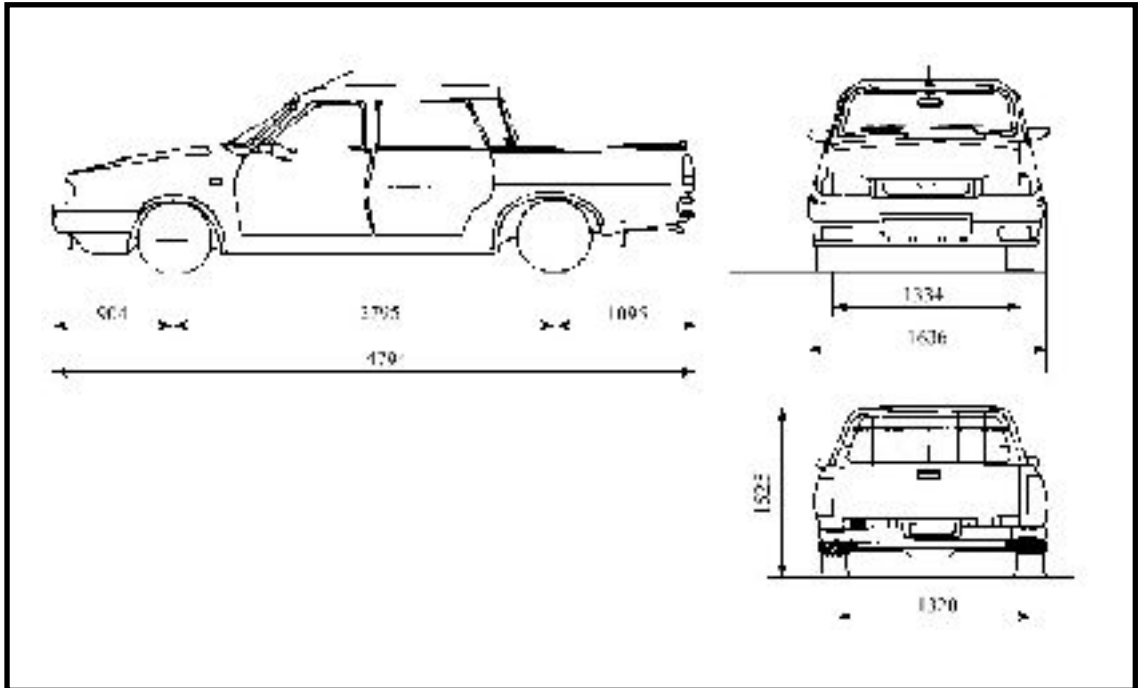
## DACIA 1304 PLATFORM

## DACIA 1305 PLATFORM



DIMENSIONS( mm )		WEIGHT ( kg )	
Total length	4599	Unloaded vehicle weight	
Total width	1615	On the front axle	595
Total height		On the rear axle	520
Empty	1550	Total	1115
Loaded	1450	Maximum authorized load	
Axle base	2675	On the front axle	760
Front wheel track width	1334	On the rear axle	1550
Rear wheel track width	1320	Total	2230
Ground clearance		Authorized payload	1000
Empty	-		
Loaded	165	Load with own brake trailer	3225
Turn radius		Load without own brake trailer	2630
Between footways	5600		
Between walls	5800		

DACIA 1307



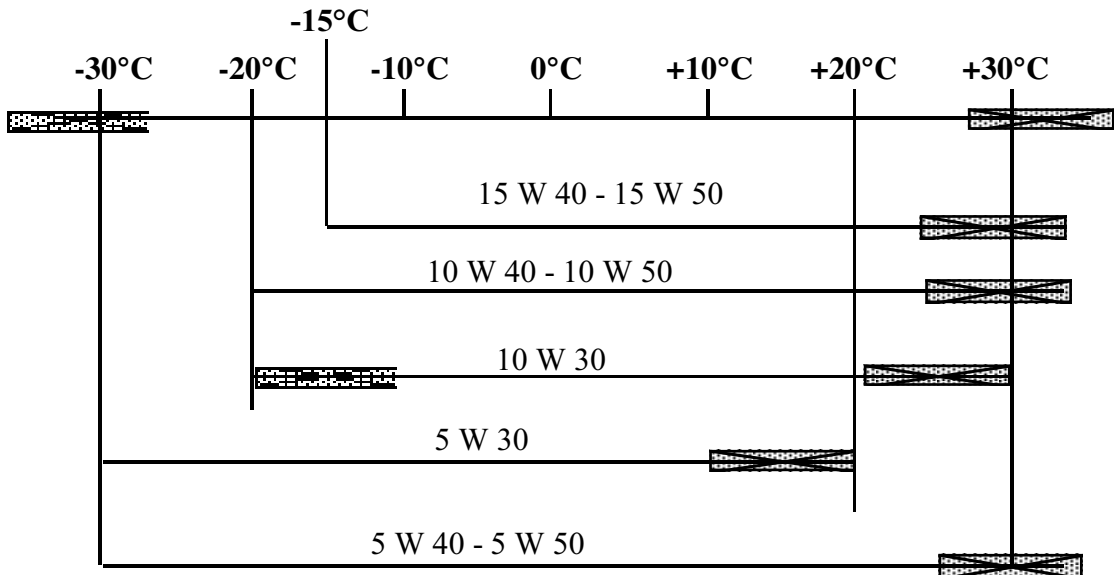
DIMENSIONS ( mm )		WEIGHT ( kg )	
Total length	4794	Unloaded vehicle weight	
Total width	2636	On the front axle	635
Total height		On the rear axle	540
Empty	1525	Total	1175
Loaded	-	Maximum authorized load	
Axle base	2795	On the front axle	820
Front wheel track width	1310	On the rear axle	1550
Rear wheel track width	1334	Total	2230
Ground clearance		Authorized payload	680
Empty	-	Weight on towing hook	1055
Loaded	165		max.50
Turn radius			
Between footways	5600		
Between walls	5800		

DENOMINATIO	CHARACTERISTICS	CAPACITY (liters)
Engine oil	SAE 15 W 40 / API SJ/CF	3
Gearbox oil	SAE 80 W 90 / API GL4/GL5	2,3
Differential oil	SAE 80 W 90 / API GL 5	2
Breaking fluid	SAE J 1703; DOT 4	0,3
Cooling fluid *	Tip C Tip D - GLACEOL RX ** (from 26.11.2001 )	6
Refrigerant A.C.	HFC 134 a PAG SP 10	0,700 kg,
Oil compresor		265 cmc

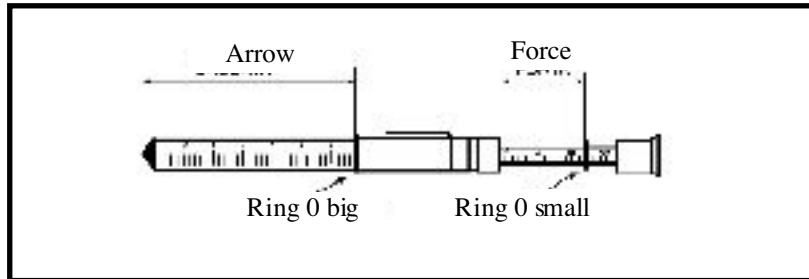
\* Mixture: 50 % concentrate antifreeze + 50 % distilled water.

\*\* On the expansion vessel a label is stacked specifying the use of this type of cooling fluid.

Engine oil quality



The checking of the belt tightening may be done by means of the **MOT 557** device which has two scales; one shows the arrow's value, and the other implicitly translates the value of the tension ( force ).

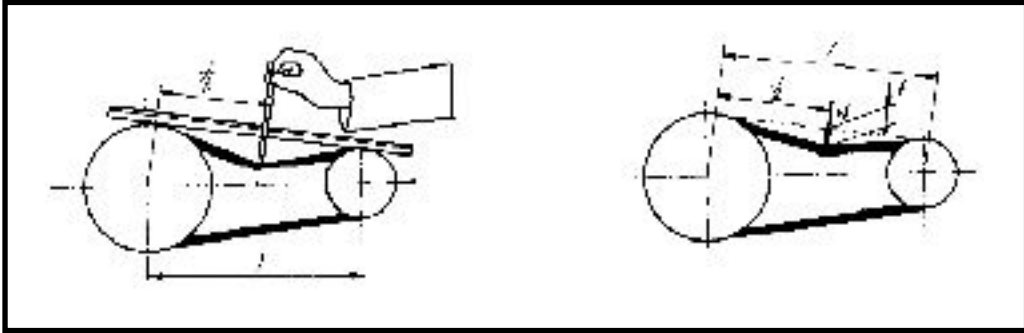


When checking and adjusting the belts tension, observe the following procedure:

- \* stretch the belt for which the tension is to be determined;
- \* place the big "O" ring on the scale at the arrow imposed value ( 2mm ; 4,5mm; 3,5 mm or 7,5 mm for the belts 1; 2 ; 3 or 4);

BELT	ARROW f (mm)	FORCE N (N)			VEHICLE OPTIONS
		MOUNTING	AFTER 5 min.	AFTER 500 km.	
<b>1</b> between compressor - alternator	2	14 +/- 15%	14 +/- 15%	11 +/- 15%	with AC
<b>2</b> between crankshaft-compressor	4,5	17 +/- 15%	17 +/- 15%	13 +/- 15%	
<b>3</b> between crankshaft-water pump	3,5	7.5 +/-15%	7.5 +/- 15%	5.5 +/- 15%	
<b>4</b> between crankshaft-water pump - alternator	7,5	30 +/-15%	30 +/-15%	-	without AC

- \* place the small "O" ring on the scale at zero value;
- \* place a metallic graduated rule on both pulleys;
- \* place the device at half- and vertical on the rule ( 1- distance between pulleys axles).



- \* press on the device until the big “O” ring passes over the rule;
- \* read the value of force N on the scale with small “O” ring;
- \* compare the read value with the imposed value :
  - if the N force value is within the imposed range, the belt tightening is good;
  - if the read value is bigger or smaller than the imposed value, perform the adjustment of the distance between pulleys axles ( re tighten the belt ), until obtaining a value within the imposed range.
- \* start the engine, run it for five minutes, check again the belt tension and compare it with the imposed value and adjust it if necessary;
- \* check the tension and correct if necessary the belts tightening at 1000km compulsory checking.



**ATTENTION!**

*In order to obtain a correct tightening of the cylinder head screws, clean the attachment holes of the cylinder head of oil or coolant liquid, by means a syringe.  
Grease the thread of screws with engine oil.*

**CYLINDER HEAD TIGHTENING**

Tighten at the required moment (**6,5 daNm**) observing the tightening sequence from the drawing.

**CYLINDER HEAD RE TIGHTENING**

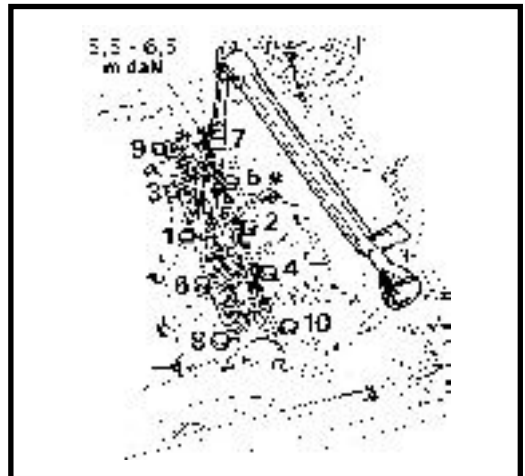
Retightening of the cylinder head is performed as follows:

- for new vehicles at the 800 – 1000 km check u;
- in case of engine repairing, which implies the cylinder head dismounting, after 800 – 1000 km driving;
- every 10.000 km.

For retightening, loose the screw (1) with 1/4 rotation, after that retighten it to the require moment:

- **6,5 daNm** at warm (50 min. after engine shopping);
- **5,5-6,5 daNm** at cold.

Repeat this operation also for the other screws, observing the sequence showed in the drawing.



TYPE VEHICLE	WHEELS	TYRES	ROLLING CIRCUMFERENCE (mm)	PRESSURE (daN/cm <sup>2</sup> )	
				FRONT	REAR
1304 1307	5 J 14 with deport 48 mm	175 R 14 PR 8	1920 +/- 25	1,9	4,2
1307 - 4WD 1305 1304 - 4WD	5 J 14 with deport 48 mm	175 R 14 PR 8	1920 +/- 25	2,0	4,5

\* Tightening moment of the wheels nuts (screws) 9 daNm.

\* Axial run out: max 1,2 mm.

\* Radial run out: max 1,2 mm.

\* Pressure in tires to be checked at cold. The increase of tire temperature during running implies a growth of pressure with 0,2 – 0,3 bar.

In case of checking the tires pressure at warm, consider this growth of pressure.

\* The tires are **TUBELESS** type (without air tube).

**FRONT BRAKES**

Brake caliper bore diameter (for brake disk non aerated)	Φ 48 mm
Brake caliper bore diameter (for aerated brake disk)	Φ 54 mm
Disk thickness non aerated	10 mm
Disk thickness aerated	20 mm
Minimal disk thickness non aerated	9 mm
Minimal disk thickness aerated	19 mm
Brake pad thickness ( the support included)	14 mm
Minimal brake pad thickness (the support included)	7 mm
Disk axial run out, measured at Φ215 mm	0,1 mm

**REAR BRAKE**

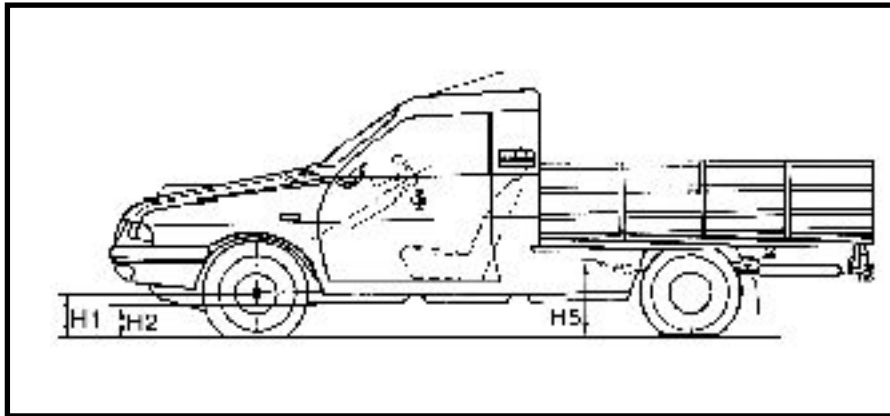
Wheel braking cylinder diameter	Φ 25,4 mm
New drum diameter	Φ 254 mm
Maximum drum diameter after grinding	Φ 255 mm
Braking lining width	50 mm
Braking lining thickness	5 mm
Minimal accepted braking lining height above rivets	0,5 mm

**MEIN BRAKE CYLINDER**

Type of main brake cylinder	Tandem master cylinder with ICP by pass included
Inner diameter	Φ 20,6 mm
Max. pump stroke	32 mm

- \* Brake fluid tank– double with level alarm.
- \* Pressure reducing valve for parallel circuit.
- \* Brake fluid as per norms SAE J 1703, DOT4.

**VALUES UNDER CARRIAGE BODY CONDITIONING THE ADJUSTMENT OPERATIONS OF THE STEERING ANGLES.**



**H1** – the distance measured from the wheels center to the ground

**H2** – the distance measured from the longitudinal girder lower part to the ground






**H5** – the distance measured from the joint axis of the front leaf spring to the ground, measured in the area of the lower arm attachment.

**C** – this value is showing the position where the rack must reach in order to obtain the midpoint for the steering rack.

**VALUES AND SETTINGS**  
**CONTROL VALUE OFFRONT AXLE ANGLES**

**07**

**COMMERCIAL U 75 DRIVE (1304, 1307)**

ANGLES	VALUES	POSITION OF THE VEHICLE		ADJUSTMENTS
		1304	1307	
<b>CASTER</b> 	$1^{\circ}11'$ $1^{\circ}28'$ $1^{\circ}45'$ $\pm 30'$ $2^{\circ}02'$ $2^{\circ}19'$ $2^{\circ}36'$ $2^{\circ}52'$ Maximum Lft / Right difference = $1^{\circ}$	$H5 - H2 = 260$ $H5 - H2 = 250$ $H5 - H2 = 240$ $H5 - H2 = 230$ $H5 - H2 = 220$ $H5 - H2 = 210$ $H5 - H2 = 200$	$H5 - H2 = 265$ $H5 - H2 = 255$ $H5 - H2 = 245$ $H5 - H2 = 235$ $H5 - H2 = 225$ $H5 - H2 = 215$ $H5 - H2 = 205$	Adjustable by modification of the tie-rod length from previous mounting
<b>CAMBER</b> 	$1^{\circ}22'$ $1^{\circ}21'$ $1^{\circ}20'$ $1^{\circ}18'$ $\pm 30'$ $1^{\circ}17'$ $1^{\circ}15'$ $1^{\circ}14'$ Maximum Lft / Right difference = $1^{\circ}$	$H1 - H2 = 66$ $H1 - H2 = 62$ $H1 - H2 = 58$ $H1 - H2 = 54$ $H1 - H2 = 51$ $H1 - H2 = 47$ $H1 - H2 = 43$	$H1 - H2 = 66$ $H1 - H2 = 62$ $H1 - H2 = 58$ $H1 - H2 = 54$ $H1 - H2 = 51$ $H1 - H2 = 47$ $H1 - H2 = 43$	Not adjustable
<b>BALL JOINT</b> 	$8^{\circ}01'$ $8^{\circ}02'$ $8^{\circ}03'$ $8^{\circ}04'$ $\pm 30'$ $8^{\circ}05'$ $8^{\circ}07'$ $8^{\circ}08'$ Maximum Lft / Right difference = $1^{\circ}$	$H1 - H2 = 66$ $H1 - H2 = 62$ $H1 - H2 = 58$ $H1 - H2 = 54$ $H1 - H2 = 51$ $H1 - H2 = 47$ $H1 - H2 = 43$	$H1 - H2 = 66$ $H1 - H2 = 62$ $H1 - H2 = 58$ $H1 - H2 = 54$ $H1 - H2 = 51$ $H1 - H2 = 47$ $H1 - H2 = 43$	Not adjustable
<b>TOTAL PARALLELISM</b> 	Opening (toe-in) $0^{\circ}10' \pm 10'$ (for one wheel $0^{\circ}05' \pm 05''$ )	Empty	Empty	Adjustable by means of the tie rods rotation
<b>ELASTIC JOINTS BLOCKING</b> 	-	Empty	Empty	-

**VALUES AND SETTINGS  
CONTROL VALUE OFFRONT AXLE ANGLES**





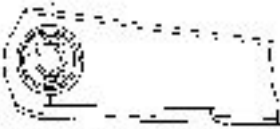
**OTHER STEERING SYSTEM VALUES TO BE RESPECTED**

ANGLES	VALUES	POSITION OF THE VEHICLE		ADJUSTMENTS
		1304	1307	
Steering box positioning	6 – 7,75 on the scale T.F.246			By means of eccentrics
Steering rack central point	C=65mm			By means of the steering wheel rotation

**VALUES AND SETTINGS**  
**CONTROL VALUE OFFRONT AXLE ANGLES**

07

**COMMERCIAL U 75 / 4X4 DRIVE (1304, 1307)**

ANGLES	VALUES	POSITION OF THE VEHICLE		ADJUSTMENTS
		1304	1307	
<b>CASTER</b> 	$1^{\circ}11'$ $1^{\circ}29'$ $1^{\circ}46'$ $2^{\circ}02'$ $2^{\circ}19'$ $2^{\circ}36'$ $2^{\circ}53'$ ± 30' Maximum Left / Right difference = 1°	$H5 - H2 = 260$ $H5 - H2 = 250$ $H5 - H2 = 240$ $H5 - H2 = 230$ $H5 - H2 = 220$ $H5 - H2 = 210$ $H5 - H2 = 200$	$H5 - H2 = 265$ $H5 - H2 = 255$ $H5 - H2 = 245$ $H5 - H2 = 235$ $H5 - H2 = 22$ $H5 - H2 = 215$ $H5 - H2 = 205$	Adjustable by modification of the tie-rod length from previous mounting
<b>CAMBER</b> 	$1^{\circ}21'$ $1^{\circ}20'$ $1^{\circ}19'$ $1^{\circ}18'$ $1^{\circ}16'$ $1^{\circ}15'$ $1^{\circ}13'$ ± 30' Maximum Left / Right difference = 1°	$H1 - H2 = 66$ $H1 - H2 = 62$ $H1 - H2 = 58$ $H1 - H2 = 54$ $H1 - H2 = 51$ $H1 - H2 = 47$ $H1 - H2 = 43$	$H1 - H2 = 66$ $H1 - H2 = 62$ $H1 - H2 = 58$ $H1 - H2 = 54$ $H1 - H2 = 51$ $H1 - H2 = 47$ $H1 - H2 = 43$	Not adjustable
<b>BALL JOINT</b> 	$8^{\circ}01'$ $8^{\circ}02'$ $8^{\circ}03'$ $8^{\circ}04'$ $8^{\circ}05'$ $8^{\circ}07'$ $8^{\circ}08'$ ± 30' Maximum Left / Right difference = 1°	$H1 - H2 = 66$ $H1 - H2 = 62$ $H1 - H2 = 58$ $H1 - H2 = 54$ $H1 - H2 = 51$ $H1 - H2 = 47$ $H1 - H2 = 43$	$H1 - H2 = 66$ $H1 - H2 = 62$ $H1 - H2 = 58$ $H1 - H2 = 54$ $H1 - H2 = 51$ $H1 - H2 = 47$ $H1 - H2 = 43$	Not adjustable
<b>TOTAL PARALLELISM</b> 	Opening (toe-in) $-0^{\circ}16' \pm 10^{\circ}$ (for one wheel $-0^{\circ}08' \pm 05^{\circ}$ )	Empty	Empty	Adjustable by means of the tie rods rotation
<b>ELASTIC JOINTS BLOCKING</b> 	-	Empty	Empty	-

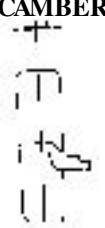
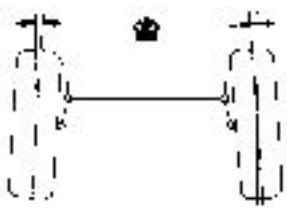

**VALUES AND SETTINGS**  
**CONTROL VALUE OFFRONTAXLEANGLES**

**OTHER STEERING SYSTEM VALUES TO BE RESPECTED**

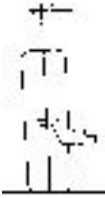


ANGLES	VALUES	POSITION OF THE VEHICLE		ADJUSTMENTS
		1304	1307	
Steering box positioning	6 – 7,75 on the scale			By means of eccentrics
Steering rack central point	T.F.246 C=65mm			By means of the steering wheel rotation



**COMMERCIAL U 75 DRIVE (1304, 1307)**

ANGLES	VALUES	VEHICLE POSITION	ADJUSTMENTS
<b>CAMBER</b> 	$0^{\circ} \pm 34'30''$	Empty	Not adjustable
<b>PARALLELISM</b> 	(For two wheels) Toe out $0^{\circ} \pm 34'30''$	Empty	Not adjustable
<b>ELASTIC JOINTS BLOCKING</b> 	-	Empty	-

**COMMERCIAL U 75 / 4 X 4 DRIVE (1304, 1307)**

ANGLES	VALUES	VEHICLE POSITION	ADJUSTMENTS
<p style="text-align: center;"><b>CAMBER</b></p> 	$0^{\circ} \pm 19'59''$	Empty	Not adjustable
<p style="text-align: center;"><b>PARALLELISM</b></p> 	(For two wheels) Toe out $0^{\circ} \pm 19'59''$	Empty	Not adjustable
<p style="text-align: center;"><b>ELASTIC JOINTS BLOCKING</b></p> 		Empty	

\* In order to check and adjust the front axle angles values, respectively the rear axle ones, the following must be done:

- perform the tires checking concerning:
  - dimensions
  - inflating pressure
  - degree of wear
- perform the joints checking:
  - elastic joints condition
  - ball joint clearance
  - wheel bearing clearance

The vehicle must be obligatory:

- positioned with the wheel on bench rotating plates being in horizontal direction
- braked ensured
- suspension tested, for vehicle setting at its free height
- steering brought at central point and steering rack blocked in this position.

These operations are to be followed by optical device attachment on vehicle, observing the prescriptions of the steering measurement bench manufacturer.

## INGREDIENTS

TYPE	UTILISATION
RHODORSEAL 5661	Propeller shaft pins. Oil sump and distribution cap.
LOCTITE 518	Petrol pump sealing ( membrane type ) and cap of bearing no. 1.
OMNI- FIT RAPID ( FIXAMEDM 28 )	Flywheel attachments screws, bearings cap screws.
OIL SUPER 15 W 40 API SJ	Engine lubrication, parts lubrication when mounting
S.E. DERO 100	Washing of steel, aluminium and cast iron parts.

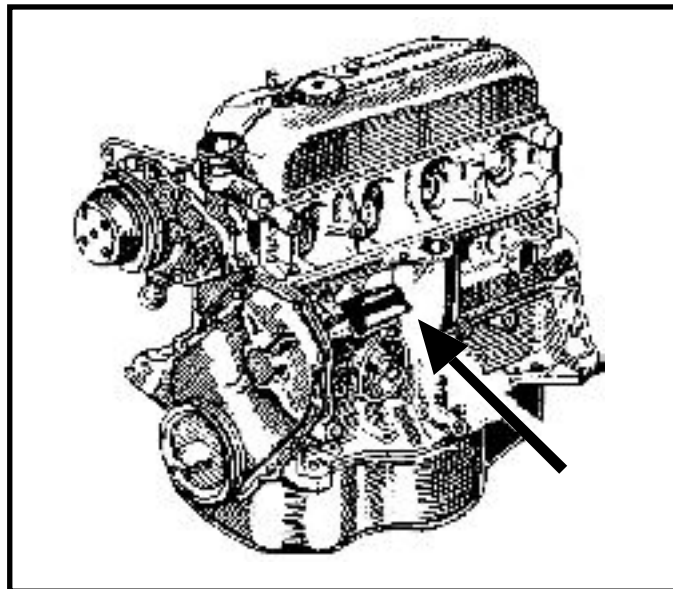
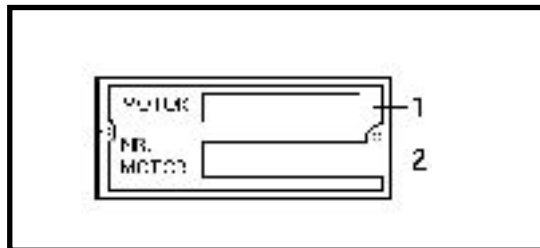
## IDENTIFICATION

VEHICLE TYPE	ENGINE	GEAR BOX	DISPLACEMENT ( cm <sup>3</sup> )	BORE ( mm )	STROKE ( mm )	COMPRESS ION RATIO
1304 Pick-up 1304 Drop-side 1304 King-cab	106 - 10	365 50 C 51 C	1557	77	83,6	8,5:1
1305 Pick-up 1305 Drop-side 1305 King-cab	106 - 02	365 50 C 51 C	1557	77	83,6	8,5:1
1307	102 - 14	365 50 C	1397	76	77	8,5:1

## IDENTIFICATION

The engine identification is done by means of a plate attached to the cylinder block, above the oil filter.

1. Type of engine.
2. Engine manufacture series.



### PREPARATION FOR TEST

Place the car on the elevator, dismount the engine shield, check the presence of oil leaks.

If there are any leaks, eliminate it and then check again.

Drain the oil from the engine.

Fill the engine with **2,750 l** new oil **15 W 40**, start the engine and let it run in force (**1000 - 1200 rpm.**) during approx. **10** minutes, then stop the engine.

### CONSUMPTION TEST

Drain the oil previously filled as per following procedures:

- emptying plug removed;
- piston of cylinder 1 at the upper dead point;
- draining time **20** min;
- the oil is collected in a special vessel which can be used both for filling and draining of the

oil.

Mount the emptying plug

Weigh the vessel with the collected oil by means of a scale. Mark this value **G1**.

The oil is filled back in the engine, directly from the special vessel.

Check the sealing of the emptying plug.

Keep the vessel with the oil traces remained after oil filling

### ROAD TEST

Driving conditions to be constant as far as speed and charge are concerned, equivalent with a 80 km/h speed on a horizontal road.

Do not force the acceleration.

Length of the route: **100 +/- 5 km**.

### OIL COLLECTING

Place the car on the elevator.

Drain the oil respecting the previous conditions.

The oil is collected in the same special vessel used for oil filling

Weigh the vessel with the collected oil on the same scale and mark this value with **G2**.

**CONSUMPTION CALCULATION**

The oil consumption is given by the difference between the first weighing and the second weighing.

Oil consumption  $G1 - G2$ .

**ADMISSIBLE CONSUMPTION**

The admissible consumption is determined by:

- the wear general condition of the engine;
- the oil quality;
- driving style, rpm;
- engine tuning; carburation.

The engines with a oil consumption greater of **100** grams at **100** km need to be adjusted.

For the cars within the warranty period the maximum admissible oil consumption is **75** grams at **100** km.

The oil pressure checking is done in the following conditions: oil to be up to the required level and of a adequate quality; oil temperature to be **80 °C**.

To check the oil pressure use the following procedure :

- check the oil level and fill in until the required level is reached (if this is necessary); if the oil is unsuitable (used) it shall be replaced.

- start the engine and let it run until the oil temperature reach **80 °C**.

- stop the engine and dismount the oil pressure transmitter;

- mount the **MOT 73-01** manometer;

- connect a rotation meter;

- start the engine and check the pressure.

The recommended pressure is:

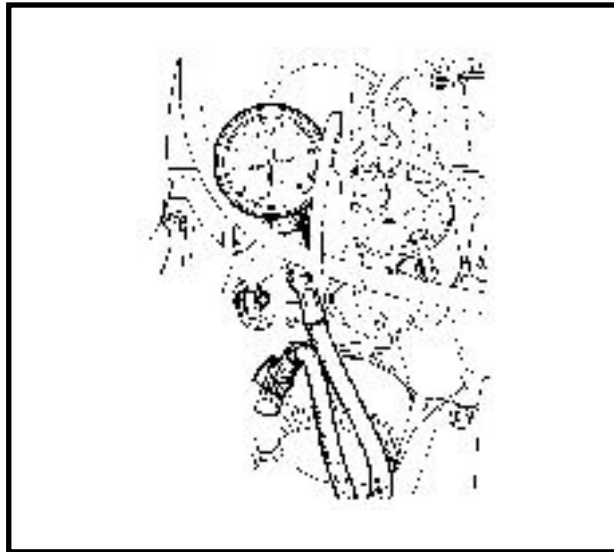
- **750-800 rpm - 0,7 bars**

- **4000 rpm - 3,5 - 4 bars**

- stop the engine, dismount the **MOT 73-01** manometer and mount the oil pressure transmitter;

- disconnect the rotation meter;

- check the oil level and fill in up to the required level.





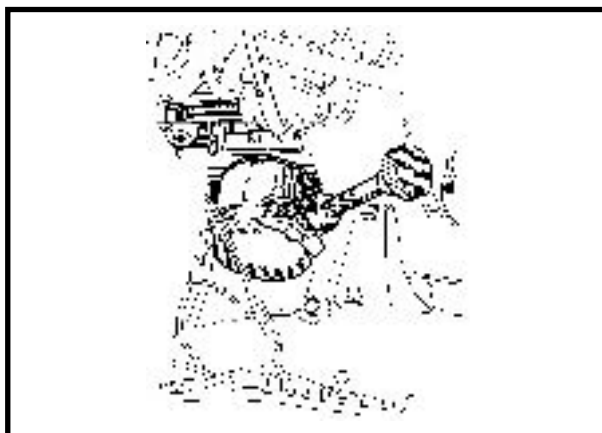
## OIL FILTER REPLACEMENT

**DISMOUNTING**

Disconnect the battery.

Loosen the filter by means of the **MOT 445**.

Handismount the filter.

**REMOUNTING**

Lubricate the gasket of the new filter with oil.

Tighten the filter by hand until the gasket comes in contact with the block.

Tighten  $1/2$  rotation more by means of the **MOT 445** wrench.

Loosen the filter, bring the gasket into contact with the block and tighten  $1/2-3/4$  more rotations.

Check and fill with oil up to the required level in the engine.

The engine may be independently dismantled by taking it out through the upper part of the engine compartment.

### DISMOUNTING ( in the engine compartment )

Disconnect the battery.

Dismount the engine hood.

Dismount the plug of the cylinder head cap, the plug of the oil casing and drain the oil from the engine.

Drain the cooling circuit:

- dismount the radiator plug;
- dismount the cylinder block plug.

Dismount the water and fuel ducts.

Dismount the radiator.

Dismount the fan, the belt and the fan pulley of the water pump.

Disconnect the electric wires (alternator, thermocouplings, oil pressure transmitter, coil, breaker);

Dismount the cables:

- acceleration and shock;

Dismount the throttle valve spring.

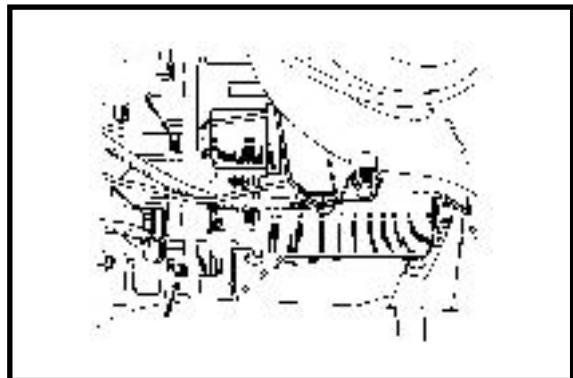
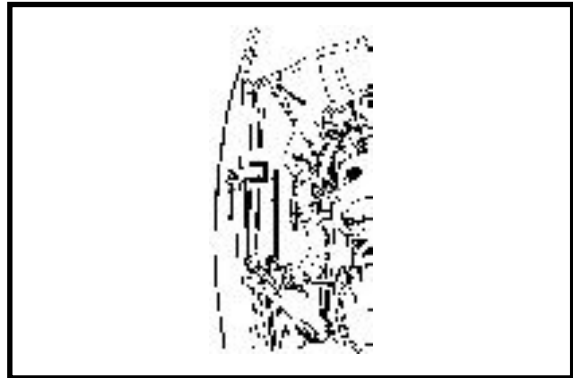
Dismount the air filter.

Dismount the starter protection.

Dismount the starter cables.

Dismount the starter.

Unscrew the fixing screws of the gearbox on the engine.



**DISMOUNTING (under the car )**

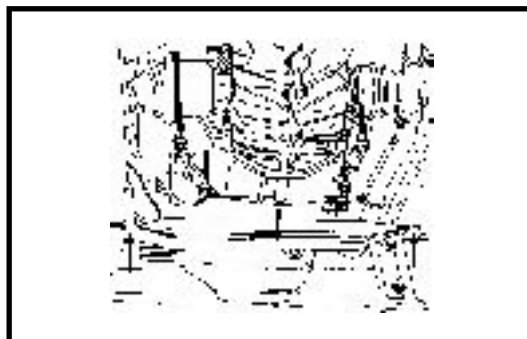
Dismount the engine shield.

Dismount the beam between the longitudinal girders.

Dismount the nuts that attach (fix) the bushings to the stabilizer rod.

Dismount the nuts that attach the gearbox to the engine.

Dismount the protection plate of the clutch.

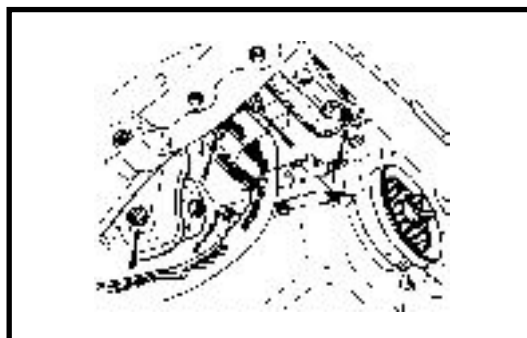


Dismount the pulley of the crankshaft.

Dismount the attachment ring of the discharge tube.

Unscrew the nuts that attach the engine supports to the buffers.

Deposer les écrous de fixation des supports moteur au tampon



Place a jack under the gearbox in order to maintain it in the right position

Mount the lifting device

Displace the engine forward and lift it.

Place the engine on the support.

**REMOUNTING**

The dismounting operations are to be performed in reverse order.

## PARTICULARS ON REMOUNTING

Check the existence of the two bushings by means of which the clutch casing is centered on the block.

Slightly grease (thin coat) the clutch shaft grooves with **Li Ca Pb type II** grease.

Adjust the stroke of the acceleration pedal.


Perform:

- the filling with oil of the engine;
- the filling and aeration of the cooling circuit.

Adjust the engine running (ignition, carburation)

Tighten the fixing nuts and screws according to the tightening moments given in the following table:

## ENGINE MOUNTING - DISMOUNTING

FIXING	TIGHTENING MOMENTS (daN.m) 
Caps to bearings	5,50 - 6,50
Caps to connecting rods	4,00 - 4,50
Flywheel	5
Cylinder head to casing (at cold)	5,50 - 6,50
Cylinder head cap	0,15 - 0,45
Tilter shaft support	1,50 - 1,75
Camshaft pinion	2,70 - 3,20
Camshaft clip	0,80 - 1,00
Oil pump on casing	0,70 - 1,00
Lower casing	1,20 +/- 0,40
Clutch mechanism $\phi$ 180 DBR	1,00 - 1,20
Clutch mechanism $\phi$ 200 DBR/ $\phi$ 200 GR	1,50 - 2,00
Distribution cap	0,70 - 1,00
Oil emptying plug	max. 3,5
Pump and water pump cap	0,70
Fan	2,00 - 2,50
Starter screen	2 - 3
Fuel pump	1,50 - 2,00
Thermocontact	1,50 - 2,00
Oil pressure transmitter	2
Carburettor	1,50 - 2,00
Crankshaft pulley	6,50
Alternator support	1,00 - 1,75

The engine-gearbox assembly may be dismantled from the car only by taking it out at the upper part of the engine compartment.

#### **DISMOUNTING ( inside the engine compartment )**

Perform the operations described for the sole engine dismantling, except the following operations:

- dismantling of the starter protection;
- dismantling of starter;
- dismantling of the screws fixing the gearbox to the engine.

Perform additionally:

- dismantling of the clutch cable.

#### **DISMOUNTING ( under the car )**

- dismantling of clutch protection plate;
- dismantling the nuts of fixing the gearbox to the engine.

Perform additionally:

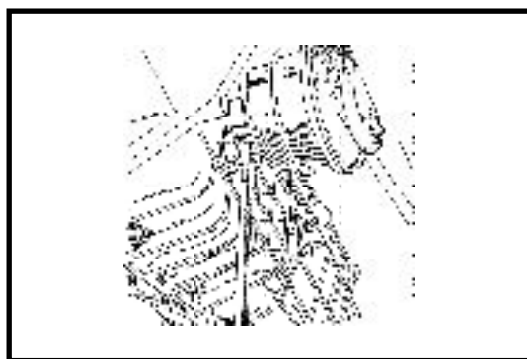
- gearbox oil draining;
- disconnecting the wires of the baking connector.

Dismount the speedometer cable;

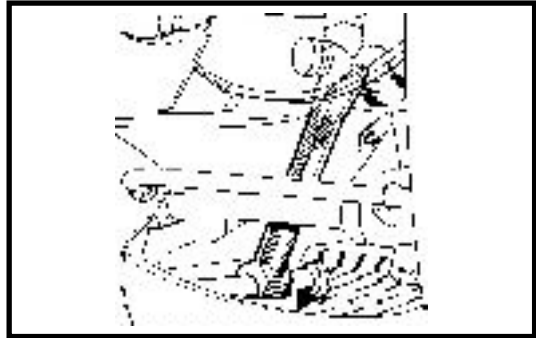
Dismount the fixing bolt of the speeds connecting rod.

Dismount the fixing nut of the exhaust pipe on the cross bar of the gearbox.

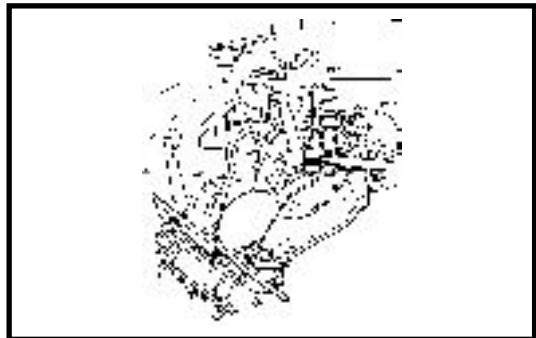
Dismount the elastic pins of the transmission.



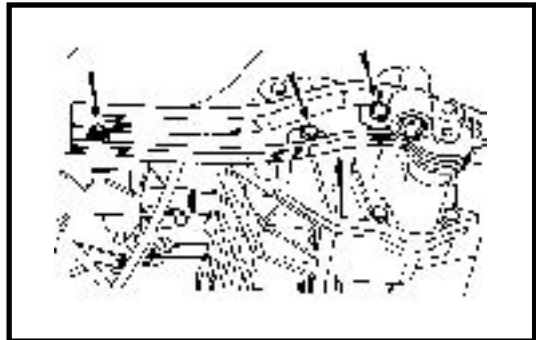
Place the cross bars supporting the front axle.  
Dismount the front wheels.



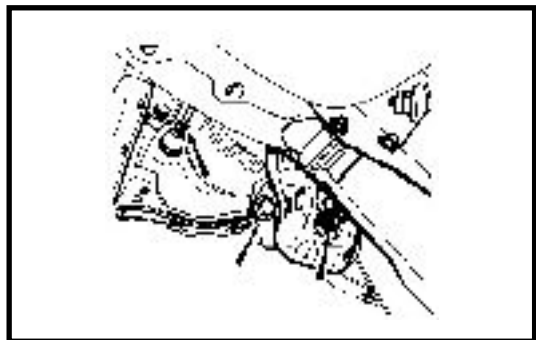
Dismount the upper suspension ball joints and  
the ball joints of the steering connecting rod.  
Disconnect the transmissions.



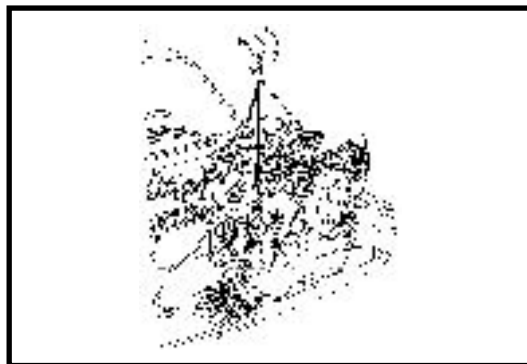
Place a jack under the gearbox to maintain it  
in the right position  
Dismount the back cross bar of the gearbox.



Dismount the fixing nuts of the engine supports.



Remove the jack from under the gearbox.  
 Mount the lifting device  
 Move the engine-gearbox assembly forward, bend it and lift it.  
 Place the engine on support.  
 Dismount the gearbox (if necessary).



### REMOUNTING

Perform in the reverse order the operations described at the dismounting.

### PARTICULARS UPON REMOUNTING

Slightly grease with grease LiCa Pb type II the grooves of the front axle spinions.  
 Upon mounting the elastic pins, the notches shall be oriented towards the exterior (wheel). After mounting, a ball of sealer shall be placed at the ends of the pins, for sealing.

Adjust the clutch stroke: **2,5 – 3 mm**.

Perform :

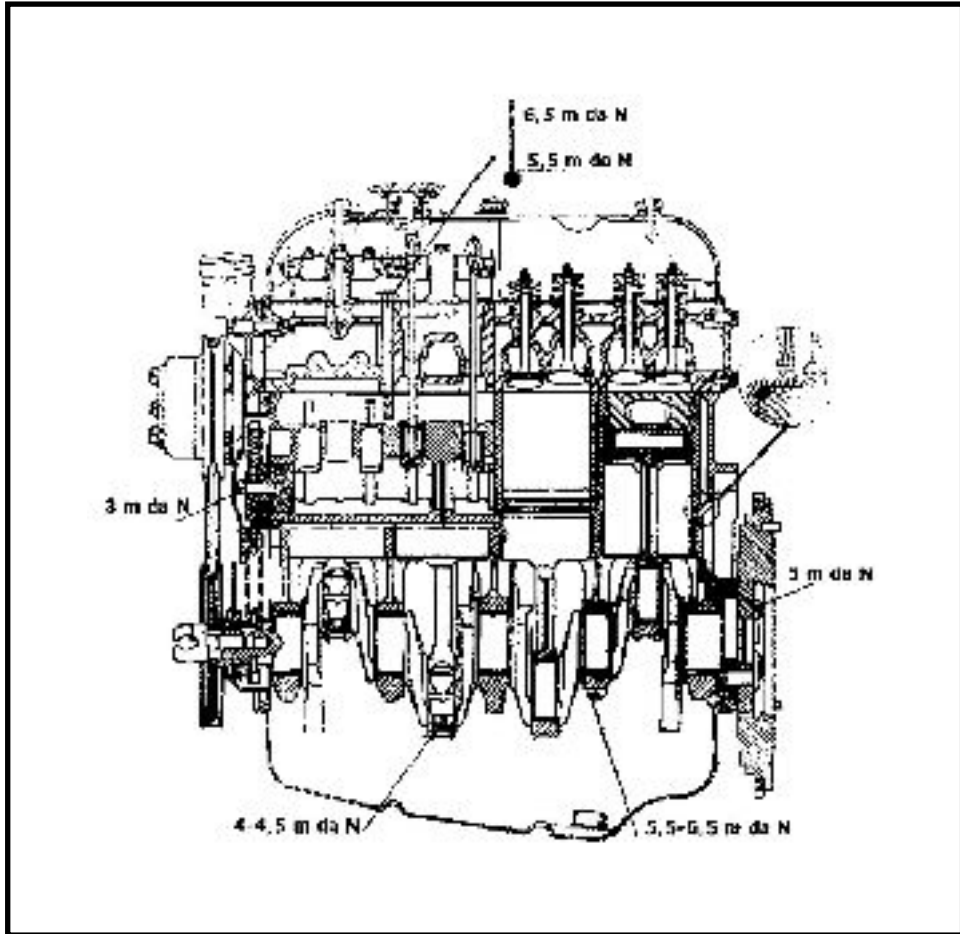
- oil fill up of the gearbox and the engine;
- filling and aeration of the cooling system.

Adjust the engine running (ignition and carburation).

Adjust the speeds command (see chapter 37 “Speeds command”).

Tighten the fixing nuts and screws according to the moments mentioned in the bellow table:

FIXING	TIGHTENING MOMENTS ( daNm )	
Gearbox control connecting rod	4	
Steering connecting rod	3	
Upper shaft ball joint	5	
Gearbox filling and draining plug	2,50	
Down lead tube clip for exhaust pipe	1,70	
Engine support on block	1,70	
Buffer on support	1,70	
Gearbox cross bar on gearbox	1,20	
Cross bar on lateral buffers	1,70	





## CHARACTERISTICS

ENGINE TYPE	102 - 14	106 - 02	106 - 10
Cylinder(cmc)	1397	1557	1557
Bore(mm)	76	77	77
Stroke (mm)	77	83,6	83,6
Compressionratio	8,5:1	8,5:1	8,5:1
Maximumpower	42,6 KW DIN at 5000 rpm	50 KW DIN at 5000 rpm	50 KW DIN at 5000 rpm
Maximumtorque	10,2 daNm at 3500 rpm	11,9 daNm at 2500 rpm	11,5 daNm at 2500 rpm
Idlerunning	750 - 800rpm	750 - 850rpm	750 - 850rpm
Rocker arm clearance (mm)	cold /warm 0,15 / 0,18	cold /warm 0,15 / 0,18	cold /warm 0,15 / 0,18
- inlet	0,20 / 0,25	0,20 / 0,25	0,20 / 0,25
- exhaust	0,4	0,4	-
Distancebetweenthe breakercontacts(mm)	57+/- 3 <sup>o</sup>	57+/- 3 <sup>o</sup>	-
Cam angle	63+/- 3%	63+/- 3%	-
Dwell percent	0+/- 1 <sup>o</sup>	0+/- 1 <sup>o</sup>	-
Initial advance	1 - 3 - 4 - 2	1 - 3 - 4 - 2	1 - 3 - 4 - 2
Ignition succession*	line	line	line
Cylinders disposal	5500 rpm	5500 rpm	5500 rpm
Max rpm Fuel	Petrol CO/R min 90	Petrol CO/R min 95/87	Leadfree petrol CO/R min 95

\* First cylindertowards the flywheel.

## CYLINDER HEAD

Aluminium alloy cast cylinder head

TYPE DU MOTEUR	102 - 14	106 - 10	106 - 02
Couple for tightening the attachment screws of the cylinder head (daNm)			
- cold engine	5,5 - 6,5	5,5 - 6,5	5,5 - 6,5
- warm engine *	6,5	6,5	6,5
Cylinder head height (mm)			
- normal	74,40	74,20	74,20
- for repairs (minimum)	73,90	73,70	73,70
Reprise maximum autorisee du plan de joint	0,50	0,50	0,50
Maximum accepted grinding of the support surface of the gasket	0,05	0,05	0,05
Ignition chamber volume (cmc)	41,80+/-0,5	46,6+/-0,5	46,6+/-0,5
Cylinder head identification (stamp on the cylinder head)	1400 / 8,5	1557 / 8,5	1557 / 8,5

\* 50 minutes after the engine is stopped.

The difference between the ignition chamber volumes of the same cylinder head, max. 0,5 cmc.

## VALVE SPRINGS

The valve springs are identical for the inlet and for the outlet.

Upon assembling, the tight coil shall be towards the cylinder head. The end with tight coils is green paint marked.

ENGINE TYPE	ALL TYPES
Wire diameter ( mm )	3,4
Exterior diameter ( mm )	21,6
Length of spring ( mm )	42
Length of spring under load of 36 daN ( mm )	25
Coiling direction	rightwise

## CHARACTERISTICS

## VALVES

TYPE OF ENGINE	102 - 14	106 - 02 106 - 10
Diameter of shaft (mm)	7	7
Angle of the support side		
- inlet	90 °	90 °
- outlet	90 °	90 °
Diameter of the head (mm)		
- inlet	33,5	34,6
- outlet	30,3	30,3
Max. clearance between the valve shaft and the valve guide (mm)		
- inlet	0,03	0,03
- outlet	0,08	0,08

## VALVESSEATS

The specialcast iron valves, warm pressed, not to be replaced.

TYPE OF ENGINE	102 - 14	106 - 02 106 - 10
Angle of the seat:		
- inlet	90 °	90 °
- outlet	90 °	90 °
Width of support side (mm):		
- inlet	1,1 - 1,4	1,1 - 1,4
- outlet	1,4 - 1,7	1,4 - 1,7
Outside diameter (mm)		
- inlet	34,5	35,7
- outlet	31,3	31,3

### VALVES GUIDES

The cast iron guides ,warm pressed ,may be replaced.

TYPE DU MOTEUR	102 - 14	106 - 02 106 - 10
Inner diameter (mm)	7	7
Outside diameter (mm):		
- normal	11	11
- 1 st repair (1 channel)	11.10	11.10
- 2-nd repair (2 channels)*	11.25	11.25
Guides inclination (inlet,outlet) as per the surface of the gasket	17 °	17 °
Guide position as per seat (mm)		
- inlet	26,5	27,4
- outlet	26,2	26,1

\* Done only upon speialrequest.

### CAMSHAFT

TYPE OF THE ENGINE	ALL TYPES
Number of bearings	4
Axial clearance (mm) measured at the adjustment strap	0,06 - 0,11
Distribution diagram:	
- inlet opening lead	22 °
- inlet dosing delay	62 °
- outlet opening lead	60 °
- outlet closing delayay	20 °

### ROCKERACTUATORS STEMS

TYPE OF THE ENGINE	ALL TYPES
Length ( mm )	176
Diameter ( mm )	5

## CHARACTERISTICS

## PUSHERS

TYPE OF THE ENGINE	ALL TYPES
Outside diameter (mm)	
- normal	19
- reparation *	19,2
Alesage du trou d'embase (mm)	19 + 0,21
- normal	0
- reparation	19 + 0,210

\* Done only upon specialrequest.

## CYLINDERJACKETS

TYPE OF THE ENGINE	102 - 14	106 - 02 106 - 10
Jackets marking / ø jackets (mm)		
green	76,000- 76,010	77,000- 77,010
blue	76,010- 76,020	77,010- 77,020
red	76,020- 76,030	77,020- 77,030
yellow	76,030- 76,040	77,030- 77,040
Diametre for centering in the block ( mm )	80,6	80,6
Jackets heights over the level of the gasket (mm)	0 ,02- 0,09 Without ring gasket "0" 0 ,05- 0,13 With Cu gasket	0 ,02- 0,09 Without ring gasket "0" 0 ,05- 0,13 With Cu gasket
Thikness of the sealing gaskets on the block (mm)	Rubber φ 1,25 - 1,45 Copper 0,1	Ruibber φ 1,25 - 1,45 Copper 0,1

\* The admissible clearance between the piston and the cylinder jacket is  $J = 0,045 - 0,065$  mm and is done by corresponding matching as per table :

PISTON MARK	CYLINDER JACKET MARK
A	Green
B	Blue
C	Red
D	Yellow

## CRANKSHAFT

TYPE OF THE ENGINE	ALL TYPES
Number of bearings	5
Type of bushings	aluminium - stanium
Tightening by screwing up moment of the bushing caps (daNm)	5,5 - 6,5
Axial clearance ( mm )	0,05 - 0,23
Thickness of washers thrust for axial clearance adjustment (mm) (half bushings )	2,28 2,38 2,43
Sliding block bearings:	54,795
Nominal diameter (mm)	54,575
Repair diameter (mm)	- 0,00
Grinding tolerance (mm)	- 0,02
Conicité et ovalité de l'axe (mm)	max. 0,005
Sliding block device:	43,98
Normal diameter (mm)	43,75
Repair diameter (mm)	- 0,00
Grinding tolerance (mm)	- 0,02
Coussinets de paliers:	
-Normal diameter	46,0
-Repair diameter	45,75

\* The bushings for bearings 1 and 3 on the one hand and the bushings for bearings 2, 4 and 5 on the other hand, are identical.

## CHARACTERISTICS

## CONNECTING RODS

TYPE OF ENGINE	ALL TYPES
Tightening by screwing up moment of the bushing caps (daNm)	4,5
Type of bushings	aluminium- stanium 0,31- 0,57
Axial clearance of the connecting rod head (mm)	20 -0,029 - 0,04
Diametre alesage du pied de bielle (mm)	47,614 + 0,011
Diametre alesage de la tete de bielle (mm)	0
Torsion ou courbement (mm)	max. 0,03 mm
Distance entre les axes de bielle (mm)	128 +/- 0.15 mm
Coussinets de bielle: - côte normale - côte de reparation	44 mm 43,75 mm

## PISTONS, PISTON SHAFTS, RINGS

TYPE DU MOTEUR	102 - 14	106 - 02 106 - 10
Piston diameter ( mm ) / A	75,945 - 75,955	76,945 - 76,955
Piston marking ( mm )	B 75,955 - 75,965 C 75,965 - 75,975 D 75,975 - 75,985	76,955 - 76,965 76,965 - 76,975 76,975 - 76,985
Piston axle bore (inside) diameter / Piston marking	( 20,000 - Ø,003 ) / X; ( 20,003 - 20,006 ) / Y ( 20,006 - 20,009 ) / Z	
Piston shaftoutside diameter (mm)/ Piston marking	( 19,991 -19,994 ) / Red ( 19,994 - Ø,997 ) /Yellow (19,997- 20,000) / Blue	
Piston axle length (mm)	62	
Pistonaxle assembling	Pressed in the connecting rod, free in the piston	
Piston assembling in the block	Arrow oriented towards the flywheel	
Rings thickness (slot) (mm): - compression ring - sealing ring - lubricating ring	1,75 (0,25 -0,40 ) 2 ( 0,25- 0,40) 4 ( 0,20- 0,35)	
Mounting position of the rings	décalés a 120°	

\* Matching of the piston with the piston shaft is done as per following table:

PISTON MARKING	PISTON SHAFT MARKING
X	Red
Y	Yellow
Z	Blue

### OIL PUMP

TYPE OF THE ENGINE	ALL TYPES
Oil pressure at 80 °C ( bars ) - for idler running ( 750 - 800 rpm ) minimum 0,7 - for 4000 rpm	minimum 3,5 - 4

### FUEL PUMP

#### Diaphragm pump ( for engines with carburettor )

Static pressure (pump does not work) (bars)

- minimum - 0,170

- maximum - 0,265

#### Electric pump ( for engine with injection )

Admissible minimum flow – 65 l/h

Pressure > 1 bar at 12 V



## DISMOUNTING - MOUNTING

Dismount from engine:

- the alternator and the fixing clip;
- the distributor and the ignition cable;
- the fuel pump;
- the oil filter;
- the oil dip stick;
- the oil pressure transmitter;
- the engine left side support and the elastic buffer.

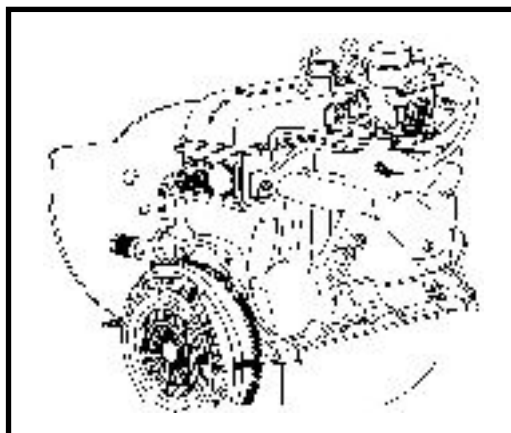
Mounts the bolts of **MOT 460** on the engine block



Place the engine on the **MOT 460** support.

Dismant:

- the rubber hoses;
- the inlet-outlet collector;
- the collector gasket;
- the pressure plate and the clutch disk.



Dismount the cylinder head and take out the cylinder head gasket.

In order to do that, unscrew the the fixing bolts of the cylinder head, except the central screw, on the side of the breaker-distributor.

Because of the tightening, always when dismounting the cylinder head gasket is stuck to the casing or the cylinder head the latter shall not be lifted in order to avoid the shifting of the jackets and breaking of the sealing gaskets at their bottom.

In order to remove the gasket, use a rubber or plastic hammer to slightly hit the cylinder head extremities, then easy turn the cylinder head around the undismounted screw.

Mount the jackets clamping device  
**MOT 484.**

Take out the tilts shafts and the pushers and put them in order.

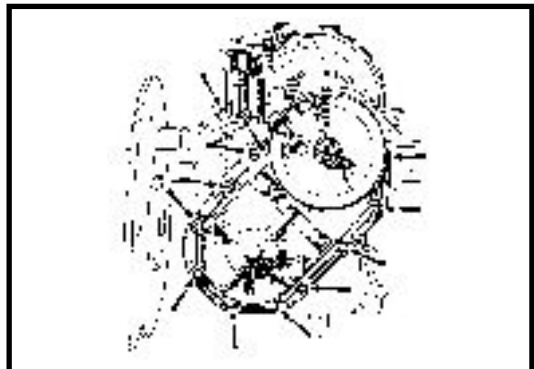
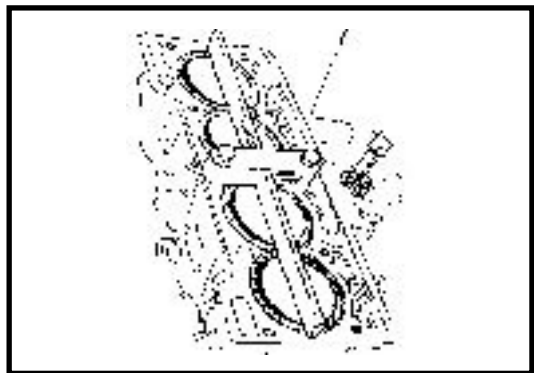
Dismount the pinion of the breaker distributor.

Turn the engine at **180°** and dismount:

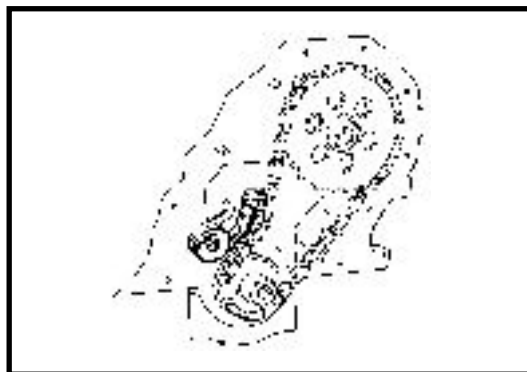
- the crankshaft pulley;
- the oil casing;
- the distribution cap.

Take out the sealing gaskets of the dismantled items (the ones provided with such sealing gaskets)

For the engine where the sealing of the oil casing and the distribution cap is done with sealant, the old sealant is to be removed by scratching and the specific surfaces are to be cleaned with solvent **002**.



Dismount the distribution chain tightener.



Straighten the lock washer and unscrew the camshaft pinion fixing screw

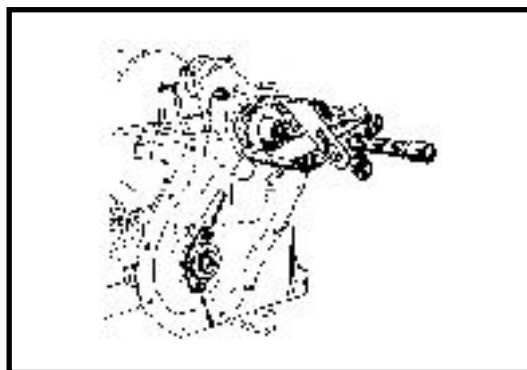
Take out the camshaft pinion and the distribution chain



Dismount the screws of the camshaft clip.

Take out the camshaft.

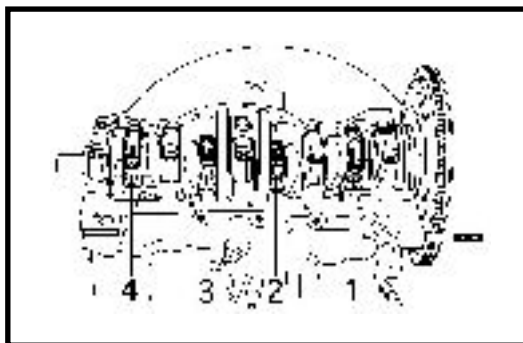
Take out the crankshaft pinion by means of the **MOT 49**.



Dismount the engine flywheel.

Check the marking of the connecting rods: number 1 towards the flywheel and on the reverse side of the camshaft.

Dismount the connecting rods caps and the half bushings and place them in order.



The bearing caps are marked from 1 to 5 number 1 towards the flywheel.

Dismount the bearing caps and the half bushings and place them in order.

Dismount the crankshaft.



Dismount the half bushings from the connecting rod and from the block and place them in order.

Remove the axial clearance adjustment thrust washers.

Take out the bearing annular oil seal.



Rotate the engine by  $180^\circ$ , dismount the **MOT 484** device and take out :

- the engine shield;
- the gaskets at the bottom of the jackets.

Dismount the block from the support.

## RETIGHTENING OF THE CYLINDER HEAD SCREWS

The retightening of the cylinder head screws is performed

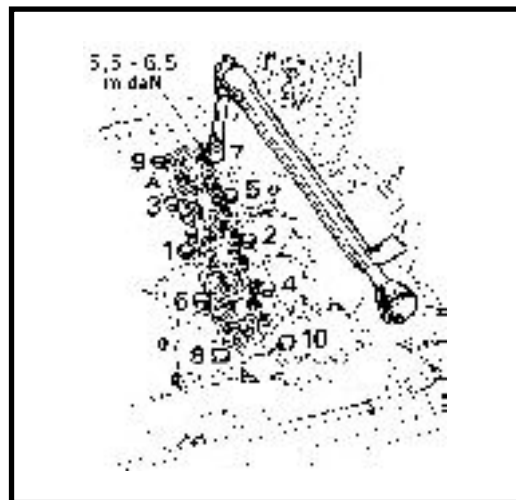
- for new cars upon revision at **800-1000 km**;
- upon an engine checking which requires dismounting of the cylinder head;
- after every **10 000 km**.

To re-tighten, loosen the screw (1) by 1/4 turns, then tighten as per required moment:

- **6,5 daNm** at warm (50 min. after engine stop);
- **5,5 daNm** at cold.

Repeat this operation also for the other screws in the tightening order specified in the figure.

After re-tightening the screws, adjust the tilters.



## ADJUSTMENT OF THE TILTERS

Before adjusting the tilters check the tightening of the platform.

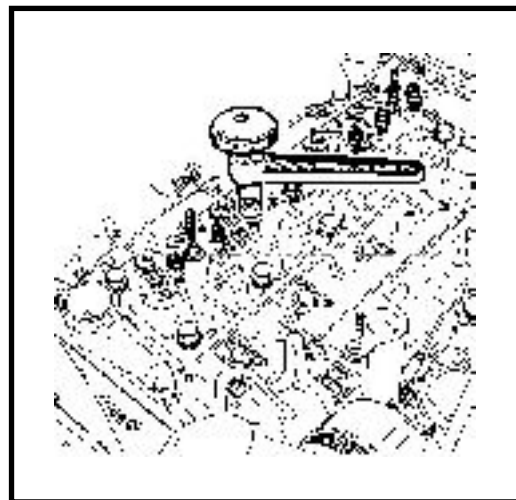
The tightening moment of the platform fixing screws: **1,5 – 1,75 daNm**.

When adjusting the tilters, the gear box shall be in the dead point.

The adjustment of tilters is to be done as per method of the completely opened valve.

Rotate the engine until the outlet valve of cylinder is completely opened and perform the adjustment by means of the **MOT 13** device, tilter adjusting wrench

- inlet valve at cylinder 3;
- outlet valve at cylinder 4.



Repeat the operation for the cylinders 3 - 4 - 2 according to the table:

OUTLET VALVE COMPLETELY OPENED	VALVE TO BE ADJUSTED	
	INLET	OUTLET
1	3	4
3	4	2
4	2	1
2	1	3

**Tilters clearance** : at cold - inlet **0,15 mm**;  
 - outlet **0,20 mm**;  
 at warm - inlet **0,18 mm**;  
 - outlet **0,25 mm**.

The checking of the distance between the tilter and the valve is done by means of a distance calliper (spy) at the corresponding dimension of the constructive clearance.

The callipers should glide with easy friction between surfaces (for a correct checking).

### CYLINDER HEAD

#### DISMOUNTING

Disconnect the battery.

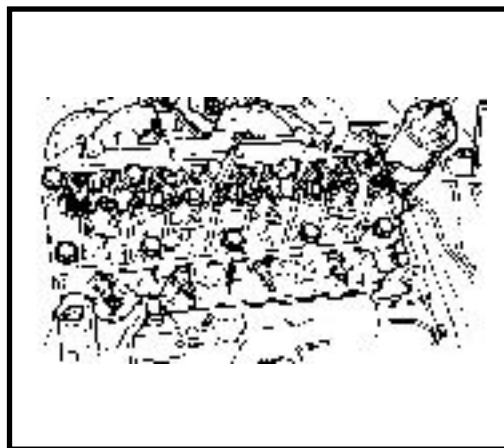
Dismount the air filter.

Empty (drain) the cooling system:

- dismount the radiator plug;
- dismount the cylinders block plug.

Dismount the breaker-distributor.

Dismount the alternator belt.



## DISMOUNTING - MOUNTING

- Dismount the alternator.
- Dismount the acceleration and shock cables.
- Disconnect the thermocontacts.
- Dismount the water hoses (cylinder head-carburator; carburator-water pump; water pump-radiator).
- Dismount the collector from the cylinder head.



- Dismount the tilters cap.
- Dismount the tilters shafts. Place them in order so that they may be mounted again in their former place.
- Dismount the fixing screws of the cylinder head except the central screw on the side of breaker distributor which shall be loosened.
- Because of the tightening, always when dismantling the cylinder head gasket is stuck to the casing or the cylinder head the latter shall not be lifted in order to avoid the shifting of the jackets and breaking of the sealing gaskets at their bottom.
- In order to remove the gasket turn the cylinder head around the unscrewed screw. For cylinder head displacement use a rubber or plastic hammer.
- Unscrew the fixing screw.
- Dismount the cylinder head.
- Mount the **MOT 484** device for jackets maintenance.
- Clean the contact surfaces of the gasket (cylinder block and cylinder head).

**IMPORTANT**

*It is forbidden the cleaning of the aluminium surfaces with the scrapper. For cleaning the rests of the gasket material which might remain stucked on the cylinder head, always use solvent products (such as Decanol or Asimilate) which can be then easily removed by wiping or scratching with a piece of wood, protecting in this way the laying surface of the cylinder head on the cylinder block. Take care not to obturate the lubricating grooves in the block and in the cylinder head (danger of getting the cams and tilters jammed). All the impurities on the pistons head shall be blown with air.*

### CHECK OF THE GASKET PLANE DEFORMATION

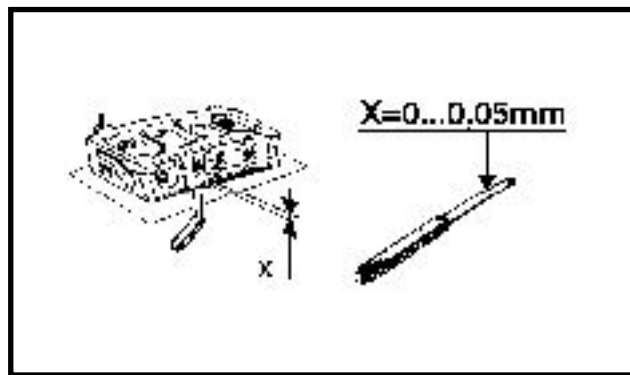
The checking of the deformation of the gasket plane is done by means of a ruler and of a set of gauges.

The maximum accepted deformation is:  $x = 0,05 \text{ mm}$ .

If the maximum deformation exceeds this value, the gasket plane is corrected by grinding.

Before grinding water pump and tilts platform are to be dismantled.

The cylinder head shall be carefully positioned on the grinding machine in order to observe the parallelism of the surfaces.



The maximum addition that may be ground: **0,5 mm**.

If by grinding the minimum accepted height is exceeded, the cylinder head is to be replaced because by reducing the height, the compression ratio is altered.

### MOUNTING

Perform the dismantling operations in the reverse order.



## PARTICULARITIES UPON RE MOUNTING

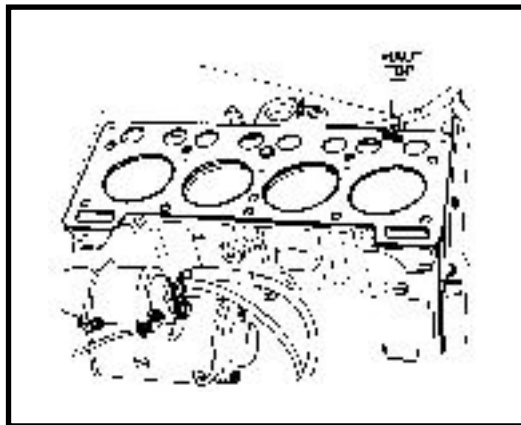
The contact surfaces of the gasket must be clean.

The grease or antifreeze fluid must be removed from the holes of the cylinder head fixing screws by means of a.

This is necessary in order to obtain a correct tightening of the screws and to avoid the appearance of casing cracks.

Dismount the **MOT 484** device for jackets attachments.

Place the gasket with the marking "HAUT" or "TOP" upwards.



Check if the hole in the gasket correctly overlaps the lubrication channel in the block.

Set the cylinder head and the fixing screws.

Tighten the screws at the required moment: **6,5 daNm**.

Mount the tilter shafts in the holes where they have been dismantled.

Adjust the acceleration pedal stroke.

Fill and aerate the cooling system.

Check and adjust the engine running.

## CYLINDER HEAD REPLACEMENT

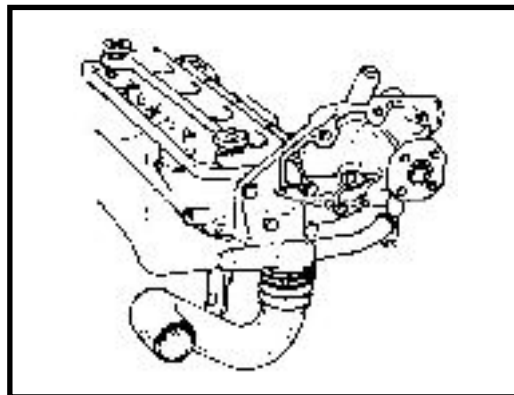
Dismount the cylinder head.

Dismount the spark plugs.

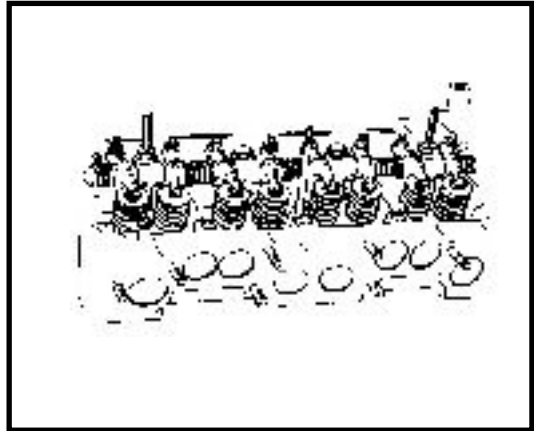
Dismant:

- the water pump pulley;
- the water pump;
- the cylinder head closing plate;
- the alternator support.

Set the **MOT 320** plate for valves support.



Dismount the tilts platform.



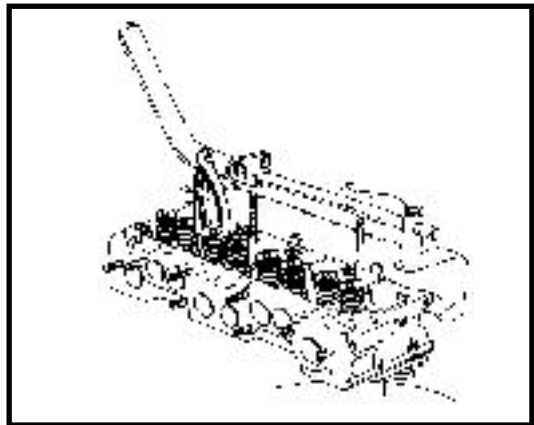
Compress the valves springs by means of the **MOT 382** compressing device.

Take out the lock half cotters, release the spring, take out the upper tray, the spring and the lower tray.

Place the parts in order so that they may be mounted back in the same place where they have been dismantled from.

Remove the valves support plate, take out the valves and set them in order.

Wash, clean and airblow the new cylinder head.



Check the presence of the lubricating channels and valves state.

Perform the lapping of the valves on the cylinder head guiding ( this operation is also to be performed when replacing the valves).

Mount the valves in the cylinder head and place the **MOT 320** valves support plate.

Place in their previous positions:

- sealing gaskets of the valves shafts;
- the lower valve heads ;
- the valve springs
- half cotters.

**NOTE:**

*The valve springs are identical both for inlet and outlet. The springs are mounted with the close coils towards the cylinder head. The end with close coils is marked with green paint.*

## DISMOUNTING – MOUNTING

Compress the springs by means of the **MOT 382** compression device and mount the lock half cotters.

Mount the cylinder head closing plate and the water pump with new gaskets.

Mount the alternator support.

Mount the cylinder head with new gasket observing the mounting instructions.

Mount the tilter shafts in the place where they have been removed from.

Adjust the tilters.

Mount the tilters cap.

Adjust the acceleration pedal stroke.

Fill and aerate the cooling system.

Check and adjust the engine (ignition, carburation).

Retighten the cylinder head after **800 km** of driving.

## VALVE SPRING REPLACEMENT (on car)

Disconnect the battery.

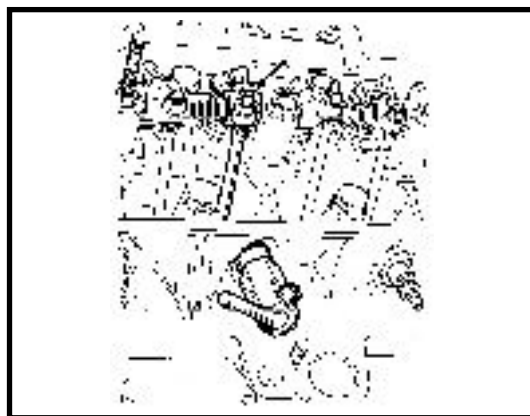
Disconnect the acceleration cable.

Dismount the tilters cap.

Dismount the spark plug.

Mount the **MOT 61** device for valve maintaining in the place of the spark plug.

Dismount the tilter shaft.



Compress the spring by means of the **MOT 382** compressing device and take out the lock half cotters.

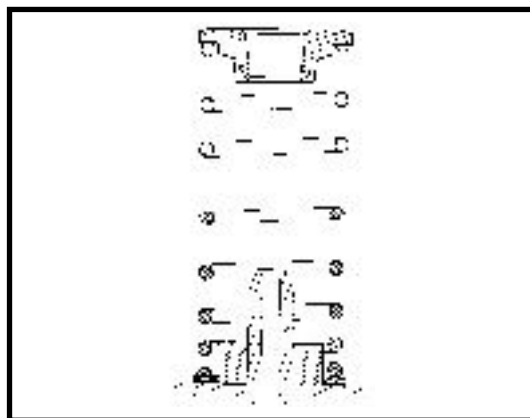
Take out the upper tray and the spring.

Clean the seat of the lower tray.

Place back in the previous site:

- new spring (with the close coils towards the cylinder head, the end marked with green paint);

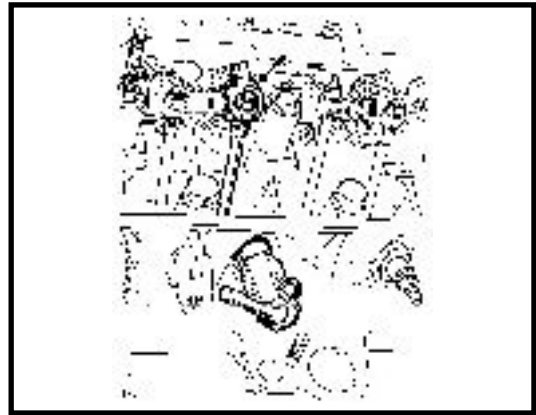
- the upper tray.



Compress the spring by means of the **MOT 382** device and mount the lock half cotters.  
 Mount the tilter shaft.  
 Adjust the tilter.  
 Mount the tilter cap.  
 The nuts tightening moment: **0,5 – 0,7 daNm**.  
 Mount the acceleration cable and adjust the acceleration pedal stroke.  
 Dismount the **MOT 61** valve support device and mount the spark plug.  
 Check and adjust the engine (ignition and carburation).

### REPLACEMENT OF THE VALVE SHAFT SEALING RING

Disconnect the battery.  
 Dismount the acceleration cable.  
 Dismount the tilter cap.  
 Dismount the spark plug.  
 Mount the **MOT 61** valve support device in the place of the spark plug.  
 Dismount the tilter shaft.



Compress the spring by means of the **MOT 382** compression device and take out the lock half cotters.

Remove:

- the upper tray;
- the spring.

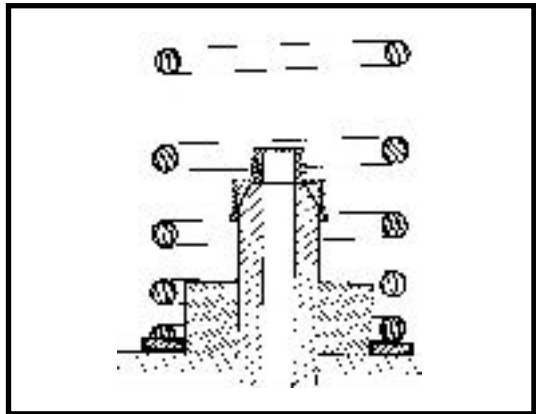
Clean the seat of the lower tray.

Dismount the sealing ring of the valve shaft using the **MOT 1335** device.

Mount the new sealing ring using the **MOT 250** device.

Replace at the previous place:

- the spring (with the close coils towards the cylinder head);
- the upper tray.



## DISMOUNTING – MOUNTING

Compress the spring by means of the **MOT 382** and mount the lock half cotteners.

Mount the tilters shaft.

Mount the tilters cap.

The nutstihteningmoment is: **0,5 - 0,7 daNm**.

Mount the acceleration cable and adjust the acceleration pedal stroke.

Dismount the valve maintain in device **MOT 61** and mount the spark plug

Check and adjust the engine (ignition, caburation).

**TILTERS PLATFORM ( on car )****DISMOUNTING**

Disconnect the acceleration cable.

Dismount the tilters cap.

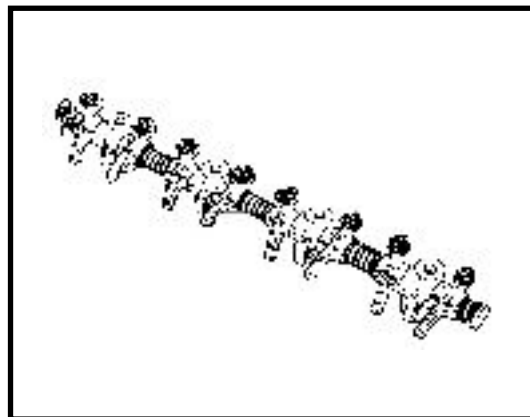
Dismount the platform from the cylinder head.

Dismount the lock clip from the shaft head.

**ATTENTION:**

*Upon distension of springs, the parts should not spring from the shaft.*

Dismount the parts from the shaft and place



them in order.

Wash the parts observing the dismounting order.

Check the parts and replace the defective ones.

**REMOUNTING**

Lubricate the supports, the tilers and the shaft with clean oil.

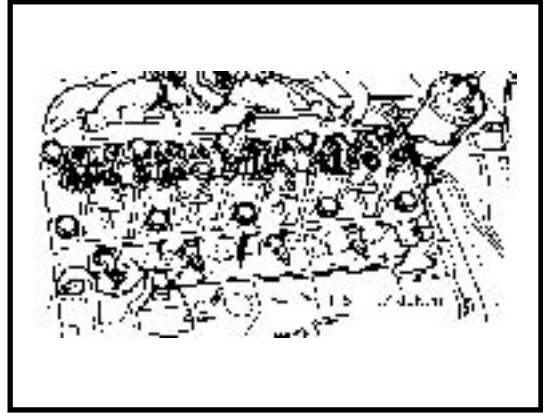
Mount the parts on the shaft in the reverse order of the operation performed for dismounting. Pay attention that attachment holes in the supports identify with the sockets on the shaft.

Mount the assembled shaft on the cylinder head and tighten it at the moment of **1,5 - 1,7 daNm**. Adjust the tilers.

Mount the tilers cover.

Mount the acceleration cable and adjust the acceleration pedal stroke.

Check and adjust the engine (ignition, carburation).

**NOTE:**

*Check the tightening at the required moment of the tilers platform attachment nuts and screws after every 10 000 km of driving before tilers adjustment.*

**VALVES GUIDES REPLACEMENT****DISMOUNTING**

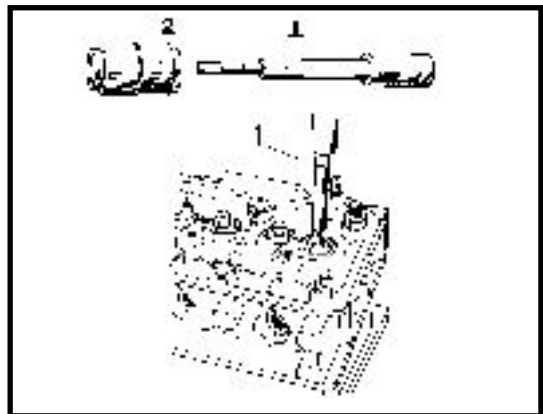
Dismount the cylinder head from the engine.

Dismount from the cylinder head the followings:

- the water pump;
- the valves;
- the valves shafts sealing rings;
- the tilers platform;
- the attachment bolts of the cap;
- the spark plugs.

Place the cylinder head on the

**MOT 121** support plate and by means of the **MOT 148** device chuck (1) depress the guiding on a hydraulic press.



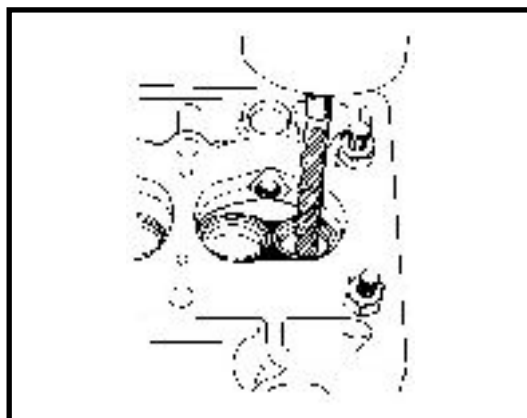
Check the diameter of the depressed guiding:

- nominal value **11 mm**;
- value 1-st repair **11,1 mm**;
- value 2-nd repair **11,25 mm**;

*NOTE: The guiding at the repair value are supplied only by request*

### REMountING

Turn the cylinder head on the support plate and bore the seat of the guide at the correspondening value of the new guide.

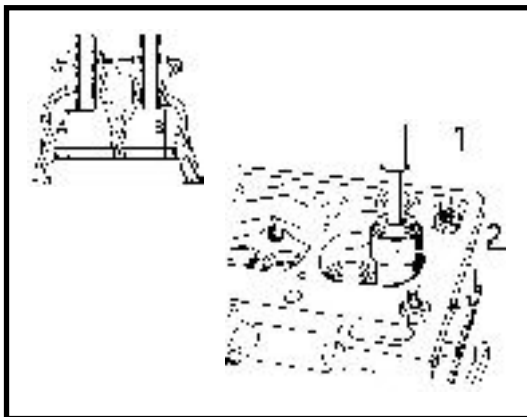


Introduce the chuck (1) in the lock bushing (2) (at one or the other side, depending on the guiding being pressed) and the guiding is placed on the end of the chuck (1).

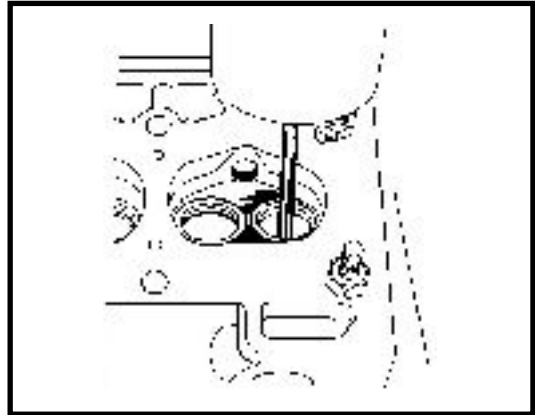
Lubricate the guiding with oil and press it with a hydraulic press observing the following values:

- Inlet **A = 26,5 mm**;
- Outlet **B = 26,2 mm**.

These values are obtained during pressing; if in the moment when the shoulder of the chuck (1) reaches close the limiting bushing (2), the latter is rotated until it comes into contact with the chuck.



Bore the guiding at the value  $\phi 7$ .



Grind the valve seat.

Perform the lapping of the valve with the valve seat.

Wash carefully the cylinder head and the component parts and blow them with air under pressure.

Mount on the cylinder head the following items:

- the cap attachment bolts;
- the valve shafts sealing rings;
- the valves (in the places where they have been removed from);
- the tilter platform;
- the water pump;
- the water pump pulley;
- the spark plugs.

Mount the cylinder head with a new gasket observing the mounting prescriptions.

Mount the acceleration cable and adjust the acceleration pedal stroke.

Perform the filling and aeration of the cooling system.

Perform the checking and adjustment of the engine running (ignition, carburation).

Retighten the cylinder head after driving **800 km**.



## VALVE SEATGRINDING

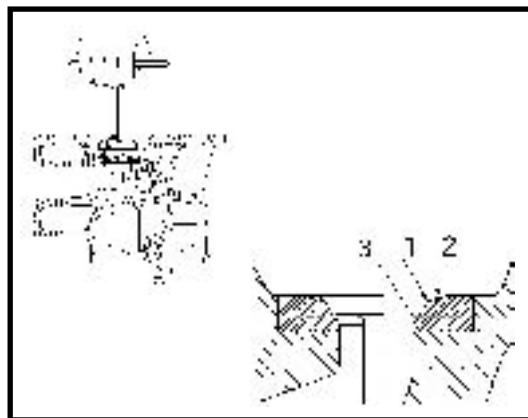
Dismount the cylinder head from the engine.

Dismount from the cylinder head:

- the water pump;
- the valves;
- the valves shafts sealing rings;
- the tilters platform;
- the cap attachment bolts
- the spark plugs.

Place the cylinder head on the **MOT 121** support plate.

Grind the valve seat by means of the **MOT 287** tool for **102** engines and with **MOT 501** tool for **106** engines observing the following order:



- grind the working part (1) by means of the **45°** cutter until the surface becomes clean and shining on the whole circumference;

- take the new or the ground valve, marked on the working surface with paint or carbon paper and place it on the seat;

- rotate the valve, take it out and check the mark left by the valve;

- according to the mark left, the surface (2) by means of the **15°** or surface (3) is ground by means of the **70°** cutter until the working surface is the prescribed one (**1,1 - 1,4 mm** for inlet and **1,4 - 1,7 mm** for outlet) and the mark left on the valve is halfway the working surface of the latter.

Perform the lapping of the valve or of the valves, then place them in order so that they can be mounted in the place they have been taken out.

Carefully wash the cylinder head and the valves and air blow them.

Check the valves sealing by means of gasoline.

Mount the following items:

- the tilters platform;
- the cap attachment bolts
- the valves shafts sealing rings;
- the valves;
- the water pump;
- the spark plugs.

Mount the cylinder head on the engine with a new gasket observing the mounting prescriptions.

Mount the acceleration cable and adjust the acceleration pedal stroke.

Perform the filling and aeration of the cooling system.

Perform the checking and adjustment of engine operation (ignition, carburation).

Re-tighten the cylinder head after driving 800 km.

### ENGINE KIT REPLACEMENT (on car)

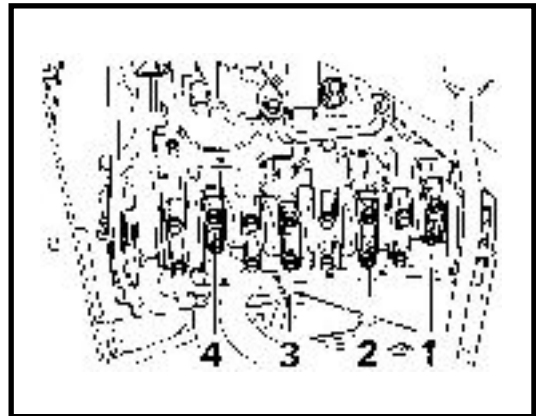
#### DISMOUNTING

Disconnect the battery.

Drain the cooling circuit and the oil from the engine.

Dismount:

- the tilters cap;
- the cylinder head;
- the oil sump;
- the oil pump.



Identify the connecting rods: connecting rod no. (1) is the one on the flywheel side. The marking of the connecting rods is done on the side opposite the camshaft.

Dismount:

- the connecting rods caps;
- the bushings;
- the engine kit (jackets – pistons – connecting rods).

#### NOTE:

*The caps and the bushings shall be placed in order so that they may be mounted in the places where they have been removed from.*

Clean and air blow the parts (it is forbidden the cleaning of the aluminium parts by means of a scrapper).

Check: - the state of the oil pump (to be repaired or to be replaced if it is used).

- the state of the cylinder head (grind the gasket surface, the seats, perform the lapping of the valves if necessary).

**NOTE:** The parts contained in the repair kit are in pairs ( jackets-piston-piston shaft) according to colours.

The colour (1) marked on the piston head must correspond to the colour marked on the jacket.

The colour (2) marked represents the piston weight and must be the same for all the pistons.

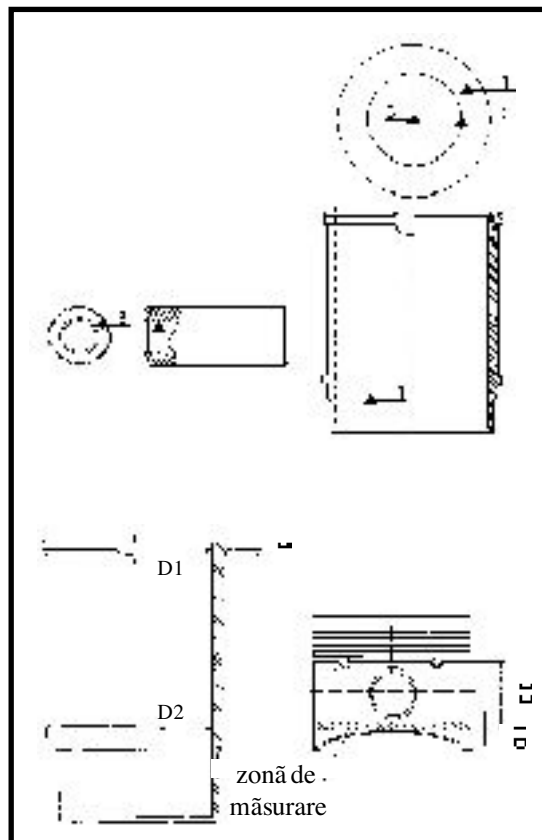
The colour (3) marked on the piston head must correspond to the one marked on the head of the piston shaft.

The piston-jacket clearance 0,045 - 0,065 mm ( valid for new pistons and valves).

The measurement of the piston is done in the area ( see the figure) in perpendicular plane on bolt hole axle.

The masurement of the jacket is done in two separate sections ( see the figure) in perpendicular plane with external flattenings. For calculation of the piston – jacket clearance the average diameter ( D ) is to be considered:

$$D = \frac{D1 + D2}{2}$$



### THE HEIGHT OF THE JACKETS OVER THE GASKET LEVEL

The checking of the jackets height over the gasket level is performed by means of the MOT 252 setting plate, the MOT 251 support and a comparison item.

For the engines with the sealing of the cylinder jackets by “0” ring, the checking is done without the gasket. At these engines, the rubber gasket is used only for sealing.

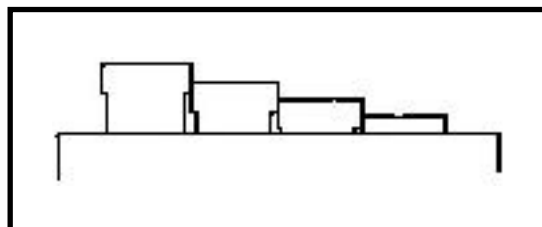
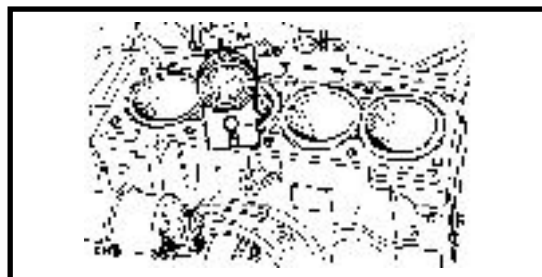
The height of the jackets over the level of the gasket is:

**0,02 - 0,09 mm**

Place the jackets without gaskets in their respective seats in the block.

Measure the height of the jackets over the gasket level.

If the height of the jackets over the gasket level is not within the prescribed limits, the jacket-block assembling values are to be checked.



For all types of engines, the jackets shall be positioned as follows:

- the maximum difference between the heights of two adjoining jackets shall be maximum **0,02 mm**, within the limit of the prescribed tolerance;
- the jackets shall be placed in growing order (by steps).

After obtaining the correct height, the position of the jackets in the block is marked so that it may be paired with the corresponding connecting rods.

For the engines where sealing is done by “Cu” made gaskets, the checking is done with gaskets fitted.

Overheight of the gaskets over the gasket level: **0,05 – 0,13 mm**. If the height of the jackets over the gasket level is not within the prescribed limits, the jacket-block assembling values are to be checked.

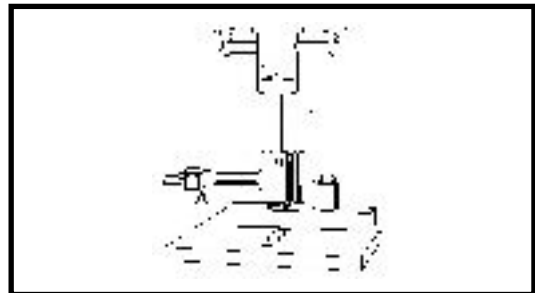
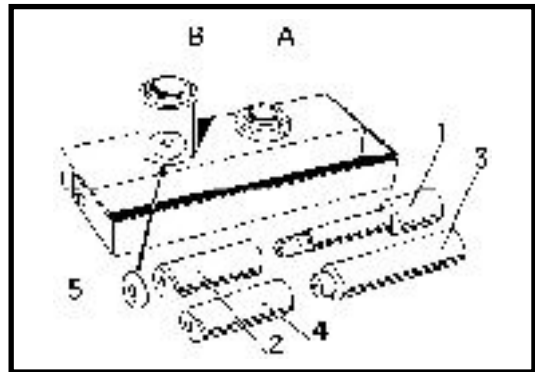
### DISMOUNTING OF THE PISTON SHAFT

The dismounting and mounting of the piston shafts is performed by means of the **MOT 255** device, made of:

- support bushing of the piston upon dismounting the piston (**A**);
- support bushing of the piston upon mounting (**B**);
- extractor mandrel (**3**);
- mounting mandrel (**1**);
- centering mandrel (**2**);
- connecting rod checking mandrel (**4**);
- washer (**5**).

Place the old piston with the blades item on the support bushing (**A**).

Introduce the extractor mandrel (**3**) and by means of a press, dismount the shaft of the old piston.



### CONNECTING RODS PREPARATION

Check:

- the state and the aspect of the connecting rods;
- the setting of the cap on the connecting rod body; remove the burrs if any in order to ensure a correct setting;
- the parallelism of the head and the foot;
- the connecting rod twist.

**NOTE:**

*If wear of the connecting rods is noticed or if the parallelism of the shafts is not correct, the connecting rods shall be corrected or replaced.*

*For the new connecting rods, a check shall be made so that they belong to the same weight class (they shall not have the same colour marked on them).*

**PREPARATION OF THE PISTON SHAFT**

Check if the piston shafts rotate freely in the corresponding pistons.

Mount shaft on the mounting mandrel (1); the piston shaft shall freely rotate on the mandrel.

Mount the centering mandrel (2) on the mounting mandrel (1).

Grease the mandrel-piston shaft assembly with special grease containing MoS<sub>2</sub>.

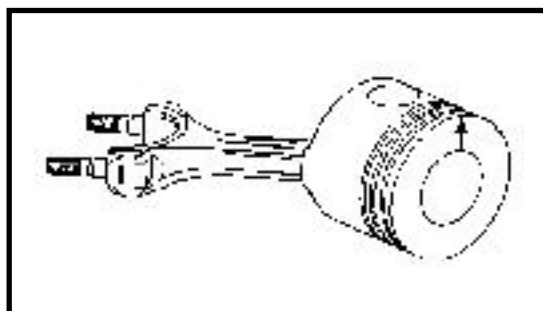
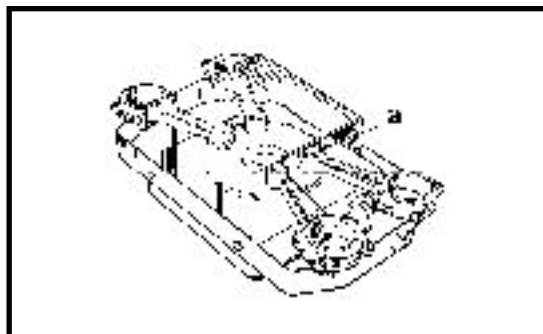
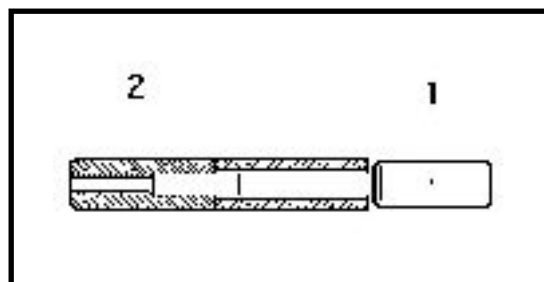
**PISTON – CONNECTING****ROD PISTON SHAFT ASSEMBLY**

Use an electric plate of **1500 W**.  
(electric oven)

Heat the crosshead end of the connecting rod in the furnace at a temperature of about **250°C (10 – 15 minutes)** in order to increase the boring of the connecting rod crosshead end by dilatation

The temperature is checked by placing a piece of tin (a) on the crosshead of the connecting rods; heat the connecting rods until the tin melts.

On the piston head there is an arrow marked which must be oriented towards the flywheel. On the opposite side of the piston there is a bladed item on which the piston lay when the piston shaft is mounted



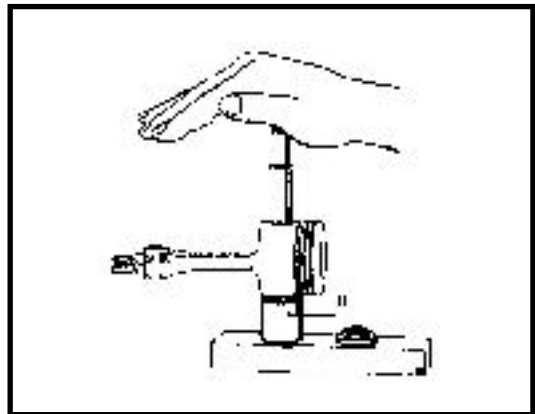
When assembling the piston with the connecting rod, the following instructions are to be observed:

- place the piston with the blade item on the bushing (B) of the piston shaft mounting device; in this situation the arrow on the piston head shall be upwards oriented;
- place the connecting rod on the piston with the marking or with the slots for bushings oriented towards the right side of the worker; in this situation when mounting the assembly in the block the arrow shall be oriented towards the flywheel and the marking on the connecting rod will be on the opposite side of the camshaft.

**NOTE: The following operations are to be performed very quickly to avoid the connecting rod cooling.**

When the connecting rods reached the temperature of **250 °C** ( the tin is melted):

- remove the tin from the crosshead end of the connecting rod;
- place the connecting rod in the piston observing the positioning indications of the latter;
- quickly introduce the mounting mandrel (1) with the piston shaft until the latter comes into contact with the bottom of the support bushing
- dismount the chuck from the piston shaft; check if the piston shaft remains retracted as to the piston disregard of the connecting rod position.



**NOTE: On the bottom of the support bushing shall be placed a 1,5 mm.**

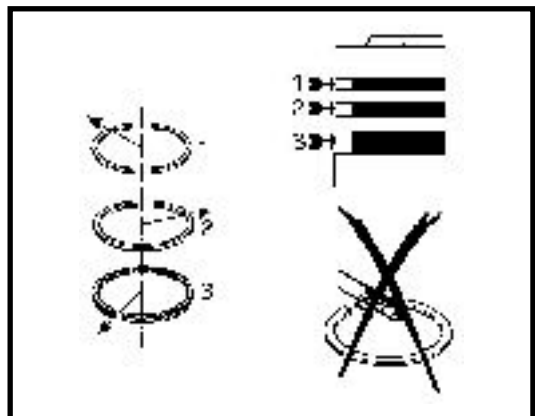
### ASSEMBLING SET MOTOR

Mount on the piston:

- the lubricating ring
- the sealing ring with the marking "TOP" towards the piston head;
- the compression ring.

Abundantly lubricate with fresh oil the rings and the piston;

Displace the rings slots at **120°**; the slot of the lubricating ring shall be obligatory on the side of a fill of its channel and at **90°** as to the piston shaft



## DISMOUNTING – MOUNTING

Lubricate the jackets with fresh oil.

Mount in the jackets the piston-connecting rod assembly with the bushing:

- **MOT 502** for **102** engines;
- **MOT 655** for **106** engines.

When mounting, the connecting rod sides will be parallel with the flattenings made on the jackets.

Mount the sealing gaskets on the jackets.

Mount the bushings on the connecting rods.

Place the connecting rod-piston-jacket assembly in the block; observe the correct positioning:

- cylinder (1) towards the flywheel;
- the marking on the connecting rod opposite to the camshaft;
- the arrow on the piston head shall be oriented towards the flywheel.

Mount the the jackets maintaining device **MOT 484**.

Oil the the bushings and the crankshaft with fresh oil.

Place the connecting rods on the bearings and mount the caps.

Tighten the cap nuts at the required moment of **4.5 daNm** with dynamometric wrench.

Check the correct rotation of the mobile assembly.

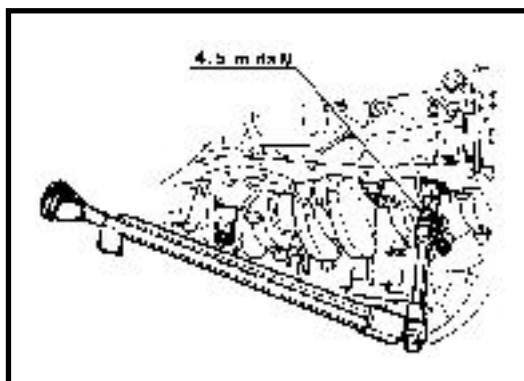
Dismount the device for jackets maintaining

Mount:

- the oil pump;
- the oil sump;
- the cylinder head; adjust the tilts;
- the breaker-distributor; adjust the ignition.

Perform:

- oil filling of the engine;
- filling and aeration of the cooling system.



## OIL PLATFORM PLUGS REPLACEMENT

## DISMOUNTING

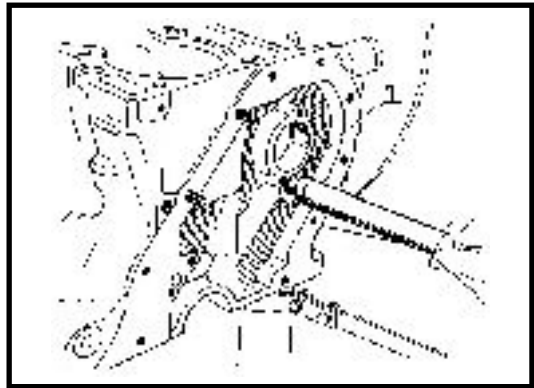
Dismount the plugs from the block by boring with a  $\phi$  10 drill.

Wash the block, clean the platform and the channels in the block and blow it with compressed air.

## REMountING

Oil the new plugs with **OMNI - FIT RAPID**.

Place the plugs (1) in their seats in the block and clamp them by means of the **MOT 111A** rivet set.



## REPLACEMENT OF THE CRANKSHAFT BEARING ANNULAR OIL SEAL

## DISMOUNTING

Disconnect the battery.

the disk, flywheel and the worn annular oil seal.

Dismount gearbox clutch mechanism and

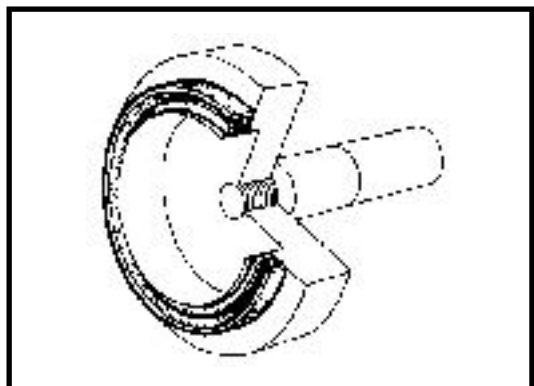
## REMountING

Place the new annular oil seal on the **MOT 259 - 01** mounting device.

Lubricate with oil the exterior diameter of the annular oil seal.

**ATTENTION:**

*The edge of the annular oil seal is very fragile: take protection steps upon mounting.*





## DISMOUNTING – MOUNTING

Mount the annular oil seal in its place slightly tapping the chuck head until it comes into contact with the crankshaft.

The mounting chuck for the annular oil seal shall be kept with care in order to avoid deterioration of the collar on which the annular oil seal is placed.

Protect the chuck by placing a worn annular oil seal on it.

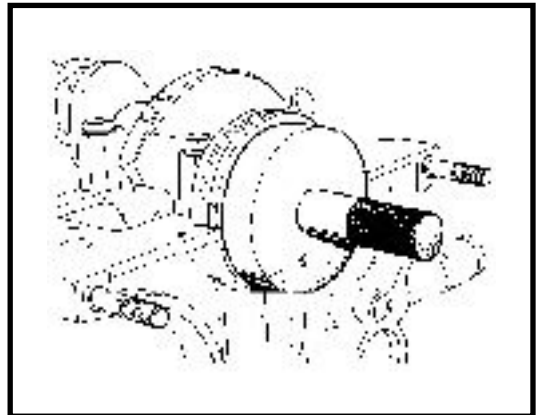
Mount the flywheel. the screws will be lubricated with **FIXAMED M 28**.

Tighten the screws at a **5 daNm** moment.

Center the disk by means of the centering chuck and mount the clutch mechanism.

Mount the gear box.

Check all the fluid fillings and perform all necessary adjustments.



## REPLACEMENT OF THE CLUTCH SHAFT CENTERING BUSHING

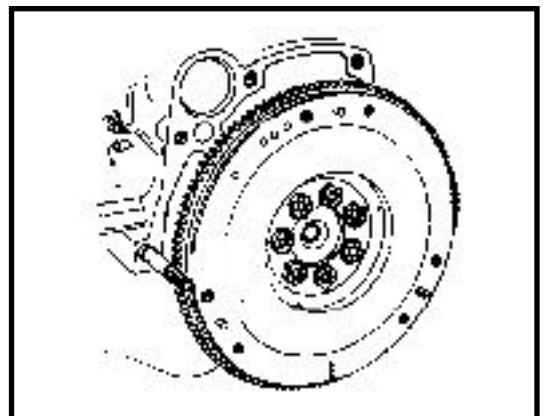
## DISMOUNTING

Disconnect the battery

Dismant:

- gear box;
- clutch mechanism and the disk;
- the worn bushing by means of the

**MOT 101** extractor.



**REMOUNTING**

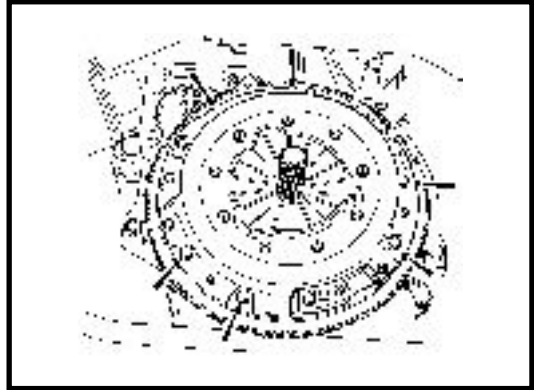
Press the new bushing by means of the clutch disk centering chuck.

Center the disk by means of the centering chuck.

Mount the clutch mechanism.

Mount the gear box.

Check all the fluid fillings and perform all necessary adjustments.

**CRANKSHAFT REPLACEMENT****DISMOUNTING**

Dismount the engine from the car.

Mount the engine on the **MOT 369** support.

Drain the oil off the engine.

Dismant:

- the alternator and the attachment clip;
- the fuel pump;
- the oil filter;
- the oil dip stick;
- the breaker-distributor and the ignition cables;
- the contact and oil pressure transmitter;
- the left side support and the elastic buffer.

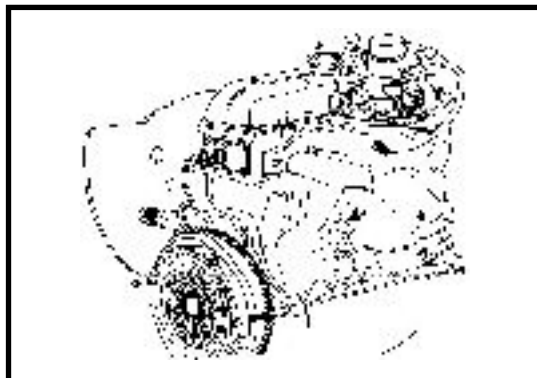
Mount the **MOT 460** device bolts on the engine block



Place the engine on the **MOT 460** support.

Dismount:

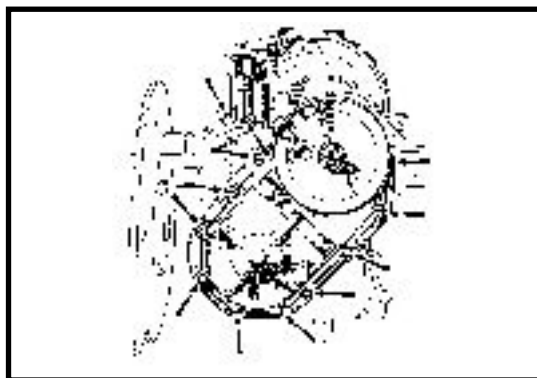
- the pressure plate and the clutch disk;
- the breaker-distributor pinion by means of a **M 12 x 1,5** screw.



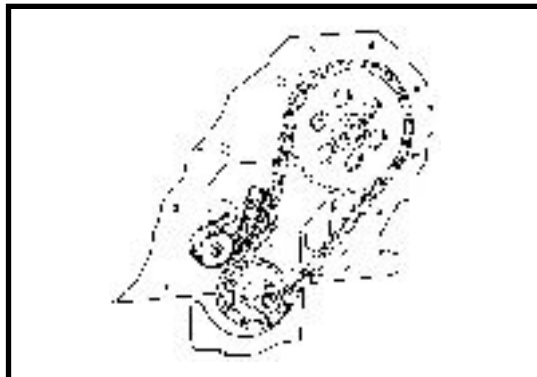
Rotate the engine by **180 °** and dismount the following parts:

- the crankshaft pulley;
- the oil casing;
- the oil pump;
- the distribution cap.

Take out the sealing gaskets of the dismantled items or remove the sealant material by scrapping it, for those with sealant sealing.



Dismount the distribution chain tightening device.

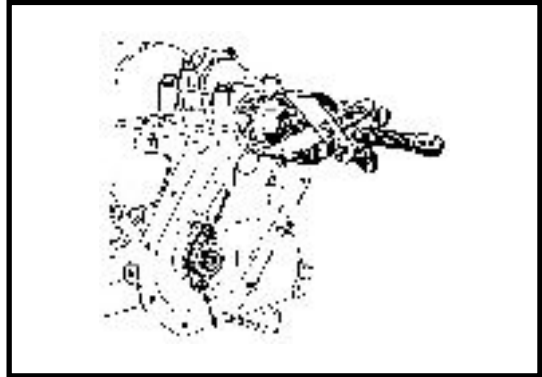


Strain the lock washer and unscrew the camshaft pinion fixing screw.

Take out the camshaft pinion and the distribution chain.



Take out the crankshaft pinion by means of the **MOT49** device.



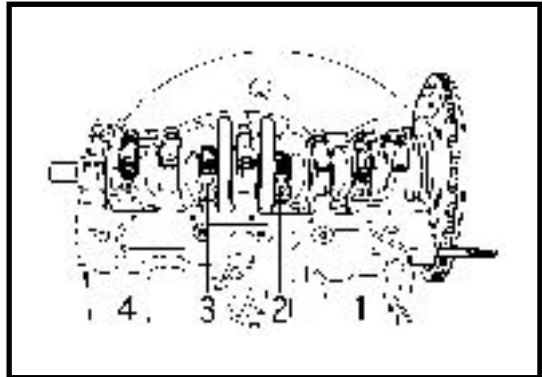
Dismount the engine flywheel.

Check the marking of the connecting rods:

- no. **1** towards the flywheel and opposite to the camshaft.

Unscrew the connecting rod caps nuts.

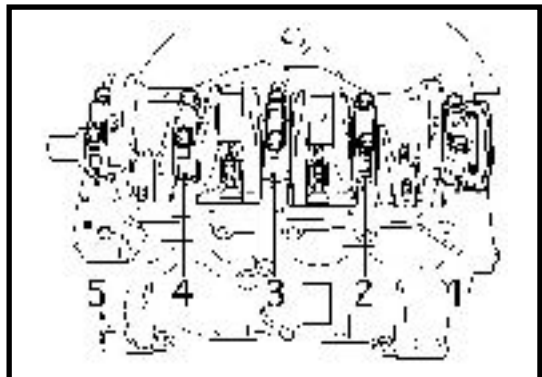
Dismount the connecting rods caps and the half bushings and place them in order.



Dismount the crankshaft.

Dismount the connecting bearing and the half bushings and place them in order.

Dismount the crankshaft.



Remove the halfbushings from the connectingrod and from the block and put them in order.

Dismount the washer thrusts for the axial clearance adjustment.

Remove the annular oil seal from the bearing.



### REMountING

Wash and air blow the new crankshaft; check the existence of the lubrication holes in the shaft. Clean the contact surface of the gasket to the block and oil sump.

Mount the half bushings on the connecting rods.

Mount the half bushings of the bearings in the block (the half bushings with lubricating holes).

### NOTE:

*The half bushings of bearings 1 and 3 on one hand and the ones for bearings 2, 4 and 5 on the other hand, are identical.*

*In case crankshaft is replaced, it is obligatory to change also the connecting rod bearings, crankshaft bearings and the distribution and bearing annular oil seals.*

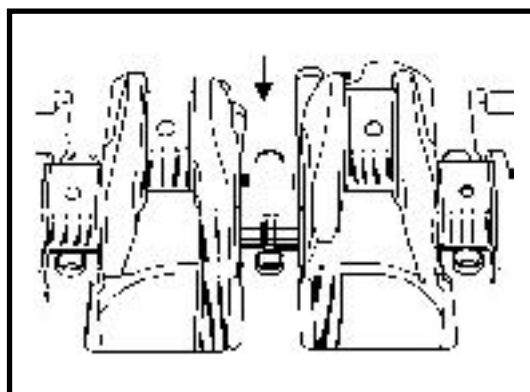
Mount the crankshaft pinion on the shaft.

Lubricate with fresh oil the following:

- the bushing of the bearings;
- the bearings of the crankshaft;

Mount the crankshaft.

Lubricate with oil the axial half bushings and mount them in their respective seats.



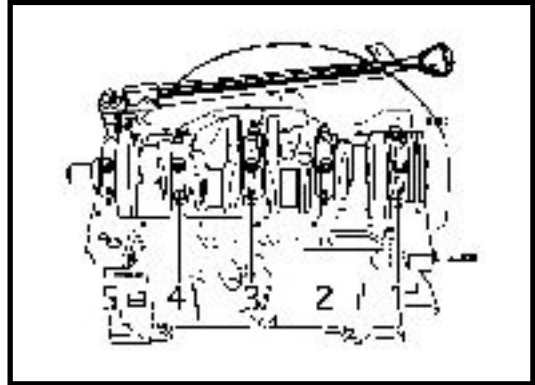
Mount the half bushings on the bearing heads ( the half bushings for caps do not have lubricating holes).

Lubricate the half bushings with fresh oil and mount the bearing caps at their place according to the marking.

It is obligatory to degrease the contact surfaces of the no.1 bearing cap and then to apply a layer of **LOCTITE 518** in order to ensure the sealing.

Tighten the attachment screws of the caps at **5,5 – 6,5 daNm** moment using.

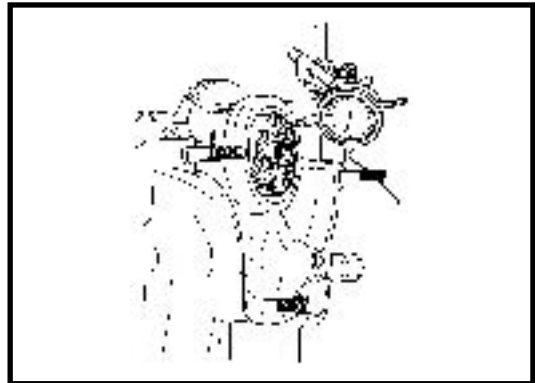
Check the free rotation of the crankshaft.



Mount a support with magnetic bottom and by means of a comparator check the axial clearance of the crankshaft which must be within **0,05** and **0,23 mm**.

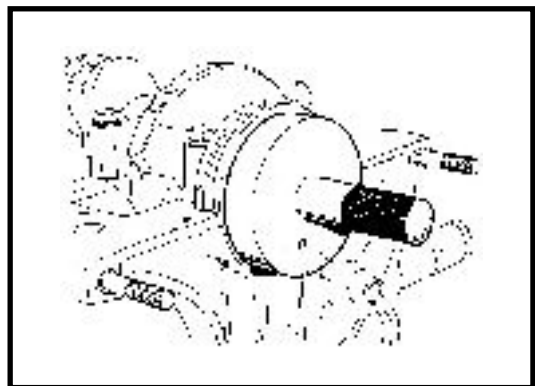
If the clearance is not as required, replace the axial half bushings.

The axial half bushings have various thicknesses such as: **2,28 ; 2,38 ; 2,43 mm**.



Mount the bearing annular oil seal on the **MOT 259-01** chuck.

Lubricate the outside of the annular oil seal with oil and mount it in its seat by slightly tapping the head of the chuck until the latter comes into contact with the crankshaft.

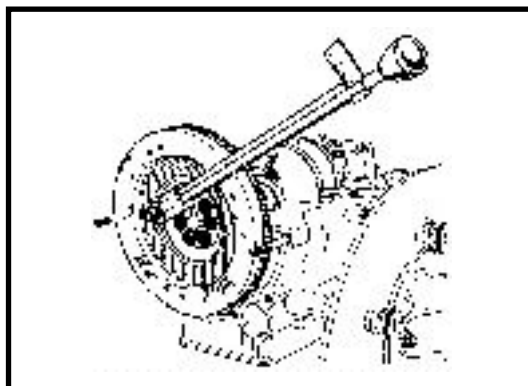


**NOTE:**

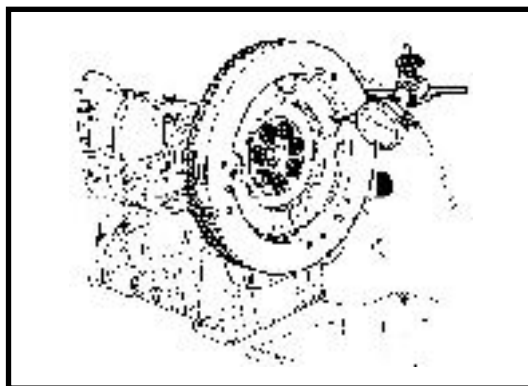
*In case the old crankshaft is to be mounted, displace the annular oil seal position by inserting a 2 mm thick washer between the chuck and the crankshaft end so that the annular oil seal does not work in its initial position.*

Mount the flywheel using new screws. Before mounting lubricate with **FIXAMED M 28** the screws.

Tighten the screws at a **5 daNm** moment using



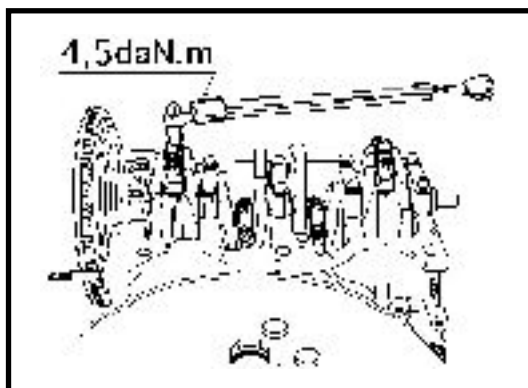
Mount the support with magnetic bottom and by means of a comparator check the axial runout of the flywheel. The maximum admitted runout: **0,06 mm**.



Mount the half bushings in the connecting rods caps.

Lubricate the half bushings and the bearings with oil and mount the connecting rod caps. Tighten the screws at a **4.5 daNm** moment using

Check the free rotation of the mobile assembly



Mount: the oil pump and the distributor, the oil sump and the distributor cap with new gaskets or sealant, the disk and mechanism clutch.

Place the engine on **MOT 369** support and mount:

- the left side support and elastic buffer;
- the anemeter and the oil pressure transmitter;
- the oil filter;
- the oil dip stick;
- the drive pinion of the breaker- distributor, the breaker- distributor and the spark plugs cables;
- the fuel pump;
- the attachment clip and the alternator.

Mount the engine on the vehicle.

Perform:

- the oil filling of the engine;
- the filling and aeration of the cooling circuit;
- engine checking and adjustment (ignition, carburation).



**DISMOUNTING**

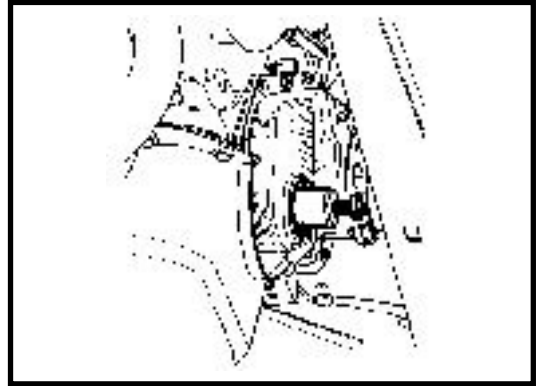
Disconnect the battery.

Place the no.1 cylinder at the dead point in order to avoid the falling of the key from the crankshaft when dismounting the crankshaft pulley.

Dismant :

- engine shield;
- alternator belt;
- crankshaft pulley.

Dismount the old annular oil seal by means of the **MOT457 A** device.

**REMountING**

Mount the new annular oil seal on the mounting chuck of the **MOT457 A** device.

Lubricate the outside of the annular oil seal with oil and place it on the cap.

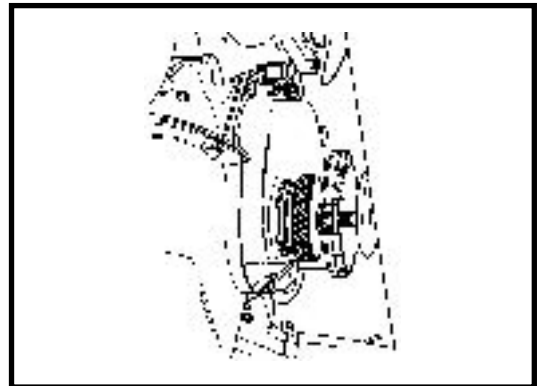
Tighten the nut until the chuck comes into contact with the cap.

Mount:

- the crankshaft pulley after the surface between the pulley hub and the distribution pinion has been lubricated with

**LOCTITE518**.

Mount the alternator belt and adjust its tightness.



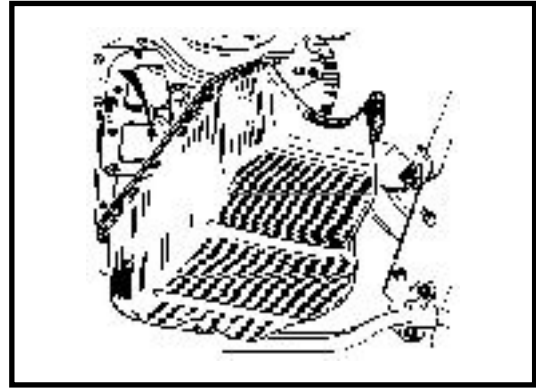
**DISTRIBUTION CAP REPLACEMENT****DISMOUNTING**

Disconnect the battery.

Drain the oil off the engine.

Dismount the alternator belt, the water pump pulley and the engine shield.

Dismount the oil sump: (adjust the engine with no.1 and 4 pistons in the lower deadpoint), rotate the front part of the oil sump towards the left and lower it.

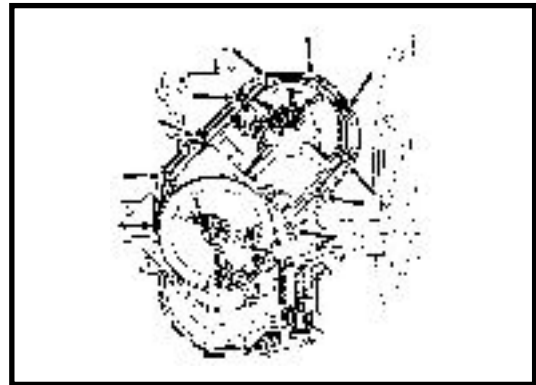


Dismount the crankshaft pulley.

Dismount the distribution cap.

Dismount the annular oil seal from the cap.

Clean the contact surfaces of the gaskets or those where sealant material has been applied (engine block, oil sump, distribution cap).



## DISTRIBUTION CAP

**REMOUNTING**

Mount the distribution annular oil seal.

Place the cap with new gasket on the block after sealant material has been applied previously.

Center the cap by means of the **MOT457 A** device.

Attach the cap on the block; the tightening of the screws is done from the upper part towards the lower part.

Re mount the crankshaft pulley, the water pump pulley, the alternator belt.

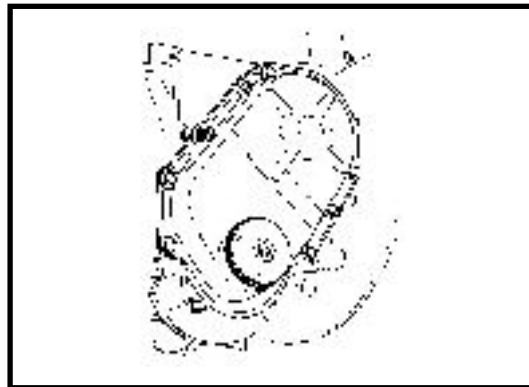
Place:

- the rubber gaskets of the bearings;
- the side gaskets of the oil sump.

In case sealant material is used, this is to be applied as per below described procedure.

Mount the oil sump taking care not to displace the gaskets of the sealant material.

Tighten the attachment screws from the center towards the edges.



Re mount the engine shield

Perform the filling with oil of the engine.

For engines fitted after 01.06.1999 the sealing of the distribution cap is done with sealant material (instead of the distribution cap gasket), the necessary quantity of sealant material is 15 grams.

Any dismounting of the distribution cap requires the replacing of the sealant material layer.

Proceed as follows:

Remove the old sealant material by scrapping with a knife from the contact surface of the distribution cap and engine casing.

Clean with **002** solvent the contact surfaces of the engine casing and of the distribution cap.  
Place a continuous sealant material layer of a **3 mm** thickness on the lower part of the contact surface of the distribution cap, taking care not to obturate the its fixing holes.

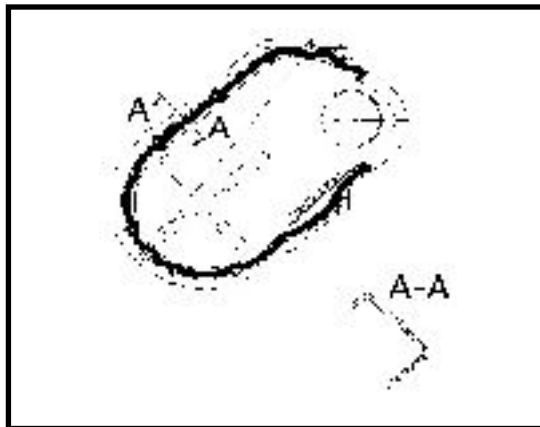
Mount the distribution cap and tighten the attachment screws at the required moment.

**ATTENTION !**

*Mounting of the distribution cap on engine casing must be done in maximum 5 minutes from the sealant material application.*

*At the distribution cap which is mounted with sealant material, the drawings of the contact surface are towards the exterior ( see chapter A - A ) different from the ones mounted with gaskets where the drawings are towards the interior.*

*The distribution cap mounted with sealant material can not be mounted with gaskets and the ones mounted with gaskets can not be mounted with sealant material.*



## REPLACEMENT OF TIGHTENER AND DISTRIBUTION CHAIN

## DISMOUNTING

Disconnect the battery.

Drain the oil from the engine.

Dismount: the engine shield, the crossbar between the longitudinal girders, the elastic bushing nuts of the stabilizer rod, the alternator belt, the fan and the water pump pulley, the oil sump and the distribution cap.

Unscrew the tightener fixing screw.

Dismount the tightener.

**ATTENTION !**

*Do not let spring the crosshead shoe and the spring .*

Straighten the lock washer and unscrew the camshaft pinion fixing screw

Take out the camshaft pinion and the distribution chain

Clean the contact surfaces of the gaskets (engine block, oil sump, distribution cap).

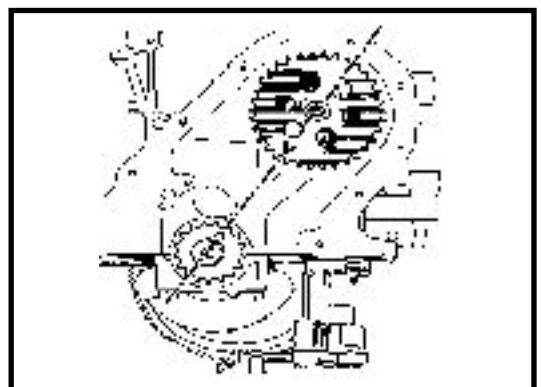


## REMOUNTING

**( Distribution adjustment )**

Mount the camshaft pinion so that markings on the pinions to be placed one in front of the other and to be collinear with pinion centers.

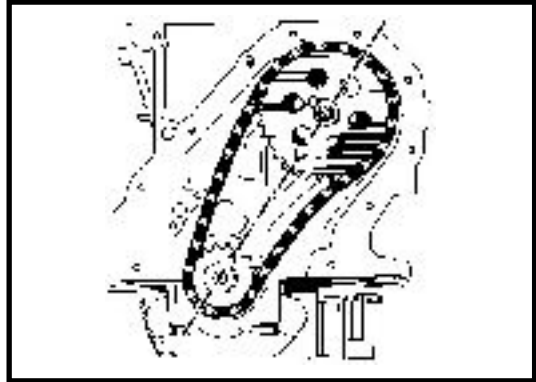
Dismount the the camshaft pinion avoiding its rotation.



Place the new chain on the camshaft pinion and on the crankshaft pinion.

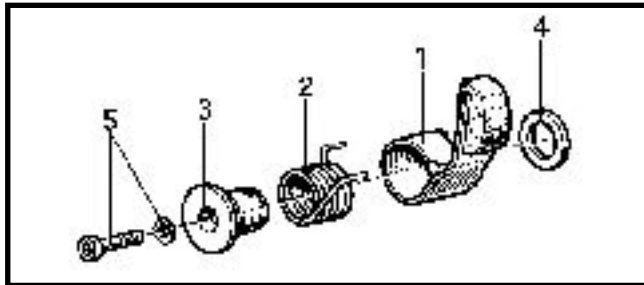
Mount the camshaft pinion maintaining the alignment of the markings on the pinions.

Tighten the fixingscrew at a **2 daNm** moment and strain the safety washer.



Mount the tightener performing the dismounting operations in the reverse order:

1. Tightener crosshead shoe.
2. Spring
3. Shaft
4. Tightening washer
5. Fixingscrew and washer



Remount:

- the distribution cap and the oil sump with new gaskets; (using sealant material for engines using this sealing with sealing material);
- the crankshaft pulley; (the surface between the pulley hub and the distribution pinion will be greased with **LOCTITE 518**);
- the water pump pulley and the fan;
- the elastic bushings fixing attachments nuts of the stabilizer rod;
- the crossbar between the longitudinal girders;
- the engine shield.

Mount the alternator belt and adjust its tightness.

Mount the radiator.

- Perform :
- oil filling of the engine;
  - filling and aeration of the cooling circuit.

## CAMSHAFTREPLACEENT

**DISMOUNTING**

Disconnect the battery.

Drain: oil from engine and the cooling circuit.

Dismant :

- air filter, front grill radiator, crossbar between the longitudinal girders, the fixing nuts of the elastic bushers from the stabilizer rod.

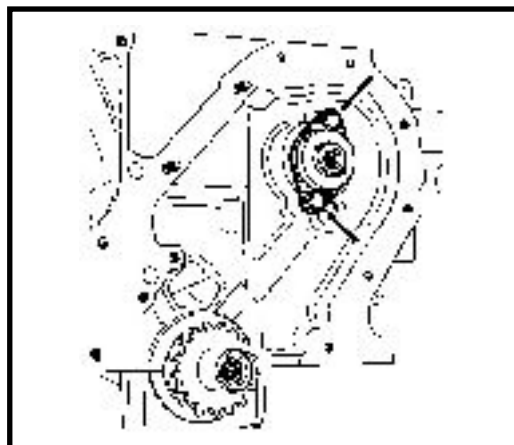
Dismount the breaker- distributor, the filters cap, the cylinder head, the filters shafts and the pushers; arrange them in order so that they may be mounted in the places they have been removed from.

Mount the jackets maintaining device **MOT 484**.

Dismount the fuel pump without disconnecting the hoses, the control pinion of the breaker distributor with a cylinder head attachment screw, the engine shield, the crossbar between the longitudinal girders, the elastic bushings attachment nuts of the stabilizer rod, the oil sump, the alternator belt, the water pump pulley and the fan, the crankshaft pulley, the distribution cap, the distribution chain tightener, the camshaft pinion and the distribution chain

Dismant:

- the fixing screws of the camshaft clip;
- the camshaft.



Clean the contact surfaces of the gaskets ( engine block, oil sump, distribution cap, cylinder head).

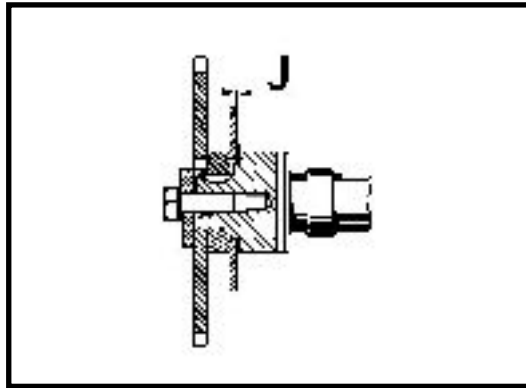
**REMOUNTING**

Mount on the new camshaft : the disk key, a new attachment clip, a new cross piece, tap the cross piece with a rod until it comes into contact with the camshaft shoulder).

Mount the camshaft pinion and tighten the screw at the moment of **3 daNm** using.

Check the attachment clip clearance (**J**) ; the clearance must be between **0,06** and **0,11 mm**.

If clearance is not the required one, replace the clip.



Dismount the camshaft pinion.

Lubricate with oil the camshaft and mount it in its place.

Tighten the screws of camshaft clip fixing at a **2 daNm** moment.

Remount: the camshaft pinion and the distribution chain, the distribution chain tightener, the distribution cap with a new gasket or sealant material, the crankshaft pulley, the water pump pulley and the fan, the oil sump with new gaskets or sealant material for engines assembled after 01.06.1996, the elastic bushings attachment nuts on stabilizer rod, the crossbar between the longitudinal girders and the engine shield.

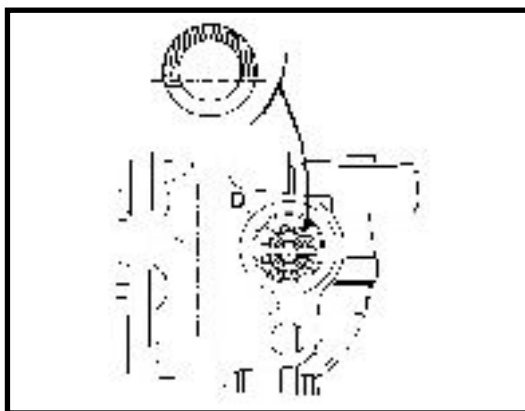


## CAMSHAFT

Mount the control pinion of the breaker distributor.

The control pinion is positioned as follows:

- place the no.1 cylinder at the upper dead point, on ignition;
- mount the pinion with a cylinder head attachment screw so that the slots are perpendicular on the engine longitudinal axle and the larger part (D) is oriented towards the flywheel.



Re mount the pushers lubricated with fresh oil, the cylinder head, the tilts shafts.

Adjust the tilts (thermal clearance) at cold:

- inlet - **0,15 mm**;
- outlet - **0,20 mm**.

Mount the tilts cap.

Mount the fuel pump, the breaker-distributor.

Re mount the radiator, the front grill, the air filter.

Mount the alternator belt and adjust its tightening.

Perform: oil filling of the engine, filling and aeration of the cooling system, engine checking and adjustment (ignition, carburation).

## OIL SUMP DISMOUNTING – REMOUNTING

## DISMOUNTING

Disconnect the battery.

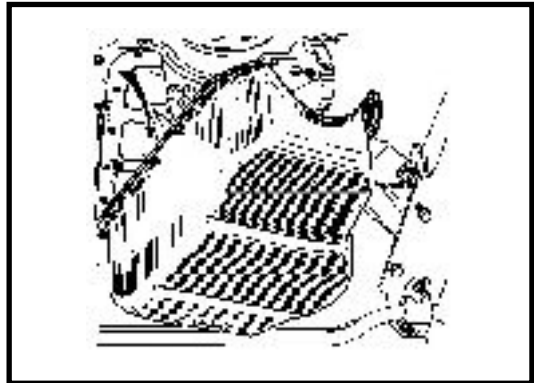
Drain the oil off the engine.

Dismount: engine shield and oil sump attachment screws.

Place the crankshaft with pistons 1 and 4 to the lower dead point.

Rotate the front parts of the sump to the left and lower it.

Clean the contact surfaces of the gaskets (engine block, oil sump) or those where sealant material has been applied.



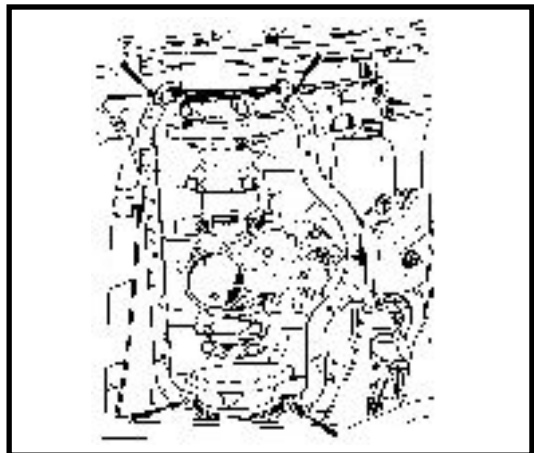
## REMOUNTING

Place:

- the rubber gaskets of the bearings;
- the side gaskets of the sump;

( sealant material on oil sump for engines fitted after **01.06.1996** )

- place the oil sump so that the gaskets or sealant material layer are not displaced;
- tighten the sump attachment screws from the middle towards edges;
- tighten the oil sump attachment nuts;
- perform the oil filling of the engine.



For engines fitted after **01.06.1996** the sealing of the oil sump is done by means of sealant material ( instead of oil sump gaskets )

Any dismantling of the oil sump requires replacement of the sealant material layer.

The sealant materials homologated by **SCAUTOMOBILEDACIA SA**, are the following:

- **RHODOR SEAL 5661;**
- **LOCTITE 5900 ( ULTRA BLAKE ).**

## LOWERCRANKCASE

The quantity of sealant material necessary for one engine is max. **60** grams, of which max. **15** grams for the distribution cap and max. **45** grams for oil sump.

Proceed as follows:

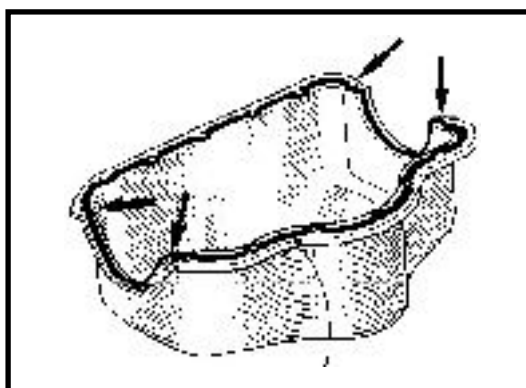
Remove the oil sump.

Remove the old sealant material using a knife by scrapping, from the contact surface of oil sump and engine casing.

Clean with **002** solvent the contact surfaces of the engine casing and the oil sump.

Place a continuous layer of sealant material of a **3 mm** thickness on the interior part of the oil sump contact surface taking care not to obturate its fixing holes.

Mount the oil sump and tighten the attachment screws at the required moment.

**ATTENTION !**

*The oil sump mounting on engine casing must be done in maximum 5 minutes from sealant material application.*

*For the oil sump which is sealed with sealant material, the drawings of the contact surface are towards the exterior, different from the ones mounted with gaskets where the drawings are towards the interior.*

*The oil sump mounted with sealant material can not be mounted with gaskets and the ones mounted with gaskets can not be mounted with sealant material.*

**OIL PUMP DISMOUNTING– REMOUNTING****DISMOUNTING**

Disconnect the battery.

Drain the oil off the engine.

Dismount: engine shield, crossbar between the longitudinal girders, elastic bushing nuts on the anti-rolling shaft and the oil pump.

Unscrew the attachment screws and take out the oil pump.

Clean the contact surfaces of the gaskets or those with sealant material ( engine bloc and oil sump).

**REMOUNTING**

Mount the new oil pump with a new gasket.

Tighten the attachment screws.

Remount:

- the oil sump;
- the bearing attachment nuts to stabilizer rod;
- the crossbar between the longitudinal girders;
- the engine shield.

Perform the oil filling of the engine.



## OIL PUMP

## REPAIR OF OIL PUMP

## DISMOUNTING

Dismount the pump cap.

Dismount the free pinion and its respective shaft.

**ATTENTION !** The valve spring and the ball may spring up.

Wash the parts and check the maximum clearance wear between the pinions and the pump body to be **0,2 mm**. If clearance is bigger, replace the pinions.

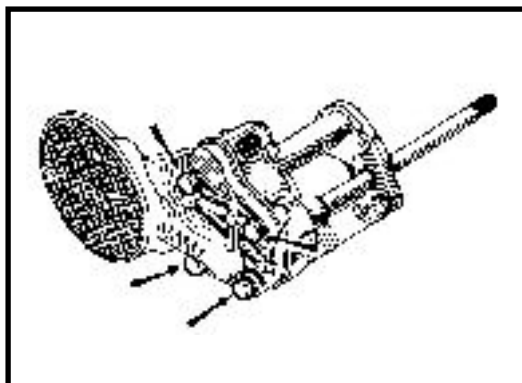
## REMOUNTING

Mount in the body of the pump the followings:

- the free pinion;
- the drive pinion;
- the spring tray;
- the spring;
- the valve ball.

Mount the cap by compressing the discharge valve spring.

Tighten the attachment screws.



# FUEL MIXTURE CHARACTERISTICS

12

ENGINE		CHECKING TO BE DONE ON IDLE RUNNING*					FUEL ( minimum octane number CO)
TYPE	INDEX	RATE ( rtm )	POLLUTION EMISSIONS				
			Co ( % ) ( 1 )	Co <sub>2</sub> ( % )	HC ( ppm )	LAMBDA ( λ )	
106	10	775 - 850	max. 0,5	min.14	max. 60	0,97 - 1,03	Unleaded fuel ( COR min 95 )

( 1 ) The CO value at 2500 rpm must be maximum 0,3 %.

\* For a water temperature of over **80° C** and after a steady value of 2500 rpm during 30 sec; after this, come back to idle running and measurement of polluting emissions is to be done.

DENOMINATION	PARTICULARITIES
Computer ( U.C.E )	Monomotronic - M.A. 1.7, Connector with 35 pins
Injection system	Monopoint Bosch type; Monomotronic M.A. 1.7
Ignition	Static, controlled by computer
RPM sensor	$R_{1-2} = 650 - 1100 \Omega$ at 20° C
Spark plugs	Spark plugs electrode distance = 0,8 Tightening moment = 2,5 - 3 daNm
Fuel filter	Mounted under the vehicle in front the fuel tank Replacement at every scheduled checking or at max. running 20000 Km
Feeding pump	Electrical, immersed in the fuel tank Flow: 1,1 l/min Pressure: min. 1 bar at power supply of 12 V
Pressure regulator	Controlled pressure: 0,8 - 1,15 bar
Injector	$R_{2-3} : 6,3 - 7,4 \Omega$ Leakage max. one drop per minute
Injection central unit	Tip ZEE 0438201216
Idle running regulator	$R_{1-2} = 4 - 250 \Omega$ $R_{3-4} = 0 - 200 \Omega$ , switch closed $R_{3-4} > 1 M\Omega$ switch open
Valve potentiometer	$R_{1-5} = 600 - 1400 \Omega$ $R_{2-4} = 400 - 4000 \Omega$ in the aria of partial valve opening
Oxygen sensor	Rich mixture $U \lambda = 0,9 V$ ; Poor mixture $U \lambda = 0,1 V$ R sensor heating ( 1-2 ) = 1 - 15 $\Omega$ ; Tightening couple: 4 - 6 daNm
Can purging valve	Supply voltage: + 12 V R valve = 35 - 55 $\Omega$

### DISMOUNTING

Disconnect the ( - ) battery terminal.

Dismount the air duct fixing clips.

Dismount the air duct attachment screws.

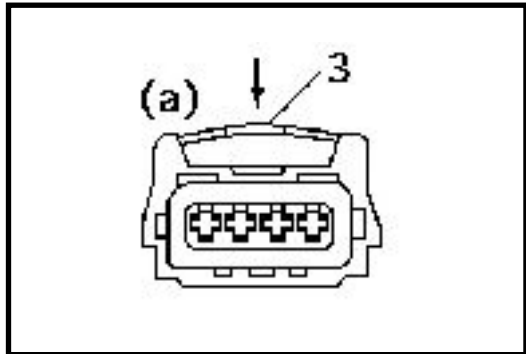
Dismount acceleration cable from the injector valve body.

Disconnect the feeding and return hoses and the connecting hose to the can purging electrovalve.

Disconnect the connectors of injector valve, as follows:

- push the lock (3) towards the arrow (a);
- disconnect the connector.

Dismount the attachment screws of the injector valve on the flange.



### REMountING

Perform in reverse order the dismounting operations: use a new gasket for the injector valve body. Functional tests ( testing injector valve body running ).


### **ATTENTION !**

*In order not to damage the air temperature sensor and the injector, protect the injector valve body against hits. Their protection cover shall be removed only after fixing the injector valve body on the flange.*

*Avoid dirtying with impurities the connectors contacts and the valve body socket contacts, in order to achieve perfect electrical connections.*

*Taking into consideration that in the feeding system, the fuel is under pressure even after stopping the engine, care must be taken that gasoline from ducts not to reach in contact with hot surfaces of the engine, in order to avoid possible going up in flames of the vehicle.*

*The feeding and return fuel ducts shall be fixed to the corresponding connections of the valve body using good ring clips, well tightened, in order to ensure the sealing of the fuel feeding system.*

<b>TIGHTENING TORQUES ( daNm )</b>	
Inlet exhaust manifold nuts .....	1,8
Attachment nuts of the tube on the inlet exhaust manifold .....	1,8

**DISMOUNTING**

- Disconnect the battery.
- Dismount the injector valvebody ( see chapt.” Replacement of the injector valve body”).
- Dismount the starter protection shield.
- Dismount the 3 attachment nuts of the inlet-exhaust manifold.
- Extract the inlet-exhaust manifold.

**REMountING**

- Perform in reverse order the dismounting operations.
- Clean the assembly surface.
- Replace the gasket of the inlet-exhaust manifold.
- Replace the gasket of the tube.
- Tighten the nuts at the required moment.

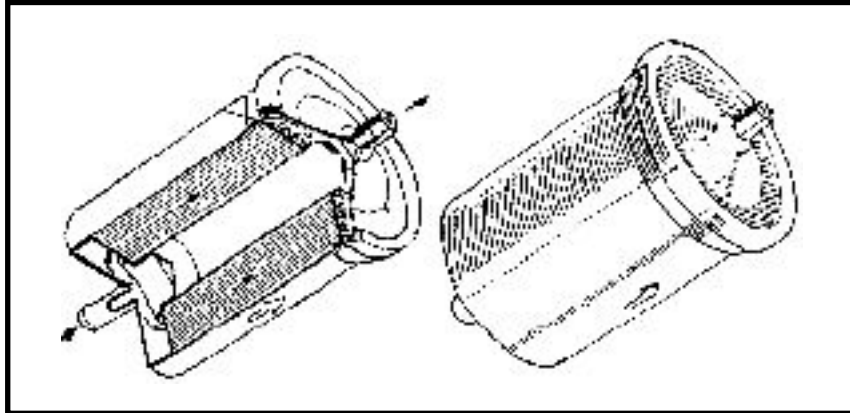


## FUEL FILTER ( INJECTION ENGINE )

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The fuel filter is placed in the fuel feeding circuit after the fuel pump and can be found under the body of the vehicle close to the tank.

The filter element is made of paper, with **0,01mm** porosity and has the very important function to retain the eventual impurities and stop them to reach the pressure regulator and injector.



### **ATTENTION:**

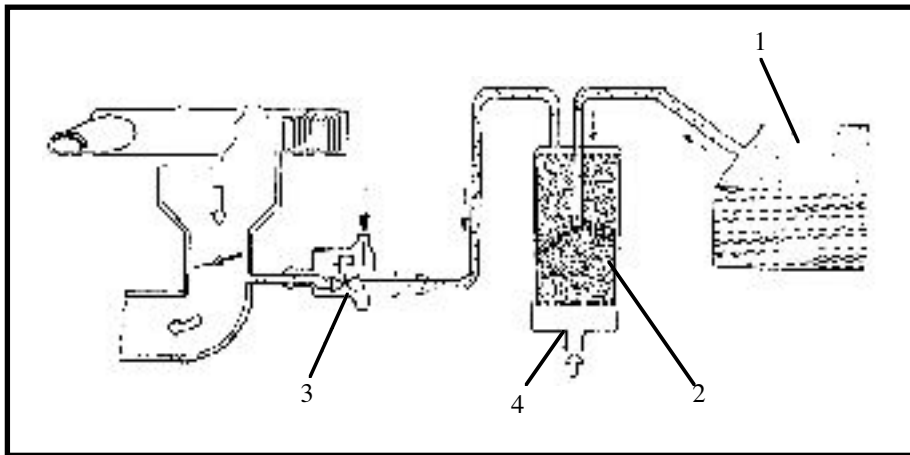
*The fuel filter is provided at the exit with a very fine metallic cloth which can retain possible filtering paper particles from it; Therefore upon mounting, attention must be paid at the arrow marked on the fuel filter body, which shows the flow direction of the fuel.*

*The filter is to be changed at maximum 20 000 km.*

## GASOLINE VAPOURS REASPIRATION

The cycling circuit of the fuel vapours has as purpose the reduction of the environment pollution with gasoline vapours, and is composed of:

1. Fuel tank, tight
2. Active carbon can
3. Carbon can purging valve
4. Fresh air intake



The gasoline vapours are absorbed from the tank (1) in the can (2) with active carbon grains and arriving then at the purging valve (3). The electric valve opening is done by the electronic control unit ( **pin 29** ) in certain operation conditions of the engine.

