Workshop Service Manual

Combines series
LAVERDA M400 - M410

M400-S/N 553900031 - **M400 LC/LCI**-S/N 554000079

M410-S/N 564000111 - **M410 LC**-S/N 564100084

LAVERDA S.p.A. - Via F. Laverda, 15/17 - 36042 BREGANZE (VI) - Italy

January 2013
No. LA327301011L
M400 - M410 - EAME
English

3 Identification number

Combine	Model identification code
M 400	X5
M 400 LC	X5AL
M 400 LCI	X5BL
M 410	X6
M 410 LC	X6AL

Description of combine identification number

		a		b		c	
Example:	*	**5640**	*	**5640**		**00001**	*
				d			

a Technical type

d Identification number **564000001**

It is made up of two parts:
- Part 1 **(b)**, made up of 4 digits "5640", identifies the technical type (machine model).
- Part 2 **(c)**, made up of 5 digits "00001" which increase in numerical order of production and identify the sequential number of the machine model produced.

5539*5539.. ...	For the **M 400** model
5540*5540.. ...	For the **M 400 LC/LCI** models
5640*5640.. ...	For the **M 410** model
5641*5641.. ...	For the **M 410 LC** model

FreeFlow grain header identification number

7116.. ...	For the **16 ft (m 4.80)** model
7118.. ...	For the **18 ft (m 5.40)** model
7120.. ...	For the **20 ft (m 6.00)** model
7123.. ...	For the **23 ft (m 7.00)** model
7125.. ...	For the **25 ft (m 7.60)** model

PowerFlow grain header identification number

7018.. ...	For the **18 ft** model
7020.. ...	For the **20 ft** model
7022... ...	For the **22 ft** model

NOTE: *The 22 ft PowerFlow header cannot be installed on model X5BL.*

- Never try to check or adjust the fan belt tension when the engine is running. Never adjust the fuel injection pump when the machine is moving.
- Never lubricate the machine when the engine is running.

Electrical systems

- When using auxiliary batteries, remember that the cables on both sides must be connected as follows: (+) with (+) and (-) with (-). Do not short-circuit the terminals. GAS RELEASED FROM BATTERIES IS HIGHLY FLAMMABLE. During recharging, leave the battery compartment open for better ventilation. Never check the battery charge with "jumpers" obtained by laying metal objects on the terminals. Avoid sparks or flames in the area surrounding the batteries. Do not smoke to prevent explosion hazards.
- Before any intervention, check there are no fuel or power leaks: eliminate these leaks before proceeding with the work.
- Never recharge batteries in closed areas: make sure there is enough ventilation to prevent accidental explosions due to the build-up of gases released while charging.
- Always disconnect the batteries before any intervention on the electrical system.

Hydraulic systems

- Fluid escaping from a very small hole can be almost invisible and can be strong enough to penetrate the skin. For this reason, use a piece of cardboard or wood when checking. DO NOT USE BARE HANDS: if a jet of fluid penetrates the skin, contact a doctor immediately. If no immediate medical care is given, severe infections or dermatosis could occur.
- Use suitable instruments to check the system pressures.

Wheels and tyres

- Make sure that tyres are correctly inflated to the pressure specified by the manufacturer. Regularly check possible damages to rims and tyres.
- Stay away from and to one side of the tyre when adjusting tyre pressures.
- Check the pressures only when the machine is unladen and the tyres are cool to prevent obtaining any wrong measurements due to overpressure. Never use parts of recovered wheels as improper welding, brazing or heating could have weakened them and could cause breakages.
- Never cut or weld a rim with a tyre that is fitted and inflated.
- To remove the wheels, secure both the front and rear wheels. After lifting the machine, to prevent it from falling, arrange suitable supports underneath in accordance with the regulations in force.
- Deflate the tyre before removing any object caught in the tread.
- Never inflate tyres using flammable gases as they may cause explosions and injuries to people nearby.

Removal and refitting

- Lift and handle all heavy parts using suitably sized lifting equipment. Make sure all the parts are secured using the appropriate slings and hooks. Use the correct eye bolts. Extra care should be taken if anyone is near the load to be lifted.
- Handle all parts with great care. Do not put hands or fingers between parts. Wear appropriate safety clothing - safety goggles, gloves and shoes
- Do not twist metal chains or ropes. Always wear safety gloves when handling cables or chains.

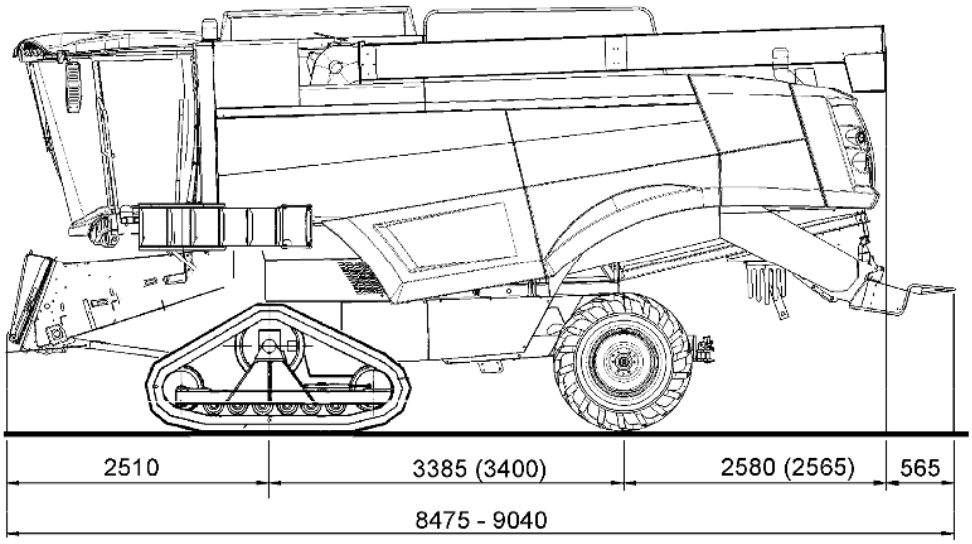
Grain tank	Unit	X5AL	X5BL	X6AL
Crop conveyed by		Tank filling elevator and tank filling auger into the middle of the grain tank		
Unloading auger speed	rpm	388		
Capacity	l	8600		
Unloading auger drive		Powerband belt, chain and angle gear		
Torque limiter		Shear bolt		
Length of unloading tube	m	5.00		
Unloading speed	litres/sec	105		
Unloading height	mm	4450		

Hydraulic system	Unit	X5AL	X5BL	X6AL
Oil tank capacity	l	36		
Table hydraulics pump oil flow	litres/min	37.5		
Table control valve max. pressure	bar	200		
Auxiliary hydraulics pump oil flow	litres/min	4		
Auxiliary hydraulics control valve max. pressure	bar	85		
Power steering pump capacity	litres/min	15.5		
Power steering pump capacity	cm^3/rev	125		
Max. pressure	bar	140		
Anti-shock valve max. pressure	bar	200		
Intake filter	micron	150		
Return filter	micron	16		
Levelling pump capacity	litres/min	50.5		
Levelling circuit max. pressure	bar	200		

Hydrostatic system	Unit	X5AL	X5BL	X6AL
Oil tank capacity	l	36		
Pump displacement	cm^3/rev	130		
Pump speed	rpm	2450		
Pressure relief valve setting	bar	420		
Motor displacement	cm^3/rev	100		
Return filter	micron	16		
Pressure filter	micron	10		

Engine	Unit	X5AL	X5BL	X6AL
Make		AGCO POWER		
Type		7.4 AWI. 747		8.4 AWI. 708
Cylinders	no.	6		
Cubic capacity	cm^3	7365		8419
Bore	mm	108		111
Stroke	mm	134		145
Combustion		direct injection		
Rotation direction (from the flywheel)		Anti-clockwise		
Nominal speed	rpm	2200		

X6 model with tracks



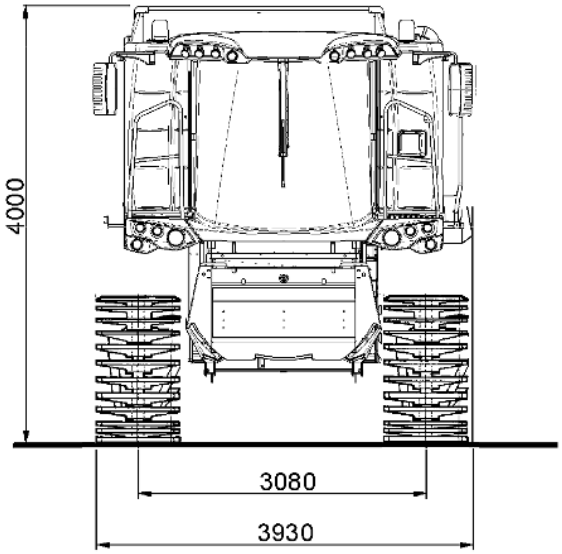


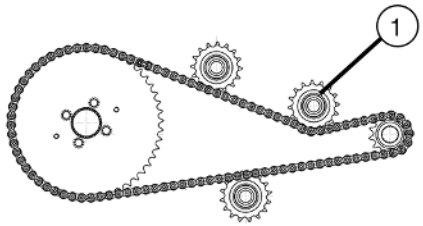
Fig. 6. I041149

The values in brackets refer to the 4WD version.
Maximum overall dimensions of tracks = 3884 mm

11 Belt and chain tension references - left-hand side

1

2



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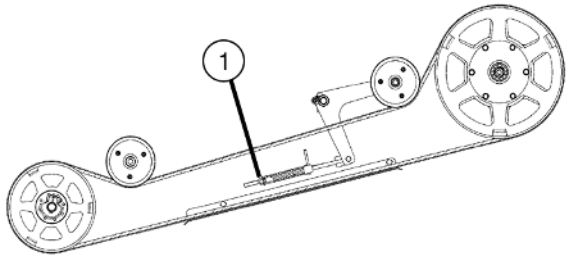

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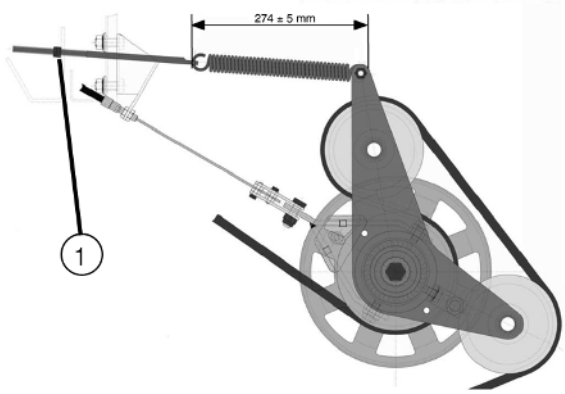


Name	Compressed spring (mm)
1. Knife drive belt	Load 80 N - Deflection 8÷9 mm
2. Transmission chain for feeding auger	Fixed - Deflection 15 mm
3. Drive belt for cutting table	Semi-automatic - Length of the spring equal to the index 165 ± 1 mm
4. Reversing drive belt for main crop elevator	Semi-automatic - Length of the spring equal to the index 274 ± 5 mm.

NOTE: *the tension of the chain (2) is obtained by working on the tensioner (1).*

NOTE: *the tension of the belt (3) is obtained by working on the self-locking nut (1).*

NOTE: *the tension of the belt (4) is obtained by working on the nuts (1).*

14 Tightening torques

Screws

(Tightening torque in Nm)

Screw type	Class			
	6.9	8.8	10.9	12.9
M4	2.4	2.9	4	5
M5	5	6	8.5	10
M6	8.5	10	14	17
M8x1	23	27	38	45
M8	21	25	35	41
M10x1	46	55	77	92
M10x1.25	44	52	73	88
M10	41	49	69	83
M12x1.25	80	95	135	160
M12x1.5	76	90	125	150
M12	72	86	120	140
M14x1.5	125	150	210	250
M14	115	135	190	230
M16x1.5	190	225	318	380
M16	182	210	295	355
M18x1.5	295	325	460	550
M18X2	265	310	440	530
M18	245	295	400	485
M20x1.5	385	460	640	770
M20X2	370	440	620	740
M20	345	410	580	690
M22x1.5	520	610	860	1050
M22X2	500	600	840	1000
M22	465	550	780	930
M24X1.5	690	820	1150	1400
M24X2	650	780	1100	1300
M24	600	710	1000	1200
M26X1.5	880	1050	1470	1760
M27x2	970	1150	1600	1950
M27	890	1050	1500	1800
M28X1.5	1070	1270	1810	2170
M30X1.5	1400	1650	2300	2750
M30x2	1350	1600	2250	2700
M30	1300	1450	2000	2400

1 AGCO POWER Product Support Service

If you need product support on any AGCO POWER engine, please follow the procedure below so that you can provide clear information and allow the AGCO organisation to respond as quickly as possible.

If you need support, always inform the Breganze Technical Support Service in writing via fax to the number 0039 0445 385315 (afterwards, you will be able to communicate by phone but it is essential to use a method of communication, especially in urgent cases, that is clear and precise).

It is essential to supply the following information:

- Combine model and frame number.
- Engine symptoms and fault (which can be found under the fault code).

The Technical Support Service will respond immediately:

- With a solution by phone, fax or email (in the event that the fault can be repaired immediately);
- With a communication to the Dealer to contact the nearest authorised workshop to organise the intervention in the field.

All interventions must be submitted to the Technical Support Service via Claims Notification.
All Claims Notifications must reach the Technical Support Service within 30 days of the repair date.

All parts that are replaced during the interventions by our authorised workshops must be sent to the Breganze technical support service.

Warranty on the engine is forfeited in the following cases:

- Interventions carried out by unauthorised workshops
- Use of parts that are not genuine
- Modification to engine components without authorisation

9 Failure codes

EEM4 ECU

Failure code	SPN	FMI	Description	Reaction
1B.2.00	110	4	Voltage below normal on engine coolant temperature sensor	FL1
1B.2.01	110	3	Voltage above normal or open circuit on engine coolant temperature sensor	FL1
1B.1.02	110	16	Engine coolant temperature above normal	FLm
1B.1.03	110	0	Alarm! Engine coolant temperature too high	FLm
1B.2.04	174	4	Voltage below normal on fuel temperature sensor	FL1
1B.2.05	174	3	Voltage above normal or open circuit on fuel temperature sensor	FL1
1B.1.06	174	0	Alarm! Fuel temperature too high (>85 °C)	FLm
1B.2.07	105	4	Voltage below normal on intake air temperature sensor	FL1
1B.2.08	105	3	Voltage above normal or open circuit on intake air temperature sensor	FL1
1B.1.09	105	16	Air temperature above normal (>90 °C)	FL1
1B.2.0A	100	4	Voltage below normal on engine oil pressure sensor	FL1
1B.2.0B	100	3	Voltage above normal or open circuit on engine oil pressure sensor	FL1
1B.1.0C	100	16	Engine oil pressure above normal (>9.5 bar / 30°C)	FL1
1B.1.0D	100	18	Engine oil pressure low	-
1B.1.0E	100	1	Alarm! Engine oil pressure too low	SD
1B.2.0F	102	4	Voltage below normal on boost pressure sensor	FL1
1B.2.10	102	3	Voltage above normal or open circuit on boost pressure sensor	FL1
1B.1.11	102	18	Boost pressure low	FL2
1B.1.12	102	31	Excessive fall of intake manifold pressure when starting	-
1B.1.13	157	4	Voltage below normal on rail pressure sensor	FL3
1B.1.14	157	3	Voltage above normal or open circuit on rail pressure sensor	FL3
1B.1.15	157	2	Intermittent rail pressure sensor signal	FL3
1B.1.16	157	20	Rail pressure sensor signal above minimum deviation	-
1B.1.17	157	21	Rail pressure sensor signal below minimum deviation	-
1B.1.18	157	16	Rail pressure above normal	FL3
1B.1.19	520200	16	Power stages could be deactivated because of high battery voltage	-
1B.2.1A	520200	18	Power stages could be deactivated because of low battery voltage	-
1B.2.1B	4201	2	Crankshaft speed signal incorrect. Pulses are too noisy	FL2
1B.2.1C	4201	31	Crankshaft speed signal missing	FL2
1B.1.1D	723	8	Excessive difference between crankshaft and camshaft speed signals	FL2
1B.2.1E	723	31	Camshaft speed signal missing	FL2
1B.2.1F	723	2	Number and/or position of camshaft pulses implausible. Signal disturbed	FL2
1B.1.20	97	31	Water in fuel	FL2

12 Engine - R./I. - Op. 1000110

Disassembly

To remove the engine from the combine, proceed as follows:

– Position the machine on level ground and apply the hand brake.
Remove the ignition key.
Activate the battery switch.

– Drain the engine oil (1) and the engine coolant (2).

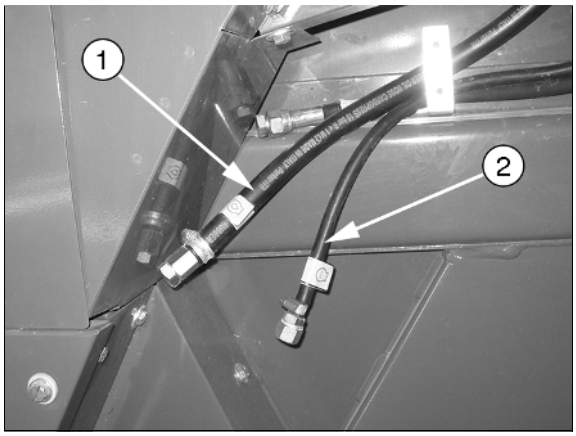


Fig. 13. I041533

– Disconnect the gas spring and remove the engine cover (3).

– Disconnect the pipes (4) to cool the DEF.

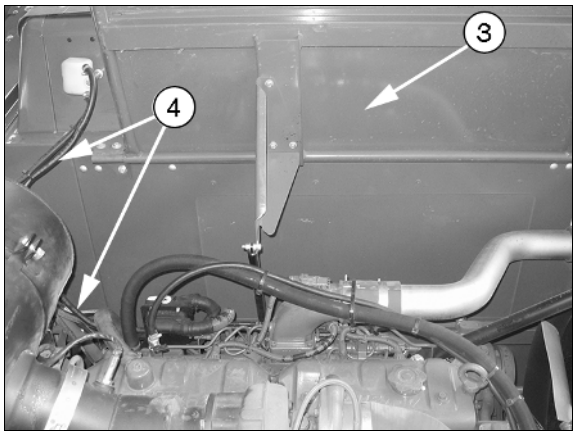


Fig. 14. I041534

– Remove the pipe (5) for draining.

– Remove the entire drainage line (6) and the reinforcement strut (7).

– Disconnect the intercooler hoses (8).

– Disconnect the pipes (9) for the engine cooling circuit.

– Disconnect the hose (10) from the air filter pipe.

– Remove the air filter pipe (11).

– Remove the hose (12) for the expansion tank.

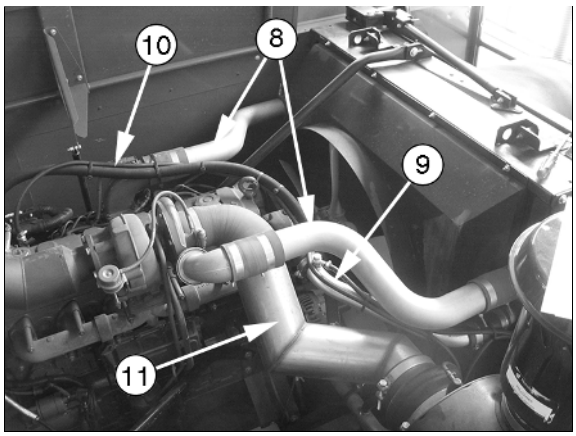


Fig. 15. I041536

16 Rail

CAUTION:
Do not open the high-pressure pipe couplings on the fuel system with the engine running. Wait for at least 30 seconds after the engine has stopped. If the high-pressure fuel jet comes into contact with skin, the fuel can penetrate the skin causing serious injuries. Call a doctor immediately.

The rail is connected to the intake manifold.
Clean the rail and the surrounding area carefully. Avoid fuel leaking on the ground. Insert plugs in the points from which the fuel connectors have been removed.
The pressure sensor (1) and closure valve (2) are supplied as spare parts for the rail. These spare parts can be replaced with the rail in position. Alternatively, the entire rail can be replaced.

Closure valve

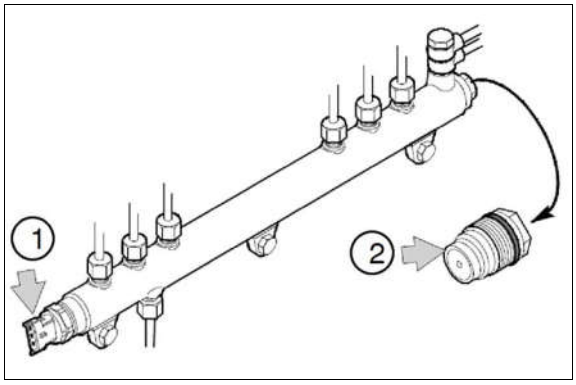
Clean the seal surface and the thread of the rail. Check the condition of the final seal surface of the closure valve. No radial scratches are allowed. Lightly lubricate the valve thread, the seal surface and the O-ring. Tighten the valve to a torque of **100 Nm**

Pressure sensor

Disconnect the electrical connector before loosening the sensor. Clean the seal surface and the thread of the rail. Check the condition of the final seal surface of the pressure sensor. No radial scratches are allowed. Lightly lubricate the sensor thread and the seal surface. Tighten the sensor in position to a torque of **70 Nm**. Connect the electrical connector.

High-pressure pipes

We recommend replacing the high-pressure pipes each time they are removed.
The tightening torque of the high-pressure pipe coupling is **40 Nm**.



I040345

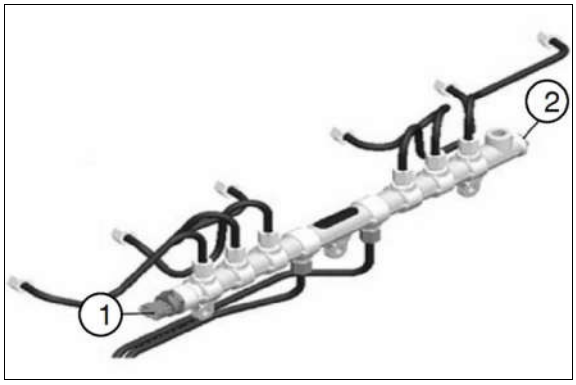


Fig. 31. I040346

26 SCR System components

The AGCO POWER SCR system is constituted by the EEM4 engine control system and the DNOX2.2 SCR system. These two systems are connected to each other by a CAN bus.

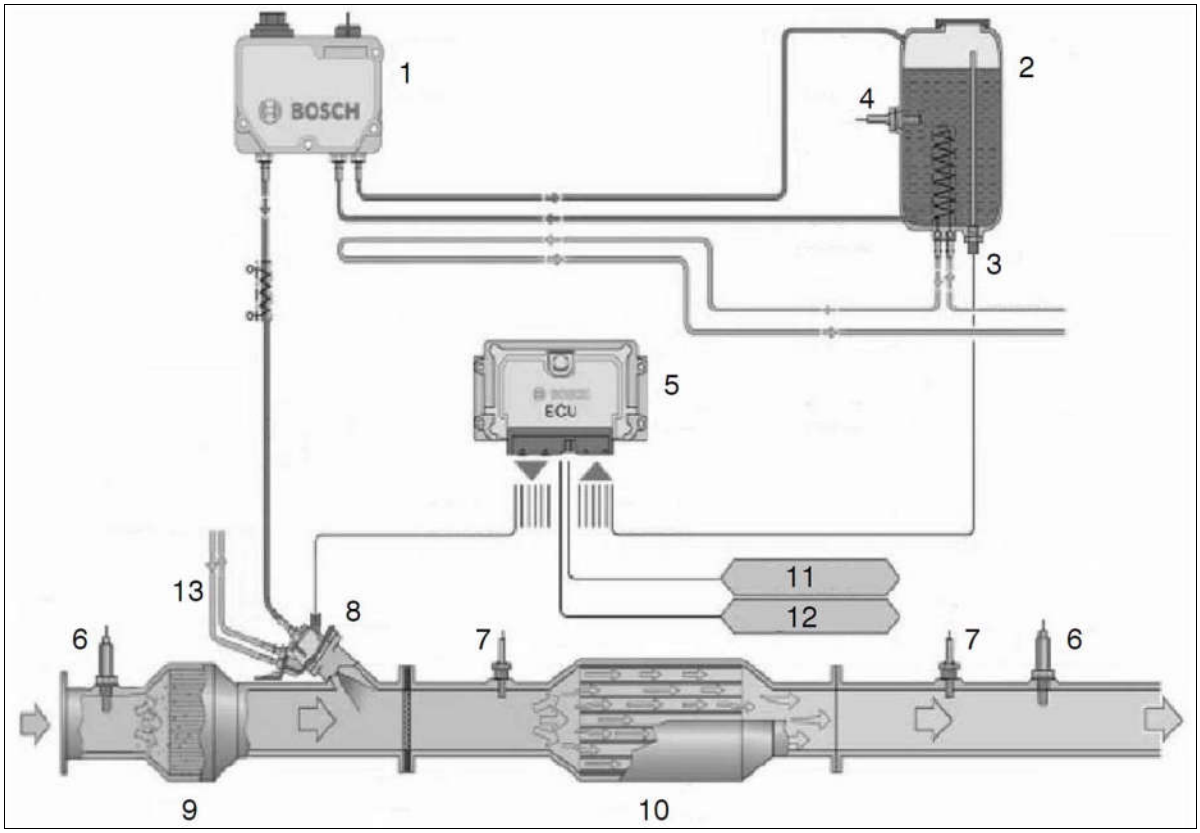


Fig. 42. I040364

1. Feed module
2. DEF tank
3. DEF level sensor
4. DEF temperature sensor
5. Engine ECU
6. NOx sensor
7. Extractor temperature sensor
8. Dosing module
9. DOC catalyst
10. SCR catalyst
11. Engine CAN
12. Diagnostic CAN
13. Dosing module cooling line

Operation

When the EEM4 control unit detects that the engine has started, the DEF pressurisation system is activated as soon as the catalyst temperature is above approximately 150°C.

