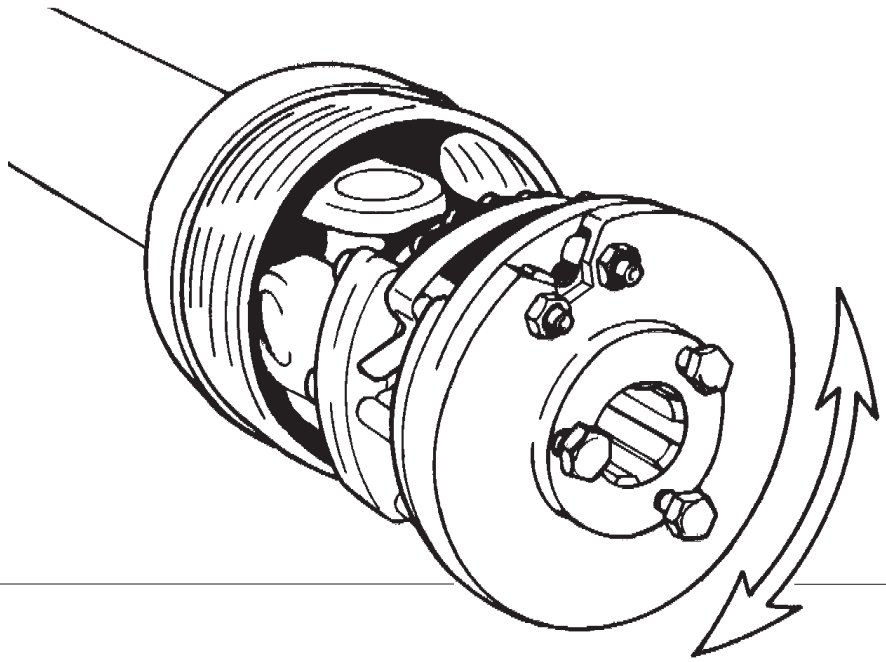
HANDLEIDING
OPERATOR'S MANUAL
LIVRET DE MISE EN ROUTE
BETRIEBSANLEITUNG

LELYMATIC

BA.T

BA.S



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PREFACE

This Operator's Manual is meant for personnel that are operating the LELYMATIC and are responsible for its daily maintenance.

Kindly read this manual fully prior to starting work.

Such instructions as are related to your safety and/or that of others are marked in the margin by a warning triangle with exclamation mark. These instructions should be observed with particular care and attention.

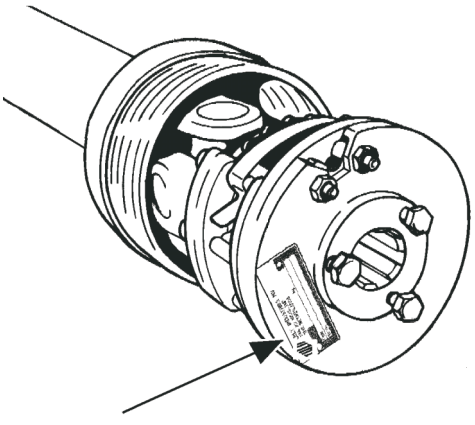
Instructions which may lead to serious material damage in case of non-compliance or incorrect use are marked in the margin by an exclamation mark.

Machines and optional extras may be adjusted to specific regional conditions whilst they are also subject to permanent research and innovation. For this reason, the specifications of your LELYMATIC may not be consistent with the pictures in this manual.

WARRANTY CONDITIONS

For those parts which fail in normal operating conditions the factory will make replacement parts available, free of charge, for a period of 6 (six) months from the date of purchase.

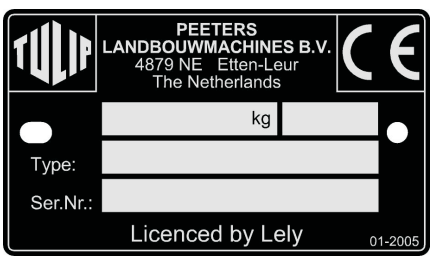
Warranty shall not apply if the instructions mentioned in this manual have not been met, or if they have not been met completely or correctly. Neither shall warranty apply in case of modification of the LELYMATIC by you or third parties without our foreknowledge and/or authorisation.



