Workshop Service Manual

Combines
FENDT 5225 E

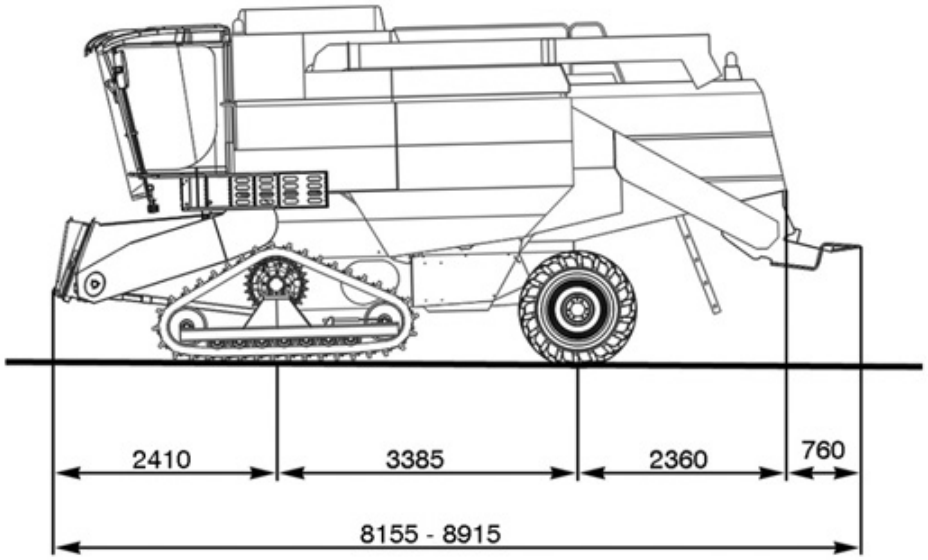
FENDT 5225 E - S/N => 551620001
ZN205516x03020093

Breganze
AGCO S.p.A. - Via F. Laverda, 15/17 - 36042
BREGANZE (VI) – Italy.
FENDT is a worldwide brand of AGCO

June 2017
LA327326012F_FE5225E_EN
EME
English

Threshing sys.	Unit	X5A
Stone trap		At concave inlet with cut-out option and the possibility to remove it (for inspection)
Threshing drum		
Type: wheat/maize		8 cylinder rasp bars
Type: rice		12 toothed bars with cast iron support
Cylinder housing width	mm	1346
Cylinder width	mm	1331
Diameter	mm	600
Cylinder variator		with 1 belt
Variator control		electrohydraulic
Speed	rpm	380÷1210
Concave		
Control		Front and rear opening, independently adjustable from the operator seat
Area	m^2	0.83
Grain/barley type:		
Clearance (between wire centers)	mm	14.1
Wire arrangement	mm	Alternately 403 and 630
Wrap angle	°	106
Wire diameter	mm	3.4
Total number of wires	no.	93
Bars	no.	12
Maize type:		
Clearance (between wire centers)	mm	24
Wrap angle	°	-
Wire diameter	mm	6
Bars	no.	9
Rice type:		
Threshing section	no.	1 (with three rows of spikes)
Spikes	no.	77
Wrap angle	°	106
Universal type:		
Bars	no.	17

Model with tracks



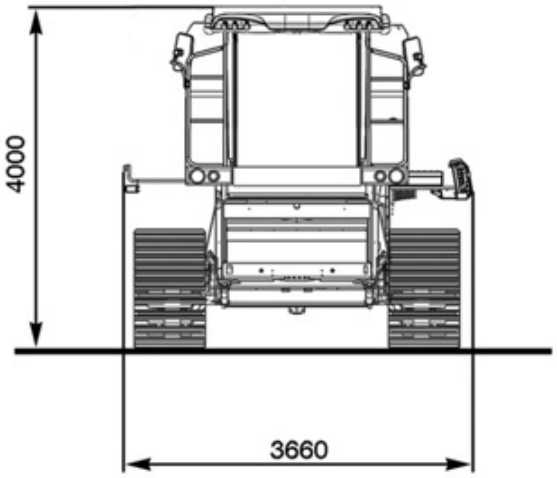


Fig. 2

Dimensions are in mm.

2.14 Belt and chain tension references - left-hand side

1. Blade drive belt (FF)

Load 80 N - Deflection 8÷9 mm

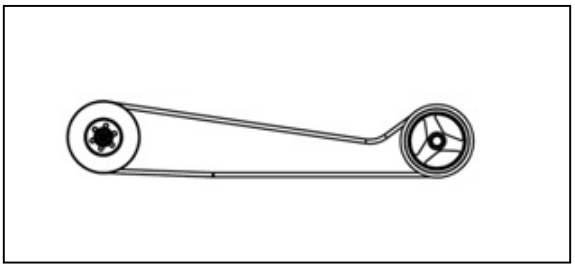


Fig. 9

2. Transmission chain for feed auger (FF)

Spring compression: Fixed - deflection 15 mm

The chain tension is adjusted using the tensioner (1).

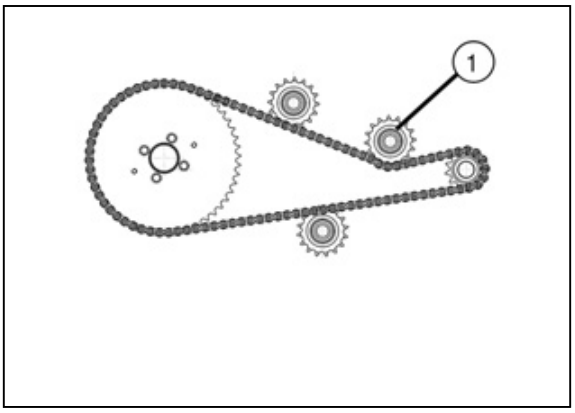


Fig. 10

3. Table drive belt

Spring compression: Semi-automatic - Length of the spring equal to the index 165 ± 1 mm

The belt tension is adjusted using the self-locking nut (1).

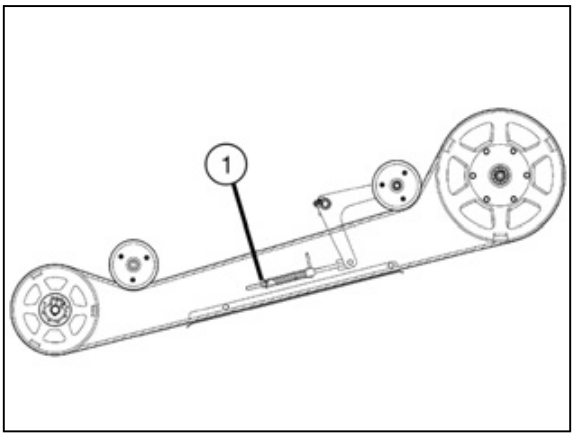


Fig. 11

6. Transmission chain for tailings auger

The chain is tensioned automatically.

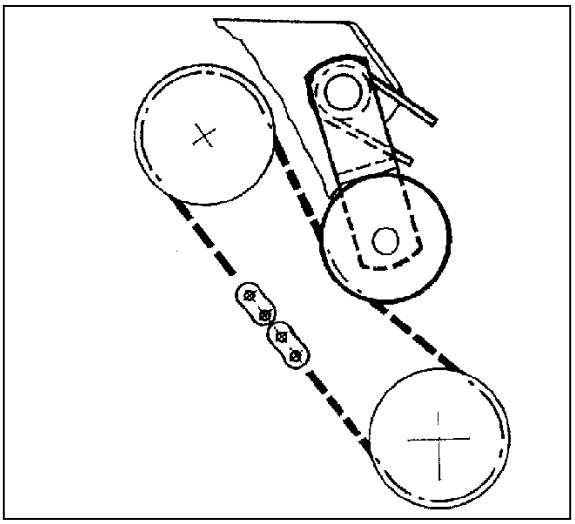


Fig. 34

7. Transmission chain for reel

Spring compression: fixed

The chain is tensioned by loosening the nut (1) fastening the hydraulic motor and by using the adjustment screw at the front. Take care to adjust the tension when the chain is at dead center.

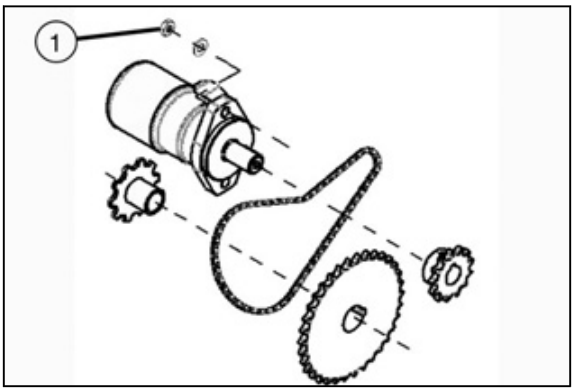


Fig. 35

8. Chain for crop elevator

The chain is tensioned automatically. If necessary, the tension can be corrected using the nuts (1) to compress the spring (2) until its length corresponds to the gage (3). Perform this operation on both sides of the elevator shaft.

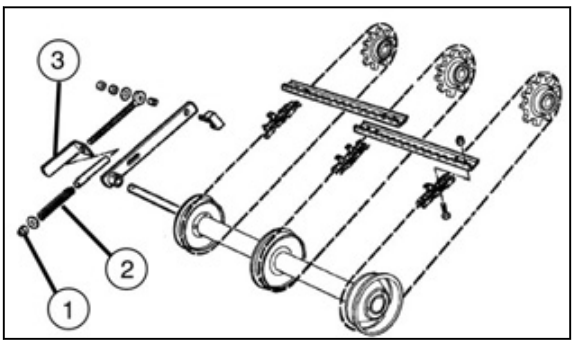


Fig. 36

B38 - Fanning mill revolution sensor

Connector **X203**

Location: On the right-hand side of the machine. Remove the fanning mill guard.

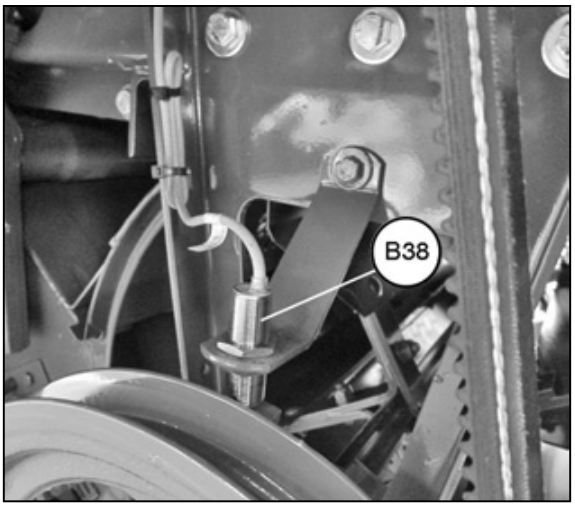


Fig. 62

B39 - Crop elevator revolution sensor

Connector **X205**

Location: On the right-hand side of the machine, at the bottom end of the crop elevator. Remove the cover.

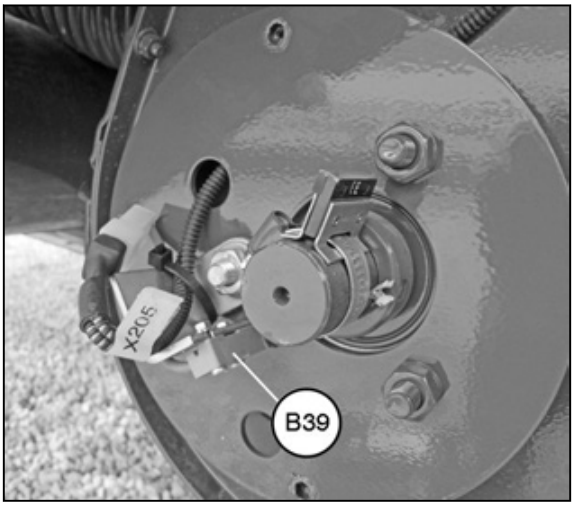


Fig. 63

B40 - Tailings elevator revolution sensor

Connector **X322**

Location: On the left-hand side of the machine. Open the left-hand side door and remove the cylinder guard.

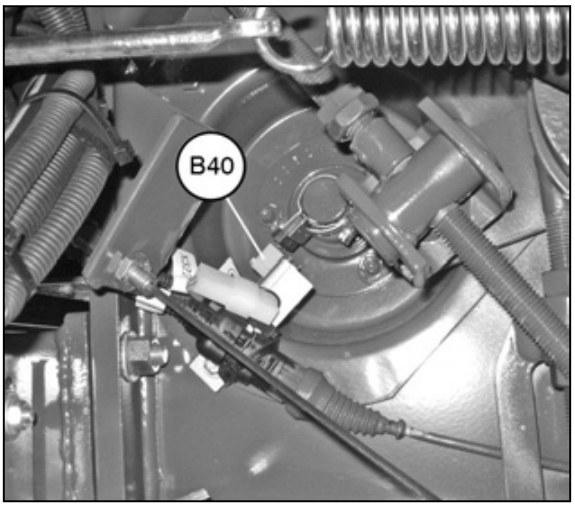


Fig. 64

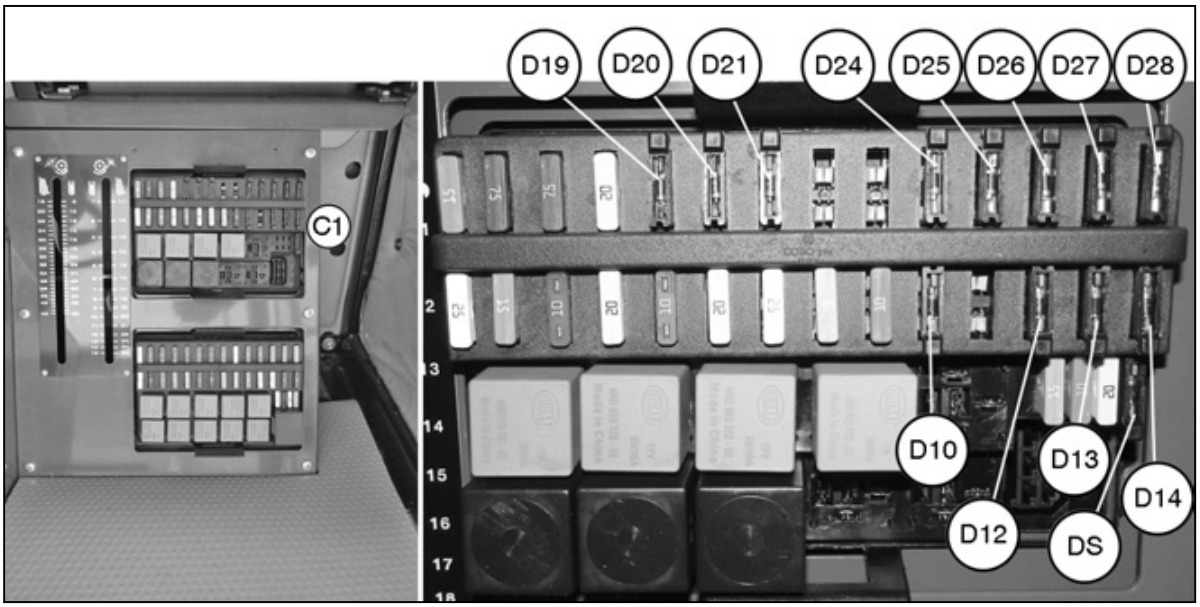


Fig. 91

List of diodes

Connector **X152**

Location: cab, inside the housing C1 (top).

D10	1A diode, not used. **X152-F10**
D12	1A diode, straw chopper disengagement. **X152-F12**
D13	1A diode, insufficient alternator charge (sent to R13). **X152-F13**
D14	1A diode, grain tank maximum level warning. **X152-F14**
D19	1A diode, engine starting cut-out with engaged unloading auger. **X152-F19**
D20	1A diode, engine starting cut-out with engaged feed mechanism. **X152-F20**
D21	1A diode, engine starting cut-out with engaged threshing mechanism. **X152-F21**
D24	1A diode, grain tank maximum level on Agritronic Plus. **X152-F24**
D25	1A diode, audible alarm and indicator light for excessive oil temperature in hydrostatic circuit. **X152-F25**
D26	1A diode, audible alarm and indicator light for insufficient oil pressure in hydrostatic circuit. **X152-F26**
D27	1A diode, audible alarm for straw walker blockage and straw chopper diffuser in turned up position. **X152-F27**
D28	1A diode, audible alarm with engaged park brake. **X152-F28**
DS	Reserve diode.

E194 - Rear left-hand side additional work light

Connector **X345**

Position: left side on rear of machine.

Fig. 119

E195 - Rear right-hand side additional work light

Connector **X233**

Position: right side on rear of machine.

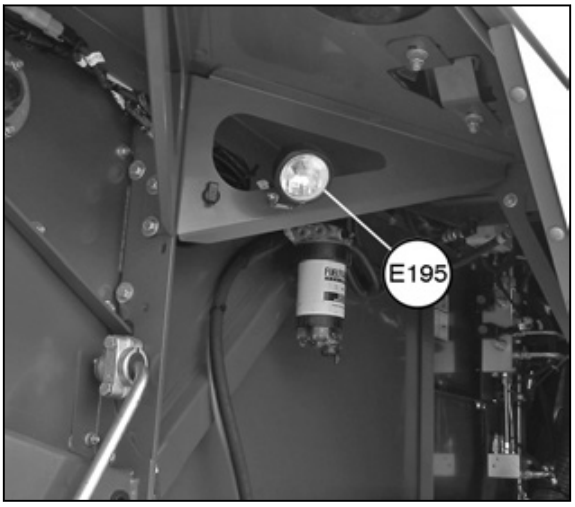


Fig. 120

E200 - Left-hand headlight for flip-up table

Connectors **X756a**, **X756b** and **X756c**

Position: on the front part of the machine.

Fig. 121

H154 - Horn (controller A)

Connector **X154**

Location: Under the right instrument panel, controller A.

Fig. 140

H576 - General horn on Agritronic Plus

Connectors **X576a** and **X576b**

Location: Above the ECU Unicontrol.

Fig. 141

H577 - DEF warning horn

Connectors **X548a** and **X548b**

Location: Under the right instrument panel, next to the OPS.

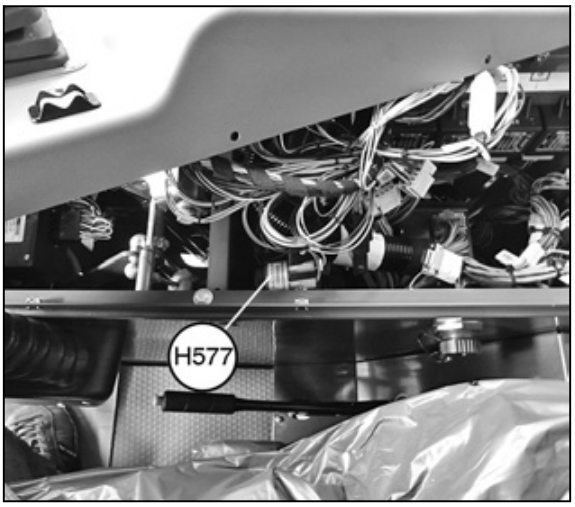


Fig. 142

M28 - Air conditioning compressor motor

Connectors **X391** and **X392**

Location: on the engine compartment, grain tank side. Lift the engine cover.

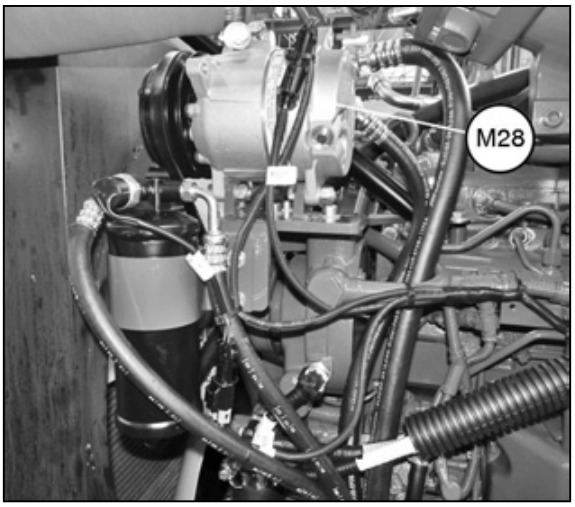


Fig. 165

M29 - Cab fan motor

Connector **X40**

Location: on the cab roof, behind the cab air filter.

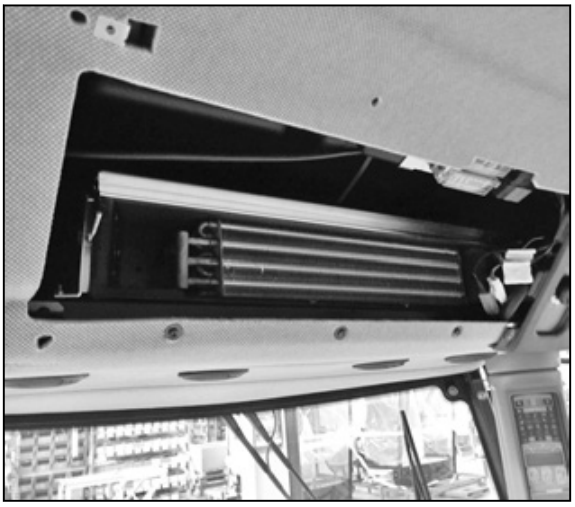


Fig. 166

M30 Cab pressurization motor

Connector **X37**

Location: on the cab roof.

Fig. 167

S475 - Rear working lights switch - Connector **X475**

S476 - Front working lights switch - Connector **X476**

S486 - GSAX control switch - Connector **X486**

S487 - Fixed/floating height deflector switch - Connector **X487**

S488 - Rear view mirror defrosting control switch - Connector **X488**

S489 - Straw chopper electrical deflector control switch - Connector **X489**

S527 - Threshing mechanism engagement/disengagement switch - Connector **X527**

S528 - Table engagement/disengagement switch - Connector **X528**

S529 - Crop unloading auger engagement/disengagement switch - Connector **X529**

S530 - Rear view mirror adjustment switch - Connector **X719**

S558 - Right-hand vertical blade control switch - Connector **X558**

S559 - Left-hand vertical blade control switch - Connector **X559**

S525 - Concave front adjustment switch

Connector **X525**

S526 - Concave rear adjustment switch

Connector **X526**

Location: Inside cab, front right instrument panel.

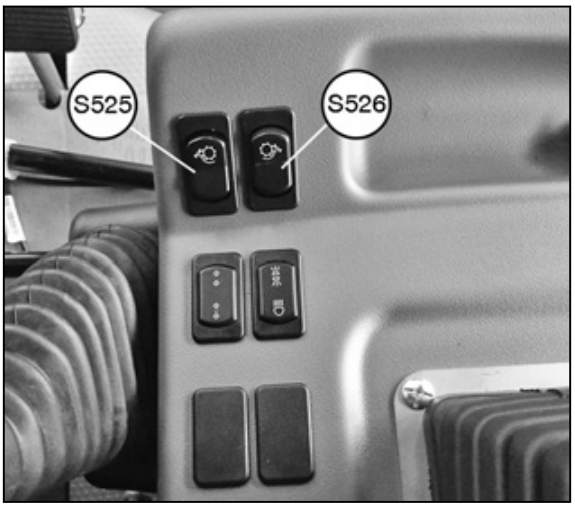


Fig. 194

S779 - Engine throttle switch

Connector **X545**

Location: Inside cab, front right instrument panel.

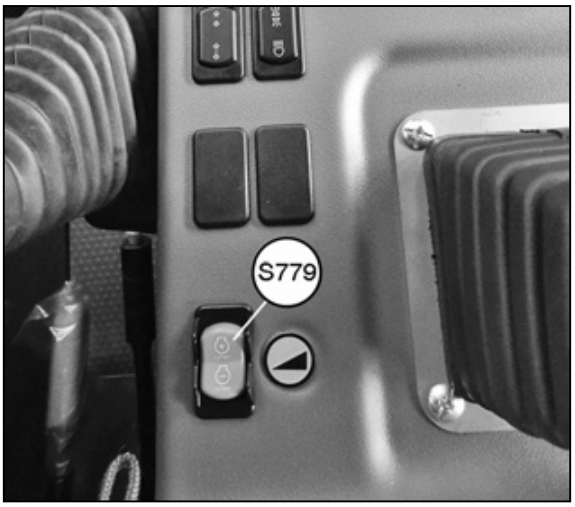


Fig. 195

X27.p - 9-pin coupling on Agritronic Plus connecting cable (for performance sensors)

X27.s - 9-pin coupling on right-hand side main cable for performance sensors

X29.p - 32 pin coupling on cab operator platform cable, for 200 bar control valve cable

X29.s - 32-pin coupling on 200 bar control valve cable

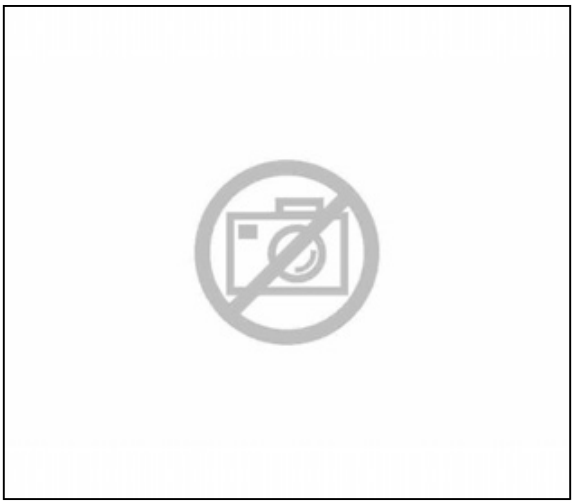


Fig. 220

X31 - Air conditioning switch connector

Position: see location of component **S170** - Air conditioning switch.

X32 - Air recirculation switch connector

Location: see location of component **S171** - Air recirculation switch.

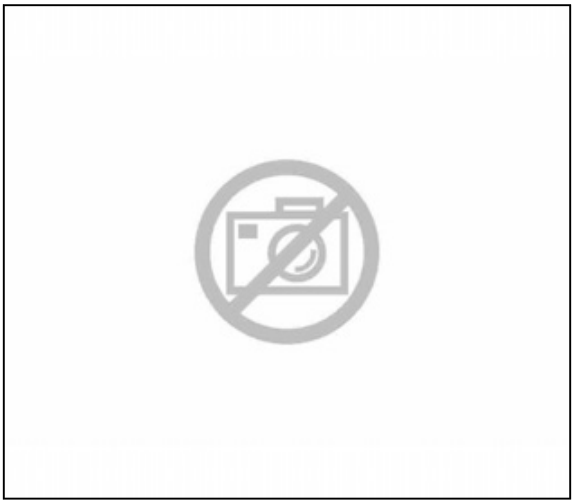


Fig. 221

X37 - HVAC pressurization connector

Position: see location of component **M30** - 4-pin coupling on HVAC cable

X40.p, **X40.s**, **X41.p** and **x41.s** - Left-hand loudspeaker "+" cable terminal

Position: cab. On the inside of the roof.

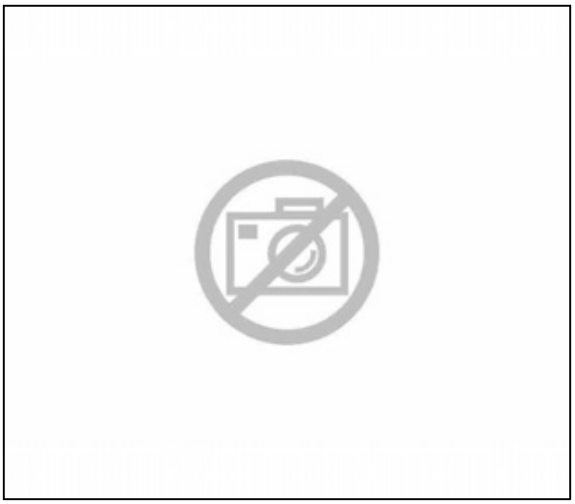


Fig. 222

X202.p - 24-pin coupling for gearbox sensor cable

X202.s - 24-pin coupling on right-hand side main cable for gearbox sensor cable

Position: on the right-hand side of the machine. Open the right-hand side door and remove the cylinder variator guard.

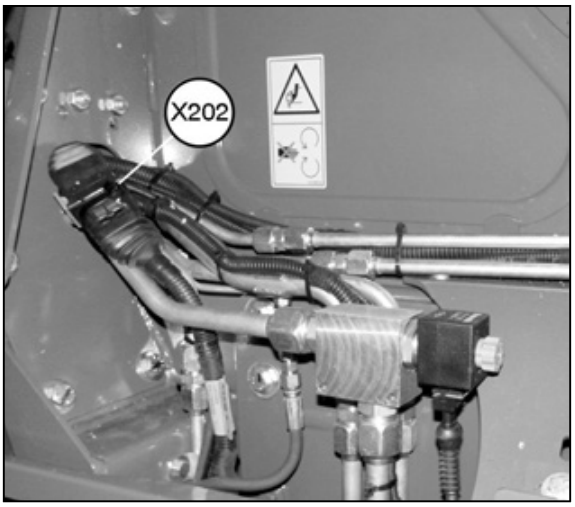


Fig. 250

X203 - Connector for fanning mill revolution sensor

Position: see component location **B38** - Fanning mill revolution sensor.

