

## WORKSHOP MANUAL

# MAXTER 60

06380299 Edition 02 (English)



**Tractors for Life**

**Registered offices and plant**  
GOLDONI S.p.A.

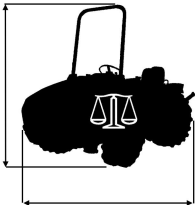
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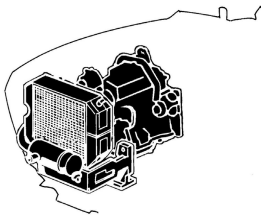
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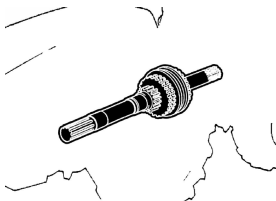
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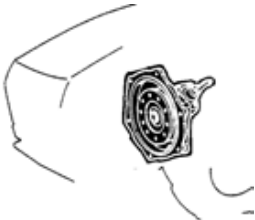
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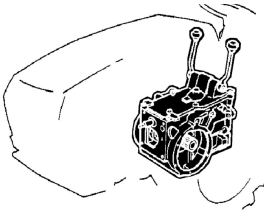
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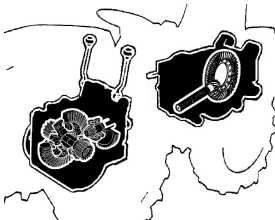
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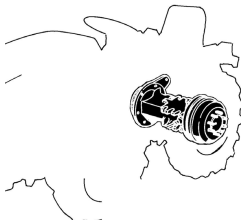
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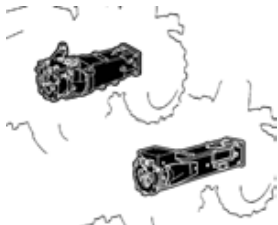
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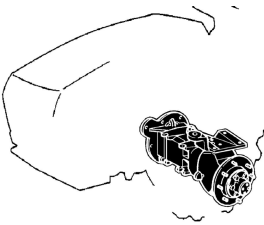
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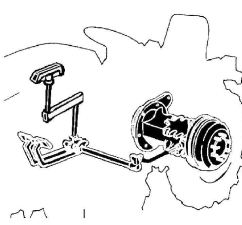
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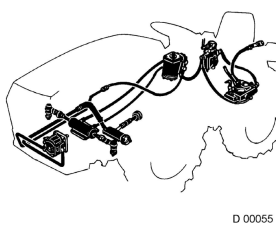
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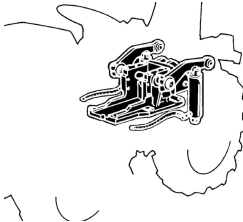
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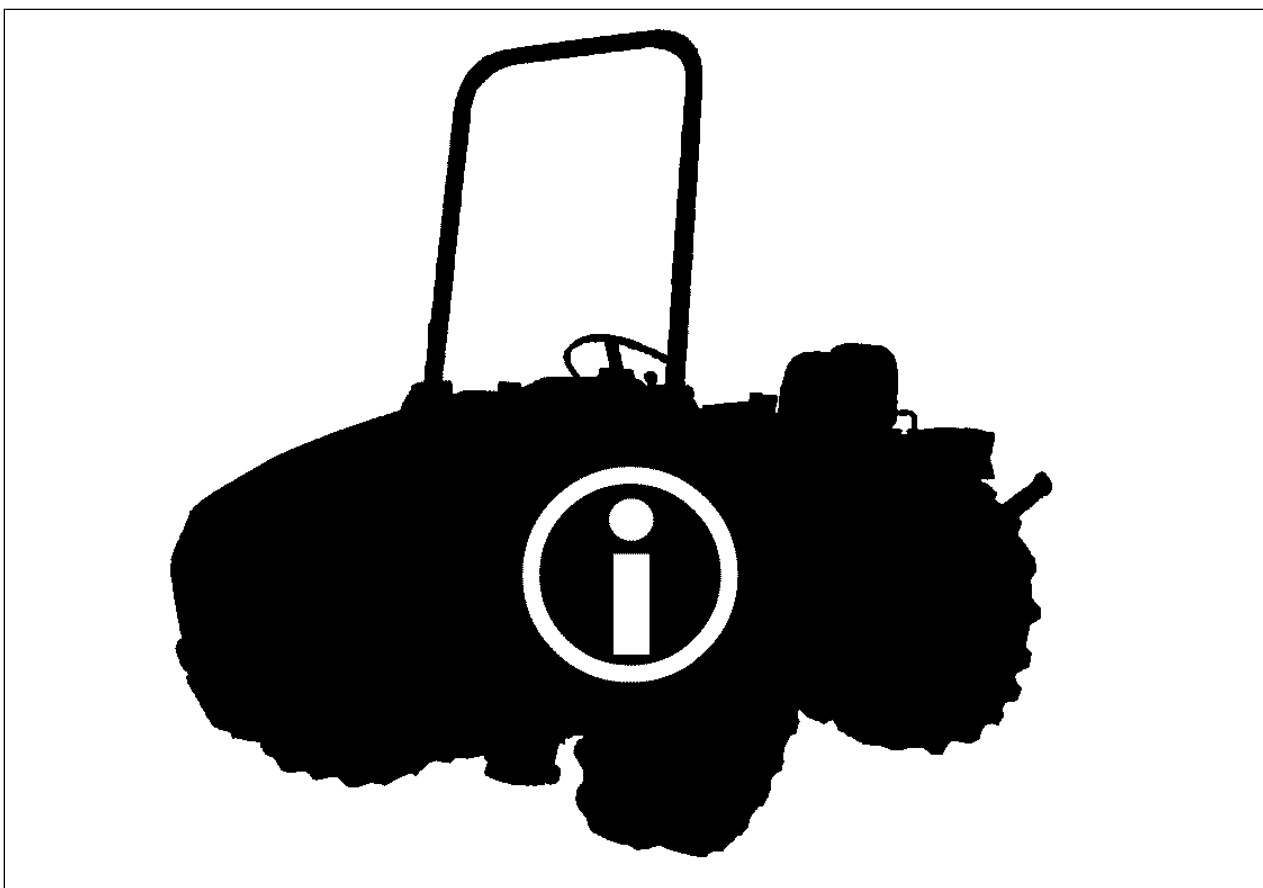
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## 00 - INTRODUCTION



## 00.1 - SAFETY REGULATIONS

 **WARNING**  
**Failure to comply with the safety regulations is the cause of the majority of accidents in workshops.**  
**The machines have been designed and made to make maintenance work as easy as possible. Despite this, accidents may still occur.**  
**Only a careful mechanic who complies with the safety rules is the best guarantee for the safety of both himself and others.**

1. Follow carefully the procedures as shown in the manual.
2. Before performing any maintenance or operations on the machine or equipment connected must be:
  - Lower implements to the ground.
  - Stop the engine and remove the key.
  - Disconnect the battery ground cable.
  - In the driving position have a sign prohibiting the operation of any command.
3. Make sure that all the rotating parts of the machine (power take-off, universal couplings, pulleys, etc.) are well protected.
4. Do not wear loose or unbuttoned garments or objects that could become caught up by moving parts of the machine.  
Depending on the work required, use approved safety clothing such as: a hard hat, safety footwear, overalls and protective goggles.
5. Do not perform work on the machine when a person is seated at the controls unless this person is authorized and is helping with the work itself.
6. Never inspect or perform work on the machine with the engine running unless this is specifically required.  
In this case, ask for help from another worker who, when seated at the controls, will keep the mechanism under constant visual control.
7. Do not operate the machine or the equipment connected from a position that is not the driving one.
8. Before removing any caps or covers, make sure that you have nothing on your person that could drop into the open housings. Take the same care with your tools.
9. Do not smoke in the presence of liquids or flammable products
10. When dealing with emergencies, it is essential to:
  - Make sure that you have an efficient extinguisher and first-aid kit ready to hand.
  - Keep the telephone numbers of the emergency services and fire brigade nearby.
11. When for reasons of maintenance must inactivate the brakes, you must maintain control of the machine through proper locking systems.
12. Use the hitching points recommended by the manufacturer when towing and make sure that the towing attachments are fastened correctly.  
Keep well clear of bars and ropes when they become taut and start to pull.

13. When loading a machine onto a transport vehicle, always make sure that they are securely fastened to each other.  
Loading and unloading operations should always be performed with the transport vehicle on a flat surface.
14. Use hoists or other equipment with an adequate carrying capacity when lifting or shifting heavy parts and make sure that the chains, ropes or belts used for lifting are fully efficient.  
Have all bystanders move well away from the area where the operations are being performed.
15. Owing to their toxic nature and for safety reasons, never pour gasoline or diesel fuel into wide, open vessels. Do not use these products for cleaning purposes. Use the specially formulated flameproof, non-toxic products available on the market.
16. When cleaning objects need to use compressed air, wear safety glasses with side protection
17. Make sure that you have routed the gas exhaust device outdoors before you start an engine in a closed place.  
In the absence of this device, make sure that there is adequate and continuous ventilation in the room.
18. Move with care and take all the necessary precautions during operations away from the workshop when you must work under the machine. Choose a flat area, place chocks under the wheels to block the machine and wear protective clothing.
19. The work area must be kept clean and dry with patches of oil and water wells.
20. Rags soaked in oil or dirtied with grease must not be thrown into corners or allowed to form heaps as they represent a constant risk of fire outbreaks. They must be put into metal containers kept tightly closed.
21. Wear approved protective clothing such as a hard hat, goggles, gloves, special overalls and footwear when using grinding wheels, lapping machines are similar.
22. Wear approved protective clothing such as a hard hat, goggles with dark lenses, gloves, special overalls and footwear when welding. If you need help from a second person, then he too must wear the garments mentioned above.
23. Do not create, and therefore inhale, dust caused by operations performed on parts containing asbestos fiber.  
Thanks to the new technologies, asbestos is practically no longer used but you should still take precautions since mechanics often have to work on machines manufactured before the new standards came into force.  
Do not compressed air on such parts and avoid brushing or grinding them. Always wear a protective mask during maintenance work.  
If any of the parts we send should contain asbestos fiber, they will bear the relative indication.
24. Unscrew the radiator cap slowly to allow the discharge pressure in the system.  
If present, even for the expansion tank cap should maintain the same precaution.
25. Close to the battery will not cause sparks or flames to not cause explosions. Do not smoke.
26. Never test the battery charge using jumpers made by placing metal objects between the terminals.
27. To avoid injury from acid must be:

- Wear rubber gloves and goggles.
- Make the topping in the ambient well ventilated and avoid breathing toxic fumes.
- Avoid spilling or dripping from electrolyte.
- Charge batteries only in well ventilated space.
- Do not charge batteries frozen because they can explode.

28. A fluid under pressure that escapes from a tiny hole may be almost invisible but have the force to penetrate under the skin and cause serious infections or dermatosis.  
Never use your hands to check for leaks from the circuit. Use a piece of cardboard or wood.
29. Check the pressure of hydraulic means using appropriate tools.

 **WARNING**  
**The safety structures with which the tractor is equipped (front and rear roll-bar, pto guard, netting that protects the rotating parts, supports and tow hooks, seat....) have undergone type-approval tests and as such have been certified.**  
**These structures must not be modified or used for purposes other than those envisaged by the manufacturer, otherwise the type-approval will become void.**

## 00.2 - MACHINE IDENTIFICATION



Indications valid for pivoted at the center versions



Fig.1

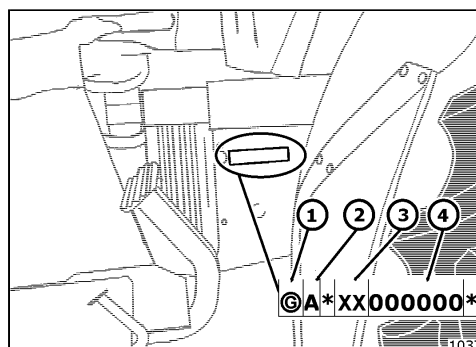


Fig.2



Indications valid for steering wheels versions



Fig.1

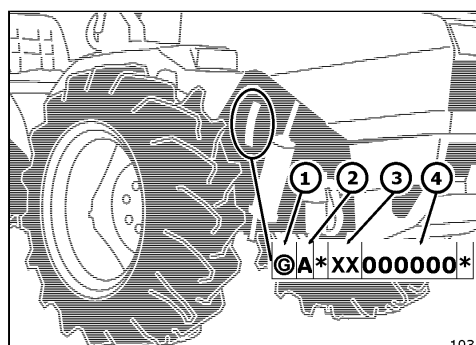


Fig.2

- ① Manufacturer's code.
- ② Production series
- ③ Type of machine
- ④ Identification number (serial number).

Always state the identification data of the machine whenever you call our assistance service for technical explanations or when ordering spare parts.

We require the following information:

1. Type or model of the machine.
2. Serial number and chassis number.

The type of machine, serial number and chassis number are stamped on the metal data plate (fig. 1) fixed in an easily accessible part of the machine.

The chassis number is stamped on the chassis itself, as shown in (fig.2).

With regard to the engine, refer to the workshop manual supplied by the relative manufacturer.

**00.2.10 - Manual update**

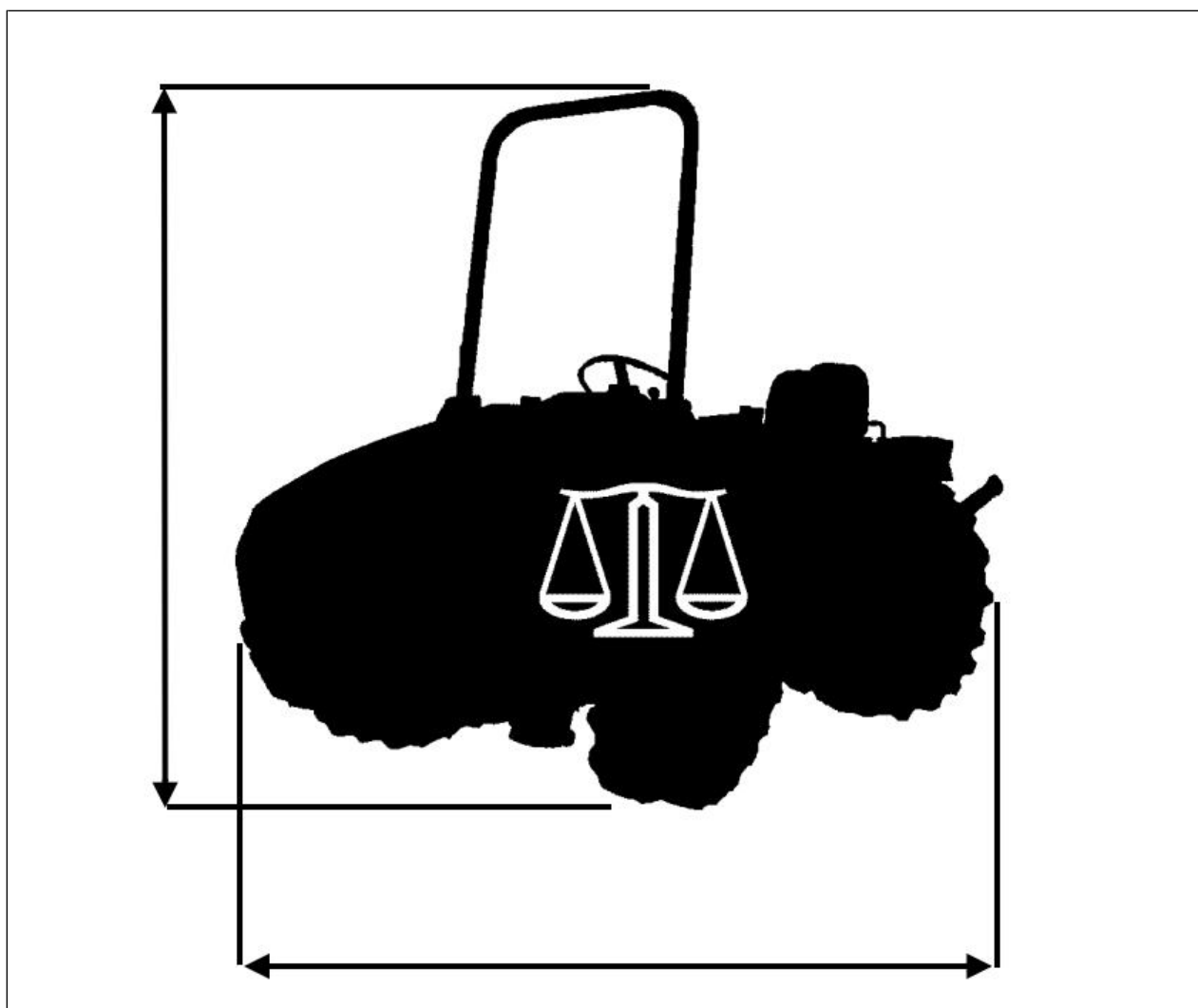
Future updates to the manual, modifications or additions to assemblies or parts of assemblies will be published in our website.

With regard to modified assemblies, the interventions prior and after the modifications will be illustrated along with the operations required should conversion be obligatory.

**00.2.20 - Recommendations for the user**

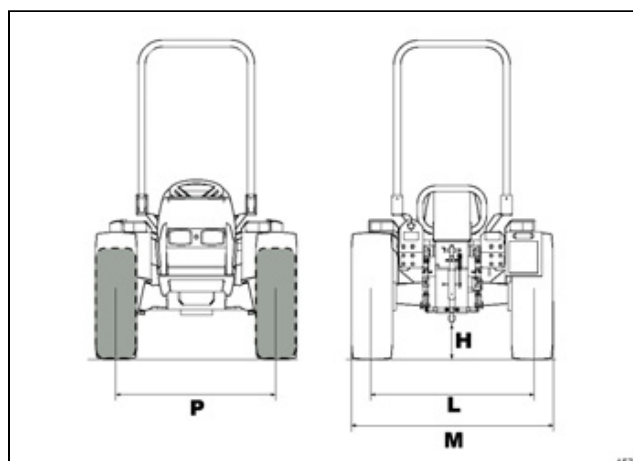
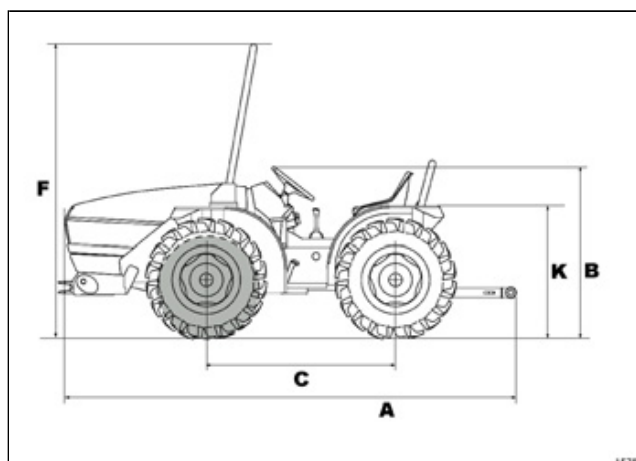
Entries "*Right*", "*left*", "*front*" and "*rear*", used in the descriptions of operations, always refers to the direction of travel of the machine or equipment

## 02 - DIMENSIONS SPEEDS WEIGHT





## 02.1 - DIMENSIONS AND WEIGHTS



### 02.1.10 - Table of Machine Dimensions and Weights

#### Steering wheels tractor

| The data are calculated with wheels: Front and Rear 280/70-R18" |                                    |    |             |
|-----------------------------------------------------------------|------------------------------------|----|-------------|
| A                                                               | Max length                         | mm | 3312        |
| M                                                               | Min - max width                    | mm | 1422 - 1518 |
| F                                                               | Height to chassis                  | mm | 2130 - 2210 |
| B                                                               | Max height to steering wheel       | mm | 1190        |
| K                                                               | Height to seat                     | mm | 831         |
| H                                                               | Ground clearance                   | mm | 230 - 290   |
| C                                                               | Wheelbase                          | mm | 1372        |
| P                                                               | Min - max Front track              | mm | 1049 - 1353 |
| L                                                               | Min - max Rear track               | mm | 1150 - 1238 |
|                                                                 | Minimum turning radius with brakes | mt | 3,50        |
|                                                                 | Weight with safety frame           | Kg | 1680        |

#### Articulated tractor

|   |                                    |    |             |
|---|------------------------------------|----|-------------|
| A | Max length                         | mm | 3312        |
| M | Min - max width                    | mm | 1194 - 1378 |
| F | Height to chassis                  | mm | 2160 - 2240 |
| B | Max height to steering wheel       | mm | 1190        |
| K | Height to seat                     | mm | 831         |
| H | Ground clearance                   | mm | 250 - 320   |
| C | Wheelbase                          | mm | 1372        |
| P | Min - max Front track              | mm | 914 - 1098  |
| L | Min - max Rear track               | mm | 914 - 1098  |
|   | Minimum turning radius with brakes | mt | 2,38        |
|   | Weight with safety frame           | Kg | 1650        |

## 02.1.20 - Track widths



### WARNING

**When disassembling the tyres:**

**Take the greatest care.**

**Use tools and equipment that set the tractor in safe conditions.**

**Use tools to lift heavy wheels.**

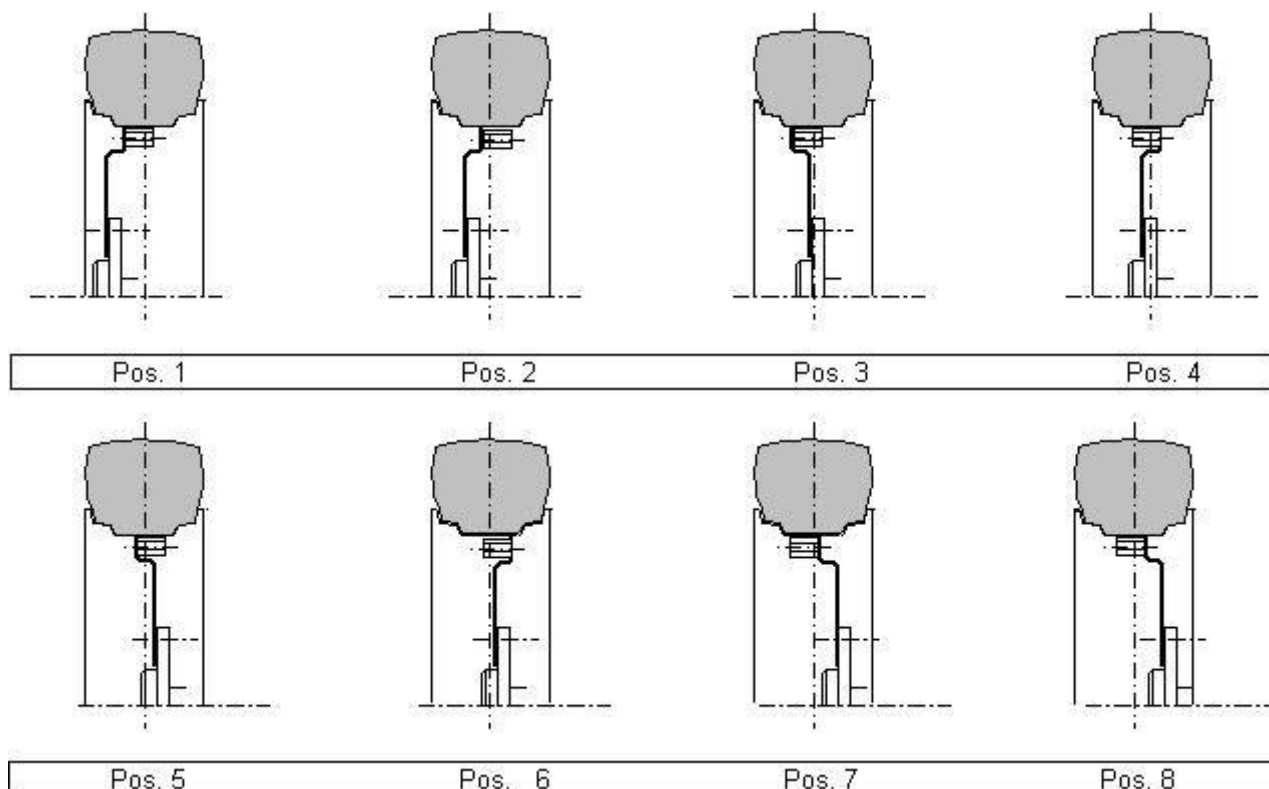


**The overall width of the tractor is governed by laws when the tractor is driven on the roads: comply with the laws in force in the country of use.**

The tractor can be equipped with adjustable, reversible wheel discs that allow the track width to be changed.

The wheel track can be changed by moving the wheel disc on his flange.

Whenever the wheels are reversed, check to make sure that the arrows indicating the turning direction on the tyre are pointing in the correct direction.



### 02.1.30 - Table of tyre inflation pressures



Indications valid for steering wheels versions

| Tyres                 | Bar (MAX) | kPa (MAX) | Position       |
|-----------------------|-----------|-----------|----------------|
| 8.25-16"              | 2,0       | 200       | Front and Rear |
| 280/70-R18"           | 2,0       | 200       | Front and Rear |
| 33/12.50 x 15" Garden | 1,7       | 170       | Front and Rear |



Indications valid for pivoted at the center versions

| Tyres       | Bar (MAX) | kPa (MAX) | Position       |
|-------------|-----------|-----------|----------------|
| 8.25-16"    | 2,0       | 200       | Front and Rear |
| 280/70-R18" | 2,4       | 240       | Front and Rear |
| 300/70-R20" | 1,6       | 160       | Front and Rear |

### 02.1.40 - Maximum load per axle

 For information about the maximum loads per axle, refer to the **certificates of conformity** supplied with the machine

|              |                          | Loading capacity | Maximum load per axle (kg) |      | Total weight |
|--------------|--------------------------|------------------|----------------------------|------|--------------|
| Model        | Tyres                    | Kg               | Front                      | Rear | Kg           |
| Maxter 60 SN | 8.25-16"                 | 950              | 1000                       | 1800 | 2800         |
|              | 280/70-R18"              | 1180             | 1000                       | 1800 | 2800         |
|              | 300/70-R20"              | 1060             | 1000                       | 1800 | 2800         |
| Maxter 60 RS | 8.25-16"                 | 950              | 1000                       | 1800 | 2800         |
|              | 280/70-R18"              | 1180             | 1000                       | 1800 | 2800         |
|              | 33/12.50 x 15"<br>Garden | 1080             | 1000                       | 1800 | 2800         |

## 02.2 - SPEEDS

### 02.2.10 - Speed Chart

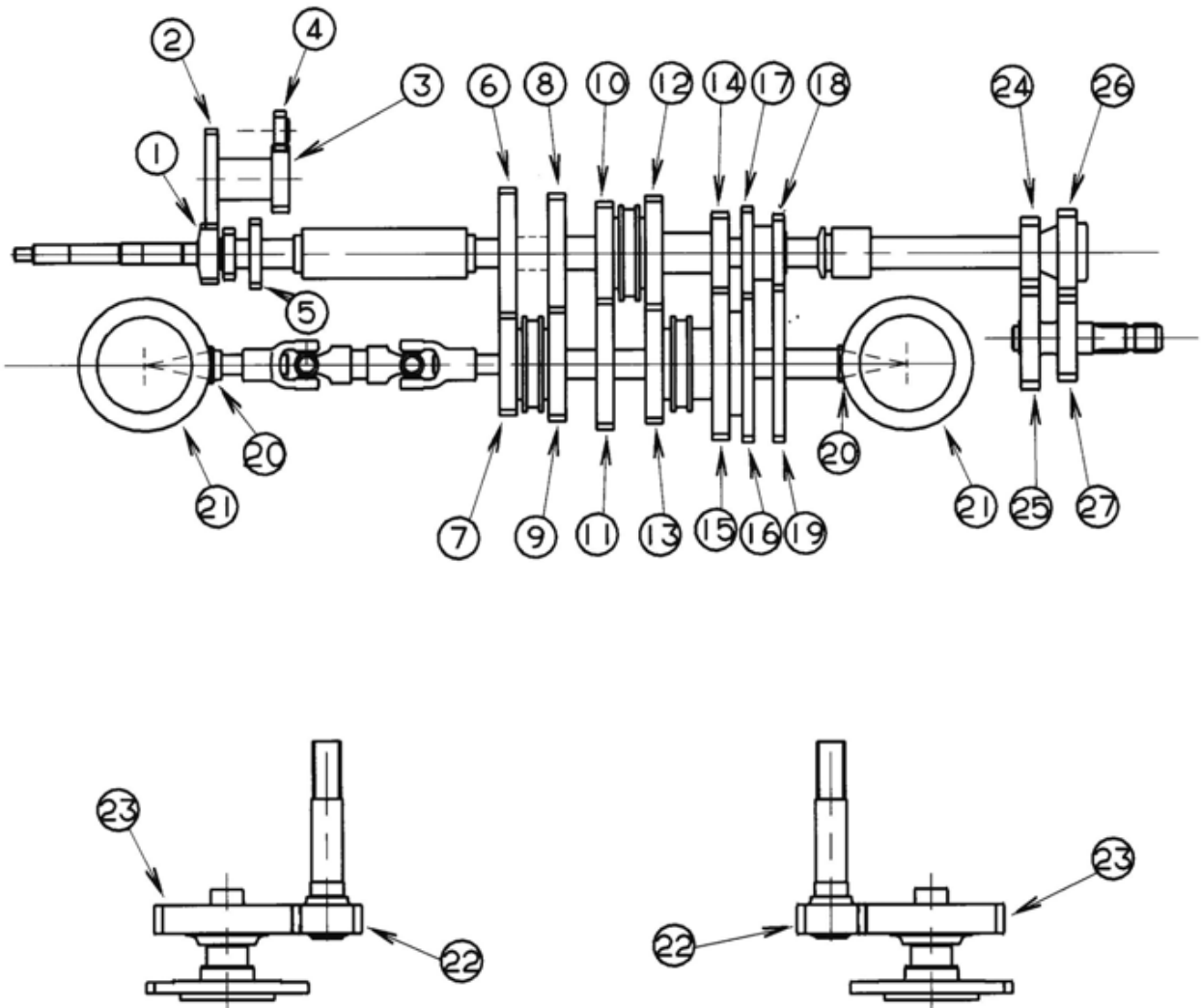
#### Articulated tractor

| In <b>kph</b> with engine at 2600 Rpm and 280/70-R18" wheels (Speeds are purely indicative) |                |                |
|---------------------------------------------------------------------------------------------|----------------|----------------|
|                                                                                             | <b>Forward</b> | <b>Reverse</b> |
| 1st Slow                                                                                    | 1,23           | 1,88           |
| 2nd Slow                                                                                    | 1,92           | /              |
| 3rd Slow                                                                                    | 2,68           | /              |
| 1° low speed                                                                                | 4,22           | 6,47           |
| 2° low speed                                                                                | 6,61           | /              |
| 3° low speed                                                                                | 9,23           | /              |
| 1° normal speed                                                                             | 4,94           | 7,57           |
| 2° normal speed                                                                             | 7,73           | /              |
| 3° normal speed                                                                             | 10,80          | /              |
| 1st Fast                                                                                    | 12,76          | 19,54          |
| 2nd Fast                                                                                    | 19,96          | /              |
| 3rd Fast                                                                                    | 27,88          | /              |

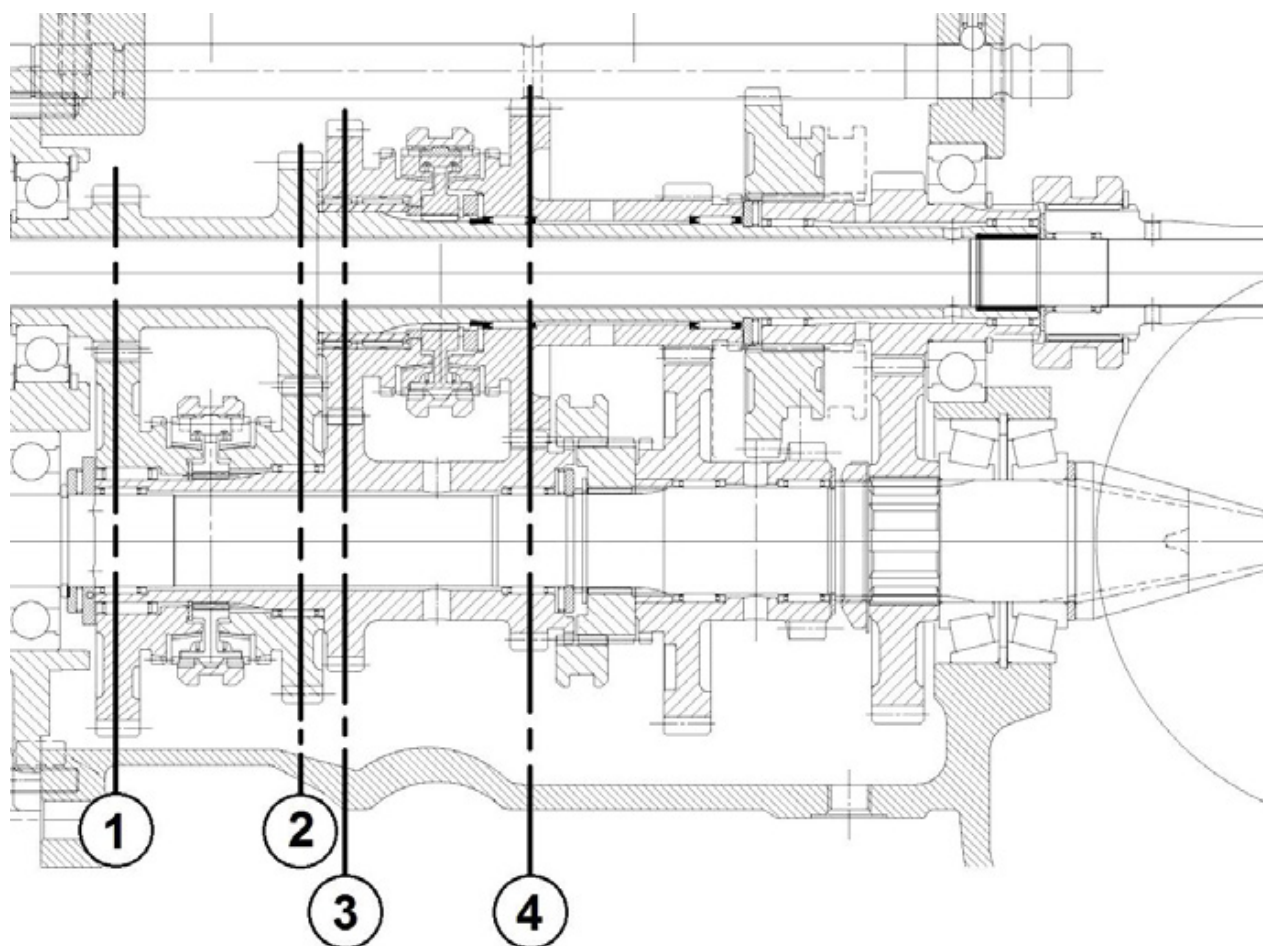
#### Steering wheels tractor

| In <b>kph</b> with engine at 2600 Rpm and 280/70-R18" wheels (Speeds are purely indicative) |                |                |
|---------------------------------------------------------------------------------------------|----------------|----------------|
|                                                                                             | <b>Forward</b> | <b>Reverse</b> |
| 1st Slow                                                                                    | 0,89           | 0,64           |
| 2nd Slow                                                                                    | 1,23           | 0,88           |
| 3rd Slow                                                                                    | 1,92           | 1,38           |
| 4th Slow                                                                                    | 2,68           | 1,93           |
| 1° low speed                                                                                | 3,06           | 2,19           |
| 2° low speed                                                                                | 4,22           | 3,03           |
| 3° low speed                                                                                | 6,61           | 4,74           |
| 4° low speed                                                                                | 9,23           | 6,62           |
| 1° normal speed                                                                             | 3,57           | 2,56           |
| 2° normal speed                                                                             | 4,94           | 3,54           |
| 3° normal speed                                                                             | 7,73           | 5,54           |
| 4° normal speed                                                                             | 10,80          | 7,75           |
| 1st Fast                                                                                    | 9,23           | 6,62           |
| 2nd Fast                                                                                    | 12,76          | 9,15           |
| 3rd Fast                                                                                    | 19,96          | 14,32          |
| 4th Fast                                                                                    | 27,88          | 20,00          |

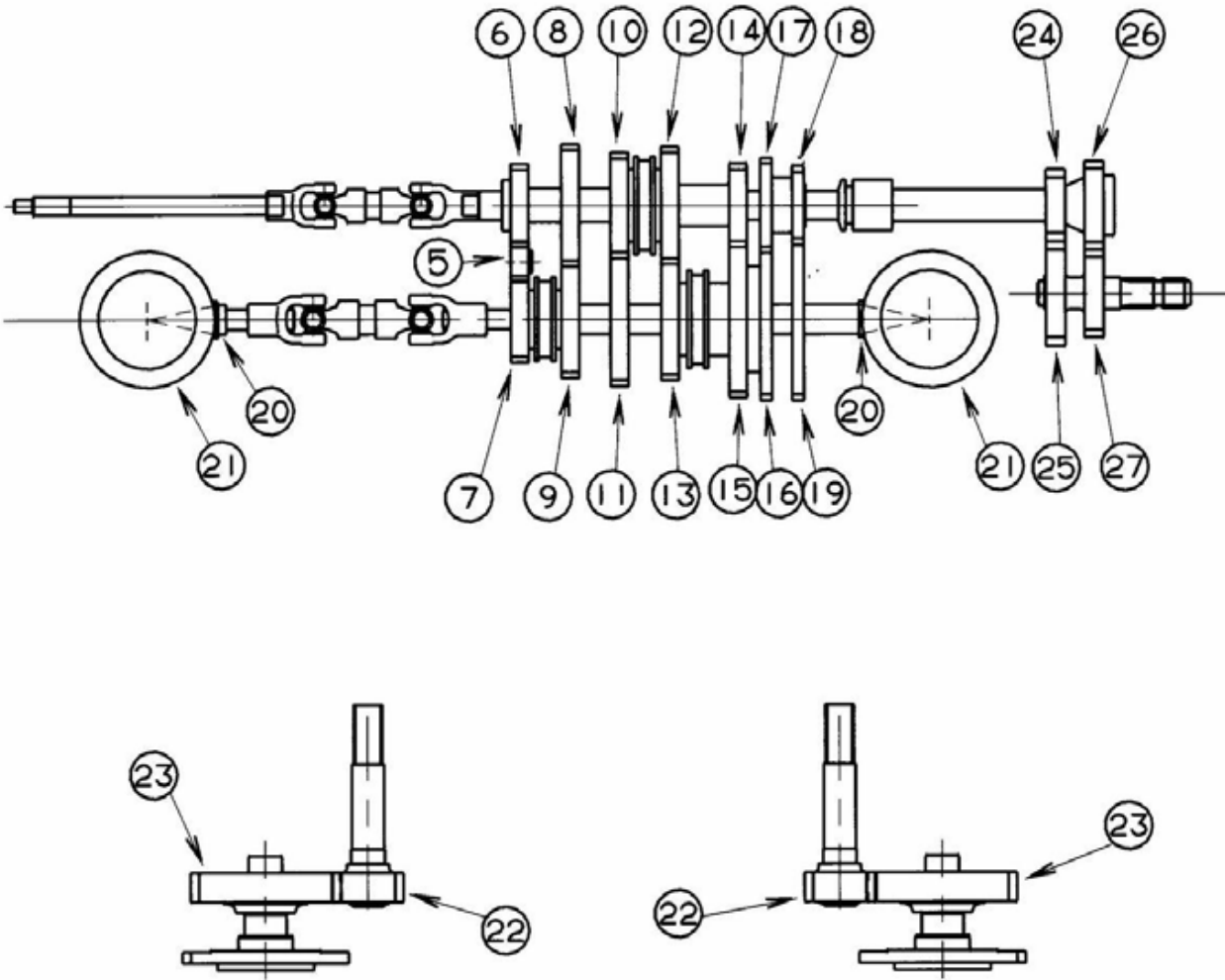
02.2.20 - Transmission scheme steering wheels version



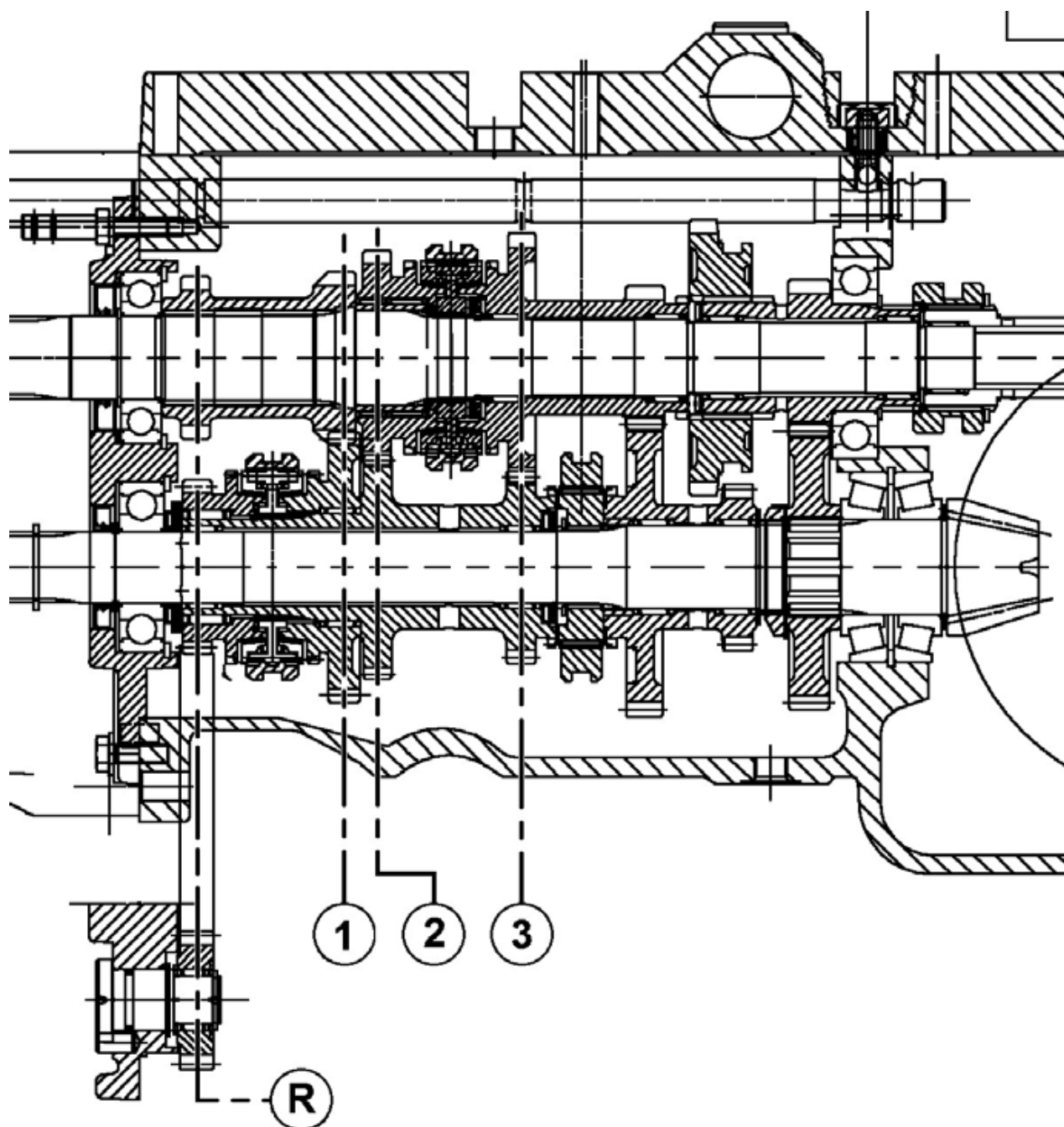
| TRANSMISSION |                 |  |          |                 |  |
|--------------|-----------------|--|----------|-----------------|--|
| POSITION     | NUMBER OF TEETH |  | POSITION | NUMBER OF TEETH |  |
| 1            | 21              |  | 2        | 28              |  |
| 4            | 22              |  | 5        | 23              |  |
| 7            | 48              |  | 8        | 26              |  |
| 10           | 35              |  | 11       | 37              |  |
| 13           | 28              |  | 14       | 21              |  |
| 16           | 25              |  | 17       | 44              |  |
| 19           | 43              |  | 20       | 9               |  |
| 22           | 10              |  | 23       | 44              |  |
| 25           | 58              |  | 26       | 15              |  |
|              |                 |  |          |                 |  |
|              |                 |  | 3        | 22              |  |
|              |                 |  | 6        | 21              |  |
|              |                 |  | 9        | 43              |  |
|              |                 |  | 12       | 28              |  |
|              |                 |  | 15       | 48              |  |
|              |                 |  | 18       | 22              |  |
|              |                 |  | 21       | 38              |  |
|              |                 |  | 24       | 18              |  |
|              |                 |  | 27       | 60              |  |



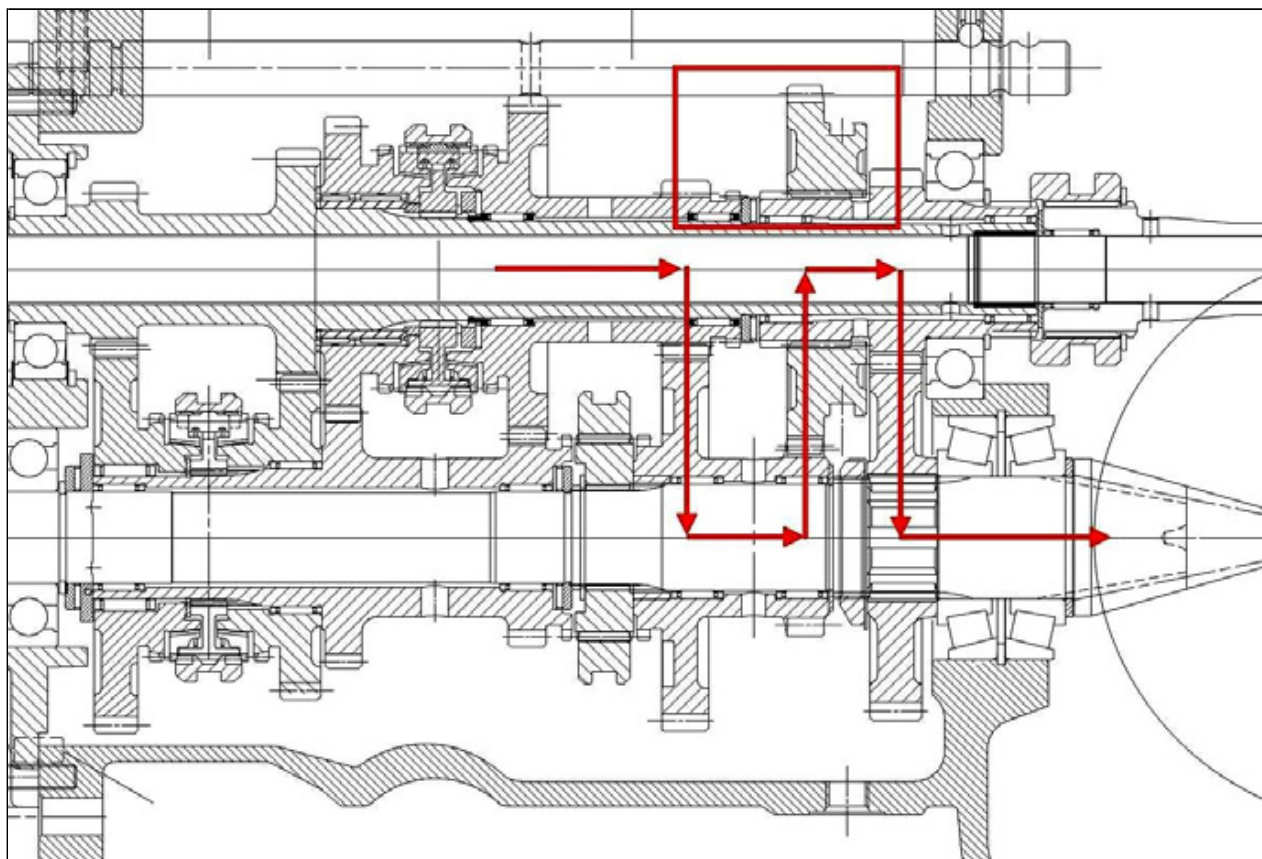
02.2.30 - Transmission scheme articulated version



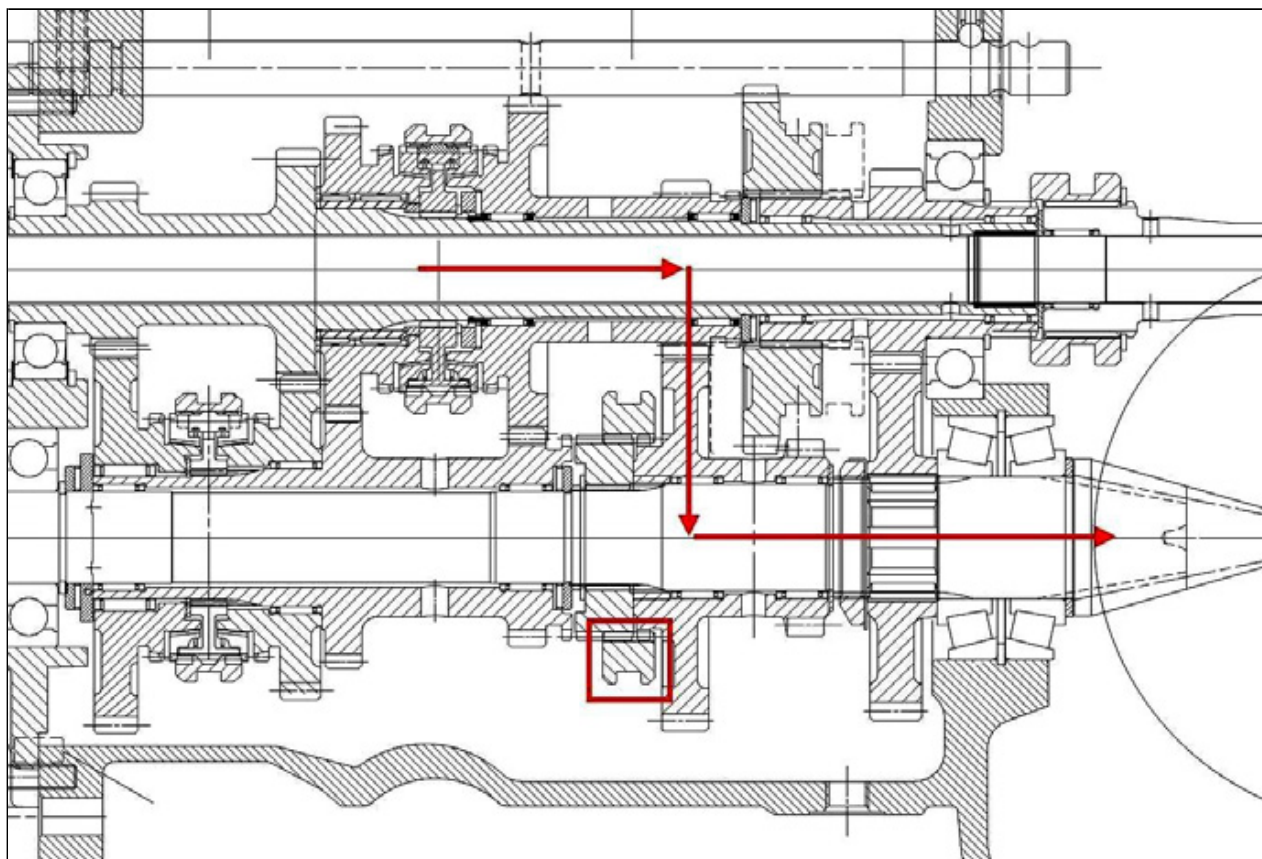
| TRANSMISSION |                 |  |          |                 |  |
|--------------|-----------------|--|----------|-----------------|--|
| POSITION     | NUMBER OF TEETH |  | POSITION | NUMBER OF TEETH |  |
| 5            | 21              |  | 6        | 25              |  |
| 8            | 26              |  | 9        | 43              |  |
| 11           | 37              |  | 12       | 28              |  |
| 14           | 21              |  | 15       | 48              |  |
| 17           | 44              |  | 18       | 22              |  |
| 20           | 9               |  | 21       | 38              |  |
| 23           | 44              |  | 24       | 18              |  |
| 26           | 15              |  | 27       | 60              |  |
|              |                 |  |          |                 |  |



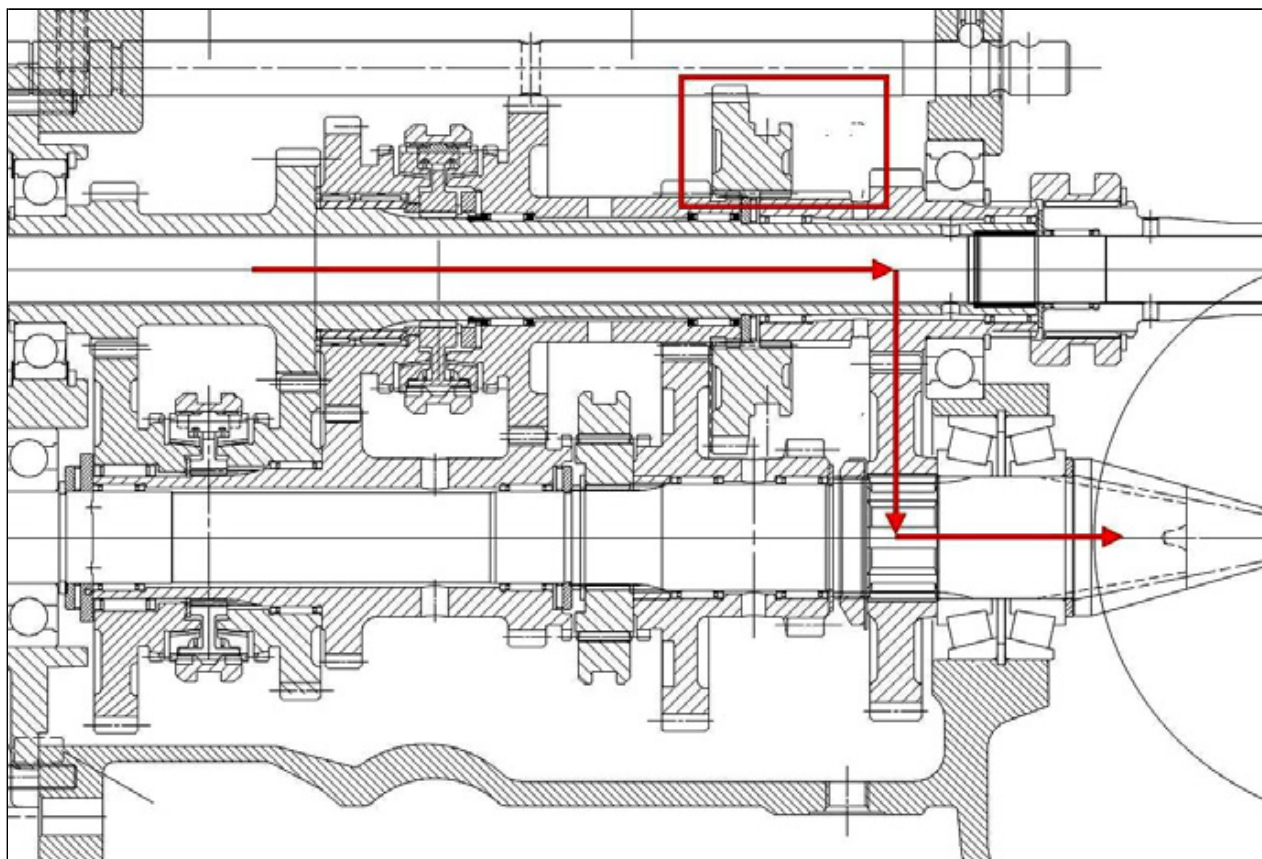


**02.2.40 - Transmission Scheme - Gearbox range engaged SLOW**

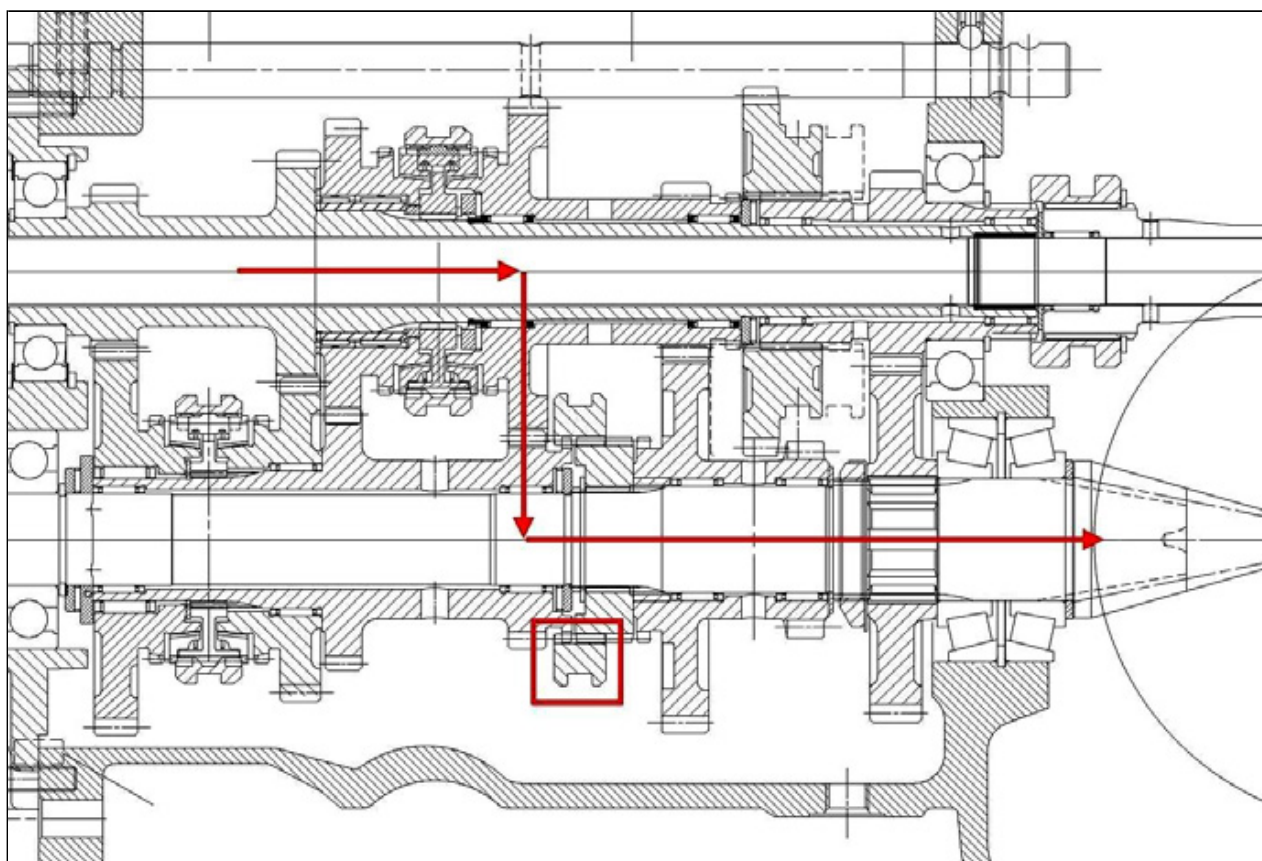
In this picture is shown the power flow inside the transmission, when is selected the SLOW gearbox range.

