

Workshop manual for the transmission mechanism of Proxima tractors

Z 6421

Z 7421

Z 8421

Z 6441

Z 7441

Z 8441

This is
for regular
Zetor
service network
only



TABLE OF CONTENTS

TABLE OF CONTENTS	5
PREFACE.....	6
IMPORTANT INTRODUCTORY REMARKS.....	7
INSTRUCTIONS FOR MANUAL APPLICATION.....	8
APPLICATION AND UPDATING OF MANUAL	9
LIFTING.....	10
STANDARD TIGHTENING TORQUES FOR BOLTS AND NUTS.....	11
VIEW OF OUTLET WHEEL ASSEMBLY IN OUTLET BOX (WITHIN ASSEMBLY OF DIFFERENT TYRE SIZES) SCHEMES OF GEARS	12
1. PREPARATORY DISMANTLING OPERATIONS.....	17
2. DISMANTLING OF FRONT COVER GROUPS 128,129,130.....	21
3.1. SYNCHRONIZED REVERSATION GROUP130	23
3.2. TORQUE MULTIPLIER GROUP 126	33
3.3. REDUCER FOR GEAR CREEP SPEED GROUP 128.....	39
4.1 REMOVAL OF REDUCER GROUPS 121A AND 185.....	47
4.2 DISMANTLING OF GEARBOX DRIVE SHAFT GROUP 121A	49
4.3 DISMANTLING OF GEARBOX COUNTERSHAFT GROUP 121A.....	53
4.4 ASSEMBLY OF COUNTERSHAFT AND REDUCER OF GEARBOX GROUPS 121A, 185	55
4.5 ASSEMBLY OF SPLINED SHAFT AND REDUCTION GROUP 121A.....	61
4.6 ASSEMBLY OF GEAR SHIFTING GROUP 147	67
5.1 DISMANTLING OF FINAL GEAR GROUP 153.....	69
5.2 ASSEMBLY OF FINAL DRIVE GROUP 153	75
6.1 DISMANTLING OF REAR AXLE SHAFT AND FOOT BRAKE GROUPS 161 AND 227	83
6.2 ASSEMBLY OF REAR AXLE SHAFT AND FOOT BRAKE GROUPS 227 AND 161.....	91
7.1 DISMANTLING OF CARRARO AXLE OUTLET BOX GROUP 185	99
7.2 ASSEMBLY OF CARRARO AXLE OUTLET BOX GROUP 185.....	103
8.1 DISMANTLING OF CARRARO AXLE GROUP 172.....	107
8.2 ASSEMBLY OF CARRARO AXLE GROUP 172.....	117
9.1 DISMANTLING OF FRONT POWER TAKE-OFF GROUP 135.....	129
9.2 ASSEMBLY OF FRONT POWER TAKE-OFF GROUP 135.....	137
10.1 SERVICE TOOLS.....	145

Preface

PREFACE

This manual is intended for expert engineers, responsible for job performance on gears of ZETOR Proxima tractors. It contains all information concerning these gears with force to inspections, revisions and regulating operations, and the most important instructions for dismantling and reassembly.

The workshop manual is an aid for expert, who participated in training, eventually superstructural courses, being regularly organized in plant training centre. Based on this manual he will be able to perform rationally and properly the necessary interventions to these gears.

The content of this manual is then a footing for worker repairing if he needs to confirm his working procedure. It should be matter of fact that any workshop will have this manual at its disposal in order to find out the desirable information if need required.

Our thanks belong to all those who will come up with practical experience to completion of our publications.

Neither text and figures included in this manual, nor their parts have to be reproduced without publisher's approval.

The manufactured engines are gradually innovated. Considering time delays between performed innovations and last edition of workshop manual the data in this manual can partly differ from actual engine design. In such case contact us, please, for data specification.

IMPORTANT INTRODUCTORY REMARKS



From the reason of close understanding the figures are made without gloves and special descriptions regarding safety measures, which have to be performed. Besides the common precautions and expert procedures it is necessary to follow below mentioned common rules.

- During dismantling and assembly works it is necessary to adopt all safety measures and measures of antiraumatic prevention prescribed by EEC directives; especially no use of any unprepared or worn tools; to pull on the gloves impervious for lubricants and fuels; to maintain clear floor free of lubricant layers; to wear suitable working clothes and antiskid footwear etc.
- If we get dirty by lubricating oil or engine oil it is necessary to change immediately the soiled clothes and rinse the affected body parts thoroughly by water.
- Do not deposit the lubricants or engine fuels, sealing or other substances classified as hazardous waste by relevant regulations of single countries, but dispose the waste as per regulations.
- Dismantling, assembly, and inspection works described in this manual will be carried out on gears dismantled from tractor and placed on working rack.

This is
for regular
Zetor
service network
only

INSTRUCTIONS FOR MANUAL APPLICATION

1. Dismantling and Assembly of Complex Assembly Groups

- (1) For dismantling and reassembly of complete structural units the performed works and used methods are described fully in single steps. If the exactly same steps in reverse order are required at reassembly opposite to dismantling these steps are not described.
- (2) Any special method used only for fitting-in are marked with symbol:  1
This symbol is also mentioned at the end of each important dismantling stage in order to show, what part intended for assembly the relevant information is concerned with

For example:

DISMANTLING OF GROUP:



:

Name of procedure

Safety standards to be followed during execution of described operation

1 – Removal of component (1):

Stage of procedure



:

Technique or important action to be followed during component dismantling.

2 – Separate before connection (2) :  1
.....

It is notified that the applicable technical specifications are at the disposal.



l:

Discharge of oil, liquid or fuel and discharged quantity reporting.

For example:

INSTALLATION OF GROUP:

Name of procedure

- Installation in reverse order than removal.



:

Technique used during assembly.



:

Technique or important action to be followed during component assembly.



l:

Oil or liquid filling and required quantity.

2. List of Special Tools

- (1) Concerning the descriptions, order number and number of tool pieces, stated in working procedures (T1, T2, etc.) see list of "SERVICE TOOLS".

3. Tightening Torques

- 1 – In working procedures the symbol  is valid for special tightening torque based on examined values and to be essentially followed.
- 2 – If no symbol is given the values defined in part STANDARD TIGHTENING TORQUES FOR BOLTS AND NUTS" should be observed for used tightening torques.

APPLICATION AND UPDATING OF MANUAL

1. UPDATE OF MANUAL

Authorized dealers will be immediately informed about addenda, revisions or alterations. Before commencing of revisions it is necessary to refer to the latest updating of information, because it can contain the additional data compared with previous edition.

2. ARCHIVING OF UPDATES

1 – **Check number of pages** and insert a page in continuing order with respect to the described group and **page section** in manual.

2 – **Additional pages:** These will be marked by means of pause (-) and sequence number as per number of pages . Example:

5
5-1
5-2
6

Additional pages

INSTRUCTION: The additional pages should be properly numbered in order to prevent a compliance with existing pages.

3 – **Pages for edition updating:** These pages require to be displayed by sequence number within one cycle; the corresponding symbol is located below number of pages. Example:

5
5-1 – Original page
5-1 – Page of updates
①
5-2 – Original page

INSTRUCTION: All additional pages, pages and pages with updates will be given in the list of manual that is newly filed with any update and it requires to be included in place of previous list.

3. SYMBOLS USED IN MANUAL

For easier use of manual the important data for safety of technicians and job quality will be marked by symbols given in the following table.

Symbol	Meaning	Remark	Symbol	Meaning	Remark
	Safety	During job performance the appropriate safety measures should be carried out.		Lubrication	Structural parts of tractor, where adhesives, lubricants should be used.
		During job performance the appropriate safety measures should be carried out as for corresponding parts being under pressure.		Oil, water	Points of oil, water or other fuel filling with statement of applicable quantities
	Attention	During job performance the special methods are used other instructions observed to make provision for standard values		Discharge	Points for oil, coolants or fuel discharge and indication of discharge quantity
	Weight	Weight of important building groups. Choose lifting ropes as per actual demands; job performance requires suitable protective systems etc.		Tightening torque	Keeping of special tightening torques for corresponding parts at installation or assembly.

LIFTING

LIFTING



- !** The tractor parts with weight over 25 kg or significantly bigger must be lifted and transported by means of suitable lifting device and steel ropes eventually belts from polyester fibers. In sections with descriptions from dismantling and assembly of groups and parts the lifted load is marked by following symbol:

STEEL ROPES – BELTS

- Use always suitable steel ropes or polyester belts as per weight of lifted parts, while it is necessary to observe the following table.

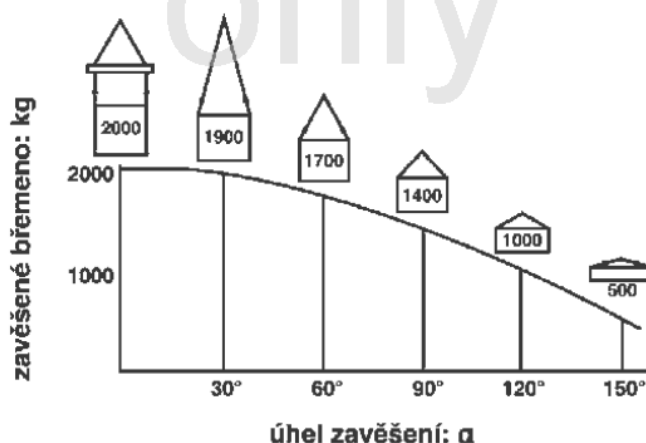
STEEL ROPES (standard type “S” or “Z”, twisted)				POLYESTER BELTS (with slot holes – simple design)				
Ø rope (mm)	Load capacity (kg)			Width (mm)	Load capacity (kg)			
8	650	620	500	25	500	400	860	700
10	1000	1740	1420	50	1000	800	1730	1410
12	1450	2500	2050	62	1250	1000	2160	1760
14	2000	3460	2820	75	1400	1120	2420	1980
16	2600	4500	3670	100	2000	1600	3460	2820
18	3300	5710	4660	150	2500	2000	4330	3530

NOTE: The load capacity was calculated by using of safety factor.

- The ropes and belts require to be slung in the centre of lifting hook. If the connection is shifted to side it is impossible to eliminate the load slipping while lifted.
- In no case lift the heavy load by only one rope. Use always two or more symmetrically spaced ropes.

! If the load hangs only on one rope its rotation, unwinding or slipping down should not be expelled. This can cause serious accidents.

- The weight of permissible loading is reduced if the ropes make together a blunt angle. The permissible weight (kg) is reduced with raising angle of loading; the following diagram illustrates the change of permissible weight (as per suspension angle) for two ropes with Ø 10 mm and load capacity of 1000 kg..



STANDARD TIGHTENING TORQUES FOR BOLTS AND NUTS

STANDARD TIGHTENING TORQUES FOR BOLTS AND NUTS



! The special tightening torques for important tractor parts and mounting carried out accord. to specified procedures are given in separate sections regarding the assembly of applicable parts.

★ The given tightening torques are applied to assembly with bolts and nuts free of lubrication, but with eventual anaerobic adhesives on thread.
The given values are considered for mounting on materials from steel or cast iron; at softer materials e.g. aluminium, copper or plastic etc. the tightening torques must be reduced by 50%.

THREAD SIZE		CLASS OF BOLT		
		8.8	10.9	12.9
		Nm	Nm	Nm
NORMAL METRIC THREAD	M6x1	8.0 – 8.8	11.8 – 13.0	13.8 – 15.2
	M8x1.25	19.4 – 21.4	28.5 – 31.5	33.3 – 36.9
	M10x1.5	38.4 – 42.4	56.4 – 62.4	67.4 – 74.4
	M12x1.75	66.5 – 73.5	96.9 – 107	115 – 128
	M14x2	106 – 117	156 – 172	184 – 204
	M16x2	164 – 182	241 – 267	282 – 312
	M18x2.5	228 – 252	334 – 370	391 – 432
	M20x2.5	321 – 355	472 – 522	553 – 611
	M22x2.5	441 – 487	647 – 715	751 – 830
	M24x3	553 – 611	812 – 898	950 – 1050
	M27x3	816 – 902	1198 – 1324	1419 – 1569
FINE METRIC THREAD	M8x1	20.8 – 23.0	30.6 – 33.8	35.8 – 39.6
	M10x1.25	40.6 – 44.8	59.7 – 65.9	71.2 – 78.6
	M12x1.25	72.2 – 79.8	106 – 118	126 – 140
	M12x1.5	69.4 – 76.7	102 – 112	121 – 134
	M14x1.5	114 – 126	168 – 186	199 – 220
	M16x1.5	175 – 194	257 – 285	301 – 333
	M18x1.5	256 – 282	375 – 415	439 – 485
	M20x1.5	355 – 393	523 – 578	611 – 676
	M22x1.5	482 – 532	708 – 782	821 – 908
	M24x2	602 – 666	884 – 978	1035 – 1143

**VIEW OF OUTLET WHEEL ASSEMBLY IN OUTLET BOX (within assembly of different tyre sizes)
SCHEMES OF GEARS**

**VIEW OF OUTLET WHEEL ASSEMBLY IN OUTLET BOX
(within assembly of different tyre sizes) SCHEMES OF GEARS**

Gear wheel 23 teeth cat.No. 53.185.003

Gear wheel 22 teeth cat.No. 53.185.022

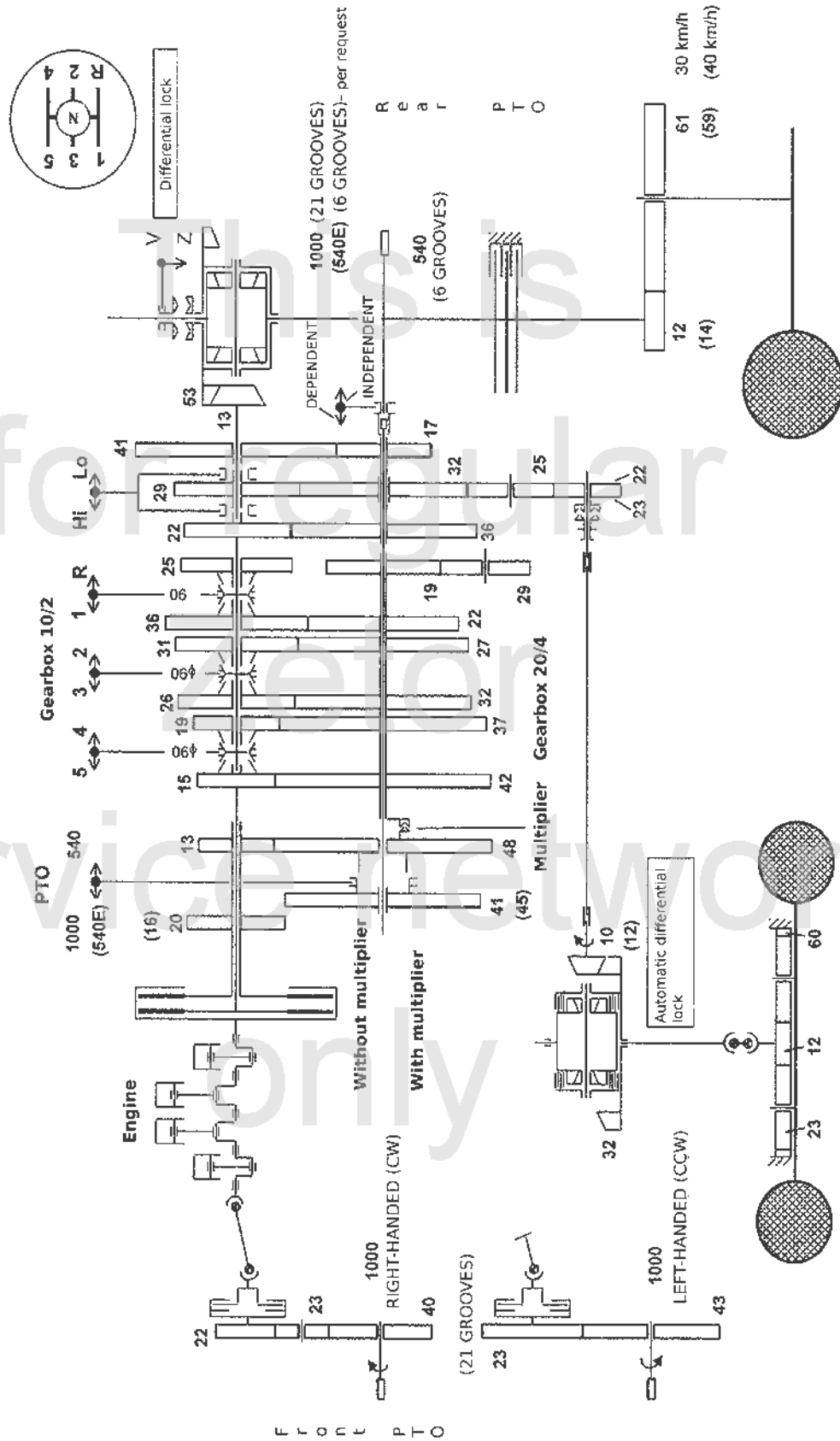
ZETOR 6441,7441,8441 - CARRARO

Rear tyre	Front tyre			
	9.5-24	11.2-24	12.4-24	13.6-24
12,4-32	53.185.003			
12,4-36	53.185.022	53.185.003		
13,6-36		53.185.022	53.185.003	
14,9-28	53.185.003			
16,9-28	53.185.003	53.185.003		
16,9-30	53.185.022	53.185.003	53.185.003	
18,4-30			53.185.003	
16,9-34			53.185.022	53.185.003
13,6-38			53.185.022	53.185.003
18,6-34				53.185.022

VIEW OF OUTLET WHEEL ASSEMBLY IN OUTLET BOX (within assembly of different tyre sizes)
SCHEMES OF GEARS

SCHEMES OF GEARS - ZETOR PROXIMA 5421/41, 6421/41, 7421/41, 8421/41

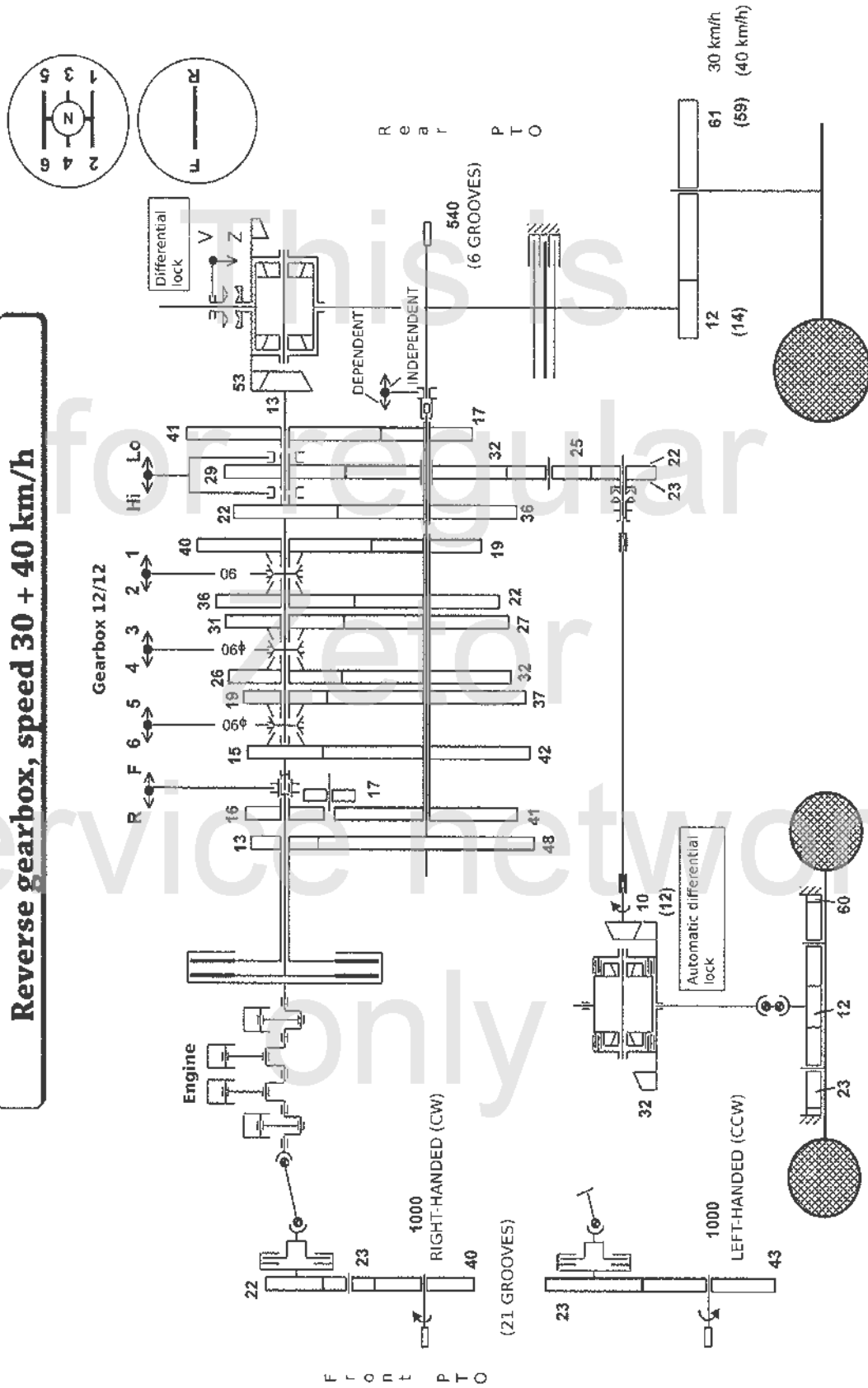
Basic gearbox with multiplier and without multiplier, speed 30 + 40 km/h



VIEW OF OUTLET WHEEL ASSEMBLY IN OUTLET BOX (within assembly of different tyre sizes)
SCHEMES OF GEARS

SCHEMES OF GEARS - ZETOR PROXIMA 5421/41, 6421/41, 7421/41, 8421/41

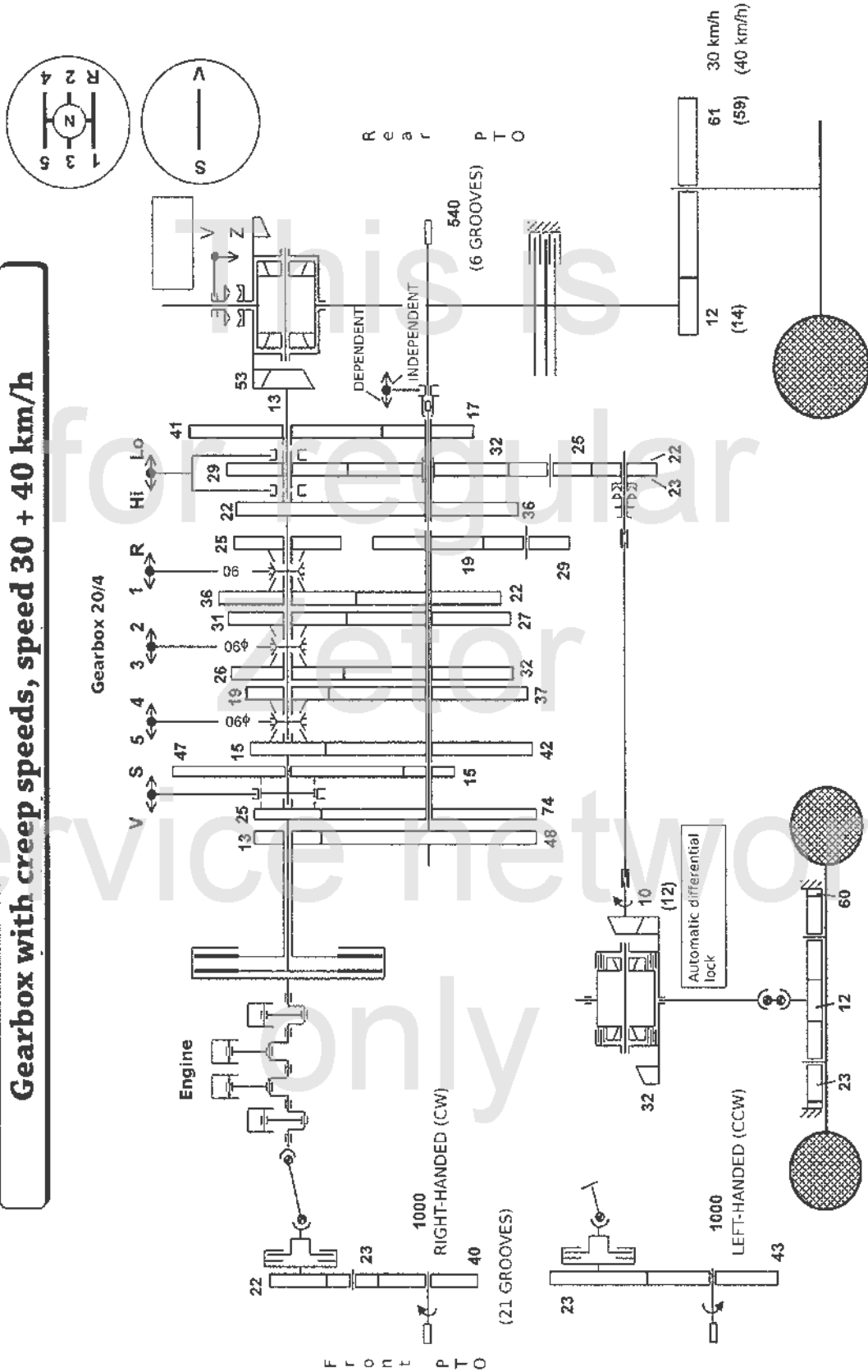
Reverse gearbox, speed 30 + 40 km/h



VIEW OF OUTLET WHEEL ASSEMBLY IN OUTLET BOX (within assembly of different tyre sizes)
SCHEMES OF GEARS

SCHEMES OF GEARS - ZETOR PROXIMA 5421/41, 6421/41, 7421/41, 8421/41

Gearbox with creep speeds, speed 30 + 40 km/h



This is
for regular
Zetor
service network
only

1. PREPARATORY DISMANTLING OPERATIONS

1. PREPARATORY DISMANTLING OPERATIONS

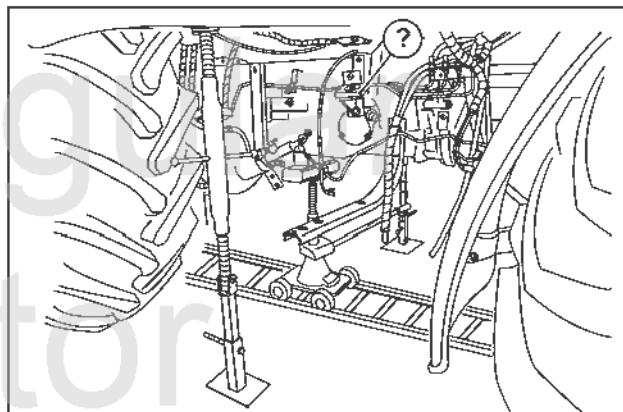
- 1 - Dismantle the cabin (group 369) if possible due to shop space.

Before gearbox dismantling from tractor:

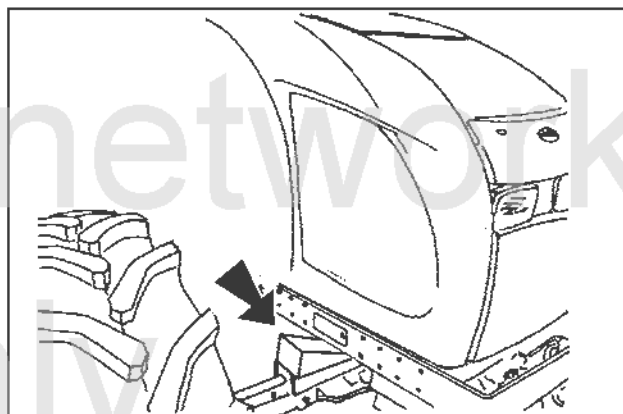
- Disconnect all bends forestalling the cabin lifting and removing the gearbox with engine off final drive.
- At tractor fitted with front drive axle disconnect the joint shaft of front axle drive.
- Remove the cabin floor.
- Discharge the coolant from engine.
- Discharge oil from gearbox and final drive.
- Disconnect electric cables from cabin to engine.
- Disconnect the hoses of hydraulic brakes to the front axle and hydrostatic steering.
- Dismantle a fuel tank.

- 2 - Place the car guides No. **78.942.901** below tractor gearbox and mount the tensile car No. **78.942.900** on it.

- 3 - Put the mounting struts under front part of cabin. Release and screw remove the bolts (9) connecting the cabin with bracket on gearbox.



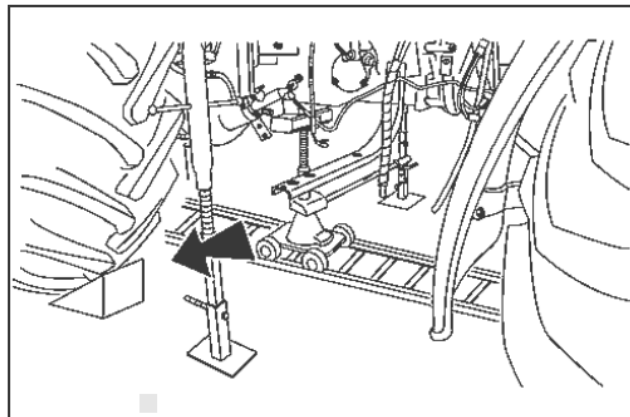
- 4 - Secure the engine against rolling by scotches.



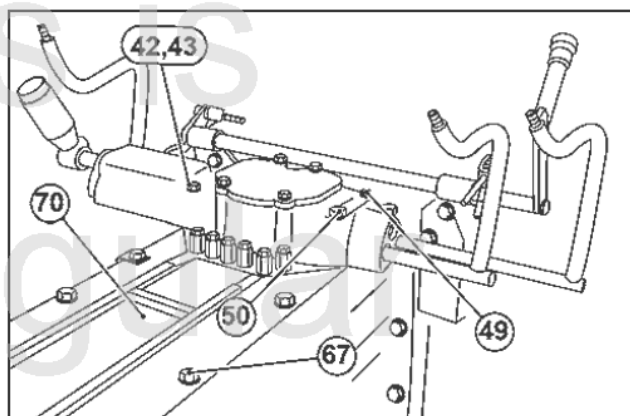
1. PREPARATORY DISMANTLING OPERATIONS

- 5 - Secure rear tractor wheels by wedges and support the final drive and rear cabin part to prevent the cabin and final drive rolling backwards. Release the bolts connecting final gear with gearbox.

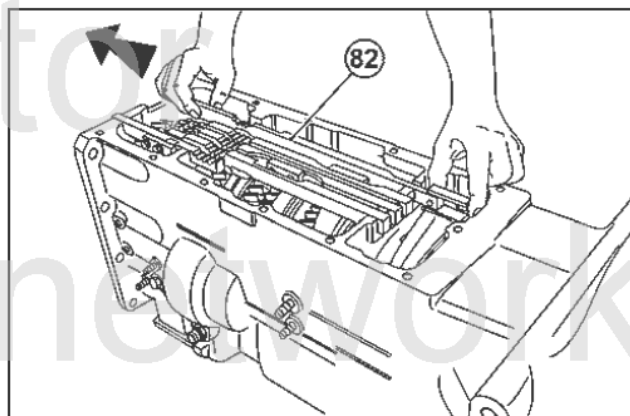
! From clearness reasons the cabin space and final gear are not drawn in other points.



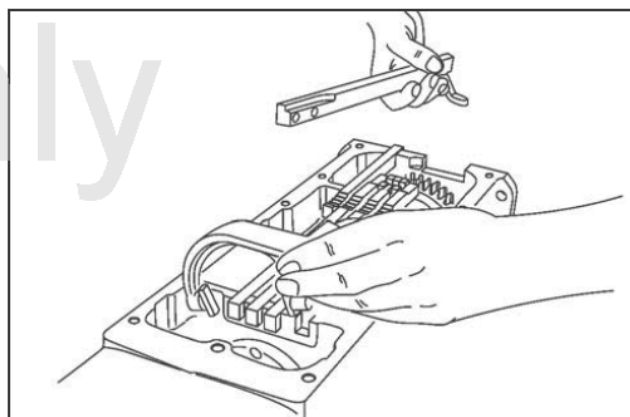
- 6 - After loosening of bolts (42,43,49,50) dismantle all shifting assembly.
7 - After loosening and unscrewing the bolts (67) remove the gearbox cover (70).



- 8 - After loosening and unscrewing of two bolts fixing the fork to the reversing rod (82). Push out the rod towards final gear.

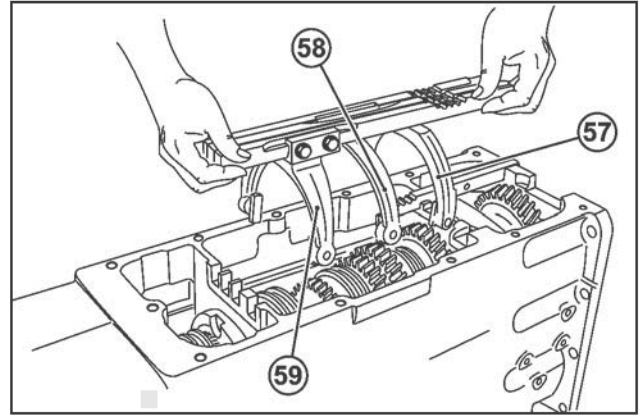


- 9 - Remove then the fork of reversion shifting.

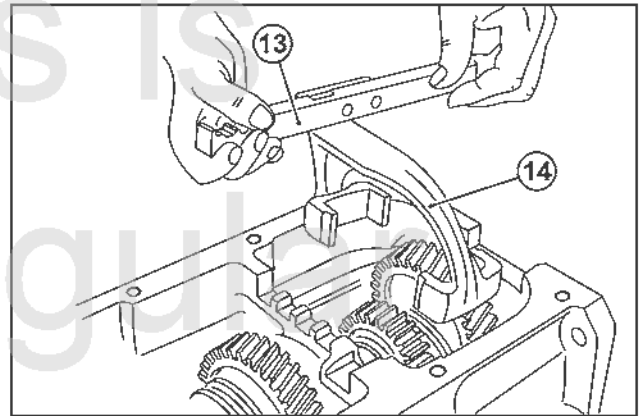


1. PREPARATORY DISMANTLING OPERATIONS

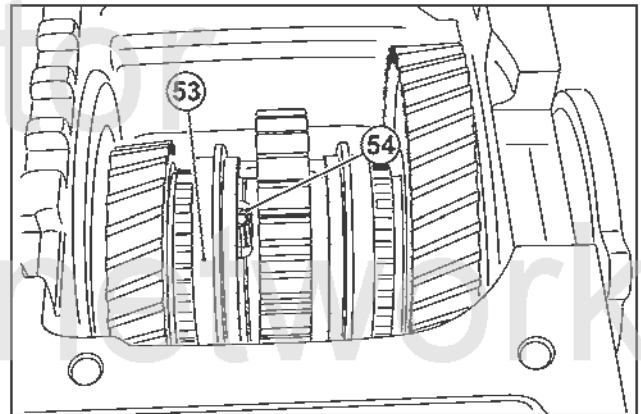
- 10 - Remove disconnecting rods and forks of 1st to 5th speeds (57,58,59) from gear case.



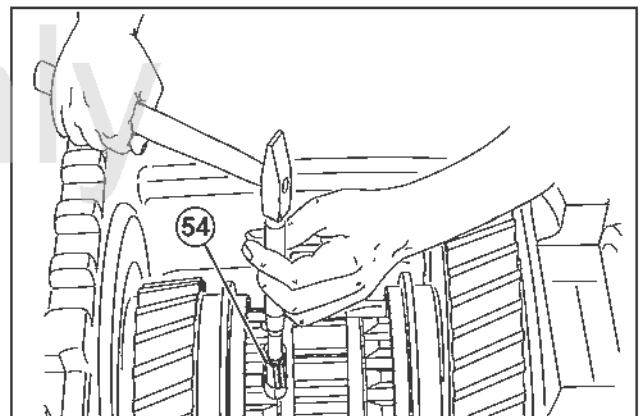
- 11 - Remove the disconnecting rod of reduction (13) together with fork (14).



- 12 - Push off the operating sleeve (53) to facilitate an approach to the pinion shaft pin (54) of final gear.

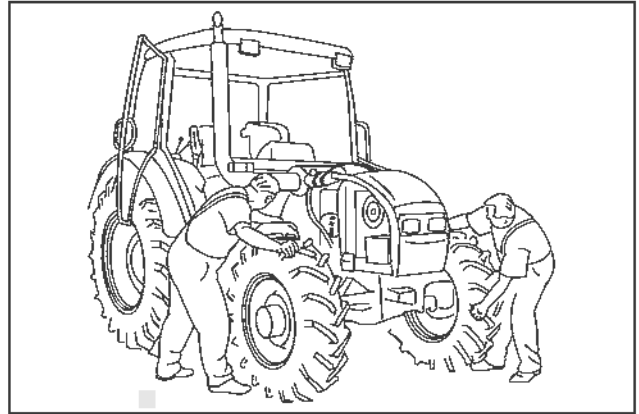


- 13 - Move the pin (54) to the pinion shaft by pusher.

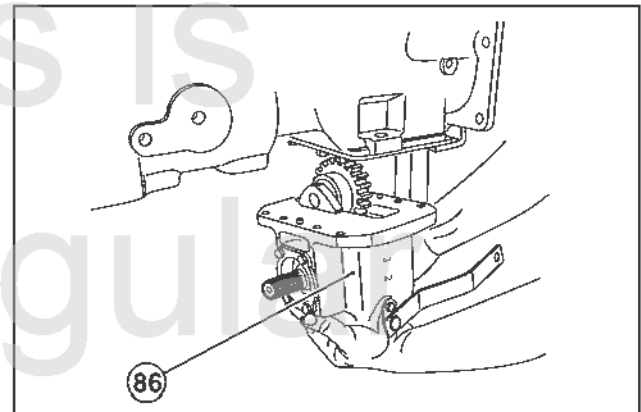


1. PREPARATORY DISMANTLING OPERATIONS

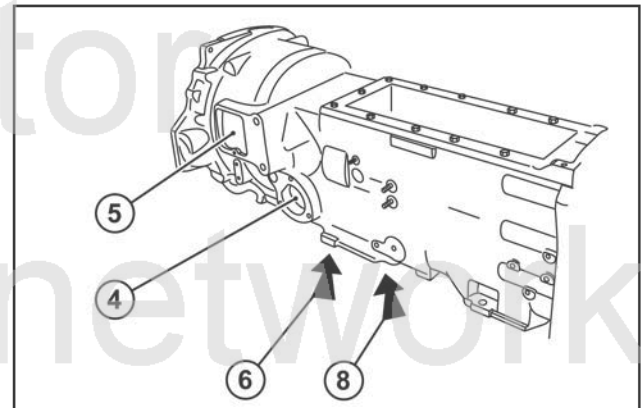
- 14 -Unscrew the bolts connecting gearbox with final gear. Disconnect carefully the front tractor part from final gear.
- 15 -In a similar manner disconnect the final gear from engine.



- 16 -Dismantle the case of front axle outlet (86).
 - ★ The outlet is used only with 4WD design.

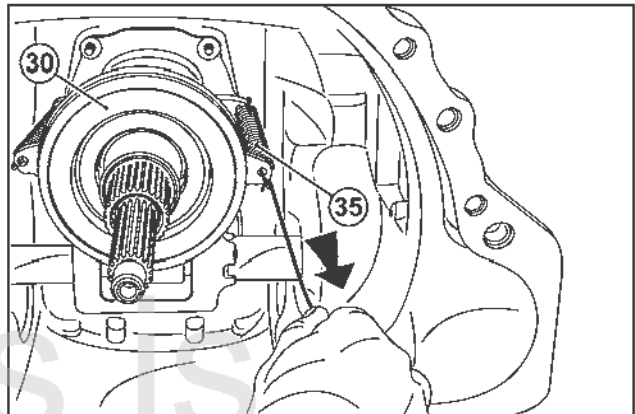


- 17 -Put the gearbox on mounting rack and dismantle the side caps (4,5) and gearbox sumps (6,8).

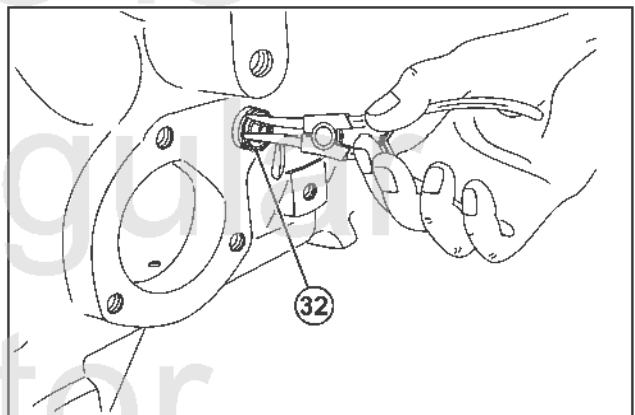


2. DISMANTLING OF FRONT COVER groups 128,129,130

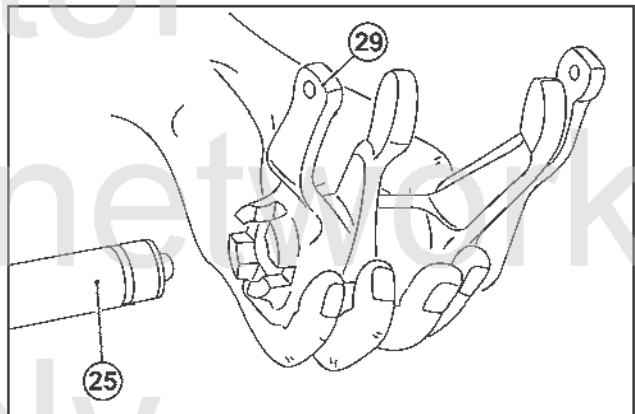
- 1 - Disconnect the spring (35) of disengaging bearing with sleeve (30) by means of hook.



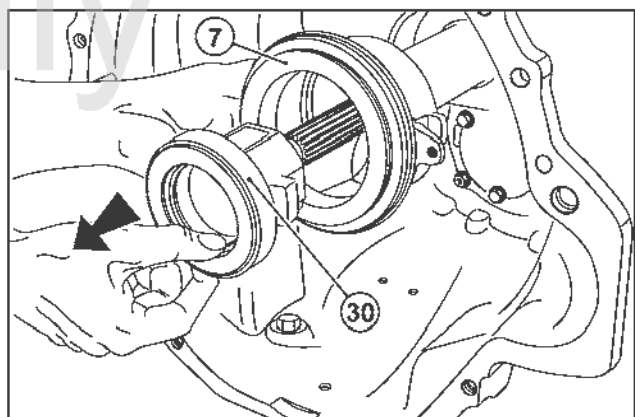
- 2 - Dismantle the lock ring (32) of disconnecting rod shafts using pliers.



- 3 - Push out the shaft of clutch control (25) together with disconnecting rods (29).

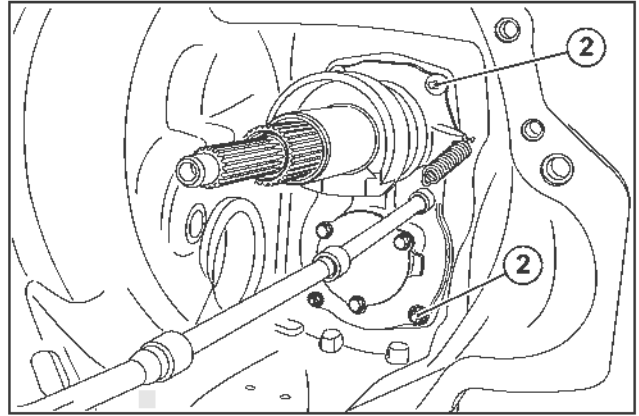


- 4 - Remove the disengaging bearing (30) and release sleeve assembly (7) from clutch shafts of gearbox.

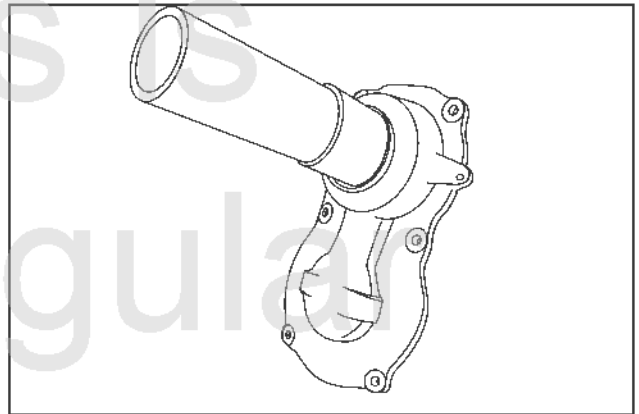


2. DISMANTLING OF FRONT COVER groups 128,129,130

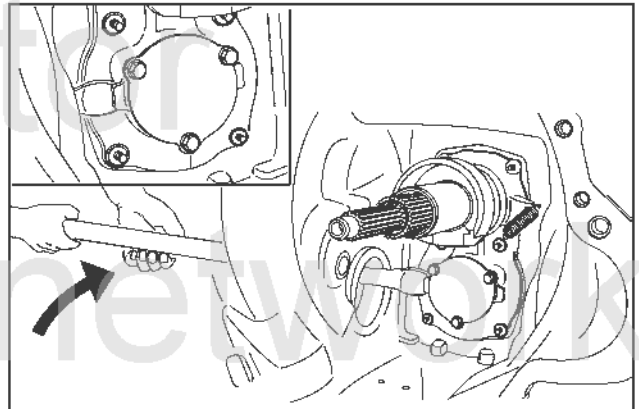
5 - Release and unscrew six nuts (2).



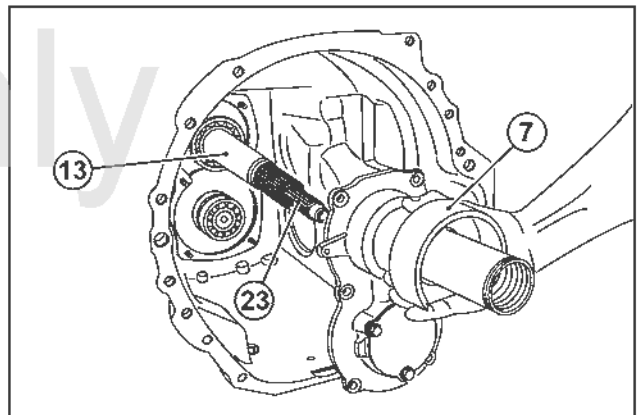
6 - The gearbox in "only with outlet shaft 540 rev.," has front cover of group (no cap).



7 - Remove the front cover using a lever.



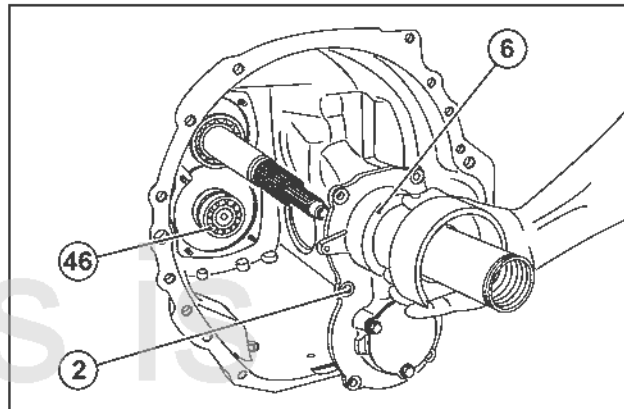
8 - Push out the front cover (7) from clutch shafts (13,23).



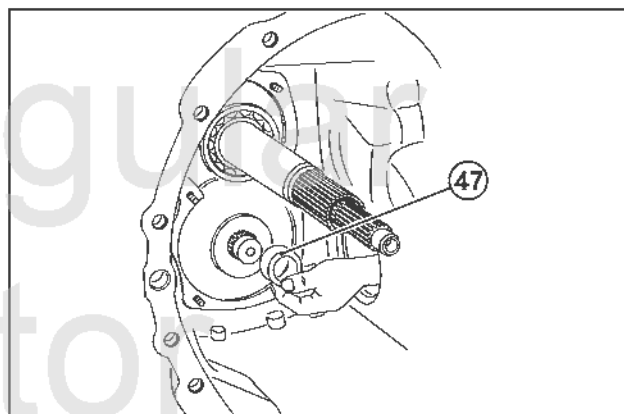
3.1. SYNCHRONIZED REVERSATION group130

3.1.1. DISMANTLING OF SYNCHRONIZED REVERSATION

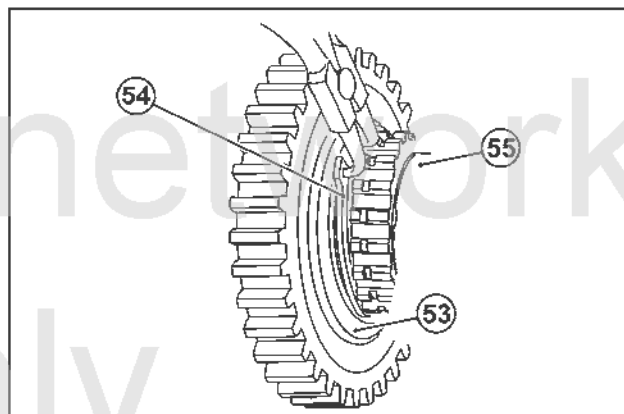
- 1 - After easing and unscrewing of six nuts (2) remove the front cover (6) of gearbox.



- 2 - If the bearing (46) stayed remain in cover (6) remove the bushing (47).

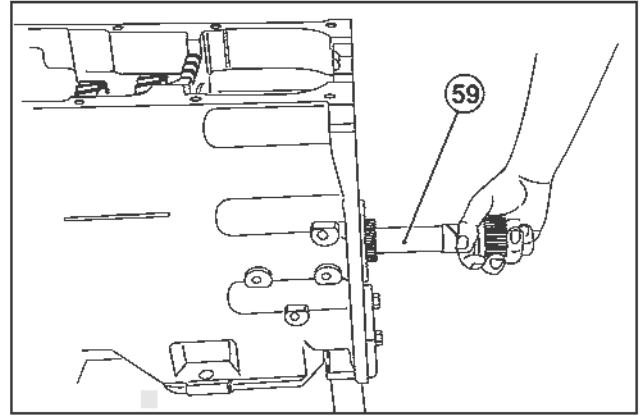


- 3 - Loosen the circlip (54) through hole in bottom cover; move it towards wheel (53) and release the bushing (55).

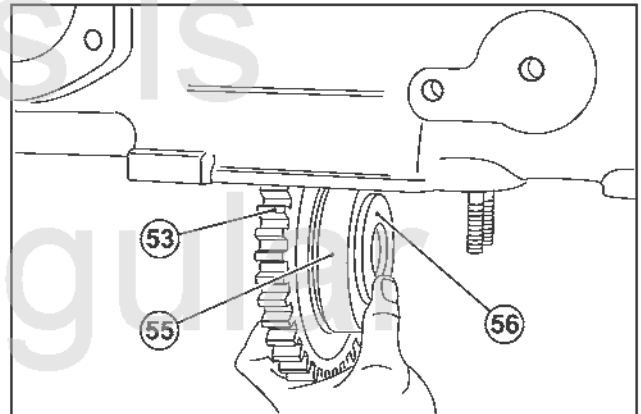


3.1. SYNCHRONIZED REVERSATION group130

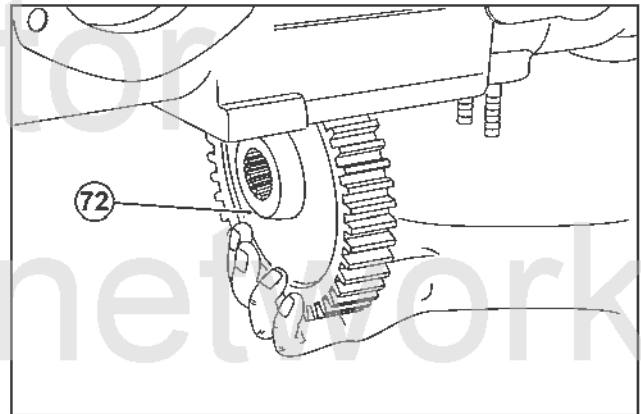
- 4 - Slide partly the outlet shaft assembly (59) out of gearbox.



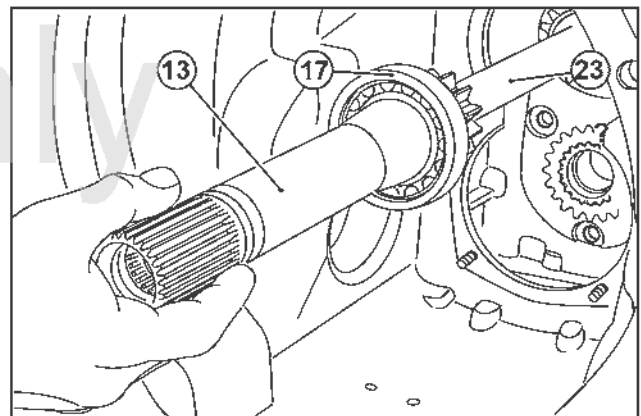
- 5 - Firstly remove the wheel (53) with sleeve (55) and bushing (56).



- 6 - Remove then the drive gear wheel (72).

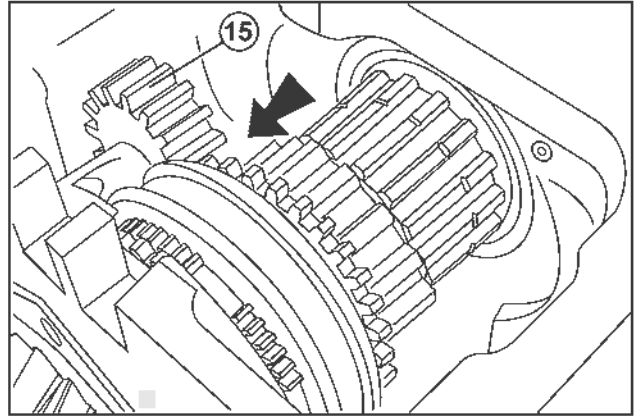


- 7 - Slide the hollow clutch shaft (13) with bearing (17) out of clutch shaft (23).

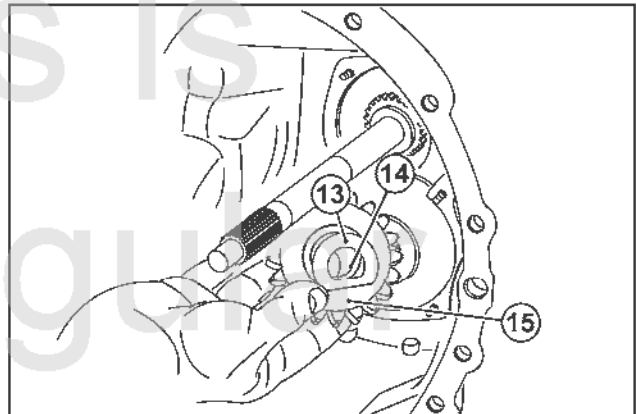


3.1. SYNCHRONIZED REVERSATION group130

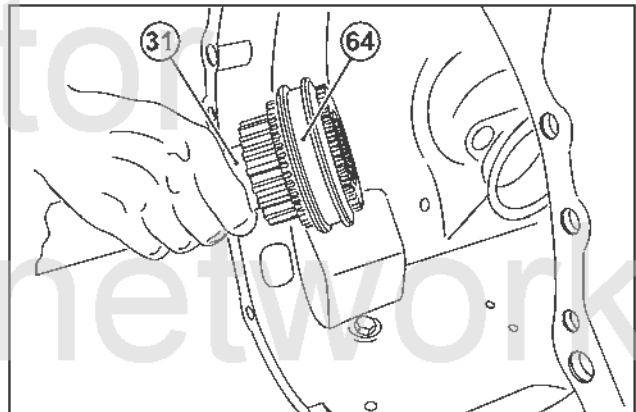
- 8 - Remove the circlip from the stud pin of idle wheel (15) using pliers.



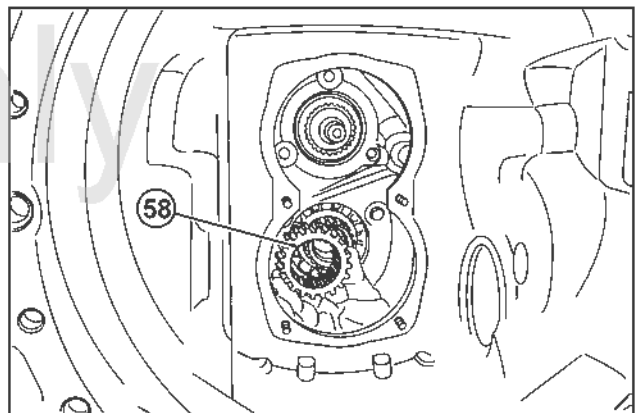
- 9 - Remove the idle wheel (15) together with needle bearing (14) and washer (13) from stud pin.



