Service manual

Dumper

3001



Machine model	**3001**
	D03-05 (from WNCD0305VPAL00283
Edition	**2.7**
Language	**en**
Article number	**1000156004**

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1.6 Control stand overview

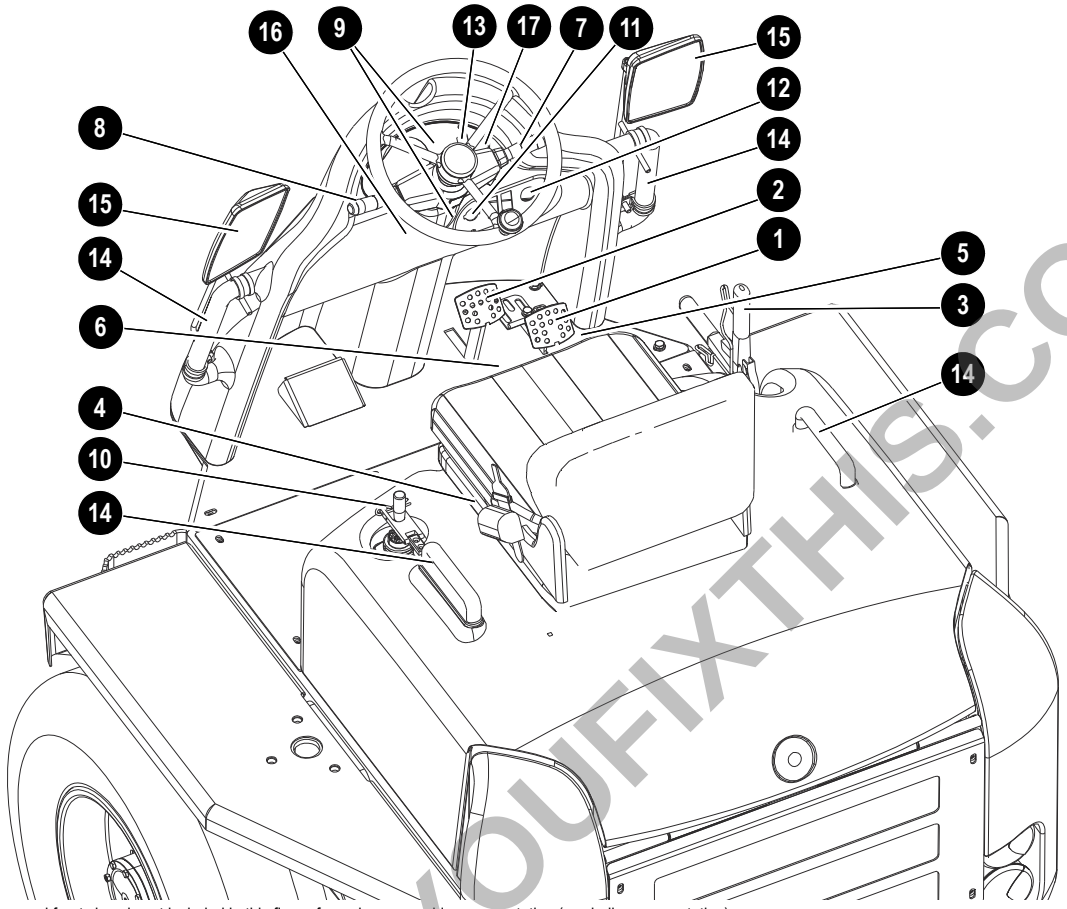


Fig. 9: Rollbar and front chassis not included in this figure for a clearer graphic representation (symbolic representation).

Pos.	Designation
1	Accelerator pedal
2	Service brake
3	Parking brake
4	Seat/backrest adjustment lever
5	Lever for horizontal seat adjustment
6	Adjusting wheel for seat weight adjustment
7	Multifunctional lever (right)
8	Multifunctional lever (left)
9	Display element
10	Skip control lever
11	Starter
12	Hazard warning switch (option) (Yanmar)
13	Low speed switch (turtle) (Yanmar)
14	Handhold
15	Rearview mirrors (option)
16	Hazard warning switch (option) (Perkins)
17	Push button for particulate filter regeneration (option) (Perkins)

