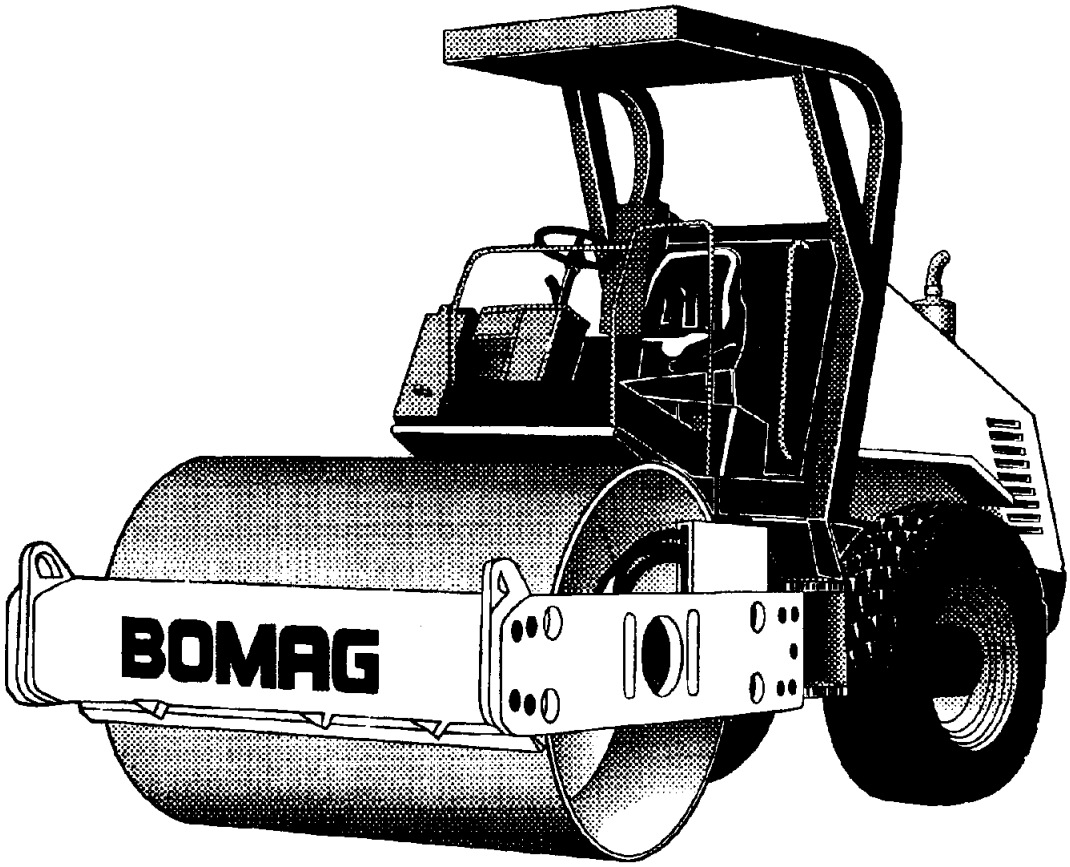
BOMAG

Service Training



Single Drum Rollers
BW 145 D-3 / DH-3 / PDH-3

Part-No. 008 099 55 08/2002

Vibration pump:	
Manufacturer:	Commercial
Type:	PE11A193BEEJ19-96
System:	Gear pump
Max. displacement:	19 cm^3/U
Starting pressure:	220 +/-5 bar
Operating pressure, soil dependent:	45-65 bar
Vibration motor:	
Manufacturer:	Sauer-Danfoss
Type:	MMF 025
System:	Axial piston-swash plate
Displacement:	25 cm^3/U
Frequency:	34 Hz
Amplitude:	1,7/0,85 mm
Steering and working pump:	
Manufacturer:	Bosch / Commercial
Type:	HY / 1PX
System:	Tandem-/Gear pump
Max. displacement:	16 + 5,5 cm^3/U
Max. steering pressure:	200 +/- 10 bar
Steering valve:	
Manufacturer:	Sauer-Danfoss
Type:	OSCP 315 LS
System:	Rotary valve
Rear axle:	
Manufacturer:	Dana
Type:	172/442
Differential:	No-Spin
Degree of locking:	100 %
Reduction ratio:	27
Filling capacities:	
Engine oil:	10,5 l (SAE 15W-40, API SJ/CF)
Hydraulic oil:	60 l (HVLP 46 VI 150)
Vibration bearing housing:	2,1 l (SAE 15W-40, API SJ/CF)
Rear axle:	5,5 l (SAE 90 EP, API GL 5)
Rear axle wheel hubs:	1 l (SAE 90 EP, API GL 5)

