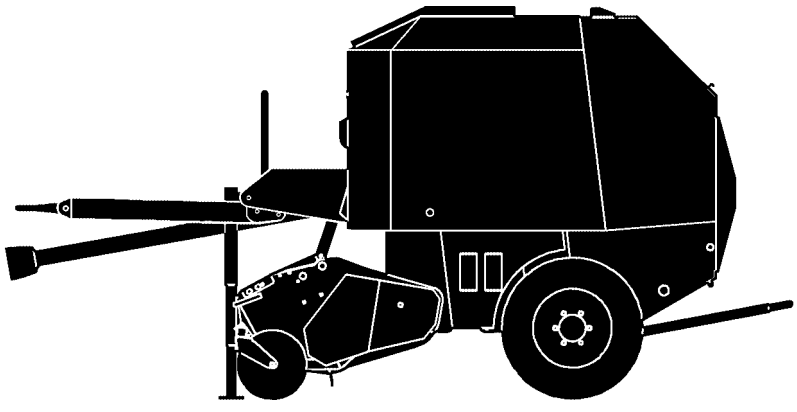
REPAIR MANUAL

CLAAS



CLAAS
ROLLANT 250
ROLLANT 250 ROTO CUT

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1
General information

GENERAL

Introduction

This CLAAS REPAIR MANUAL is to assist in preserving the permanent working order and therefore the high value of your CLAAS round baler by careful maintenance and service.

Experience gathered by both our service engineers and factory staff has been compiled in this REPAIR MANUAL.

The figures explain the procedure of repairs and the text describes the different adjustments to be made, the use of CLAAS special tools etc.

The illustrations included in support to the explanations show the sequence of major repairs so that minor repairs can easily be followed.

The CLAAS REPAIR MANUAL is filed in a folder which allows to insert supplementary pages as issued following technical developments and to always have an updated manual at hand for reference.

To be sure, always compare settings and filling capacities with specifications stated in the current Operator's Manual which applies to the machine.

CLAAS KGaA mbH
Service Department

Introduction to the CLAAS REPAIR MANUAL

The CLAAS REPAIR MANUAL is divided into main groups and subgroups.

Pages and illustrations are numbered consecutively throughout each main group. The first figure at the bottom of each page refers to the main group whereas the second figure following the point indicates the subgroup; the figure behind the second point indicates the page number. In each subgroup, the figures and pages are numbered consecutively, starting at 1.

Where differences between the machine types must be observed, this is indicated in headings. Where a service procedure applies to all machines covered by this book, the machine names are not specifically given.

When supplements are to be added, the subgroups are supplemented or exchanged. All supplements are inserted into the respective main group / subgroup and the table of contents is updated.

The symbols communicate brief messages when recurring service procedures are described. Their meaning is explained at the beginning of this manual.

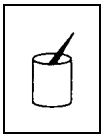
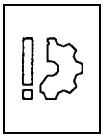
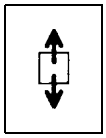
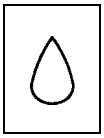
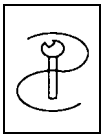
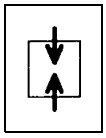
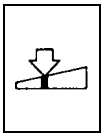
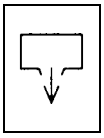
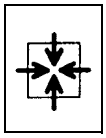
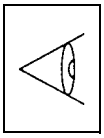
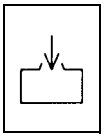
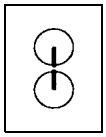
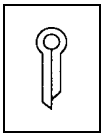
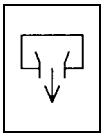
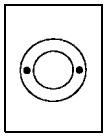
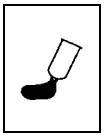
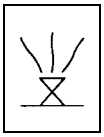
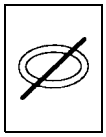
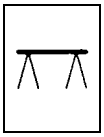
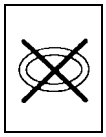
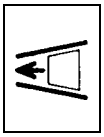
The section “GENERAL REPAIR INSTRUCTIONS” at the beginning of this manual contains useful practical hints. Read and follow these fundamental instructions. They are the basis for reliable service and durability of parts after repairs have been carried out.

The description of a particular service procedure can easily be found by checking the table of contents of the appropriate main group / subgroup.

Key to symbols

This CLAAS REPAIR MANUAL uses some symbols as defined in the “DIN 30600 Symbol summary” by the German Standardisation Institute (DIN).

The meaning of these symbols will be easily recognised and remembered by the user. These symbols are to help to quickly recognise recurring service procedures and they also help to communicate information shown on the illustrations.

 Dismantle, remove	 Grease	 Prevent damage to materials
 Disassemble	 Oil	 Special tools
 Assemble	 Adjust/set	 Drain, outlet
 Install, mount on	 Check visually	 Fill, filler opening
 Mark	 Unlock, release, secure	 Overflow
 Balance	 Lock by means of liquids, glue, seal	 Bleed
 Possibly reuseable	 Underprop, support	
 Renew on each assembly	 Observe direction of installation	

SAFETY RULES

Important information

The instructions contained in this manual should be carefully read and observed by all persons who are concerned with the operation, maintenance and inspection of this machine in order to prevent accidents. In particular, read the section “Safety rules”.

The use of spare parts, accessories and ancillary equipment other than genuine CLAAS products or those which have been tested and approved by CLAAS, may change the specified design characteristics of this CLAAS machine or detract from its functional performance, with a possible adverse effect on the active and/or passive operational safety of the machine and its occupational safety standards (accident prevention).

