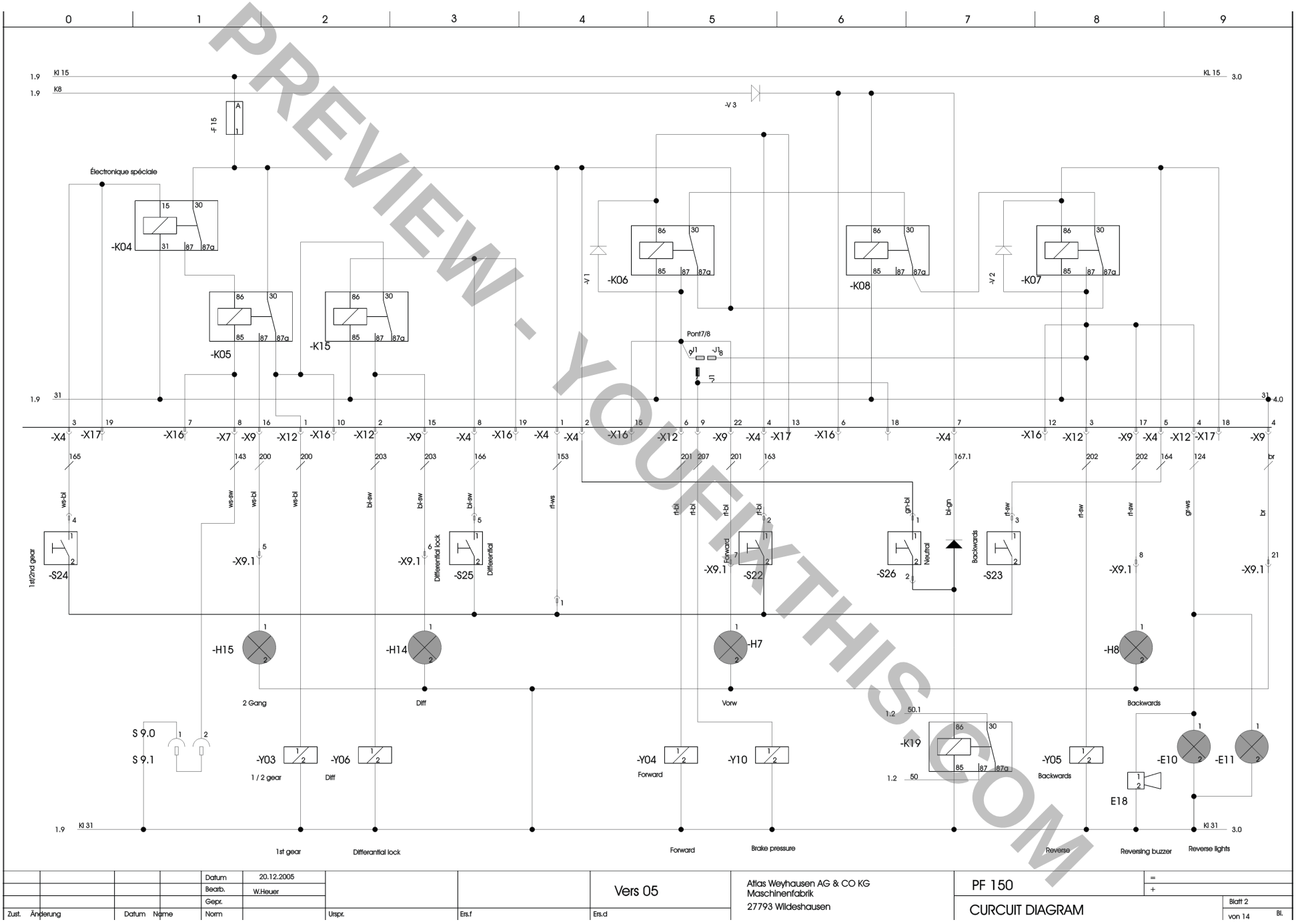


				Datum	20.12.2005			Vers 05	Atlas Weyhausen AG & CO KG Maschinenfabrik 27793 Wildeshausen	PF 150	=
				Bearb.	W.Heuer						+
				Gepr.						CURCUIT DIAGRAM	Blatt 2
Zust.	Änderung	Datum	Name	Norm		Urspr.	Ers.f	Ers.d			von 14 Bl.

