

Comprehensive Technical Guide to Bomag BW 100 and BW 120 Series: Service, Maintenance, and Engineering Specifications

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In the realm of modern road construction and pavement engineering, the efficiency of compaction equipment determines the longevity and structural integrity of the finished surface. Among the most recognized names in this sector is **BOMAG**, a global leader in compaction technology. Specifically, the **BW 100** and **BW 120** series of articulated tandem rollers have become industry standards for asphalt and soil compaction in medium-to-small scale projects. These machines, ranging from the traditional internal combustion models like the **BW 100 AD-4** to the innovative electric **BW 100 AD e-5**, represent a sophisticated blend of mechanical engineering and hydraulic precision.

Understanding the operational nuances, service requirements, and technical frameworks of these rollers is essential for fleet managers, service technicians, and site engineers. This guide provides an exhaustive technical analysis based on official service repair manuals and operational training data, focusing on the mechanical architecture, hydraulic systems, and maintenance protocols that define the Bomag BW series.

1. Technical Taxonomy: Understanding the AD, AC, and E-Series Designations

BOMAG utilizes a specific nomenclature that informs the user about the machine's configuration and primary application. Understanding these codes is the first step in proper equipment selection and maintenance planning.

- **AD (All-Drum):** These models feature two vibrating steel drums. They are primarily designed for standard asphalt compaction where maximum density is required across the entire width of the machine.
- **AC (Combination):** The combination roller features a vibrating steel drum at the front and a set of four smooth rubber tires at the rear. This configuration is crucial for achieving a specific surface finish, as the kneading effect of the rubber tires seals the asphalt surface more effectively than a steel drum alone.
- **The Dash Series (-4 vs -5):** The suffix (e.g., -4 or -5) denotes the generation of the machine. The -4 series typically features mechanical or early electronic controls, while the -5 series introduces more advanced digital monitoring, telematics, and in the case of the e-5, fully electric drivetrains.

1.1. Physical Dimensions and Weight Distribution

The engineering of the **BW 100** and **BW 120** focuses on a compact footprint without sacrificing static linear load. The BW 100 typically features a drum width of 1,000mm, whereas the BW 120 extends this to 1,200mm. This 200mm difference significantly impacts the machine's **Area Capacity** (m^2/h), calculated by the formula:

Area Capacity = (Width - Overlap) $\times$ Speed $\times$ 0.9 (Efficiency Factor)

2. Mechanical Architecture and Articulated Joint Design

One of the defining features mentioned in technical documentation for the **BW 100 AD e-5** and its predecessors is the robust construction of the articulated joint. Unlike many competitors that use a simplified pivot, Bomag utilizes a **solidly bolted articulated joint** connecting the front and rear frames. This design ensures that both drums follow

the same track during turns, reducing the risk of 'scuffing' or damaging the hot asphalt mat.

2.1. The Oscillating Articulated Joint

The joint allows for both steering (articulation) and oscillation. Oscillation ensures that both drums maintain constant contact with the ground, even on uneven terrain. Technically, this is achieved through a heavy-duty center pin and high-tensile bolts that are a primary focus during 500-hour service inspections. If the joint develops play, the compaction uniformity is compromised, leading to "density stripes" in the finished pavement.

Feature	BW 100 AD-4 Technical Spec	BW 120 AD-4 Technical Spec
Working Width	1,000 mm	1,200 mm
Static Linear Load	Approx. 12.0 kg/cm	Approx. 12.5 kg/cm
Centrifugal Force	30/34 kN	36/41 kN
Vibration Frequency	58/66 Hz	58/66 Hz
Drive System	Hydrostatic	Hydrostatic

3. Hydraulic System Analysis and Service Training

According to the **Bomag Service Training** data for the BW 100/120 series, the hydraulic system is the heart of the machine. It manages three critical functions: propulsion (travel), vibration, and steering.

