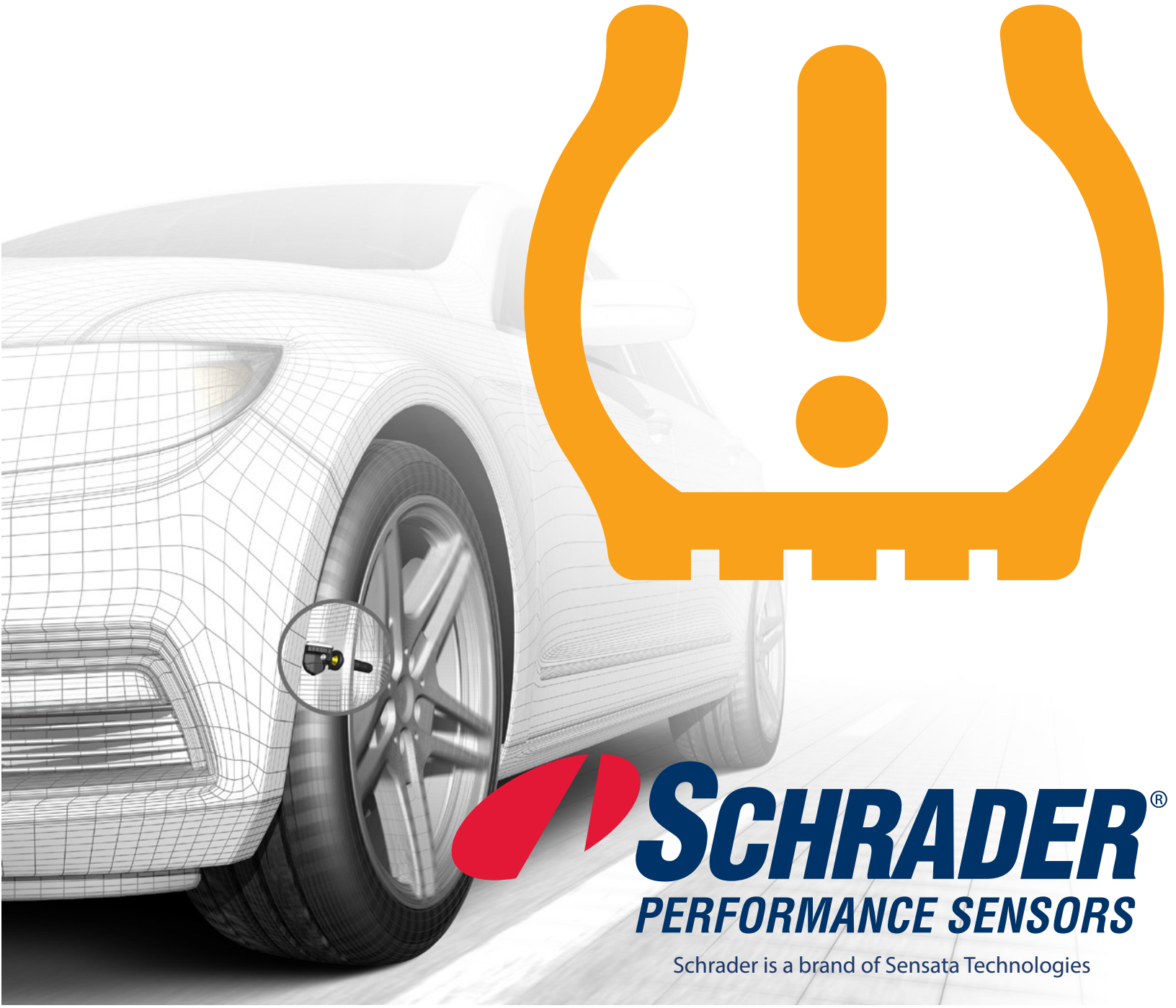
TPMS PLAYBOOK

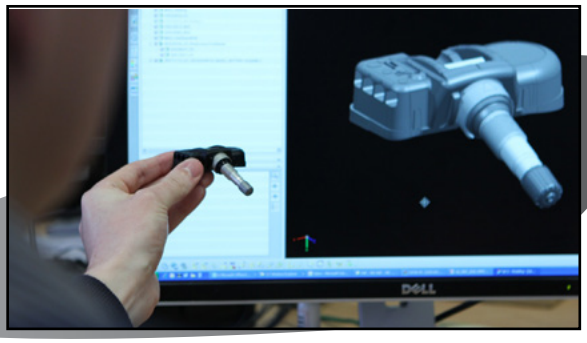
A Step-By-Step Guide from the World Leader in TPMS



SCHRADER®
PERFORMANCE SENSORS

Schrader is a brand of Sensata Technologies

Why Schrader?



For over 170 years, Schrader has been the leading global manufacturer of valve and sensing solutions for automotive and industrial applications, delivering solutions that protect and perform. Schrader is widely known as the inventor of the standard pneumatic tire valve - the same valve used on every motor vehicle in the world today. Schrader is also a pioneer in tire pressure monitoring systems (TPMS). Schrader's direct TPMS technology can be found in over 50% of global OEM vehicle platforms with more than 300 million Schrader sensors currently produced and installed.

Schrader brought its reputation of quality and innovation to the automotive aftermarket with the first universal, programmable TPMS sensor. The introduction of Schrader's patented and programmable EZ-sensor® in 2010 revolutionized TPMS for the industry, eliminating the need to inventory multiple OE replacement sensors. All of Schrader's products carry an OE quality specification, including OE replacement aftermarket sensors.

More than just a supplier, we are a TPMS PARTNER!

We are dedicated to your success in TPMS. We offer marketing programs, training, online resources, technical support and products that help businesses profit from TPMS. With this step-by-step resource, a reliable, profit-building TPMS program is only three steps away!

Step 1 - Get Equipped

Step 2 - Get Educated

Step 3 - Start Turning a Profit!

Get Equipped

