



MACHINES (FLOW BENCHES) DIAGNOSTIC & CALIBRATION SERIES “Flow test ONE”, Redline – 3001, Redline- 3011 from TURBOLABER.

Description, principle of operation, technical parameters.

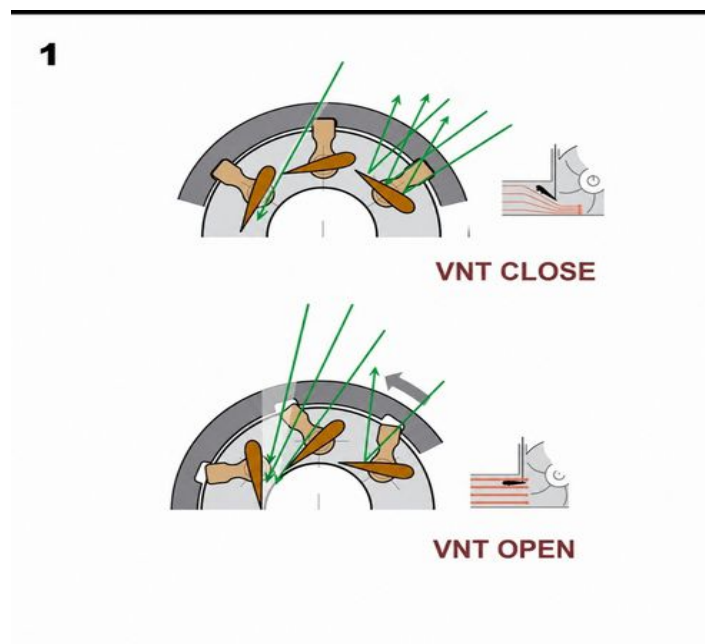
This series of machines (benches) is intended for diagnostics and calibration of turbochargers for cars with variable geometry (VNT) with vacuum and electronic servo drives (actuators) and bypass valves.

The principle of operation of the stands is based on measuring the differential pressure created by a stabilized air flow through the VNT blades (pic. 1).



This technology allows not only to calibrate the VNT, but also to diagnose the serviceability of the turbocharger after repair. Calibration by differential pressure measurement achieves a relative accuracy of almost 100% (not taking into account the backlash of new original parts), eliminating the error associated with the difference in atmospheric pressure, temperature and humidity of the surrounding air (unlike air flow meter measurement systems). Exceptional calibration accuracy is achieved by a constant value of the calibration pressure of the air flow in each particular stand, tied to the standard on which the database is built. At the same time, the calibration on all sends at any time and will always be identical due to binding to a single standard. The air blower uses a high speed electric motor which gives a very smooth air flow (less than 1% sine), which eliminates calibration error if multiple setpoint checks are required for the same turbocharger.

Turbocharger diagnostics. After assembling the turbocharger, it is necessary to check it. Calibration without this check may result in the vehicle's turbocharger not working properly. The stand simulates the flow of exhaust gases after starting the engine with its own air flow. All the air flow from the electric motor enters the cast iron (hot) part of the turbocharger housing. Under ideal conditions, 100% of the air should pass between the VNT blades with the VNT blades fully open, and conversely, 100% of the air should be deflected back with the VNT blades fully closed (with the VNT adjustment screw turned out). Even a new original turbine has gaps and backlashes in the VNT elements and assemblies, so 100% of the reflected air in reality is an unattainable parameter. But there is a certain parameter of reflected pressure on all new turbochargers. And this volume in terms of pressure is 120 conventional units or more. The total flow pressure is 150. Of this volume, at least 120 units should be reflected from the VNT blades if the turbocharger is assembled correctly. Why do we sometimes have less than 120 units after assembling a turbocharger? The main reason is parasitic air flow, leakage into the gaps above and below the VNT blades, as well as backlash in the gaps of the rings and actuators. Ideally, the air flow should only go between the blades, creating a force vector on the edges of the rotor impeller.



The turbocharger is calibrated according to the database. The database is accessible via a tablet in the stand kit. Updates online, free of charge. Updates occur at least once a month. The database contains information on 500 unique turbochargers and over 4500 unique numbers. In case of difficulty in finding the number or data for a particular turbocharger, you must contact the technical support service. The data includes turbocharger numbers, vehicle make and model description, engine data, VNT and actuator calibration data. (pic.2)

16:07						
	Nr Turbo	Model, motor, Comments	Image	VNT min (vac 0) Ele...	VNT max, Electr Act ...	VAC(inHg/ mbar) AC...
407	709836-9005S 709836-5005S 709836-9004S 709836-5004S 778794-5001S 778794-0001 726698-5003S 726698-0003/2/1 A6110960899 A6110961699 A6110961599	Mercedes-PKW Sprinter I 211CDI/311CDI/ 411CDI Build: Jan 2000 to Dez 2006 Engine: OM 611 DE 22 LA Capacity: 2148 ccm Power: 80 Kw Mercedes-PKW Sprinter I 213CDI/313CDI/ 413CDI Build: Jan 2000 to Dez 2006 Engine: OM 611 DE 22 LA Capacity: 2148 ccm Power: 95 Kw		-4 +3	72-82	19/640

Comparison table of machine parameters:

	Flow Test One	3001	3011
			
Diagnostic,calibration VNT	+	+	+
Diagnostic,calibration vacuum actuators	+	+	+
Diagnostic,calibration electronic actuators	With tester	With tester	With tester
Calibration press valve	-	+	+
Oil leak test	-	-	+
Analog duplication	-	+	+
Data base (models turbochargers)	9800	9800	9800
Online update	+	+	+
Adapter set	4	4	10
Universal fasteners and clamps	12	12	12
Electrical connection	220B/6A	220B/10A	220B/16A
Dimensions	80x40x70/60kg	110x45x120/100kg	110x45x120/110kg
CE certificate	+	+	+