**02.2.50 - Transmission Scheme - Gearbox range engaged MEDIUM - SLOW**

In this picture is shown the power flow inside the transmission, when is selected the MEDIUM-SLOW gearbox range.

**02.2.60 - Transmission Scheme - Gearbox range engaged MEDIUM - FAST**

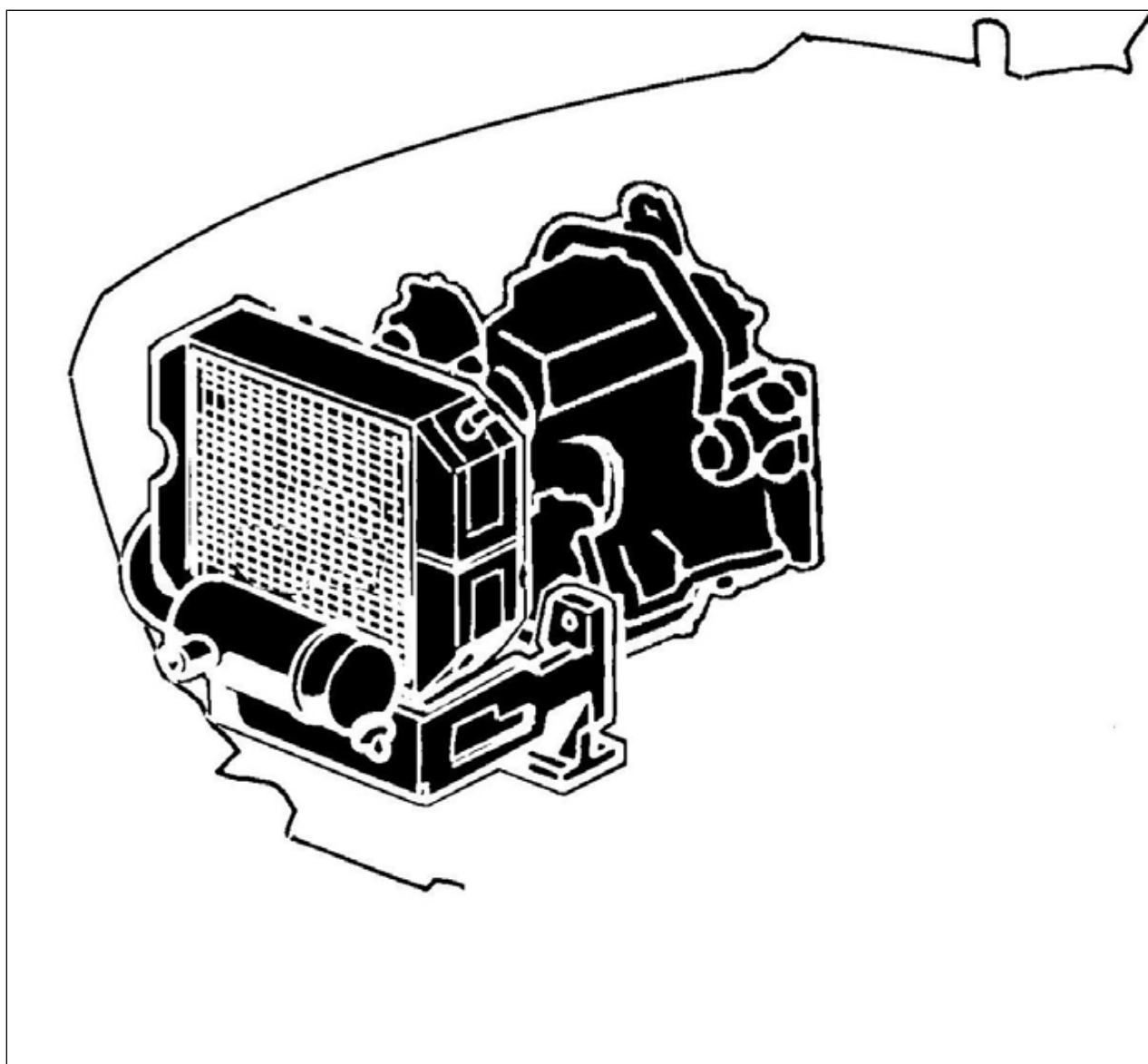
The diagram displays the machine's gear transmission scheme, when the MEDIUM FAST range mode is used.

**02.2.70 - Transmission Scheme - Gearbox range engaged FAST**

In the beside figure is a diagram of the motion transmission of the tractor's gearbox when used in FAST gear.



## 15 - ENGINE



## 15.1 - ENGINE SPECIFICATIONS

### 15.1.10 - Engine technical data

|                                                                      |                |                                         |
|----------------------------------------------------------------------|----------------|-----------------------------------------|
| Engine                                                               |                | VM direct injection<br>D703 E3 - 15 C/3 |
| Type                                                                 |                | Diesel                                  |
| Cooling                                                              |                | Water                                   |
| Cylinders                                                            | N              | 3                                       |
| Displacement                                                         | cc             | 2082                                    |
| Bore                                                                 | mm             | 94                                      |
| Stroke                                                               | mm             | 100                                     |
| Compression ratio                                                    |                | 18±0.5:1                                |
| Engine RPM                                                           |                | 2600                                    |
| Rated power<br>Power rating in kW according to 80/1296/EC - ISO 1585 | Kw (hp) / rpm  | 36 (49) / 2600                          |
| Max torque                                                           | Nm (Kgm) / rpm | 145 (14.7) / 1600                       |
| Torque reserve                                                       |                | /                                       |
| Idling rpm                                                           | Engine RPM     | 1000 ± 50                               |
| Standard sump capacity                                               | Kg             | 4.5 / 5.5                               |
| Dry weight                                                           | Kg             | 190                                     |
| Battery                                                              | V / ah         | 12 / 74                                 |
| Fuel consumption (2600 - 2000 - 1500) r.p.m.                         | g/kWh          | /                                       |
| Fuel tank                                                            | L              | 50                                      |

## 18 - REVERSER



## 18.1 - REVERSER GROUP ASSEMBLY

### 18.1.10 - Reverser

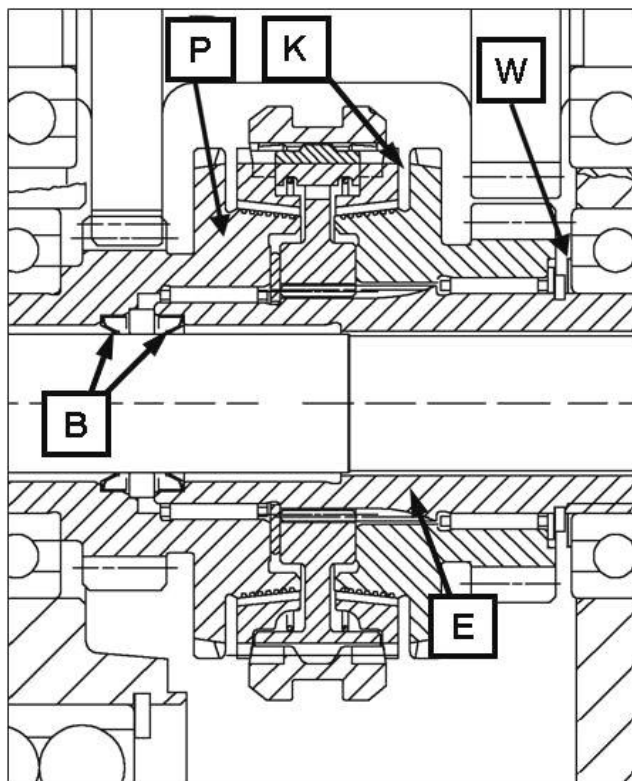


Fig.1

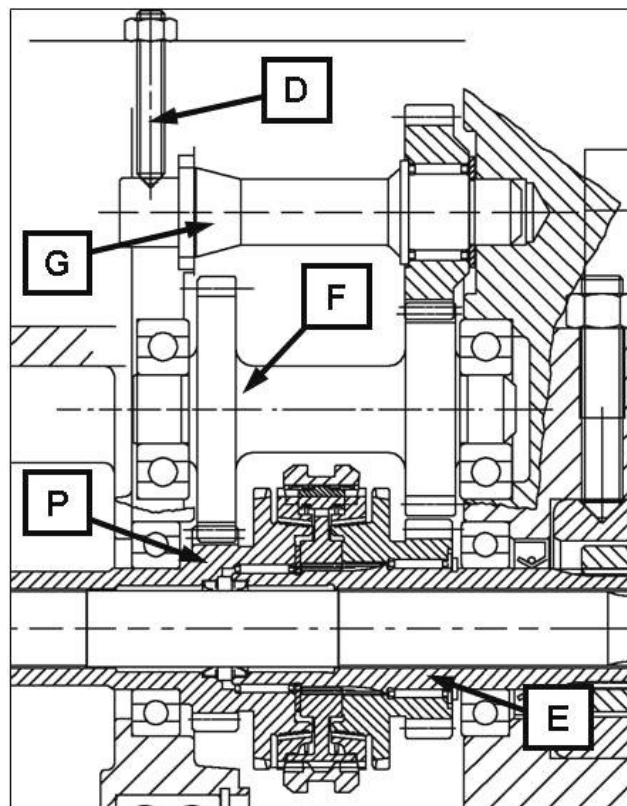


Fig.2

In Fig. 1 is visible the assembly of reverser group. This group is located in the front part of the tractor, after the axial joint and behind the front differential.

In order to demount the reverser group, first you have to demount the central axial joint (see chapter 48).



Fig.3

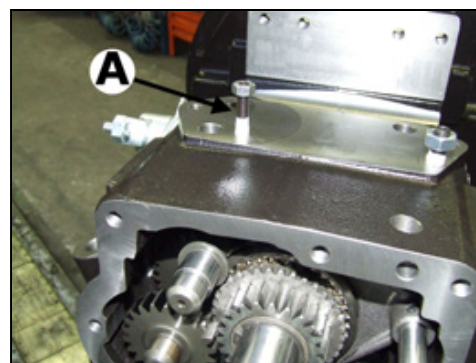


Fig.3a

After you have removed the axial joint group, you are in the situation visible in Fig. 3.

Remove (as shown in Fig. 3a) the threaded pin **A** that fixes the neutral shaft of the reverser, whose components will be described in the in the next pages.





Fig.4

As shown in fig. 4 is possible to go on with the demounting of the synchronizers, to check the wear of friction cones. If there's too much wear, always replace also the gears and the shafts where the synchro works. As it's already been described for gearbox synchronizers, the space **K** of Fig. 1 must be between 1,8 and 2 mm with new cones.

This space will decrease in function of the synchronizer's wear.

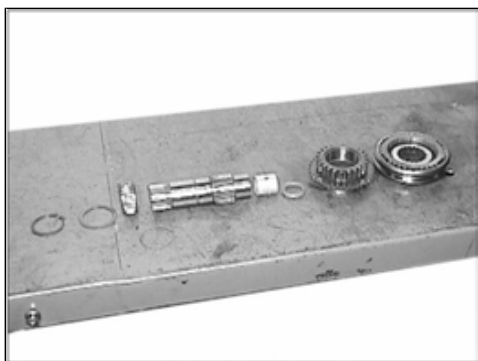


Fig.5

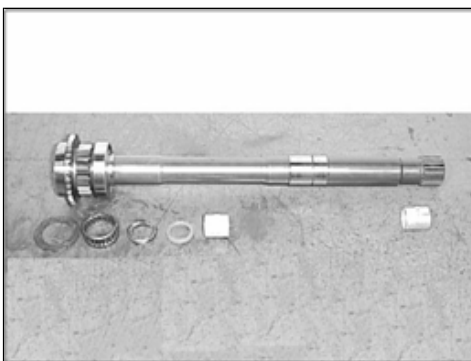


Fig.6

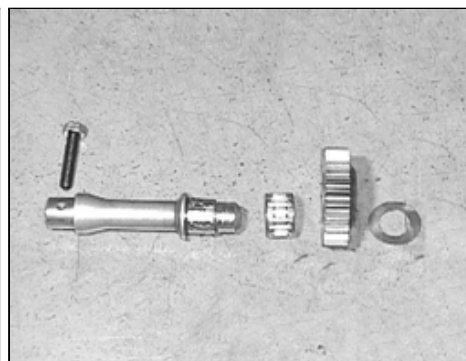


Fig.7

In fig. 5 - 6 - 7, are shown all the single components of the reverser group; take care to **DO NOT FORGET** the seals **B** of Fig. 1, in order to avoid oil leaks into the clutch housing or in the axial joint: these seals are kept in position with the intermediate spacer.

To obtain the correct clearance between gears and synchronizer's cones is necessary to work in the point **W** of Fig. 1, inserting the spacer **D** 35.5x40x(0.2-0.4-0.8) with spare part number 0004601-0004602-00035253.

The synchronizer doesn't have to tighten on the cone of the primary shaft **P** of Fig.1 and the shaft **E** has to turn free when the synchronizer is in neutral.

The spacer **W** must be inserted in order to obtain the right clearance of the synchronizer, indicated in the gearbox section of this manual..

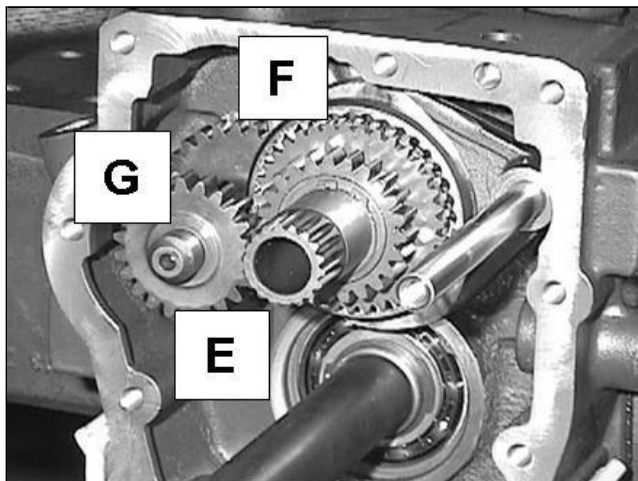


Fig.8

In Fig.2 are reported the mounting assemblies of the 3 shafts marked with letters **F - G - E**.  
The mounting of these 3 shafts must be made at the same time, taking care to don't forget spacers and the seals visible on the assembly.

## 18.1.20 - Assembly sequence



Fit the bearing in the clutch bell, sending it into a position with the appropriate tool. Fit the seeger to ensure that it is in the correct position.

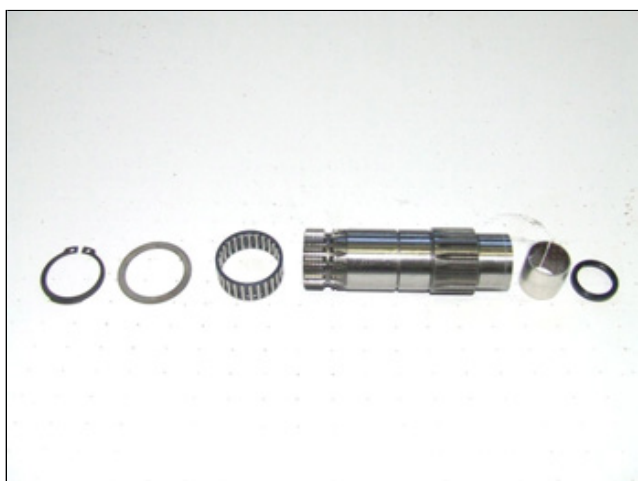


Take the front differential pinion, insert the spacer and the bearing and using the appropriate buffer, send in position the bearing. Assembly the other spacer and the snap ring, making sure that it is correctly positioned.





Insert the differential pinion just assembled in the front differential crankcase, put it in the right position with the appropriate buffer and install the snap ring.



Take the front shaft, planting the bush and the oil seal, then turn the shaft, slide the roller bearing and the spacer and then place the snap ring.



Take the primary shaft and plant the bushes on both sides. With the appropriate buffer put the oil seal in place, put the spacer and the roller cage and, finally, another spacer



Install the synchronizer, the reverse gear and insert the short shaft prior pre-assembled





Take the double-reverse gear and mount the bearing. Take the fork and pin the shaft of reverse command.



Take the primary shaft and the reverser double gear. Put the fork in the synchronizer and put everything in the front differential. Then install the snap ring retainer and the oil seal on the opposite side of the shaft.



Place the pin of the gear in place. Fit ball, spring and adjusting screw on the reverser shaft and the set screw on the pin of the gear. Tighten the set screw of the pin and adjust the preload on the reverser shaft. Install the reverse gear and the spacer on its pivot.



Fig.11



Fig.11a

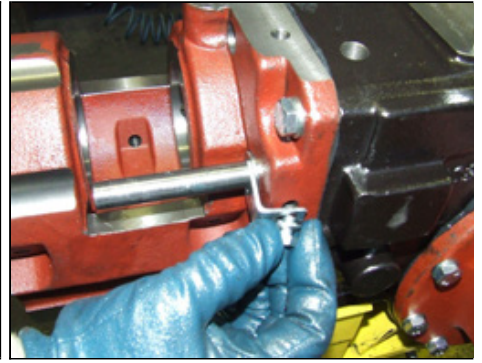


Fig.11b

After the installation of the front joint housing (as shown in the group 48), must do the following:  
Check for proper installation and working of the reverse command:

- 1) Check that the selections of the synchronizer working properly.
- 2) Verify if the preload of spring and ball is not too hard in the neutral position and maintains fixed in neutral central position of the synchronizer ring.
- 3) Verify that in the limit switch of the load spring and ball is such that the ball does not allow the rod to exceed more than about 3 mm. point of throat.

As shown in Fig. 11, 11a and 11b, to prevent leaking of oil, mount the O-ring and the corresponding stop sheet being careful not to pinch the seal during assembly.

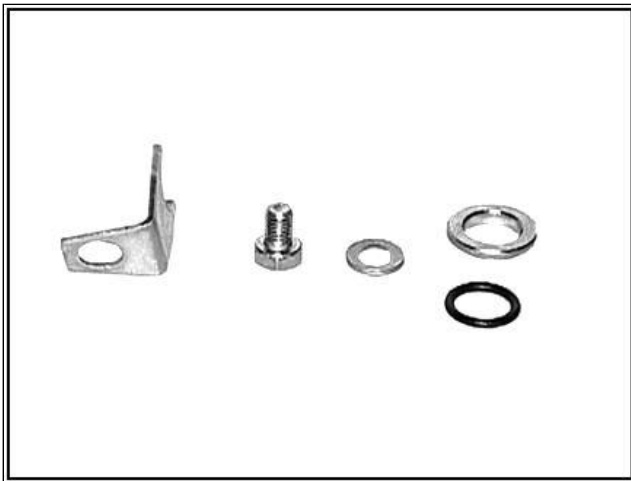


Fig.12

In fig. 12 are shown all the elements that constitute the seals on the reverser selection rod.

#### **N.B.**

The oil quantity in reverser housing is more or less 9,2 liters.  
The used oil is a SAE 80W/90.



### 18.1.30 - External lever assembly

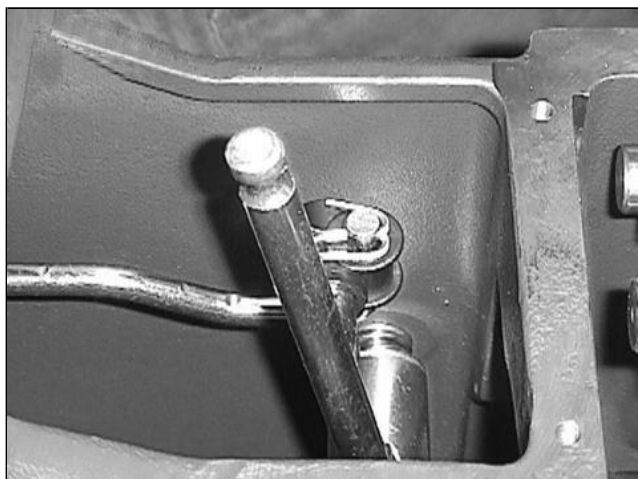


Fig.13

The adjustment of the reverser command external levers must be made in a way that selecting both forward and rearward modes, there is never interference between command and the axial joint casting.

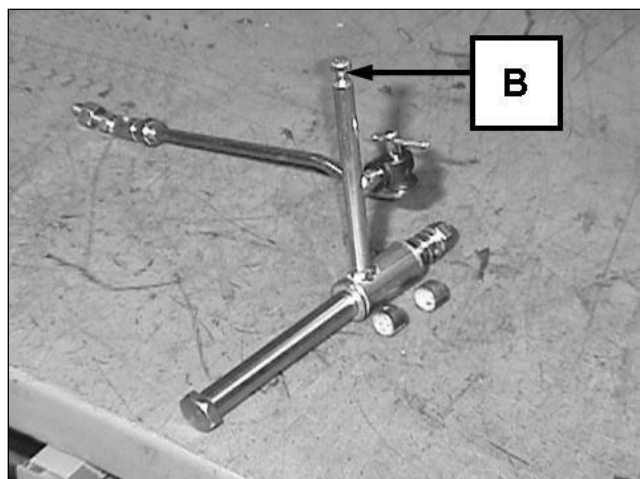


Fig.14

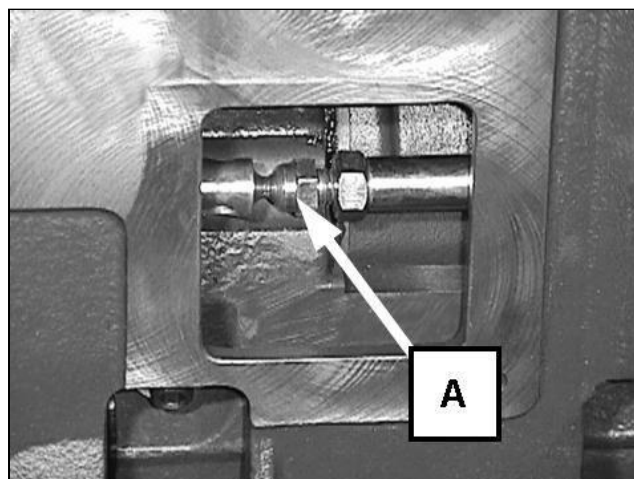


Fig.15

In Fig. 14 e 15 are shown the levers to command the reverser group, located inside the articulation joint. With the correct adjustment of part **A** of Fig. 15 is possible to establish the travel extremities of lever **B** in Fig. 14, in such a way that there is not interference with the casting.

On lever **B** of Fig. 14 is then mounted the command of the reverser lever, fixed on the steering unit support.

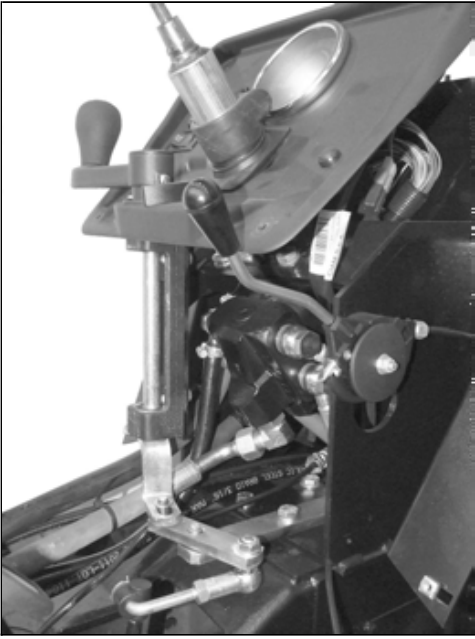


Fig.16

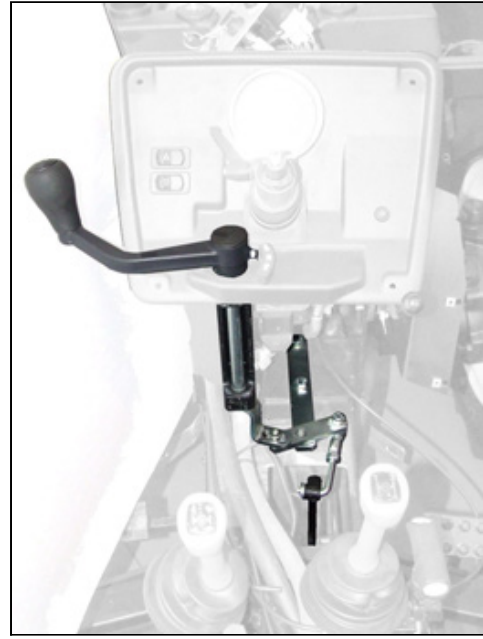


Fig.17

In fig.16 and 17, is shown the mounting of reverser levers.

The rod with joint must be fully screwed on his threaded part and, once that the locknut has been tightened at 4 Kgm, fix the self-locking nut on the joint with a load of 3 Kgm.

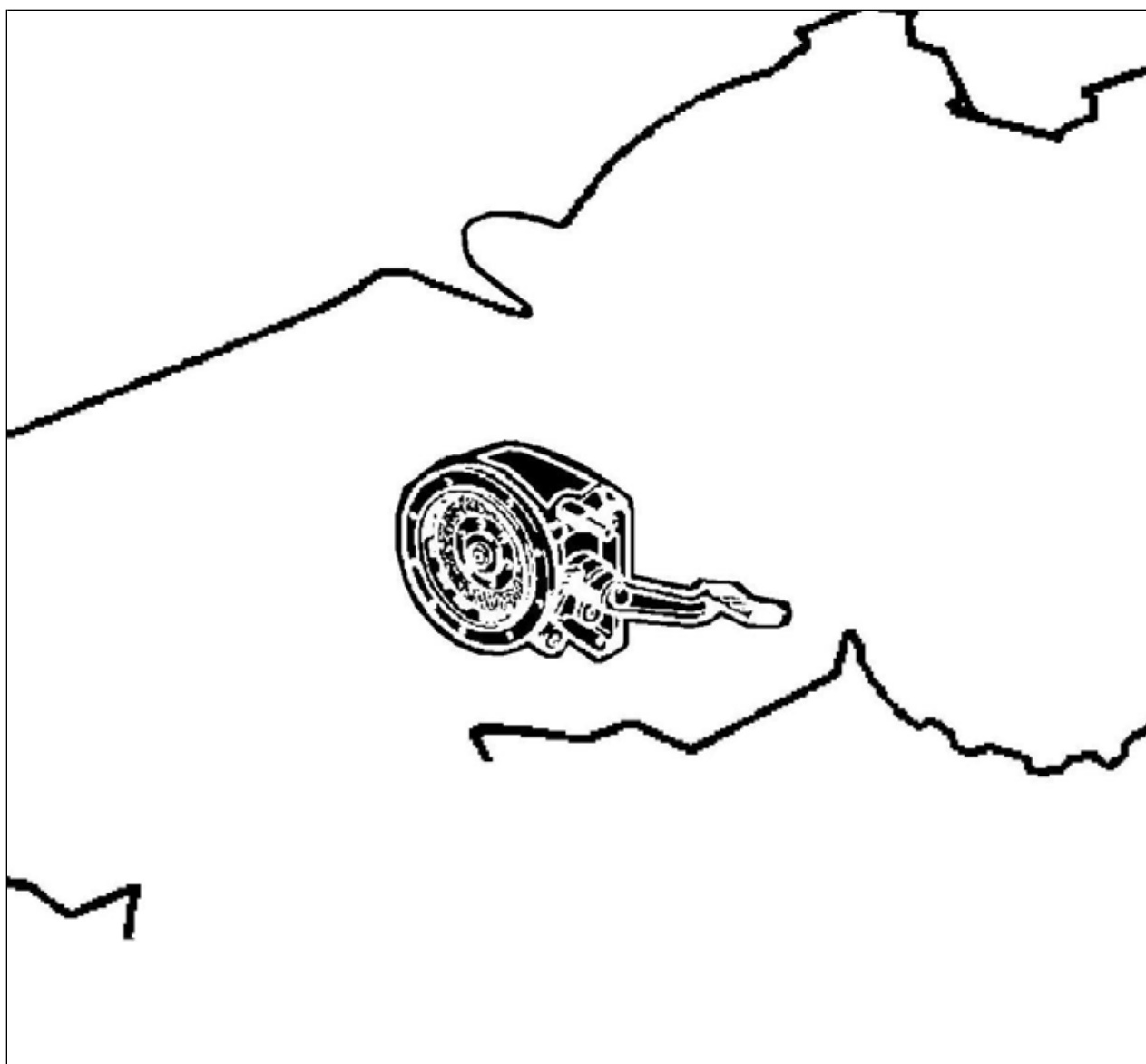
Check that with reverser in forward position, the joint is not in collision with the casting (there must be a clearance of 4-5 mm).

Grease the collet and the splined shaft before mounting the plastic lever.

Once that all the rods have been mounted, check to have a correct engagement of the reverser, without interferences at full stroke.

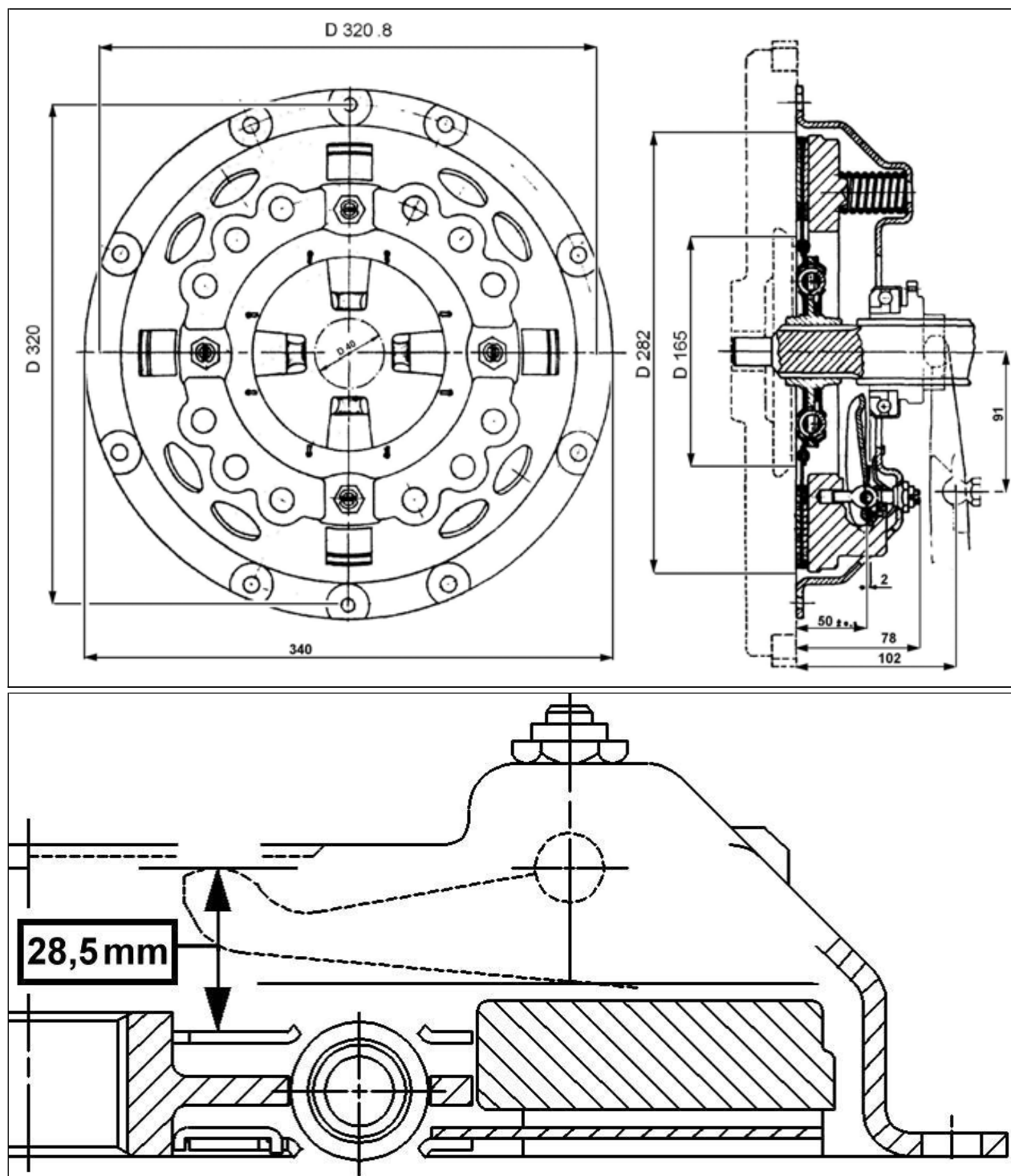
The plastic lever on the dashboard insert the forward mode when the lever is moved forward and the rearward mode when it's moved rearward.

## 27 - CLUTCH



## 27.1 - ASSEMBLY CLUTCH ADJUSTMENT

### 27.1.10 - Specifications assembly clutch - steering wheel version



Dimension and characteristics of the traction clutch disc.

This picture reports dimension and characteristics of clutch disc.

In the drawing are mentioned the mounting dimensions (clutch foot registration, wear travel and other specific dimensions of clutch in mounting condition).

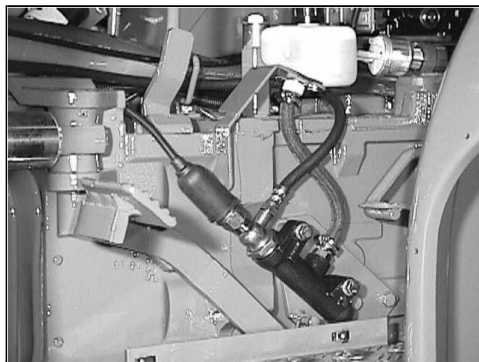


Fig.1

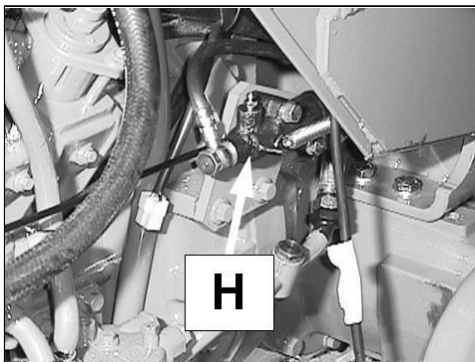


Fig.2

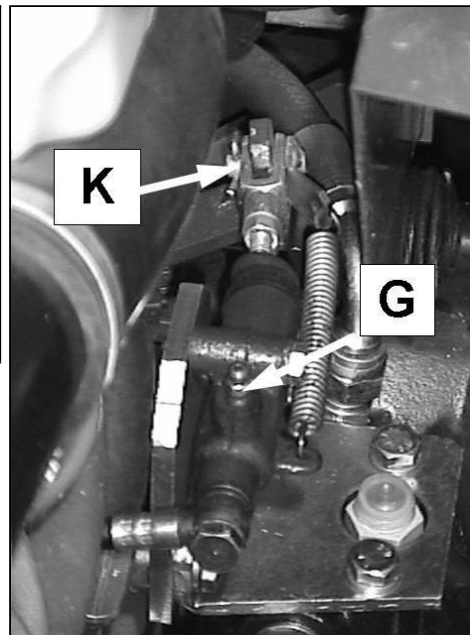


Fig.3

In the beside picture is shown the engagement and registration system of the traction clutch. The engagement is mechanical-hydraulic.

In Fig.1 is shown the pump that is connected to the clutch pedal.

This pump moves a piston internally to the cylinder **H** of Fig.2, mounted nearby the clutch housing (casting); then is actuated the lever that acts on the axial bearing that disengages the clutch.

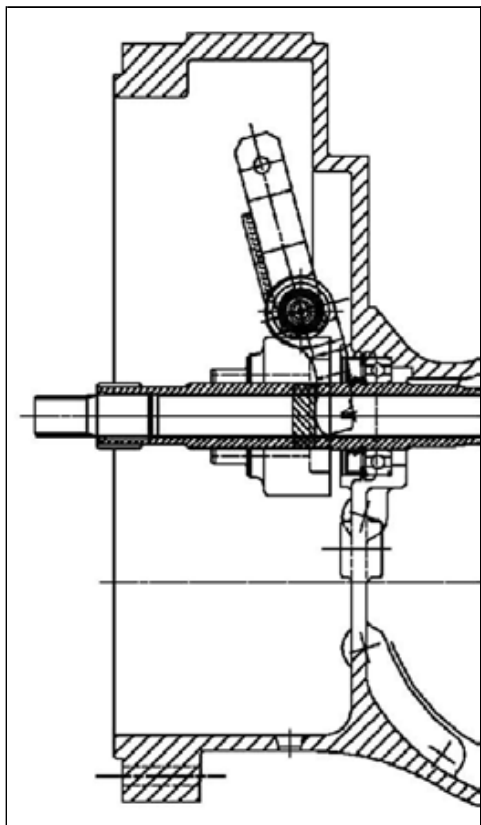
On the pump connected to the clutch pedal is connected the fluid tank, where you can fill up the circuit; on the actuating cylinder is mounted the vent (part. **G** of fig. 3) to remove air from the circuit, considering that this is the highest point of the circuit.

The fork **K** of fig.3 allows to make the adjustment of clutch lever (by the thrust rod) and to eliminate excessive clearance.

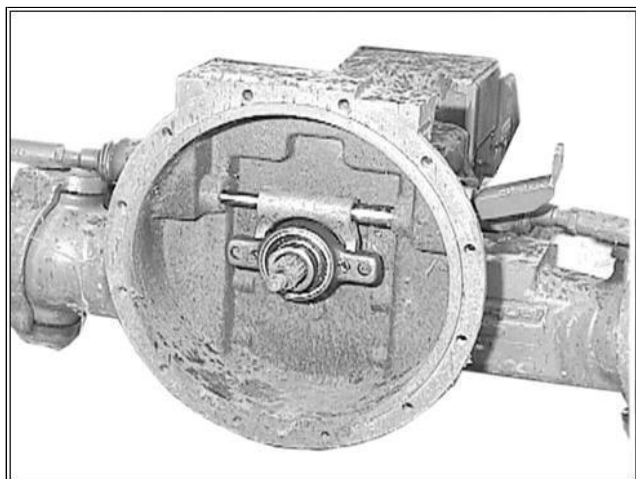
Once that the adjustment has been made in such a way that the lever connected to the thrust rod doesn't remain engaged and that there isn't too much play on the fork **K**, tighten the locknut on the fork and block the adjustment.

#### **N.B.**

In the hydraulic circuit for the command and registration of the clutch are used more or less 400 g of hydraulic oil.

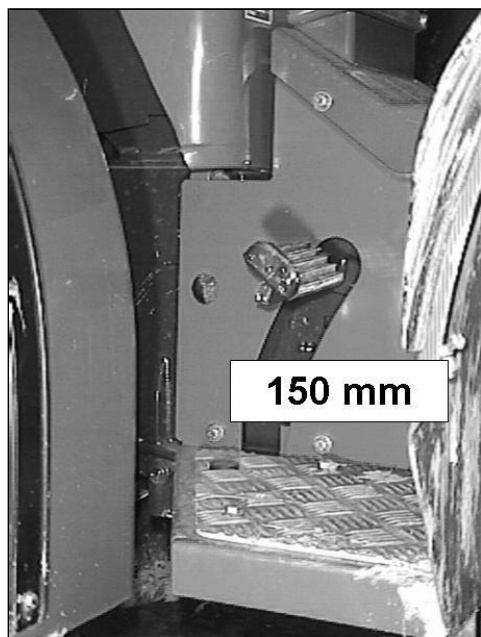


In the picture above is shown the clutch housing with the command lever of the axial bearing.  
In the steering wheels version there are 2 concentric shafts, one for the PTO and one for the traction on the wheels; the flange on the flywheel transmit torque to the PTO shaft and then to the PTO clutch; the traction clutch transmit torque to the primary shaft of the gearbox.



In these pictures are visible the internal levers that acts on the clutch axial bearing.

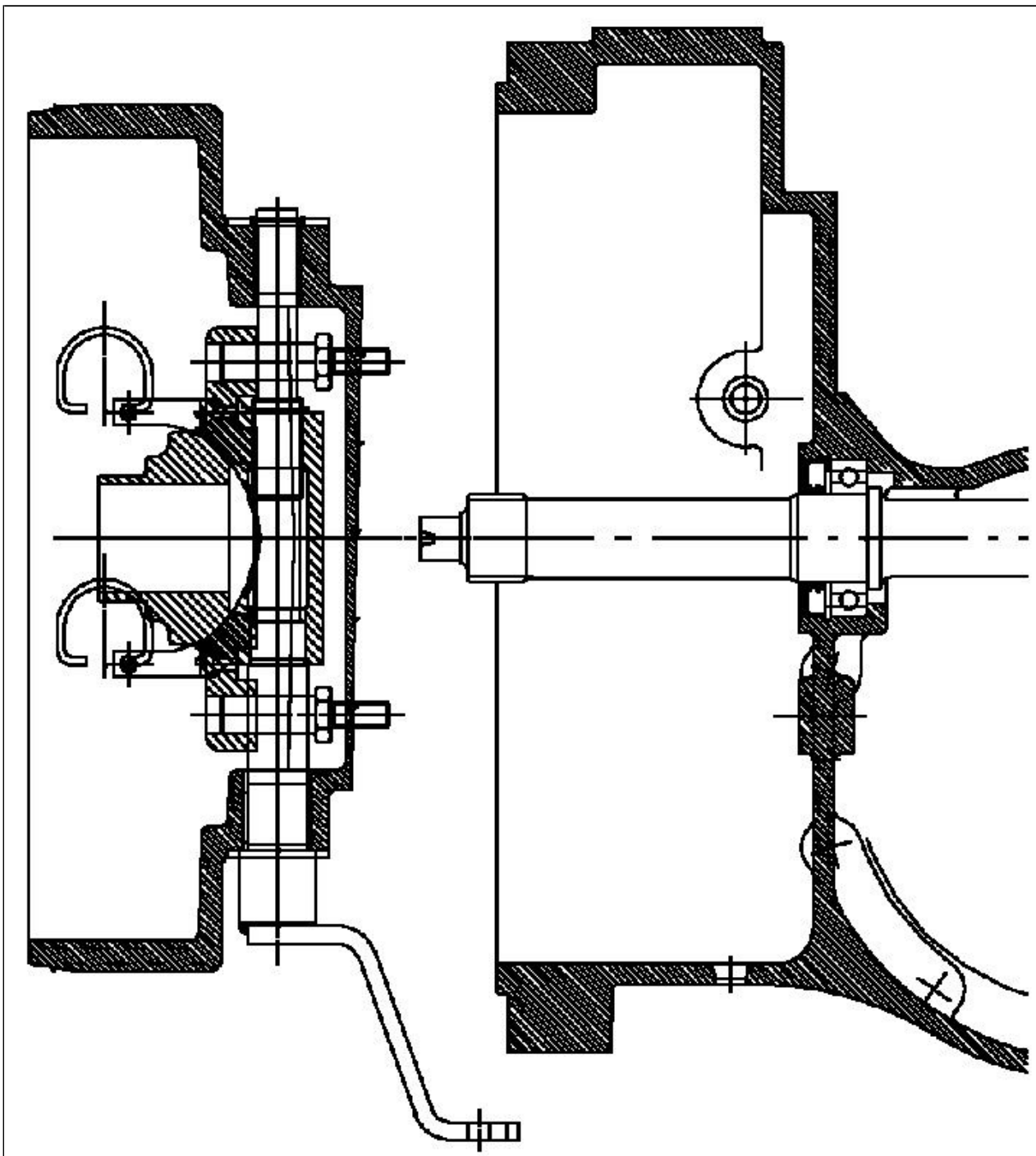




Once that all the adjustments listed in the previous page has been made, the clutch pedal, that has a starting point identified as high position, has a travel, shown in fig 3, of more or less 150 mm; of these 150 mm 40 are play, while other 110 mm are useful travel.

Periodically check the oil level in the fluid tank, unscrewing the cap positioned above the gearbox.

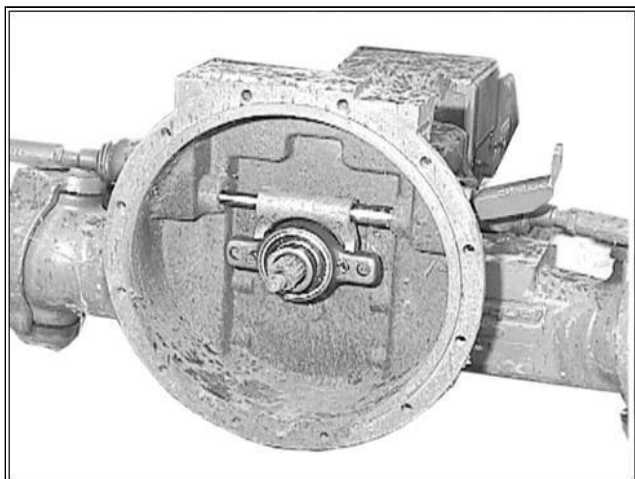
### 27.1.20 - Specifications assembly clutch - articulated version



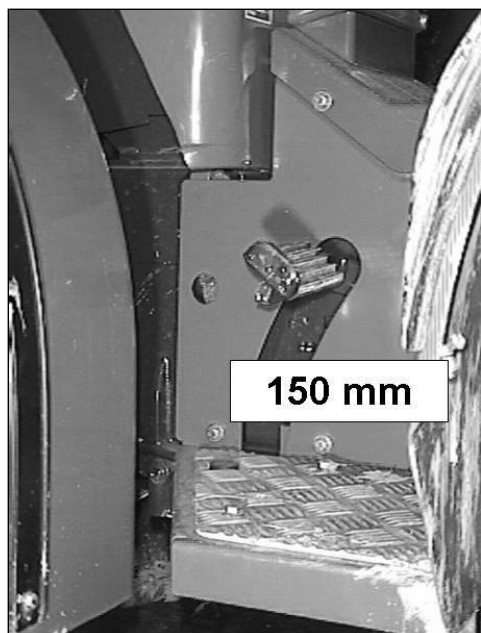
The figure show the side view and view from above of the clutch bowl with the thrust bearing and thrust bearing control lever premounted. As you can see there is only one shaft.

The flywheel is fitted

The flywheel, which is common to both versions, is fitted with two different flanges.

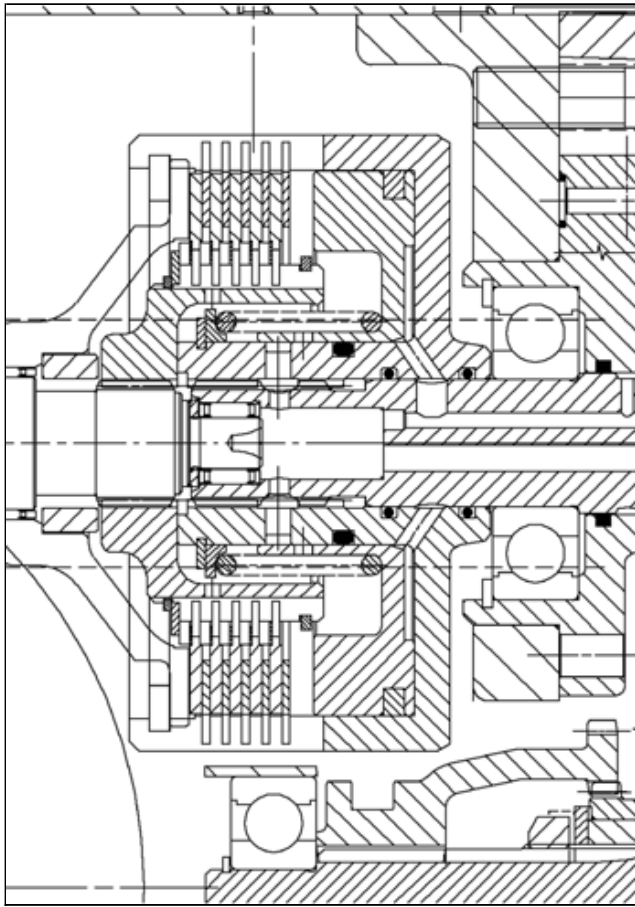


In these pictures are visible the internal levers that acts on the clutch axial bearing.



Once that all the adjustments listed in the previous page has been made, the clutch pedal, that has a starting point identified as high position, has a travel, shown in fig 3, of more or less 150 mm; of these 150 mm 40 are play, while other 110 mm are useful travel. Periodically check the oil level in the fluid tank, unscrewing the cap positioned above the gearbox.

### 27.1.30 - Specifications assembly PTO clutch



In addition to the clutch disc shown in the previous pictures, that is the heart of the clutch assembly, is present a oil bath discs clutch that controls the PTO.

This electrohydraulic piloted wet disc clutch is located in the rear part of the tractor over the differential gearbox and is a clutch totally independent from the tractor clutch.

This PTO clutch is made of an anular piston and a series of discs that are put in contact by oil pressure; the discs pack is made of 5 steel discs and 5 friction discs.

This clutch works on the shaft directly connected to the engine, while on the external part of the clutch acts a brake that is necessary to avoid dragging of clutch when not inserted.

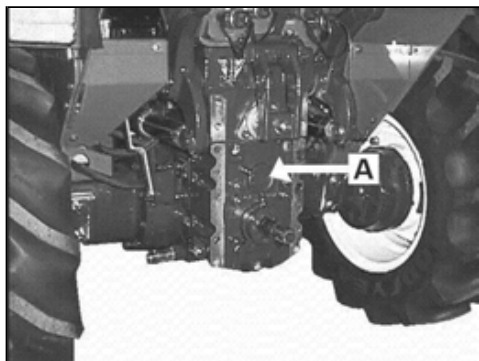


Fig.8

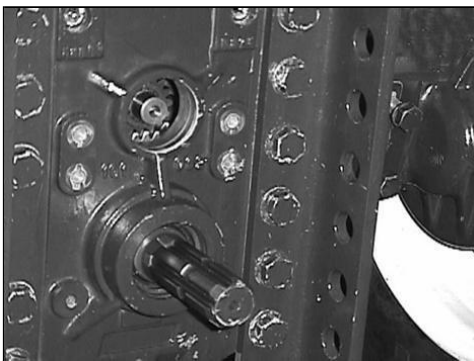


Fig.9



Fig.10

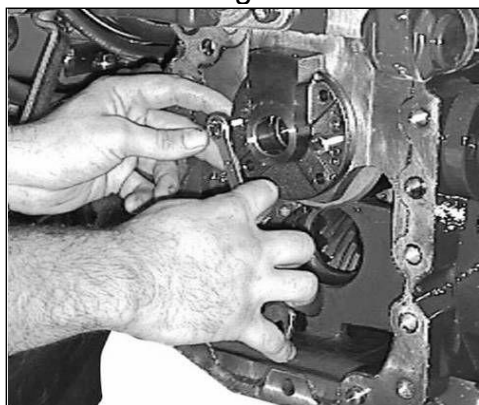


Fig.11

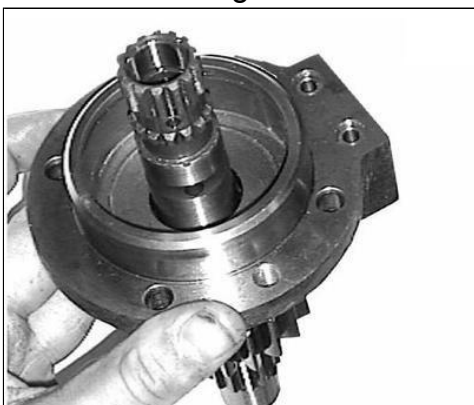


Fig.12

If there is necessity to replace or to check the seals on the PTO shaft follow these operations:

- Demount the rear cover **A** of the PTO, as shown in Fig.8;
- Collect the oil using a basin;
- Remove the back PTO cover;
- The PTO shaft has a thread on his head in order to allow its extraction using the tool shown in Fig.10;
- Extract the shafts by acting with subsequent hits using tool of Fig.10;
- While you are extracting, or afterwards, untightening the screws that fixes the flange, as in Fig.11, is possible to extract the complete shaft as in Fig. 12 and, bringing the shaft on a desk is possible to remove the QUADRING seals of Fig. 12 (part. **Q** of Fig.13) with no hurry!.
- Check all the seals and replace them if they are wearied.

Reassembly all the particulars, with the warning to do not damage new seals.

Execute all operations listed above in reverse order.

If it's necessary to replace the wearied PTO friction discs, you have to remove the rear lifter casting.

