Protecting the electronic / electrical systems during charging or welding

To avoid damage to the electronic/electrical systems, always observe the following:

1. Never make or break any of the charging circuit connections, including the battery connections, when the engine is running.
2. Never short any of the charging components to ground.
3. Always disconnect the ground cable from the battery before arc welding on the machine or on any attachment attached to the machine.
   - Position the welder ground clamp as close to the welding area as possible.
   - If welding in close proximity to a computer module, then the module should be removed.
   - Never allow welding cables to lay on, near or across any electrical wiring or electronic component while welding is in progress.

IMPORTANT: *If welding must be performed on the unit or the attachment (if it is attached), the battery ground cable must be disconnected from the battery. The electronic monitoring system and charging system will be damaged if this is not done.*

   Remove the battery ground cable. Reconnect the cable when welding is completed.

4. Always disconnect the negative cable from the battery when charging the battery with a battery charger.

⚠ WARNING ⚠

Batteries contain sulfuric acid. In case of contact with skin, flush the affected area with water for five minutes. Seek medical attention immediately. Avoid contact with the skin, eyes or clothing. Wear eye protection when working near batteries.

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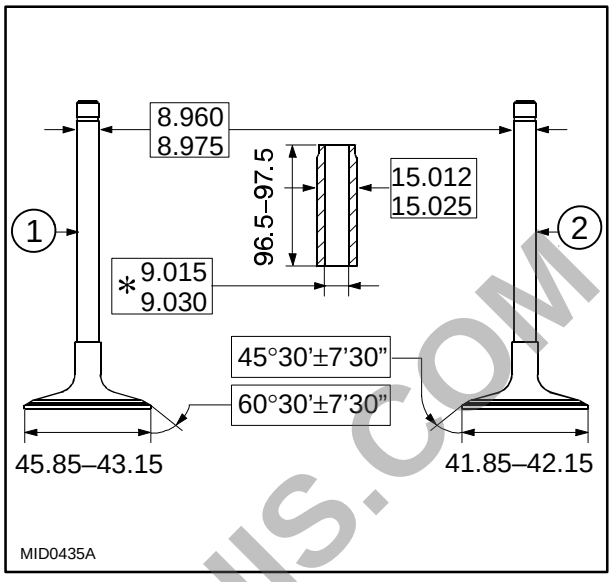
Main data of the valves and valve guides (Dimensions in mm)

Check with a micrometer that the diameter of the valve stems is as specified in the Fig.:

– 8.960 – 8.975 (0.3528 – 0.3533″)

* Measurement to make after driving in the valve guides.

1. Intake
2. Exhaust.



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Valve grinding

If necessary, grind the seats on the valves with a grinding machine, scalping as little material as possible.

Checking clearance between stem–valve and relevant valve guide

Using a dial gauge with a magnetic base, check the clearance between the valve stem and the relevant guide. If the clearance is too great, replace the valve and, if necessary, the valve guide.

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Checking connecting rods

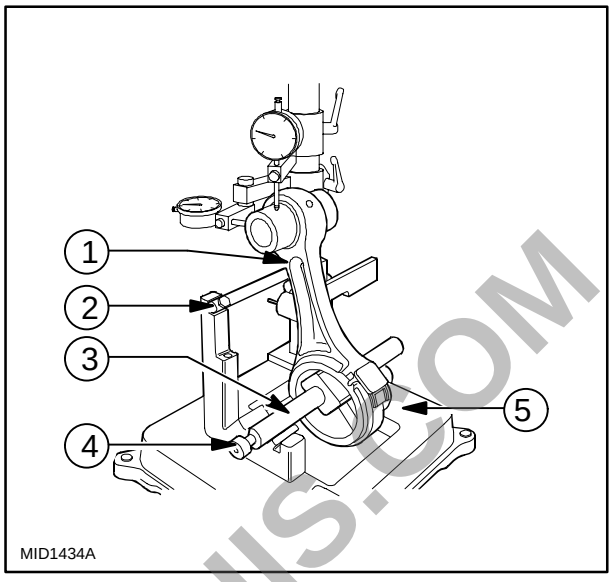
The alignment of the connecting rod, twisting and bending are checked with the appropriate tool.

Checking alignment

Check the alignment of the connecting rods (1) as follows:

– Fit the connecting rod (1) on the spindle of the tool (5) and lock it with the screw (4).

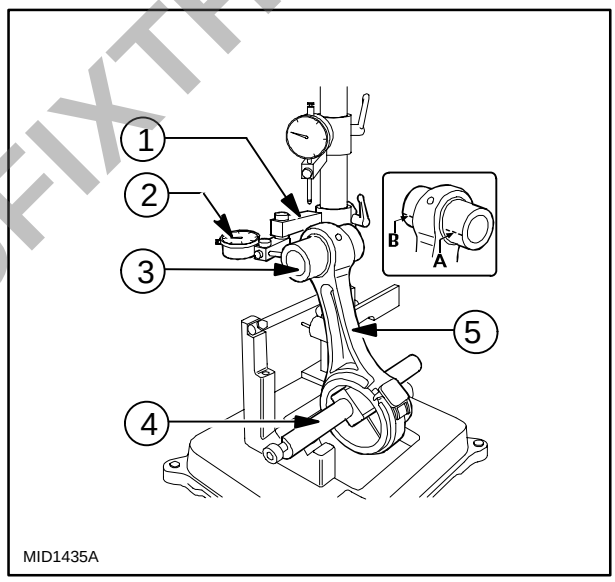
– Place the spindle (3) on the V–prisms resting the connecting rod (1) on the stop bar (2).



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Checking twisting

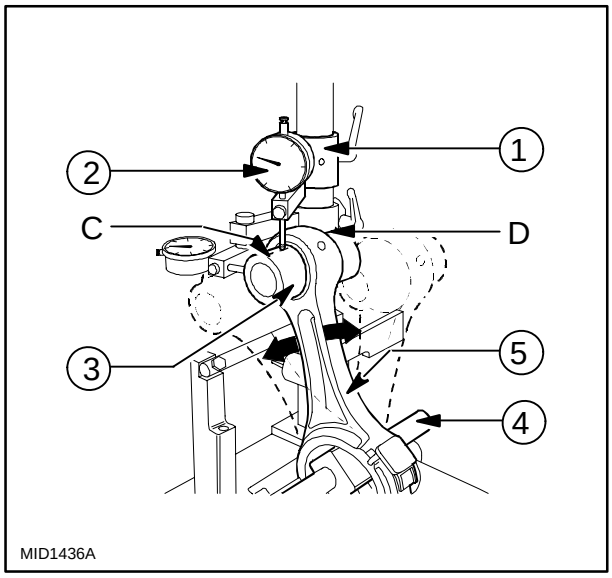
Check the twist of the connecting rod (5) by comparing two points (A and B) of the pin (3) on the horizontal plane of the connecting rod.
Position the mount (1) of the dial gauge (2) so that the latter is pre–loaded by approx. 0.5 mm on the pin (3) at point A and zero the dial gauge (2). Move the spindle (4) with the connecting rod (5) and on the opposite side (B) of the pin (3) compare any deviation: the difference between A and B must be no greater than 0.08 mm.



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Checking bending

Check the bend of the connecting rod (5) by comparing two points C and D of the pin (3) on the vertical plane of the connecting rod. Position the vertical mount (1) of the dial gauge (2) so that the latter rests on the pin (3) at point C.
Swing the connecting rod forwards and backwards, searching for the highest position of the pin and zero the dial gauge (2) in this condition.
Move the spindle with the connecting rod (5) and on the opposite side D of the pin (3) repeat the check for the highest point. The difference between points C and D must be no greater than 0.08 mm.