Then, when the catalyst temperature is high enough (200-250°C approximately), the DEF injection is enabled into the exhaust system.

After the engine has been switched off, the DEF delivery and return pipes must be emptied. For this purpose, a return valve inside the feed module allows the DEF to be routed back to the tank before the system is closed down, with the help of air from the exhaust line through the dosing module.

36 Closed crankcase ventilation (CCV)

AGCO POWER 7.4 AWI.747 and 8.4 AWI.708 engines are fitted with closed crankcase ventilation, with filtration of the ventilation gases. This prevents oil and carbon deposits entering the engine air intake together with the ventilation gases. The CCV filter, which uses a small part of the boost pressure for filtering, **does not require maintenance.**

On 7.4 AWI.747 engines, the CCV filter is fitted on the rear end of the intake manifold and is connected via hoses to the valve cover and the intake manifold. The CCV system also includes a non-return valve for the return oil pipe, fitted on the engine oil pressure regulating valve cover.

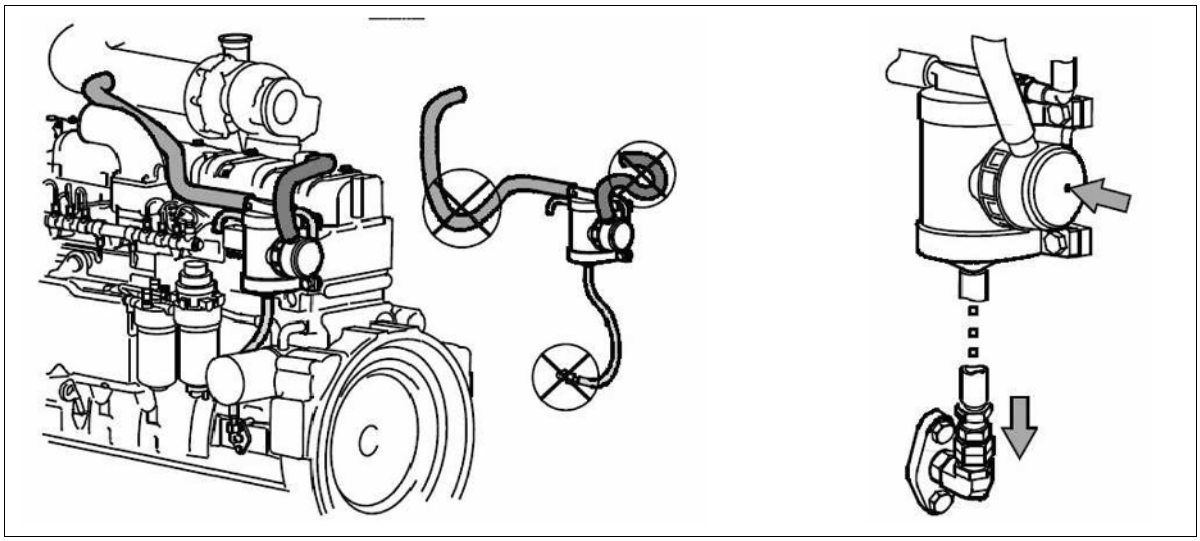


Fig. 53. I040378

Fit the valve in the vertical position, as shown in the image above. When assembling the CCV system hoses, make sure that they are not bent or folded unnecessarily.

The line of the hose must be straight upwards, as shown in the image. The filter pressure controller has a hole for monitoring the air pressure.
Make sure that the hole is not blocked.

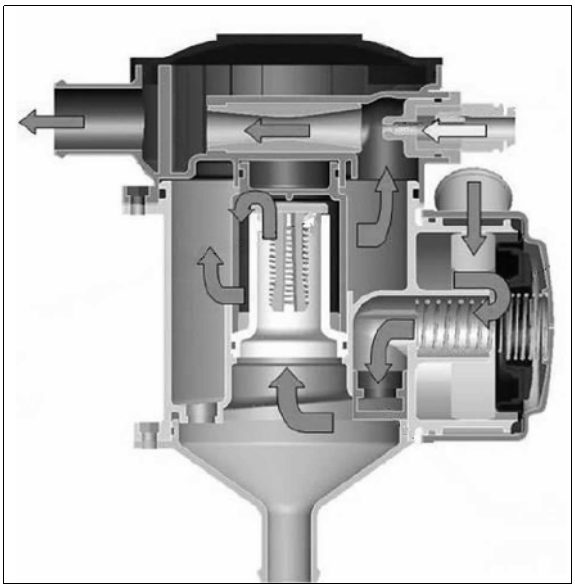


Fig. 54. I040379

43 Engine control system - Sgr. 55220

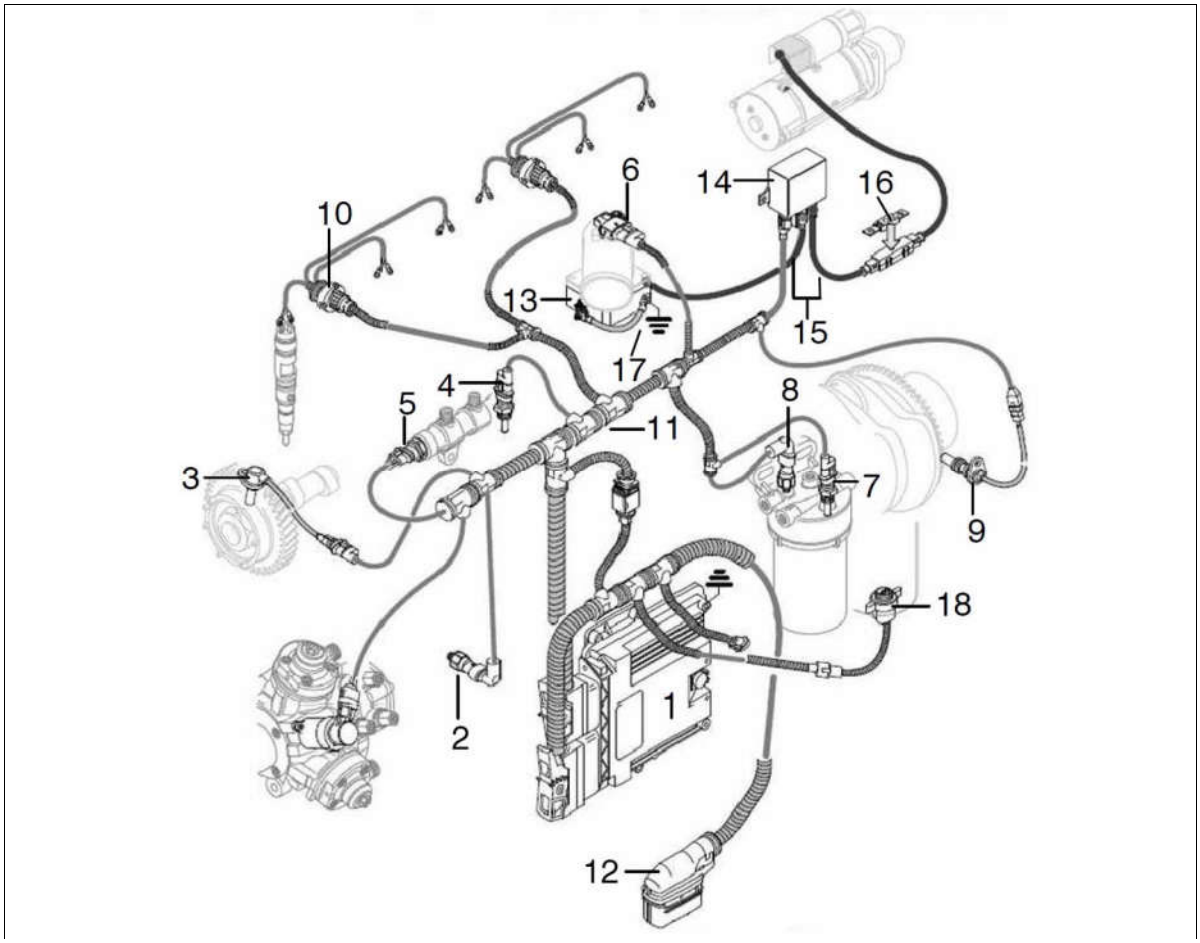


Fig. 67. I040401

1. Electronic control unit (ECU)
2. Oil pressure sensor
3. Speed sensor (camshaft)
4. Coolant temperature sensor
5. Rail pressure sensor
6. Boost pressure sensor
7. Fuel temperature sensor
8. Fuel pressure sensor
9. Speed sensor (crankshaft)
10. Injector wiring
11. Sensor wiring
12. Vehicle connector wiring
13. Air flow heater
14. Air flow heater solenoid
15. Heater wiring
16. 250 A fuse
17. Ground plate
18. Water detector (fuel)

The main function of the engine ECU is the continuous adjustment and measurement of the load, the quantity of fuel and the engine speed.
Other additional functions include automatic cold start and automatic engine protection.
The ECU continuously receives signals from the sensors which measure various engine functions, such as engine speed, oil pressure, boost pressure and fuel and coolant temperature.
The control unit receives relevant information on the engine load requirement from the transmission or the cab through the CAN bus.
In addition, the EEM4 provides exhaustive diagnostics through digital codes or a diagnostic light.

1 Specifications

	X5	X5AL X5BL	X6	X6AL
Coupling between engine and transmission shaft	Transfluid RBD 11 S			
Coupling between drive plate and driven plate	rubber pads			
Power take-off shaft	mounted on two bearings			
Thresher PTO	4HB multiple-section belt			
Hydrostatic pump transmission	4HB multiple-section belt			
Hydraulic pump transmission	with direct intake from the hydrostatic pump			

– Fit the threshing unit drive belt (2) and assemble the upper runner (3).

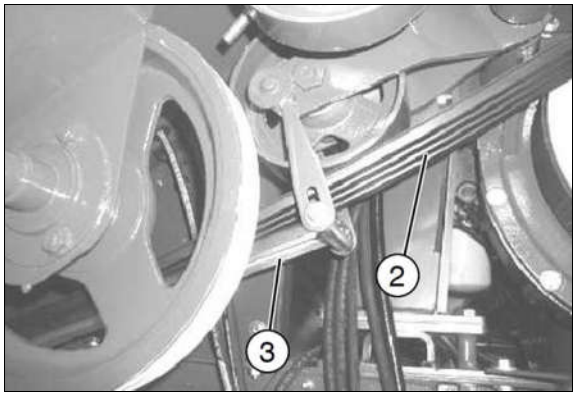


Fig. 22. I040246

– Fit the threshing unit drive pulley (4), tightening the screws (5) to a torque of **91 Nm**.

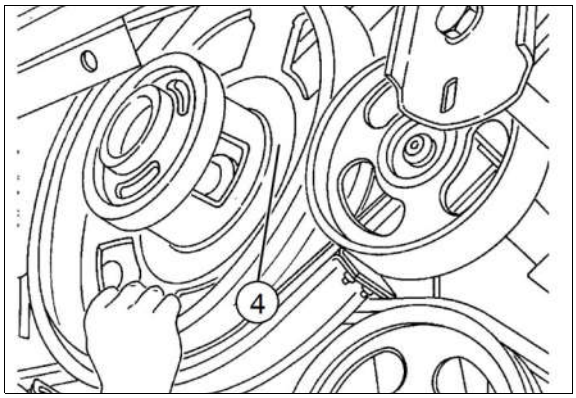


Fig. 23. I040247

– Fit the lower runner (6) onto the threshing unit belt. Engage the belt and adjust the tension with the adjustment screw as described in Section 00. Adjust the runner (6) to 7÷8 mm from the tensioned belt.
– Fit the MCS drive belt (7).

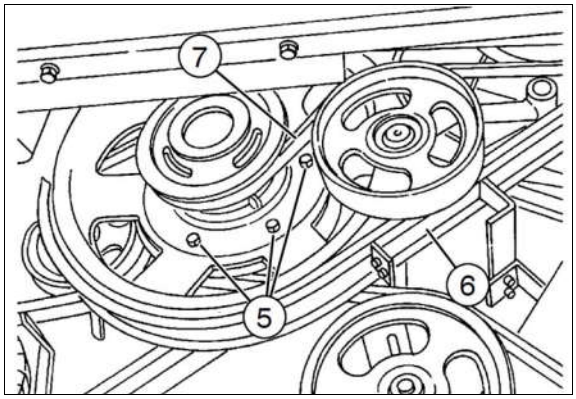


Fig. 24. I040251

– Fit the air-conditioning compressor belt (1), adjusting the tension as described in Section 00. Tighten the screws (2).

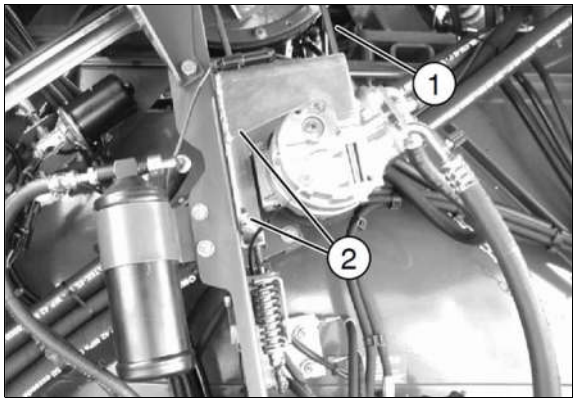


Fig. 25. I040248

The machine forward speed (2) can easily be seen on the main screen, as shown in this picture.
The speed value will only be correct if calibration has been carried out properly and successfully.

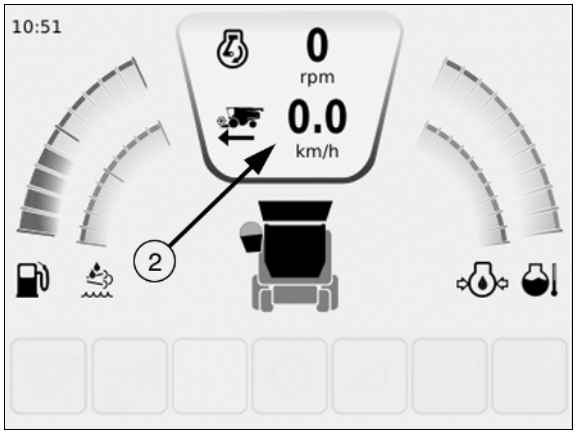


Fig. 6. I041300

Sequence for the disassembly/assembly of internal components (with the transmission housing cover removed and the assembly on the workbench).

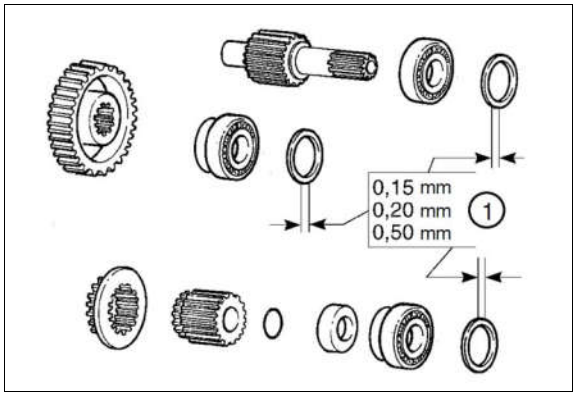
Shaft A - main shaft:
– disassembly/direct reassembly.

Shaft B - auxiliary shaft:
– disassembly is only possible after the disassembly of the lay shaft;
– assembly is only possible after the assembly of the lay shaft.

Shaft C - lay shaft:
– disassembly/direct reassembly.

Shaft D - differential half-shaft:
– disassembly is only possible after the disassembly of the lay shaft;
– assembly is only possible after the assembly of the lay shaft.

1. Available shims for adjusting shaft bearing end float.
2. Available shims for adjusting countershaft gear end float.



I040462

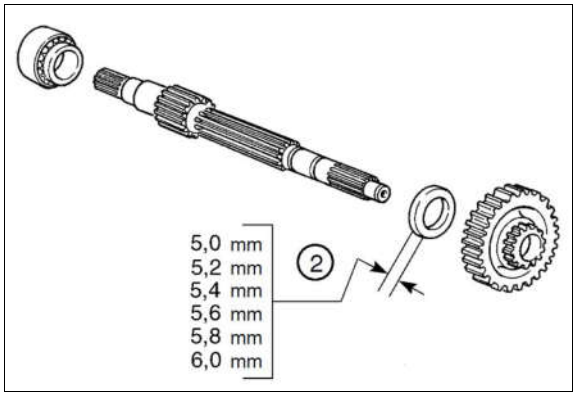


Fig. 26. I040463

Fork supporting shafts - Op. 2114526

Disassembly

Proceed as follows:
– remove the screws (1), the spring pins (2), the springs (3) and collect the balls under the springs;
– take out the rods (4);
– remove the forks (5) and the dogs (6).

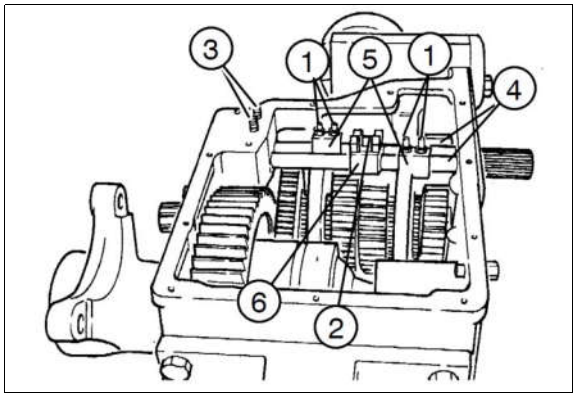


Fig. 27. I040464

Lay shaft - Op. 2114532

Disassembly

Remove the screws (7) and the flange (8).

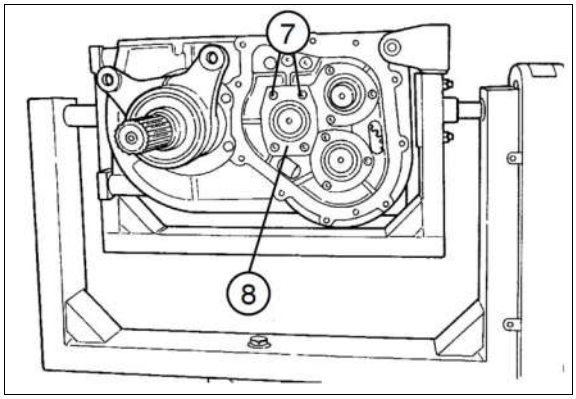


Fig. 28. I040465

Fit the spacer ring (16) with the machined part facing inwards.

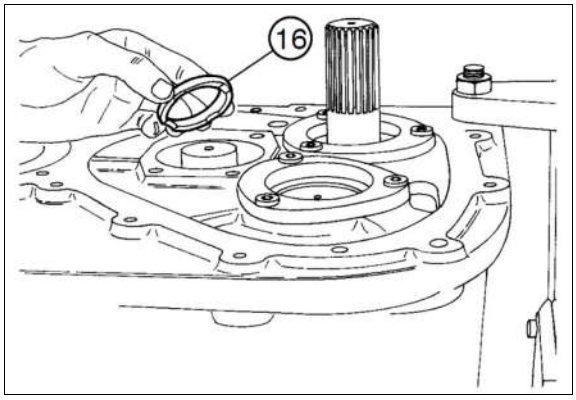


Fig. 65. I040509

Remove the clearance using an appropriately sized drift (17) on the spacer ring (16) and then, using a thickness meter, check that the end float at point (18) is between 0.5 and 0,8 mm.

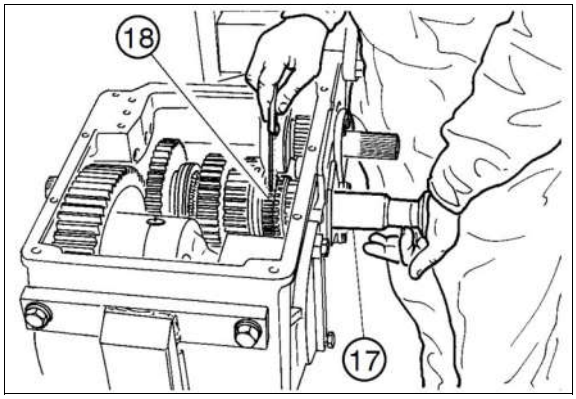


Fig. 66. I040510

If the end float is lower than 0,5 mm, lower the base (19) of the spacer (16).
If the end float is higher than 0,8 mm, lower the inner base (20) of the spacer (16).
This operation must be carried out with the appropriate machine tools.

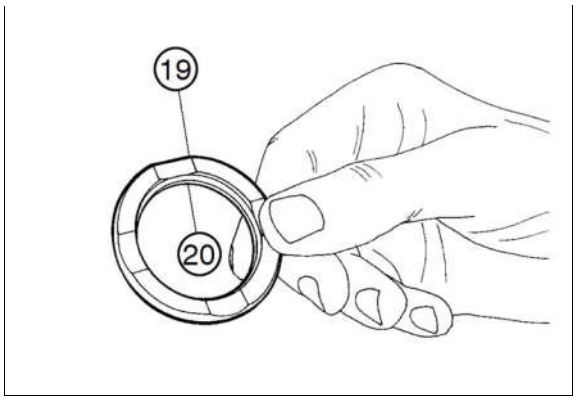


Fig. 67. I040511

Fit the bearing and its respective ring nut ((21).
Pre-load the ring nut of the bearing (21) with a pressure of 2 bar.
Measure the end float with a dial gauge.

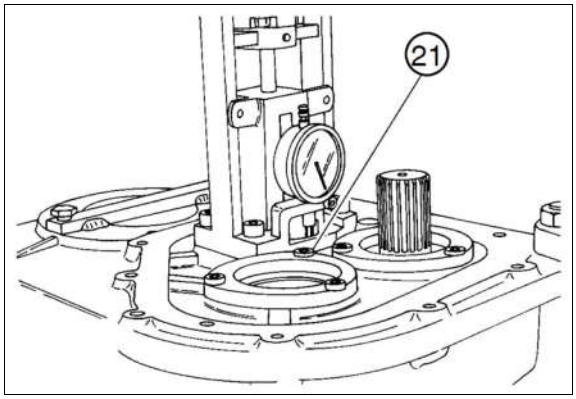


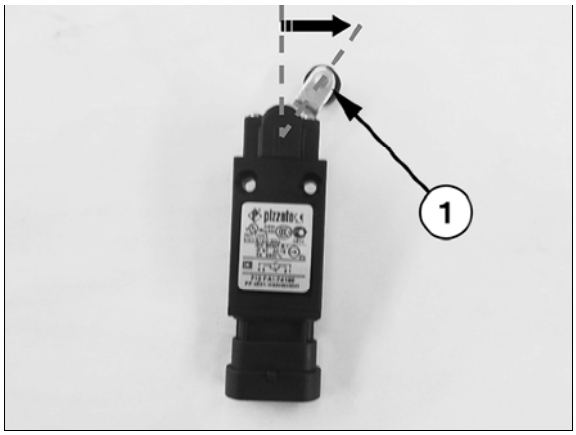
Fig. 68. I040512

9 Transmission position sensor adjustment

Two angular position sensors are installed on the transmission gear engagement lever to read the position of the lever based on the gear selected.

Position sensor 1

Taking the sensor and positioning it as in the first photo (on the side with the supplier's plate) remove the feeler (1) 3 positions to the right, loosening the screw (2), starting from the central position.



I041381

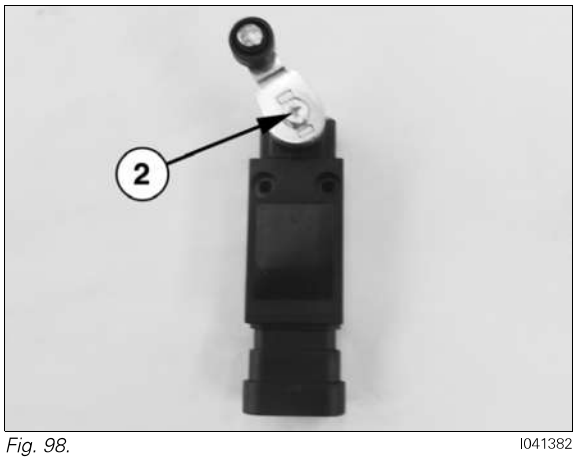


Fig. 98. I041382

The sensor (3) is fastened to the plate (4) on the label side (as shown in the diagram).