CLAAS is in no way liable for any damage or personal injury caused through the use of other than original or approved CLAAS parts, accessories and ancillary equipment.

Technical data, dimensions and weights are given as an indication only. CLAAS reserve the right to make changes subsequently as technical developments continue. Responsibility for errors and omissions not accepted.

IMPORTANT: Front, rear, right and left refer to the direction of forward travel.

Identification of warning and danger signs

All parts of this manual having to do with your safety or the safe operation of the machine are marked with the following signs. Please pass all safety instructions on to other users, too.

Danger!

Sign to indicate instructions which must be observed. Failure to do so would cause danger to life and limb to the operator and the people around him.

☞Preventive measures

Caution!

Sign to indicate instructions which must be observed. Failure to do so could result in damage to the machine.

☞Measures to prevent damage to the machine

Note!

Sign to indicate instructions for a more efficient and economic use of the machine.

Important!

Sign to indicate instructions to be followed during disassembly / assembly.

Environment!

Sign to indicate instructions which must be observed in order to avoid damage to the environment.

Danger to the environment is caused by irregular handling and incorrect disposal of toxic material (e.g. used oil).

The warning and instruction signs placed on the round baler provide recommendations for safe operation. These instructions involve your safety – observe them at all times!

Correct use of the round baler

Fitting and retrofitting of ancillary equipment which is not originally manufactured by CLAAS, and, in addition, also modifications and changes may only be carried out with the consent of CLAAS, as any such actions may have considerable adverse effects on the safety and operational function of the machine.

Any arbitrary modifications carried out on the round baler will relieve the manufacturer of all liability for any resulting damage or injury.

General safety and accident prevention regulations

1. In addition to the instructions contained in this manual, also observe the general safety and accident prevention regulations.
2. Always comply with local traffic regulations when driving on public roads!
3. Clothing worn by the fitter must be close-fitting. Avoid wearing loose jackets and shirts.
4. Prevent fires by keeping the machine clean!

Leaving the round baler

1. Repair, service and cleaning work and the elimination of malfunctions should only be performed with the drive and the tractor engine switched off – remove the ignition key!
2. Escaping fluid (fuel or hydraulic oil) under high pressure can penetrate the skin and cause serious injury. In such a case, consult a doctor immediately as otherwise serious infections may result!

Service

1. Repair, service and cleaning work and the elimination of malfunctions should only be performed with the drive and the tractor engine switched off – remove the ignition key!
2. Escaping fluid (fuel or hydraulic oil) under high pressure can penetrate the skin and cause serious injury. In such a case, consult a doctor immediately as otherwise serious infections may result!
3. Dispose of oil, fuel and filters in a way that is harmless to the environment and in accordance with existing anti-pollution regulations.
4. Do not attempt to mount a tyre unless you have the proper equipment and experience to perform the job safely.
5. Retighten the wheel nuts regularly.
6. Only have qualified workshops carry our repair work on the hydraulic system.

Basic rule

Always check the operating and road safety of the round baler before using it!

GENERAL REPAIR INFORMATION

Reason of damage

Identify reason of damage, limit the case of damage and safeguard the machine.

Spare parts

Use genuine CLAAS spare parts and corresponding CLAAS special tools.

Indicate the machine number of the round baler and also the respective serial numbers when ordering spare parts and in case of technical questions. This is necessary as otherwise, incorrect spare part deliveries may result.

Transmission

When removing the transmission, first drain the oil and then remove the transmission. Separate parts which are firmly connected with each other by means of a soft metal-tip or plastic-tip hammer.

Tensioning the steel roller chains

Find the centre point in the slack span between sprockets. With the tight span slightly under load, push in the centre point of the slack span with the thumb. The chain tension is correct when its slack span deflects about 2% of the centre distance between shafts. Check chain tension more frequently when using new chains.

Example: For a distance between centres of shafts of 500 mm, the slack span of the chain should deflect about 10 mm.

Taper ring fasteners

Taper ring fasteners provide a safe mechanical connection, even when transmitting high forces from the driving element on the shaft and vice versa, if they are properly prestressed.

Installation:

When installing taper ring fasteners, it is important that the shaft, hub, parallel key and the taper rings have been thoroughly cleaned, that semi-fluid lubricant of NLGI class 00 (e.g. Shell Retinax G or similar brands) is applied and that the components are tightened to the specified torque in the correct order of assembly.

Caution!

No solid grease must be used when assembling the parts.

Removal:

After loosening the axial clamping, loosen the taper ring fasteners with a sharp blow, using a block-ended tube.

Caution!

The inside diameter of the block-ended tube must be large enough to extend over the tapered ring.

Self-locking bolts

(with microencapsulated adhesive)

Replace self-locking bolts, e.g. Verbus-Plus / Imbus-Plus and similar types every time such bolts are removed. In exceptional cases, they may be reused up to three times. Always observe the specified tightening torque.

Always tighten self-locking bolts with microencapsulated adhesive rapidly to the specified tightening torque. When removing these bolts, quickly unscrew them completely. These self-locking bolts must not come into contact with sealing compound (e.g. “Epple 33” or similar products).

In individual cases, bolts with liquid locking compound can be used instead of self-locking bolts only where these bolts can be heated up to approx. 200 °C for removing them. Ensure that the specified quality grade of bolts (8.8/10.9 or similar grades) is observed here as well.

Self-locking bolts with microencapsulated adhesive may be used only where operating temperatures will not exceed +90 °C max. These bolts can be subjected to full stress after 24 hours at +20 °C. To speed up the curing time, heating may be applied (e.g. to 15 minutes at +70 °C).