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3.11 Checking the Hydraulic Circuit

3.11.1 Checking the hydraulic oil

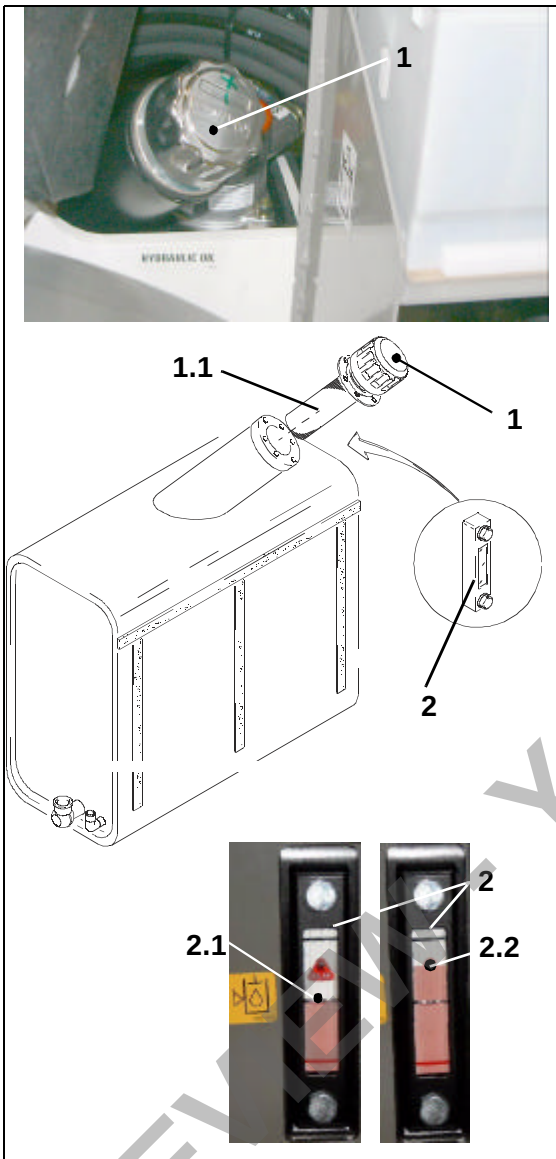


Fig.3.120Checking the hydraulic oil level

Checking the hydraulic oil level

- Always check the level of hydraulic oil in the hydraulic oil tank before starting the hydraulic system up following repairs and before each venting process.
- Check the hydraulic oil level in the inspection glass when the hydraulic oil is cold.
- The oil level (2.1) should be in the middle of the inspection glass (2).
- In the case of insufficient oil, refill hydraulic oil via the filling filter (1.1).
- In the case of warm hydraulic oil (operating temperature), the oil level should not rise above the oil level depicted (2.2).

Filling hydraulic oil

- Open the filling cap (1) and fill hydraulic oil, using a suitable funnel, through the filling filter (1.1).

⚠ WARNING

Machine damage!
Only refill with the same hydraulic oil already contained in the hydraulic circuit.
Using different sorts of oil can cause machine damage.

- Only fill the quantity of hydraulic oil up to the necessary oil level (2.1).

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0.9 Tightening Torques

0.9.1 Hose connections

TIGHTENING TORQUES M_A IN [Nm] FOR CONNECTIONS						
ROW	**TUBE A. Ø**	**DN**	**THREAD**	**Test Pressure [bar] (1)**	**DKL (2)**	**DKOL (2)**
L	6	5	M12x1.5	375	10-12	8-10
L	8	6	M14x1.5		12-15	10-13
L	10	8	M16x1.5		20-23	18-23
L	12	10	M18x1.5		30-35	27-32
L	15	13	M22x1.5		50-55	45-50
L	18	16	M26x1.5	240	75-85	70-80
L	22	20	M30x2.0		110-120	100-110
L	28	25	M36x2.0	150	160-180	150-160
L	35	32	M45x2.0		240-260	200-220
L	42	40	M52x2.0		320-350	300-320
					DKS (2)	**DKOS (2)**
S	8	5	M14x1.5	960	20-25	18-23
S	10	6	M16x1.5		30-35	27-32
S	12	8	M20x1.5		45-50	40-50
S	14	10	M22x1.5		60-70	50-60
S	16	13	M24x1.5	600	80-100	70-90
S	20	16	M30x2.0		130-150	120-140
S	25	20	M36x2.0		240-270	200-240
S	30	25	M42x2.0	375	360-400	320-360
S	38	32	M52x2.0		600-640	520-560

Counterpart:
Screwed end DIN 3853
Bore form W DIN 3861 Row L+S

(1)Complies with EO nominal pressure + 50%
(2)Union nuts complying with DIN 3870 Form A

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1.4.3 Disconnecting the front carriage from the rear carriage

NOTE

The repair work described here may only be carried out in the workshop.