Lubrication oil circuit

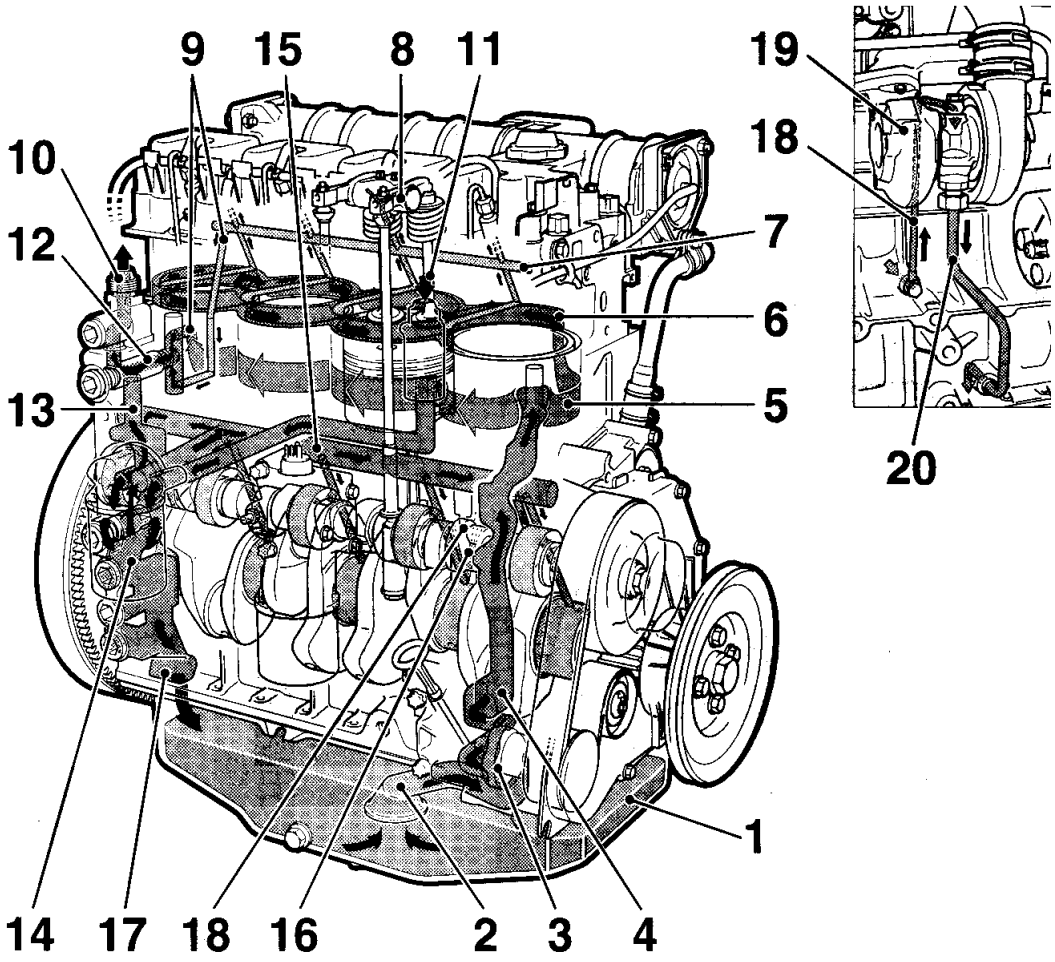
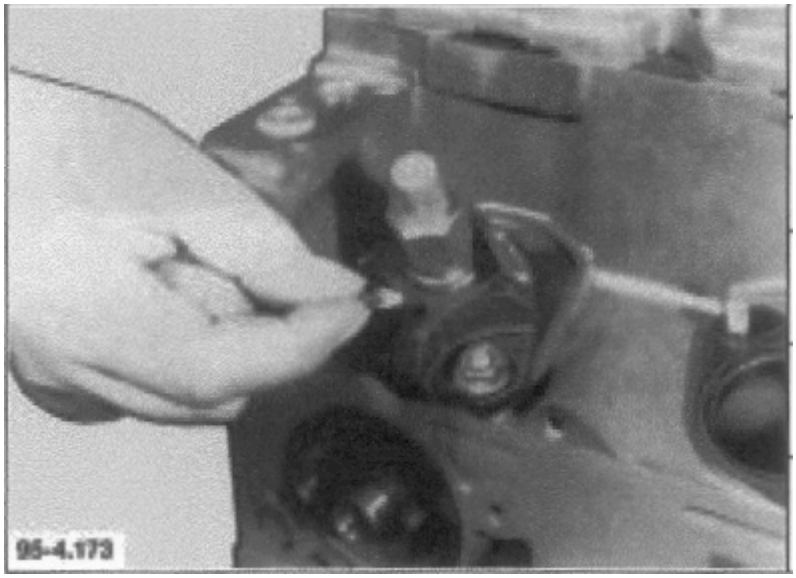