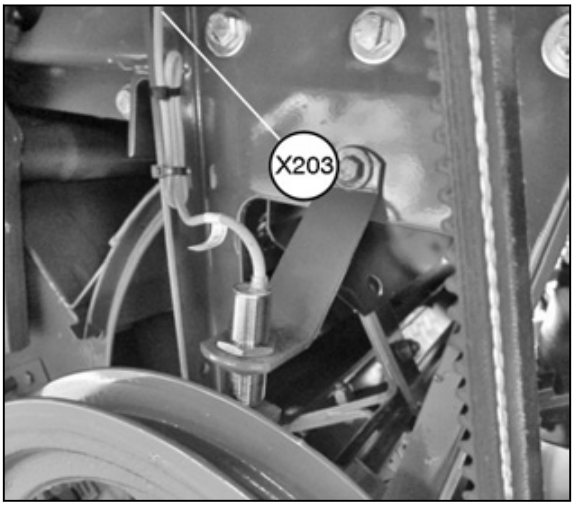


Fig. 251

X204 - Connector for fanning mill revolution variator

Position: see component location **M50** - Gear motor for fanning mill revolution variator.

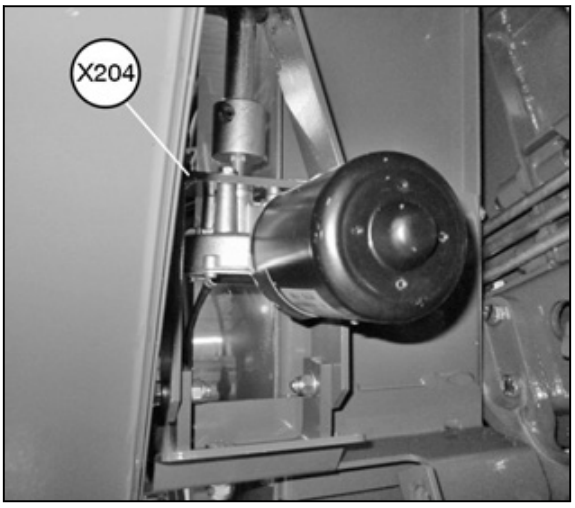


Fig. 252

X268.p - 4-pin coupling on left-hand side sieve performance sensor cable

X268.s - 4-pin coupling on right-hand side main cable for left-hand side sieve performance sensor

X269.p - 4-pin coupling on right-hand side main cable for left-hand side straw walker performance sensor

Position: see component location **B60** - Left-hand sieve performance sensor.

X270.p - 4-pin coupling for additional cable to rear left-hand side light

X270.s - 4-pin coupling for additional cable to rear left-hand side light

Position: see component location **E60** - Rear left-hand side light assembly.

X271 - Connector for hydraulic oil temperature sensor

Position: see component location **S13** - Hydraulic oil temperature sensor.

X273 e **X272** - Cable terminal for pressure switch on hydraulic oil return filter

Position: see component location **S11** - Pressure switch on hydrostatic circuit return.

X274 e **X275** - Cable terminal for pressure switch on hydraulic oil return filter

Position: see component location **S12** - Pressure switch on hydraulic circuit return.

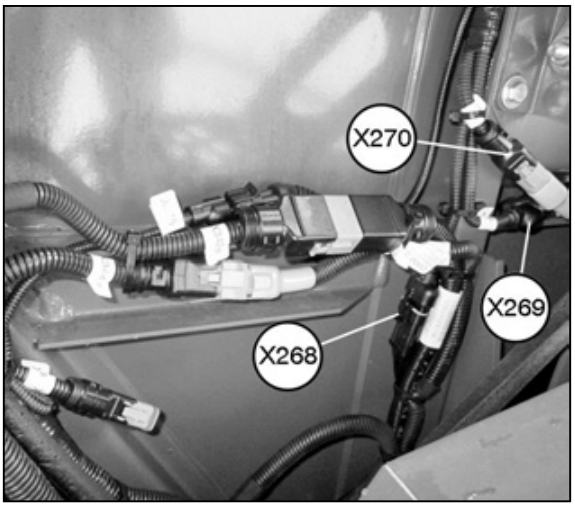


Fig. 280

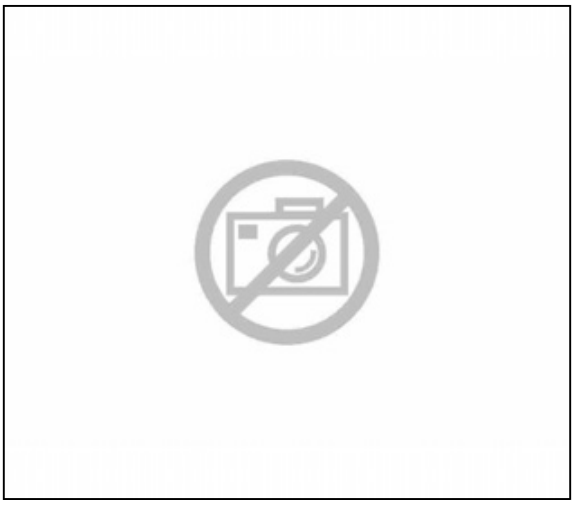


Fig. 281

X277.p - 4-pin coupling for cable to rear right-hand side light

X277.s - 4-pin coupling for cable to rear right-hand side light

Position: see component location **E61** - Rear right-hand side light assembly.

X278.p - 4-pin coupling for cable to rear left-hand side light

X278.s - 4-pin coupling for cable to rear left-hand side light

Position: see component location **E60** - Rear left-hand side light assembly.

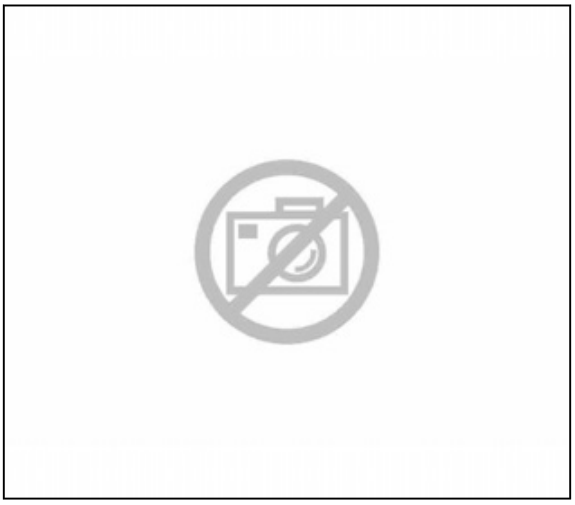


Fig. 282

X358 - Connector for table engaged limit switch

Location: See component location **S358** - Table engaged limit switch.

X359 - Connector for table disengaged limit switch

Location: See component location **S359** - Table disengaged limit switch.

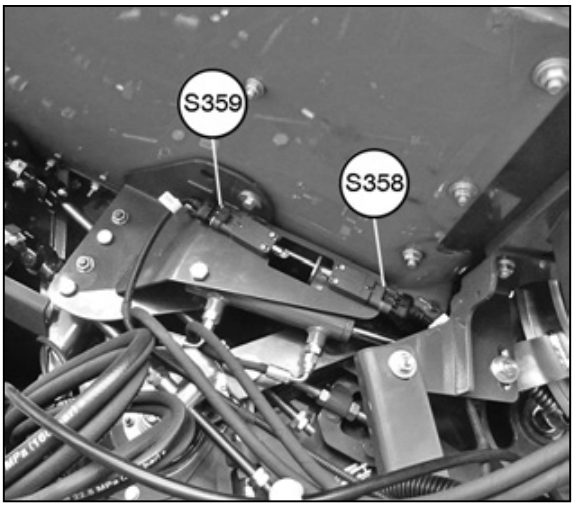


Fig. 309

X374 - Connector for hydrostatic pump micro-switch in neutral position

Location: See component location **S533** - Hydrostatic pump neutral position switch.

X375 - Connector for hydrostatic pump micro-switch for reverse gear warning

Location: See component location **S534** - Reversing gear warning alarm switch.

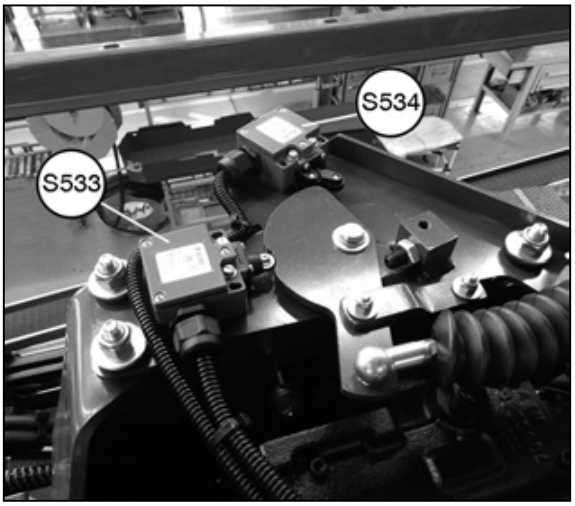


Fig. 310

X378 - Cable terminal for pressure switch of hydrostatic pump 90L100 filter

X379 - Cable terminal for pressure switch of hydrostatic pump 90L100 filter

Location: See component location **S15** - Hydrostatic pump supply circuit pressure switch.

X380 - Connector for DOC inlet temperature sensor

Location: See component location **B105** - Exhaust gas temperature sensor.

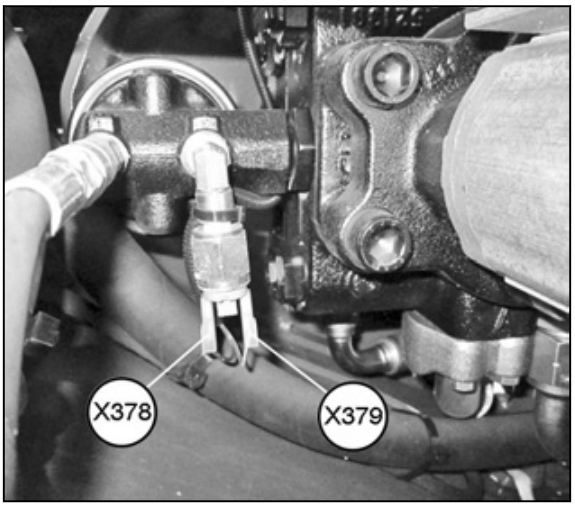


Fig. 311

X455R.p - 3-pin coupling for front right-hand side light and position light cable

X455R.s - 3-pin coupling for cabin operator platform for front right-hand side light and position light cable

X455L.p - 3-pin coupling for front left-hand side light and position light cable

X455L.s - 3-pin coupling for cabin operator platform for front left-hand side light and position light cable

Location: See component location **E86** and **E88** - Front position lamp.

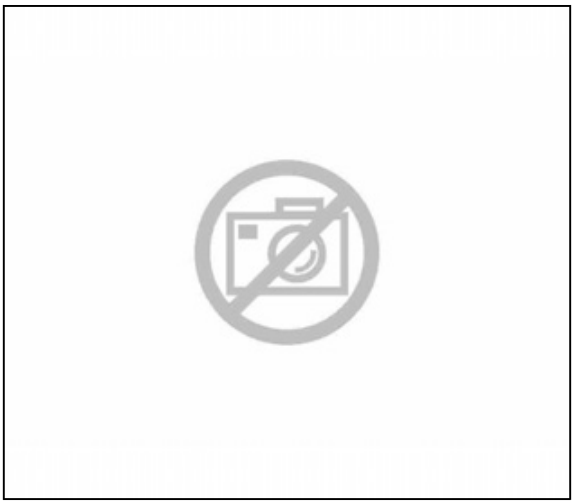


Fig. 339

X458.p - 2-pin coupling for straw chopper clogging micro-switch

X458.s - 2-pin coupling for straw chopper clogging micro-switch cable

Location: See component location **S42** - Straw chopper overloading switch.

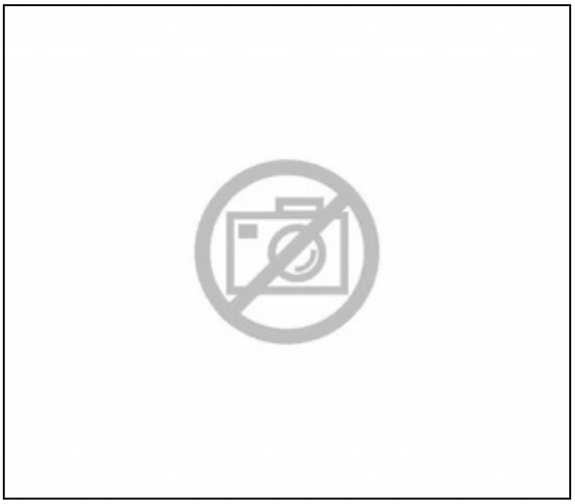


Fig. 340

X459 - Connector for reversing warning alarm

Location: See component location **H9** - Reverse gear warning alarm.

X460.p - 2-pin coupling for rear rotary beacon cable

X460a - Cable terminal for **black** wire to rear rotary beacon

X460b - Cable terminal for **red** wire to rear rotary beacon

Location: See component location **E160** - Rear rotary beacon.

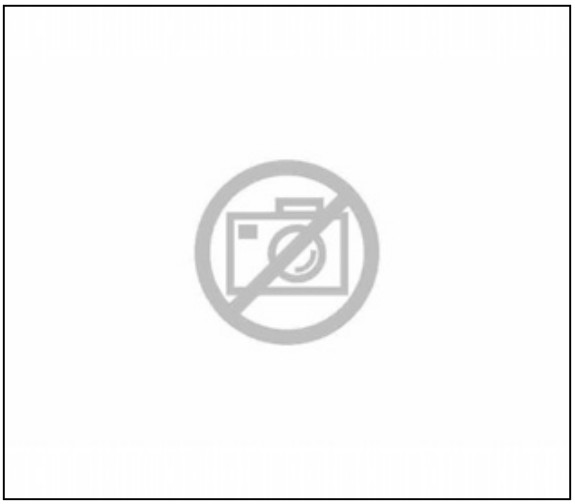


Fig. 341

X554 - Fuse module F114, right-hand side vertical blade

X555 - Fuse module F115, left-hand side vertical blade

X556 - Relay module K108, right-hand side vertical blade

X557 - Relay module K109, left-hand side vertical blade

Location: If the kit is fitted, under the front left platform.

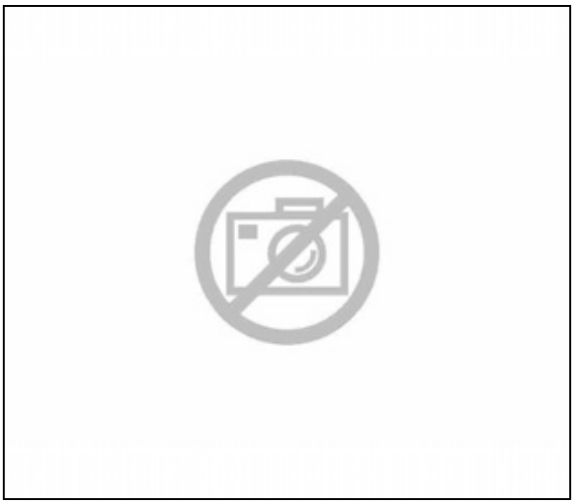


Fig. 369

X558 - Connector for right-hand vertical blade control switch

Location: See component location **S558** - Right-hand vertical blade control switch.

X559 - Connector for left-hand vertical blade control switch

Location: See component location **S559** - Left-hand vertical blade control switch.

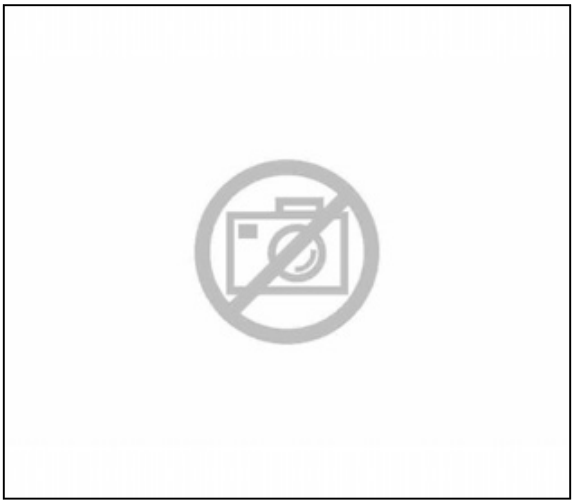


Fig. 370

X567 - Connector for front right-hand side additional work light

Location: See component location **E191** - Front right-hand side additional work light.

X568 - Connector for front left-hand side additional work light

Location: See component location **E190** - Front left-hand side additional work light.

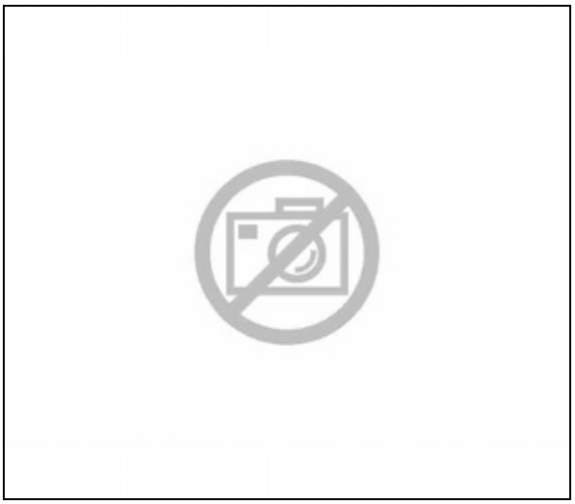


Fig. 371

X822 - Connector for fuel temperature sensor on end filter

Location: See component location **B93** - Fuel temperature sensor on end filter.

X823 - Connector for fuel low pressure sensor on end filter

Location: See component location **B87** - Fuel low pressure sensor on end filter.

X824 - Connector for power cable to preheater **K118**

Location: See component location **K118** - Engine preheater relay.

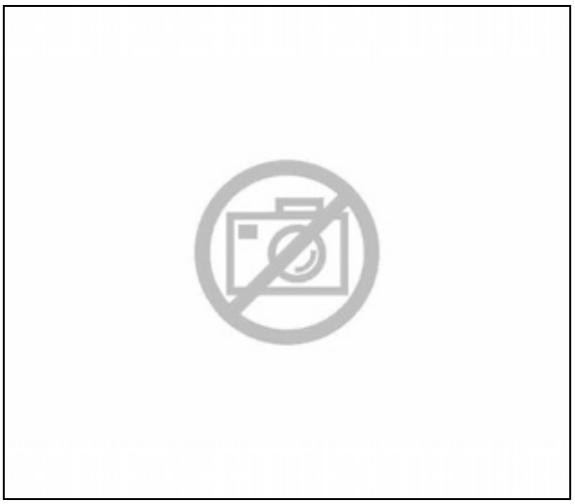


Fig. 398

X825 - Connector for power cable to preheater

Location: In the engine. Lift the engine cover.

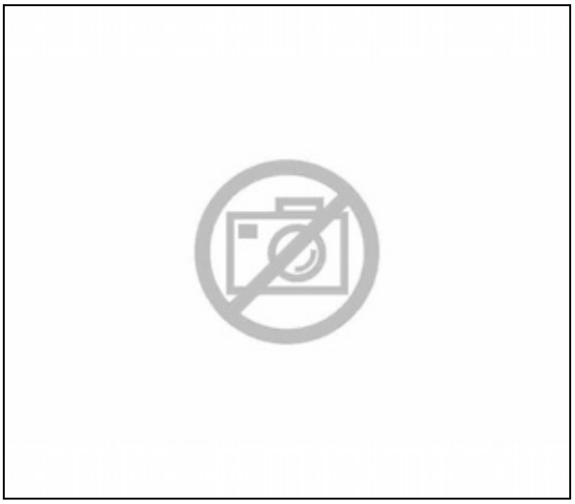


Fig. 399

X826 - Connector for preheater power supply cable to **K118**

Location: See component location **K118** - Engine preheater relay.

X827 - Connector for preheater power supply cable for starter motor

Location: See component location **M1** - Starter motor.

X831 - Cable terminal for injector 1 (**IJ1**)

Location: See component location **IJ1** - Injector 1.

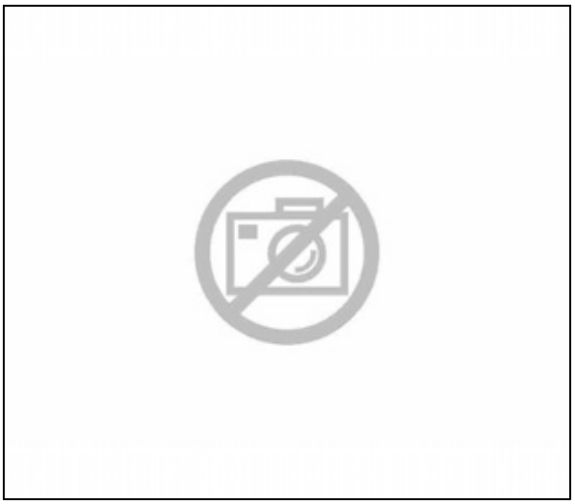


Fig. 400

Cl14b - Right-hand steering cylinder

Location: On the rear axle, right-hand side.

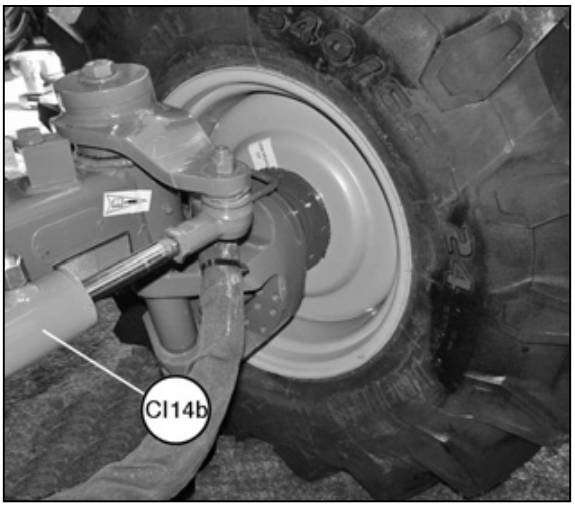


Fig. 427

2.17.21 Hydraulic components - FL

FL1 - 16 micron circuit return filter 200 bar

Position: on the top part of the machine, on the left-hand side, in the oil tank.

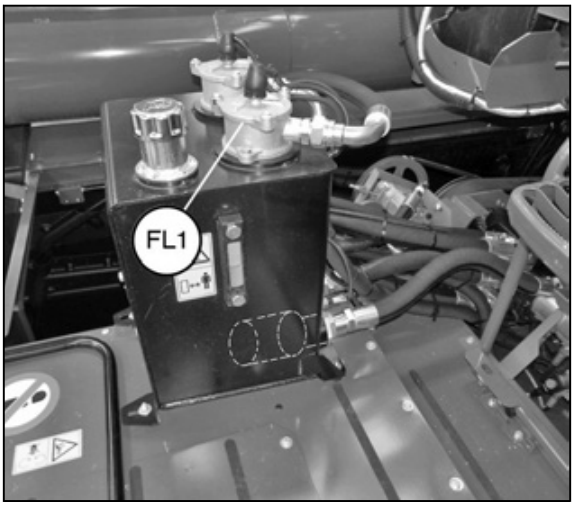


Fig. 428

FL2 - 16 micron hydrostatic circuit return filter

Position: on the top part of the machine, on the left-hand side, in the oil tank.

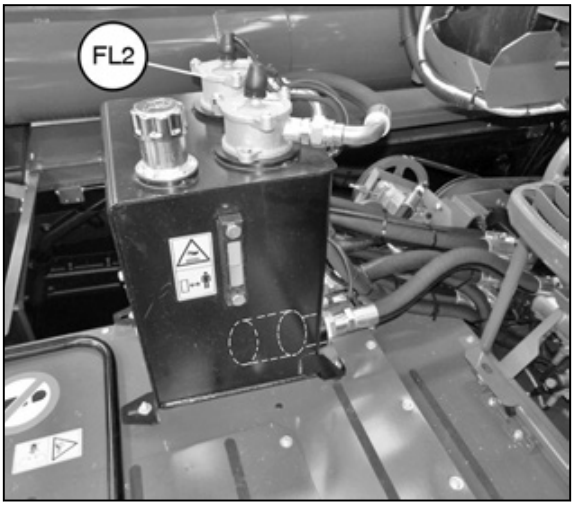


Fig. 429

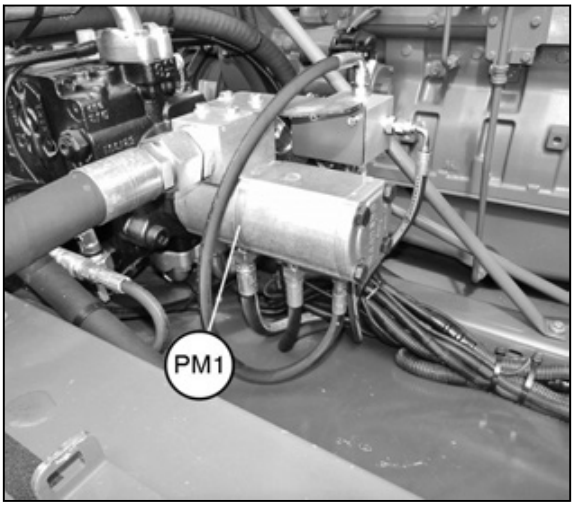
2.17.26 Hydraulic components - PM

PM1 - Triple pump

Pump consisting of 3 in-line gear pumps:

- **PM1a** - Triple pump first section. Hydraulic circuit for table control. Maximum pressure 200 bar.
- **PM1b** - Triple pump second section. Hydraulic circuit for hydrostatic power steering. Maximum pressure 170 bar.
- **PM1c** - Triple pump third section. Hydraulic circuit for auxiliary hydraulics Maximum pressure 85 bar.

Position: on top part of machine, left-hand side, flanged onto the rear part of the hydrostatic pump. Open the engine cover.



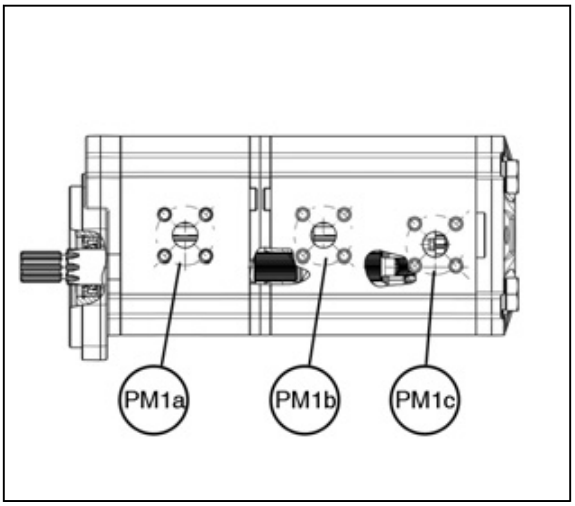


Fig. 456

PM2 - Reel rotation supply pump

Position: right-hand side, at the front, above the cylinder revolution variator. Open the right-hand side door.

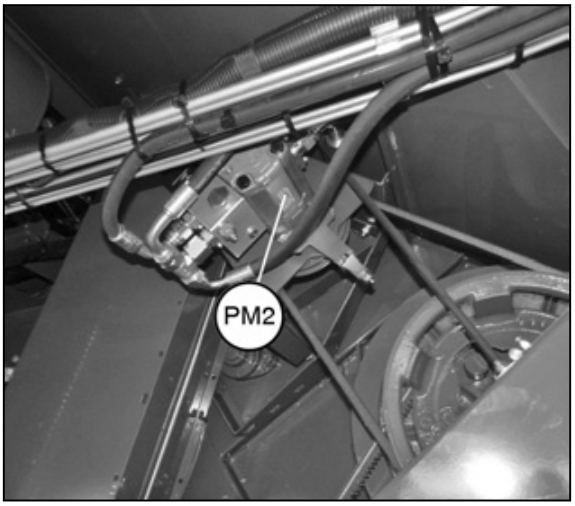


Fig. 457

VB6 - Reel speed proportional control unit

Location: On the right-hand side, at the front, above the cylinder revolution variator. Open the right-hand side door.

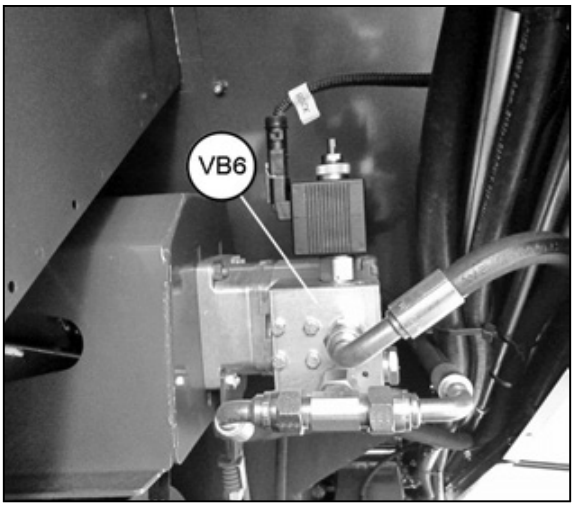


Fig. 483

VB13 - 4WD Equa-Trac control unit (only models with 4WD).

