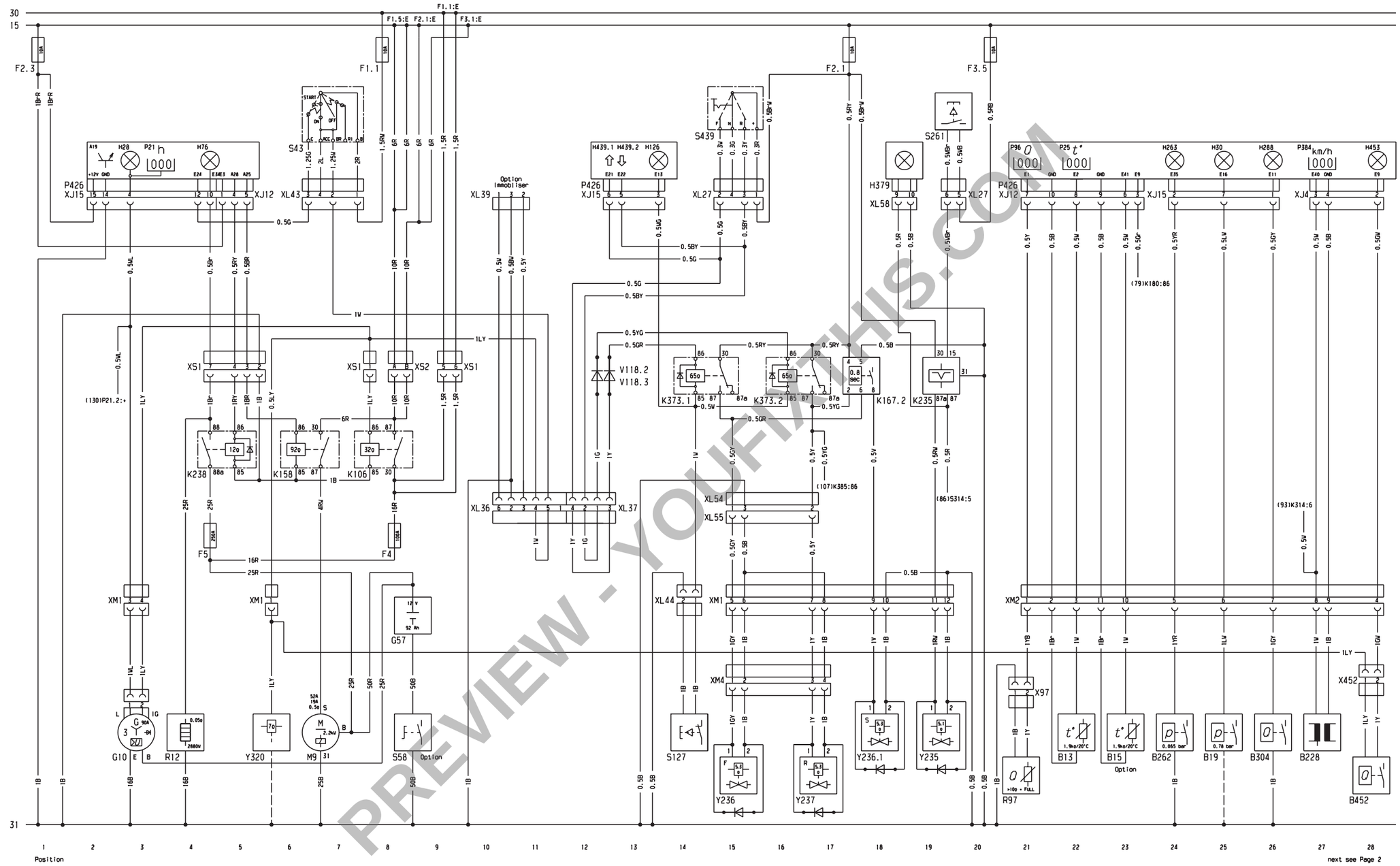
Wiring diagram1/5

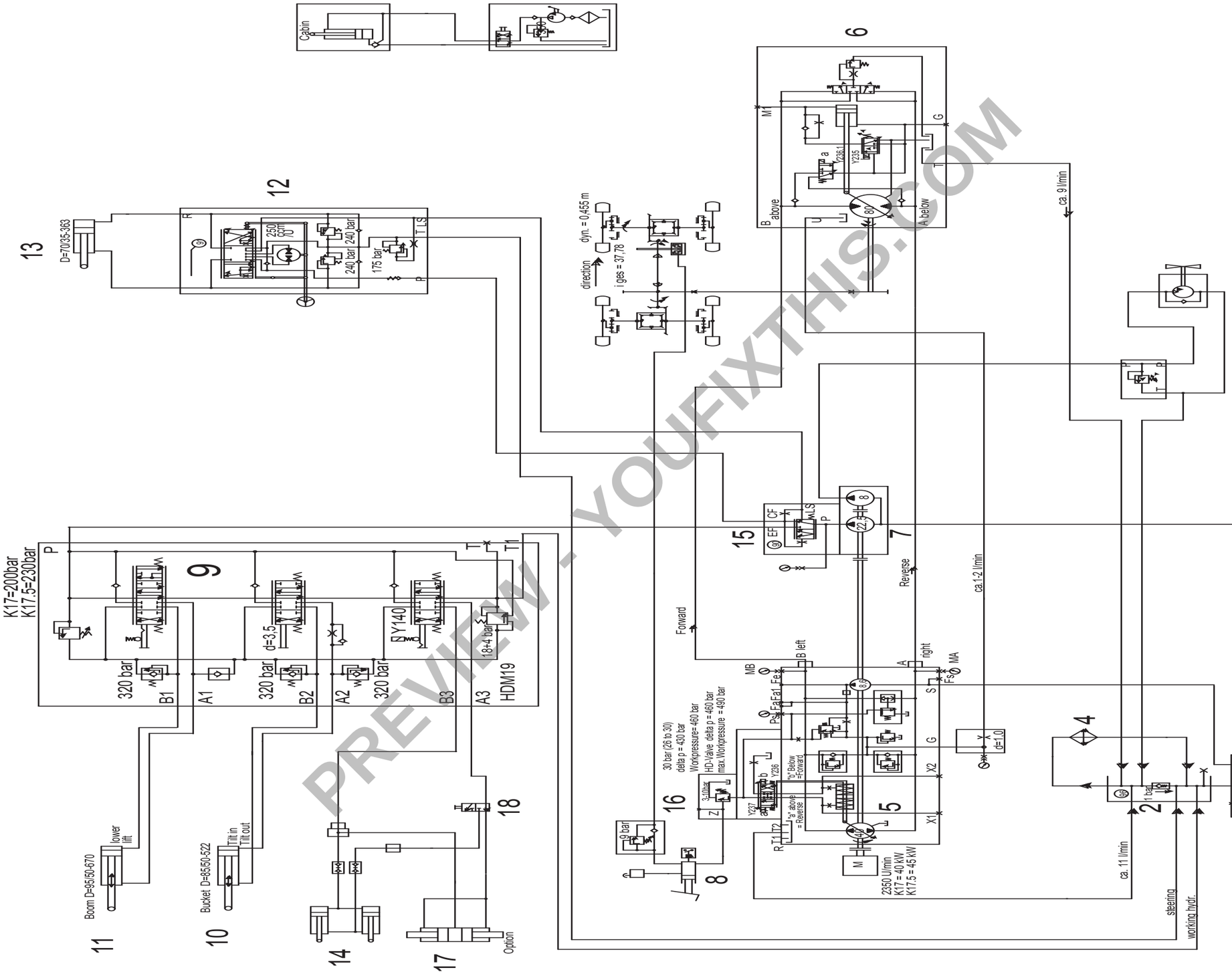


No.	Componente	Pos.	No.	Componente	Pos.	No.	Componente	Pos.	No.	Componente	Pos.	No.	Componente	Pos.	No.	Componente	Pos.
S43	Key Switch	6	P21	Service Meter	3	K106	Relay Battery	7	XL...	Connector Floor Frame Harness	-	H28	Control Lamp Alternator	3	B13	Sensor Cooling Watertemperat.	22
S58	Battery Main Switch	8	P25	Cauge Cooling Watertemperature	22	K158	Relay Startermotor	6	XM...	Connector Engine Harness	-	H30	Control Lamp Engine Oil Press.	25	B15	Sensor Hydraulic Oil Temperat.	23
S127	Switch Parking Brake	14	P96	Cauge Fuel Level	21	K167.2	Relay Timer 0.8 sec.	17	XF...	Connector Front Frame Harness	-	H76	Control Lamp Preheater Engine	4	B19	Sensor Engine Oil Pressure	25
			P384	Cauge Speed	27	K180	Relay Blower Engine Cooler	23	XJ...	Connector Main Monitor	-	H126	Control Lamp Parking Brake	14	B228	Sensor Speed	27
S261	Switch Driving Range	19	P426	Main Monitor	2	K235	Relay Driving Range	19	XS...	Connector Fuse	-	H379	Control Lamp Air Cleaner	24	B262	Sensor Air Cleaner	24
S439	Switch Drive Direction	14				K238	Relay Air Preheater Engine	4	F...	Fuse	-	H288	Control Lamp Brake Oil Level	26	B304	Sensor Brake Oil Level	26
			Y236.1	Magnet Valve Synchron	18	K314	Switch Frequency ALS	27	SS...	Joint Of Wires	-	H439.1	Control Lamp Forward	13	Y235	Magnet Valve Driving Range	19
G10	Alternator	3				K373.1	Relay Parking Brake Forward	14	-	-	-	H439.2	Control Lamp Reverse	13	Y236	Magnet Valve Forward	15
