manuale d´officina
manuel d´atelier
workshop manual
Werkstatthandbuch
manual de taller

SAME

90 100 110
130 150 170

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GENERAL CONTENTS

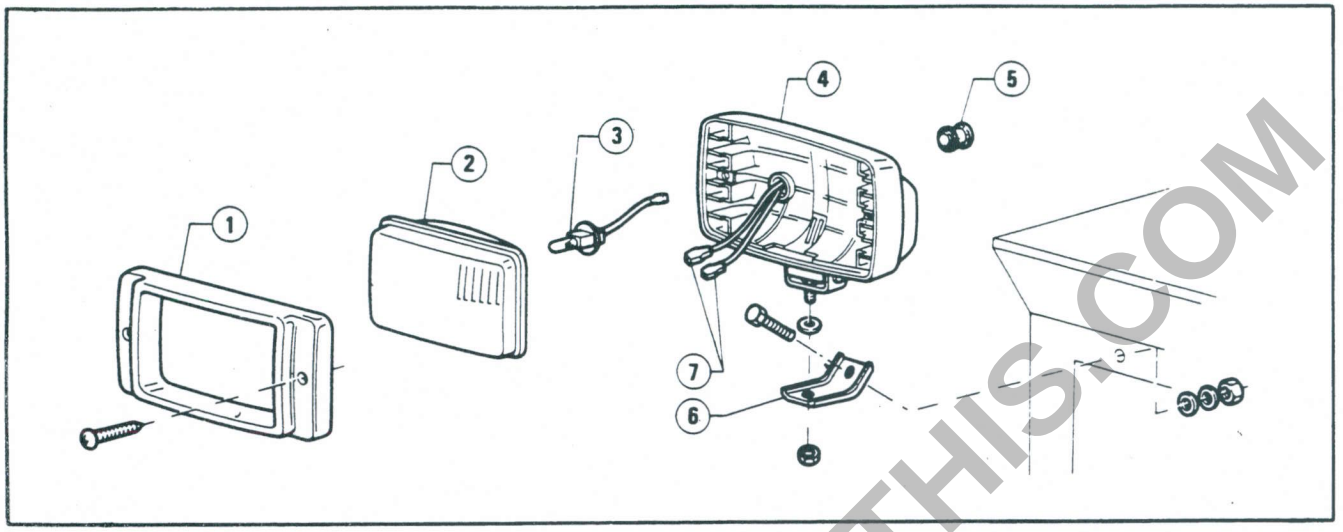
GENERAL	GR. 00
ENGINE UNIT	GR. 1
ENGINE LUBRICATION SYSTEM	GR. 1.5
FUEL SYSTEM	GR. 1.6A
OVERFUELLING	GR. 1.6B
GEARBOX CLUTCH	GR. 2.3
GEARBOX	GR. 3
GEARBOX LUBRICATION SYSTEM	GR. 3bis
CLUTCH P.T.O	GR. 3.8
FRONT AXLE 2R.M.	GR. 4.2
FRONT DRIVING AXLE	GR. 4.3
BACK AXLE	GR. 4.4
BRAKES	GR. 5.4
WHEELS AND TYRES	GR. 5.5
HYDROSTATIC STEERING	GR. 6.3
COMPLETE CABINE	GR. 7
LIFTING GROUP	GR. 8.2A
SUPPLEMENTARY HYDRAULIC CIRCUIT	GR. 8.2B
ELECTRICAL LIGHTING	GR. 8.5
MODEL 170	GR. 20.0

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HEADLIGHTS

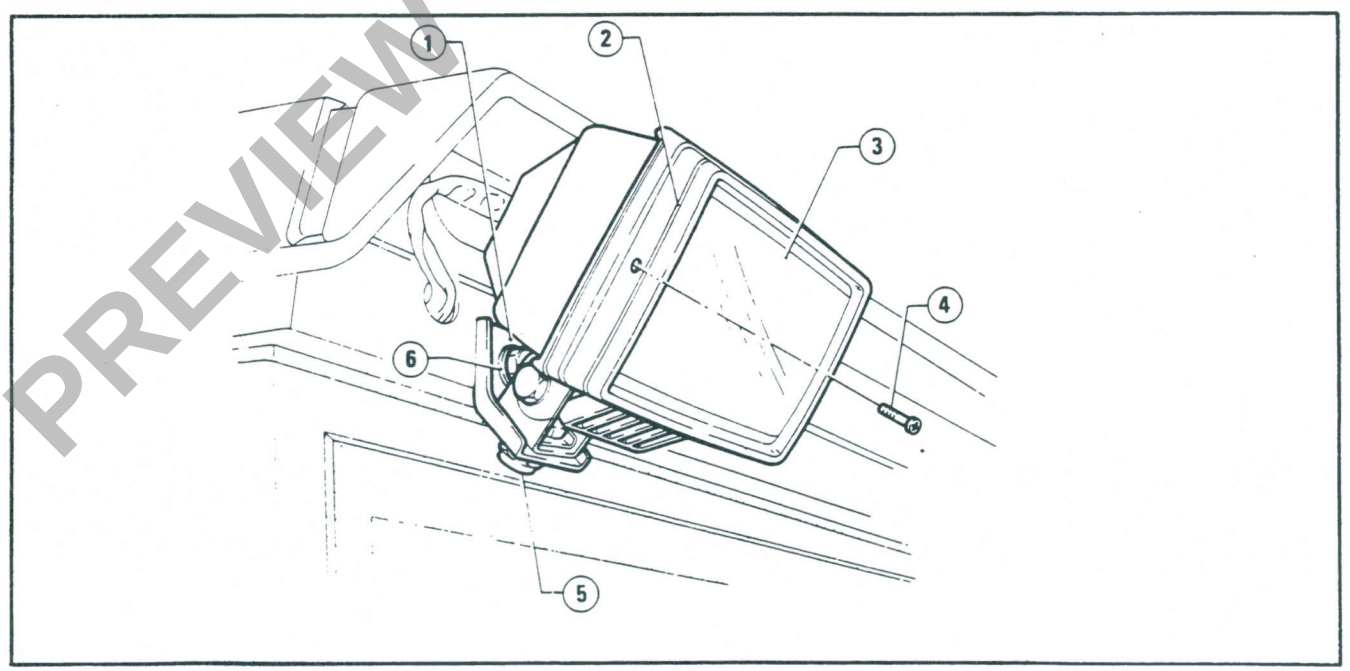
FRONT HEADLIGHTS



1 Rim
2 Optical centre
3 Bulb
4 Headlamp
5 Rubber wiring holder
6 Clip
7 Wiring harness

REMOVAL AND INSTALLATION

1. Loosen the screws (4) fixing the rim (2) and remove.
2. Referring to the enlarged diagram, remove the faston connectors (7) and remove the optical centre (2).
3. Remove the rubber wiring holder (5) and slip the electrical wiring from the headlamp shell (4).
4. Refer to the following diagram and loosen the nut (5) and remove the headlamp shell from the harness (1).



1 Harness
2 Rim
3 Optical centre
4 Screws
5 Automatic lock nut

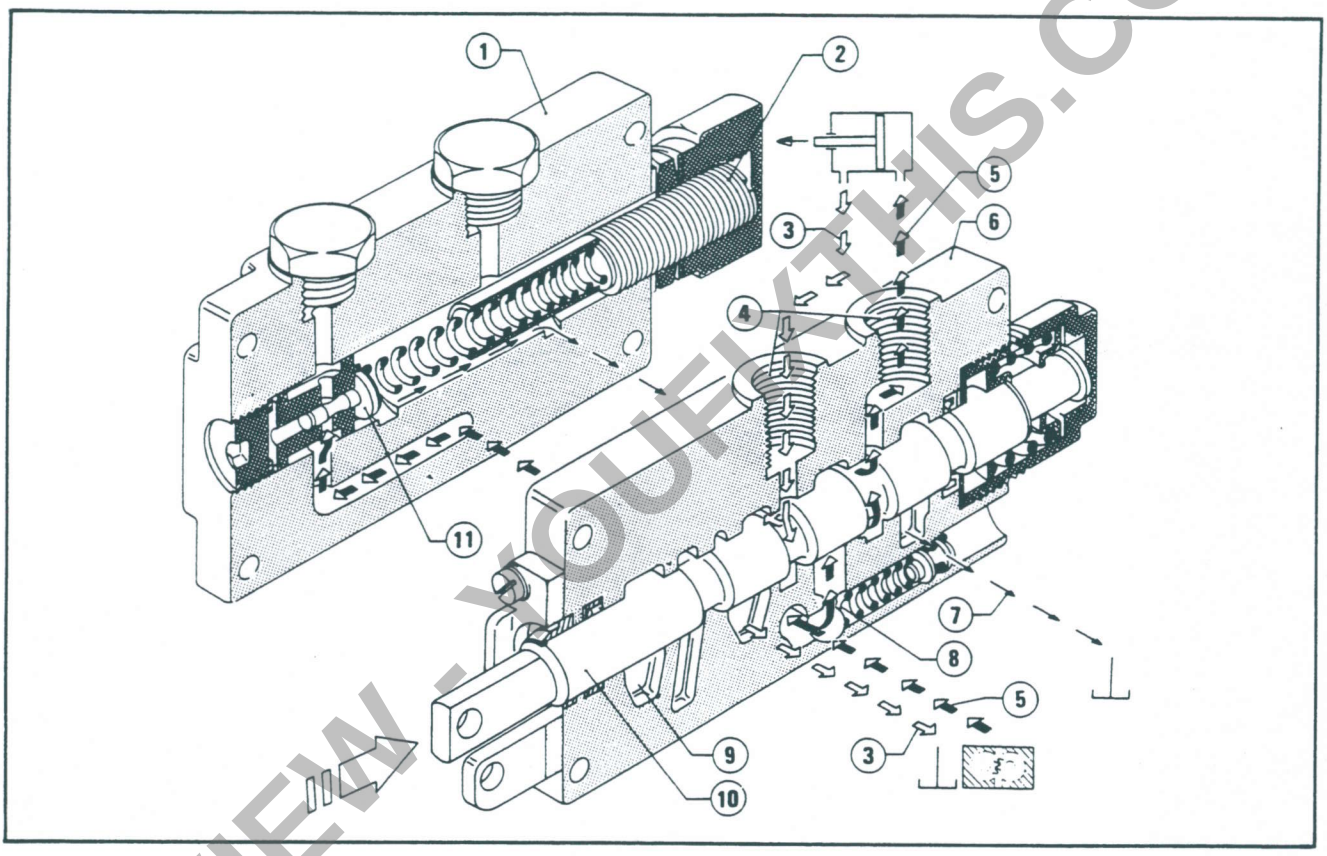
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WORKING PHASE

The moving of the distributor shaft (10) to the right (work position) determines the pressurized oil delivery flow (5) to the utilizer; simultaneously allowing the flow of oil (3) from the utilizer to the exhaust (crossing fittings (4)).

The pressurized oil also flows to the safety valve (11). Whenever pressure in the circuit exceeds that of the calibrated value of the safety valve, the oil is drained by way of pipe (7). In shaft position (10), oil does not flow to the lifting distributor because the distributor neutral pipe (9) is closed. The movement of the shaft towards the left (10) determines the reverse flow (3) and (5). In any case the previous instructions are still valid.