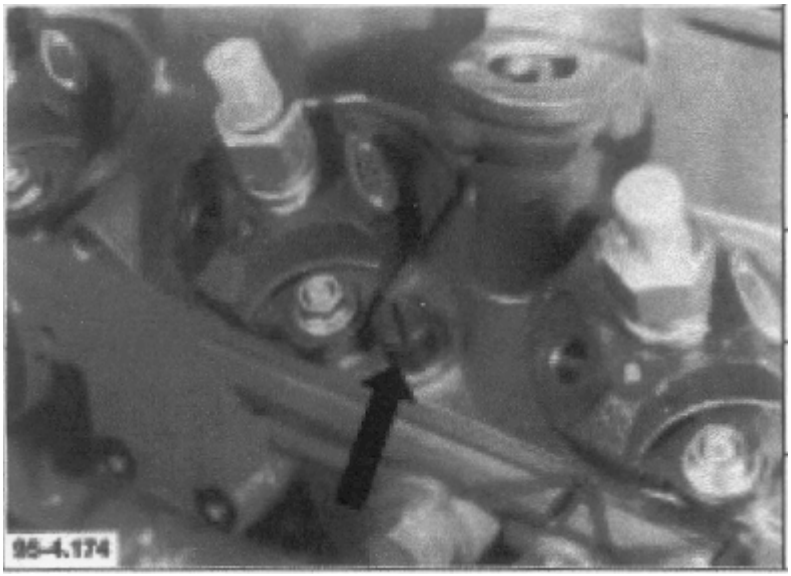
Fig. 3: Lubrication oil circuit

1 Oil sump
2 Suction screen with suction tube
3 Oil pump
4 Main oil channel
5 Oil cooled cylinders
6 Cylinder head cooling groove
7 Oil channel for rocker arm lubrication
8 Rocker arm
9 Oil manifold to thermostat
10 Supply to ext. oil cooler (not for BOMAG)
11 Return from ext. oil cooler (not BOMAG)
12 Thermostat housing with thermostat spool
13 Oil channel to oil filter
14 Oil filter
15 Oil to camshaft, conrod and crankshaft
16 Oil spray nozzle for piston cooling
17 Oil return through crankcase to oil sump
18 Lubrication oil supply
19 Exhaust turbo charger

13. Close the bore again with the locking pin



14. Remove the locating pin for the governor rod



Legend Fig. 2

1 Diesel engine
2 Variable displacement pump
3 Pump control
4 High pressure relief valves with boost check valve function
5 Control piston
6 Pressure override
7 Charge pressure relief valve
8 Axle drive motor
9 Axle with brakes
10 Control piston, axle drive motor
11 Flushing valve
12 Speed range selector valve, axle drive motor
13 Drum drive motor with brake

Pressure override

Since the cross-sections of the high pressure relief valves are very small, longer responding of these valves would cause very quick overloading of the hydraulic circuit and would subsequently lead to severe damage in pump or other components. In order to avoid this, the travel pump is equipped with another safety device, the pressure override.