G57	Battery	8	R12	Air Preheater Engine	4	K373.2	Relay Parking Brake Reverse	16	-	-	-	H453	Control Lamp Water-In-Fuel	28	Y237	Magnet Valve Reverse	17
M9	Starter Motor	6	R97	Sensor Fuel Level	21	K385	Relay Backup Alarm	17	B452	Sensor Water-In-Fuel	28	H453	Control Lamp Water-In-Fuel	28	Y320	Magnet Engine Stop	5

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Hydraulic circuit diagram 2/4 for WA65-5 and WA70-5

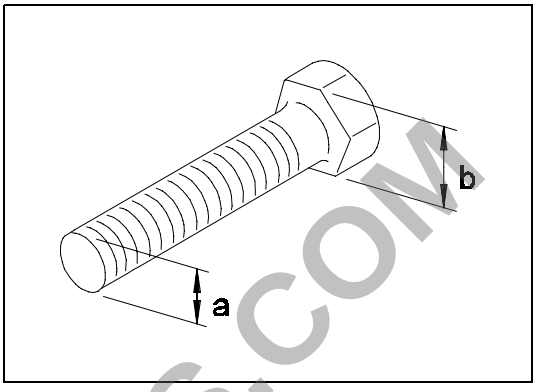


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Torque list – screws and nuts

- Unless otherwise specified, tighten the metric bolts and nuts to the torque shown in the table.
- The tightening torque is determined by the width across flats of the nut and bolt.
- If it is necessary to replace any nut or bolt, always use a Komatsu genuine part of the same size as the part that was replaced.



NOTE
When tightening panels or other parts having tightening fixtures made of plastic, be careful not to use excessive tightening torque: doing so will damage the plastic parts.

Metric Thread – 10.9					
Thread diameter [mm] (a)	Width across flat [mm] (b)	Steel		Aluminium-Cast	
		Nm	kpm	Nm	kpm
M 6	10	14	1.4	7.7	0.77
M 8	13	35	3.5	19	1.9
M 10	17 (15)	70	7	37	3.7
M 12	19	115	11.5	64	6.4
M 14	22	185	18.5	101.5	10.15
M 16	24	280	28	158	15.8
M 18	27	390	39	218	21.8
M 20	30	560	56	306.5	30.65
M 22	32	750	75	416	41.6
M 24	36	960	96	528.5	52.85
M 27	41	1400	140	774	77.4
M 30	46	1900	190	1053	105.3
M 33	50	2600	260	–	–
M 36	55	3300	330	–	–
M 39	60	4300	430	–	–

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5. Keep all tools in good condition and learn the correct way to use them.

