



**EUROPEAN SECURITY**  
**Renault Laguna smart key evaluation**  
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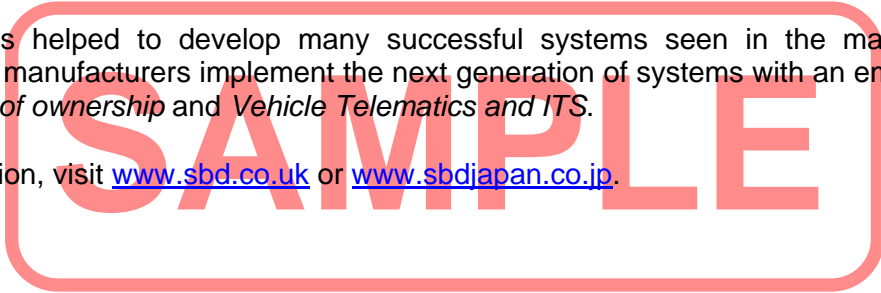
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# 1. Executive Summary

Laguna IIには、ルノーの第二世代スマートキー装置が取り付けられている。現在「ウォーク・アウェイ・ロッキング (WAL)」を出しているのは欧州ではルノーだけである。ルノーが「ハンズフリー」とよぶこの装置は、Lagunaの上位6つのグレードに、標準装備されている。2001年に発売された第1世代スマートキーは欧州では左ハンドル車のみを対象としていたが、2005年から出されているこの第二世代装置は、欧州の右ハンドル車、左ハンドル車両方を対象としている。

The Laguna II is fitted with Renault's xxxxxx xxxxxxxxxx smart key system. Renault is currently the only manufacturer to offer "Walk Away Locking" (WAL) in Europe. The system is offered as standard equipment on the top six grades of the Laguna model and is called "Hands-Free" by Renault. Renault's first generation smart key system was released in 2001 and was only available in LHD European markets. This second generation is available in both RHD & LHD Europe from 2005 onwards.

## 1.1 Conclusion

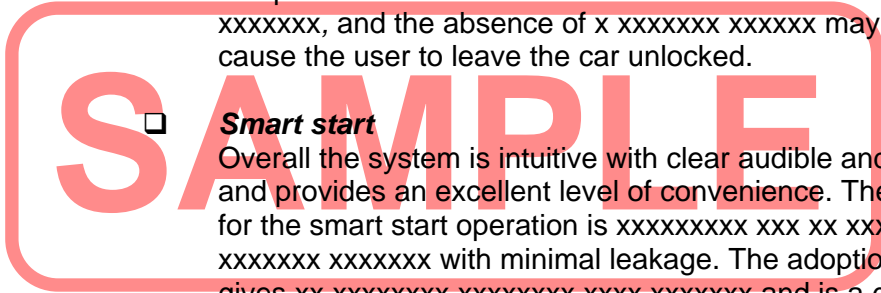
Overall the *Hands-Free* system is intuitive and provides the user with an excellent level of convenience. The system offers a good level of features and has taken a major step forward in terms of security from the original system fitted to the 1<sup>st</sup> generation Laguna II.

❑ **Smart entry**

The WAL feature provides an excellent level of convenience. The system does not require the user to make any specific action and the vehicle locks when the card key is taken out of x xxxx xxxxxx xx xxxxx. There is a good feature level but the security is slightly compromised since xxx xxxxxx xxxxxxxx xxxxxx xx xxx xxxxxx xxxxxxxx, and the absence of x xxxxxxx xxxxxx may also inadvertently cause the user to leave the car unlocked.

❑ **Smart start**

Overall the system is intuitive with clear audible and visual messages and provides an excellent level of convenience. The detection range for the smart start operation is xxxxxxxxxx xxx xx xxxx xxxxxxxx xxxxxxxx xxxxxxxx with minimal leakage. The adoption of a card reader gives xx xxxxxxxx xxxxxxxx xxxx xxxxxxxx and is a good feature. If a card is left inside the car it can xx xxxx xx xxxx xxx xxxxxx and may represent a security weakness in some circumstances.