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2 Technical data

2.1 Chassis

Sturdy steel sheet chassis, rubber-mounted engine

2.2 Engine (Yanmar)

Engine	3001	
	(up to serial number AD310200)	(from serial no. AE310242)
Product	Yanmar diesel engine	
Type	3TNV88-KNSV	3TNV88-BKNSV
Design	Water-cooled 4 stroke diesel engine	
Number of cylinders	3	
fuel injection system	Direct injection	
Aspiration	Natural aspiration	
Cooling system	Water-cooled/aspirating fan	
Lubrication system	Force-feed lubrication with trochoidal pump	
Displacement	1642 cm³ (100.2 in³)	
Nominal bore and stroke	88 x 90 mm (3.46 x 3.54 in)	
Power	26 kW +/− 5 % at 2800 rpm (34.9 hp +/− 5 % at 2800 rpm)	24.4 kW +/– 5 % at 2800 rpm (32.7 hp +/− 5 % at 2800 rpm)
Max. torque	101.5 – 110.5 Nm (75 – 82 lbf ft) at 1100 rpm	105 Nm (77 lbf ft) at 1000 rpm
Max. engine speed without load	2995 rpm +/− 25 rpm	
Idling speed	~1000 rpm +/− 25 rpm	
Valve clearance (intake = outlet)	0.15 – 0.25 mm (0.006 – 0.01")	
Injection pressure	196 – 206 bar (2843 – 2988 psi)	
Compression	Standard 34.3 bar (497.5 psi) Limit 27.5 ± 1 bar (399 ± 15 psi)	33.3 – 35.3 bar (483 – 512 psi) at 250 rpm
Engine oil pressure	2.9 - 3.9 bar (42 - 57 psi)	3.5 – 5.0 bar (51 – 73 psi)
Pressure switch for engine oil pump	0.5 ± 0.1 bar (7± 1.5psi)	0.4 - 0.6 bar (6 - 9 psi)
Thermostat opening temperature	71 °C/160 °F (start) 85 °C/185 °F (fully open)	69.5 – 72.5 °C/157.1 – 162.5 °F
Thermal switch	107 – 113 °C/224.6 – 235.4 °F	
Firing order	1 – 3 – 2 (1st cylinder on fan wheel side)	
Direction of rotation	Anticlockwise (as seen from the flywheel)	
Starting aid	Preheater (preheating time 15 seconds)	Glow elements (preheating time 10 – 15 seconds)
Exhaust values according to	97/68/EC tier 2 EPA tier 2	EC tier 3A EPA tier IV interim

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Engine capacities

Capacities	3001
Fuel tank	45 l (11.9 gal)
Engine oil (max./min. fill)	6.7 l/3.9 l (1.8/1.0 gal)
Coolant (without radiator)	2.0 l (0.5 gal)
Radiator	5.36 l (1.42 gal)
Coolant reservoir	0.84 l (0.22 gal)

Overview of capacities – *see Fluids and lubricants (Yanmar)* on page 3-2

Engine tightening torques

Tightening torques	Nm/lbf ft
Cylinder-head bolt	85.3 – 91.1/62.9 – 67.2 (M10x1.25)
Connecting rod bearing screw	44.1 – 49.0/32.5 – 36.1 (M9x1)
Main bearing screw	93.2 – 98.1/68.7 – 72.4 (M12x1.5)
Flywheel screw	83.3 - 88.2 / 61.4 - 65.1 (M10x1.25)

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Tightening torques for high-resistance threaded fittings

With coarse-pitch thread					
Thread	Screws according to DIN 912, DIN 931, DIN 933, etc.			Screws according to DIN 7984	
	8.8	10.9	12.9	8.8	10.9
	Nm (lbf ft)	Nm (lbf ft)	Nm (lbf ft)	Nm (lbf ft)	Nm (lbf ft)
M5	5,5 (4)	8 (6)	10 (7)	5 (4)	7 (5)
M6	10 (7)	14 (10)	17 (13)	8,5 (6)	12 (9)
M8	25 (18)	35 (26)	42 (31)	20 (15)	30 (22)
M10	45 (33)	65 (48)	80 (59)	40 (30)	59 (44)
M12	87 (64)	110 (81)	147 (108)	69 (51)	100 (74)
M14	135 (100)	180 (133)	230 (170)	110 (81)	160 (118)
M16	210 (155)	275 (203)	350 (258)	170 (125)	250 (184)
M18	280 (207)	410 (302)	480 (354)	245 (181)	345 (254)
M20	410 (302)	570 (420)	690 (509)	340 (251)	490 (361)
M22	550 (406)	780 (575)	930 (686)	460 (339)	660 (487)
M24	710 (524)	1000 (738)	1190 (878)	590 (435)	840 (620)
M27	1040 (767)	1480 (1092)	1770 (1305)	870 (642)	1250 (922)
M30	1420 (1047)	2010 (1482)	2400 (1770)	1200 (885)	1700 (1254)

DIN 912 - hexagon socket head cap screws; DIN 931/DIN 933 - hexagon bolts with / without shaft;
DIN 7984 – hexagon socket head cap screw with short head
All values subject to a friction coefficient of μ = 0.12 and are to be used as approximate figures.