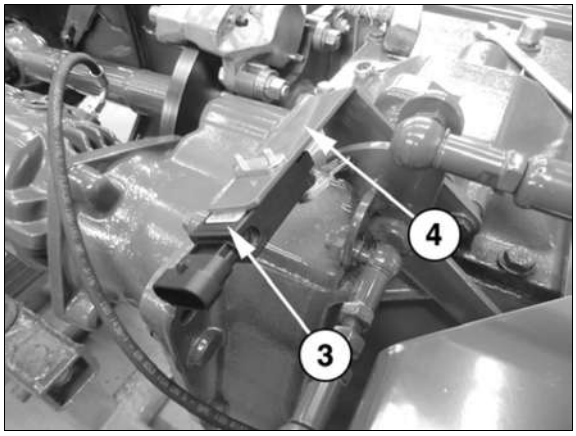


Fig. 99. I041383

19. Screw on pinion flange, **50 Nm**
20. Final drive to axle fastening screws, **300 Nm**

NOTE: *Check the wheel axle ring nuts (7 and 8) tightening torque every 2000/2500 hours.*

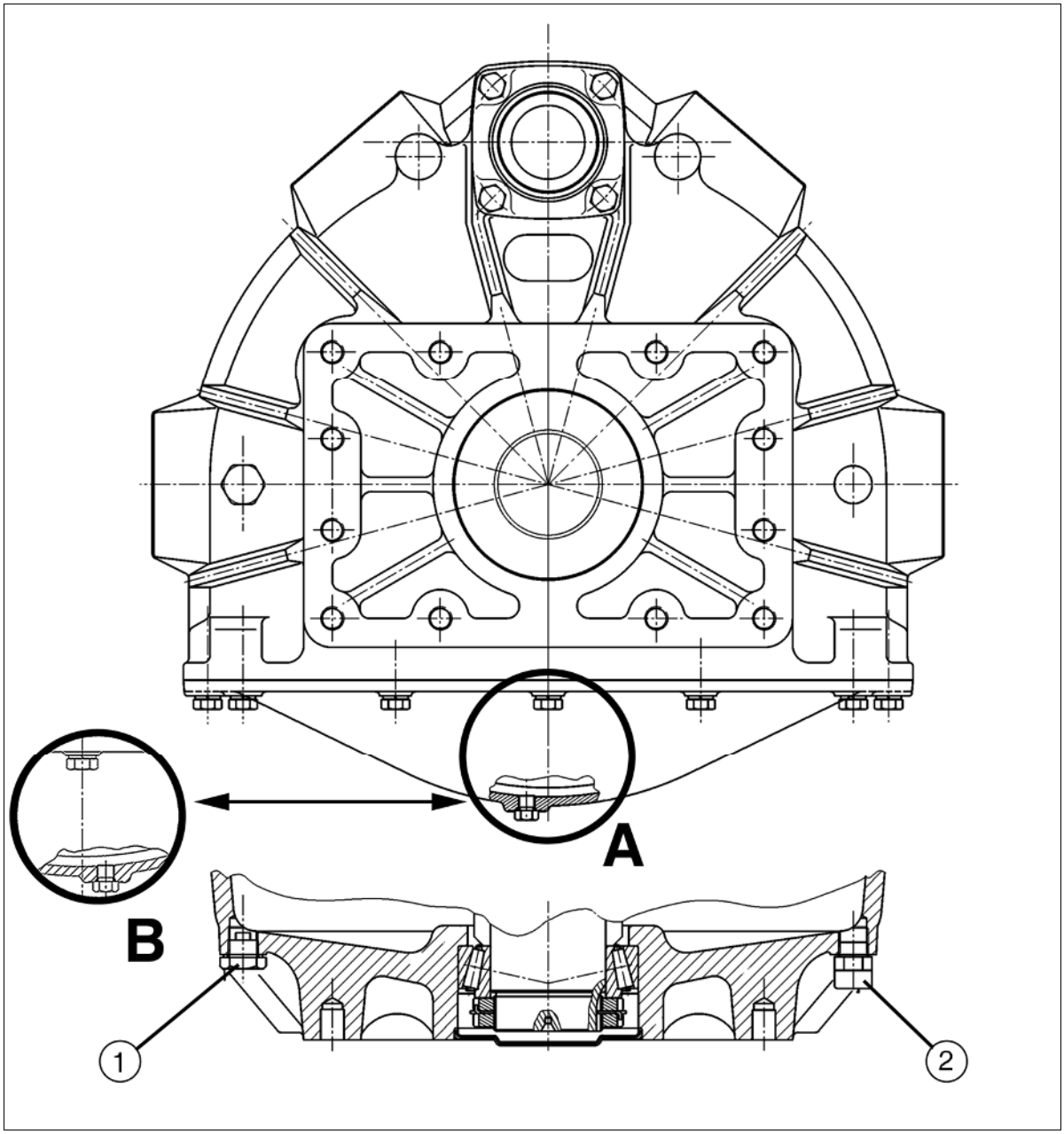


Fig. 3. I041403

The previous picture refers to the left side final drive assembly.
The following operations are needed to obtain the right side final drive assembly:

- Invert the plug with reference 1 with the bleed plug reference 2
- Invert the fitting of the cover (see detail in diagram) to position the level plug correctly.
  - Reference "A" = left final drive
  - Reference "B" = right final drive

Apply a thin film of Loctite Superfast 510 on the surface of the flange to be coupled (6).
Assemble the flange (6) checking that the seal is still correctly positioned.
Tighten the flange screws to a torque of **50 Nm**.

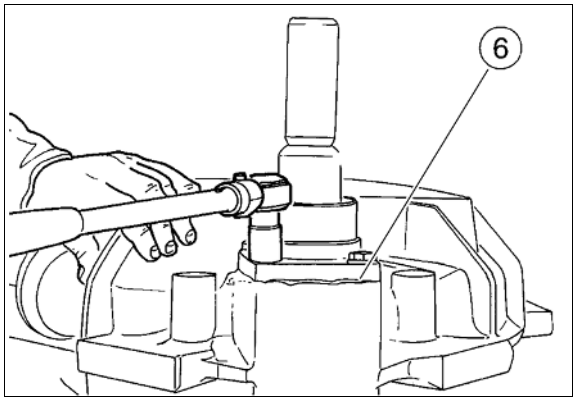


Fig. 24. I040567

Fit the ring nut of the bearing (7) on the final drive housing, using a suitably sized drift.

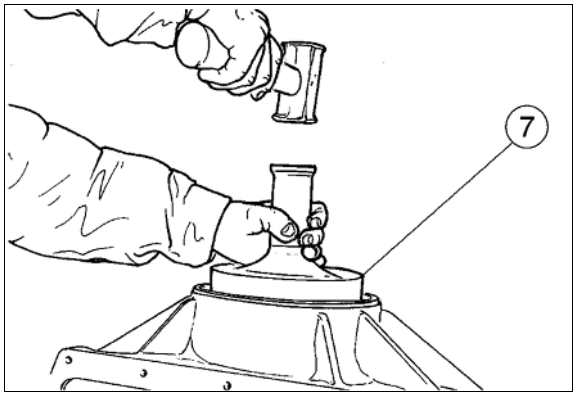


Fig. 25. I040568

Apply a thin layer of Loctite 290 on the outer housing of the seal (8) and then fit it using a suitably sized drift.
Apply some Silmate silicone on the outer side of the dust cover ring (9) and then fit the ring in its housing.
Lubricate the inner diameter of the seal with Gasket Seal 730 Teflon grease.

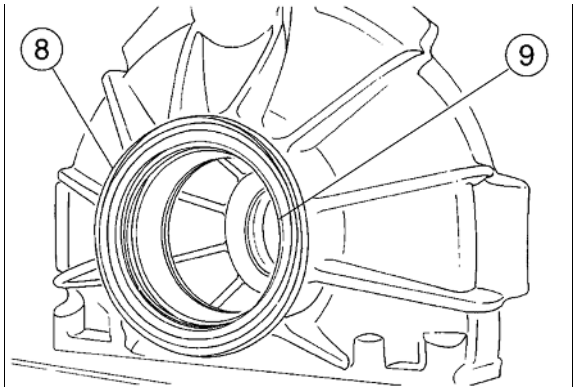


Fig. 26. I040569

Pre-heat the spacer (14) to a maximum temperature of 90°C and then fit it applying some Loctite 641 or 290 on the surface that touches the wheel axle.
Oil the bearing housing on the wheel axle and then fit the bearing (13), pre-heating the inner ring of the bearing to a maximum temperature of 90°C.
Position the wheel axle on the stand using the support (15) to hold it.

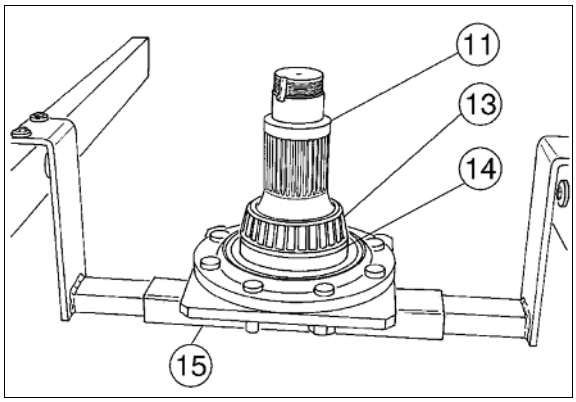


Fig. 27. I040570

Now, at the same time, insert the ring gear (15) into the wheel axle and the pinion (12) in to the outer ring of the bearing.

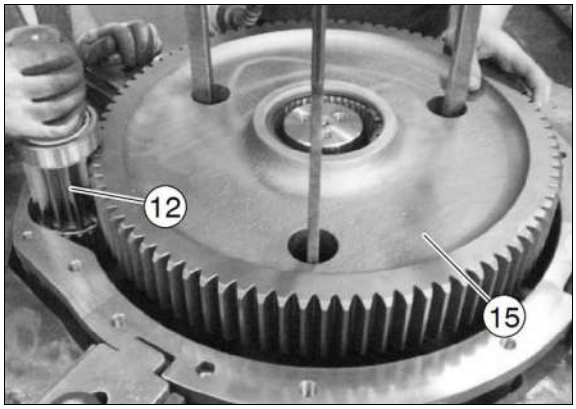


Fig. 58. I040605

Once the pinion and the ring gear have been inserted correctly, insert the spacer (16) onto the wheel axle.

Apply adhesive (Loctite Superfast 510) on the whole of the outer edge of the housing (17).
Apply a suitable amount of adhesive to guarantee a good seal.

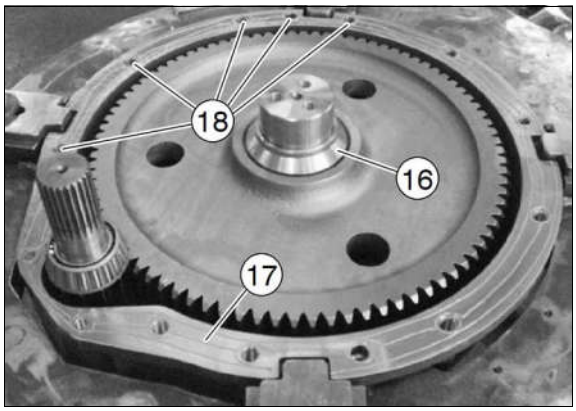


Fig. 59. I040606

Apply thread-locking Loctite 242 in the seats (18) of the two spring pins and the stud bolts.

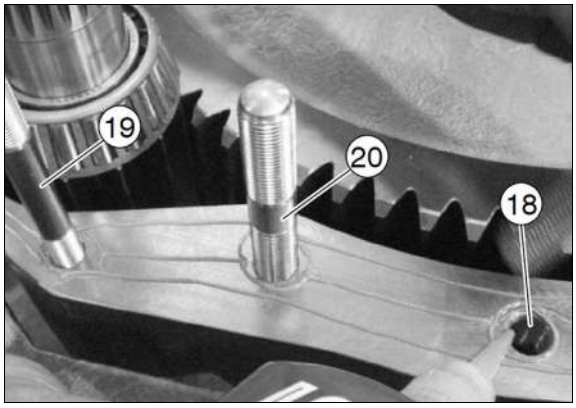


Fig. 60. I040607

Using a copper hammer, insert the two spring pins (21) by tapping them in.

Fit the stud bolts in all the threaded holes on the housing as shown in the diagram.

NOTE: *The two M12 stud bolts (19) are inserted with the longer threaded part first. Tighten the two M12 stud bolts to a torque of* ***90 Nm.***

NOTE: *The two M16 stud bolts (20) are inserted into the threaded holes with the rounded head on the stud bolts facing upwards. Tighten the M16 stud bolts to a torque of* ***210 Nm.****.*

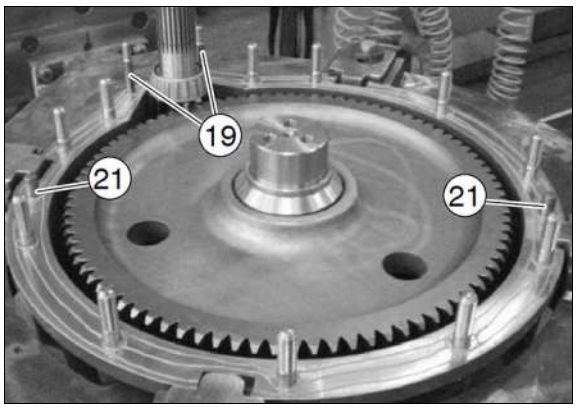


Fig. 61. I040608

1 Specifications

	Unit	X5	X5AL X5BL	X6	X6AL
SAUER pump		90 L 100	H1 P 130	90 L 100	H1 P 130
Pump displacement	cm^3/rev	100	130	100	130
Pump revolutions	rpm	2620	2450	2620	2450
Feed pump displacement	cm^3/rev	17	26	17	26
Pressure relief valve setting	bar	420			
Supply circuit valve setting	bar	20			
Motor		SAUER 90 M 100			
Motor displacement	m^3/rev	100			
Oil		(see specifications in the "Operator's Manual" or in Section 00 of this manual)			
System oil quantity	litres	41.5			

IMPORTANT: *To check the hydraulic and hydrostatic system operation, it is indispensable to have the pressure gauge box and the relevant hoses and fittings ref. 327700050.*

NOTE: *When the machine needs to be towed, put the gear lever into neutral and disengage 4WD.*

7 4WD troubleshooting

Faults	Possible causes	Remedies
Irregular 4WD.	No supply to the solenoid valve.	Check the electrical power supply.
	Oil leak from 4WD control direction valve.	Check that there are no oil leaks from the components involved.
	No oil.	Add oil up to the correct level. Use only oil according to the required specifications.
Noisy 4WD system.	Air in the circuit.	Check that there are no oil leaks from the components involved.
	Damaged internal parts.	Replace the parts involved and clean the circuit.
4WD control valve not working.	The solenoid valve is powered but it is not engaging.	Check the coil winding for continuity and replace if it is interrupted.
	Locked solenoid valve.	Valve gear cartridges seized. Check if the solenoid valve can be released or replace it
	ENEDC control unit not operating properly.	Check the control unit operation. If needed, reinstall the software or replace the control unit.
	Control cable electrical connector interrupted.	Check the connectors and the supply cables of the 4WD solenoid valve referring to the relevant wiring diagram (section 55), then repair or replace the faulty cable or connector.
	Faulty switch.	Replace the switch.
Rear wheels slip when the machine moves forward.	Wrong working or transfer gear.	Engage the second gear, as the ratio is the most appropriate one.
		Never use 4WD with fourth gear engaged.

NOTE: *4WD engagement and release must be carried out with the machine at a standstill. Never use 4WD in fourth gear.*

14 H1 P 130 pump - Sgr. 29212

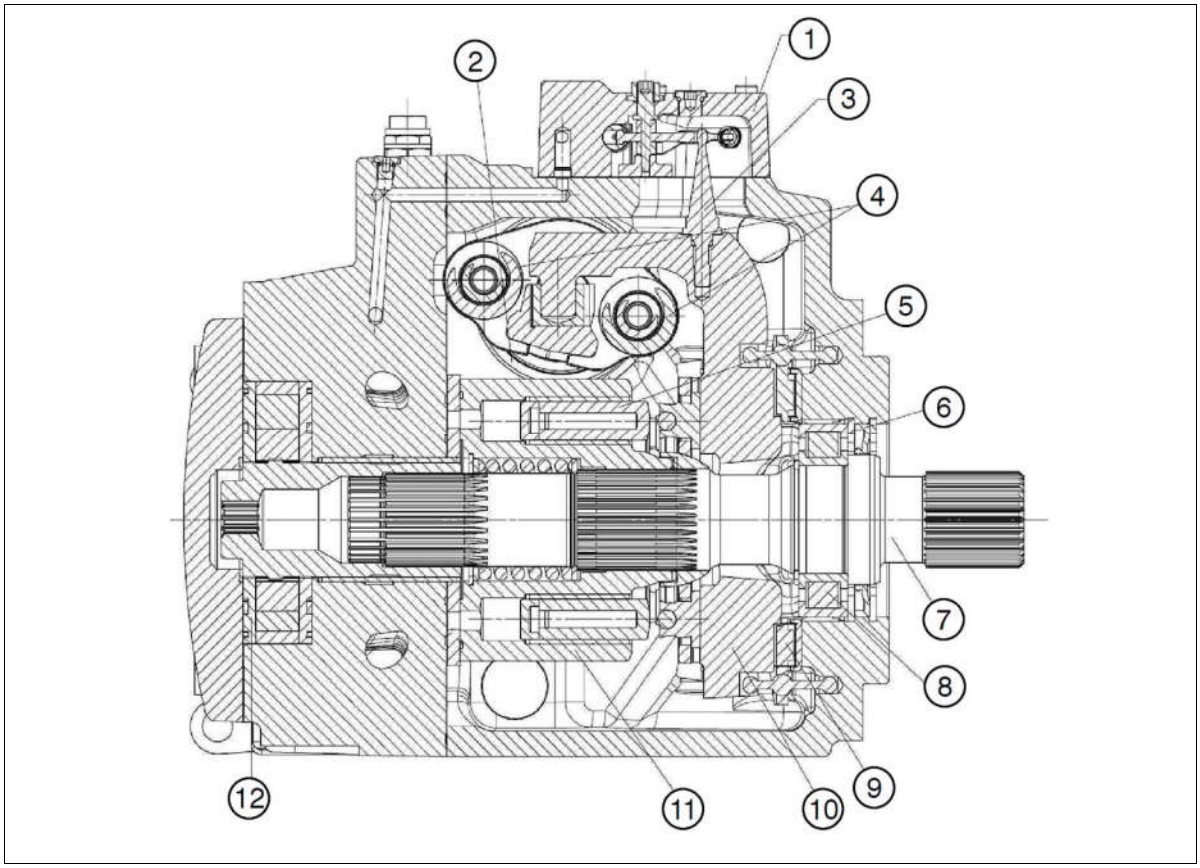


Fig. 16. I040669

1. Electrical servo-control
2. Servo-cylinder
3. Connecting rod
4. Spring
5. Piston
6. Oil seal
7. Shaft
8. Roller bearing
9. Oscillating plate bearing
10. Oscillating plate
11. Cylinder block
12. Feed pump

The cylinder block (11) is rotated by means of the spline on the pump's main shaft.

On this block, there are floating pistons (5) equidistant from each other and arranged in parallel along the main shaft axle. The end of each piston has an articulated runner that is in constant contact with the oscillating plate (10).

When the oscillating plate is at a perfect right angle with the piston axis, the pistons do not make any axial movement; they simply rotate.

When the plate tilts, the pistons begin to make a reciprocating axial movement directly proportional to the tilt of the plate. All the friction is reduced to a minimum by a film of oil that constantly wraps around the pistons.

The oil which is pressurised by the pump circulates around the two main circuit lines following a closed loop.

By varying the tilt of the plate, the travel of the pistons varies and results in variable displacement. By changing the rotation direction, the flow is reversed.

The plate tilt control is carried out by means of a double-acting servo-cylinder (2) powered by an electrical servo-control.

If the load becomes the driving force due to the inertia of the vehicle moving downhill, the two main components (pump and motor) reverse their roles and the high pressure line becomes the low pressure line and vice versa. At this point, the hydrostatic pump, which is mechanically attached to the heat engine, provides dynamic braking as its rotation binds it to the transmission coming from the diesel engine.

– Disconnect the hose (9) connected to the hydrostatic pump filter and the electrical connector (10) for the filter clogging pressure switch.

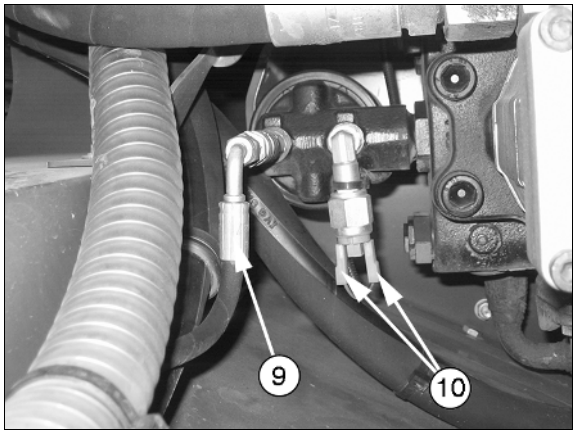


Fig. 28. I041595

– Disconnect the electrical connector (11) from the servo-control.

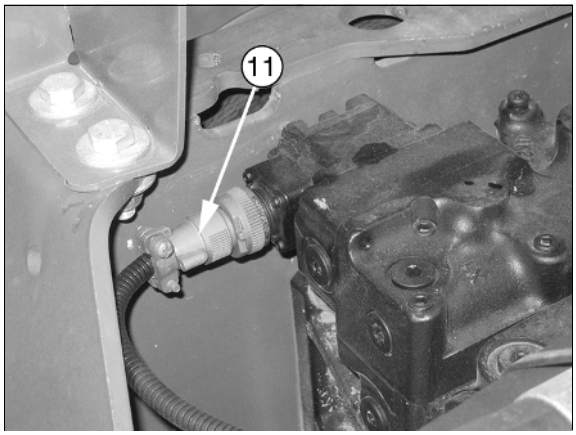


Fig. 29. I041597

– Disconnect the hoses (12) on the lower part of the pump.

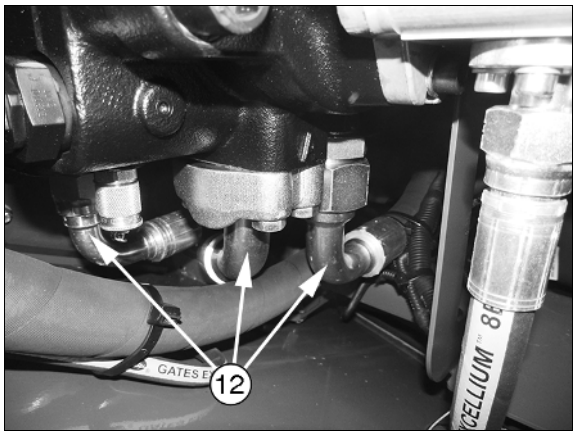


Fig. 30. I041599

Servo-control - R./I. - Op. 2921622

To disassemble the servo-control, proceed as follows:

– Drain the oil from the hydrostatic tank. Remove the six cylindrical head screws (1) and lift the servo-control valve (2) with the seal from its housing.

IMPORTANT: *Protect the exposed surfaces and the cavities from any possible damage and foreign bodies.*
The presence of any foreign body could cause the combine to make an uncontrolled movement.

– Fit a new seal (3) in the housing.

– Check that the control orifice (4) and the spring are in the correct position.

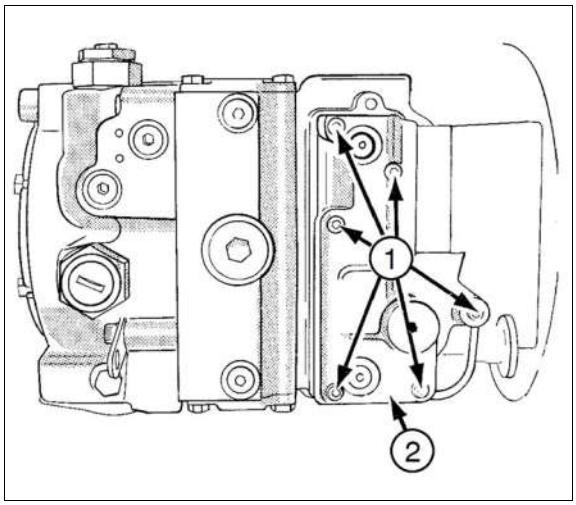
– Fit the pin (5) on the control link rod in the corresponding hole (6) of the pivot connected to the tilted disc.

– Move the control forwards and backwards to check that the pin has been fitted into the attachment correctly.
This will be seen in the form of an increase in the force of the spring when the control is moved from the centre.

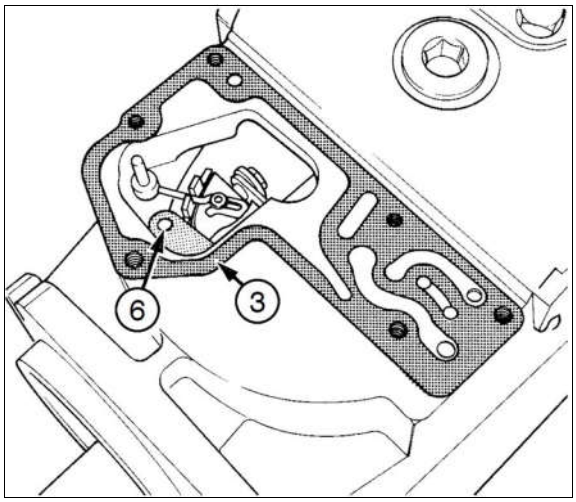
– Connect the control in its position against the pump housing, align the seal and tighten the screws (1) to a torque of **16 Nm**.

