

RENAULT LAGUNA MKII

TYRE PRESSURE MONITORING SYSTEM

GENERAL INFORMATION AND COMMON PROBLEMS

INTRODUCTION

This technical bulletin deals with a common problem encountered on Renault Laguna II vehicles by the helpline staff over the last few months. This problem has been re-occurring during this time, and the following topic details the reasons and where possible the solutions to the problem.

RENUALT LAGUNA II – TYRE PRESSURE MONITORING SYSTEM

Fault

The tyre pressure monitoring system displays errors after replacing or rotating tyres on vehicle.

Cause

The Renault Laguna II models in question are all fitted with the Renault tyre pressure monitoring system, fitted either as standard or as an option on the vehicle. The tyre pressure monitoring system incorporates tyre pressure sensors located as part of the tyre pressure valve assembly.

The tyre pressure sensors are coded to the tyre pressure monitoring system for location on each wheel on the vehicle, and if a wheel is swapped around on the vehicle or the tyre pressure sensors are replaced, the tyre pressure monitoring system detects an incorrect signal from the swapped wheels and displays errors on the instrument cluster.

Vehicles

Model	Year	Engine code
Renault Laguna II	2001 onwards	All models fitted with the tyre pressure monitoring system.

System operation and rectification of faults

The Renault tyre pressure monitoring system consists of the following 4 components:

A tyre pressure sensor built into the tyre pressure valves (one per tyre) to monitor the pressure of each tyre on vehicle (not fitted to the spare wheel).

A tyre pressure monitor control module (UCH) which is used to decode and process the signals from each of the tyre pressure sensors, and outputs the required message to the instrument cluster assembly.

A display either built into the instrument cluster or as a separate assembly on base models with tyre pressure monitoring system fitted as an option

An under body aerial (receiver) to pick up and boost signals from tyre pressure sensors.

System operation

The tyre pressure sensors are activated after about one minute of driving faster than 18 MPH (30 km/h). When the vehicle is stationary the tyre pressure sensors send out a signal to the UCH approximately once every 60 minutes on normal operation

If the pressure measured inside one or more tyres changes by more than 84 mbar (1.2psi) between two tyre pressure signals, the tyre pressure sensors will send out a signal every 10 seconds to allow the UCH control module to quickly detect if a tyre is deflating.

The UCH control module is programmed with the following warning messages:

"Over inflation when cold" = recommended tyre pressure + 700 mbar (10 psi) during eight cold starts

"Over inflation when hot" = recommended tyre pressure + 850 mbar (12 psi)

"Under inflation when cold" = recommended tyre pressure – 400 mbar (6psi) during eight cold starts

"Major under inflation" = recommended tyre pressure – 600 mbar (9psi) mbar

"Imbalance" = pressure difference between the left hand and right hand wheels on the same axle exceeding 500 mbar (7 psi)

"Unsuitable pressure for speed" = at least one wheels pressure when cold is less than the recommended high speed pressure – 400 mbar (6psi) and the vehicle is driven faster than the 100 MPH (160 km/h) for at least three minutes.

Note. The tyres are considered as being "cold" after approximately 1 hour and 45 minutes after the vehicle has stopped.

Tyre pressure sensors

Each tyre pressure sensor is marked with a ring of a different colour. When a tyre pressure valve or tyre is being replaced, the colour of the sensor should be noted and fitted to the correct side of the vehicle as follows:

Tyre pressure sensor coloured green = Front left location

Tyre pressure sensor coloured yellow = Front right location

Tyre pressure sensor coloured red = Rear left location

Tyre pressure sensor coloured black = Rear right location

Note. If the tyre pressure sensor is damaged or fitted to the incorrect side of the vehicle, the UCH control module will detect the fault and either require the correct tyre pressure sensor to be fitted to the correct wheel on the vehicle or the UCH control module can be reprogrammed using suitable page (where possible). In addition, on the inside frame of the driver's door, there is a decal detailing the colour of each ring and its location for each wheel.

The UCH control module is also programmed for two sets of tyres – summer / winter tyres for regions of Europe where it is common practise to have a separate set of tyres for harsh winter conditions. For these applications, the first time the tyres are changed between summer / winter, the UCH control module must be programmed by using suitable diagnostic equipment to enter that two sets of tyres (summer/winter) are in use for the vehicle.

Then, when the tyres are changed, the UCH control module automatically selects the proper set (summer/winter) based on the coded signals produced by the tyre pressure sensors in each wheel for the set.

UCH CONTROL MODULE – CONFIGURATION & PROGRAMMING

The UCH control module has been designed with 4 configurations which can be adjusted / programmed using suitable diagnostic equipment connected to the vehicles 16 pin EOBD diagnostic plug (usually located under the front ashtray in the centre console on the vehicle).