With fine-pitch thread					
Thread	Screws according to DIN 912, DIN 931, DIN 933, etc.			Screws according to DIN 7984	
	8.8	10.9	12.9	8.8	10.9
	Nm (lbf ft)	Nm (lbf ft)	Nm (lbf ft)	Nm (lbf ft)	Nm (lbf ft)
M8X1.0	25 (18)	37 (28)	43 (32)	22 (16)	32 (24)
M10X1.0	50 (37)	75 (55)	88 (65)	43 (32)	65 (48)
M10X1.25	49 (36)	71 (52)	83 (61)	42 (31)	62 (46)
M12X1.25	87 (64)	130 (96)	150 (111)	75 (55)	110 (81)
M12X1.5	83 (61)	125 (92)	145 (107)	72 (53)	105 (77)
M14X1.5	135 (100)	200 (148)	235 (173)	120 (89)	175 (129)
M16X1.5	210 (155)	310 (229)	360 (266)	180 (133)	265 (195)
M18X1.5	315 (232)	450 (332)	530 (391)	270 (1991)	385 (284)
M20X1.5	440 (325)	630 (465)	730 (538)	375 (277)	530 (391)
M22X1.5	590 (435)	840 (620)	980 (723)	500 (369)	710 (524)
M24X2.0	740 (546)	1070 (789)	1250 (922)	630 (465)	900 (664)
M27X2.0	1100 (811)	1550 (1143)	1800 (1328)	920 (679)	1300 (959)
M30X2.0	1500 (1106)	2150 (1586)	2500 (1844)	1300 (959)	1850 (1364)

DIN 912 - hexagon socket head cap screws; DIN 931/DIN 933 - hexagon bolts with / without shaft;
DIN 7984 – hexagon socket head cap screw with short head
All values subject to a friction coefficient of μ = 0.12 and are to be used as approximate figures.

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3.6 Maintenance plan (overview – Yanmar)

Work description

For servicing and maintenance on the attachment, please refer to the operation and maintenance manual of the attachment manufacturer as well.

	Maintenance plan/operating hours (o/h)								
	Service work (daily)	Every 50 o/h	Every 250 o/h	Every 500 o/h	Every 1000 o/h Once a year	Every 1500 o/h	Every 2000 s/h	Customer	Authorized service center
Fluid and filter changes ( ):									
Perform the following oil and filter changes (check oil levels after test run):									
• Engine oil [1]		●	●						●
• Engine oil filter [2]		●	●						●
• Fuel filter [3]		●		●					●
• Air filter [4]				●				●	
• Coolant					●				●
• Gear oil in axles, transfer gearbox [5]		●			●				●
• Brake fluid				●					●
• Hydraulic oil filter insert [6]		●		●					●
• Hydraulic oil [7]					●				●
• Hydraulic oil reservoir breather					●				●
Inspection work ( ):									
Check the following material. Refill if necessary:									
• Engine oil	●							●	
• Engine coolant	●							●	
• Hydraulic oil	●							●	
• Fuel	●							●	
• Gearbox oil			●						●
• Check the gearbox and axles for leaks	●							●	
• Brake fluid	●							●	
Clean water ducts							●		●
Re-tighten the axle fastening screws		●						●	