Check this circuit as far as its sealing is concerned, its valve operation as well as the free cycling of the vapours between the fuel tank and the carbon can.

Take into consideration, when valve mounting, the flow direction of the gasoline vapours, which must be according to the arrow marked on its body, from the can to the inlet manifold.

Reference value: **R** purging valve = **35 66 Û**

**DISMOUNTING**

Remove the can from its fixing support by pulling up.  
Dismount the fixing ring clips of the hoses to the can and disconnect the hoses.

**REMOUNTING**

Perform in reverse order the dismantling operations.

***ATTENTION:***

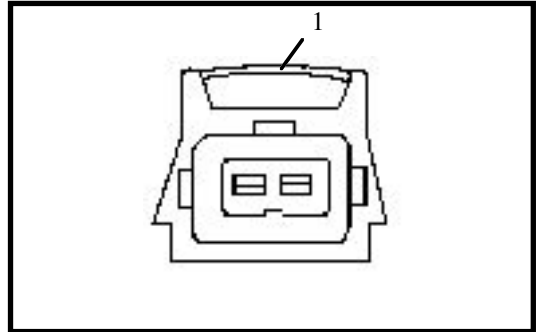
***Take into consideration when mounting, about the hoses connection direction (the gasoline vapour cycling is from the duct to the carbon can purge valve). Use good ring clips, which must be well tightened.***

**DISMOUNTING**

Disconnect the (-) terminal of the battery.

Disconnect the connector of coupling the fuel injection control wiring to the purging valve, pushing the lock (1), after that disconnecting the connector.

Dismount the fixing clips of the hoses to the purging valve and disconnect the hoses.



**REMOUNTING**

Perform in reverse order the dismounting operations.

The can purging valve shall be mounted so that the arrow marked on its body to be oriented from the can to the injector valve body.

The Dacia pick-up vehicles can be equipped with following types of alternators:

Type of alternator	1114.200	1180
<b>Operating voltage</b>	12V	12V
<b>Ampere rating in stable operating conditions</b>	50 A	80 A
<b>Maximum excitation current</b>	3,9 A	5 A
<b>Maximum power</b>	700 W	1100 W
<b>Type of relay used</b>	1410;1342 electronic	electronic incorporated

For vehicles of Dacia range, there are used alternators type 1114.200 and type 1180 (used for vehicles provided with AC).

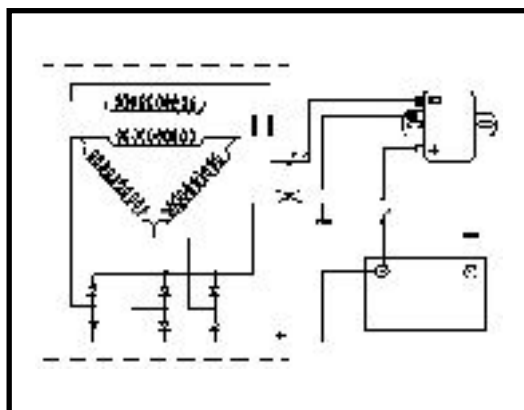
### CHECKING ON BENCH ( for alternator type 1114.200 )

#### LOAD CHARACTERISTIC

$$I = f(n); U = ct = 13,5 \text{ V}$$

RPM [ rot/min ]	INTENSITY [ A ]
N1    1300	$I_1 > 11$
N2    3000	$I_2 \geq 43$
N3    5000	$I_3 \geq 47$
N4    8000	$I_4 \geq 52$
N5    12 500	$I_5 \geq 50$
NN    6000	$I_N \geq 40$

#### General electric diagram:



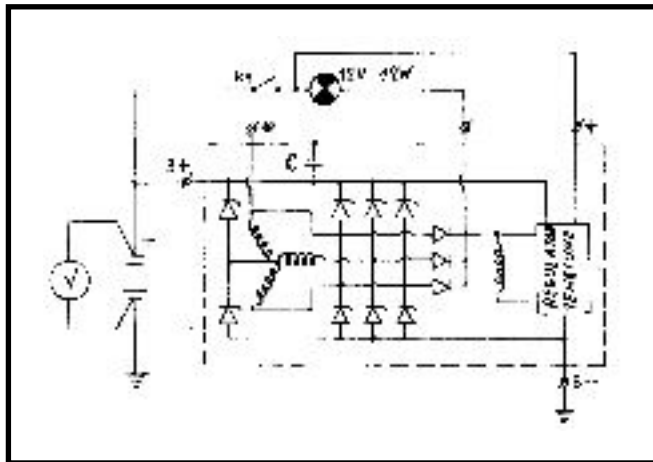
The checking tests of the values for alternator type **1114**, which are measured at **N 4 rpm**, are performed when engine is cold.

The checking of the values at rpm **N1, N2, N3, N5**, are performed when the engine is warm, i.e. after the alternator has been working for about one hour on voltage **14 +/- 0,1 V**.

After measuring the value of the current at rpm **N5**, adjust the exciter voltage at **10 +/- 0,1 V** and the voltage at the plugs level at **14 +/- 0,1 V**. Adjust rpm **NN** at **6000 +/- 60 rpm** and measure the corresponding value of the current, as soon as it is stabilized.

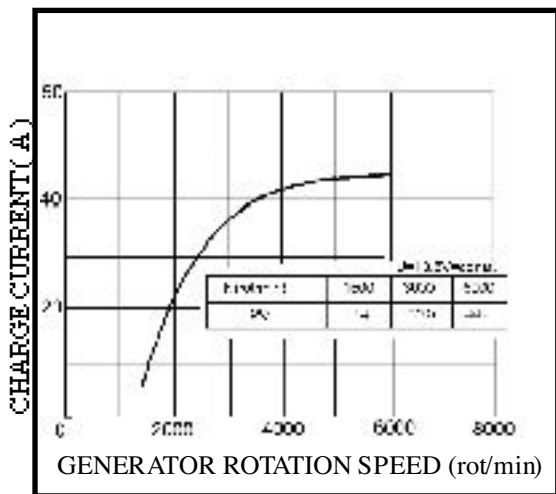
**ALTERNATOR CHECKING  
( for alternator type 1180 )**

The general electric diagrams and the curves of the load characteristic of the alternator type **1180** are the followings:

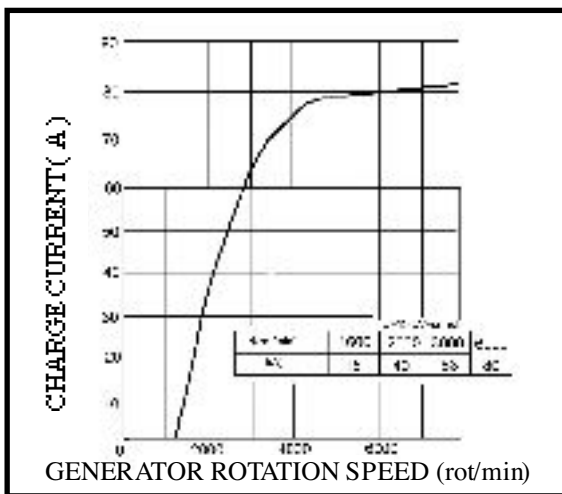


**A. CHECKING OF THE CURRENT INTENSITY**

- A - Unstable operating conditions
- B - Stable operating conditions



Tip 1114. 200



Tip 1180

LOAD CHARACTERISTIC

$I = f(n); U = ct = 13,5 V$

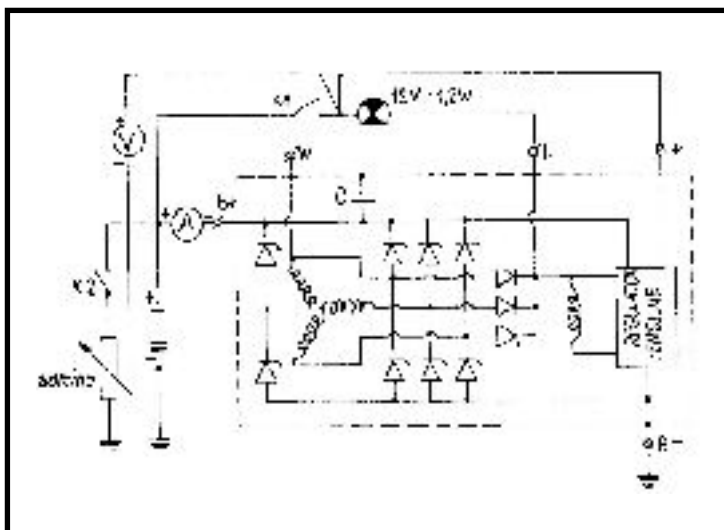
$I_N = 50 A; U_d = 13,5 V$	RPM REGIM [ rot/min ]		CORRESPONDING INTENSITY [ A ]	
	N0	1200	I0	$\geq 0$
	N1	1250	I1	$\geq 10$
	N2	1500+/- 1%	I2	$\geq 20$
	N3	3000+/- 1%	I3	$\geq 43$
	N4	6000+/- 1%	I4	$\geq 48$
	Nmax.	12500+/- 1%	I max.	$\geq 50$

B. CHECKING OF THE ADJUSTED VOLTAGE

For checking the adjusted voltage, perform an assembly similar to next diagram.

After starting the engine, accelerate until rpm is **300 rot/min** then increase the alternator current from **10 A** to **43 A** ; the voltage must be between **13,8** and **14,5 V**, at a temperature of **22 ° +/- 5 ° C**.

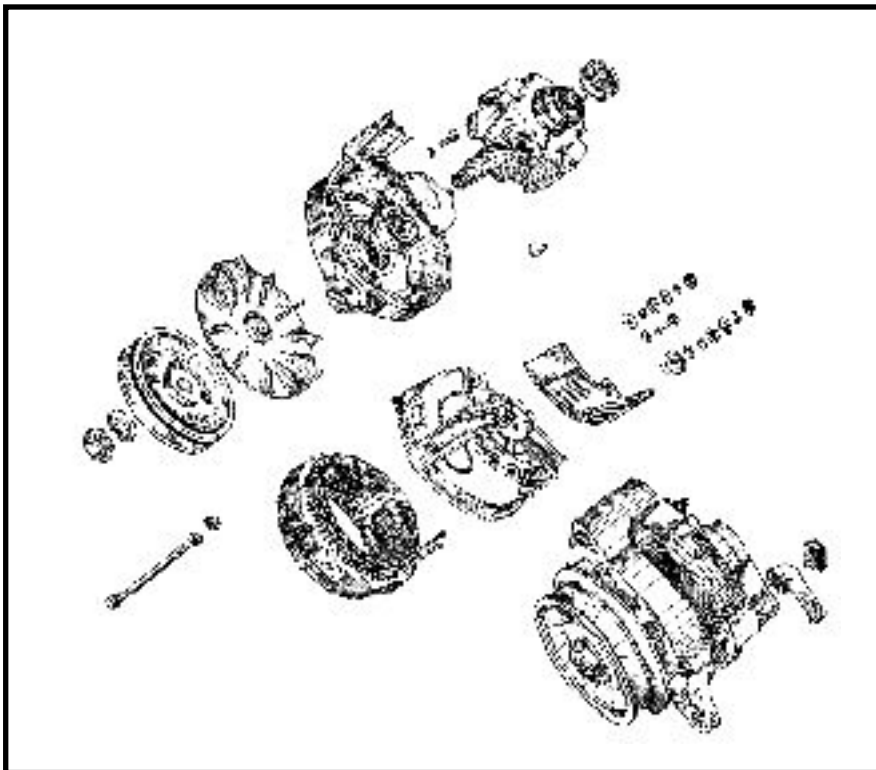
If this condition is not accomplished, check the voltage; if also this is correct, replace the electronic regulator and check again. If defect persists, check by dismounting, the altemator components.



**MAINTENANCE OF THE ALTERNATOR AND  
OF THE ELECTRONIC REGULATOR**

It is recommended the periodical checking of the connections to avoid the loosening of the imperfect connections which may produce electric arc during operation. The followings are forbidden:

- rotation of the alternator mounted on the engine without being connected at the battery and disconnection of the battery during running;
- connection of the alternator before checking if the battery is correct connected (minus at the chassis ground) because contrary, the built in electronic regulator is instantaneously destroyed;
- reversing of the two wires connected at the regulator;
- connecting at chassis ground of the supply plug of the electronic regulator;
- performing electric welding without previous disconnecting of the alternator electric wires, of the voltage electronic regulator and of the battery.

**ALTERNATOR TYPE 1114.200**



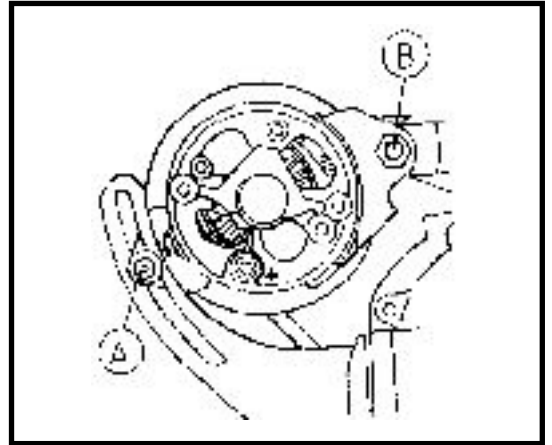
**DISMOUNTING**

Disconnect:

- battery;
- wires connected to the alternator.

Dismount:

- tightening screw (A);
- belt;
- attachment screw (B).

**REMountING**

Mount: attachment screw (B), the belt, the tightening screw (A).

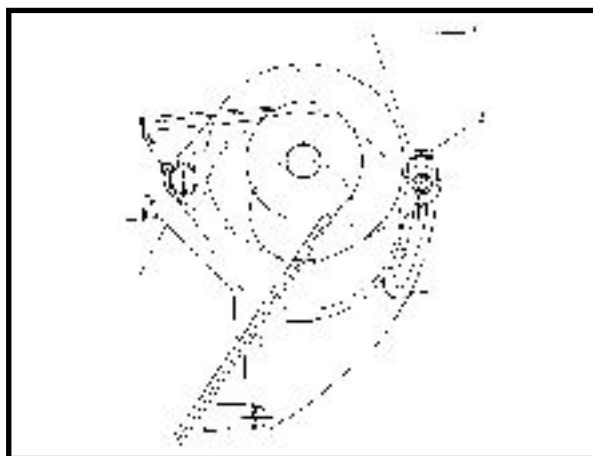
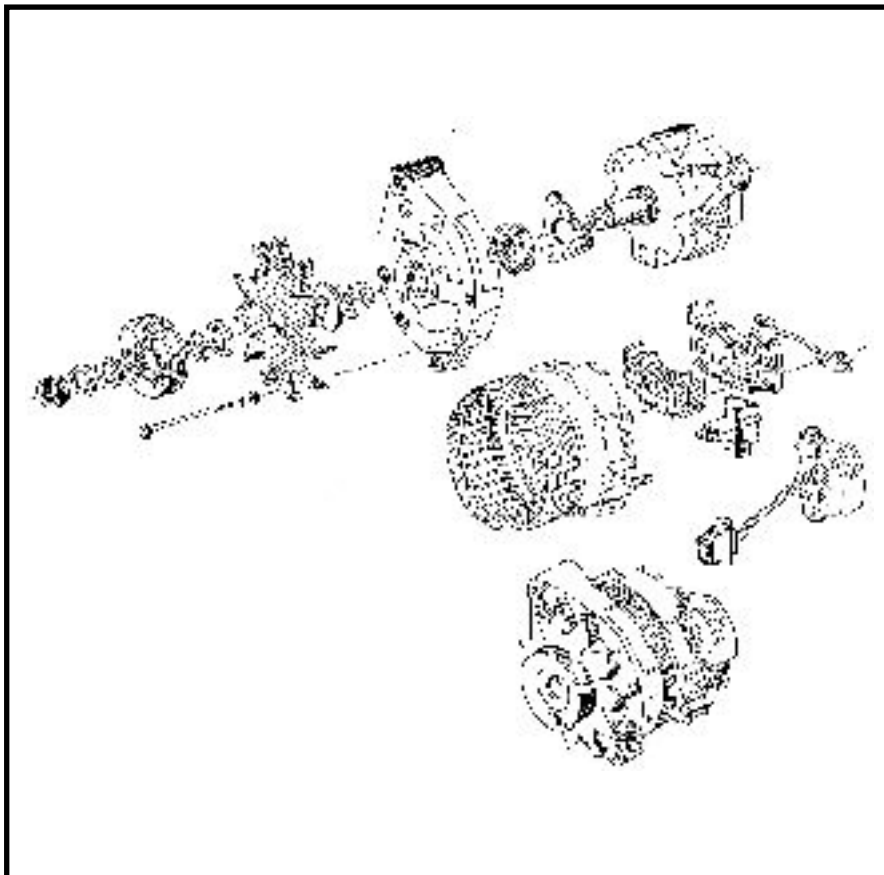
Tighten the belt.

Connect: wires to the alternator and the battery.

**NOTE:**

*The belt will be tighten so to obtain the maximum arrow of 7,5 mm at half distance between the water pump pulley and the alternator pulley. The excessive tightening of the belt may lead to a premature wear of the water pump bearings and of the alternator bearings.*

ALTERNATOR TYPE 1180



**DISMOUNTING**

Disconnect: battery, wires connected to the alternator and the connections box from the voltage electronic regulator.

Dismount: tightening screw (2) by acting on the locking nut, the tightened (3) by unscrewing, the belt; pushing down the alternator, take out the alternator belt from the pulley and the alternator attachment screw (1).

**REMOUNTING**

Mount: attachment screw (1), the V-belt, the tightening screw (2) and the tightener (3).

**NOTE:**

*For dismantling/re mounting the alternator type 1180, perform same operations as for alternator type 1114.200. For tightening and checking of the belt tightening see chapt.07.*

**ATTENTION !**

*Do not tension exaggeratedly the belt ! Danger of premature wear both of alternator bearings and of water pump bearings.*

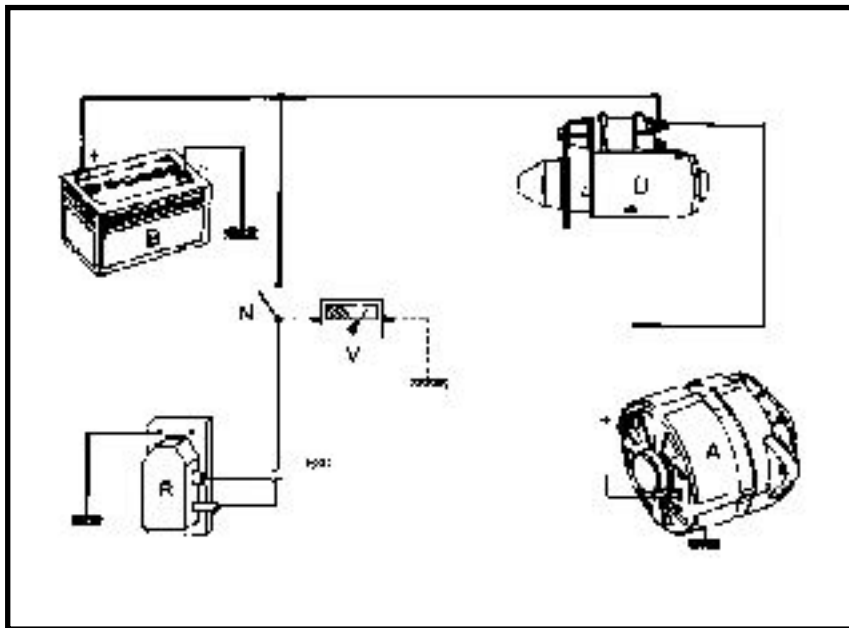
Connect: supply wires and chassis ground wires to the alternator, the connections box at the electronic voltage regulator and the battery.

**CHECKING OF THE ALTERNATOR MOUNTED ON THE VEHICLE.**

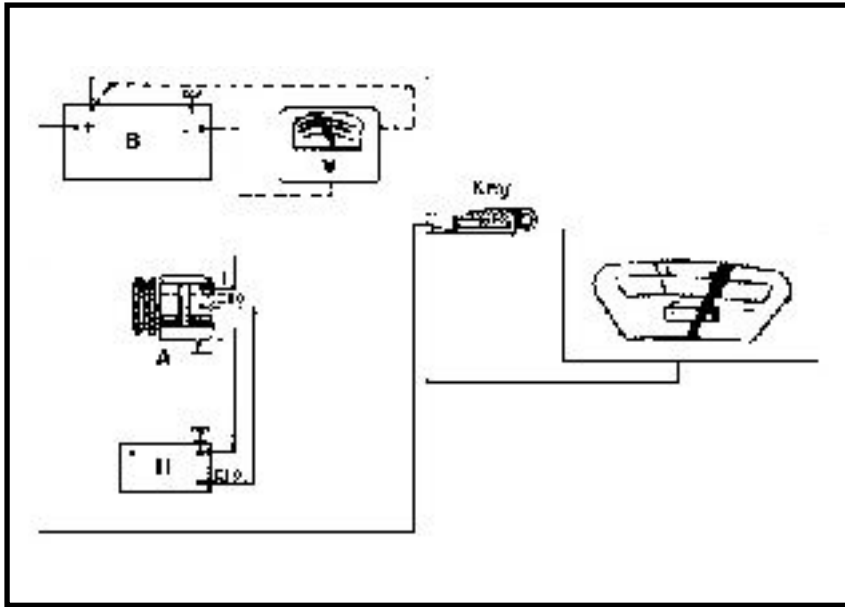
The operation of the alternator can be checked on the vehicle, by connecting a voltmeter to the battery plugs.

At rpm of 2000 rot/min without consumers, the voltage read on the instrument must be about **14,6 +/- 0,1 V**.

At same rpm (**2000 rot/min**) with consumers ( headlights, air conditioner, windscreen wipers ) the voltage read on the instrument must be between **13,5** and **14,5 V**. If the measured values are not correct, perform the checking of the alternator on bench.



CHEKING THE VOLTMETER OF THE INSTRUMENT BOARD



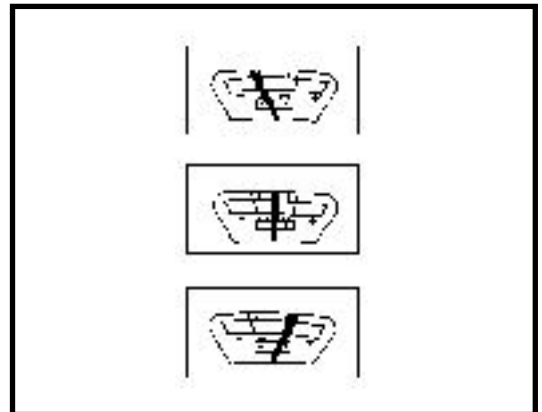
Checking is performed by means of a voltmeter connected according to the above diagram, where you can identify:

**B** = battery , **V** = voltmeter, **A** = altemator , **R** = voltage regulator , **Key** = ignition contact, **Tb** = instrument board.

For a voltage of **12,8 V** read on instrument, the needle of the voltmeter on the instrument board must be placed in the left side of the central area.

For a voltage of **13,5 V** read on instrument, the needle of the voltmeter on the instrument board must be placed in the middle of the central area ( white area ).

For a voltage of **15,6 V** read on instrument, the needle of the voltmeter on the instrument board must be placed in the right side of the central area.

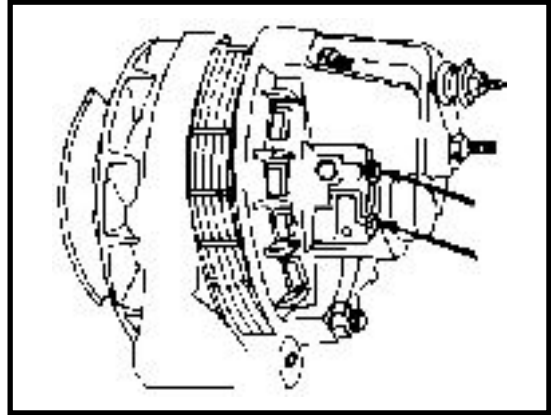


### ALTERNATOR REPAIR ( type 1 114.200 )

#### DISMOUNTING

Dismount the alternator from the vehicle.

Unscrew the two attachment screws of the brushes support and dismount them.



Clamp on vice the pulley provided with an old belt to avoid its faulting.

Unscrew the fixing nut of the pulley.

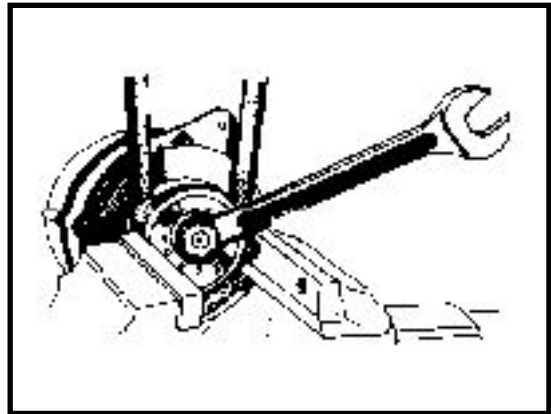
Dismount :

- the pulley;
- the pulley wedge;
- the fan.

Dismount the brushes supports.

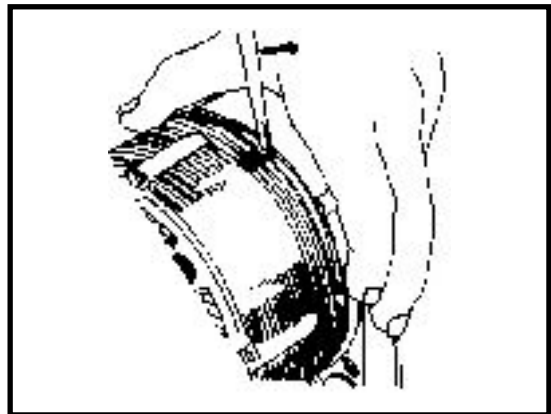
Unscrew the alternator assembly screws.

Dismount the rotor and the front bearing by means of a screwdriver placed between the stator and the front bearing.



#### **ATTENTION !**

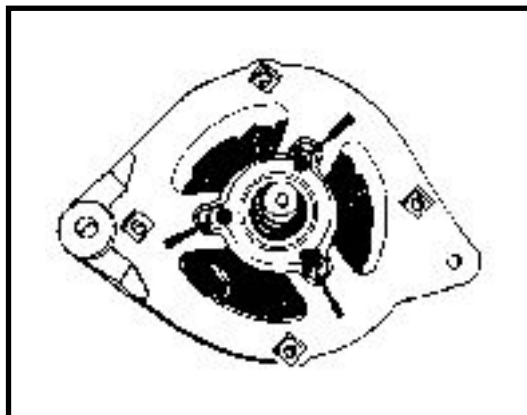
*Do not insert the screwdriver more than 2 mm. The rotor coiling may be damaged.*



Dismount the front bearing from the rotor by tapping the shaft end with a piece of wood.

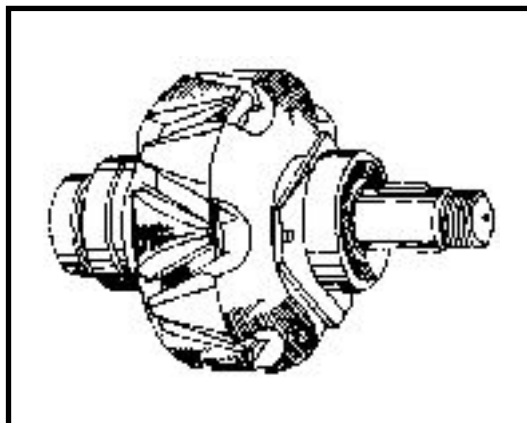


Unscrew the attachment screws of the sustaining shield of the front bearing.



The dismantling operation of the front bearing is performed only in case of front bearing replacement.

Check the aspect of the coiling (damaged insulation, scratched rings, broken wires).



**REMUONTING**

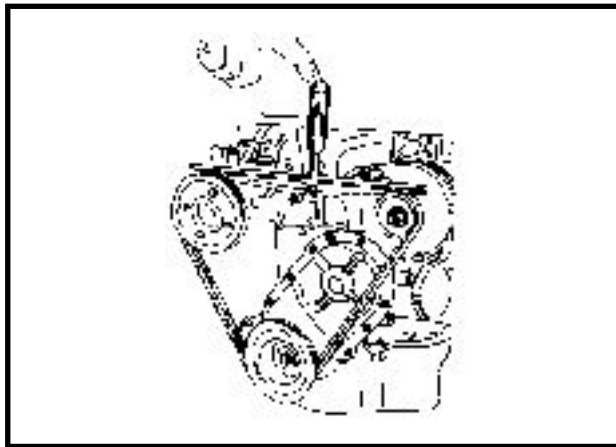
Remount :

- the end bearing and the stator;
- the front bearing;
- the attachment screws;
- the pulley wedge;
- the fan and the pulley;
- the snap ring and the pulley fixing nut;
- the brushes support;
- the voltage regulator ( for altemator type 1180 ).

Check the alternator on the bench.

Mount the alternator on the vehicle.

Connect the battery.

**NOTE:**

**Tightening moment:** - for the pulley nut 3 – 3,5 daNm (for type 1114.200) or 7 daNm (for type 1180);

- terminal ( B + ) : 0.3 da Nm.

**The belt shall be tighten to obtain a maximum arrow of 7,5 mm for a pushing force of about 3 daNm, at half distance between the water pump pulley and the alternator pulley. Exaggerate tensioning of the belt may lead to the premature wear of the both alternator bearings and water pump bearings.**

**For additional informations ,please see Chapt. 07.**



**ALTERNATOR BEARINGS REPLACEMENT**

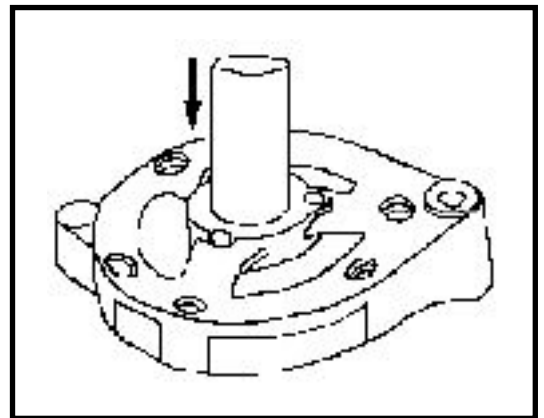
Dismount the alternator from the vehicle.

**A. FRONT BEARING REPLACEMENT**

Dismount : pulley, washers and Grower washer, fan, pulley wedge and the drive shield.  
Place the drive shield in a horizontal position and unscrew the three attachment screws of the bearing cap and take out the bearing.

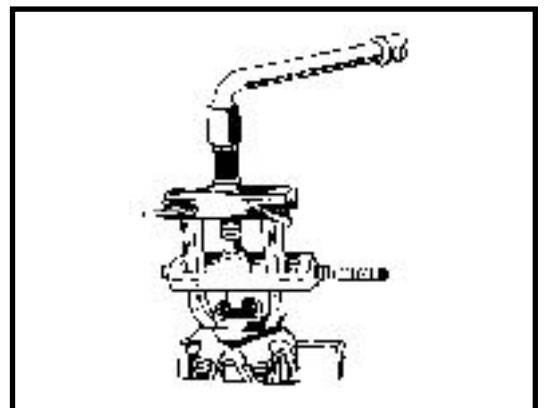
Mount the new bearing in the drive shield and fix the bearing cap by means of the three screws.

Perform in reverse order the dismounting operations of the alternator.

**B. REAR BEARING REPLACEMENT**

Dismount: pulley, washers and Grower washer, fan, pulley wedge, brushes support and front bearing – rotor assembly.

Extract the bearing by means of the **CV 28 A** extractor provided with **CV 48** clamps and **RO 15.01** protector.



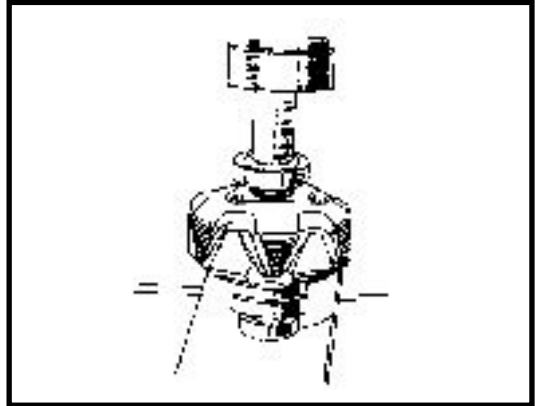
Place the protector **RO 15.01** on the rotor shaft end.

Mount the new bearing by means of a press and using a tube, which shall rest only on the inner ring of the bearing.

Assembly the alternator and then mount it on the vehicle.

Mount the belt and adjust its tightening.

Connect the battery.



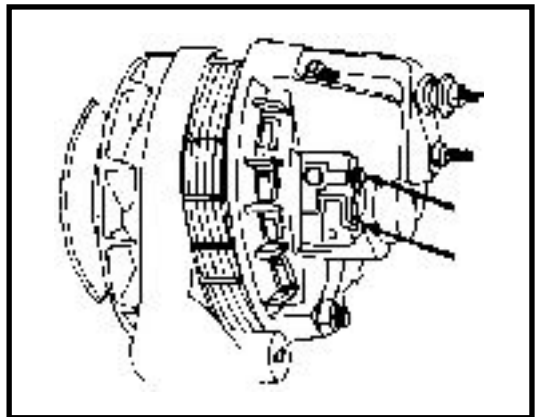
### ALTERNATOR BRUSHES REPLACEMENT

#### DISMOUNTING

Disconnect the battery.

Unscrew the attachment screws of the brushes support.

Dismount the used brushes off the support.



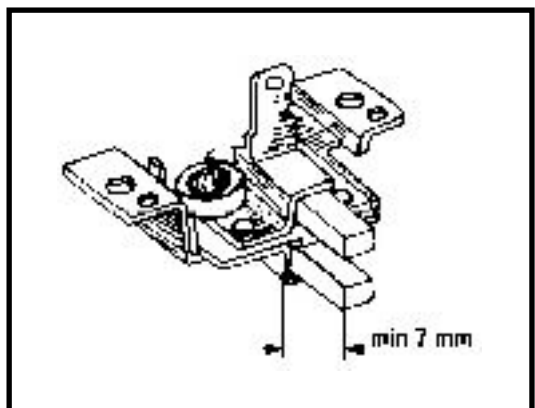
#### REMOUNTING

Mount the new brushes in their support.

Check: the sliding of the brushes in their support, the insulation between brushes, the continuity from the brushes contact point with the collector up to the contacts with chassis ground and excitation.

Mount the brushes support on the alternator.

Connect the battery.



**ALTERNATOR DIODE SUPPORT REPLACEMENT****DISMOUNTING**

Dismount the plastic protection cap and the condenser.

Disconnect the terminals; mark the position of the wires so that may be reconnected in the same place.

Unscrew the attachment nuts; dismount the diode support.

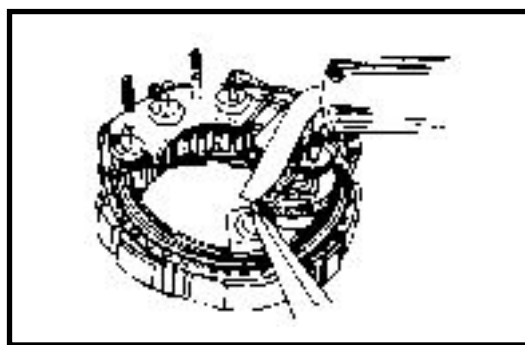
**REMountING**

Mount the diode support ; tighten the attachment nuts.

Connect the terminals ; observe the marking made upon disconnecting.

Mount the protection cap and the condenser.

Check on the bench the alternator.

**DIODE REPLACEMENTS**

The diodes having a diode support type housing made of two parts are not replaceable. A burnt diode decreases the current intensity by about % A.

**DISMOUNTING**

Dismount the diode support off the alternator.

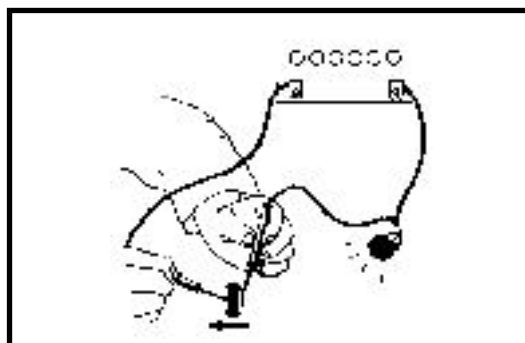
Check diodes by means of a control lamp connected to a 12 V direct current source.

Connect the control lamp in one sense than reverse the polarity.

The lamp should light on when connected to one single sense.

If the lamp lights or does not light in both senses the respective diode is defective and is to be replaced.

Depress the defective diode and take it out.



**REMOUNTING**

Check the new diode.

Press the new diode in the diode support observing the marking : red for “ + “ , black for “ - “.

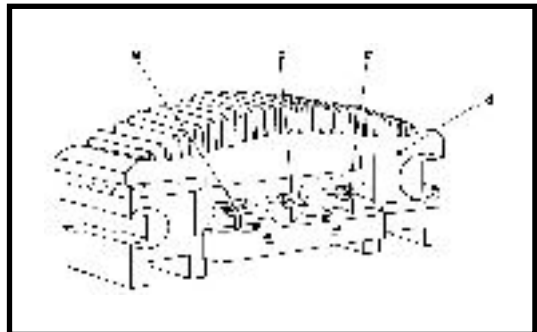
Mount the diode support on the alternator.

**CHECKING OF THE RECTIFYING BRIDGE**

After dismounting the diode support perform a visual checking of the diodes to avoid defects ( short circuits, broken ) as well as the connections state.

**A. CHECKING OF THE POSITIVE DIODES**

Place the red terminal ( positive cable ) of the ohmmeter on the support , in “ d “ point then the black terminal ( negative cable ) in sequence in “ a “ point , “ b “ point and “ c “ point. After reversing the cables and repeating the checking the ohmmeter needle must not deviate ( resistance =  $\infty$ ).

**B. CHECKING OF THE NEGATIVE DIODES**

Place the negative terminal of the ohmmeter on the support, then on “e” point, after that, the red terminal in sequence , on “a” point , “ b” point and on “c “ point.

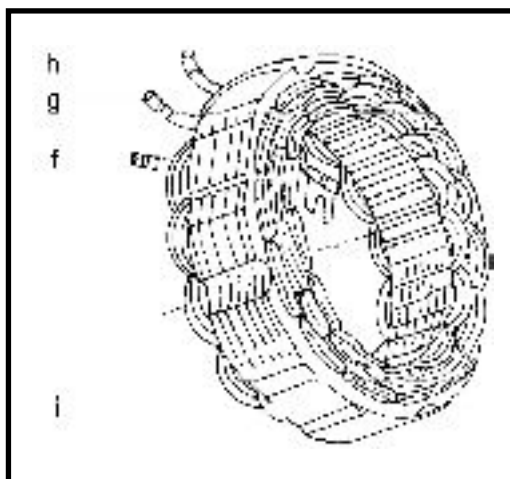
For a correct operation, the ohmmeter needle must deviate. After reversing the cables and repeating the checking on the mentioned points , the ohmmeter needle must not deviate ( resistance =  $\infty$ ).

### CHECKING OF THE ALTERNATOR STATOR

After visual checking of the coils which must not show heating or oxidation traces, check the resistance and the insulation of the coils.

#### A. CHECKING OF THE COILS INSULATION

After placing the ohmmeter terminals on chassis ground, on “I” point and on one of the three terminals marked with “f”, “g”, “h”, the ohmmeter needle must not deviate (resistance =  $\infty$ ).



#### B. CHECKING OF THE COIL RESISTANCE

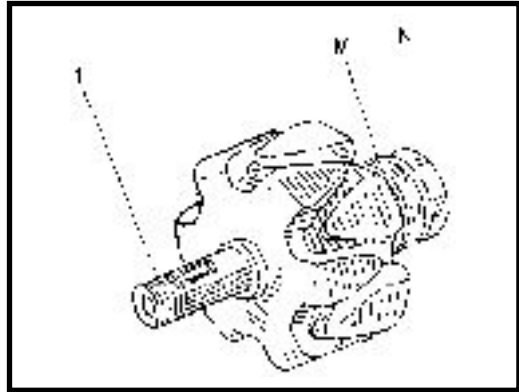
Place in sequence, the terminals on the coils extremities: “f” and “g”; “g” and “h”; “f” and “h”, the values of the measured resistances must be equal in the three cases, the maximum allowed variation being of + / - 5 %.

**CHECKING OF THE ALTERNATOR ROTOR**

After the visual checking of the coiling (without heating or oxidation traces), check the collecting rings for defects (sometimes it is recommended their polishing with very fine granulation sandpaper).

**A. CHECKING OF THE COILING INSULATION**

Place the ohmmeter terminal on chassis ground, on 1 and on one of the M or N collector rings. The ohmmeter needle must not deviate (resistance = ∞). If it deviates, there is a short circuit between the rotor collector rings or current leakage between coiling and shaft.



**B. CHECKING OF THE COILING RESISTANCE**

To check the coiling resistance place the ohmmeter terminals on M and N collector rings; the measured resistance must be  $4,6 \pm 0,1 \Omega$  at 20 °C. If the value of the resistance is very high the rotor coiling is burnt and if the resistance is zero, there is a short circuit.

**VOLTAGE REGULATOR – RELAY**

The pick-up vehicles equipped with alternator type 1114.200 have the voltage regulator fixed on the left front inner wing ;the alternator type 1180 is provided with incorporated voltage regulator (type 1180.120).

Their characteristics are the followings :

CHARACTERISTICS	ADJUSTMENT RANGE
<b>Adjusted voltage [ V ]</b>	13,8 - 14,5
<b>Adjusted voltage at low charge of the alternator [V]</b>	14,1 - 14,5
<b>Adjusted voltage at high charge of the alternator [V]</b>	13,8 - 14,1
<b>Voltage difference between the two adjustment steps [V]</b>	0,2 - 0,6
<b>Maximum IF excitation current [ A ]</b>	5

**VOLTAGE REGULATOR****( alternator type 1114.200 )****DISMOUNTING**

Disconnect: the battery, the ( + ) supply cable and the excitation wire of the voltage regulator by unscrewing the fixing nut.

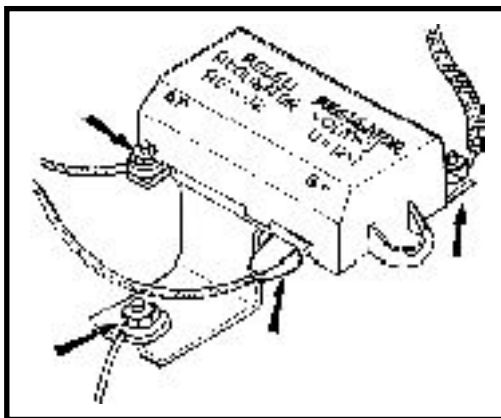
Unscrew the right side nut, loosen the left side one and dismount the relay.

**REMountING**

Place in its place the regulator and tighten the fixing screws.

Connect :

- the supply cable;
- the excitation wire by tightening the nut;
- the battery.

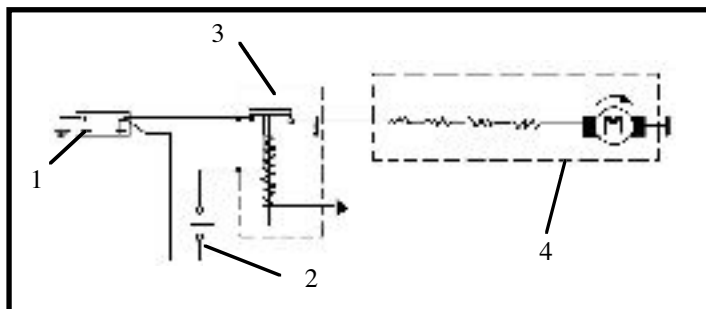


<b>TYPE OF STARTER</b>		2146
<b>MAXIMUM POWER</b>		995 W ( 1,35 CP )
<b>NOMINAL VOLTAGE</b>		12V
<b>MINIMUM STARTING ROTATION</b>		150 tr./ min.
<b>PINION CHARACTERISTICS</b>	<b>Number of teeth</b>	9
	<b>Module</b>	2,116 / 1,1814
	<b>Pressure angle</b>	12°
<b>CHARACTERISTICS IN LOAD</b>	<b>Voltage ( Us )</b>	9,5 +/- 0,5 V
	<b>Intensity ( Is )</b>	200 A
	<b>Coupling ( Cs )</b>	0,5 daNm
	<b>Minimum rpm ( n min s )</b>	1400 rot. / min.
<b>BLOCKED COUPLING (bendix to be blocked)</b>	<b>Voltage ( Ub )</b>	7,5 V
	<b>Coupling ( Cb )</b>	0,95 daNm
	<b>Absorption current ( Ia )</b>	425 A

The starter is an engine of continuous current with serial excitation provided with a roll side running mechanism and gearing commended by side electromagnet.

#### A. ELECTRIC DIAGRAM OF THE STARTER TYPE 2146

1. Battery
2. Contact switch
3. Starter solenoid
4. Starter rotor and stator

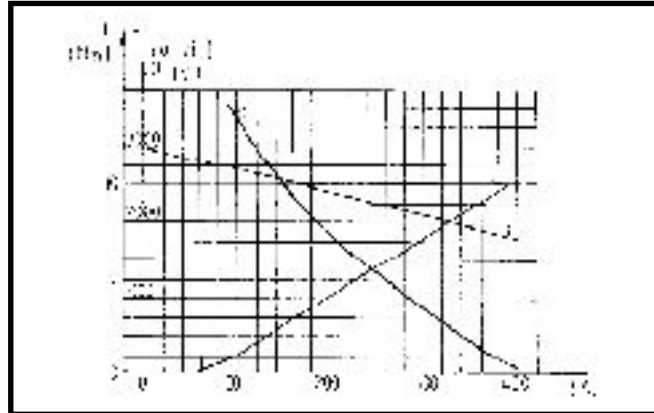




STARTER

Characteristics of load at the temperature of  $20^{\circ} \pm 5^{\circ} \text{C}$ . Average curves:

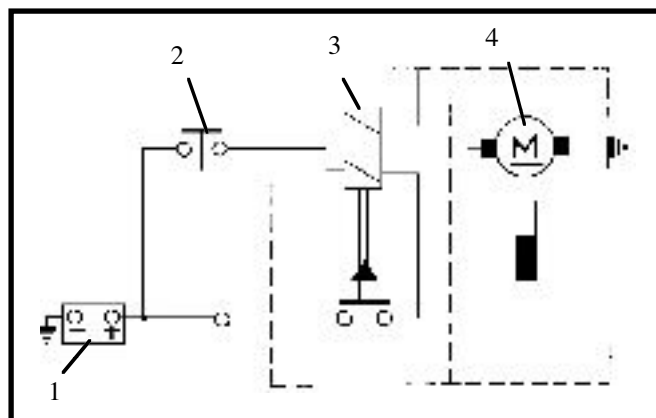
Test must not be done more than 4 – 5 seconds To lay out these characteristics measure the absorbed current, supply voltage, RPM and coupling.



**B. ELECTRIC DIAGRAM OF THE 2600 TYPE STARTER**

The starter type 2600 is an engine of continuous current with excitation by constant magnets having a coupling mechanism with rolls and gearing commended by side electromagnet.

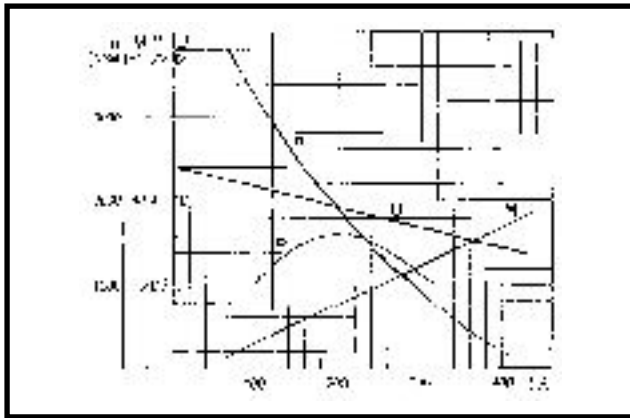
1. Battery
2. Contact switch
3. Starter solenoid
4. Starter rotor and magnets



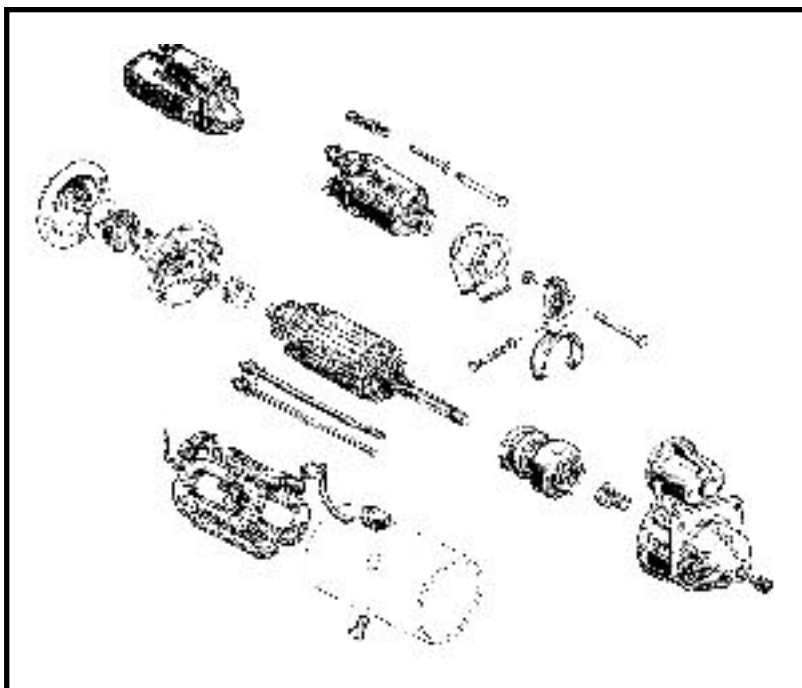
Characteristics of load at temperature of  $23^{\circ} \pm 5^{\circ} \text{C}$ . Minimal curves.

STARTER

Test must not be done more than 4 – 5 seconds To lay out these characteristics measure the absorbed current, supply voltage,RPM and coupling.



STARTER



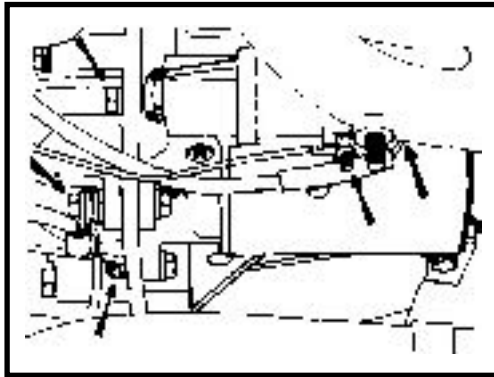
## STARTER

**DISMOUNTING**

Disconnect: battery, starter supply cable, supply wire of the coupling relay.

Dismount: air filter, starter protection screen, and the three screws, which attach the starter to the clutch housing.

Detach the starter let its end down until comes into contact with the exhaust pipe, rotate the starter by  $90^{\circ}$  and take it out.

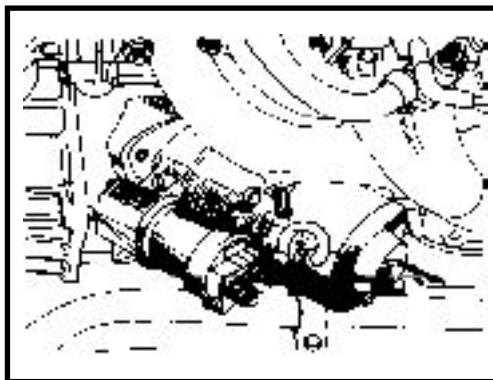
**REMOUNTING**

Place the starter with its end up; lower it until it comes in contact with the engine support. Rotate the starter by  $90^{\circ}$  until the end comes in contact with the exhaust pipe, bring out the starter then place it in its seat.

Remount :

- attachment screws;
- supply wires;
- protection screen;
- air filter.

Reconnect the battery.



## STARTER REPAIR

The operation is performed after the starter is dismantled from the vehicle.

## DISMOUNTING

Dismount: sheet cap and the screw from the rotor top (A) electric plug (B), back bearing with brushes support, stator, attachment nuts of the coupling relay, take out the rotor and the solenoid.

Check the state of the collector; if the wear on diameter is higher than 0,5 mm, grind and then clean the channels. If rotor is replaced, adjust the fork stroke.

Check: the state of the coupling mechanism (bendix) and of the brushes the insulation of the brush support ( + ) the state of the bushings in the two bearings, replace them is necessary.

## REMOUNTING

Lubricate with bearing oil the bushing of the support bearing and introduce the rotor of the assembled solenoid with the coupling fork.

Tighten the attachment nuts of the solenoid and introduce the fork shaft.

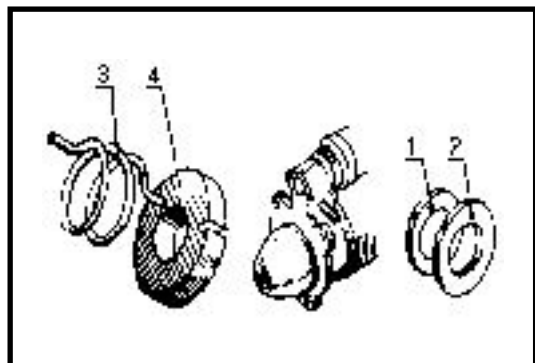
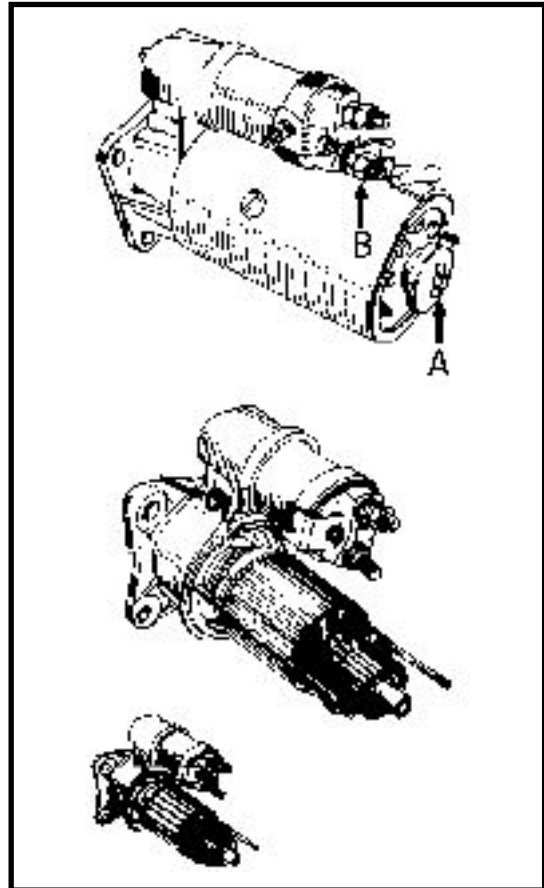
Mount the washers on the rotor in the following order:

1. The steel washer
2. The textolite washer

Lubricate with bearing oil the collector bearing bushing.

Mount: stator, collector bearing, spring (3) and washer (4).

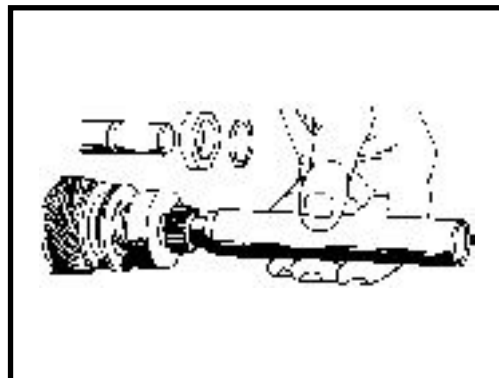
Tighten the attachment screw (A) and mount the sheet cap.



## STARTER

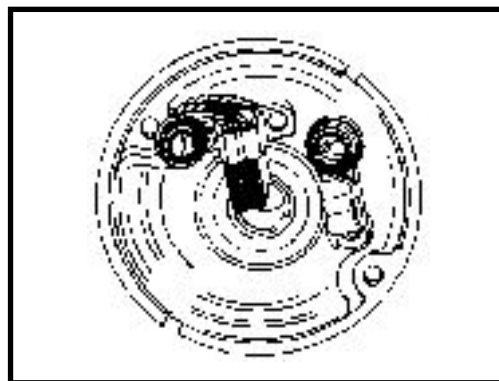
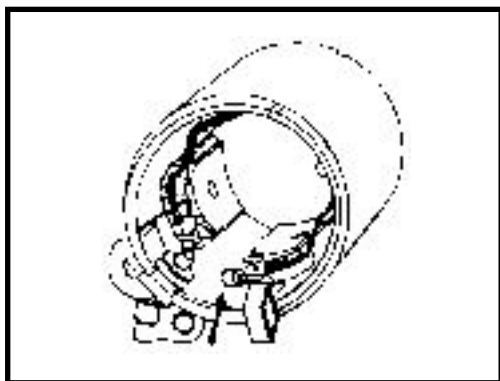
**BENDIX REPLACEMENT**

Dismount the starter.  
 Take out the rotor.  
 Move the stopping bushing by means of a rod.  
 Take out the lock then the bendix.  
 Mount the new bendix , the stopping bushing and the safety ring.



Grease with a thin coat of **UM 185 Li2** grease the grooves, the area between the grooves and the support ring the fork shaft and the rolling area of the coupling mechanism with the fork.

Remount the rotor and adjust the fork stroke.

**BRUSHES REPLACEMENT**

Dismount the starter take out the collector bearing and the stator.

Take out the old brushes.

The minimum length of the brushes is **7 mm**.

Stick the new brushes check the rotor and re mount the starter.

### SOLENOID REPLACEMENT

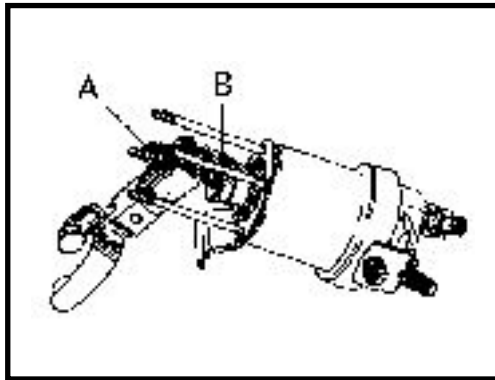
The operation is performed after dismantling the starter from the vehicle.

#### DISMOUNTING

Dismount the stator and the rotor.

Dismount the solenoid.

Unscrew the (A) screw and recover the fork, which can be used again if it is in good state.



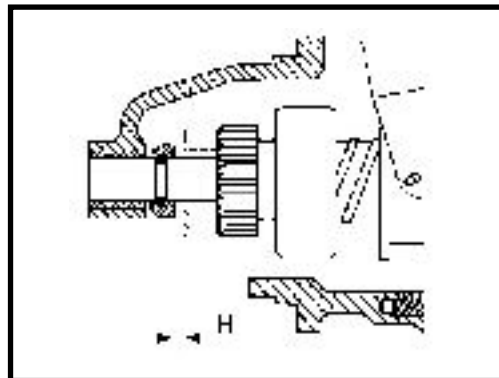
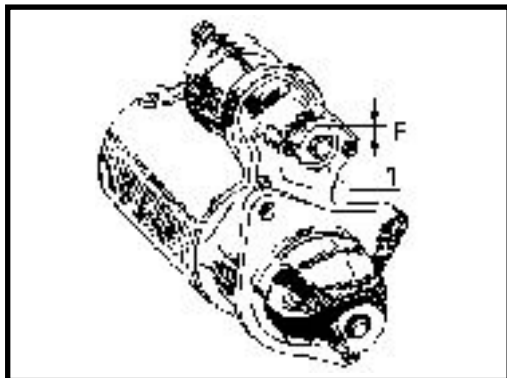
#### REMOUNTING

Mount the fork on solenoid shaft.

Tighten the screw (A).

Assembly the starter and adjust the fork stroke.

## FORK STROKE ADJUSTMENT



Dismount the protector from the solenoid end.

Check the clearance (**F**) between the screw and the adjustment nut, which must be as small as possible. In this situation the coupling mechanism ( bendix ) must be leaning on the rotor.

Check if clearance (**H**) is between  $1 \pm 0,5$  mm.

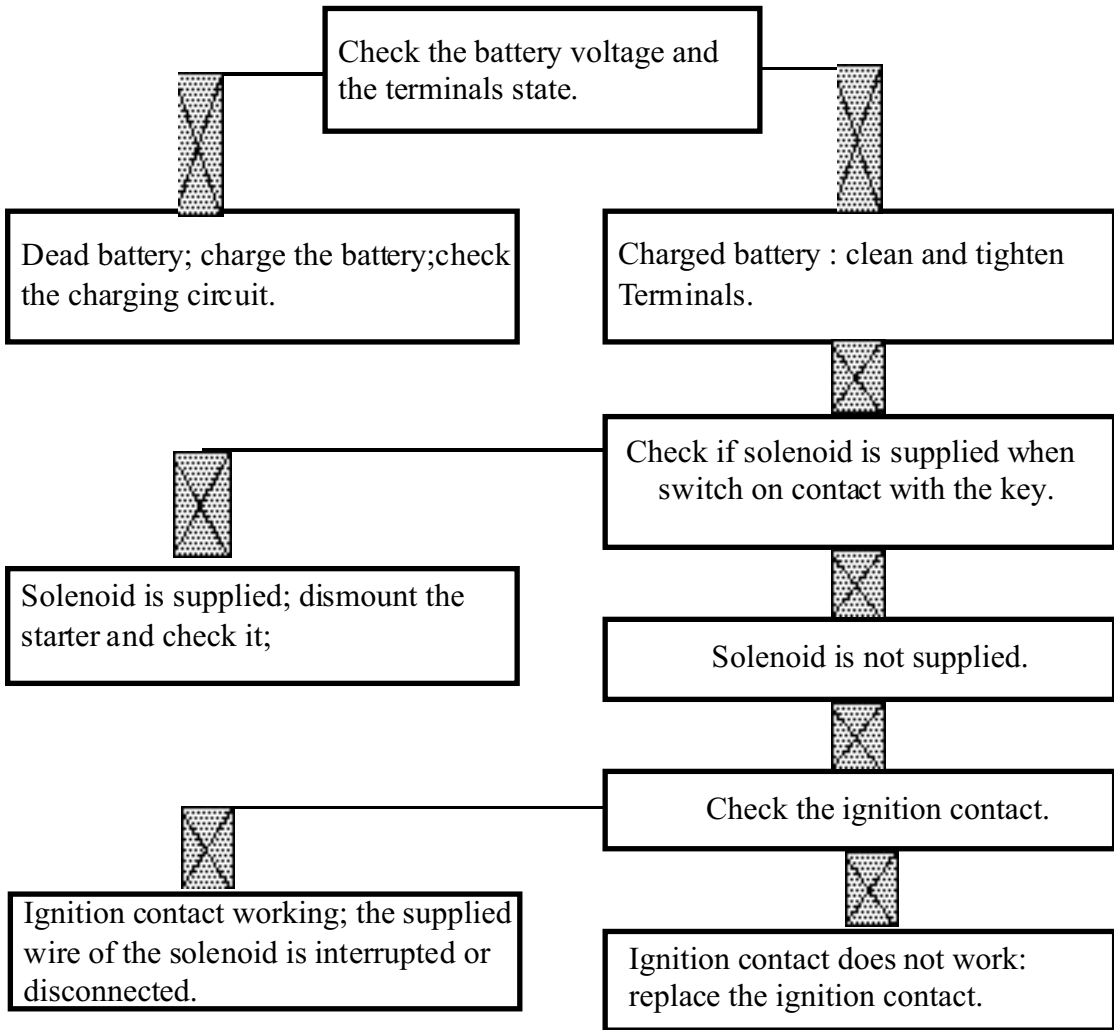
For adjustment act on the adjustment nut ( **1** ) until clearances **F** and **H** are correct.

By loosening the nut the clearance ( **H** ) is reduced.

**NOTE:**

*When mounting/remounting the 2600 type starter, it is forbidden its hitting with the hammer of some other hard thing which might cause the breaking of the stator magnets. The maintenance operations are to be performed on a clean table in order to avoid depositing of iron scraps or metallic parts on magnets.*

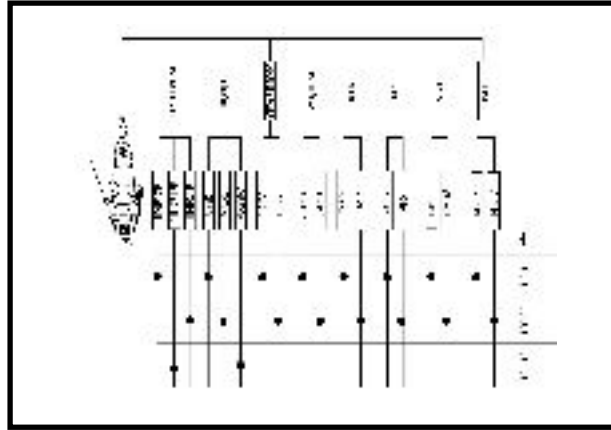
STARTER DOES NOT WORK





## SPARKPLUGS

The following spark plugs are to be used for Dacia vehicles:



The following spark plugs are to be used for Dacia vehicles:

The inducing voltage of the spark plug is **4–8 KV**. The maximum voltage difference between the spark plugs, measured on the engine is **2 KV**.

The distance between the electrodes is set by means of thickness gauges at the preset values, according to the spark plug type.

The spark plugs may be checked on the engine itself by means of a special tester for spark plugs or by testing the inducing voltage.

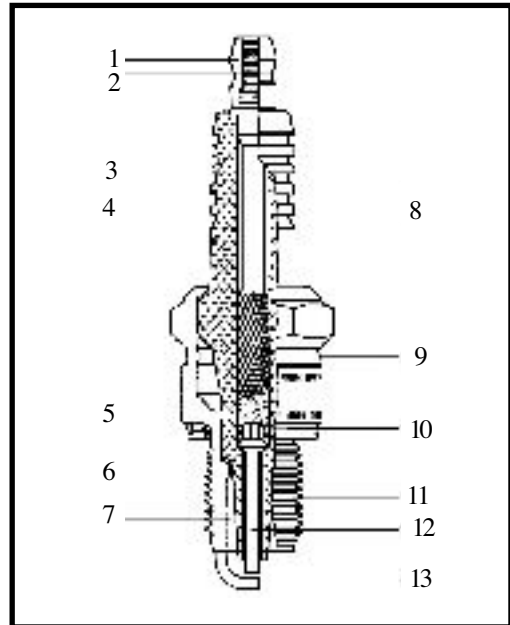
Mount the spark plug on the tester; increase the pressure to **12-13 bars** and observe the spark aspect:

- the spark plug should be replaced as inadequate, in case the spark is reddish and dispersed or in case there is an external discharge;
- the spark plug is adequate in case the spark is blue and is between the electrodes.

Constructive components of the spark plug:

## SPARKPLUGS

1. Terminal nut
2. Terminal thread
3. Anti-power hazard protection step
4. Insulator
5. Conducting material
6. Internal gasket
7. Ventilation room
8. Connection rod
9. Insuring area
10. Sealing ring
11. Insulating bulb
12. Central electrode
13. Mass electrode



### MONO - MOTRONIC INJECTION SYSTEM (MA 1.7)

#### OPERATION PRINCIPLE

The BOSCH MONO-MOTRONIC injection system is a ( $\alpha$ , n) type, where:

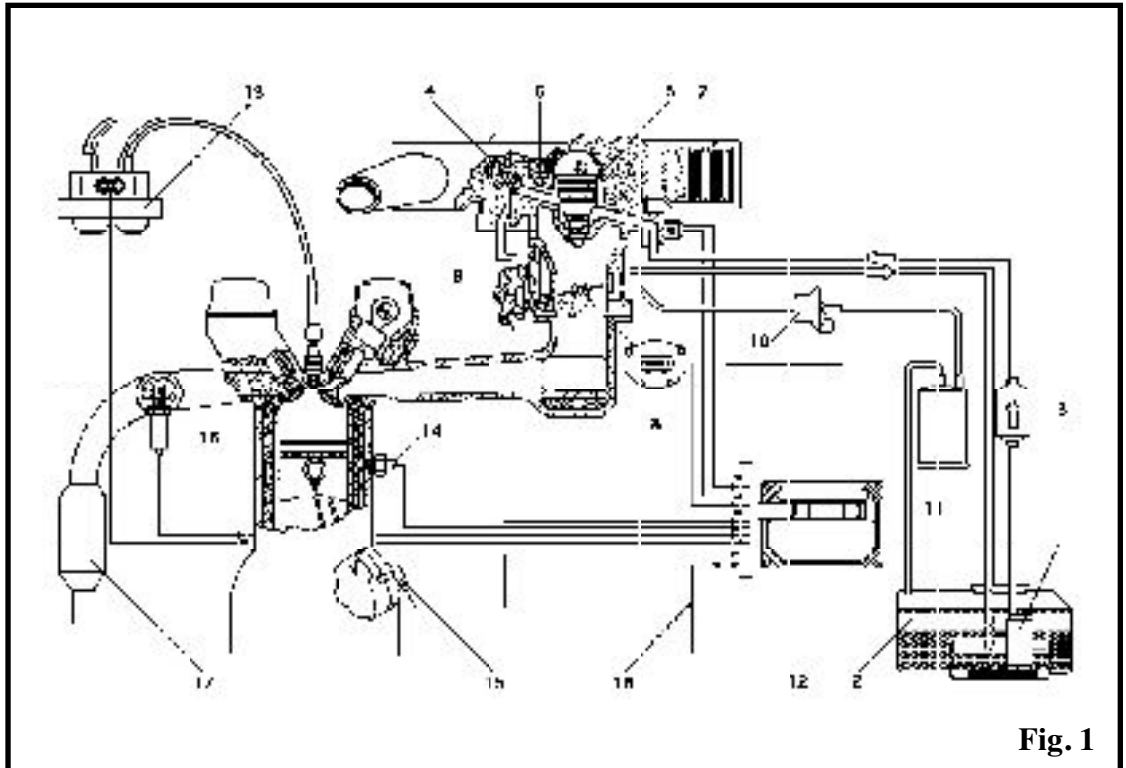
$\alpha$  = angle indicating the position of the valve and reading the engine load.

n = engine rotation

These are the principle information for the electronic control unit (computer), used for determining the basic injection time ( $t_i$ ); this basic time value is corrected depending upon the variation of the parameters with lent evolution: **T engine**, **T suction air**, lambda value ( $\bar{\epsilon}$ ), battery voltage.

The electronic control unit does the ignition advance calculation and the ignition coil control for the MONO-MOTRONIC injection system, taking into account the evolution of the parameters: **T engine**, **T air**, **n** (engine rotation).

The system is available and does not require adjustments. It is a self-adapting type system, which corrects itself the parameters during the engine running, taking as well into account its wearing during the run.

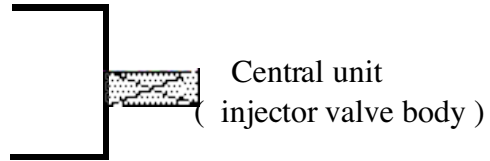


**Fig. 1**

## DESCRIPTION OF THE SYSTEM AND ITS COMPONENTS

The components of the injection system are: (drawing no.1).

- 1 - Fuel electric pump
- 3 - Fuel filter
- 4 - Fuel pressure regulator
- 5 - Injector
- 6 - Air temperature sensor
- 8 - Valve position potentiometer
- 9 - Idle motion regulator
- 10 - Carbon canister purging valve
- 11 - Active carbon canister
- 12 - Electronic control unit ( computer for injection and ignition ).
- 13 - Induction coil
- 14 - Engine sensor T
- 15 - Rotation sensor
- 16 - Oxygen sensor ( Lambda ).
- 17 - Catalytic convertor
- 18 - Ignition control cables with plug for system diagnosis



The drawing also indicates 2 – Fuel tank, 7 – Air filter.

The fuel supply circuit consists of tank fuel electric pump, fuel filter, injection central unit, supply and back-feed pipes.

### INJECTION CENTRAL UNIT

The injection central unit consists of:

- 1 - The upper part (hydraulic part)
- 2 - The lower part (body-valve)
- 3 - Pressure regulator
- 4 - Injector
- 5 - Air sensor T
- 6 - Fuel input ( supply connection ) .
- 7 - Fuel output ( back-feed connection )
- 8 - Idle motion regulator

A = Connector for air sensor T aer and injector.

B = Connector for valve potentiometer.

C = Connector for idle motion breaker and valve positioning engine.

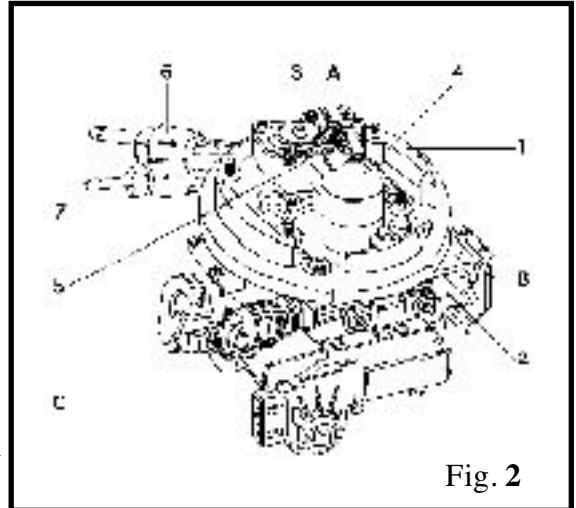


Fig. 2

### PRESSURE REGULATOR

It is a mechanical membrane regulator which insures an injection pressure of **0,8 – 1,15 bar**, the engine being under motion.

The pressure is measured as follows:

- a **T** connection and a manometer of **0 – 4 bar** are connected to the fuel input connection into the valve body;
- the pump is supply by starting the engine or by shunting the terminals **30** and **87** of the relay **R1**, with both engine and contact OFF.

### AIR TEMPERATURE SENSOR ( AIR T )

The air T sensor (**5**) – (**drawing 4**) measures the temperature of the air sucked by the engine.

Knowing that the air density decreases with the temperature increasing, the electronic control unit will correct the injection time ( $t_i$ ), in order to maintain the report air/fuel at optimal values.

The air sensor T is a NTC type (temperature negative coefficient), which means that its internal resistance decreases with temperature increase. It is supplied with **U = 5 V** (pin **13**, computer).

Reference values:  $R = 1450 - 3300 \ \Omega$  at  $15 - 30 \ ^\circ\text{C}$

$R = 2500 \pm 125 \ \Omega$  at  $20 \ ^\circ\text{C}$

## INJECTOR

The injector (**drawing 4**) is placed above the valve in order to ensure an optimal supply and homogenous mixture of the fuel. The injector basic function is to ensure a very fine and homogenous spraying of the fuel, shaped as a conic jet. This fuel is sprayed through the half-moon gap between the valve and the wall, without hitting the latter, as it happens in case of a straight spraying (carburetor).

For an exact dosing of fuel quantity we use the light component of the injector (its moving needle), which ensures a rapid movement. Being permanently washed in fuel, it avoids its heating and the fuel bubbles.

The electronic unit (pin **35**) controls the injector functioning.

The injection time ( $t_i$ ) is the while the injector is opened and it is the most important value of the injection system.

The injection time ( $t_i$ ) depends upon the voltage accumulator battery; if there are voltage fluctuations during the functioning, the electronic control unit will correct the injection time for an air-fuel optimal report ( $\epsilon = 1$ ).

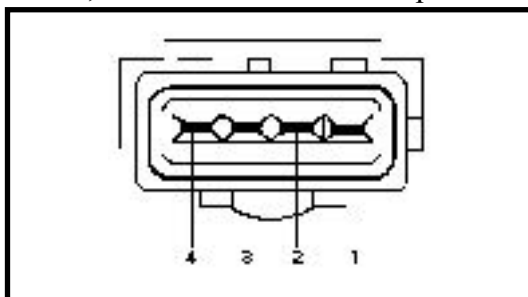
In case of a low voltage at start the value ( $t_i$ ) should be increased in order to compensate the lower flow of the fuel electric pump.

The simple testing of the injector is done by means of stroboscopic lamp. The air pipe above the injection unit is to be dismantled, the engine is to be started and the spraying cone of the fuel is watched by means of the stroboscopic lamp. The upper part (hydraulic part) of the injection central unit is not to be repaired – the whole injector-valve-body system is to be replaced.

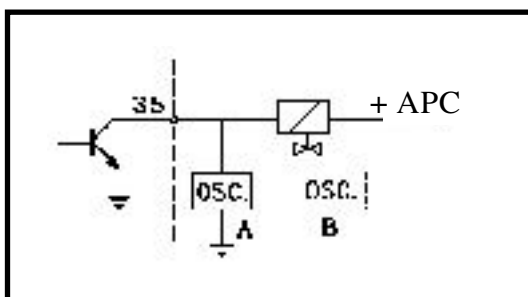
In case of damaging the injector or the air sensor T, both of them are to be replaced.

The connector between the air sensor T and the injector has the following connections:

- 1 - Air sensor T ( pin **13** computer )
- 2 - Injector supply ( + )
- 3 - Injector control ( pin **35** computer )
- 4 - Mass ( pin **27** computer )



The oscilloscope checks the injector functioning; it is to be connected according to the position “A”, namely mass parallel. It is not to be connected as in position “B”, which will affect the transistor, leading to errors of signal.



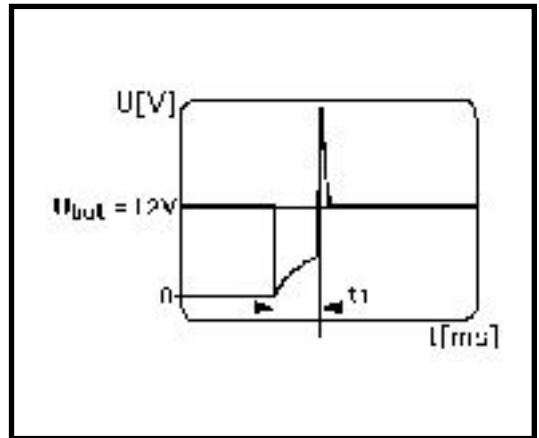
A sign shaped as follows will be displayed on the oscilloscope screen. It is to be used for the calculation of the injection time =  $t_1$ .

The injection time value increases when the battery voltage is lower than **12 V**.

Reference values for the injector:

- resistance measured between the wires 2 and 3,  $R_{2,3} = 6.3 - 7.4 \text{ } \Omega$

- a maximum of 1 fuel drop at the injector/ 1 minute is visually checked and admitted when supplying the fuel pump by shunting the terminals 30 and 87 of the relay  $R_1$ , with lose contact.

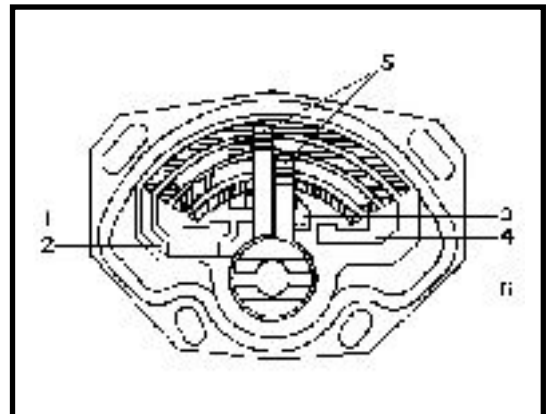


### VALVE POTENTIOMETER

The valve potentiometer (**drawing 4, position B**) is fixed on the injection unit at the end of the valve axle and consists of a potentiometer a double way. This is supplied with + **5 V** from the pin 25 computer and sends to the later a voltage signal proportional with its position. Then the computer will control the injector and the induction coil.

The potentiometer consists of:

- 1 - Mass
- 2 - Potentiometer I
- 3 - Potentiometer II
- 4 - Supply ( + )
- 5 - Brushes
- 6 - Insulator



The valve potentiometer consists of a first potentiometer, working on the range ( $0^\circ - 22^\circ$ ) and a second one, working on the range ( $19^\circ - 90^\circ$ ). A common area is noticed, between ( $19^\circ - 22^\circ$ ) established for a more precise reading of the load necessary in the partial load area, the most used for the engine exploitation.

The connector of the valve potentiometer consists of the following connections (**drawing 2**):

- 1 - Mass ( pin 27 computer )
- 2 - Potentiometer I (  $0^\circ - 22^\circ$  )
- 3 - Blank
- 4 - Potentiometer II (  $19^\circ - 90^\circ$  ).
- 5 - Supply ( 15 V, pin 25 computer ).

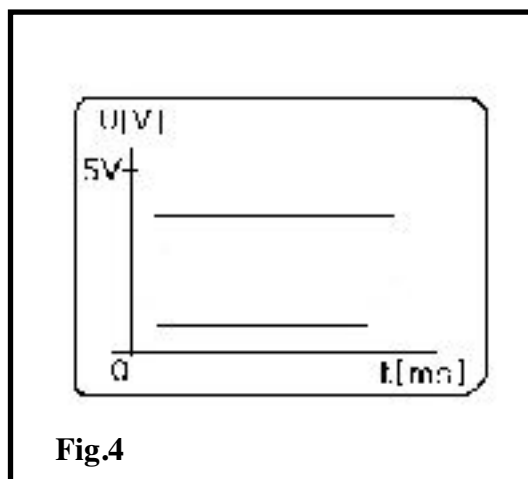
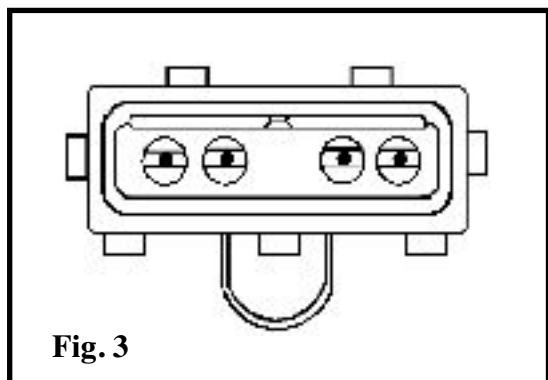
It can be checked by means of means of an oscilloscope as follows:

- engine on contact;
- manual moving of the control clutch lever;
- oscilloscope contacted to the pins 1 and 2 of the connector; if the displayed sign looks like a row of horizontal straight lines with no interactions the potentiometer is ready to use (**drawing 10**)

In case of damage, the potentiometer is not to be repaired – the lower part of the injection central unit is to be replaced.

The wires of the potentiometer connector should be checked by an ohmmeter. The following values are indicated for a good potentiometer:

- potentiometer I  $R_{1-5} = 600 - 1400 \text{ } \Omega$
- potentiometer II  $R_{2-4} = 400 - 4000 \text{ } \Omega$ ; the maximal values should contact each other within the partial load area.





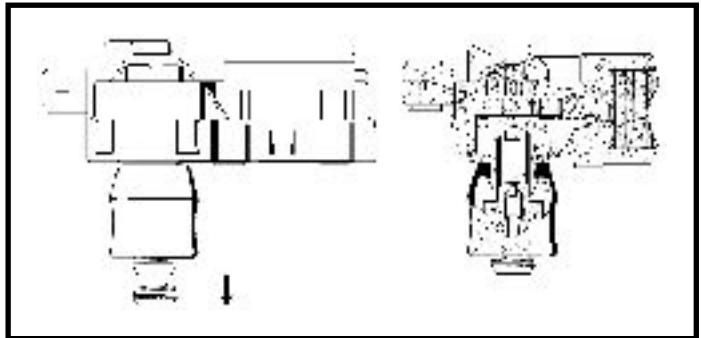
### REGULATOR OF IDLE RUNNING

This regulator (**drawing 1, position 9**) is used to position the valve in order to obtain the idle rotation. It is mounted into a case together with a switch. The idle running is realized at the moment of switch contact closing (**position 4**), being necessary to the normal idle functioning or to the engine brake.

The computer sends an electric signal to the regulator through the pins **32** and **34**. The regulator will position the valve in order to obtain the idle rotation ( $800 \pm 50 \text{ rot/min}$ ).

Components:

- 1 - Electric motor step by step
- 2 - Endless screw
- 3 - Endless screwed wheel
- 4 - Switch
- 5 - Protection buffer



The switch connector and the idle motion actuator consist of:

- 1, 2 - Actuator supply  
( **pin 32, pin 34 computer** ).
- 3 - Idle motion switch  
( **pin 8 computer** ).
- 4 - Mass

By connecting an ohmmeter to the connector wires 3 and 4, one can see that the switch positions:

- CLOSE – functioning status, continuity

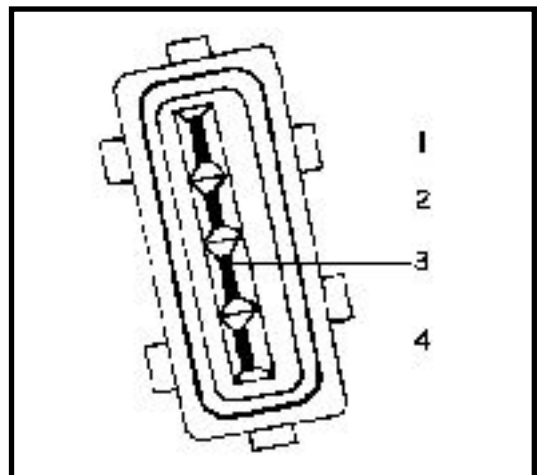
- OPEN – stand-by status,  $R = \infty$

Reference values measured at the connected wires:

$R_{3-4} = 0 - 200 \text{ } \Omega$  – contact close

$R_{3-4} > 1 \text{ M}\Omega$  – contact open

$R_{1-2} = 4 - 250 \text{ } \Omega$

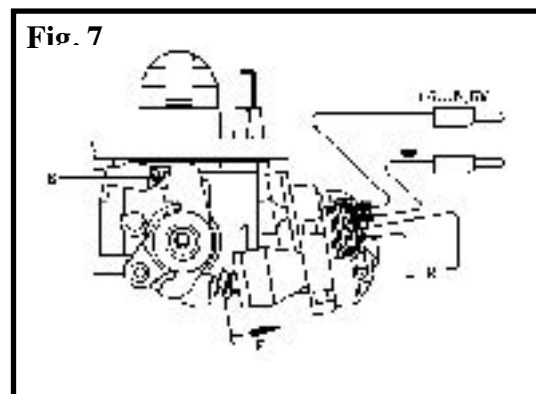
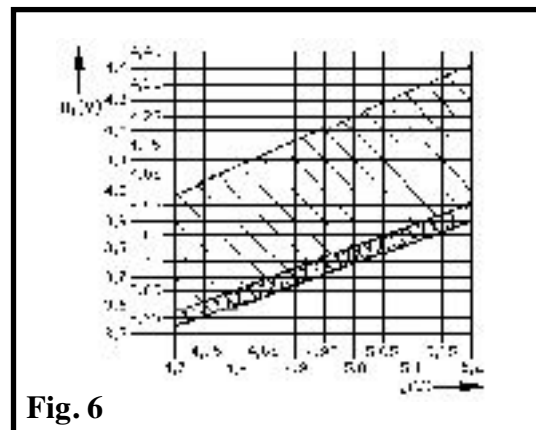
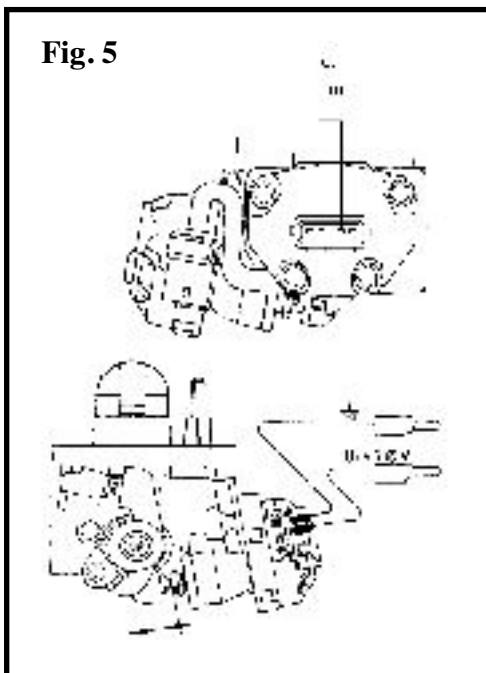


**IMPORTANT:**

*The connector disconnection and connection is to be done only with contact OFF for the following checking and adjustment.*

*The basic adjustment of the valve (drawing 5) is the correlation between the potentiometer position and the positioning engine of the valve. The adjustment is checked as follows:*

- *engine on contact;*
- *idle motion regulator supplied according to the diagram by a continuous source having  $U = 5 - 6,5 \text{ V}$ , necessary to lead it at the end of its way;*
- *the voltage  $U_v$  and the partial voltage  $U_1$  are measures on the potentiometer;*
- *the point with  $(U_v, U_1)$  coordinates is marked on the diagram (drawing 6); in case of a correct setting the point will appear on the shaded area of the diagram;*
- *the setting screw "3" should be rotated both ways.*



## EXAMPLE:

When  $U_v = 5\text{ V}$ ,  $U_1$  should be within  $3.75 - 4.25\text{ V}$  for a correct adjustment.

This adjustment is used in case of changing regulator or of an irregular functioning during the idle motion.

For checking the contact (**drawing 7**):

- engine on contact;
- regulator at the way, supplying an  $U = 5 - 6\text{ V}$  and helping it by hand;
- connection of the ohmmeter according to the drawing; we measure and  $R$  should be zero;
- the partial voltage in this position should be  $U_1 = 0.19 - 0.22\text{ V}$ ; in case this condition is not fulfilled we can adjust it by the screw "B".

**NOTE:**

*The distance between the screw "3" and the axle "2" should be 1 mm at cold, in order to avoid the idle rotation increasing when the engine is hot.*

## ROTATION SENSOR

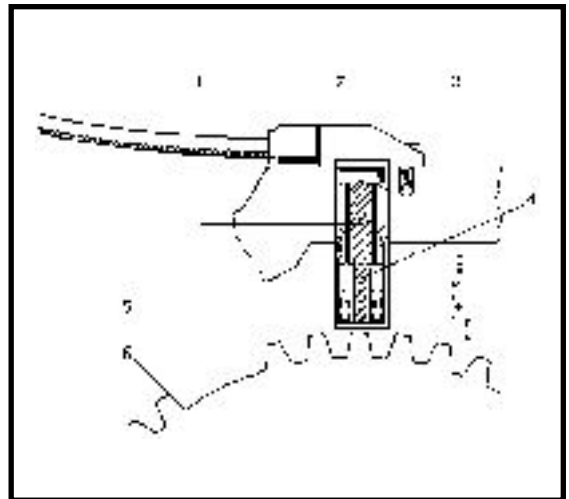
The rotation sensor is of inductive type and consists of:

- 1 - Permanent magnet
- 2 - Insulator body
- 4 - Ferite core
- 5 - Coil

The drawing also indicates:

3 – gearbox clutch casing; 6 – flywheel for rotation sensor.

The flywheel has **60** equidistant teeth; there are **2** teeth missing. The space of the remaining **58** teeth is used to watch the rotation while the space of the **2** missing teeth is used to watch the reference position of the crankshaft, corresponding to the cylinders **1** and **4** at **PMS**.



From now on, we can calculate the injection time ( $t_i$ ), the injection moment and the ignition advance moment for each engine cycle.

The rotation sensor is fixed on the clutch case of the gearbox therefore it should be at  $\pm 0,5 \text{ mm}$  from the teeth peak of the flywheel.

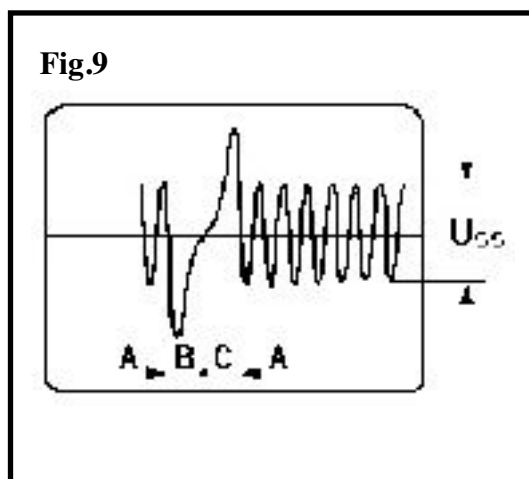
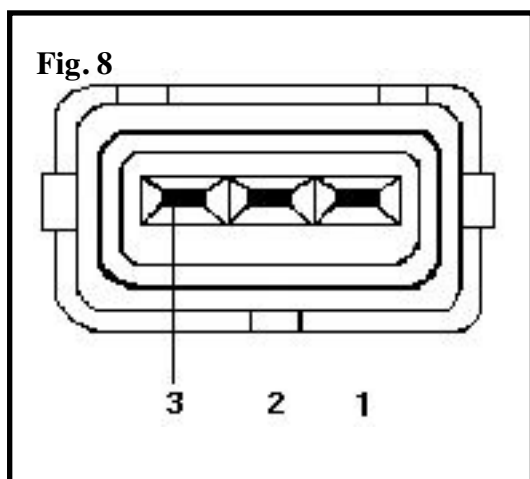
The connector for the rotation sensor has the following connections (drawing 8):

- 1,2 – capture of rotation signal
- 3 – screening

The sensor functioning can be checked by connecting the connector pins 1 and 2 or the computer pins 3 and 21 to an oscilloscope. A good sensor will generate a signal shaped as in drawing 8, during the engine functioning, in which we can identify the following:

- A = gear toothed area (rotation signal)
- B = the 2 missing teeth area
- C = the first tooth area (reference signal)

The rotation sensor is not to be repaired but replaced.



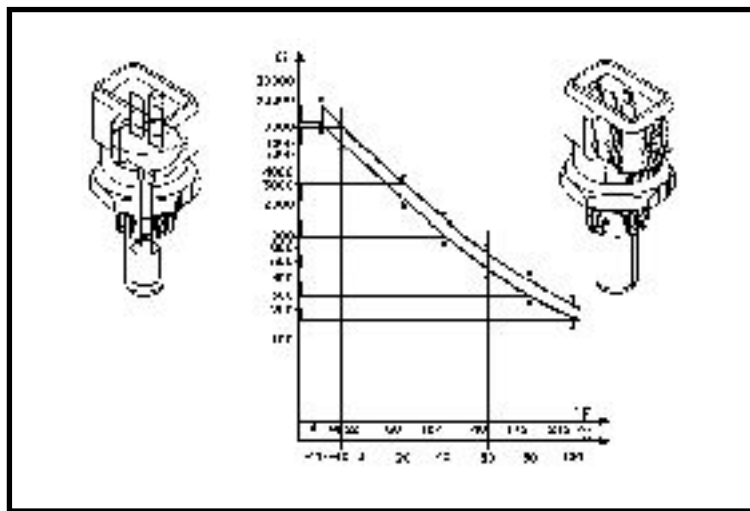
*The rotation signal level should be  $U_{ss} > 2,5 \text{ V}$ , otherwise the engine won't start.  
The reference value  $R_{1-2} = 650 - 1100 \text{ } \dot{U}$  at an environmental temperature of  $20^\circ\text{C}$ .*

### ENGINE TEMPERATURE SENSOR

The engine sensor T is an NTC type (negative temperature coefficient); its internal resistance will decrease with the increasing of the temperature.

It is checked with an ohmmeter connected to the sensor terminals or even better with a voltmeter, during the engine running. The voltage of the cold engine should be  $U = 5\text{ V}$ ; this voltage decreases according to the heating of the engine. In case there is a short circuit the voltage will drop, first slowly, then suddenly. This is a very precise diagnosis as it is done under running.

The engine sensor T is not to be repaired but replaced.



Reference values:  $R_{\text{sensor}} = 1450 - 3300\ \Omega$  la  $15 - 30\ ^\circ\text{C}$

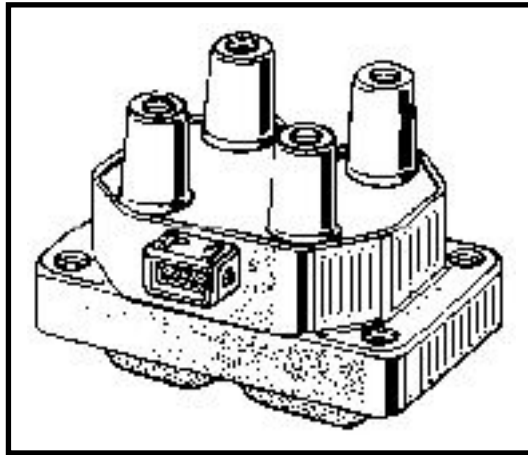
$R_{\text{sensor}} = 2500 \pm 125\ \Omega$  la  $20\ ^\circ\text{C}$

The report between the sensor resistance and the temperature is:

T [°]	- 10	0	10	20	40	60	80	100
R [Ω]	9200	5900	3700	2500	1180	600	325	190

## INDUCTION COIL

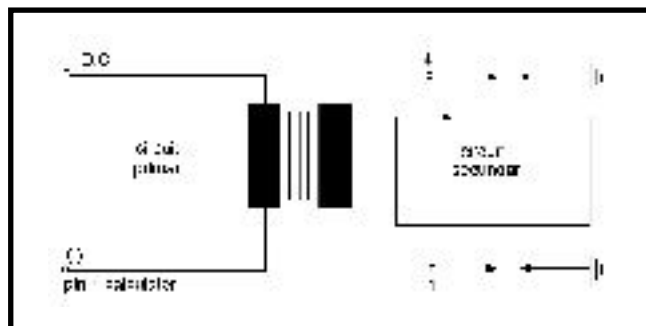
The induction coil is a double-coil with stationary distribution of the voltage without moving elements. The voltage in the secondary circuit of the coil can reach **30 KV**, the distance between the spark plugs electrodes should be **0,8 mm** and the spark plugs wires should have a special construction according the new concept of anti-electric interference.



When the engine is on contact the coil is supplied with a (+ DC) voltage; it is controlled by the electronic control unit (-), as follows:

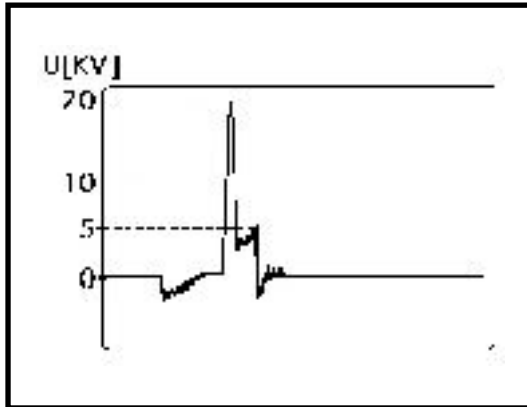
- for spark plugs 1 and 4 – pin 1;
- for spark plugs 2 and 3 – pin 19.

The secondary circuit is closed by the two spark plugs; the spark voltage at the cylinder under compression is about **20 KV**; the auxiliary voltage at the cylinder under evacuation is **250 – 300 V**, reversed polarity.

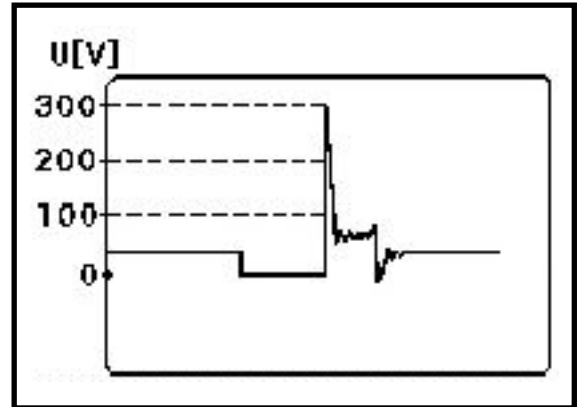


**EXAMPLE:**

- piston 4 at compression = ignition spark; about **20 KV** (**drawing 10**).
  - piston 1 evacuation = auxiliary spark; about **300 V** (**drawing 11**).
- The two voltages can be viewed through an oscilloscope and an adapter.



**Fig. 10**



**Fig.11**

The reference values, measured at the ignition coil connector are as follows:

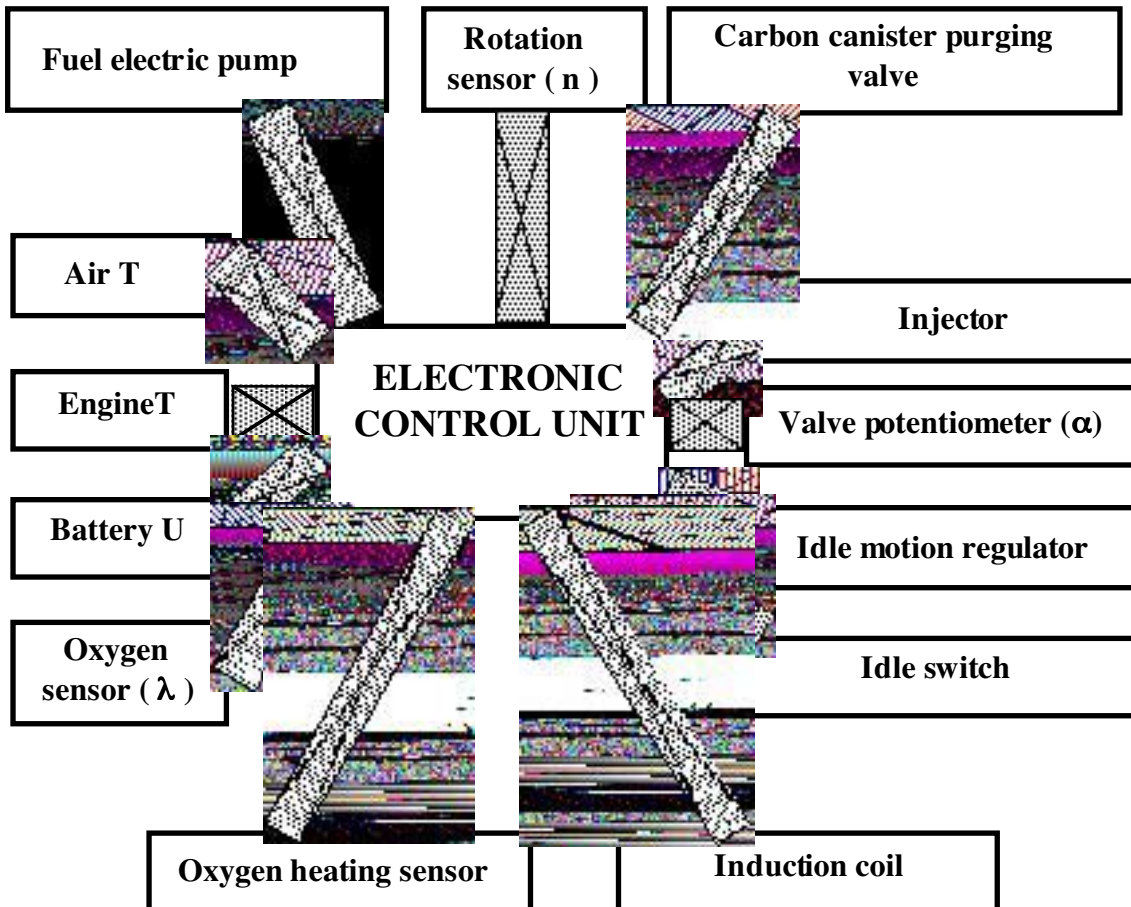
- for secondary windings:  $R_{1-4} = R_{1-3} = 10 - 16 \text{ K}\Omega$  at  $20^\circ\text{C}$
- for primary windings:  $R_{1-2} = R_{3-4} = 0.4 - 0.6 \text{ }\Omega$  at  $20^\circ\text{C}$

The reference values for spark plugs wires:

$R = 3000 - 7000 \text{ }\Omega$  at an environmental temperature of  $20^\circ\text{C}$

## ELECTRONIC CONTROL UNIT

The electronic control unit is situated in the engine compartment and fixed on the right bumper column. It is connected to the injection control cables through a 35 pins connector. The information track between the control unit and the system components is as follows:





**WARNING!**

*In case of electric welding on the vehicle, the battery the alternator and the electronic control unit should be disconnected. In case of fine painting above 85°C, the electronic control unit should be taken off the vehicle. When remounting the fixing screws of the control unit should be well secured, in order to ensure a perfect electric contact to the vehicle chassis.*

*The cabling connector to the computer won't be disconnected or reconnected before interrupting the contact to the engine and disconnecting the battery terminal (-).*

The electric correspondence between the 35 pins of the electronic control unit and the system elements should be according to the **Table 1 (page 17-29)** and to the afferent electric diagram.

Taking into consideration the special construction of the connectors used for this cabling system, their disconnection should be done (only after interrupting the contact to the engine) by pushing the fuse and then by disconnecting it.

The connection should be done carefully; the fuse should assure a perfect fixing and electric contact of the cable connectors to the system components.

Disconnection mode (according to the instructions):

- electronic control unit: pull the lock (1) arrow sense, hinge the connector and disconnect (see **drawing a**);
- rods, induction coil: push the lock (2), then disconnect the connector (see **drawing b**);
- oxygen sensor: pull the locking valve, then disconnect the connector; front cables connection: turn the coupling cassette (see **drawing c**).

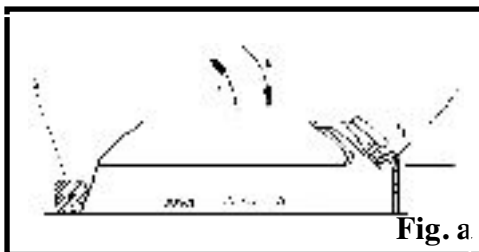


Fig. a

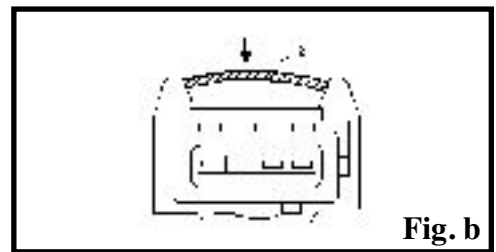


Fig. b

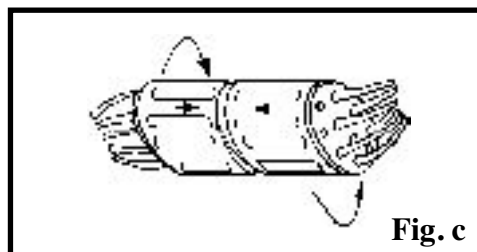


Fig. c

The **pin 23** should be tightly fixed to the mass.

The **pin 16** is very important; it ensures a permanent supply (+) to the computer in order to keep in its memory all the damages which might occur during the running and to introduce the necessary connection at starting up for the ignition and injection system.

The system takes into consideration the wearing in time of the engine, introducing the necessary correction factors for engine functioning under optimal parameters. When reconnecting the battery, the computer rememorizes all the data sent by the sensors and the possible damages of the system, after about 20 minutes of engine running.

The **pins 33** and **18** are very important; they ensure the link between the computer mass and the vehicle body.

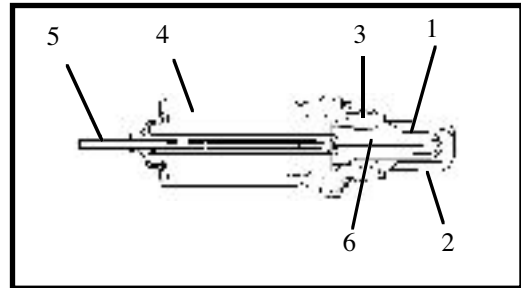
Pin no. computer	Injection and ignition system component MA1.7	Wire position in the component connector
1	Control ignition coil ( cylinders 1 and 4 )	3
2	Not connected	-
3	Signal rotation sensor	2
4	Diagnosis plug ( line K )	1
5	Not connected	-
6	Not connected	-
7	Not connected	-
8	Idle switch	3
9	Signal oxygen rod	3
10	Signal oxygen rod	4
11	Valve potentiometer ( signal track 2 )	4
12	Valve potentiometer ( signal track 1 )	2
13	Sensor air temperature	1
14	Sensor engine temperature	1
15	Not connected	-
16	Permanent supply ( + )	clamp 30
17	Supply ( + ) after contact, relay R2	clamp 87
18	Mass	clamp 31
19	Control ignition coil ( cylinders 2 and 3 )	1
20	Mass	clamp 31
21	Signal rotation sensor	1
22	Control air conditioning	-
23	Mass	clamp 31
24	Speed-meter	-
25	Valve potentiometer ( supply + 5 V )	5
26	Not connected	-
27	Mass valve potentiometer	1
	Mass engine temperature sensor	2
	Mass air temperature sensor	4
28	Control relay fuel pump R1	clamp 86
29	Control canister purging valve	1
30	Control relay air conditioning R3	clamp 86
31	Control witness injection ( front panel )	-
32	Control idle regulator	1
33	Mass	clamp 31
34	Control idle regulator	2
35	Control injector	3

**Table no. 1**

## OXYGEN SENSOR ( Lambda )

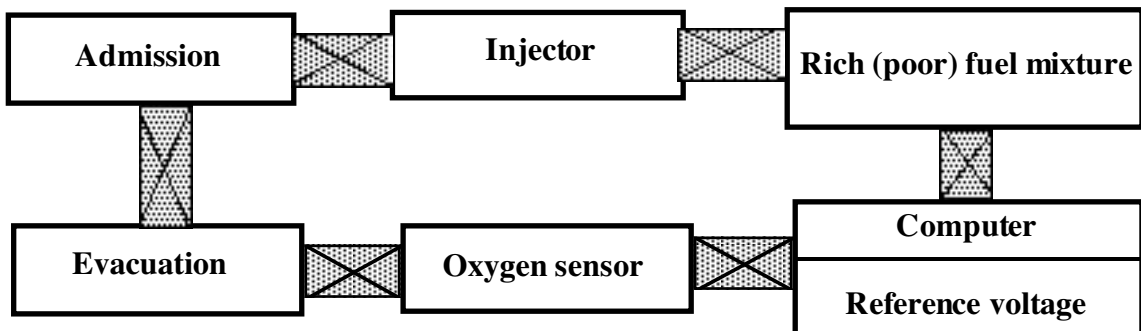
The oxygen sensor (Lambda) is fixed on the primary down tube, in front of the catalytic converter. Its purpose is to determine the oxygen content of the exhausted gases; this oxygen content value depends upon the dosing of the air-fuel mixture. The sensor consists of:

- 1 - Ceramic element ( $ZrO_2$ )
- 2 - Protection tube with 3 slits
- 3 - Threaded metallic body
- 4 - Protection case
- 5 - Electric connection
- 6 - Electric element for rod heating



The functioning mode of the sensor is based upon the ceramic property of leading the oxygen ions, at temperatures within **300 – 800 °C**. The external area of the ceramic element is in contact with the burned exhausted gases while its internal area is in contact with the fresh air. As a consequence there will be a voltage signal between these two ceramic areas; this signal will be transmitted to the electronic control unit (**pin 9 – pin 10**). According to the size of this signal, the computer will control the ignition and injection systems in order to obtain a value  $\lambda = 1$ , essential condition for catalyst operation under optimal conditions, namely an efficient de-pollution.

The setting method in closed loop with Lambda rod is according to the following diagram:

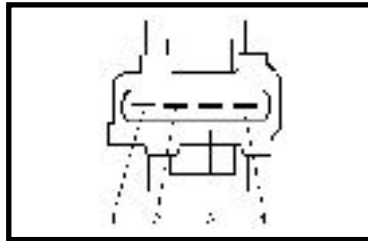


For starting the oxygen sensor as soon as possible after the engine start up it should be heated by its electric resistance, type **PTC** = positive temperature coefficient.

The evacuation track of the burned gases should be 100% sealed in the area in front of the  $\ddot{e}$  rod and of the catalytic converter in order to not get measurements errors of the oxygen content in the burned gases.

Reference values:

- heating resistance of the  $\ddot{e}$  rod:  $R_{1-2} = 1 - 15 \text{ } \ddot{U}$
- R insulation =  $R_{1-4} = R_{1-3} = R_{2-3} = R_{2-4} > 25 \text{ M}\ddot{U}$  at 20 °C



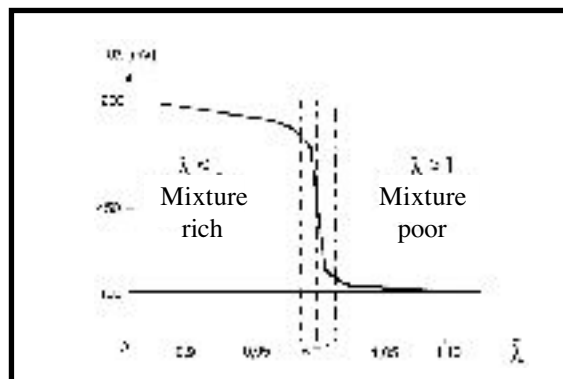
**IMPORTANT: Only fuel without lead should be supplied. Otherwise the oxygen sensor and the catalyst will be broken. The oxygen sensor and the catalyst are damaged in case of overheating caused by a difficult starting up or by an improper functioning of the engine.**

The correlation between the value  $\ddot{e}$  and the dosing of the mixture is indicated in the diagram here under.

The voltage limit values are  $U \ddot{e} = 0.9 \text{ V}$  for a rich mixture and  $U \ddot{e} = 0.1 \text{ V}$  for a poor mixture. The value  $U \ddot{e} = 0.45 \text{ V}$ , existing between these two, is the reference voltage existing in the computer memory; the later uses it in case of damage of the  $\ddot{e}$  rod, the engine being under running.

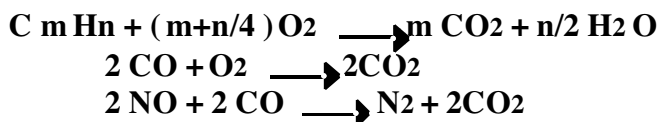
The value  $\ddot{e}_1 = 1 \pm 002$  is the area of the voltage jump characteristic to the ceramic element ( $\text{ZrO}_2$  in this case).

A voltmeter with internal resistance  $R_1 = 10 \text{ M}\ddot{U}$  is used for measuring the voltage generated by the  $\ddot{e}$  rod. This voltmeter will be connected to the  $\ddot{e}$  rod (**pins 3 and 4**) or to the electronic control unit (**pins 9 and 10**).



## CATALYTIC CONVERTER

The catalytic converter (**drawing 1, position 17**) is placed on the burned gases evacuation track between the primary down tube and the detector it is three ways type and it is used for simultaneous transformation of the three gases existing in the evacuation gas, according to the following chemical reactions:



The catalytic converter is honeycomb shaped, in ceramic, covered with a very thin film of active catalytic substances (Platinum, Rhodium and Palladium) It accelerates the oxidation and chemical reaction of the noxious substances existing in the evacuated burned gases. This ceramic structure is protected by a stainless steel case, resisting to high temperatures and environmental agent action.

**WARNING !**

*Knowing that the catalytic converter reaches high temperatures during the functioning it is forbidden to install it in areas storing inflammable materials – fire hazard.*

*In order not to damage the catalyst during a difficult engine starting, do not insist in repetitiously trying to start the engine; pushing the vehicle it is also forbidden, one can use a helping battery.*

*The engine shouldn't run without sparking at one of its cylinders, even during testing; a not burned fuel can reach and damage the catalyst.*

The maximal permitted values of the noxious substances (vehicle technical checking):

- CO  $\leq$  0,4 % vol.
- HC  $\leq$  100 ppm
- CO<sub>2</sub>  $\geq$  12 % vol.
- $0,97 \leq \lambda \leq 1,03$

The above mentioned formula determination is done at an idle rotation of **800 ± 50 rot/min** after a minimum period of 5 minutes since the engine start up (engine T = **85 – 90 °C**).

---

**WORKING MODE**  
**IN CASE OF INTERVENTION ON THE MONO-MOTRONIC INJECTION**  
**SYSTEM**

Prior to the engine start up one should check the correct connection of the battery; the battery should be well loaded and its terminals should be cleaned and well tightened up.

The maximum supplying voltage of the system should not exceed **15 V**.

The battery should be disconnected only after stopping the engine, the contact key being on the position "St" (contact closed).

The electronic control unit can be disconnected only after closing the contact and disconnecting the battery terminal (-).

For checking the cylinders compression one should interrupt the power supply of the relays ( $R_1 - R_2$ ) of the injection system.

The ignition system should be disconnected, turning the contact key on the position "0", prior to the interventions at the ignition system.

For instance:

- changing the engine system components
- connection to the engine tester
- connection to the checking bench

The cables in the engine compartment should be well placed in order not to be in contact with the hot areas or with the moving parts of the engine.

In case of charging the battery from a redresser, the battery should be first disconnected from the electric system of the vehicle.

**WARNING !**

***1 – Only fuel without lead should be supplied, otherwise the catalytic converter will be damaged. Use only fuel or oil additives recommended by the constructor.***

***2 – You should avoid bumping the catalytic converter***

***3 – The engine should be fit for working with the catalytic converter under normal conditions (injection, ignition). In case of miss-ignition, supplying problems and power losses stop the car, for avoiding the overheating of the catalytic converter; the later can also be damaged by the too extended use of the starter in case of difficult start up.***

***4 – In case that fuel with lead is used by mistake, prior to changing the ÷ rod or the catalytic converter one should refill the tank twice with no-lead fuel.***

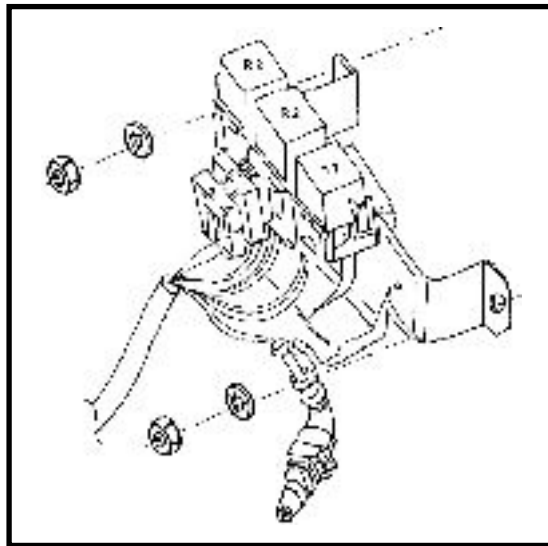
***5 – Taking into consideration the high pressure of the fuel supplying system, all the joints between pipes and hoses should be well tightened up with the adequate gaskets, in order to avoid the possible fuel losses, which might lead to vehicle fire hazard.***

**IMPORTANT:**

Two protecting relays and two fuses, placed on a fixed support on the front of the left mudguard coating (front) electrically protect the injection system. The relays protect the supplying circuits as follows:

- relay R1: for supplying the fuel electric pump the heating resistance of the oxygen rod and the injector;
- relay R2: for supplying the computer (pin 17) and the injection witness of the vehicle front panel;
- relay R3: for controlling the air conditioning compressor.

The plate fuses are **10 A**; they are placed on the supplying circuit of the fuel electric pump (S1) and of the oxygen rod (S2).



### NECESSARY DEVICES FOR DIAGNOSIS AND MEASUREMENTS OF THE SYSTEM PARAMETERS

- Voltmeter, ohmmeter, class 20000  $\dot{U}/V$ ;
- Manometer for liquids, 0 – 4 bar, with T-connection;
- Tester SAGEM CLIP Dacia, KTS 300 or AT 520 with soft DACIA (MA 1.7) and accessories for series diagnosis;
- Marked vessel 0 – 2000 ml.



### PRELIMINARY CHECKING OPERATIONS PRIOR THE DIAGNOSIS

The starting up electric circuit components should be under best conditions:

- Starter battery and cables;
- Fuel in accordance with the indications (without lead), sufficient quantity (minimum 5l);
- Fuel filter according to the indications and correctly installed;
- Correct recirculation circuit (fuel vapors) with no clogging;
- Supplying circuit: good sealing between the components, air filter in order;
- Acceleration cable should not be tensioned;
- The stroke of the acceleration pedal should be set to permit the complete opening of the valve;
- The vacuum circuit for servo brakes and its valves should be in order;
- The engine should be in good mechanical order: compression tappet-levers setting, distribution steps, etc.;
- The spark plugs should be according to the constructor specifications;
- The control cables for fuel injection should be firmly fixed on the mass points (gearbox case, direction column) and on supplying points (+12 V) – at starter;
- The exhausting track should be sealed mainly between the evacuation gallery, down tube and ð rod.

### CONNECTING THE DIAGNOSIS TESTER

The diagnosis tester is connected to the vehicle injection cables, provided with the two ways connector (AMP type, code 282189-1). This connector is placed on the left front mudguard coating next to the relay and fuses block and fixed by a sealing clip. The connector is provided with a protection gate valve. This protection is dismantled when connecting the tester; the corresponding connector of the diagnosis tester is mounted in its place. The tester is also connected to the 12 V battery of the vehicle.

#### **WARNING !**

*During the diagnosis the control lever of the gearbox should be on neutral and the hand break should be pulled, to avoid the hazard risk.*

*The tester-connecting table should be not in contact with the hot components of the vehicle (collectors, exhausting system, etc.) or the moving components (engine shaft pulley, water pump pulley, and ventilation propeller).*

*When connecting the tester the contact key should be on “0”; at diagnosis the contact key should be turned on “M” (contact ON).*

### A. DIAGNOSIS BY SAGEM CLIP TESTER

The injection and ignition system diagnosis can be done by using the SAGEM CLIP tester, after connecting it to the diagnosis plug of the vehicle and after its + 12 V supply from the battery terminals and from the lighter plug.

The detailed description of the tester as well as the diagnosis software Dacia installing and their operation mode are written on the CD no. 1 joint to the tester purchase.

Additionally this tester can be purchased as a complex variant (CLIP TECHNIC), which serves to the diagnosis of the injection system; it also serves for physical measurements of different parameters of the injection and ignition system components.

### B. DIAGNOSIS BY TESTER KTS 300

The injection and the ignition system diagnosis can also be done by means of the “**Pocket-System Tester KTS 300 – Bosch**”.

The tester KTS 300 executes the following operations:

- \* processing of the communication structures;
- \* processing of the communication by electronic control unit (computer);
- \* selection of the memorized damages;
- \* selection of helping menu (**HELP**);
- \* processing of damage code by comparing the real and the set up values;
- \* checking of acting elements (actuators test).

The tester is provided with the following keys:

- the keys **1, 2, 3**, are used for selecting a line from the option list, proposed by the program at a certain moment;
- the keys **>** and **<** are used for shifting to the following screen or for returning to the previous screen;
- the key **H** is the helping key for the following;
  - screen lighting;
  - meter stopping;
  - displaying the data concerning the ignition and injection system;
  - printer setting up;
  - working speed setting for data transfer;
  - the memorized data operations (printing canceling).
- the key “**N**” - is used for shifting to the previous level of the program;
- the key “**-->**” for data memorizing;
- the key “**-->**” for memorized data reading.

After accessing the diagnosis menu by pressing the key >, a submenu is displayed, with the following options:

- press key **1** for reading the memorized damages;
- press key **2** for displaying the real values of the checked measures;
- press key **3** for checking the functioning of the acting items;
- press key **H** for displaying the helping menu;
- press key **N** for returning to the diagnosis menu.

In case of choosing the option “reading of the memorized damages”, when pushing key “**1**”, the screen will display a message with a total amount of the possible memorized damages.

When pressing key “>”, the following message will be displayed:

- the damage track;
- the damage type;
- the damage code.

When pressing again the key “>” further information about the damage type (sporadic or permanent) will be displayed.

From now on the list of the memorized damages can be explored by pressing the key “>”, when selecting a damage, one presses key “**1**” the damages possible causes can be identified.

Each time one presses the key “**N**” the previous message will be displayed.

After displaying the data about the last damage of the list by pressing the key “>” the computer sends a message to the user, asking if the damage has been rectified.

The following options are displayed:

- press key “**1**” for YES;
- press key “**3**” for NO.

When pressing key “**1**” a message concerning the memorized damages will be displayed, with two options:

- press key “**1**” for canceling it;
- press key “**3**” for keeping it.

After pressing key “**1**” the message “**memorized damages cancelled**” will be displayed.

For turning to the diagnosis menu, one presses key “**3**” or the keys “**1**”, “**N**” in a row.

When choosing the option of action items checking (injector, electric-valve, idle motion regulator etc.), one presses the key “**3**” and two options for selection of the action items will be displayed

- pressing key “**1**” - an action item is selected;
- pressing key “**3**” the unit list is explored from the first on.

Once selecting an item its action is done under pulsing regime, for viewing it or for listening to; the question “**Is the item pulsing?**” is displayed, with the following options:

- press key “**1**” for YES;
- press key “**3**” for NO.

The next unit is activated with each pressing of the key “1”.

When pressing key “3” the working instructions for canceling the malfunctioning cause of the unit will be displayed and by pressing the key “>” the unit is reselected.

When pressing key “N” during the activation of a unit, one returns to the checking sub-range of the activation units.

In case of choosing the displaying of the real values of the measured checking two options for real values selection will be displayed by pressing the key “2”:

- press key “1” for selecting three parameters with real values;
- press key “2” for exploring one parameter in a row, starting with the first one.
- press key “>” for selecting the next item of the list;
- press key “N” for returning to the sub-menu displaying the real values of the measured elements.

Further information concerning the KTS 300 Tester are provided in the Instructions Book “**Pocket – System Tester KTS 300 Bosch**”.

The diagnosis of the injection system by **KTS 300 Tester** permits the detection of the system damages components; the damage code is provided in the following table:

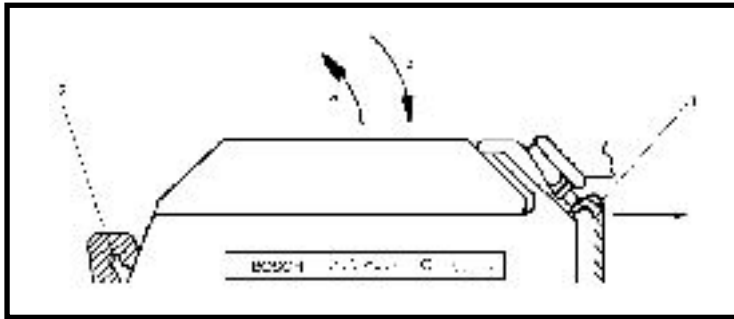
DAMAGE COD	DAMAGED COMPONENT	DAMAGE DENOMINATION
011 A	Idle motion regulator	Unreal signal
0203	Rotation sensor	Missing of rotation signal
0204	Idle motion switch	Short circuit at mass
0204	Idle motion switch	Stopping/ Short circuit at plus
0206	Valve potentiometer	Unreal signal
0206	Valve potentiometer	Short circuit at plus
0206	Valve potentiometer	Stopping/ Short circuit at mass
0206	Valve potentiometer	Short circuit at mass
0206	Valve potentiometer	Stopping/ Short circuit at plus
020A	Engine temperature sensor	Stopping/ Short circuit at plus
020A	Engine temperature sensor	Short circuit at mass
020A	Engine temperature sensor	Unreal signal
020B	Air temperature sensor	Stopping/ Short circuit at plus
020B	Air temperature sensor	Short circuit at mass
020D	Oxygen sensor	Short circuit at mass
010D	Oxygen sensor	Short circuit at plus
0219	Regulator Lambda( $\lambda$ )	Poor mixture
0219	Regulator Lambda( $\lambda$ )	Rich mixture
0231	Mixture adapting	Adapting to the lower limit
0231	Mixture adapting	Adapting to the upper limit
0303	Rotation sensor	Missing of synchronizing PMS
463A	Carbon canister purging valve	Active
FFFF	Electronic control unit	Damaged digital component

### DISMOUNTING

Disconnecting of the battery terminal (-).

Disconnecting of the connector coupling the control unit to the control cables of the fuel injection, as follows:

- the lock (1) is pulled arrow-sense;
- the connector is turned around point (2), arrow-sense (a), until its disconnection;
- the fixing screws of the electronic control unit on the right bumper column are dismounted.



### REMOUNTING

Reverse the above mentioned operations.

Functioning tests (system testing).

### **WARNING !**

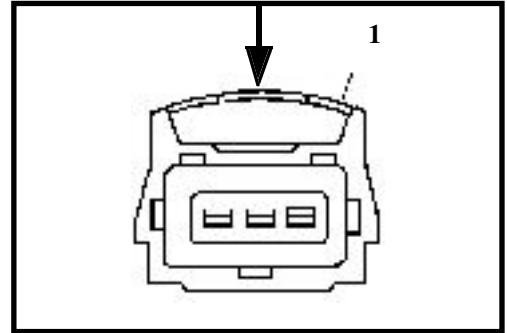
*When manipulating the electronic control unit, you should avoid mechanic shocks and above 85 °C heating. You should also avoid any dust or other impurities on the contacts of the control unit and of the connector; these could lead to signal errors.*

*The control unit should be connected or disconnected only after battery terminal (-) disconnection.*

**DISMOUNTING**

The connector is disconnected from the rotation sensor by pressing the fuse (1), arrow-sense and then it is dismantled.

The fixing screw of the sensor on the clutch case is dismantled.

**REMOUNTING**

Reverse the above mentioned operations.

Functioning tests (testing of the rotation sensor functioning).

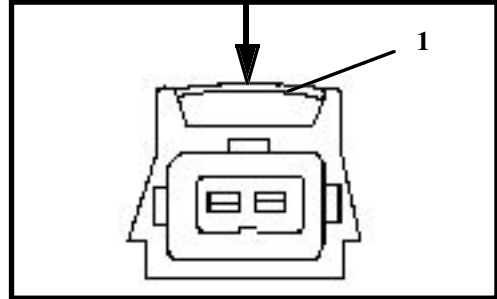
**WARNING:** In order to avoid its damaging, the sensor should be placed in the clutch case by pushing, not by hammering.

**The tightening strength of the fixing screw =  $8 \pm 2$  Nm.**

**DISMOUNTING**

The injection control cables from the sensor are disconnected by pushing the fuse (1), arrow-sense and by dismantling it.

The sensor is dismantled.

**REMOUNTING**

Reverse the above mentioned operations. The cooling and the checking of the cooling liquid level in the gas vessel are to be done.

Functioning tests (testing of the engine temperature sensor functioning).

**WARNING!** *Avoid bumping the sensor.*

*The tightening of the sensor to the couple = max. 18 Nm.*

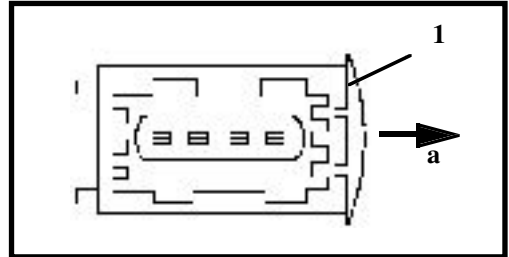


**DISMOUNTING**

The sensor coupling connector to the fuel injection control cables is disconnected as follows:

- the blocking valve (1) is pulled arrow-sense (a);
- the connector is dismantled.

The sensor is dismantled from the primary down tube.

**REMountING**

Reverse the above mentioned operations; when fixing the rod, its thread should be lubricated with 12 g anti-gripping grease.

Functioning tests (testing of the oxygen sensor functioning).

**WARNING!**

*In order to avoid its damaging, the sensor should be protected against mechanical shocks.*

*The tightening of the sensor to the couple = 40 – 60 Nm. Seal the gasket between the rod and the primary down tube.*

*The evacuation tubes of the burned gases should be tightened up; otherwise the oxygen sensor will not be able to detect the real noxious values.*

**DISMOUNTING**

Disconnect the battery terminal (-)

Disconnect the connector of fuel injection control cables from the coil as follows:

- push the lock (1) arrow-sense;
- disconnect the connector from the coil.

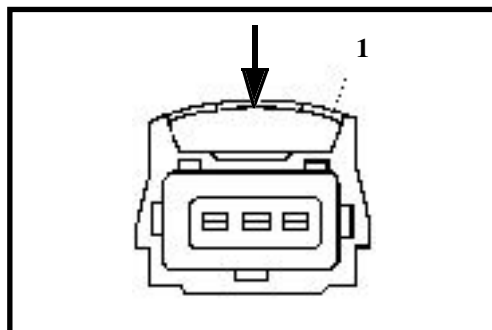
Disconnect the spark plugs cables from the coil.

Disconnect the coil fixing screws on the cylinder head closing plate.

**REMOUNTING**

Reverse the above mentioned operations.

Functioning tests (ignition testing).

**WARNING!**

*When connecting the spark plug cables respect the number marked on each coil plot and the number of the corresponding engine cylinder.*

*The high voltage in the primary and secondary circuits of the coil is very dangerous.*

### **DISMOUNTING**

Disconnect the spark plugs and the coil cables.

### **REASSEMBLING**

Connect the cables to the spark plugs and to the corresponding plots of the induction coil.  
Functioning tests (testing of ignition system)

### **WARNING!**

*When mounting the cables, they should be connected to the cylinder corresponding to the number marked near the coil plot.*

*Tightening couple for the spark plugs 20 – 40 Nm.*

CHARACTERISTICS

Cooling system with under pressure liquid in the circuit, mechanical fan driven by belt and radiator core type, with vertical basins.

COOLING FLUID QUANTITY

ENGINE	QUANTITY ( litres )	QUALITY	PARTICULARITIES	REMARKS
102; 106	6	Type C	Protection up to - 40°	Mixture: 50% concentrated antifreeze + 50% water distilled
		Type D GLACEOL RX		

**NOTE:**

*The vehicles, which are using the type D cooling fluid, have a label stacked on the expansion vessel as follows:*

**ATTENTION !**

*Use only cooling fluid type DACIA GLACEOL RX type D.*

The D-type antifreeze has a yellow colour.

For the engines variants (with type C antifreeze) it is forbidden the use of type D antifreeze because the type D antifreeze is damaging the cooper gaskets from the cylinders jackets lower part and compromising the sealing.

It is forbidden the use of type C antifreeze for the engines with cooling fluid type D.

THERMOSTAT

COUNTRY TYPE	OPENING START ( ° C )	OPENING END ( ° C )	BORE ( mm )
Warm countries	76	87	7
Cold and temperate countries	87	100	7,5

Check :

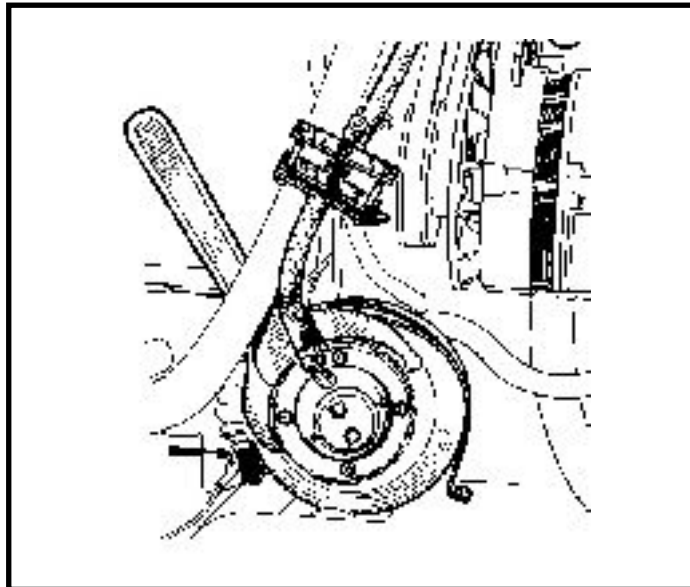
- the tightness of the rings;
- the tightness of the draining plugs from the engine block and from the radiator.

Dismount the radiator plug and mount in its place the **MOT 401** filling device.

Completely open the air conditioning radiator tap.

Open the water pump and the air conditioning radiator hose purges.

Fill the expansion vessel 30 mm over the maximum level mark.



Lock the radiator - expansion vessel hose by means of the **MOT 453** device.

Pour fluid in the device and fill the radiator and the circuit.

Start the engine ,accelerate it up to about **1500 rpm**.

Continue the filling of the circuit till the fluid flows in a continuous jet without air bubbles, through the aeration purges.

In this situation,close the two purges.

Dismount the device,fill the radiator and mount the plug.

Dismount the **MOT 453** device.

Check the fluid level in the expansion vessel.

## CONTROL

The cooling circuit is filled with a fluid which ensures the protection against frost, up to **- 40° C**.

The fluid is made up of a mixture of distilled or de mineralised water and antifreeze fluid as follows:

- for a protection up to **- 21° = 35 %** concentrate antifreeze fluid + **65 %** distilled water.

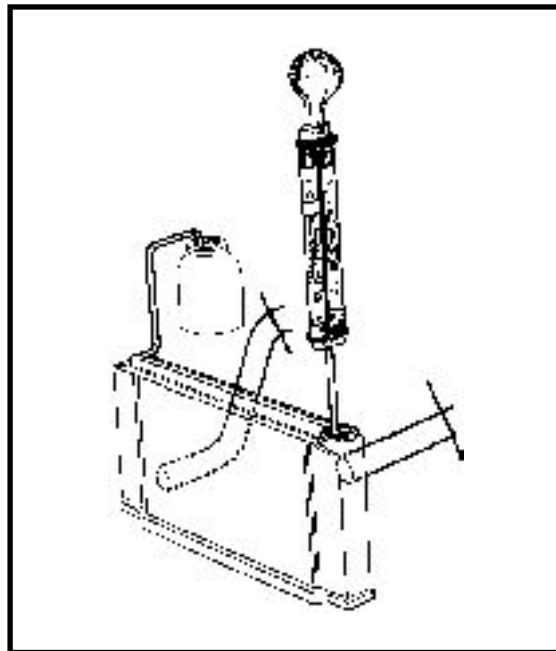
- for a protection up to **- 40° = 50 %** concentrate antifreeze fluid + **50 %** distilled water.

The protection temperature of the fluid is decreasing in case antifreeze fluid rate is over **60%**.

Remove the radiator plug and take out a certain quantity of the liquid.

Read on densimeter or refractometer scale, the protection temperature of the liquid.

Depending the liquid temperature, perform the necessary corrections as per bellow table:



**CHECKING OF THE COOLING FLUID CONCENTRATION**

Protection up to - 21° C Warm countries		Protection up to - 40° C Cold countries	
The value of protection temperature red on thermal densimeter	The fluid quantity (liters) which is replaced with concentrated antifreeze	The value of protection temperature red on thermal densimeter	The fluid quantity (liters) which is replaced with concentrated antifreeze
- 5° C	1,6	- 5° C	2,6
- 10° C	1,1	- 10° C	2,3
- 15° C	0,7	- 15° C	1,9
- 20° C	0,2	- 20° C	1,6
		- 25° C	1,2
		- 30° C	1,0
		- 35° C	0,5

**EXEMPLE**

The cooling fluid temperature during the measurements must be aprox. **40° C**.

- the cooling fluid temperature: **40° C**.

- the protection temperature red on thermal densimeter: **- 15° C**.

In order to have a protection of up to **- 21° C**, take out **0,7 l** of fluid and put in **0,7 l** of pure antifreeze.

In order to have a protection of up to **- 40° C**, take out **1,9 l** of fluid and put in **1,9 l** of pure antifreeze.

**IMPORTANT:**

*Do not use for cooling purpose water without antifreeze fluid addition. The water pump may be thus damaged.*

## CHECKING OF THE COOLING CIRCUIT TIGHTNESS AND TAR RING OF THE EXPANSION VESSEL VALVE

### 1. CHECKING OF THE CIRCUIT TIGHTNESS

Mount the **MS 554** device instead of the radiator plug.

Open the heating tap.

Warm the engine till the thermostat opens.

Clamp the radiator - expansion vessel hose by means of the **MOT 453** device.

By means of the **MS 554** device, pressure is created in the circuit, the value of the pressure being 0,1 bar higher than the value marked on the expansion vessel valve (**0,8 +/- 0,1 bar**).

The pressure must not go down.

If the pressure in the circuit is going down, check :

- the tightness of the rings;
- the radiator;
- the water pump;
- the cylinder head.

Lock the pump heating radiator ducts.

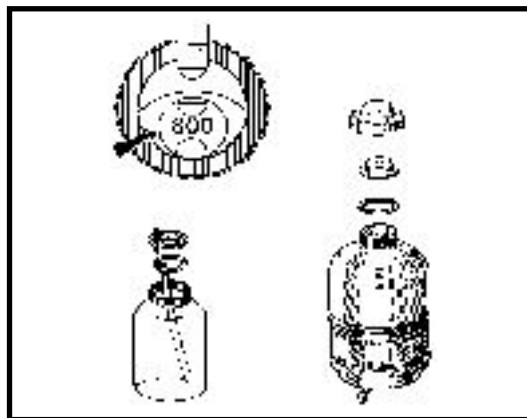
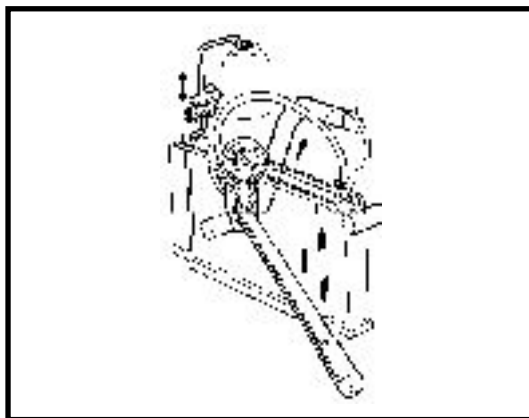
Create pressure in the circuit:

- if the pressure is not decreasing, it means that heating radiator is defective; check it and replace it if required;

- if the pressure is decreasing, dismount the oil sump, create pressure in the circuit and check if there are any fluid leaks at the bottom of the jackets; if there are any leaks, replace the gaskets from the bottom of the jackets and if there are not leaks, replace the cylinder head gasket.

Decompress the circuit, dismount the **MOT 453** clamping device and **MS 554** device.

Check and refill with fluid the expansion vessel up to required level.





**2. CHECKING OF EXPANSION VESSEL VALVE TAPPING**

After checking the tightness of the cooling circuit, release the radiator-expansion vessel hose.

Create pressure in the circuit, value of the pressure shall be **0,1 bar** higher than the value marked on the valve.

In this situation, the pressure must decrease. If the pressure does not decrease, the valve is blocked and shall be replaced. The valve shall also be replaced in case it permits the fluid passing

The mark on the expansion vessel valve is in milibars (**800 = 0,8 bars**).

## COOLING RADIATOR

**DISMOUNTING**

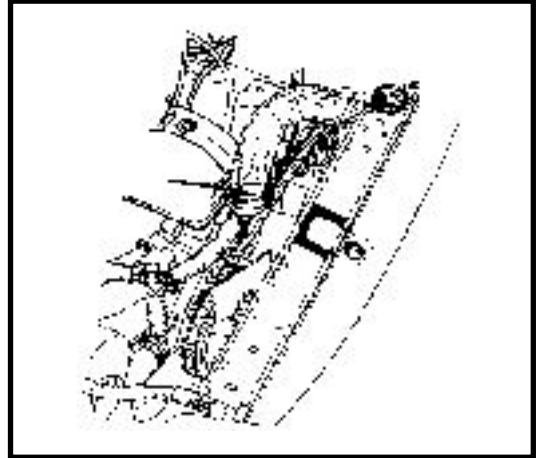
Disconnect the battery.

Clamp the radiator hoses by means of the **MOT 453** device.

Drain the radiator and recover the cooling fluid.

Dismount the radiator hoses.

Unscrew the fixing screw and take out the radiator.

**REMOUNTING**

Check the presence of the lower buffers.

Mount the radiator

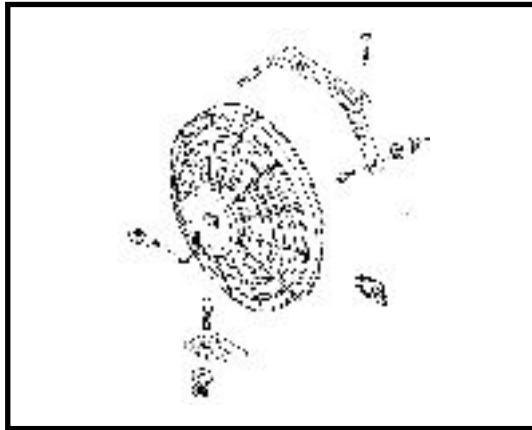
Mount the upper buffer and tighten the fixing screw.

Mount the hoses and tighten the collars.

Dismount the **MOT 453** device.

Perform the filling and aeration of the cooling circuit.

( for A.C. )



#### **DISMOUNTING**

Disconnect the battery.  
Drain the cooling system.  
Drain the A.C system.  
Disconnect the hoses from the radiator.  
Disconnect the hoses from the condenser.  
Disconnect the G.M.V connector..  
Dismount the radiator attachment screws on the vehicle body..  
Detach the radiator – condenser – cooling GMV assembly  
Dismount the G.M.V attachment screws on the condenser.  
Take out the G.M.V

#### **REMOUNTING**

Perform the same operations in the reverse order.  
Fill up the A.C system with freon ( refrigerant ) and check for leakage.  
Perform operation tests with running engine after A.C starting.

**NOTE: The GMV thermocouple may not be repaired ;It is located on the radiator.**

The G.M. V. thermocouple is located on the lateral right side of the radiator, attached on this. The tightening moment is **5 daNm**.

It has a double purpose:

- it controls the engine cooling G.M.V. starting, by means of a relay, when the temperature of the cooling fluid reaches to **95° C** ( stage I ) and its stopping, when the temperature is lowering under **90° C**.

- it controls the uncoupling of the AC compressor if the cooling fluid temperature reaches until to **105° C** ( stage II ) and permits its coupling when the temperature is lowering under **100° C**.

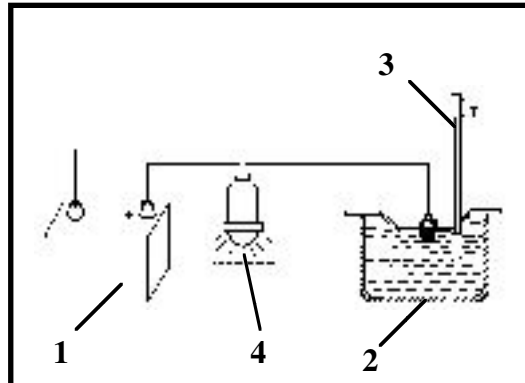
The thermocouple operation is performed in two stages of temperature, as follow:

- stage I ( between the posts B and A ) - coupling at **95° C** and uncoupling at **90° C**.

- stage II ( between the posts ( B and C ) - coupling at **105° C** and uncoupling at **100° C**.

In order to check the correct operation of the thermocouple, there are necessary the followings:

- a battery (1);
- a cooling fluid vessel (2);
- a thermometer for fluids between 0 – 200° C (3);
- a control lamp (4);
- a heat source.



Make an assembly according to the a.m. diagram.

Heat the fluid in the vessel.

When the liquid temperature reaches to **95 C** the lamp, connected between the posts B and A of the thermocouple should light up and shall remain so, until the temperature is lowering under **90° C**.

If the lamp does not light up at the coupling temperature or it remains lit also after the temperature lowering, under the uncoupling temperature, replace the thermocouple. Then connect the lamp at the posts B and C of thermocouple ; it should light up when the cooling fluid reaches to **105° C** and it remains lit until the temperature is lowering under **100° C**. Contrary, replace the thermocouple.

**DISMOUNTING**

Disconnect the battery.

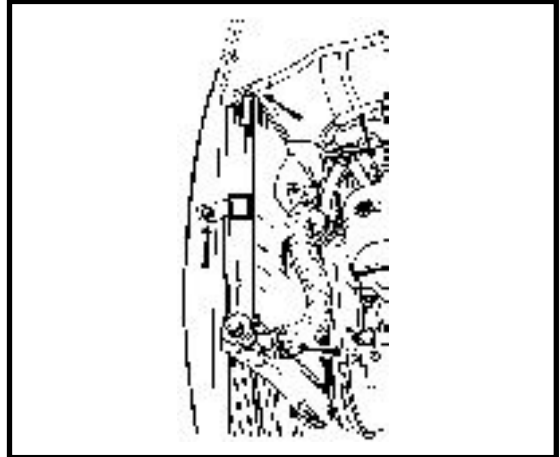
Drain the cooling circuit and recover the cooling fluid.

Dismount :

- the hoses connected to the pump;
- the fan belt;
- the fan and the water pump pulley.

Unscrew the fixing screws of the pump and dismount the pump by tapping it with a plastic hammer.

**The water pump is not to be repaired.**

**REMountING**

Clean the contact surface of the gasket and mount a new gasket on the pump.

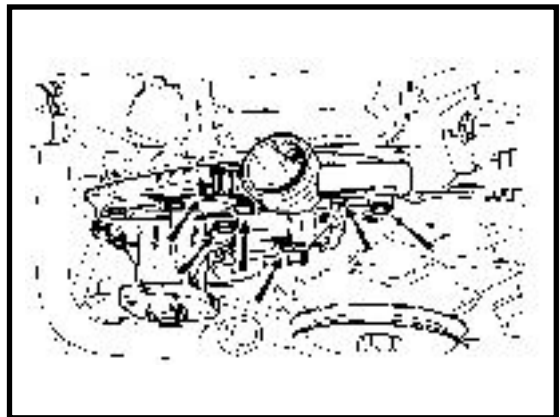
Mount the water pump pulley and the fan.

Mount the hoses and tighten the collars.

Mount the belt and adjust the tightness; maximum sag of **7,5 mm** at a pushing force of about **3 daNm**. The belt shall not be overtightened so that pump and alternator bearings are not forced.

Connect the battery.

Perform the filling and aeration of the cooling circuit.



**WATER PUMPCOVER**

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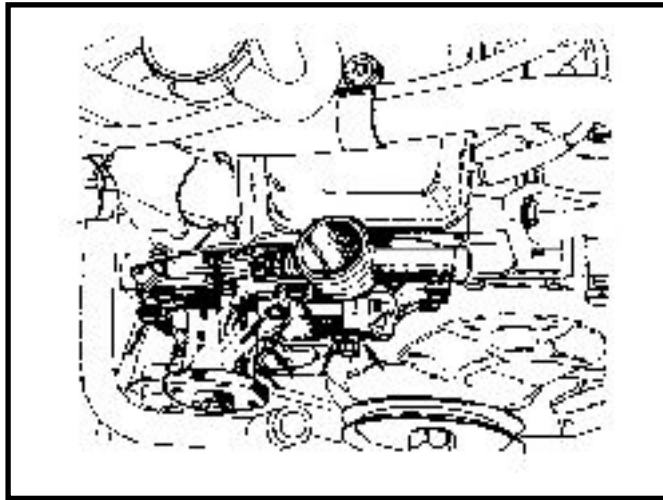
**DISMOUNTING**

Disconnect the battery.

Drain the cooling circuit.

Dismount : the pump belt, the fan and the water pump pulley.

Unscrew the fixing screws of the cover and take out the cover by slightly tapping it with a plastic hammer.

**REMOUNTING**

Clean the contact surface of the gasket and mount the cover with a new gasket.

Mount the water pump pulley and the fan.

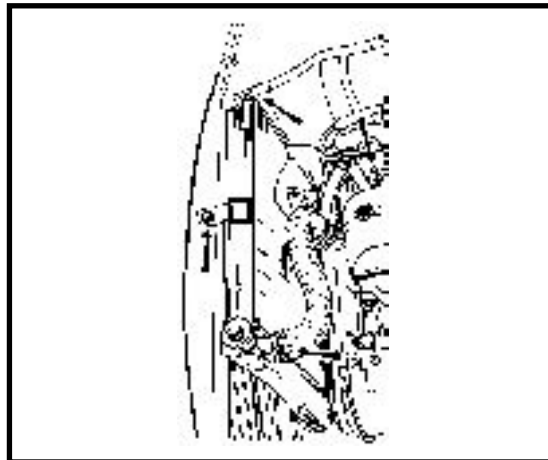
Connect the battery.

Perform the filling and aeration of the cooling circuit.

**DISMOUNTING**

Loosen the tightening ring and dismount the pump hose

Loosen the tightening ring of the thermostat and dismount the thermostat.



**CHECKING OF THE THERMOSTAT OPERATION**

Pour in a vessel a convenient quantity of cooling fluid.

Check the fluid temperature by means of a thermometer.

The opening temperature is :

THERMOSTAT	OPENING TEMPERATURA		BORE ( mm )
	OPENING START ( ° )	OPENING END ( ° )	
Warm countries	76	87	7
Cold and temperate countries	87	100	7,5

**REMOUNTING**

Mount the thermostat in the hose and tighten the fixing ring. The thermostat is placed in the hose with the cylindrical part.

Mount the hose on the pump and tighten the fixing ring.

Perform the filling the aeration of the cooling circuit.

## EXHAUSTASSEMBLY

The exhaust assembly ensure the evacuation of the burnt gases issued during the engine running and reduction of both noise level and dangerous emissions.

The assembly is composed of :

- downtake pipe (1);
- pipe and expansion chamber (8);
- intermediate pipe (4);
- silencer (7).

For vehicle equipped with injection system the downtake pipe is equipped with catalyst (11) which has the purpose of pollution emissions reduction.

**DISMOUNTING**

To dismount the silencer assembly perform the following operations :

Loosen the collar (6) between the intermediate pipe (4) and the silencer (7).

Dismount the two elastic rings (5) for attaching the back part of the silencer.

Dismount the silencer by throw it towards back.

To dismount the intermediate pipe (3) perform the following operations:

Loosen the collar (4) of fixing the intermediate pipe with the expansion chamber (8).

Dismount the two elastic rings (5) for attaching the intermediate pipe and take it out by turning and pulling it back.

To dismount the expansion chamber assembly perform the following operations:

Loosen the collar (9) between the expansion chamber assembly (8) and the primary downtake pipe (1).

To dismount the downtake pipe perform the following operations:

Dismount the engine shield.

Unscrew the right crossbar fixing screw, loosen the fixing screw in the left part and rotate the crossbar.