## 1.2 Summary of performance

Figure 1 summarises the performance findings from SBD's investigation. Both *Smart entry* and *Smart start* were judged in three areas of *Convenience*, *Features* & *Security*. The evaluation is based on SBD's experience of customer expectation, competitor systems and vehicle security. In the area of security the car was assessed against Thatcham's smart key criteria and against additional items judged by SBD as potential security issues.

Figure 1. Summary of performance

Criteria	Smart entry	Smart start
Convenience	☆☆☆☆	☆☆☆☆
Features	☆☆☆	☆☆☆
Security	☆☆	☆☆☆

☆☆☆☆ Excellent    ☆☆☆ Good    ☆☆ Average    ☆ Poor

Source: SBD 2007

### 1.3 Smart Entry



The Laguna *Hands-Free entry* system fitted to the Laguna is extremely convenient and easy to operate once the user is familiar with the *Walk-Away-Locking (WAL) functionality*.

The system is supplied by Valeo and is the only system in Europe that uses *Infra-Red* sensors on the exterior handles. The xx xxxxxx have adequate performance but xx xxx xxx xxx xxxxxxxxxx xxxxxxxx xxxxxxxx xxx xxxxx xx xxxxxx xx xxxxxxxxxx compared to alternative technologies used by other manufacturers

*One significant advantage that the Renault system offers is an excellent level of xxxxxxxxxx xx xx xxxxxx xxx xx xx xxxxxx to lock the car. This is achieved by the xxx where the user is xxx xxxxxx xx xxx x xxxxxxxx xxxxxx to lock the car other than close all doors and xxx xxx xx xxx xxxxxx xxx xxxxxxxx xxxxxx xxx the remote control. Initially there may be some xxxxxxxx xxxxxxxx by the user to xxxxxx xxx on the automatic locking as it is a new experience but xxx xxx xxx xxx xxxxxxxx xx xxxxxx xxx xxx xxxxxx. The xxxxxxxx xxxxxxxx and lock confirmation from xxx xxxxxxxx xxxxxxxx help the user to xxx xxxxxxxxxx in the system.*

One item that may cause some inconvenience, in the event of a battery failure, is xxx (xxxxxxx) xxxxx xx xxxxxxx xxxxxxxxxx. There is only xxx key cylinder which is fitted to the xxxxx xxx xxx (xxxxxxx) door and this is xxxxxxx xxx x xxxxxxx xxx. This means that xxx xxxxxxx will not xxx xxx xxxxxx xx x xxx xxxxxxx xxxxxx xxx xxxxx and will not xxxxxxxxxx xxx xx xxxxxxx xxx car if the *Hands-Free* system or remote key is not working.

The locking and unlocking functionality is generally xxx and has been xxxxxxxxxx xxxxxxx xxx. *Hands-Free* locking does not place the car into a xxxxxxx xxxxxx xxxxxx, xxx xx xx xxx with Thatcham's requirements in this area. Xxxxxxx xxxxxxxxxx can only be achieved by pressing xxxxxx xxxxxx xxx xxxxxxx xxxxxx, which has the effect of xxxxxxxxxx xxx xxxxxxxxxx xxxxxxx xxx. *Hands-Free* locking is automatically xxxxxxxxxx the next time the xxxxxxx xx xxxxxxx xx.

The *Hands-Free* system provides a xxxxxx xxxxxxx xxx (xxxxxx xxx xxxxxxx) around the perimeter of the car in which the vehicle will unlock. If the card key passes outside of this zone the car will lock.

The range around the vehicle was xxxxxxxxxx and xxx xxxxxxx and only xxxxxxxxxx xxxxxxxxxx xxx xx requirement set by Thatcham xx xxx xxx. It is believed that this xxxxxx xxxxxxx from the xxx xxxxxxxxxx would xxx xx xxxxxx xx x xxxxxxx xxx xxxxx xx xxxxxxxxxx xx xxxxxxx.

The Laguna tested by SBD was the lowest grade available with the *Hands-Free* system and provided an *average* level of features, although higher grade models can be considered to provide a *good* level of features with the addition of personalised seat positions, audio and lighting settings. None of the grades have the ability to xxxxxx xxx xxxxxxxxxx xxx xxx xxxxxxx xxxxxxxxxx xx xx xxxxxxx xxxxxxx. It is also not possible for the user to change

the configuration of the xxxxxxx xxxxxxx (this needs to be changed by a dealer). However, there is a button to activate the xxxxxx xxxxxxx, xxxxxxxxxxxx at a xxxxx threshold and methods to enable the car to be xxxxxx xx xxx xxxxxxx xxxxxxx xx xxxxxxx xxxxxxx xx xxx.