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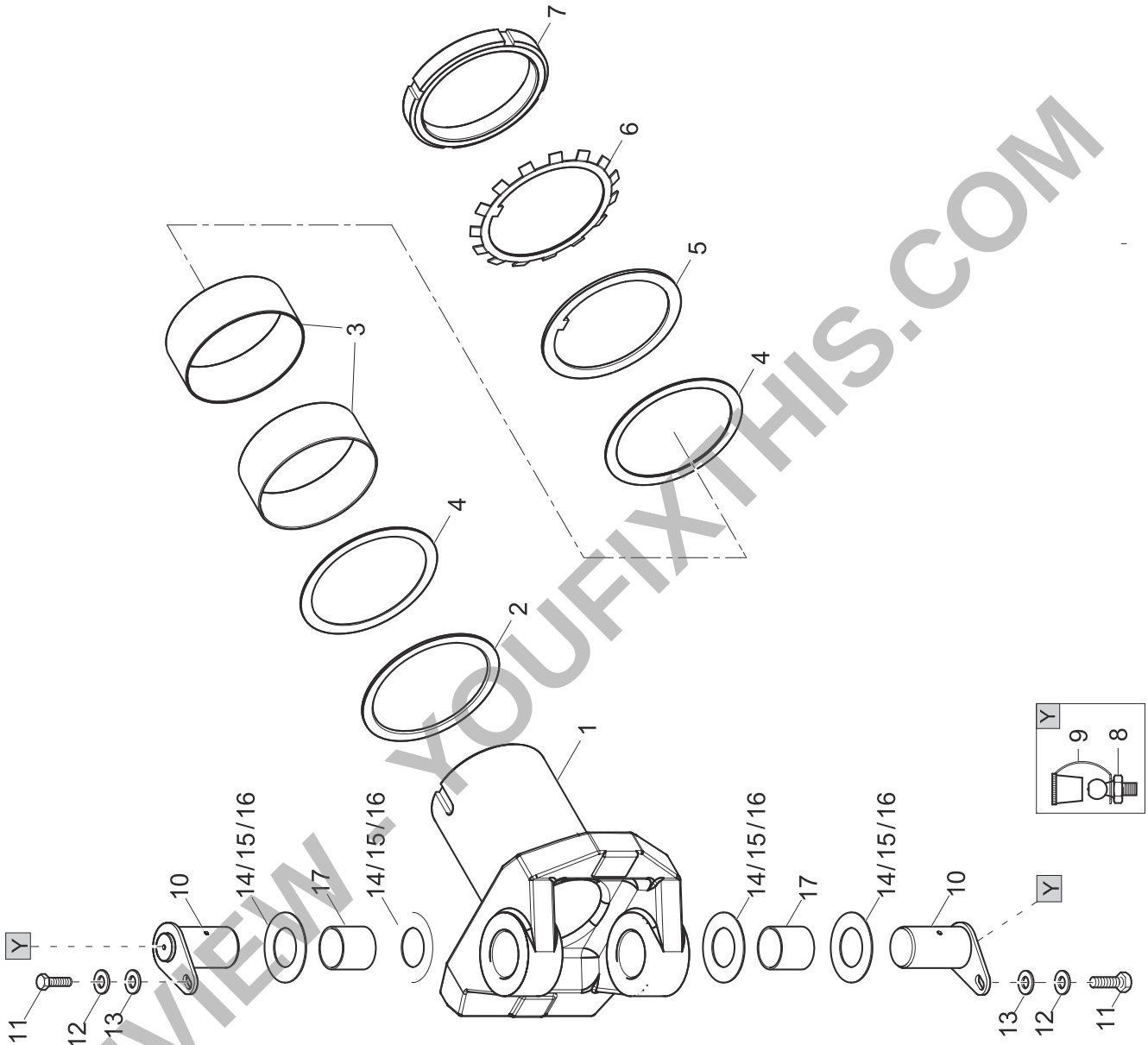
4.20 Engine malfunctions

Problem	Possible causes
Engine does not start or is not easy to start	Wrong SAE grade of engine lubrication oil
	Fuel grade does not comply with specifications
	Malfunctioning or empty battery
	Loose or oxidized cable connections in starter circuit
	Malfunctioning starter, or pinion does not engage
	Wrong valve clearance
	Malfunctioning fuel injector
	Malfunctioning starting relay
	Malfunctioning glow plug
	Malfunctioning solenoid switch
	Cutoff solenoid does not attract
	Cutoff solenoid without current
	High pressure created immediately in the hydraulic system
Engine starts, but does not run smoothly or faultless	Fuel grade does not comply with specifications
	Wrong valve clearance
	Injection line leaks
	Malfunctioning fuel injector
Engine overheats. Temperature warning system responds	Oil level too low
	Oil level too high
	Dirty air filter
	Dirty oil radiator fins
	Malfunctioning fan, torn or loose V-belt
	Resistance in cooling system too high, flow capacity too low
	Malfunctioning thermostat
	Malfunctioning fuel injector
Insufficient engine power	Oil level too high
	Fuel grade does not comply with specifications
	Dirty air filter
	Malfunctioning air filter maintenance switch or gage
	Wrong valve clearance
	Injection line leaks
	Malfunctioning fuel injector
Engine does not run on all cylinders	Injection line leaks
	Malfunctioning fuel injector
Insufficient or no engine oil pressure	Oil level too low
	Machine inclination too high (max. 25°)
	Wrong SAE grade of engine lubrication oil