TYPE- AND SERIAL NUMBER OF YOUR LELYMATIC

In case of correspondence and ordering of spare parts, kindly state the type- and serial number of your LELYMATIC. Complete the box below with these numbers.

type number	
serial number	



SAFETY INSTRUCTIONS

During machine operation the LELYMATIC shearpin automat should be guarded by a protection guard. If the original protection does not fit or if a guard is not available, it is the user's responsibility to ensure that adequate protection is provided.

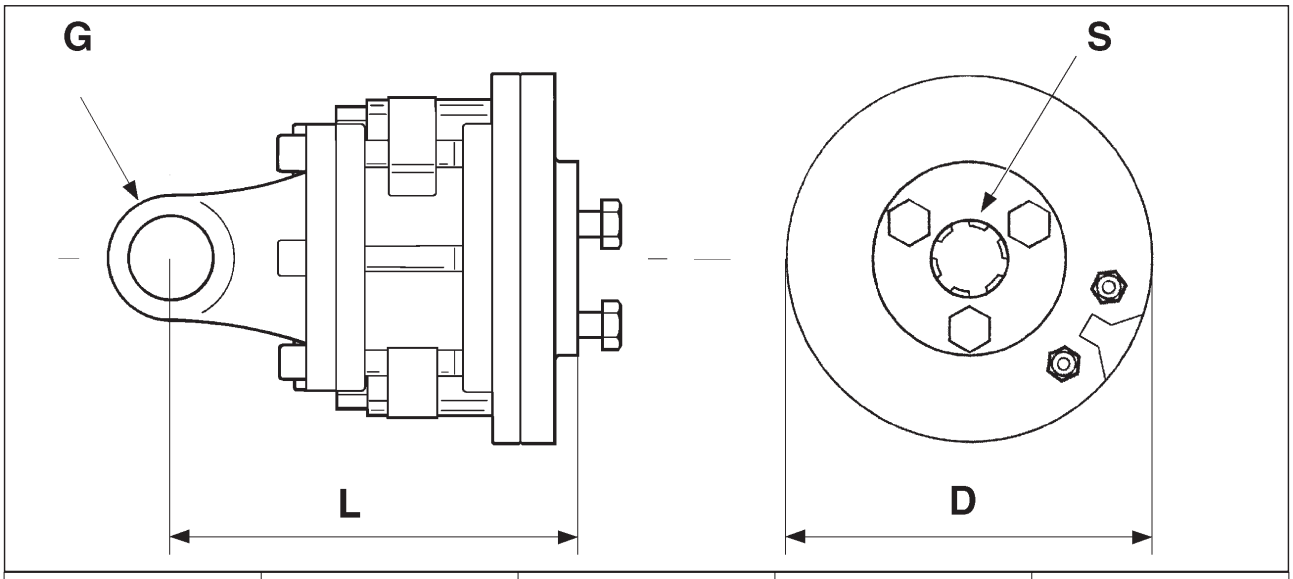
Those TULIP machines supplied with a LELYMATIC have been fitted with a protection guard to suit the LELYMATIC.

Follow all safety and maintenance instructions that are mentioned in the manual.

Tulip Industries accepts no liability whatsoever if a shearpin automat has been used without adequate protection or proper maintenance.

1 INTRODUCTION

The LELYMATIC shearpin automat has been developed to protect the drive of agricultural machines.
The coupling required for driving the machine is conveyed via a shearpin. In case of overload, a portion of this shearpin is cut off, as a result of which the drive is interrupted. After the PTO shaft has been disengaged, the coupling is re-set automatically by one of the ten shearpins fitted in the LELYMATIC. By means of one set of ten shearpins the LELYMATIC can operate about 50 times. The LELYMATIC is available in a variety of versions, depending on the torque required, type of PTO shaft and PTO connection (table 1). The versions described in this manual can be used both for RH and LH machine drive, which makes the LELYMATIC suitable for front linkage as well.