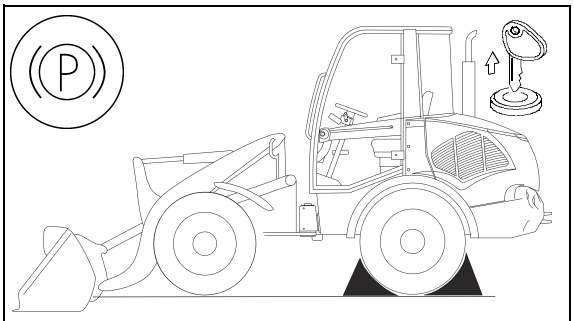


Fig.1.6 Securing the wheel loader

Securing the wheel loader

To disassemble the articulated pendulum joint, the front carriage must be separated from the rear carriage; secure the wheel loader to do this.

- Lower the attachment to its home position, refer to the operating manual.
- Stop the diesel engine and prevent it from being switched on again by removing the ignition key.
- Apply the hand brake.
- Place wheel chocks under the wheels to secure them.
- Check the hydraulic circuit is depressurized; depressurize it, if necessary.

Disassembling the cardan shaft on the front axle

⚠ WARNING

After disassembling the cardan shaft, the hand brake no longer affects the rear axle.
Place sufficient wheel chocks under the tires to secure the rear wheels.
Secure all four wheels of the wheel loader with wheel chocks.

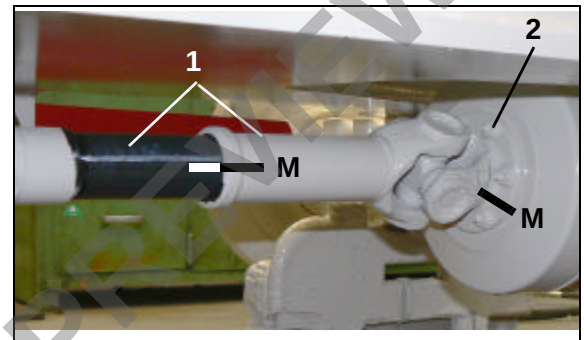


Fig.1.7 Disassembling the cardan shaft on the front carriage

- In order to be able to reassemble the cardan shaft (1) in the correct position **M** following repair, mark the cardan shaft flange position and junction point.
- Loosen the nuts (2) on the flange connection cardan shaft-front axle and screw off the nuts.
- Slide the cardan shaft (1) together sufficiently far until the front axle is free.
- To ensure the front section of the cardan shaft does not fall off, fix the cardan shaft (1) to the base frame.
- Release the hand brake.

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2.3 Maintenance Work

2.3.1 Greasing the hoisting gear

Tools and aids

- Hand-operated grease gun with hose
- Cleaning cloths

Lubricant specifications

- Grease specification: NL-GI 2 DIN 51818, Order no. 0346905

Greasing

- Clean the lubricating nipples before greasing.
- Use a grease gun with an extension hose so that no problems occur accessing the greasing points.
- If no grease can be applied at the bearing points, check the grease lines and grease gun.