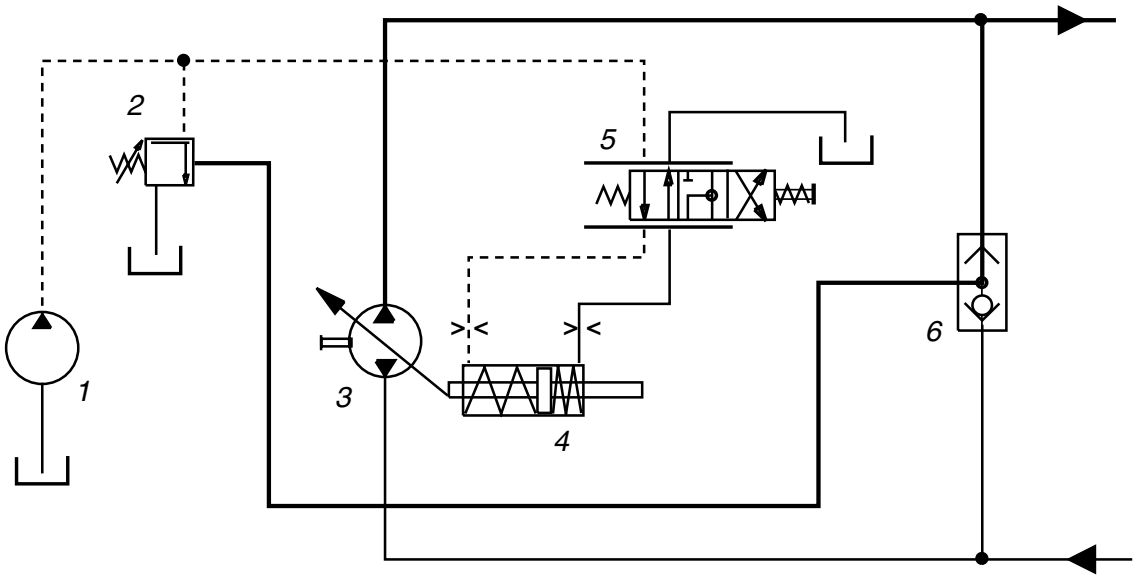


Fig. 9 Pressure override

1 Charge pump
2 Pressure override
3 Travel pump
4 Control piston
5 3/4-way valve
6 Shuttle valve

The pressure override is hydraulically arranged in the pilot oil flow to the pump control before the 4/3-way valve and consists off:

- axial spool with control edges,
- adjustment spring and
- setscrew with counter nut.