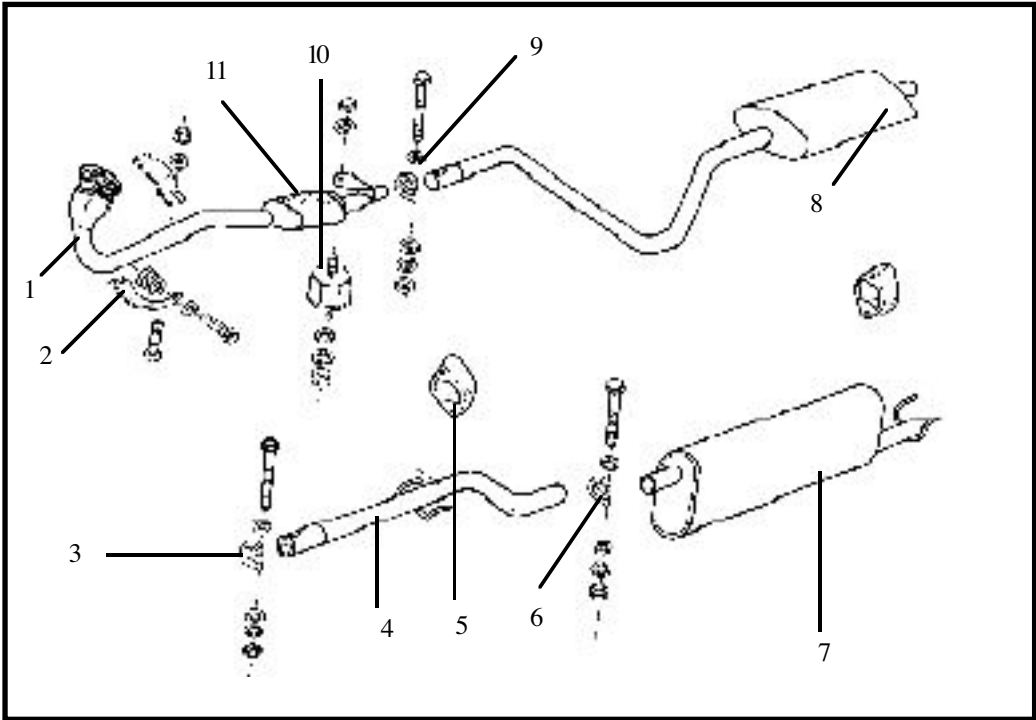
Dismount the fixing half collars (2) of the downtake pipe (1).

Dismount the attachment nuts of the downtake pipe on the exhaust manifold flange.

Dismount the elastic buffer **RON** (10)

Take out the downtake pipe.





**REMOUNTING**

Perform in reverse order the dismounting operations.

## FUEL TANK ASSEMBLY

**DISMOUNTING**

In order to dismount the fuel tank the following operations are to be performed:

Disconnect the battery.

Drain the fuel tank (1).

Disconnect the rear wiring from the tank cap.

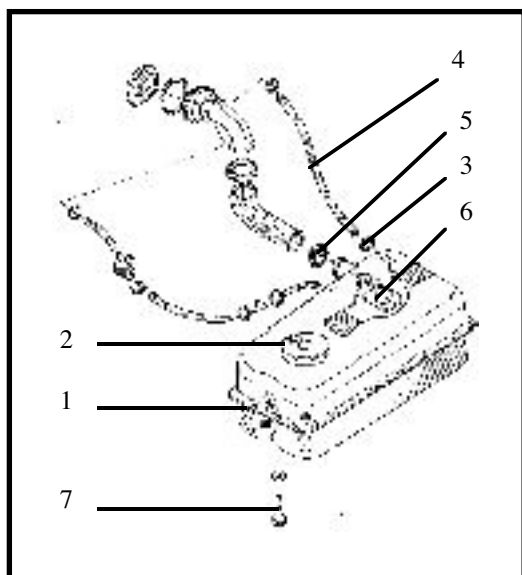
Dismount the fuel pump (2).

Dismount the hose fixing ring (3) on the air exhaust duct (4) for Dacia 1304 Pick-up, respectively the sealing gasket (8) for Dacia 1304 Dropside.

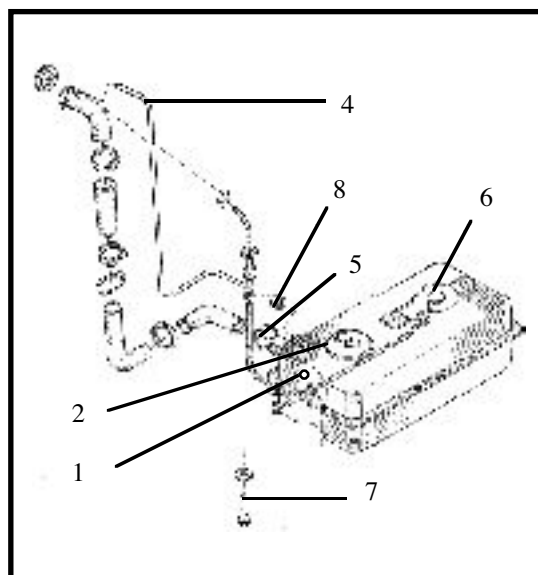
Dismount the fixing collar (5) of the fuel duct on the lower filling hole.

Dismount the anti-turning valve (6).

Dismount the fixing washers (7) of the fuel tank on the car body.



Dacia 1304Pk.



Dacia 1304 Pl.

**REMOUNTING**

Perform in reverse order the dismounting operations.

## PARTICULARITIES

The electric fuel pump (picture 2) is fixed on the tank, being immersed in fuel and is commanded by the computer, by means of the fuel pump relay (R1). When contact is on, with the key in the position M (engine), but without starting the engine, the pump will be fed with electricity only for 3-4 sec. The pump will permanently flow only when the computer is receiving signal from the rpm sensor and must ensure a minimum flow of

**1 - 1,1 l/min.** and a pressure of **1-1,1 bars** at 12 V. The cause of an insufficient flow may be the low feeding tension of the pump or a dirty fuel filter.

In case it is defective the pump is not to be repaired but replaced.

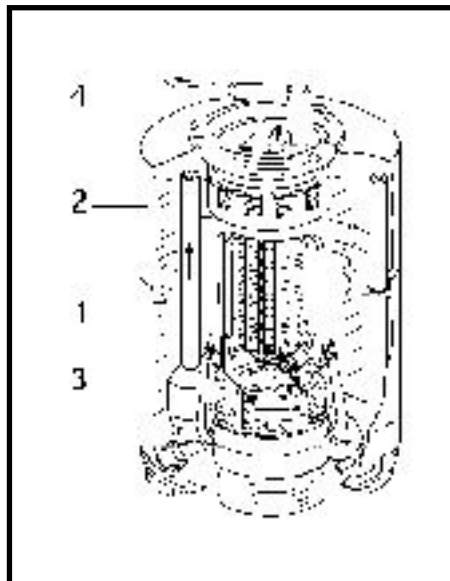
**ATTENTION!**

*In the feeding system, the fuel remains under pressure even after stopping of the engine; in case of hoses disconnecting, place a cloth material next to the connection so that fuel does not reach the hot areas of the engine.*

The flow measurement is done as follows:

- connect the return from the injector valve body to a hose which will flow fuel in a gauged vessel of 2000 ml;

- feed directly the pump during 1 minute, starting the engine or by by-passing the connector 30 and 87 of the fuel pump relay (R1), with the engine stopped and contact off.



(dismounting the tank from the vehicle not required)

#### DISMOUNTING

Unscrew the fixing screws of the fuel tank visiting cap.

Disconnect the rear wiring from the tank cap.

Dismount the fixing rings of the hoses and disconnect the hoses from the tank cap.

Dismount by turning counter clockwise direction, the blocking ring of the tank cap.

Lift a little bit the tank cap, to enable unlocking the fixing clamp of the pump support in the protector vessel; unlock the clamp and take out from the tank its cap together with support with the electric pump and the fuel level transmitter.

Disconnect the feeding wiring from pump and fuel level transmitter.

Dismount the fixing ring of the hose going to the pump.

Unscrew the fixing screws of upper and lower rings of the fuel pump.

Take out the pump from the collars with gaskets.

#### REMOUNTING

Perform in reverse order the dismounting operations.

#### ATTENTION:

*When mounting, good fixing rings are to be used and these will be well tightened. The feeding wiring terminals of the pump and of the fuel level transmitter shall be well fixed, to enable perfect electric contacts. The maximum applied force on connectors terminals on axial direction of the pump shall not exceed 80 N.*

**(dismounting the tank from the vehicle not required)**

#### **DISMOUNTING**

Unscrew the fixing screws of the fuel tank visiting cap.

Disconnect the rear wiring from the tank cap.

Dismount the hoses fixing rings and dismount the hoses from the tank cap.

Dismount, by turning counter clockwise direction, the fixing ring of the tank cap.

Lift a little the tank cap, to enable unlocking the fixing clamp of the pump support in the protector vessel; unlock the clamp and take out from the tank its cap together with support with the electric pump and the fuel level transmitter.

Disconnect the wiring of the fuel level sensor.

Unscrew the sensor fixing screws.

#### **REMOUNTING**

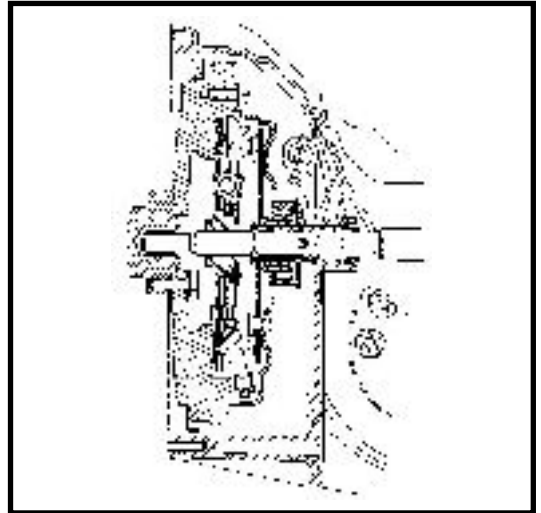
Perform in reverse order the dismounting operations.

#### ***ATTENTION!***

***When mounting, good fixing rings are to be used and these will be well tightened. The feeding wiring terminals of the pump and of the fuel level transmitter shall be well fixed, to enable perfect electric contacts. The maximum applied force on connectors terminals on axial direction of the pump shall not exceed 80 N.***

***The blocking ring of the fuel cap shall ensure the perfect sealing of it.***

Dry single disk clutch.  
Membrane mechanism.  
Clutch disk with elastic hub.  
Disk thickness: **7,4 mm**  
Clutch stroke at the lever end: **2,5 - 3,5 mm**

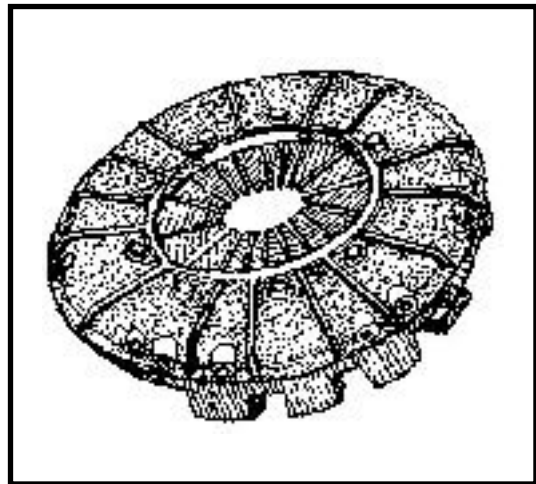
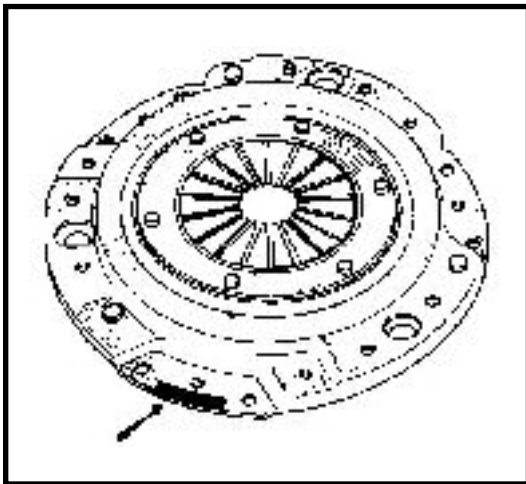


# CLUTCH IDENTIFICATION

The clutch type is marked on the front side of the mechanism.

**Φ 180 DBR CLUTCH**  
**Φ 200 DBR CLUTCH**

**Φ 200 GR CLUTCH**



## CLUTCH DISMOUNTING- REMOUNTING

**DISMOUNTING**

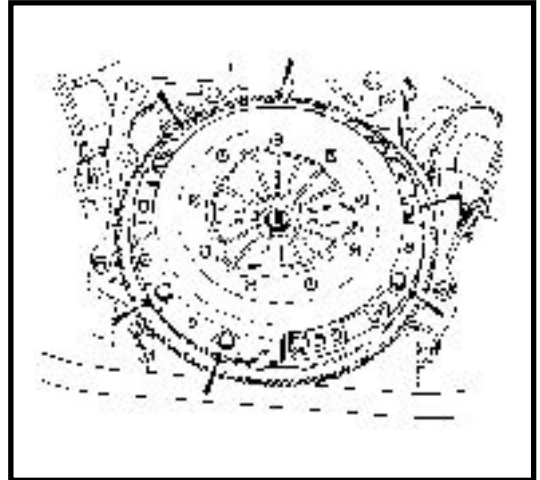
Dismount the gearbox. from the vehicle.

***ATTENTION!***

*For the injection engines, before gearbox dismounting from the vehicle, dismount the RPM transducer in order to avoid its damaging.*

Unscrew the clutch mechanism attachment screws and dismount the clutch.

Check the state of the component parts and replace the used or defective ones.

**REMOUNTING**

Degrease the flywheel friction surface.

Place the clutch disk with the damping flange towards the gearbox.

Center the clutch disk by means of the **AMB 319** mandrel (for  $z = 20$ ) or by means of the **AMB 320** mandrel (for  $z = 21$ ).

Place the mechanism and center it on the centering shafts.

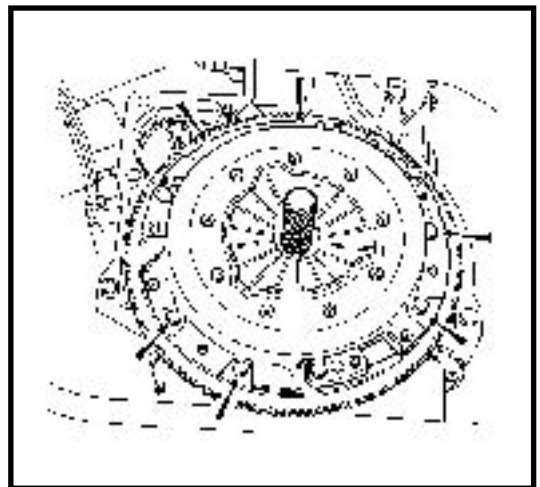
Progressively tighten the screws then tighten them at the required moment :

- M7 : 1 - 1,2 daNm;
- M8 : 1,5 - 2 daNm.

Slightly grease the diaphragm with grease **UM170 Li Ca Pb 2M**, on the area where it comes into contact with the pressure bearing.

Remount the gearbox. on the vehicle.

Adjust the clutch stroke (**2,5 - 3,5 mm** at the end of control lever).





### PRESSURE BEARING REPLACEMENT

#### DISMOUNTING

Dismount the gearbox. from the vehicle.  
Release the spring from the pressure bearing ears.  
Dismount the pressure bearing.

#### REMOUNTING

Grease the bearing guide and the clutch forksends with grease **UM 170 Li Ca Pb 2M**.

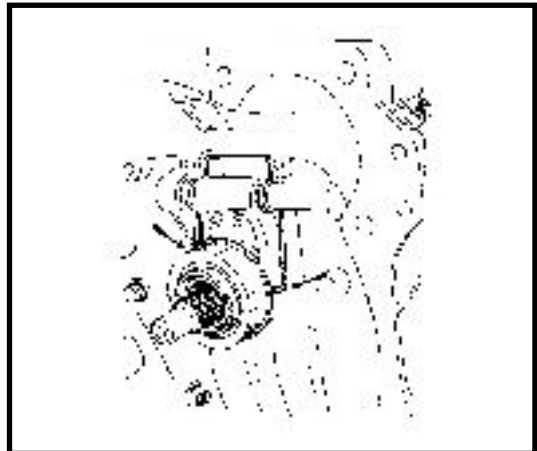
Place the new bearing.

Place the spring by introducing the ends in the bearing holes.

Slightly grease the contact surface between the diaphragm and the bearing with grease **UM 170 Li Ca Pb 2M**.

Remount the gearbox.

Adjust the clutch stroke (**2,5 - 3,5 mm** at the end of control lever).



## CLUTCH FORK REPLACEMENT

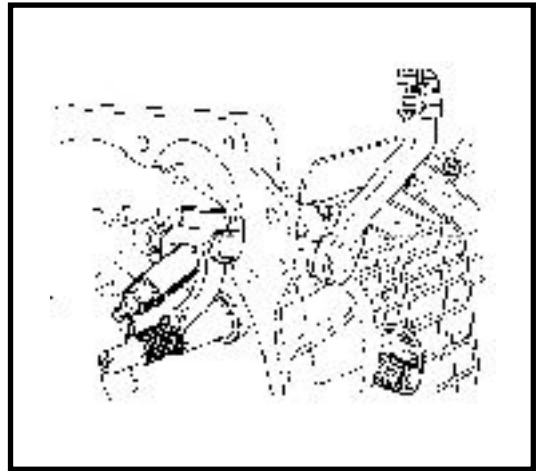
**DISMOUNTING**

Dismount the gearbox from the vehicle.

Dismount the pressure bearing.

Extract the attachment shaft of the clutch fork by means of the **AMB 384 A** extractor.

Dismount the fork spring and recover the fork and the spring.

**REMountING**

Grease the fork shaft with **UM 170 Li Ca Pb 2M**.

Introduce the shaft with the sealing bushing.

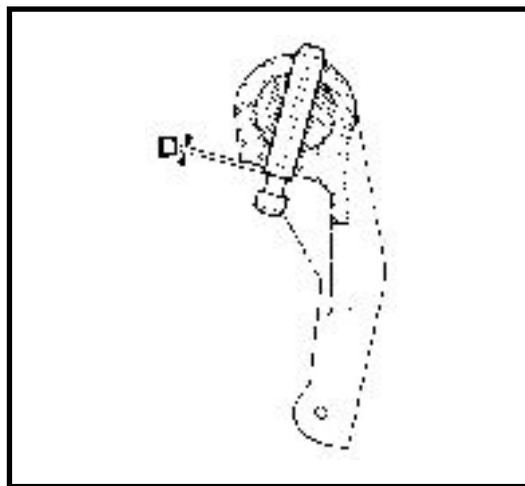
Mount on shaft the new fork and the return spring.

Mount the fork attachment pins by means of the **AMB 384 A** device, observing the value **D = 1mm**.

Mount the pressure bearing.

Remount the gearbox.

Adjust the clutch stroke ( **2,5 - 3,5 mm** to end of control lever).

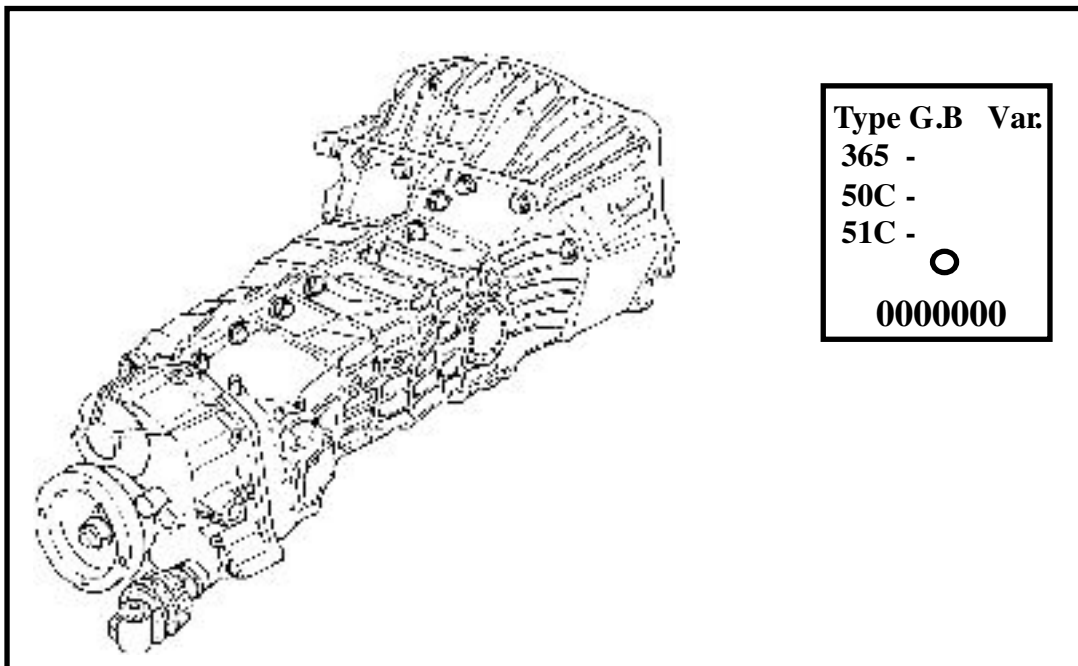


## IDENTIFICATION

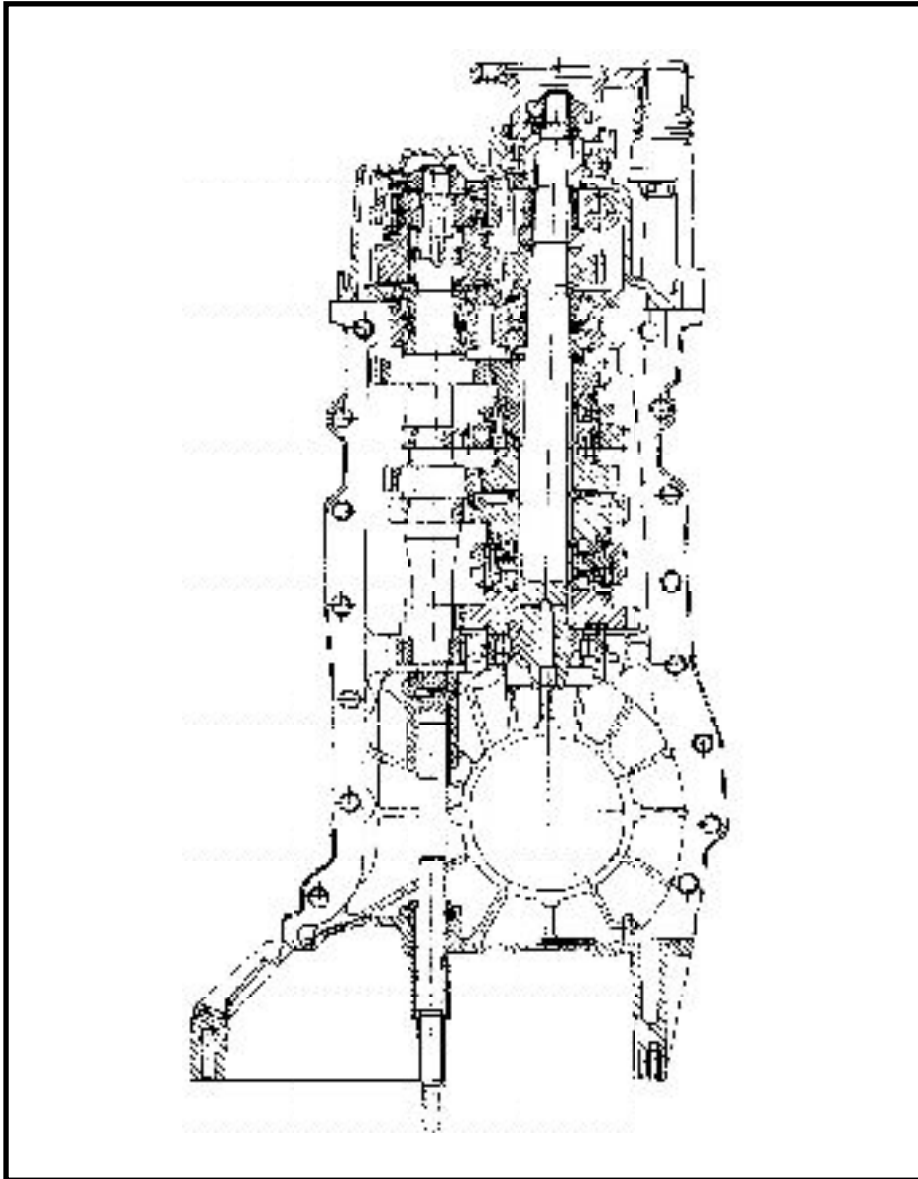
## IDENTIFICATION

Identification of the gearbox is done by means of a rectangular plate, attached to the clutch housing of the gearbox with a **3,5 mm POP** rivet.

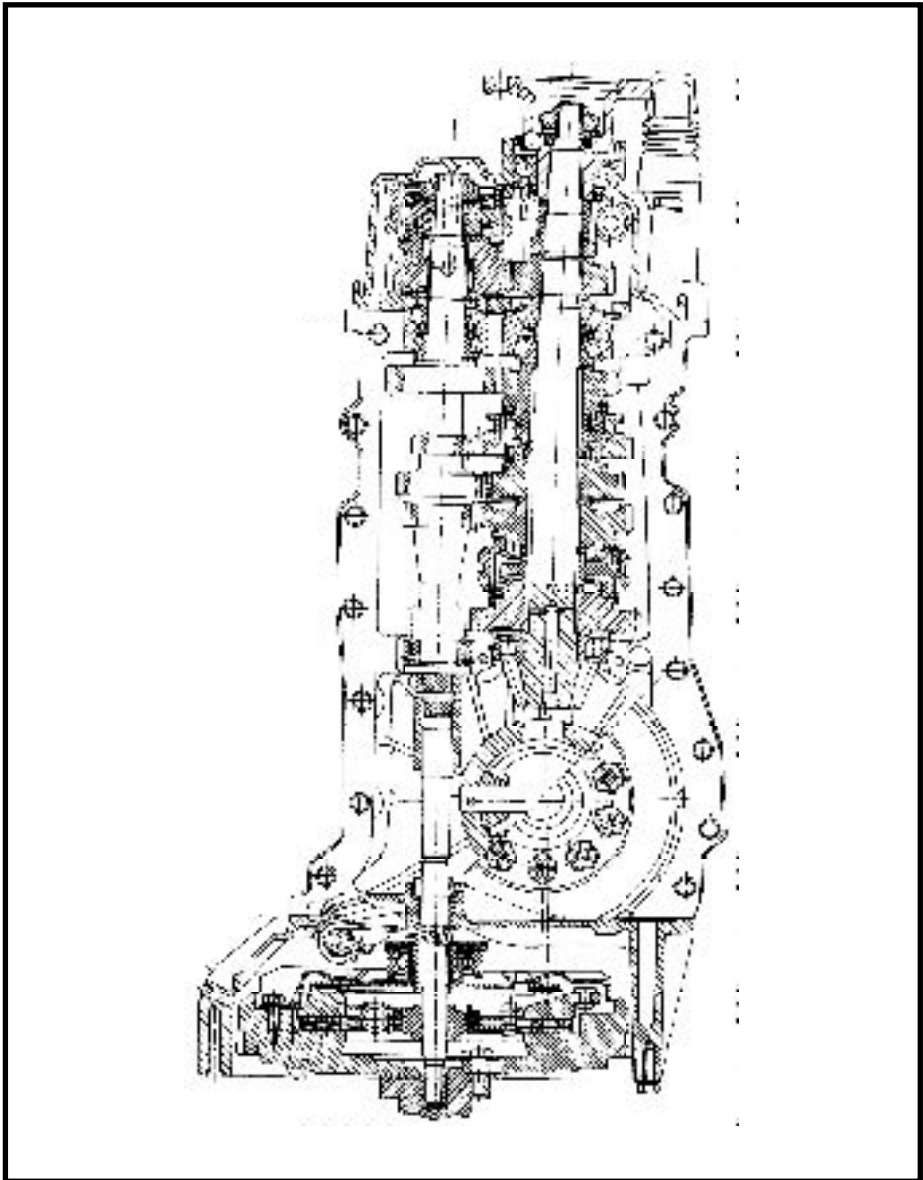
On the rectangular plate, the type, variant and fabrication serial numbers of the gearbox are marked.



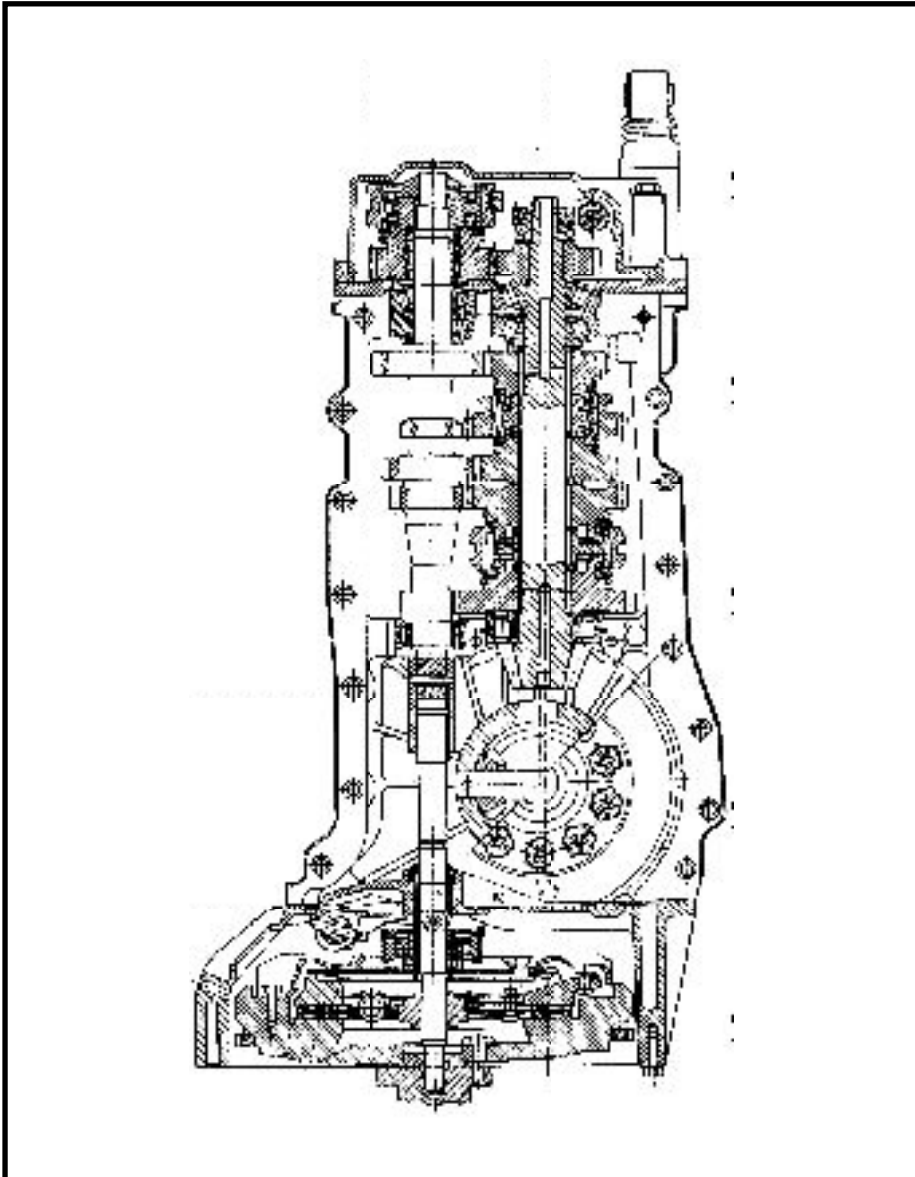
GEARBOX 50C



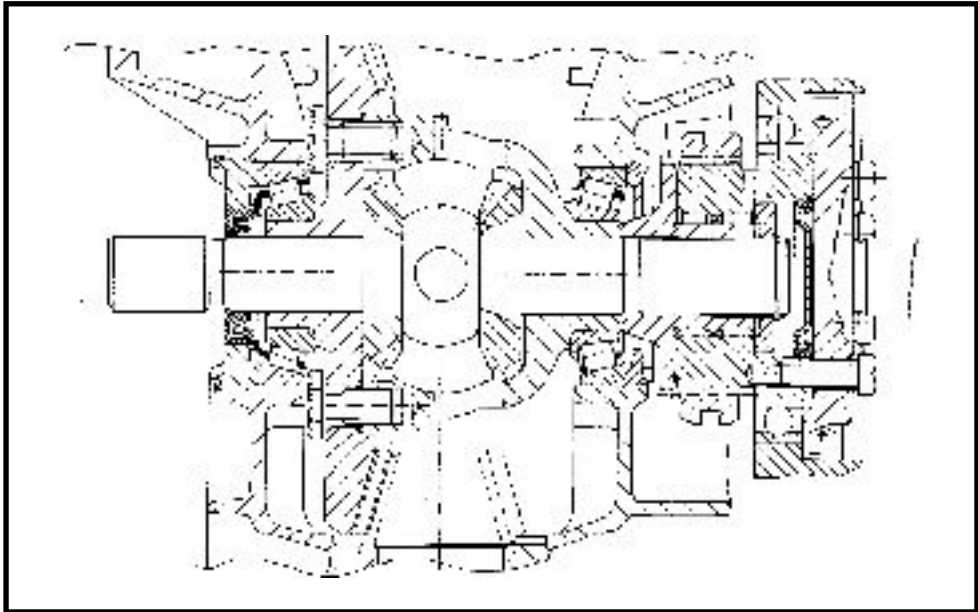
GEARBOX 51C



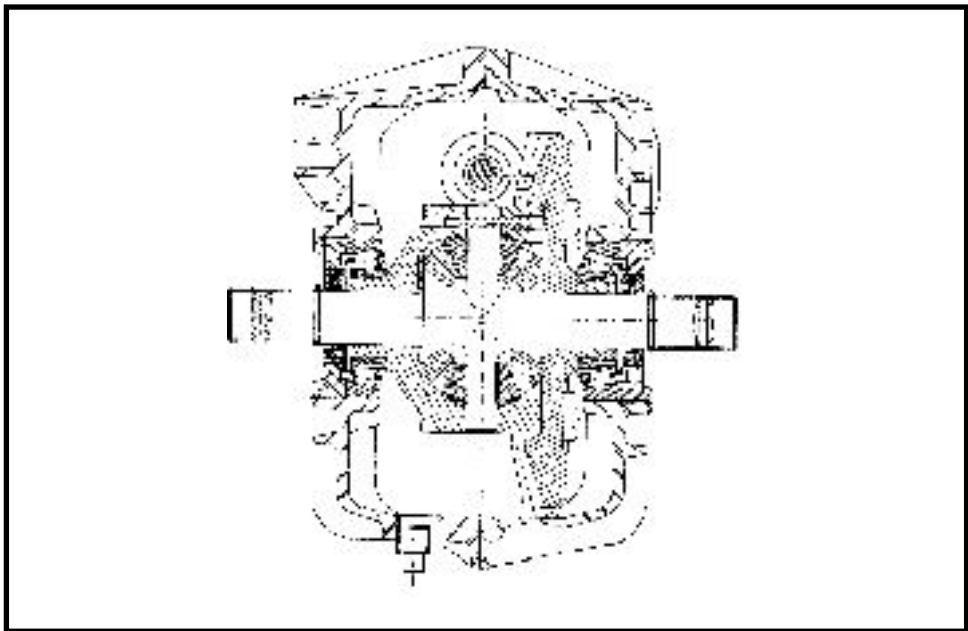
GEARBOX 365



DIFFERENTIAL 51C



DIFFERENTIAL 365



GLOSSARY

Operations to be performed.

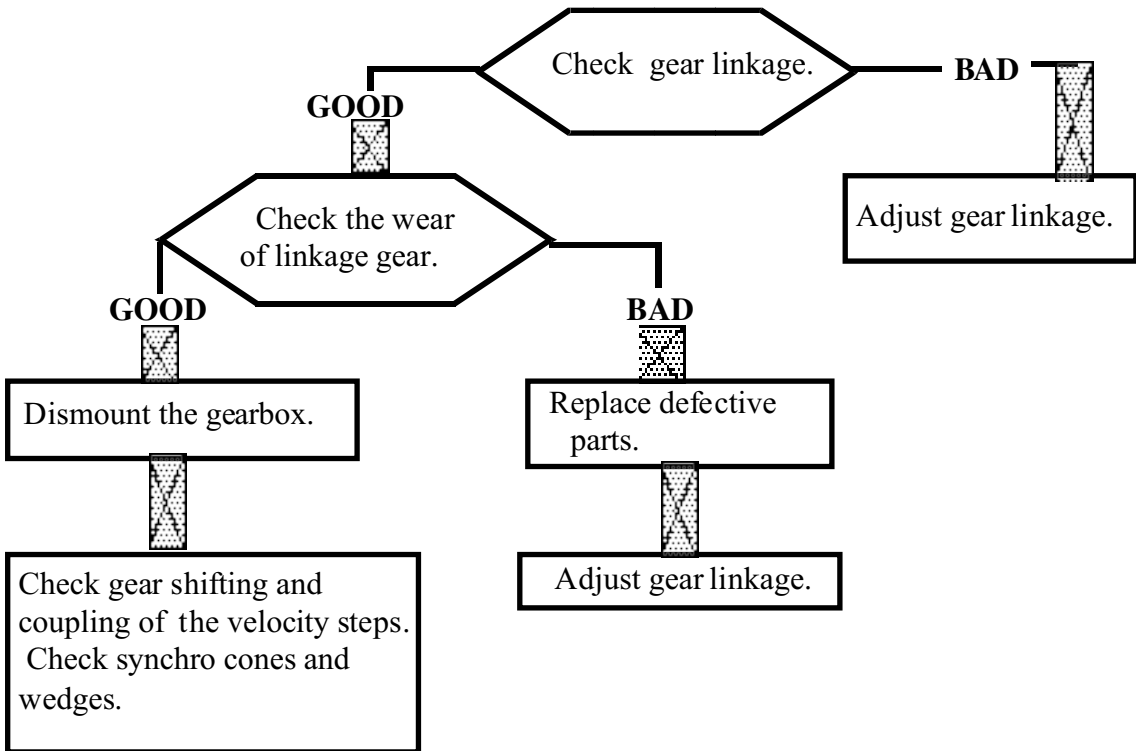
Checking

**A. NOISY GEAR SHIFTING  
(AFTER CLUTCH CHECKING)**

Dismount the gearbox.

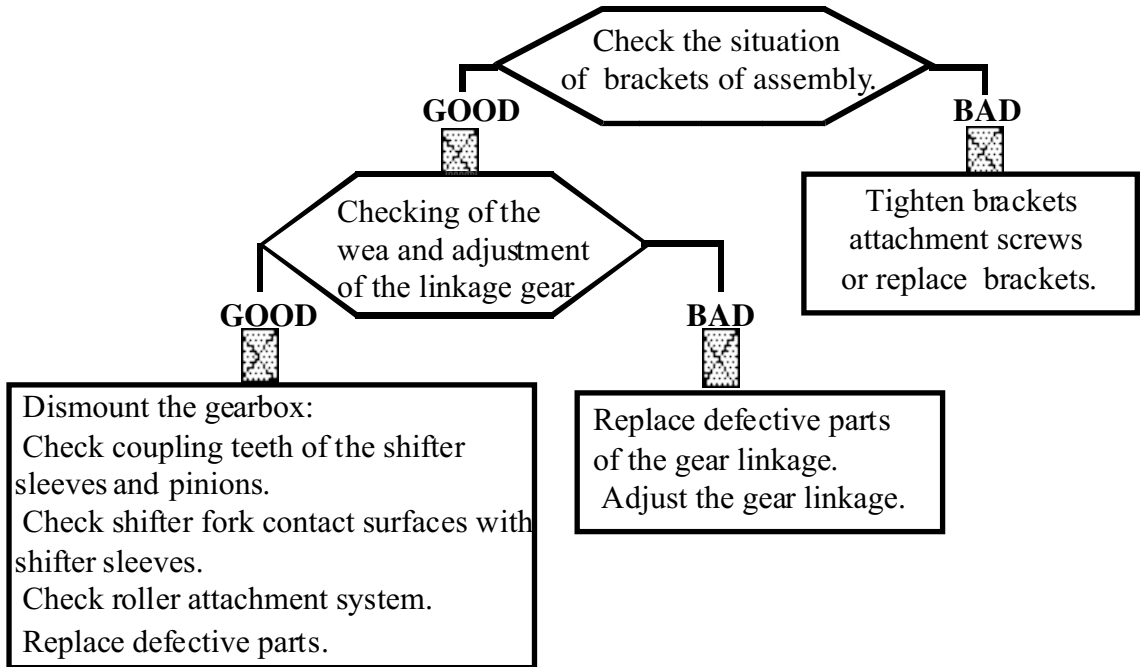
Check the synchro assembly of the velocity step :  
- friction cones of the synchro pinion and gear;  
- synchro hub, springs and wedges;  
- coupling gears of the pinion and the sliding gear.

**B. IMPOSSIBILITY OF GEAR COUPLING  
( AFTER CLUTCH CHECKING )**

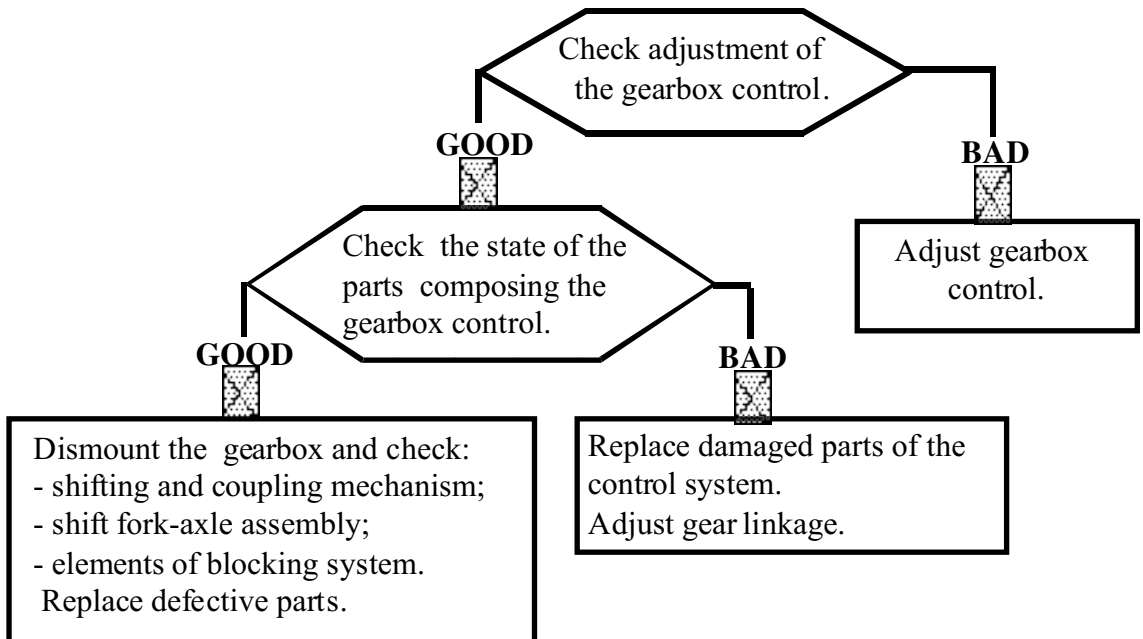




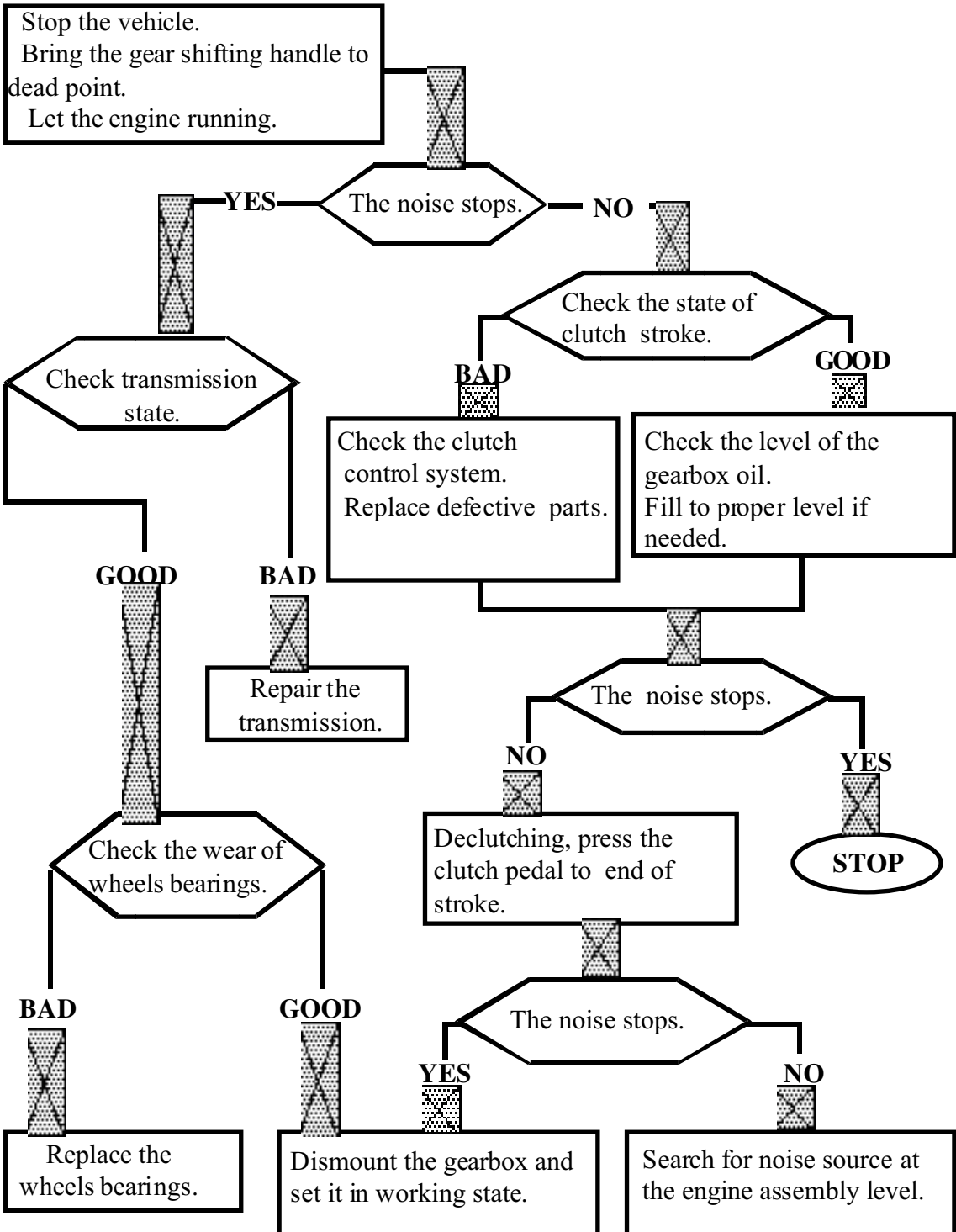
**C. SLIPS OUT OF VELOCITY STEPS OF GEAR BOX**



**D. BLOCKING IN A VELOCITY STEP**



E. UNUSUAL NOISES DURING DRIVING



CHARACTERISTICS

The **365, 50C, 51 C** gearboxes are monoblock type , mechanical in steps (5 forward steps and one reverse step).

The forward driving velocity steps are provided with Borg – Warner synchronizers.

The reverse driving step is not synchronized.

GEARBOX		CONICAL GEARS RATIO	SPEEDOMETER RATIO	NUMBER OF TEETHES	RATIO	ENGINE	CLUTCH
TYPE	VAR.						
50C	30	-	6X13	I. 42X11 II. 38X17 III. 34X23 IV. 29X28 V. 29X38 M.Î.40X13	3,81 2,23 1,47 1,03 0,76 3,07	102; 106	Φ200 GR
	32					106	Φ200 DBR
	33					106	Φ200 DBR
	78					102; 106	Φ180 DBR; Φ200 GR
51C	31	9X41	6X13	I. 42X11 II. 38X17 III. 34X23 IV. 29X28 V. 29X38 M.Î.40X13	3,81 2,23 1,47 1,03 0,76 3,07	102; 106	Φ200 GR
	37					106	Φ200 DBR
	38					106	Φ200 DBR
	73					102	Φ180 DBR
	76					106	Φ200 GR
365	32	8X33	6X12	I. 42X11 II. 38X17 III. 34X23 IV. 33X34 V. 31X36 M.Î.40X13	3,81 2,23 1,47 0,97 0,86 3,07	102 106	Φ180 DBR
	37						Φ180 DBR Φ200 GR
	13	8X33	6X12	I. 42X11 II. 38X17 III. 34X23 IV. 29X28 V. 31X36 M.Î.40X13	3,81 2,23 1,47 1,03 0,86 3,07	102 106	Φ180 DBR Φ200 GR
	17						106

Capacity gearbox (liters) : C.V. 365.....2,3

C.V. 50C.....2,2

C.V. 51C.....2,3

Oil utility: SAE 80W/90; API GL 5

**ADJUSTEMENT VALUES**

Distance between the conical gears: **59 mm.**

Differential gear bearings pre-tightening : - reused bearings : free, without clearance;  
- new bearings : **1-3 daN.**

Gear teeth clearance: **0,12- 0,25 mm;**

Clearance in differential gear: **max. 0,1mm**

**TIGHTENING MOMENTS (daNm)**



- Half crankcases assembling screws :
  - \* M7..... 1,9 - 2,4
  - \* M8..... 2,8 - 3,3
- Back cap attachment screws..... 1 - 1,4
- Clutch housing attachment screws:
  - \* M8..... 2 - 2,8
  - \* M10..... 3,2 - 4
- Reverse drive selector shaft nut ..... 2 - 2,5
- Crown attachment screws..... 9 - 11
- Speedometer endless screws..... 10 - 12
- Primary shaft nut..... 6
- Differential gear nut lock screws ..... 2,4
- Filling or emptying plug..... 2 - 2,8
- Lock nut of the speedometer fixing screw ..... 0,1 - 0,3
- Backing contactor..... 2 - 3
- Base plate attachment screws :
  - \* M6..... 1 - 1,4
  - \* M7..... 1 - 1,4
- Breather valve..... 1 - 1,9
- Shifter shaft nut..... 4 - 4,5
- Plug M16..... 1 - 1,5
- Secondary shaft flange nut..... 10 - 12
- 4X4 differential flange attachment M8 screws..... 2 - 2,8
- 4X4 differential cap attachments M7 screws ..... 1 - 1,4

INGREDIENTS

MATERIALS

Parts that are to be obligatory replaced, if they were dismantled: paper gaskets, annular oil rings, toothed crown attachment screws, speedometer endless screw, elastic pins, primary shaft nut, secondary shaft nut, reverse selector shaft nut, shifter shaft nut.

MATERIALS	USE
80W/90; API GL 5 Oil	Parts lubrication upon mounting
LOCTITE 518	Sealing : half crankcases, clutch casing, flange of differential hub (4x4)
RHODORSEAL 5661	Transmissions pins sealing
LOCTITE 577	Backing selector; plug M 16
Grease UM 170 Li Ca Pb 2M	Lubrication of knuckles and contact parts.

MAINTENANCE

The maintenance of the **365,50 C, 51 C** type gearboxes consists in repeatedly performing certain revisions, according to the performed mileage as mentioned below:

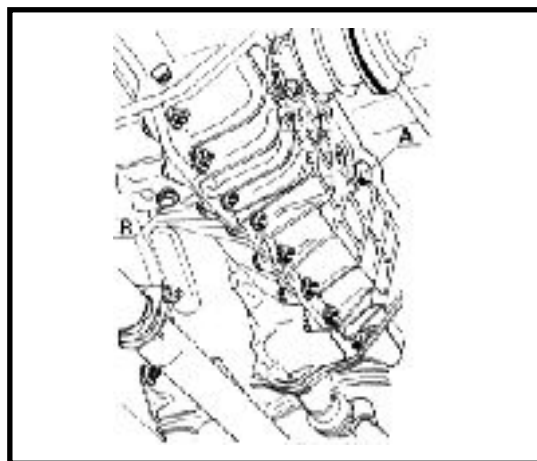
- gearbox oil replacement : is done after covering the first **800 – 1000 km** and then periodically, every **20.000 km**;
- checking of gearbox oil level – periodically, every **5000 km**.

The oil in the gearbox is replaced through the emptying (**B**) and filling (**A**) plugs.

The oil in the gearbox should reach the level of the orifice uncovered by the filling plug (**A**).

If the level is lower than that, add oil until it starts flowing through the orifice.

The plugs are tightened according to the required moment (**2,4 daNm**).



### GEARBOX DISMOUNTING – REMOUNTING FROM THE VEHICLE

**NOTE:** For the vehicles equipped with injection system, first dismantle the RPM transducer attached on the clutch casing, to avoid its damaging during gearbox dismantling.

Disconnect the battery.

Disconnect:

- starter power cable;
- supply wire of cutting relay.

Unscrew the three attachment screws of the starter shield.

Take out the starter, by drawing it along the shaft.

Unscrew the attachment screws of the gearbox upper part on the engine block.

Dismount the clutch cable.

Mount the crossbar **TF 509**, for maintaining the half front axle, between the shock absorber and the suspension lower arm shaft (**GB 365, GB 51 C**).

Place the vehicle on the elevator and lift it.

Drain the oil from the gearbox by unscrewing the threaded plug and recover it.

Dismount the front wheels.

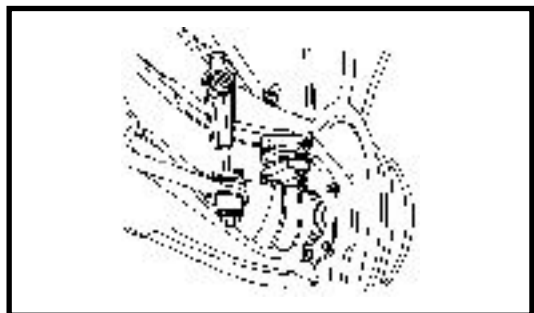
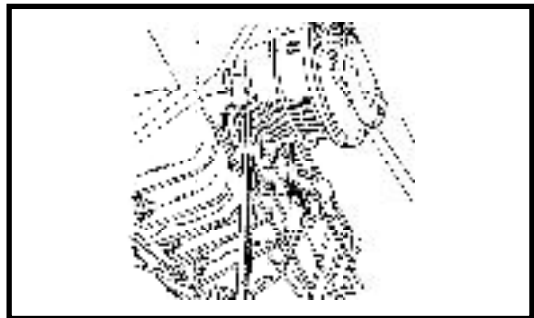
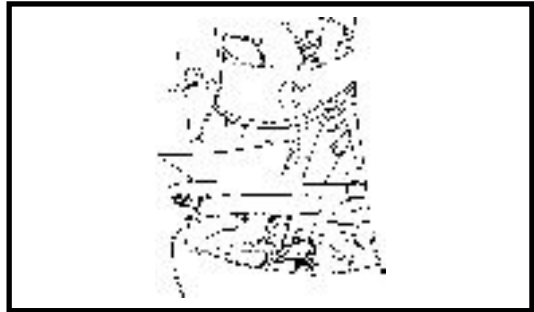
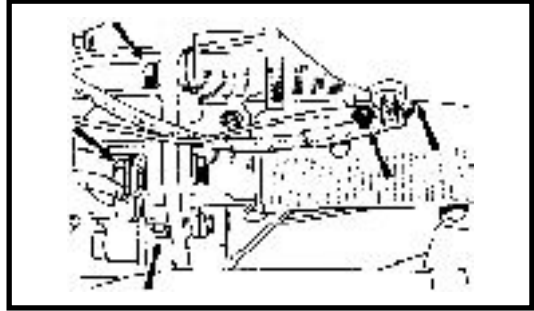
Dismount the transmission lock pins, by means of the **GB 31 B** mandrel.

Dismount by means of the **TF 476** extractor:

- the steering joint;
- the upper suspension joint.

Rock the steering knuckle support and take out the transmission off the propeller shaft.

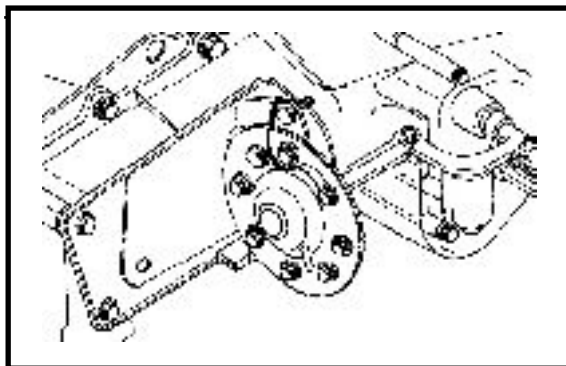
Perform the same operations for the other side of the car.



## DISMOUNTING - REMOUNTING

Disconnect the vacuum hoses and the electrical connector of the vacuumcapsule (G.B. 51 C).

Dismount the 4 attachment screws of the secondary shaft flange and rock the transmission (G.B. 51 C; 50 C).



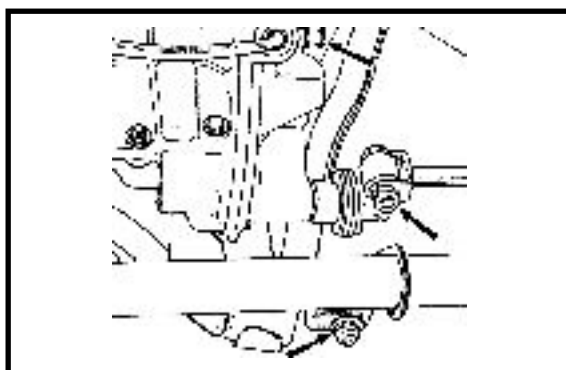
Disconnect the speed gear control by unscrewing the control auxiliary rod screws.

Unscrew the attachment nut of the exhaust pipe.

Disconnect the backward driving contact wire.

Disconnect the speedometer cable.

Lift the back part of the gearbox by means of a jack.



Dismount :

- the three crossbar attachment screws to the gearbox.

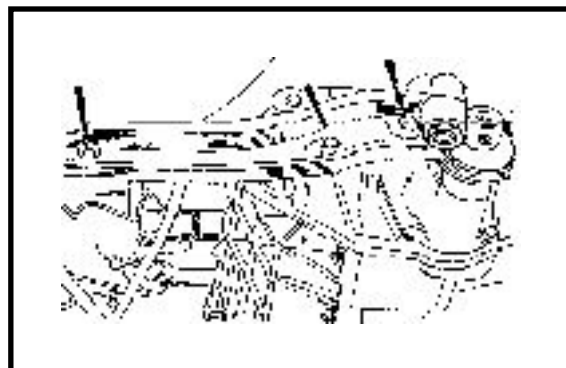
- the two crossbar attachment nuts to the longitudinal girders.

Dismount the crossbar.

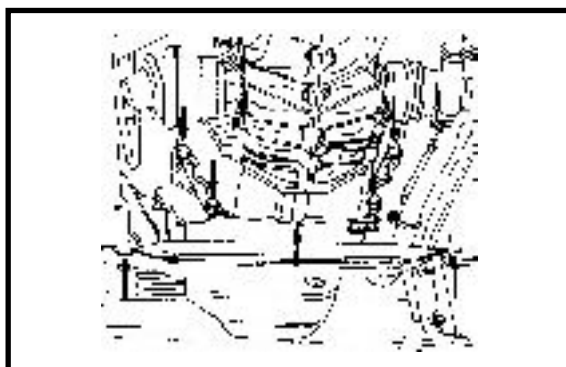
Dismount the clutch protection plate.

Dismount the two nuts attachment gear box.

Take out the box drawing it backwards.



**When dismantling the gearbox, pay attention not to catch the clutch mechanism.**



### REMOUNTING

Check the state of the centering bushing from the crankshaft end.

Grease the grooves of the clutch shaft with grease **U M 170 Li Ca Pb 2 M**.

Assembly the gearbox to the engine.

***ATTENTION! Do not catch the clutch mechanism.***

Mount the clutch shield plate.

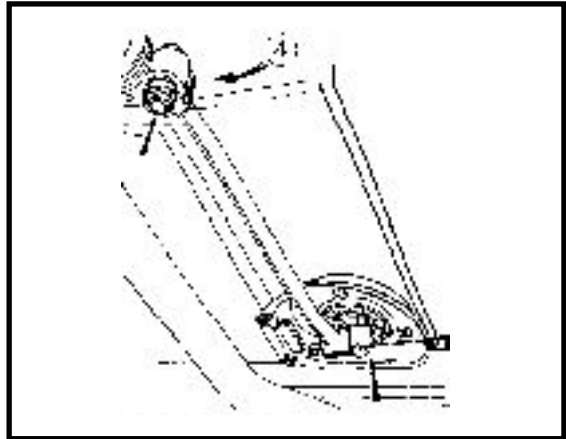
Mount the back crossbar.

Connect the electric wire of the back drive connector.

Connect the propeller shaft and tighten at the required moment ( **5 daNm** ) the 4 attachment screws **M10** (G.B. 50 and G.B. 51).

Connect:

- the speedometer cable;
- the velocity steps control.



Connect the vacuum hoses and the electrical connector of vacuum capsule (G.B. 51 C).

Grease the propellershaft grooves with grease **UM170 Li Ca Pb2M** (G.B. 365 and 51 C).

Position the transmission in correspondence with the propeller shaft pinion.

Rock the steering knuckle support, connect the transmission to the propeller shaft pinion and center it by means of the **CV 31-B** mandrel.

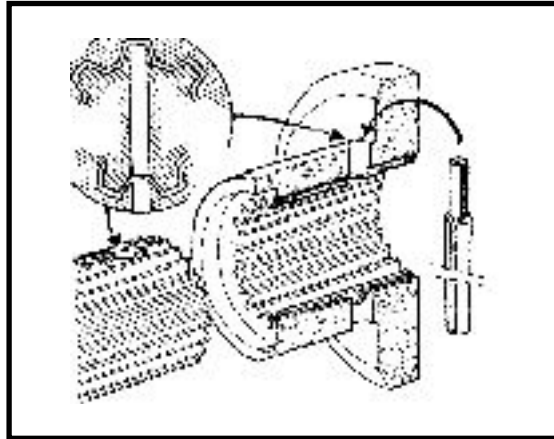


Place the new elastic pins.

The pins notches shall be oriented towards the wheel. The ends of the pins shall be sealed with **RHODORSEAL 5661**.

Mount (on both sides):

- a. the upper suspension joint
- b. the steering joint



Mount the front wheels, take the vehicle down from the elevator and tighten the wheels nuts at the required moment (**9 daNm**).

Dismount the **TF 509** support cross bar.

Mount the clutch cable with its support.

Adjust the clutch stroke (**2,5 – 3,5 mm** to the end of shifter shaft).

Adjust the velocity steps gearing.(see chapt.” Velocity steps control adjustment “).

Mount the starter and the protection shield.

Connect :

- the starter power cable ;
- the coupling relay supply wire.

Fill up the gearbox with oil **SAE 80/90 ; API GL 5**.

Check the velocity steps gearing.

Connect the battery.

Dismount the gearbox off the vehicle  
 Dismount the reverse driving lamp contact.  
 Dismount the clutch casing.



### DISMOUNTING OF THE COUPLING MECHANISM 4X4 (G.B. 51 C)

Dismount the attachment pin of the connection bolt (1) between the vacuum capsule shaft and the control lever and take out the bolt.

Dismount the vacuum capsule support from the gearbox casing.

Take out the safety washer (2) of the control lever fixing.

Dismount the control lever (3) of the front transmission.

Dismount the threaded plug (4) for stroke limiting.

Unscrew the attachment screws (5) of the deflector and flange on the differential hub.

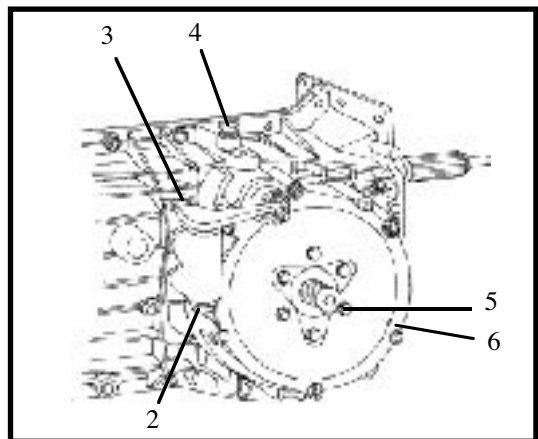
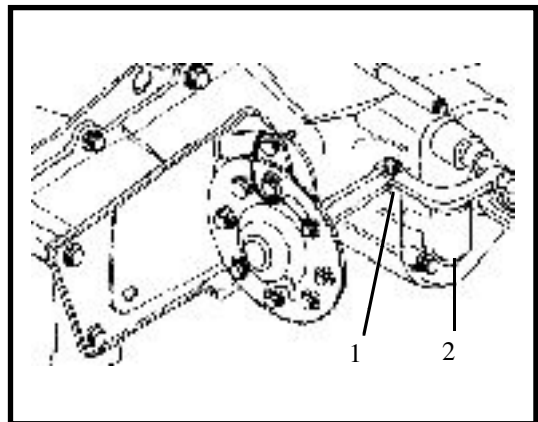
Take out the deflector and flange.

Unscrew the attachment differential cover screws (6) on half crankcase.

Take out the differential cover assembly and its paper gasket.

Dismount the bearing from the differential hub by means of an extractor (only if this is used and must be replaced).

Take out the annular oil ring from the differential cover by means of a screwdriver.



## REPAIR

Clean the annular oil seal place from the differential cover.

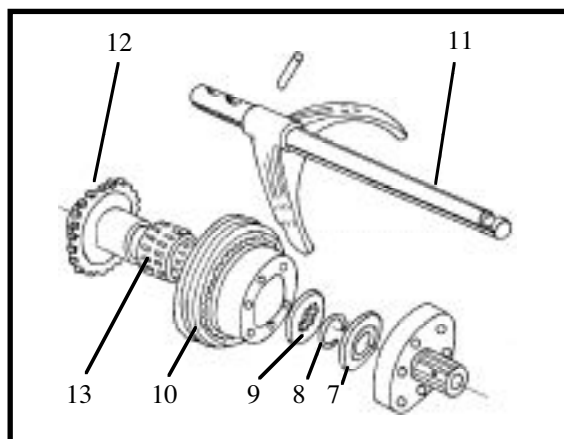
Take out the cover (7) from the hub differential.

Dismount the safety ring (8) from the propeller shaft gear.

Take out slotted shim (9).

Extract the hub-gear assembly (10) together with fork and shaft (11).

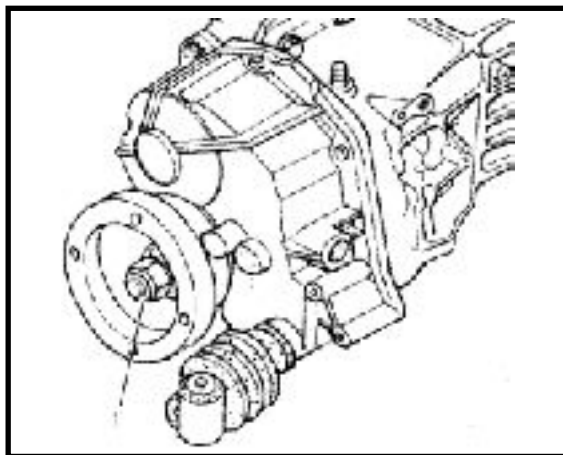
Take out the claw (12) and the pins housing (13).



### DISMOUNT THE VELOCITY STEP V

Dismount the flange attachment nut flange on secondary shaft and take out the flange (G.B. 50C , 51 C).

Bring the gearbox to the dead point and dismount the back cap.

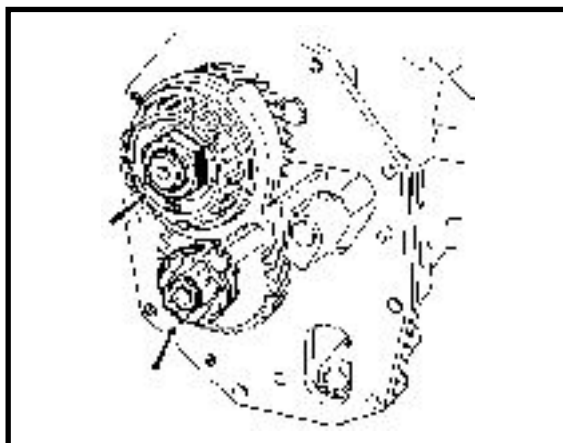


Engage the velocity step V and the reverse one.

Unscrew the primary shaft nut.

Bring the gearbox to the dead point, then engage velocity step IV.

Take out the speedometer spring by means of CV 204 wrench at GB 365.



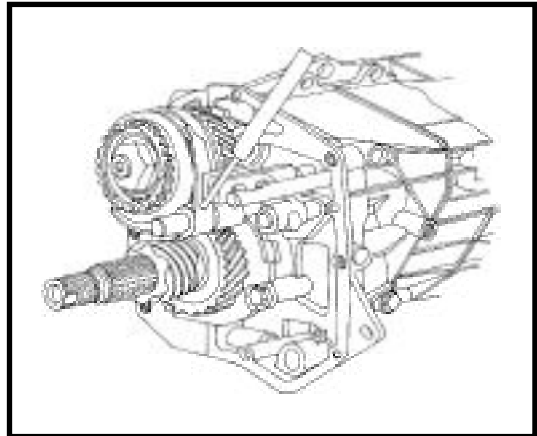
Dismount the velocity step V fork pin by means of 31 B mandrel.

Observe the hub and the tooth gear sliding mechanism of velocity step V.

Dismount:

- the synchronizing mechanism and the fork of velocity step V;
- the velocity step V pinions.

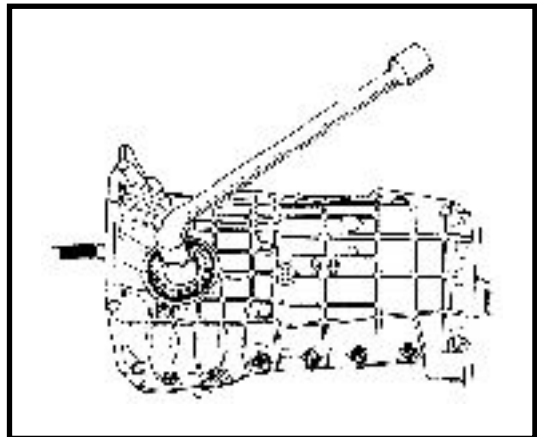
Dismount the distance plate.



#### For G.B. 365 and 51 C

Dismount the nuts lock washers for the differential gear adjustment.

Dismount the adjustment nuts of the differential gear by means of the CV 377 wrench.



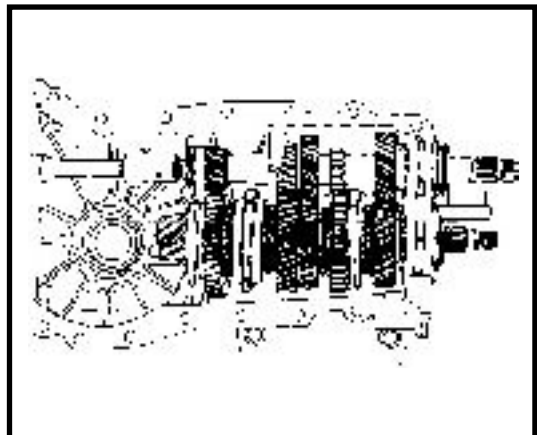
Rotate the gearbox with the left side upwards.

Unscrew the attachment screws of the crankcases.

Remove the left half crankcase.

Dismount :

- the differential gear(G.B.365, and 51 C);
- the secondary shaft and the lockerpin of the biconical bearing;
- the primary shaft.



## FORKS AND SHAFTS DISMOUNTING

Bring the fork **III - IV** to the dead point.

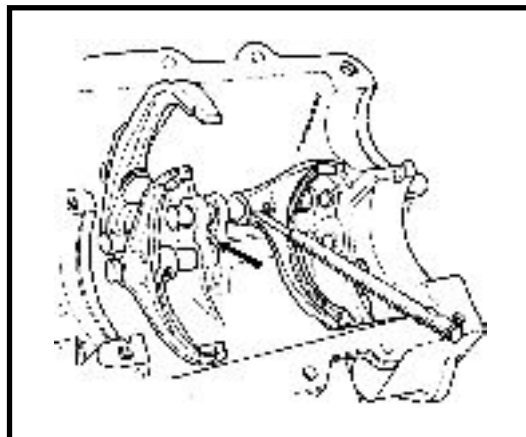
Dismount the speed **V** fork shaft and recover :

- the interlocking ball between forks shafts **III-IV** and **V**.

- the ball and the attachment spring of the speed **V** fork shaft;

Dismount the elastic pin of fork **III - IV** by means of the **CV 31 B** mandrel.

Take out the interlocking disk of the forks shafts.

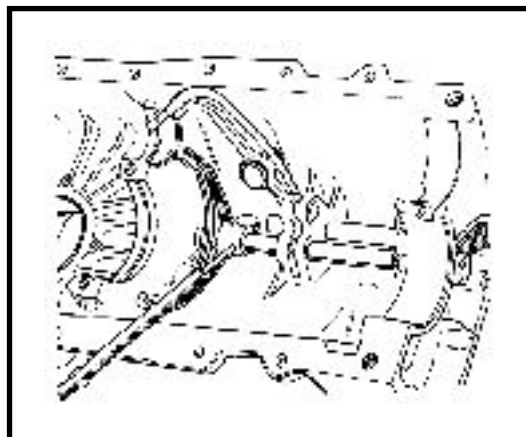


Engage speed **I**.

Move toward back the reverse driving shaft.

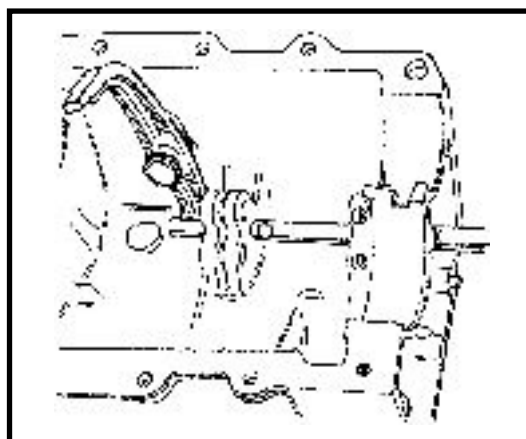
Dismount the elastic pin of fork **I - II** by means of the **CV 31 B** mandrel.

Dismount the shaft and the fork, recover the attachment spring and ball.



Dismount :

- the reverse selector;
- the reverse driving shaft.

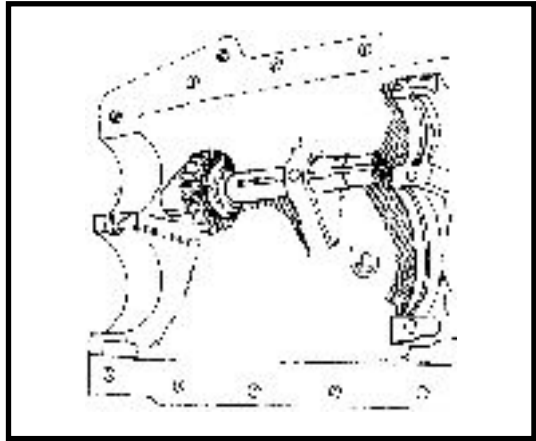


**REVERSE DRIVING PINION DISMOUNTING**

Dismount:

- the lock ring;
- the shaft;
- the pinion;
- the friction ring;
- the guiding wedge.

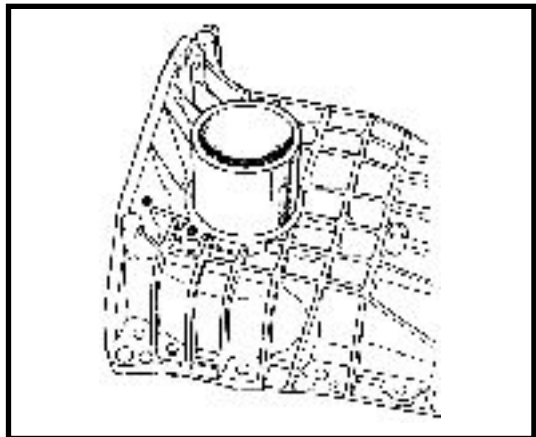
Recover the spring and the attachment ball.

**HALF CRANKCASES DISASSEMBLING**

Dismount the outer ring of the bearing by means of a trod.

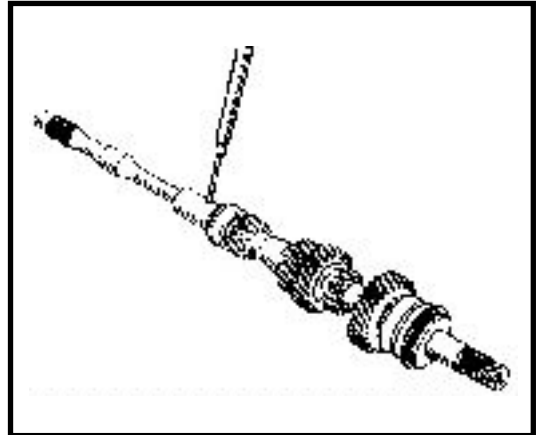
Dismount the annular oil seals from the differential gear adjustment nuts.

(G.V. 365 i 51C).



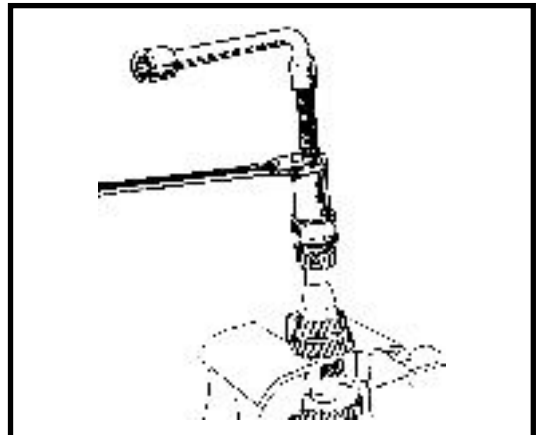
## PRIMARY SHAFT DISASSEMBLING

Dismount the elastic pin by means of the **CV 39** mandrel and separate the clutch shaft from the primary shaft.

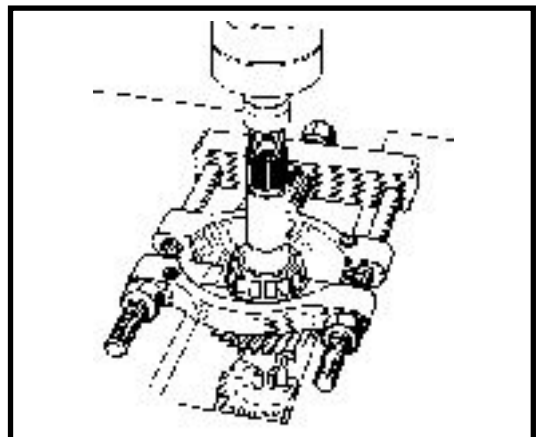


Take out the outer rings of the bearings and the rollers cage.

Dismount the bearing inner ring by means of the **CV 22** extractor.



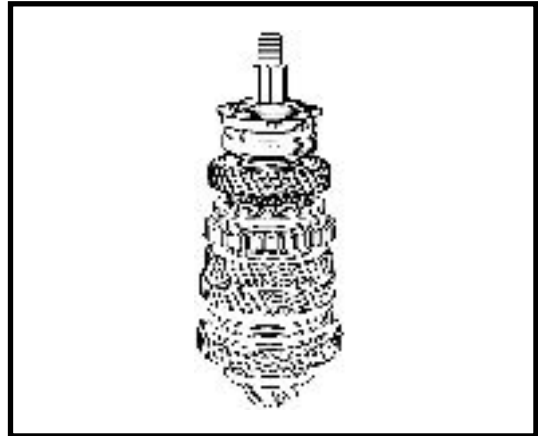
Dismount the biconical bearing on a press by means of the **TS 65** extractor.



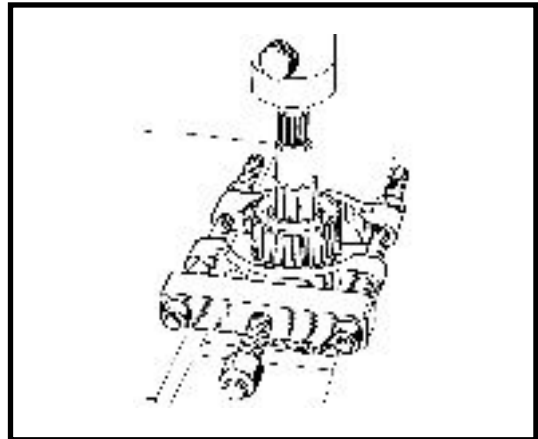
## SECONDARY SHAFT DISASSEMBLING

Dismount :

- the biconical bearing;
- the ring for the adjustment of the distance between the cones gear;
- the velocity step **IV** pinion and its synchronizing ring;
- the synchronizer tooth gear sliding mechanism **III - IV**.

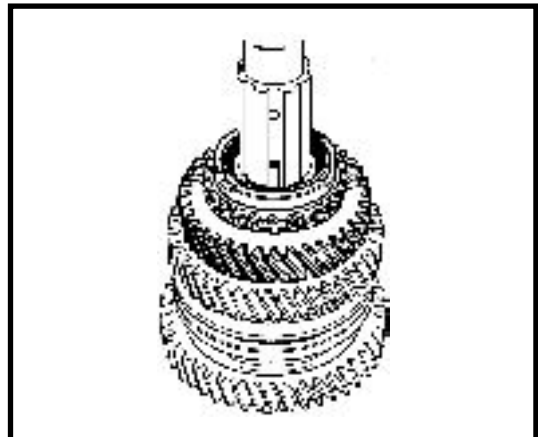


Dismount the speeds **III-IV** synchronizer hub on a press, by means of the **TS 65** extractor.



Dismount:

- the wedge of the lock ring of the speed **III** pinion;
- the lock ring of speed **III** pinion;
- the speed **III** free pinion and its synchronizer ring.

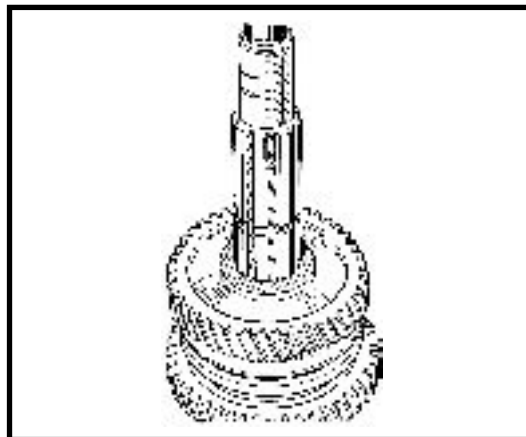




Dismount:

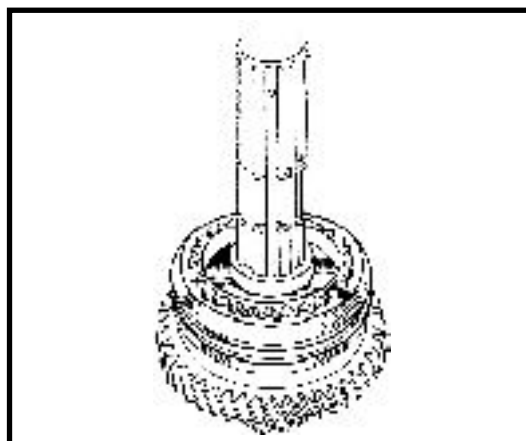
- the lock ring of the speed **II** pinion;
- the speed **II** free pinion and its synchronizer ring;
- the lock ring of the synchronizer hub speeds **I -II**;
- the synchronizer tooth gear sliding mechanism of speeds **I – II** (observe the position of the gear sliding corresponding to that of the synchronizer hub).

Dismount on a press, the hub of the velocity steps **I-II** synchronizer, by means of the **TS 65** extractor.



Dismount:

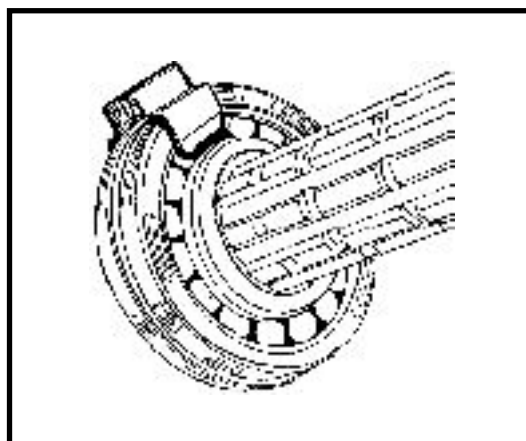
- the lock ring of the speed **I** pinion;
- the synchronizer ring of speed **I** pinion;
- the speed **I** free pinion.



### ***IMPORTANT!***

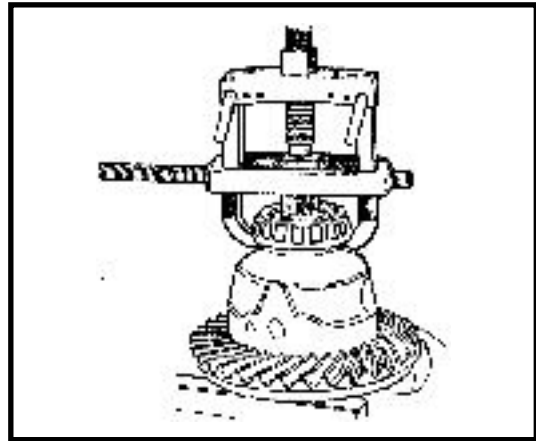
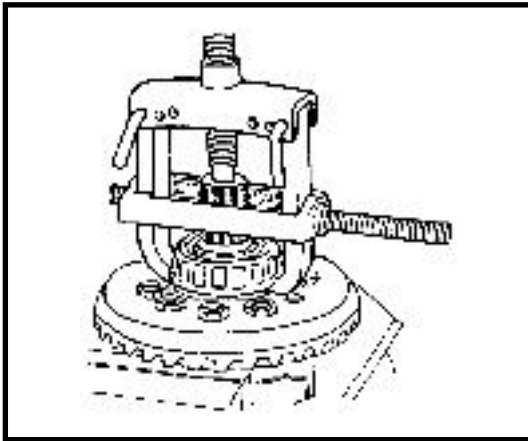
***Place the maintaining device of the bearing outer ring.***

***The bearing inner ring is stuck to secondary shaft, so that the bearing cannot be replaced.***



### DIFFERENTIAL GEAR DISASSEMBLING ( G.B. 365 "i 51C )

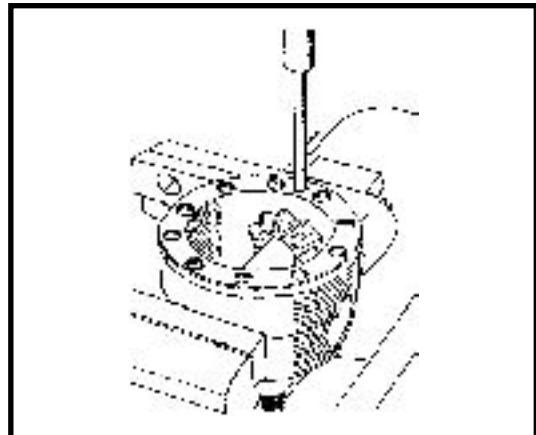
Unscrew two opposite attachmentscrews of toothed crown.  
Dismountthebearings by meansoftheCV28 A extractor, provided withthe CV48 grippers.  
Dismount the toothed crown; **the screws may not be re-used.**



Dismount the elastic attachment pin of the pinions shaft, by means of the CV 31 B mandrel.

Dismant :

- the differential pinions shaft;
- the different pinions;
- the friction washers;
- the propeller shaft pinion.



## BACK CAP DISASSEMBLING

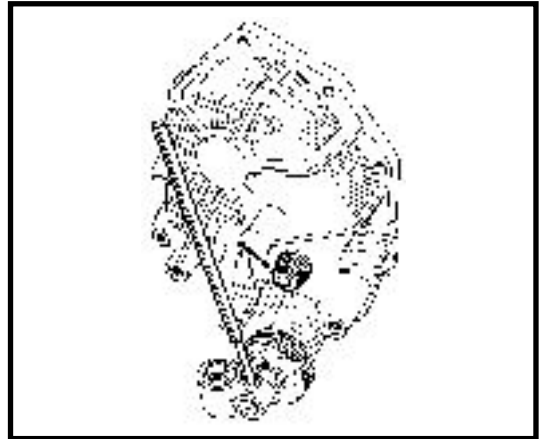
Dismant :

- the speedometer pinion guide and its sealing gasket;
- the speedometer pinion.

Dismount the nut at the end of the rocking lever; take out the shaft.

Dismount the plug of the V velocity step pusher, recover the spring, the pusher and the gasket.

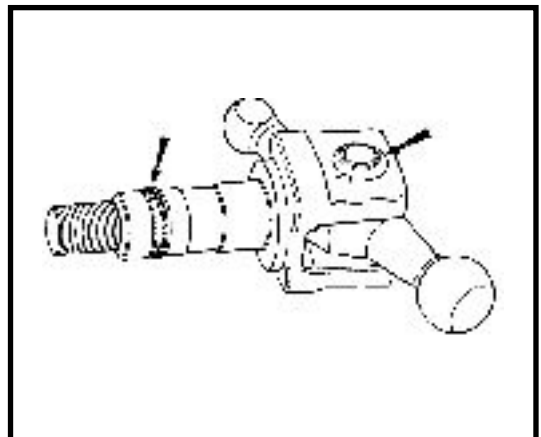
Dismount the elastic pin from the end of the control shaft, by means of the CV344 mandrel.



Dismount the lock ring of the rocking lever shaft; dismount the shaft and the rocking lever

Dismant :

- the sealing gasket;
- the control shaft bushing (if it is worn).



## SECONDARY SHAFT ASSEMBLING

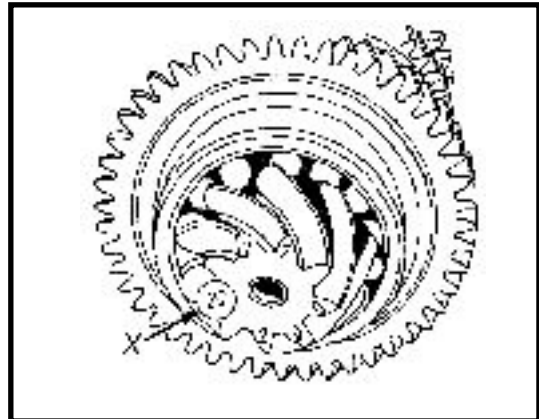
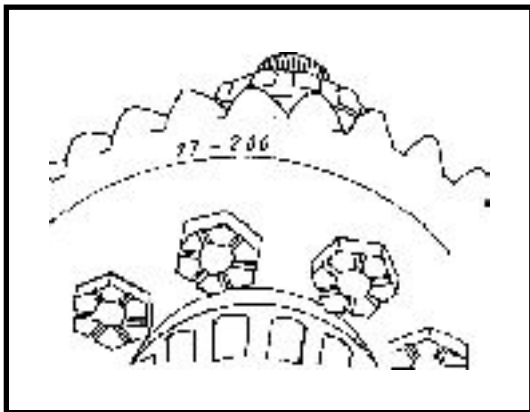
For **G.B. 365**  $\varnothing$  **51C**.

The differential drive pinion and the toothed crown are lapped together.

Replacing of one part obligatory requires replacing the pair part.

A pairing number is marked both on the pinion end and on the toothed crown.

No other markings shall be taken into consideration besides the pairing number.

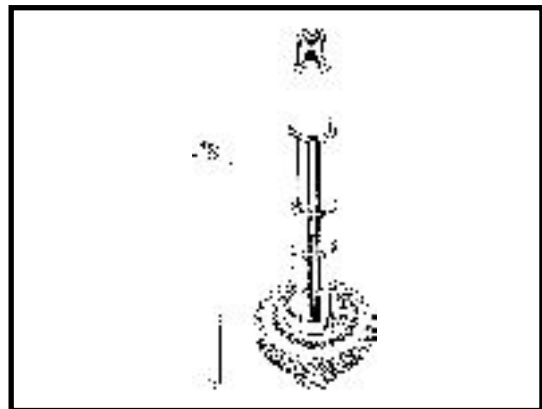


**NOTE:** All spare parts will be lubricated with 80W 90 oil before being mounted.

Mount on the secondary shaft:

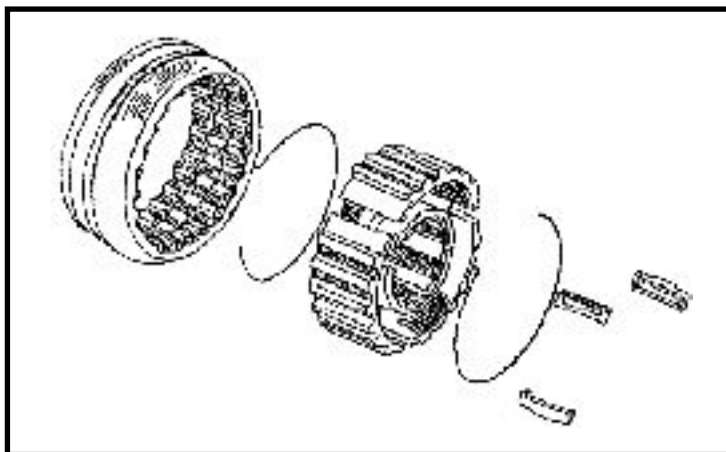
- the velocity step I pinion together with its synchroniser;
- the lock washer of the velocity step I pinion;
- a false wedge, made from a normal wedge, with a curved end; the false wedge is introduced in a channel which has a lubricating hole.

Remove the maintaining device of the bearing outer ring.



Mount the velocity steps **I–II** synchroniser hub:

- the three wedges;
- the two springs;
- the tooth gear sliding mechanism (for the re-used parts, observe the markings made upon dismantling).

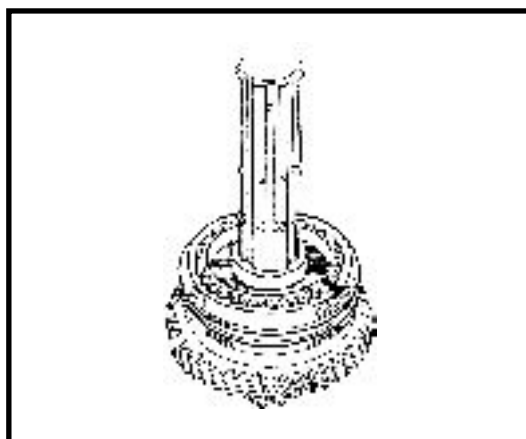


The mounting of the hub I – II can be performed in two variants :

1. By difference of temperature (for gearbox made until **26.04.1999**, series **172321**). Place the velocity steps I – II synchroniser hub on electrical stove, at a 120° C, dgr temperature, and keep it there for about 15 minutes, to heat it.

2. Without difference of temperature (for gearbox made after **26.04.1999**, series **172321**).

**The pressing force for the hubs I – II and III – IV will be max. 2000 daN.**



Press the assembled hub until it comes into contact with the velocity step I pinion lock.

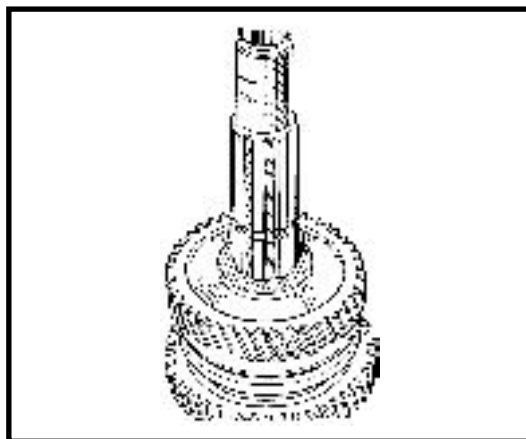
Center the three wedges in the synchronising ring grooves.

Remove the false wedge.

Mount the hub I – II washer.

Mount the velocity step II pinion together with its synchroniser ring.

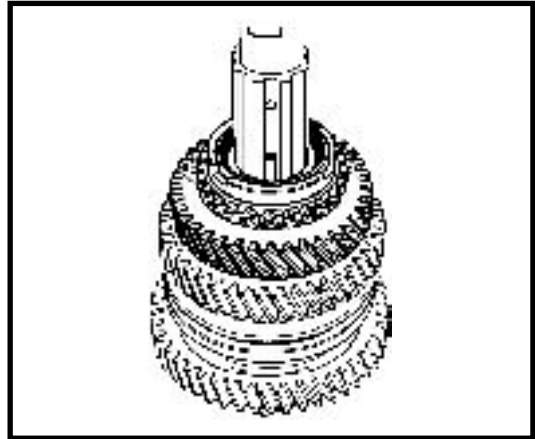
Mount the velocity step II pinion washer.



Mount the velocity step **III** pinion and its synchronising ring

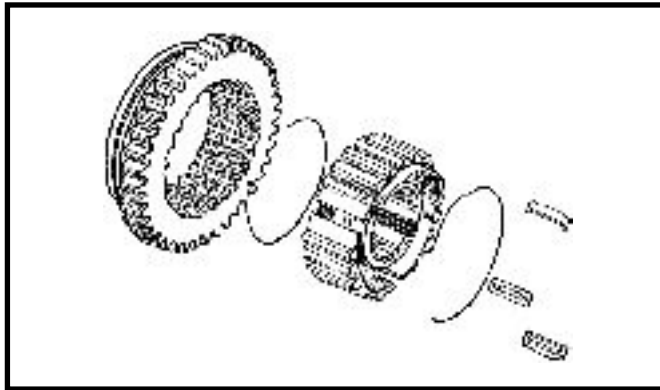
Mount :

- the velocity step **III** pinion lock washer;
- the lock wedge of the washers; the wedge is mounted in a channel which has a lubricating hole.



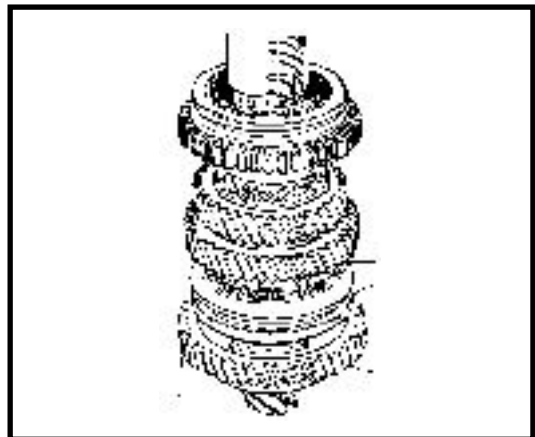
Mount on the velocity steps **III-IV** synchroniser hub :

- the three wedges ;
- the two springs ;
- the tooth gear sliding mechanism ,with its groove opposite to the groove hub.



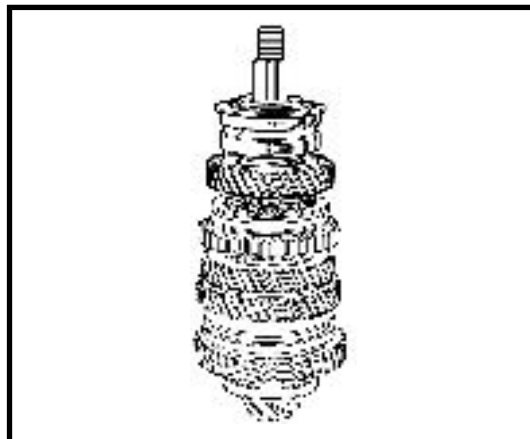
Press the assembled hub until it comes into contact with the lock washer of the velocity step **III** pinion ; the groove in the hub shall be oriented towards the velocity step **III** pinion.

Centre the three wedges in the synchroniser ring grooves.



Mount :

- the velocity step **IV** pinion and its synchronising ring;
- the adjustment washer for the conical mechanism distance, recovered upon dismantling;
- the biconical bearing;
- the spacer;
- the velocity step **V** pinion;
- the elastic washer.



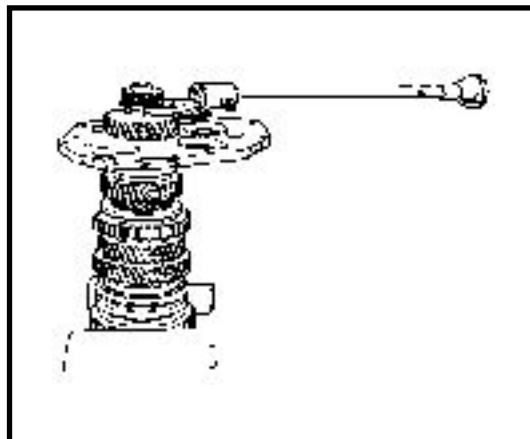
Mount the speedometer endless screw (**G.B. 365**).

Mount the speedometer endless and flange of the secondary shaft (**G.B. 51 C**).

Tighten the velocity step **I**, in a soft dies vice. Engage gearbox in speed **I**.

Tighten at the required moment (**10-12 daN**) the secondary shaft flange nut or speedometer endless screw by means of the **CV 204** wrench.

The speedometer endless screw shall not be locked by straining in order to enable adjustment of the conical distance.

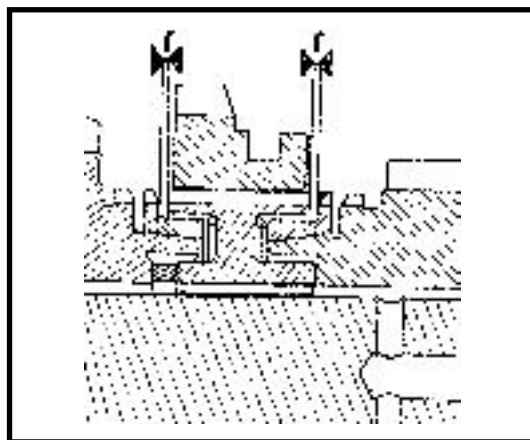


Check the clearance (**J**) between the synchronising rings of the velocity steps **I** and **II** and the sides of the hub : **J = min. 0,2 mm**.

The check shall be performed as follows:

- the pinion in contact with the hub;
- the synchronising ring in contact with the pinion con.

Check in the same way also the clearance of the synchronising rings of the velocity step **III** and **IV**.



**PRIMARY SHAFT ASSEMBLING**

Mount the biconical bearing.

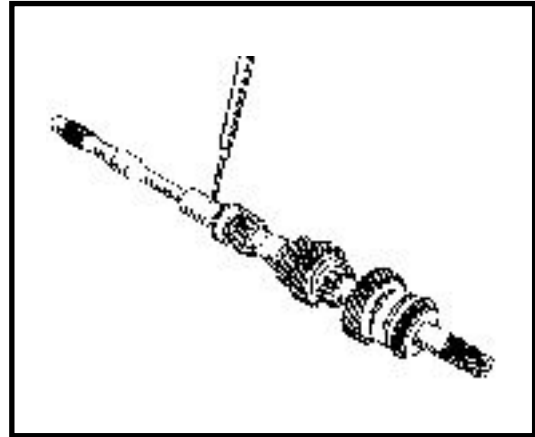
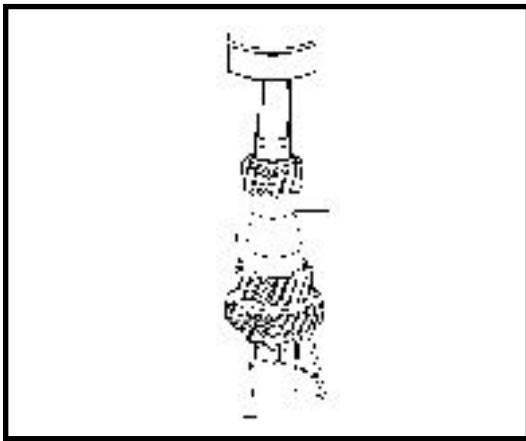
Press the needle-roller bearing inner ring.

Mount the outside bearing ring together with its rollers casing.

Mount the lock washer.

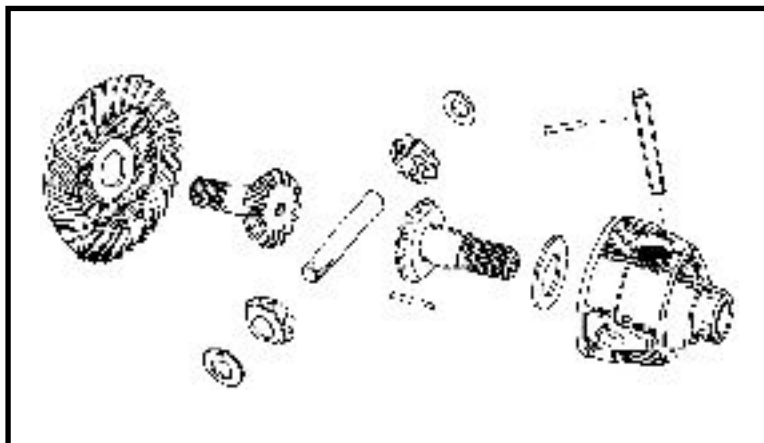
Mount the clutch shaft ; place a new compensation washer between the end of the shaft, in order to prevent the noise.

Mount the elastic pin by means of the **C.V.31B** mandrel.





## DIFFERENTIAL GEAR ASSEMBLING (G.B. 365 and 51C)



Place the following parts in the casing

- the textolite washer, with the lubricating grooves directed towards the propeller shaft pinion; use **1.96 - 2 mm** thick washers. The **2.03 - 2.07 mm** thick washers shall be used only if the clearance between the propeller shaft pinion and the differential pinion is very big.
- the propeller shaft pinion, lubricated with oil;
- the friction washers of the differential pinions;
- the differential pinions.

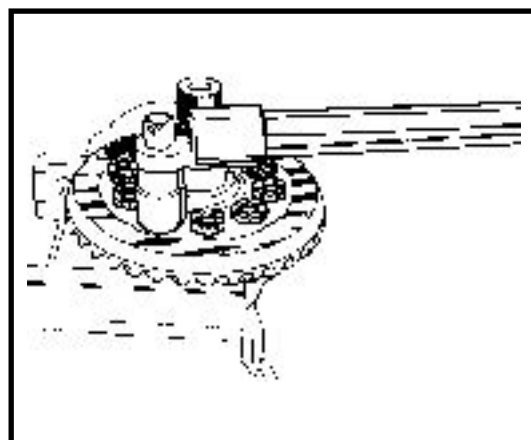
Mount the differential pinions shaft and center the pin shaft with the one in the casing.

Mount the elastic pin by means of the **G.B. 31 B** mandrel; the pin shall be introduced about **5 mm** in the differential gear casing

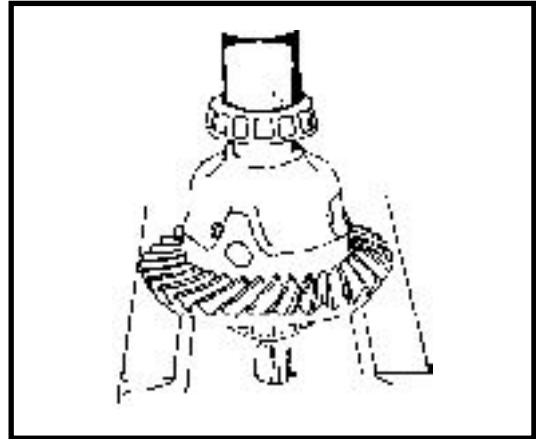
Lubricate the second propeller shaft pinion with oil and place it in the casing.

Mount the toothed crown on the differential gear casing with new screws.

Tighten the screws at the required moment (**9 - 11 daNm**).



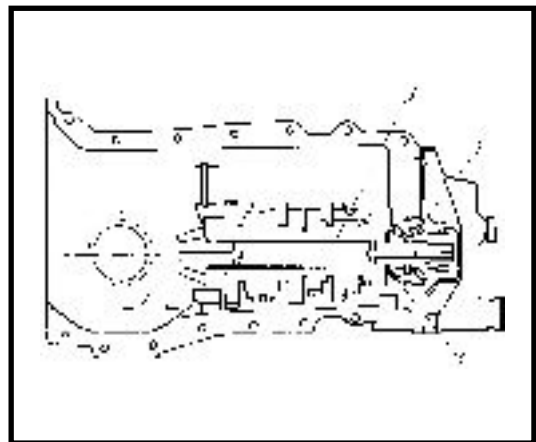
Mount the differential bearings on a press.



### ADJUSTMENT OF THE CONICAL DISTANCE (G.B.365 AND 51 C)

The differential drive pinion is in the correct position, when its front is at distance  $A=59 \text{ mm}$  from the toothed crown axis.

This position is obtained by mounting a washer (1) of the adequate thickness between the biconical bearing (2) and the differential drive pinion shoulder (3).



### CASE EXCEPTIONEL

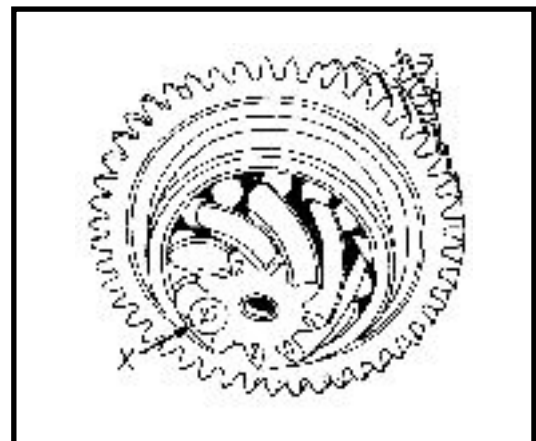
There may be situations when the value  $A=59 \text{ mm}$  is not correct value for the pinion positioning.

The difference ( $X$ ) between the actual value and the value  $A=59 \text{ mm}$  is marked on the front side of the pinion near the number marked for pairing with the toothed crown.

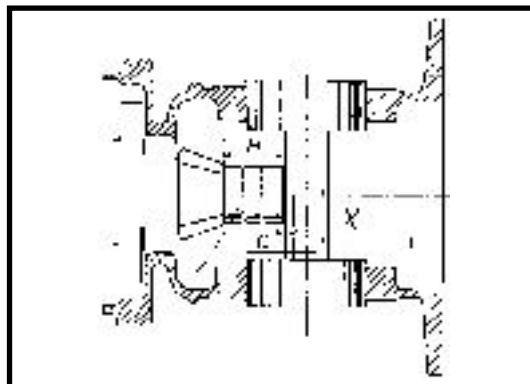
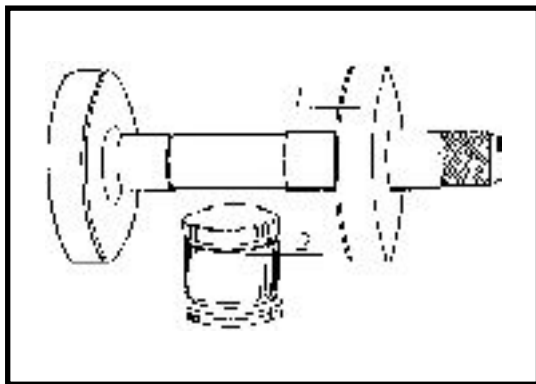
The value is given in hundredths of mm.

**EXAMPLE :  $X = 20 (0,2 \text{ mm})$**

In this situation, the distance between the conical mechanisms shall be  $A + X$ . In a.m. case:  $A + X = 59 + 0,2 = 59,2 \text{ mm}$



The checking of the conical distance is performed by means of the **CV239 - 01** control device, which materializes the toothed crown axis and by means of a spacer **CV 239 - 02**, with the height **H = 48,5 mm**. The height (**H**) of the **48,5 mm** spacer plus radius (**C**) of the device axis of **10 mm** represents: **48,5 mm + 10 mm = 58,5 mm**.



The distance value (**X**) measured between the spacer and the pinion face shall be:  
**X = 59 mm - 58,5 mm = 0,5 mm** (when the actual value is **A = 59mm**).

Attach the right half crankcase on the support, with the separating plane upwards.

Place the secondary shaft.

Place the left (**1**) half crankcase and tighten it by means of several screws.

Tighten the attachment spacer screws on the half crankcase at the required couple.

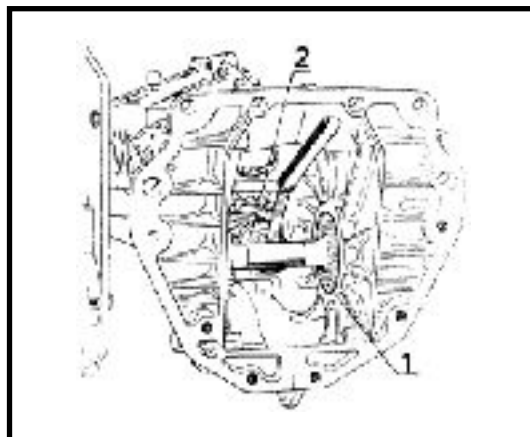
Introduce the **CV 239 - 01** control device.

Place the **CV 239 - 02** spacer at the end of the differential drive pinion

Measure by means of a thickness gauge the distance (**X**) between the spacer and the device shaft :

1. The distance value measured is smaller than the normal one (**0,5 mm**). In this case, replace adjustment washer for the distance between the conical mechanisms with a thinner one.

2. The distance value measured is bigger than the normal one (**0,5mm**). In this case, replace the adjustment washer for the conical distance with a thicker one.



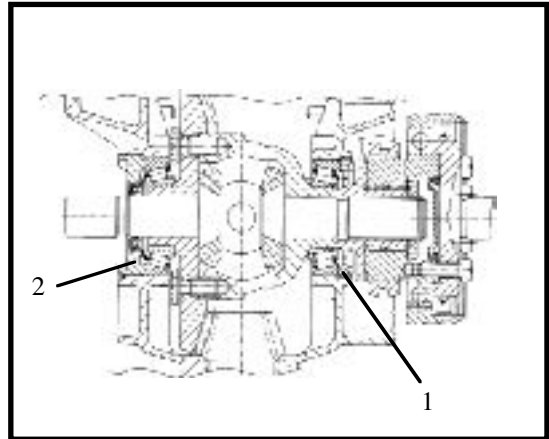
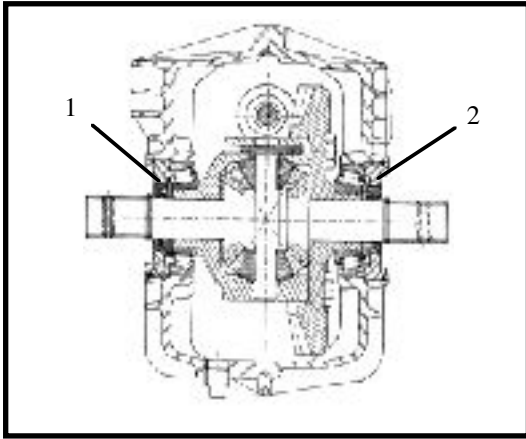
The thickness of the adjustment washers is **1,8 - 3,8mm**, every 10 hundredths of millimeter.

The measurement of the value (**X**) is performed by means of the speedometer endless screw (**G.B.365**) or the flange nut (**G.B. 51 C**) tightened at the required moment (**10 - 12 daNm**).

Take out the checking device.

Dismount : the spacer, the left half crankcase; secondary shaft.

## DIFFERENTIAL GEAR BEARINGS ADJUSTMENT ( G.B. 365 and 51 C )

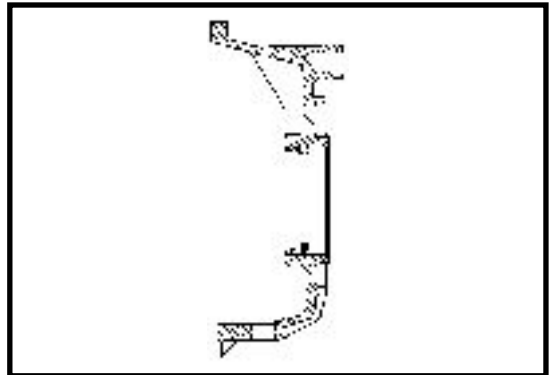


The differential gear bearings adjustment is performed by means of the nuts (1) and (2).  
Mount the annular oil seal rings on the adjustment nuts.  
Grease the adjustment nuts threads with sealing paste **LOCTITE 518**

**NOTE:**

*Before mounting, the annular oil rings will be immersed in oil 80W/90.*

Mount the outer rings of the differential gear bearing in the half crankcases so that they are protruding as compared to the inner side of the half crankcase.



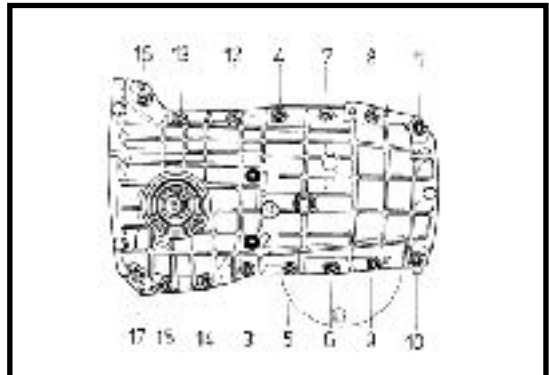
Place the differential gear in the right side half crankcase.

Place the left side half crankcase and assemble it by means of screws.

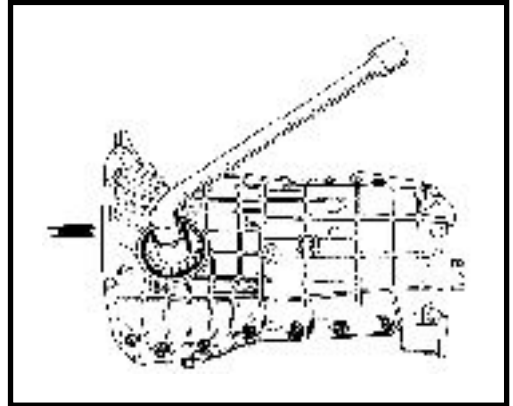
Tighten the screw to the required moment, observing the tightening orders specified in the drawing.

**M 7 : 1,9 - 2,4 daNm**

**M 8 : 2,8 - 3,3 daNm**



Tighten the adjustment nuts by means of the CV 377 wrench, until they come into contact with the outer rings of the bearings.



### 1. REUSED BEARINGS

The reused bearings shall be mounted freely, without clearance. Tighten the adjustment nuts until the bearings rotate freely without any clearance.

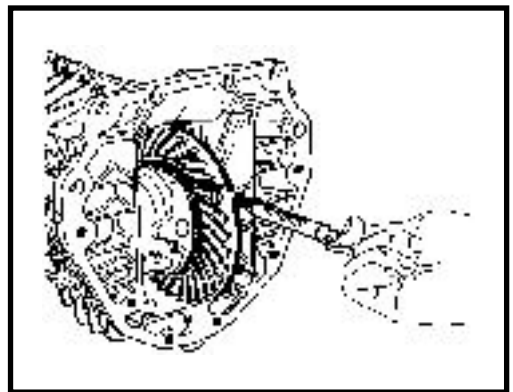
### 2. NEW BEARINGS

The new bearings shall be mounted by pretightening.

Tighten the adjustment nuts until the bearings show a certain resistance to rotating.

Check the pre-tightening of the bearings as follows:

- rotate the differential gear several times, in order to set the bearings;
- place a thread around the differential gear casing and draw the thread by means of a dynamometer; the differential gear should rotate at a **1 - 3 daN** force.

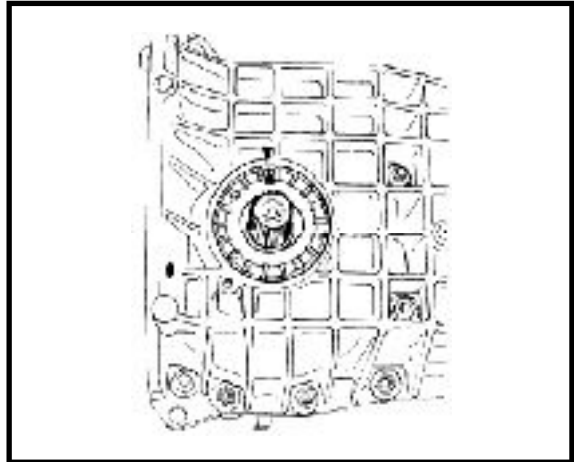


#### NOTE:

*For both types of bearings, the nut (1) in the right side half crankcase shall be tightened more, in order to obtain a bigger clearance of the toothing.*

Notice the nuts position corresponding to the half crankcases.

Dismount the left side half crankcase and the differential gear.



### REMounting OF FORKS AND SHAFTS

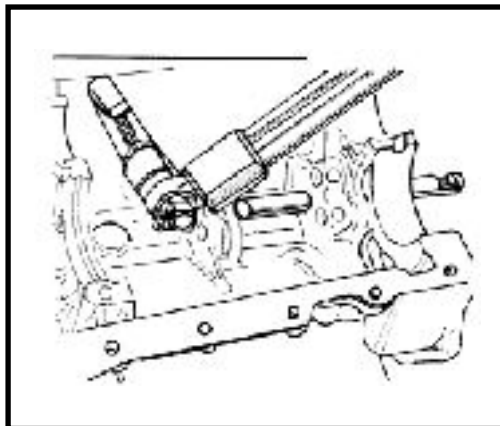
#### NOTE:

*Upon remounting, the elastic pins shall be positioned with the slot towards the back side of the gearbox.*

Mount the reverse driving shaft in the right side half crankcase.

Position the reverse drive selector in the notch of the reverse driving shaft.

Tighten at the required couple (2,3 daNm) the reverse driving selector shaft.

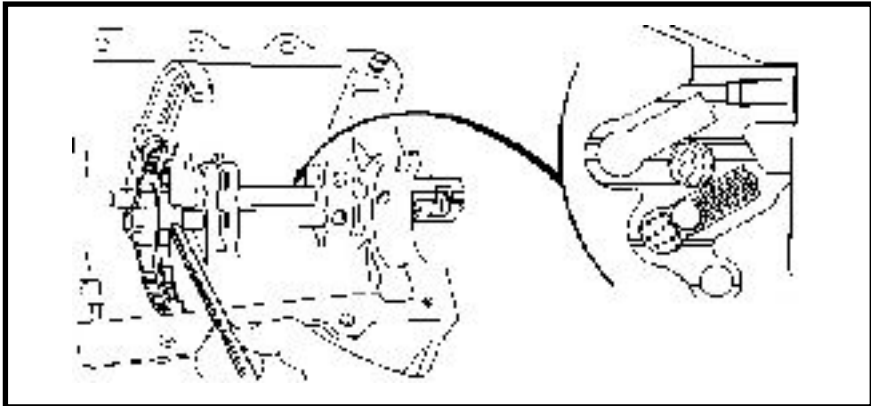


Place the attachment spring and ball of the velocity steps I-II fork shaft.

Introduce the shaft.

Assemble the velocity steps I-II fork with the hub, towards the back side of the gearbox.

Introduce the elastic pin.



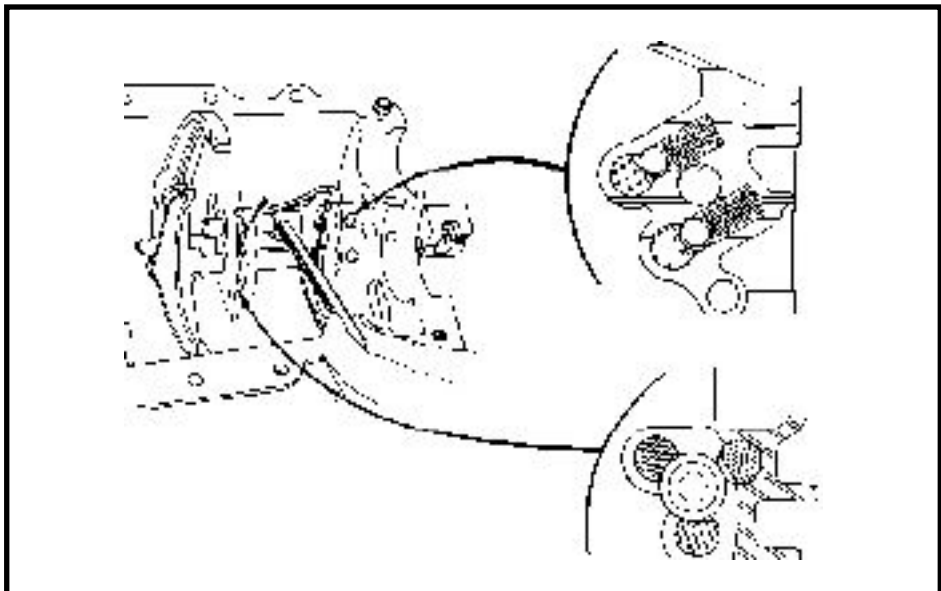
Place the interlocking disk of the fork shafts.

Place the attachment spring and ball of the velocity steps **III-IV** fork shaft.

Introduce the shaft.

Mount the velocity steps **III - IV** fork with the hub towards front side of the box.

Introduce the elastic pin.

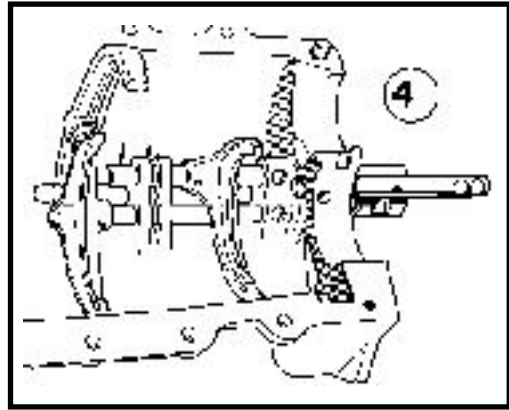
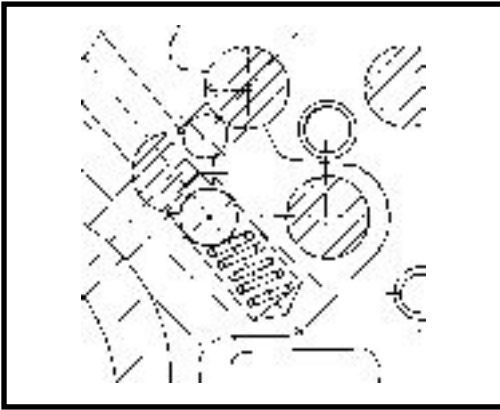


Place the attachment ball and spring of the fork shaft velocity step **V**.

Place the blocking ball of fork shafts, velocity steps **V** and **III - IV**.

Introduce velocity step **V** fork shaft.

Engage the velocity steps III - IV fork in the position required for the coupling of velocity step IV and keep it in this position until complete mounting of the gearbox.



### REMountING OF THE REVERSE DRIVING PINION

Place the attachment spring and ball of the shaft in the left side half crankcase.

**NOTE:**

*The spring is black painted to be different from locking spring of forks shafts.*

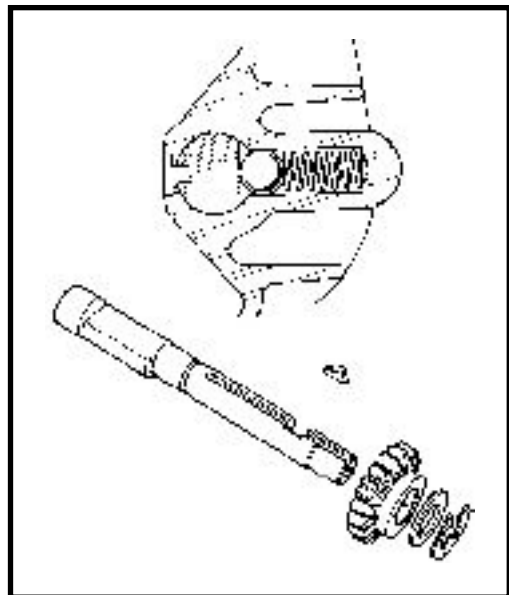
Introduce the reverse driving pinion shaft

Mount:

- the reverse driving pinion, with the hub directed towards the front of the gearbox;
- the friction washer, with the bronze side towards the pinion.

Introduce the guiding wedge in its seat and completely introduce the shaft.

Mount the safety ring.





**HALF CRANKCASE ASSEMBLING**

Place in the right side half crankcase

- primary shaft;
- secondary shaft together with the lock pin of the biconical bearing taking care that the assembled forks to be positioned in their seats;
- the differential gear (**G.B. 365** and **G.B. 51C**).

Grease the assembling areas of the crankcases with sealing paste **LOCTITE 518**.

Place the left side half crankcase over the right side half crankcase; position correctly the reverse selector.

Place the assembling screws of the half crankcase and slightly tighten them.

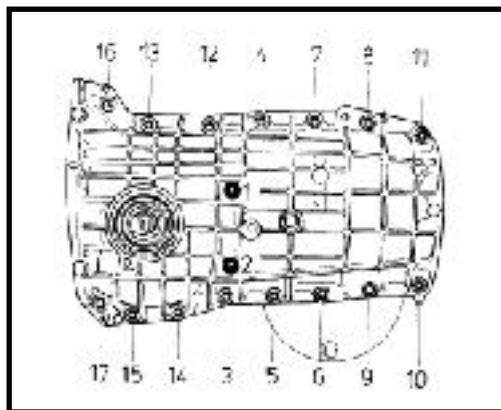
Mount the spacer and tighten its attachment screws at the required moment

**(1 - 1,4 daNm)**.

Tighten the assembling screws of the half crankcases at the required moment, observing the tightening order specified in the drawing.

**M 7 : 1,9-2,4 daNm**

**M 8 : 2,8-3,3 daNm**

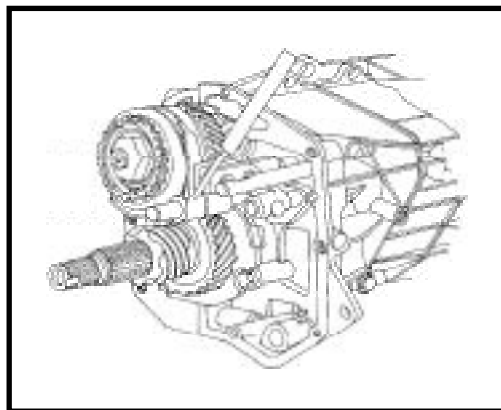


**VELOCITY STEP V PINION REMOUNTING**

Place the following parts on the primary shaft:

- the spacer;
- the inner bushing and needle casings;
- the free pinion of velocity step V;
- the synchronizer assembly together with the fork and shaft for velocity step V;
- the elastic washer;
- the locking nut.

Mount the elastic pin of fork for velocity step V, by means **CV 31 B** mandrel.



**NOTE:**

*The synchronizer for velocity step V shall be assembled in the same way as the one for velocity steps I - II; mount additionally the retentive segment.*

Place the following parts on the secondary shaft:

- the velocity step V pinion;
- the elastic washer;
- the speedometer endless.

Check the clearance “J” between the synchronizing ring and the surface of the hub:  $J = \min 0,2 \text{ mm}$

The checkings shall be performed as follows:

- the pinion in contact with the hub;
- the synchronizing ring in contact with the pinion con.

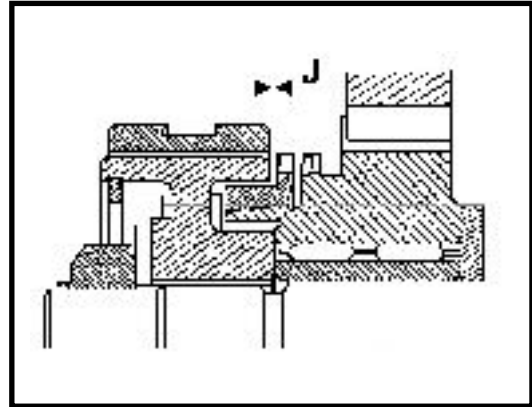
the pinion con.

Couple the reverse driving and the velocity step V.

Tighten at the required couple:

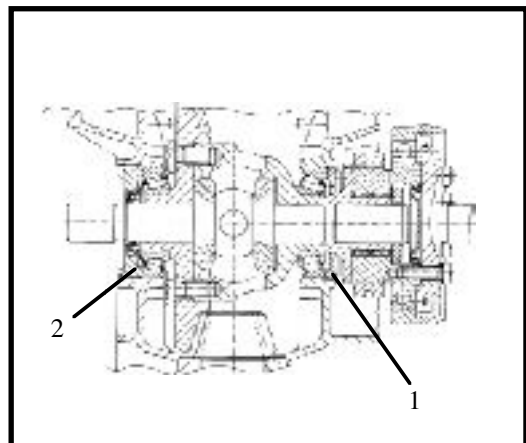
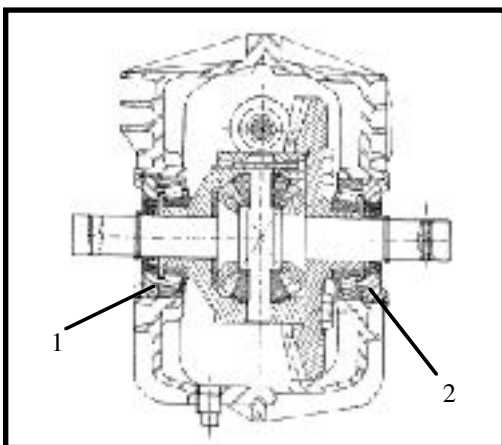
- the nut of the primary shaft: **6 daNm**
- the speedometer endless screw: **10 - 12 daNm ( G.B. 365)**.

Secure the locking nut and the speedometer endless screw.



### GEAR CLEARANCE ADJUSTMENT (G.B. 365,51C)

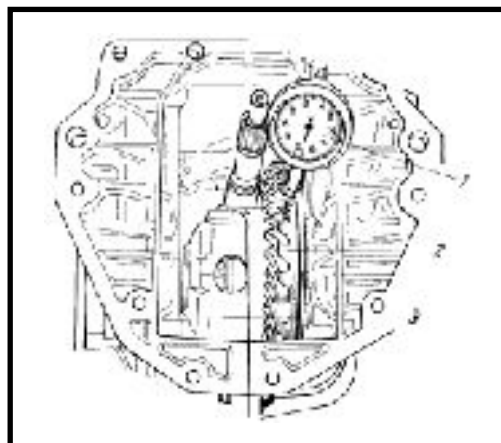
In order to adjust the clearance of the gear, loosen the nut (1) from the right side half crankcase and tighten the nut (2) from the left side half crankcase by the same value.



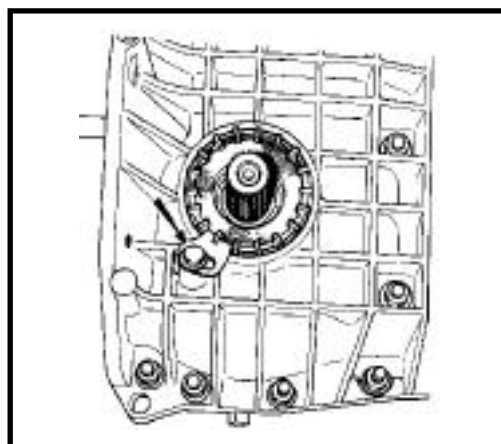
Mount a comparing device on the crankcase and place the feeler perpendicularly on the crown tooth flank, as much to the edge of the rim as possible.

Check the clearance of the gear which should be: **0,12-0,25 mm**.

Adjust the nuts until correct clearance is obtained.



Mount the nuts locks.



### BACK CAP ASSEMBLING

Mount the control shaft annular oil seal.

Assemble the rocking lever with its shaft.

Mount together:

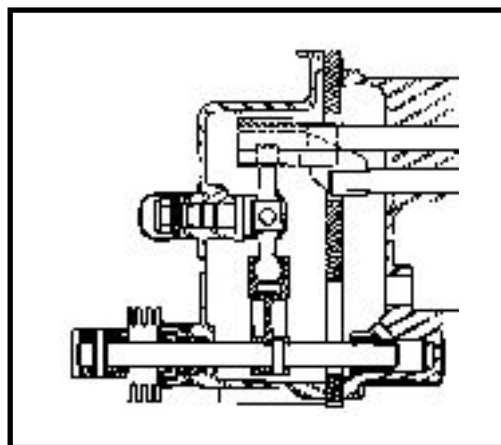
- the assembled rocking lever shaft;
- the control shaft.

Tighten the attachment nut of the return rocking lever (**4-4,5 daNm**).

Mount the rubber protection.

Mount on the control shaft:

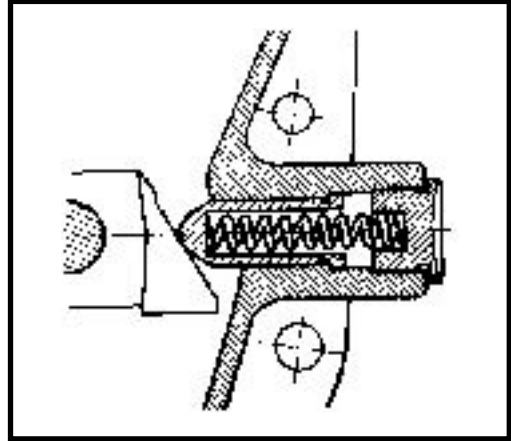
- the protection bellows;
- the control shaft end;
- the elastic pin.



Mount the speedometer pinion and its guide provided with a sealing gasket.

Mount:

- the velocity step V pusher;
- the spring;
- the gasket;
- the plug greased with **LOCTITE 577** and tighten at the required couple (**1,1-1,5 daNm**)



### BACK CAP RE MOUNTING

Bring the forks to the dead point.

Place the back cap gasket lubricate with oil.

Place the back cap; position the velocity steps selector in the forks shafts notches.

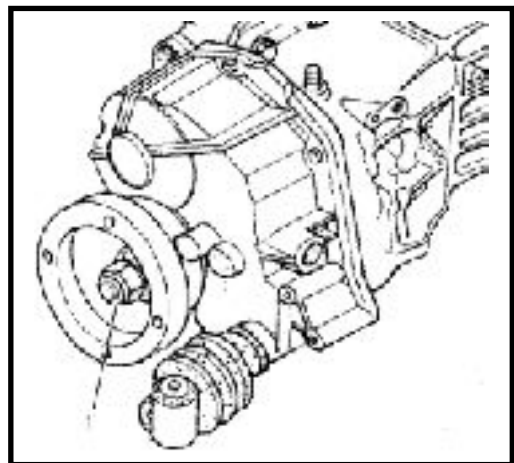
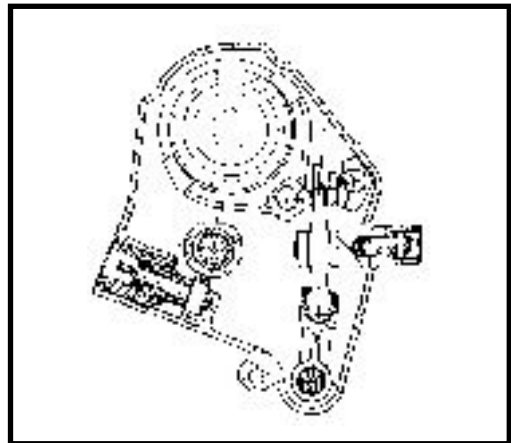
Tighten at the required moment (**1- 1,4 daNm**) the back cap attachment screws.

For **G.B. 50C** and **51C**:

Fill the contact surface between the annular seal and the flange with grease **UM 170 Li Ca Pb 2M**.

Mount the flange of propeller shaft transmission.

Place the washer and tighten at required moment (**10 - 12 daNm**) the flange attachment nut (1).



**CLUTCHCASING RE MOUNTING**

Press in the clutch casing the guiding bushing of the pressure bearing (only if it has previously been dismantled).

Mount the annular oil seal of the clutch shaft by means of the device **CV 488**.

**NOTE: Before mounting, the annular oil seal shall be immersed in 80W/90.**

Apply a layer of sealing paste **LOCTITE 518** on the assembling area of the clutch casing with mechanisms crankcase.

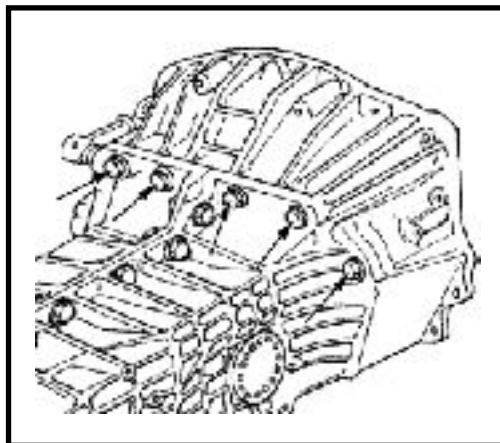
Mount the clutch casing by means the device **CV 488** for oil sealing protection.

Tighten the attachment screws of the clutch casing at the required moment.

**M8 : 2 - 2,8 daNm**

**M10 : 3,2 - 4 daNm**

Mount the reverse lamp contact, after its thread has been greased with **LOCTITE 577** and tighten it at required moment (**2,5 daNm**).



**REMOUNTING THE COUPLING MECHANISM 4X4 (G.B. 51 C)**

Check by visual inspection the state of the mechanism elements and replace damaged parts with new ones.

Mount the pins housing (**13**) and the claw (**12**).

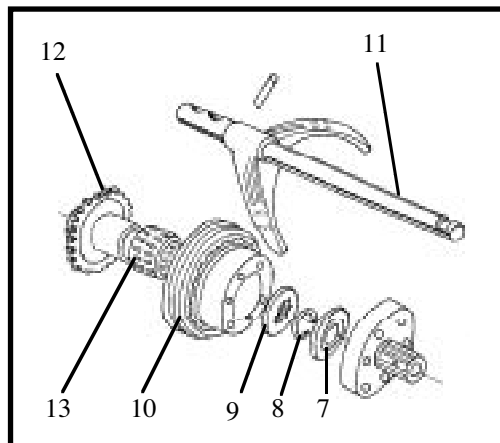
Mount using a press, by means of a metallic strap, the bearing on the differential hub (if this was previously dismantled).

Mount the assembly hub - the tooth gear sliding mechanism (**10**), together with coupling shaft and fork (**11**).

Place the washer rut (**9**).

Mount the safety ring (**8**) on the propeller shaft pinion.

Mount the cover (**7**).



Replace the annular oil seal from the differential cap, as follows:

- grease the new annular oil seal with gear oil **80W90**;

- mount the new annular oil seal by slightly tapping by means of the plastic hammer until it came into contact with the support shoulder from the differential cap resulting in this case the dimension of  $6 \pm 0,5$  mm.

Mount the differential cap assembly with a new lubricated gasket.

Grease the contact surface between the flange and differential hub with sealing paste **LOCTITE 518**.

Necessary quantity: **2ml**.

Mount the flange and deflector.

Tighten the screws at the required moment:

- differential cap - **1,2 daNm**;
- differential flange - **2,4 daNm**.

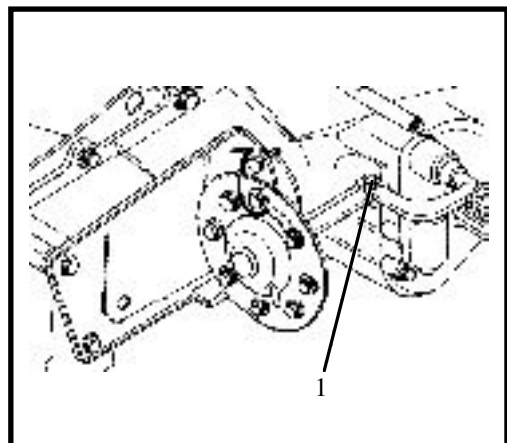
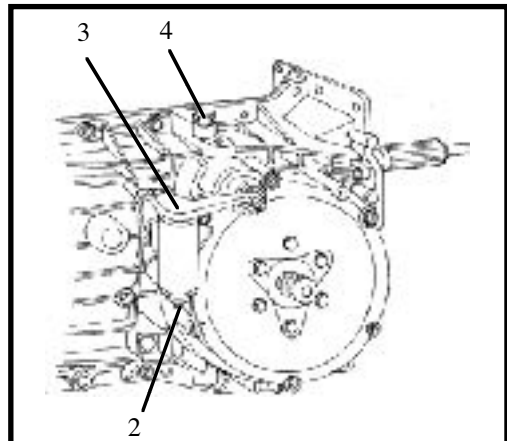
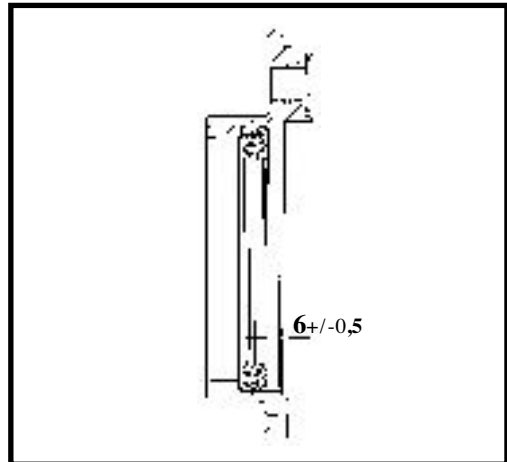
Mount the threaded plug (4) for limiting the stroke.

Mount the control lever (3) and secure with safety ring (2) (position the end of lever in the notch of the control shaft).

Check the front transmission engagement and disengagement

Mount the vacuum capsule bracket on the gearbox casing.

Mount the connecting bolt (1) between the vacuum capsule shaft and the control lever and secure with the attachment pin.



## BACKCAP

(on vehicle)

## DISMOUNTING

Lift the car on the elevator.

Drain the oil from the gearbox.

Disconnect:

- the speedometer cable;
- the velocity steps control.

Support the back part of the gearbox.

Unscrew the attachment nut of the exhaust pipe from back cap cross bar gearbox.

Dismount the back crossbar of gearbox.

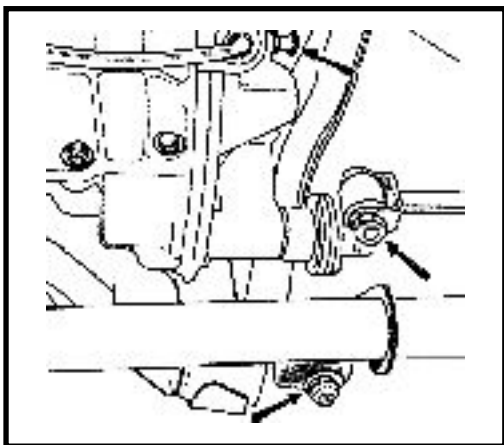
For G.B. 50C and 51C:

- dismount the cardan transmission from the secondary shaft flange and tilt it over.
- dismount the secondary shaft flange.

Engage the gear velocity step IV

Unscrew the back cap attachment screws.

Dismount the back cap

**NOTE:**

*The velocity step V fork shaft shall not be dismantled because the interlocking ball may fall; their mounting implies dismantling the whole gearbox.*

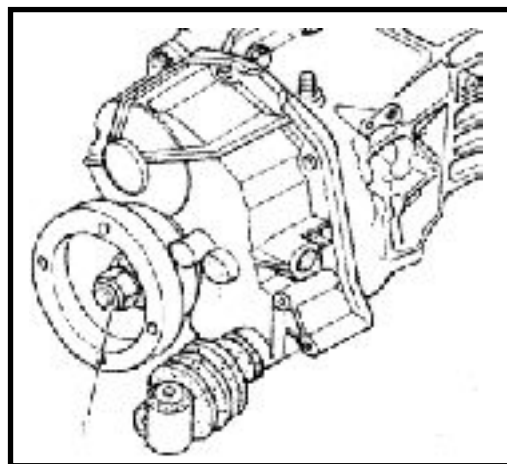
## REMountING

Clean the contact surface of the gasket.

Place a new paper gasket after it was lubricated with oil.

Place the back cap; position the velocity steps selector in the forks shafts grooves.

Place the cap attachment screws and tighten them at the required moment of **1,2daNm**.



For G.B. 50C and 51C:

- mount the driving flange of cardan transmission and tighten the attachment nut at the required couple (**10 -12 daNm**);

- engage the cardan transmission.

Mount the back support of the gearbox.

Connect:

- the speedometer cable;
- the velocity steps control.

Fill up the gearbox with oil **80W/90**.

(on vehicle)

**DISMOUNTING**

Lift the car on the elevator.

Drain the oil from the gearbox.

Dismount the back crossbar of the gearbox.

For G.B. 50C and G.B.51 C:

- disengage the cardan transmission;
- dismount the flange of secondary shaft

Dismount the back cap.

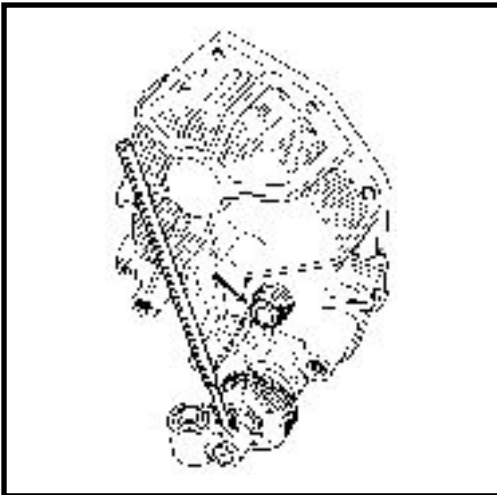
Unscrew the nut from the end of the rocking lever shaft.

Dismount the elastic pin from the control shaft end.

Dismount together :

- the control shaft;
- the rocking lever and shaft.

Dismount the worm annular oil seal.

**REMounting**

Mount the new annular oil seal, after it was immersed in **80W90** oil.

Mount together :

- the rocking lever shaft;
- the control shaft.

Tighten the attachment nut of the rocking lever shaft, at the required couple (**4 - 4,5 daNm**).

Mount the rubber protection.

Mount on the control shaft :

- the protection bellows;
- the control shaft end;
- the elastic pin.

Mount the back cap with a new lubricated gasket.

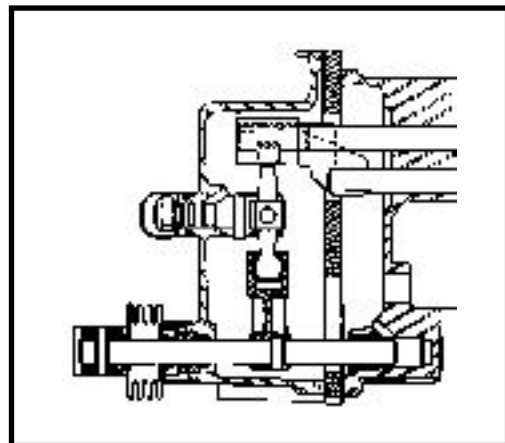
Mount the back crossbar of the gearbox.

Mount the flange of secondary shaft and connect the cardan transmission (G.B.50C, G.B.51C)

Check the velocity steps control mechanism.

Fill up the gearbox with **80W90** oil.

Lower the vehicle from the elevator.





SPEEDOMETER ENDLESS SCREW PINION REPLACEMENT

(on vehicle)

**DISMOUNTING**

Lift the car on the elevator  
 Drain the oil from the gearbox.

Disconnect:

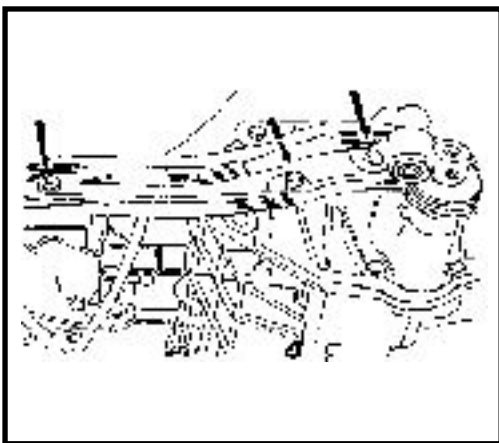
- the speedometer cable;
- the velocity steps control.

Disconnect the cardan transmission and dismount the secondary shaft flange (G.B.50C;51).

Dismount the back crossbar.

Dismount the back cap.

Dismount the speedometer endless pinion from the back cap.



Replace the speedometer endless (G.B.50C,51C).

Engage velocity step I and draw the hand brake.

Dismount the speedometer endless screw by means of the CV 204 wrench.

**REMOUNTING**

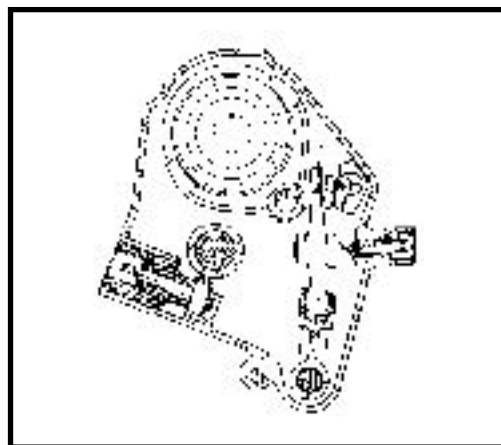
Mount the speedometer new endless screw by means of the wrench CV 204 and tighten at the required moment (10-12 daNm) and secure it by straining. (G.B. 365).

Mount the new speedometer pinion in the back cap.

**NOTE:**

*Before mounting, the speedometer pinion shall be immersed in 80W/90.*

Mount the back cap with a new gasket.



Mount the back crossbar.

Connect:

- the speedometer cable;
- the velocity steps control.

Mount the flange, tighten its nut at the required moment (10-12 daNm) and connect cardan transmission (G.B.50C,51C).

Check the velocity steps control.

Fill up the gearbox with 80W90 oil.

(on vehicle)

**DISMOUNTING**

Lift the car on the elevator  
Drain the oil from the gearbox.

Disconnect:

- the speedometer cable;
- the velocity steps control.

Disconnect the cardan transmission and dismount the flange (G.B. 50C, G.B. 51C).

Dismount the back crossbar of the gearbox.

Dismount the back cap.

Engage the velocity step V and the reversedriving

Dismount the primary shaft nut.

Dismount the elastic pin of the velocity step V fork by means of the CV 31 B mandrel.

Dismount the velocity step V fork together with the tooth sliding mechanism and velocity step V hub.

**NOTE:**

*The velocity step V shaft shall not be dismantled because the interlocking ball and the attachment ball may fall; their mounting implies complete dismantling of the gearbox.*

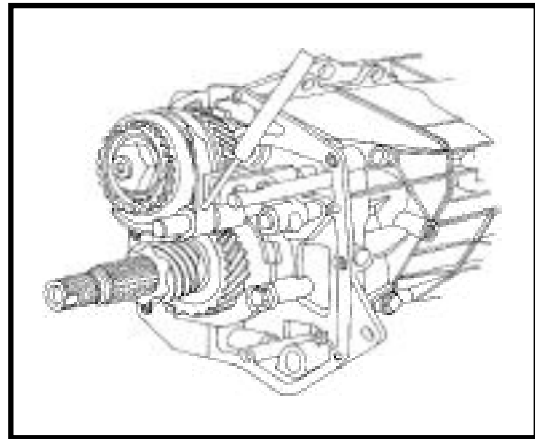
**REMountING**

Place the fork on the gear tooth gear sliding mechanism;

Mount the velocity step V synchronizer assembly together with the fork, on the primary shaft

Mount the fork elastic pin by means of the 31 B mandrel.