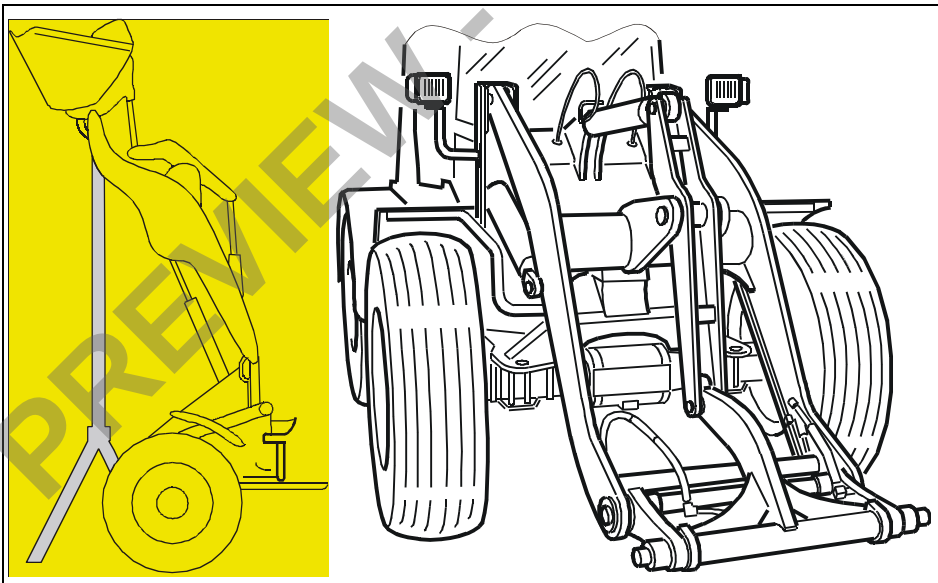
NOTE

Pay attention sufficient grease comes out at the bearing or bushing.

- After completing greasing, replace the protecting cap, use a new protecting cap if necessary.

⚠ DANGER

Risk of fatal injury!
If you have to work underneath the hoisting gear or the hoisting gear needs to be raised to complete the greasing work, always secure the hoisting gear with a hoisting gear support.



15 lubrication points, breakdown:

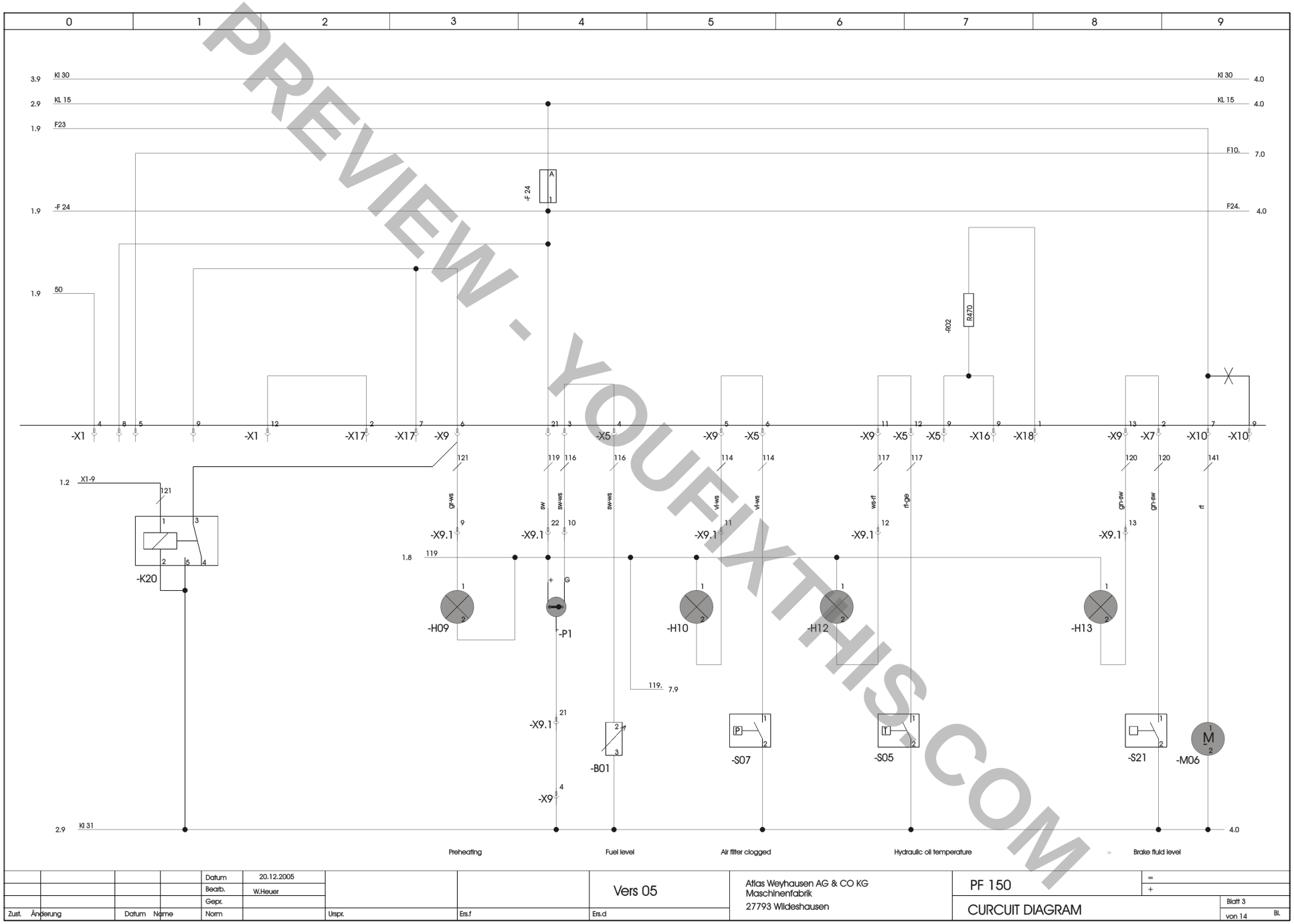
- 4x lifting cylinder
- 2x working cylinder
- 2x lifting arm
- 2x lifting arm
- 1x reversing lever
- 4x QDC