– Fill the circuit as described in op. 2920406.

NOTE: *Take great care when starting the machine in order to prevent any accidents occurring if the servo-control pin (5) hasn't been fitted correctly.*



I040692



I040693

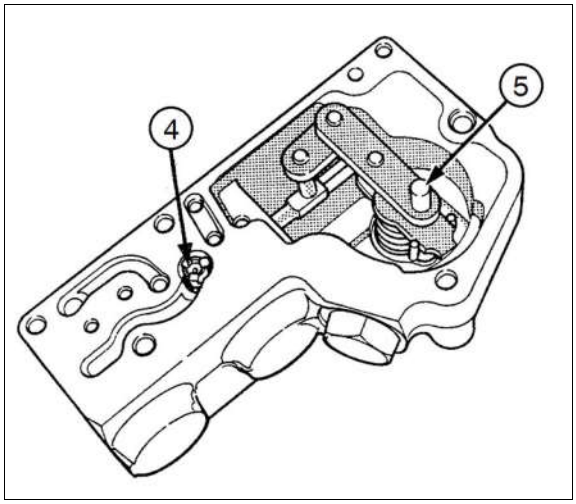


Fig. 48.
I040694

31 Equa-Trac valve - Sgr. 29300

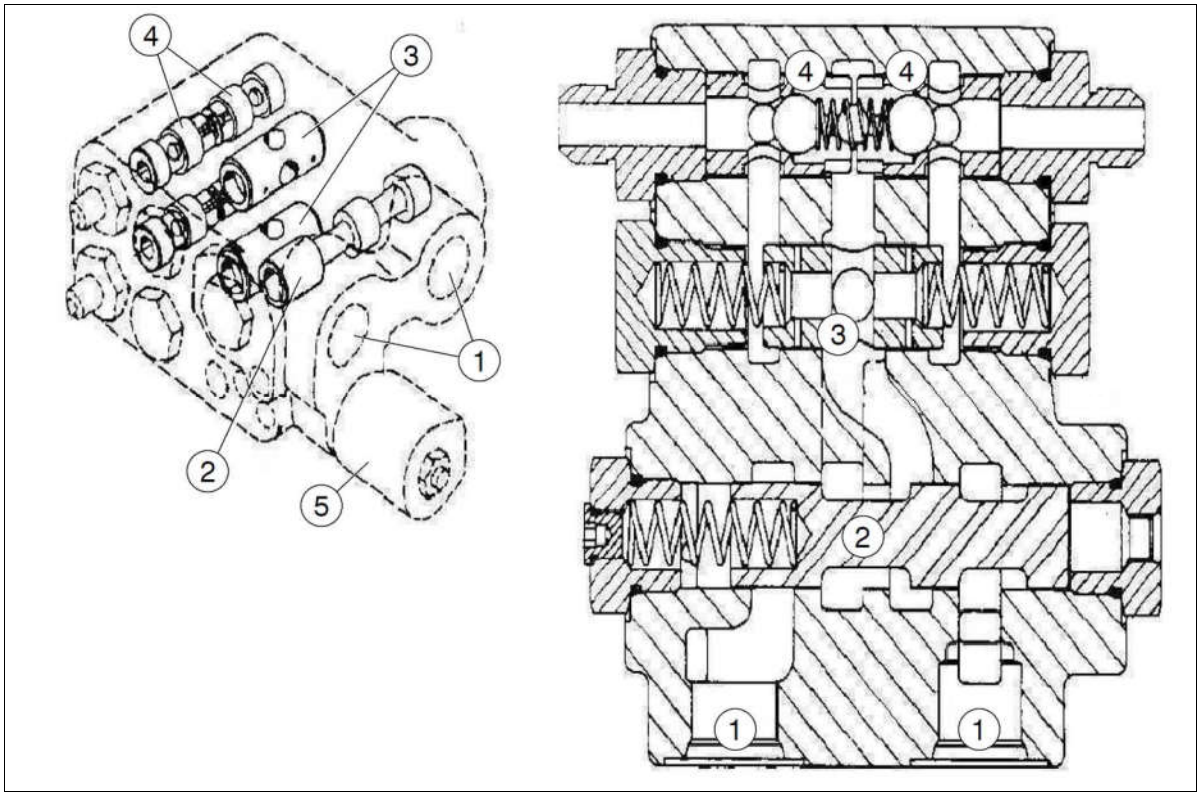


Fig. 65. I040716

1. High pressure inlets
2. Selector
3. Flow divider
4. Control valve.
5. Solenoid

When the solenoid (5) is excited, the oil flow from the main fixed displacement motor enters the valve through the inlets (1) and is directed by the selector (2) towards the forward and reverse gear flow dividers. The oil flow is evenly distributed by the divider and directed to the control valve and the wheel motors.

The flow divider (3) is kept in a central position by two springs, one at each end. When the rear wheel drive is equal, the pressure on both sides of the flow divider is the same and the spool is at dead centre. If one of the rear wheels begins to slip, the loss of load on that side of the flow divider becomes greater than the drop in pressure on the other side. The spool will move to close the flow to the motor of the wheel that is slipping. When the wheel gains traction again, the pressure on both sides of the spool regains equilibrium and brings the spool back to the centre.

Moreover, the flow divider has the additional function of limiting the maximum quantity of oil to the rear hydraulic motors to prevent the constant slipping of both rear wheels. When operating, the spool movement is verified repeatedly.

The function of the control valve (4) is to prevent all of the return oil flow from the wheel motors from flowing back through the Equa-Trac valve and the

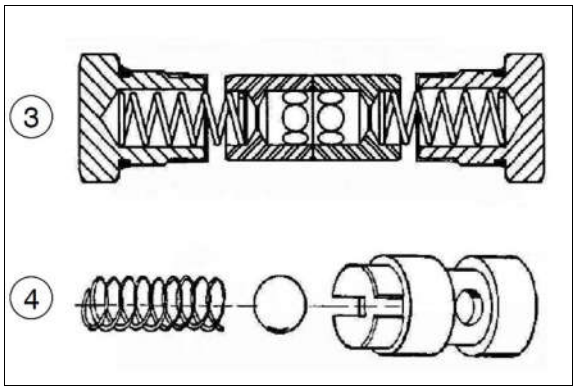


Fig. 66. I040717

Parking brake circuit

Parking brake drum

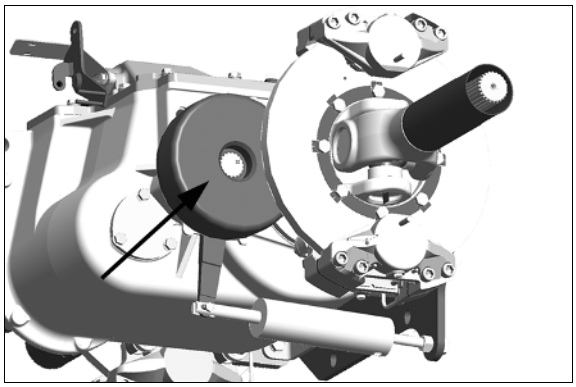


Fig. 2. I041632

The parking brake drum is activated by a solenoid valve that drives a hydraulic cylinder.

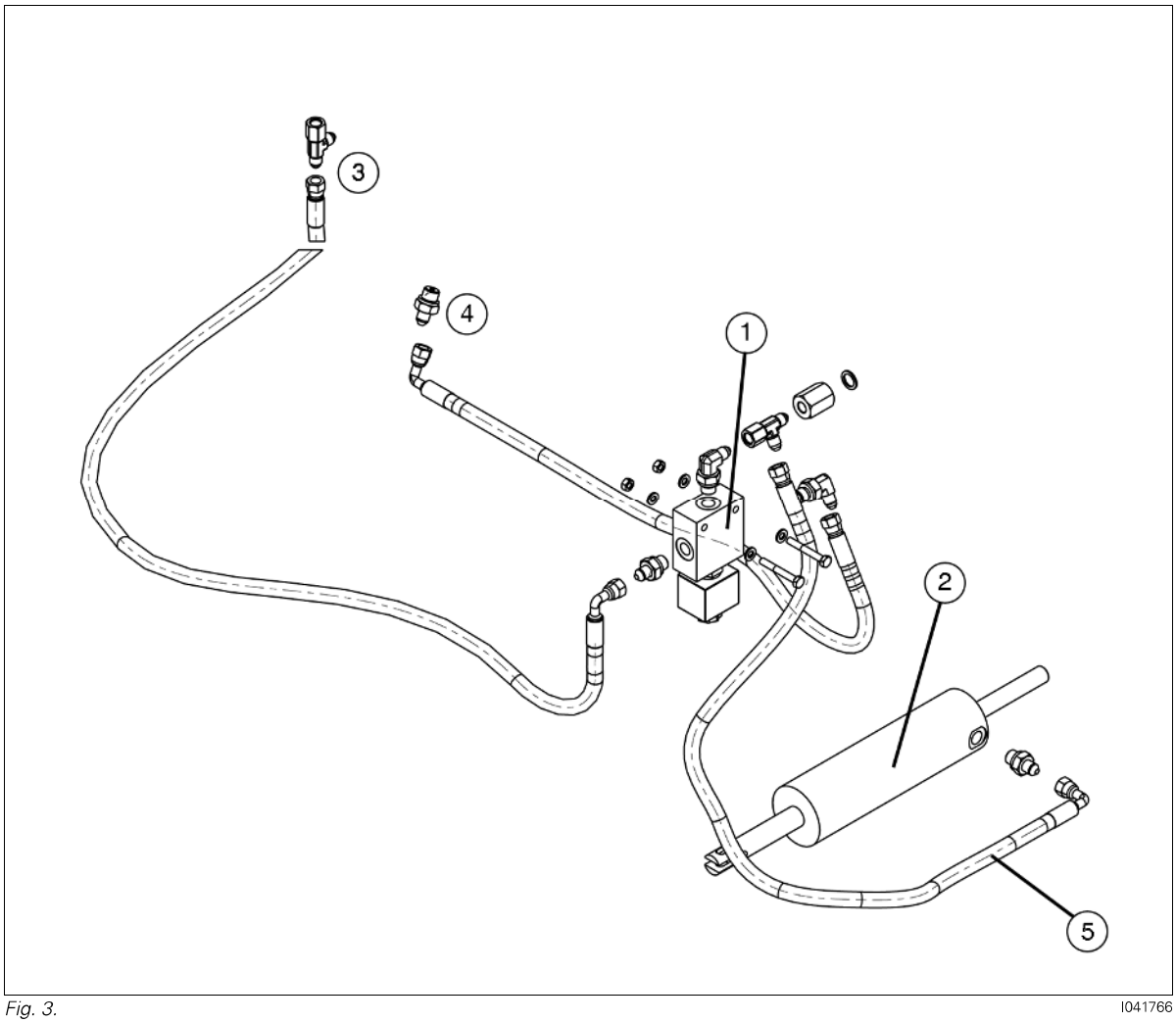


Fig. 3. I041766

1. Solenoid valve
2. Hydraulic cylinder
3. Hydraulic pipe - pressurised oil from hydrostatic pump
4. Hydraulic pipe - oil drained to hydrostatic motor
5. Hydraulic pipe - pressurised oil to hydraulic cylinder

7 Hydraulic brake system - Air bleeding - Op. 3320204

To reach the brake reservoir, open the guard located on the left-hand side of the cab, towards the grain tank.

Proceed as follows:

- Fill the brake reservoir with fluid (for the characteristics of the fluid, refer to the Operator's Manual).
- Remove the protection cover (1) of the brake calliper bleed valve (2), on the right-hand side of the transmission.
- Place a transparent drain pipe on the bleed valve (2), while the opposite end must be dipped in a container holding the same brake fluid. In this way, no air is sucked in when the pedal is released.
- Loosen the bleed valve by about half a turn.
- Press the right brake pedal several times, consecutively, then release it slowly and wait a few moments so that the pump can be fed from the reservoir.
- Repeat these operations several times, topping up the reservoir from time to time.
- The bleeding operation is completed when only fluid comes out of the drain pipe.
- Repeat the same operations on the left brake.

NOTE: *Air bleeding must be carried out only on the upper calliper, as described above.*

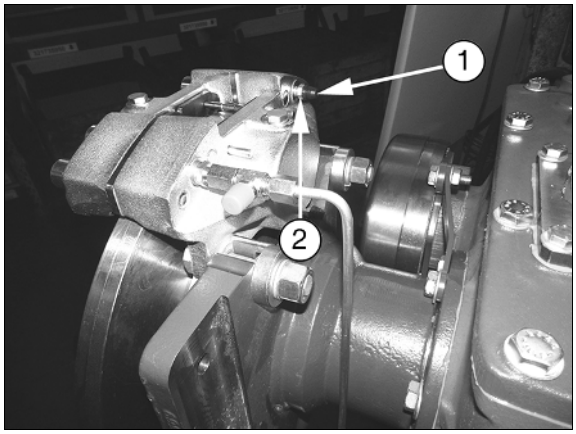


Fig. 17. I041677

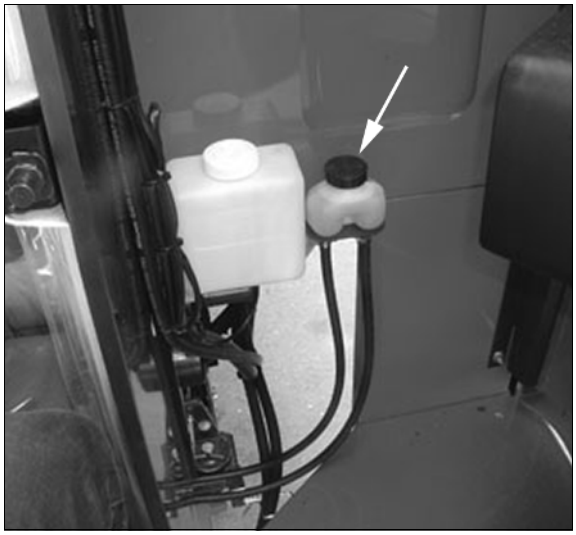


Fig. 18. I041678

Changing the fluid

Change the fluid every 2 years.

Fluid type: refer to the Operator's Manual or section 00 of this manual.

Quantity: 0.30 litres.

Hydraulics system

6 Header drive control valve - Sgr. 35310

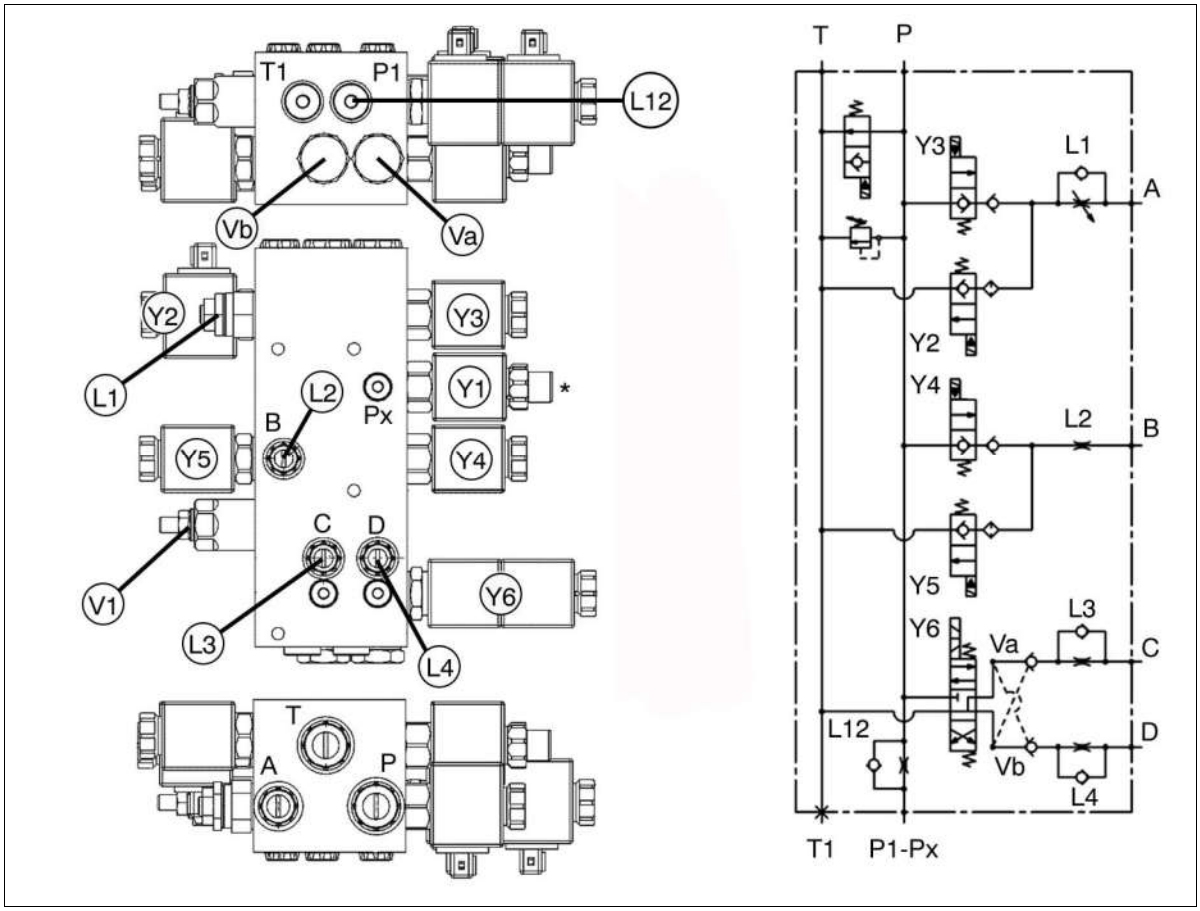


Fig. 9. I041756

* = Y1 common solenoid valve manual control (inside the cover)

Y1. NO common
Y2. NC for header lowering control (··)
Y3. NC for header lifting control (•)
Y4. NC for reel lifting control (•)
Y5. NC for reel lowering control (··)
Y6. NC for reel advance/retract control
V1. Maximum pressure valve: calibration 200 bar.
P1-Px. Control valve pressure control point 200 bar.
The connector for the pressure test is installed as standard.

(•) equal
(··) equal

Y = SOLENOID VALVE
L = THROTTLE VALVE
V = ADJUSTMENT VALVE

All the unidirectional throttles must be fitted with the flat face facing outwards as shown in the diagram:

10 Reel drive hydraulic block

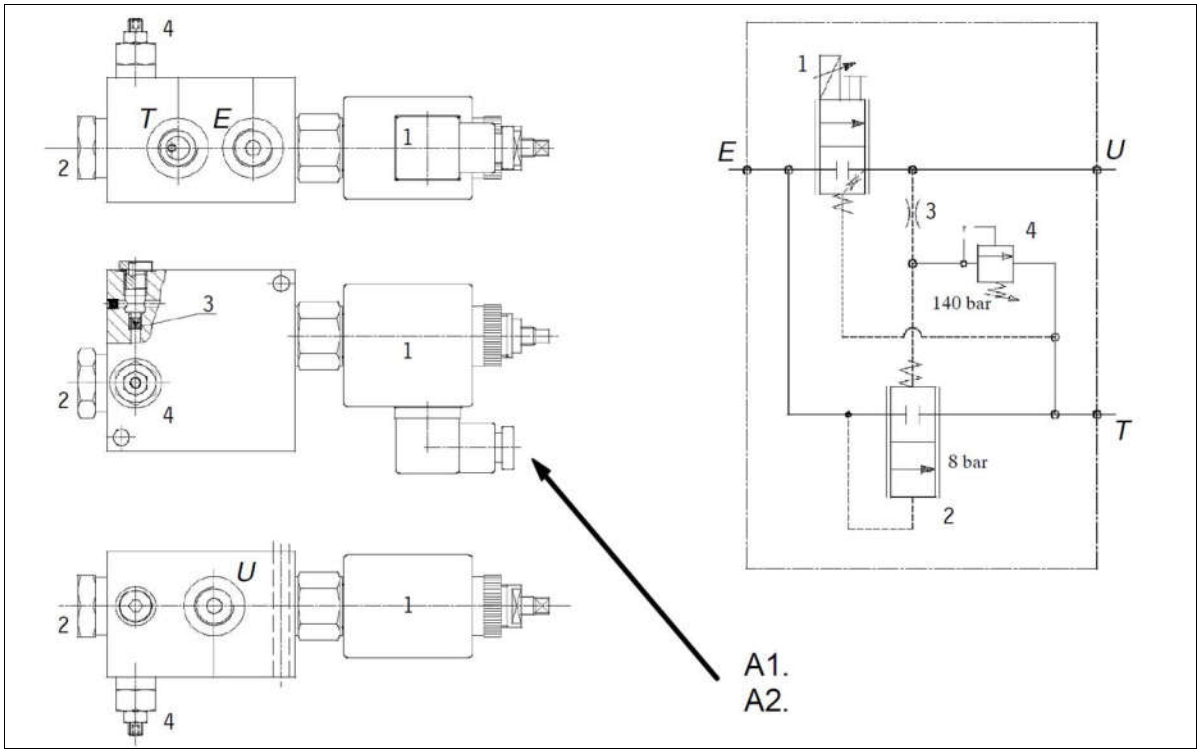


Fig. 22. I039950

1. Hydraulic reel control solenoid valve
2. Check valve
3. Throttle valve with hole Ø 0.5 mm
4. Pressure safety valve max. (140 bar)

Maximum intake capacity (E): 40 litres/min
Maximum output capacity (E): 30 litres/min

	Colour	Section	Function
1A.	AN	1.0	Proportional solenoid valve impulse
2A.	N	1.0	Proportional solenoid valve ground

The solenoid valve controlled by the operator or the control unit (FTD1) which controls the reel revolutions maintains a constant rotation speed regulating the hydraulic motor oil flow.
If there are pressure peaks on the delivery circuit U, the pressure safety valve (4) allows the non-return valve (2) to open and let the oil flow to the tank on the circuit T.

Reel drive hydraulic block position

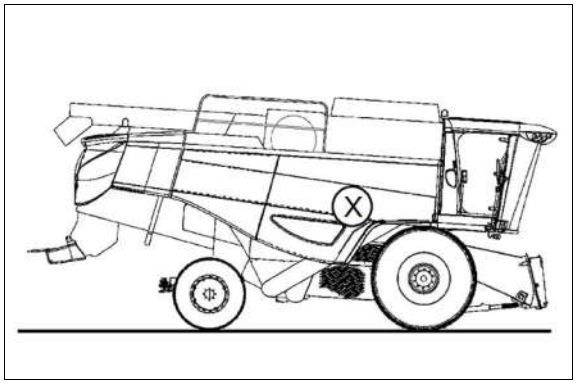


Fig. 23. I039957

Solenoid valve Y416 / Y418 powered

The piloting control valve rod moves and oil enters the inner chamber (1) of the levelling control valve cylinder;

The oil in the outer chamber flows out through the hole ((2) and duct **T** of the outer solenoid valve so that the levelling control valve cylinder rod can move freely.