Liquid locking compound

(e.g. Delo-ML 187 / Loctite 242 or similar types)

Use liquid locking compound only where specified by the manufacturer.

Correct application:

Metal surfaces where liquid locking compound is to be applied must be absolutely free from grease. Use the “Aktivator” included in the workshop package for cleaning.

Before applying the liquid locking compound, the metal surfaces where Aktivator has been applied must have dried. Especially in blind holes, no Aktivator (cleaning agent) residues are allowed.

When installing bolts, apply the liquid locking compound only to the internal thread (nut) if possible in small quantities (drops). In blind holes only wet approx. 1d (d = nominal diameter of bolt) at the thread bottom. The same applies to any extra-long female threads. When applying the liquid locking compound to the bolt or at the top end of a female thread, the liquid locking compound will spread over the entire thread length when screwing the bolt in. As a result, too much break-away torque is required to remove the bolt – Danger of breaking!

Threaded assemblies secured with liquid locking compound can be easily unscrewed by heating them up to approx. 200 °C.

Correct installation of lock collar bearings

Lock collar bearings are tightened on the shaft by rotating the eccentric ring over the inside bearing ring.

Prior to installation, apply semi-fluid lubricant of NLGI class 00 (e.g. Shell Retinax G or similar brands) to the inside ring and the shaft to make bearing removal easier during future repairs.

Always fasten the eccentric ring moderately in the direction of rotation of the shaft and lock by means of a set screw. To remove the bearing, loosen the eccentric ring in opposite direction of rotation of the shaft.

Correct installation of adapter sleeve bearings

Adapter sleeve bearings do not require a specially machined bearing seat. They may be mounted on any drawn or scalped shaft. This is an advantage because it allows the shaft to be axially moved as required to obtain correct alignment.

Always install adapter sleeve bearings according to the conical inside ring. Clean the taper lock adapter sleeve and the shaft and check that the sleeve nut runs easily so the taper lock adapter sleeve will not turn on the shaft when tightening.

Tightening the bearing:

First tighten the sleeve nut to the point where the taper lock adapter sleeve has no more play and is under slight preload. Now tighten the nut by approx. 90° and continue turning until the next nearest slot fits the tab. Secure sleeve nut with the tab.

Loosening the bearing:

Bend up the tab which secures the sleeve nut and first back off the nut a few turns only (the thread must still fully grip). Loosen the taper lock adapter sleeve with a sharp blow, using a block-ended tube.

Ferrule fittings on hydraulic lines

When pre-assembling the unit and for pre-assembled factory-delivered ferrule fittings, the following applies: installation is in the associated, well-oiled threaded joint with half a turn of the union nut beyond the point where resistance is felt.

Pre-assembly:

1. Cut off the tube at right angles. Do not use a pipe cutter because this will slant the tube wall, causing heavy inside and outside burrs. Slightly deburr the tube end on the inside and outside (do not chamfer!) and clean it. In case of tube bends, the straight tube end up to where the bending radius starts must be at least twice the height of the union nut.
2. Push the union nut and the ferrule on the tube.
3. Push the tube against the stop in the union and tighten union nut until the ferrule grips the tube (the tube must not rotate with the nut). This point can be felt because increase power is needed from here.
4. Tighten the union nut half a turn beyond the point where resistance is felt.
5. Check the cut made by the ferrule edge: A visible shoulder must fill the space before the ferrule front end. The ferrule may rotate, but axial displacement must not be possible.

Installation:

Insert the pre-assembled tube into the well-oiled threaded joint, tighten the union nut up to the point where resistance is felt and then half a turn beyond this point.

Re-installation:

Every time the ferrule fitting has been loosened, retighten the union nut without using increased force.

Ferrule fitting leaks:

If a ferrule fitting leaks, first loosen the union nut until some oil escapes and then tighten it as specified.

Progressive ring fittings on hydraulic lines

When pre-assembling the unit and for pre-assembled factory-delivered progressive ring fittings, the following applies: installation is in the associated, well-oiled threaded joint with half a turn of the union nut beyond the point where resistance is clearly felt.

Pre-assembly:

1. Cut off the tube at right angles. Do not use a pipe cutter because this will slant the tube wall, causing heavy inside and outside burrs. Slightly deburr the tube end on the inside and outside (do not chamfer!) and clean it. In case of tube bends, the straight tube end up to where the bending radius starts must be at least twice the height of the union nut.
2. Push the union nut and the progressive ring on the tube.
3. Push the tube against the stop in the union and tighten union nut until the progressive ring grips the tube (the tube must not rotate with the nut). This point can be felt because increase power is needed from here.
4. Tighten the union nut half a turn beyond the point where resistance is felt.
5. Check the cut made by the progressive ring edge: A visible shoulder must fill the space before the progressive ring front end. The progressive ring may rotate, but axial displacement must not be possible.

Installation:

Insert the pre-assembled tube into the well-oiled threaded joint, tighten the union nut up to the point where resistance is felt and then half a turn beyond this point.

Important: Back up the threaded joint with a wrench!

Re-installation:

Every time the progressive ring fitting has been loosened, retighten the union nut until resistance is felt and then continue for half a turn beyond that point.

Important: Back up the threaded joint with a wrench!

Progressive ring fitting leaks:

If a progressive ring fitting leaks, first loosen the union nut until some oil escapes and then tighten it as specified.

Caution!

Failure to observe the tightening torques reduces the nominal power and the service life of the fitting, resulting in leaks and in the tube slipping out.

