



FIATALLIS®

WHEEL LOADERS

**SERVICE
MANUAL**

FW60
S/N 300 55-UP

FW80
S/N 302 57-UP

76589732
ISSUE 1

AVOID ACCIDENTS

Most accidents, whether they occur in industry, on the farm, at home or on the highway, are caused by the failure of some individual to follow simple and fundamental safety rules or precautions. For this reason MOST ACCIDENTS CAN BE PREVENTED by recognizing the real cause and doing something about it before the accident occurs.

Regardless of the care used in the design and construction of any type of equipment there are conditions that cannot be completely safeguarded against without interfering with reasonable accessibility and efficient operation.

A careful operator is the best insurance against an accident.
The complete observance of one simple rule would prevent many thousand serious injuries each year.
That rule is:

Never attempt to clean, oil or adjust a machine while it is in motion.

WARNING

On machines having hydraulically, mechanically, and/or cable controlled equipment (such as shovels, loaders, dozers, scrapers, etc.) be certain the equipment is lowered to the ground before servicing, adjusting and/or repairing. If it is necessary to have the hydraulically, mechanically, and/or cable controlled equipment partially or fully raised to gain access to certain items, be sure the equipment is suitably supported by means other than the hydraulic lift cylinders, cable and/or mechanical devices used for controlling the equipment.

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

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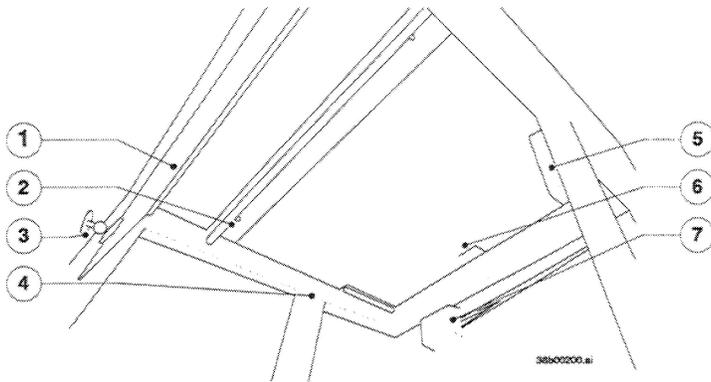
FW60, FW80 WHEEL LOADERS

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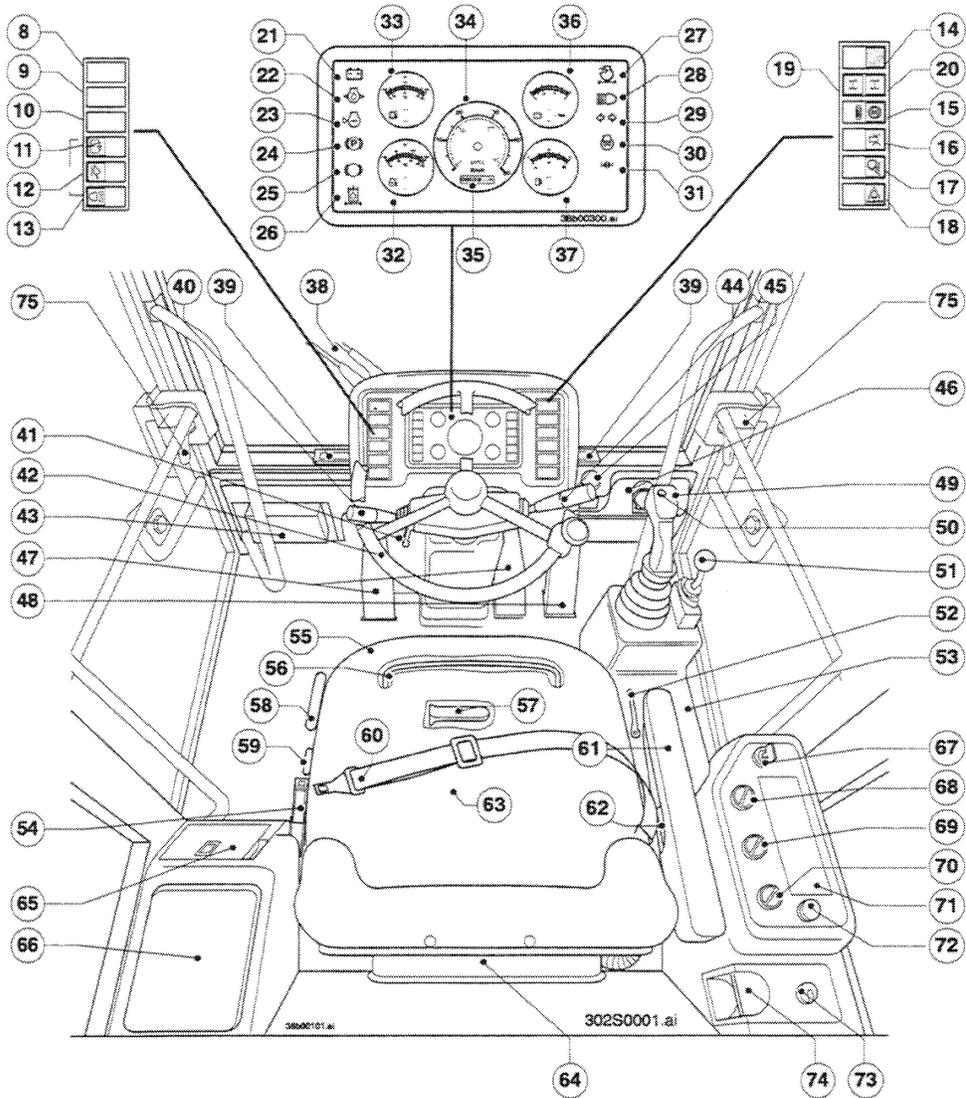
Please note; Model references of '220' is the
'FW60' and '420' is the 'FW80'.

Controls

Operator compartment 220 / 320 / 420 (Typ 300 55 / 301 56 / 302 57)



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Operator compartment 220 / 320 / 420 (Typ 300 55 / 301 56 / 302 57)

Ref. no.	Description	Ref. no.	Description
Roof		41	Lever – steering wheel angle and height adjustment
1	Sun visor	42	Steering wheel
2	Roof fixture for sun visor	43	Fuse box
3	Windscreen fixture for sun visor	44	Steering column combination control lever – indicators, front wiper with intermittent wipe, front washer, horn, headlight flasher, main beam/dipped beam
4	Operator compartment type label	45	Brake fluid tank
5	Interior light	46	Washer fluid tank – windscreen and rear window washer system
6	Roof hatch lock	47	Inching/service brake pedal
7	Rear wiper	48	Accelerator pedal
Front instrument panel		49	Control lever – loader unit (raising – lowering – tilting in – dumping out)
8	not used	50	Pushbutton – differential lock
9	not used	51	Control lever with lock – implements and quickhitch facility (3rd control circuit)
10	not used	52	Lock for loader unit and implements
11	Rocker switch – rear wiper with washer switch	53	Control lever console
12	Rocker switch – bounce control (SO)	54	Lever – parking brake
13	Rocker switch – lights	Operator seat	
14	Switch (red) – steering synchronisation	55	Height adjustment
15	Rocker switch – steering (SO)	56	Handle – horizontal adjustment of complete seat
16	Rocker switch – rotating beacon (SO)	57	Lever – weight setting
17	Rocker switch – working light	58	Handle – horizontal adjustment of upper part of operator seat
18	Rocker switch – hazard warning light	59	Lever – backrest adjustment
19	Telltale (green) – four wheel steering	60	Seat belt
20	Telltale (green) – front axle steering	61	Arm rest
21	Telltale (red) – generator/battery monitoring	62	Twist knob – arm rest angle
22	Telltale (red) – engine oil pressure	63	Operator seat
23	not used	Side and rear controls	
24	Telltale (red) – parking brake	64	Storage area – operation manual
25	Telltale (yellow) – brake pad wear	65	Tool box
26	Telltale (red) – hydraulic reflux filter	66	Storage area/emergency
27	Telltale (yellow) – air filter	67	Preheating start switch
28	Telltale (blue) – main beam	68	Rotary switch – 3 level heater blower
29	Telltale (green) – indicators	69	Rotary switch – heater blower temperature regulation
30	Telltale (yellow) – cold starter	70	Rotary switch – fresh air/recirculated air
31	Telltale (green) – differential lock	71	Dummy cover – radio (SO)
32	Temperature gauge – engine and cooling oil	72	Cigarette lighter/socket
33	Temperature gauge – hydraulic oil	73	Rotary switch – vehicle heater (SO)
34	Speedometer with hour meter (high speed SO)	74	Drink holder
35	Hour meter	75	Door locks
36	Voltmeter – Battery		
37	Fuel level indicator		
Front controls			
38	Front wiper		
39	Air nozzle – windscreen		
40	Steering column control lever – hydrostatic drive and driving direction		

Specifications wheel loader 220 (model 300 55)

Frame

Sturdy U-section frame, rubber-mounted operator cab, rubber-mounted engine

Engine

Product:	Deutz diesel engine
Model:	KHD F3L 1011 "F"
Cylinder arrangement:	In line
Number of cylinders:	3, oil-to-air cooled
Displacement:	2049 cm ³
Nominal bore and stroke:	91 x 105 mm
Compression ratio:	18.5 : 1
Output:	99 kW / 39.4 HP, 2,500 rpm (DIN ISO 3046)
Rated engine torque:	110 Nm
Max. engine torque:	120 Nm, 1,800 rpm
Fuel consumption:	223 g/KWh minimum
Fuel injection system:	Direct fuel injection with single pumps
Injection pressure:	250 bar
Firing order:	1 - 2 - 3
Start of delivery:	14° before top dead centre
Starting aid:	Heater plug (preheating time 1 minute)
Oil lubrication of engine is ensured up to the following inclined positions:	max. lateral inclination left/right: 58/58 % max. inclination upward/downward: 84/47 % Observe tilting limit of the machine!
Oil pressure:	2.3 bar minimum, 2,500 rpm
Valve tip clearance ^a :	Inlet 0.30 mm Outlet 0.5 mm engine at cold temperature respectively

a. Minimum time for engine to cool down = 30 minutes; oil temperature below 80° C

Power train

Hydrostatic power train with drive automatic and permanent four wheel drive.

