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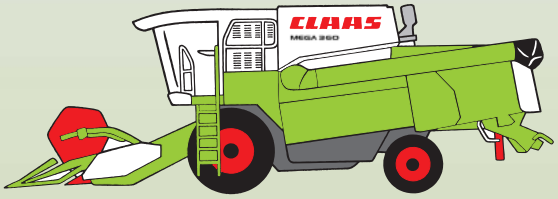


**MEGA 360 - 350**

**Up to serial number:**
**845 00386**
**835 00360**

# Technical Systems

# Hydraulic System

SERVICE & PARTS

## Overall hydraulic system circuit diagram

- from serial no. 835 00147
  845 00124

**Key to diagram:**

| | | |
|---|---|---|
| 205 | Working hydraulics pump | 11 $cm^3$/rev. |
| 217 | Rotary chaff screen drive pump | 5.5 $cm^3$/rev. |
| 218 | Steering hydraulics pump | 5.5 $cm^3$/rev. |
| 706 | Pressure relief valve | 120 bar |

**Description of function:**

Steering

In the neutral steering position, oil flows freely through the steering control unit = Orbitrol (609).
Turning the steering wheel to one direction causes the discs to rotate relative to each other. At 1.5°, opening the channels towards the chambers starts. At 4°, the neutral position channels are fully closed. At 6°, the channels to the chambers are fully open. The rotation of the discs relative to each other is limited to ± 8°.
A feed of pressurized oil to the rotor set has the following effects:

- Rotation of rotor
- Feed of an oil quantity which is proportional to the rotation into the steering cylinder, the rear wheels being influenced.
- An internal mechanical return from the rotor to the outside disc so that the channels in the valve are closed when the rotor rotates to the same angle as the steering wheel.

Autopilot
(see Electric system - Diagram 28)

When the road travel circuit is unlocked and the threshing mechanism is engaged, the AUTOPILOT module A 9 is supplied with power by the main switch S 10. Following the start signal by foot switch S 9, the solenoid coil Y9 / Y10 is actuated according to the signals from touch sensor B7 / B8. The steering position is being checked by rear wheel position indicator B 6.
For safety reasons, the AUTOPILOT function is interrupted immediately by the signal of the overrider switch Z3 when actuating the steering manually. If the driver leaves the seat, the seat contact Z5 will interrupt the autopilot function after approx. 5 s.
The centralizing switch R3 on the switch console enables the machine to drive precisely straight ahead even when driving on a slope.
For quick response of the steering in autopilot mode, the hydraulic system is equipped with a accumulator 503. If the pressure in this accumulator falls below approx. 135 bar, the oil pressure switch Z4 actuates the circulation shut-off valve Y77 until the pressure level reaches approx. 160 bar again.

**Key to diagram:**

| | |
|---|---|
| 410 | Orifice plate ..... Ø 1.5 mm |
| 503 | AUTOPILOT accumulator ..... 0.7 l/ 80 bar |
| 604 | AUTOPILOT balance screw |
| 732 | Non-return valve |
| 734 | Lock-up valve unit (non-return valve) |
| Y9 | AUTOPILOT left solenoid valve |
| Y10 | AUTOPILOT right solenoid valve |
| Z4 | Autopilot oil pressure actual value switch ..... 135/160±5 bar |
| A | Steering cylinder port |
| B | Steering cylinder port |
| P1 | Working hydraulics pump via circulation shut-off valve port |
| T | Working hydraulics return line port |

**Important!** Prior to dismounting items 503, 732, Z4, Y9 or Y10, the accumulator must be relieved at the balance screw (604).

**Description of function:**

If the accumulator pressure falls below 135±5 bar while the engine is running, the oil pressure switch (Z4) actuates the circulation shut-off valve (Y77).
The pressure build-up within the system caused by the circulation shut-off valve pre-loads the accumulator (503) via the non-return valve (732).

When the system pressure and consequently the accumulator pressure reach 160±5 bar, the oil pressure switch (Z4) opens and the circulation shut-off valve (Y77) goes back to neutral position. The non-return valve (732) separates the energy thus stored from the remaining working hydraulics system.
The pressure in this closed system is applied at the balls of the valve inserts of solenoid valves (Y9/Y10).

One of the solenoid valves (Y9/Y10) is actuated by the AUTOPILOT module, depending on the required steering direction.
The corresponding pilot spool opens the ball in the valve insert and closes the return line to the tank. The pressure now rising builds up against the piston and now opens the non-return valve at port A or B.
The return line of the steering cylinder is relieved to the tank via the valve insert of the unactuated solenoid valve (Y9/Y10).
The pressure rising further now opens the non-return valve at the opposite port and the steering cylinder is retracted or extended.
When the corresponding steering angle has been reached, the AUTOPILOT module deenergizes the solenoid valve (Y9/Y10).
If the oil pressure inside the accumulator (503) falls below 135±5 bar during the steering procedure, the oil pressure switch (Z4) is closed.
The circulation shut-off valve is actuated again and the accumulator (503) is pre-loaded again (see Electric system – diagram 28).

