

# BOMAG

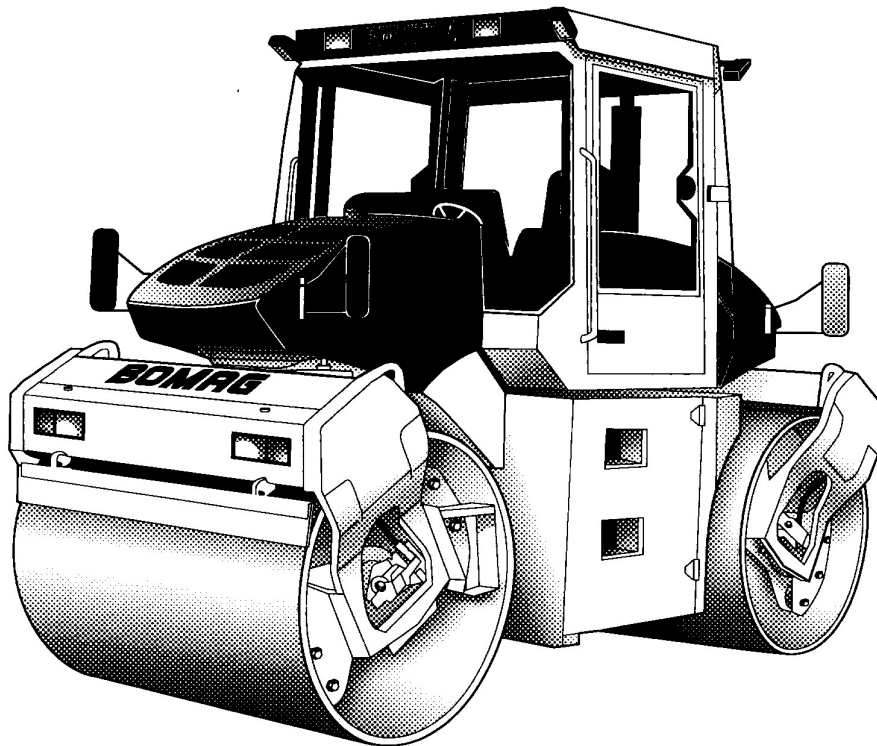
## Instructions for repair

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**BW 180 AD**

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101 870 00 ....



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**Tandem Vibratory Roller**

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## **1 General**

## Introduction

These repair instructions contain all necessary information for training and repair work.

Notes on maintenance, care and trouble shooting can be found in the operating and maintenance instructions.

- 1 **General**
- 2 **Tests and adjustments**
- 3 **Flushing**
- 4 **Trouble shooting**
- 5 **Drum**
- 6 **Pivot steering**
- 7 **Components**

This instruction manual contains only assembly groups needed for this type of machine.

The repair instructions describe the removal or dismantling and assembly of components and assembly groups.

The repair of disassembled assembly groups is described as far as this makes sense with respect to available tools and spare parts supply and as far as it can be understood by a skilled mechanic.

### **Danger**

#### **Danger of injury**

**Please observe strictly the safety regulations in these operating instructions and the applicable accident prevention regulations.**

Spare parts needed for repairs can be taken from the spare parts catalogue for the machine.

#### **You should only use genuine BOMAG spare parts.**

These repair instructions are not subject of an updating service; for this reason we would like to draw your attention to our additional technical service bulletins.

In case of a new release all necessary changes will be included.

In the course of technical development we reserve the right for technical modifications without prior notification.

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## Important notes

**These safety regulations must be read and applied by every person involved in the repair of this machine. The applicable accident prevention instructions and the safety regulations in the operating and maintenance instructions must be additionally observed.**

**Repair work shall only be performed by appropriately trained personnel or by the after sales service of BOMAG.**

These repair instructions contain headers like „Note“, „Attention“, „Danger“ and „Environment“, which must be strictly complied with in order to avoid dangers for health and for the environment.

### Danger

Paragraphs marked like this highlight possible dangers for persons.

### Caution

Paragraphs marked like this highlight possible dangers for machines or parts of the machine.