Hydraulic pump:	Direct flanged to the engine, Model: A4VG28DA
Displacement:	28 cm ³ /rev maximum
Max. service pressure (Δp):	440 bar
Starting RPMs:	1.150 ± ⁵⁰ rpm, 50 bar HP
Droop:	2.300 ± ¹⁰⁰ rpm, 260 bar HP
Boost pump:	Displacement: 6.1 cm ³ /rev Charging pressure: 25 bar, 1,500 rpm
Control:	Speed-sensitive hydraulic feed volume adjustment with pressure cut-off
Drive direction:	Electrohydraulic control
Inching:	Hydraulic inching valve, controlled via master brake cylinder
Hydraulic motor:	Attached to the rear axle transfer gearbox
Variable displacement motor	Model: A6VM80DA/63
Capacity:	17.8 cm ³ /rev minimum 80 cm ³ /rev maximum
Control:	Speed-related controller
Drive speed:	1st position forward - reverse 0 - 5 kph 2nd position forward - reverse 0 - 20 kph
Traction force:	32.2 kN

Specifications wheel loader 220 (model 300 55)

Axles

Front axle

model PLT steering and drive axle (portal-type); gear reductions in the wheel hubs; with central brake disc at axle input and 100% differential lock; rigid screw connection with frame.

Track width:	1375 mm
Camber:	1°
King-pin inclination:	10°

Rear axle

model PLT steering and drive axles (portal-type) with oscillation; gear reductions in the wheel hubs; disc brake (high speed version) and multidisc differential lock; flange-mounted hydrostatic motor with axle transfer gearbox.

Oscillation:	± 9°
Track width:	1.375 mm
Camber:	1°
King-pin inclination:	10°

Axle load

Front and rear 3,750 kg maximum

Brakes

Service brake:	Disc brake at front axle input
Components:	Master brake cylinder, pressure difference valve, brake calliper, differential lock (inching valve on power train)
Brake fluid:	see <i>Lubricants and engine/machine fluids</i> on page A-24



Additional brake force via the hydrostatic drive!

Parking brake:	Mechanical disc brake installed on rear axle, acting to both axles via propshaft
Brake disc outer Ø:	Ø 270 mm

Steering

Fully hydraulic four wheel steering with emergency steering features.

Steering modes:	Four wheel steering
Components:	Hand pump; hydraulic pump; 1 steering ram per axle; safety valves; solenoid valve for steering synchronisation, priority valve.
Hand pump:	Eaton servostat Displacement 120 cm ³ /rev Service pressure 172 bar
Hydraulic pump:	Gear pump (priority valve) Displacement 28 cm ³ /rev
Maximum steering angle:	45°

Work hydraulics

Hydraulic pump	Gear pump Displacement 28 cm ³ /rev 70 ltr/min maximum Service pressure 175 bar
Control valve:	Nordhydraulik 3-fold pilot control
Secondary safety:	Tilt ram rod side 200 bar bottom side 120 bar

Pilot control

Pilot control pump = boost pump of hydraulic pump	Displacement: 6.1 cm ³ /rev Charging pressure 25 bar, 1,500 rpm
Pilot valve (Joystick):	Four-way lever - control of lift and tilt rams
Pilot control unit (simple):	Control of lock ram and implements
Ball-type stop cock:	Lock against unintentional actuation (for long-haul travel)

Specifications wheel loader 220 (model 300 55)

Loader unit

Bucket capacity	heaped as per SAE0.58 m ³		
Tipping load	2.800 kg		
Payload	1.400 kg (tipping load x 0.5)		
Lift load at max. height	2.365 kg		
Bucket width	1.750 mm		
Dumping height	2.475 mm		
Dumping reach	720 mm		
Scraping depth	-80 mm		
Tilt-back angle	50°		
Dump-out angle	-45°		
Breakout force (lift ram)	27.0 kN (hydr. 32.3 kN)		
Breakout force (tilt ram)	29.0 kN		
Payload on pallet forks			
Tipping load (DIN 24 094)	2.250 kg		
Payload	Factor 1.25	1.800 kg	
	Factor 1.67	1.350 kg	
Movable payload in transport position			
	Factor 1.25	2.230 kg	

Electrical system

Alternator	14V 60A
Starter	12V; 2.2 kW
Battery	12 V 74 Ah
Socket	E. g. for cigarette lighter; 15 A maximum

Tyres

Tyre size	Tyre pressure (bar)*		Wheel rims	
	front	rear	Wheel rim	Wheel off-set
12.0-18 TL T86-10 PR	1.75*	1.75*	9 x 18	100 mm
10.5-18 KM Grip-8 PR	2.0*	2.0*	9 x 18	100 mm
275/80 R18 XM27	2.50*	2.0*	9 x 18	100 mm
335/80 R18 XM27	2.0*	1.5*	9 x 18	100 mm

* Increase tyre pressure by 0.5 bar during pallet forks operation!

Weights

Kerb weight	4.600 kg (daN)*
Gross weight rating	5.500 kg
Front axle weight rating	3.750 kg
Rear axle weight rating	3.750 kg
Maximum authorized load for towing facility	5.500 kg

* Values indicated are valid for machines equipped with standard bucket.

Noise levels

Sound power level	99 dB(A)
Noise level in the cab	79 dB(A)



Noise measurement in accordance with EC guidelines 84/532 EEC, 79/113 EEC and 86/662 EEC.

Vibration

Effective acceleration value for the upper extremities of the body	<2,5 m/s ²
Effective acceleration value for the body	<0,5 m/s ²

Specifications wheel loader 220 (model 300 55)

Capacities

Fuel tank	90 ltr.	Diesel fuel as per DIN 51601
Hydraulic oil tank	57 ltr.	ATF 66 M ^a
Diesel engine (engine oil)	10.5 ltr.	for oil changes, incl. filter HD-C 15W40 (MIL-L-2104C) (API CD/CE/CF4; CCMC D4)
Gearbox and rear axle differential	5.0 ltr.	SAE 90, GO90 ^a MIL-L-2105B; API - GL4
Front axle differential	4.25 ltr.	SAE 90, GO90 ^a MIL-L-2105B; API - GL4
Front and rear axle final drives	1.25 ltr. each	SAE 90, GO90 ^a MIL-L-2105B; API - GL4
Brake system	0.5 ltr.	Brake fluid DOT 3.4, SP-A ^a
Windscreen washing system	2.5 ltr.	Cleaning agent
Rear washing system		

a. Abbreviation for lubricants (Hauptverband der Deutschen Bauindustrie e.V. - German construction engineering association)

Tightening torques

Screw dimensions	Tightening torque in Nm)*		
	8.8	10.9	12.9
M4	3	5	5
M5	6	9	10
M6	10	15	18
M8	25	35	45
M10	50	75	83
M12	88	123	147
M14	137	196	235
M16	211	300	358
M18	290	412	490
M20	412	578	696
M22	560	785	942
M24	711	1000	1200
M27	1050	1480	1774
M30	1420	2010	2400

* These values are valid for screws with untreated, non-lubricated surfaces.

Dimensions

Overall length ^a	5.060 mm
Overall height ^{b, c}	2.645 mm
Overall width ^a	1.750 mm
Ground clearance	400 mm
Front/rear track width	1.375 mm
Wheelbase	1.850 mm
Outer turning radius ^d	3.760 mm
Outer track circle ^d	2.430 mm

a. with standard bucket

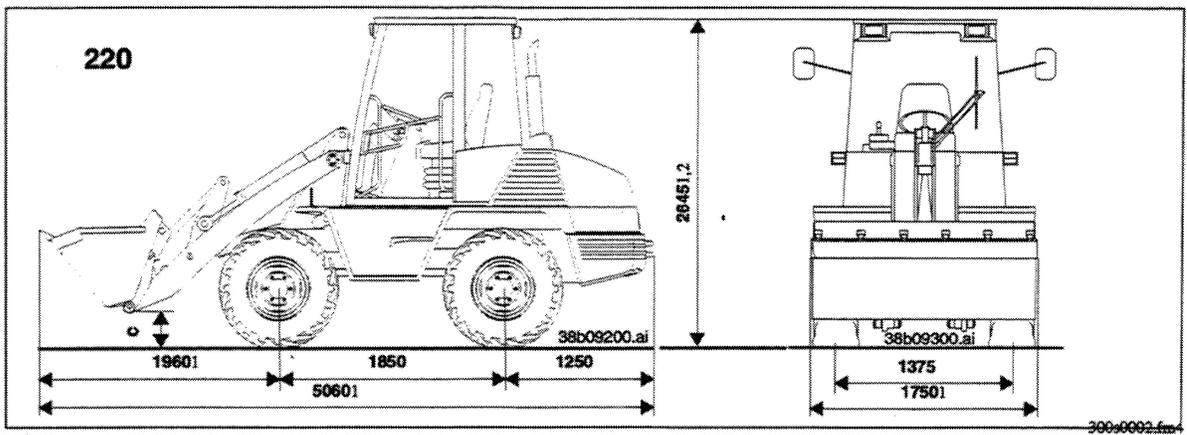
b. with standard tyres

c. with FOPS screen plus 295 mm

d. with 4 wheel steering

Specific tightening torques

Wheel nut	300 ^{±20} Nm
Castle nut – track rod (steering ram)	200 Nm
Axle mounting	380 Nm



