

TIRE WATCH

Improve Comfort & Safety

TECHNICAL MANUAL

FOR EXCLUSIVE USE OF MOTORCYCLE DEALERS

Subject : Wheel unit sensors (WUS) mounting and dismounting instructions

Reference : S 304 001 0008 A2

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I - DESCRIPTION

The wheel unit sensor (WUS) of TIRE WATCH™ system is a pressure and temperature sensor composed by :

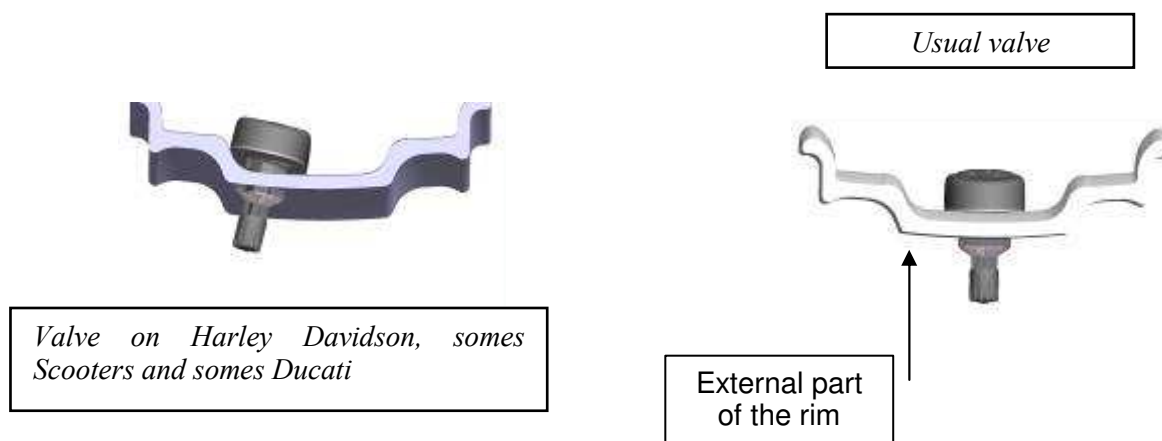
- A molded black and white plastic housing,
- An anodized aluminium nut with BTR cavity for hexagonal key (5mm.), clipped in housing with a stainless steel spring,
- An anodized aluminum valve including an EPDM seal, a short core mechanism and a grey cap. Depending on the rim, this valve can be equipped with 3 different seals (cf : 2-2) :
 - **the standard seal** which is already mounted on the valve (seal for 11,5mm diameter valve hole or specific magnesium rim)
 - **the O-ring seal** for 8,5mm diameter valve hole (except on some magnesium rims)
 - **a grey-colored seal** specific for some BMW rims (deep external concavity)

II – RULES OF UTILISATION

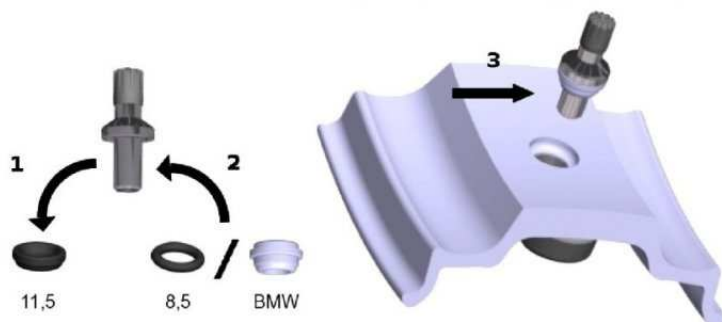
The Wheel Unit Sensor can be mounted on all motorcycle rims

- with a minimal wide of 3 inches and with a diameter from 12 to 21 inches,
- with a 8.5mm or 11.5mm diameter valve hole

You will find on our website the updated list of motorcycles that can be equipped with TIRE WATCH™: www.ldr-technology.com



On some rims, the valve hole geometry makes the use of a specific seal mandatory to insure a perfect airtightness.





According to the picture, you have first to remove the 11,5mm standard original seal (1). Then you have to place either the grey-coloured seal for BMW rims which present a deep external concavity, or the O-ring seal for 8,5mm diameter valve hole (2). Keep the original seal (11,5mm) for some magnesium rims (ex : OZ racing)



2-1 – Specifications

Screwing torque for valve core mechanism :	0.6 +/- 0.1 Nm.
Screwing torque for valve cap:	0.2 à 0.35 Nm.
Manual screwing torque for nut:	4.2 Nm +/- 0.2 Nm.
Environmental Temperature Range:	-20°C to +60°C.
Pressure Range :	0 to 4 bars.
Used Inflating Fluid :	Air or Nitrogen
Anti-puncture utilisation :	Utilisation without any consequence.

