SAFETY RULES

Important notice

The instructions contained in this manual should be carefully read and observed by all persons involved 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 or omissions not accepted.

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

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SPECIFICATIONS

Lubricants chart

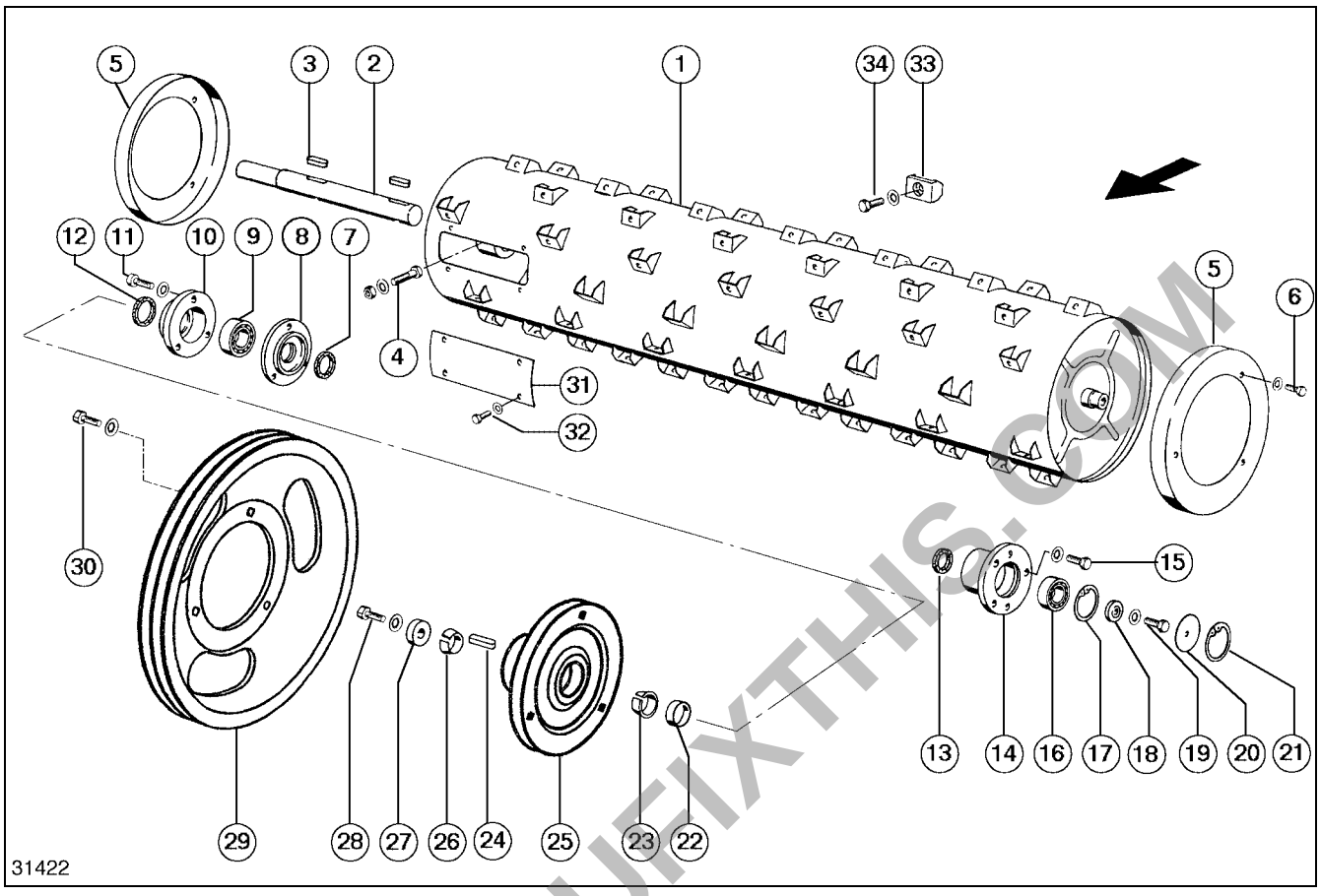
Component	Type of lubricant	Viscosity	Capacity
Hydraulic system	Multi-grade hydraulic oil ISO-VG 46 conforming to DIN 51 524 specifications, part 3**		approx. 20 litres (oil change) approx. 70 litres (new system filling)
Manual gearbox 20 t / 17 t / 15 t	Multi-grade transmission oil conforming to (MIL-L-2105 B) API-GL-5-90 specifications	90	7.0 litres
Manual gearbox 20 t HD			6.5 litres
Final drives 20 t / 17 t			8.0 litres each
Final drives 15 t / single-step			5.0 litres each
Planetary gearbox 20 t			7.5 litres each
Threshing drum reduction gearbox	Multi-grade transmission oil conforming to (MIL-L-2105) API-GL-4-90 specifications	90	1.8 litres
Transfer gearbox (engine output shaft)			3.0 litres
Grain tank unloading tube Upper angle drive	Rolling bearing grease, e.g. Alvania R3		270 g
Grain tank unloading tube Lower angle drive (up to serial no. …)			530 g
Grain tank unloading tube Lower angle drive (from serial no. …)			900 g
Foot brake	ATE brake fluid	SAE-specifications DOT 4	Reservoir must always be full
SANDEN compressor SD 7 H 15	Sanden oil SP 20 PAG		as required (approx. 300 cm³ for initial filling)
	Refrigerant R 134a		1800 g

** When selecting the hydraulic oil, the following conditions need to be met:

Pour point	< -25 °C (DIN ISO 3016)
Viscosity 0 °C	< 600 cSt. (DIN 51 562)
Viscosity 40 °C	max. 50.6 cSt. (DIN 51 562)
Viscosity index	> 170 (DIN ISO 2909)

The oil must have detergent properties!

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51

Accelerator, disassembled

1 Accelerator
2 Shaft
3 Parallel key A 14 x 9 x 40
4 Hex. bolt M 12 x 65 DIN 931-8.8
Hex. nut M 12 DIN 934
Contact washer A 12
5 Anti-wrapping guard
6 Hex. bolt M 8 x 18 DIN 933-8.8
Contact washer A 8
7 Felt ring
8 Bearing cover
9 Self-aligning roller bearing
10 Bearing housing
11 Cheese-head screw M 12 x 35 DIN 7984-8.8
Lock washer 12
12 Felt ring
13 Felt ring
14 Bearing housing
15 Hex. bolt M 12 x 35 DIN 933-8.8
16 Self-aligning ball bearing
17 Circlip
18 Washer
19 Hex. bolt M 12 x 30 DIN 933-8.8
Contact washer A 12
20 Washer
21 Circlip
22 Spacer ring
23 Tapered ring
24 Parallel key
25 Hub
26 Tapered ring
27 Washer
28 Hex. bolt M 16 x 50 DIN 933-8.8
Contact washer A 16
29 V-belt pulley
30 Hex. bolt M 12 x 30 DIN 933-10.9
Contact washer A 12
31 Cover
32 Hex. bolt M 8 x 20 DIN 933-8.8
Contact washer A 8
33 Cap
34 Hex. bolt M 10 x 20 DIN 933-8.8
Contact washer A 10

(Fig. 51)

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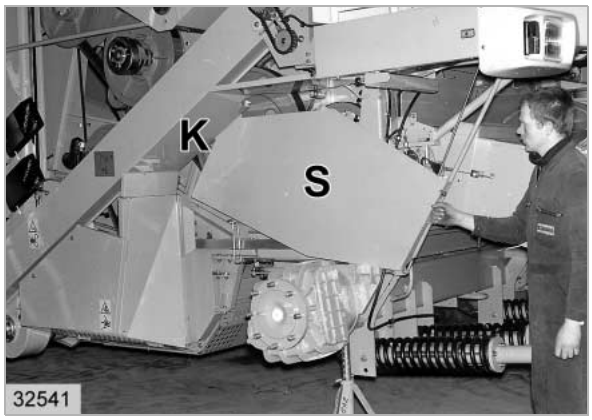
ACCELERATOR

Removing the bearing assembly and the shaft on the right-hand side

Support the machine safely under the front axle on the right-hand side.