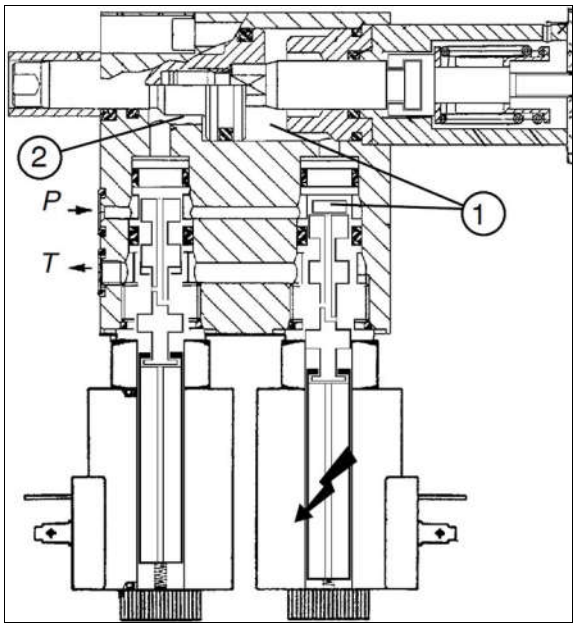


Fig. 35. I039980

20 Hydraulic circuits index

Header positioning circuit

1. Oil tank
2. Oil filter (16-micron)
3. Triple pump
4. Header drive control valve
5. Header suspension hydraulic block

6a. Right header lifting cylinder
6b. Left header lifting cylinder

L1. Header lowering speed adjustment limiter
V1. Maximum pressure valve: calibration 200 bar
Y1. NO common
Y2. NC header lowering control
Y3. NC header lifting control
Y54. 0.75 litre shock absorber cut-out valve
Y55. Throttle valve

Reel vertical positioning circuit

1. Oil tank
2. Oil filter (16-micron)
3. Triple pump
4. Header drive control valve

7a. Right reel lifting cylinder
7b. Left reel lifting cylinder

L2. Throttle valve with hole Ø 1,5 mm
V1. Maximum pressure valve: calibration 200 bar
Y1. NO common
Y4. NC reel lifting control
Y5. NC reel lowering control

Reel horizontal positioning circuit

1. Oil tank
2. Oil filter (16-micron)
3. Triple pump
4. Header drive control valve

8a. Right reel advance/retract cylinder
8b. Left reel advance/retract cylinder

L3. Throttle valve with hole Ø 1,25 mm

Steering

Axles and wheels

Section 50 - Cab air conditioning system

Failure code		Cause	Remedy
Open circuit	Closed circuit		
-	E9	Valve controlling heating fluid (blocked) or control panel.	Check and replace the components, if necessary.
-	EA	Fan actuator (blocked) or control panel	Check and replace the components, if necessary.
-	Eb	-	-
-	Ec	Electrical connectors for valve controlling heating fluid flow	Check the connectors
-	Ed	Electrical connectors for fan actuator	Check the connectors
-	EF	-	-

Electrical system

Fuse box Q3				Pinout	
Position	Ampere	Reference	Description/Use	Colour	Section
7	15 A	F39a	Control unit supply bridge (K15 from key)	-	-
		F39b	Left-hand side auxiliary sockets	G-N	1.5
			Left-hand side auxiliary sockets	G-N	1.5
8	5 A	F40a	Control unit supply bridge (K15 from key)	-	-
		F40b	CB transceiver	R-N	1.5
			Chamber (supply preparation)	R-N	1.5
9	5 A	F41a	Control unit supply bridge (K15 from key)	-	-
		F41b	Telemetry	C	1
10	5 A	F42a	Control unit supply bridge (K15 from key)	-	-
		F42b	MCS concave enabling	R-N	1
11	5 A	F43a	Control unit supply bridge (K15 from key)	-	-
		F43b	PW PVED (not used)	C	1.5
12	-	F44a	Control unit supply bridge (K15 from key)	-	-
		F44b	-	-	-
13	-	F45a	-	-	-
		F45b	-	-	-
14	-	D46a	K15 from key	H	1
			K15 from key	H	1
			IGN lights panel	H	0.5
		D46b	IGN EXT	H	1
			-	H	1
15	-	D47a	Hazard wake	B	0.5
		D47b	-	H	1
			-	H	1
16	-	D48a	Marker wake	B	0.5
		D48b	Diode (cathode)	H	1

Fuse box Q4				Pinout	
Position	Ampere	Reference	Description/Use	Colour	Section
1	5 A	F49a	Position lights supply	S	1.5
			Position lights supply	S	1
		F49b	Left-hand position lights	G-N	1
			Left-hand tail position lights	G-N	1
2	5 A	F50a	Position lights supply	S	1.5
		F50b	Right-hand position lights	G	1
			Right-hand position lights	G	0.5
			Left-hand tail position lights	G	1
3	7.5 A	F51a	Low beam supply	S	1.5
		F51b	Left-hand high beam	VN	1
4	7.5 A	F52a	Low beam supply	S	1.5
		F52b	Right-hand high beam	V	1

Relay box Q11				Pinout	
Position	Ref.	Pin	Description/Use	Colour	Section
5	R42	85	Brake lights signal	C-B	0.5
		86	Brake lights supply	C	0.5
		30	Break lights supply	C; C	1.5; 0.5
		87	Left-hand rear brake light; right-hand rear brake light	R; R	1; 1
		87a			
6	R43	85	Ground	B; B	0.5; 0.5
		86	Reversing lights control	Z-N	0.5
		30	Reversing lights supply	SR	2.5
		87	Reversing lights	V-N	2.5
		87a			
7	R44	85	Ground	B; B	0.5; 0.5
		86	Rear work lights control	H	0.5
		30	Rear lights supply	R	2.5
		87	Left-hand rear work light - right-hand rear work light	R-N; S-N	1.5; 1.5
		87a			

Cable colour table			
A = blue	B = white	C = orange	G = yellow
H = grey	L = dark blue	M = brown	N = black
R = red	S = pink	V = green	Z = purple

Gear change neutral switch

Switch pinout:
Position 1 = Black
Position 2 = Yellow/Green
Position 3 = Black
Position 4 = Yellow/Dark blue

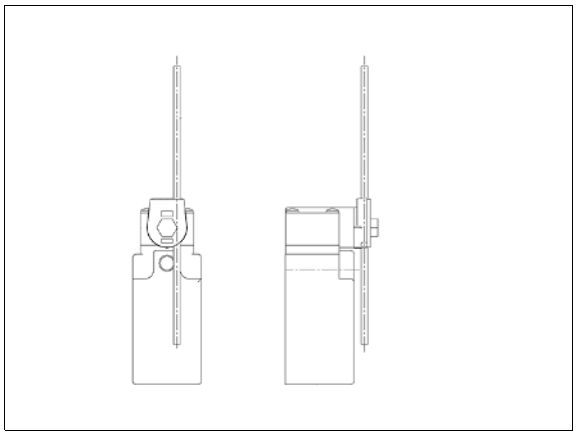


Fig. 34. I042034

Cable colour table			
A = blue	B = white	C = orange	G = yellow
H = grey	L = dark blue	M = brown	N = black
R = red	S = pink	V = green	Z = purple

Pin	Colour	Section	Function
26.	Z-V	0.5	Clogged air filter signal
27.	G-N	0.5	Fuel level sensor
28-29	-	-	-
30.	B-N	0.5	Insufficient pressure in hydrostatic supply circuit pressure switch
31.	H-B	0.5	Common control valve relay enabling (solenoid valve Y1)
32.	A	0.5	Exchange relay
33.	A-B	0.5	Fan variator control
34.	A-N	0.5	Bottom sieve actuator control
35.	B-R	0.5	Tank risers actuator control
36.	B	0.5	Straw chopper deflector actuator control
37.	V	1.5	Hydrostatic pump piloting (backward)
38.	Z	1.5	Hydrostatic pump piloting (forward)
39.	M-N	1.5	Hydrostatic pump coil common return
40.	H	1	4WD solenoid valve control
41.	S-G	1	Drive control solenoid valve control
42.	R-V	1	Engine ignition switch
43.	G-V	0.5	Top sieve actuator control
44.	-	-	-
45.	B-G	0.5	Front concave motor
46.	B-V	0.5	Rear concave motor
47.	R	1	+12 V ENEDC supply
48.	R	1	+12 V ENEDC supply
49.	R	1	+12 V ENEDC supply
50.	R	1	+12 V ENEDC supply

16 Electronic management system connections

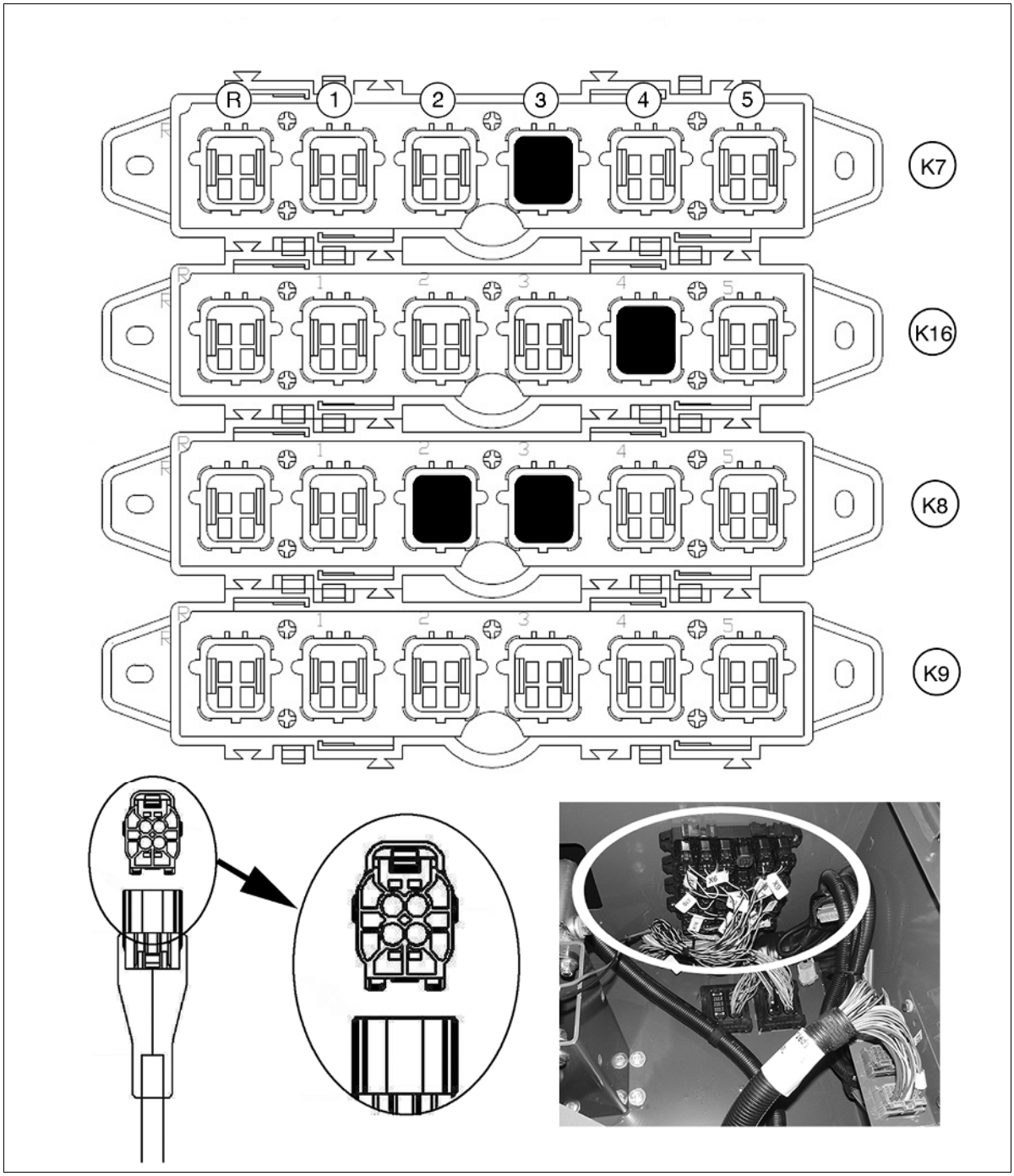


Fig. 51. I042485

Inside the compartment next to the drive selection lever, there are 4 multiple sockets for the wiring connectors of the combine electronic management system:

K7. ISO-Bus: the ISO-Bus network terminations for communication between the EXT control unit and the NT-01 monitor are connected here.
K16. GD-Bus: the display management network, control panel and lights panel terminations are connected here.
K8. MACHINE-Bus: The combine electronic management network terminations are connected here. The Machine-Bus line provides communication between the EXT control unit and the other electronic control units.
K9. ENGINE-Bus: The engine electronic management network terminations are connected here.

Pinouts of the various connectors connected to the multiple socket.

1. ENGINE-bus			
Pin	**Colour**	**Section**	**Function**
A.	M	0.5	CAN1 H, ENGINE-Bus from cabinet
B.	B	0.5	CAN1 L, ENGINE-Bus from cabinet
C.	H	0.5	CAN1, ENGINE-Bus from cabinet (Screened)

2. ENGINE-Bus ENEDC			
Pin	**Colour**	**Section**	**Function**
A.	M	0.5	CAN1 H, ENGINE-Bus ENEDC
B.	B	0.5	CAN1 L, ENGINE-Bus ENEDC
C.	H	0.5	CAN1, ENGINE-Bus ENEDC (Shielded)

3. ENGINE-Bus CAN1 Engine			
Pin	**Colour**	**Section**	**Function**
A.	M	0.5	CAN1 H, ENGINE-Bus from engine
B.	B	0.5	CAN1 L, ENGINE-Bus from engine
C.	H	0.5	Negative for CAN1, ENGINE-bus

Cable colour table			
A = blue	B = white	C = orange	G = yellow
H = grey	L = dark blue	M = brown	N = black
R = red	S = pink	V = green	Z = purple

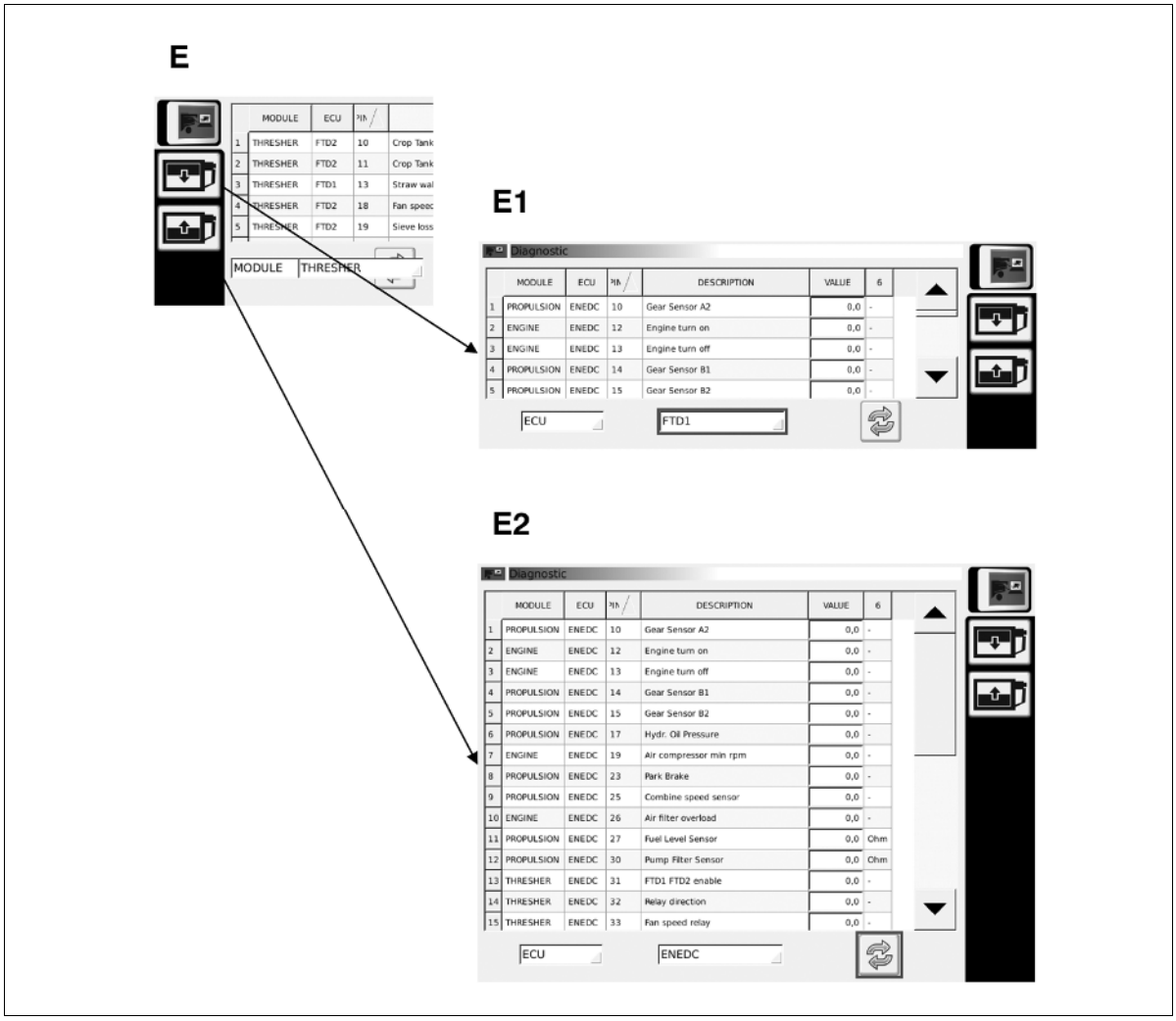


Fig. 71. I041983

Diagnostics (E)

The diagnostics menu (E) can be displayed in various formats (1/4 page, 1/2 page and full page).

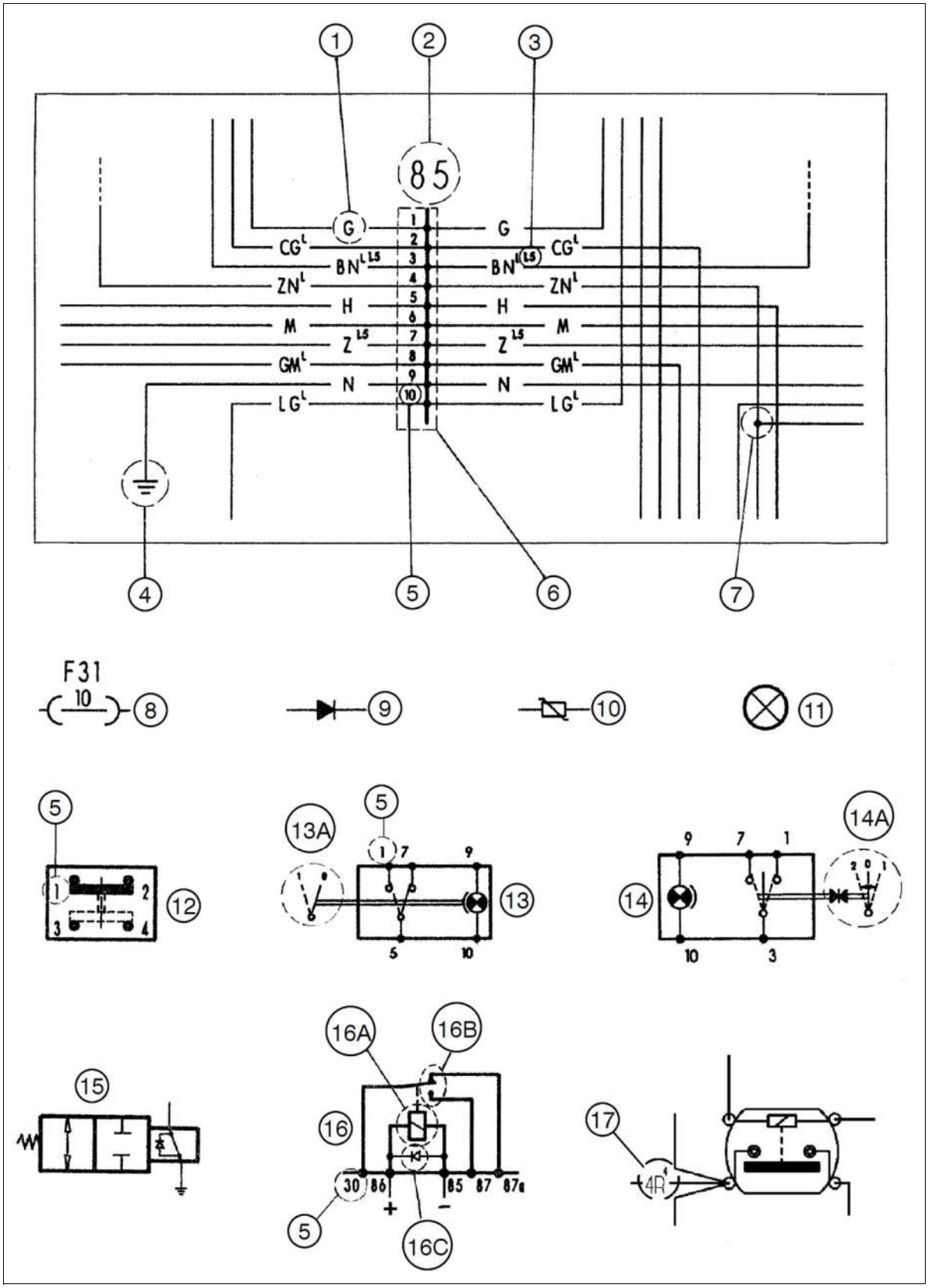
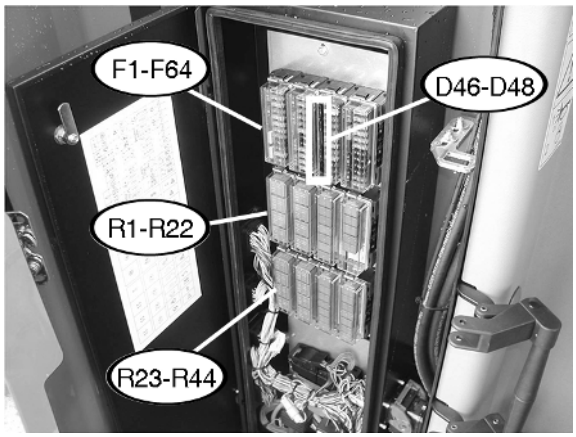


Fig. 77.

I040985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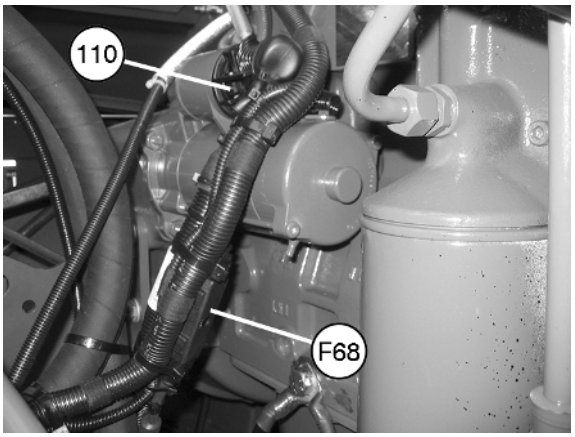
R1-R22
R23-R44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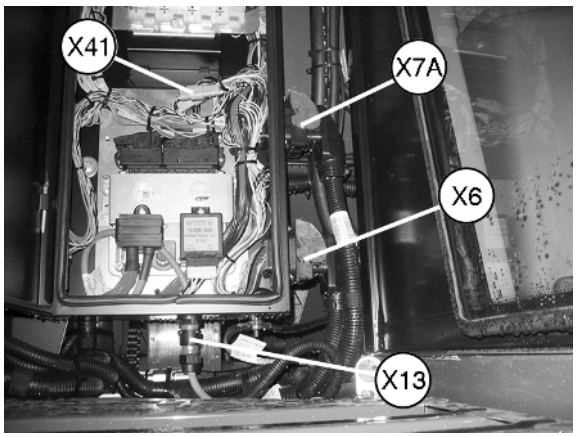
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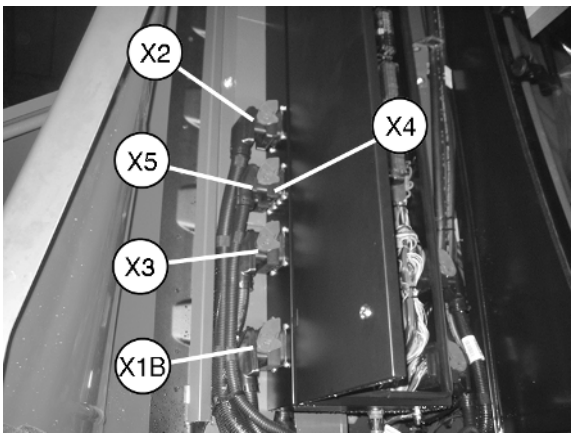
X13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X4
X5
X3
X1B