	L (mm)	D (mm)	S	G (Walterscheid)
BA.T8	180	160	1 3/8" (6)	W2400
BA.T9	180	160	1 3/8" (6)	W2400
BA.T9	180	160	1 3/8" (21)	W2500
BA.T10	180	160	1 3/8" (6)	W2400
BA.T10	180	160	1 3/8" (21)	W2500
BA.S-9	205	180	1 3/4" (6)	W2600

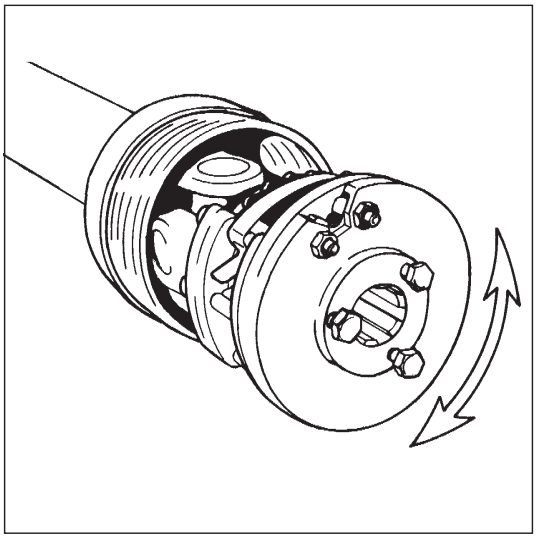
Table 1

2 SPECIFICATIONS

The LELYMATIC BA.T and BA.S can be used both for RH and LH machine drive (fig. 1). By exchanging the (Walterscheid) yoke, the LELYMATIC BA.T can be fitted to a W 2400 or W 2500 PTO shaft. The BA.S type is a more heavy version suitable for a W 2600 PTO shaft.

A LELYMATIC is suitable for a particular diameter of shearpin. The diameter of the shearpin to be used is indicated on the side of the cutting ring (fig. 2).

It is possible to convert the LELYMATIC so that it may hold a different shearpin diameter; this can be done by replacing the cutting ring and cutting plates.



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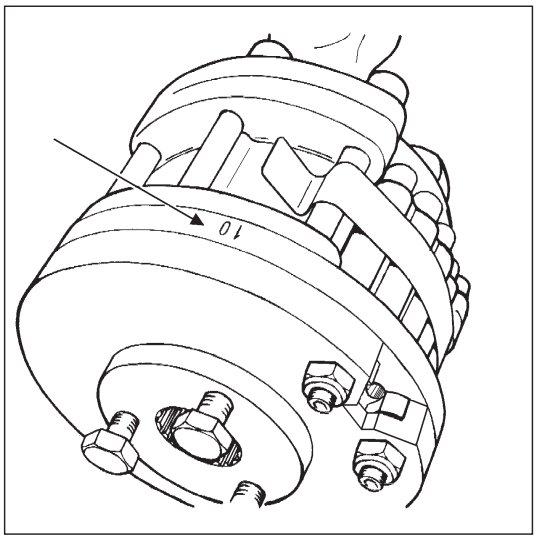

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2.1 Torque

The torque of the shearpin is determined by its diameter and grade (hardness), while the type of LELYMATIC is also relevant. All torques have been listed in table 2.

The grade of the shearpin is indicated by grooves at the top of the pin. The number of grooves corresponds with the grade number.

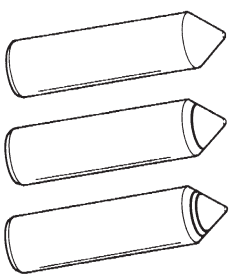
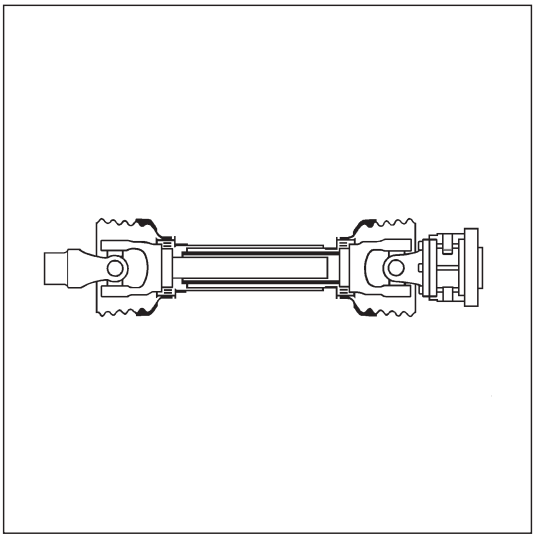
LELYMATIC		BA.T			BA.S
SHEARPIN	Diameter → / Grade ↓	8	9	10	9
	0	1420	1795	2220	2095
	1	1895	2395	2965	2795
	2	2365	2990	--	3490
		Torques in Nm (10 Nm = +/- 1 kgm)			