Taper fittings on hydraulic lines

Montage:

Apply oil to the O-ring on the taper. Tighten the union nut a third of a turn beyond the point where resistance is felt.

Important: Back up the threaded joint with a wrench!

Caution!

Failure to observe the tightening torques reduces the nominal power and the service life of the fitting, resulting in leaks and in the tube slipping out.

Welding

Caution!

When carrying out electric welding work on the machine, proceed as follows:

1. Turn off the battery isolating switch!
2. Disconnect the connector to the display monitor.
3. Pull out the electrical plug-in modules in the central terminal compartment.
4. Always connect the earth clamp of the welder in the near vicinity of the area where the welding is being carried out.

Some advice for speedy and correct repair work:

- Mark machine parts prior to disassembly to ensure their correct left-to-right positions and balance when reassembled.
- Fit expansion pins with the slot facing the side under load. When fitted with a quarter turn from this position, they will get loose, fall out or shear off.
- Replace cotter pins, locking wires, locking plates, tab washers and lock washers when carrying out repairs.
- Fit lubricated ball and slide bearings with high-quality grease.
- Align chain wheels and V-belt pulleys towards each other.
- Care for strict cleanliness when working on hydraulic systems.
- Never mix different oil types.
- Run the machine or operate machine assemblies at low speed after any repair.

TIGHTENING TORQUES

Bolts

Tightening torques (in Nm) of hexagon bolts, cheese-head screws and hexagon nuts				
Bolts and nuts		blackened, phosphatised or galvanized		
Strength class		8.8	10.9	12.9
	Dimensions	Metric thread		
Hexagon bolts DIN 931 DIN 933	M 4	2.7	3.8	4.6
	M 5	5.5	8.0	9.5
	M 6	10.0	14.0	16.0
	M 8	23.0	33.0	40.0
	M 10	45.0	63.0	75.0
	M 12	78.0	110.0	130.0
Cheese-head screws DIN 912	M 14	122.0	175.0	210.0
	M 16	195.0	270.0	325.0
	M 18	260.0	370.0	440.0
	M 20	370.0	525.0	630.0
Hexagon nuts DIN 934	M 22	510.0	720.0	870.0
	M 24	640.0	900.0	1080.0
	M 27	980.0	1400.0	1650.0
	M 30	1260.0	1800.0	2160.0
	Dimensions	Metric fine thread		
Hexagon bolts DIN 960 DIN 961	M 8 x 1	25	35	42
	M 10 x 1.25	48	67	80
	M 12 x 1.25	88	125	150
	M 12 x 1.5	82	113	140
	M 14 x 1.5	135	190	225
	M 16 x 1.5	210	290	345
Hexagon nuts DIN 934	M 18 x 1.5	300	415	505
	M 20 x 1.5	415	585	700
	M 22 x 1.5	560	785	945
	M 24 x 2	720	1000	1200
	M 27 x 2	1050	1500	1800
	M 30 x 2	1450	2050	2500
CAUTION! Cadmium-plated and copper-plated bolts and nuts must be tightened with tightening torques 25% below the specified values.				

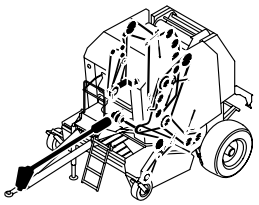
Hydraulic screw fittings

Tightening torques for hydraulic screw fittings with O-ring according to ISO 6149	
Dimensions	Tightening torque according to ISO 6149
M 8 x 1	7^{+2} Nm
M 10 x 1	11^{+4} Nm
M 12 x 1,5	16^{+5} Nm
M 14 x 1,5	23^{+8} Nm
M 16 x 1,5	29^{+10} Nm
M 18 x 1,5	38^{+13} Nm
M 20 x 1,5	46^{+15} Nm
M 22 x 1,5	67^{+22} Nm
M 24 x 1,5	86^{+29} Nm
M 26 x 1,5	103^{+34} Nm
M 27 x 2	103^{+34} Nm
M 30 x 2	170^{+57} Nm
M 33 x 2	200^{+67} Nm
M 36 x 2	245^{+82} Nm
M 38 x 2	245^{+82} Nm
M 39 x 2	310^{+103} Nm
M 42 x 2	380^{+127} Nm
M 45 x 2	440^{+147} Nm

SPECIFICATIONS

Lubricants chart

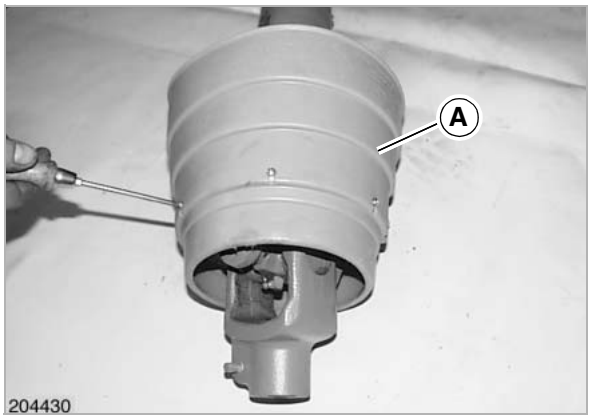
Transmission	Oil type	Capacity
Transmission 540/min Transmission 1000/min	SAE 90 API-GL-5 SAE 90 API-GL-5	1.2 l 1.6 l
Spur gear in swinging segment	Semi-fluid lubricant 500 G	0.8 kg



2
Drives

UNIVERSAL DRIVE SHAFT

Disassembling the universal drive shaft half (tractor side)



1

Unscrew all cheese-head sheet metal screws from the universal drive shaft guard (A).