K6
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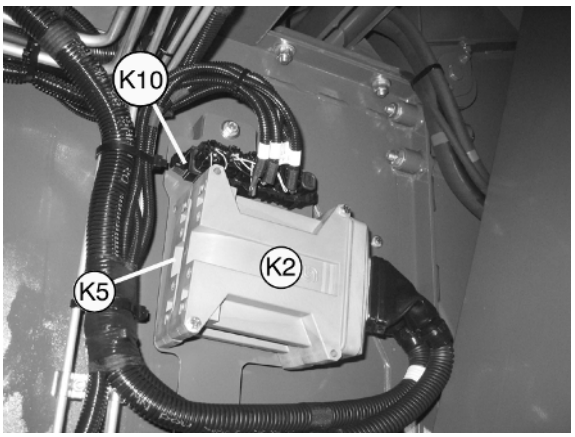
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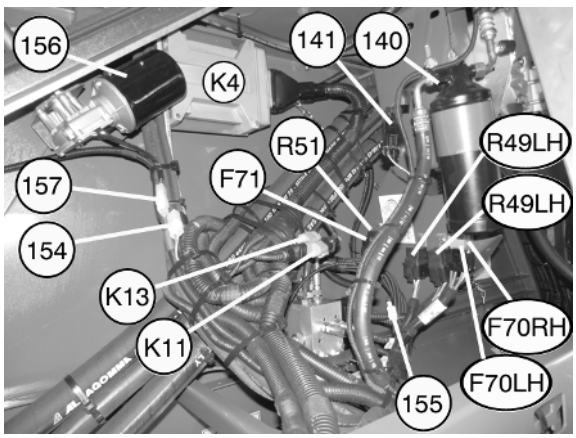
K2
K5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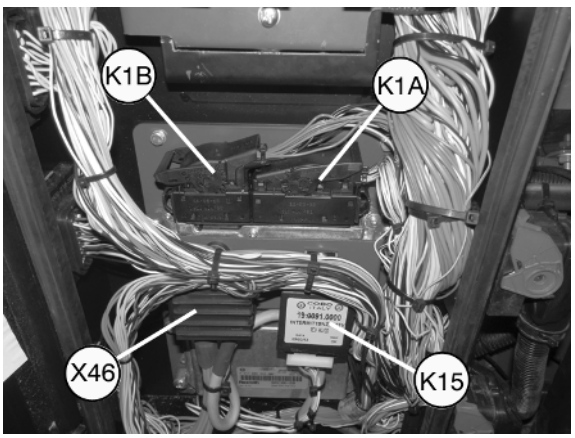
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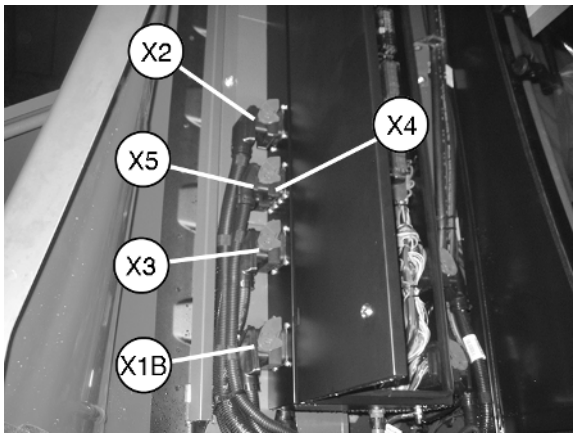
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X5
X3
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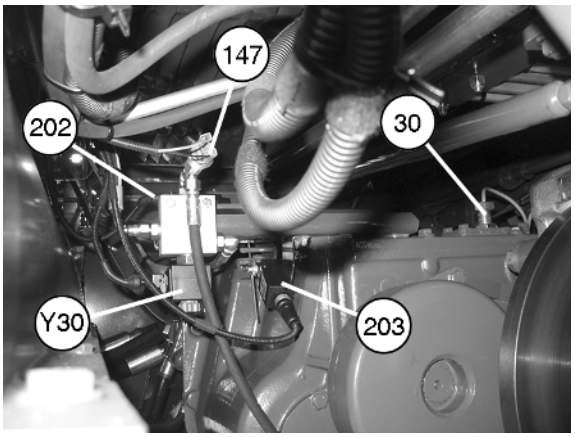
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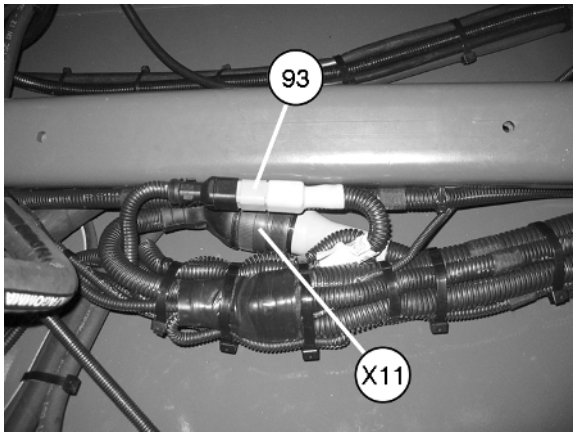
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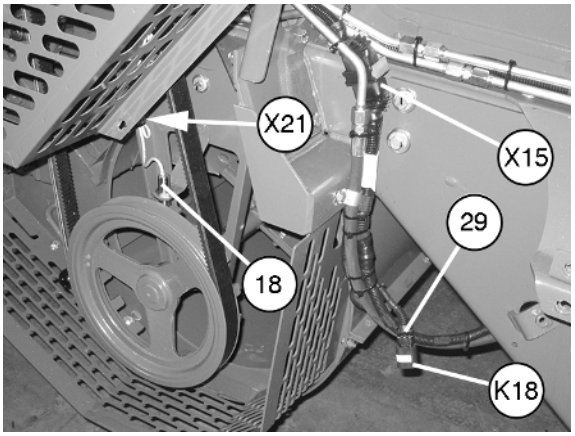
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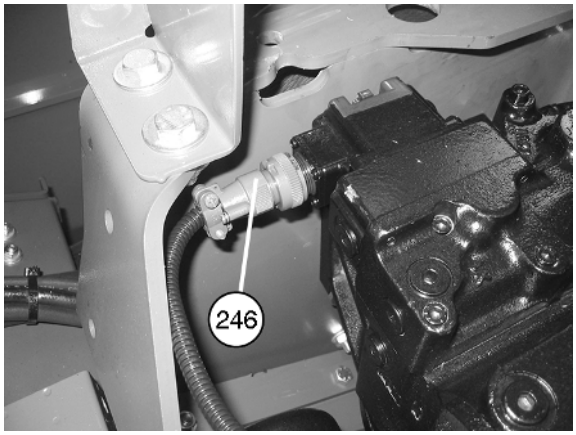
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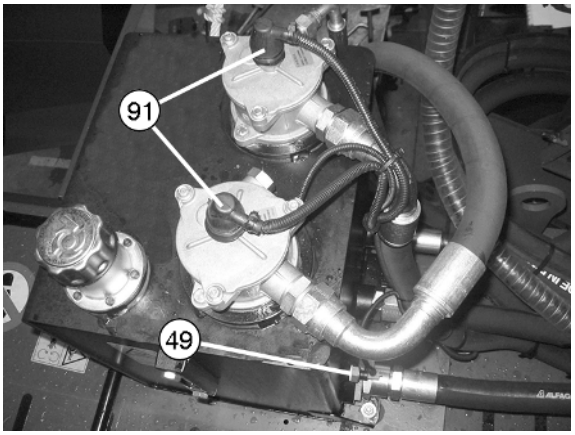
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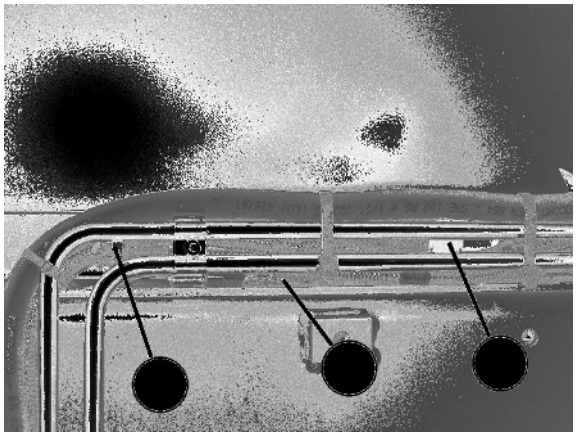

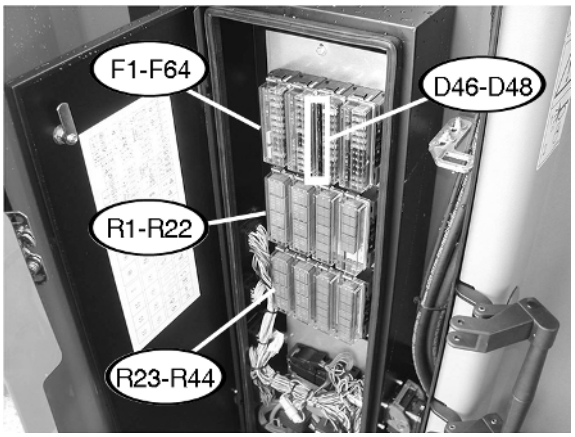
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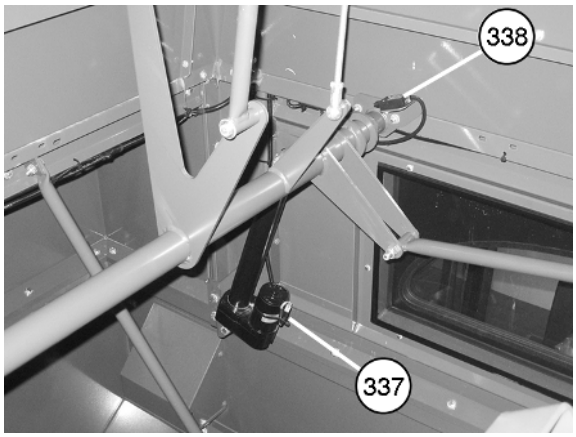
R23-R44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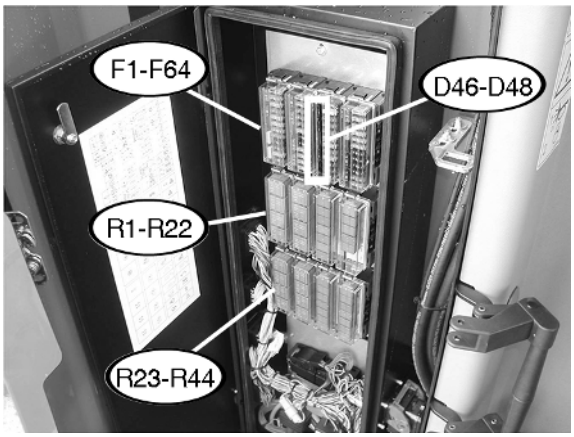
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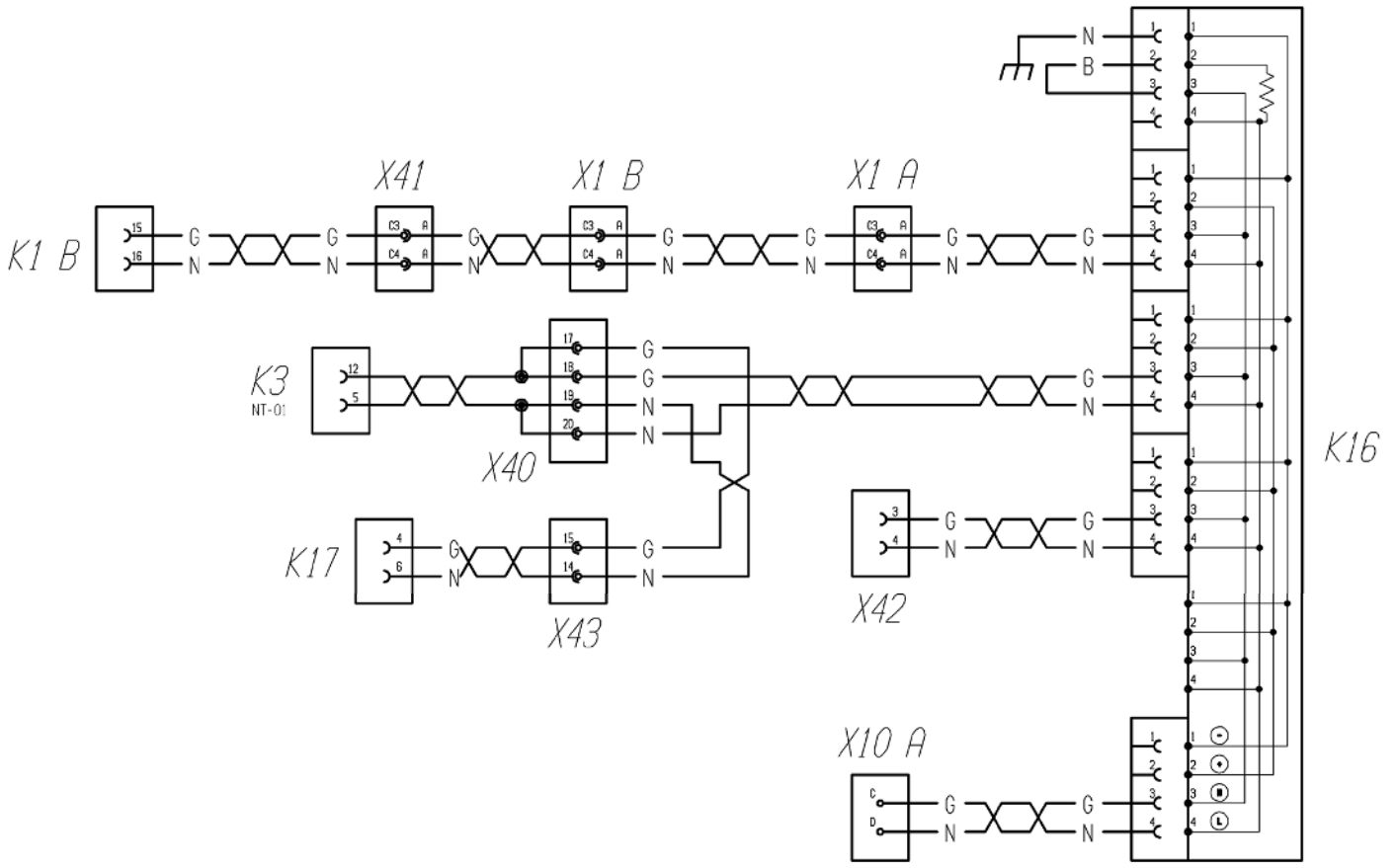
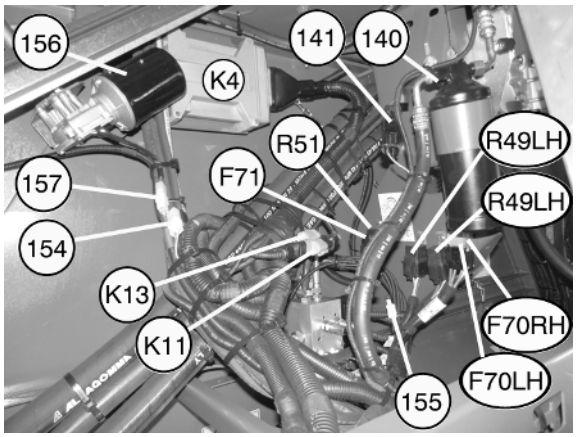


Fig. 102.

I042395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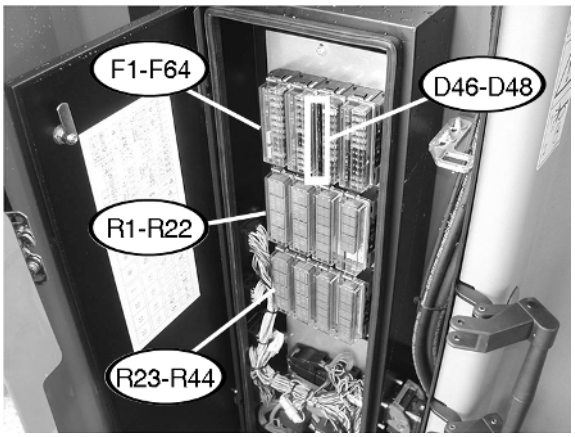
F70LH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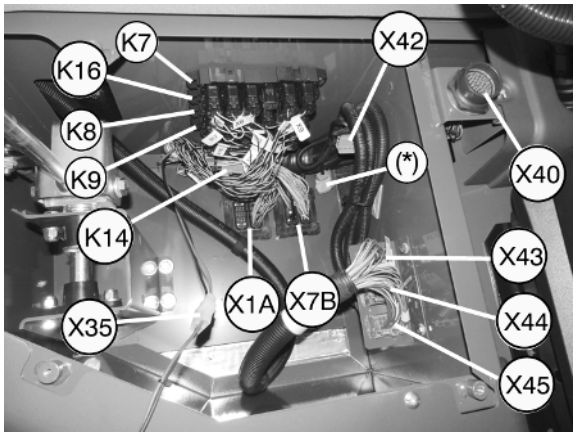
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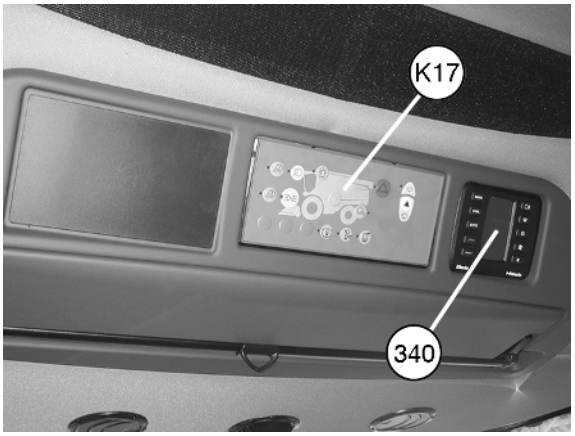
X45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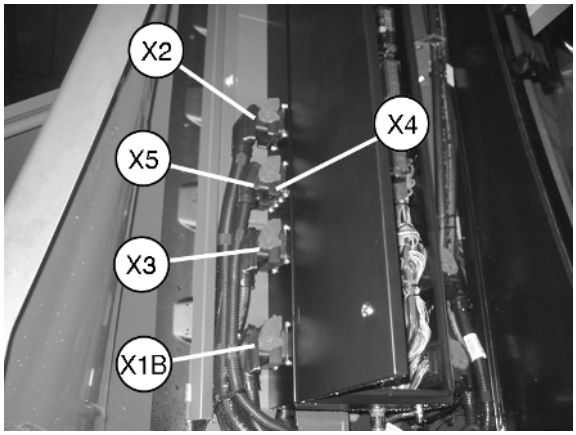
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X5
X3
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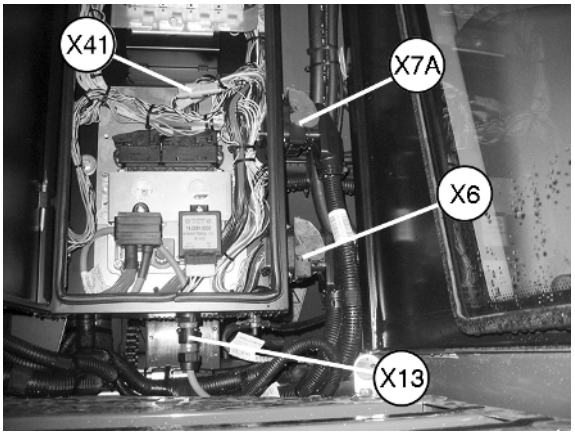
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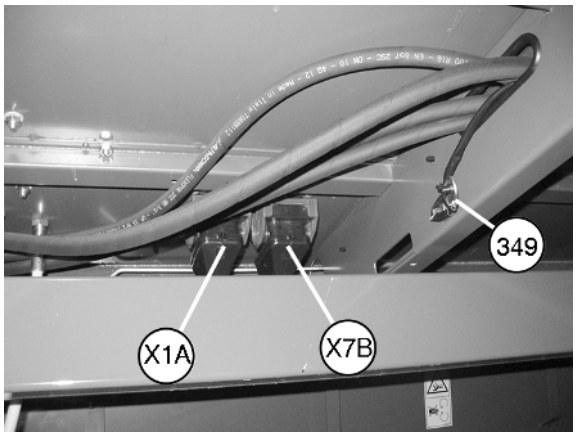
X7A
X6
X13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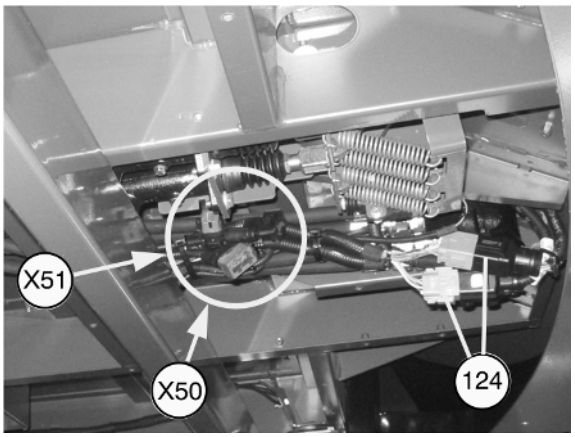
X1A
X7B


X51
X50
124

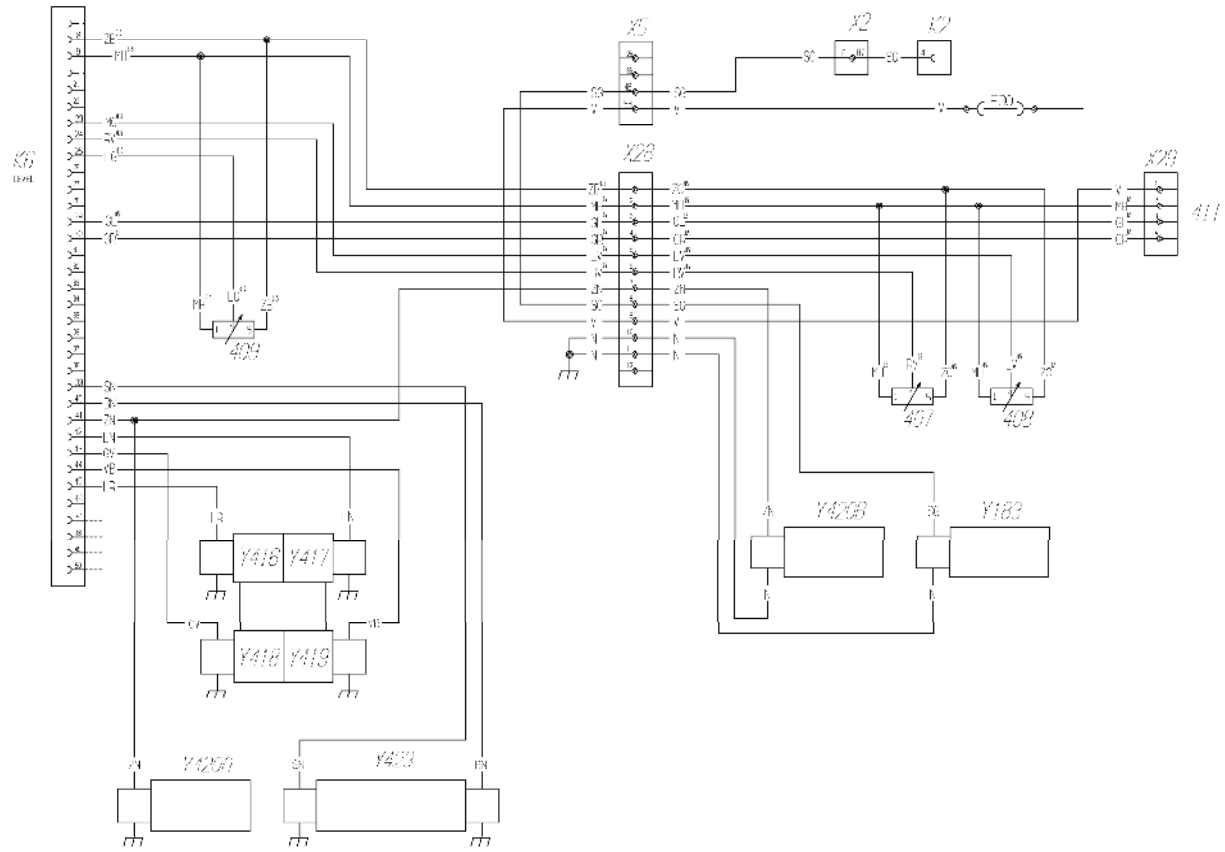


Fig. 107.

I042405

4 Threshing unit - Sgr. 58110

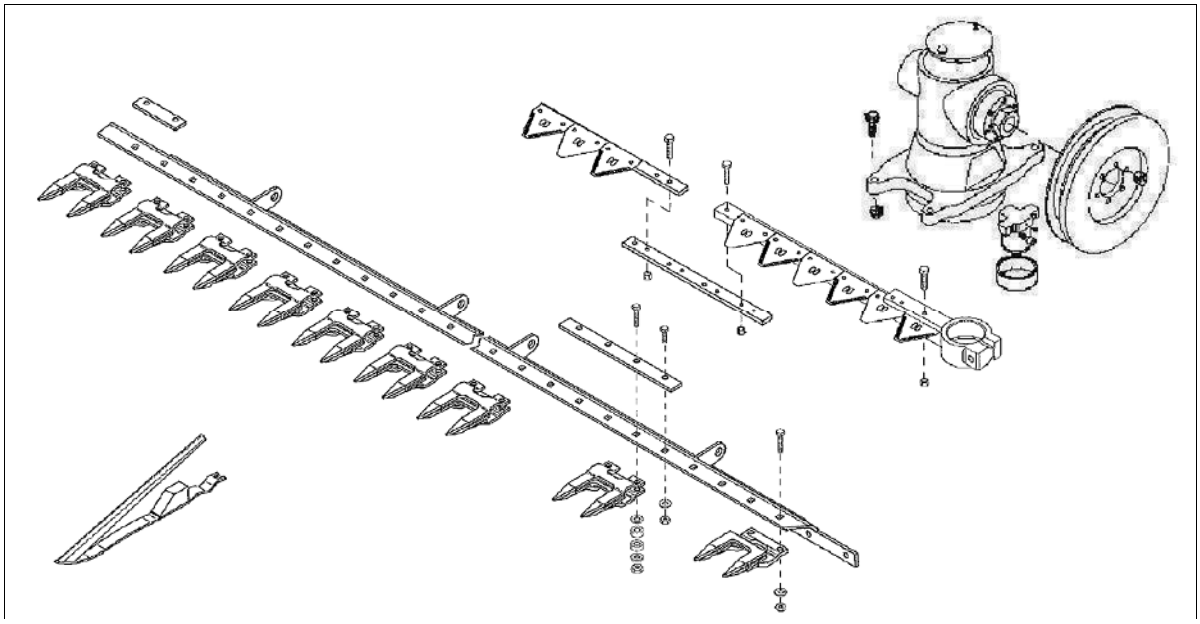


Fig. 6. I040255

Blade section - Replace - Op. 5811014

Blade sections (1) can be replaced easily as they are fastened by screws. Tighten the screws to a torque of **15 Nm**.

1. Blade section
2. Blade section fastening screw
3. Blade guard tooth fastening screw

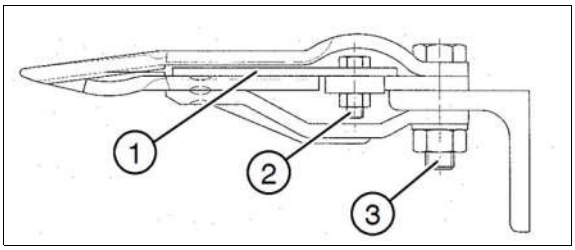


Fig. 7. I040256

Blade guard tooth and ear lifter - D./A. - Op. 5811018

To dismantle the blade guard teeth, just unscrew the screws (3). To fit, tighten them to a torque of **60 Nm**.

The assembly is arranged for easy installation of ear lifters, thanks to the presence of spacers (4).