Table 2

2.2 PTO speed

The LELYMATIC can be used at a PTO output of either 540/min or 1,000/min. If the PTO speed is changed, the shear pin grade needs to be adjusted as well. The power to be transmitted as a maximum should remain unchanged.

! Therefore, always fit shearpins of correct diameter and grade!



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3 INSTRUCTIONS FOR USE

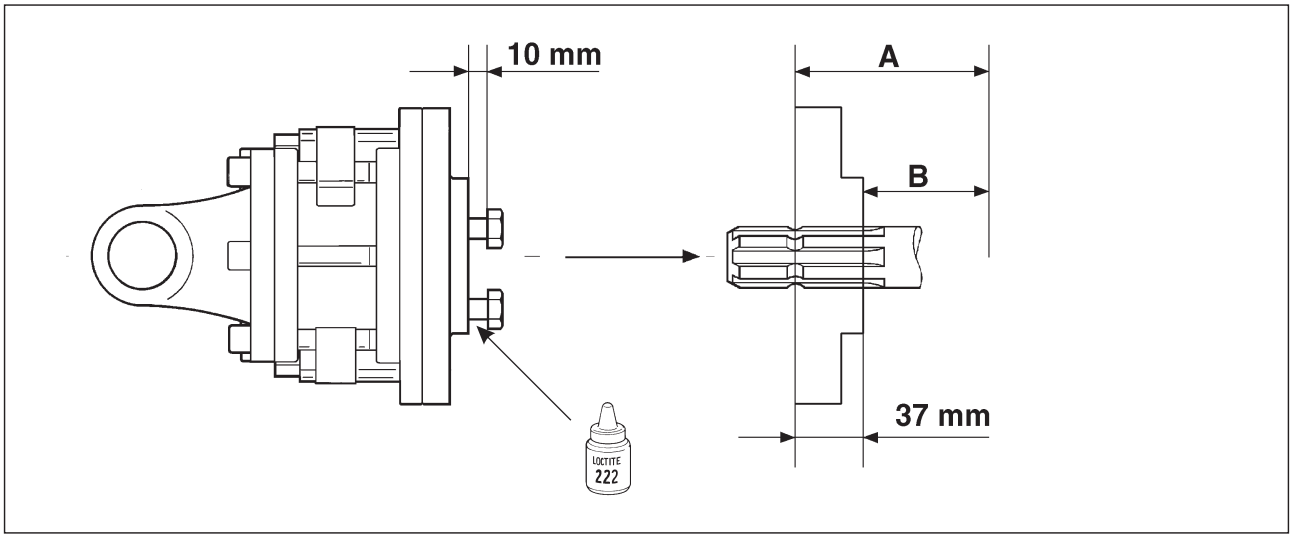
3.1 Fitting to the PTO shaft

Mount the LELYMATIC to the shaft half with outer guard tube (fig. 3).

Check the total length of the PTO shaft fitted with the LELYMATIC, as compared to the original length.
If necessary, the length of the PTO shaft should be reduced.