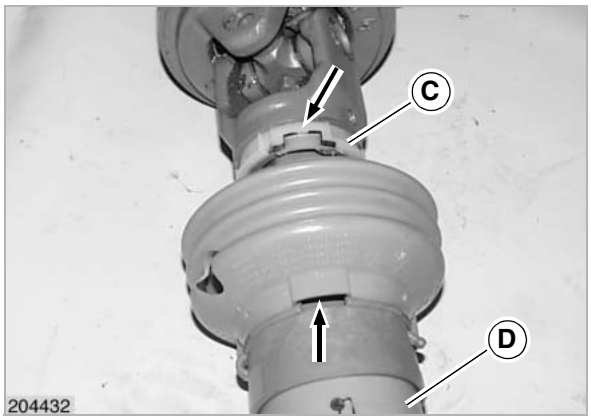
Remove universal drive shaft guard.

(Fig. 1)

2

Remove slide ring (B) from the double yoke.

(Fig. 2)



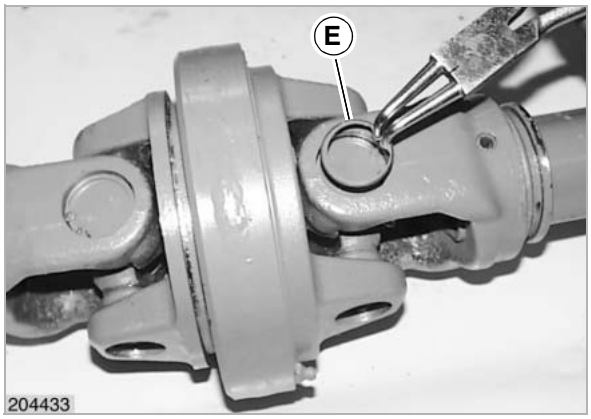
3

Unscrew the cheese-head sheet metal screw and rotate guard half (D) until the relief is aligned with the peg at the slide ring (C).

Remove guard half (D) from the lemon tube.

Remove slide ring (C).

(Fig. 3)

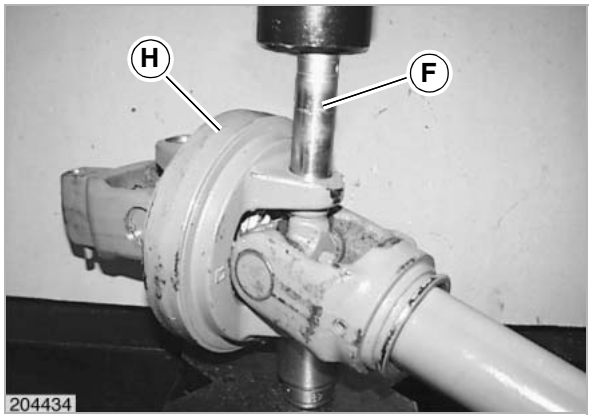


4

Clean the receivers in the grooved yoke and in the double yoke from dirt and rust.

Remove the circlips (E) from the receivers of the grooved yoke.

(Fig. 4)



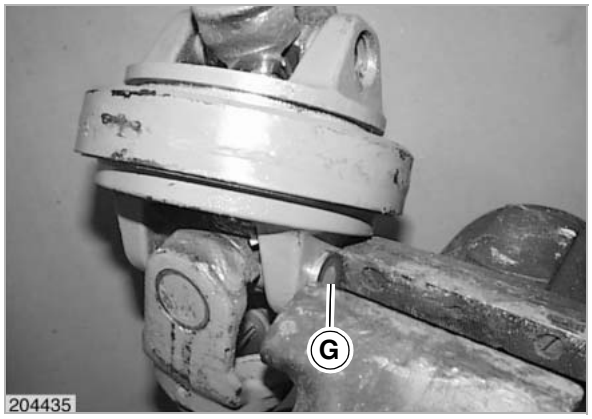
5

Force one bushing in the double yoke (H) through on one side, using a tube, far enough for the grooved yoke to make contact.

Important!

The tube must be 1 mm smaller than the bushing diameter.

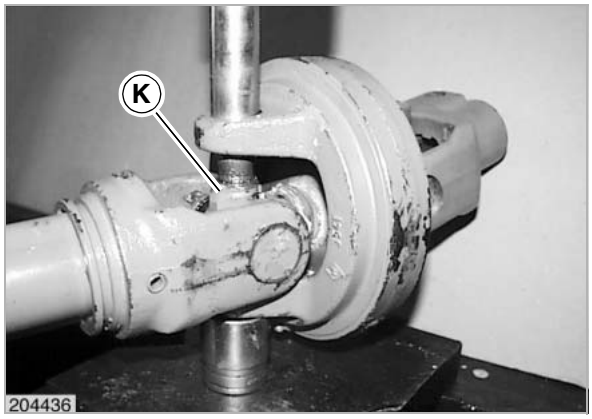
(Fig. 5)



6

Clamp the forced-out bushing (G) in a vise and drive it out by light blows against the double yoke.

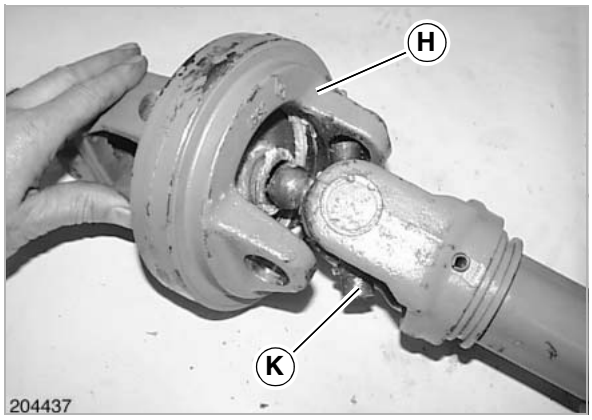
(Fig. 6)



7

Push the centre cross assembly (K) downward to the stop, at the same time pushing the second bushing a little out of the double yoke.