Tyre pressure sensor configuration

Each tyre pressure sensor is matched to the correct wheel during production and the UCH control module is programmed with the identification codes for each tyre pressure sensor. This is done to ensure that the correct tyre (wheel) can be identified when a pressure drop is detected by the pressure sensor.

It is not recommended to change the wheels around on the vehicle without reprogramming the UCH control module using suitable diagnostic equipment. If the wheels have been rotated, after reprogramming the UCH control module, the coloured rings on each tyre valve must be put back in position as described below:

Front left – Green, Front right – Yellow, Rear left – Red, Rear right – Black

If the driver wants the wheels to be swapped over, there are two possible methods.

Method 1 Remove the tyre pressure sensors from each swapped wheel and replace the tyre pressure sensors in their original position on the vehicle.

Method 2 using suitable diagnostic equipment program the UCH control module with the new tyre pressure sensor locations (remembering to move the coloured rings so that they are in the correct position as detailed above).

Programming new tyre pressure sensor to UCH control module

Each tyre pressure sensor transmits a message which includes a unique sensor identity code, tyre pressure measurement and status condition (stationary / driving). If a new tyre pressure sensor is fitted to the vehicle, the tyre pressure sensor identity code must be programmed into the UCH control module, before the UCH can recognise the new tyre pressure sensor.

There are two methods to find out the tyre pressure sensor identity codes.

Method 1 if the tyre pressure sensor is new: the new sensor comes with a two part label, one part of which is detachable. The tyre pressure sensor code is written on both sections. The detachable section can be kept by the driver as a reminder of the code once the tyre pressure sensor has been fitted (it is advisable to temporarily stick the label on the wheel containing the sensor).

Method 2 if the tyre pressure sensor has already been mounted on the wheel and no label can be seen: In this case either the tyre can be removed from the wheel and the tyre pressure sensor identity number can be read directly of the body of the tyre pressure sensor, or the tyre pressure sensor identity codes can be obtained by using suitable diagnostic equipment.

Note. It is difficult to read the tyre pressure sensor identity code using diagnostic equipment due to the fact that the tyre pressure sensor only transmits a signal once every hour when the vehicle is stationary. In addition, if more than one new tyre pressure sensor is fitted to the vehicle, it is not possible for the UCH control module to determine which

tyre pressure sensor is transmitting the signal.

In this case, either turn the wheel at a speed above 12 MPH (20 km/h) so that the tyre pressure sensor transmits its signal more frequently for the UCH control module to detect (with only one new tyre pressure sensor fitted) or force the sensor to transmit its signal by allowing some air to escape (drop the tyre pressure by at least 1 bar (15 psi)).

Manual method of programming tyre pressure sensor identity code into UCH control module

Using suitable diagnostic equipment, connect to the 16 pink EOBD diagnostic plug (usually located under the front ashtray in the centre console on the vehicle) and select "tyre pressure monitoring system" in the diagnostic equipment menu.

Then, in the diagnostic equipment menu, select "manual tyre pressure sensor code programming". Enter the applicable code for the tyre pressure sensor and then select which wheel the new tyre pressure sensor is located in. The new tyre pressure sensor identity code should then be programmed into the UCH control module.

Note. The actual menu and selection of the tyre pressure sensor identity code and selection of wheel location will vary between diagnostic equipment. Always follow the instructions supplied with the diagnostic equipment.

Automatic method of programming tyre pressure sensor identity code into UCH control module

If the new tyre pressure sensor identity code is not known, connect suitable diagnostic equipment to the 16 pin EOBD diagnostic plug (usually located under the front ashtray in the centre console on the vehicle) and select "tyre pressure monitoring system" in the diagnostic equipment menu.

Then, in the diagnostic equipment menu, select "automatic tyre pressure sensor code programming", and wait for the code to be transmitted from the new tyre pressure sensor.

Note. The tyre pressure sensor transmits a signal to the UCH control module, which includes its identity code, its pressure reading and its status. When the vehicle is moving, the tyre pressure sensor transmits this information every minute if there is no leak, and every 10 seconds if a leak (pressure drop) is detected.

When the vehicle is stationary, the tyre pressure sensors transmit this information once every hour if there is no leak and every 15 minutes if a leak (pressure drop) is detected.

To manually send the tyre pressure sensor identity code to the UCH control module (without having to wait one hour), allow some air to escape (reduce the tyre pressure by at least 1 bar to change the status of the tyre pressure sensor). This can be done with the vehicle stationary and after approximately 15 minutes (or drive the vehicle in excess of 12 MPH and after approximately 1 minute) the new tyre pressure sensor identity code should be transmitted to the UCH control module and displayed on the diagnostic equipment.