3.2 Fitting to the machine

Unscrew the 3 securing bolts, located around the axis hole, to an extent of about 10 mm (fig. 4). The shearpin automat can now be pushed onto the machine's drive shaft at +/- 37 mm past the centre of the retainer groove, after which the securing bolts can be tightened. Bolts can be secured by applying Loctite 222 (screwlock). A practical method for fitting the LELYMATIC onto the shaft at the correct distance would be the following:



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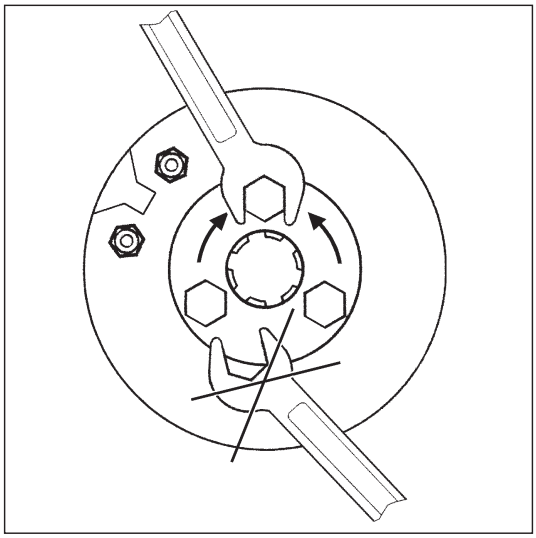
- measure distance A between the centre of the retainer groove in the shaft and a reference plane, say the front of the gearbox;
- slide the LELYMATIC onto the shaft to such an extent that distance B between the LELYMATIC and the reference plane equals A minus 37 mm.



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Please note that the bolt being tightened should always be in the TWELVE O'CLOCK position, allowing the internal locking ball to fall into the groove of the input shaft (fig 5). Check -after fitting- if all three bolts have been tightened roughly to the same extent.

! **Attention:** When mounting the PTO shaft with shearpin automat it should be checked if the shaft is of the correct length, both in working and transport position. This check should be repeated when using another tractor.

3.3 Operating proceedings

After overload and subsequent pin shearing, the coupling between tractor and machine will be interrupted. In order to re-set the coupling, the following procedure is required:

- Disengage PTO shaft.
- Reduce engine speed to tick over.
- Lift machine out of ground.
- Remove obstacle where necessary.
- Engage PTO shaft.
- Lower machine and continue operation.

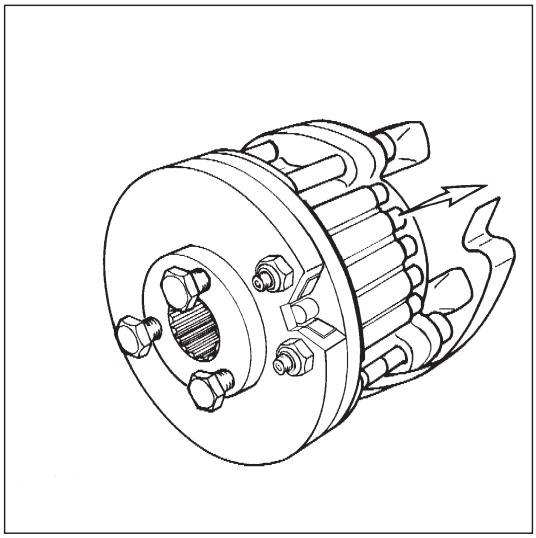
The LELYMATIC will automatically insert another shearpin, as a result of which the coupling between tractor and machine will be restored.

⚠ **Attention:** should the blockage be within the machine, the tractor engine should be disengaged and all parts should have come to a complete standstill, before you are allowed to remove the obstacle. Under no circumstance are you allowed to get underneath a lifted machine.

3.4 Re-fill of shearpins

If the LELYMATIC no longer automatically restores the drive of a coupling that was interrupted, then a fresh set of shearpins should be inserted.

- Lift the cartridges from the LELYMATIC (fig. 6).
- Remove the remainders of the pins from the cutting ring.
- Insert the fresh pins into the cutting ring with the point of the shearpin uppermost (fig. 7).
- Re-place the cartridges and secure them by means of the spring clips.