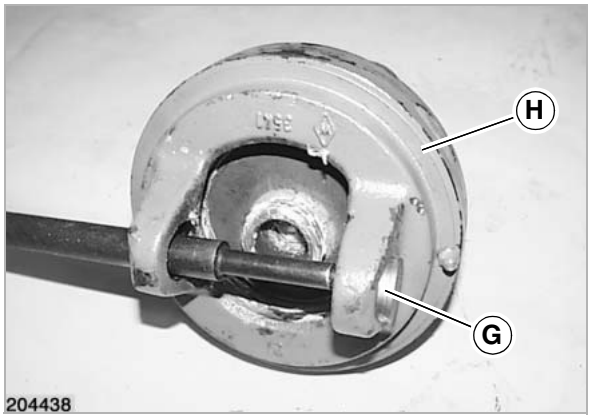
(Fig. 7)



8

Remove centre cross assembly (K) from the double yoke (H) and the bushing.

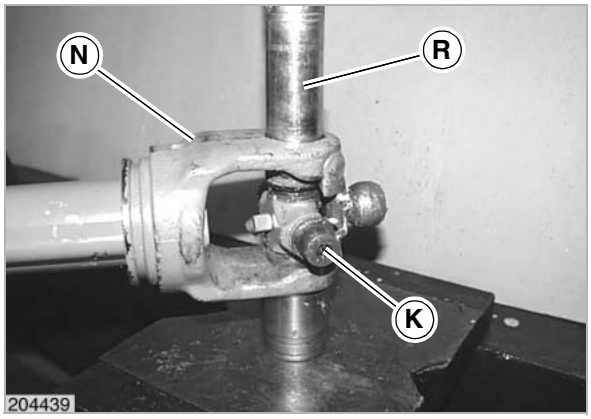
(Fig. 8)



9

Drive bushing (G) out of the double yoke (H).

(Fig. 9)



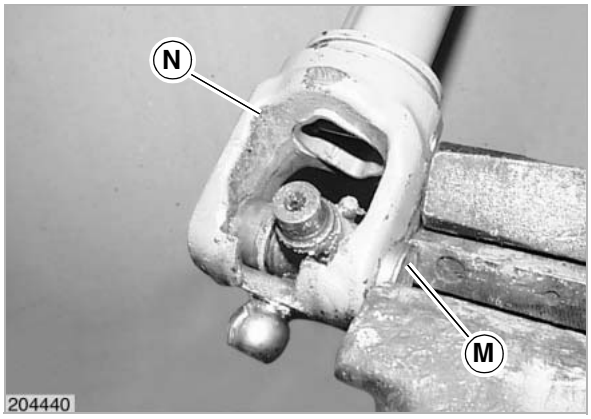
10

Force a bushing (M) in the grooved yoke (N) through far enough, using a tube (R), until the centre cross assembly (K) makes contact.

Important!

The tube (R) must be 1 mm smaller than the bushing diameter.

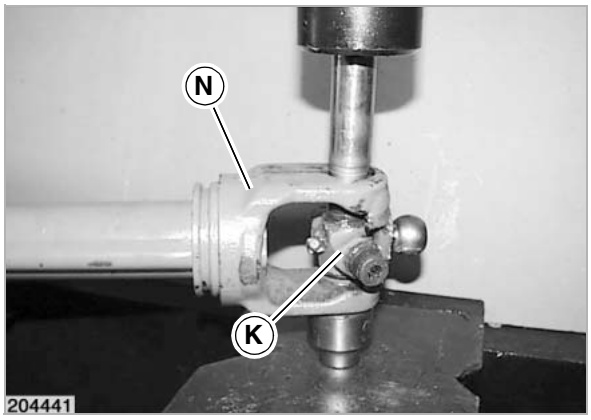
(Fig. 10, 11)



11

Clamp the forced-out bushing (M) in a vise and drive it out by light blows against the grooved yoke (N).

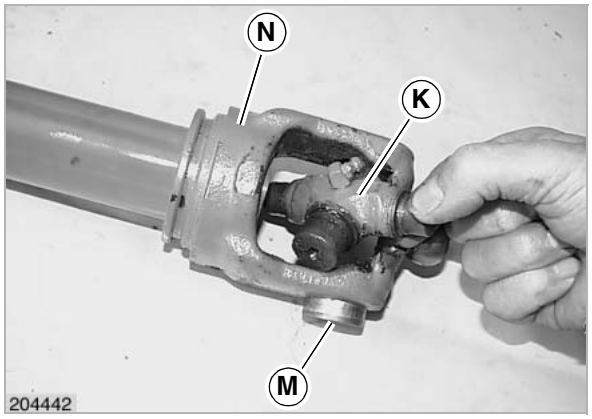
(Fig. 11)



12

Push the centre cross assembly (K) downward to the grooved yoke (N) until the stop is reached.