6. Decide a place in the repair workshop to keep tools and removed parts. Always keep the tools and parts in their correct places. Always keep the work area clean and make sure that there is no dirt or oil on the floor. Never smoke while working. Smoke only in the areas provided for smoking.

Preparations for work

1. Before adding oil or making any repairs, park the machine on hard, level ground, and block the wheels or tracks to prevent the machine from moving.

2. Before starting work, lower blade, ripper, bucket or any other work equipment to the ground and install the safety bar on the frame. If this is not possible, insert the safety pin or use blocks to prevent the work equipment from falling. In addition, be sure to lock all the control levers and hang warning signs on them.

3. When disassembling or assembling, support the machine with blocks, jacks or stands before starting work.

4. Remove all mud and oil from the steps or other places used to get on and off the machine. Always use the handrails, ladders or steps when getting on or off the machine. Never jump on or off the machine. If it is impossible to use the handrails, ladders or steps, use a stand to provide safe footing.

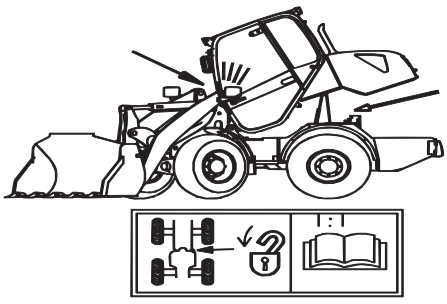
Tipping up the driver's cab

1. Park the machine on solid, level ground.

2. Lower the work unit to the ground and switch off the engine.

3. Use the locking bolt to secure the articulated steering (cross-reference "Securing the articulated steering", Page 2-24).

The machine has to be positioned straight and the articulated steering has to be secured with the locking bolt! If the driver's cab is tipped up while the machine is bent, the front frame can cause damage to the windscreen!