### Note

Paragraphs marked like this contain technical information for the optimal economical use of the machine.

### Environment

Paragraphs marked like this point out practices for safe and environmental disposal of fuels and lubricants as well as replacement parts.

**Observe the regulations for the protection of the environment.**

## General

- Before starting repair work stand the machine on level and solid ground.
- Always secure the machine against unintended rolling.
- Secure the engine reliably against unintentional starting.
- Mark a machine that is defective or being repaired by attaching a clearly visible warning tag to the steering wheel.
- On machines with articulated joint keep the articulated joint locked during work.
- Use protective clothes like hard hat, safety boots and gloves.
- Keep unauthorized persons away from the machine during repair work.

- Tools, lifting gear, lifting tackle, supports and other auxiliary equipment must be fully functional and in safe condition.
- Use only safe and approved lifting gear of sufficient load bearing capacity to remove and install parts or components from and to the machine.
- Be careful with cleansing agents. Do not use easily inflammable or harmful substances, such as gasoline or paint thinners for cleaning.
- Cleaning or repair work on the fuel tank is very dangerous. Do not smoke or allow any ignitable sparks or open fire in the vicinity when cleaning or repairing a tank. .
- When performing welding work strictly comply with the respective welding instructions.

## Special safety regulations

- Use only genuine BOMAG spare parts for repair purposes. Original parts and accessories have been specially designed for this machine.
- We wish to make explicitly clear that we have not tested or approved any parts or accessories not supplied by us. The installation and/or use of such products may therefore have an adverse effect on the specific characteristics of the machine and thereby impair the active and/or passive driving safety. The manufacturer explicitly excludes any liability for damage caused by the use of non-original parts or accessories.
- Unauthorized changes to the machine are prohibited for safety reasons.
- If tests on the articulated joint need to be performed with the engine running, do not stand in the articulation area of the machine, danger of injury!
- Do not perform cleaning work while the engine is running.
- If tests must be performed with the engine running do not touch rotating parts of the engine, danger of injury.
- Exhaust gases are highly dangerous. Always ensure an adequate supply of fresh air when starting the engine in closed rooms.
- Refuel only with the engine shut down. Ensure strict cleanliness and do not spill any fuel.
- Keep used filters in a separate waste container and dispose of environmentally.
- Dispose of oils and fuel environmentally when performing repair or maintenance work.
- Do not refuel in closed rooms.
- Do not heat up oil higher than 160 °C because it may ignite.
- Wipe off spilled oil and fuel.

- Do not smoke when refuelling or when checking the acid level in the battery.
- Do not check the acid level of the battery with a naked flame, danger of explosion!
- Old batteries contain lead and must be properly disposed of.
- There is a danger of scalding when draining off engine or hydraulic oil at operating temperature.
- on machines with rubber tires a tire may burst if incorrectly assembled. This can cause severe injury.
- Do not exceed the specified highest permissible tire pressure.

### Hydraulics

- Hydraulic oil escaping under pressure can penetrate the skin and cause severe injury. You should therefore relieve the pressure in the system before disconnecting any lines.
- Before applying pressure to the system make sure that all line connections and ports have been properly tightened and are in perfect condition.
- Hydraulic oil leaking out of a small opening can hardly be noticed, therefore please use a piece of cardboard or wood when checking for leaks. When being injured by hydraulic oil consult a physician immediately, as otherwise this may cause severe infections.
- Do not step in front of or behind the drums/wheels when performing adjustment work in the hydraulic system while the engine is running. Block drums and/or wheels with wedges.

**Reattach all guards and safety installations after all work has been completed.**

## General

- Before removing or disassembling and parts, hoses or components mark these parts for easier assembly.
- Before assembly oil or grease all parts, as far as this is necessary.

## Hydraulic system

### Caution

**Do not open any hydraulic components if you have not been properly trained and without exact knowledge.**

### Please note

Cleanliness is of utmost importance. Make sure that no dirt or other contaminating substances can enter into the system.