**Key to diagram:**

| | |
|---|---|
| I | Working hydraulics valve block |
| 110 | Oil tank |
| 112 | Return filter |
| 116 | Resonance tube |
| 205 | Working hydraulics pump |
| 217 | Rotary chaff screen pump (from serial no. 835 00147, 845 00124) |
| 218 | Steering hydraulics pump |
| 226 | Front attachment reverser drive motor |
| 703 | Working hydraulics pressure relief valve..... $175^{+15}$ bar |
| 706 | Pressure relief valve (rotary chaff screen) ..... 120 bar (from serial no. 835 00147, 845 00124) |
| 801 | Quick release coupling |
| 901 | Working hydraulics measuring port |
| A1 – A9 | Port |
| P1 | Pump port |
| T | Tank port |
| Y22/Y23 | Reel raise/lower solenoid valve |
| Y24/Y25 | Reel forward/backward solenoid valve |
| Y33/Y34 | Swing grain tank unloading tube in/out solenoid valve |
| Y67/Y68 | AUTOPILOT left/right transverse control solenoid valve |
| Y77 | Working hydraulics master valve solenoid valve (only with autopilot) |
| Y85/Y87 | Front attachment raise/lower solenoid valve |
| Y86 | Reverse front attachment solenoid valve |

**Description of function:**

Pressure relief valve

The pressure relief valve protects the hydraulic system or the connected mechanical components from damage by excessive forces.
The spring in the pressure relief valve (703) is pre-stressed for a system pressure of **$175^{+15}$ bar**. The pressure setting may be modified by removing or adding shims.

- 0.5 mm shim corresponds to approx. 10 bar
- 1.2 mm shim corresponds to approx. 23 bar

Note: The above values refer to a rated pressure of 180 bar and may deviate, depending on the actual system. Each time the setting has been modified, the system pressure must be checked.

**Key to diagram:**

| | |
|---|---|
| I | Working hydraulics valve block |
| 110 | Oil tank |
| 112 | Return filter |
| 116 | Resonance tube |
| 205 | Working hydraulics pump |
| 217 | Rotary chaff screen pump (from serial no. 835 00147, 845 00124) |
| 218 | Steering hydraulics pump |
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| 706 | Pressure relief valve (rotary chaff screen) ..... 120 bar (from serial no. 835 00147, 845 00124) |
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| Y85/Y87 | Front attachment raise/lower solenoid valve |
| Y86 | Reverse front attachment solenoid valve |

| | | |
|---|---|---|
| **Key to diagram:** | A2 | Reverser drive motor connection |
| | B | Hydraulic cylinder port |
| | 353 | Front attachment reverse hydraulic cylinder |

**Description of function:**

Adjustment

The reverser support is aligned towards the feeder housing drive shaft by adjusting an eccentric bushing on the reverser cylinder (353).
The stroke is adjusted on the adjusting screw in the piston so that the drive pinion of the hydraulic motor (226) has a backlash of approx. 0.2 mm with the drive gearwheel at maximum engagement. To this end, adjust the screw to **0.5 mm** from the stop, with the reverser swung in.
The total stroke of the reversing cylinder (353) is 12 mm, with the oil flow to the hydraulic motor being released at approx. 11 mm.

**Notes:**

# Chapter 4
# Low-pressure hydraulic circuit

**Key to diagram:**

| | |
|---|---|
| 301 | 3-D sieve pan hydraulic cylinder |
| 406 | Orifice plate.....Ø 0.8 mm |
| 601 | 3-D sieve pan pendulum control 4/3 way valve |
| T | Tank port |
| P4 | Low-pressure port 19 bar |
| A | 3-D sieve pan hydraulic cylinder (301) port |
| B | 3-D sieve pan hydraulic cylinder (301) port |
| a | Lid |
| b | Pendulum |
| c | Housing |
| d | Spool |
| e | Bleeding screw (M6x16) |
| f | Linkage |

**Description of function:**

Even with a slight lateral inclination of the machine, the housing (c) will change its position relative to the spool (d) which is constantly kept in a horizontal position by the pendulum (b) via a mechanical link.
This releases the oil flow (P4) to one of the two sides (A/B) of the 3-D sieve pan hydraulic cylinder (301).
The corresponding opposite side (A/B) is connected to the return line to the tank (T) by the pendulum housing (c).

The hydraulic cylinder (301) positions the housing (c) until the parallel vertical position relative to the pendulum (b) is reached again.
In this process, the 3-D sieve pan pendulum control 4/3 way valve (601) is returned to neutral position.