- 10 - Remove the clutch shaft (31) with synchronized clutch (64) of reversal.

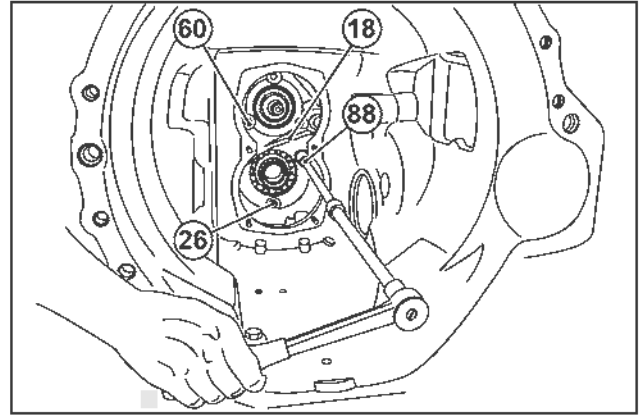


- 11 - Remove the clutch (58) from outlet shaft.



3.1. SYNCHRONIZED REVERSATION group130

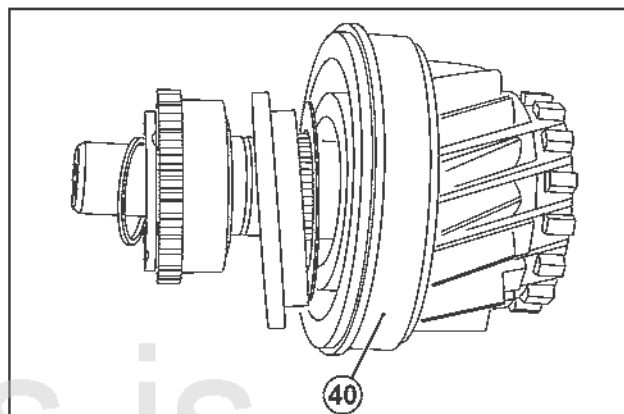
12 -Unscrew the bolts (26,60,88) and remove the cover (18).



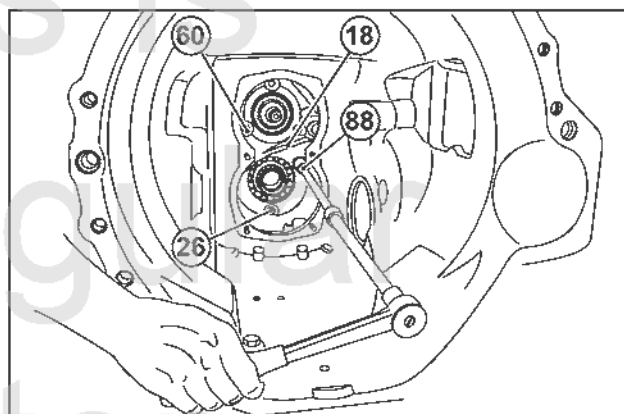
This is
for regular
Zetor
service network
only

3.1.2 ASSEMBLY OF SYNCHRONIZED REVERSATION

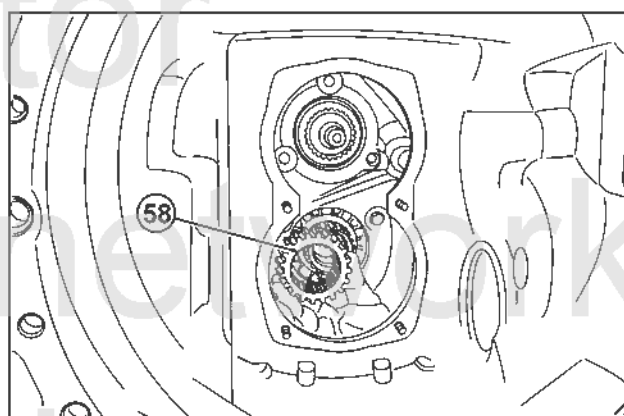
1 - If the reversing drive shaft (40) was dismantled assemble it as per figure and slide it into gearbox. Take up the clearance as specified in chapter 4.3.



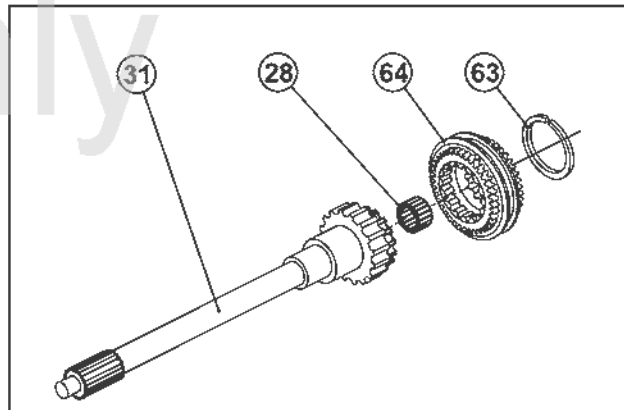
2 - If the cover was dismantled fix it by bolts (26,60,88).



3 - Slide the clutch (58) on outlet shaft.

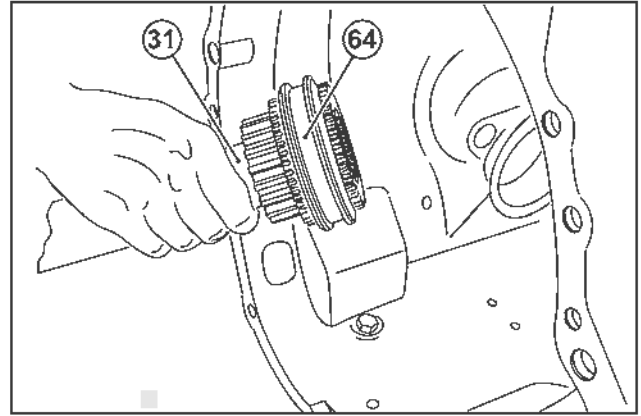


4 - Prepare the clutch shaft (31) together with needle bearing (28) and clutch stop (64) fixed by circlip (63). Attention! To increase its service life the clutch stop has double synchronization).

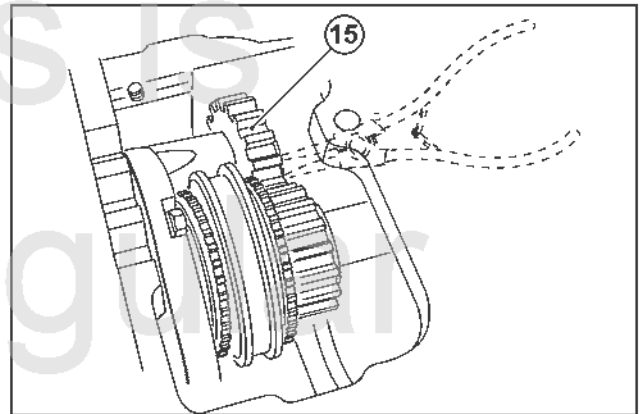


3.1. SYNCHRONIZED REVERSATION group130

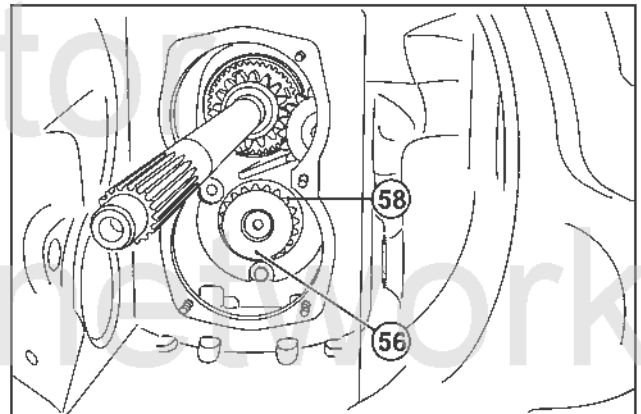
- 5 - Slide on the clutch shaft (31) with reversing clutch stop.



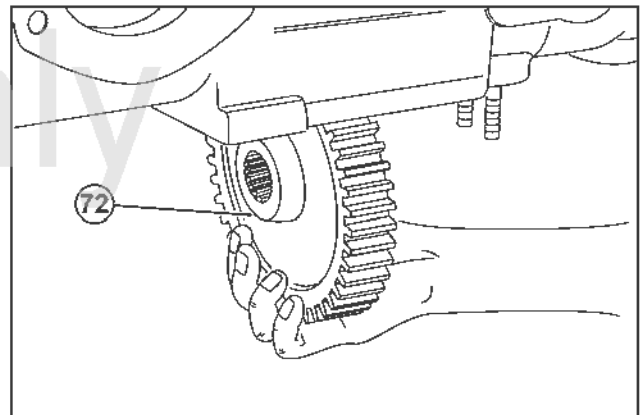
- 6 - Slide the idle wheel (15) on the strud pin (16) of cover (18) and fix them by circlip (12) by means of pliers.



- 7 - Glue the silon liner (56) to the clutch (58) using grease.

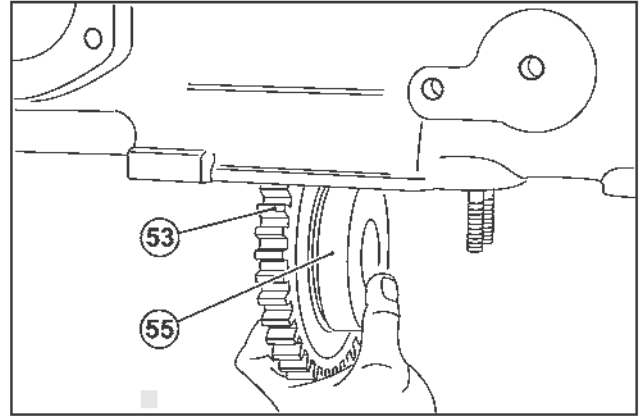


- 8 - Insert the drive gear (72) into gearbox housing.

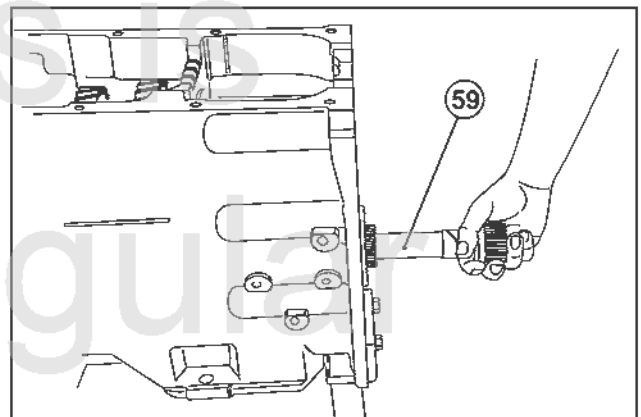


3.1. SYNCHRONIZED REVERSATION group130

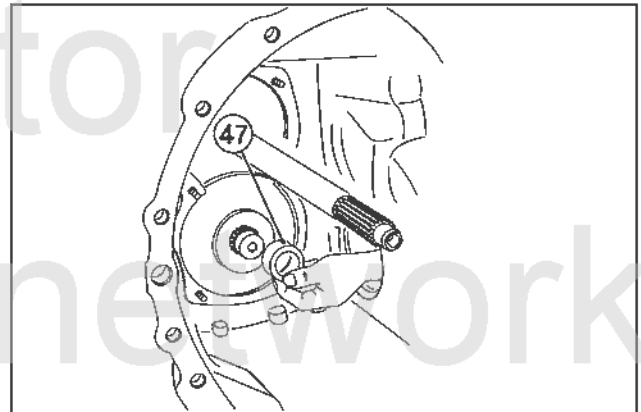
9 - Then put in the wheel (53) with sleeve (55) and liner.



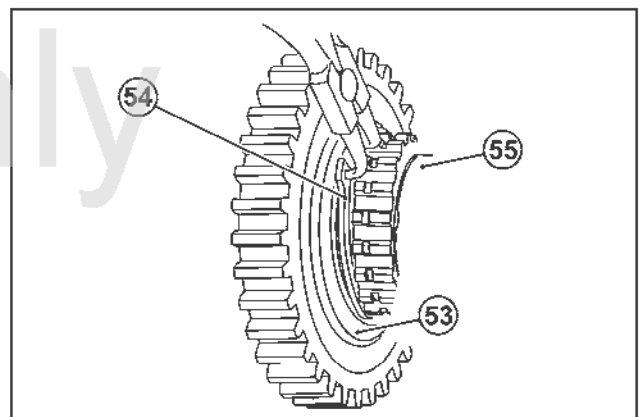
10 - Slide the partly extended outlet shaft assembly (59) into gearbox.



11 - Slide in the countershaft and put the bushing (47) on its gearing.

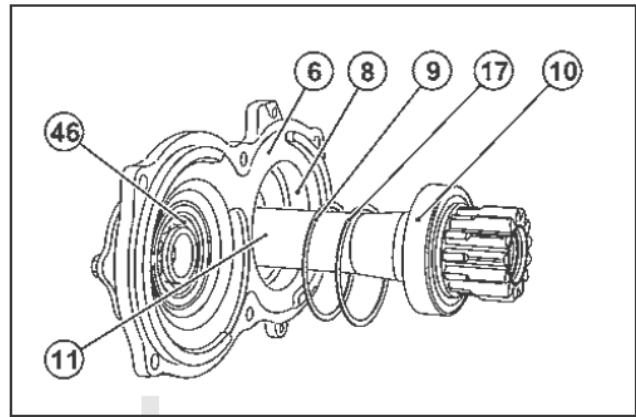


12 - Slide the circlip (54) to wheel (53) through hole after bottom cover removal and move the sleeve (55) over it.

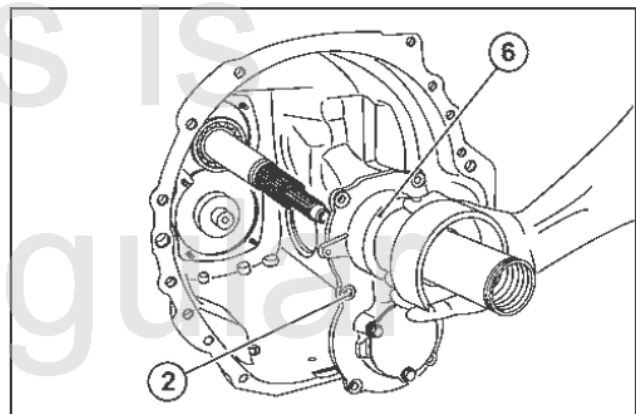


3.1. SYNCHRONIZED REVERSATION group130

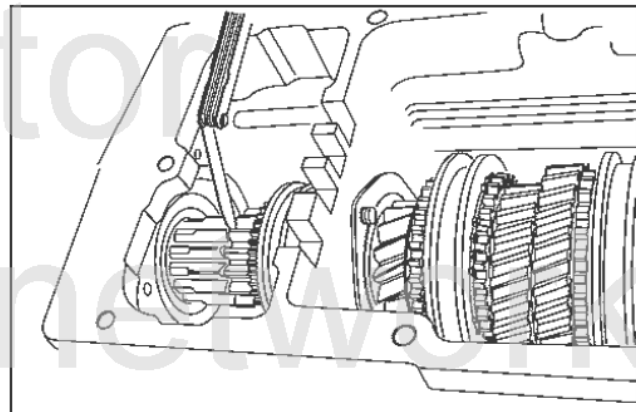
- 13 -Insert bearing (46), gip seal (8), spacers (9,17) and hollow clutch shaft (11) with bearing (10) into the cover (6). Slide the hollow shaft on clutch shaft.



- 14 -Mount the front gearbox cover (6) together with bearing (46) to the gearbox and fasten it by bolts (2).

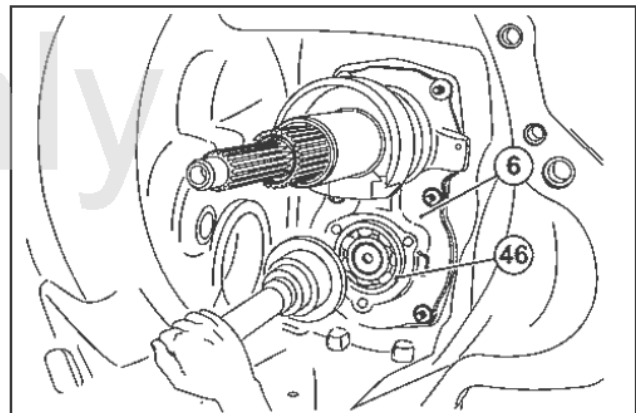


- 15 -Measure an axial clearance between gear wheel by means of leaf gauges. The guide value is 0.1 to 0.2 mm. The measured value is different dismantle again the cover together with hollow clutch shaft (11) and adjust the clearance by means of spacers (9, 17).



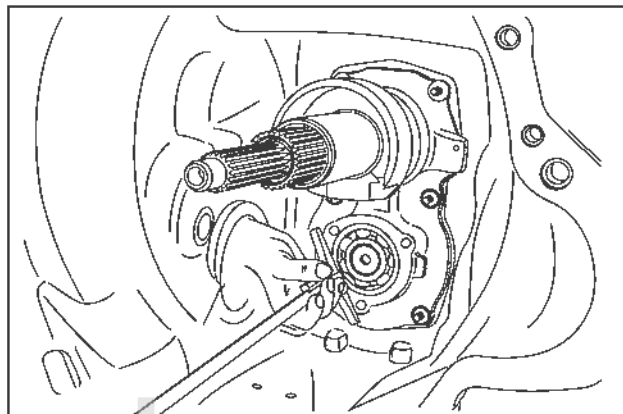
- 16 -Using jig press the bearing (46) of the outlet shaft into the front gearbox cover (6).

- !** Before pressing the bearing (46) secure the outlet shaft (111), countershaft (81,82), and layshaft (129) in rear part of gearbox against movement.

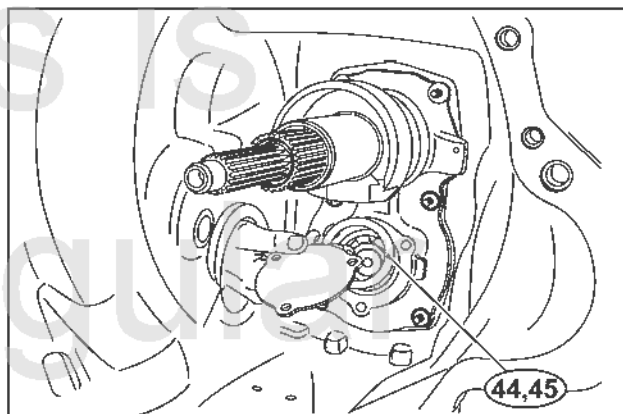


3.1. SYNCHRONIZED REVERSATION group130

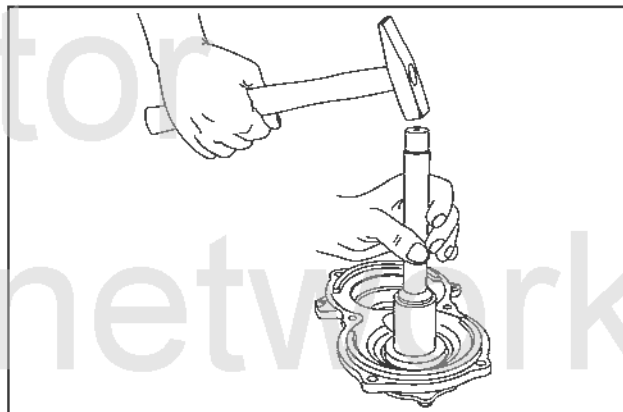
- 17 - Measure the clearance between cover face and bearing. The guide value is 0.1 to 0.2 mm.



- 18 - Adjust the value by inserting of spacers (44,45). Screw the cover lid (21) to the cover (6). Then dismantle the cover assembly.



- 19 - Press the bearing (46) into cover (6) and to the cover lid (21) so that the clearance will remain between gear wheels. Mount the cover with bearings and tighten thoroughly the bolts and nuts.

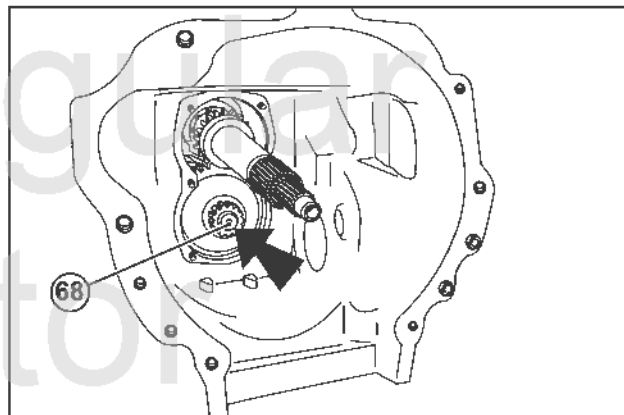


This is
for regular
Zetor
service network
only

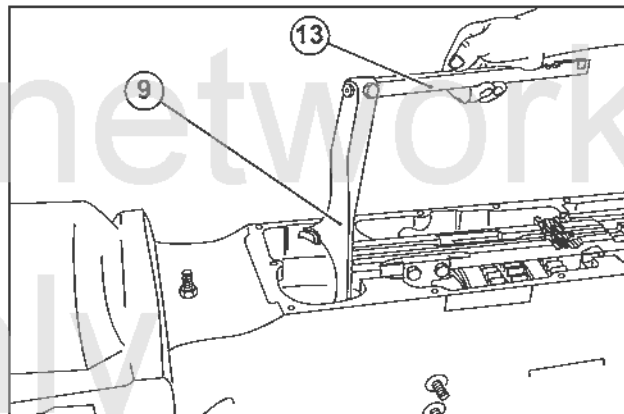
3.2. TORQUE MULTIPLIER group 126

3.2.1 DISMANTLING OF TORQUE MULTIPLIER

- 1 - Dismantle the cabin (group 369) if possible due to shop space
- 2 - In case of troubles during cabin removal dismantle:
 - driver's seat (group 342)
 - bridging (group 368 pos.82)
 - supporting rear bulkhead (group 369-6 pos.106)
- 3 - Further proceed as with gearbox dismantling (see chap. 1 "Preparatory dismantling operations".)
- 4 - Dismantle the front gearbox cover and push out partly the outlet shaft (68) towards final gear.



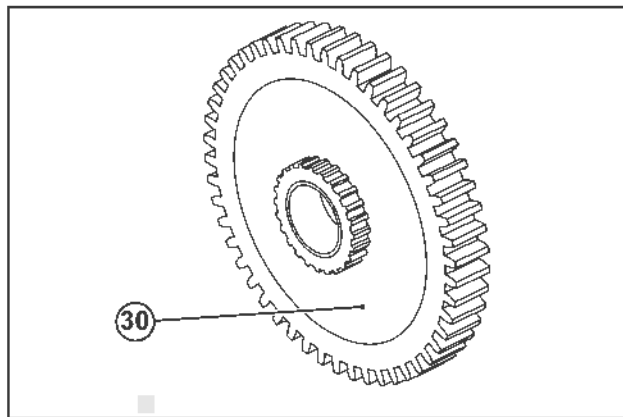
- 5 - Remove the disconnecting rod of drive (13) together with fork (9).



3.2. TORQUE MULTIPLIER group 126

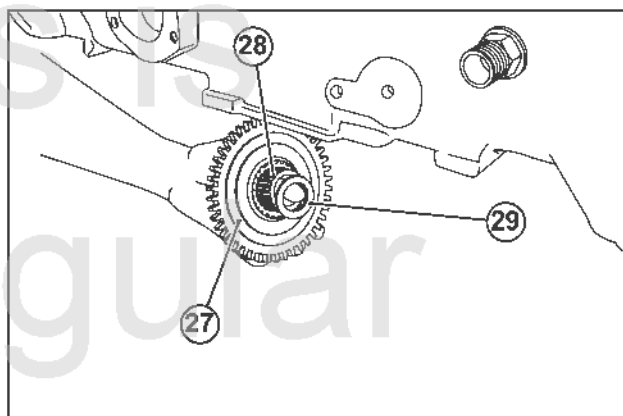
6- Firstly remove the outlet wheel (30,38) through bottom cover in gearbox.

- ★ Wheel (30) is at group 126 i.e. for outlet shaft 540 rev.
- ★ Wheel (58) is at group 131 i.e. for outlet shaft 540/1000 rev.

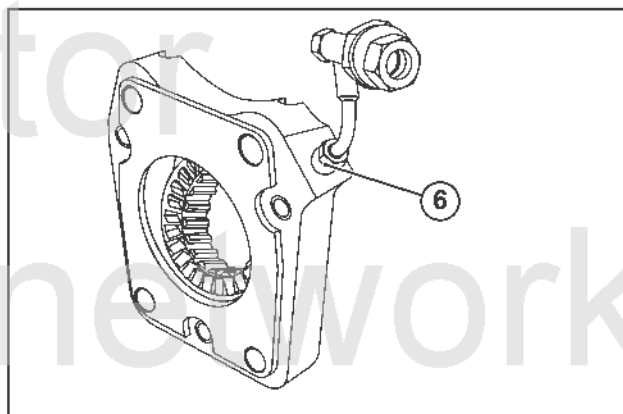


7- Remove then the outlet wheel (27) together with insert (28) and thrust ring (29) from gearbox.

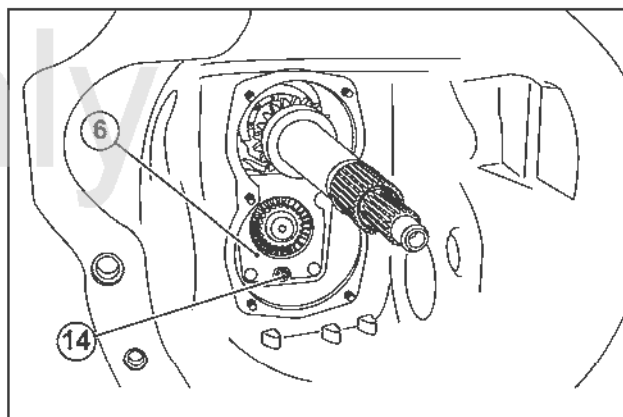
- ★ The wheel (27) is used only in combination in group 131 i.e. for 540/1000 rev.



8- Loosen the hollow screw of air feed to the torque multiplier body and cap nut (6).

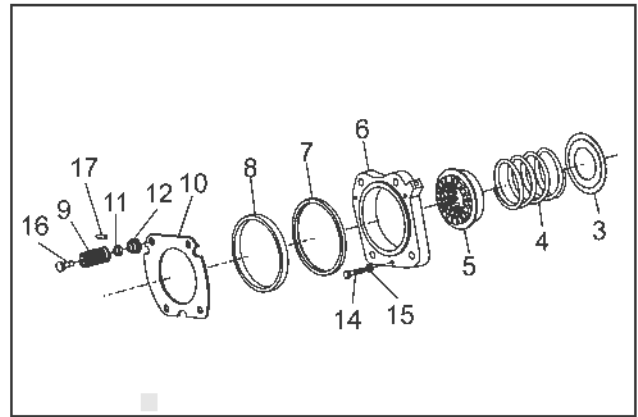


9- Unscrew three bolts (14) fixing the torque multiplier body (6) to the gearbox.



3.2. TORQUE MULTIPLIER group 126

- 10- Remove body from gearbox and dismantle them or repair a breakdown as per damage criteria (single parts are marked by position numbers given in PROXIMA spare parts catalogue).

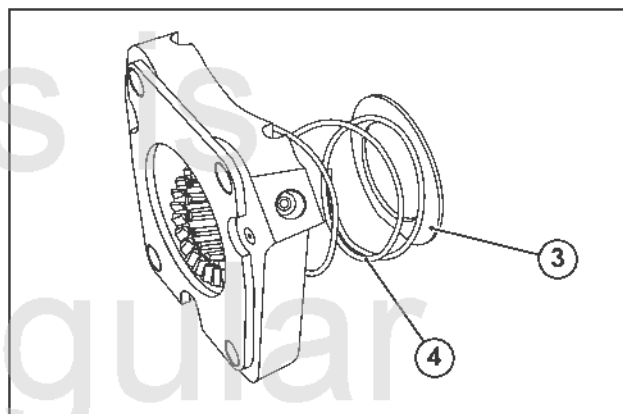


This is
for regular
Zetor
service network
only

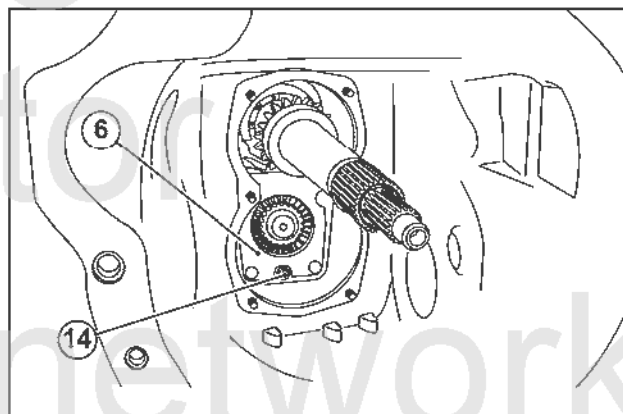
3.2. TORQUE MULTIPLIER group 126

3.2.2 ASSEMBLY OF TORQUE MULTIPLIER

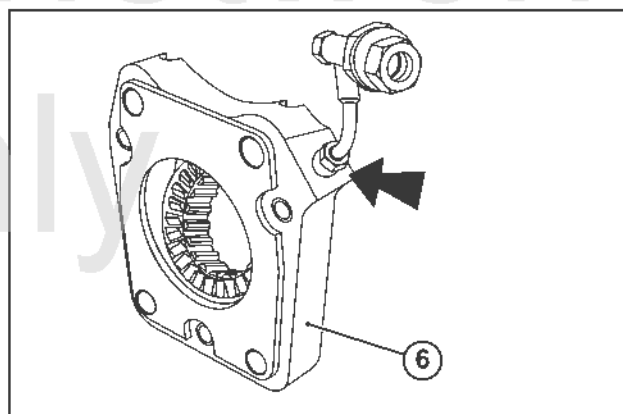
- 1 - Before assembling check if the counter-shaft (82) group 121a is prepared for group 126.
- 2 - After repair or replacement of some parts of torque multiplier make the leakage test by compressed air just before building into gearbox.
- 3 - Check if washer (3) and spring (4) are slipped over outlet shaft. Then put the assembled body without feed pipe to the gearbox.



- 4 - Fix the torque multiplier body (6) to the gearbox using three bolts (14).



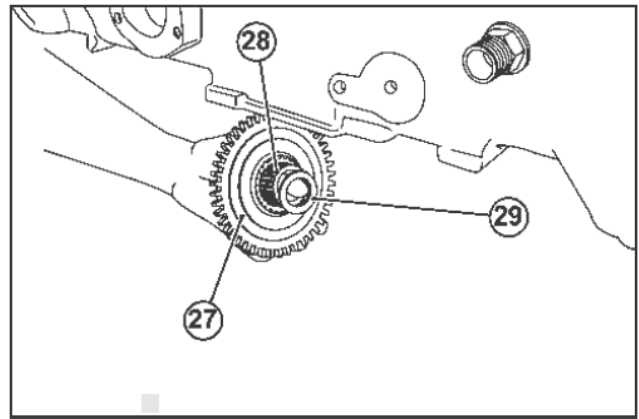
- 5 - Mount the feed pipe with screw cap into the body (6) of the torque multiplier by means of hollow screw. Then tighten the screw and nut.
 - ★ While tightening the hollow screw secure that the screw will not be spinned in gear case.



3.2. TORQUE MULTIPLIER group 126

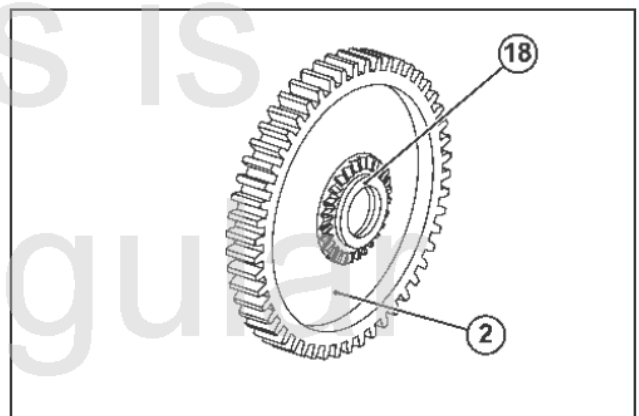
6 - Put the outlet wheel (27) together with insert (28) and thrust ring (29) into gearbox.

- ★ The variant of VH 540/1000 rev is shown in figure.

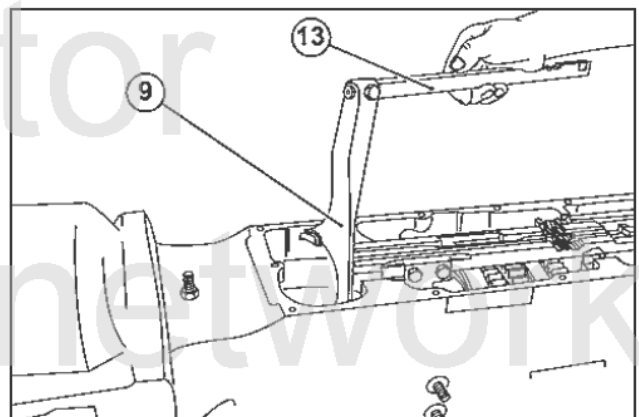


7 - Put the guide plate (18) and torque multiplier wheel (2) on partly extended outlet shaft.

- ★ Use the adapter (1) for group 126. It is variant of VH wheel 540 rev.
- ★ Use the adapter (18) for combination with group 131. It is variant of VH 540/1000 rev.

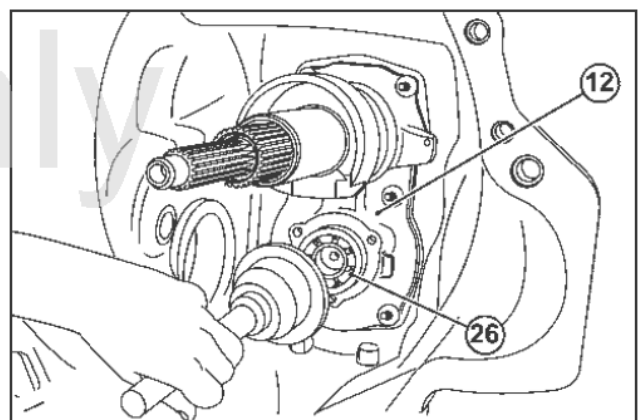


8 - Insert the disconnecting rod of drive (13) together with fork (9) and check the gearing. The final assembly of gearing is executed after connection of gearbox with final drive.



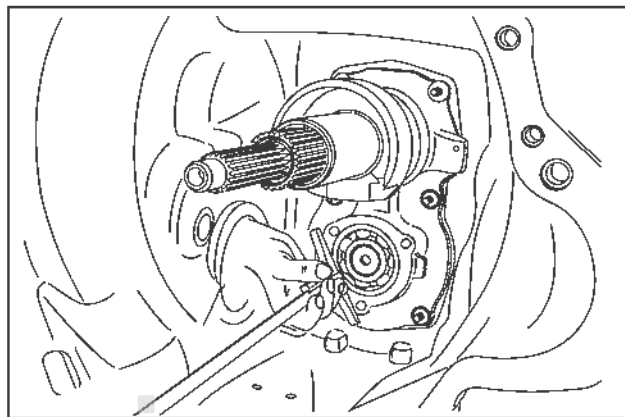
9 - Slide the front cover (12) with bearing (26) into gearbox and push it into gearbox using pusher.

- ⚠ Before pressing the bearing (46) secure the outlet shaft (111), countershaft (81,82), and layshaft (129) in rear part of gearbox against movement.

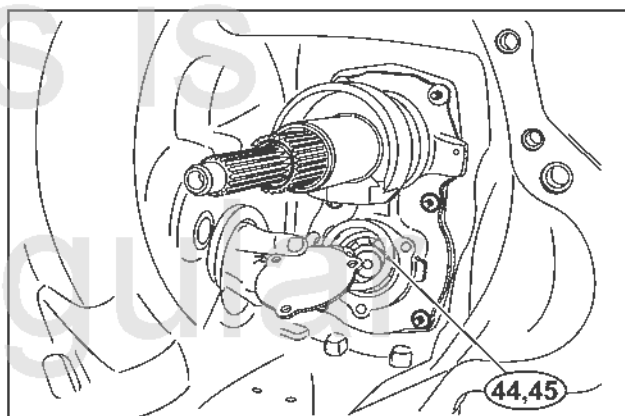


3.2. TORQUE MULTIPLIER group 126

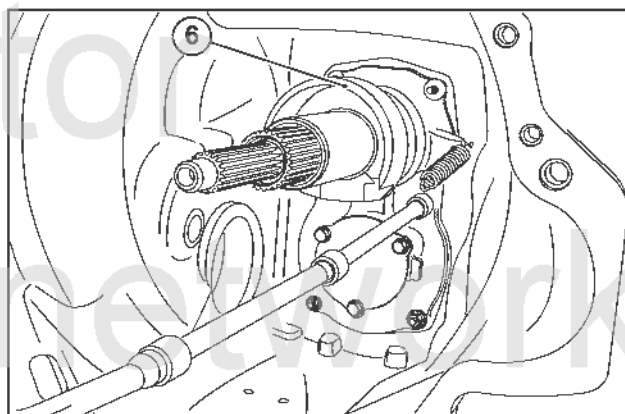
10 -Measure the clearance between cover face and bearing. The guide clearance is $0.2 + 0.1$ mm.



11 -Adjust the clearance by inserting of spacers (44,45) under cap.



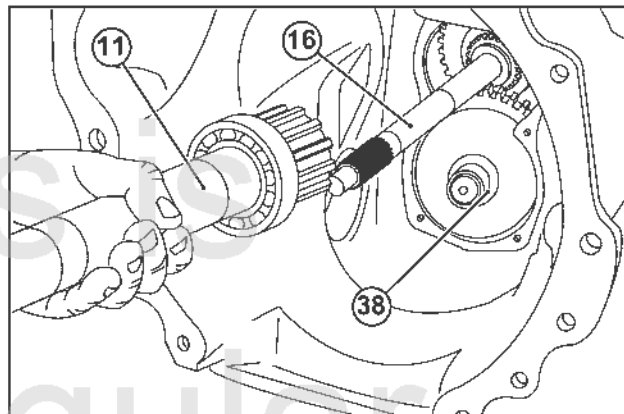
12 -Then remove the cover (6) and push the bearing (26) towards cap (23). Thus the guide clearance between mounted gear wheels is provided. Now fix the front cover (6) into the gear case.



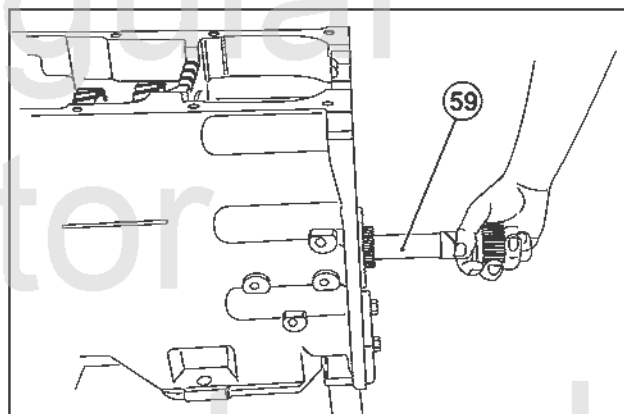
3.3. REDUCER FOR GEAR CREEP SPEED group 128

DISMANTLING OF REDUCER FOR GEAR CREEP SPEED

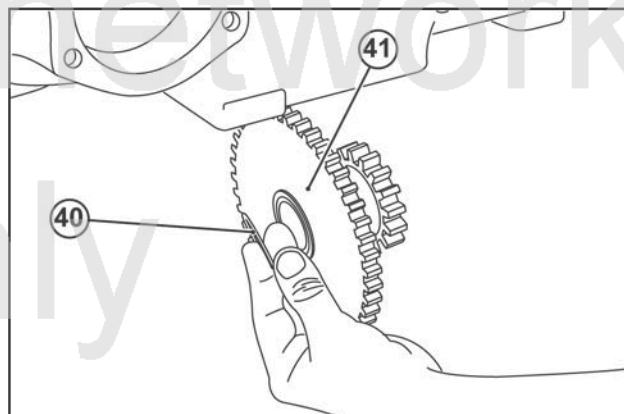
- 1 - Dismantle the front cover (6) of gearbox, gearbox cover and gearing of gearbox.
- 2 - Press off the hollow clutch shaft (11) and spacing tube (38) from clutch shaft (16).



- 3 - Force out partly the outlet shaft (59) offward clutch.

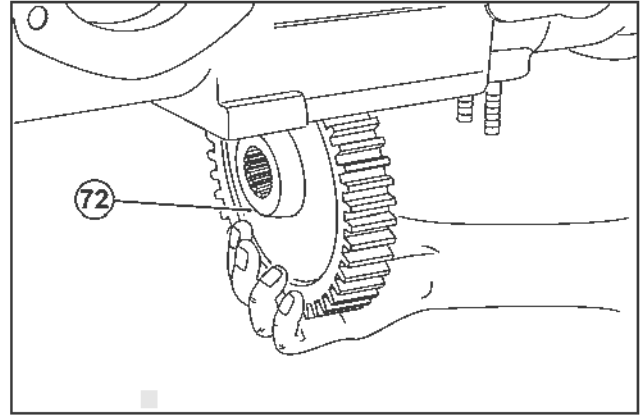


- 4 - Remove the double gear assembly (41) together with bronze thrust rings (40) through case bottom hole.

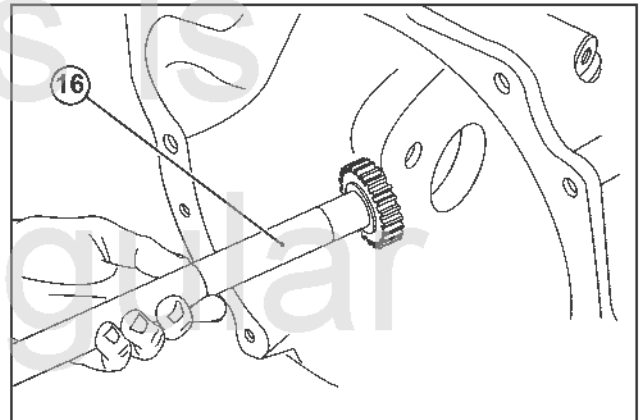


3.3. REDUCER FOR GEAR CREEP SPEED group 128

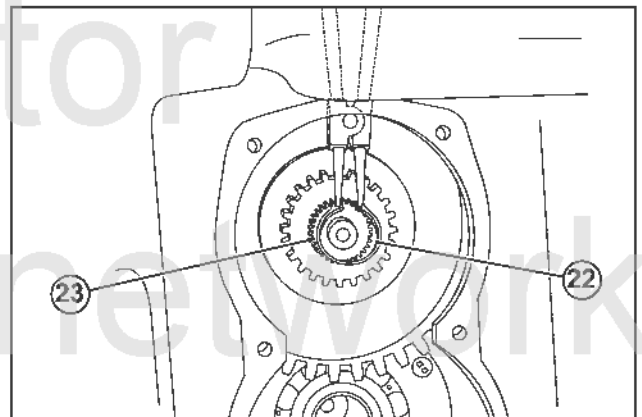
5 - Remove the drive gear (72) from case.



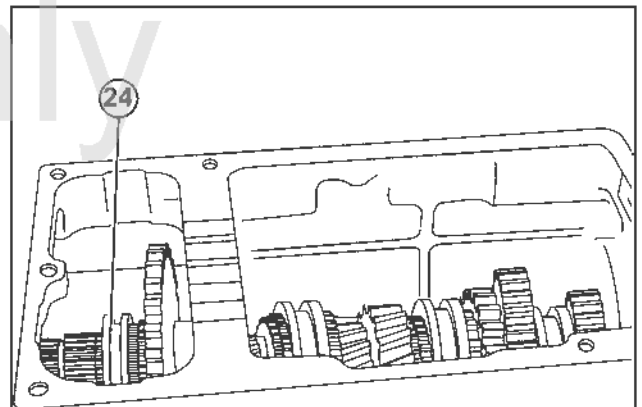
6 - Release the clutch shaft (16) from gear-box.



7 - After dismantling of circlip (22) push out the hub (23) of gear clutch of reducer gearing.

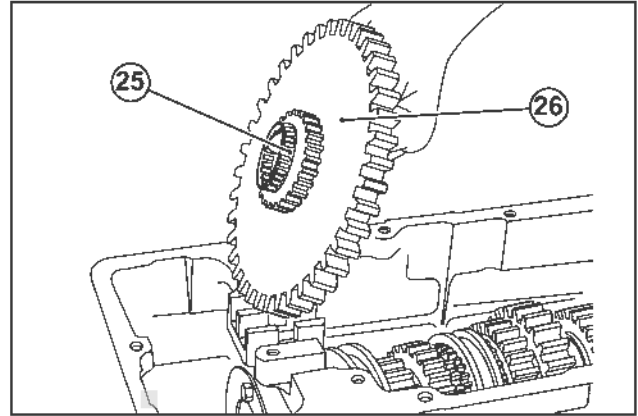


8 - Release the sleeve 24) of gear clutch of reducer gearing.

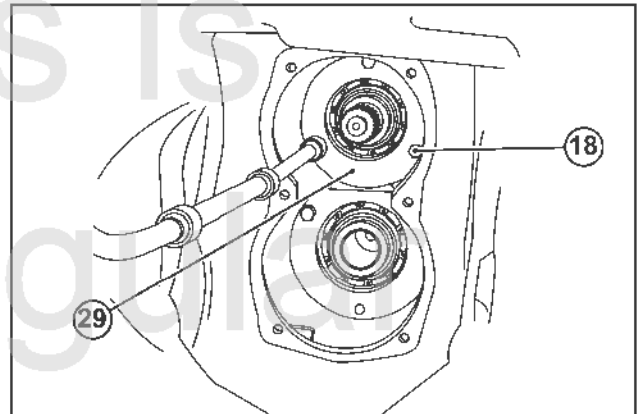


3.3. REDUCER FOR GEAR CREEP SPEED group 128

- 9 - Remove the driven wheel (26) with needle bearing (25) from gearbox.



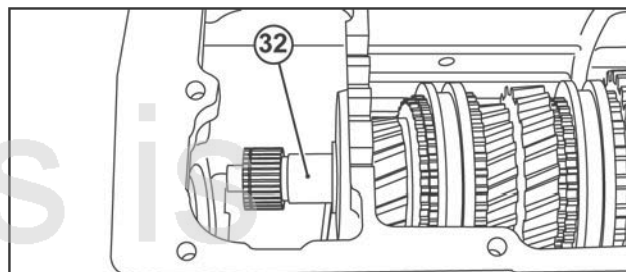
- 10 - Dismantle the adapter (29) after unscrewing of three bolts (18).
- 11 - The dismantling of top shaft is made equal to other versions.



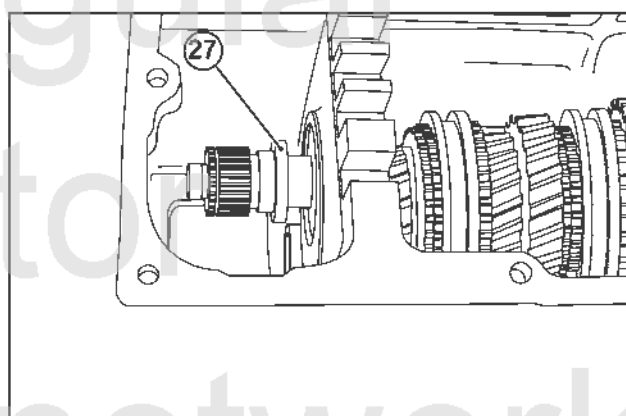
3.3. REDUCER FOR GEAR CREEP SPEED group 128

ASSEMBLY OF REDUCER FOR GEAR CREEP SPEED

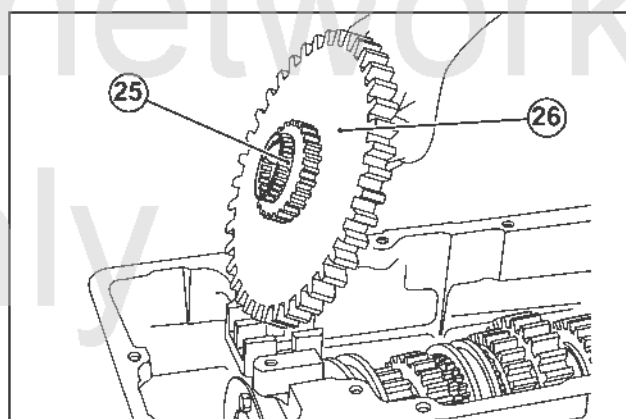
- 1 - When assembling the reducer for gear creep speed take care that the layshaft, cat. No. 54.121.010, group 128, pos. 47 and group 121, pos. 74 was mounted in gearbox.
- 2 - When assembling the drive shaft (32) proceed with clearance adjustment as if mounting of transmission spline shaft (see chapter 4.5 step 13 to 17).
- 3 - After assembly of drive shaft (32) fix the adapter (29) to the gear case.



- 4 - Slide the washer (27) on drive shaft.

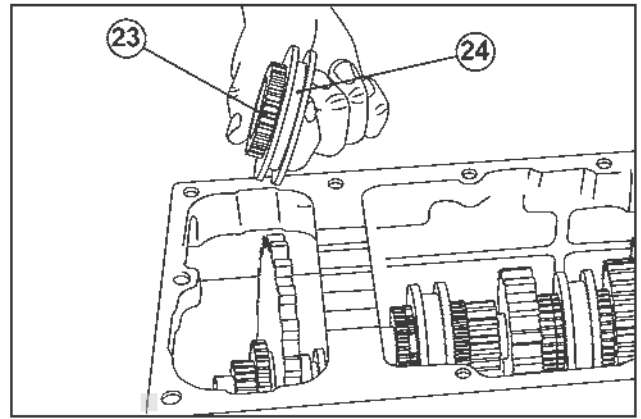


- 5 - Mount the driven wheel (26) with needle bearing (25) from gearbox.

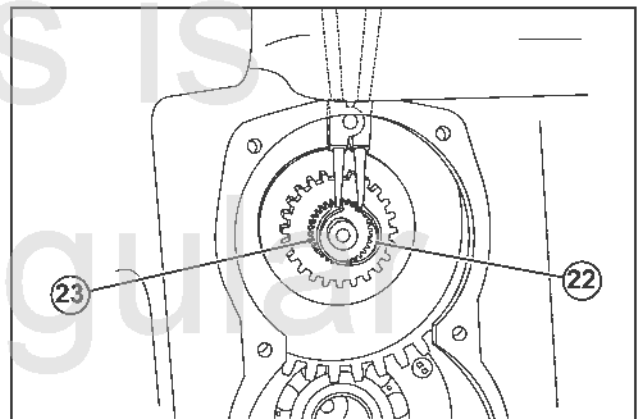


3.3. REDUCER FOR GEAR CREEP SPEED group 128

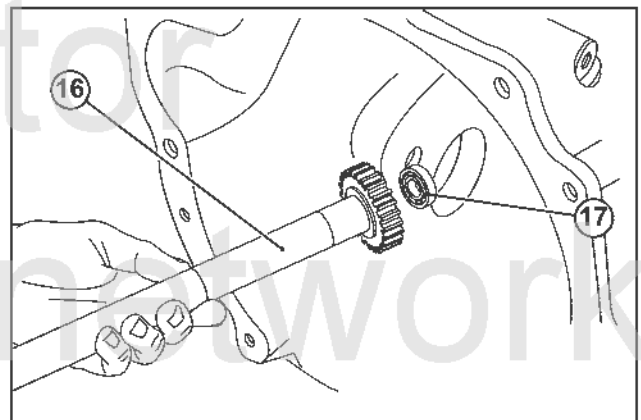
- 6 - Slide the hub (23) and sleeve (24) of gear clutch on shaft.



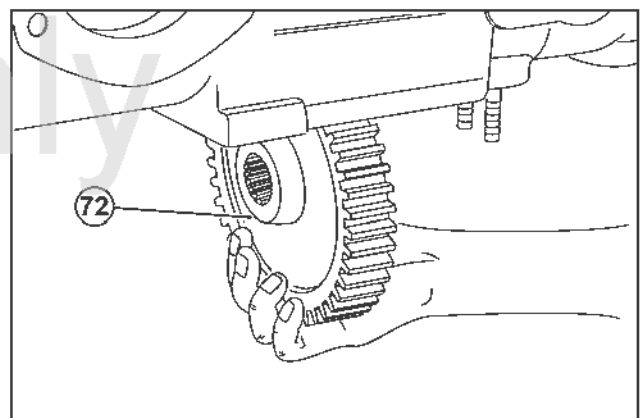
- 7 - Attach the assembly by circlip (22).



- 8 - Push the bearing (17) into the clutch shaft and place the clutch shaft (16) into gearbox.



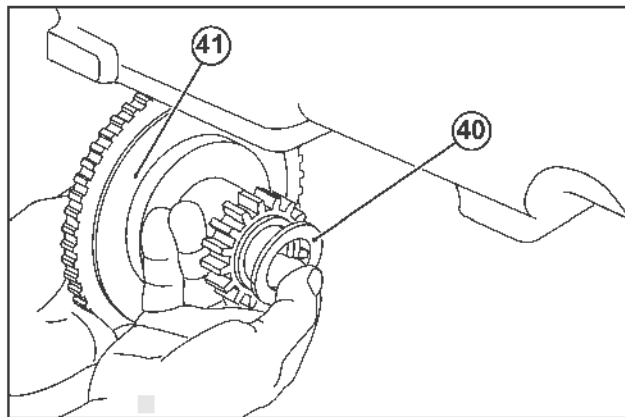
- 9 - Place the drive gear (72) in bottom part of gear case.



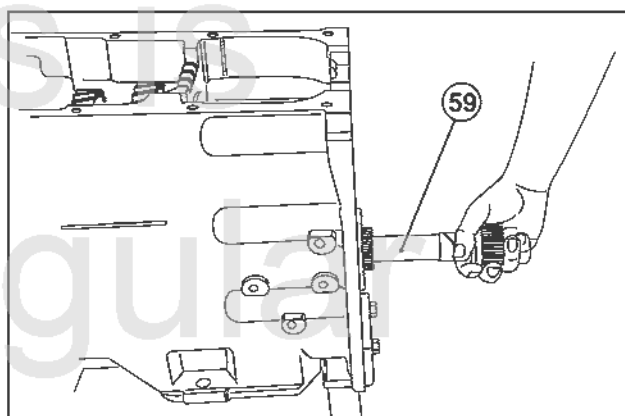
3.3. REDUCER FOR GEAR CREEP SPEED group 128

- 10- Slide the bronze thrust ring (40) and double gear assembly (41) with other thrust ring (40) on outlet shaft (59).

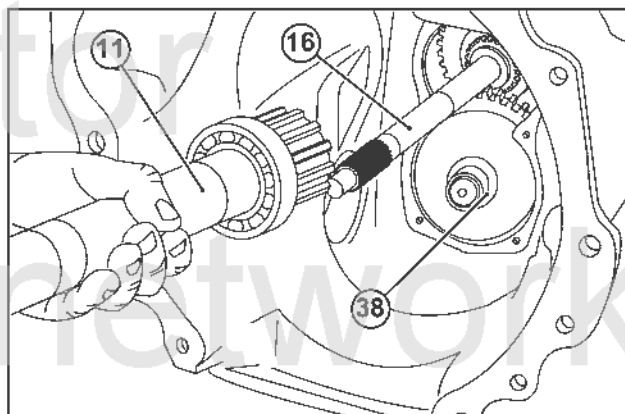
★ While inserting the bronze thrust rings use the grease for fixing to wheel.



- 11- Then move the outlet shaft (59) forward and fit the drive gear (72).