Position:

- on the rear axle, in central position

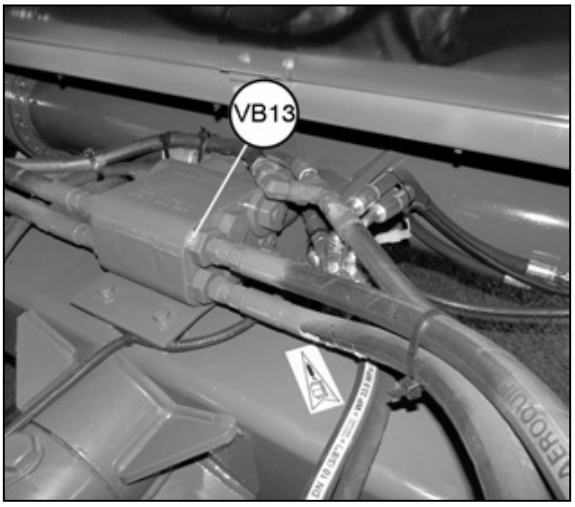


Fig. 484

VB14 - Hydrostatic pump manual servo control

Location: In the upper part of the machine, assembled in the hydrostatic pump **PM4**. To gain access, lift the diesel engine cover.

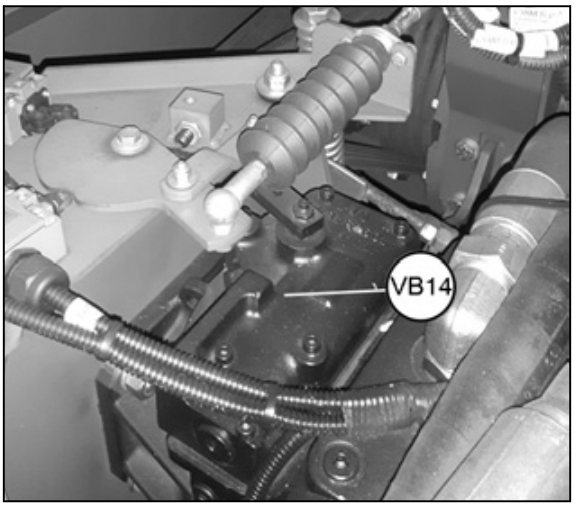


Fig. 485

3.2 Technical specifications

	Unit	X5A
Make		AGCO POWER
Type		7.4 AWF 1043
ECU		EEM4
Cylinders	no.	6
Bore	mm	108
Stroke	mm	134
Cubic capacity	cm^3	7400
Injection order		1 - 5 - 3 - 6 - 2 - 4
Combustion		direct injection
Injection advance		with automatic timing adjustment
Valve, air intake and exhaust clearance	mm	0.35 (when hot or cold)
Rotation direction (from the flywheel)		Anti-clockwise
No-load and full-load speed	rpm	2100
Nominal power (ECE 120R) at 2100 rpm	kW	150
Maximum power (ECE 120R) at 1950 rpm	kW	160
High-pressure pump		Bosch
Injector		Bosch electronically controlled
Feed pressure at idling speed on the final fuel filter		4.5 - 5.5 bar
Injection pressure		max. 2000 bar
Fuel pre-filter under tank	micron	150
Fuel prefilter	micron	10
Fuel final filter	micron	5
Oil sump capacity with filters	liters	25.5
Oil pressure at minimum speed		minimum 1.5 bar
Oil pressure when the engine is hot and at working speed		2.5 - 5 bar
Cooling circuit capacity	liters	40
Thermostats	no.	2

SPN	FMI	Fault description	Response
1083	3	Auxiliary analog input voltage 1 above normal or open circuit	-
1083	4	Auxiliary analog input voltage 1 below normal	-
1084	3	Auxiliary analog input voltage 2 above normal or open circuit	-
1084	4	Auxiliary analog input voltage 2 below normal	-
1132	3	Intake manifold air temperature sensor voltage 1 above normal or open circuit	1
1132	4	Intake manifold air temperature sensor voltage 1 below normal	1
1136	0	ECU temperature high, WARNING	S
1136	3	ECU temperature sensor voltage above normal or open circuit	-
1136	4	ECU temperature sensor voltage below normal	-
1321	3	Voltage on high side of starter relay above normal	-
1321	6	Current on high side of starter relay above normal	-
1378	31	Required oil change interval exceeded	-
1381	3	Fuel feed pump inlet pressure sensor voltage above normal or open circuit	1
1381	4	Fuel feed pump inlet pressure sensor voltage below normal	1
1381	16	Fuel feed pump inlet pressure ABOVE NORMAL	1
1381	18	Fuel feed pump inlet pressure BELOW NORMAL	1
1485	11	Internal error in ECU 0100	-
1485	31	Premature trip of main relay during previous afterrrun	-
1639	18	Fan drive speed too low or no signal detected	-
1639	19	No fan speed request CAN signal	-
1761	1	DEF tank EMPTY	E
1761	3	DEF tank level sensor voltage above normal or open circuit	E
1761	4	DEF tank level sensor voltage below normal	E
1761	18	DEF tank LEVEL LOW	E
2659	1	EGR recirculation flow rate below normal	E
2791	0	EGR valve temperature alert	-
2791	6	EGR valve overload	-
2791	7	EGR valve position deviation	-
2791	9	EGR valve communication error	-
2791	10	EGR valve initialisation error	-
2791	11	EGR valve limited torque	-
2791	12	EGR valve short circuit	-
2791	13	EGR valve mechanical failure	E
2791	16	EGR valve temperature alert	-
2791	31	No EGR valve	-
3031	3	DEF tank temperature sensor voltage above normal or open circuit	E

High-pressure pump	
Type	2 cylinder/radial piston
Max. injection pressure	2000 bar
Transmission ratio	3:2

Fuel system	
Max. continuous fuel delivery temp.	70°C
Prefilter	10 micron
Main filter	5 micron
Feed pump	hand, with prefilter

Injectors	
Nozzle	9 holes
Injection order	1-5-3-6-2-4

3.14 Prefilter / water separator - Replace (optional filter)

There are circumstances, especially in some countries, where it is advisable to replace the separator filter originally installed on the machine with the filter (1). The filter (1) offers greater separation of water and has a 30 micron inner cartridge.

To fit the filter, proceed as follows:

- Stop the engine and remove the ignition key.
- Close the diesel fuel piping connected to the filter installed on the machine and remove the filter assembly, including the support, retrieving the fixing screws.
- Pre-install the new filter by assembling the couplings in positions (3 and 4) in the order shown in the diagram: Coupling (5), olive (6), nut (7) and pipette (8) for fixing the rubber pipe.
- Close the two free holes with the plugs (2) using an 8 mm hexagon wrench.
- Secure the new assembly (1) using the screws set aside earlier.

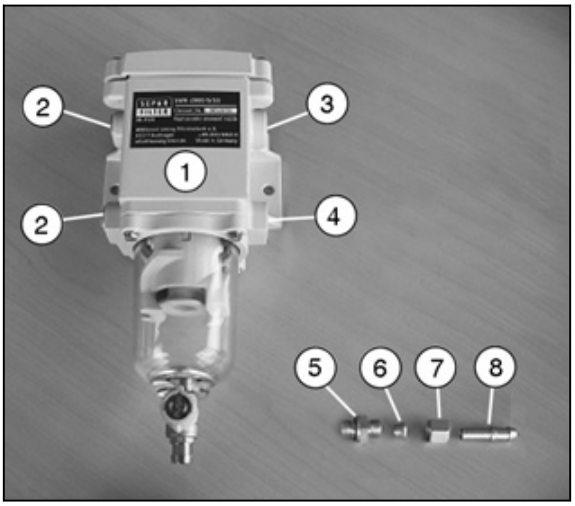


Fig. 21

- Connect the diesel fuel tank outlet pipe at position (9) and the pipe that goes down from the engine compartment at position (10).
- Remember to close the cock (11) before reopening the diesel fuel piping.

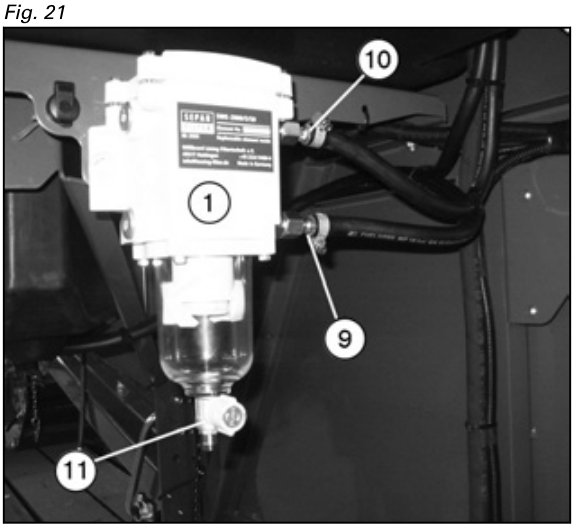


Fig. 22

- Loosen the screws (12) and follow the instructions in the "Bleeding the fuel system with the hand pump" paragraph in section 10 of this manual.
- Tighten the screws (12), start the engine and after a few minutes, stop the engine and check for diesel oil leaks.

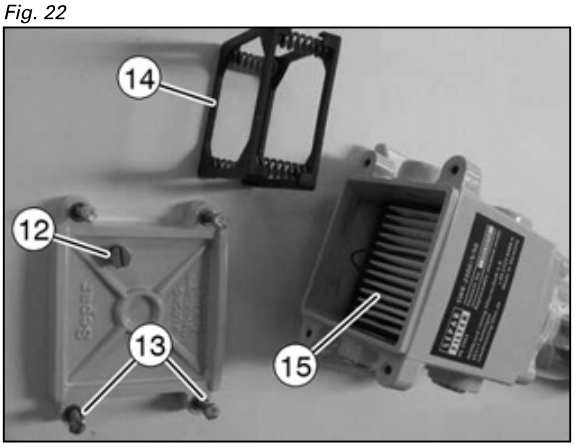


Fig. 23

NOTE:
The temperature sensors (B105, B106 and B107) (8, 9 and 10 in the diagram above) are interchangeable.

NOTE:
The NOx sensors (A82 and A83) (6 and 7 in the diagram above) are interchangeable.

- a pressure-limiting valve protects the system from excessive pressures;
- the procedure also allows the supply air heat exchanger to be pressurized;

Contents:

- 7 pairs of cup plugs (35-40, 45-50, 55-60, 65-70, 75-80, 85-90 and 95-100-105 mm);
- 1 pressure-limiting valve 1.3 bar;
- 1 50 cm extension hose;
- plastic case with foam padding

5. Use the extension cable and the pipe in the SCR tool kit to connect the dosing valve to the vehicle.

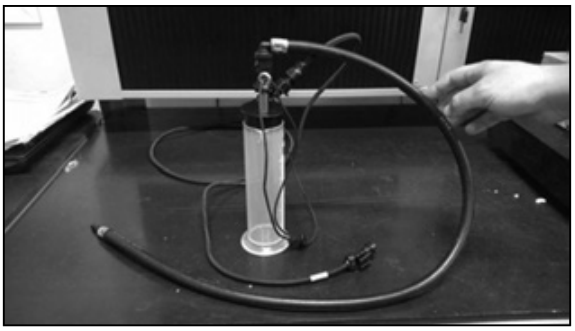


Fig. 59

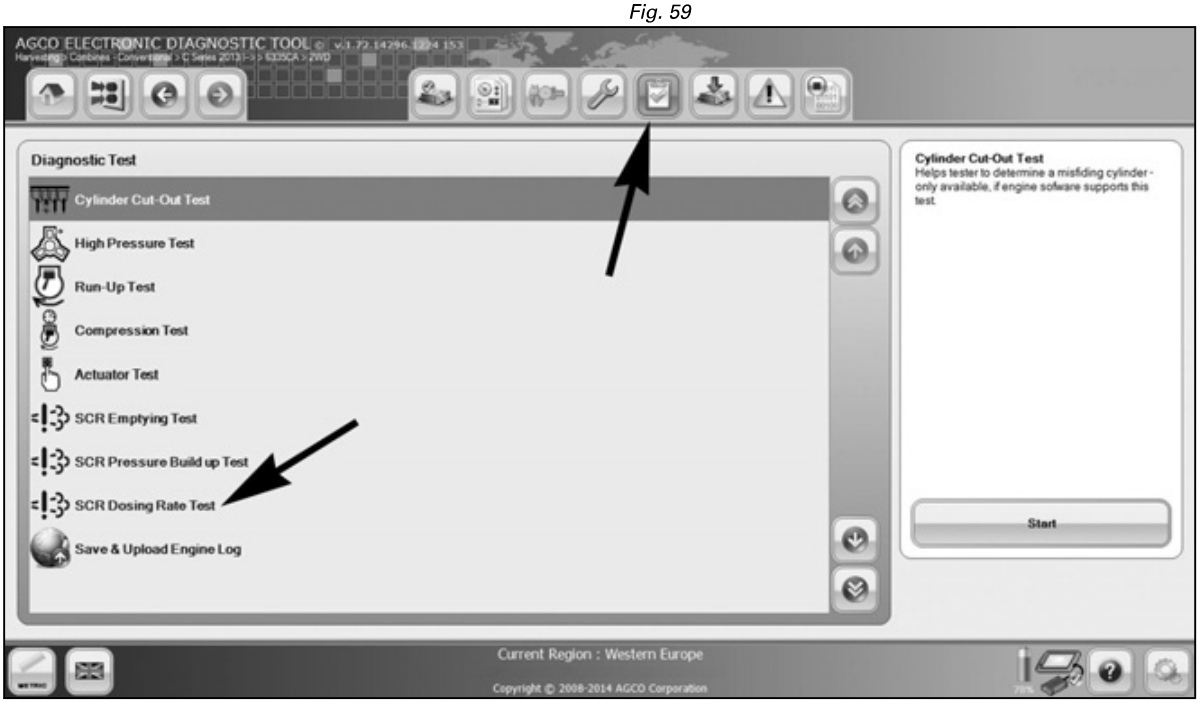


Fig. 60

6. Switch on the power, select "SCR Dosing Rate Test" on the EDT and press the button shown to the side.

7. Once the procedure has finished, read the amount of DEF in the measuring beaker (ml). The level should be within the range 165 - 202 ml.

3.36 Engine cooling pump with Flexonic belt

7.4 AWF 1043 engines are fitted with a water pump driven by a Flexonic belt.

- To install the Flexonic belt for controlling the cooling pump, use the fitting tool 9201 86480.

NOTE:
The Flexonic belt is not fitted with a separate belt tensioner. We recommend replacing the belt every 3000 hours of operation.

IMPORTANT:
The Flexonic belt is single-use. Do not reinstall the same belt after it has been removed.

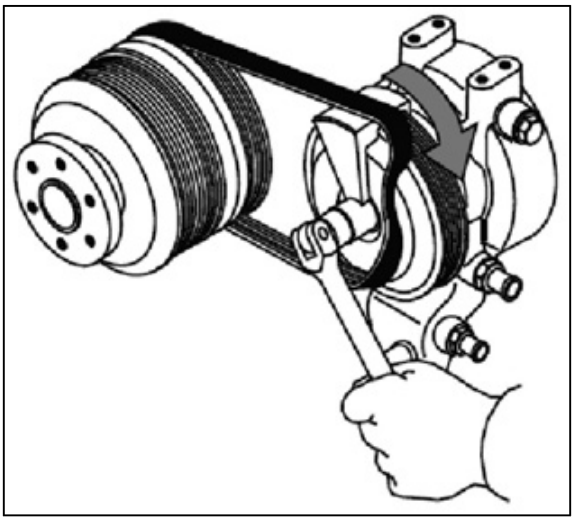


Fig. 73

3.41 Precautions for welding operations

To prevent damage to the engine electronic components, remove the specific component from the combine and weld it separately.

If the component cannot be removed, proceed as follows:

Procedure

- Stop the machine on level ground.
- Activate the park brake.
- Stop the engine.
- Disconnect the negative cable from the battery.
- Remove the electronic control unit cover (1).
- Disconnect connections **X393** and **X800** (2 and 3) of the engine control unit **A99**.
- Disconnect connectors **X570**, **X571**, **X573**, **X574** and **X575** from the **Unicontrol** electronic machine management controller.
- Secure all the wiring harnesses to the machine so that they cannot touch the electronic control units.
- Connect the welder ground cable as close as possible to the area where the welding is to be carried out.
- Protect hydraulic and electric components exposed to welding spatters.

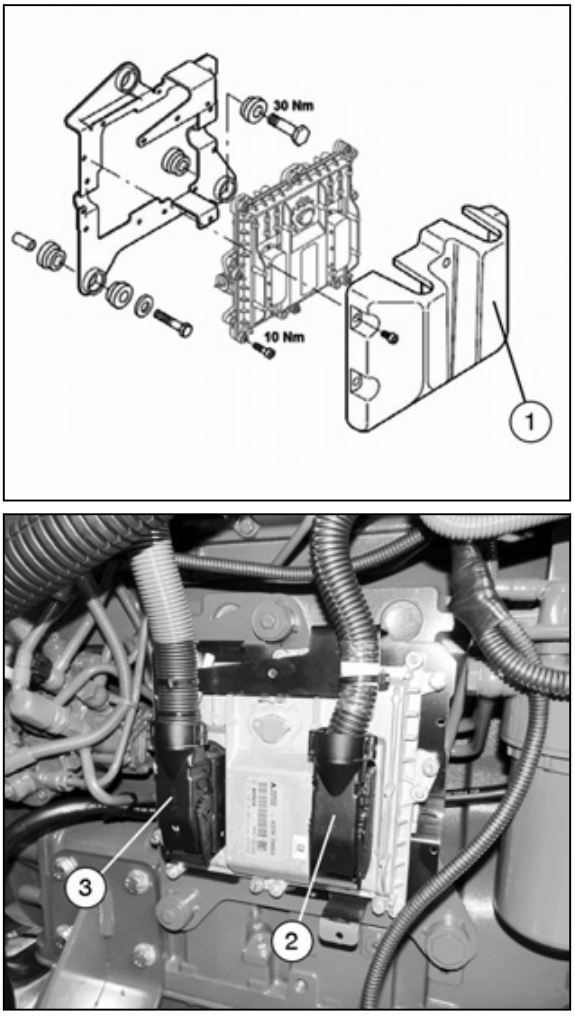


Fig. 89

4.4 Troubleshooting

Faults	Possible causes	Solutions
Drive shaft flickering.	Rubber pad wear.	Replace the pads.
	Rubber pad breakage.	Replace the pads.
	Wear of the spline between shaft and pulley.	Replace the spline and check the housings.
	Loose pulley locking nut.	Tighten the nut and check the couplings.
	Bearings with excessive clearance.	Replace the bearings.
The drive transmission shaft does not turn.	Broken coupling.	Replace it.
	Drive plate screws sheared.	Replace the screws.
	Broken drive transmission shaft.	Replace the shaft.
	Spline sheared.	Check the spline housing is in good condition and replace the damaged parts.

- Fit the rear screw (8) that fastens the transmission and tighten it to a torque of **331 Nm**.

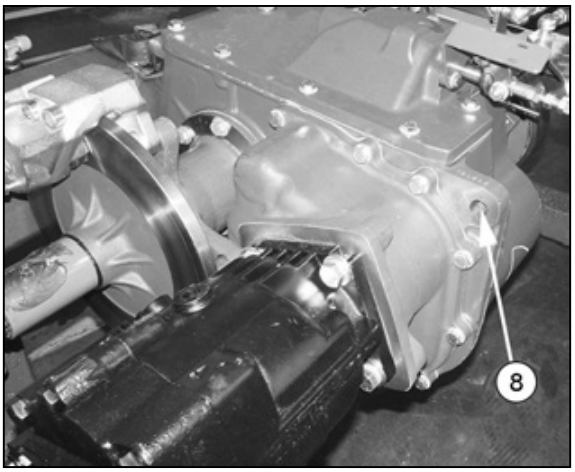


Fig. 14

- Connect the two axle-shaft sleeves (5) to the transmission outlet shafts.
- Fit the snap rings (6).

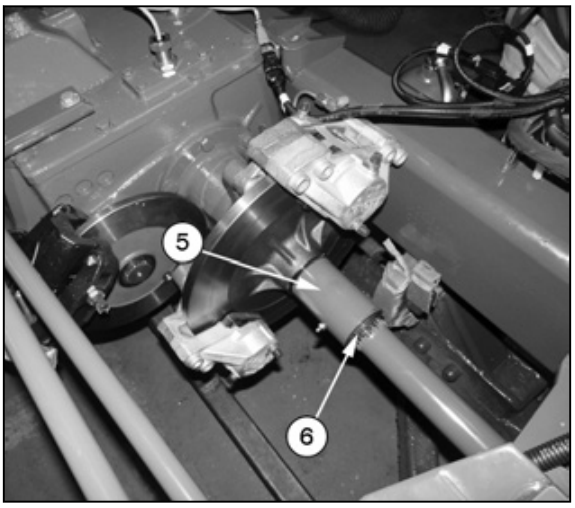


Fig. 15

- Assemble the parts: gear engagement control rods (4) and the tachometer sensor cables.

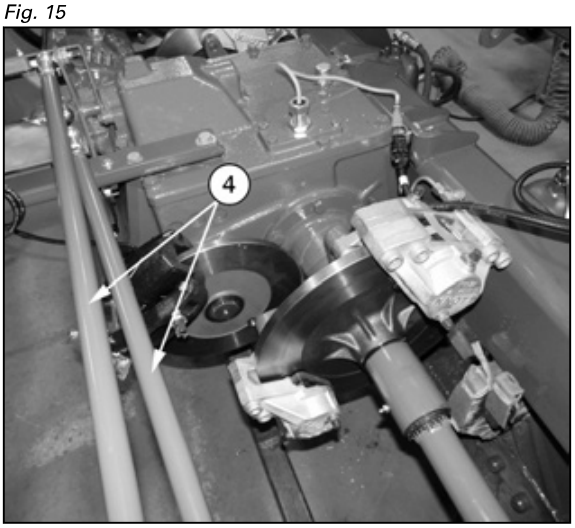


Fig. 16

- Fit the required shims (4), checking that they are flat, even and clean.

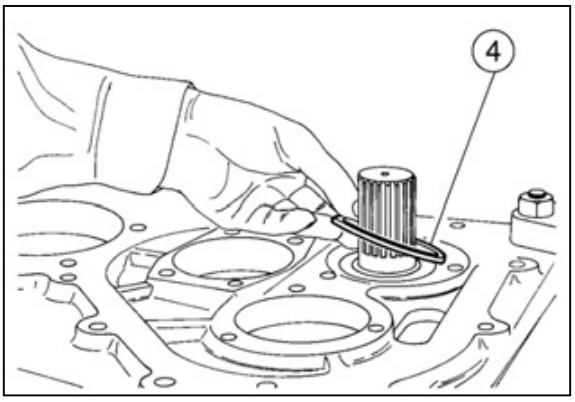


Fig. 45

- Fit the flange (5), tightening the screws to a torque of **70 Nm**.

  NOTE: *Make sure that the shaft rotates freely.*

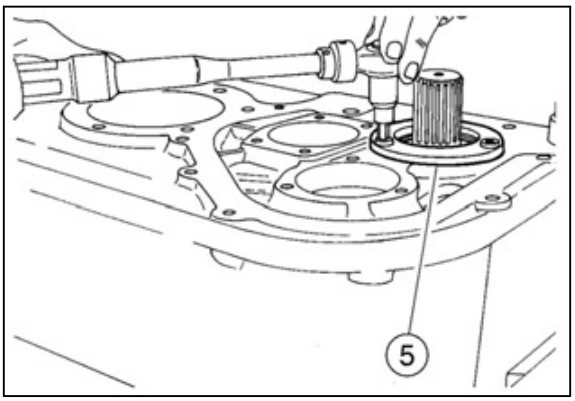


Fig. 46

5.7.6 Lay shaft - Installation

Procedure

- **CAUTION: Handle all parts with great care. Do not put hands or fingers between parts. Wear appropriate safety clothing - safety goggles, gloves and shoes.**

  Pre-assemble the auxiliary shaft (6) with gears and bearings in the order shown.

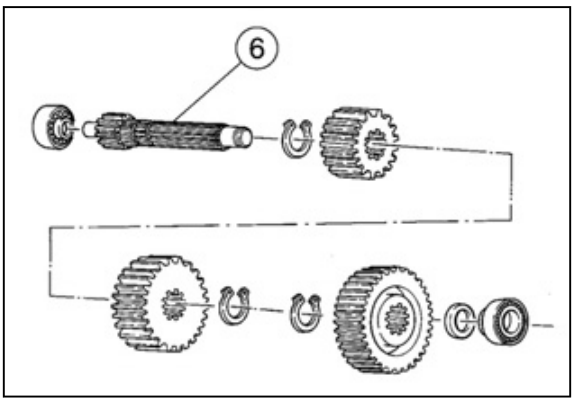


Fig. 47

5.8 Differential

5.8.1 Differential right-hand support - removal

Procedure

- Support the differential assembly appropriately.
- Disassemble all parts inside the supports.
- Remove the screws (1) and take out the support (2) exerting leverage on the cavities (3).

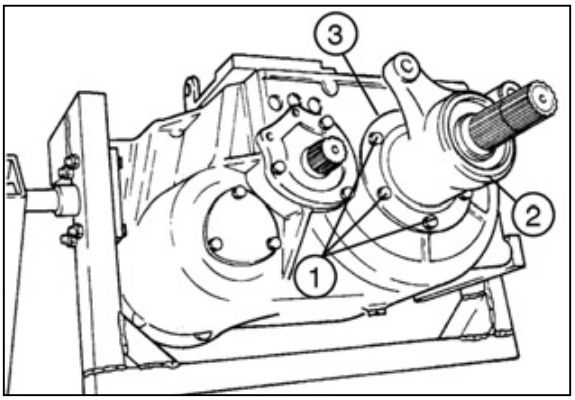


Fig. 77

5.8.2 Differential left-hand support - removal

Procedure

- Support the differential assembly appropriately.
- Disassemble all parts inside the supports.
- Remove the screws (4) and take out the support (5) exerting leverage on the cavities (6).

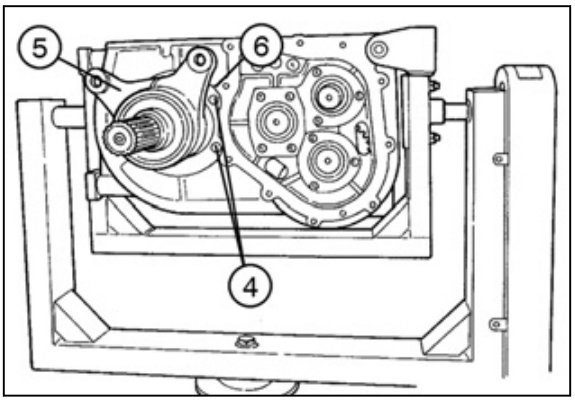


Fig. 78

5.8.3 Differential - Removal

Procedure

- Remove the differential assembly by releasing it from the bearing (7) and using a suitably sized drift (8).

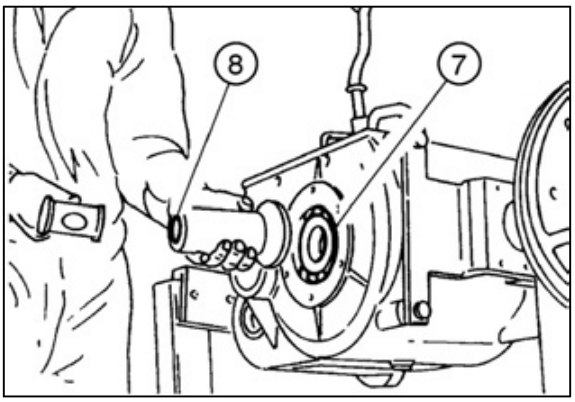


Fig. 79

5.10 Gear engagement rods

5.10.1 Adjustment

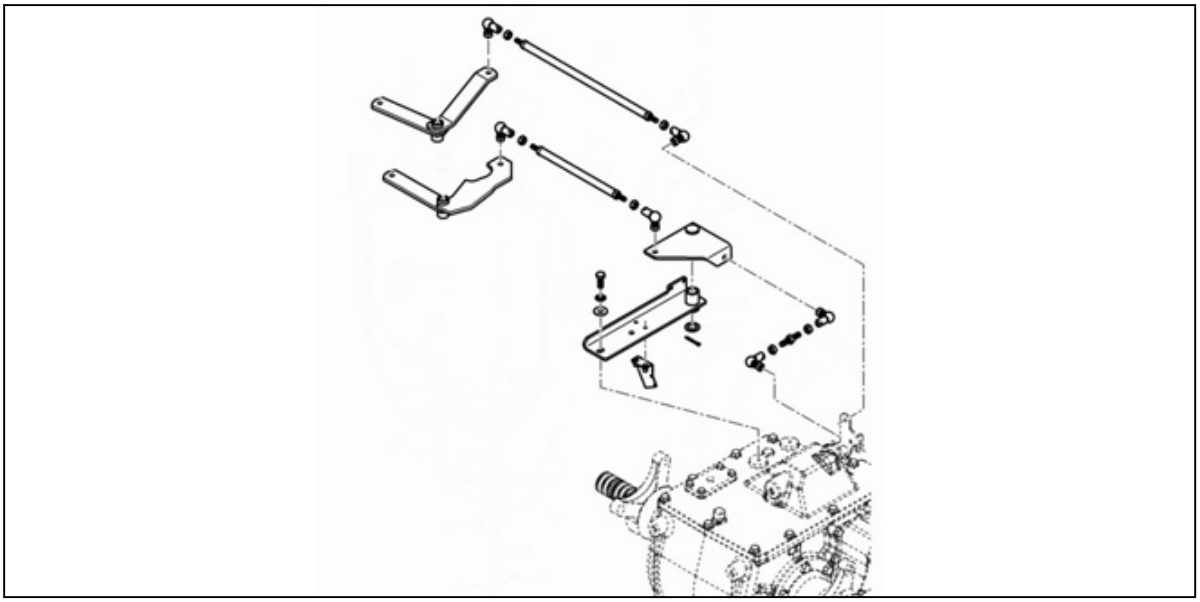


Fig. 107

Procedure

- Align the adjusting plate (1) as much as possible with the support (2).
- With the transmission in neutral, fit the tie rod (3) and fasten the joints with the lock nuts ensuring that the joints have as much freedom of movement as possible.
- Fit the longer tie rod on the lever and the shorter one on the adjusting plate without tightening, for the moment, the lock nuts to fasten the joints.