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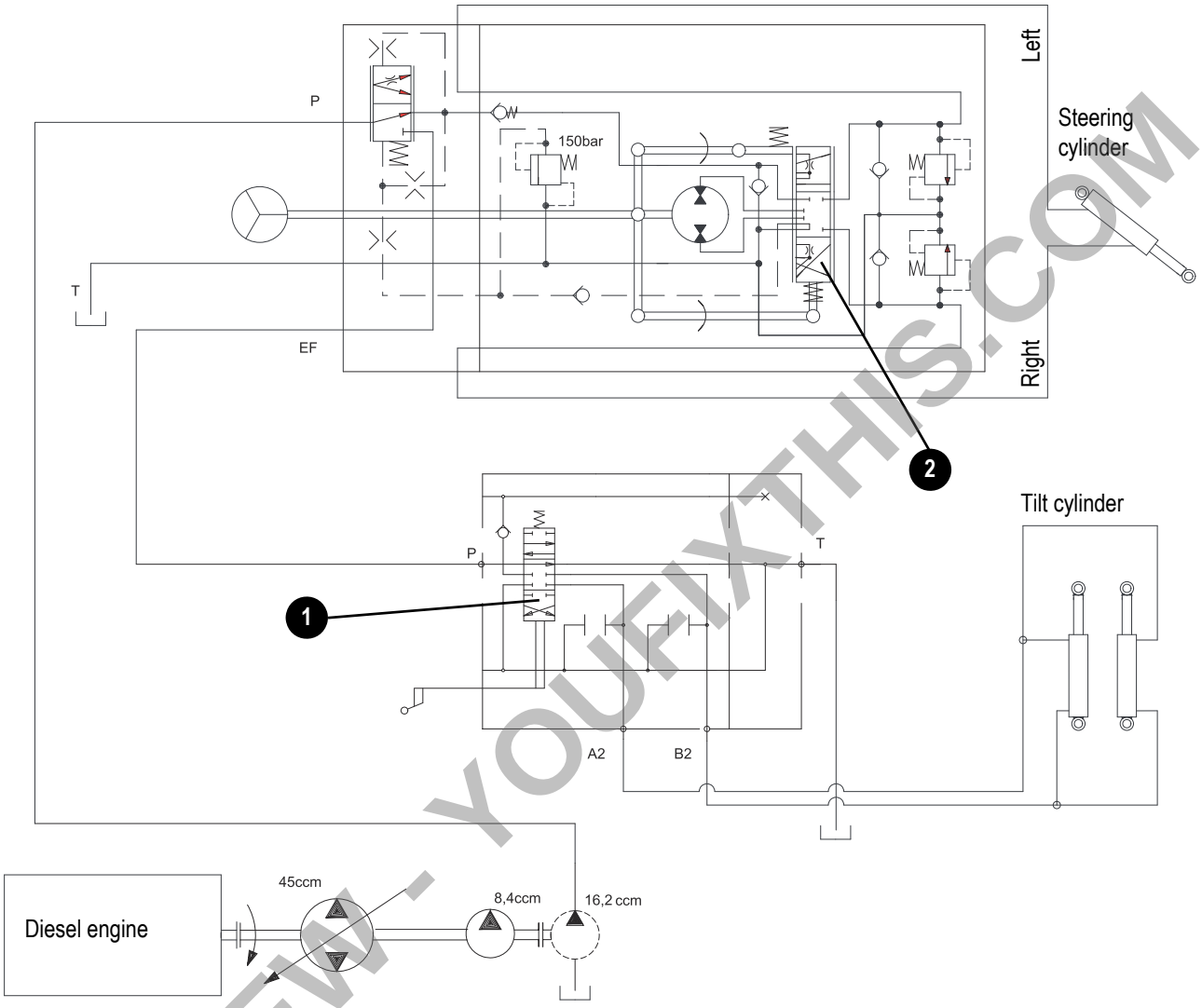
6.4 Articulated joint (up to AB)



