February 12, 2010

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Certification for Toyota MY11 FSK 315MHz $20^{o}/40^{o}$ Fixed Angle Transmitters

Model #:	226196 (20 degree)
	226204 (40 degree)
FCC ID:	GQ4-45T
Canada IC:	1470A-26T

PRINCIPLES OF CIRCUIT OPERATION

The sensor incorporates an ASIC to measure the parameters within the tire. The ASIC outputs the measured data in digital pulses. The digital data gates on and off a power amplifier which couples the RF carrier to the antenna. The transmitted signal uses Frequency Shift Keying (FSK). The carrier frequency of the sensor is 315MHz typically. The worst case frequency shift of the carrier is 314.77MHz for the low frequency and 315.15MHz for the high frequency shift. The receiver bandwidth must be wide enough to pass the transmitter worst case frequency shifts.

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RE: Certification for Toyota MY11 FSK 315MHz $20^{o}/40^{o}$ Fixed Angle Transmitters
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GENERAL DESCRIPTION

This transmitter is a transmitter device with tire valve, which is mounted in the valve hole of the wheel rim and transmits the pressure and temperature inside the tire, the battery voltage flag of the transmitter, and the tire identification code (ID) at normal and abnormal condition with the radio wave (RF) that conforms to the used area. Also this device has a countermeasure function such as the random delay of transmission time so that the RF signal from each tire will not interfere such as due to the simultaneous transmission. The transmitter device also has a Low Frequency (LF) receiver. This receiver supports Low Frequency (LF) magnetic field communications allowing the changing of measurement/monitoring states of the transmitter by commands sent via LF trigger tool, special hand held tool (LF transmitter). The RF signal operates at 315MHz and uses FSK Manchester modulation.

Description of Operations

Mode of Operation for 226196 and 226204	Explanation	Frequency of Transmission
Storage Mode	No transmission. Measures temperature & pressure	4 Packets when activation occurs with TPM diagnostic tool
Normal Mode	Measures temperature and pressure and accel. Transmits periodically. Enters this mode from storage when pressure goes above threshold.	• 4 Packets every 180±12 seconds • 4 Packets when activation occurs with TPM diagnostic tool
Alert Mode	Transmits when: a) significant pressure delta detected b) high temperature is detected	8 Packets every 4 seconds for 1 minute