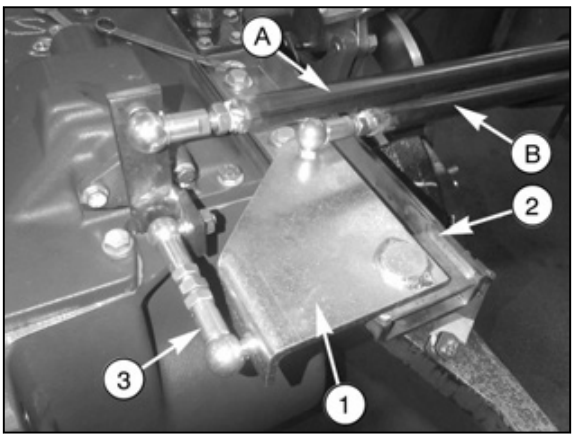


Fig. 108

- Connect the other end of the tie rods (A and B) to the shifter arms (4 and 5) without tightening, for the moment, the lock nuts to fasten the joints.

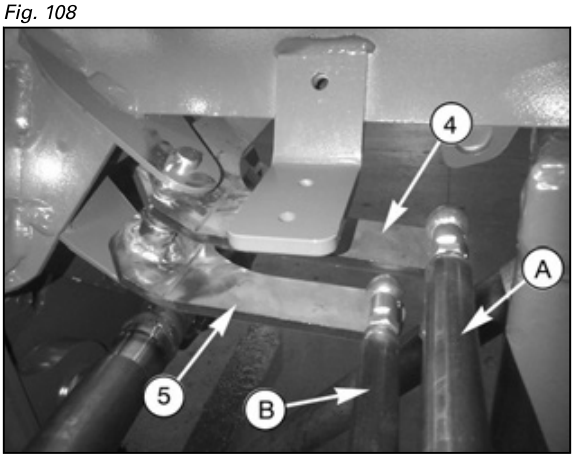


Fig. 109

6.4 STD 8 lateral final drive

6.4.1 Removal - Installation

CAUTION: Lift and handle all heavy parts using suitably sized lifting equipment. Make sure the assemblies or parts are secured with suitable slings and hooks. Ensure that nobody is standing near the load to be lifted.

Park the combine on level ground and place wedges against the front and rear wheels.

Removal

- Put in position a hydraulic lift (1) and a stand (2) on the side of the wheel to be removed, both with a working payload of at least 8000 kg to hold the combine in position, and then remove the wheel.

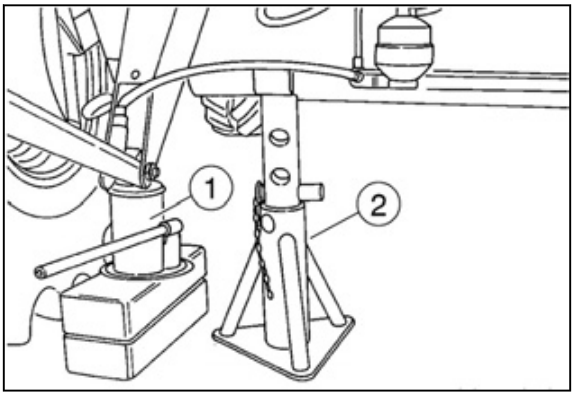


Fig. 6

- Support the final drive assembly with a hydraulic lift with a capacity of at least 500 kg and the special tool ref. 296145.
- Remove the snap ring.
- Move the bushing (3) toward the gearbox, uncoupling it from the final drive pinion.
- Remove the screws (4) and then the final drive pinion.

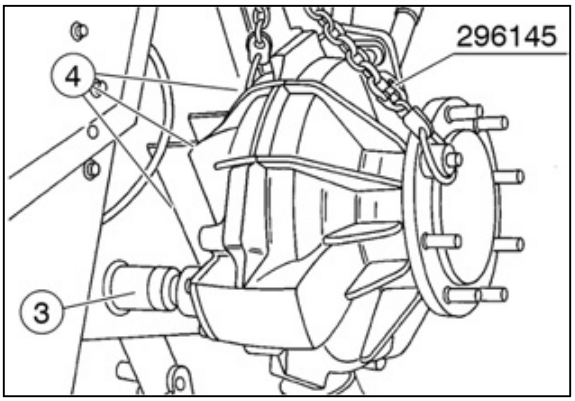


Fig. 7

Installation

- To refit the final drive, use the same tool used for removal.
- Lift the final drive pinion, align it with the assembly position on the axle and then attach it with the appropriate screws (4). Tighten them to a torque of **300 Nm**.
- Connect the half-shaft bushing (3) to the final drive pinion and install the snap ring (5).

  NOTE: *This operation can be prevented if the bushing is installed while you put the final drive pinion in position.*

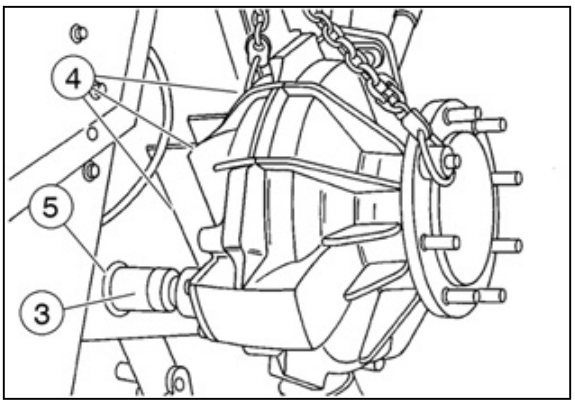


Fig. 8

7.6 4WD troubleshooting

Faults	Possible causes	Solutions
Irregular 4WD.	No feed to solenoid valve Y182.	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 VB13 not working.	Solenoid valve Y182 is powered but not engaging.	Check the coil winding for continuity and replace if it is interrupted.
	solenoid valve Y182 locked.	Valve gear cartridges seized. Check if the solenoid valve can be released or replace it
	Control cable electrical connector interrupted.	Check the connectors and the feed cables of the 4WD solenoid valve Y182 referring to the relevant wiring diagram (section 55), then repair or replace the faulty cable or connector.
	Faulty switch S174.	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.

7.13 Motor 90M100 - MR2

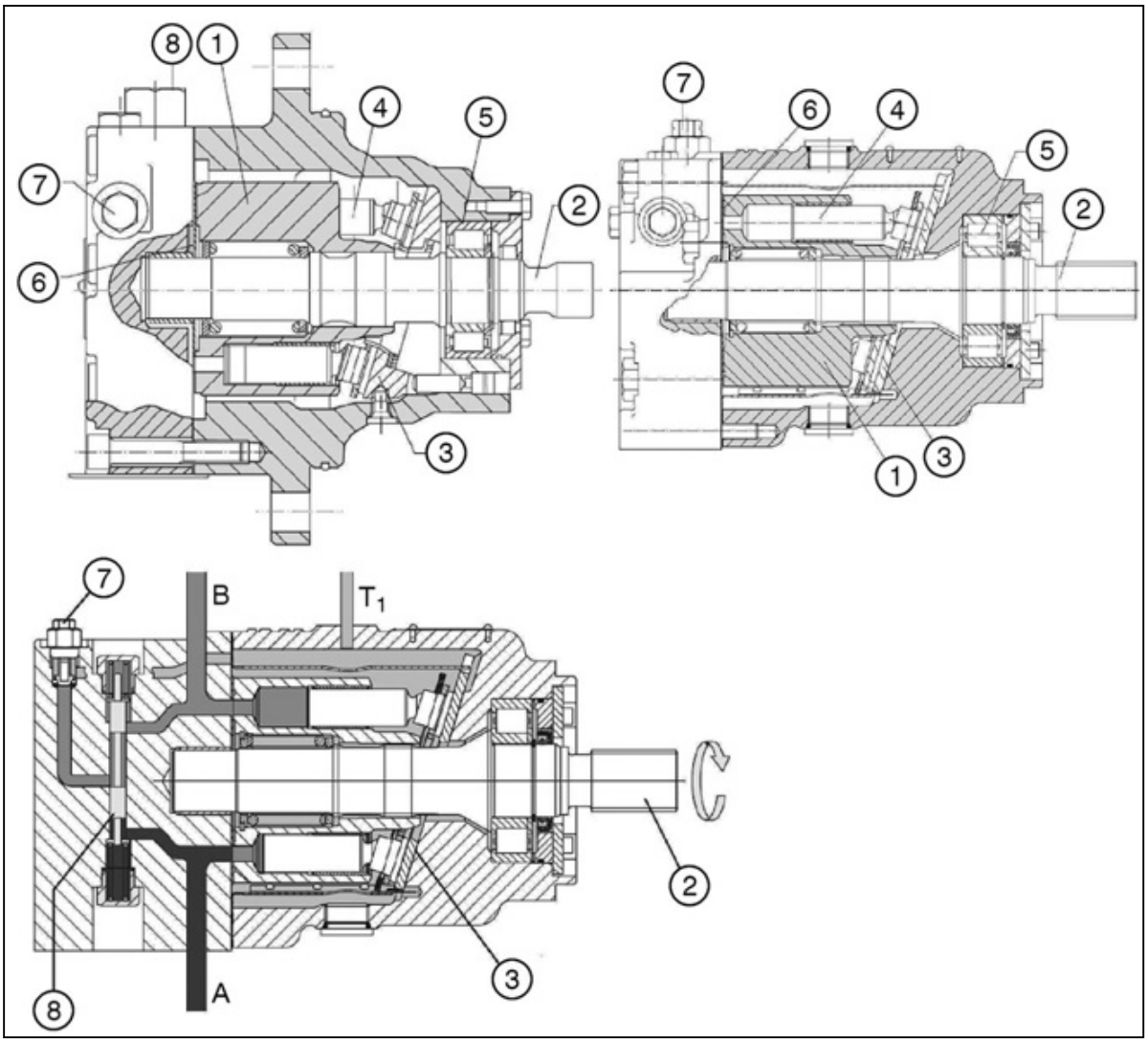


Fig. 14

(1.) Cylinder block
(2.) Shaft
(3.) Fixed oscillating plate
(4.) Piston
(5.) Bearing
(6.) Valve plate
(7.) Bleed valve V16
(8.) Oil exchange selector V15
(A.) High-pressure line
(B.) Low-pressure line
(T_1.) To hydraulic pump housing

The hydraulic motor fitted on the X5A models is a fixed displacement motor.

The motor has the same basic parts that are found on the pump; the fundamental difference is that the tilt on the plate that the pistons work on is fixed.

When the motor receives oil from the pump, it feeds the oil to the pistons through the distribution plates. These are pushed into their seats generating a rotational movement of the cylinder block and consequently of the motor shaft.

In the 90 series motor, the oil intake-outlet ports are bi-directional. This allows the motor to rotate in both directions.

The motor components are cooled by means of a low-pressure bleed valve that discharges oil at high temperature.

- open the lower fuse box (C1) and disconnect the fuse F8 from 3A to prevent the engine from starting;
- put the gear lever into neutral;
- turn on engine with the starter motor for 10 seconds and then repeat the operation at intervals of 10–15 seconds;
- reconnect the 3A fuse (F8) and close the electrical component tray;

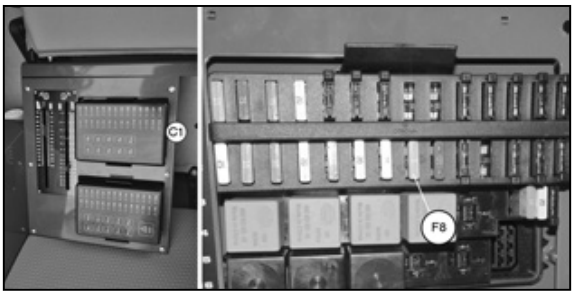


Fig. 29

- start the engine and let it run at low idle for 5 minutes;
- check the oil level and check that there aren't any leaks in the area surrounding the filter.

pressure on the return circuit from the rear wheel motors. A control valve consists of a spring and a ball. There are four control valves in an Equa-Trac valve.

8.3 Service brake calipers

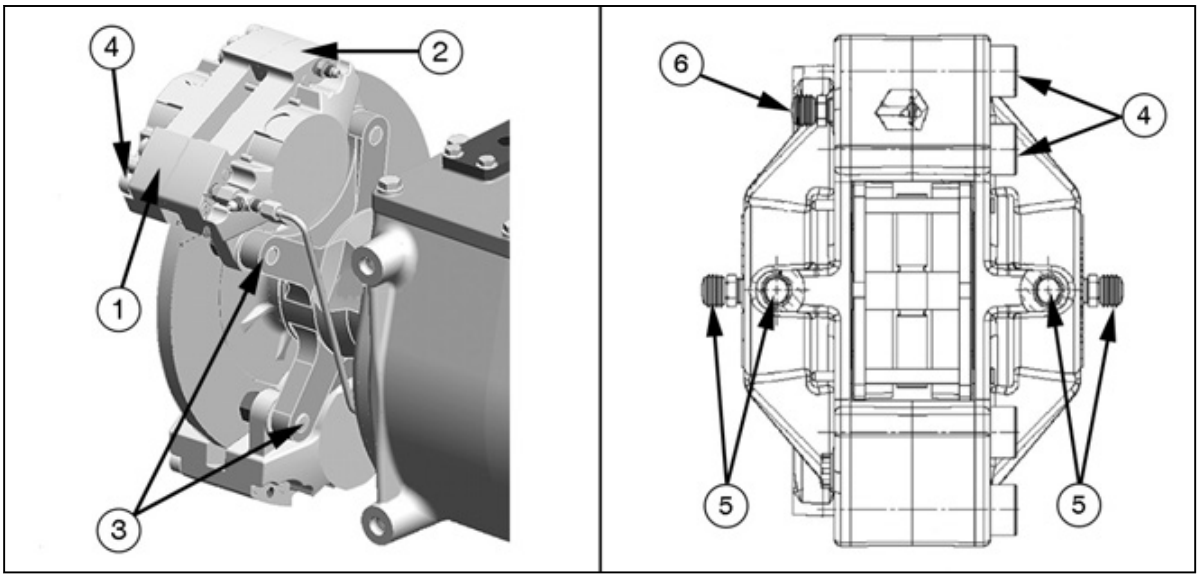


Fig. 4

1. External half-shell
2. Internal half-shell
3. Nut fastening caliper to mount, **225 Nm** .
4. Screw fastening brake half-shells, **170+10 Nm** .
5. Bleed plug, **12+4 Nm**
6. Supply plug **12+4 Nm**

8.9 Brake hydraulic pump - R./I.

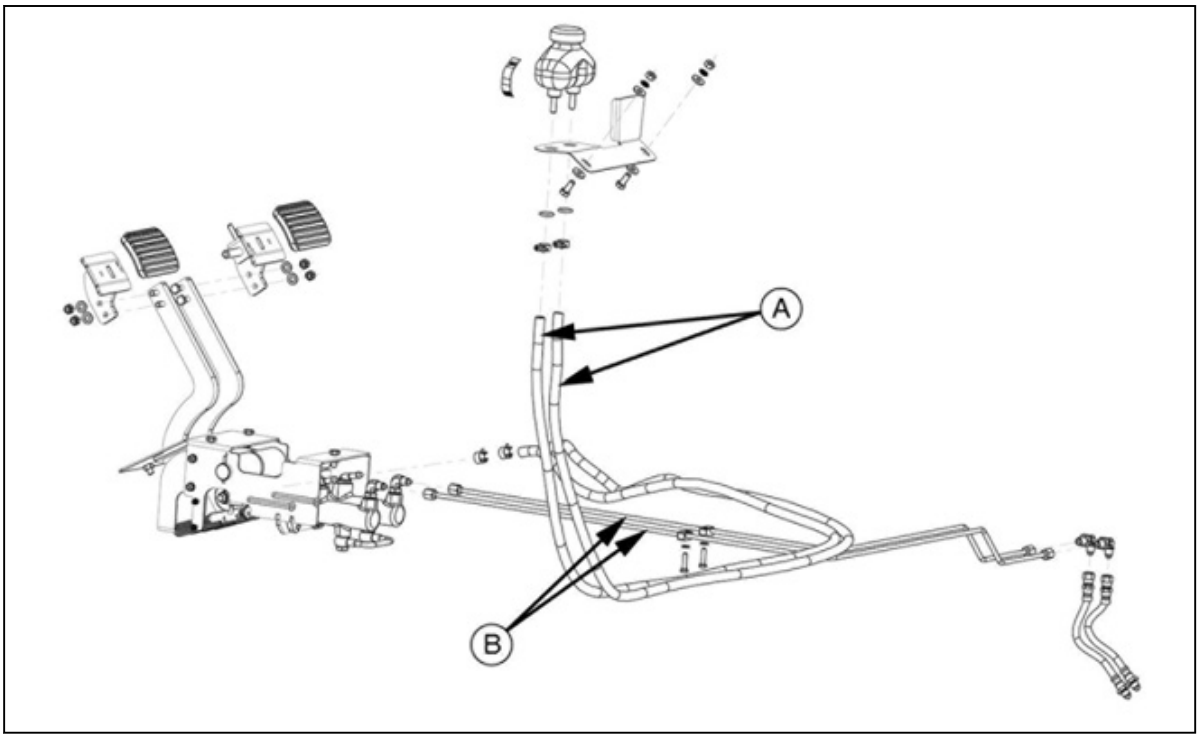


Fig. 15

WARNING: Protect hands with rubber gloves.

Collect the oil in a suitable container and do not let it percolate into the ground.

Removal

- Remove the guards under the footboard of the operator platform.
- Place a container under the brake master cylinder, to collect the braking circuit fluid.
- Disconnect the supply lines (A) and the steel delivery pipes (B).
- Remove the pins (C) connecting the master cylinder sleeves to the brake pedals.
- Remove the 4 fastening screws (D).
- Remove the two master cylinders.

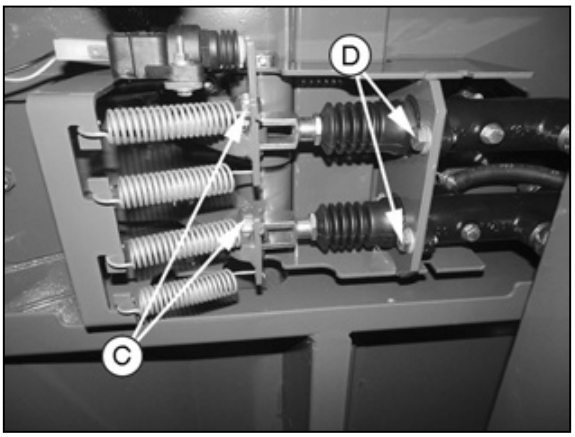


Fig. 16

Installation

- Connect the supply lines (A).
- Connect the master cylinders with the pins (C) and relevant springs to the pedals.
- Connect the steel pipes (B).

Coupler function control valve

Control valve type	cylinder block with solenoid valves for single acting and double acting cylinders
Solenoid valve type	single acting (no. 3): normally open (no. 1) - normally closed (no. 2) dual-effect (no. 5) of which: with open centre (no. 5)
NO single acting solenoid valves	common solenoid valve
NC single acting solenoid valves	cylinder revolutions variation
double acting open center solenoid valves	auger opening - auger closing thresher engaged - thresher disengaged tank unloading engaged - tank unloading disengaged bar engaged - bar disengaged straw chopper drive (optional)

Flotation control valve (optional)

Control valve type	cylinder block with solenoid valves for single acting and double acting cylinders
Solenoid valve type	dual effect (no. 1) of which: normally open (no. 1) dual-effect (no. 1) of which: with open centre (no. 1)
NO single acting solenoid valves	common solenoid valve
double acting open center solenoid valves	bar orientation cylinder (optional)

Name	Description	Type	Specifications	Tightening torque
A	Connection for cylinder head lifting/ lowering			
B	Connection for reel lifting/lowering			
C	Connection for reel forward movement			
D	Connection for reel retraction			
L1	Capacity limiter	Unidirectional	Adjustable. Standard: align the lowering time with the lifting time.	Open 2 and 1/4 turns from the fully closed position.
L2	Capacity limiter	Unidirectional	Ø 1.5 mm	
L3	Capacity limiter	Unidirectional	Ø 1.25 mm	
L4	Capacity limiter	Unidirectional	Ø 1.25 mm	
L12	Capacity limiter	Unidirectional	Ø 0.5 mm	
Px	Pressure measurement point			
P	Pressure connection			
P1	Pressure connection			
T	Drainage connection			
T1	Drainage connection			
Y1	Common solenoid valve	2-way, hydraulically-piloted (with manual control)	Normally open	39-51 Nm
Y2	Table lowering	2-way, unidirectional	Normally closed	39-51 Nm
Y3	Table lift	2-way, unidirectional	Normally closed	39-51 Nm
Y4	Reel lift	2-way, unidirectional	Normally closed	39-51 Nm
Y5	Reel lowering	2-way, unidirectional	Normally closed	39-51 Nm
Y6	Reel forward movement/retraction	4-way, three positions	Open center	39-51 Nm
V1	Pressure limiting valve	Hydraulically controlled	Calibrated to 200 bar	41-47 Nm
V5a	Reel forward movement lock valve		Externally piloted	34-41 Nm
V5b	Reel retraction lock valve		Externally piloted	34-41 Nm

9.8 Cylinder head and reel positioning hydraulic circuit

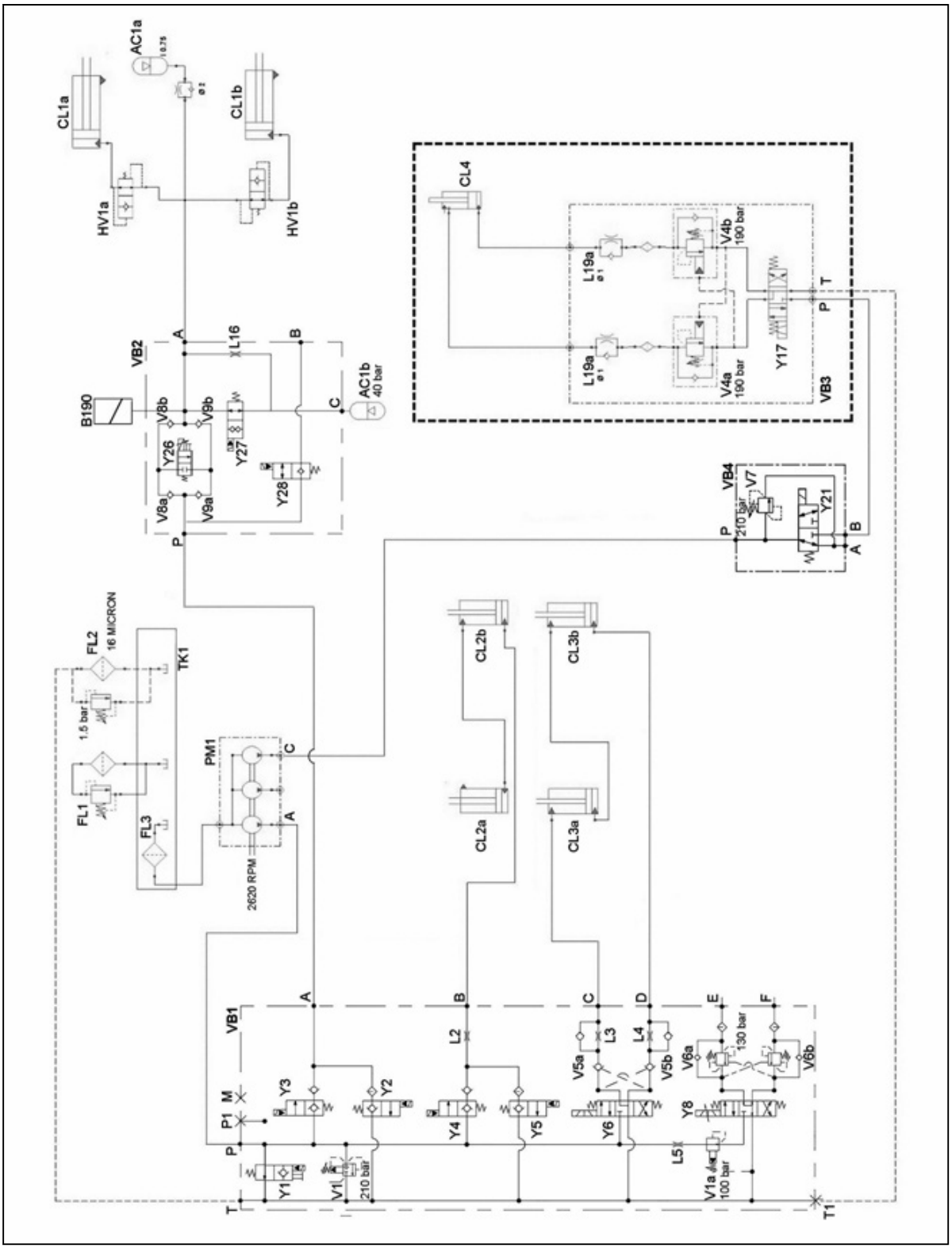


Fig. 18

by the potentiometer on the right-hand side of the crop elevator, or from the reverse movement sensor on the hydrostatic pump servo control) and connects port P, which is connected to control valve VB1, with port A, which is connected to the lift cylinders.

Solenoid valve Y27 partially excludes accumulator AC1b, allowing the passage of oil only through the two L16a and L16b restrictors; this prevents any pressure variations in the accumulator from affecting the readout on pressure sensors S444 and S432.

Automatic lowering stage

In this mode, the system automatically detects the instant position or the instant ground pressure and automatically corrects the height of the crop elevator, maintaining the set values.

9.11 Reel forward and retraction movement

9.11.1 Operating logic

Control for Y1 and Y6 solenoid valves

Fig. 39

A700	ECU multifunction lever	V5b	Reel retraction unidirectional lock valve
K157	Relay group for unloading auger position and reed forward movement	V1	200 bar maximum pressure valve table lift control valve
D158	Diode block for table common solenoid valve	VB1	200 bar control valve
Y1	Common control valve solenoid valve 200 bar	CL3a	- Left-hand side reel advance/retract cylinder
Y6	Reel forward movement (Y6a) / retraction (Y6b) solenoid valve	CL3b	- Right-hand side reel advance/retract cylinder
TK1	Hydraulic oil reservoir	FL1	Filter in return circuit, 200 bar, 16 micron
L3	Unidirectional capacity limiter	FL2	Filter in hydrostatic return circuit, 16 micron
L4	Unidirectional capacity limiter	FL3	150-micron intake filter
V5a	Reel forward movement unidirectional lock valve	PM1	Triple pump

9.11.2 Reel forward movement and retraction

The command for reel forward and retraction movement is made from the multi-function lever.

The signal is transferred to controller A700 (ECU multifunction lever),which then sends the signal to power the solenoid valves.

The valves are powered only if the following pre-conditions are in place:

1. Road transport mode must be disabled;

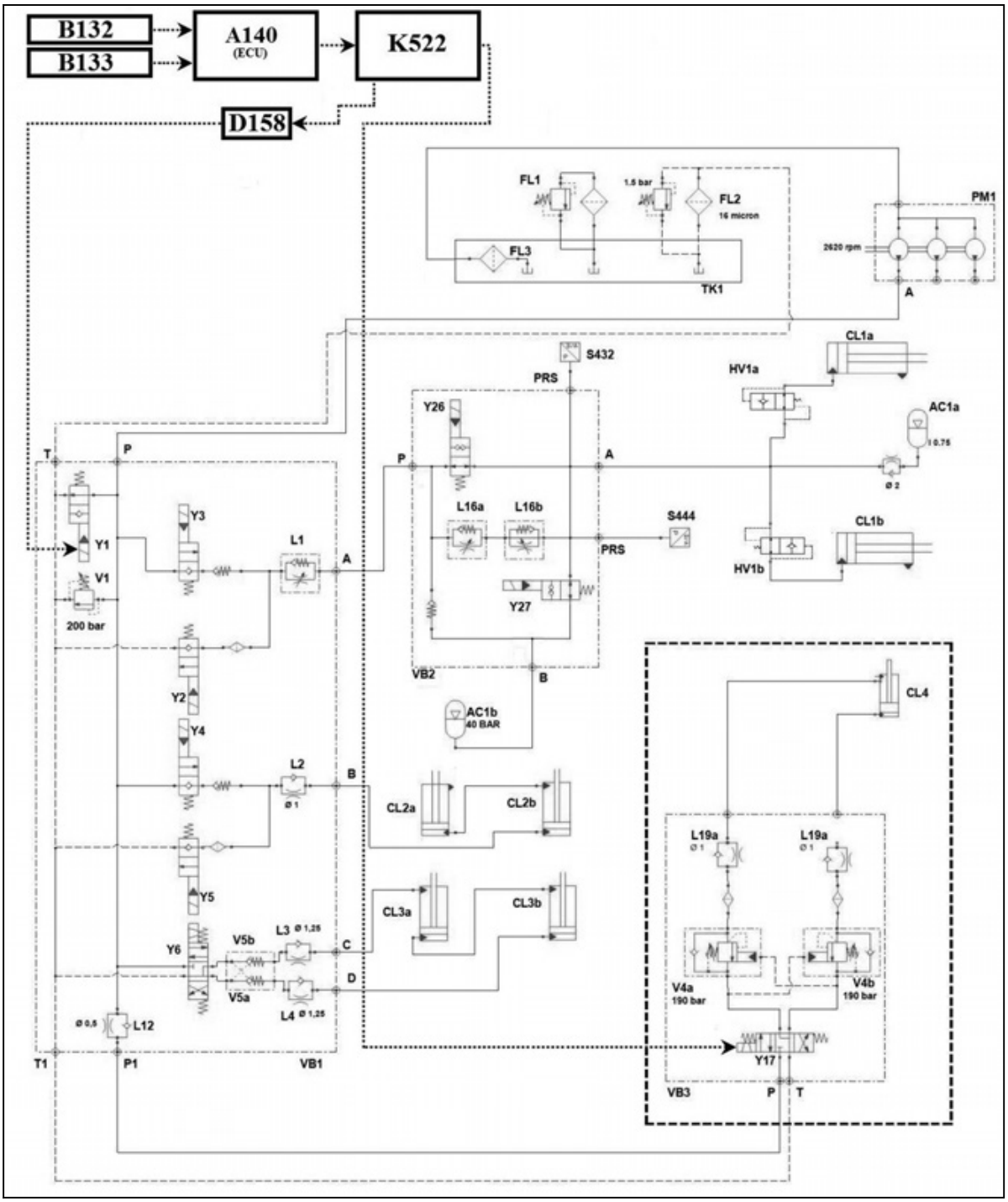


Fig. 49

In this mode, the inputs that determine the variation of orientation of the bar are the voltage signals detected by the two potentiometers of the mobile slides B132 (right slide) and B133 (left slide).