Mount the primary shaft nut and tighten at the required moment (**6 daNm**).



Connect:

- the speedometer cable;
- the velocity step control.

Mount the flange, tighten at the required moment (**10- 12 daNm**) its nut, and connect the cardan transmission (G.B. 50C, G.B. 51C).

Check the velocity steps control mechanism.

Fill up the gearbox with **80W/90** oil.

(on vehicle)

**DISMOUNTING**

*Clutch annular oil seal replacement requires gearbox dismounting from the vehicle.*

Dismount the gearbox from the vehicle.

Dismount the pressure bearing.

Dismount the clutch casing.

Dismount the annular oil seal clutch shaft.

**REMOUNTING**

*NOTE: Before mounting, the annular oil seal shall be immersed in 80W/90 oil.*

Mount the new annular oil seal by means of the **CV 488** device, composed of:

- a pipe (1) for mounting the annular seal oil.

- a pipe (2) for protection of the annular seal oil.

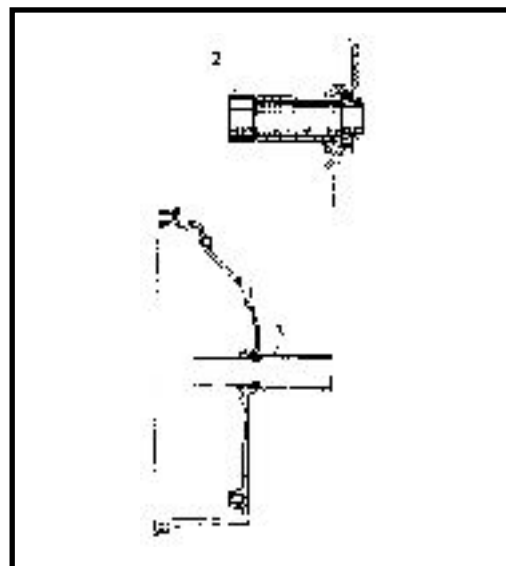
Clean the assembling surface clutch casing with the half crankcases and apply a layer of sealing paste **LOCTITE 518**.

Mount the clutch casing, using the protector (2) for protection of the annular seal oil.

Tighten the screws at the required moment:

**M8 : 2-2,8 daNm;**

**M10 : 3,2-4 daNm.**



Mount the pressure bearing.

Mount the gearbox on the vehicle.

Adjust the clutch stroke (**2,5 - 3,5 mm** at the declutching lever end).

(on vehicle)

**DISMOUNTING**

Mount the **TF 509** support crossbars between the attachment shaft of the shock absorber and the lower suspension arm shaft.

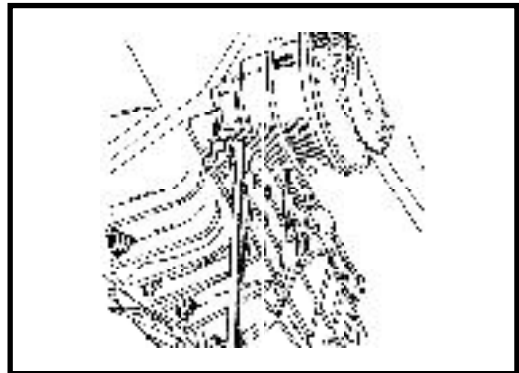
Lift the car on the elevator.

Dismount the front wheels.

Drain the oil from the gearbox.

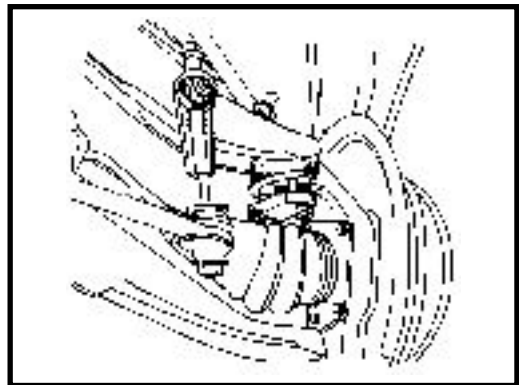


Take out the attachment pins of the transmission by means of the CV 31 mandrel.



Disconnect:

- the steering joint;
- the upper suspension joint, by means of the **TF 476** extractor.



Rock the steering knuckle support and remove the transmission from the propeller shaft pinion.

Observe the position of the nut corresponding to the crankcase.



## PROPELLERSHAFT ANNULAR OIL REPLACEMENT

(on vehicle)

Dismount the lock washer.

Dismount the adjustment nut by means of the **CV377** wrench; mark the number of rotations of the nut to enable the mounting in the same position, avoiding this way the further adjustment of the differential gear bearings.

Dismount the annular oil seal and the tightening ring.

Clean the nut.

**RE MOUNTING**

**NOTE:** Before mounting, the annular oil seals shall be immersed in **80W/90**.

Mount the new annular oil seal and tightening ring.

Mount the nut, observing the number of rotations and the dismantling marking.

Grease the propeller shaft pinion grooves with grease **UM 170 Li Ca Pb 2 M**.

Position the transmission gear in correspondence with the pinion; center the transmission by means of the **CV 31 B** mandrel.

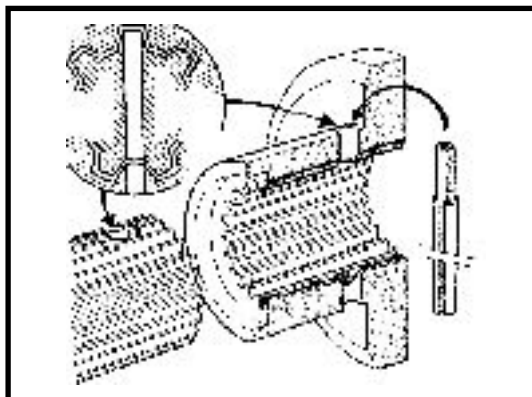
Introduce the new elastic pins.

The pins notches shall be oriented towards the wheel.

The pins ends shall be sealed with **RHODORSEAL 5661**

Mount:

- the upper suspension joint;
- the steering joint.



Mount the front wheels.

Lower the vehicle from the elevator and tighten the wheels nuts to required moment (**9 daNm**).

Mount the **TF 509** support cross bars.

Fill up the gearbox with **80W/90** oil.

## I. FRONT CROSS TRANSMISSION

### CHARACTERISTICS

Transmission of the motion from the gearbox to the front two driving wheels is performed by means of two assembled homo-kinetics transmissions provided at their ends with two joints of the following type:

- **GE 86** - towards the wheel;
- **GI 69** - towards the gearbox.

Both couplings are tripod type, the one from the gearbox, consisting in a tulip and GB tripod assembly and the one from the wheel, consisting in a steering knuckle casing with a tripod assembly, which is to be assembled with the propeller shaft tulip, the connection being ensured by the retention star.

These couplings allow: the transmission of the rotation motion, an axial sliding movement and accomplishment of the imposed turning angles.

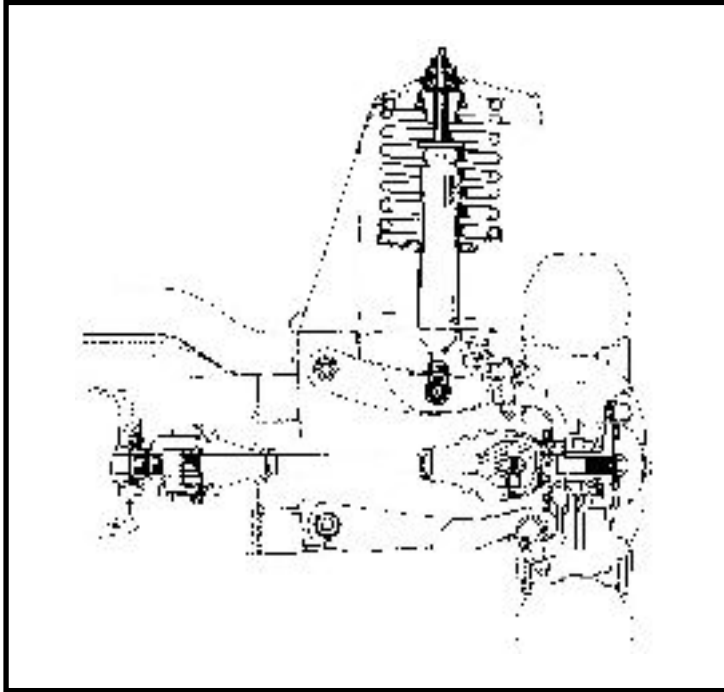
The both couplings are working in special grease **UM 185 Li 2** or **ELF CARDREXA RNT2**, being sealed towards exterior by means of a protection bellow.

### INGREDIENTS

<b>GREASE</b>	<b>QUANTITY</b>	<b>COUPLING</b>
ELF CARDREXA RNT 2 UM 185 LI 2 M	14,0 cl. 14,0 cl.	JOINT GI
ELF CARDREXA RNT 2 UM 185 LI 2 M	26,0 cl. 26,0 cl.	JOINT GE


## DRIVE SHAFTS

### FRONT CROSS TRANSMISSION



#### SPECIAL TOOLS

Pivot pins extractor	PF 476
Mandrel	C.V. 31 B
Hub immobiliser	PF 235 A
Device for mounting transmission in the hub	PF 236

TIGHTENING MOMENTS ( daNm )		
Suspension upper joint nut	5	
Steering joint nut	4	
Transmission nut	23	
Wheels nut	9	

**DISMOUNTING**

Mount the **TF 509** support cross bar between the shock absorber attachment shaft and the suspension lower arm shaft.

Lift the vehicle on the elevator.

Dismount the wheel.

Loosen:

- the attachment nut of the suspension upper ball joint;
- the steering joint fixing nut.

Depress by means of the **PF 476** extractor:

- the upper suspension ball joint;
- the steering ball joint.

Remove the attachment elastic pin by means of the **CV 31 B** mandrel.

Stuck the hub by means of the **PF 235 A** device and dismount:

- the transmission nut;
- the washer.

Dismount the brake caliper.

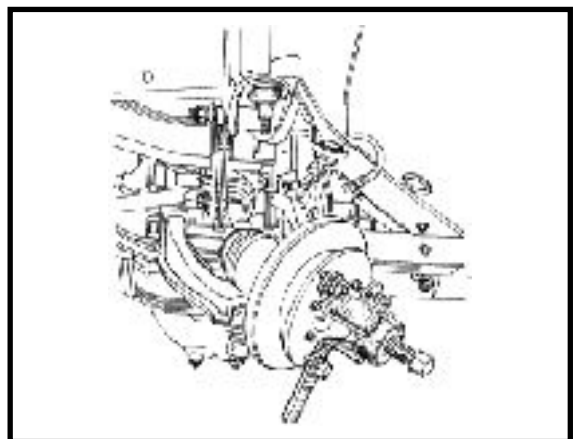
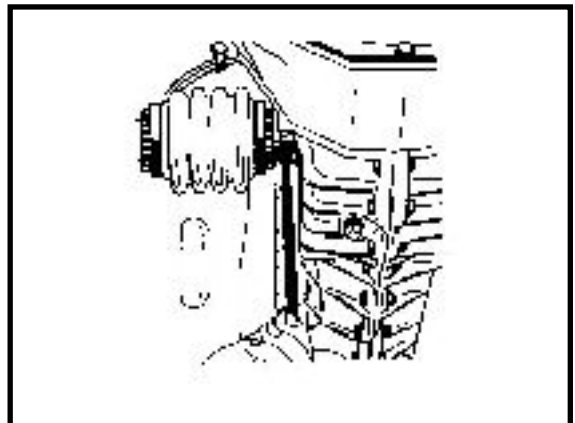
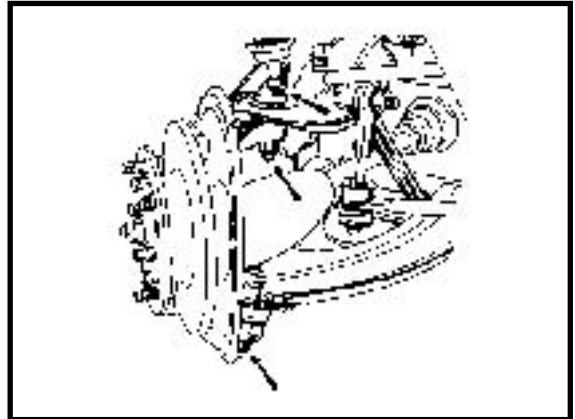
Dismount the suspension upper joint nut and the steering joint nut.

Take the suspension off the propeller shaft pinion.

Temporarily mount the steering ball joint.

Remove the transmission from the hub by means of the **PF 235 A** extractor.

Dismount the steering ball joint and remove the transmission.





### REMOUNTING

Grease the propeller shaft pinion grooves with **Li Ca Pb type II**.

Couple the transmission with the propeller shaft pinion.

Introduce the new elastic pins.

*The pins notches shall be oriented towards the wheel. The pins ends shall be sealed with **RODORSIL**.*

Introduce the transmission in the hub.

Mount the transmission in the hub by means of the **PF 236** device.

Mount:

- the suspension upper ball joint;
- the steering ball joint.

Tightening the nuts at the required couple.

Fix the hub by means of the **PF 235 A** device.

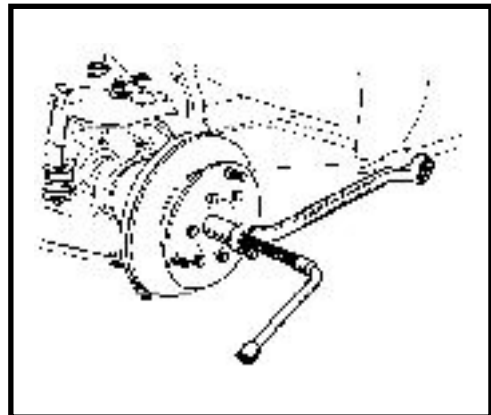
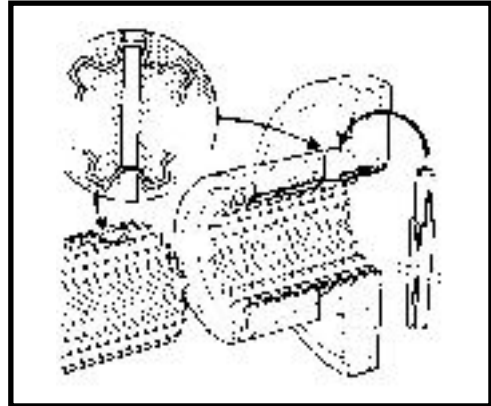
Mount:

- the washer ;
- the transmission nut.

Tighten the transmission nut at the required moment.

Remount:

- the brake caliper;
- the wheel.



Take the vehicle down from the elevator and tighten the wheel nuts at the required moment.

Dismount the **PF 509** support cross bar.

Press the brake pedal several times in order to bring the brake piston in contact with the friction linings.

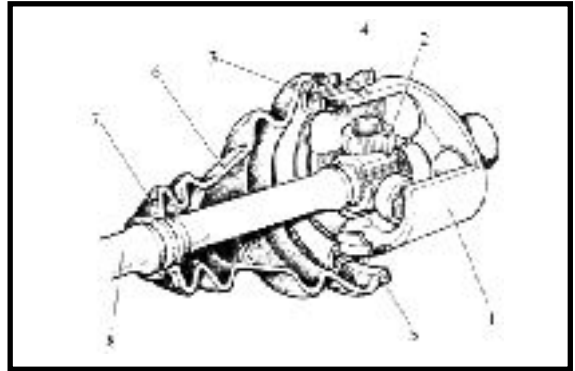
### **NOTE:**

*If after front brake beginning the brake damage warning light remains on perform the dismounting of the ICP from the brake pump; push three-five times the brake pedal then remount the ICP and the brake damage warning light will not be on again.*

**GI 69 JOINT BELLOWS REPLACEMENT**

Joint bellows replacement - the part towards the gearbox – is to be performed with dismantled transmission.

1. Tulip
2. Assembled tripod
3. Assembled type
4. Casing
5. Collar
6. Bellows
7. Ruber ring
8. Transmission shaft



**DISMOUNTING**

Dismount the transmission off the vehicle.

Dismount the collar (5) maintaining the bellows (6) on the tulip.

Dismount the rubber ring (7).

Cut the bellows on the entire length.

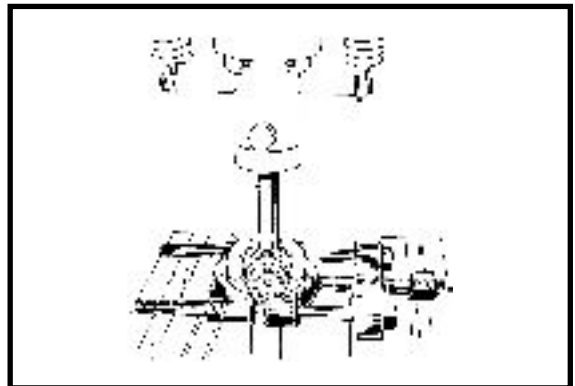
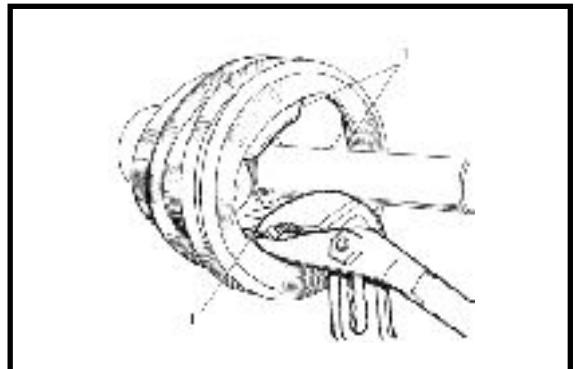
Remove maximum possible of the grease.

By means of a pair tongues, strain the tulip tilt towards the outside in the three zones of the tulip ramps.

Dismount the tulip.

Dismount the tulip safety ring.

Depress the tripod off the shaft.



**NOTE:**

*The sliding blocks and the needles are in pairs. Do not dismount the sliding off the tulip. Do not ever use solvent for parts washing.*

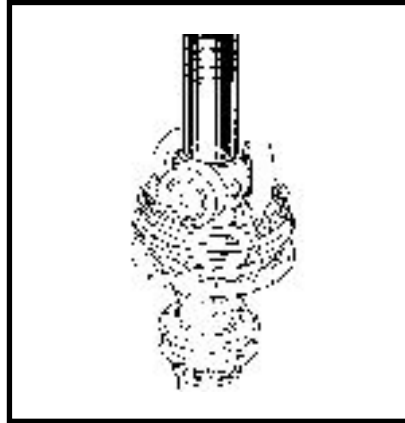
### REMOUNTING

Grease, the transmission shaft, the bellows and the rubber ring with MoS 2 grease.

Place on the shaft, the rubber ring and the new bellows.

Mount the tulip on the shaft.

Mount the safety ring.



Mount the tulip on the shaft.

Introduce approximate 14,0 cl special grease **ELF CARDEXA** or **UM 185 Li 2 M** in the bellows and the tulip.

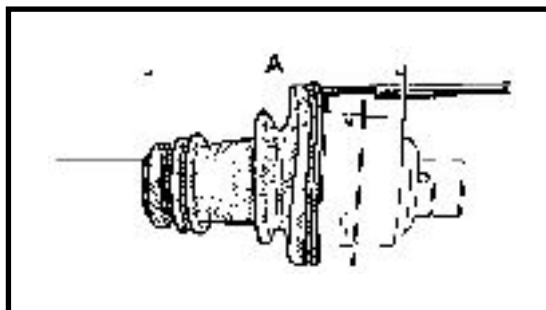
Introduce a bar between the bellows and the transmission shaft in order to dose the quantity of air inside the bellows.

Move the tulip until the value **A=162 mm** is obtained ( the value comprised between the bellows edge and the tulip extremity).

In this position take out the bar.

Mount the clip.

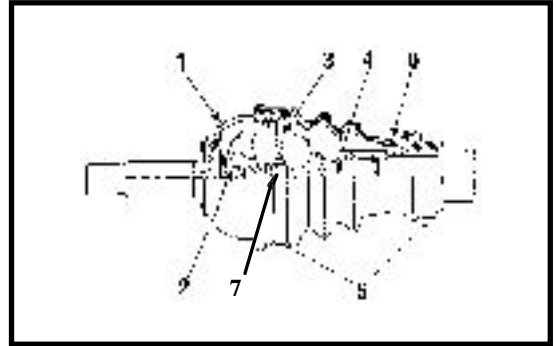
Mount the transmission on the vehicle.



### **GE 86 JOINT BELLOWS REPLACEMENT**

Bellows replacement – the wheel side- is to be performed having the transmission dismantled.

1. Steering knuckle casing
2. Retention star
3. Tripod assembly
4. Tulip shaft
5. Collars
6. Bellows
7. Spring



#### **DISMOUNTING**

Remove the two collars (5) taking care not to damage the channels made on the steering knuckle surface.

Cut and remove the damaged bellows.

Take out maximum of grease.

For **GE** joint bellows replacement it will be necessary to dismantle the joint parts towards the gearbox (joint **JI 69**) ( see previously described method).

#### **REMOUNTING**

##### **NOTE:**

*It is absolutely necessary to observe the prescribed grease quantity ( 26,0 cl ).*

Position: the bellows reinforcements in the steering knuckle casing channels and in the shaft rod channel.

Mount the **GE** joint collars.

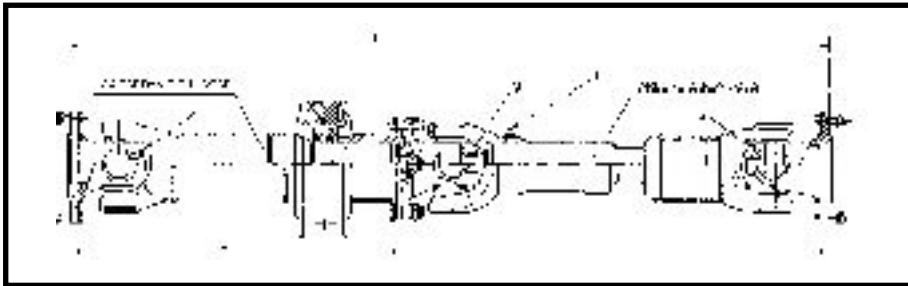
Remount **GI** joint parts.

## II. LONGITUDINAL TRANSMISSION (CARDANIC)

### CHARACTERISTICS

Longitudinal transmission is specific and is equipping the D1304, D 1307 vehicles (rear wheel drive or f.w.d. 4 W D) and has the purpose to transmit the motion from GB to rear axle (drive axle). It is composed of three asynchronous cardanic joints open type and two longitudinal cardanic shafts, the first one assembled to the gearbox, sustained on a support with intermediary bearing, the second one assembled with the first and with the main transmission, owing an axial compensating coupling (slotted joint).

In the cardanic joints areas there are mounted the lubricators G which have the purpose to distribute the grease through the channels made for the access to the four bearings.



### DISMOUNTING

Dismount:

- the four bolts **M10 x 1,25 - 35** assembling the cardanic flanges to the side towards the drive axle;
- the four bolts **M10 x 1,25 - 35** assembling the cardanic flanges to the side towards the drive gearbox;
- the two bolts **M 8 x 1,00 - 25** positioning the transmission relay on the cross bar.

Dismount the cardanic transmission off the vehicle.

### REMountING

For remounting, perform in reverse order the dismounting operations.

Additionally, observe the following conditions:

- before assembly the shaft flanges must not show shocks marks, marks, paint marks, oxides, etc.
- when assembling the intermediary support on the cross bar, the screws will be oriented from top to bottom.

**IMPORTANT !**

The cardanic joints forks which are mounted at the both ends of the longitudinal transmission are to be placed in the same plane.

**SIZE CHARACTERISTICS [ mm ]**

- Lt - total length of the cardanic transmission
- L - length of the cardanic shaft with bearing
- Lz - length of the assembled cardanic shaft

VEHICLE RANGE	NUMBER OF GEARS GB	Lt	L	Lz
DACIA 1304	4 TR	1970	870	1100
DACIA 1304	5TR	1950	850	1100
DACIA 1307	4 TR	2080	980	1100
DACIA 1307	5 TR	2060	960	1100

**TIGHTENING MOMENTS [ daNm ]**

- cardanic flanges tightening screws (extremities) - **M 10 x 1,5**.....**4 - 6**
- cardanic intermediary flanges tightening screws - **M 8 x 1,25**.....**1,5 - 2,5**

**CARDANIC TRANSMISSION MAINTENANCE**

In order to avoid arising of some problems in exploitation such as : noise, joint clearance, nooses gutter wear, it is necessary to perform the greasing of the cardanic transmission every 5000 km.

The operation is performed within adjust in within the periodical technical revisions by means of the Tecalemit (grease gun).

This to be applied on the lubricators from the joints areas (cross-head) and the corresponding lubricator to the gutters. Needle roller bearings and the gutter connection is to be lubricates under pressure using **UM 185 Li 2** type grease or its equivalent.

Greasing is considered adequate when by the sealing elements (gaskets) the old grease is eliminated and the new one is coming out.

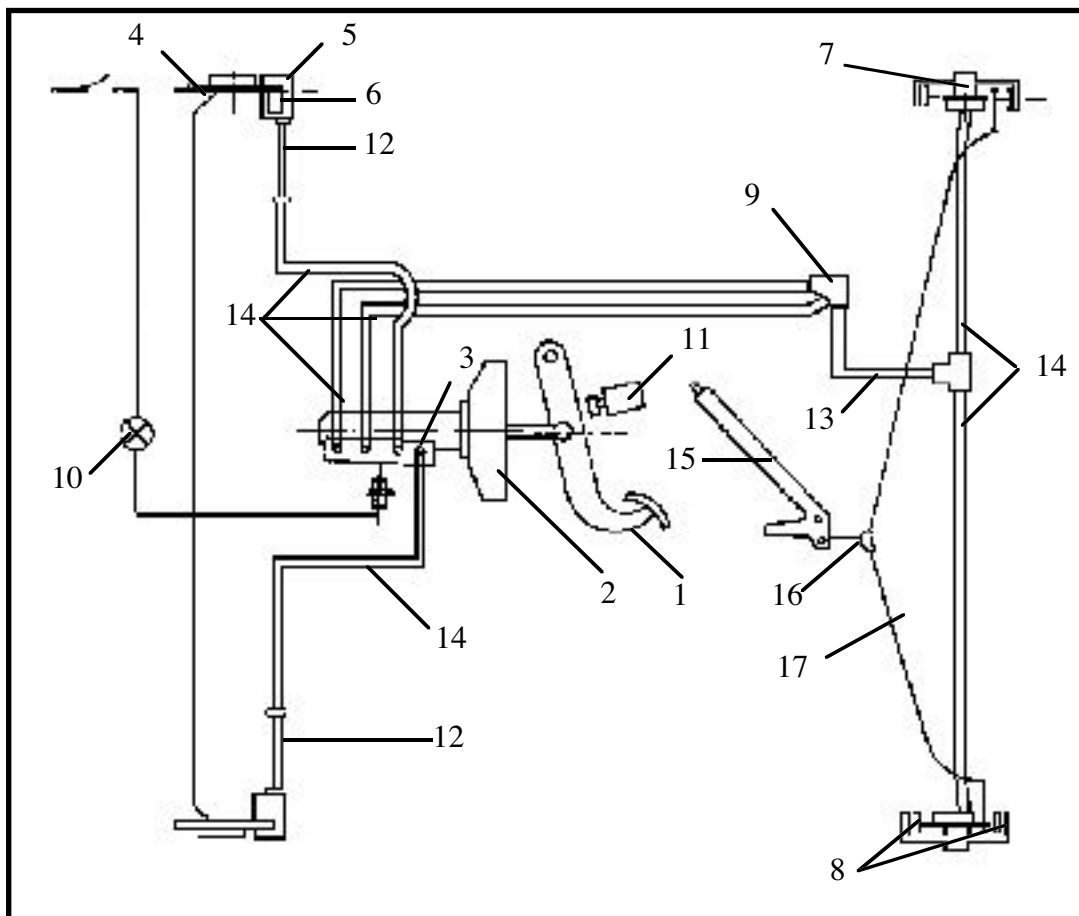
The intermediary support does not require maintenance.

**GENERAL**  
**GENERAL PRINCIPLE SCHEDULE OF A BRAKE CIRCUIT**  
**IN PARALLEL WITH BY-PASS CIRCUIT**

The DACIA commercial vehicles, are equipped with hydraulic braking system, double circuit by-pass brake pump , brake amplifier, pressure limiter in order to avoid the rear wheels blocking.

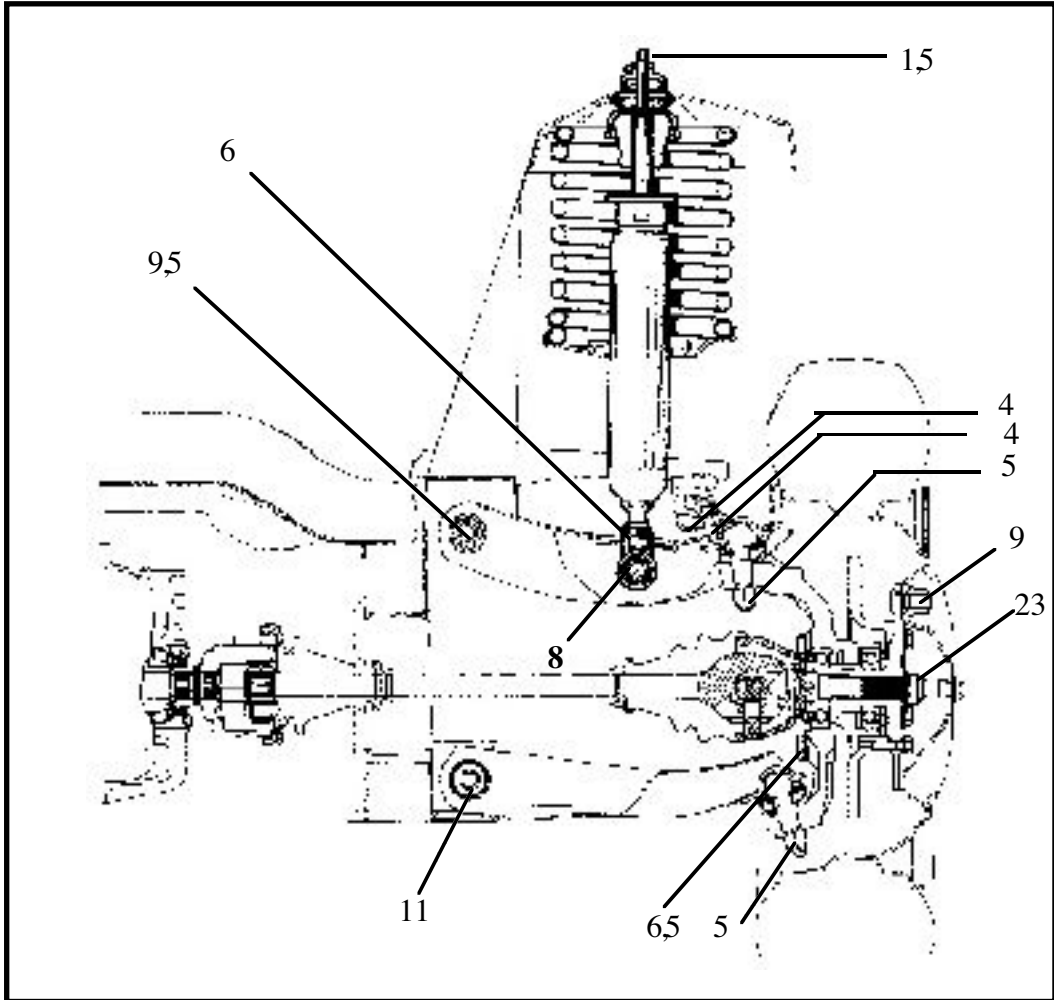
The front brakes are disk type and the rear brakes are drums type.

The brake disks are aerated, for the wheels with 5 attachment screws and non aerated for wheels with 3 attachment screws.



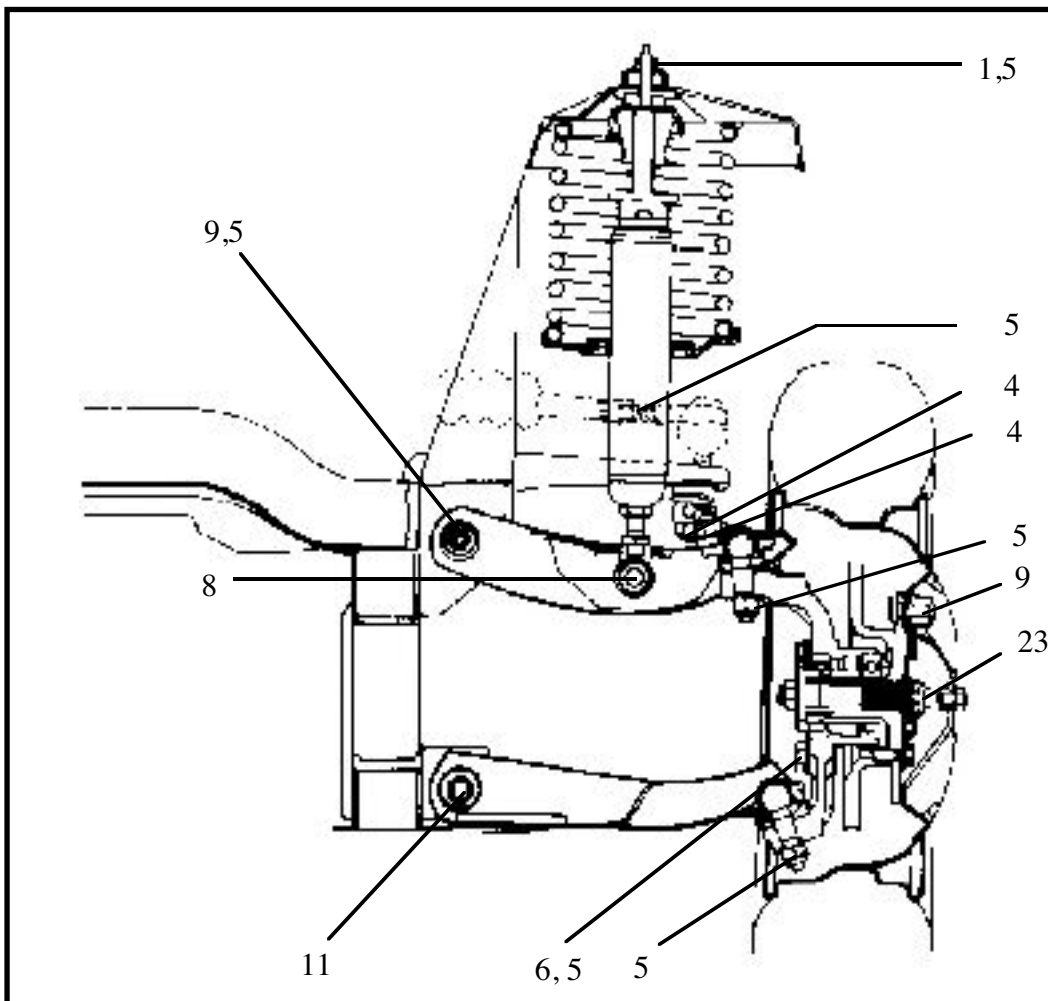
- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>1. Brake pedal</li> <li>2. Master - Vac amplifier.</li> <li>3. Master cylinder</li> <li>4. Front brake disk</li> <li>5. Front brake caliper</li> <li>6. Brake pads</li> <li>7. Brake drum</li> <li>8. Brake shoes</li> </ul> | <ul style="list-style-type: none"> <li>9. Pressure limiter</li> <li>10. Warning light</li> <li>11. STOP contact</li> <li>12. Front brake hose</li> <li>13. Rear brake hose</li> <li>14. Rigid piping</li> <li>15. Parking brake control lever</li> <li>16. Parking brake primary cable</li> <li>17. Parking brake secondary cable</li> </ul> |
|---|--|

FRONT DRIVING AXLE

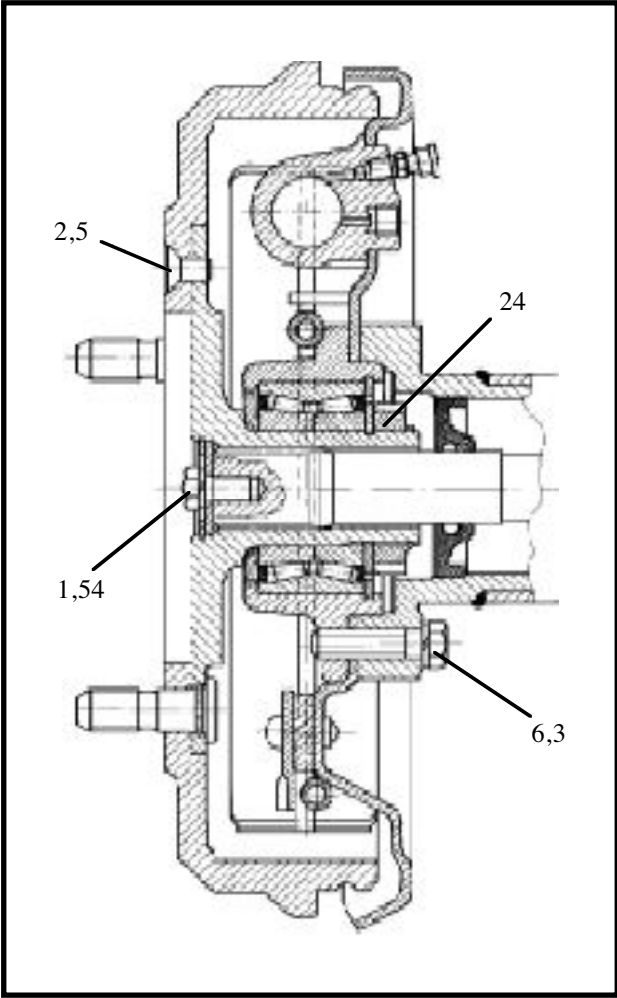




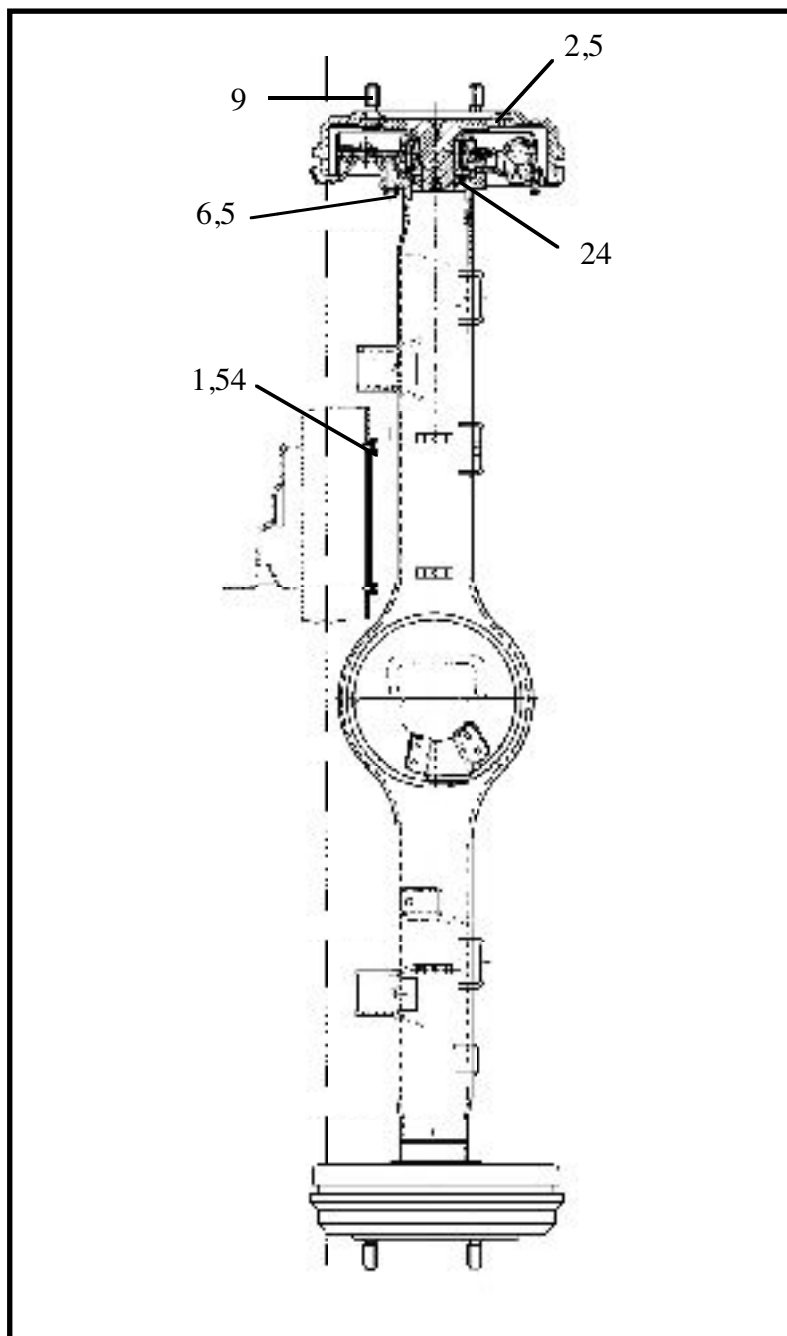
FRONT NON DRIVING AXLE



REAR DRIVING AXLE



REAR UNDRIVING AXLE





ELEMENT	TIGHTENING MOMENT
Caliper purging screw	1 - 1,2
Flexible hoses in calipers	2
Rigid tubing linkage in wheel cylinder	1,5
Pad holder attachment screw	6,5
Attachment screw disk to the hub	2
Front wheel steering knuckle nut	23
Wheel attachment screw	9
Wheel fixing nuts	9
Main brake cylinder fixing nut with servobrake	1,3
I.C.P. transducer	2
Servobrake on bridge floor	2
The screw-connection of the rigid linkage on: main brake cylinder, pressure limiter, rear wheel cylinder, flexible hose.	1,5

**GENERAL**  
**THE DIMENSIONS OF MAIN BRAKING ELEMENTS**

30

( in mm )  
**FRONT BRAKE**

Brake caliper bore diameter (for 3 screws wheel)	$\phi$ 48
Brake caliper bore diameter (for 5 screws wheel)	$\phi$ 54
Brake disk diameter	228
Disk thickness non aerated	10
Disk thickness aerated	20
Minimal disk thickness non aerate	9
Minimal disk thickness aerated	19
Braking pad thickness ( the support included)	14
Minimal brake pad thickness (the support included)	7
Disk axial run out measured at $\Phi$ 215	0,1

**REAR BRAKE**

Wheel braking cylinder diameter	25,4
New drum inner diameter	254
Maximum drum diameter after grinding	255
Braking lining width	50
Braking lining thickness	5
Minimal accepted braking lining height above rivets	0,5

TANDEM MASTER CYLINDER with I.C.P. BY PASS INCLUDED Inner diameter Max.pump stroke BRAKE FLUID TANK PRESSURE LIMITER	20,6 32 Double, with alarm sensor For parallel circuit
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The sewerage connection between the brake pump, brake calipers, pressure limiter is performed by means of the sleeves threaded with METRIC PITCH

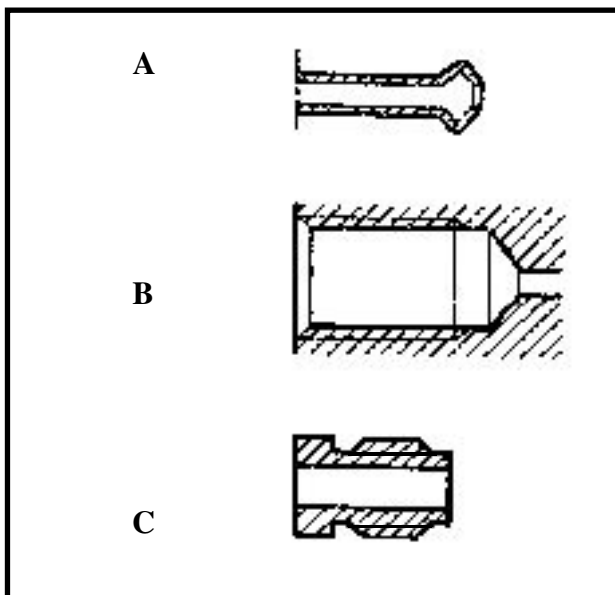
Therefore it is important to use only original spare parts, recommended in the spare parts catalogue specific for this type of vehicle.

**Spare parts identification**

The cupping shape of the copper or steel ducts (A).

The shape of the threaded lengths on parts (B).

Connections of ducts (C).



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### **PERIODIC CHANGE OF THE BREAK FLUID**

The manufacturing conception of the brakes equipping the Dacia vehicles especially the disk brake type (inner empty pistons, low quantity of fluid with cylinder, sliding calipers avoiding existence of a fluid reserve in the less cooled area of the wheel) enable the maximum rejection of fluid vaporization even in case of intensive using of brakes (mountain area).

The current brake fluids suffer in all cases a slight degradations during the first months of use by a slight humidity absorption series (see the Vehicle Warranty and Maintenance Booklet, for brake fluid change)

### **COMPLETION OF THE BRAKE FLUID LEVEL**

The wear of brakes pads and shoes leads to a gradually diminution of brake fluid level in the brake fluid tank.

It is not necessary to compensate this diminution, because the level will be restored when changing the brake pads and shoes.

Obviously, in the meantime, the level of brake fluid in tank must not go down below the minimal mark.

### **HOMOLOGATED BRAKE FLUIDS**

The mixture in the braking circuit of two non compatible brake fluids may leads to important risks mainly due to gasket damage. In order to avoid such risks, it is important to use brake fluids checked and homologated by our laboratories and which are conformed with Norm **SAEJ 1703, DOT 4**.

### **AIR ELIMINATION FROM THE HYDRAULIC CIRCUIT ( PURGING )**

The air existence in the hydraulic circuit may be noticed by an elastic displacement of the brake pedal, sometimes even, close to the floor. This fact is more evident with the engine stopped.

#### **GENERAL RECOMMENDATIONS**

Always use for completion or total changing the brake fluid Norm **SAE J 1703, DOT 4**

In case of changing the brake fluid it is necessary to wash the system with one liter of industrial alcohol.

During the purging, the brake fluid from the tank must not go down bellow the minimal level marked on the tank.

To perform the purging, one person will stay on the driver place, to push the brake pedal and the other one will perform the purging (bleeding) at the wheel using a 500 ml vessel, a transparent plastic tube and brake fluid for completion.

#### **PROCEDURE**

Place on the bleeding (purging) screw, a transparent tube with its end in a vessel with brake fluid and proceed as follows: press the brake pedal slowly, dismount the bleeding screw, maintaining the full stroke of the pedal, then tighten the bleeding screw and slowly release the brake pedal.

Repeat the same procedure until complete cease of bubbles. Proceed in the same way also for the other purging places. ( Take into consideration the existence all the time of the brake fluid in the tank ).

***ATTENTION : Before beginning the purging procedure dismount the I.C.P. from the brake pump. It shall be remounted at the end of the operation.***

#### **PROCEDURE IN PARALLEL SYSTEM**

It is important to observe the following sequence of the purging points:

- 1,6. Main cylinder with I.C.P. incorporated;
2. Left rear wheel brake cylinder;
3. Right rear wheel brake cylinder;
4. Caliper of front right wheel;
5. Caliper of front left wheel.

#### **OPERATING CONDITIONS**

The vehicle is on wheels.

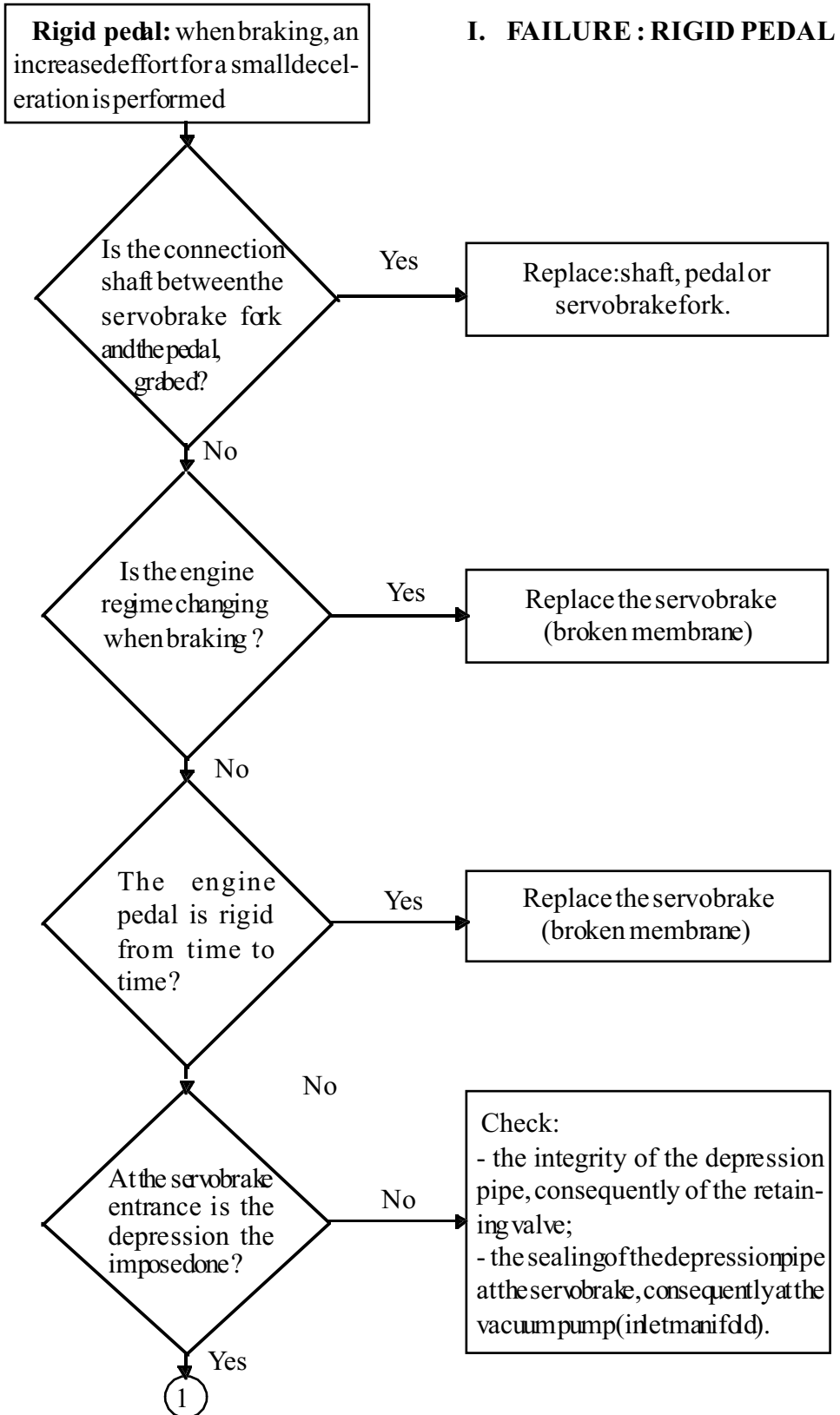
If the fuel tank is empty, place on the rear bench of the vehicle one or two persons to enable the possibility of the circuit opening ( the passing of a larger fluid flow through the brake limiter).

#### **CHECKING THE BRAKE SYSTEM SEALING**

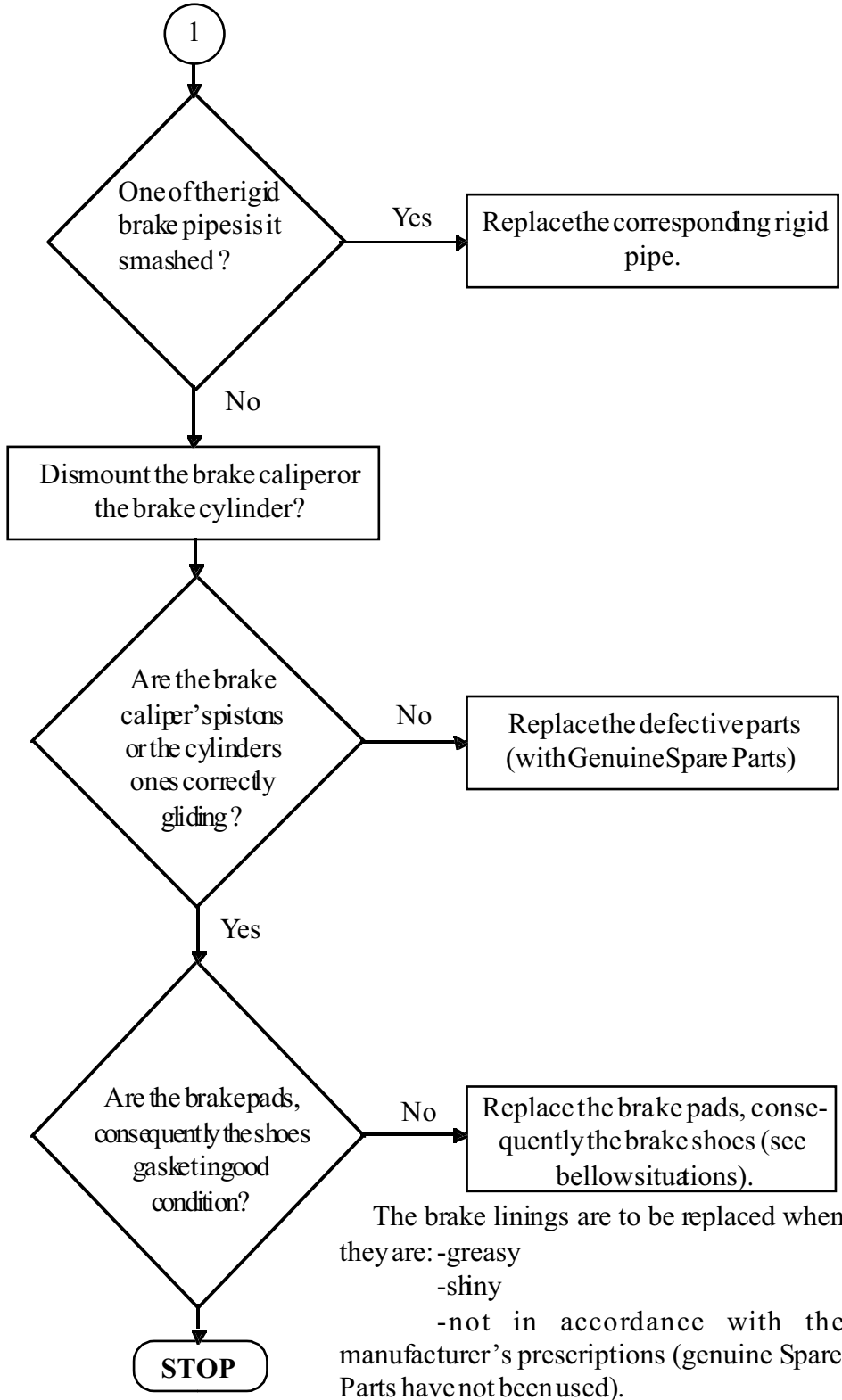
After purging the front and rear circuits, check if the level of brake fluid in tank is within the prescribed limits, than press the brake pedal for 30 s ,during this time the pedal shall not change its place.

Leaking in the brake system is not acceptable.

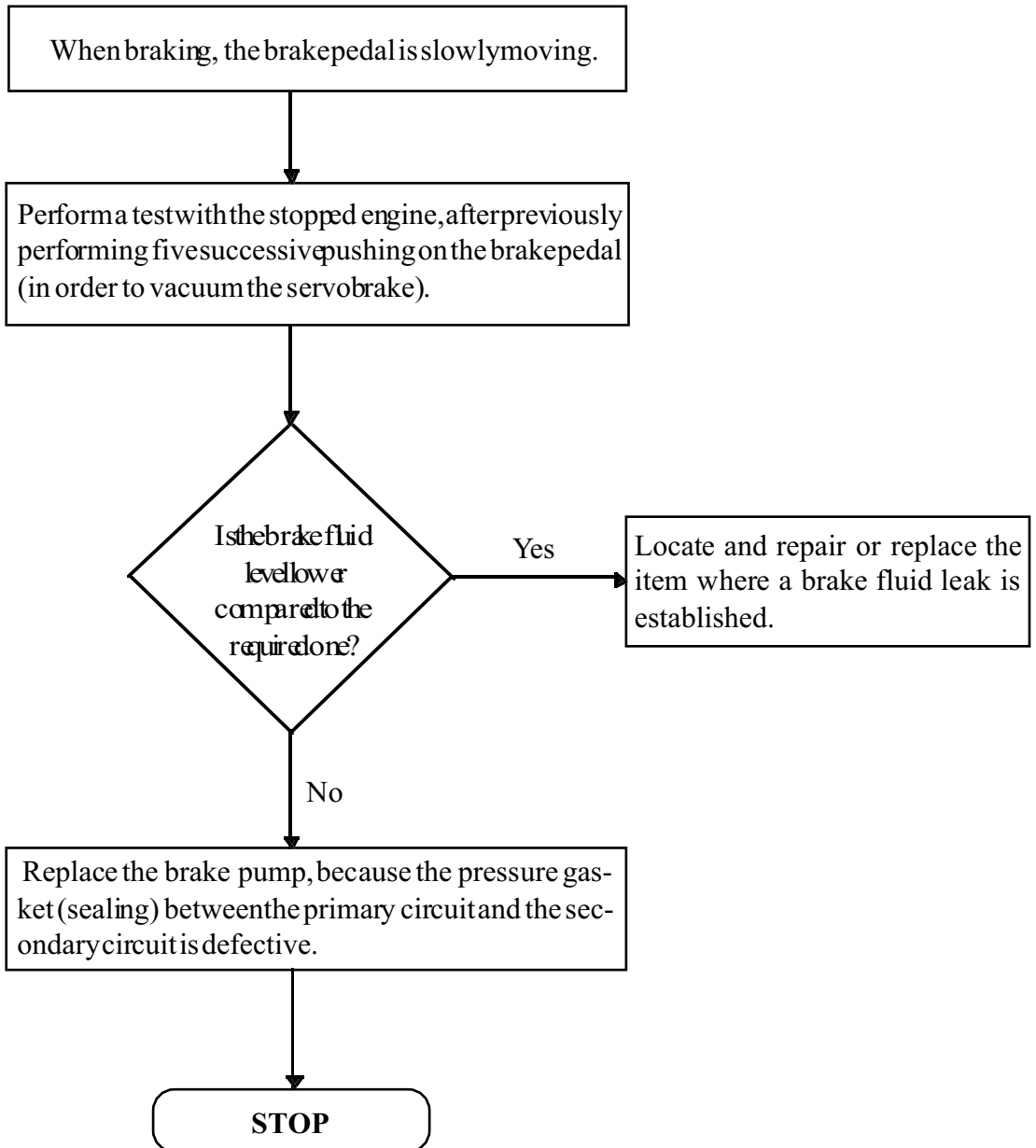




I. FAILURE : RIGID PEDAL (ctd)



II. FAILURE : LONG PEDAL



I. CONSTANT EFFECT TO THE PEDAL

EFFECTS	POSSIBLE CAUSES
<p><b>Tough pedal:</b> <u>High effort for small deceleration</u></p>	<ul style="list-style-type: none"> <li>- Assistance defect</li> <li>- Brake linings:               <ul style="list-style-type: none"> <li>- greasy</li> <li>- stacking to the disk ( non-conform )</li> <li>- heating, prolonged braking with constant pedal press</li> </ul> </li> <li>- Stuck piston</li> <li>- Rigid duct narrowed (flattening)</li> </ul>
<p><b>Elastic pedal</b> In order to diagnose, an incident where the use was normal is to be analyzed and two tests are to be performed:</p> <p><b>1. While driving the vehicle :</b> Interpretation test: pedal stroke/ deceleration rate.</p> <p><b>2. While vehicle is stopped, engine cut.</b> Additional test of brake pedal press: Perform five consecutive pressings on the brake pedal in order to vacuum the servobrake, before taking into consideration the test result.</p>	<ul style="list-style-type: none"> <li>- Air presence in the circuit defective purging</li> <li>- Internal leak in the braking circuit.</li> <li>- Leak of fluid from reservoir (external fluid leak from braking circuit)</li> </ul> <p>Automatic adjustment : hand brake cable too tighten.</p>
<p><b>Long pedal</b> The test is to be performed with stopped vehicle and cut engine.</p> <p><b>REMARK:</b> <b>It is necessary to perform five consecutive pressings on the brake pedal, in order to vacuum the servobrake before taking into consideration the test result.</b></p>	<ul style="list-style-type: none"> <li>- Important and asymmetric wear of the brake linings</li> <li>- Stroke too ample between the servobrake pushing rod and the brake pump</li> <li>- Brake fluid having high temperature.</li> <li>- Hydraulic leak (check the sealing of the braking system components)</li> </ul>
<p><b>Floor pedal</b> The test is to be performed with stopped vehicle and cut engine.</p> <p><b>REMARK :</b> <b>Perform five consecutive pressings on the brake pedal, in order to vacuum the servobrake before taking into consideration the test result.</b></p>	<ul style="list-style-type: none"> <li>- Sealing gaskets defects of the two brake pump circuits.</li> <li>- Brake fluid having high temperature</li> </ul>

**II. CONSTANT EFFECT AT BEHAVIOUR**

<b>EFFECTS</b>	<b>POSSIBLE CAUSES</b>
<b>Brakes not accomplishing the required braking distance</b>	<ul style="list-style-type: none"> <li>- Non-uniform worn brake linings (backing off);</li> <li>- Brake linings slightly greased;</li> <li>- Springs with modified characteristics.</li> </ul>
<b>Vibrating brakes</b>	<ul style="list-style-type: none"> <li>- Brake disks with high wobbling;</li> <li>- Inconstancy brake disks width;</li> <li>- Particles abnormal deposit on brake disks (oxidation between linings and disk).</li> </ul>
<b>When braking, the vehicle (front part) is left/right deviating</b>	<ul style="list-style-type: none"> <li>- Front axle suspension, steering (to be checked);</li> <li>- Stuck piston;</li> <li>- Tires – wear, inflation pressure;</li> <li>- Rigid duct narrowed (flattening).</li> </ul>
<b>Braking</b>	<ul style="list-style-type: none"> <li>- Stuck piston;</li> </ul> <p>Automatic adjustment : hand brake cable very tighten</p> <p style="text-align: center;"><b>REMARK :</b></p> <p style="text-align: center;"><i>Automatic recovering is performed by means of the brake pedal, if there is no abnormal tension in the hand brake cable when released (hand brake released).</i></p> <ul style="list-style-type: none"> <li>- Return spring.</li> </ul>
<b>Heating brakes</b>	<ul style="list-style-type: none"> <li>- Insufficient hydraulic stroke of the brake pump, not allowing the return at rest of the brake pump pistons ( brake pump remaining under pressure);</li> <li>- Stuck pistons or hardly returning;</li> <li>- Rigid duct narrowed (flattening);</li> <li>- Defective adjustment of the hand brake control.</li> </ul>

### FRONT AXLE ANGLES

#### CAMBER ANGLE $1^{\circ} 30' \pm 30'$

It is formed by the wheelplane with the vertical that crosses the wheel axis.

A difference higher than  $1^{\circ}$  between the two camber angles (left side and right side) leads to:

- the deviation from the trajectory that must be adjusted by means of the steering wheel;
- abnormal wear of the tires and bearings.

This angle results from building may not be adjusted.

#### THE CASTER ANGLE $4^{\circ} \pm 1^{\circ}$

**This angle is formed in the vehicle longitudinal plane, by the axis of the attachment point of the steering knuckle by means of the suspension ball joint and the vertical that passes through the front wheel shaft.**

A difference higher than  $1^{\circ}$  between the two angles (left side and right side) leads to:

- the deviation to the trajectory that must be adjusted by means of the steering wheel;
- irregular wear of the tires.

### STEERING GEAR BOX POSITION

The steering gear box should be placed at a certain height from the attachment points of the steering auxiliary connecting rod ball joints.

The position of the steering gear box influences the variation of the parallelism.

The steering box is mounted in the position for which the variation of the parallelism is minimal.

The modification of the parallelism between left side and right side leads to:

- the deviation of the vehicle from trajectory in one sense upon accelerating;
- the deviation of motor car in the opposite side upon braking;
- the deviation of the trajectory on the hilly ground;
- the premature wear of the tires.

The horizontality of the steering box is ensured by the producer.

### **PARALLELISM**

It is measured in horizontal plane as a difference between the front and rear part of the wheels of same axle.

The wheels of the front axle are :

- divergent for DACIA commercial vehicles with front drive (opening 1 – 4 mm);
- convergent for DACIA commercial vehicles with rear drive or four wheels drive (closing 1 – 3 mm).

#### ***ATTENTION!***

***A too much opening causes the wear of the tires towards the interior.***

***A too much closing causes the wear of the tires towards the exterior.***

### **THE TRANSVERSAL INCLINATION ANGLE OF THE BALL JOINT $8^{\circ} \pm 30'$**

It is formed by the ball joint axle and the vertical, measured in transversal plane.

The purpose of this angle is the same with the one of the caster angle: retrieve the wheels after turning, in the corresponding position for rectilinear driving and to maintain this movement.

This angle is not adjustable.

#### ***NOTE :***

***The parallelism, the transversal inclination of the ball joint and the parallelism variation are adjustable.***

### **ADJUSTMENT POSSIBILITIES**

Only the following parameters may be adjusted:

- the caster angle, by means of the rod;
- the parallelism and the distribution, from the connecting rod pipe;
- the steering gear box position, by means of the eccentrics (positioning will be adjusted only if the steering gear box has been dismantled **DIR 487**).

### **PRELIMINARY CHECKINGS**

Before checking and adjustment of the front axle geometry perform the following operations:

The checking of tires concerning:

- dimensions;
- air pressure;
- the state of wear.

**NOTE:**

*The tires must be of same type, with the same state of wear, air pressured at the prescribed pressure.*

The check of joints

- the wear of elastic bushings;
- ball joints clearance;
- connecting rod clearance;
- wheels bearings clearance.



### THE SEQUENCE OF THE OPERATIONS

**Due to the geometric conception of the front axle, modification of one side angle (castor angle, camber angle, ball joints) has no major impact on the value of other side angles (the parallelism being directly influenced).**

The modification of these angles does not happen during vehicle exploitation, but only as a consequence of a vehicle accident.

It is important to observe the following sequence:

- placing the vehicle on rotating plates;
- braked vehicle;
- check suspension for placing the vehicle at its free height;
- establishing of the steering central point and steering box lock;
- fixing of the optical devices on the vehicle, as per manufacturer instructions.

### ESTABLISHING OF THE STEERING CENTRAL POINT

**In order to establish the steering box central point, bring gear rod in the position where  $C = 65$  mm.**

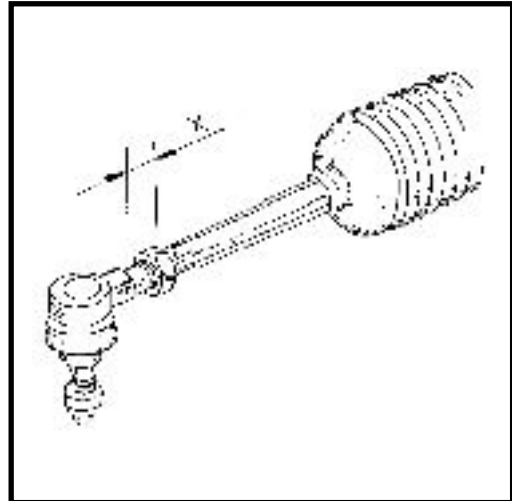
This value is obtained when a rivet of the elastic coupling is upward orientated.

The performing of one checking or adjusting front axle operation implies location of the steering box point in order to avoid errors when measuring.

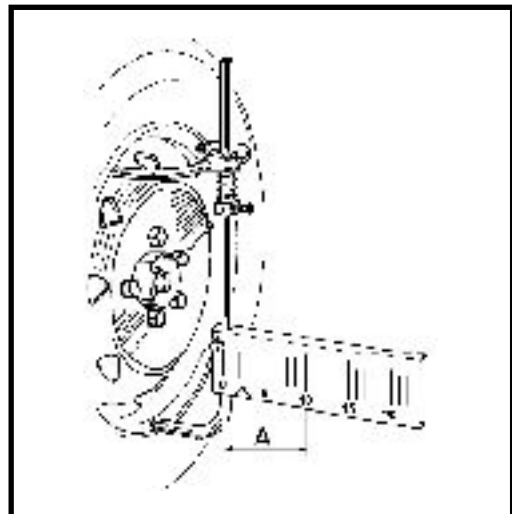


REPARTITION CHECKING AND ADJUSTMENT

Check the connecting rods symmetry "X".



Read the value "A" on the scale.



**Case1.** The symmetry dimension “X” is correct:

- the value “A” is equal distributed.

**Case2.** The symmetry dimension “X” is incorrect:

- read the value “A” on each side, mark it, calculate an average value, establishing the value for each side.

**EXAMPLE**

Right side value: **A = 16;**

Left side value: **A = 10;**

**16 + 10 = 26; 26 : 2 = 13.**

Operating the steering rods tie bar, restore the same value for both side **A = 13.**

In this position, lock the rotating plate to zero point.

Check in order: camber angle, caster angle, parallelism, ball joint angle.

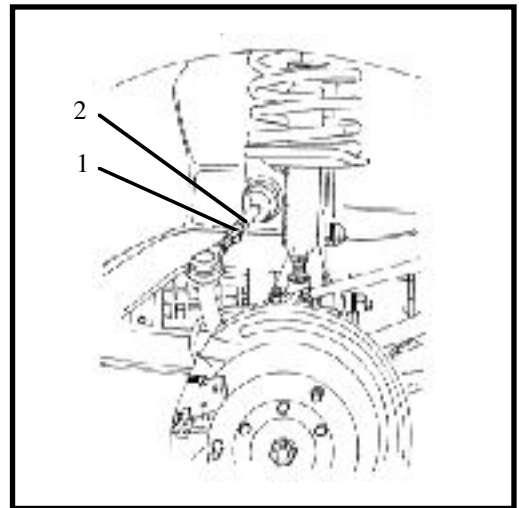


**PARALLELISM ADJUSTMENT**

Loosen the locknut (1) maintaining the tierod of steering connecting rod (2) in a fixed position

Act upon the rod of steering connecting rod taking into account the rotation sense of latter in order to obtain the convergence or divergence and also the fact that one of its complete rotation leads to an axial displacement of **1,5 mm.**

After obtaining the correct parallelism, tighten the lock nut at a moment of **5 daNm.**



**OBSERVATION:** Three situations may appear:

PARALLELISM	REPARTITION	CORRECTION WHICH MUST PERFORMED
1. CORRECT	INCORRECT	It is performed the same number of connecting rod rotation on left side and right side until obtain the same value “A”.
2. INCORRECT	CORRECT	Adjust the parallelism at the same value for left and right side ensuring in the same time, the same value “A” on both sides.
3. INCORRECT	INCORRECT	First operate on repartition in order to balance the value “A” on each side, than adjust the parallelism (see <b>Case 2</b> ).

THE AXIAL DEVIATION OF THE WHEELS TO THE LEFT OR RIGHT AT  
STABLE SPEED

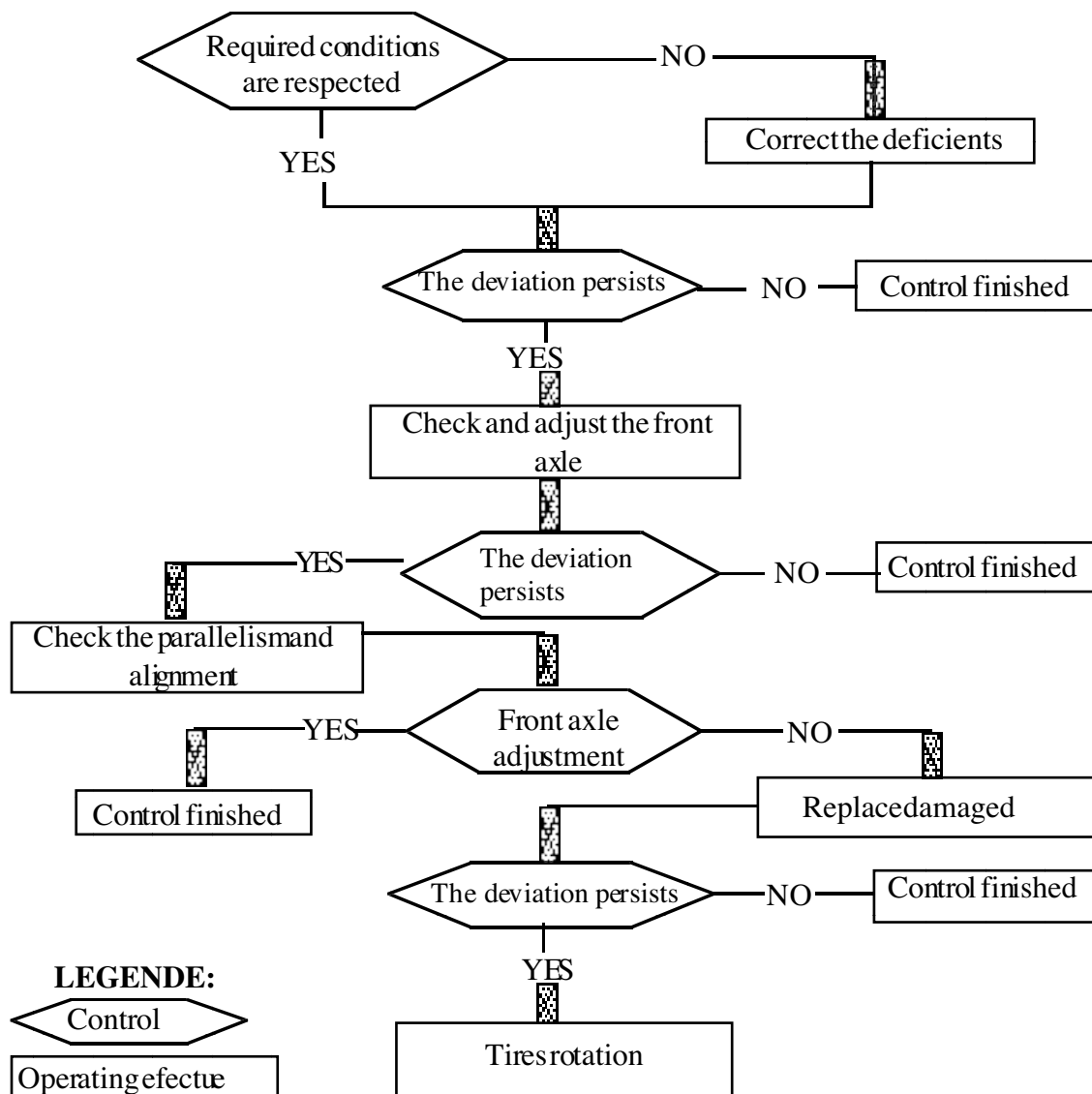
Preliminary checking:

WHEELS (front,rear): - pressure;

- dimensions;
- types;
- adjusting wheels.

HINGES: - bush.

CONTROL POINTS HEIGHT: - symmetry



## SUSPENSION UPPER ARM

## SPECIAL TOOLS

DENOMINATION	CODE
Front axle support cross bars	PF 509
Ball joints extractor	PF 476
Dynamometric wrench	MOT 50

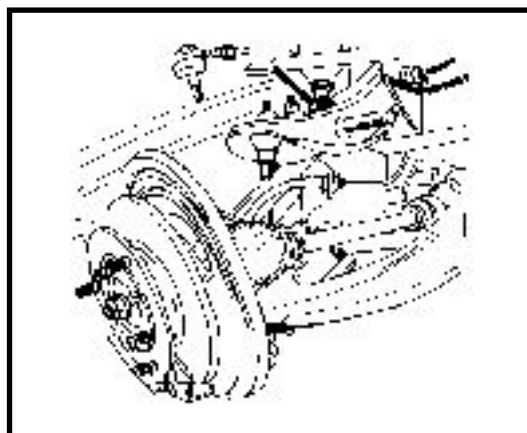
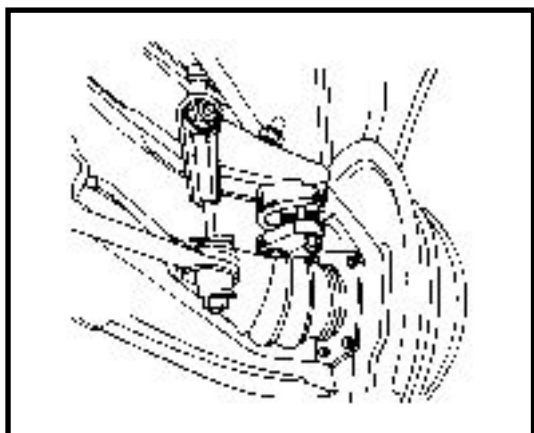
## DISMOUNTING

The operation that were performed on a half axle are identical to those performed on the other one.

Suspend the vehicle on the elevator.

On the part where the upper arm is dismantled , the following operations are performed:

- dismantle the wheel;
- loosen the lower lock nut of the shock absorber;
- detach the caster angle rod off the upper part of the arm;
- dismantle the suspension upper ball joint and the steering ball joint by means of the **PF 476** extractor;
- dismantle the lower joint shaft of the shock absorber;
- dismantle the upper arm of the shaft;
- lift the arm and dismantle the lower joint of the shock absorber;
- remove the arm.



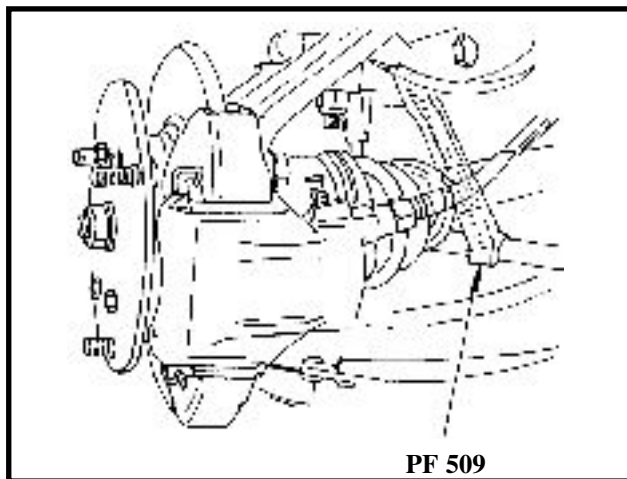
### REMOUNTING

Position the arm and clamp the lower joint of the shock absorber.

Couple the upper suspension ball joint with the steering knuckle and slightly tighten the nut.

Mount , without tightening ;

- the upper arm shaft;
- the lower joint shaft of the shock absorber;
- the steering ball joint;
- the caster rod.



Mount the crossbar **PF 509** or compress the front axle in position **H1 – H2 = 80 mm**.

In this position of elastic bushings locking , tighten to the required moment:

- the upper arm shaft nut;
- the lower joint shaft of the shock absorber;
- the caster rod nut;
- the upper suspension ball joint nut;
- the steering ball joint nut.

Mount the wheel and get the vehicle down from the elevator.

### TIGHTENING MOMENTS

- Upper arm shaft nut..... **9,5 daNm**
- Shock absorber lower shaft nut..... **6 daNm**
- Caster rod nut..... **4 daNm**
- Upper ball joint nut..... **5 daNm**
- Wheels nut..... **9 daNm**

**CHECKING**

**SPECIAL TOOLS**

DENOMINATION	CODE
Front axle support cross bars	PF 509
Ball joints extractor	PF 476
Upper arm checking device	PF 502
Dynamometric wrench	MOT 50

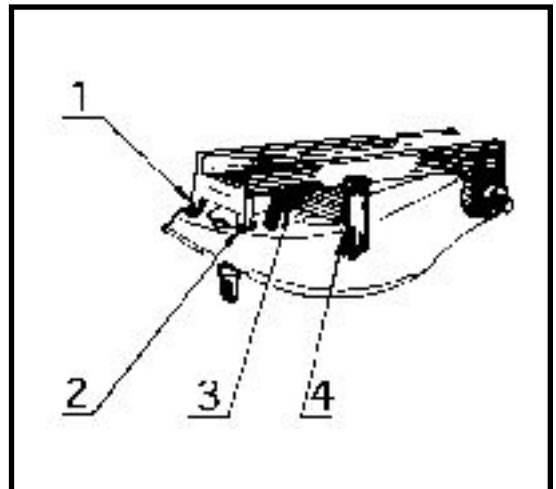
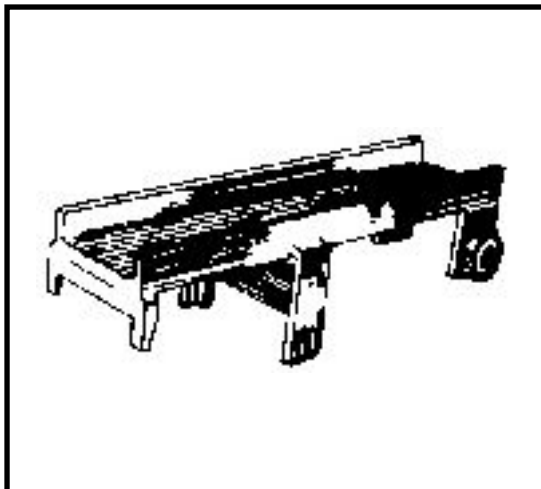
Dismount the upper arm of the suspension.

Place the device on the arm and mount the shaft.

The arm should easily enter in the device central guiding and should be placed on one of the support pins (1,2,3,4).

Measure the distance between the support pins and arm, which should be between **0** and **1 mm**.

Re mount the suspension upper arm on the vehicle.



### ELASTIC BUSHING REPLACEMENT

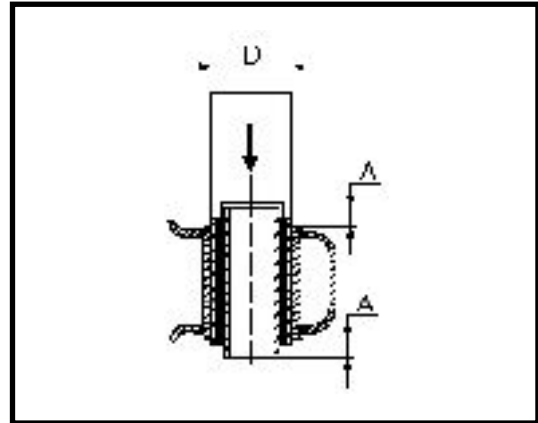
**SPECIAL TOOLS:**

DENOMINATION	CODE
Front axle support cross bar	PF 509
Ball joint extractor	PF 476
Dynamometric wrench	MOT 50

Dismount the upper arm of the suspension.  
Dismount on a press the worn bushing, using a rod with the outer diameter of **D = 26mm**.

Press the new bushing. On pressing, observe the value **A = 6mm**.

Mount the upper arm on the vehicle.



### BALL JOINT REPLACEMENT

**SPECIAL TOOLS:**

DENOMINATION	CODE
Front axle support cross bar	PF 509
Ball joint extractor	PF 476
Dynamometric wrench	MOT 50



Lift the vehicle using a two columns elevator.

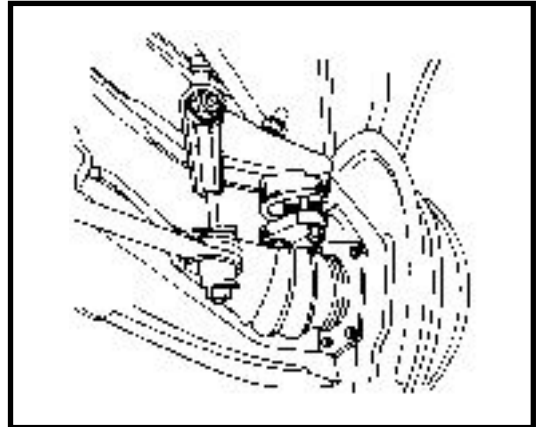
Dismount the wheel, mounting the **PF 509** crossbar, between the lower arm shaft and the shock absorber joint shaft.

Release the ball joint from the steering knuckle by means of the **PF476** extractor.

Dismount the attachment screw of the upper ball joint.

Dismount the ball joint.

Assemble the attachment screw of the rod with the ball joint and place it on the arm.



*In case protection below is damaged, replace it with a new one.*

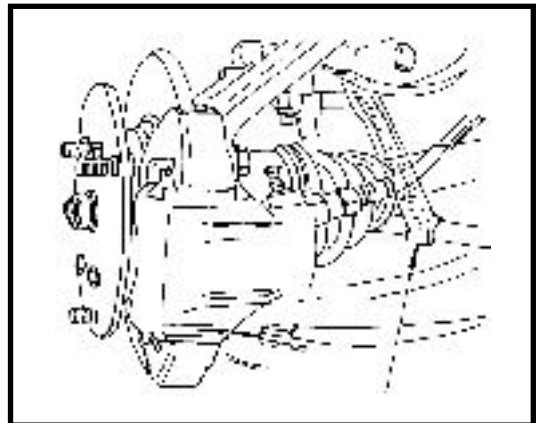
Attach the ball joint to the arm by replacing the rivets with screws, the latter being mounted with the ends towards the bellow.

Mount the caster rod.

Couple the ball joint and tighten it to the required moment.

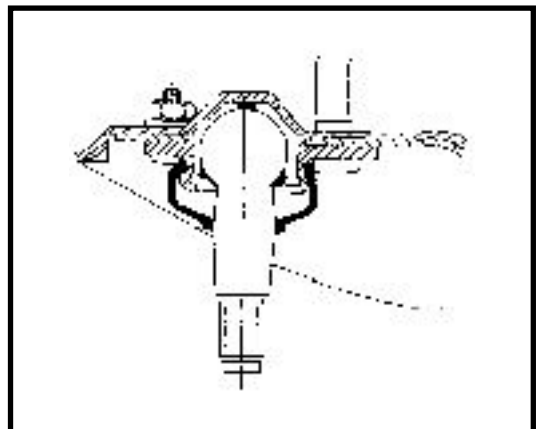
Dismount the cross bar **PF 509**.

Mount the wheel and take down the vehicle from the elevator.



Check and adjust, if necessary :

- the caster angle;
- the camber angle;
- the steering box position;
- the parallelism and the wheels alignment.

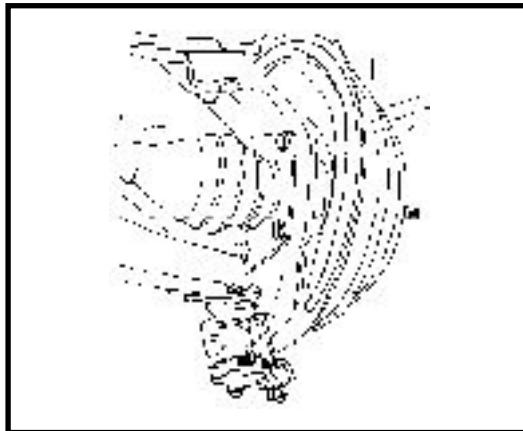


**SUSPENSION LOWER ARM****SPECIAL TOOLS:**

DENOMINATION	CODE
Front axle support cross bar	PF 509
Ball joint extractor	PF 476
Dynamometric wrench	MOT 50

**DISMOUNTING**

Lift the vehicle on the elevator and dismount the wheel.  
Release the lower suspension ball joint by means the **PF 476** extractor  
Dismount the elastic bushings of the rod stabilizer.  
Slowly lower the stabilizer rod to enable the taking out of the shaft.  
Unscrew the nut and take out the shaft.  
Release the lower ball joint and dismount the arm.



**REMOUNTING**

Mount the lower ball joint in the steering knuckle and slightly tighten the nut.

Lift the half-front axle by means of a jack.

Position the arm, grease it with special **MoS2** grease and mount it.

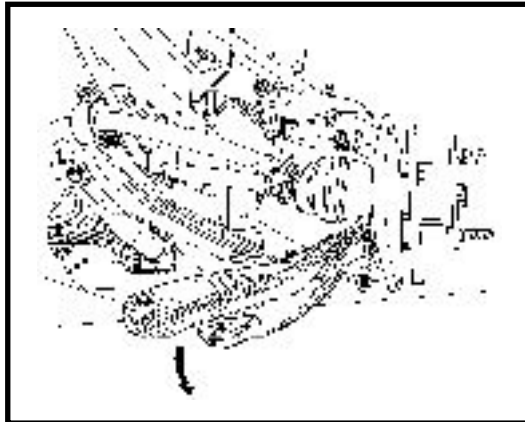
Mount the elastic bushings of the stabilizer rod.

Compress the front axle in the lock position of the elastic bushings, introducing the **PF 509** support cross bar between lower arm shaft and shock absorber shaft.

Tighten the following to the required moment :

- the lower ball joint nut;
- the lower arm shaft nut;
- the stabilizer rod elastic bushing nut.

Mount the wheel, take down the vehicle from the elevator and remove the **PF509** support cross bar.



**CHECKING****SPECIAL TOOLS:**

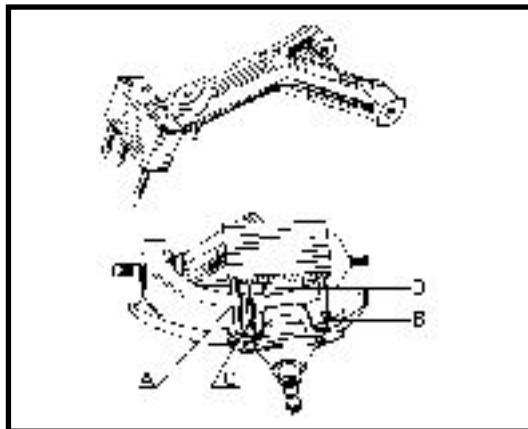
DENOMINATION	CODE
Front axle support cross bar	PF 509
Ball joint extractor	PF 476
Lower arm checking device	PF 502
Dynamometric wrench	MOT 50

Dismount the suspension lower arm.

Mount the lower arm checking device **PF502** on the lower arm and introduce the shaft.

By means of the pin (**D**) placed on the arm, measure the distance between the pins (**A,B,C**) and arm, which should be between **0** and **1 mm** .

Mount the suspension lower arm on the vehicle.



**ELASTIC BUSHING REPLACEMENT**

**SPECIAL TOOLS:**

DENOMINATION	CODE
Front axle support cross bar	PF 509
Ball joint extractor	PF 476
Dynamometric wrench	MOT 50

This operation implies bushings replacement one by one ,in order to maintain their position as to the arm shaft.

Dismount the suspension lower arm.

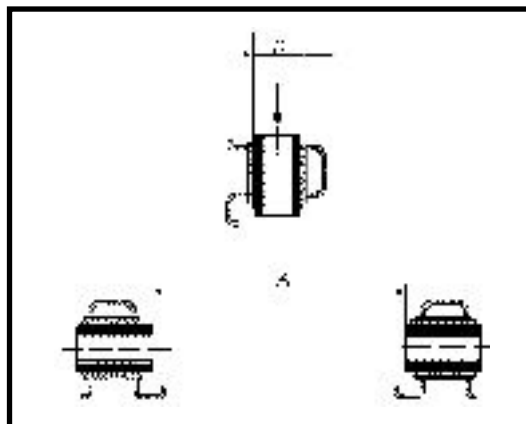
Depress one elastic bushing, using a **31 mm** outside diameter (**D**) rod.

Mount the new bushing on a press ,observing the value **A = 151 mm**.

Dismount on a press the other elastic bushings.

Press the new bushing ,observing the value **A = 151mm**.

Mount the suspension lower arm on the vehicle.



### BALL JOINT REPLACEMENT

**SPECIAL TOOLS:**

DENOMINATION	CODE
Front axle support cross bar	PF 509
Ball joint extractor	PF 476
Dynamometric wrench	MOT 50

Release the ball joint by means of the **PF 476** extractor.

Dismount the suspension lower arm.

Bore and remove the ball joint attachment rivets.

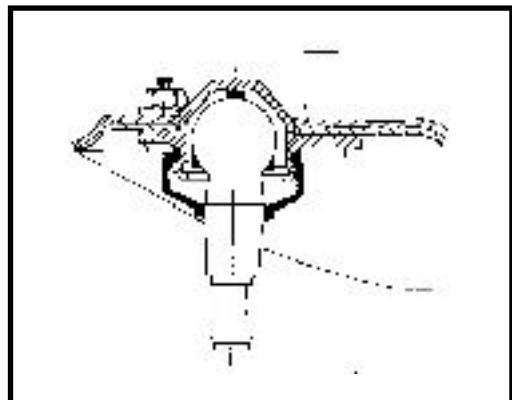
Mount the new ball joint and attach it with screws, which shall have the head oriented towards the bellows.



Mount the lower arm on the vehicle.

Check and adjust:

- the caster angle;
- the camber angle;
- the steering box position;
- the parallelism and repartition.



**SPECIAL TOOLS:** *Pushing piston device FR 500*

### **FRONT BRAKE PADS REPLACEMENT**

**NOTE:**

*In order to maintain the brake efficiency, the replacement of the brake pads shall be made only in complete kit; never fit brake pads of different makes and different qualities. The replacement is made when the pad thickness is less than 7 mm (support included).*

#### **DISMOUNTING**

Lift the vehicle by means of a two columns elevator.

Dismount the wheels.

Dismount the calipers without detaching the flexible hoses.

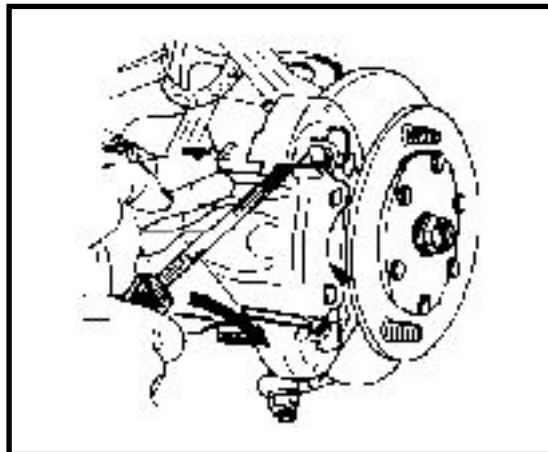
**NOTE:** *Do not press the brake pedal*

Dismount :

- the brake pads;
- elastic blades.

Dismount the protection bellows.

Clean with alcohol the housing of bellow and the piston end; blow with compressed air.



**REMOUNTING**

Mount the protection bellow.

Check :

- the wear of brake disk;
- the wear of flexible hoses.

Push the piston by means of the **FR 500** device.

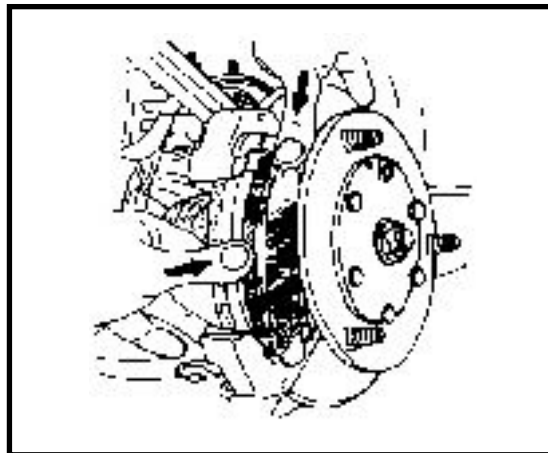
Mount:

- the protection bellows;
- the elastic blades;
- the new brake pads; pads must easily slide in the caliper fork.


Mount the calipers.

Mount the wheels and get down the vehicle on the ground.

Press the brake pedal for several times in order to bring the pistons in contact with the brake pads.





TIGHTENING MOMENTS ( daNm )		
Wheel nuts	9	
Rigid sewerage-connection screws	1,5	

**DISMOUNTING**

Drain the brake fluid tank.

Lift the vehicle by means of a two columns elevator

Dismount the wheel.

Dismount:

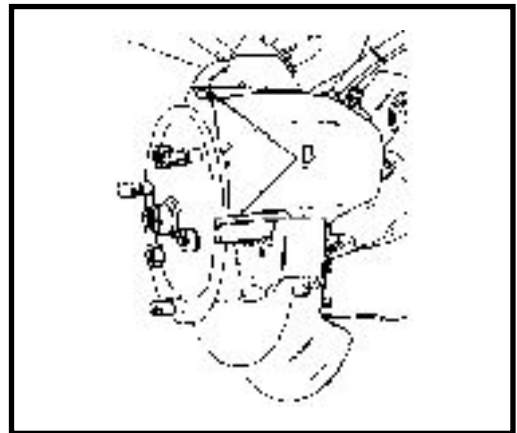
- safety wedges;
- the wedges (**B**) by lateral sliding.

Disconnect the brake wear sensor.

Unscrew the rigid sewerage-connection from the brake flexible hose.

Remove the safety washer of the flexible connection from the stopper and dismount the caliper.

Unscrew the flexible connection from caliper and the purging screw.

**REMOUNTING**

Check:

- the state of flexible connection;
- the state of brake disk;
- the state of brake pads;
- the state of protection bellow.

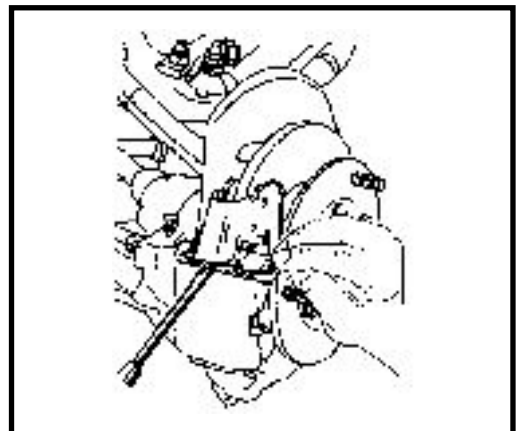
Replace the damaged or worn parts.

Fill the caliper with brake fluid.

Mount on the caliper:

- aerating screw;
- the flexible connection with a new copper gasket.

Push the piston by means of the **FR 500** device.



Clean and grease the sliding surfaces of the caliper, wedges and pads holder.

Mount the caliper on the pad holder.

Mount the lower wedge, which must smoothly slide.

Introduce a screwdriver between upper caliper part and pad holder and press the screwdriver.

Mount the upper wedge.

Mount the wedges safety washers.

Place the flexible connection on its stopper.

Connect the rigid connection with the flexible connection.

Mount the safety maintenance washer.

Fill the tank with brake fluid.

Purge the brake circuit.

### FRONT BRAKE CALIPER REPAIRING

Dismount the caliper off the vehicle

Dismount:

- the flexible connection;
- the purging screw;
- the protection bellow.

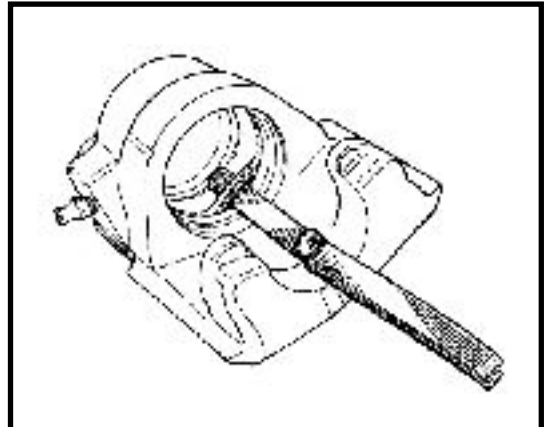
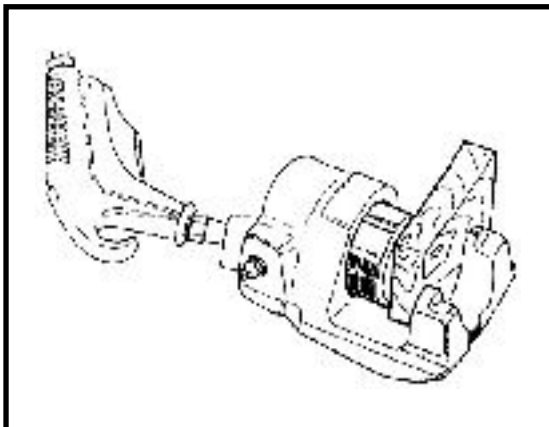
Place a wooden wedge between the piston and the caliper.

Take out the piston by means of compressed air.

Dismount the sealing gasket from the caliper groove by means of a steel blade with round ends.

Wash with alcohol the parts and blow them with compressed air; clean attentively the sealing gasket housing.

Check the wear of parts; replace the parts showing wear, scratches or ripple-marks, with new, original ones and reassemble for sealing test.



**TEMPORARY REMOUNTING FOR TESTING**

Lubricate the caliper groove and the sealing gasket with brake fluid.

Mount the sealing gasket in its seat.

Lubricate the piston with brake fluid and introduce it in the brake caliper. The piston should be displaced easily by hand; in any case, it shall be not forced or tapped by a hammer.

Mount the purging screw.



**BRAKE CALIPER SEALING CHECKING**

Connect to the brake caliper, a pressure gauge attached to a compressed air source.

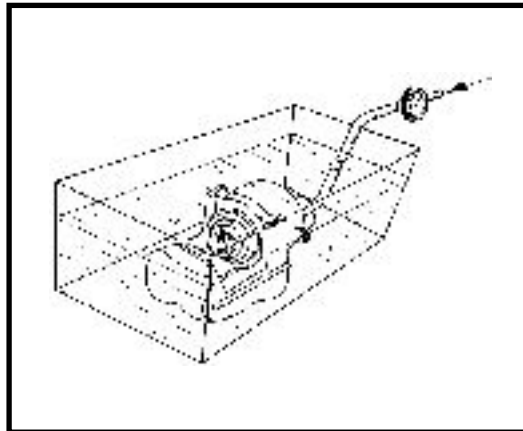
Create a **0,3 bars** pressure in the brake caliper.

Dip the caliper into a vessel with alcohol.

Move the piston several times to remove the air from the sealing gasket seat.

Place a wooden wedge between the piston and the brake caliper.

Check the sealing of the brake caliper at various pressures , without going over **2 bars**.



If the brake caliper lets the air flow by the piston, dismount the caliper brake once more.

If the piston has been reused, it shall be replaced, and if has been replaced, it shall be recovered and the brake caliper shall be replaced with a new assembly.

Perform again the sealing test.

After having performed the sealing test, dismount the brake caliper and blow it with compressed air.

If the brake caliper is in a good state, it shall be mounted.

Grease the pinion and the inside of the caliper brake grease.

Mount:

- the sealing gasket;
- the piston;
- the protection bellow;
- the purging screw;
- the flexible connection, with a new copper gasket.

Fill up the caliper with brake fluid.

Mount the caliper brake on the vehicle.

Purge the braking circuit.

**FRONT BRAKE DISK**

**SPECIAL TOOLS:**

DENOMINATION	CODE
Caliper piston pusher	FR 500
Dynamometric wrench	MOT 30



**TIGHTENING MOMENTS**

- Brake caliper fork attachment screw on steering knuckle..... **6,5 daNm**
- Disk attachment screw on the hub..... **2 daNm**
- Steering knuckle front wheel nut..... **23 daNm**
- Wheel nut..... **9 daNm**

The brake disk shall be not rectified.

A bigger wear or important marks on the brake disk impose obligatory replacement of the brake disk.

The minimal accepted thickness of not aerate disk .....**9 mm**

The minimal accepted thickness of aerate disk.. .....**19 mm**

The maximum accepted axial deviation ..... **0,2 mm** on diameter  $\phi$  215

**NOTE:**

***The maximum axial deviation is 0,2 mm. If the thickness of the disk is smaller than 9 mm or if the wear is not uniform, the disk shall be replaced.***

### DISMOUNTING

Lift the vehicle on the elevator

Dismantle:

- the wheel;
- the front wheel steering knuckle nut;
- the caliper without disconnecting the flexible connection;
- the brake pads;
- the caliper support.

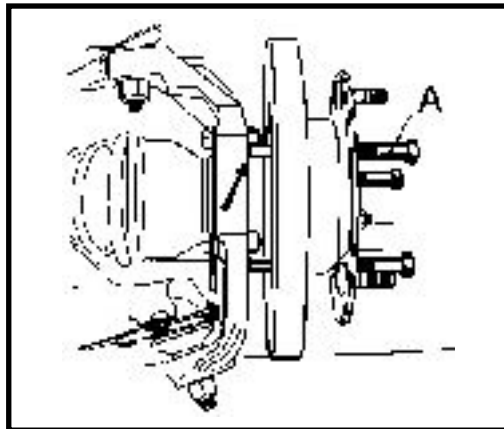
Lock the hub by means of the **PF 235 A** device and unscrew the steering knuckle nut.

Unscrew the three attachment screws of the hub disk, located at  $120^\circ$  one of another; mount in their place the **RO 482 – 01** extractor.

Place a screw near the attachment nut of the bearing closing plate and bring the three screws in contact with the steering knuckle.

Alternatively tighten the three screws until dismantling the “hub – disk” assembly

Dismount the disk off the hub.



## REMountING

Check the state of the flexible hose and of the brake pads; replace them if necessary.  
Attach the disk to the hub.

Grease the bearing with **LiCaPb type II grease**.

Mount the cross bar on the hub and place the “hub – disk” assembly on the steering knuckle.

Mount the “hub – disk” assembly on the steering knuckle by means of the **PF 236** device.

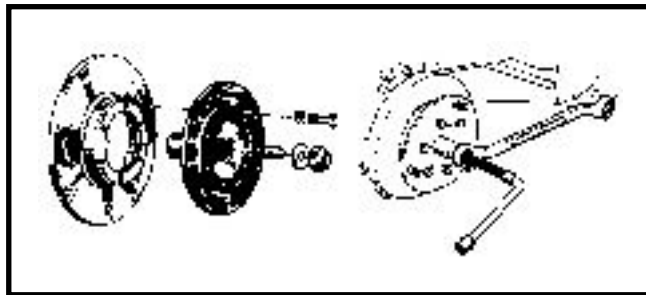
Mount the steering knuckle nut and tighten at **23 daNm** moment by means of the **MOT 50** wrench.


Mount:

- the caliper support with the screws greased with **FIXAMED R 58** and new Grower washer;
- the brake pads;
- the brake caliper;
- the wheel.

Get the vehicle down from the elevator.

Press the brake pedal several times, in order to bring the piston in contact with the brake pads.



TIGHTENING MOMENTS (in daNm)	
The attachment caliper support screw on steering knuckle .....6,5	
The attachment protector screw on the caliper support.....1,3	
The attachment protector screw on the steering knuckle..... 2	

**DISMOUNTING**

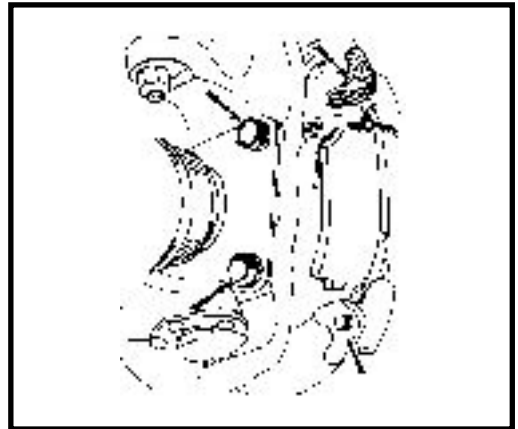
Lift the vehicle on a two columns elevator;

Dismant:

- the wheel;
- the caliper without disconnecting the flexible connection;
- the brake pads.

Dismant:

- the two screws **M 6 x 1** that attach the protector on the brake caliper support;
- the two screws **M 8 x 1,25** that attach the brake caliper support on the steering knuckle;
- the two screws **M 12 x 1,25** that attach the brake caliper support on the steering knuckle the brake caliper support.

**REMOUNTING****NOTE:**

*Upon remounting, grease the screws with FIXAMED R 58 and replace the Grower washers.*

Place the brake caliper support in the right position.

Tighten the screws **M 12 x 1,25** at the required moment of **6,5 daNm**.

Tighten the screws **M 6 x 1** that attach the protector at the required moment of **1,3 daNm**.

Mount:

- the brake pads;
- the brake caliper support;
- the wheel.

Take down the vehicle from the elevator.



**DISMOUNTING**

**SPECIAL TOOLS:**

DENOMINATION	CODE
Transmission gear and hub extractor	PF 235 A
Transmission gear mounting device	PF 236
Ball joint extractor	PF 476
Front axle support cross bar	PF 509
Dynamometric wrench	MOT 50



**TIGHTENING MOMENTS**

- Upper ball joint nut.....**5 daN.m**
- Lower ball joint nut.....**5 daN.m**
- Steering ball joint nut.....**4 daN.m**
- Transmission nut.....**23 daN.m**
- Wheels nut.....**9 daN.m**
- Caliper support attachment screws.....**6,5 daN.m**

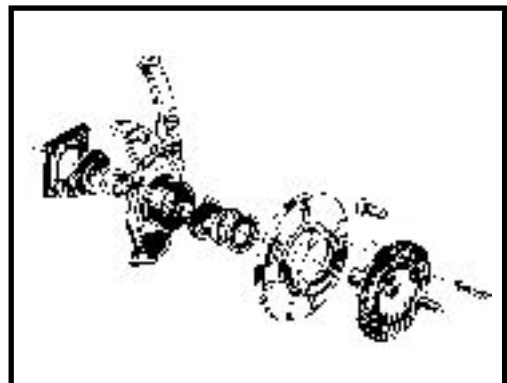
**DISMOUNTING**

Lift the vehicle by means of an elevator.

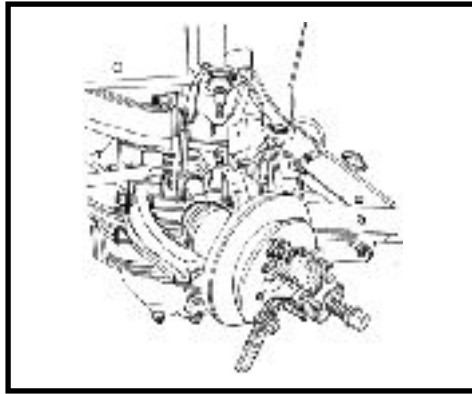
Mount the **PF 509** support cross bar.

Dismant:

- the wheel;
- the brake caliper together with flexible connection;
- the brake caliper support and the mud flap
- the transmission gear nut.



Mount the **PF 235 A** extractor on the hub;  
 Depress the “hub – disc” assembly;  
 Dismount the three ball joints by means **PF 476** and take out the steering knuckle.



### REMOUNTING

Position and press the steering knuckle on the “hub – disk” assembly, after previously having introduced a grease supply.

Mount the “hub – disk - steering knuckle” assembly, by coupling the ball joints and tighten their nuts to the required moment.

Mount the transmission gear by means of the **PF 236** device.

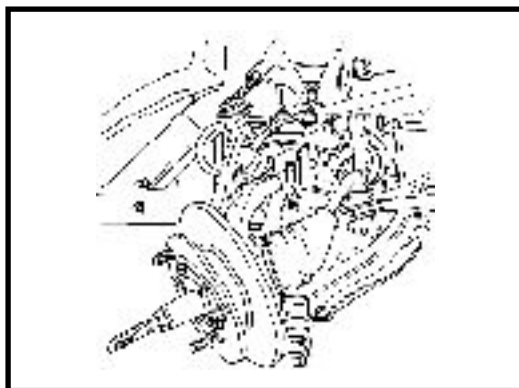
Mount and tighten:

- the transmission nut;
- the brake caliper support and the mud flap;
- the brake caliper.

Mount the wheel, get the vehicle down from the elevator, recover the **PF 509** crossbar.

Press the brake pedal several times in order to bring the brake caliper piston in contact with the brake pads

When replacing the steering knuckle, check and adjust the steering box position, the parallelism, distribution.



STEERING KNUCKLE - CHECKING

SPECIAL TOOLS:

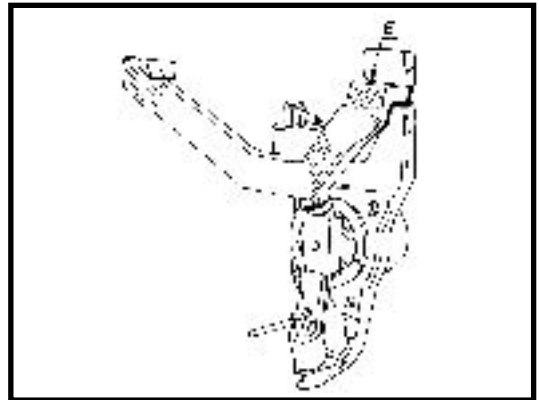
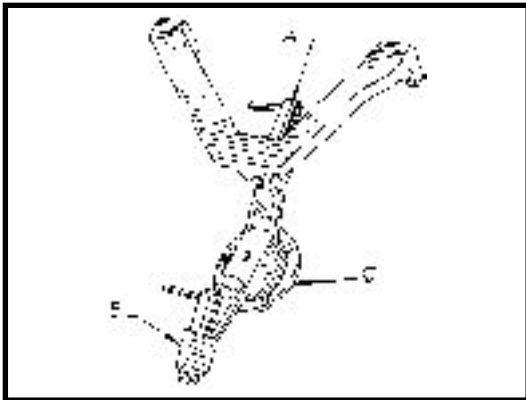
DENOMINATION	CODE
Steering knuckle checking device	PF 496

The steering knuckle is dismounted off the motor car.

Dismount the inner bearing of the steering knuckle.

In its seat, place the pin (C) of the PF 496 checking device, and place mandrels (A) and (B) in the suspension ball joint seats.

In this situation, the side (E) of the steering knuckle should be parallel to the checking device front side, and the seat of the steering ball joint should get into the device bore.



### STEERING KNUCKLE - BEARINGS REPLACEMENT

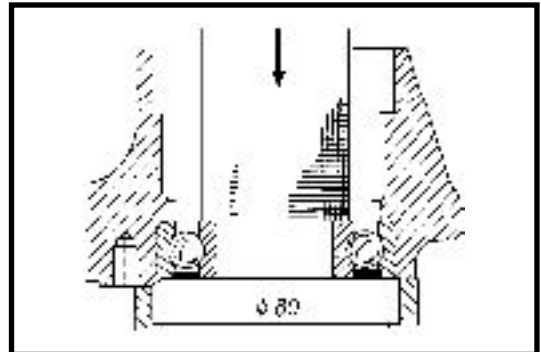
#### SPECIAL TOOLS:

DENOMINATION	CODE
Front axle support crossbar	PF509
Transmission gear and hub extractor	PF 235 A
Transmission gear mounting device	PF 236
Ball joint extractor	PF 476
Shaft protection bushing	RO 15 - 01
Bearings extractor	CV 28 A
Dynamometric wrench	MOT 50

Dismount the steering knuckle off the vehicle and dismount the sealing plate.

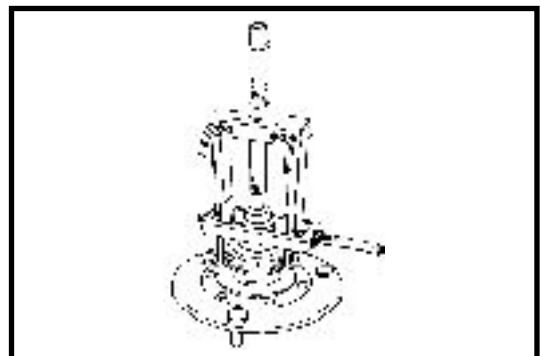
#### INNER BEARING DISMOUNTING

Place the steering knuckle on a **80 mm** → inner diameter tube and depress the inner bearing, using a **45 mm** → outer diameter rod.



#### OUTER BEARING DISMOUNTING

Once the “hub – disk” assembly being dismantled, mount the **RO 15 – 01** protection sleeve and dismount the bearing by means of the **CV 28 A** extractor.



**INNER BEARING REMOUNTING**

Mount the new bearing by means of a press, using a bushing having the outer diameter of **71 mm** and the inner diameter of **66 mm**.

The bushing shall be supported and shall be pressed on the bearing outer ring.

***NOTE: Do not deteriorate the bearing sealing gasket !***

**OUTER BEARING REMOUNTING**

Mount bearing by pressing it on the hub, using a **36 mm** inside diameter rod. This shall be supported and shall press the inner ring of the bearing.

Put grease **LiCaPb** type **UM 180 Li 2** in the steering knuckle.

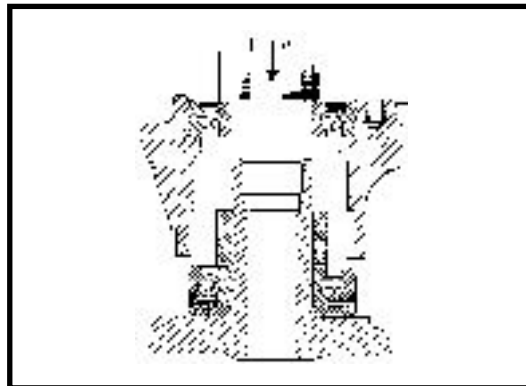
Introduce the bearing spacer.

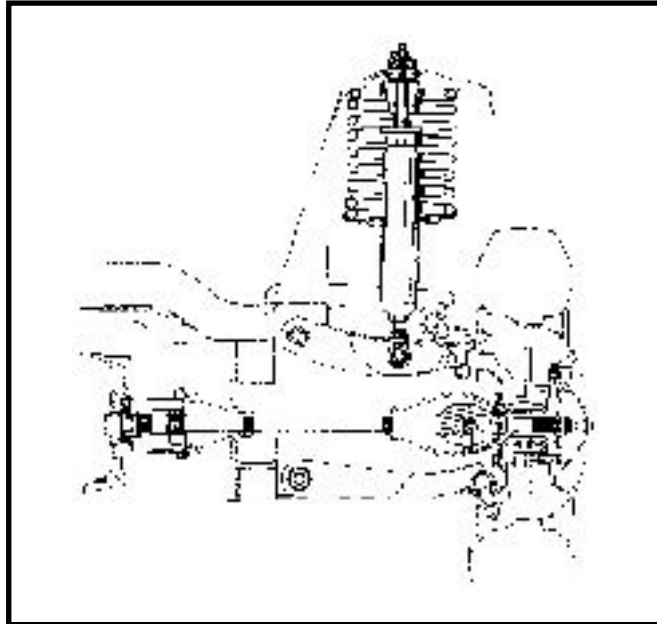
Position the bearing together with the steering knuckle on the “hub– disk” assembly

This is pressed on the hub using a rod that shall rest on the inner ring, and that shall have the following dimensions: outer diameter: **43 mm** and inner diameter **36 mm**.

Grease the inner bearing sealing gasket edge with grease **LiCaPb** type **UM 180 Li 2**.

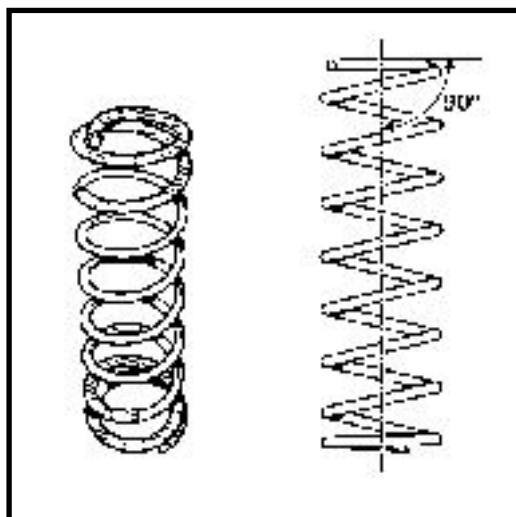
Mounting the sealing plate.



**FRONT SUSPENSION ( section)****FRONT SUSPENSION**

With helical springs, hydraulic shock absorber with double effect, with incorporated lock buffers and stabilizer rod.

The helical springs have a flat support area at the upper part, and a flat support area at the lower part.



*NOTE: Make sure the suspension springs of each axle have the same characteristics.*

TYPE OF MOTOR CARE	COIL DIAMETER ( mm )	FREE LENGTH / UNDER LOAD daN/mm
<b>FRONT SPRINGS</b>		
<b>Pick - up 1304, 1305, 1307</b>	14,5	410 / 250

**STABILIZER ROD**

VEHICLE TYPE	DIAMETER ( mm )
<b>Pick - up 1304, 1305, 1307</b>	19

**FRONT SUSPENSION TIGHTENING MOMENTS**

- Upper arm shaft nut.....**9,5 daN.m**
- Lower arm shaft nut.....**11 daN.m**
- Upper ball joint nut.....**5 daN.m**
- Lower ball joint nut.....**5 daN.m**
- Steering ball joint nut.....**4 daN.m**
- Stabilizer rod shaft nut.....**8 daN.m**
- Steering connecting rod lower nut.....**1,5 daN.m**
- Shock absorber lock nut.....**1,5 daN.m**
- Front shock absorber lock nut.....**6 daN.m**
- Stabilizer rod shaft attachment nut.....**1,5 daN.m**

**IMPORTANT!**

*Since the shock absorbers are stored in the spare parts warehouses in horizontal position, it is possible, that they get depressed.*

*That is why, before mounting on the motor car, the shock absorbers shall be pressed by shifting the rod upwards and downwards (the shock absorber in vertical position).*

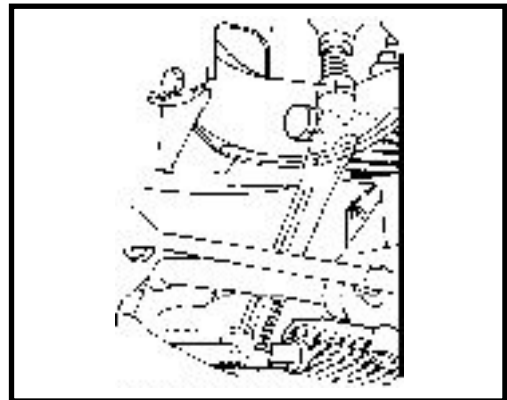
### FRONT SHOCK ABSORBER REPLACEMENT BY MEANS OF THE SUS 478 - 01 DEVICE

The front shock absorber may be dismantled as follows:

- single, using the **SUS 478 – 01** device;
- together with the spring, using the **SUS 478** device.

#### DISMOUNTING

Mount the **PF 509** support crossbar between the shock absorber lower attachment shaft and the suspension lower arm shaft.



Lift the engine by means of a 2 columns elevator.

Remove the plastic shutter mounted on the shock absorber column.

Dismount the wheel.

Mount the **SUS 478 – 01** device on the wing double lining reinforcement.

Place the threaded rod and compress the spring.

Loosen the stabilizer rod shaft nut.

Unscrew:

- the shock absorber upper lock nut and nut;
- the shock absorber lower lock nut.

Rotate the shock absorber and remove it from the lower joint.

Push the rod, tilt the shock absorber and take it out.





**REMOUNTING**

Grease the threaded parts of the shock absorber with special **MoS2** grease.

Press the rod, tilt and place the shock absorber.

Fully screw the shock absorber into the lower joint.

Pull the shock absorber rod by means of the **SUS 513** device.

Position the rubber buffers and the crossbar.

Tighten the upper nut at the required moment.

Tighten the lock nut.

Tighten at the required couple:

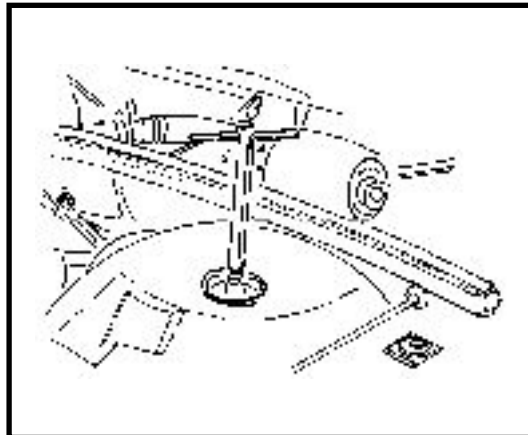
- the lower lock nut;
- the stabilizer rod shaft nut.

Dismount the **SUS 478 – 01** device.

Mount the wheel.

Lower the vehicle from the elevator.

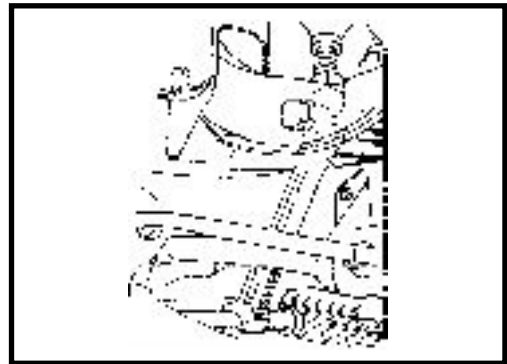
Remove the **PF 509** support crossbar.



## FRONT SHOCK ABSORBER REPLACEMENT BY MEANS OF THE SUS 478 DEVICE

### DISMOUNTING

Mount the **PF 509** support crossbar.



Lift the vehicle by means of a 2 columns elevator.

Dismount the wheel.

Take the **SUS 478** device and perform the following operations:

- grease the thread of the grippers;
- hook the grippers to the last but one upper coil of the shock absorber spring;
- place the lower plate of the device;
- slightly tighten the nuts;
- mount the lock collar at the middle of the springs;
- compress the spring by alternately tightening the nuts, until the spring raises from the shock absorber flange.

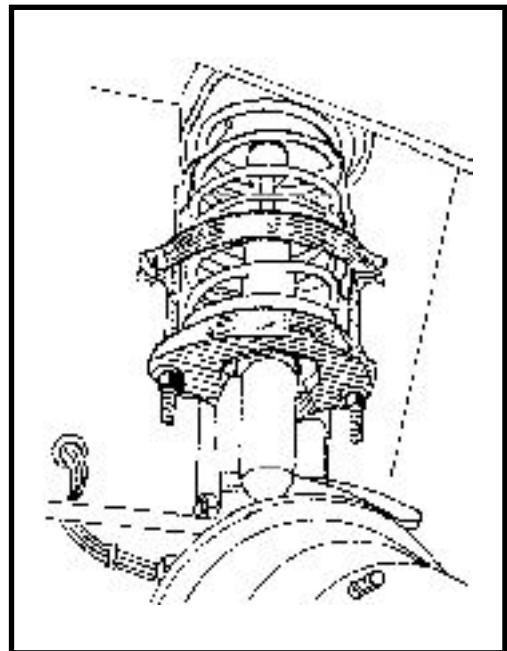
Dismount:

- the shock absorber upper nut and lock nut;
- the shock absorber lower lock nut.

Rotate the shock absorber and remove it from the lower joint.

Push the shock absorber rod.

Dismount the “device – spring – shock absorber” assembly.



**REMountING**

Grease the threaded parts of the shock absorber with special **MoS2** grease.

Place the “ device– spring – shock absorber “ assembly.

Fully screw the shock absorber into the lower joint.

Pull the shock absorber rod by means of the **SUS 513** device.

Position the rubber buffers and the crossbar.

Tighten the upper nut at the required moment.

Tighten the lock nut.

Tighten at the required couple:

- the lower lock nut;

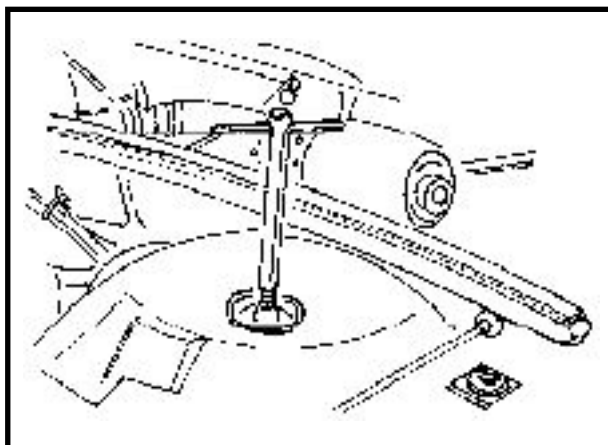
- the stabilizer rod shaft nut.

Depress the spring and dismount the **SUS 478** device.

Mount the wheel.

Lower the vehicle from the elevator.

Remove the **PF 509** support crossbar.



**DISMOUNTING**

Dismount the shock absorber and the spring by means of the **SUS478** device.

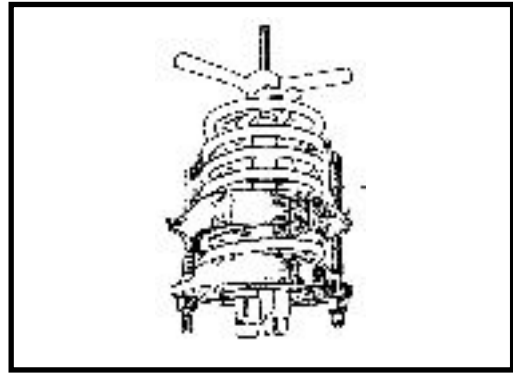
Clamp the **SUS480** device into the vice.

Place the “**SUS478** device – spring” assembly on the **SUS480** device.

Place the upper plate and press the spring until the **SUS478** device is released.

Dismount the **SUS478** device.

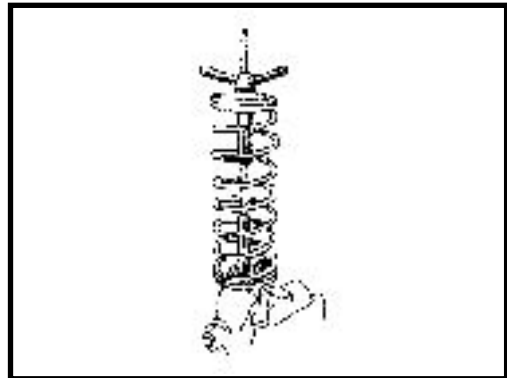
Depress the spring and remove it.

**REMOUNTING**

Place the new spring on the **SUS480** device.

Press the spring, observing its mounting position.

Mount the **SUS478** device (the grippers shall be hooked on the last but one upper coil).

**NOTE:**

*The lower end of the spring must be in contact with the plate and aligned with the **SUS478** device support slot.*

Dismount the **SUS480** device.

Mount the “device – spring – shock absorber” assembly.

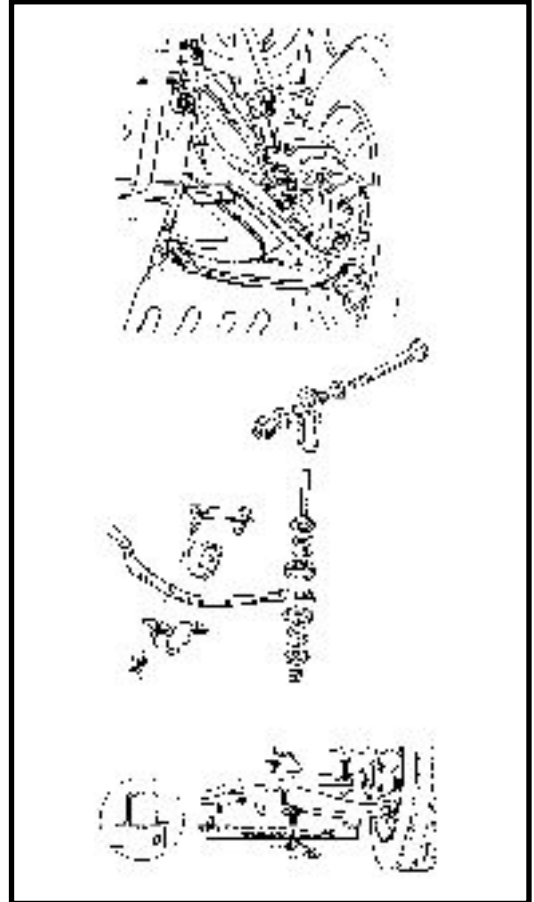
## DISMOUNTING

Unscrew:

- the attachment nuts (1) and (2) of the casing on the longitudinal girder;
- the nuts (3) of the stabilizer rod auxiliary connecting rod.

Dismount the stabilizer rod together with the auxiliary connecting rod.

Check the state of the elastic bushings; if it shows marks of wear, replace the auxiliary connecting rod.



## REMOUNTING

Mount the auxiliary connecting rods on the stabilizer rod.

Grease the auxiliary connecting rod shaft with special MoS<sub>2</sub> grease.

Mount the assembled stabilizer rod.

Press the front axle at a distance  $D = 45$  mm by means of the TAV 238-02 device.

Tighten at the required moment:

- casing attachment nut;
- auxiliary connecting rods shaft nuts;
- the nuts that attach the auxiliary connecting rod to the stabilizer rod.

## PLATE DRIVE REAR AXLE

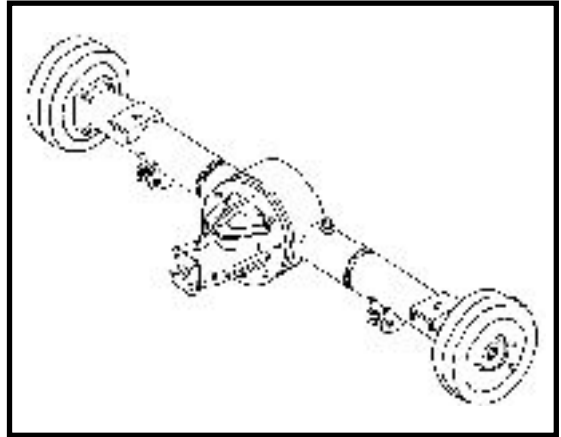
DACIA 1304,1307

## CHARACTERISTICS

It is a rigid type axle made of plate, with differential gear and propeller shafts.

It is attached to the chassis by means of semi elliptic springs and hydraulic shock absorbers.

The main transmission is simple type, with hypoid gear between the pinion and the rim. The differential is symmetrical, simple, with four conical differential pinions.

**ATTENTION!**

*After fixing, the tighten nut of the cardanic flange shall be lock by straining.*

## IDENTIFICATION

On the rear part of the axle casing it is marked by stamping :

- mark or symbol of the manufacturer;
- manufacture series;
- week /year( month / year).

The characters height is at least **5 mm**.

The minimal deep is **0,15 mm**

## CONSUMPTION PRODUCTS

Transmission gear oil **80 W/90** or **T90 EP 2 ( 2,0 l )**

**Fixamed R 58.**

**Loctite 518.**

## REAR BEARING ELEMENTS

### PLATE DRIVE REAR AXLE

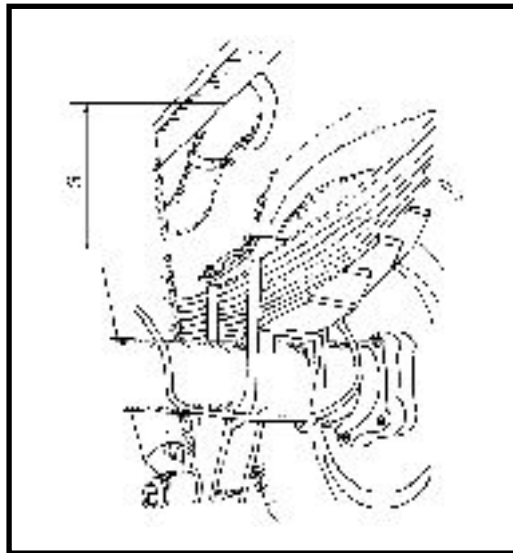
#### ANGLES

	VALUE	ADJUSTMENT
Parallelism	0°	Not adjustable
Camber angle	0°	Not adjustable
Pressing position of the leave spring	G = 162 mm	



#### TIGHTENING MOMENTS

- Shock absorber lower nut.....**3 daN.m**
- Axle attachment nut.....**11 daN.m**
- Wheel nut.....**9 daN.m**



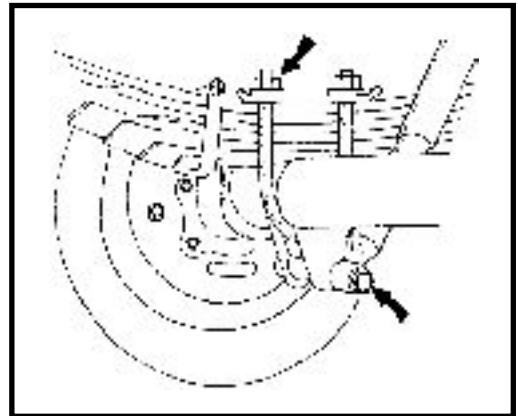
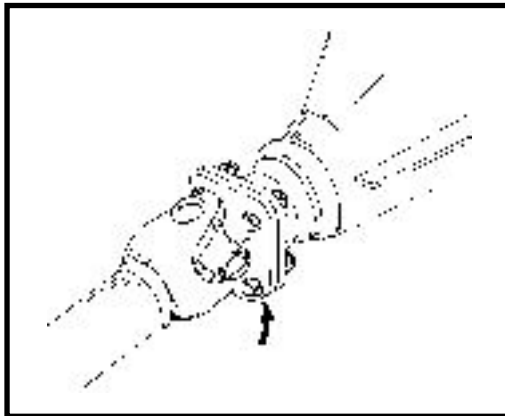
#### DRIVE REAR AXLE

##### DISMOUNTING

- Lift the rear axle by means of a two columns elevator.
- Dismount the wheels.
- Disconnect the brake limiter control.

Dismount :

- the four screws of the cardanic flange at the side towards the differential gear;
- the shaft nut that attaches the shock absorber;
- the clamping clips of the half-elliptic spring.



Detach the brake cable from the hand brake levers.

Disconnect the flexible connecting hose of the braking hydraulic circuit from the three ways connection.

Remove the rear axle, place it on a support and drain the oil, by dismantling both the empty plug and the level one, to speed draining.

#### REMOUNTING

Perform the same operation in reverse order; attention should be paid to the fact that the axle may overturn when lifting it to mount the clips.

#### NOTE:

*The steps performed when dismantling , remounting the rear axle ( as assembly ) are similar for all types of pick-ups.*



# REAR BEARING ELEMENTS

## BRAKE DRUM

The two rear brake drums must have the same diameter, the rectifying of one drum implying the same operation for the other one.

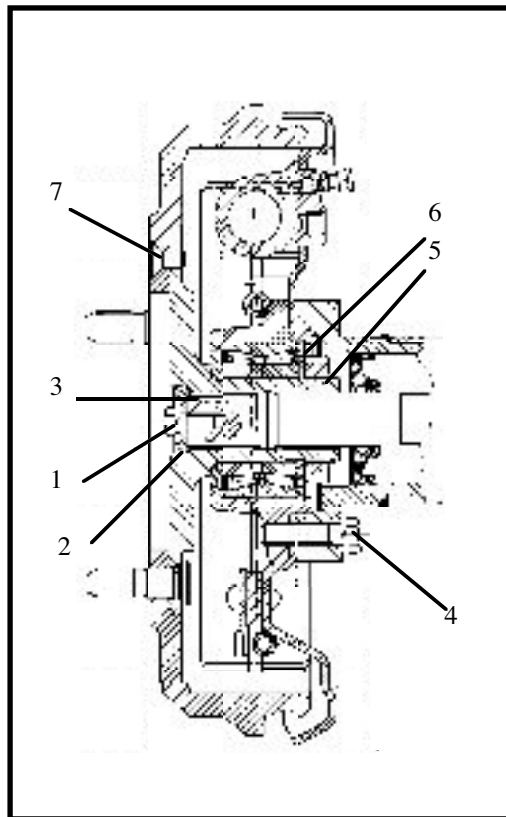
### SPECIAL TOOLS

*Depress bearing closing assemble device PS 65.*



### TIGHTENING MOMENTS

- Wheels nuts .....**9 daN.m**
- Slotted nut .....**24 daN.m**
- The attachment screws of the assembly “ drum – axle brakeplate “ .....**6,3 daN.m**
- The connecting screw propeller shaft – drum hub assembly .....**1,54 daN.m**



**DISMOUNTING**

Dismount the **M 8 x 1,25 - ( 1 )** screw.

Dismount the elastic ring **32** and washer **8,1 x 12,7 - ( 3 )**.

Dismount the four 4 screws **M 10 x 1,5 - ( 4 )**.

Dismount the “ hub drum – brake plate “ assembly and place it on a bench.

Straighten the shoulder of the slotted nut **( 5 )**.

Unscrew the slotted nut and take out the bearing washer **( 6 )**.

Separate the brake plate from the drum-hub assembly.

Dismount :

- the sunk screw **( 7 )** and separating the drum from the hub assembly;
- the safety ring **AI 68**;
- depress the bearing casing assembly from the hub by means of the **PS 65** device.

**REMOUNTING**

Clean of dust the drum and brake shoes by means of a cleaner ( vacuum cleaner) for brake.

For remounting, perform the mounting operations in reverse order, respecting the required tightening moments;

The clearance adjustment shall be perform as follows :

- by means of a wrench, rotate the eccentric downwards until the drum locks, than rotate it upwards with 1/12 rotations **( 30° )**;
- after performing the adjustment, the drum must easily hand rotate. Begin with the compression brake shoe;
- the brake shoes by pressing several times the brake pedal;
- the hand brake ( see chapter 37 “Controls”).



## TIGHTENING MOMENTS

- Wheels nuts .....	<b>9 daN.m</b>
- Slotted nut .....	<b>24 daN.m</b>
- Attachment screws of the assembly “ drum – axle brake plate “ .....	<b>6,3 daN.m</b>
- Connecting screw propeller shaft – drum hub assembly .....	<b>1,54 daN.m</b>
- Connection screw of the rigid duct.....	<b>1,5 daN.m</b>
- Cylinder attachment screws on the brake plate .....	<b>0,53...0,99 daN.m</b>

## DISMOUNTING

Dismount :

- the rigid duct connection from brake cylinder by means of a wrench;
- the connection of secondary cable with the hand brake lever;
- the brake drum ( see corresponding chapter);

The brake plate being placed on bench, dismount:

- the upper return spring (see the corresponding paragraph);
- the assembly rod assembled with the hand brake lever;

Distance the shoes in the cylinder area.

Unscrew the two cylinder attachment screws on the plate by dismounting it.

Check the state of the shoes linings and if oil trace are present, replace the brake shoes.

## REMOUNTING

Clean of dust the drums and the brake shoes by means of a cleaner(vacuum cleaner) for brake.

Perform in reverse order the dismounting operations.

Adjust the drum clearance.

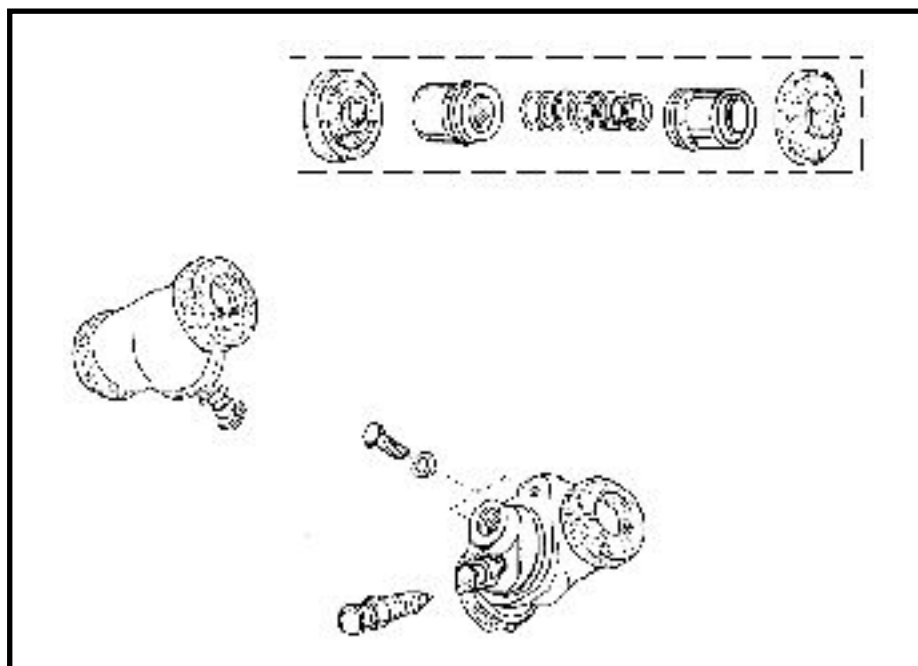
Aerate the brake system.

Check the pressure in braking system.

## REPAIRING

Dismount the cylinder off the vehicle.

Dismount: the protection bellows assembled with pistons, the pressure gaskets, and the purging screw.



Check the state of cylinder boring, pressure gaskets of the bellows and of the pistons. Any trace of wear, oxidation or scratches implies the replacement of brake cylinder assembly.

If the cylinder components are in a good state, lubricate the parts with brake fluid and mount them in the reverse order of dismounting.

Check the easy moving of the pistons in the cylinder.

Mount the brake cylinder on the vehicle.

Check the adjustment of the hand brake.

Perform the purging of the brake system.



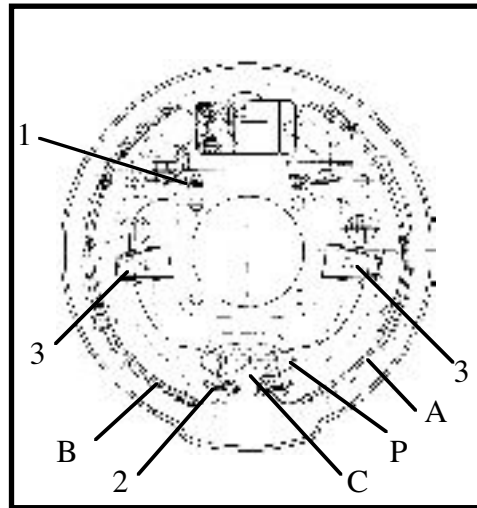
TIGHTENING MOMENTS

- Wheels nuts .....9 daN.m
- Attachment screws of the assembly “ drum – axle brake plate “ .....6,3 daN.m
- Slotted nut .....24 daN.m
- Connecting screw propeller shaft – hub drum .....1,54 daN.m

**The brake components with adjustment by eccentrics:**

- A - tightening shoe
- B - compression shoe
- C - supporting plate ( fixe point )
- P - shoe’s foot

- 1. Upper return spring
- 2. Lower return spring
- 3. Clip for maintaining shoes



**DISMOUNTING**

The replacement of brake shoes must be performed in complete set, never mount the brake shoes equipped with linings of different brands and qualities.

Dismount :

- the connection of the brake secondary cable with the hand brake lever;
- the brake drum ( see the corresponding paragraph) separating it from the brake plate;

The brake plate being placed on a bench, dismount ;

- the shoes maintaining clips on the brake plate;
- the upper return spring by means of a nipper for brake shoes;
- the assembled connecting rod with the hand brake lever;
- the assembled shoes with the lower return spring;
- the lower return spring.

**REMOUNTING**

The shoes assembled with the lower return spring is attached on the plate ( the shoes **P** foos in contact with supporting plate **C**).

Remount the auxiliary connecting rod assembled with the hand brake lever.

By means of a brake shoes nipper, set the upper connection of shoes by means of the upper return spring.

Mount the brake shoes maintaining clips.

Apply a sealant layer ( **ROMTIX 1502** ) in the areas of the maintain clips with the brake plate.

Assembly the brake plate with the drum – hub assembly.

Tighten at therequired moment the attachment screw of the assembly “drum - rear axle brake plate”.

**Drum clearance adjustment:**

- rotate downward the eccentric until the dum is locked than rotate it upward with 1/12 rotations ( aprox. 30’).
- after performing drum adjustment, it must be easy rotating by hand.
- begin with the compression shoe.

**SPECIAL TOOLS*****Depressing device for bearing casing assembly PS 702*****TIGHTENING MOMENTS**

- Wheels nuts .....**9 daN.m**
- Slotted nut .....**24 daN.m**
- Attachment screws of the assembly “drum axle brake plate” .....**6,3 daN.m**
- Connecting screw propeller shaft – hub drum .....**1,54 daN.m**

**CHECKING**

Check by means of a comparator device attached on the drum, the axial clearance:  
**0 - 0,15 mm max.**

**DISMOUNTING**

Dismount :

- the connection of the secondary cable with the hand brake lever;
- the assembly hub drum-brake plate.

Take out from the assembled bearing casing :

- the safety ring by means of adequate nippers;
- the bearing by means of a tube.

**REMOUNTING**

Clean the inside of the bearing casing.

Mount the bearing by means of a tube and a press;

Set in its place:

- the safety ring for boring by means of special nippers.

Press the bearing casing on the hub – drum assembly, tighten at the required moment the slotted nut.

Set the assembly hub drum –rear brake and mount it on the axle.

Fix the secondary hand brake cable.

Adjust:

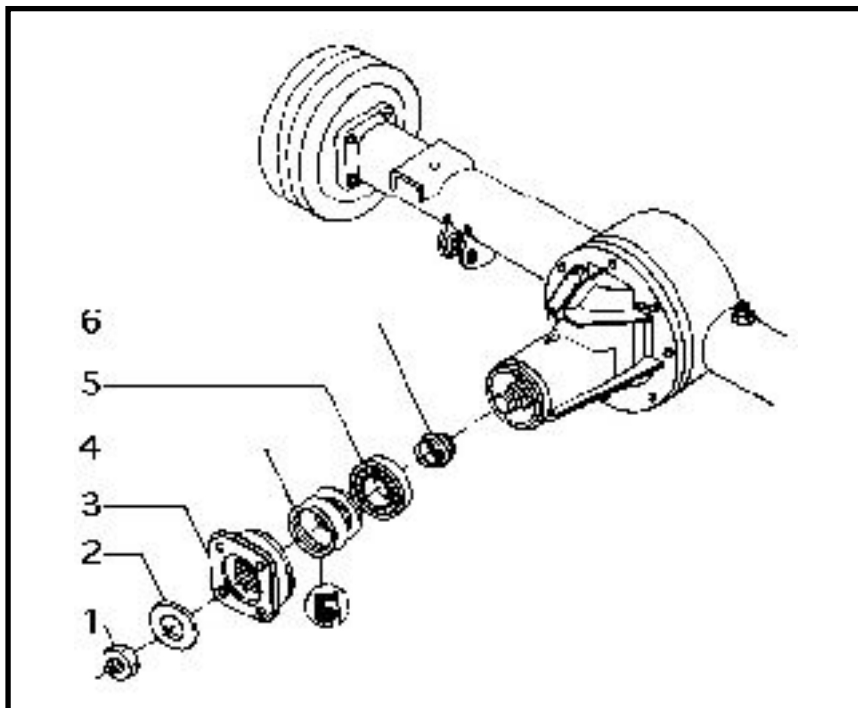
- the drum clearance ( see the corresponding chapter );
- the hand brake.

The rear axle assembly is dismantled from the vehicle, placed on an universal support, having its propeller shaft removed.

**DISMOUNTING**

Dismount:

- the flange nut (1);
- the washer (2);
- the cardanic flange (3);
- the sealing ring (4) ( annular oil ring ) 42 x 72 x 12;
- the deflector (5);
- the bearing (6) ( the inner ring with balls ) 30 x 72 x 28,75;
- the adjustment bushing set (7).





## REAR BEARING ELEMENTS

### PLATE DRIVE REAR AXLE DIFFERENTIAL

Remove the differential assembly by unscrew the eight screws of the casing.

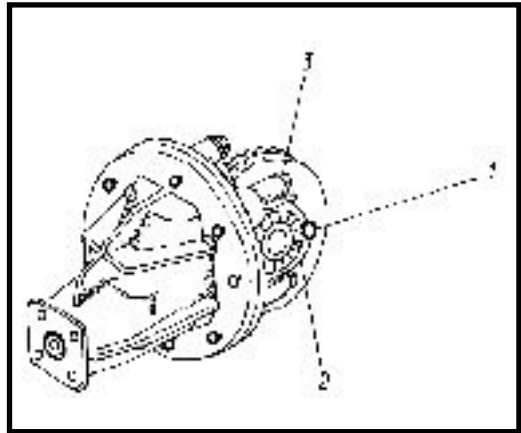
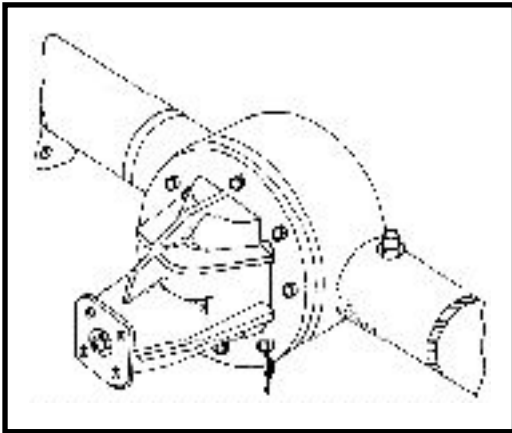
Dismount :

- the screws that attach the differential nuts lock washers (1);
- the differential adjustment nuts (2);
- the stub bolts nuts that attach the bearings half casings (3);

Remove the centering bushing and unscrew the stub bolts.

Together with the conical balls bearings, remove the differential assembly, detaching it from the front part of the drive pinion.

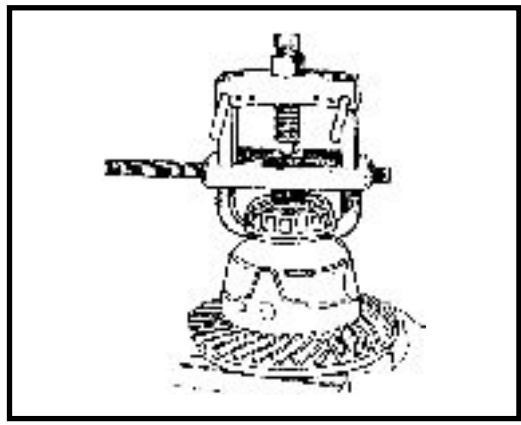
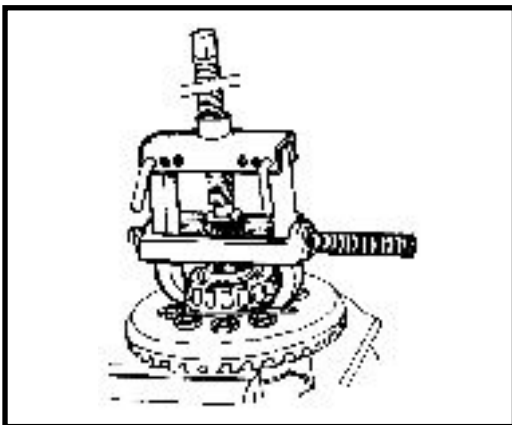
Remove the differential drive pinion together with the conical balls bearing from the differential casing.



Dismount two rim attachment screws, on opposite sides.

Depress the bearings by means of the CV 28A extractor, provided with CV 48 claws.

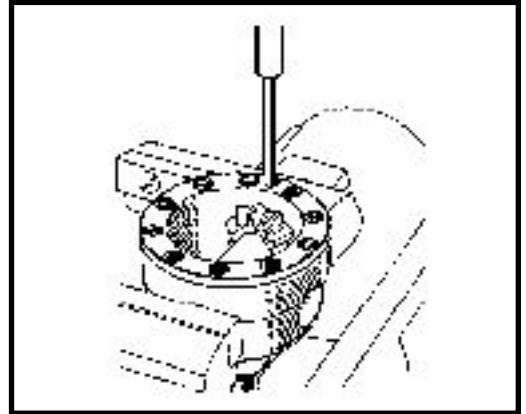
Dismount the rim ; do not reuse the screws.