Swapping wheels

To swap wheels on the vehicle and prevent warning messages being displayed in the instrument cluster requires suitable diagnostic equipment to be connected to the tyre pressure monitoring system to program the UCH control module to accept the tyre pressure sensor identity codes for each new position on the vehicle.

Follow the screen menus for the applicable diagnostic equipment, which will allow the user to select the location of the wheel to be swapped and then to select the new location for the wheel on the vehicle. In this way the UCH control module will identify that the tyre pressure sensor identity code for each applicable wheel has been moved to a different location on the vehicle.

Note. After reprogramming the UCH control module it is recommended to remove the coloured rings on the tyre pressure sensor valve assembly and refit to its correct locations on the vehicle as detailed below:

Front left – Green, Front right – Yellow, Rear left – Red, Rear right – Black

Wheel set selection

To select the wheel set for the vehicle (summer / winter) and prevent warning messages being displayed In the

instrument cluster when changing from summer to winter tyre sets requires suitable diagnostic equipment to be connected to the tyre pressure monitoring system to program a UCH control module to automatically accept that the set of tyres has been changed.

When the new set of tyres is fitted to the vehicle (either summer or winter set), follow the screen menus for the applicable diagnostic equipment that will allow the user to select the "wheel set" selection menu. Then the menu should provide the option to select either "summer" or "winter" for the new set of tyres for the vehicle.

Select the applicable option and the new set of tyres with its set of tyre pressure sensor identity codes will be programmed into the UCH control module. Then, in future when the tyre sets are swapped from summer to winter and back again the UCH control module will switch between the summer and winter sets automatically.

Recommended pressure readings

The tyre pressure reading parameter settings allow the user to select the correct pressure values for both the front and rear wheels for both low speed and high speed driving to adjust the tyre pressure settings requires suitable diagnostic equipment to be connected to the tyre pressure monitoring system to reprogram the UCH control module.

Selecting the tyre pressure parameter setting in the diagnostic equipment allows the user to change the front wheel tyre pressure and rear wheel tyre pressure tolerances for both low speed and high speed driving. I.e. motorway driving in comparison to lower pressures for low speed driving i.e. town driving.

The differences between high speed and low speed tyre pressure differences can be as much as 0.3 bar for both the front wheels and rear wheels. It is recommended to always refer to vehicle handbook (if available) or vehicles workshop manual for correct tyre pressures to be programmed into the UCH control module.

Note. In addition, on Renault Laguna's MKII's up to January 2002, it has been noted that the pressure alarm tolerances initially programmed into the UCH control module were too tight. This resulted in false alarms being recorded by the tyre pressure monitoring system. Renault designed an additional configuration for the UCH control module to modify / raise the pressure warning system threshold to prevent false alarms.

If this is available on the diagnostic equipment, an additional item on the menu should show "activation threshold modification" when this option is selected, the UCH control module will reset to a slightly higher tolerance for pressure drop readings, and therefore prevents false warning messages being displayed in the instrument cluster.

UCH configuration option

If the UCH control module has been replaced on the vehicle, the UCH control module may require programming to accept that the vehicle is fitted with a tyre pressure monitoring system.

Note. It has come to our attention that there may be two types of tyre pressure monitoring systems fitted to the Renault Laguna vehicles. There may be a more basic version of the tyre pressure monitoring system available which just notifies of a pressure drop in either the front or rear axles wheels, and does not provide actual pressure values to the UCH control module for each wheel tyre pressure.

Therefore, when a new UCH control module is purchased, it requires reprogramming. This involves connecting suitable diagnostic equipment to the tyre pressure monitoring system to program the UCH control module. If available on the diagnostic equipment, a menu will allow the user to select "UCH configuration" menu. On selecting this option, the menu will usually allow the user to select one of two options for "tyre pressure monitor system fitted – yes/no"

If this option is not available on the diagnostic equipment, and the new UCH control module does not operate correctly and the tyre pressure monitoring warning system on the instrument cluster is also not operating, this indicates that the UCH module requires programming, and the vehicle will need to either be returned to the Renault

dealer for programming or connected to a different item of diagnostic equipment that has the UCH control module configuration menu in its software.

UCH CONTROL MODULE – DIAGNOSTIC FAULT CODES

The UCH control module can detect and store diagnostic fault codes for common problems that can occur on the tyre pressure monitoring system. The diagnostic fault codes can be retrieved by using suitable diagnostic equipment. Connect to the 16 pin EOBD diagnostic plug (usually located under the front ashtray in the centre console on the vehicle) and select "read diagnostic trouble codes" in the diagnostic equipment menu.