2-2 – List of compatible motorcycles

Valve diameter		TUBELESS TYRE ONLY	
MANUFACTURER	 Ø 8,5	 Ø 11,5	
		Can be mounted on all motorcycles commercialized before june 2005. For other motorcycles, ask you motor dealership For all mounting on specific rims (OZ Racing, Marchesini, Marvic), control the valve hole diameter in order to select the right kit (8,5 or 11,5mm)	
Aprilia	•	Caponord 1000 ETV / Tuono / RSV 1000 – 1000R (2005) / Falco 1000 SL / Futura RST1000 / Pour les motos suivantes équipées de jantes OZ Racing : RSV 1000 & Tuono / R (< 2005) ; R Factory, conserver le joint d'origine 11,5 mm.	
		•	50 SR / Atlantic 500 / 125 – 300 Leonardo / 500 Scarabeo / 650 Pegaso Strada
Benelli	•	900 Tomado TRE / TNT – Sport – Café Racer – Titanium	
Bimota	•	600 YB9 SRI / 900 DB / 900 Mantra / 1000 DB5 Mille / 1000 SB8 K / 1000 TESI 2D / 1000 YB11 / 1100 SB 6R	
BMW		•	F 650 CS / R 850R – R 1150R (Rockster) / R 850RT – R 1150 RT / R 1100 S (BoxerCup Replica) / K 1200 LT / K1200 GT / R 1200C / K 1200RS / R 1200 CL / R 1200GS . Attention : Kit spécial disponible dès mars 2006 pour les nouvelles jantes à valve latérale intégrée dans le rayon.
Buell	•		XB9R / XB9S / XB9SX City Cross / 1200 M2 Cyclone / 1200 S1 Lightning / S1 Xhite Lightning / S3 Thunderbolt / X1 Lightning / X1W White Lightning / XB12R / XB12S
Cagiva		•	Raptor 650 - 1000 / Navigator 1000
Ducati	•		Monster 600 - 620 - 750 - 800 - 900 - 1000 DS / Multistrada 620 - 1000 DS / SS 600 - 750 - 800 - 900 – 1000DS / 748 / 749 / 888 / 916 / 944 ST2 / 996 / 998 / 999 / ST3 / ST4
Harley Davidson		•	VRSCR Street Rod
Honda		•	CBF 600 - 900 - 1000 - 1300 / CBR 600 - 900 - 1000 - 1100 / 650 NT Deauville / 750 CB Seven-fifty / 750 VFC / 750 VFC2 / 750 VFR F / 750 VT C / 800 pacific Coast / 800 VFR / 1000 CB1 F (big one) / 1000 VTR / 1000 XL V / ST Pan European 1100 – 1300 / 1100 VTC / 1300 VTX S / 1500 GL C-C2 (F6C) / 1500 GL SE Golwing / 1800 GL Goldwing (valves coudées) / 1800 VTX C / Silver Wing 600
	Hyosung		•
Kawasaki		•	600 Eliminator / ZX (6R& 6RR) - 636 R - (7R & 7RR) - 9R - 10R - 12R / ZZR 600 - 1100 - 1200 / 750 Z / 750 ZS / 750 ZR (7 & 7S) / 1000 GTR / 1000 KLV / 1000 Z / 1100 GPZ / ZRX 1100 / 1200 (R & S) / VN 1500 -1600 - 2000 / ER6 (N & F)
KTM	•		Duke / 990 Super Duke / 950 Supermoto / SM tubless
Moto Guzzi	•		1000 Daytona RS / 1000 V10 Centauro / 1100 V11 / California EV 1100 / Brevia 1100 / Griso 1100 / Norge 1200
		•	750 Brevia ie /
MV Agusta	•		Brutale 750 – 910 / F4 750 - 1000
MZ		•	1000SF / 1000S / 1000ST
Piaggio		•	Beverly 500 / X8 / X9 Evolution 500
Suzuki		•	GSF 600 - 1200 / GSR 600 / GSX 600 (F& R) - 750 (F&R) - 1000 R - 1100 R - 1200 - 1300 R – 1400 / DL Vstorm 650 - 1000 / SV 650 - 1000 / 800 VX / VZ 800 - 1600 / 1000 TL / 1500 VL
Triumph	•		Speed Four / Daytona 650 / Daytona 951 / Speed Triple (2004) / Sprint ST / Trophy / Rocket III
Voxan	•		Street Scramber / Roadster New and Limited / Café Racer / Black Magic / Charade
Yamaha		•	Fazer 600 - 1000 / 600 XJ / YZF R6 - R7 – R1 / 660 SZR / TDM 850 - 900 / 850 TRX / 900 GT / 900 XJS / 1100 BT / XJR 1200 – 1300 / 1300 FJR / XV 1600 – 1700 / 1700 MT 01 / 500 TMAX