1 Security valve casing
2 Maximum operating pressure adjusting screw
3 Oil brackflow pipe (exhaust)
4 Utilizer connection fitting
5 Oil delivery pipe (pressurized)
6 Distributor casing
7 Oil backflow (exhaust)
8 Non return valve
9 Neutral conduit (delivery to the lifting distributor)
10 Distributor shaft
11 Securing valve

pressurized oil

oil to discharge

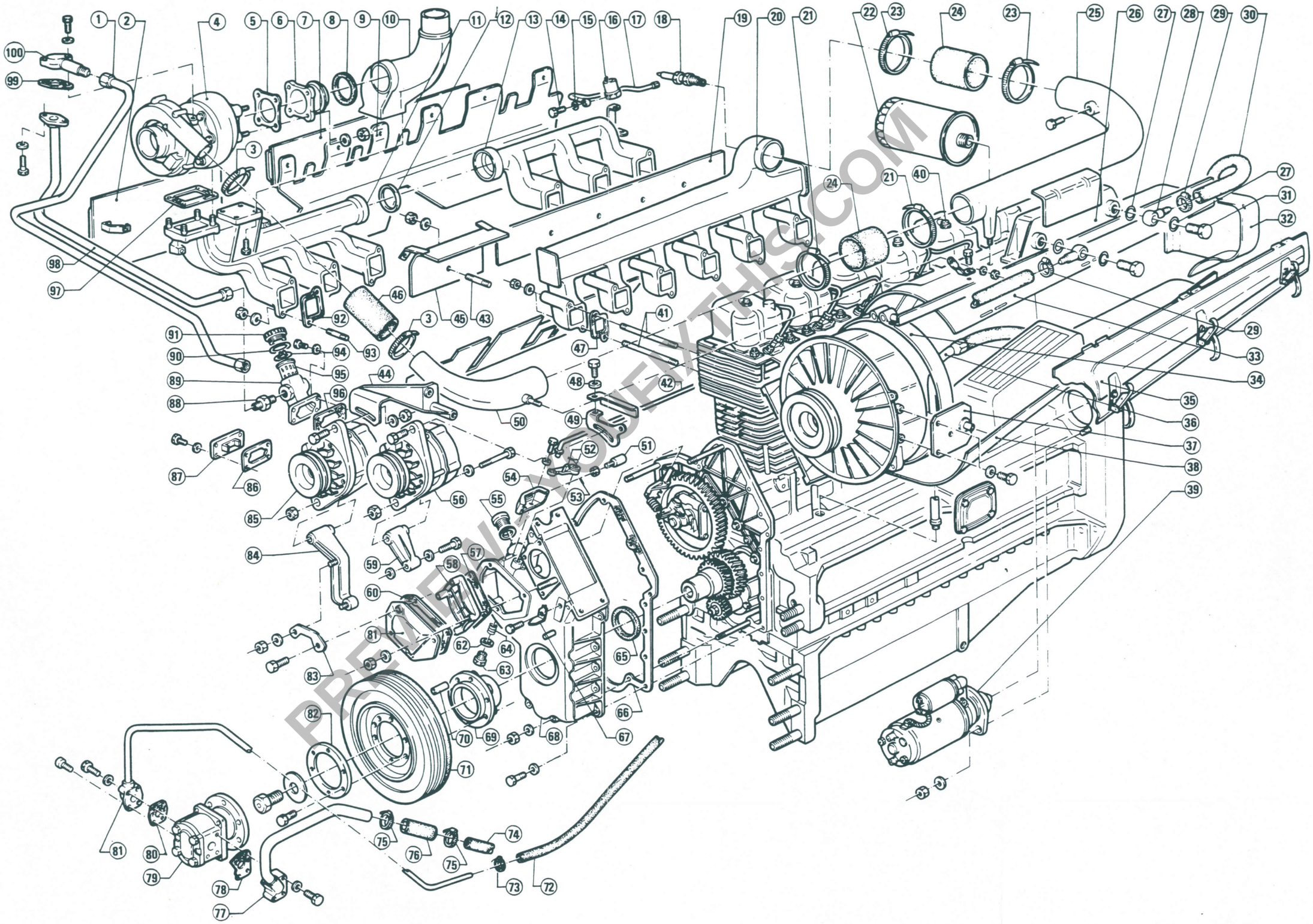
oil to discharge (when exceeding the maximum operating pressure)

movement

external action

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TIGHTENING TORQUES

Unit: N·m (kg·m; ft·lb)

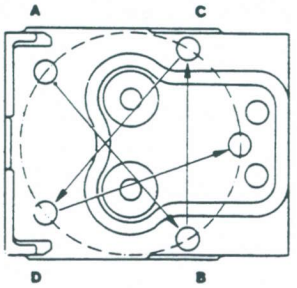
Item \ Model	90	100	110 / 130	150 / 170
Main bearing support nuts	118 (12; 86.76)	118 (12; 86.76)		127.5 (13; 93.99)
Connecting rod screws	113 (11.5; 83.15)			
Distributor gear screws	73.5 (7.5; 54.23)			
Flyball governor nuts	17.5 (1.8; 13.01)			
Oil sump screws	24.5 (2.5; 18.08)			
Head nuts (*) (1) New nuts first torque – Conveyor side (1 - 4) – Central nut (5) – Collector (2 - 3)	 $83^{\pm 4}$ ($8.5^{\pm 0.4}$; $61.46^{\pm 2.89}$) $53^{\pm 3}$ ($5.4^{\pm 0.3}$; $39.04^{\pm 2.17}$) $64^{\pm 4}$ ($6.5^{\pm 0.4}$; $47^{\pm 2.89}$)			
Nuts tightened more than once – Conveyor side (1 - 4) – Central nut (5) – Collector side (2 - 3)	 $98^{\pm 5}$ ($10^{\pm 0.5}$; $72.3^{\pm 3.62}$) $61^{\pm 3}$ ($6.2^{\pm 0.3}$; $44.83^{\pm 2.17}$) $78.5^{\pm 4}$ ($8^{\pm 0.4}$; $57.84^{\pm 2.89}$)			
Retaining screw crankshaft pulley	98 (10; 72.3)			
Valve rocker support - blind nut	54 (5.5; 39.77)			
Screws and nuts securing rear flange (engine - to - gearbox connection)	147 (15; 108.45)			
Oil pump nut	29 (3; 21.69)			
Injector nut	9.8 to 12 (1 to 1.2; 7.23 to 8.68)			16.5 to 18.5 (1.7 to 1.9; 12.29 to 13.74)
Fly wheel screw	147 (15; 108.45)			
M8 counterweight screws	39 (4; 28.92)			
M10 counterweight screws	78.5 (8; 57.84)			
Connectors - oil delivery pipe to radiator	44^{+5} ($4.5^{+0.5}$; $32.54^{+3.62}$)			
Connectors - injector pump - injectors	20^{+5} ($2^{+0.5}$; $14.46^{+3.62}$)			
Nut securing the oil pump gear	64 (6.5; 47)			

Note:

– All screw threads must be cleaned and greased before tightening

– All screws not listed must be tightened according to valued given in "GENERAL - Method of tightening nuts", according to dimensions.

(*) Head nuts must be tightened following the order given in the Fig. until the prescribed torque.



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TROUBLESHOOTING AND CORRECTIONS

WARNING
If necessary, consult Troubleshooting Groups: Fuelling, Lubrication.

Trouble	Probable cause	Corrective action
Engine fails to start	Put stop motor lever into free position	Disengage starter motor
	Starter motor fails to start:	
	• Battery terminals oxidized	Clean contacts and tighten terminals
	• Battery discharged	Recharge battery or replace
	• Cables connection poor	Restore connection
	• Ignition switch faulty	Replace ignition switch
	• Starter motor faulty	Check current through flow; if so, repair motor, or replace
	• Gearbox lever engaged	Disengage gear (into neutral)
	• Start up enable device faulty	Replace the device
	Starter motor incorrect r.p.m.:	
	• Terminals oxidized	Clean contacts and tighten terminals
	• Cables connection poor	Restore connection
	• Improper engine oil	Use the oil prescribed
	• Motor brushes worn	Replace brushes
	Starter motor operates, but engine fails to start:	
	• Fuel pre-filter clogged	Clean prefilter
	• Fuel piping and/or filters clogged	Replace piping and/or filters
	• Air in the fuel system	Bleed the system
	• Fuel pump faulty	Replace the pump
	• Injectors locked or faulty	Overhaul injectors; replace spray nozzles if required
	• Injection pump faulty	Overhaul pump; replace the faulty components, if required
	• Insufficient seal of valves and/or liners	Overhaul engine
Engine start is difficult	• Fuel lever insufficient	Add fuel into tanks
	• Fuel filters clogged	Clean filters; replace them if required

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TECHNICAL DATA AND SPECIFICATIONS

CAUTION
Technical data for models 170 and 150 are very similar and are given jointly in the following table. Only where there are substantial differences for model 150 are the specifications given separatly.

TECHNICAL FEATURES

ENGINE

Details \ Model	90	100	110	130	150	170
Engine type	SAME 1054 PT	SAME 1055 P	SAME 1006 P	SAME 1056 P	SAME 1056 PS	SAME 1056 PTI
Fuel	DIESEL					
Strokes	4					
Fuel supply	DIRECT					
Extra fuel supply	With turbocompressor	–			With turbocompressor	
No. of cylinders & controls	4 in line	5 in line	6 in line			
Diameter & length mm (in)	105 x 120 (4.13 x 4.72)		100x120 (3.94x4.72)	105 x 120 (4.13 x 4.72)		
Gear length	1.14		1.2	1.14		
Cubic capacity cm^3 (in^3)	4154 (249.24)	5193 (311.58)	5655 (339.3)	6235 (374.1)		
Gear pressure	17 : 1			16.6 : 1	15 : 1	
Max. power rating (CV CUNA) Kw	64.6 (88) to 2270 r.p.m.	72 (98) to 2200 r.p.m.	77.1 (105) to 2200 r.p.m.	92 (125) to 2300 r.p.m.	106.5 (145) to 2200 r.p.m.	121 (165) to 2200 r.p.m.
Max. torque kg·m (ft·lb) of N·m	31.8 (229.91) 31.25	36 (260.28) 35.28	38 (274.74) 37.2	43.5 (314.51) 42.6	55.8 (403.43) 56.4	63.4 (458.38) 62
Max. torque speed r.p.m.	1247	1400				
Specific power capacity CV/l	21.17	18.87	18.5	20	23.3	26.5
Piston speed (for 2200 r.p.m. engine) m/1' (ft/1')	9.08 (29.78)	8.8 (28.86)		9.2 (30.18)	8.8 (28.86)	
Min. speed r.p.m.	550 to 700					
Max. speed r.p.m.	2460 to 2480	2340 to 2360	2440 to 2460	2340 to 2360		

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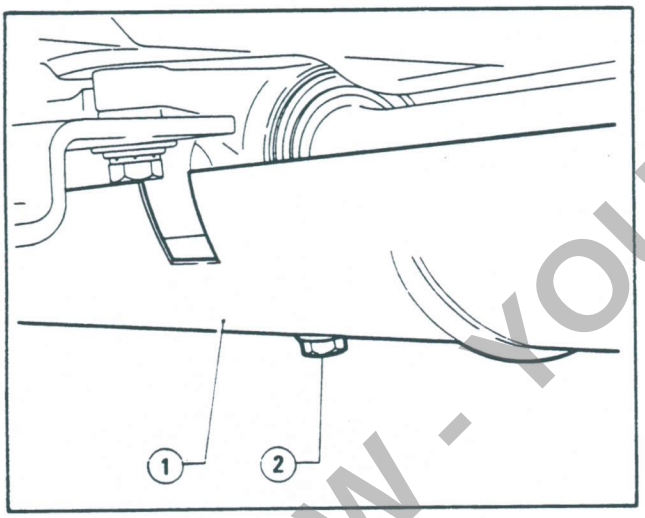
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PRELIMINARY OPERATIONS

CAUTION
Verify that the workshop is equipped with a bridge crane, or other means, of adquate capacity.

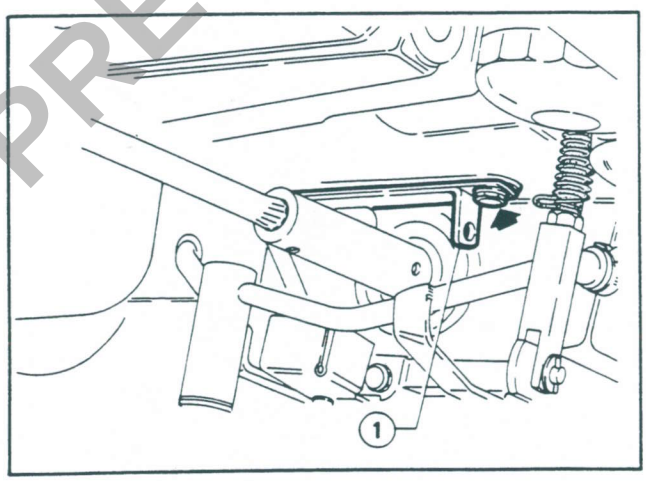
WARNING
Operate carefully when working on a hot engine to avoid being burned.