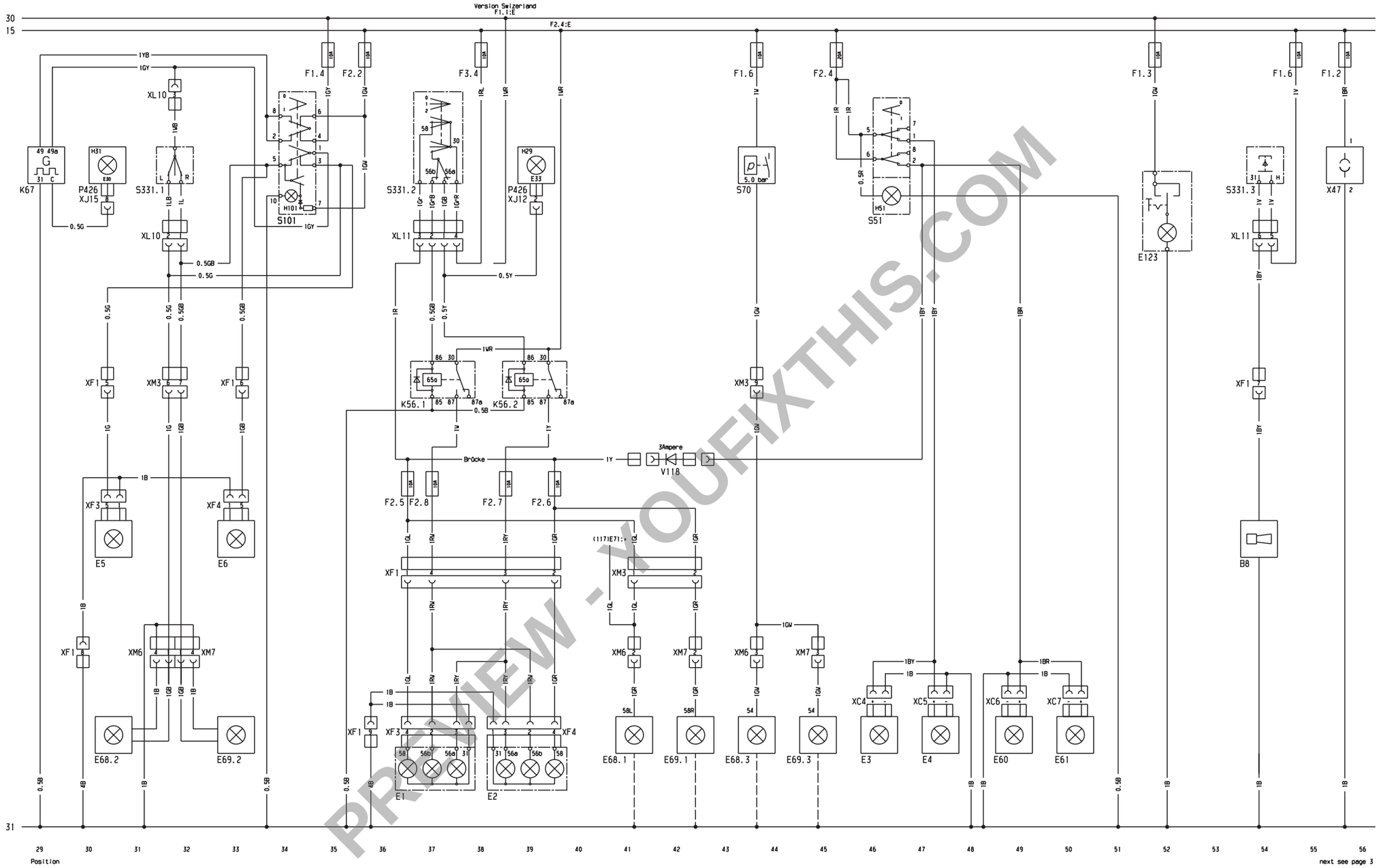
G0065099

4. Open the bonnet..

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Wiring diagram 2/5



No.	Componente	Pos.	No.	Componente	Pos.	No.	Componente	Pos.	No.	Componente	Pos.	No.	Componente	Pos.
S51	Switch Work Lamps	46	H29	Control Lamp High Beem	39	E1	Head Light Left	36	E68.2	Turn Light Rear Left	30	XJ...	Connector Main Monitor	-
S70	Switch Brake Lamps	43	-	-	-	E2	Head Light Right	38	E69.2	Turn Light Rear Right	33	XL...	Connector Floor Frame Harness	-
S101	Switch Hazard	34	H31	Control Lamp Turn Light	30	E3	Work Lamp Front Left	46	E68.3	Stop Lamp Left	43	XC...	Connector Cabine Harness	-
S331.1	Steering Column Switch Turn	31	H51	Control Lamp Work Lamps	46	E4	Work Lamp Front Right	47	E69.3	Stop Lamp Right	44	XM...	Connector Engine Harness	-
S331.2	Steer.Column Switch Head Lamps	36	H101	Control Lamp Hazard	34	E5	Turn Light Front Left	30	E71	License Lambs	91	XF...	Connector Front Frame Harness	-
S331.3	Steering Column Switch Horn	53	-	-	-	E6	Turn Light Front Right	33	E123	Interior Lamp	51	XC...	Connector Cabine Harness	-
	-	-	-	-	-	E60	Work Lamp Rear Left	49	-	-	-	X47	Socket	55
	-	-	B8	Horn	53	E61	Work Lamp Rear Right	50	K56.1	Relay Low Beam	36	-	-	-
	-	-	-	-	-	E68.1	Position Lamp Rear Left	41	K56.2	Relay High Beam	38	-	-	-
V118	Diode	42	P426	Main Monitor	30	E69.1	Position Lamp Rear Right	42	K67	Flasher	29	F...	Connector Fuse	-

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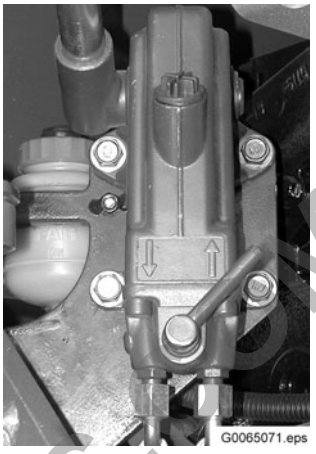
Metric Fine Thread – 10.9					
Thread Diameter [mm] (a)	Width across Flat[mm] (b)	Steel		Aluminium-Cast	
		Nm	kpm	Nm	kpm
M 8 × 1	13	35	3.5	20	2
M 10 × 1	17 (15)	75	7.5	42	4.2
M 10 × 1,25	17 (15)	70	7	39	3.9
M 12 × 1,25	19	125	12.5	70	7
M 12 × 1,5	19	120	12	67	6.7
M 14 × 1,5	22	200	20	110	11
M 16 × 1,5	24	300	30	167.5	16.75
M 18 × 1,5	27	440	44	243	24.3
M 18 × 2	27	420	42	230	23
M 20 × 1,5	30	620	62	338.5	33.85
M 20 × 2	30	–	–	322.5	32.25
M 22 × 1,5	32	820	82	454.5	45.45
M 22 × 2	32	–	–	436	43.6
M 24 × 1,5	36	1090	109	596	59.6
M 24 × 2	36	1040	104	573	57.3
M 27 × 2	41	1500	150	832	83.2
M 30 × 2	46	2120	212	1158	115.8
M 33 × 2	50	2800	280	–	–
M 36 × 3	55	3500	350	–	–
M 39 × 3	60	4600	460	–	–

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Tipping down the driver's cab

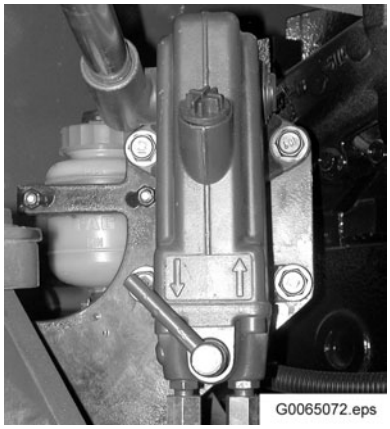
1. Insert the lever into the pump. Set the lever at the pump to "pump up" and pump the cab upward until it reaches the limit stop.



2. Fold down the safety rod on the right side and fasten it in this position (arrow).



3. Set the lever to "pump down" and pump the cab downward until the cylinder is entirely retracted (the resistance at the lever increases markedly).



NOTE
Make sure that the guide pin (arrow) on the left of the rear frame is inserted into the guide bushing of the cab.



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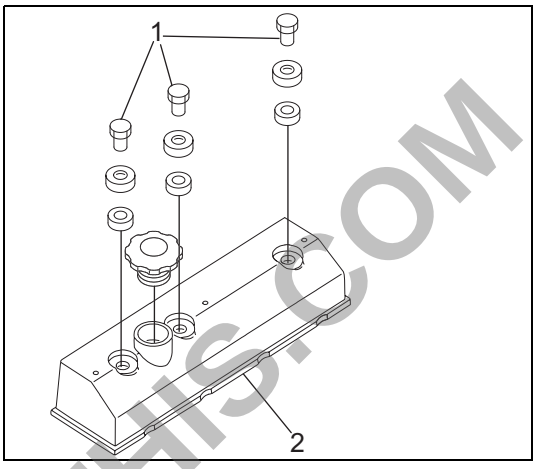
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Valve lash clearance

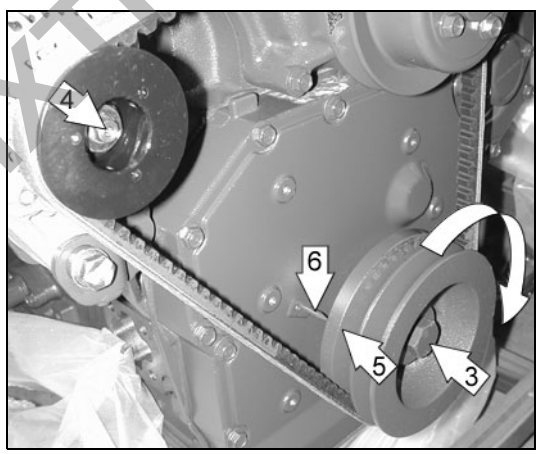
Park the machine on level ground and secure it against rolling away and jack-knifing!
Lower the bucket, switch the engine off and actuate the parking brake!