Remove the right-hand wheel.

Remove the drum inspection cover.



1

Remove the guard (S) and the mud guard (K) on the right-hand side.

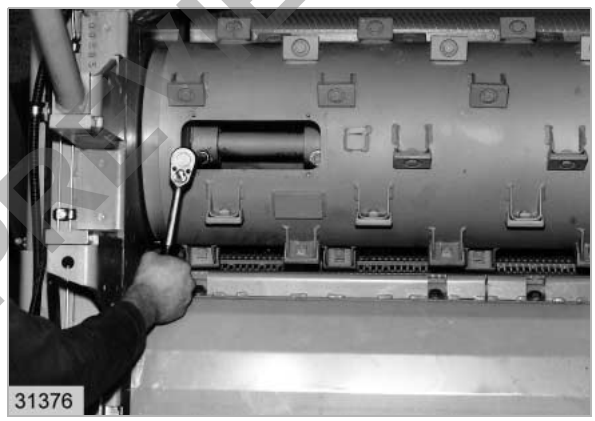
(Fig. 1)



2

Remove the cover (D) on the accelerator.

(Fig. 2)



3

Clean the shaft with emery paper and grease it.

Remove the M 12 x 65 hex. bolts from the clamping hubs.

(Fig. 3)

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TIGHTENING TORQUES

Bolts

Tightening torques (in Nm) of hex. bolts, cheese-head screws and hex. nuts				
Bolts and nuts		anodized, plated or zinc plated		
Property class		8.8	10.9	12.9
	Dimensions	Metric standard thread		
	M 4	2.7	3.8	4.6
	M 5	5.5	8.0	9.5
Hex. bolts DIN 931 DIN 933	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
Hex. 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-pitch thread		
	M 8 x 1	25	35	42
	M 10 x 1.25	48	67	80
Hex. bolts DIN 960 DIN 961	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
	M 18 x 1.5	300	415	505
Hex. nuts DIN 934	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

IMPORTANT! Cadmium or copper-plated screws and nuts must be fastened with a torque 25 % below the specified value.

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STEERING

Scenes of failures on the Orbitrol steering unit

External leaks

External leaks are identified by oil leaking from the valve block and steering block mounting faces, by oil leaking from the pressure relief valve and from the shock valve.

Cause:

1. O-rings on the flange do not seal properly.
2. O-rings on the adjustment screw of the pressure relief valve do not seal properly.
3. O-rings on the shock valve plug do not seal properly.

Remedy:

In case of leaks replace the respective O-rings by new ones.

Internal leaks

Internal leaks might be the reason when the rear wheels do not respond immediately to steering on soft ground, or when no firm resistance is felt on the steering wheel when the rear wheels are turned all the way to the to the left or right end position.

Cause:

The oil is leaking from the internal O-rings of the shock valve.

Remedy:

1. If oil is leaking from the valve block or steering block mounting faces, replace the shock valve O-rings by new ones.
2. If oil is leaking from the pressure relief valve, the shock valve and in case of internal leaks, replace the complete valve block by a new one.

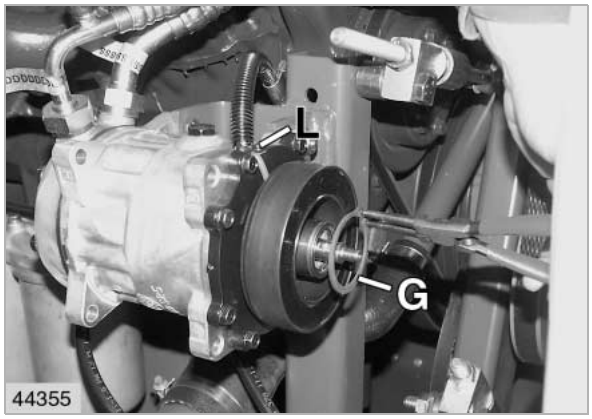
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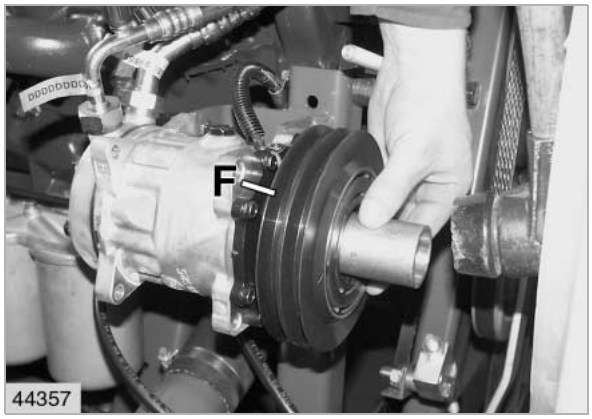
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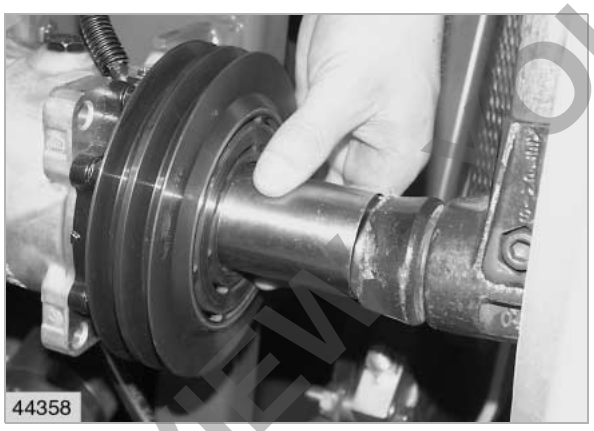
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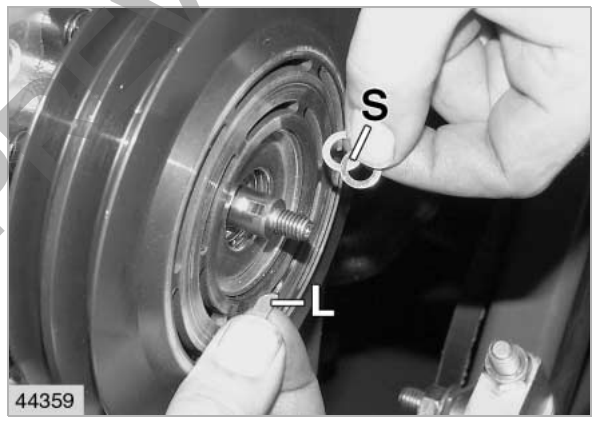
26



27



28



29

Installing the air conditioner compressor electro-magnetic clutch

(Air conditioner compressor Sanden Sd 7h 15)

1. Put magnet (M) in place and fix cable using cable clamp (L).
2. Insert outside circlip (G).
3. Carefully drive on the V-belt pulley (F) completely with bearing, using a block-ended tube and secure with outside circlip (E).

   Tube, outside diameter 46 mm, inside diameter 41 mm, 100 mm long (self-sourced)

(Fig. 21, 24, 25, 26, 27)

4. Insert dust protection (3) into the V-belt pulley (F) and drive in carefully using a block-ended tube if necessary.

   Tube, outside diameter 60 mm, inside diameter 52 mm, 50 mm long (self-sourced)

(Fig. 25, 28)

5. Push existing washers (S) on air conditioner compressor shaft.

   Insert curved washer (L).