Dismount the elastic pin that attaches the differential pinions shaft by means of the mandrel **CV 31 B**.

Dismount:

- the differential pinions lock washer;
- the differential pinions shaft, the ball joint;
- the differential pinions;
- the friction washers (elastic bushings);
- the propeller shaft pinions.



### RE MOUNTING

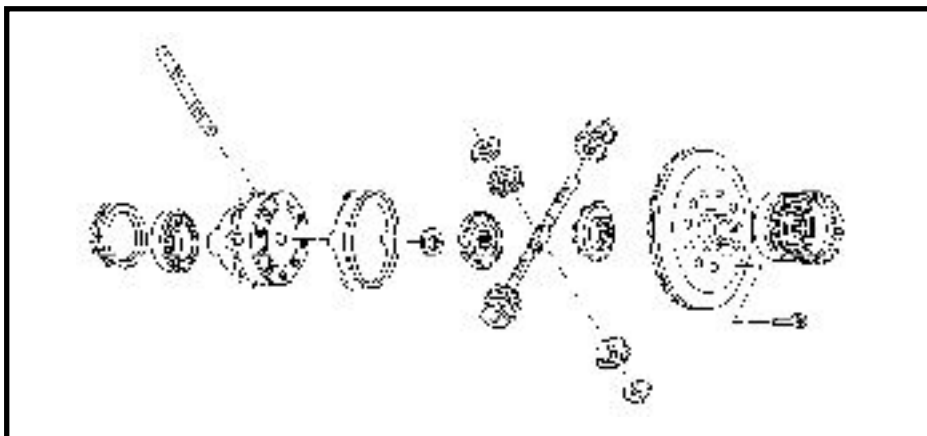
The differential gear shall be re mounted by performing the dismounting operations in the reverse order.

Before mounting, the component elements from the differential casing, shall be lubricated with **T 90** or **T80** oil.

Mount the following items in the casing:

- the propeller shaft pinion opposite to the rim , after attaching the support washer on the former;
- put in, the four differential pinions and their respective bushings, oriented with the lock notch in the casing seat;
- put in the ball joint the differential pinions shaft and half shafts, so that the pin hole corresponds to the hole in the casing;
- attach and push the pins by means of the **CV 31 B** broach;
- after attaching the differential pinion shaft lock washer, mount the rim on the casing by means of the ten self lock screws ( use new screws).

Tighten at the required moment of **9 ..... 11 daNm**



The two conical ball bearing shall be mounted by pressing in the differential casing. Press the two outer rings of the differential drive pinion bearing in the differential casing.

Put the differential drive pinion in the casing; the former has the adjustment washer mounted on it and the **30 x 80 x 32,75** conical balls bearing pressed on.

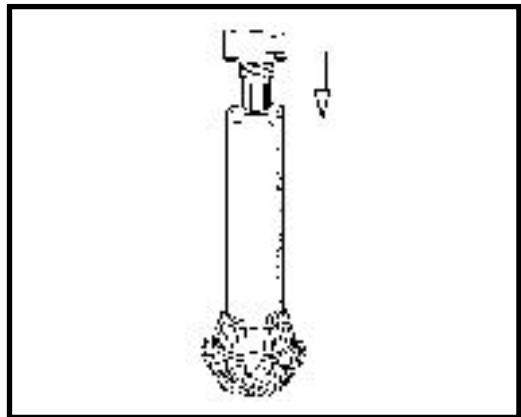
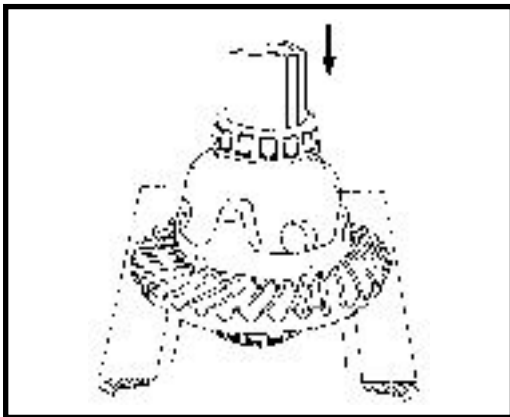
The differential assembly shall be fixed and mounted in the casing, with the bearings cushioned on half casings.

Tighten the differential bearing caps on the differential casing at a moment of **3,5-5 daNm**.

Tighten the bearing adjustment nuts.

**NOTE:** *Mark the adjustment nuts in correspondence with the casing.*

*Check the mark on the bearings in correspondence with the casing.*



To remount the main transmission, observe the following:

**1.** The pairing of the conical gear.

The pinion and the rim are lapped together.

They are inseparable.

Replacing one of the parts implies obligatory replacing of the other one.

There is a common, corresponding mark both on the rim and on the pinion.

**2.** The use of a continuous sealing material layer of **LOCTITE 518** on the contact surface of the differential casing and the axle casing (aprox. 5 gr). Operation procedure is as follows:

- dismount the differential assembly from the rear axle;
- clean the old sealing material ( by scraping );
- clean with solvent the contact surface of the differential casing and of the axle casing.

- place continuous sealant material layer on the whole contact surface of the rear axle taking care not to close the attachment wholes of differential casing;
- mount the differential assembly and tighten the screws at the required couple of **2 - 2,5 daNm**.

**NOTE: The interchangeable of the gasket with the layer is not affected.**

**DIFFERENTIAL REMOUNTING – ADJUSTMENT**

Continue the attachment and mounting of the following items :

- the new adjustment bushing of the bearing;
- the **30 x 72 x 28,75** conical balls bearing;
- the deflector ;
- the **42 x 72 x 12** annular oil seal.

Attach and tighten:

- the washer;
- the flange nut.

**NOTE: When assembling the cardanic flange, check the wear degree of the surface in contact with the annular oil seal.**

After remounting , the rear axle must be sealed.

The sealing test is performed by blowing air at a **0,15 – 0,20** bars pressure through the aeration valve seat.

No air leaking is accepted.



**TIGHTENING MOMENTS**

- The screws for the attachment of gear rim to the differential box .....**9- 11 daN.m**
- The two screws of the differential bearings adjustment nuts lock washer .....**2 daN.m**
- The four nuts of the attachment stud bolts of the bearing cups.....**3,5 - 5 daN.m**
- The differential drive pinion nut tightening moment .....**9 - 11 daN.m**

**ATTENTION: After tightening ,the nut shall be locked by straining.**

### MOUNTING CONDITIONS

1. Adjustment of the conical distance  $54^0 \text{ mm}$  between the rim axis and the front surface of the pinion head. -0,1

2. The propeller shafts and the differential pinions shall be selected so that a maximum **0,1 mm** clearance is obtained in the whole differential assembly, one propeller shaft being locked, the moment required for the rotation of the propeller shaft should be maximum **1 daN.m**.

3. The geared rim shall be adjusted so that the clearance between the pinion and the rim measured on the outer diameter of the rim is between **0,12 – 0,25 mm**, measured in three points, placed at **120°**.

4. The resistant moment due to the initial tightening of the differential bearings, without differential drive pinion, shall be between **0,12 – 0,15 daNm**, measured within the range of the gear clearance.

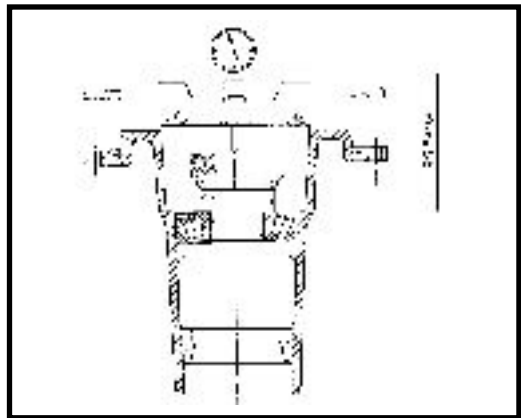
5. The rotation moment of the differential drive pinion, without the mounted rim, is **0,15 - 0,20 daN.m**.

### DIFFERENTIAL ADJUSTMENT

To be performed before and upon remounting

This implies three operations :

1. Adjustment of the conical distance
2. Adjustment of the gearing clearance
3. Adjustment of the differential bearings



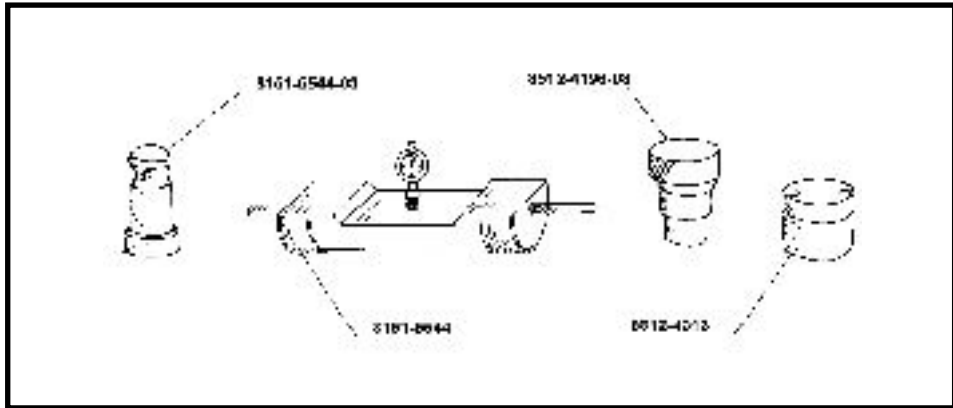
#### 1. ADJUSTMENT OF THE CONICAL DISTANCE

It supposes to measure and correct the distance between the front face of the differential drive pinion and symmetry axis of the rim.

The following operations shall be performed:

- place the outer housing of the bearing in the differential casing;
- place the conical balls bearing;
- place the **8512 41196 – 08** standard gauge and then place the **8151 – 5544** gauge checking device.

Check the distance **90 +/- 0,015 mm** by reading the value shown by the device.



***OBSERVATION: Regarding the mounting conditions:***  
 - *in case there are accidental deviations from the absolute value 54, on the front side of differential drive pinion it will be marked the effective deviation in hundredth;*  
 - *the conical distance of 54<sup>0</sup> mm shall be algebraic corrected with a.m. value.*  
 - 0,1

The adjustment of the value shall be done as follows:

- for the 0 value read on the device, choose a washer of A value (value A is the one written on the differential pinion; for example: **185 means A = 1,85 mm**);

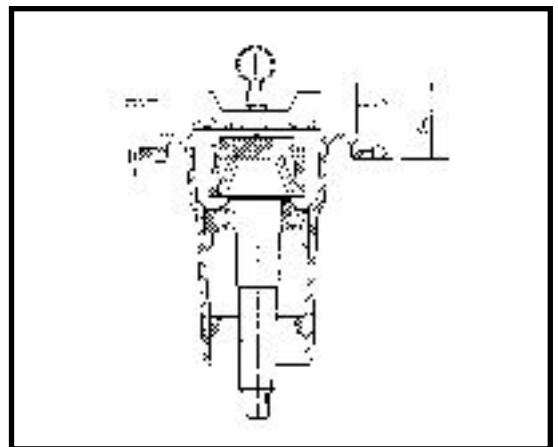
- for negative values ( example : - **0,05** ) choose a washer of A value = + **0,05** mm;

- for positive values ( example: + **0,05** ) choose a washer of A value = - **0,05** mm.

Remove the bearing.

Place the adjustment washer on the differential drive pinion and press the bearing.

The differential drive pinion and the pressed bearing shall be placed in the differential casing.



Place the **8512 4313** standard gauge on the front side of the differential drive pinion, then place the gauge checking device and measure the **54<sup>0</sup> mm** distance value.  
 - 0,1

According to the value shown on the gauge, the washer shall be replaced or not.

## 2. ADJUSTMENT OF THE PINION – RIM GEARING CLEARANCE

Checking of the clearance of the conical assembly gear is performed initially by estimation, by hand.

If the clearance felt is too big, act upon the nut on the side of the casing; by unscrewing it a number of rotations, until a smaller clearance in the conical assembly gear is obtained, or, perform the opposite operation clearance is too small.

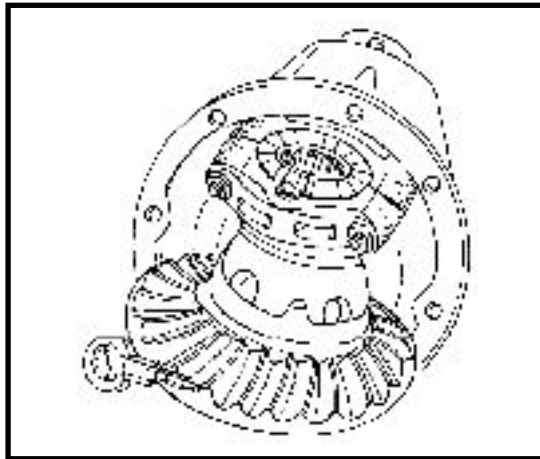
The following operations shall be performed:

Place in the differential drive pinion casing, the casing – rim assembly, mount the bearing casings, the adjustment nuts, observing the marking made upon dismounting.

Tighten the bearings casings nuts at a moment of a **4 – 5 daNm**.

Screw the adjustment nuts until the clearance value of the gear may be estimated by hand.

Mount a dial comparator with the tester perpendicular on the rim tooth flank and check the gearing clearance : it must be between **0,12 – 0,25 daNm**.



The measurement shall be made in three equidistant points.

The bearings tightening correction is performed by means of the adjustment nuts.

Mark the position of the nuts in correspondence with the casing.

### 3. DIFFERENTIAL GEAR BEARINGS ADJUSTMENT

It is performed by means of the adjustment nuts until the bearing opposes a certain resistance.

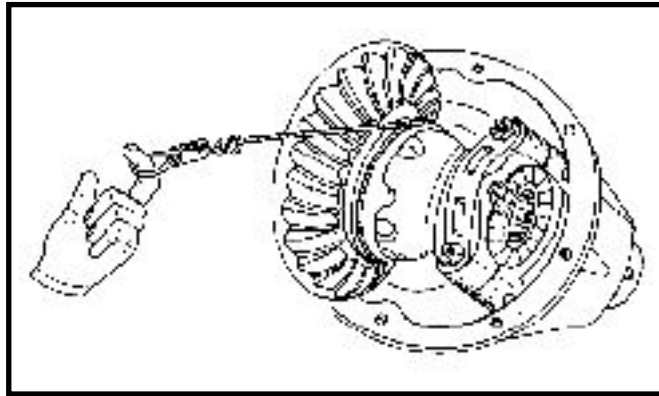
The bearing clearance is correct if upon rotation of the differential, without differential drive pinion, the resistant moment shall have values between **0,10 – 0,15 daNm**.

The adjustment shall be performed as follows.

Rotate the differential rim several times so that the bearings get in their seats.

Wind a string around the differential gear casing and pull the end of the string by means of a dynamometer.

The force that allows the rotation of the differential is between **2 – 3 daNm**.



If the force measured is not within the specified range, tighten or loosen the nuts.

Mark the nuts in correspondence with the marks on the casing.

The rotate tightening couple of one propeller shaft shall be maximum **1 daNm** when the other is blocked.



**NONDRIVEPLATEREAR AXLE  
DACIA 1305, 1307 F**

**CHARACTERISTICS**

It is rigid, drawn type.

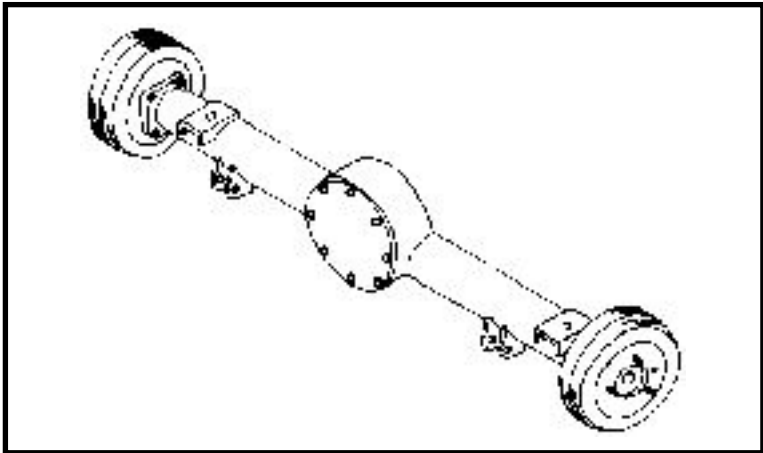
From the manufacturing point of view, it looks like the platedrive axle.

The central and annular part is sealed by means of a cap.

Provided for : **DACIA 1305, 1307 F.**

Values of the steering angles:

- parallelism ..... **0°**
- pivot cross indicator angle ..... **0°**
- tightening position of the leaf springs ..... **G = 162 mm**



## WHEEL HUB

## DISMOUNTING

*NOTE: It is assumed that the axle is dismantled and fixed on the support.*

Dismount the wheel.

Unscrew the **M8** sunk screw.

Unscrew the four **M10** screws attaching the bi-conical bearing casing to the axle end.

Remove the hub – bearing casing assembly

Dismant:

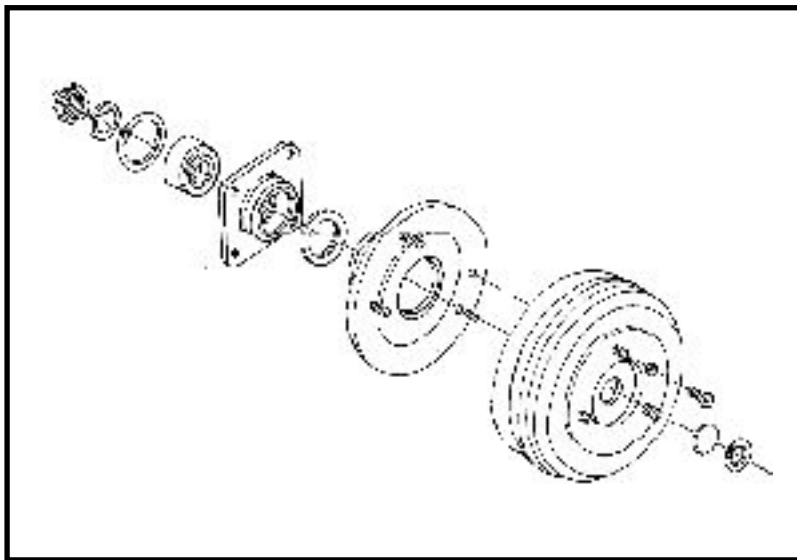
- the slotted nut and the spacer which attach the bearing casing on the inner part;
- the inside safety ring

Depress the hub from the bearing casing by means of the **PS 65** device.

## REMOUNTING

Perform the dismantling operations in the reverse order.

The tightening moments have the same values as those for the hub of the drive plate axle.



## NONDRIVE PIPE REAR AXLE

DACIA 1305, 1307 F

## CHARACTERISTICS

It is a drawn, rigid type axle.

Attachment to the chassis is performed by means of the half axial blades springs and of the hydraulic shock absorbers.

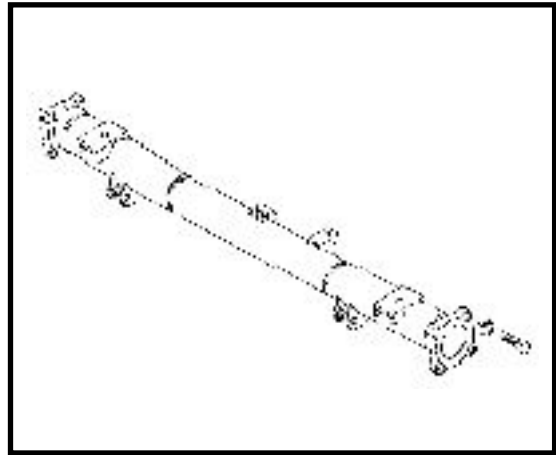
Provided for Dacia 1305, 1307 F.

Values of steering angles:

- parallelism.....**0°**
- pivot cross angle.....**0°**
- tightening position of the leafsprings

.....**G = 162 mm**

The parallelism and the pivot cross inclination angle are not adjustable.



## WHEEL HUB

## DISMOUNTING

**NOTE:** It is assumed that the axle is dismantled and fixed on the support.

Dismount the wheel.

Detach the drum from the wheel hub by unscrewing the three **M 8** sunk screws.

Dismount the drum cap by means of the **RO 441** tongues.

Straighten the nut retainer and unscrew the steering knuckle nut.

Take out:

- the retainer;
- the support washer.

Extract the hub by means of the **PF 235 A** extractor.

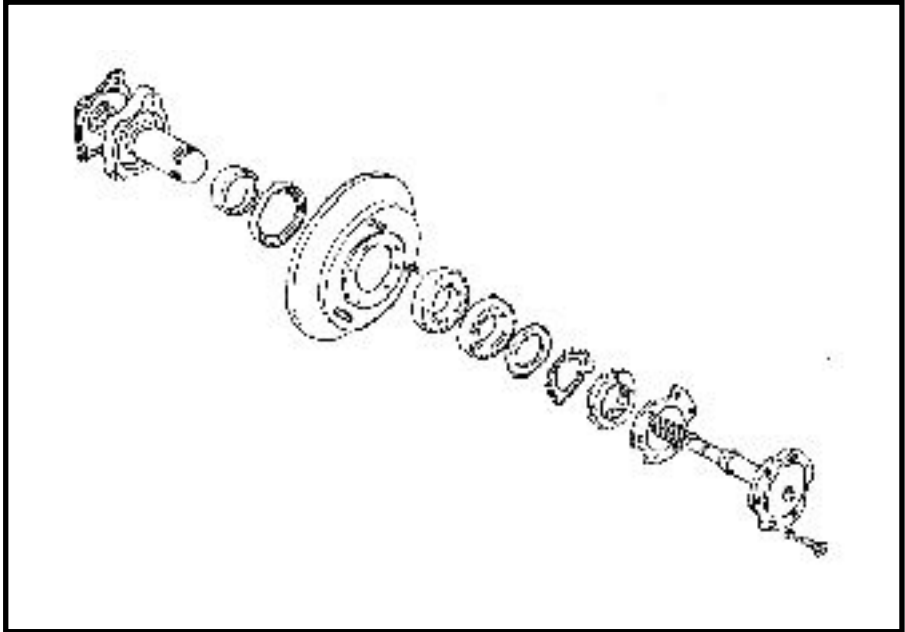
Depress and recover the two conical balls bearings.

**NOTE:**

*If the sealing ring (annular oil seal) has marks of wear on the sealing surface, it shall be replaced.*

REMOUNTING

Perform the dismounting operations in the reverse order.



**REAR DRIVE AXLE OF CAST IRON  
DACIA 1304, 1307 ( supplier ARO CÂMPULUNG )**

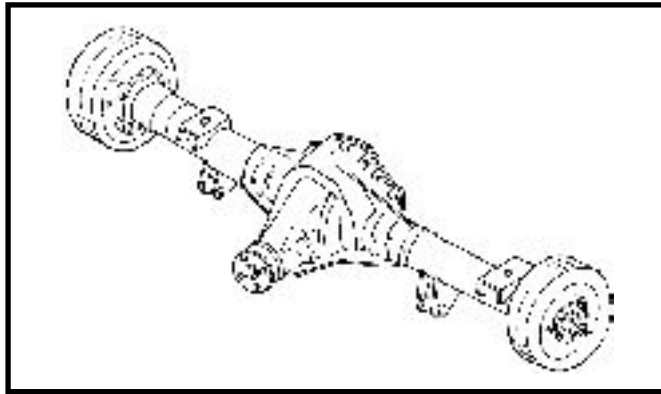
**CHARACTERISTICS**

It is a rigid type cast iron axle, with differential and propeller shafts.

It is attached to the chassis by means of the half-elliptical springs and the hydraulic shock absorbers.

The main transmission is simple type, with hypoid gearing between the pinion and the rim.

The differential is symmetrical, simple, with two differential conical pinions.



**IMPORTANT !**

*The interchangeability of the cast drive axle with the pipe axle ( assembled axle ) is dependent of the replacement of the shock absorbers, springs attachment plates, attachment clips from the springs and shock absorbers buffers.*

**NOTE:**

*The dismantling – remounting steps of the cast drive axle ( as an assembly ) are the same as the ones for the drive axle made of plate, previously presented.*

WHEEL HUB

DISMOUNTING

*NOTE: It is assumed that the axle is dismantled and fixed on the support.*

Dismount the wheel.

Detach the drum from the wheel hub by unscrewing the three M8 sunk screws.

Unscrew the six attachment screws of the propellershaft flange on the wheel hub and remove the propellershaft.

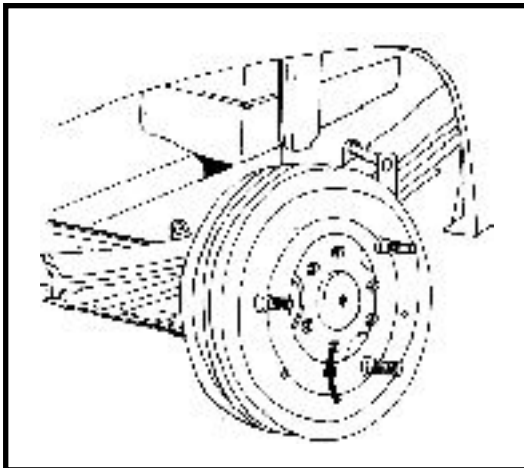
Straighten the retainer blade which is found on the nut groove.

Unscrew the slotted nut and remove:

- the nut retainer;
- the bearing support washer.

Take out the first bearing of the hub.

Extract the hub and the second bearing



Remove the 50 x 70 x 10 sealing ring from the wheel hub, and extract the bearings spacer from the steering knuckle.

RE MOUNTING

Perform the dismantling operations in the reverse order, observing the following technical conditions.

- put grease in the central part of the hub;

- grease the bearings with grease type **LiCaPb tip 180 Li 2**;

- replace the sealing gasket of the propellershaft flange.

The propellershaft flange screws shall be tightened at the required moment only after having checked and adjusted the axial clearance of the hub bearings.





### TIGHTENING MOMENTS

- Screws assembling the propeller shaft flange.....**2,5 daN.m**
- The sunk screw .....**0,8 +/- 0,3 daN.m**
- The rear wheel stud bolt nut.....**7 daN.m**

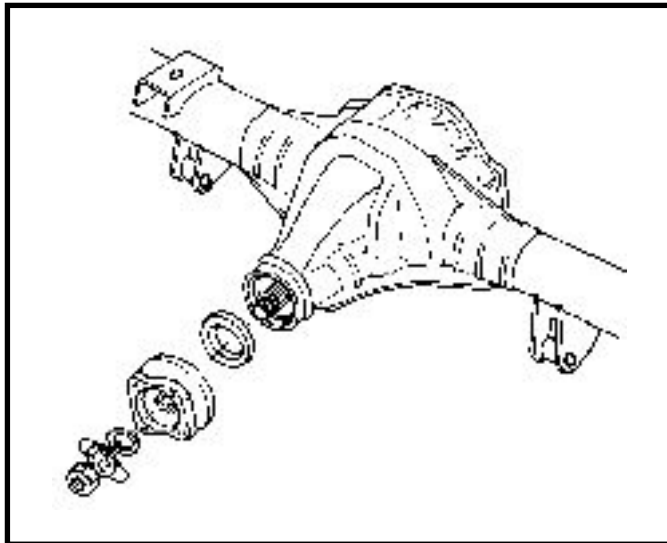
### THE DIFFERENTIAL OF THE REAR DRIVE AXLE CAST IRON

The rear axle assembly is dismounted from the vehicle, placed on a universal support; having its propeller shaft dismounted.

### DIFFERENTIAL DISMOUNTING

On side of cardanic flange, dismount:

- the nut retainer;
- the nut retainer;
- the cardanic flange;
- the sealing ring (annular oil sealing ring) **42 x 72 x 12**;
- the oil deflector;
- the bearing (the inner ring with conical balls) **30 x 72 x 28,75**;
- the adjustment washer;
- the differential drive pinion washer.



From the back part of the axle dismount the cap of the axle, by unscrewing the fourteen **M 8** screws.

Remove the **G 3 – 36** and **G 5 – 36** elastic pins of the slotted bushing, by means of the **31 B** set of mandrels, marking the position of the bushing and shifting it towards the exterior.

Dismount the adjustment nuts retainers, marking the position of the nuts in correspondence with the casing

Unscrew the bearings nuts.

Dismount the bearings half casings by unscrewing the **M 10** screws.

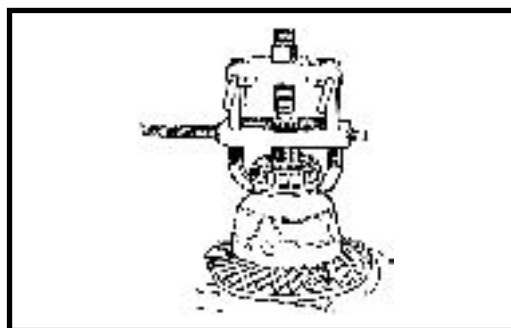
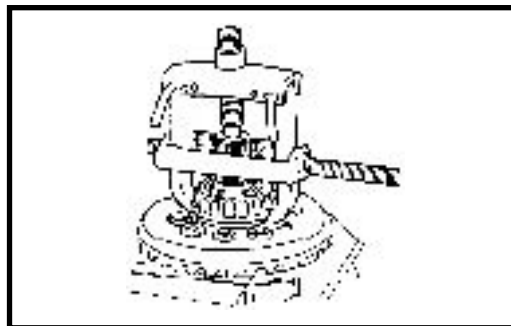
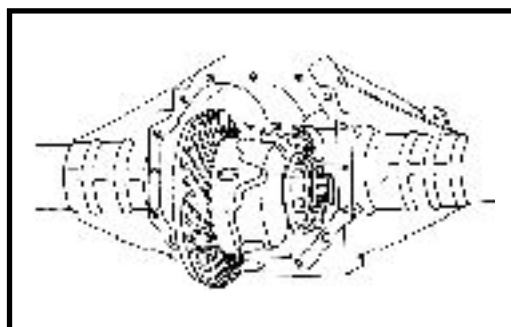
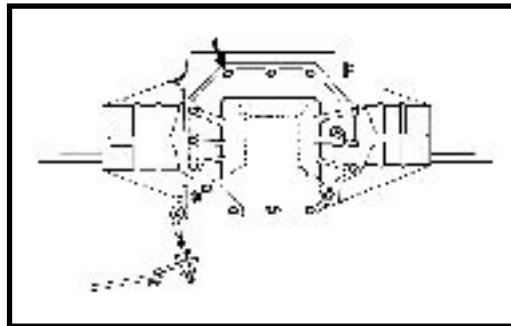
Remove the differential gear assembly from the rear axle casing, together with the two bi-conical balls bearings.

From the back part of the axle also remove the differential drive pinion together with the **35 x 80 x 32,75** conical balls bearing.

Dismount the two opposite screws that attach the rim.

Depress the bearings by means of the **CV 28 A** provided with **CV 48** grippers.

Dismount the rim ; the screws shall not be reused.



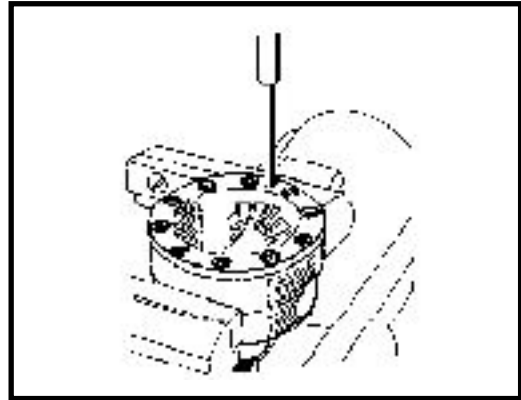


Dismount the attachment elastic pin of the differential pinions shaft by means of the  $\phi 5$  CV 31 B mandrel.

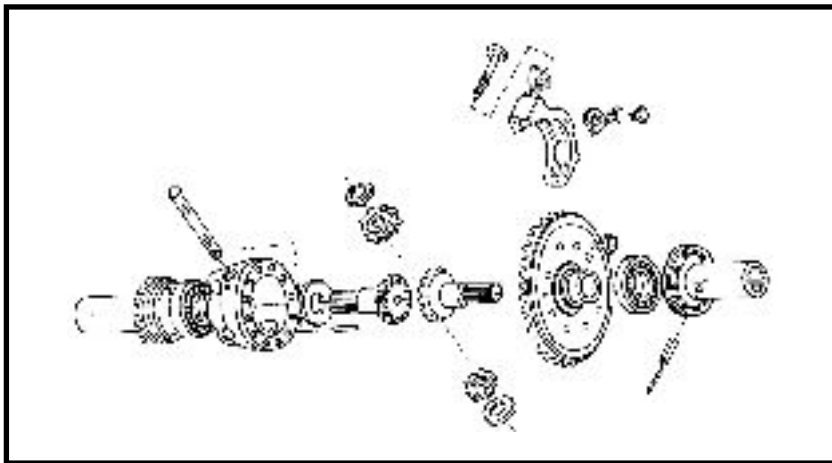
Dismount:

- the differential pinions shaft ;
- the differential pinions;
- the differential pinions bushings;
- the propellers shaft pinions.

Recover the support washer of the propellers shaft pinion opposite to the rim.



### DIFFERENTIAL REMOUNTING



Perform the dismounting operations in the reverse order, to remount the differential.

Before mounting the component parts in the differential casing shall be lubricated with **T 80** or **T 90** oil.

Mount the following parts in the casing:

- the propellers shaft pinion opposite to the rim, after attaching on the former the support washer;
- place the two differential pinions together with their respective bushings oriented with the locking notch towards the exterior;
- place the differential pinions in such a way that the pin hole corresponds with the hole in the casing.

By means of a → **5 mandrel**, attach and push the **G 5 – 40** elastic pin.

Mount the second propeller shaft pinion in the rim.

Mount the rim on the casing by means of the ten **M 11 x 22** screws ( use new ,selflocking screws).

Tighten them at the moment of **9 – 11 daNm**.

On the side towards the flange mount the following items:

- the adjustment washer ( the values of the adjustment washers are measured every **5/100** and are within the range: **1,45 – 2,85 mm** )
- the bearing washer;
- the **30 x 72 x 28,75** conical balls bearing;
- the oil deflector;
- the **42 x 72 x 12** annular oil seal.

**NOTE:**

*When assembling the cardanic flange, check the wear of the contact surface with the annular oil seal.*

Attach the nut retainer, tighten the flange nut and lock it.

After remounting and performing the required adjustment operations, make the sealing test, and then fill up with **T 90** oil the drive axle differential casing.



**TIGHTENING MOMENTS**

- Axle cap attachment screws..... **1,5 - 2 daN.m**
- Tooth rim attachment screws..... **9 - 11 daN.m**
- The screws of the differential adjustment nuts retainers..... **2 daN.m**
- The differential drive pinion nut..... **9 - 11 daN.m**

The two conical balls bearings shall be mounted by pressing on the differential casing.

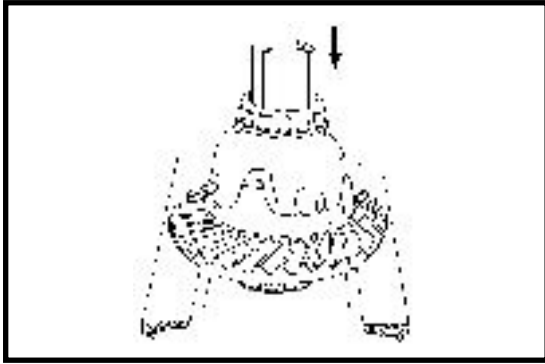
Press the outer ring of the small bearing and the outer ring of the big bearing in the differential casing; for which, previously, the adjustment washer required for the conical distance measurement has been selected and attached.

Place the differential drive pinion in the casing; the **35 x 80 x 32,75** conical balls bearing being already mounted on it.

The differential assembly is attached and mounted in the casing, with the bearings resting in the half bearings.

The screws from the bearings caps shall be tightened at a moment of **4 – 5 daNm**.

Tighten the bearings adjustment nuts.



**NOTE:** Check the marks on the axes in correspondence with the casing.  
Mark the adjustment nuts in correspondence with the casing.

When remounting the main transmission, observe the following technical conditions:

1. The pinion and rim are lapped together.  
They are inseparable.  
Replacing one part obligatory implies replacing of the other one.  
There is a common symbol marked both on the rim and on the pinion..
2. The two caps bearings shall be in correspondence with differential casing.

### DIFFERENTIAL ADJUSTMENT

It is performed before and upon remounting and assumes the performance of the three types of adjustment:

1. Check and correction of the conical distance
2. Adjustment of the differential drive pinion
3. Adjustment of the rim gearing clearance

#### 1. ADJUSTMENT OF THE CONICAL DISTANCE

It consists in the measurement and correction of the distance between the front face of the differential drive pinion and the rim symmetry axis (its value is  $A = 54 \text{ mm}$ )

The following devices shall be used:

- the chuck M, together with the comparator dial CC;
- the **18 mm** spacer C.

The outer rings of the differential drive pinion bearings are mounted in the differential casing.

**Working procedure:**

Temporarily mount the inner ring with balls of the back bearing on the pinion, and introduce it in the casing, without mounting the adjustment washer.

Tighten the flange nut at a moment of **3 – 4 daNm**.

Set the comparator dial to zero.

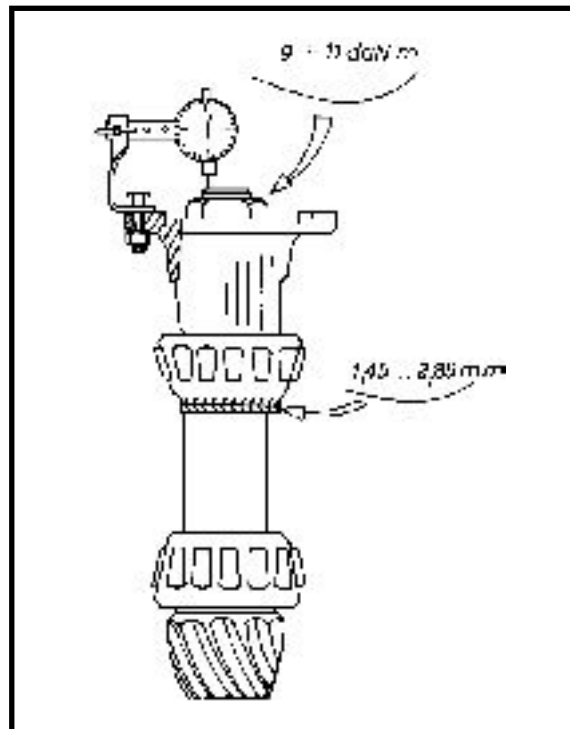
**1. ADJUSTMENT OF THE CONICAL DISTANCE**

Now set the **18 mm** spacer **C** in front of the differential drive pinion and the chuck **M**, in the half casings of the bearings.

By means of the comparator dial, measure the difference between the real value (the measured one) and the value **A**.

Depending on the value of this difference, select the washer of the required thickness.

The washer shall be placed under the outer ring of the big bearing.



## 2. ADJUSTMENT OF THE DRIVE PINION BEARINGS

The drive pinion is mounted in the casing together with the two bearings, without the adjustment washer.

Mount the cardanic flange and tighten the nut at a moment of about **0,20 daNm**, so that the pinion rotates easily at a load between **2 and 3 daNm**.

Mount the support **S** of the comparator dial **CC** on the cardanic flange.

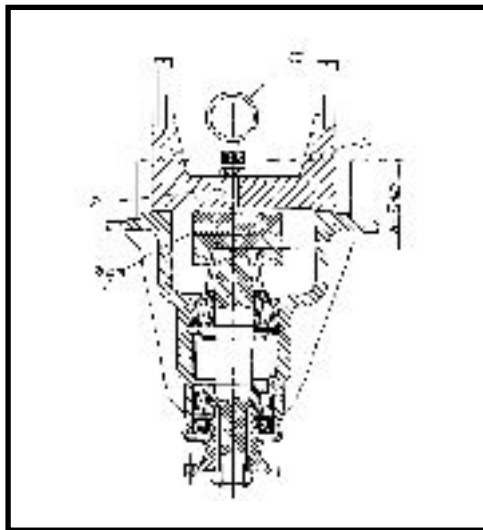
Remove the support and the dial, dismounting the flange and the inner balls ring of the bearing.

Remove the differential drive pinion from the casing, clamp it in a vice and place on its shaft the following parts:

- the front bearing washer;
- the bearing inner ring;
- the flange;
- the nut.

Tighten the nut at a **9 – 11 daNm** moment and place the support with the comparator dial again on the flange, measuring the difference between the axis and the differential drive pinion front side. The value of this difference corresponds to the value of the adjustment washer thickness.

Dismount the following from the pinion: the flange, the bearing inner ring and washer.



Remove the pinion from the vice, place it again in the differential casing, mounting the following parts on the pinion shaft: the adjustment washer, having the thickness previously established, the bearing washer, the balls inner ring, the annular oil seal, the flange and the nut, which shall be tightened at a moment of **9 – 11 daNm**.

### **3. ADJUSTMENT OF THE DIFFERENTIAL DRIVE PINION AND DIFFERENTIAL RIM CLEARANCE**

In a first phase, the clearance of the conical group gearing is measured by hand. The checking and the exact correction are performed using the comparator dial.

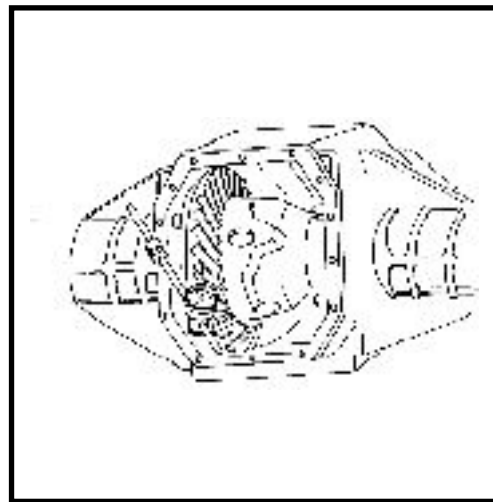
#### **Working procedure:**

Place the differential drive pinion, the rim – casing assembly, the bearings set, the adjustment nuts in the differential casing, observing the marking made upon dismounting.

Tighten the bearings casing screws at a moment of **4 – 5 daNm**;

Screw the adjustment nuts until the gear clearance may be estimated by hand.

Mount the comparator dial with the sensor perpendicular on the rim tooth flank and check the clearance of the gearing; it should be between **0,12** and **0,25 mm**.



The measurements shall be performed in three equidistant points.

The correction of the clearance shall be performed by means of the adjustment nuts. The differential bearings clearance is correct if, upon rotating the differential, a **0,05 – 0,20 daNm** moment is used.

After performing the a.m. adjustments, lock the adjustment nuts by means of the plate retainers.

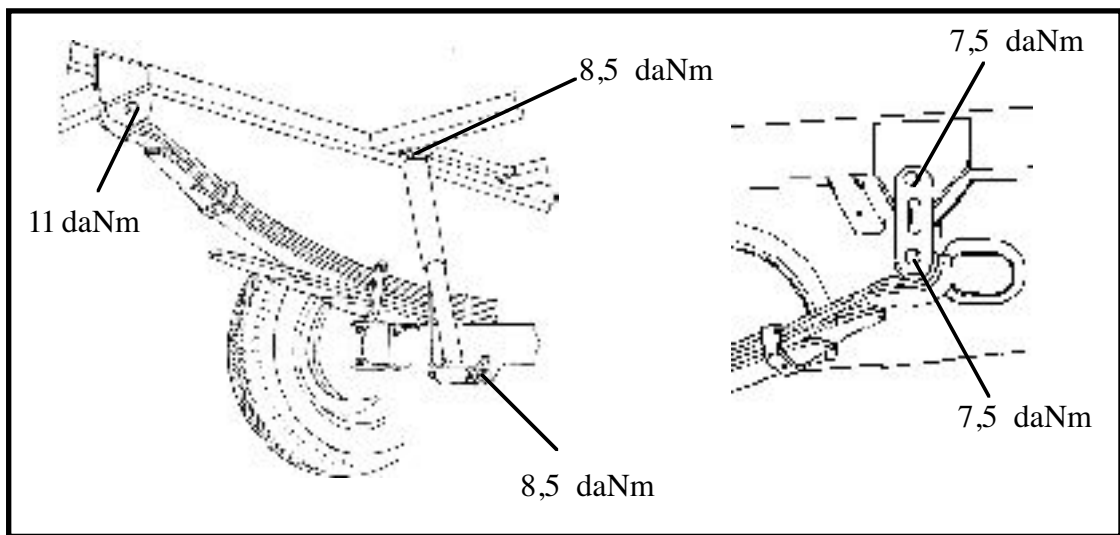
Remount the sleeves and the pins, observing the marks made upon dismounting.

### REAR SUSPENSION WITH LEAF SPRINGS AND HYDRAULIC SHOCK ABSORBERS



#### TIGHTENING MOMENTS

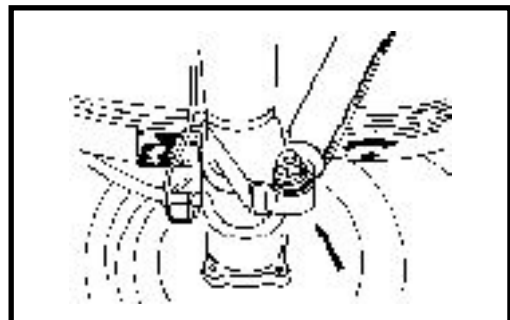
- Shock absorber upper attachment nut ..... **8,5 daNm**
- Shock absorber lower attachment nut ..... **8,5 daNm**
- Leafspring front attachment nut ..... **11 daNm**
- Leafspring rear attachment nut ..... **7,5 daNm**
- The nut that attach the clip of the leaf spring on the rear axle ..... **8,5 daNm**



### REAR SHOCK ABSORBER ( for DACIA 1305 , 1304 , 1307 vehicles )

#### DISMOUNTING

- Lift the pick up on a two column selevator.
- Dismount the rear wheels.
- Unscrew the nuts that attach the shock absorber at the lower and upper parts.
- Remove the shock absorber.



**REMOUNTING**

Performed in the reverse order the shock absorber dismounting operations, taking into account the shafts greasing and tightening at required moments, as follows:

- upper attachment nut .....8,5 daNm
- lower attachment nut .....8,5 daNm

**REAR SPRING**

Dacia 1304, 1305, 1307, light trucks are provided with leaf springs.

The leaf springs suspension has the advantage that it undertakes in the same time with the vertical forces, the longitudinal and the cross ones; these are the forces that occur upon contact between tire and road, without requiring additional guiding elements.

**DISMOUNTING**

Unscrew the nuts of rear wheels.

Lift the pick up on a two column elevator.

Dismount the rear wheels.

Dismount the nuts (1) of the rods that attach the leaf springs (2) to the front part.

Lift the back axle by means of a jack in order to facilitate the dismounting of the (3) nuts fixing the leaf spring to the clip (4) that attaches the spring to the axle in the rear part.

Unscrew the nuts (5) that attach the leaf spring on the rear axle.

Remove the leaf spring



**REMOUNTING**

Perform the operations required for dismounting in the reverse order, observing the following:

- when placing the spring on the axle, a good centering of the central screw should be done, in order to avoid internal tension;
- the nuts are locked at the established moments, for the spring shafts and for the flange;
- check the rear axle parallelism with the front axle.





## TIGHTENING MOMENTS

- Anti roll rod shaft attachment screw..... **1,5 daN.m**
- Antiroll rod-auxiliary connectingrod connectionaxlesnut ..... **8 daN.m**

## DISMOUNTING

Loose the rear wheels nuts.

Lift the vehicle on a two columns elevator.

Dismount the rear wheels nuts.

Dismount the rear wheels.

Unscrew the connections of the rear anti roll rod (1) with connecting rods (2).

Dismount the connections (3) of the rear anti roll rod with the rear axle.

Dismount the anti roll rod.

## REMONTING

Grease the attachment screws of the anti roll rod with special grease **MoS2**.

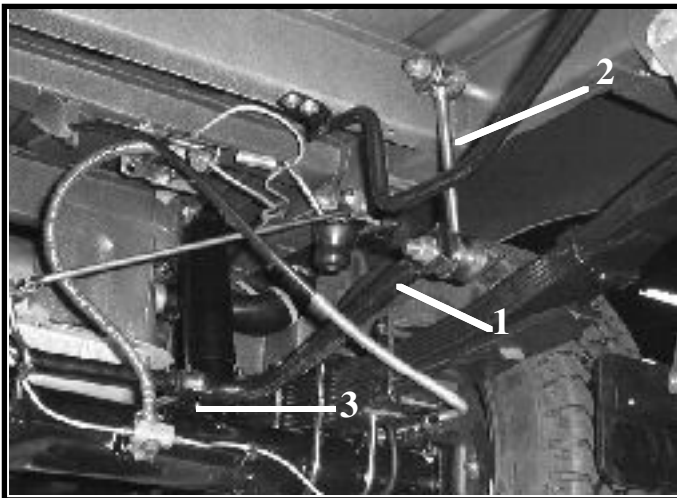
Mount the anti roll rod on the rear axle.

Attach the anti roll rod to the connecting rods.

Tighten at the required moments: the anti roll rod- auxiliary connecting rod connection axles nuts and screws, anti roll rod attachment screws on the rear axle.

Mount the rear wheels

Lower the vehicle from the elevator.



The rear anti roll rod diameter is:  $\phi 24$  mm.

RIMS

The wheels identification marking is represented in two ways:

- engraved marking for steel rims;
- cast marking for aluminum rims.

The marking enables acknowledgment of the main wheels dimensions criteria.

This marking may be:

- complete.

**Example: 5 J 14 3 CH 48**, or

- simplified.

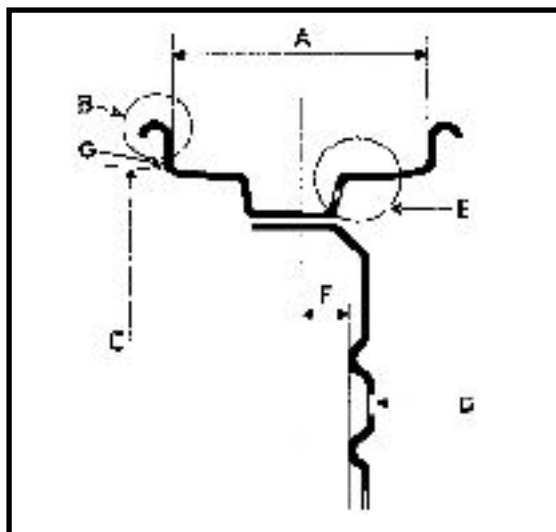
**Example: 5 J 14**

	A	B	C	D	E	F
Wheels type	Width (in inches)	The rim edge profile	$\phi$ Nominal (in inches) Under tire bead	Number of fixing points	Tire staffing profile	Offset (in mm)
5 J14 3CH48	5	J	14	3	CH	48
5 J14 5CH48	5	J	14	5	CH	48

The wheel bolts (studs) are situated on a diameter of 100 mm.

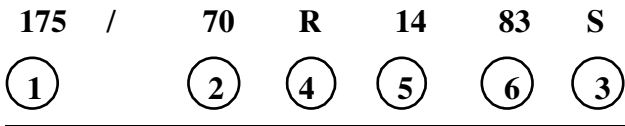
Maximum axial runout: 1,2 mm measured on the rim edge ( in G ).

Maximum radial runout: 1,2 mm measured on the bedding side of the tires beads.

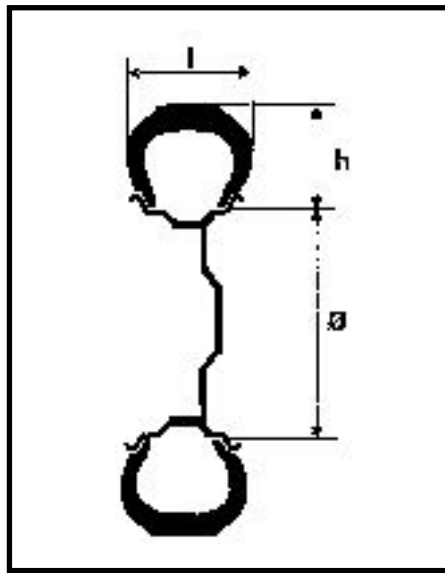


TIRES

Identification marking examples: 175/70 R 14 83 S



- ① - 175 - Tire width in mm ( 1 )
- ② - 70 - Ratio  $\frac{h \text{ height}}{l \text{ width}}$
- ④ - R - Radial structure
- ⑤ - 14 - Inner diameter in inches (  $\phi$  ): This is corresponding with the rim diameter
- ⑥ - 83 - Charging index
- ③ - S - Speed index max. 180 km/h max.



## CHARACTERISTICS

<b>Some speed markings:</b>	<b>Max. speed</b>	<b>Km/h</b>
	R	170
	S	180
	T	190
	U	200
	H	210
	V	240
	ZR bigger than 240	

**Structure types:**

Diagonal	No marking
Radial	R
Diagonally belted	B

### RIMS - TIRES

VEHICLE	RIM	TIRES	OUTER DIAMETER [mm]	AIR FILLING PRESSURE [bars]	
				AT COLD	
				FRONT	REAR
D 1304 D 1307	5 J 14 with 48 mm offset	175 R 14 PR 8	1920+/- 25	1,9	4,2
D1307 4 WD D 1305 D1304 4 WD	5 J 14 with 48 mm offset	175 R 14 PR 8	1920+/- 25	2,0	4,5

The nuts ( screws ) tightening moment of the wheels: **9 daNm**.

The inflating pressure must be checked at cold

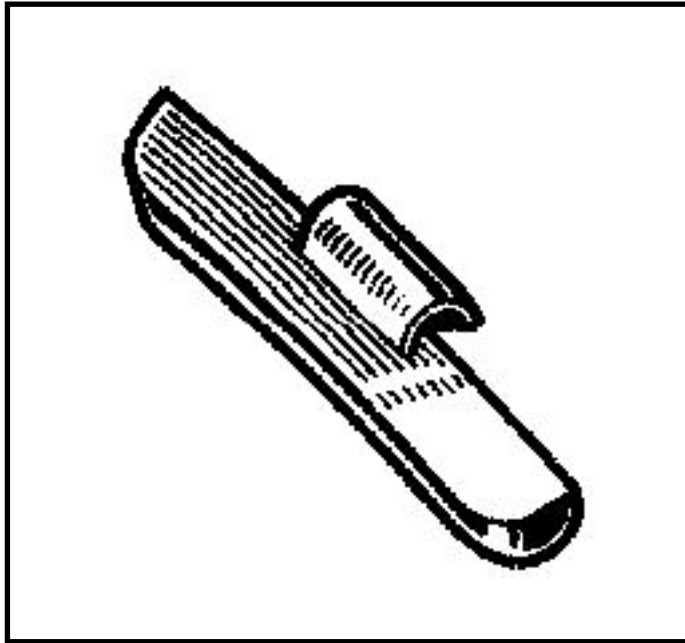
The temperature raising during driving, leads to a pressure increase from 0,2 to 0,3 bars.

In case temperature checking is done at warm, take into account this pressure increase and never let air coming out.

**BALANCING WEIGHTS**

Use exclusively the weights delivered as spare parts :

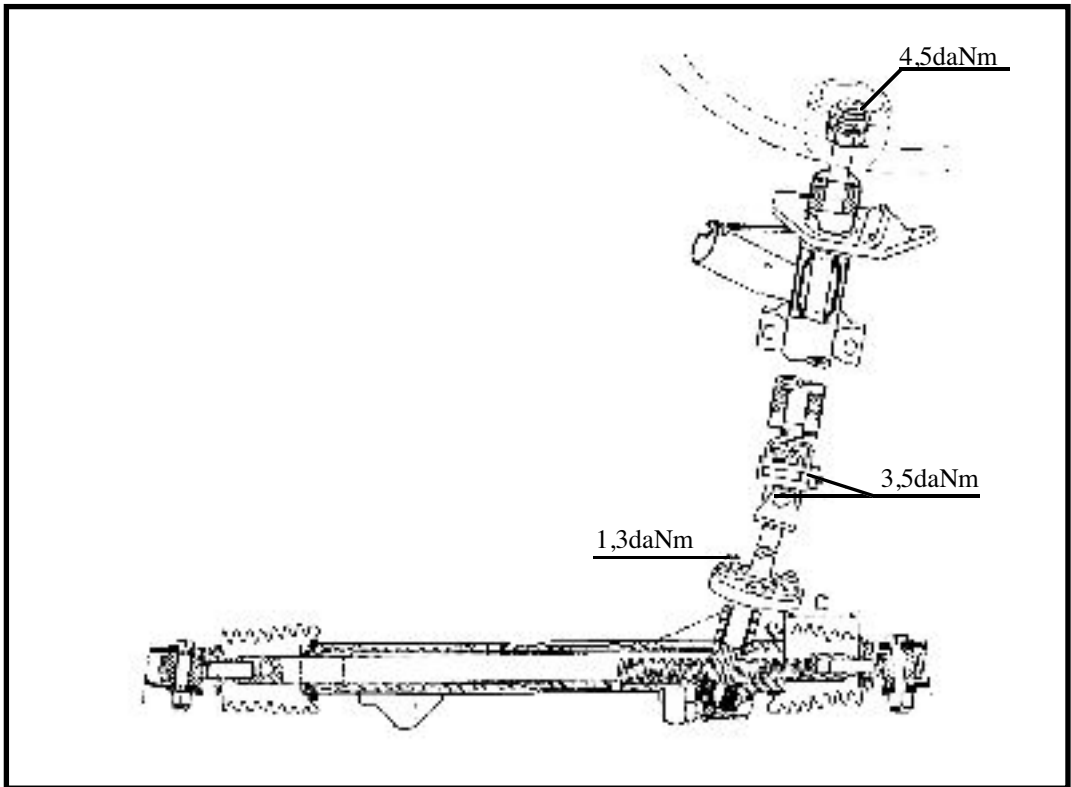
- fixed by means of clamp on steel rims (clamps included in weights)



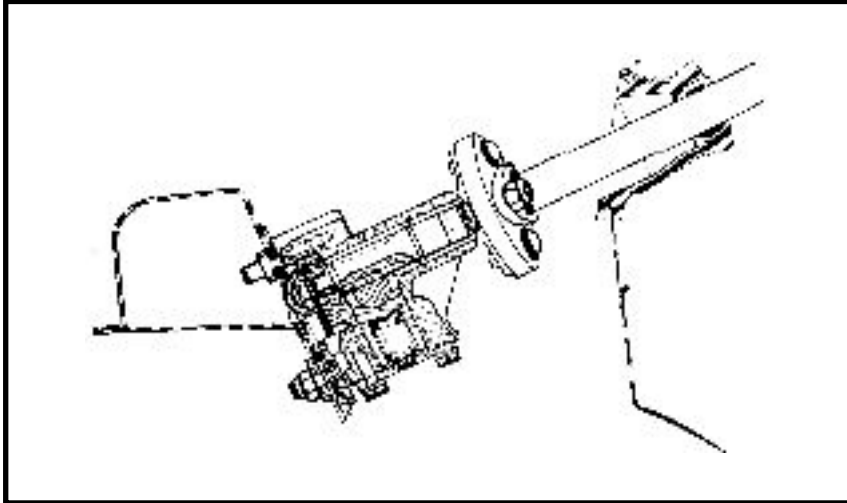
**CHARACTERISTICS**

- The steering mechanism is rack-and-gear drive.
- The multiplication ratio in the steering box is: **20:1**.
- The steering wheel number of rotations, corresponding to passing from one end to the other of the rack: **3,5**.
- The central point of the steering gear is: **c = 65 mm**
- The diameter of the turning circle between:
  - pavement.....**11,2 m**
  - walls.... .....**11,6 m**

**LONGITUDINAL SECTION**



CROSS SECTION



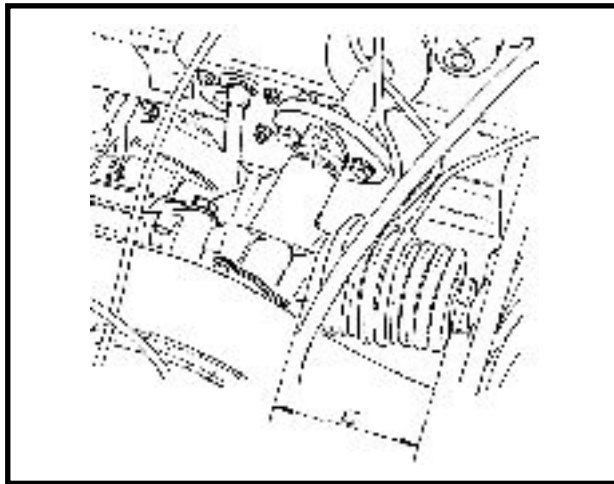
TIGHTENING MOMENTS

- Screws for the attachment of the box on the cross rod.....**2,5 daNm**
- Steering ball joint nut.....**4 daNm**
- Elastic coupling nut..... **1 ,3 daNm**
- Steering auxiliary connecting rod shaft nut..... **3,5 daNm**
- Steering wheel shaft nut..... **4,5 daNm**
- Steering cardan nut ..... **3,5 daNm**
- Corp articulație pe cremalieră .....**5 daNm**

In order to set the steering gear central point, bring the rack in the position in which the value **C = 65mm**.

This position is obtained when a rivet of the elastic coupling is oriented upwards.

Performing of a checking and adjustment operation of the front axle, impose the identification of the steering gear central point in order to avoid measurement errors occurrence.



### **STEERING GEAR BOX**

*The replacement of the steering gear box implies the adjustment of the steering gear height and the parallelism adjustment*

#### **DISMOUNTING**

Disconnect the battery.

Dismount: the battery and the battery support.

Dismount the steering gear auxiliary connecting rods shaft nuts.

Remove the ball joints of the auxiliary connecting rods using the **PF476** extractor.

Disconnect the steering auxiliary connecting rod connections with the steering box.

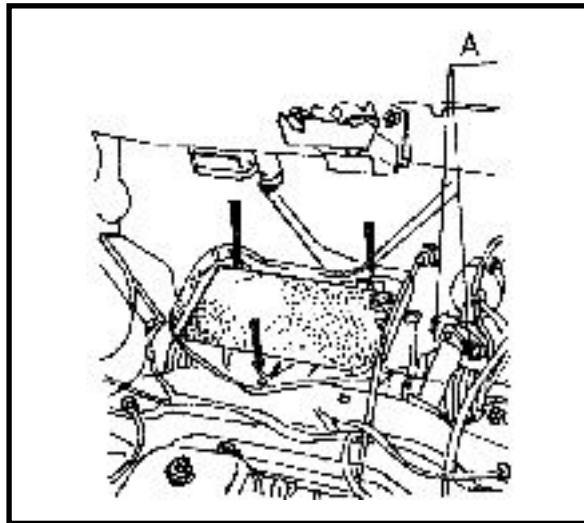


Dismount:

- the attachment screws of the elastic coupling;
- the steering box attachment screws on the cross rod.

**NOTE:**

*If the steering gear box is not replaced, do not dismount the eccentric safety rings, so that, after remounting, it will not be necessary to adjust the height of the steering gear box.*



#### REMOUNTING

Perform the dismounting operations in the reverse order:

Grease the ball joints with **Li Ca Pb Hp2** grease.

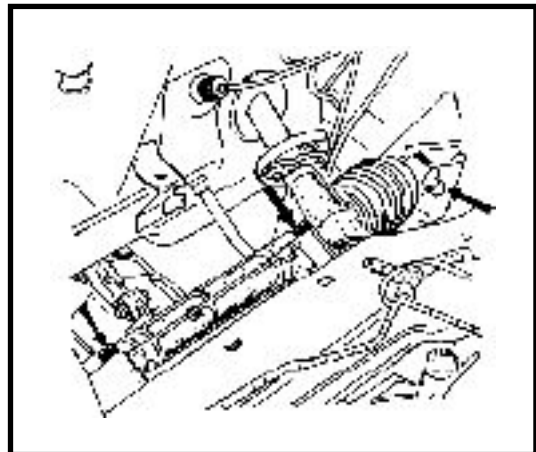
Check the state and the attachment of the protection bellows of the steering box.

Tighten the steering gear auxiliary connecting rods shafts nuts to the required moment.

Tighten the elastic coupling nuts to the required moment.

Check and adjust:

- the steering gear box height, after which, the screws by means of which the box is attached to the cross rod are tightened at the required moment;
- the parallelism.



REPLACEMENT OF THE NOISE ABSORBER BEARING

DISMOUNTING

1. Noise absorber bearing
2. Elastic bushings
3. Inside support washer
4. Outside support washer
5. Safety ring



Place the car on the elevator.

Dismount the wheel on the noise absorber bearing side (right side).

Dismount:

- the steering auxiliary connecting rod;
- the protection bellows.

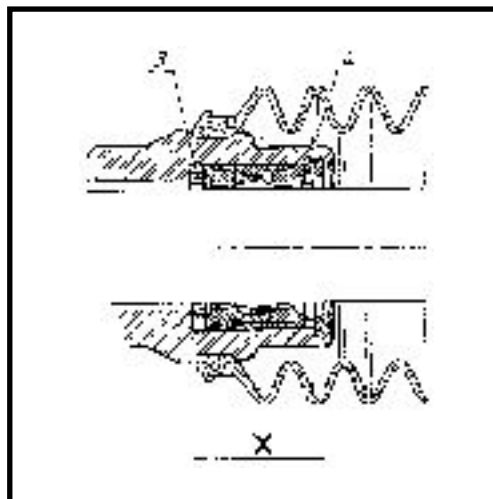
Rotate the steering wheel until the rack is withdrawn.

Dismount:

- the safety ring;
- the outer washer.

Remove, by means of a screw driver:

- the elastic rings;
- the worn noise absorber bearing.



**RE MOUNTING**

Carefully clean the rack and the noise absorber bearing seat and grease with a special grease containing **MoS2**.

Mount the elastic rings on the noise absorber bearing.

Rotate the steering wheel towards the left until the rack is on the extreme right position.

Mount the following parts on the rack:

- the new noise absorber bearing;
- the support washer;
- the old noise absorber support.

Temporarily tighten the joint body of the steering auxiliary connecting rod.

Rotate the steering wheel until the rack is completely withdrawn; in this way, the new noise absorber bearing gets into its seat.

Dismount:

- the articulation body ;
- the worn noise absorber bearing.

Check if the noise absorber bearing got into its seat and if the outer washer does not cover the safety ring.

Dismount:

- the safety ring;
- the steering auxiliary connecting rod;
- the protection bellows.

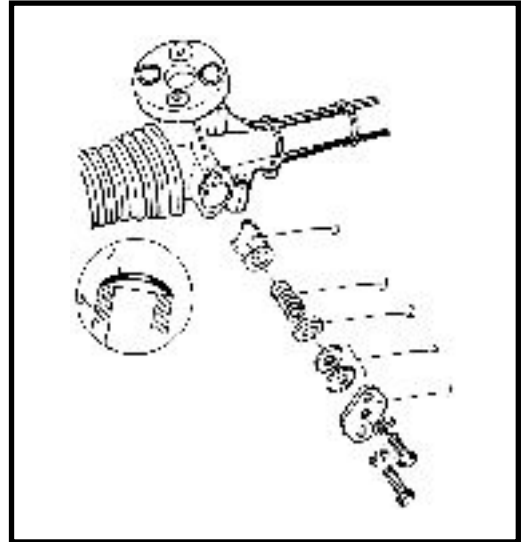
Check and adjust the parallelism.

The pusher clearance adjustment shall be performed taking into account the wear degree of the following parts: rack, pusher, casing.

The adjustment method shall be observed every time it is necessary to alter the spacers clearance, in order to maintain a normal operation of the steering gear box.

1. Cap
2. Elastic washer
3. Sprig
4. Adjustment washer
5. Pusher

The operation shall be performed after removing the steering gear box off the vehicle.



### ADJUSTMENT METHOD

Clamp the steering gear box in the vice.

Dismount:

- the pusher cap (1);
- the adjustment washers (4);
- the elastic washer (2);
- the spring (3);
- the pusher (5).

Carefully clean the pusher seat and the parts that have been dismantled.

Grease the parts with special grease containing **MoS<sub>2</sub>**.

Mount the parts in the pusher seat, except for the elastic washer.

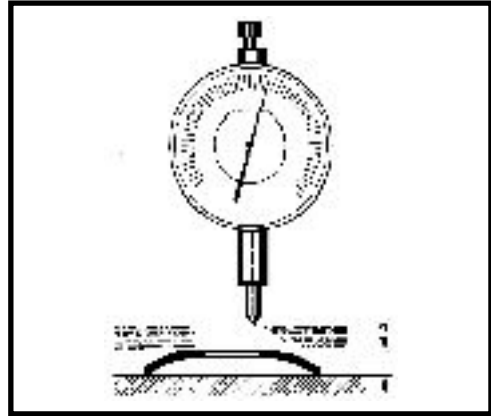
Make a comparator support out of an old cap.

**NOTE: Do not rotate the drive pinion while the cap is dismantled.**

### MEASUREMENT OF THE FREE HEIGHT “ H “ OF THE ELASTIC WASHER

Place the washer on a straight plate and measure its height by means of a comparator, using a set of spacers with a known thickness.

Note the average value.

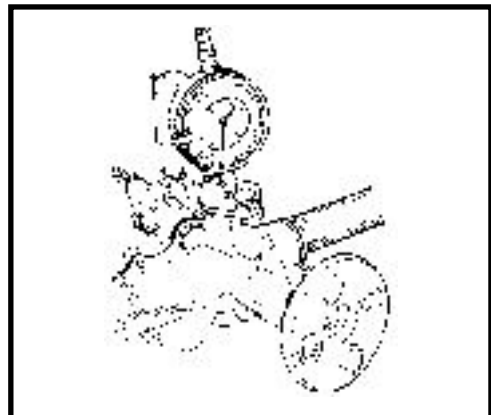


### RACK WEAR CHECKING

The rack wear degree is established by measuring the difference between the maximum and minimum values on the rack, in the central area.

Attach the comparator support instead of the cap.

Bring the feeler in contact with the pusher.



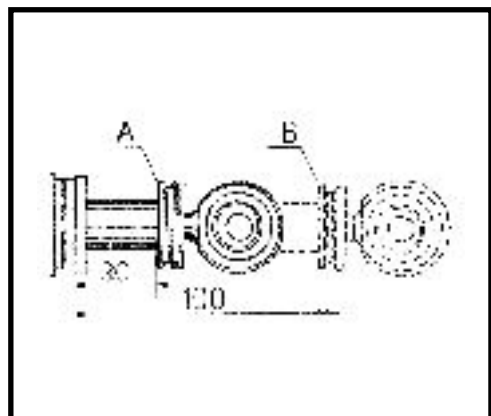
Mark points **A** and **B** in the central area of the rack, corresponding to the box extremity.

The measurements are always performed from point **(A)** towards point **(B)**.

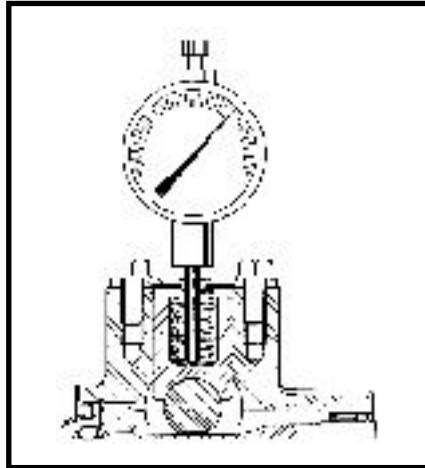
Bring the rack to point **(A)** and set the comparator to zero.

Slowly move the rack until it reaches point **(B)**.

Bring the rack back to point **(A)**.



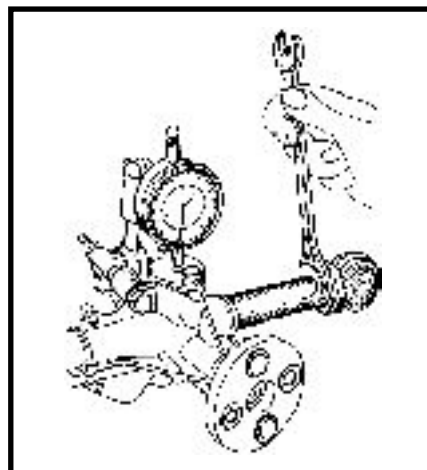
Move the rack up to the point where the value is the highest.  
In this point, reset the comparator to zero.



**MEASUREMENT OF DISTANCE ( D ) ABOVE THE PUSHER**

In the position previously set, rotate the rack by means of a fixed wrench, without forcing, until the pusher comes into contact with the adjustment washers; the rotation must be done in both directions.

Read the displacement value on the comparator and note the highest value.



### SETTING OF THE ADJUSTMENT WASHERS THICKNESS

The thickness of the adjustment washers shall be measured for the lowest point of the rack, so that a pre compression of the washer is obtained:

$$E = ( D + 0,06 \text{ mm} ) - H$$

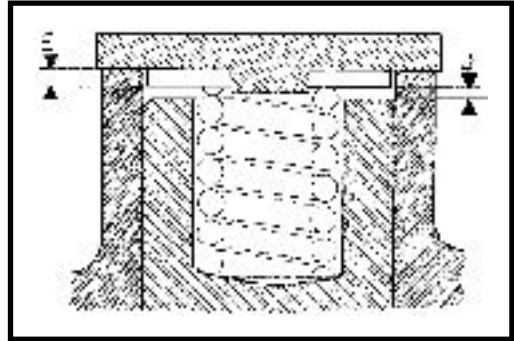
**E** - washers thickness;

**D** - the distance above the pusher;

**H** - the free height of the elastic washer;

**0,06** - pre compression of the washer.

In order to obtain an adequate thickness which may be obtained from the existing washers, diminish the calculated value by **0,04 mm**.



On remounting, place the elastic washer (2) in contact with the pusher (5) and the adjustment washers (4), in contact with the cap (1).

Observe the mounting sense of the elastic washer.

Place the set of washers, established by measurement above the pusher.

### CHECKING

Place the set of the washers, established by measurement, above the pusher.

Measure the distance between the pusher and the adjustment washers; this distance should be equal to the free height of the elastic washer, minus **0.02-0.06mm**.

If this value is not obtained, measure again.

Dismount the comparator support.

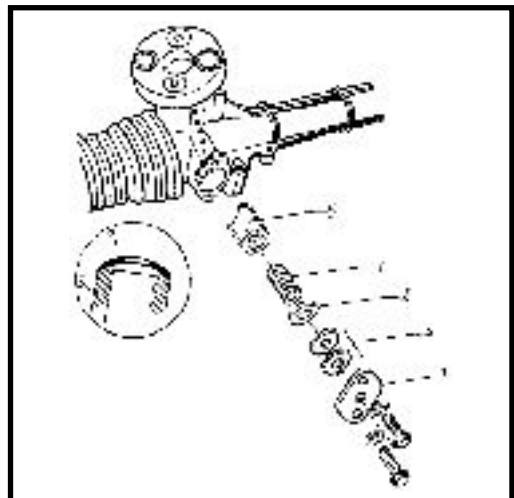
Remove the adjustment washers.

Put specialgrease, containing **MoS2**, in the seat.

Remount:

- the elastic washer;
- the adjustment washers;
- the cap.

Tighten the cap attachment screws at the required moment.



**ADJUSTMENT EXAMPLE**

The distance between the pusher and the adjustment washers: **D = 1,48 mm**

Free height of the elastic washer: **H = 1,32 mm**

Thickness of the adjustment spacer:  **$E = (D + 0,06) - H = (1,48 + 0,06) - 1,32$**   
**E = 0,22 mm**

**PARTICULAR CASE**

It may happen that value found for the adjustment washers thickness is negative.

**EXAMPLE**

The distance between the pusher and the adjustment washers: **D = 1,17 mm**

Free height of the elastic washer: **H = 1,35 mm**

Thickness of the adjustment spacer:  **$E = (D + 0,06) - H = (1,17 + 0,06) - 1,35$**   
**E = - 0,12 mm**

In this case, take out a **0,15mm** thick washer from the washers set, after which perform measurement again to establish the thickness of the adjustment washers.



#### DISMOUNTING

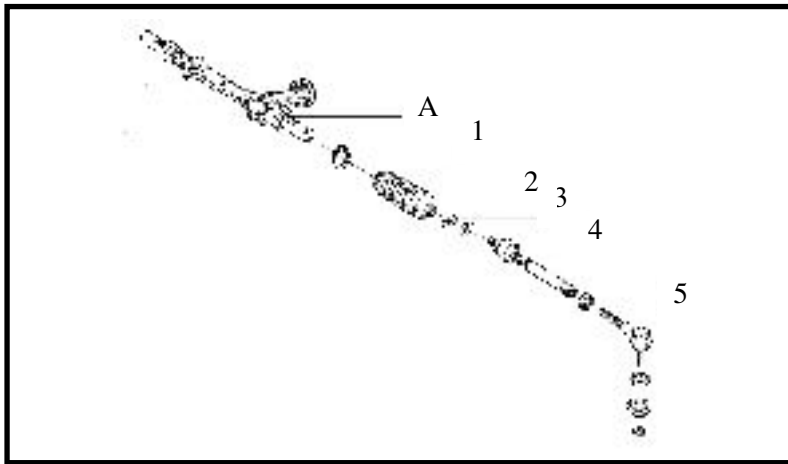
Unscrew The attachment nut of the funnel to the steering knuckle support and depress the auxiliary connecting rod ball joint.

Take out the attachment collar of the bellows on the casing box.

Detach bellows (2) from the steering box.

Straighten the edges of the safety washer (4).

Unscrew the steering connecting rod from the rack, using the special wrench and take it out together with the safety washer (4) and the locking washer (3).



#### REMountING

Fold the bellows (2) towards the connecting rod funnel.

Apply a layer of **FIXAMED R 58** on the threaded part of the joint ball.

Put the safety washer (4) and the locker washer (3) (in this order) on the threaded shaft of the steering auxiliary connecting rod, passing the curved pin of the safety washer through the slot of the locking washer.

Screw the steering auxiliary connecting rod by placing the safety washer pin on the flat area (A) at the end of the rack.

Tighten the ball joint ball body with the rack at a moment of **5 daNm**.

Bend the safety washer in the opposite part to the pin in at least one of the cuts made on the ball joint body.

Mount the bellows in its channel from the steering casing.

Mount the bellows collar.

Mount the auxiliary connecting rod funnel in the steering knuckle support.

Check the tightening of the nut (5) at a moment of **4daNm**, on the vehicle.

The tightening at the moment of **5 daNm** shall be performed with the **6902-4105** special wrench.

### **AUXILIARY CONNECTING ROD FUNNEL**

In case only the auxiliary connecting rod funnel is worn, this may be replaced.

#### **DISMOUNTING**

Dismount the attachment nut of the auxiliary connecting rod funnel ball joint on the steering knuckle support.

Depress the funnel ball joint from the steering knuckle support

Loosen the nut (**5**).

Unscrew the auxiliary connecting rod funnel from the assembled auxiliary connecting rod end.

#### **REMOUNTING**

Remount the new funnel performing the dismounting operations in the reverse order. See that the nut (**5**) is tightened to the moment of **4daNm**.

**STEERING WHEEL SHAFT BUSHINGS REPLACEMENT****DISMOUNTING**

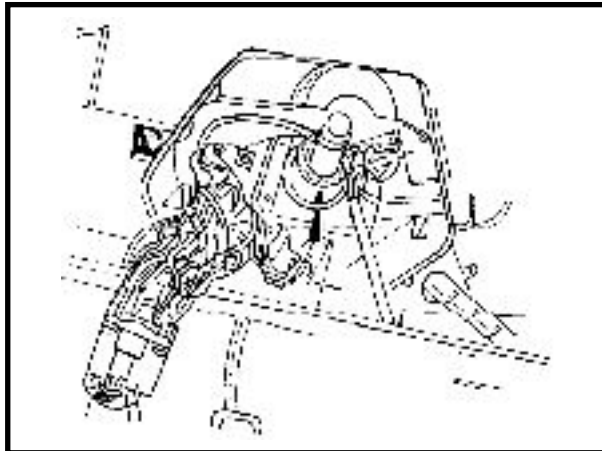
Disconnect the battery.

Dismount:

- the lower half case;
- the steering wheel;
- lights control switch;
- windscreen washer control switch;
- the steering cardan;
- upper bushing safety ring;
- the ignition/starting contact.

Push the steering wheel shaft by means of a bronze mandrel and a plastic hammer until the lower bushing gets out of the steering gear support.

Take out the upper bushing.



**RE MOUNTING**

Place an old lower bushing, with the diameter diminished by 2mm, under the new lower bushing(1).

Push the steering wheel shaft (3) upwards until the lower bushing gets in its seat.

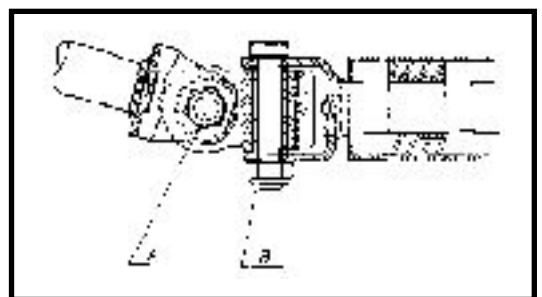
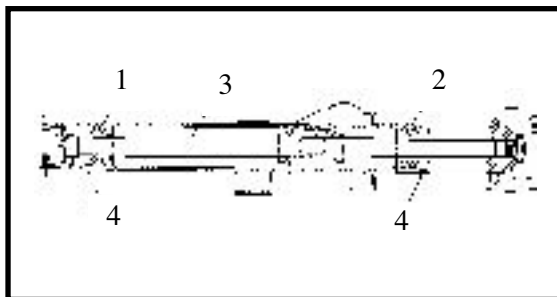
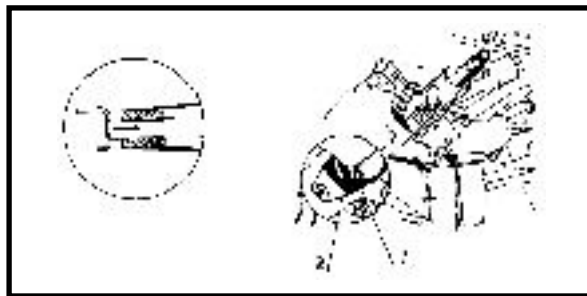
Push downwards the steering wheel shaft and recover the old bushing.

Mount the new upper bushing (2) by means of a pipe.

Check the correct positioning of the bushings in their respective seats.

Mount the safety ring (4) of the upper bushing.

Bring the steering gear to its central point.



Tighten the lower nut (A) of the cardan.

Rotate the steering wheel to the left or to the right and tighten the lower nut (B) of the cardan.

When the steering gear is in the central point (the wheels in straight line), one of the ends of the cardan screws should be oriented upwards.

Mount:

- the lights control switch;
- the steering wheel;
- the lower half casing;
- the ignition/starting contact.

**DISMOUNTING**

Disconnect the battery.

Dismount:

- the lower half casing;
- the steering wheel;
- the lights control switch;
- the tum lights relay.

Disconnect the stop lamp switch and the ignition/starting contact.

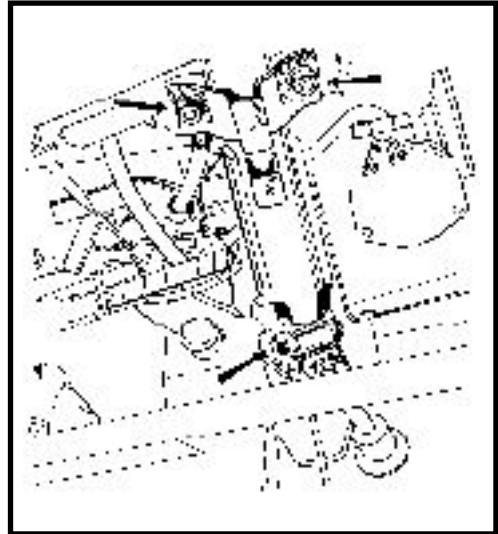
Dismount:

- the steering cardan;
- the servo brake attachment nuts;
- the servo brake.

Disconnect:

- the brake pedal pushing rod and the clutch cable.

Unscrew the two attachment nuts of the steering column and dismount the column.

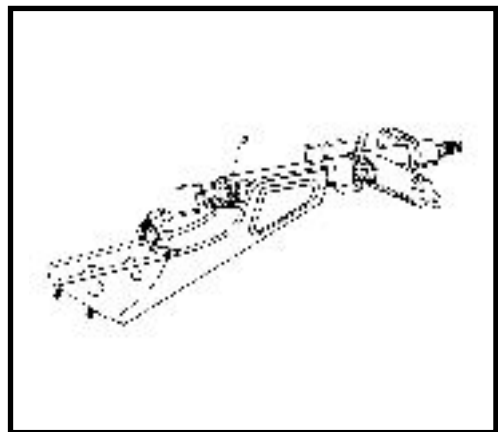
**REPAIR**

Check the parts; steering wheel shaft, steering wheel shaft bushing, steering column. Replace the defective or worn parts.

**REMOUNTING**


It shall be performed in the reverse order as to the dismounting.

Tighten at the moment the steering cardan nuts.



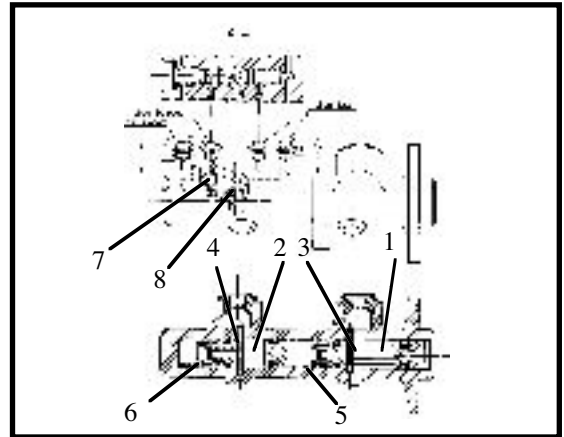
## BRAKE PUMP

## DOUBLE BRAKE PUMP WITH PRESSURE DROP INDICATOR (ICP) INCLUDED

TIGHTENING MOMENTS ( daNm )	
The hydraulic ducts guides	1,4
The attachment nuts brake pump with servobrake	1,3

## COMPONENTS

1. Assembled primary piston with gaskets
  2. Assembled secondary piston with gaskets
  3. Primary piston pin.
  4. Secondary piston pin.
  5. Primary piston return spring
  6. Secondary piston return spring.
  7. Purging screw
  8. ICP transducer
- A – A ICP assembly section



## OPERATION

## a) BRAKING

## THE FRONT BRAKE CIRCUIT

The primary piston is controlled by the pushing rod. A part of the brake fluid under pressure will operate together with the spring on the secondary piston, and the other part of the brake fluid shall penetrate through the ducts to the upper floor towards both exits leading to the front brake calipers.

## THE FRONT BRAKE CIRCUIT

The secondary piston is continuing its movement, conducting the brake fluid under pressure, through the ducts, to the upper floor, towards the exit to the pressure reducing valve.

## b) DE BRAKING

After effort ending, the two pistons resume their initial position under the effect of the retainer springs, while the fluid is coming back and the pressure is decreasing in both circuits.

### PRIMARY CIRCUIT – PRESSURE LOSING

Lack of pressure in the primary circuit leads to the following situation:

The primary piston advances up to the pin, so it controls mechanically the secondary piston.. The secondary piston reaches a fluid pressure that shall operate on the piston – linings assembly moving it to the right, opening also the second exit of the rear circuit (the by-pass circuit) increasing the pressure in this circuit.

In this moment, by means of the transducer, the warning light on the instrument panel is on.

### SECONDARY CIRCUIT – PRESSURE LOSING

Both cylinder pistons go on. The caliper cylinders of the front brake shall normally operate.

The secondary piston reaches its respective pin, but the pressure will decrease (due to the failure).

### BRAKE PUMP DISMOUNTING

Drain the brake fluid reservoir.

Disconnect the pump from the ICP transducer.

Dismount the four pipes from central pump.

Unscrew the attachment nuts of the pump on the servobrake.

Dismount the pump.



### BRAKE PUMP REMONUTING

Before remounting, check the stroke of the servobrake push rod to be min. 30 mm.

Mount the brake pump on the servobrake, performing the dismounting operations in reverse order.

After assembling with the brake fluid reservoir and fluid filling, no leakage must occur in the surface of separation between the two elements.

***VERYIMPORTANT: The I.C.P. transducer is mounted after the braking system purging. The tightening moment = 2daNm. ICP sub-assembly is not reparable (ICP – pressure decreasing indicator)***

**BRAKE PUMP REPAIRING**

*The operation is performed after dismantling the central pump off the vehicle.*

**DISMOUNTING**

Dismount the brake fluid reservoir, recovering the two gaskets.

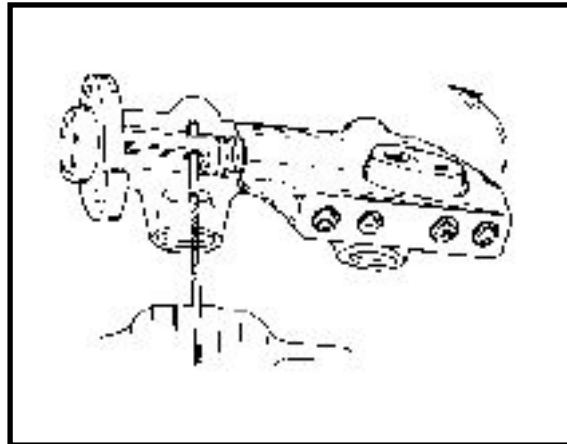
Dismount the transducer and the purging screw.

Clamp a **3,5 mm** drill in the vice.

Introduce the drill in the elastic pin of the primary piston.

Rotate and draw the pump until the pin is extracted.

Extract the secondary piston elastic pin, in the same way.





## BRAKE PUMP

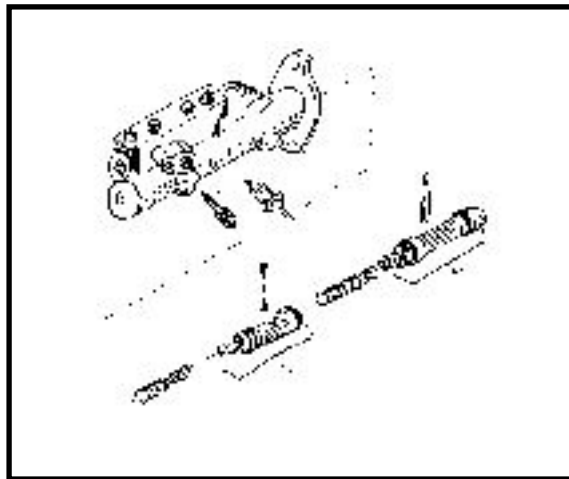
Remove from the pump bore :

- the primary piston assembled with Pp gaskets;
- the primary piston return spring;
- the secondary piston assembled with Ps gaskets;
- the secondary piston return spring.

Wash the parts with alcohol and blow them with compressed air.

Check:

- the pump bore;
- the pistons gaskets the springs.



The parts of the “ primary piston” Pp and those of the “secondary piston” Ps, cannot be repaired. In case one of these parts is damaged, replace the whole” primary piston” and “secondary piston” assembly.

### REMOUNTING

Before remounting, the parts and the pump bore will be lubricated with brake fluid.


Mount the “ secondary piston”, retained spring and “primary piston “ assemble.

Compress the pistons and introduce the elastic pins; the elastic pins slot shall be oriented towards the back of the pump (towards the pushing rod).

Mount the purging screw.

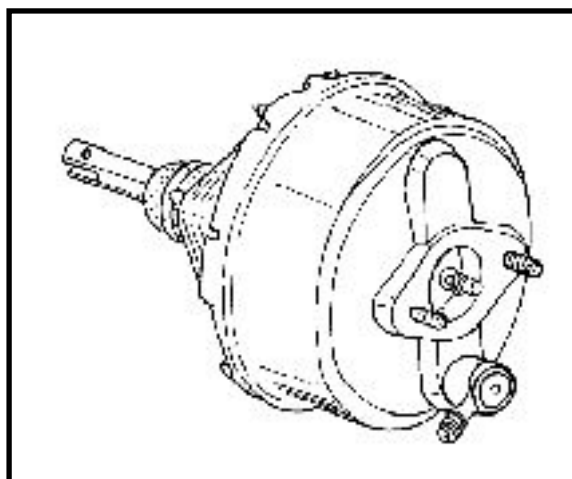
Purge the brake circuit and remount the ICP transducer.

## MASTER - VAC SERVOBRAKE

TIGHTENING COUPLE ( daNm )	
Servobrake on the iron brake	2
The attachment nut of the central pump with servobrake	1,3

## CHARACTERISTICS

The Master-Vac servobrake is a brake booster with the objective of reducing the driver effort on the brake pedal and may be of **152 mm** or **177,5 mm** with a minimal booster rate of **1,9**.

**NOTE :**

*In case one circuit is damaged, the pedal stroke shall be longer, the braking being done only by the circuit still working.*

*The servobrake cannot be repaired.*

*The only items which are to be replaced are the air filter and the retainer valve.*

**DISMOUNTING**

Drain the liquid out of the reservoir.

Detach the four brake ducts from the pump.

Disconnect the electrical contact from ICP transducer.

Dismount the central pump from the servobrake.

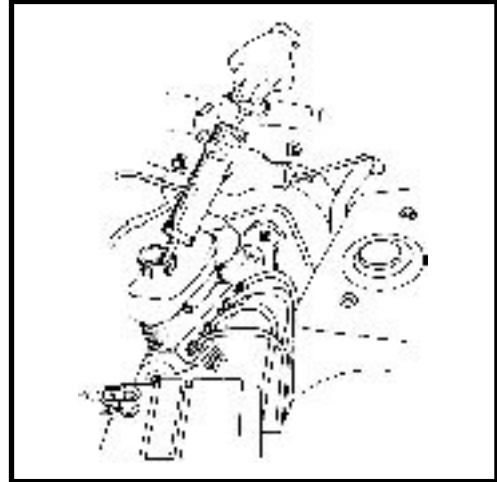
Disconnect the suction hose of the servobrake.

Dismount :

- the connecting fork shaft to brake pedal (**1**);

- the attachment nuts of the servobrake on the iron plate.

Dismount the servobrake.

**REMOUNTING**

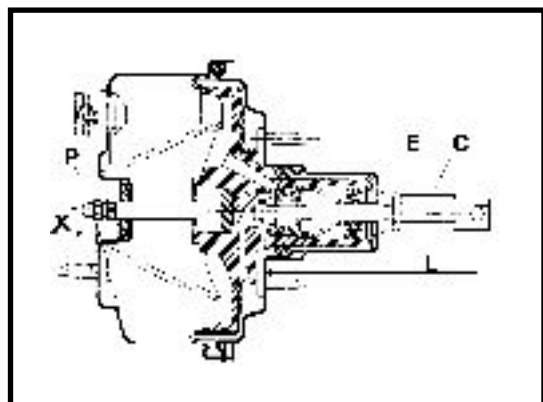
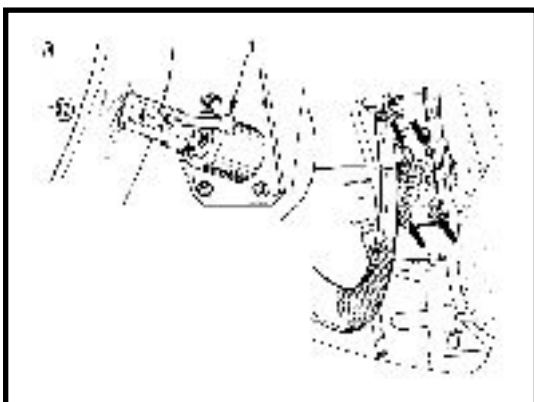
Before remounting, check:

- the adjustment of the main cylinder stroke, which is obtained by acting on the pushing rod (**P**) nut in order to obtain value **X = 9 mm**, between the pushing rod end and the rest surface of the main cylinder;

- the adjustment in order to obtain the value **L = 131 mm** is performed by screwing or unscrewing the fork **C**, followed by blocking the lock nut **E**.

For remounting, perform the dismounting operations in the reverse order.

Purge the brake circuit.



## TIGHTNESS CHECKING

*The tightness of the servobrake is checked on the vehicle, with the hydraulic circuit under operation.*

Connect the vacuum meter between the servobrake and the inlet collector by means of a “ T ” type connector.

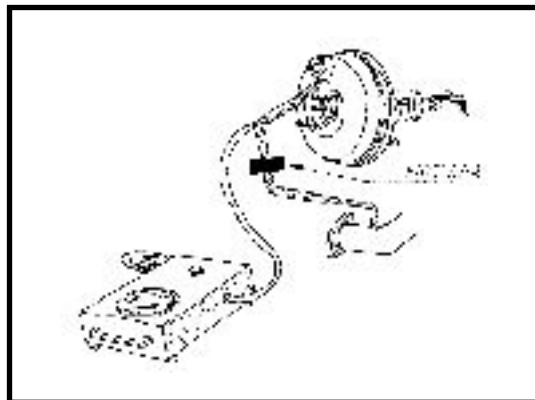
The connecting hose of the vacuum meter shall be as short as possible.

Start the engine and let it idle run for **1min.**

Block the air suction hose by means of the **MOT 453** device.

Stop the engine.

Read the indicator.



If air suction lowers with more than **33 mbar** (25 Hg) in 15' period, it means there is a loss: at the retainer valve - replace the valve or at the servobrake membrane - replace the servobrake.

Dismount the **MOT 453** device.

Dismount the vacuum hose.

Connect the air suction hose to the servobrake.

If the servobrake does not work, but the braking system is working, then the effort on the brake pedal is increased.

### AIR FILTER REPLACEMENT

#### DISMOUNTING

Dismount the servobrake off the vehicle.

Loosen the lock nut and dismount : the coupling brake and the lock nut.

Remove the old filter, F.

#### REMOUNTING

Mount the new filter.

Mount:

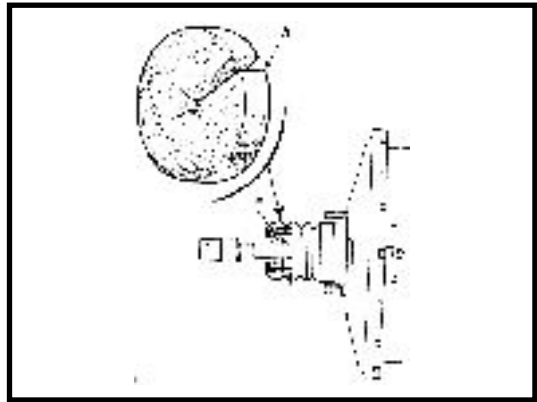
- the lock nut;
- the coupling fork.

Adjust the value L.

Tighten the lock nut on the fork.

Mount the servobrake on the vehicle.

Purge the braking circuit if necessary.



### SERVOBRAKE RETAINER VALVE REPLACEMENT

The operation shall be performed without dismounting the servobrake off the vehicle.

#### DISMOUNTING

Disconnect the air suction hose.

Dismount the valve by rotating and then pulling it.

Dismount the retainer valve gasket.

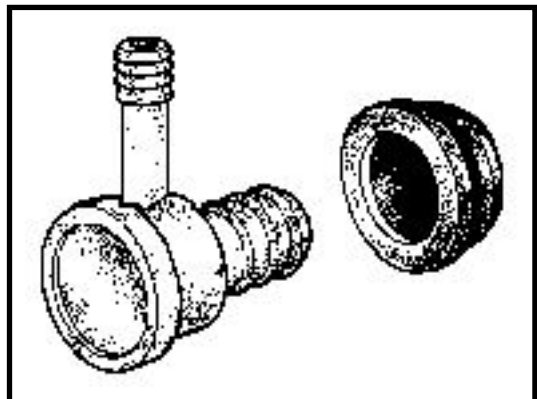
#### REMOUNTING

Check the state of the retainer valve gasket; replace it if necessary.

Mount the retainer valve gasket.


Mount the new retainer valve.

Connect the air suction hose.



## HAND BRAKE

Lever on floor, mechanical controlled, operating on the rear wheels.

TIGHTENING MOMENTS ( daNm )		
The attachment screws of the hand brake lever assembly on the floor	1,2	
The primary cable tightening nut on swing bar	2	

## ADJUSTMENT

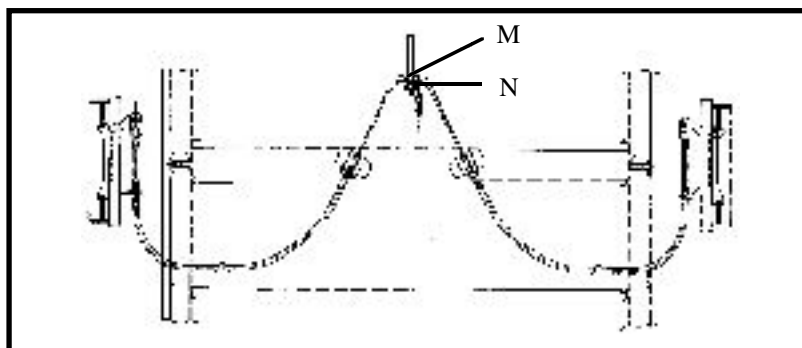
With rear wheels suspended and hand brake lever released ,tighten the castle nut **M** until the shoes gaskets come lightly into contact with the brake drum.

Tighten the lock nut **N** at the required moment.

The adjustment shall be performed so that is insuring a hand brake lever stroke of min.7 teeth until the blocking of all wheels.

The adjustment shall be performed anytime the shoes wear is requiring it.

The hand brake adjustment shall be performed only after the rear brake adjustment.



**DISMOUNTING**

Disconnect the battery.

Lift the vehicle by means of an elevator.

Release the hand brake.

Disconnect the primary cable from the rocking joint.

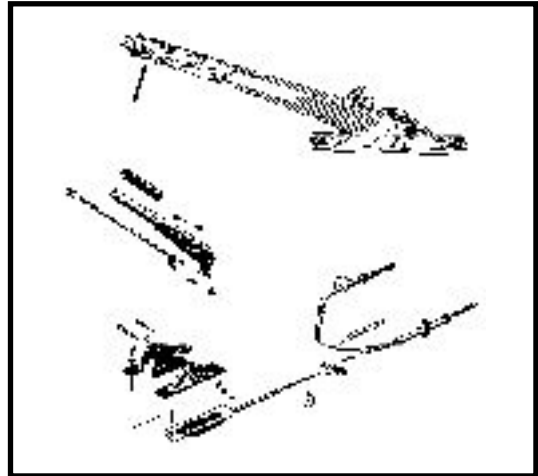
Dismount the hand brake ornament case.

Dismount the screws that attach the hand brake lever to the floor.

Release the hand brake lever.

Dismount:

- the locking ring of the primary cable fork shaft;
- the primary fork shaft;
- the hand brake lever.

**REMOUNTING**

Grease the primary cable fork shaft with special **MoS2** grease.

Connect the primary cable.

Mount the hand brake lever.

Mount the hand brake ornament case.

Adjust the hand brake.

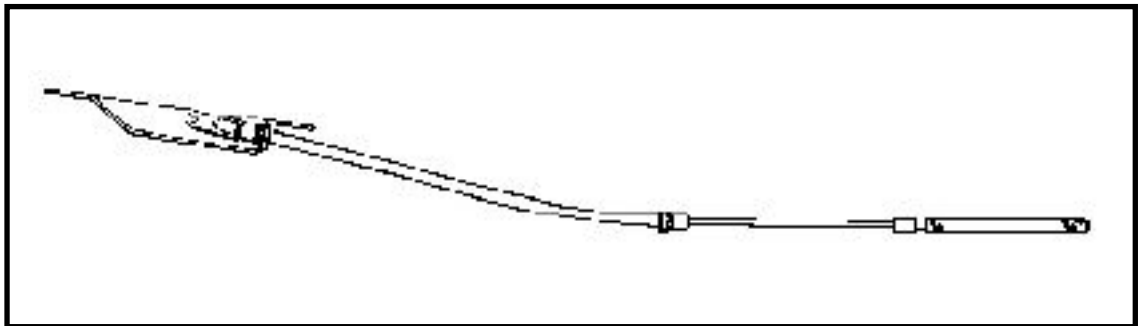
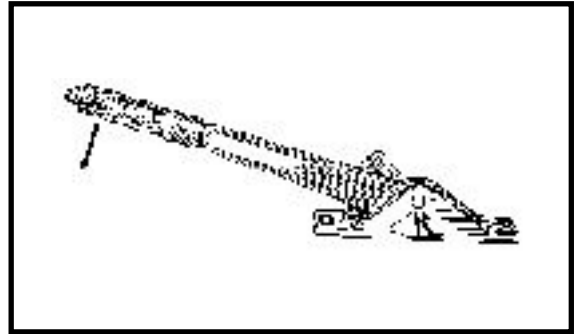
Get down the vehicle on ground.

Connect the battery.

THE HAND BRAKE SECONDARY CABLE REPLACEMENT

**DISMOUNTING**

- Dismount the hand brake lever.
- Disconnect the primary cable from the rocking joint.
- Dismount the stop sheath of the primary cable.



**REINSTALLING**

- Place a sealant material layer between the floor and the primary cable case.
- Mount the primary cable.
- Mount the stop sheath.
- Mount the hand brake lever.
- Adjust the hand brake.

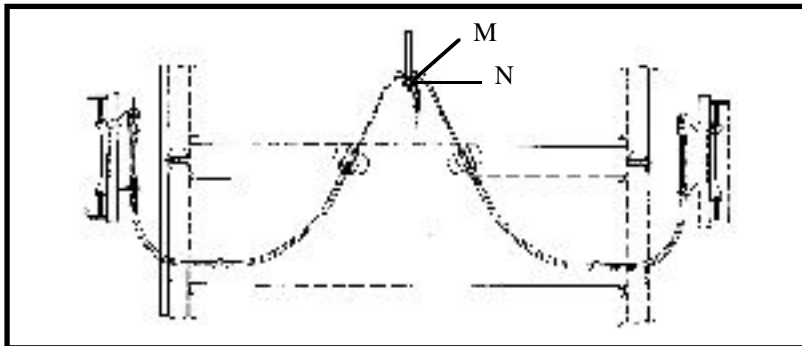


**HAND BRAKE SECONDARY CABLE REPLACEMENT****DISMOUNTING**

- Disconnect the battery.
- Release the primary cable from the rocking joint.
- Dismount the drums.
- Lift the motor-car by means of a jack.
- Unscrew the nuts **M** and **N**.
- Release the secondary cable from the control levers.
- Dismount the sheaths stops (from the plate and from the floor).
- Dismount the secondary cable.

**REMountING**

- Position the secondary cable.
- Connect the secondary cable in:
  - the floor;
  - the sheaths stops from the plate;
  - the sheaths stops floor.
- Adjust the hand brake.
- Tighten to the required moment the nut **N**.



**BRAKE LIMITER CHECKING-ADJUSTMENT**

Place the vehicle on the checking bench so that wheels are in contact with the ground (unloaded pick up and one person on board ).

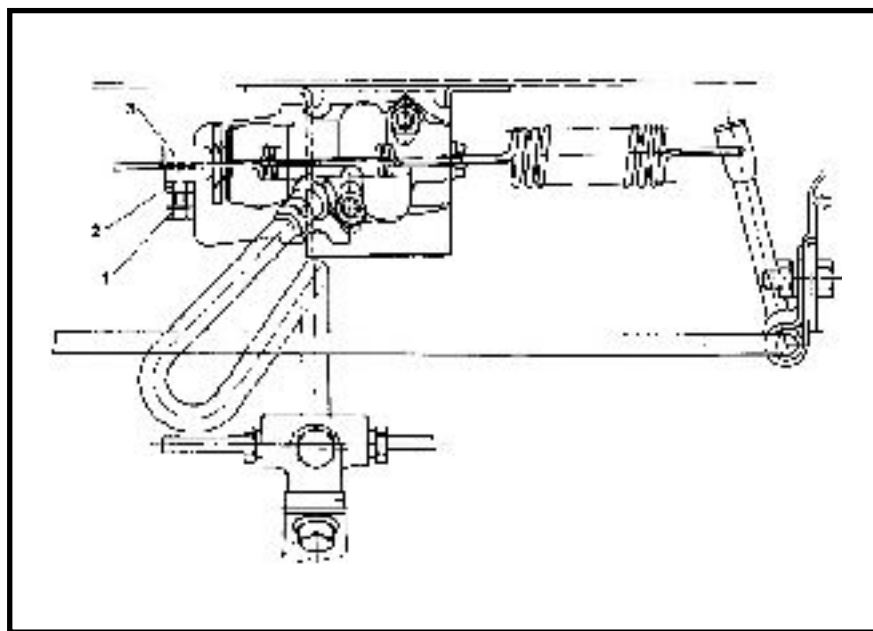
Mount in the place of the purging screw of the brake cylinder, the IR 214 – 02 checking manometer.

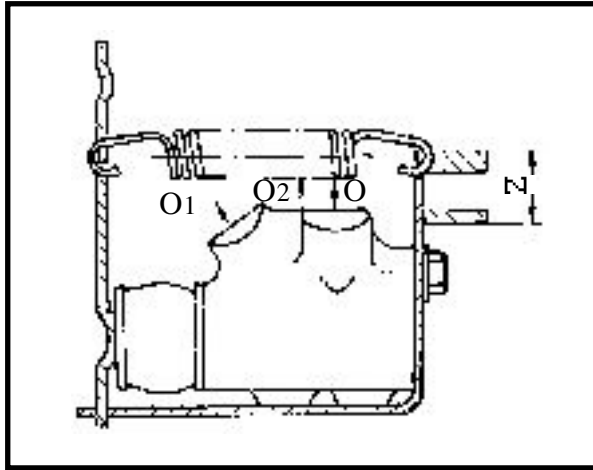
Dismount the fork from the big spring.

After 3,4 successively pressings, the brake pedal remains pressed.

Read the value of the pressure which must be  $20^{+0}_{-2}$  bars.

In order to obtain this value, strain by bending the limiter support slide from the base ( Z area) for lower the pressure ( to inner side ).





After obtaining the pressure of  $20^{+0}_{-2}$  bars, with the brake pedal pressed, slide the passing fork (3) until the contact with the limiter control lever.

In this moment block the passing fork by means of the screw (1) and the nut (2).

Release the brake pedal and purge the braking circuit.

Dismount the manometer and the adjustment is considered ready.

### ***OBSERVATION!***

*If, with the limiter being mounted, the pressure of  $20^{+0}_{-2}$  bars can not be obtained, proceed to the limiter replacement.*

*Repairing of the limiter is forbidden !*

**DISMOUNTING**

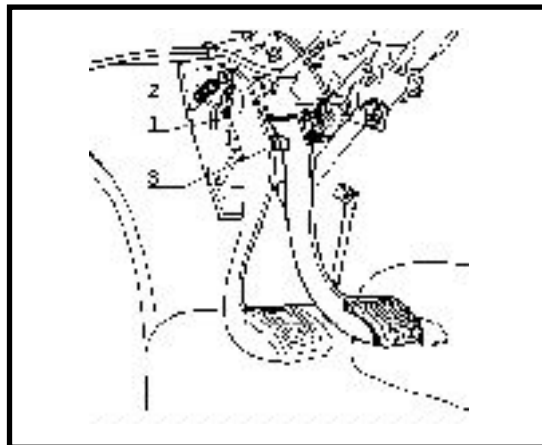
Remove the safety clip (1).

Detach the spring (2) of the clutch cable shaft.

Remove the pins and the shaft (3) of the main cylinder pushing rod.

Remove the clutch pedal from the pedals shaft.

By means of a bronze nail, push the pedals shaft towards the right, then remove the brake pedal.

**REMOUNTING**

Grease the shaft (A) with special grease containing **MoS<sub>2</sub>**.

Mount in the following order:

- the brake pedal (F);
- the washer (C).

Place the shaft (A) together with the elastic pin (B) in the pedal support.

Place the shaft in the second support bore, then place the following items:

- the washer (D);
- the clutch pedal (E).

Check that the elastic pin (B) is well set in its seat.

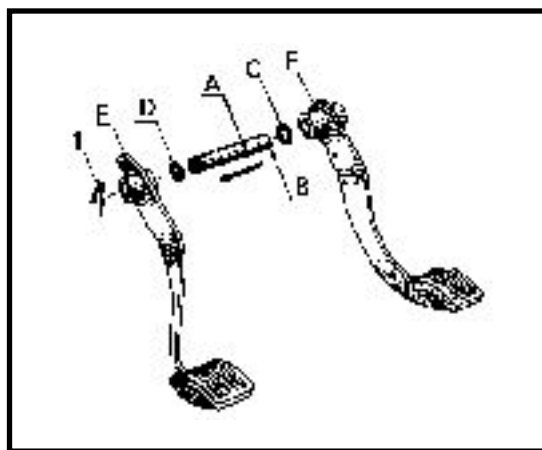
Mount the safety lock (1).

Attach the following parts:

- the clutch cable;
- the pushing rod of the main cylinder, on the brake pedal.

Adjust:

- the clutch stroke;
- the brake stroke.



### CLUTCH CABLE REPLACEMENT

#### DISMOUNTING

Dismount the clutch lever cable.

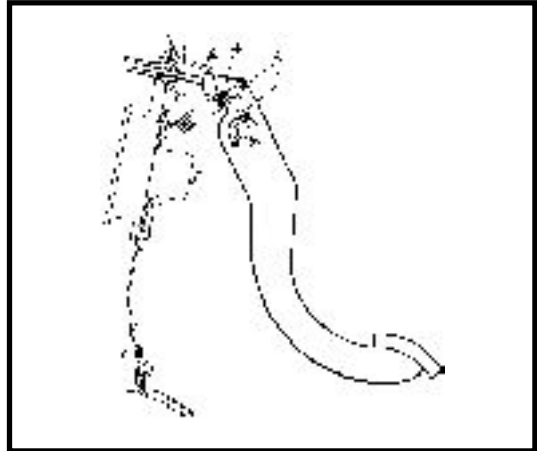
Dismount the attachment clip (1) of the pedal.

Push the shaft rightward and take out the pedal.

Release the spring (2) and the shaft (3) of the fork.

Dismount the fork.

Release the cable from the housing stopper on the pedal support and dismount it.



#### REMountING

Perform the dismounting operations in the reverse order.

Grease :

- the pedal shaft;
- the fork shaft.

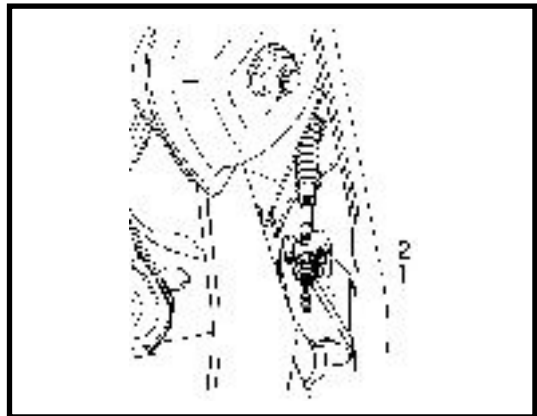
Adjust the clutch stroke.

### CLUTCH GEAR STROKE ADJUSTMENT

Loosen the lock nut (1).

Tighten or unscrew the nut (2) until obtaining the 2,5-3,5 mm stroke at the lever end.

Lock the lock nut.



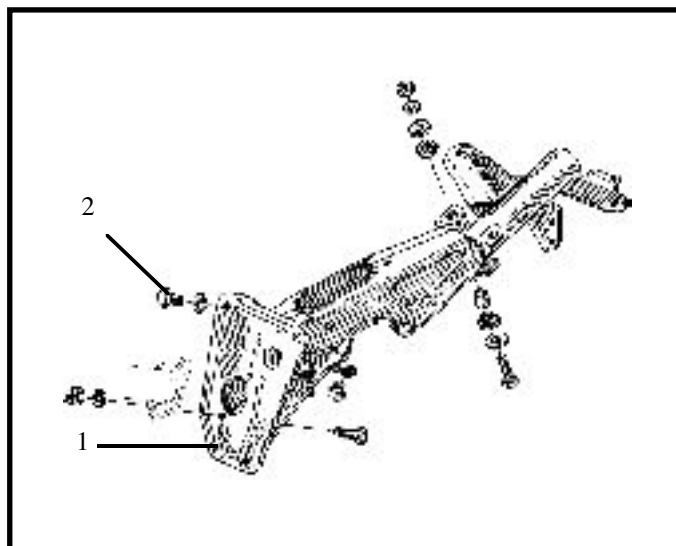
**DISMOUNTING**

Dismount the throttle, brake and clutch pedals.

Dismount the attachment screws (2) of the steering column mounting (1) on the wall metal.

**REMOUNTING**

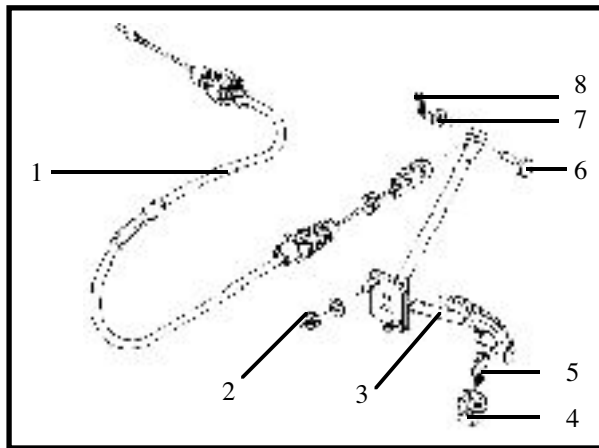
Perform the dismounting operations in the reverse order by screws tightening at the moment of 1,5 – 2,5 daNm.



**THROTTLE PEDAL REPLACING****DISMOUNTING**

Release the throttle pedal by dismounting the clip (8), the washer (7) and support shaft (6).

Dismount the attachment nuts of the pedal support (2) and release the throttle pedal (3).

**REMOUNTING**

Perform the dismounting operations in the reverse order then adjust the throttle stroke at the “maximum” position of the valve, which is obtained by pedal pressing till its calibration on the limiter (4) and by threaded pin adjustment (5) in this position.

**THROTTLE CONTROL CABLE REPLACEMENT****DISMOUNTING**

Dismount the attachment screw of the cable (1) from the throttle control lever, then remove the clips (8) the washer (7), and the pedal shaft (6), releasing the attachment throttle pedal.

**REMOUNTING**

Perform the dismounting operations in the reverse order, followed by the corresponding adjustment of the throttle pedal.

## DISMOUNTING

Dismount the return spring (1).

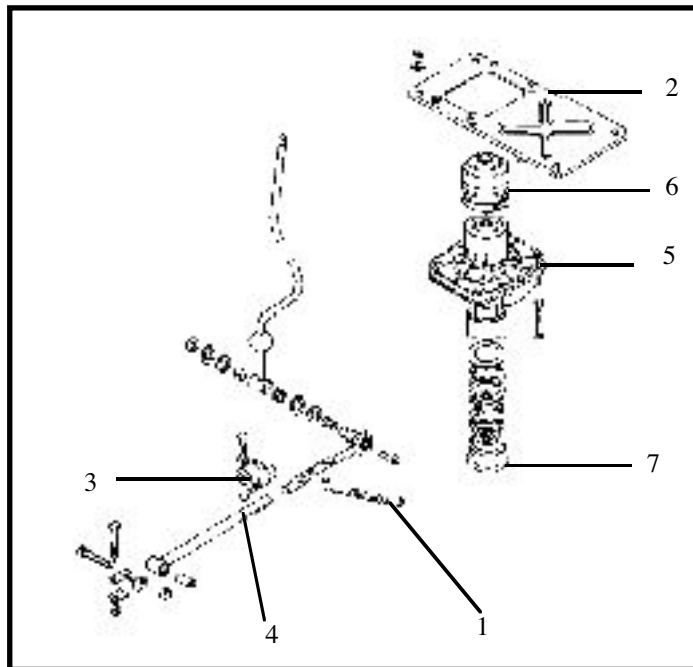
Dismount the control auxiliary connecting rod screw.

Dismount the four attachment support nuts M8 (2) of the gearbox control case.

Dismount the attachment screws M7 of the bellow control lever.

Remove from the vehicle, the gears control assembly .

Dismount the attachment strap (3) from the control rod (4).



Dismount the safety ring from the lever end.

Dismount the control lever from control rod and recover the two elastic washers and the flat washers.

Dismount the four screws M7 of control box assembly (5) with its support.

Dismount the ring and the protection bellows (6).

Dismount the elastic ring D68 (7).

Take out: assembled bellows, spring, elastic ring, elastic washer, the cap and the ball bearing.

Take out the control lever.

Check the wear of bushings for axial-radial clearance taking over.

Replace the damaged or worn parts.



REMountING

Re mounting is done by performing in the reverse order, the dismounting operations.

Before mounting grease the parts with grease **UM 170LiCa Pb2M**.

Tighten at the required moment the attachment nuts and screws:

- nuts M8 .....**1,5 - 2 daNm**
- screws M7 ..... **1 - 1,5 daNm**

GEARS CONTROL ADJUSTMENT

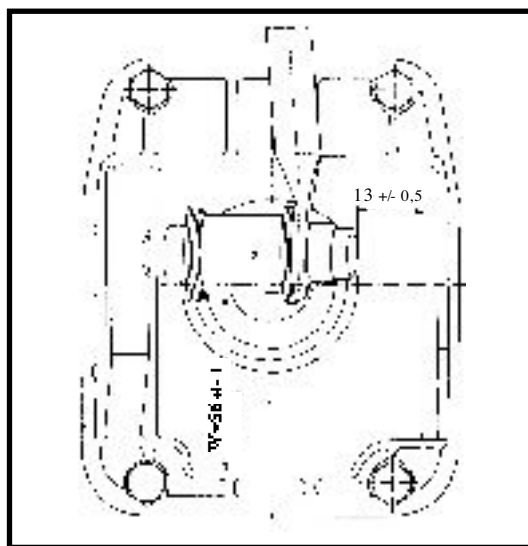
Engage the end lever of the gearbox in the velocity step IV.

Place in contact the plug of the control lever with an adjustment washer of **13 +/- 0,5 mm**, placed between the control box wall and the plug, observing also the value **W = 56 +/-1**.

Tighten at the required moment the strap attachment screws (**1,8 –1,9 daNm**) and the elastic joints at the control shaft end (**1,1 – 1,9 daNm**) observing the value **L=10**.

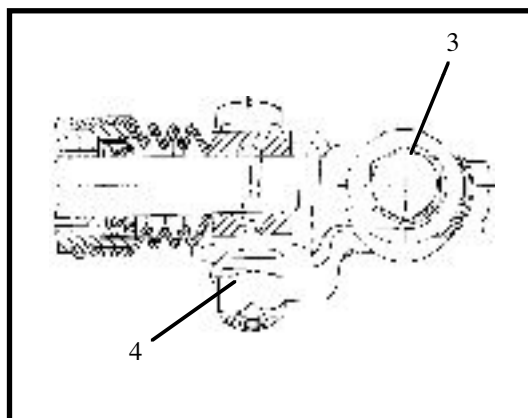
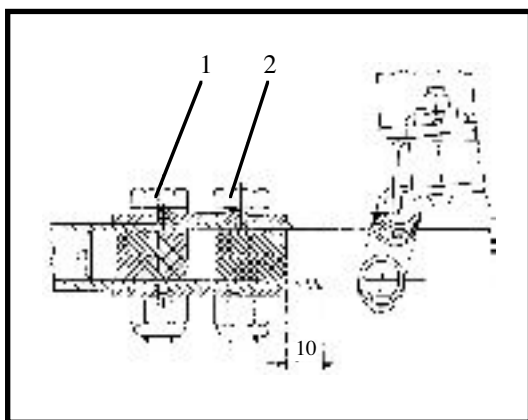
The strap must be in horizontal position with the screws heads down.

Attach the return spring.

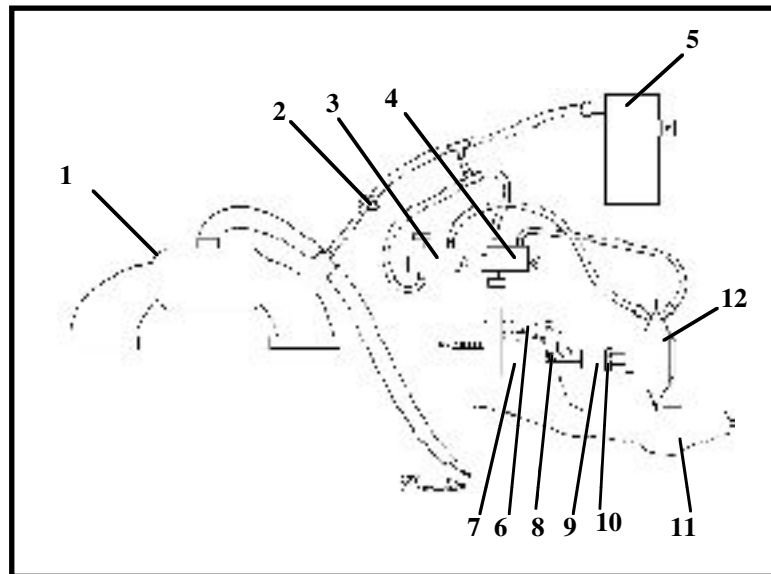


**NOTE:**

*Before mounting grease the joints with grease **LiMoS2***



It is used for the Dacia 1304, 1307 vehicles equipped with 51 C type gearbox, for front transmission coupling. This is allowed after vehicle stopping or during driving, at a speed of max.10 km/h, after declutching.



The specific elements of this system may be identified in the above drawing:

- the vacuum capsule (**12**) – attached on the gearbox left half casing (**11**); it has the purpose of mechanic control of the front transmission coupling and uncoupling.
- electric valves (**3** and **4**) are placed in the engine compartment, on the right wing lining. These are destined to open or close the vacuum route between the inlet manifold and the two vacuum capsule compartments ;
- 4x4 switch – is placed on dashboard. When this is operated, the front transmission coupling is controlled.
- intermediary relay- is placed under the dashboard, on the left side and it is controlling the lighting of the “ 4 x 4 “ warning light on the instruments panel, when front transmission coupling is done.
- vacuum tank (**5**) – is placed in the engine compartment, being attached by means of a clamp, on the right shock absorber column.
- vacuum control ducts assembly – is performing the vacuum route, between the inlet manifold , the vacuum tank, electric valves and the vacuum capsule.

- one-way vacuum valve ( 2 ) – is placed on the connection hose between the inlet manifold and the electric valves.

- “ 4x4 ” coupling control wiring – is performing the connection of the system components to the vehicle electrical equipment.

The system is working based on the vacuum from the inlet manifold (1), which, during engine running, is acting on the membrane separating the two vacuum capsule compartments (12). This will impose the longitudinal movement of the capsule axle, which by means of the control lever (6) will act upon the front transmission coupling control axle (7), placed in the gearbox right front part (1). In this way is performed the front transmission coupling and the transit from rear drive to all wheel drive (4 x 4).

Suspend the vehicle on an elevator.

Dismount the fixing lock pin of the connection bolt (8) between the capsule axle and the control lever (6), then remove the bolt from its place.

Rotate the front right wheel and set the positions coupled-uncoupled acting upon the front transmission control axle. The front transmission control axle stroke = **11,5 mm**.

Operate the front transmission axle (7) in the position uncoupled, then rotate the threaded bushing (9) placed on the capsule axle, so that the hole from the capsule axle fork is corresponding with the hole from the control lever.

Place the bolt (8) in this position and ensure it by means of the lock pin.

Check the uncoupled position of the front transmission; the uncoupling condition is performed when the front right wheel will be freely turning and in the gearbox no gears engagement noises can be heard.

Block the threaded bushing position from the capsule axle by means of the nearby nut.

For the good operation of this system, in case of the reparation, the following requirements must be observed:

- The system sealing condition ( piping, vacuum tank, electric valves, vacuum capsule) must be performed at a depression of **0,07 Mpa = 0,7 bar**, which must be maintained for 30 seconds.

- The vacuum valve – is to be mounted so that the arrow marked on its body to be oriented from the electric valve towards the inlet manifold.

- The tightening moment for vacuum capsule attachment = **1,8 – 2 daN.m**

- The tightening moments for capsule support attachment are :

- **1,8 – 2 daN.m** for the screws **M8 x 1,25 x 18** and

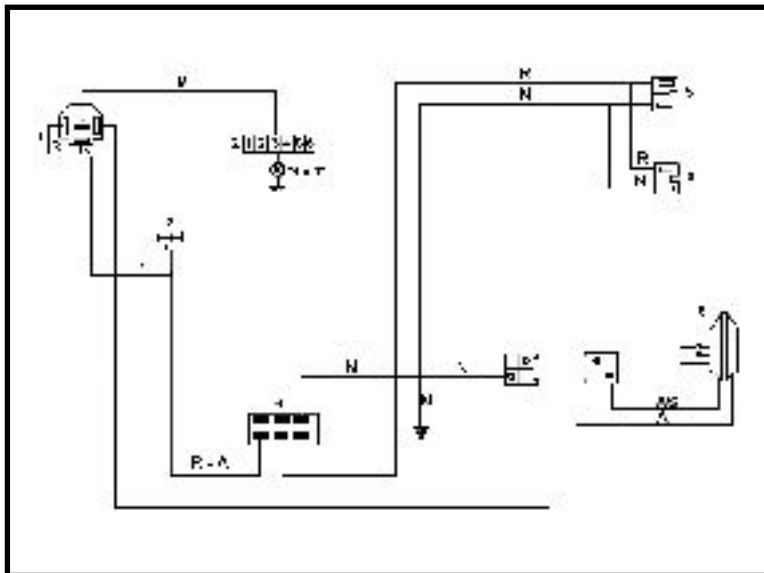
- **1,9 – 2,2 daNm** for the screw **M10 x 1,5 x 20**

- The tightening moment of the vacuum tank attachment screw = **0,32 – 0,6 daN.m**.

-The vacuum piping connecting mode between the electric valves and the vacuum capsule is according to the drawing: the pipe from the vacuum capsule axle is connected to the electric valve having the pipes on both sides of its body, and the pipe from the opposite part of the capsule axle is to be connected to the electric valve having the pipes on the same side of its body.

-The connecting mode of the electrovacuumatic coupling control wiring is as per next diagram, where the following components may be identified:

1. Intermediary relay
2. Instruments panel
3. Right connection plate ( +DC ).
4. 4 x 4 switch
5. Electric valves connectors
6. Vacuum capsule



**DISMOUNTING**

Suspend the vehicle on an elevator.

Disconnect the vacuum capsule connector.

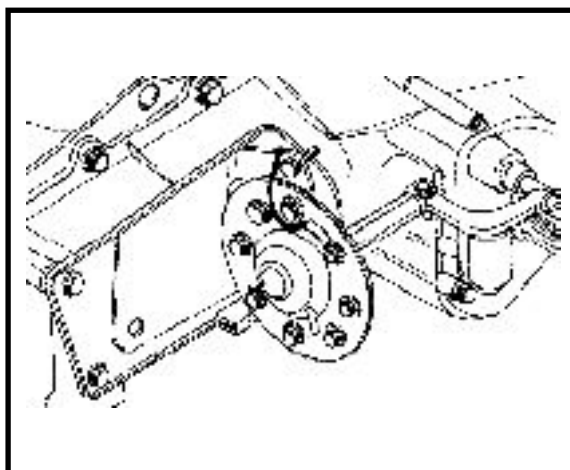
Disconnect the vacuum hoses from the capsule.

Dismount the lock pin and remove the bolt which is connecting the capsule axle with the GB control lever.

Dismount the capsule attachment nuts on the support.

**REMountING**

Perform the dismounting operations in reverse order.



**NOTE:**

*Observe the connecting position of the hoses to the capsule, from corresponding electric valves. After capsule replacement, perform the electrovacuumatic control adjustment.*

**DISMOUNTING**

Disconnect the connector from the electric valve.  
Disconnect the hoses from the electric valve.  
Dismount the electric valve attachment screw.

**REMOUNTING**

Perform the dismounting operations in the reverse order.

**NOTE:**

*Observe the connection position of the hoses to the electric valve, before disconnecting.*

# REPAIR MANUAL

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## DACIA COMMERCIAL

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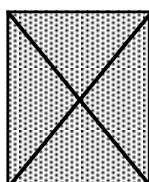
**RM 502-2 BODY**  
**ENGINE: C3L**  
**GERBOX: NG1; NG3**  
**TAPV: U75B; U75F**

The reparation methods prescribed by the manufacturer in the present document are established subject to technical specifications in force at the document issuing date.

These are subject to modifications brought by the manufacturer at the fabrication of different assemblies, subassemblies or accessories of its vehicles.

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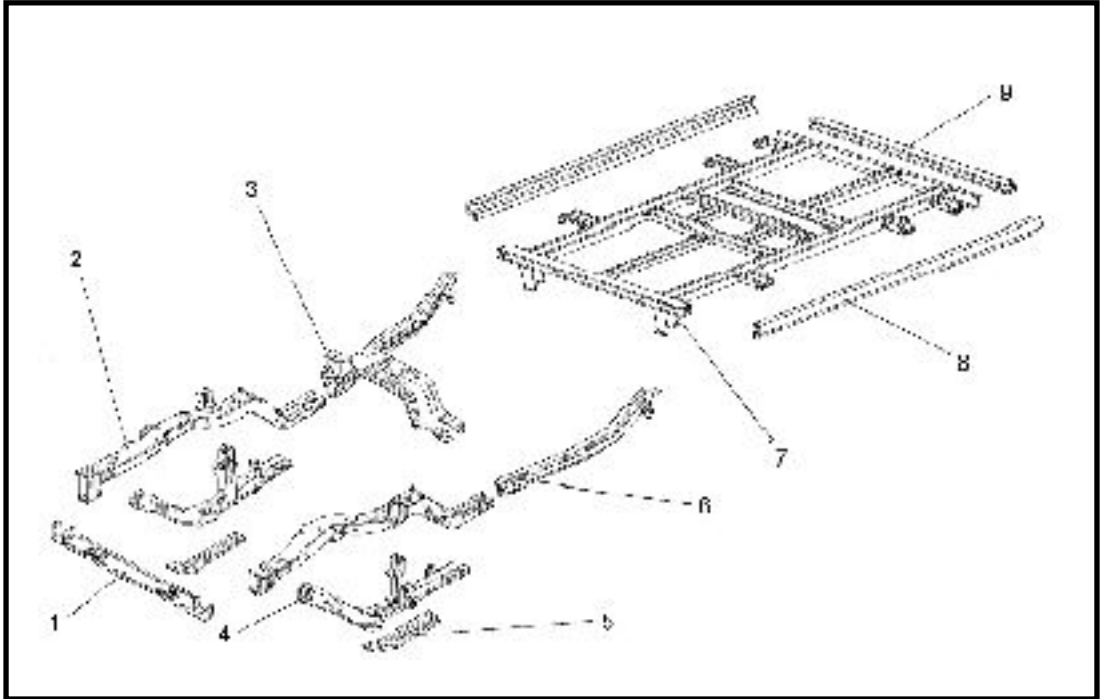
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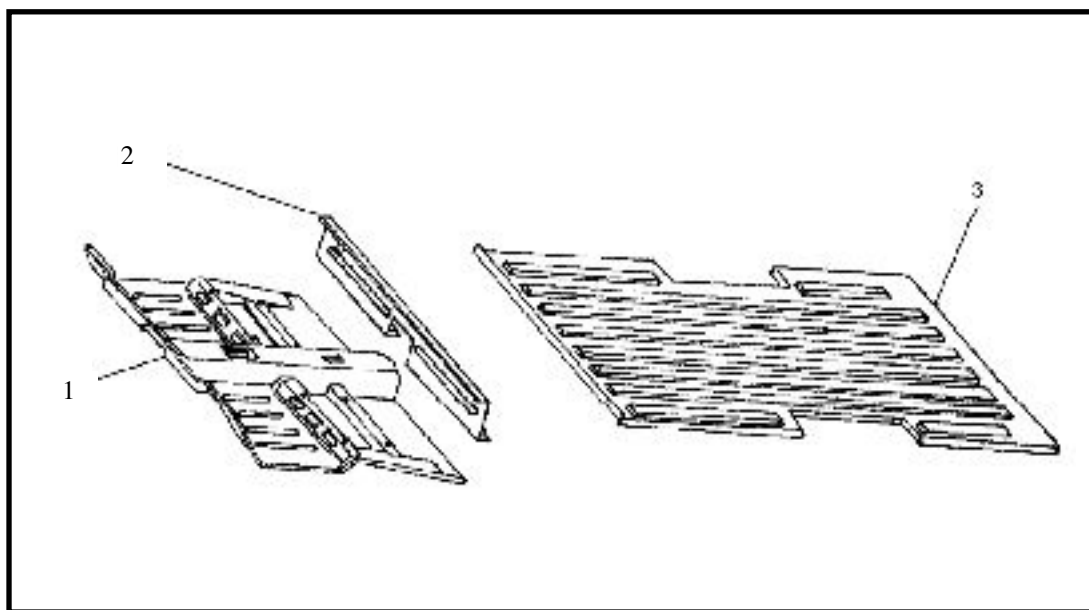
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LOWER STRUCTURE COMPOSING ELEMENTS  
DACIA 1304



1. Front cross member
2. Upper longitudinal girder assembly
3. Steering cross member
4. Lower longitudinal girder assembly
5. Longitudinal girder closing plate
6. Intermediary longitudinal girder
7. Rear unit assembly
8. Rear longitudinal girder
9. Rear cross member

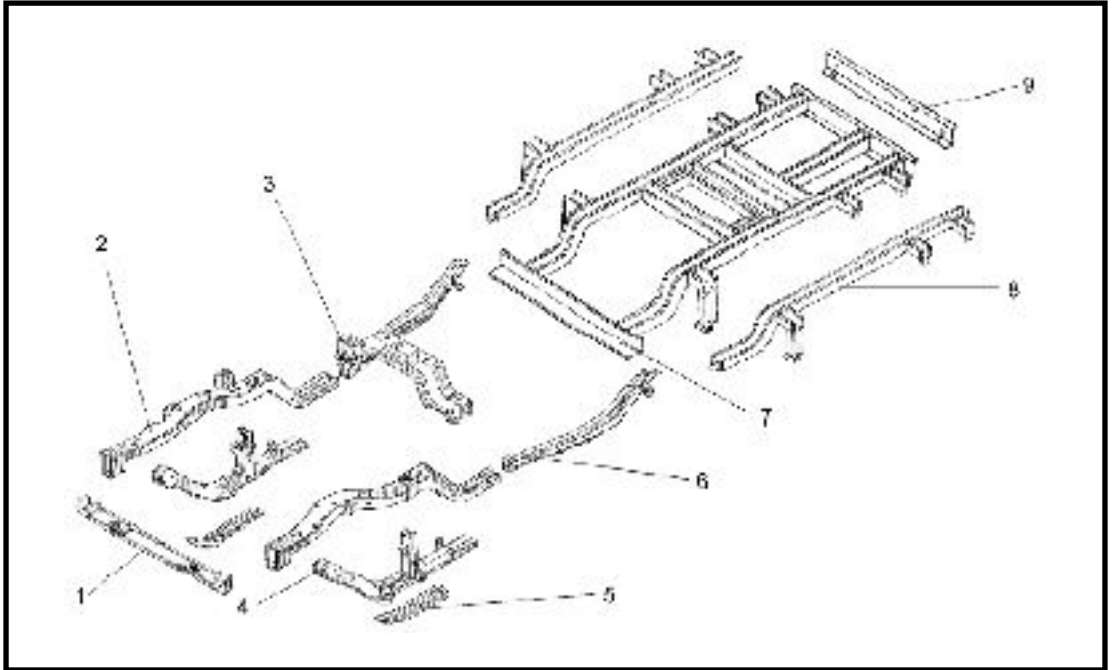
**LOWER STRUCTURE COMPOSING ELEMENTS  
DACIA 1304 PICK-UP, DROP - SYDE**



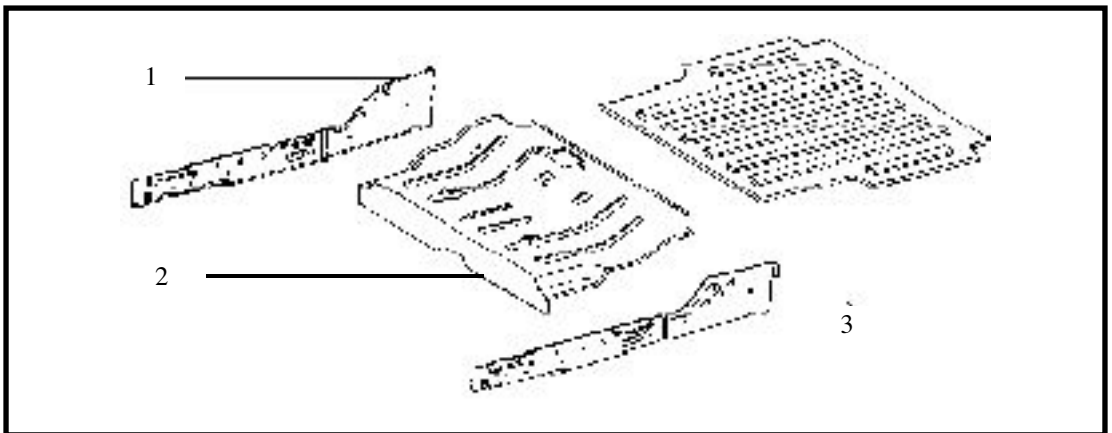
1. Pedals floor
2. Cabin closing panel
3. Central floor panel

DESIGNATION OF PARTS (BLOW-UP)

LOWER STRUCTURE COMPOSING ELEMENTS  
DACIA 1307

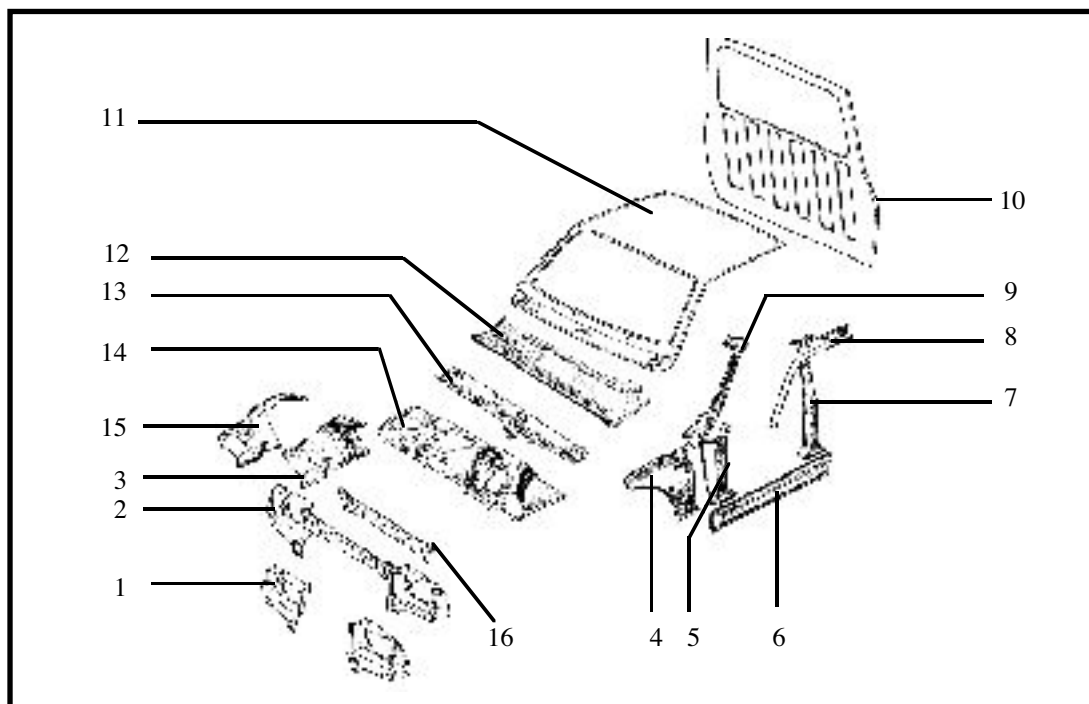


- |                                       |                                     |
|---------------------------------------|-------------------------------------|
| 1. Front cross member                 | 6. Intermediary longitudinal girder |
| 2. Upper longitudinal girder assembly | 7. Rear unit assembly               |
| 3. Steering cross member              | 8. Rear longitudinal girder         |
| 4. Lower longitudinal girder assembly | 9. Rear cross member                |
| 5. Longitudinal girder closing plate  |                                     |



1. Front side plate.
2. Central floor
3. Rear floor

UPPER STRUCTURE COMPOSING ELEMENTS  
DACIA 1304, 1307



1. Headlamp support

2. Front grill simple

3. Front wing lining

4. Front pillar lining

5. Front pillar

6. Buffer

7. Middle pillar

8. Front part belt

9. Side windscreen lining

10. Separating wall

11. Ceiling

12. Windscreen frame

13. Lower cross member

14. Climate control box

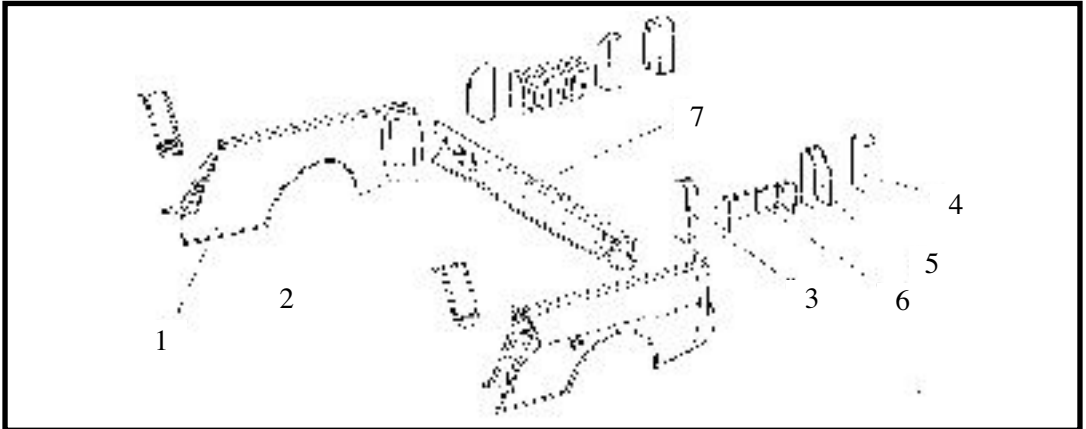
15. Iron plate

16. Upper radiator cross bar

DESIGNATION OF PARTS (BLOW-UP)

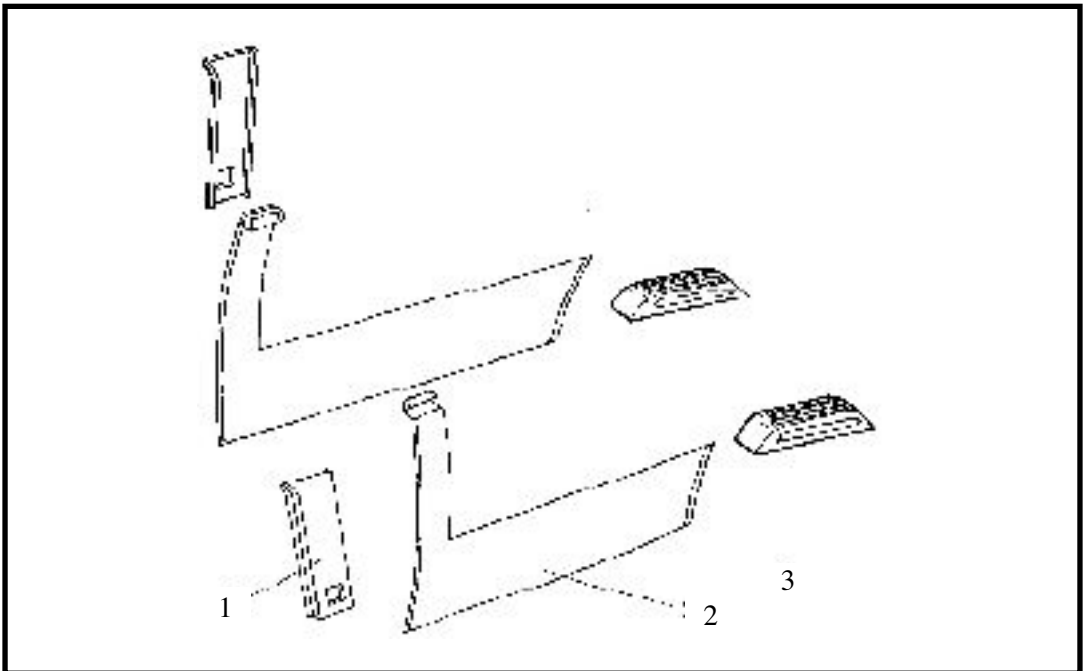
UPPER STRUCTURE COMPOSING ELEMENTS

DACIA 1304 PICK - UP, 1307



- |                          |                       |
|--------------------------|-----------------------|
| 1. Side panel            | 5. Rear extensor      |
| 2. Side panel upper part | 6. Rear wheel passage |
| 3. Front extensor        | 7. Rear plate         |
| 4. Rear lamp lining      |                       |

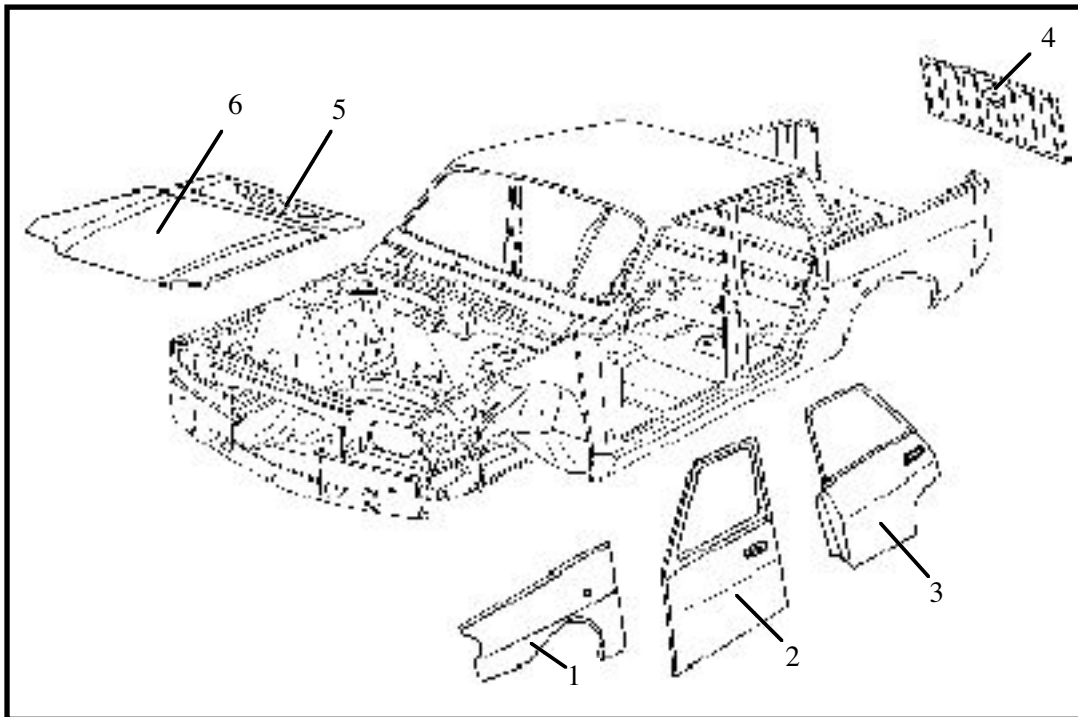
DACIA 1304 DROP - SIDE



1. Side panel
2. Side panel
3. Rear wheel passage

## DESIGNATION OF PARTS (BLOW-UP)

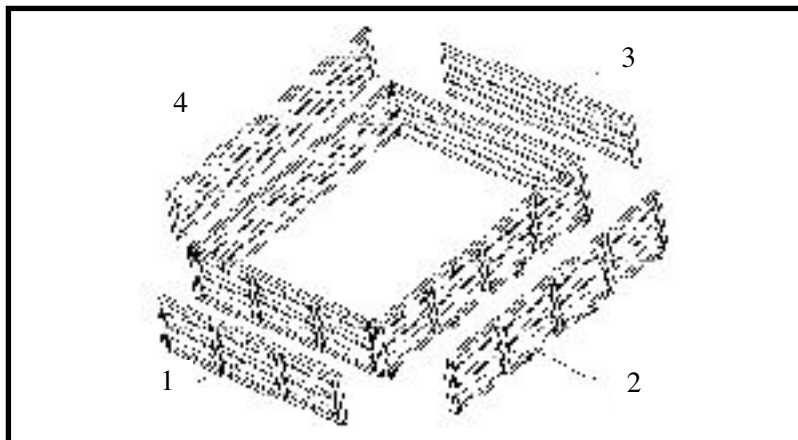
**BODY REMOVABLE ELEMENTS  
DACIA 1304 PICK - UP, 1307**



- 1. Front wing
- 2. Front door
- 3. Rear door

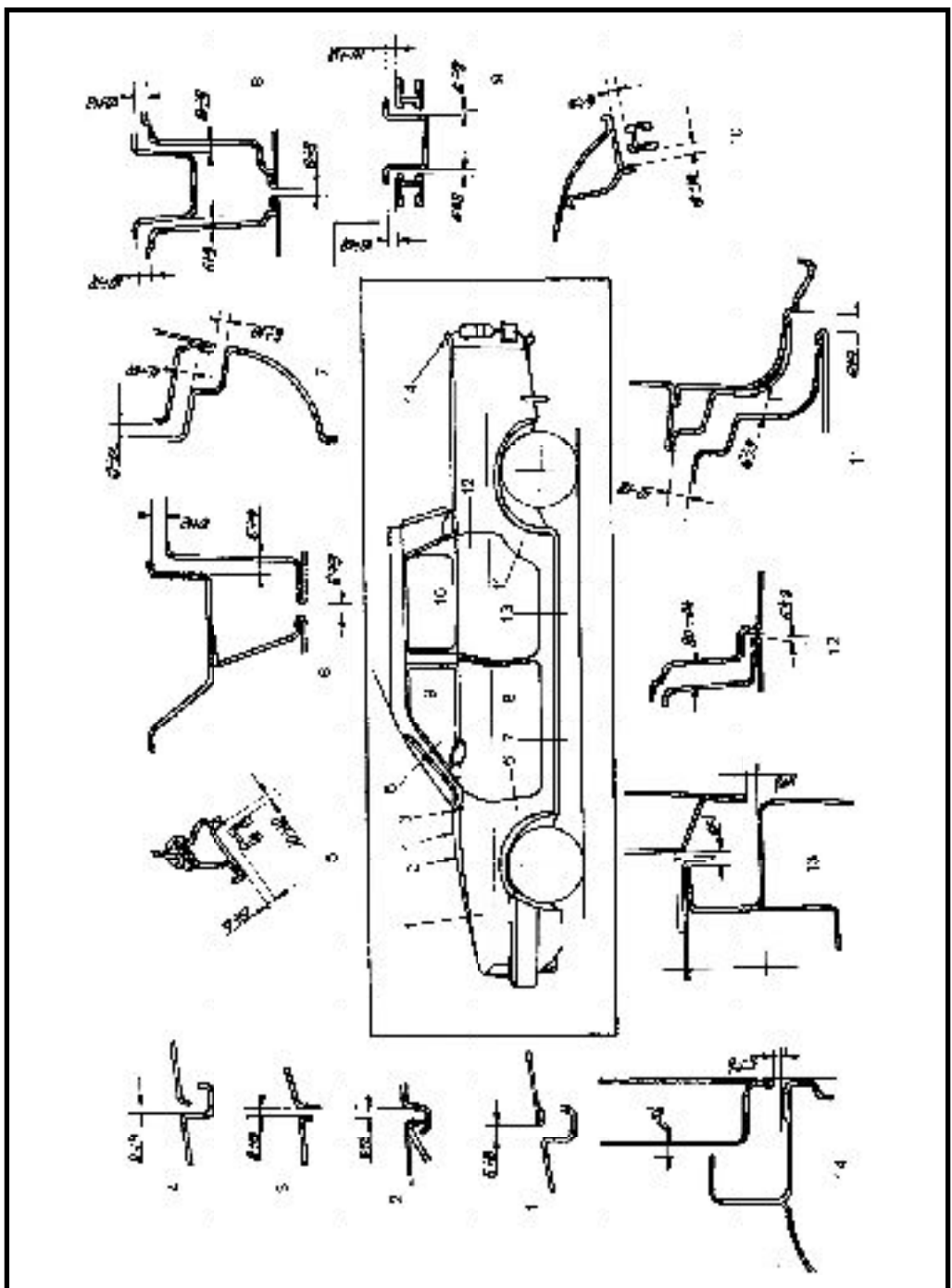
- 4. Rear drop side
- 5. Aerating grill
- 6. Front bonnet

**DACIA 1304 DROP - SIDE**



- 1. Front drop side
- 2. Left drop side

- 3. Rear drop side
- 4. Right drop side





The replacement (reparation) operations of the weldable elements described in this chapter are specified subject to: removing of the parts to be replaced, access to the welded elements, tools and checking devices accessibility, etc.