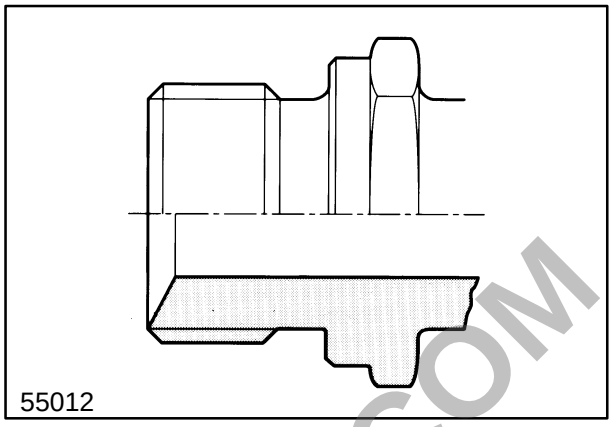
166

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Connections

Are screwed in ISO metric thread - tolerance class 6H - with a tightening torque as specified in the table below.

Tube outer diameter mm (in)	Torque Nm (lbf.ft)	
	Min.	Max.
8 (0,32)	40 (29)	45 (33)
10 (0,40)	65 (48)	70 (51)
12 (0,47)	80 (59)	85 (63)
16 (0,63)	100 (74)	120 (88)
18 (0,71)	120 (88)	140 (103)
22 (0,87)	200 (147)	220 (164)
28 (1,10)	350 (257)	380 (280)

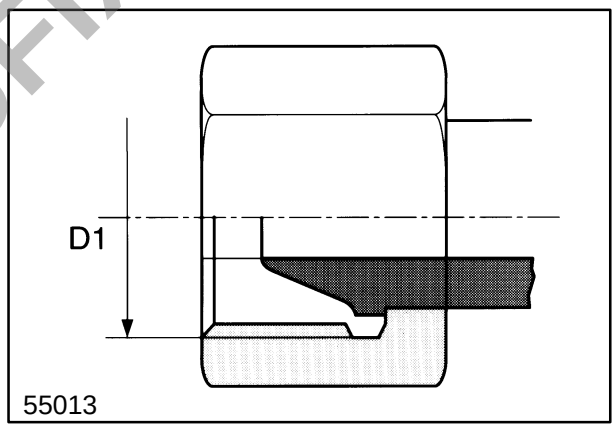


3

Swivel nut with ball-type nipple

Are suitable for use with female unions

D1 6H	Torque Nm (lbf.ft.)	
	Min.	Max.
M14 x 1.5	–	–
M16 x 1.5	15 (11)	20 (15)
M18 x 1.5	20 (15)	25 (18)
M24 x 1.5	30 (22)	35 (26)
M26 x 1.5	–	–
M30 x 2	–	–
M36 x 2	–	–



4

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P. Measuring equipment

Code	Description	Location	Line
P1.	Engine temperature gauge	Console module in cab	7330
P2.	Fuel gauge	Console module in cab	7350
P4.	Clock	Cab roof	9850

R. Resistances

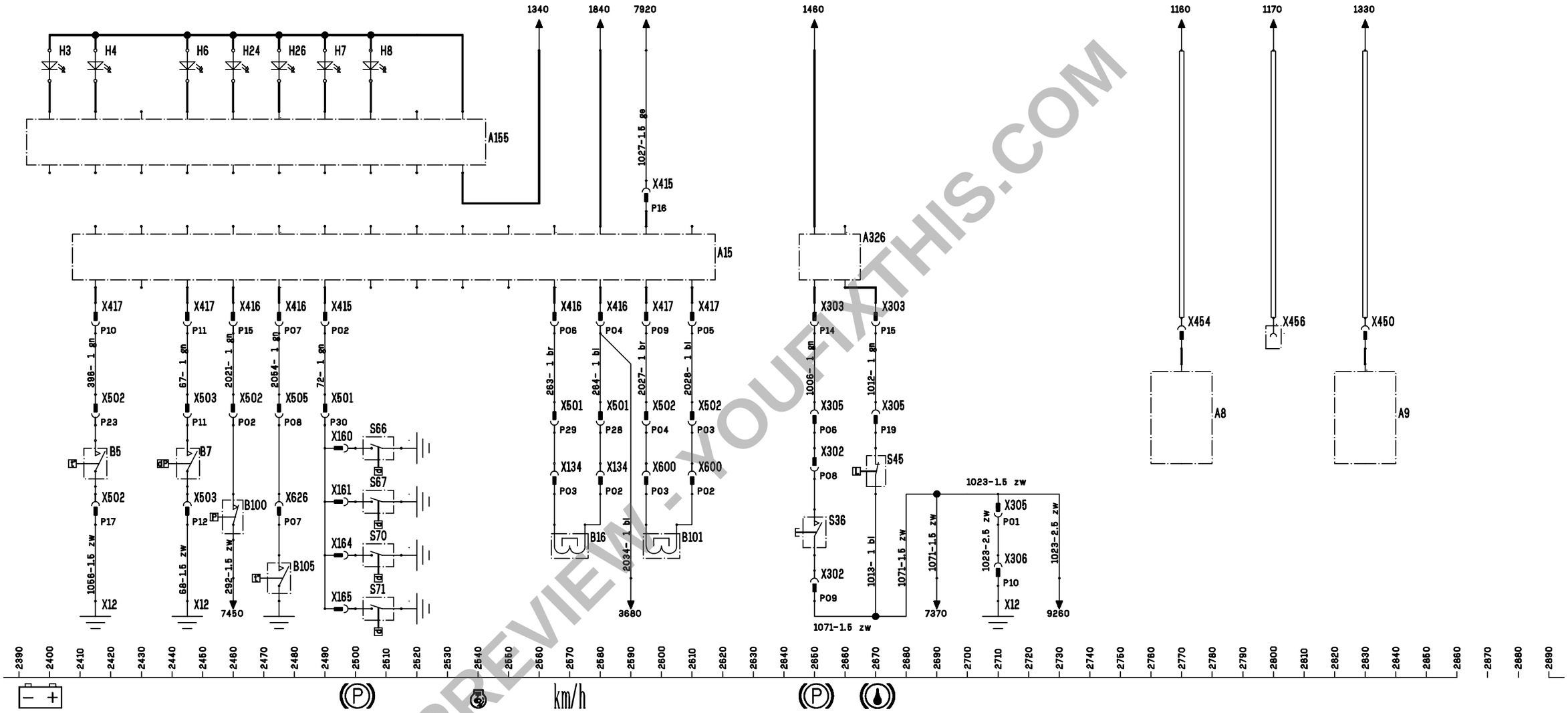
Code	Description	Location	Line
R1.	Engine heating	Engine	12040
R4.	Header height sensor	Chopper body, left–hand side	7160
R5.	Multifunctional lever position potentiometer	Underneath multifunctional lever	750
R6.	Stubble height control potentiometer	Arm rest module	6820
R7.	Ground pressure control potentiometer	Arm rest module	6850
R14.	Auto–Pilot centering potentiometer	Steering column	6610
R15.	Rear windshield heating	Rear windshield	10480
R30.	Crop processor roll clearance potentiometer	Left–hand side of chopper body	4300
R31.	CAN resistance	Engine	11740

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8a CPU INPUTS AND DISPLAY
FX30NA 5262 > ..... FX40NA 5262 > ..... FX60NA 5262 > .....

