

**BETBOLT**



**AUTOMATIC ENGINE  
OVERSPEED  
SHUTDOWN VALVE  
SPINDLE TYPE**



**ATEX  
APPROVED**



## INTRODUCTION

Our range of spring-loaded poppet-type engine air intake shut-off valves is specifically engineered to provide automatic and reliable engine overspeed protection. These valves are designed to immediately stop engine operation by positively closing the air intake when abnormal or excessive engine speed is detected, thereby preventing catastrophic engine failure and secondary damage.

The valve family is available in a wide range of sizes and configurations, enabling compatibility with most common diesel engine ratings and air-intake pipe diameters, across both mobile and stationary applications.

## OPERATING PRINCIPLE

The operation of the valve is based on a self-actuating airflow-sensing mechanism, eliminating the need for external power or electronic control.

As engine speed increases, the intake airflow velocity and mass flow rate rise proportionally, generating an increasing aerodynamic force on the valve poppet (disc). This closing force acts against a calibrated and adjustable compression spring.

When the airflow-induced force exceeds the preset spring resistance—corresponding to a defined overspeed threshold—the valve rapidly closes, fully blocking the air intake. Once actuated, the valve remains in the closed position until the engine comes to a complete standstill, ensuring a fail-safe shutdown condition.

## APPLICABILITY TO ENGINE TYPES

These spring-loaded poppet valves are suitable for use on both:

- Naturally aspirated diesel engines
- Turbocharged diesel engines

In turbocharged applications, due to intake pressure fluctuations and compressor dynamics, the exact shutdown speed may exhibit slightly higher variability compared to naturally aspirated engines. However, the valve continues to provide effective and dependable protection against engine overspeed and runaway conditions.

This valve is for protective shutdown only. For precise or repeatable shutdown speeds, use alternative sensing or control methods.