3.1. Hydrostatic Travel Drive

The travel drive uses a closed-loop hydraulic circuit. A variable displacement pump, driven by the engine, provides high-pressure oil to hydraulic motors located in the drums. Service technicians must monitor the **charge pressure**. If charge pressure drops below the manufacturer's specification (typically 20-25 bar), the risk of cavitation in the main pump increases, leading to catastrophic component failure.

3.2. Vibration Circuit and Centrifugal Force

The vibration system utilizes eccentric weights inside the drums. When the hydraulic motor spins these weights at high speeds (up to 4,000 RPM), they generate centrifugal force. The **Service Repair Manual** specifies that the vibration frequency must be checked using a tachometer or a specialized vibration sensor. A deviation of more than 5% from the standard 66 Hz (high frequency) indicates a loss of hydraulic efficiency or a worn eccentric bearing.

4. Maintenance Standards and Service Intervals

Proper maintenance of a **Bomag BW 120 AD** or 100 series roller is governed by the "Standard Values" outlined in the technical documentation. Adhering to these intervals is critical for maintaining warranty and operational safety.

4.1. Daily Maintenance Checklist (Every 10 Hours)

- Scrapers: Inspect the drum scrapers to ensure they are adjusted correctly (approx. 1-2mm gap). Worn scrapers allow asphalt to build up on the drum, ruining the surface finish.
- Water Sprinkler System: Check filters and nozzles. The BW 100/120 uses a pressurized system to prevent asphalt from sticking to the drums. Clogged nozzles lead to "pick-up," where hot mix sticks to the steel.
- Engine Oil and Coolant: Standard levels must be checked. In the -4 series (Kubota/Deutz engines), specific oil grades (e.g., 10W-40) are mandatory for thermal stability.

4.2. Periodic Service Training Benchmarks

Technicians are trained to perform deep-dives every 500 and 1,000 hours. The **Bomag BW 100 AD BW 100 AC BW 120 AD BW 120 AC Drum Roller Service Manual** provides comprehensive diagrams for:

1. Hydraulic Oil Change: Replacing the high-pressure filters and the suction filter.
2. Valve Lash Adjustment: On mechanical engines, ensuring the intake and exhaust valves meet the specified

clearance (often 0.15mm to 0.20mm).

3. Battery and Alternator Diagnostics: Ensuring the charging system maintains 13.8V - 14.2V to support the solenoid-operated vibration valves.

5. The Electric Evolution: BW 100 AD e-5

The introduction of the **BW 100 AD e-5** represents a significant shift in technical requirements. The traditional internal combustion engine and much of the complex hydraulic plumbing for the drive system are replaced or augmented by high-capacity battery packs and electric motors.

5.1. Advantages of the E-Series

- Zero Emissions: Ideal for indoor projects or urban environments with strict noise and emission regulations.
- Reduced Maintenance: No engine oil, air filters, or coolant (for the engine) are required. However, the cooling system for the power electronics and the battery health monitoring (BMS) become the new focus of service.
- Instant Torque: Electric motors provide peak torque at 0 RPM, allowing for smoother starts and stops on asphalt, which reduces the likelihood of creating indentations in the mat.

6. Safety Protocols and Lifting Procedures

The **BW 100/120/125 AD-4/AC-4** manuals place heavy emphasis on machine transport. Because these rollers are often moved between sites, the use of proper **lifting tackle** is a critical safety requirement.

6.1. Rigging Specifications

According to the technical guidelines, lifting must only be performed by **qualified personnel**. The machines are equipped with specific lifting points, often located on the central articulation joint and the front/rear frames. Technicians must ensure that:

- The lifting belt or chain has a Safe Working Load (SWL) exceeding the machine's operating weight (typically 2,500kg to 3,000kg for these series).
- The angle of the slings does not exceed 60 degrees to prevent excessive lateral stress on the lifting eyes.
- The machine is in the "neutral" position with the parking brake engaged before lifting.