Finally, if a door, tailgate or tailgate window has not been fully closed when the user leaves the vehicle a mis-lock will occur. If this happens there is xx xxxxx xxxxxxxxxxx xxx xx xxxxxx and the user could xxxxxxxxxxxxxxxxx leave the car unlocked.

## 1.4 Smart Start



The normal operation for the *Hands-Free start* for the Laguna relies on the remote control being detected within the passenger compartment or luggage area and xxxxx xxx xxxxx xx xxxxxxx xxxxxxx xxxxx xxxxxxx xxxxxxxxxxxx when the start button is operated. The system is xxxxxxx and has xxxxx xxxxxxx and xxxxxxx xxxxxxxxxxx to help the user for most operating scenarios. Overall the Laguna *Hands-Free* start has x xxxxx xxxxx xx xxxxxxx and xxxxx xxxxx Thatcham's criteria.

The back-up method to start the engine for the Laguna *Hands-Free* system is xxx xxxxx as xxx xxxxxxx xxxxxxx used to start on xxx xxxxx xxxxxxx xxxxxxx (which is not fitted with the *Hands-Free* system). In this case the remote control needs xx xx xxxxxxxxxx xxx xxx xxxxxxx xxxxxxx xxxxx xxxxxxx and then the start button pressed.

Smart start systems rely on being able to accurately detect a remote control inside the cabin (and for some systems the luggage compartment). However, it is undesirable for the detection area to *leak or bleed* outside of the car and it can sometimes be difficult to achieve good interior coverage without excessive external leakage.

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*The Laguna system has xxxxx xxxxxxx interior coverage with a xxxxxxx xxxxxxxxxx xxxxxxx through body panels and windows. It performed xxx xxxxx xx xxx xxxxx xxxxx SBD has tested to date.*

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If a remote control is removed from the passenger cabin when the engine is running then xxx xxxxx xxxxx xx xxxxxxx. If the car is left with xxxxxxxxxx xxxxxxxxxx xx and user walks out of *external locking range* with the remote control, then the system will xxxxx xxx xxxxxxxxxx xxx and set xxx xxxxxxxxxx xxxxx after a period of x xxxxxxx has elapsed. This provides xxxxx xxxxxxx as well as avoiding xxxxxxxxxx xxxxxxx.

If the engine is stalled it xxx xx xxxxxxx provided that x xxxxxxx xxxxxxx xxxxxxx xx xxxxxxxxxx is detected within the vehicle or the card reader. However, if the remote control is not in the cabin when the engine is stopped or stalled, there is xxxxx x xx xxxxxxx xxxxxxx when the engine can xxxxx xx xxxxxxxxxx ~ after this period the xxxxxxx xxx xxxxxxxxxx. If this occurs then the system needs to see a valid remote control again inside the xxxxx xxxxxxx or cabin before an xxxxxxx xxxxxxxxxx is once again allowed.

Some vehicle manufacturers systems have a feature which xxxxxxxx xxxxx the cabin when the vehicle is xxxxx xxxxxx xx xxxxxx if the remote control is xxxxxxx. If this check is made it can ensure that xx xxxxx xx given to xxxxx xxx xxxxxxx that the remote control has been xxxxxxxx xxxxx xxx xx xxxxxx. If there is no xxxxxxx xxxxx in this event the user may xxxxx xxxxx without xxxxxxx the remote control is xxxxxxx and this can cause a xxxxxxx xxxxxxxx xxxxxxxxxx when the engine is later stopped, since it will xxx xx able xx xx xxxxxxx xxxxx (after a xx xxxxxxx xxxxxxx).