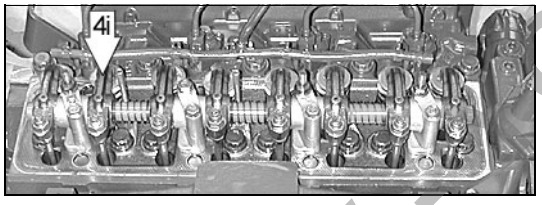
★ The adjustment must be carried out at cold engine!

1. Unscrew the three bolts (1) and remove the cylinder head cover (2).

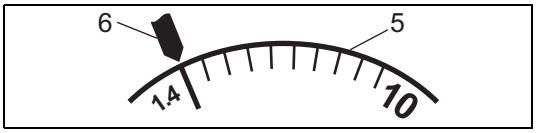


2. Rotate the crankshaft in the normal direction (as indicated by the arrow), using the crankshaft pulley mounting cap screw (3) or the alternator pulley mounting nut (4).
3. While watching the movement of the intake valve of the No. 4 cylinder (4i), bring the No. 1 cylinder into compression top dead center (TDC) position.

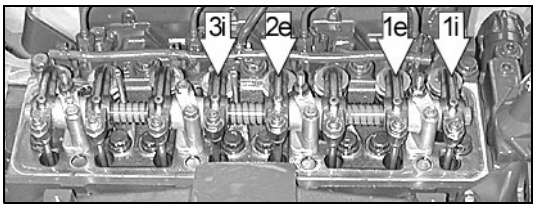




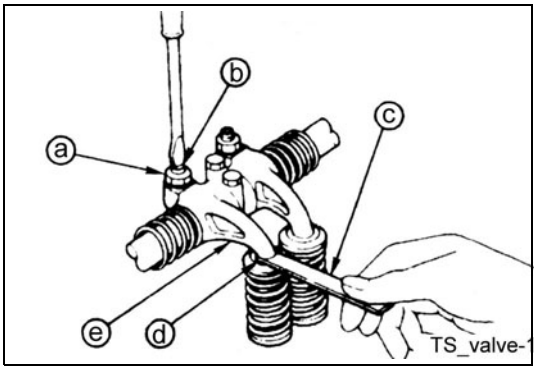
4. Align the engraved mark "1.4" on the crankshaft pulley (5) with the pointer (6).



5. Adjust the valve clearances of the four valves (1i), (1e), (2e) and (3i) one after the other as follows:



   a. Loosen the locknut (a) on the adjustment screw (b).
   b. Insert the feeler gauge (c) between the valve stem (d) and the rocker arm (e).
   c. Adjust the clearance with the adjustment screw (b) until slight drag is felt on the feeler gauge.



Valve clearance (engine cold):

Intake valves (i)	Exhaust valves (e)
0.35 mm	0.50 mm
0.014 in	0.020 in

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00 SAFETY

Safety notice 00-3
- Preparations for work 00-4
- Tipping up the driver's cab 00-4
- Tipping down the driver's cab 00-7
- Precautions during work 00-8

Foreword 00-11

How to read the shop manual 00-12
- Volumes 00-12
- Distribution and updating 00-12
- Filing method 00-12
- Symbols 00-13

Hoisting instructions 00-14
- Wire ropes 00-14

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Safety notice

Important Safety Notice
Proper service and repair is extremely important for safe machine operation. Some of the described service and repair techniques require the use of tools specially designed by Komatsu for the specific purpose.
To prevent injury to workers, the symbol ⚠ is used to mark safety precautions in this manual. The cautions accompanying these symbols must always be followed carefully. If any dangerous situation arises or may possibly arise, first consider safety, and take the necessary actions to deal with the situation.

General Precautions
Mistakes in operation are extremely dangerous. Read the OPERATION AND MAINTENANCE MANUAL carefully before operating the machine! Always follow the safety rules valid in your country carefully!

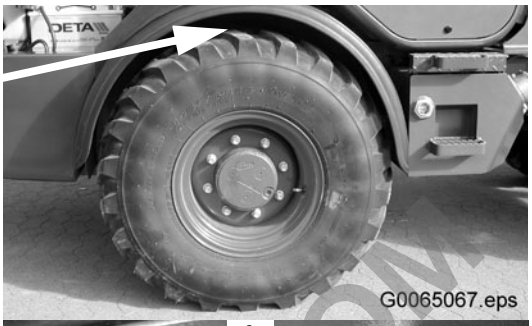
1. Before carrying out any greasing or repairs, read all the precautions given on the decals which are fixed to the machine.
2. When carrying out any operation, always wear safety shoes and helmet. Do not wear loose work clothes, or clothes with buttons missing.
   - Always wear safety glasses when hitting parts with a hammer.
   - Always wear safety glasses when grinding parts with a grinder, etc.
3. If welding repairs are needed, always have a trained, experienced welder carry out the work. When carrying out welding work, always wear welding gloves, apron, glasses, cap and other clothes suited for welding work.
4. When carrying out any operation with two or more workers, always agree on the operating procedure before starting. Always inform your fellow workers before starting any step of the operation. Before starting work, hang UNDER REPAIR signs on the controls in the operator's compartment.

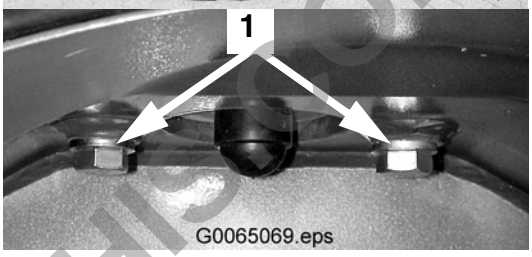
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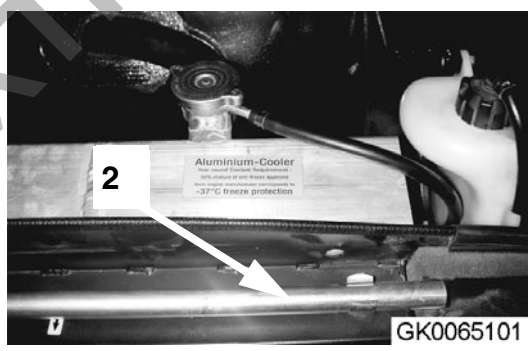
5. Remove the cab fastening screws under the rear wheel cover (arrow).