300-0002.fms

Specifications wheel loaders 320 / 420 (models 301 56 / 302 57)

Frame

Sturdy U-section frame, rubber-mounted operator cab, rubber-mounted engine

Engine 320 (301 56)

Product:	Deutz diesel engine
Model:	KHD F4L 1011 F "KR4"
Cylinder arrangement:	In line
Number of cylinders:	4, oil-to-air cooled
Displacement:	2732 cm ³
Nominal bore and stroke:	91 x 105 mm
Compression ratio:	18.5 : 1
Output:	39 kW / 53 HP, 2,500 rpm (DIN ISO 3046)
Rated engine torque:	149 Nm
Max. engine torque:	161 Nm, 1,600 - 2,000 rpm
Fuel consumption:	215 g/KWh minimum
Fuel injection system:	Direct fuel injection with single pumps
Injection pressure:	250 bar
Firing order:	1 - 3 - 4 - 2
Start of delivery:	14° before top dead centre
Starting aid:	Heater plug (preheating time 1 minute)
Oil lubrication of engine is ensured up to the following inclined positions:	max. lateral inclination left/right: 58/58 % max. inclination upward/downward: 84/47 % Observe tilting limit of the machine!
Oil pressure:	2.3 bar minimum, 2,500 rpm
Valve tip clearance ^a :	Inlet 0.30 mm Outlet 0.5 mm engine at cold temperature respectively

a. Minimum time for engine to cool down = 30 minutes; oil temperature below 80° C

Engine 420 (302 57)

Product:	Deutz diesel engine
Model:	KHD BF4L 1011 FT "KR5"
Cylinder arrangement:	In line
Number of cylinders:	4, oil-to-air cooled
Displacement:	2732 cm ³
Nominal bore and stroke:	91 x 105 mm
Compression ratio:	17 : 1
Output:	42 kW / 57 HP, 2,500 rpm (DIN ISO 3046)
Rated engine torque:	160 Nm
Max. engine torque:	181 Nm, 1,800 rpm
Fuel consumption:	215 g/KWh min.
Fuel injection system:	Direct fuel injection with single pumps
Injection pressure:	250 bar
Firing order:	1 - 3 - 4 - 2
Start of delivery:	14° before top dead centre
Starting aid:	Heater plug (preheating time 1 minute)
Oil lubrication of engine is ensured up to the following inclined positions:	max. lateral inclination left/right: 58/58 % max. inclination upward/downward: 84/47 % Observe tilting limit of the machine!
Oil pressure:	minimum 2.3 bar, 2,500 rpm
Valve tip clearance ^a :	Inlet 0,30 mm Outlet 0,5 mm engine at cold temperature respectively

a. Minimum time for engine to cool down = 30 minutes; oil temperature below 80° C

Specifications wheel loaders 320 / 420 (models 301 56 / 302 57)

Power train

Hydrostatic power train with drive automatic and permanent four wheel drive. High speed gearbox available as an option

Hydraulic pump:	Direct flanged to the engine, Model: A4VG40DA
Displacement:	40 cm ³ /rev maximum
Max. service pressure (Δp):	420 bar
Starting RPMs:	1.100 ±50 rpm, 50 bar HP
Droop:	2.300 ±100 rpm, 430 ±40 bar HP
Boost pump:	Displacement: 8.4 cm ³ /rev Charging pressure: 25 bar, 1,500 rpm
Control:	Speed-sensitive hydraulic feed volume adjustment with pressure cut-off
Drive direction:	Electrohydraulic control
Inching:	Hydraulic inching valve, controlled via master brake cylinder
Hydraulic motor:	Attached to the rear axle transfer gearbox
Variable displacement motor	Model: A6VM107JA/63
Capacity:	27.1 cm ³ /rev minimum 107 cm ³ /rev maximum
Control:	Speed-related controller
Drive speed:	1st position forward - reverse 0 - 5 kph 2nd position forward - reverse 0 - 20 kph
High speed (option) via the mechanical stand-still transfer gearbox	1st position forward - reverse 0 - 9.5 kph 2nd position forward - reverse 0 - 39 kph
Traction force:	40.4 kN

Axles

Front axle

model PLT steering and drive axle (portal-type); gear reductions in the wheel hubs; with central brake disc at axle input and 100% differential lock; rigid screw connection with frame.

Track:	1,440 mm
Camber:	1°
King-pin inclination:	10°

Rear axle

model PLT steering and drive axles (portal-type) with oscillation; gear reductions in the wheel hubs; multidisc differential lock; high speed version with disc brake; flange-mounted hydrostatic motor with axle transfer gearbox.

Oscillation:	± 9°
Track:	1,440 mm
Camber:	1°
King-pin inclination:	10°

Axle load

Front and rear 3,750 kg maximum

Brakes

Service brake:	Disc brake at front axle input (high speed version: also on rear axle)
Components:	Master brake cylinder, pressure difference valve, brake calliper, differential lock (inching valve on power train)
Brake fluid:	see <i>Lubricants and engine/machine fluids</i> on page A-24



Additional brake force via the hydrostatic drive!

Parking brake:	Mechanical disc brake installed on front axle, acting to both axles via propshaft
Brake disc outer Ø:	Ø 270 mm

Specifications wheel loaders 320 / 420 (models 301 56 / 302 57)

Steering

Fully hydraulic four wheel steering with emergency steering features.

Steering modes:	Four wheel steering In 2nd speed of high speed version, front axle steering only!
Components:	Hand pump; hydraulic pump; 1 steering ram per axle; safety valves; solenoid valve for steering synchronisation, priority valve.
Hand pump:	Eaton servostat Displacement 120 cm ³ /rev Service pressure 172 bar
Hydraulic pump:	Gear pump (priority valve) Displacement 28 cm ³ /rev
Maximum steering angle:	45°

Work hydraulics

Hydraulic pump	Gear pump Displacement 28 cm ³ /rev 70 ltr/min maximum Service pressure 210 bar
Control valve:	Nordhydraulik 3-fold pilot control
Secondary safety:	Tilt ram rod side 240 bar bottom side 120 bar

Pilot control

Pilot control pump = boost pump of hydraulic pump	Displacement: 8.4 cm ³ /rev Charging pressure 25 bar, 1,500 rpm
Pilot valve (Joystick):	Four-way lever - control of lift and tilt rams
Pilot control unit (simple):	Control of lock ram and implements
Ball-type stop cock:	Lock against unintentional actuation (for long-haul travel)

Loader unit 320

Bucket capacity	heaped as per SAE 0.7 m ³	
Tipping load	2,970 kg	
Payload	1,485 kg (tipping load x 0.5)	
Lift load at max. height	2,910 kg	
Bucket width	1,850 mm	
Dumping height	2,510 mm	
Dumping reach	680 mm	
Scraping depth	-45 mm	
Tilt-back angle	50°	
Dump-out angle	-45°	
Breakout force (lift ram)	28.8 kN (hydr. 39.8 kN)	
Breakout force (tilt ram)	34.7 kN	
Payload on pallet forks		
Tipping load (DIN 24 094)	2,375 kg	
Payload	Factor 1.25	1,900 kg
	Factor 1.67	1,420 kg
Movable payload in transport position	Factor 1.25	2,450 kg

Loader unit 420

Bucket capacity	heaped as per SAE 0.8 m ³	
Tipping load	3,290 kg	
Payload	1,645 kg (tipping load x 0.5)	
Lift load at max. height	2,910 kg	
Bucket width	1,850 mm	
Dumping height	2,510 mm	
Dumping reach	680 mm	
Scraping depth	-45 mm	
Tilt-back angle	50°	
Dump-out angle	-45°	
Breakout force (lift ram)	31.5 kN (hydr. 39.8 kN)	
Breakout force (tilt ram)	34.7 kN	
Payload on pallet forks		
Tipping load (DIN 24094)	2,560 kg	
Payload	Factor 1.25	2,050 kg
	Factor 1.67	1,530 kg
Movable payload in transport position	Factor 1.25	2,500 kg

Specifications wheel loaders 320 / 420 (models 301 56 / 302 57)

Electrical system

Alternator	14V 60A
Starter	12V; 2.2 kW
Battery	12 V 74 Ah
Socket	E. g. for cigarette lighter, 15 A maximum

Tyres 320

Tyre size	Tyre pressure (bar)*		Wheel rims	
	front	rear	Wheel rim	Wheel off-set
12.5-18 MPT 30-8 10PR	2.5	1.75	11 x 18	67 mm
12.5-18 MPT TG32-10 PR	2.25	1.75	11 x 18	67 mm
12.5-18 MPT E91-2-8 PR	2.25	1.75	11 x 18	67 mm
12.5-18 Super TL-10 PR	2.25	1.75	11 x 18	67 mm
15.5-55 R18 SPPG 7	3.0	2.0	11 x 18	67 mm
335/80 R18 XM27	2.25	1.75	11 x 18	67 mm
365/70 R18 SPT9	2.5	2.0	11 x 18	67 mm

* Increase tyre pressure by 0.5 bar during pallet forks operation!