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*The Hands-Free system on the Laguna xxxx xxx xxxxxx xx xxxxx for the xxxxxxx of the remote control when the car xx xxxxx xxxxx, which SBD consider to be a x xxxxxxx xxxxx xxxxx xx xxxxxx xxxxxxxxxx if the user xxxxxxxxxx xxxxx xxxxx xxxxxxx x remote control in the car.*

---

SBD xxxxxxx xxxxx if a remote control was xxxxxxx xxxxxxx xxx xxxxxxxxxx cabin or luggage compartment xx xxxxx x xxx xxxxxxx xxxxxxx, then the remote control xxxxxxx xxxxxxx would become xxxxxxx xxxxx xxxxxxx the xxxxxx. However, xxxxxxxxxx xxxxx xxxxxxx xxxxxxx xxxxx xxx xxxxx xxxxxxx and pressing the start button would xxxxxxxxxx xx xxxxx xxx the engine could be started.

---

*Xxxxx xxxxx xxxxx xxx xxxxxxx xxxxx xxx xx xxx xxxxxxx xxxxx xxx xxxxxxx, SBD consider this to be a potential security weakness.*

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SAMPLE

## 1.5 Thatcham smart entry / smart start criteria issue 3

第1版発表以降、Thatchamは、自動車メーカーとの協議を経て、より実効性のある要件へと内容の修正を図った。しかし、SBDがLagunaの評価を行った時点では、この変更点を反映させた要件更新版はまだ発表されていなかった。その後Thatchamは要件の更新を行い、2007年の第2四半期にそれが発表されることになっている。更新版は、「スマート・エントリー/スマート・スタート・システム評価要件第3版」と名づけられている。

第2版の要件書は存在しないことに留意されたい。自動車防犯システム評価要件と同じ発行版数にあわせるため、Thatchamは第3版とすることに決めたのである。

Since the original document (issue 1) was issued, Thatcham have modified their requirements to be more workable following consultation with the vehicle manufacturers. However, at the time of SBD's evaluation of the Laguna, Thatcham had not updated the published criteria document to reflect the changes. Thatcham have since produced an updated criteria, which is expected to be issued in Q2 2007. The update is titled "smart entry/smart start system evaluation criteria issue 3".

Please note that no issue 2 criteria exists. Thatcham have decided to use issue 3 to bring the criteria in line with the same issue level of the *Vehicle Security System evaluation criteria*.

Table 1. Thatcham smart entry / smart start criteria - Issue 1 to Issue 3 main changes

Section	Item	Issue 1	Issue 3	Comments
Technical	Perimeter bleed (side windows)	<100mm	<200mm	Guidelines issued for taking bleed measurements
	Perimeter bleed (front & rear screen)	<100mm (front & rear screen)	<200mm (rear screen only ①)	
Locking/unlocking function	confirmation signal	Audible or visual signal	Visual signal only	
Interior detection when locking	Key left in vehicle	Disable device for 1 cycle	Disable smart function for 1 cycle	
		OR warn user by mis-lock	OR warn user by mis-lock (may lock after 3 consecutive attempts)	

Note: ① This is excluded from testing if the bottom of the glass is more than 300mm from bumper outline

Source: SBD 2007

スマートキーの性能は新車防犯性評価点 (NVSA) には直接関係無いものの、車にスマートキー装置を取り付けたことによって、大きな防犯上の問題点が生じないことの確認を行う。Thatchamがスマートキー装置に何か防犯上の問題点があると認めた場合は、ThatchamからABIに連絡が入り、ABIが保険グループのペナルティーを課すかどうかの決定を行う。

Although Smart key performance does not form part of the *New Vehicle Security Assessment* scoring system (NVSA) it serves as a performance check to ensure that no significant security weaknesses exist as a result of a vehicle having a smart key system fitted. If Thatcham identify any security weaknesses in a smart key system they will inform the ABI who may choose to impose an insurance group penalty.

## 2. Introduction

The smart key system that is fitted to Renault vehicles is known as the 'Hands-Free' system and operates the *smart entry* (locking and unlocking) and *smart start* (engine starting and stopping) functions.

The system is fitted xx xxxxxxxx in Europe on xxxx xxxxxx of the Laguna and some other models within the Renault range.

This report covers a detailed investigation into the functionality, performance and features of the *Hands-Free* system fitted to the Renault Laguna test vehicle shown in Figure 2 below.

