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## **SmartTire**

### **Tire Pressure Monitoring System**

Motorists are a lazy bunch when it comes to basic maintenance, and I include motorcyclists in that group. We've all heard mention made of the T-CLOCK inspection, but how many of us understand what that inspection entails or actually perform it? It seems only racers or professional drivers religiously check things like tire pressure. Low tire pressures are reported on at least 50 percent of all motorcycles inspected by repair facilities, and few riders (or car drivers) seem to understand the nature of the tire damage that can result. To be fair, riders of full-boat touring rigs like the Gold Wing have a harder job with a T-CLOCK inspection due to the fully enclosed nature of the bike, but this is merely an excuse that can result in disaster. We know from experience that our lackadaisical attitude won't change; many riders simply judge their tires' pressure by gauging sidewall deflection. Yet sidewall deflection is no indicator of proper tire pressure. As an example, the rear tire of a GL1500 or GL1800 is likely to appear fully inflated with only 20 pounds of pressure inside. Is there a way to accurately gauge tire pressure without having to get down on one's hands and knees or lie on the ground in a filthy parking lot? And if the pressures are okay, what guarantee do we have that a puncture or failed valve stem isn't releasing pressure as we ride? What's often referred to as "sudden tire deflation" has been the unfortunate fate of far too many

riders in recent memory, yet the deflation actually isn't all that sudden. What's sudden is the period between the time the rider first notices the symptoms of low tire pressure and the time he or she loses control of the machine.



Package contents: band clamps-air valve bridges-transmitters-receiver.



LEDs in self-test mode.



Transmitter mounted on wheel rim using very long hose clamp.  
Installation courtesy of All Cycle Sales, Tempe, AZ.



Harness customized for GL1500.

During the testing of this product, we (my wife Hilo and I) were being passed by a small pickup truck when we heard the ominous thump, thump, thump of a tire separating. Oblivious to this noise, the driver actually accelerated. That was good; between his acceleration and my deceleration, I was able to put enough distance between us to avoid the hail of rubber shards and broken truck parts that filled the air when the tire exploded. The truck then coasted harmlessly onto the road shoulder. Had this tire failure occurred on a motorcycle, I assure you the outcome would have been far less pleasant for the rider and passenger.

ZTechnik, a division of National Cycle, has recently addressed these problems with the introduction of the SmarTire tire pressure monitoring system. Unlike previously available products, the SmarTire system

does not incorporate any devices installed in the tires' valve stems. Those things were visible only while dismounted, and they were reported to have actually caused tire deflation in a few cases. Instead, the SmarTire system is an adaptation of what's currently being installed as OEM equipment on some expensive luxury cars. The system incorporates a battery powered pressure sensor/transmitter inside each tire (Photo A.) and a receiver mounted under the seat or at some other convenient location. A pair of light emitting diodes (LEDs) is then mounted in a location where the rider's attention will be drawn to them should either one illuminate (Photo B.). An enclosure is provided for mounting the LEDs externally, or they may be flush mounted by drilling mounting holes. We chose the key panel as the mount point on our GL1500.

When the key is first turned on, both LEDs will illuminate briefly, and the receiver will emit three beeps as a system self-test. After that, the yellow LED will light if a system error occurs while riding. The receiver, calibrated to compensate its trigger points for normal pressure change due to temperature, will illuminate the red LED steadily (deviation alert) at five pounds below the inflation pressure set in the unit. And should the pressure drop to as much as ten pounds under the pressure set point, the red LED will begin flashing (low pressure warning). An audible beep occurs to match the steady or flashing red light, but we found it impossible to hear with the engine running. Again, this unit is an adaptation of an automotive product; perhaps future motorcycle versions might incorporate something to honk the bike's horn.

The folks at ZTechnik sell the SmarTire product for installation only by their authorized (read trained) dealers, and for good reason. The unit comes programmed for a front tire pressure of 36 psi and a rear pressure of 42 psi. Should the owner be operating with different cold inflation pressures, the unit will need reprogramming. This involves the use of a programming display unit available only to dealers. Actually, the programming unit is nothing more than the full-function remote display device used in automotive applications, but it permits adjustments that if tinkered with by the uninformed user would result in system malfunction. We've been advised that warranty will not be honored on units installed by other than SmarTire authorized dealers. Speaking of dealer installation, you'll need a shop capable of dismounting the tires to install the sensors and band clamps as shown in Photo C. Extreme care must be used so as not to damage the sending units with tire mounting tools. Our initial concern with the sensors and clamps affecting tire balance proved unwarranted. One tire needed no adjustment to its existing balance weights, while the other tire required moving one of the existing weights about an inch. The sensors/transmitters shouldn't need fiddling with at least until the next tire change, as their lithium batteries are said to last about five years at

an average yearly mileage of 30,000 miles. If and when the batteries go dead, the sensors must be replaced. Current price for the sensors is \$89.95; National Cycle predicts the price will come down as more units enter service.