Tyres 420

Tyre size	Tyre pressure (bar)*		Wheel rims	
	front	rear	Wheel rim	Wheel off-set
12.5-18 MPT NB38 10PR	2.5	2.0	11 x 18	67 mm
12.5-18 MPT 30-8 10PR	2.25	2.0	11 x 18	67 mm
12.5-18 MPT TG32-10 PR	2.5	2.0	11 x 18	67 mm
12.5-18 MPT E91-2-8 PR	2.5	2.0	11 x 18	67 mm
12.5-18 Super TL-10 PR	2.25	2.0	11 x 18	67 mm
12.5-20 MPT E58 10 PR	2.0	1.75	11 x 20	67 mm
15.5-55 R18 SPPG 7 14PR	3.25	2.25	11 x 18	67 mm
335/80 R18 XM27 132G	2.25	1.75	11 x 18	67 mm
335/80 R20 SPT9 136B	2.5	2.0	11 x 20	67 mm
365/70 R18 SPT9 135B	2.75	2.25	11 x 18	67 mm

* Increase tyre pressure by 0.5 bar during pallet forks operation!

Weights

Kerb weight 320	4,730 kg (daN)*
420	4,910 kg (daN)*
Gross weight rating	5,500 kg
Front axle weight rating	3,750 kg
Rear axle weight rating	3,750 kg
Maximum authorized load for towing facility	5,500 kg

* Values indicated are valid for machines equipped with standard bucket.

Noise levels

Sound power level	98 dB(A) 320
	97 dB(A) 420
Noise level in the cab	75 dB(A)
 Noise measurement in accordance with EC guidelines 84/532 EEC, 79/113 EEC and 86/662 EEC.	

Vibration

Effective acceleration value for the upper extremities of the body	<2.5 m/s ²
Effective acceleration value for the body	<0.5 m/s ²

Specifications wheel loaders 320 / 420 (models 301 56 / 302 57)

Capacities

Fuel tank	90 ltr.	Diesel fuel as per DIN 51601
Hydraulic oil tank	57 ltr.	ATF 66 M
Diesel engine (engine oil)	10.5 ltr.	for oil changes, incl. filter HD-C 15W40 (MIL-L-2104C) (API CD/CE/CF4; CCMC D4)
Gearbox and rear axle differential	5.0 ltr.	SAE 90, GO90 MIL-L-2105B; API - GL4
Front axle differential	4.25 ltr.	SAE 90, GO90 MIL-L-2105B; API - GL4
Front and rear axle final drives	1.25 ltr. each	SAE 90, GO90 MIL-L-2105B; API - GL4
Brake system	0.5 ltr.	Brake fluid DOT 3.4, SP-A
Windscreen washing system	2.5 ltr.	Cleaning agent
Rear washing system		

Tightening torques

Screw dimensions	Tightening torque in Nm)*		
	8.8	10.9	12.9
M4	3	5	5
M5	6	9	10
M6	10	15	18
M8	25	35	45
M10	50	75	83
M12	88	123	147
M14	137	196	235
M16	211	300	358
M18	290	412	490
M20	412	578	696
M22	560	785	942
M24	711	1000	1200
M27	1050	1480	1774
M30	1420	2010	2400

Dimensions

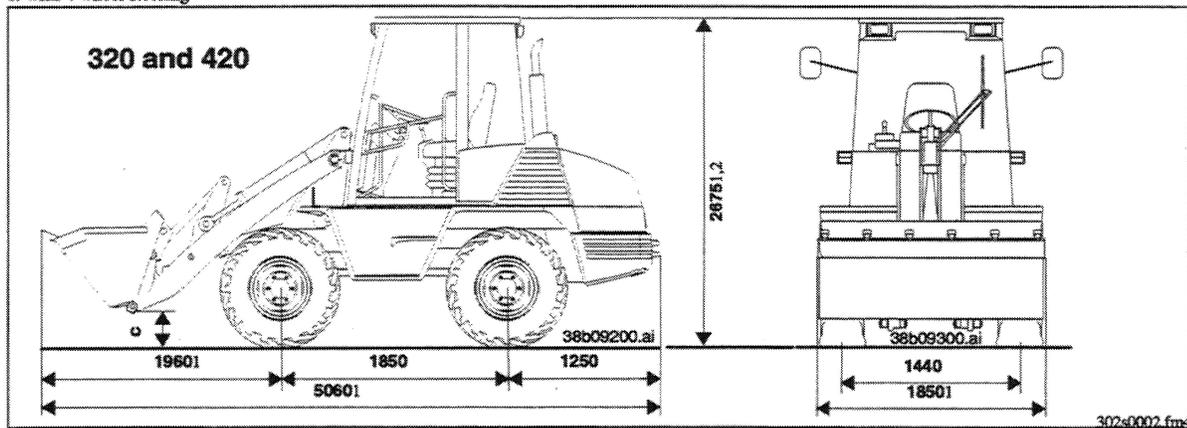
Overall length ^a	5.060 mm
Overall height ^{a, b}	2.675 mm
Overall width ^a	1.850 mm
Ground clearance	440 mm
Ground clearance c in transport position ^a	260 mm
Front/rear track width	1.440 mm
Wheelbase	1.850 mm
Outer turning radius ^c	3.790 mm
Outer track circle ^c	2.470 mm

* These values are valid for screws with untreated, non-lubricated surfaces.

Specific tightening torques

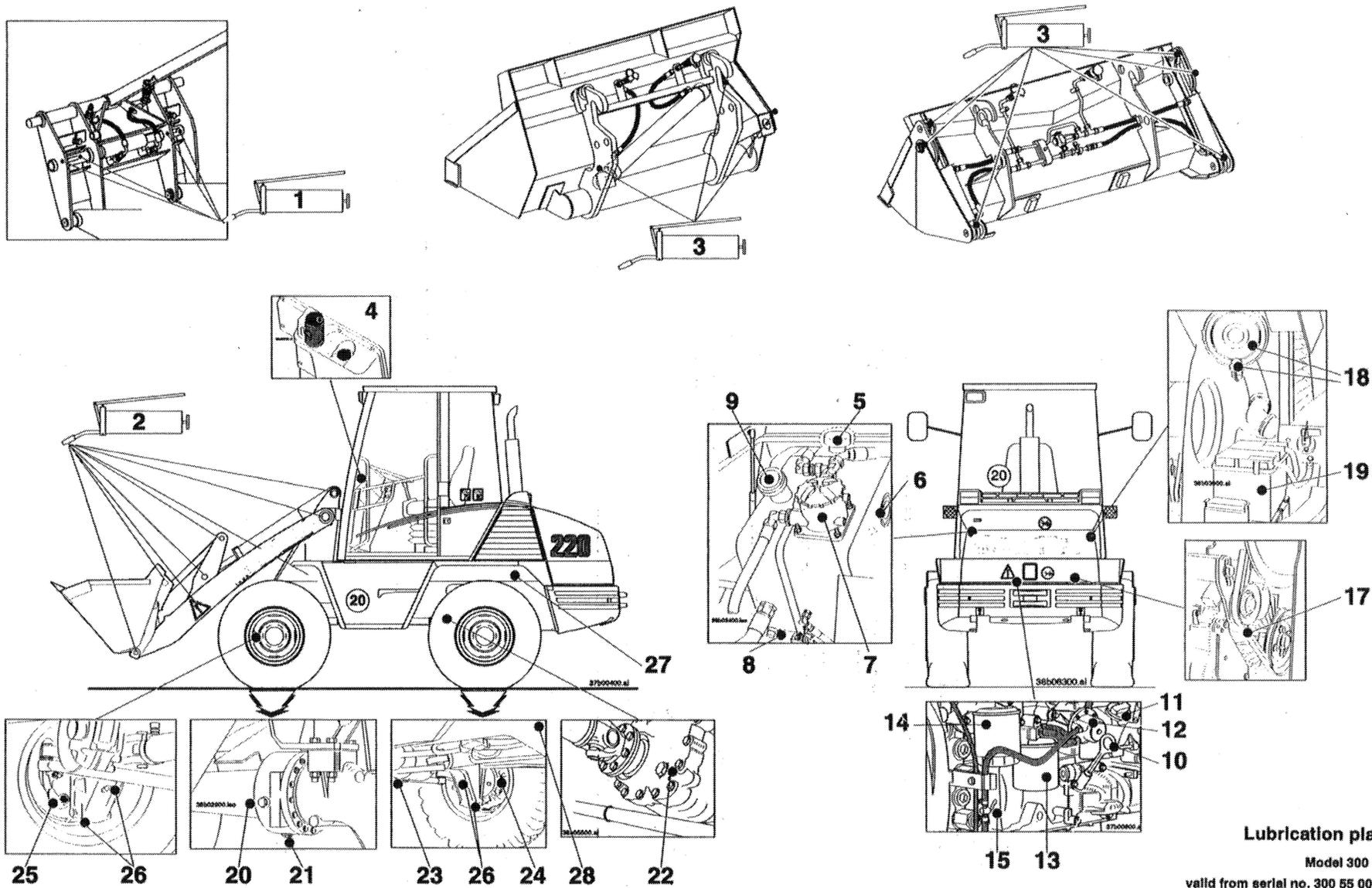
Wheel nut 320	300 ±20 Nm
420	320 ±20 Nm
Castle nut - track rod (steering ram)	200 Nm
Axle mounting	380 Nm

- a. with standard bucket and standard tyres
- b. with FOPS screen plus 295 mm
- c. with 4 wheel steering