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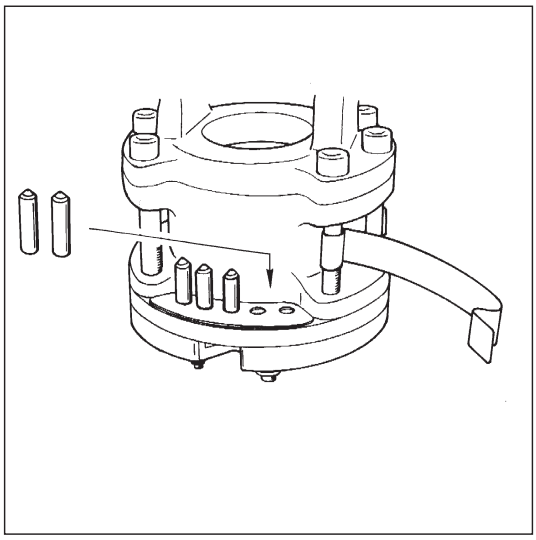
! ALWAYS FIT SHEARPINS OF CORRECT DIAMETER AND GRADE.



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Lelymatic model	PTO output	Roterra	Partnumber shearpins (=10x)
BA.T 9-1	540	15/20/25	0.9001.1148.1
BA.T 8-0	1000	15/20/25	0.9001.1090.1
BA.T10-1	540	35	0.9001.1249.1
BA.T 9-2	540	35	0.9001.1149.1
BA.T 9-0	1000	35	0.9001.1147.1
BA.T 9-1	1000	45/55	0.9001.1148.1

BA.T 9-0	1000	600-45H	0.9001.1147.1
BA.T 9-1	1000	600-55H	0.9001.1148.1
BA.S 9-1	1000	500-55 600-55	0.9001.1148.1

4 MAINTENANCE

Check frequently:

- tightness of cylindrical hexagonal-headed bolts
- tightness of bolts securing the LELYMATIC on the machine's drive shaft
- axial clearance between hub and housing.
  Please, be also referred to § 4.2 "Adjustment of axial clearance".

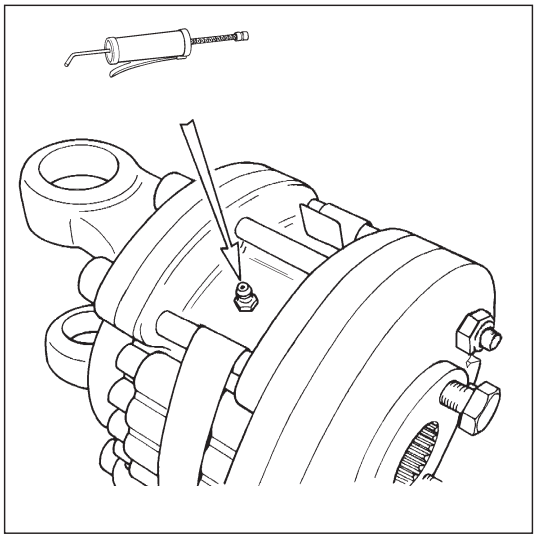
The above mentioned checks should also be carried out shortly after receiving the LELYMATIC.

LELYMATIC to be properly greased with molykote (fig. 8) prior to every new season of operation. After each re-fill of 10 shearpins, this greasing procedure also applies.

Remove a surplus of grease that may be present around the pins, since sticky pins may hamper the process of automatic coupling. Wear and tear of the cutting edge of the cutting plate, if any, is evident from burrs or distortions occurring on the pins after shearing. In that case a fresh cutting edge should be exposed, which can be done as follows:

- Remove shearpin in line with the cutting plate.
- Unscrew securing nut of cutting plate (fig. 9).
- Turn cutting plate a quarter of a turn, so that the next cutting edge is exposed (fig. 10). The angles of the hub and cutting plates should be in line. Ensure that an old cutting edge is not re-used.
- Arrange a shearpin in front of the cutting plate.
- Secure the cutting plate tightly by means of the securing nut. Ensure that the plate is not twisted.

When the cutting edges on one side of the cutting plates are worn, the two cutting plates can be exchanged and turned over so that the cutting edges on the other sides can be used.