Stock EZ-sensor®:

- Covers 314.9, 315 MHz and 433 MH applications
- Patented rubber snap-in design (aluminum valve replacement option)
- Adaptable technology supports additional coverage
- Meets OE quality and replicates diverse OE functionality
- Programmable with the leading TPMS tools in the market including ATEQ® and Bartec©

EZ-sensor Benefits:

- Optimize inventory levels
- Eliminate potential lost sales
- Reduce overall cost of service
- Improve inventory returns

Stock Service Packs

Service pack components are intended for a one-time use only. Schrader recommends that these critical sealing components be replaced each and every time the tire is removed from the wheel, using a genuine OEM validated Schrader TPMS Service Pack.

Galvanic Corrosion occurs when two dissimilar metals react to each other and cause a deterioration effect. Corrosion in any component prevents accurate assembly during installation.

Schrader Service Packs for EZ-sensor

Snap-in Valve Service Packs

OE quality, rubber snap-in service kits (Part #s 20008 and 20018) replace components for rubber snap-in style valve stems.

Part# 20018

Aluminum Clamp-in Valve

The aluminum clamp-in valve allows Schrader snap-in sensors to be rebuilt with an aluminum clamp-in style valve to match or upgrade an existing look.

Part# 34000

Service Pack Assortment

Schrader offers a Service Pack Assortment that contains 8 packs of 12 of the most popular vehicle-specific service packs in a handy plastic case.

Part# 20598

TPMS Tools

Proper torque for the mounting nut, valve core and attachment screw is critical for all facets of proper TPMS installation and sealing.