1. Place the vehicle on a level surface with gears disengaged.
2. Propeller shaft removal (4-wheel drive models).
(1) Unscrew the seven screws securing cover (1), remembering that central screw (2) is the last to be removed.



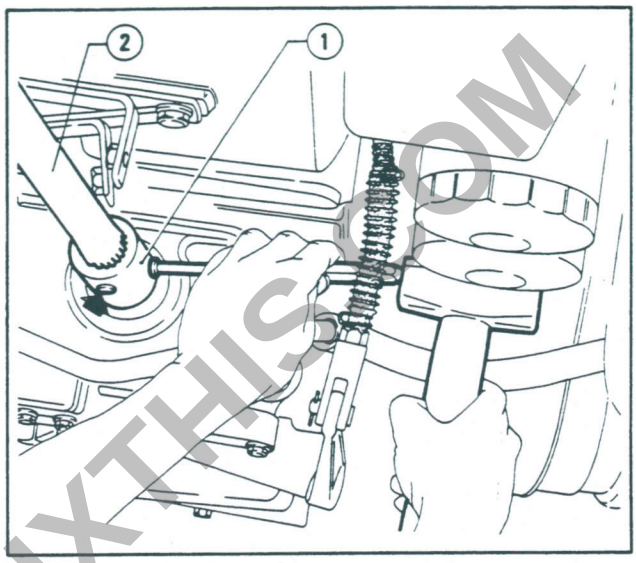
1 Propeller shaft cover
2 Central screw

(2) Unscrew the two screws securing bracket (1), and move it.



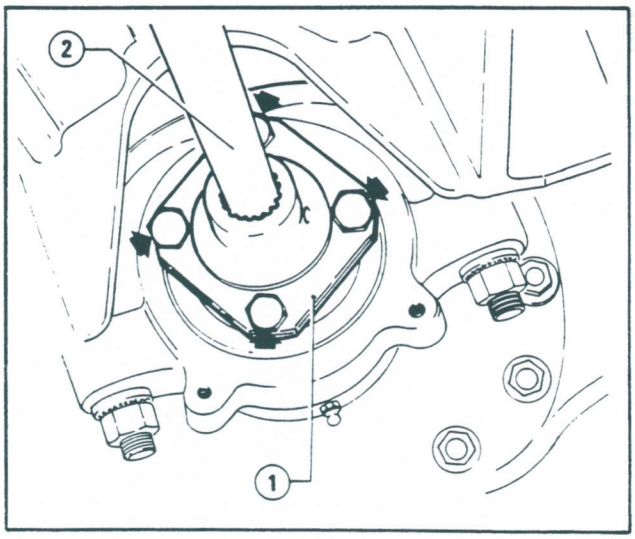
1 Rear bracket securing propeller shaft cover

(3) Move tractor so as to cause propeller shaft to move and bring the pins securing sleeve (1) in the horizontal position. Remove the two pins by means of a punch, starting from the rear one (with repeat to running direction).



1 Sleeve
2 Propeller shaft

(4) By means of a lever, move the sleeve connection propeller shaft to front power take off forward.
(5) Remove the four bolts securing flange (1) two by two.



1 Flange connecting front differential to propeller shaft
2 Propeller shaft

(6) Unscrew the two screws securing support (1) to engine, move support backwards, and remove propeller shaft.

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GENERAL SPECIFICATIONS

FLUIDS AND LUBRICANTS

Engine oil - Type

Model / Enviroment temperature	90 150 170	100 110 130
<– 15°C (302°F)	AGIP DIESEL SIGMA S SAE 20W/20 (API SE – CD/MIL – L – 2104 C)	AGIP F1 SUPER MOTOROIL SAE 15W/50 (API SE – CD/USA – MIL – 2104 C)
–15 to 10°C (59 to 50°F)		AGIP DIESEL GAMMA SAE 20W/20 (API CC – SC/USA – MIL – L2104 B)
5 to 30°C (41 to 86°F)	AGIP DIESEL SIGMA S SAE 30 (API SE – CD/MIL – L – 2104 C)	AGIP DIESEL GAMMA SAE 30 (API CC – SC/USA MIL – L – 2104 B)
>30°C (86°F)	AGIP DIESEL SIGMA S SAE 40 (API SE – CD/MIL – L – 2104 C)	AGIP DIESEL GAMMA SAE 40 (API CC – SC/USA MIL – L – 2104 B)
– 5 to 40°C (41 to 104°F) (For all seasons)	AGIP SUPERDIESEL MULTIGRADE SAE 15W/40 (API SE CD/USA MIL – L – 2104 C)	AGIP UNITRACTOR SAE 20W/40 (API CC – GL – 3/USA MIL – L – 2104 B)
		AGIP SUPER MULTIGRADE SAE 15W/40 (API SE – CD/USA MIL – L – 2104 C)

(*) For supercharged engines it is fundamental to respect the replacement time (50 hours) of the specific oil for running-in and of the oil filter cartridge.

NOTE:

- For first oil filling on all engines use: AGIP F1 SUPERMOTOROIL 10W/30. Specific for running in.
- Substitute engine oil every 150 hours.

Engine oil - Quantity

Unit: l (imp. gall)

Model	90	100	110 130 150 170
Quantity	10.2 (2.24)	13.3 (2.93)	16.2 (3.56)

NOTE:

The above quantity refers to the maximum capacity. The good functioning of the group is guaranteed also with a slightly inferior quantity as long as the level is between the minimum and maximum marking shown on the dipstick.

Sealers and Fixatives

Application	Type	Denomination	Model	Q.ty
Engine oil pump clamp screws to main bearing support	Fixative	LOCTITE 270	90 100 110 130 150 170	–

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FOREWORD

This manual is addressed to our Authorized Workshops, and contains the instructions for setting up, repairing and overhauling the new high range tractors (models **90** - **100** - **110** - **130** - **150** - **170** *).*

It contains general information, and the procedures related to removal and installation, disassembly and reassembly, checks and inspections of the tractors together with the troubleshooting instructions.

The Workshop Manual is the perfect supplement for the expert mechanic, to the training and specialization courses which are organized yearly by our Mechanics Training School, to enable them to interven in the best way and with the utmost accuracy on the machines.

It is an essential reference point for the repairs technician who needs confirmation on how to intervene, consequently, it is therefore necessary that every Authorized Workshop must keep this material available, so that it can be referred to at any time.

All data, figures and technical specifications, contained in this manual are up-dated to the date of issue. Any modifications and/or improvements concerning interventions on the machine, characteristics of the product and the technical specifications introduced between one issue of the manual and the others, will be timely indicated through Bulletins issued by the service Department.

The Manufacturer, reserves the right to make-at any time and without notice - all those changes that it deems necessary to improve the vehicle, or arising out of manufacturing or commercial requirements. It further advises that not all models mentioned in this manual will be available in all countries.

We thank in advance for the collaboration which will be kindly given by all those that will provide us with any corrections or improvements, thus allowing our publications to be more complete.

HOW TO USE THIS MANUAL

The given procedures are, in general, common to all models of the range: when they are referred to a specific model, the same is indicated with reference to the commercial power.

Each operation is illustrated in order to immediately detect where to intervene, and with what tools, and to indicate the correct procedures.

Since the instructions provided are, in general, referred to complete disassemblies of units, they should be followed entirely only when strictly necessary.

Page III contains a GENERAL LIST OF CONTENTS, where topics are listed and refer to the various functional units. to consult the manual easily, refer to the general list of contents, and then to the special reference index at the beginning of each section.

Each section contains the chapter TECHNICAL DATA AND SPECIFICATIONS to be complied with when repairing and setting up the machine. Within each single section, the specifications have been subdivided into four different items: Technical Features, Checks and Adjustments, Tightening Torques and General Specifications.

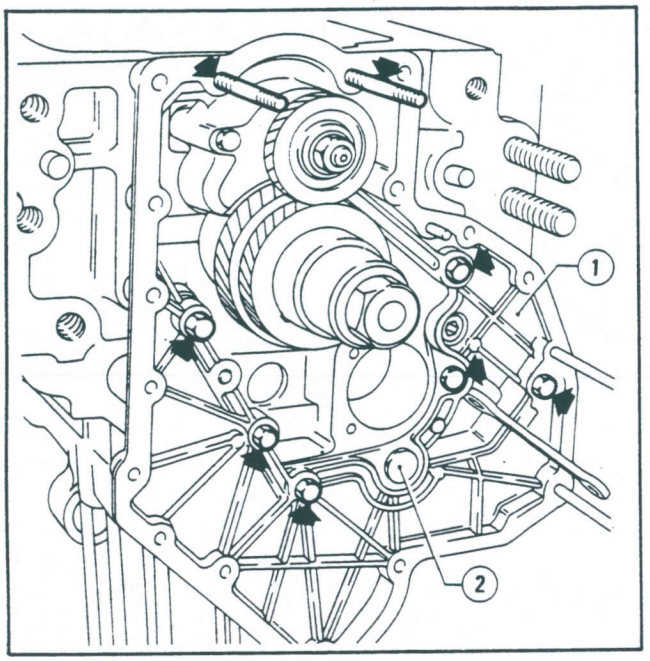
Each section contains also the chapter TROUBLESHOOTING AND CORRECTIONS where, in addition to a list of the probable causes of the trouble, the related recommended corrective actions are also given.

A few sections contain also a list of the SPECIAL TOOLS, realized to allow quick, accurate and safe repairs.

The couplings to be realized by means of fixing requiring specific tightening torques, are emphasized along the text with the following symbol.
For the other not specific tightening torques, refer to the method of tightening nuts and bolts reported in the Group "GENERAL".

Tightening torque:

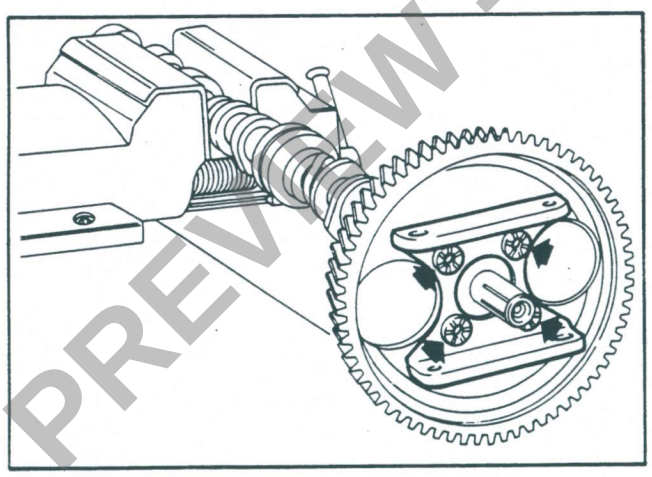
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1 Regulator case rear cover
2 Plug for oil flow hole

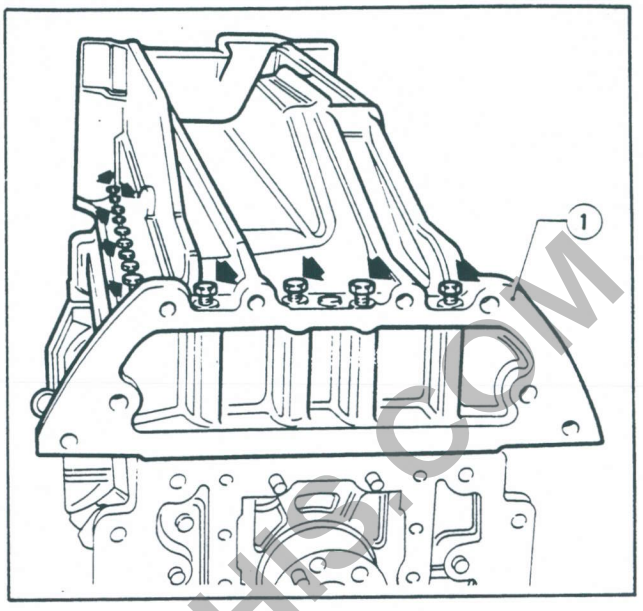
6. If required, to remove the camshaft gear, secure it on a vice fitted with protective jaws, and unscrew the four screws securing the shaft.

