









# Content

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# Serial diagnostics - HW

# HARLEY-DAVIDSON® & BUELL®, INDIAN® & VICTORY®

Our aim is to provide the technician of **DIAG4BIKE** with a diagnostic tool that is comparable to the original diagnostic equipment for the brands in terms of common diagnostic operations.

It enables the technician to perform diagnostics of electronic fuel injection modules and others (i.e. security modules, ABS etc.) through the diagnostic connector on the vehicle. The kit contains a **communication interface** with the necessary **adapter**(s), a **USB cable** for connection to your laptop (or PC) and **diagnostic software** that is compatible with **Windows 7, 10** and **11**. There is also a wireless **Bluetooth version** of the communication interface available.







Reference	ZODIAC ATAL
Communication interface USB	732050 AT532 5006
Communication interface USB+BT	732051 AT532 5007
Software Indian® & Victory®	732043 AT531 5051
Software Harley-Davidson®	732056 AT531 5049

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# Serial diagnostics - SW

### HARLEY-DAVIDSON® & BUELL®

Includes functions to perform diagnostics of electronic fuel injection modules and others (i.e. security modules, ABS etc.) through the diagnostic connector on the motorcycle. The kit contains a communication interface with **Harley-Davidson**® adapters, a **USB cable** for connection to your laptop (or PC) and **diagnostic software** that is compatible with **Windows 7, 10** and **11**. There is also a wireless Bluetooth version of the communication interface available.

## **Motorcycle diagnostics**

- Overview of the Harley-Davidson® models
   All models since 1995 (Delphi, Magneti Marelli, VDO IGN, Thunder MAX EFi)
- Overview of control units that can be diagnosed and functions

Ignition Module

EFI (Electronic Fuel Injection Module)......All models

TSSM (Turn Signal Security Module).....Key FOB with button

HFSM (Hands Free Security Module).....Key FOB without button

BCM (Board Control Module).....Key FOB without button

SCM (Security Control Module)

Gauges (Speedo, Tacho and Instrument Module).....All models

ABS Module (Delphi + CAN models)......All models

Radio, Thunder MAX EFI (models with 4-pin Datalink connector)

Read and Clear Diagnostic Trouble Codes.....All models, updated trouble codes, parameters and texts Limits of measured parameters

New modules LHCM and RHCM (Left/Right) hands control module (parameters, special functions)

Read Identification data (parts number, VIN number).....All models

Monitoring real-time data (throttle position, temperature, oxygen sensors, turn signals etc.)

Test actuators (injectors, coils, main relay, fuel pump, idle, turn signals, tachometer, lamps, alarm etc.)

New function "Service Information", links to Owners manual, Wiring Diagrams, Parts catalog

Buell diagnostics is incorporated in Harley-Davidson diagnostics

Unit of measure selection metric/american

Communication interface is CAN ready (models with 6-pin Datalink connector)

Motorcycle report (search for and identify all embedded control units, read fault code memory, erase fault code memory by one button, generate and print a diagnostic report, odometer reading, the diagnostic report is printed into pdf file after successful motorcycle report).



Reference: ZODIAC: 732056 ATAL: AT531 5049







# Serial diagnostics - SW

## HARLEY-DAVIDSON® & BUELL®

- **Toolbox** (special functions in one place with description of the functions)
  - Speedo module : Parking Brake, Instrument External Indicator Bar, Traction control telltale ( two wheels / trike ) Instrument TPMS Option ( enable/disable)
  - Vehicle speed sensor calibration (VSS)
  - Module replacement (TSSM, HFSM, BCM)
  - ABS Service (Bleeding and configuration, Delphi + CAN models) up to model year 2021
  - ACR (Automatic compression release during starting)
  - Cruise Control, Exhaust actuator, EITMS (enable/disable)
  - Side Stand Switch configuration All models
  - Intake solenoid valve configuration on CAN models (6-pin Datalink connector)
  - Chassis Fan Cooler configuration (enable/disable)
  - Radio customization (all models including)

RADIO BOOM! ™ BOX GTS 2019 - Speaker Configuration, Radio region code, Digital Audio Broadcast, Rear Speaker switch installed, Navigation, TPMS (Tyre Pressure Monitoring System), Audio input 1 2 and 3, CB Radio, CB Frequency, Intercom, WHIM (Wireless Headset Interface Module), Bluetooth, Apple CarPlay Mic Type, Apple Siri, SMS Text Messaging, Front Audio Output, Rear Audio Output

- Custom Audio Flash J&M Corporation (Audio Flash Stage 5)
- ABS Telltale configuration on CAN models
- Radio pairing, Buell TPS adjustment, Speedo pairing (CAN models)
- Reset AFV (all models and Buell®)
- Oil Cooler Fan (enable/disable)
- TCU module Installed / not Installed (Telematic Control Unit)
- Exchange PTT and Cruise Control on Hand Control modules
- Idle speed adjustment all models with Delphi Electronic Fuel Injection Module up to 2017.