III – WUS MOUNTING

3.1 – Precautions during mounting operation

- ◆ Do NOT use WUS after a drop of more than 1 meter on a hard ground
- ◆ Do NOT generate an electrostatic discharge higher than 6 Kilovolts by air onto the WUS, during mounting and disassembly of the WUS or at any time during utilization (avoid the use of nylon worksuit, and in general way, avoid all textile rubbing before handling WUS)
- ◆ Do NOT store the TIRE WATCH at temperatures higher than 30°C and lower than 0°C
- ◆ When removing the core from the valve, it has to be replaced by a new short core (brass and viton) of the same type, according to V0.07.1 ETRTO core chamber specification.
- ◆ The valve cap must always be in place (except for inflating, pressure release or pressure checks).

3.2 - WUS mounting

- ◆ Before processing to the mounting, check that the valves are equipped with the right seal. Also check that your kit is adapted to the motorcycle to be equipped by consulting the list page 3.
- ◆ Check the external surface of the rim cleanness ; remove grits and other paint marks
- ◆ Orientation of the Wheel Unit Sensor on the rim : the side with the white cover must face towards the rim, the black cover must be visible after mounting.
- ◆ The sensor body must be presented in front of the valve hole, inside the rim, ; then lay the spring upon the flat surface around the valve hole.
- ◆ Shove the valve into the valve hole, the seal must face the rim.
- ◆ Push onto the WUS nut in order to bend the spring, and then start screwing the valve manually until the seal get in touch with the rim.
- ◆ While screwing keep the WUS in place.
- ◆ Make sure that the screwing tool stays aligned with the torx cavity of the nut during the screwing process.



3.3 – WUS screwing recommendations

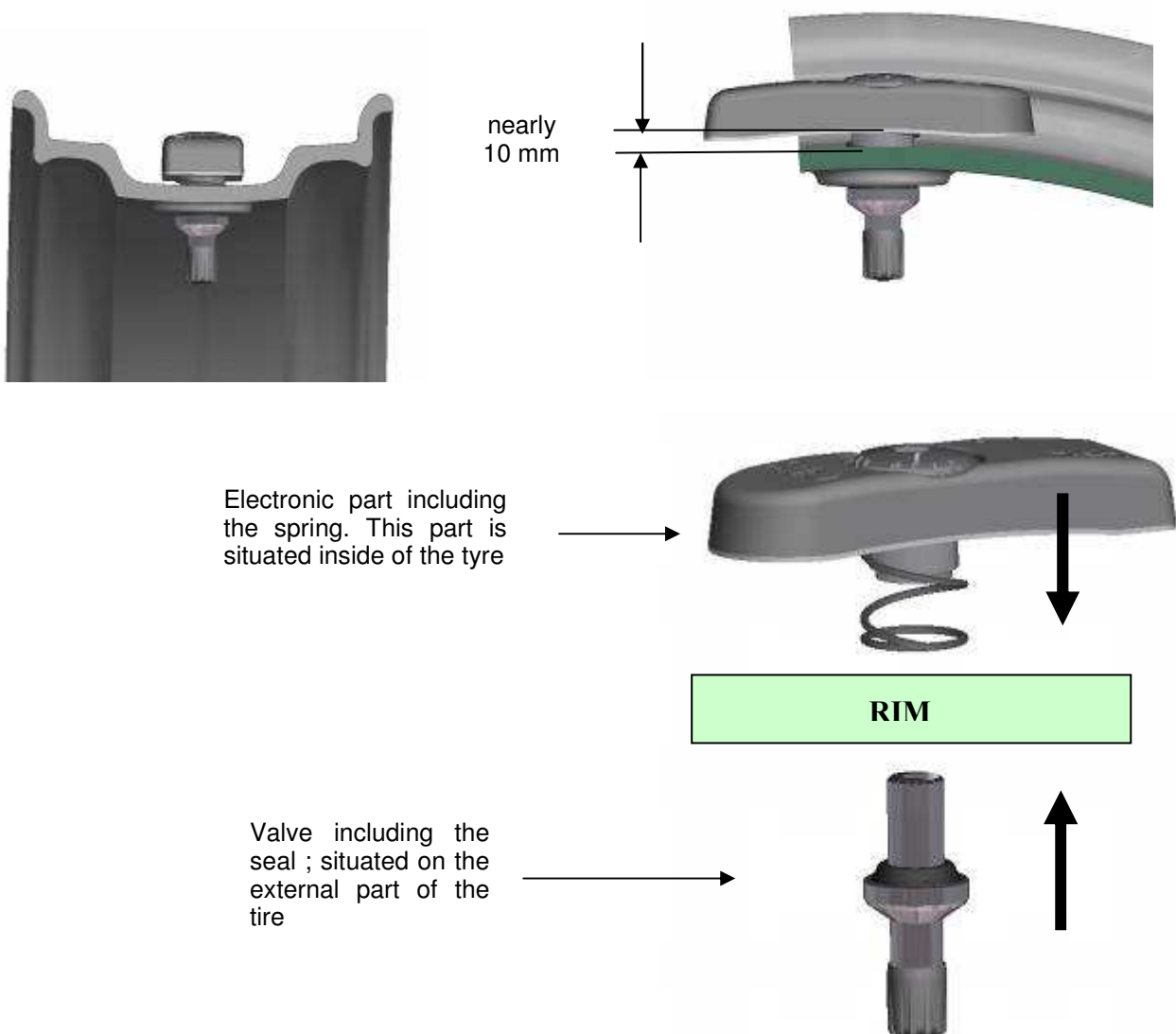
Please make sure the following recommendations are respected :