CAUTION
Take into account that, if the camshaft gear is disassembled, it is necessary to repeat the camshaft timing.



OIL SUMP

1. Unscrew the screws securing oil sump (1). With the aid of two screws, screwed on the rear side of sump, sling and remove sump, using an appropriate lifting device.



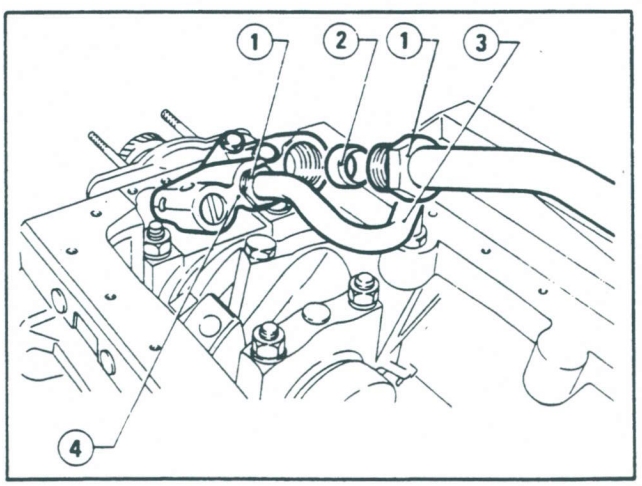
1 Oil sump

LUBRICATION SYSTEM INTERNAL TO SUMP

Only for 150 - 130 - 110 - 100

1. Disconnect the suction pipe by loosening union (1) and unscrewing the support bracket screw of suction pipe itself.
2. Unscrew the two unions (1) and disconnect pipe (3) between oil manifold and engine block. Unscrew the two screws securing oil manifold (4), and remove it together with the related gasket.

CAUTION
Recover ogive (2) internal to manifold (4).

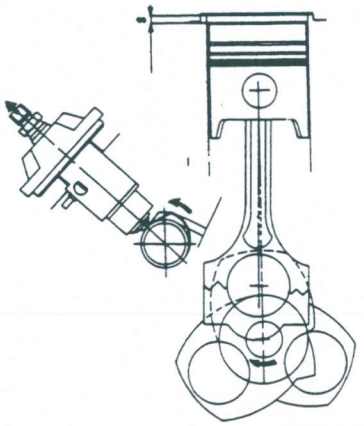


1 Unions
2 Ogive
3 Pipe between manifold and engine block
4 Oil manifold

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DISTRIBUTOR TIMING

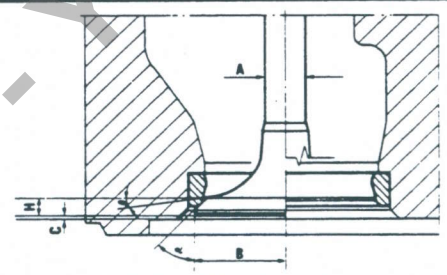


Unit: mm (in)

Type of control \ Model	90	100	110	130	150 170
Timing values corresponding to a "S" movement reading on gauge on distributor shaft	6.58 (0.2590)	6.58 (0.2590)	6.58 (0.2590)	6.58 (0.2590)	4.60 (0.1811)
Timing values to be read on gauge placed on distributor shaft	2.68 (0.1055)	2.68 (0.1055)	2.68 (0.1055)	2.68 (0.1055)	2.68 (0.1055)

VALVES, VALVE SEATS, VALVE GUIDE AND SPRINGS

Valves



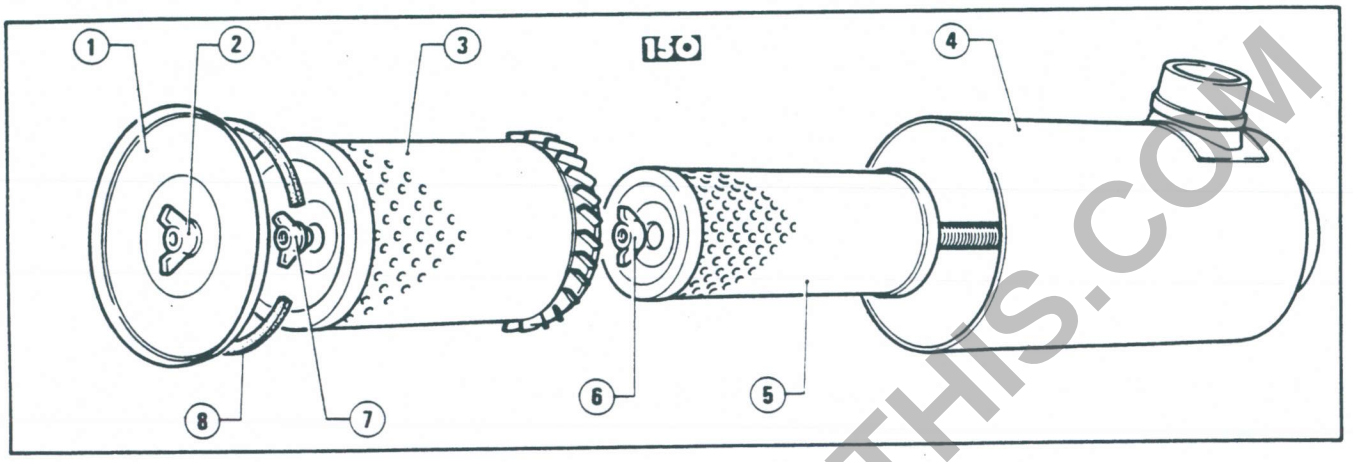
Unit: mm (in)

Type of control \ Model			90	100	110	130	150 170
Stem "A" diameter	Intake	Original dia.	$8.02\ ^{0}_{-0.015}$ ($0.3157\ ^{0}_{-0.0005}$)				$9.00\ ^{0}_{-0.015}$ ($0.3543\ ^{0}_{-0.0005}$)
		Max. wear dia.	7.99 (0.3145)				7.97 (0.3137)
	Exhaust	Original dia.	$8.02\ ^{0}_{-0.015}$ ($0.3157\ ^{0}_{-0.0005}$)				$8.98\ ^{0}_{-0.015}$ ($0.3535\ ^{0}_{-0.0005}$)
		Max. wear dia.	7.99 (0.3145)				7.95 (0.3129)
Valve recess with respect to plane of head "C"		Original dia.	1 to 1.2 (0.0393 to 0.0472)				
		Max. wear dia.	1.5 to 1.7 (0.0590 to 0.0669)				

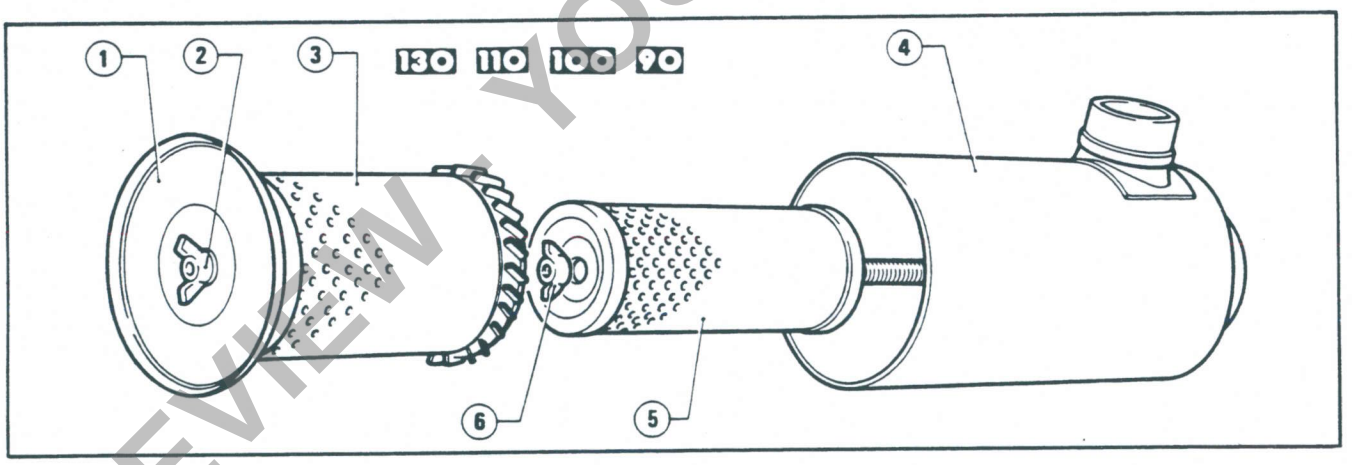
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DRY AIR CLEANER



1 Cover
2 Wing nut
3 Outer cartridge
4 Filter casing
5 Inner safety cartridge
6 Wing nut
7 Wing nut
8 Seal ring



1 Cover
2 Wing nut
3 Outer cartridge
4 Filter casing
5 Inner safety cartridge
6 Wing nut

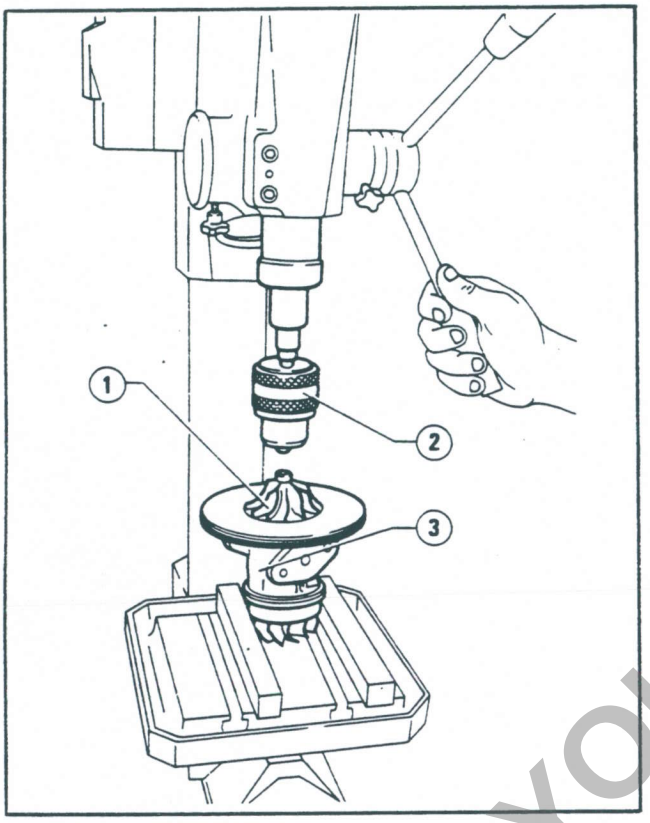
NOTE
Filter must be disassembled and cleaned only when the dashboard warning lamp indicating clogging lights up.

CAUTION
It is of the utmost importance that the warning lamp indicating air cleaner clogging is always perfectly functioning. The related check can be performed by switching on the engine and temporarily clogging the air inlet in the intake piping.