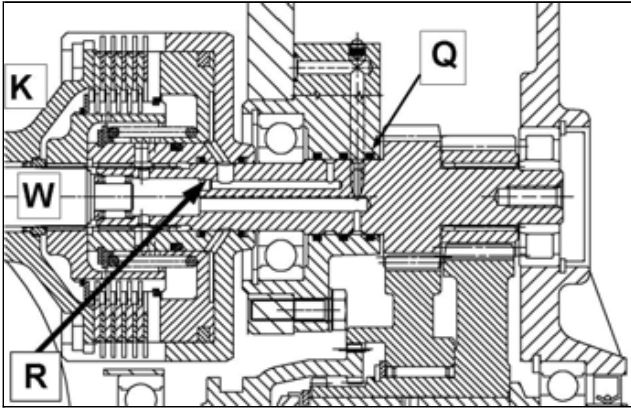


Fig.13

If is necessary to go on with the demounting in order to check or replace PTO clutch discs, follow these operations:

- remove the rear lifter casting in order to have free access to the PTO clutch;
  - Remove the clutch brake unscrewing the 3 screws that links it to the casting;
  - Remove the seeger ring **K** of Fig.13;
  - Demount the tractor in the central articulation joint, in order to allow to the shaft **W** to advance and give the possibility to extract it from the rear part of the tractor;
  - Now is possible to remove the PTO clutch and to check the 5 steel discs and the 5 friction discs.
- Once that all has been checked and the weared discs have been replaced, remount all in reverse order.

**NB:**

Remember during the remounting of PTO clutch to ALWAYS check the threaded pin indicated with **R** in the assembly: if you forget to remount it the PTO clutch will not work and will be necessary to demount of all the group. Once that the cap **R** has been mounted, engrave it with a burin, in order to lock it in the correct position.

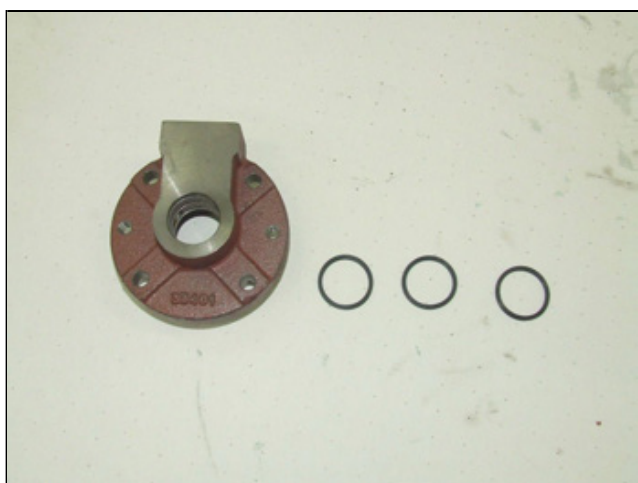


**27.1.40 - PTO distribution oil cover shaft - steering wheel version**

Shaft and cap



Insert the cap in the place of the shaft PTO clutch, positioning it with the spherical part upwards, then hammer.



Take the cover PTO clutch and put the three rings "Quadring" in place. Check that the rings are properly positioned in place.



Insert the two caps in place, positioning them with the spherical part upwards, then hammer them with a special tool.



Take the bearing and place it in place with the appropriate buffer. Install the snap ring and check for proper opening, making sure that there are no axial clearance.



Place the shaft PTO clutch, previously assembled, in the bearing



Insert the spacer and the roller cage in the shaft, then place the two O-rings in the two holes below the shaft

**27.1.50 - PTO brake - steering wheel version**

Install the first ring on the piston clutch brake. Insert the pin on the piston and then mount the other O-ring on the cylinder carrying piston.

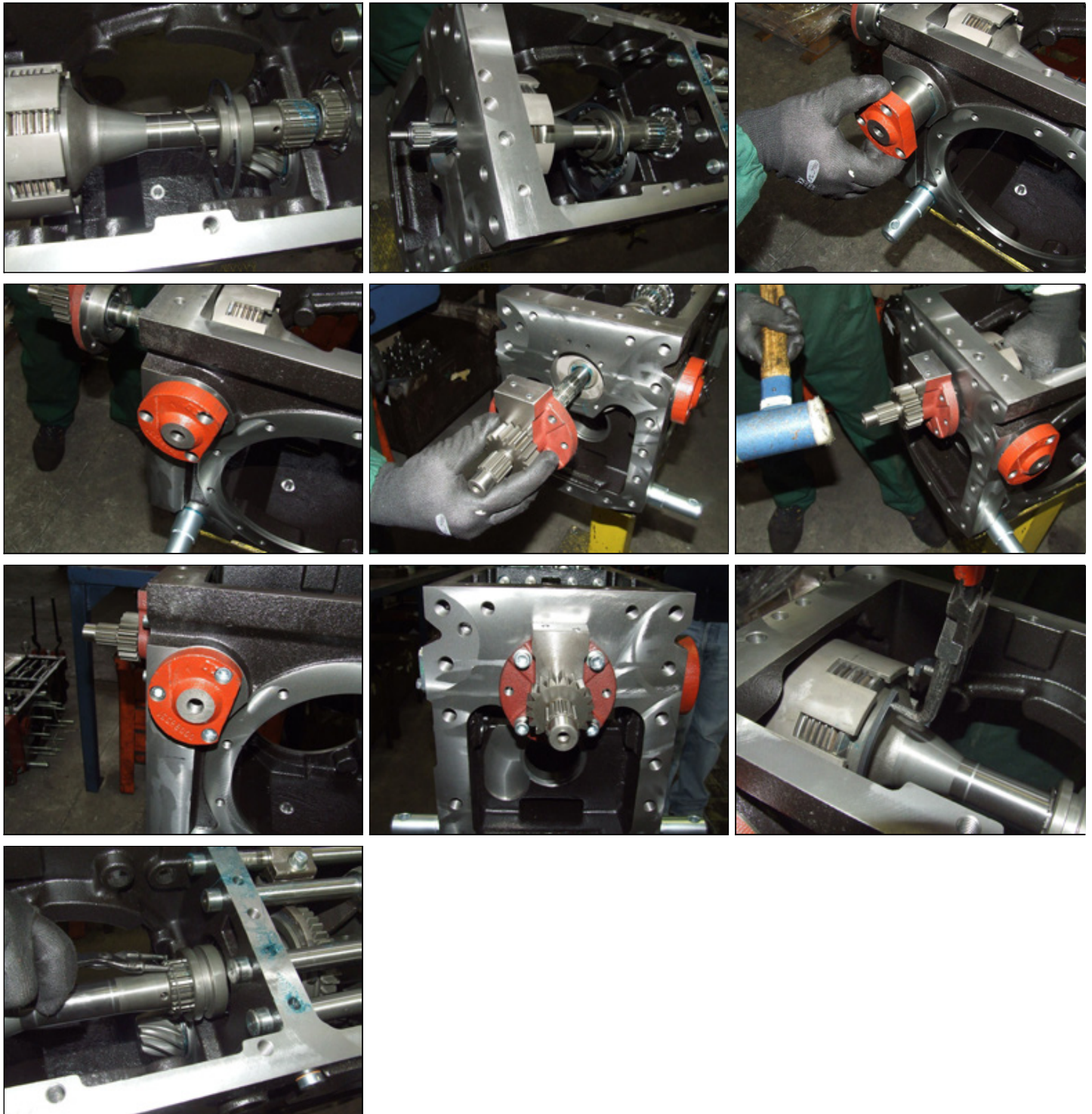
Lightly grease both the O-rings and insert the cylinder into the crankcase, being careful not to damage the O-rings.



**27.1.60 - Double clutch group - steering wheel version**

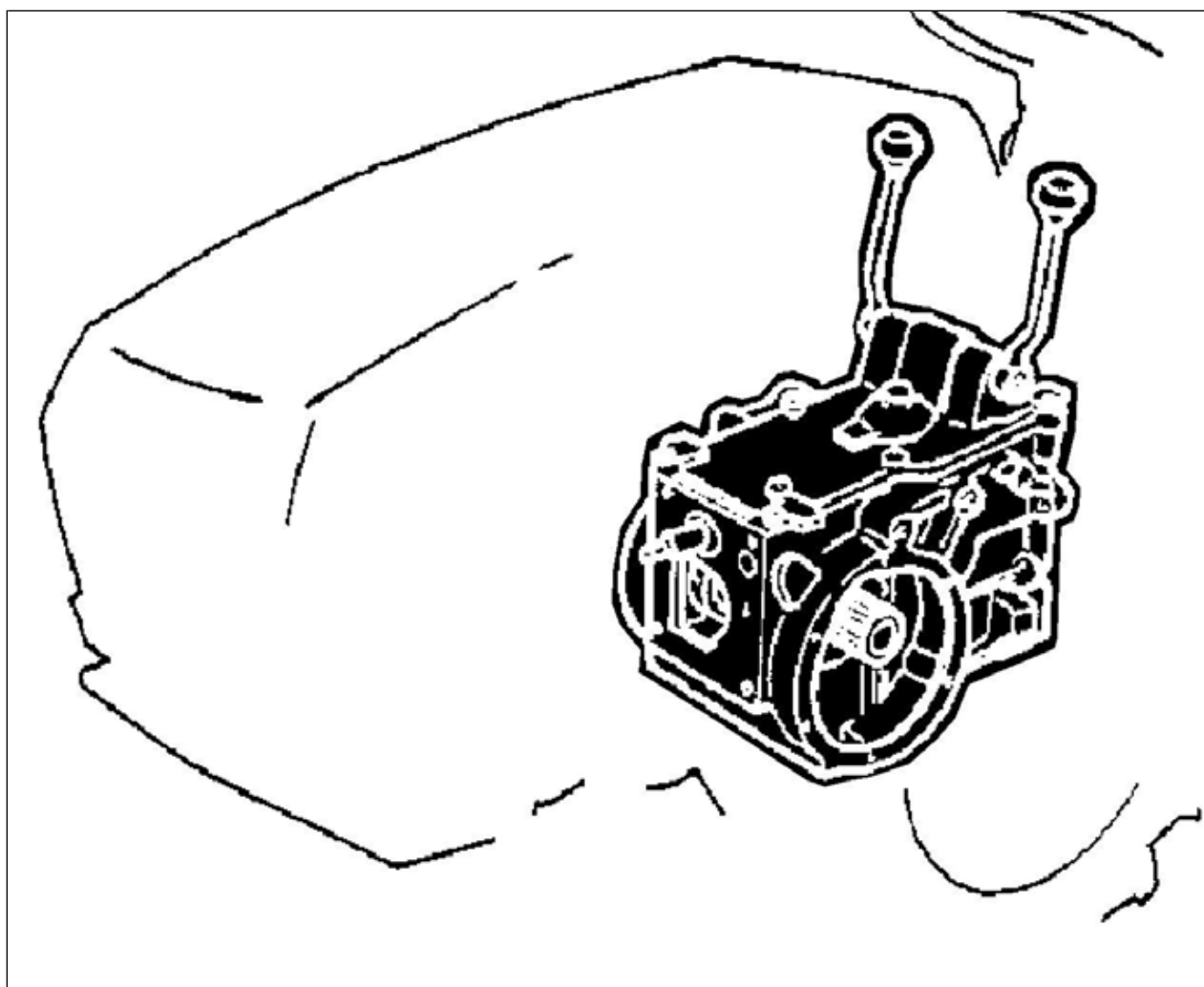
Install the two O-rings by placing in the back of the clutch pack. Carefully check that the two rings are in place. Turn the clutch pack and remove the snap ring that holds the disc pack. Take the PTO shaft and insert the roller cage and the spacer in the rear. Then splined the PTO shaft in the clutch pack and mount a small seeger that subsequently stop the control sleeve.

## 27.1.70 - Double clutch group assembly - steering wheel version



Insert the shaft dual-clutch pack (previously mounted) in the rear differential crankcase, then place the dual-clutch brake assembly. Also place the cover of the rear PTO clutch previously assembled, insert the screws on both the particulars in place and tighten. Putting in place the circlip for locking the disc pack, always on the same shaft, and put in place also the circlip that acts as a stop for the sliding sleeve. Verify, using compressed air or a pump test, the proper functioning of the brake and the correct opening / closing the disc pack.

## 33 - GEARBOX





## 33.1 - GEARBOX ADJUSTMENT

### 33.1.10 - Gearbox characteristics - steering wheels version

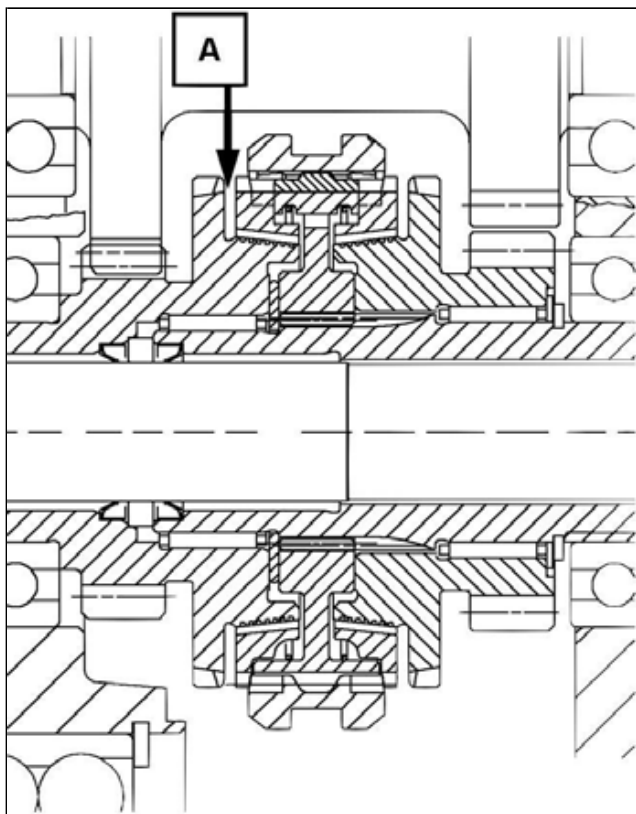


Fig.1

The synchronizer, if it is used in the reverser, gearbox or reducer group, is surely a critical element for the correct functioning of tractor mechanics.

In this short introduction we want to highlight the principal features of the synchro used in this tractor, that are common to all its different uses.

As shown in Fig. 1, the space **A** with new synchronizers (not weared cones) must be 1,8-2 mm.

This space is going to reduce once that the synchro start to wear.

When this space is near to zero, the synchro is completely weared and is not more able to do its function.

In addition to this wear travel of correct dimensions, another parameter of synchro correct working that must be checked is the axial play, that must be 0,5-0,8 mm, and this play is what allows to the synchro to brake on the conical surfaces of gears.

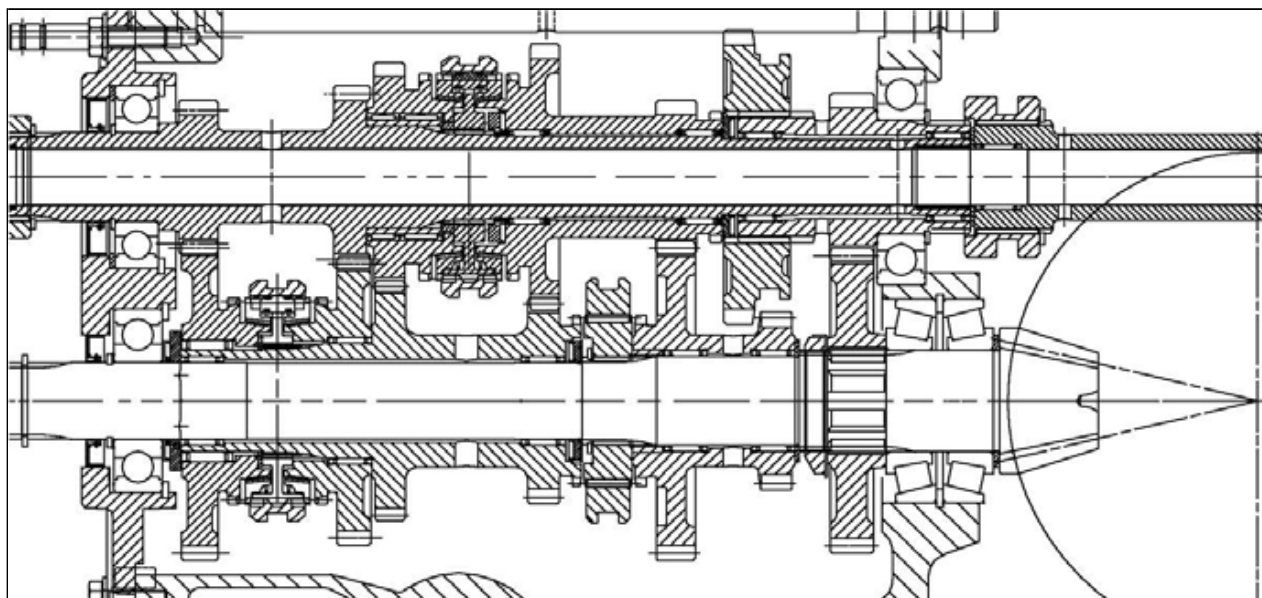


Fig.2

In the assembly of Fig. 2 is represented the gearbox of steering wheels version.

The amount of oil inside the gearbox in steering wheels version is 18 liters and the type of oil is: SAE 15W/40 (multifunctional oil).

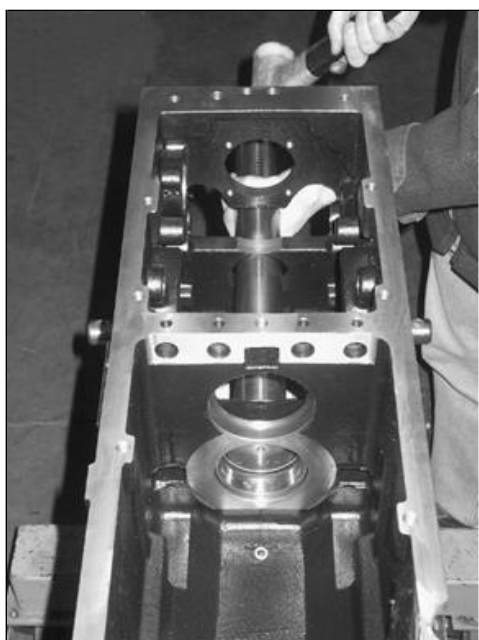


Fig.3

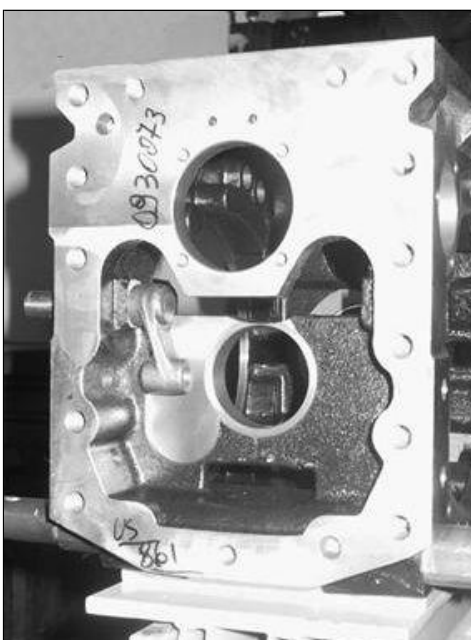


Fig.4

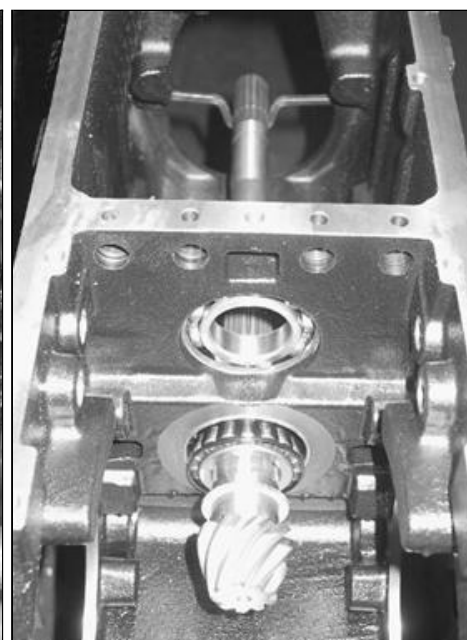


Fig.5

In the mounting of the gearbox the first thing to do is to position the external part of conical bearings, that will position the rear conical pinion, as shown in Fig.3. Use a plug as shown in figure.

Another operation that you don't have to forget before going on with the mounting, is to position the PTO selection fork support as shown in Fig. 4

As shown in Fig. 5 go on with the mounting of the conical pinion after the mounting of the bearing on the upper shaft.

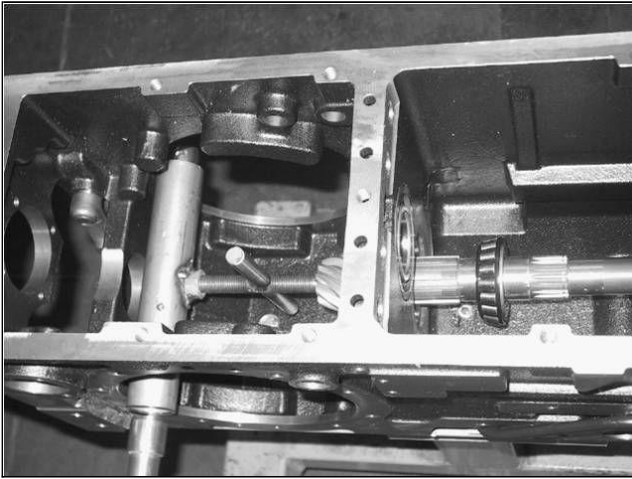


Fig.6

In Fig. 6 is shown the mounting of the pinion using a positioner that keeps the pinion in position while you can mount the second conical pinion.

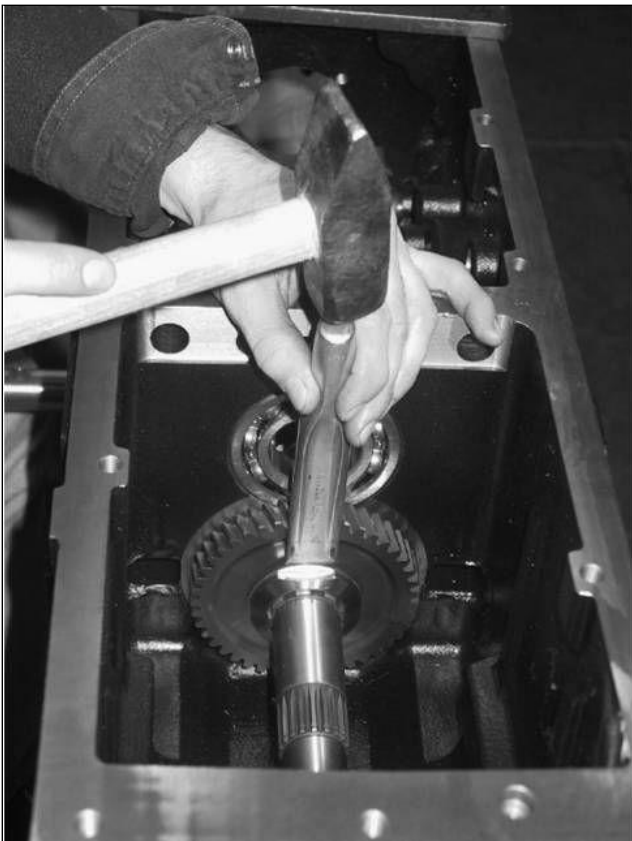


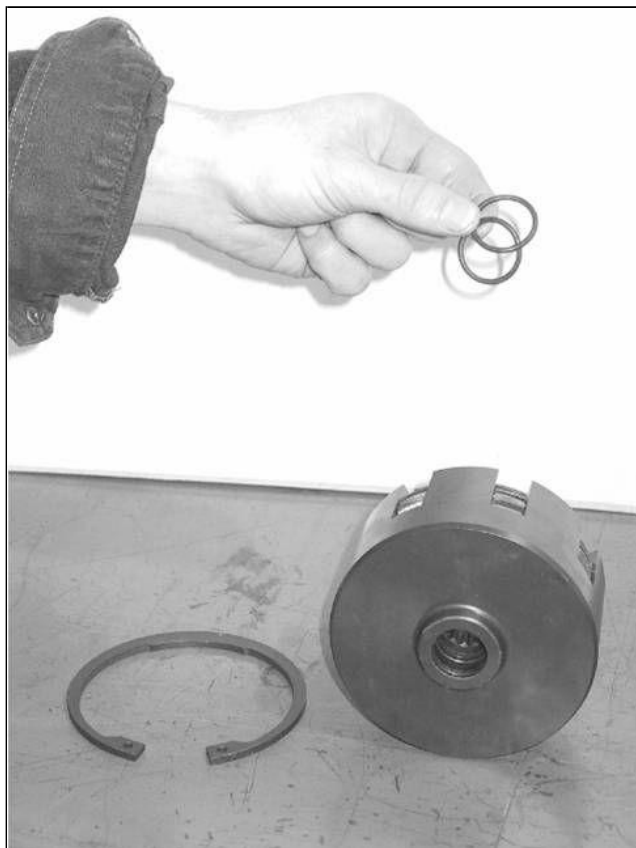
Fig.7

In Fig. 7, after you have mounted the gear on the conical pinion, mount the latten used to block the ring nut and the ring nut.

To tighten the ring nut follow this procedure:

- tighten the ring nut at full stroke, give some hits with a plastic hammer, unscrew of 1/4 turn and then lock with a load of 3Kgm, then check that the pinion can roll free.

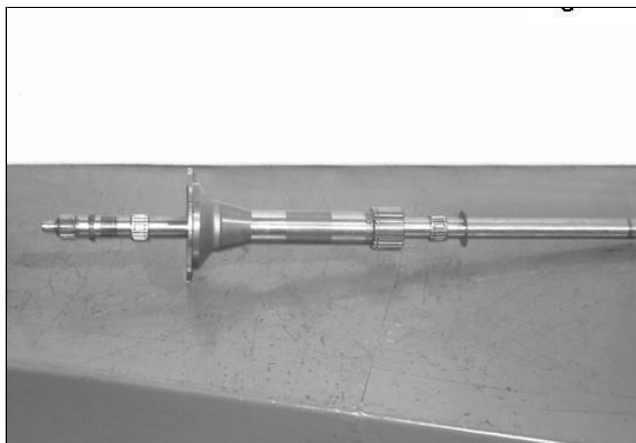
Clinch the ring nut block, check that the pinion roll free, give another hit with the plastic hammer in order to be sure of the complete positioning of all particulars.



Then you can go on with the mounting of the PTO clutch.

This group has been already described in the relative chapter.

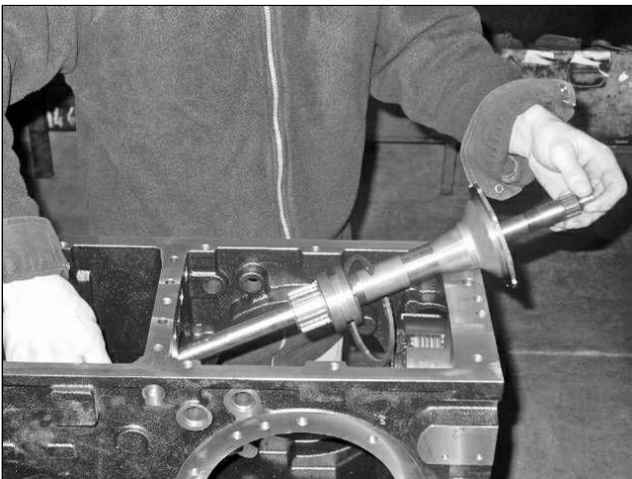
Is used the pre-assembled clutch pack and the only operation that must be made is to remove the locking seeger ring, as shown in figure, to go on with the mouning of the PTO shaft.



As shown in figure premount the gearbox primary shaft over the PTO shaft, paying attention to mount only the needle roller bearing on the clutch side and the needle roller bearing plus the spacer on the gearbox side.



Then mount the PTO selection sleeve on the primary shaft, paying attention to the internal turning of the sleeve, that must be oriented towards the engine once that the shaft is mounted in the gearbox housing as shown in figure.



Then mount all the shaft as shown in figure inside the gearbox housing, together with the PTO clutch locking seeger.

The PTO clutch has already been mounted inside the gearbox as visible in figure and is kept in position from the rear PTO shaft bearing, whose mounting has already been described in the PTO clutch chapter. Tilt the assembly as shown in figure in order to allow its passage inside the casting.

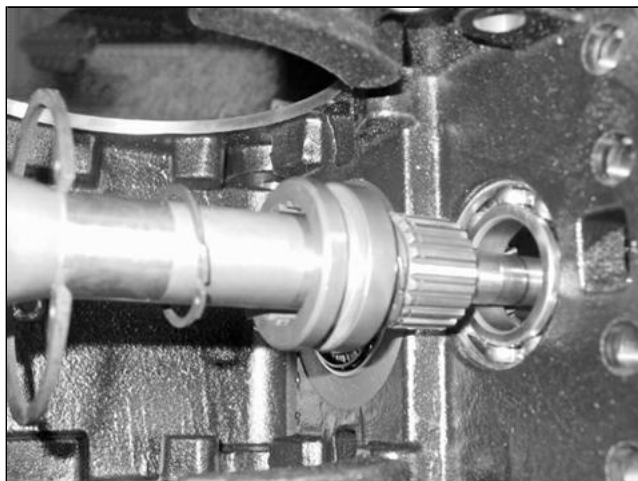


Fig.8

While you are doing the operation mentioned in the previous page, match the spline of the primary shaft with the internal spline of the PTO clutch.

In fig.8 is visible a passage of the mounting, with all the seeger rings premounted on the shaft and ready to be inserted in their housings.

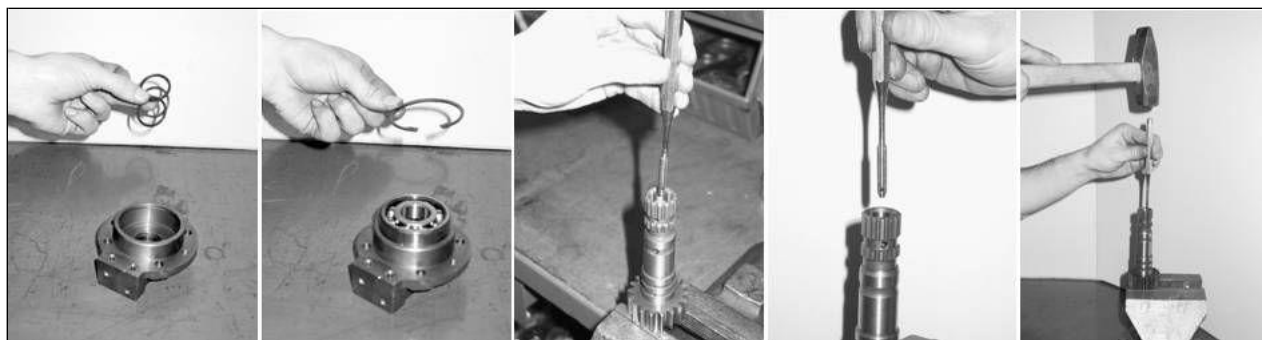


Fig.9

Here are summarized the principal phases of the rear PTO shaft mounting, whose assembly is mounted in Fig. 11.

As shown in the sequence of Fig. 9, mount the threaded pin inside the small hole of the rear PTO shaft, then clinch with the appropriate tool in order to avoid the accidental loss of the part.

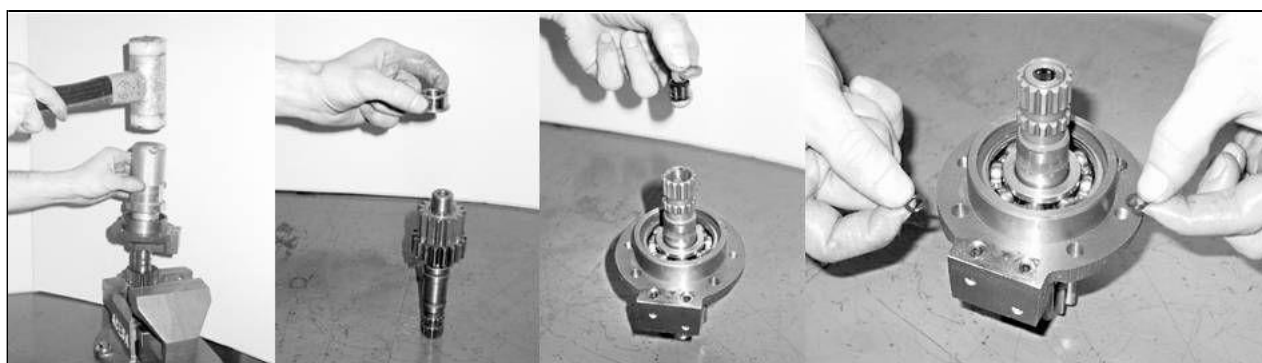


Fig.10

In the sequence of Fig.10, is shown the final phase of the PTO shaft mounting.

**DON'T FORGET** the O-rings of the oil ducts to the PTO clutch as shown in the last picture, otherwise will be necessary to demount all another time.



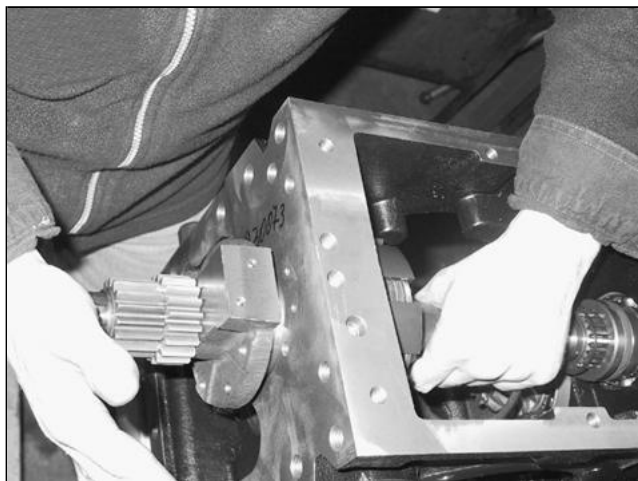


Fig.11

Then is positioned the rear PTO shaft, where are mounted the PTO primary gears. This operation is shown in Fig. 11, where is visible the correct orientation of the flange used as a hydraulic distributor for the PTO clutch.

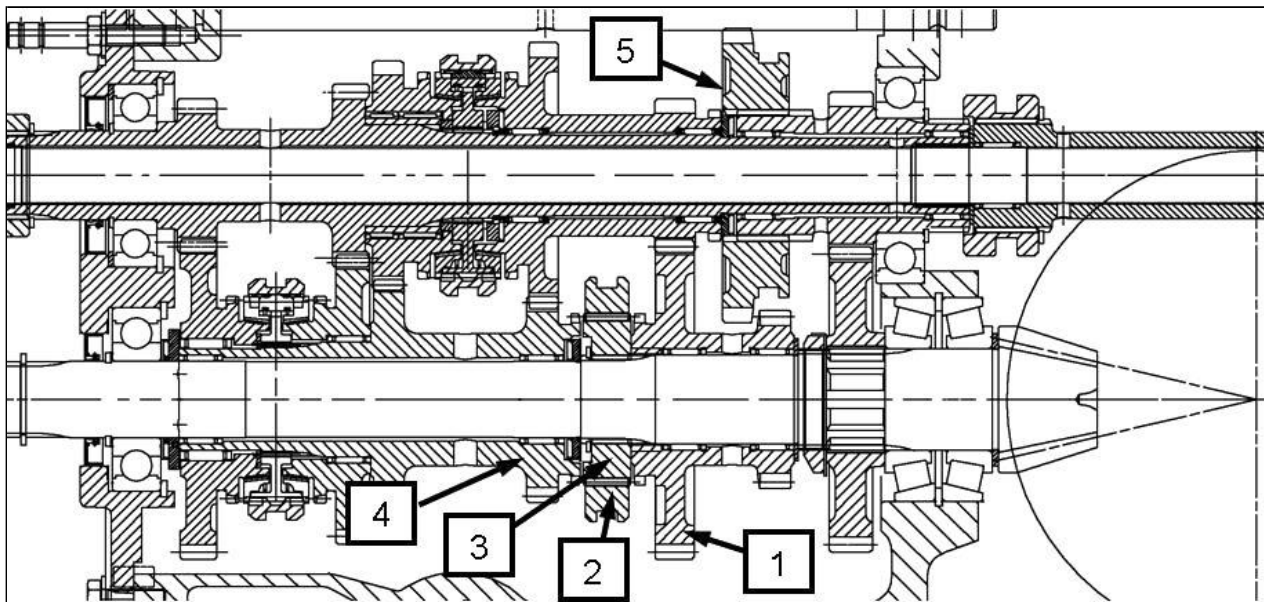


Fig.12

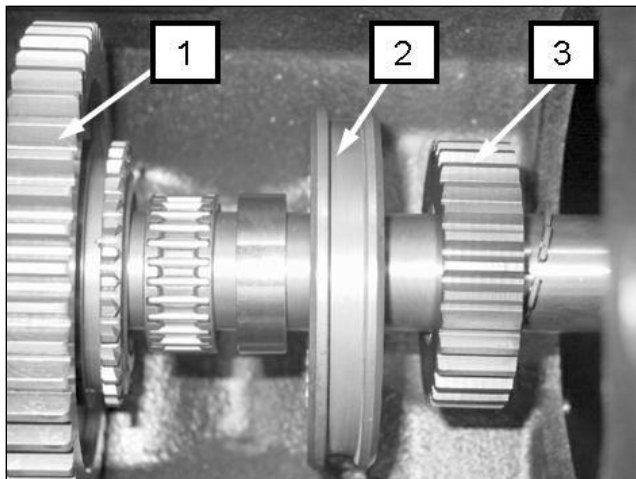


Fig.13

In Fig. 12-13 are shown other phases of the lower gearbox shaft mouning inside the gearbox. With numbers **1,2** and **3** are shown the components on the assembly and the same parts during the mounting sequence.

During the mounting insert between part **3** & **4** the spacer and the seeger ring as shown in the assembly.

Before mounting the gear **1** position gear **5** and a part of the upper shaft and then go on with the subsequent operations.

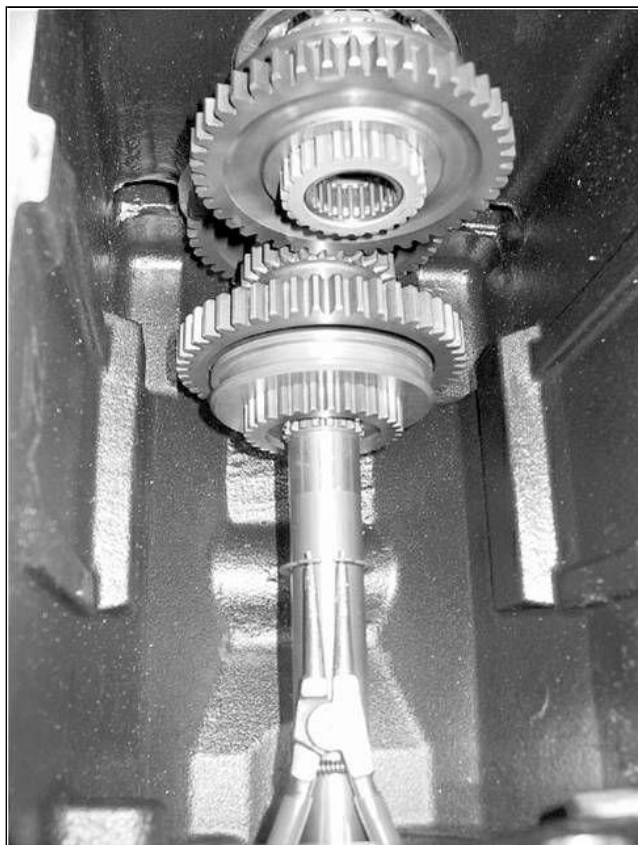


Fig.14

While you are mounting the lower shaft it's necessary to start to mount the upper primary shaft as shown in Fig. 14, keeping in mind of the mesh between respective gears and bringing them in the correct position as shown in Fig.14.



Fig.15

In Fig. 15 are shown some components of the primary upper shaft that can be prepared for the mounting.

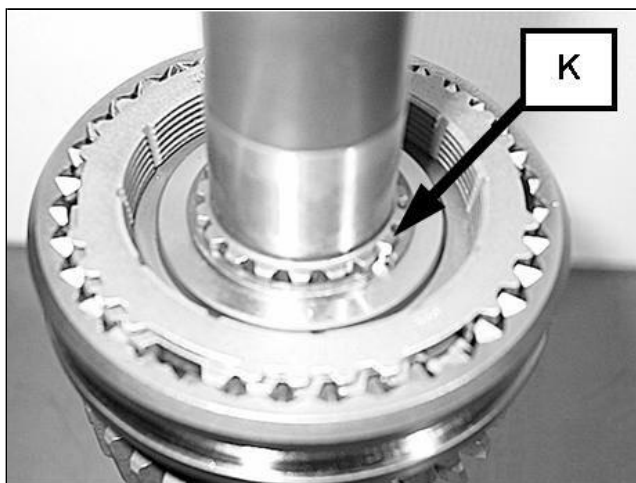


Fig.16

Don't forget to mount inside the synchronizers pack the seeger ring that position the central sleeve as shown in Fig. 16(part. K).

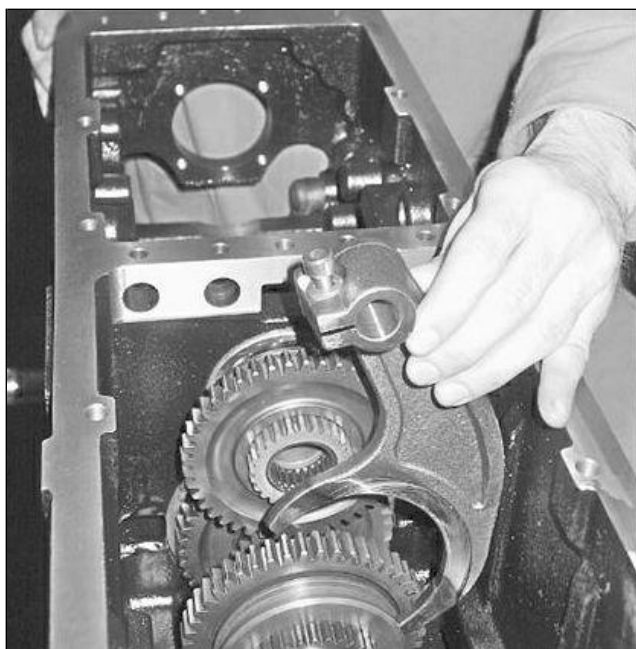


Fig.17

While you are positioning inside the casting the preassembled group, is necessary to position the reducer selection fork as shown in Fig. 17.

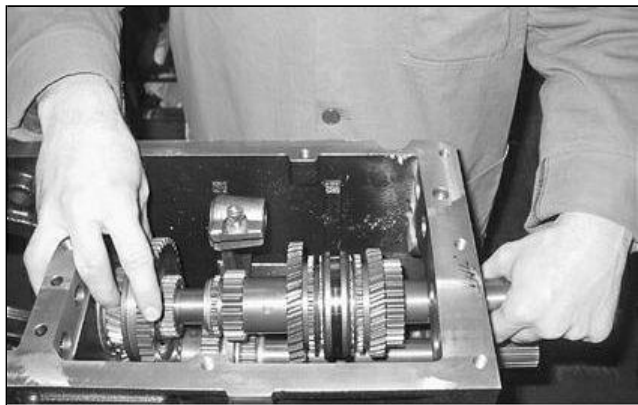


Fig.18

Carry on with the mounting of the upper primary shaft as in Fig. 18.



Fig.19

Carry on with the mounting of the lower shaft, till you have mounted the lower synchronizer and don't forget to mount the stop seeger for the central sleeve also in this synchronizer pack.

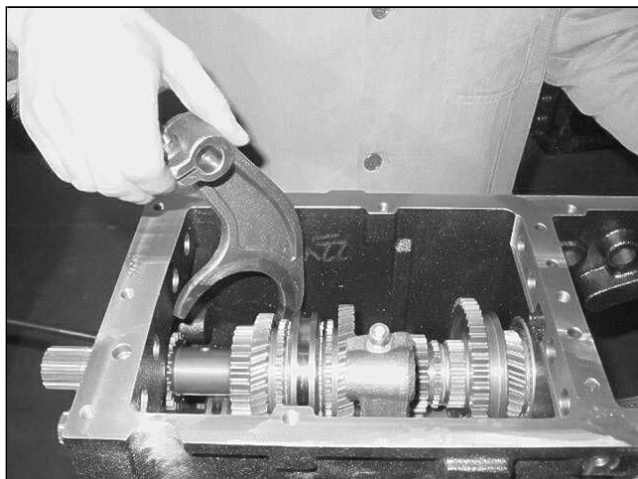


Fig.20

Then proceed with the mounting of gears selection fork on the lower shaft, as shown in Fig. 20.

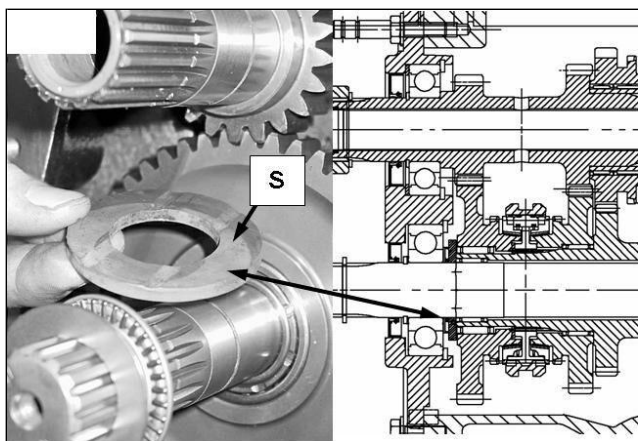


Fig.21

While you are finishing to mount the lower gearbox synchronizer, over the axial bearing don't forget the spacer **S** of Fig. 21, that keeps in position the needles roller bearings below the gears and one of the two supporting track of the axial bearing.





Fig.22

Then you can premount the closing flange of Fig. 22, premounting on them the bearings and the seeger rings; don't forget the spacer that must be mounted behind the upper one.

Then is necessary to register the distance between the seeger ring and the bearing on the lower shaft, inserting spacers of different thickness, after that has been mounted the front flange, correctly adding some silicon on the mating surfaces.

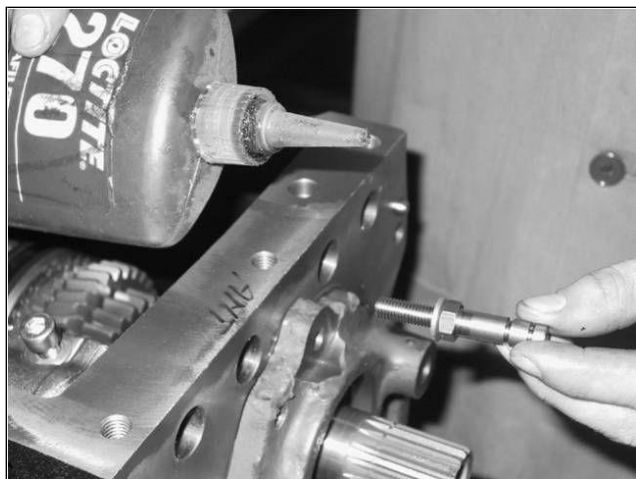


Fig.23

Tighten the front flange fixing screws (M8) with a torque of 3Kgm, taking care to add some drops of Loctite 720 on the upper screw, as shown in Fig.23.

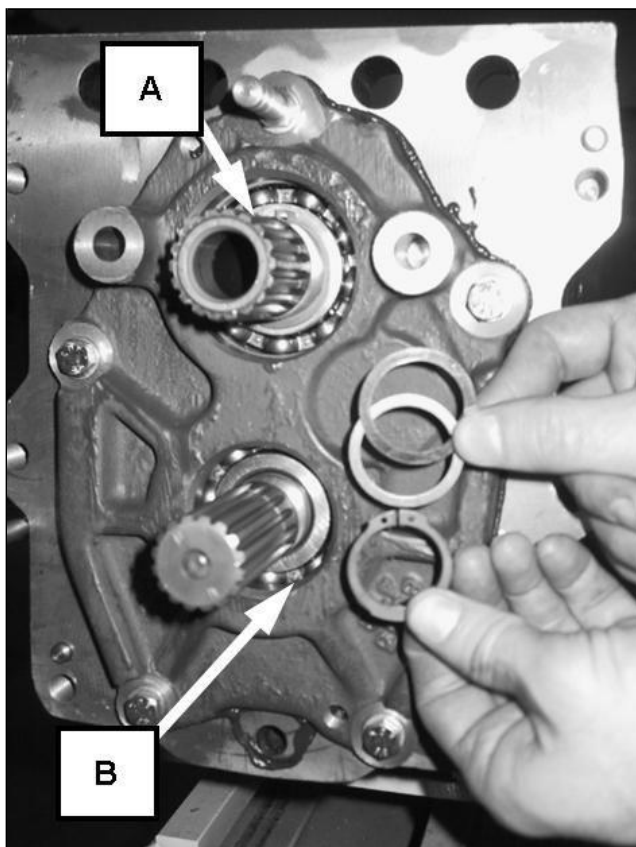


Fig.24

On the shaft **A** the last operation is to mount the closing seeger ring, while on the shaft **B** is necessary to regulate the distance between the seeger ring and the bearing following these operations:

- pack the bearing, then add all the spacers (thickness 0,2-0,4 mm) necessities to mount the seeger ring.

Then, acting from above with a screwdriver, subdivide the play on the conical rings of the synchronizer and check that there still is a play of 0,6-0,8 mm on each part with the central ring in neutral. Then check the correct insertion of the gears on the synchro before on the right and then on the left and check that there are all the clearances necessary for the correct functioning of the synchro.

Then grease the seal mounted on the shaft **A** of Fig.24 before the final mounting of the central PTO shaft.

Once that all the above described operations have been made, mount the seals on the shafts **A** and **B** of fig. 24 and go on with the subsequent operations.

On the same shafts mount on the appropriate housings the sliding joints's full stroke seeger rings.

#### **NB:**

During the substitution of gearbox's mechanical parts, always replace all seals and O-rings because mounting and demounting of shafts could damage the seals.

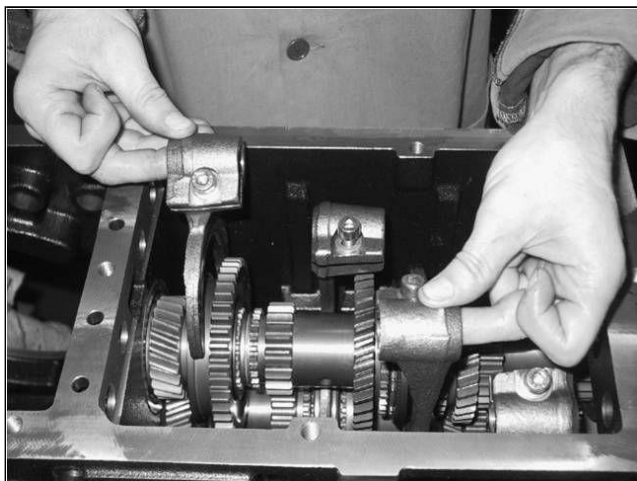


Fig.25

Now, as shown in Fig. 25, is possible to go on with the mounting of upper forks that moves third and fourth gear and the reducer.

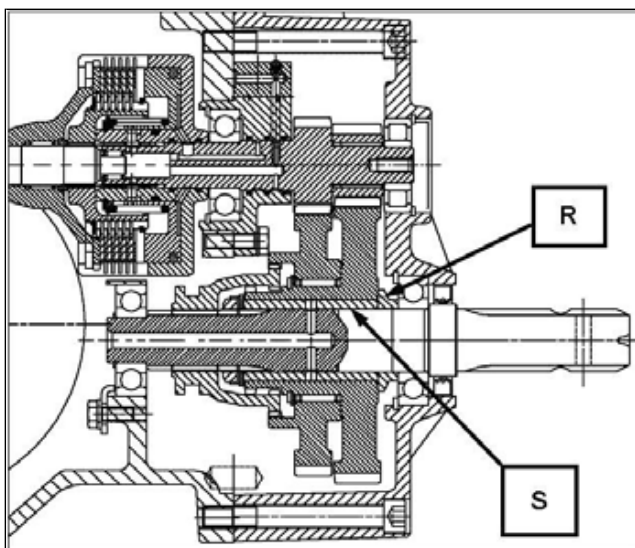


Fig.31



Fig.32

Before going on with the assembling of forks and rods of the gearbox is better to conclude the assembling of the rear PTO part.

On the rear PTO casting, premount the upper roller bearing and the lower PTO shaft as shown in Fig. 31 e 32.

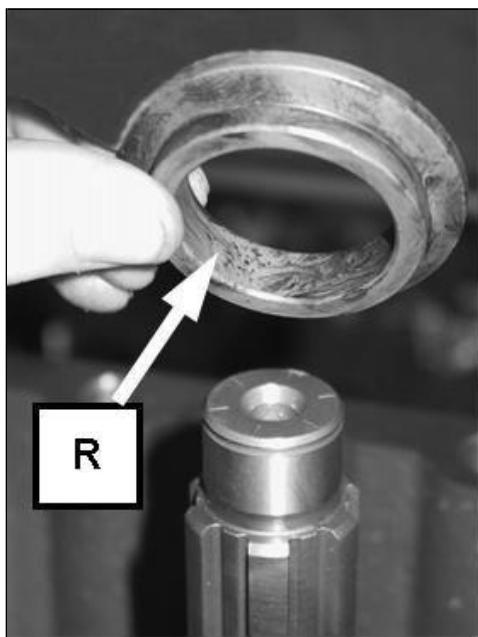


Fig.33

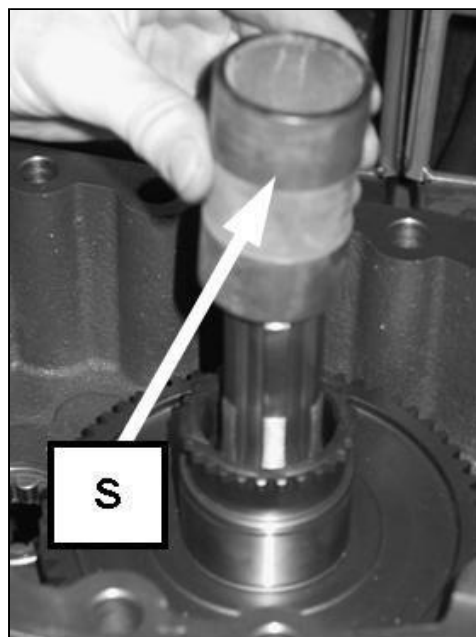


Fig.34

In Fig. 33 and 34 are shown the subsequent phases of the lower PTO shaft mounting; pay attention to the mounting orientation of the spacer visible in Fig. 33 and then go on as shown in Fig. 34 for the mounting of the collet.



Fig.35



Fig.36



Fig.37

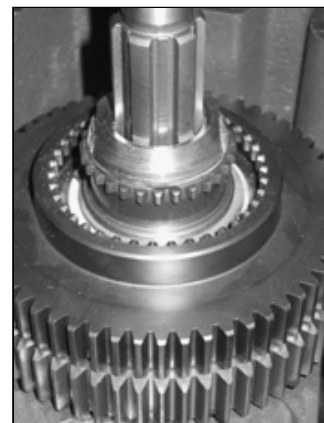


Fig.38

Go on with the mounting following sequence:

Pay attention in the succession of the following parts: spacer, stop sheet and ring nut.

Lock at full stroke the ring nut with a torque of 8 Kgm, then clinch the ring nut stop washer on both sides.



Fig.39



Fig.40

Complete the mounting with the selection sleeve, the bearing and the bearing's positioning seeger ring. Before the rear PTO casting final mounting don't forget to position the PTO speed selection fork, internally to the little fork previously mounted in fig. 40.

While you are mounting the rear PTO casting, after an accurately application of silicone, bring the PTO speed selection sleeve towards the bearing in order to help the clutch between the fork and the relative housing.