V+VOOR KONTAKT
V+NA KONTAKT 1
V+NA KONTAKT 2

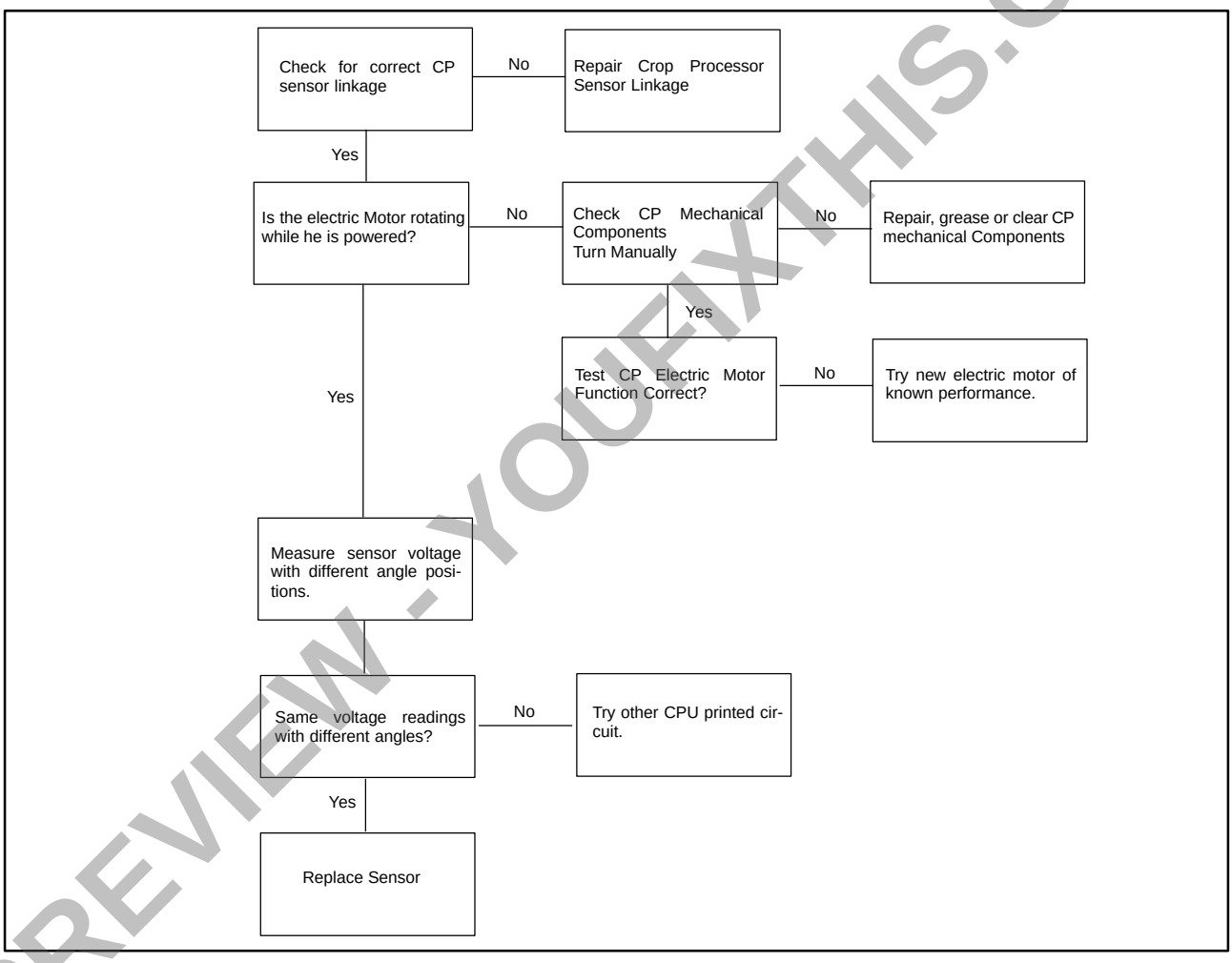


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Error Code	Description	Importance
150	CROP PROCESSOR SENS.	Medium

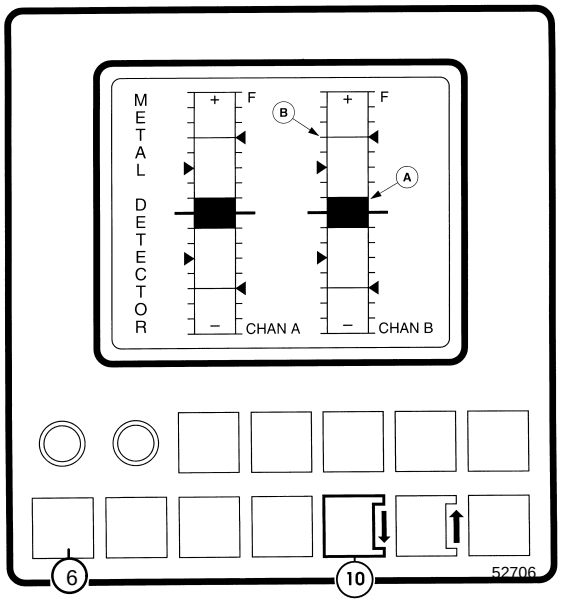
Explanation :	There is no voltage change of the crop processor distance sensor **while the CP electric motor is powered.**
Action :	If no crop processor is installed, check in the InfoView calibration for “CROP PROCESSOR : NO”. If the crop processor is installed, check crop processor sensor linkage. If correct, check potentiometer voltage with different sensor angle. If same voltage, change potentiometer. If different voltages, try other CPU printed circuit.



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INFOVIEW MONITOR



44

The metal detector page can be displayed on the InfoView monitor after key 10 is pressed.

Since there are 2 channels, left and right, there are 2 bargraphs, CHAN A and CHAN B, as shown on the InfoView monitor display (Fig. 44).

The black segments (A) on both bargraphs represent the peak magnetic noise readings in the two channels (measured during a period of 6 1/4 seconds).

In case the machine would be perfectly quiet (which in reality is rare), the bargraphs would be empty. As soon as magnetic noise is detected, part of the histogram will be filled around the midpoint with black sections.

The resolution of the noise readings is half a bargraph segment.

NOTE: *In case the background magnetic noise is high and the size or speed of the ferrous object is small, the magnetic disturbance caused by the object may not be able to exceed the magnetic noise. It will not be detected in that case, regardless, of the position of the threshold.*

The 4 lines B above the black sections represent the actual (fixed or adptative) threshold levels (or trip levels). When the magnetic noise readings exceed a threshold level, a metal detection will take place.

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Assembly

Input shaft

1. Install bearing E onto shaft K.

2. Install the same quantity of shims at D as you removed during disassembly. If you need to restart shimming from scratch then install a 1.00 mm (0.04”) shim pack.

NOTE: *No shimming codes are provided.*

3. Install bearing C onto shaft K.

4. Install bearing cup B into the gearbox housing CC.

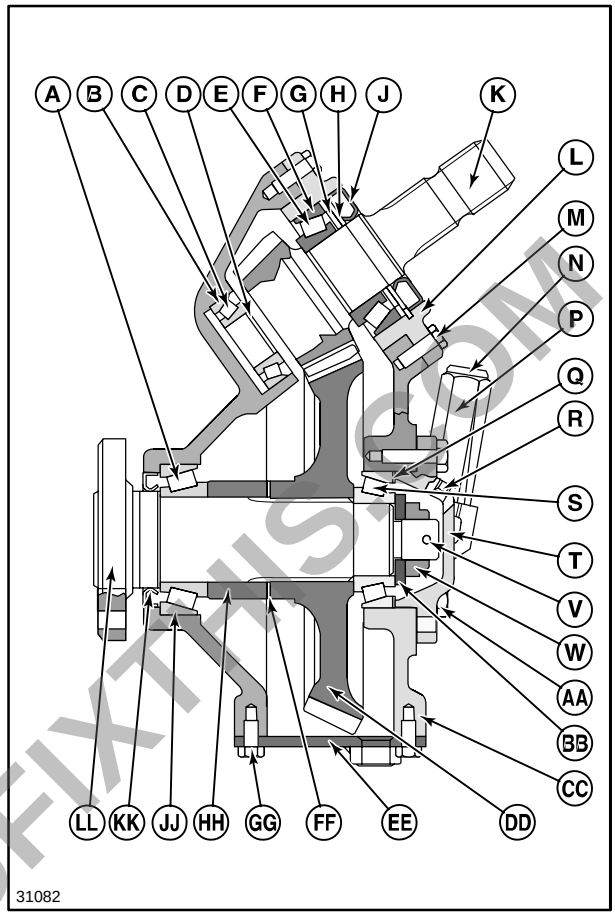
5. Install the preassembled shaft K and bearingsC and E into the gearbox housing CC.