For models since 2018 is idle speed adjustment available in advanced or professional tuning

- TSSM Customization PIN read/change, Auto arming disable/enable, Key FOB assignment instruction
- HFSM Customization Key FOB assignment/replacement, PIN read/change, disable/enable: Auto arming, Sidecar, Service mode
- BCM Customization External Bank Angle sensor, Auxiliary/Fog light Operation, etc.

Updated Key FOB assignment/replacement, PIN read/change,

disable/enable: Auto arming, Sidecar, Service mode, Lights configuration, Keyless ignition, BCM customization: Stealth mode "Police"-(enable/disable)

Rider Assistance - ABS, Traction Control configuration

Fork Lock Switch - configuration TPMS - valve assignment

Front and rear turn signal (LED/Incandescent)

EBAS (External Bank Angle Sensor) - no EBAS / FLHTCUTG / FLRT

Power Lock Switch for Saddle bags and Trunk (disable/enable)

- Disarming (HFSM/BCM module) - PIN read/FOB assignment on armed bike

(for BCM modules a CAN disarming cable is needed)

- TPMS configuration - BCM, Speedo, Radio

- Odometer units settings KM / MIL - All models

Button with a direct link to the On Line Help (www.doc4bike.eu)

Reference: ZODIAC: 732049 ATAL: AT531 4028









# Engine tuning HARLEY-DAVIDSON®

### **TUNING STRATEGY**

- The tuning system focuses on Harley-Davidson engines equipped with DELPHI EFI (diagnostic communication J1850 or CAN)
- The tuning system is based on diagnostic system DIAG4BIKE. DIAG4BIKE is the professional diagnostic tool for Harley-Davidson Motorcycles. The tuning software DIAG4TUNE is included in the diagnostic software from DIAG4BIKE. To tune an individual motorcycle a MULTI-DONGLE (hardware key) and tuning licence is needed.
  It is recommended to use last version of DIAG4BIKE software for diagnostic or tuning.
- The tuning process does not require the installation of additional component(s) or any motorcycle harness modification. Tuning is based
  on the modification of EFI Calibrations (software modification) exclusively via the diagnostic connector.
- The first step in Tuning is storage of the original EFI Calibration. The tuning operator can restore the original EFI Calibration at any time during tuning process (stock calibration).
- The tuning process is used to optimize Fuel Maps in case of any changes to the configuration of engine components or accessories (exhaust or/and intake system etc.)

### **AVAILABLE TUNING METHODS**

### 1. ADVANCED TUNING

By this method of the tuning is possible to use full range of **DIAG4TUNE** functions. The method provides ability to use an embedded database of calibrations. These calibrations (maps) are pre-set for several configurations of exhaust and intake components (open exhaust, intake and combinations). Advanced tuning method provides important improvement of engine functions. The best engine efficiency is possible to reach only by using PROFESSIONAL TUNING method.

### **Necessary Tuning Components:**









# Engine tuning

# HARLEY-DAVIDSON®

### 2. PROFESSIONAL TUNING - engine fuel maps optimization

With this method of tuning it's possible to use the full range of **DIAG4TUNE** functions. The key function here is VOLUMETRIC EFFICIENCY MAP MEASUREMENT under load. It means real VE maps measurement of each engine configuration. VE map measurement can be done on an appropriate Roller Station, good example is SMART POWER BENCH, or during Road Test on the street. Professional tuning method provides the best bike tuning for each special engine - maximal efficiency, torque and power.

**Necessary Tuning Components:** 

**AFR TUNING MONITOR** 

Reference **ZODIAC: 732 0** 



**DIAG4BIKE** 





### **Useful Tuning Components:**

## **INSTALLATION SET LAMBDA**

Reference: 70DIAC: 732042 ATAL: AT106 4020



#### INSTALLATION SET LAMBDA MINI

Reference: ZODIAC: 735435 ATAL: AT106 4064





# Blank ECM Flash

This function is used to flash a new blank ECM. By this function you can set a VIN number and after flash the selected calibration according to the VIN number. It can be also done for the used ECM. If this function is successful you can do full range of the DIAG4TUNE functions.