Schrader TPMS Hand Tools

20138
Torque screwdriver with sockets.

20140
T-10 Torque Tool
Installs Schrader snap-in valves.

20142
Universal Nut Torque Tool
Serves as a torque wrench for valve nuts.

20141
Valve Core Torque Tool

20145
T-20 Torque Tool
Installs adjustable clamp-in valves.

TPMS Diagnostic Tools

ATEQ	ATEQ	ATEQ	Bartec	Bartec	Bartec	Bartec	Bartec	Bartec	Bartec
VT-55	VT-56	VT-46	Tech 200	Tech 300SD	Tech 300Pro	Tech 400+	Tech 400SD	Tech 400Pro	Tech 500

Bartec	MAC	Matco	NAPA	OTC	Schrader	Schrader	Schrader	Snap-on	Snap-on
TPMS Pad	ET 3824	TPR 3834	92-1525	3834	21230	EZ-programmer	EZ-sensor Pad	TPMS2	TPMS3

A quality diagnostic tool can test all sensors, program new sensors, provide audit reports, assist with relearn procedures and includes OBD2 connectivity.

ATEQ

1-888-621-TPMS (8767)
www.AteqTPM.com

Bartec

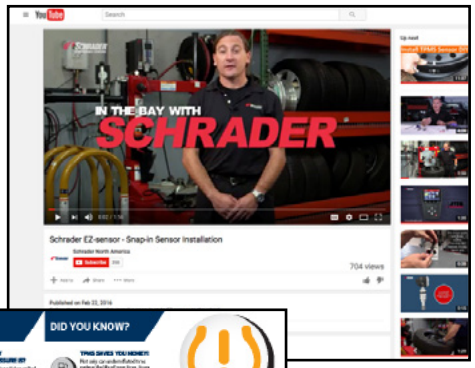
1-855-877-9732
www.BartecUSA.com

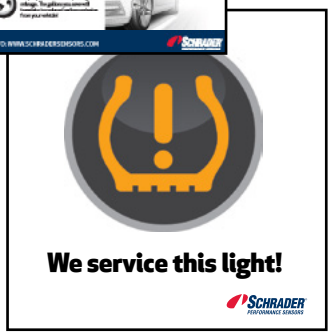
Get Educated

Get Trained

Sales and Technician Training

- Subscribe to Schrader's Social Channels
  - YouTube - www.youtube.com/SchraderInnovation
  - Facebook - www.facebook.com/SchraderPerformance
  - LinkedIn - www.linkedin.com/company/456894
- Sign up for the Schrader e-Newsletter at SchraderSensors.com
- Attend Schrader's free webinars
- Instructor-led training



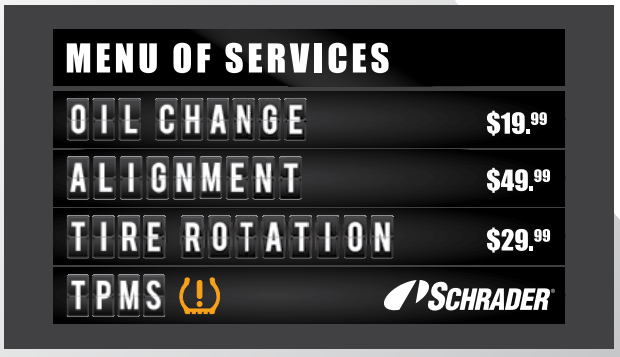


Consumer Education

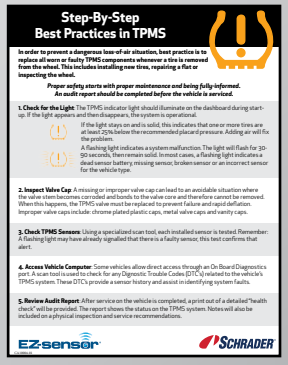
Consumer Awareness

- In-store point of sale material
- In-house graphic capabilities
- Customized web banners, brochures and more

Start Turning a Profit!



Ask us how we can help with "best practice" material!