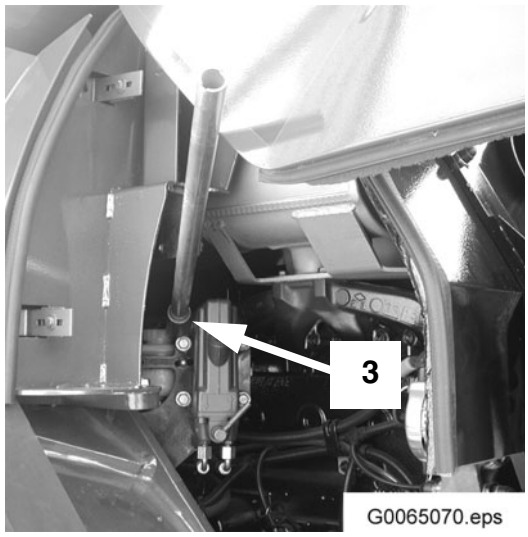
   2 screws on the left and 2 screws on the right (1).





6. Take the hand pump lever out of its holder on the radiator (2) and insert it into the receptacle of the pump (3).





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Hydraulic drive system 20Km/h

1. Pressure control valve
2. Main brake cylinder
3. Variable displacement pump
4. 4/3 way valve (control valve)
5. Safety valve with charge valve
6. Control cylinder
7. Regulating valve
8. Charge pressure relief valvent)
9. Hydraulic travel pressure cut-off valve
10. Charge pump
11. Steering and working hydraulic pump
12. Shuttle flushing valve
13. Throttle check valve
14. Drive range valve
15. Check valve
16. Control piston
17. Control valve
    1. Range: Energized
    2. Range: De-energized
18. Variable displacement motor
19. Suction and return filter