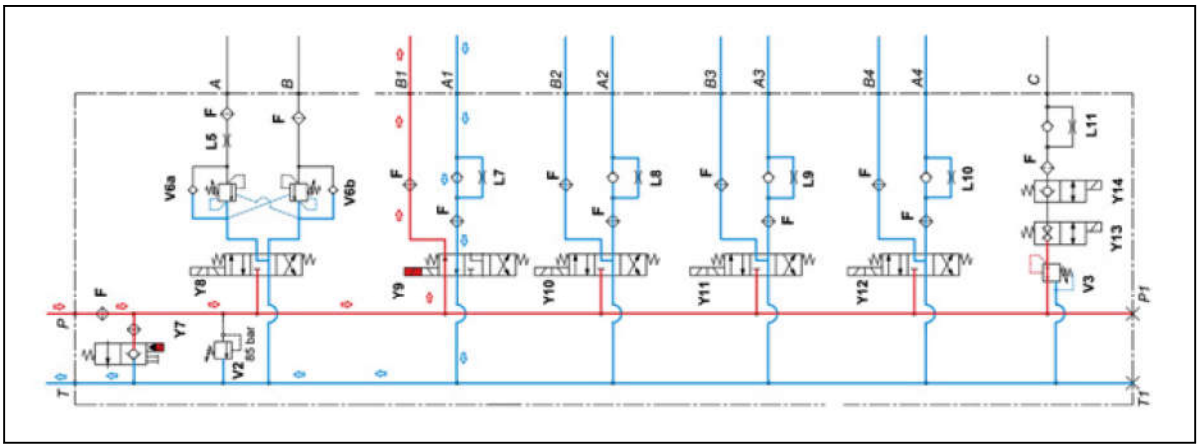


Fig. 58

VB5 - Common solenoid valve Y7 and threshing mechanism disengagement solenoid valve Y9b powered.

Solenoid valve Y7, which is powered, cuts off the drainage flow, while the oil flow from port P pressurizes the control valve. At the same time, solenoid valve Y9b is powered, which connects line P to port B1 and drainage line T to port A1.

At this point, the pressure in line P enters the spool side of the cylinder chamber.

The oil in the bottom side of the chamber drains out through port A1 passing through flow capacity limiter L7 which, however, does not restrict the flow in this direction. F mesh filters are installed in both lines.

Neutral, in hold position

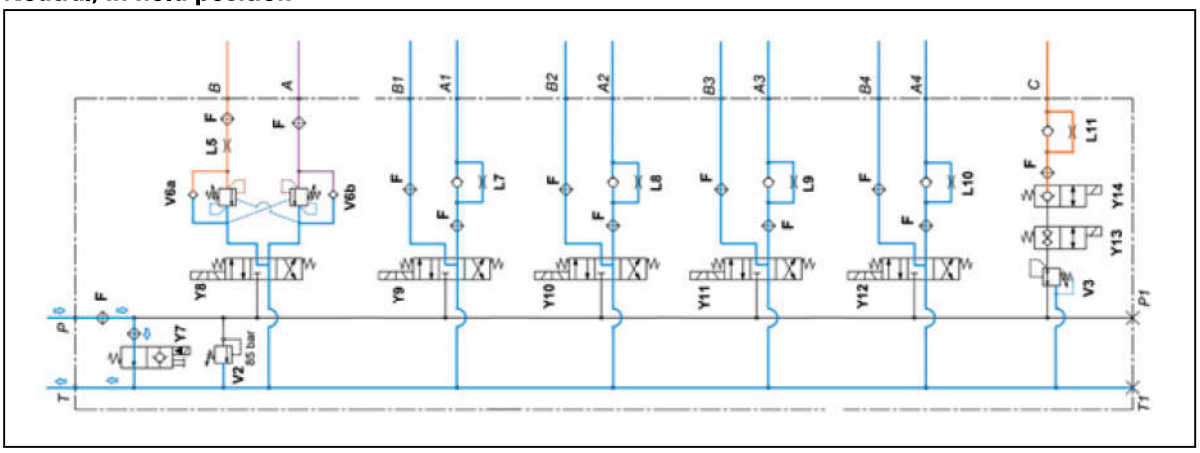


Fig. 59

VB5 - Common solenoid valve Y7 in hold position.

The oil inflow into port P passes through valve Y7 (normally closed and not powered) in the direction of port T, which is connected with tank TK1.

Ports A1 and B1 are connected with drainage line T, which means there is no pressure in the cylinder chambers.

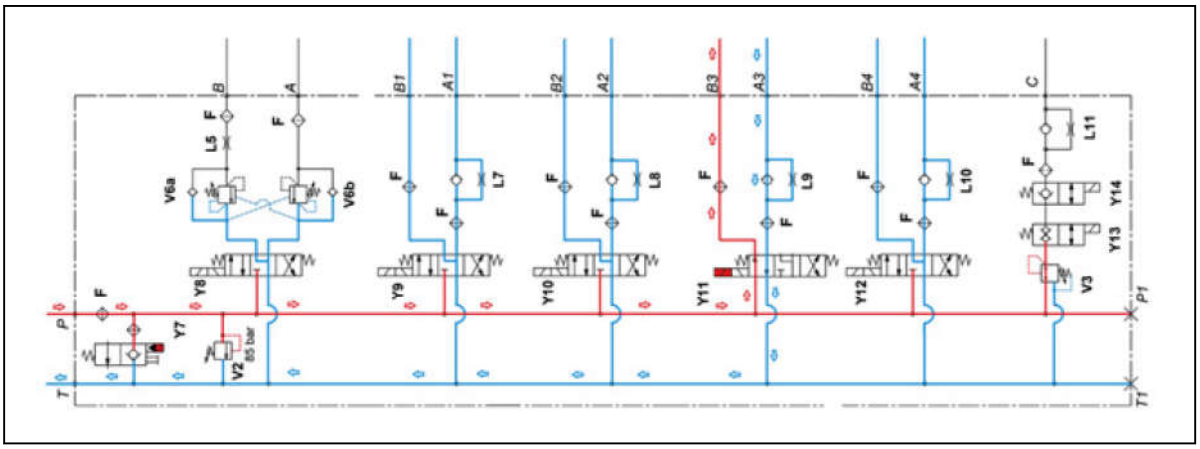


Fig. 68

VB5 - Common solenoid valve Y7 and feeding mechanism disengagement solenoid valve Y11b powered.

Solenoid valve Y7, which is powered, cuts off the drainage flow, while the oil flow from port P pressurizes the control valve.

At the same time, solenoid valve Y11b is powered, which connects line P to port B3 and drainage line T to port A3. At this point, the pressure in line P enters the spool side of the cylinder chamber.

The oil in the bottom side of the cylinder chamber drains out through port A3 passing through flow capacity limiter L7 which, however, does not restrict the flow in this direction.

F mesh filters are installed in both lines.

Neutral, in hold position

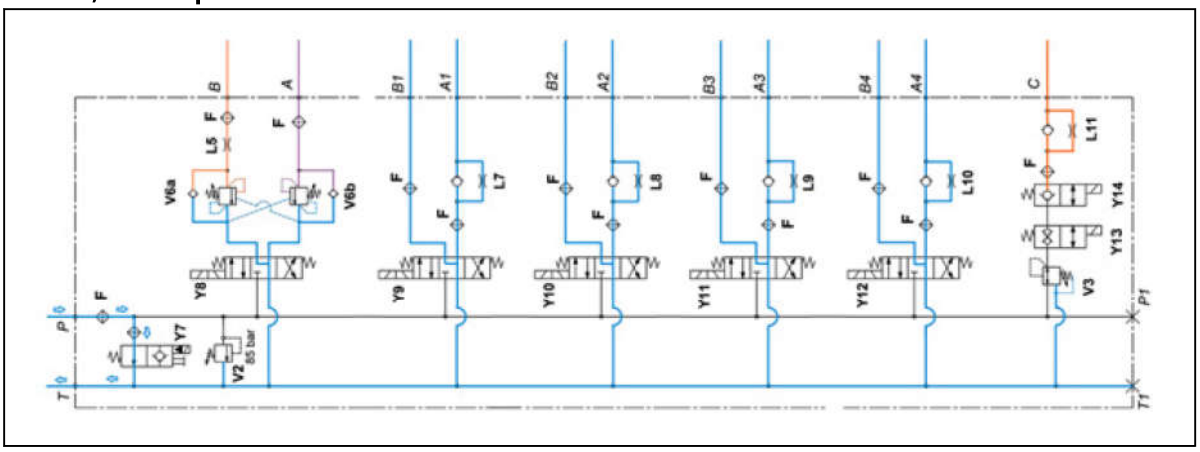


Fig. 69

VB5 - Common solenoid valve Y7 in hold position.

The oil inflow into port P passes through valve Y7 (normally closed and not powered) in the direction of port T, which is connected with tank TK1.

Ports A3 and B3 are connected with drainage line T, which means there is no pressure in the cylinder chambers.

Movement	Solenoid valve	Condition
Decrease	Y7	In hold position
	Y13	Powered
	Y14	Powered

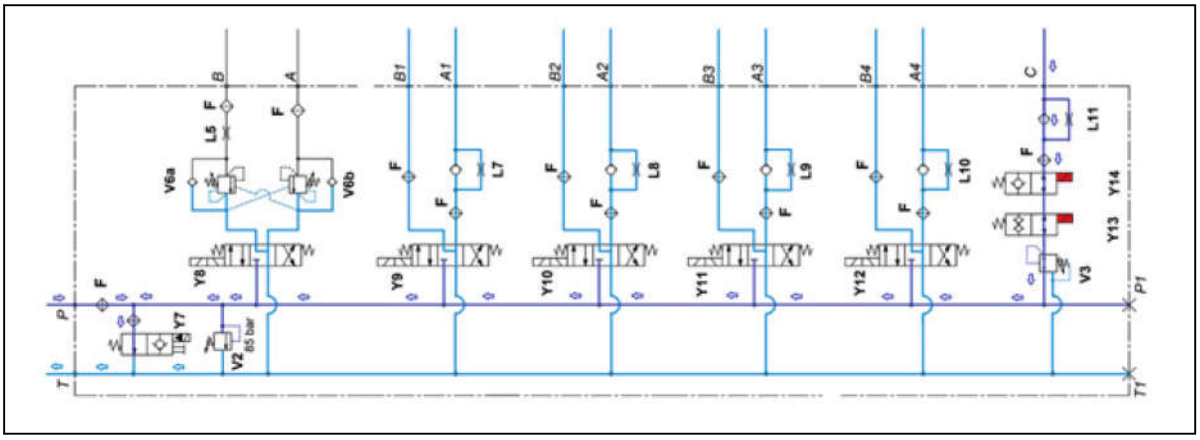


Fig. 78

VB5 - Common solenoid valve Y7 in hold position and cylinder revolution decrease solenoid valves Y13 and Y14 powered.

Valve Y7, which is not powered, allows the free drainage flow of oil.

When solenoid valves Y13 and Y14 are powered, line P is connected with port C.

At this point, the pressurized oil in line C induced by the spring inside the cylinder variator flows out through limiter L11 at full capacity, and drains through valve Y7 using line P, which is now connected with the drainage line. An F mesh filter is installed on the line.

Neutral, in hold position

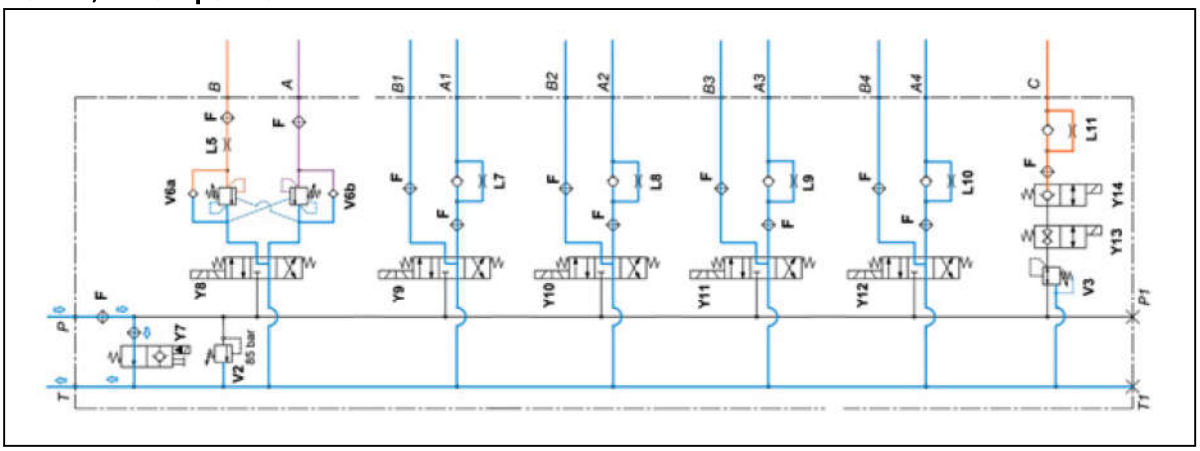


Fig. 79

VB5 - Common solenoid valve Y7 in hold position.

The oil inflow into port P passes through valve Y7 (normally closed and not powered) in the direction of port T, which is connected with tank TK1.

Port C is closed by valves Y13 and Y14, which means that the pressure inside the cylinder is the pressure induced by the contrast spring inside the variator.

9.23 Circuit pressure measurement

9.23.1 VB1 control valve - Maximum pressure check (200-bar valve)

DANGER: The safety precautions indicated in section 00 must be observed

To carry out pressure measurement, the following items, included in the pressure gage case, are needed:

- 292246 - Hose
- 293244 - 250-bar pressure gage

Procedure

- Connect the pressure gage to the hose, then connect it to control valve VB1 on the right-hand side. The fitting for the connection is already installed in the control valve.

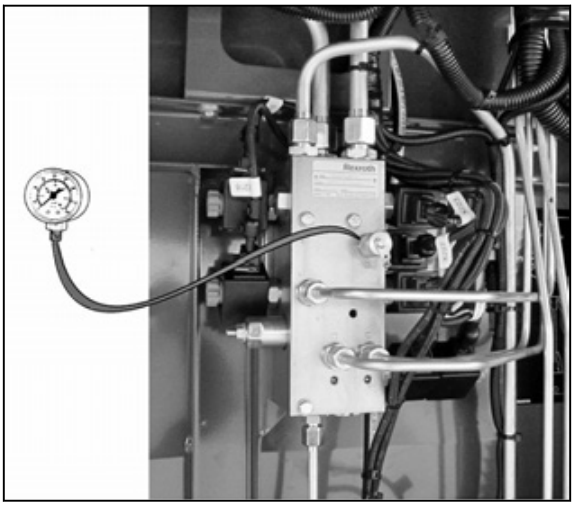


Fig. 92

- Remove the retaining plug of the common solenoid valve Y1 (as indicated in the diagram to the side).
- Start the engine, accelerate to the maximum rpm, press the manual activation push button completely for common valve Y1 and keep it pressed for a few seconds. The pressure readout will be the maximum pressure of the circuit, which must be 200 bar ± 10 when the oil is at operating temperature.

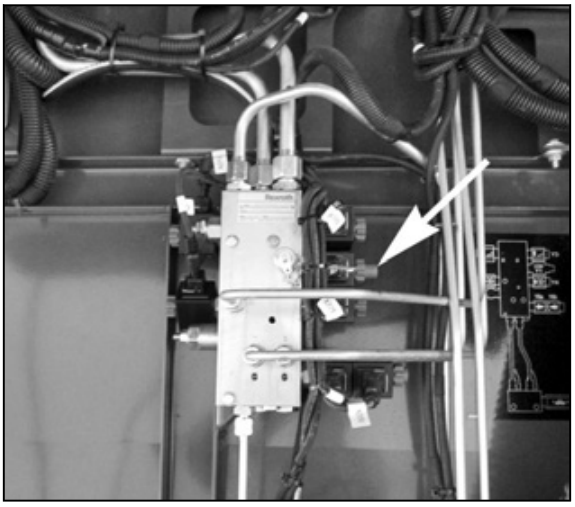


Fig. 93

10.4 Hydrostatic power steering hydraulic circuit

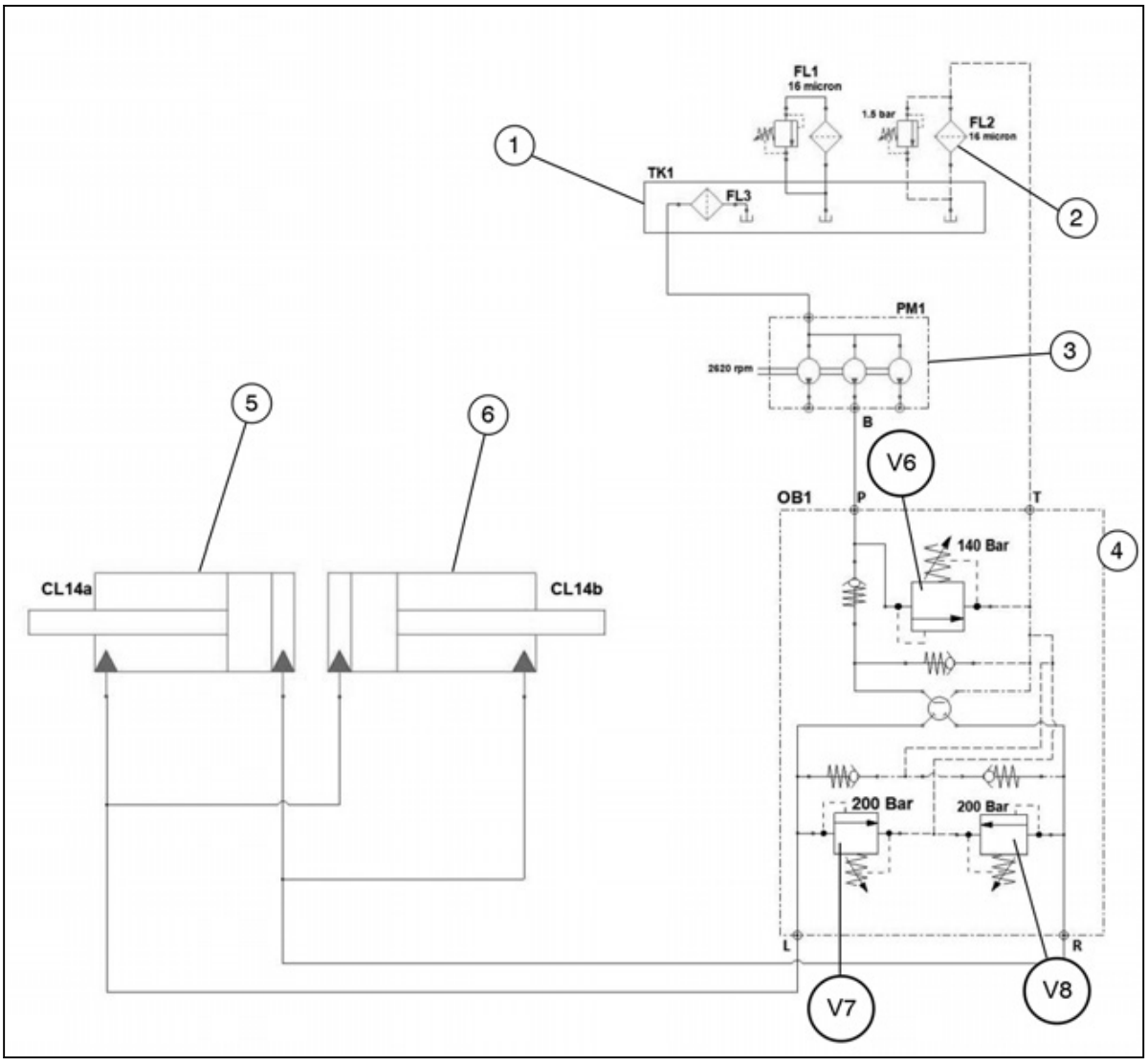


Fig. 4

(1.) Hydraulic oil reservoir
(2.) 16-micron filter on return
(3.) Hydraulic gear pumps
(4.) Orbitrol power steering
(5.) Steering cylinder
(6.) Steering cylinder
(V6.) Maximum pressure valve: calibration 140 bar
(V7.) Anti-shock valve: calibration 200 bar
(V8.) Anti-shock valve: calibration 200 bar
(P.) From the power steering pump
(T.) To the oil tank
(L.) To the steering cylinders
(R.) To the steering cylinders

11.6 Rear axle position

11.6.1 Wheel toe-in check and adjustment

Steering wheels toe-in must be correctly adjusted to prevent premature wear of the tires and for easier traveling on roads.

The clearance between the rear wheels must be smaller in front than the clearance measured at the back (viewed in the traveling direction).

Procedure

- **WARNING: Use suitable supports firmly fixed under the rear end of the machine, when adjusting the toe-in.**

  Apply the handbrake and lift the rear axle, so that the wheels are clear of the ground.

- Align the rear wheels using the steering wheel, so that the measurement C is equal to measurement D.
- Place two rods on the outside of the two tires, in the central line.

  NOTE: *Measurement A between the tyres must be 5 mm less than measurement B, measured at a distance of 1000 mm behind the tyres.*

- If necessary, adjust the tie rod (1).

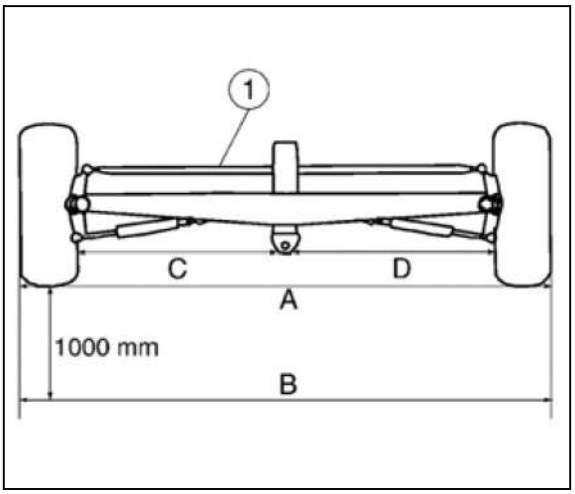
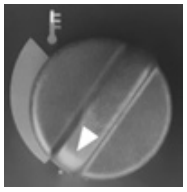


Fig. 8

12.4 Air conditioning control panel

Fig. 4

	Fan variation command selector (three speeds).
	Ambient temperature selector (air conditioner). If you turn the knob clockwise, it increases the temperature.
	Air conditioning activation/deactivation push button.
	Recirculation on/off push button. Activating recirculation will disable the pressurizer fan and vice versa.

NOTE: *It is advisable to use the fan at a certain speed (speed 2-3 on the fan variation selector). If the temperature is too low, use the selector to adjust the temperature*

13.5 A84 - DEF feed module

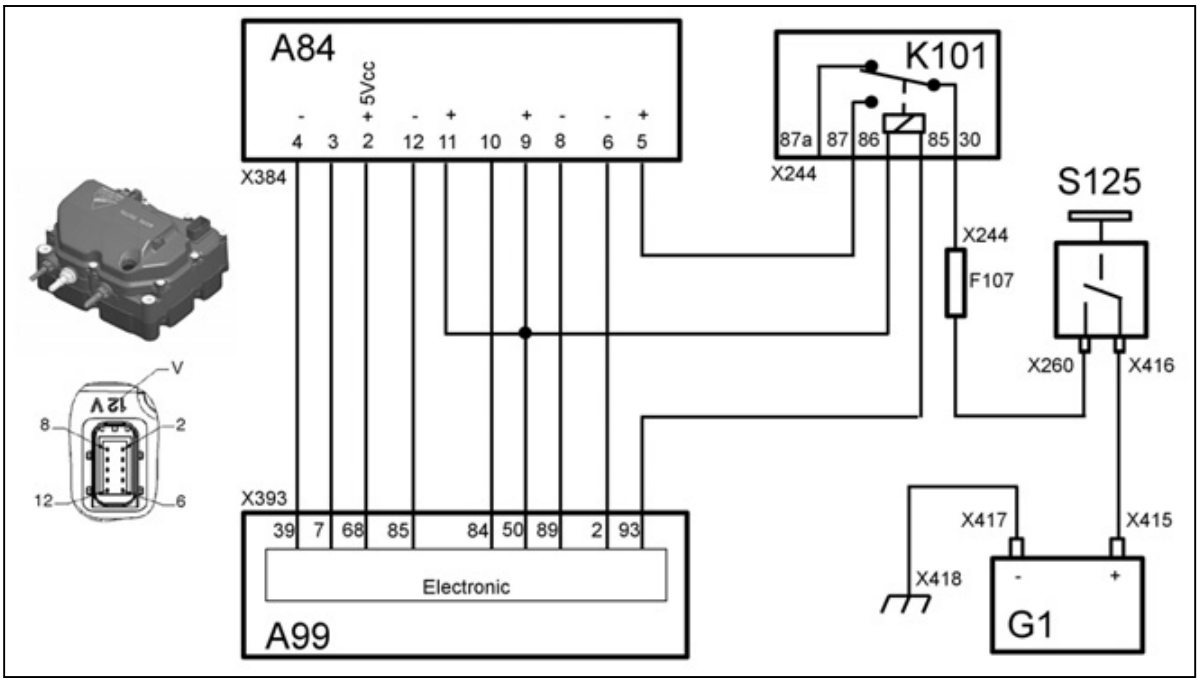


Fig. 10

A84	DEF feed module (X384 connector)	X260	Ø10 eyelet for + 12 V power take-off
A99	Engine controller (X393 and X800 connectors)	X384	A84 DEF feed module connector
F107	10 A fuse, DEF pump heater	X393	96-pin connector for engine controller
G1	Battery	X415	Connection clamp to the battery positive pole
K101	DEF feed module heater relay	X416	Ø10 eyelet for the positive cable of the battery
S125	Battery disconnect switch	X417	Connection clamp to the battery negative pole
X244	Box for four micro relays (K101–K104) and eight mini fuses (F103–F110)	X418	Battery negative cable eyelet Ø10

Connector pinout

Pairing	A84 - DEF feed module	A99 - Engine controller
Not used	01 (X384)	-
DEF pressure + 5 V DC	02 (X384)	68 (X393)
DEF pressure signal	03 (X384)	07 (X393)
DEF pressure ground	04 (X384)	39 (X393)
DEF module heater	05 (X384)	-
DEF module heater	06 (X384)	02 (X393)

Pin	Name	Function	Pairing
8	+ 5 V DC	Potentiometer power supply: Position of main crop elevator, skids, reel rotation speed	B131 - Front elevator position sensor B132 - Right-hand side slide position sensor (FF/PF table) B133 - Left-hand side slide position sensor (FF/PF table) B138 - Reel revolution sensor (FF/PF table)
9	Analogue input signal	Feedback signal from the potentiometer on the left skid	B133 - Left-hand side slide position sensor (FF/PF table)
10	+ 5 V DC	Potentiometer power supply: Position of main crop elevator, skids, reel rotation speed	B131 - Front elevator position sensor B132 - Right-hand side slide position sensor (FF/PF table) B133 - Left-hand side slide position sensor (FF/PF table) B138 - Reel revolution sensor (FF/PF table)
11	Analogue input signal	Feedback signal from the potentiometer for the main crop elevator position	B131 - Front elevator position sensor
12	+ 5 V DC	Potentiometer power supply: Position of main crop elevator, skids, reel rotation speed	B131 - Front elevator position sensor B132 - Right-hand side slide position sensor (FF/PF table) B133 - Left-hand side slide position sensor (FF/PF table) B138 - Reel revolution sensor (FF/PF table)
13	Analogue output signal	Table lowering relay	K12 - Relay for table lowering from "Terra Control" cutaway on A140, only with engine running.
14	Analogue output signal	Table raising relay and enabling of common valve	K155 - Relay box (B) vertical table position, reel retraction D158 - Diode box, common solenoid valve on table control valve Y1 — Common solenoid valve for 200-bar control valve
15	+12 V DC	Feeding	
16	Ground	Feeding	
17	Analogue input signal	Reverse gear signal	S534 - Reverse gear signal switch