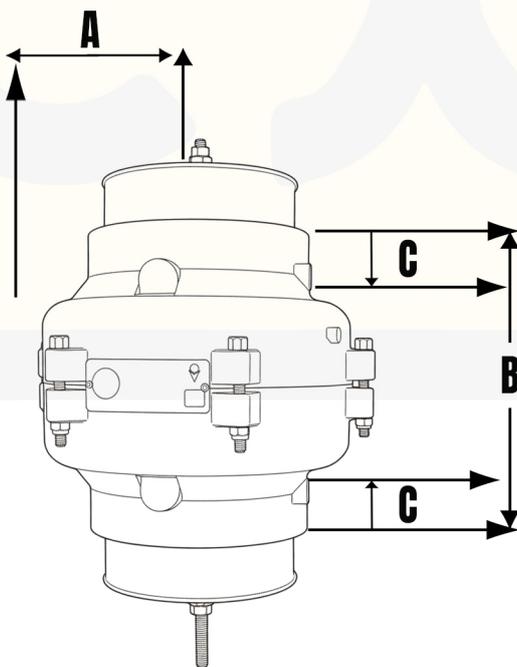
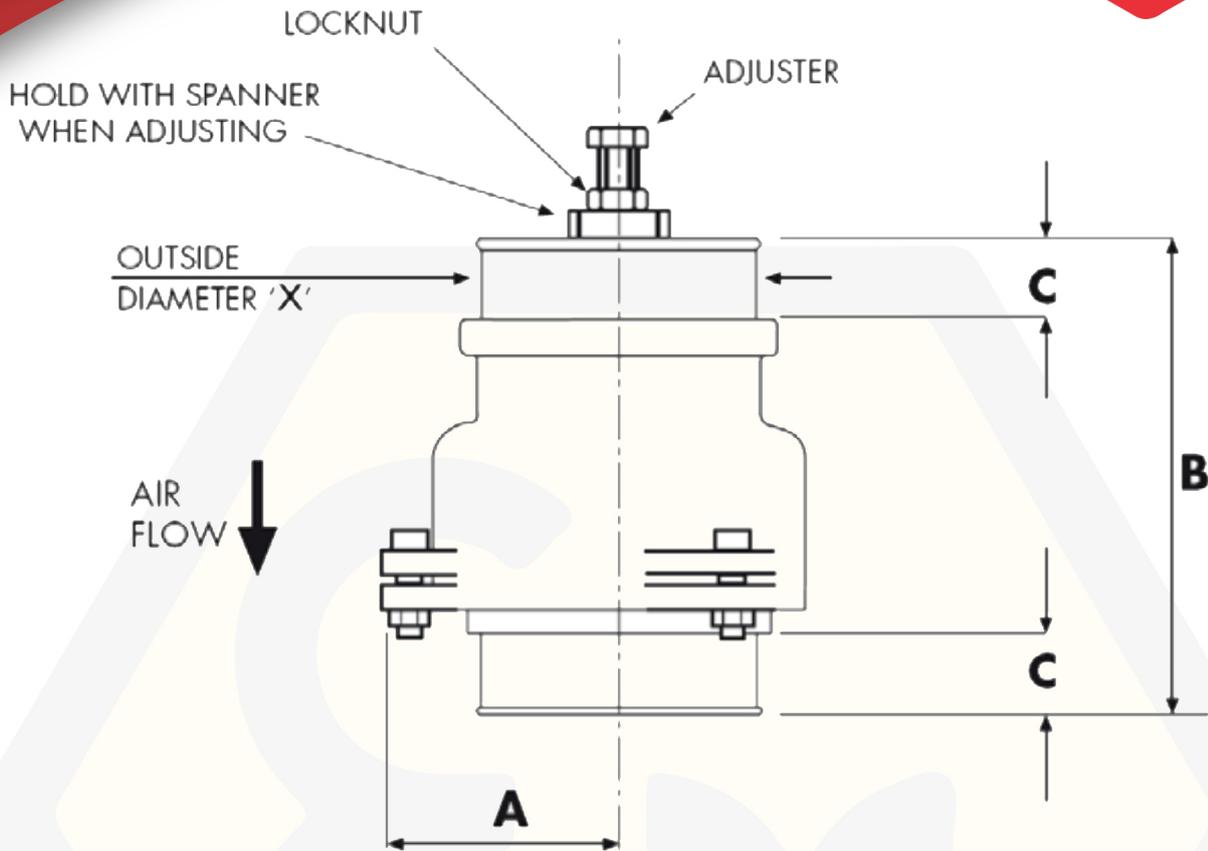
## TECHNICAL CHARACTERISTICS & DESIGN FEATURES

- Self-actuating, airflow-responsive closing mechanism
- Adjustable spring preload for overspeed set-point tuning
- Positive shut-off design ensuring complete air isolation
- Fail-safe operation (no external power required)
- Robust construction suitable for harsh industrial and oil & gas environments
- Compatible with both NA and turbocharged diesel engines
- Designed to minimize intake restriction under normal operating conditions
- Flow calculation is done using applicable bernoulli's principle, fluid dynamics theory, CFD polygon mesh theory.
- HP range is calculated from CFD analysis for fluid dynamics, pressure drop, velocity change and thermodynamic principle of expansion and contraction.
- Material selected is cast Aluminium along with SS fasteners for durability, reliability and endurance

## VALVE SIZING AND CONFIGURATION

Each valve size within this product family is designed with carefully balanced bore diameter, disc geometry, lift, and spring characteristics to ensure:

- Adequate airflow capacity during normal engine operation
- Controlled and predictable closing behavior at overspeed
- Acceptable intake pressure drop within recommended limits



Automatic engine overspeed shutdown valve  
for 5" & 6" inch only



The specific dimensional details, flow capacities, and applicable engine power ranges for each valve size are provided in the table below.