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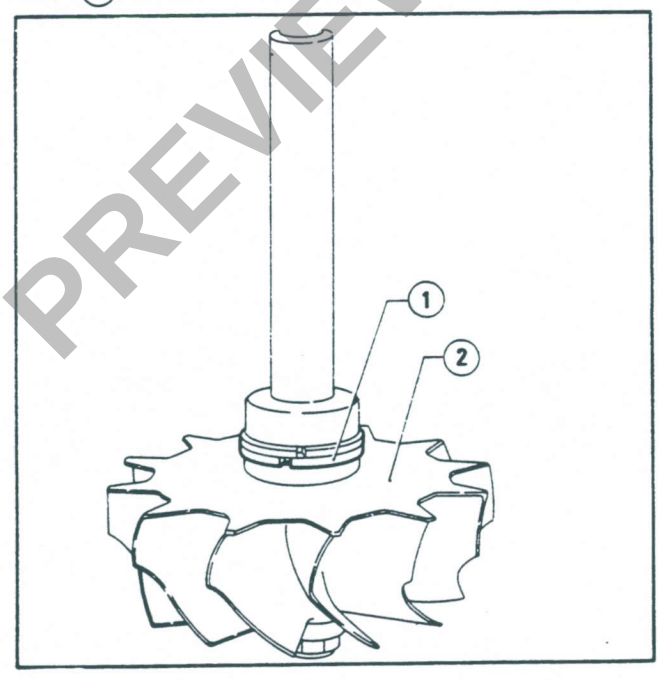
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5. Heat the compressor fan wheel (1) with either air or oil to a maximum temperature of **130°C (266°F)**, and working with a plug or a spindle (2) or a pillar drill push with great care downwards onto the rotor and remove it from the support (3) without moving the internal parts.



1 Compressor fan wheel
2 Spindle
3 Bearing support

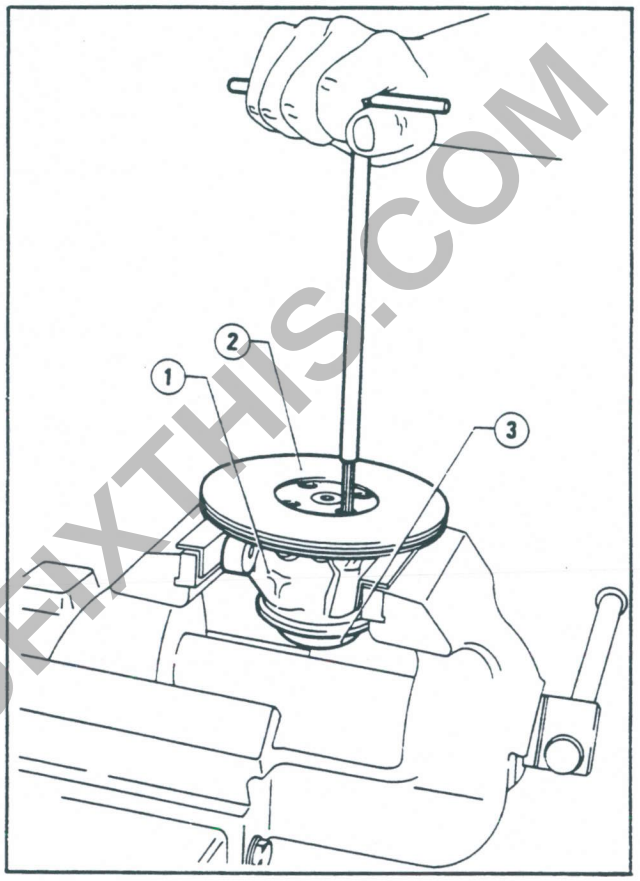
6. Remove the two parts (1) from their seats on the rotor (2) with the correct tool.



1 Segments 2 Rotor

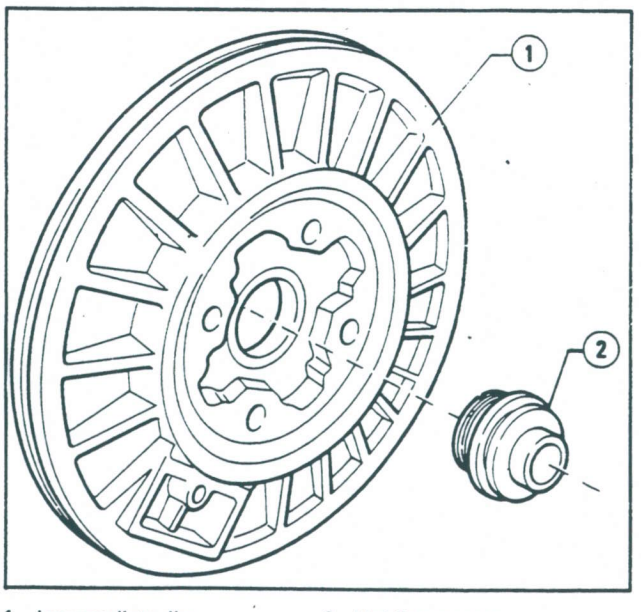
7. Fix the bearing support (1) in a vice with protective teeth, and loosen the four nuts fixing the intermediate disc (2) and remove it.

8. Remove from bearing support (1) the heat shield.



1 Bearing support
2 Intermediate disc
3 Heat shield

9. Press the holding magnet (2) towards the inside of the intermediate disc (1) and remove it.



1 Intermediate disc 2 Holding magnet

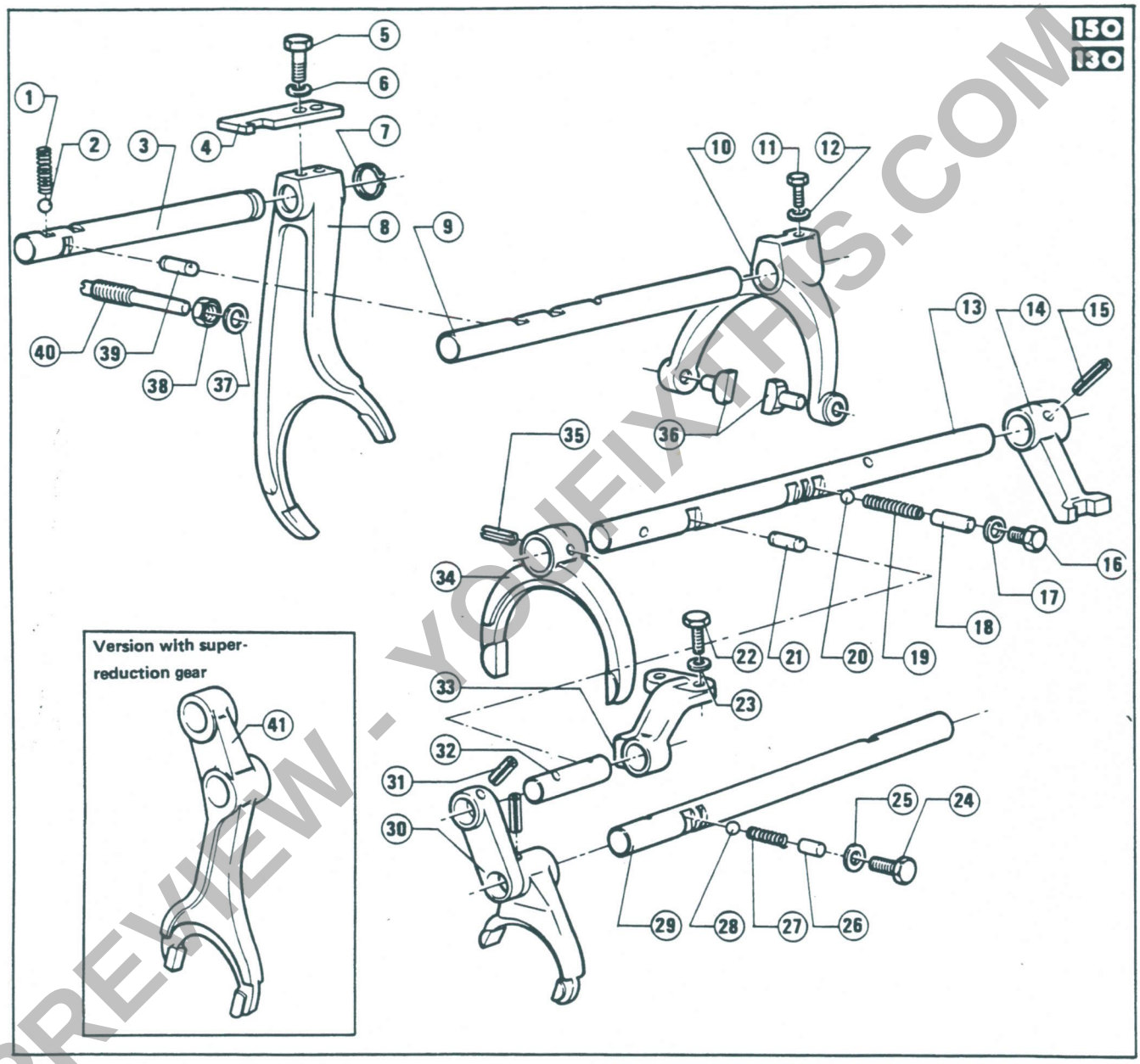
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FRONT GEARBOX

RODS AND FORKS

DISMOUNTING

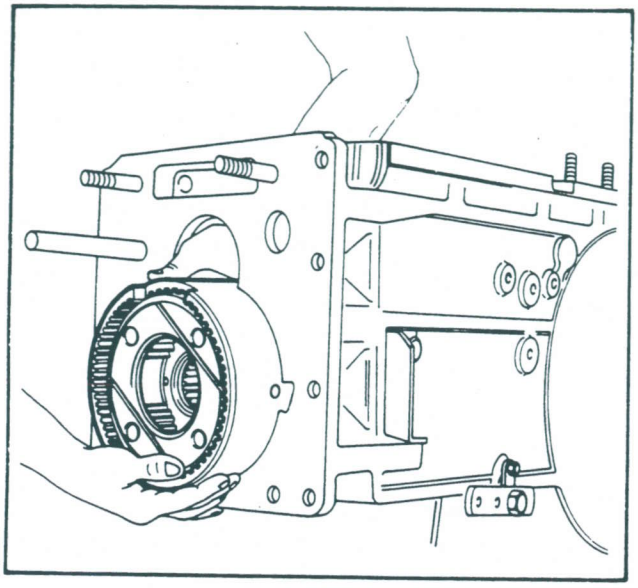


1 Spring
2 Ball
3 1st and 2nd gear coupling rod
4 Connecting plate
5 Screws
6 Washer
7 Seeger ring
8 1st and 2nd gear coupling fork
9 3rd and 4th gear coupling rod
10 3rd and 4th gear coupling fork
11 Screw
12 Washer
13 Mini reduction gear (super reduction gear coupling rod)
14 Return lever
15 Lock pin
16 Screw
17 Washer
18 Cap
19 Spring
20 Ball
21 Safety pawl
22 Screw
23 Washer
24 Screw
25 Washer
26 Cap
27 Spring
28 Ball
29 Reversal coupling rod
30 Reversal coupling fork (mini reduction gear version)
31 Lock pin
32 Rod
33 Bracket
34 Mini reduction gear coupling fork
35 Lock pin
36 Pressure pad
37 Gasket
38 Nut
39 Safety pawl
40 Adjusting screw
41 Reversal coupling fork (super reduction gear version)

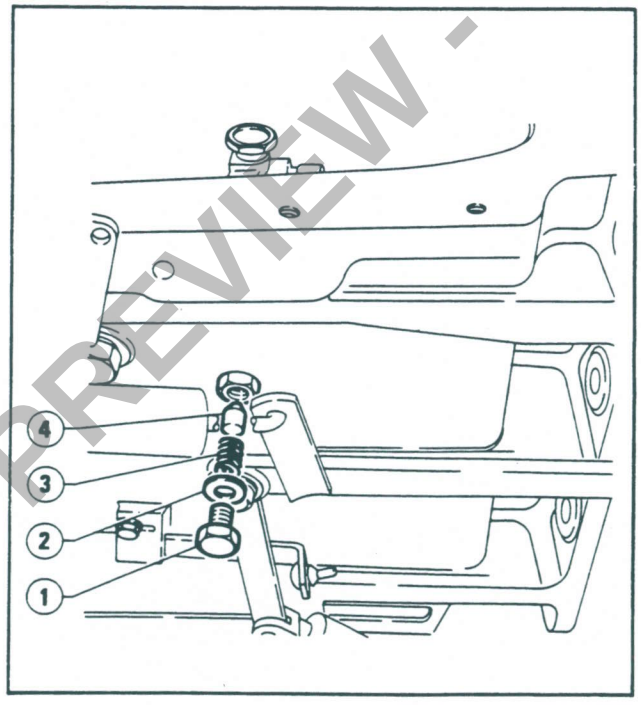
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1. Separate the two gearboxes (refer to: Preliminary Operations).
2. Take off with caution; as shown in the figure, the reduction group collecting the rear shouldering.