Pin	Name	Function	Pairing
6	Analogue input signal	Reel RPM increase signal	A700 - Multifunction lever PCB
7	+12 V DC	Feeding	
8	Ground	Feeding	
9		Not used	
10	Analogue output signal	Proportional valve negative side signal	Y25 - Hydraulic reel rotation proportional solenoid valve
11	Analogue input signal	Enable controller signal (table engaged)	
12		Not used	
13	+12 V DC	Feeding	
14	Ground	Feeding	
15		Not used	
16		Not used	
17	Analogue input signal	Reel RPM decrease signal	A700 - Multifunction lever PCB
18	Analogue input signal	Reel RPM signal	X600 - Cylinder head connection connector on multifaster

13.15 B38 - Fanning mill revolution sensor

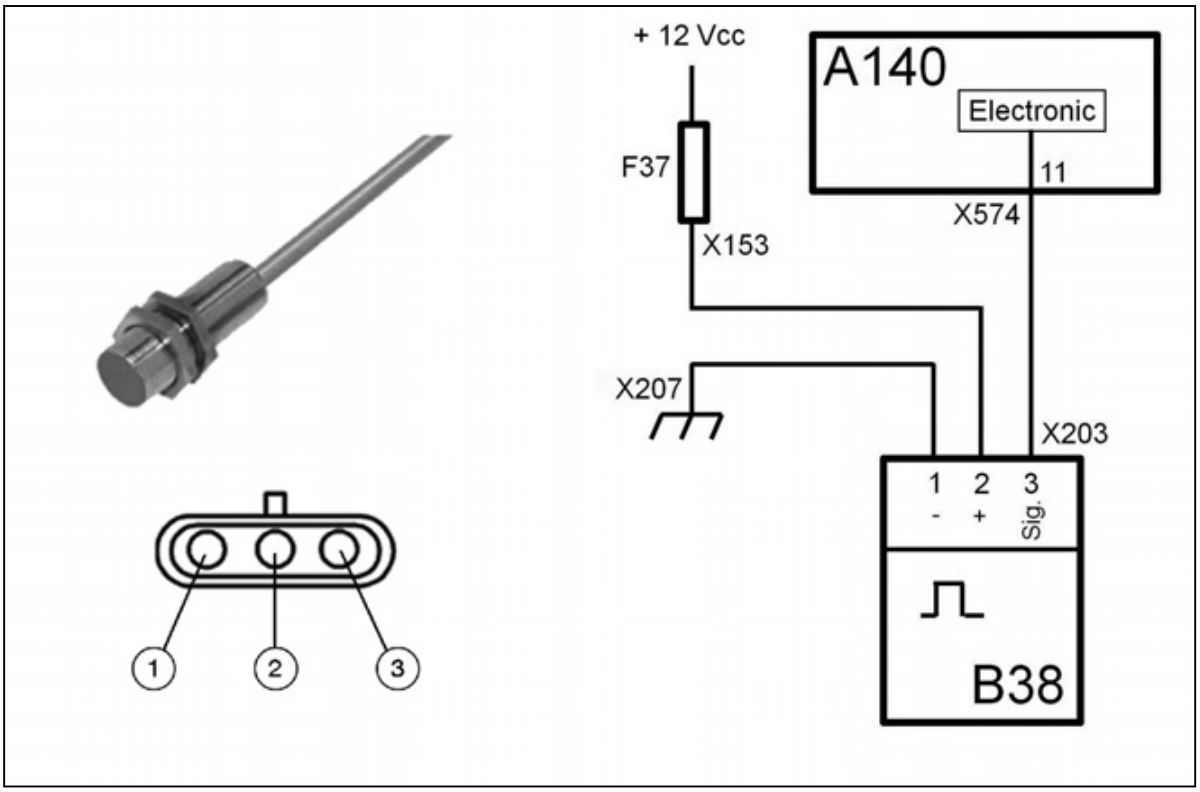


Fig. 30

A140	Agritronic Plus	X203	Fanning mill revolution sensor connector
B38	Fanning mill revolution sensor	X207	Earth eyelet Ø 10 of the right-hand side main cable
F37	3A fuse, cylinder revolution, fanning mill, straw chopper and tachometer sensors	X574	White 15-pin connector, Agritronic Plus on-board computer section
X153	Cab fuse/diode/relay box connector B (bottom)		

Connector pinout

Pairing	B38 - Fanning mill revolution sensor	A140 - Agritronic Plus
Ground	01 (X203)	-
+12 V DC	02 (X203)	-
Signal	03 (X203)	11 (X574)

Measurement of component connector

Requirements for measurement:

- Ignition on
- Disconnect connector X203 — Connector of the fanning mill revolution sensor

13.21 B102 - DEF level/temperature sensor

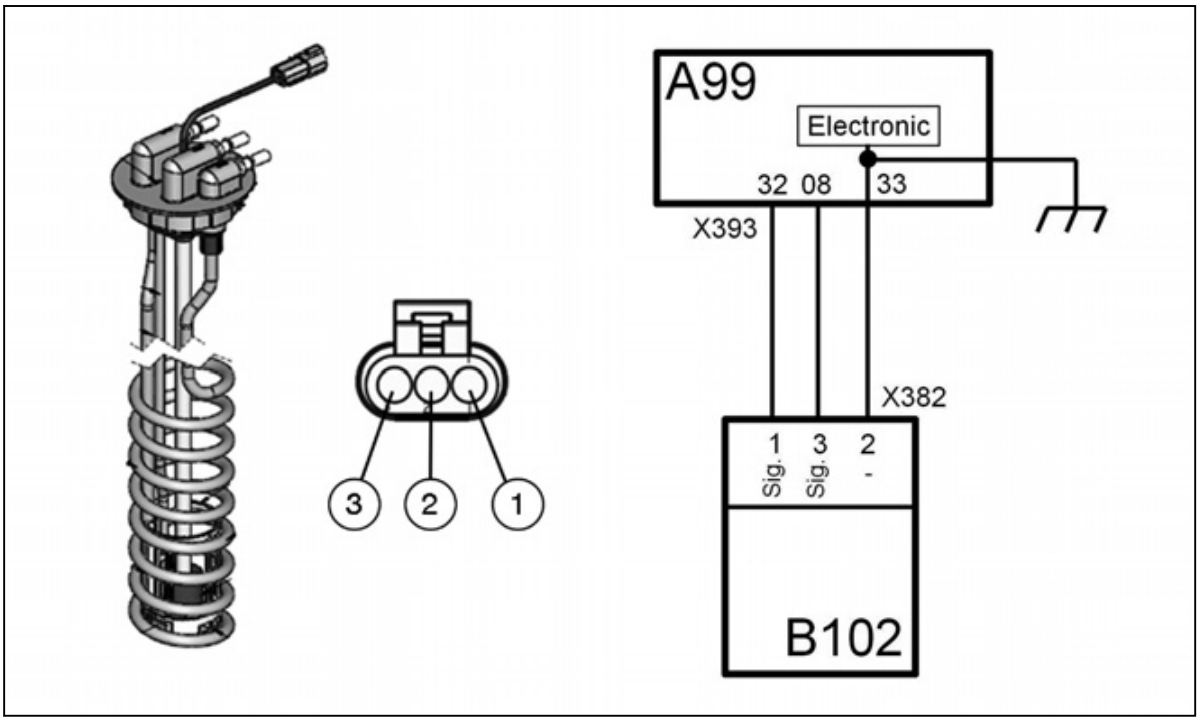


Fig. 38

A99	Engine controller (X393 and X800 connectors)	X382	Connector for DEF level/temperature sensor
B102	DEF level/temperature sensor	X393	96-pin connector for engine controller

Connector pinout

Pairing	B102 - DEF level/temperature sensor	A99 - Engine controller
DEF level signal	01 (X382)	32 (X393)
Ground	02 (X382)	33 (X393)
DEF temperature signal	03 (X382)	08 (X393)

Measurement of component connector

Requirements for measurement:

- Ignition off
- Disconnect the X382 connector - DEF temperature and level sensor connector
- Remove B102 from the DEF tank
- Measure the component by manually moving the float (see the arrow)

13.26 B138 - Reel revolution sensor

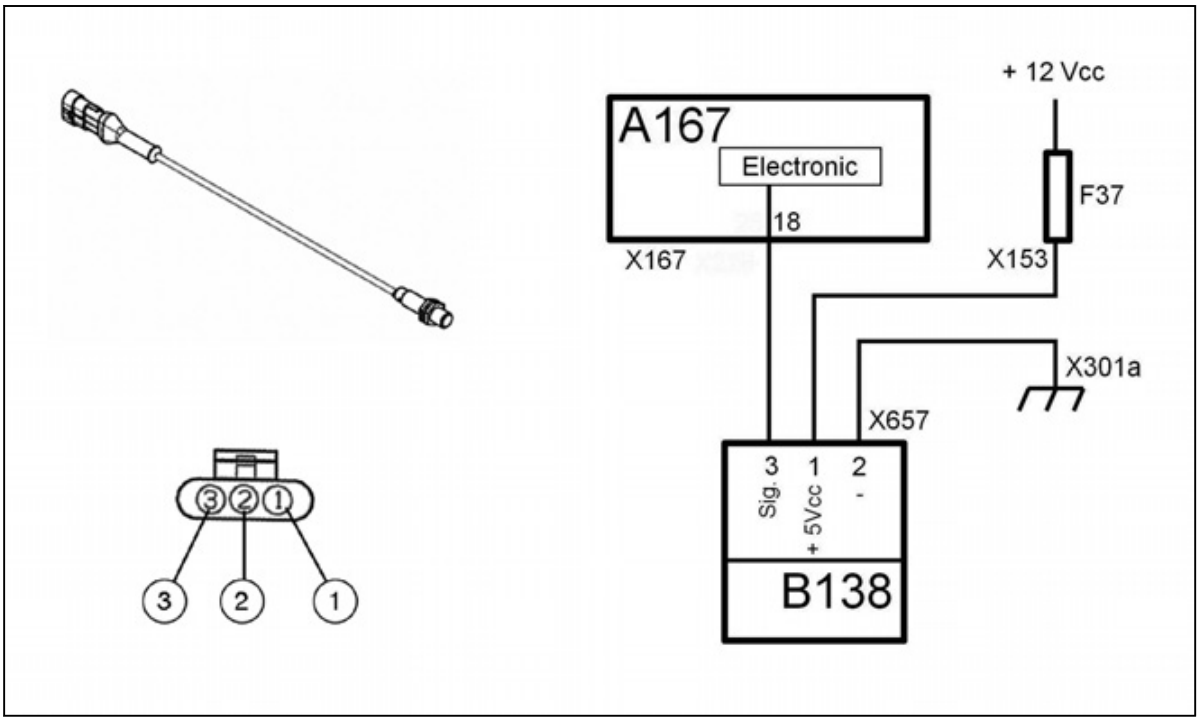


Fig. 47

A167	Reel rotation speed controller	X167	18-pin connector for A167 - Reel rotation speed controller
B138	Reel revolution sensor (FF/PF table)	X301a	Earth eyelet Ø 8 of the cab platform cable
F37	3A fuse, cylinder revolution, fanning mill, straw chopper and tachometer sensors	X657	Hydraulic reel revolution sensor connector
X153	Cab fuse/diode/relay box connector B (bottom)		

Connector pinout

Pairing	B138 - Reel revolution sensor	A167 - Reel rotation speed controller
+ 5 V DC	01 (X657)	-
Ground	02 (X657)	-
Signal	03 (X657)	18 (X167)

13.30 General calibration information

To compensate for mechanical and electrical tolerances in the sensors and actuators, the components concerned must be calibrated. If a component is replaced, it must be calibrated.

NOTE:
Check that the associated device is free to move throughout the operating range before calibrating a component or function.

The following components and functions require calibration

Table

- Bar height, B131 - Front elevator position sensor
- Skid height, B132/B133 - Right/left skid position sensor (FF/PF table)

NOTE:
The calibration procedure is unique. The angular position sensor values are saved according to whether or not they are present on the table. It is important to configure the table that is coupled to the combine before calibrating the angular position sensors.

Threshing mechanism engagement micro-switch

Adjust the micro-switch (A) with the threshing mechanism engaged. Loosen the fixing screws (2) for and bring the micro-switch feeler towards plate (C) until it clicks (opening of the electrical circuit).

After tightening the screws (2), check that the micro-switch feeler can still perform a stroke section (approximately 1 mm); if not, move the micro-switch away from the cam slightly.

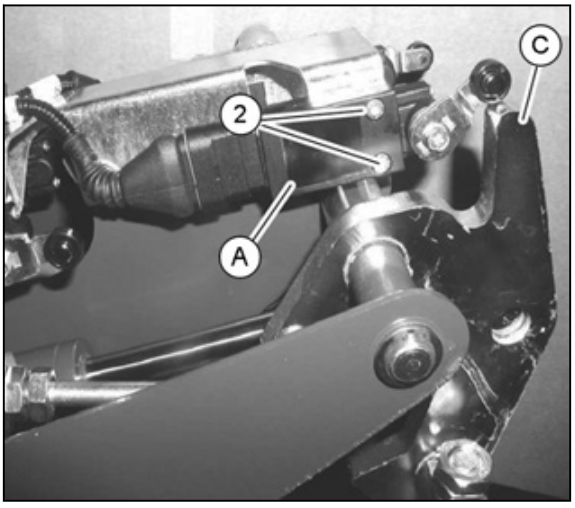


Fig. 70

Grain unloading auger micro-switch disengaged

Adjust the micro-switch (H) with the grain unloading device disengaged and the hydraulic cylinder CL10 retracted (spool inside). Loosen the fixing screws (2) and bring the micro-switch feeler towards the cam (C) until it clicks (opening of the electrical circuit).

After tightening the screws (2), check that the micro-switch feeler can still perform a stroke section (approximately 1 mm); if not, move the micro-switch away from the cam slightly.