6. Install bearing housing L with bolts M.

7. Install bearing cup F into housing L and press it as far down as possible.

8. Install as many shims as possible between the bearing cup F and the circlip cavity H. Install circlip H.

9. The rotating torque on shaft K should be 5 to 30 Nm (3.6 – 22 lbf.ft) without oil seal J.



10

Output shaft

10. Check the condition of seal KK and replace, if damaged. Lubricate the seal cavity.

11. Install bearing cup JJ if it was removed.

12. Carefully introduce shaft LL into the gearbox housing CC.

13. While installing shaft LL, install simultaneously bearing A, spacer HH, shims FF,gear DD. Drive or press them in place.

14. Install the same quantity of shims at FF as you removed during disassembly. If you need to restart shimming from scratch then install a 1.50 mm (0.06”) shim pack.

NOTE: *No shimming codes are provided.*
Install gear DD on the splines.

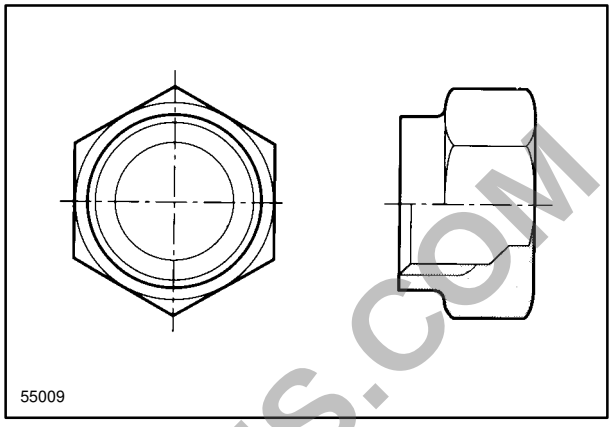
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TORQUE TABLES FOR HYDRAULIC COMPONENTS

UNION NUTS AND FERRULES

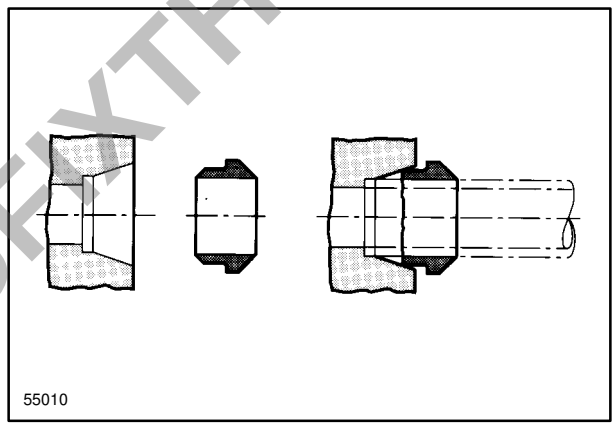
Union nuts



1

Ferrules

The ferrule must be pre-assembled on the tube. Tighten the union nut as specified in the table below. The ferrule and screw thread are greased.



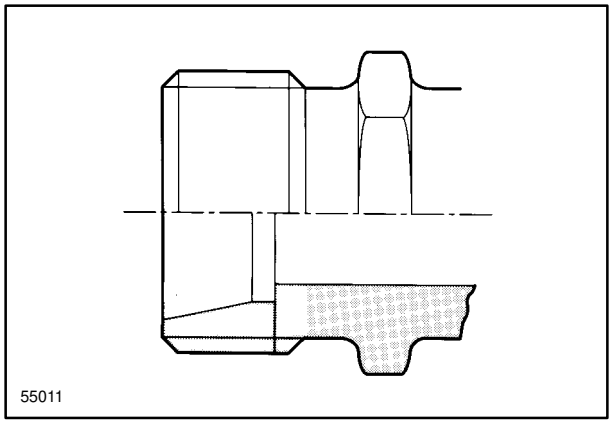
2

Tube outer diameter mm (in)	Torque Nm (lbf.ft)	
	Min.	Max.
8 (0.32)	15 (11)	20 (15)
10 (0.4)	25 (18)	30 (22)
12 (0.47)	35 (26)	40 (29)
16 (0.63)	50 (37)	55 (40)
18 (0.71)	60 (44)	70 (51)
22 (0.87)	100 (74)	110 (81)
28 (1.10)	110 (81)	120 (88)

METRIC FITTINGS

Unions

Are suitable for use with union nuts and ferrules and ball-type nipples.



3

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ELECTRICAL DIAGRAMS FX EUROPE

Ref.	Line	Group / Series		
1a	10	STARTER CIRCUIT 24V		
		FX300 27.04 > 27.08	FX375 29.04 > 29.08	FX450 30.04 > 30.08
		9630 18.04 > 18.08	9640 21.04 > 21.08	9645 22.04 > 22.08
1b	10	STARTER CIRCUIT 24V		
		FX300 27.09 > 5080	FX375 29.09 > 5080	FX450 30.09 > 5080
		9630 18.09 > 5080	9640 21.09 > 5080	9645 22.09 > 5080
1c	10	STARTER CIRCUIT 24V IVECO		
		FX28 5083 > 5168	FX38 5083 > 5168	FX48 5083 > 5168
1d	10	STARTER CIRCUIT 24V IVECO		
		FX28 5174 > 5214	FX38 5174 > 5214	FX48 5174 > 5214
1e	10	STARTER CIRCUIT 24V IVECO		
		FX28 5218 >	FX38 5218 >	FX48 5218 > ....
1f	10	STARTER CIRCUIT 24V CATERPILLAR		
		FX58 5083 > 5168		
1g	10	STARTER CIRCUIT 24V CATERPILLAR		
		FX58 5174 > 5214		
1h	10	STARTER CIRCUIT 24V CATERPILLAR		
		FX58 5218 >		
2a	520	ENGINE THROTTLE CONTROL		
		FX300 27.04 > 5080	FX375 29.04 > 5080	FX450 30.04 > 5080
		9630 18.04 > 5080	9640 21.04 > 5080	9645 22.04 > 5080
2b	520	ENGINE THROTTLE CONTROL IVECO		
		FX28 5083 > 5168	FX38 5083 > 5168	FX48 5083 > 5168
2c	520	ENGINE THROTTLE CONTROL IVECO		
		FX28 5174 > 5214	FX38 5174 > 5214	FX48 5174 > 5214
2d	520	ENGINE THROTTLE CONTROL IVECO		
		FX28 5218 >	FX38 5218 >	FX48 5218 > ....
2e	520	ENGINE THROTTLE CONTROL CATERPILLAR		
		FX58 5083 > 5168		
2f	520	ENGINE THROTTLE CONTROL CATERPILLAR		
		FX58 5174 > 5214		
2g	520	ENGINE THROTTLE CONTROL CATERPILLAR		
		FX58 5218 >		
3a	690	HYDROSTATIC CONTROL		
		FX300 27.04 > 5080	FX375 29.04 > 5080	FX450 30.04 > 5080
		9630 18.04 > 5080	9640 21.04 > 5080	9645 22.04 > 5080
3b	690	HYDROSTATIC CONTROL IVECO		
		FX28 5083 > 5214	FX38 5083 > 5214	FX48 5083 > 5214

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25e AIR CONDITIONING
FX28 5083 > .... FX38 5083 > .... FX48 5083 > ....
FX58 5083 > ....