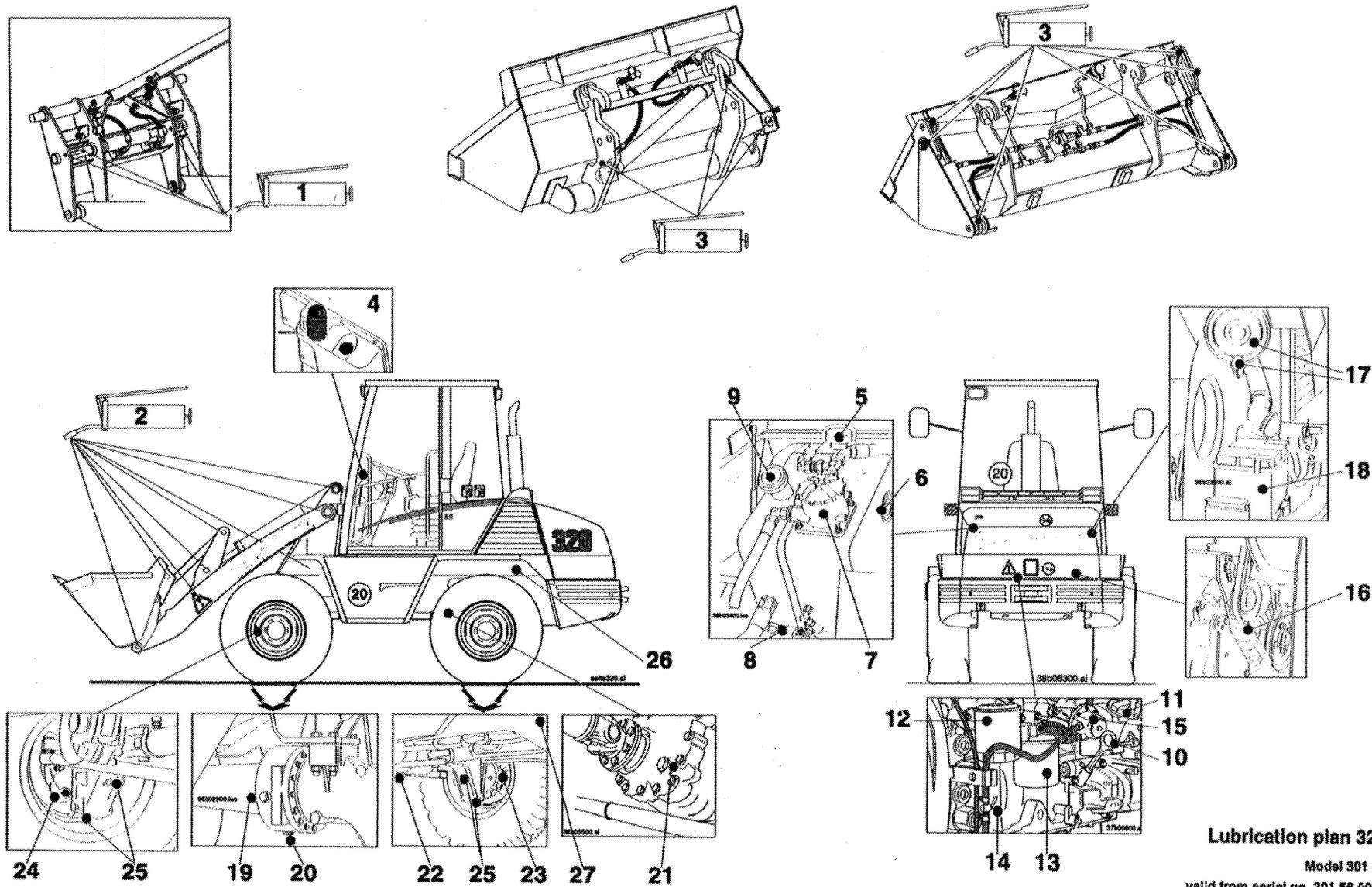
Work description For service and maintenance work on the diesel engine/implement, we also refer to the operation and maintenance manual of the engine/implement manufacturer.	Maintenance plan/service hours					
	Maintenance daily	"A" every 50 h weekly	1st inspection ¹ after 100 h	"B" every 300 h	"C" every 600 h ²	"D" every 1200 h yearly
Oil change and filter replacement ():						
Carry out the following oil changes and filter replacements (check oil levels after test run):						
• Engine oil			X		X	X
• Engine oil filter			X		X	X
• Fuel filter			X		X	X
• Clean primary fuel filter/screen filter of the fuel supply pump. Replace if necessary			X		X	X
• Air filter insert ³					X	X
• Gearbox oil in the front and rear axle differential/gearbox			X			X
• Gearbox oil in the front and rear final drives, left and right			X			X
• Brake fluid						X
• Hydraulic oil						X
• Hydraulic oil filter insert ³			X			X
• Ventilation filter (hydraulic oil tank)						X
Inspection work ():						
Check the following material. Refill if necessary:						
• Engine oil	X	X		X		
• Hydraulic oil	X	X	X	X	X	
• Brake fluid	X	X	X	X	X	
• Gearbox oil in the front and rear axle differential/gearbox				X	X	
• Gearbox oil in the front and rear final drives, left and right				X	X	
Cardan shaft						X
Check radiator for engine cooling and hydraulic oil cooler for fouling. Clean if necessary ⁴		X	X	X	X	X
Clean dust valve on air filter housing	X	X	X	X	X	X
V-belt: check condition and pretension. Retighten or replace if necessary	X	X	X	X	X	X
Check toothed belt of the engine. Replace if necessary ⁵						X
Check valve tip clearance. Adjust if necessary			X			X
Battery: check electrolyte level and charge condition		X	X	X	X	X
Service and parking brake: check thickness of brake pads. Replace if necessary					X	X
Check toe-in. Correct if necessary					X	X
Tyre check (damage, air pressure, tread depth)	X	X	X	X	X	X
Check screws and nuts or screw connections for tightness on the following assemblies/components. Retighten if necessary:						
• Engine and engine bearing		X	X	X	X	X
• Steering system		X	X	X	X	X
• Hydraulic system		X	X	X	X	X
• Axle mounting, axle suspension		X	X	X	X	X
• Fastening screws of the propshafts			X	X	X	X
• Wheel nuts			X	X	X	X
Lubrication service ():						
Lubricate the following assemblies/components:						
• Rear axle oscillating bearing		X	X	X	X	X
• Front and rear axle final drive bearing, left and right		X	X	X	X	X
• Loader unit:						
- Lift frame bearing		X	X	X	X	X
- Lift ram bearing		X	X	X	X	X
- Tilt ram bearing		X	X	X	X	X
- Tilt lever bearing	X	X	X	X	X	X
- Tilt rod bearing	X	X	X	X	X	X
- Quickhitch frame (lock pins, lift frame bearing)	X	X	X	X	X	X
Functional check (?):						
Check the function of the following assemblies/components. Rectify if necessary:						
• Service and parking brake	X	X	X	X	X	X
• Steering system	X	X	X	X	X	X
• Hydraulic system	X	X	X	X	X	X
• Hydrostatic drive/gearshift	X	X	X	X	X	X
• Light system	X	X	X	X	X	X
• Electrical system (heater blower, horn, windscreen wiper, washer system, etc.)	X	X	X	X	X	X
Leakage check ():						
Check pipe and flexible lines, as well as screw connections of the following assemblies/components for tightness, leakage and chafings. Rectify if necessary:						
• Air intake line (air filter – engine)		X	X	X	X	X
• Engine lubrication (engine – filter)		X	X	X	X	X
• Fuel feed lines		X	X	X	X	X
• Cooling system (engine and hydraulic oil cooler)		X	X	X	X	X
• Brake system		X	X	X	X	X
• Steering system		X	X	X	X	X
• Hydraulic system		X	X	X	X	X
Leakage check of the following hydraulic rams. Rectify if necessary:						
• Front and rear axle steering rams		X	X	X	X	X
• Loader unit:						
- Lift ram		X	X	X	X	X
- Tilt ram		X	X	X	X	X
- Control ram on quickhitch frame		X	X	X	X	X

1: Work to be carried out once only after the first 100 service hours. This maintenance and inspection work must be carried out by a dealer or authorized workshop for warranty claims to be accepted.
 2: Maintenance and inspection work after the first 600 service hours (2nd inspection) must be carried out by a dealer or authorized workshop for warranty claims to be acknowledged.
 3: Clean/replace filter insert as indicated by the tailale in the instrument panel, however at least every 12 months or 1200 service hours.
 4: Depending on operation and dust conditions, it may be necessary to clean the radiator more frequently.
 5: Replace toothed belt every 4500 service hours.