- Incorporate a standard operating procedure in your shop
- Always "test before you touch"
- Actively communicate the benefits of a functioning TPMS system to the consumer
- Charge for relearns
- Use Schrader's EZ-sensor and the rubber snap-in design for quick turn around
- Replace the rubber snap-in valve or clamp-in sensor components every time that a tire is removed from the wheel
- Be creative! Consider including service packs with the sale of road hazard protection

Contact Us:
Aftermarket Sales - 1.800.345.0578
Tech Support - 1.800.288.1804
www.SchraderSensors.com

Schrader's TPMS Glossary of TERMS

ABS - Anti-Lock Braking System

ADJUSTABLE VALVE STEM ANGLE - Valve stem angle can vary, it is not fixed

ALM - Auto Locate Module

ANTENNA - Portion of sensor that receives the Low Frequency activation

ASK - Amplitude Shift Keying

BAND - Metal band that secures the TPMS to the rim

BANDED SENSOR - TPMS sensor that is strapped to the rim via a band cradle and CPA clip.

BELLY BAND - Portion of the valve that prevents the snap-in tubeless tire valve from being pushed back through the valve hole.

BULB - The round portion of the valve that prevents the snap-in tubeless tire valve from being pulled through the valve hole.

CHROME PLATED PLASTIC CAP - Valve cap is made from plastic and plated in chrome. This type of valve should not be used on an aluminum stem.

CLAMP-IN SENSOR - TPMS sensor identified by a large aluminum hex nut on the outside of the valve stem. Clamp-in sensors are installed by piecing together the valve stem and the sensor with a hex bolt.

CPA CLIP - Plastic clip that secures the TPMS to the cradle

DIAGNOSTIC TROUBLE CODE (DTC) - Code that signifies vehicle's specific TPMS issue

DPRS - Diagnostic Performance Requirement Specification

DRIVER INFORMATION CENTER (DIC) - Appears on display to show driver the individual pressure of each tire

DUST CAP - Valve cap that does not have a seal

ELECTRONIC CONTROL UNIT (ECU) - Device that decodes the TPMS data and then converts the data into information that can be used by the vehicle systems

FSK - Frequency Shift Keying

FULLY PROGRAMMABLE SENSOR - Blank sensor that can be programmed with the correct protocol and unique ID

GALVANIC CORROSION - Corrosion caused by two dissimilar conducting materials in contact with each other electrically and exposed to an electrolyte

GROMMET - Accommodates rim tolerances and secures axial sealing

HEX BOLT - Attaches the valve stem to the sensor

HI-LINE - Vehicle displays "Pressure by Location"

INCH POUNDS - Unit of measure in relationship to torque

INITIATORS - Triggering device to activate the sensor

LF - Low Frequency

LIKE FOR LIKE - Term used by Schrader to describe their direct TPMS replacement program

LOW-LINE - Vehicle displays only the MIL (Malfunction Indicator Lamp)

MALFUNCTION INDICATOR LAMP (MIL) - Light that appears on the dash to warn that the TPMS is not operational and therefore, the tire pressure is not being monitored

MMY - Make, Model, Year

MOUNTING SCREW - Used to attach the valve to the enclosure

MULTI-PROTOCOL SENSOR - Sensors that are loaded with multiple protocols

NATIONAL HIGHWAYS AND TRANSPORTATION SAFETY AGENCY (NHTSA) - Body responsible for defining a TPMS warning strategy in response to the TREAD Act

NEWTON METERS - Unit of measure in relationship to torque

OE - Original Equipment

OEM - Original Equipment Manufacturer

OES - Original Equipment Supplier

ON BOARD DIAGNOSTIC CONNECTION (OBD II) - On Board Diagnostic Connection

ON OFF KEY (OOK) - Modulation for Radio Frequency

ONE PIECE SENSOR - When the valve stem or enclosure is damaged, the entire sensor must be replaced.

OVERTORQUING - Occurs when hex bolt is too tight

"PING" - "Pinging" a sensor is when a tool is used to wake up the sensor. When a sensor is "pinged" it starts to transmit.

PLACARD PRESSURE - OEM specified tired pressure

POTTING - The protective material that encapsulates the electronic portion of the sensor

PRESSURE BY LOCATION - Vehicle will display each tire's pressure on the dash.