Code	Description	Location	Line
A17.	AC–compressor surveillance	CPU print	9400
A37.	AC–compressor control	Lights print	9350
A156.	Compressor LED's control	Dashboard print	9470
A324.	Air conditioning operation	Dashboard print	9200
B61.	Thermostat switch	Dashboard print	9230
F3.	25A - Air conditioning fan	Fuse print	9230
F43.	Fan	Central electronic box	9330
H13.	Compressor overpressure LED	Instrument panel	9460
H14.	Compressor underpressure LED	Instrument panel	9470
K56.	Fan relay	Console module in cab	9280
K57.	Fan ground relay	Console module in cab	9310
M11.	Fan motor	Underneath operator's seat	9310
M19.	Additional fan		9290
S37.	Fan + air conditioning switch	Console module in cab	9250
S60.	Air conditioning safety switch	Console module in cab	9230
S62.	Compressor overpressure contact	Compressor	9380
S63.	Compressor underpressure contact	Compressor	9420
Y27.	Compressor	Left–hand side of engine	9340

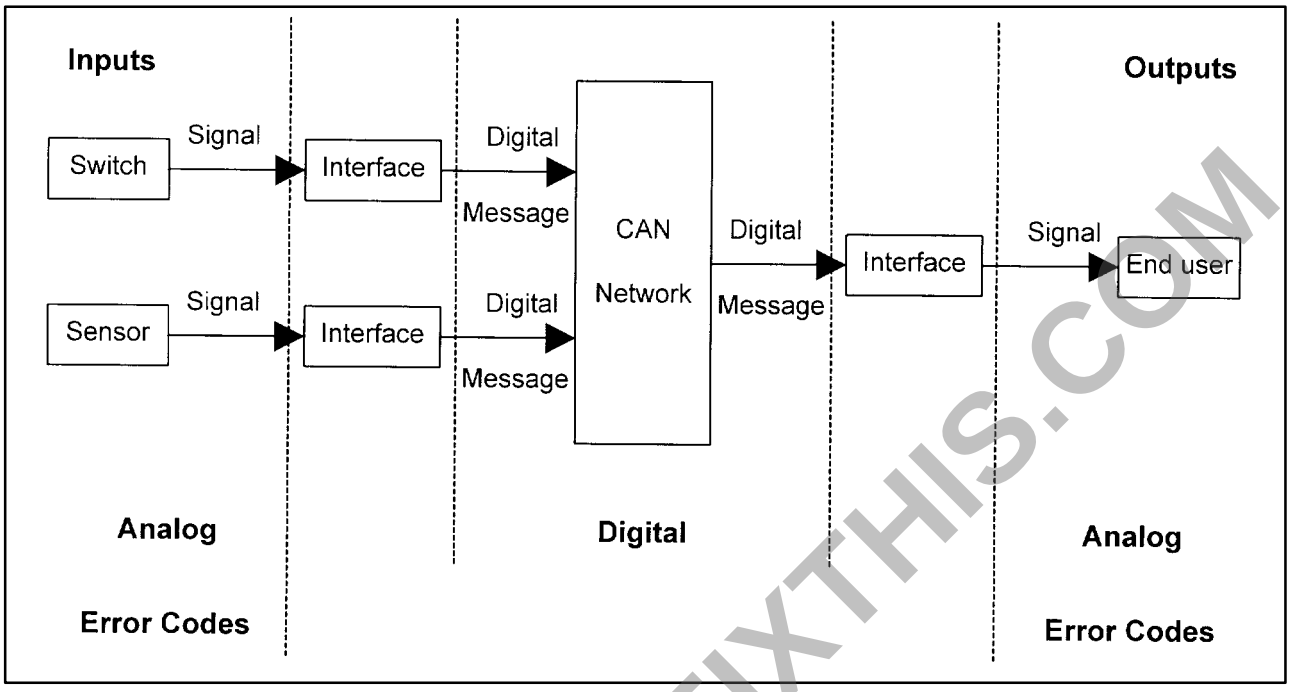
Line: 9190 - 9520

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ERROR CODES MESSAGES



6

All interfaces are built in such a way that they can deduce an interruption in the signal. This interruption can be a short circuit or an open circuit from the sensor / switch or to an end user (motor, valve).

The interface will send a message on the CAN system, which will be translated into an error message on the InfoView monitor.
Also refer to chapter 9/4b "Error messages overview".

Once an interruption in the signal for an end user is detected, the electronic system will automatically stop to power the output line.

Possible causes:

- Open or short circuit in wiring loom or connectors.
- Sensor or end user shorted or damaged.
- Interface defect.

Action:

1. Check wiring and connections.
2. Check switch/sensor or end user (motor, valve).
3. Check interface visually (located on printed circuit boards).

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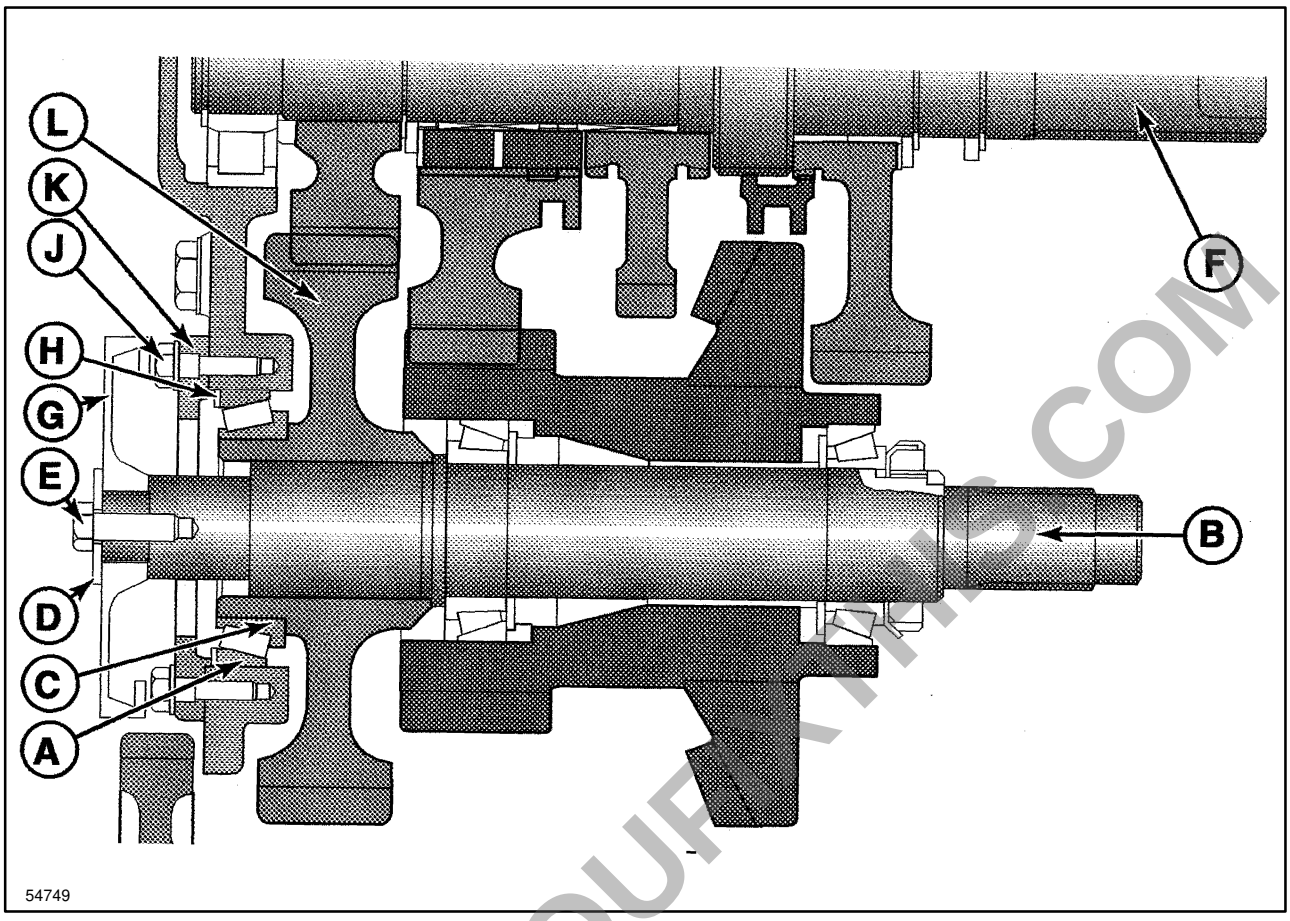
Error messages

Error Code	Key words
360	No engine oil press.
361	Oil press sens fault
362	No hydrost. pressure
363	Hydrost. sensor fault

Electrical diagrams
Group 9 : Engine quick-stop system

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19

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EXPLANATION OF MACHINE SERIAL NUMBER

Example : n° 375262001

375262001: The first two digits identify the model within a product line:

FX30 = 35
FX40 = 36
FX50 = 37
FX60 = 38

FX30NA = 40
FX40NA = 41
FX60NA = 42

37**5**262001 : The third digit indicates the product line. The code for the forage harvester product line is (5).