Fig.2.2 Greasing points, hoisting gear

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Hydraulic Diagram Key

1.1	Travel pump, variable displacement pump	**4.3**	Secondary valves, steering circuit
1.2	Charge pump	**6.0**	Hydraulic pump, loading and steering circuits
1.3	Charge pressure valve	**6.1**	Priority valve
1.4	Control valve, starting speed	**6.2**	Primary valve, loading circuit
1.5	Thermostatic valve	**6.3**	Prefill valves
1.6	Pressure relief valve, travel pressure	**6.4**	Secondary valve, loading circuit
1.7	Travel direction solenoid valves	**6.5**	Secondary valve with resuction
1.8	Spring assembly, variable displacement pump	**6.6**	Crossover cock, working tool
1.91	Secondary valve, high pressure	**7.1**	Brake cylinder
1.92	Secondary valve, high pressure	**7.2**	Brake fluid reservoir
2.0	Travel motor	**7.3**	Inching valve (brake inching valve)
2.1	Switching valve	**7.4**	Solenoid valve, differential lock
2.2	Outlet valve	**MA**	Gauge point, travel pressure forwards
2.3	Pressure regulator	**MB**	Gauge point, travel pressure reverse
2.4	Regulating piston	**G**	Gauge point, charge pressure
2.5	Solenoid valve, 1st/ 2nd gear	**PS**	Gauge point, control pressure
2.6	Brake pressure cutoff	**H**	Gauge point, loading-steering circuit
4.1	Steering unit		
4.2	Primary valve, steering circuit		

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0.9.2 Metric headless screws with standard threads

DIMENSIONSx P	TIGHTENING TORQUE M_A [Nm]				
	4.6	5.6	8.8	10.9	12.9
M 4 x 0.7	1,02	1,37	3,3	4,8	5,6
M 5 x 0.8	2.0	2.7	6.5	9.5	11.2
M 6 x 1.0	3.5	4.6	11.3	16.5	19.3
M 8 x 1.25	8.4	11	27.3	40.1	46.9
M 10 x 1.5	17	22	54	79	93
M 12 x 1.75	29	39	93	137	160
M 14 x 2.0	46	62	148	218	255
M 16 x 2.0	71	95	230	338	395
M 18 x 2.5	97	130	329	469	549
M 20 x 2.5	138	184	464	661	773
M 22 x 2.5	186	250	634	904	1057
M 24 x 3.0	235	315	798	1136	1329
M 27 x 3.0	350	470	1176	1674	1959
M 30 x 3.5	475	635	1597	2274	2662
M 33 x 3.5	645	865	2161	3078	3601
M 36 x 4.0	1080	1440	2778	5957	4631
M 39 x 4.0	1330	1780	3597	5123	5994