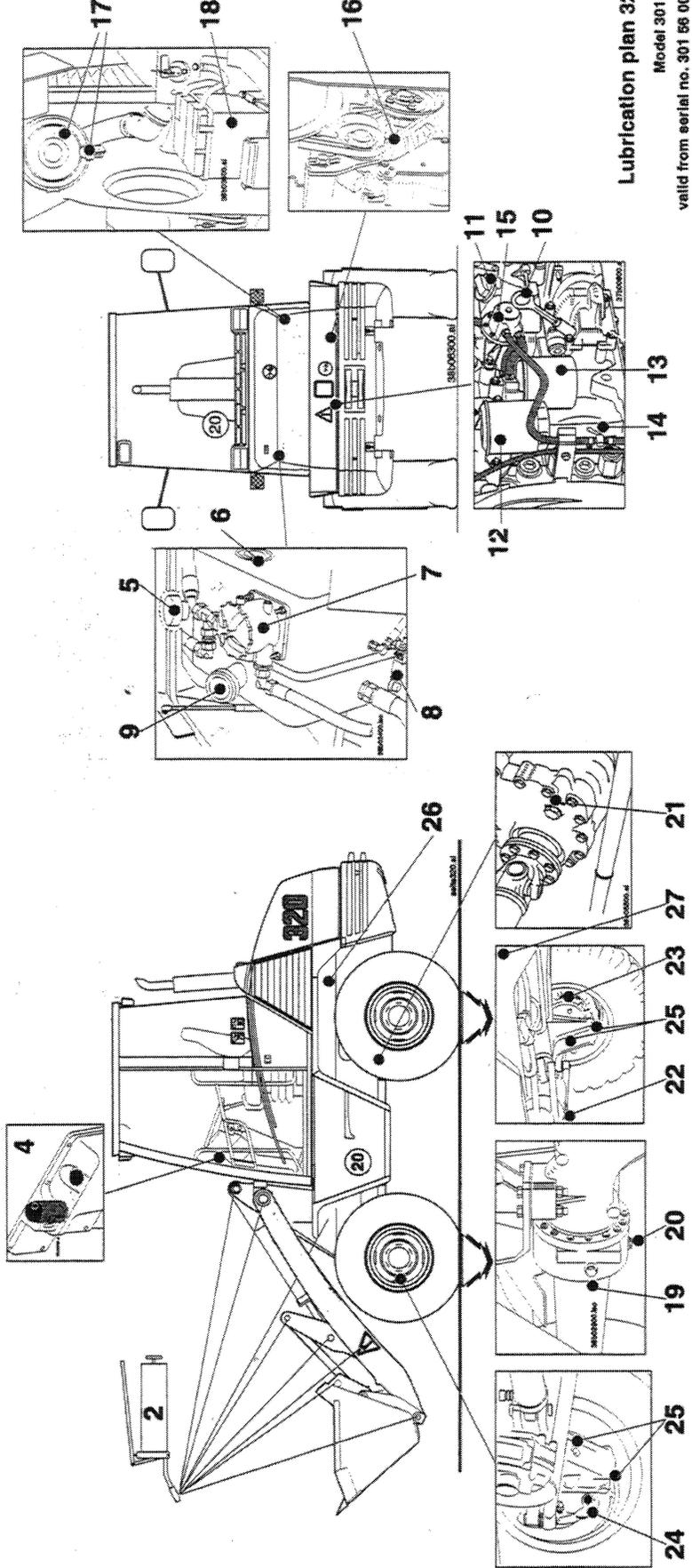
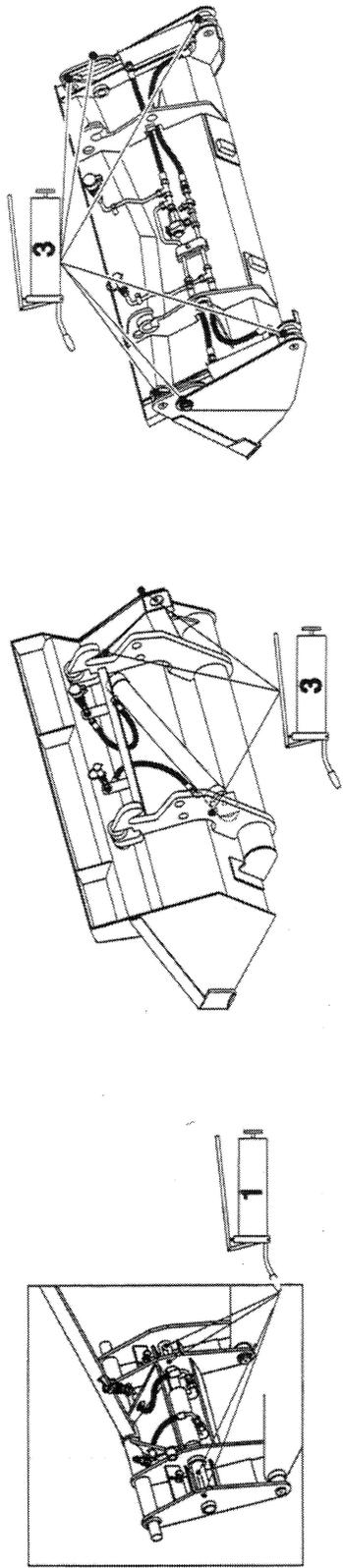


Lubrication plan

Model 300 55
valid from serial no. 300 55 0001



Lubrication plan 320
 Model 301 56
 valid from serial no. 301 56 0001
 up to 3001 56 129



Lubrication plan 320
 Model 301 56
 valid from serial no. 301 56 0001
 up to 3001 56 129

Maintenance plan 220 (300 55) from serial no. 300 55 0001
Maintenance plan 320 (301 56) up to serial no. 301 56 0129

Lubricants and engine/machine fluids

Component/application	Engine/machine fluid	SAE grade Specification	Season/temperature	Capacities ¹
Diesel engine	Engine oil ²	SAE 10W; EO10 ³	below -5°C	10.5 ltr.
		SAE 20W20; EO20 ³	-10° up to +10°C	
		SAE 30; EO30 ³	5°C up to 30°C	
		HD-C 10W-40; EO1040B ³	year-round	
		HD-C 15W-40; EO1540B ³		
Rear axle differential and gearbox	Gearbox oil ⁴	SAE 90 GO90 ³	year-round	5.0 ltr.
Rear axle final drives	Gearbox oil ⁴	SAE 90 GO90 ³	year-round	1.25 ltr. each
Front axle differential				4.25 ltr.
Front axle final drives				1.25 ltr. each
Hydraulic oil tank	Hydraulic oil:ATF BIO BIO	ATF 66 M (ATF ³) AVIA Syntofluid 46 PANOLIN HLP Synth 46	year-round	about 57 ltr.
Grease nipples	Multipurpose grease	lithium-saponified brand-name grease MPG-A ³	year-round	as required
Battery terminals	Acid-proof grease	SP-B ³	year-round	as required
Mounting of pins, shafts, etc.	Special grease	Optimoly paste *TA ⁵	year-round	as required
Fuel tank	Diesel fuel	DIN 51 601, min 45 Cetan,		90.0 ltr.
Brake system	Brake fluid	SAE J 1703 DOT 3.4, SP-A ³		0.5 ltr.

1. The capacities indicated are approximative values; the oil level check alone is relevant for the correct oil level
2. MIL-L-2104C; API-CD/CE/CF4; CCMC-D4
3. Abbreviation for lubricants (Hauptverband der Deutschen Bauindustrie e.V. - German construction engineering association)
4. MIL-L-2105B; API - GL4
5. 250 gr tube Order no.: 0 00 441 32 10

Delivery inspection – valid for all vehicles

Delivery Inspection¹

Inspection work:	Ref. no.²
Check the following material. Refill if necessary:	
• Engine oil	10, 11
• Hydraulic oil	6, 9
• Brake fluid	4
• Gearbox oil in the front and rear axle differential/gearbox	20, 22
• Gearbox oil in the front and rear planetary drives, left and right	24
Check screws and nuts or screw connections for tightness on the following assemblies/components. Retighten if necessary:	
• Engine and engine bearing	
• Steering system	
• Hydraulic system	
• Axle mounting, axle suspension	
• Fastening screws of the propshafts	
• Wheel nuts	
Check fuel filter cartridge. Replace if necessary	13
Clean dust valve on air filter housing	18
V-belt: Check condition and pretension. Retighten or replace if necessary	17
Tyre check (air pressure)	
Lubrication service:	Ref. no.²
Lubricate the following assemblies/components:	
• Rear axle oscillating bearing	27
• Front and rear axle final drive bearing, left and right	26
• Loader unit:	
- Lift frame bearing	2
- Lift ram bearing	2
- Tilt lever bearing	2
- Tilt rod bearing	2
- Tilt ram bearing	2
- Quickhitch frame (lock pins, lift frame bearing)	1

Delivery inspection – valid for all vehicles

Delivery Inspection¹

Functional check:

Ref. no.²

Check function of the following assemblies/components. Rectify if necessary:

- Service and parking brake
- Steering system
- Hydraulic system
- Hydrostatic drive/gearshift
- Light system
- Electrical system (heater blower, horn, windscreen wiper, etc.)