375**262**001 : These 3 digits indicate the batch in which the machine was made.

37**5262**001 : Product line number (5) and batch (262) together form the series number (5262).

375262**001** : The last 3 digits are a sequential number for each model within a batch.

Summarizing we can say that this machine is the first FX50 of serie 5262.

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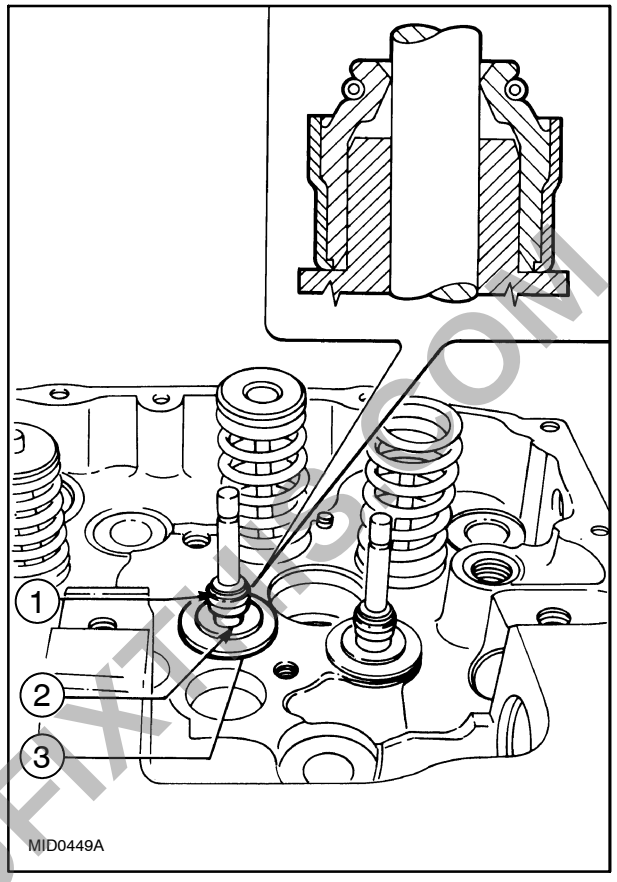
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Fitting valves and oil seal

Lubricate the stem of the valves and insert them in their valve guides. Mount the bottom plates, 3, with a key:

- **296181**, for engine F3A.

Fit the oil seal, 1, on the valve guide, 2, then mount the valves as follows.



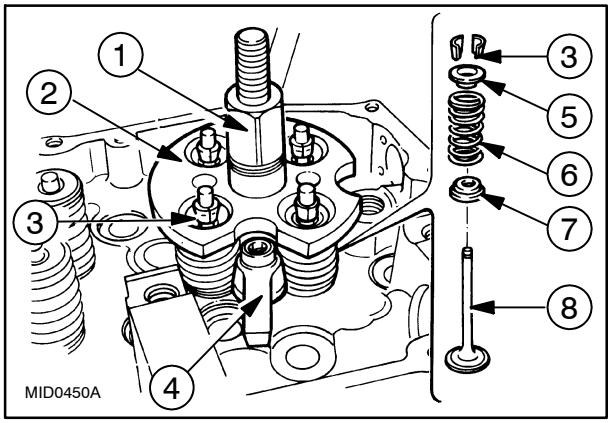
189

Mount the springs, 6, and top plate, 5.

On the cylinder head, fit the tool, 2:

- **296173** and **296174**, for engine F3A.

And secure it with the bracket, 4. Screw down the lever, 1, until it is possible to mount the cotters, 3, remove the tool, 2.

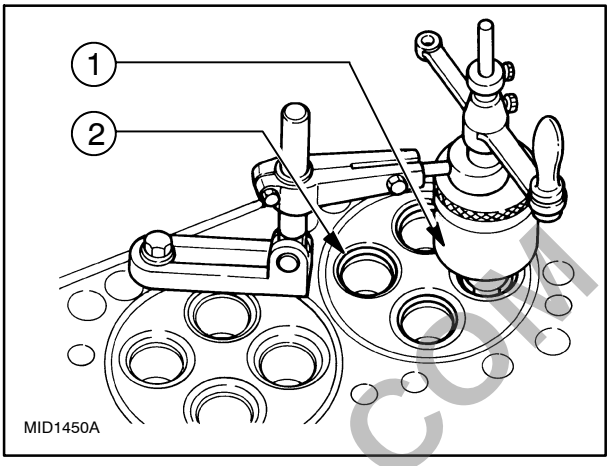


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Check the valve seats (2). If you find any slight scoring or burns, rebore them with the tool (1) according to the angles given in figures 178 and 179. If you need to replace them, with the same tool and taking care not to damage the cylinder head, scalp as much material as possible from the valve seats until it is possible, with a punch, to extract them from the cylinder head.



180

Heat the cylinder head to 80–100°C and, using a suitable drift, mount the new valve seats (chilled in liquid nitrogen) (2) in them. Using the tool (1), rebore the valve seats according to the angles given in figures 178 and 179.