No.	Model Name	Type Code	A (mm)	B (mm)	C (mm)	Weight (kg)	Capacity (Hp) (Naturally Aspirated)	Capacity (Hp) (Turbo Charged)
1	1.5" Betbolt-Filter Type	ENX BT 75 38	75	143	21	1.4	7 to 16	7 to 14
2	1.75" Betbolt	ENX BT 90 45	37.5	95	20	0.45	8 to 78	8 to 70
3	2" Betbolt	ENX BT 100 51	60	115	19	0.65	20 to 104	20 to 94
4	2.5" Betbolt	ENX BT 125 63	65	120	19	0.7	60 to 167	60 to 151
5	2.75" Betbolt	ENX BT 140 70	69	119	20	1.2	60 to 221	60 to 200
6	3" Betbolt	ENX BT 150 76	80	125	19	1.2	67 to 247	67 to 223
7	3.5" Betbolt	ENX BT 175 89	80	125	25	1.2	85 to 292	85 to 258
8	4" Betbolt	ENX BT 200 102	95	140	25	1.45	100 to 391	100 to 346
9	5" Betbolt	ENX BT 250 127	120	200	25	3.5	150 to 546	150 to 513
10	6" Betbolt	ENX BT 300 252	140	210	25	3.5	150 to 642	150 to 594



## Installation Guidelines

### Safety Warning :

Here are some safety guidelines to follow:

- Handle with care during unpacking to avoid injury.
- Exhaust gases can cause severe respiratory issues, suffocation, or death; therefore, all exhaust systems must vent outside of enclosed spaces.
- Always allow a hot engine to cool adequately before beginning any maintenance. Ensure the engine cannot start accidentally before starting work.
- Position the BT Valve in a safe, easily accessible location to prevent injuries from moving parts or contact with hot surfaces during valve adjustment.
- Design and construct machinery parts where workers stand or move to set the valve to prevent slipping, tripping, or falling.
- Conduct a thorough risk assessment before starting work to eliminate or minimize hazards such as exhaust fumes, moving parts, noise, and hot surfaces.

### 1. Valve Positioning :

- Proximity:** Install as close to the engine intake manifold as possible for rapid shutdown.
- Turbochargers:** If space is limited at the manifold, install upstream of the turbocharger.
- If turbo outlet air exceeds 150°C, the valve must be downstream of the intercooler or upstream of the turbo to avoid heat damage.

### 2. Specialized Configurations

- Multiple Intakes:** Use a balance pipe (approx. 30% of primary pipe diameter) to connect intake pipes on the engine side of the valves.
- Orientation:** Follow the airflow direction arrow indicated on the valve body.

### 3. Mounting & Pipe Integrity

- Connections:** Use reinforced flexible cuffs/hoses and support brackets to manage vibration and weight.
- Hose Safety:** Keep hose gaps small and use collapse-resistant reinforced hoses to ensure effective shutdown.

### Notes :

- *There are no special handling requirements for the BT Valve.*
- *Before starting work, thorough read and understand the installation instructions.*
- *Installation of the BT Valve should be performed only by competent personnel.*
- *Ensure to wear suitable Personal Protective Equipment (PPE), including safety footwear, safety glasses, thermal and oil-resistant gloves and earplugs.*



## OVERSPEED TRIP SETTING ADJUSTMENT PROCEDURE

### Safety Warning :

When calibrating the Betbolt valve, ensure precautions are taken to avoid contact with hot surfaces or entanglement with adjacent equipment.

Once the BetBolt valve has been installed, the overspeed trip point is adjusted using the adjuster screw and locknut (refer to the relevant diagram). Turning the adjuster clockwise increases the engine speed at which automatic shutdown occurs.

At initial installation, the valve is factory set to trip well below the engine's high idle speed. The shutdown speed must therefore be adjusted to suit the specific engine and application.

1. **Baseline Test:** Start the engine and gradually increase speed, recording the exact RPM at which the valve initiates shutdown.
2. **Access:** Stop the engine and disconnect the inlet hose to reach the adjuster and locknut (refer to diagram).
3. **Adjust:** Loosen the locknut, rotate the adjuster one full turn clockwise, and re-tighten.
4. **Retest:** Reconnect the hose and restart the engine to observe the updated shutdown speed.
5. **Iterate:** Repeat the adjustment until the engine no longer shuts down at high idle (max throttle, no load).
6. **Finalize:** Set the trip point 10%–15% above high idle for precision, or add one extra clockwise turn for general applications.
7. **Secure:** Fully tighten the locknut and apply a thread-locking compound for added security.
8. **Verify:** Perform a final functional test to ensure the valve trips as intended before returning to full operation.