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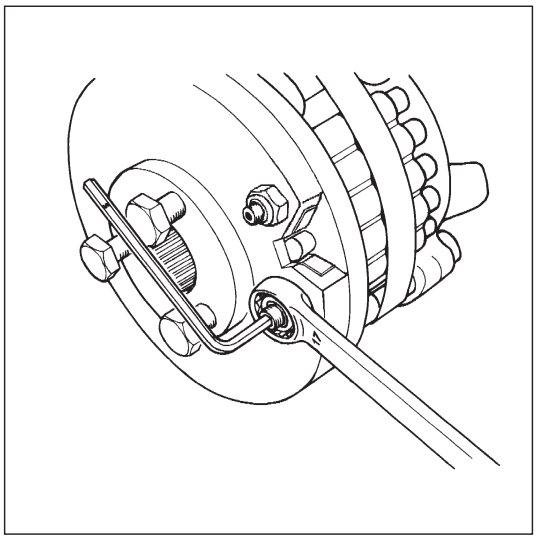

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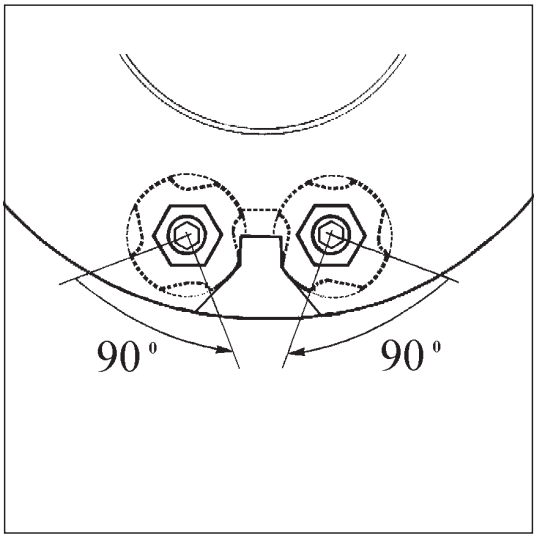

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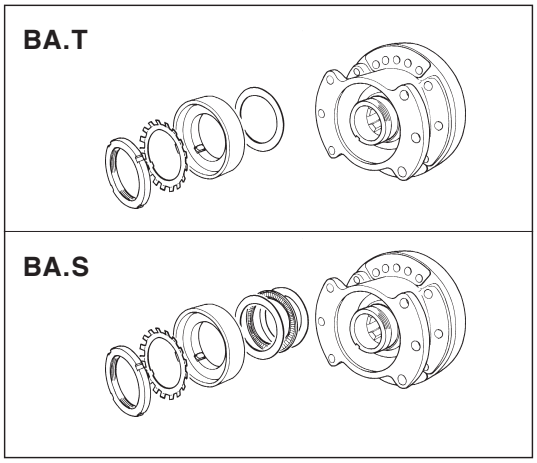
4.1 Replacement/turning of the cutting plates (type BA.T/BA.S)

For replacing or turning of the cutting plates, the following procedure applies.

- Remove the cartridges and shearpins.
- Unscrew the 6 cylindrical bolts, after which the flange yoke can be taken off the LELYMATIC.
- Unscrew the adjusting nut from the hub and remove the underlying securing ring, pressing ring and shaft ring /axial needle bearing (fig. 11). Now the housing and cutting ring can be pushed from the hub.
- Dismount the cutting plates and unscrew the adjusting screws from the cutting plates.
- Screw the adjusting screw from the other side into the cutting plate, resp. into a fresh cutting plate. Turn or replace both cutting plates at the same time. Adjusting screw to be secured in the cutting plate by means of Loctite 638. Ensure that the adjusting screw is flush with, or slightly below, the outside of the cutting plate (fig. 12).
- Mount the cutting plates in their proper position in the hub (fig. 13). The angles of the hub and cutting plates should be in line.
- Arrange the cutting ring and housing on the hub.
- Mount the shaft ring / axial needle bearing, pressing ring with key and securing ring with adjusting screw on the hub. Adjust axial clearance (§ 4.2).
- Mount the flange yoke by means of six cylindrical hexagonal-headed bolts. Fit the spring clips to two bolts. The choice of these bolts depends upon the direction of rotation that is mainly used (fig. 14). Tighten the cylindrical bolts at a torque of 120+/-20Nm (12 +/- 2 kgm).