(Fig. 29)

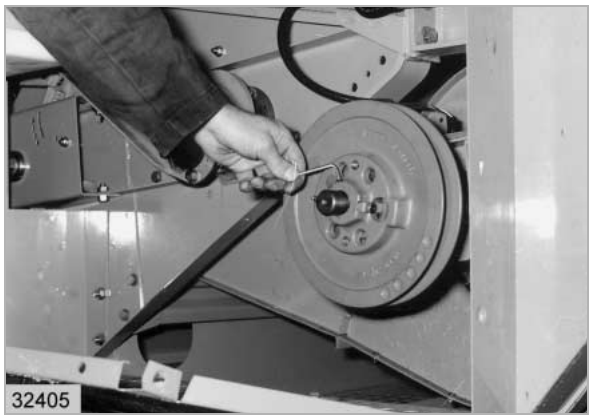
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Removing the cleaning fan shaft

Removing the fan drive belt (21), see page 7.3.5.

Fold down the hinged bottom plate on the right-hand side of the combine. For this, remove the plug. Unscrew the lateral guard.



13

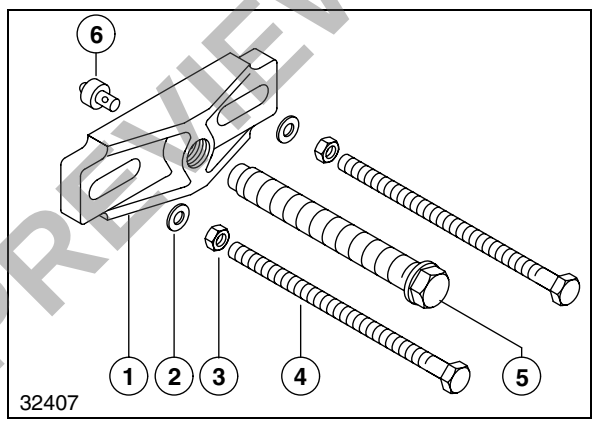
Loosen the two set screws M 10 x 8 of the variable-speed pulley.

Pull the variable-speed pulley assembly off the shaft, using the special tool and remove the parallel key.

(Fig. 13, 14)



14



15

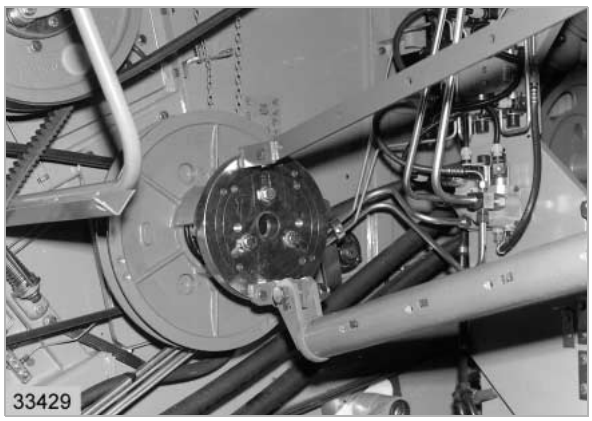
Special tool:

1 Puller bridge, part no. 181 800.0
2 Washer 13
3 Hex. nut M 12 DIN 934, part no. 236 172.0
4 Hex. bolt M 12 x 50 DIN 933-8.8, part no. 237 573.0
5 Threaded spindle, part no. 181 801.1
6 Centraliser with ball, part no. 181 849.0

(Fig. 15)

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97

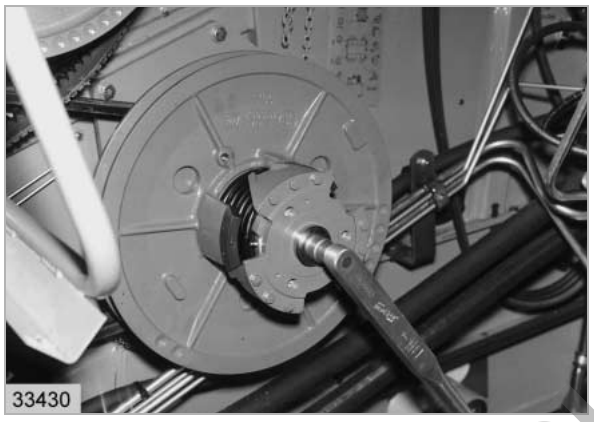
Grease the thrust piece hub as well as the pulley hub and the flange shaft.

Using a special tool and a lifting device such as a Hydrobull, slide the variable-speed pulley assembly onto the flange shaft.

CAUTION!

Secure variable-speed pulley so it will not slip off the thrust piece (18).

(Fig. 97)



98

Bolt down the M 16 x 50 DIN 933-8.8 hex. bolts with lock washers.

Tightening torque = 180 Nm

(Fig. 98)



99

Using suitable feel gauges, check the axial play between the mounting flange and the thrust piece (0.2 to 0.6 mm).

(Fig. 99)

Installing and adjusting the cutterbar variable-speed drive belt (3), see page 7.2.6.

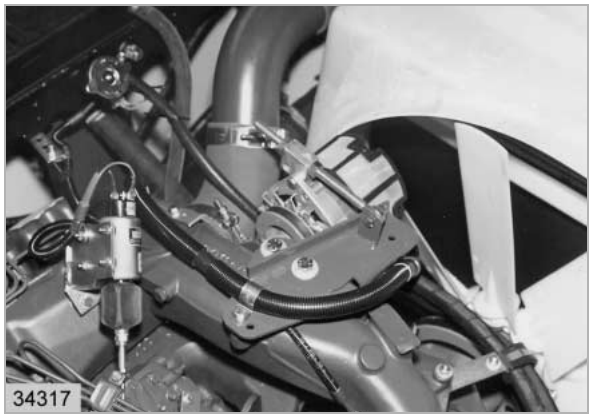
Once the pulley has been completely installed, thoroughly grease at all grease nipples until all grease channels are full.

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ENGINE ELECTRIC SYSTEM

Alternator



1

ATTENTION!

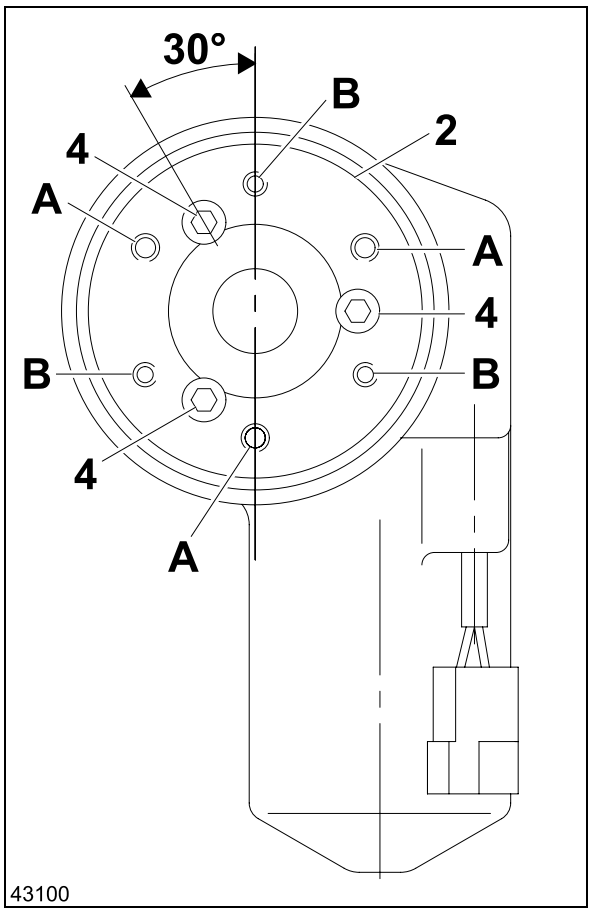
For all work on the engine, the following points must be observed:

- Never disconnect the cables connecting the alternator and battery whilst the alternator is running.
- Ensure correct polarity when connecting the cables to the battery as otherwise the diodes will be burnt out.
- Do not carry out any work on live parts unless the engine is stopped and the battery cables are disconnected.
- Do not under any circumstances flash connections to check current flow on three-phase alternators. This will damage the semiconductors.
- When performing electrical welding work on the machine, the alternator must be disconnected.
- The battery provides the current for the field excitation required to start the alternator via the battery charge indicator bulb. Blown bulbs must therefore be replaced to ensure reliable field excitation.