To fit the ear lifters, proceed as follows:

– Remove the lock (6) and insert the ear lifter into the special nut channel (4);

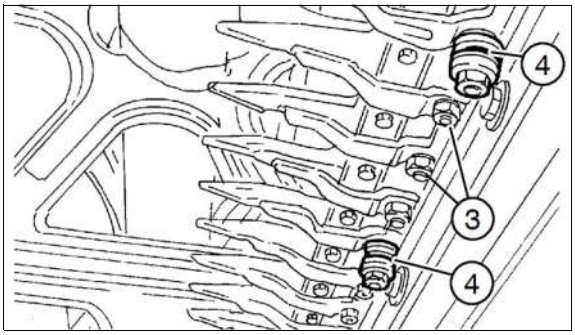


Fig. 8. I040257

– Fit the support (7) and lock it with the M10 screws (10), or with the hexagon head screws previously used to fasten the blade drive joint.

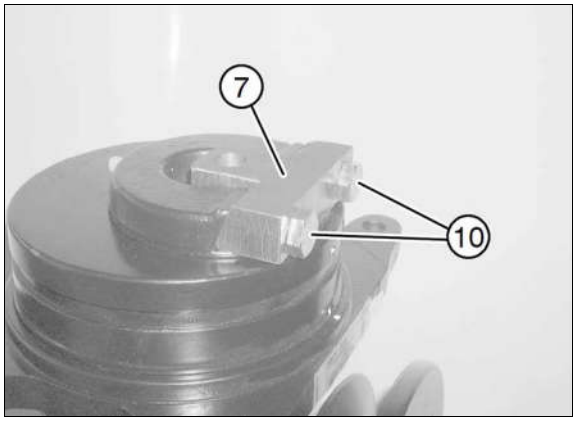


Fig. 28. I040276

– Fit the extractor unit as shown in the diagram; insert the M16 threaded pin (2) and tighten the nut (4) until the support (7) is removed from the inner bearing housing.

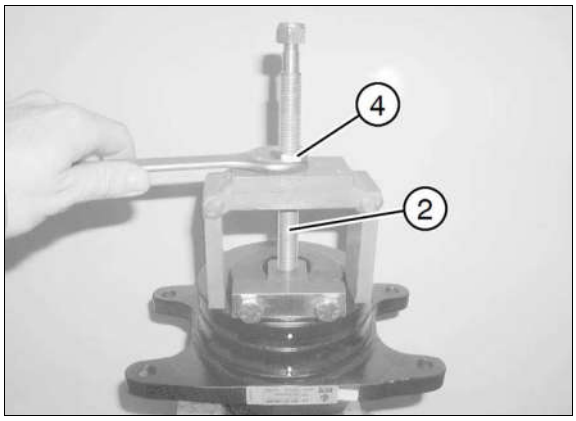


Fig. 29. I040277

– Note the housing timing when the support has been removed: The axis (11) of the pinion (12) is parallel to the drive pulley when the markings (A and B) are in contact.
– Clean the area.

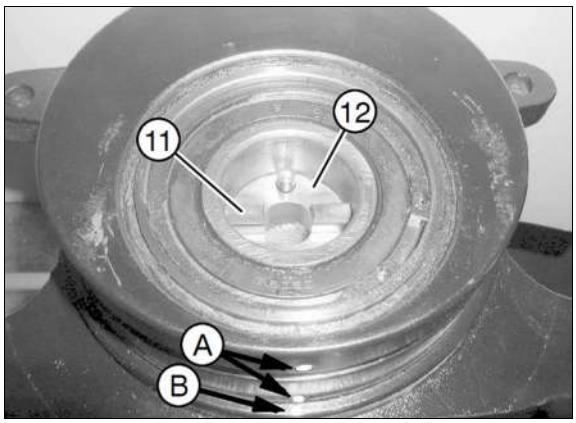


Fig. 30. I040278

– Remove the snap ring (13) with appropriate pliers.

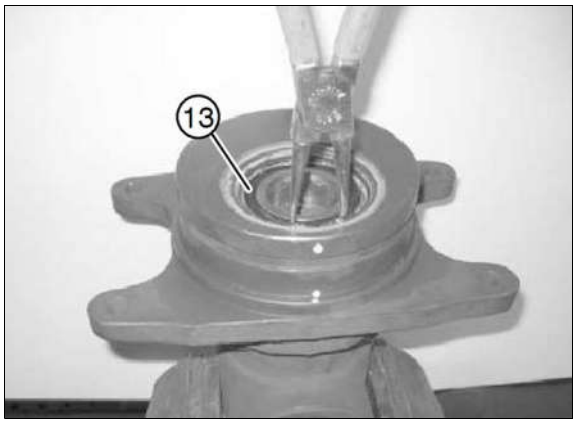


Fig. 31. I040279

– Remove the bearing (8) and the gear wheel from the housing.

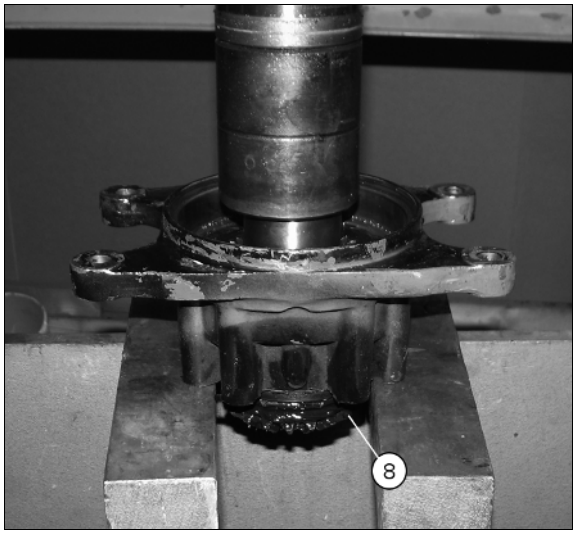


Fig. 55. I020595

– Hit the inside of the sprocket (9) carefully with a brass punch. Turn the sprocket slightly before each blow.
– Remove the bearing (10) with a screwdriver.

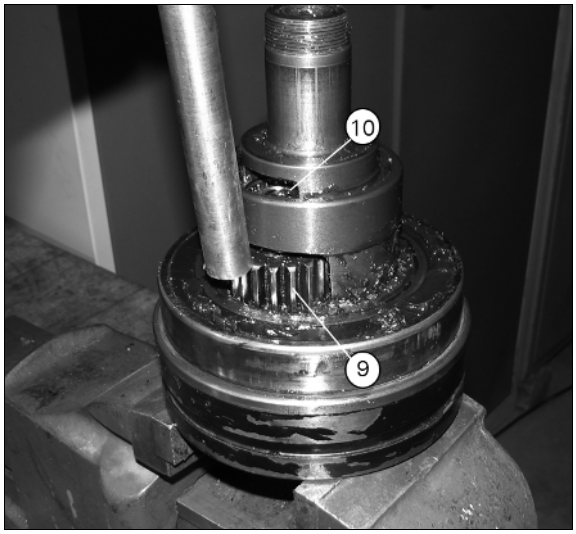


Fig. 56. I020596

– Remove the bolts (11).
– Hit the crown wheel (12) carefully on the rear part with a brass punch.

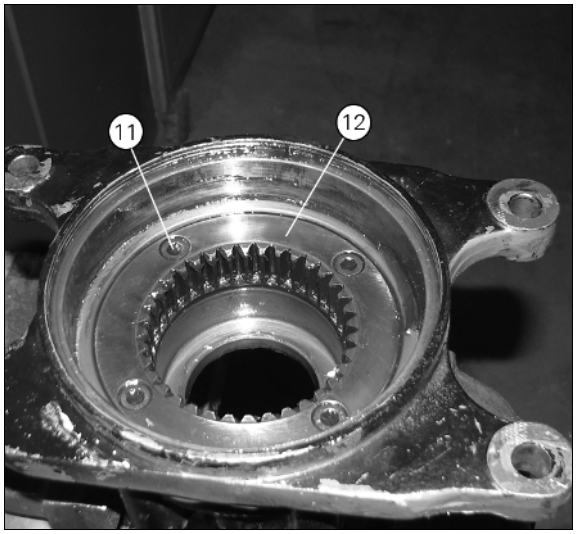


Fig. 57. I020599

Adjusting the auger and retractable fingers

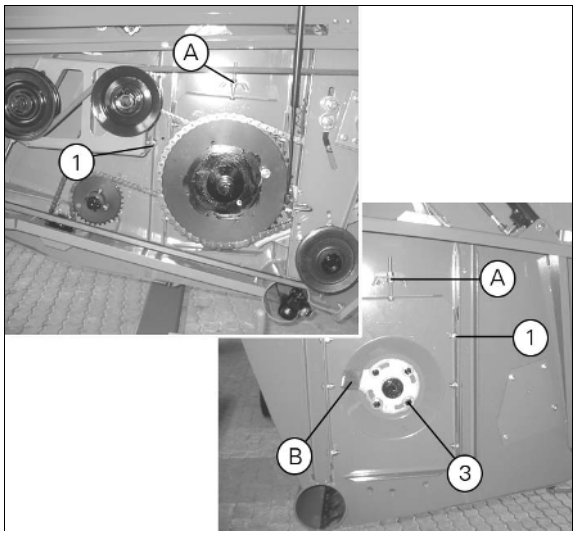
NOTE: *Depending on the geographical area and the different harvesting conditions, it may be necessary to use different adjustments to achieve better results.*
The adjustment measurements indicated are those initially recommended by the factory.
The adjustments can be modified according to local conditions and experience.

- Loosen the screws (1) of the cover on both sides.
  Adjust the adjustment screw (A) to set the distance between the auger flight and the base to X = 10 mm± 2
- Tighten the screws (1) and (A).
- Loosen the nuts (3) on the right-hand side: turning the adjustment bracket (B), set the distance between the retractable fingers and the table base to Z = 23 $^{+2}/_{-3}$ mm when the fingers are perpendicular to the base.

NOTE: *When cut-off plates are fitted, set the distance between the auger flight and the cut-off plates to Y = 3 mm ± 1 and the distance between the retractable fingers and the lower edge of the table to Z = 33 mm $^{+2}/_{-3}$ when the fingers are perpendicular to the base.*

IMPORTANT: *The distances must be checked across the entire width of the cutting table and the dimensions listed must be obtained at the points when the distances are smaller.*

NOTE: *The clearance allowed for the cutting table auger depends on the width of the table and is shown in the table below.*
The check measurements can be seen only when the cutting table has been parked closed or in the shade for at least four hours.
If the cutting table is left in the sun for a short time, the auger bends because of the difference in temperature between the front and rear parts.
This is relevant especially for cutting tables over 6 metres wide:



I020609

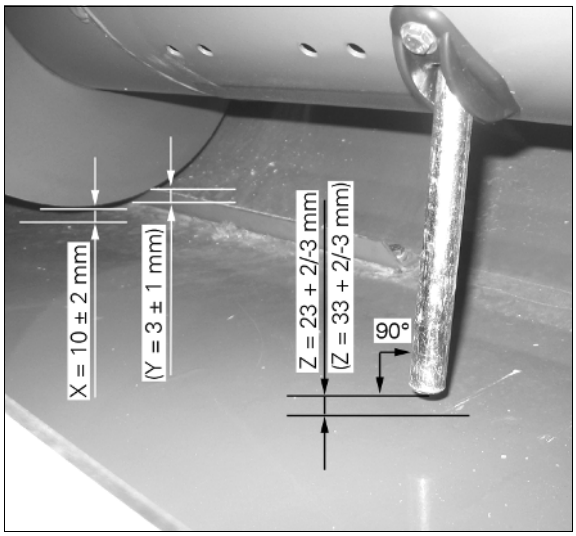


Fig. 78.
I020620

Cutting table	Permitted clearance
12' - 3.7 m	4 mm
14' - 4.3 m	4 mm
16' - 5.0 m	5 mm
18' - 5.6 m	5 mm
20' - 6.2 m	6 mm
22' - 6.8 m	6 mm
25' - 7.7 m	8 mm
30' - 9.2 m	8 mm

– Remove the guard (2).

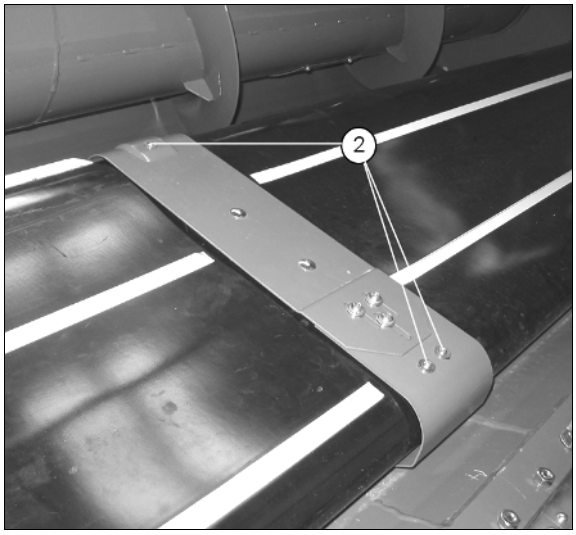


Fig. 99. I020631

– Loosen the front bearing support screws (3) on both sides of the belt.
– Lift the entire section (4), including rollers, scrapers and bearings, and remove it from the belt.

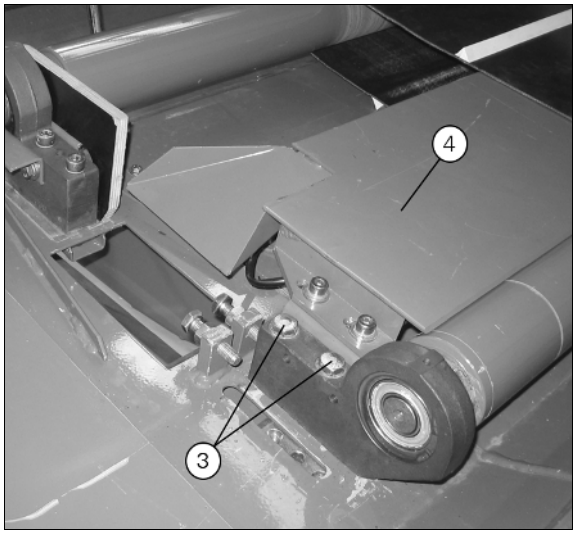


Fig. 100. I020633

Removal of rear rollers from right side

– Remove the cover (5).

Fig. 101. I020636

19 Reel

Disassembly

- Disconnect the hydraulic motor oil pipes (1).
- Disconnect the cable (2) for the revolution sensor.
- Disconnect the hydraulic cylinder using the bolt (3) on the right and left sides.
- Support the reel with a forklift truck or a crane and remove it gently from the frame on both sides.

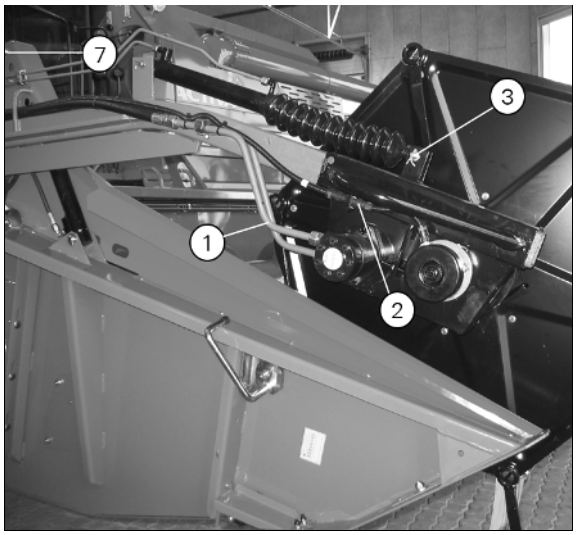


Fig. 125. I020567

- Disconnect the hydraulic cylinder oil pipes (5).
- Remove the shell (6) from the bearing.
- Disconnect the hydraulic cylinder using the bolt (7).
- Remove the reel arms.

IMPORTANT: *Plug the hydraulic pipes and connectors to avoid oil leaks. Make sure the pipe positions are marked. The reel will not work properly if the pipes are inverted.*

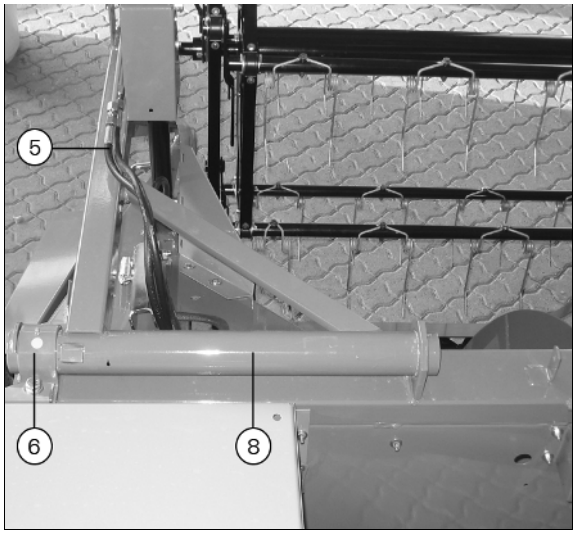


Fig. 126. I020551

Right reel advance and retract cylinder

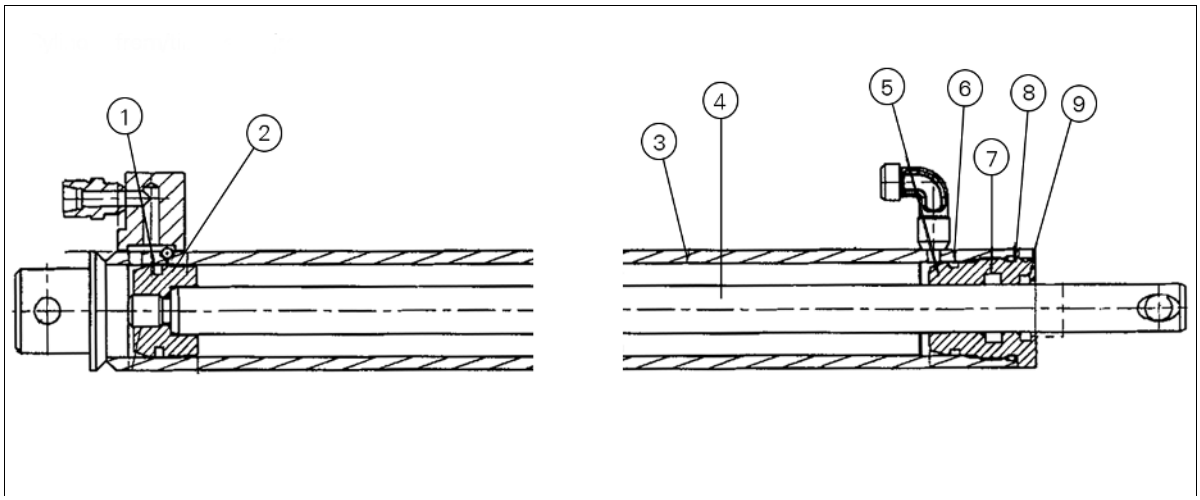


Fig. 142. I020572

1. Piston seal ring
2. Piston
3. Cylinder
4. Piston rod
5. Cylinder lock
6. O-ring
7. Cylinder seal ring
8. O-ring
9. Scraper ring

Left reel advance and retract cylinder

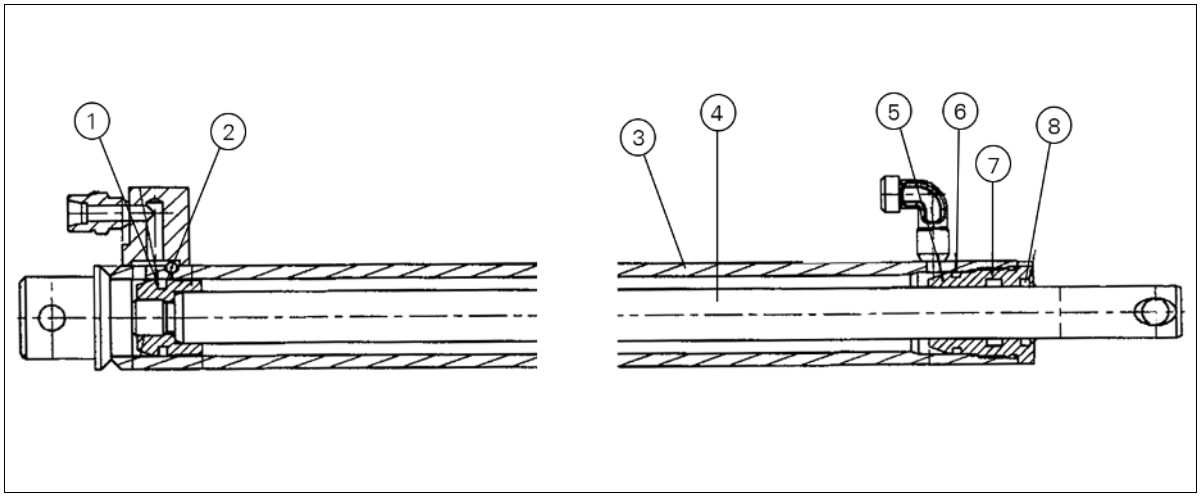


Fig. 143. I020571

1. Piston
2. Piston seal ring
3. Cylinder
4. Piston rod
5. Cylinder lock
6. O-ring
7. Cylinder seal ring
8. Scraper ring

4 Adjusting the elevator housing adapter (X5 and X6 models) - Sgr. 60110

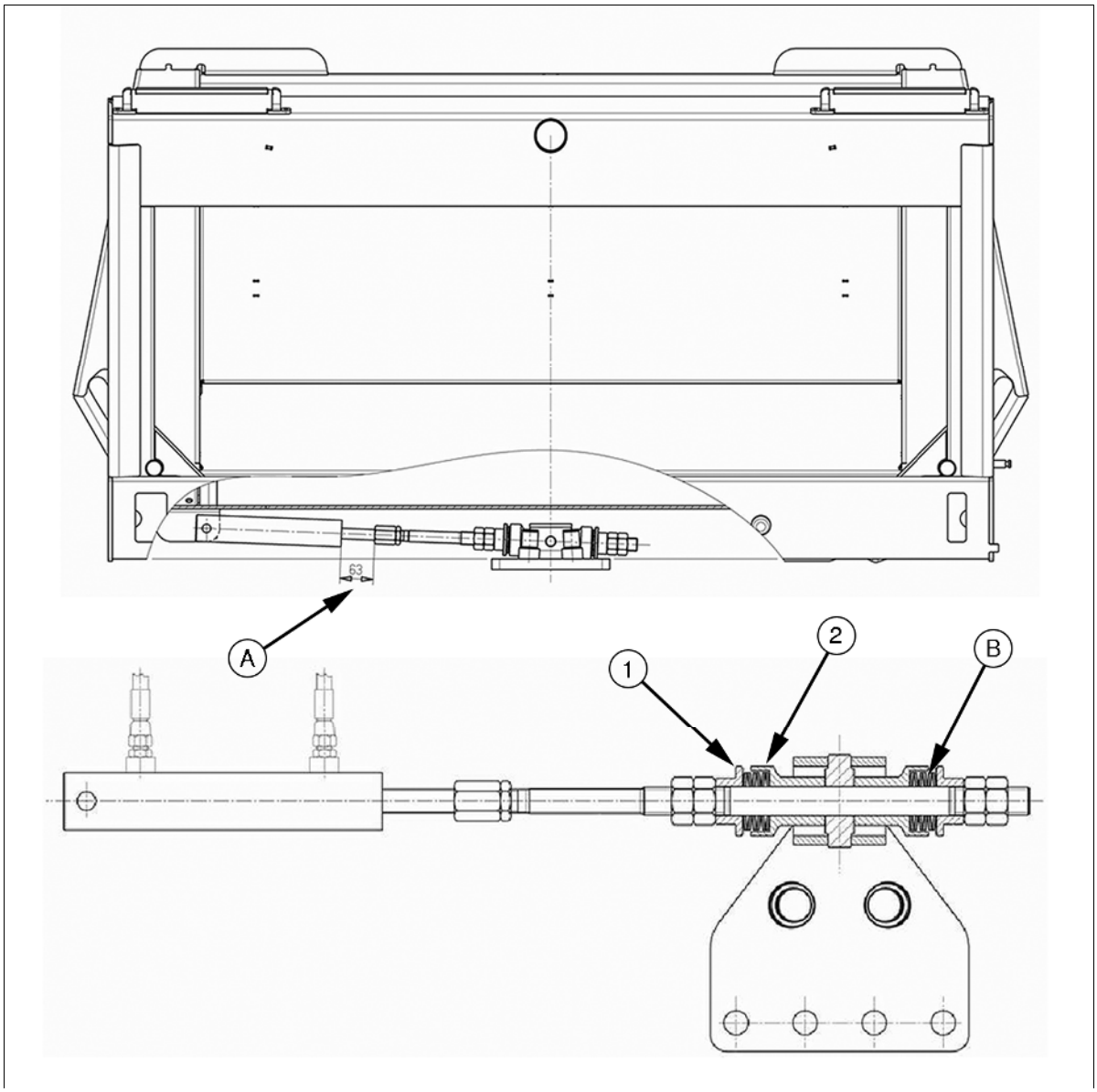


Fig. 6. I041827

A. Cylinder extension measurement corresponding to the elevator housing and adapter in the horizontal position.

B. The cup springs must be fitted as shown in the drawing. If removed, before refitting, grease the springs and the housings.