In case the vehicle body has suffered important deformations it is recommended the straightening of the damaged body elements, by means of some hydraulic presses, the operation being performed slowly and at cold.

For this range of vehicles, the elements resistance structure which is affecting the vehicle security, are not to be partially replaced (not to be cut), but entirely.

After welding detaching, the body elements must remain straight, without breakage or cracks, the possible holes being covered out with filling material or by tinning. The body elements surfaces are to be pickled (to eliminate possible oxidation marks), dried and initially applied a paint layer.

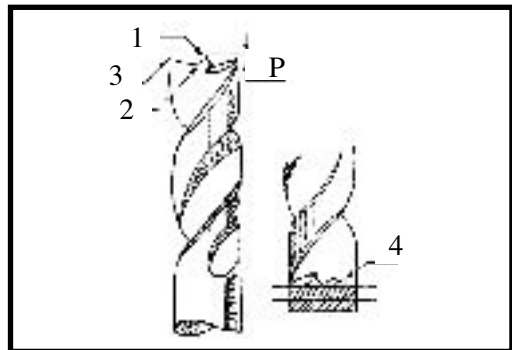
The electric welding detaching of the body elements, is performed as follows:

- with a well sharpened chisel, this method may lead to parts deformation or even parts breaking.

- by using some extractors equipped with steel cutter type **BRENDEO** or **PICKVANT** max. 6 mm, having the cutting head as per shape shown in fig. 1.

1. Centering point
2. Sharpen slope
3. Drill acting edges
4. Gap for catching the welding material

**P = cca. 4mm**



Whatever method is used, the remaining element must be in good order and to allow performing of a good quality welding joint.

The plates cutting it is recommended to be performed (subject of importance and thickness) using manual scissors or pneumatic portable tools for plates cutting.

During cutting or welding of the body elements it is necessary to protect the electric wiring from the interior of the body structure.

The cutting, welding, or strengthening operation done on body welded elements, are to be performed on body checking/straightening bench type CELETTE.

### **IMPORTANT !**

*When removing or straightening the body resistance elements it is forbidden the total or partial heating with flame, in order to avoid the mechanical resistance decreasing and of the metal elasticity.*

WELDING TYPES AND PARAMETERS

At the reparation of the welded body elements, three welding categories may be used: protection gas welding (CO<sub>2</sub>), electric spot welding and filling materials welding (autogenous).

At the autogenous welding, it is recommended that flame must be slightly inclined so that arch can be seen and the flame extremity to be maintained at aprox. 5 mm from the part to be welded.

1. Spot welding resistive parameters for steel plates with carbon content C < 0,15 %.

Plate thickness (mm)	Welding current (KA)	Welding time(per)	Tightening force (daNm)
0,5	6,5	5	130
0,8	8,0	8	200
1,0	9,5	10	250
1,25	10,5	10	295
1,5	10,0	14	310
2,0	12,0	16	350

NOTE : 1 period = 1/50 part of a second

2. Welding parameters for the welding in protector gas for carbon steel plates or low alloyed steel.

Horizontal welding position ( fig. 1 )

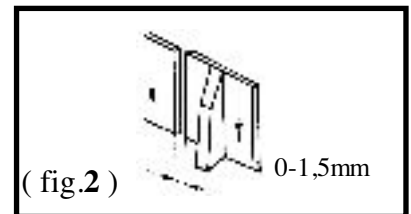
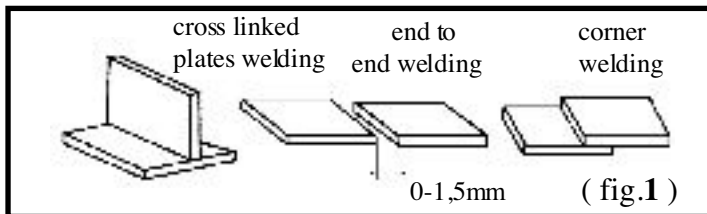


Plate thickness (mm)	0.6		1.0		1.5		2.0	
Electrode diameter (mm)	0,6	0,8	0,8	1,0	0,8	1,0	0,8	1,0
Welding wire speed (m/min)	2,5	1,9	3,2	2,4	4,4	3,8	5,7	4,4
Welding current (A)	35	35	55	80	80	120	100	130
Welding speed (m/min)	0,25	0,25	0,35	0,33	0,33	0,50	0,45	0,45
Welding voltage (V)	17	17	18	18	19	19	20	20
Protection gas flow(l/min)	12 - 17							
Electron free length (mm )	6 - 12							

**NOTE:**

*In case of using Ar + CO<sub>2</sub> mixture, the welding voltage will decrease with 2 V.*

**Vertical welding position (obligatory from top to bottom) fig. 2**

Plate thickness (mm)	0,6		12		2,0	
Electrode diameter (mm)	0,6	0,8	0,8	1,0	0,8	1,0
Welding wire speed (m/min)	2,5	1,9	3,3	3,2	5,7	4,4
Welding current (A)	35	35	70	100	100	130
Welding speed (m/min)	0,25	0,25	0,38	0,48	0,50	0,50
Welding voltage (V)	17	17	18	18	20	20
Protection gas flow (l/min)	12 - 17					
Electron free length (mm)	6 - 12					

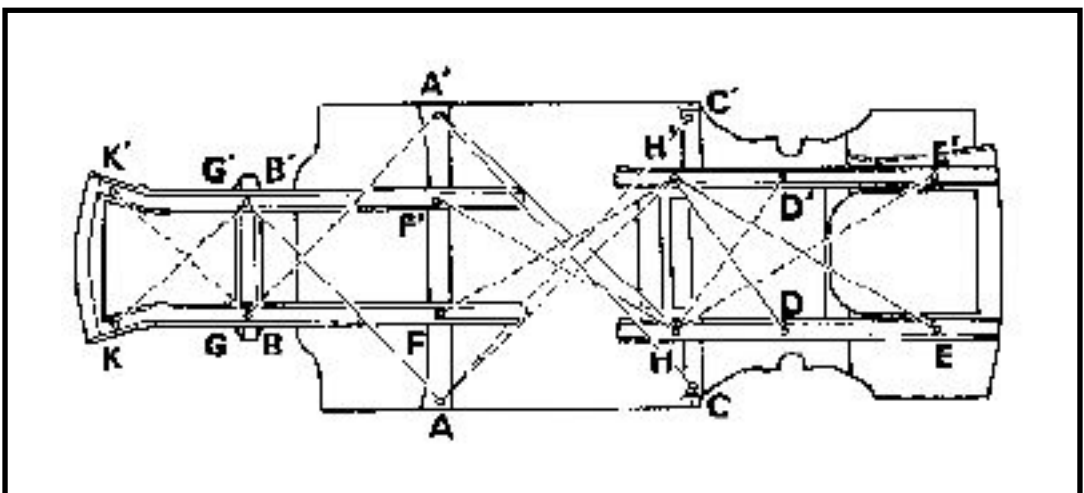
During the vehicle exploitation, the body may suffer different distortions, that lead many times to the wheels setting angles change, body elements breakage, vibrations or even mechanical parts wear.

In these conditions, before performing the vehicle body reparation, some checking is necessary:

**Visual checking** - consisting in the examination of the mechanics elements attachments and of the distortions that occur in the damaged areas.

**Checking with the bar (control gauge)** – consisting in comparing the measurements done in symmetric points.

### CHECKING OF THE LONGITUDINAL GIRDERS POSITION



The checking of the longitudinal girders position consist in comparing the measurements done on symmetric points.

The checking of **B – B'** , **H – H'** points is affecting the mechanical part of the half-front axles and of the rear axle. Certainly, the distances between the points must be equal, as follows: **BB' = HH'**.

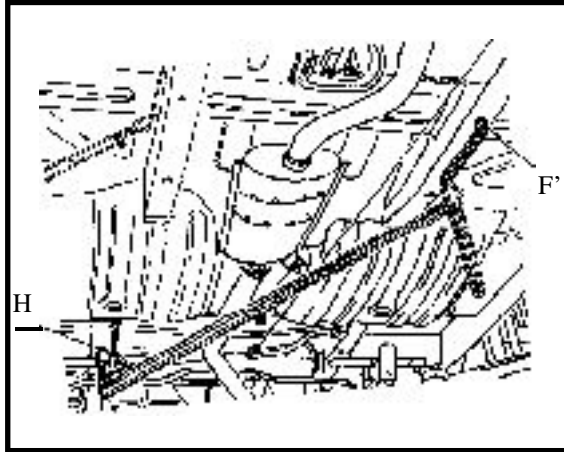
The checking of **A, F, F'** , **A'** points is affecting the centering of removable parts of the body.

The distances between the points must be equals, as follows: **AF = A'F'**.

### CHECKING WITH THE BAR GAUGE

#### CENTRAL PART CHECKING

It is performed in the purpose to establish if one of the distortions is not affecting this part, from which the checking starts.



The checking points are : Holes  $A - F - F' - A'$  and consequently  $H - H'$  and  $B - B'$ .

#### FRONT LONGITUDINAL GIRDERS CHECKING

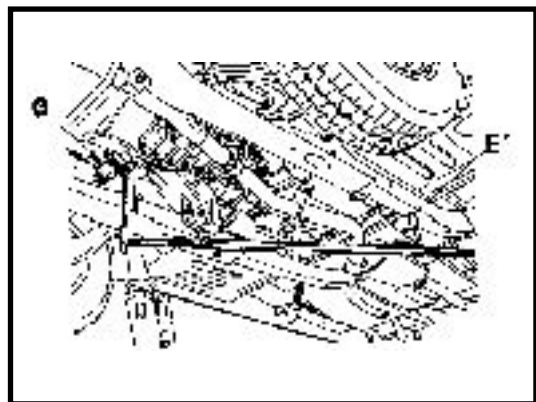
Checking points are:  $B - B'$  for lower longitudinal girders and  $G - G'$  for upper longitudinal girders.

##### **Lower longitudinal girders:**

Compare the diagonal distance  $A - B'$  with diagonal  $A' - B$ .

##### **Upper longitudinal girders:**

Compare the diagonal distance  $F - G'$  with the diagonal  $F' - G$ .

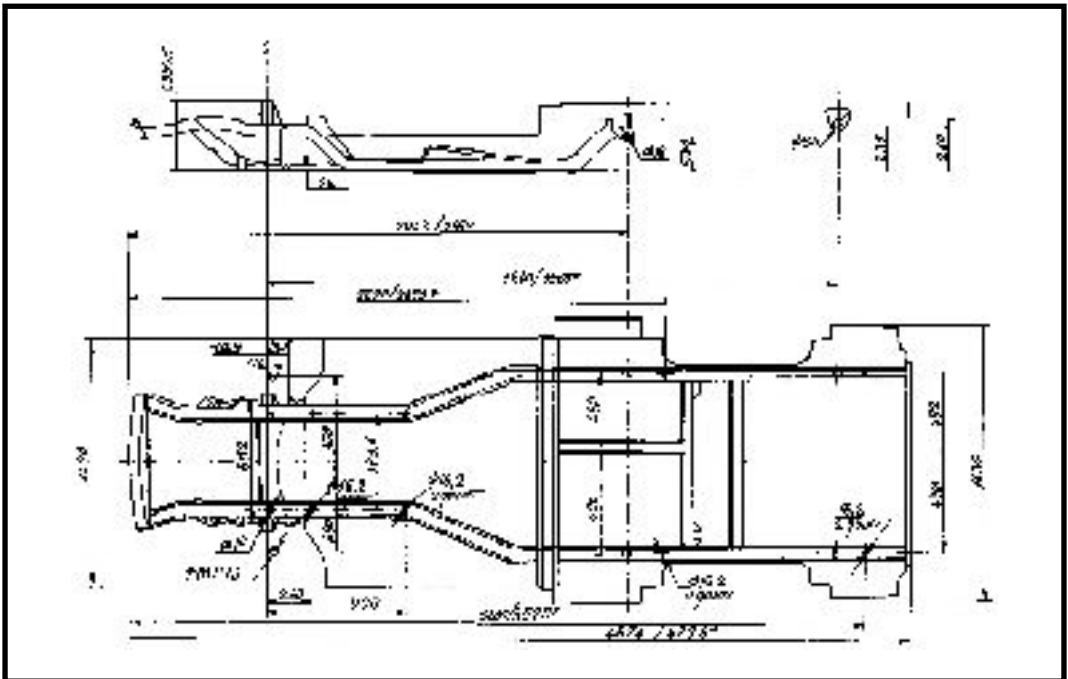


### REAR LONGITUDINAL GIRDERS CHECKING

The checking points are **C – C'** , **H – H'**, **D – D'** and **E – E'**. Compare the **A' – H** diagonals, continuous line with **A – H'** **diagonal** broken line and the **A' – C** diagonal continuous line with **A – C'** diagonal broken line.

These four holes being closest to the rear axle, must be first checked. Compare diagonals **H' – D** and **H' – E** continuous line with diagonals **H – D'** and **H – E'** straight line.

### FLOOR FRAME CHECKING



*NOTE: The values marked \* are for Dacia 1307.*

**GENERAL**  
**BODY CHECKING/ STRAIGHTENING BENCH**  
**TYPE CELETTE**

---

For checking, straightening or repairing the DACIA vehicles bodies, the use of the CELETTE bench is recommended.

The checking / straightening bench type CELETTE ( service code CAR 500 ) is composed of:

-CAR 501 ( 1 mobile bench with four wheels, four parts for vehicle anchoring, one traction arm of 10 t, type “ CAIMAN “).

-CAR 502 - set modular cross bars;

-CAR 503 - 22 towers MZ;

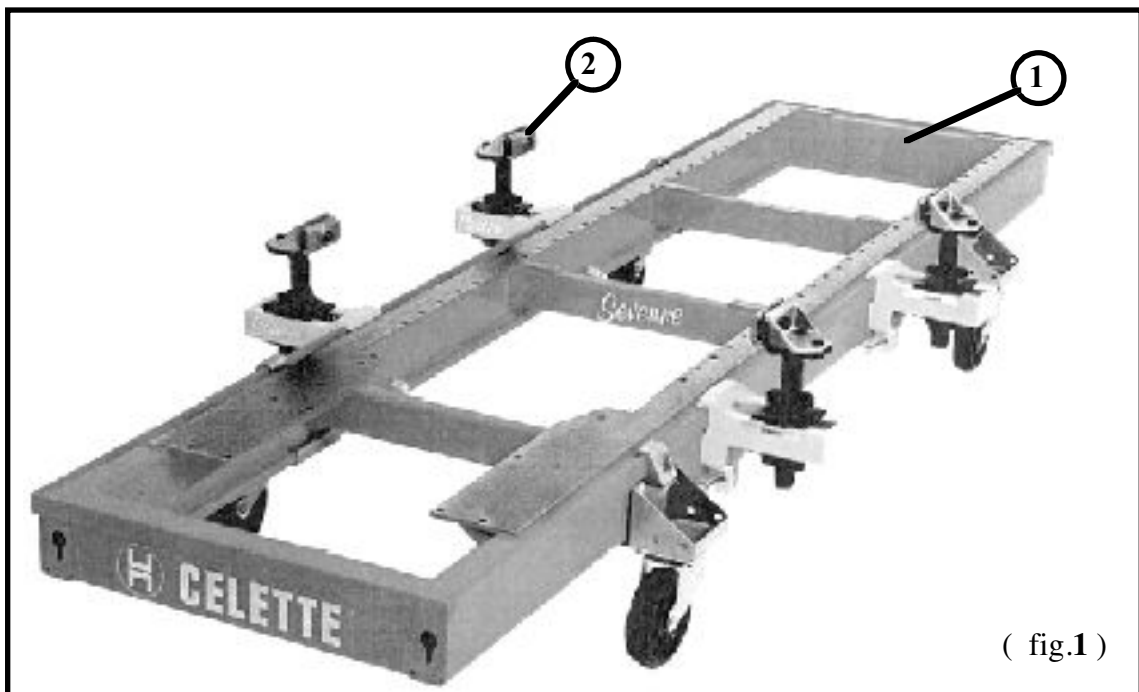
-CAR 504 - set accessories for traction;

-CAR 505 - set of specific supports for DACIA Bl, Bk.;

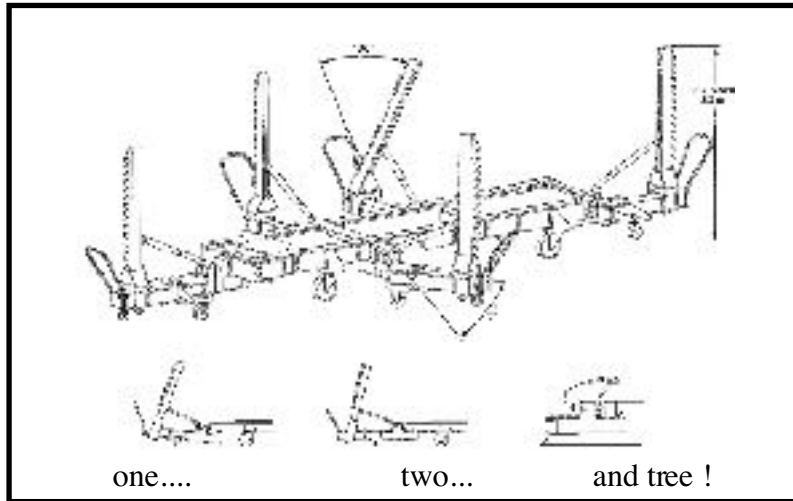
-CAR 506 - set of specific supports for DACIA 1304, 1307 CAR 507 - set of specific supports for DACIA NOVA.

### 1. CAR 501

The mobile bench (1) is provided with four anchoring parts (2) - (fig 1), which can be used when a body checking / straightening operation is performed.



To straighten the vehicle body, CELETTE bench is provided with a traction arm of 10 tons, Caiman type, 250 mm stroke of the hydraulic cylinder, with rapid anchorage on any side of the mobile bench ( fig. 2 ) stands is.



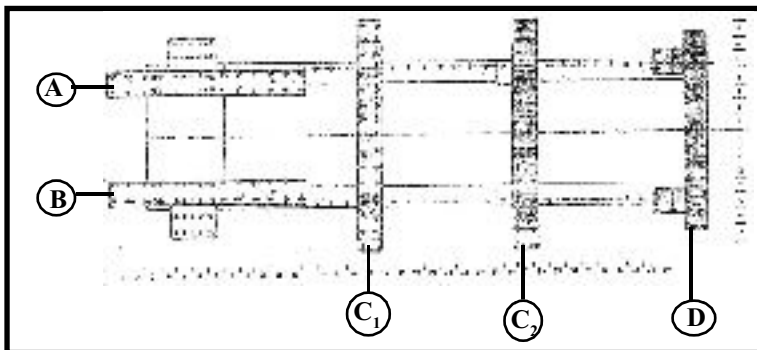
( fig.2 )

**2. CROSS BAR MODULAR SET CAR 502 )**

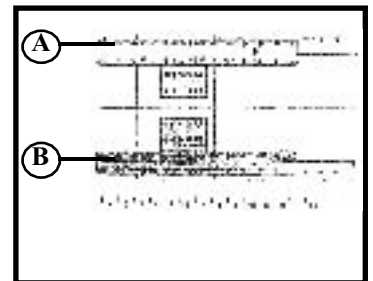
CELETTE bench has in its composition, five modular cross bars ( fig.3 ), as follows:

- two front cross bars A and B ( T shaped ) there are always ready in the same position (towards front of bench) – fig. 4.
- two straight cross bars C1 and C2 and one D cross bar ( U-shaped ) which may be placed in different positions subject to vehicle type.

The marked figures ( 14.....36 ) are engraved on the mobile bench, every mounting being supplied with a drawing indicating the exact position of the modular cross bars subject to vehicle type.



( fig.3 )



( fig.4 )



### 3. TRACTION ACCESSORIES SET( CAR 504 )

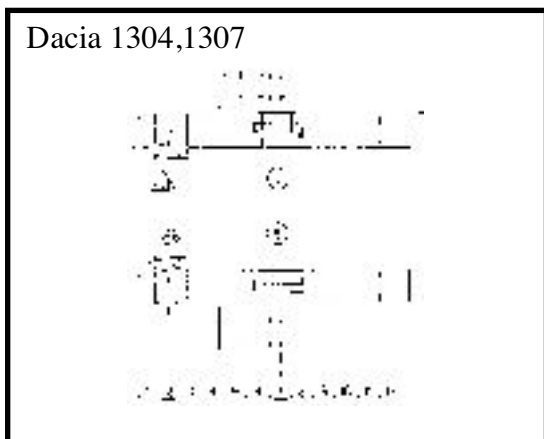
CELETTE bench is equipped with a traction accessories set CAR 504, which allow the operator to achieve different anchoring when a body strengthening is performed (fig. 5).



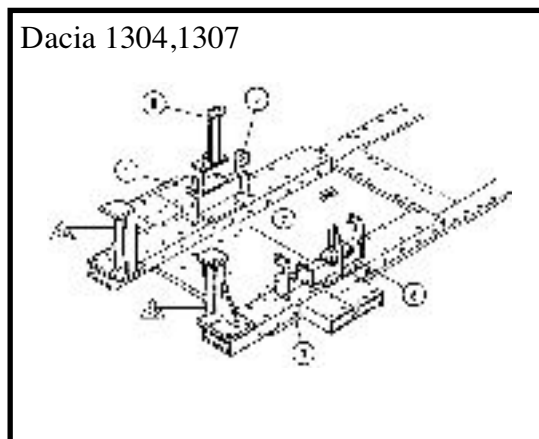
( fig. 5 )

### 4. SET OF SPECIFIC SUPPORTS FOR DACIA 1304, 1307 ( CAR 506 )

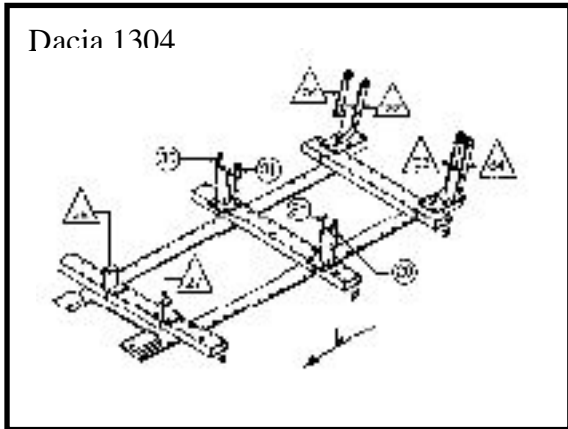
The mounting of the specific supports for DACIA vehicles 1304, 1307 shall be performed according with the mounting diagram which is supplied with this KIT (fig. 6,7,8,9,10,11). This is a compact mounting system.



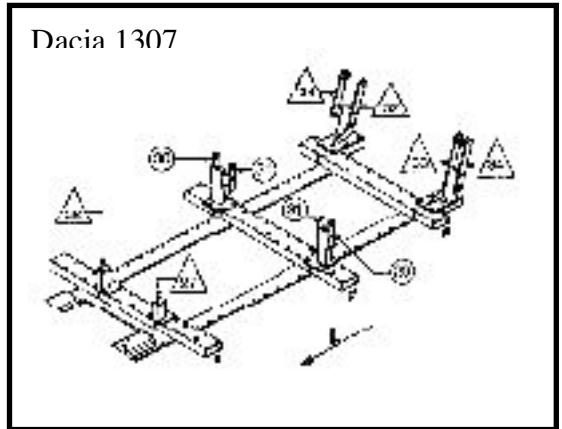
( fig.6 )



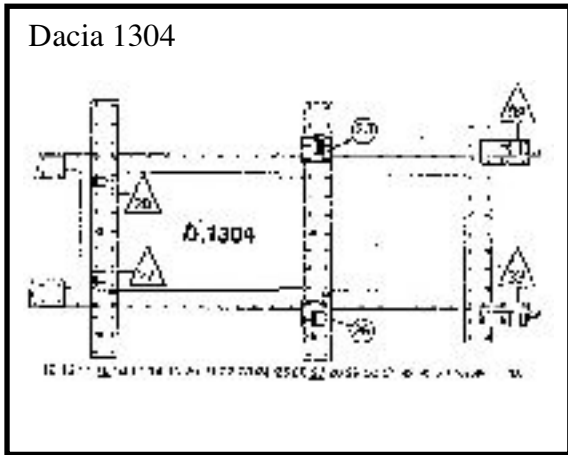
( fig.7 )



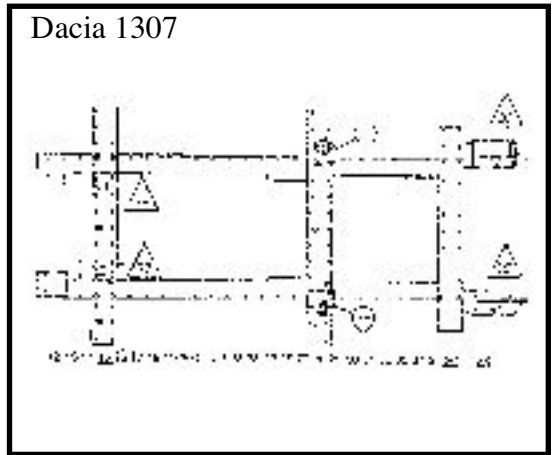
( fig. 8 )



( fig. 10 )

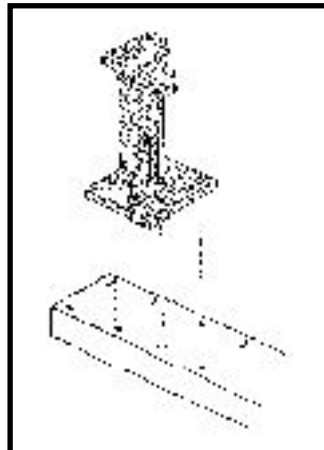


( fig. 9 )

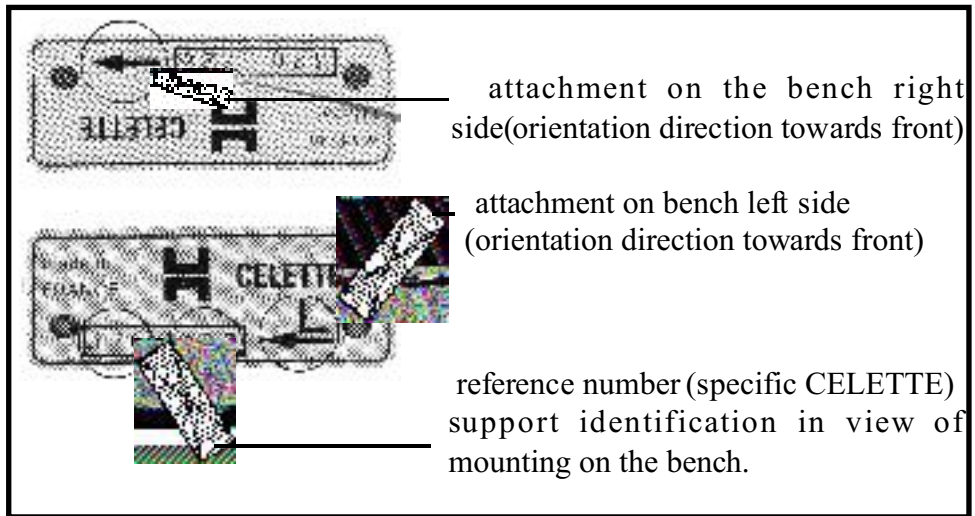


( fig. 11 )

Each support is identified by a plate showing the CELETTE specific item number, the mounting direction and its orientation on the bench. (fig. 12,13)



( fig. 12 )



Caption:

( fig.13 )



- with dismantled mechanic elements



- with or without dismantled mechanic elements.

### REFERENCE POINTS ON VEHICLE ( DACIA 1304, 1307 )

#### Front longitudinal girder extremity supports fixing

Supports (1) and (2) are used in front straightening, front mechanic elements dismantled.

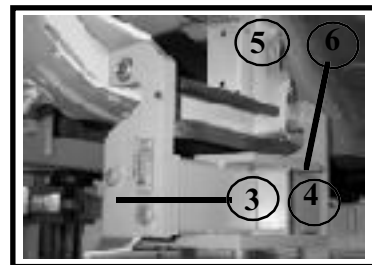
They enable the positioning of the front longitudinal girders extremity ( fig. 14 ).



( fig.14 )

#### Front suspension lower arm supports fixing

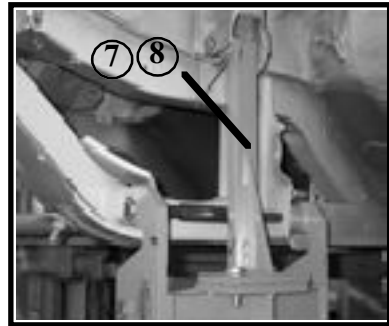
Supports (3) , (4), (5) and (6) are used in front straightening. They enable the positioning and centering of the front longitudinal girders ( fig. 15 ) and consequently the vehicle front alignment on the bench.



( fig.15 )

**Front suspension upper arm supports fixing**

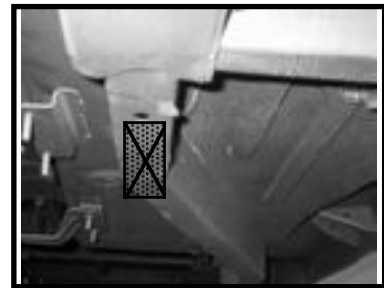
Supports (7) and (8) are used in front straightening. They enable the positioning and centering of the upper longitudinal girders- ( fig. 16 ).



( fig.16 )

**Centering under front longitudinal girder**

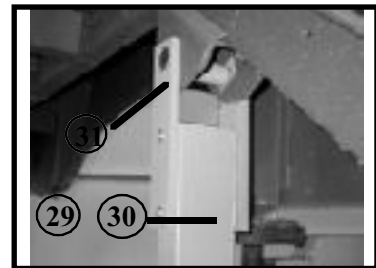
Supports (27) and (28) are used for centering and alignment of the front longitudinal girders. They are to be used for any reparation cases because they are a main reference of vehicle setting on the bench.( fig. 17 )



( fig.17 )

**Rear spring front supports fixing**

Supports (29),(30) and (31) are used mainly in rear strengthening for positioning and centering the rear unit or the rear longitudinal girders. In the sametime, they may also be used for vehicle alignment in the front straightening when vehicle front part is replaced. ( fig. 18 )

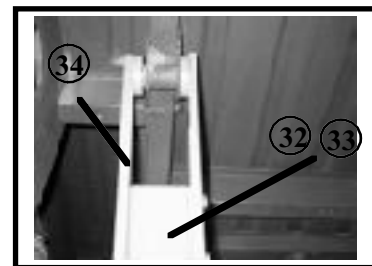


( fig.18 )

**Rear spring front supports fixing**

Supports ( 32 ),(33 ) and ( 34 ) are used mainly in rear strengthening for positioning the rear unit or the rear longitudinal girders.

In the same time, they may also be used for vehicle alignment in the front straightening when vehicle front part is replaced ( fig. 19 ).



( fig.19 )

**REPLACEMENT**

This operation shall be performed only on the repair bench. For the specific supports mounting on the bench, please see the 40 chapter.

**DISMOUNTING**

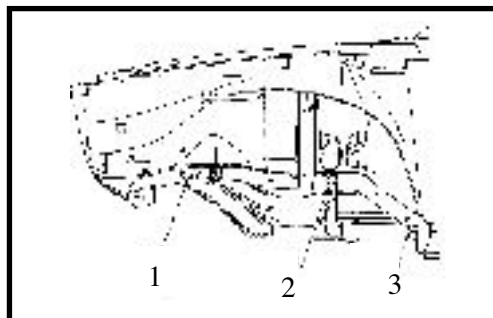
Dismount the damaged elements that are in contact with lower longitudinal girder.

Straighten the areas resulted from disassembling.

Process the areas resulted from disassembling.

In order to reduce the deformation danger of the upper longitudinal girder it is recommended the use of a steel cutter for detaching the welding points.

Detach the welding points of the lower longitudinal girder with the upper longitudinal girder in areas (1),(2),(3).

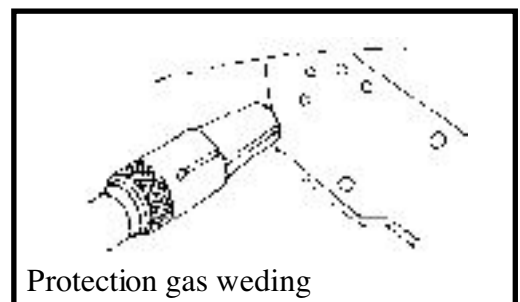
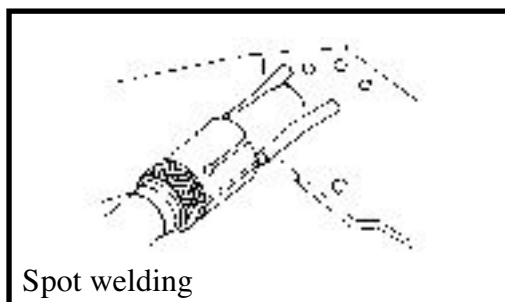


**REMOUNTING**

Position and center the new element

Perform a spot welding in the areas (1) ,(2), (3) where the lower longitudinal girder is in contact with the upper longitudinal girder and a protection gas welding in the area connection with the upper longitudinal girder.

Protect the new element with coat of sound deadening compound



Protect the lower longitudinal girder with a corrosion preventing and noise absorbent product.

### REPLACEMENT

This operation shall be performed only on the repair bench. For the specific supports mounting on the bench, please see the 40 chapter.

#### DISMOUNTING

Dismount the damaged elements, which are in contact with the longitudinal girder.

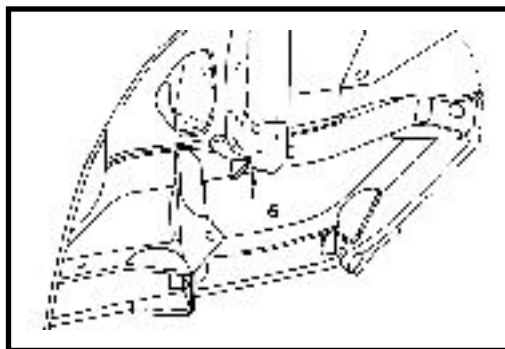
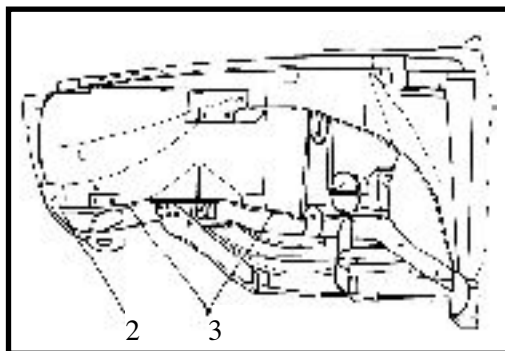
Detach the welding points of the longitudinal girder (1) which are in connection with:

- the front cross bar in the area (2);
- the front wing lining on the outline (3);
- the steering cross bar in the areas (4), (5);
- the gusset in the area (6);
- the pedal and central floor in the area (7);
- the iron plate in the area (8).

Detach the damaged element.

Straighten the areas resulted by dismounting.

Grind the areas resulted by dismounting.



REMOUNTING

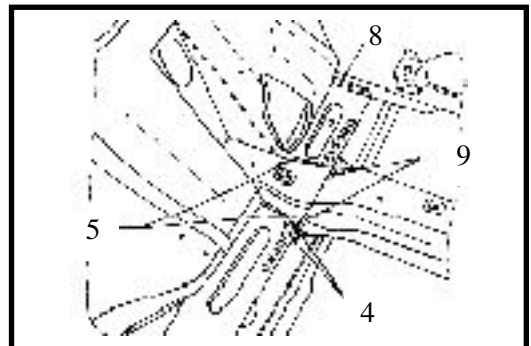
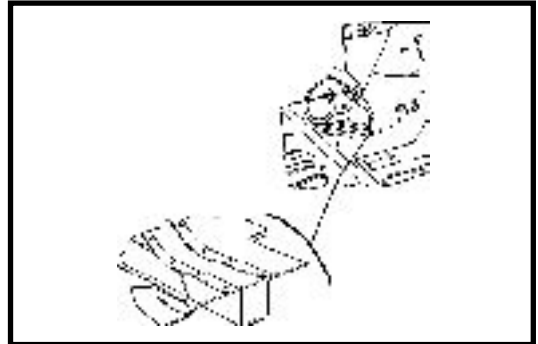
Position the new element.

Perform an electric spot welding as follow:

- in the area (2) connecting the longitudinal girder with the front cross bar;
- in the area (3) connecting the longitudinal girder with the front wing lining;
- in the area (4) connecting the longitudinal girder with the steering cross bar;
- in the area (6) connecting the longitudinal girder with fixing gusset;
- in the area (7) connecting the pedal floor and central floor;
- in the area (8) connecting the longitudinal girder with the iron plate.

Perform a hardening gas welding in the areas (5) and (9) connecting the longitudinal girder with steering cross bar.

Protect the new element with a corrosion preventing and noise absorbent product.



### REPLACEMENT

This operation shall be performed only on the repair bench. For the specific supports mounting on the bench, please see the 40 chapter.

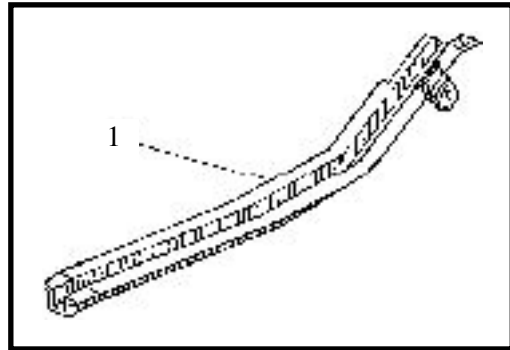
#### DISMOUNTING

Dismount the elements, which are in contact with the intermediary longitudinal girder.

Detach the welding points of the intermediary longitudinal girder (1) that are connecting with:

- the longitudinal girder in the area (4);
- the pedal floor in the area (2);
- the lateral cross bar in the area (3);
- the central floor in the area (5);
- rear longitudinal girder in the area (7).

Straighten the areas resulted by dismounting. Grind the areas resulted by dismounting.



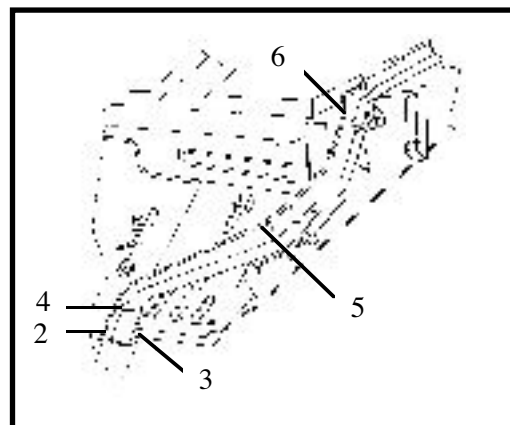
#### REMOUNTING

Position and center the new element.

Check the correct positioning of the intermediary longitudinal girder.

Weld the intermediary longitudinal girder following the assembly outliners 2,3,4,5,6.

Protect the new element with a corrosion preventing and noise absorbent product.





REPLACEMENT

This operation shall be performed only on the repair bench. For the specific supports mounting on the bench, please see the 40 chapter.

**DISMOUNTING**

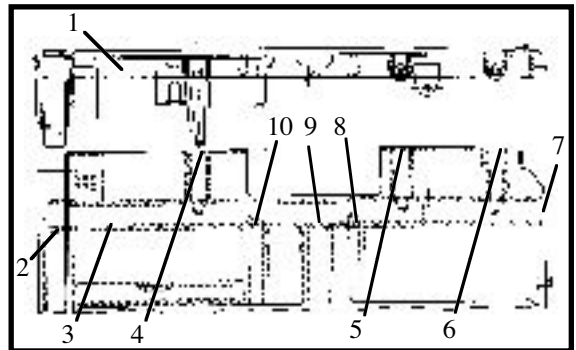
Dismount the elements, which are in contact with the rear longitudinal girder.

Detach the welding points of the rear longitudinal girder (1) which are in contact with:

- the front cross bar in the area (2);
- the inner frame in the areas (4),(5),(6);
- the rear end cross bar in the area (3);
- the middle cross bar in the area (9);
- the spare wheel cross bar in the area (8);
- the central cross bar in the area (10);
- the rear floor in the area (3).

Straighten the areas resulted by dismounting.

Grind the areas resulted by dismounting.



**RE MOUNTING**

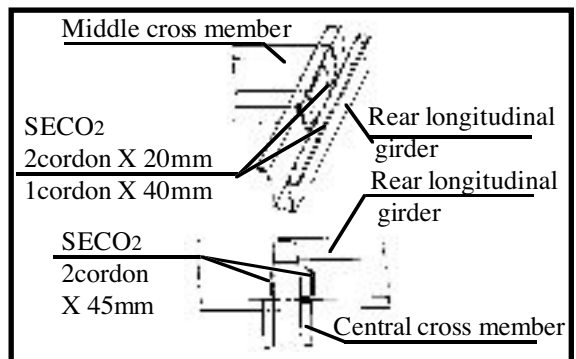
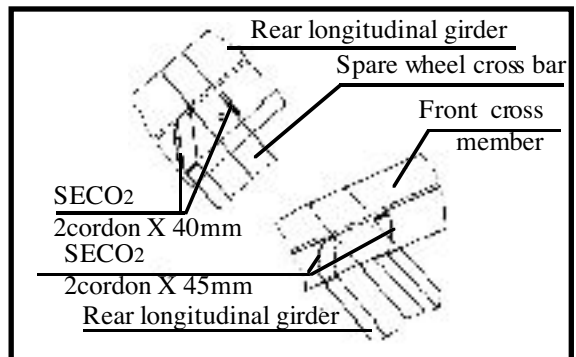
Position and center the new element.

Check the correct positioning of the rear longitudinal girder.

Weld the rear longitudinal girder (1) after the assembling outliners 2,3,4,5,6,7,8,9,10.

Perform two C0 2 welding layers in the connecting area of the rear longitudinal girder with the front cross bar, central, middle and the spare wheel cross bar.

Protect the new element with a corrosion preventing and noise absorbent product.



### REPLACEMENT

This operation shall be performed only on the repair bench. For the specific supports mounting on the bench, please see the 40 chapter

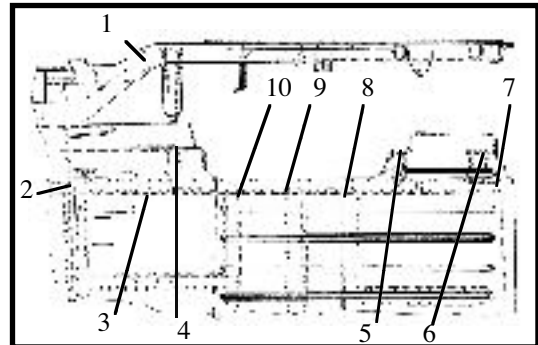
#### DISMOUNTING

Dismount the elements which are in contact with the rear longitudinal girder.

Detach the welding points of the rear longitudinal girder (1) which are connecting with:

- the front cross bar in the area (2);
- the lateral plate in the areas (4), (5), (6);
- the rear end cross bar in the area (7);
- the middle cross bar in the area (9);
- the spare wheel cross bar in the area (8);
- the central cross bar in the area (10);
- the rear floor in the area (3).

Straighten the areas resulted by dismounting.  
Grind the areas resulted by dismounting.



#### REMOVING

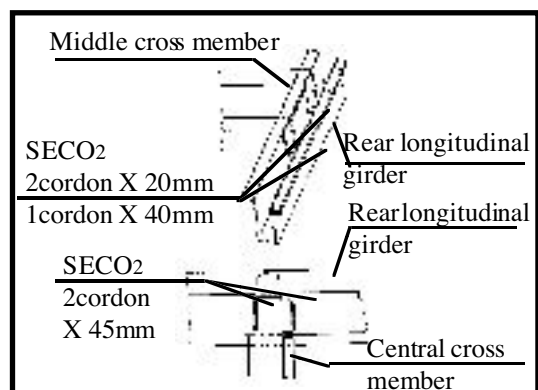
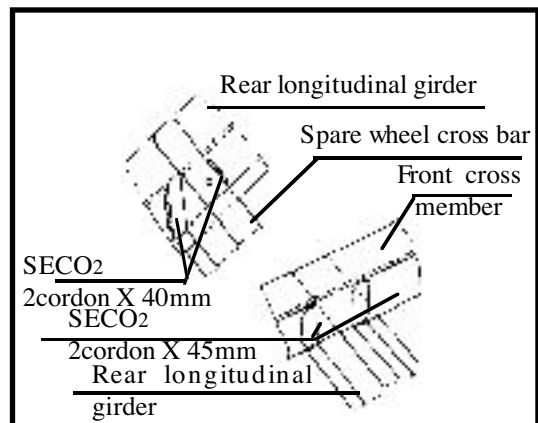
Position and center the new element.

Check the correct positioning of the rear longitudinal girder.

Weld the rear longitudinal girder (1) following the assembling outliners 2,3,4,5,6,7,8,9,10.

Perform two welding layers in the connecting areas of the rear longitudinal girder with the front cross bar, central, middle and the spare wheel cross bar.

Protect the new element with a corrosion preventing and noise absorbent product.

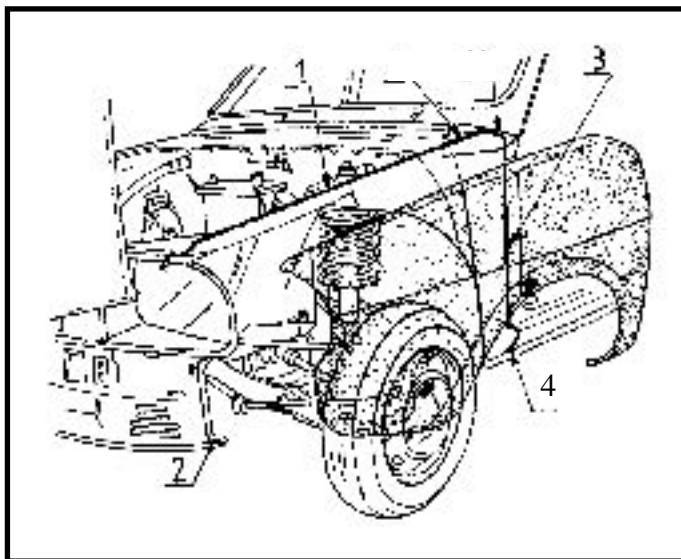


**DISMOUNTING**

Dismount the elements which are in contact with the front wing ( front bumper, the turning lamp from the wing).

Dismount from the front wing the following screws:

- in (1) at the upper part;
- in (2) at the connection of the wing with the front grill, at the lower part;
- in (3) at the connection of the wing with the front pillar (it is not necessary dismounting of the front door);
- in (4) at the lower part of the body.

**PREPARATION**

Apply by means of a brush a layer of thermo-weldable product **class. 33 B CS 4603–202** on the contact areas of front wing with : front wing lining, front grill and front pillar.

Apply a sealant material layer type **223** in the contact area of the front wing with: the front wing lining, the lateral frame, and front pillar.

**REMOUNTING**

Perform the dismounting operations in the reverse order.

## REPLACEMENT

This operation shall be performed only on the repair bench. For the specific supports mounting on the bench, please see the 40 chapter.

## DISMOUNTING

Dismount the damaged elements, which are in contact with the front part body.

Perform a checking redressing on the checking/repairing bench, until bringing the carriage body almost at the initial shape.

Detach the welding points from to front part of carriage body as follows :

- in (2) joining area of the front longitudinal girders with the pedal floor;
- in (3) joining area of the front longitudinal girders with the left / right lateral cross bar;
- in (4) joining area of the front longitudinal girders with the intermediary longitudinal girders;
- in (5) joining area of the front wing linings with the iron plate;
- in (6) joining area of the cover reinforcements and climate control box;
- in (7) joining area of the front wing linings with the front pillar linings;
- in (8) joining area of the front longitudinal girder with the iron plate.

Straighten the areas resulted by dismounting.

Grind the areas resulted by dismounting.

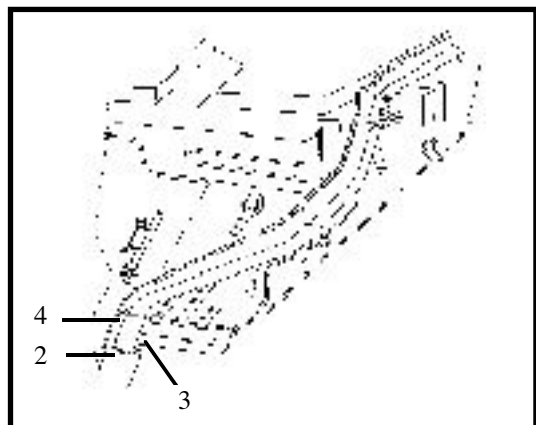
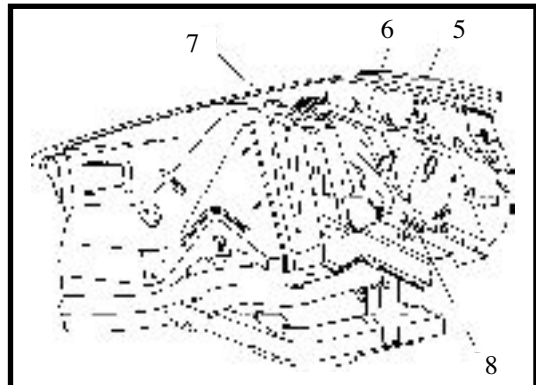
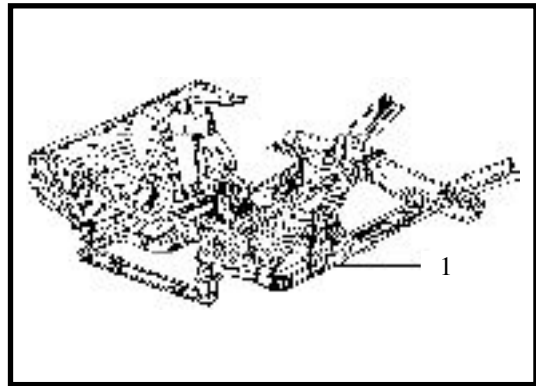
## REMOUNTING

Position and center the new element on the repairing bench.

Check the correct positioning of the front unit carriage body.

Weld the front unit carriage body (1) following the assembling outliners 2,3,4,5,6,7,8,9,10.

Protect the new element with a corrosion preventing and noise absorbent product.



**REPLACEMENT**

This operation shall be performed only on the repair bench. For the specific supports mounting on the bench, please see the 40 chapter.

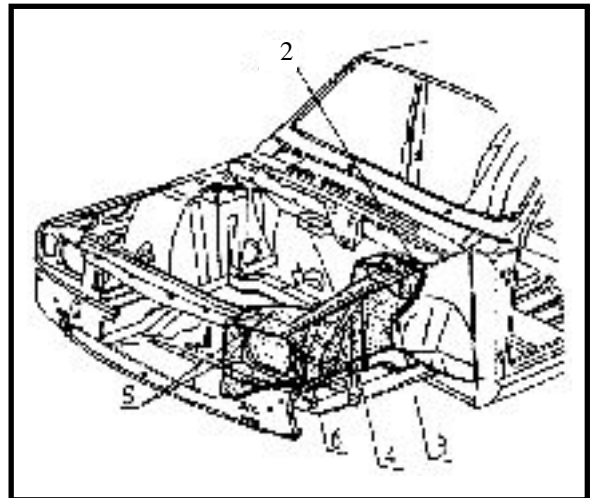
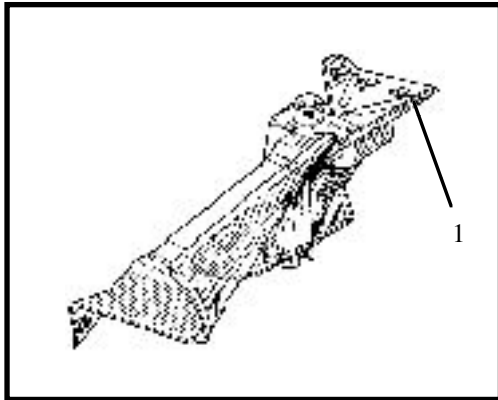
**DISMOUNTING**

Dismount the damaged elements, which are in contact with the front wing lining. Detach the welding points from to the front wing lining (1) which are in contact with

- the front grill in the (5) area;
- the upper longitudinal girder in (6) area;
- the iron plate in the (3) area;
- the steering cross bar in the (4) area;
- the climate control box in the (2) area.

Straighten the areas resulted by dismounting.

Grind the areas resulted by dismounting.

**RE MOUNTING**

Position and center the new element.

Check the correct positioning of the front wing lining.

Weld the front wing lining (1) following the assembling outliners 2,3,4,5,6.

Protect the new element with a corrosion preventing and noise absorbent product.

## UPPER FRONT STRUCTURE

### HEAD LAMP SUPPORT

#### DISMOUNTING

Dismount the elements, which are in contact with the headlamp support.

Detach the welding points of the head lamp (1) support which are in connection with :

- the radiator upper cross member in the area (3);
- the reinforcement in the area (4);
- the lower part of the front wing lining in the area (5);
- the front wing lining in the lateral part in the (6) area.

Straighten the areas resulted by dismounting.

Grind the areas resulted by dismounting.

#### REMountING

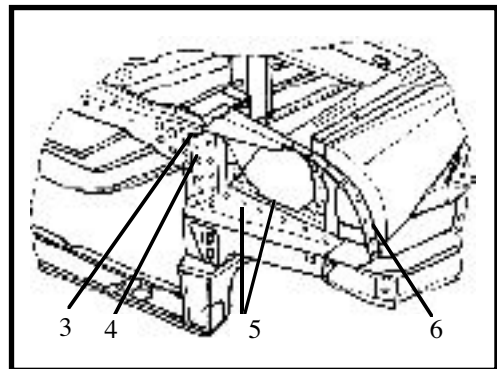
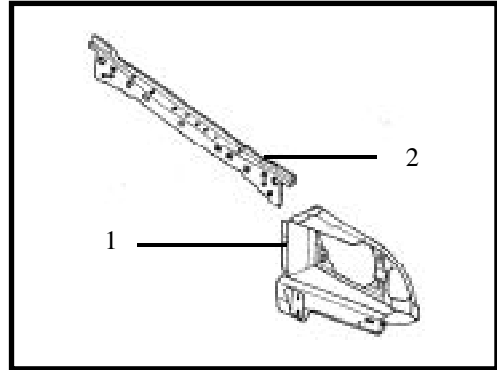
Position and center the new element.

Check the correct positioning of the head lamp support.

Weld the headlamp support (1) following the assembling outliners 2,3,4,5,6.

Protect the welding with a corrosion-preventing product.

Mount the elements, which are connections with the headlamp support.



**DISMOUNTING**

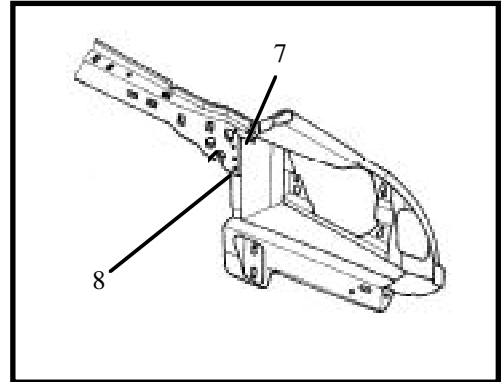
Dismount the elements, which are in contact with the radiator upper cross-member.

Detach the welding points of the radiator upper cross member (2) which are in connection with:

- the head lamp support (7);
- the reinforcement in the (8) area.

Straighten the areas resulted by dismounting.

Grind the areas resulted by dismounting.



**REMOUNTING**

Position and center the new element.

Check the correct positioning of the radiator upper cross-member.

Weld the tank mask assembly (2) after the assembling outliners 7, 8.

Protect the welds with a corrosion-preventing product.

Mount the elements, which are in connection with the radiator upper cross-member.

**DISMOUNTING**

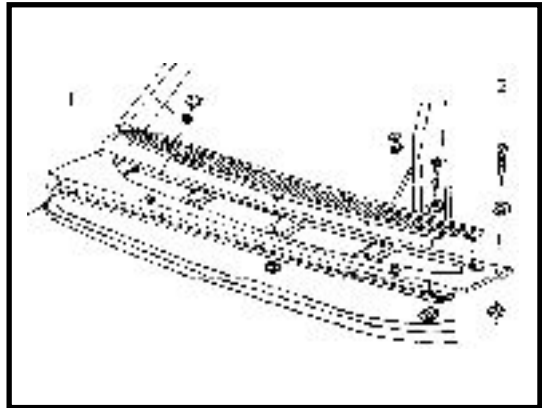
Dismount the two nozzles (1) of the wind-screen washer.

Dismount the attachment screws (2) of the aeration grill.

Take out the clips (3) from the front grill grippers taking care to prevent their distortion or damaging.

**REMOUNTING**

The mounting shall be done by performing the dismounting operations in reverse order.





## FRONT PILLAR LINING

**DISMOUNTING**

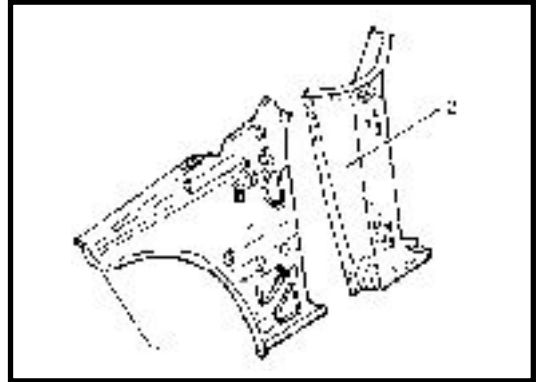
Dismount the elements which are in contact with the front pillar lining.

Detach the welding points of the front pillar lining (1) which are in connection with:

- front pillar in the area (4) and (5);
- floor closing plate in the area (8);
- windscreen lower cross bar in the area (9);
- front wing lining upper edge in the area (10);
- climate control box end in the area (11);
- iron plate in the area (12).

Straighten the areas resulted by dismantling.

Grind the areas resulted by dismantling.

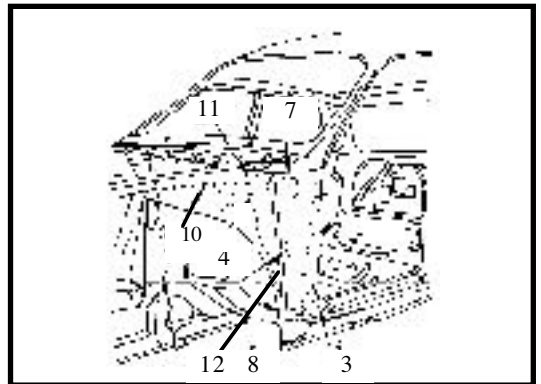
**REMOUNTING**

Position and center the new element.

Check the correct positioning of the front pillar lining.

Weld the front pillar lining (1) following the assembling outlines 4,5,8,9,10,11,12.

Protect the new element with a corrosion preventing and noise absorbent product.



**DISMOUNTING**

Dismount the elements which are in contact with the front pillar .

Detach the welding points of the front pillar (2) which are in connection with :

- lateral frame in the areas (3);
- front pillar lining in area (4) and (5);
- upper spacer and the lower windscreen

lining in the areas (6), and (7).

Straighten the areas resulted by dismantling.

Grind the areas resulted by dismantling.

**REMOUNTING**

Position and center the new element .

Check the correct positioning of the front pillar.

Weld the front pillar (2) following the assembling outliners 3, 4,5,6,7.

Protect the new element with a corrosion preventing and noise absorbent product



## FRONT LOWER PANEL

**DISMOUNTING**

Dismount the elements which are in contact with the front lower panel .

Detach the welding points of the front lower panel

- (1) which are in connection with :
- floor closing plate in the area (2);
  - front pillar in the (3) area;
  - in the length of the area (4) with floor closing plate;
  - side panel in the area (5);
  - central pillar in the area (6).

Straighten the areas resulted by dismounting.

Grind the areas resulted by dismounting.

**REMountING**

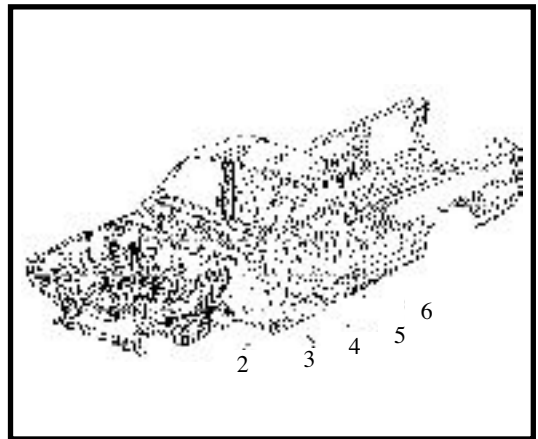
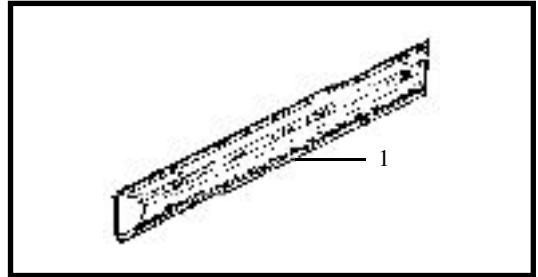
Position and center the new element .

Check the correct positioning of the front lower panel .

Weld the front lower panel (1) following the assembling outliners 2, 3,4,5,6.

Straighten with the autogenous welding the (3) area with the front pillar, the (6) area with the central pillar and the (5) area with side panel.

Leave open the water evacuation holes from the front lower panel.



**DISMOUNTING**

Dismount the damaged elements which are in contact with the middle pillar.

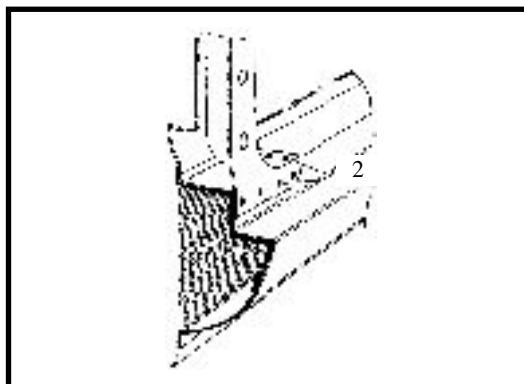
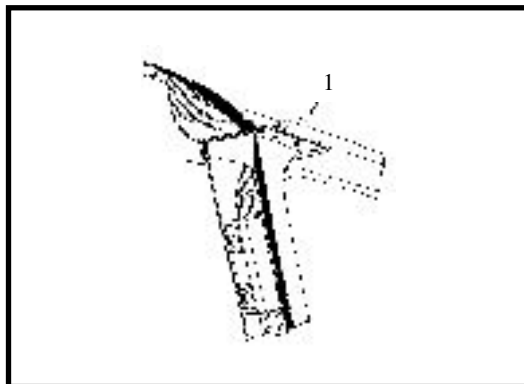
Detach the welding points of the middle pillar which are in connection with:

Ceiling in the area (1).

Front lower panel in the (2) area.

Straighten the areas resulted by dismantling.

Grind the areas resulted by dismantling.

**REMOUNTING**

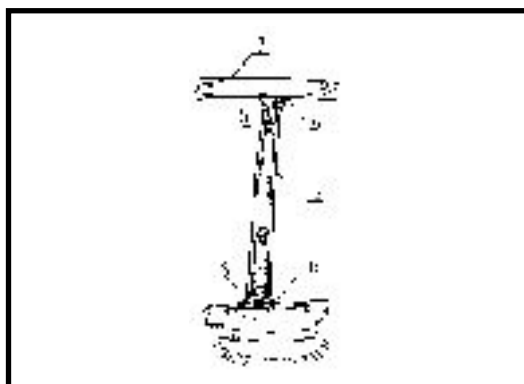
Fit temporarily the middle pillar (3), by introducing the pillar lining under the upper frame (7) and under the lower panel plate (6).

Check the correct pillar positioning using the door as geometric gauge.

Welding the middle pillar following the welding outliner (1), and (2).

Perform a straightening gas protection welding in the areas (4) and (5).

Remount the elements which are in connection with the middle pillar.



### DISMOUNTING

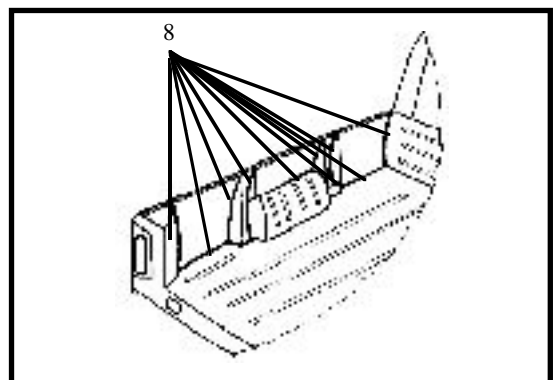
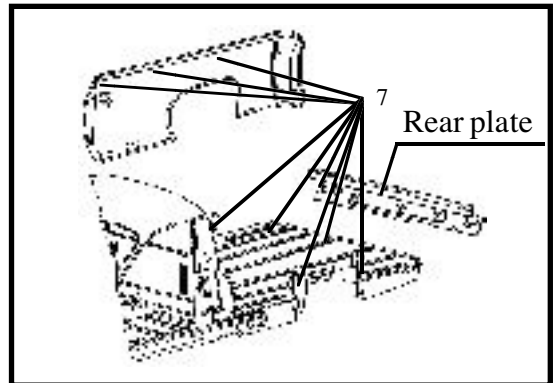
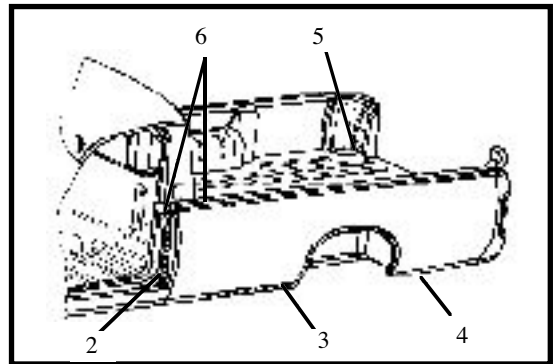
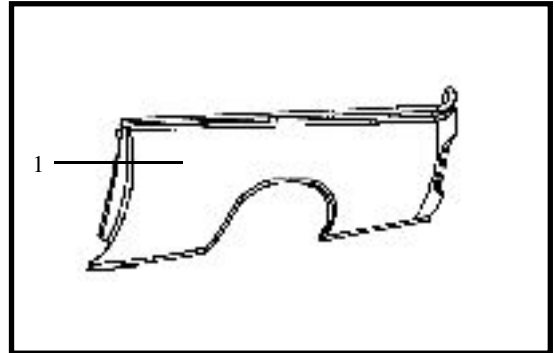
Dismount the elements which are in contact with the side panel.

Detach the welding points of the side panel (1) which are in connection with:

- middle pillar in the area (2);
- floor side plate and front extensor lower edge in the (3) area;
- the rear side plate and rear extensor lower edge in the area (4);
- the platform floor in the area (5);
- the cabin side plate in the area (6).

Straighten the areas resulted by dismounting.

Grind the areas resulted by dismounting.



### REMountING

Apply a layer of **5322** material on the joints areas (7) of the side panel with: front / rear extensor, lower panel, side plate, rear side floor cabin, rear plate.

Position and center the new element.

Check the correct positioning of the side panel .

Weld the lateral panel (1) following the assembling outliners **2,3,4,5,6**.

Apply a sealant material layer

**PLASTISOL 4** in the joint area (8) of the side panel with : rear side floor, rear lamp lining, front/rear extensor, wheel passage, cabin separating wall.

**DISMOUNTING**

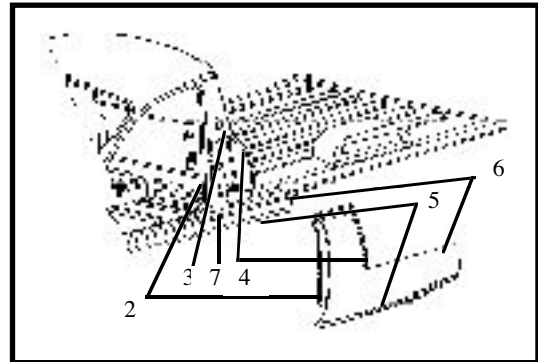
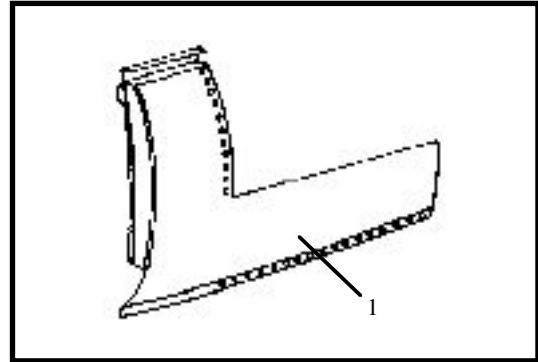
Dismount the elements which are in contact with the side panel.

Detach the welding points of the side panel (1) which are in connection with :

- middle pillar in the area (2);
- separating wall in the (4) area;
- floor side plate in the area (5).

Detach the 5 welding strippers between the side panel and outer frame in the (6) area.

Straighten the areas resulted by dismounting.  
Grind the areas resulted by dismounting.

**REMOUNTING**

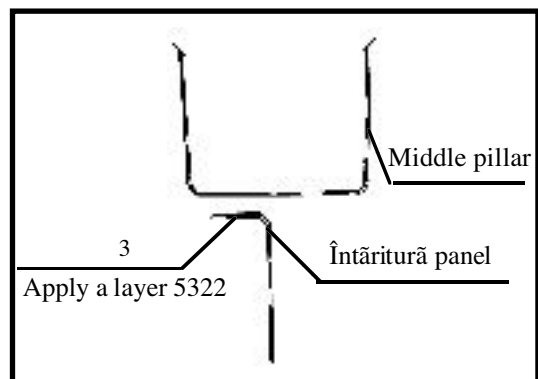
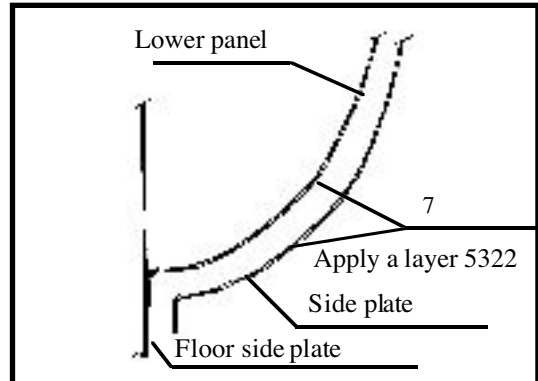
Apply a layer of 5322 a secured stripping on the joints areas (3) and (7) of the side panel with lower panel and cabin closing plate.

Position and center the new element.

Check the correct positioning of the side panel.

Weld the side panel (1) following the assembling outliners 2,4,5,6.

Protect the welding with a corrosion preventing product.



### DISMOUNTING

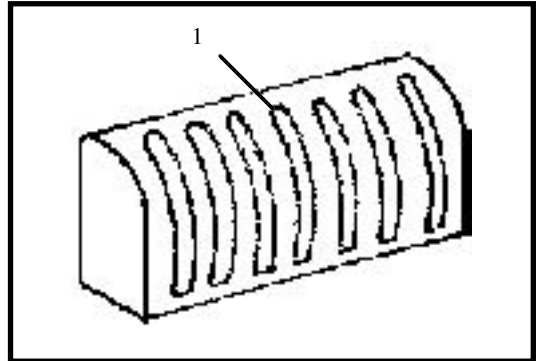
Dismount the elements which are in contact with the rear wheel passage.

Detach the welding points of the rear wheel passage (1) which are in connection with :

- platform floor in the area (2);
- front extensor in the (3) area;
- rear extensor in the area (4).

Straighten the areas resulted by dismantling.

Grind the areas resulted by dismantling.



### REMOUNTING

Position and center the new element.

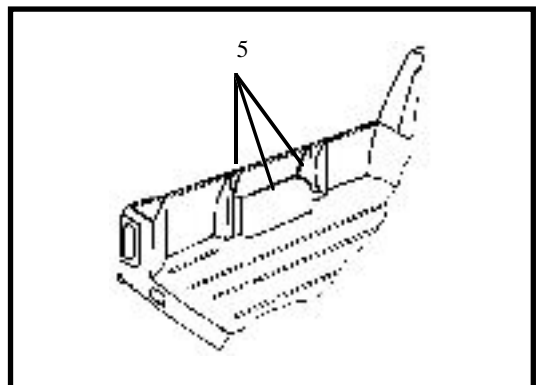
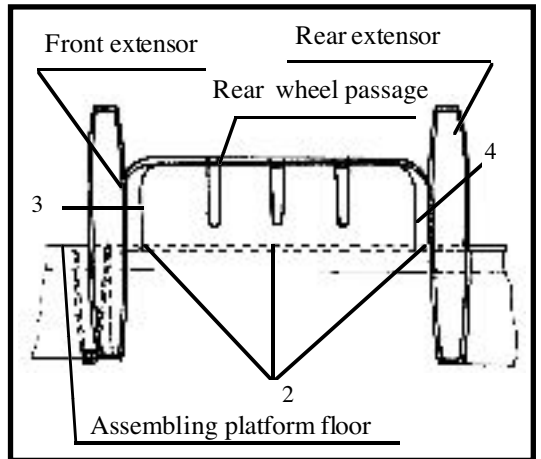
Check the correct positioning of the rear wheel passage.

Weld the rear wheel passage (1) following the assembling outliners 2,3,4.

Protect the welding with a corrosion preventing product.

Apply a sealant material layer

**PLASTISOL 4**, in the contact areas (5) of the rear wheel passage with: platform floor, front extensor and rear extensor.



**DISMOUNTING**

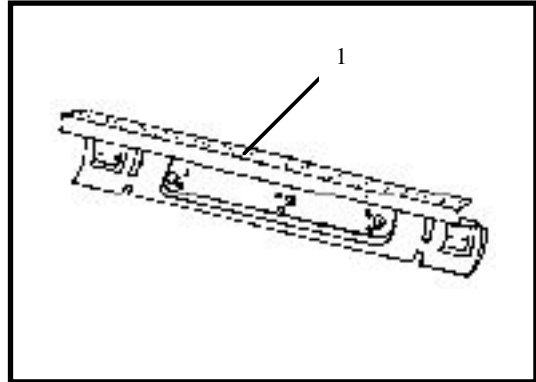
Dismount the elements which are in contact with the rear plate.

Detach the welding points of the rear plate (1) which are in connection with:

- platform floor rear edge in area (2);
- corner plate edge in the area (3).

Straighten the areas resulted from dismounting.

Grind the areas resulted from dismounting.

**REMOUNTING**

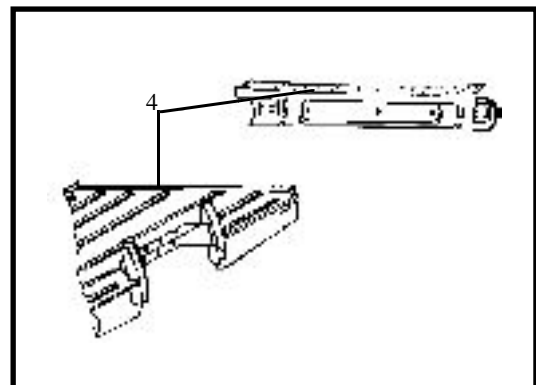
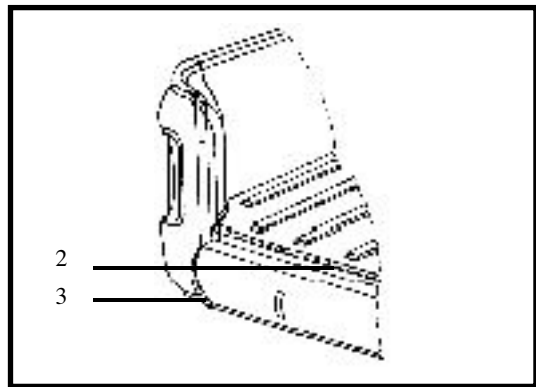
Position and center the new element.

Check the correct positioning of the rear plate.

Apply a secured stripping in the joint area (4) of the rear plate with the rear extreme crossbar.

Weld the rear plate (1) following the outliners (2) and (3).

Protect the welding with a corrosion preventive product.





**DISMOUNTING**

Dismount the elements which are in contact with the roof ( doors, front wings, windscreen, cabin glass, roof sealing of the ceiling and windows gaskets).

Detach the welding points of roof (1) which are in connection with :

- windscreen lower cross-bar in (2) area;
- front pillar in (3) area;
- front safety belt (front side ) in the (4) area;
- windscreen pillar lining in the (5) area;
- front safety belt (rear side ) in the (6) area.

Upper border of the separating wall in the (7) area.

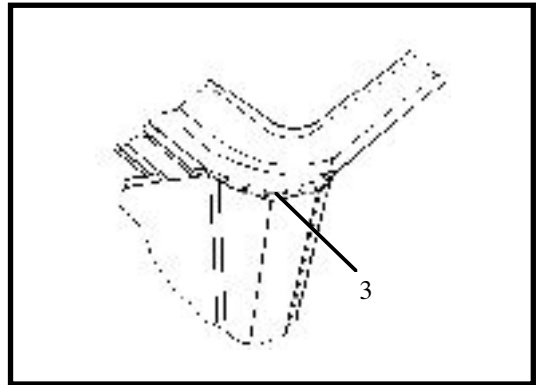
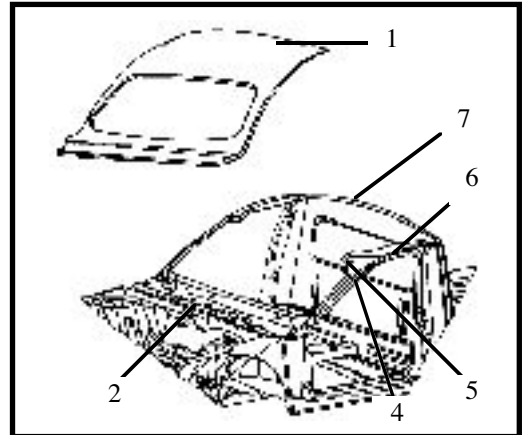
**REMountING**

Position and center the new element.

Check the correct positioning of the roof.

Weld the roof (1) following the assembling outliners 2,3,4,5,6, 7.

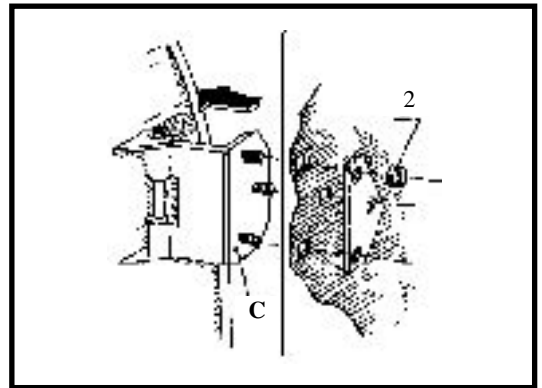
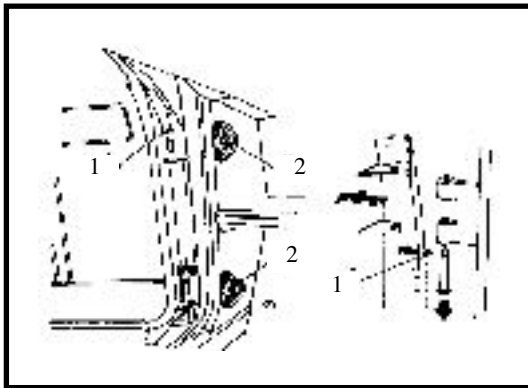
Mount in the reverse order the elements, which are in connection with the roof.



**DISMOUNTING**

Front door dismounting may be performed in two different ways:

- a) by removing the clips (1) and pushing out the hinge pins.
- b) by removing the attachment screws (2) on the front pillar.

**REMOUNTING**

Perform the dismounting operations in the reverse order.

**ADJUSTMENT**

- a) Horizontally, adjustment bush C are to be used.
- b) Vertically, the front pillar holes are to be used.

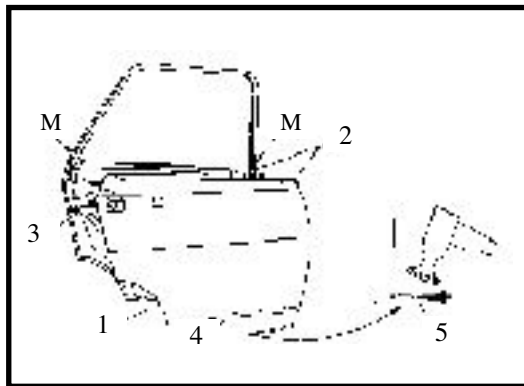
**DISMOUNTING**

Dismount the front door and the elements which are in contact with this.

Cut the outside panel of the door following the outline (1).

Unscrew the screws (2) from the joint of outside panel-glass frame.

Adjust, if necessary, the extensor (3).

**REMountING**

Apply a strip of zinc on the caisson.

Apply a sealant material layer in the area (4).

Position the new outside plate and weld in the (2) area.

Fit the outside panel on the door caisson by folding in the area (5).

Remount the elements which are in connection with the front door.

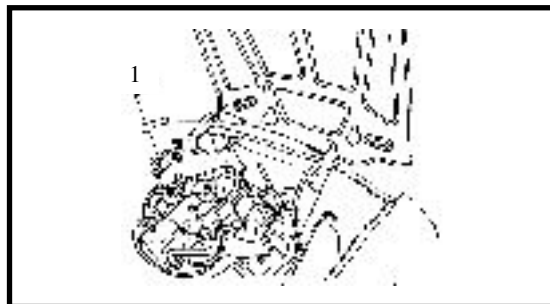
## FRONT BONNET

---

### **DISMOUNTING**

Dismount :

- the attachment screws (1) of the hinges;
- the front bonnet.



### **REMOUNTING**

Perform the dismounting operations in the reverse order.

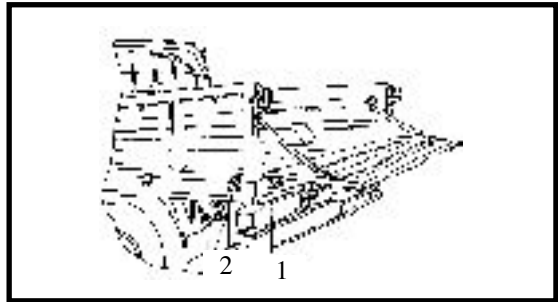
**DISMOUNTING**

Dismount :

- the attachment screws (1) of the hinges (2);
- the rear drop side (the drop side).

**REMOUNTING**

Perform the dismounting operations in the reverse order.



**DISMOUNTING**

Dismount :

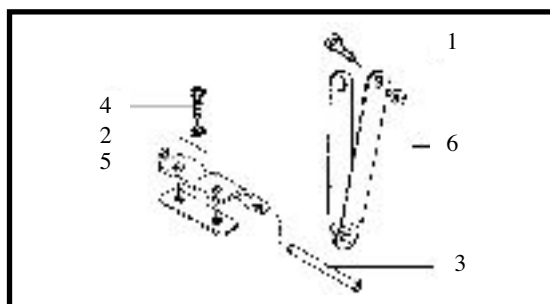
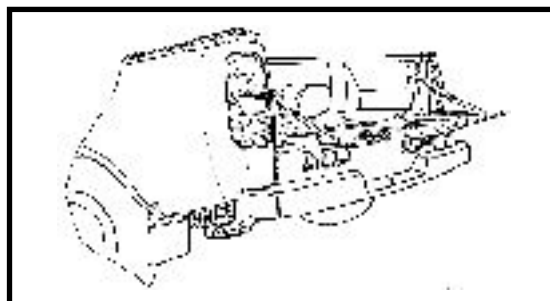
- the screws (1) from the end of the limiting mechanism (6).

Then, the rear drop side dismounting may be performed in two different ways:

a) extract the safety ring (2) and the hinge shaft (3).

b) unscrew the screws (4) of the hinges (5).

Dismount the rear drop side.

**REMOUNTING**

Perform the dismounting operations in the reverse order.

**DISMOUNTING**

Dismount the arm rest, the window regulator , the locking knob and the front/rear door panel.

Detach the door panel from the door frame.

Dismount the lock control of the front/rear door (1).

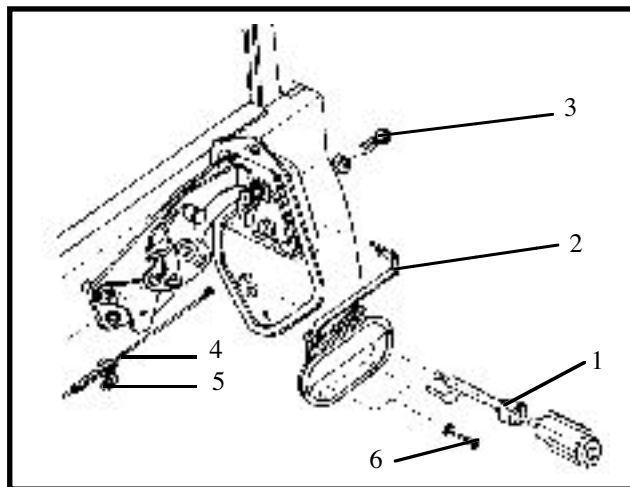
Dismount the attachment screws (3) of the front/rear door lock.

Release the control lever (2) of the outside opening flap.

Release the distance control lever (4) by taking out the clips bracket (5).

Dismount the attachment screws (6) of outside opening flap, releasing the flap.

Dismount the front/rear door lock from the door frame.



**REMOUNTING**

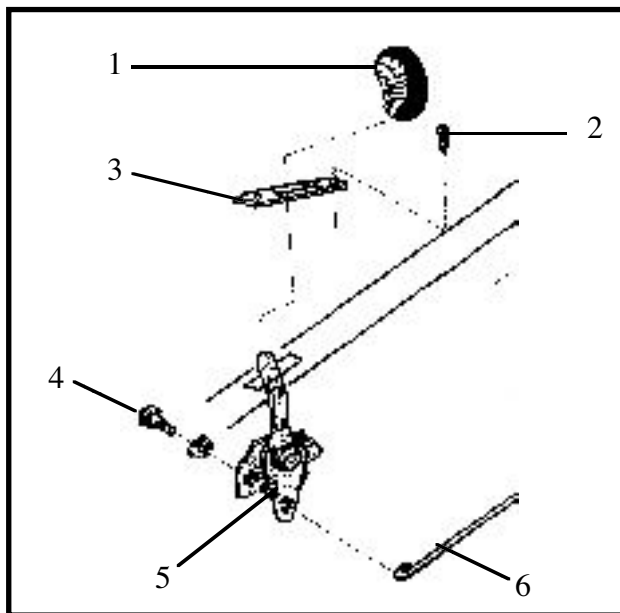
Perform in reverse order the mounting operations.

**DISMOUNTING**

Before dismounting the door lock control, remove the door panel and leave the window in the lift position.

Dismount:

- opening knob (1);
- ornament (3) attachment screws (2);
- the attachment screw (4) of opening mechanism (5);
- control lever (6) off the hinge, releasing the opening mechanism.

**REMountING**

Perform the dismounting operations in reverse order.

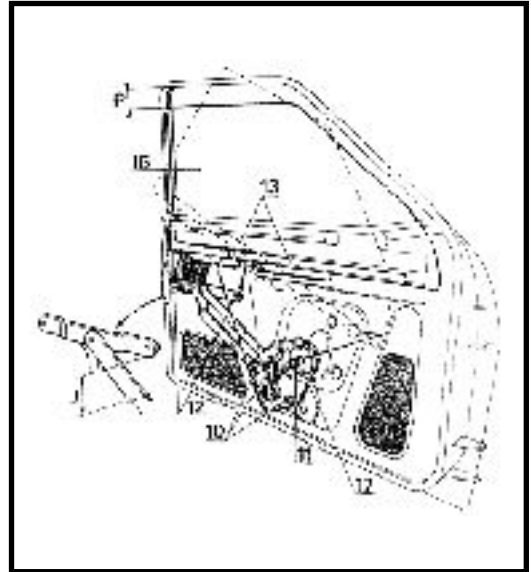


**DISMOUNTING**

To dismount the door window regulator assembly, perform the following operations:  
Bring the window in the position **P = 85 mm**.

Unscrew the attachment nuts (**10**), press the shaft (**11**) for releasing the window regulator towards the inner side.

Easy bend the “ window regulator-window “ assembly, take out the supports (**12**), the slides from the window base (**13**) and the glass slide (**14**).



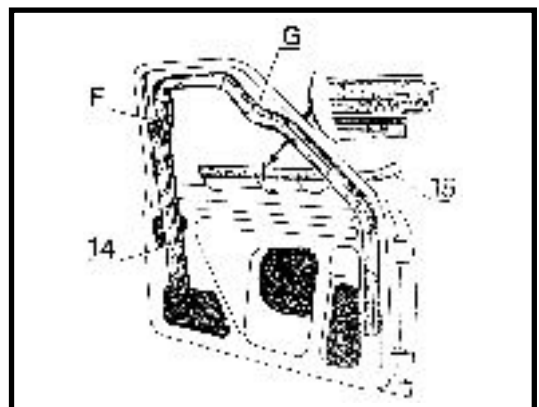
**REMountING**

For remounting perform the following operations:

Place in it housing the outside wiper (**15**) assembled with bracket (**15'**).

In order to re mount the glass slide, easy curve it in (**F**) and (**G**) ensuring a correct attachment in the door frame.

Lift the window regulator in the position **J = 40mm**,introducing the glass through the door frame, with the top down (**16**) center it in its slide and bring it in position **P = 85mm**.



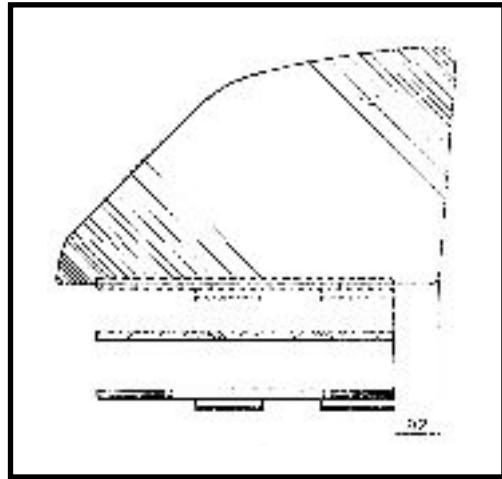
Put in its place the window regulator , introducing the shaft (11) in the frame than the attachment washer (17) and attachment nuts (10).

Place the supports (12) at the glass bottom and perform a first sliding test.

Grease the window regulator hinges and supports and perform the others operations in reverse order.

### **PREPARING THE GLASS BASE**

When fitting the bottom edge and at the glass positioning in the slide-bars, observe the value of **92 mm**.



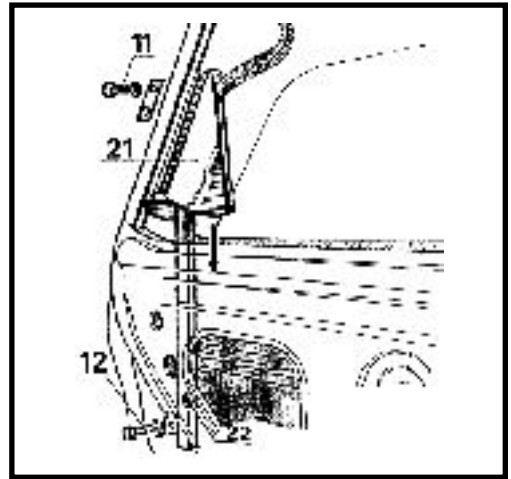
**DISMOUNTING**

In order to dismount a door window and the window regulator of the back door window, perform the following operations:

Remove the screws (11) and (12).

Using the technological opening (14) in the inner side of the door, remove the elastic washer and the safety washer (20), which make the connection with the window slide-bar, by slightly sliding it to the lower part.

Remove the three screws (15), releasing the back window regulator (19) and remove it from the inner door.



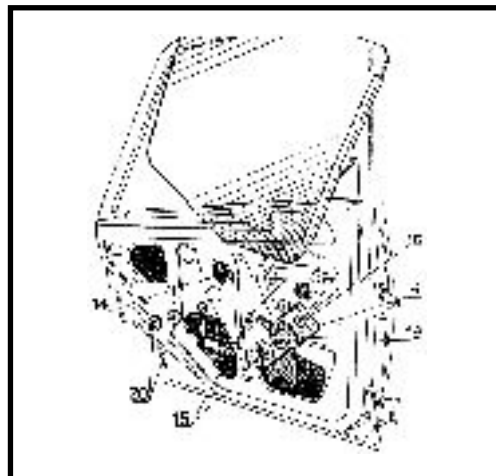
**REMOUNTING**

For remounting, the operations shall be performed in the reverse order:

Replace the channel support in the rear inner side of the door, place the assembly inside the door frame, then remove again the frame, to allow the placing of the window in the channel support.

Replace the window regulator mechanism (19) and temporarily attach its sealing washer (R).

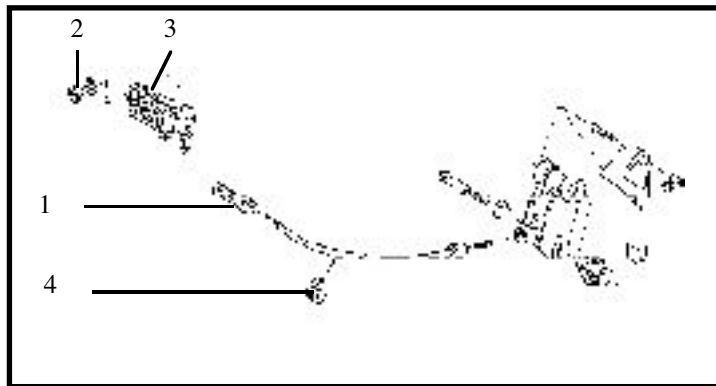
The window placed in the channel support shall be secured by means of the safety gasket and the washer (20) and the lateral frame from the window attachment (21) shall be temporarily attached by means of the screws (11) and (12), using the technological opening (22); test rolling up the window several times, after which completely tighten the screws.



**DISMOUNTING**

Release the cable of front hood (1) from the connection with lock (3) and take out by lock hook rod (4).

Dismount the attachment front hood lock nuts (2).

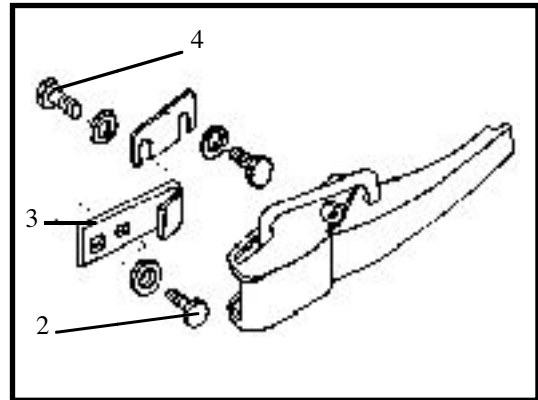
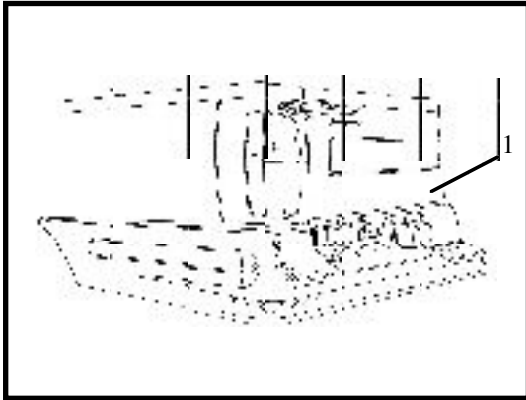


**REMountING**

Perform in the reverse order the dismounting operations.

**REAR DROP SIDE LOCKING SYSTEM DACIA 1304 Pk, 1307****DISMOUNTING**

To dismantle the rear drop side lock (1) unscrew the screws (2) of the closing hook (3) and the screws (4) of the assembled lock (5).

**REMOUNTING**

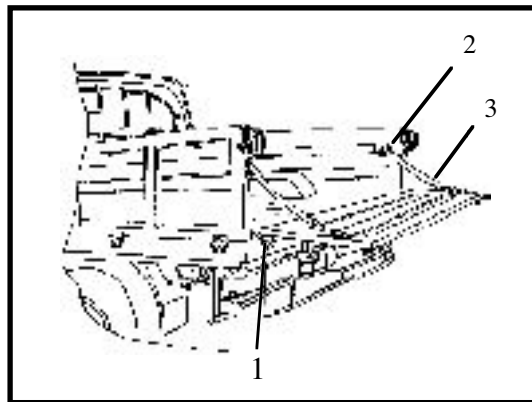
Perform in the reverse order the dismounting operations.

**REAR DROPSIDELOCKINGSYSTEMDACIA 1304 platform**

**DISMOUNTING**

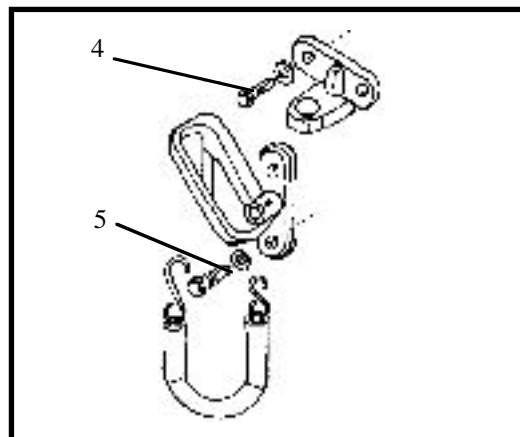
Dismount :

- the screws (1) and (2) of the end of the stopper chain (3);
- the lock attachment screws (4) of the side panel the lock attachment screws (5) of the rear drop side panel.



**REMOUNTING**

Perform the dismounting operations in the reverse order.



### WINDSCREEN AND CAB REAR WINDOW

The replacement of these windows is performed in case they are broken, when they are not according to the required overall dimensions or have manufacturing defects (image distortions, cracks, etc).

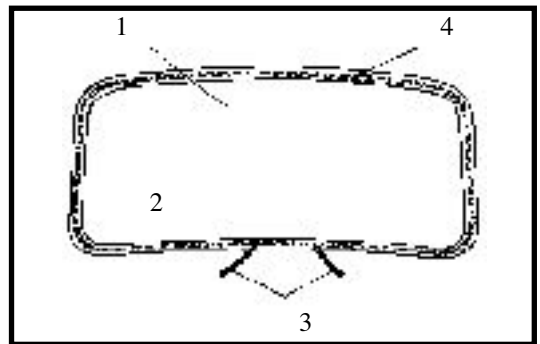
#### DISMOUNTING OF A BROKEN WINDOW

If the window or part of it did not fall, the window gasket shall be dismantled and the pieces of broken window shall be removed from it easier by sticking a sheet of paper on each surface.

#### PREPARING FOR MOUNTING

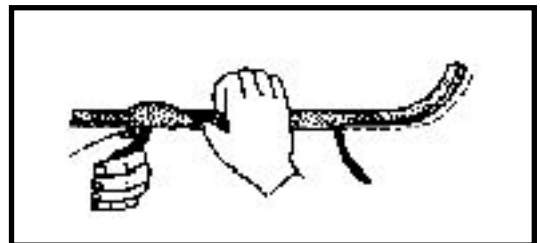
Position the gasket (2) around the window (1) and place the assembly on a protection plate.

Place in the gasket channel all around the gasket frame; a cotton cord (4) of 3 – 4 mm diameter, so that at its ends (3) to have some more 20 cm of cord, and between the ends, the distance shall not be more than 10 cm.



#### MOUNTING OF WINDSCREEN AND REAR WINDOW

The windscreen – gasket – cord assembly is placed on the frame, for mounting, so that the cord ends are placed towards the inside of carriage body.



From the inside of the vehicle, successively draw the ends of the cord, beginning with the lower parts, in this way the window gasket edge is lifted and then lowered on the frame. At the outside, the window gasket is seated by slightly pressing it on window, so that the tightening is uniform on the whole windscreen contour and frame.

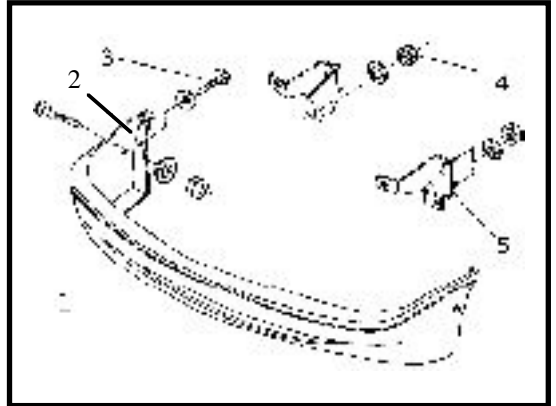
The cord is always removed through the upper part of the windscreen.

Each time a windscreen or rear window is mounted, ensure the uniform setting of the whole assembly on the carriage body by tapping several times with a rubber hammer, on the edge of the window frame.

**DISMOUNTING**

Dismount :

- the attachment screw (1) and (3) of the front bumper (2) on the front wings;
- the nuts (4) which attach the bumper supports (5) on the front grill;
- release the front bumper.

**REMOUNTING**

Perform the dismounting operations in the reverse order.



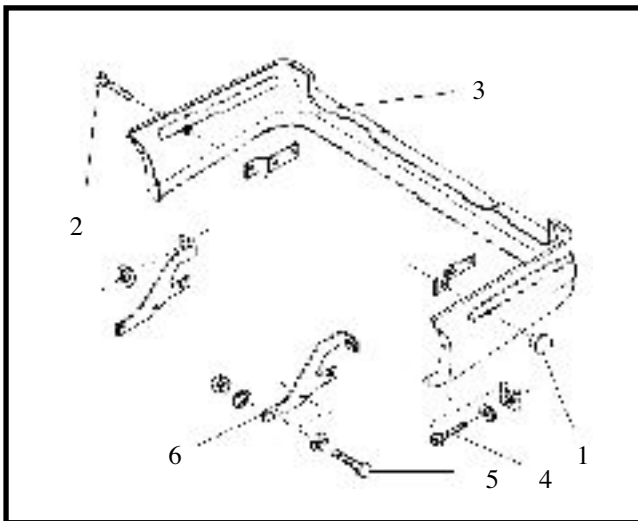
## REAR BUMPER

( for vehicles Dacia 1304 Pk., 1307 )

## DISMOUNTING

Dismount :

- the protectors (1) and the side attachment screws (2) of the rear bumper (3);
- the attachment screws (4) of the rear bumper on side panels ;
- the attachment screws (5) of the rear bumper supports (6) on the rear girders;
- release the rear bumper.



## REMOUNTING

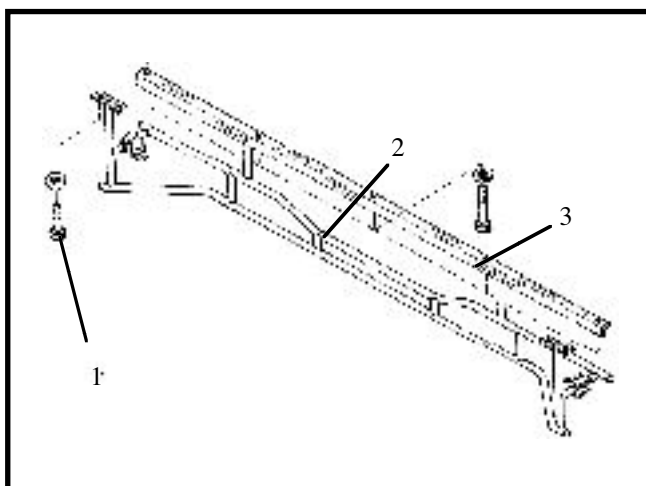
Perform the dismounting operations in the reverse order.

## REAR BUMPER

**REAR BUMPER**  
( for Dacia 1304 platform drop side )**DISMOUNTING**

Dismount :

- the attachment screws (3) of the rear bumper (2) on the end rear cross bar;
- the attachment screws (4) of the rear bumper supports on the rear girders;
- release the rear bumper.

**REMOUNTING**

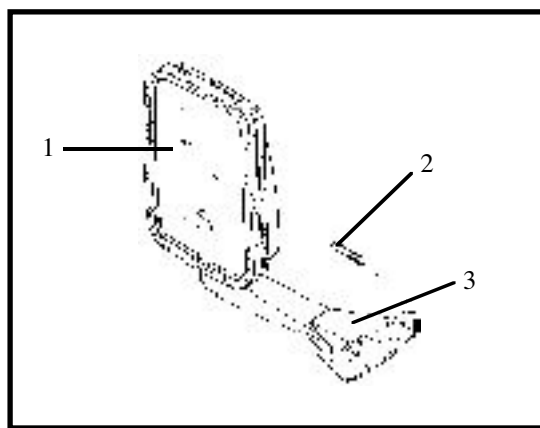
Perform the dismounting operations in the reverse order.

**DISMOUNTING**

Detach the protector of the outside rear view mirror (3).

Dismount the attachment screws (2) of outside rear view mirror (1).

Release the outside rear view mirror.

**REMOUNTING**

Perform the dismounting operations in the reverse order.

# REPAIR MANUAL

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## DACIA COMMERCIAL

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**RM 502-3 SEALING, ELECTRICITY**

**ENGINE: C3L**

**GEARBOX: NG1; NG7**

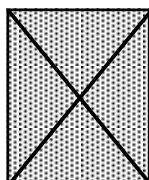
**TAPV: U75B; U75F**

The reparation methods prescribed by the manufacturer in the present document are established subject to technical specifications in force at the document issuing date.

These are subject to modifications brought by the manufacturer at the fabrication of different assemblies, subassemblies or accessories of its vehicles.

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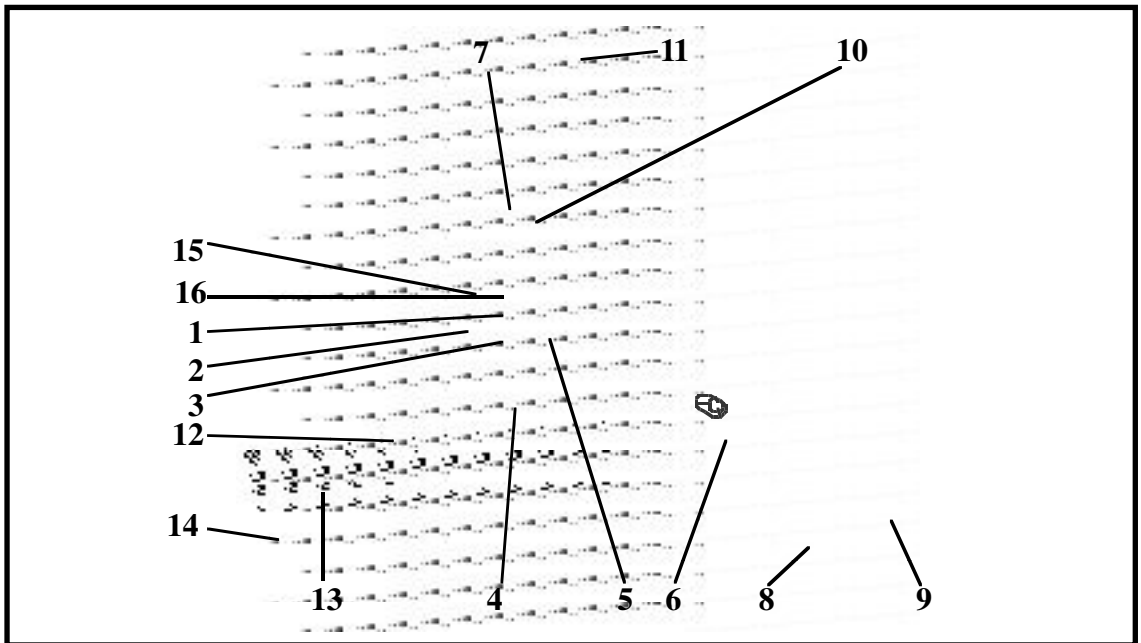
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**DISMOUNTING**

Dismount the battery

Dismount:

- the windscreen,
- the steering wheel and the lower/upper casing.

Dismount the attachment nut (12) of the coupling bar for dashboard sustaining.

Dismount the dashboard attachment screws (8) on the side support (9).

Dismount the dashboard attachment screws (11) on the windshield lower frame cross member.

Dismount the headlamp adjustment switch (5) and the two attachment screws.

Dismount from the engine compartment:

- the control cable from the climate control valve,
- the vacuum hose from the servobrake valve,

Detach the dashboard and swing it over, in order to have access to the wiring disconnecting.

Disconnect the following connectors:

- dashboard,
- fog lamp switch,
- hazard switch,
- electronic clock,
- blower switch,
- blower wiring connection,
- 4 X 4 switch,

- fog headlamps switch,
- windscreen wiper timer,
- radio-cassettes player.

Disconnect the following wires:

- lighter lighting,
- climate control lighting,
- ashtray lighting,
- documents compartment lighting.

Dismount the followings: diagnostic socket and the three hoses from the climate control unit, observing the corresponding positions.

Extract the dashboard from cockpit.

Dismount the followings:

- the instrument panel,
- the hazard switch (7),
- the climate control unit
- the documents compartment (6) ( see page 57 -3 ),
- the radio-cassettes player and its support (4),
- the coupling bar (13) attached on the dashboard by means of the screw (14),
- the electronic clock,
- the lighter (2),
- the ashtray (3),
- the windscreen wiper timer (15),
- the fog headlamps switch (16),
- the 4 X 4 switch (1),
- the fog lamps switch,
- the blower switch.

#### REMOUNTING

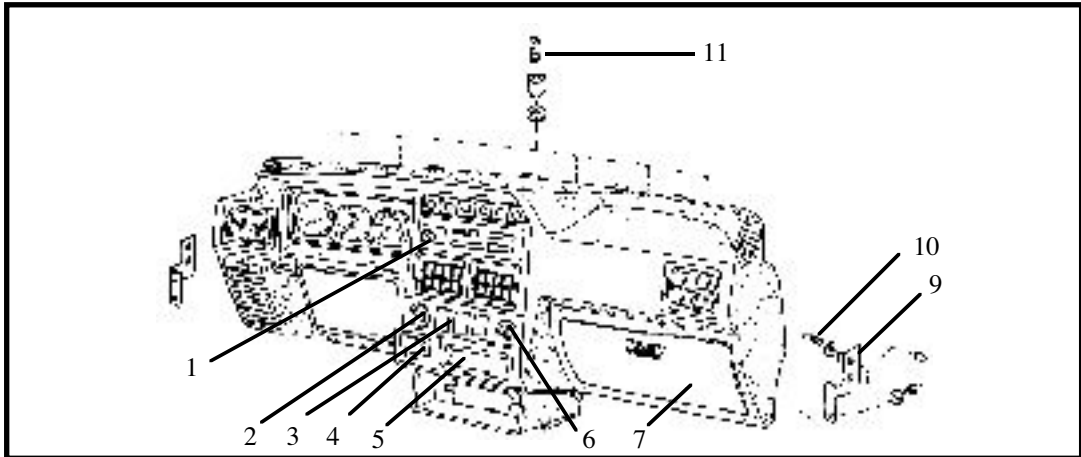
Perform the dismounting operations in the reverse order.  
Check the operation of the board instrument and switches.



DASHBOARD

DASHBOARD TYPE DACIA 1325

DISMOUNTING



In order the dismount the dashboard, perform the following operation :

Dismount:

- the steering wheel and the upper-lower steering wheel half cases;
- the ash try (5);
- wiper timer by dismounting the control knob (2), disconnecting the wiper timer wires and the attachment nuts on dashboard;
- valve control cable on the control lever;
- upper flaps control cable from the climate maintenance block to the control lever;
- glove box (7) and disconnecting of the two wires of instrument board supply on glove box lighting lamp;
- lower flaps control cable from the climate maintenance block;
- speedometer cable from the instrument board;
- the attachment screws (11) dashboard on the windscreen lower cross;
- the attached nuts (8) dash board on the lateral support (9);
- the attachment screws (10) dash board on the left/right pillar;
- three front wire connection boxes from the dashboard with RPM;

Disconnect the lighting wire of the cigarette lighter (4).

Disconnect and dismount the hazard warning switch (3).

Disconnect and dismounting G.M.V. climate maintaining switch (1).

Dismount headlamps adjustment switch (6).

Remove the dashboard and take out from vehicle interior.

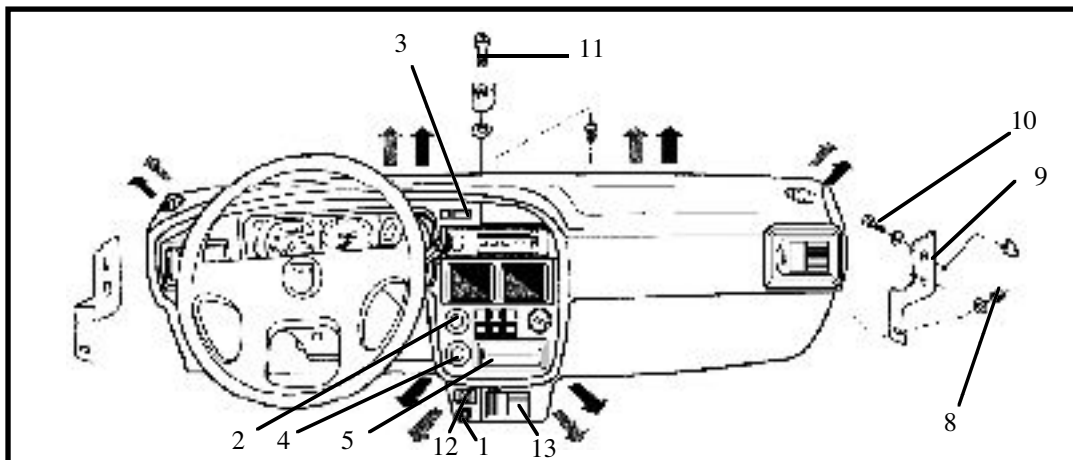
REMOUNTING

Perform the dismounting operations in the reverse order.

Check the operation of the board instruments and of the contact switches.

## DASHBOARD TYPE DACIA 1325

## DISMOUNTING



In order to dismount the dashboard, perform the following operation :

Dismount :

- the steering wheel and the upper-lower steering wheel half cases;
- the ash tray (5);
- wiper timer by dismounting the control knob (2), disconnecting the wiper timer wires and the attachment nuts on dashboard;
- valve control cable on the control lever;
- upper flaps control cable from the climate maintenance block to the control lever;
- glove box (7) and disconnecting of the two wires of instrument board supply on glove box lighting lamp;
- lower flaps control cable from the climate maintenance block;
- speedometer cable from the instrument board;
- the attachment screws (11) dashboard on the windscreen lower cross;
- the attached nuts (8) dashboard on the lateral support (9);
- the attachment screws (10) dashboard on the left/right pillar;
- three front wire connection boxes from the dashboard with RPM;

Disconnect the lighting wire of the cigarette lighter (4);

Disconnect and dismount the hazard warning switch (3);

Dismount:

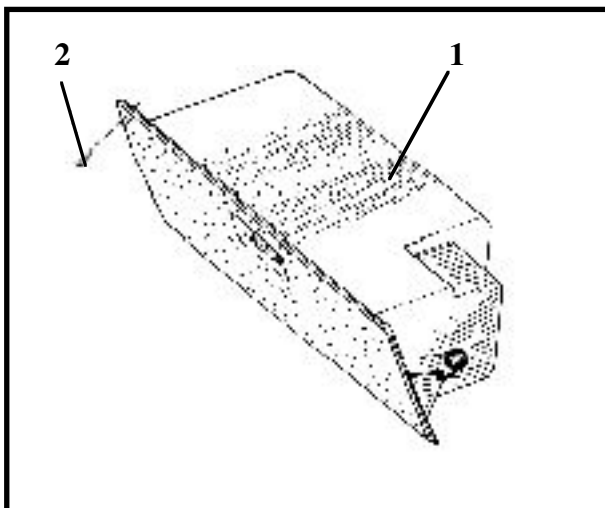
- headlamps adjustment switch (6);
- the selector speed knob (12) and the attachment nut screen AC controls;
- blower (13) by detaching the clips;
- AC knob control (1).

Remove the dashboard and take out from the vehicle interior.

## REMOUNTING

Perform the dismounting operations in the reverse order.

Check the operation of the board instruments and of the contact switches.

**DISMOUNTING**

Disconnect the battery.

Dismount the diagnostic socket.

Dismount the documents compartment attachment screws (2) on the dashboard.

Disconnect the documents compartment lighting wires.

Extract the documents compartment from the dashboard.

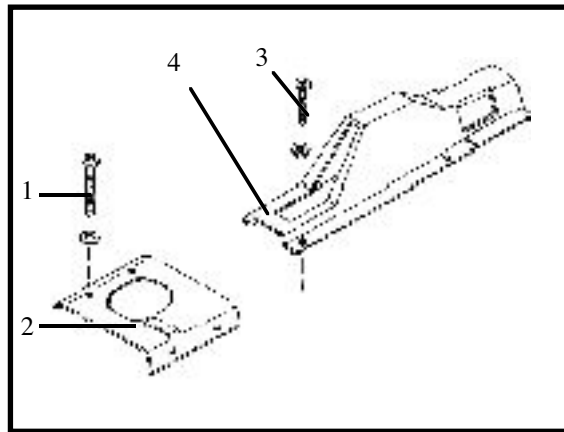
**REMOUNTING**

Perform the dismounting operations in the reverse order.

#### DISMOUNTING

Dismounting the screws (1) and release the gearbox lever ornament (2).

Dismounting the screws (3) and release the handbrake casing (4).



#### REMOUNTING

Perform the dismounting operations in reverse order.

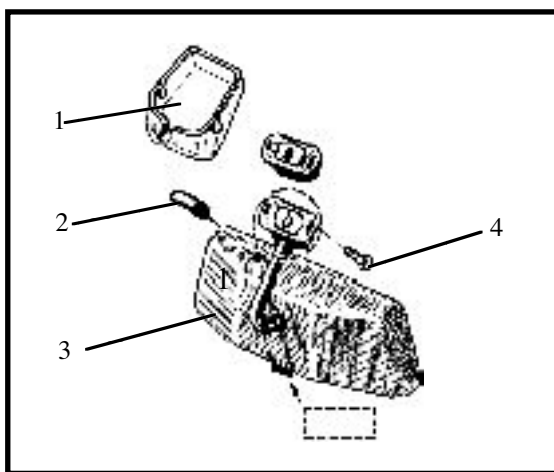
**DISMOUNTING**

Dismount the protector support (1).

Dismount the rubber buffer (2).

Detach from clips the sun visors rod from the inside rear view mirror support.

Release the inside rear view mirror (3) by dismantling the attachmentscrews (4).

**REMOUNTING**

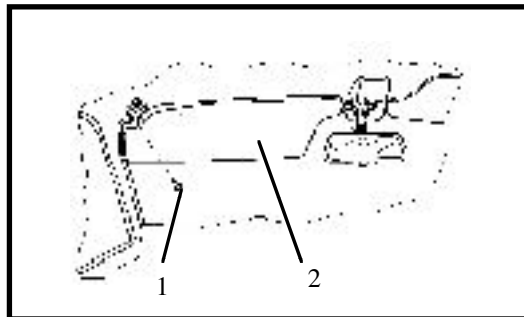
Perform the dismounting operations in reverse order.

**DISMOUNTING**

Take out inside rear view support protector.

Detach the sun visors (2) rod from the inside rear view mirror support.

Release the sun visors (2) by dismantle the attachment screws (1).

**REMOUNTING**

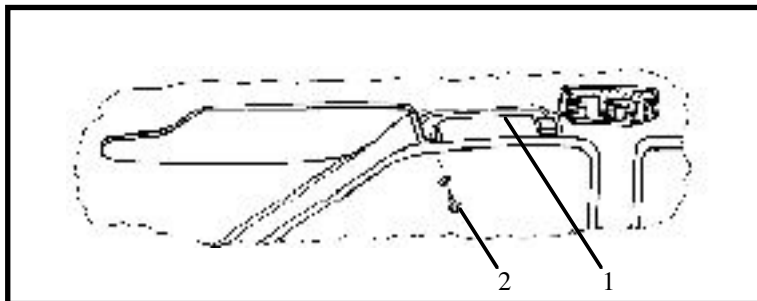
Perform the dismantling operations in reverse order.

**TURN HANDLES**

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**DISMOUNTING**

Dismount the turn handles (1) attachment screws (2) from the stretcher.  
Dismount the turn handles.

**REMOUNTING**

Perform the dismounting operations in reverse order.

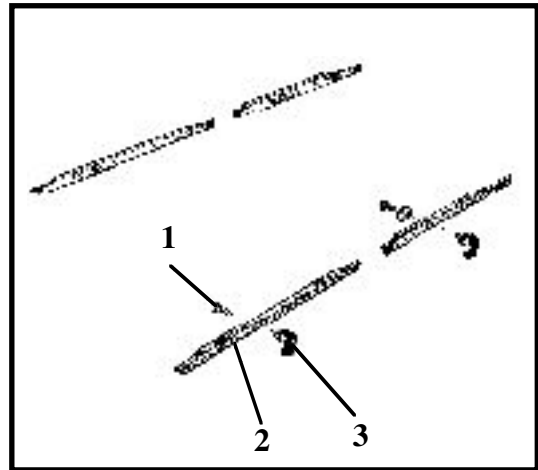
**DISMOUNTING**

Dismount the screws (1) from the cable supports (3).

Release the front doors (2) respectively rear doors thresholds.

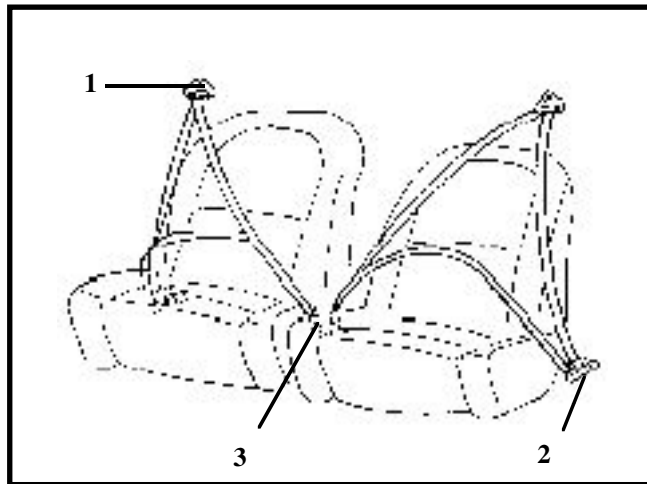
**REMOUNTING**

Perform the dismounting operations in the reverse order.





**DISMOUNTING**

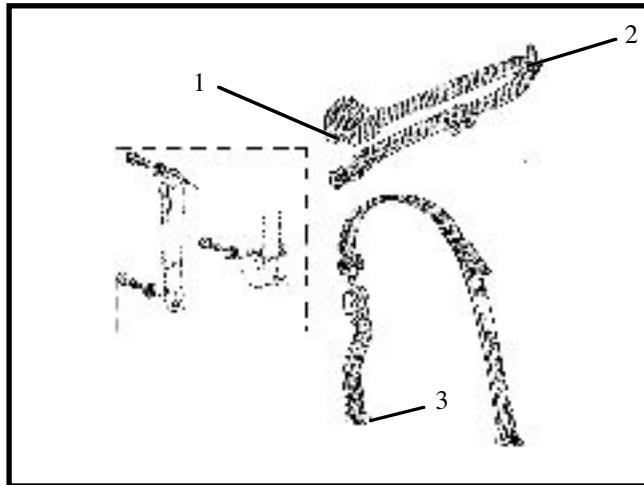


Dismount :

- the protector and attachments front safety belts screws on the upper middle pillar (pos. **1**);
  - the attachments front safety belts screws on the lower middle pillar (pos.**2**);
  - the attachment screw of lock front safety belts on the front plate protection (pos.**3**)
- of fixing front belt on middle pillar – lower part;
- front safety belt.

**REMOUNTING**

Perform the dismounting operations in reverse order.

**DISMOUNTING****Dismount :**

- the protector and the attachment rear safety belt screw on the upper part of lateral panel (pos. 1);
- the attachment rear safety belt screw on the inner lateral frame (pos. 2);
- the attachment screws of the rear belt lock on central floor (pos.3);
- rear safety belt.

**REMOUNTING**

Perform the dismounting operations in reverse order.

**DISMOUNTING**

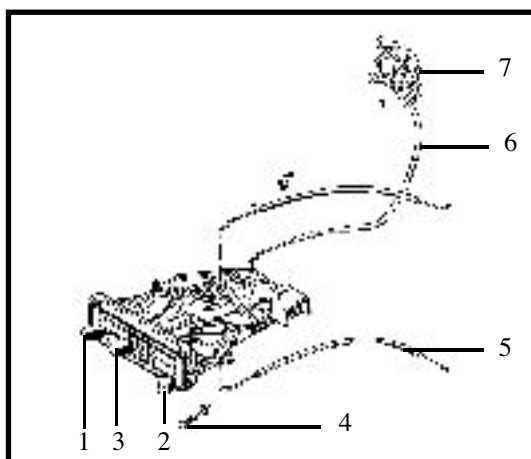
Disconnect the battery.

Dismount the ash try from the dash board.

Dismount the attachment screws (4) of the block on the dash board and detach the block from its place.

Disconnect:

- the control cables (5) of the flaps;
- the control cable (6) of the climate control valve.

**REMountING**

Perform the dismounting operation in the reverse order, observing the following conditions:

- when remounting the flaps cables, operate one by one other, the levers (1) and (2) to the left, leaving a clearance of 3 – 4 mm, the cable sheath being attached in this position, by means of a clip and check the correct operation of the lever and the flap closing;

- the control cable (6) of the climate control valve (7) is mounted to the lever (3), so that the valve is set in the open position ( the arrow direction ) and the lever (3) is moved towards right, leaving a clearance of 3 – 4 mm. In this position attach the cable sheath by means of clip, than check the correct operation of the lever in the position corresponding to the valve closing, respectively opening.

( for the commercials with dashboard type 1325 )

### DISMOUNTING

Disconnect the battery.

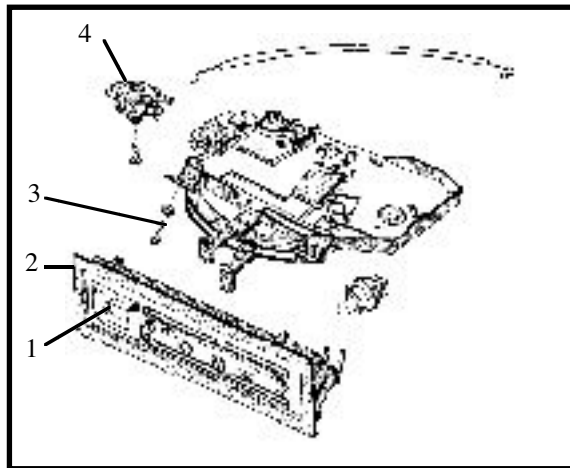
Dismount the switch knob (1), the climate control switch and the luminous plate (2).

Disconnect the connections of the luminous plate and the vacuum hoses.

Dismount the attachment screws (3) of the climate control.

Take out the climate control block from its housing.

Disconnect the climate control valve cable (4) and the climate control cable.



### REMOUNTING

Perform the dismounting operations in the reverse order.

**DISMOUNTING**

In case AC system can not be used, the classis climate control system may be used according to necessities.

Dismount the dashboard.

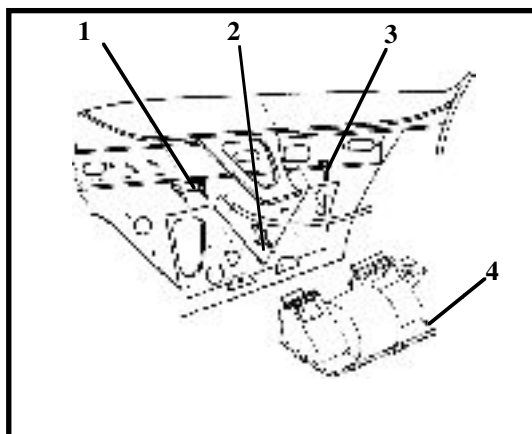
Disconnect the wires from the dashboard wiring.

Dismount the control cables of the distribution flaps and mixing flaps from the control levers and the recycling flaps cable from the climate control panel.

Dismount the ducts of the heating valve and the aeration connection.

Dismount the attachment nuts of the climate control unit (4) - positions (1),(2) and (3).

Detach the climate control unit through inside cockpit, together with the ducts, through the iron plate shutter.



**REMOUNTING**

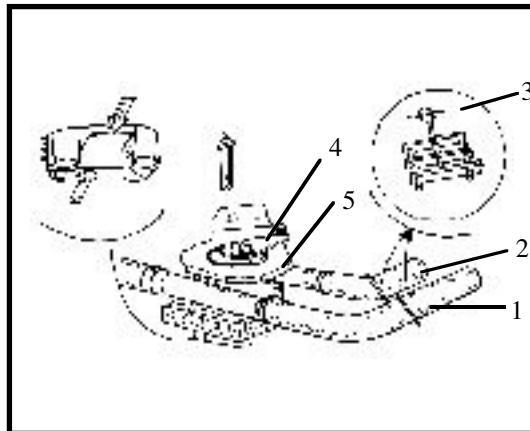
Perform the dismounting operations in the reverse order.

### DISMOUNTING

Clamp the heating hoses (1) , (2) by means of the clamp (3) – **MOT 453** and dismount the hoses from the valve.

Dismount the control cable (4) of the valve (5) and bring the valve in the OFF position.  
Dismount the climate control valve.

**NOTE: The valve cannot be repaired.**



### REMountING

Valve remounting is to be done by performing the dismounting operations in the reverse order, observing the following conditions:

- the valve control cable is mounted at the valve control lever so that valve is set in open position and the control lever is moved to the right, leaving a clearance of 3-4 mm. In this position attach the cable sheath by means of clip, then check the correct operation of the lever and valve closing;

- after remounting the climate control valve, the purging of the cooling system and the checking of the cooling fluid in the expansion vessel must be obligatory performed.

**A.COMMERCIALS EQUIPPED WITH DASH BOARD TYPE SERIES**

Climate control GMV is located under the dashboard, in the right side and can be with one or two rotation steps.

**DISMOUNTING**

Disconnect the battery.

Disconnect the GMV connectors from the right connection plate (+DC).

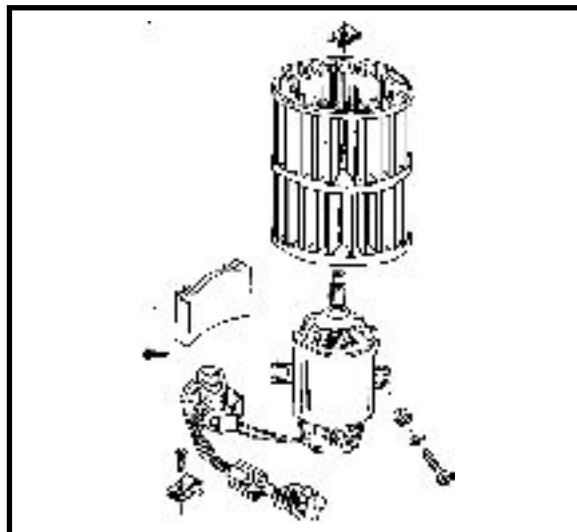
Dismount the attachment screws of the GMV on the iron plate.

**REMOUNTING**

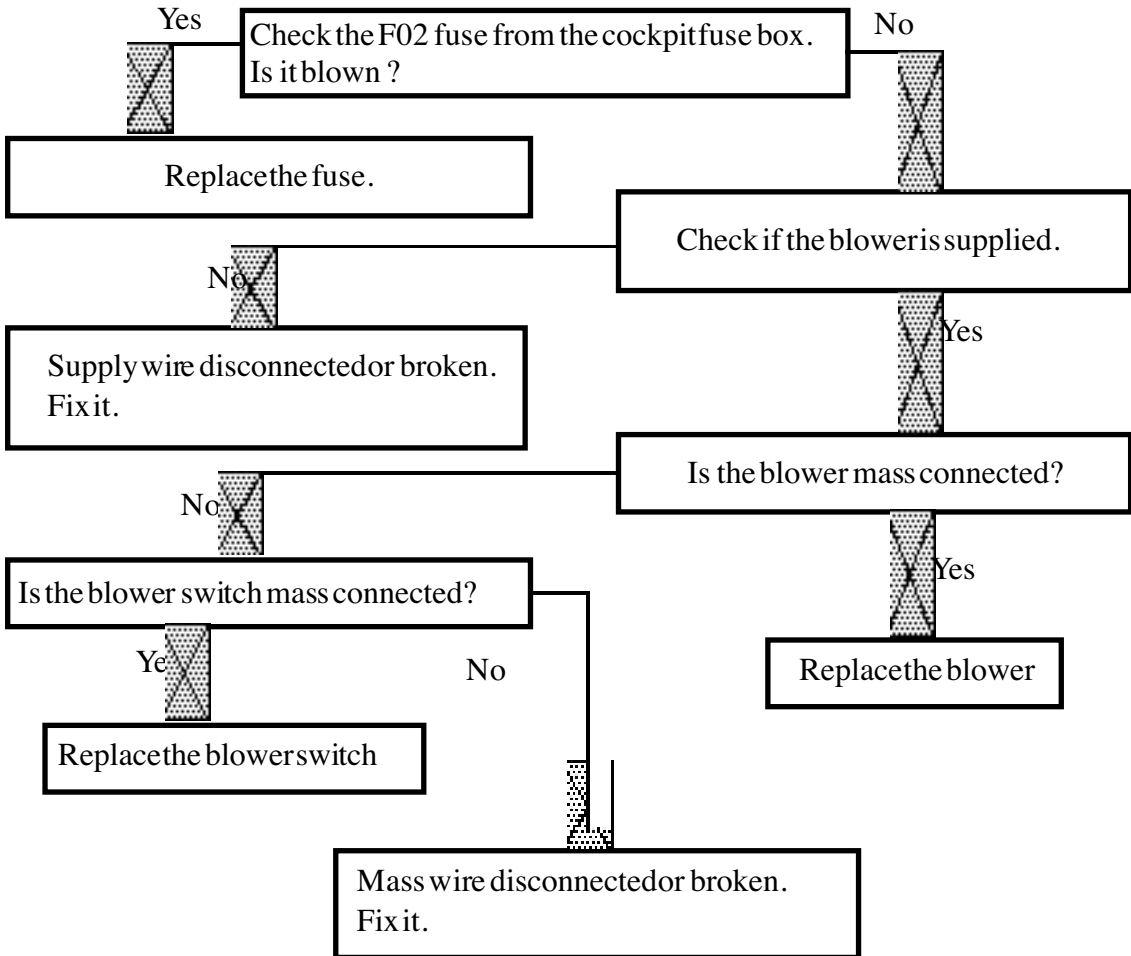
Perform the dismounting operations in the reverse order.

**B.COMMERCIALS EQUIPPED WITH DASHBOARD TYPE 1325**

The climate control GMV is mounted in the climate control unit. It is located under the dashboard, in the central zone, being attached on the iron plate and it has 4 rotation steps. Dismount the GMV, after previously the climate control unit has been dismantled from the vehicle.



CLIMATECONTROLBLOWER NOT WORKING





The purpose of the air conditioning unit is to produce a decrease of the temperature in the passengers compartment and to maintain this temperature at an inferior value compared to the environment one, reducing in the same time the air moisture.

Basically the AC unit is operating in a closed circuit and it is composed of the following main elements:

- evaporator
- compressor
- condenser
- thermostatic expansion valve
- connection pipes.

## DRAINING– FILLING REFRIGERANT CIRCUIT


### DRAINING

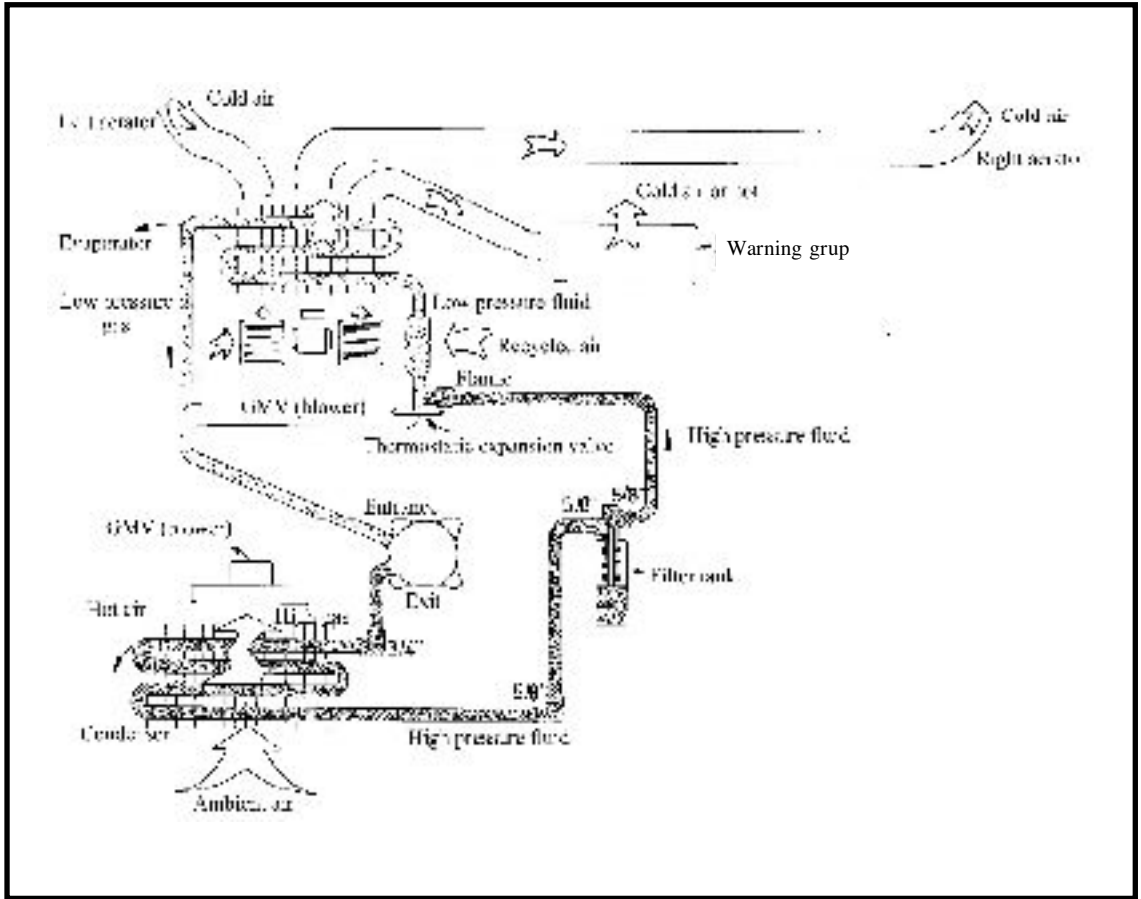
Connect the charging equipment piping to the filling-dRAINING valves.  
Perform the vacuuming of the air condition system, recovering the oil and the refrigerant fluid.  
Close the hoses valves.  
Disconnect the charging equipment piping and stop the equipment.

### TIGHTENING MOMENTS

#### FILLING

Attach the draining – filling hoses of the equipment to the air conditioning valves.  
Put compressor oil type **SP 10** in the charging equipment vessel.  
Set the quantity of the refrigerant fluid which must be charged (**0,700kg**).  
Observe the filling instructions prescribed by the equipment producer.

TIGHTENING MOMENTS ( daNm )	
Thread 1” (14 steps / 1”)	2,5
Thread 3/4” (16 steps / 1”)	1,6
Thread 5/8” (18 steps / 1”)	1,6
The tank filter attachment screw M6	0,44
The tank filter support attachment screw M5	0,5
The upper condenser attachment screw M6-16	1,1
The clip nut pipes attachment clamp on cross - bar	0,1
The compressor attachment screws on supports	3,5
Compressor shaft attachment screw	3,5
The compressor belt tighten nut	3,5
The alternator bracket nut	1,25
The alternator attachment screw on support	2,4
Pressure controller couple	0,7



For important leakage removal, for any components replacement (compressor, condenser, etc) and if moisture was noticed in the air conditioning circuit, the dryer filter tank is to be replaced and the unit draining is to be done. The same is valid also when the conditioning circuit still open without protection covers more than 10 minutes.

For component replacement implying the circuit draining, it is absolutely necessary the use of new parts and of a special oil for compressor.

### *ATTENTION !*

*The new components must be obligatory provided with protection covers. In order to avoid the moisture penetration, protect with protection covers the parts dismantled from the unit.*

*The vehicle equipped with an air conditioning system will be not exposed for more than 20 minutes in painting cabin where there are temperatures higher than 80 grd C.*

*It is absolutely forbidden to perform welding on the elements of the air condition circuits.*

*It is essential using the type of the refrigerating agent and of the compressor oil prescribed by the producer.*

*The filling of the conditioning system can be performed only in authorized service stations, observing the producer's instructions.*

*For mechanical or body operations it is recommended piping protection in order to avoid their disconnection by accident.*

*Avoid the drip of the oil compressor on the painted vehicle body.*

*Avoid the contact between the refrigerant liquid and the body skin because this can produce a refrigerant effect ( temp. of – 26 dgr C).*

*The filling up with oil for different repairs is to be performed by adding in the charging equipment container, the recovered oil quantity, plus an oil quantity, as per following:*

- Condenser replacement .....30 g*
- Evaporator replacement.....30 g*
- Dryer filter replacement.....10 g*

In order to detect the refrigerant liquid leakage, the detector **INFICON** type **HDL 300** (or similar) may be used, calibrated to detect leakage of approx. 9gr./an.

Start the engine and switch on the air conditioning unit. Check through the sight glass of the dryer filter tank if there are any air bubbles; if through the sight glass air bubbles can not be seen, the unit is in good operation, but if air bubbles are occurring and they remain during operation, this shows the lack of refrigerant fluid.

If there are not air bubbles and the air conditioning system is not operating, the refrigerant fluid must be checked.

The lack of refrigerant fluid can be confirmed by measuring the circuit pressure, at a filling station.

***IMPORTANT :***

***When starting each time the compressor, air bubbles appearance through the sight glass, for few seconds, is normal.***

**Condenser** has the purpose to achieve the second heat exchange, where the refrigerant fluid by condensation, is transmitting outside the abstracted heat. When coming out from the condenser, the refrigerant fluid is liquid, at high pressure.

The condenser is made of aluminum, Harrison type, with parallel flows.

It is mounted in front of the vehicle's radiator in the front part of the vehicle and is ensuring the abstraction of heat of the refrigerant fluid.

In order to grant the optimum condenser operation, its outside surfaces must be always clean and air penetration not to be stopped. Also, the condenser pipes must not show deformations.

### DISMOUNTING

Disconnect the battery.

Drain the cooling circuit.

Dismount the radiator.

Drain the refrigerant circuit

Dismount the pipes (1) and (2) connected to the condenser.

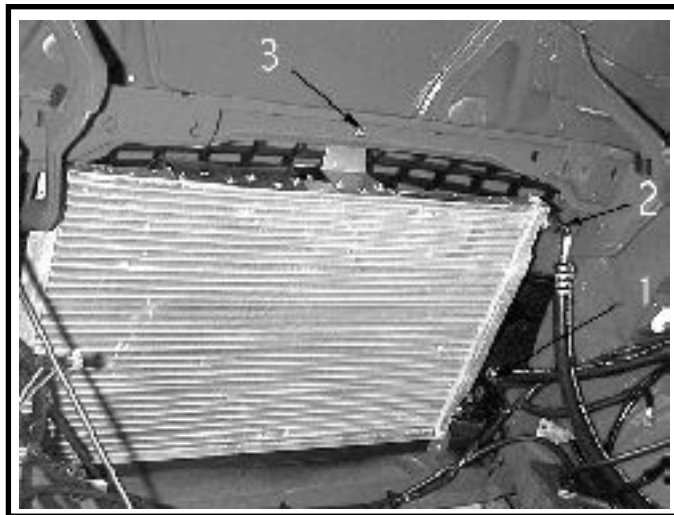
Disconnect the electric connector of the cooling GMV.

Dismount the condenser attachment screw (3) on the upper crossbar.

Detach the condenser.

Separate the GMV from the condenser.

**ATTENTION** : *Avoid the possible deformation of the ducts and finned plates.*



### REMOUNTING

Perform the dismounting operations in the reverse order.

Tighten at the required moment (**1,6 daNm**) the refrigerant fluid pipes attached at the condenser.

Tighten at the required moment (**1,1 daNm**) the condenser attachment screw on the upper crossbar.

The dryer filter tank is mounted by means of a support, on the front wing lining and it has a triple purpose in the air conditioning system:

- filtering the refrigerant fluid from the system;
- absorbing the moisture from the system;
- it is a buffer storage tank of refrigerant fluid.

### FILTER TANK REPLACEMENT

#### DISMOUNTING

Disconnect the battery.

Drain the refrigerant circuit

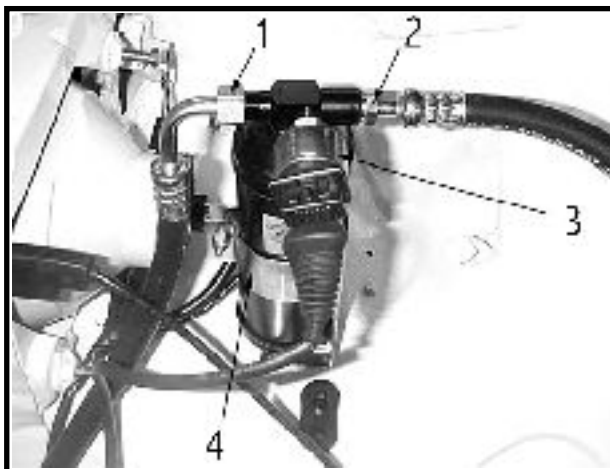
Dismount the refrigerant fluid pipes (1) and (2).

Disconnect the electric connector of the pressure controller.

Dismount the pressure controller (3).

Loosen the attachment ring of the tank filter (4).

Replace the receiver tank filter.



#### REMOUNTING

Perform the dismounting operations in the reverse order.

Tighten at the required moment (**0,4 daNm**) the tank filter attachment nut.

Tighten at the required moment (**1,6 daNm**) the refrigerant fluid pipes connections.

Fill the refrigerant circuit and check the good operation of the unit.

**ATTENTION! Do not mount dryer filter tanks which do not have protection covers.**

**Compressor** is absorbing the vapors coming from the evaporator at low pressure and temperature, is compressing them and convey the gas at high temperature and pressure to the condenser.

The compressor is type Harrison V5, alternating with pistons and variable cylinders capacity. Compressor oil used **PAG SP 10**

Quantity of compressor oil used **265 cmc**

The compressor is mounted on the left side of the engine block by means of two supports.

### *ATTENTION !*

*During handling the compressor oil, reduce to minimum the oil contact with the air, which contains moisture.*

### DISMOUNTING

Disconnect the battery.

Drain the refrigerant circuit

Disconnect the pipes (1) and (2) from the compressor.

Dismount the tensioning clip (3) and the alternator belt.

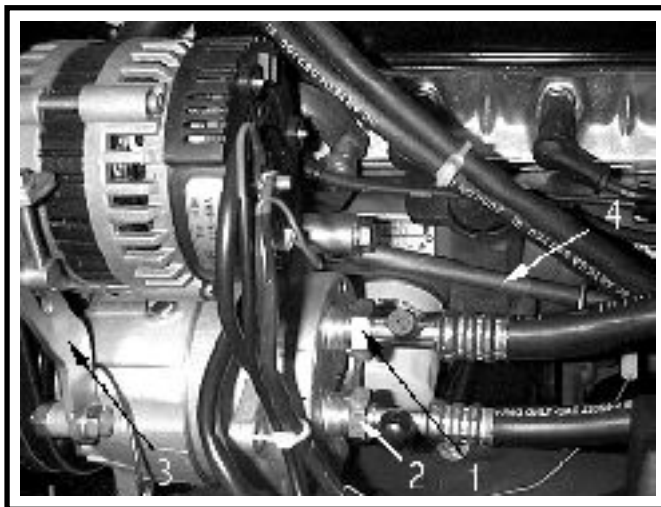
Disconnect the electric connectors of the alternator and the electric connector of the compressor.

Dismount the alternator attachment screw on the support and detach the alternator.

Dismount the compressor tie rod (4).

Dismount the compressor attachment screws on supports.

Dismount the compressor.





**REMOUNTING**

Position the compressor on the attachment supports.

Tighten the compressor on the supports, by means of 3 screws, which are to be initially screwed in the following order : front upper left, rear lower right, front lower left.

Position and tighten the tie rod on the compressor upper support and on the cylinder housing.

Screw and tighten at the required moment the compressor attachment screws in the following order : front upper left, front lower left, rear upper right, rear lower right  
**(3,5 daNm)**.

Tighten at the required moment the tie rod attachment screw on the cylinder housing **(3,5 daNm)**.

Mount and tension the alternator belt by acting upon the tightener screw (see chapt. "Belt tightening checking and tensioning"), then lock it, by tightening the tightener nut at the required moment **(3,5 daNm)**.

Tension the alternator belt (see chapt. "Belt tightening checking and tensioning") and tighten at the required moment **(1,25 daNm)** the alternator clamp attachment nut. and the clamp for alternator belt tightener.

Tighten at the required moment the alternator attachment screw on the support  
**(2,4 daNm)**.

Mount the pipes to the compressor and tighten them at the required moment **(2,5 daNm)**.

**ATTENTION !**

*The compressor – evaporator pipe of 1 1/2", is the suction pipe, and the compressor – condenser pipe of 1 3/8", is the discharging pipe ( in case mounting is not correct, the system is not working).*

*Fill the refrigerant circuit and check the climate control system operation.*

*NOTE : When compressor is replaced, obligatory replace also the tank filter.*

## COMPRESSOR SUPPORTS

### DISMOUNTING

Dismount the compressor (see “Compressor replacement”).

Dismount the upper support.

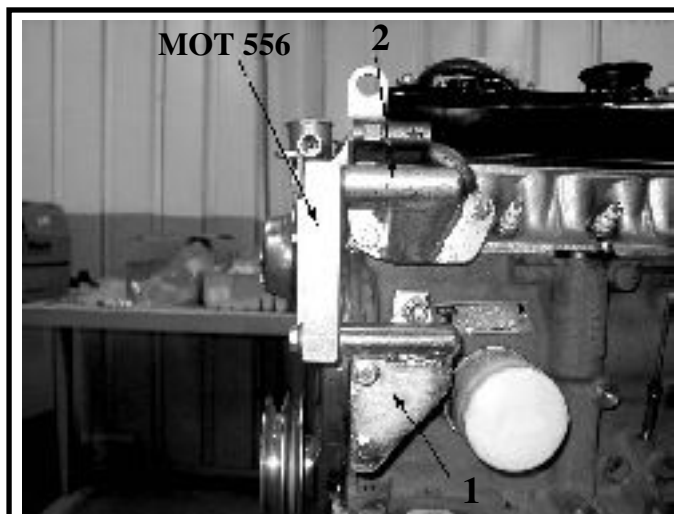
Dismount the lower support.

### REMOUNTING

Position the lower support (1) of the compressor on the cylinder housing and initially tighten its attachment screws.

Position the upper support (2) of the compressor on the cylinder head and initially tighten its attachment screws.

Position adjustment device MOT 556 on the upper and lower supports and slightly tighten its attachment screws on the supports.



Tighten at the required moment (1,9 daNm) the upper support attachment screws in the following order: lower left, upper right.