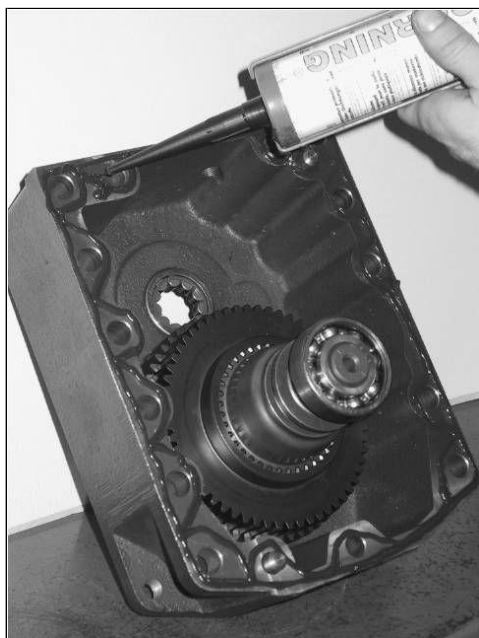


Fig.41

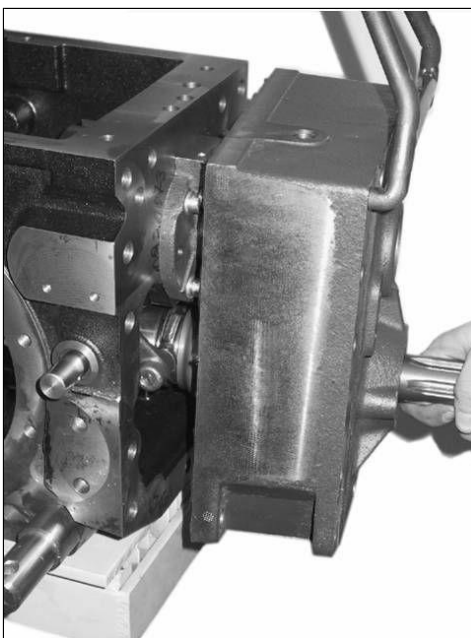


Fig.42



Fig.43

As shown in the sequence of Fig. 41-42-43, during the assembly of rear PTO casting, turn the PTO shaft as shown in fig. 42, and insert correctly the fork in the sleeve. During the fixing of rear PTO casting Fig. 43, tighten the hex head screw M12 x100 at 6 Kgm and the 2 M14x40 screws at 8 Kgm. Once that the locking has been correctly done check that the fork allows a correct insertion of the sleeve; while with a hand you turn the external shaft of the PTO, with the other one you can try the correct engagement.



Fig.44

Now is possible to go on with the mounting of the external selection levers for the PTO speed.

Regarding the selection sheet mounted externally to the casting, first of all is assembled without tightening the fixing screws, then you check the adjustment of the neutral point, then you check the clearance in the two PTO selection modalities (540-750 rpm). Once that all is OK tighten the fixing screws at 2 Kgm.

As shown in Fig. 44 with the Allen screw is possible to preload in order to obtain enough pressure on the ball, in the way that with vibrations or normal use of the tractor is not possible to lose the selection, then is possible to lock the locknut.

**NB:**

The same procedure has to be used for the registration for the selection sheet used to select the PTO modality on the left side of the tractor.

The operations to be done are the same.



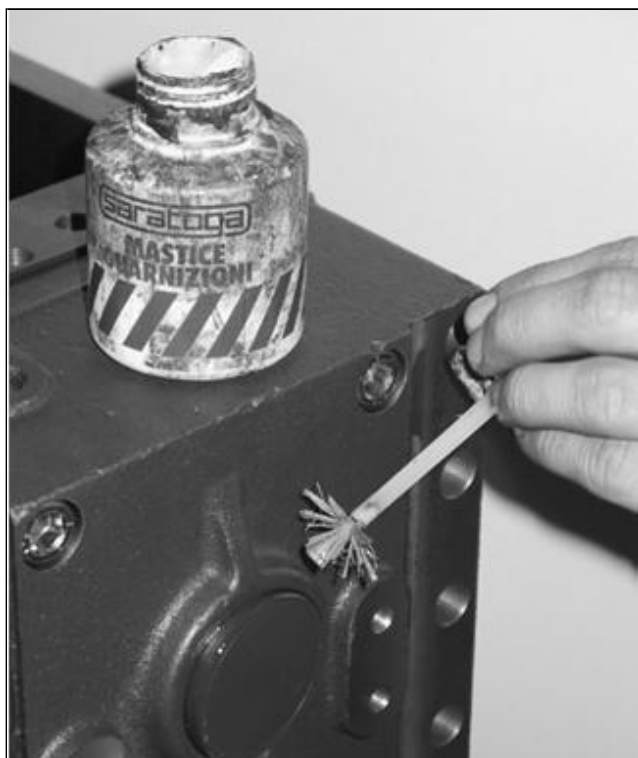


Fig.45

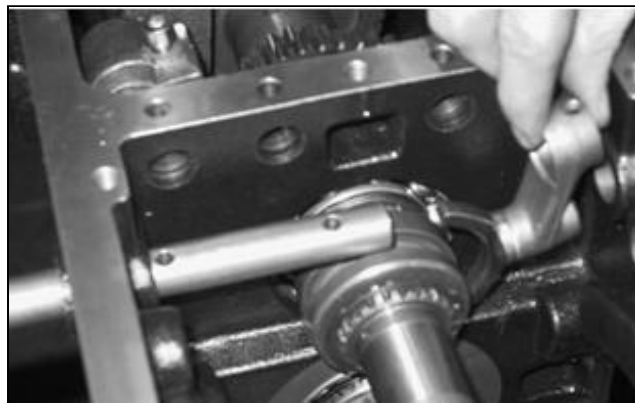


Fig.46

As shown in Fig. 45, close with a cap and silicone the upper hole of the rear PTO casting. Then you can go on with the mounting of the command rod of the PTO selection mode (independent or synchronized) as shown in Fig. 46.

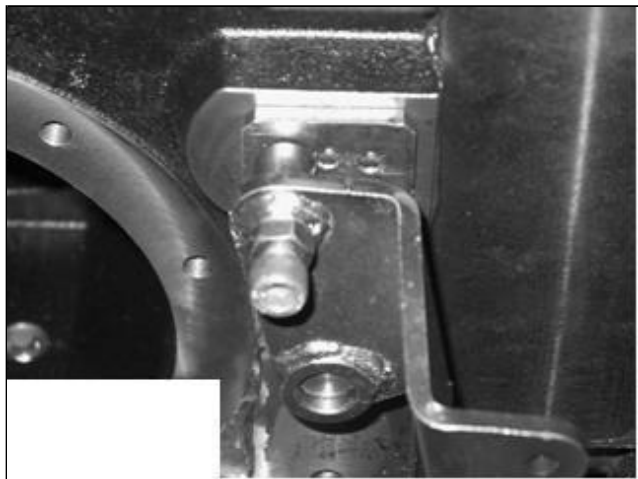


Fig.47

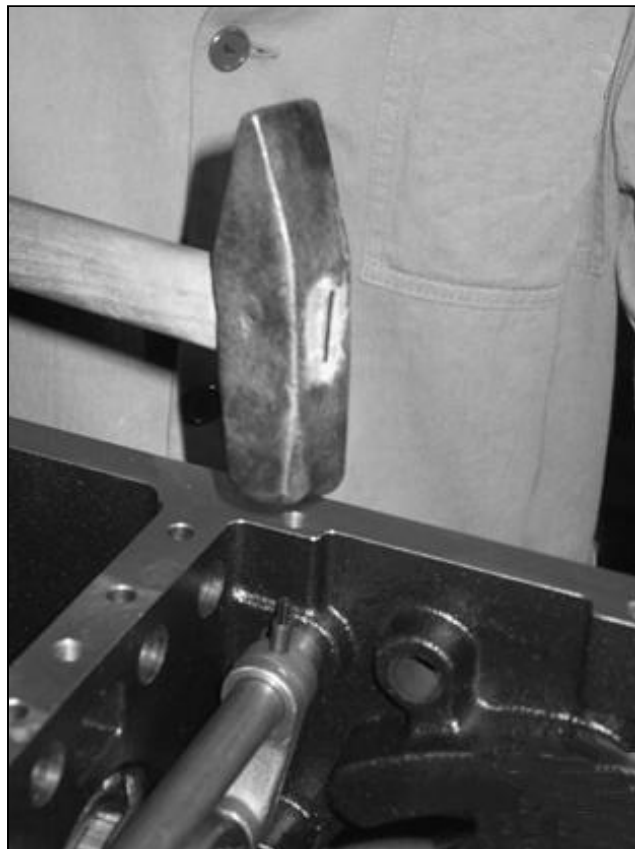


Fig.48

The support of internal command fork must be fixed as shown in Fig 47 on the previously mounted command rod.

For the external adjustment of the selection sheet follow the previous instructions.

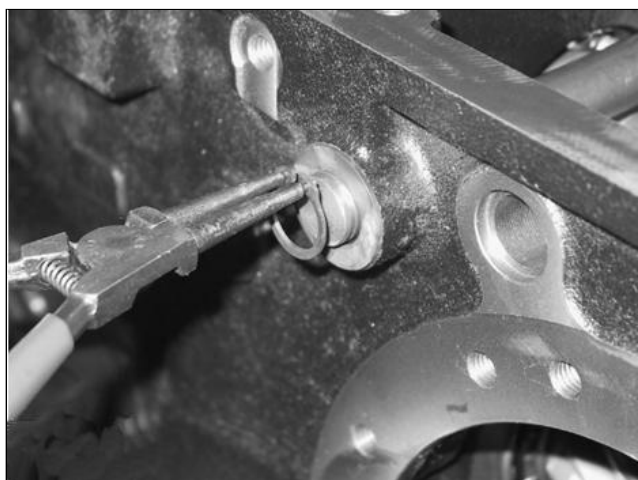


Fig.49



Fig.50

As shown in Fig.49, using a pair of pliers mount the rod's positioning seeger.

Position on the rod, before to fix le PTO command lever, the O-ring seal as in Fig. 50.



Fig.51

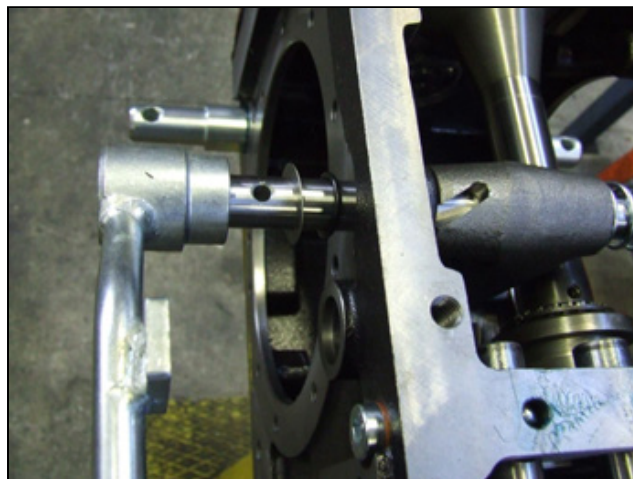


Fig.52

Mount, as already previously shown, the O-ring, the spacer and subsequently the hub of the differential lock pedal, see Fig. 51.

As shown in Fig. 52, mount the differential lock pedal and conclude this part of the mounting.

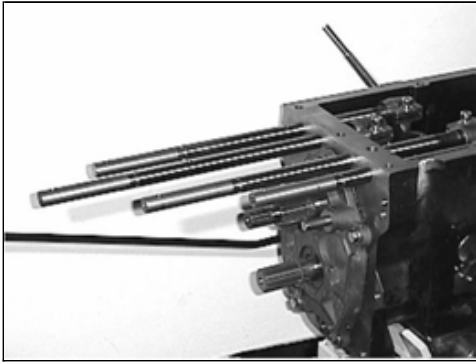


Fig.53

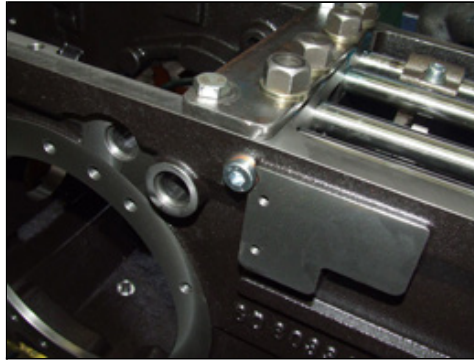


Fig.54

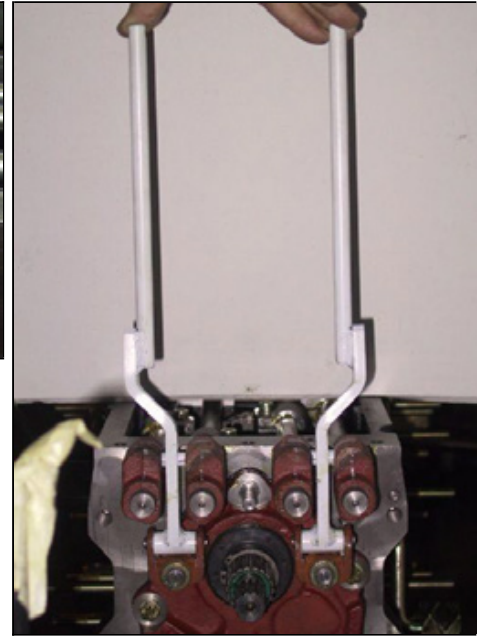


Fig.55

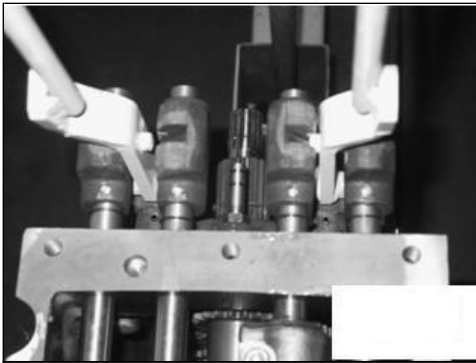


Fig.56

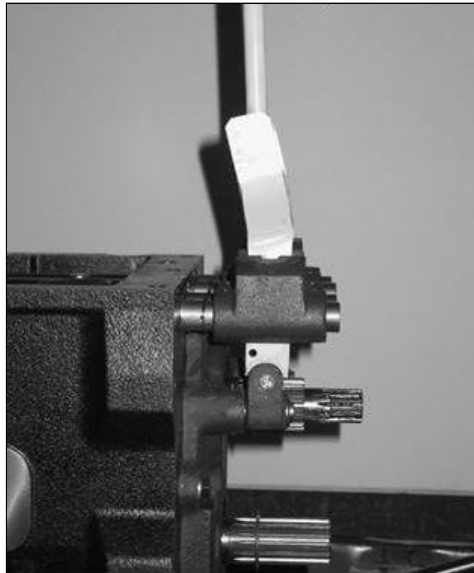


Fig.57

Then is possible to mount the gearbox and reducer selection rods and the relative impediments. Before mount the two rods towards the center of the tractor. Then position the two more internal rods in neutral position and insert the two block pins as shown in Fig. 54.

- Mount the external rods trapping the block pins between two consecutive rods.

It's important that during the mounting you keep all four rods with the sleeve fixing hole in the vertical position. Then apply a temporary locking and check the correct engagement of all the groups checking all strokes and engagements.

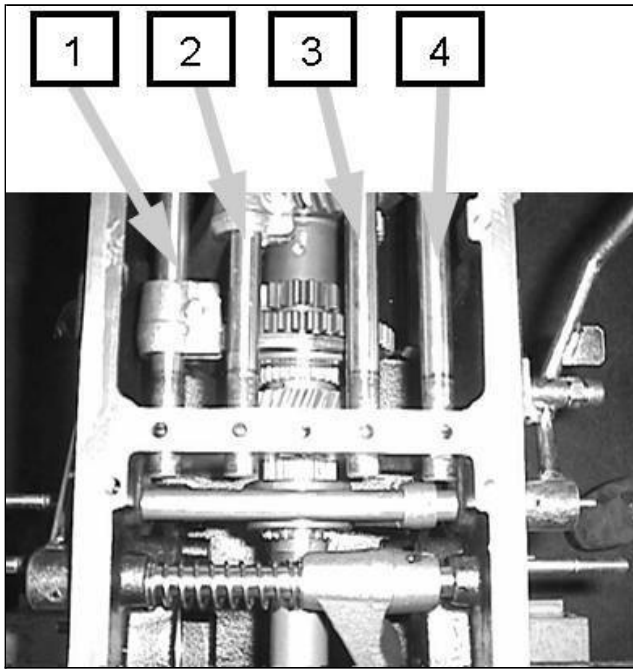


Fig.58

Remember that the first rod starting from left **1** mounts a fork that works on the primary shaft, the second rod **2** works on the secondary shaft.

The third rod **3** works on the secondary shaft, while the fourth rod **4** works on the primary shaft.

Mount the rods with the selection housings strictly oriented upwards.

Once that all the impediments have been inserted in their respective holes on the casting, close these holes with the threaded pins adding on them silicone in order to avoid oil leakages.

Then you can tighten the forks on the rods:

with the fork on neutral on the synchronizer, look for the neutral on the rod, loosening the Allen screw on the fork and then split up the clearance on the full strokes.

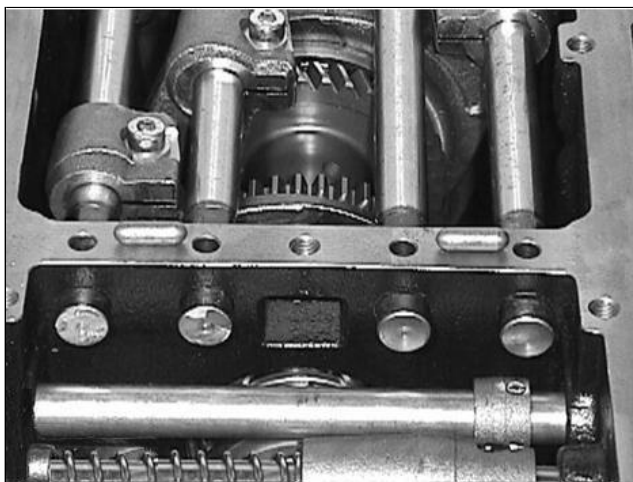


Fig.59

Fig. 59 shows the positioning of the impediments internally to the casting, between two rods.

Then concerning the mounting of the gearbox and reducer sleeves you can follow these operations: (Fig. 56 e 57).

- both the two reducer's sleeve than the two gearbox's sleeve have to slightly converge one towards the other; in this way the central lever doesn't have to exit from the selection.

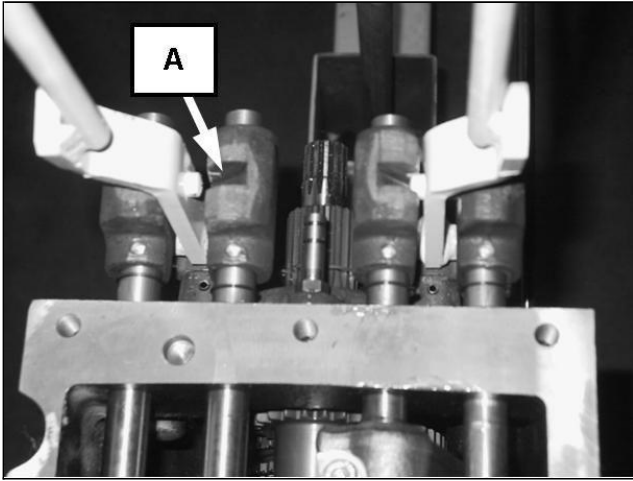


Fig.60

When the command engages on the sleeve, on the other side you must have a 2 mm clearance (space **A** of fig. 60).

As last operation, check the correct functioning of the impediments: keeping the lever (both the gearbox than the reducer ones) in the central position, try to insert in selection both sleeves; this has to be impossible.

If this doesn't happen check the dimension of the impediment; surely it's not correct.



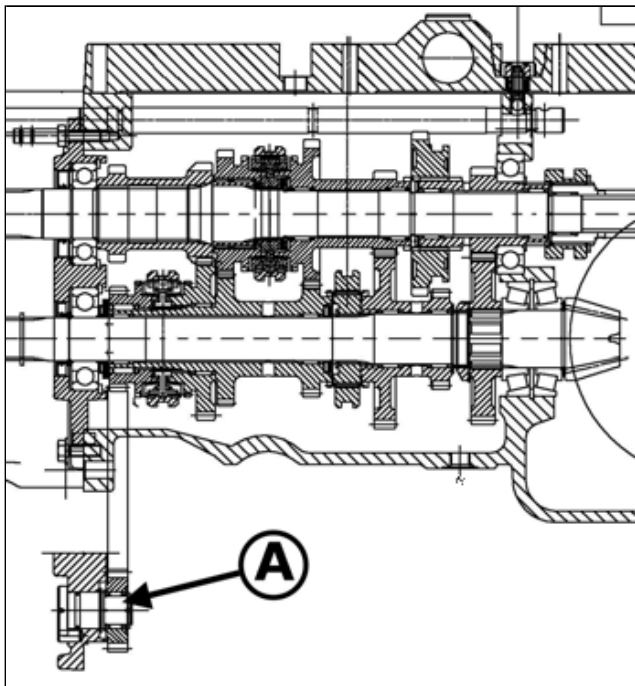
**33.1.20 - Gearbox characteristics - articulated version**

Fig.1

As shown in the power train diagram, unlike the steering wheels version, the articulated version does not have a reverse shuttle but just the REV function (shaft A of fig. 1). Instead of being a 16+16 type, it is a 12+4 one. When it comes to the other gearbox assembly specifications, there are no significant difference in relation to the RS version so comply with the instructions given on the previous pages.

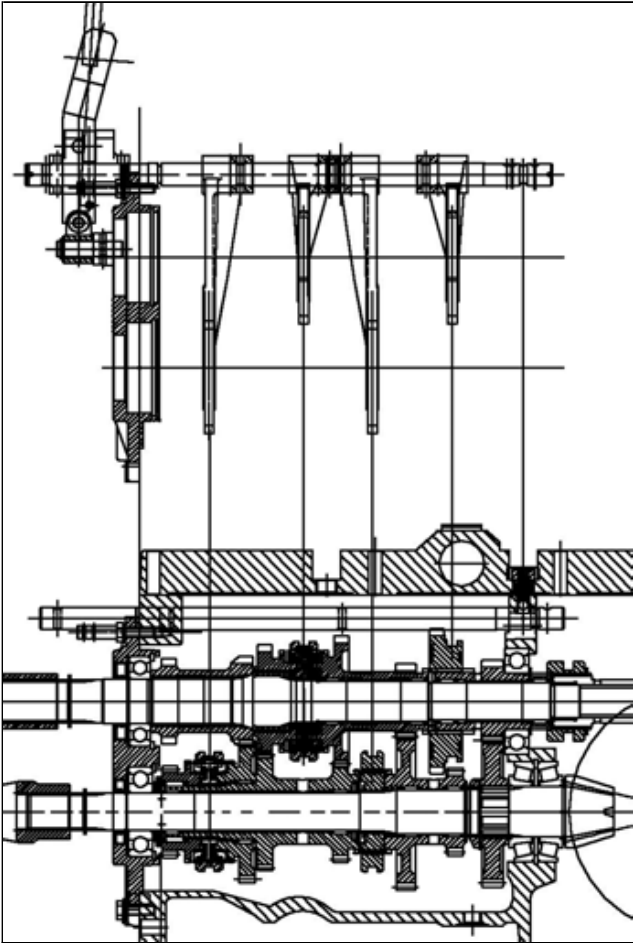


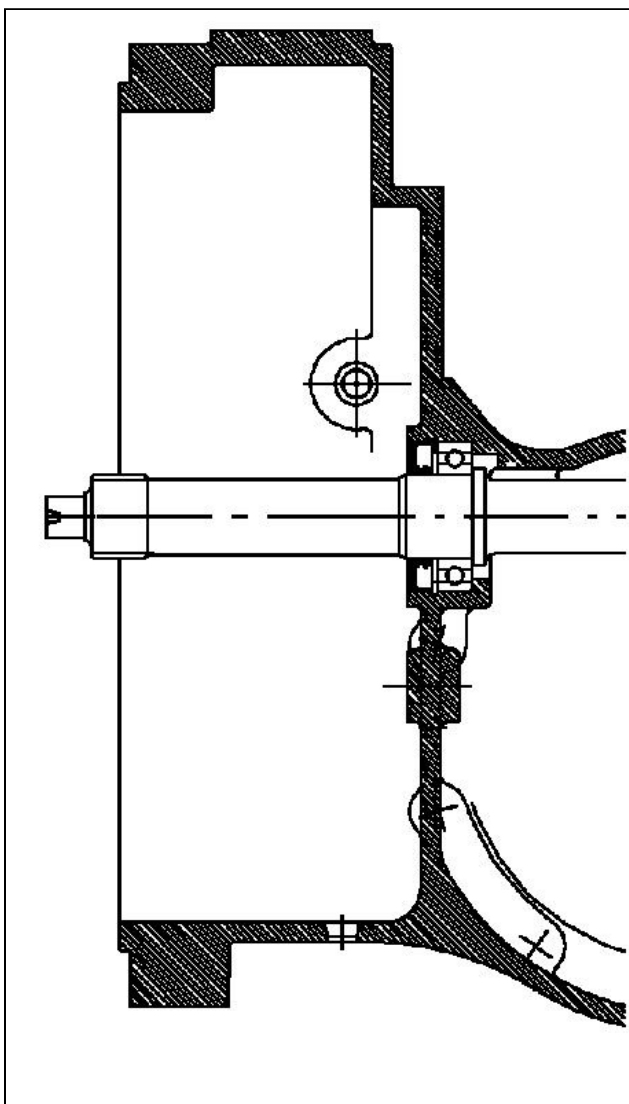
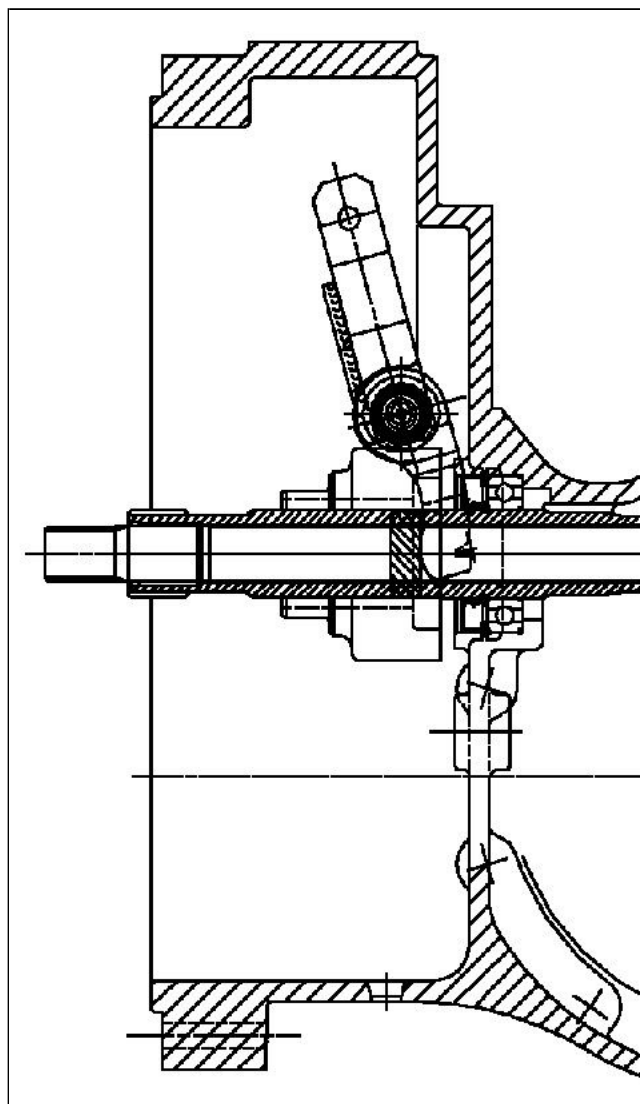
Fig.2



Other parts of the gearbox which are different from the steering wheels and articulated version, we should mention the main shaft.

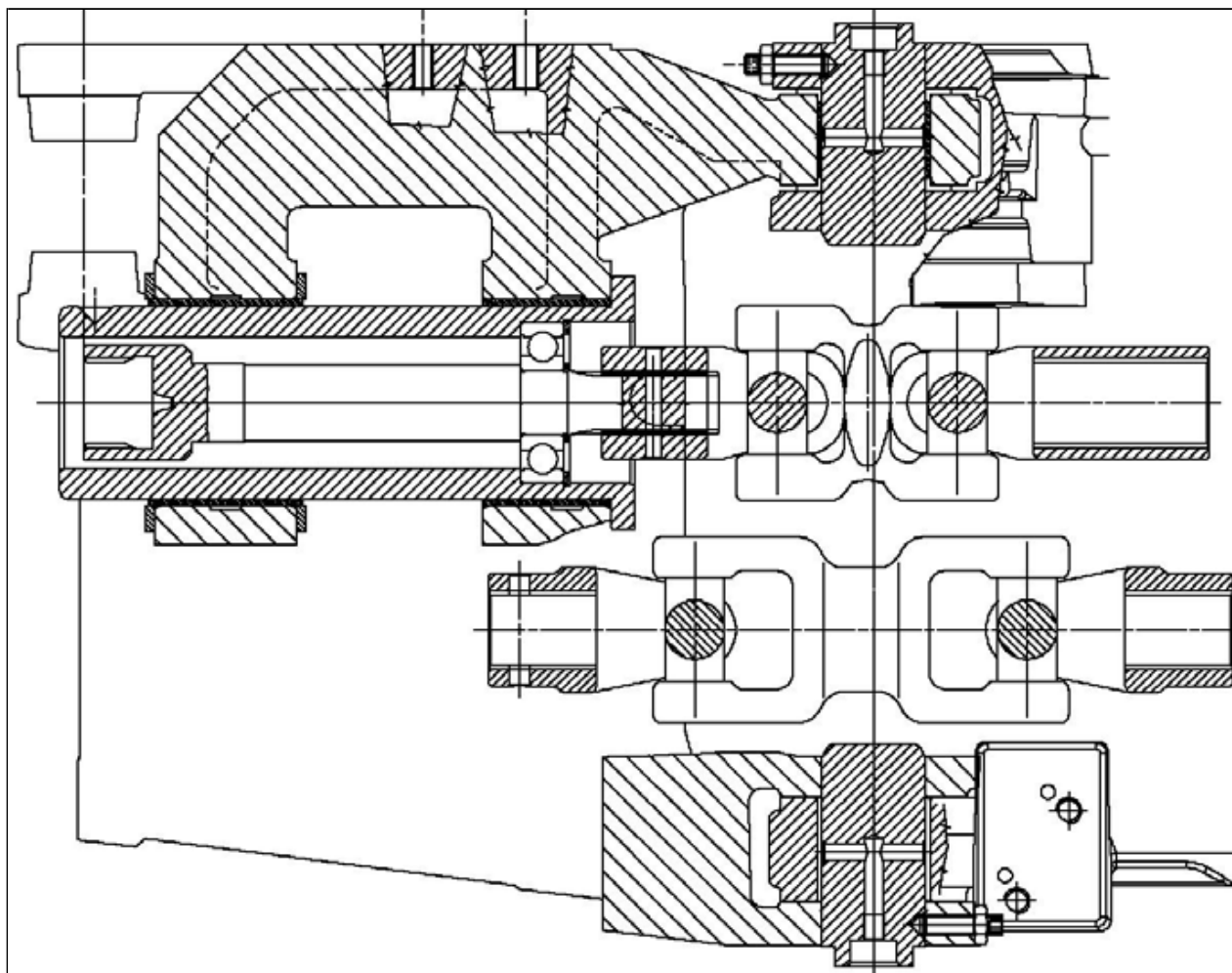
There is a substantial difference between the articulated and steering wheels version: while in the steering wheels version the PTO shaft is independent of the traction and take the movement from the flywheel, in the articulated version is the traction shaft which brings the movement also to the PTO.

This leads to having in the steering wheels version a main shaft hollow with inside the PTO shaft, while in the articulated version the main shaft is full and unique.



In the two images above are evident the differences of the main shafts between articulated and steering wheels version.

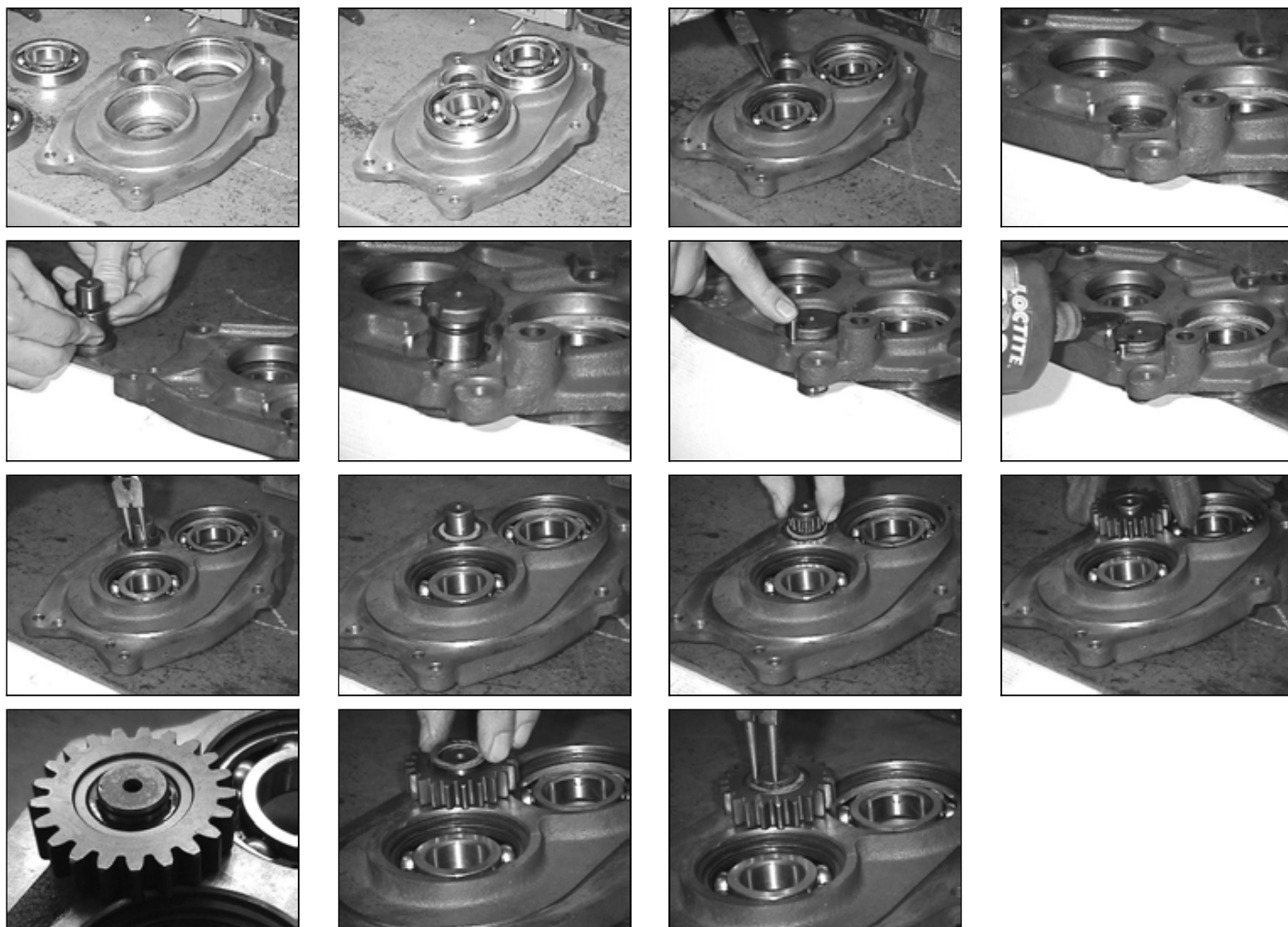
To adjust both front and rear differentials, are worth the indications that already have been provided for the steering wheels version



In front of the joint, there isn't a housing that accommodates the reverse group as a steering wheels version, but the front differential housing.

It is also indicated that the quantity of oil in the gearbox in the articulated version is the same as the steering wheels version and is equal to 22 liters, the type of oil is always: SAE 15W/40.

The quantity of oil in the front differential casing of the articulated version is equal to 11.5 liters of SAE 80W/90.

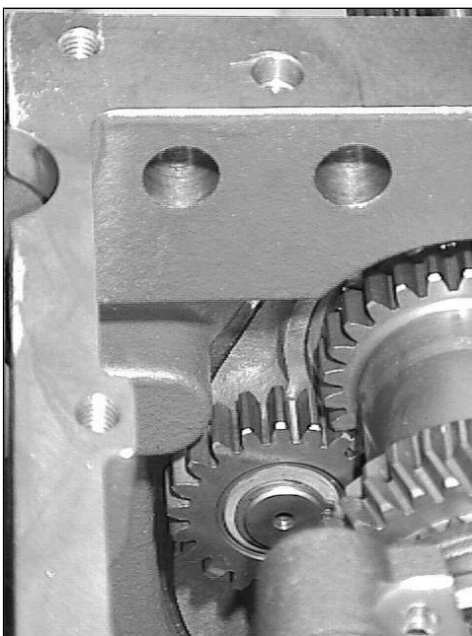
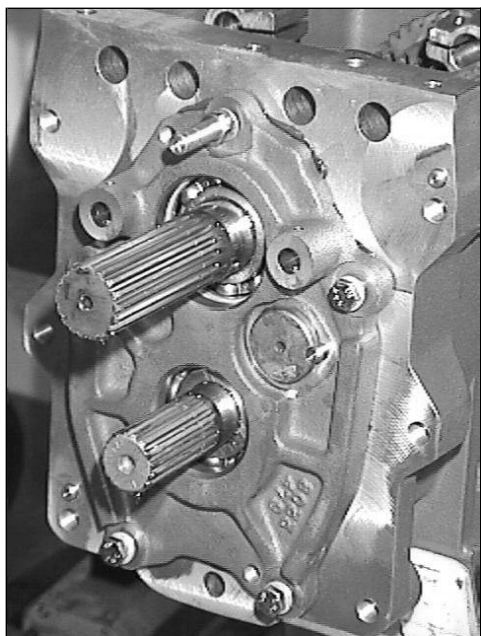
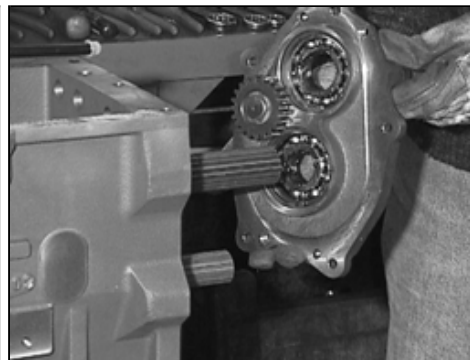
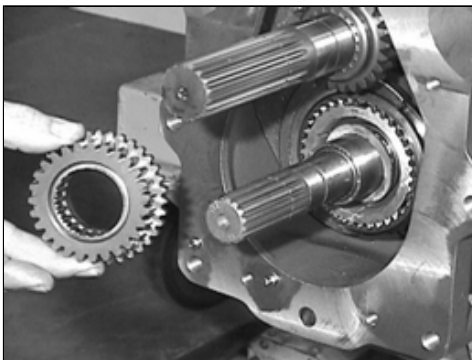
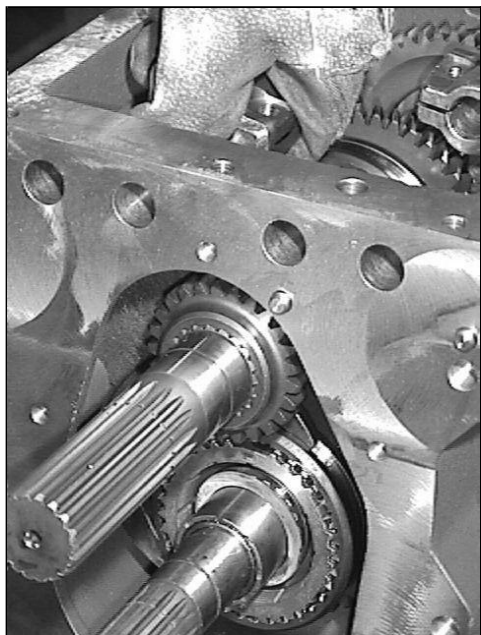


Unlike the version with steering wheels, the articulated version mounts a reverse gear on the front cover of the gearbox, the sequence of which mounting is described below.

Take the cover, insert the bearings and block them at the bottom with a snap ring. Lubricate the pivot reverse, mount on the pin the O-ring seal then insert the pin into place. Also place the dowel pin with Loctite.

Turn the cover, install the snap ring retainer, shim and rolling cage.

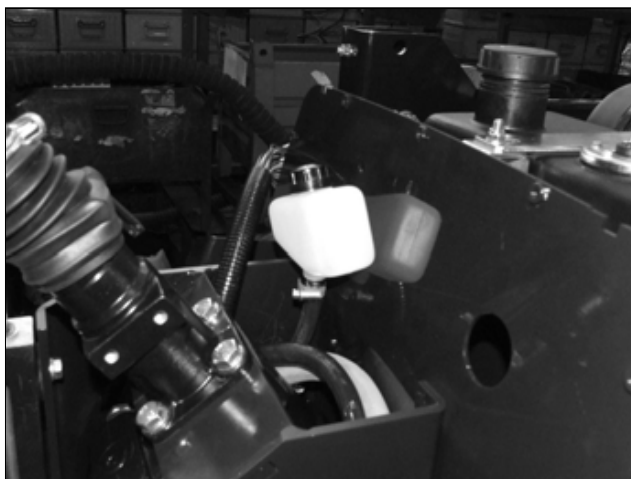
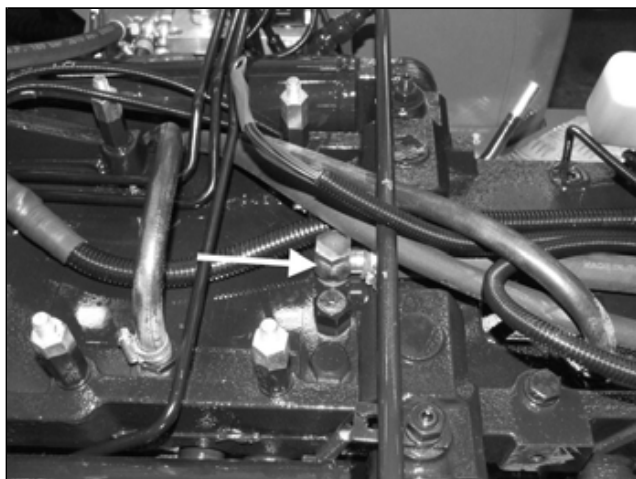
Then move the gear wheel, the spacer and the retainer seeger.



In large part, the gear assembly of the articulated version is the same of the steering wheels version. The main difference may be found in the fact that inside of the main shaft there is not the housing for the PTO shaft, as it is the same main shaft to control the rear PTO. The first pair of toothed wheels at the inlet of the gearbox is used as reverse.

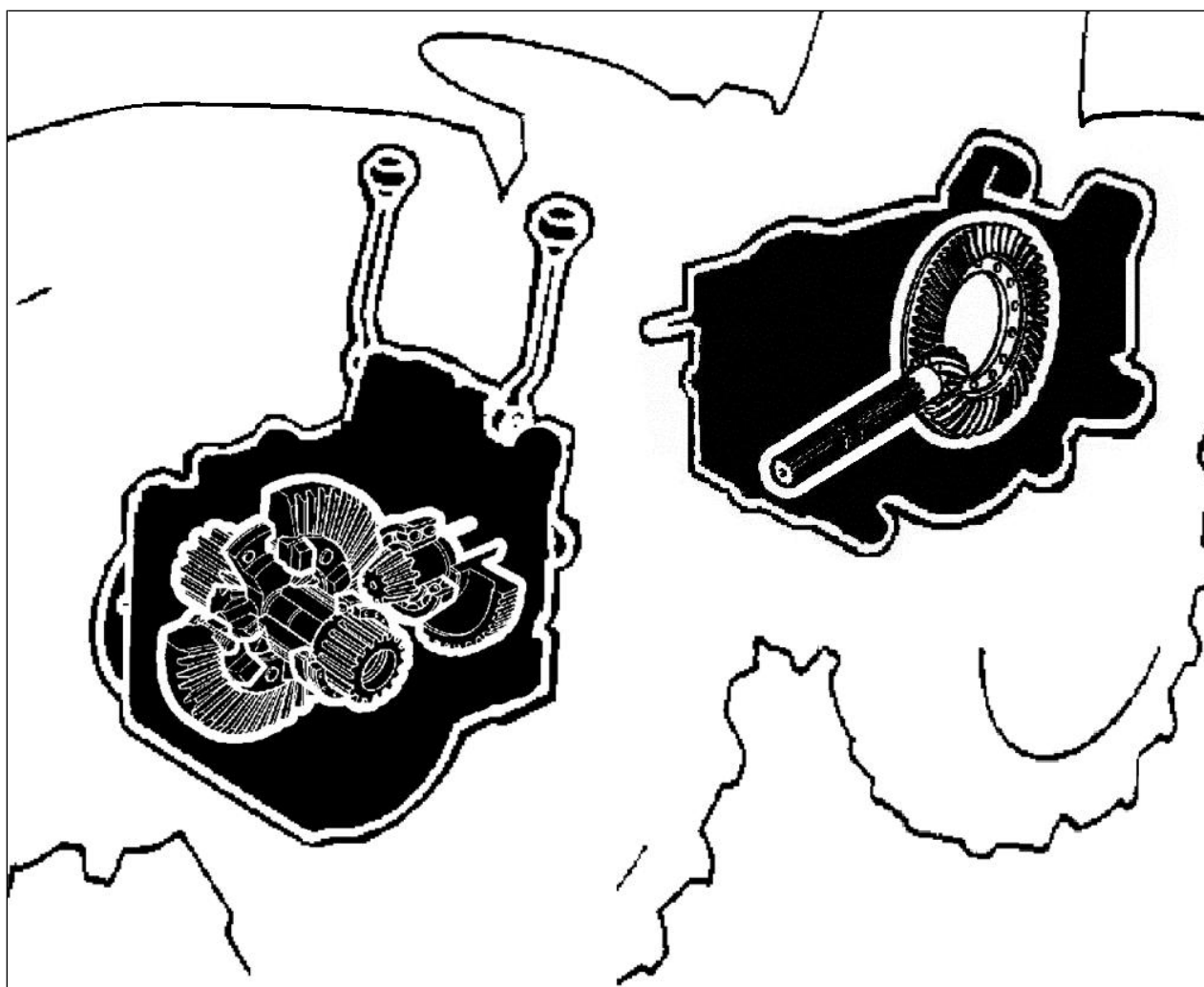


### 33.1.30 - Tank oil recovery



Connection and tank for the gear box recovery oil.

## 36 - REAR & FRONT DIFFERENTIALS



## 36.1 - ADJUSTMENT FRONT DIFFERENTIALS

### 36.1.10 - Front differential assembly



Pre-assemble the shaft of the locking front differential, mounting the snap ring limit switch, the spacer and O-ring. Insert the shaft so assembled in the front differential, mounting inside the spring and the fork. Insert the O-ring to the other side and, if needed, a spacer. Insert the transmission lever of the external command of the locking, then put in position and split pins. Put the fork in and split pins, and finally attach the return spring.



Fit the bearing in the clutch bell, sending it into a position with the appropriate tool. Fit the seeger to ensure that it is in the correct position.





Take the front differential pinion, insert the spacer and the bearing and using the appropriate buffer, send in position the bearing. Assembly the other spacer and the snap ring, making sure that it is correctly positioned.



Insert the differential pinion just assembled in the front differential crankcase, put it in the right position with the appropriate buffer and install the snap ring.



### 36.1.20 - Front bevel gear assembly



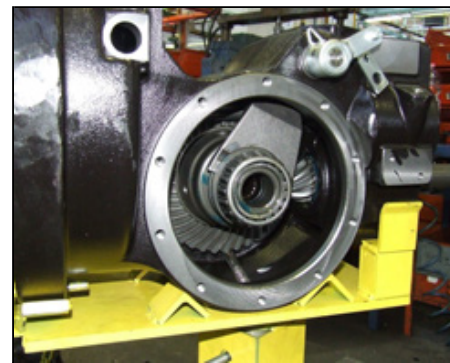
Insert the planetarium in the front differential housing, using the planetarium with slots for locking balls. Then insert the two satellites with the relative pin.

Then mount the stop pin of the satellite pin. Then insert the other planetarium.

Place the crown on the front differential housing, put the retainer plates and screws, then tighten the screws. Check the tightness with a torque wrench (see "Table screw tightening torques" the last chapter of this manual). Finally beating a retainer plates.

Turn the crown, put the balls in place and slide the locking ring.

Caution: Place the ring on the side with the flaring on the inside diameter.



Slip on the crown overall a spacer (which will be initially of 0.8 mm. And which will be modified - if need it - later) and a bearing. Slide the bearing to stop with the appropriate buffer, turn the crown and then repeat the same steps on the other side. Insert them into the crankcase front differential. Place the external part of the bearing just mounted on the crown in the crankcase hub, and then do the same thing on the other side.

Putting in position the crackcase, sending him to stop on the front differential housing, and tighten the screws on both sides. Give some light knock of adjustment and rotate the pinion in both directions to free it completely. Check the correct clearance on the conical bevel (the clearance between the crown and pinion must be between 0.1 and 0.3 mm.).

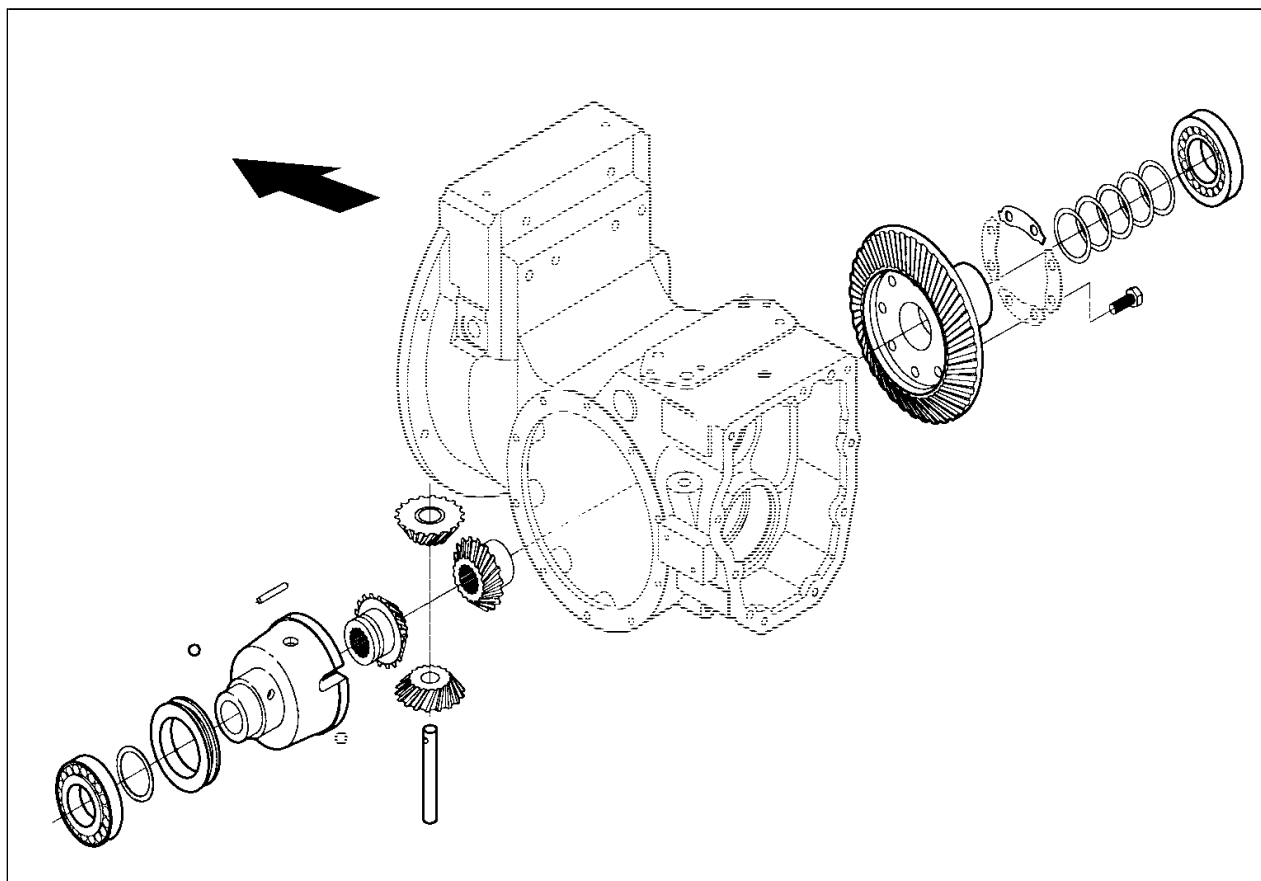
In the event that the clearance are going well, take care to put the silicone and repeat the installation. Otherwise, proceed to modify the shimming under oblique bearings of the crown, removing or adding thickness to the same extend on both side, for the preload on the bearings. Got the right preload on the bearings, check the clearance between pinion and crown, always changing the spacers under the bearings, but always remembering that, in any way of changing the shimming (both to remove or to add clearance) it is necessary to keep the same total sum of the thicknesses. For example, if you take off a one-tenth from one side need to add the same to the other side.

The clearance between the satellites and planetary must be between 0.1-0.3 mm.

If the clearance exceeds this value, check the pin and, if necessary, replace it.

Once you have cecked the correct shimming the bevel gear, mount permanently front hubs by tightening the fixing screws M 10 at 6-7 Kgm.





## 36.2 - ADJUSTMENT REAR DIFFERENTIAL

### 36.2.10 - Rear differential assembly

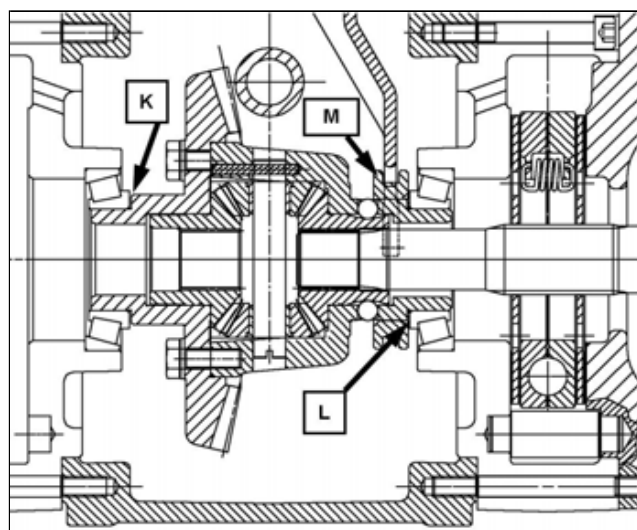
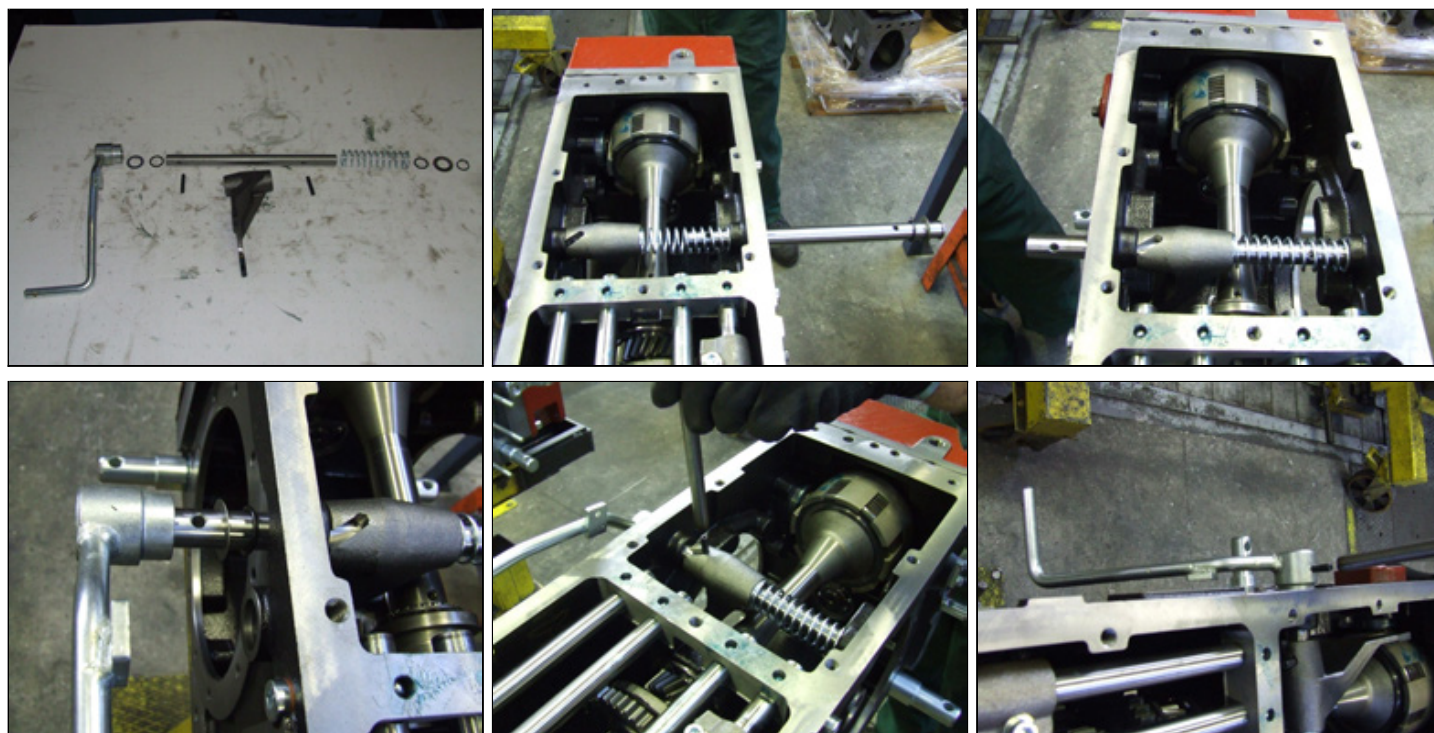


Fig.1



Install the snap ring retainer on the rod and, before inserting the rod into the rear differential cover, insert the spacer and O-ring. Then insert the rod into the crankcase, also assembling the spring and the fork of the front differential lock. Fix, on the other side, the O-ring and spacer. Assemble the external control lever and pin.