Leakage check:

Ref. no.²

Check pipe and flexible lines, as well as screw connections of the following assemblies/components for tightness, leakage and chafings. Rectify if necessary:

- Air intake line (air filter - engine)
- Engine lubrication (engine - filter)
- Fuel feed lines
- Cooling system
- Brake system
- Steering system
- Hydraulic system

Leakage check of the following hydraulic rams. Rectify if necessary:

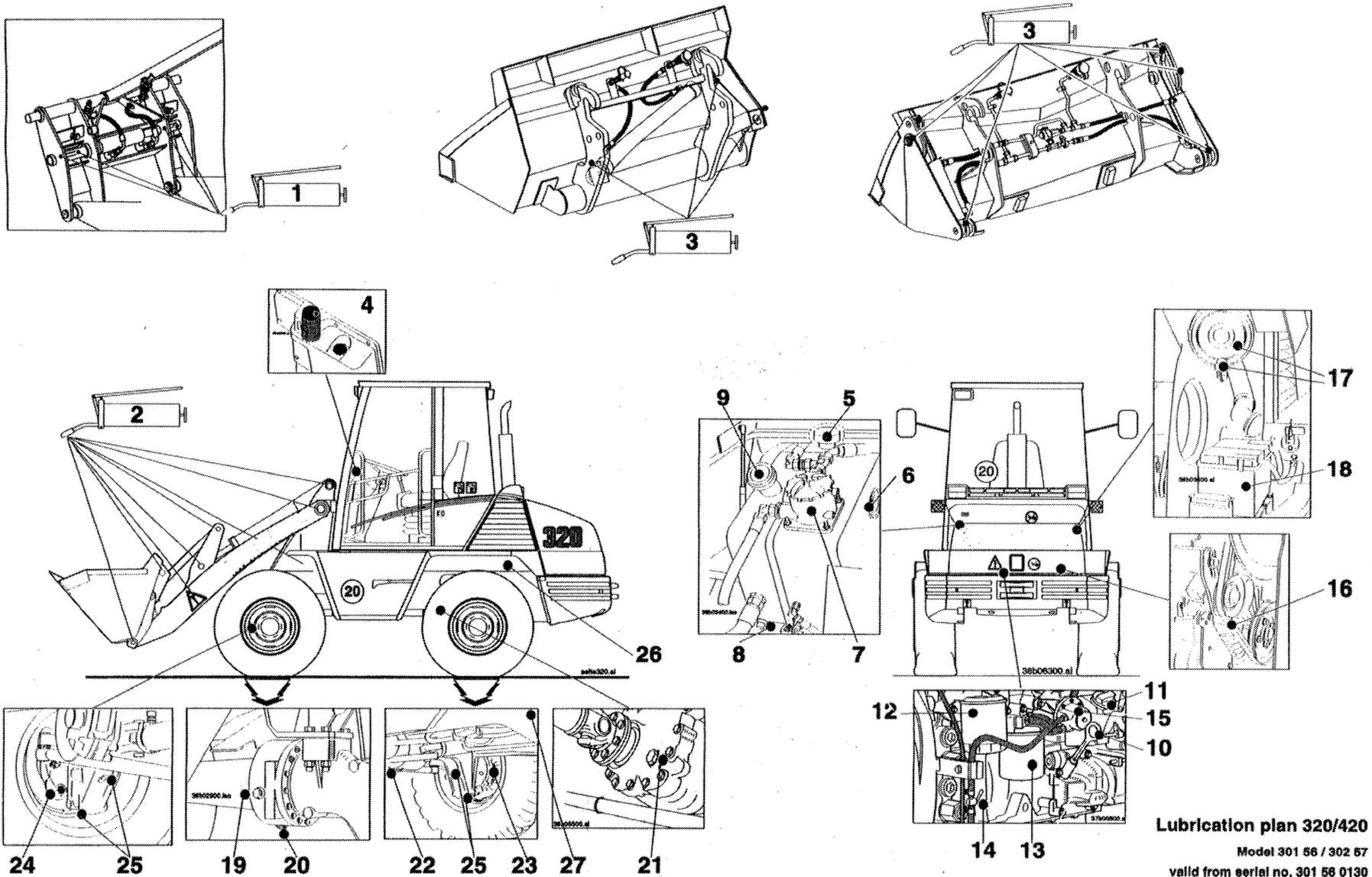
- Front and rear axle steering rams
- Loader unit:
 - Lift ram
 - Tilt ram
 - Control ram on quickhitch frame

1. For service and maintenance work on the diesel engine we also refer to the operation and maintenance manual of the engine manufacturer.
2. Reference number for the lubrication plan

Maintenance plan 320 (model 301 56) valid from serial no. 301 56 0130 and 420 (model 302 57) valid from serial no. 302 57 0170

Work description For service and maintenance work on the diesel engine/implement, we also refer to the operation and maintenance manual of the engine/implement manufacturer.	Maintenance plan/service hours					
	Maintenance daily	"A" every 50 h weekly	1st inspection ¹ after 100 h	"B" every 300 h	"C" every 600 h ²	"D" every 1200 h yearly
Oil change and filter replacement ():						
Carry out the following oil changes and filter replacements (check oil levels after test run):						
• Engine oil			X		X	X
• Engine oil filter			X		X	X
• Screen filter of the fuel supply pump			X		X	X
• Primary fuel filter			X		X	X
• Air filter insert ³					X	X
• Gearbox oil in the front and rear axle differential/gearbox			X			X
• Gearbox oil in the front and rear final drives, left and right			X			X
• Brake fluid						X
• Hydraulic oil						X
• Hydraulic oil filter insert ³			X			X
• Ventilation filter (hydraulic oil tank)						X
Inspection work ():						
Check the following material. Refill if necessary:						
• Engine oil	X	X		X		
• Hydraulic oil	X	X	X	X	X	
• Brake fluid	X	X	X	X	X	
• Gearbox oil in the front and rear axle differential/gearbox				X	X	
• Gearbox oil in the front and rear final drives, left and right				X	X	
Cardan shaft						X
Check radiator for engine cooling and hydraulic oil cooler for fouling. Clean if necessary ⁴		X	X	X	X	X
Clean dust valve on air filter housing	X	X	X	X	X	X
V-belt: check condition and pretension. Retighten or replace if necessary	X	X	X	X	X	X
Check toothed belt of the engine. Replace if necessary ⁵						X
Check valve tip clearance. Adjust if necessary			X			X
Battery: check electrolyte level and charge condition		X	X	X	X	X
Service and parking brake: check thickness of brake pads. Replace if necessary					X	X
Check toe-in. Correct if necessary					X	X
Tyre check (damage, air pressure, tread depth)	X	X	X	X	X	X
Check screws and nuts or screw connections for tightness on the following assemblies/components. Retighten if necessary:						
• Engine and engine bearing		X	X	X	X	X
• Steering system		X	X	X	X	X
• Hydraulic system		X	X	X	X	X
• Axle mounting, axle suspension		X	X	X	X	X
• Fastening screws of the propshafts			X	X	X	X
• Wheel nuts			X	X	X	X
Lubrication service ():						
Lubricate the following assemblies/components:						
• Rear axle oscillating bearing		X	X	X	X	X
• Front and rear axle final drive bearing, left and right		X	X	X	X	X
• Loader unit:						
- Lift frame bearing		X	X	X	X	X
- Lift ram bearing		X	X	X	X	X
- Tilt ram bearing		X	X	X	X	X
- Tilt lever bearing	X	X	X	X	X	X
- Tilt rod bearing	X	X	X	X	X	X
- Quickhitch frame (lock pins, lift frame bearing)	X	X	X	X	X	X
Functional check ():						
Check the function of the following assemblies/components. Rectify if necessary:						
• Service and parking brake	X	X	X	X	X	X
• Steering system	X	X	X	X	X	X
• Hydraulic system	X	X	X	X	X	X
• Hydrostatic drive/gearshift	X	X	X	X	X	X
• Light system	X	X	X	X	X	X
• Electrical system (heater blower, horn, windscreen wiper, washer system, etc.)	X	X	X	X	X	X
Leakage check ():						
Check pipe and flexible lines, as well as screw connections of the following assemblies/components for tightness, leakage and chafings. Rectify if necessary:						
• Air intake line (air filter – engine)		X	X	X	X	X
• Engine lubrication (engine – filter)		X	X	X	X	X
• Fuel feed lines		X	X	X	X	X
• Cooling system (engine and hydraulic oil cooler)		X	X	X	X	X
• Brake system		X	X	X	X	X
• Steering system		X	X	X	X	X
• Hydraulic system		X	X	X	X	X
Leakage check of the following hydraulic rams. Rectify if necessary:						
• Front and rear axle steering rams		X	X	X	X	X
• Loader unit:						
- Lift ram		X	X	X	X	X
- Tilt ram		X	X	X	X	X
- Control ram on quickhitch frame		X	X	X	X	X

- 1: Work to be carried out once only after the first 100 service hours. This maintenance and inspection work must be carried out by a dealer or authorized workshop for warranty claims to be accepted.
- 2: Maintenance and inspection work after the first 600 service hours (2nd inspection) must be carried out by a dealer or authorized workshop for warranty claims to be acknowledged.
- 3: Clean/replace filter insert as indicated by the telltale in the instrument panel, however at least every 12 months or 1200 service hours.
- 4: Depending on operation and dust conditions, it may be necessary to clean the radiator more frequently.
- 5: Replace toothed belt every 4500 service hours.



Lubrication plan 320/420

Model 301 56 / 302 57
valid from serial no. 301 58 0130
and 302 57 0170

Maintenance plan 320 (301 56) from serial no. 301 56 0130
Maintenance plan 420 (302 57) from serial no. 302 57 0170

Lubricants and engine/machine fluids

Component/ application	Engine/machine fluid	SAE grade Specification	Season/ temperature	Capacities ¹
Diesel engine	Engine oil ²	SAE 10W; EO10 ³	below -5°C	10.5 ltr.
		SAE 20W20; EO20 ³	-10° up to +10°C	
		SAE 30; EO30 ³	5°C up to 30°C	
		HD-C 10W-40; EO1040B ³	year-round	
		HD-C 15W-40; EO1540B ³		
Rear axle differential and gearbox	Gearbox oil ⁴	SAE 90 GO90 ³	year-round	5.0 ltr.
Rear axle final drives	Gearbox oil ⁴	SAE 90 GO90 ³	year-round	1.25 ltr. each
Front axle differential				4.25 ltr.
Front axle final drives				1.25 ltr. each
Hydraulic oil tank	Hydraulic oil:ATF BIO BIO	ATF 66 M (ATF ³) AVIA Syntofluid 46 PANOLIN HLP Synth 46	year-round	about 57 ltr.
Grease nipples	Multipurpose grease	lithium-saponified brand- name grease MPG-A ³	year-round	as required
Battery terminals	Acid-proof grease	SP-B ³	year-round	as required
Mounting of pins, shafts, etc.	Special grease	Optimoly paste "TA" ⁵	year-round	as required
Fuel tank	Diesel fuel	DIN 51 601, min 45 Cetan,		90.0 ltr.
Brake system	Brake fluid	SAE J 1703 DOT 3.4, SP-A ³		0.5 ltr.

