

## TPMS – RR Sport + Disco

Because of the requirement for different pressure targets and thresholds for the front and rear tires, the TPMS module can identify the location of the tires on the vehicle, and assign a received tire pressure sensor identification to a specific position on the vehicle (i.e. FL (front left), FR (front right), RL (rear left) or RR (rear right)).

Tire location is performed automatically by the module using an auto-location function. This function requires no manual intervention by the driver. The TPMS module can automatically learn the position of tires on the vehicle if the tire pressure sensors or their positions are changed on the vehicle.

The tire learn and location process is ready to commence when the vehicle has been stationary or travelling at less than 12 mph (20 km/h) for 15 minutes. This is known as 'parking mode'. The learn/locate process requires the vehicle to be driven at speeds of more than 12 mph (20 km/h) for 15 minutes. If the vehicle speed reduces to below 12 mph (20 km/h), the learn process timer is suspended until the vehicle speed increases to more than 12 mph (20 km/h), after which time the timer is resumed. If the vehicle speed remains below 12 mph (20 km/h) for more than 15 minutes, the timer is set to zero and the process starts again.

The TPMS module can automatically detect, under all operating conditions, the following:

- \* one or more tire pressure sensors have been replaced
- \* one or more tire pressure sensor identifications are missing
- \* one or more 'alien' identifications are being received, i.e. the module can reject identifications from tire pressure sensors that do not belong to the vehicle
- \* the spare tire and one of the tires in use on the vehicle have exchanged position on the vehicle.

If the tire pressure sensors fitted to the running wheels (not the spare) are changed, the module can learn the new sensor identifications automatically. The learn function requires no manual intervention by the driver.

If a new sensor is fitted to the spare tire, it must have its identification code programmed into the TPMS module diagnostically using a Land Rover approved diagnostic system or used on the vehicle as a 'running' wheel and the vehicle driven for 15 minutes at more than 12.5 mph (20 km/h).

## Spare Tire Identification

Depending on the vehicle specification, the spare tire may or may not be fitted with a tire pressure sensor.

### NOTE:

Tire pressure sensors cannot be fitted to space saver spare wheels.

If the spare tire is fitted with a tire pressure sensor, the TPMS module can detect it, determine that it is the spare tire and monitor its pressure and issue warnings to the driver accordingly. If the TPMS module expects the spare tire to be fitted with a tire pressure sensor and it does not, the module will not show a fault to the driver, however a fault code will be stored in the TPMS module.

If the spare tire is being monitored and the driver replaces a flat 'running' tire with the spare tire, the module will not continually warn the driver that the original flat tire (now in the spare position) is flat. This prevents distraction of the driver by constant pressure warnings being issued. The driver is reminded by a message displayed for 20 seconds at each ignition on cycle that the spare tire is flat.

## System Operation

Each time the vehicle is driven, the TPMS module transmits a Low Frequency (LF) (125 KHz) signal to each initiator in turn. This is received by the tire pressure sensor which transmits a Radio Frequency (RF) (315 or 433 MHz depending on market) signal to the module. This signal contains coded data which corresponds to sensor identification, air pressure, air temperature and acceleration data.

The system enters 'parking mode' after the vehicle speed has been less than 12.5 mph (20 km/h) for 12 minutes. In parking mode the tire pressure sensors transmit a coded signal to the module once every 13 hours. If the tire pressure decreases by more than 1 lbf/in<sup>2</sup> (0.6 bar) the sensor will transmit more often if pressure is being lost.

The spare tire sensor transmits a signal every 13 hours in the same manner as the road wheels when in parking mode. If the tire pressure decreases by more than 1 lbf/in<sup>2</sup> (0.6 bar) the sensor will transmit more often if pressure is being lost.

As each wheel responds to the LF signal from the TPMS module, it is assigned a position on the vehicle and is monitored for the remainder of that drive cycle in that position.

When the vehicle has been parked for more than 15 minutes and then driven at a speed of more than 12.5 mph (20 km/h), the initiators fire in turn for 6 seconds on vehicles fitted with 433 MHz systems or for 18 seconds on vehicles fitted with 315 MHz systems in the following order:

- \* Front left
- \* 6 second pause (for the TPMS module to detect a response from the tire pressure sensor)
- \* Front right
- \* 6 second pause
- \* Rear right
- \* 6 second pause
- \* Rear left
- \* 6 second pause.

Each tire pressure sensor responds in turn so the module can establish the sensor positions at the start of the drive cycle. This process is repeated up to three times but less if the sensor positions are already known in the module. The process is known as 'Auto Location' and takes 3 to 4 minutes on vehicles fitted with 433 MHz systems and 7 to 8 minutes on vehicles fitted with 315 MHz systems to complete. During this period the tire sensors transmit at regular intervals, once every 5 seconds on vehicles fitted with 433 MHz systems and once every 15 seconds on vehicles fitted with 315 MHz systems. For the remainder of the drive cycle the tire sensors transmit once every 60 seconds or if a change in tire pressure is sensed until the vehicle stops and the system returns to parking mode.

Once the wheel position is established, the initiators stop firing a signal and do not fire again until the vehicle has been parked for more than 15 minutes. The signal transmissions from each wheel sensor continue at 1 minute intervals whilst the vehicle is being driven. This transmission is to monitor the tire pressure.

At 25% deflation the amber warning indicator in the instrument cluster is illuminated and an appropriate message displayed in the message centre.