Fig.3

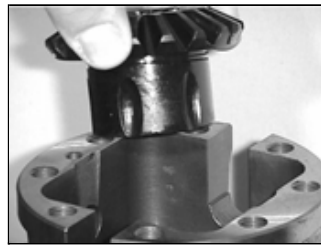


Fig.4

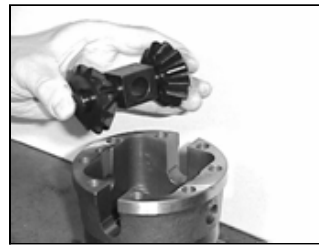


Fig.5



Fig.6



Fig.7



Fig.8



Fig.9

The sequence above shows the mounting of rear differential group.

Put the external box of the differential in vertical position (Fig.3) and mount all parts inside the box, starting from planetary (Fig.4), then the 4 satellites (fig.5-6), the second planetary and then the conical crown (Fig.8)

Tighten the crown's M10 special screws at the described torque. (Fig.9)

Don't forget the fixing pin (Fig.7) on the satellite's pin and, in order to mount it using a screwdriver, rotate the pin until you all the hole is free.

Clinch the sheets on the fixing screws in order to avoid loosening.

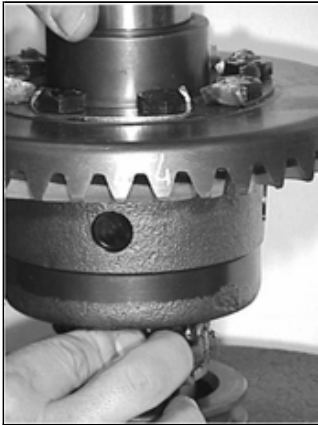


Fig.10



Fig.11



Fig.12



Fig.13

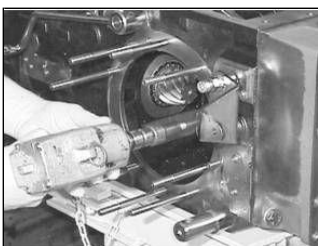


Fig.14



Fig.15



Fig.16

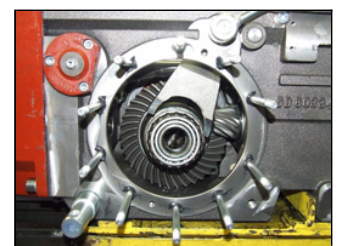


Fig.17

Complete the premounting of rear differential as shown in this sequence.

During this premounting you have to make a standard thickness adjustment, that could be improved when the differential group is mounted inside the gearbox casting.

This thickness is the following:

- 0,8 mm on the differential lock side (balls);
- 0,6 mm on the conical gear fixing screws's side;

The point where you have to adjust thickness are the following:

K and L on Fig. 1:

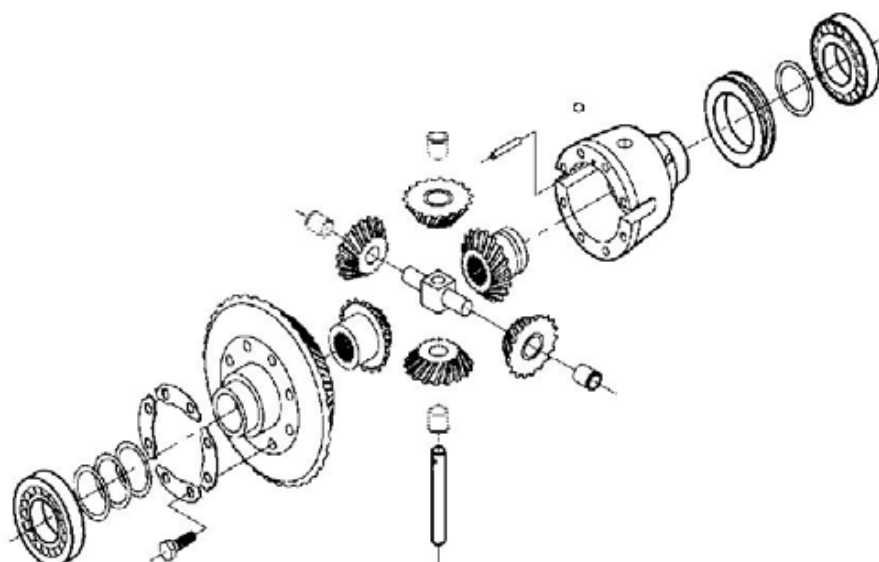
K - 0,6 mm

L - 0,8 mm.

The thickness spacer L has also the function to support the differential lock's ring. Pay attention that the spacer has the correct diameter in order that an uncorrect positioning causes the exit of locking balls.

NB:

The rear differential box is different from the frontal one, because on the first there are a hole and a buttonhole more.



## 36.2.20 - Rear differential lock assembly

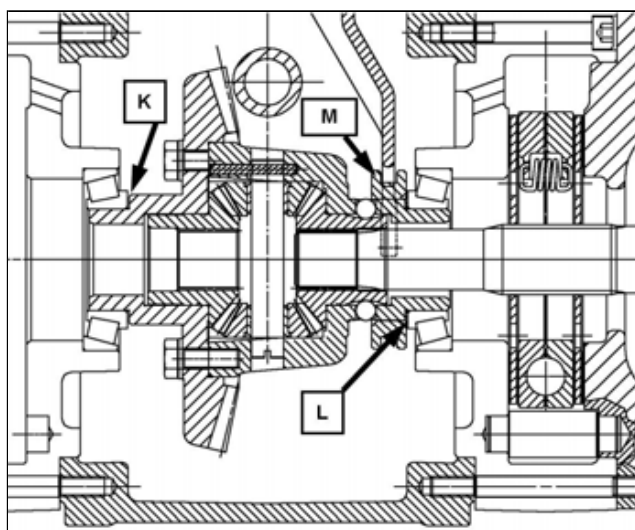


Fig.1

Pay attention to differential lock's mounting and his working mode (part. **M** of Fig.1).

The differential lock system is made by using a collar that forces some balls to move towards the center, fixing together the planetary to the differential box.

The collars, the balls and the spacers are the same both for front than for rear differential.

During the mounting of fork's stop pin, that matches on the collar, on the command shaft pay attention that the cut on the pin does not work with the sliding surfaces of fork.

Remember that a rotation of the command shaft corresponds to a traslation of the fork, due to the pin on the shaft and a inclined cut on the fork.

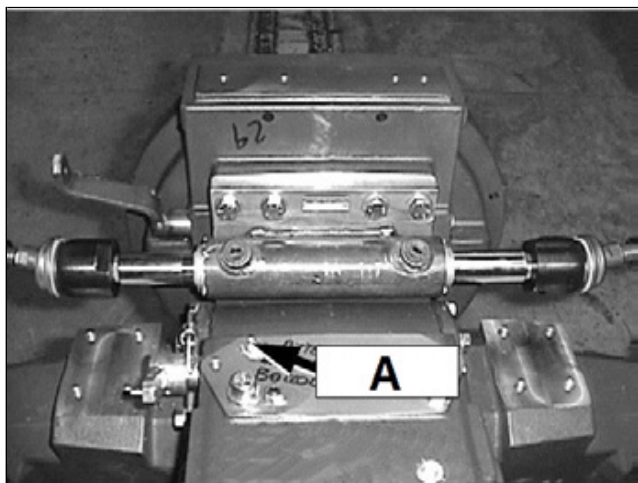


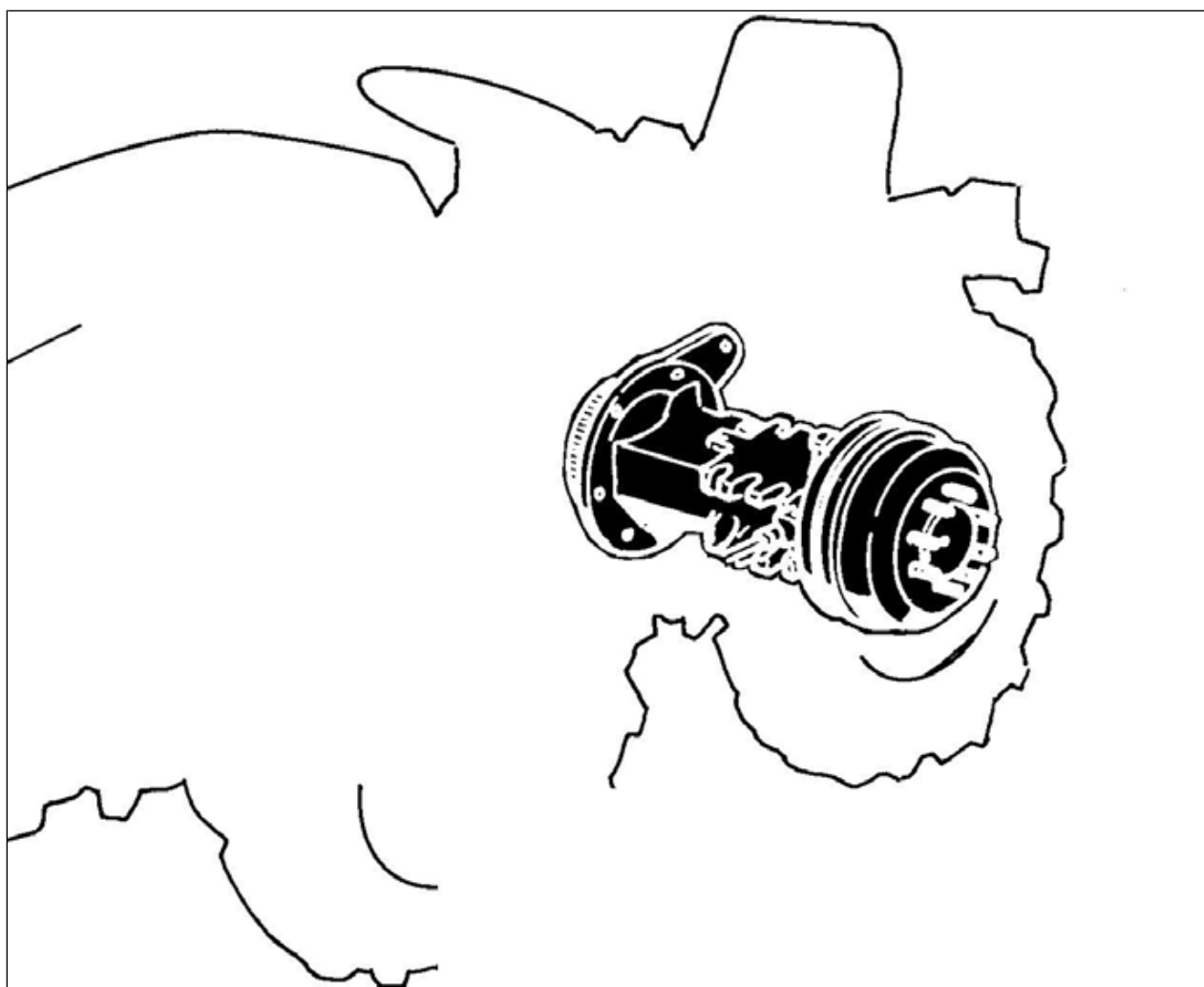
Fig.2

During sliding there's a relative movement between pin and fork, if the pin is uncorrectly mounted you could have an uncorrect engagement, with a poor functioning of the mechanism.

To extract the stop pin on front differential is necessary to take away the upper cap (part. **A** of Fig. 2), on the frontal group's casting: so it's necessary to remove all the parts mounted above the front group. Fig. 2.

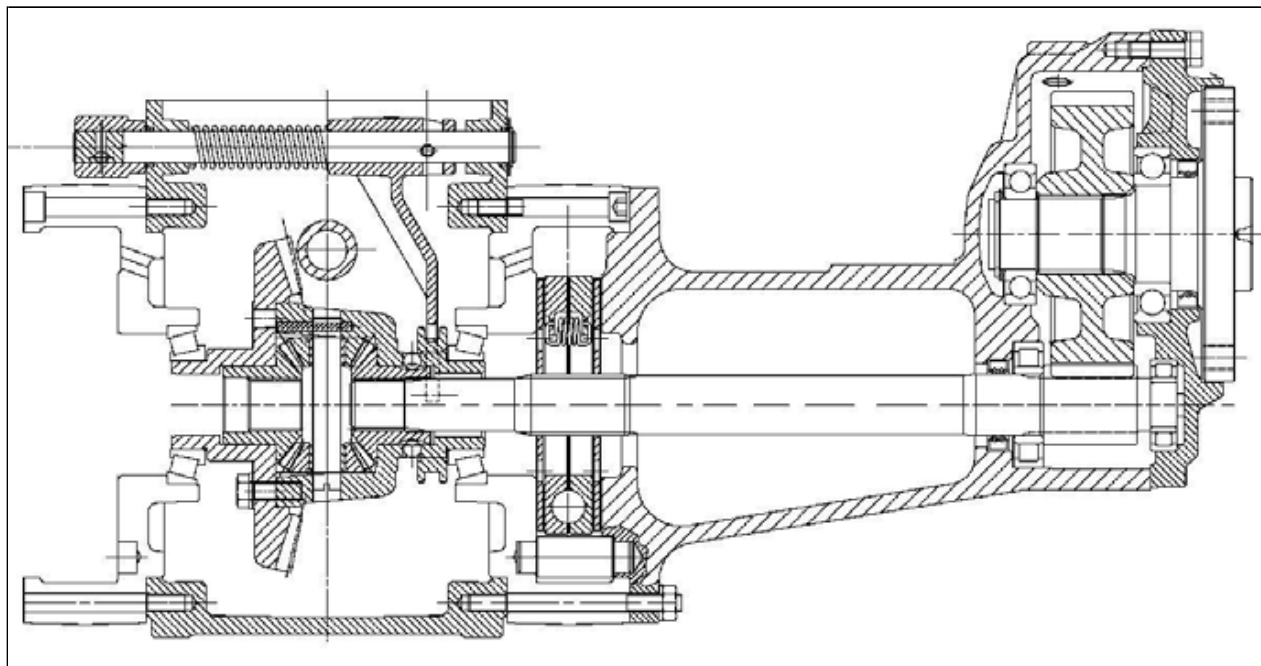


## 39 - REAR FINAL DRIVE

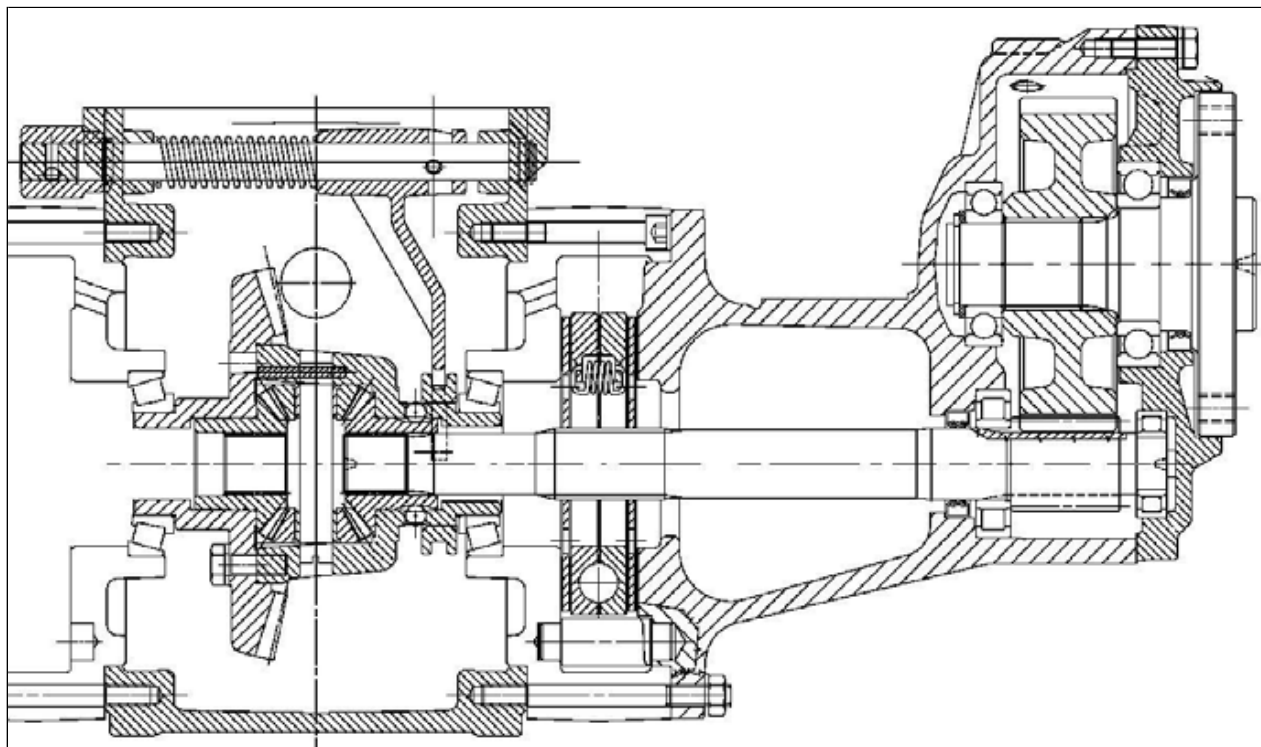


## 39.1 - ADJUSTMENT ON REAR FINAL REDUCERS

### STEERING WHEELS TRACTOR



### ARTICULATED TRACTOR





### 39.1.10 - Final reducers housing assembly

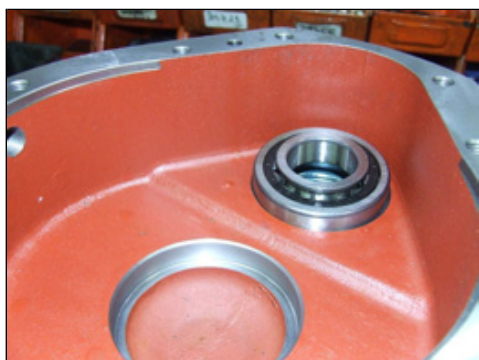
The process of assembly of the external reducers is the same in the both versions.  
The hub mounting differs between the articulated version and the steering wheels version only by the size of the particulars, but the assembly process is always the same.



Take the rear reducer crankcase and fit the oil seal. Prepare the driveshaft in mounting position and insert the cap by sending him to stop. Insert and send it to stop the bearing and spline the rear gear reducer. Insert the bearing, sending him to stop, then place a spacer and snap ring retainer. Insert and send to stop the bearing in two-part of reducer shaft. Take the inner part of the bearing and assemble it on the shaft reducer.



### 39.1.20 - Rear wheel hud housing assembly



Take the crankcase rear hub, mount the two oil seal plugs with teflon, mount the oil breather also. Prepare the double lip seal, put in place and send him to stop with the appropriate buffer. Assemble and send it stops the two parts bearing. Remove the center ring of the bearing and assemble it to the reducer shaft.



Take the reducer shaft and the two inner parts of the previously mounted bearings, send them into place. Insert the shaft reducer in its crankcase. Clean the surfaces of the gear box and the hub, apply the silicone and merge the two casings. Place the centering pin, which for convenience of assembly is put after the assembly of the gearbox. Put the screws and tighten. If necessary, place two screws on the axle shaft to facilitate the rotation of the gear unit during assembly.

### 39.1.30 - Rear reducers assembly

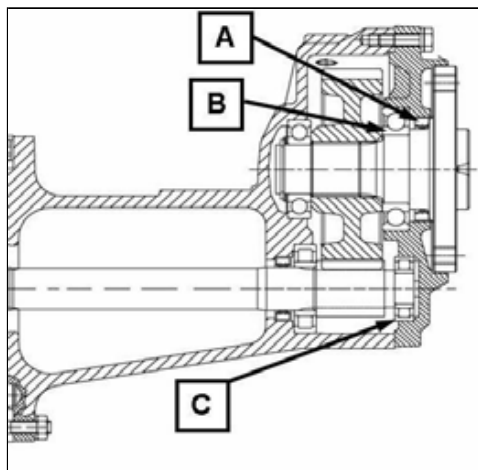


Fig.1



Fig.2



Fig.3



Fig.4

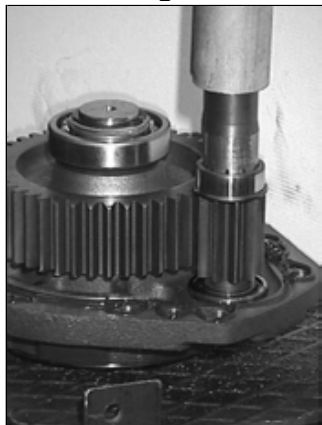


Fig.5



Fig.6



Fig.7

In the pictures above is represented the mounting sequence of rear hubs, very similar to what already told for front hubs. As first operation is possible to premount the rear hub's closing casting (Fig.2), mounting before seal A of Fig. 1, then the bearing B and then the other parts as shown in Fig.2.

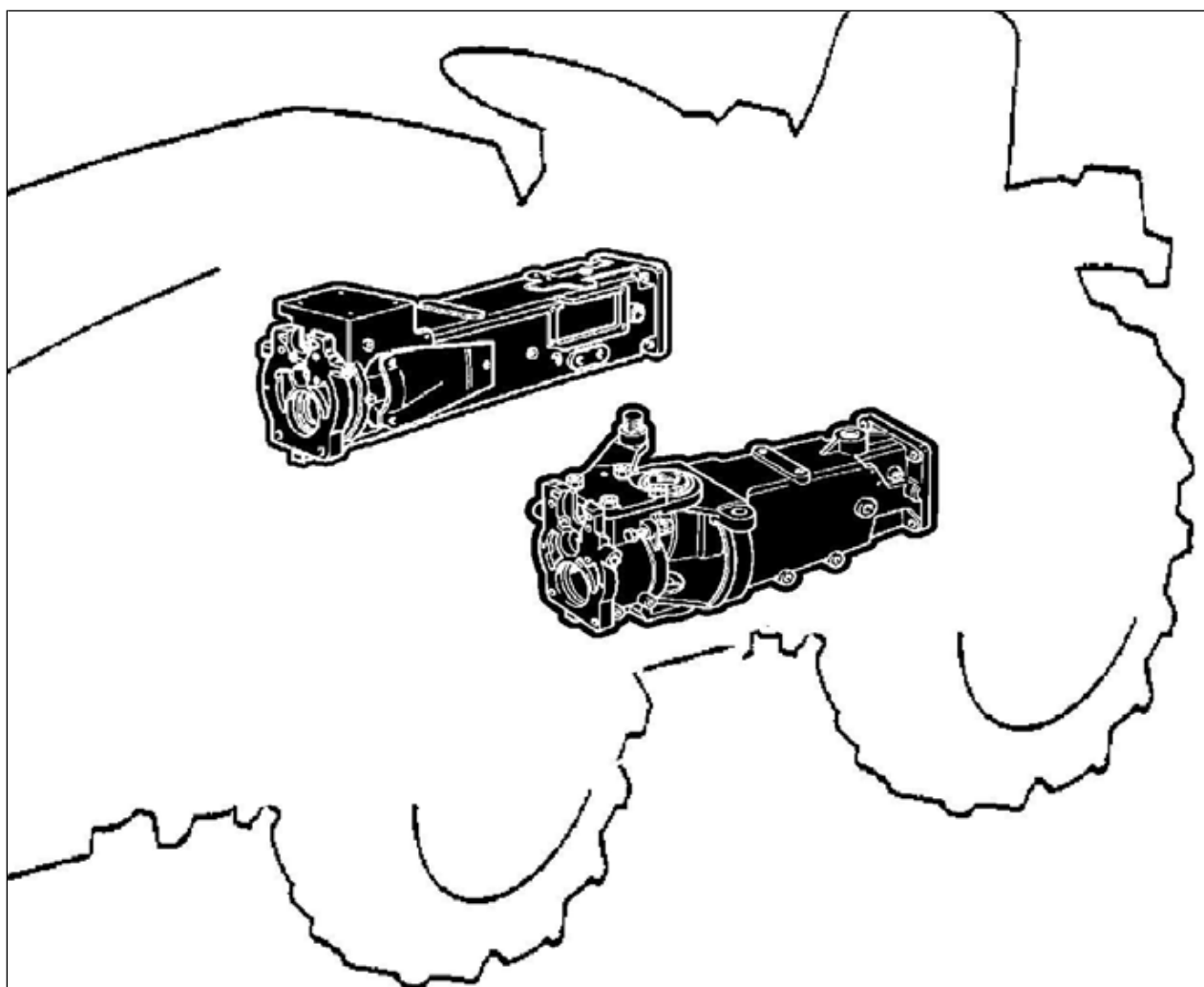
The next operation is the mounting of seal and the roller bearings internally to the hub as in Fig. 4 & 5. Then in Fig. 6 & 7 you can carry on with the mounting of the external casting on the hub, paying attention to do not damage the roller bearing on the casting. Then tighten the M10 screws to a torque of 6 Kgm.

As already shown for front reducers fill each hub with 0,7 liters of oil.

The prescribed oil is SAE 80/90W. On the upper part of hubs are mounted the vents.

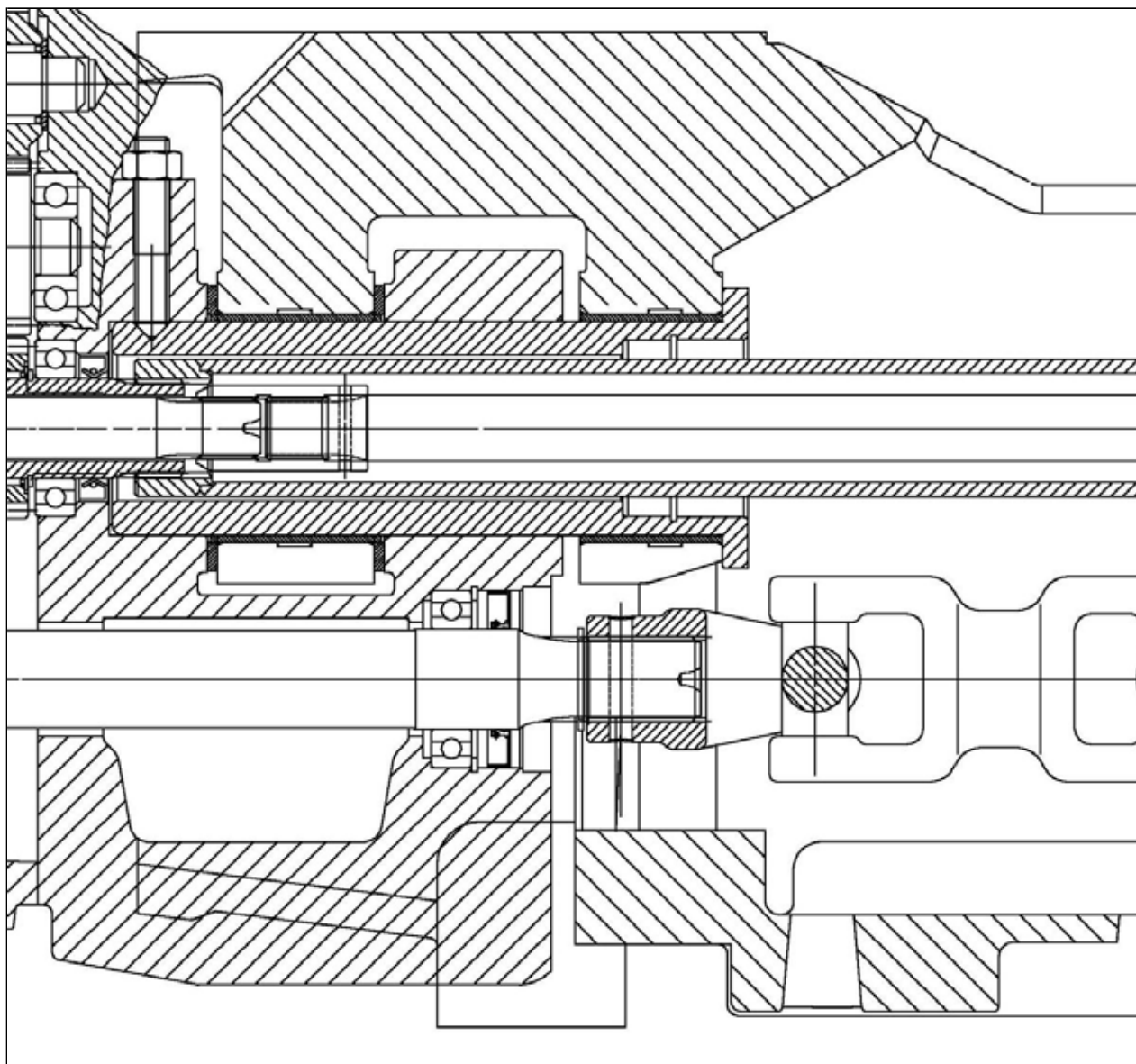


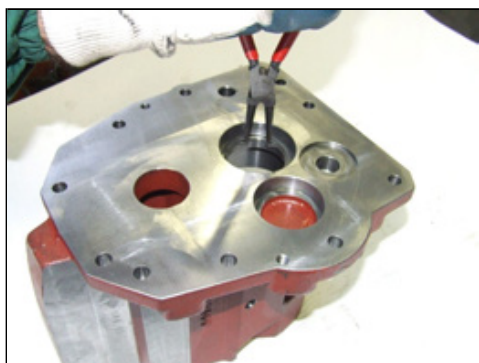
## 48 - CENTRAL JOINT



## 48.1 - ADJUSTMENT ON CENTRAL JOINT

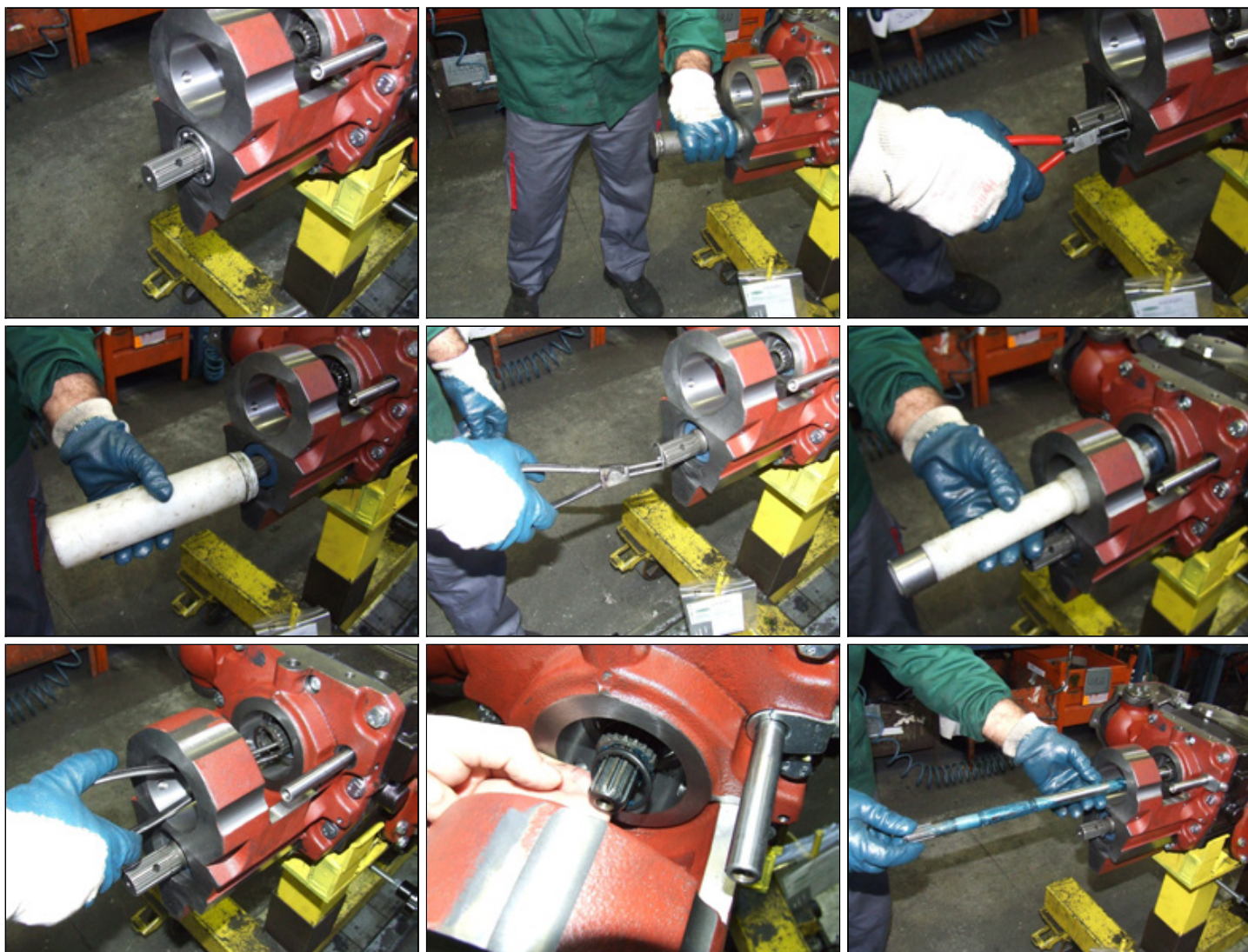
### 48.1.10 - Central joint - steering wheels version





Take the front casing of articulation and place the snap ring bearing retainer. Insert bearings and place them with the aid of buffer. Thoroughly clean the surfaces of both the casing, insert the dowel pins, apply the silicone and place the front casing of articulation on the casing of the front differential. Send him to stop with the help of small hammer blows, then position and tighten the screws.





Insert the bearing and take it to the stop using the appropriate buffer. Insert the oil seal, take it to the stop and install the snap ring retainer. Slide to stop the oil seal on the upper shaft, mount the snap ring retainer and the O-ring seal of the conjuncture. Insert the main PTO shaft.



With a part of the selection reverser command test if the section is working properly. If not functioning properly check and solve the problem. If everything works correctly, install the O-ring and the seal cover, and secure everything with his plate retaining screw.

## 48.1.20 - Central joint - articulated version

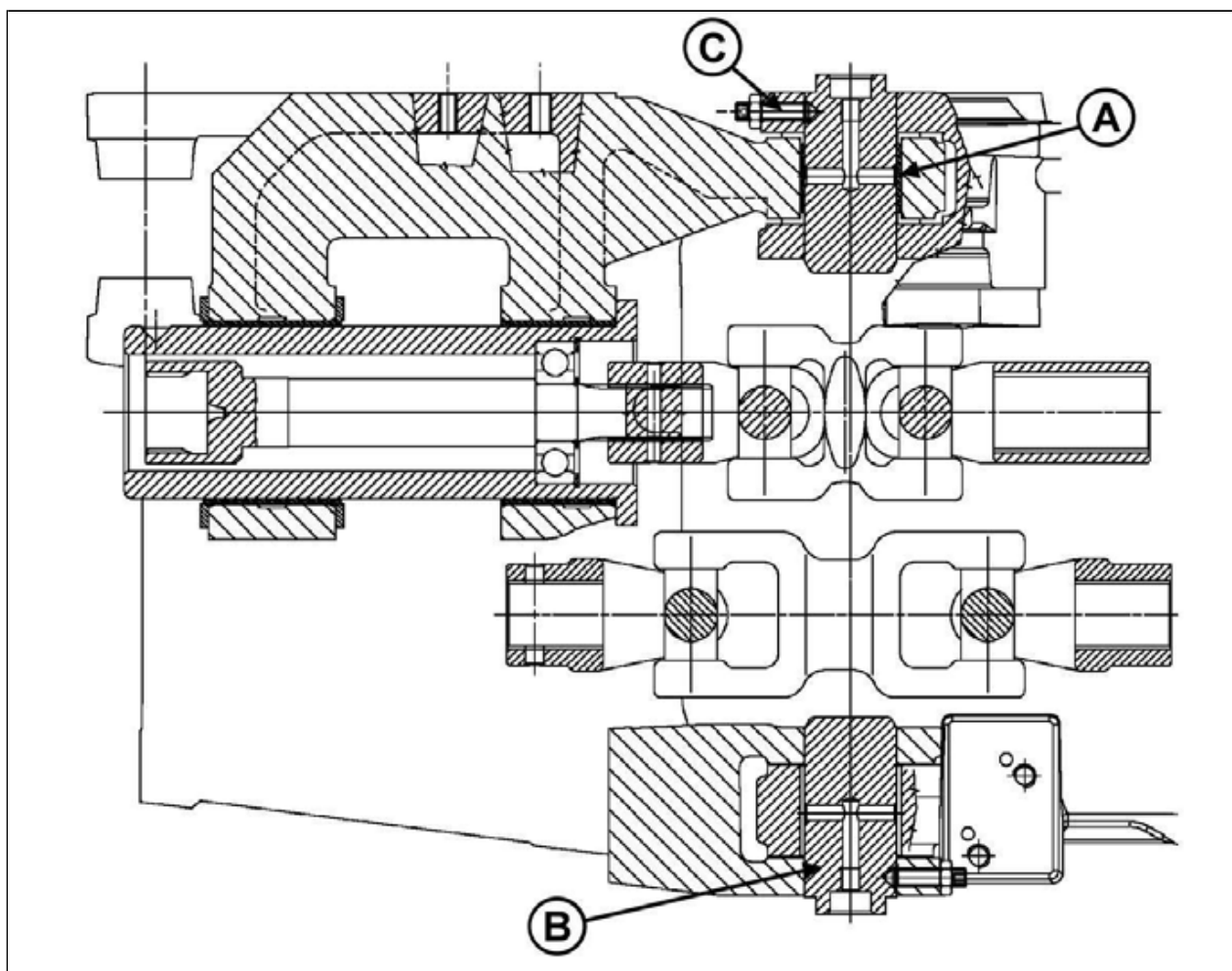


Fig.5

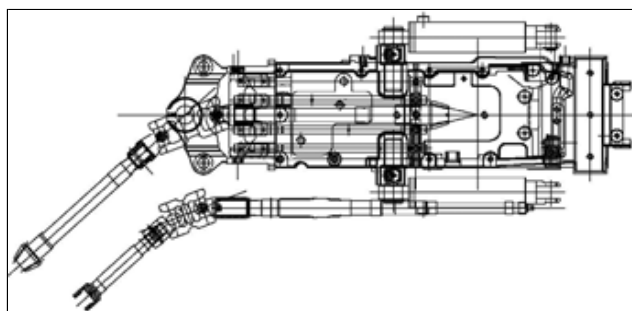
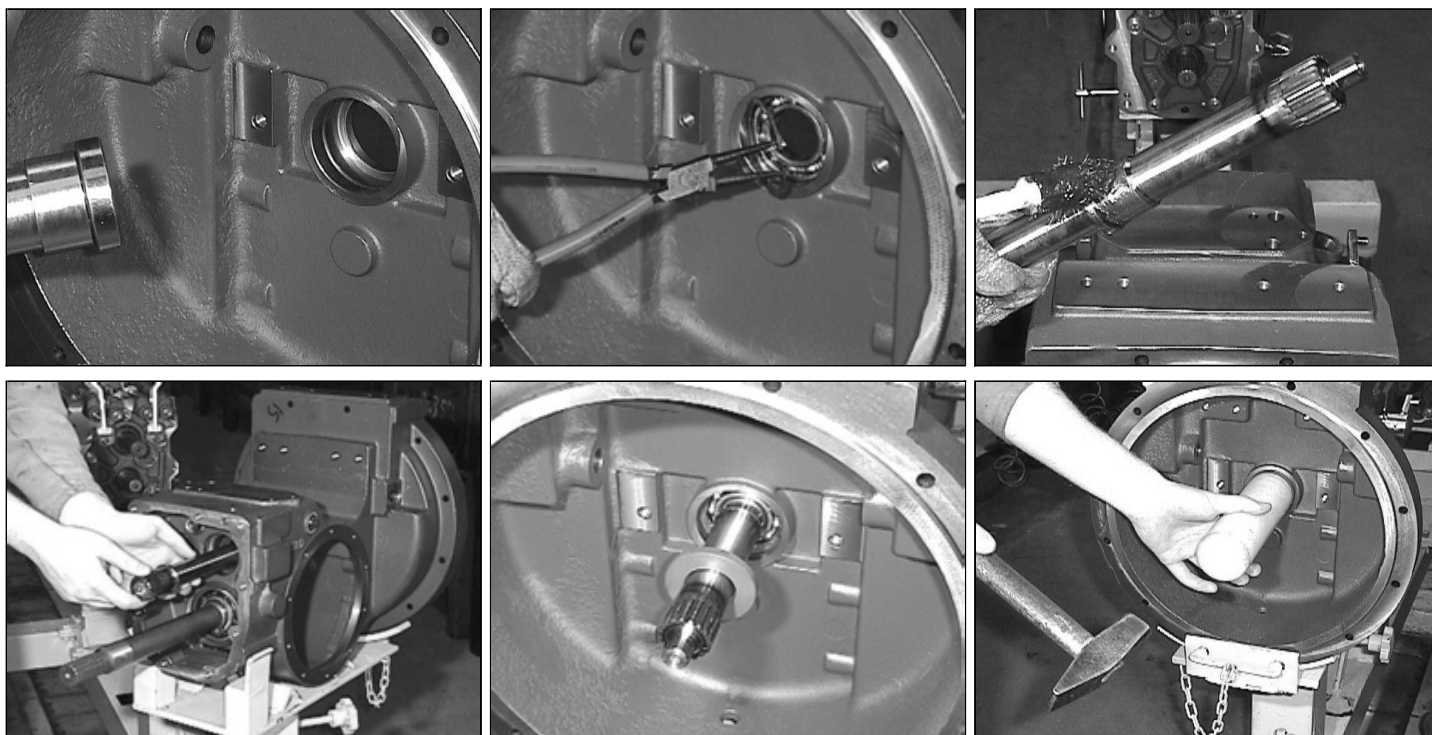


Fig.7

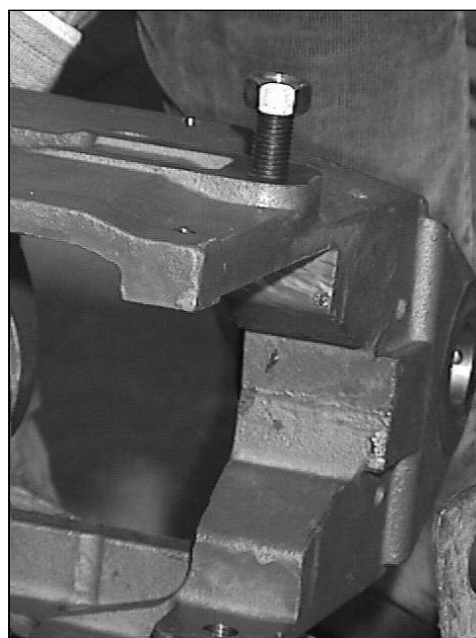
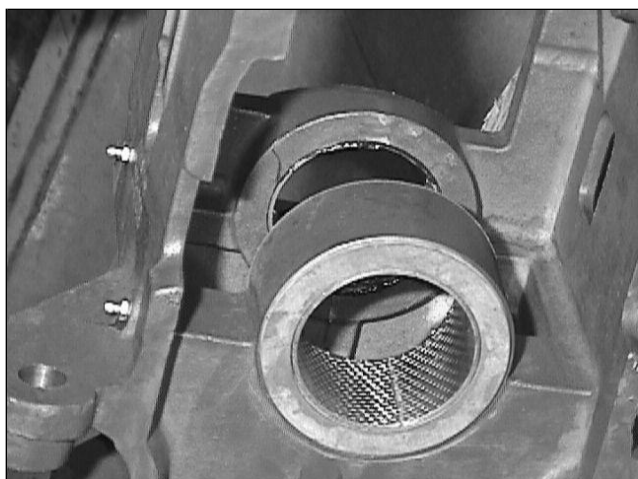
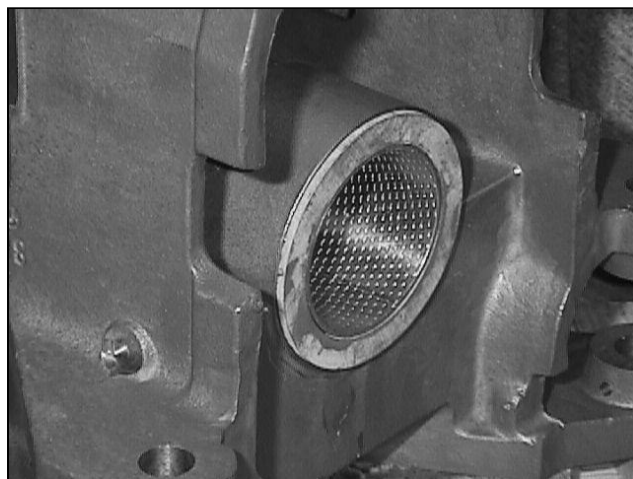
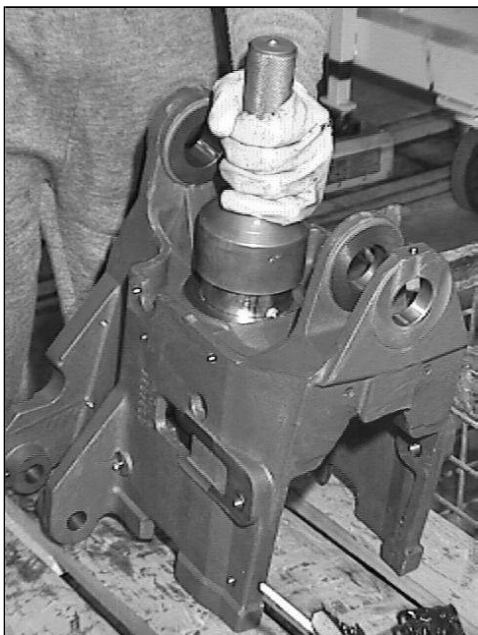
In the drawings above, shows the central joint of the articulated version and articulation of the steering cylinder. The longitudinal joint of the tractor is set up in the same way as the steering wheels version and directions to perform an correct assembly are already been mentioned in the previous pages.

The central link in this articulated tractors, allows dual rotation, a rotation of 15 degrees (as a steering wheels version) on each side between the front group and the gearbox following the oscillations of the ground, and a rotation between the same particular for steering

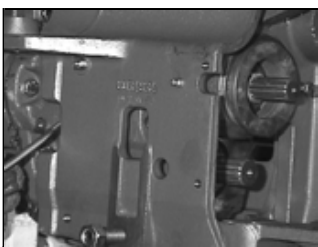
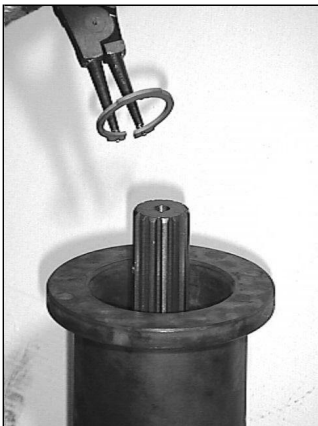
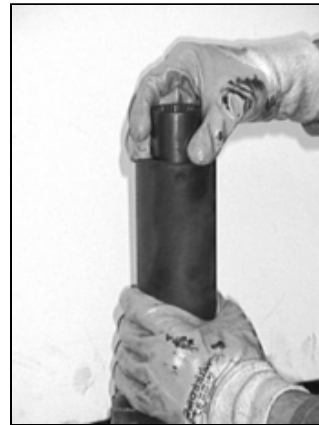




Put the bearing in its place in clutch housing and take it to the stop with the appropriate buffer. Place the snap ring retainer and make sure it is positioned correctly. Take the main shaft, and insert it into the bearing into position with the appropriate buffer. Insert and position the oil seal.



Take the conjuncture, planting two bushes and place the two spacers on the bushings. Place the screws of the stop joint.



Put in a vertical position the cylinder of joint, insert the bearing and send him place, then install the snap ring retainer. Rotate the shaft 180 degrees and insert the transmission shaft sending him to stop on the bearing just mounted using the appropriate buffer. Fit the seeger cardan joint on the drive shaft and two M8 screws to facilitate subsequent installation of the assembly. Mount the bearing on the main shaft. Insert the conjuncture and the joint cylinder on the top shaft and place it with the help of screws M8 previously positioned. Insert the bearing, the snap ring retainer and oil seal on the secondary shaft. Then install the snap ring that holds the lower cardan joint. Tighten the screws of the joint cylinder and lock nuts.

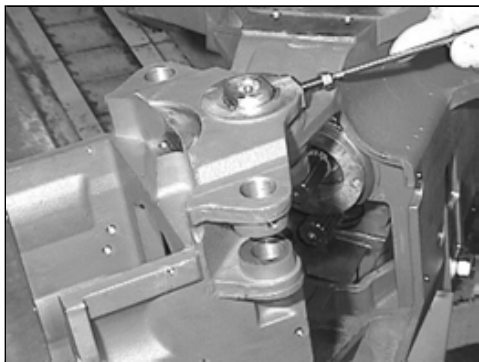


Fig.8

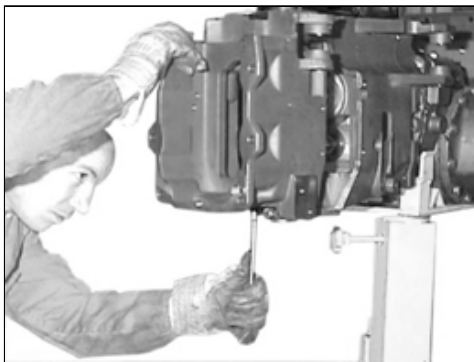


Fig.9

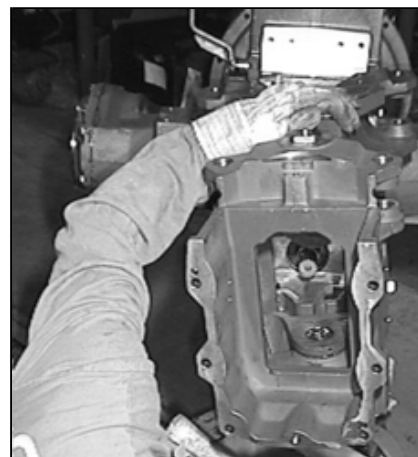


Fig.10

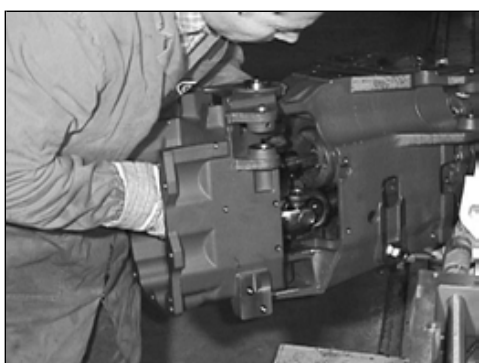


Fig.11

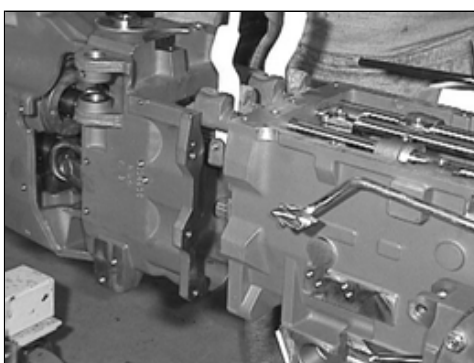


Fig.12

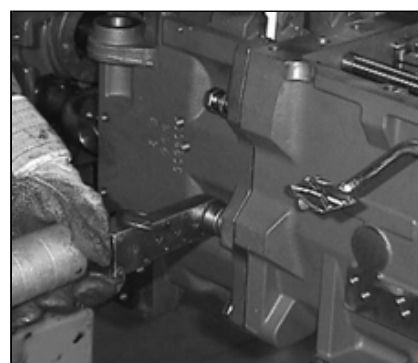


Fig.13

Joint mounting sequence of the articulated version.

With the help of a hoist, bring the two fusions that constitute the joint, take the pins of the articulated joint in bushings as represented in the total of fig. 5, taking care not to damage the bushings.

As illustrated in fig. 5, the upper part of the joint is from the lower one.

The spacers (detail **A** in fig. 5) serve as centering for the upper pin and vertically support the two fusions, are present only in the upper part.

In the lower part of the joint are present only the bushings **B**, which allow the articulation of move but which have no function of the vertical support. The Parts. **C** of fig. 5 is mounted in fig. 8, and is the grain that holds in place of the vertical pin joint.

Same operation is to be conducted to the lower pin.

Once the assembly of these parts, be sure to attach the grease nipples and grease using a grease gun until the lubricant leakage from the bushes in both the lower and upper part of the joint.

As illustrated in fig. 11-12-13, once the joint assembly is completed, proceed to center the shafts on the joint and the joint to gearbox. Tighten the screws that secure the housing to the joint at 7 Kgm with the help of a key, as illustrated in fig. 13.

Basically, the following steps are the same to those already described for the version steered wheels, except for the mounting of the steering cylinder, the characteristics of which are shown in the hydraulic system (see Group 60).

Also in this version it is necessary to mount and fix the two grains of torsional stroke end, as already described for the version steered wheels.