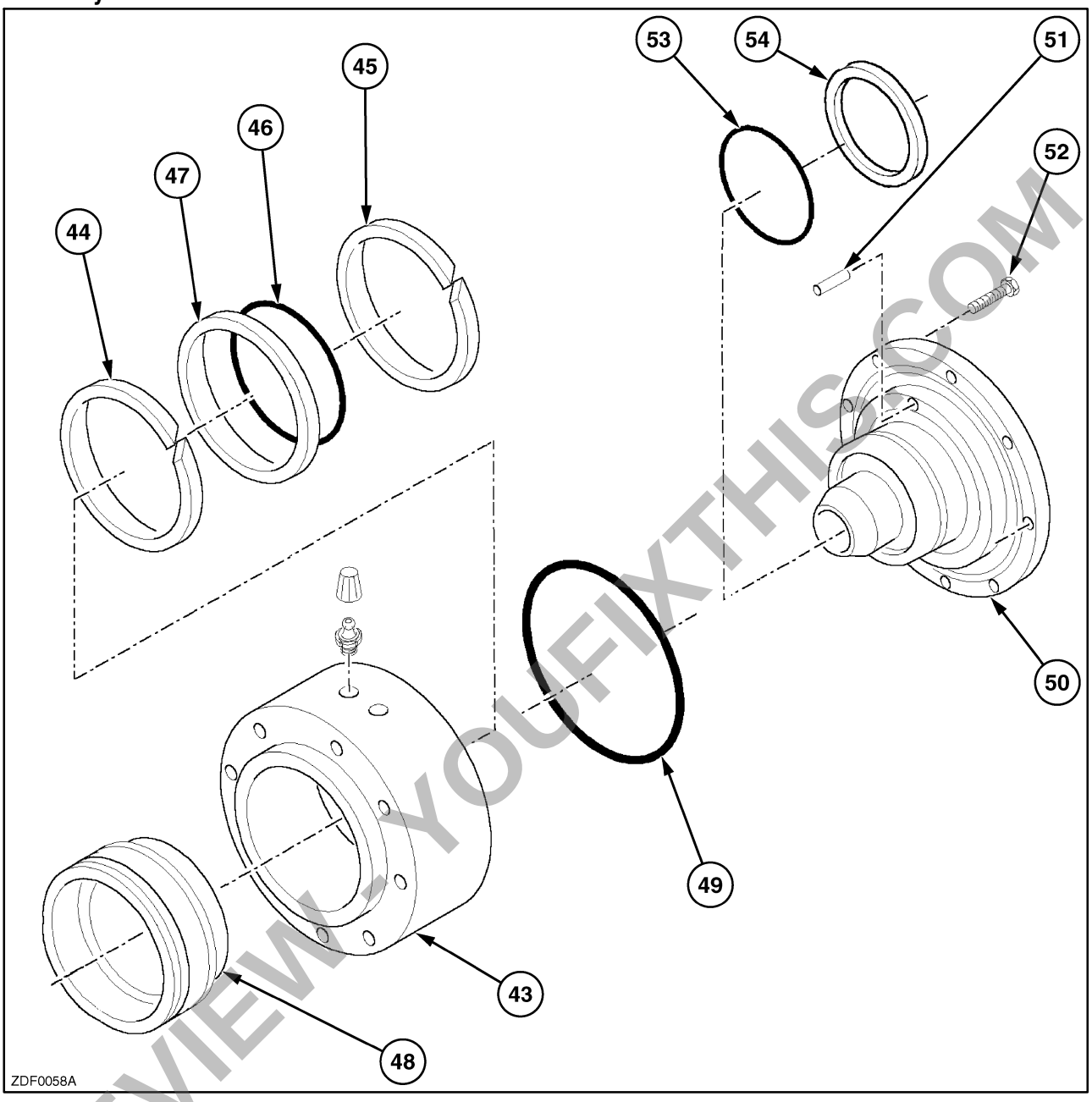
After reboring the valve seats, use tool **296151** and the dial gauge to check that the position of the valves in relation to the face of the cylinder head is:

- –0.54 - –0.85 mm (cavity) intake valves;
- –1.75 - –2.05 mm (cavity) exhaust valves.

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Clutch cylinder



8

22. Apply some air pressure to the cylinder to remove the piston (48) from its housing.

23. Remove the bolts (51).

24. Take apart the clutch cylinder inner housing (50) and the clutch cylinder outer housing (43).

25. In the outer housing (43), replace the piston guide rings (44) and (45).

26. Replace the O-ring (46) and the seal ring (47).

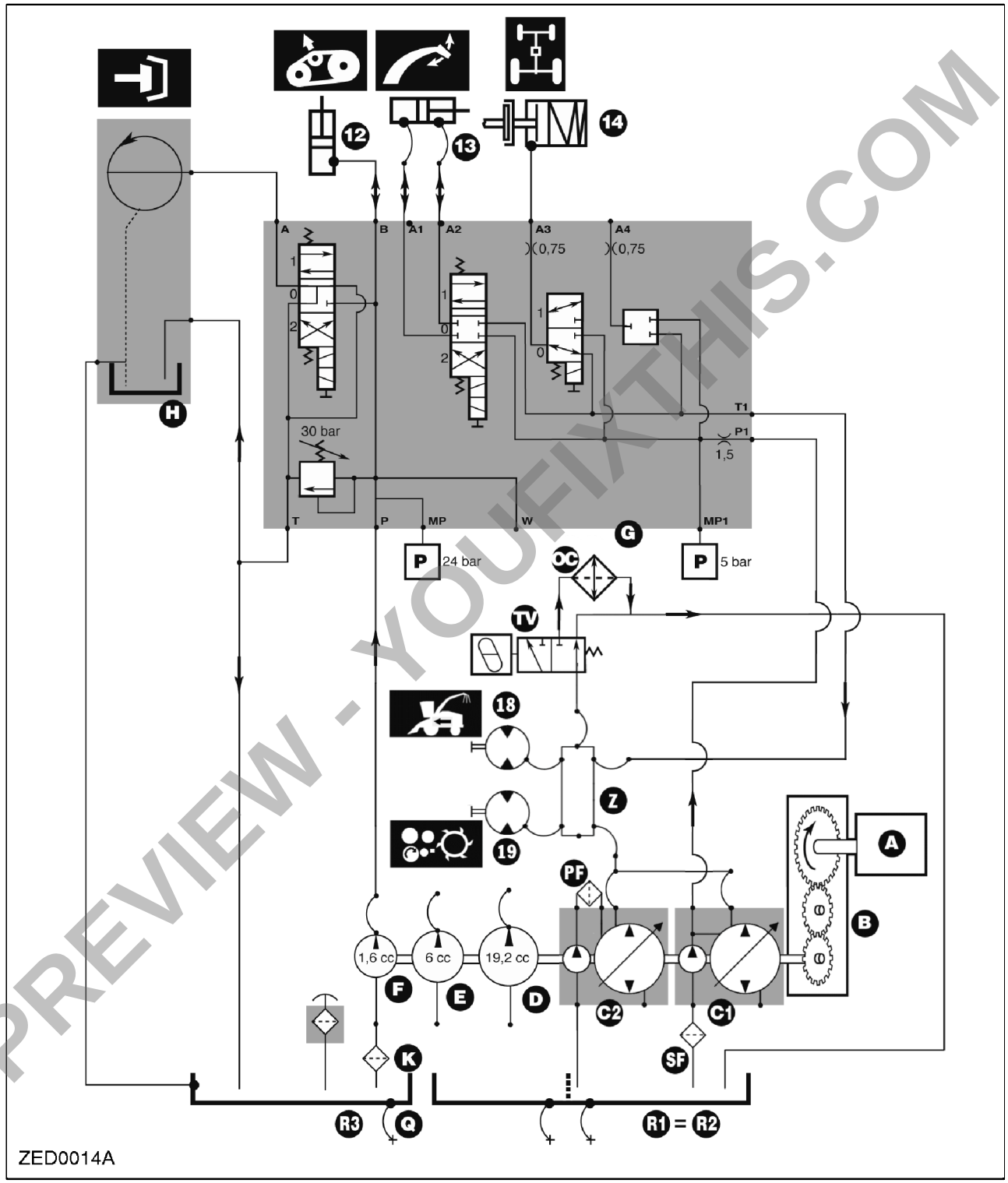
27. On the inner housing (50), replace the O-ring (53) and the seal ring (54).

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4a Low Pressure Hydraulics

FX30 5262 > .... FX40 5262 > .... FX50 5262 > ....
FX60 5262 > ....