(Fig. 1)

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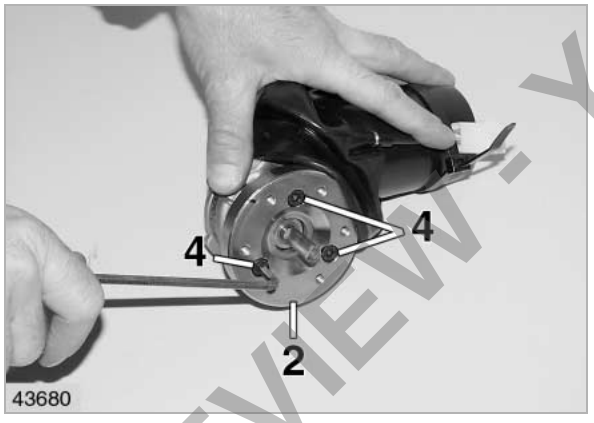
60

Assembling the fan adjustment (electric)
(Version 2)

CAUTION!

Prior to assembly, apply K2K grease according to DIN 51825, lithium-stiffened multi-purpose grease, e.g. Shell “Alvania G2” or similar brands to all sliding faces, shims, sheet gaskets and bearings.

(Fig. 7, 60)

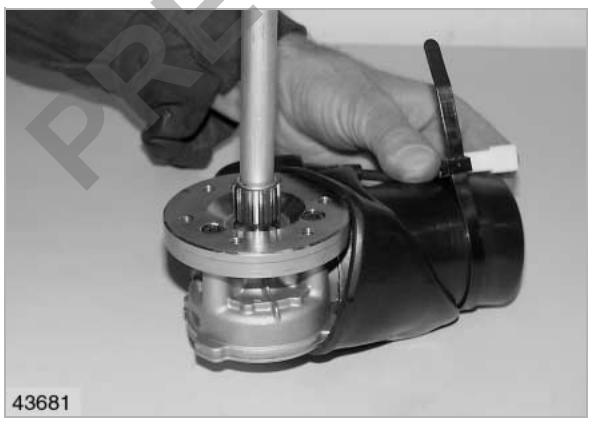


61

1. Bolt flange (2) on the DC motor with the cheese-head screws (4).

   Tightening torque M 6 x 16 = 8 Nm

(Fig. 7, 61)



62

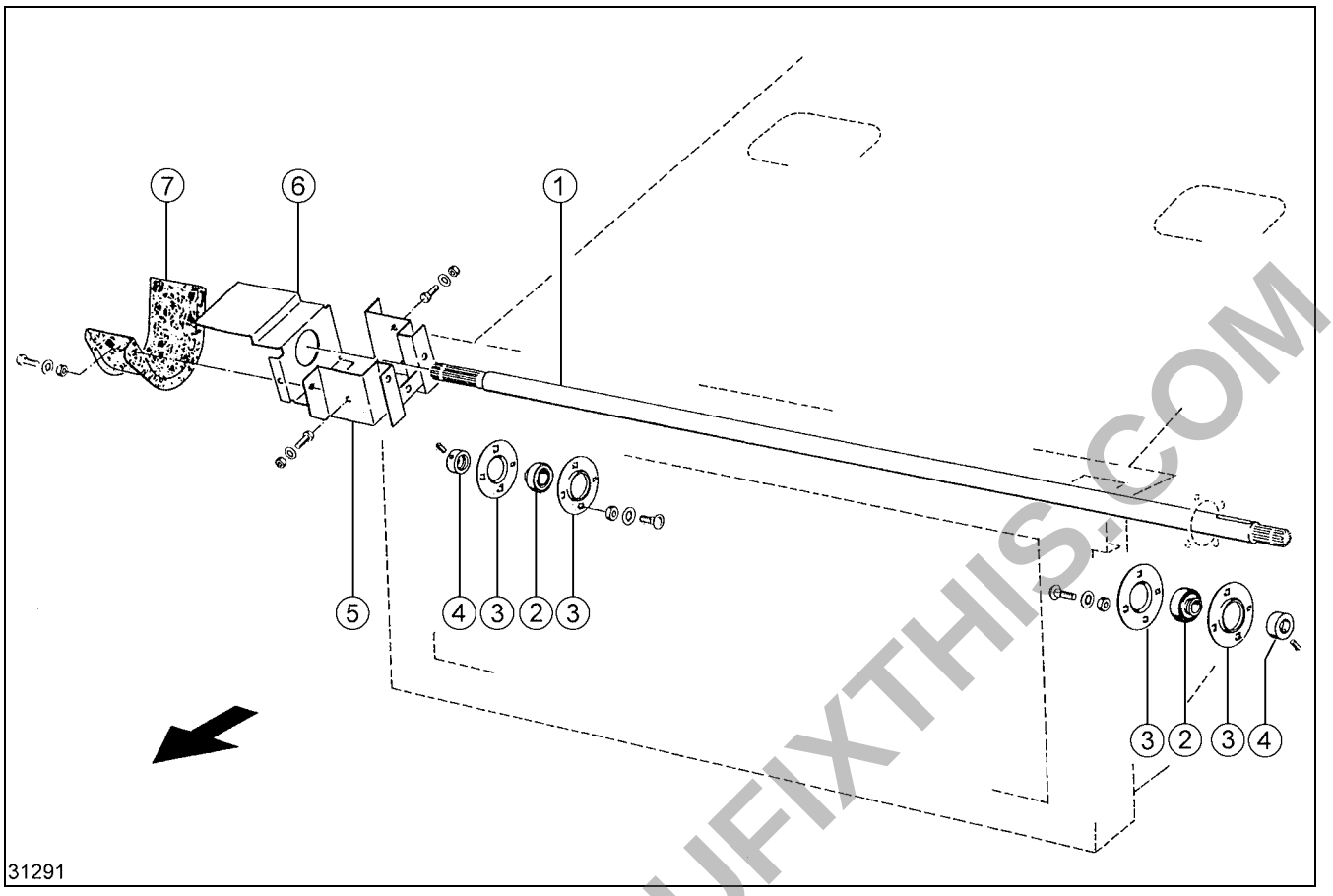
2. Slide on the catch (5) and push on the quick-release fastener using a tube.

(Fig. 7, 62)

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102

Intermediate drive shaft, disassembled

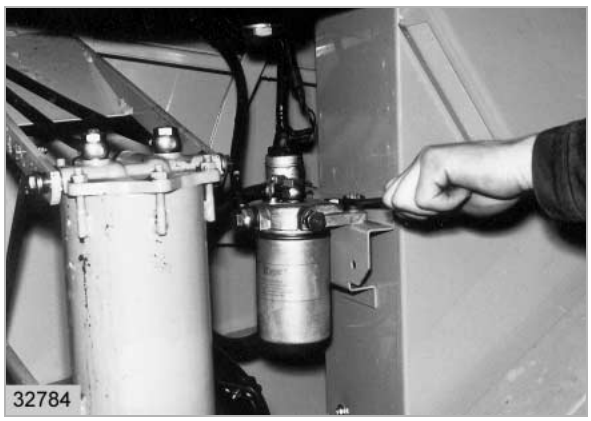
1 Intermediate drive shaft
2 Lock collar bearing PEA 208-2 S
3 Sheet-metal flange BF 80
4 Lock collar 40
Set screw M 10 x 1.25 x 8
5 Bracket
Hex. bolt M 6 x 12 DIN 933-8.8
Hex. nut M 6 DIN 934-8
Contact washer A 6
6 Guard
7 Guard
Hex. bolt M 8 x 16 DIN 933-8.8
Self-locking nut VM 8
Contact washer B 8

(Fig. 102)

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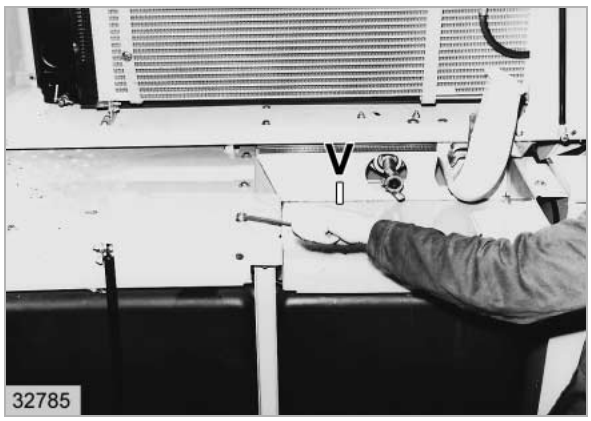
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18

Unscrew the fuel pre-filter and the fuel pump from the elevator shaft.