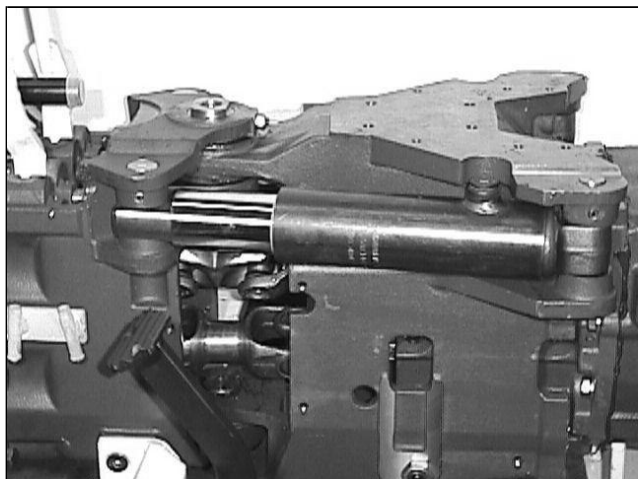
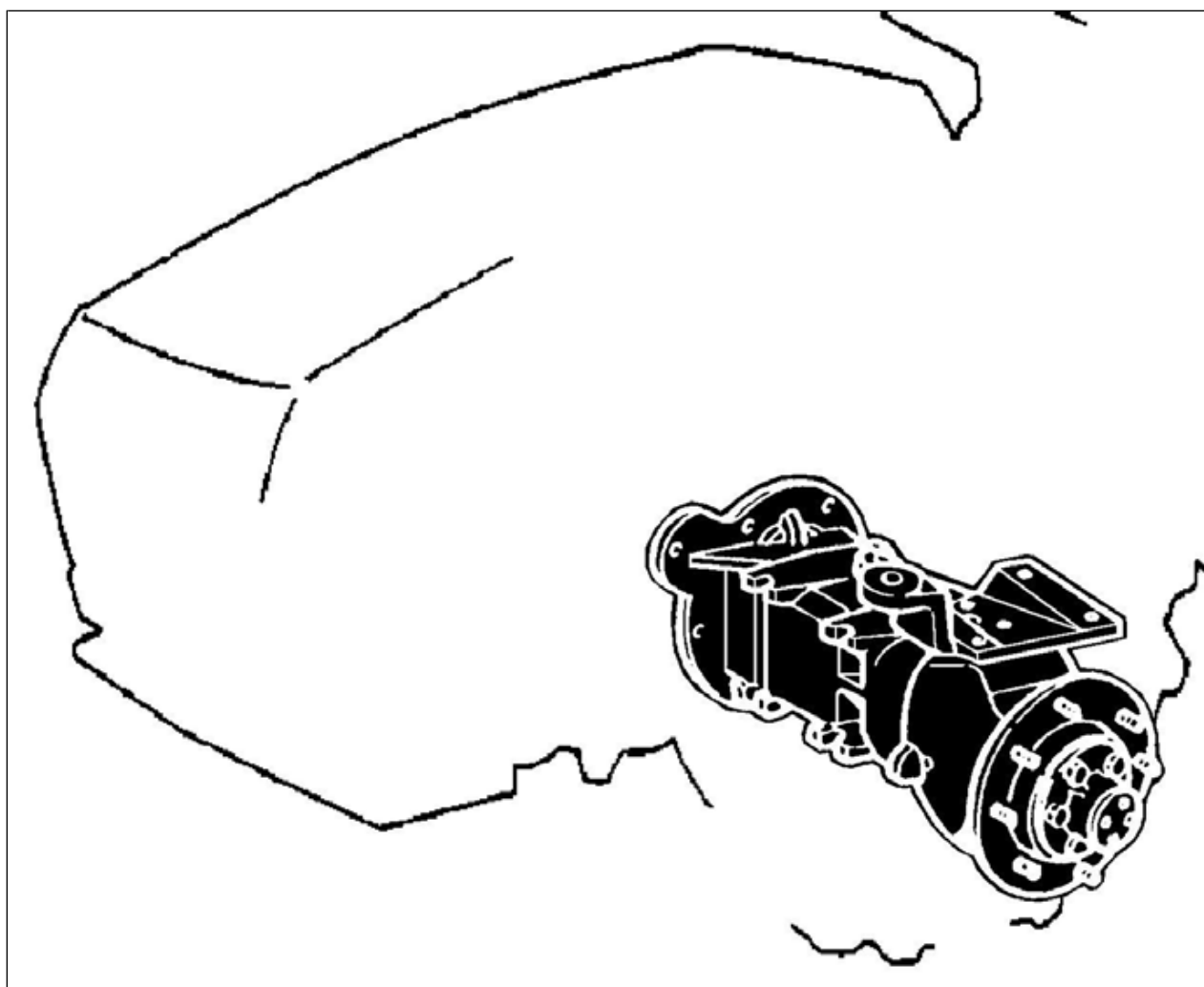


Fig.6

The mounting of the steering cylinder of the articulated version is obtained using two pins, set with thorns, interposed with two bushes that need to be maintained properly greased.

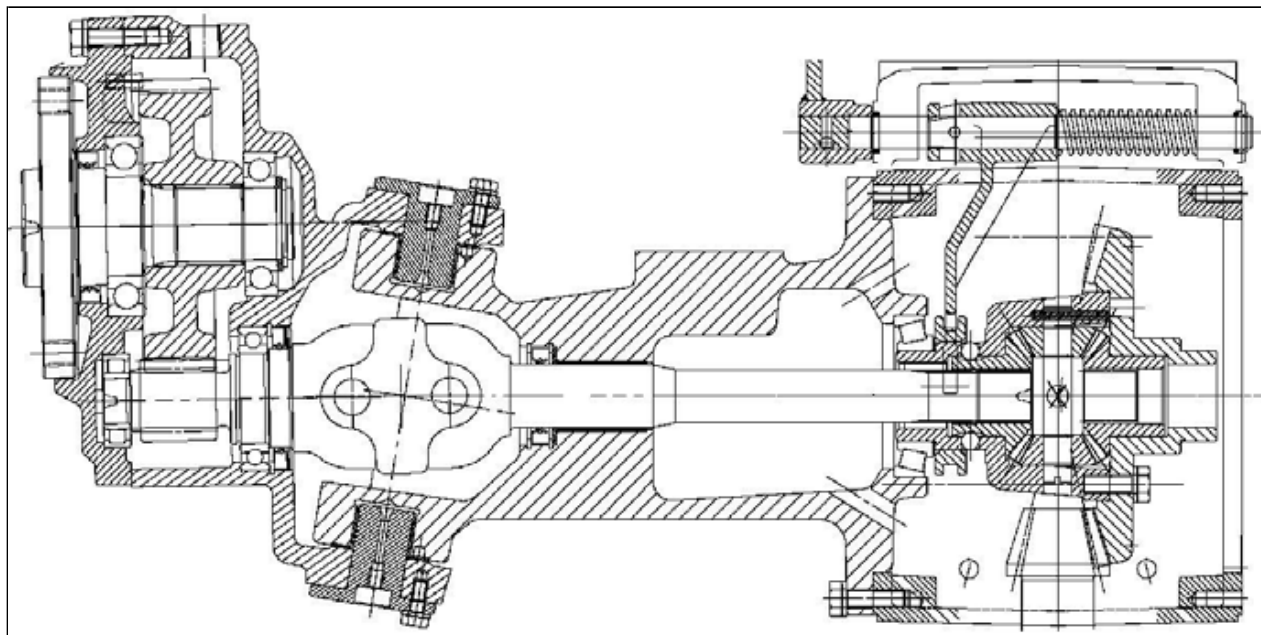


## 54 - FRONT FINAL REDUCERS

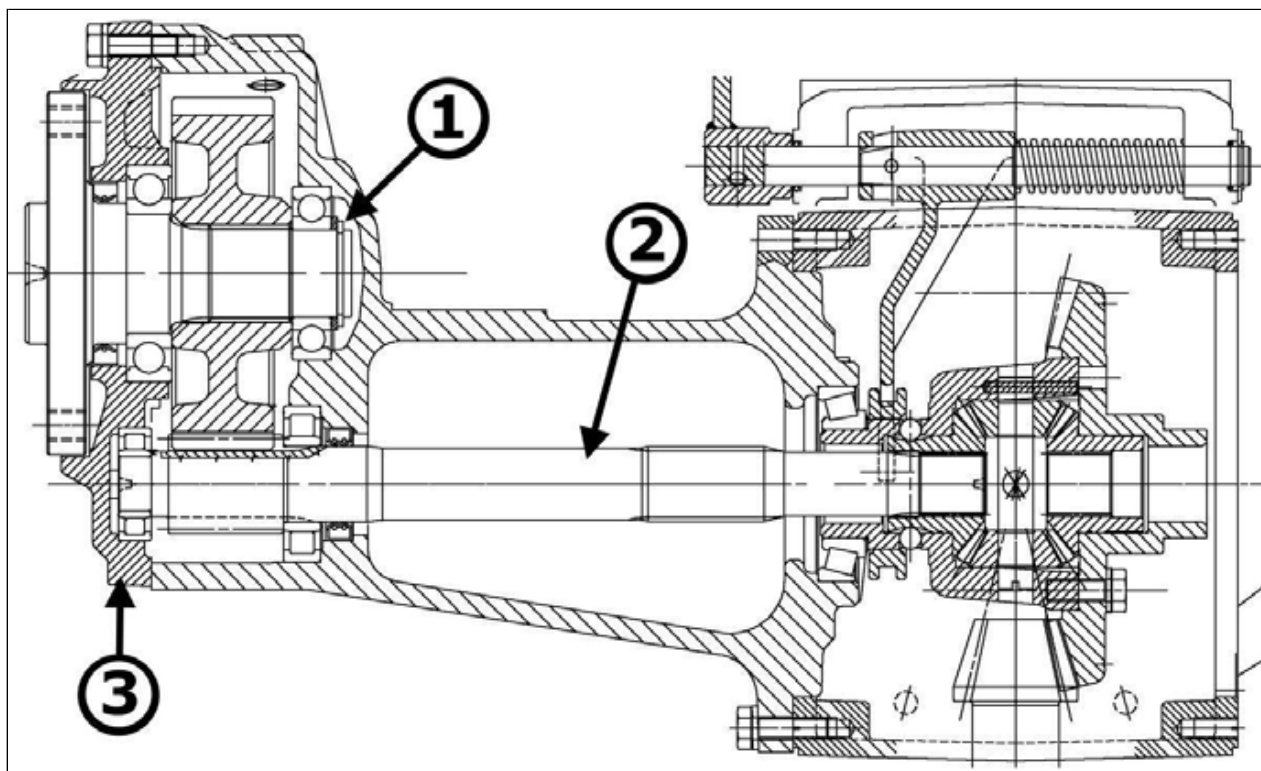


## 54.1 - ADJUSTMENT ON FRONT FINAL REDUCERS

### STEERING WHEELS TRACTOR



### ARTICULATED TRACTOR





### 54.1.10 - Final reducers housing assembly

The process of assembly of the external reducers is the same in the both versions.  
The hub mounting differs between the articulated version and the steering wheels version only by the size of the particulars, but the assembly process is always the same.



Take the rear reducer crankcase and fit the oil seal. Prepare the driveshaft in mounting position and insert the cap by sending him to stop. Insert and send it to stop the bearing and spline the rear gear reducer. Insert the bearing, sending him to stop, then place a spacer and snap ring retainer. Insert and send to stop the bearing in two-part of reducer shaft. Take the inner part of the bearing and assemble it on the shaft reducer.



### 54.1.20 - Front hub housing assembly - steering wheels version



Fit the front hub bearing bushing, position it with the proper tool, put the spacer and the snap ring retainer. Insert the oil seal and put it in place with the appropriate buffer, put the snap ring retainer. Place the front hub cover on the side and insert the bushing, position the locking pin spacer. Insert the spacer in place with the positioning hole of the spacer into the holding pin, taking care to position the spacer portion with the anti-seizure towards the outside of the hub.

### 54.1.30 - Joint steering housing assembly - steering wheels version



Take the front reducer casing, mount the plug seals and the oil breather plug. Insert the bearing and put it in place with the appropriate buffer, insert the snap ring retainer and oil seal. Slide the cardan joint, insert the swab that prevents the movement of the joint and send him place. Fit the retainer seeger joint



### 54.1.40 - Final assembly



Thoroughly clean the floors of the front differential casing and hub. Spread the silicone sealant. Assemble the casing, insert the screws and lock washers and tighten. Place the front reducer housing on the hub, insert the two joint pins (above and below). Insert the screws and washers and tighten. Attach the grease pins on the pivot joint. Thoroughly clean the surfaces of the front reducer housing and the hub, assemble and distribute the silicone sealant. As for the rear reducers, the centering pin is inserted after the mounting. Install screws and washers and tighten.

**N.B.**

On the cover of the gearbox there are two threaded holes that serve for the disassembly of the cover; with the aid of two screws M8.

**N.B.**

The breaking of the oil seal on the fixed part causes the oil from the front gearbox to leak out. Verify the tolerance play of the steering part with respect to the fixed part which should absolutely not be perceptible. Otherwise it is necessary to replace the bushings.

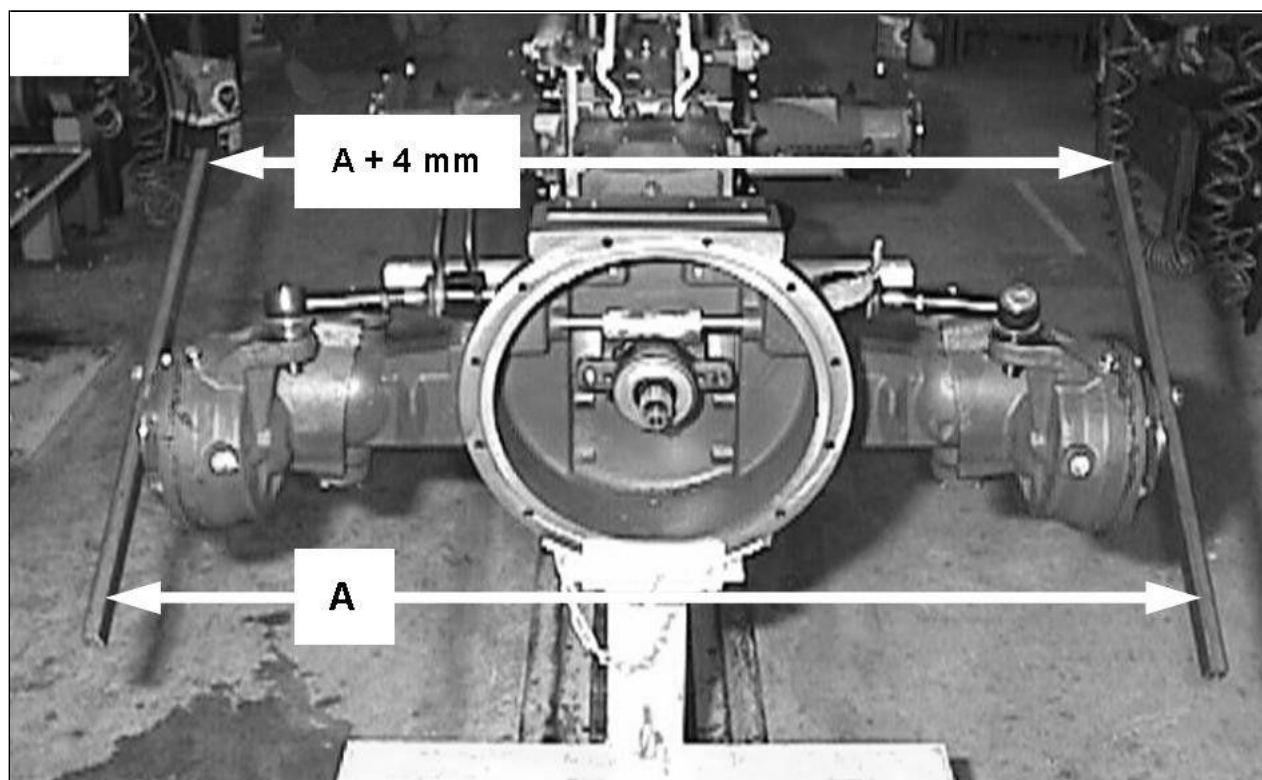
**54.1.50 - Toe-in adjust**

Fig.17

Regarding the adjustment of the convergency of the front axle to allow proper tire wear, follow indications in Fig. 17.

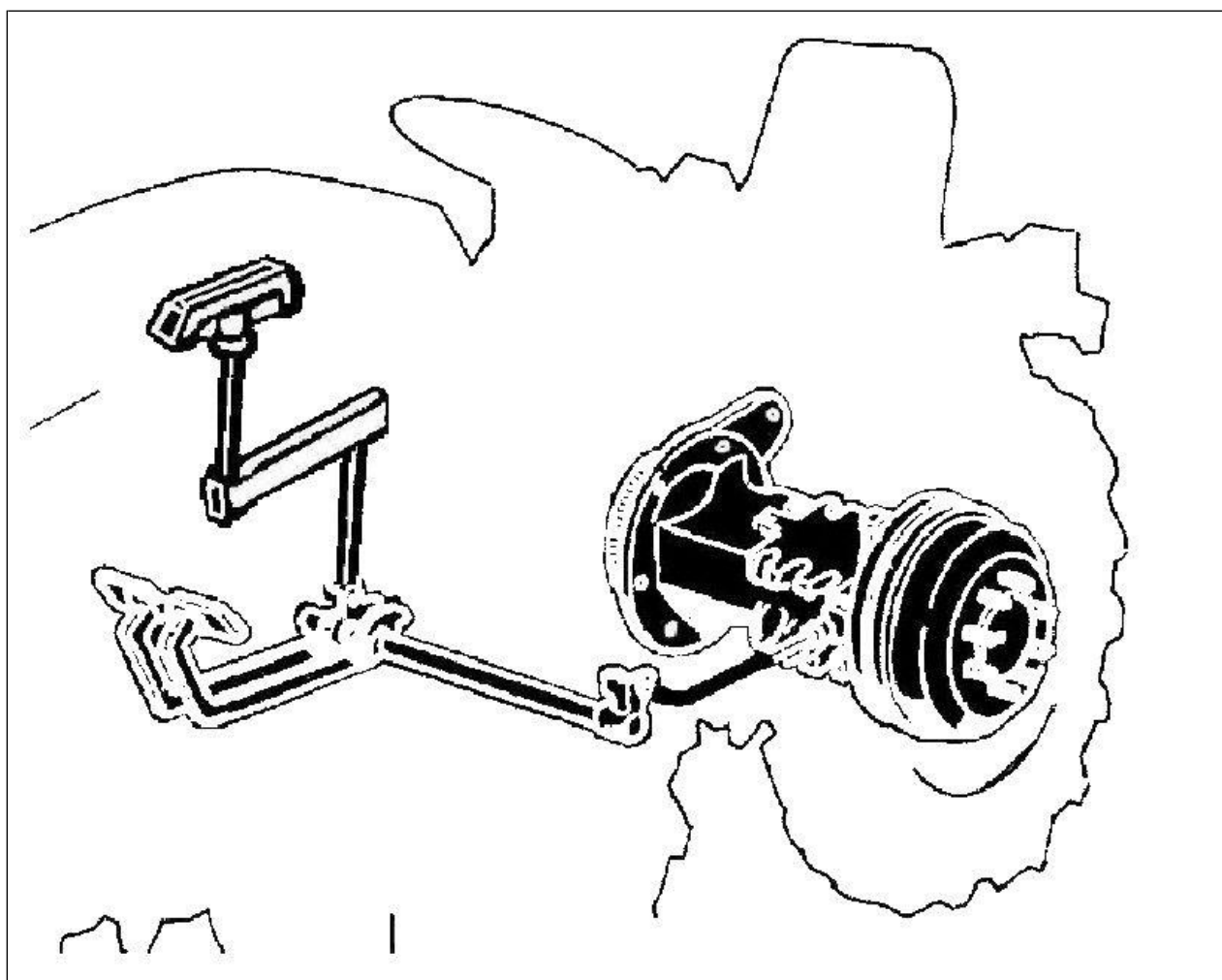
Together with the indications in the figure, the following details are to be considered:

- Implement two rods of the length of 70cm mountable as shown in the figure, in a central position with respect to the axis of the two front wheels and then proceed with carrying out the measurement shown in Figure 17 by blocking the small joints of the front steering in the indicated position.

**Note:**

Since the reducers are separated from the differential unit, must be lubricated separately, so pay particular attention to the inclusion of oil in the gearbox (0.7 liters). For the characteristics of the oil refer to the table "Fluids and Lubricants" section at the end of this manual.

## GROUP 57 - BRAKES



## 57.1 - BRAKES ADJUSTMENT

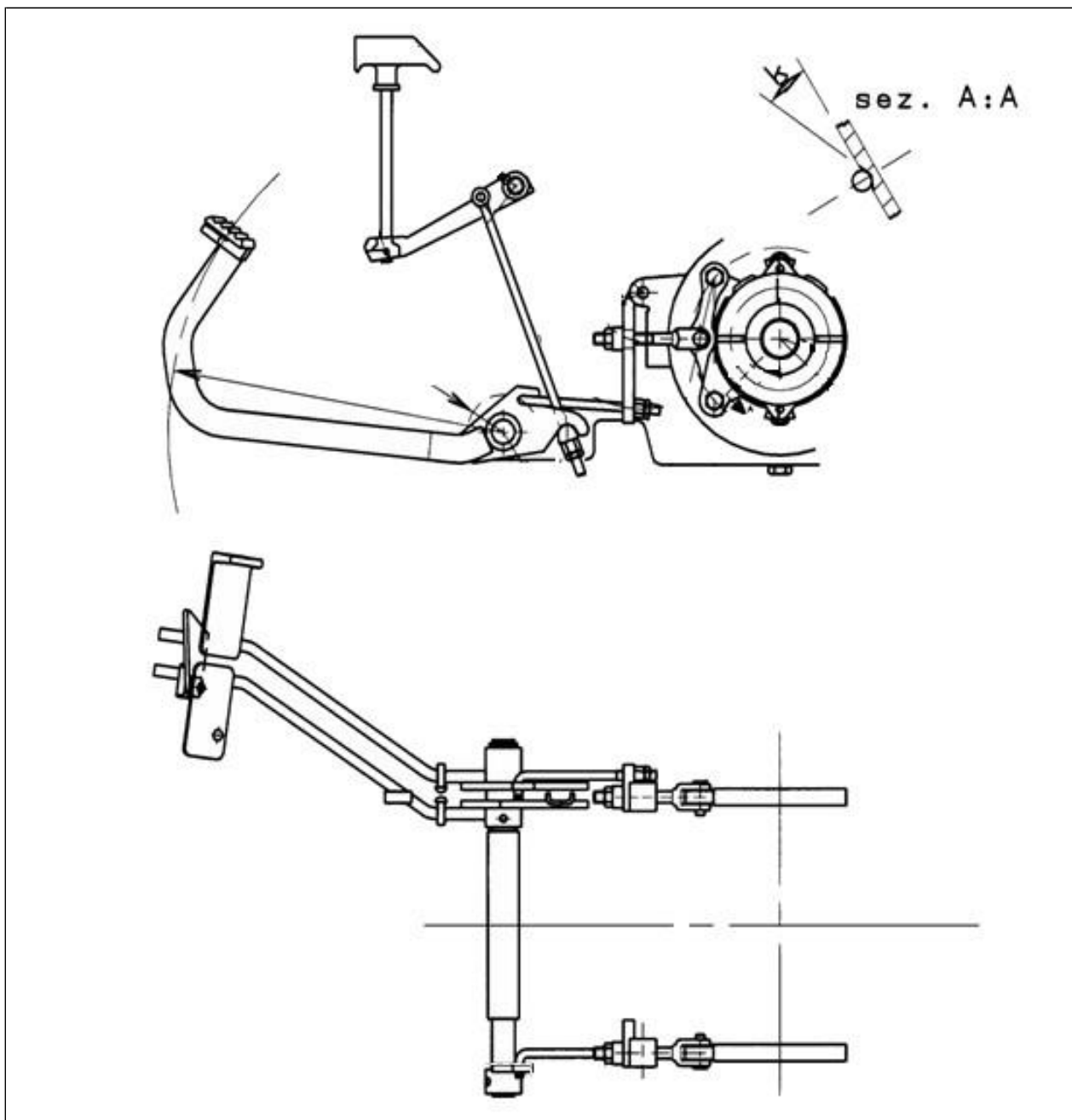
### 57.1.10 - Braking devices - steering wheels version

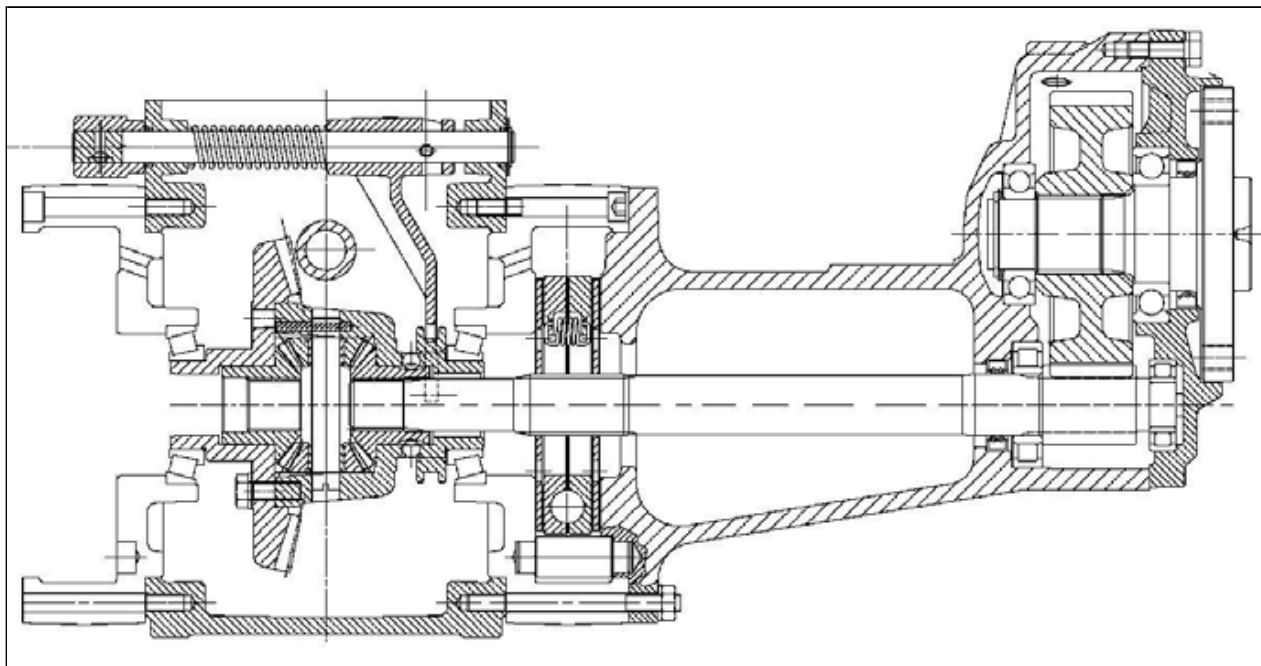
- **SERVICES**

1. Mechanical brake discs in oil bath, operated on the axle shafts of the rear wheels.

- **PARKING**

Act on the rear service breaking device, with mechanical transmission manually operated equipped with a mechanism for the irreversibility of the command.





The tractor is equipped with disc brakes in oil bath.

The brake assembly is composed essentially of a central expander braking mass and two friction discs in oil bath.



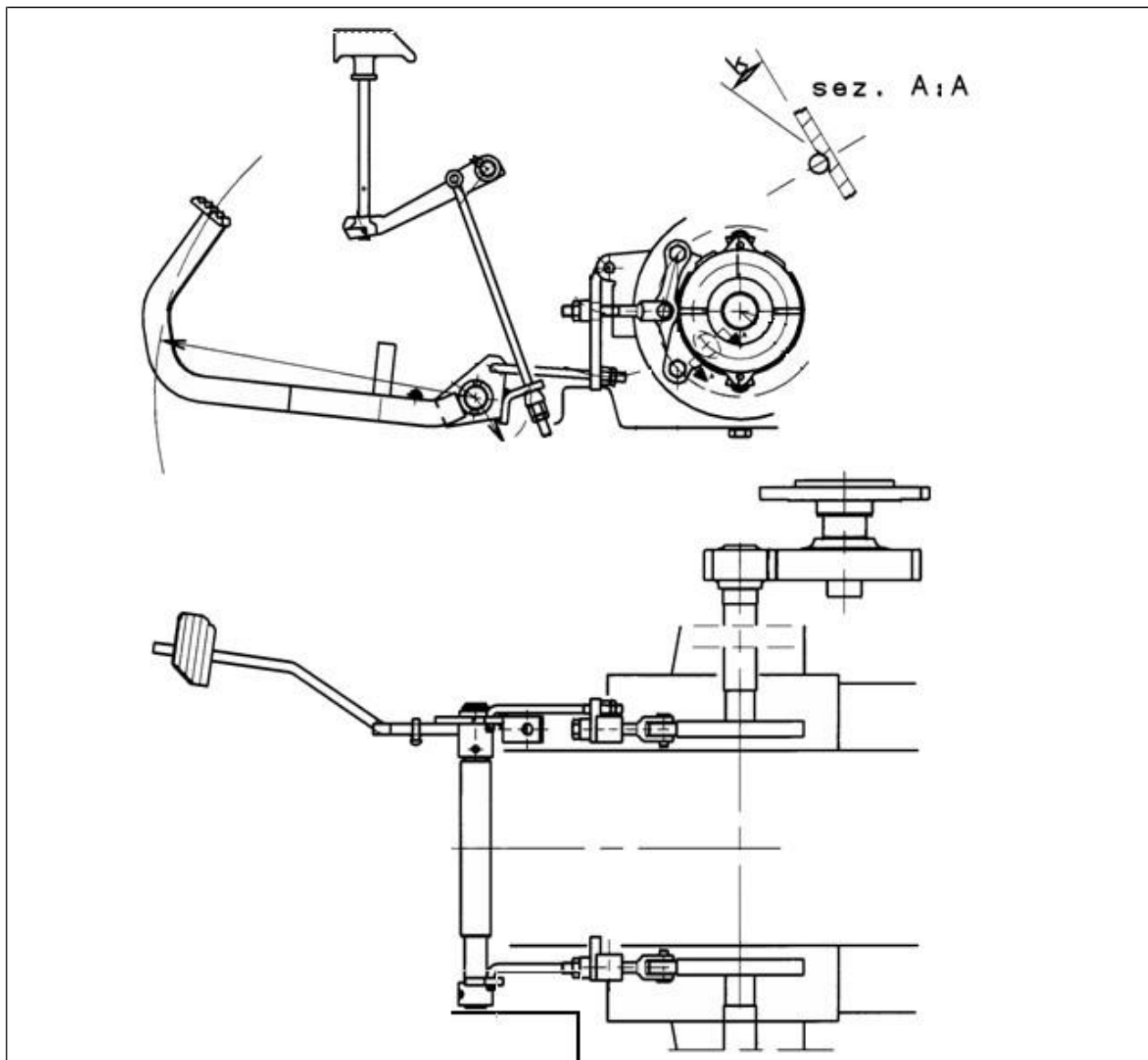
**57.1.20 - Braking devices - articulated version**

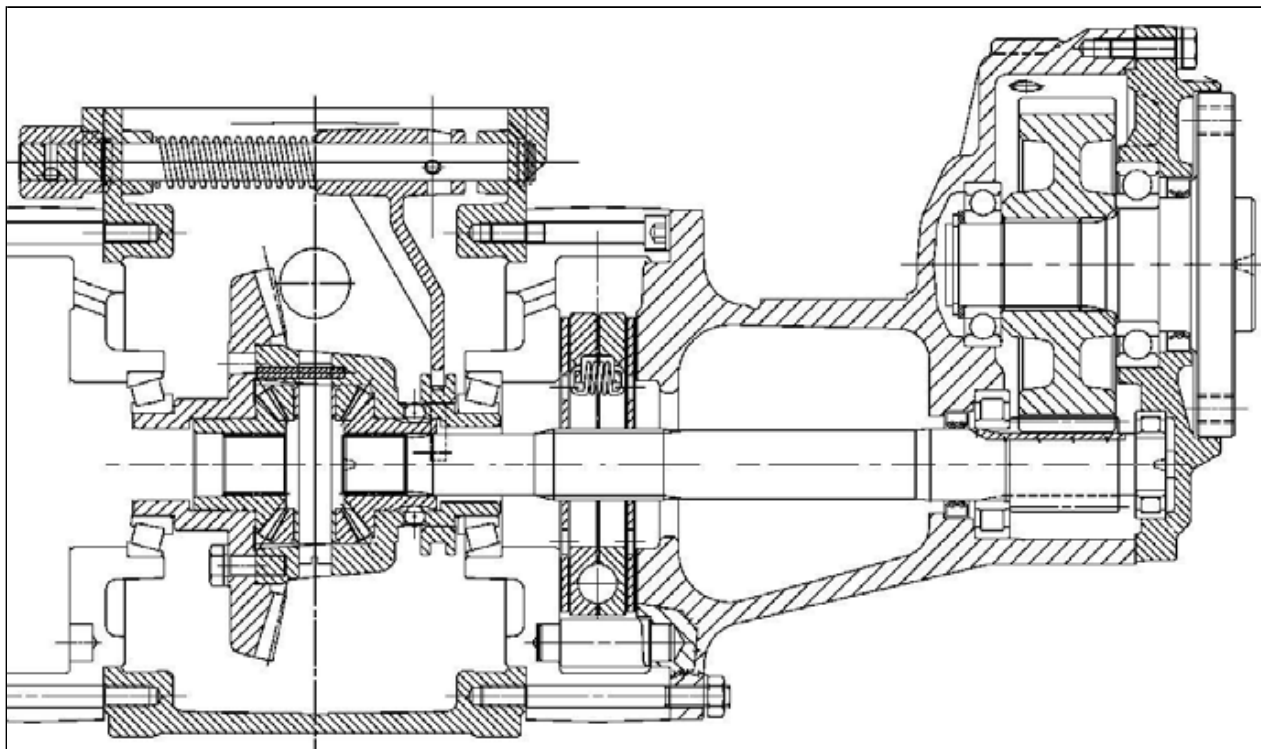
- **SERVICES**

1. Mechanical brake discs in oil bath, operated on the axle shafts of the rear wheels.

- **PARKING**

Act on the rear service breaking device, with mechanical transmission manually operated equipped with a mechanism for the irreversibility of the commad.



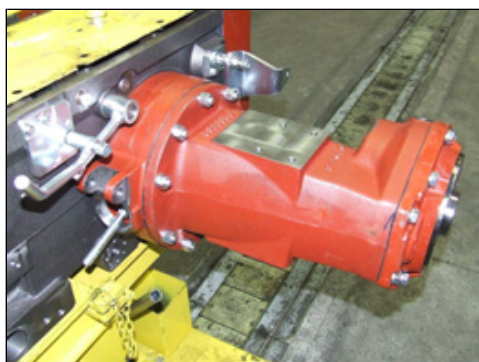
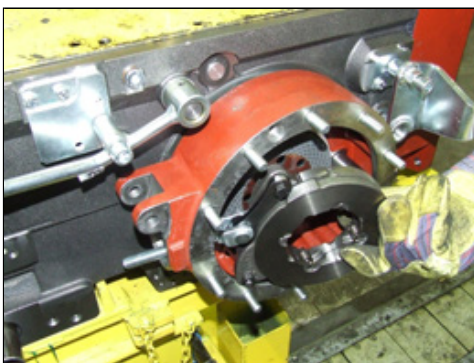
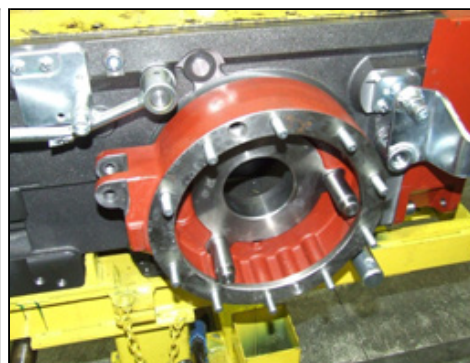


The tractor is equipped with disc brakes in oil bath.

The brake assembly is composed essentially of a central expander braking mass and two friction discs in oil bath.

**57.1.30 - Braking assembly**

Place the outside part of the differential bearing into the rear brake crankcase using the appropriate buffer. Repeat the same operation on the other side. After applying the silicone on both faces, put in place the rear brake casing then sending it to stop on the differential casing. Insert and tighten the screws on both sides.



Pre-assemble the braking unit with brake cable, pin and split pin. Place two of the three pins in the rear brake crankcase and a disc. Insert the brake unit. Then insert the third pin and, for ease of assembly, place the other disc on the hub. Clean the surfaces of the differential casing and the hub, apply the silicone, and finally assembling the hub to the differential unit, place the screws and tighten. Insert and tighten the screws on both sides.



### 57.1.40 - Assembly of the external protection



Fig.8



Fig.9

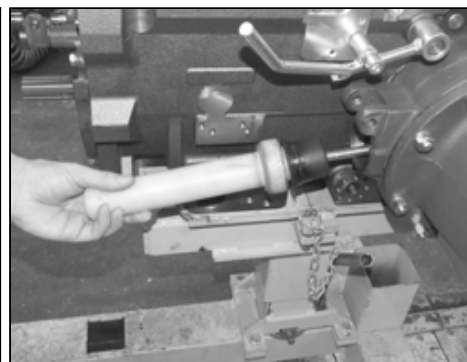
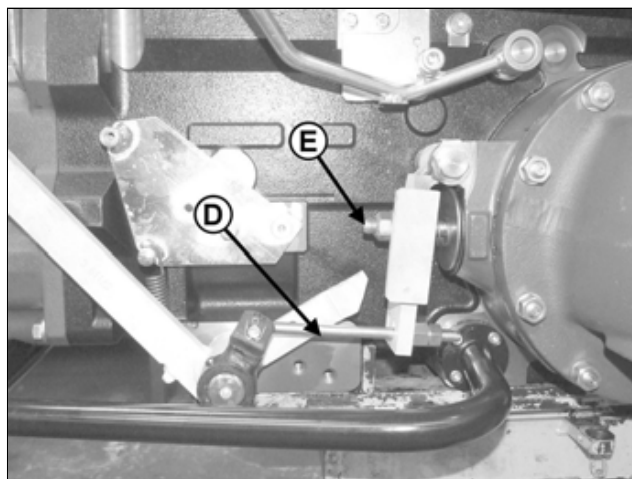
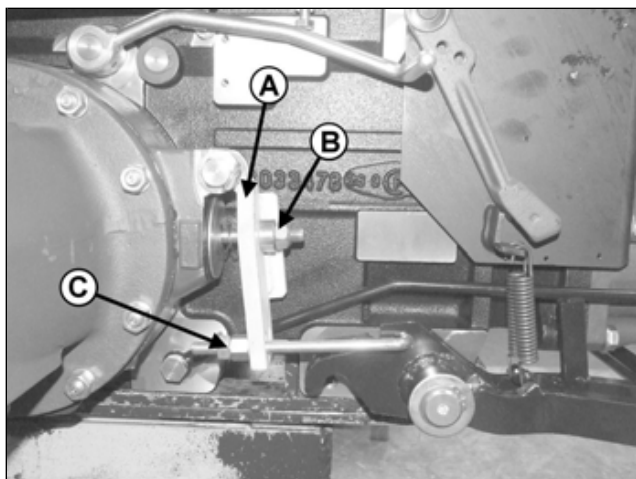


Fig.10

When the cowling and retainer O-ring are mounted, as illustrated in Fig.8 and 9, thoroughly grease the rod and make sure that the rubber cowling is mounted without being damaged. If necessary, with a buffer as shown in Fig. 10.



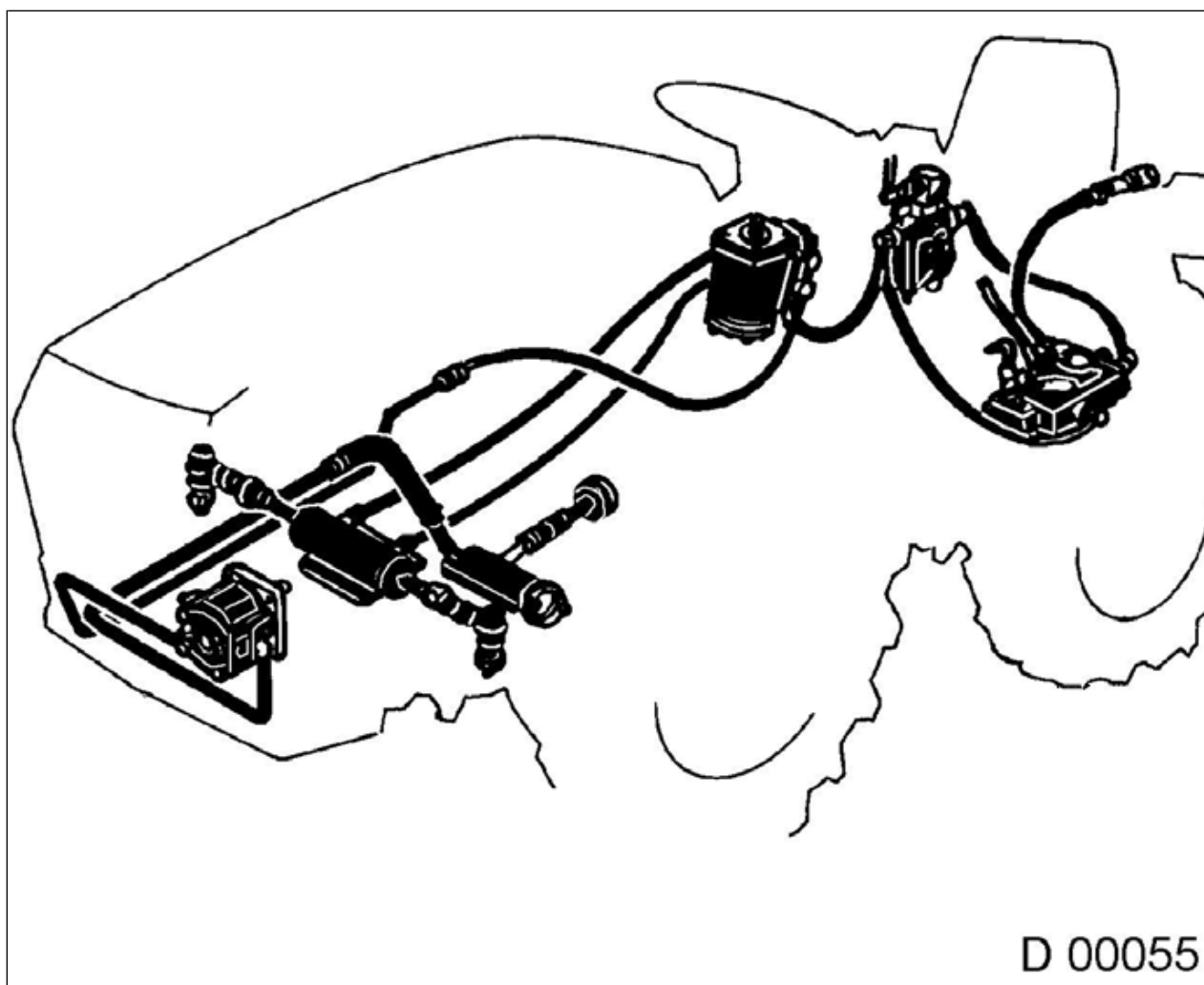
Proceed with the installation of the movable plate (detail **A**), place the tie rod (**E**), above the cap, the washer diameter 62 mm. and the spring, which allow the return of the movable plate. Attach the tie rod braking mass expansion with spacer and nut (**B**). Complete assembly by fixing the lower links of the brake pedal (**D**) to the movable plate through the ball nut and the lock nut (**C**).

Register the fixing nuts (**B** and **C**) of the upper and lower tie rods (**D** and **E**) in such a way that the movable flange assume a vertical position in machine braked, thus allowing simultaneous clamping of the rear wheels.

As a last operation must be done the registration of the handbrake (with a load of about 20 Kg): the linkage must perform a shift of three teeth of the tie rod. Act on the adjusting nut that connects the handbrake linkage with the brake pedal.

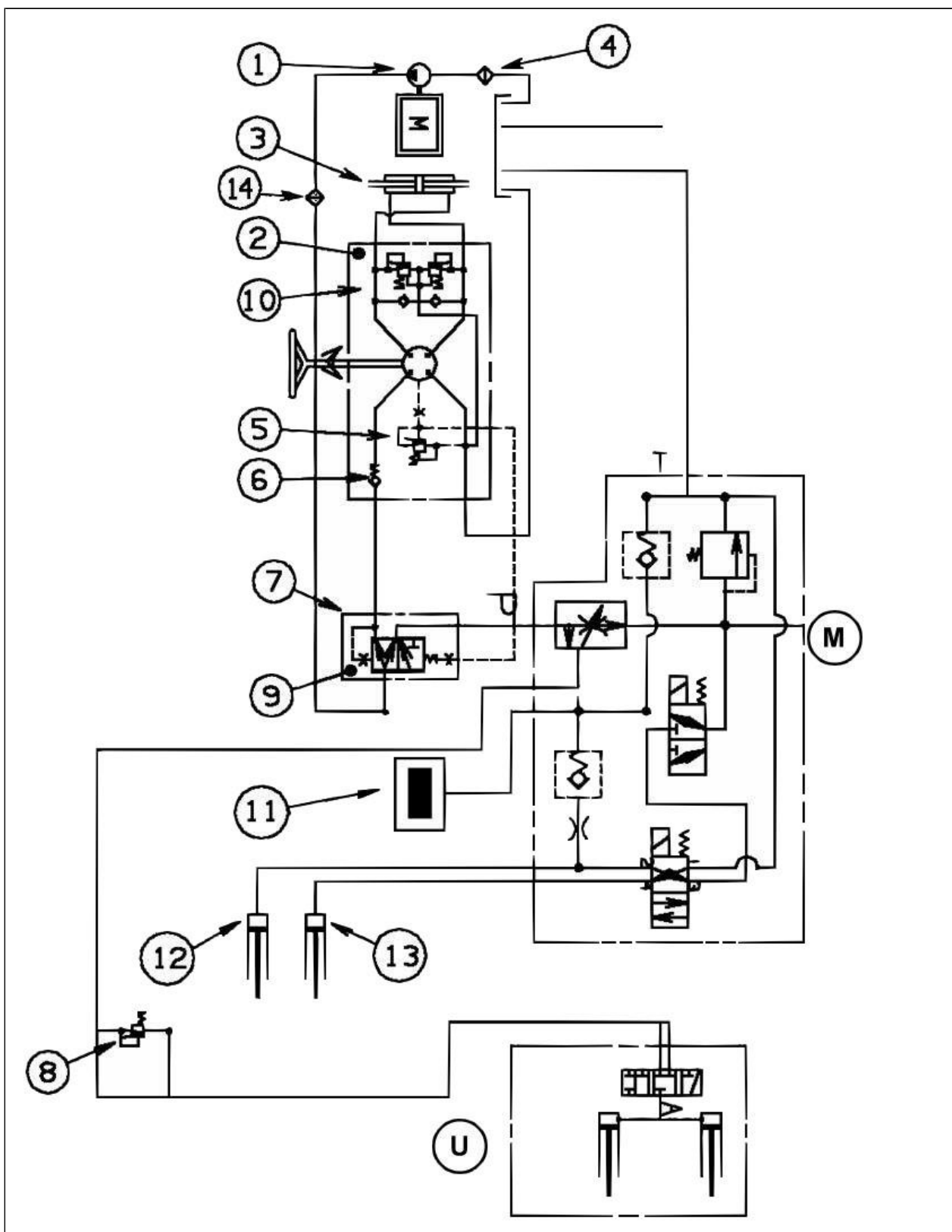


## 60 - HYDRAULIC SYSTEM



## 60.1 - HYDRAULIC SYSTEM ADJUSTMENT

### 60.1.10 - Hydraulic system diagram



**HYDRAULIC CIRCUIT**

1. Hydraulic pump
2. Hydraulic drive system
3. Steering cylinder
4. Intake transmission oil filter
5. Relief valve
6. Monodirectional valve
7. "LS" valve for steering
8. SCV
9. Priority valve with max pressure
10. Antishock valve
11. Drain
12. Clutch brake
13. Clutch accumulator
14. Delivery oil filter (Main Pump)

Ⓜ Hydraulic gauge

Ⓢ Hydraulic auxiliaries

## 60.1.20 - Hydraulic pump



Fig.1

The tractor is equipped with a single pump that supplies oil to steering unit, distributors, rear lifter and auxiliaries.

The hydraulic pump is located on the front part of the tractor, flanged to the engine Fig. 1. To check the correct functioning is necessary to mount a 250 bar pressure gauge on the rear quick-release hydraulic couplings and check that the pressure is 180-190 bar when you act on a distributor lever. This procedure must be made with cold oil and hot oil, both. If the pressure variation is high between cold and hot oil, this is a sign of pump wearing.

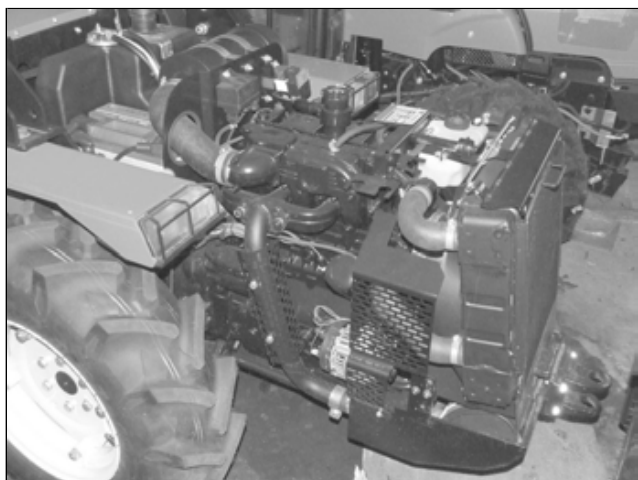


Fig.2

If the measured pressure is different from the expected, is necessary to replace the pump. To make this operation is necessary to demount the hood, the water radiator and the relative support. Then unscrew the hydraulic hoses and replace the pump.

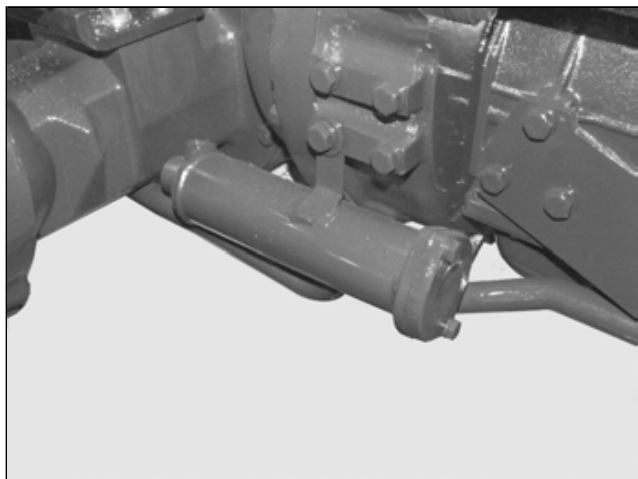


Fig.3

In fig. 3 is visible the principal suction pipe, located beside the engine. The hydraulic gear pump (located in the front part of the engine below the water radiator) takes oil from this pipe.

During the mounting phase of this pipe, grease the O-ring and lock the flange screws at 1,5 Kgm.



### 60.1.30 - Solenoid valve - steering wheels version

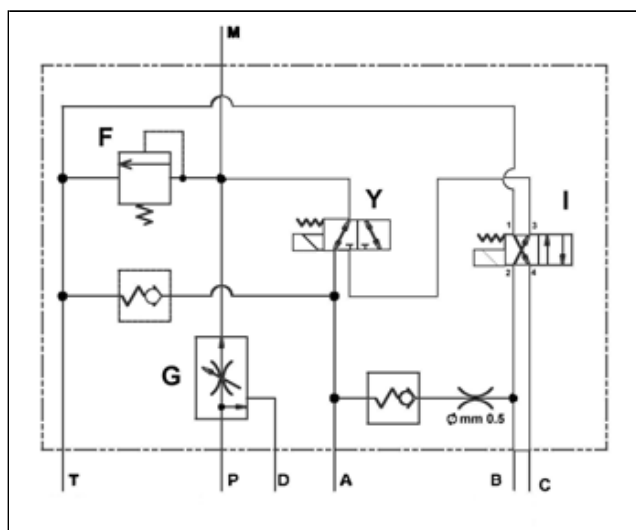


Fig.1

- Ⓜ Hydraulic gauge
- Ⓣ Discharge
- Ⓟ Delivery (pump)
- ⓓ SCV
- Ⓐ Drain
- Ⓑ SERVICE BRAKE
- Ⓒ Clutch

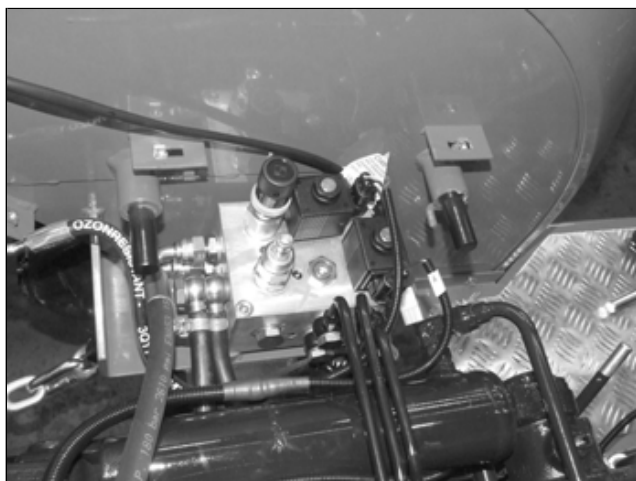


Fig.2

In Fig.1 and 2 is shown the electrovalves group, that controls the rear PTO functioning

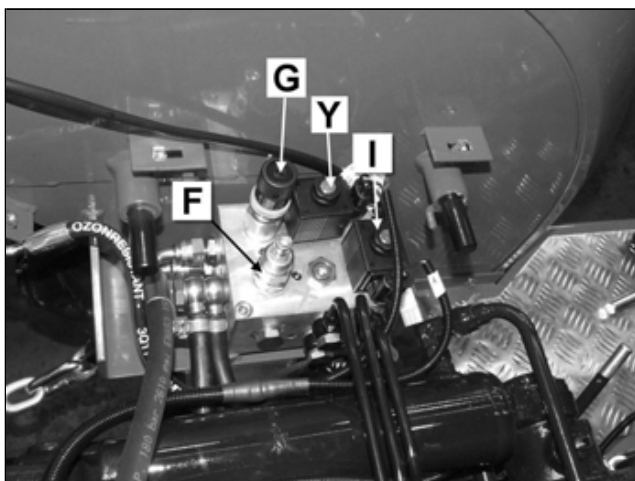


Fig.3



Fig.4

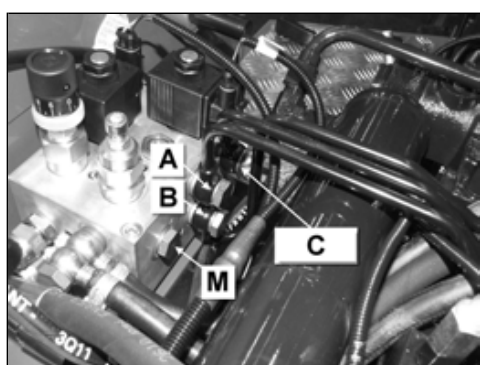


Fig.4



Fig.4

With letter **F** of Fig.3 is shown the relief valve, that must be regulated to 21 bar with cold oil (that becomes 18 bar with hot oil).

This pressure can be checked applying a pressure gauge (with a 1/4" thread) directly on the outlet port **M**. With letter **G** is shown the priority valve that must give to the clutch a flow rate of 3,5 liters (with engine at low idle), with oil at temperature of 20 C.

3,5 l/min flow rate can be measured using a measuring tank and a chronometer, collecting oil directly from the pipe **C-C1**.

The discharge from the EV group is used to lubricate the upper front bearing of the PTO.

If the engagement speed of the PTO is incorrect it's necessary to act on the regulation tap **G** of Fig. 3, turning the tap clockwise you increase the flow rate, in this way is increased the clutch engagement speed; turning the tap counterclockwise is decreased the flow rate to the clutch, decreasing the PTO engagement speed.

PTO engagement modalities and EV excitation state:

PTO not engaged: EV "I" of Fig. 3 is OFF, EV "Y" of Fig. 3 is ON.

PTO in modality INDEPENDENT: EV "I" and "Y" are both ON.

PTO in modality SYNCHRONIZED: EV "I" and "Y" are both OFF.