The wiring is not plug & play like most Wing-specific products. But then, the SmarTire is not vehicle specific. As supplied, the LEDs would end up hardwired to the plug that connects them to the receiver, and the connection points for power and ground are left up to the installer. We fabricated a custom harness for the GL1500 (Photo D.) that takes power and ground from the unused front fairing marker light plug (the GL1800 has a similar arrangement) while providing quick disconnects for the LEDs. Without that last feature, the LEDs would need to be mounted on (or in) some bike part that never needs removal for normal service operations. We hope that authorized installers will take the time and care, as we did, to insure a durable, reliable wiring system for this product.

After installation, the receiver was recalibrated for a front tire cold inflation pressure of 40 psi, then the bike was ridden onto the street. Almost immediately, the pressure deviation alert triggered. Thinking about it, we realized the tires' pressure had last been adjusted three weeks ago (the last time the bike had been ridden) at an outside air temperature of 105 degrees. The temperature at test time was 85 degrees. Could the tires actually be 5 psi low? Yes, they were! This thing didn't even let us get 100 yards from the garage before telling us, "Hey, Dummy! Check your tires!" Before restoring the tires to correct pressure, one tire was relieved of another five psi, whereupon the low pressure alert began flashing.

Best Thing Since Sliced Bread?

Okay, we take issue with the wheezy beeper and the one-size-fits-all wiring, but what's the bottom line? We tested the unit for two weeks and 5,000 miles and found it comforting to know our tires were up to snuff while underway. It's a peace-of-mind thing as well as a safety thing. Not that we initially trusted the product. After riding for several days in temperatures ranging between 60 and 105 degrees, we never once saw the deviation alert or low pressure warning illuminate. A pressure check on the fourth morning of our trip (in Birmingham, Alabama) showed the front tire at 40 psi and the rear at 42, exactly where I'd set them before leaving Phoenix. Though I continued to check the tires each morning for puncturing objects, I no longer felt the need to check pressure daily.

Many riders who want optimum tread life and handling from their tires may not be satisfied with the first alert coming at a deviation of five psi. For them, the sensitivity can be increased, though we don't advise doing so. This product isn't designed to replace vigilant pressure checks and tread inspections, and those who perform regular checks will catch deviations of less than five pounds. They'll also catch objects

that have punctured the tire but haven't yet resulted in pressure loss. It sometimes takes several hundred miles of mashing the object around in the tread before leakage occurs, and I'd rather find such punctures in my garage than view the low pressure warning light (10 psi or more pressure loss) on some lonely stretch of highway on Sunday afternoon. Considering the fact that many riders never check their tires' pressure at all, the five-psi deviation alert should prove to be a real lifesaver. There's one feature available on the automotive version of the SmarTire that we'd like to see on the motorcycle unit. That feature alerts the operator to dangerously high tire temperature. Even with correct inflation pressure, severe overloading can result in heat buildup sufficient to cause catastrophic tire failure. Are you aware whether or not you regularly exceed your tires' rated load capacity? Think about it. I personally feel the SmarTire is a lifesaving device that should be made optionally available, at a minimum, on every luxury touring motorcycle. For the small price increase caused by factory installation of the system, I see no reason for manufacturers not to incorporate it as standard equipment, especially on a bike such as a Gold Wing, Harley Ultra, BMW K1200LT, etc. This is a well-tested piece of automotive equipment, not a toy or gadget. Many riders spend thousands of dollars on accessory items that do little more than reflect sunlight, jokingly referring to such items as "safety chrome." At a suggested retail price of \$264 plus installation, we feel the SmarTire pressure monitoring system may be a far wiser use of those accessory dollars. For more information or to find the dealer nearest you, contact ZTechnik at (866) 983-2465 or visit them on the Web at [ztechnik.com](http://ztechnik.com).

—*Stu Oltman*