- Clean fittings, filler covers and the area around such parts before disassembly to avoid entering of dirt.
- Before disconnecting hoses, pipes or similar relieve the system pressure with the engine shut down.
- During repair work keep all openings closed with clean plastic plugs and caps.
- Do not run pumps and motors without oil.
- When cleaning hydraulic components take care not to damage any fine machine surfaces.
- Chemical and rubber soluble cleansing agents may only be used to clean metal parts. Do not use such substances to clean seals and gaskets.
- Rinse of cleaned parts thoroughly, dry them with compressed air and apply anti-corrosion oil immediately. Do not install parts that show traces of corrosion.
- Avoid the formation of rust on fine machined caused by hand sweat.
- Grease must not used as a sliding agent for assembly work. Use hydraulic oil.
- Do not start the engine after the hydraulic oil has been drained off.
- Use only the specified pressure gauges. Risk of damaging the pressure gauges under too high pressure.
- Clean ports and fittings before removal so that no dirt can enter into the hydraulic system.
- Check the hydraulic oil level before and after the work.
- Use only clean oil according to specification.
- Check the hydraulic system for leaks, find and rectify the cause.

- Fill new hydraulic units with hydraulic oil before starting operation.
- After changing a component thoroughly flush and bleed the entire hydraulic system.
- Perform measurements at operating temperature of the hydraulic oil (approx. 40 °C).
- After changing a component perform a high and charge pressure test, if necessary check the speed of the exciter shaft.
- The operating pressure of the exciter shaft to a great extent depends on the base under the vibrating drum. If the soil is too hard place the drums on old rubber tires. Do not activate the vibration on a hard, concreted base, danger of bearing damage.
- After the completion of all tests perform a test run and then check all connections and fittings for leaks with the engine still stopped and the hydraulic system depressurized.

### Before commissioning

- After changing a component clean the hydraulic oil tank thoroughly.
- Fill the housings of hydraulic pumps and motors with hydraulic oil.
- Use only hydraulic oils according to the specification in the maintenance instructions.
- After changing a component clean the hydraulic system as described in the flushing instructions in order to prevent all other components from being damaged by abrasion and metal chips remaining in the system.
- Change the hydraulic oil filter.

### Commissioning

- Bleed the hydraulic circuits.
- Start up the system without load.
- Check the hydraulic oil level in the tank, fill up oil if necessary.

### After commissioning

- Check system pressures and speeds.
- Check fittings and flanges for leaks.
- After each repair check all adjustment data, rotational speeds and nominal values in the hydraulic system, adjust if necessary.
- Do not adjust pressure relief valves and control valves to values above their specified values.

## Electrical system

- Always disconnect the battery before starting work in the electrical system.
- Ensure correct polarity when connecting the battery.

- Do not check voltage by tapping against ground.
- When performing welding work always fasten the earth clamp of the welding unit in the immediate vicinity of the welding location. Strictly disconnect the cables from the generator before starting work.

### **Seals and gaskets**

- Generally use new seals and gaskets when performing assembly work. The required seal kits are available as spare parts.

## Tightening torques

- Tighten fastening screws and nuts according to the table of tightening torques.
- Tightening torques deviating from the ones in the table are specially mentioned in the repair instructions.

### Caution

**Self-locking nuts must be generally renewed.**

#### Tightening torques for screws with metric unified thread

Screw dimension	Tightening torque Nm* (ft-lb)		
	8.8	10.9	12.9
M4	3 (2)	5 (4)	5 (4)
M5	6 (4)	9 (7)	10 (7)
M6	10 (7)	15 (11)	18 (13)
M8	25 (18)	35 (26)	45 (33)
M10	50 (37)	75 (55)	83 (61)
M12	88 (65)	123 (91)	147 (108)
M14	137 (101)	196 (145)	235 (173)
M16	211 (156)	300 (221)	358 (264)
M18	290 (213)	412 (303)	490 (361)
M20	412 (304)	578 (426)	696 (513)
M22	560 (413)	785 (559)	942 (695)
M24	711 (524)	1000 (738)	1200 (885)
M27	1050 (774)	1480 (1092)	1774 (1308)
M30	1420 (1047)	2010 (1482)	2400 (1770)