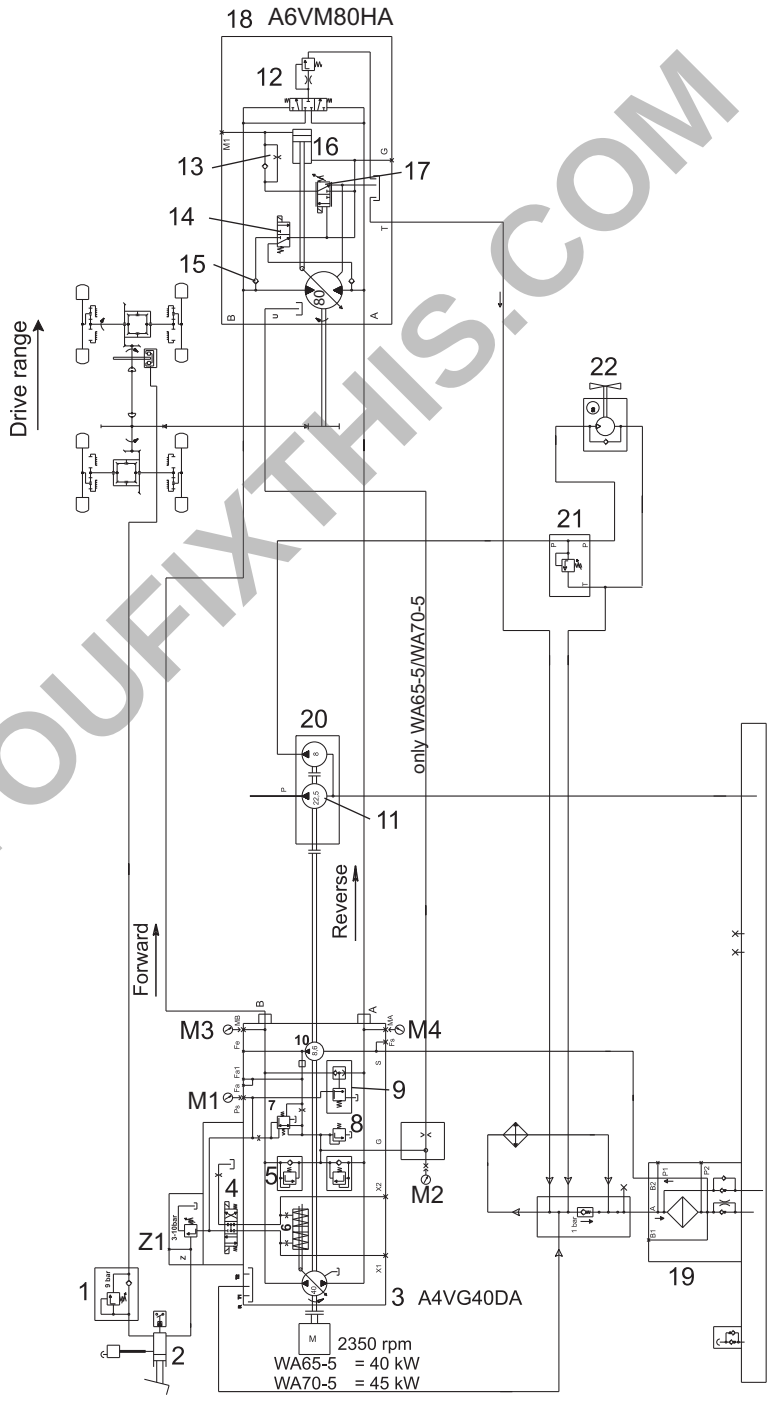
Z1 Air bleeding valve

M1 Control pressure check point

M2 Charge pressure check point

M3 Forward travel pressure check point

M4 Reverse travel pressure check point

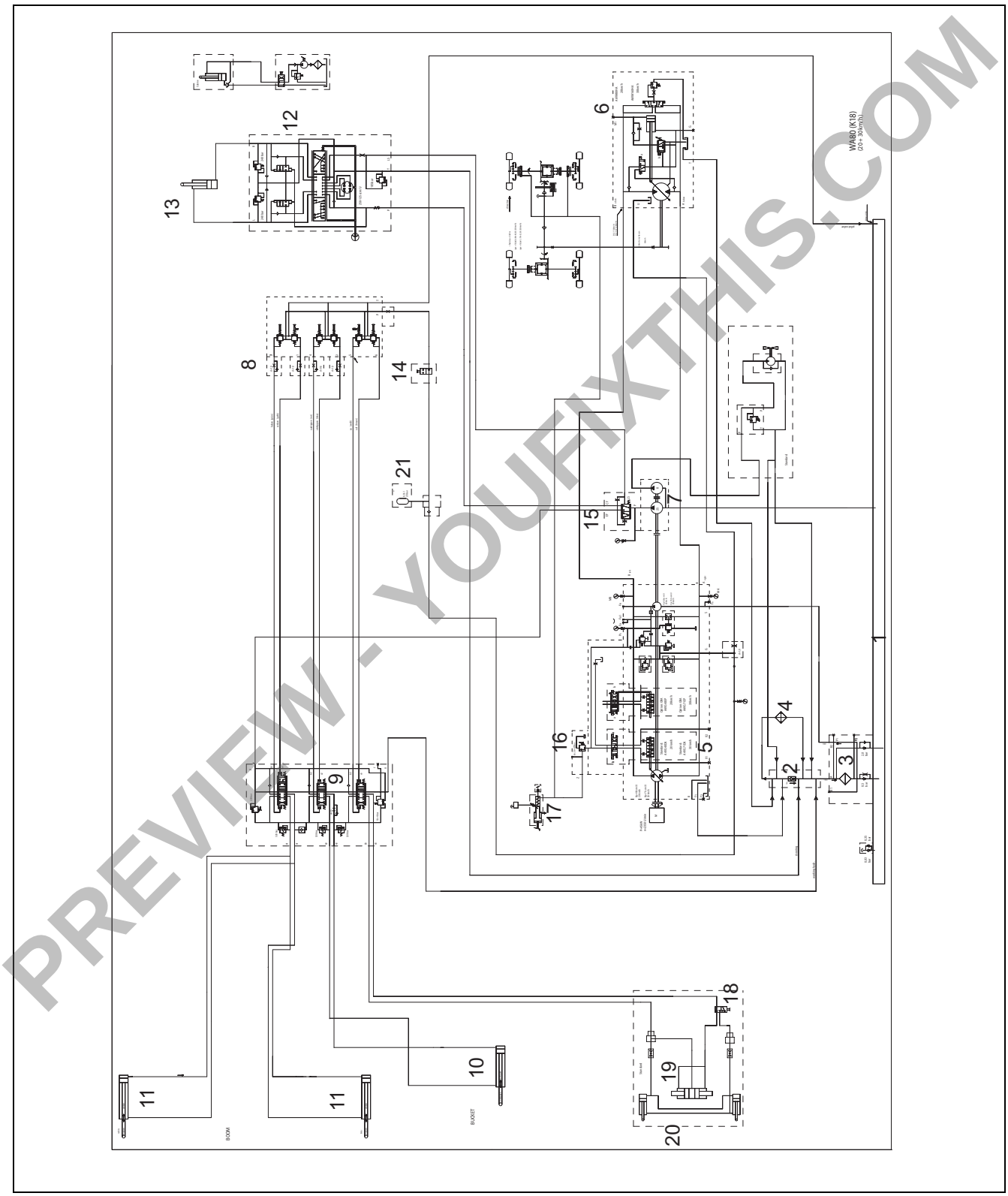


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Work equipment hydraulic WA80-5

Travel, steering and work hydraulics



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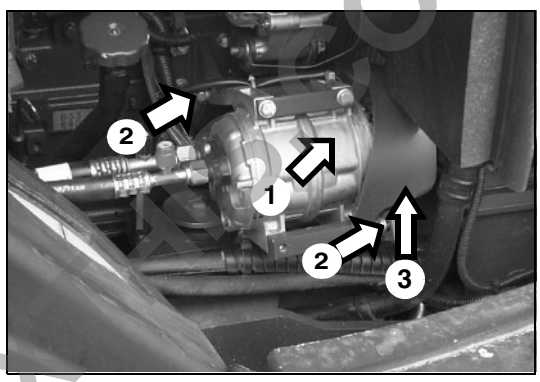
Regular maintenance

Check the air-conditioning system twice a year, in spring and autumn.

The air conditioning system must be switched on at least once a month for a brief time (approx. 10 min) so that the compressor is lubricated.

The following maintenance work must be carried out at the beginning, middle and end of a cooling period:

Check V-belt tension and compressor fastening.



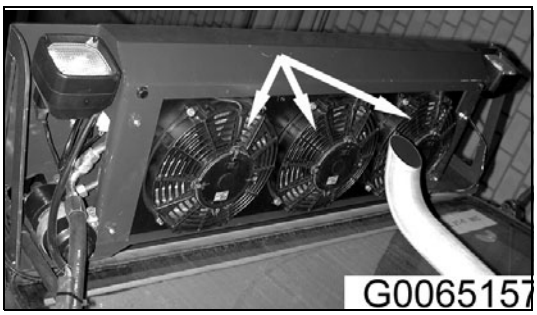
1. Compressor
2. Fixing screw
3. Cover for Tension Pulley

Check coolant level, See chapter 10 STRUCTURE AND FUNCTION "Checking coolant level" on page 10-84.

NOTE
The coolant must flow through the filter dryer's inspection glass free of bubbles with the engine running and air conditioner at maximum output (max. blower setting, top idling speed, setting "cold").

Clean the condenser

The fins of the condenser must not be operating at excessive pressure as this could deform the fins and reduce the cooling output. Clean the condenser with cold water.



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Feed pump (and servo oil pressure for WA80-5)

★ For the WA80-5 the hydrostatic drive feed pump oil is also used for the servo control system. If the feed pump oil pressure is changed this will also influence the servo control oil pressure.
The feed pump oil pressure and the servo system oil pressure are the same.

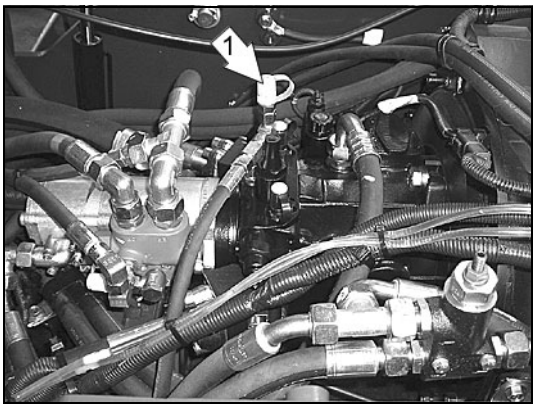
Apply the parking brake and chock the wheels!