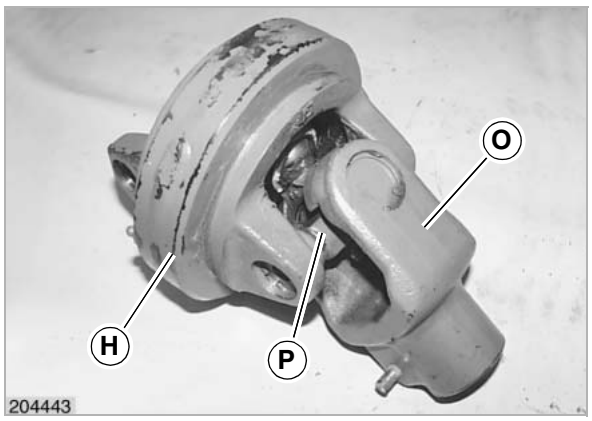
(Fig. 12)



13

Remove the centre cross assembly (K) from the bushing (M) and the grooved yoke (N).

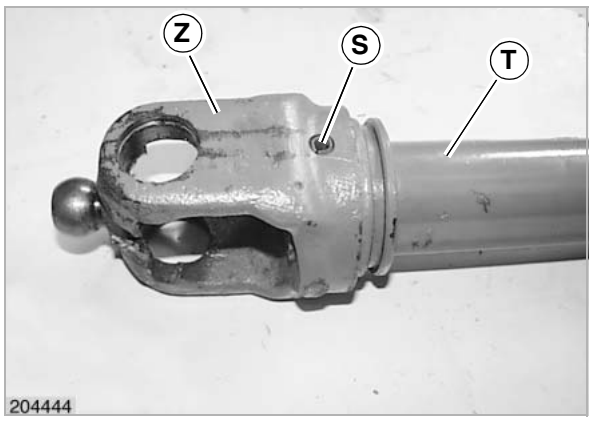
(Fig. 13)



14

In the same way, remove the centre cross assembly (P) from the double yoke (H) and the slip-on yoke (O).

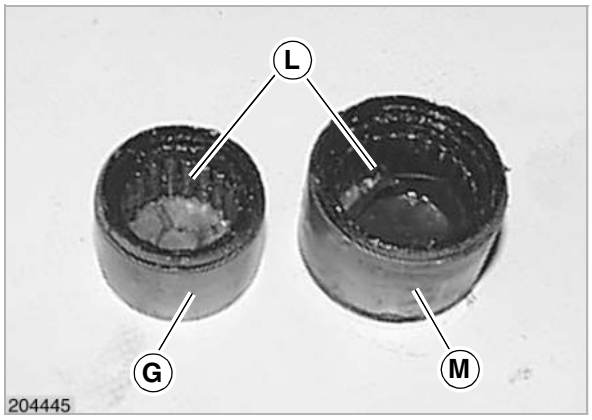
(Fig. 14)



15

To replace the grooved yoke (Z), drive out the expansion pin (S) and pull grooved yoke off of lemon tube (T).

(Fig. 15)



16

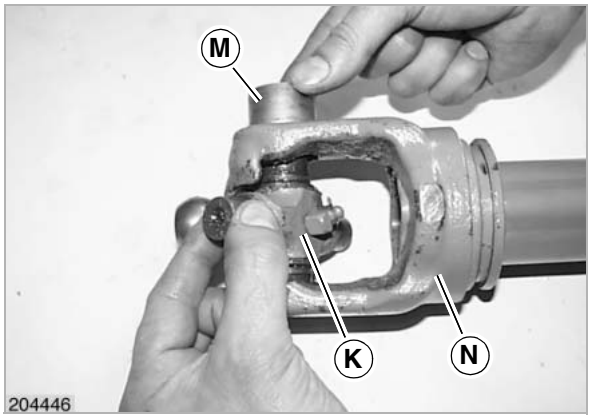
Assembling the universal drive shaft half (tractor side)

Pull off the bushings (G) and (M) from the new centre cross assembly.

Important!

The inside of the bushings must be fully covered with needles (L). Grease needles if required. The seals must be correctly inserted into the bushings.

(Fig. 16)



17

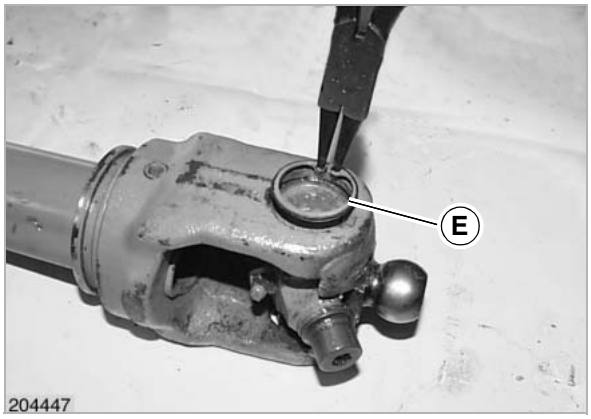
Insert centre cross assembly (K) into the grooved yoke (N).

Place the bushing (M) in position on one side and push it in far enough to allow the circlip to be installed.

Important!

To prevent the needles from falling out when pushing the bushing in, lift centre cross assembly into the bushing.

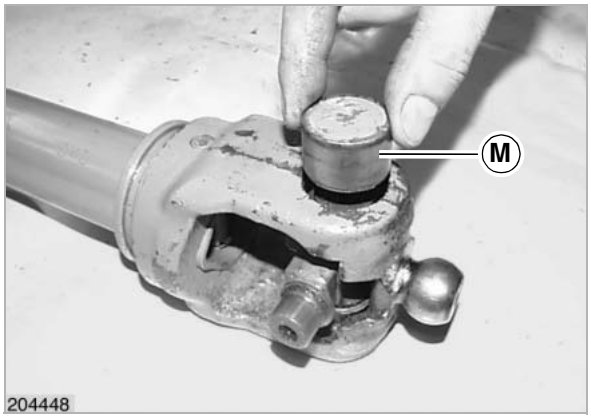
(Fig. 17)



18

Insert circlip (E).