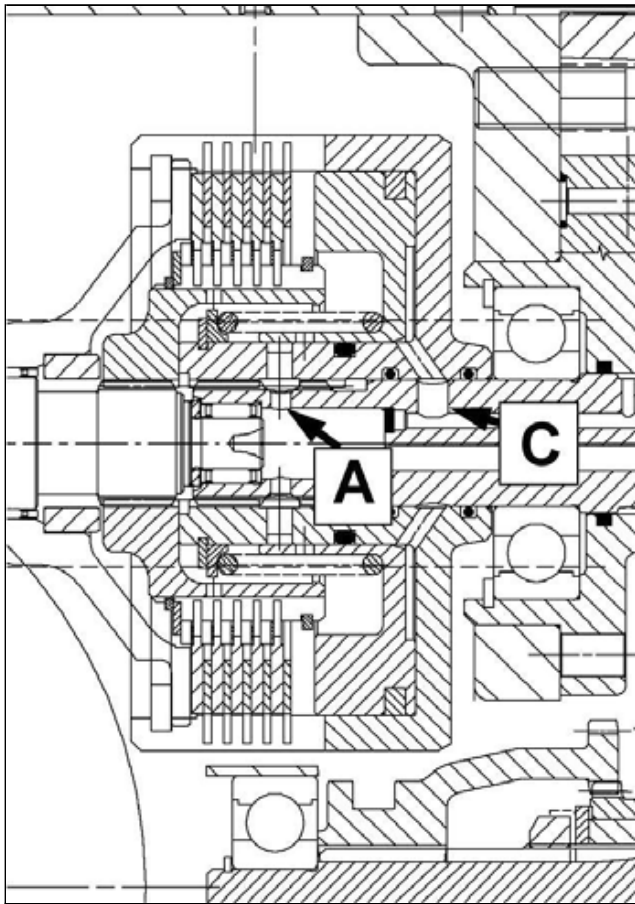


Fig.5

In Fig. 5, with letter **C**, is shown the pressure supplying duct to the PTO clutch, that corresponds to the pipe **C-C1** of Fig. 4, while with letter **A** of Fig. 5 is shown the drain duct; this drain is always supplied with oil from the EV group when the clutch is not closed and is necessary to avoid the dragging of PTO due to the accidental contact between clutch discs.

This pipe is indicated with letters **A-A1** of Fig. 4 and goes in the gearbox beside the previous pipe.

The accumulator **H** of Fig. 3, with a displacement of 0,16 liters and precharge pressure of 4 bars, allows a smooth PTO engagement, and is mounted in parallel (by pipe **C-C2** of Fig. 4) with the pipe **C-C1**, that supplies oil to the PTO clutch.

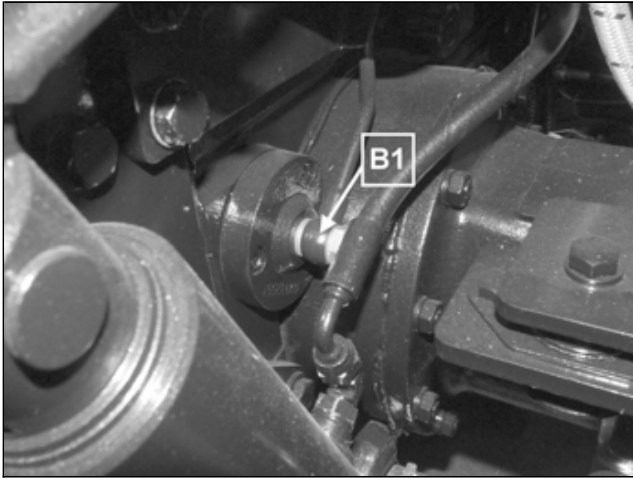


Fig.6

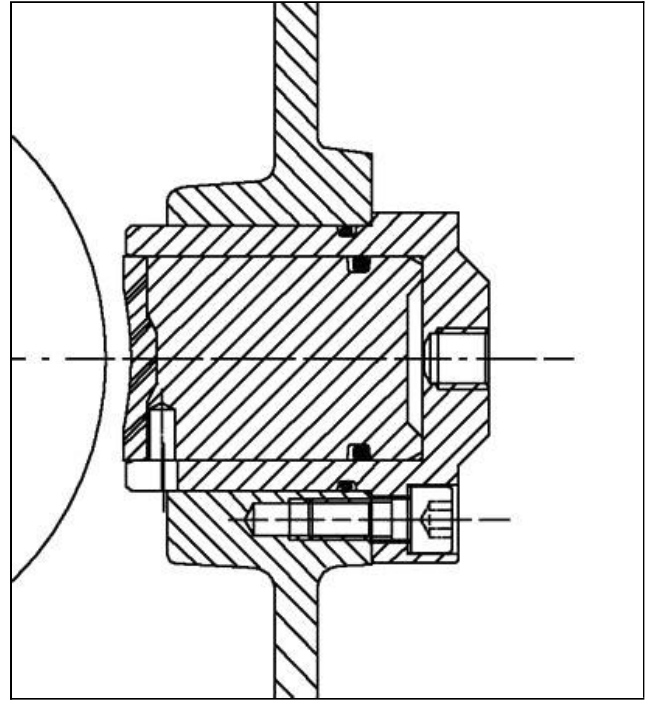


Fig.7

With letter **B** in Fig. 4 and **B1** in Fig.6 is shown the supplying pipe to the clutch brake.

On the external part of the PTO, when the independent modality is not selected, together with the drain between clutch discs, acts the brake visible in Fig. 6.

This helps, together with drain, to avoid dragging of PTO.

On this piston acts a pressure similar to the one that acts on the clutch (18-20 bar).

A further check of the correct functioning of the EV group could be made connecting a pressure gauge on the flange's thread of Fig. 6 and checking the pressure value when the independent PTO is selected but the the PTO is not rotanting.

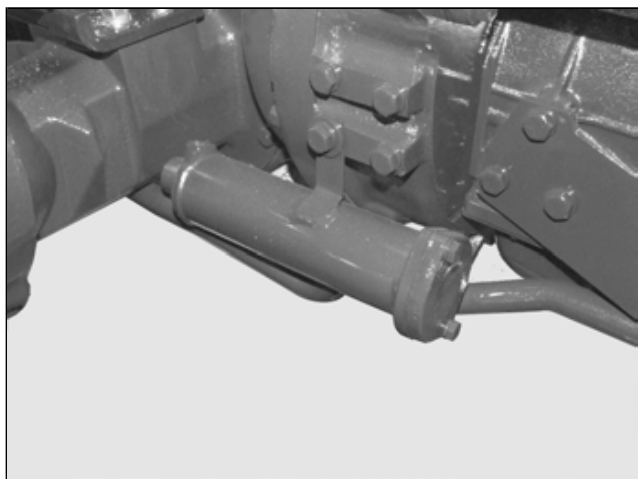
**60.1.40 - Filter**

Fig.1

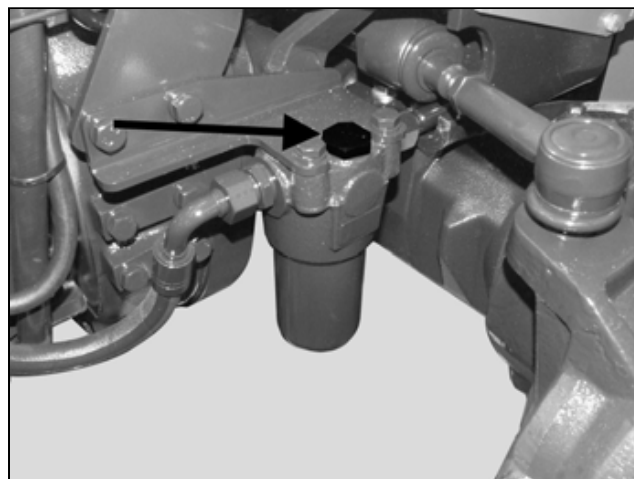


Fig.2

In Fig. 1 and 2 are shown the hydraulic oil filters.

In Fig.1 is shown the suction filter, located in the rear right part of the tractor.

To remove the filter is necessary to unscrew the screws visible in Fig. 1 and then, removing the cover is possible to pull away the metallic filter (WARNING: when you remove the cover, all the transmission oil will exit from the hydraulic circuit, so be careful);

In Fig. 2 is represented the high pressure filter with cartridge, that must be replaced following the service intervals listed on operator's manual.

Use only cartridges supplied from our Spare Parts Service.

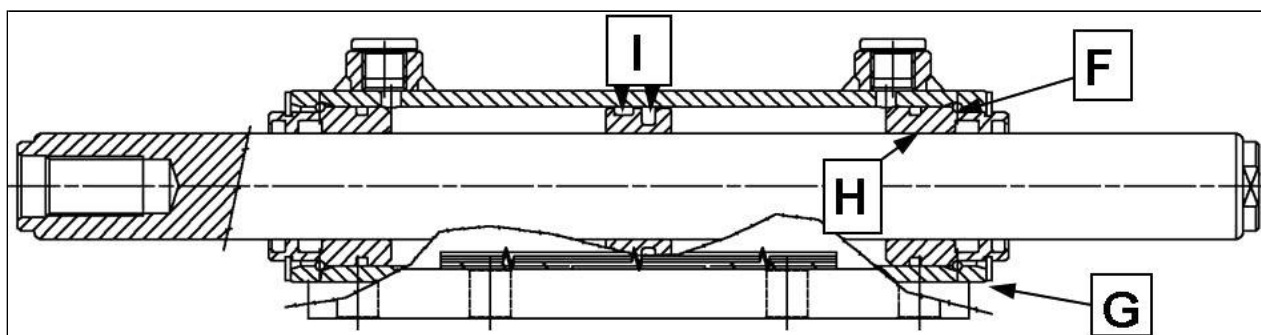
To check the correct operation of the system it is possible to directly measure the pressure on the supply pipe. To do this, unscrew the hexagonal cap on top of the filter and replace it with the special cap code 00061157.

On this cap there is a threaded hole 1/4" to which you can connect a pressure gauge using special fittings and / or pipes.



## 60.1.50 - Steering cylinder

### STEERING WHEELS TRACTOR

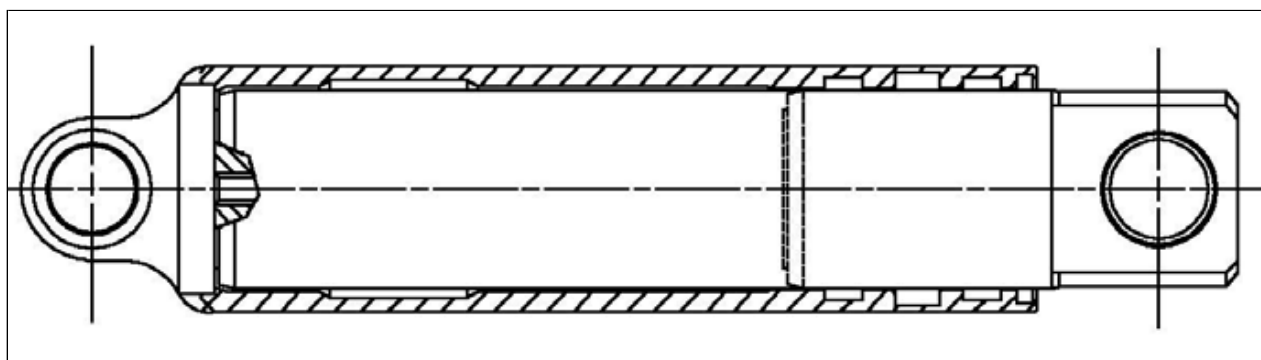


In the upper figure is shown the steering cylinder of steering wheels version.

To demount the cylinder and replace the internal seals is necessary to demount the seeger ring **G**, using a pair of pliers. Push towards the interior of the cylinder the entire head **H**. In this way you have access to the ring **F** and, using a screwdriver, you can remove it from its housing. Now it's possible to take off all the internal part of the stem and to replace the seals **I**. Take care to DON'T scratch the cromed part of the stem.

To remount the cylinder, once you have replaced the seals, follow the previous operations in reverse order.

### ARTICULATED TRACTOR



In the upper figure is shown one of the two steering cylinders of articulated steering tractor. In this case, the replacement of the internal seals of the piston and eventually of the adjacent guides is extremely simple.

Is enough to slide off the piston without any other additional operation and access to the seals.

During this operation, and in subsequent reassembling be careful not to damage the chrome surface of the stem.

## 60.1.60 - Steering unit

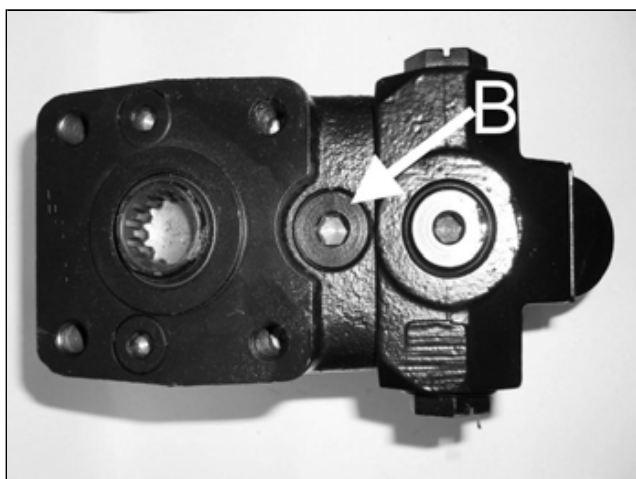


Fig. 4

The relief valve of the steering unit is set at 130 bar.  
The cap **B** in Fig.4, gives access to the valve setting maximum of the steering unit.



Fig. 5

The calibration/setting of the relief valve can be verified by inserting on the delivery pipe steering unit-steering cylinder the pressure gauge CODE 07000122 and bringing the steering cylinder to its limit stop on the right or on the left.

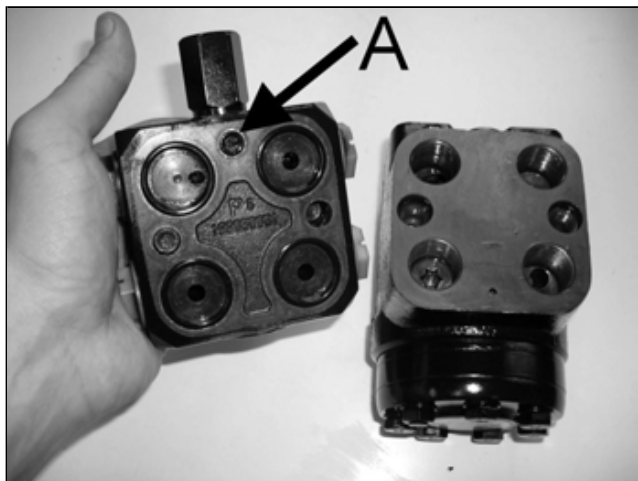


Fig. 6

Fig. 6 shows the detail **A** of the branch of the load-sensing of the steering unit, which is used for piloting the valve by the steering unit. When we act on the steering wheel a small amount of oil pass through the passage and goes to operate the load-sensing valve that picks up from the hydraulic system the oil required to operate the steering.

Malfunctions to the steering unit can be caused by contamination that clog the hole **A** or the valve spool, thus hindering the proper functioning of the unit.



Fig. 7

To clean the valve, the steering unit must be removed as follows:

remove the steering wheel by using the proper puller code 07006212, the hand throttle lever and the shuttle reverse lever.

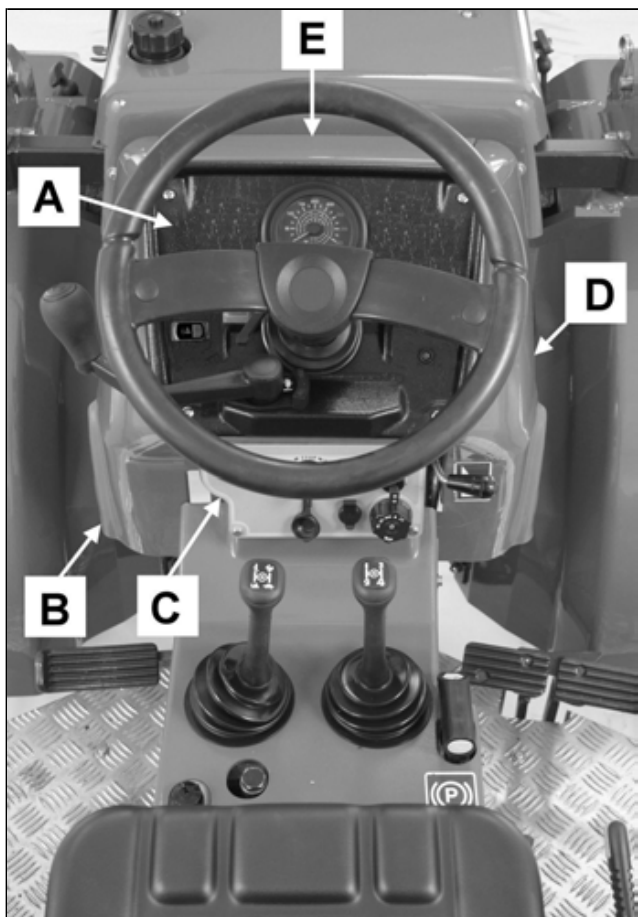


Fig. 8

Remove the dashboard and connect cables from the instrument.  
Remove all the cover panels to have access to the steering unit support.



Fig. 9

After removing the tie rod of the shuttle reverse lever and the hydraulic hoses from the steering unit, proceed with the removal of the complete support and steering unit.



Fig. 10

After removing the steering unit from its support, proceed with the removal of the hexagonal stud.

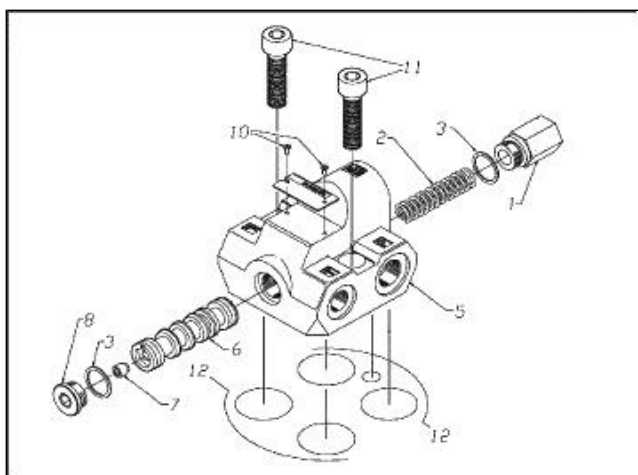


Fig. 13

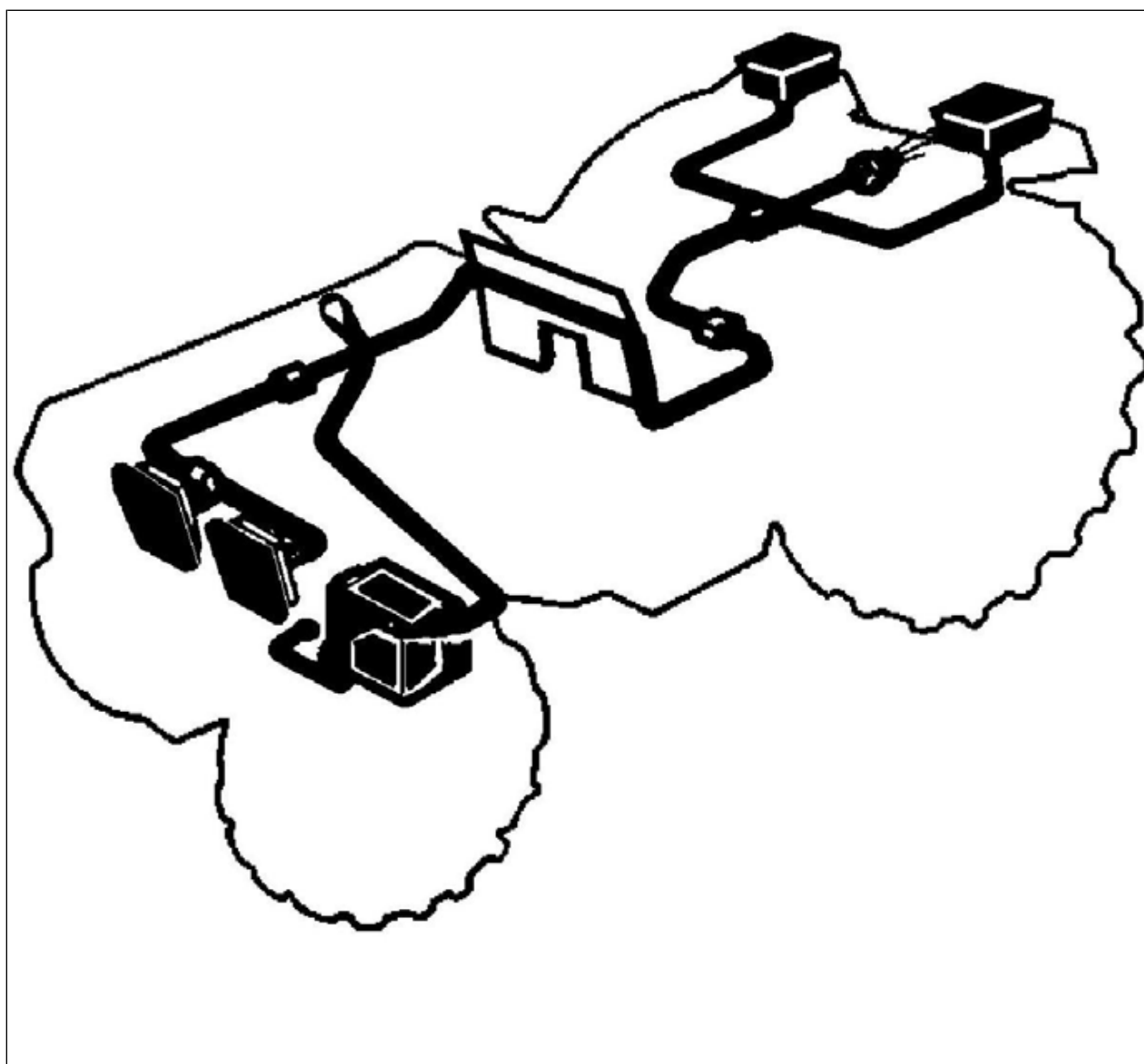
Proceed to clean the inside of the priority valve, taking care to reassemble the components in the right order, see Fig 13. If you need more details of the activities, please refer to the Use and Owner's manual of the manufacturer.



**60.B - Needed tools group hydraulic circuit**

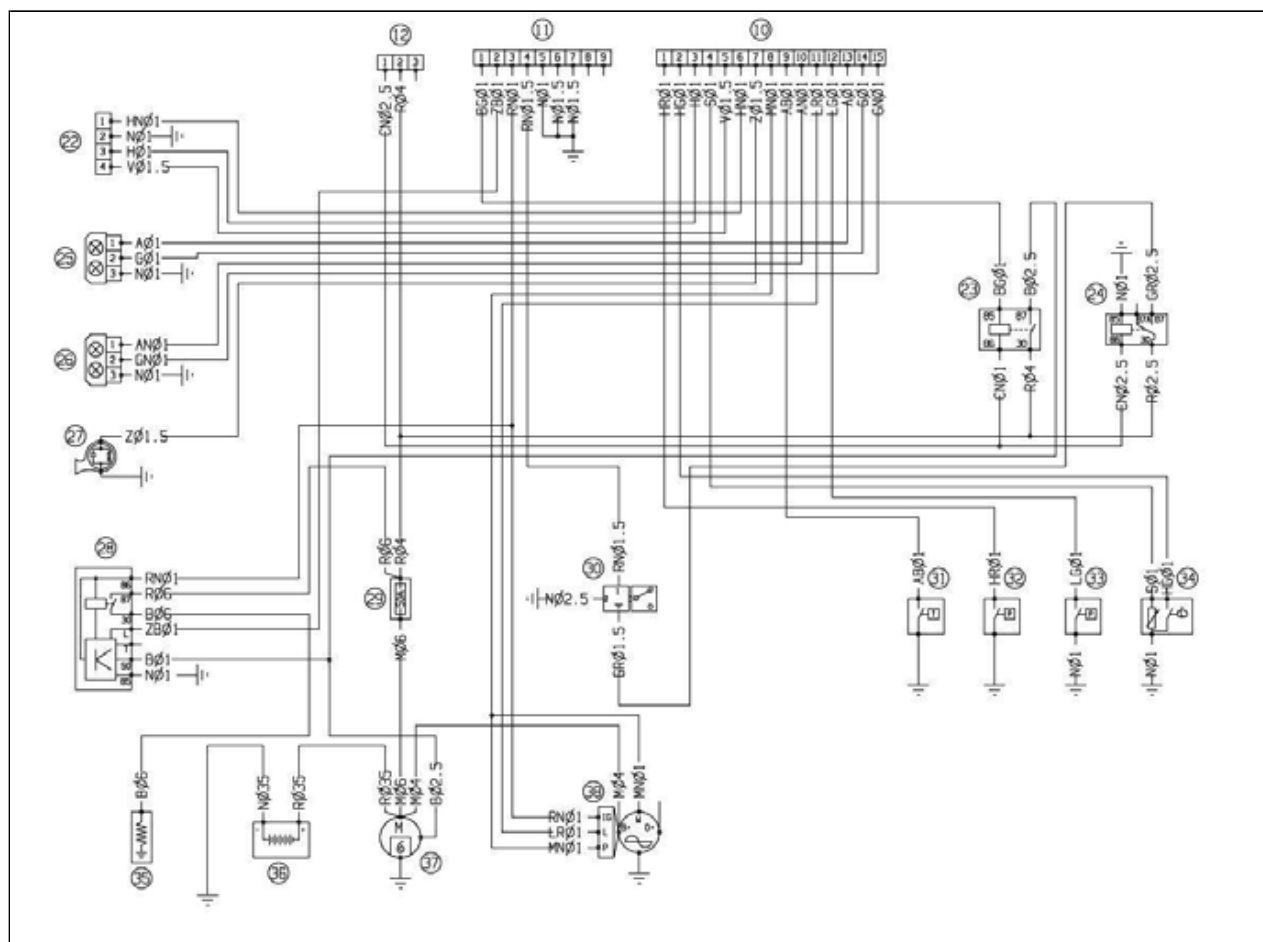
| CODE     | DESCRIPTION                 | QUANTITY |
|----------|-----------------------------|----------|
| 07000122 | HYDRAULIC GAUGE             | 1        |
| 07000241 | DISTR. VALVE TEST TOOL 1363 | 1        |
| 07000249 | TOOL SETTING LIFT EFFORT    | 1        |
| 07006212 | STEERING WHEEL PULLER       | 1        |
| 07006220 | TOOL STOPS ARMS             | 2        |

## 63 - ELECTRICAL SYSTEM

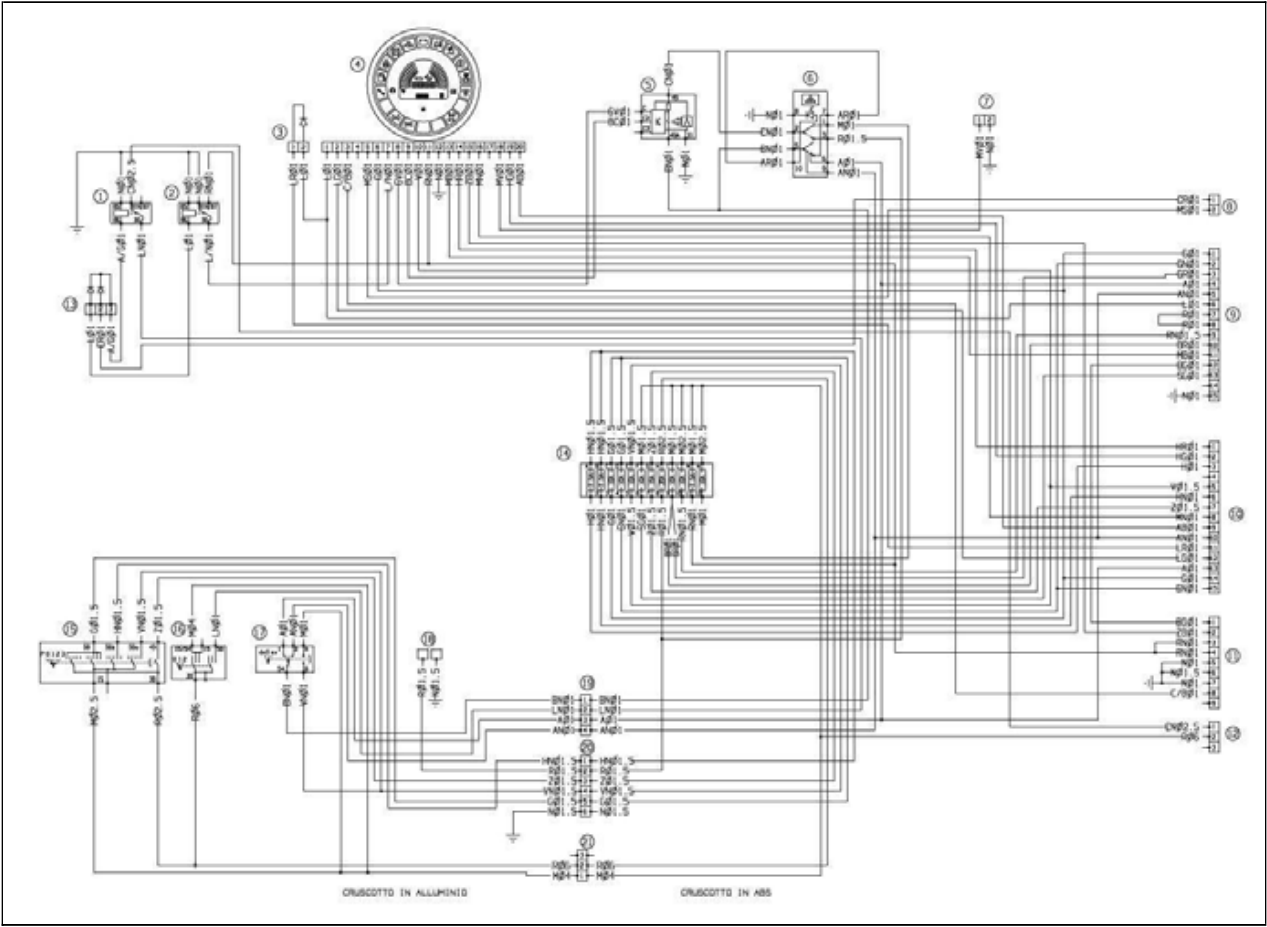


## 63.1 - ELECTRICAL SYSTEM WIRING - STEERING WHEELS VERSION

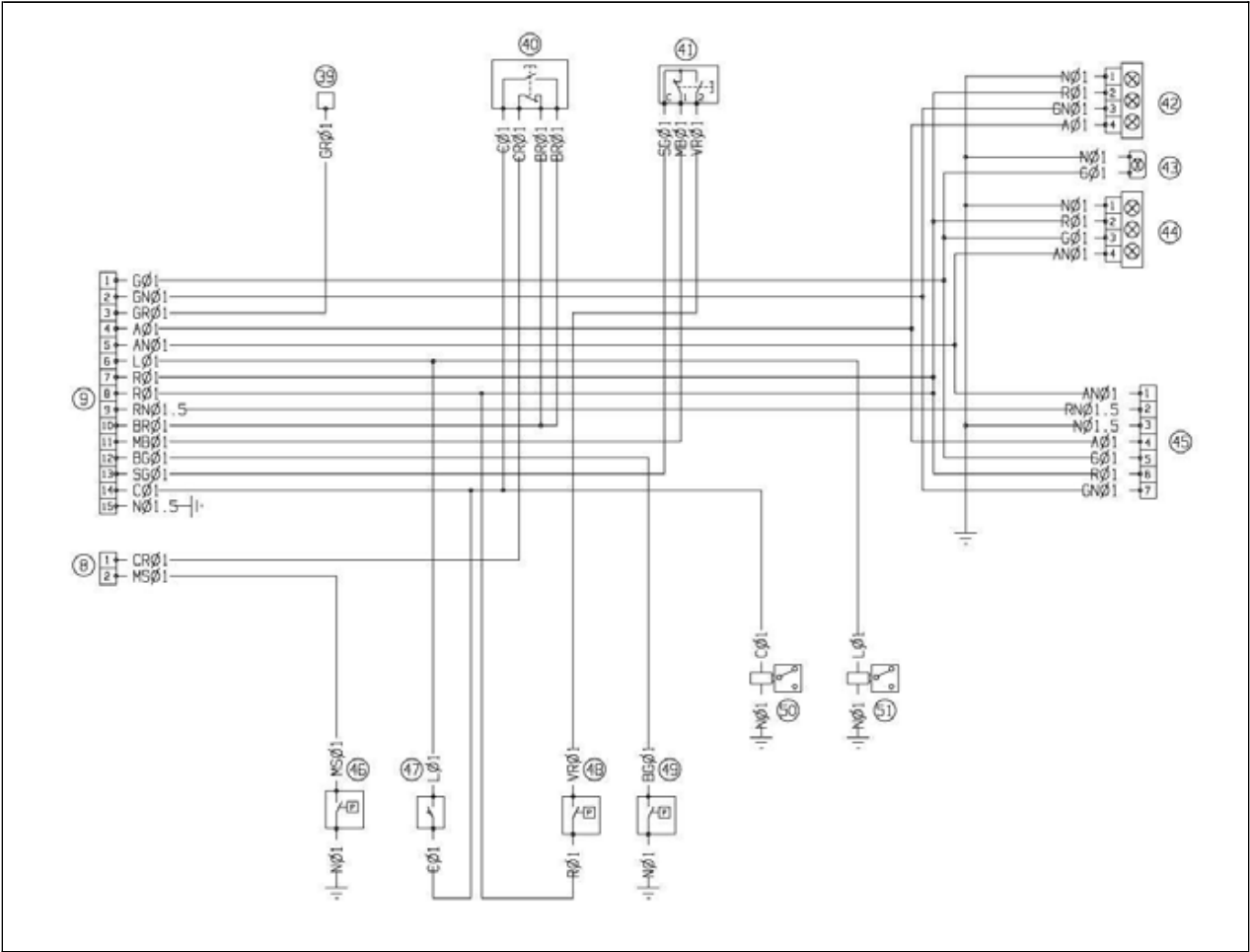
### 63.1.10 - Wiring diagram engine circuit



63.1.20 - Wiring diagram dashboard circuit



63.1.30 - Wiring diagram rear circuit



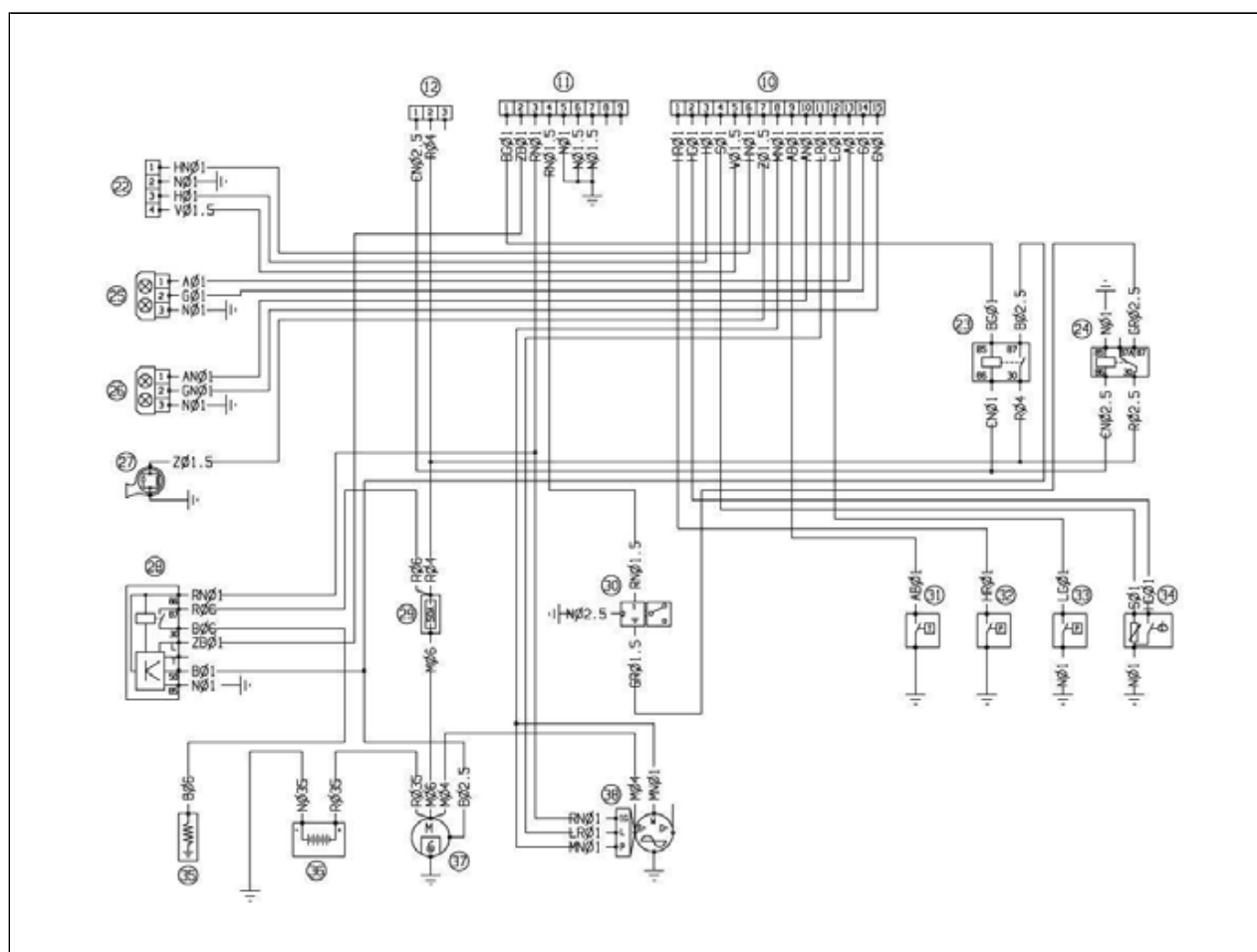


**ELECTRICAL SYSTEM**

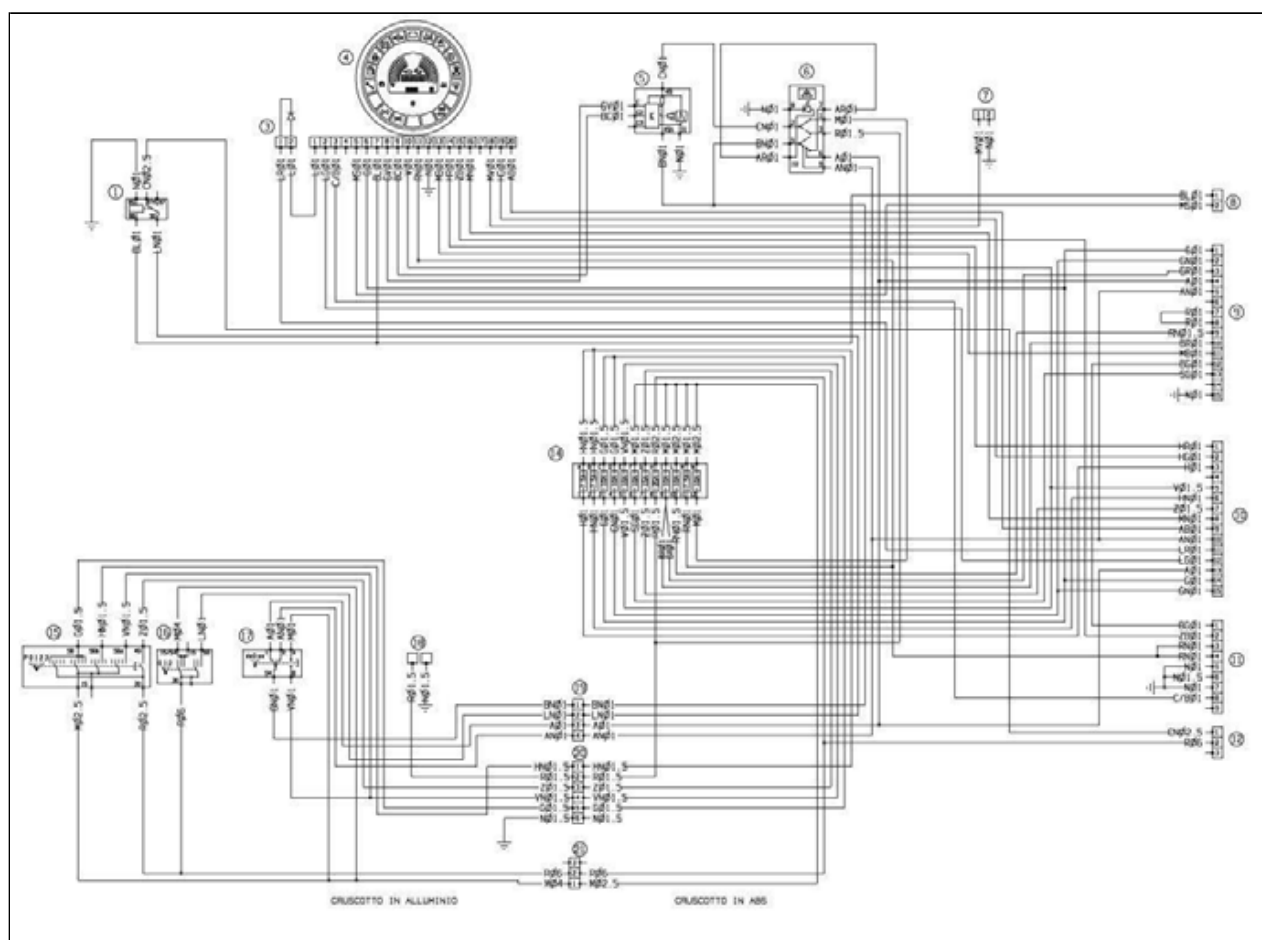
1. Security start relay from ignition switch
2. Security starter relay Power take-off
3. 2-pole connector Diode
4. Multifunction digital instrument
5. Turn indicator blinking function
6. Emergency lights switch
7. Security starter relay
8. 2-pole connector dashboard circuit - rear circuit
9. Fifteen-pole connector engine circuit - dashboard
10. Fifteen-pole connector dashboard circuit - rear circuit
11. Dashboard connector - engine circuit
12. Dashboard connector - engine circuit
13. Three-pole connector Diode
14. Fuse box
15. Light switch
16. Ignition switch
17. Light switch
18. 1-pin socket
19. Four pole connector dashboard circuit - dashboard
20. Six-pole connector dashboard circuit - dashboard
21. 3-pole connector dashboard circuit - dashboard
22. Front lights
23. Security star relay from security star switch
24. Security start relay for EV engine stop
25. Right headlight
26. Left hadlight
27. Horn.
28. Glow plug relay
29. Maxifuse protection circuit
30. Engine stop solenoid
31. Water temperature sensor
32. Engine oil pressure sensor
33. Air filter clogging sensor
34. Fuel level sensor
35. Glow starter
36. Battery
37. Starter
38. Alternator
39. Rear draft ELX connection.
40. PTO selector switch.
41. Parking brake switch
42. Right rear light.
43. License plate light.
44. Left rear light.
45. 7-pin socket.
46. Slow fast PTO switch
47. PTO switch.
48. Idrostop
49. Security start switch
50. PTO electrovalve
51. Drain electrovalve

## 63.2 - ELECTRICAL SYSTEM WIRING - ARTICULATED VERSION

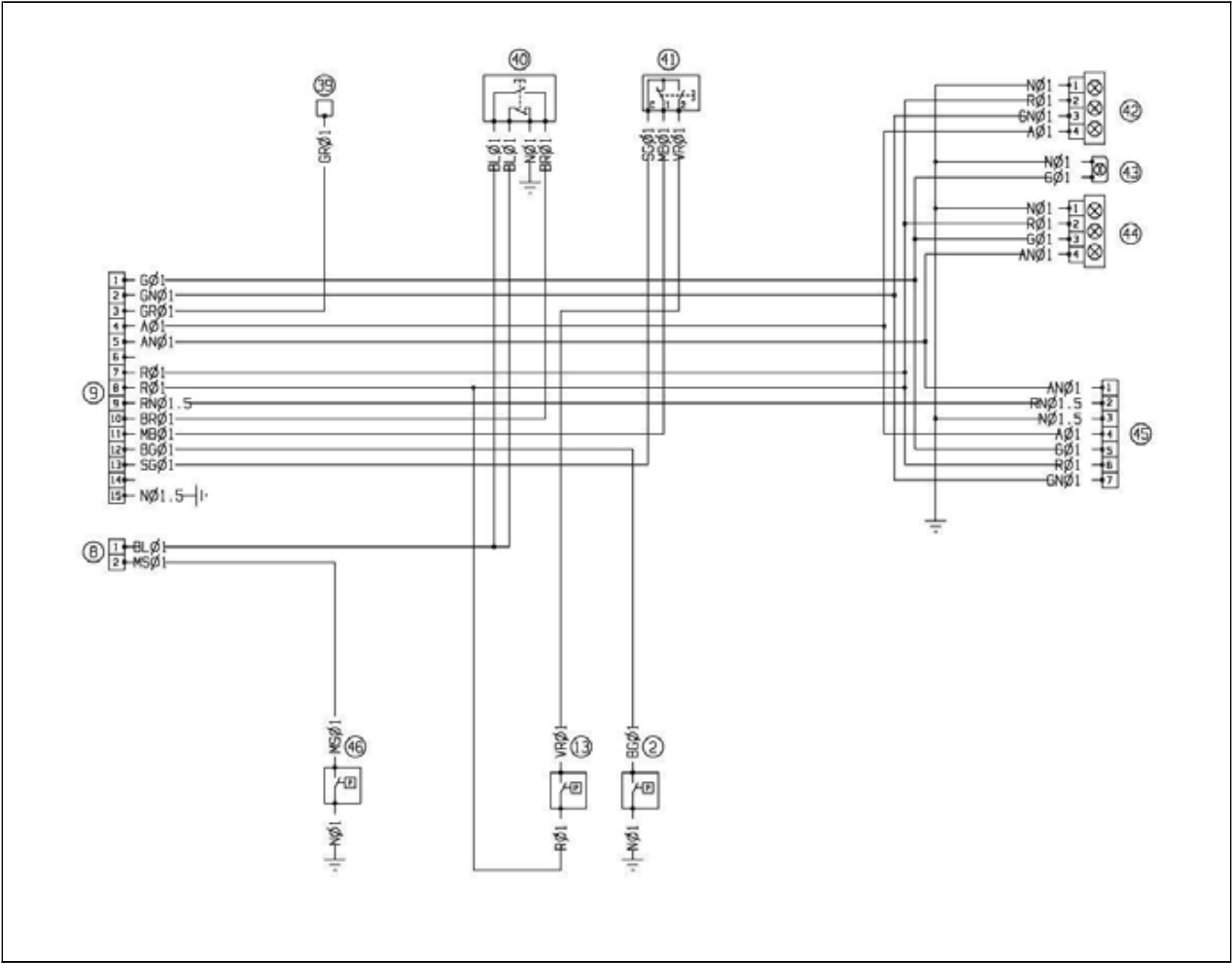
### 63.2.10 - Wiring diagram engine circuit



## 63.2.20 - Wiring diagram dashboard circuit



63.2.30 - Wiring diagram rear circuit



**ELECTRICAL SYSTEM**

1. Security start relay from ignition switch
2. Security start switch
3. 2-pole connector Diode
4. Multifunction digital instrument
5. Turn indicator blinking function
6. Emergency lights switch
7. Security starter relay
8. 2-pole connector dashboard circuit - rear circuit
9. Fifteen-pole connector engine circuit - dashboard
10. Fifteen-pole connector dashboard circuit - rear circuit
11. Dashboard connector - engine circuit
12. Dashboard connector - engine circuit
13. Idrostop
14. Fuse box
15. Light switch
16. Ignition switch
17. Light switch
18. 1-pin socket
19. Four pole connector dashboard circuit - dashboard
20. Six-pole connector dashboard circuit - dashboard
21. 3-pole connector dashboard circuit - dashboard
22. Front lights
23. Security star relay from security star switch
24. Security start relay for EV engine stop
25. Right headlight
26. Left hadlight
27. Horn.
28. Glow plug relay
29. Maxifuse protection circuit
30. Engine stop solenoid
31. Water temperature sensor
32. Engine oil pressure sensor
33. Air filter clogging sensor
34. Fuel level sensor
35. Glow starter
36. Battery
37. Starter
38. Alternator
39. Rear draft ELX connection.
40. PTO selector switch.
41. Parking brake switch
42. Right rear light.
43. License plate light.
44. Left rear light.
45. 7-pin socket.
46. Slow fast PTO switch

| CABLE COLOUR KEY |                                    |
|------------------|------------------------------------|
| <b>A</b>         | LIGHT BLUE                         |
| <b>B</b>         | WHITE                              |
| <b>C</b>         | ORANGE                             |
| <b>G</b>         | YELLOW                             |
| <b>H</b>         | GRAY                               |
| <b>L</b>         | BLUE                               |
| <b>M</b>         | BROWN                              |
| <b>N</b>         | BLACK                              |
| <b>R</b>         | RED                                |
| <b>S</b>         | PINK                               |
| <b>V</b>         | GREEN                              |
| <b>Z</b>         | VIOLET                             |
| <b>(D)</b>       | DARK<br>EXAMPLE: V(D) DARK GREEN   |
| <b>(E)</b>       | LIGHT<br>EXAMPLE: V(E) LIGHT GREEN |



A-B : Light Blue - White (Extending Laterally)



A/B : Light Blue / White (Extending Spirally)



## 63.3 - ASSEMBLY ELECTRICAL SYSTEM ADJUSTMENT

### 63.3.10 - Fuses

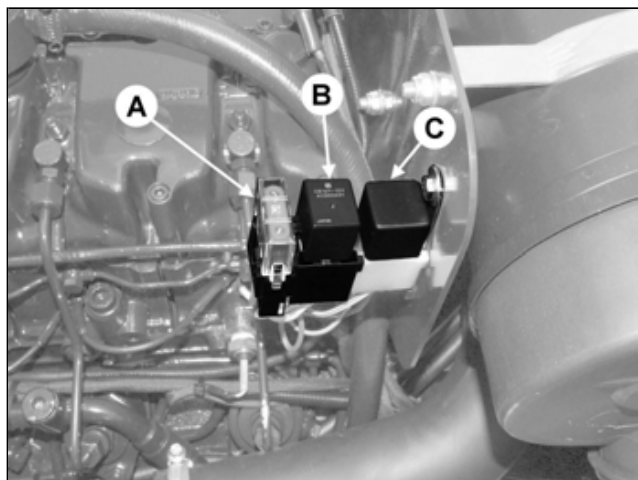


Fig. 2

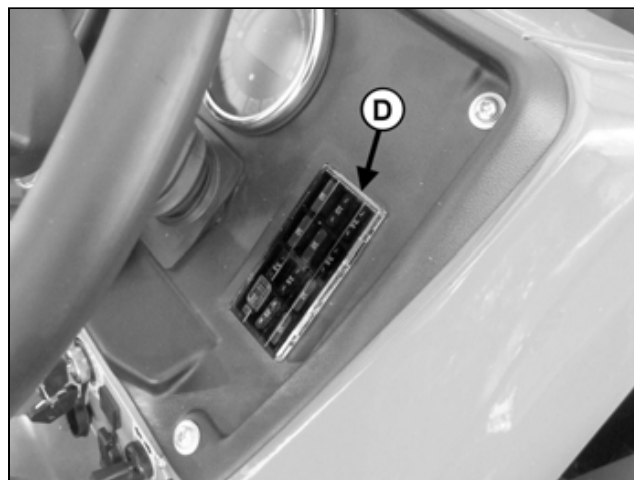


Fig. 2a

In Fig. 2 and 2a are visible for the following components:

- Maxi fuse 70A (A) of the general system, starter and glow plugs.
- Starter relay (B).
- Relay maintenance and recall power solenoid (C)
- Location of the fuse box (D)

When replacing a fuse, after removing the cause that caused the interruption, replace it with one of the same amperage.

These components are placed on a plate fastened to the sheet metal detour air.

The relay shown in Fig. 2 with the letter **B** is the one that gives consensus for ignition.

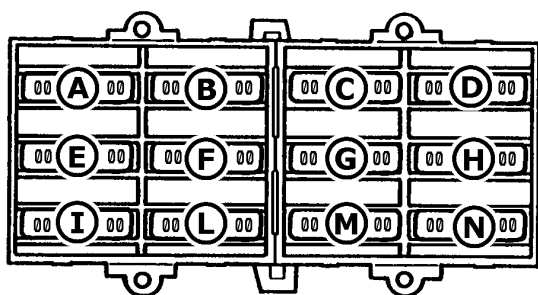
After having received consensus from all the switches that control the safety requirements for starting the engine (clutch pedal pressed down, PTO disengaged) the indicated relay with letter **B** gives current to the starting engine.



Before changing a fuse, find and eliminate the short circuit that caused it to blow.

Replace the burnt-out fuses with others possessing the same technical characteristics (see indications on the actual fuse itself).

Consult specialized personnel if in doubt.

**FUSE FUNCTIONS:**

D0047-0

**(A) 7.5A**

Right dipped beam.

**(B) 7.5A**

Left dipped beam.

**(C) 10A**

Right headlight  
Multifunction instrument lighting  
License plate light.  
Left rear light.  
7-pin socket.

**(D) 10A**

Left hadlight  
Right rear light.  
7-pin socket.

**(E) 10A**

Driving beams.  
Driving beam indicator.  
Flashing headlights.  
Multifunction digital instrument

**(F) 10A**

Revolving beacon switch  
Parking brake switch power supply.

**(G) 15A**

Horn.

**(H) 25A**

Power supply of turn indicator hazard light switch (+30).  
1-pin socket power supply.

**(I) 10A**

PTO selector switch.

**(L) 10A**

7-pin socket.

**(M) 7.5A**

Power supply of engine stop solenoid.  
Alternator  
Preheater plant energizing.  
Multifunction digital instrument  
Security starter relay Power take-off

**(N) 10A**

Emergency lights switch

**Main fuse****70A**

General protection of electrical system.  
Glow plugs

## 63.3.20 - Electrical system, platform maintenance, engine

### STEERING WHEELS TRACTOR

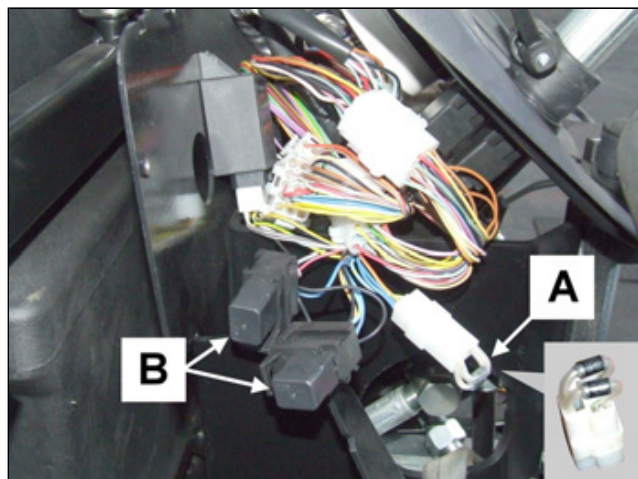


Fig.1

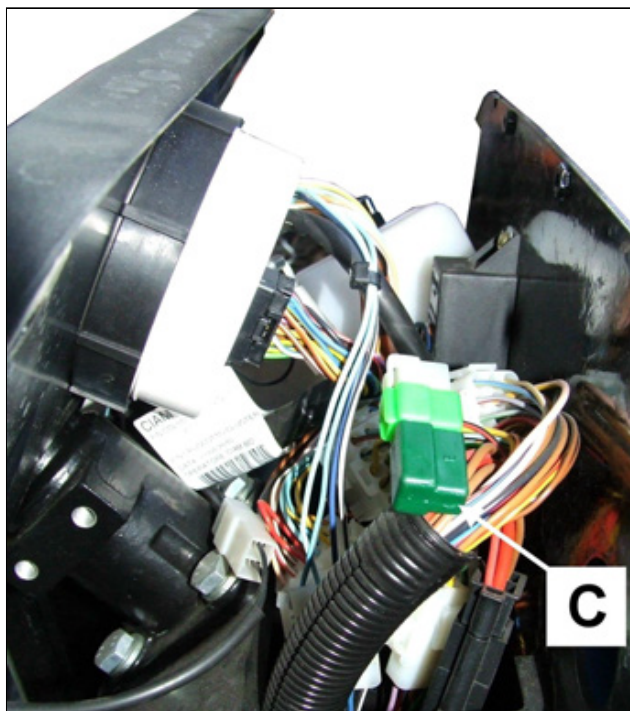


Fig.1a

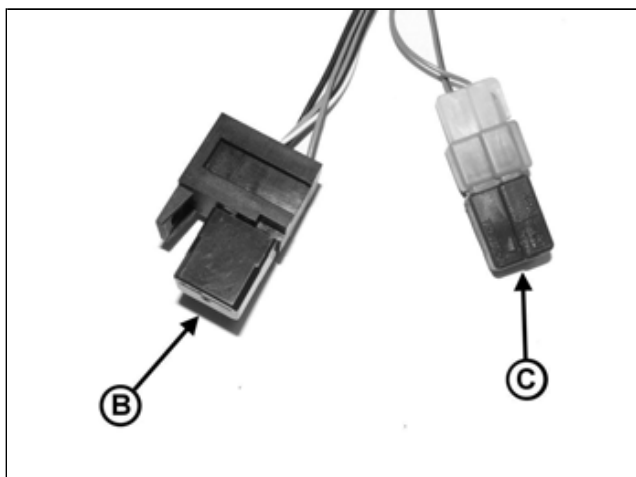
Fig. 1 highlights the connections between the engine and the platform, situated between the steering wheel and the air deflection plate.