Tighten at the required moment the lower support attachment screws in the following order: upper left (3 daNm), lower left (1,9 daNm), upper right (3,5 daNm).

Dismount the adjustment device.

Perform the other operations as dismounting in the reverse order.

Tension the compressor belt.

Tension the alternator belt.

Fill the refrigerant circuit and check the climate control operation.

**Evaporator** has the purpose to transfer to the refrigerant liquid the air heat, which is passing through it

The cooled air, is so conveyed in the passengers compartment, progressively reducing the temperature. The refrigerant fluid which goes into the evaporator, absorbs the passengers compartment heat, cycled transmitted by the GMV-AC at constant temperature and is transforming it from liquid into vapors.

At the inlet refrigerant is liquid at the outlet in G.M.V. – AC it has changes into gas.

The evaporator consists of a package with slotted aluminum plates, separated by an empty “U-shape” space, where the refrigerant fluid flow is pushed.

The evaporator is mounted on the iron plate, in the right side, under the dashboard, right side, under the dashboard.

### DISMOUNTING

Disconnect the battery.

Drain the refrigerant circuit

Dismounting the dashboard.

Remove anti-condense sealing material.

Disconnect the pipes evaporator – compressor and evaporator – tank filter.

Disconnect the connector of the evaporator GMV.

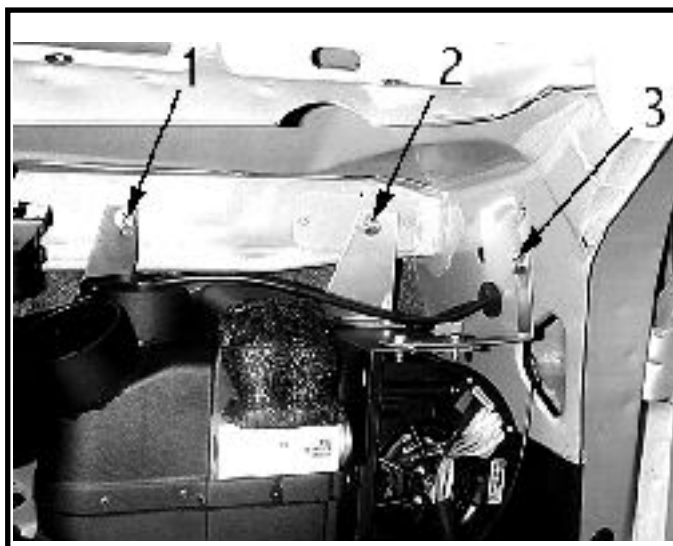
Dismount the thermostatic expansion valve.

Disconnect the air flow pipes.

Dismount the front attachment nuts (1) and (2) of the evaporator unit.

Dismount the evaporator attachment screw (3) on the right front pillar.

Dismount the evaporator.



**REMOUNTING**

Perform the dismounting operations in the reverse order.

Fill the refrigerant circuit and check the good operation of the climate control system.

**NOTE :**

*Ensure that evaporator finned plates are not deformed and they are not excessive dirty.*

**ATTENTION !**

*For mounting or remounting the piping connections from refrigerant circuit, use two wrenches to balance the tightening moment in order to avoid the piping spinning.*

The air conditioning system piping ensure the refrigerant fluid circulation between the system components.

When pipes are replaced, check the existence of the protective covers. Lubricate the connections and gaskets with compressor oil and fill up with compressor oil.

The system filling and draining valves are placed on the compressor piping and have different diameters, so that they can not be reversed.

When one air conditioning pipe is replaced it is compulsory that its mounting to be performed immediately after dismantling the protection cover.

Piping compressor – condenser .....	13/32”
Piping compressor – evaporator .....	1/2”
Piping condenser - tank filter .....	5/16”
Piping tank filter – evaporator .....	5/16”

**Thermostatic expansion valve** – allows the reduction of the refrigerant liquid which is coming from the condenser, passing through the tank filter and is continuously adjusting the refrigerant flow from the evaporator, to reach the compressor in gaseous shape.

The good operation of the air conditioning system is ensured by a dryer filter tank which has the purpose to protect the unit by absorbing the eventually solid particles found in the oil and refrigerant liquid circulation, if not, these might block the operation of the thermostatic expansion valve or may produce the compressor mobile parts worn or gripping.

**Refrigerant:** HFC 134 a

**Quantity of refrigerant:** 0,700 kg.

**Compressor oil:** PAG SP 10

**Quantity of compressor oil:** 265 cmc.

### REPLACEMENT THE THERMOSTATIC EXPANSION VALVE

#### DISMOUNTING

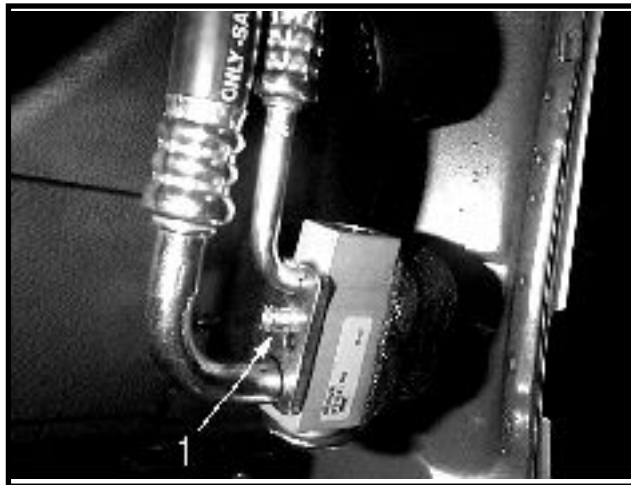
Clean the anti-condense sealant material.

Dismount the refrigerant fluid piping attachment flange (1) on the thermostatic expansion valve.

Mount protection covers at the two refrigerant fluid pipes.

Dismounting the thermostatic expansion valve

Replace the thermostatic expansion valve.



#### REMOUNTING

Perform the dismounting operations in the reverse order.

Lubricate the connections and sealing gaskets (“O” rings) with compressor oil,

**PAG – SP 10.**

Mount the anti-condense sealant material over the refrigerant fluid pipes from the thermostatic expansion valve.

## **PRESSURE CONTROLLER**

The pressure controller is mounted on the dryer filter tank.

The pressure controller is an electric/mechanical device, which has the purpose to protect the air conditioning unit and it has the following functions:

- cuts off the compressor operation, when the pressure in the high pressure circuit is lowering more than **2,5 bars**.

- cuts off the compressor operation, when the pressure in the high pressure circuit is more than **27 bars**.

starts the cooling GMV, when the pressure in the high pressure circuit is more than **16 bars** and cuts off the GMV when the pressure is lowering more than **12 bars**.

## **PRESSURE CONTROLLER REPLACEMENT**

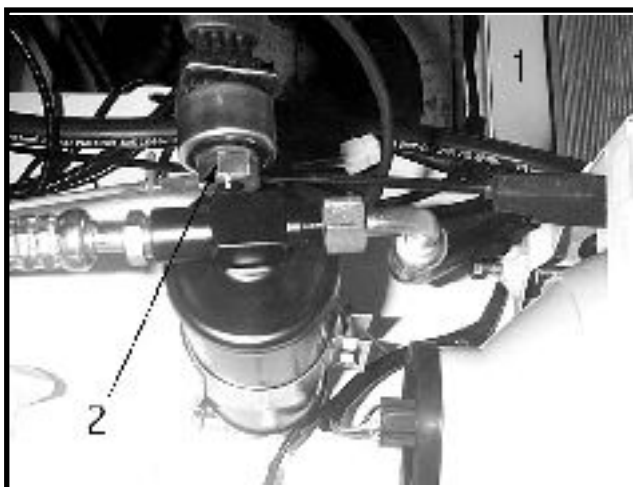
### **DISMOUNTING**

The dismantling of pressure controller may be performed without draining the refrigerant circuit.

Disconnect the battery.

Disconnect the connector (1) of the pressure controller.

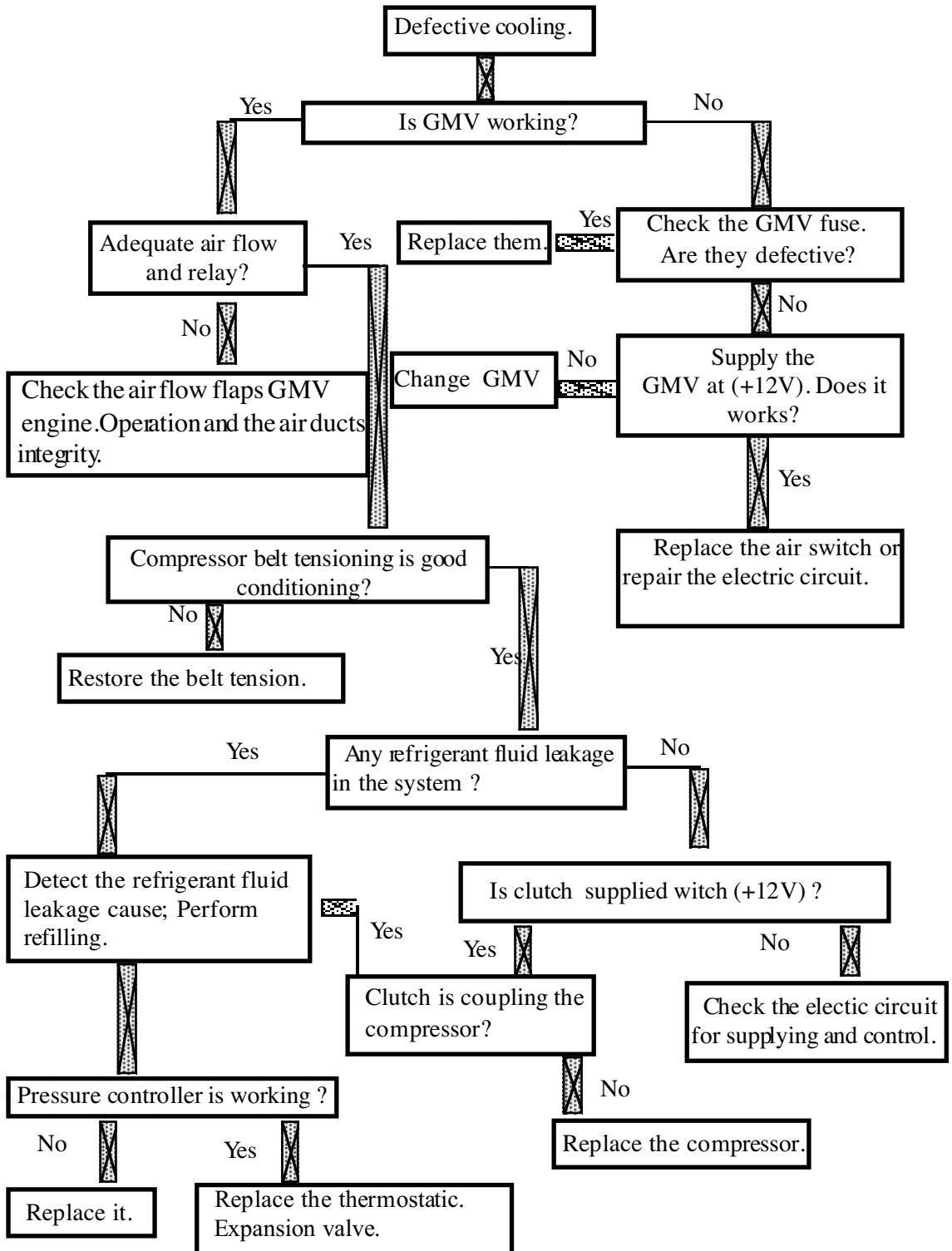
Dismount the pressure controller (2).



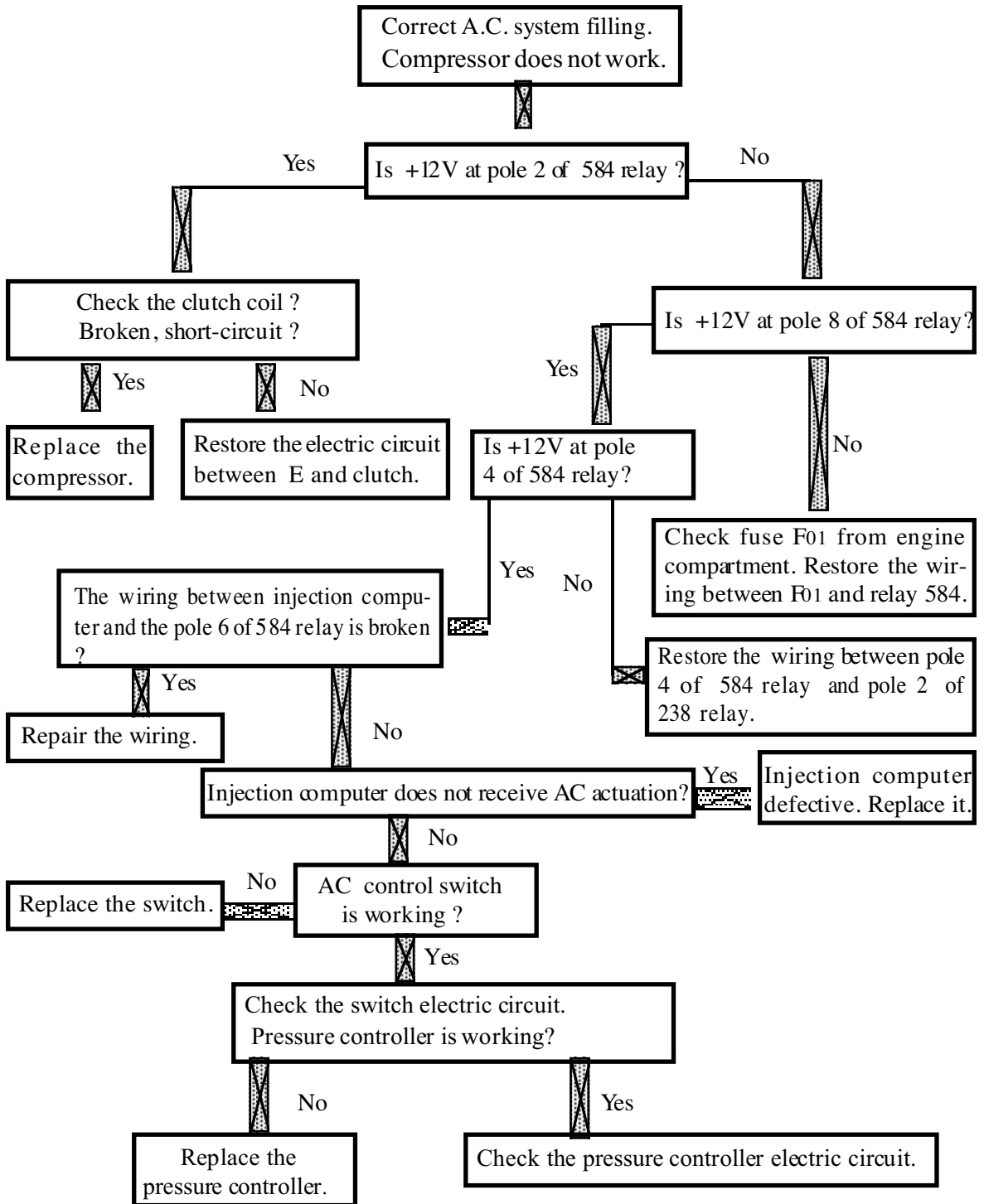
### **REMOUNTING**

Perform the dismantling operations in the reverse order.

Tightening at the required moment the pressure controller (**0,7 daNm**).



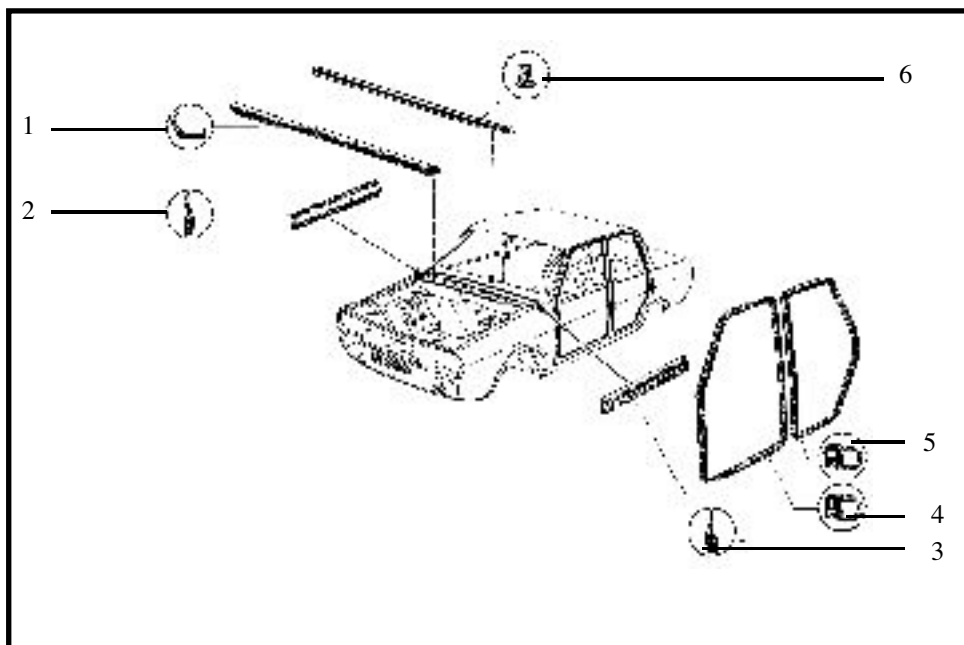




## DISMOUNTING

- 1 - gasket under front grill
- 2 - front bonnet gasket
- 3,4 - wing chute gaskets
- 5,6 - rear/front doors frames gaskets

Manually dismount by pulling one end toward applying area external.

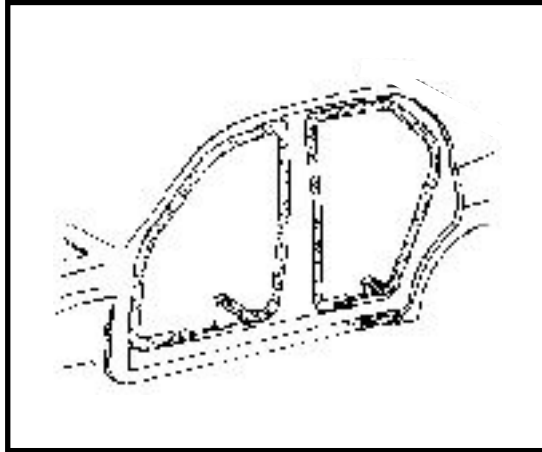


## REMOUNTING

To be mounted by hammer tapping. Cut the extra ends. Tighten the clipping areas

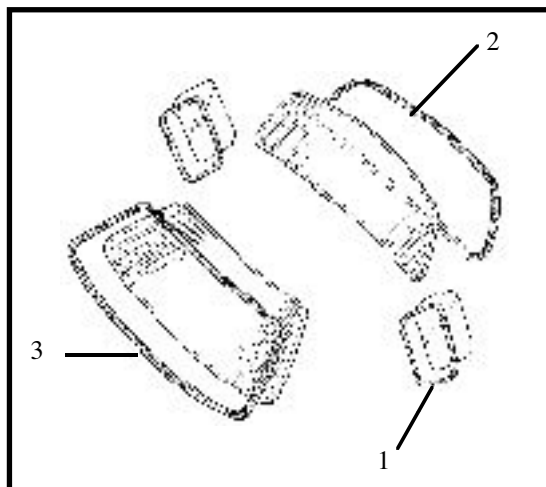
**DISMOUNTING**

Dismount the gaskets from the door profile, by pulling them towards exterior, following the door outline.

**REMOUNTING**

Perform the dismounting operations in the reverse order.

Mounting of the sealing gaskets on the door frames is performed by plastic hammer tapping.



- 1 - Side glass rubber gasket ( D 1304 King - cab )
- 2 - Separating wall glass rubber gasket
- 3 - Windshield rubber gasket

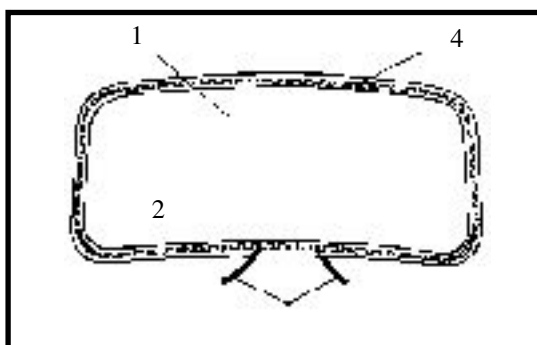
#### DISMOUNTING

Remove the glass together with the rubber gasket, by pushing it from the interior of the vehicle.

Clean the rubber gasket if it will be reused or replace it with a new one.

#### REMOUNTING

Place the rubber gasket around the glass on all its contour, where previously has been introduced a cotton rope (4) with the diameter of **3-4 mm** leaving some 20 cm of free rope at each end (3) but no more than **10 cm** between ends.



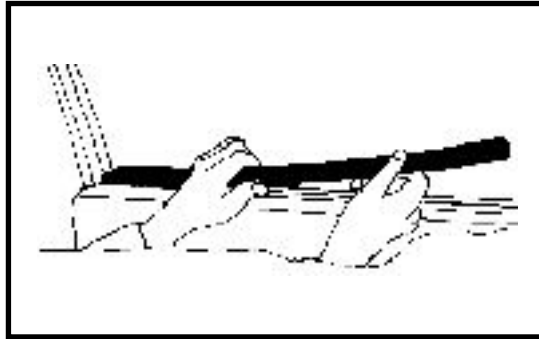
For glasses dismounting/remounting please see s/chapter 54.

**DISMOUNTING**

Dismount the arm rest at the upper part.

Dismount the window regulator handle and the inner opening mechanism.

Dismount the panel by removing it from clips and take out the inner wiper.

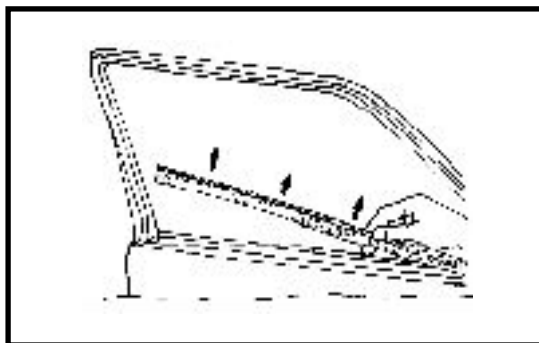
**REMountING**

Perform the dismounting operations in the reverse order.

**DISMOUNTING**

Lower the window to the minimum position

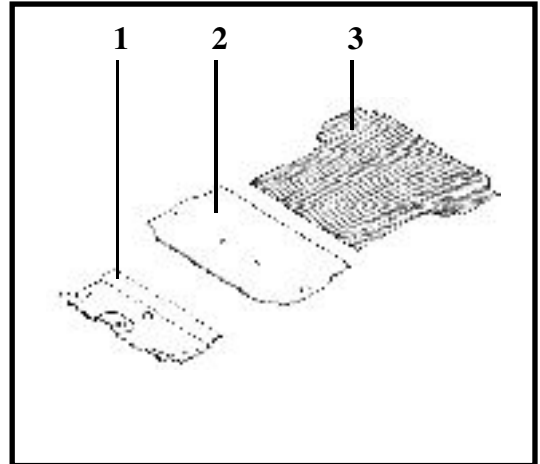
The dismounting of the outside wiper is performed by removing it from the fixing clips.



**REMOUNTING**

Perform the dismounting operations in the reverse order.

1. molded carpet
2. under bench carpet ( Dacia Double Cab)
3. platform carpet ( bed mat)

**MOLDED CARPET****DISMOUNTING**

Dismount:

- the front seats
- the front safety belts locks
- the gearbox lever ornament
- the front/rear doors thresholds.

Dismount by hand the molded carpet.

**REMOUNTING**

Perform the dismounting operations in the reverse order.

**UNDER BENCH CARPETS ( DACIA DOUBLE CAB )****DISMOUNTING**

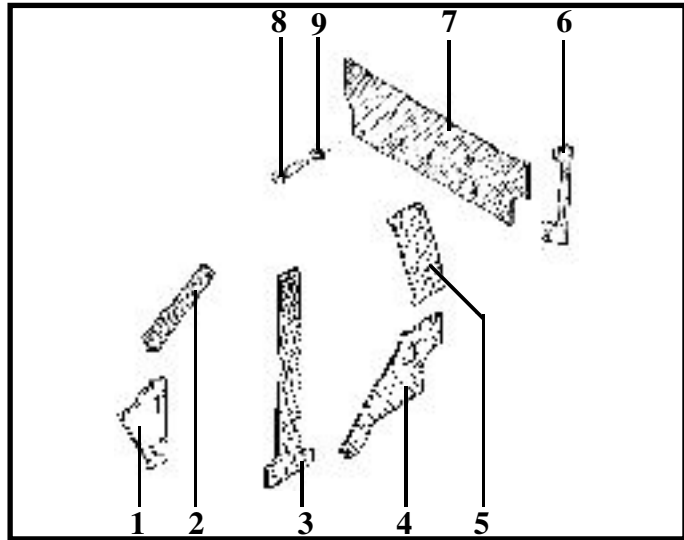
Dismount :

- the rear bench
  - the rear safety belts locks that are attached on the intermediary floor.
- Dismount by hand the carpet under the bench.

**REMOUNTING**

Perform in the reverse order the dismounting operations.

1. front pillar covering
2. windscreen covering
3. middle pillar lining
4. side lining lower covering
5. upper side panel lining
6. side panel covering
7. cabin wall lining
8. plate screw
9. flat washer



### REPLACEMENT OF THE WINDSCREEN COVERING

#### DISMOUNTING

Dismount :

- the windscreen
- partially the front doors weather-strip.

Unstuck the windscreen covering

#### REMOUNTING

Perform the dismounting operations in the reverse order.



**REPLACEMENT OF THE MIDDLE PILLAR LINING**

**DISMOUNTING**

Move ahead the front seat, in order to enable the access at the middle pillar.

Dismount :

- the front thresholds
- partially the front/rear doors weather-strips
- the front safety belts at their upper/lower part attachment on the middle pillar.

Unstuck in the reverse order of the dismounting operations.

**REMOUNTING**

Perform the dismounting operations in the reverse order.

**REPLACEMENT OF THE UPPER SIDE PANEL LINING**

**DISMOUNTING**

Swing over the rear bench back

Dismount :

- the rear safety belts at the upper part.
- partially the rear doors weather-strip.

Unstuck the upper side panel lining.

**REMOUNTING**

Perform the dismounting operations in the reverse order.

**REPLACEMENT OF THE CABIN WALL LINING**

**DISMOUNTING**

Swing over the rear bench back

Dismount :

- the rear glass grill
- the rear cabin glass
- the screws and washers attaching the cabin wall lining.

**REMOUNTING**

Perform the dismounting operations in the reverse order.

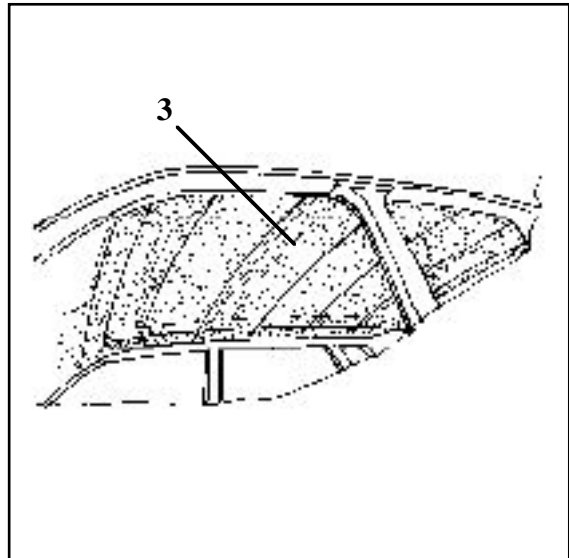
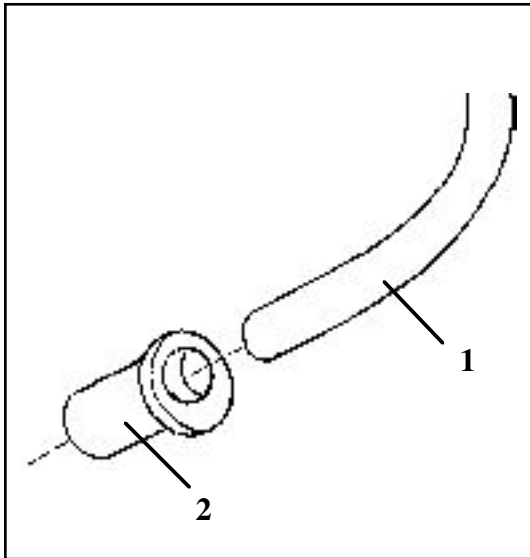
**REPLACEMENT OF THE CEILING COVERING****DISMOUNTING**

Dismount :

- the front and rear doors weather-strips;
- the front windshield and the cabin separating glass;
- the side lamps, sun visors and turn handles ;
- the ceiling covering from the front doors upper frames, rear doors upper frames ( Dacia Double Cab, windshield fixing frame and the cabin rear glass in the contact areas with the ceiling covering.

Remove the rods (1) assembled with the plastic bushings (2) ( arch ends ) from the side taps.

Release the covering (3) by unstuck it and remove the rods from the corresponding sleeves.

**REMOUNTING**

Perform the dismounting operations in the reverse order, by consecutive mounting of the rods, positioning and stacking of the ceiling covering edges on the windshield fixing frame, on the front and rear ( Dacia Double Cab ) upper frames and creating the access for the side lamps.

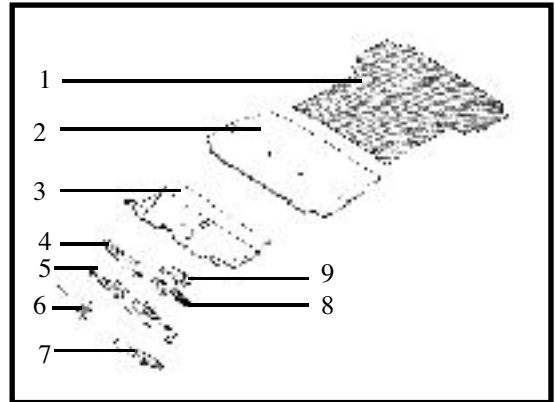
**DISMOUNTING**

Dismount by hand the floor mat (1) the under bench mat (2) and the molded mat (3).

Remove (unstuck): front cross member noise absorbents (4),(8),the cowlpanel noise absorbent (5), the front wheel noise absorbents (6) ,(7) and the gearbox casing noiseabsorbent(9).

**REMOUNTING**

Perform the dismounting operations in the reverse order, the stacking of the elements no. 3,4,5,6,7,8,9 being done with adhesive.



**DISMOUNTING**

Dismount:

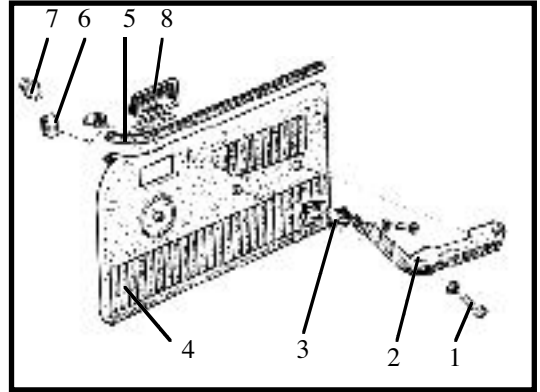
- the arm rest connection (3);
- the arm rest (2) from the screws (1);
- the window regulator handle;
- the distance control cover (8) by

dismounting the attachment screw;

- the inner wiper (5) from the clips (6);
- the store box (9).

Detach the front door panel from its clips.

Pull toward exterior to enable the panel releasing from the attachment done by clips (7).

**REMOUNTING**

Perform the dismounting operations in the reverse order.

**DISMOUNTING****Dismount:**

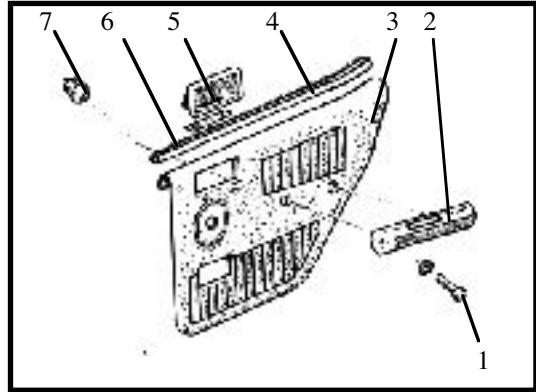
- the arm rest (2) from the screws (1);
- the window regulator handle;
- the distance control cover (5) by

dismounting the attachment screw;

- the inner wiper (4) from the clips (6);
- the store box (9).

Detach the rear door panel from its clips.

Pull toward exterior to enable the panel releasing from the attachment done by clips (7).

**REMOUNTING**

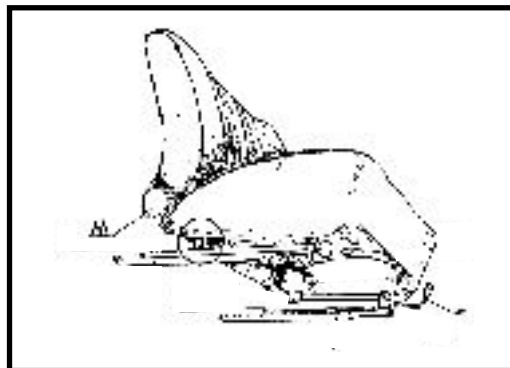
Perform the dismounting operations in the reverse order.

**ADJUSTMENTS**

The front seats equipping the Dacia vehicles offer the following adjustment possibilities:

- longitudinal displacement back and forth which may be performed by using the control lever (**L**).

- the back rest rocking until the horizontal position is obtained by using the button (**M**).

**DISMOUNTING**

In order to dismount the seat, perform the following operations :

Lift the control lever (**L**), bring the seat in the front position and dismount the screws (**5**) as well as the seat attachment cross-pieces (**6**) on the central floor (the rear part).

Bring the seat in the back position and dismount the seat attachments screws (**2**) and cross-pieces (**1**) on the central floor (the front part).

**REMOUNTING**

Perform the dismounting operations in the reverse order.



**REPLACEMENT****DISMOUNTING**

Dismount the seat off the vehicle.  
Dismount the slide guides from the front seat.  
Remove the upholstery and the clothing from the armature.

**REMOUNTING**

Perform the dismounting operations in the reverse order.



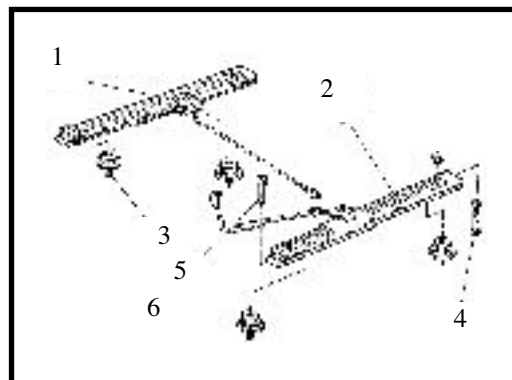
**DISMOUNTING**

Dismount:

- the front seat attachment screws (5) and cross- pieces (3) and (6) on the central floor;
- the slide guides (1) and (2) attachment screw (4) on the seat armature;
- release the slide guides (1) and (2).

**REMOUNTING**

Perform the dismounting operations in the reverse order.



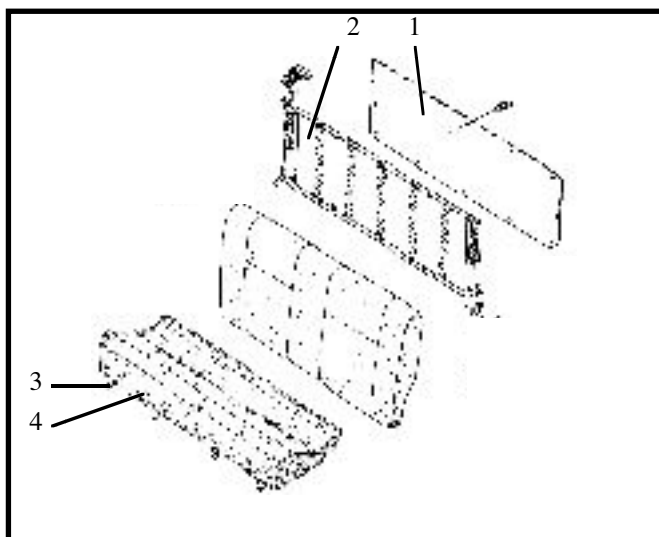
**DISMOUNTING**

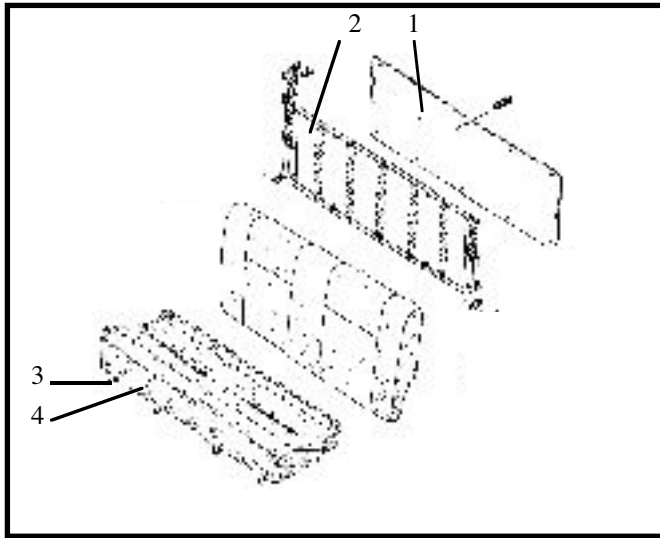
Dismount the closing plate (1) by removing it from the clips of the rear bench back rest.

Dismount the upholstery and clothing from the rear bench back rest (2).

**REMOUNTING**

Perform the dismounting operations in the reverse order





### DISMOUNTING

The rear bench seat (4) is dismantled by rocking it in the supports (3).  
Remove the upholstery from the seat clothing.

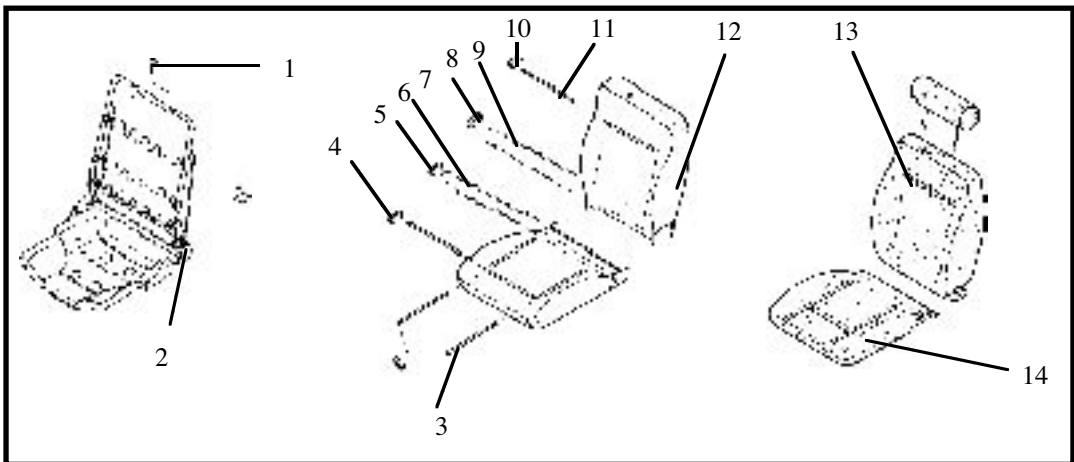
### REMOUNTING

Perform the dismantling operations in the reverse order .

**DISMOUNTING**

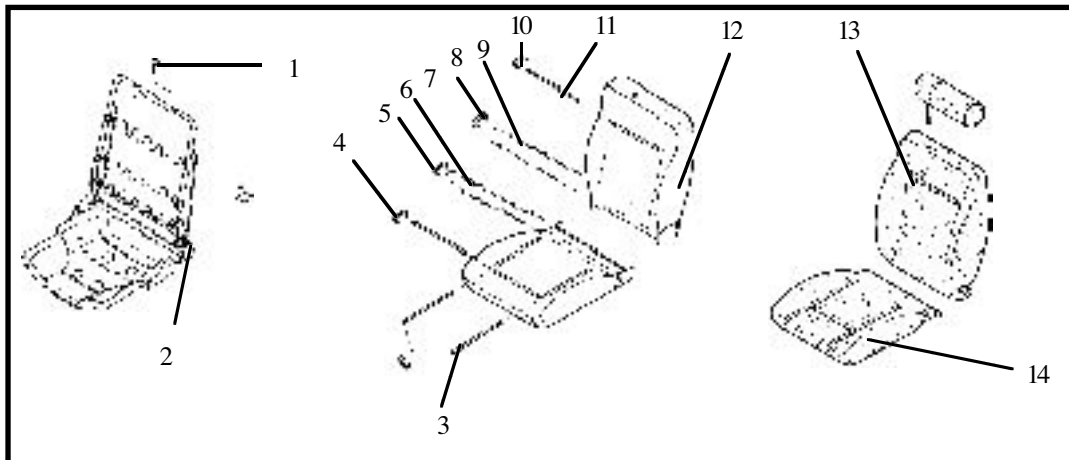
Take out the rods (3) from the seat upholstery (7) attachment clips (4) on the clothing (14).

Take out the rods (6) from the attachment clips (5) with the front seat armature.

**REMOUNTING**

Perform the dismounting operations in the reverse order.

## FRONT SEAT TRIM BACKREST UPHOLSTERY



### DISMOUNTING

Dismount the back rest control button (2) releasing the screw, the washer, the plate and the counter plate.

Remove the sleeves for the headrest from the pipes (1) welded on the front seat armature. Take out the rods (9) from the clips (8).

Take out at the second criss cross arch level the rod (11) from the attachment clips (10) of the back rest upholstery (12) on the clothing (13) and remove the back rest upholstery.

### REMOUNTING

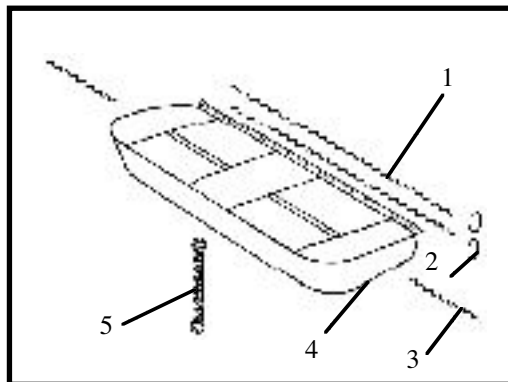
Perform the dismounting operations in the reverse order.

**DISMOUNTING**

Take out the rods (1) from the attachment clips (2) of the seat upholstery (4) with the seat clothing.

Dismount the rods (3) from the chains (5), consequently the attachment clips from the bench seat armature rod.

Remove the upholstery from the seat clothing.

**REMOUNTING**

Perform the dismounting operations in the reverse order.

## REAR SEAT TRIM BENCHBACK RESTUPHOLSTERY

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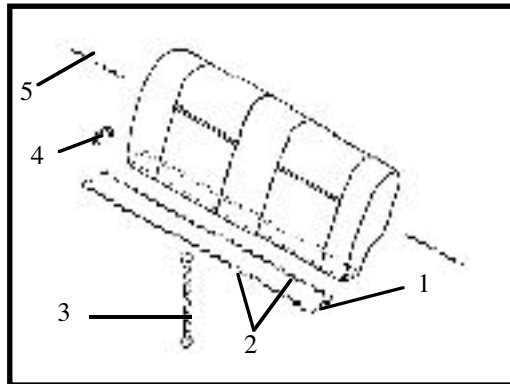
### DISMOUNTING

Dismount the back rest plate from its plastic clips.

Take out from clips the rods (2) at the lower part and the side ends rods (1) from the clips (4)

Release the clipping rods (5) from the attachment with the back rest clothing, by means of the chains (3).

Remove the back rest upholstery from the bench back rest clothing.



### REMOUNTING

Perform the dismounting operations in the reverse order.



**ELECTRIC EQUIPMENT PROTECTION**

When performing a repair at the vehicle, a set of actions must be taken to protect the electric equipments of damages or to avoid a short-circuit which may lead to vehicle burning. The battery is always disconnected by first disconnecting the negative terminal and then the positive one. The connecting is done in reverse order.

Before starter operation, check if the battery is correctly connected ( negative terminal connected at the mass, if the terminals are clean and well tightened. Never disconnect the battery when engine is running order to avoid damages on voltage regulator or the alternator.

Disconnecting of the alternator, the voltage regulator, the battery and the repairs at their connections are to be performed only when the engine is stopped ( the alternator is not turning ).

In case of the battery connection to a charging rectifier, for charging purpose, ( without dismantling the battery from the vehicle), it is obligatory to disconnect the heavy wiring from the battery terminals.

In case electric welding is performed on vehicle body, disconnect the battery terminals and the connections plugs to the alternator

Some external or functional factors have a direct impact on the electric equipment, which has as effect the modification in time of the nominal parameters of the component elements of the electric equipment, affecting their reliability and operating safety.

The main affecting factors are:

- **Temperature** – some elements being placed next to the engine, are obliged to operate at high temperatures.

- **Humidity** – the electric equipment components are operating in a an environment where they may be in contact with water, oil or fuel, consequently there is the danger of contacts oxidation and destruction of the electric wires insulation.

- **Variable running condition** – the running condition of the engine being variable, it signifies that electric equipment elements which are geared by the engine will also have a variable running condition.

- **Requests of energy sources** – when starting the engine by means of the starter, the battery is requested at high currents and after engine starting, due to the variable number of consumers and to the variable rotation regime of the alternator, the battery is forced to pass, in a short period of time, from unloading regime to loading regime and viceversa.

## BATTERY

## BATTERY

## CHARACTERISTICS

The DACIA vehicles are equipped with the following types of batteries: **12V/45 Ah**, **55 Ah**, and **60 Ah**. The battery is attached to its support by means of a clip, supported by two bars. The battery is connected to the vehicle electric system with the negative terminal to the mass. The battery terminals and cables clips shall be clean and well tightened, after which they shall be greased with neutral grease.

The electrolyte level shall be maintained **10–15 mm** over the upper edge of the separators.

If lowering of the electrolyte level is noticed due to evaporation, the refilling is to be done only with distilled water or free of minerals water.

Never empty the electrolyte off the battery.

The charging degree of the battery may be established by means of the densimeter, comparing the values obtained, with the ones of the following table:

ELECTROLITE DENSITY [ g/cm <sup>3</sup> ]		BATTERY CONDITION
IN TEMPERATE CLIMATE	IN TROPICAL CLIMATE	
1,28	1,23	100 % charged
1,20	1,15	50 % charged
1,12	1,09	discharged

## ELECTROLYTE PREPARATION

The electrolyte is obtained from sulfuric acid for batteries **STAS 164 /75** and distilled or free of minerals water, without impurities.

When preparing the electrolyte, use vessels and funnels made of materials resistant to acids (lead, glass, ceramics) that not made impurities or elements that should discharged early the battery.

When preparing the electrolyte, pour the acid into the water; **never pour water over the acid**. There is **danger of explosion!**

When preparing the electrolyte, use vessels and funnels made of lead, glass or ceramic, materials which do not react with the sulfuric acid and are not producing impurities or compounds which may lead to early self discharging of the battery.

Depending on the climate area where the battery is used, the electrolyte density measured at 15° C, must be:

- 1,23 g / cm ≈ for tropical climate;
- 1,28 g / cm ≈ for temperate climate;
- 1,30 g / cm ≈ for cold climate.

**BATTERY**

ELECTROLYTE DENSITY [ g/cm <sup>3</sup> ]	QUANTITY OF SULFURIC ACID [ cm <sup>3</sup> ]
1,23	290
1,25	328
1,27	368
1,29	412

To prepare electrolyte of a certain density, for each liter of distilled water, add a quantity of sulfuric acid as per a.m. table.

**BATTERY CHARGING**

The batteries are charged in special rooms, well ventilated, where the working temperature shall be of **20 – 25° C**.

**The dry-discharged batteries** shall be filled with electrolyte with 1,26 g/cm<sup>3</sup> density at a temperature of **15 – 25 °C** until the level of the electrolyte is **10 – 15 mm** over the upper edge of the separators; after a **2 – 3 hours** pause, during which the electrolyte penetrates the plates, check again the level, and refill with electrolyte of same concentration.

The battery prepared in this way, shall be charged by a continuous current source (rectifier), which will be connected with the (+) terminal at the (=) terminal of the battery and the (-) terminal at the (-) terminal of the battery. The charging shall be performed only when the electrolyte temperature is not higher than 30°C, and the battery will be immersed in a cooling vessel, with the level at 2/3 from the battery height.

The battery charging is performed in two stages, the battery without plugs, as follows:

- **stage I** - adjust the charging current (**II**) to **10 %** of the battery nominal capacity (**II = C n / 10**) - and shall be maintained at a constant value until the voltage per element reaches **2,4 V**. The temperature of electrolyte shall not be over **30° C**; in this case the charging shall be stopped in first stage **I** and follows the charging in second stage **II**.

- **stage II** - adjust the charging current (**III**) to **5 %** of the battery nominal capacity (**III = C n / 20**) and shall be maintained until the end of charging, when can be notice an active gas emission from all elements, the electrolyte density increases to 1,28 c / cm<sup>3</sup> and the voltage reaches at 2,6 – 2,75 V / element, these values being necessary to remain constant during 3 hours, in case of a good battery.

The charging currents of the batteries are showed in the following table:

TYPE OF BATTERY	NOMINAL VOLTAGE [ V ]	CHARGING CURRENT	
		I I [ A ]	I II [ A ]
12 V - 45 Ah	12	4,5	2,25
12 V - 55 Ah	12	5,5	2,75
12 V - 66 Ah	12	6,6	3,3
12 V - 70 Ah	12	7,0	3,5

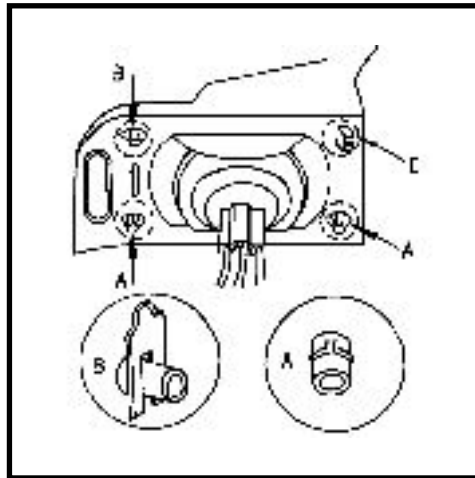
If after battery charging the density is higher, add distilled water, and if it is lower add electrolyte with **1,40 g / cm<sup>3</sup>** density, observing that the electrolyte level to be **10 – 15 mm** over the separators. In case of adding water or electrolyte, the battery shall be submitted to a homogenization charging process, in the second stage II, during **15 – 20 min.**

The total charging time of these types of batteries is of about **35** hours.

**The dry-charged batteries** shall be filled with electrolyte with **1,28 g/cm<sup>3</sup>** density at **20 ° C**, until the level of the latter is **10 – 15 mm** over the separators. After **2 – 3 hours**, during which the electrolyte penetrates the plates, check again the level the level and refill it with electrolyte of same density, then batteries can be put it in operation. This type of batteries are submitted to a charging processus, by mean of a voltage rectifier having the charging current value set in second stage II, in the follow situations: batteries stored for more than 6 months from the manufacturing date; extremely heavy exploitation conditions (repeated startings at low temperatures).

After finishing the charging process, screw the battery plugs, taking care not to obturate the plugs vents, the surface of the battery to be dry and clean and the terminals greased with neutral grease, acid resistant.

**DISMOUNTING**



- Disconnect the battery.
- Take out the headlight corrector attachment clip (**B**).
- Unscrew the headlight corrector control screw (**C**).
- Disconnect the headlight and signaling lamp connectors.
- Push the headlight forward.

**REMOUNTING**

- Place by pressing the adjustment screws in the headlight seats (by pushing towards the engine compartment of the headlight).
- Mount the headlight corrector control screw (**C**).
- Insure the headlight by means of the attachment clip (**B**).
- Connect the battery and adjust the headlights.

**HEADLIGHT BULB REPLACEMENT****DISMOUNTING**

Disconnect the connector (1).  
Take out the protector (2).  
Release the springs sustaining the bulb.  
Replace the bulb.

**REMOUNTING**

Perform the dismantling operations in the reverse order.

**NOTE:**

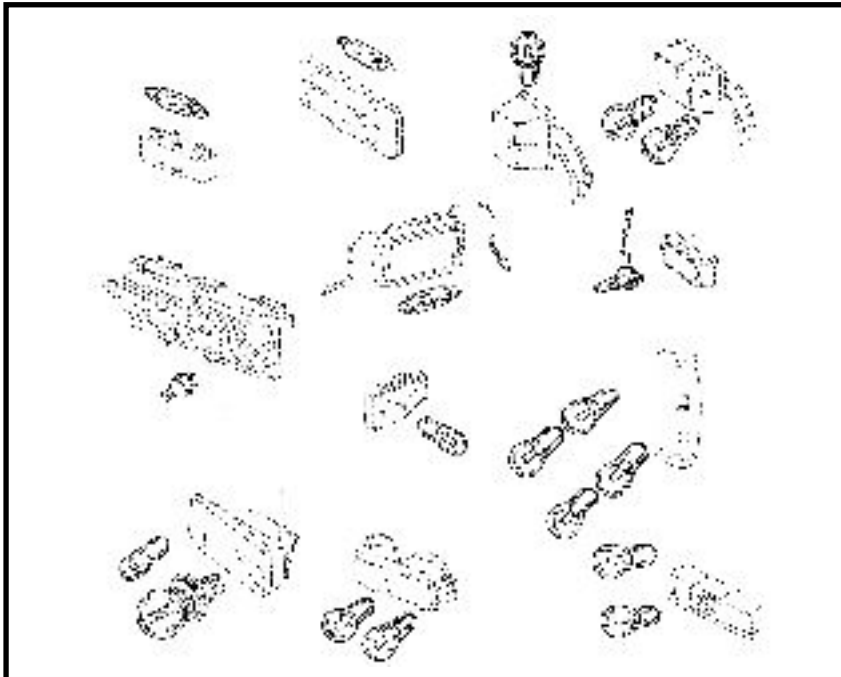
*After headlight or bulb replacement it is recommended the adjustment checking.*

**FRONT SIGNALING BULB REPLACEMENT**

Disconnect the wires from the signaling lamp.  
Rotate the lamp-holder (3) and then remove it (draw it).  
Replace the bulb.  
Place the lamp-holder (3) in the signaling lamp and fix it by rotation.

LAMPS

BULBS



BULBS		
Headlights	Two phases bulb R2 - 12 V - 40/45 W, holder with flange P 45 t 41.	
Front parking, side signaling lamp, trunk lighting	Bulb 12 V - 4W with holder B A9 s.	
Front turn signal lamps	Bulb 12 V - 21W (colored) with holder BAU 15 s.	
Fog projectors	Halogen bulb H3; 12 V - 55 W with holder P 16225.	
Rear lamp	Stop, parking	Bulb 12 V - 21/5 W with holder BAY 15 d.
	Turn signal and back-up	Bulb 12 V - 21W with holder BA 15 s.
Rear fog lamp	Bulb 12 V - 21W with holder BA 15 s.	
License plate lamps, courtesy lamp, glove box lamp	Bulb SOFIT 10x35 type AS02; 12V - 5W wholder Sv 8,5	
Instruments panel lighting and warnings	Bulb 12 V - 1,2W	

**FOG PROJECTOR DISMOUNTING – REMOUNTING**

Disconnect the battery.

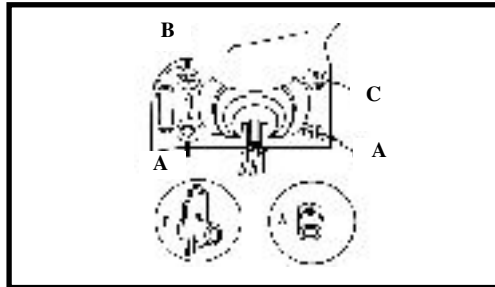
Detach the projector supply wires from the front wiring.

Dismount the attachment screws of the projector from front bumper.

Mounting is done by performing in the reverse order the dismounting operations.



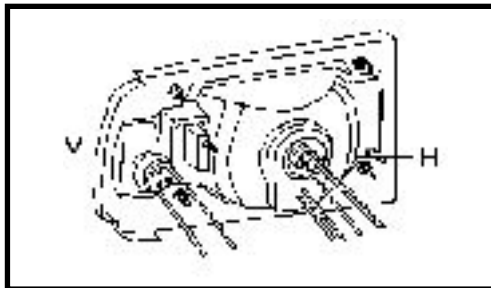
The DACIA pick ups are equipped with two rectangular headlights.



The headlights adjustment is performed observing the following conditions :

- the vehicle shall be placed on a horizontal surface;
- the vehicle shall be empty (without load or passengers on board);
- the tires shall be inflated at the prescribed pressure;
- the dynamic adjustment switch in position “ empty “ (without load – rotate it to the right).

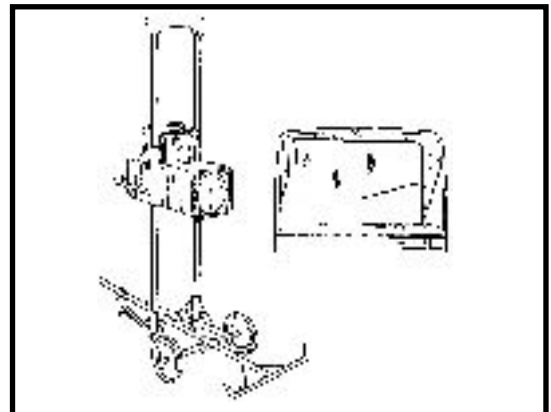
The adjustment is performed with a special headlights adjustment device.



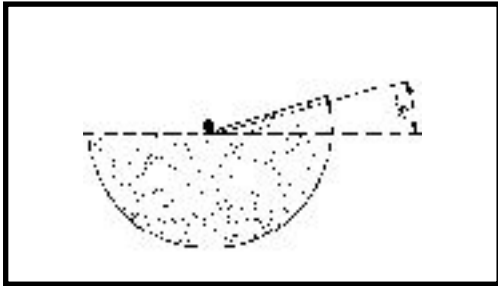
**ADJUSTMENT OF MEETING BEAM ( LOW BEAM )**

This is performed by actuating the screw (C) or (V) ( adjustment in the vertical plan .By screwing up the light beam “descends” and by unscrewing it, the beam “goes up”.

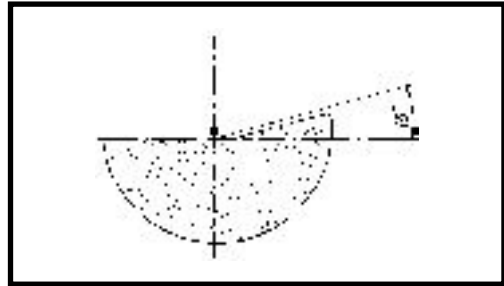
Check if the lighted area is centered on the vertical axe and if the optical mark at 15° is the same with the light of headlamps. It is admissible 1 cm error.



A lightening fascicle deviated to the left side is shown as in ( figure a ), and a lightening fascicle deviated to the right is shown as in ( figure b ).



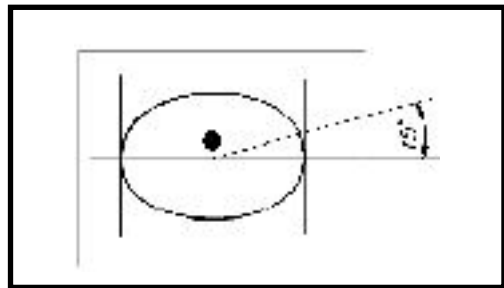
( fig a )



( fig a )

**HIGH BEAM ADJUSTMENT ( LONG BEAM )**

Check that the position to coincide with the adjustment made for the low beam, and the lightening fascicle shall be uniform distributed between the two vertically lines on the panel.



When checking the high beam, the lightening center of the ellipse must be situated on the cross sign marking the screen center.

If a major deviation compared to the short beam is noticed, it is recommended the replacement of the bulb, this one being in most of the cases responsible for this defect.

**MOUNTING – REMOUNTING LICENCE PLATE LAMP.**

Dismount the protector of the license plate lamp, then the attachment screws of the lamp on the body.

Disconnect the lamp from the vehicle wiring.

Mounting is done by performing the dismounting operations in the reverse order.

**REAR LAMP DISMOUNTING – REMOUNTING**

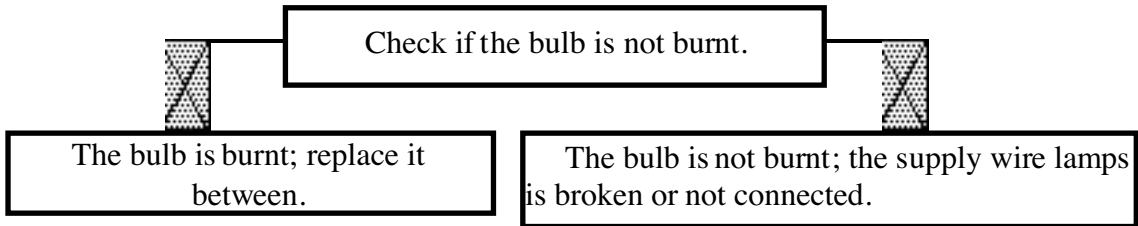
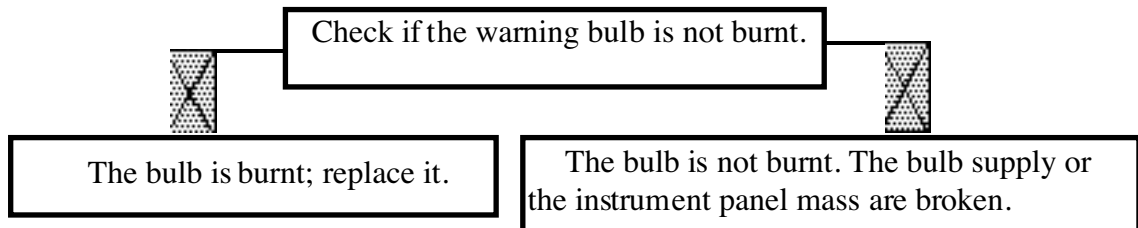
Dismount the screws that attach the protector ( DACIA 1304 Pick – up ).

Dismount the screws that attach the lamp body on the vehicle body (DACIA 1304 Pick – up).

Dismount the nuts that attach the lamp body on the vehicle body ( DACIA 1304 Drop-Side )

Disconnect the lamp from the vehicle wiring.

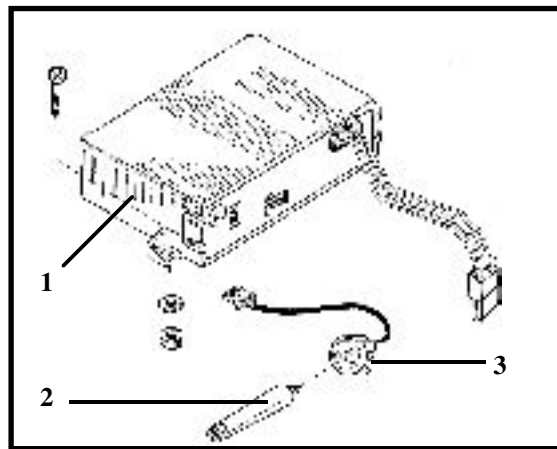
Perform the dismounting operations in the reverse order.

**REAR RIGHT FOGG LAMP NOR WORKING****REAR RIGHT FOGG LAMP WORKING;  
THE WARNING IS NOT WORKING**

**PRESENTATION****PRESENTATION**

This anti starting system( type 0802) is composed of the following components elements:

- UCE anti starting (1) attached by means of three screws on the side wall of the left side dashboard;
- anti starting electronic keys (2) are attached to the vehicle keys;
- anti starting receiver (3) is fixed by clip on the dashboard, in the left side of the central aerator.

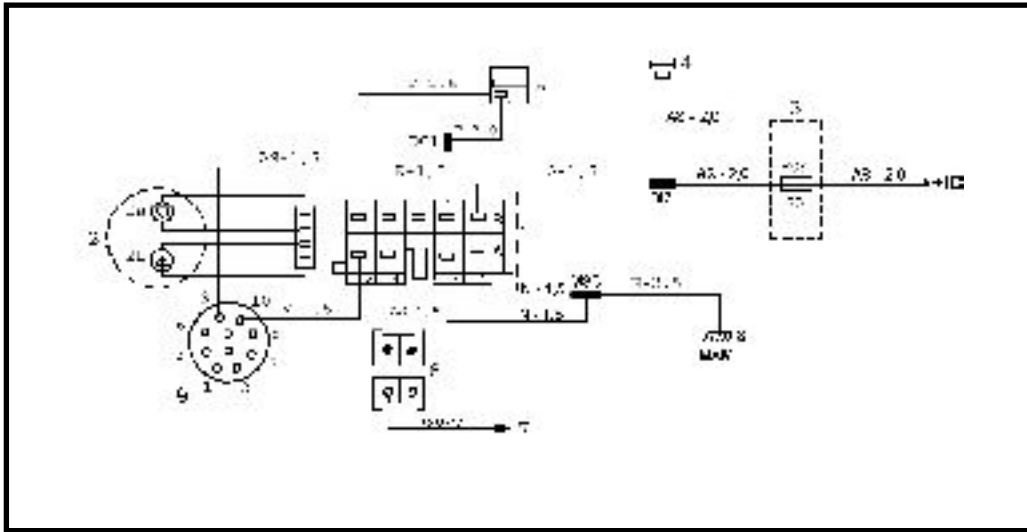


The anti starting electronic control unit (UCE) is connected at the front wiring of the vehicle by means of a 10 ways connector which is attached by means of a gear behind the left side dashboard.

The anti starting receiver is connected to anti starting UCE by means of a 4 ways connector and has a double purpose:

- transferring the information received from the electronic key to the UCE anti starting;
- showing the active or not active state of the anti starting, confirmed by LED indicator lighting respectively lighting off, placed on the receiver.

## CIRCUIT DIAGRAM



On the circuit diagram of the system type 0802, the following component elements may be identified

1. UCE anti starting
2. Anti starting receiver (2 a = electronic key contact, 2 b = anti starting LED indicator)
3. Inside fuse box
4. Left connection plate (+ I.C.)
5. Anti theft device (starting- ignition contact)
6. Rear/front wiring connection
7. Electric fuel pump
8. Left side dashboard ground.
9. Front/fuel injection wiring connection

**OPERATING CONDITIONS**

The anti starting has the purpose to block the supply of the electric fuel pump and the ignition and injection system.

The anti starting system is automatically armed after 30 seconds from the ignition contact off (bringing the key on "S" position or taking out the key from the anti theft device); the LED indicator will light, showing in this way that anti starting system has been activated.

To turn off the anti starting, consequently to start the engine, it is necessary the bringing of the electronic key end in the contact with the anti starting receiver. In this moment the LED indicator placed on the dashboard will light off confirming in this way that the anti starting system has been turned off and the vehicle starting is now authorised.

If the LED indicator does not light off, then the electronic key does not belong to the vehicle or there is a defect in the anti starting system.

***ATTENTION !***

*The system activation may be also obtained without waiting the 30 seconds timing after engine stopping. To do that it is necessary the bringing of the electronic key end in contact with the anti starting receiver; in this moment the LED indicator will light on, and the anti starting will become active.*

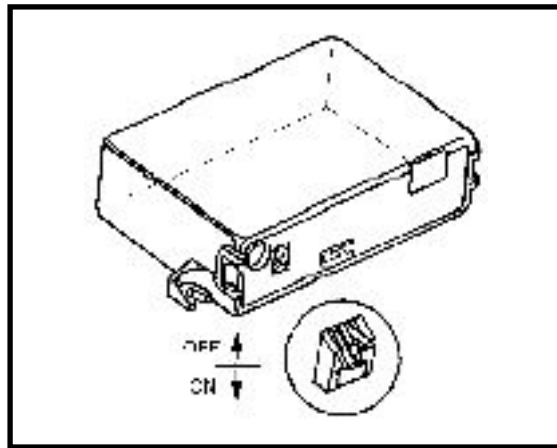
*UCE anti starting is provided with a safety circuit which restrains the anti starting activation when the engine is not started.*

*The electronic keys are not provided with batteries for operation. These keys are coded and consequently specific for only one vehicle, their using for another vehicle will not enable that engine starting.*

### ELECTRONIC KEYS PROGRAMMING PROCEDURE

This is to be applied when the replacement of the electronic keys is needed and the procedure is as follows:

- bring the switch(1) of the UCE anti starting in position “ON”;
  - place the end of the first electronic key in contact with the anti starting receiver;
  - after one second, place the end of the second electronic key in contact with the anti starting receiver;
- receiver;
- bring the switch(1) of the anti starting UCE to the position “OFF”;
  - check using both electronic keys the good operation of the anti starting.

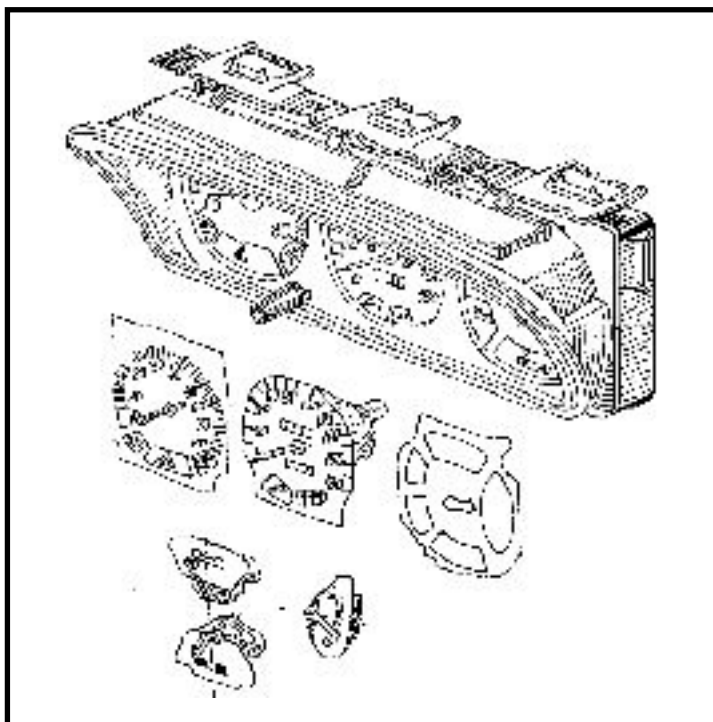


### ***ATTENTION !***

*These operations must be performed only when the UCE anti starting is not in stand by state.*

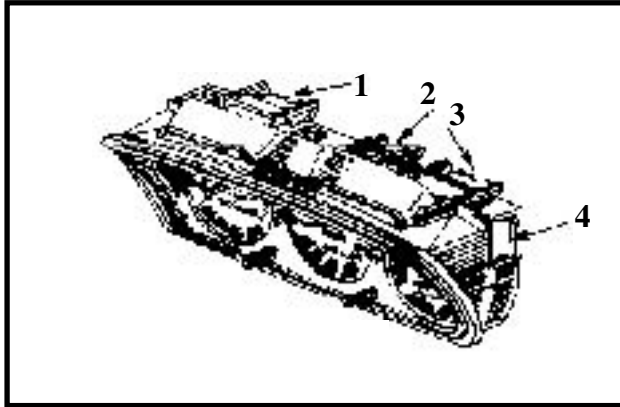
*The maximum number of electronic keys which can be re-programmed for a vehicle is maximum 4; so, if the two original electronic keys of the vehicles have been lost or have been defected, only maximum two other electronic keys may be re-programmed.*





( for vehicles made after 02.04.2003)

The instrument panel dismantling does not imply dashboard dismantling.



#### DISMOUNTING

Disconnect the battery.

Disconnect the speedometer cable from the instrument panel.

Disconnect connectors from the instrument panel. (1, 2 and 3).

Disconnect connectors of the switches from the instrument panel.

Dimounting the cable of tachometer, by realising, at the back of the panel instrument.

Dimounting the timer of windscreen wipers windscreen.

Dimounting the control reglage fares.

Dimounting house four screws which fix the frame fixation device: two are situated in front of the picture, two are under the ashtray of panel instrument.

Remove the frame fixation device, on which is the panel instrument.

Kick away both lateral clips (4) which fix the panel instrument to the panel instrument.

Take out the instrument panel.

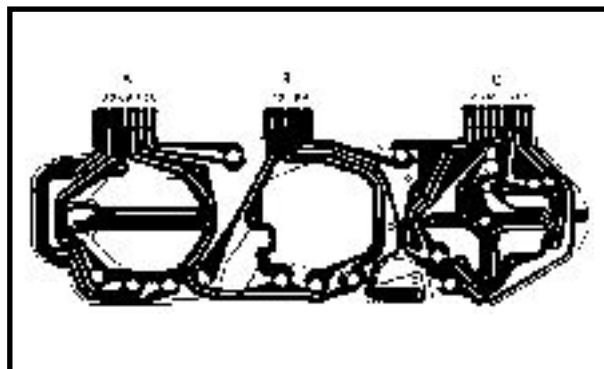
#### REMounting

Perform in reverse order the dismantling operations.

Connectors disposal– front view of instrument panel:

**CONNECTOR A**

1. Hazard warning light
2. Headlight mainbeam warning light
3. Sidelights warning light
4. Mass ( - )
5. Revolutions counter (RPM)
6. Supply ( + DC ) after contact switch
7. Fog lights warning light
8. Mass



**CONNECTOR B**

1. Hand brake warning light
2. Choke warning light
3. Battery charging warning light or fog projector
4. Rear window heating warning light
5. Dashboard lighting
6. Braking system failure warning lamp or wear brake pads warning lamp

**CONNECTOR C**

1. Supply ( + DC ) after contact switch
2. Oil pressure gauge
3. Oil pressure warning light
4. Mass ( - )
5. Turn signal lights
6. Fuel level indicator
7. Water temperature warning light
8. Temperature indicator warning light
9. Low fuel level warning light

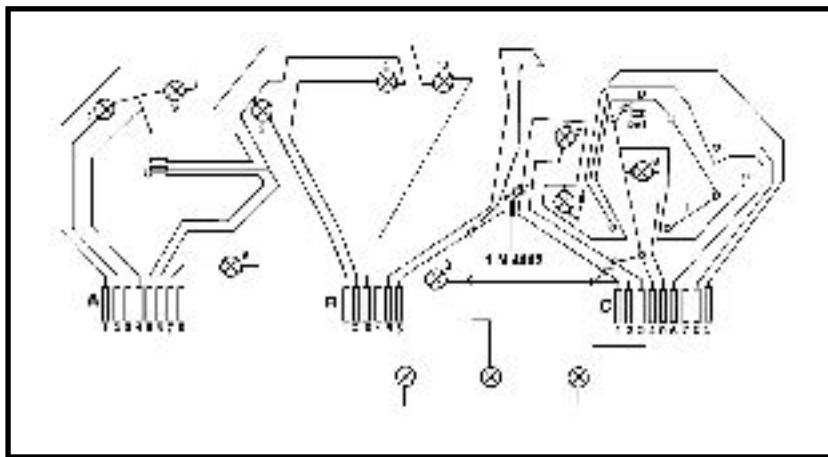
Subject to the vehicle equipping status, the function of some indicators shall be modified as follows:

VEHICLE EQUIPMENT	POSITION IN CONNECTOR B	INITIAL	BECOMING
4x2 BOSCH injection	2	Choke warning light Choke warning light	Fuel injection warning light
4x4 BOSCH injection	2	Rear window heating light	Fuel injection warning light
	4	Defrost fieldglass indicator	4x4 coupling warning light
Carburetor 4x4	4	Battery charging light	4x4 coupling warning light
Standard equipment	3		120 km/h speed warning light

Beginning with 01.01.2000 the DACIA type pick-ups have been equipped with instruments panel SACELE type, where the oil pressure indicator and the water temperature warning light were suppressed i.e. the corresponding positions 2 and 7 from connector C.

### INSTRUMENTS PANEL TYPE TAKOSAN

Connectors – view of rear instruments panel.



#### CONNECTOR A

1. Hazard warning lamp
2. Headlight main beam warning light
3. Free
4. Mass (-)
5. Revolutions counter (RPM)
6. Supply (+ DC) after contact switch
7. Fog lights warning light
8. Mass

#### CONNECTOR B

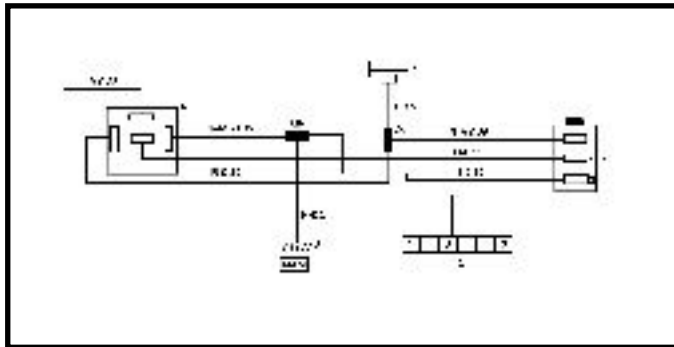
1. Handbrake warning light
2. Choke warning light or fuel injection
3. Free
4. Rear window heating warning light or 4 x 4
5. Dashboard lighting
6. Braking system failure warning light

#### CONNECTOR C

1. Supply (+ DC) after contact switch
2. Free
3. Oil pressure warning light
4. Mass (-)
5. Turn signal lights
6. Fuel level indicator
7. Free
8. Water temperature warning light
9. Low fuel level warning light

**PRESENTATION**

This indicator, located on the instrument panel, has the warning purpose for the driver when the vehicle is running with over 120 km/h. The signal generated from the RPM sensor (2), located on the speedometer cable will act on the indicator relay (4) through which the “120 km/h” warning light from the instrument panel is lighted.



**INCLUDED ELEMENTS**

On the circuit diagram the following components elements may be noticed:

1. Right connection plate (+DC)
  2. Vehicle speed sensor (on speedometer cable)
  3. Left dash board mass
  4. Speed limit warning light relay
- Dashboard ( warning light 120 km/h).

**INSTRUMENT PANEL**  
**INSTRUMENTS PANEL**  
**( Commercialsequipped with C.A.)**

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- A:**
1. Hazard warning light
  2. Headlights main beam warning light
  3. Sidelights warning light
  4. Mass
  5. Revolutions counter (RPM)
  6. Supply ( + DC )
  7. Fog lights warning light
  8. Mass

- B:**
1. Hand brake warning light
  2. Fuel injection warning light
  3. 120 km/h speed warning light
  4. 4x4 warning light
  5. Rheostat lightening board
  6. Braking system failure warning light  
( I.C.P. and wear of brake pads )

- C:**
1. Supply ( + DC )
  2. -
  3. Oil pressure warning light
  4. Mass
  5. Turn signal warning light
  6. Fuel level gauge
  7. -
  8. Water temperature warning light
  9. Low fuel level warning light

# INSTRUMENT PANEL

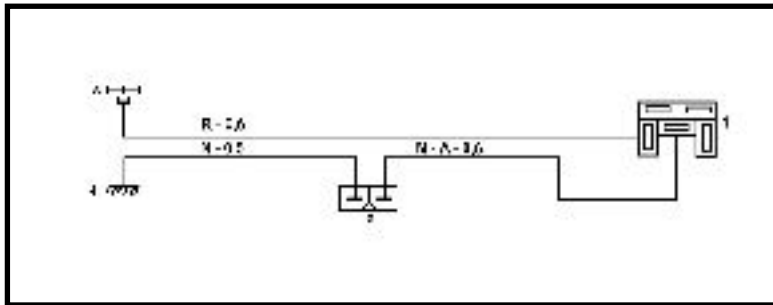
## FASTEN SAFETYBELTS WARNINGLIGHT

### PRESENTATION

This function is activated after switch on the ignition contact (engine starting) and is warning if the driver has not fastened its safety belt, by means of the safety belts warning light, located on the central dashboard.

### OPERATING DIAGRAM

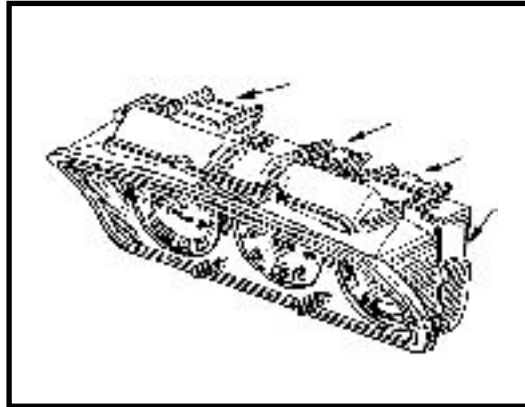
The following components elements may be identified:



1. Safety belts warning light board lamps
2. Safety belts contacts
3. Right connection plate (+ DC)
4. Mass (at hand brake attachment)

As it can be seen from this diagram, when the ignition contact is on, the warning light (1) shall be lighted if the safety belt is not fastened, and after driver fastens its safety belt, the warning light must turn off, confirming the correct attachment of the safety belt.





### **DISMOUNTING**

Disconnect the battery.

Disconnect the speedometer cable from the dash board.

Disconnect the connectors and the speedometer cable.

Dismount the half housings of the steering wheel.

Dismount the headlight adjustment control.

Dismount the screws that attach the instrument frame.

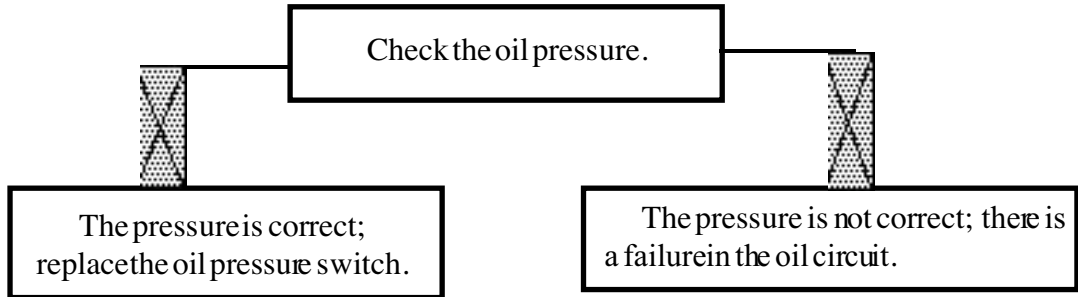
Release the two side attachment clips that attach the instrument panel on the dashboard.

Take out the instrument panel.

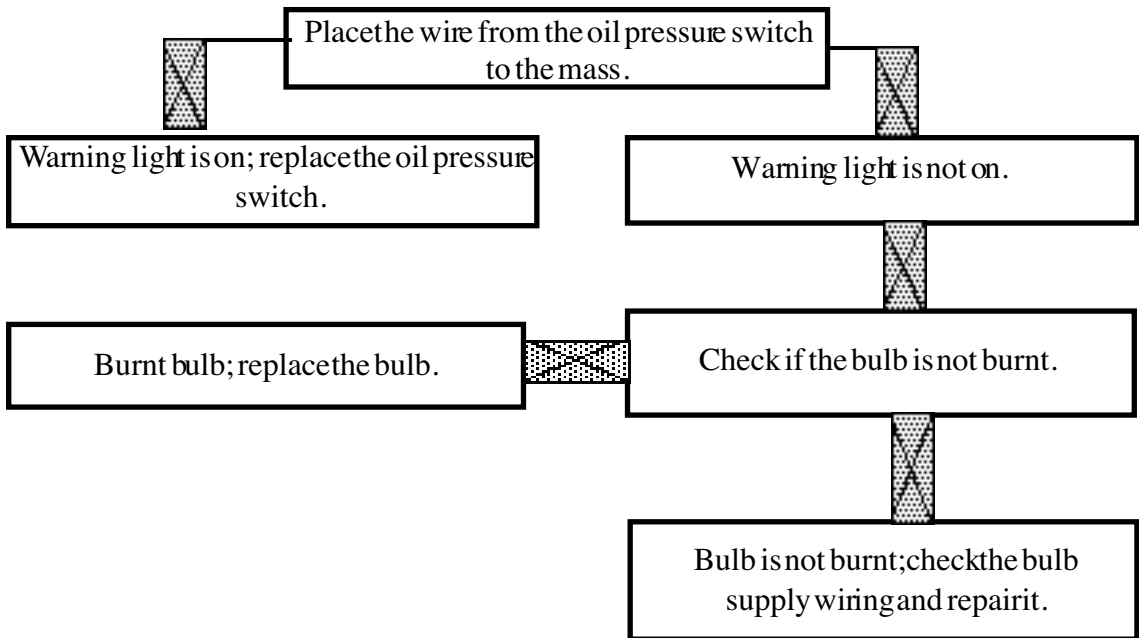
### **REMOUNTING**

Perform in reverse order the dismounting operations.

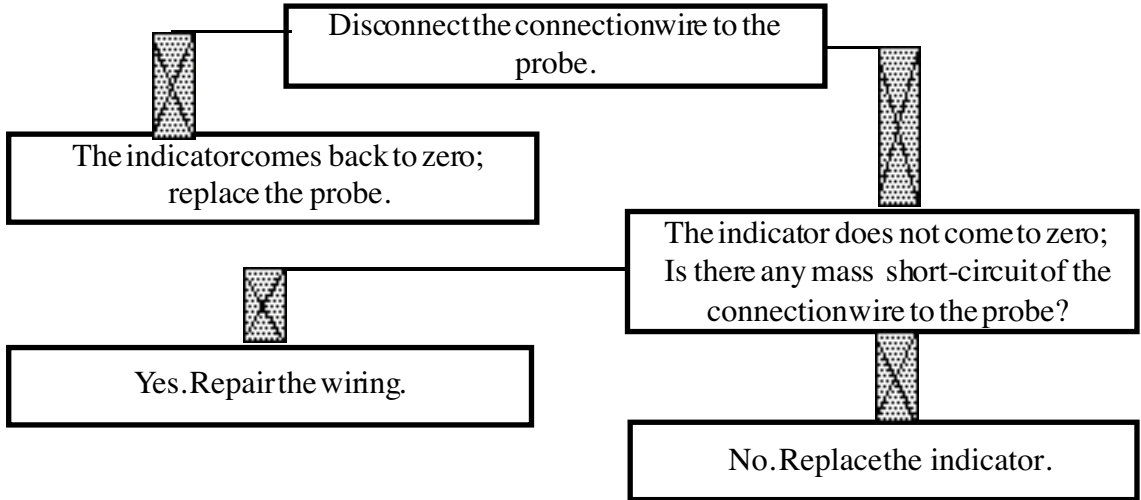
**OIL PRESSURE WARNING LIGHT STILL ON AFTER ENGINE STARTING**



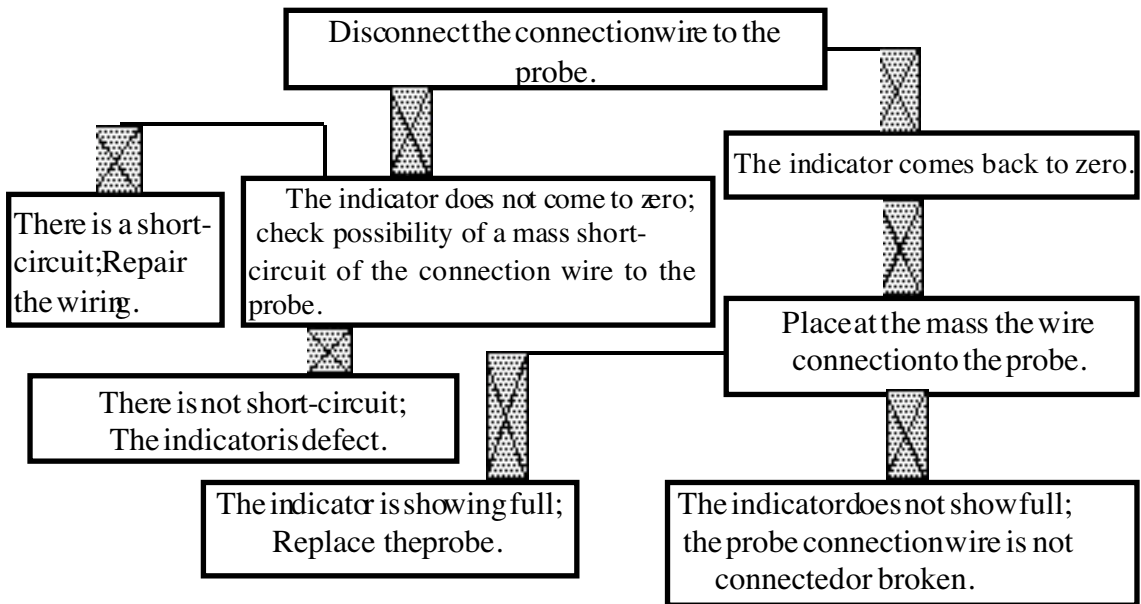
**OIL PRESSURE WARNING LIGHT IS NOT ON WHEN CONTACT SWITCH ON**



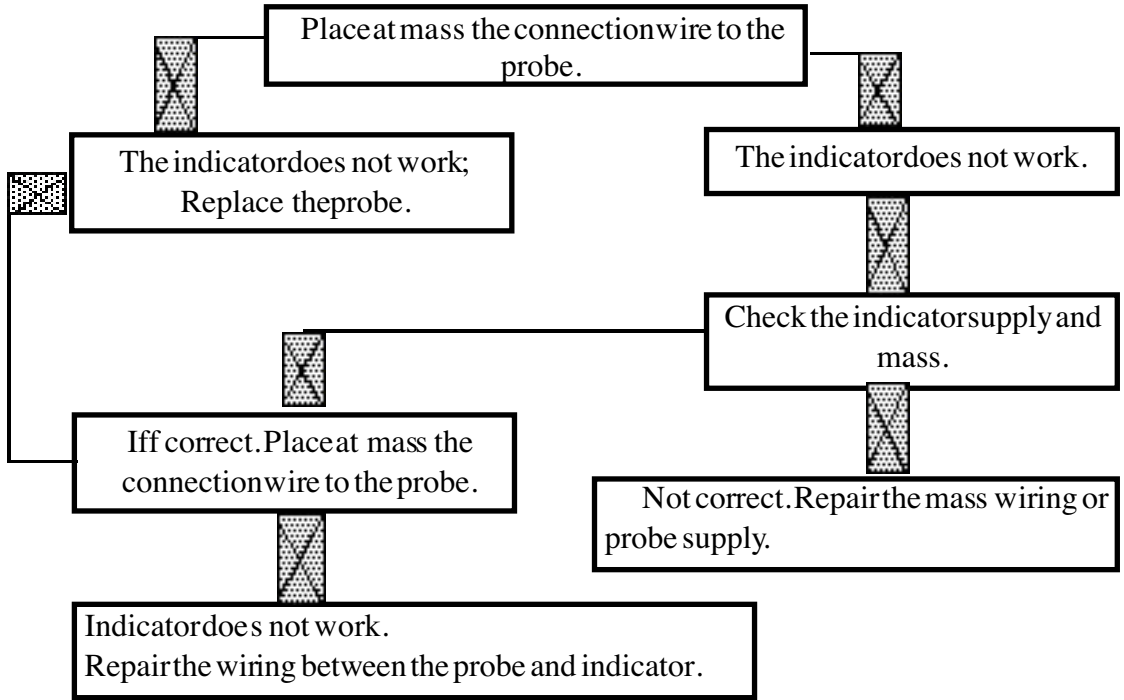
**FUEL LEVEL INDICATOR SHOWING ALWAYS FULL**



**FUEL LEVEL INDICATOR NOT SHOWING CORRECTLY**



FUEL LEVEL INDICATOR NOT OPERATING



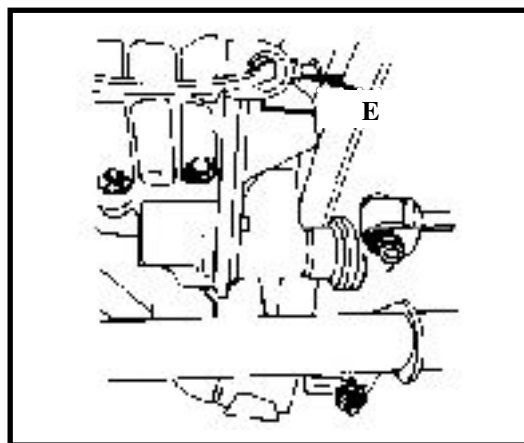
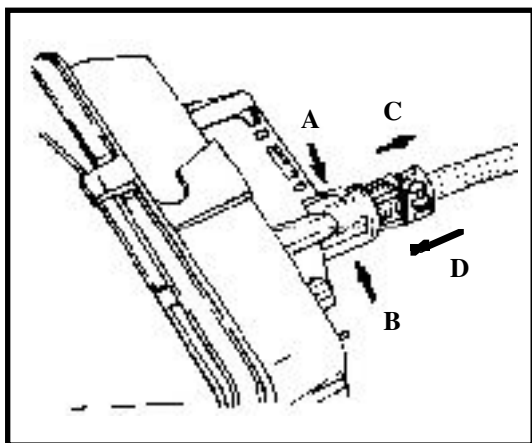
Dismounting of the speedometer cable does not imply the dismounting of the instrument panel from the dashboard.

### DISMOUNTING

Push in the direction of **A** and **B** arrows, then pull in the **C** direction.

Loosen the attachment screw **E** at the gearbox and pull the cable.

Detach the cable from the attachment clips on the longitudinal girder.



### REMOUNTING

Center the speedometer cable in the instrument panel socket, then push in the direction of **D** arrow, until a “click” is heard, confirming the coupling.

Center the cable in the speedometer endless screw, tighten the screw and lock it with the locking nut.

Position it in the attachment clips of the longitudinal girder, observing the curve. (**R min = 150 mm**).

**NOTE:**

*The oil pressure switch may not be repaired. It is placed on the left side of the engine block.*

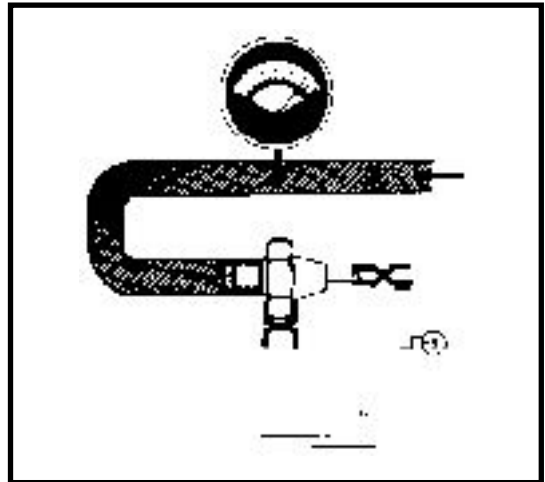
To check the oil pressure switch, the following items are required:

- a compressed air source;
- a **0 – 1 bars** manometer;
- a control lamp.

Make an assembly according to the diagram. When the air is off, the control lamp should be lighted. If the lamp does not light, replace the oil pressure switch.

When the air is open and the pressure is over **0,35 +/- 0,08 bars**, the control lamp should go off.

If the lamp does not go off at all, or does not go off at the required pressure, replace the oil pressure switch.



## THERMOCOUPLE CHECKING

**NOTE:** *The thermocouple may not be repaired. It is located on closing plate of the cylinder head.*

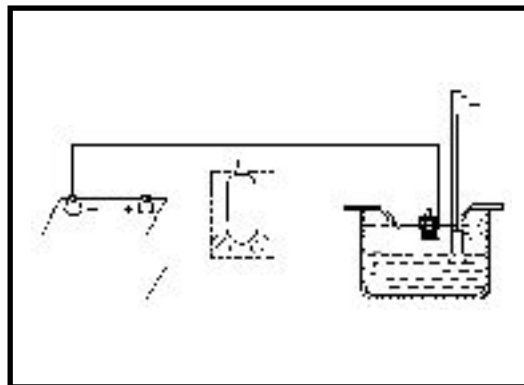
In order to check the thermocouple, there are necessary : a vessel with cooling liquid (antifreeze + distilled water), a **0 – 200 ° C** thermometer, a control lamp, a heat source.

Make an assembly according to the diagram.

When the temperature of the fluid is low, the control lamp should be off. If the lamp is on, replace the thermocouple.

Warm up the fluid in the vessel. When the fluid temperature reaches the temperature required for the thermocouple contact ( **180 ° C** ) the control lamp should be lighted. If the lamp does not light up, replace the thermocouple.

The coupling temperature is marked on the thermocouple body.

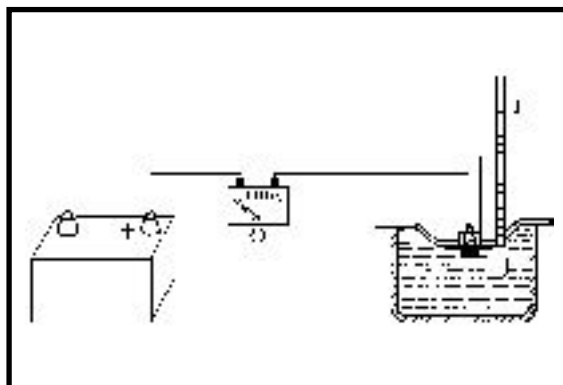


**NOTE:** *The temperature transmitter may not be repaired. It is attached on the closing plate of the cylinder head.*

In order to perform the checking there are necessary: a vessel with cooling fluid (antifreeze + distilled water), a thermometer 0 – 200° C, a heat source, an ohm meter.

Make an assembly according to the diagram. The variation of the resistance (**R**) in function of the temperature (**T**) must be according to the following table:

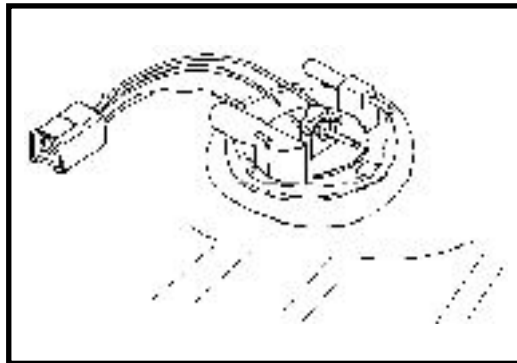
<b>T [° C ]</b>	<b>60 ° +/- 5 °</b>	<b>90 ° +/- 4 °</b>	<b>120 ° +/- 5 °</b>
<b>R [ Ω ]</b>	<b>1010</b>	<b>342</b>	<b>139</b>





**DISMOUNTING**

Disconnect the battery.  
Disconnect the transmitter connector from the rear wiring.  
Rotate the gauge attachment flange anti-clockwise by about 1/3 rotation.  
Take out the transmitter from the tank, by lift it carefully.



**REMOUNTING**

Perform in the reverse order the dismounting operations.

**NOTE:**

*When remounting, pay attention that rubber sealing gasket of the transmitter to be in good state and flange to tightly fix it on the tank.*

**ANTI THEFT MECHANISM REPLACEMENT**

( STARTING - IGNITION SWITCH )

The anti theft mechanism is placed on the right part of the steering column and has the purpose to starter control when electric wiring is connected, being provided in the same time also with a steering locking device, with anti theft lock.

CONTACT KEY POSITIONS		
POSITION	INTERPRETATION	OBSERVATIONS
S	Stop anti theft ( parking )	This position enables the introduction and taking out of the key from the contact switch. When key is taken out from the contact switch, the steering is blocking. Unblock-ing is obtained by introducing the key in the contact switch and if necessary, the easy rotation in both senses of the steering wheel.
A	Accessories	In this position, accessories are voltage supplied, protected by means of a bridge fuse <b>F 02</b>
I	Intermediary	This position enables the removing of the anti theft mechanism, after its attachment screw on the steering column has been dismantled and the mechanism blocking pin has been pressed.
M	Engine contact	In this position, the steering is not blocked and all consumers are voltage supplied, protected by means of the bridge fuse <b>F 01</b> ( inside fuse box) as well as the injection system relays.
D	Starter contact	This position enables the voltage supply of the starter and engine starting, after that key is returning in M position The mechanism is such built not to enable the passage in succession of the contact key in the D position without returning in S position

Subject to the vehicle manufacturing variant, on the anti theft mechanism there is not any more marked **G** position ( garage ) because does not enable the taking out of the key in this position but helps in pin unblocking for removing the mechanism from the steering column.

**DISMOUNTING**

Disconnect the battery

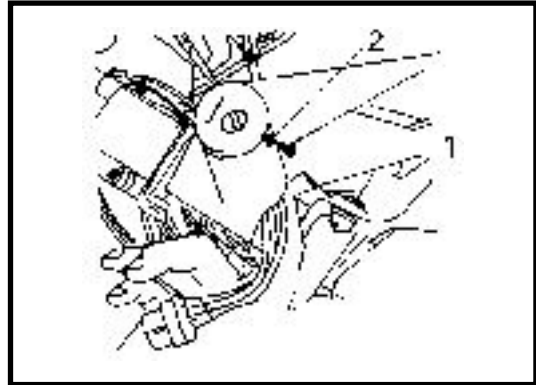
Dismount the halfsteering wheel housings.

Disconnects the connecting plugs of the contact switch.

Bring the key in **G** position.

Unscrew the attachment screw (1).

Press the mobile pin (2) and draw the contact backwards.

**REMountING**

Mount the contact in its seat.

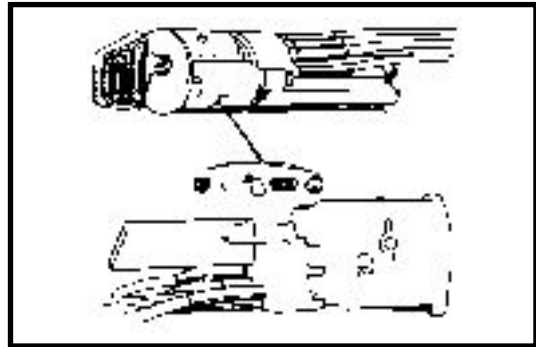
Tighten the attachment screw (1).

Connect:

- the contact switch;
- the battery.

Check the contact switch operation.

Mount the steering wheel housings and the contact switch cover.

**CONNECTING PLUGS REPLACEMENT**

The operations are to be performed after dismounting the contact switch from the vehicle.

**DISMOUNTING**

Dismount the attachment screws of the blocking wedge guiding.

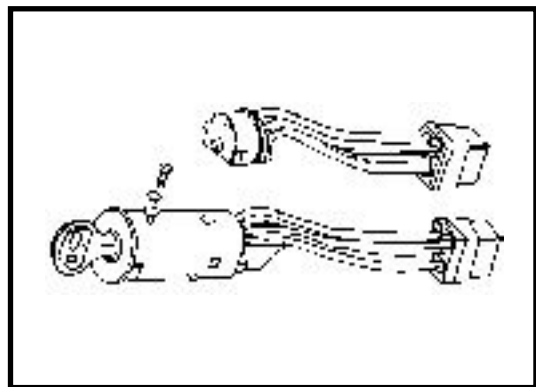
Dismount the connecting plugs.

**REMountING**

Position and mount the connecting plugs.

Mount the blocking wedge guiding.

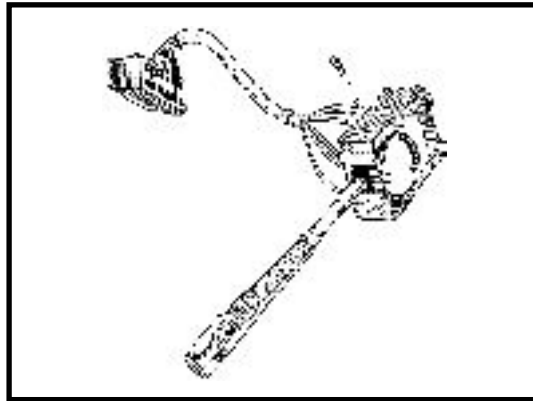
Tighten the attachment screws of the blocking wedge guiding.



## **LIGHTS CONTROL SWITCH**

The DACIA vehicles are provided with a lights control switch shown in the bellow drawing.

***NOTE: The lights control switch may not be repaired.***



### **DISMOUNTING**

Disconnect the battery.

Dismount the lower half housing of the steering wheel.

Cut the plastic ring that attach the wiring on the steering wheel column.

Disconnect:

- the switch connector to the front wiring;
- the wires attached by the nut.

Unscrew the attachment screw of the light control switch off the steering wheel column

Disconnect the switch.

### **REMOUNTING**

Tighten the attachment screw.

Connect:

- the wire attached by nuts;
- the switch connector to the front wiring.

Position and tie the wire bundle with a new plastic ring.

Connect the battery.

Check the operating mode of the light control switch.

Mount the lower half casing.

**TURN SIGNALING SWITCH****DISMOUNTING**

Disconnect the battery.

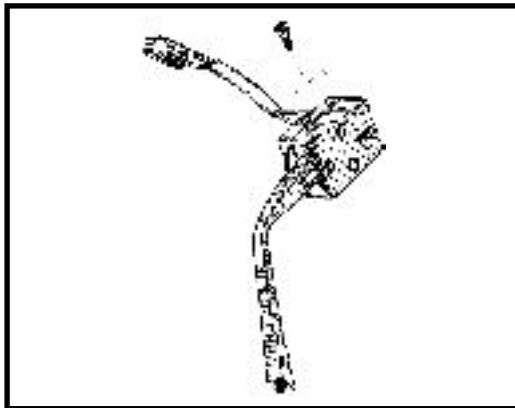
Dismount the lower housing of the steering wheel.

Cut the plastic ring.

Disconnect the connecting coupling to the front wiring.

Unscrew the connecting screws of the signaling switch off the steering wheel column.

Remove the switch.

**REMOUNTING**

Mount the switch.

Tighten the switch attachment screws.

Connect the connecting coupling to the front wiring.

Position and tie the wire bundle with a new plastic ring.

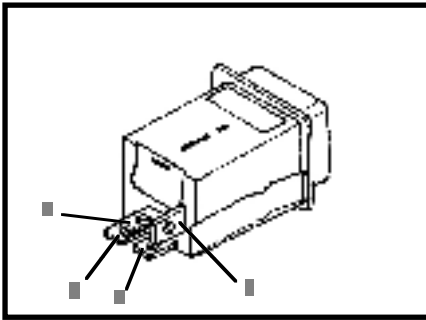
Connect the battery.

Check the operation of the signaling switch.

Mount the lower half casing of the steering wheel.

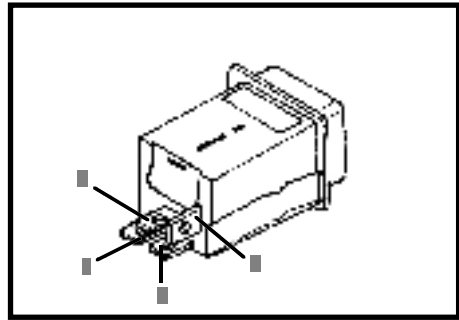
for vehicles made after 02.04.2003

**4X4 SWITCH**



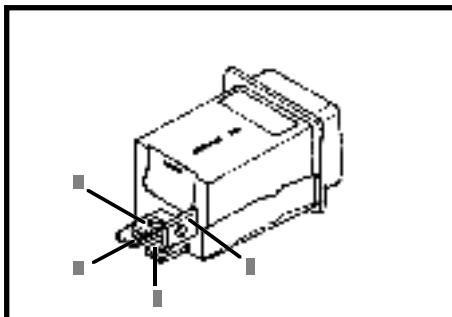
Pos.	Destination
1	Supply + accessories
2	4x4 coupling command
4	+ Position lights
5	Mass

**FOG LAMPS SWITCH**



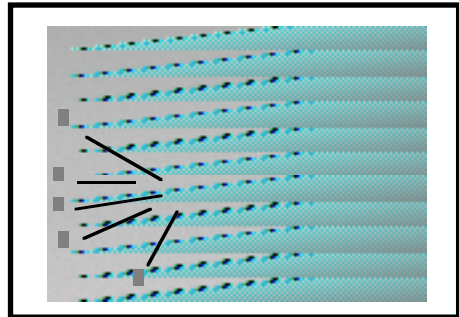
Pos.	Destination
1	High - beams / Road lights
2	Fog lamps command
4	+ Position lights
5	Mass

**FOG LIGHT SWITCH**



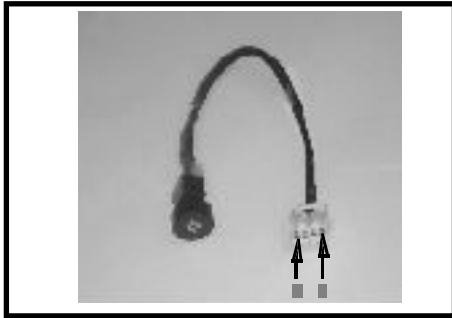
Pos.	Destination
1	+ Position lights
2	Fog lamps command relay
4	+ Position lights
5	Mass

**TEMPORISATEUR SUITE-GLACES  
PARE-BRISE**

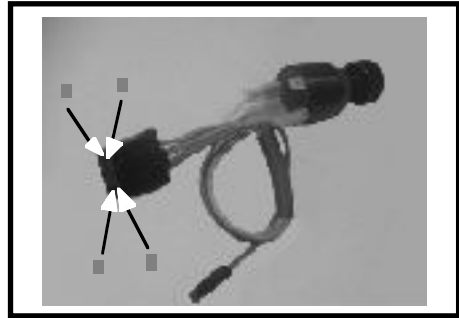


Pos.	Destination
1	Windscreen wipers pump control
2	Windscreen wiper timer command
3	Mass
4	Windscreen wiper small speed command
5	Supply + battery

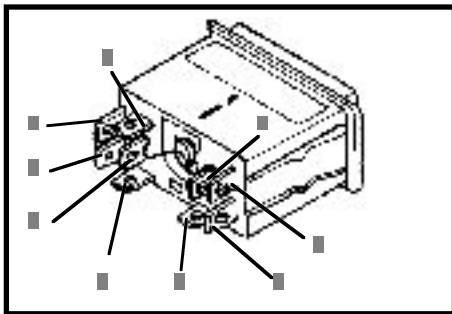
for vehicles made after 02.04.2003

**CASWITCH**

Pos.	Destination
1	Mass
2	+Positionlights
3	ACcommand
4	Supply + accessories

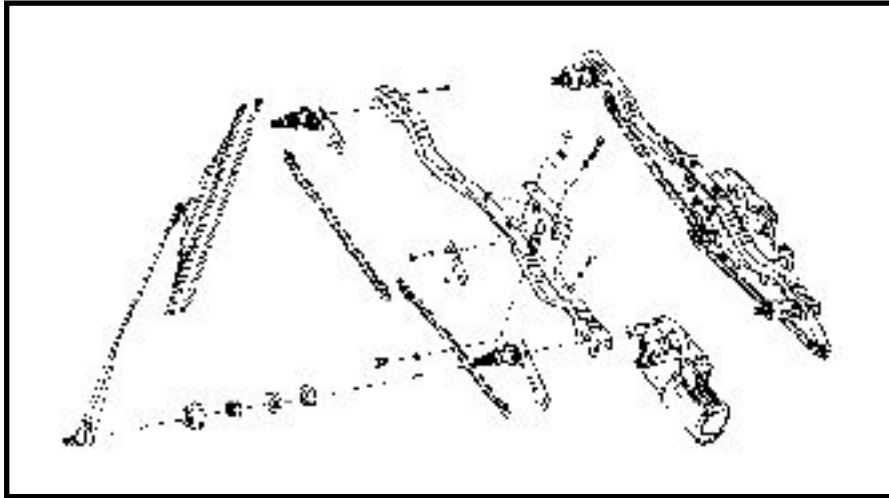
**HEATINGSWITCH**

Pos.	Destination
2	GMV climat control speed3
3	GMV climat control speed1
4	GMV climat control speed4
5	GMV climat control speed2
6	Supply + accessories

**DAMAGESWITCH**

Pos	Destination
1	Command+signaling
2	Leftsignalisation
3	Right signalisation
4	Damagewitness
5	+Positionlights
6	Mass
7	Supply+signalisation relay
8	Supply+ after contact
9	Supply+permanent

The windscreen wiper mechanism which is equipping the DACIA pick-ups and its components may be seen in the following detailed drawing.



Subject to the type of dashboard which the DACIA pick-ups are equipped with (restyled dashboard or dash board type CN) the mechanism dismounting shall be performed differently.

According to the type of the vehicle equipment, with or without windscreen wiper timer, the windscreen wiper is connected to its wiring as per following diagrams:

- a) with windscreen wiper timer.
- b) without windscreen wiper timer.

On these diagrams the following elements may be identified:

1. Windscreen wiper motor
2. Right connection plate (+ DC)
3. Windscreen wiper washer pump
4. Washer – wiper switch
5. Windscreen wiper timer



**VEHICLE WITH DASH BOARD TYPE 1325**

**DISMOUNTING**

Disconnect the battery.

Dismount the attachment nuts of the windscreen wiper arms and the blades.

Unscrew the attachment nuts of the shafts on the lower frame of the windscreen, recover the rubber washers and bushings.

Dismount the dashboard.

Disconnect the wiring connector from the windscreen wiper drive motor.

Unscrew the attachment screws of the mechanism on the plate.

Draw the mechanism backwards and then take it out from the right side of the steering wheel.

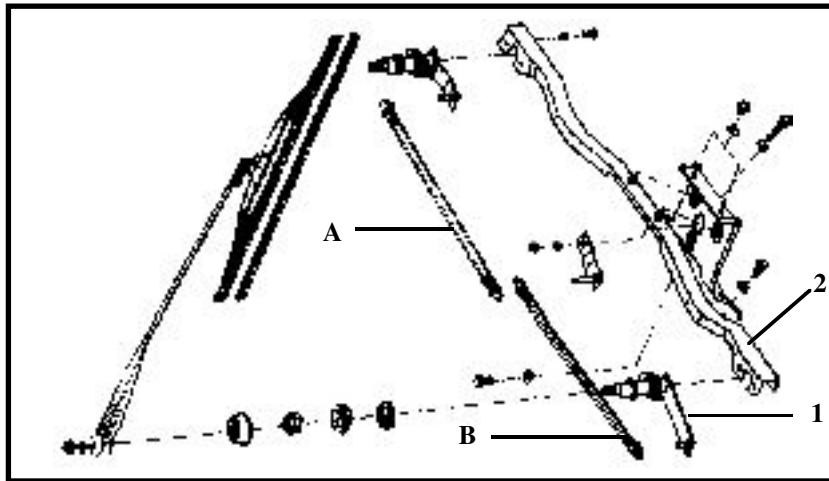
**REMOUNTING**

Perform the dismounting operations in the reverse order.

***NOTE: When mounting the windscreen wiper arms, the wiper drive engine must be in position "stop at fixe point ".***

**WINDSCREEN WIPER DRIVE SHAFT REPAIR**

This operation shall be performed for Dacia vehicles, as per the following drawing, after dismantling the mechanism from the vehicle.



**DISMOUNTING**

Disconnect the auxiliary connecting rods (A) and (B) off the shafts.

Dismount the shafts (1) off the mechanism support (2).

Depress the grooved bushing.

Dismount the shaft; recover the bushing and the rubber gaskets.

**REMOUNTING**

Check the state of the rubber gaskets.

Clean the parts to be free of oxides.

Grease the parts with grease **Li Ca Pb type II**.

Remount :the rubber gasket on the shaft, the rubber gasket shaft and the bushing.

Press the grooved bushing.

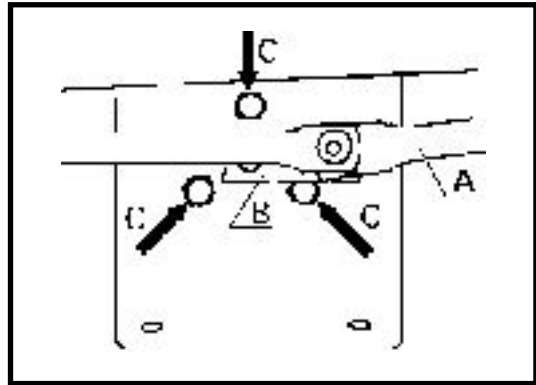
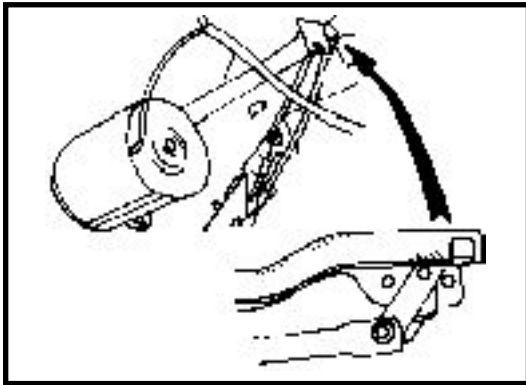
Mount the shafts on the mechanism support.

Grease the joints with grease **type II Li Ca Pb** and couple the auxiliary connecting rods on the shafts (A) and (B).

# WINDSCREEN WIPERS

## WINDSCREEN WIPER DRIVE MOTOR

The operations shall be performed after dismantling the mechanism off the vehicle.



### DISMOUNTING

Unscrew the attachment nut of the control auxiliary connecting rod, (B) on the drive motor shaft.  
Unscrew the attachment screws of the drive motor on the mechanism support.

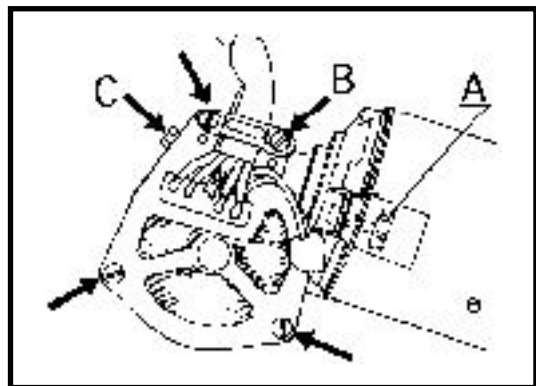
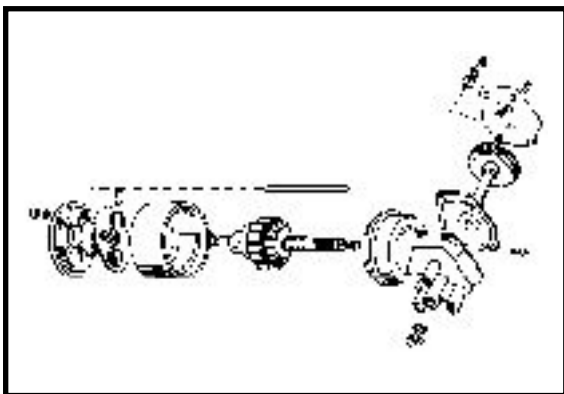
### REMountING

Perform the dismantling operations in reverse order.

**NOTE:** When remounting, the auxiliary connecting rods A and B shall be aligned, the drive motor being "stopped at fix position".

## WINDSCREEN WIPER DRIVE MOTOR REPAIRING

Windscreen drive motor ( components parts drawing ).



### DISMOUNTING

Dismount the windscreen wiper drive motor off the mechanism support.

#### 1. Reduction gear dismantling:

- unscrew the attachment screws of the cap (B);

- loosen the adjustment screw of the rotor axial clearance.

Dismount: the reduction gear cap, the pinion.

**2. Rotor dismounting:**

- unscrew the attachment screws (A) of the reduction gear casing, on the drive engine.

Dismount: the reduction gear casing, the bearing at the back of the motor and the rotor.

**REMOUNTING**

Clean the parts.

Check the state of the parts (pinions, bearings, collector), replace the defective or worn parts.

Grease the parts with grease type **LiCaPb type II**.

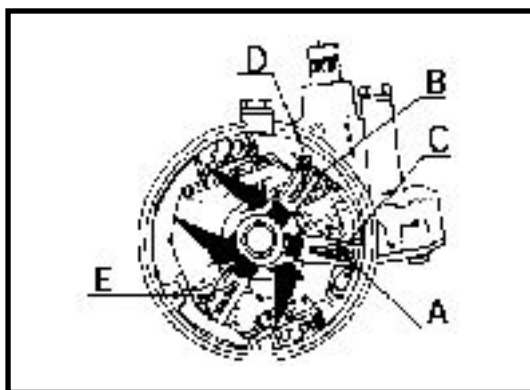
Mount: the rotor, the bearing at the back of the motor, the reduction gear casing, the pinion, and the reduction gear cap.

Adjust the axial clearance of the rotor (C); the screw should gently press the rotor shaft end.

Mount the windscreen wiper drive motor on the mechanism support.

**WINDSCREEN WIPER DRIVE MOTOR COAL BRUSHES REPLACEMENT**

The operations shall be performed after dismantling the mechanism off the vehicle.



**DISMOUNTING**

Dismount the drive motor from the windscreen wiper mechanism.

Dismount: the reduction gear and the rotor.

Disconnect the coal brush terminals (A, B, E).

Dismount the coal brushes.

**REMOUNTING**

Check the state of the collector and its channels.

Mount the new coal brushes; check the free displacement of the coal brushes in the supports.

Mount the rotor and the reduction gear.

Adjust the axial clearance of the rotor, by means of the adjustment screw.

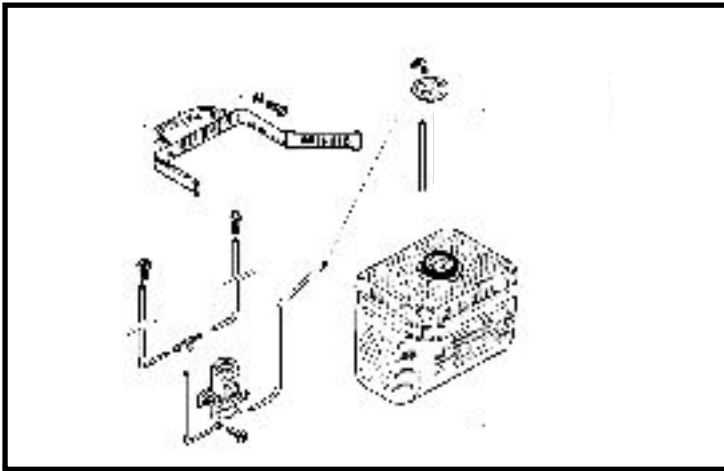
Mount the drive motor on the mechanism.

# WINDSCREEN WIPERS

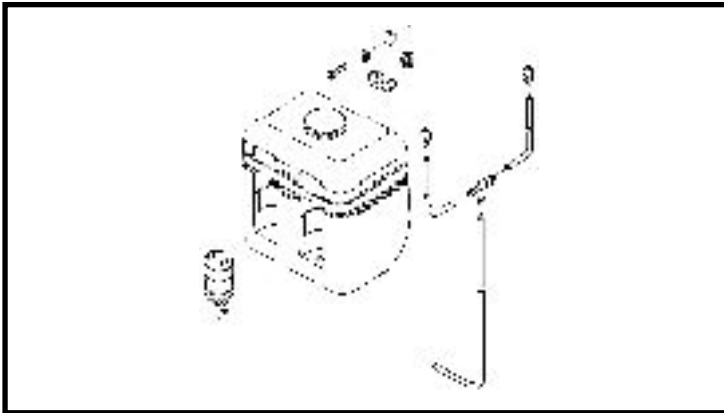
## WINDSCREEN WASHER ASSEMBLY

The windscreen washer assembly is placed in the engine compartment, being attached on the left front wing lining. According to the manufacture variant, this may have the electric pumps attached on the front wing lining (fig. a) or on the washer reservoir (fig. b).

(fig a)



(fig b)



### DISMOUNTING

Disconnect the battery; then the connecting wires from washer pumps.

Disconnect the aspiration and exhaust tubes from the couplings and adjustable nozzles.

Dismount the attachment screws of washer reservoir support.

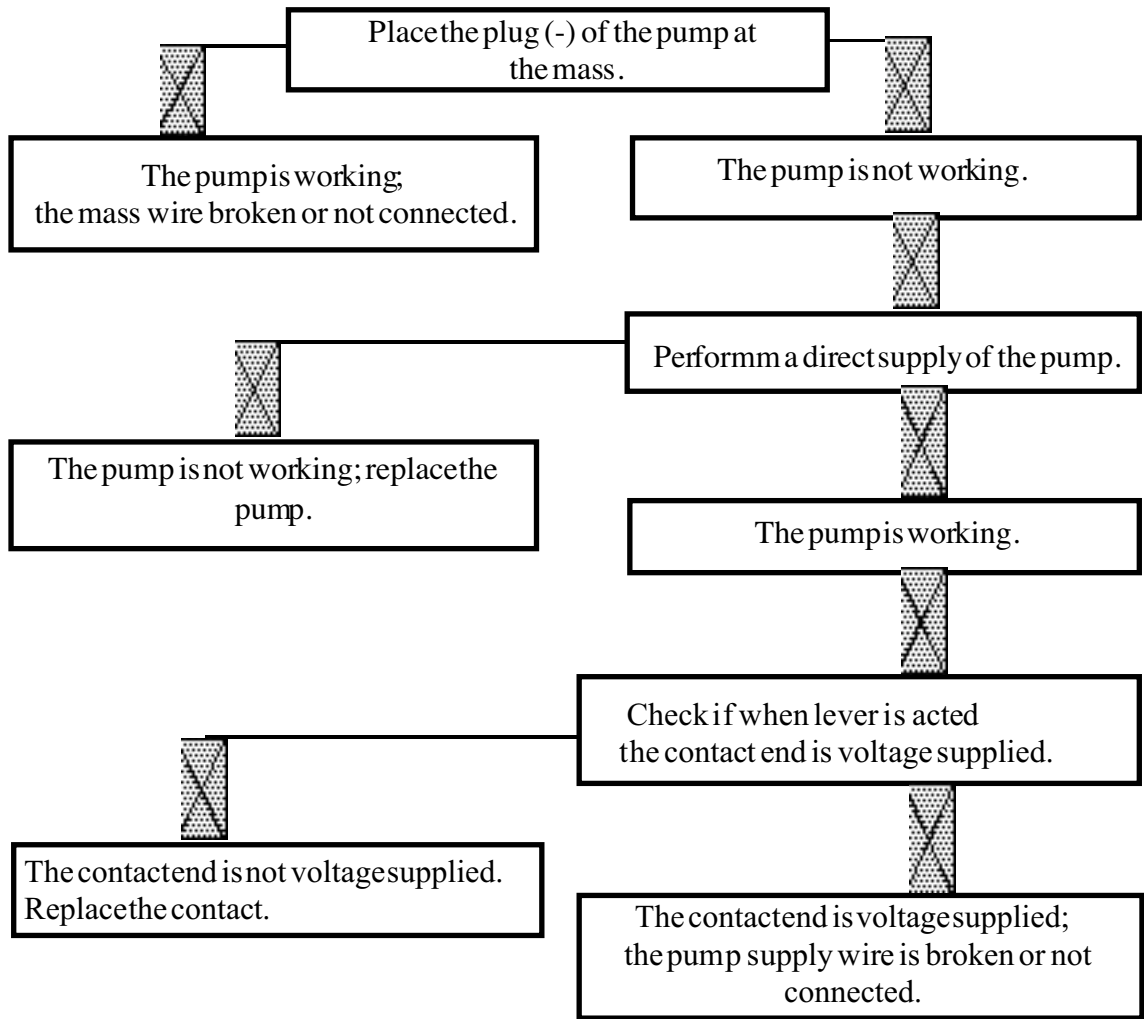
Dismount the washer pumps from the left wing lining or from the reservoir, according with the manufacture variant.

### RE-MOUNTING

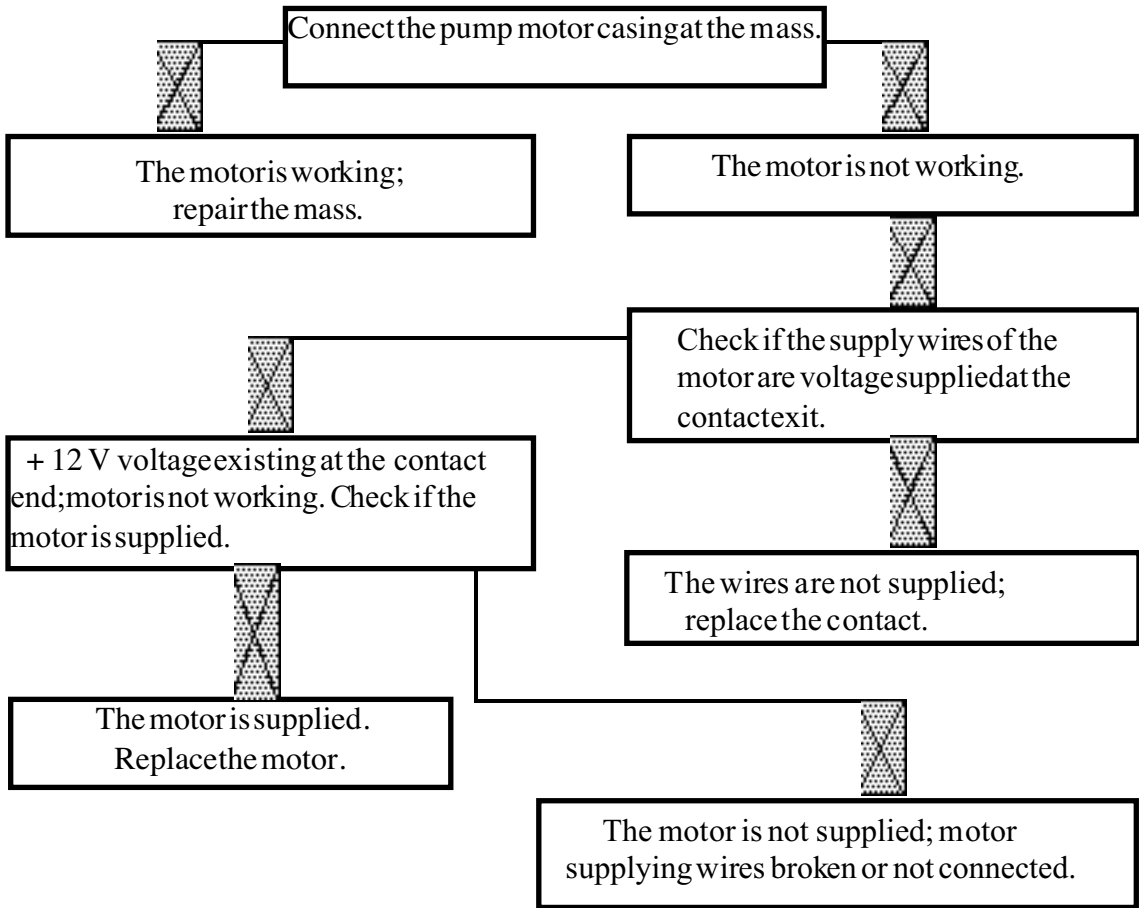
Perform the dismounting operations in reverse order.

Check the operating and eventually adjust by means of a “needle” the nozzles, in order to correctly wash the windscreen.

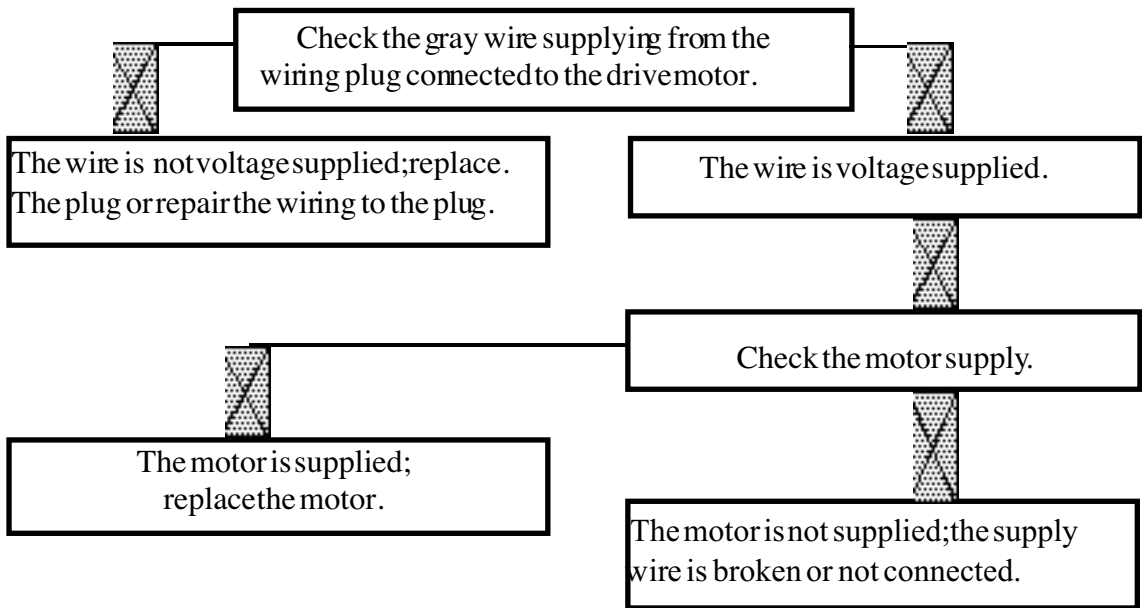
**THE WINDSCREEN WIPER IS WORKING  
THE WASHER PUMP IS NOT WORKING**



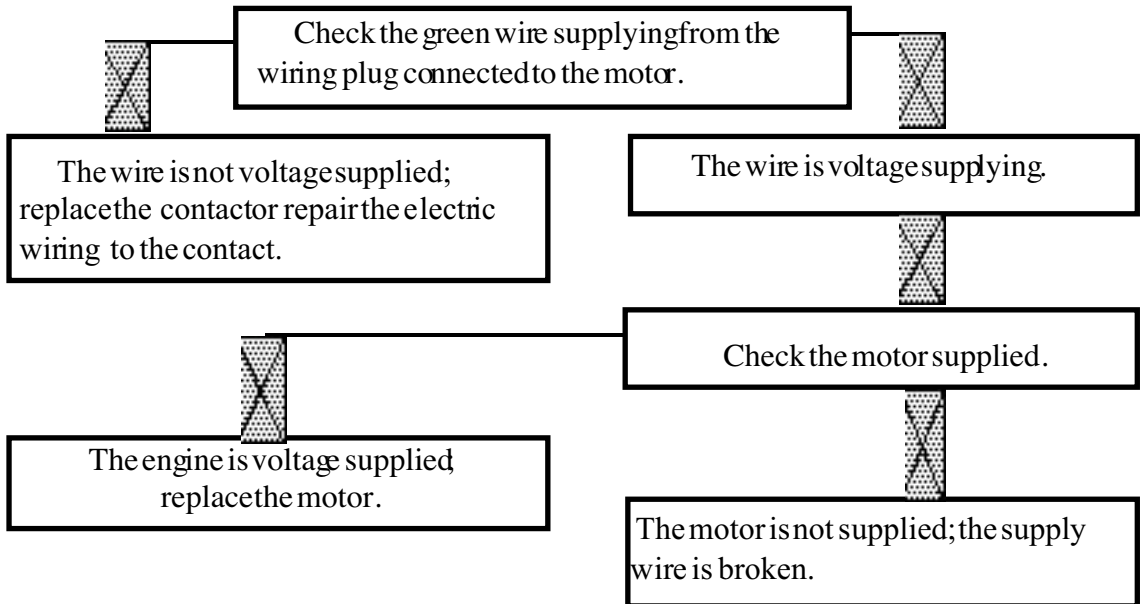
THE WINDSCREEN WIPER IS NOT WORKING  
THE PUMP IS WORKING



**WINDSCREEN WIPER NOT WORKING AT HIGH SPEED;  
THE PUMP IS WORKING**

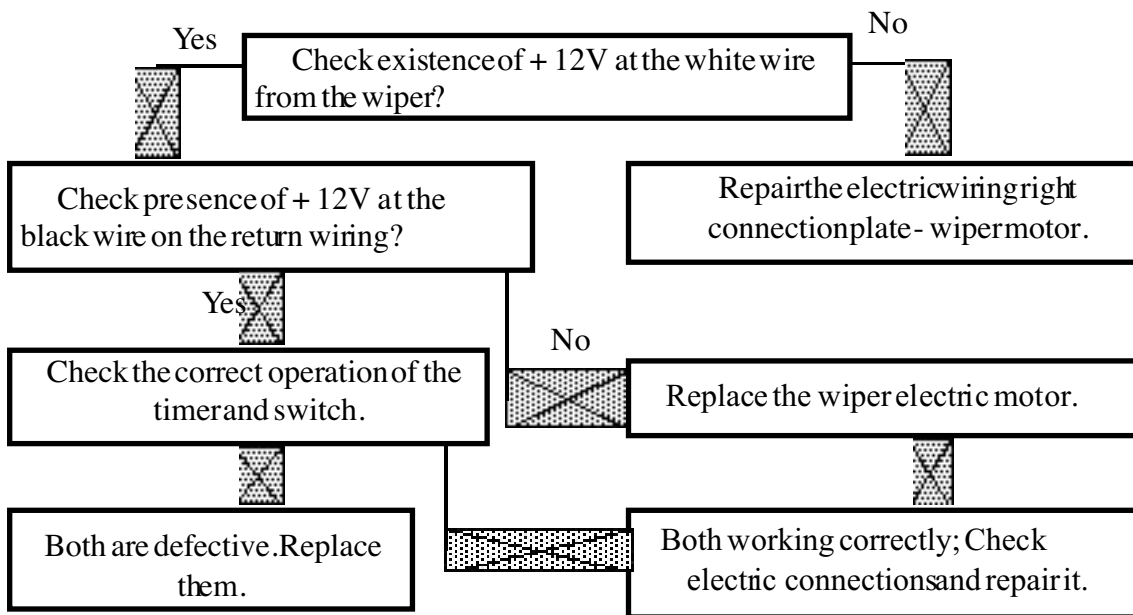


**WINDSCREEN WIPER NOT WORKING AT LOW SPEED;  
IT DOES NOT STOP AT FIX POINT; THE PUMP IS WORKING**





WINDSCREEN WIPER WORKING ON BOTH SPEEDS, BUT IT DOES NOT STOP AT FIX POINT; THE PUMP IS WORKING



### GENERALPRESENTATION

From the electric point of view, the electric diagrams of the vehicle have been structured as Applied Principle Schemes (APS), which are presented according to each function of the systems. These APS diagrams also contain detail concerning the internal function of some simple electric components (contacts, relays), thus contributing to a better understanding of the system functioning and of the incident good diagnosis.

● **Chapter 2** includes the list of the functional diagrams (APS). They are divided in: electric supply diagrams, mass connection diagrams and system functional diagrams.

● **Chapter 7** includes the electric functional diagrams (APS), indicating the following

- electric components, marked by a 3-4 figures; their identification on the electric diagrams can be achieved by means of “index of components” – Chapter 3;

- couplings between the electric wires, marked by the letter R followed by figures; they are indicated in the Chapter 4 list;

- mass connections, marked by the letter M followed by figures or letters; they are indicated in Chapter 4.

Each wire of the electric diagrams is marked by an alphanumeric code, representing the wire function, followed by a group of letters representing the wire colour.

● **Chapter 11** includes the connectors and couplings between the wires. These are drawn from the wires inlet to the connector/coupling. The wires entering each connector socket are identified by means of the above-mentioned drawings. The Chapter 11 also includes tables with details about each wire entering the connector: wire location in the connector socket, wire sectioning, wire function code and its destination.

● **Chapter 10** includes the index of wire functions in connectors and couplings, representing the list of all the connectors and couplings and helping to their easy identification in Chapter 11.

● **Chapter 5** includes the mass and coupling position on the vehicle and helps to identify the electric mass fixing points on it and the location of the couplings between its wires.

● **Chapter 6** includes the electric components position on the vehicle. The position of the various components with electric functions on the vehicle can be identified by means of the components list.