7. Common Troubleshooting and Failure Modes

Drawing from the **Service Repair Manual**, we can categorize common field issues into three primary systems: Propulsion, Compaction, and Electrical.

7.1. Propulsion Issues (Machine Won't Move)

If the roller fails to move, the technician should first check the **Bypass Valve**. This valve is often used for towing the machine in an emergency. If left open, the hydraulic oil bypasses the drive motors. If the valve is closed, the next step is checking the **Multi-Function Valve** in the main pump for pressure relief failures.

7.2. Poor Compaction Results

If the achieved density is below specification, the vibration frequency may be too low. This is often caused by:

- A slipping fan belt (which in some models drives a secondary hydraulic pump).
- Worn rubber buffers (isolators) on the drum. If these buffers are cracked, the vibration energy is absorbed by the frame instead of the ground.
- Internal leakage in the vibration motor.

7.3. Electrical Fault Codes

Modern **-5 series** rollers utilize CAN-bus communication. If a sensor fails (e.g., the seat occupancy sensor or the travel lever neutral switch), the machine's ECU (Electronic Control Unit) will prevent operation. Diagnosis requires a specialized Bomag service tool or an OBD-style interface to read specific fault codes (SPN/FMI codes).

8. Operational Mathematics: Compaction Efficiency

To maximize the utility of the BW 120, operators must understand the relationship between **Frequency (f)**, **Amplitude (a)**, and **Travel Speed (v)**. The goal is to achieve a specific number of impacts per meter (typically 30-40 impacts/m).

The formula for **Impact Spacing (\$\$)** is:

$$S = \frac{v}{f \times 60}$$

Where v is speed in meters per minute and f is frequency in Hz. If the operator drives too fast, the impact spacing increases, leading to uneven compaction and potential surface ripples.

9. Strategic Integration and Future Outlook

The **Bomag BW 100 and 120** series continue to evolve. The shift toward the **e-5** models suggests a future where maintenance is centered around software updates and battery cell balancing rather than mechanical valve adjustments. However, the fundamental principles of **Soil and Asphalt Mechanics** remain unchanged. The weight of the drum and the centrifugal force applied to the surface are the immutable laws of construction physics.

For owners of older **-4 series** machines, the availability of **PDF Service Manuals** and **Operation Maintenance** documents is vital for extending the machine life. Regular hydraulic oil analysis and strict adherence to the lubrication schedules provided in the **BW 120 AD-4** manual can extend the life of the hydrostatic pumps by thousands of hours, ensuring a high return on investment (ROI) for the equipment.

In conclusion, whether operating a classic diesel-powered **BW 100 AD** or the latest electric variant, the key to success lies in technical literacy. By understanding the intricate balance of hydraulic pressures, mechanical joint stability, and periodic service requirements, construction professionals can ensure their Bomag equipment delivers the high-performance compaction required for the infrastructure of tomorrow.

Baca Juga (Artikel Terkait)

- [Comprehensive Technical Guide to International 4900 and DT466E Engine Systems: Service, Maintenance, and Electronics](#)

URL: <http://123caramba.com/international-4900-dt466e-service-manual-technical-guide.pdf>

- [The Comprehensive Guide to Bobcat 753 Maintenance: Technical Analysis and Service Standards](#)

URL: <http://123caramba.com/bobcat-753-service-manual-technical-guide.pdf>

- [Comprehensive Engineering and Service Guide for the Bobcat 873 Skid Steer Loader: Technical Analysis, Maintenance, and Repair Frameworks](#)

URL: <http://123caramba.com/bobcat-873-service-repair-manual-technical-guide.pdf>

- [The Comprehensive Engineering Guide to Volvo A30 and BM A30 Spare Parts: Maintenance, Technical Analysis, and Performance Optimization](#)

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Tags: #Bomag BW 100 #Bomag BW 120 #Service Repair Manual #Asphalt Roller #Construction Engineering #Tandem Vibratory Roller