(Fig. 18)



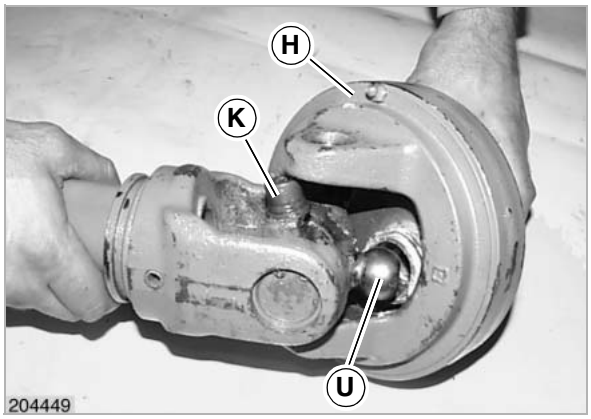
19

Push in bushing (M) from the other side. Insert circlip.

Important!

The entire circumference of the circlip must be placed inside the groove.

(Fig. 19)



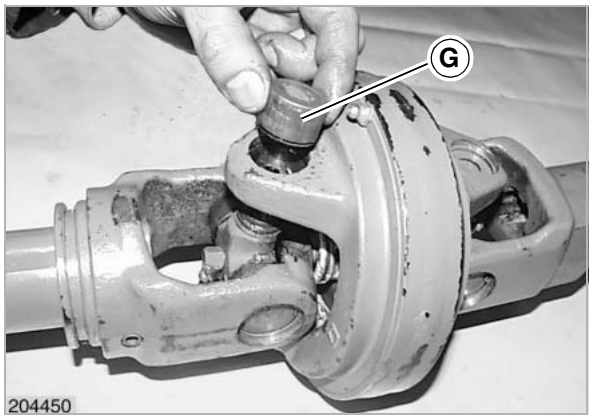
20

Insert the cog of the centre cross assembly (K) into the receivers of the double yoke (M).

Important!

The ball head (U) on the grooved yoke must be placed in the ball receiver at the double yoke.

(Fig. 20)



21

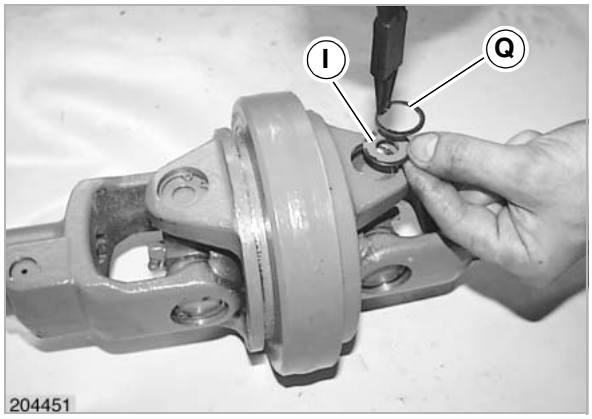
Place bushing (G) in position on one side and push in far enough until the washer and the circlip can be installed.

Important!

To prevent the needles from falling out when pushing the bushing in, lift centre cross assembly into the bushing.

In the same way, push in the bushing on the other side.

Install washer (I) and circlip (Q).

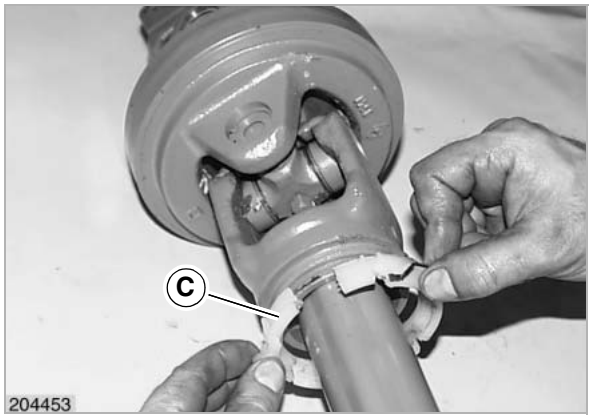


22

Important!

The entire circumference of the circlip must be placed inside the groove.

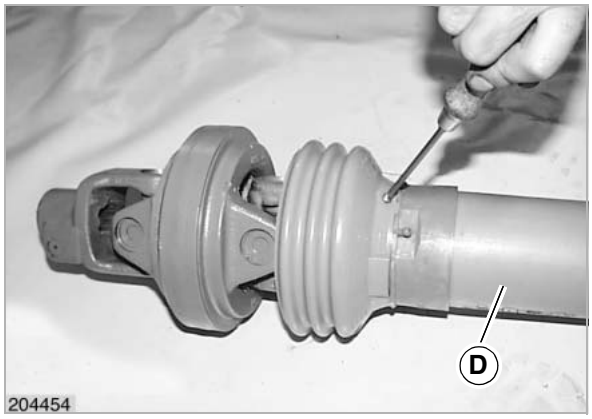
(Fig. 21, 22)



23

Grease the groove in the grooved yoke and install slide ring (C).

(Fig. 23)



24

Push guard half (D) over the lemon tube, rotate by a quarter turn and screw cheese-head sheet metal screw C 4.2 x 9.5 into the slide ring (C).

(Fig. 23, 24)