★ Testing conditions

- Normal engine working temperature
- Hydraulic oil temperature: 50 - 60°C

Testing

1. Connect a pressure testing gauge (60 bar) to the testing point (1).
2. Run the engine at high idle RPM.
   ★ Make sure that the correct low and high idle speeds are adjusted.
3. Note the pressure shown on the pressure testing gauge.
   Feed pump oil and servo oil pressure: **30 bar**



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Installation of radiator assembly

- To fit the radiator carry out the removal procedure in reverse order.

  ★ Before installing the radiator, remove any residual oil and dirt from the engine compartment.

- Make sure that the fan is not damaged in any way when replacing the radiator.

✳ 3

kgm Screws: **115 Nm**

✳ 1

- Fill the radiator up with coolant again. See Operation Manual: COOLANT SYSTEM, CHANGING THE COOLANT AND CLEANING THE SYSTEM.

  Coolant: **9.1 l**

✳ 2

- Fill the hydraulic tank with oil again and check the hydraulic oil level.

  Hydraulic oil: **45 l**

  Correct the oil level if necessary. Once finished you should vent the hydraulic oil tank. See Operation Manual: HYDRAULICS, CHANGING OIL, VENTING HYDRAULIC OIL TANK.

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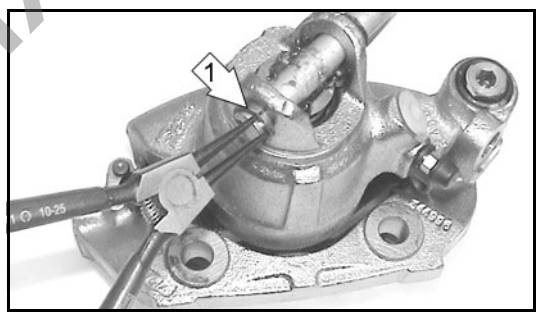
Disassembly (calliper removed)

1. Remove the piston dust cover.
2. Using a square-section tool (10 mm on a side) as indicated, unscrew the piston until it rotates freely.
3. Place a piece of wood between the piston and the calliper. Eject the piston from the calliper body by gradually applying compressed air to the inlet port. If the piston is to be reused take special care not to damage or dirty it. Clean only with unused LHM mineral brake fluid.
4. Extract the seal from its groove using a smooth, round-edged tool.

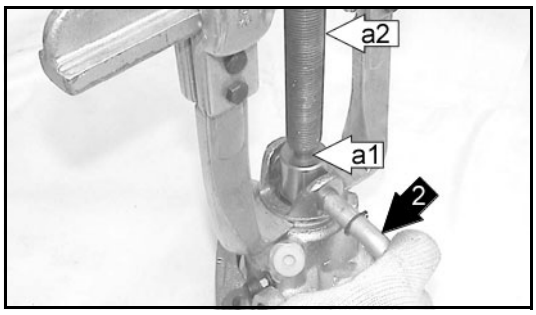
Under no circumstances should the internal piston components be disassembled.

Disassembly

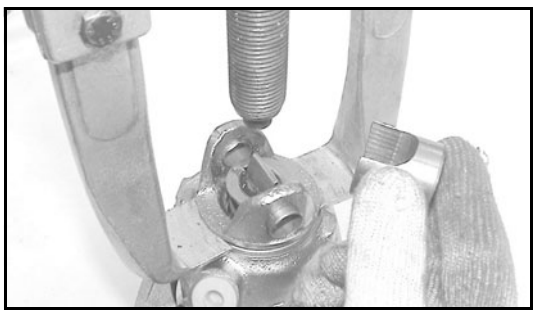
1. Remove the dust cover protecting the parking brake assembly.
2. Clean all grease off the assembly.
3. Remove the snap ring (1).



4. Fit an extractor by sliding the legs into the grooves normally intended for the lip of the parking brake assembly dust cover.
5. To compress the cover and the spring, use special tool CA715755 (a1).
6. Screw the extractor bolt (a2). Remove the cam shaft (2).



7. Remove the extractor and the special tool.



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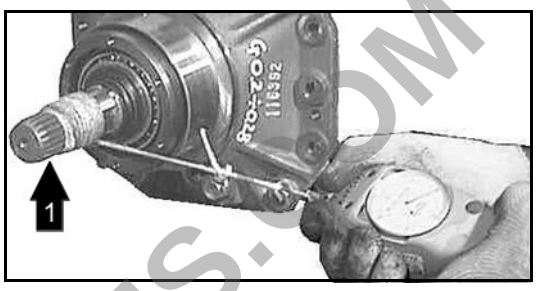
21. Tighten the ring nut (10) gradually. If the tightening is excessive, the collapsible spacer (5) must be replaced and the procedure repeated.

22. When you check the preloading, it is advisable to beat slightly both pinion ends with a soft hammer, so as to help setting the bearings (3) and (8).

P = 9.2 - 13.8 daN

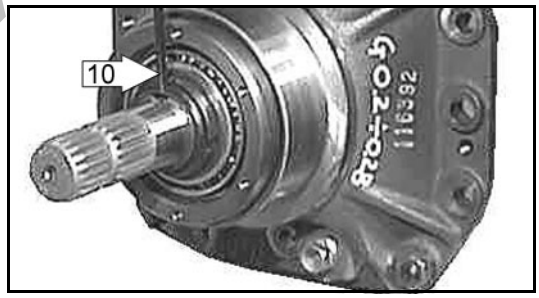
23. Carry out the preloading measurement (P) of the pinion taper roller bearings (3) and (8), using a dynamometer whose cord is wound on the end of pinion spline (1).

24. The adjustment is carried out by increasing the ring nut (10) torque gradually, being careful not to exceed.



Warning: all preloadings must be measured without the seal ring.

25. Once the requested preloading value is achieved, caulk the ring nut (10), using a hammer and a chisel.



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