#### Tightening torques for screws with metric fine thread

Screw dimension	Tightening torques Nm* (ft-lb)		
	8.8	10.9	12.9
M8 x 1	26 (19)	37 (27)	48 (35)
M10 x 1.25	52 (38)	76 (56)	88 (65)
M12 x 1.25	98 (72)	137 (101)	126 (119)
M12 x 1.5	93 (69)	127 (94)	152 (112)
M14 x 1.5	152 (112)	216 (159)	255 (188)
M16 x 1.5	225 (166)	318 (235)	383 (282)
M18 x 1.5	324 (239)	466 (344)	554 (409)
M20 x 1.5	461 (340)	628 (463)	775 (572)
M22 x 1.5	618 (456)	863 (636)	1058 (780)
M24 x 2	780 (575)	1098 (808)	1294 (1416)
M27 x 2	1147 (846)	1578 (1164)	1920 (1416)
M30 x 2	1568 (1156)	2254 (1662)	2695 (1988)

\* Strength classes for screws with untreated, non-lubricated surface.

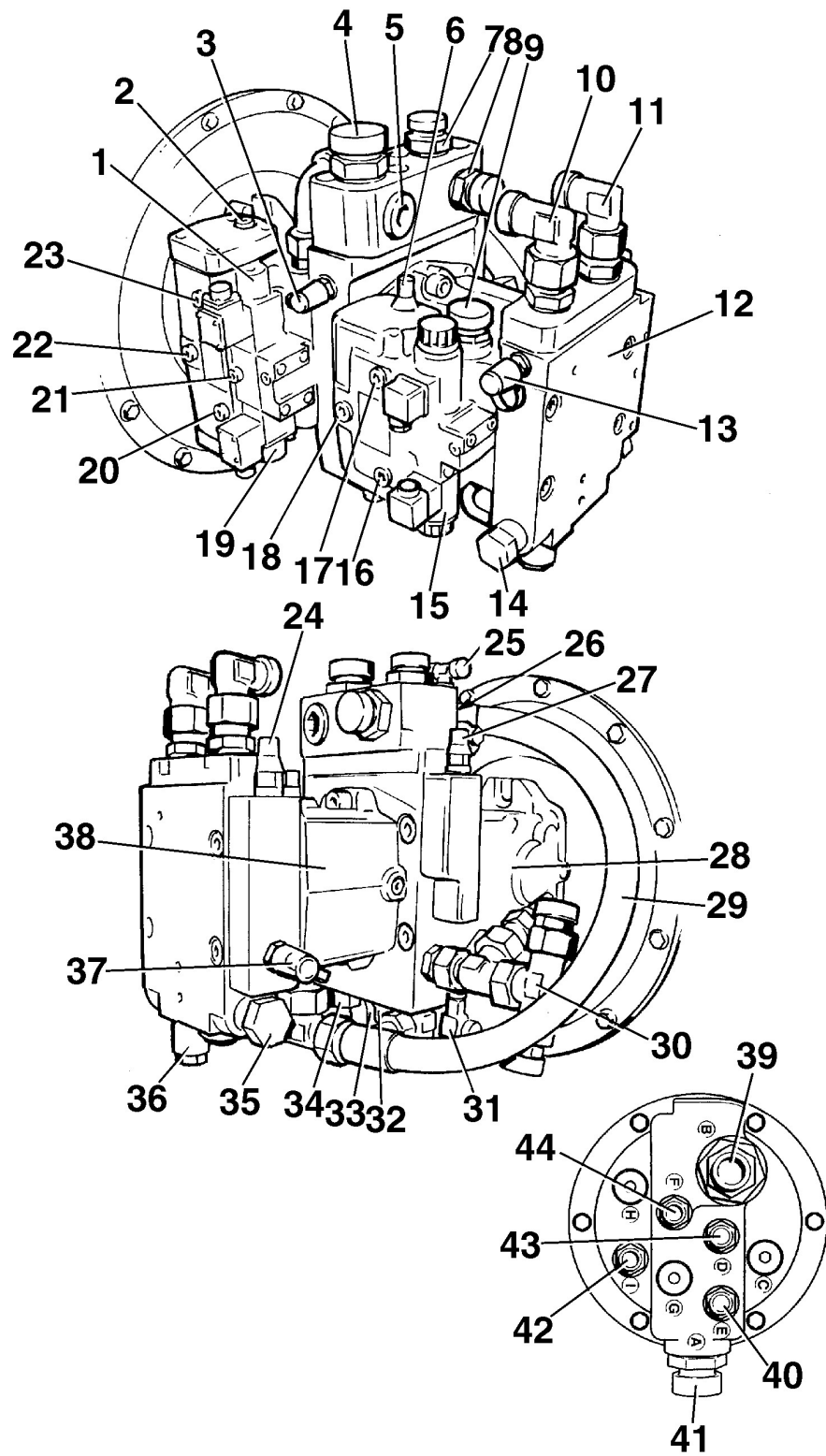
The values result in a 90% utilization of the screw's yield point at a coefficient of friction  $\mu_{\text{total}} = 0,14$ .