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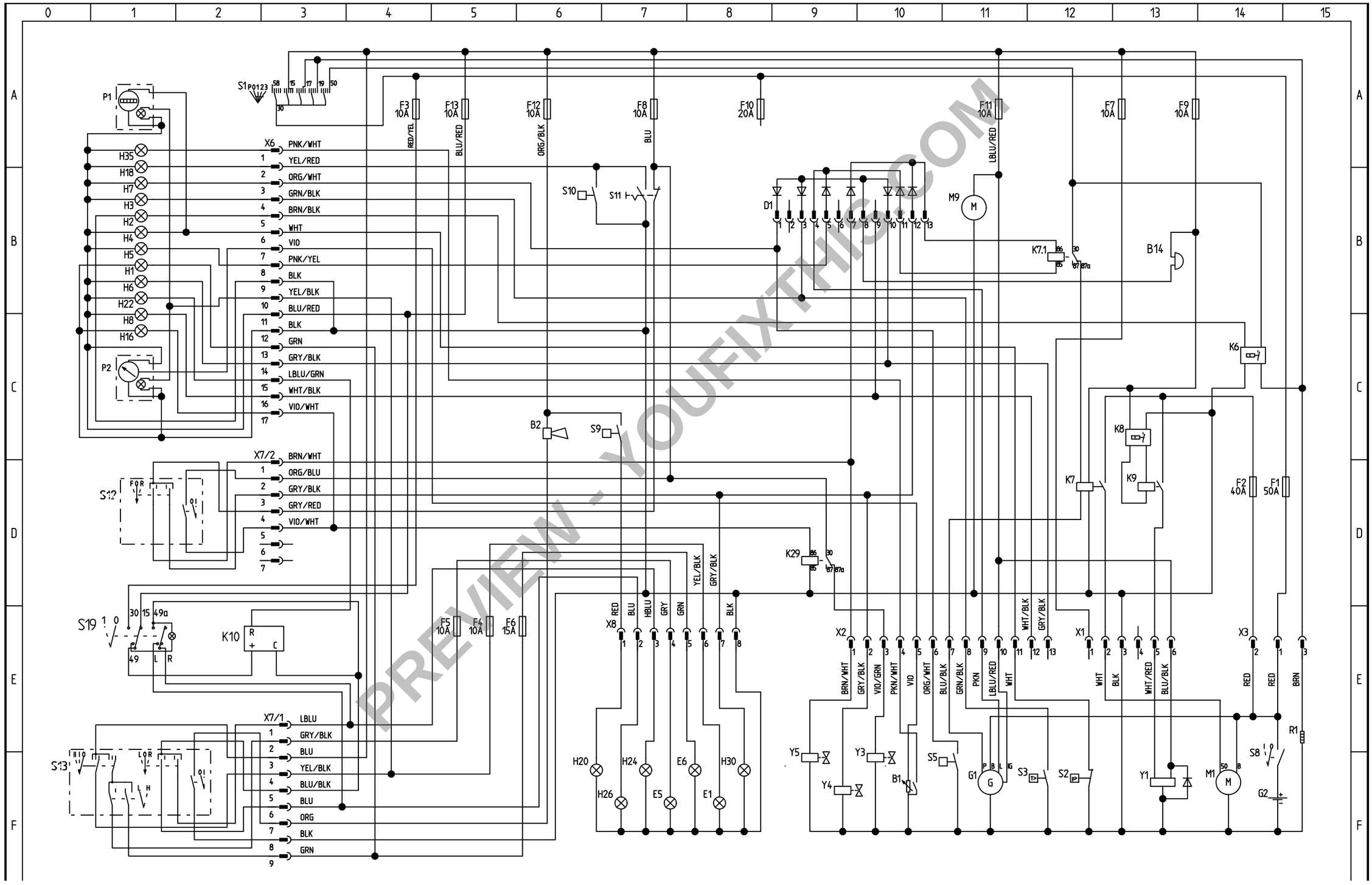
9.3 Tilting the skip: hydraulic diagram (up to AB)



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10.7 Yanmar wiring diagram (up to AB)