1. The capacities indicated are approximative values; the oil level check alone is relevant for the correct oil level

2. MIL-L-2104C; API-CD/CE/CF4; CCMC-D4

3. Abbreviation for lubricants (Hauptverband der Deutschen Bauindustrie e.V. - German construction engineering association)

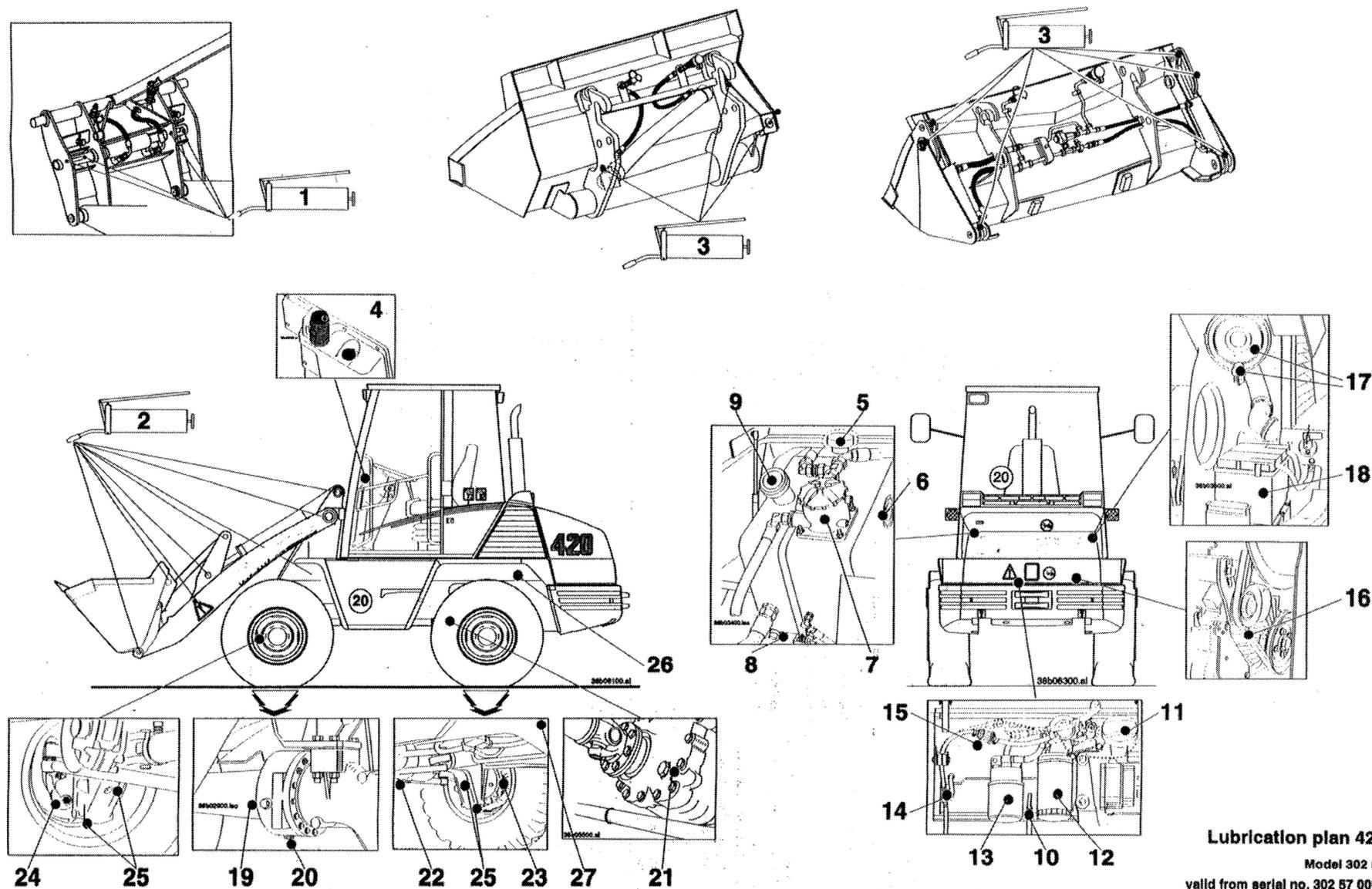
4. MIL-L-2105B; API - GL4

5. 250 gr tube Order no.: 0 00 441 32 10

Maintenance plan 420 (model 302 57) valid up to serial no. 302 57 0169

Work description For service and maintenance work on the diesel engine/implement, we also refer to the operation and maintenance manual of the engine/implement manufacturer.	Maintenance plan/service hours					
	Maintenance daily	"A" every 50 h weekly	1st inspection ¹ after 100 h	"B" every 300 h	"C" every 600 h ²	"D" every 1200 h yearly
Oil change and filter replacement ():						
Carry out the following oil changes and filter replacements (check oil levels after test run):						
• Engine oil			X	X	X	X
• Engine oil filter			X	X	X	X
• Fuel filter			X		X	X
• Clean primary fuel filter			X		X	X
• Air filter insert ³						X
• Gearbox oil in the front and rear axle differential/gearbox			X			X
• Gearbox oil in the front and rear final drives, left and right			X			X
• Brake fluid						X
• Hydraulic oil						X
• Hydraulic oil filter insert ³			X			X
• Ventilation filter (hydraulic oil tank)						X
Inspection work ():						
Check the following material. Refill if necessary:						
• Engine oil	X	X				
• Hydraulic oil	X	X	X	X	X	
• Brake fluid	X	X	X	X	X	
• Gearbox oil in the front and rear axle differential/gearbox				X	X	
• Gearbox oil in the front and rear final drives, left and right				X	X	
Cardan shaft						X
Check radiator for engine cooling and hydraulic oil cooler for fouling. Clean if necessary ⁴		X	X	X	X	X
Clean dust valve on air filter housing	X	X	X	X	X	X
V-belt: check condition and pretension. Retighten or replace if necessary	X	X	X	X	X	X
Check toothed belt of the engine. Replace if necessary ⁵						X
Check valve tip clearance. Adjust if necessary			X			X
Battery: check electrolyte level and charge condition		X	X	X	X	X
Service and parking brake: check thickness of brake pads. Replace if necessary					X	X
Check toe-in. Correct if necessary					X	X
Tyre check (damage, air pressure, tread depth)	X	X	X	X	X	X
Check screws and nuts or screw connections for tightness on the following assemblies/components. Retighten if necessary:						
• Engine and engine bearing		X	X	X	X	X
• Steering system		X	X	X	X	X
• Hydraulic system		X	X	X	X	X
• Axle mounting, axle suspension		X	X	X	X	X
• Fastening screws of the propshafts			X	X	X	X
• Wheel nuts			X	X	X	X
Lubrication service ():						
Lubricate the following assemblies/components:						
• Rear axle oscillating bearing		X	X	X	X	X
• Front and rear axle final drive bearing, left and right		X	X	X	X	X
• Loader unit:						
- Lift frame bearing		X	X	X	X	X
- Lift ram bearing		X	X	X	X	X
- Tilt ram bearing		X	X	X	X	X
- Tilt lever bearing	X	X	X	X	X	X
- Tilt rod bearing	X	X	X	X	X	X
- Quickhitch frame (lock pins, lift frame bearing)	X	X	X	X	X	X
Functional check (?):						
Check the function of the following assemblies/components. Rectify if necessary:						
• Service and parking brake	X	X	X	X	X	X
• Steering system	X	X	X	X	X	X
• Hydraulic system	X	X	X	X	X	X
• Hydrostatic drive/gearshift	X	X	X	X	X	X
• Light system	X	X	X	X	X	X
• Electrical system (heater blower, horn, windscreen wiper, washer system, etc.)	X	X	X	X	X	X
Leakage check ():						
Check pipe and flexible lines, as well as screw connections of the following assemblies/components for tightness, leakage and chafings. Rectify if necessary:						
• Air intake line (air filter – engine)		X	X	X	X	X
• Engine lubrication (engine – filter)		X	X	X	X	X
• Fuel feed lines		X	X	X	X	X
• Cooling system (engine and hydraulic oil cooler)		X	X	X	X	X
• Brake system		X	X	X	X	X
• Steering system		X	X	X	X	X
• Hydraulic system		X	X	X	X	X
Leakage check of the following hydraulic rams. Rectify if necessary:						
• Front and rear axle steering rams		X	X	X	X	X
• Loader unit:						
- Lift ram		X	X	X	X	X
- Tilt ram		X	X	X	X	X
- Control ram on quickhitch frame		X	X	X	X	X

- 1: Work to be carried out once only after the first 100 service hours. This maintenance and inspection work must be carried out by a dealer or authorized workshop for warranty claims to be accepted.
- 2: Maintenance and inspection work after the first 600 service hours (2nd inspection) must be carried out by a dealer or authorized workshop for warranty claims to be acknowledged.
- 3: Clean/replace filter insert as indicated by the telltale in the instrument panel, however at least every 12 months or 1200 service hours.
- 4: Depending on operation and dust conditions, it may be necessary to clean the radiator more frequently.
- 5: Replace toothed belt every 4500 service hours.



Lubrication plan 420
Model 302 57
valid from serial no. 302 57 0001
up to serial no. 302 57 0169