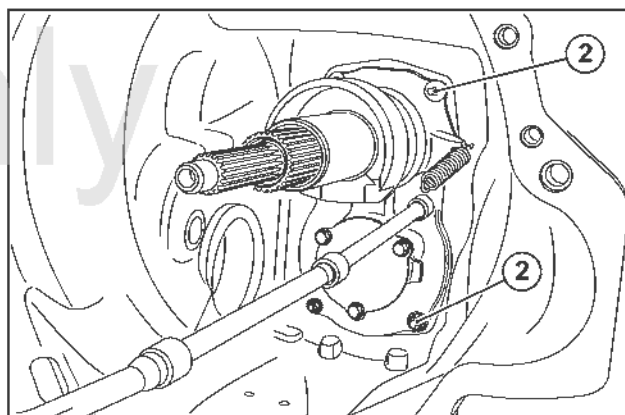


- 12- Move the spacing tube (38) over to drive gear and slide the hollow clutch shaft (11) with bearing on drive shaft (16).



- 13- Mount the front cover with cap on gear case using bolts (2).

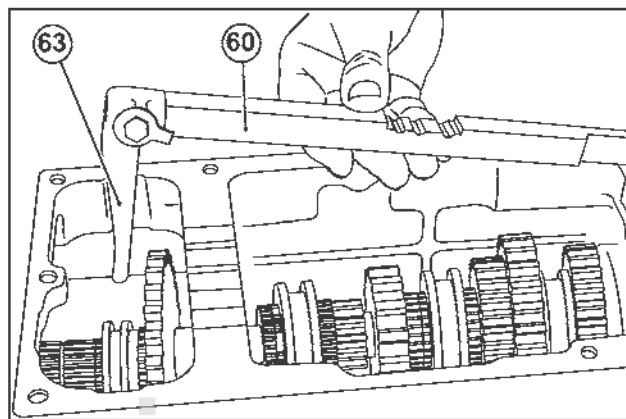
★ Make the clearance adjustment as with reversion.



3.3. REDUCER FOR GEAR CREEP SPEED group 128

- 14- Push in the disconnecting rod of drive (60) with fork (63).

★ Make the shifting test.



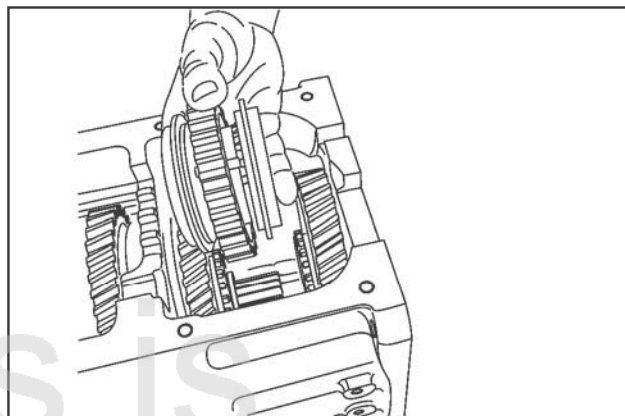
This is
for regular
Zetor
service network
only

This is
for regular
Zetor
service network
only

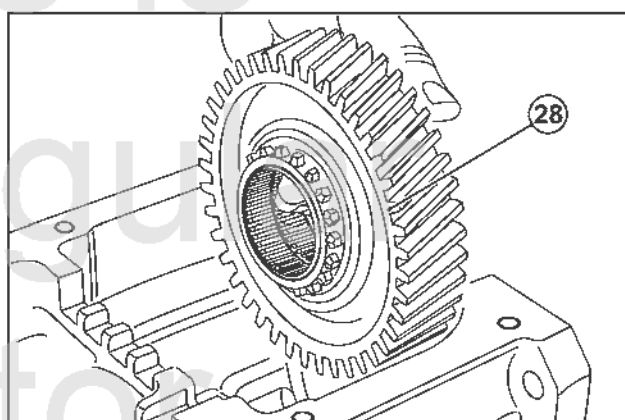
4.1 REMOVAL OF REDUCER groups 121a and 185

1 - Before removal of synchronized gearbox remove firstly the idle wheel and sliding reducer sleeve.

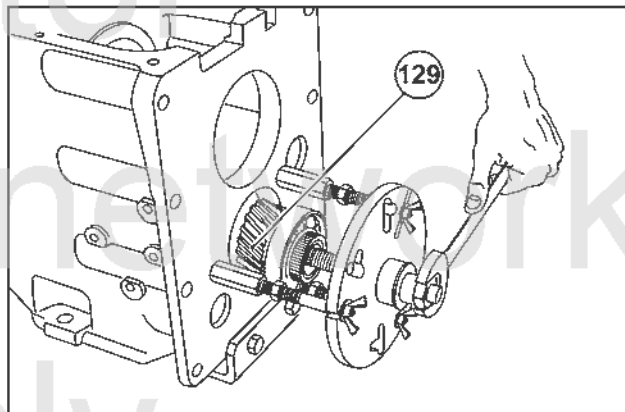
- ★ Use gear wheel (63) group 185, cat. No. 54.185.001 for 4WD tractors.
- ★ Use the hub (55) group 121a, cat. No. 54.121.022 for 2WD tractors.



2 - Remove the driven reducer wheel (28).

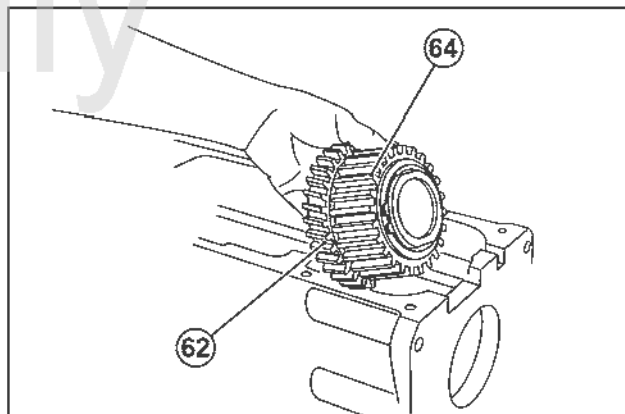


3 - By means of puller No. **78.942.614** and No. **78.942.615** pull out the layshaft (129).



4 - Remove the gear wheels (62,64) of front axle drive from gear case.

- ★ The gear wheel (127) and ring (128) is used for 2WD tractors.

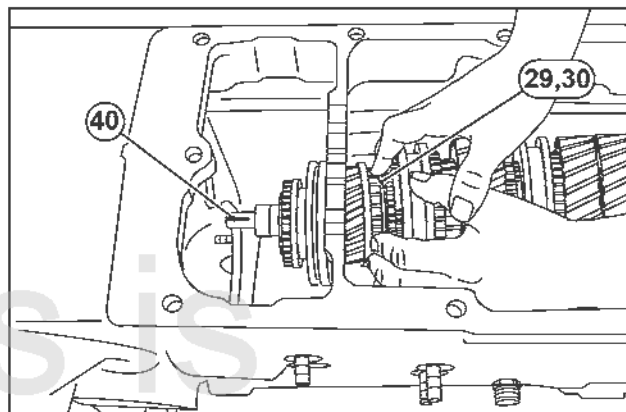


This is
for regular
Zetor
service network
only

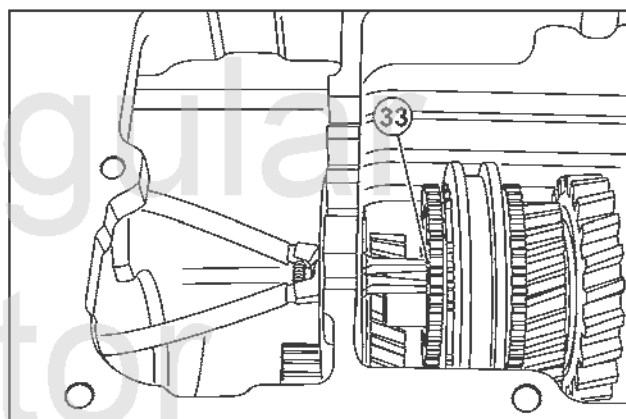
4.2 DISMANTLING OF GEARBOX DRIVE SHAFT group 121a

- 1 - Before dismantling of gearbox drive shaft (40) hold the spacers (29,30) at synchronized gearbox of the 4th and 5th speed gears to avoid their locking into mortise of drive shaft (40).

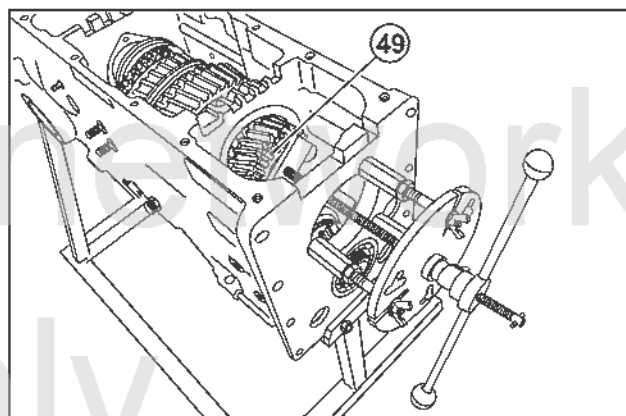
★ The gearbox drive shaft (40) has different design as per gearbox versions.



- 2 - Remove the circlip (33) using pliers.

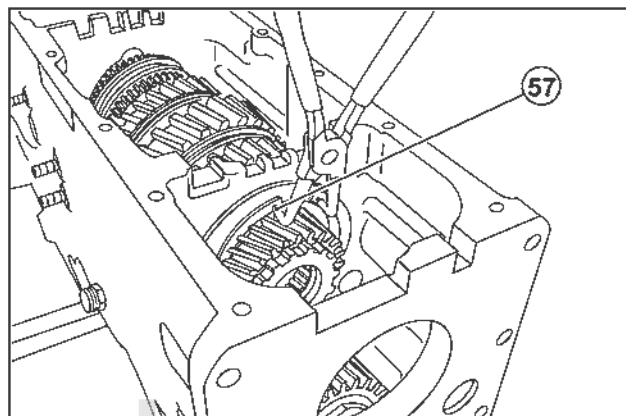


- 3 - By means of puller No. **78.942.610**, No. **78.942.614** and No. **78.942.655** pull out partly the spline shaft (49) for circlip gripping.

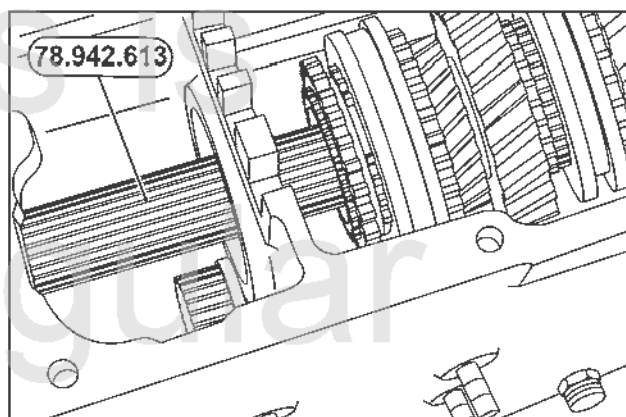


4.2 DISMANTLING OF GEARBOX DRIVE SHAFT group 121a

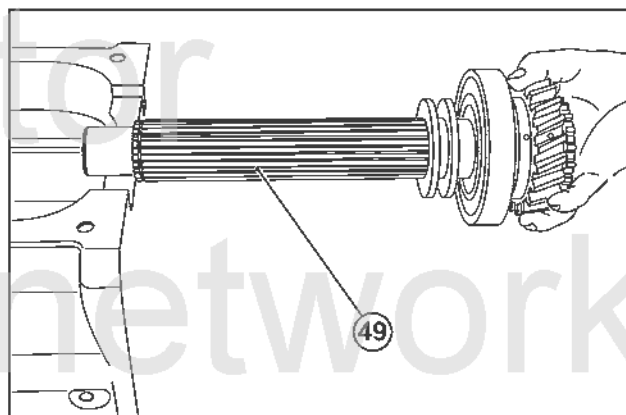
4 - Remove the circlip (57).



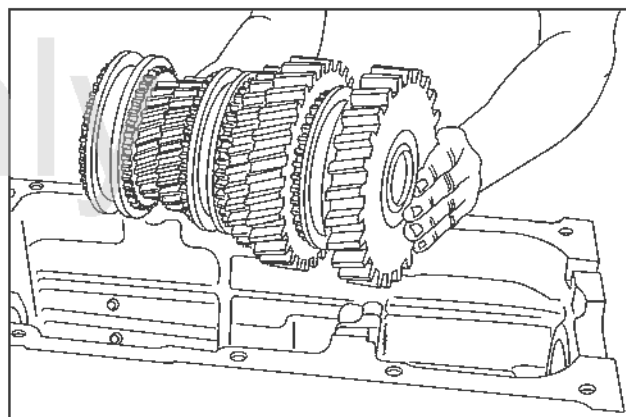
5 - Put an auxiliary spline shaft No. **78.942.613** in spline shaft (49) from the gearbox front part and press out the spline shaft (49).



6 - After pushing in the auxiliary spline shaft remove the gearbox spline shaft (49).

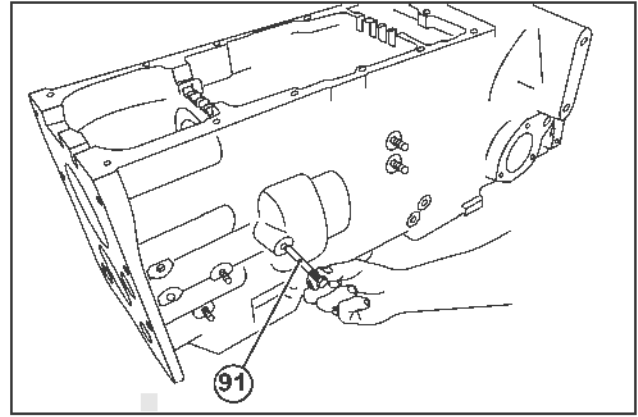


7 - Remove then the whole assembly of gear wheels and clutch stops from gearbox.

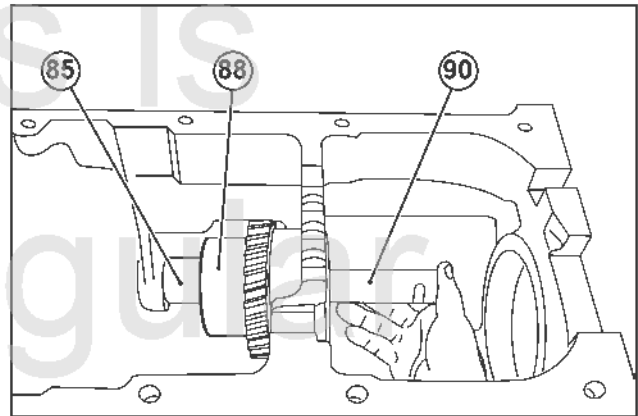


4.2 DISMANTLING OF GEARBOX DRIVE SHAFT group 121a

- 8 - If the gearbox is fitted with reverse gear (without reversion) unscrew then the holding screw (91).



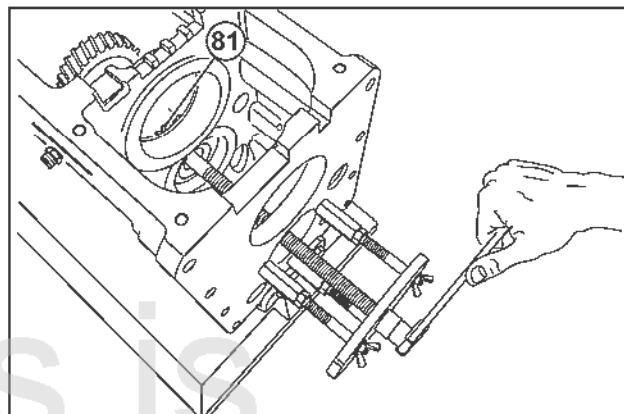
- 9 - Push out the reverse shaft pin (90), reverse idler gear (88) with bearings (86) and (89). Remove then the spacing tube (85).



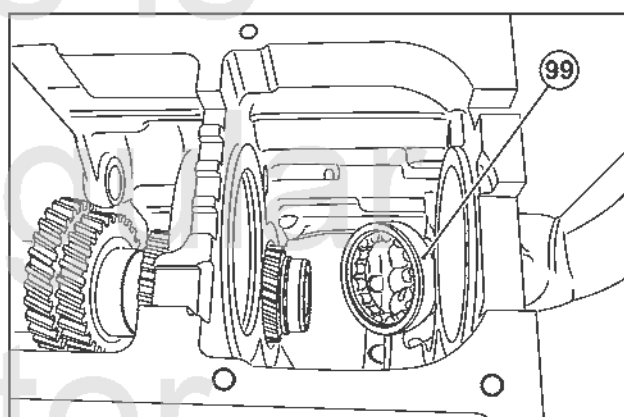
This is
for regular
Zetor
service network
only

4.3 DISMANTLING OF GEARBOX COUNTERSHAFT group 121a

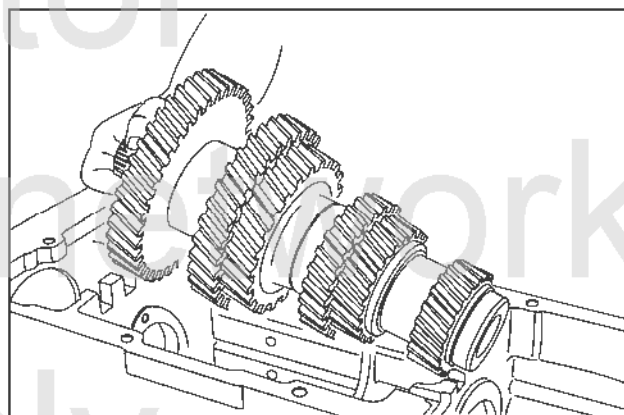
- 1 - Using puller No. **78.942.614** and **78.942.616** pull up a little the countershaft (81) as a whole.



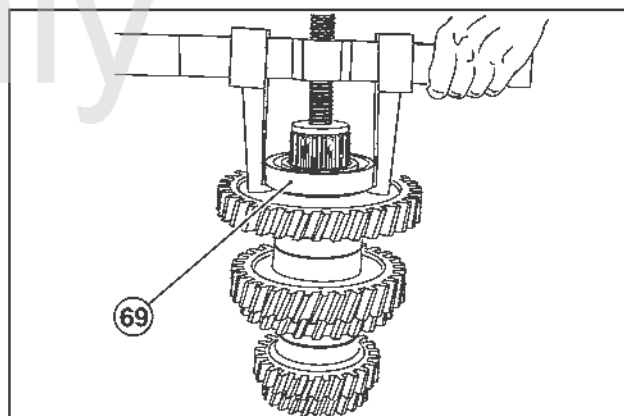
- 2 - Remove the bearing (99) used for reverse gearbox.
★ The bearing (69) is used for other versions.



- 3 - Remove the countershaft assembly.



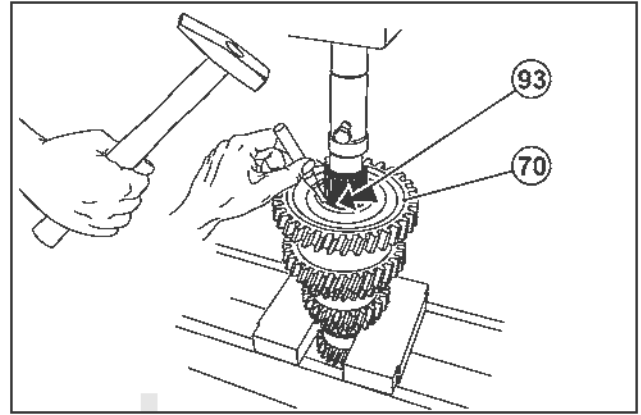
- 4 - Firstly pull off the bearing (69) from countershaft by means of puller No. **78.942.650**.



4.3 DISMANTLING OF GEARBOX COUNTERSHAFT group 121a

5 - Place the countershaft assembly under hydraulic press and press the spigot (93) to the wheel so that it would stay in groove while pressing-off the gear of the constantly mesh (70) from shaft.

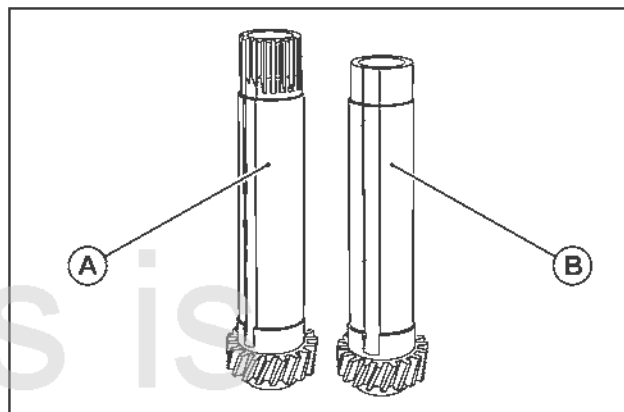
★ Observe this principle while pressing-off all gear wheels (70,71,72,76,77).



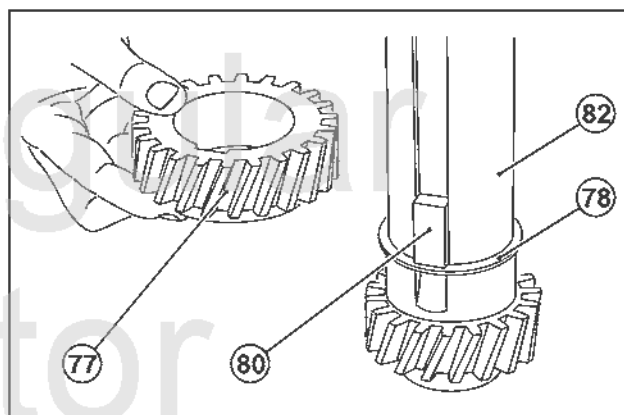
This is
for regular
Zetor
service network
only

4.4 ASSEMBLY OF COUNTERSHAFT AND REDUCER OF GEARBOX groups 121a, 185

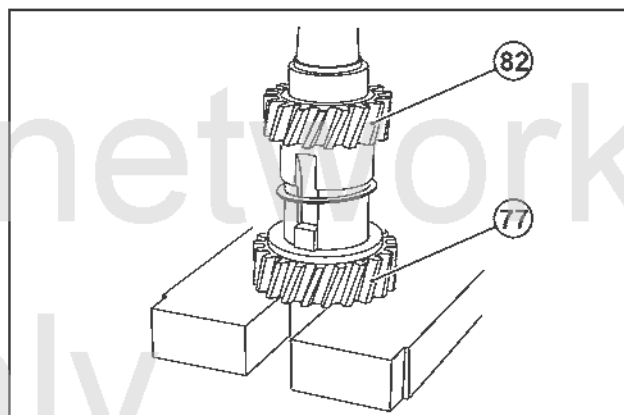
- 1 - Just before assembly start-up determine what type of shaft is correct for mounted gearbox:
 - A shaft is designed for reverse gearbox or air intensifier. Cat. No. 54.121.020.
 - B shaft is designed for standard gearbox or reducer for gear creep speed. Cat. No. 54.121.010.



- 2 - Firstly place the spacer (82) on counter-shaft. Put the spigot (80) on spacer (78) and to the shaft (82) and slide on the 1st speed drive gear (77).

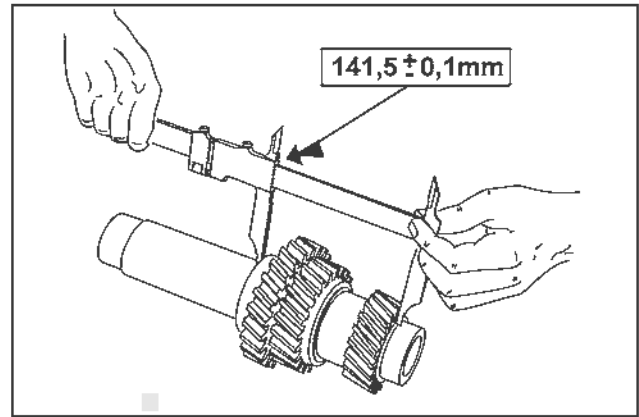


- 3 - Turn the shaft (82) and press into the wheel (77) in hydraulic press.

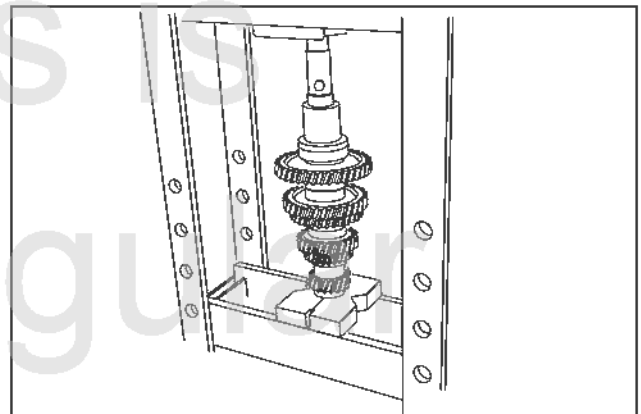


4.4 ASSEMBLY OF COUNTERSHAFT AND REDUCER OF GEARBOX groups 121a, 185

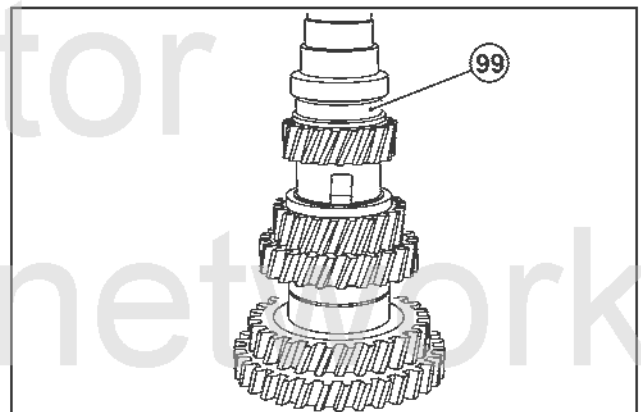
- 4 - After the same procedure of pressing the 2nd speed wheel measure an exact size of wheels (**attention - not from gear teeth**). The rated distance is 141.5 ± 0.1 mm. Size is adjusted by spacers (73,74,75,78).



- 5 - The remaining gear wheel will be pressed in the same way.

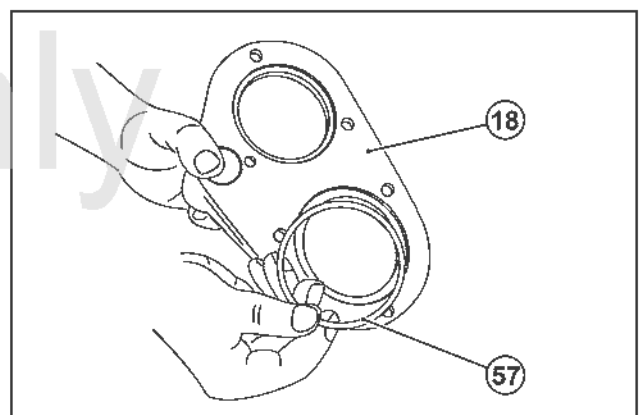


- 6 - Press the inner ring of special bearing (99) on shaft designed for reverse gearbox after shaft turning in press.



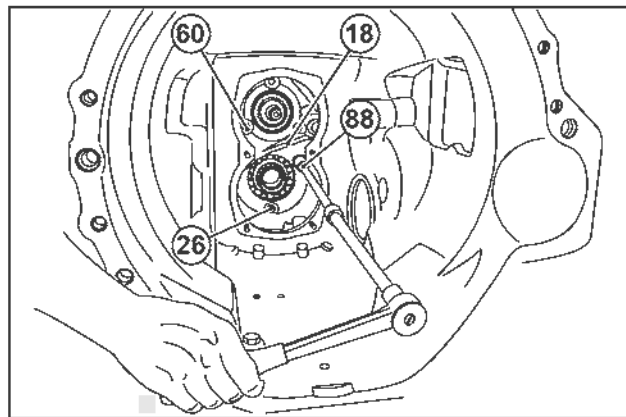
- 7 - Put the ring (57) into the cover (18) designed for reverse gearbox for its centering.

★ The adapter (29,68,102) are used by other versions.

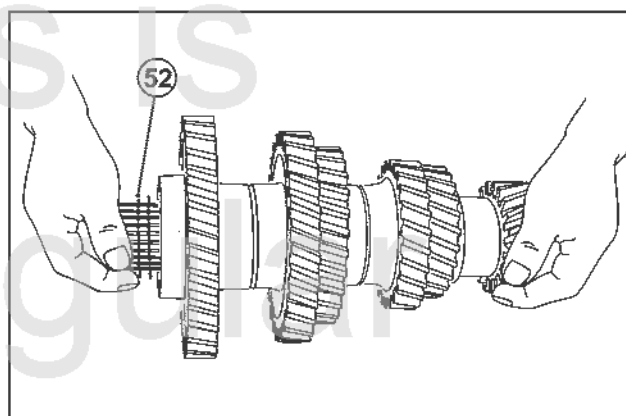


4.4 ASSEMBLY OF COUNTERSHAFT AND REDUCER OF GEARBOX groups 121a, 185

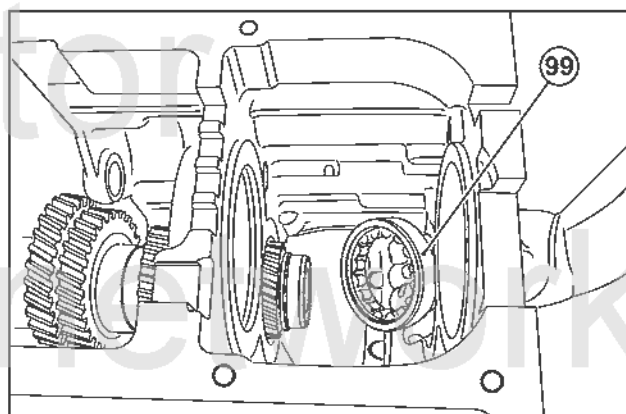
- 8 - Mount the cover (18) to the case and screw it (26,60,88).



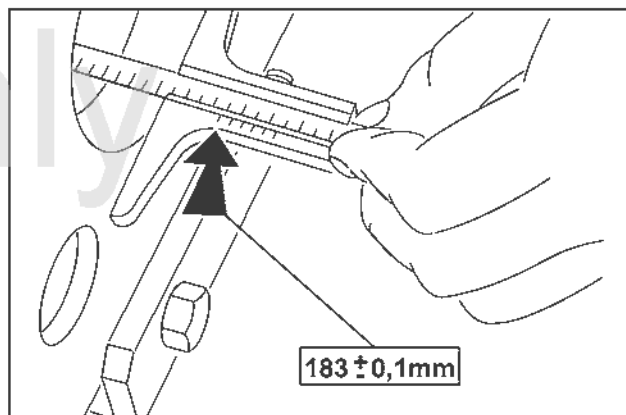
- 9 - Place the assembled shaft together with washers (52,77) 1.5 mm thick (valid only for reverse gearbox) into gearbox.
★ The other versions of gearboxes have different values.



- 10 - Slide the external retaining ring with rollers over inner ring of special bearing (99) of reverse gearbox so that the marking on inner ring and external ring would lead up to the tractor front part.
★ The ball bearings are for other gearbox versions.

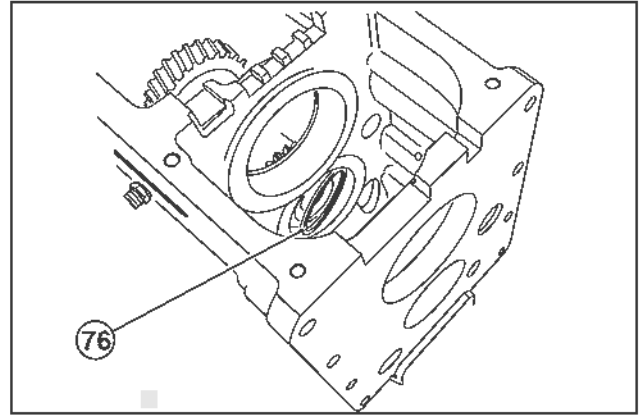


- 11 - Measure the distance of external bearing ring (99) from gear case by means of depth gauge. The specified distance is 183 ± 0.1 mm.

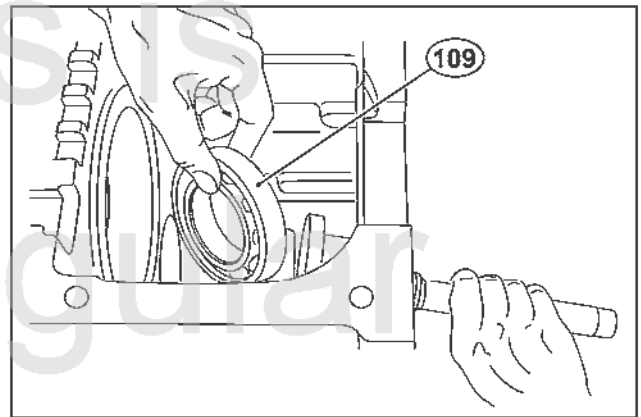


4.4 ASSEMBLY OF COUNTERSHAFT AND REDUCER OF GEARBOX groups 121a, 185

12 - Adjust a distance using washers (76,94,95).

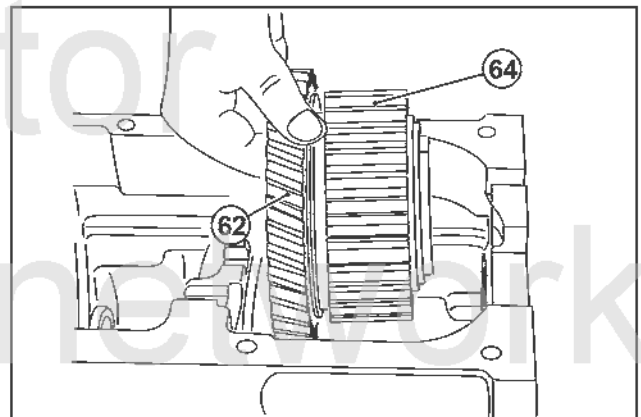


13 - Put the bearing (109) into case.

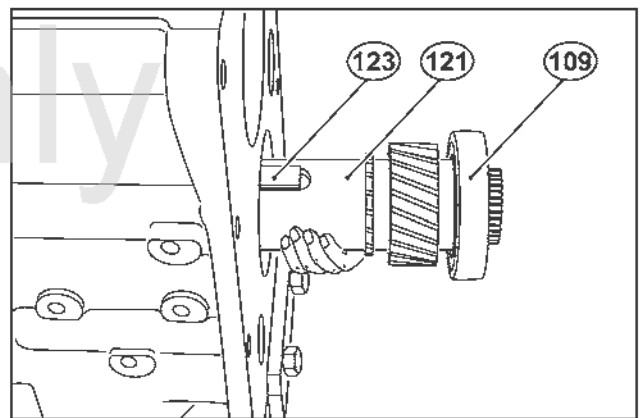


14 - Prepare reversing double gear (62,64) with bearings (65,66) for gearbox installation.

★ The wheel (124) and ring (125) is used for 2WD.

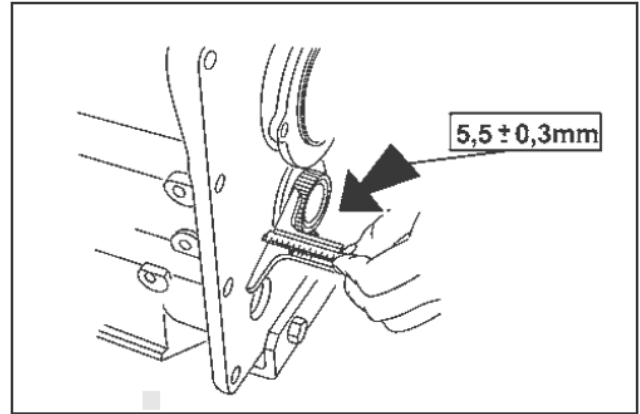


15 - Put the spigot (123) on layshaft (121) and press the shaft into the double gear.

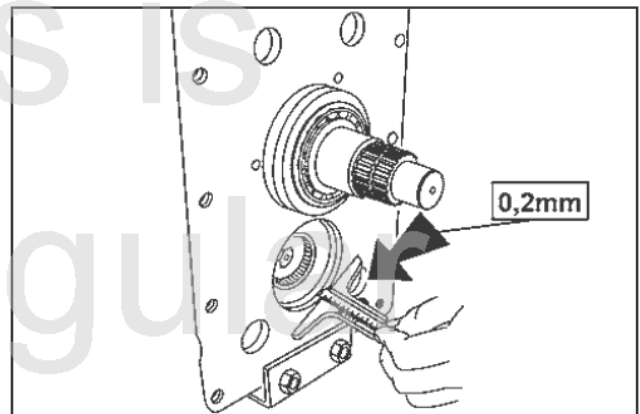


4.4 ASSEMBLY OF COUNTERSHAFT AND REDUCER OF GEARBOX groups 121a, 185

- 16 - Measure the distance of bearing extension (109) from case rear part. The guide value is 5.5 ± 0.3 mm (max 5.8 mm).



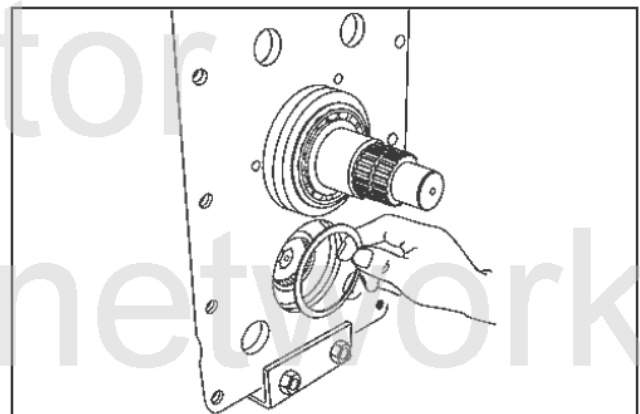
- 17 - Measure the case mounting in final gear case. The final value should include the clearance 0.2 mm for clearance of gearbox bearing.



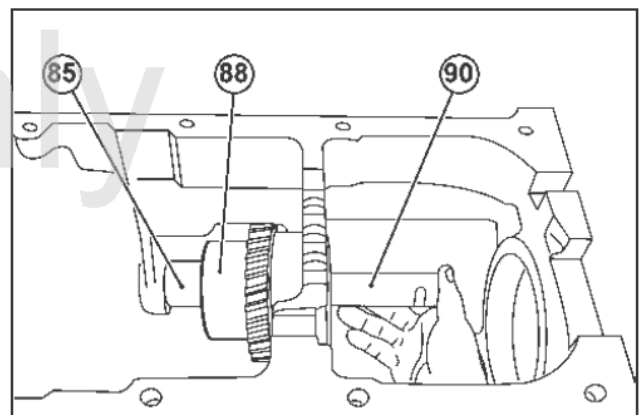
- 18 - Adjust the clearance by washer inserting to the final gear case.

! The clearance value is important for connection of gearbox with final gear.

- 19 - To facilitate the mounting of splined shaft release partly the gear reduction assembly after clearance adjustment.



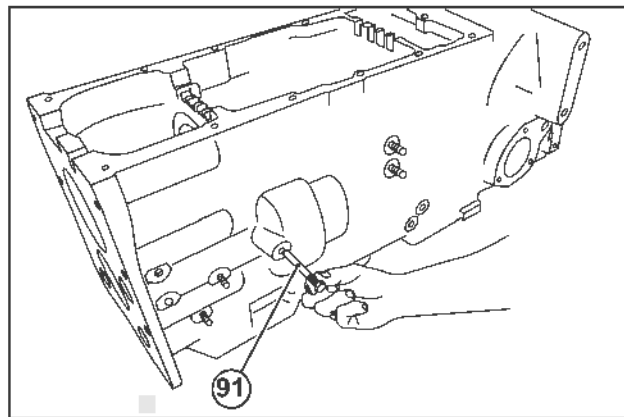
- 20 - Put the spacing tube (85); reverse idler gear (88) with circlips (87) and bearings (86) and (89) to the gear case without reversion, i.e. with reverse motion. Fix the wheel by insertion of the pin of reverse idler wheel (90).



4.4 ASSEMBLY OF COUNTERSHAFT AND REDUCER OF GEARBOX groups 121a, 185

- 21 -Secure the pin of reversing wheel in gearcase by holding screw (91). Lubricate the screw thread by Loctite 243 sealant

 Screw: Loctite 243



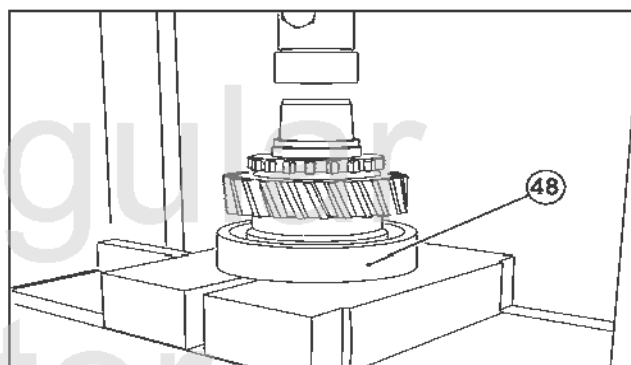
This is
for regular
Zetor
service network
only

4.5 ASSEMBLY OF SPLINED SHAFT AND REDUCTION group 121a

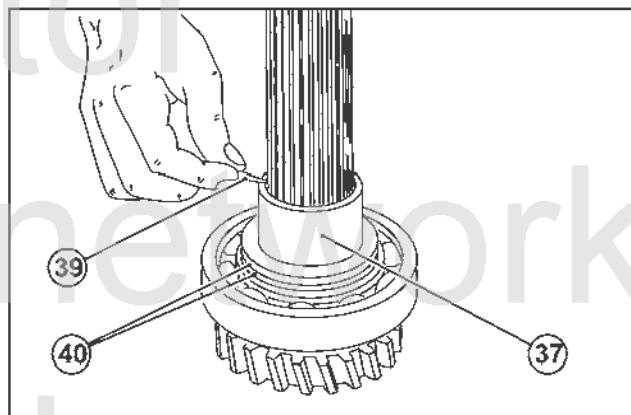
- 1 - Before mounting of splined shaft prepare a clutch stop. The clutch stop for 5th and 4th speed gears (34) has its stepping for circlip.



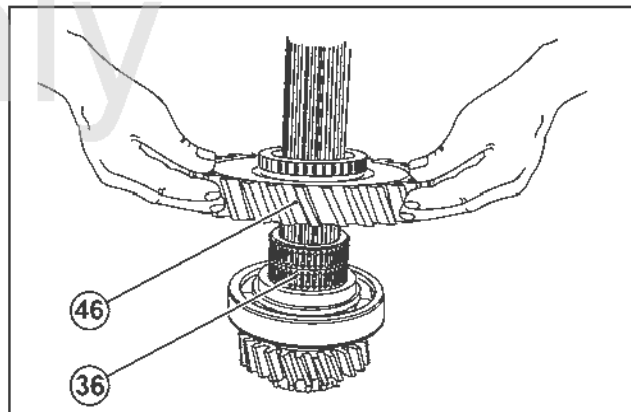
- 2 - Mount the bearing (48) using a press.



- 3 - Remove the shaft from press and slide two spacers 2x5 mm thick (40) towards bearing and then sleeve (37). Slide short wire (39) into sleeve and secure it by grease against move.

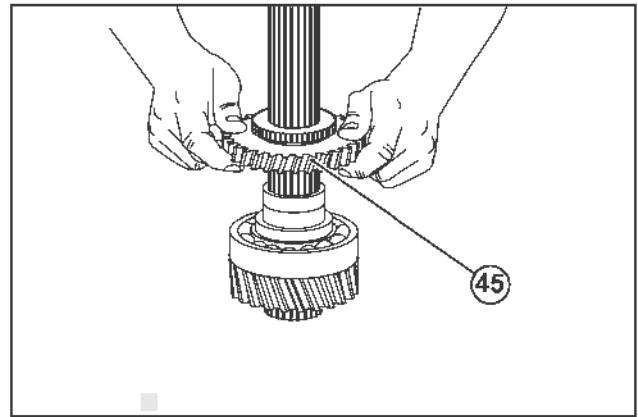


- 4 - Slide the needle bearing (36) on sleeve and driven gear of the lowest gear (46). It is valid for reverse gearbox.

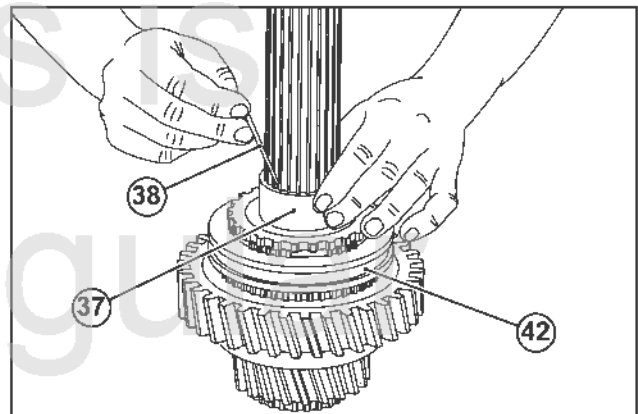


4.5 ASSEMBLY OF SPLINED SHAFT AND REDUCTION group 121a

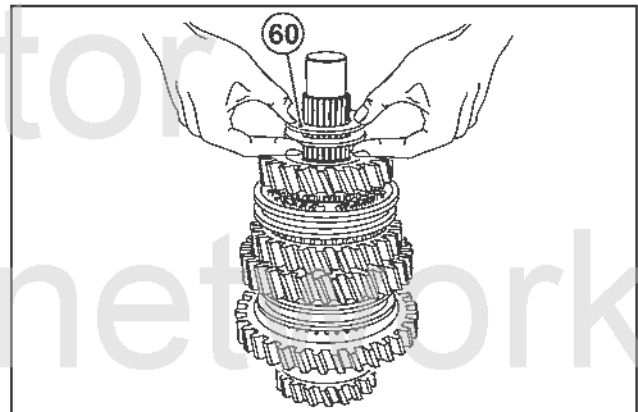
- 5 - If the gearbox is fitted with reverse gear, i.e. without reversion slide the reverse driven gear (45) over needle bearing.



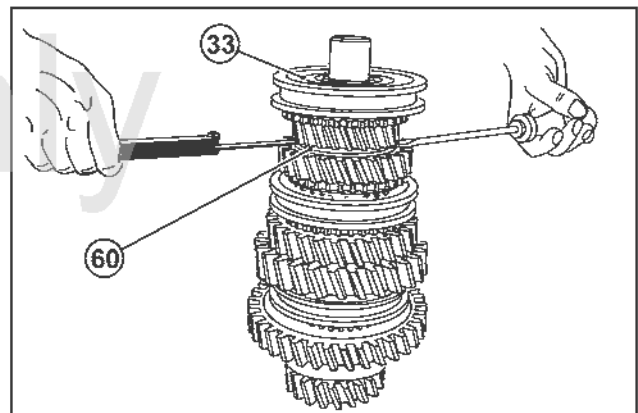
- 6 - Slide the clutch stop (42) and sleeve (37) over spline shaft. Put a wire (38) in it.



- 7 - Use the same procedure with other parts and put again two spacers (60) 2.5 mm thick between wheels of 3rd and 4th speed gears.

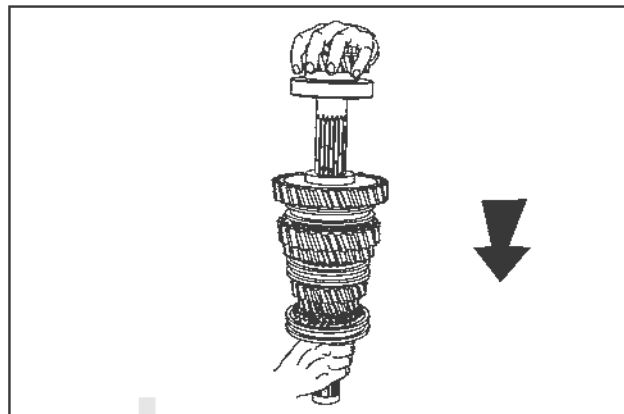


- 8 - After mounting of last clutch stop and its fastening by circlip (33) measure the clearance between spacer rings (60). The specified clearance is 0.1 mm. Adjust the clearance by spacers (64,65,66,67) inserting between spacer rings (60).

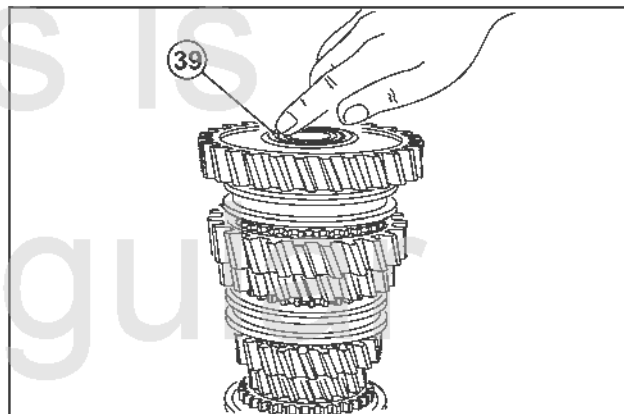


4.5 ASSEMBLY OF SPLINED SHAFT AND REDUCTION group 121a

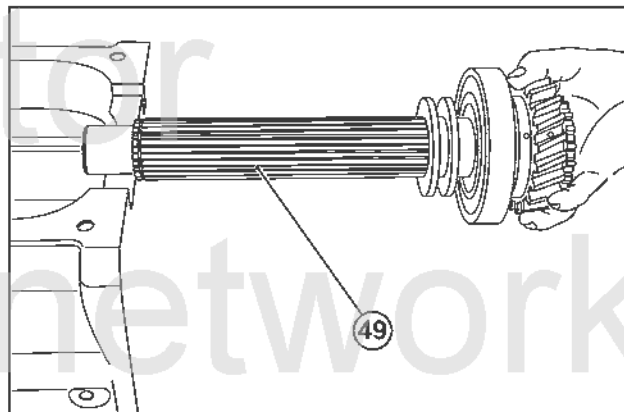
- 9 - Move the assembly of wheels and clutch stops to prepared auxiliary spline shaft No. č. **78.942.613**.



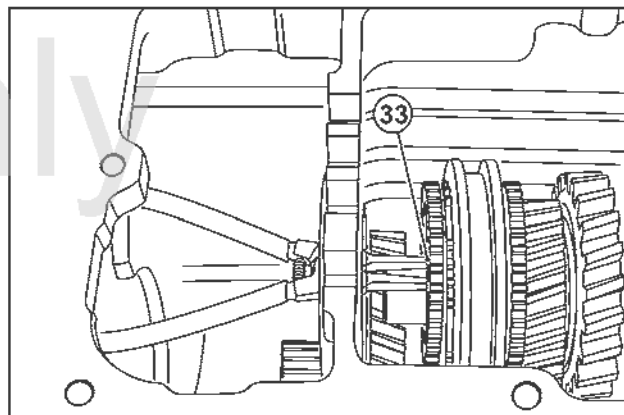
- 10 - Secure the wire (39) against fall from auxiliary spline shaft by grease.



- 11 - Place the assembly of wheels and clutch stops to the case and push out the auxiliary spline shaft No. č. **78.942.613** by means of spline shaft (49).



- 12 - Secure the clutch stop (34) by circlip (33).

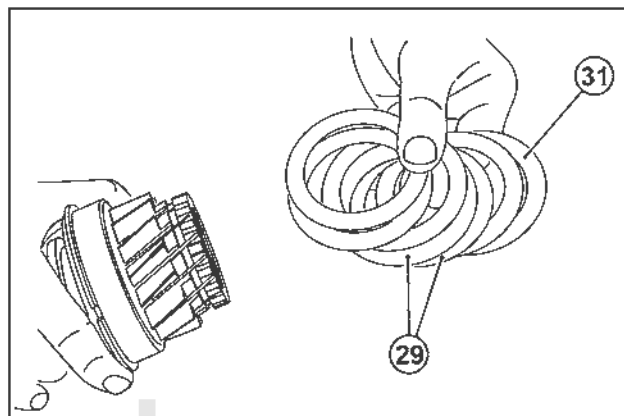


4.5 ASSEMBLY OF SPLINED SHAFT AND REDUCTION group 121a

13 -Mount the drive shaft assembly (40) with washers (29,30) to spline shaft.

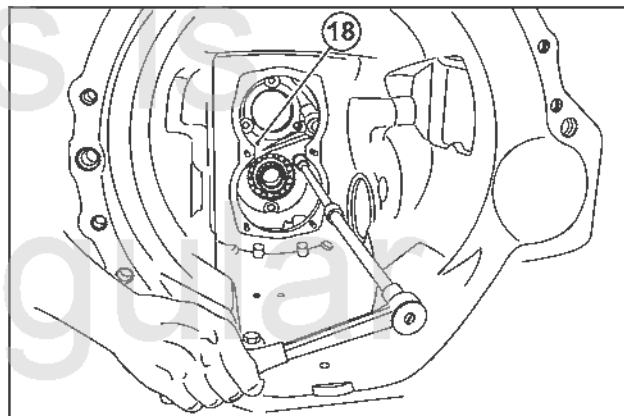
★ At first apply the thrust ring (31) to the clutch stop.

★ The drive shafts are different as per gearbox designs.



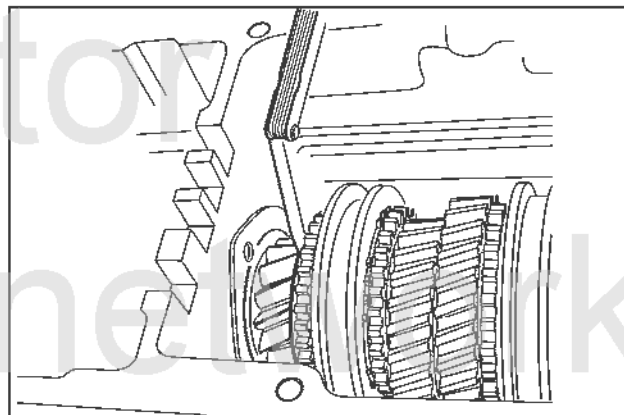
14 -Bolt the reversation cover (18).

★ Mount the guide plate at other gearbox versions.



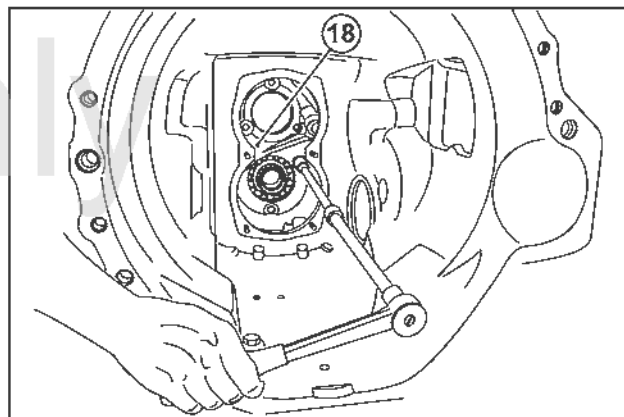
15- Measure the clearance between drive gear and clutch stop. The specified clearance is 0.1 to 0.3 mm.

16- If the guide value is not reached dismantle it and make adjustment by means of spacers.



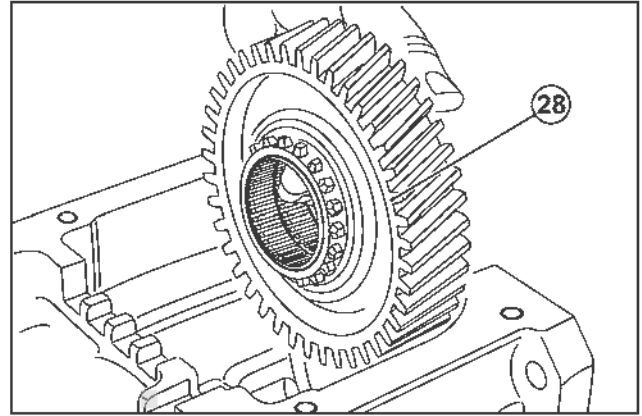
17- Mount back the reversation cover (18).

★ Mount the guide plate at other gearbox versions.



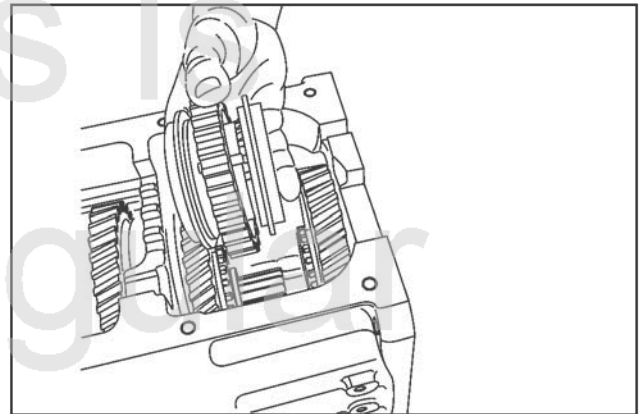
4.5 ASSEMBLY OF SPLINED SHAFT AND REDUCTION group 121a

18- Slide the reversion assembly into the correct position and insert the gearing-down driven gear (28).



