Technical Description
and
User's Manual
of the
Volvo Tag ID with Motion Sensor

Model: HUF8432MS

Volvo SPA Tag ID with Motion Sensor
HUF8432MS

Contents

1 General operation of the key

The Volvo Tag ID has a HF transmitter and a motion sensor implemented. It only works based on a bi-directional communication when Keyless Entry & Start functionality is triggering via a LF Wake Up command issued by the vehicles antennas and the Tag ID responds in HF. The Volvo Tag ID has no buttons and only is available at vehicles with Keyless Entry & Start functionality.

With Keyless Entry or Start both Volvo Tag ID reacts on a LF Wake Up-Signal from the vehicle (initiated after activating of the sensor of the vehicle, i.e. at sensor at the door handle or the Push Start Button, which recognizes the wish to lock/ unlock the vehicle or to open the trunk or to start the vehicle) from the vehicle and after that the Volvo SPA Tag ID responds in HF on the RKE frequency for autorization purposes. When the authorization is successful the vehicle performs the desired action.

In general the following functions are provided:
- Lock the car (with Keyless Entry functionality)
- Unlock the car (with Keyless Entry functionality)
- Open/Close the trunk of the car (with Keyless Entry functionality)
- Engine Start of the vehicle (with Keyless Start functionality)

When the battery power is too low, the Volvo SPA Tag ID can start the vehilce with the emergency back up function via the LF-Transponder interface @134,2 kHz (by placing the keys near the transponder coil located near the steering column inside the vehicle) which operates at a very short range (< 10cm).

Relay-Station-Attack (RSA) countermeasure: when the Tag ID has been stationary without movement for a defined time (timer configurable), the motion sensor will deactivate the LF front end in the Tag ID and will not react to Keyless Entry or Start LF triggers from the vehicle. Only when motion has been detected by the implemented motion sensor, the LF front end of the Tag ID will become active for a defined time.

2 Operating frequencies of HF transmission

2.1 2-channel

Two channels are implemented on the 434MHz variant (excl. South Korean variant) and on the 315MHz variant. The following table shows the carrier frequency of the individual channels for each frequency band.

Frequency Variant	Frequencies	
	Channel 1 (CH1)	Channel 2 (CH2)
315MHz	314.37MHz	314.97MHz
434MHz (excl. S. Korea)	433.66MHz	434.18MHz
434MHz S. Korea	433.92MHz	---

3 Technical data

3.1 Electrical characteristics Volvo SPA Tag ID:

Power supply:	Battery (Panasonic CR2032/F4N, coin cell with battery contacts)	
Type of Battery:	Lithium	
Voltage range:	2,3V … 3,3V	
Temperature range:	Keyless Entry/Start	-20°C … +65°C
	Emergency start:	-40°C … +85°C

3.2 General HF specification

2-channel operation:

f_{op1} = 314.37 MHz / 314.97 MHz

f_{op2} = 433.66 MHz / 434.18 MHz

1-channel operation (narrow band)

$f_{op\ (S.\ Korea)}$ = 433.92 MHz

Type of modulation: FSK, deviation ±15.625 kHz

Type of HF antenna: PCB Loop antenna

3.3 Disposal

An old battery must be lodged at a collection point or the service.

4 Declaration of Conformity, product Label

4.1 Radio equipment authorization to FCC in USA

Volvo Tag ID FCC ID: YGOHUF8432MS

The transmitter will be supplied as an original equipment device to the car manufacturer.

According to 47 CFR 15.19 (labeling requirements) the car manufacturer will print the following text in the appropriate User's Manual of the car:

> This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
> (1) This device may not cause harmful interference, and
> (2) this device must accept any interference received, including interference that may cause undesired operation.
>
> Usually this is followed by the following FCC caution:
> Any changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

4.2 Radio equipment authorization to RSS-210 in Canada

Volvo Tag ID: 4008C-HUF8432MS

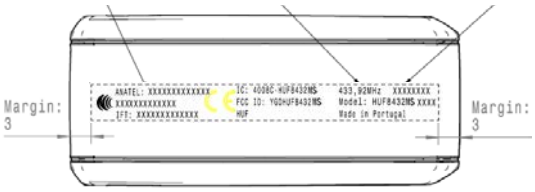
The transmitter will be supplied as an original equipment device to the car manufacturer.

According to RSS-210 (labeling requirements) the car manufacturer will print the following text in the appropriate User's Manual of the car:

> This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:
> (1) This device may not cause harmful interference, and
> (2) this device must accept any interference received, including interference that may cause undesired operation.
>
> Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:
> (1) l'appareil ne doit pas produire de brouillage, et
> (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, mêmesi le brouillage est susceptible d'en compromettre le fonctionnement.
>
> Usually this is followed by the following RSS caution:
> Any changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

4.3 Location of product label

On the Volvo SPA Tag ID the product label with FCC ID and IC certification number can be found lasermarked on the housing (at opposite side from "VOLVO" lettering housing).



The Label for Argentina will be placed in the Users Manual of the Vehicle in the following way:

CNC COMISIÓN NACIONAL DE COMUNICACIONES

CNC ID: X-XXXXX