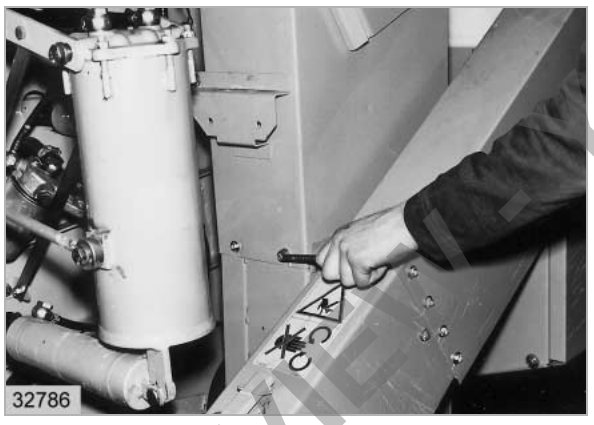
(Fig. 18)



19

Unscrew the extension plate (V).

(Fig. 19)



20

Unscrew the elevator shaft from the elevator boot.

Lift the elevator shaft out of the machine.

(Fig. 20)

Installing the grain elevator shaft

1. Lower the grain elevator shaft into the elevator boot and bolt it down.
2. Bolt down the extension plate (V).
3. Refit the fuel pre-filter and fuel pump.
4. Bolt down the supporting brace and the cable bracket.
5. Install the grain elevator head.
   Install the grain elevator chain.

(Fig. 15, 16, 17, 18, 19)

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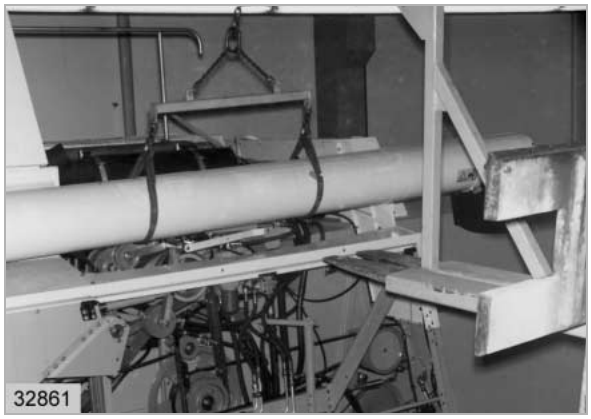


98

Removing the upper grain tank unloading angle drive

Remove the work light (S).

(Fig. 98)

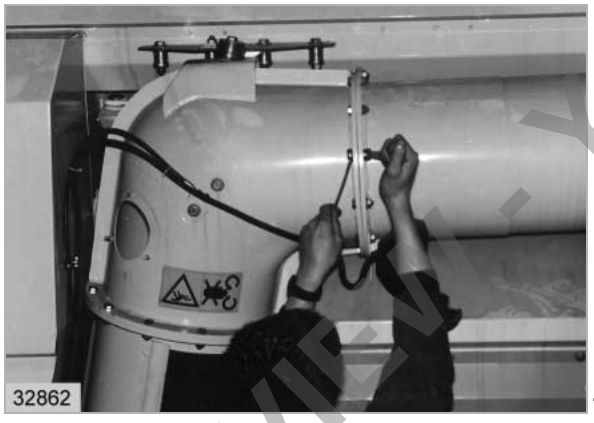


99

Swing the grain tank unloading tube out, then remove the bolts at the back of the tube.

Swing the grain tank unloading tube back in and, using a suitable lifting device, support the tube.

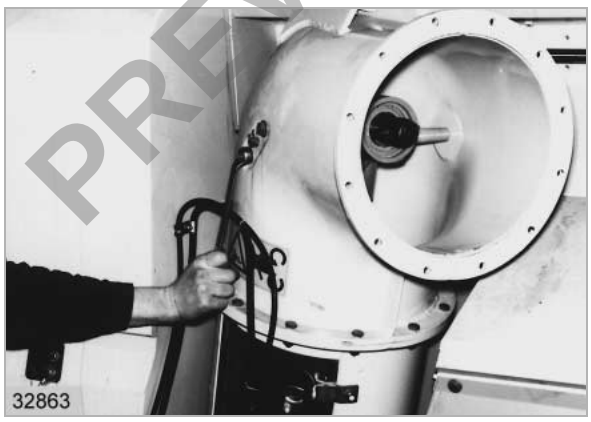
(Fig. 99)



100

Unscrew the bolts at the front around the flange, then remove the tube.

(Fig. 100)



101

Remove the grease pipes.

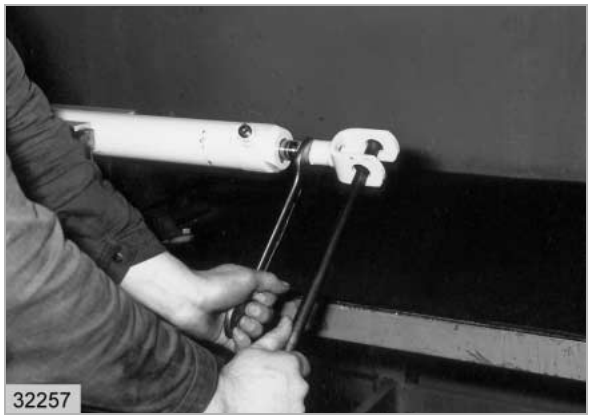
Unscrew the angle drive and remove it.

(Fig. 101)

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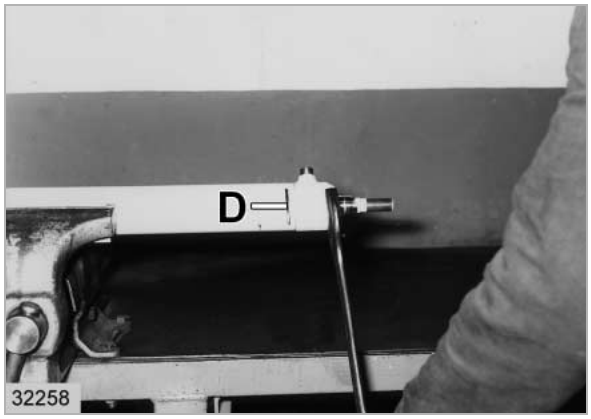
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58

Once the M 18 x 1.5 lock nut has been loosened, unscrew the yoke from ram rod.

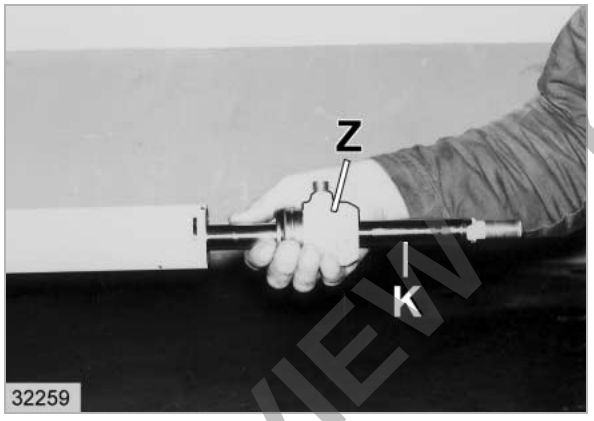
(Fig. 58)



59

Chuck the cylinder and turn the cylinder head until the securing wire (D) comes out of the groove of the cylinder barrel.