19- Insert the idle gear and reverse shift sleeve.

- ★ Use gear wheel (63) group 185, cat. No. 54.185.001 for 4WD tractors.
- ★ Use the hub (55) group 121a, cat. No. 54.121.022 for 2WD tractors.

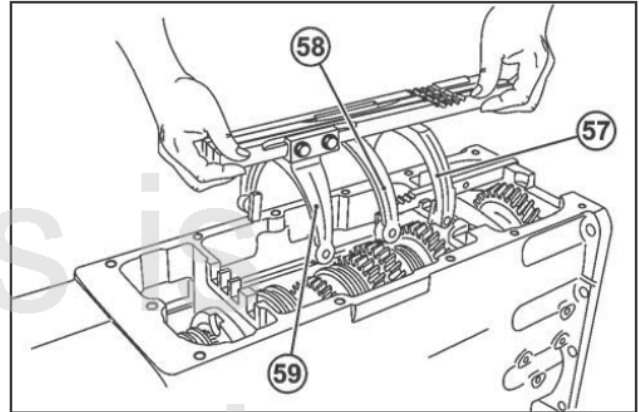


This is
for regular
Zetor
service network
only

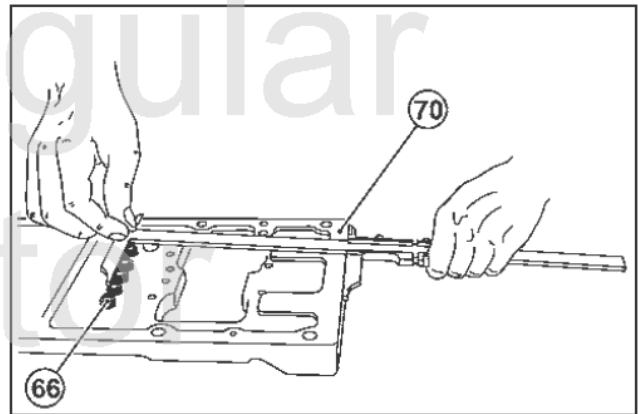
4.6 ASSEMBLY OF GEAR SHIFTING group 147

! It executes after connection of gearbox with final gear! The final gear is not drawn up from the clearness reasons.

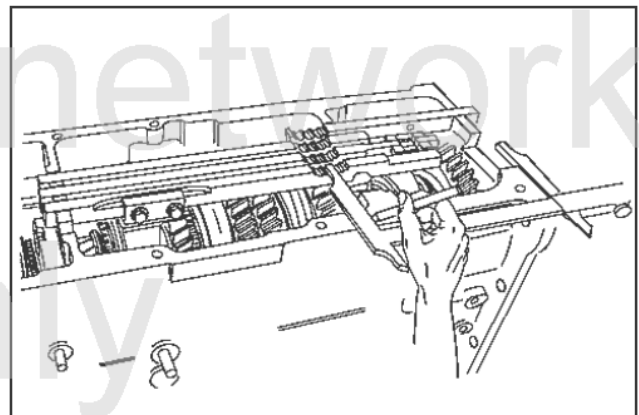
- 1 - Put the disconnecting rod including shifting forks (57,58,59) of gear speeds into gear case.



- 2 - Measure the distance of fuse centres (66) from edge of gearbox cover (70).

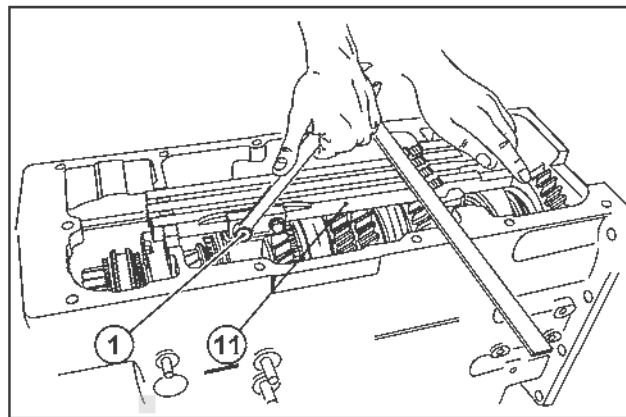


- 3 - Mark the measured distance on gear case.

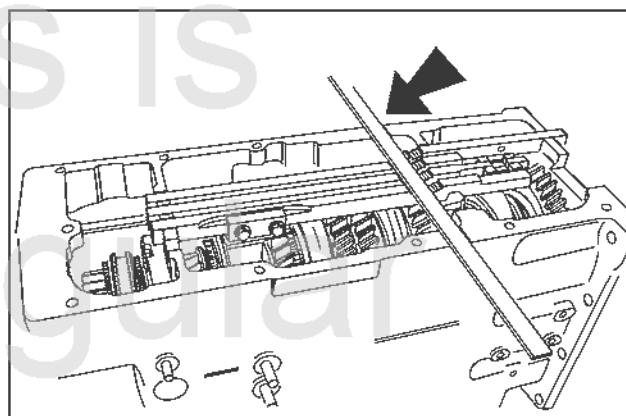


4.6 ASSEMBLY OF GEAR SHIFTING group 147

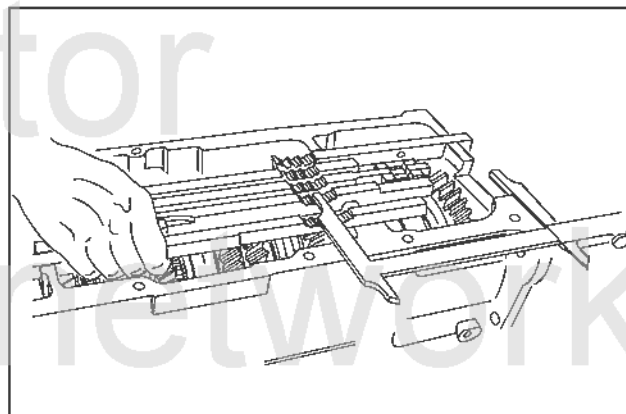
- 4 - Release the bolts (1) fixing the fork to the shift rod of the 4th and 5th gear speeds (11). Fit the fork in the centre of clutch stop.



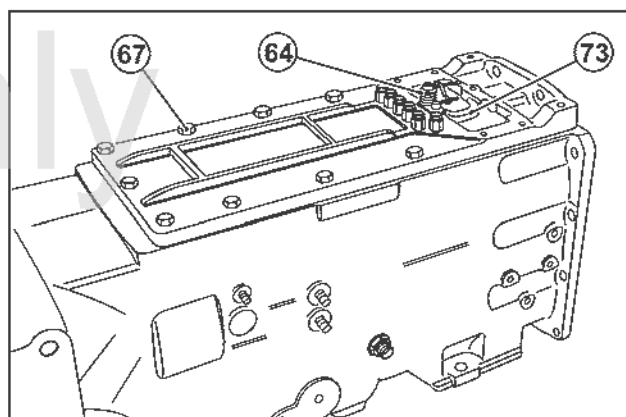
- 5 - Now fit in place all shift rods by central mortise to the mark on gear case.



- 6 - Use the same procedure for adjustment of reversing shift rod.
★ Mount also other forks as per gearbox versions.

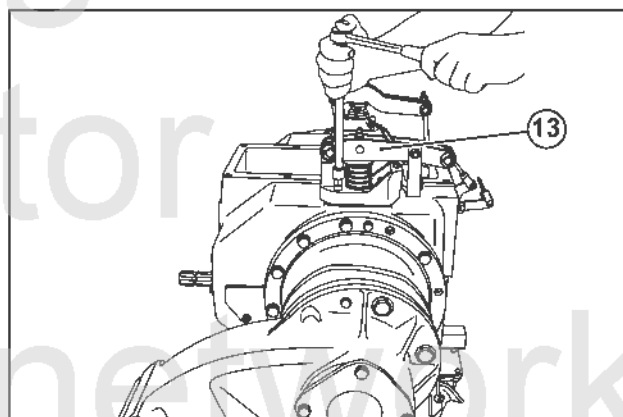


- 7 - Lubricate the contact surfaces of case gearbox case and cover by Rhodoseal sealant and apply cover to the case. Mount the cover by bolts (67). Put the shifting fuse (73) to the hole in cover with fixed spring (64).

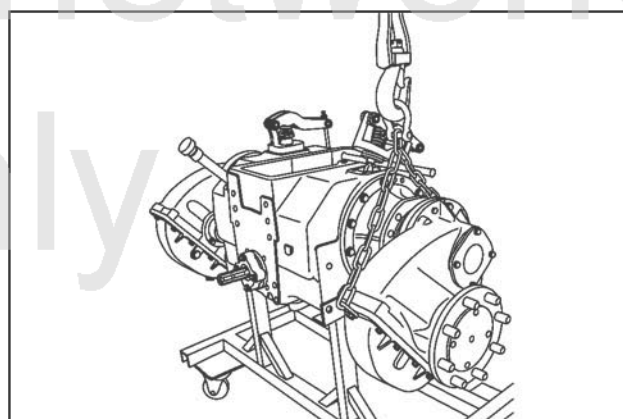


5.1 DISMANTLING OF FINAL GEAR group 153

- 1 - Dismantle the cabin (group 369) if possible due to shop space.
- 2 - In case of troubles during cabin removal dismantle:
 - driver's seat (group 342)
 - bridging (group 368 pos.82)
 - supporting rear bulkhead (group 369-6 pos.106)
- 3 - Secure the front axle and wheels against move.
- 4 - Support the gearbox and place the final gear to mounting car.
- 5 - Remove the lifting mechanism (group 400, pos. 16).
- 6 - Remove the top cover on gearbox and press the pin into drive shaft of final gear.
- 7 - Dismantle the rear wheels.
- 8 - Dismantle the control assembly (13) foot disc brakes (group 227).

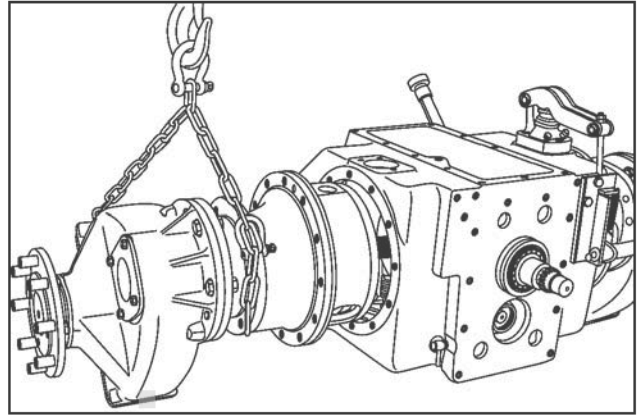


- 9 - Release the bolts connecting semi-axes with final gear. Hook up the semi-axle to lifting mechanism using chains.

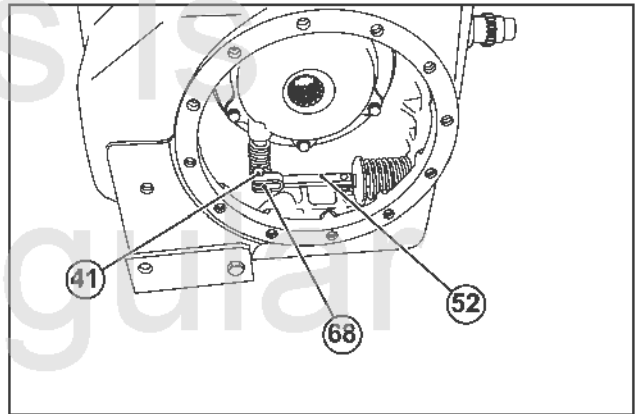


5.1 DISMANTLING OF FINAL GEAR group 153

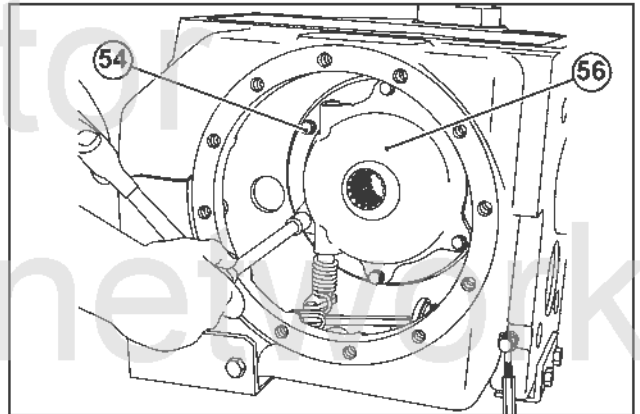
10 -Push aside the semi-axle from final gear.



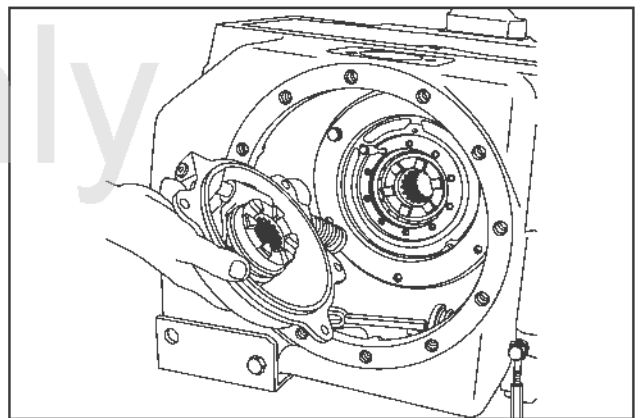
11 -Disconnect the lock release lever (68) from rod (52) by removal of pin (41) (group 153).



12 -Release the bolts (54) of cover lock (56).

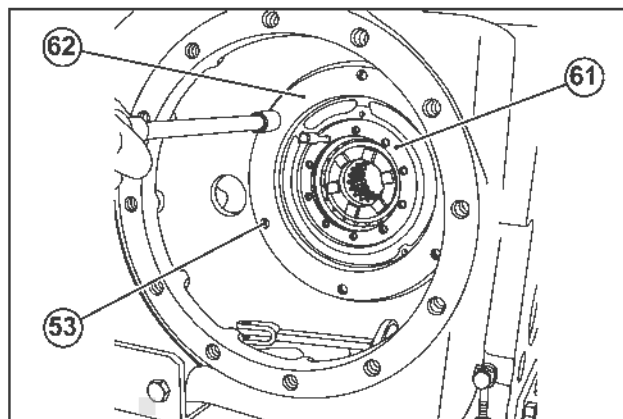


13 -Remove the cover with lock from final gear case.

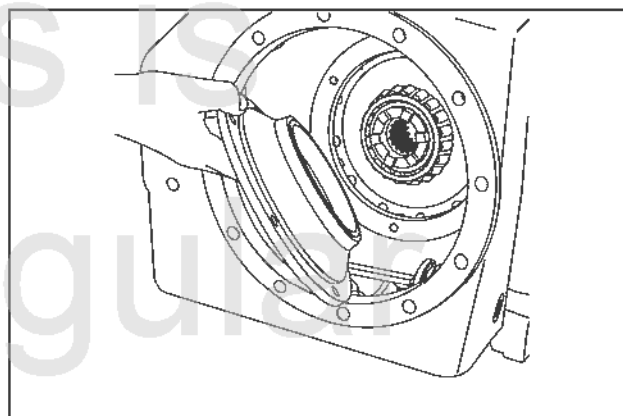


5.1 DISMANTLING OF FINAL GEAR group 153

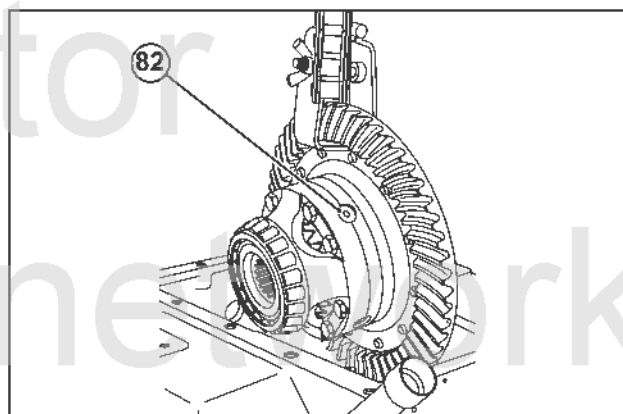
- 14 -Unscrew the bolts (53) and remove the flange (62) together with adjusting screw (61).



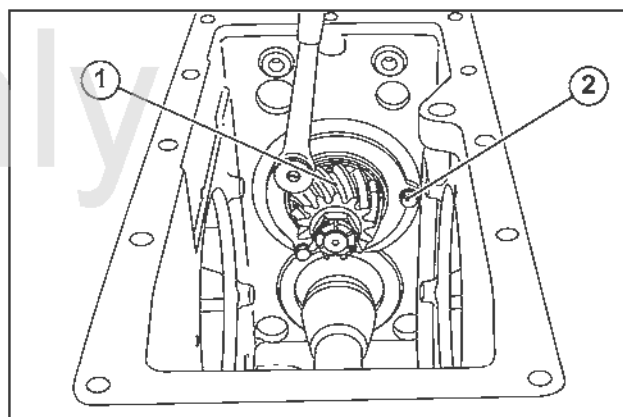
- 15 -Leave the bearing inner ring with roller in ring gear. Dismantle the bearing on the opposite side by the same procedure.



- 16 -Remove the differential body with ring gear (82) from final gear by means of lifting mechanism.

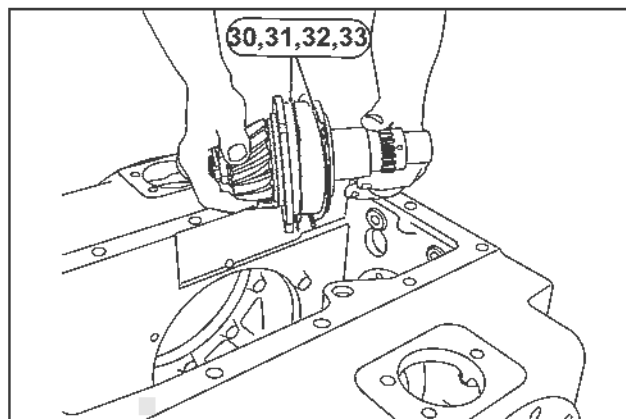


- 17 -Release and unscrew the bolts (2) and push out the shaft (1) with pinion and bearings towards final gear.

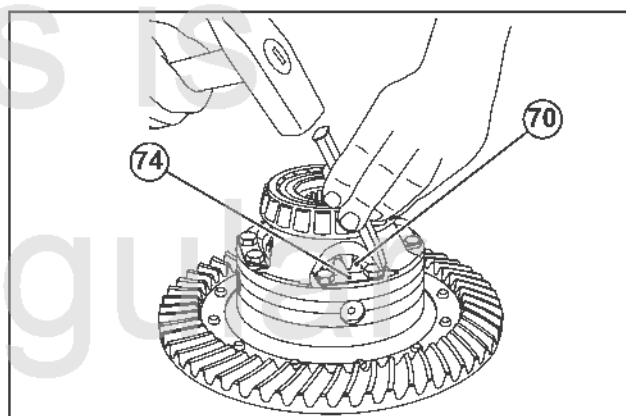


5.1 DISMANTLING OF FINAL GEAR group 153

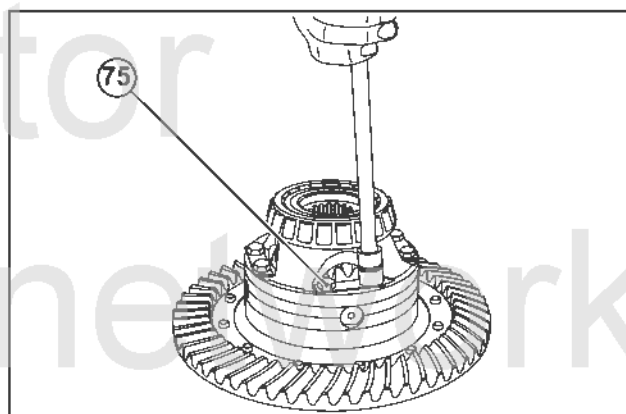
18 - Keep the spacers (30,31,32,33) in full number for subsequent assembly.



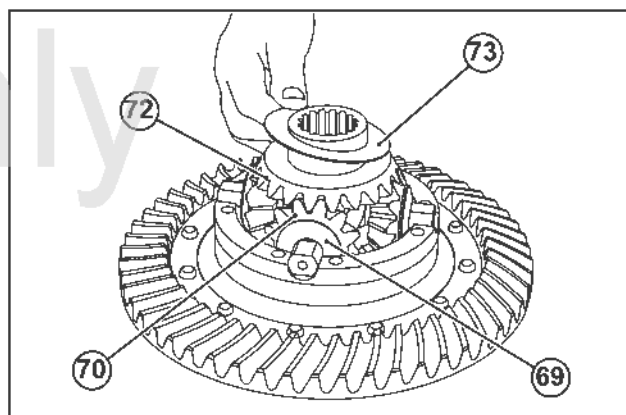
19 - Before dismantling of planet pinions (70) and planet gears (72) release the tab washers (74).



20 - The differential body can be divided after unscrewing the bolts (75).



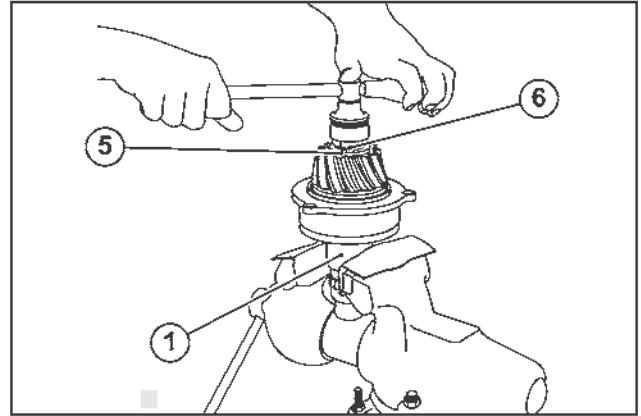
21 - As per wear state the single parts may be replaced: spherical pads (69), planet pinions (70), planet gears (72), and washer (73).



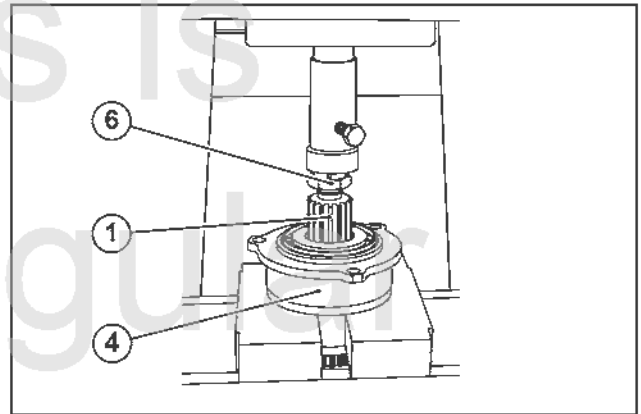
5.1 DISMANTLING OF FINAL GEAR group 153

22 -Before dismantling of pinion remove the cotter (7) from nut (6). Unscrew the nut, remove the washer (5) and pull the pinion off shaft (1).

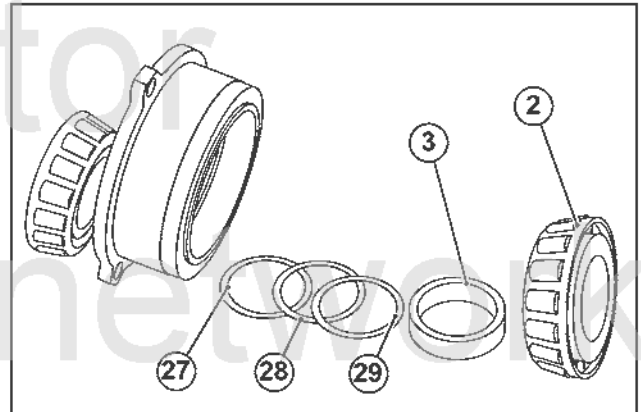
★ Place protectors from soft metal on jaws.



23 -Screw partly the nut (6) into shaft and push the shaft (1) out of sleeve (4) using a press.



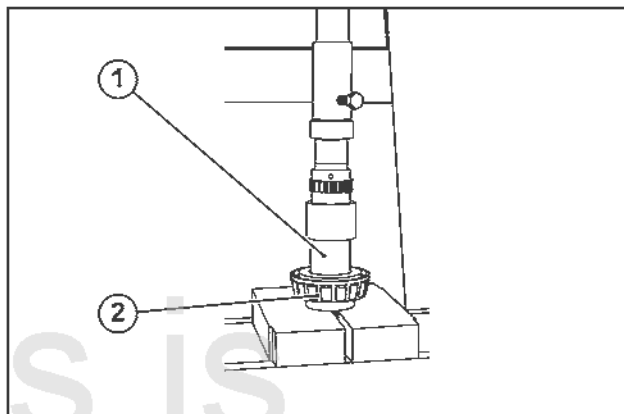
24 -After pressing of bearing inner rings (2) from shaft (1) keep all spacers (27,28,29) and lock ring (3) for reassembly.



This is
for regular
Zetor
service network
only

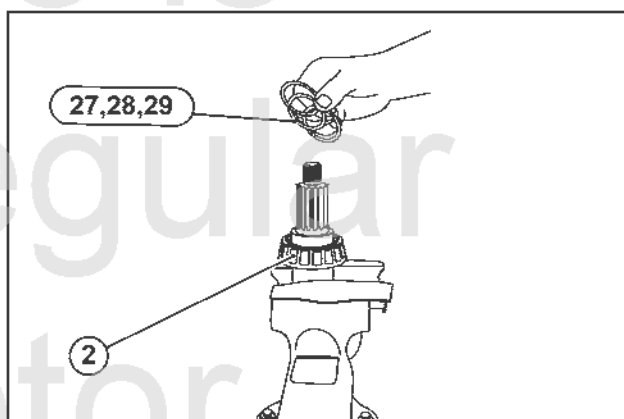
5.2 ASSEMBLY OF FINAL DRIVE group 153

- 1 - Press the inner ring (2) of bearing on pinion shaft (1).

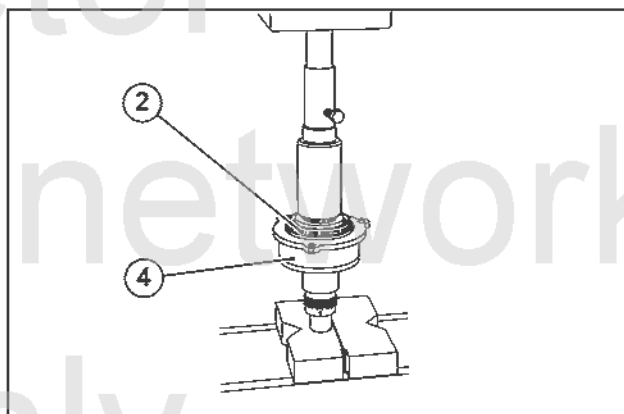


- 2 - Slide the spacers (27,28,29), which were dismantled, as well as lock ring (3) over inner ring (2) of bearing.

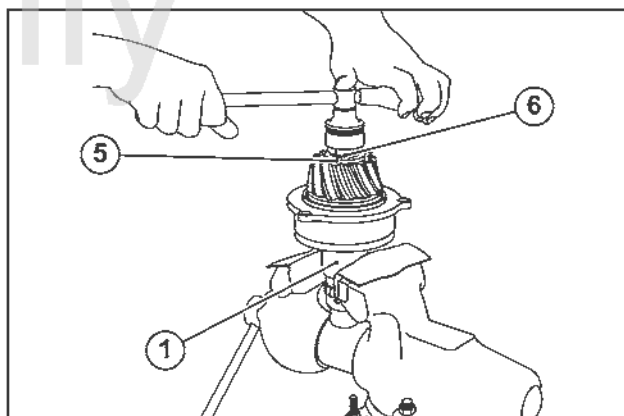
★ Choose number and size of spacers as per bearing clearance.



- 3 - After sliding of sleeve (4) and inner ring of the second bearing (2) press the whole assembly and check, if the sleeve (4) turns. The specified clearance is 0.0 to 0.05 mm. When the sleeve does not turn in press or in case of bigger clearance remove the sleeve and refit the clearance by adding or withdrawal of spacers.

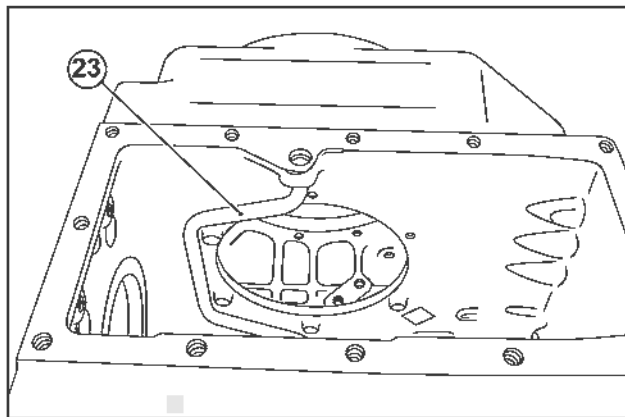


- 4 - Now slide on the pinion and washer (5), screw the nut (6) and secure it by cotter (7).

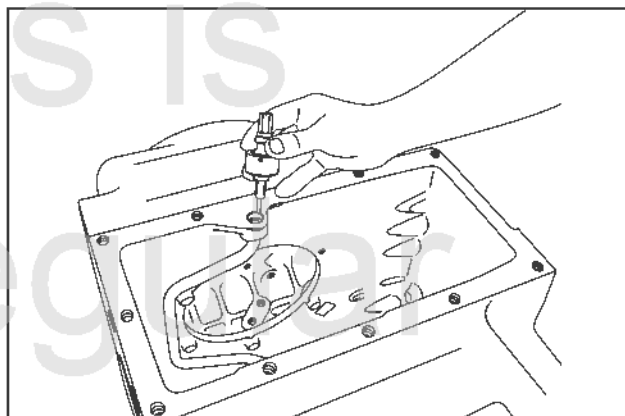


5.2 ASSEMBLY OF FINAL DRIVE group 153

- 5 - Before assembly of differential to the final gear check if the tube is not damaged (23). If damaged replace it.
★ The replacement procedure is specified in next steps (6,7,8 and 9).

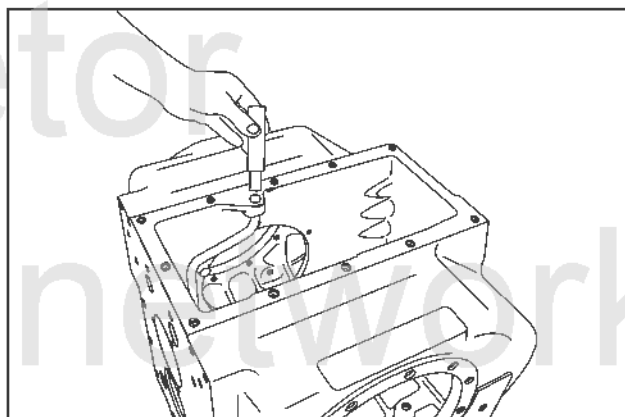


- 6 - Cut out the tube and remove pressed ends in case by means of tap so as not to damage the holes in case. Remove the tube from case.

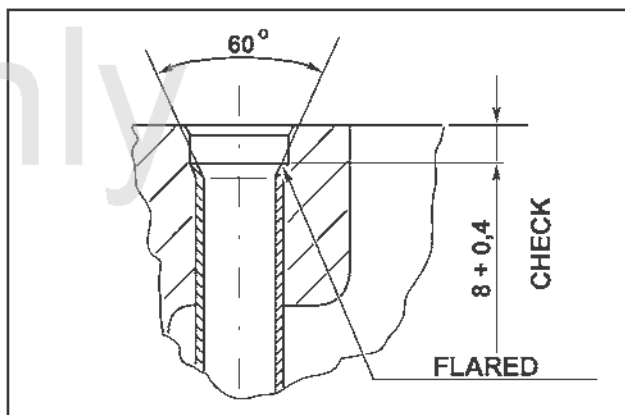


- 7 - Put in new tube (23) and press it towards case wall. Fit the tube in case using the tool for hydraulic tube pressing No. **78.942.625**.

- 8 - Flare it in the bottom part of case, too.



- 9 - To seal it use the pusher; the first one with cone end and then the second pusher with round one.



- 10 - Check the countersinking accuracy of both joints as per figure.

11 -The assembly of pinion with bushing (4) into final gear is made after thickness calculation of washer under bushing (4). The calculation is made in the following way as per figure:

- S – total thickness of washers
- $X = A - P$
- $S = H - (X + O)$
- $S = 185,??? - (X + 166 \text{ mm})$

$H = 185,??? \text{ Mm}$

It is marked on top part of final gear.

$O = 166 \pm 0.1 \text{ mm}$

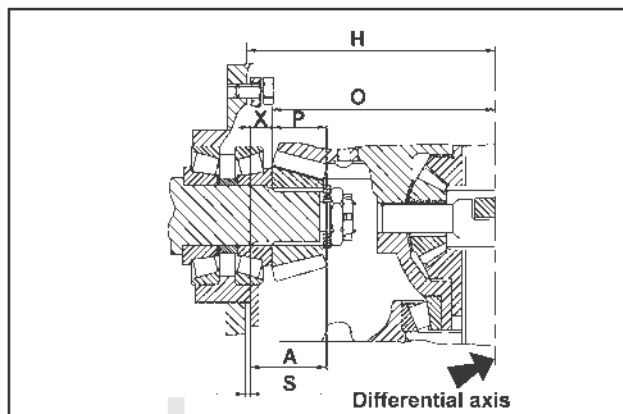
The dimension is given by manufacturer.

$P = 41 \pm 0.115 \text{ mm}$

The dimension is given by manufacturer.

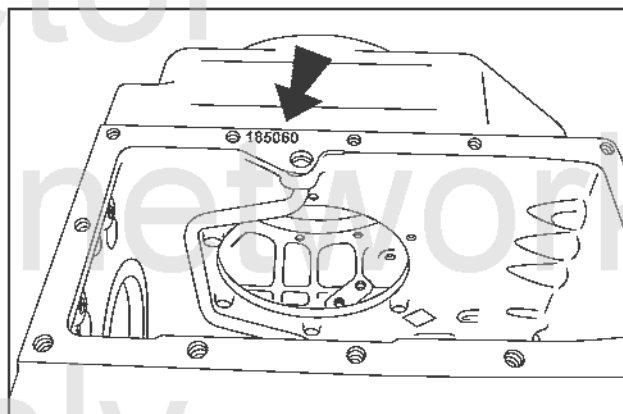
A = measured value

- ★ The correct engagement in tooth-
ing of level pinion and disc is pro-
vided by calculation and proper
installation

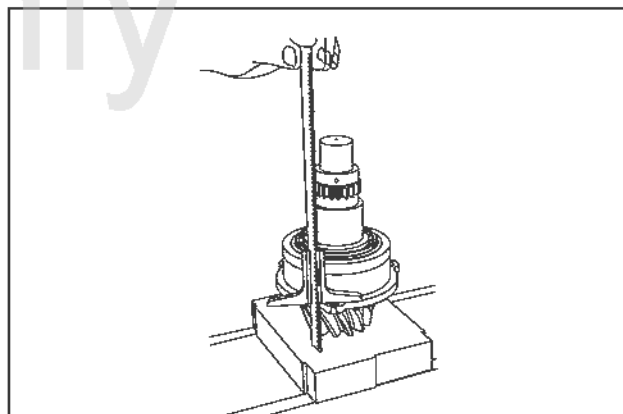


12 - $H = 185,060 \text{ mm}$

It is marked on top part of final gear.

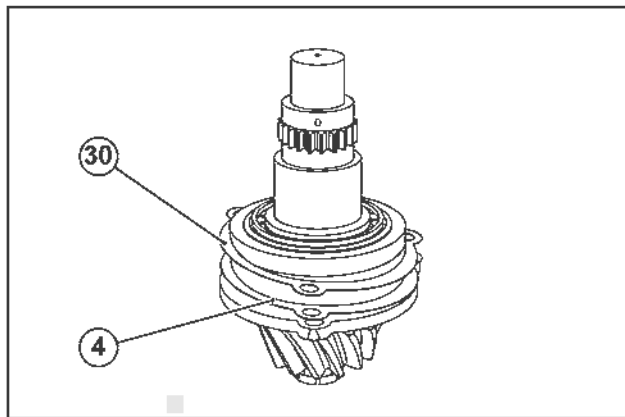


13 -The figure shows the measurement method of A value.

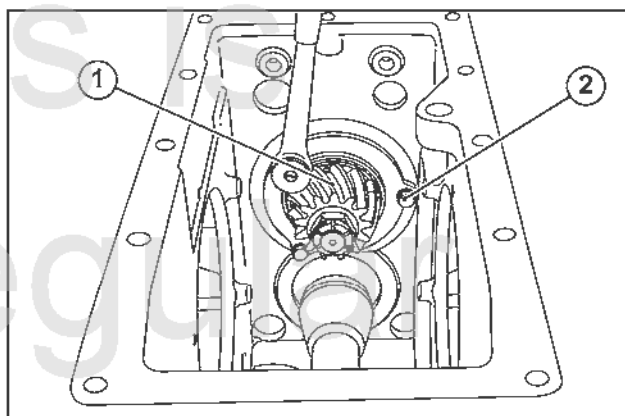


5.2 ASSEMBLY OF FINAL DRIVE group 153

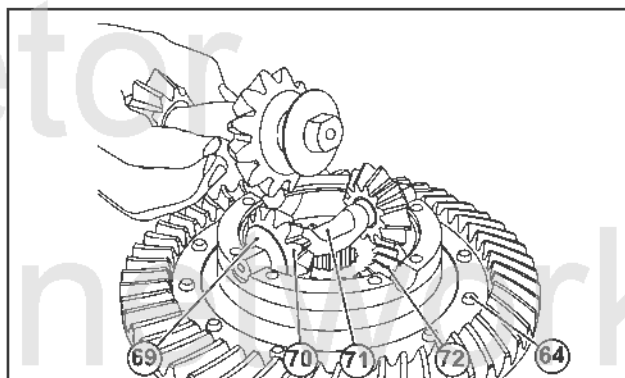
- 14 -Mount the required thickness of washers (30,31,32,33) to the bushing (4).



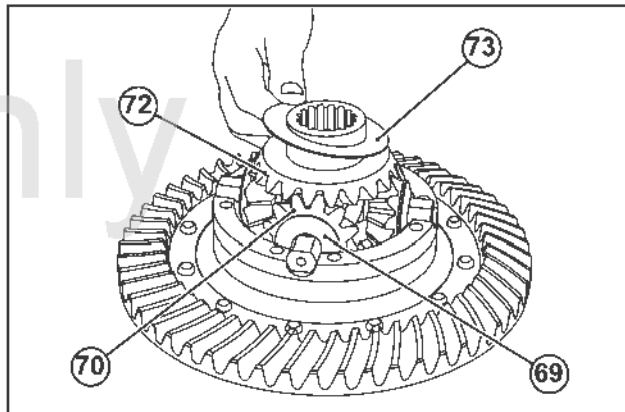
- 15 -Mount the pinion shaft assembly into the case and bolt it (2).



- 16 -Check if the ring gear is properly rivetted on differential body using rivets (64). Further ensure that the original pair of disc and pinion (80) is used for assembly. Put the planet gear (72), planet pins (71), pinion gears (70) and spherical washers (69).

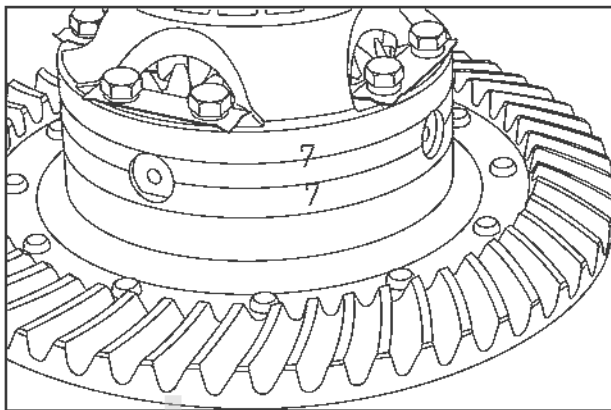


- 17 -Apply the second planet gear (72) and washer (73).

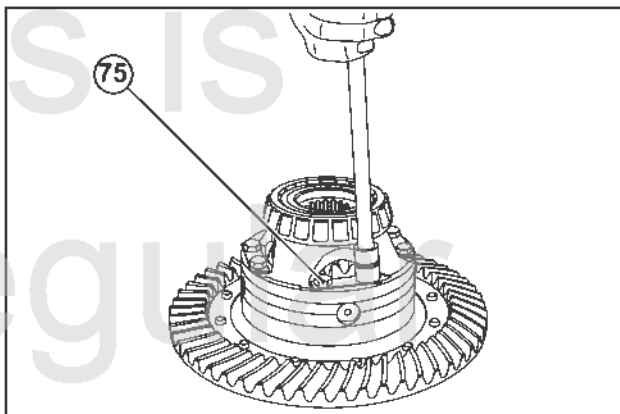


5.2 ASSEMBLY OF FINAL DRIVE group 153

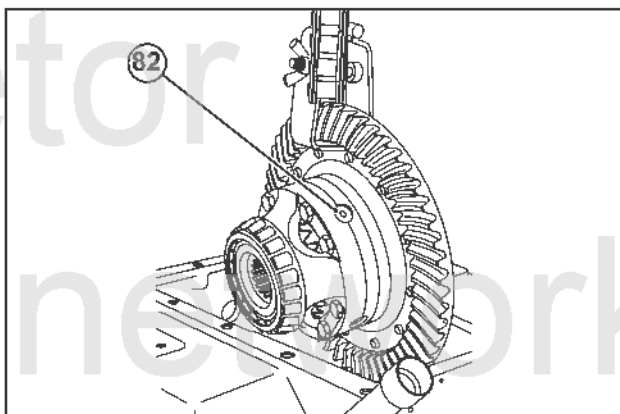
18 -Mount the differential so that both parts would have the same marking from manufacturer and these marks are placed against each other.



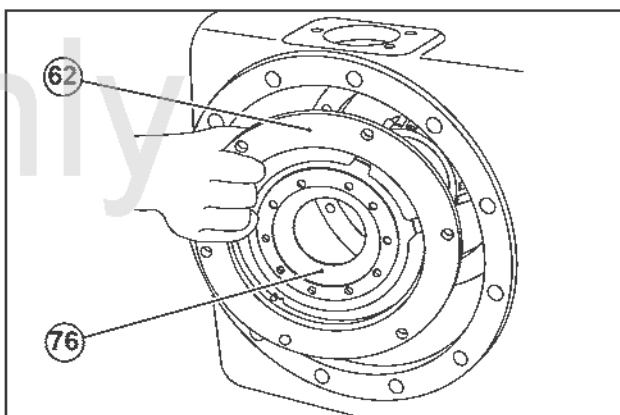
19 -Tighten bolts (75) and secure by tab washers (74).



20 -Put the differential assembly (82) together with inner rings of bearings (63) into final gear.

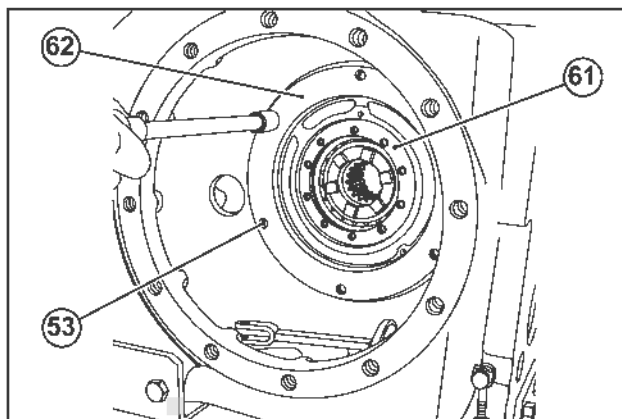


21 -Put the flange (62) together with covering cap (76) and external ring of bearing (63).

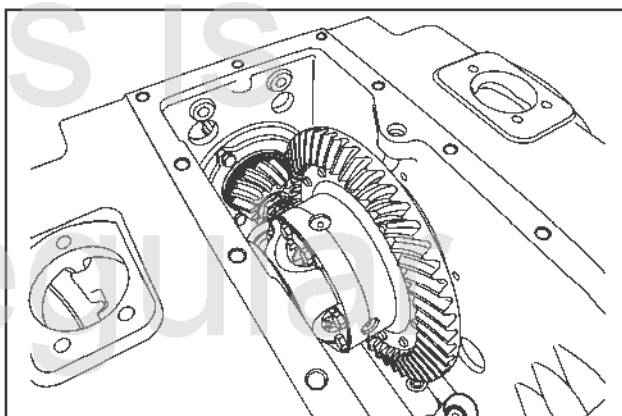


5.2 ASSEMBLY OF FINAL DRIVE group 153

22 -Use the same procedure for mounting of right flange.

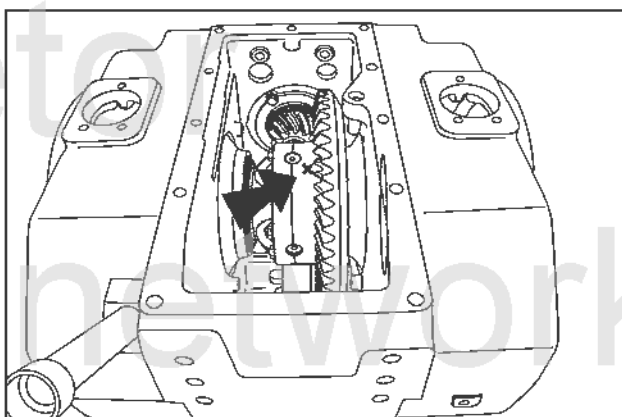


23 -If the pinion assembly was not made as per "calculation of spacers thickness" then lubricate the teeth of planet gear by Prussian and check if the starting curves on teeth of both gears are at the same point as if after startup from production.

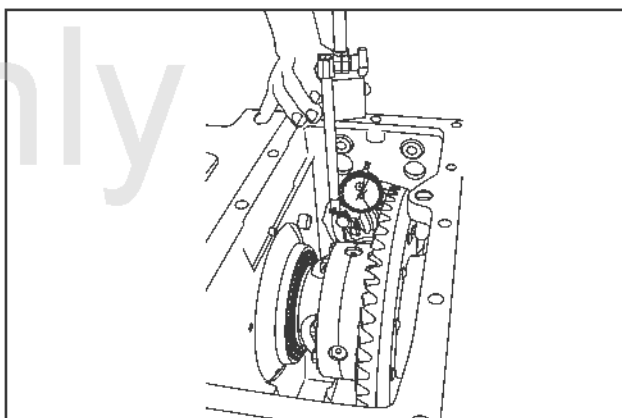


24 -Before observing the tooth clearance between pinion and ring gear (80) turn the differential body (81) with x mark towards pinion.

- ★ The mark is placed in point of the highest shimmy of ring gear!

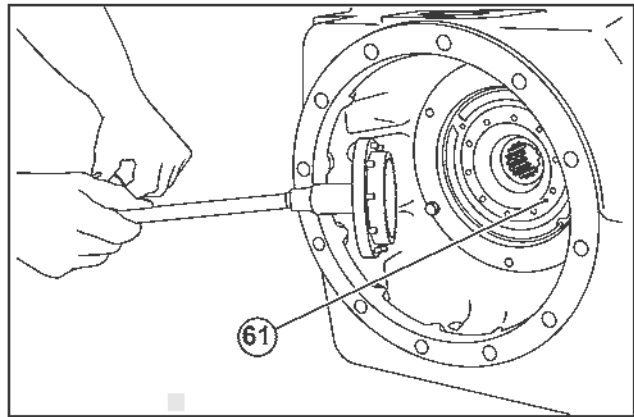


25 -Find the tooth clearance using indicator placed by measuring tip perpendicular to the pinion teeth. The guide value is 0.2 to 0.3 mm.



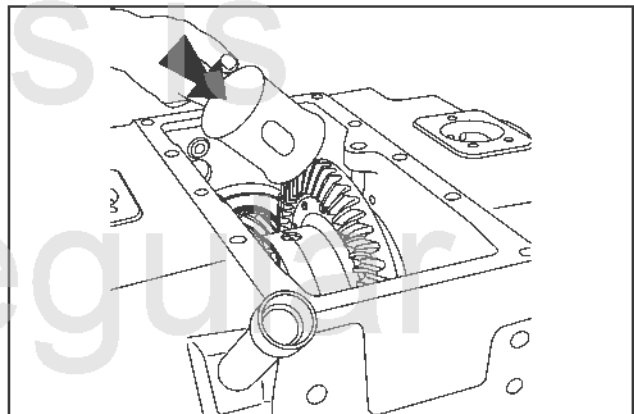
5.2 ASSEMBLY OF FINAL DRIVE group 153

- 26 - Adjust the clearance by means of adjusting nuts (61), those you apply to move the ring gear to gear mesh or from gear mesh with pinion.

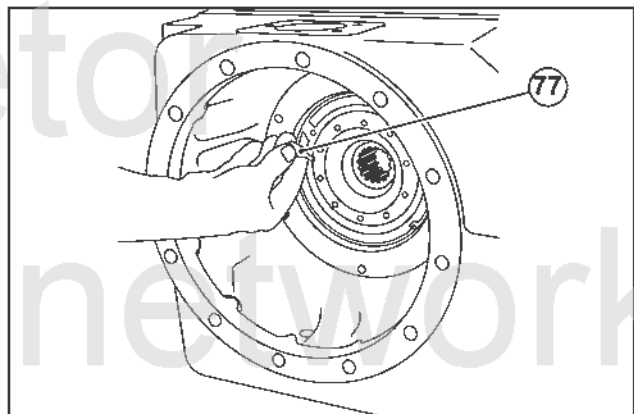


- 27 - Before any move of differential body by means of nuts tap by mallet made of soft metal on disc in order to release the rolling bodies in bearings.

- ★ Check if the gears of the final gear can freely move in all range. The specified clearance in cone bearings is 0.0 to 0.5 mm.



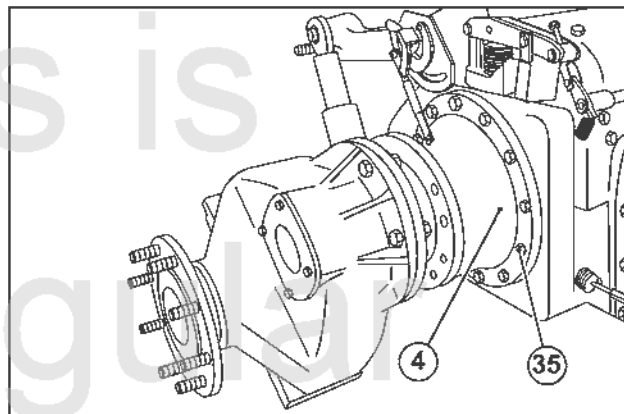
- 28 - Secure the adjusting nuts in final position by lock (77).



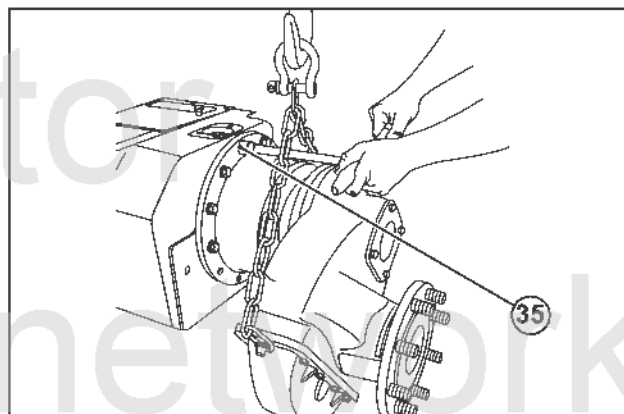
This is
for regular
Zetor
service network
only

6.1 DISMANTLING OF REAR AXLE SHAFT AND FOOT BRAKE groups 161 and 227

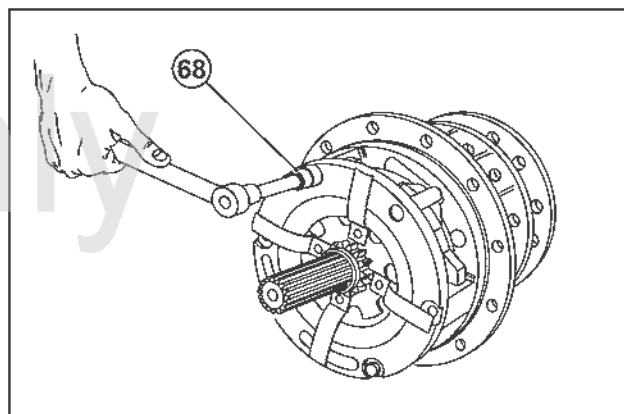
- 1 - Wedge the final gear by car jack before dismantling of rear axle shaft from tractor.
- 2 - Dismantle the rear wheel.
- 3 - Drain the oil.
- 4 - Release the hydraulic brake control.
- 5 - Release the bolts (35) connecting the sleeve of axle shaft (4) with final gear.



- 6 - Due to shop possibilities lift or wedge the axle shaft and unscrew the bolts (35).
- 7 - Dismantle the rear axle shaft from final gear and put the axle shaft to dismantling place.

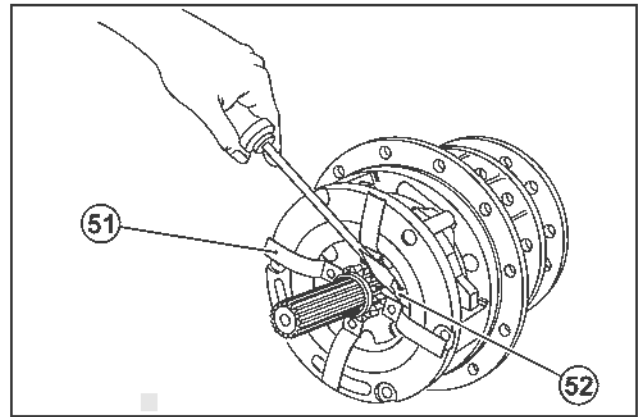


- 8 - Release and unscrew the bolts (68).

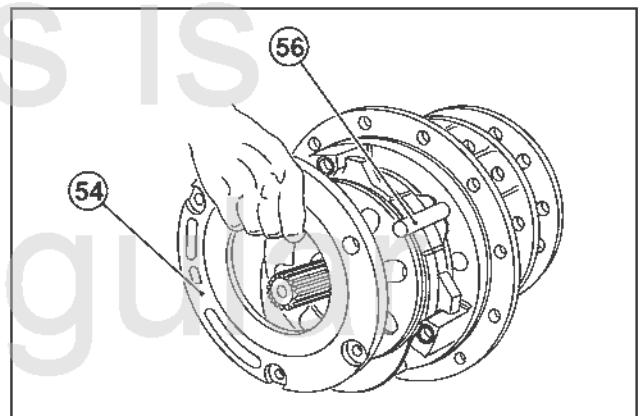


6.1 DISMANTLING OF REAR AXLE SHAFT AND FOOT BRAKE groups 161 and 227

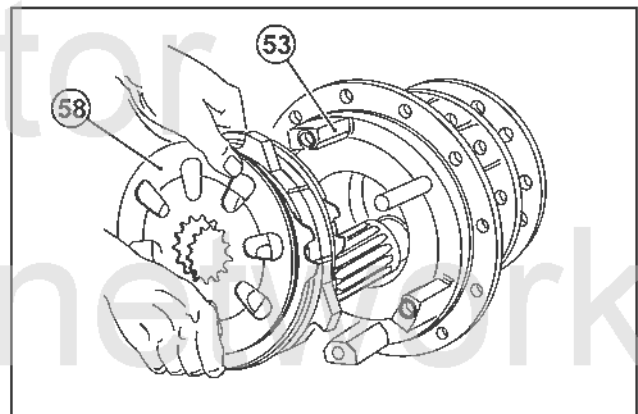
9 - Release and remove the flexible clips by means of screwdriver and dismantle the clarifier (51).



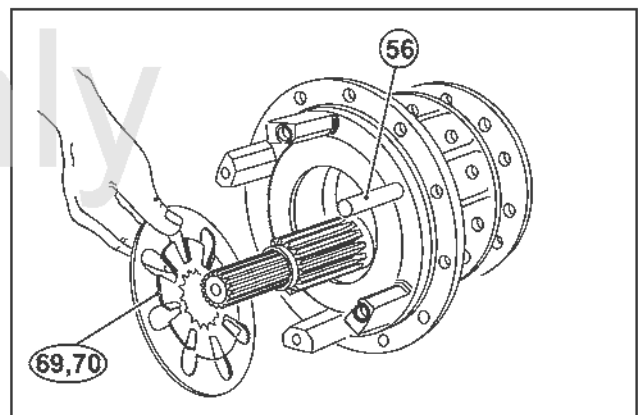
10- Pull the basic plate (54) off pin (56).