Screwing speed : max of 2 turns in 1 second.

- ◆ Apply a torque of 4.2 Nm +/- 0,2 Nm with the good **screwing speed**. This is the screwing condition of on which the specification of our WUS is based.
- ◆ For the manual process please use a torque controlled tool.
- ◆ The valve and the nut have to be screwed on 5 complete threads (5 nut rounds),

The plastic part must slightly be able to turn around its nut after tightening ; under no circumstances it has to be layed on the rim surface. You must be able to introduce a piece of paper between the sensor and the rim (mimimum slack of 1/10 mm).

Once mounted, the WUS must be distant from the rim as illustrated hereunder ; the distance between them can reach and even exceed 10mm.



3.4 – Detailed views of WUS assembly

Step N° 1



The white cover must face the rim.

Step N°2



The valve seal must face the rim valve hole.

Step N°3



*- The sensor body must be presented in front of the valve hole, inside the rim
- Lay the spring upon the flat surface around the valve hole.*

Step N°4



While pushing on the nut, keep it centred on the valve hole ; then introduce the valve in the valve hole.

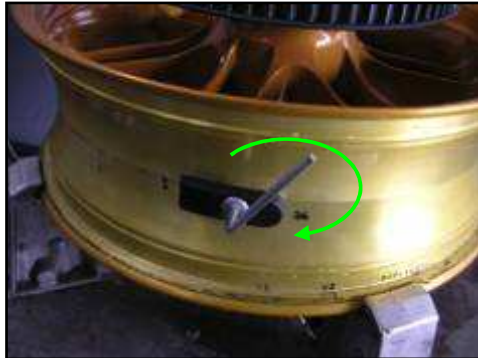


Step N°5



While you are still pushing on the nut start screwing the valve manually still the seal get in touch with the rim.

Step N°6



- Screw the nut with a allen key (5mm). Do not exceed 2 rounds per second.
- Final torque 4.2 Nm +/- 0.2 Nm.

AVOID ANY SCREWING IF PLASTIC HOUSING IS IN CONTACT WITH THE RIM

(the introduction of a piece of paper (80gr/m²) between the rim and the plastic parts make you sure that there is no contact).

Step N°7



- Check that the external part of the valve does not meet any obstacle during rim rotation (it can be the case on some scooters).
- Check that the external seal is correctly bended and that the valve is in contact with the metallic part of the rim.

Step N°8



- The flat surface of the valve must feet the flat surface of rim valve hole.
- The plastic parts must be free from rim constraints (no contact).
- The plastic parts must slightly be able to turn around its nut. (no constraints on plastic parts operated by the rim sides after tightening).



3.5 – Method to verify the screwing torque

- ◆ The measurement of the residual torque is done by retightening the valve nut by a ¼ turn in reduced speed (1/4 of a turn in 10 seconds). Therefore please use a torque-controlled tool which is able to memorize the maximum torque.
- ◆ The retightening torque may not be smaller than 3.8Nm.