(Fig. 59)

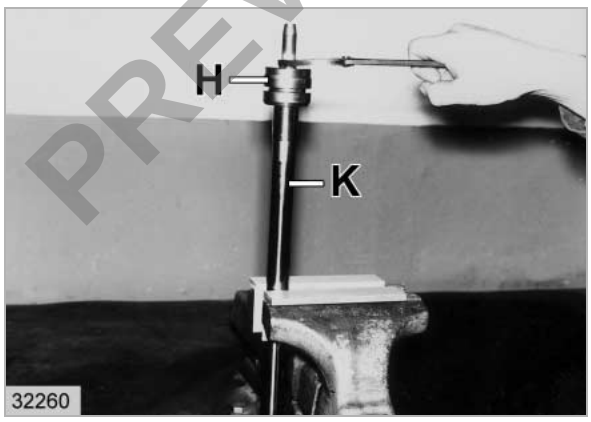


60

Pull the cylinder head (Z) and the ram rod (K) from the cylinder barrel.

Clean the ram rod and pull off the cylinder head.

(Fig. 60)



61

Unscrew the ram (H) from the male screwed end of the ram rod (K).

NOTE!

The joint is secured with liquid locking compound. It can be released easily by heating it to about **200 °C**.

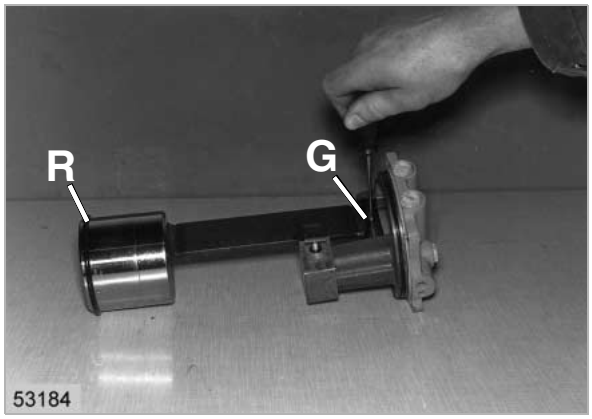
The ram seal and the O-ring can now be replaced.

(Fig. 61)

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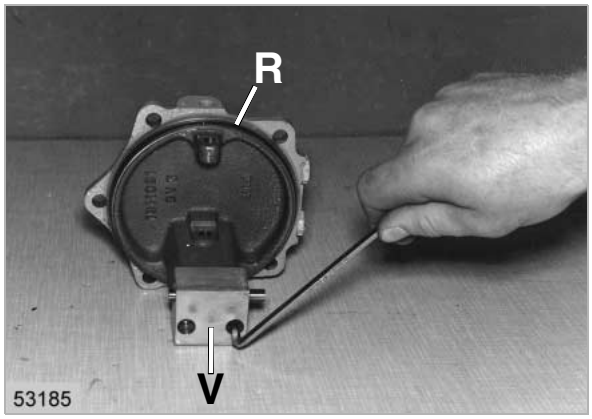


77

Loosen the set screw (G) at the pendulum and push the cylinder pin out of the pendulum.

Replace the O-ring (R) of the pendulum.

(Fig. 77)



78

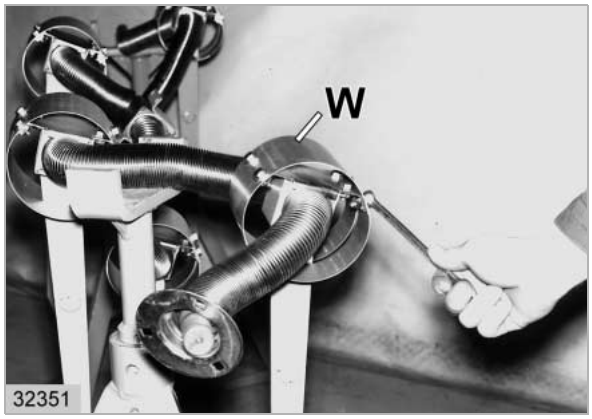
Remove the cheese-head screw from the cover and remove the valve housing (V).

Replace the O-ring (R) of the cover.

(Fig. 78)

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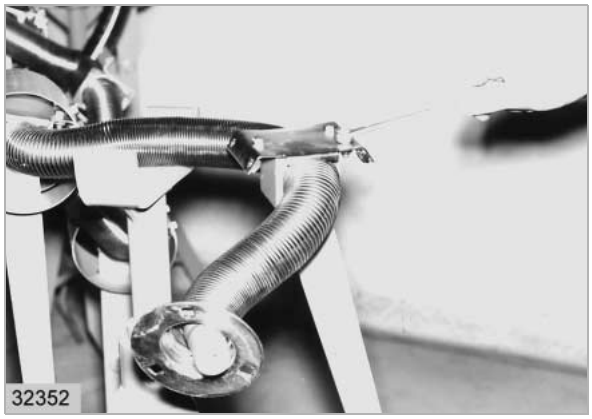


16

Disassembling the intensive separation system crankshaft

Unbolt anti-wrapping guard (W).

(Fig. 16)

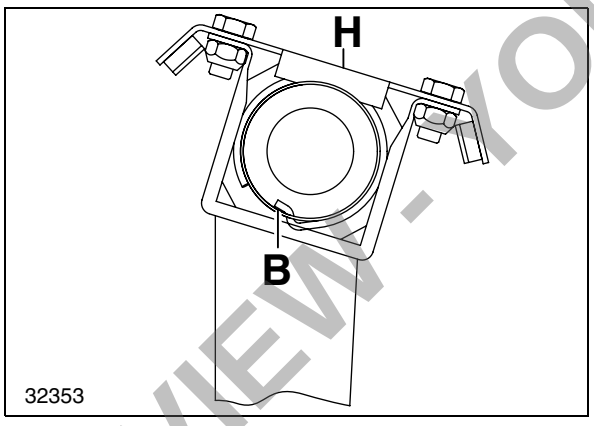


17

Unbolt the bearing plate and remove the agitator tines with bearings.

Remove the spring retainers and the compression springs.

(Fig. 17)



18

Assembling the intensive separation system crankshaft

1. Slide the spring retainer with compression spring on the intensive separation system crankshaft.
2. Put the intensive separation system bearings into position.

   Install the agitator tines and the mounting plate.

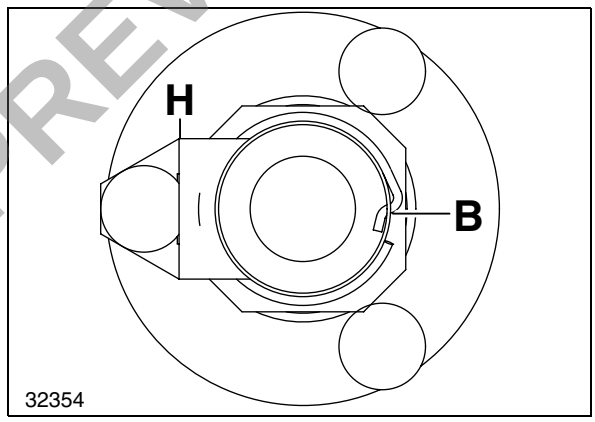
   Hook the ends of the compression springs into bore (B) of the spring retainer or bearing cup.

CAUTION!

Mounting plate (H) must be fitted between the 1st and 2nd spring winding.