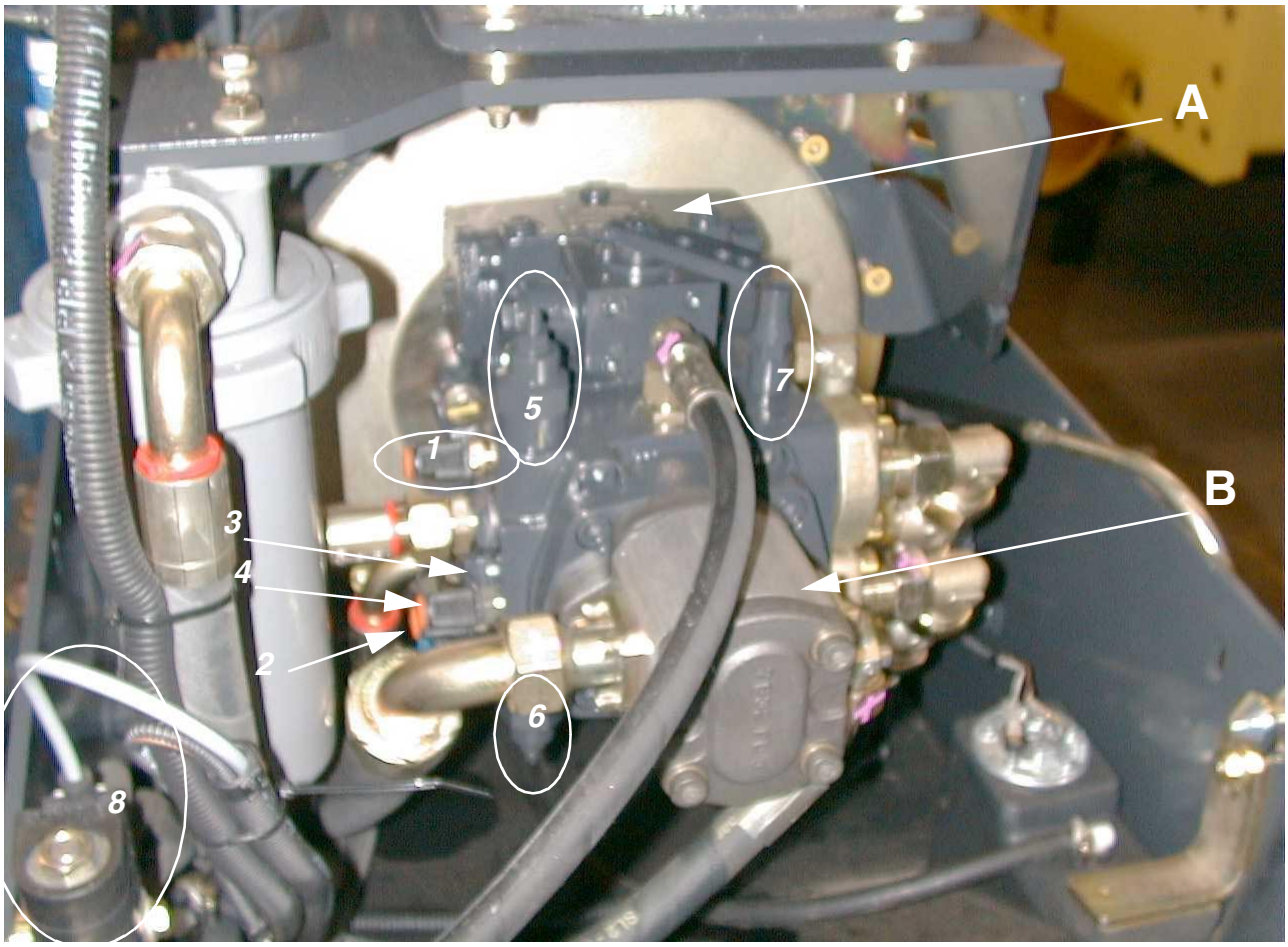


Fig. 17 Pump unit BW 145 D-3

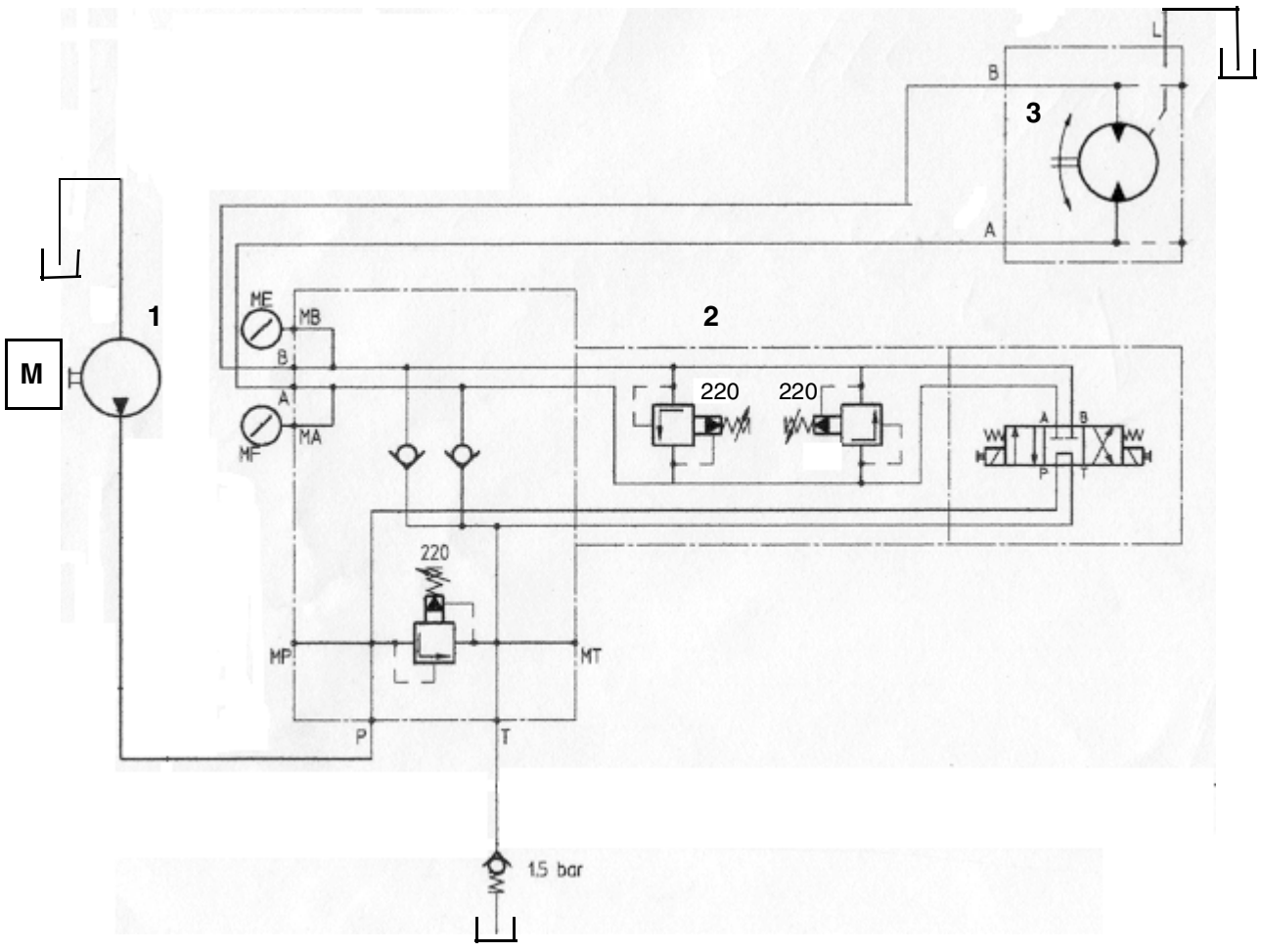
Pos.	Designation	Pos. in wiring diagram	Pos. in hydraulic diagram	Measuring values
A	Travel pump		10	
B	Vibration pump		11	
1	Pressure test port, travel pressure forward		MC (pump MB)	380 +/- 15 bar
2	Pressure test port, travel pressure reverse		MD (pump MA)	380 +/- 15 bar
3	Charge pressure relief valve			25 +/- 1 bar
4	Charge pressure test port		MA	25 +/- 1 bar
5	High pressure relief valve forward			405 +/- 5 bar absolute
6	High pressure relief valve, reverse)			405 +/- 5 bar absolute
7	Pressure override			380 +/- 5 bar
8	Brake valve	Y04		0 / 12 V

Vibration system

The vibration system of the single drum rollers BW 145 of generation 3 works with two amplitudes. This enables perfect adaptation of the machine to various types of soil and different applications.

The vibration drive is an open hydraulic circuit. The circuit consists of:

- the vibration pump,
- the vibration control valve with integrated safety elements,
- the pressure resistant connecting hoses.
- and the vibration motor