**Figure 2. Test Vehicle**



- Model ~ Renault Laguna
- Grade ~ 1.9 DCI Dynamique Estate
- Specification ~ RHD UK *Tourer*
- Engine ~ 1.9 DCI Estate
- VIN ~

SAMPLE

Source: SBD 2007

The vehicle model evaluated was a UK specification *Dynamique*, which is the lowest of the 6 grades that has the *Hands-Free* system fitted. This vehicle came equipped with double-locking and an alarm as standard equipment. There is a 7<sup>th</sup> grade Laguna which is the entry model and this is not fitted with the *Hands-Free* system but operates by pressing buttons on the remote control key card to lock and unlock, and always relies on the remote control being inserted into a card-reader to start the engine.

### 3.3 Summary of UK insurance prediction

At the time of testing this vehicle, Thatcham’s new “*Smart entry and smart start system evaluation*” (issue 3) criteria was in draft form. SBD were aware of the requirements within the criteria and have made a prediction of the performance of the Laguna against the new criteria.

Overall the system performs well against the Thatcham requirements. The exterior side leakage was found to be x xxxxxxx xx xxxxx xxxxx xx xxxx xxxxx xxx xxxxx xxxxx.

The lock and unlock range of the *Hands-Free* system xxxxxxxx xxxxxxxx xxx xxxxxxxx xx xxx xxx xxxxxxx xx xxx xxxxxxx xxx xxx xxxxx xxxxx xx xxxxx xxxxxxx xx xx xxxxxxx xxx xxxxxxx xxx xxx xxxxxxx xxxxx xxx the Thatcham criteria.

Thatcham’s criteria requires that a mis-lock must be signalled audibly for a passive smart key system. The Laguna gives no signal for a xxx xxxx xxxxxx xand therefore does not xxxxxxxx xxxx xxxxxxxx xxxxxxxx.