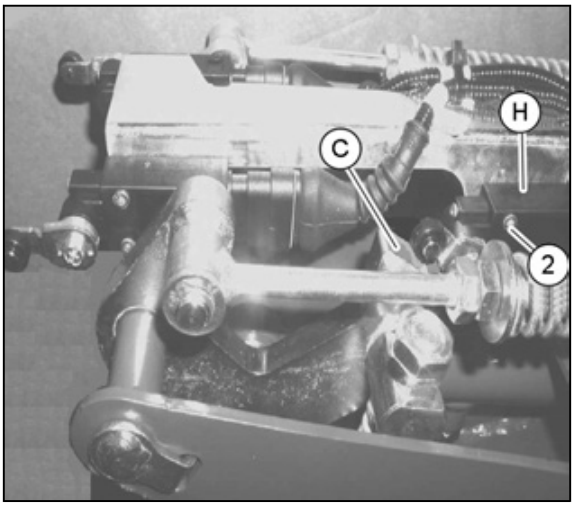


Fig. 71

13.36.4 Power distribution - Distribution 1 - K15

Page 4

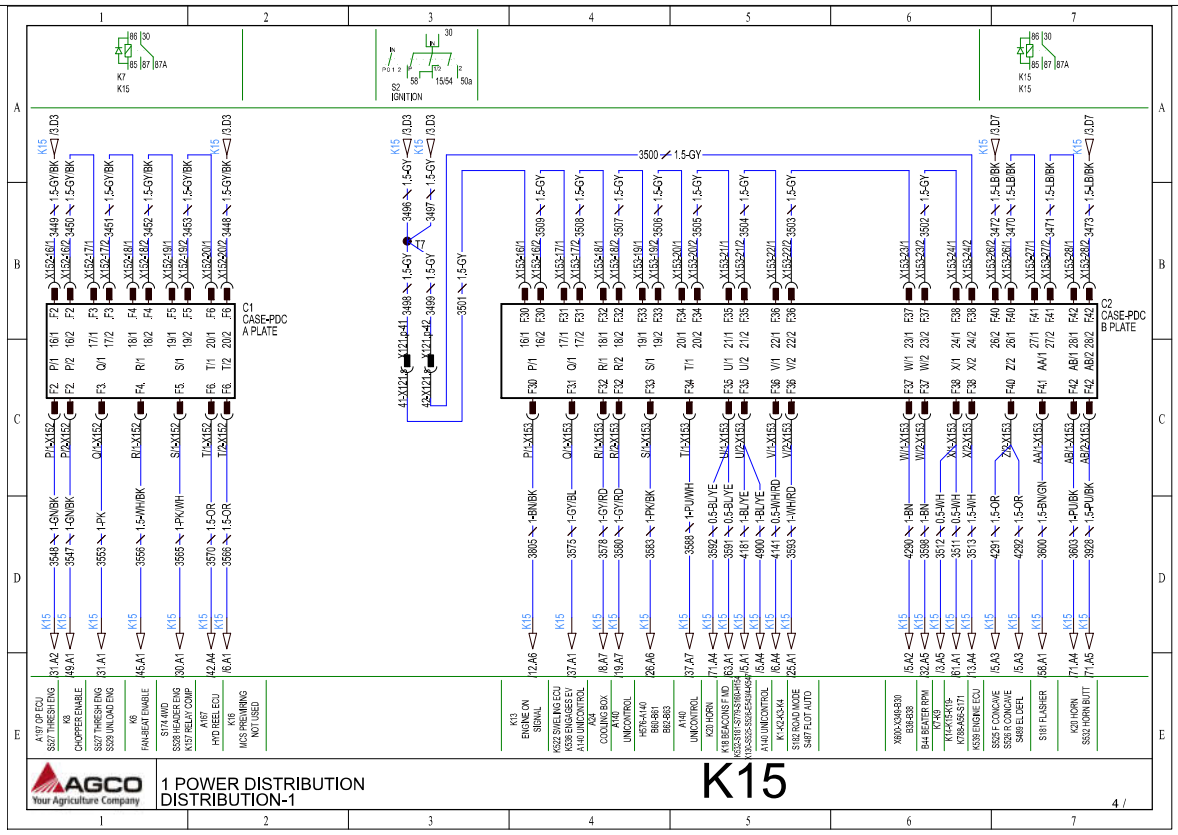


Fig. 79

13.36.14 Engine - Air filter - Temperature - Fuel - Water in fuel

Page 14

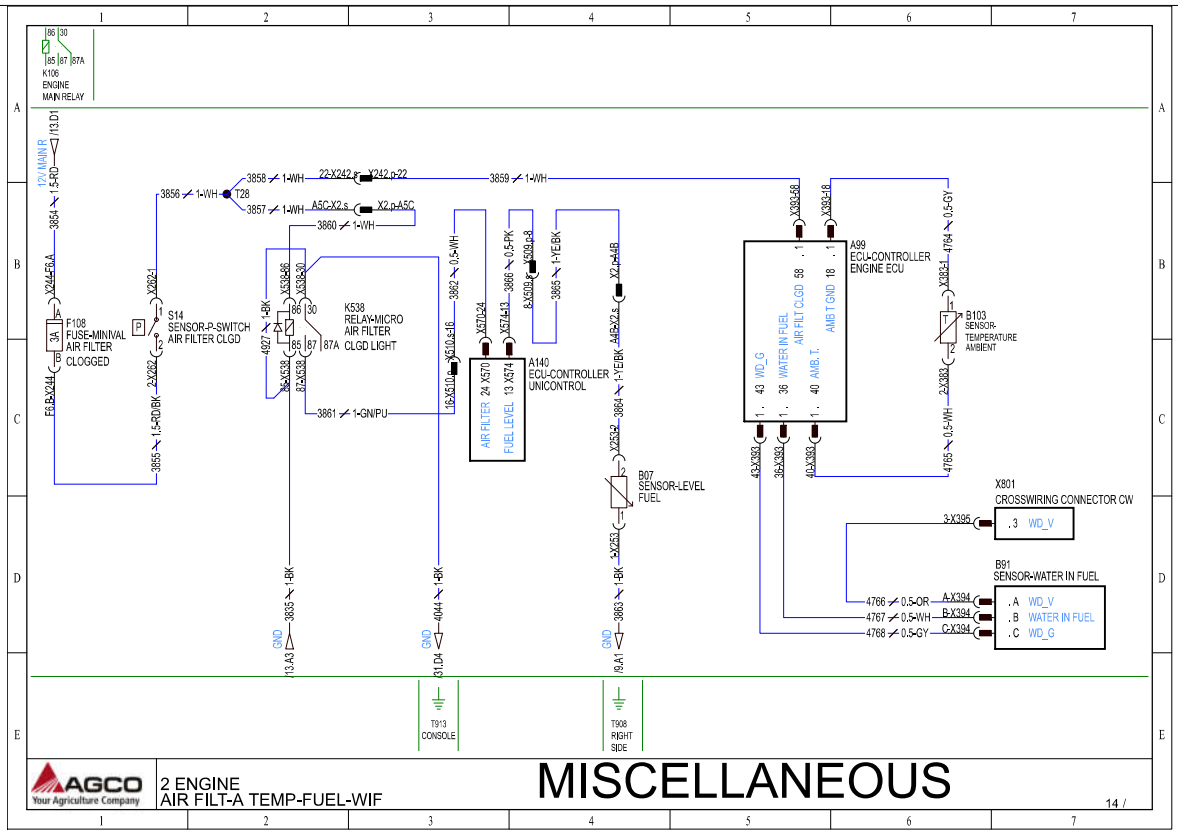


Fig. 89

13.36.24 Hydraulics - Cutting table distribution

Page 24

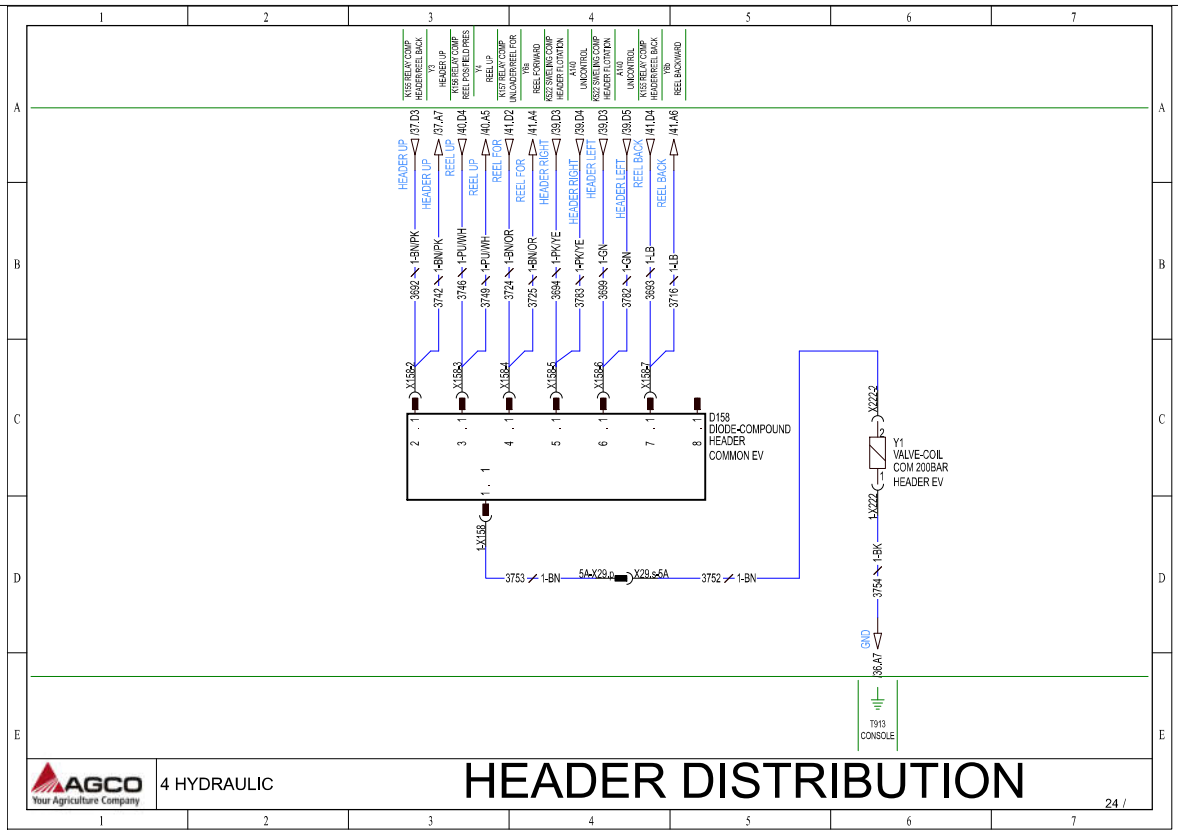


Fig. 99

13.36.34 Front concave adjustment

Page 34

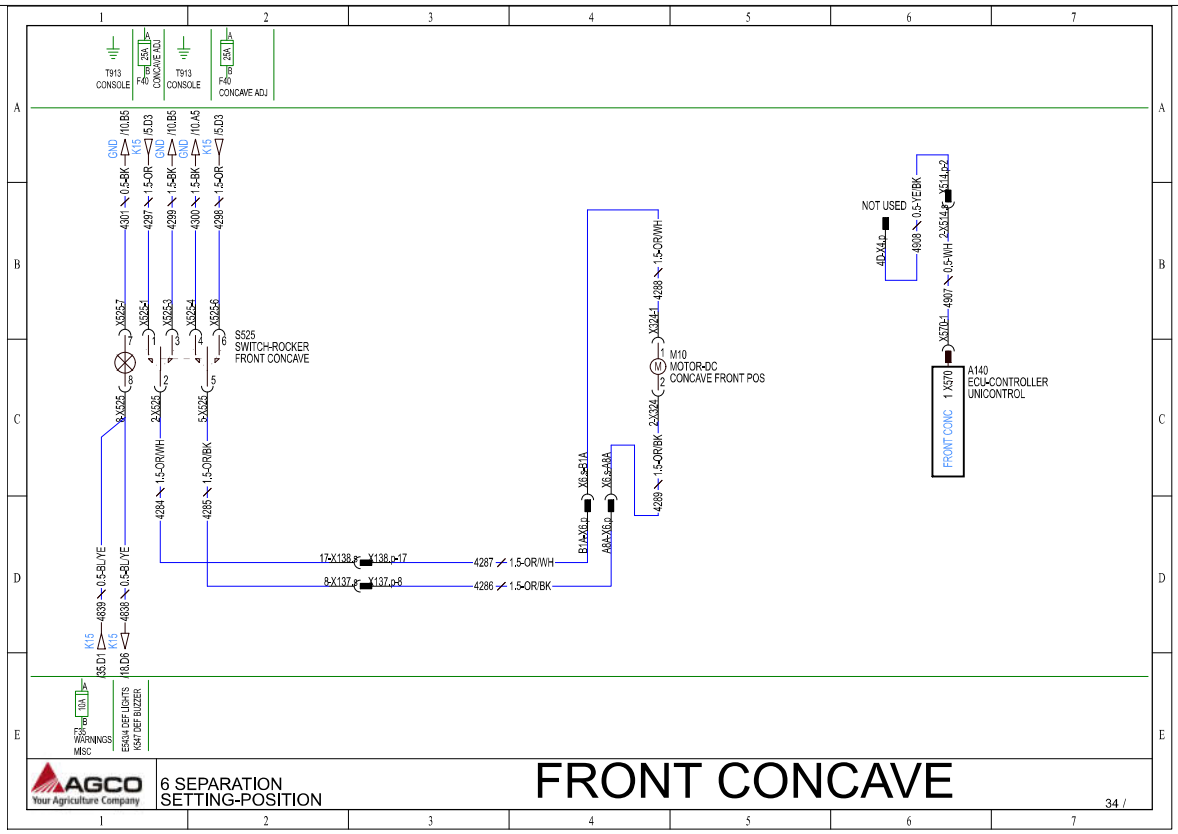


Fig. 109

13.36.44 Vertical Knifes

Page 44

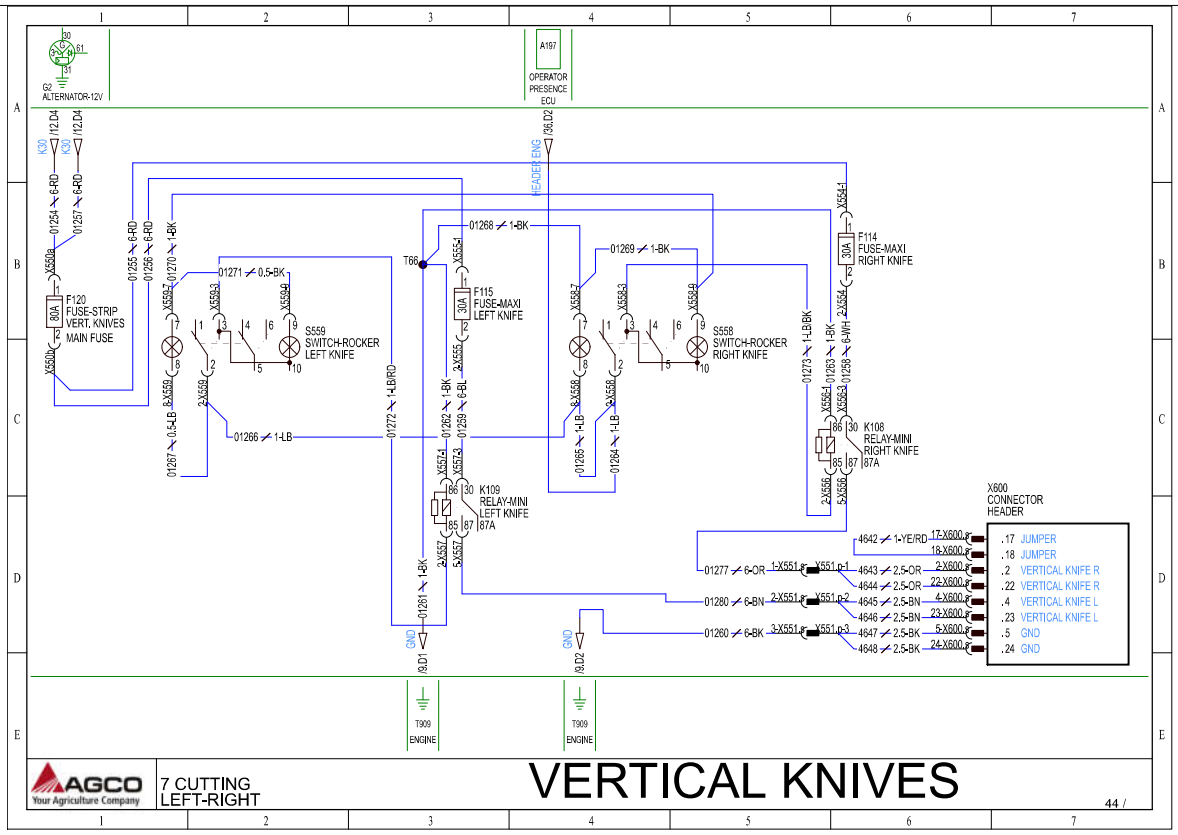


Fig. 119

13.36.54 Unloading auger out/in

Page 54

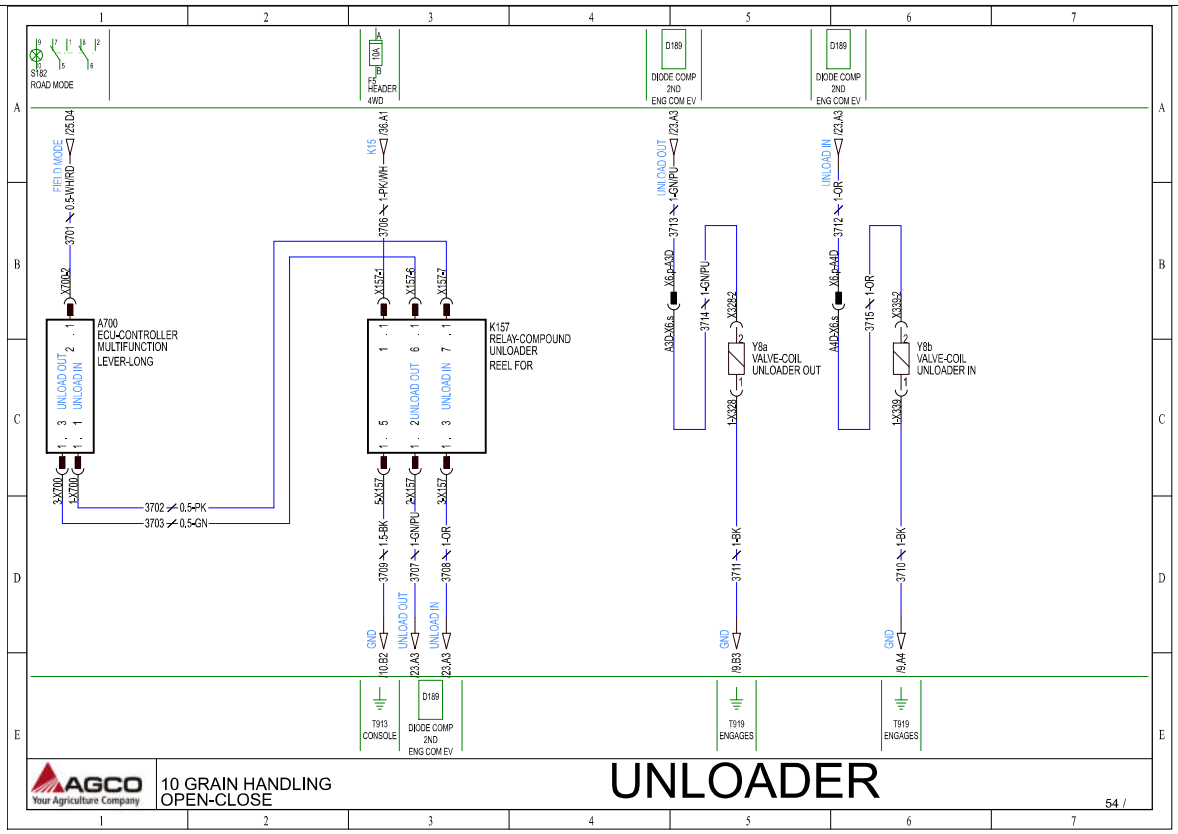


Fig. 129

13.36.64 Work lights - Cab operator platform

Page 64

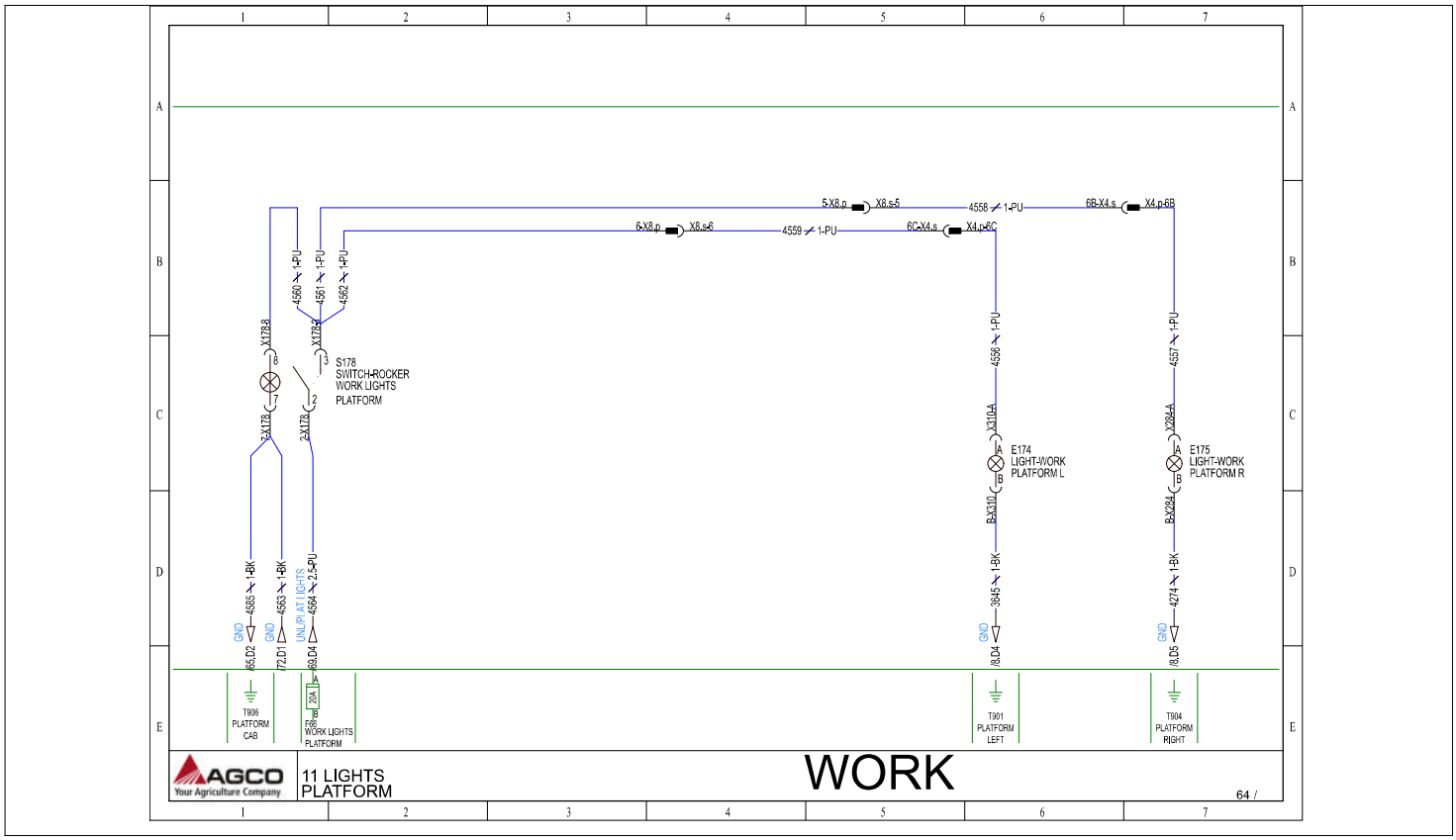


Fig. 139

13.36.74 Air compressor

Page 74

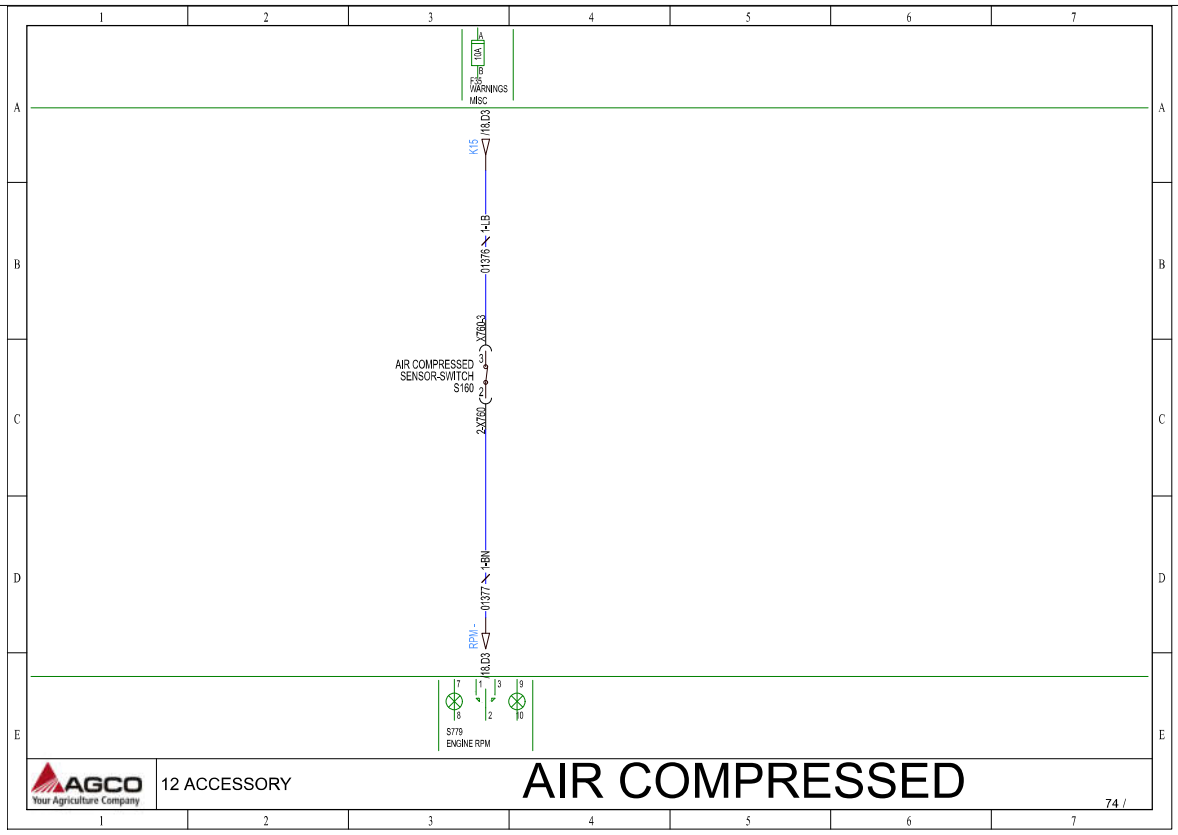


Fig. 149

Wobble box- R./I.

- The wobble box has a frequency of 610 cycles/ minute.

  IMPORTANT: *As the operating temperature of the box reaches 90°C on average, leave it to cool before working on the wobble box and in any case protect your hands with rubber gloves.*

  IMPORTANT: *For routine maintenance of the wobble box, refer to the Operator's Manual for the cutting table.*

Removal

- Loosen the drive belt tensioner (5) and remove the belt.
- Remove the cutting blade.
- Unscrew the screws (6) and remove the wobble box.

Assembly

- To reassemble, proceed in reverse order, making sure to tighten the screws (6) to **100 Nm**.

  The belt (7) is tightened correctly if, when applying a force of 80 N (at the point indicated by the arrow) a deflection of 8-10 mm is obtained.

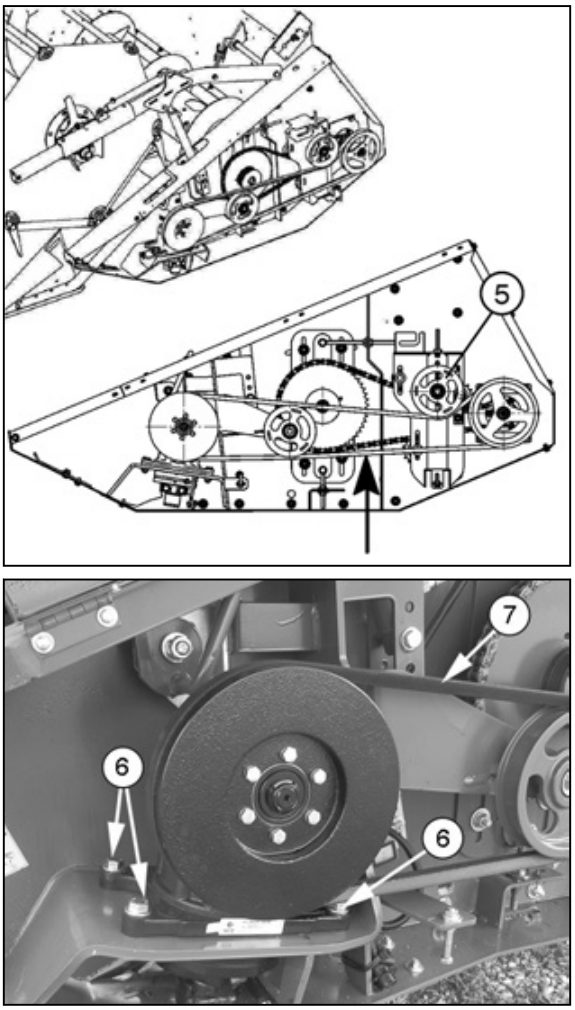


Fig. 10

- Check with a small rod that the hole for the grease is free.

Fig. 30

- Using an appropriate bronze punch, remove the pinion (15) from the bearing (14), taking care not to damage the coupling (16) as shown in the diagram.

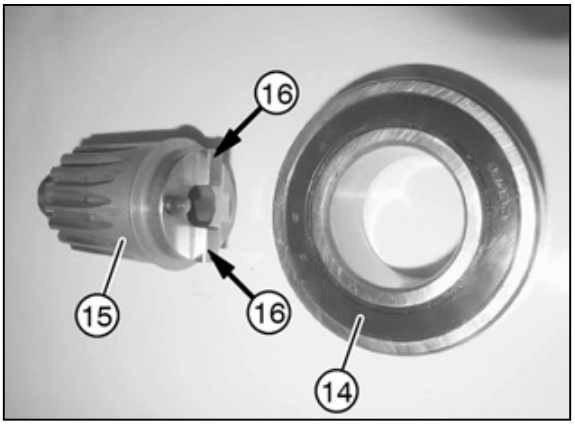


Fig. 31

- Insert the pinion (15) in its housing, ensuring that the coupling (16) is parallel to the housing drive pulley and the markings are in line, as shown in the diagram (A+B).

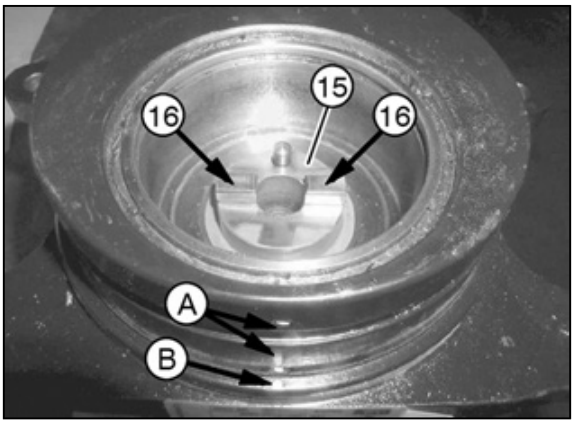


Fig. 32

- Remove the bolts (3).
- Remove the plug (4) using a screwdriver.
- Remove the miter gear by hitting the edges (B) with a plastic hammer.

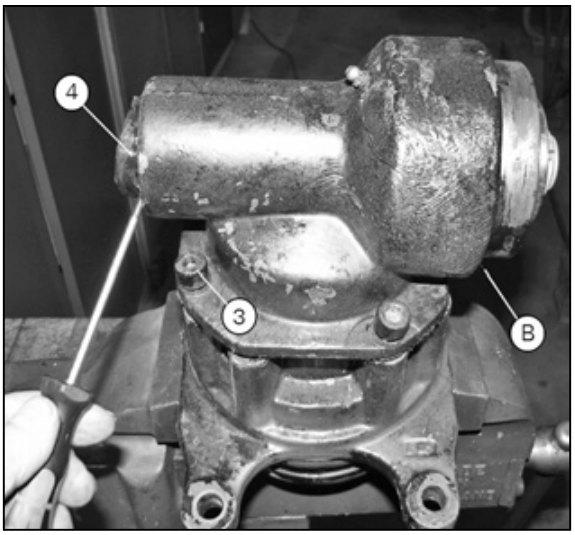


Fig. 51

- Remove the ring nut (6) with a special tube wrench.

  NOTE: *The bolt is fastened with Loctite. It must therefore be heated to approximately 100°C before being loosened.*
- Remove the rotor (7) with an extractor.

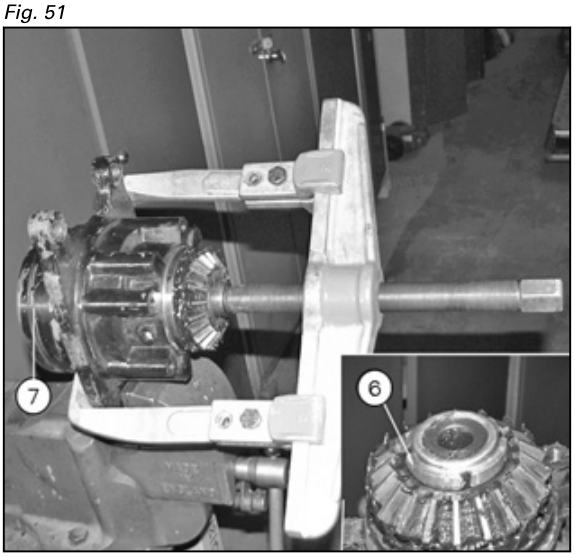


Fig. 52

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

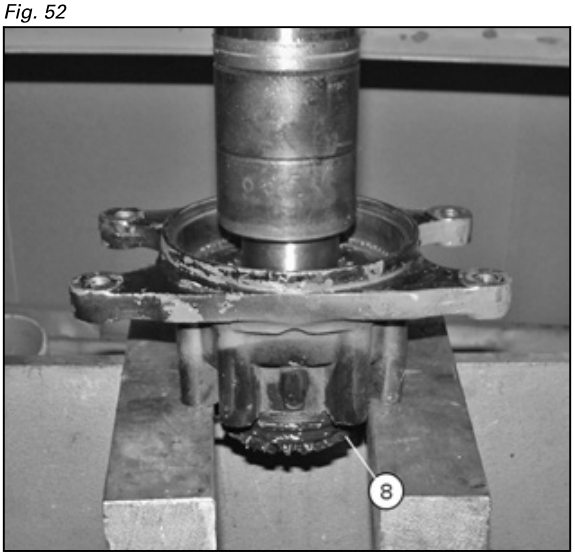


Fig. 53

- Remove the locking collar (9) of the bearing.
- Remove the bolts (10).
- Remove the adjustment screw (11).
- With one lever up (E) and one down (F), remove the cover (G).
- Loosen the shaft hitting the end of the shaft (H) (putting a cushion in between).
- Remove the cover.
- The auger is now free and can be lifted with a crane or hoist, removing it through the opening on the side of the cutting table.

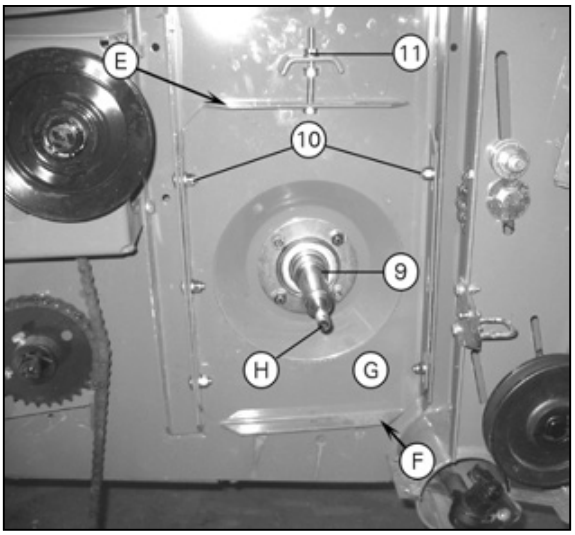


Fig. 74

Refitting

- To assemble, follow the points in the "Disassembly" paragraph in reverse order. Please note:
  - Adjust the position of the auger and the retractable fingers.
  - Adjust the slip clutch.

14.15.2 Replacing the shaft on the right-hand side

Procedure

- Take off the cover.
- Remove the bolts (2).

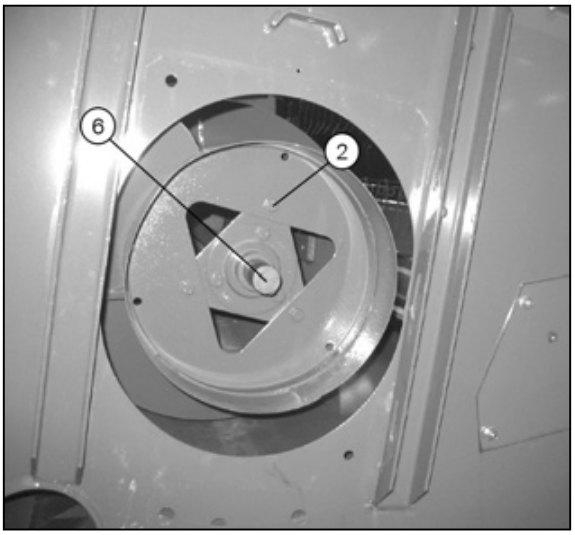


Fig. 75

- Check the sliding surfaces on the clutch hub (A), the gear wheel (B) and the thrust plate (C) for seizing and wear.
- Fit a new O-ring (D) in the clutch hub.
- Fit the clutch with new friction elements (E).

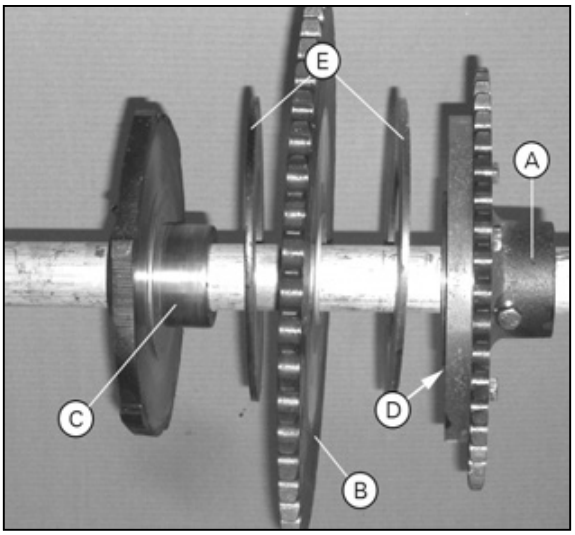


Fig. 90

- **IMPORTANT:** *Assemble and adjust the section as described below before fitting it on the cutting table.*

  The bearing supports must be parallel and the distances (C) between the centers of the holes must be:
  - 1498 mm for the 5' (152.4 cm) sections
  - 1205 mm for the 4' (121.9 cm) sections

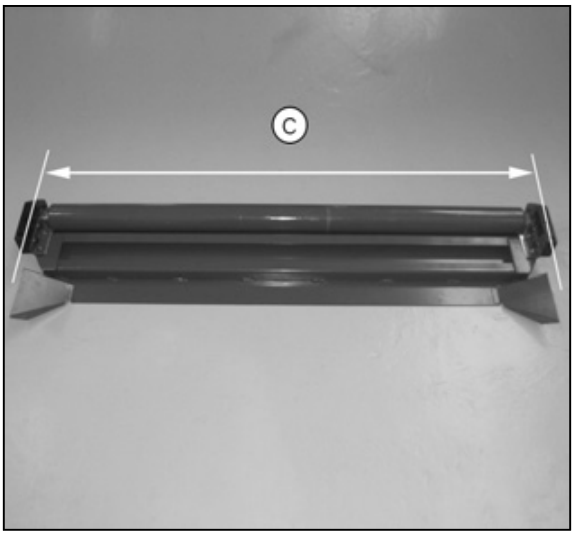


Fig. 110

- Adjust the scraper (D) so that the distance (E) from the roller is 0.4 ± 0.2 mm.

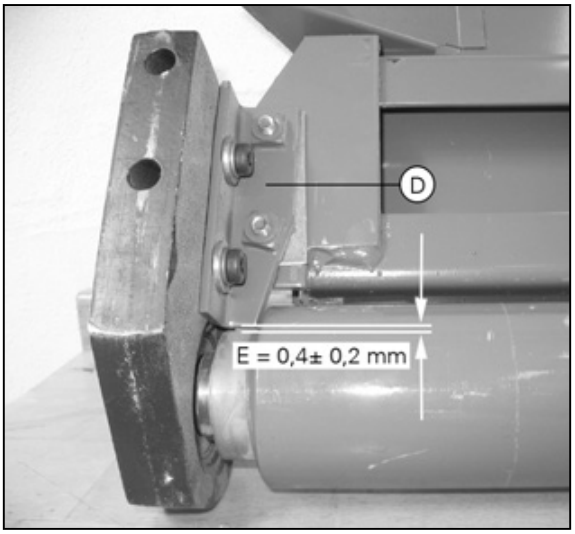


Fig. 111

- Adjust the scraper (F) using the shims (G) until it is 2 ± 0.5 mm below the roller across its entire width.

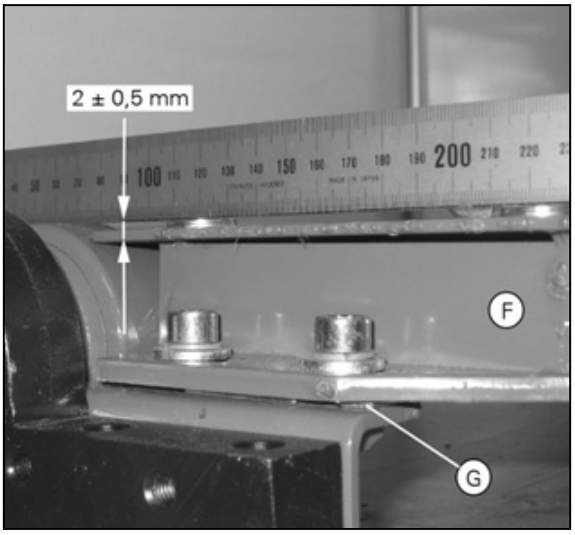


Fig. 112

14.20.2 Replacing reel tines and plastic bearings

Procedure

- Remove the plastic bearings (1) from all the reel tine bars and disconnect the bar from the reel.
- Remove the spring tines (2) from the reel.
- Remove the split pins (3).
- Remove the mounting brackets (only on tables wider than 18').

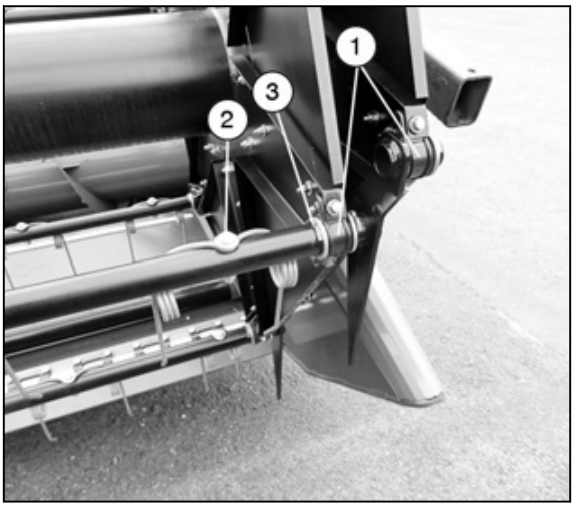


Fig. 129

- While fitting the spring tines, make sure that they are resting on the tine bar at points (A and B).
- The split pins must be fitted from below and bent so that they go round the reel tine bar closely to prevent wrapping.