#### **MULTI DONGLE**

Reference **ZODIAC: 735 448** 







# Multi-Dongle

# A new generation of selling tuning licences

**Multi-Dongle** is a special hardware key that can be used to tune motorcycles using the **DIAG4BIKE** system.

At the same time, it serves as a carrier for electronic tuning licences which are purchased online via the order form, accessible from the **DIAG4BIKE** program (beginning from **version 21.1**).



- Harley-Davidson® and Indian® motorcycles can currently be tuned using the Multi-Dongle. In the future, it will be possible to use Multi-Dongle for tuning other brands of motorcycles as well
- For one **Multi-Dongle**, an unlimited number of tuning licences can be purchased
- When using the Multi-Dongle, the computer must be connected to the Internet
- · New Multi-Dongle does not include any tuning licences
- Original calibrations read from motorcycles are newly stored on the
   DIAG4BIKE server which is secured at a professional level against data loss
- All **DIAG4BIKE** tuning calibrations are stored on the **DIAG4BIKE** server as well. In this way, newly created calibrations are available immediately after release.
- Users can access the data even after a crash of their computer and from anywhere in the world.
- Access to the data is allowed only to the owner of the respective Multi-Dongle
- Customers can still create their own calibrations and save them to their computer







Learn more about the
Multi-Dongle from the
training video at
www.diag4bike.com/multidongle







# Models for tuning

and Blank ECM Flash - HARLEY-DAVIDSON®

Version 23.0

Professional tuning is available for H-D® models 2006-2023

Except for Live Wire® models

Adve	anced	Advanced tuning ma	aps available for H-D®	naps available for H-D® models 2006-2023 (see below)	
DIAG4BIK	01AG4BIKE® Maps	H-D®- SE Equivalent	Engines	Components	Note
Level 0			All	Stock Intake and Exhaust	Equal to Stock
Level 0 Plus	2		Milwaukee-Eight	Stock Intake and Exhaust	Driving Comfort increasing
Level 0,5			Evolution	Open Intake (KN, SE)	Transition Level 0-1
Level 1			All (except Revolution Max®)	Open Exhaust	
Level 1,5			Evolution	Open Intake and partly open Exhaust	Transition Level 1-2
Level 2		Stage 1	All (except Sportster®S a Nightster™)	Open Intake and Exhaust (SE Components)	
Level 3		Stage 2	All (except Revolution Max®)	Camshaft, Open Intake and Exhaust (SE Components)	
Level Custom	ш	Stage 3,4	All (except Revolution Max®)	Custom Configuration	Available On Demand

Level 1-4 is not available for: Softail® 2006 25 deg.injectors, Touring® 2006

Daly Level 0 and Level 2 are available for following models: XL883 L,N,R 2007-19 / XL883 P 2007-10 / Street® / Dyna@2006 / Dyna@2007-10 SE / V-Rod® 2006-07 except VRSCR,VRSCD / Softail® 2006 /

Softail® 2007-13 SE / Touring® SE, CVO/ Pan America® / Pan America S®

Only the Level 0 map and professional tuning are available for the Sportster®S. Maps for Nightster™993T under preparation





# Smart Power Bench

## power bench for bike diagnostics and tuning

## SMART POWER BENCH (SPB) 2nd Generation (with gearbox)

- The station may only be operated by a trained person
- Simulates engine load equivalent to road test Gear 1
- Simulates double load for comfortable tuning measurements (VE maps) Gear 2
- Provides measurements for both power and torque curves Gear 1
- Facilitates measurement of VE maps for engine tuning
- Provides the opportunity to carry out engine diagnostics whilst under load
- · Utilises built-in fan for engine & rear tyre cooling
- · Embedded protection of rear tyre

SPB is an ideal tool for motorcycle specialists who carry out bike repairs and servicing, ECU diagnostics and especially engine tuning.

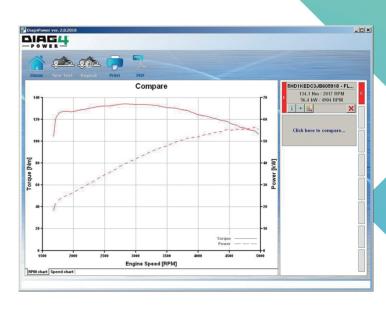
SPB gives you more than basic measuring capabilities.

It is able to simulate the engine load without the hazards associated with road tests, under both stable and dynamic conditions. Utilising a large roller with high moment of inertia & specially adapted fan assembly is equivalent to the motorcycle and rider mass and drag caused by air flow.