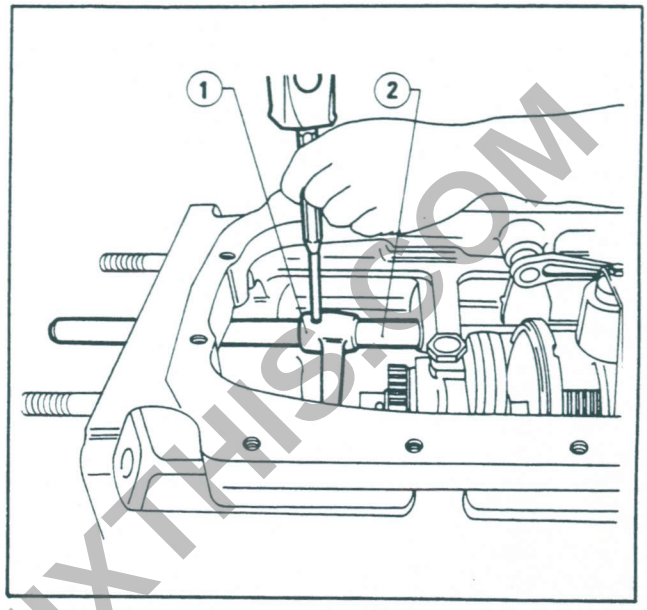


3. Loosen the cap (1) and take off the spring (3) and the pawl (or the ball) (4) using a magnet.



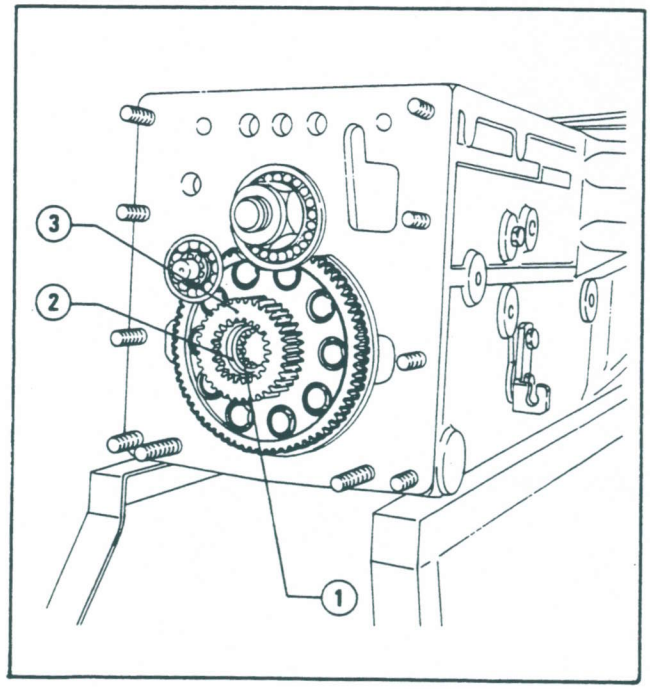
1 Cap
2 Gasket
3 Spring
4 Rod positioning pawl

4. Using a hammer and punch remove the pin fixing the coupling fork (1) to the rod (2). Take out the rod, the fork and extract the sleeve.



1 Coupling fork
2 Reduction coupling fork

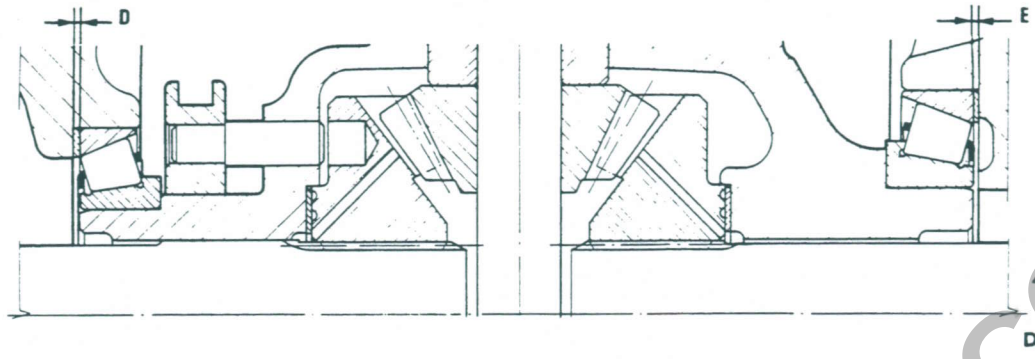
5. If necessary, remove the side pinion of the mill holder taking it off the pin. Recover the rollers.
6. If necessary, extract the external ring (2) and the roller crown wheel (1) of the front bearing, housed on the inside of the gearbox counter shaft (3).



1 Roller crown wheel
2 External ring
3 Gearbox counter shaft

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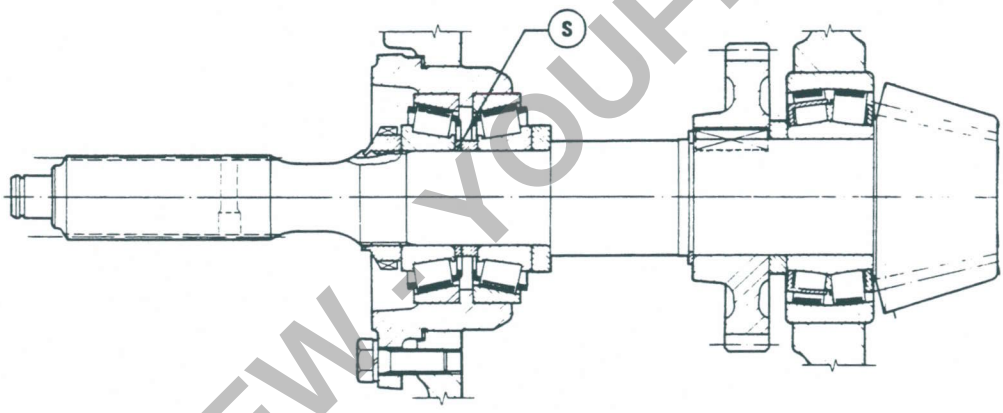
Differential

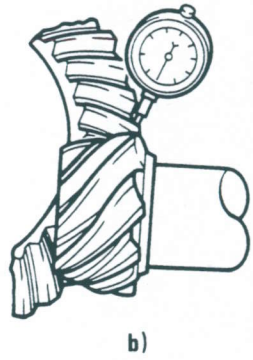


Unit: mm (in)

Type of check \ Model	90	100	110	130	150
Bearing preload adjustable with shim pack D & E	0.1 (0.004)				

Pinion and Crown Wheel





Unit: mm (in)

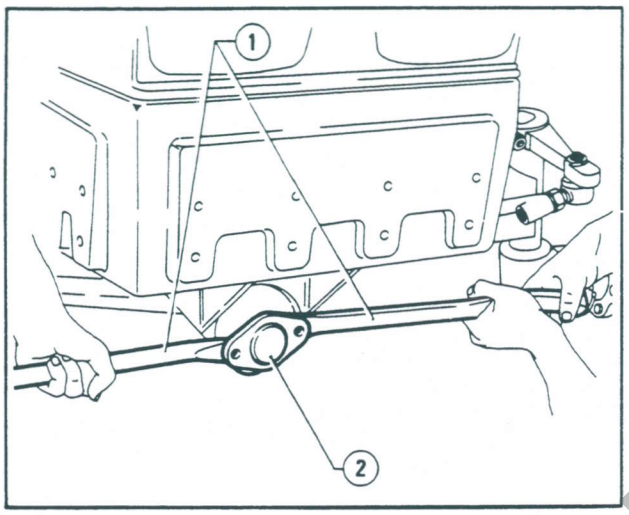
Type of check \ Version \ Model			90	100	110	130	150
a) Pinion axle play adjustable with shim package S			0.03 to 0.05 (0.0012 to 0.0020)				
b) Play between pinion teeth and crown wheel	with bevel gear for speed	25 km/h (15.53 mi/h)	0.21 to 0.29 (0.0083 to 0.0114)		0.20 to 0.28 (0.008 to 0.0110)		0.22 to 0.30 (0.0086 to 0.0118)
		30 km/h (18.63 mi/h)	0.23 to 0.31 (0.0090 to 0.0122)		0.21 to 0.29 (0.0083 to 0.0114)		0.23 to 0.32 (0.0090 to 0.0125)

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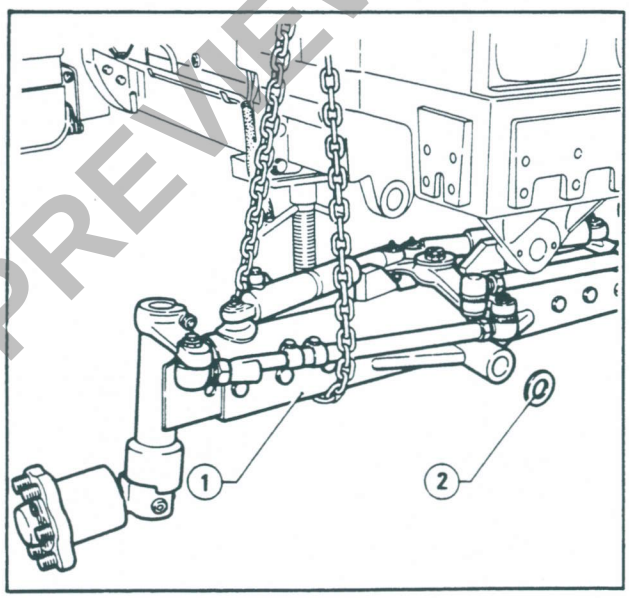
8. By means of two levers (1), withdraw pin (2) forwards, and recover the shims interposed between flange and front mounting.

CAUTION
Keep the two shim packages separated so that the correct positioning can be maintained on reassembly.



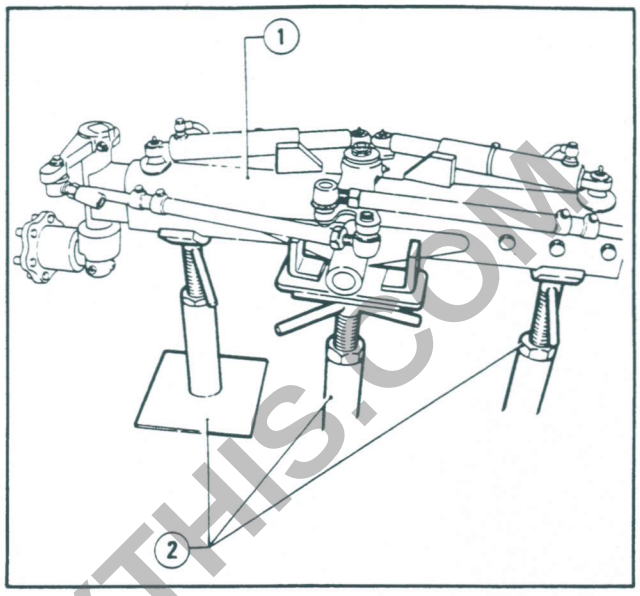
1 Levers
2 Pin

9. Remove the axle from front mounting by slightly tapping on central axle with a hammer.
10. Lower axle (1) very slowly, ensuring that operation is not hindered, then remove shovel rings (2).