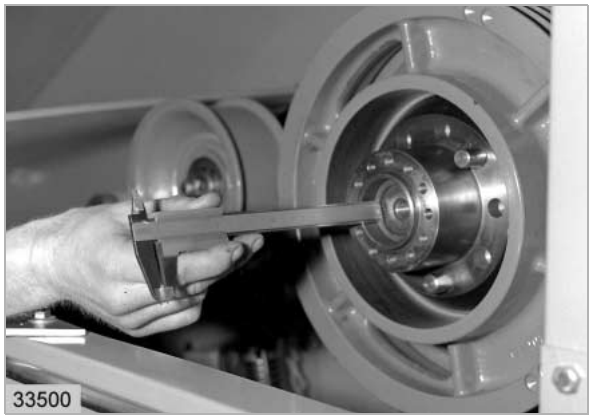
3. Install the intensive separation system crankshaft.

(Fig. 18, 19)



19

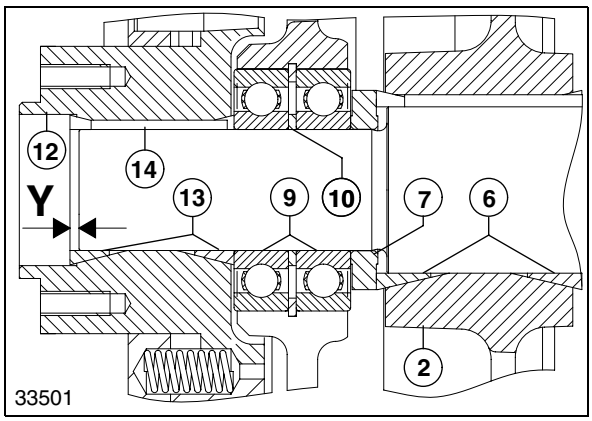
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31

11. Unscrew hex. bolt (15). The clearance (X) between the shaft end and the tapered ring must be at least **0.8 mm**.

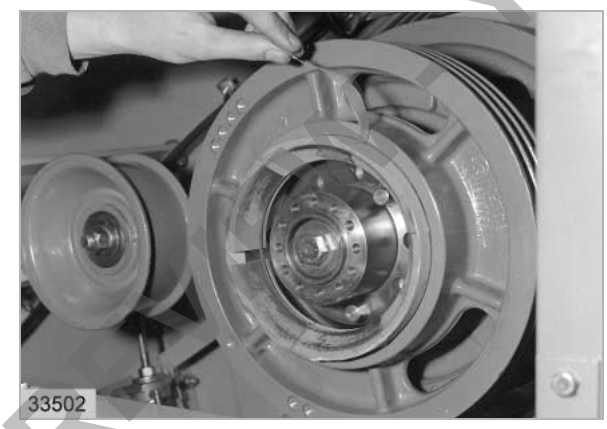
(Fig. 31, 32)



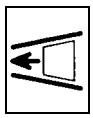
32

12. Refit hex. bolt (15) and tighten to **210 Nm**.

(Fig. 30)



33

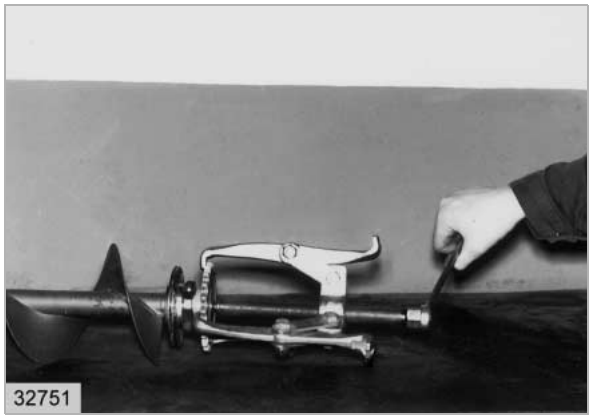


13. When fitting new friction rings (18), lay them around the inner spring (19) in the numbered order. Tape the outer edge of the friction rings with suitable tape.
14. Place the friction ring in the clutch hub (12), then remove the tape.

(Fig. 20, 21, 33)

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14

Drive the expansion pin out of the sprocket, then pull sprocket from the shaft.

(Fig. 14)



15

Remove the set screw from the cam wheel. Tap the cam wheel free, then pull the bearing off.

(Fig. 15)

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Installing the top returns auger

1. Turn the returns auger in from the right through the assembly slot.
2. Install the flange ball bearings on both sides and bolt tight. Slide on the cam wheel on the right-hand side.
3. Screw the screw plug into the assembly slot.
4. Fit the sprocket into position on the returns auger and secure using an expansion pin.
5. Align the returns auger to the sprocket and tighten the lock collar and the cam wheel of the flange ball bearings by tapping them in direction of rotation, then secure.
6. Install the drive chain and tension it, using the block tensioner (S).

   (Fig. 9)

7. Refit the magnetic pick-up and adjust so that the clearance between the pick-up head and the highest part of the cam when is **1 ± 0.5 mm**. Connect the cable.
8. Refit the cover at the top of the returns elevator and the drum inspection cover.

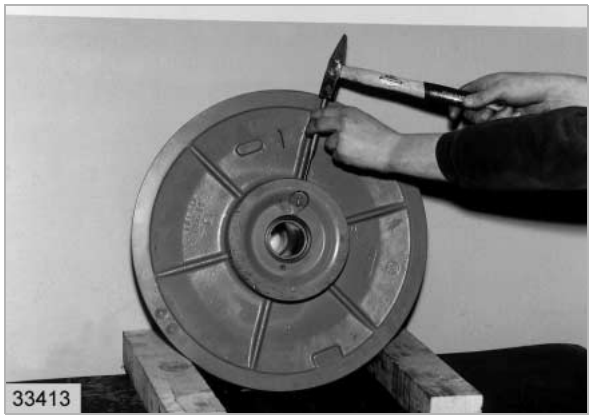
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21

Remove the compression spring and the mounting flange.

(Fig. 21)



22

Remove the variable-speed pulley half.

Drive out the roll pin.

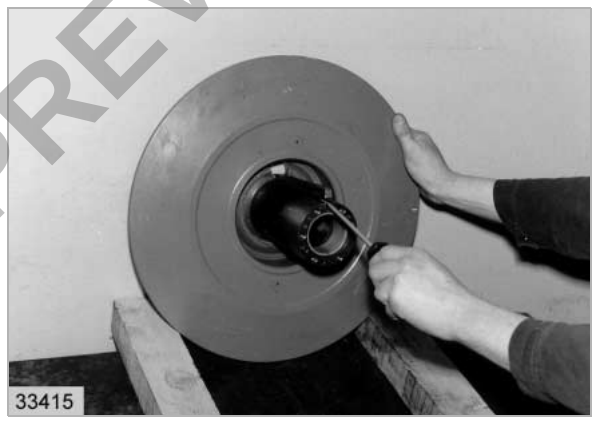
(Fig. 22)



23

Remove the M 12 x 1.5 screw plug and both M 6 x 13 cheese-head screws.

(Fig. 23)



24

Remove the parallel key with a notched dowel using a suitable screwdriver.