**SPB** is designed to complement the range of equipment available in the DIAG4BIKE family and is especially well suited for the tuning of Harley-Davidson engines.

DIAG4POWER is our new software program allowing full control of measurements with SMART POWER BENCH.















# **Smart Power Bench**

## power bench for bike diagnostics and tuning

### SPB specifications

- Weight: 550 kg
- Dimensions: 2,8m x 0,5m x 1m (W x H x D), 110" x 20" x 40"
- Roller diameter: 450 mm, 18"
- Mass moment of inertia of the system: ~12 kgm2 (see label on SPB) Gear 1
- Measurement range of engine power: 10 250 kW

• At load, power input of the fan is mainly given by the built-in load fan, and is dependent on the engaged gear of the station (the following data is for illustration only):

#### Gear 1

- o 10 kW at 100 km/h (60 MPH)
- o 30 kW at 150 km/h (90 MPH)
- o 70 kW at 200 km/h (120 MPH)

#### Gear 2

- o 10 kW at 50 km/h (30 MPH)
- o 30 kW at 75 km/h (45 MPH)
- o 70 kW at 100 km/h (60 MPH)
- · Maximum driving speed (peripheral speed of the roller):
  - o Gear 1: 225 km/h, 140 MPH
  - o Gear 2: 110 km/h, 68 MPH
- · Connection to PC: RS 232 or USB
- Required PC operation system: W7, W8, W10
- Power supply of the station: 230V AC or 12V DC with power of 24 W.
   Power supply can therefore be provided from a 12V vehicle battery.
- The operating temperature range of the station: +10 to +40 °C
- · Cooling of rear tire: provided automatically by the built-in fan
- Temperature measurement of the rear tire: IR measurement
- Remote control: IR (infra red)
- Measuring ambient air pressure: 870 to 1100 hPa (at sea level)

Reference Zodiac: 732040 ATAL: AT531 4098



 Fast & Simple installation without the need for building works or anchorage

Intuitive usage and simple maintenance

 Cost effective high quality solution produced 100% in Europe (product of the Czech Republic)

 Approved for P&T measuring according to DIN 70020 and ECE-85-R standards (Germany)







# Smart Power Bench

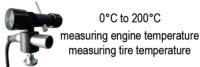
### Standard accessories

Intake air temperature sensor



-9°C to 70°C

#### **Contactless infrared thermometer**



Footer adapter

Software Diag4Power



#### **Ignition sensor SPB**



Speed Measurement



Clampingstraps for motorcycle



Wireles inrared remote controller

### Option



#### **Trolley with PC for SPB**



- Trollev
- · Industrial box PC with OS
- Monitor 21.5" with Touchscreen
- · Ink color printer
- · Keyboard and mouse

Diagnostic and Tuning System DIAG4BIKE for H-D®

It allows to read the engine parameters for power and torque

measurement directly from the H-D® diagnostic connector

(engine speed and temperature, TPS position, VIN number)

Reference Zodiac: 735434 ATAL: AT857 5016

### ATAL: AT857 5016

**Additional motorcycle cooling** 



SMART

This powerful Axial Fan is useful equipment for additional engine cooling while using the Smart Power Bench. The fan is equipped with two power levels. Power levels are switchable between level 1, level 2 and auto. The Auto level is dedicated for Tuning Measurements (VE maps measurement). The Smart Power Bench automatically controls the power level of the fan dependent on engine temperature.

Reference Zodiac: 735483 ATAL: AT131 4002 Level 1 - Electric Power 0.5 kW, Airflow 4 700 m3/h, Air speed 26 km/h Level 2 - Electric Power 2 kW, Airflow 11 000 m3/h, Air speed 60 km/h

Transport wheels for SPB





Reference Zodiac: 735484 ATAL: AT533 4074

#### **Exhaust** gas extractor

This powerful Radial Fan is designed for extraction of exhaust gases from motorcycles during power tests and during tuning measurements. The fan is equipped with adapters for one side and two side motorcycle exhaust pipe configurations. The fan output is connected to the hose diameter of 305 mm with a length of 3 m. Electric Power 3 kW, Airflow 6000 m3/h



a) One side exhaust pipe
735517 Left – diameter 250 mm



b) Duo sides exhaust pipe
- diameter 2x200 mm



c) Yoke

12

Zodiac: 735517 Left Zodiac 735518 Right ATAL: AT131 4001



# Serial diagnostics - SW

# INDIAN® & VICTORY®

Includes functions to perform diagnostics of all embeded control units through the diagnostic connector on the motorcycle. The kit contains a communication interface with a **INDIAN® & VICTORY®** adapter, a **USB cable** for connection to your laptop (or PC) and diagnostic software that is compatible with **Windows 7**, **10** and **11**. There is also a wireless Bluetooth version of the communication interface available.

