

Technical Engineering and Maintenance Guide for Bomag BW 80 ADH-2 and AD-2 Tandem Vibratory Rollers

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In the landscape of light compaction technology, the **Bomag BW 80** series has long served as a benchmark for efficiency, reliability, and precision engineering. Specifically, models such as the **BW 80 ADH-2** and the **BW 80 AD-2** represent a critical evolution in tandem vibratory rollers, designed to bridge the gap between heavy-duty compaction and high-maneuverability requirements in confined urban spaces. These machines are ubiquitous in road repair, landscaping, and the construction of driveways, where the integrity of the surface layer depends heavily on the mechanical consistency of the compaction equipment.

The Engineering Architecture of the BW 80 Series

The fundamental design of the Bomag BW 80 series centers around a **tandem vibratory configuration**. Unlike single-drum rollers, tandem rollers utilize two smooth steel drums—one at the front and one at the rear—both of which are often capable of vibration to ensure a uniform density across the treated surface. The 'AD' designation typically refers to **All-Drum Drive** with vibration on the front drum (and sometimes rear), while the 'ADH' variant often indicates **High Output** or specialized hydraulic configurations for enhanced travel characteristics.

The Articulated Steering Mechanism

A core component of the BW 80 series is its **articulated steering joint**. This oscillation-joint design allows the front and rear drums to follow the exact same track during turns, reducing the risk of 'scuffing' or 'tearing' the asphalt surface—a critical factor when working on finishing layers. The articulation angle, typically around 30 to 35 degrees, combined with a tight turning radius, ensures that the operator can navigate around manholes, curbs, and tight corners with surgical precision.

Hydrostatic Drive Systems

The propulsion of the BW 80 ADH-2 is powered by a **hydrostatic travel drive**. This system replaces traditional mechanical transmissions with a hydraulic pump and motor circuit. In a hydrostatic setup, the engine drives a variable displacement pump, which sends pressurized hydraulic fluid to motors mounted directly in the drum hubs. This allows for infinitely variable speed control without the need for shifting gears, providing the smooth acceleration and deceleration necessary to prevent surface rippling.

Theoretical Framework: The Physics of Compaction

To understand the operational excellence of the BW 80 series, one must analyze the mathematical principles of soil and asphalt compaction. Compaction is the process of increasing the density of a material by packing the solid particles more closely together and expelling air. The Bomag machines achieve this through three primary forces: **Static Linear Load**, **Impact Force**, and **Vibration Frequency**.

The Centrifugal Force Formula

The vibration in a Bomag roller is generated by an eccentric weight spinning within the drum. The force generated (F_c) can be expressed by the following physical formula:

$$F_c = m \cdot r \cdot \omega^2$$

- m : The mass of the eccentric weight.
- r : The distance of the center of gravity of the weight from the axis of rotation (eccentricity).
- ω : The angular velocity (linked directly to the vibration frequency in Hz).

The BW 80 series is engineered to optimize the balance between frequency and amplitude. High frequency with low amplitude is generally preferred for thin asphalt layers to prevent aggregate crushing, whereas higher amplitude is used for thicker base layers. The **BW 80 AD-2** typically operates at frequencies optimized for these varied applications, ensuring maximum productivity per pass.

Technical Specifications and Model Comparison

The following table provides a comparative analysis of the primary technical specifications for the BW 80 and its immediate counterparts, as derived from technical data sheets and service manuals.

Metric Parameter	Bomag BW 80 AD-2	Bomag BW 80 ADH-2	Bomag BW 90 AD-2
Operating Weight	1,470 kg	1,600 kg	1,600 kg
Drum Width	800 mm	800 mm	900 mm
Engine Model	Hatz 2G40	Hatz 2G40	Hatz 2G40
Power Output	13.2 kW	13.2 kW	13.2 kW
Vibration Frequency	60 Hz / 40 Hz	60 Hz / 40 Hz	60 Hz / 40 Hz
Centrifugal Force	15 kN	15 kN	17 kN
Travel Speed	0 - 8 km/h	0 - 9 km/h	0 - 8 km/h

As illustrated in the data, the **ADH-2** variant offers a slight increase in operating weight and travel speed efficiency, making it more suitable for projects requiring faster transit between compaction sites or higher static pressure.

The Water Sprinkler System and Surface Quality

A critical operational component mentioned in the **Bomag Operating Instructions** is the **pressure sprinkler system**. When compacting hot mix asphalt (HMA), the temperature of the asphalt can cause it to stick to the cold steel drums, leading to 'pick-up' and surface destruction. The BW 80 series utilizes a pressurized water system with an interval switch to prevent this.

System Components:

- **Water Tank:** Typically high-capacity corrosion-resistant plastic.
- **Interval Timer:** Allows the operator to set water flow at specific intervals (e.g., 5 seconds on, 10 seconds off) to conserve water while maintaining drum moisture.
- **Scrapers:** Each drum is equipped with two spring-loaded, tiltable scrapers. These mechanical blades physically remove any debris or asphalt residue that the water spray fails to lubricate.

Maintenance Protocols: Ensuring Longevity

According to the **Bomag Service Training** documents, adherence to a strict maintenance schedule is non-negotiable for machine longevity. The high-vibration environment of a roller subjects every bolt, seal, and hydraulic line to significant mechanical stress.