The movement of the pendulum housing (c) changes the sieve pan linkage (f) via a rodding. The height of the 3-D effect always depends on the inclination of the slope in question.

Bleeding of 3-D system

For filling and bleeding the housing (c), first the bleed screw (e) is loosened so the oil can flow without restriction.
With the rodding (f) to the sieve pan unhinged and at min. no-load speed of the diesel engine, the pendulum (c) housing is moved manually until the oil comes out without bubbles.
Now re-install the rodding (f) to the sieve pan.

Note: Leaks near the bleed screw (e) must absolutely be avoided as otherwise there would be constant movement of the housing (c) against the end positions.

## 5.2

## Maize picker fold / Snapping plate adjustment circuit diagram

# Chapter 6
# Ground drive hydraulics

**Key to diagram:**

| | |
|---|---|
| 313 | Ground drive pump servo control hydraulic cylinder |
| 606 | Ground drive servo adjustment valve |
| G | Threaded bushing |
| M | Mechanical feedback |
| P | Spool |
| S | Swing disc |
| V | Adjusting lever |

**Description of function:**

Servo adjustment valve

In the neutral position of the ground drive servo adjustment valve (606), both ground drive pump servo control hydraulic cylinders (313) are pressure-loaded, keeping the swing disc (S) stable in any position.

The cable mounted on the adjusting lever (V) moves the spool (P) in the ground drive servo adjustment valve (606) from the neutral position to one or the other direction. Depending on the direction of travel, one of the ground drive pump servo control hydraulic cylinders (313) is thus pressure-relieved whereas the other servo cylinder remains connected to the feed pressure circuit.
The movement at the swing disc (S) thus corresponds to the pressure difference between the ground drive pump servo control hydraulic cylinder (313).

The ground drive pump servo control hydraulic cylinders (313) swing the variable displacement pump only by the path defined by the adjusting lever (V) because there is a mechanical feedback (M) of the swing angle to the ground drive servo adjustment valve (606).
This mechanical feedback (M) balances the spool (P) in the ground drive servo adjustment valve (606) at the control edge to the neutral position. The pre-set swing angle is thus maintained by the pressure compensation in both ground drive pump servo control hydraulic cylinders (313).

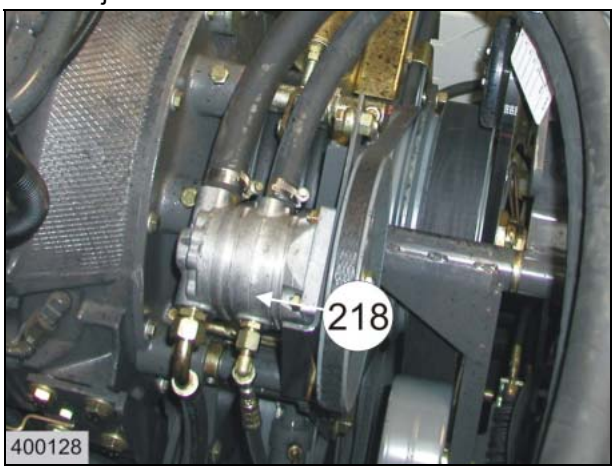
Adjusting the hydraulic neutral position:

To align the mechanical neutral position of the adjusting lever (V) with the hydraulic neutral position of the variable displacement pump, the spool (P) in the servo adjustment valve is adjusted using the threaded bushing (G). To do this, the bushing is first set to a clearance of **X = 14.75 mm** (X) from the housing of the ground drive servo adjustment valve (606). A pressure measurement on both sides of the high-pressure circuit determines the respective pressure rise caused by rotating the bushing (G) to one or the other direction. The centre position of the path by which the bushing (G) has been rotated corresponds to the average neutral position.

## 7.1

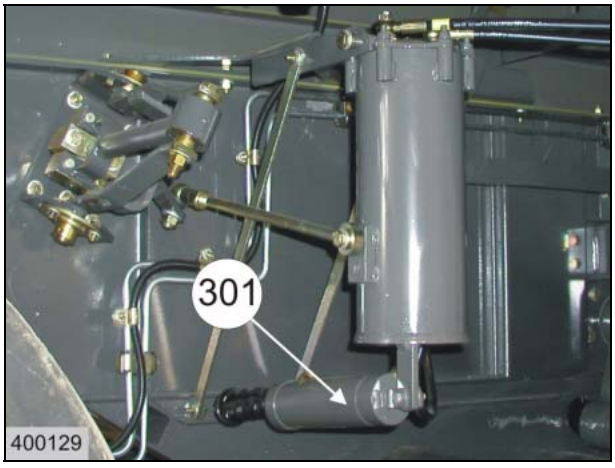
## Rotary chaff screen circuit diagram

218 – 3 j 20




226 – 8 e 16


301 – 7 o 16




305 – 8 e 16


306 – 8 e 19


311 – 5 j 16