The spring (1) reference marks must compress the springs to a distance of 1 mm from the cup spring container (2).

10 Reverser drive - Sgr. 60160

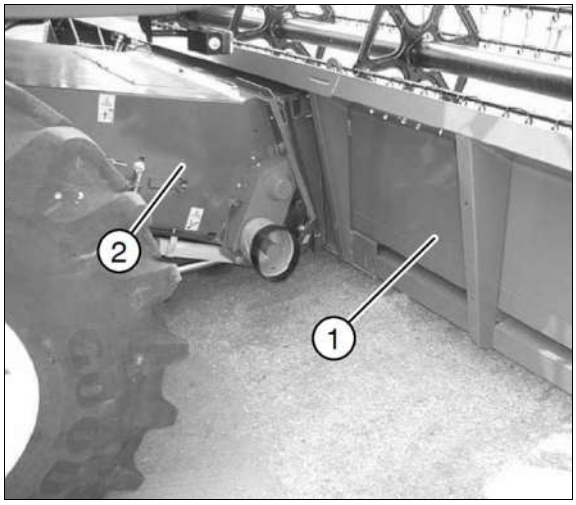
The machine is supplied with a special system for reversing the rotational direction of the cutting header (1) and main crop elevator (2).
If the feed auger or main crop elevator becomes blocked and the torque limiter is activated, proceed as follows:

- Immediately stop the combine and disengage the header by pressing down the control switch.
- Move the machine a few metres back and reduce the engine speed to idling.
- Fully extend the lever (3).
- Gradually move the lever (3) for the reverser (4) until all the material has been ejected, then reinsert the moving part of the lever (3) in the fixed part.
- Lift the reel and engage the header drive.
- The crop can be slowly fed by the reel into the table auger.

WARNING:

If the blockage cannot be removed by the reversing mechanism, disengage the threshing unit, switch off the engine, remove the ignition key and wait until all moving parts have come to a complete halt before removing the blockage manually.

The belt is correctly tensioned when the length of the spring (5) is 274 ± 3 mm (measured between the two spring attachment points).



I040197

I040198

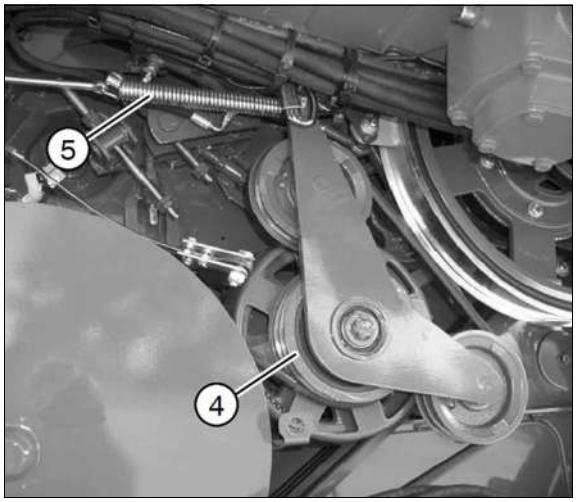


Fig. 22.
I040199

3 Concave - Sgr. 66105

Wheat - Barley - Light seed crops - Rye - Oats (normal/wide spacing)		
No. bars and wrap angle	°	12 and 106
Distance between bar upper side and wire centre	mm	10
Wire diameter	mm	3.4
Wire clearance	mm	14.1 - 28.2 (*)

(*) All models are supplied with a standard spacing concave, with wires alternately cut from the eighth discharge. If required, short wires can be replaced with long ones.
The machine is fitted with no. 3 de-awning bars.

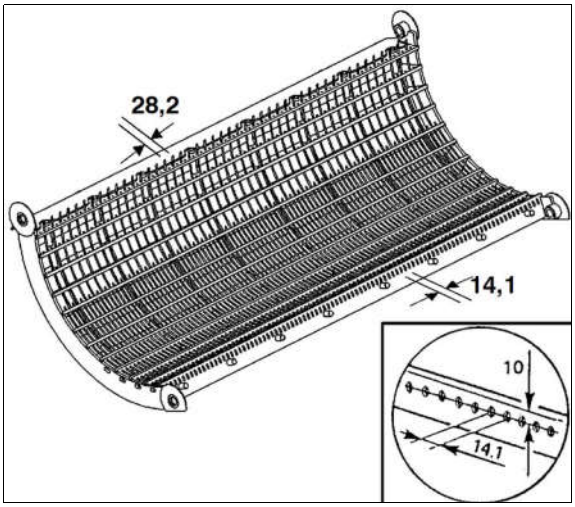


Fig. 3. I040100

Maize (Option)		
No. bars and wrap angle	°	9 and 106
Distance between bar upper side and wire centre	mm	10
Wire diameter	mm	6
Wire clearance	mm	24

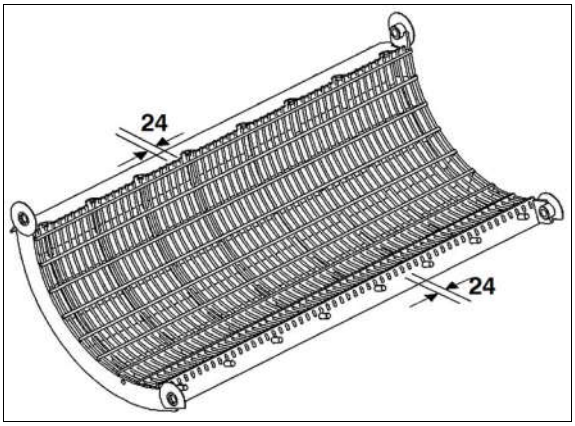


Fig. 4. I040101

Universal wheat/maize (Option)		
No. bars and wrap angle	°	17 and 102
Distance between bar upper side and wire centre	mm	12
Wire diameter	mm	6
Wire clearance (first 5 discharges)	mm	48
Diameter of bar connection rods	mm	14
Clearance of bar connection rods	mm	169

Recommended for countries / areas where maize is more dominant than wheat.

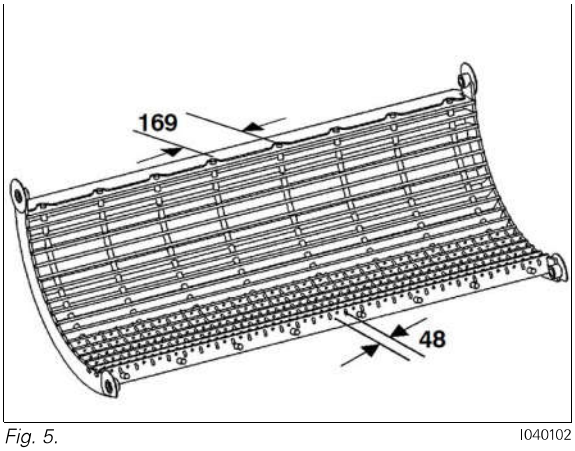


Fig. 5. I040102

7 Thresher PTO - Sgr. 66260

1. Rear beater shaft (rotation speed empty and loaded with motor on maximum: 818 rpm)
2. Cleaning shoe return drive belt
3. Feeder drive belt
4. Tensioner for table engagement belt
5. Belt drive for threshing unit.
6. MCS drive belt
7. Pulley fastening nut, tighten to **800 Nm.**

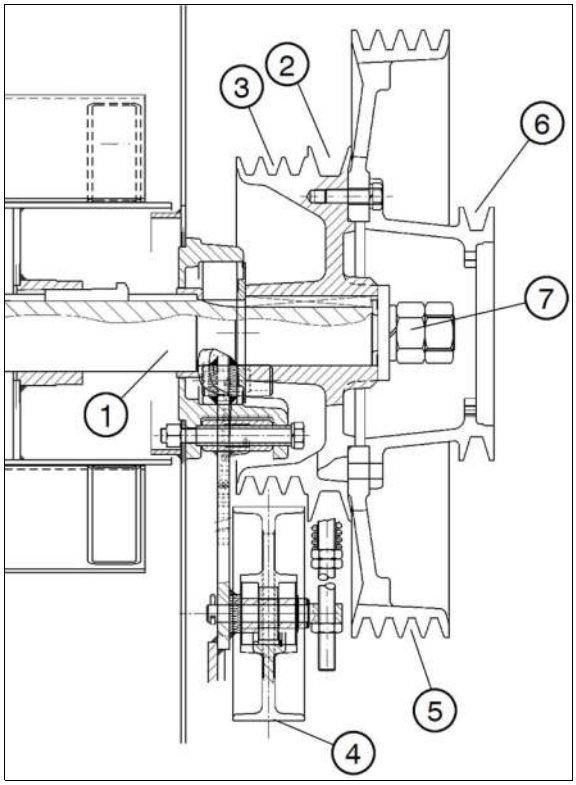


Fig. 22. I040127

14 Rotary separator (MCS) - Sgr. 66420

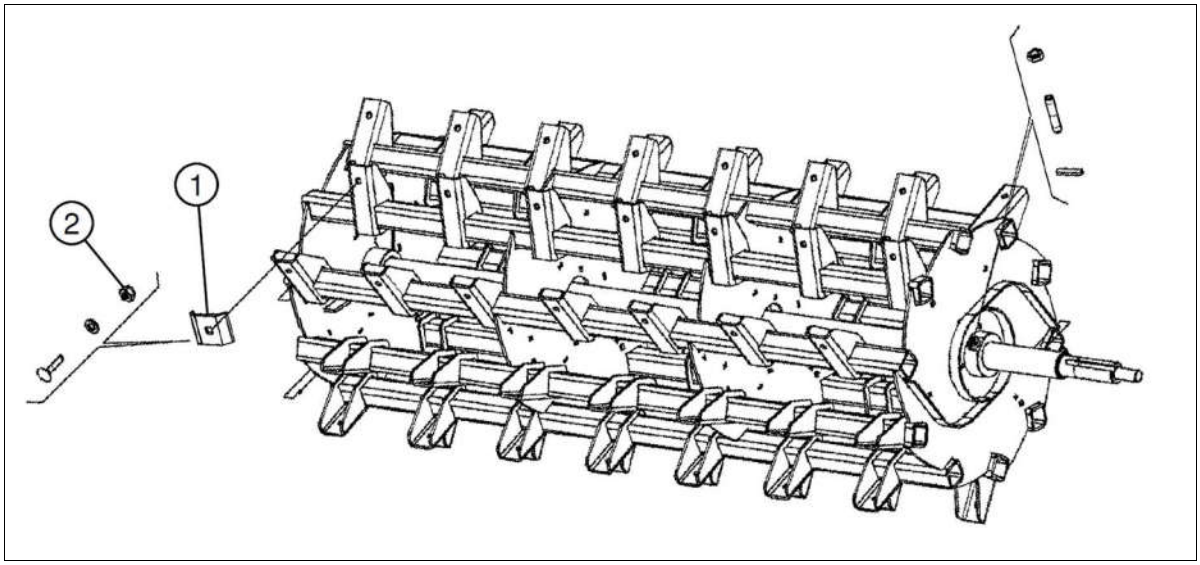


Fig. 40. I040157

1. Anti-wear plates for the MCS teeth, recommended for abrasive crops (optional kit), tighten the nuts (2) fastening the plates to a torque of **40 Nm.**

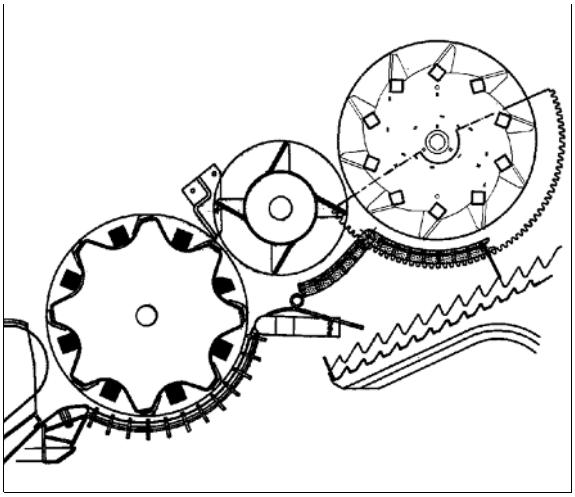


Fig. 41. I040158

Cylinder	Unit	Models with 5 straw walkers	Models with 6 straw walkers
Bars	no.	10	10
External diameter	mm	600	600
Width	mm	1346	1600
Speed	rpm	410 (*) - 750	410 (*) - 750

(*) only for maize

1 Specifications

	Units	X5	X5AL X5BL	X6	X6AL
Straw Walkers	no.	5		6	
Ramp	no.	5			
Shaft stroke	mm	150			
Shaft diameter	mm	38			
Outer width	mm	255			
Length	mm	4256			
Rotation speed	rpm	177			

1 Specifications

	Units	X5	X5AL X5BL	X6	X6AL
Transmission type		belt type			
Connection		Electrohydraulic			
Rotor diameter	mm	498.5			
Knives	no.	52		64	
Counter-blades	no.	52		62	
Counter-blade position		Adjustable			
Rotation	rpm	3544 (wheat) - 2200 (maize)			
Crop spreader adjustment		manual (electrical upon demand)			

1 Specifications

	Units	X5	X5AL X5BL	X6	X6AL
Fan rotation speed	rpm	350 ÷ 1050			
Reduced rotation speed (optional)		270 ÷ 840			
Vane	no.	4			
Grain pan		fixed			
Grain pan movement		opposite to the lower sieve			
Upper shaker shoe movement		opposite to the lower sieve			
Adjustable upper sieve		CS4 (standard) - CZ4 (optional)			
Adjustable lower sieve		CLOSZ CS2			
Returns		To cylinder			
Transport type		auger and paddle elevator			
Tailing auger rotation speed	rpm	285			
Crop transport		auger and paddle elevator			
Grain auger rotation speed	rpm	350			

Actuator fitting diagram for models with 5 straw walkers

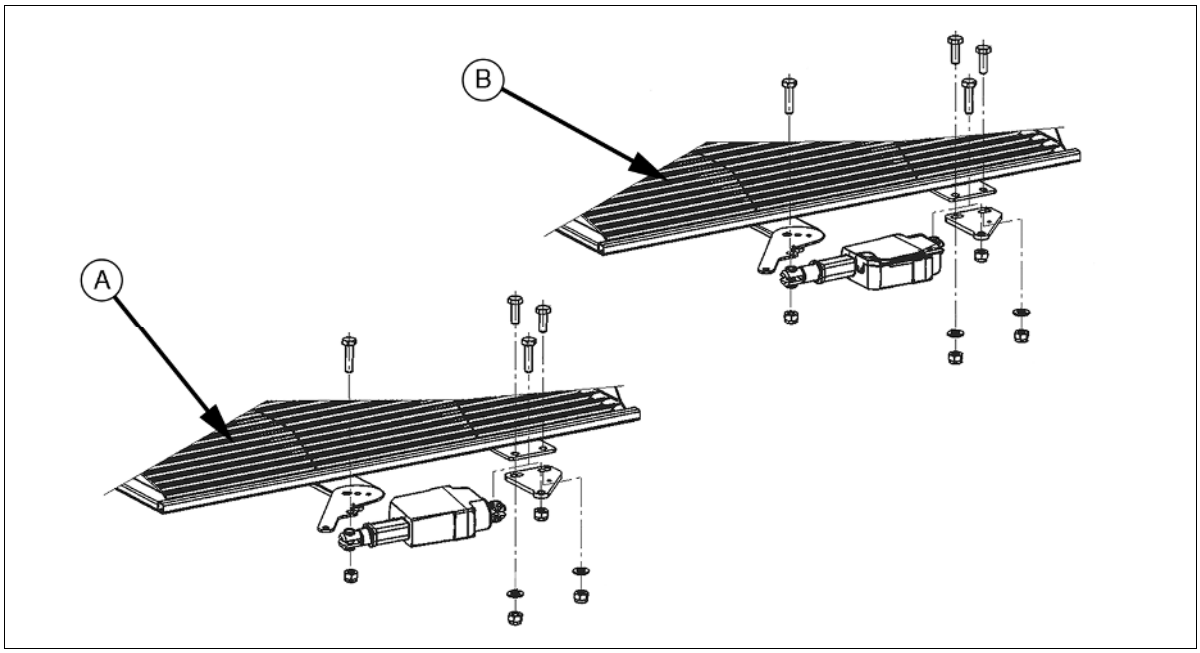


Fig. 14. I041877

A. Bottom sieve
. Top sieve

Actuator fitting diagram for models with 6 straw walkers

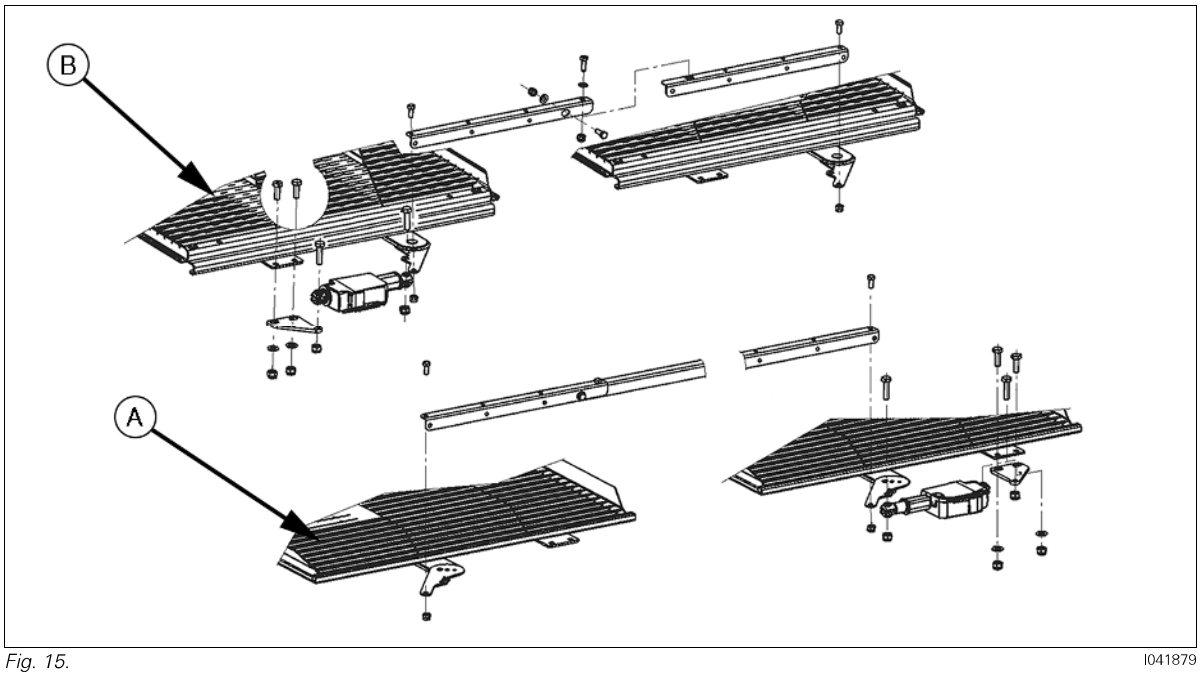


Fig. 15. I041879

A. Bottom sieve
. Top sieve

3 Grain tank - Sgr. 80150

General information

The crop in the tank can be unloaded when the machine is both at a standstill and on the move, irrespective of the position of the unloading auger, except when it is completely closed.

Tank unloading is started by pressing the push button (1).

Before unloading the grain tank, ensure that the unloading auger is in the desired position. Unloading is engaged with the push buttons (2) on the multifunction lever.

CAUTION:

When the horizontal unloading auger is operated or when the combine is travelling with the auger turned out, make sure it does not interfere with any obstacles or overhead power lines.

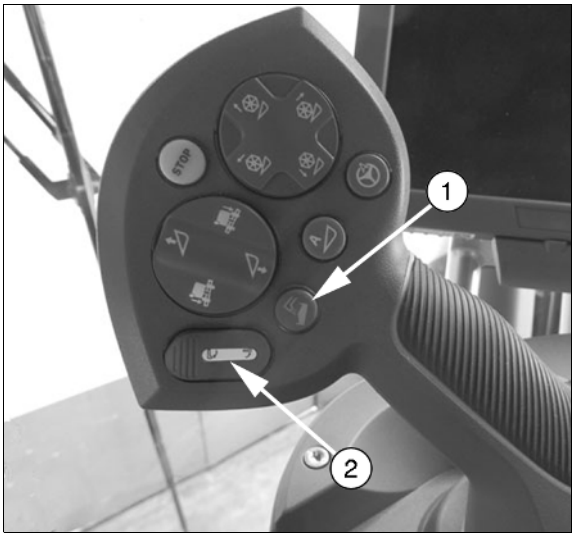


Fig. 3. I041865

Grain tank unloading auger

The grain tank bottom auger (3) is protected by a covering plate (4) with adjustable extensions (5) for setting the unloading speed according to crop type and moisture.

Raise the extensions (5) to increase unloading speed and lower them to obtain the opposite effect.

The tank unloading drive is protected by a shear bolt, which interrupts the action in the event of an overload.

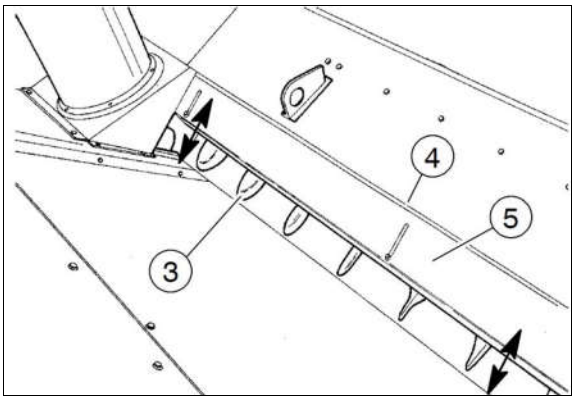


Fig. 4. I039856

Electrical riser closures

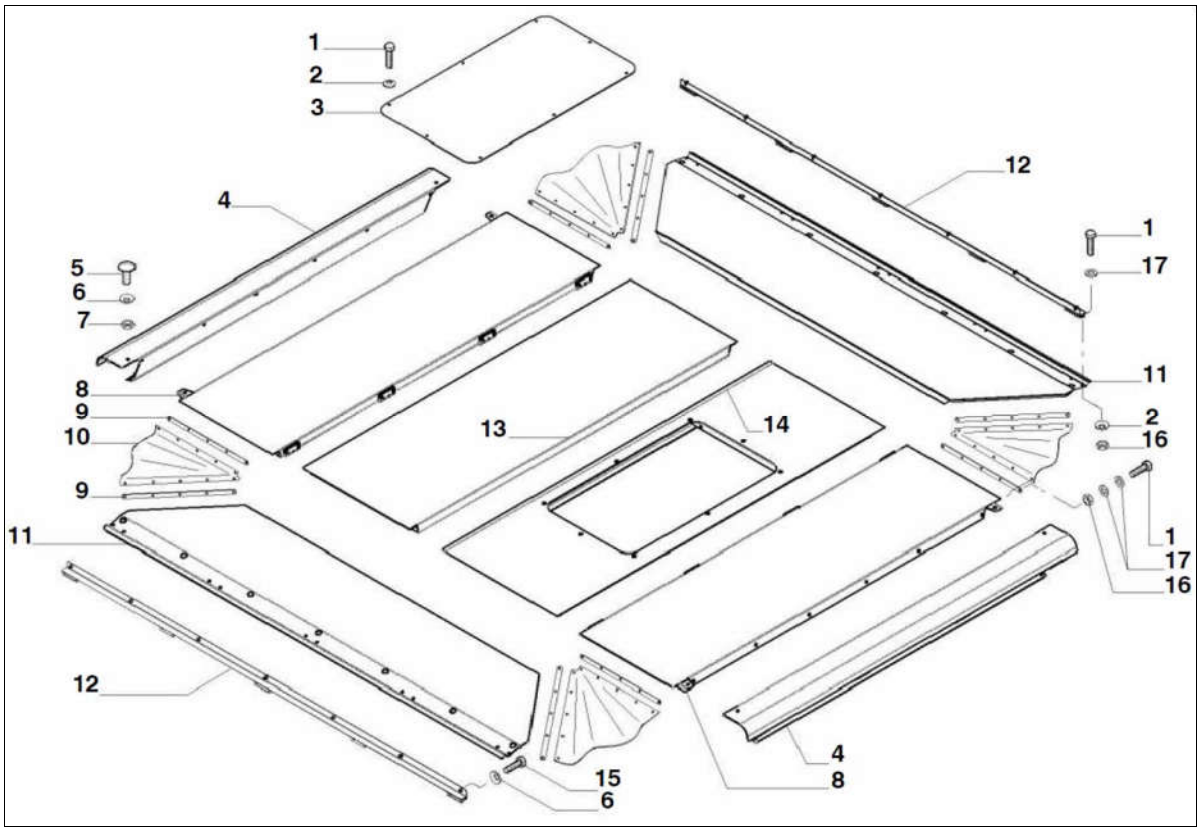


Fig. 20. I039871

1. M6x16 screw, **12 Nm** (9 lbf ft)
2. Spring washer
3. Close
4. Cover
5. M8x16 screw, **30 Nm**
6. Spring washer
7. M8 nut, **20 Nm**
8. Cover
9. Curtain rod
10. Curtain
11. Cover
12. Angular iron
13. Cover
14. Cover
15. M8x20 screw, **30 Nm**
16. M6 nut, **8 Nm**
17. Washer