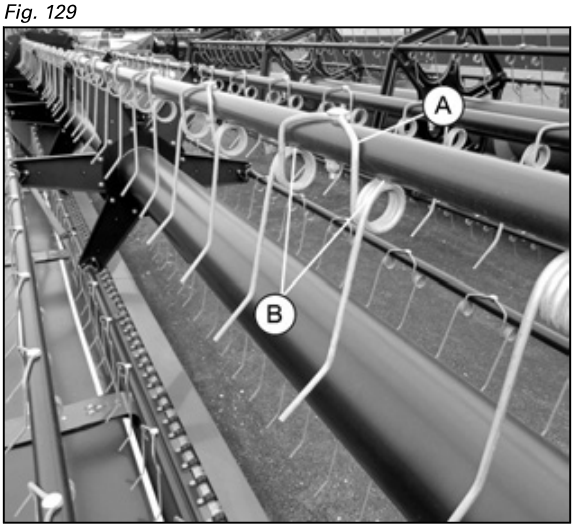


Fig. 130

15.8 Shuttle drive

The machine is supplied with a special system for reversing the rotational direction of the table (1) and main crop elevator (2).

If during work the feed auger and/or main crop elevator becomes blocked and the torque limiter is activated, proceed as follows.

WARNING: If the blockage cannot be removed by the shuttle, 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.

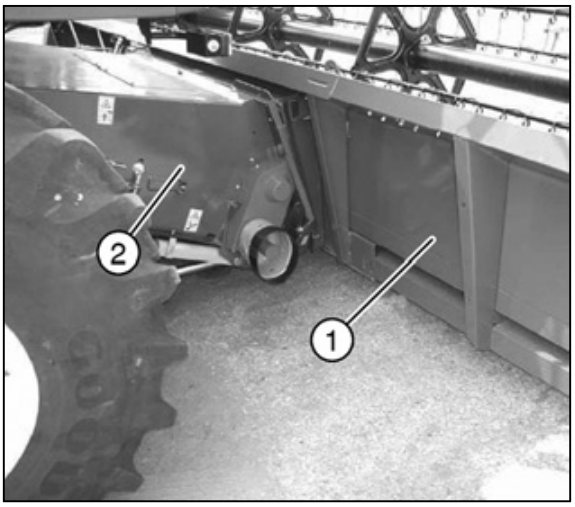


Fig. 17

Procedure

- Immediately stop the combine and disengage the header by pressing down the control switch.
- Move the machine a few meters back and reduce the engine speed to idling.
- Gradually move the lever (3) for the reversing mechanism (4) until all the material has been ejected, and release the lever (3).
- Lift the reel and engage the header drive.
- The crop can be slowly fed by the reel into the table auger.

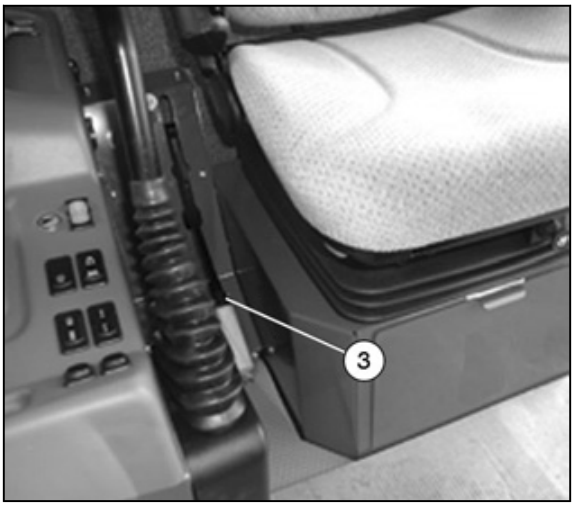


Fig. 18

- Remove the snap ring (8), washer (9) and screw (10) from both rear suspension rods.
- Move the rear concave support plate (11) and unscrew the bushing (12); remove the bushing.
- Lift the concave out from the front of the cylinder housing, being careful not to damage the side seals of the grain pan frame.

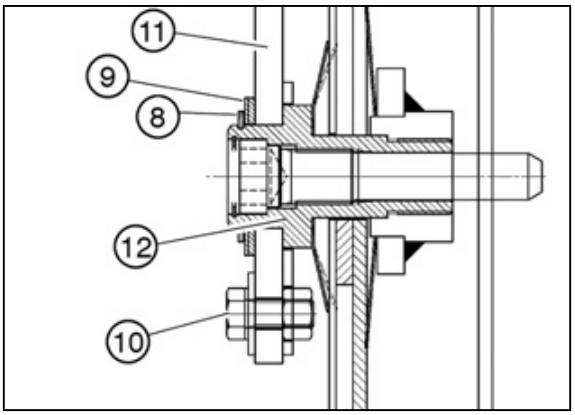


Fig. 13

16.3.5 Installation

Proceed as follows:

- **CAUTION: Use the appropriate tools to align holes. Never use your fingers or hands.**

  Using a chute (A), fit the concave in the cylinder housing, being careful not to damage the side seals of the grain pan frame.

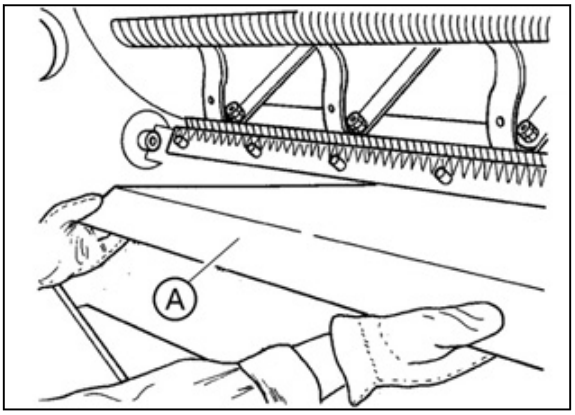


Fig. 14

- After positioning the rear bushings (12) and the support plates (11), fit the rear pins (13), bearing in mind that they must also fasten the rake in place.
- Fit the washers (9) and snap rings (8).
- Tighten the screws (10).

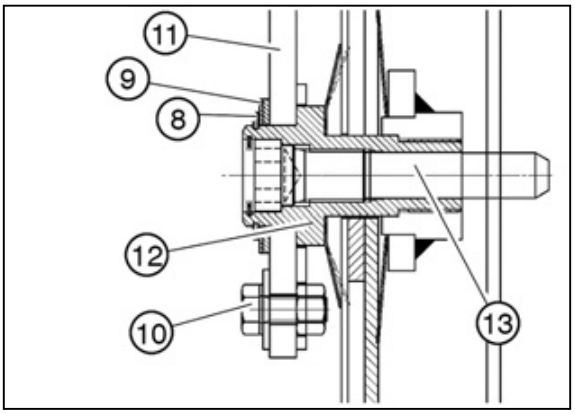


Fig. 15

- Fit the plate (A) ref. 296008, tightening the 2 threaded rods (B), ref. 296114 (M 12 x 310) by at least 25 mm on the outer disc of the variator;
- Tighten the nuts (4).
- Tighten the 2 nuts (5) until maximum compression of the spring (6).
- Remove the belt from the variator disks.
- Open the concave access cover from the left-hand side and lock the cylinder by fitting a copper or aluminum element (C) between one of the cylinder bars and the side as shown in the diagram.
- Remove the nut (7).
- Remove the outer disk (8) and the parts (A, B, 6 and 9).

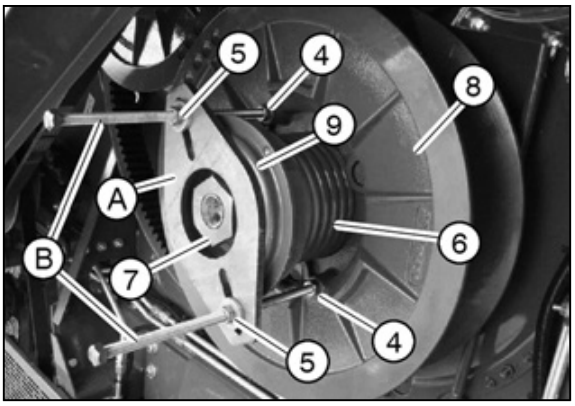


Fig. 31

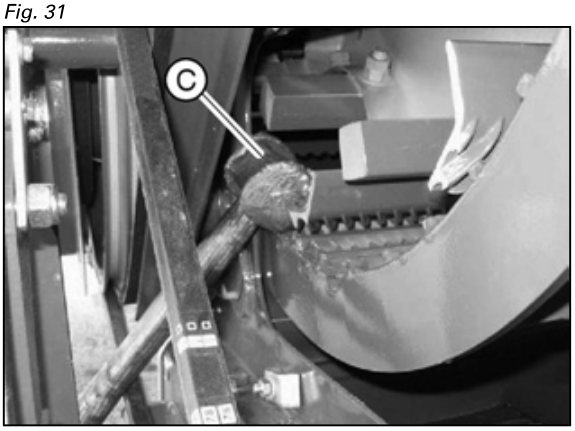


Fig. 32

- Remove the inner disk (10).

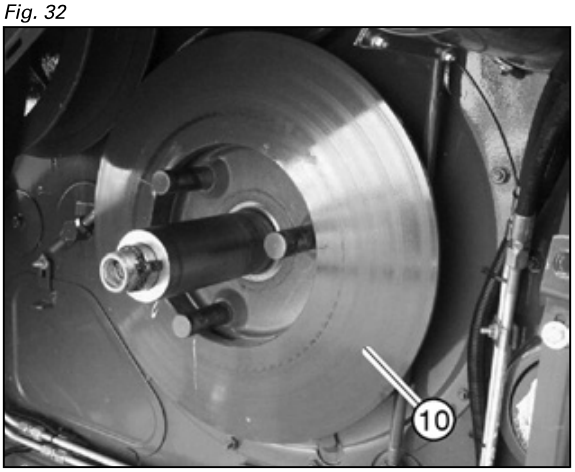


Fig. 33

17.2 Straw walker and shafts

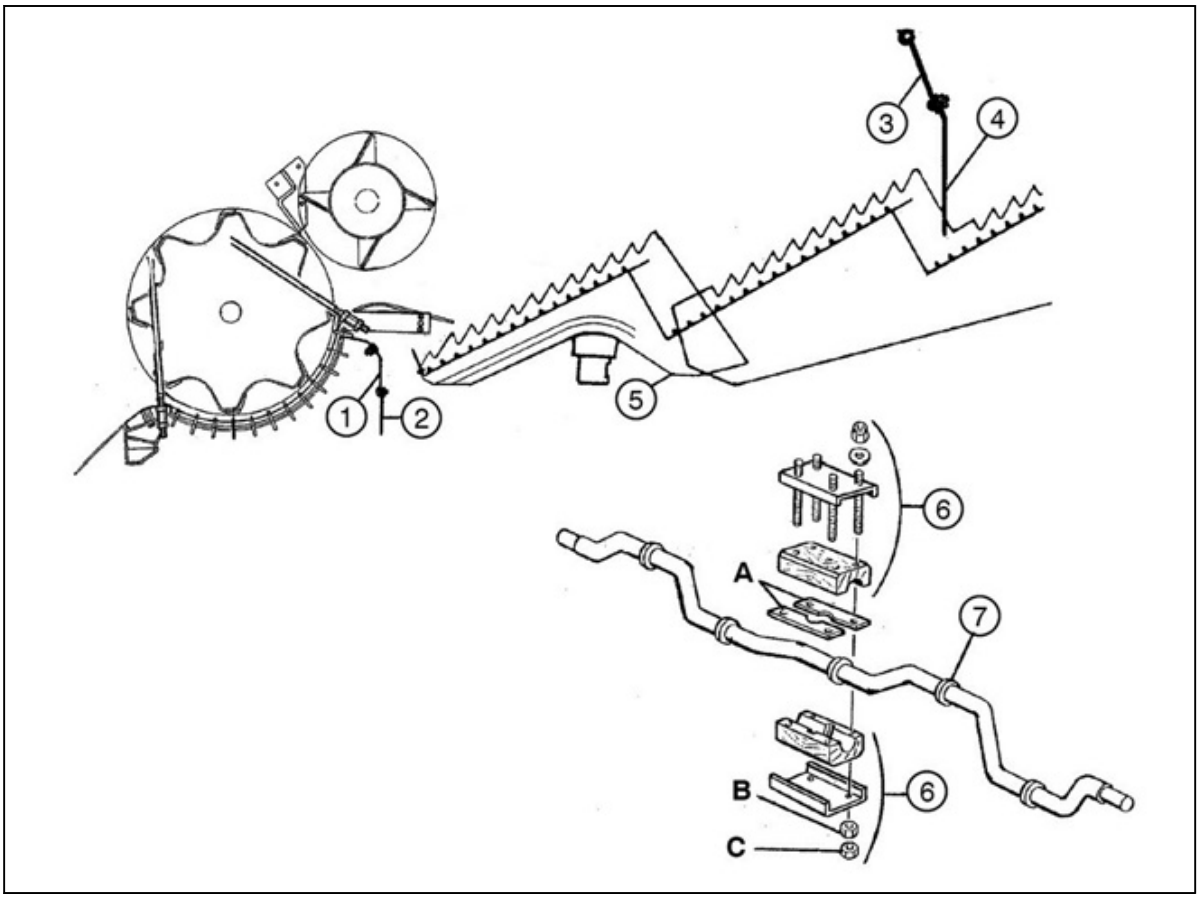


Fig. 1

(1.) Crop saving canvas support
(2.) Crop saving canvas
(3.) Straw saving canvas support
(4.) Straw saving canvas
(5.) Straw walkers
(6.) Straw walker support assembly
(7.) Straw walker shaft
(A.) Support clearance adjusting plate: can be removed if significant clearance is found between the shaft and pads
In any case, a minimum clearance of 1 mm should be ensured
(B.) Straw walker support fastening nut: tighten to **10 Nm**
(C.) Locking nut to lock nut B: tighten fully

NOTE: *Before each harvest, we recommend removing the straw walker support pads to clean them of residual dust and lubricate them with grease (for the type of grease, refer to the "Operator's Manual").*

18.4 Adjustment of the straw chopper rotor knives

Procedure

- The rotor blades (1) have two cutting edges. When worn they can be reversed, whereas when damaged they need replacement. Proceed as follows:
- Remove the screw (2), taking care not to lose the two spacers and the washers.
- Reverse the knife or replace it with a new one.
- Insert the screw (2) from the right-hand side (checking the direction of travel)

  NOTE: *The nut* (3) *should be on the side of the drive train.*
- Tighten the nut (3) to a torque of **64 Nm**.

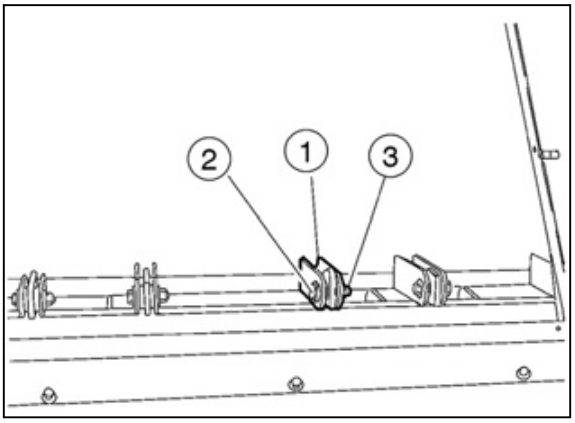


Fig. 4

NOTE: *When replacing one blade, the diametrically opposite blade must also be replaced to prevent rotor unbalance.*

- The pair of rotating knives (B) must be positioned centrally with respect to the fixed counter-knife (A) at the left and right-hand end of the straw chopper by moving the rotor on its axis.

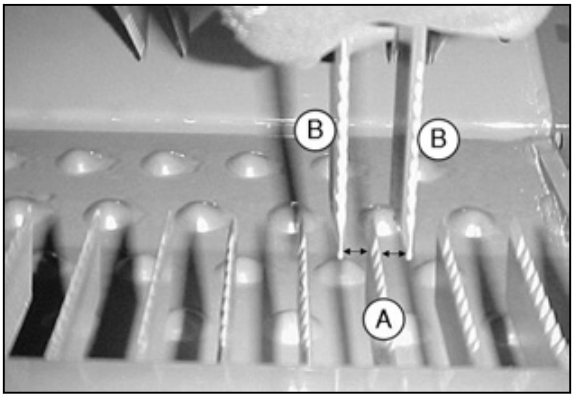


Fig. 5

- Lock the rotor shaft after centring the knives using the ring nut.
- Tighten the ring nut to a torque of **85±5 Nm**.
- Use the special wrench ref. LA327701200.
- Repeat the operation on the opposite side of the machine.

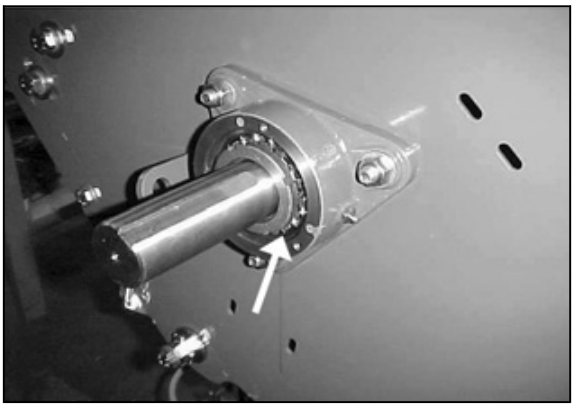


Fig. 6

19.2 Cleaning drive transmission

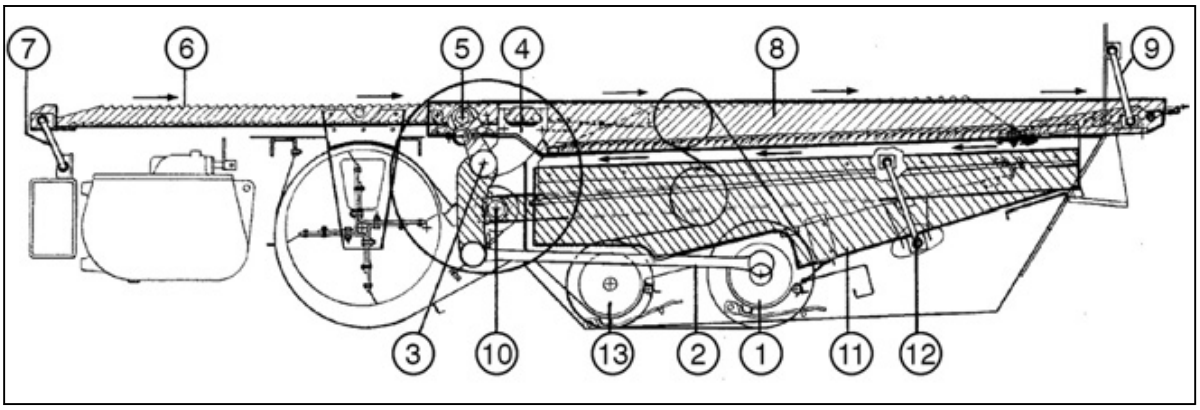


Fig. 1

1. Tailing control pulley
2. Box drive connecting rod
3. Box control shaft
4. Box control shaft support
5. Feed box support and upper shaker shoe
6. Feed box
7. Feed box front connecting rod
8. Upper shaker shoe
9. Upper shaker shoe rear connecting rod
10. Lower shaker shoe support
11. Lower shaker shoe
12. Lower shaker shoe rear connecting rod
13. Crop auger control pulley

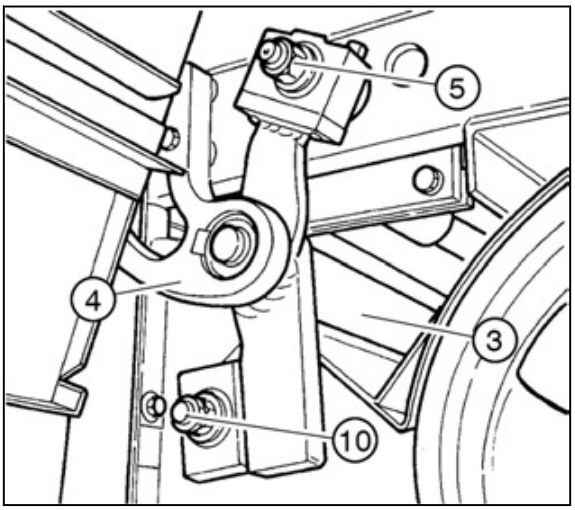


Fig. 2 Right-hand side

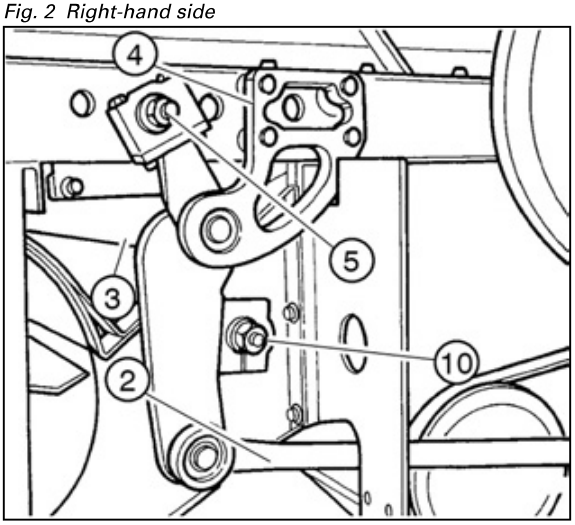


Fig. 3 Left-hand side

19.7 Upper shaker shoe

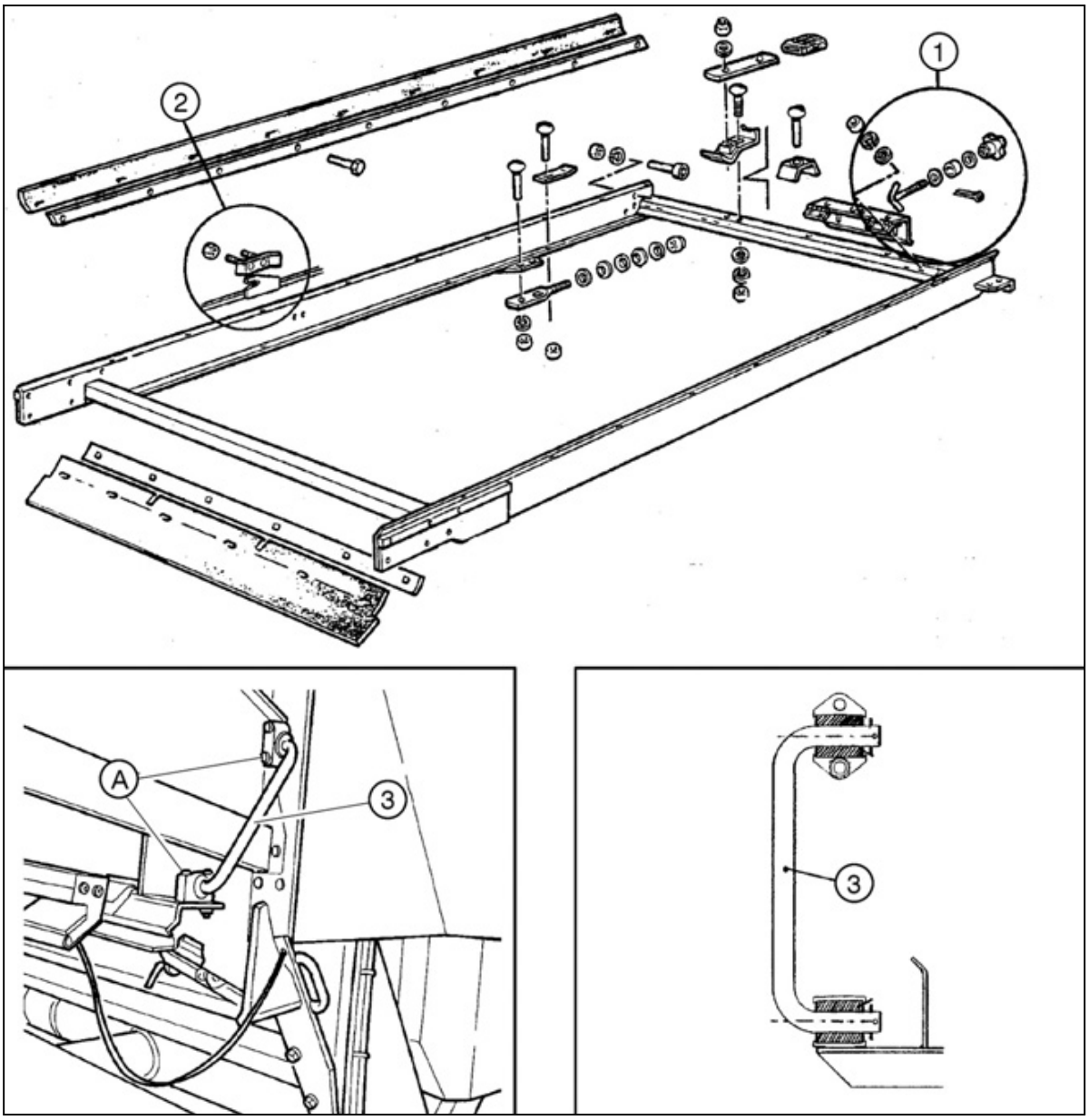


Fig. 24

1. Rear sieve fastener
2. Side sieve fastener
3. Swinging box support connecting rod

NOTE: *The support screws (A) must be fastened with the connecting rods at half-stroke.*

20.6 Grain unloading auger

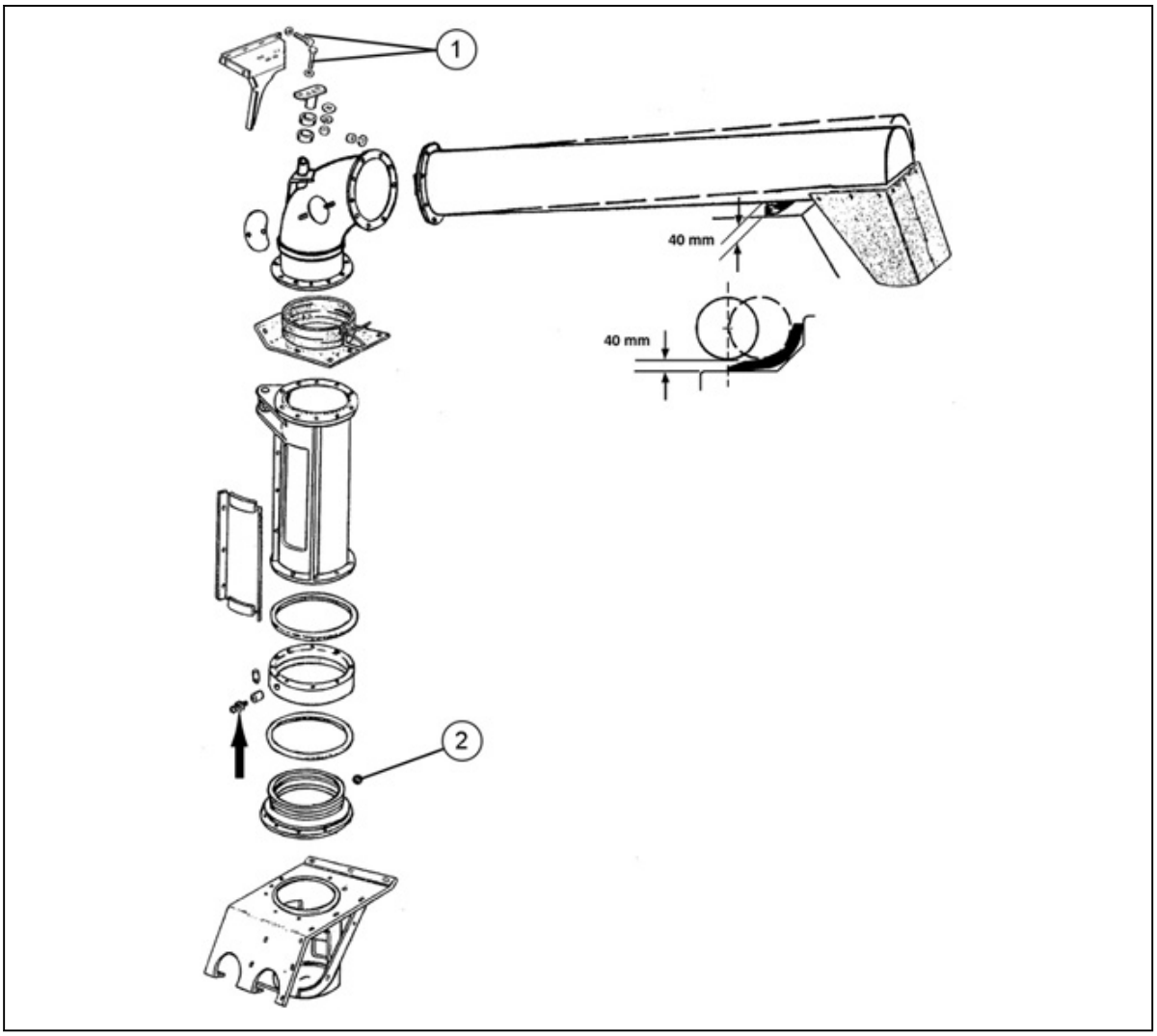


Fig. 16

When the unloading auger is in the position indicated in the figure, it must be located at a height of 40 mm from the base of the rubber support.

Adjustment:

- Position the unloading auger as shown in the figure;
- slightly loosen the screws (1);
- position the unloading auger at the height indicated;
- tighten the screws (1)
- bring the unloading auger into the rest position and ensure that it arrives at full lock position, whilst simultaneously resting lightly on its rubber support.

Regularly grease the vertical pipe support spheres (2).