0.9.3 Metric headless screws with fine threads

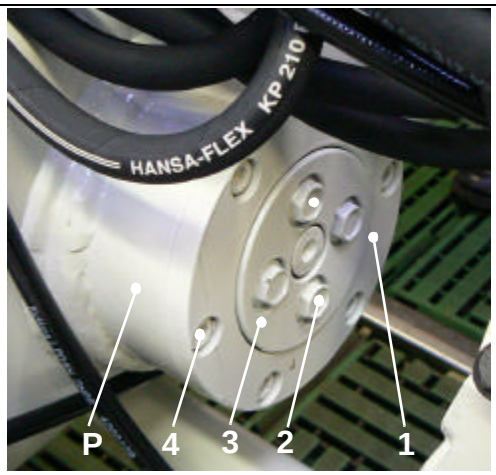
DIMENSIONSx P	TIGHTENING TORQUE M_A [Nm]		
	8.8	10.9	12.9
M 8 x 1	29.2	42.8	50.1
M 9 x 1	42.6	62.6	73.3
M 10 x 1	60	88	103
M 10 x 1.25	57	83	98
M 12 x 1.25	101	149	174
M 12 x 1.5	97	143	167
M 14 x 1.5	159	234	274
M 16 x 1.5	244	359	420
M 18 x 1.5	368	523	613
M 18 x 2	348	496	581
M 20 x 1.5	511	728	852
M 22 x 1.5	692	985	1153
M 24 x 1.5	899	1280	1498
M 24 x 2	865	1232	1442
M 27 x 1.5	1304	1858	2174
M 27 x 2	1262	1797	2103
M 30 x 2	1756	2502	2927
M 33 x 2	1352	3350	3921
M 36 x 2	3082	4390	5137
M 39 x 2	3953	5631	6589

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1.4.4 Checking/Disassembling the pendulum joint and replacing components



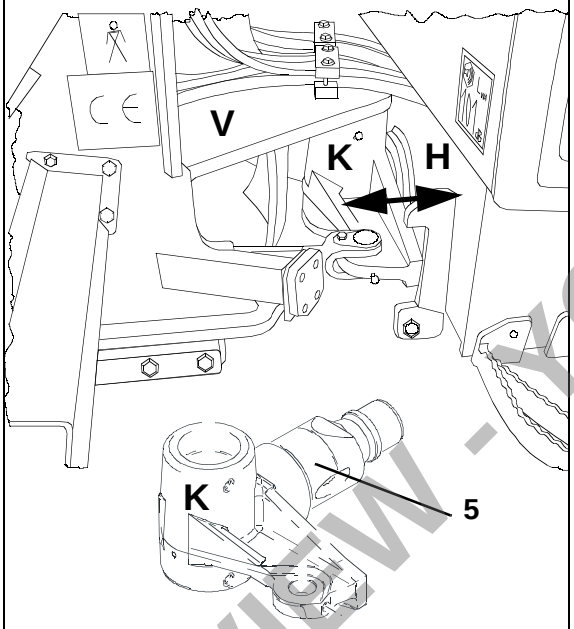


Fig.1.13 Disassembling the pendulum bearing

To separate the front carriage at the pendulum joint or to repair the pendulum bearing, disassemble the pendulum bearing and pull the front carriage away.

Disassembling the pendulum bearing

- Loosen (do not remove) the hexagon socket screws (4) in the bearing retaining disk (1).
- Unscrew the hexagon head screws (2) from the retaining disk (3) of the bearing journal (5).
- Remove the retaining disk (3).
- Insert a hydraulic press between the articulated pendulum joint **K** and rear carriage **H**.
- Remove the wheel chocks from the front wheels.
- Use the hydraulic press to force the front carriage **V** from the rear carriage **H** until the bearing journal (5) of the articulated pendulum joint **K** is pressed out of the rear carriage **H**.