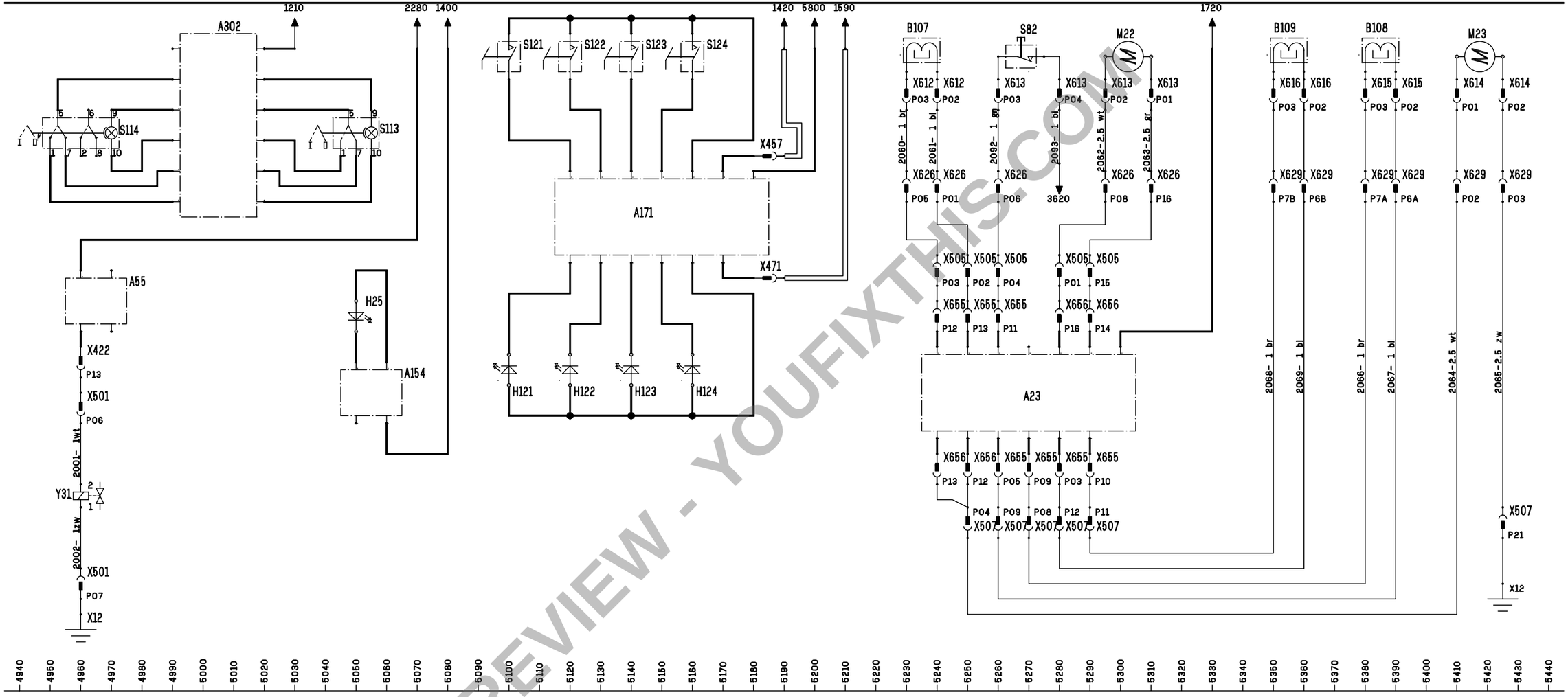
1

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15b REVERSE DRIVE CUTTERHEAD AND SHARPENING

FX30NA 5306 > .... FX40NA 5306 > .... FX60NA 5306 > ....



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Error Code	Description	Importance
459	SPOUT DOWN HYDR.SOL.	Medium

Explanation :	The solenoid of the spout down hydraulic valve is open or shorted.
Action :	Refer to wiring diagram : solenoid Y39, line 4530. Disconnect the solenoid Y39 on the stack valve. Check for battery voltage at Y39 while the spout down switch is pressed. If no battery voltage: Locate and repair the open or shorted circuit in wire 2017-gr and/or wire 2018-zw. If no open or shorted circuit can be found, try new hydraulic printed circuit of known performance. If battery voltage: Check coil resistance of the solenoid (a resistance of app. 4 ohm should be measured) or eventually power the solenoid with separate battery (insert fuse in power cable). If the valve is not functioning, try new hydraulic valve Y39 of known performance. If the coil resistance is correct and the hydraulic valve is functioning, connect everything and try again.

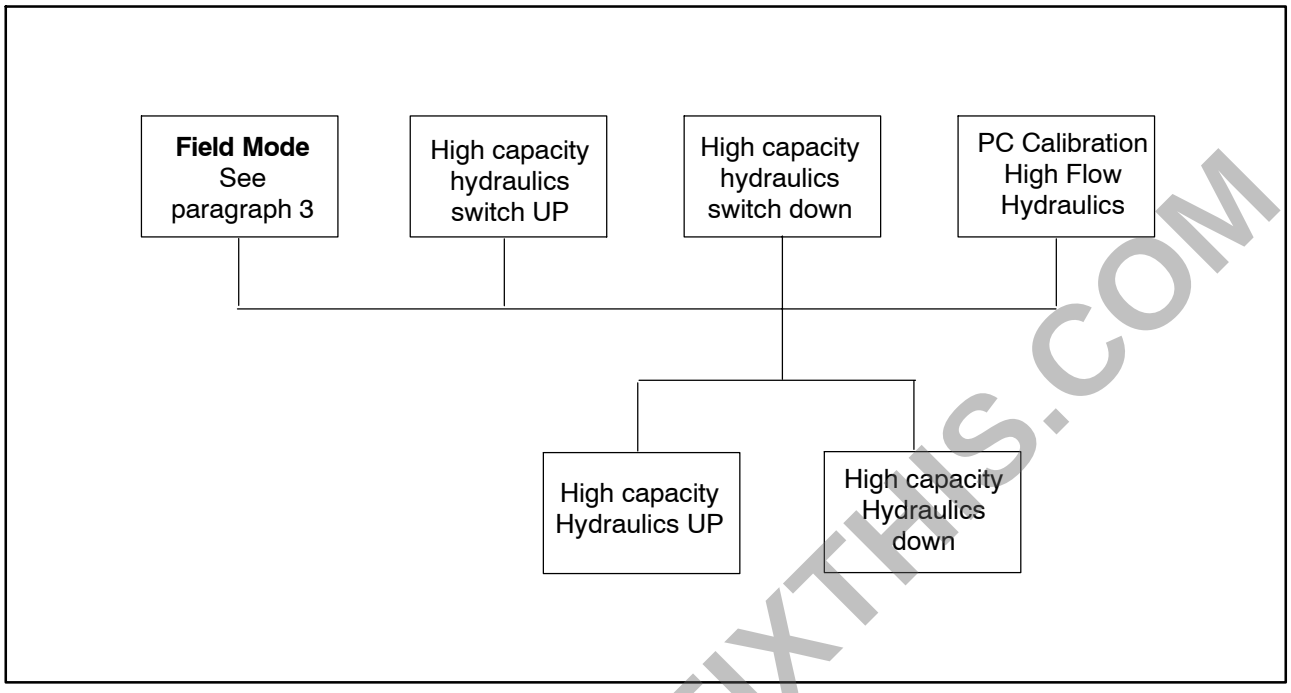
Error Code	Description	Importance
460	SPOUT UP HYDR.SOL.	Medium

Explanation :	The solenoid of the spout up hydraulic valve is open or shorted.
Action :	Refer to wiring diagram : solenoid Y38, line 4510. Disconnect the solenoid Y38 on the stack valve. Check for battery voltage at Y38 while the spout up switch is pressed. If no battery voltage: Locate and repair the open or shorted circuit in wire 2015-wt and/or wire 2016-zw. If no open or shorted circuit can be found, try new hydraulic printed circuit of known performance. If battery voltage: Check coil resistance of the solenoid (a resistance of app. 4 ohm should be measured) or eventually power the solenoid with separate battery (insert fuse in power cable). If the valve is not functioning, try new hydraulic valve Y38 of known performance. If the coil resistance is correct and the hydraulic valve is functioning, connect everything and try again.

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24. HIGH FLOW HYDRAULICS



To use the high capacity hydraulics.

1. Switch ON ignition and start the engine.
2. Switch ON the Harvest switch.
3. Press the high capacity hydraulics UP switch to power the high capacity UP valve.

   Press the high capacity hydraulics DOWN switch to power the high capacity DOWN valve.

REMARKS: *High capacity hydraulics are an accessory.*
To use the high capacity hydraulics, first the switch needs to be installed in the dashboard and the EST calibration "High Flow Hydraulics" needs to be set (check on CAN SPY page 1345).
Afterwards the output lines can be powered.

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