# Motorcycle diagnostics for model year 2021 and older

#### Models

Indian – 2014 - 2021 Victory – 2008 - 2017

#### Overview of control units that can be diagnosed and functions

Engine control module
ABS control module
Gauge (Speedo, Tacho ...) module
Vehicle control module
Radio control module

Read Vehicle information Reading / erasing errors Reading parameters



#### Motorcycle report

Search for and identify all embedded control units, read fault code memory + generate and print a diagnostic report

#### Software Kit included

Adapter Indian® & Victory® SW installation on USB disk SW licence code Multi-Dongle











# Engine tuning INDIAN® MOTORCYCLE

#### **TUNING STRATEGY**

- The tuning system focuses on INDIAN engines equipped with BOSCH EFI
- The tuning system is based on diagnostic system DIAG4BIKE. DIAG4BIKE is the professional diagnostic tool for INDIAN Motorcycles. To tune an individual motorcycle a MULTI DONGLE and a tuning licenseand, must be purchased that can be used for that specific motorcycle.
- The tuning process does not require the installation of additional component(s) or any motorcycle harness modification. Tuning is based on the modification of EFI Calibrations (software modification) exclusively via the diagnostic connector.
- The first step in Tuning is storage of the original EFI Calibration. The tuning operator can restore the original EFI Calibration at any time during tuning process.
- The tuning process is used to optimize Fuel Maps in case of any changes to the configuration of engine components or accessories (exhaust or/and intake system etc.)

#### ADVANCED TUNING

Advance tuning method provides ability to use an embedded database of calibrations.

These calibrations (maps) are pre-set for several configurations of exhaust and intake components (open exhaust, intake and combinations). These calibrations are not editable (yet). Advanced tuning method provides important improvement of engine functions.

#### **Necessary Tuning Components:**





Reference: ZODIAC: 732043 ATAL: AT531 5051



Model / Year

Springfield / 116

Challenger FTR 1200 / S

Springfield Dark Horse / 116

T SUPPORTED

**MULTI DONGLE** 

2017

2018

Reference ZODIAC: 735 448

ZODIAC: 732050

ZODIAC: 732051 ATAL: AT532 5006 ATAL: AT532 5007

Model not produced

X

Calibrations available

Scout		X	X	х	х	х	X	X
Scout Bobber					X	X	X	X
Scout Sixty			X	X	X	X	X	X
Chief	x	x	X	X	X		×	X
Chief Classic	x	x	x	x	x		×	x
Chief Vintage	x	x	X	x	x	x	×	x
Chief Dark Horse			x	x	x	x	X	X
Chieftain / 116	х	x	x	x	x	x	X	X
Chieftain Classic / 116					х	x	X	X
Chieftain Dark Horse / 116			x	х	х	х	х	X
Chieftain Limited / 116				х	х	х	х	X
Roadmaster / 116		х	х	х	х	х	х	X
Roadmaster Classic / 116				х	х		х	X
Roadmaster Elite / 116					х	X	х	X

List of currently supported models available on www.diag4bike.com/indianmodels

x







# Parallel diagnostics

HARLEY-DAVIDSON® & BUELL®, BMW®

Parallel diagnostic equipment is designed for measuring input and output signals to and from the electronic control unit (ECU) which is typically used in modern vehicles to control engine functions. However, it can also be used for measurements on other control units installed in vehicles. Measurements can be carried out on a system that is in operation (i.e. a running engine).



Reference			ZODIAC	ATAL
1 Breakout diagnostic box 62P			732053	AT521 3037
2 Deriv (T-adapter) 36PT	H-D®	EFI Delphi	732054	AT531 4014
3 Deriv (T-adapter) 35PT	H-D <sup>®</sup> , BMW <sup>®</sup>	EFI MM	732055	AT531 4015
Deriv (T-adapter) 73PT	H-D®	EFI Delphi (Touring models)	732058	AT531 4064
5 Deriv (T-adapter) 12+4PT	H-D®	TSM/TSSM/HFSM	732059	AT531 4077
6 Deriv (T-adapter) 36/48PT	H-D®	BCM	732048	AT531 4073
7 Deriv (T-adapter) 18/18PT	H-D®	EFI Delphi	732047	AT531 4078
8 Deriv (T-adapter) 3x 18PT	H-D®	EFI Delphi	735441	AT531 4080





# Business partner



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