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5.4.2 Maintenance table

MAINTENANCE PROCEDURES	Daily or every 8 hours	Every 250 hours or every 6 months	Every 500 hours or every 12 months	Every 1000 hours	Every 2000 hours	Every 3000 hours
Check the level of coolant	■					
Check the coolant concentration Renew the antifreeze every 2 years. If anticorrosive is used instead of antifreeze, change it every 6 months. Ensure the correct quantity is used.		■				
Check the condition and tension of the drive belt						
Renew the drive belt on the electric alternator				■		
Drain off water from the prefilter (if installed)	■					
Change the fuel filter element			■			
Check the function of the injection nozzle Only by properly trained personnel!						■
Check the engine oil level	■					
Change the engine oil (fill slowly, ensure correct quantity) In the case of a load factor in excess of 40% or the use of engine oil of an incorrect specification, adapt the oil change interval. In the case of questions related to calculation of the load factor, contact the Perkins representative responsible for you. Refer to Chapter "Completing a visual inspection of the engine" and check the unit does not leak and correct oil specification.			■			
Replace the engine oil filter			■			
Clean the air filter and empty the air filter dust collector in the case of extremely dusty operating conditions.	■					
Clean the air filter and empty the air filter dust collector in the case of normal operating conditions.			■			
Clean the turbocharger's turbine and compressor housing. Only by properly trained personnel!				■		
Check valve play, adjust as necessary. Only by properly trained personnel!				■		
Check all hoses and connections				■		
Replace the ventilation					■	
Check the electric alternator and starter motor. Only by properly trained personnel!					■	
Check the cables in the electrical system are in a safe condition and for signs of wear					■	
Check for signs of engine damage and leaks (clear problems as necessary)	■					

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0.9.4 RIPP screws with cheese head and hexagon socket

TERMINOLOGY		M5	M6	M8	M10	M12
Across flat dimension	S	4	5	6	8	10
Torque Figures M_A/ Nm	Fkl.	on connecting material steel R_m < 800 / ≥ 800 N/mm²				
	90/80 RG	-	-	-	-	-
	100/10 RG	13/11	24/20	45/42	90/85	150/140
	100/10 FG	-	-	-	-	-
	12.9/12 RG	15/13	28/24	52/50	115/105	180/160
	12.9/12 FG	-	-	-	-	-
RG = Standard thread FG = Fine thread	Fkl.	on connecting material gray cast iron				
	90/80 RG	-	-	-	-	-
	100/10 RG	10	19	39	80	120
	100/10 FG	-	-	-	-	-
	12.9/12 RG	12	22	48	95	140
	12.9/12 FG	-	-	-	-	-

0.9.5 RIPP screws and nuts with cheese head and hexagon head

TERMINOLOGY		M5	M6	M8	M10	M12	M14	M16
Across flat dimension	S	8	10	13	15	17	19	22
Torque Figures M_A/ Nm	Fkl.	on connecting material Rm steel <800/ > 800 N/mm²						
	90/80 RG	-	-	-	-	-	-	-
	100/10 RG	11/10	19/18	42/37	85/80	130/120	230/215	330/310
	100/10 FG	-	-	45/40	95/90	145/138	250/240	370/350
	12.9/12 RG	13/12	22/20	50/45	100/90	165/155	275/255	410/390
	12.9/12 FG	-	-	55/50	110/ 105	175/165	300/290	440/420
RG = Standard thread FG = Fine thread	Fkl.	on connecting material gray cast iron						
	90/80 RG	-	-	-	-	-	-	-
	100/10 RG	9	16	35	75	115	200	300
	100/10 FG	-	-	38	85	130	230	335
	12.9/12 RG	11	18	43	85	150	240	380
	12.9/12 FG	-	-	48	100	160	275	400

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2.4.2 Disassembling the hoisting gear



Fig.2.6 Removing the hoisting gear bolts

Disassembling the hoisting gear with hydraulic cylinders installed

- Place a raising harness (G1) around each of the lifting arms (LS1, LS2).
- Attach the raising harnesses to a crane and support the hoisting gear (LS).
- Secure it to the hoisting gear with a sling (G2) before releasing the lifting cylinder **6.10**.
- Unscrew all the locking screws (1.1) from the points marked by a circle in the illustration.
- Start pressing out the bearing bolts at the upper lifting cylinder **6.10**.
- Secure the lifting cylinder below the hoisting gear using the raising harness.
- Press out the bearing bolts in the working cylinder **6.11** on the reversing lever (UH).
- Lay the working cylinder on a flexible base on the hoisting gear.
- Raise the hoisting gear slightly with the crane.
- Press the bearing bolts out of the hoisting gear bearings of the front carriage.
- Before raising the hoisting gear, check that all the hydraulic connections, holders and cables have been disconnected.
- Raise the hoisting gear slowly and carefully with the crane.
- Set the hoisting gear down on a flat surface in the workshop.

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