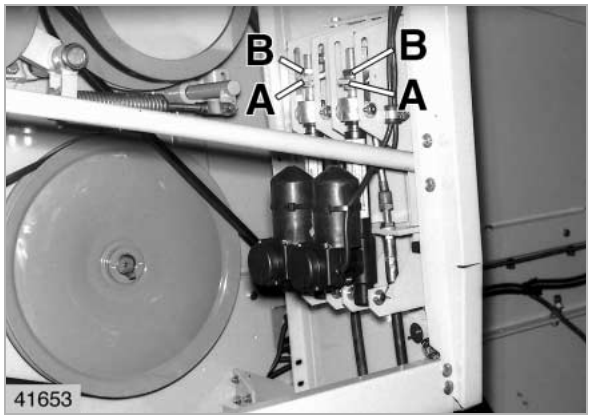
(Fig. 24)

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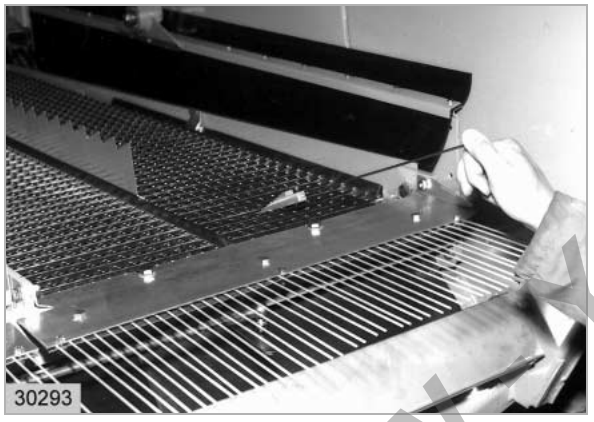
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Tightening torques of axial mountings for the upper and lower sieves
(up to serial no. ...)

Upper sieves = 45 Nm (M 12 hex. bolts)
Lower sieve = 23 Nm (M 10 hex. bolts)



24



25

Sieves – Basic setting

(electric sieve adjustment – up to serial no. ...)

If the rods have been adjusted, the basic setting of the sieves has changed and must be reset.

This is done as follows:

1. Unhinge the ball joints of the Bowden cables from the sieve adjusting levers.
2. Using the rotary switch and +/– keys, move the sieve adjusting linkage to the “0” position.
3. Fully close the sieve openings.
4. Adjust den cables so that the can be installed without stress and refit the Bowden cables.

   The Bowden cables can be adjusted at the hex. nuts (A and B at the electric motors) and / or at the Bowden cable retarders (behind the sieves).
5. Checking the identical positions of frogmouth sieves:

   Open sieves, e.g. to position “15”.

   Openings of the left-hand frogmouth sieve must be identical with the openings of the right-hand frogmouth sieve.

   To check the frogmouth sieve openings use a gauge (CLAAS special tool, part no. 181 625.0) if necessary.

   With this gauge the lower sieves can be checked too. But the upper sieves must then be in the fully open position.

   If necessary, set the frogmouth sieves by adjusting the rods. Make sure sieve openings are not set too narrow.

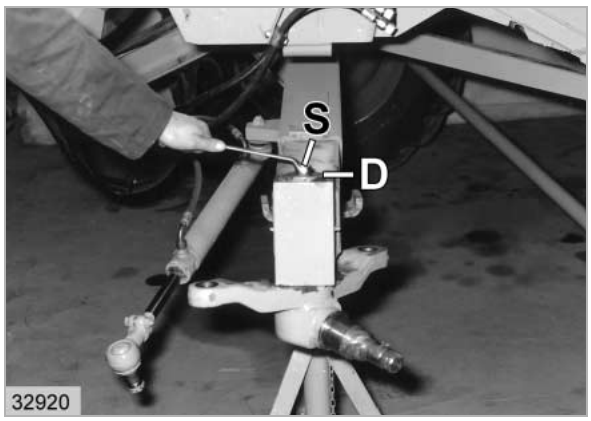
   To adjust the finishing sieves for identical openings, one of the upper sieves has to be removed.

(Fig. 24, 25)

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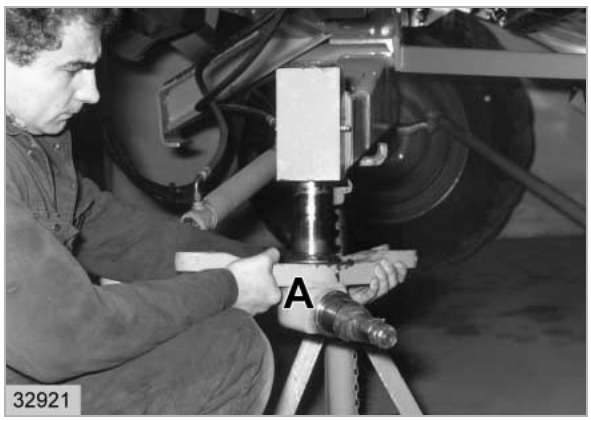
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16

Remove bolt (S) from the stub axle and remove it with the lock washer and cover disc (D).

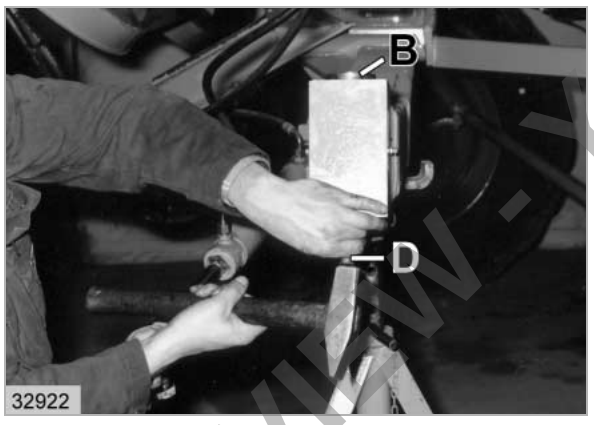
(Fig. 16)



17

Remove the stub axle (A) from underneath.

(Fig. 17)



18

Pull the axial roller bearing out of the steering axle housing from underneath.

Drive the worn-out bearing bushings (B) out of the steering axle housing using a punch (D).

(Fig. 18)

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STRAW WALKER

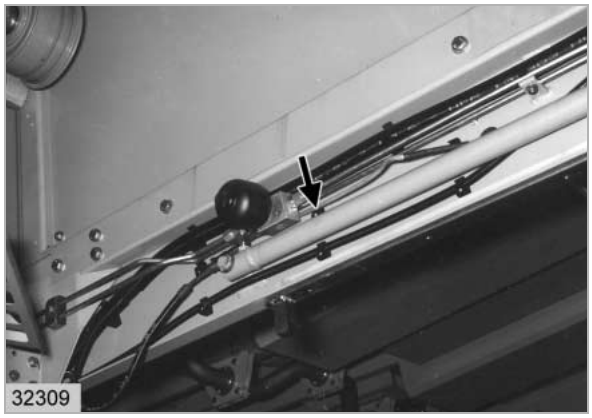
Removing the straw walker racks

Removing the under-walker return floor, see page 4.1.1.

Disconnect the cable connections to the straw walker sensor on the left and right sides and pull through the side panel.

Unscrew the cable clamps on the combine side panel.

(Fig. 1)



1

Unbolt the straw walker racks at the bearings of the straw walker crankshafts at the front and rear.

(Fig. 2)



2

With the rear hood raised, pull the straw walker racks out to the rear.

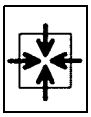
(Fig. 3)



3

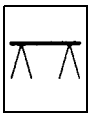
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Installing the threshing drum

1. Using a suitable lifting device, guide the drum into the machine housing from the right-hand side. While doing so, place a suitable tube onto the shaft end on the left-hand side. Use this tube to guide the shaft end into the notch.



2. Support the underside of the drum with wooden wedges on both sides.
3. The bearing bore, taper lock sleeve and the shaft seat must be dry and free from grease.
4. On the right-hand machine side, assemble the bearing assembly (8 – 12), the spacer (7) and the assembly cover (6) on the shaft end.
5. Guide the M 12 x 100 bolts through the bearing assembly (8 – 12) and the spacer (7) and bolt into the assembly cover (6).
6. Remove the wooden wedge from under the drum and reinstall the assembly cover to the drum housing.

   Refit the grease pipe.
7. *Installing the right-hand drum bearing*, see page 3.4.5.

   Installing the left-hand drum bearing assembly, see page 3.4.9.



CAUTION!

Align the threshing drum to be centred in the drum housing.

(Fig. 31)

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