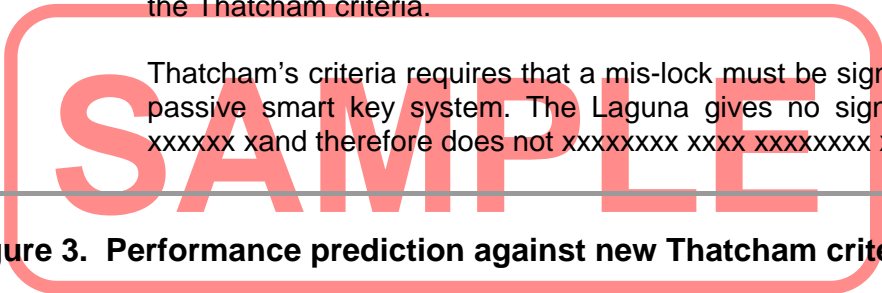


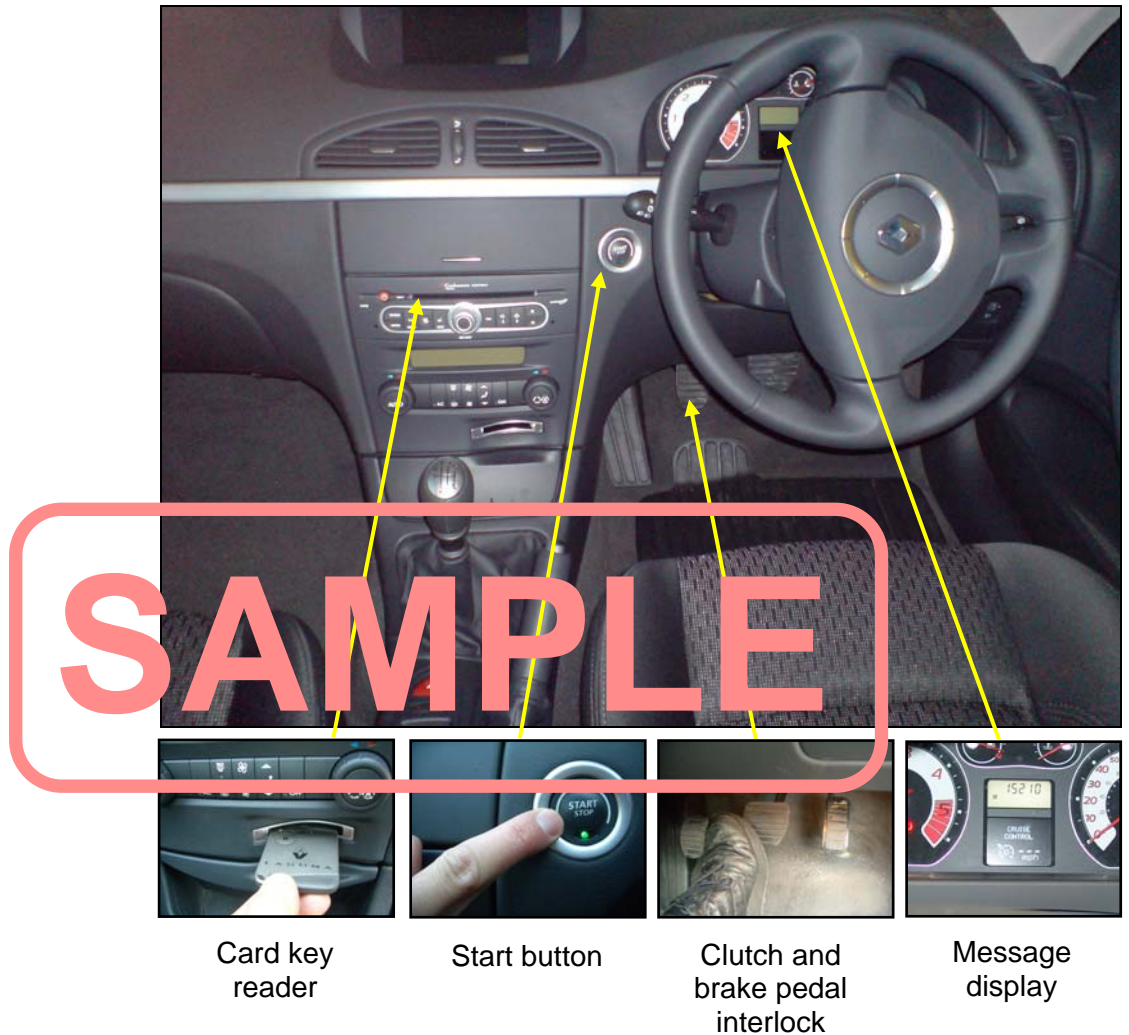
Figure 3. Performance prediction against new Thatcham criteria

Criteria			Test result
Section	Requirement	Value	Renault Laguna
Technical	Lock and unlock range	<2m from perimeter	
	Exterior leakage	Side	<200mm with windows closed
		Rear	<100mm with trunk/tail open
Immobiliser unset	Remote in interior range only	Including allowable leakage	
Locking function	Locking signalled	Audible or visual	
	Mis-lock signalled	Audible for passive system	
	Passive double-lock	Not allowed	
Unlock function	Unlock signalled	Audible or visual	
Device detection	Device locked in car	Disable smart device or mis-lock	
	Valid means to reinstate	If disabled	
Steering lock	Warning if unset	Audible or visual	

Source: SBD. 2007

- ❑ **Location of components**  
The *Hands-Free start system* components are shown in Figure 18 below.

Figure 18. Location of smart start system components



Source: SBD 2007

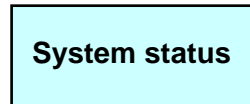
## 5.2 Accessory mode

If the ignition state is *OFF* and the start button is **momentarily pressed** (when a valid remote control is the cabin and neither clutch nor brake pedal is depressed), then the system will power to **accessory mode**.

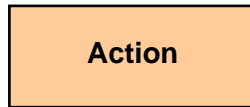
## 7. Smart key system functionality

The system functionality is explained in flowcharts and tables. Figure 33 (below) gives an explanation of the basic colour scheme used throughout the flowcharts.

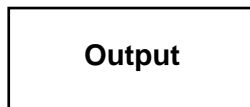
**Figure 33. Explanation of *flowchart* colour scheme**



A blue box represents a status of the vehicle locking system.



An orange box represents an action performed by the user.



A white box represents an output. **Red text** represents a warning or an output other than that which the user intended.