11- Remove the disc brake (58) from brake basket (53).

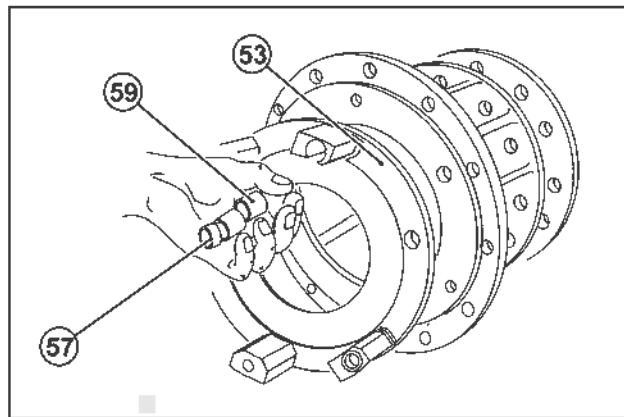


12- Remove the brake plate (60) with blade wheel (69) for left brake and (70) for right brake and pin (56) from brake basket.

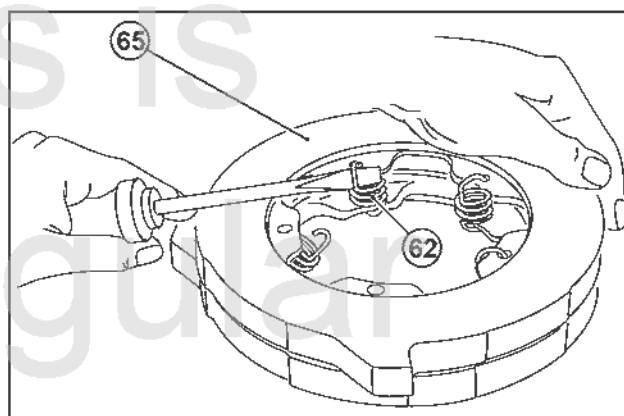


6.1 DISMANTLING OF REAR AXLE SHAFT AND FOOT BRAKE groups 161 and 227

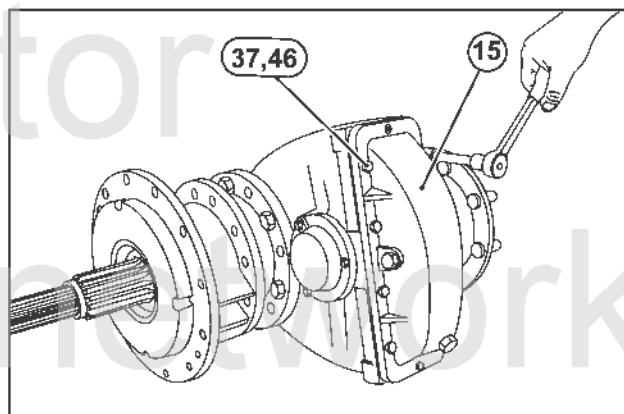
- 13- Push the washer (57) and rollers (59) from brake basket.



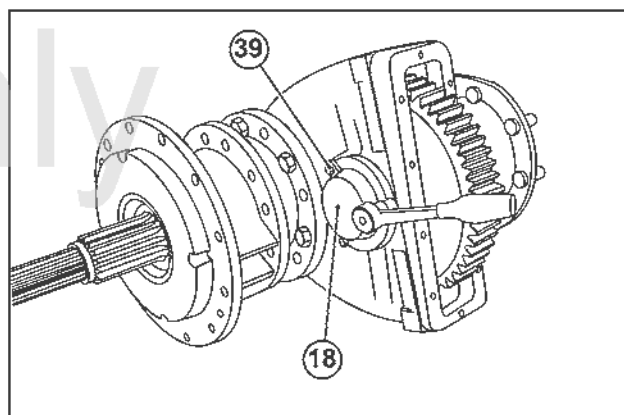
- 14- In case of failure on pressure disc (65) release the springs (62) and you can replace the rollers (63).



- 15- Release and unscrew the bolts (37,46) and remove the portal cover (15).

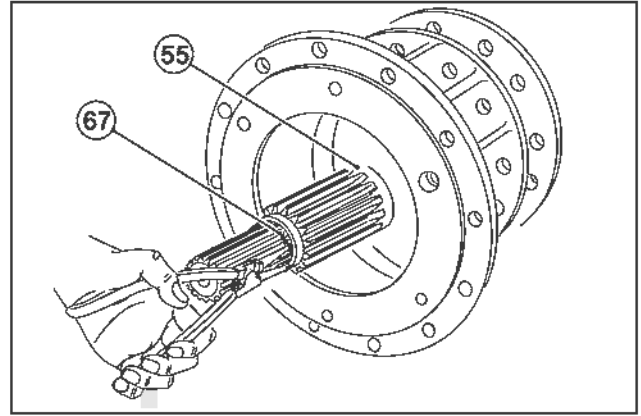


- 16- Release and unscrew the bolts (39) and remove the cover (18).

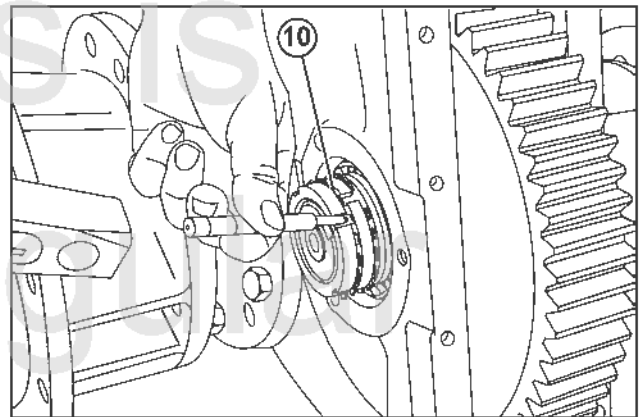


6.1 DISMANTLING OF REAR AXLE SHAFT AND FOOT BRAKE groups 161 and 227

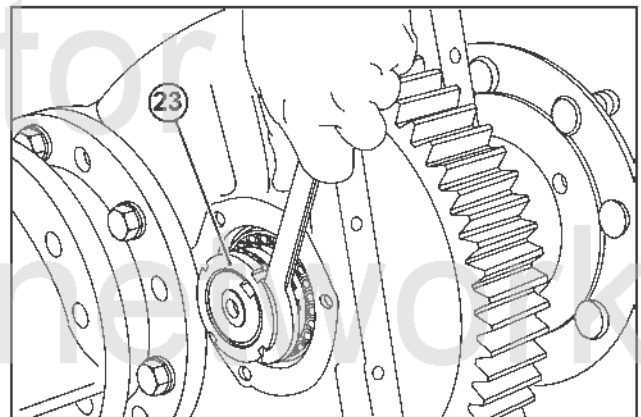
17- Remove the circlip (67) from differential shaft and pull off the clutch plate hub (55).



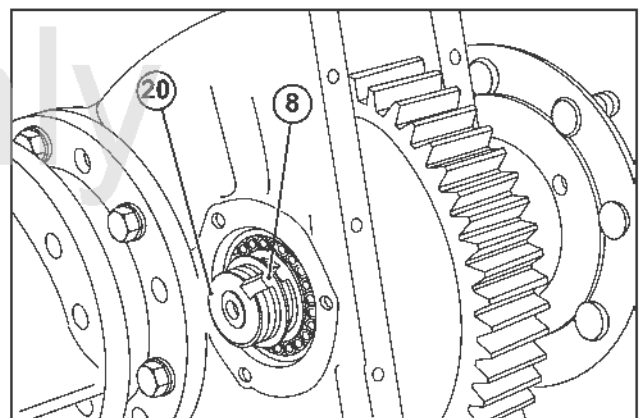
18- Unlock the lock washers (10).



19- Release and unscrew the nuts (23).

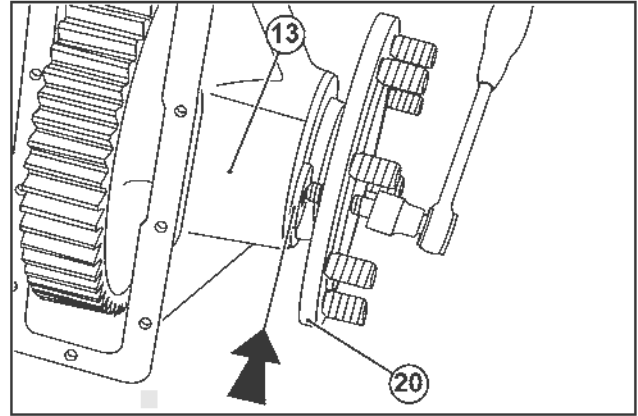


20- Remove the ring (8) from wheel shaft (20).

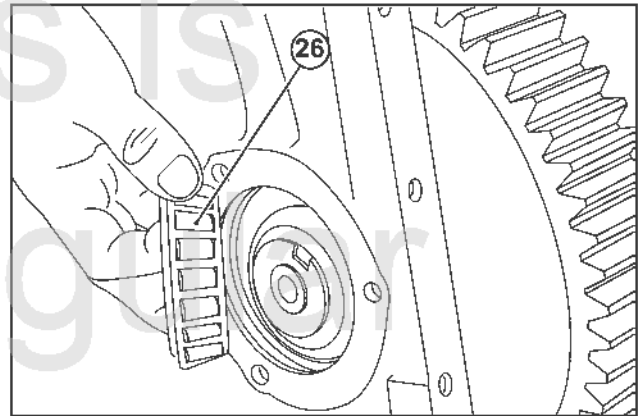


6.1 DISMANTLING OF REAR AXLE SHAFT AND FOOT BRAKE groups 161 and 227

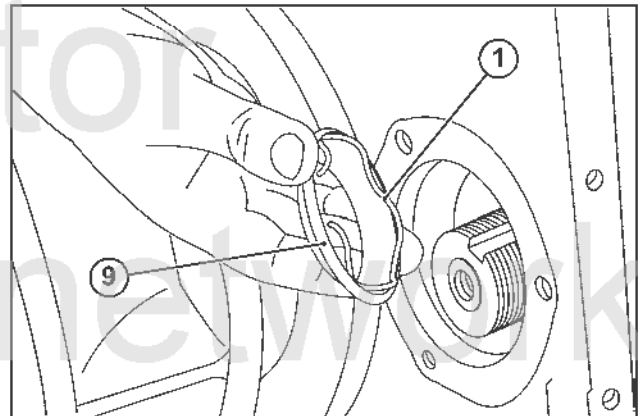
21- Slip out partly the wheel shaft (20) by means of bolts M16x1.5 backed by portal body (13).



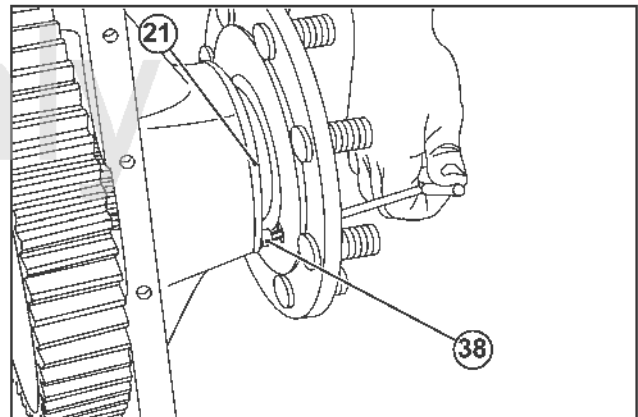
22- Remove bearing (26) from wheel shaft.



23- Remove spacing ring (9) with spring (1) from wheel shaft.

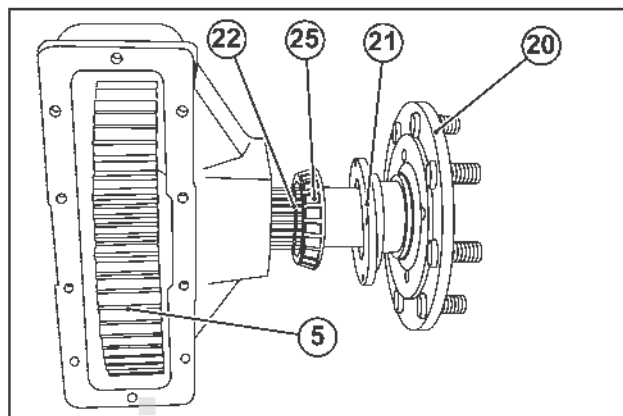


24- Release and unscrew the bolts (38) of the front cover (21).

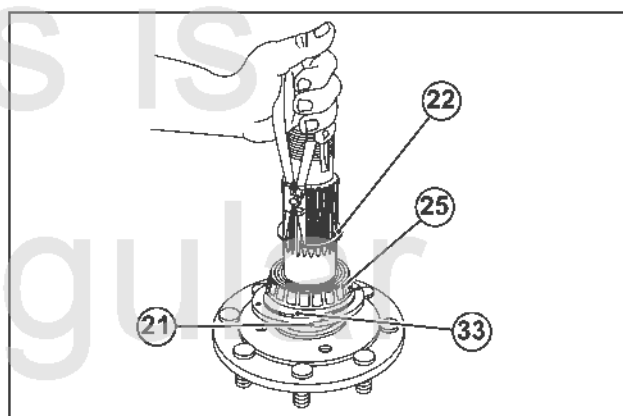


6.1 DISMANTLING OF REAR AXLE SHAFT AND FOOT BRAKE groups 161 and 227

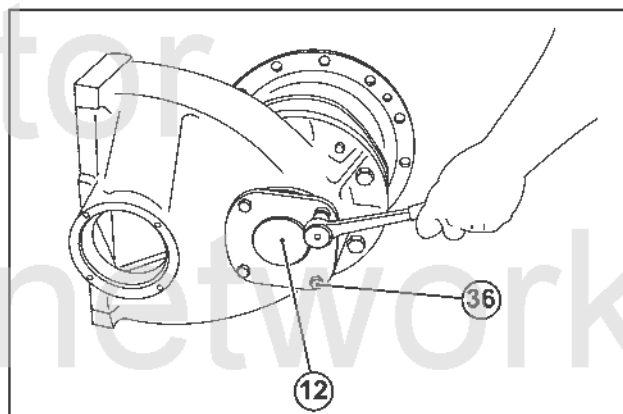
25- After releasing of wheel shaft (20) with front cover (21), bearing (25) and circlip (22) remove the gear wheel (5) from semi-axle.



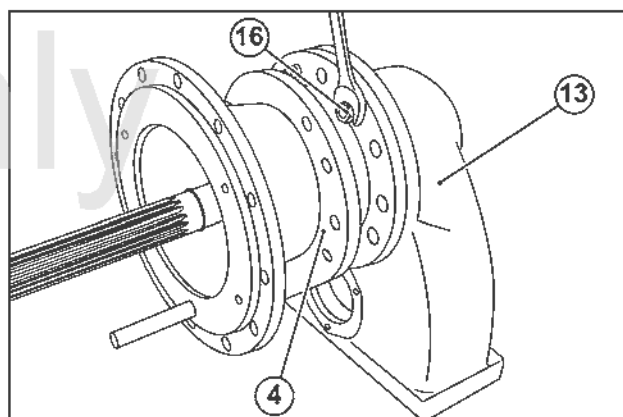
26- The bearing (25) can be dismantled after removal of circlip (22) and as well as oil seal (33) in front cover (21) as per its wear state.



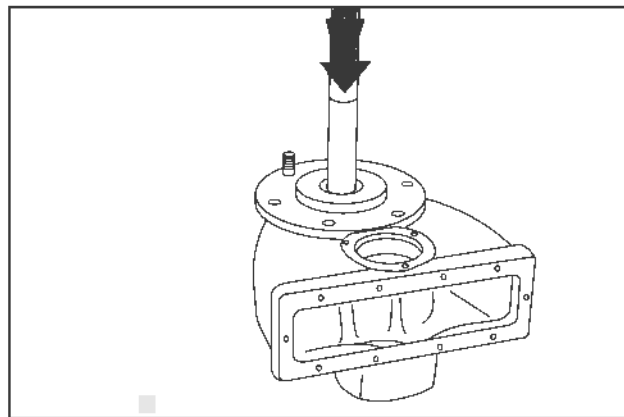
27- Release and unscrew the bolts (36) and remove the top cover (12).



28- Release and unscrew the bolts (16) connecting the rear axle casing (4) with portal (13).



29- Put the portal into press and press out the differential shaft (6,42).



This is
for regular
Zetor
service network
only

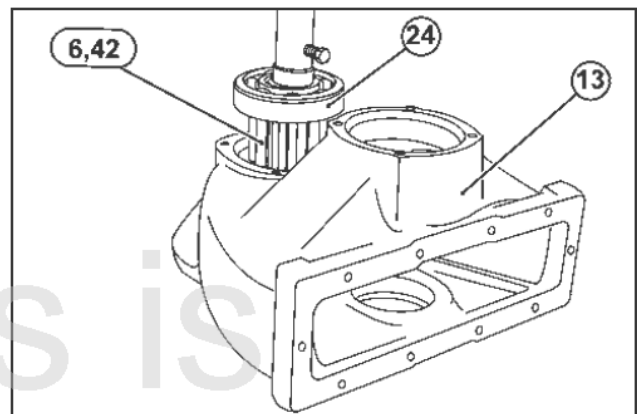
This is
for regular
Zetor
service network
only

6.2 ASSEMBLY OF REAR AXLE SHAFT AND FOOT BRAKE groups 227 and 161

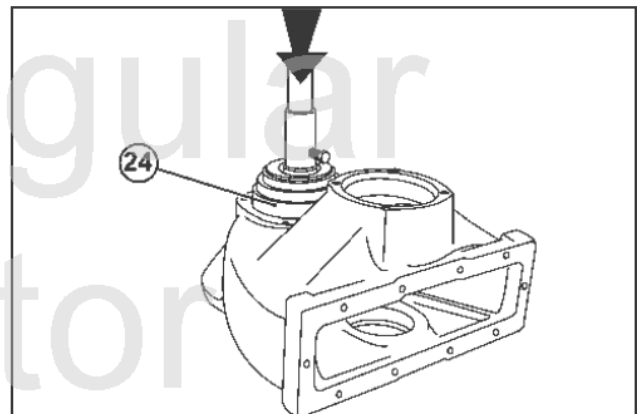
- 1 - Press the differential shaft (6,42) with bearing (24) /not shown on picture/ and other prepared bearing (24) into portal (13).



As per requirements for max. speed use always pair of gear wheel and differential shaft as follows: (5,6) or (42,43).



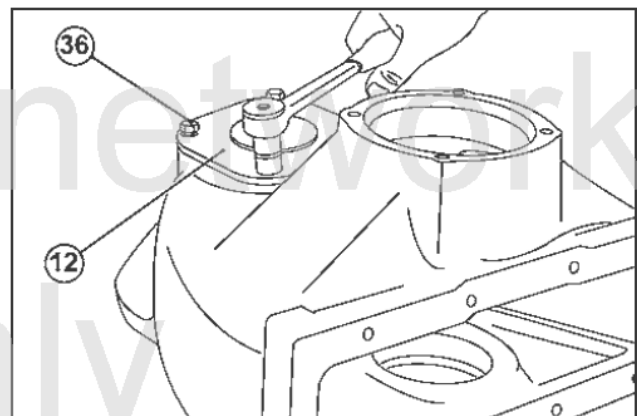
- 2 - Press on the external ring of the second bearing (24) using corresponding tool.



- 3 - Grease the contact surfaces of portal and top cap (12) and portal (13) with Rhodoseal sealant and fix the cap to the portal by bolts (36).



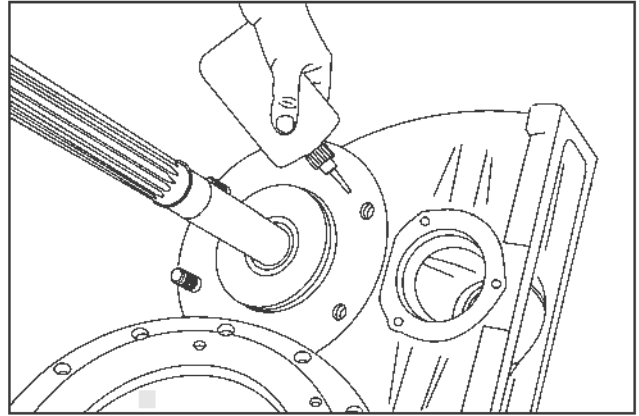
Cap: Rhodoseal



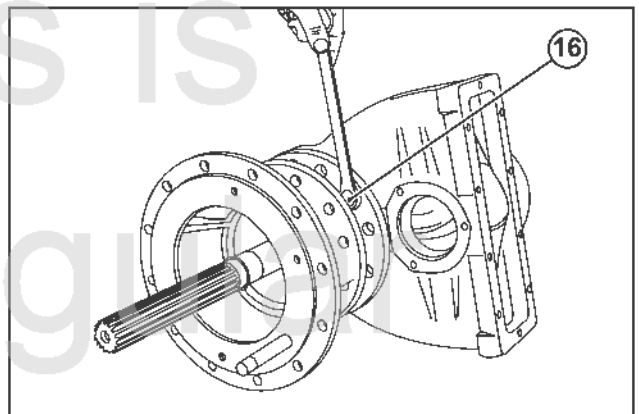
6.2 ASSEMBLY OF REAR AXLE SHAFT AND FOOT BRAKE groups 227 and 161

- 4 - Grease the contact surfaces of portal and rear axle casing (4) by Loctite 277 sealant and slide properly over each other.

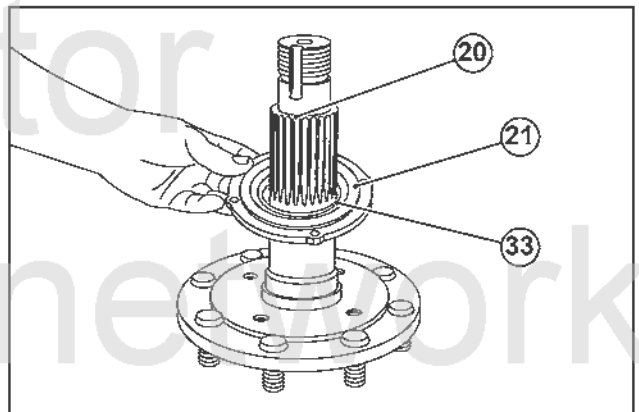
 Portal: Loctite 277



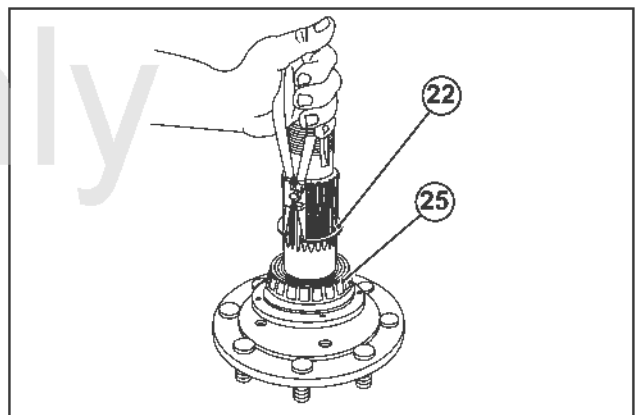
- 5 - Fasten both parts by means of bolts (16) and other bolts (17).



- 6 - Check eventually replace the gasket seal (33) in front cover (21) and slide it on wheel shaft (20).



- 7 - Press the inner bearing ring (25) on wheel shaft and mount the circlip (22).

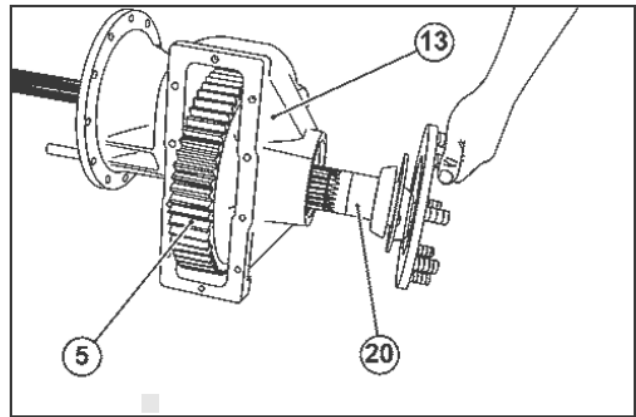


6.2 ASSEMBLY OF REAR AXLE SHAFT AND FOOT BRAKE groups 227 and 161

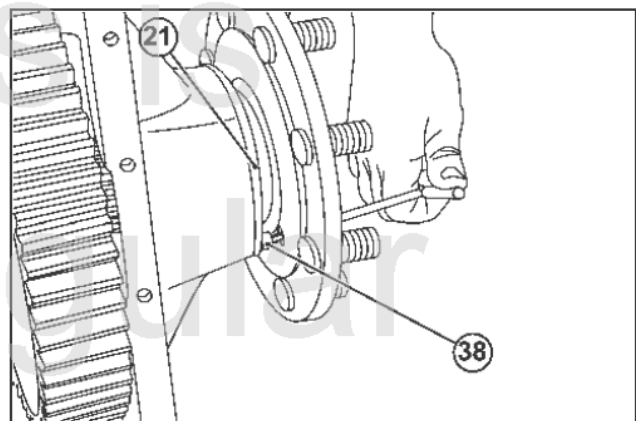
- 8 - Put the gear wheel (5) into portal (13) and slide on the assembled wheel shaft (20). Grease the contact surface of front cover and portal.

! As per requirements for max. speed use always pair of gear wheel and differential shaft as follows: (5,6) or (42,43).

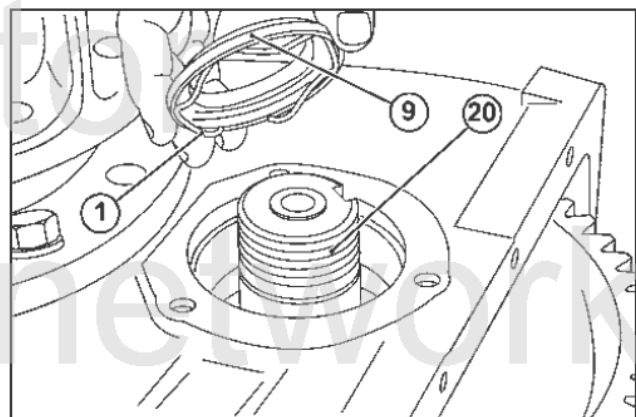
 Contact surfaces: Rhodoseal



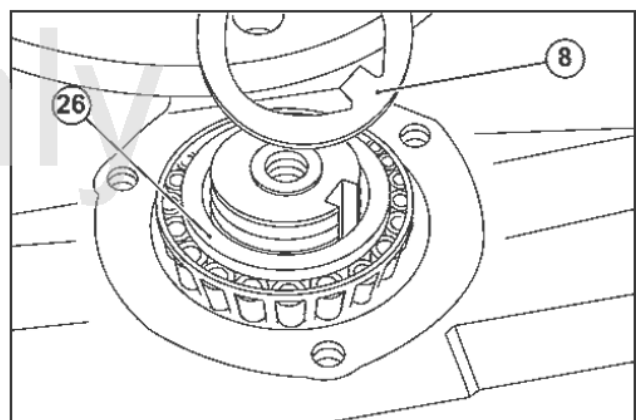
- 9 - Mount the front cover (21) to the portal using bolts (38).



- 10- Place carefully the spacing ring (9) with spring (1) on wheel shaft.



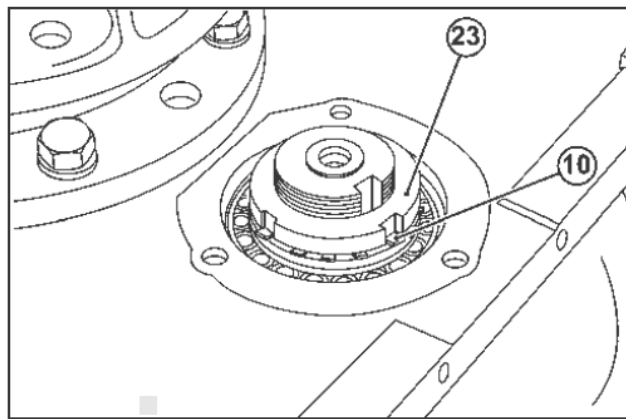
- 11- After mounting the bearing (26) place the ring (8) on wheel shaft.



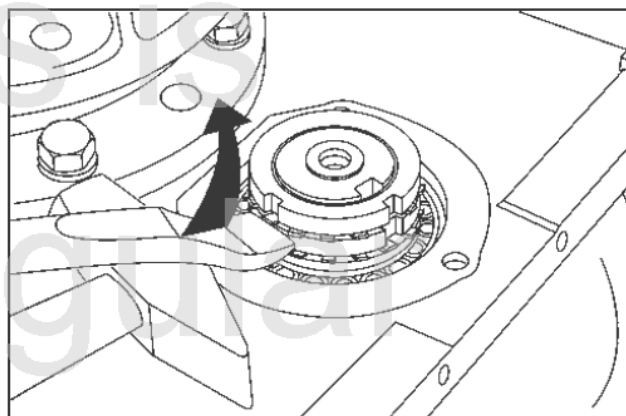
6.2 ASSEMBLY OF REAR AXLE SHAFT AND FOOT BRAKE groups 227 and 161

12- Place the lock washer (10) and nut (23), tighten it properly and then release about 1/3 round in order to reach bearing clearance 0.05%.

- ★ Just before assembly of another lock washer and nut check, if the spacer (9) with spring (1) is correctly positioned.

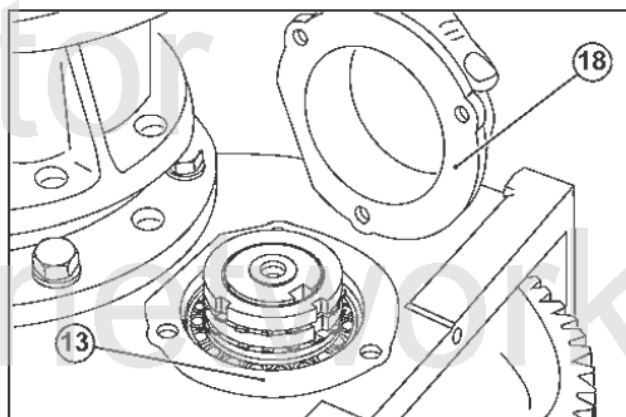


13- Place on another lock washer and nut and tighten it properly. Then secure both lock washers by their kick-up to the notch groove of nuts.



14 -Grease the contact surfaces of rear cover (18) and portal (13) by Rhodoseal and mount the cover by bolts (39)

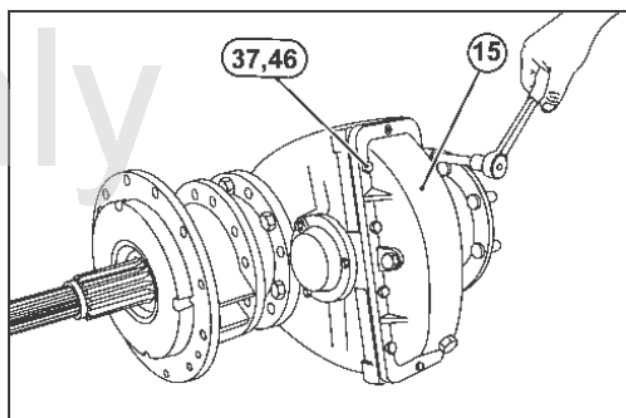
- 🔧 Contact surfaces: Rhodoseal



15- Grease the contact surfaces of cover and portal by Rhodoseal. Apply the portal cover (15) and mount it by bolts (37,46).

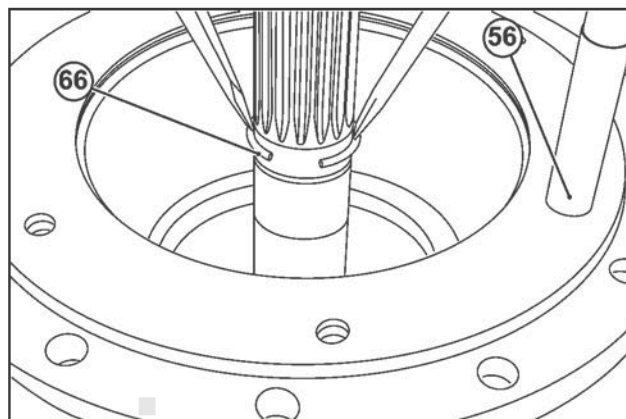
- ⚠ Mount the covers on tractor as per position of check holes; they are left and right ones!

- 🔧 Contact surfaces: Rhodoseal

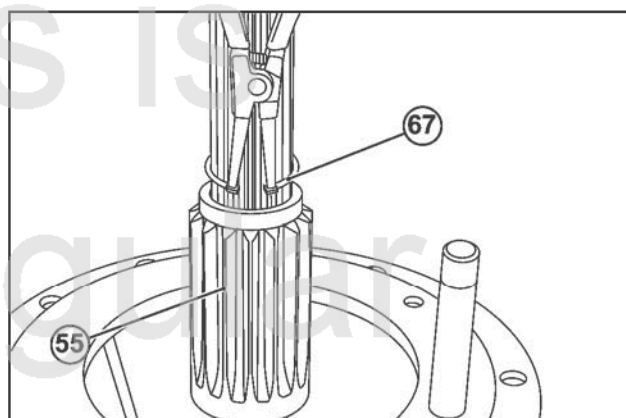


6.2 ASSEMBLY OF REAR AXLE SHAFT AND FOOT BRAKE groups 227 and 161

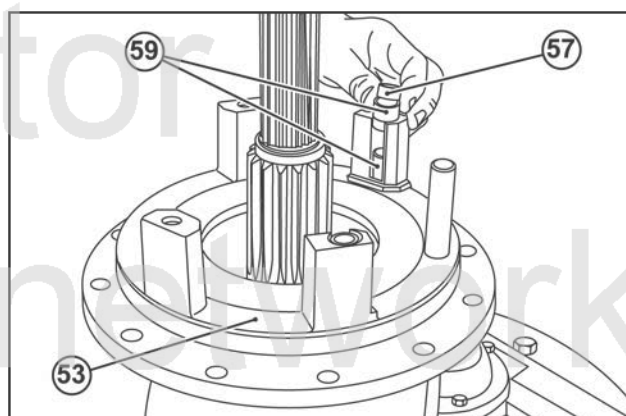
16- If the circlip (66) was removed slide it on differential shaft. Put the pin (56) into the rear axle casing so that its smaller diameter would be prepared for basic plate.



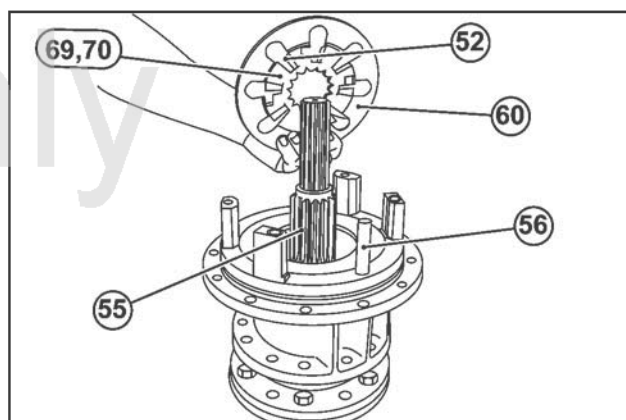
17- Push the clutch plate hub (55) on the differential shaft and secure its position by lock ring (67).



18- Apply the brake basket (53) to the rear axle casing. Insert two rollers (59) and washer (57) to the bored holes in brake basket (53) each.



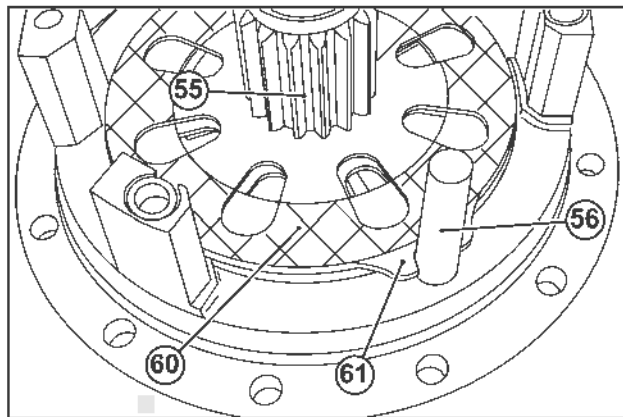
19- Slide the brake plate with lining (60) on clutch plate hub (55) on which the blade wheel (69) for left brake and blade wheel (70) is mounted using flexible clips.



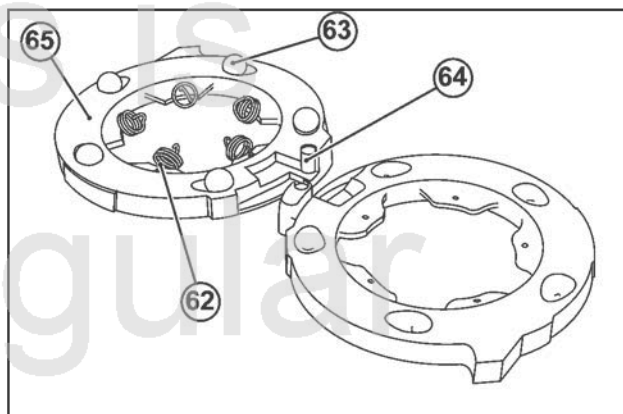
6.2 ASSEMBLY OF REAR AXLE SHAFT AND FOOT BRAKE groups 227 and 161

20- Apply firm plate (61) and other plate with lining (60) to the clutch plate hub (55) and pin (56).

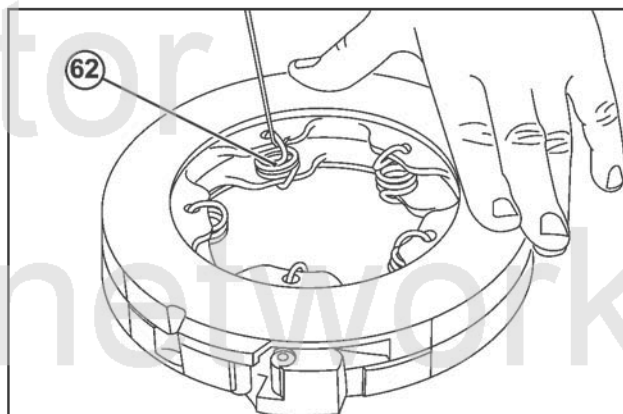
- ★ The plates with lining have to be placed so that the holes are corresponding for good oil flow.



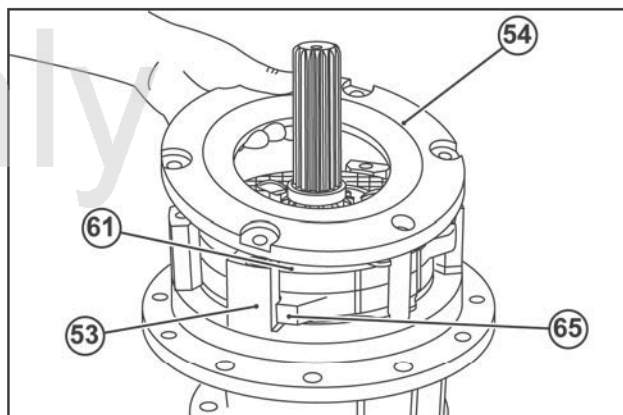
21- If the pressure disc assembly (65) is not prepared for mounting apply five balls (63) to one component; slide five springs (62) on one disc and slide the roller (64) into each disc.



22- Apply the plates to each other and hang up five springs (62).

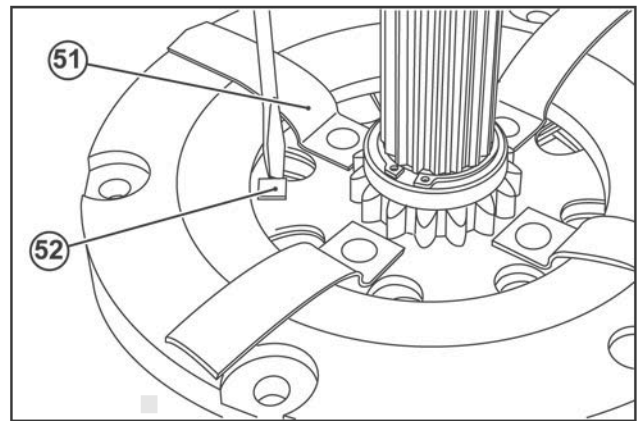


23- Insert the pressure disc assembly, plate with lining (60), to the brake basket (53), firm plate (61), and basic plate (54) to the brake basket (53).

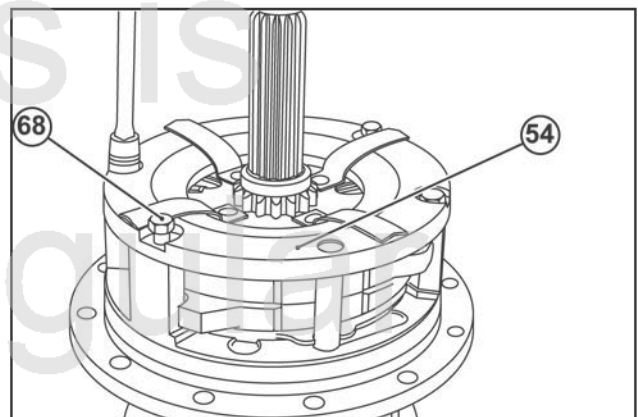


6.2 ASSEMBLY OF REAR AXLE SHAFT AND FOOT BRAKE groups 227 and 161

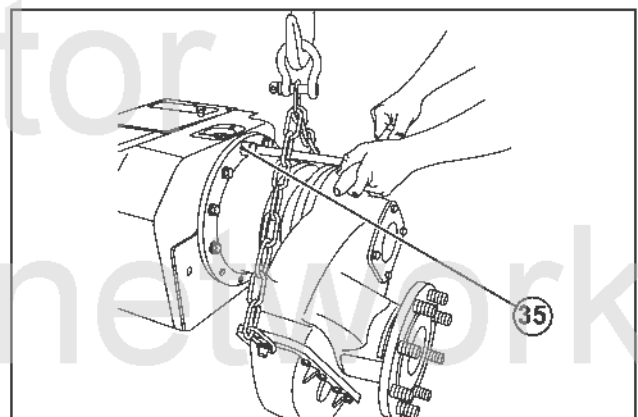
24- Fix the clarifier assembly (51) by means of flexible clips (52).



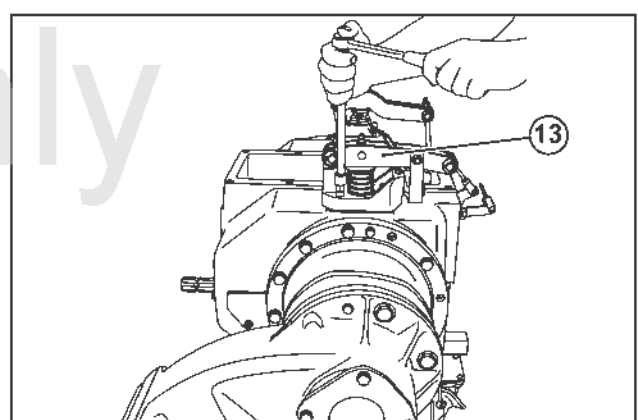
25- Fix the basic plate (54) to the rear axle casing by means of four bolts (68).



26- Hang the axle shaft and screw in the complete axle shaft to the final gear by bolts (35).



27- Mount the control assembly (13) of the foot disc brake (group 227).

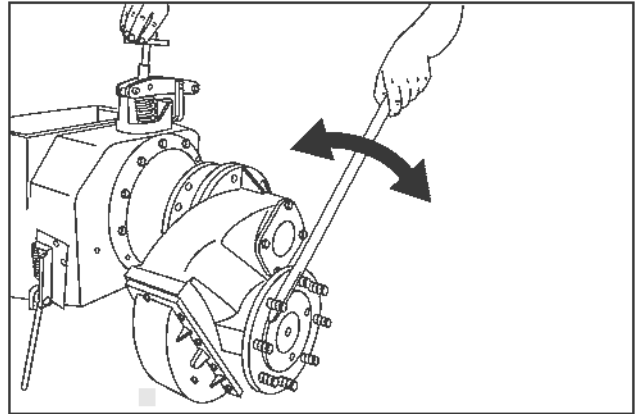


6.2 ASSEMBLY OF REAR AXLE SHAFT AND FOOT BRAKE groups 227 and 161

28- After assembly of foot brake control make the basic brake adjustment so that you turn the wheel shaft using lever and adjust the action of thrust spigot control.

- The permissible resistance value on lever is 300 Nm.

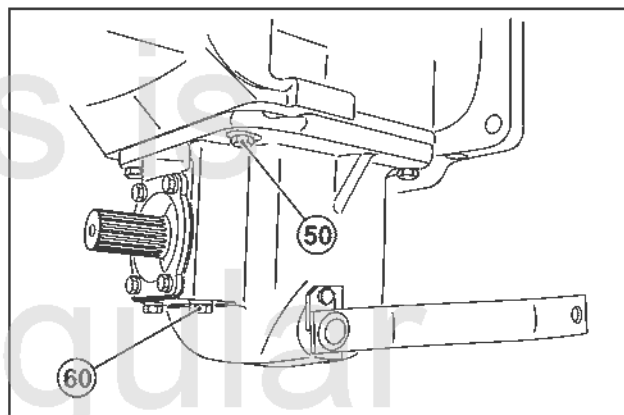
29- Bleed the slave cylinder of brake.



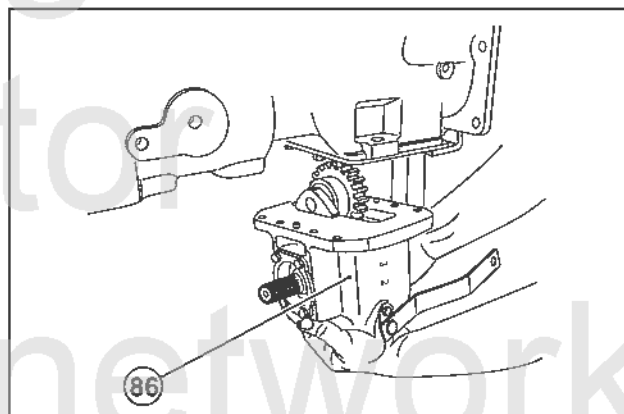
This is
for regular
Zetor
service network
only

7.1 DISMANTLING OF CARRARO AXLE OUTLET BOX group 185

- 1 - Dismantle the connecting shaft with complete carrier (105).
- 2 - Drain oil from gearbox by unscrewing the plug on sump of outlet box.
- 3 - Disconnect the control of steering lever on outlet box.
- 4 - Wedge the jack under body of outlet box.
- 5 - Release and unscrew four bolts (50) and four bolts (60).



- 6 - Remove carefully the outlet box (86) from gearbox.

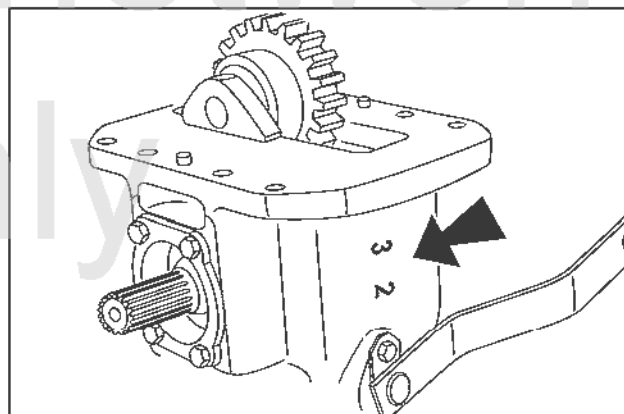


- 7 - While dismantling check a number stamped on box side, marking number of teeth of outlet wheel belonging to tyre size on front axle.

Figure 2 indicates 22 teeth of outlet wheel (85).

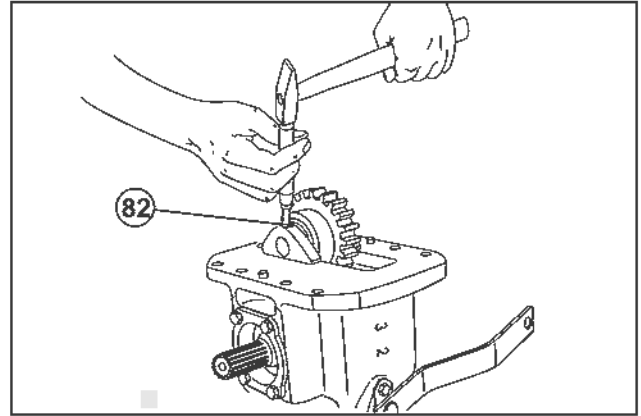
Figure 3 indicates 22 teeth of outlet wheel (97).

- ★ Numbers of teeth on wheel (85) are given in this manual introduction.

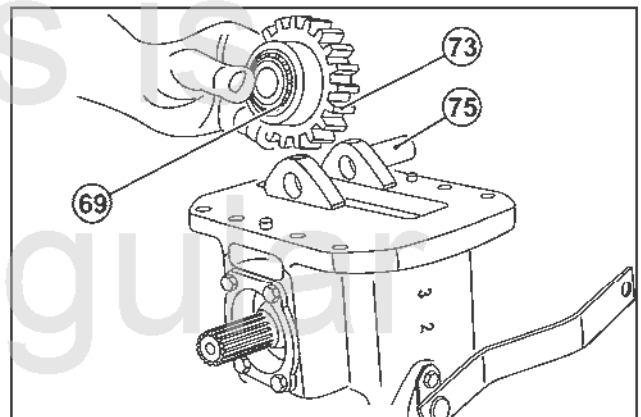


7.1 DISMANTLING OF CARRARO AXLE OUTLET BOX group 185

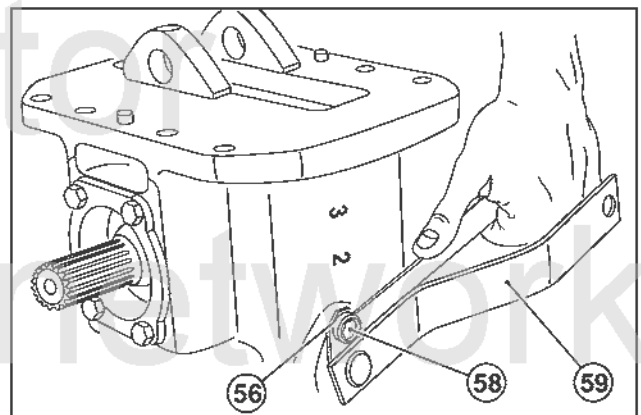
- 8- Before pressing out the pin (75) press the spigot (82) to the pin.



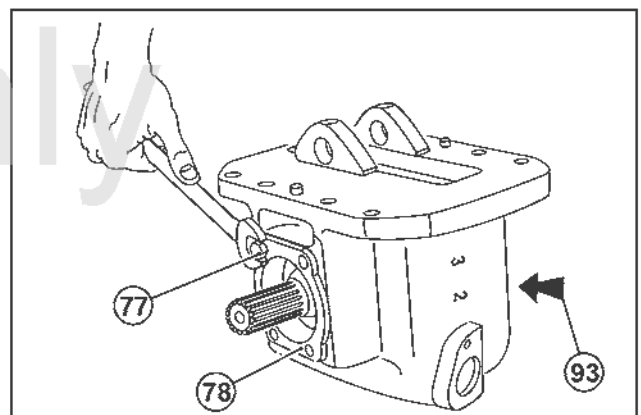
- 9- Press out the pin (75) and remove the idle gear (73) with bearings (69).



- 10- Unscrew the bolt (58) and remove stopper (56) and release the complete shaft (59).

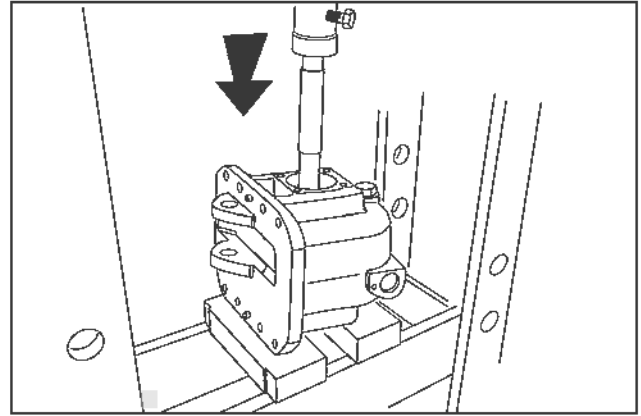


- 11- Unscrew eight bolts (77) and remove the caps (78,93) from both box sides.

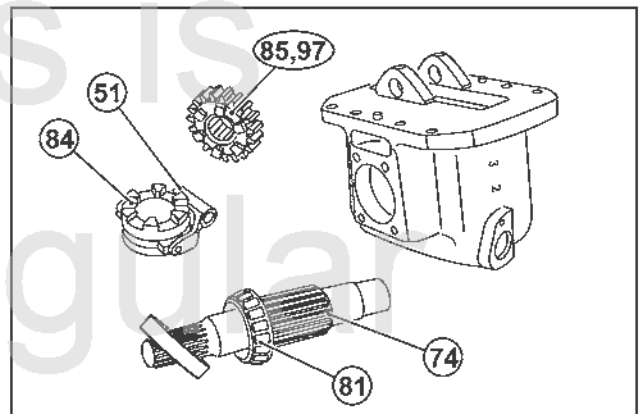


7.1 DISMANTLING OF CARRARO AXLE OUTLET BOX group 185

12- Press out the outlet shaft (74) from the outlet box (86) towards connecting shaft.



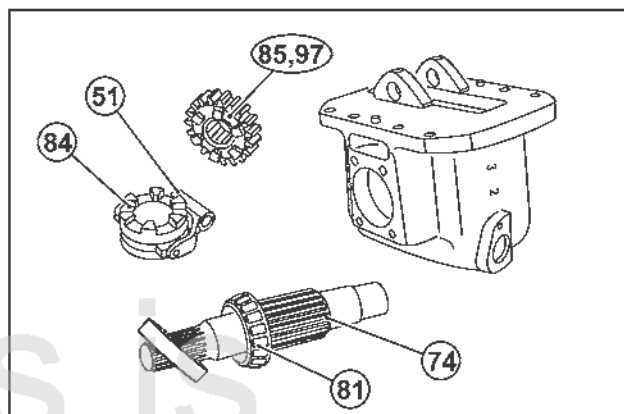
13- After pressing out the outlet shaft (74) together with bearing (81) from box remove the outlet wheel (85 or 97 as per version) and fork (51) with clutch (84).



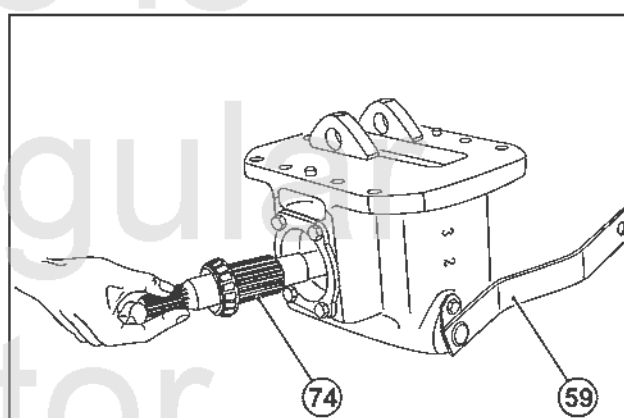
This is
for regular
Zetor
service network
only

7.2 ASSEMBLY OF CARRARO AXLE OUTLET BOX group 185

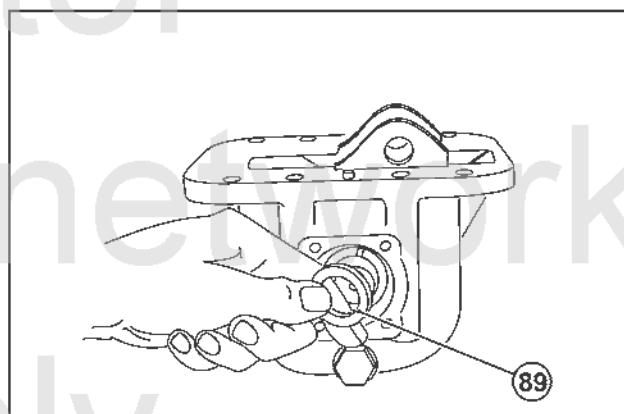
- 1 - Before assembling check the box marking by figures 2 or 3 as per number of teeth of the mounted outlet wheel (85 or 97). Then put the fork (51) with coupling (84) and outlet wheel (85 or 97) into the box, and prepare the outlet shaft (74) with bearing (81).