Refer to the following table for a list of the diagnostic fault codes for the UCH control module:

Fault code	Fault code description
DF - 001	Front axle imbalance – difference in tyre pressures between both front tyres
DF - 002	Rear axle imbalance – difference in tyre pressures between both rear tyres
DF - 003	Left front tyre pressure sensor – incorrect coding or faulty tyre pressure sensor
DF - 004	Right front tyre pressure sensor – incorrect coding or faulty tyre pressure sensor
DF – 005	Right rear tyre pressure sensor – incorrect coding or faulty tyre pressure sensor
DF – 006	Left rear tyre pressure sensor – incorrect coding or faulty tyre pressure sensor
DF – 007	Under body aerial (receiver) – wiring or aerial fault
DF – 008	Summer set tyre pressure sensor valve code fault – reprogram for summer set
DF – 009	Winter set tyre pressure sensor valve code fault – reprogram for winter set
DF – 011	No vehicle speed information – from ABS / Engine management systems
DF – 013	UCH control module internal fault

Note. Each fault code can be displayed on the diagnostic equipment as being "present" or "stored".

"Present" diagnostic fault codes are for faults that are still present on the vehicle at the time of using the diagnostic equipment. "Stored" diagnostic faults are for faults that are not on the vehicle at this time but have been a problem in

the past.

"Stored" diagnostic fault codes can be erased out of the UCH control module using diagnostic equipment but "present" diagnostic fault codes cannot be erased until the fault has been repaired on the vehicle.

In addition to retrieving and clearing the diagnostic fault codes, some items of diagnostic equipment may also be able to retrieve component parameters and operate the warning display (actuator test) from the UCH control module.

Some of these parameter values that can be display include:

Tyre pressure values and status for each wheel tyre pressure sensor

Status warning for high inflation / low deflation / deflation / puncture conditions.

Status for service lamp / stop lamp conditions

Status for set of wheels (summer / winter)

Battery voltage value

UCH control module ignition ON status

Refer to the manufacturers diagnostic equipment instructions for details of component parameters and status conditions.

Using the Bosch Forcing tool to make the new sensor send its id number.

When using the Bosch forcing tool to get the tyre pressure monitoring sensor to send its signal make sure the forcing tool is put on the tyre very close to the valve.

Not on the wheel or on top of the valve.

The tool only sends a lower power signal to the sensor and signal wont go thought the metal wheel rim.

If you haven't got a forcer you can program the cars computer with the serial number of the sensor.

The new sensor should have a label on it with 9 digits on it. The Bosch KTS can be set to this number.

We have found that the first digit is a zero and this must be omitted and the 8 digits then entered.

Torque the new valve to 0,45daN.m

Precautions when changing tyres on vehicles fitted with tyre pressure monitoring systems

On vehicles fitted with tyre pressure sensors, extreme care and precautions should be taken when removing / refitting tyres to ensure that the tyre pressure sensors are not damaged. If damage occurs to any of the tyre pressure sensors, it will be necessary to fit new tyre pressure sensors and program the UCH control module (see information detailed earlier in this bulletin).

Tyre removal: tyre bead separation on the external side of the tyre

While separating the tyre bead from the wheel rim, it is advised to start with the side of the tyre opposite to the tyre pressure sensor (180 degrees from the tyre valve). Be careful that the tyre bead does not push on the tyre pressure sensor, as the bead on the external side of the tyre does not press down on the tyre pressure sensor.

Tyre removal: tyre bead separation on the internal side of the tyre

It is recognised that the tyre bead removal on the internal side of the tyre does not present a major difficulty, providing that, once again, the tyre bead on the external side of the tyre does not press down on the tyre pressure sensor.

Tyre removal: removal of external tyre bead

To remove the external tyre bead, it is recommended to place the tyre lever at approximately 15 cm from the tyre pressure sensor and remove the tyre bead finishing by the side of the tyre pressure sensor in the wheel. During the external tyre bead removal it is important to make sure that the tyre bead does not push down on to the tyre pressure sensor.

Tyre removal: removal of internal tyre bead

To remove the internal tyre bead it is recommended to place the tyre lever at approximately 15 cm from the tyre pressure sensor to remove the tyre bead finishing by the side of the tyre pressure sensor in the wheel during the internal tyre bead removal it is important to make sure that the external tyre bead does not push down on to the tyre pressure sensor.

Tyre refitting onto wheel

To assemble the tyre onto the wheel rim, the tyre beads and the wheel rim must be properly lubricated. Inset the internal tyre bead at approximately 15 cm from the tyre pressure sensor in the wheel. Assembly the tyre over the wheel rim finishing by the tyre pressure sensor. At the same time, make sure not to push on the tyre pressure sensor.

Repeat the same operation for the external tyre bead, whilst making sure no force is exerted on to the tyre pressure sensor. Re-inflate the tyre to approximately 3.5 bar and then adjust the tyre pressure according to manufacturer's data.