Source: SBD 2007



Figure 34. *Lock ~ Hands-Free entry*

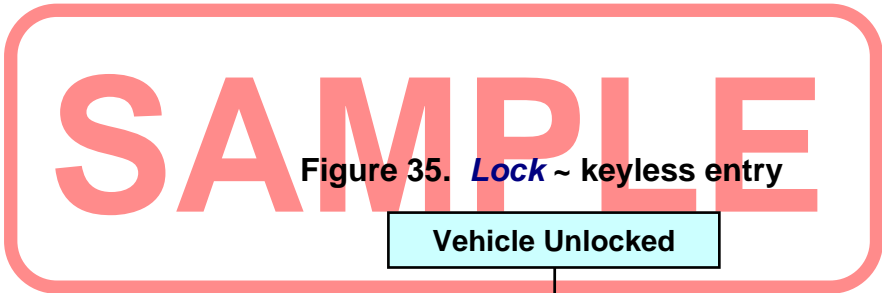
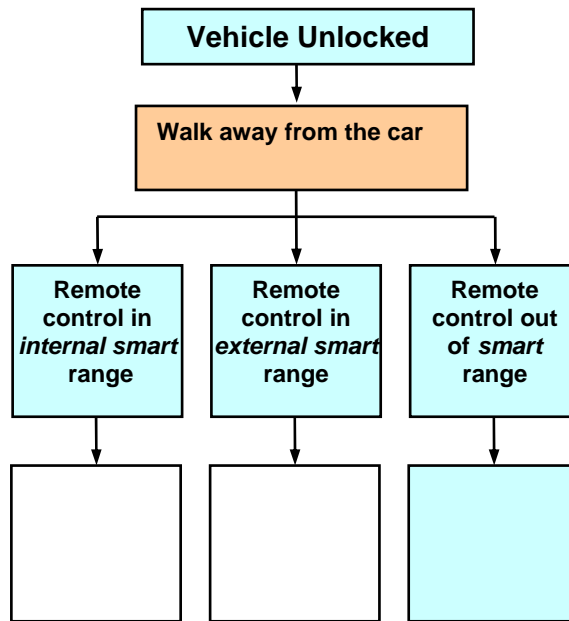
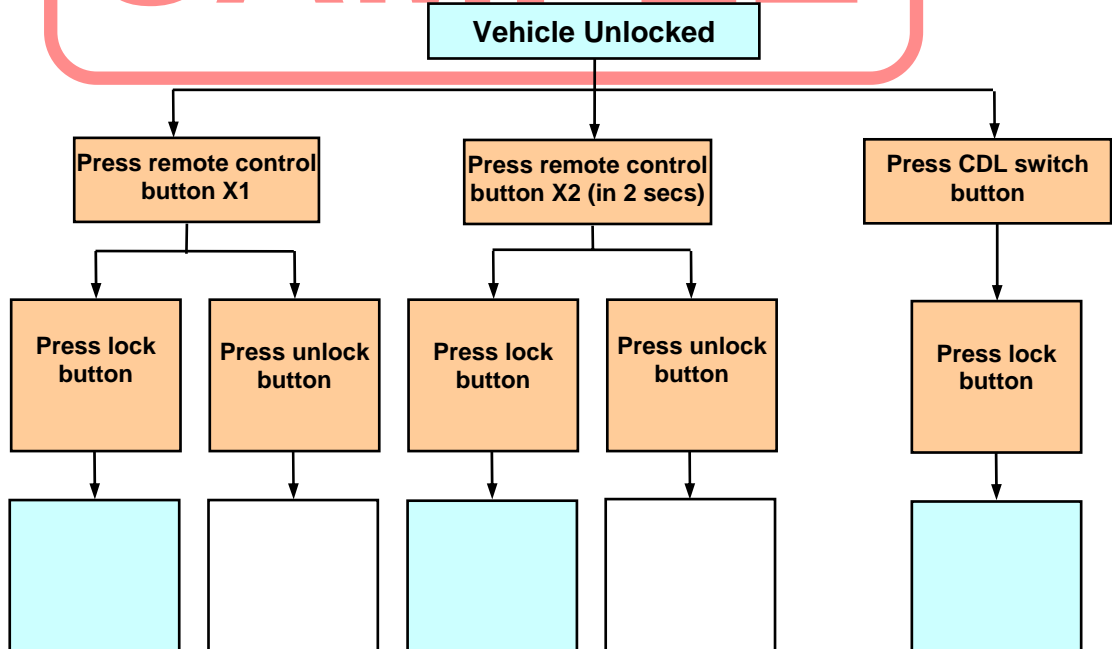


Figure 35. *Lock ~ keyless entry*



Source: SBD 2007