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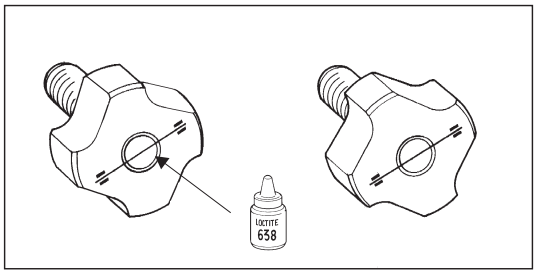

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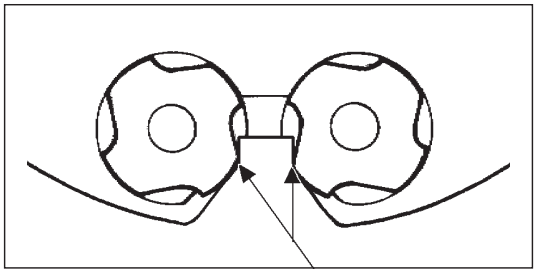

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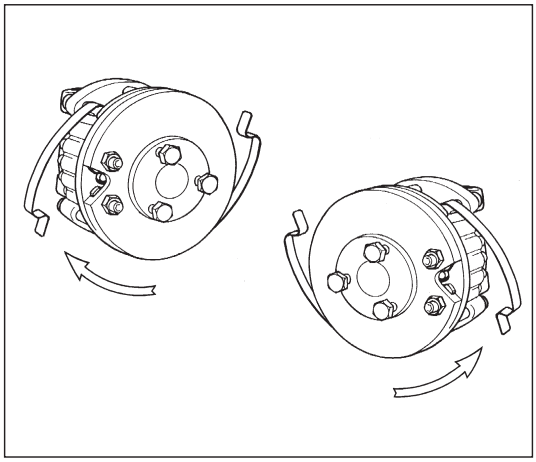

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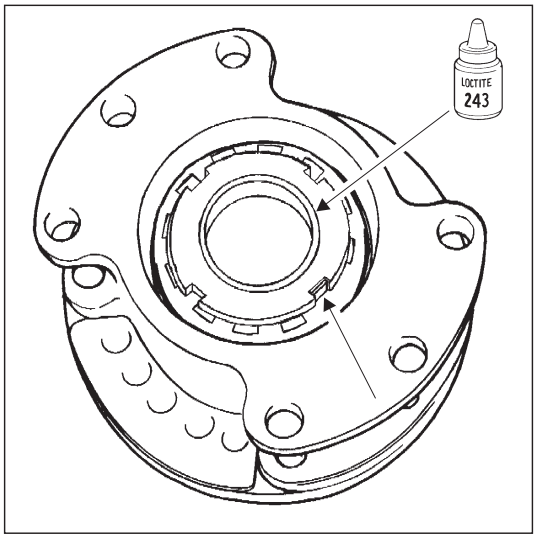
4.2 Adjustment of axial clearance

In order to maintain an effective and reliable operation of the LELYMATIC, the axial clearance between the hub and housing should be checked regularly and adjusted when necessary.
Proper axial clearance is achieved when the hub and housing can be turned by hand with a slight resistance.

The axial clearance can be adjusted by means of the adjusting nut on the hub as follows:

- Remove the cartridges and shearpins.
- Unscrew the 6 cylindrical bolts.
- Dismount the flange yoke.
- Bent back the lip of the securing ring.
- Secure the nut with Loctite 243.
- Tighten the nut to such an extent that all clearance is eliminated.
- Turn back the nut a quarter of a turn.
- Tighten the nut to such an extent that hub and housing are just tight.
- Check underneath the four recesses in the nut which one has an open space.
- Relax the nut until the first lip of the securing ring is right in front of this recess in the adjusting nut.
- Secure the nut again by means of the ring (fig. 15).

During assembly of the flange yoke, the 6 cylindrical bolts should be tightened at a torque of 120+/-20 Nm (12+/-2 kgm).



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5 TROUBLE-SHOOTING

PROBLEM	Possible cause	Remedy
LELYMATIC fails to couple	Set of shearpins has been used fully	Re-fill LELYMATIC with new pins
	Too much grease around the pins, causing them to stick	Remove excess grease from pins
Pins are not sheared off effectively	Cutting edge of cutting plate has worn	Expose new cutting edge
	Axial clearance between hub and housing is too substantial	Ensure correct adjustment of axial clearance