## FUNCTIONAL DIAGRAMS INTERPRETATIONS

The functional diagrams information included in Chapter 7 are to be interpreted taking into consideration the explanation referring to the following example:

- 1 = vehicle class
- 2 = manufacturing year
- 3 = electric functional diagram denomination
- 4 = criteria of equipment differentiation for identifying the functional diagram
- 5 = electric connector colour\*
- 6 = connector graphical representation
- 7 = electric component index number
- 8 = fuses box number (the relay or the safety fuse are mounted on this box)
- 9 = identification of the safety fuse on the fuses box
- 10 = safety fuse value
- 11 = identification of wiring joints
- 12 = electric mass identification
- 13 = electric connection colour between wires\*
- 14 = electric connection identification
- 15 = electric connection graphical representation
- 16 = symbol, pages containing functional diagrams
- 17 = wire function code
- 18 = wire colour
- 19 = functional diagram number

**OBSERVATION:**

1. The electric connectors (5) the couplings (13) and wires (18) are symbolised by the following colours:

BA = white	GR = grey	SA = salmon pink
BE = blue	MA = brown	VE = green
BJ = beige	NO = black	VI = violet
CY = white	OR = orange	
GR = grey	RG = red	

2. The zone (4) specifies the differentiation elements serving to the identification of the various functional diagrams, taking into consideration the following symbols:

- PROJAB for vehicles with fog lights
- EVCVAR for vehicles with windscreen wiper timer
- CHAUFO – for vehicles without AC
- CA – for vehicles with AC
- ANTID – for vehicles provided with anti-starting system
- DAIF country group with SASO standards
- 4X4 – for vehicles provided with 4X4 traction
- U75 – representing DACIA 1304 Pick-Up
- M75 – representing DACIA 1304 King Cab
- E75 – representing DACIA 1304 Drop-Side
- H75 – representing DACIA 1307 Double Cab



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**INTERPRETATION OF CONNECTORS WIRES FUNCTION INDEX**

The information concerning the function of the wires in connectors and couplings included in Chapter 1, are to be interpreted taking into account the explanations based upon the following example:

- 1 = symbol of the pages containing connectors and couplings
- 2 = connector destination
- 3 = vehicle class
- 4 = manufacturing year
- 5 = name of the wiring on which the respective connector is placed
- 6 = wire colour
- 7 = connector code
- 8 = component to whom the described connector is to be connected
- 9 = connector colour
- 10 = connector symbol
- 11 = indication of the connector socket
- 12 = wire sectioning (mm<sup>2</sup>)
- 13 = wire functional code
- 14 = wire destination
- 15 = chapter number and connector drawing number

**NOTE:**

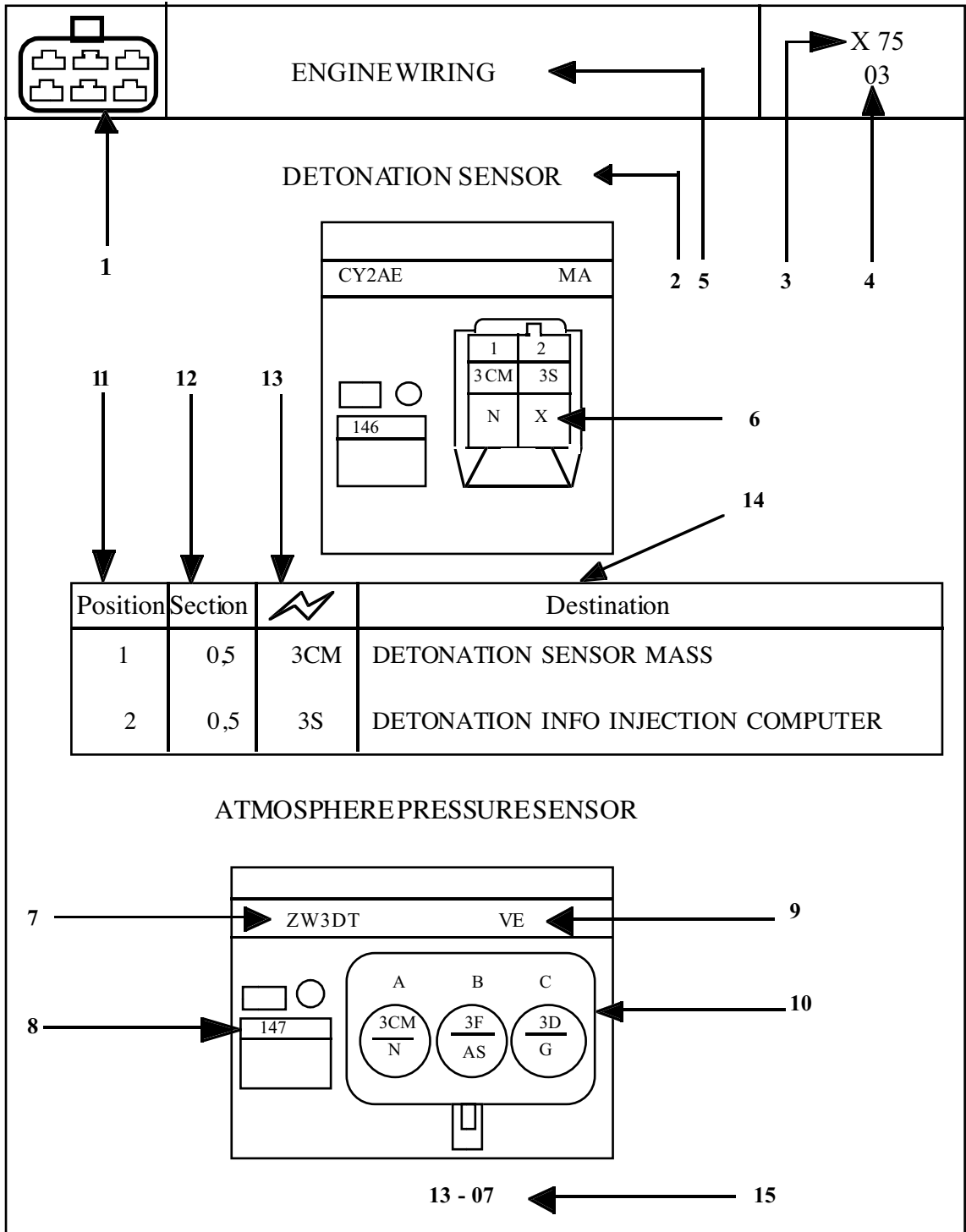
*Concerning position 6, we point out that we are to mark one X for one wire and two Xs for two wires. The colour of the wire is to be symbolized only in case the electric track of the wire represents one of the fundamental statuses: + permanent (+IC), + after contact (+DC), mass, (-) or controls.*

*The symbols used for the wire colours are as follows:*

A = white  
N = black  
M = brown

AS = blue  
G = yellow  
VI = violet

GR = grey  
V = green  
R = red



No.	Electric diagrams denomination	U75	H75	E75	M75
1.	Antistarting	O	O	O	O
2.	Speed limit alarm (DAIF)	S	S	S	S
3.	Lighter	S	S	S	S
4.	Climate control system	S	S	S	S
5.	Climate control system and air conditioning	O	O	O	O
6.	Ashtray lighting	S	S	S	S
7.	Ceiling lamp	S	S	S	S
8.	Documents compartment lighting lamp(CHAUFO)	S	S	S	S
9.	Documents compartment lighting lamp	S	S	S	S
10.	Transmission 4x4	O	O	O	O
11.	Starting circuit	S	S	S	S
12.	GMV cooling(CA)	O	O	O	O
13.	Electronic injection (CHAUFO)	S	S	S	S
14.	Electronic injection(CA)	O	O	O	O
15.	Charging circuit	S	S	S	S
16.	Rear wire mass	S	S	S	S
17.	Battery mass	S	S	S	S
18.	4x4 transmission additional wire mass	O	O	O	O
19.	AC additional wire mass	O	O	O	O
20.	Windscreen wiper additional wire mass	O	O	O	O
21.	Fog lights additional wire mass	O	O	O	O
22.	Driver belt witness additional wire mass(DAIF)	S	S	S	S
23.	Speed limit alarm wire mass (DAIF)	S	S	S	S
24.	Front wire mass/dashboard(CHAUFO)	S	S	S	S
25.	Front wire mass/dashboard(CA)	O	O	O	O
26.	Front wire mass/dashboard(ANTIDID,CA)	O	O	O	O
27.	Engine wire mass	S	S	S	S
28.	Cockpit fuses box	S	S	S	S
29.	Coupling plates (CA)	O	O	O	O
30.	Coupling plates (4x4)	O	O	O	O
31.	Coupling plates (DAIF)	O	O	O	O
32.	Coupling plates (CA,4x4)	O	O	O	O
33.	Coupling plates (DAIF,4x4)	O	O	O	O
34.	Witness hand brake/brake system failure	S	S	S	S
35.	Fuel level indicator	S	S	S	S
36.	Oil pressure witness	S	S	S	S
37.	Instrument panel	S	S	S	S
38.	Cooling fluid temperature alert witness	S	S	S	S
39.	Witness brake plates damage	S	S	S	S
40.	Driver belt witness (DAIF)	S	S	S	S
41.	Acoustic alarm	S	S	S	S
42.	Windscreen wiper - cleaner	S	S	S	S
43.	Windscreen wiper - cleaner (EVCVAR)	O	O	O	O

No.	Electric diagrams denomination	U75	H75	E75	M75
44.	Rear fog lights	S	S		S
45.	Rear fog lights			S	
46.	Fog lights	O	O	O	O
47.	High - beams	S	S	S	S
48.	Backward running lights	S	S		S
49.	Backward running lights			S	
50.	Position lights	S	S		S
51.	Position lights			S	
52.	Road lights	S	S	S	S
53.	STOP lights	S	S		S
54.	STOP lights			S	
55.	Signalisation and break down lights	S	S		S
56.	Signalisation and break down lights			S	

NOTA : S= equipment series; O= optional equipment



CODE	COMPONENT DENOMINATION	CODE	COMPONENT DENOMINATION
101	Electric lighter	236	Fuel pump control relay
103	Alternator	238	Main relay
104	Anti - theft system	244	Injection water temperature sensor
105	Acoustic alarm	247	Board panel
107	Battery	250	Vehicle speed transducer
113	Windscreen wiper timer	251	Water thermo-contact, 2 steps
120	Injection computer (UCE)	255	Front right signalling light
121	Fog headlights switch	256	Front left signalling light
122	Air heater switch	262	GMV cooling and AC
124	Breakdown switch	267	Right front side signalisation light
125	Signalisation relay	268	Left front side signalisation light
137	Releu semnalizare	271	Water temperature transmitter
145	Windscreen wiper - cleaner switch	272	Injection air temperature sensor
149	Rotation sensor	298	Climate control lights
155	Backwards running contactor	319	Air conditioning control(push + button and switch)
156	Handbrake contactor	321	GMV resistance (for AC)
160	Stop contactor	326	Speed over-limit indicator relay (120km/h)
163	Starter	329	Right front ceiling light
166	Registration number right lamp	333	Driver safety belt contactor
167	Registration number left lamp	335	GMV climate control relay-step I
171	AC compressor clutch	362	Supply plate (+IC)
172	Rear right light	371	Canister purging valve
173	Rear left light	411	Air conditioning pressure gauge
176	Fog right headlight	448	Supply plate (+DC)
177	Fog left headlight	474	AC relay (la board)
180	Front left door contactor	478	4x4 contactor
184	Front right position light	484	4x4 coupling electro-valve
185	Front left position light	503	Decoder UCE
199	Fuel level transmitter and electric pump	584	Clutch control relay for AC compressor
205	Manual contact	597	Safety fuses and relays box, engine compartment
209	Switch for lights, signalisation direction and honk	600	GMV climate control
210	Electronic clock	654	Anti-starter receptor
212	Windscreen wiper motor	659	A.C. pressure gauge anti-return diode
216	Front right brake plate	687	Diode group for starter switch A.C.
217	Front left brake plate	720	A.C. stopping relay
221	Windscreen cleaner pump	723	A.C. compressor clutch diode
222	Potentiometer valve	778	Ignition coil
225	Diagnosis plug	797	Oxygen rod
226	Right headlight	1016	Cockpit fuses box
227	Left headlight	1091	Braking system ICP
228	Idle motion regulator	1155	4x4 witness control relay
230	Fog lights relay	1157	Cockpit GMV 2 (for A.C)
231	Fog headlight control relay	1187	Vacuum capsule contact
234	GMV cooling control relay	1335	Front ashtray lighting

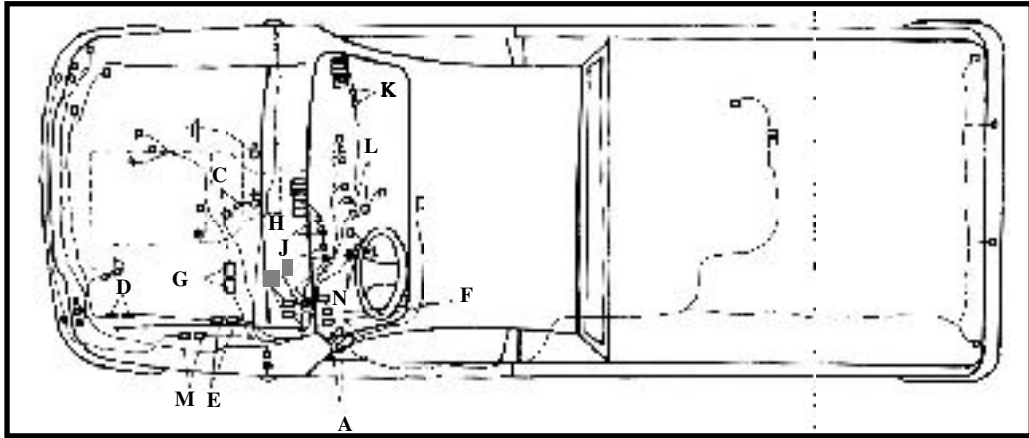
**COUPLING LIST**

- R 9 = ADDITIONAL BOARD PANEL (E)/ ADDITIONAL FRONT WIRES COUPLING**  
**R 25 = BATTERY (C)/ FRONT WIRES COUPLING**  
**R 67 = DIAVIA (D)/ADDITIONAL FRONT/ADDITIONAL FRONT WIRES COUPLING**  
**R 82 = AC CONTROL (L)/ADDITIONAL BOARD PANEL WIRES COUPLING**  
**R 93 = COCKPIT GMV 2(K)/ ADDITIONAL BOARD PANEL WIRES COUPLING**  
**R 99 = GMV CLIMATE CONTROL (J)/ CLIMATE CONTROL SWITCH WIRES  
COUPLING**  
**R106 = WINDSCREEN WIPER (N)/FRONT WIRES COUPLING**  
**R107 = BOARD PANEL (B)/FRONT WIRES COUPLING**  
**R111 = GMV CLIMATE CONTROL (H)/BOARD PANEL WIRES COUPLING**  
**R112 = DECODER U.C.E. (F)/FRONT WIRES COUPLING**  
**R122 = FRONT WIRES COUPLING / FOG LIGHTS**  
**R212 = ENGINE (G)/FRONT WIRES COUPLING**  
**R217 = REAR (R)/FRONT WIRES COUPLING**  
**R265 = REAR (A)/FRONT WIRES COUPLING**  
**R318 = BOARD PANEL(P)/FRONT WIRES COUPLING**

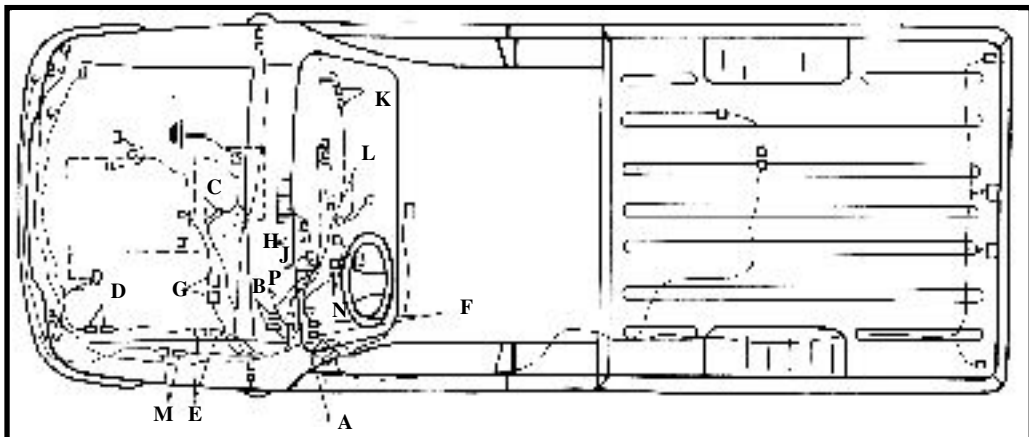
**MASS LIST**

- MA = RIGHT FRONT BODY ELECTRIC MASS**  
**MB = LEFT FRONT BODY ELECTRIC MASS**  
**MF = RIGHT REAR ELECTRIC MASS**  
**MG = LEFT REAR ELECTRIC MASS**  
**MG = BATTERY ELECTRIC MASS**  
**MN = LEFT WINDSCREEN CROSS ELECTRIC MASS**  
**MU = HANDBRAKE MASS**

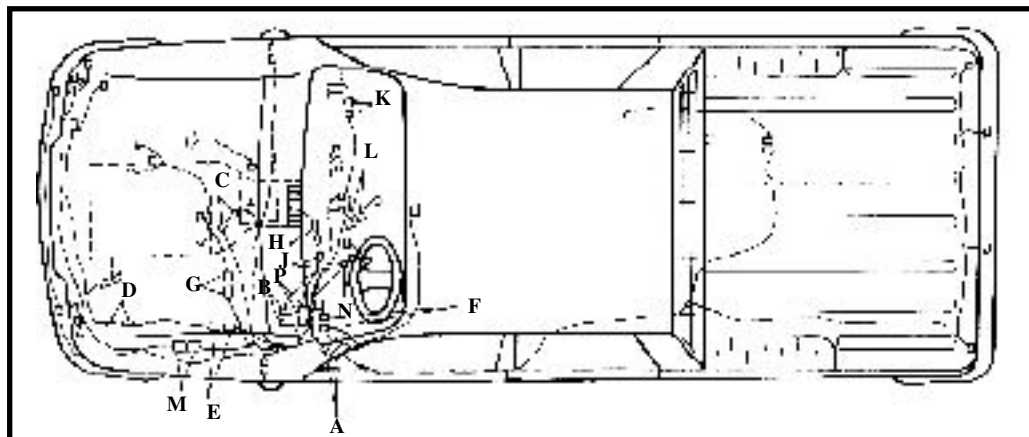
A. for U75 (Pick-up), M75 (King Cab)



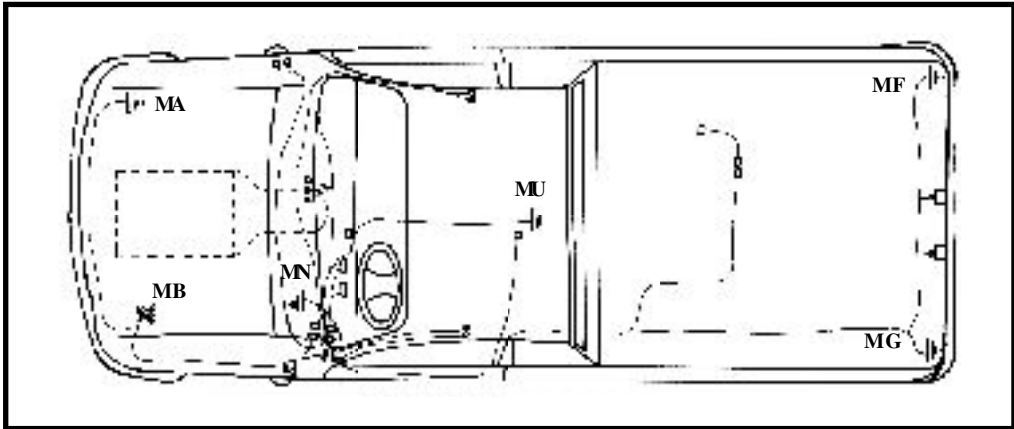
B. for E75 (Drop -Side)



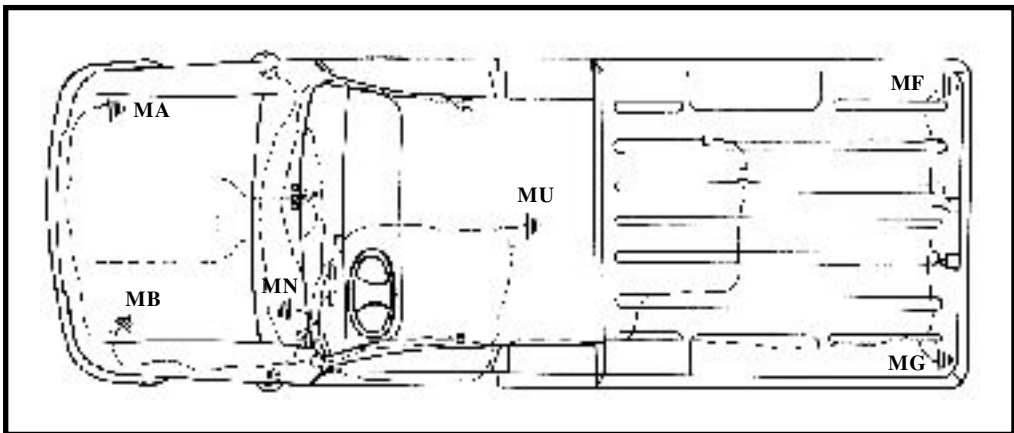
C. for H75 (Double Cab)



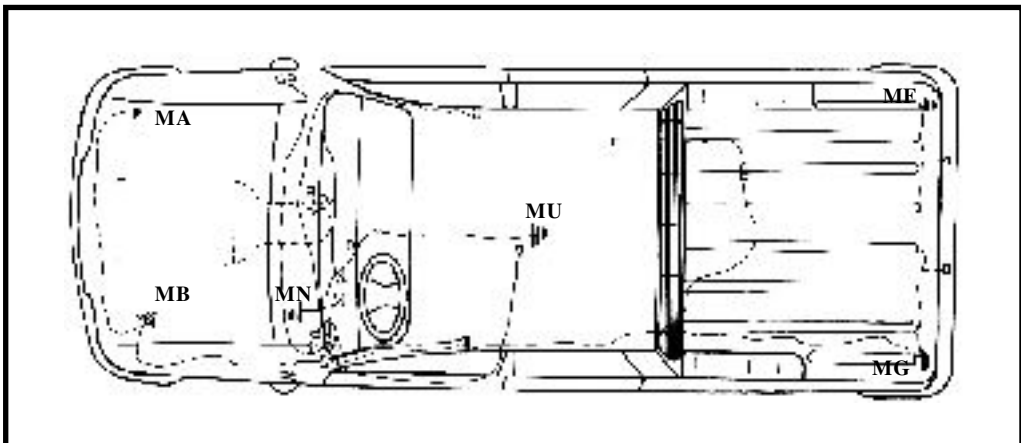
A. for U75 (Pick-up), M75 (King Cab)



B. for E75 (Drop -Side)



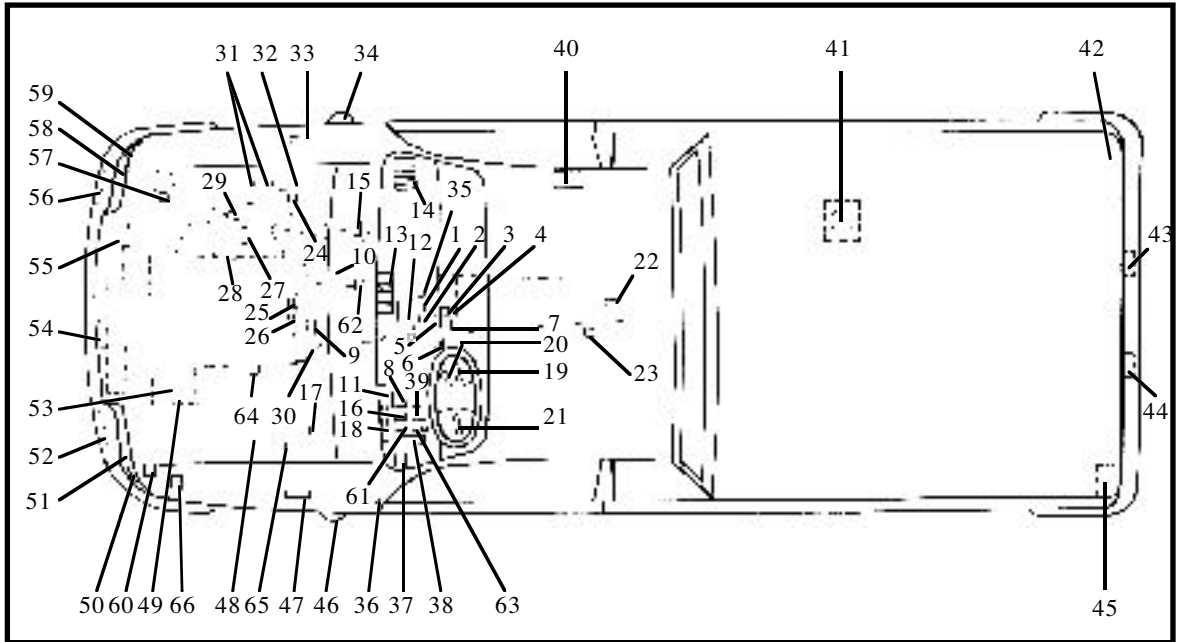
C. for H75 (Double Cab)



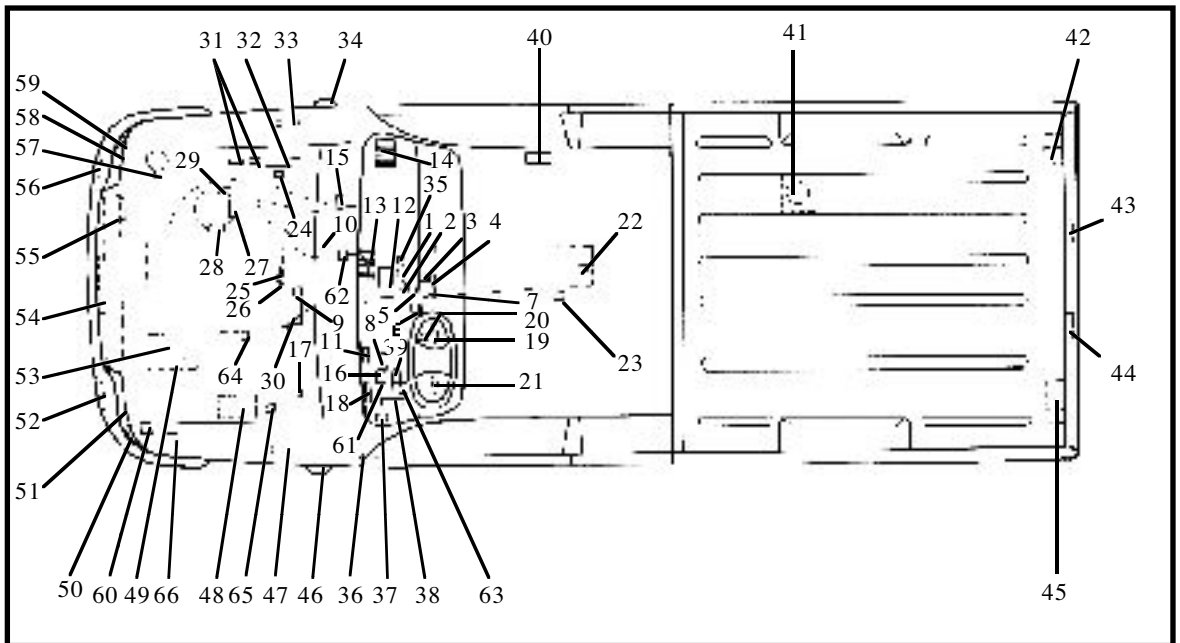
1	Breakdown switch	35	Electronic clock
2	Fog lights switch	36	Left front door contact
3	Safety belt witness	37	Cockpit fuses box
4	Fog headlights switch	38	Decoder UCE
5	Air heater switch	39	Control relay for climate GMV - step1
6	Anti-starter receptor	40	Right front ceiling light
7	Air conditioning control (push button + switch)	41	Fuel level transmitter and electric pump
8	Indicating relay for over-limit speed 120km/h	42	Right rear light
9	Rotation sensor	43	Right registration number light
10	Vacuum capsule contact	44	Left registration number light
11	Supplying plate (+DC)	45	Left rear lamp
12	Windscreen wiper motor	46	Left front sidesignalisation light
13	Climate control GMV	47	Left front brake plates
14	Cockpit GMV2 (for A.C)	48	Safety fuses and relays box, engine compart.
15	Oxygen rod	49	A.C compressor clutch
16	Signalisation relay	50	Left front signalisation light
17	Braking system ICP	51	Left headlight
18	Supplying plate (+IC)	52	Left fog headlight
19	Windscreen wiper-cleaner switch	53	Alternator
20	Anti-theft system	54	Cooling GMV and A.C
21	Switch for lights, signalisation, direction, horn	55	Water thermocontact - 2 steps
22	Handbrake contact	56	Right fog headlight
23	Contacteur centură conducător	57	Air conditioning pressure gauge
24	Canister purging valve	58	Right headlight
25	Water temperature transmitter	59	Right front signalisation light
26	Injector water temperature sensor	60	Acoustic alarm
27	Valve potentiometer	61	Windscreen wiper timer
28	Engine step by step	62	Idle running contactor
29	Injection air temperature sensor	63	A.C relay (board)
30	Ignition oil	64	Manual contact
31	4x4 coupling electro valve	65	Diagnosis socket
32	Injection computer (UCE)	66	Fog headlights control relay
33	Right front brake plate	67	
34	Right front side signalisation light	68	

## ELECTRIC COMPONENTS LOCATION ON THE VEHICLE

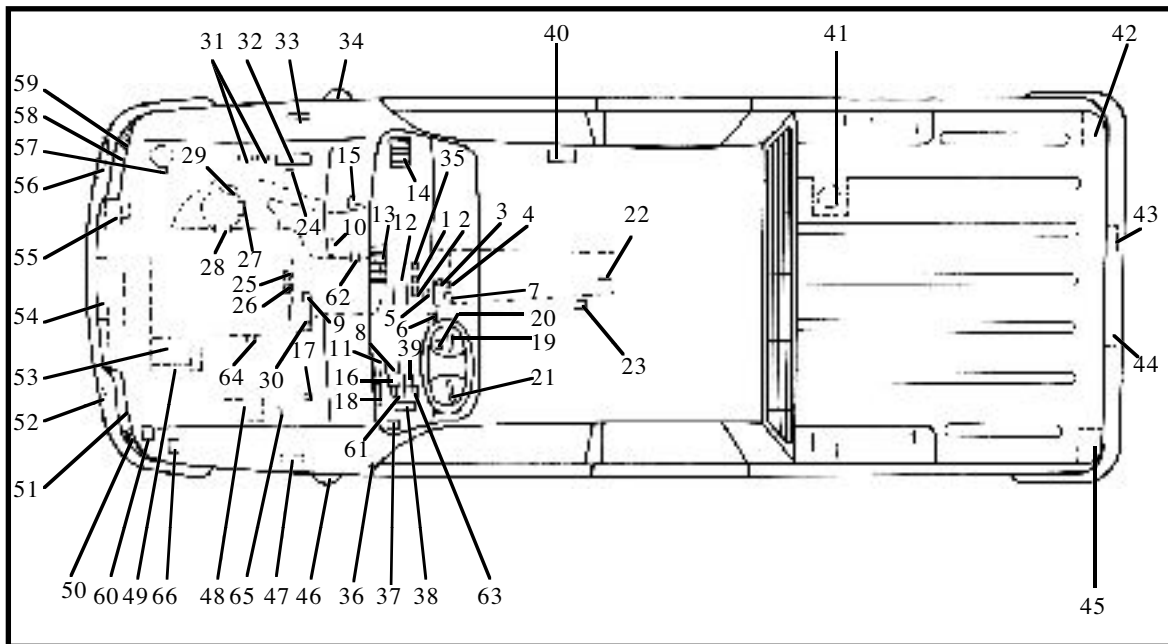
### A. PENTRU U75 (Pick-up), M75 (King Cab)



### B. PENTRU E75 (Drop -Side)



C. PENTRU H75 (Double Cab)



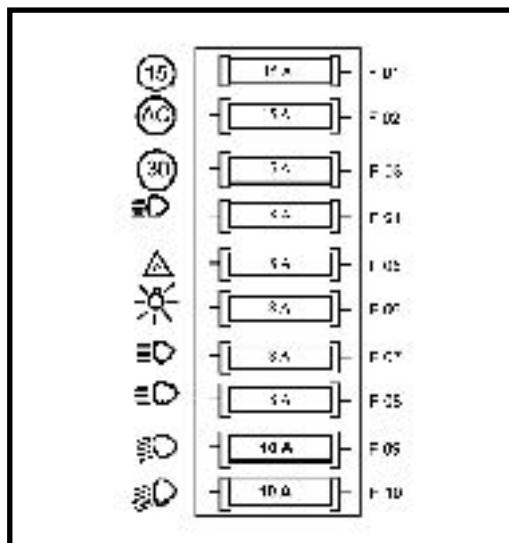
## COCKPIT FUSE BOX

The DACIA commercial vehicles are provided with a fuses box (10 safety fuses) situated in the cockpit, under the board, left side.

In case of electric system damage, before other interventions we must first check the fuses and connections of the equipment, power off. The fuses protect the following electric circuits:

FUSE NUMBER	FUSE TYPE	PROTECTED CIRCUIT
F 01	15 A	Rear lights and board panel supply, STOP lights;
F 02	15 A	4x4 electro-vacuum control*, climate control with CA*, speed over-limit 120km/h indicator*, vehicle speed transducer*;
F 03	15 A	GMV climate control, clock;
F 04	8 A	Fog lights, ceiling light, ashtray, windshield wiper-cleaner
F 05	8 A	Direction and break-down signalisation
F 06	8 A	Position lights, lighting of the board panel, ashtray, lighter, gloves box, clock, switches;
F 07	8 A	Left driving lights;
F 08	8 A	Right driving lights;
F 09	10 A	Left high beam;
F 10	10 A	Right high beam.

\* for vehicle with 4x4, CA or speed over-limit indicator.





# ELECTRICAL DIAGRAMS

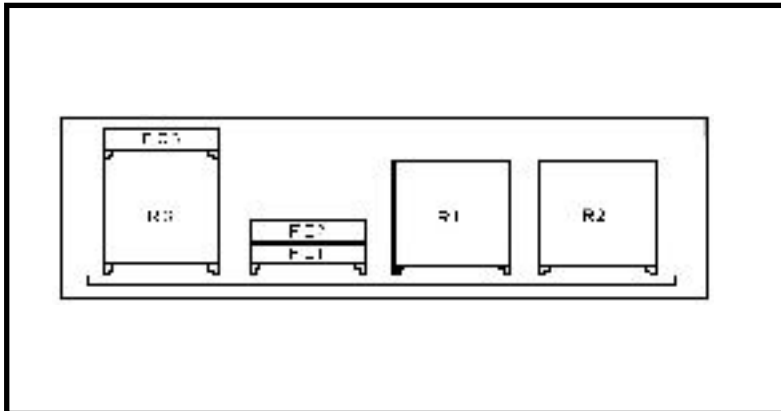
## ENGINE COMPARTMENT FUSE BOX

The electric equipment of DACIA commercial vehicles is provided with safety fuses and relay, situated in the engine compartment and fixed on the left mudguard coating.

Electric circuits protected by fuses and relays:

FUSE NUMBER	FUSE TYPE	PROTECTED CIRCUIT
F01	10 A	Fuel electric pump
F02	10 A	Oxygen rod
F03*	15 A	Fog lights

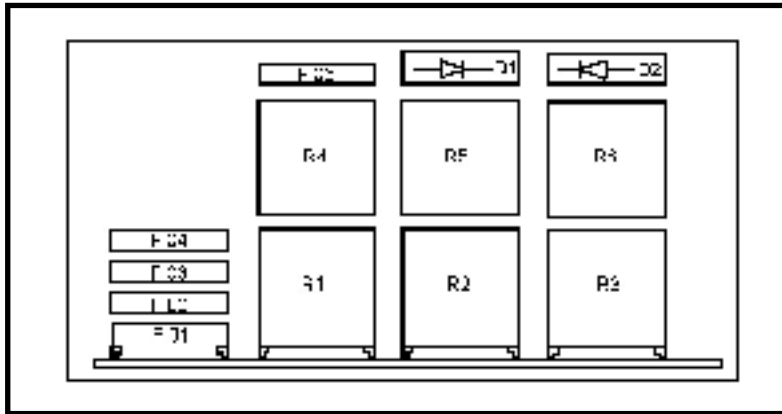
RELAY	PROTECTED CIRCUIT
R 1	Oxygen rod, fuel electric pump.
R 2	Injection computer, injection witness.
R 3*	Fog lights



\* -for vehicle with fog lights

## ENGINE COMPARTMENT FUSE BOX

The vehicles provided with AC system, the fuse box situated in the engine compartment is fixed on the left mudguard coating, having the following configuration



FUSE NUMBER	FUSE TYPE	PROTECTED CIRCUIT
F01	10 A	A.C. compressor
F02	10 A	Oxygenrod
F03	10 A	Fuelectric pump
F04	30 A	G.M.V.cooling
F05*	15 A	Fog lights

DIODE	TYPE	DESTINATION
D 1	6 A	A.C. compressor
D 2	6 A	A.C.pressure gauge anti-return

RELAY	PROTECTED CIRCUIT
R 1	Oxygenrod , fuelectric pump
R 2	A.C. compressor
R 3	Injectioncomputer,injectionwitness.
R 4*	Fog lights.
R 5	G.M.V.cooling
R 6	Injectioncomputer( thermo-protectionA.C.)

\* -for vehicle with fog lights

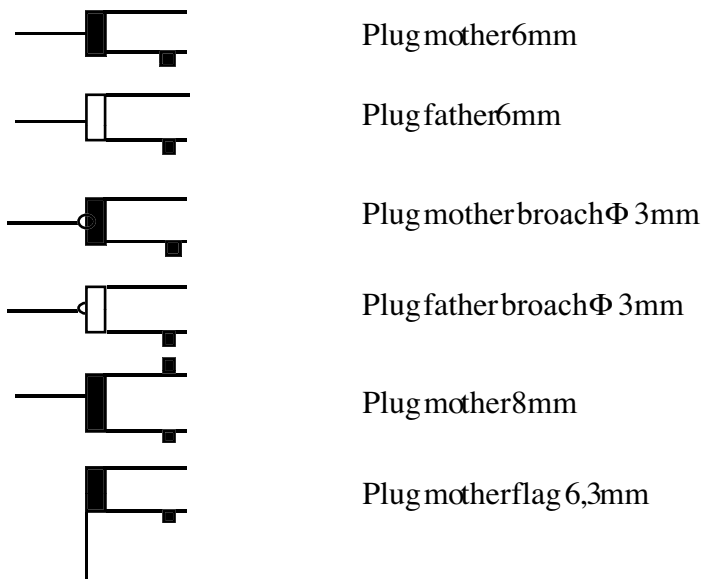
CONNECTOR NO.	DENOMINATION
101	ELECTRIC LIGHTER
103 HA	ALTERNATOR
103 HB	ALTERNATOR EXCITATION
104	ANTI-THEFT SYSTEM
105	ACOUSTICAL ALARM
107 AA	BATTERY TERMINAL (+)
107 AB	BATTERY TERMINAL (-)
113	WINDSCREEN WIPER MOTOR
120	INJECTION U.C.E.
121	FOG LIGHTS SWITCH
122	FOG HEADLIGHT SWITCH
125	BRAKE - DOWN SWITCH
137	SIGNALISATION RELAY
145	WINDSCREEN WIPER - CLEANER SWITCH
149	ROTATION SENSOR
155	REAR RUNNING CONTACTOR
156	HANDBRAKE CONTACTOR
160	STOP CONTACTOR
163 BA	STARTER
163 AB	STARTER
163 DB	STARTER EXCITATION
166	REGISTRATION NUMBER RIGHT LIGHT
167	REGISTRATION NUMBER LEFT LIGHT
168	GLOVES BOX LIGHTS
171	A.C. COMPRESSOR CLUTCH
172	RIGHT REAR LIGHT
173	LEFT REAR LIGHT
176	RIGHT FOGLIGHT
177	LEFT FOGLIGHT
184	RIGHT FRONT POSITION LIGHT
185	LEFT FRONT POSITION LIGHT
199	ELECTRIC PUMP AND FUEL LEVEL TRANSMITTER
205	MANUAL CONTACT
209 A	HORN AND LIGHTS SWITCH
209 B	DIRECTION SIGNALISATION SWITCH
210	ELECTRONIC CLOCK
212	WINDSCREEN WIPER MOTOR
216	RIGHT FRONT BRAKE PLATE
217	LEFT FRONT BRAKE PLATE
221	WINDSCREEN CLEANER PUMP
222	VALVE POTENTIOMETER

225	DIAGNOSIS PLUG
226	RIGHTS HEADLIGHT
227	LEFT HEADLIGHT
228	IDLE MOTION REGULATOR
230	FOG LIGHTS RELAY
231	FOG LIGHTS CONTROL RELAY
234	GM V R A C I R E COOLING CONTROL RELAY
236	FUEL PUMP CONTROL RELAY
238	MAIN RELAY
244	WATER INJECTION TEMPERATURE SENSOR
247	BOARD PANEL
250	VEHICLE SPEED TRANSDUCER
251	WATER THERMO-CONTACT
255	RIGHT FRONT SIGNALISATION LIGHT
256	RIGHT FRONT SIGNALISATION LIGHT
262	GM V COOLING
267	RIGHT FRONT SIDE SIGNALISATION LIGHT
268	LEFT FRONT SIDE SIGNALISATION LIGHT
271	WATER TEMPERATURE TRANSMITTER
272	AIR TEMPERATURE SENSOR/INJECTOR
298	CLIMATE CONTROL LIGHTING
326	SPEED OVER-LIMIT INDICATOR RELAY (120 km/h)
329	RIGHT FRONT CEILING LIGHT
333	DRY VER SAFETY BELT CONTACTOR
335	GM V CLIMATE CONTROL RELAY
371	CANISTER PURGING VALVE
411	A.C. PRESSURE GAUGE (PRESSURE ROD)
474	A.C. RELAY (board)
484	4x4 COUPLING ELECTRO-VALVE
478	4x4 CONTACTOR
584	A.C. COMPRESSOR CLUTCH CONTROL RELAY
597	ENGINE RELAYS AND SAFETY FUSES BOX
654	ANTI-STARTER RECEPTOR
720	A.C. STOPPING RELAY
778	IGNITION COIL
797	OXYGEN ROD
1016	COCKPIT FUSES BOX
1091	I.C.P. BRAKING SYSTEM
1155	4x4 WITNESS CONTROL RELAY
1187	VACUUM CAPSULE CONTACT
1335	FRONT ASH TRAY LIGHTING

R9	ADDITIONAL FRONT WIRES COUPLING/ADDITIONAL BOARD PANEL	
R25	FRONT WIRES COUPLING / BATTERY	
R67	ADDITIONAL FRONT WIRES COUPLING/ADDITIONAL FRONT DASHBOARD	
R82	ADDITIONAL BOARD PANEL WIRE COUPLING/AC CONTROL	
R93	ADDITIONAL BOARD PANEL WIRE COUPLING/GMV 2 COCKPIT	
R99	AIR HEATER SWITCH WIRE COUPLING/AIR HEATER MOTOR	
R106	FRONT WIRE COUPLING/WINDSCREEN WIPER	
R107	FRONT WIRE COUPLING/ BOARD PANEL	
R111	BOARD PANEL WIRE COUPLING/AIR HEATER	
R112	FRONT WIRE COUPLING/DECODER U.C.E.	
R122	REAR WIRE COUPLING/FOG LIGHTS	
R212	FRONT WIRE COUPLING/ENGINE	
R265	FRONT/REAR WIRE COUPLING	
R318	FRONT WIRE COUPLING/BOARD PANEL	
MA	FRONT RIGHT BODY ELECTRIC MASS	
MB	FRONT LEFT BODY ELECTRIC MASS	


**OBSERVATION:**

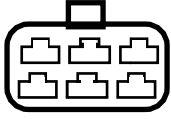
- connectors and couplings are represented backwards (from wires forward);  
 - some electric components are not connected to the vehicle wiring by means of multi-way connectors, but by means of protected individual plugs. For illustrating the type of the respective plug, the following symbols are to be used:



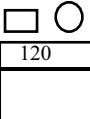
	ENGINE WIRING	X75 03
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### INJECTION U.C.E.


Position	Section		Destination
1	1,5	3CV	CONTROL- 1-4CYLINDERSIGNITIONCOIL
3	0,35	3BL	SIGNAL - ENGINE ROTATION > ROTATION SENSOR
4	0,75	HK	LINEK DIAGNOSISSIGNAL
8	0,75	3AY	IDLE MOTION SWITCH MASS SIGNAL
9	0,5	3GK	UPSTREAMOXYGENERODSIGNAL
10	0,5	3GH	UPSTREAMOXYGENERODMASS
11	0,75	3LW	SIGNAL + POTENTIOMETER 2
12	0,75	3LS	SIGNAL + POTENTIOMETER 1
13	0,75	3B	SIGNAL +AIR TEMPERATURE SENSOR
14	0,75	3C	SIGNAL + WATER TEMPERATURE SENSOR
16	0,75	B	+BATTERY
17	1,0	3BR	SUPPLY+ D.C. > MAIN RELAY
18	0,5	ML	MASS
19	1,5	3CW	CONTROL - 2-3CYLINDERS IGNITIONCOIL
20	2,5	ML	MASS
21	0,35	3BG	ENGINE ROTATION SIGNAL > ROTATION SENSOR
22	0,5	49F	+AIR CONDITIONINGCONTROL
23	0,75	MB	MASS
25	0,75	3AQ	SUPPLY + VALVEPOTENTIOMETER
27	1,5	NF	SENSORSMASS: WATER , AIR, POTENTIOMETER
28	0,75	3AC	CONTROL - FUELPUMPRELAY
29	0,75	3BB	CANISTERPURGING VALVECONTROL
30	0,75	38R	CONTROL+ COMPRESSOR CLUTCHA.C.
31	0,75	3FH	CONTROL - INJECTION DAMAGESWITNESS
32	1,0	3BU	CONTROL 1IDLEMOTION REGULATOR
33	1,5	ML	MASS
34	1,0	3BV	CONTROL2IDLEMOTIONREGULATOR
35	1,0	3AM	CONTROL-INJECTOR

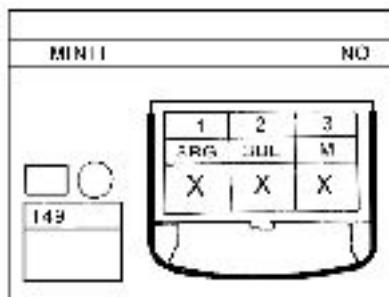
	ENGINE WIRING	X75 03
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MINTI															NO				
18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1		
ML	3BR	B		3C	3B	3LS	3LW	3GH	3GK	3AY				HK	3BL		3CV		
N	G	R		X	X	X	X	N	X	X				X	X		X		
35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19			
3AM	3BV	ML	3BU	3FH	38R	3BB	3AC	NF		3AQ		MB	49F	3BC	ML	3CW			
X	X	N	X	X	X	X	X	Vi-N		X	X	As-M	X	X	N	X			



ROTATION SENSOR

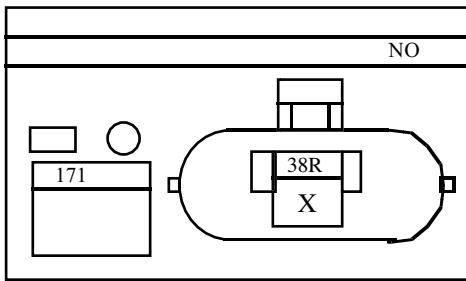
Position	Sectioning		Destination
1	0,35	3BG	ENGINE ROTATION SIGNAL > ROTATION SENSOR
2	0,35	3BL	SIGNAL -ENGINE ROTATION > ROTATION SENSOR
3	0,35	M	SCREENING



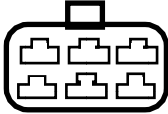
	<p>ENGINE WIRING</p>	<p>X75 03</p>
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A.C. COMPRESSOR CLUTCH  
(for A.C. provided vehicles)


Position	Sectioning		Destination
1	0,75	38R	CONTROL + A.C. COMPRESSOR CLUTCH

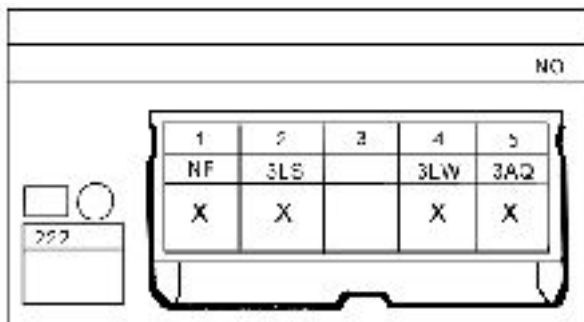





	<p>ENGINE WIRING</p>	<p>X75 03</p>
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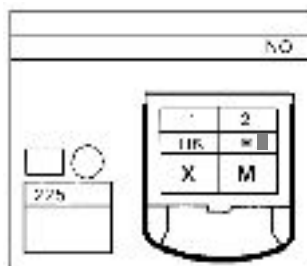
VALVE POTENTIOMETER

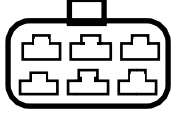
Position	Sectioning		Destination
1	0,5	NF	POTENTIOMETER MASS
2	0,75	3LS	SIGNAL +POTENTIOMETER 1
3			
4	0,75	3LW	SIGNAL +POTENTIOMETER 2
5	0,75	3AQ	SUPPLY+ VALVEPOTENTIOMETER




DIAGNOSIS PLUG

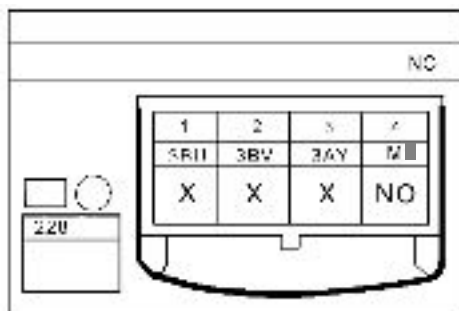
Position	Sectioning		Destination
1	0,75	HK	LINE KDIAGNOSIS SIGNA
2	0,5	ML	MASS




	ENGINE WIRING	X75 03
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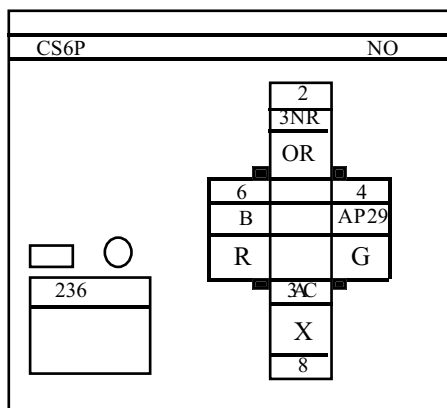
### IDLE MOTION REGULATOR

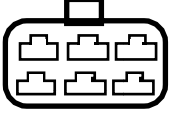
Position	Sectioning		Destination
1	1,0	3BU	CONTROL1 IDLE MOTION REGULATOR
2	1,0	3BV	CONTROL2 IDLE MOTION REGULATOR
3	0,75	3AY	IDLE MOTION SWITCH MASS SIGNAL
4	0,75	ML	MASS




### FUEL PUMP CONTROL RELAY

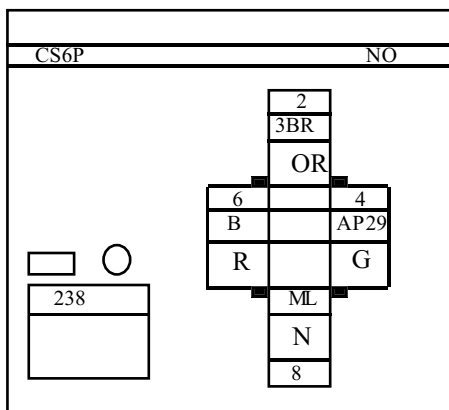
Position	Sectioning		Destination
2	1,0	3NR	+ INJECTOR > FUEL PUMP RELAY
4	0,75	AP29	+ AFTER PROTECTE I CONTACT
6	0,75	3AC	CONTROL- FUEL PUMP RELAY
8	2,5	B	+ BATTERY




	ENGINE WIRING	X75 03
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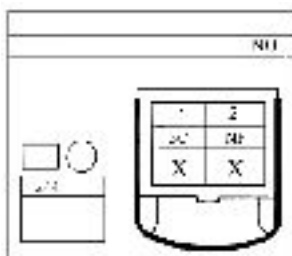
MAIN RELAY

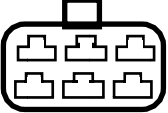
Position	Sectioning		Destination
2	1,0	3BR	+AFTER CONTACT > MAIN RELAY
4	0,75	AP29	+AFTER PROTECTED CONTACT
6	1,0	B	+BATTERY
8	0,75	ML	MASS




INJECTION WATER TEMPERATURE SENSOR

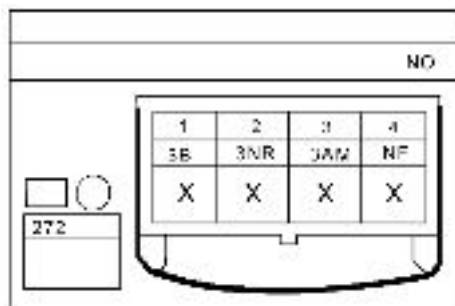
Position	Sectioning		Destination
1	0,75	3C	SIGNAL WATER TEMPERATURE SENSOR
2	0,5	NF	MASS WATER TEMPERATURE SENSOR




	ENGINE WIRING	X75 03
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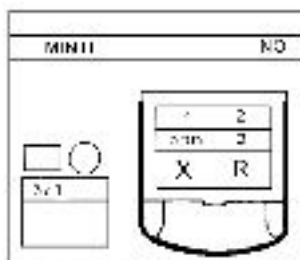
### INJECTOR / AIR TEMPERATURE SENSOR

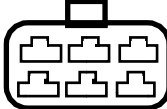
Position	Sectioning		Destination
1	0,75	3B	SIGNAL + AIRTEMPERATURE SENSOR
2	1,0	3NR	+ INJECTOR >FUELPUMP RELAY
3	1,0	3AM	CONTROL-INJECTOR
4	0,5	NF	AIRTEMPERATURE SENSOR MASS




### CANISTER PURGING VALVE

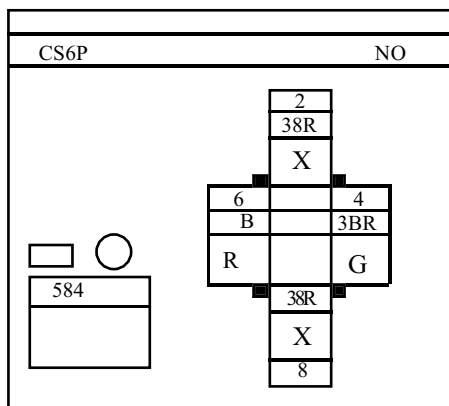
Position	Sectioning		Destination
1	0,75	3BB	CANISTERPURGINGVALVECONTROL
2	0,75	B	+BATTERY

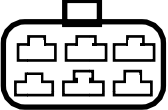


	<p>ENGINE WIRING</p>	<p>X75 03</p>
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A.C.COMPRESSOR CLUTCH CONTROL RELAY  
(For A.C. provided vehicles)

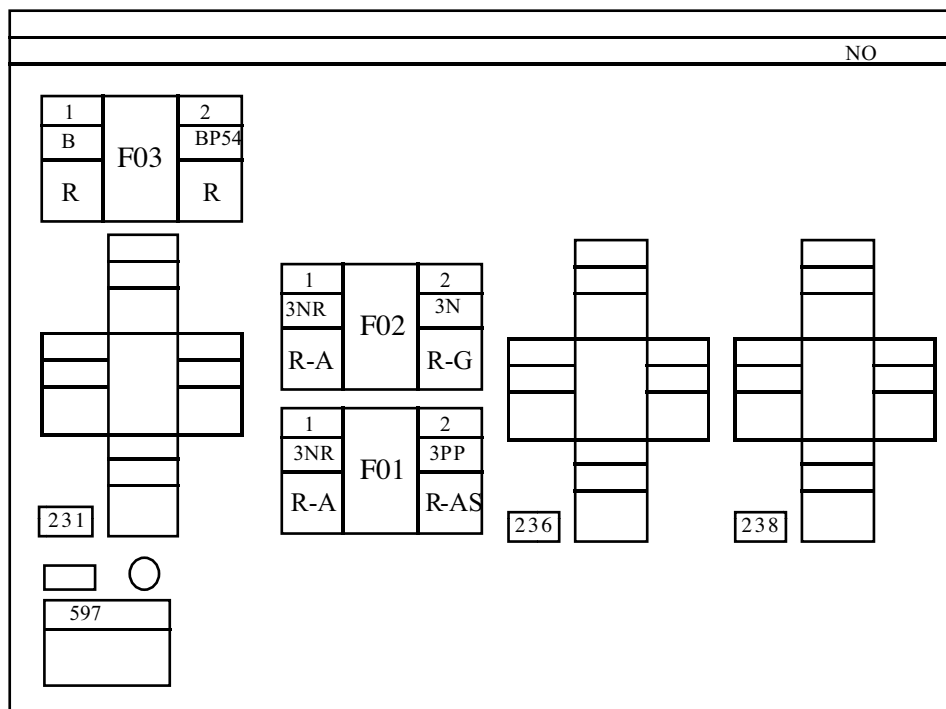
Position	Sectioning		Destination
2	0,75	38R	CONTROL +A.C. COMPRESSOR CLUTCH
4	0,5	3BR	+ AFTER CONTACT >MAIN RELAY
6	0,75	B	+BATTERY
8	0,75	38R	CONTROL +A.COMPRESSORCLUTCH & COMPUTER

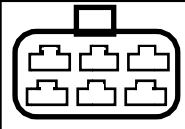


	ENGINE WIRING	X75 03
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### ENGINE RELAYS AND SAFETY FUSES BOX

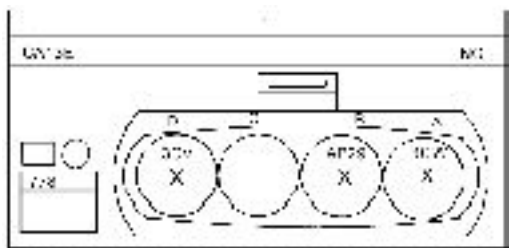
	Position	Sectioning		Destination
F01	1	1,0	3NR	+INJECTOR > F02 FUSE INPUT
	2	1,0	3 PP	OXYGEN ROD HEATING CONTROL
F02	1	1,5	3NR	+ INJECTOR > F03 FUSE INPUT
	2	1,5	3N	+ FUEL PUMP
F04	1	2,0	B	+BATTERY
	2	2,0	BP54	+ BATTERY > FOG HEADLIGHT RELAY




	<p>ENGINE WIRING</p>	<p>X75 03</p>
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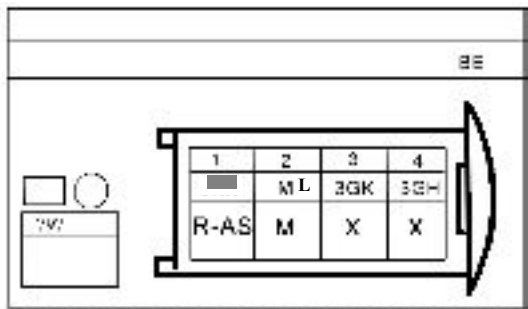
IGNITION COIL

Position	Sectioning		Destination
A	1,5	3CW	CONTROL-2-3CYLINDERSIGNITIONCOIL
B	2	AP29	+AFTER PROTECTING CONTACT
D	1,5	3CV	CONTROL-1-4 CYLINDERSIGNITIONCOIL




OXYGEN ROD

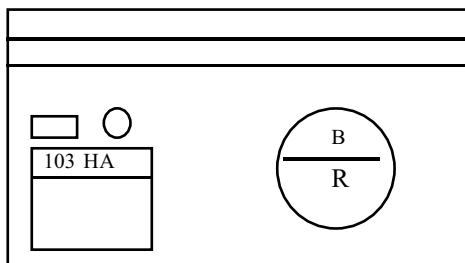
Position	Sectioning		Destination
1	1,0	3PP	OXYGEN ROD HEATING CONTROL
2	1,0	ML	MASS
3	0,5	3GK	UPSTREAMOXYGEN RODSIGNAL
4	0,5	3GH	UPSTREAMOXYGENROD MASS





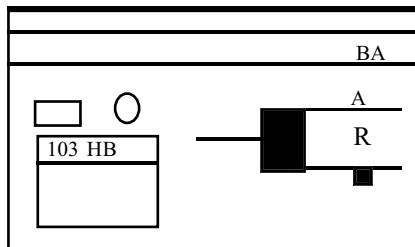
### ALTERNATOR

Position	Sectioning		Destination
1	7,0	B	+BATTERY



### ALTERNATOR EXCITATION


Position	Sectioning		Destination
1	0,7	A	CONTROL-CHARGE WITNESS AFTER CONTACT

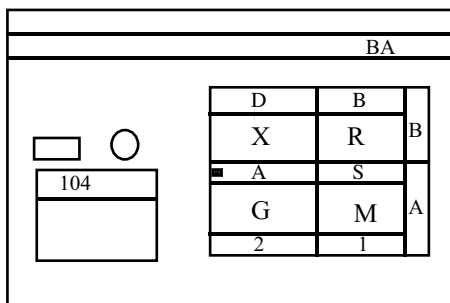







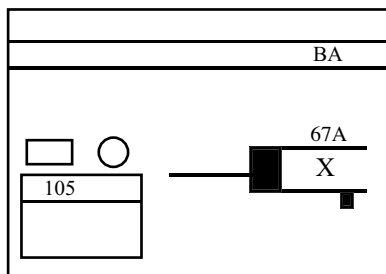
ANTI-THEFT SYSTEM

Position	Sectioning		Destination
A1	2,0	S	SUPPLY + ACCESSORIES
A2	3,0	A	SUPPLY ++ AFTER CONTACT
A2	1,5	A	SUPPLY ++ AFTER CONTACT
B1	3,0	B	+ BATTERY
B2	3,0	D	CONTROL + STARTER




ACOUSTIC ALARM

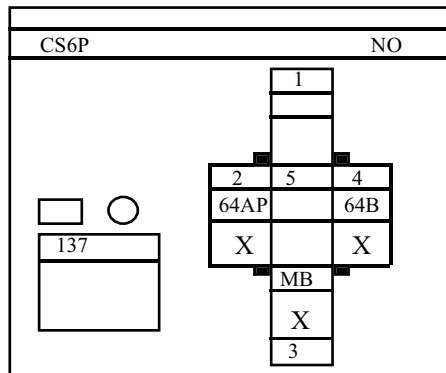
Position	Sectioning		Destination
1	0,75	67A	CONTROL + ACOUSTIC ALARM




	FRONT WIRING	X75 03
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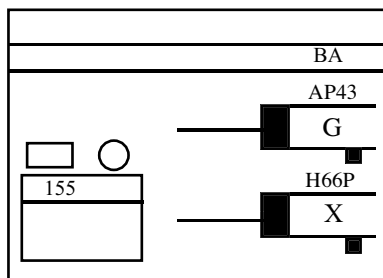
### SIGNALISATION RELAY

Position	Sectioning		Destination
1	0,75	64 AP	+ PROTECTED SIGNALISATION LIGHT
2	0,75	64 B	CONTROL + SIGNALISATION
4	0,5	MB	MASS




### BACKWARDS RUNNING CONTACTOR

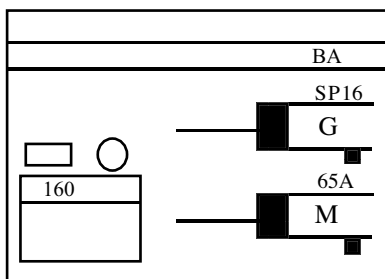
Position	Sectioning		Destination
1	0,5	AP43	+ AFTER PROTECTED CONTACT
2	0,5	H66P	CONTROL + BACKWARDS RUNNING LIGHTS






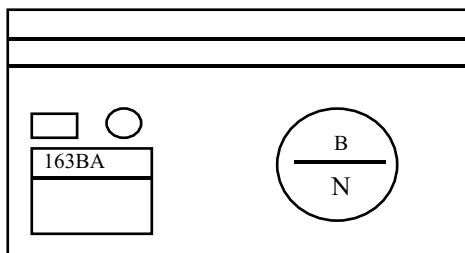
STOP CONTACTOR


Position	Sectioning		Destination
1	0,6	SP16	+PROTECTED ACCESSORIES CONTROL + STOP LIGHTS
2	1,0	65A	

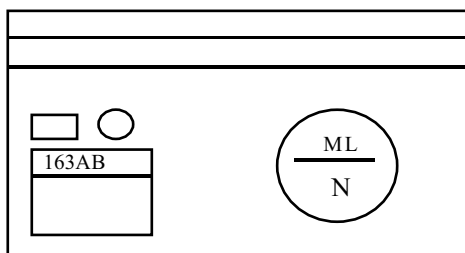


STARTER

Position	Sectioning		Destination
1	16,0	B	+BATTERY



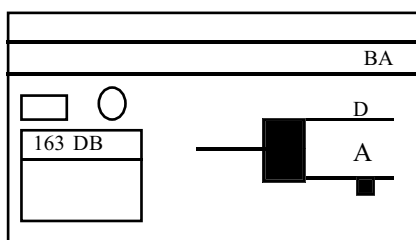
Position	Sectioning		Destination
1	16,0	ML	BATTERY ELECTRIC MASS






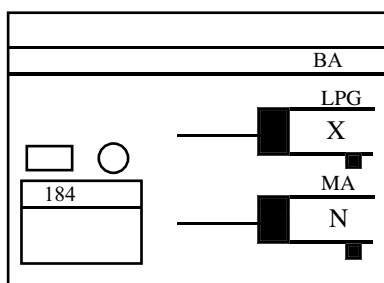
### STARTER EXCITATION

Position	Sectioning		Destination
1	3,0	D	CONTROL+ STARTER




### RIGHT FRONT POSITION LIGHT

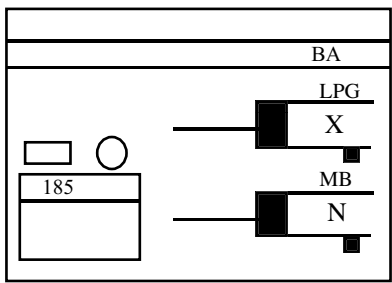
Position	Sectioning		Destination
1	0,35	LPG	+ POSITION LIGHTS PROTECTED MASS
2	0,35	MA	



	<p>FRONT WIRING</p>	<p>X75 03</p>
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LEFT FRONT POSITION LIGHT

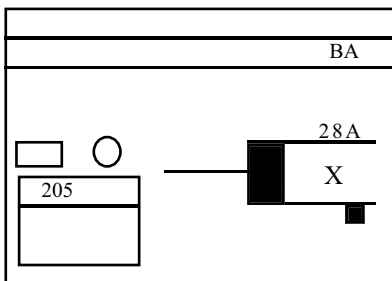
Position	Sectioning		Destination
1	0,35	LPG	+ POSITION LIGHTS PROTECTED MASS
2	0,35	ML	




	FRONT WIRING	X75 03
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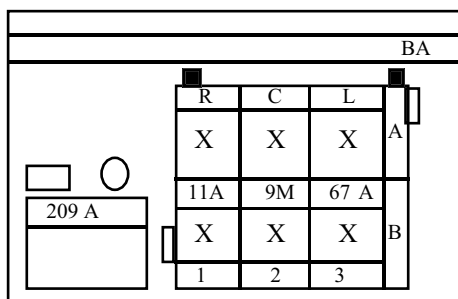
### MANUAL CONTACT

Position	Sectioning		Destination
1	0,35	28A	CONTROL OIL PRESSURE WINESS




### HORN AND LIGHTS SWITCH

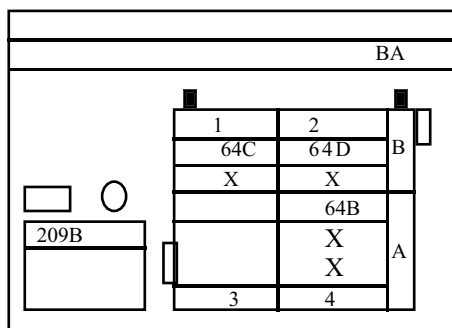
Position	Sectioning		Destination
A1	1,4	R	+ DRIVING LIGHTS
A2	1,4	C	+ HIGH-BEAMS
A3	1,0	LPG	+ PROTECTED POSITION LIGHTS
B1	0,35	11A	CONTROL + DRIVING LIGHTS
B2	0,6	9M	SHUNT > FO LIGHTS SWITCH
B3	1,0	67A	CONTROL + ACOUSTIC ALARM






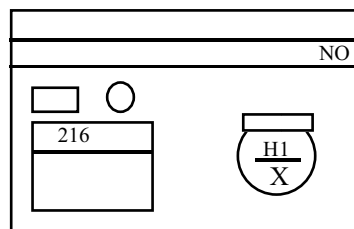
DIRECTION SIGNALISATION SWITCH

Position	Sectioning		Destination
1	1,0	64C	LEFT SIGNALISATION LIGHTS CONTROL
2	1,0	64D	RIGHTSIGNALISATION LIGHTS CONTROL
2	1,0	64B	CONTROL + SIGNALISATION
4	1,0	64B	CONTROL + SIGNALISATION > SHUNT




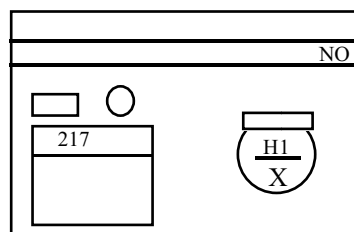
RIGHT FRONT BRAKE PLATE

Position	Sectioning		Destination
1	0,35	H1	CONTROL - I.C.P. BRAKING SYSTEM WITNESS



LEFT FRONT BRAKE PLATE


Position	Sectioning		Destination
1	0,35	H1	CONTROL - I.C.P. BRAKING SYSTEM WITNESS

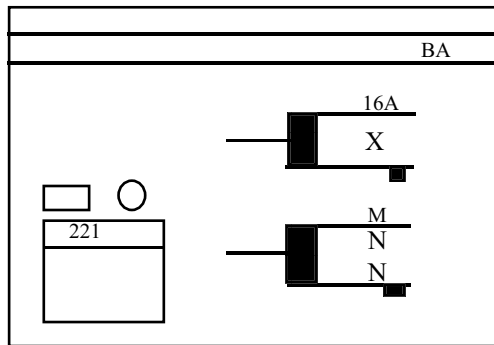


## WIRE FUNCTIONS IN CONNECTORS AND COUPLINGS


	FRONT WIRING	X75 03
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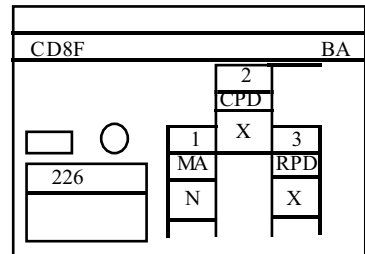
### WINDSCREEN CLEANER PUMP

Position	Sectioning		Destination
1	0,5	16A	CONTROL + WINDSCREEN CLEANER PUMP
2	0,5	M	MASS
2	0,5	M	MASS



### RIGHT HEADLIGHT

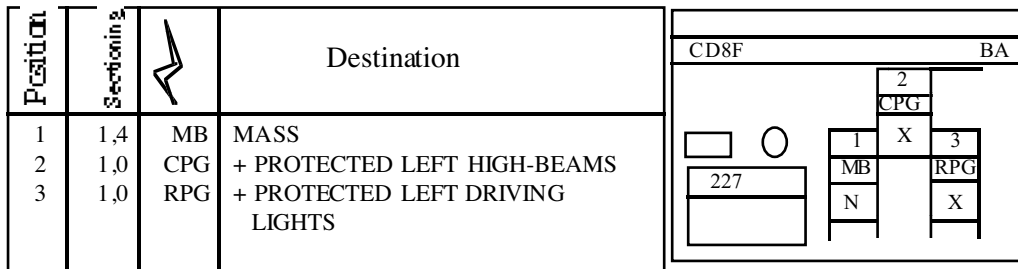
Position	Sectioning		Destination
1	1,4	MA	MASS
2	1,0	CPD	+ PROTECTED RIGHT HIGH-BEAMS
3	1,0	RPD	+ PROTECTED RIGHT DRIVING LIGHTS





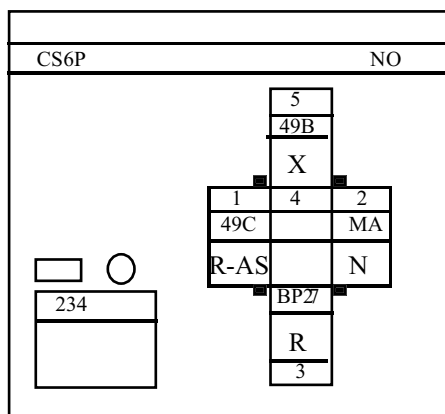


LEFT HEADLIGHT



GMV COOLING CONTROL RELAY  
(for A.C. provided vehicles)


Position	Sectioning		Destination
1	0,35	49C	CONTROL + GMV COOLING RELAY > THERMOCONTACT > PRESOSTAT
2	0,35	MA	MASS
3	1,5	BP27	+ PROTECTED BATTERY
5	1,0	49B	CONTROL + GMV COOLING

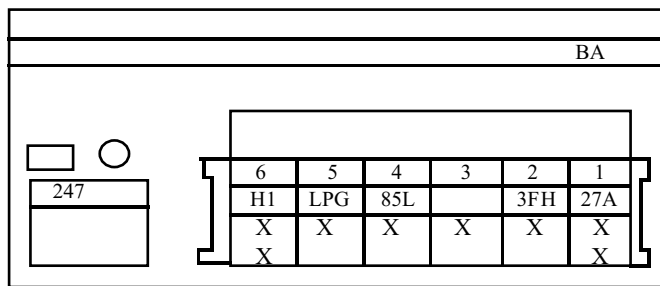



## WIRE FUNCTIONS IN CONNECTORS AND COUPLINGS

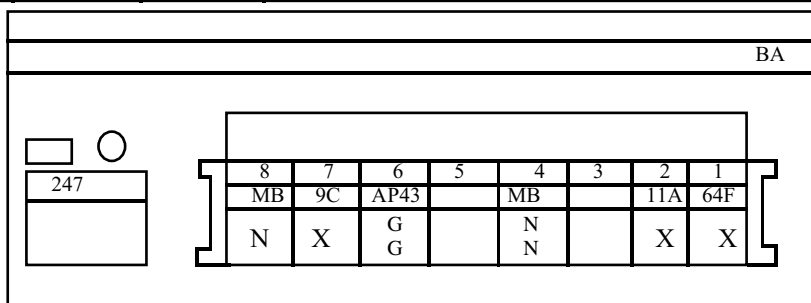


### BOARD PANEL


Position	Sectioning		Destination
1	0,35	25A	CONTROL HANDBRAKE PLÆ WEAR WITNESS
2	0,35	25A	CONTROL HANDBRAKE PLÆ WEAR WITNESS
3	0,35	3FH	CONTROL INJECTIONDAMAGEWITNESS
4	0,35	85L	CONTROL- 4x4 WITNESS
5	0,35	LPG	+PROTECTEDLEFTPOSITIONLIGHTS
6	0,35	H1	CONTROL - I.C.PBRAKING SYSTEMWITNESS
6	0,35	H1	CONTROL - I.C.PBRAKING SYSTEMWITNESS

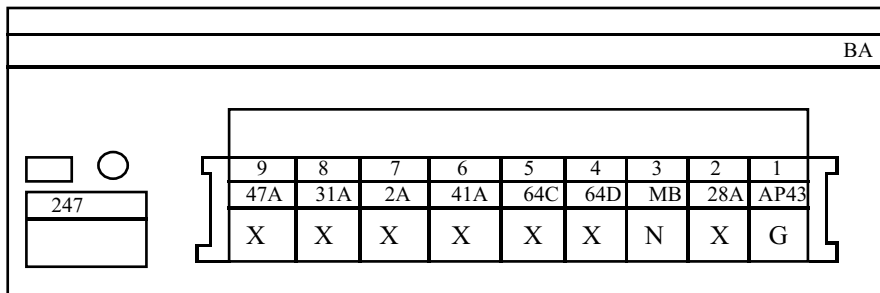


Position	Sectioning		Destination
1	0,35	64F	CONTROL + BREAKDOWNWITNESS
2	0,35	11A	CONTROL+DRIVINGLIGHTS
4	0,35	MB	MASS
4	0,35	MB	MASS > SHUNT
6	0,35	AP43	+AFTER PROTECTED CONTACT
6	0,35	AP43	+AFTER PROTECTED CONTACT > SHUNT
7	0,35	9C	CONTROL+ REAR FOG IGHTS WITNESS
8	0,35	MB	MASS > SHUNT






Position	Sectioning		Destination
1	0,6	AP43	+AFTER PROTECTED CONTACT
2	0,35	28A	CONTROL - OIL PRESSURE WITNESS
3	0,35	MB	MASS
4	0,35	64D	CONTROL + RIGHT SIGNALISATION WITNESS
5	0,35	64C	CONTROL + LEFT SIGNALISATION WITNESS
6	0,6	41A	SIGNAL + FUEL LEVEL TRANSMITTER
7	0,35	2A	CONTROL - ALTERNATOR CHARGE WITNESS
8	0,35	31A	SIGNAL + WATER TEMPERATURE
8	0,35	47A	- ALARM FUEL MINIMAL LEVEL

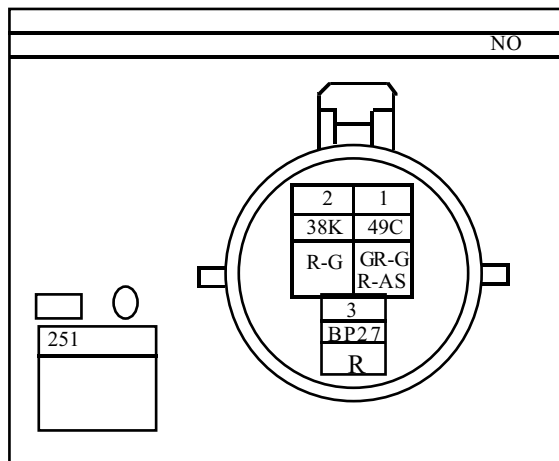


## WIRE FUNCTIONS IN CONNECTORS AND COUPLINGS


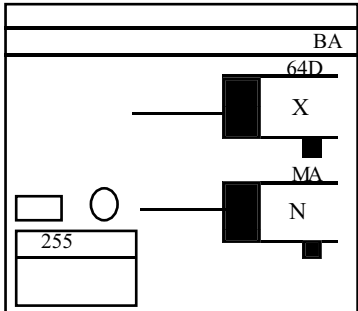


### WATER THERMO-CONTACT (for A.C. provided vehicles)

Position	Sectioning		Destination
1	0,35	49C	CONTROL+ GMVCOOLINGRELAY > PRESSURE GAGE
1	0,35	49C	CONTROL+ GMVCOOLINGRELAY > PRESSURE GAGE
2	0,35	38K	A.C. STOPPING CONTROL
3	0,35	BP27	+ PROTECTED BATTERY

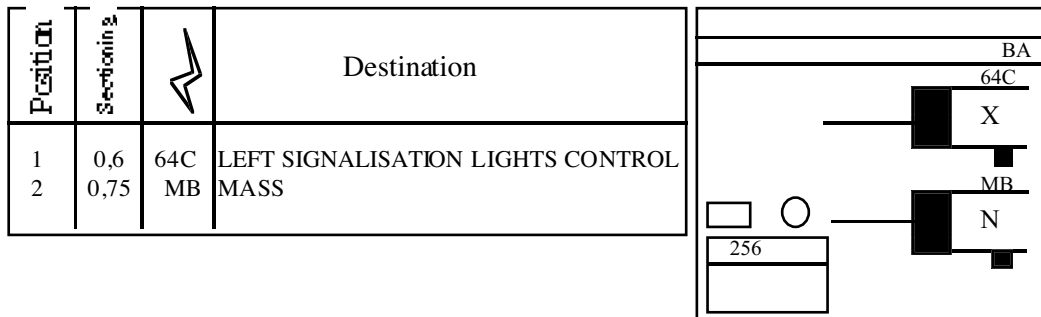


### RIGHTFRONTSIGNALISATION LIGHT

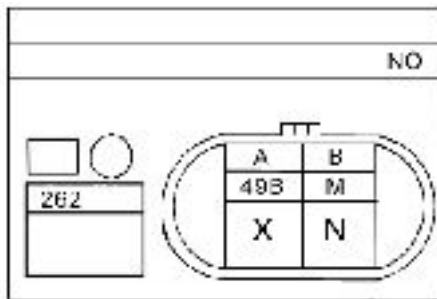
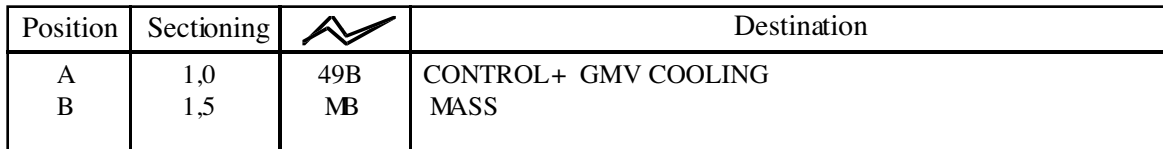
Position	Sectioning		Destination	
1	0,6	64D	RIGHT SIGNALISATION LIGHTS CONTROL	
2	0,6	M	MASS	



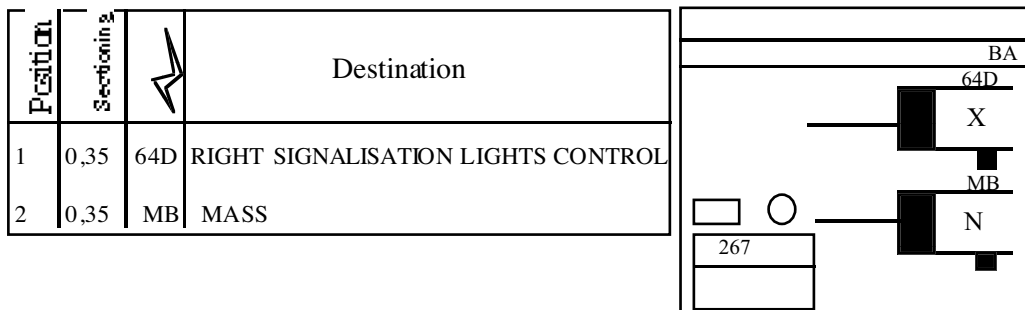
LEFT FRONT SIGNALISATION LIGHT



GMV COOLING  
(for A.C. provided vehicles)



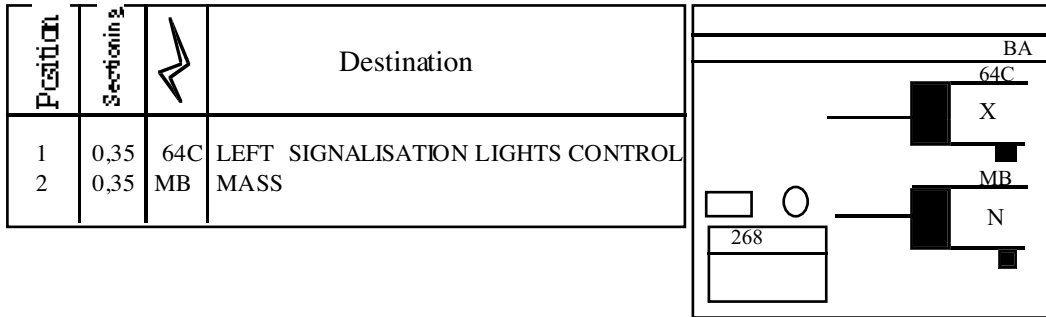
RIGHT FRONTSIDE SIGNALISATION LIGHT



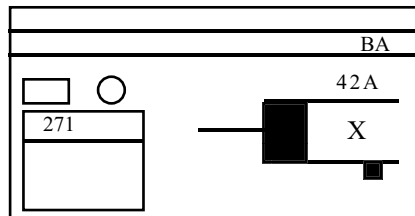
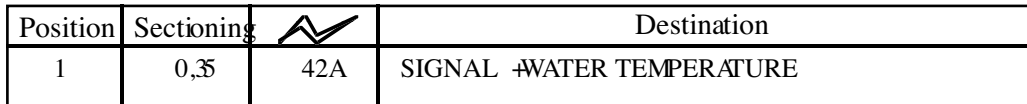
## WIRE FUNCTIONS IN CONNECTORS AND COUPLINGS



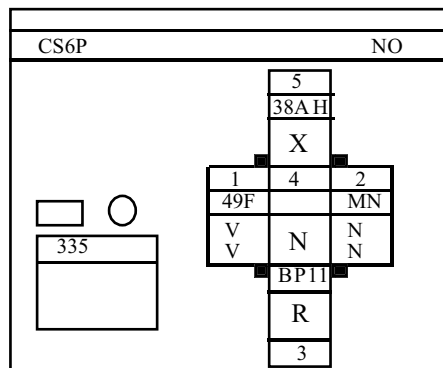
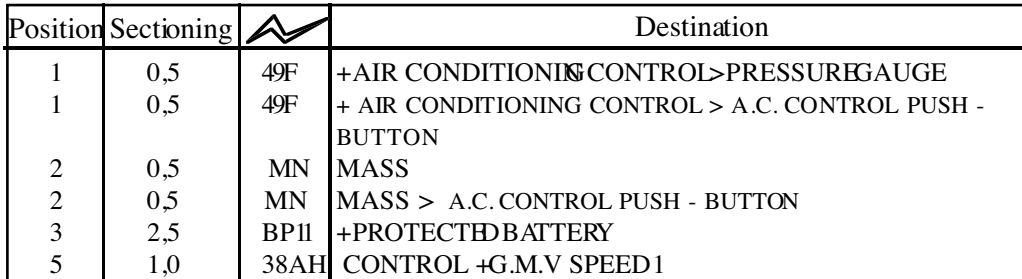
### LEFT FRONT SIDE SIGNALISATION LIGHT



### WATER TEMPERATURE TRANSMITTER




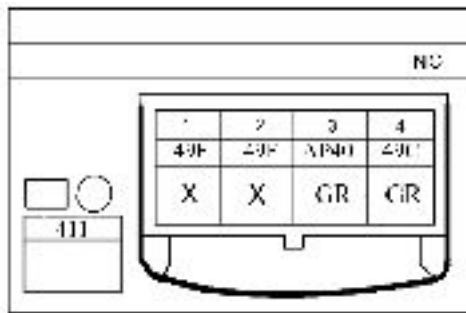
### G.M.V CLIMATE CONTROL RELAY (for A.C. provided vehicles)



	<p>FRONT WIRING</p>	<p>X75 03</p>
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AIR CONDITIONING PRESSURE GAUGE  
(for A.C provided vehicles)

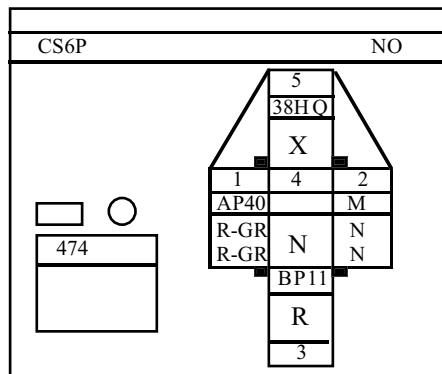
Position	Sectioning		Destination
1	0,5	49F	+AIR CONDITIONING CONTROL > GMV CONTROL RELAY
2	0,5	49F	+AIRCONDITIONING CONTROL > GMV STOPPING RELAY
3	0,5	AP40	SUPPLY + PROTECTED ACCESSORIES
4	0,5	49C	CONTROL + GMV COOLING RELAY






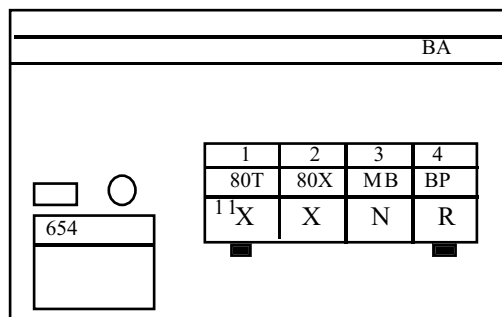
A.C. RELAY (on bord - for A.C vehicles)

Position	Sectioning		Destination
1	0,5	AP40	SUPPLY + PROTECTED ACCESSORIES
1	0,5	AP40	SUPPLY + PROTECTED ACCESSORIES
2	0,5	M	MASS
2	0,5	M	MASS > G.M.V CONTROL RELAY
3	2,5	BP11	+PROTECTED BATTERY
5	1,0	38HQ	G.M.V 2 AIR CONDITIONING COCKPIT



ANTI - STARTER RECEPTOR  
(for anti-starter provided vehicles)


Position	Sectioning		Destination
1	1,5	80T	CONTROL -ANTI -STARTER WITNESS
2	1,5	80X	ANTI -STARTER SIGNAL WY
3	1,5	MB	MASS
4	1,5	B11	+ PROTECTED BATTERY

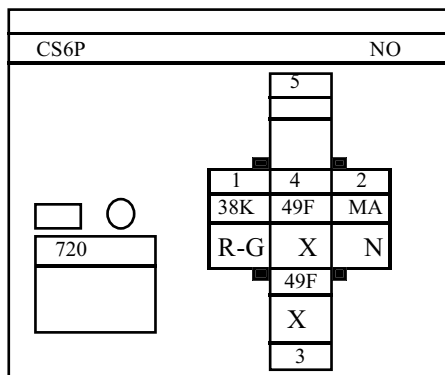




	<p>FRONT WIRING</p>	<p>X75 03</p>
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A.C. STOPPING RELAY  
(for A.C. provided vehicles)

Position	Sectioning		Destination
1	0,35	38K	A.C. STOPPING CONTROL THERMO-CONTACT
2	0,35	MA	MASS
3	0,35	49F	+ AIR CONDITIONING CONTROL PRESSURE GAUGE
4	0,35	49F	+ AIR CONDITIONING CONTROL U.C.E. INJECTION



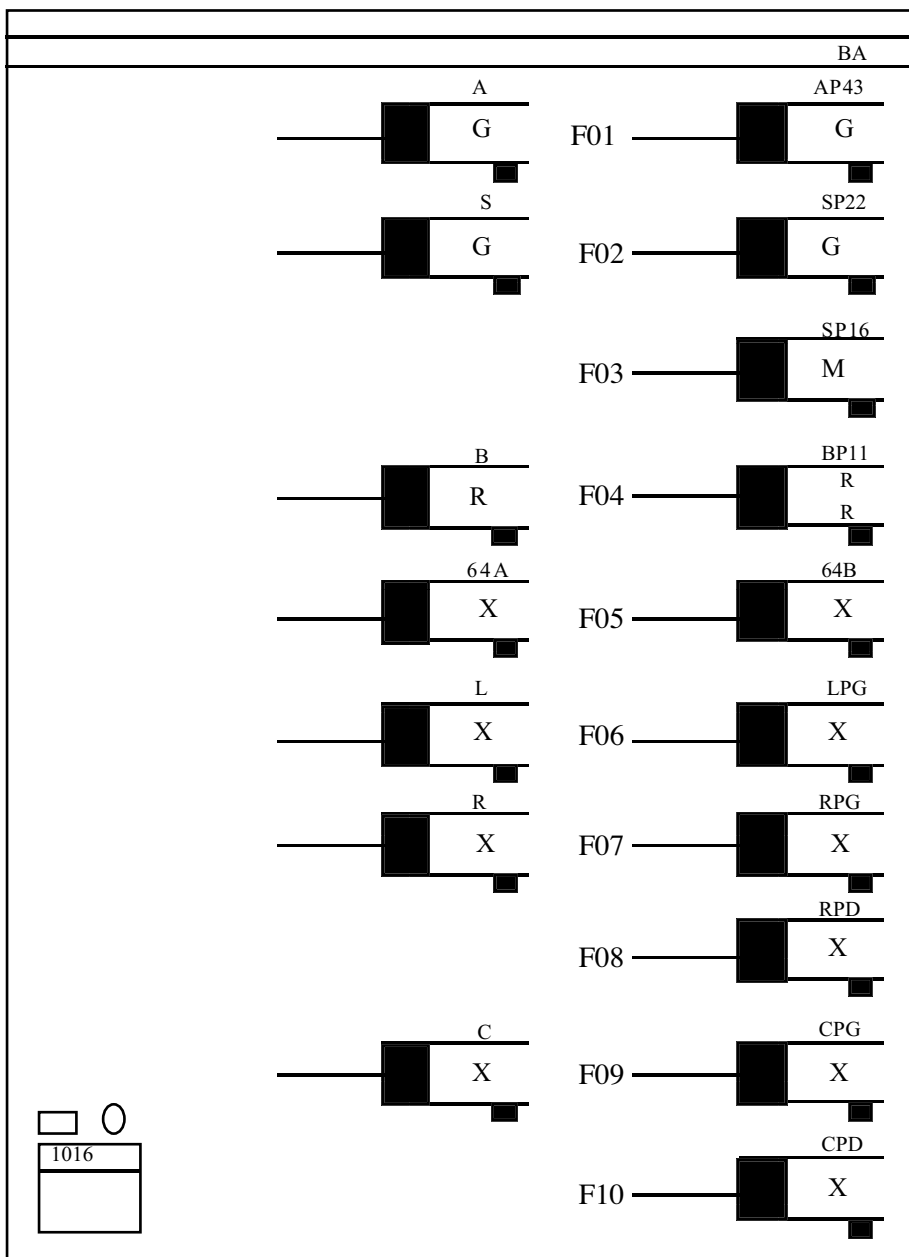
	FRONT WIRING	X75 03
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## CUTIE SIGURANȚE HABITACLU

Prinle	Secțiune		Designation
F01	5.0	A	SUPPLY + DC
F01	2.0	AP43	+ PROTECTED AFTER CONTACT
F02	2.0	S	SUPPLY + ACCESSORIES
F02	2.0	SP22	SUPPLY + PROTECTED ACCESSORIES
F03	0.35	SP16	+ PROTECTED ACCESSORIES > HEATING
F04	2.0	B	+ BATTERY
F04	1.0	BP11	+ PROTECTED BATTERY
F04*	1.4	BP11	+ PROTECTED BATTERY > ANTISTARTING
F05	1.0	64A	SUPPLY + SIGNALISATION
F05	1.0	64B	CONTROL + SIGNALISATION
F06	1.0	L	+ POSITION LIGHTS
F06	1.0	LPG	+ PROTECTED LEFT POSITION LIGHTS
F07	1.4	R	+ ROAD LIGHTS
F07	1.0	RPG	+ PROTECTED LEFT ROAD LIGHTS
F08	1.0	RPD	+ PROTECTED RIGHT ROAD LIGHTS
F09	1.4	C	+ HIGH - BEAMS
F09	1.0	CPG	+ PROTECTED LEFT HIGH - BEAMS
F10	1.0	CPD	+ PROTECTED RIGHT HIGH - BEAMS

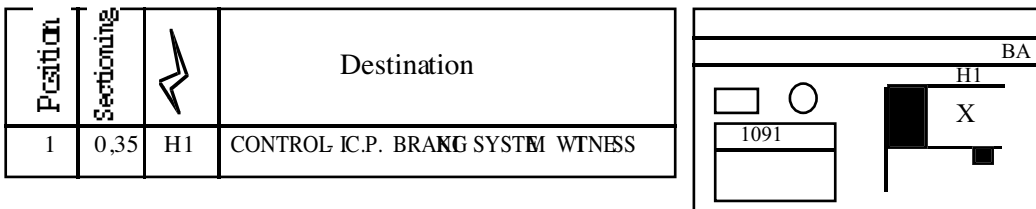
\*- for vehicle with antistarting

	<p>FRONT WIRING</p>	<p>X75 03</p>
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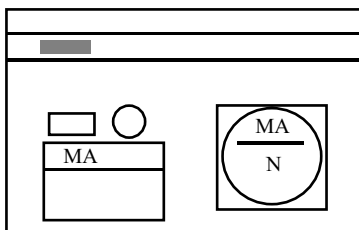
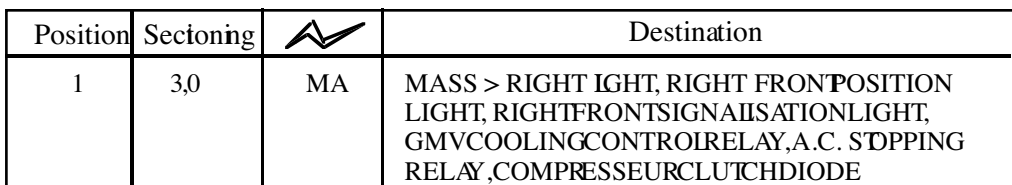




### I.C.P. BRAKING SYSTEM




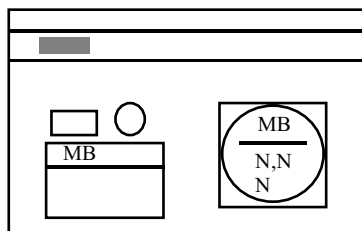
### FRONT RIGHT BODY ELECTRIC MASS

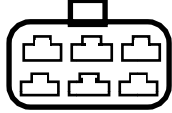


	<p>FRONT WIRING</p>	<p>X75 03</p>
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LEFT FRONT BODY ELECTRIC MASS

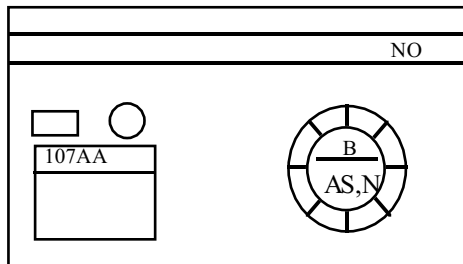
Position	Sectioning		Destination
1	3,0	MB	MASS > LEFT LIGHT, LEFT FRONT POSITION LIGHT, LEFT FRONT SIGNALISATION LIGHT, WINDSCREEN CLEANER PUMP, BACK WINDSCREEN CLEANER PUMP
1	3,0	MB	MASS > EC INJECTION, SIGNALISATION RELAY, LEFT-RIGHT FRONT SIDE SIGNALISATION LIGHT, BOARD PANEL, LIGHTING: GLOVE BOX, CLOCK, ELECTRIC LIGHTER, ASH TRAY, HEATING CONTROL, SWITCHES
1	1,0	MB	MASS > GM COOLING AND CA




	BATTERY WIRING	X75 03
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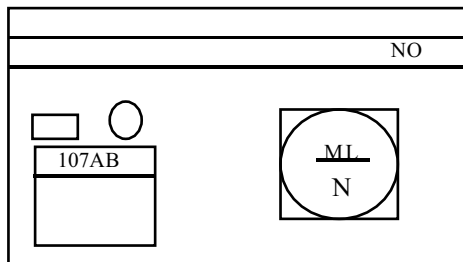
### BATTERY TERMINAL (+)

Position	Sectioning		Destination
1	16,0	B	+ BATTERY > +STARTER
2	6,0	B	+BATTERY




### BATTERY TERMINAL (-)

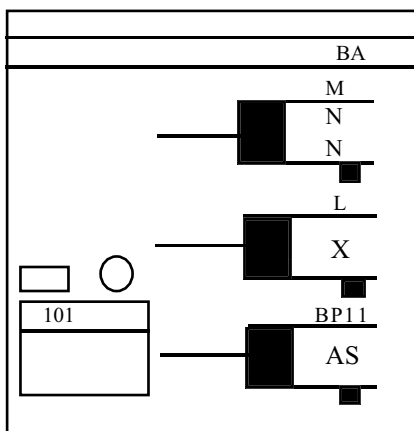
Position	Sectioning		Destination
1	16,0	ML	BATTERY ELECTRICMASS




	BOARD PANEL WIRING	X75 03
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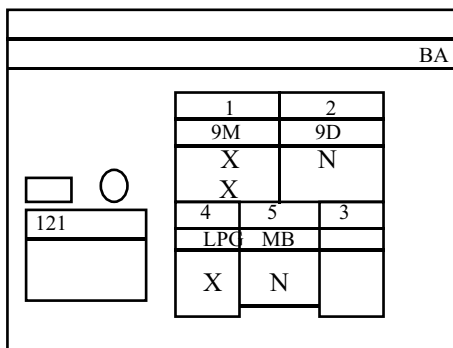
ELECTRIC LIGHTER

Position	Sectioning		Destination
1	1,0	M	MASS
1	0,35	M	MASS >ASHTRAYLIGHTING
2	0,35	L	+ POSITIONLIGHTS
3	1,5	BP11	+PROTECTEDBATTERY





FOG HEADLIGHTS SWITCH

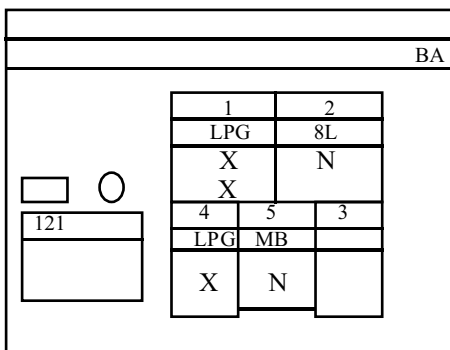
Position	Sectioning		Destination
1	0,6	9M	SHUNT
2	0,6	9D	CONTROL +REAR FOG LIGHTS >RELAY
4	0,35	LPG	+ PROTECTED POSITIONLIGHTS
5	0,35	M	MASS



	BOARD PANEL WIRING	X75 03
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FOG HEADLIGHTS SWITCH


Position	Sectioning		Destination
1	0,6	LPG	POSITION LIGHTS
1	0,35	LPG	POSITION LIGHTS>SHUNT
2	0,35	8L	CONTROL +REAR FOG LIGHTS RELAY
4	0,35	LPG	+ POSITION LIGHTS
5	0,35		MASS

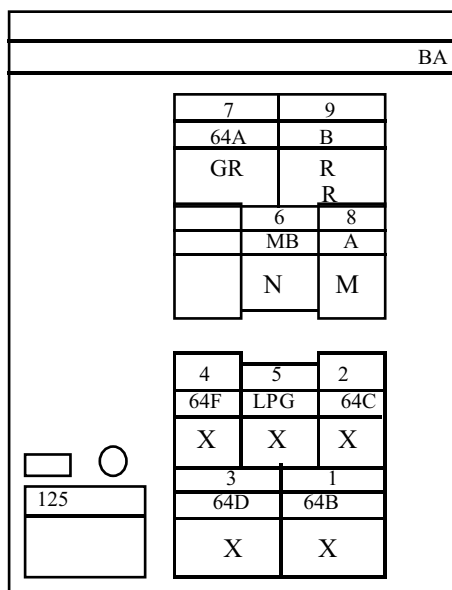






BREAKDOWN SWITCH

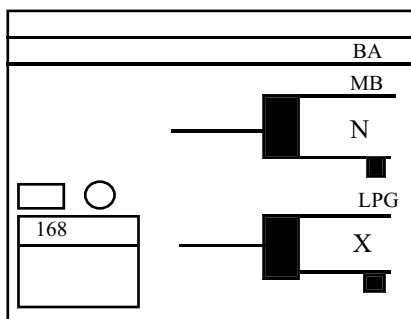
Position	Sectioning		Destination
1	1,0	64B	CONTROL + SIGNALISATION
2	1,0	64C	LEFT SIGNALISATION LIGHTS CONTROL
3	1,0	64D	RIGHT SIGNALISATION LIGHTS CONTROL
4	0,35	64F	CONTROL + BREAKDOWN WITNESS
5	0,35	LPG	+ PROTECTED POSITION LIGHTS
6	0,35	MB	MASS
7	1,0	64A	SUPPLY + SIGNALISATION
8	1,0	A	+ AFTER CONTACT
9	1,0	B	+ BATTERY
9	0,35	B	+ BATTERY > CLOCK




	BOARD PANEL WIRING	X75 03
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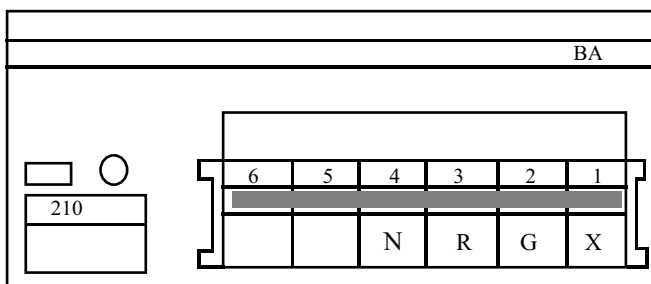
GLOVES BOX LIGHT

Position	Section		Destination
1	0,35	MB	MASS
2	0,35	LPG	+PROTECTED POSITION LIGHTS




ELECTRONIC CLOCK

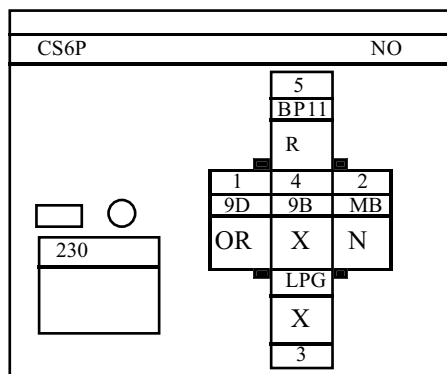
Position	Section		Destination
1	0,35	LPG	+ PROTECTED POSITION LIGHTS
2	0,35	AP40	+ AFTER PROTECTED CONTACT
3	0,35	B	+ BATTERY
4	0,35	MB	MASS
5			
6			




	BOARD PANEL WIRING	X75 03
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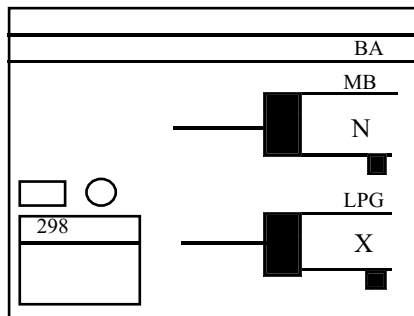
FOGLIGHTS RELAY

Position	Sectioning		Destination
1	0,5	9D	CONTROL+REAR FOGLIGHTS
2	0,5	M	MASS
3	0,5	LPG	+PROTECTED POSITION LIGHTS
4	0,5	9B	CONTROL+REAR FOGLIGHTS
5	0,5	BP11	+PROTECTED BATTERY




CLIMATE CONTROL LIGHTING

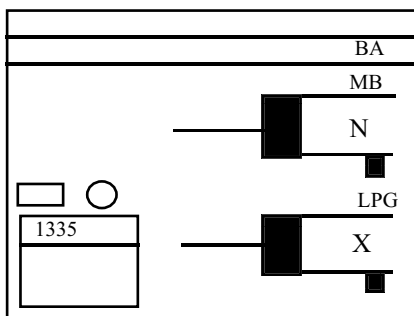
Position	Sectioning		Destination
1	0,35	LPG	+PROTECTED POSITION LIGHTS
2	0,35	MB	MASS






### FRONT ASHTRAY LIGHTING

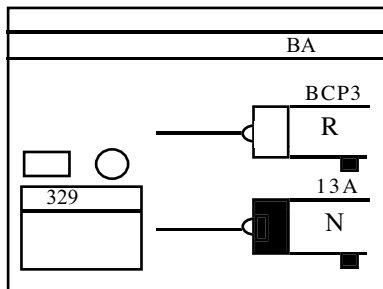
Position	Sectioning		Destination
1	0,35	MB	MASS
2	0,35	LPG	+PROTECTED POSITION LIGHTS



	<p>CEILING LIGHT WIRING</p>	<p>X75 03</p>
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FRONT RIGHT CEILING LIGHT

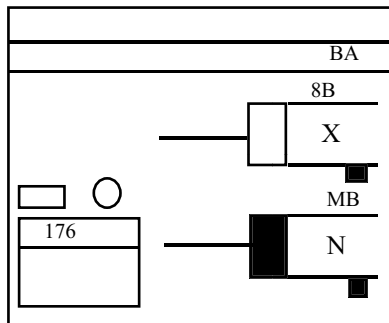
Position	Sectioning		Destination
1	0,6	BCP3	+ PROTECTED BATTERY CEILING LIGHTING > LEFT COUPLING PLATE
2	0,6	13A	CONTROL CEILING LIGHTING > LEFT DOOR CONTACTOR





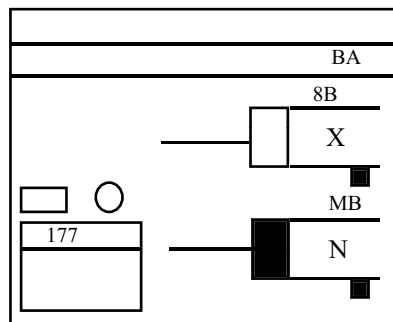
### RIGHTFOG HEADLIGHT

Position	Sectioning		Destination
1	1,0	8B	+ FOGHEADLIGHTS>FOGHEADLIGHTSRELAY
2	1,0	MB	MASS




### LEFTFOG HEADLIGHT

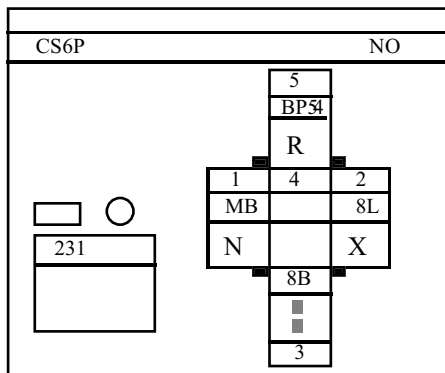
Position	Sectioning		Destination
1	1,0	8B	+ FOGHEADLIGHTS>FOGHEADLIGHTSRELAY
2	1,0	MB	MASS



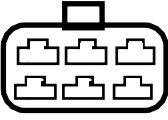
	<p>FOG HEADLIGHTS WIRING</p>	<p>X75 03</p>
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FOG HEADLIGHTS CONTROL RELAY


Position	Sectioning		Destination
1	0,6	MB	MASS
2	0,6	8L	CONTROL+ FOGHEADLIGHTSRELAY
3	1,0	8B	+FOGHEADLIGHTS>LEFTFOGHEADLIGHT
3	1,0	8B	+FOGHEADLIGHTS>RELAY
5	2,0	<b>B54</b>	+PROTECTED BATTERY

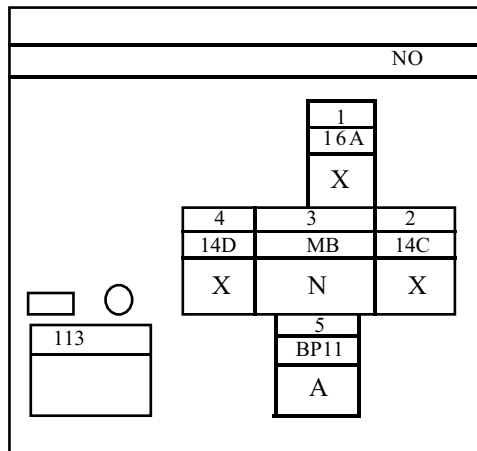


## WIRE FUNCTIONS IN CONNECTORS AND COUPLINGS


	WINDSCREEN WIPER WIRING	X75 03
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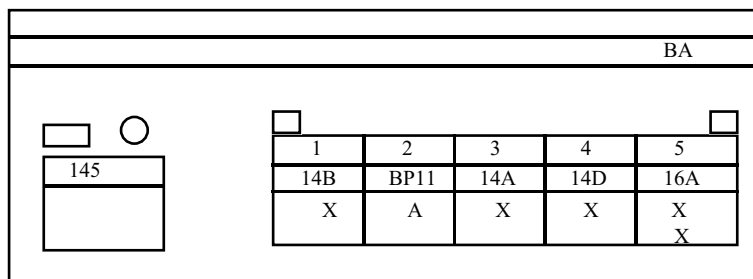
### WINDSCREEN WIPER TIMER

Position	Sectioning		Destination
1	0,6	16A	CONTROL+WINDSCREEN CLEANER PUMP
2	0,6	14C	CONTROL + WINDSCREEN WIPER TIMER
3	0,5	MB	MASS
4	0,6	14D	CONTROL WINDSCREEN WIPER TIMER LOW-SPEED
5	0,5	BP11	+ PROTECTED BATTERY

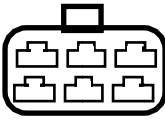


### WINDSCREEN WIPER CLEANER SWITCH


Position	Sectioning		Destination
1	0,6	14B	CONTROL+WINDSCREEN WIPER HIGH-SPEED
2	0,75	BP11	+ PROTECTED BATTERY
3	0,6	14A	CONTROL + WINDSCREEN WIPER LOW-SPEED
4	0,6	14D	CONTROL WINDSCREEN WIPER TIMER LOW-SPEED
5	0,6	16A	CONTROL + WINDSCREEN CLEANER PUMP > TIMER
5	0,5	16A	CONTROL + WINDSCREEN CLEANER PUMP

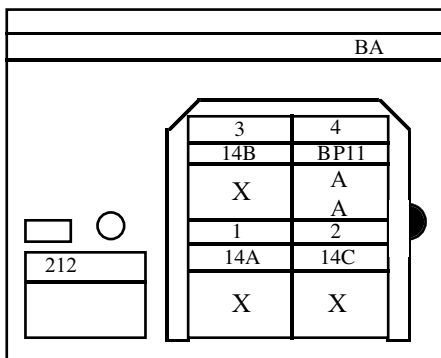


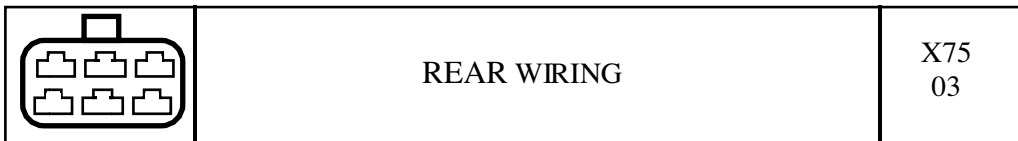


	<p>WINDSCREEN WIPER WIRING</p>	<p>X75 03</p>
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WINDSCREEN WIPER MOTOR

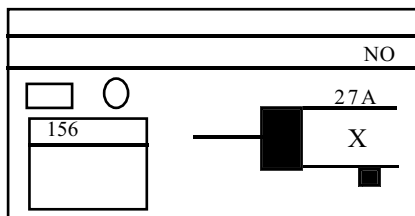
Position	Sectioning		Destination
1	0,6	14A	CONTROL + WINDSCREEN WIPER LOW-SPEED
2	0,6	14C	CONTROL + WINDSCREEN WIPER TIMER
3	0,6	14B	CONTROL + WINDSCREEN WIPER HIGH-SPEED
4	0,75	BP11	+ PROTECTED BATTERY
4	0,5	BP11	+ PROTECTED BATTERY > WINDSCREEN WIPER TIMER






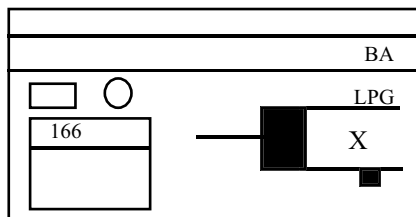
### HANDBRAKE CONTACTOR

Position	Sectioning		Destination
1	0,3	27A	CONTROL - HANDBRAKE WITNESS




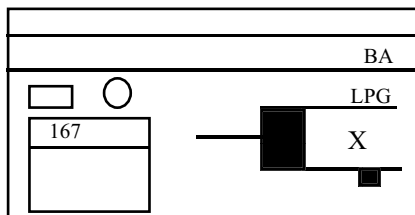
### RIGHT REGISTRATION NUMBER LIGHT (for U75, M75, H75)

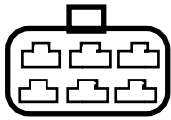
Position	Sectioning		Destination
1	0,3	LPG	+PROTECTED POSITION LIGHTS



### LEFT REGISTRATION NUMBER LIGHT (for U75, M75, H75)

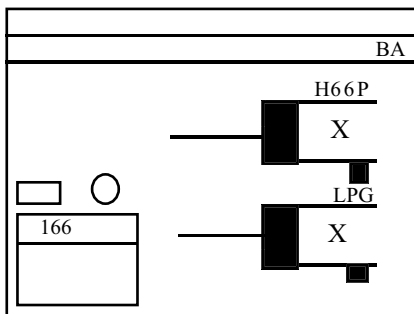
Position	Sectioning		Destination
1	0,3	LPG	+ PROTECTED POSITION LIGHTS



	<p>REAR WIRING</p>	<p>X75 03</p>
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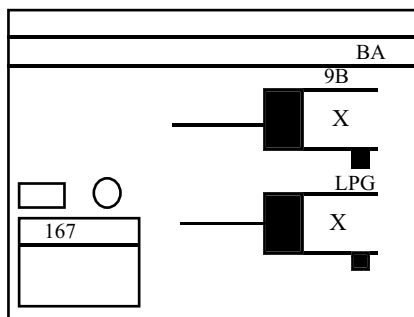
RIGHT REGISTRATION NUMBER LIGHT  
(for E75)

Position	Sectioning		Destination
1	0,6	H66P	+CONTROL+ BACKWRDS RUNNING LIGHTS
2	0,35	LPG	+PROTECTED POSITION LIGHTS

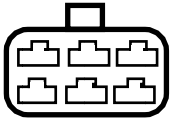


LEFT REGISTRATION NUMBER LIGHT  
(for E75)


Position	Sectioning		Destination
1	0,6	H66P	+CONTROL+ BACKWRDS RUNNING LIGHTS
2	0,35	LPG	+PROTECTED POSITION LIGHTS

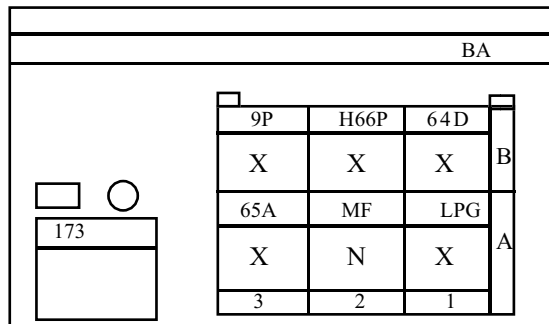


## WIRE FUNCTIONS IN CONNECTORS AND COUPLINGS


	<b>REAR WIRING</b>	<b>X75 03</b>
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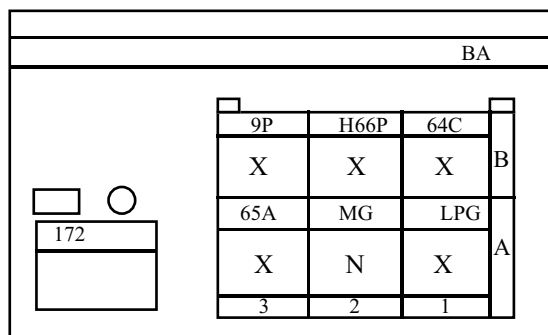
### REAR RIGHT LIGHT (for U75, M75, H75)

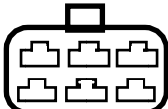
Position	Sectioning		Destination
A1	0,35	LPG	+PROTECTED POSITION LIGHTS
A2	1,0	MF	MASS
A3	0,6	65A	CONTROL+ STOP LIGHTS
B1	0,6	64D	RIGHTSIGNALISATION LIGHTS CONTROL
B2	0,6	H66P	CONTROL + BACKWARDS RUNNING LIGHTS
B3	0,6	9 C	CONTROL+ REAR PROTECTED FOG LIGHTS




### REAR LEFT LIGHT (for U75, M75, H75)

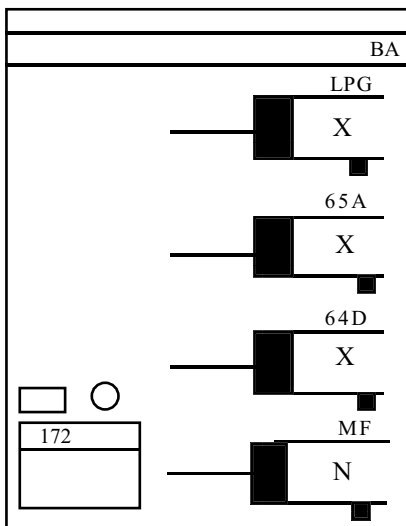
Position	Sectioning		Destination
A1	0,6	LPG	+PROTECTED POSITION LIGHTS
A2	0,6	MG	MASS
A3	0,6	65A	CONTROL+ STOP LIGHTS
B1	0,6	64C	LEFT SIGNALISATION LIGHTS CONTROL
B2	0,6	H66P	CONTROL+ BACKWARDS RUNNING LIGHTS
B3	0,6	9 C	CONTROL + REAR PROTECTED FOG LIGHTS

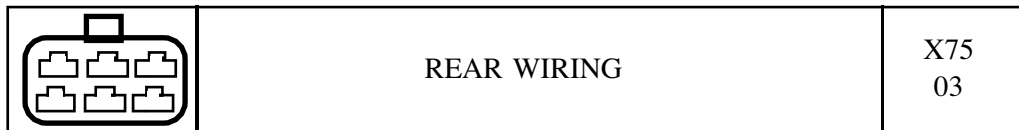


	<p>REAR WIRING</p>	<p>X75 03</p>
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REAR RIGHT LIGHT (for E75)

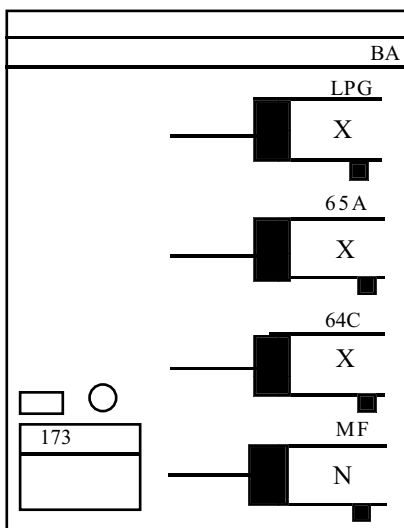
Position	Sectioning		Destination
1	0,35	LPG	+PROTECTED POSITION LIGHTS
2	0,6	65A	CONTROL+ STOP LIGHTS
3	0,6	64D	RIGHTSIGNALISATION LIGHTS CONTROL
4	1,0	MF	MASS






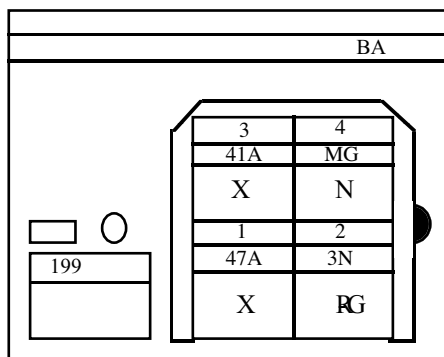
### REAR LEFT LIGHT (for E75)

Position	Sectioning		Destination
1	0,35	LPG	+PROTECTED POSITION LIGHTS
2	0,6	65A	CONTROL+ STOP LIGHTS
3	0,6	64C	LEFT SIGNALISATION LIGHTS CONTROL
4	1,0	MF	MASS




### ELECTRIC PUMP AND FUEL LEVEL TRANSMITTER

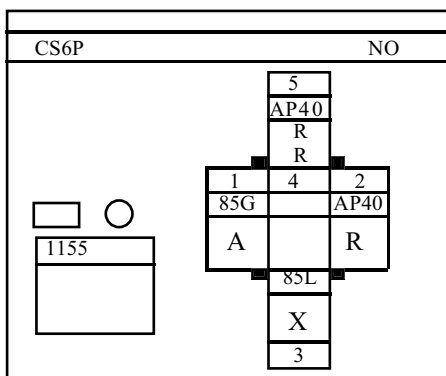
Position	Sectioning		Destination
1	0,5	47A	- FUEL MINIMAL LEVEL ALARM
2	1,5	3N	+ FUEL PUMP
3	0,5	41A	SIGNAL+ FUEL LEVEL TRANSMITTER
4	1,5	MG	MASS




	4X4 CONTROL WIRING	X75 03
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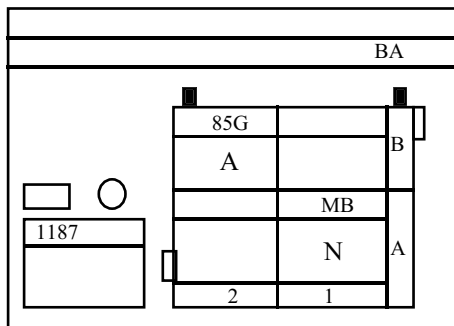
4X4 WITNESS CONTROL RELAY

Position	Sectioning		Destination
1	0,75	85G	4X4 COUPLING RELAY CONTROL
2	0,5	AP40	SUPPLY + PROTECTED ACCESSORIES SHUNT
3	0,5	85L	4X4 WITNESS CONTROL
4			
5	0,75	AP40	SUPPLY + PROTECTED ACCESSORIES
5	0,5	AP40	SUPPLY + PROTECTED ACCESSORIES SHUNT




VACUUM CAPSULE CONTACT

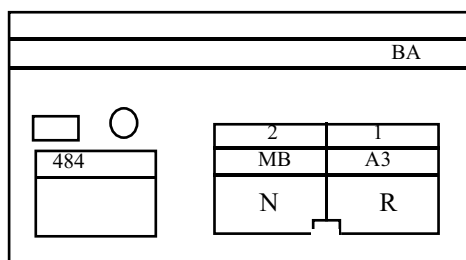
Position	Sectioning		Destination
A1	1,0	MB	MASS
B2	0,75	85G	4X4 COUPLING RELAY CONTROL






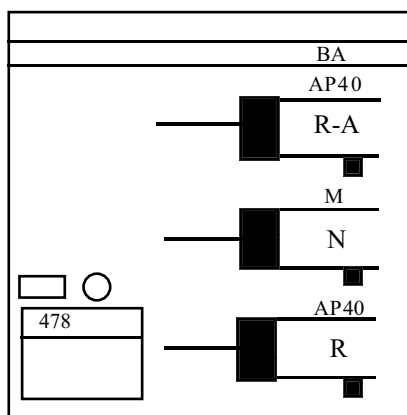
### 4X4 COUPLING ELECTRO-VALVE

Position	Sectioning		Destination
1	0,75	A3	SUPPLY + PROTECTED ACCESSORIES
2	0,75	MB	MASS



### 4X4 SWITCH


Position	Sectioning		Destination
1	0,75	AP40	SUPPLY + PROTECTED ACCESSORIES
2	0,75	A3	+ PROTECTED ACCESSORIES
4	0,35	LPG	+ POSITION LIGHTS
5	0,35	MB	MASS

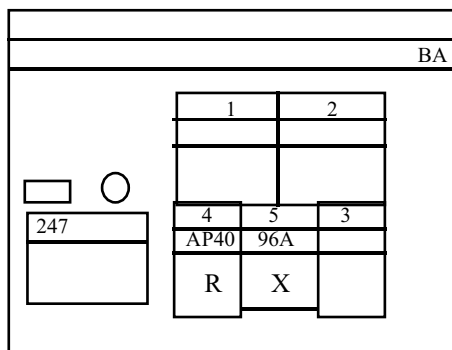




	OVER - SPEED WIRING	X75 03
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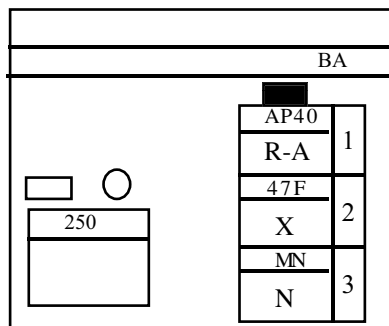
SAFETYBELT WITNESS  
(forDAIF)

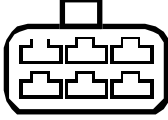
Position	Sectioning		Destination
4	0,6	AP40	SUPPLY+PROTECTEDACCESSORIES
5	0,6	96A	CONTROL - SAFETYBELT WITNESS




VEHICLE SPEED TRANSDUCER  
(forDAIF)

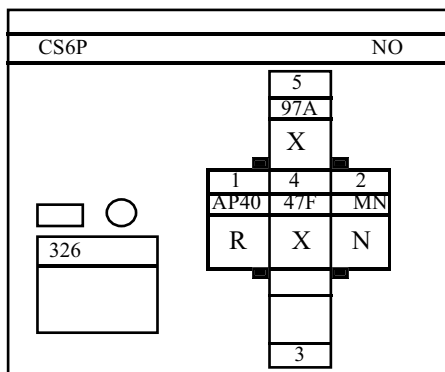
Position	Sectioning		Destination
1	0,35	AP40	SUPPLY + PROTECTED ACCESSORIES
2	0,35	47F	VEHICLE SPEED SIGNALISATION
3	0,35	MN	MASS




	OVER - SPEED WIRING	X75 03
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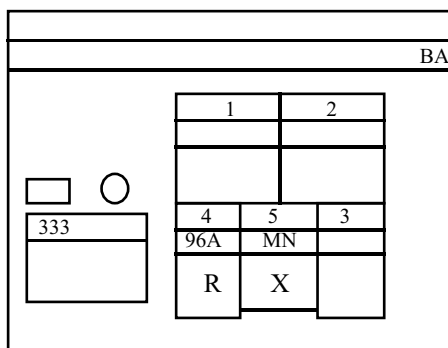
### OVER - SPEED INDICATOR RELAY (for DAIF)

Position	Sectioning		Destination
1	0,35	AP40	SUPPLY + PROTECTED ACCESSORIES
2	0,35	MN	MASS
4	0,35	47F	VEHICLE SPEED SIGNALISATION
5	0,35	97A	CONTROL - SPEED WITNESS 120KM/H



### SAFETY BELT WITNESS (for DAIF)

Position	Sectioning		Destination
4	0,6	96A	CONTROL - SAFETY BELT WITNESS
5	0,5	MN	MASS

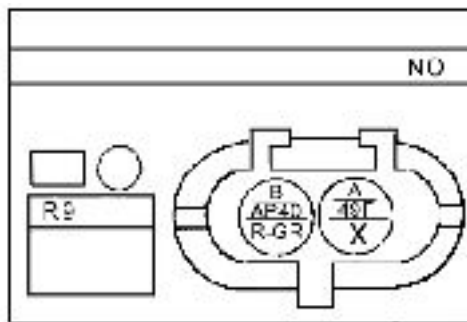


	<p>COUPLINGS</p>	<p>X75 03</p>
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ADDITIONAL FRONT/ADDITIONAL BOARD PANEL WIRES COUPLING  
(for A.C. provided vehicles)

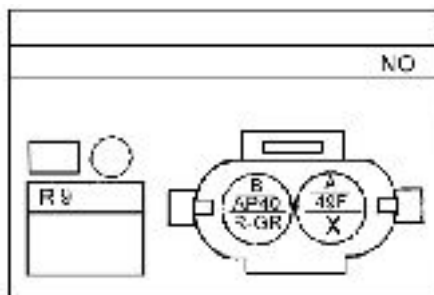
ADDITIONAL FRONT WIRES COUPLING

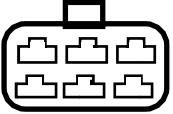
Position	Sectioning		Destination
A	0,75	49F	AIRCONDITIONING CONTROL>PRESSURE GAUGE SUPPLY + PROTECTED ACCESSORIES
B	0,5	AP40	



ADDITIONAL BOARD PANEL WIRES COUPLING

Position	Sectioning		Destination
A	0,5	49F	+AIR CONDITIONING CONTROL> G.M.V. RELAY SUPPLY + PROTECTED ACCESSORIES
B	0,5	AP40	

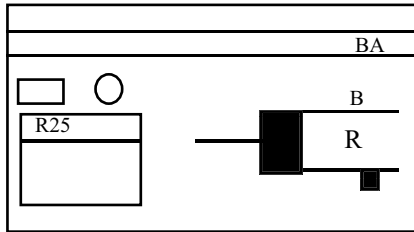


	COUPLINGS	X75 03
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### FRONTWIRES COUPLING/BATTERY

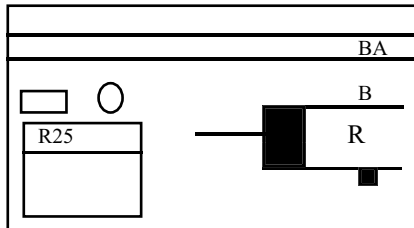
#### FRONTWIRES COUPLING

Position	Sectioning		Destination
1	7,0	B	+BATTERY



#### BATTERYWIRES COUPLING

Position	Sectioning		Destination
1	7,0	B	+BATTERY

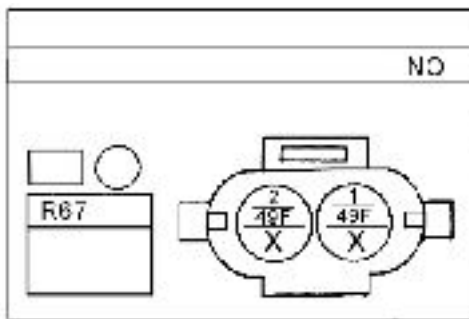


	<p>COUPLINGS</p>	<p>X75 03</p>
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ADDITIONAL FRONT/DIAGNOSTIC ADDITIONAL FRONT WIRES COUPLING  
(for A.C. provided vehicles)

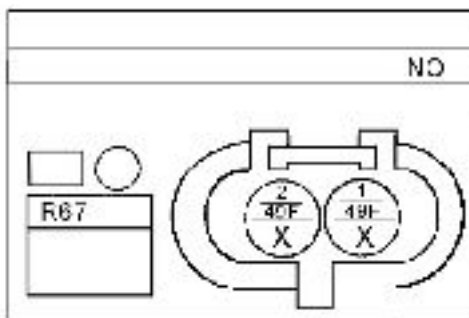
ADDITIONAL FRONT WIRES COUPLING

Position	Sectioning		Destination
1	0,75	49F	+AIR CONDITIONING CONTROL > G.M.RELAY
2	0,35	49F	+AIR CONDITIONING CONTROL & A. RELAY

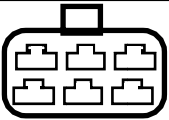


DIAGNOSTIC ADDITIONAL FRONT WIRES COUPLING

Position	Sectioning		Destination
1	0,5	49F	+AIR CONDITIONING CONTROL
2	0,5	49F	+AIR CONDITIONING CONTROL




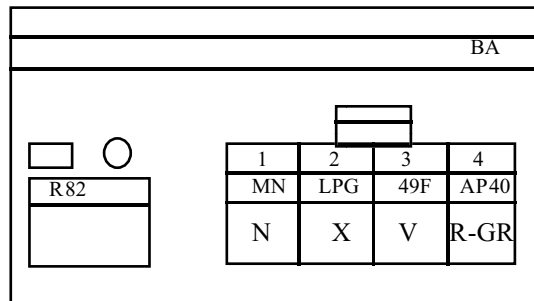
## WIRE FUNCTIONS IN CONNECTORS AND COUPLINGS

	COUPLINGS	X75 03
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ADDITIONAL BOARD PANEL WIRES COUPLING/A.C. CONTROL  
(for A.C. provided vehicles)

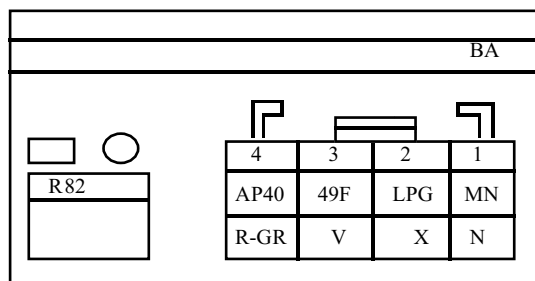
### ADDITIONAL BOARD PANEL WIRES COUPLING

Position	Sectioning		Destination
1	0,5	MN	MASS
2	0,5	LPG	+ PROTECTED POSITION LIGHTS
3	0,5	49F	+ AIR CONDITIONING CONTROL > RELAY
4	0,5	AP40	SUPPLY + PROTECTED ACCESSORIES



### A.C. CONTROL WIRES COUPLING


Position	Sectioning		Destination
1	0,5	MN	MASS
2	0,5	LPG	+ PROTECTED POSITION LIGHTS
3	0,5	49F	+ AIR CONDITIONING CONTROL > CONTROL PUSH-BUTTON
4	0,5	AP40	SUPPLY + PROTECTED ACCESSORIES

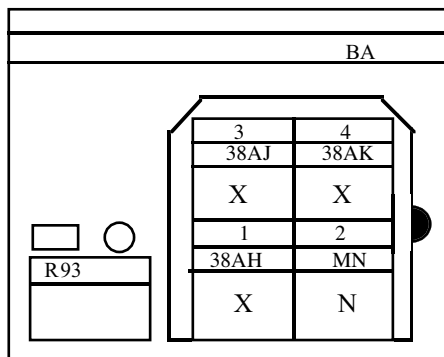


	COUPLINGS	X75 01
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ADDITIONAL BOARD PANEL WIRES COUPLING/GMV 2 COCKPIT  
(for A.C. provided vehicles)

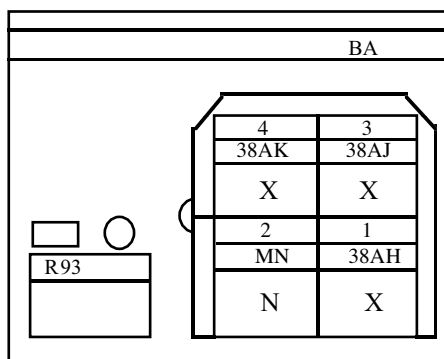
ADDITIONAL BOARD PANEL WIRES COUPLING

Position	Sectioning		Destination
1	1,0	38AH	CONTROL +G.M.V. MOTOR SPEED 1
2	2,5	MN	MASS
3	1,5	38AJ	CONTROL +G.M.V. MOTOR SPEED 2
4	2,5	38AK	CONTROL +G.M.V. MOTOR SPEED 3

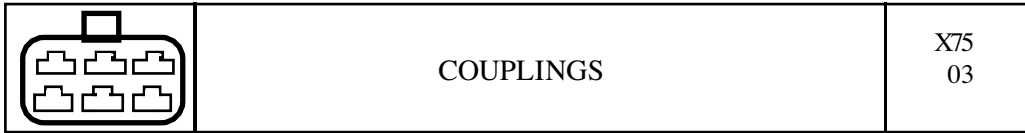


G.M.V. 2 COCKPIT WIRES COUPLING


Position	Sectioning		Destination
1	1,5	38AH	CONTROL +G.M.V. MOTOR SPEED 1
2	2,5	MN	MASS
3	1,5	38AJ	CONTROL +G.M.V. MOTOR SPEED 2
4	2,5	38AK	CONTROL +G.M.V. MOTOR SPEED 3

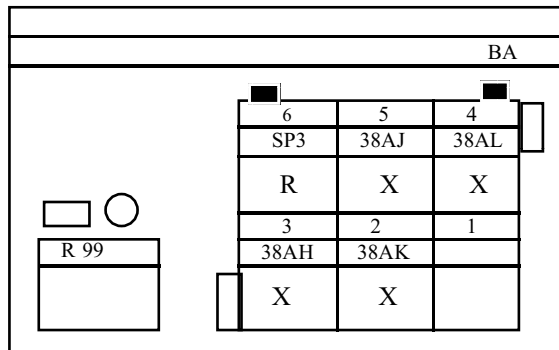


## WIRE FUNCTIONS IN CONNECTORS AND COUPLINGS




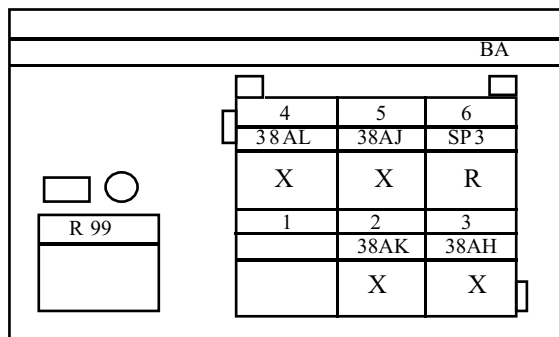
### CLIMATE CONTROL SWITCH WIRES COUPLING/ GMV CLIMATE CONTROL CLIMATE CONTROL SWITCH WIRES COUPLING

Position	Sectioning		Destination
2	1,0	38AK	CONTROL + GMV CLIMATE CONTROL SPEED 3
3	0,6	38AH	CONTROL + GMV CLIMATE CONTROL SPEED 1
4	1,5	38AL	CONTROL + GMV CLIMATE CONTROL SPEED 4
5	1,0	38AJ	CONTROL + GMV CLIMATE CONTROL SPEED 2
6	1,5	SP3	+ PROTECTED ACCESSORIES > CLIMATE CONTROL



### GMV CLIMATE CONTROL WIRES COUPLING

Position	Sectioning		Destination
2	1,0	38AK	CONTROL + GMV CLIMATE CONTROL SPEED 3
3	0,6	38AH	CONTROL + GMV CLIMATE CONTROL SPEED 1
4	1,5	38AL	CONTROL + GMV CLIMATE CONTROL SPEED 4
5	1,0	38AJ	CONTROL + GMV CLIMATE CONTROL SPEED 2
6	1,5	SP3	+ PROTECTED ACCESSORIES > CLIMATE CONTROL




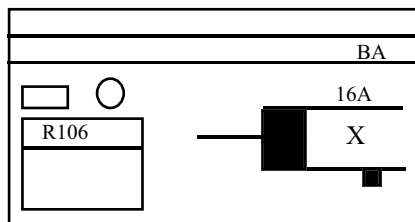


	COUPLINGS	X75 03
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FRONT WIRES COUPLING/WINDSCREEN WIPER

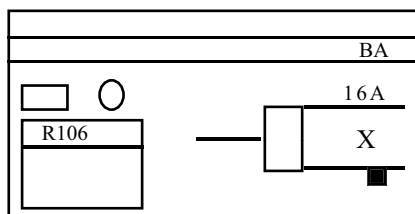
FRONT WIRES COUPLING

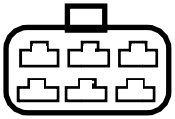
Position	Sectioning		Destination
1	0,6	16A	CONTROL+WINDSCREEN CLEANER PUMP



WINDSCREEN WIPER WIRES COUPLING


Position	Sectioning		Destination
1	0,6	16A	CONTROL + WINDSCREEN CLEANER PUMP

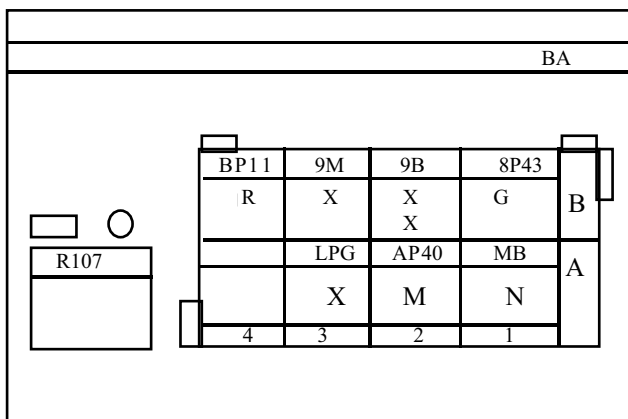


	<p>COUPLINGS</p>	<p>X75 03</p>
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FRONT WIRES COUPLING/BOARD PANEL  
(for A.C. provided vehicles)


### FRONT WIRES COUPLING

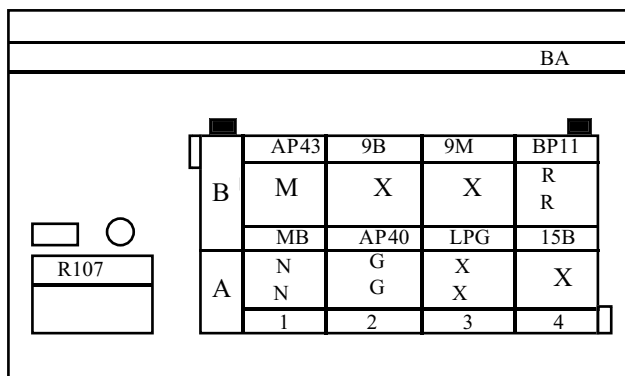
Position	Sectioning		Destination
A1	3,0	MB	MASS
A2	2,0	AP40	+AFTER PROTECTED CONTACT
A3	0,6	LPG	+PROTECTED POSITION LIGHTS
B1	2,0	8A	+AFTER PROTECTED CONTACT
B2	0,6	9B	CONTROL + PROTECTED REAR FOG LIGHTS
B2	0,35	9B	CONTROL + PROTECTED REAR FOG LIGHTS > WITNESS
B3	0,6	9M	SHUNT > LIGHTS CONTROL SYSTEM
B4	1,0	BP11	+ PROTECTED BATTERY



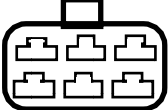
	<p>COUPLINGS</p>	<p>X75 03</p>
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BOARD PANEL WIRES COUPLING

Position	Sectioning		Destination
A1	3,0	MB	MASS
A1	0,6	MB	MASS > FOGLIGHTS RELAY
A2	2,0	AP40	+AFTER PROTECTED CONTACT
A2	1,0	AP40	+AFTER PROTECTED CONTACT > WINDSCREEN WIPER CONTROL
A3	1,0	L	+PROTECTED POSITION LIGHTS
A3	1,0	L	+PROTECTED POSITION LIGHTS > FOGLIGHTS RELAY
B1	2,0	AP43	+AFTER PROTECTED CONTACT
B2	0,6	9B	CONTROL +PROTECTED REAR FOG LIGHTS
B3	0,6	9M	SHUNT > FOGLIGHTS SWITCH
B4	1,4	BP11	+ PROTECTED BATTERY > ELECTRIC LIGHTER
B4	0,6	BP11	+ PROTECTED BATTERY >FOG LIGHTS RELAY



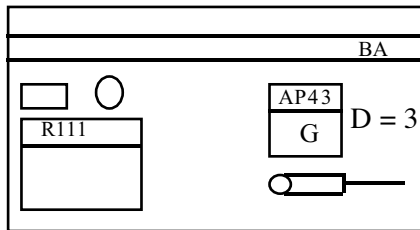
WIRE FUNCTIONS IN CONNECTORS AND COUPLINGS

	COUPLINGS	X75 03
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BOARD PANEL WIRES COUPLING/G.M.V. CLIMATE CONTROL

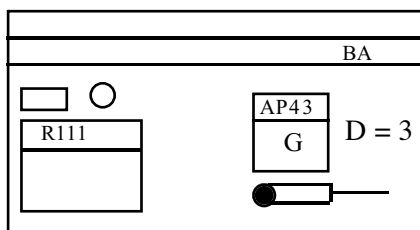
BOARD PANEL WIRES COUPLING

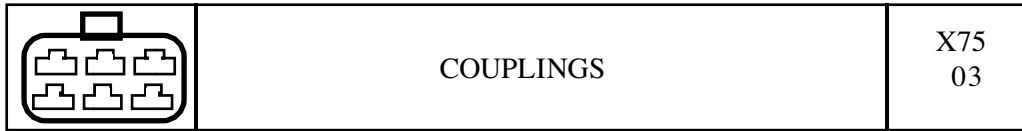
Position	Sectioning		Destination
1	2,0	AP40	+ PROTECTED ACCESSORIES > G.M.V. CLIMATE CONTROL



G.M.V. CLIMATE CONTROL WIRES COUPLING

Position	Sectioning		Destination
1	1,5	AP40	+ PROTECTED ACCESSORIES > G.M.V. CLIMATE CONTROL

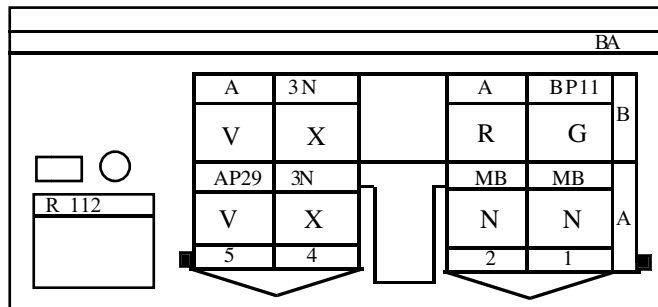




FRONTWIRES COUPLING / U.C.E. DECODER  
(for DAIF)

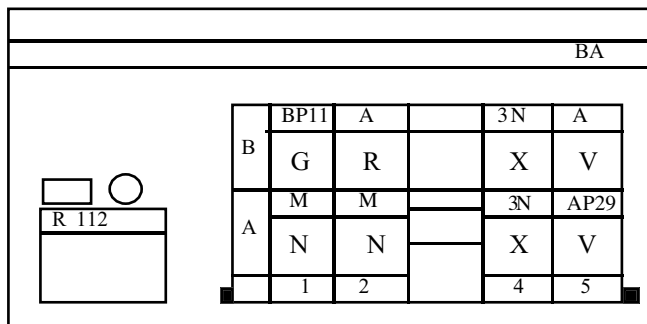
FRONTWIRES COUPLING

Position	Sectioning		Destination
A1	1,5	MB	MASS
A2	1,5	MB	MASS
A4	1,5	3N	+ FUELPUMP
A5	1,5	AP29	+ AFTER PROTECTED CONTACT ENGINE SAFETY FUNCTION
B1	1,5	BP11	+ PROTECTED BATTERY
B2	1,5	A	SUPPLY+ AFTER CONTACT
B4	1,5	3N	+ FUELPUMP
B5	1,5	A	SUPPLY+ AFTER CONTACT



U.C.E. DECODER FRONTWIRES COUPLING

Position	Sectioning		Destination
A1	1,5	MB	MASS
A2	1,5	MB	MASS
A4	1,5	3N	+ FUELPUMP > U.C.E. DECODER
A5	1,5	AP29	+ AFTER PROTECTED CONTACT
B1	1,5	BP11	+ PROTECTED BATTERY
B2	1,5	A	SUPPLY+ AFTER CONTACT
B4	1,5	3N	+ FUEL PUMP > U.C.E. DECODER INPUT
B5	1,5	A	SUPPLY+ AFTER CONTACT



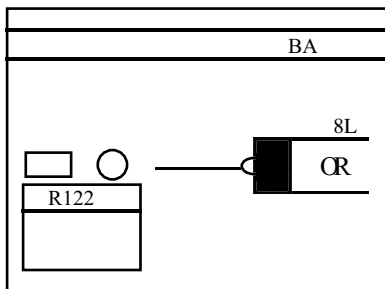
## WIRE FUNCTIONS IN CONNECTORS AND COUPLINGS

	COUPLINGS	X75 03
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FRONT WIRES COUPLING/FOG LIGHTS

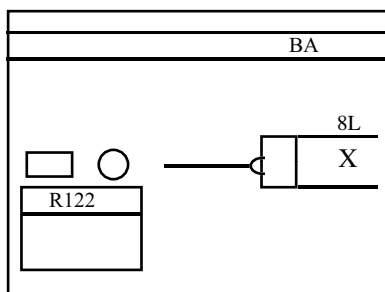
FRONT WIRES COUPLING

Position	Sectioning		Destination
1	0,6	8L	CONTROL+POSITION LIGHTS



FOG LIGHTS WIRES COUPLING


Position	Sectioning		Destination
1	0,6	8L	+POSITION LIGHTS

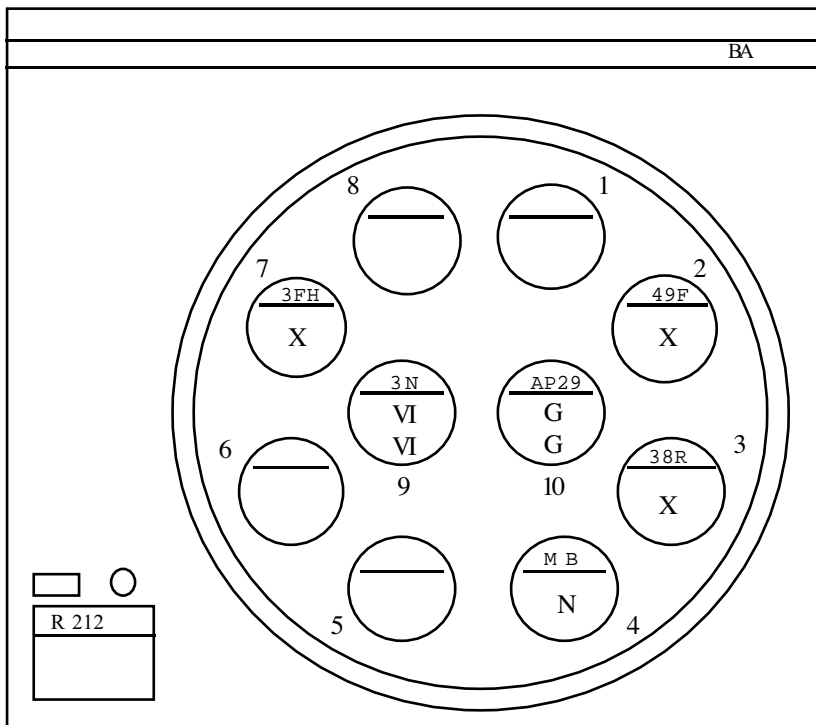


	<p>COUPLINGS</p>	<p>X75 03</p>
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FRONT/ENGINE WIRES COUPLING


FRONT WIRES COUPLING

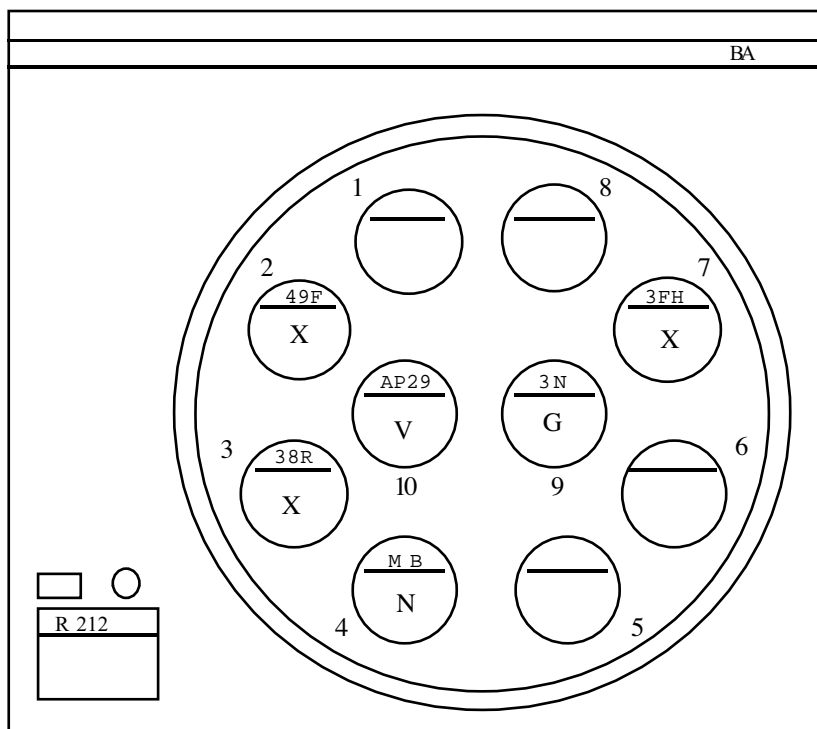
Position	Sectioning		Destination
2*	0,35	49F	+AIR CONDITIONING CONTROL A.C. RELAY
3*	1,0	38R	CONTROL +A.C. COMPRESSOR CLUTCH
4	0,6	MB	MASS
7	0,35	3FH	CONTROL - INJECTION DAMAGE WITNESS
9	1,4	3N	+ FUEL PUMP > UC.E. DECODER
9	1,4	3N	+ FUEL PUMP
10	1,4	AP29	+AFTER PROTECTED CONTACT
10	1,4	AP29	+AFTER PROTECTED CONTACT



	<h3 style="margin: 0;">COUPLINGS</h3>	X75 03
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### ENGINE WIRING COUPLING

Position	Sectioning		Destination
2*	0,35	49F	+ AIR CONDITIONING CONTROL > U.C.E. INJECTION
3*	1,0	38R	CONTROL +A.C. COMPRESSOR CLUTCH
4	0,6	MB	MASS
7	0,35	3FH	CONTROL - INJECTION DAMAGE WITNESS
9	1,4	3N	+ FUEL PUMP
10	1,4	AP29	+AFTER PROTECTED CONTACT




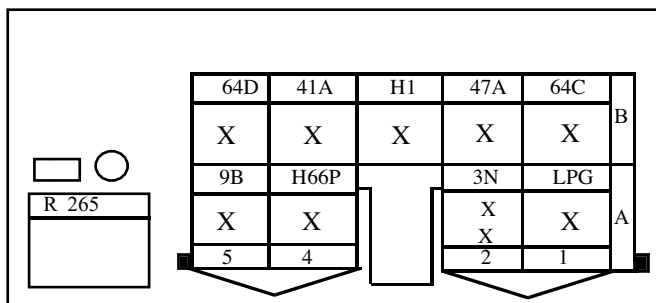


	COUPLINGS	X75 03
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FRONT/REAR WIRES COUPLING


FRONT WIRES COUPLING

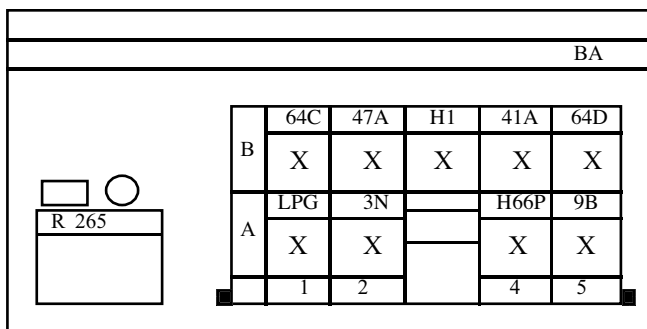
Position	Sectioning		Destination
A1	0,6	LPG	+PROTECTED POSITION LIGHTS
A2	1,4	3N	+ FUEL PUMP > ANTISTARTING
A2	1,4	3N	+ FUEL PUMP
A4	0,6	H66P	CONTROL + BACKWARD RUNNING LIGHTS
A5	0,6	9B	CONTROL + PROTECTED REAR FOGLIGHTS
B1	0,6	64C	LEFT SIGNALISATION LIGHTS CONTROL
B2	0,35	47A	- ALARM FOR FUEL MINIMAL LEVEL
B3	0,35	H1	CONTROL - HANDBRAKE WITNESS
B4	0,6	41A	SIGNAL + FUEL LEVEL TRANSMITTER
B5	0,6	64D	LEFT SIGNALISATION LIGHTS CONTROL



	<h3 style="margin: 0;">COUPLINGS</h3>	X75 03
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### REAR WIRES COUPLING


Position	Sectioning		Destination
A1	1,0	LPG	+PROTECTED POSITION LIGHTS
A2	1,4	3N	+ FUEL PUMP
A4	0,6	H66P	CONTROL + BACKWARD RUNNING LIGHTS
A5	0,6	9B	CONTROL + PROTECTED REAR FOGLIGHTS
B1	0,6	64C	LEFT SIGNALISATION LIGHTS CONTROL
B2	0,35	47A	- ALARM FOR FUEL MINIMAL LEVEL
B3	0,6	H1	CONTROL - HANDBRAKE WITNESS
B4	0,6	41A	SIGNAL + FUEL LEVEL TRANSMITTER
B5	0,6	64D	LEFT SIGNALISATION LIGHTS CONTROL

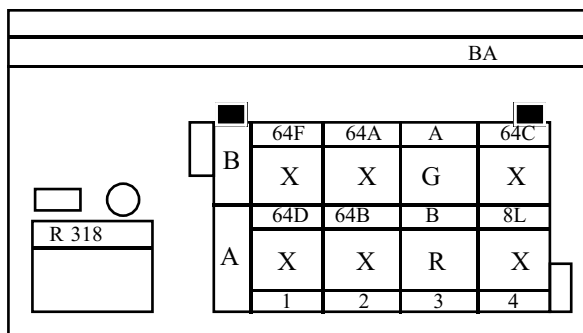




FRONTWIRES COUPLING / BOARD PANEL

FRONTWIRES COUPLING


Position	Sectioning		Destination
A1	1,0	64D	RIGHTSIGNALISATIONLIGHTSCONTROL
A2	1,0	64B	CONTROL+ SIGNALISATION
A3	1,6	B	+BATTERY
A4	0,6	8L	CONTROL +FOG LIGHTS RELAY
B1	0,35	64F	CONTROL +BREAKDOWN WITNESS
B2	1,0	64A	SUPPLY + SIGNALISATION
B3	1,0	A	SUPPLY+AFTER CONTACT
B4	1,0	64C	RIGHTSIGNALISATIONLIGHTSCONTROL

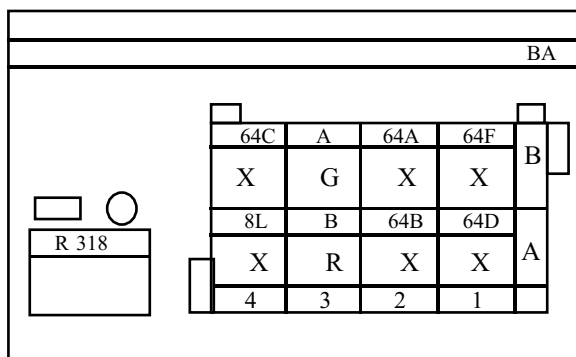


## WIRE FUNCTIONS IN CONNECTORS AND COUPLINGS

	COUPLINGS	X75 03
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### BOARD PANEL WIRES COUPLING

Position	Sectioning		Destination
A1	1,0		RIGHTSIGNALISATIONLIGHTSCONTROL
A2	1,0		CONTROL+ SIGNALISATION
A3	1,0		+BATTERY
A4	0,35		CONTROL +FOG LIGHTS RELAY
B1	0,35		CONTROL +BREAKDOWN WITNESS
B2	1,0		SUPPLY + SIGNALISATION
B3	1,0		SUPPLY+AFTER CONTACT
B4	1,0		RIGHTSIGNALISATIONLIGHTSCONTROL



# ELECTRICAL DIAGRAMS

## WIREFUNCTIONES EXPLANATION

LINK CODES	WIRE FUNCTIONS
A	SUPPLY + AFTER CONTACT
A3	PROTECTED ACCESSORIES
AP29	+ AFTER PROTECTED CONTACT ENGINE SAFETY FUNCTION
AP40	SUPPLY + PROTECTED ACCESSORIES
AP43	+ AFTER PROTECTED CONTACT
B	+ BATTERY
BCP3	+ PROTECTED BATTERY CEILING LIGHTING
BP11	+ PROTECTED BATTERY > COCKPIT 1
BP27	+ PROTECTED BATTERY / GMV COOLING, THERMOCONTACT
BP54	+ PROTECTED BATTERY > FOG LIGHTS
BP7	+ PROTECTED BATTERY > G.M.V SAFETY FUSE 1
C	+ HIGH-BEAM LIGHTS
CPD	+ RIGHT PROTECTED HIGH-BEAM LIGHTS
CPG	+ LEFT PROTECTED HIGH-BEAM LIGHTS
D	+ STARTER CONTROL
H1	CONTROL HANDBRAKE WITNESS, IC.P. BRAKING CIRCUIT
H66P	CONTROL + BACKWARDS RUNNING LIGHTS
HK	LINE K DIAGNOSIS SIGNAL
HL	LINE L DIAGNOSIS SIGNAL
L	+ POSITION LIGHT
LPG	+ LEFT PROTECTED POSITION LIGHTS
MA	RIGHT FRONT ELECTRIC MASS
MB	LEFT FRONT ELECTRIC MASS
MF	RIGHT REAR ELECTRIC MASS
MG	LEFT REAR ELECTRIC MASS
ML	BATTERY ELECTRIC MASS
MN	LEFT WINDSCREEN CROSS ELECTRIC MASS
MU	HANDBRAKE MASS
NF	MASS : AIR, WATER, TEMPERATURE SENSORS, POTENTIOMETER
R	+ RUNNING LIGHTS
RPD	+ RIGHT PROTECTED RUNNING LIGHTS
RPG	+ LEFT PROTECTED RUNNING LIGHTS
S	+ ACCESSORIES
SP16	+ PROTECTED ACCESSORIES
SP22	SUPPLY + PROTECTED ACCESSORIES
SP3	+ PROTECTED ACCESSORIES > GMV CLIMATE CONTROL
2A	CONTROL - CHARGE WITNESS
3AC	CONTROL - FUEL PUMP RELAY CONTROL
3AM	CONTROL - INJECTOR
3AQ	SIGNAL + VALVE POTENTIOMETER
3AY	IDLE MOTION SWITCH MASS SIGNAL
3B	SIGNAL + AIR TEMPERATURE SENSOR
3BB	CANISTER PURGING VALVE CONTROL
3BG	ENGINE ROTATION SIGNAL > ROTATION SENSOR
3BL	SIGNAL - ENGINE ROTATION > ROTATION SENSOR
3BR	+ AFTER CONTACT > MAIN RELAY
3BU	IDLE MOTION REGULATOR CONTROL 1
3BV	IDLE MOTION REGULATOR CONTROL 2
3C	SIGNAL + WATER TEMPERATURE SENSOR
3CV	CONTROL - IGNITION COIL FOR CYLINDERS 14
3CW	CONTROL - IGNITION COIL FOR CYLINDERS 23
3FH	CONTROL - INJECTION DAMAGE WITNESS

## WIREFUNCTIONS EXPLANATION

3GH	UPSTREAMROD O2 MASS
3GK	UPSTREAMROD O2 SIGNAL
3LS	SIGNAL + POTENTIOMETER 1
3LW	SIGNAL + POTENTIOMETER 2
3NA	+ FUEL PUMP
3NR	+ INJECTOR > FUEL PUMRELAY
3PP	ROD O2 CONTROL
8B	+ FOG HEADLIGHTS >RELAY
8DP	CONTROL +FOGHEADLIGHTS RELAY
9A	+REARFOG LIGHTSRELAY CONTROL
9B	CONTROL +REARFOG LIGHTS
9C	CONTROL + PROTECTED REAR FOG LIGHTS
9D	CONTROL +REAR FOGLIGHTS >RELAY
9M	SHUNT > FOG LIGHTS SWITCH
11A	CONTROL +RUNNINGLIGHTS
13A	CONTROL -CEILING LIGHTING >DOOR CONTACTORS
14A	CONTROL + WINDSCREEN WIPER LOWSPEED
14B	CONTROL +WINDSCREEN WIPER HIGH-SPEED
14C	CONTROL + WINDSCREEN WPER STOPPING IN A FIXED POINT
14D	CONTROL FOR WINDSCREEN WPER TIMER LOWSPEED
15B	CONTROL + REAR WINDOW ANTI-ICE
16A	CONTROL + WINDSCREEN CLEANER PUMP
25A	CONTROL -BRAKE PLATES WEAR WITNESS
27A	CONTROL HANDBRAKE WITNESS
28A	CONTROL -OILPRESSURE WITNESS
31A	CONTROL- WATER TEMPERATURE WITNESS
38AH	CONTROL + GMV CLIMATE CONTROL SPEED 1
38AJ	CONTROL + GMV CLIMATE CONTROL SPEED 2
38AK	CONTROL + GMV CLIMATE CONTROL SPEED 3
38AL	CONTROL + GMV CLIMATE CONTROL SPEED 4
38HQ	CONTROL FORGMV 2 AIR CONDITIONING COCKPIT
38K	A.C. STOPPING CONTROL > THERMO-CONTACT
38R	CONTRPL + A.C.COMPRESSORCLUTCH
41A	SIGNAL + FUEL LEVEL TRANSMITTER
42A	SIGNAL + WATER TEMPERATURE
47A	- FUEL MINIMAL LEVEL ALARM
47F	VEHICLESPEEDSIGNAL
49B	CONTROL +GMV COOLING
49C	CONTROL+ GMV COOLING RELAY
49F	CONTROL + AIR CONDITIONING
64A	SUPPLY +SIGNALISATION
64AP	+ PROTECTED SIGNALISATION LIGHTS
64B	SIGNALISATION CONTROL
64C	CONTROL LEFT SIGNALISATION LIGHTS
64D	CONTROL RIGHT SIGNALISATION LIGHTS
64E	CONTROL +SIGNALISATION WITNESS
64F	CONTROL +BREAKDOWN WITNESS
65A	CONTROL + STOP LIGHTS
67A	CONTROL +ACOUSTIC ALARM
80T	ANTI-STARTER CONTROL WITNESS
80X	ANTI-STARTER RECEPTOR SIGNAL WAY
85G	4x4 COUPLING RELAY CONTROL
85L	4x4 WITNESS CONTROL
96A	SAFETY BELT WITNESS CONTROL
97A	SPEED WITNESS CONTROL 120 KM/H