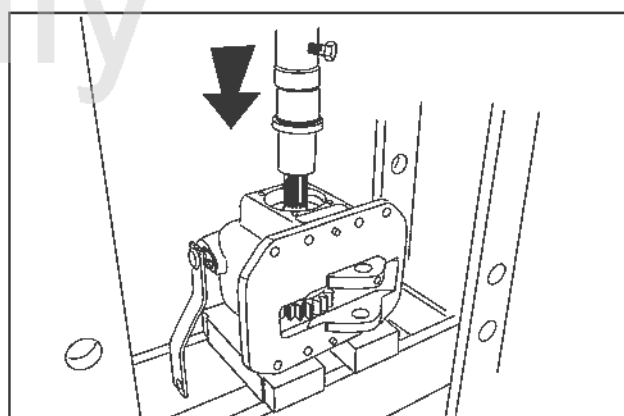
- 2 - Slide the complete shaft (59) with spigot (55) into the outlet box so that the shaft can pass through the fork (51). Then slide carefully the prepared outlet shaft (74) into the clutch and outlet wheel.



- 3 - Push the spacing tube (89) on outlet shaft.

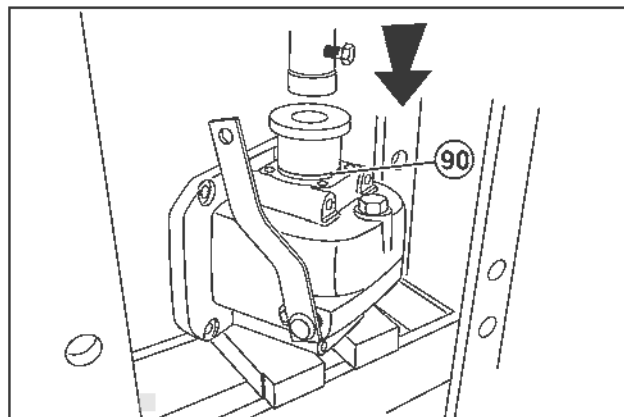


- 4 - Put the bearing (90) to press. Force on the outlet shaft (74) to the box.

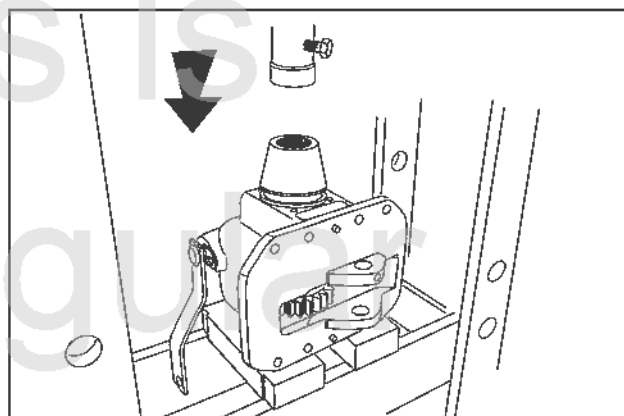


7.2 ASSEMBLY OF CARRARO AXLE OUTLET BOX group 185

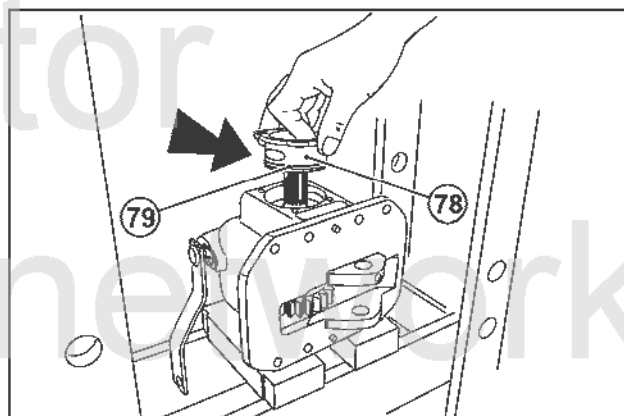
- 5 - After pressing on the outlet shaft (74) turn the box and apply the internal bearing ring (90) and press it into box.



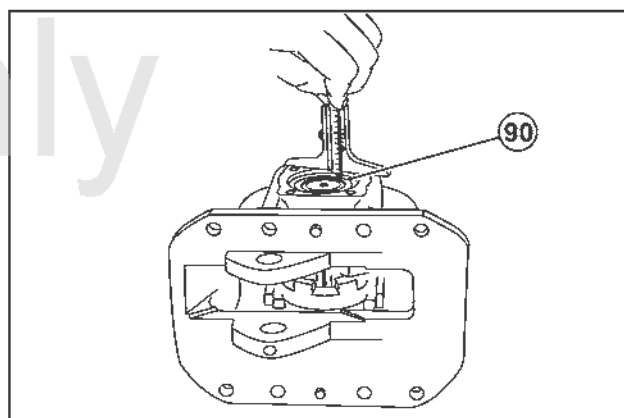
- 6 - Turn again the box and press on the bearing (81).



- 7 - Apply the COMBI git seal (80) and slide on the cap (78) with ring (79) so that the notch grooves on cap enable to slide on the fixing bolts (60).

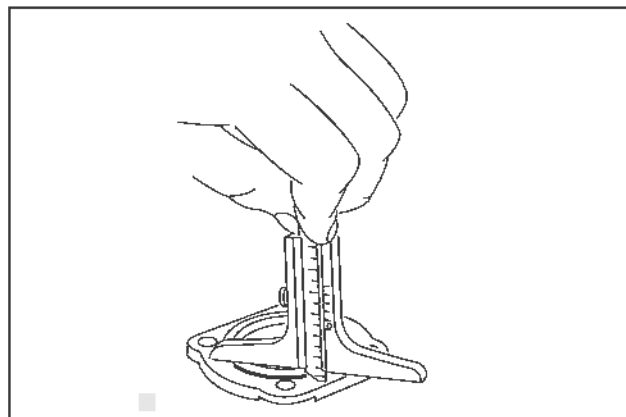


- 8 - After pressing on the bearings and front cap (78) measure the counterering of external bearing (90).

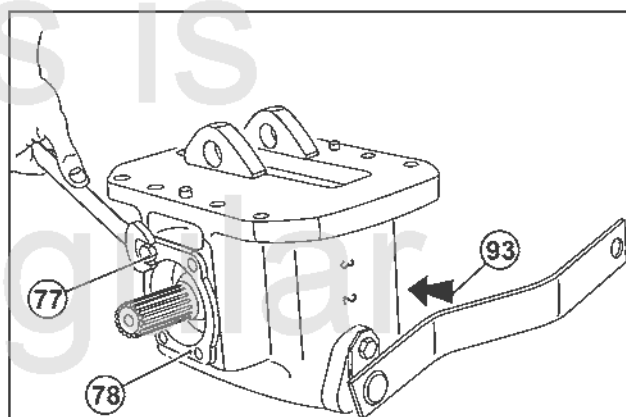


7.2 ASSEMBLY OF CARRARO AXLE OUTLET BOX group 185

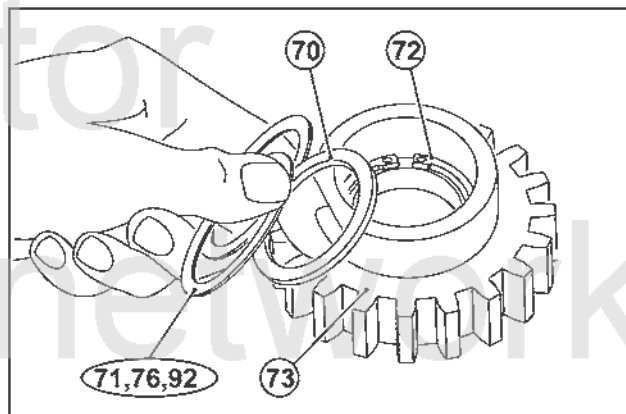
- 9 - Now measure the boss putting-out on covering cap (93) and apply spacers (83,91,98,99,100) so that the clearance in bearings (81,90) will be 0.05 mm.



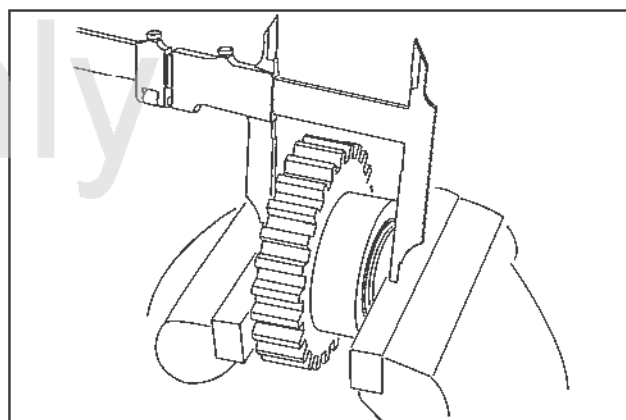
- 10- Now mount the both caps (78) and (93) (not seen on figures) by bolts (77).



- 11- Prepare the idle wheel (73) for assembly into the box. Place the bearing (69) and lock ring (72) into the wheel. Apply the ring (70) and set of spacers (71,76,92), dismantled before, on the lock ring (70).

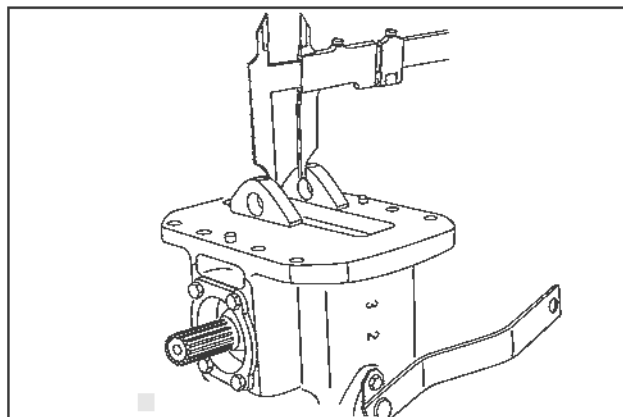


- 12- The second bearing (69) being put into measure the mounting dimension of the all assembly.

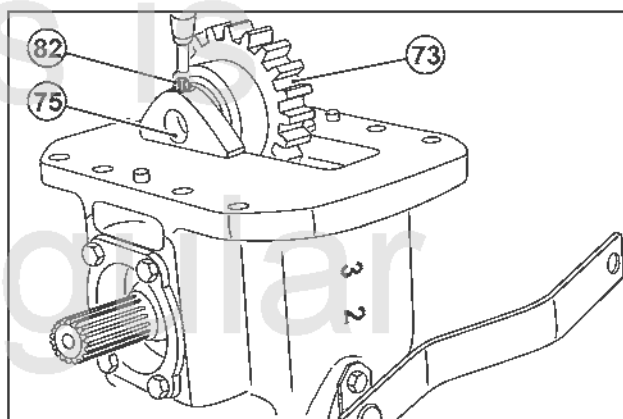


7.2 ASSEMBLY OF CARRARO AXLE OUTLET BOX group 185

- 13- After measuring of loop distance on outlet box the difference in values is to be 0.05 mm. If this value is not reached then adjust the dimension by spacers between bearings (69).

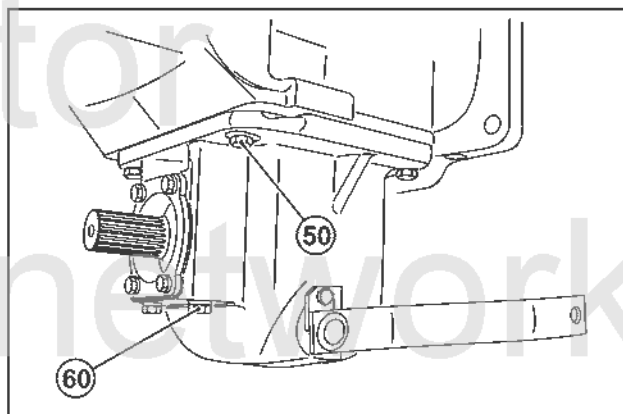


- 14- Fix the wheel (73) by pin (75) and secure it by spigot (82).



- 15 -Clean the contact surfaces of case and gearbox. Lubricate the surfaces by Rhodoseal sealant. Apply the case to the gearbox on pins and fix it by four bolts (50) and four bolts (60).

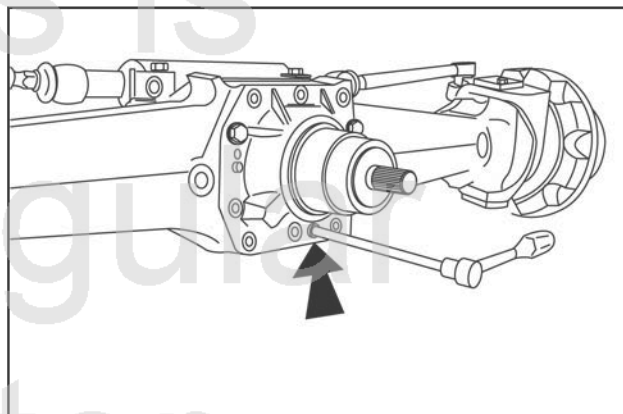
 Contact surfaces: Rhodoseal.



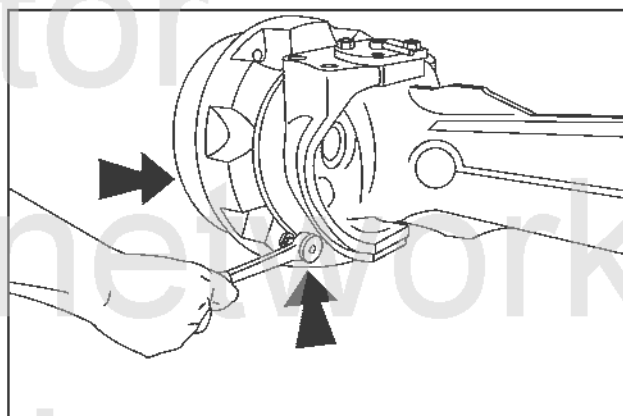
8.1 DISMANTLING OF CARRARO AXLE group 172

Valid for both types of axles, i.e. for speed 30 km/hr without brakes and for speed 40 km/hr with brake, and for various gears between pinion and gear wheel.

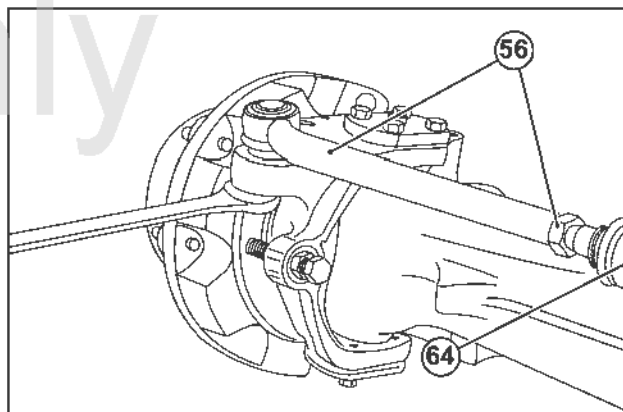
- 1 - Wedge an engine by jack and secure the rear wheels against move.
- 2 - Dismantle front wheels (group 266)
- 3 - Disconnect the hoses of hydraulic brakes
- 4 - Drain the oil from hydrostatic steering.
- 5 - Disconnect the hose to the steering cylinder.
- 6 - Drain the oil from PHN final gear.



- 7 - Drain the oil form end gears.
- 8 - Dismantle the axle out of tractor (group 172).

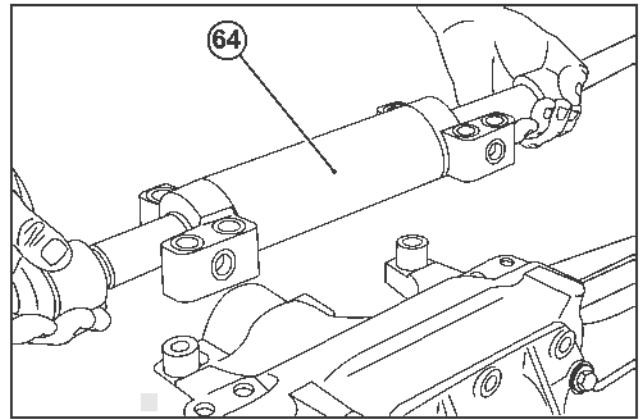


- 9 - Dismantle the ball pins of steering rods and rods (56) (group 275).

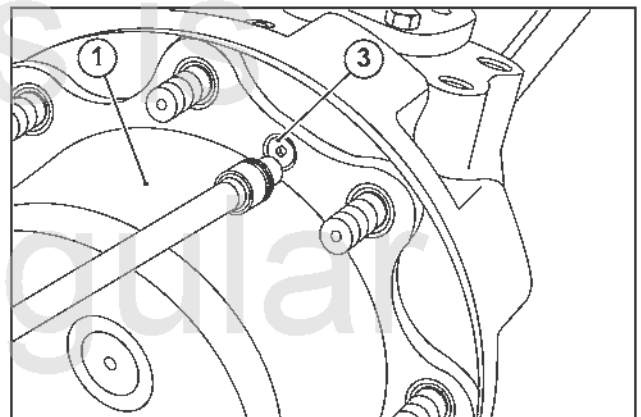


8.1 DISMANTLING OF CARRARO AXLE group 172

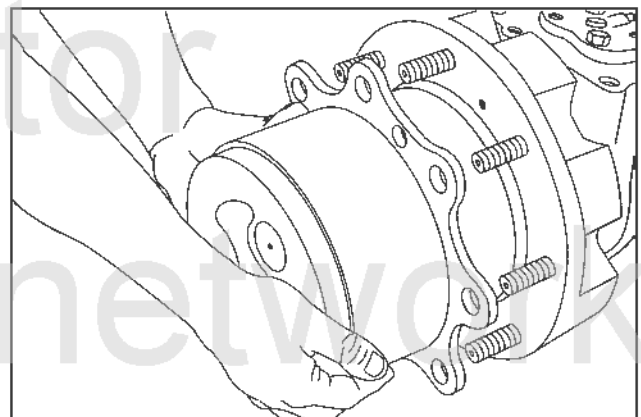
10- Dismantle the complete cylinder of hydrostatic steering (64) group 275.



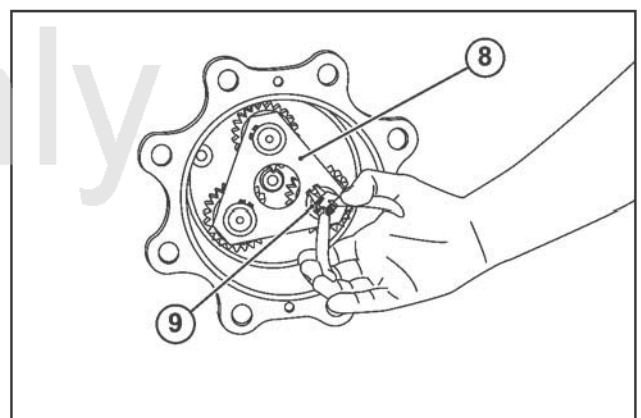
11- Release and unscrew two bolts (3) from reducer (1) ensuring the wheel hub.



12- Remove the reducer from wheel hub.



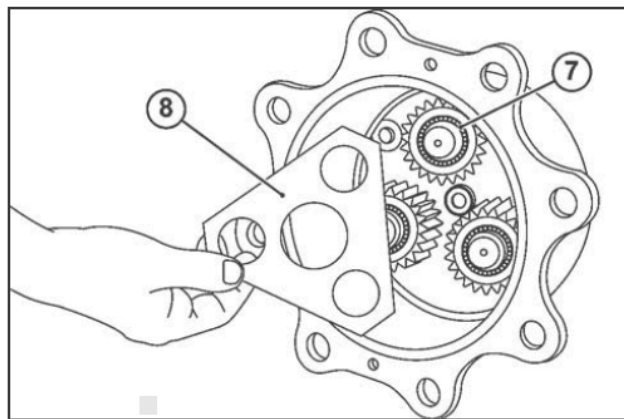
13- Dismantle the circlips (9) and remove the washer (8).



8.1 DISMANTLING OF CARRARO AXLE group 172

14- Check if the needle bearings (7) and thrust washer (8) are not worn.

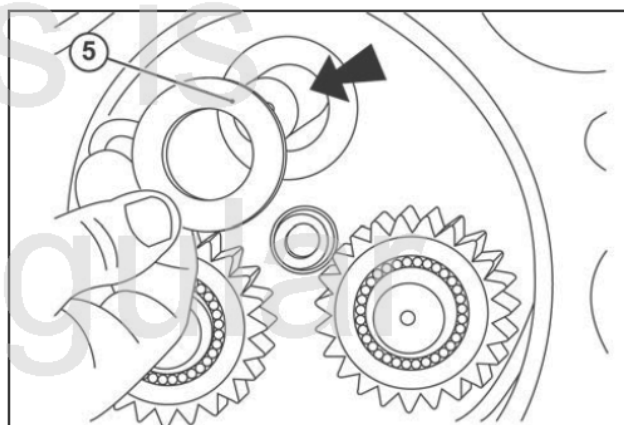
- ★ There are 30 needles on one satellite pin.



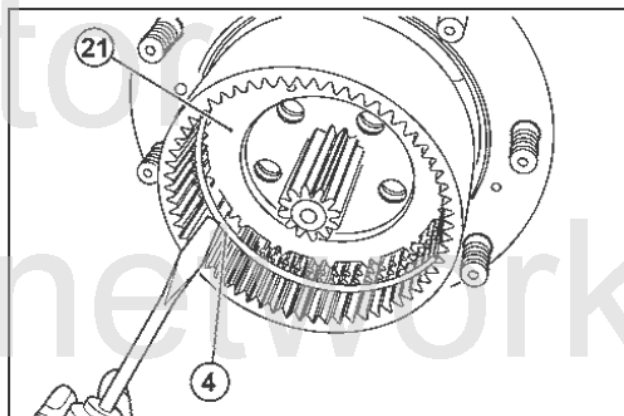
15- Dismantle the washer (5) and check if the pins are not worn.

- ★ If the pins damaged the complete reducer with pins needs to be replaced.
- ★ If the reducer is undamaged reassembly it.

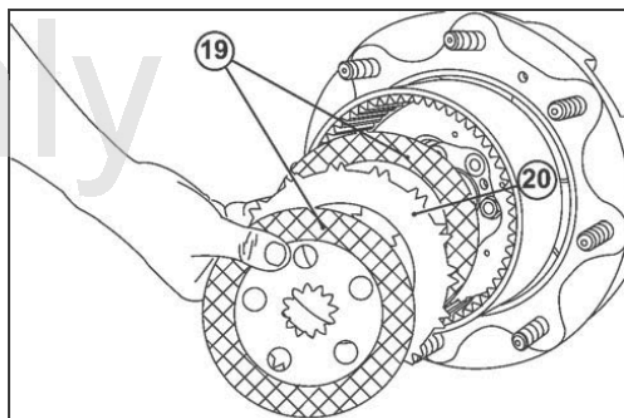
! The dismantling procedure of axle fitted with wheel hub and brake is described in next points 16 to 24.



16- Dismantle the lock ring (4) and remove the plate (21).

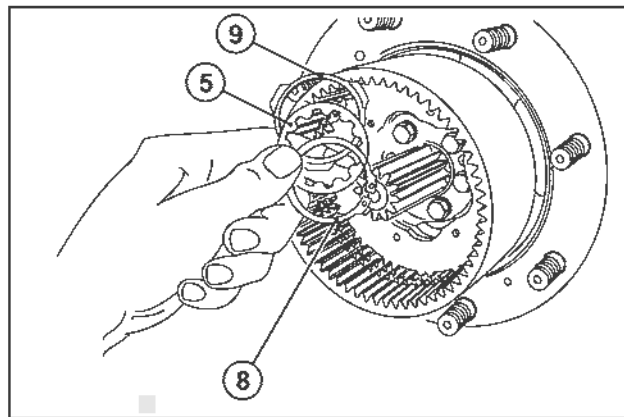


17- Remove gradually the plates (19), (20) and (19).

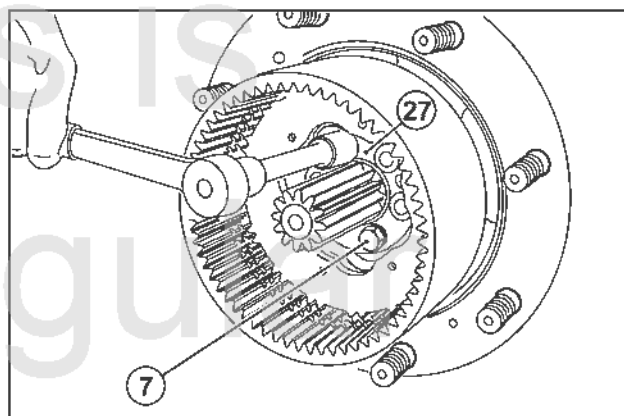


8.1 DISMANTLING OF CARRARO AXLE group 172

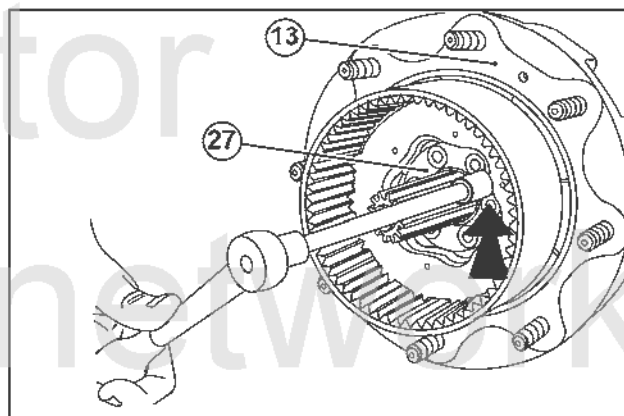
- 18- Remove the circlip (8), washer (5), and washer (9) from shaft.



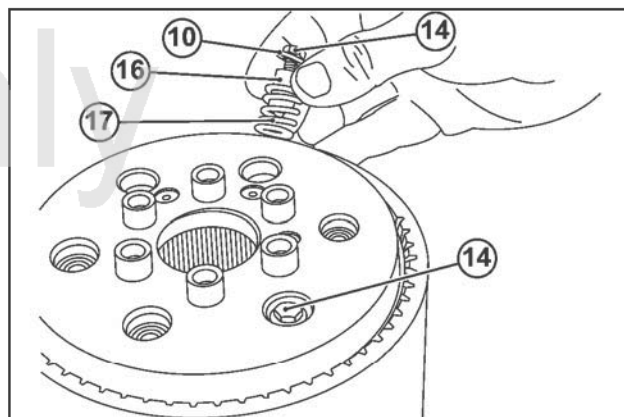
- 19- Remove and unscrew six bolts (7) from planet gear (27).



- 20- Push out the planet gear (27) from wheel hub (13) by means of bolts. Two threaded holes in planet gear make a dismantling easier.

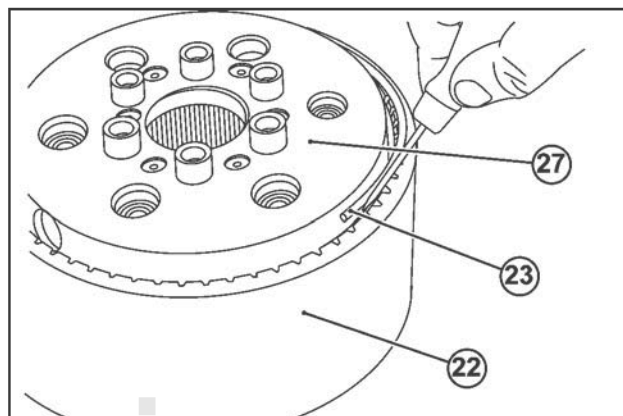


- 21- Unscrew three bolts (14) with washer (10), bushing (16) and spring (17), further three bolts (14) without bolts.

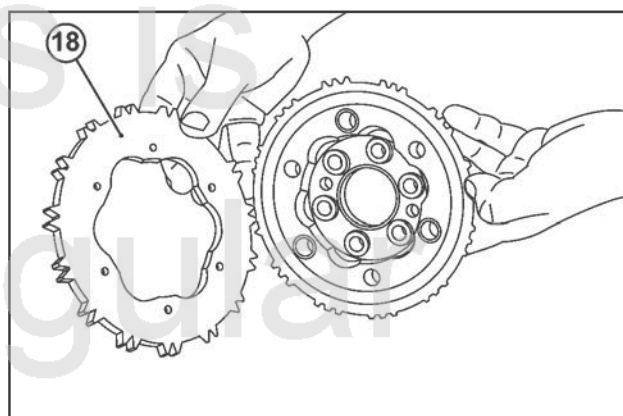


8.1 DISMANTLING OF CARRARO AXLE group 172

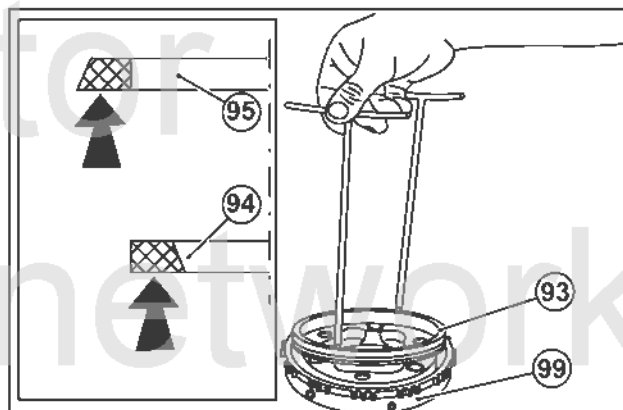
- 22- Remove the wire (23) from ring gear (22) and release the planet gear (27).



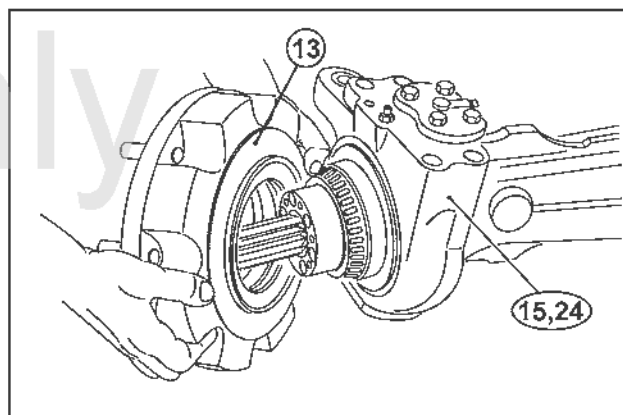
- 23- Remove the plate (18).



- 24- Remove the piston (93) from planet gear (99) and check the quality of two rubber rings. The external ring (95) and inner ring (94).
★ A tightness must be provided by proper orientation of trapezoidal section.

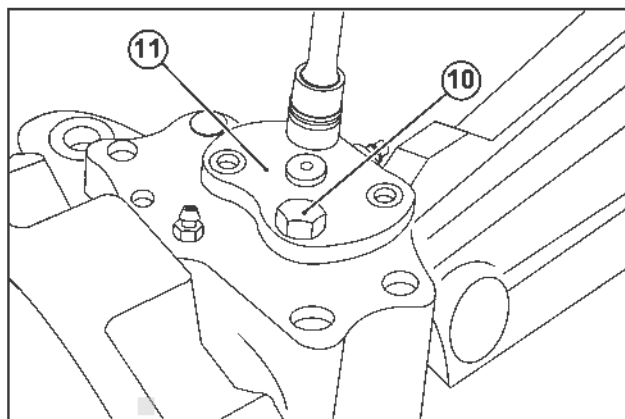


- 25- Remove the wheel hub (13) from body with brake (15,24).

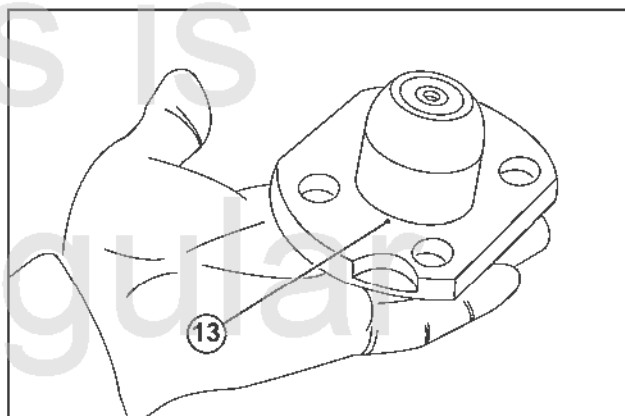


8.1 DISMANTLING OF CARRARO AXLE group 172

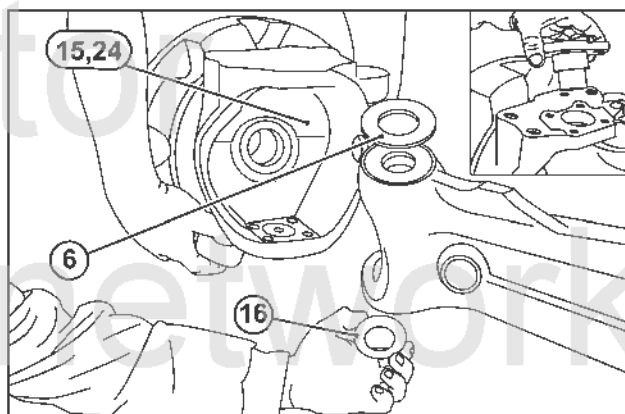
26- Unscrew the bolts (10) from upper pivot pin (11) and remove the pin (group 172g).



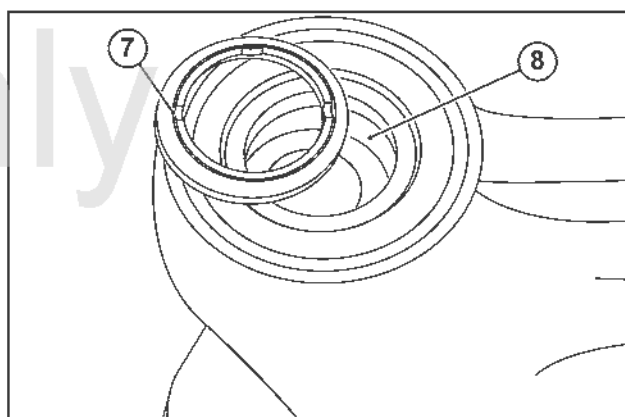
27- Unscrew the bolts from bottom pivot pin (13) and remove it. Put the body off.



28- Remove the body (15,24) and plate washers (6,16).
★ Be careful about plate washers (6,16).



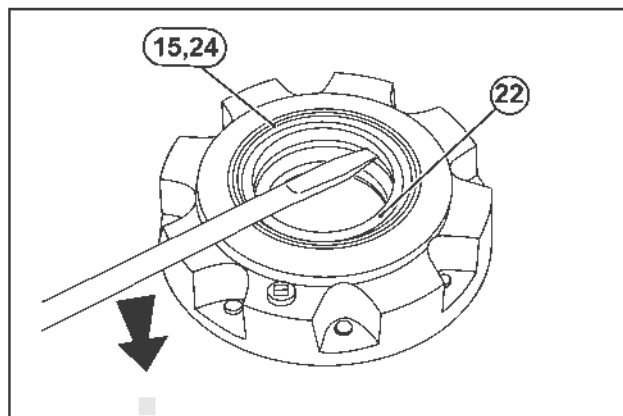
29- Check the ring (7) and bushing (8) in mounting of the upper pivot pin.



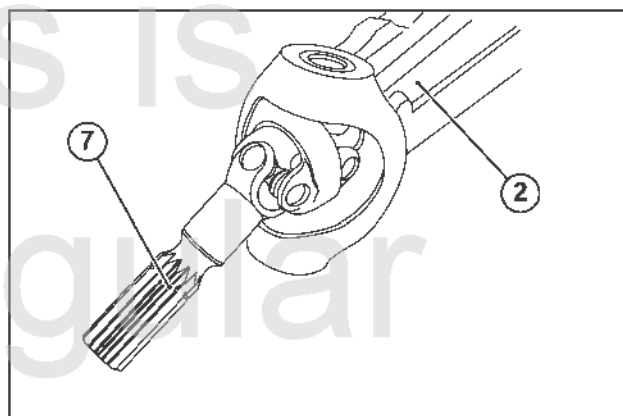
8.1 DISMANTLING OF CARRARO AXLE group 172

30- Check the special git seal (22) in wheel hub (15,24). If it is leaky, dismantle it by lever.

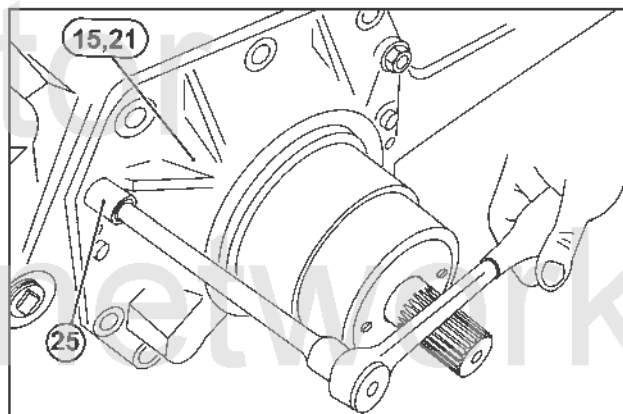
★ The git seal is unserviceable after removal.



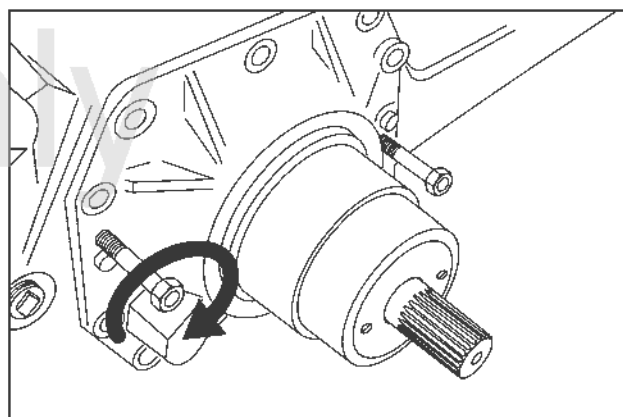
31- Release both complete drive shafts (7) from axle (2).



32- Release and unscrew the flange bolts (25) and remove the differential (15) and axle drive gear with pinion (21) from axle.

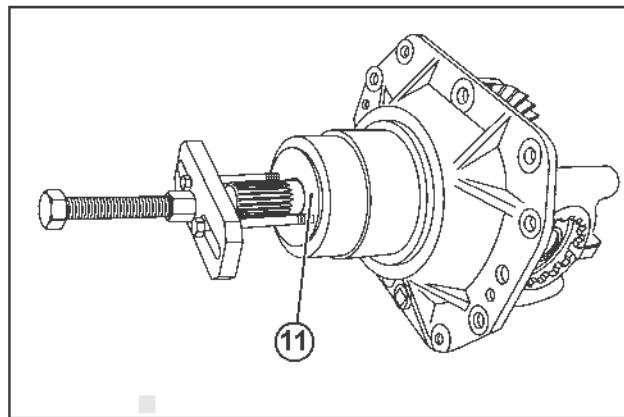


33- Screw the dismantling bolts for easy release of differential flange

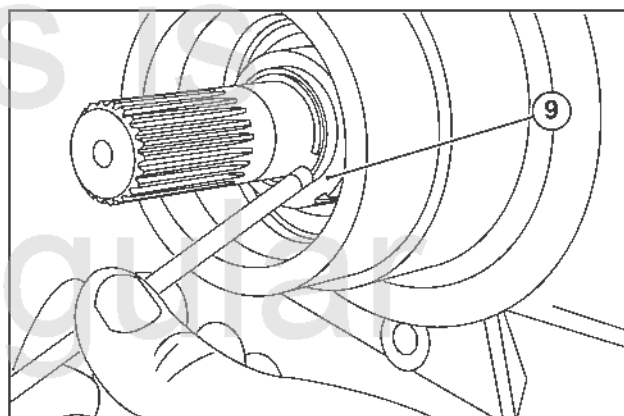


8.1 DISMANTLING OF CARRARO AXLE group 172

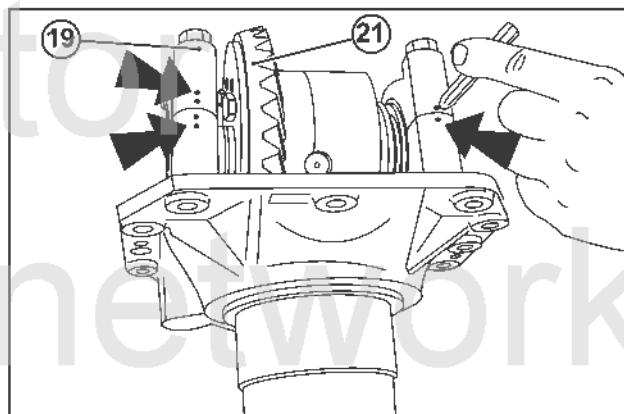
34- Remove the cover (11) from differential flange using puller.



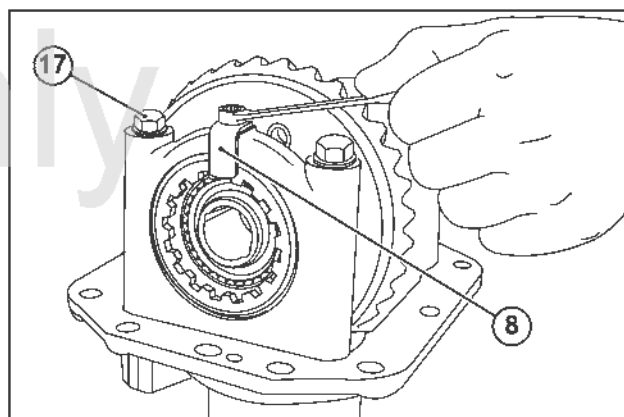
35- Unlock the crown nut (9) and unscrew it by special wrench No. **78.942.703** and remove the lock washer.



36- Before dismantling of the holder (19) from differential flange mark the positions and remember the position of crown gear (21).

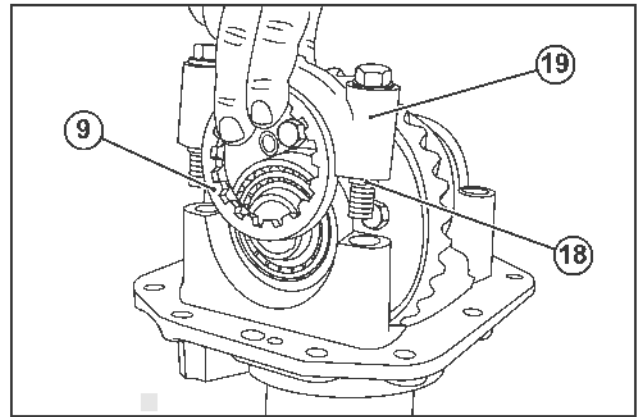


37- Dismantle the safety lock (8) and unscrew the bolts (17).

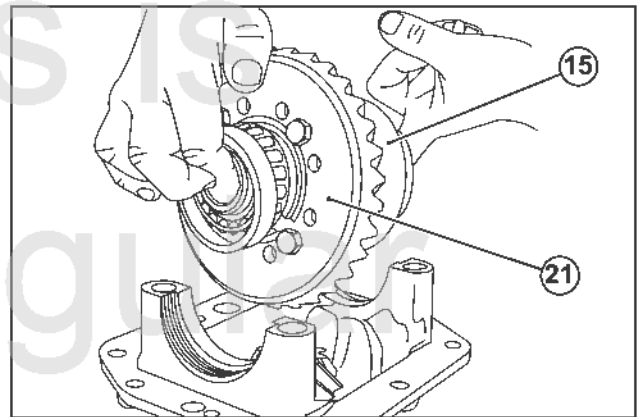


8.1 DISMANTLING OF CARRARO AXLE group 172

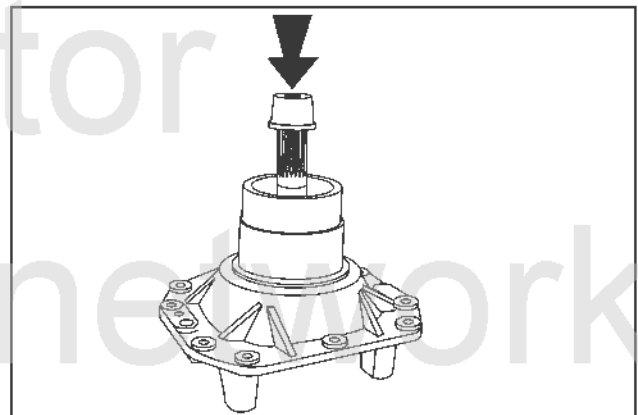
38- Remove the holder (19), centering guide (18), and lock nut (9).



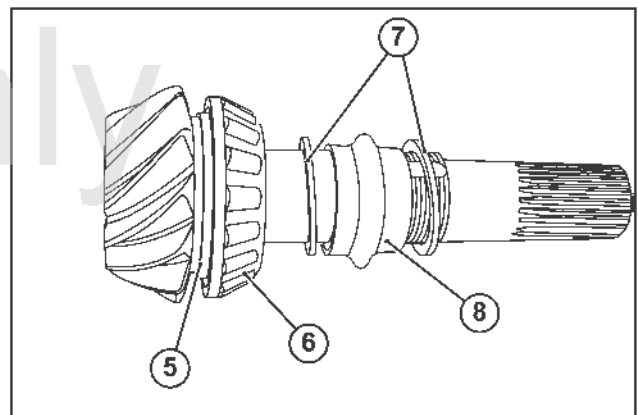
39- Now it is possible to remove the complete differential (15) with ring gear (21) from differential flange.



40- Press out the pinion (21) with bearing (6).

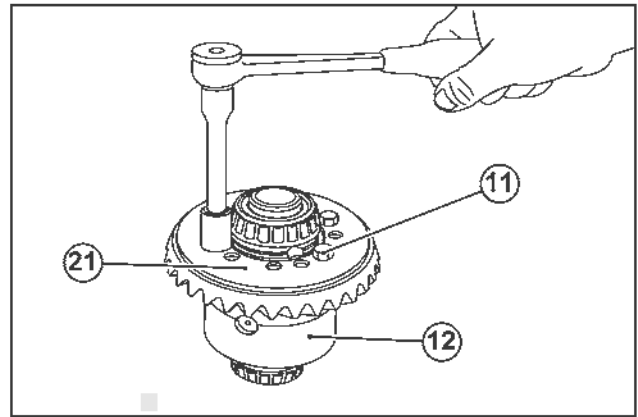


41- The adjusting washer (5) or (12-20), bearing (6), washer (7), and ring (8) are pushed on extended pinion under bearing.

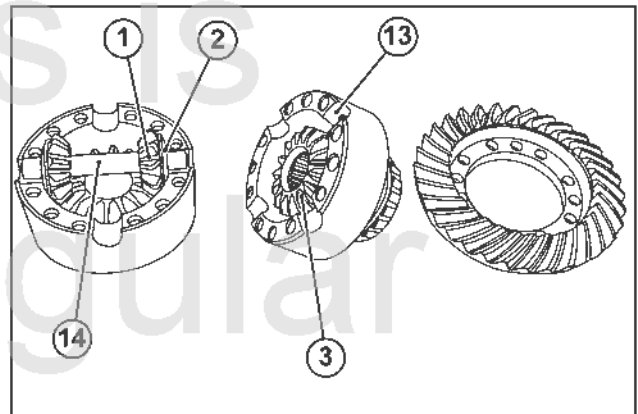


8.1 DISMANTLING OF CARRARO AXLE group 172

42- Dismantle the differential so that you will unscrew twelve bolts (11). Thus you will release the ring gear (21) and differential can be divided into halves.

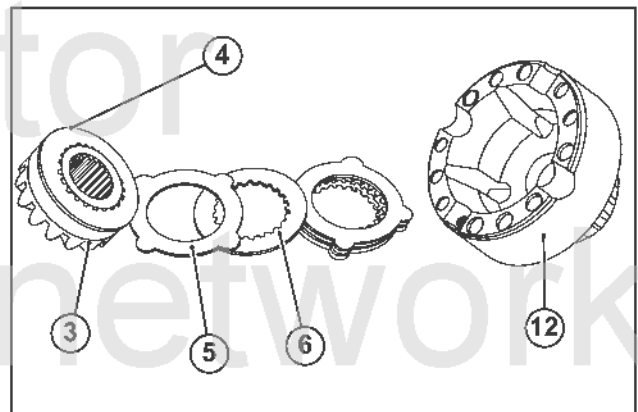


43- Check the gearing of planet gears (1) and planet pinions (3). Replace washers (2) if needed. The pinion frame (14) is stabilized in basic position by spigot (13), which is put in the differential hole.



★ Only one pinion frame is now used in differential. Initially two pinion frames, not secured by spigot, were used.

44- The thrust ring (4) and external plates (5) and inner plates (6) are alternately pushed on planet pinion (3).



8.2 ASSEMBLY OF CARRARO AXLE group 172

1 - If the differential was dismantled put the thrust rings (4) on bevel gear and set of plates; external (5) and inner (6) plates alternately.

★ Before assembly check the technical condition and dimensions of thrust ring (4) and plates (5,6):

- a. new thrust ring (4) thickness 2.8mm, max. wear 0.1mm.
- b. new external plate (5) 1.5 mm thick
- c. new inner plate (6) 1.6 mm thick, max. wear 0.15 mm.

2 - Apply pinion frame (14) with planet pinion (1) and washers (2) on planet gear of one differential half. Then insert the spigot (13), which must fit in the hole of one differential half (12).

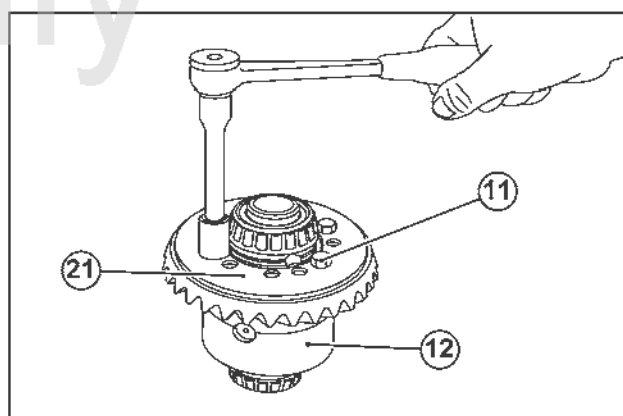
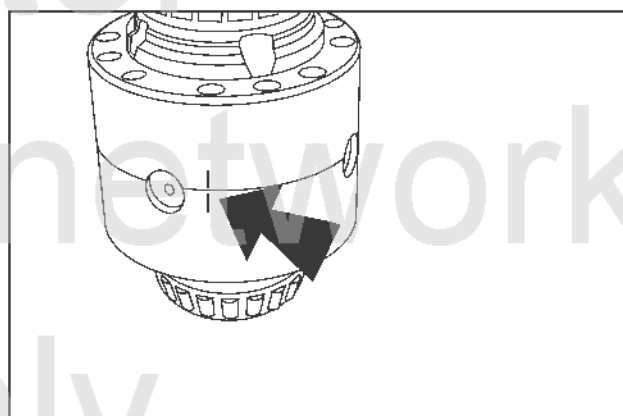
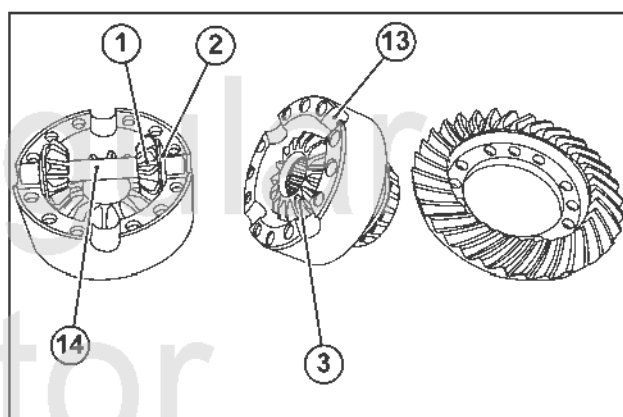
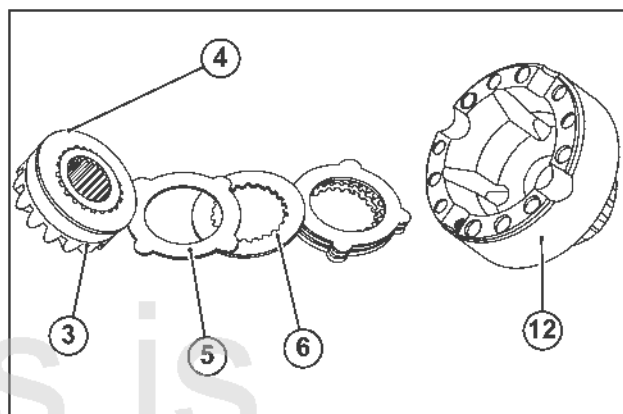
★ Before assembly check the technical state of planet pinions and washers.

3 - Now apply the second half of differential so that the marks on both halves correspond to one another.

4 - Mount the planet gear by means of twelve bolts (11) and simultaneously join together both halves of differential (12).

★ Before assembly of ring gear prepare the corresponding pinion with the same marking.

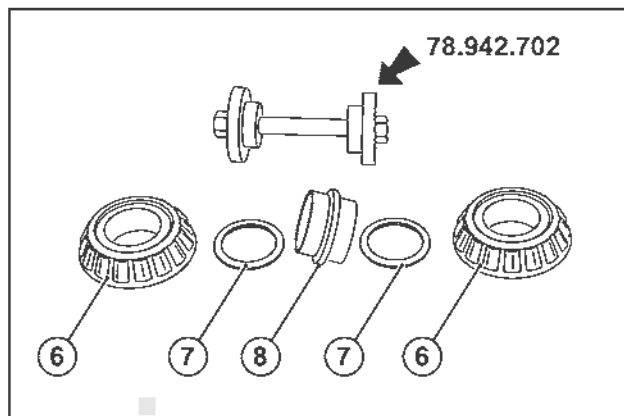
🔧 Bolts: Loctite 243!



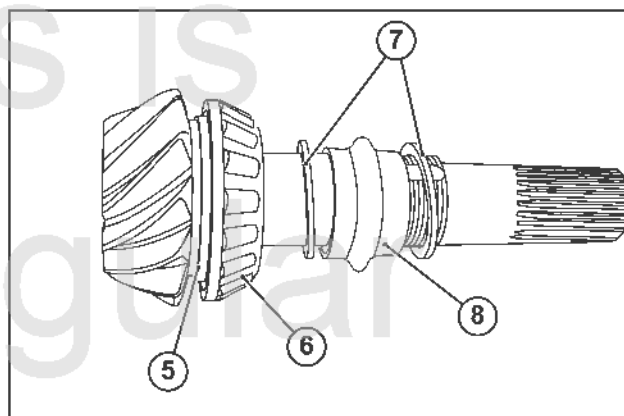
8.2 ASSEMBLY OF CARRARO AXLE group 172

5 - For pinion reassembly prepare firstly both bearings (6), washers (7), and bushing (8). For pinion adjustment into flange prepare also the tool No. **78.942.702** for mounting to flange. Mount all assembly to flange on pinion place.

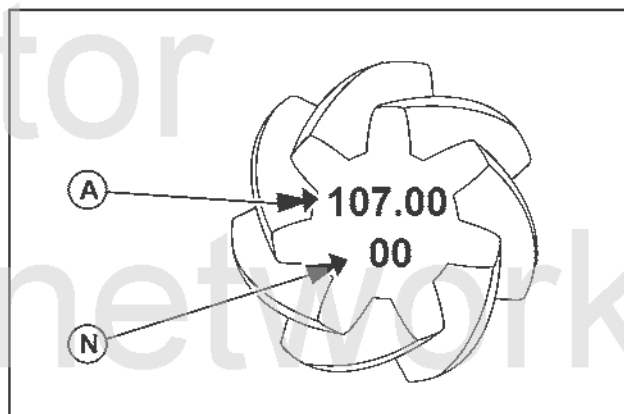
★ New insert (8) is to be used with any new assembly



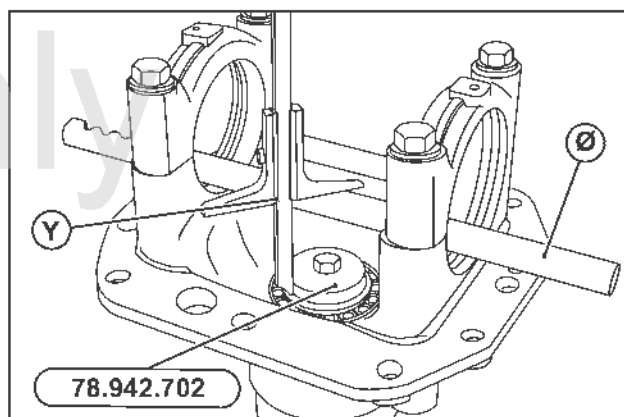
6 - It is necessary to determine the total thickness of washers (5) or (12 to 20) for proper gearing of pinion and ring gear as per calculation.