Compliance with the tightening torques is checked with torque wrenches.

Tightening torques deviating from the ones mentioned in the table are specially mentioned in these descriptions.

The values specified in the table apply for screws black, oiled and with surface protection A4C.

The quality designation of the screws is stamped on the screw heads.



872 600

Fig. 1

- |  |  |
|--|--|
| 1 Proportional valve, travel system  | 21 Adjustment screw, hydraulic neutral position                    |
| 2 Pressure test port X4, control chamber pressure, travel pump                     | 22 Pressure test port R, travel pump case pressure                 |
| 3 Pressure test port M <sub>B</sub> high pressure, reverse travel                  | 23 Pressure test port X2, travel pump                              |
| 4 High pressure port B to rear travel motor, high pressure reverse travel          | 24 Pressure override valve 380 bar, vibration pump                 |
| 5 High pressure port B to front travel motor, high pressure reverse travel         | 25 Port T, flushing oil, travel motors                             |
| 6 Adjustment screw, high frequency   | 26 Pressure test port M <sub>A</sub> high pressure, forward travel |
| 7 High pressure port A to rear travel motor, high pressure forward travel          | 27 Pressure override valve 400 bar, travel pump                    |
| 8 High pressure port A to front travel motor, high pressure forward travel         | 28 Travel pump   |
| 9 Port T1, leak oil tank A   | 29 Leak oil connection T1 travel pump - T2 vibration pump          |
| 10 High pressure port B, to vibration shut-off valve, high pressure low frequency  | 30 Port G, charge oil from steering valves                         |
| 11 High pressure port A, to vibration shut-off valve, high pressure high frequency | 31 Port T2, flushing oil, vibration motors                         |
| 12 Magnetic coil Y57, low frequency  | 32 High pressure relief valve, forward travel, 440 bar             |
| 13 High pressure test port, low frequency  | 33 Charge pressure relief valve 25 bar, travel pump                |
| 14 High pressure relief valve, vibration, 420 bar                                  | 34 High pressure relief valve, reverse travel, 440 bar             |
| 15 Magnetic coil, high frequency   | 35 High pressure relief valve, vibration, 400 bar                  |
| 16 Pressure test port X2, vibration pump   | 36 Connecting line, charge pressure supply to vibration pump       |
| 17 Pressure test port X1, vibration pump   | 37 High pressure test port, high frequency                         |
| 18 Pressure test port R, vibration pump case pressure                              | 38 Vibration pump  |
| 19 Proportional valve, travel system   | 39 Port B, leak oil to cooler                                      |
| 20 Pressure test port X2, travel pump  | 40 Port E, leak oil, front travel motor                            |
|  | 41 Port A, flushing/leak oil, travel/vibration pump                |
|  | 42 Port I, leak oil from brake valve                               |
|  | 43 Port D, leak oil, rear travel motor                             |
|  | 44 Port F, leak oil from vibration shut-off valve                  |



## **2 Tests and adjustments**

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