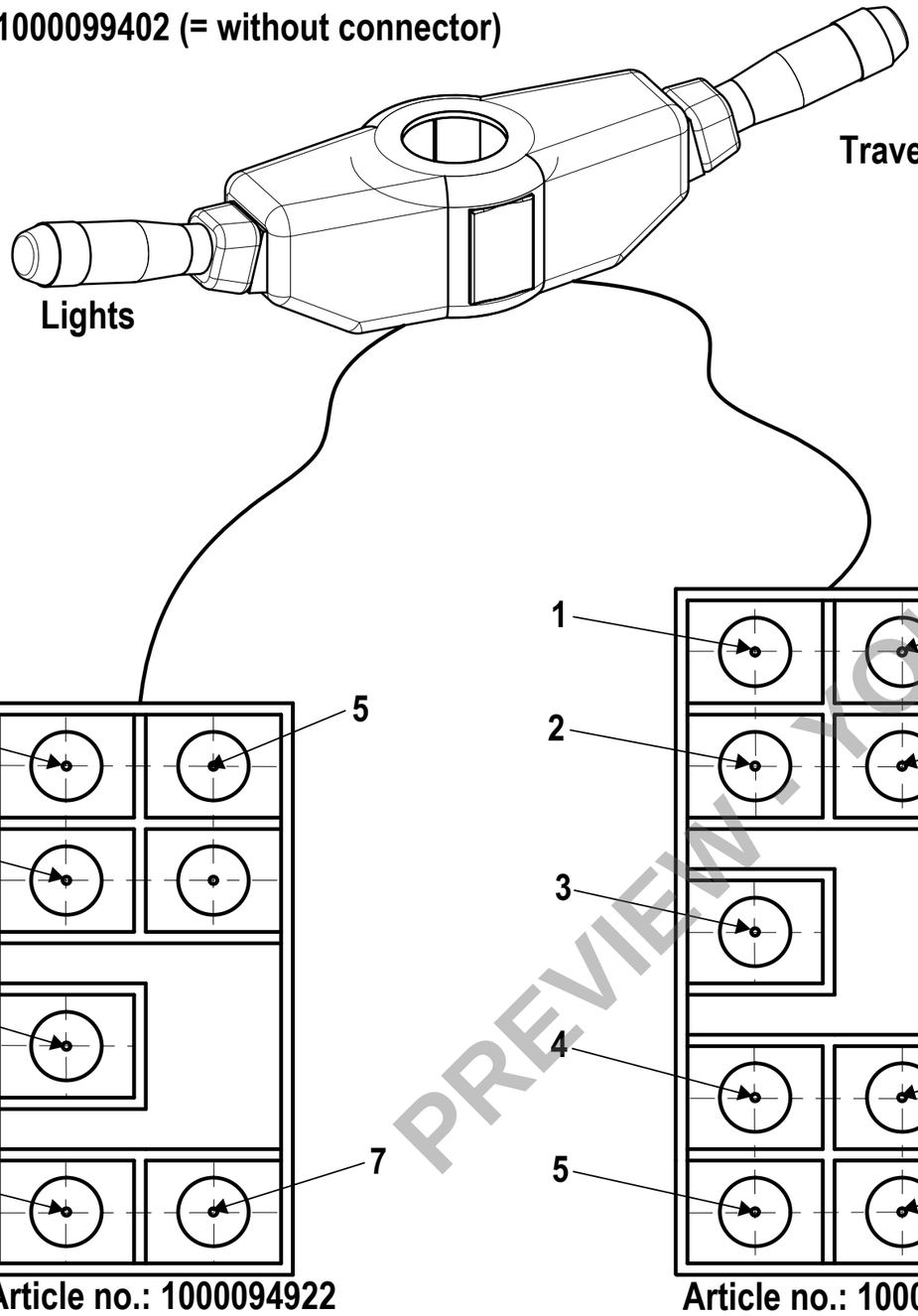


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10.26 Light switch connector assignment

Article no.: 1000099402 (= without connector)



Article no.: 1000094922

Article no.: 1000095321

Connector article no.: 1000094922		
Pos. no.	**Color**	**Function**
1	Blue – black	Forward
2	Red	+ (15)
3	Blue	Reverse
4	White	+ (15)
5	Green	Fast
7	Yellow	Slow

Connector article no.: 1000095321		
Pos. no.	**Color**	**Function**
1	Blue – black	Turn indicators (right)
2	Gray	Low beam
3	Brown	+ (15)
4	Yellow	Parking light
5	Orange	Turn indicator relay
6	Blue	Turn indicators (left)
7	White	Horn (ground contact)
8	Black	Ground
9	Green	High beam

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