7 - To calculate the washer thickness you must know the dimensions of pinion, whose values are shown on its face.
a. A – extension size of gearing position
b. N – indicates the pair number for the ring gear

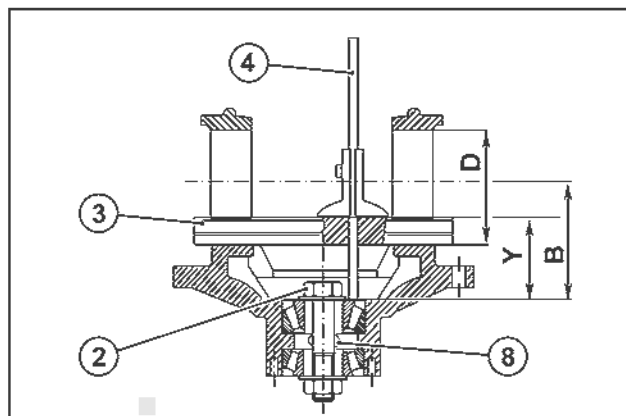


8 - Insert gradually bearing, bushing and second bearing to flange. Bolt the assembly together by tool (2) No. **78.942.702**. Thus you will adjust the bushing length for assembly. Screw the holders (19).



8.2 ASSEMBLY OF CARRARO AXLE group 172

- 9 - Measure the diameters "D" holes for bearings (6). Put the metering rod (3) for determination of "Y" dimension to the holes for bearings.



- 10- The calculation of washer thickness inserted no pinion is made as per relations:

$$B = Y - \varnothing \text{ cal. rod} + D/2$$

B – Distance of bearing face from axis of ring gear wheels

Y – Value measured by depth gauge

D – Hole diameter for bearings of ring gear

Washer thickness P:

$$P = A - B$$

Example of calculation procedure:

E.g. it was measured by depth gauge $Y=80,3$ mm

Size of calibrating rod (3) $\varnothing = 19$ mm

Hole for bearing $D = 85$ mm

After substitution:

$$B = 80,3 - 19 + 42,5$$

$$B = 103,8 \text{ mm}$$

Washer thickness P

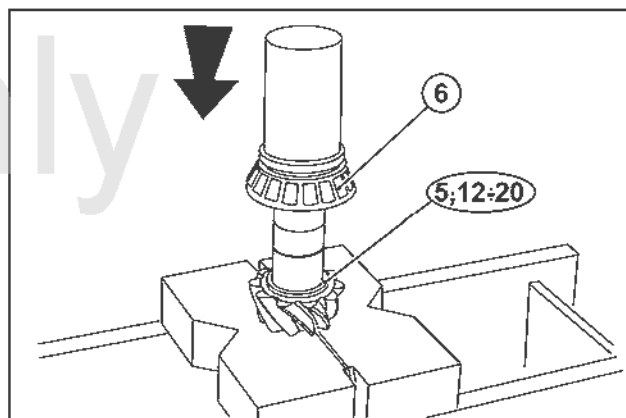
$$P = 107 - 103,8 = 3,2 \text{ mm}$$

The pinion should be fitted by washer

(18) of thickness $P=3,2$ mm i.e. cat. No.

93-0171

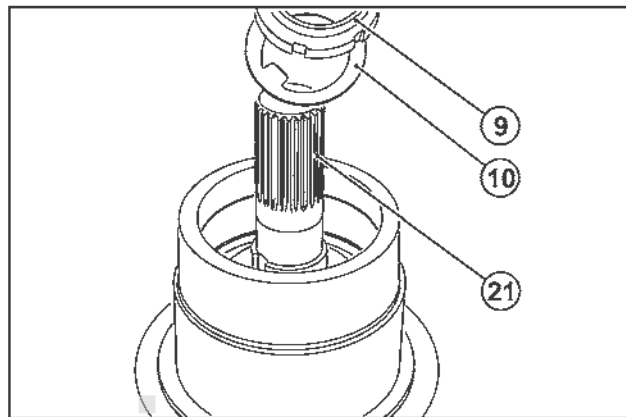
- 11- Slide the washer on pinion as per calculated dimension and press on the bearing inner ring (6).



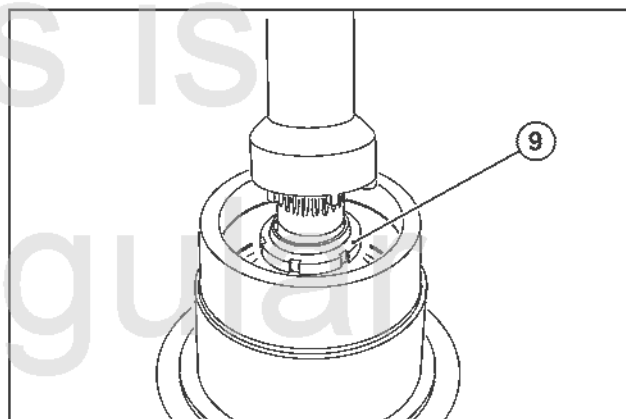
8.2 ASSEMBLY OF CARRARO AXLE group 172

12- Slide the pinion with bearing on differential flange. Apply the second bearing and press all into flange. Place the locking plate (10) on shaft and fix the crown nut (9).

★ Use always new crown nut (9) by any assembly.



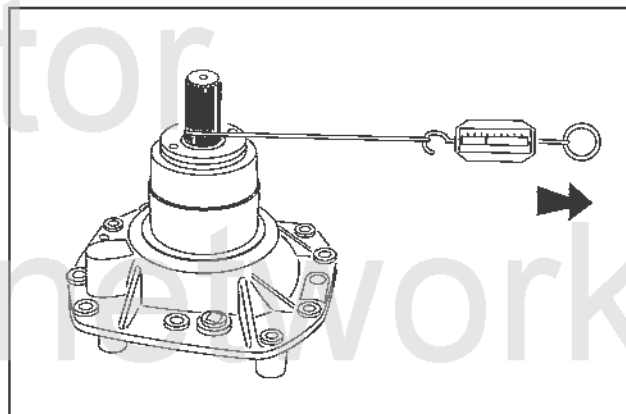
13- Screw on the nut using the special wrench. No. **78.942.701**.



14- Check the initial loading of cone bearings by means of dynamometer turning the pinion.

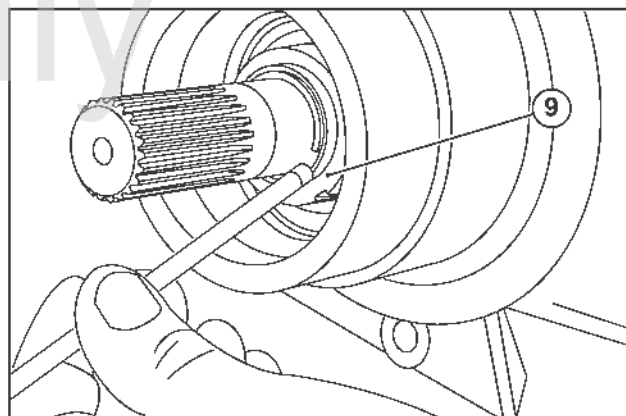
★ Procedure of initial loading test:

- Whip the wire cord over shaft,
- Attach the dynamometer to its end and pull,
- The shaft is to be spinned at force 105 to 157 N
- Tighten up the nut (9) if force is lower,
- Release it, if force is higher.



 Pinion: 105 to 157 N

15- After initial loading of bearings secure the nut (9) by hammering.

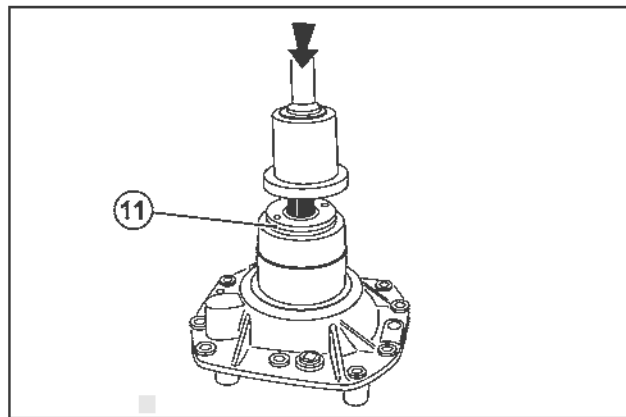


8.2 ASSEMBLY OF CARRARO AXLE group 172

16- Press the cover (11) to the shaft with pinion.

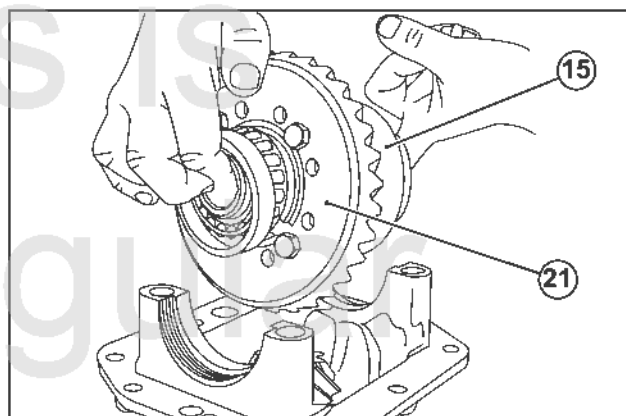
★ Replace also the git seal (3) if needed.

 Lubricate the cover external surface: Loctite 243

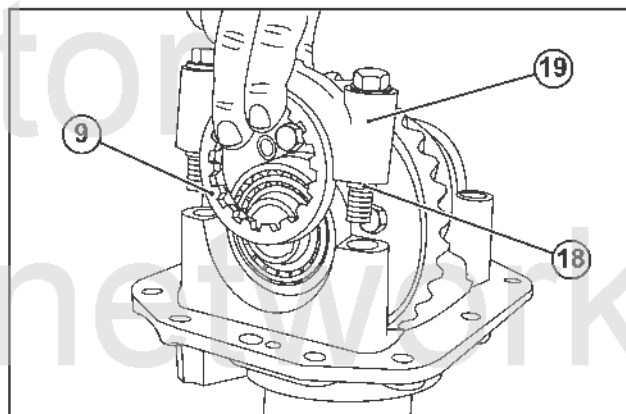


17- Insert the complete differential with ring gear to shaft.

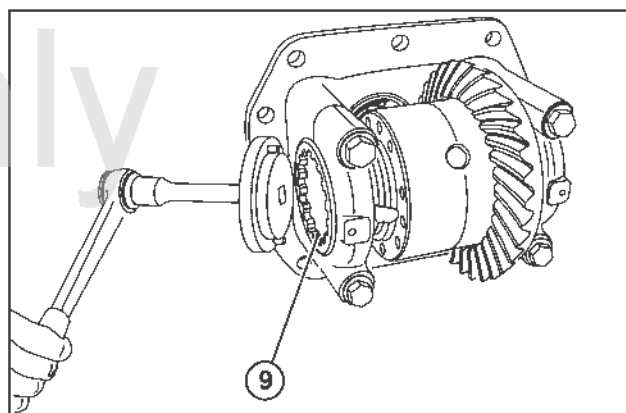
★ During any assembly check the correct mounting of ring gear in the wheel as per marking within dismantling.



18- Mount the differential in flange using holders (19). Their correct position should be marked by marks on face side within dismantling. Firstly put the centering guide (18) into holes for bolts. Then fasten slightly the holders by bolts (17). Using locking nuts fit the ring gear to engagement with pinion.



19- Adjust the clearance in toothing by alternate release and tightening of locking nuts (9) by special wrench No. **78.942.705**.

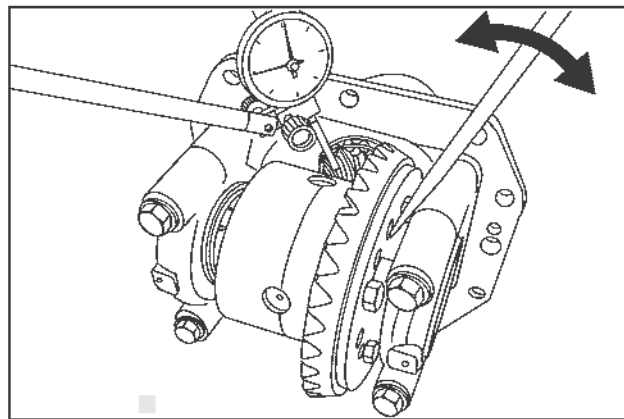


8.2 ASSEMBLY OF CARRARO AXLE group 172

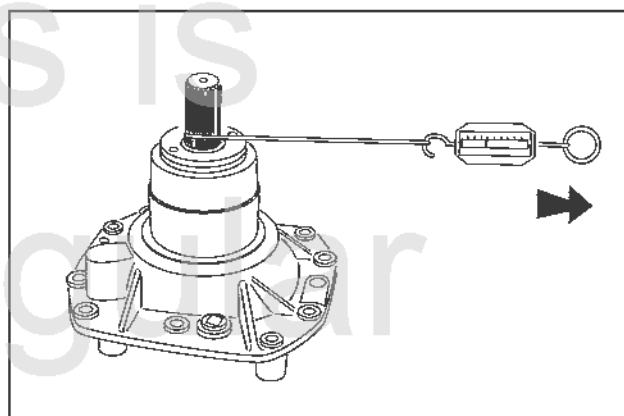
20- Measure the specified value of clearance between gearing of pinion and ring gear by gauge.

★ The specified clearance in gearing of pinion and ring gear is: 0.16 to 0.21 mm.

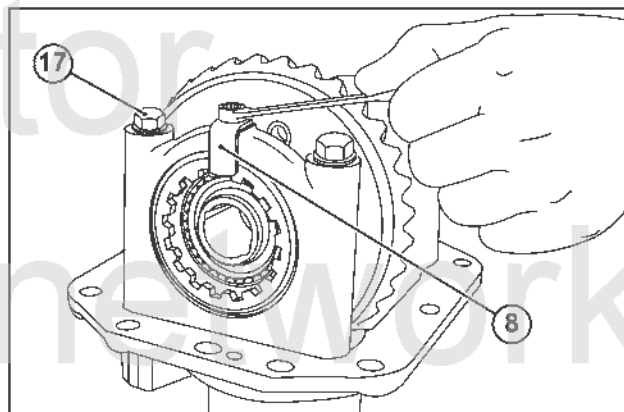
★ Take up the clearance in single bearings using lever.



21- Measure again the total initial loading of the bearings of pinion and differential on pinion shaft by means of dynamometer. The shaft is to spin at force 134.5 to 201.1 N for final gear 30 km/hr and 40 km/hr.



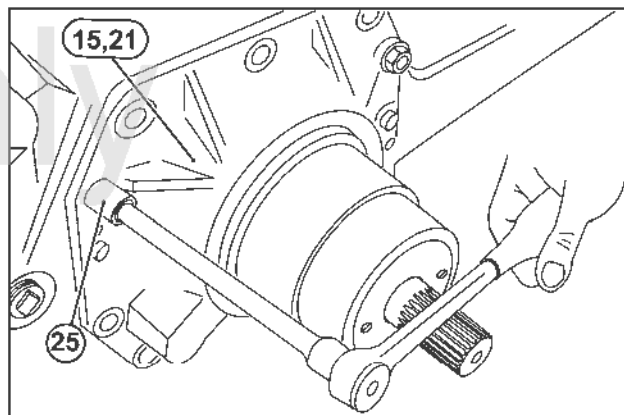
22- After clearance adjustment in gearing unscrew gradually the single bolts (17). Lubricate thread by Loctite 243 and tighten properly. Secure the locknuts by stoppers (8) against loosening.



23- Put the flange with differential (15,21) into axle and fasten properly by bolts (25).

↙ Contact surfaces: Rhodoseal

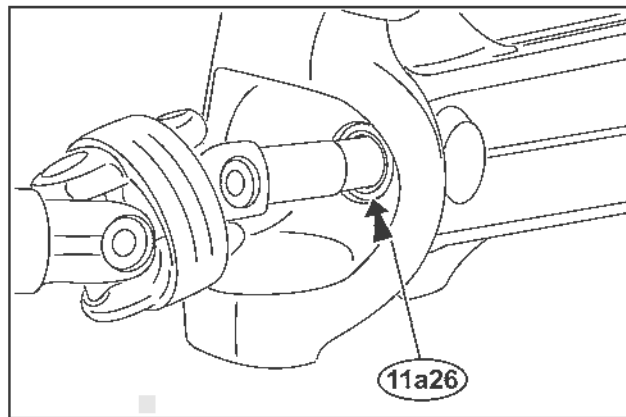
↙ Bolts: Loctite 243



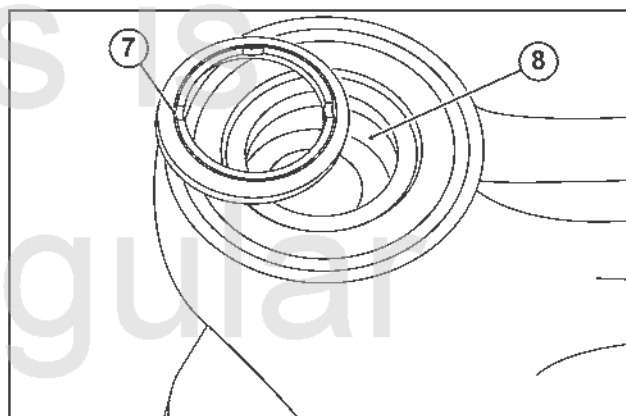
8.2 ASSEMBLY OF CARRARO AXLE group 172

24- Put both joint shafts into the axle and differential.

- Check the technical condition of bushing (11) and git seal (26) just before pushing the joint shaft into axle.
- Assemble the bushing by means of punching pin No. **78.942.706**.
- Assemble the git seal by means of punching pin No. **78.942.707**.

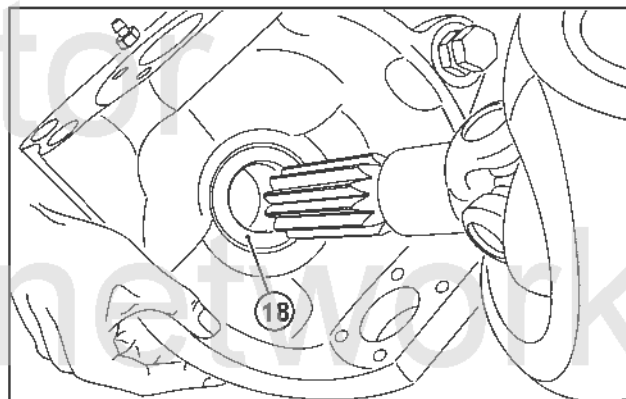


25- Check the bushing (8) and ring (7) in the upper loop of axle body. Replace in case of damage or wear.

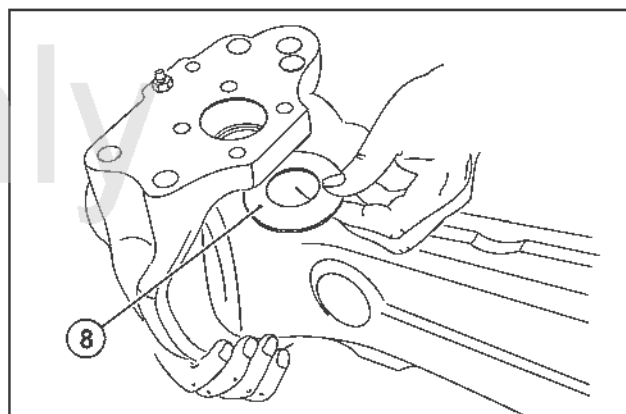


26- Check the git seal (18) and bushing (17) in the body (15,24). In case of damage or wear replace it. Slide the body on axle.

- ★ Assemble the bushing by means of punching pin No. **78.942.712**.
- Assemble the git seal by means of punching pin No. **78.942.708**.

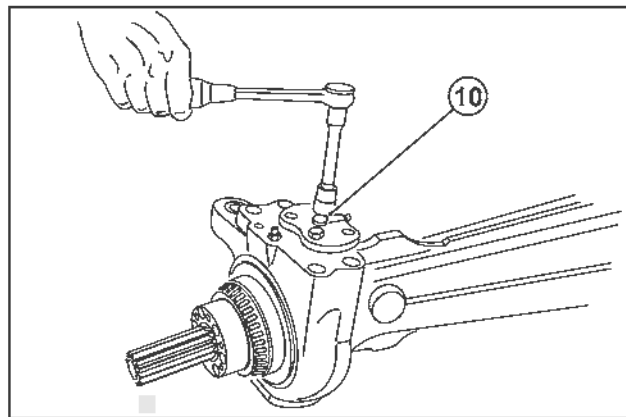


27- While pushing the body on axle place the plate washer just before insertion of pivot pin on axle (8).

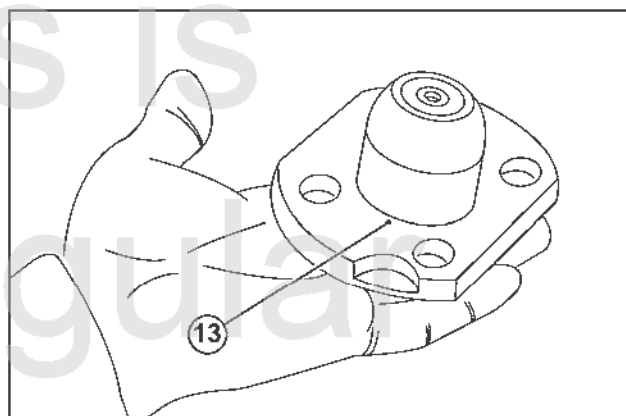


8.2 ASSEMBLY OF CARRARO AXLE group 172

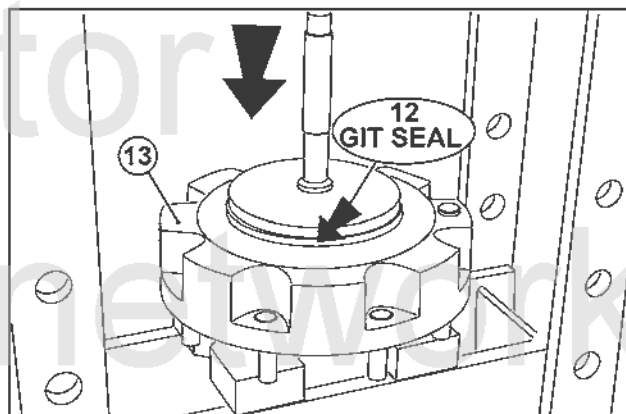
28- Put the top pin to the body and fasten it slightly by bolts (10).



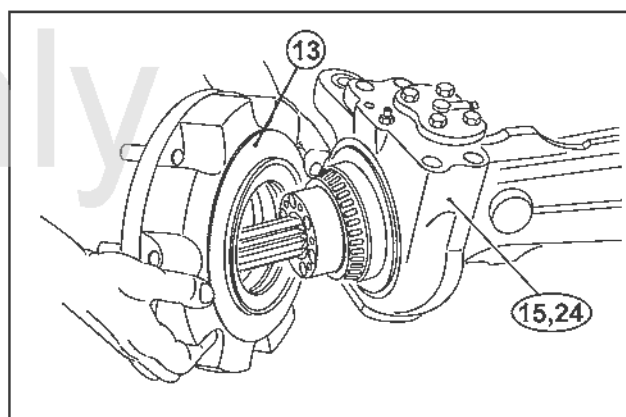
29- Put the bottom pivot pin (13) to the body after insertion of plate washer (16).
★ When both pins are slid on lubricate them by specified oil by means of forced-feed oiler.



30- Press the special git seal (12) to the wheel hub (13) by tool No. **78.942.709**.
★ The tool size indicates the depth of git seal embedding to the hub. The git seal should not be inserted without tool!
★ The manufacturer provides two types of git seals. Their proper installation can be made only when using the given tool.



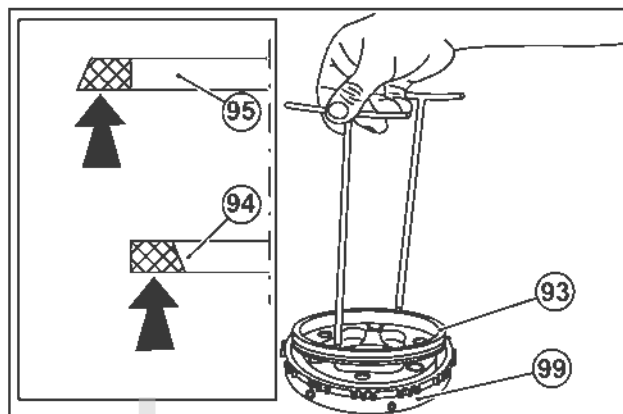
31- Place the wheel hub (13) into body (15,24).



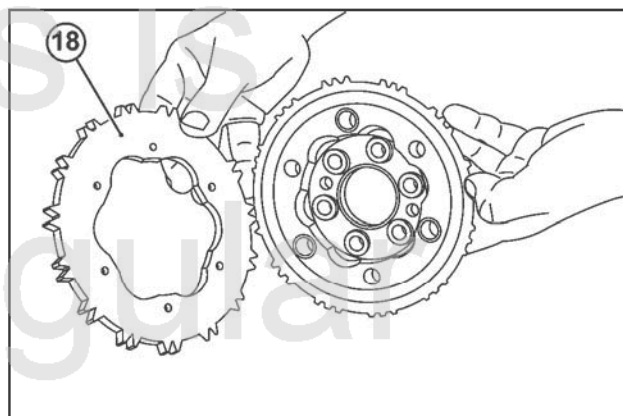
8.2 ASSEMBLY OF CARRARO AXLE group 172

32- Put carefully the piston (93) into planet gear (99) and replace and check the quality of two rubber rings. The external ring (95) and inner ring (94).

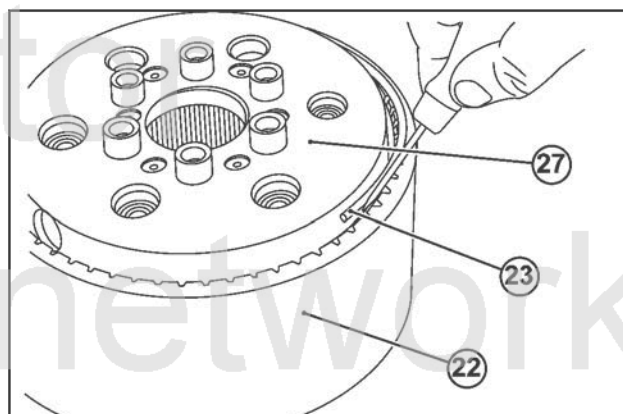
★ The correct orientation of trapezoidal section must ensure its tightness.



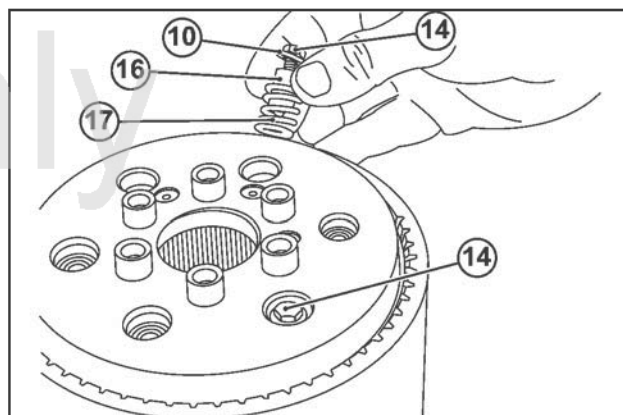
33- Put the plate (18) to the crown wheel.



34- Put the planet gear (27) into crown wheel (22) and secure it in position by wire (23).

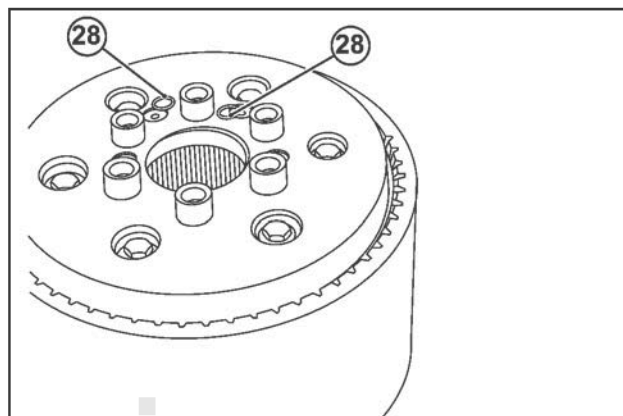


35- Screw the plate (18) by three bolts (14) with washers (10), bushings (16) and springs (17). Then fasten three bolts (14) without springs.

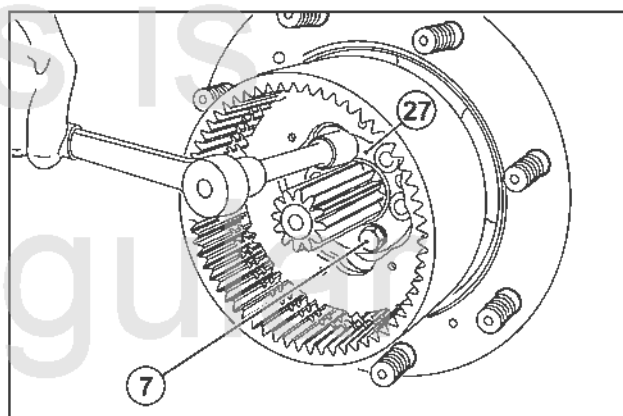


8.2 ASSEMBLY OF CARRARO AXLE group 172

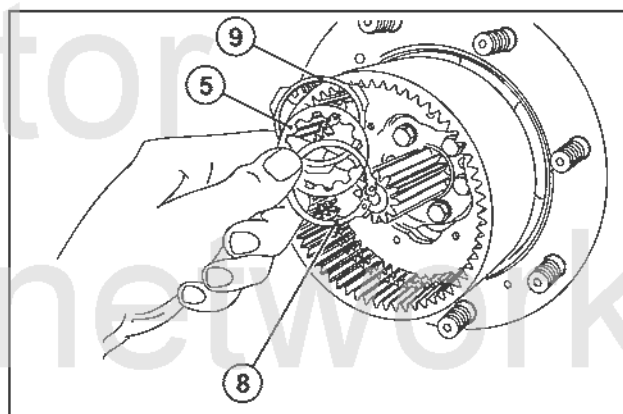
36- Put new rings (28) into holes for brake fluid supply.



37- Mount the planet gear (27) using six bolts (7).

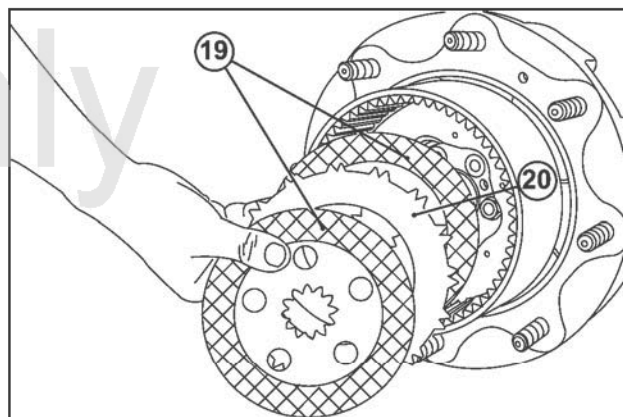


38- Firstly push the washer (9) and then the washer (5) on the shaft and secure all by circlip (8).



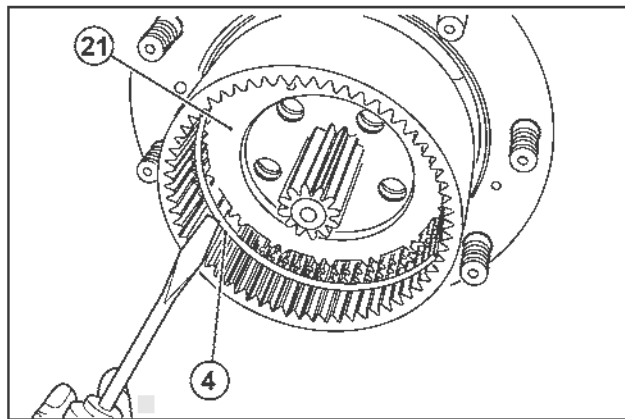
39- Put in gradually the plates (19), (20), and (19).

- ★ Before insertion check the technical condition of inner plates (19). The correct thickness is 4.8 mm at new plate and permissible wear is 0.4 mm.

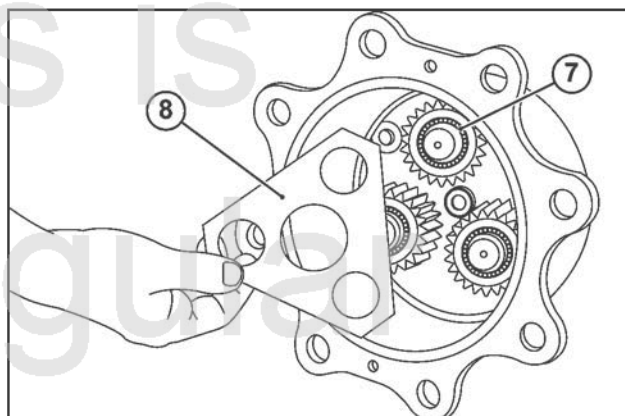


8.2 ASSEMBLY OF CARRARO AXLE group 172

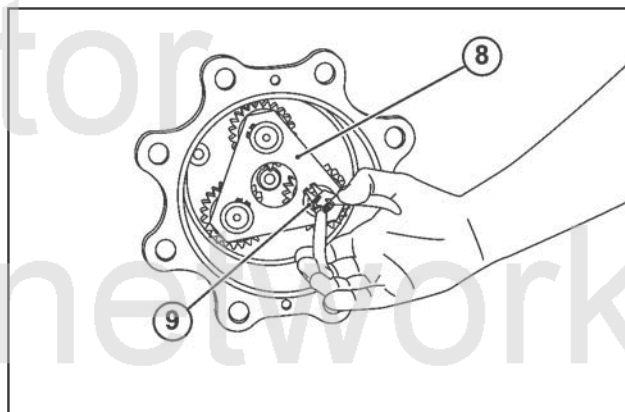
- 40- Put the plate (21) in crown wheel and secure it by circlip (4).



- 41- Check if no needle bearings (7) and thrust washer (8) are worn in reducer.
★ There are 30 needles in one pinion frame.

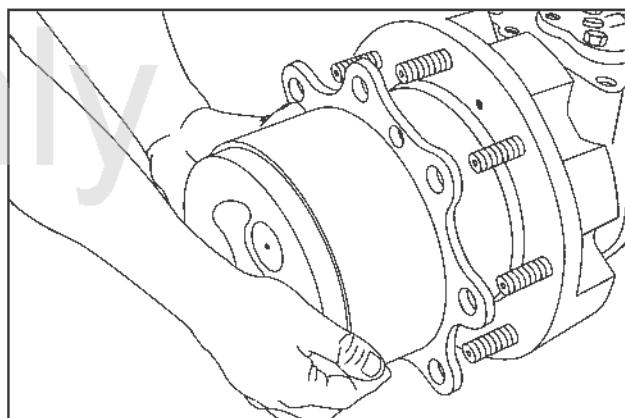


- 42- Mount the washer (8) by means of circlips (9).



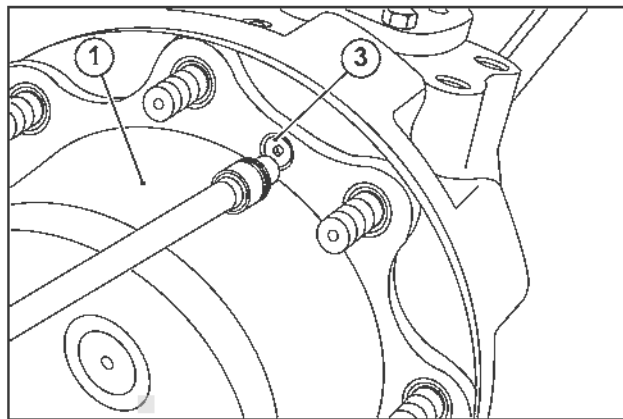
- 43- Place the reducer on wheel hub.

- ★ Slide new rubber ring for sealing of reducer on hub.

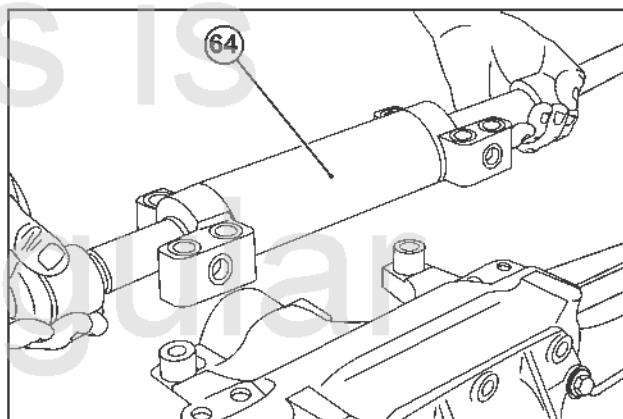


8.2 ASSEMBLY OF CARRARO AXLE group 172

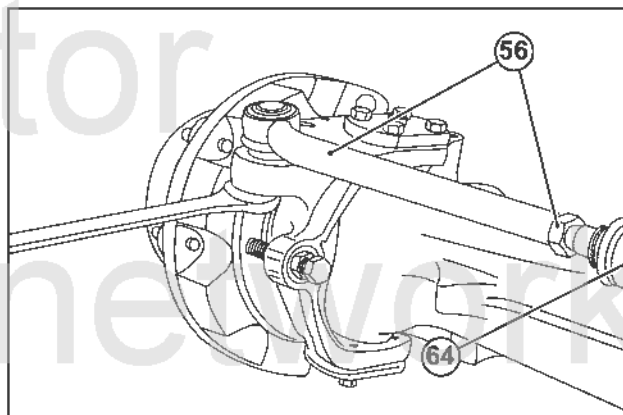
- 44- Mount the reducer to wheel hub by two bolts (3).



- 45- Fasten the complete cylinder of hydrostatic steering (64) group 275 to the axle.



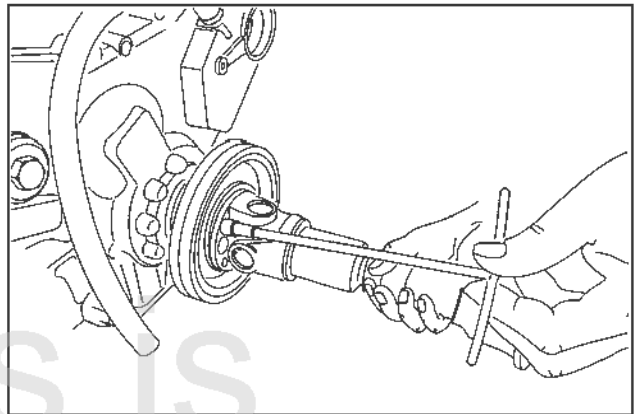
- 46- Connect the steering rods (56) group-275 by means of ball pins.



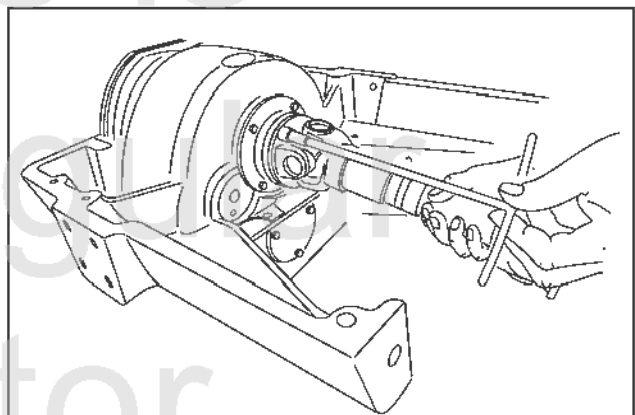
- 47- After axle mounting on tractor it is necessary to fill the specified oil to reducers and final gear as per lubrication chart.
- ★ The failure in oil change causes damage of plates and non-functionality of differential lock.

9.1 DISMANTLING OF FRONT POWER TAKE-OFF group 135

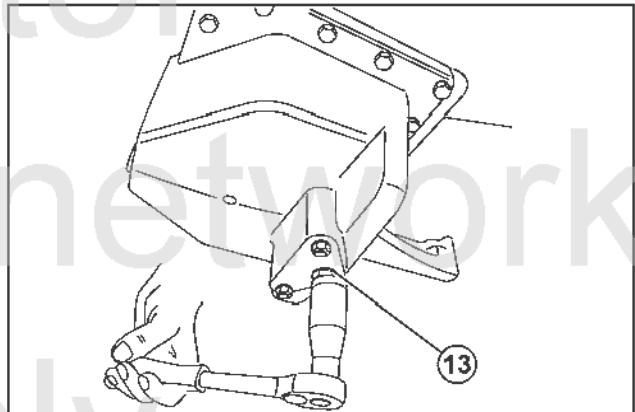
- 1 - Dismantle the flange of drive shaft from engine pulley.



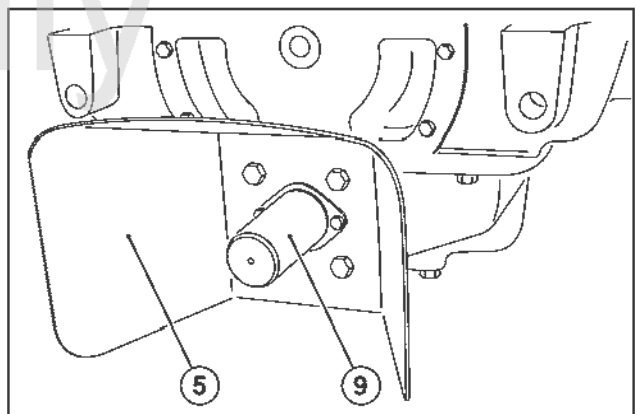
- 2 - Dismantle the flange of drive shaft from carrier (42).



- 3 - Drain the oil from outlet box by plug (13).

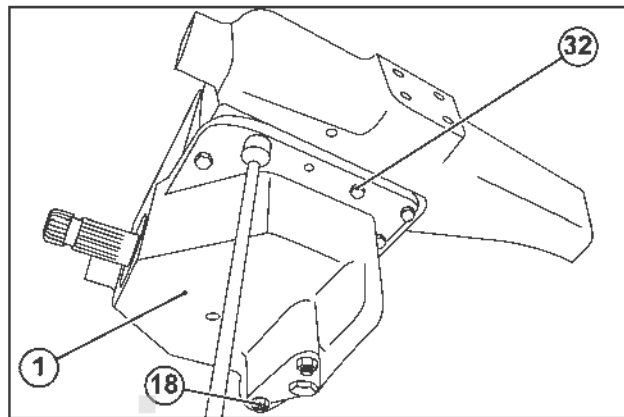


- 4 - Dismantle the cover of power take-off (9) and cover (5).

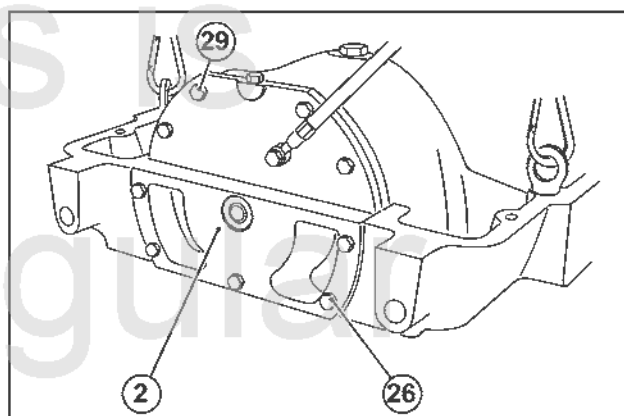


9.1 DISMANTLING OF FRONT POWER TAKE-OFF group 135

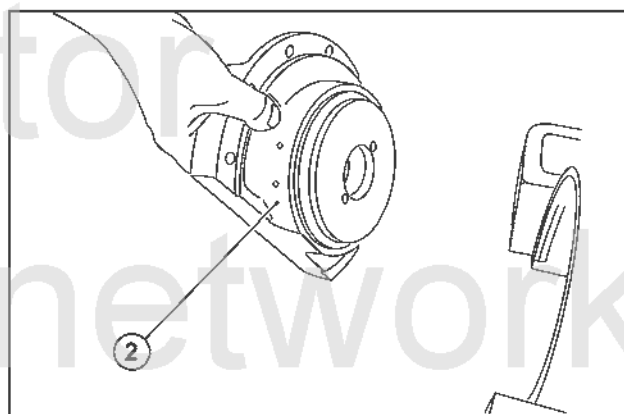
- 5 - Unscrew the bolts (32) and nuts (18) and remove the bottom cover (1).



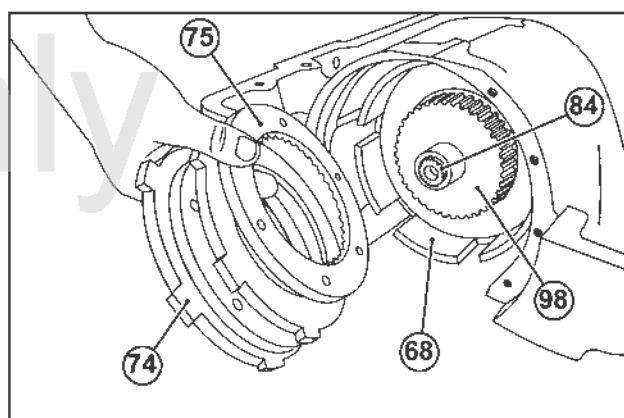
- 6 - Unscrew the bolts (26) and (29) from front cover (2). Remove the hollow screw of compressed air feed for clutch control.



- 7 - Remove the front cover (2) with clutch control.

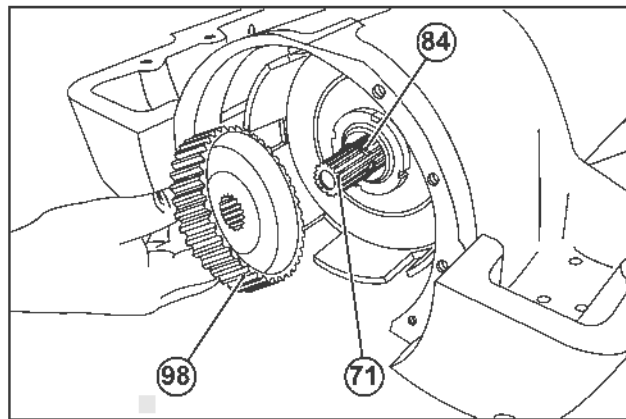


- 8 - Remove the plates (74 and 75) from driving (98) and driven (68) drums. Dismantle the circlip (84).

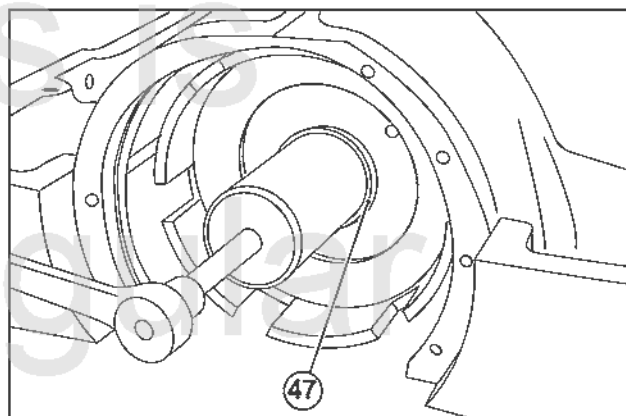


9.1 DISMANTLING OF FRONT POWER TAKE-OFF group 135

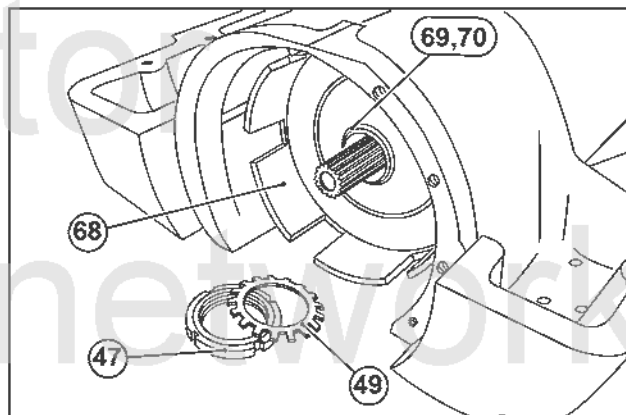
- 9 - Pull the driving drum (98) and circlip (84) from power shaft (71).



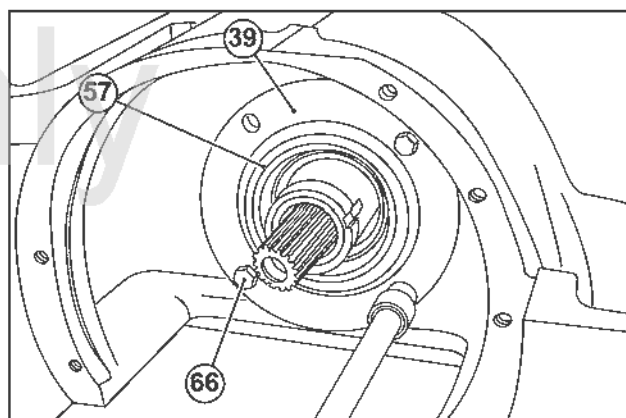
- 10- Unscrew the nut (47) using the tool No. **78.942.703**.



- 11- Remove the lock washer (49) and driven drum (68) from drive gear (69,70).
- Wheel (69) is used with standard right-handed gear.
 - Wheel (70) is used with left-handed gear.

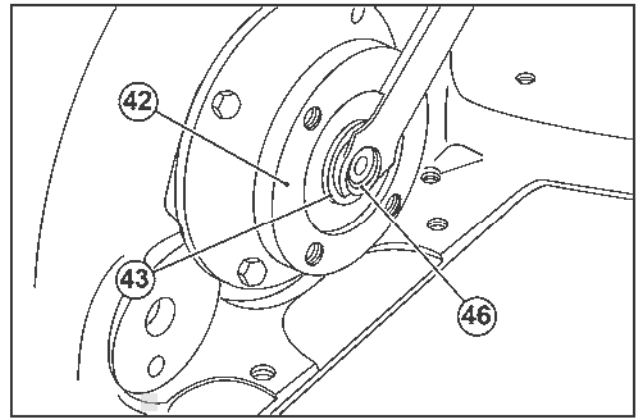


- 12- Unscrew the bolts (66) and remove the cap (39) together with gasket seal (57).

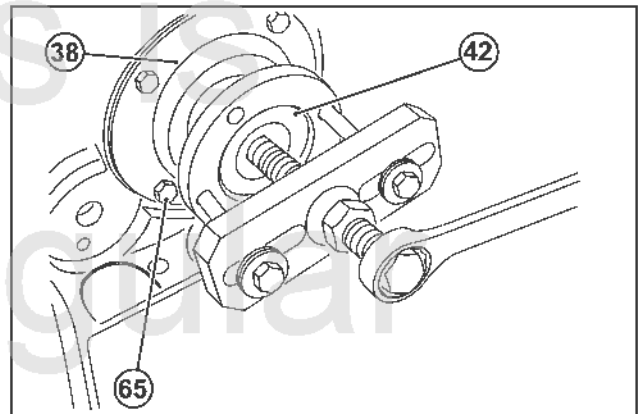


9.1 DISMANTLING OF FRONT POWER TAKE-OFF group 135

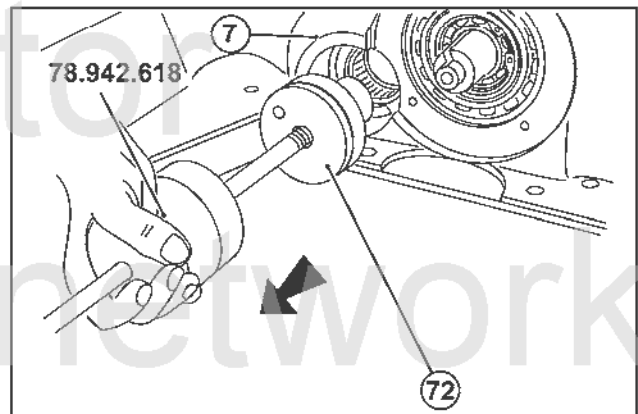
13- Unscrew the nut (46) and remove the lock washer (48), and washer (43) for carrier release (42).



14- Pull off the carrier (42) using puller. After releasing of bolts (65) remove the cap (38).

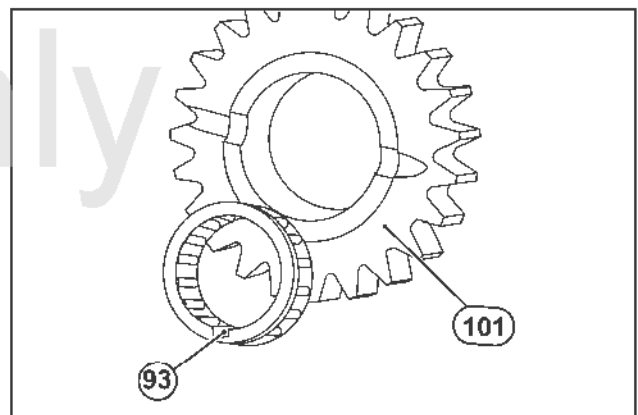


15- Push the pin (72) out of sump (7) by means of tool No. 78.942.618.



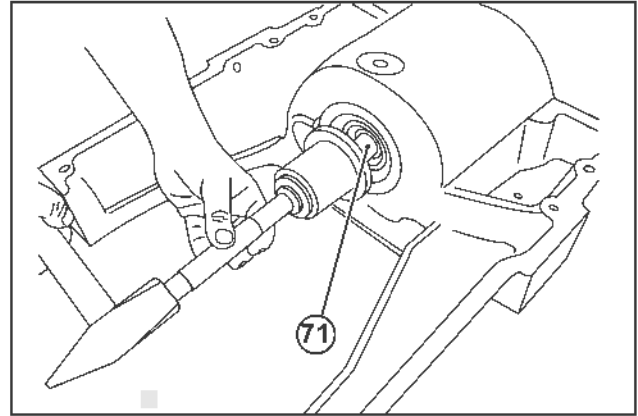
16- Remove the needle bearing (93) and idle gear (101).

★ Wheel (101) and bearing (93) are not used with left-handed version.

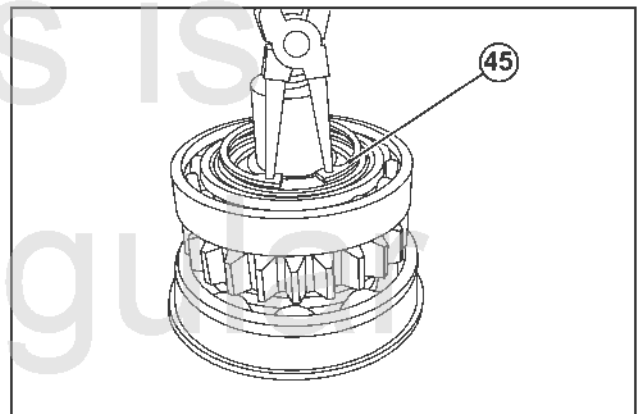


9.1 DISMANTLING OF FRONT POWER TAKE-OFF group 135

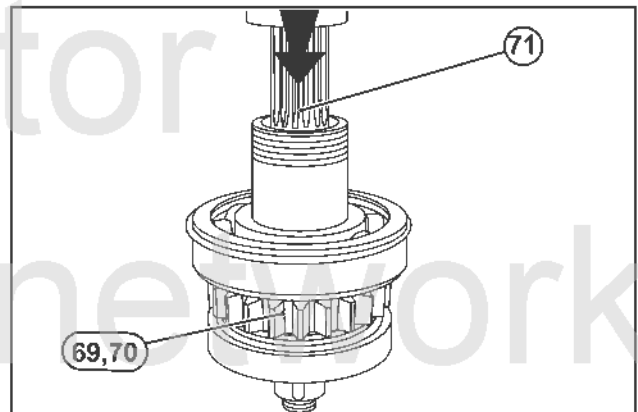
17- Force out the drive shaft (71) and drive gear (69,70) with bearings from sump by means of pusher towards front part of tractor.