PROTOCOL - The specific configuration of a signal that a TPMS sensor transmits to a receiver

PWM - Pulse-Width Modulation

RF - Radio Frequency

RCA - Root Cause Analysis

RCDLR - Remote Control Door Lock Receiver

RECEIVER - Component on vehicle that receives the TPMS transmissions

RELEARN PROCEDURE - Process by which the TPMS sensors on a vehicle are learned to the vehicle's ECU or TCU. There are three types of relearn procedures,

1. Auto-Relearn - Sensors are learned automatically to the vehicle's ECU, usually by driving the vehicle at a specified speed continuously for a specified amount of time.
2. Stationary Relearn - Sensors are relearned to the vehicle via RF signal that is broadcasted from each sensor after the vehicle has been put into relearn mode.
3. OBD Relearn - Sensors are read by an OBD capable TPMS scan tool and then relearned to the vehicle by connecting directly to the ECU via the OBD connector.

Depending on which type of relearn is required the use of a TPMS scan tool or program tool may be necessary.

RSSI - Received Signal Strength Indication

SCAN TOOL - Tool used to scan, read, activate and diagnose TPMS sensors. Certain tools are also capable of connecting to the ECU via the OBD connector to read sensor IDs, write new sensor IDs and diagnose DTCs.

SDD - Standard Diagnostic Data

SEALING VALVE CAP - Valve cap that has a seal to prevent air loss

SEL - Schrader Electronics Limited

SENSOR ID - The identification number assigned to a TPMS sensor that is unique to that sensor only. The ID is stored in the vehicle's ECU and identifies a specific sensor at its specific wheel location.

SERVICE PACK - Small package containing the proper hex nut and grommet (sometimes also includes valve core and self-sealing valve cap) to properly install sensor

SHEAR COLLAR - Limits the torque of the valve assembly to prevent damage to the plastic housing caused by over tightening

SITS - Schrader Issue Tracking System

SNAP-IN SENSOR - TPMS sensor with a rubber valve stem. The snap-in sensor valve is installed to the wheel by being pulled through rim hole.

STEEL CAP - Valve cap is made of steel and can damage the aluminum valve stem because of dissimilar metals

TBYT - Test Before You Touch

TPMS Control Unit (TCU) - Component that receives and interprets the signals broadcasted by TPMS sensors and then relays the signal to the ECU

TORQUE SETTING - Amount of tightened pressure used when screwing in hex bolt

TORQUE TOOL - Tool used to achieve the correct amount of pressure when attaching valve stem to sensor with a hex bolt

TWO PIECE SENSOR - Valve stem or enclosure and sensor are separate and can be replaced interchangeably

TPM - Tire Pressure Monitor

TPMS - Tire Pressure Monitoring System

TREAD - Transportation Recall Enhancement, Accountability and Documentation - Safety Act in USA

TRANSPONDER / INITIATOR - A component on some TPMS systems that is normally located inside the wheel well that broadcasts an LF signal to activate the sensor. Transponders identify specific sensors to a tire location.

TRIGGER TOOL - Tool that is used to activate TPMS sensors

UHF - Ultra High Frequency

UNIVERSAL CRADLE - Aftermarket solution that can be banded to a rim to secure a clamp-in sensor or a banded sensor

VALVE CORE - Spring loaded valve installed in the valve stem that lets air in and keeps the valve stem from leaking out. The valve core threads into the tire valve stem. To avoid galvanic corrosion in aluminum TPMS valve stems, a special nickel-plated valve core is required.

VALVE STEM - Metal/ rubber tube that provides a means for air passage in and out of a tire. The valve stem is internally threaded to accommodate the installation of a valve core and externally threaded to accommodate the installation of a sealing cap. For Direct TPMS equipped vehicles where the sensor is mounted in the rim hole, the valve stem is a component of the TPMS sensor.

VIO - Vehicles In Operation

WAL - Wireless Auto Locate

WASHER - Shapes the grommet to help seal the valve hole

WCM - Wireless Control Module

WHEEL UNIT (WU) - The device that is mounted in the wheel assembly that senses the tire pressure and then sends the information via RF to the vehicle receiver