1 Front driving axle
2 Shovel rings

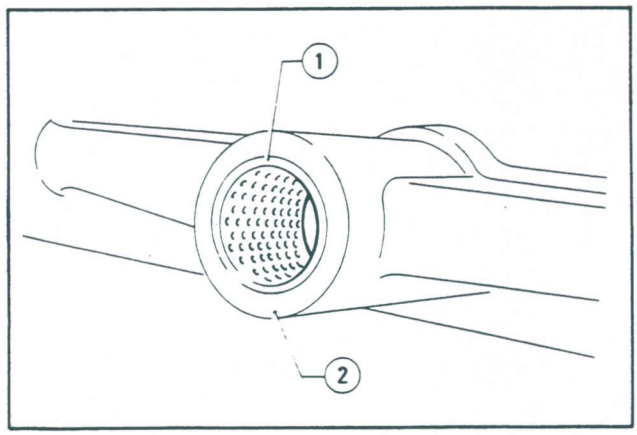
11. Position axle (1) on three stands (2), ensuring that it rests safely.



1 Front axle assembly
2 Stands

CHECKS AND VERIFICATIONS

1. Verify that bushes (1) of central axle are not worn, checking that indentations are still present. If required, remove the bushes using a hammer and a punch.



1 Bush
2 Central axle

2. Verify that pin surface is free from cracks, deformations, or splinters. Replace the pin if required.

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Reassemble the differential casing by reversing the order of disassembly, complying with the following.

- Before reassembling the components, **lubricate** them with the grease prescribed.
- Replace all gaskets, seal rings, and O-rings.
- Tighten the following screws to the prescribed torque.

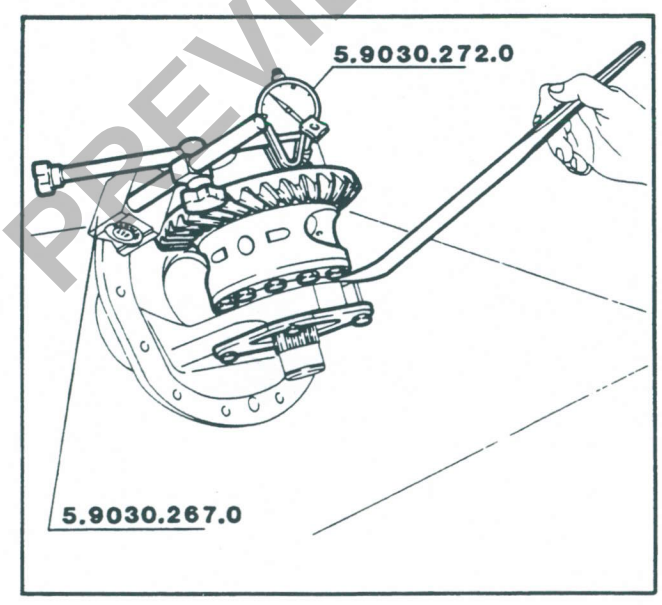
: Tightening torque

Screws securing flange to differential half-casing
118 N·m
(12 kg·m;
86.76 ft·lb)

Screws securing crown wheel to differential casing
11.3 to 11.8 N·m
(11.5 to 12 kg·m;
83.15 to 86.76 ft·lb)

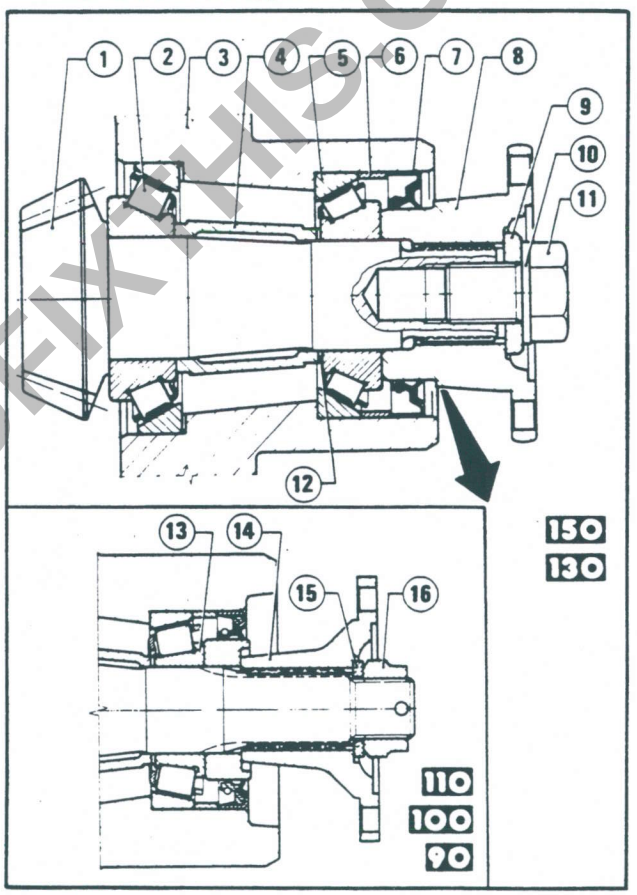
- Refer to the cross section, and carry out reassembly taking care, when reassembling the differential casing on support flange (3), to house roller bearing (4) on the side of crown wheel (5), and ball bearing (18) on the opposite side.
- Proceed to adjust the differential casing bearings by operating as follows.

(1) Together with flanges (1) and (17), position a number of shims greater than that measured on disassembly.
(2) Refer to the following diagram and position magnetic base No. **5.9030.267.0** on the flange supporting the differential with the probe of the comparator **5.9030.272.0** on the outer surface of the crown wheel.
(3) Reset the comparator, and with the aid of a lever, move the differential casing measuring the backlash.



(4) Remove shims accordingly, from one side or the other of the flange supporting bearings, until obtaining a backlash value of **0.03 to 0.04 mm. (0.0011 to 0.0015 in).** Repeat the measurement until the correct value is obtained.

- Remove the differential casing from the flange supporting differential, and mount the pinion assembly complete, with all components, taking care to position the same shim package (12) removed on disassembly.
  Verify manually that the pinion rotates freely without backlash. If required, change the number of shims (12); if pinion rotates too loose, remove shims, add shims in the opposite case.



1 Pinion
2 Tapered roller bearing
3 Flange supporting differential
4 Spacer
5 Tapered bearing
6 Spacer
7 Seal ring
8 Flange connecting propeller shaft
9 Shoulder ring
10 Washer
11 Screw
12 Adjusting shims
13 Spacer
14 Flange connecting propeller shaft
15 Shoulder ring
16 Castle nut

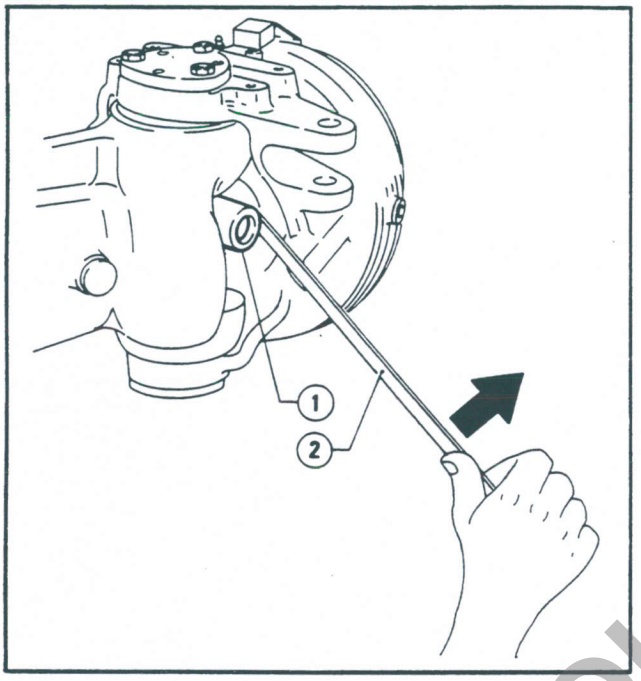
- Proceed to adjust the pinion-crown wheel position (refer to: Pinion-Crown Wheel Position Adjustment).

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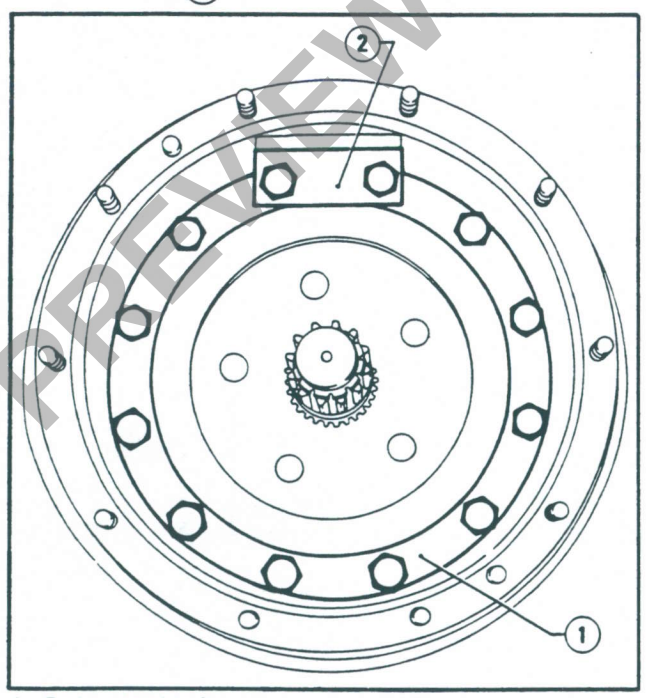
CAUTION

When removing the epicyclic reduction gear, use lever (1) as shown in the figure, and act on cross journal (2) in order to prevent the axle shaft from moving unintentionally with consequent damage of the seal rings housed inside the fork.



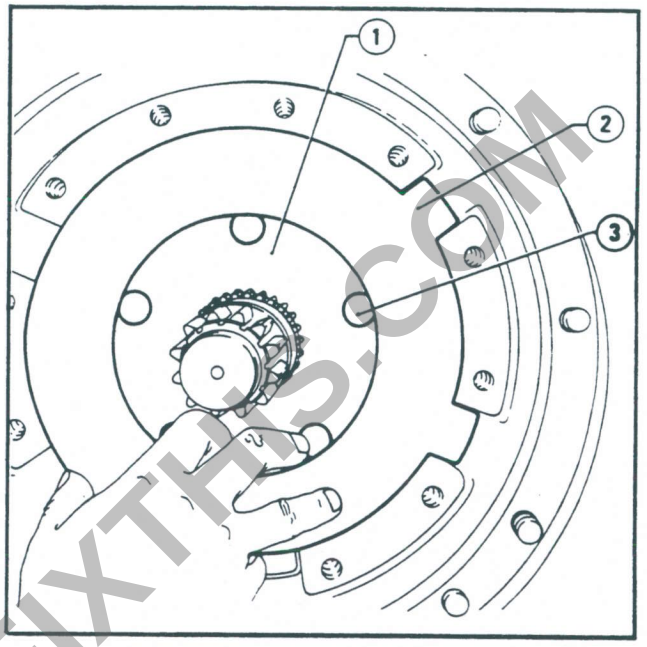
1 Lever
2 Cross journal

12. Unscrew the twelve selflocking screws securing the brake assembly flange (1) and remove it together with oil deflector plate (2).



1 Brake assembly flange
2 Oil deflector plate

13. Extract brake discs (1), and intermediate disc (2), then let compressed air into the brake oil union, and remove the brake control piston (3).



1 Brake discs
2 Intermediate discs
3 Brakes control piston

CHECKS AND VERIFICATIONS

Wash all brake components with suitable liquid, and dry them with compressed air.
Perform an accurate visual inspection verifying in particular the following.