1 Vibration pump

2 Vibration control valve with integrated safety elements

2 Vibration motor

Drum

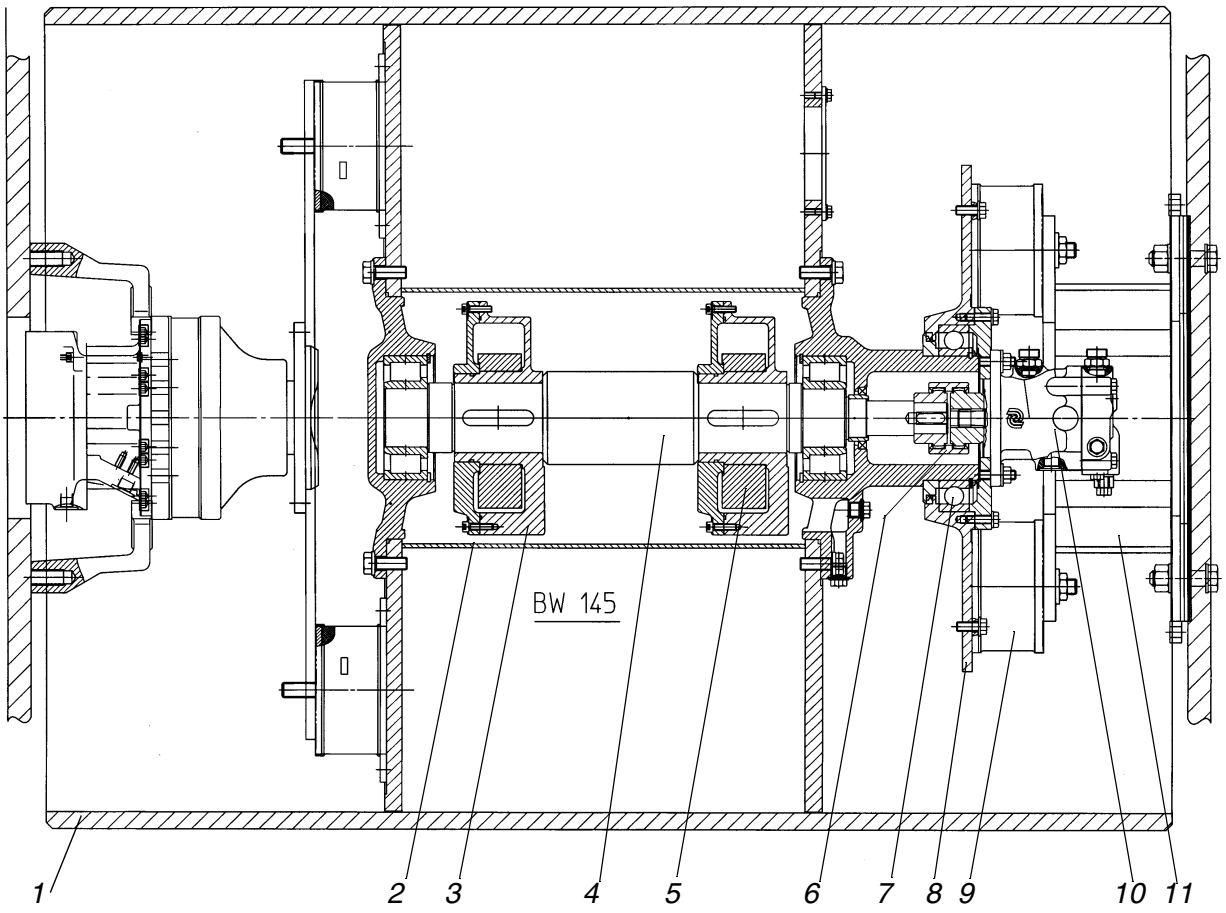


Fig. 7 Cross-sectional view of drum

1	*Drum shell*	*7*	*Travel bearing*
2	*Vibration bearing housing*	*8*	*Travel bearing housing*
3	*Basic weight*	*9*	*Rubber buffer*
4	*Vibrator shaft*	*10*	*Vibration motor*
5	*Change-over weight*	*11*	*Flanged housing*
6	*Coupling vibr.-motor – vibrator shaft*		

Articulated joint

Front and rear frames of the single drum rollers BW 145-3 are connected by an oscillating articulated joint. This ensures that drum and wheels will always have ground contact, even when driving around curves.