### Notes :

- *If a manual shut down cable assembly is fitted, ensure that excessive effort is not required to operate the manual override.*
- *Turbo charged Engines. When setting up a valve on a turbo charged engine using the preceding method, it may be found that at high power outputs, the engine will shut down at a lower speed than required. If this occurs, further small adjustments in steps of one halfturn clockwise should be made until the problem is eliminated.*
- *Jammed Valve. If in the course of adjusting the valve it jams on its seat, release by turning **CLOCKWISE** viewed from adjuster end of valve.*



## MAINTENANCE

### Safety Warning :

When cleaning the Betbolt valve externally, ensure the engine has cooled adequately before beginning work. If cleaning a hot valve, exercise caution to avoid contact with hot surfaces and prevent entanglement with nearby equipment.

Be mindful not to trap fingers when adjusting the valve setting. During disassembly, handle equipment containing springs with care to safely release spring forces.

When cleaning internal components with chemical agents, avoid skin contact, inhalation, and ingestion of cleaning agents and removed dirt/debris. Wear appropriate Personal Protective Equipment (PPE) for safety.

### Routine Inspection – Every Three Months

To ensure reliable operation and long-term performance, the BetBolt engine air intake shut-off valve shall be inspected at three-month intervals or more frequently if operating in dusty or harsh environments.

- 1. Valve Removal :** Disconnect the intake pipework and remove all brackets or clamps to safely extract the valve from the system.
- 2. Inspection and Cleaning :** Check internal components for dust, oil, or carbon buildup. If contaminated, clean with paraffin or white spirit and dry thoroughly before reuse.
- 3. Mechanical Check :** Ensure the poppet and spring are free of wear or damage and move smoothly through their full stroke. Do not apply lubricants, as they attract debris.
- 4. Reinstallation and Testing :** Reinstall the valve in its original orientation and secure all supports. Verify the overspeed setting and perform a functional test to confirm correct operation.
- 5. Operational Validation :** Start the engine and gradually increase speed to observe and record the exact point at which the valve initiates shutdown.

### Notes :

*Here are the guidelines for handling the Betbolt valve:*

- *The Betbolt valve does not have any special handling requirements.*
- *Before starting maintenance, thoroughly read and understand the maintenance instructions.*
- *Maintenance of the Betbolt valve should only be conducted by competent personnel.*
- *Wear suitable Personal Protective Equipment (PPE) including safety footwear, safety glasses, thermal and oil-resistant gloves, and earplugs.*
- *The frequency of routine maintenance every three months depends on the operating conditions of the equipment and may need adjustment based on experience.*
- *For any maintenance issues not addressed in the routine schedule, consult your Betbolt valve distributor before initiating any repair work.*



## QUALITY ASSURANCE

EnvisionX, the manufacturer of BETBOLT engine air intake shut-off valves, is committed to delivering products that meet the highest standards of quality, reliability, and durability.

Each BetBolt valve is supplied with a one-year warranty, reflecting EnvisionX's confidence in the product's design, materials, and manufacturing quality.

EnvisionX operates under a certified Quality Management System and is fully compliant with ISO 9001:2015 standards. This certification demonstrates the company's commitment to consistent product quality through:

- Controlled manufacturing processes
- Documented inspection and testing procedures
- Continuous process monitoring and improvement

The ISO 9001:2015 certification is maintained through regular audits and independent assessments, ensuring that EnvisionX's systems consistently produce products that conform to stringent quality and performance requirements.

This structured quality assurance framework provides customers with confidence in the reliability, safety, and long-term performance of BetBolt engine shut-off valves across demanding industrial and oil & gas applications.

*Betbolt valve are tested for certification to ensure they met high standard. All the documents are as per standard ENIEC 60079-0:2018, EN ISO 80079-36:2016, EN ISO 80079-37:2016 The certification is granted by an Atex Body having notified body number 2336, SCA Belgelendirme Ve Özel Eğitim Hizmetleri Ltd. Şti.*

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ENGINE SHUTDOWN VALVE are a safety device.  
The use of the correct product and  
proper installation is critical and should be treated seriously.

## MANUFACTURERS OF SPECIALIST EXHAUST PRODUCTS & EMERGENCY SHUTDOWN VALVE

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