The figure highlights:

- Detail **A**, Diode (serves to prevent current return and operates abnormally the safety systems when starting the machine - start as shown in Fig.1).
- Detail **B**, Micro Relays (always have a safety feature for the ignition and work together with the diodes **A**. Furthermore, one has the function to light the indicator for PTO insertion on the dashboard).
- Detail **C**, Diode (has the function to prevent current return from the switch when moved from start to OFF position).

#### **N.B.**

The diodes (details **A** in Fig.1) have a main function in the starting of the machine when in safety mode - therefore carefully observe the mounting polarity as indicated.

**ARTICULATED TRACTOR**

Unlike to the machines steered wheels, on the articulated version with single clutch are present only the following components:

- Detail B (n ° 1), micro relay
- Detail C. Diode, which has the function to prevent the return of the current of the alternator when the start switch is turned to the OFF position.



The battery is located in front of the machine, between the fuel tank and the air filter.  
For battery maintenance, see instructions supplied together with the machine's official documentation.

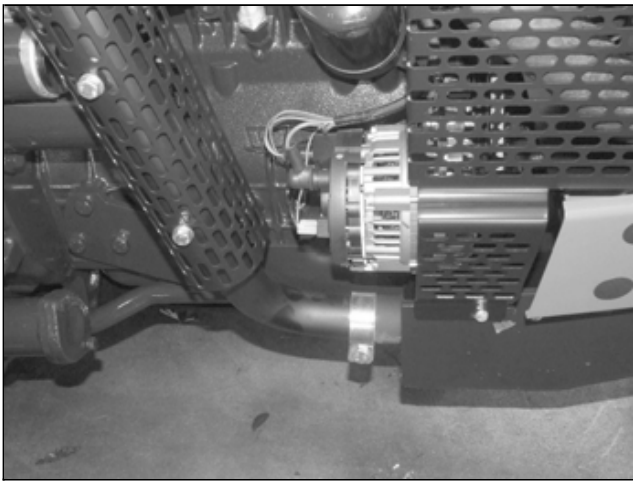


Fig.11

The alternator is located on the front right side of the tractor.

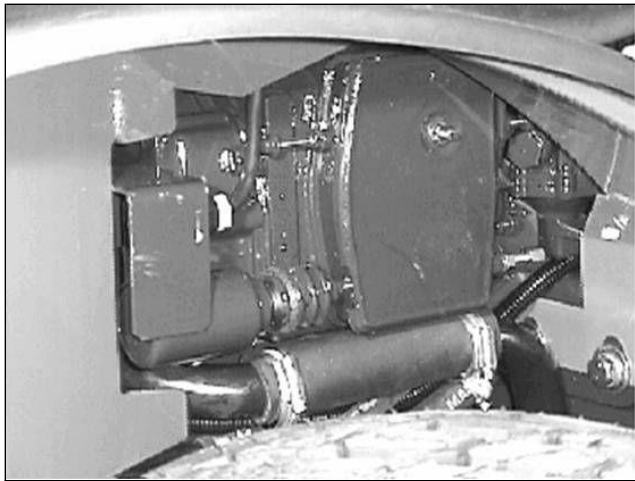


Fig.14

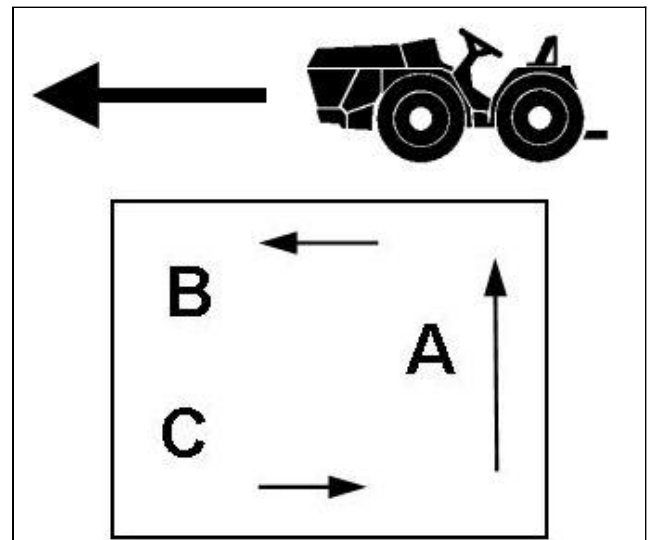


Fig.14a

The figure 14 depicts the electrostop (engine shut off).

The correct connection of the solenoid should reflect the beside scheme.

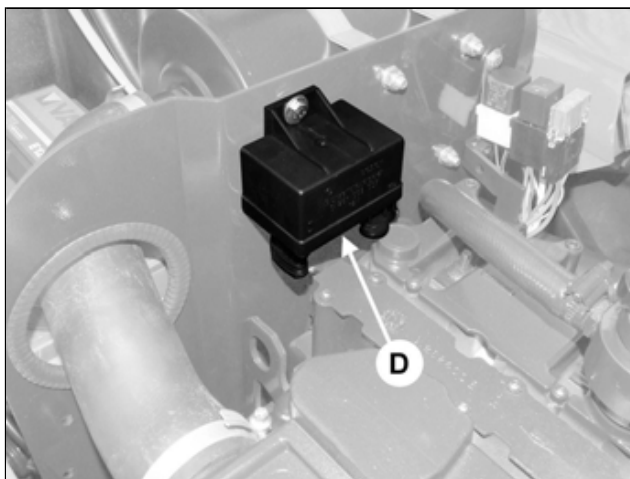
The tip **A** of the solenoid must be connected to 50 of the ignition key.

The tip **C** must be connected to earth.

The tip **B** must be connected to 15 of the key.

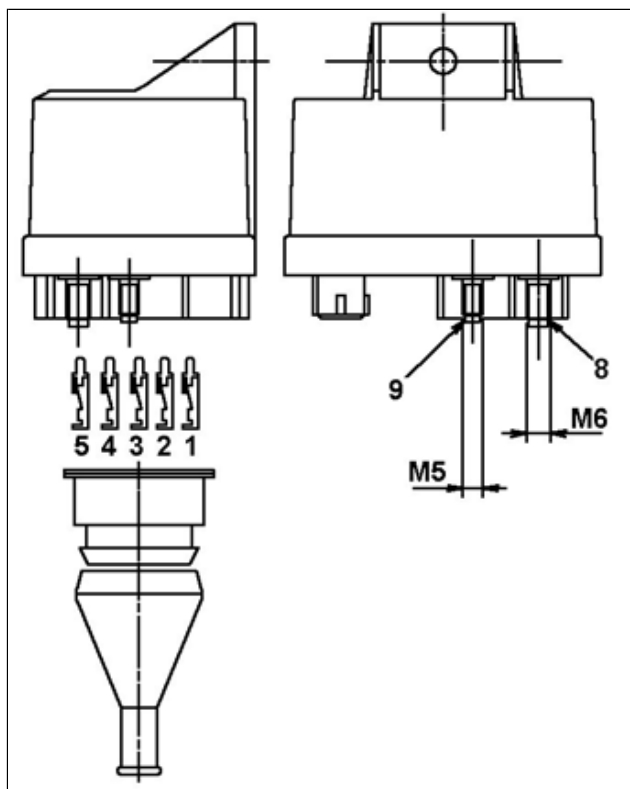
Within the Electrostop, there are two circuits that are energized simultaneously during the ignition phase of the machine. Then remains the sole circuit powered by the 15 that maintains the engine running.

### 63.3.30 - Preheating unit



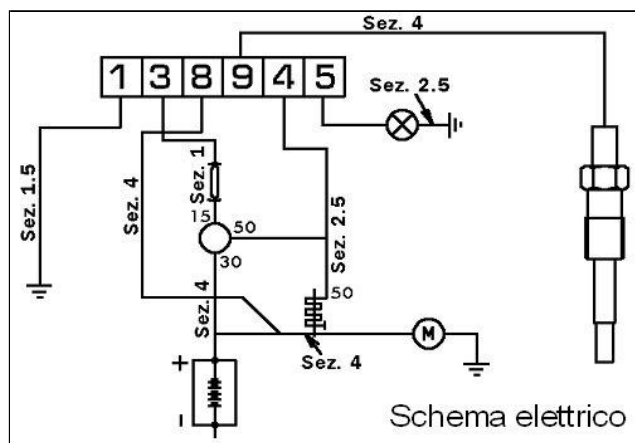
The figure shows the preheating unit (**D**), which is a device to protect against the present pollution on approved VM engines to reduce emissions at start.

It is reported separately the connection diagram of the controller, if it becomes necessary to change it. Being this a direct-injection engine, with very cold climates, the presence of this controller makes it easy to start. The preheating time varies depending on outside temperature.



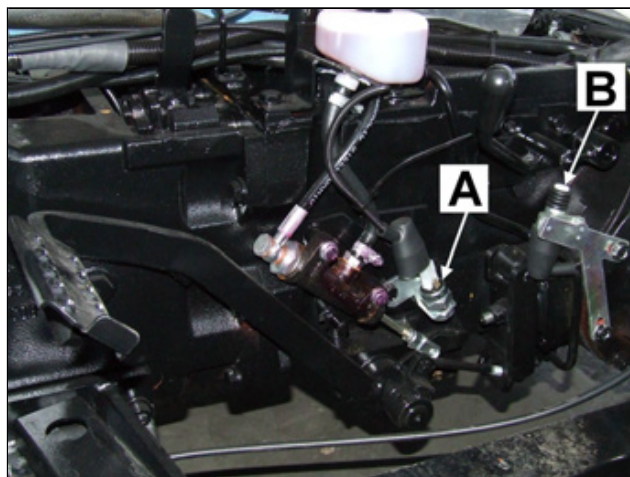
Complete device for preheater glows plugs for engine VM ; ref. VM: 18642001F





Specifications voltage **12V** plugs inrush **10A**

### 63.3.40 - Start enable switches



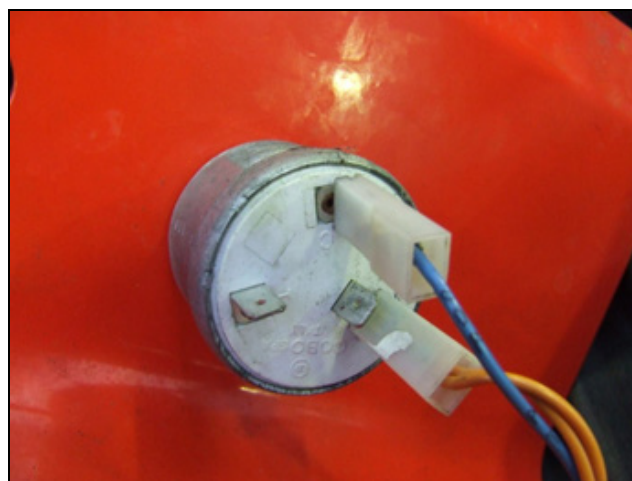
#### STEERING WHEELS TRACTOR

The tractor is equipped with three switches to enable ignition. One is positioned on the clutch pedal (A) which allows to set in motion the engine with the clutch pedal pressed down. The other is positioned on the PTO selector lever (B) which allows starting the engine when the PTO is independantly engaged. A third can be found within the PTO engagement selector which allows the engine to start when the selector is in an OFF position.

#### ARTICULATED TRACTOR

The articulated tractor is equipped with two switches enable starting, one is positioned on the clutch pedal (A) which allows to start the engine with the clutch pedal pressed; another positioned on the selection lever of the PTO (B) which allows you to start the engine with the rear PTO disengaged.

#### PTO SWITCH.



Connect the double orange wire to + terminal  
Connect the blue wire to C terminal

**SECURITY START SWITCH (A)**

The drive clutch is actuated hydraulically.

On the clutch pedal is mounted a switch, as shown in the picture, when pressed (connect the wires on the close contacts behind the switch, the black one on the left, the yellow one on the right) gives the start through a relay (see wiring diagram).

If there are starting problems verify the registration of the switch and / or the efficiency of the relay (in addition to the other conditions on the position of the PTO.)

## SECURITY START SWITCH (B) DOUBLE CLUTCH MACHINE



Connect the wire white-red to **NO** lower terminal



Connect the end white-red wire to the **NO** right terminal

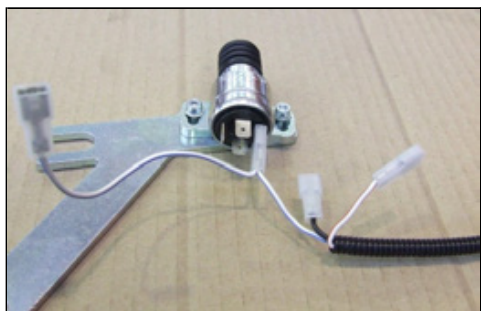


Connect the orange-red wire to **NO** left terminal



Connect the double orange wire to **NO** upper terminal

## SECURITY START SWITCH (B) SINGLE CLUTCH MACHINE



Connect the white-violet wire to **NO** right terminal



Connect the end with violet wire to the **NO** lower terminal



Connect the single black wire to **NO** left terminal



Connect the wire white-red to **NO** upper terminal



### 63.3.50 - Brake switches

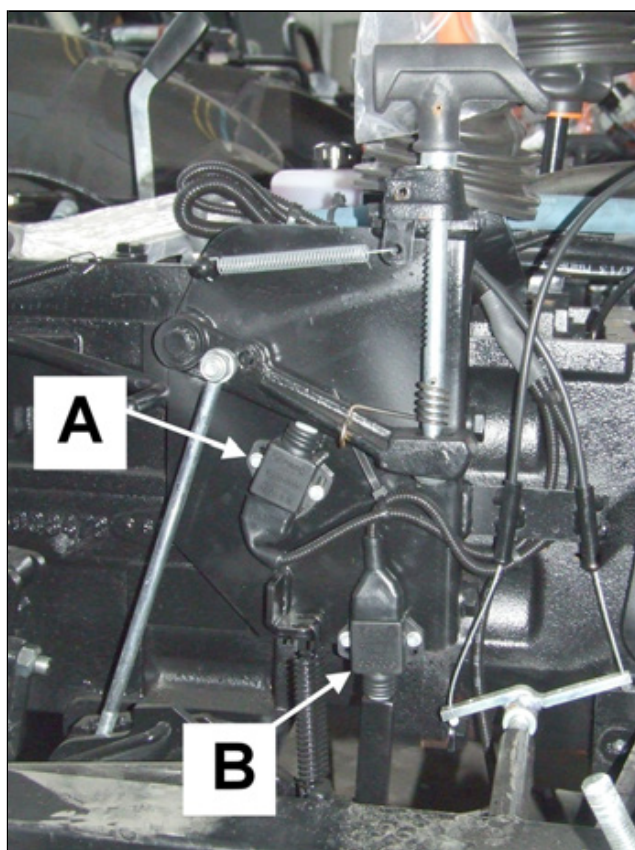


Fig.12

Fig.12 shows two switches, one mounted on the brake pedal (**B**) and the handbrake switch (**A** for assistance and parking). Remember that it is very important to register the two switches correctly, with respect to the brake lever. The switches work in extension and therefore with the pedal at rest position and the handbrake not pulled - they must result compressed. The contacts to be used on the switches are marked by numbers 1 and 2.

The switch on the brake pedal controls the brake lights whereas the handbrake switch controls the parking light indicated on the dashboard.



### 63.3.60 - Sensor and bulbs

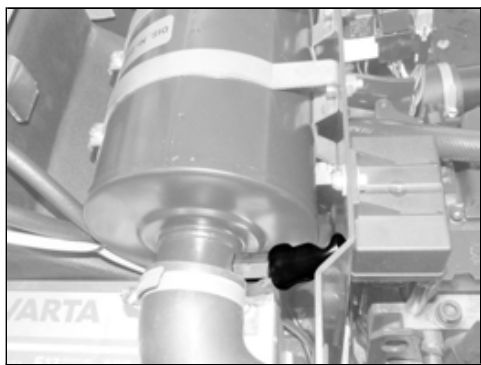


Fig.1

Fig. 1 shows the bulb that indicates the clogged air filter; in the case that even with clean air filter the corresponding indicator light stays lit on the dashboard, first try to disconnect the wires from the bulb and check if it's a short circuit on the wire causing ignition (the light should turn off), then replace the bulb shown in the picture.

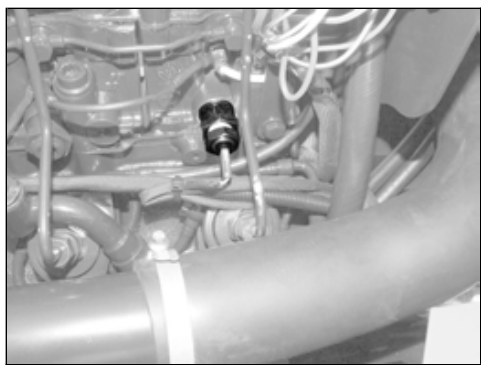


Fig.3

The sensor shown in the figure 3 is positioned on the left side of the engine, near the maxi fuses, and is the sensor that detects the water temperature and sends the signal to the instrument located on the dashboard.

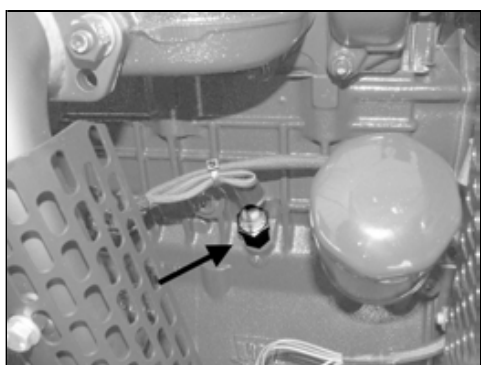


Fig.10

The engine oil pressure sensor is located near the alternator, behind the exhaust collector. The sensor is connected with a negative wire in the case that even with engine oil pressure, the relative light remains lit on the dashboard. First, try unplugging the wire from the sensor and see if it is a short circuit on the wire that ignites the light (the light should switch off). Then replace the sensor shown in Figure 10 once sure there is pressure in the lubrication circuit.

63.3.70 - Multifunction digital instrument

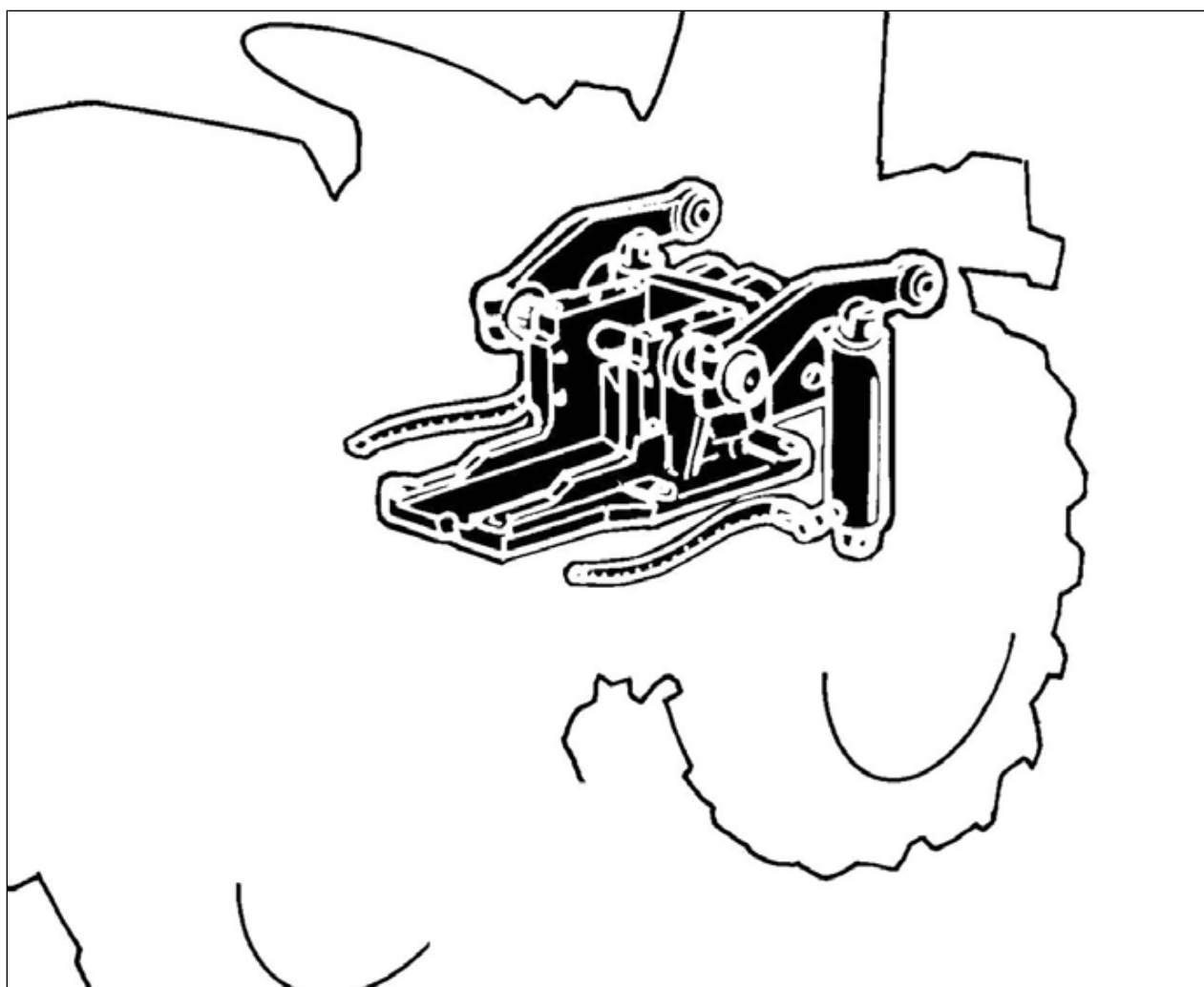


Digital dashboard calibration

Keep the reset button on the dashboard pressed and turn the ignition key until the dashboard lights up.  
The word **SET** will appear with the first number flashing.  
Press the button several times until the correct first number appears.  
Keep the button depressed until the next number flashes.  
Repeat the procedure for all the numbers.  
After the last number has been selected, keep the button depressed until the word **OFF** appears.  
Now turn off the panel. The selection will be correct.

| Machine model.  | Tyres |  | Code |   |   |   |   |   |
|-----------------|-------|--|------|---|---|---|---|---|
|                 |       |  | 1    | 2 | 3 | 4 | 5 | 6 |
|                 |       |  |      |   |   |   |   |   |
| Maxter 60 SN RS | -     |  | 0    | 9 | 0 | 0 | 5 | 1 |

## 78 - REAR LIFT



## 78.1 - ASSEMBLY REAR LIFT ADJUSTMENT

### 78.1.10 - Hydraulic lifter

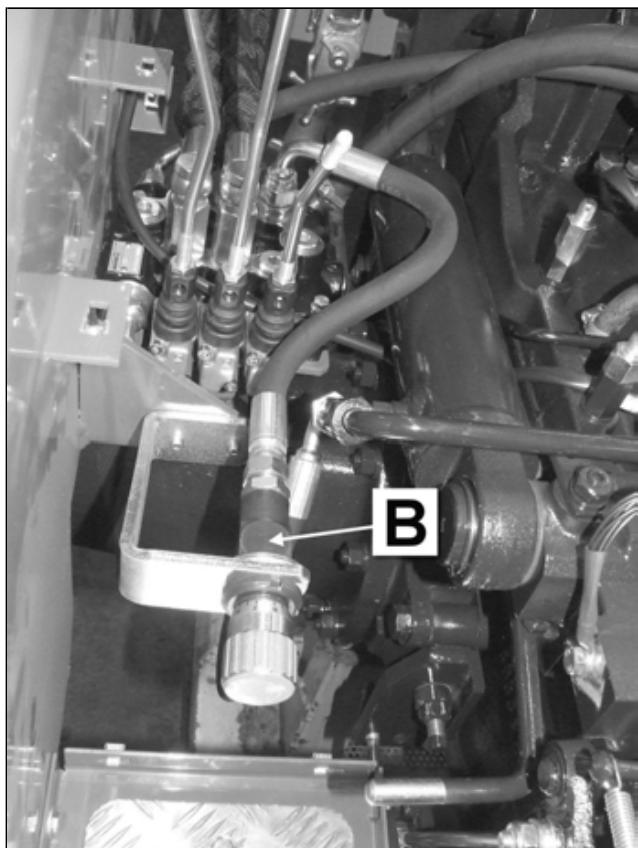


Fig.1

The tractor is equipped with a Up/down rear lifter.

On the pressure pipe to the lifting cylinders is mounted a bidirectional regulator tap (**B** in Fig. 1), that allows to select the correct Up and Down speeds of the lifter.

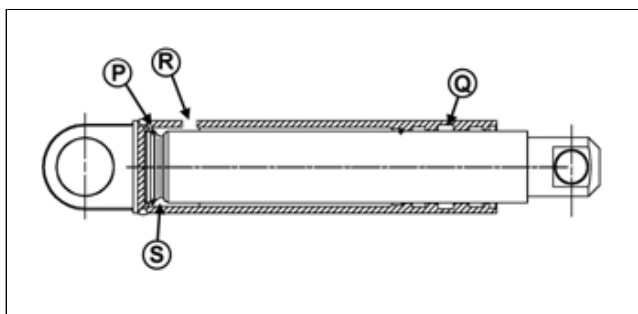


Fig.2

In the drawing above is represented one of the two lifting cylinders which drive the rear linkage.

To be able to replace the seal in **Q** and the adjacent guides, do the following:

- Through the hole power supply **R** of the cylinder, with a screwdriver, remove from its place the ring **P**;
- Extract all the stem and make the replacement of worn seals;
- Insert the piston ring into the groove **S** and reinsert the piston inside the cylinder;
- Correctly position the **P** ring in its housing through the opening **R**.

## 90 - LUBRICANT



## 90.1 - RECOMMENDED LUBRICANTS AND FLUIDS

### 90.1.10 - Original lubricants

| GROUP                      | LUBRICANTS                                                                                                                                                                                                                                                                                                                                                                          | CAPACITY<br>L |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Engine oil                 | <b>ARBOR ALFATECH SYNT 10W-40 oil</b> <ul style="list-style-type: none"> <li>• Viscosity at 100° C (mm<sup>2</sup>/s) 14</li> <li>• Index of viscosity 158</li> <li>• Flash point V.A. (°C) 200</li> <li>• Pour point (°C) -33</li> <li>• Mass Volume at 15 °C (kg/l) 0.875</li> </ul>                                                                                              | 4.5 / 5.5     |
| Front differential housing | <b>ARBOR TRW 90 oil</b> <ul style="list-style-type: none"> <li>• Viscosity at 40° C (mm<sup>2</sup>/s) 135</li> <li>• Viscosity at 100° C (mm<sup>2</sup>/s) 14.3</li> <li>• Viscosity at -26° C (mPa.s) 108000</li> <li>• Index of viscosity 104</li> <li>• Flash point V.A. (°C) 220</li> <li>• Pour point (°C) -27</li> <li>• Mass Volume at 15 °C (kg/l) 0.895</li> </ul>       | 9.2           |
| Gearbox housing            | <b>ARBOR UNIVERSAL 15W-40 oil</b> <ul style="list-style-type: none"> <li>• Viscosity at 40° C (mm<sup>2</sup>/s) 110</li> <li>• Viscosity at 100° C (mm<sup>2</sup>/s) 14</li> <li>• Viscosity at -15° C (mPa.s) 3450</li> <li>• Index of viscosity 135</li> <li>• Flash point V.A. (°C) 220</li> <li>• Pour point (°C) -36</li> <li>• Mass Volume at 15 °C (kg/l) 0.886</li> </ul> | 18            |
| Front reducers.            | <b>ARBOR TRW 90 oil</b> <ul style="list-style-type: none"> <li>• Viscosity at 40° C (mm<sup>2</sup>/s) 135</li> <li>• Viscosity at 100° C (mm<sup>2</sup>/s) 14.3</li> <li>• Viscosity at -26° C (mPa.s) 108000</li> <li>• Index of viscosity 104</li> <li>• Flash point V.A. (°C) 220</li> <li>• Pour point (°C) -27</li> <li>• Mass Volume at 15 °C (kg/l) 0.895</li> </ul>       | 0.7           |
| Rear reducers.             | <b>ARBOR TRW 90 oil</b> <ul style="list-style-type: none"> <li>• Viscosity at 40° C (mm<sup>2</sup>/s) 135</li> <li>• Viscosity at 100° C (mm<sup>2</sup>/s) 14.3</li> <li>• Viscosity at -26° C (mPa.s) 108000</li> <li>• Index of viscosity 104</li> <li>• Flash point V.A. (°C) 220</li> <li>• Pour point (°C) -27</li> <li>• Mass Volume at 15 °C (kg/l) 0.895</li> </ul>       | 0.7           |



| GROUP             | LUBRICANTS                                                                                                                                                                                                                                                                                                                                                                                      | CAPACITY<br>L     |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Clutch pedal pump | <b>ARBOR MTA oil</b> <ul style="list-style-type: none"> <li>• Viscosity at -40° C (mPa.s) 28000</li> <li>• Viscosity at 40° C (mm<sup>2</sup>/s) 35.5</li> <li>• Viscosity at 100° C (mm<sup>2</sup>/s) 7.5</li> <li>• Index of viscosity 160</li> <li>• Flash point V.A. (°C) 200</li> <li>• Pour point (°C) -40</li> <li>• Mass Volume at 15 °C (kg/l) 0.870</li> <li>• Colour red</li> </ul> | Top up the level. |
| Radiator.         | <b>PARAFLU 11 antifreeze fluid</b> <ul style="list-style-type: none"> <li>• Density at 15°C (g/cc) 1.135</li> <li>• pH (dil. 50%) 7,7</li> <li>• Alkaline reserve (ml HCl 0.1 N) 16</li> <li>• Boiling point (dil. 50%) (°C) 108</li> <li>• Graining point (dil. 50%) (°C) -38</li> <li>• Foam at 88°C (cc) 50</li> </ul>                                                                       | 9                 |

## 99 - PROBLEMS AND SOLUTIONS



## 99.1 - TECHNICAL HITCHES - CAUSES - REMEDIES

### 99.1.10 - Table of Screws Torque

| SCREW     | 6.6  |     | 8.8  |      | 10.9 |      | 12.9 |      |
|-----------|------|-----|------|------|------|------|------|------|
|           | (A)  | (B) | (A)  | (B)  | (A)  | (B)  | (A)  | (B)  |
| M 8X1     | 14   | 15  | 25   | 27   | 36   | 38   | 43   | 46   |
| M 8X1.25  | 13.5 | 14  | 23   | 25   | 33   | 35   | 40   | 42   |
| M 10X1.25 | 28   | 30  | 50   | 55   | 70   | 75   | 85   | 90   |
| M 10X1.50 | 26   | 28  | 46   | 50   | 66   | 70   | 80   | 85   |
| M 12X1.25 | 51   | 55  | 90   | 97   | 127  | 135  | 143  | 155  |
| M 12X1.75 | 46   | 48  | 82   | 86   | 115  | 120  | 138  | 145  |
| M 14X1.5  | 80   | 85  | 142  | 153  | 200  | 215  | 240  | 260  |
| M 14X2    | 73   | 78  | 130  | 140  | 182  | 195  | 220  | 235  |
| M 16X1.5  | 120  | 130 | 215  | 230  | 300  | 320  | 360  | 390  |
| M 16X2    | 113  | 120 | 200  | 215  | 280  | 300  | 340  | 360  |
| M 18X1.5  | 175  | 185 | 310  | 330  | 435  | 470  | 520  | 560  |
| M 18X2.5  | 153  | 165 | 270  | 295  | 385  | 415  | 460  | 495  |
| M 20X1.5  | 240  | 265 | 430  | 460  | 610  | 660  | 720  | 770  |
| M 20X2.5  | 220  | 235 | 390  | 415  | 550  | 585  | 660  | 705  |
| M 22X1.5  | 335  | 350 | 570  | 620  | 820  | 880  | 970  | 1050 |
| M 22X2.5  | 295  | 320 | 520  | 565  | 720  | 800  | 880  | 960  |
| M 24X2    | 415  | 440 | 730  | 790  | 1030 | 1100 | 1250 | 1320 |
| M 24X3    | 380  | 405 | 670  | 720  | 950  | 1000 | 1130 | 1220 |
| M 27X2    | 600  | 650 | 1070 | 1150 | 1500 | 1620 | 1800 | 1950 |
| M 27X3    | 560  | 810 | 990  | 1440 | 1400 | 2020 | 1640 | 1800 |
| M 30X2    | 830  | 900 | 1460 | 1600 | 2060 | 2250 | 2500 | 2700 |
| M 30X3.5  | 760  | 810 | 1350 | 1440 | 1890 | 2020 | 2270 | 2430 |

#### N.B.

tightening toques are expressed in Nm, to obtain this value in Kgm divide the value in the table by 9.81.



Zinc plated screw (friction coefficient 0.125)



Burnished screw (friction coefficient 0.14)



#### IMPORTANT

The tractor screws are Class 8.8, except for some special applications which will be shown later.

| SPECIAL CLASS SCREWS                | CLASS OF HARDNESS |
|-------------------------------------|-------------------|
| Fissing screw of differential Crown | 12.9              |
| Steering regulation screw           | 10.9              |

**ENGINE**

| <b>Technical hitches</b>    | <b>Possible causes</b>                                                                                                                                                                                                                     | <b>Remedies</b>                                                                                                                                                                                                                                                           |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The engine has low power.   | <ol style="list-style-type: none"> <li>1. Clogged fuel filter.</li> <li>2. Refusal injector partially blocked.</li> <li>3. Suction of air in the circuit.</li> <li>4. Injectors not calibrated.</li> <li>5. Clogged air filter.</li> </ol> | <ol style="list-style-type: none"> <li>1. Replace the filter.</li> <li>2. Remove the obstruction.</li> <li>3. Make the circuit waterproof.</li> <li>4. Revise or replace the injectors.</li> <li>5. Clean the filter and, if necessary, replace the cartridge.</li> </ol> |
| The engine has a bad start. | <ol style="list-style-type: none"> <li>1. injection pump not calibrated.</li> <li>2. Injectors not calibrated.</li> <li>3. Fuel pump does not work properly.</li> </ol>                                                                    | <ol style="list-style-type: none"> <li>1. Revise or replace the pump.</li> <li>2. Revise or replace the injectors.</li> <li>3. Replace the pump.</li> </ol>                                                                                                               |
| The engine does not start.  | <ol style="list-style-type: none"> <li>1. Damaged electrostop.</li> <li>2. blown fuse.</li> </ol>                                                                                                                                          | <ol style="list-style-type: none"> <li>1. Replace the electrostop.</li> <li>2. Check the fuses box, remove any cause that caused the short circuit of the fuse and replace.</li> </ol>                                                                                    |
| The engine does not stop.   | <ol style="list-style-type: none"> <li>1. Electrostop with powder.</li> </ol>                                                                                                                                                              | <ol style="list-style-type: none"> <li>1. Clean the electrostop.</li> </ol>                                                                                                                                                                                               |

**CLUTCH - TRANSMISSION**

| <b>Technical hitches</b>    | <b>Possible causes</b>                                                                                                                                                                                                                                                                         | <b>Remedies</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The clutch slides           | <ol style="list-style-type: none"> <li>1. Clutch disk is dirty with oil.</li> <li>2. Clutch without correct adjustment play.</li> </ol>                                                                                                                                                        | <ol style="list-style-type: none"> <li>1. Remove any oil leaks, clean the flywheel and replace the clutch disk.</li> <li>2. Adjust the clutch pedal.</li> </ol>                                                                                                                                                                                                                                                                                                              |
| The clutch does not detach. | <ol style="list-style-type: none"> <li>1. Clutch disk wavy or undulated.</li> <li>2. Clutch release lever bent.</li> <li>3. Pressure plate levers not properly registered.</li> <li>4. Clutch disk glued to the engine flywheel.</li> <li>5. Clutch with excessive adjustment play.</li> </ol> | <ol style="list-style-type: none"> <li>1. Replace the clutch disk.</li> <li>2. Replace the clutch disengagement lever.</li> <li>3. Make sure the levers are not worn out and if not, proceed with their registration.</li> <li>4. Start the machine, lock the brakes, engage and disengage repeatedly the clutch and if the outcome is negative, remove and clean the clutch.</li> <li>5. Adjust the external linkages, and if necessary, also the internal ones.</li> </ol> |

**GEARBOX**

| Technical hitches                                    | Possible causes                                                                                                                                                                                                                                                                               | Remedies                                                                                                                                                                                                                          |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gearbox scratches.                                   | 1. Synchronizers are worn.                                                                                                                                                                                                                                                                    | 1. Demount the gearbox and replace the synchronizers.                                                                                                                                                                             |
| Gearbox is noisy during his functioning.             | 1. Insufficient oil level.<br>2. Bearings are worn.                                                                                                                                                                                                                                           | 1. Check oil level.<br>2. Replace the bearings.                                                                                                                                                                                   |
| The gears disengage.                                 | 1. Synchronizer stack and speed selection gears have excessive adjustment play.<br>2. Incorrect synchronization between speed selection rod and sliding sleeve engagement.<br>3. Sliding sleeve speed engagement and gearbox selector with worn teeth due to malfunction of the synchronizer. | 1. Restore the adjustment play required.<br>2. Restore the drive transmission, deleting all clearance and replacing, if necessary, rod, spring and selection sphere.<br>3. Replace the complete synchronizer and selecting gears. |
| The gears do not engage.                             | 1. The clutch does not detach.<br>2. Synchronizer with ring brake is wavy or undulated.<br>3. Synchronizer stack and speed selection gears with little axial play.                                                                                                                            | 1. Adjust the clutch as required.<br>2. Replace the ring brakes.<br>3. Restore the adjustment play required.                                                                                                                      |
| The transmission or reducer are difficult to engage. | 1. Check lubrication on levers.                                                                                                                                                                                                                                                               | 1. Grease the levers.                                                                                                                                                                                                             |
| The reverser does not engage.                        | 1. The clutch does not detach.                                                                                                                                                                                                                                                                | 1. Adjust the clutch as required.                                                                                                                                                                                                 |

**DIRECTION REVERSER**

| Technical hitches                    | Possible causes                 | Remedies                                                   |
|--------------------------------------|---------------------------------|------------------------------------------------------------|
| Reverser scratches.                  | 1. Synchronizers are worn.      | 1. Demount the frontal group and replace the synchronizer. |
| The reverser is difficult to engage. | 1. Check lubrication on levers. | 1. Grease the levers.                                      |
| The reverser does not engage.        | 1. The clutch does not detach.  | 1. Adjust the clutch as required.                          |

**FRONT DIFFERENTIAL**

| Technical hitches                                                    | Possible causes                                | Remedies                  |
|----------------------------------------------------------------------|------------------------------------------------|---------------------------|
| The differential emits a dull sound in acceleration or deceleration. | 1. Excessive tolerance play in the bevel gear. | 1. Adjust the bevel gear. |
| The differential emits an alternating noise.                         | 1. The bevel gear bearings are worn out.       | 1. Replace the bearings.  |

**REAR DIFFERENTIAL LOCK.**

| Technical hitches                                | Possible causes                                                                                                                                                                                                                                                                       | Remedies                                                                                                                                                                                                                                     |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Noisy axle.                                      | <ol style="list-style-type: none"> <li>1. Differential lock disengagement command not adjusted.</li> <li>2. Differential lock disengagement internal lever not adjusted.</li> <li>3. Bevel gear not adjusted.</li> </ol>                                                              | <ol style="list-style-type: none"> <li>1. Adjust the command.</li> <li>2. Adjust the levers.</li> <li>3. Adjust the bevel gear.</li> </ol>                                                                                                   |
| The differential lock does not work.             | <ol style="list-style-type: none"> <li>1. Rupture of the holding pin between the shaft and fork.</li> <li>2. Rupture of the pin between the shaft and command lever.</li> <li>3. Damage of the spheres or shaft.</li> <li>4. The spheres have moved out of their position.</li> </ol> | <ol style="list-style-type: none"> <li>1. Replace the plug.</li> <li>2. Replace the plug.</li> <li>3. Replace the spheres or planetary or sliding sleeve.</li> <li>4. Check the correctness of the stroke of the sliding sleeves.</li> </ol> |
| Hissing or noisy sound of the differential lock. | <ol style="list-style-type: none"> <li>1. The bevel gear does not have sufficient adjustment play.</li> <li>2. Insufficient oil level.</li> </ol>                                                                                                                                     | <ol style="list-style-type: none"> <li>1. Adjust the bevel gear.</li> <li>2. Check oil level.</li> </ol>                                                                                                                                     |



**FRONT REDUCERS.**

| Technical hitches                                        | Possible causes                                                                                                                                                | Remedies                                                                                                                                   |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Noisy wheels.                                            | <ol style="list-style-type: none"> <li>1. Screws fixing flange and rims are slow.</li> <li>2. Axial adjustment play on the axle shafts.</li> </ol>             | <ol style="list-style-type: none"> <li>1. Tighten the screws to torque.</li> <li>2. Eliminate the adjustment play as described.</li> </ol> |
| The reducer is noisy.                                    | <ol style="list-style-type: none"> <li>1. Worn bearings or gears.</li> </ol>                                                                                   | <ol style="list-style-type: none"> <li>1. Replace bearings and check the gears.</li> </ol>                                                 |
| During steering, a noisy sound comes from the wheel hub. | <ol style="list-style-type: none"> <li>1. The universal joint of the axle shaft (steering wheels version) is damaged or the fixed bush is worn out.</li> </ol> | <ol style="list-style-type: none"> <li>1. Replace the universal joint and check the fixed bush.</li> </ol>                                 |
| The hub has adjustment play.                             | <ol style="list-style-type: none"> <li>1. The washers or bushings are worn out.</li> <li>2. The steering head is damaged.</li> </ol>                           | <ol style="list-style-type: none"> <li>1. Change the washers or bushings.</li> <li>2. Replace the joints.</li> </ol>                       |
| Oil leak on the wheel side.                              | <ol style="list-style-type: none"> <li>1. Damaged oil seal.</li> </ol>                                                                                         | <ol style="list-style-type: none"> <li>1. Replace the oil seals.</li> </ol>                                                                |

**REAR REDUCERS.**

| Technical hitches           | Possible causes                                                                                                                                    | Remedies                                                                                                                                   |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Noisy wheels.               | <ol style="list-style-type: none"> <li>1. Screws fixing flange and rims are slow.</li> <li>2. Axial adjustment play on the axle shafts.</li> </ol> | <ol style="list-style-type: none"> <li>1. Tighten the screws to torque.</li> <li>2. Eliminate the adjustment play as described.</li> </ol> |
| The reducer is noisy.       | <ol style="list-style-type: none"> <li>1. Worn bearings or gears.</li> </ol>                                                                       | <ol style="list-style-type: none"> <li>1. Replace bearings and check the gears.</li> </ol>                                                 |
| Oil leak on the wheel side. | <ol style="list-style-type: none"> <li>1. Damaged oil seal.</li> </ol>                                                                             | <ol style="list-style-type: none"> <li>1. Replace the oil seals.</li> </ol>                                                                |

**POWER TAKE-OFF**

| <b>Technical hitches</b>                      | <b>Possible causes</b>                                                                                                                                                                                                             | <b>Remedies</b>                                                                                                                                                                                                                                                   |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The clutch slips or does not transmit motion. | <ol style="list-style-type: none"> <li>1. Used disks.</li> <li>2. Insufficient oil pressure.</li> <li>3. The solenoid valve command does not open the oil passage.</li> <li>4. The shaft or clutch pack seals are worn.</li> </ol> | <ol style="list-style-type: none"> <li>1. Replace the clutch disks.</li> <li>2. Calibrate the pressure or flow-rate valve of the solenoid valve group.</li> <li>3. Check electrical connection and/or clean the valves.</li> <li>4. Replace the seals.</li> </ol> |
| Oil leak from the shaft.                      | <ol style="list-style-type: none"> <li>1. Damaged oil seal.</li> </ol>                                                                                                                                                             | <ol style="list-style-type: none"> <li>1. Replace the oil seals.</li> </ol>                                                                                                                                                                                       |
| The PTO shaft has too much adjustment play.   | <ol style="list-style-type: none"> <li>1. Bearings are weared.</li> </ol>                                                                                                                                                          | <ol style="list-style-type: none"> <li>1. Remove the rear casting of the PTO and replace the bearings.</li> </ol>                                                                                                                                                 |
| The PTO disengages.                           | <ol style="list-style-type: none"> <li>1. PTO engine or selection command not adjusted.</li> <li>2. Selection control of 540/750 rpm is not adjusted.</li> </ol>                                                                   | <ol style="list-style-type: none"> <li>1. Adjust the selection as required.</li> </ol>                                                                                                                                                                            |
| The PTO does not engage.                      | <ol style="list-style-type: none"> <li>1. PTO engine or selection command not adjusted.</li> </ol>                                                                                                                                 | <ol style="list-style-type: none"> <li>1. Adjust the selection as required.</li> </ol>                                                                                                                                                                            |
| The PTO is noisy.                             | <ol style="list-style-type: none"> <li>1. With the equipment application that requires little effort and with an uneven rotation.</li> <li>2. Adjustment play on the PTO shaft.</li> </ol>                                         | <ol style="list-style-type: none"> <li>1. There is no remedy to a problem concerning an inconvenience on the equipment.</li> <li>2. Adjust the shaft as explained and control the fluency of the cardan joints connected.</li> </ol>                              |

**BRAKES**

| <b>Technical hitches</b>    | <b>Possible causes</b>                                                                                                                                                      | <b>Remedies</b>                                                                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| The machine does not brake. | <ol style="list-style-type: none"> <li>1. Brakes not adjusted.</li> <li>2. Worn brake disks.</li> </ol>                                                                     | <ol style="list-style-type: none"> <li>1. Adjust emergency and parking brakes.</li> <li>2. Replace disks.</li> </ol>                                |
| The machine remains braked. | <ol style="list-style-type: none"> <li>1. Brakes not adjusted.</li> <li>2. Broken return springs.</li> <li>3. Hardened commands due to insufficient lubrication.</li> </ol> | <ol style="list-style-type: none"> <li>1. Adjust emergency and parking brakes.</li> <li>2. Replace springs.</li> <li>3. Restore fluency.</li> </ol> |
| Uneven braking.             | <ol style="list-style-type: none"> <li>1. Brakes not adjusted.</li> </ol>                                                                                                   | <ol style="list-style-type: none"> <li>1. Adjust the service brakes taking into consideration its simultaneous adjustability.</li> </ol>            |

**STEERING**

| <b>Technical hitches</b>                 | <b>Possible causes</b>                                                                                                                                                                                                                                                                                         | <b>Remedies</b>                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Loss of control in driving the machine.  | <ol style="list-style-type: none"> <li>1. Steering cylinder with worn retention rings</li> <li>2. Hydraulic steering with antishock valves not correctly calibrated.</li> <li>3. Suction of air in the circuit.</li> </ol>                                                                                     | <ol style="list-style-type: none"> <li>1. Replace the cylinder retention rings</li> <li>2. Check after careful cleaning of the valves, if you have the prescribed pressure levels, if you don't reach those levels change the hydraulic steering</li> <li>3. Check all the clamps and the unions of the oil inlet circuit</li> </ol>                                                                                    |
| Loss of oil from the hydraulic steering. | <ol style="list-style-type: none"> <li>1. Loose fittings.</li> <li>2. Worn sealing rings.</li> <li>3. Closed hydraulic steering discharge.</li> </ol>                                                                                                                                                          | <ol style="list-style-type: none"> <li>1. Tighten fittings.</li> <li>2. Restore the hydraulic steering sealing.</li> <li>3. Check the status of the exhaust pipe and the operation of lifting distributor.</li> </ol>                                                                                                                                                                                                   |
| Difficult steering.                      | <ol style="list-style-type: none"> <li>1. Hydraulic steering with low pressure.</li> <li>2. Presence of air on the circuit.</li> <li>3. Priority LS valve badly adjusted</li> <li>4. Poor performance of the gear pump.</li> <li>5. Steering column rusted</li> <li>6. Excessive load on front axle</li> </ol> | <ol style="list-style-type: none"> <li>1. Check and restore the maximum pressure of the circuit</li> <li>2. Clean carefully the suction circuit and check the tightness.</li> <li>3. Clean and carefully reassemble the valve, control the wear and the sliding.</li> <li>4. Update it or replace it.</li> <li>5. disassemble and lubricate the steering column</li> <li>6. Check the load on the front axle</li> </ol> |

**CENTRAL ARTICULATION**

| Technical hitches                                               | Possible causes                          | Remedies                                           |
|-----------------------------------------------------------------|------------------------------------------|----------------------------------------------------|
| The tractor does not follow the changes in terrain.             | 1. Connecting pin with friction.         | 1. Greasing the bushings                           |
| Hear noise when steering.                                       | 1. Wearing semishaft universal joint.    | 1. Change the universal joint in the cardan shaft. |
| During breaking and starting the front and back part is moving. | 1. Wearing connecting pins and bushings. | 1. Change the pin and the bushings.                |

**ELECTRICAL SYSTEM**

| Technical hitches                                                            | Possible causes                                                                                                                                                                                                                                                                                                                                             | Remedies                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The starter doesn't work.                                                    | <ol style="list-style-type: none"> <li>1. The battery is low or damaged</li> <li>2. The starter is defective.</li> <li>3. The start switch is defective.</li> <li>4. Battery cables oxidized or broken to the terminal.</li> <li>5. Start release switch on the machine is not registered.</li> <li>6. PTO selection switch is in work position.</li> </ol> | <ol style="list-style-type: none"> <li>1. Provide for recharging the battery, if it does not stay, replace it.</li> <li>2. Revise or replace the starter.</li> <li>3. Replace the switch.</li> <li>4. Replace or clean terminals oxidized.</li> <li>5. Set the switches or replace if necessary.</li> <li>6. Disconnect the rear PTO (red knob).</li> </ol> |
| The generator's light still on also with a high number of engine revolution. | 1. The alternator is not charging enough.                                                                                                                                                                                                                                                                                                                   | 1. Revise or replace the alternator.                                                                                                                                                                                                                                                                                                                        |
| The battery is deformed.                                                     | 1. The battery is too charged.                                                                                                                                                                                                                                                                                                                              | 1. Revise or replace the alternator.                                                                                                                                                                                                                                                                                                                        |
| the battery liquid become black.                                             | 1. Damaged element.                                                                                                                                                                                                                                                                                                                                         | 1. Replace the battery.                                                                                                                                                                                                                                                                                                                                     |
| The rev counter doesn't work.                                                | <ol style="list-style-type: none"> <li>1. Does not reach the feed pulse.</li> <li>2. Wrong calibration of the instrument.</li> <li>3. Damaged instrument.</li> </ol>                                                                                                                                                                                        | <ol style="list-style-type: none"> <li>1. Reset the circuit.</li> <li>2. Reset the instrument.</li> <li>3. Replace it.</li> </ol>                                                                                                                                                                                                                           |

**HYDRAULIC CIRCUIT**

| Technical hitches                                                                | Possible causes                                                                                                                                  | Remedies                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| overheating pump.                                                                | <ol style="list-style-type: none"> <li>1. Excessive pressure.</li> <li>2. Cavitation.</li> </ol>                                                 | <ol style="list-style-type: none"> <li>1. Reduce the pressure to the normal values.</li> <li>2. Clean the suction stuff; check the fittings.</li> </ol>                                                                |
| None pressure pump.                                                              | <ol style="list-style-type: none"> <li>1. Breaking of the pump shaft.</li> </ol>                                                                 | <ol style="list-style-type: none"> <li>1. Replace the pump.</li> </ol>                                                                                                                                                 |
| Noisy pump.                                                                      | <ol style="list-style-type: none"> <li>1. Cavitation.</li> <li>2. Imperfect seal on shaft pump.</li> <li>3. body pump not waterproof.</li> </ol> | <ol style="list-style-type: none"> <li>1. Clean the suction stuff; check the fittings.</li> <li>2. Replace the oil seals.</li> <li>3. Tighten the screws of the pump housing and replace the sealing rings.</li> </ol> |
| The oil in the circuit becomes foamy and increase in volume in an anomalous way. | <ol style="list-style-type: none"> <li>1. Suction of air in the circuit.</li> <li>2. Pump cavitation.</li> </ol>                                 | <ol style="list-style-type: none"> <li>1. Verify the oil level and eliminate any suction of air.</li> <li>2. Clean the suction stuff; check the fittings.</li> </ol>                                                   |

**POWER LIFT**

| Technical hitches                                                                 | Possible causes                                                                                                                                  | Remedies                                                                                                                                                                      |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The lift raises to jerks.                                                         | <ol style="list-style-type: none"> <li>1. Clogged intake filter hydraulic pump.</li> <li>2. Air on intake pipe of the hydraulic pump.</li> </ol> | <ol style="list-style-type: none"> <li>1. Clean the filter, change it if necessary</li> <li>2. Tighten the fittings of the suction circuit and look out the leaks.</li> </ol> |
| The lift has difficulty to holding the load: with the engine stop the load drops. | <ol style="list-style-type: none"> <li>1. Lift distributor with internal leaking.</li> </ol>                                                     | <ol style="list-style-type: none"> <li>1. Replace the seals or if necessary replace the complete distributor.</li> </ol>                                                      |
| The lift does not reach the prescribed lifting capacity.                          | <ol style="list-style-type: none"> <li>1. Calibration valve not correct.</li> </ol>                                                              | <ol style="list-style-type: none"> <li>1. Record the pressure value following the instructions provided in the chapter on plumbing.</li> </ol>                                |

## TOOLS LIST

### TOOLS LIST

| GROUP | CODE     | DESCRIPTION                                                            | QUANTITY |
|-------|----------|------------------------------------------------------------------------|----------|
| 27    | 07006228 | CENTERING PIN CLUTCH 02020046                                          | 1        |
| 33    | 07003542 | BEARING ASSEMBLY BUFFER                                                | 1        |
| 33    | 07006227 | OIL SEALS 06220124 ASSEMBLY BUFFER                                     | 1        |
| 33    | 07006229 | OIL SEALS 06220188 ASSEMBLY BUFFER                                     | 1        |
| 33    | 07006441 | OIL SEALS 06220189 ASSEMBLY BUFFER                                     | 1        |
| 54    | 07006446 | NUT KEY REGISTER TOOL                                                  | 1        |
| 60    | 07000122 | HYDRAULIC GAUGE                                                        | 1        |
| 60    | 07006212 | STEERING WHEEL PULLER                                                  | 1        |
| 60    | 00061157 | FITTING FOR DETECTING THE WORKING PRESSURE OF<br>THE HYDRAULIC CIRCUIT | 1        |