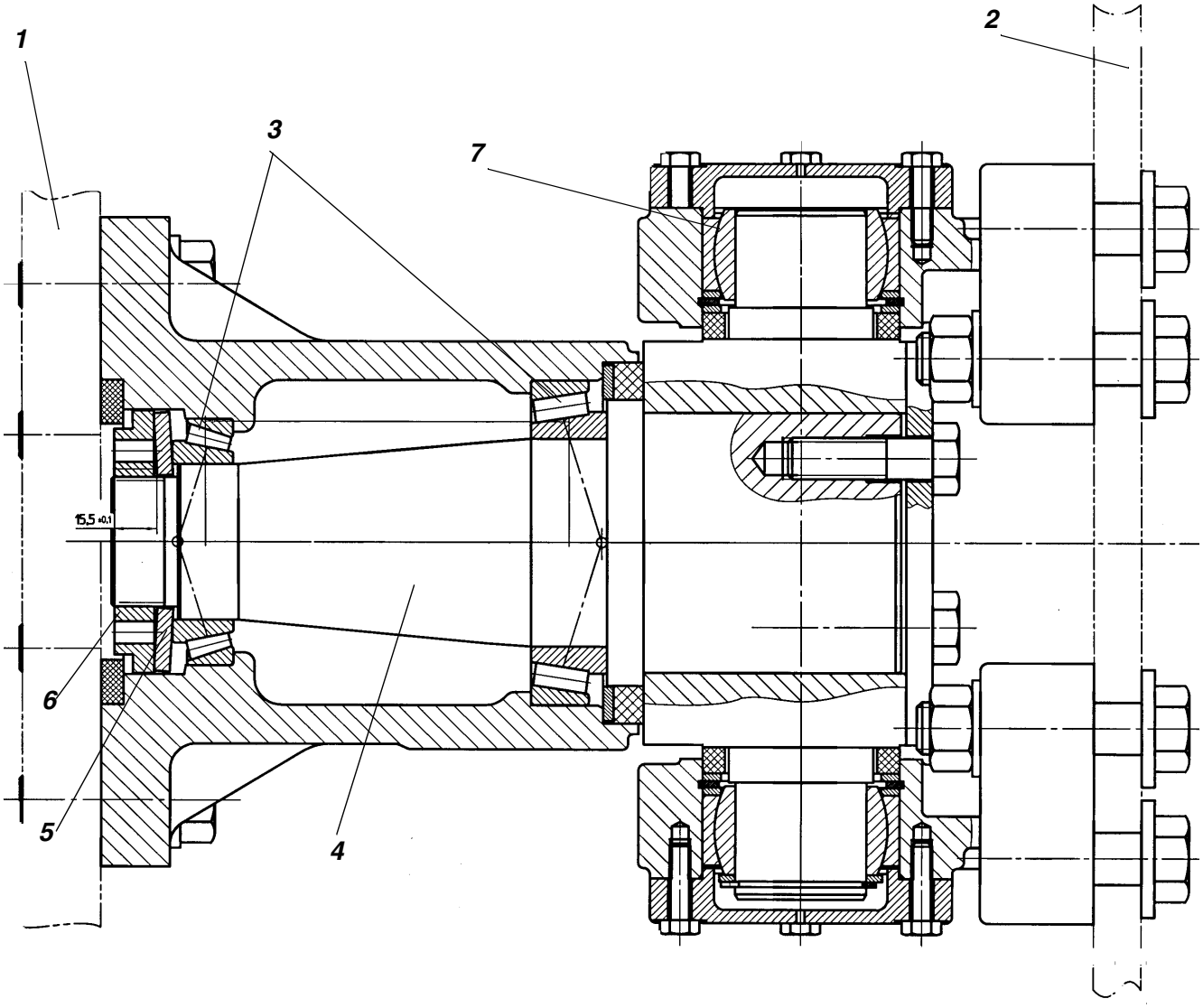


Fig. 4 Articulated joint

1	*Front frame*	*2*	*Rear frame*
3	*Tapered roller bearing*	*4*	*oscillation axis*
5	*Clamping nut*	*6*	*Belleville springs*
7	*Friction bearing (steering axis)*		

Generator

While the engine is running a 14 V generator (G02) supplies the vehicle electrics via terminals B+ (to potential 30) and B- (to potential 31) with current.

Terminal D+ delivers a (+) or (-) signal to the charge control, to relay K61 and to terminal S+ of the time relay for engine oil pressure. When the engine is not running terminal D+ is negative (ground potential). The charge control light (H08) lights up.

Socket

The machine is equipped with a socket (XS 12V). This socket is connected to potential 30 and secured by fuse (F05).

Ignition and starting circuit, monitoring

Ignition switch (S00) in position "0" (ignition off)

The ignition switch (S00) is permanently supplied with current from battery (G01) via main fuse (F00) (potential 30) and fuse (F13).

In this position the connection to the coil of relay (K11) is interrupted and the relay drops off. The solenoid valve (Y58) interrupts the fuel supply and stops the engine.

Ignition switch (S00) in position "1" (ignition on) with the engine at rest

In this position the coil of relay (K11) is supplied with current.

Relay (K11) switches potential 30 to potential K11.

- from potential K11,
- via fuse (F24),
- the closed emergency stop switch (S01),
- to solenoid valve (Y58) for interruption of fuel supply.

The engine is now ready for starting.