1. Check for scratches on both inner and outer sliding surfaces of piston. Replace it if required.

2. Verify that the seal ring seats are clean. If required, blow compressed air into the seats.

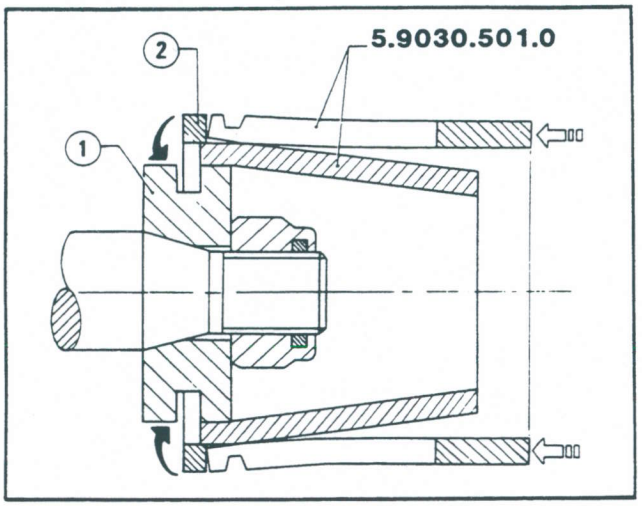
3. Verify the seal ring conditions; replace them if required.

4. Verify that the ground surfaces mating with the brake discs are free from excessive scratches.
If not , replace the damaged components.

5. Check the discs by operating as follows.
(1) Verify that the sliding surfaces of discs are not worn, splintered or scratched. Replace the damaged discs.
(2) Check that discs can slide freely into their seats.
(3) Use a gauge to check that the thickness of disc package is not lower than the value given in "Technical Data and Specifications - Checks and Adjustments" for the model of tractor in object. Replace if required.

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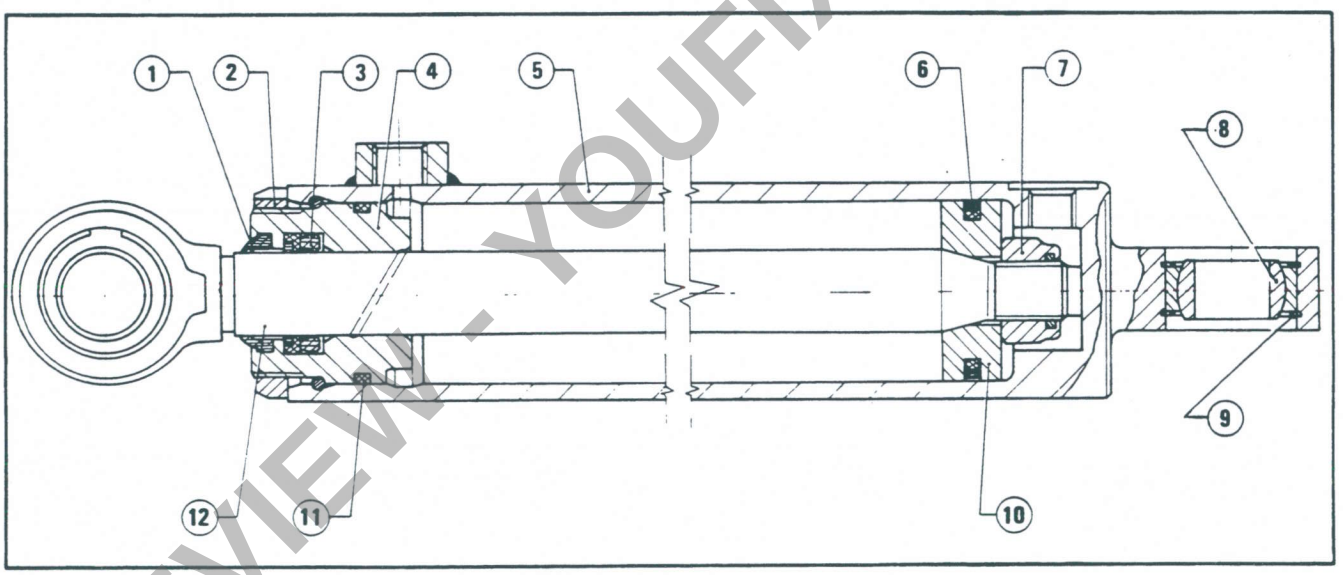


1 Piston
2 Support link

2. Proceed with the remounting of the power steering working in reverse order adhering to the following instructions.

- If it has been necessary to remove the gasket inside the bush be careful not to damage the new parts when remounting them as shown in the diagram.
- Remount the compression ring placed in front of the bush, first inserted one end and then the other so as to avoid the bending of the ring.
- Accurately **lubricate** the dust ring and the roller.
- Correctly position the two conical parts of the piston and shaft then tighten the fixing screws.

REASSEMBLY



1 Dust ring
2 Ring nut
3 Gasket
4 Bush
5 Cylinder
6 Support link
7 Self locking nut
8 Ball bearing
9 Compression rings
10 Piston
11 O-ring
12 Shaft

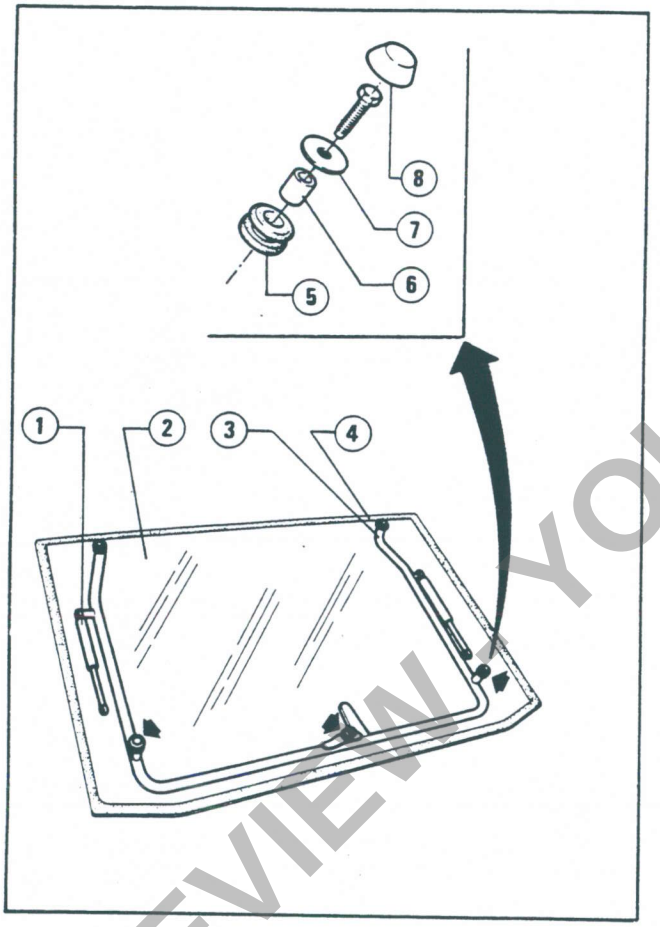
Proceed with the reassembly of the power steering working in the reverse order (refer to: **Front Axle** - Reassembly) adhering to the following instructions.

- Reassembly completed, **grease** the fixing pins by way of the grease nipples.
- Top up the level of the hydraulic circuit oil (refer to: Steering Oil Tank, Reassembly).
- Proceed with the deaereation of the circuit (refer to: Complete Hydraulic Circuit - Deareation of the Hydraulic Circuit).

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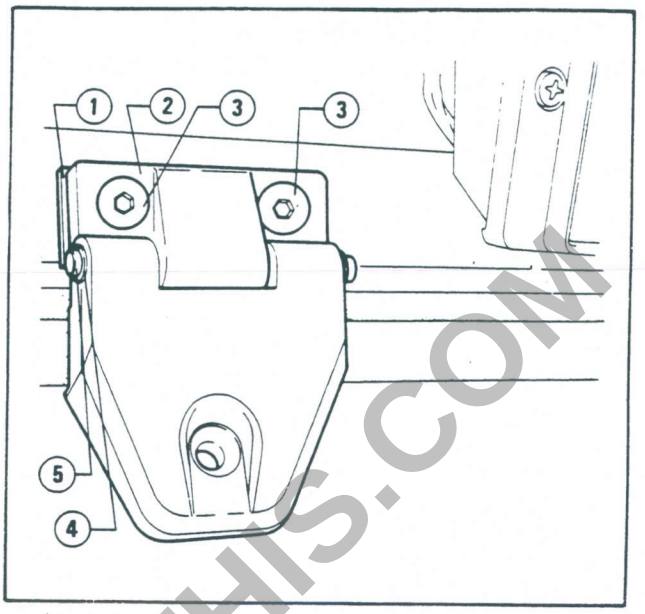
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3. Remove the shock absorbers (1) from the frame (3). Remove the cap (8) that cover the contact points of the frame (3) to the glass (2), then unloosen the two screws and the nuts shown in the following diagram and separate the glass from the frame (3) recovering the washer (7).
4. Take off the spacers (6) and remove the small rubber blocks (5).
5. Remove the weather strip (4) fixed by pressure on all the perimeter of the glass. In the need that the weather strip has to be reused, take care not to stretch the metal insert of the lip where the glass fits.



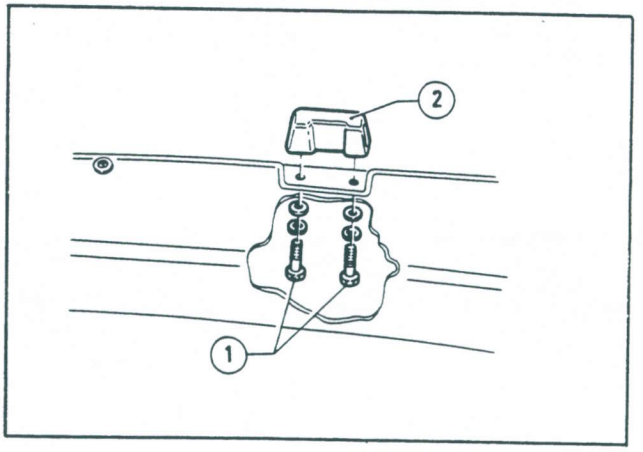
1 Shock absorbers
2 Glass
3 Window frame
4 Weather strip
5 Small rubber block
6 Spacer
7 Washer
8 Cap

6. Unloosen the two screws (3) that hold the hinge (2) to the cab and remove the hinge and the spacer (1).
7. Remove one of the two retaining rings (4), slip off the pivot (5) and separate the two parts of the hinge.



1 Spacer
2 Hinge
3 Screw
4 Retaining ring
5 Pivot

8. With reference to the diagram on page 7-19, unscrew the nut (14) and remove the handle (15) from the frame (10).
9. If necessary, with reference to the following diagram, unloosen the two screws (1) that fix the lock clamp (2) to the cab and remove them.
10. For the installation work in the reverse order to that of the dismounting, taking note of the following specifications:
- **Lubricate** the hinge pivot and the blockage handle with the recommended grease.
- Check the correct closing of the window and if necessary regulate the position of the lock clamp (2) blocking it with the screws (1).



1 Screws
2 Lock clamp

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Condition	Probable cause	Corrective action
When the lifter arms are raised to the maximum height, the safety valve discharges oil	Incorrect adjustment of the Distributor control lever and/or of the safety valve	Adjust correctly
With the engine OFF the lifter arms lower	• Defective non return valve • Excessive wear of the piston gasket and/or of the secondary hydraulic cylinders (if mounted)	Overhaul the distributor and check the non return valve Replace the damaged gaskets
Excessively noisy system (with circuit pipe vibrations)	• Air is present in the circuit • Interference in the pipes (visual check)	Check that the fittings are tightened correctly and that the gaskets are efficient Move the pipes so there is no contact between them and other components
Circuit oil leakage	• Loosened pipe fittings • Worn or defective gaskets • Damaged pipes	Tighten correctly Replace Replace
Slowness or absence of movement of the lifter whilst working with control of the strain	• Wrong fixture or fixture incorrectly coupled • Excessive play of the lifting meccanism • Sensitive machine part wrongly adjusted or damaged • Incorrect adjustment of the control lever • Hardening of the lower arms support shaft of the lifter	Check the fixture and that it is also correctly attached Overhaul the lifting meccanism and eliminate any excessive play Overhaul sensitive machine part and eventually replace the damaged component Adjust correctly Overhaul the lifting meccanism

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