The 1000-Hour Critical Service

The 1000-operating-hour milestone is perhaps the most critical in the machine's lifecycle. Key procedures include:

1. **Exhaust Valve Adjustment:** On the Hatz diesel engines, valve clearances must be checked and adjusted to ensure optimal combustion and prevent overheating.
2. **Hydraulic System Flush:** The hydrostatic drive relies on the purity of its oil. At 1000 hours, the hydraulic oil and the high-pressure filters must be replaced to remove microscopic metal shavings generated by the pump and motors.
3. **Articulated Joint Inspection:** The central pivot point must be checked for play. Excessive wear here leads to 'dog-tracking,' where the drums no longer align correctly.

Daily Maintenance Checklist

- Fluid Levels: Check engine oil, hydraulic oil, and diesel levels.
- Water Filter: Clean the sprinkler system filter to prevent nozzle clogging.
- Safety Labels and ROPS: Ensure the Roll-Over Protective Structure is secure and safety decals are legible.

Safety Regulations and Operational Best Practices

The **Bomag Safety Regulation** emphasize several high-risk areas unique to tandem rollers. Due to their relatively high center of gravity and narrow width, stability is a primary concern.

Edge and Embankment Management

Operators must keep a safe distance from the edges of embankments or deep trenches. The weight of the machine, combined with the **dynamic force of the vibration**, can cause the soil at the edge to collapse. It is a standard engineering recommendation to avoid vibration when working within 0.5 meters of an un-shored edge.

Travel Characteristics

When operating on slopes, the machine should always be driven straight up or down, never across the face of the slope. The hydrostatic braking system is robust, but the **parking brake** must always be engaged when the machine is stationary, as hydraulic drift can occur over time if the system is under load.

Troubleshooting Common Operational Failures

Even with meticulous maintenance, technical issues can arise. Below is a diagnostic matrix for common failures in the BW 80 ADH-2 series.

Symptom	Potential Cause	Technical Solution
Loss of Vibration	Faulty solenoid valve or broken drive belt.	Test the vibration toggle switch for continuity; inspect the hydraulic valve block for debris.
Machine Veers to One Side	Uneven hydraulic pressure in drum motors.	Perform a pressure test on the left and right travel circuits; check for internal leakage in the motor.
Clogged Sprinkler Nozzles	Mineral buildup or contaminated water tank.	Flush the system with a mild descaling agent; replace the primary water filter.
Excessive Engine Smoke	Clogged air filter or fuel injector timing.	Replace the air filter element; check the Hatz engine timing marks as per the service manual.

The Role of Technical Documentation

Access to the **Full Operators Manual** and **Parts Catalogs** is essential for any professional outfit. These documents provide the precise torque specifications and wiring diagrams needed to perform complex repairs. For instance, the wiring of the vibration control circuit involves specific relays that, if bypassed or wired incorrectly, can lead to permanent damage to the hydraulic solenoids. The **Bomag Serwisówka**(Service Manual) remains the definitive source for these schematics.

Integration of Technology: The BW 80 AD-5 and Beyond

While the BW 80 AD-2 and ADH-2 are legendary for their simplicity, modern iterations like the **BW 80 AD-5** have introduced electronic monitoring systems. These newer models incorporate 'Economizer' technology, which uses sensors to measure the stiffness of the ground in real-time. This prevents 'over-compaction,' which can lead to material fracturing. However, for many contractors, the mechanical robustness and 'repairability' of the AD-2 and ADH-2 series make them the preferred choice for rugged field use.

Conclusion: The Strategic Importance of Precision Compaction

The technical depth of the **Bomag BW 80 ADH-2** underscores the importance of choosing the right equipment for the specific engineering task. By understanding the hydrostatic drive mechanics, the physics of centrifugal force, and the rigorous maintenance requirements of these machines, operators and fleet managers can ensure maximum uptime and superior construction quality. Whether it is adjusting exhaust valves at the 1000-hour mark or managing water intervals to ensure a perfect asphalt finish, every technical detail contributes to the structural integrity of our built environment. The legacy of the BW 80 series continues to be defined by this intersection of mechanical simplicity and engineering excellence.

Baca Juga (Artikel Terkait)

- [Comprehensive Technical Analysis of Liebherr 904 Litronic Series: Engineering, Maintenance, and Operational Optimization](#)

URL: <http://www.amotionselfie.com/liebherr-904-litronic-technical-guide.pdf>

- [The Bobcat 863 Skid Steer Loader: A Comprehensive Technical Maintenance and Engineering Analysis](#)

URL: <http://www.amotionselfie.com/bobcat-863-skid-steer-technical-manual-specs.pdf>

- [Engineering Excellence in Soil Compaction: A Comprehensive Technical Analysis of Bomag BW 216, 219, and 225 Series Single Drum Rollers](#)

URL: <http://www.amotionselfie.com/bomag-bw-216-219-225-technical-guide.pdf>

- [Comprehensive Engineering Guide to BOMAG Single Drum Rollers: Maintenance, Operation, and Technical Analysis of BW 216, 219, and 226 Series](#)

URL: <http://www.amotionselfie.com/bomag-bw-216-219-226-service-repair-manual-technical-guide.pdf>

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