It is recommended to verify the screwing torque at each time mounting.

IV – TIRE MOUNTING

4.1 - Precautions

- ◆ Before any mounting operation of the tire, make sure that the Wheel Unit Sensor has been correctly mounted and tightened to the rim.
- ◆ The tire must be lubricated so as to facilitate its mounting. Respect manufacturer recommendations.
- ◆ No lubrication product or any other matter may partially or completely cover the pressure measuring hole or the inflation hole of the wheel unit sensor.
- ◆ The tire must never be allowed to put mechanical constraints onto the wheel unit sensor during the mounting operation.
- ◆ Make sure that the tire does not get trapped between the rim and the wheel unit sensor.
- ◆ It's recommended to check the screwing torque before any tire mounting.

4.2 - Mounting

- ◆ The bead of the tire must be engaged approximately 30 centimeters beyond the valve.
- ◆ Do not introduce a mounting tool between the valve and the point of engagement of the tire.
- ◆ Tire mounting must be done while moving away from the valve.
- ◆ Beyond this point starts the final engagement operation, which finishes in the zone of the valve.
- ◆ During this phase, any constraint on the Wheel Unit Sensor by the tire is forbidden.





For clockwise tire mounting machine

First sidewall :

Step N°1



Start putting the tire on the rim on the opposite side of the valve

Step N°2



The first sidewall is now introduced



Second sidewall :

Step N°3



Start introducing manually the second sidewall in front of the valve

Step N°4



Turn the rim to introduce the second sidewall into the rim with the roll

Step N°5



At the end of the mounting process, the second sidewall end climbing on the rim when the shoe is in front of the valve



V – DISMOUNTING A TIRE EQUIPPED WITH A WUS

- ◆ Before detaching the tire, make sure that the Wheel Unit Sensor is still correctly mounted and tightened on the rim, by checking that the valve is tightened.
- ◆ Before any introduction of tools between the tire and the rim, make sure that both sidewalls of the tire are completely detached from the rim.

For clockwise tire mounting machine

Step N°1



Grip the tire with the press at 30° minimum from the valve

Step N°2



With a tire iron, raise the first sidewall at 30° from the valve

Step N°3



Slide the tool head under the tire

Step N°4



Then make the tire turn to disengage the first sidewall



Disassembly of the second sidewall.

Step N°5

Overview



Rear View



With a tire iron, raise the second sidewall at 30° from the valve

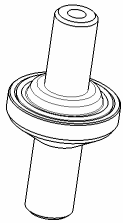
- ◆ Repeat the disassembly operations of the first sidewall until the tire is completely separated from the rim.
- ◆ At any time the tire must get in touch with the sensor.

VI – WUS DISMOUNTING

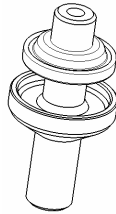
It is **MANDATORY** to interchange the seal if a complete disassembly of the WUS is done (if you change the rim for example), all unscrewing action on the nut is equivalent to a complete disassembly. It's **RECOMMENDED** to check the screwing torque at each time the tire is dismantled

6-1 – Replacing valve seal

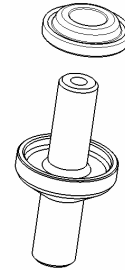
For the used valve seal dismounting, use a **PLASTIC TOOL** to disengage the seal from its case (in order to avoid damaging the valve).



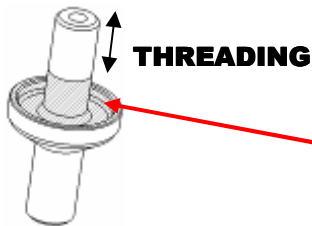
Disengage the seal from its case



Slide the seal along the valve body



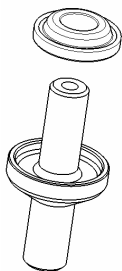
Remove the used seal



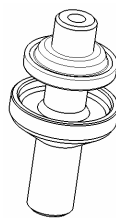
IT IS MANDATORY TO CHANGE THE VALVE IF THERE IS ANY SCRATCH OR HIT IN THIS AREA

NEW VALVE SEAL MOUNTING

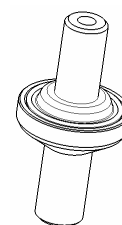
- ◆ *Do not use lubricant, solvent, grease or oil.*
- ◆ *Check that the valve can be used again.*



Present the seal in this way, flat surface oriented to the valve



Shove the seal into the valve



Check that the seal is in its lower position