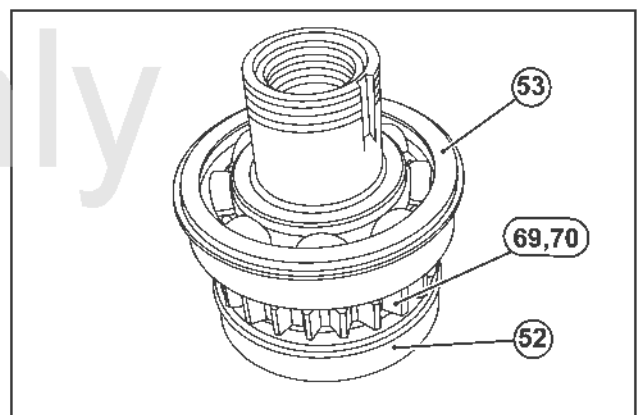
18- Firstly dismantle the circlip (45) from removed shafts.



19- Place the turned assembly to the press and press out the drive shaft (71) together with bearing (51) from drive gear (69,70).

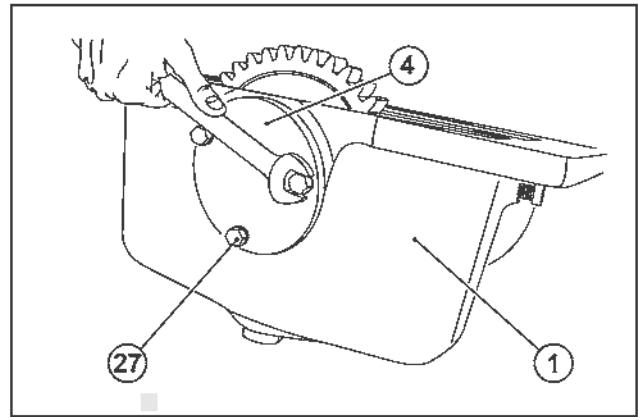


20- Note: Check the ball bearings (52) and (53). Check also the needle bearing (54) and git seal (55) inside drive gear (69,70). The drive gear (69) has 22 teeth and is designed for standard version with idle wheel. The drive gear (70) has 23 teeth and is designed for left-handed run of power take-off (without idle wheel).

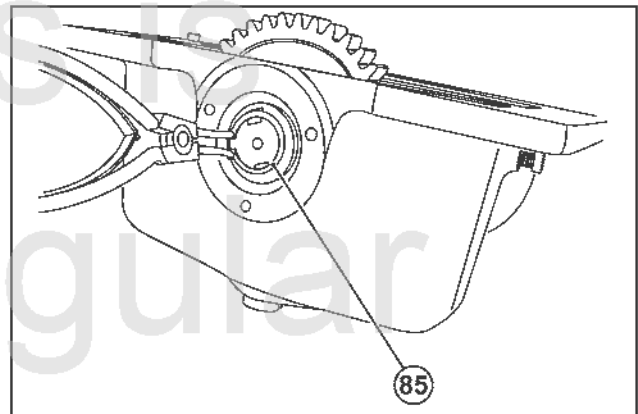


9.1 DISMANTLING OF FRONT POWER TAKE-OFF group 135

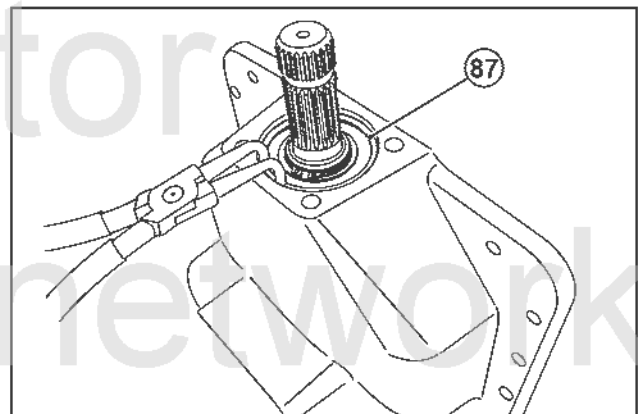
21- Dismantle the cap (4) of the bottom cover (1) after release and unscrewing of bolts (27).



22- Remove the circlip (85).

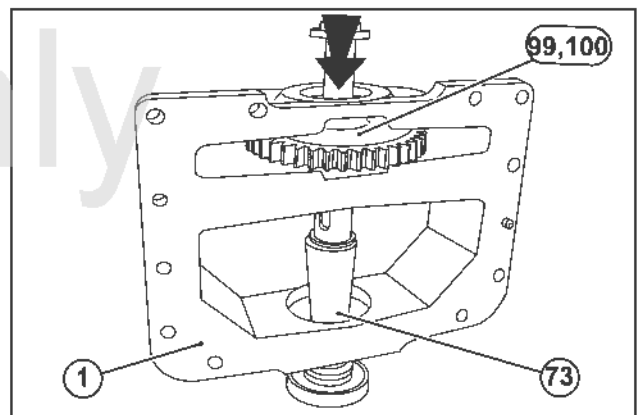


23- Remove the circlip (87).



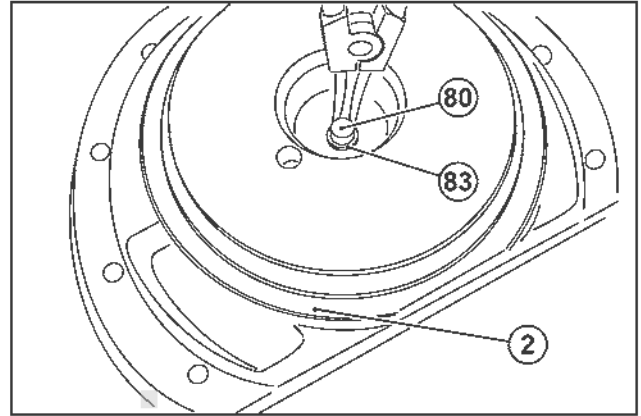
24- Place the bottom cover (1) to the press so that the power take-off (73) can be pushed out from cover and wheel (99,100). Release this wheel.

- Wheel (99) has 40 teeth and is designed for standard right-handed run.
- Wheel (100) has 43 teeth and is designed for standard left-handed run.

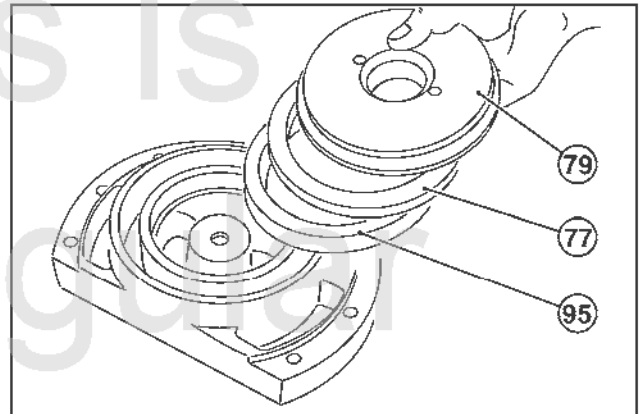


9.1 DISMANTLING OF FRONT POWER TAKE-OFF group 135

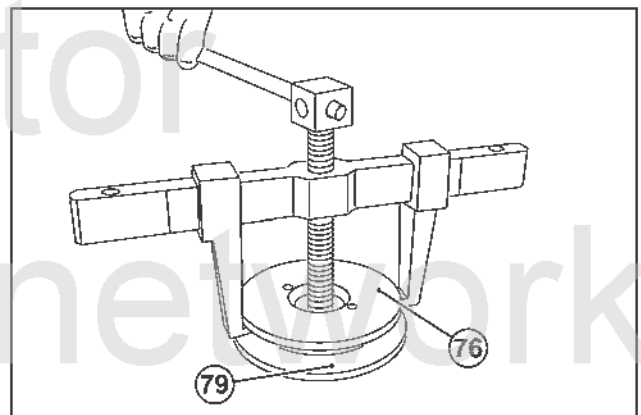
- 25- Press the pin (80) to the front cover (2) and release the circlip (83) using pliers.



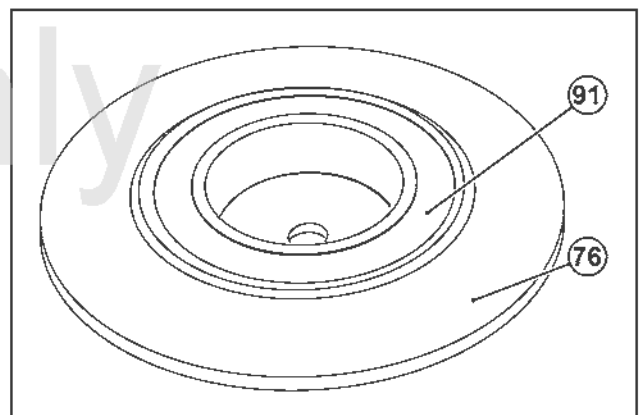
- 26- Remove the shaft sleeve (79), clutch piston (77), and collar (95) from front cover.
★ Check the collar (95) and functional surface of front cover (2).



- 27- Remove the thrust plate (76) from shaft sleeve (79) using puller.



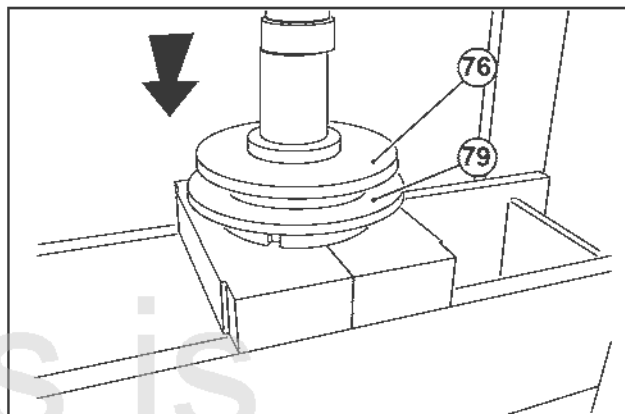
- 28- Check the bearing (91) and replace it if needed.



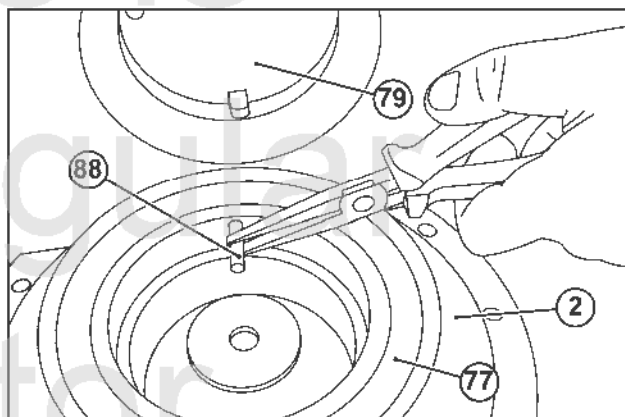
This is
for regular
Zetor
service network
only

9.2 ASSEMBLY OF FRONT POWER TAKE-OFF group 135

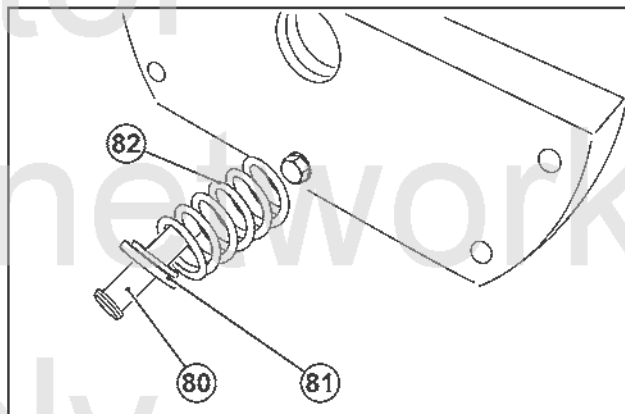
- 1 - Apply the thrust plate (76) with bearing (91) on bearing bush (79) and press it inward.



- 2 - Put the collar (95), clutch piston (77) to the front cover (2) and slide needle (88) into the hole. Then apply the bearing bush (79) by groove for needle (88).

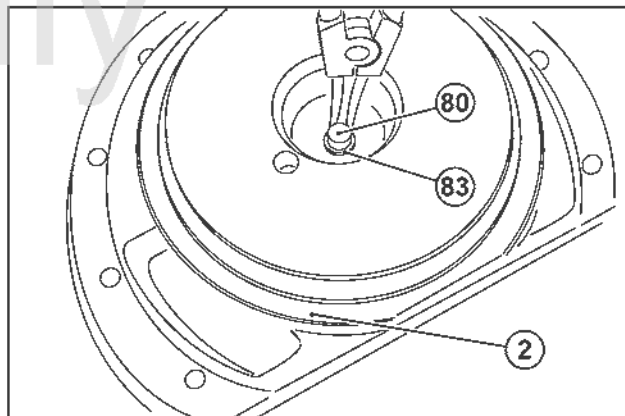


- 3 - Complete the clutch controlling mechanism by means of pin (80), cup (81), spring (82), and circlip (83).



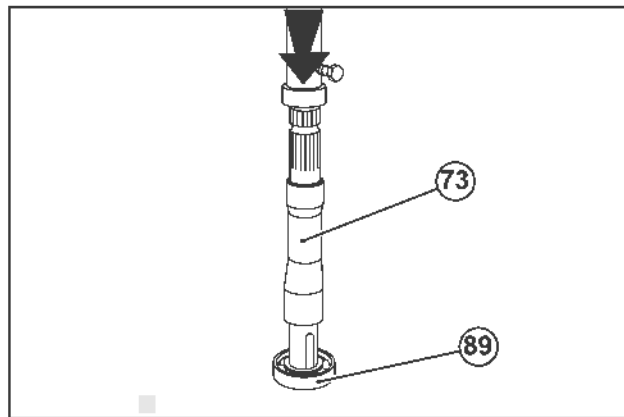
- 4 - Secure the pin (80) in cover (2) by circlip (83).

- Check the tightness and function of clutch by compressed air.

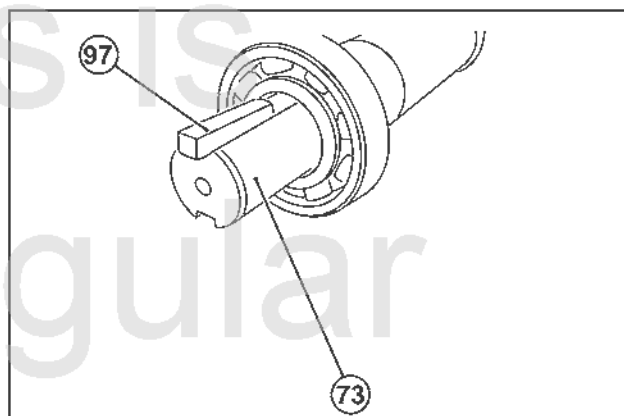


9.2 ASSEMBLY OF FRONT POWER TAKE-OFF group 135

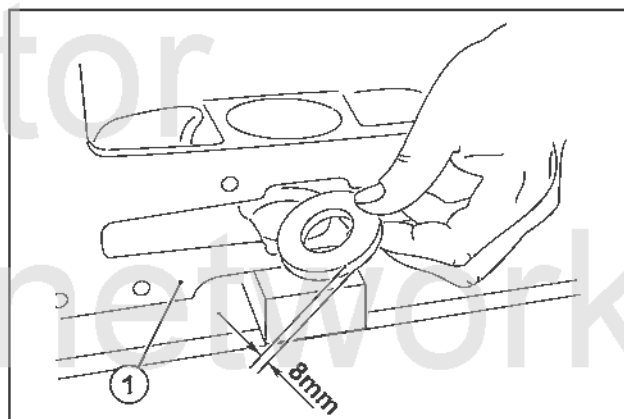
- 5 - Press the bearing (89) on the power take-off.



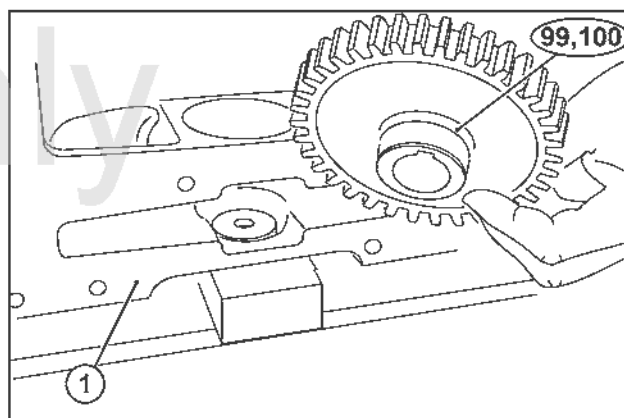
- 6 - Place two keys (97) on power take-off (73).



- 7 - Before pressing of the power take-off into driven wheel and bottom cover (1) insert the mounting washer 8 mm thick to the shaft hole for correct shaft positioning.

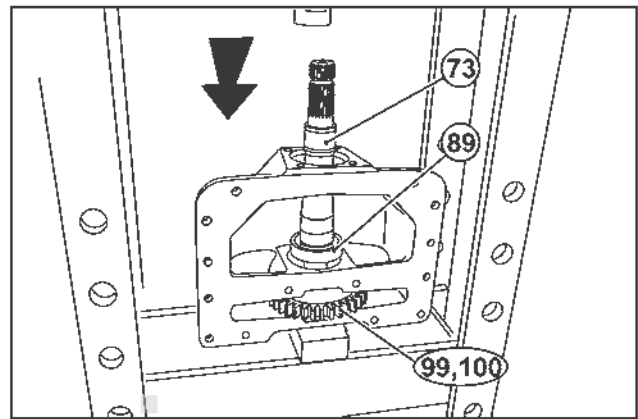


- 8 - Slide the driven wheel (99,100) into bottom cover.

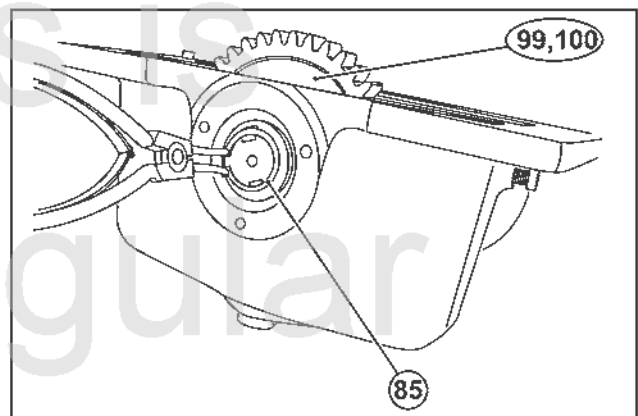


9.2 ASSEMBLY OF FRONT POWER TAKE-OFF group 135

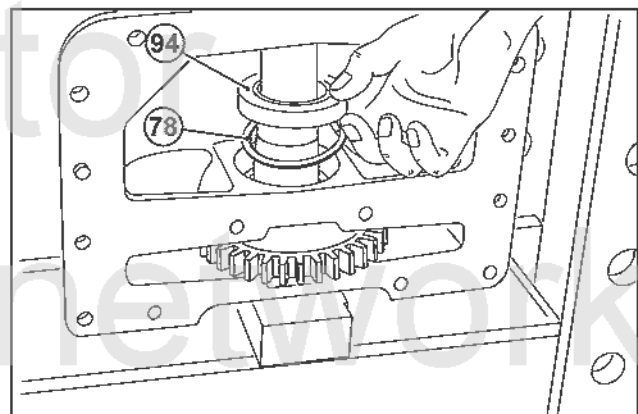
- 9 - Press the power take-off (73) with bearing (89) and keys (97) on the wheel (99,100) home to the mounting washer 8 mm.



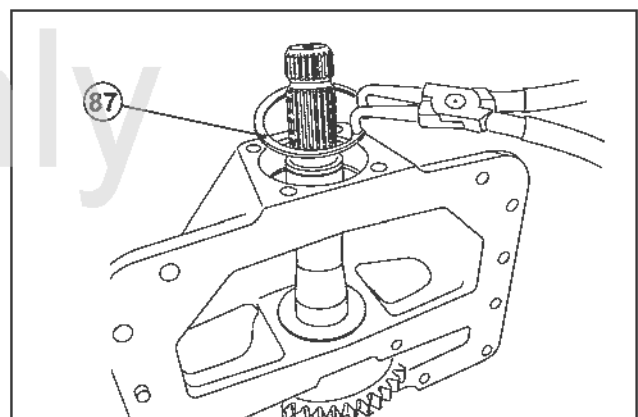
- 10- Remove the mounting washer 8 mm and secure the driven wheel (99,100) by circlip (85).



- 11- Slide firstly the washer (78) and then git seal (94) on shaft. Press the git seal to the body of bottom cover.

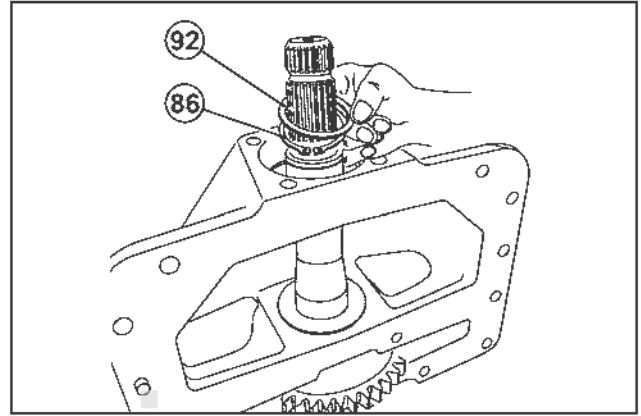


- 12- At first put the bigger circlip (87) to the hole of bottom cover.

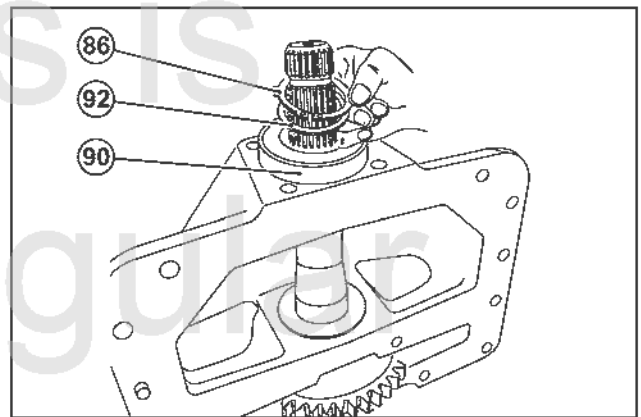


9.2 ASSEMBLY OF FRONT POWER TAKE-OFF group 135

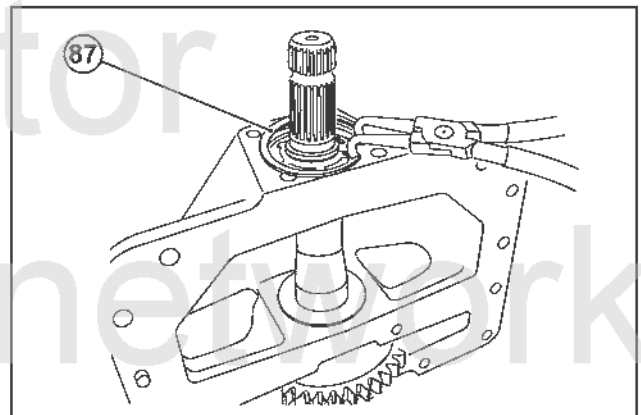
- 13- Slide then the circlip (86) and spacer (92) on power take-off.



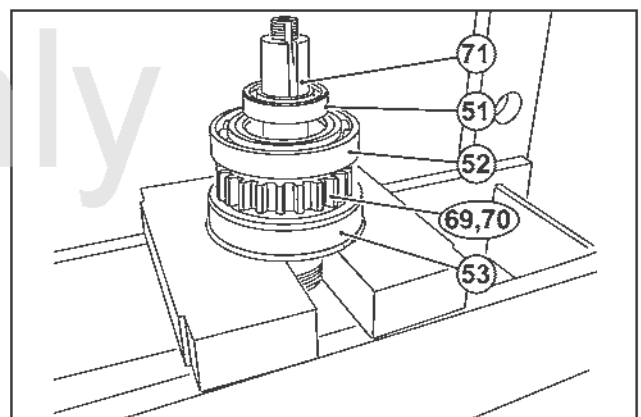
- 14- Press the bearing (90) into the hole and slide on the spacer (92) and circlip (86).



- 15- Secure the bearing in the bottom cover by circlip (87).

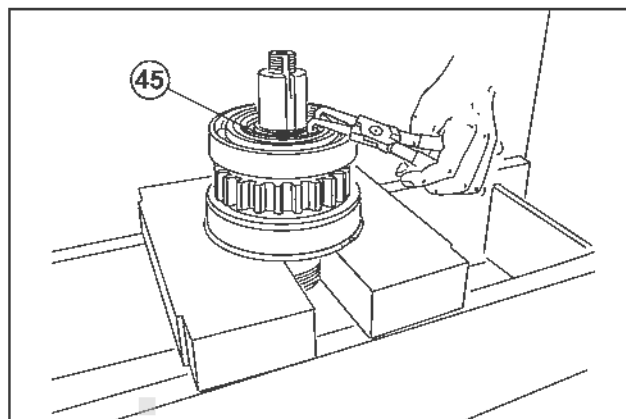


- 16- Press the drive shaft (71) with bearing (51) on the drive gear (69,70) with bearing (52) and (53).

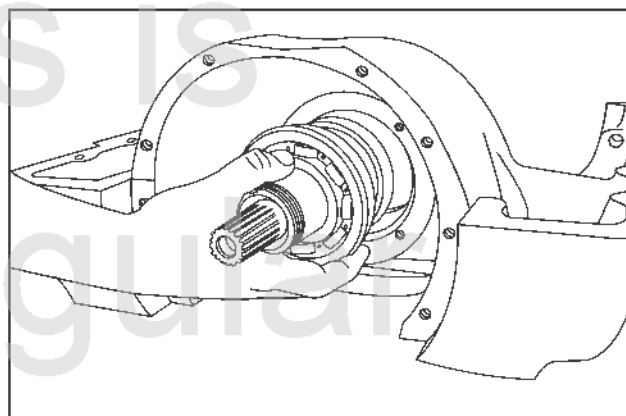


9.2 ASSEMBLY OF FRONT POWER TAKE-OFF group 135

17- Fasten the shafts by circlip (45).

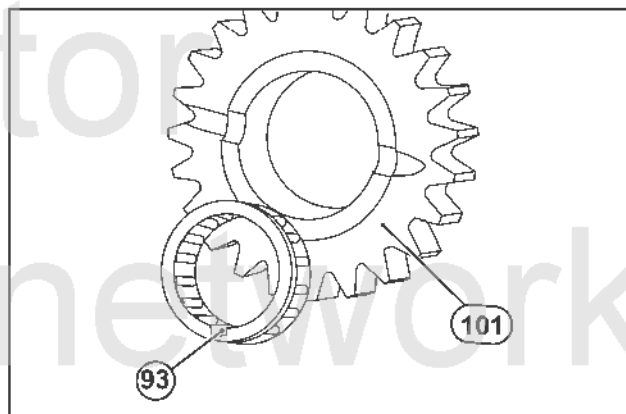


18- Push the shafts (69,70) and (71) into sump.



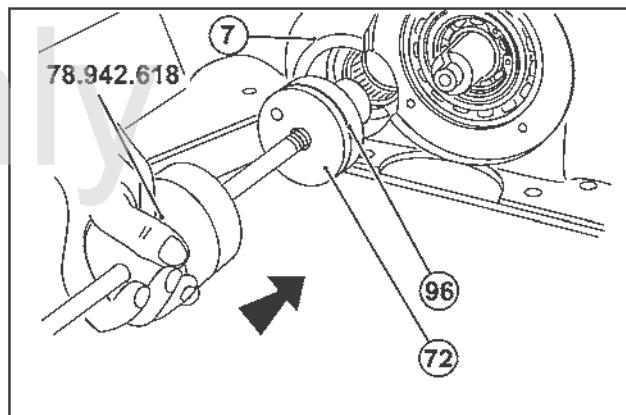
19- Put then the wheel (101) together with needle bearing (93) into sump.

- Valid only for standard version (right-handed).



20- Fasten the wheel with bearing in sump by pin. Use jig for hammering.

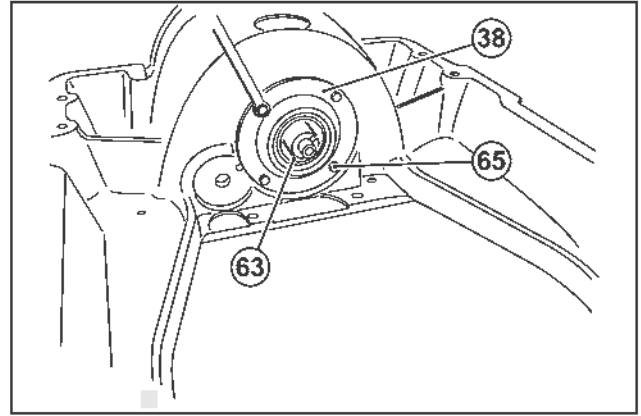
- ★ Before hammering the pin (72) check the ring (96).



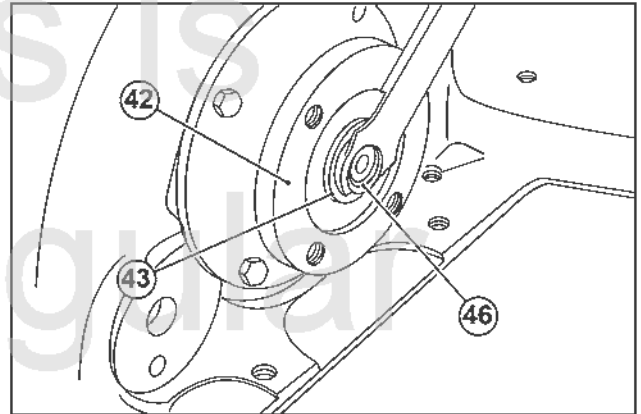
9.2 ASSEMBLY OF FRONT POWER TAKE-OFF group 135

- 21- Lubricate the contact surface of cap (38) by Rhodoseal sealant and fix the cap by bolts (65). Fasten the cap by bolts.

 Cap :Rhodoseal

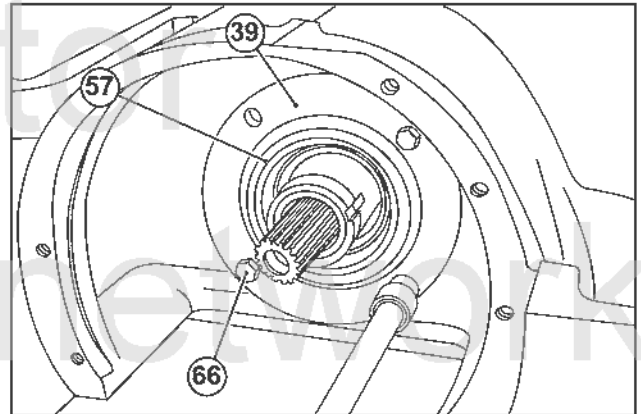


- 22- Push the carrier (42) and washer (43) , and locking washer (48) on drive shaft. Fasten the carrier (42) using nut (46). Secure the nut (46) by locking washer (48).

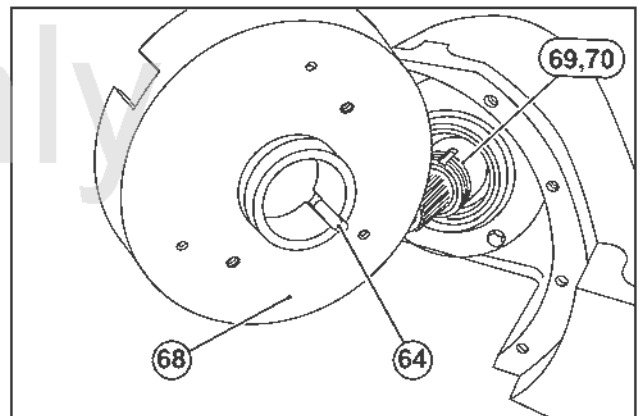


- 23- Mount the cap (39) with git seal (57) by means of bolts (66). Lubricate the contact surfaces by Rhodoseal sealant.

 Cap: Rhodoseal

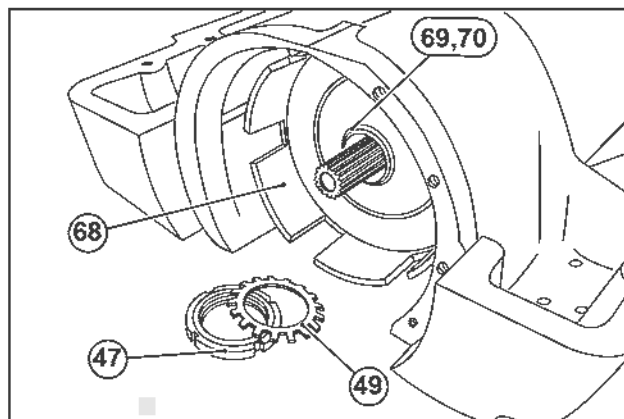


- 24- Put the key (64) to the driven drum (68) and push on drive gear (69,70).

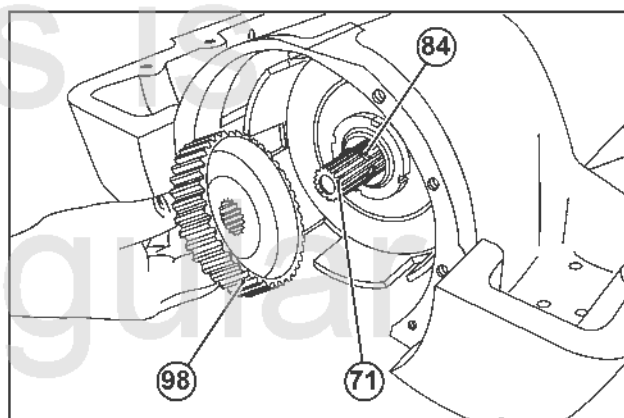


9.2 ASSEMBLY OF FRONT POWER TAKE-OFF group 135

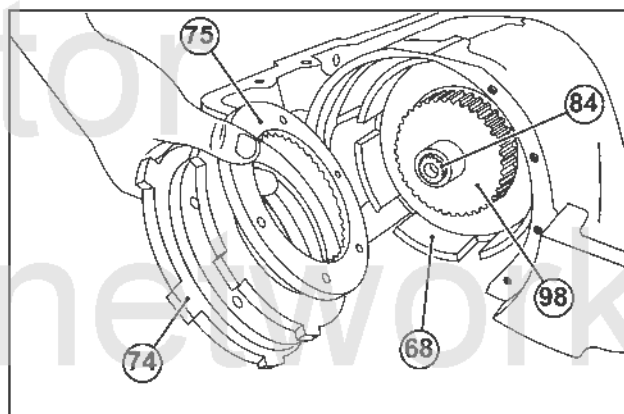
25- Mount the driven drum (68) by means of nut (47) secured by locking plate (49) on drive gear (69,70).



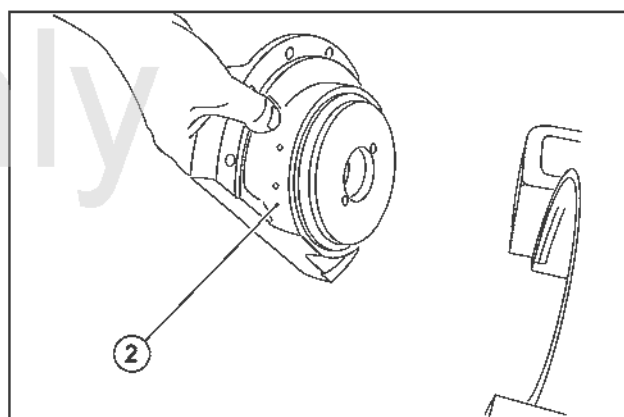
26- Mount the circlip (84) on drive gear (71) and push on the drive gear (98) and fasten by another circlip (84).



27- Check if the plates (74) and (75) are worn and push them on driving drum (98) and into the driven drum (68).

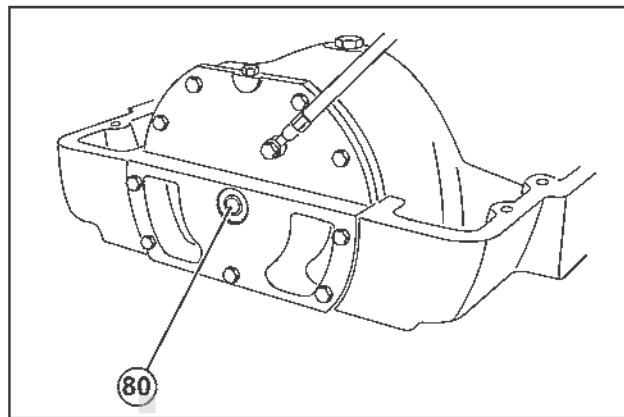


28- Put the front cover (2) together with mounted thrust plate to the sump.



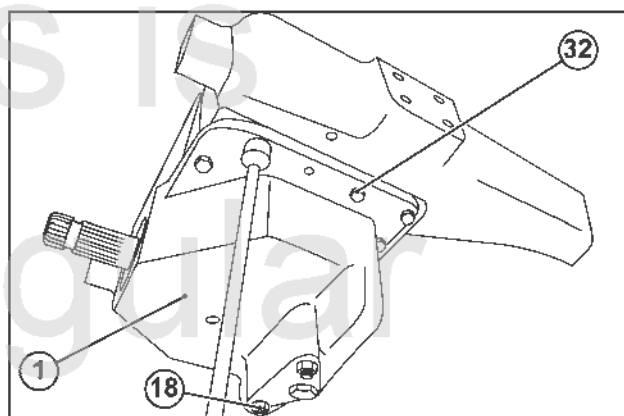
9.2 ASSEMBLY OF FRONT POWER TAKE-OFF group 135

29- Connect the hose with compressed air to the front cover and make the clutch functional test. The clutch operation is visible on pin move (80).



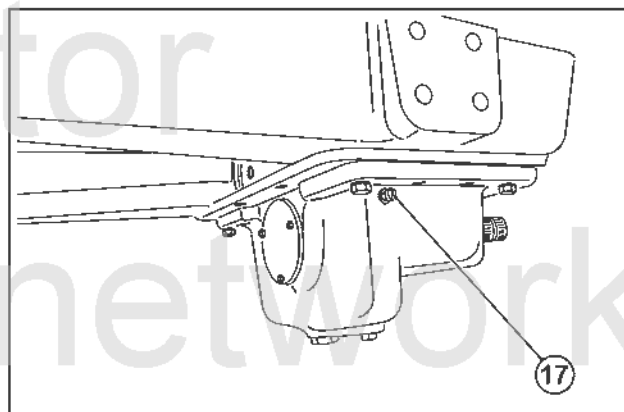
30- Prepare the bottom cover with power take-off. Lubricate the contact surfaces of cover and sump by Rhodoseal sealant and mount the bottom cover (1) by bolts (32) and nuts (18).

 Cover: Rhodoseal



31- Fill the specified oil up to the level of inspection hole (17).

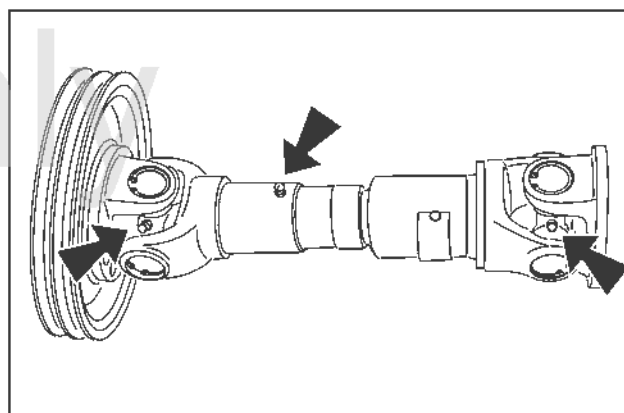
32- Mount the complete sump of the front outlet to the tractor.



33- Assemble the joint shaft so that the carriers on both shaft sides are parallel ones.

34- Fix the joint shaft to the engine and PVH carrier.

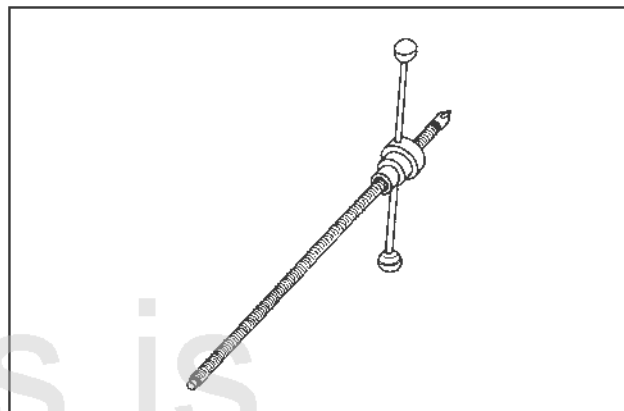
35- Lubricate the marked points by forced-feed oiler.



10.1 SERVICE TOOLS

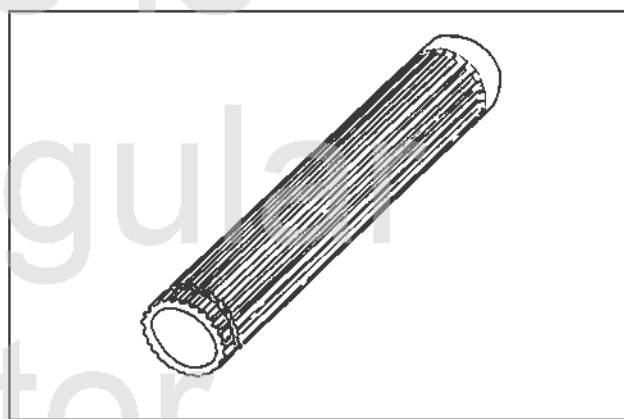
78.942.610

Puller



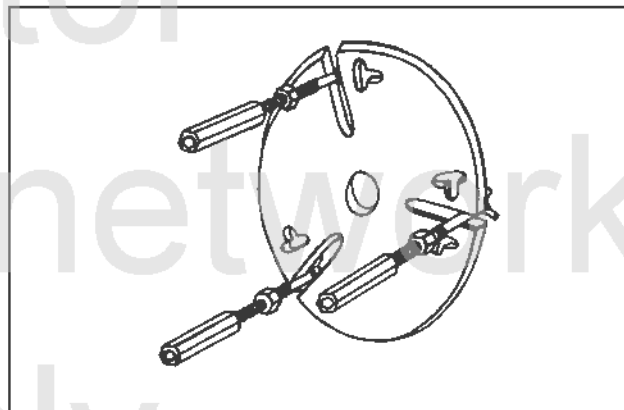
78.942.613

Auxiliary spline shaft



78.942.614

Layshaft puller



78.942.615

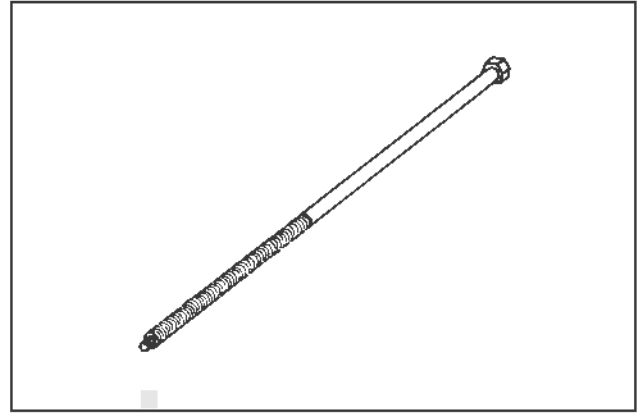
Layshaft puller



10.1 SERVICE TOOLS

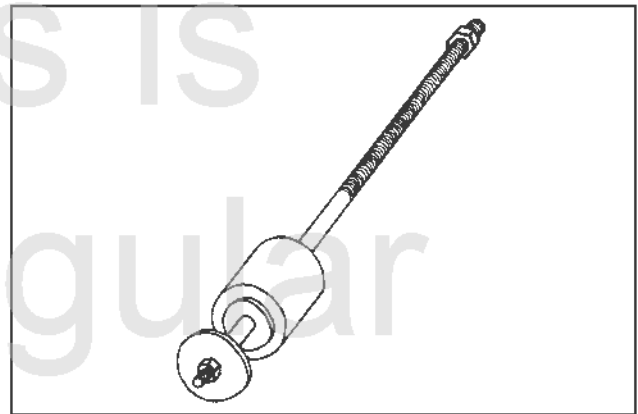
78.942.616

Countershaft puller



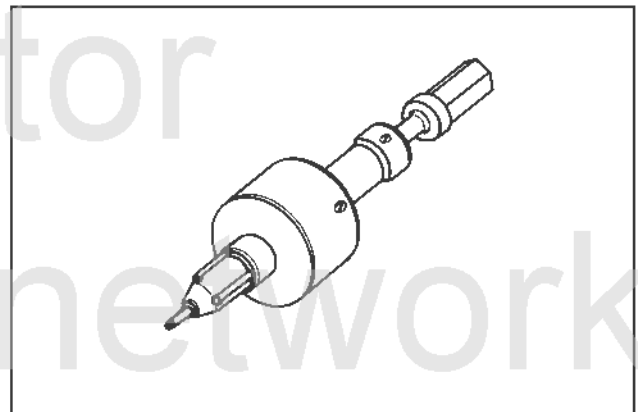
78.942.618

Jig



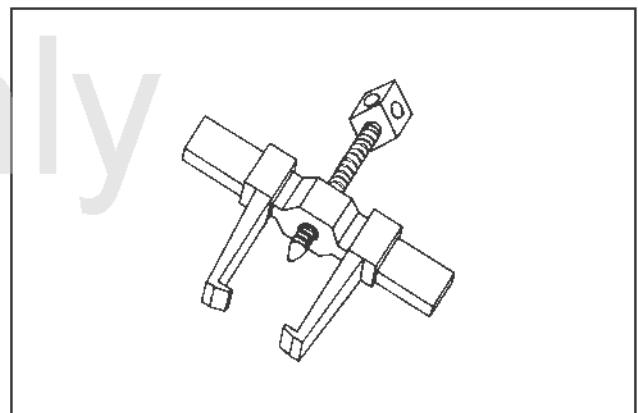
78.942.625

Tool for hydraulic pipe flaring



78.942.650

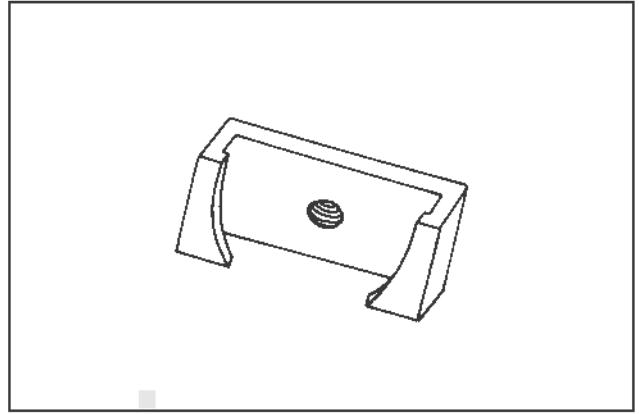
Puller



10.1 SERVICE TOOLS

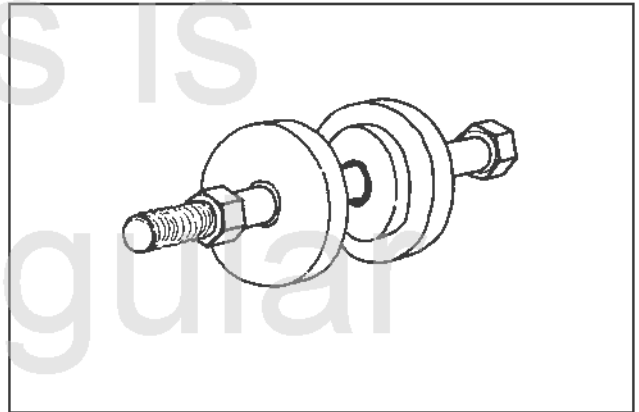
78.942.655

Puller of spline shaft



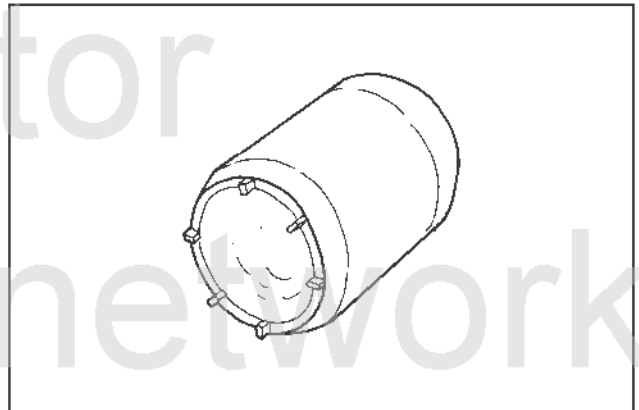
78.942.702

Set for adjustment of bevel gear



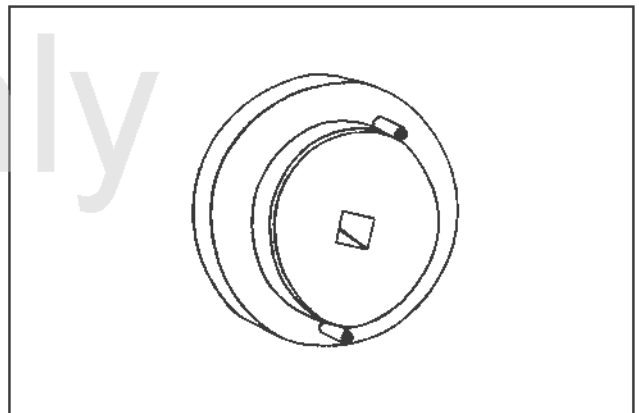
78.942.703

Wrench for pinion nut



78.942.705

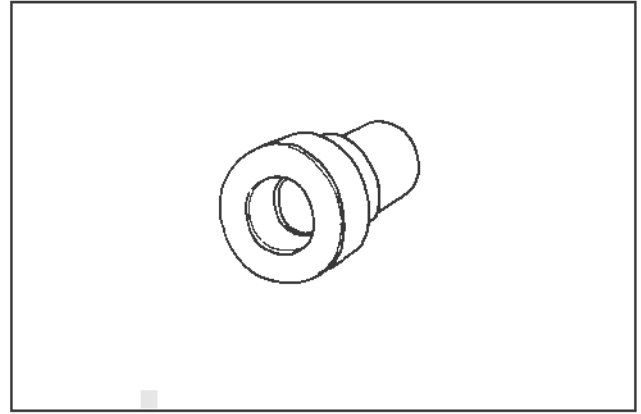
Wrench for ring nut of differential



10.1 SERVICE TOOLS

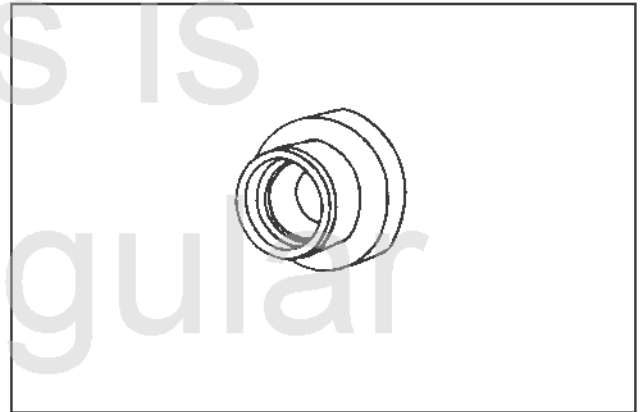
78.942.706

Pusher of drive shaft sleeve from differential side



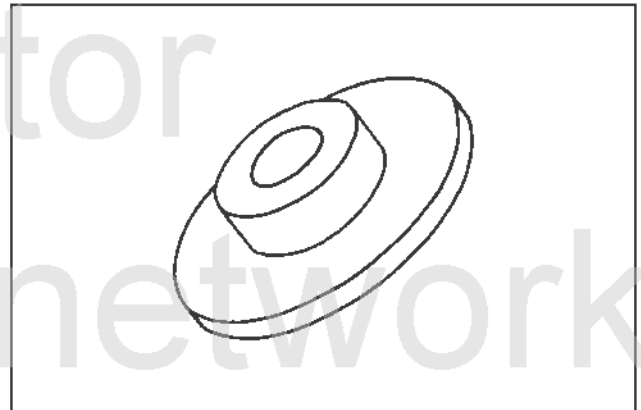
78.942.707

Pusher of shaft seal of drive gear from differential side



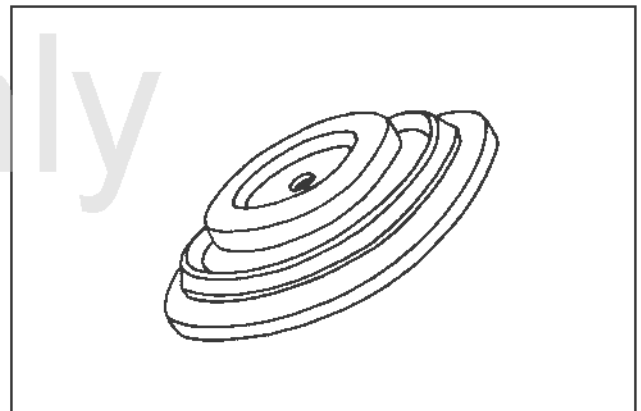
78.942.708

Pusher of shaft seal of drive gear from wheel side



78.942.709

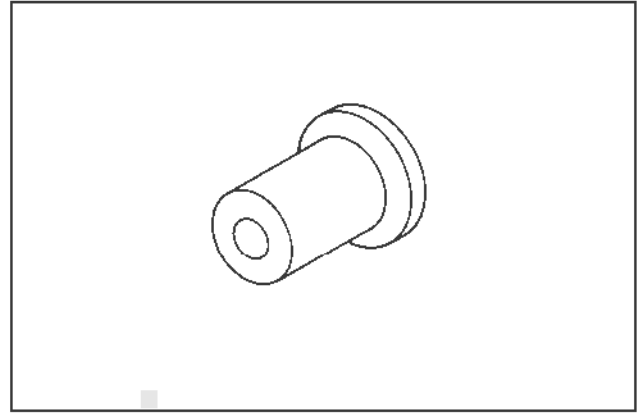
Pusher of plug-in seal of hub



10.1 SERVICE TOOLS

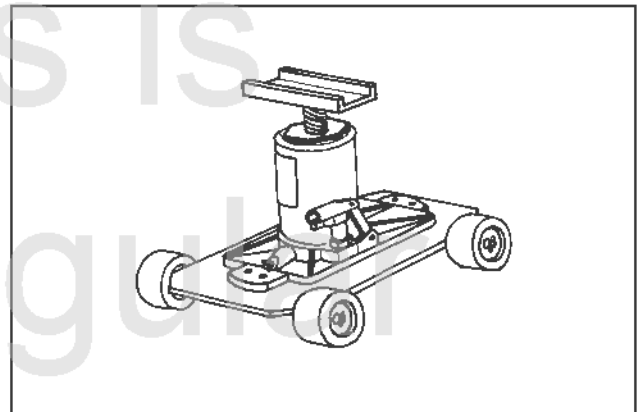
78.942.712

Ring of drive shaft sleeve from wheel side



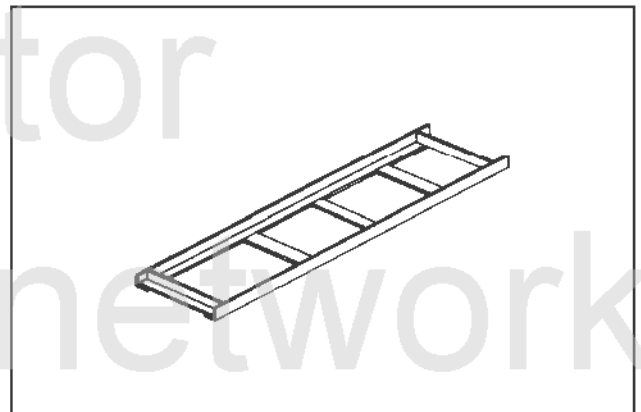
78.942.900

Tensile car 5t



78.942.901

Car guides



This is for regular Zetor service network only

Workshop manual for the transmission mechanism Proxima Z 6421 – Z 8441

Publication number: 22.22.12.441

Edition: I - 100 - 2007

Zetor Tractors a.s.

Technical Documentation Department

Trnkova 111

632 00 Brno

