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LAND ROVER

LAND ROVER MANUAL

ADVANCED
DIAGNOSTICS

CONTENTS

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ADVANCED
DIAGNOSTICS

APPLICATIONS

VEHICLE	SYSTEM	YEAR	CABLE
CLASSIC RANGE ROVER	10AS	95 ON	ADC110-B
DEFENDER	10AS	95 ON	ADC110-B
DISCOVERY (OLD)	10AS	95 ON	ADC110-B
FREELANDER	27VT	95 ON	ADC110-B

NOTE : THE SYSTEMS ABOVE USE THE REMOTE PLIP UNIT AS PICTURED BELOW.

ANY OTHER REMOTE PLIPS ARE NOT PROGRAMMABLE WITH THIS SOFTWARE

PLIP KEY FOR USE WITH 5AS, 10AS AND 27VT SYSTEMS

GENERAL OPERATION

SYSTEM DESCRIPTION (10AS ALARM SYSTEM)

INTRODUCTION

The 10AS Alarm system was fitted as standard equipment on Model Year 96 onwards across a number of Land Rover vehicles. The system consists of a number of components as follows :-

- ECU Alarm Unit
- Plip Key
- Passive Immobiliser Coil (Optional)
- Alarm sensor (Optional)
- Central Door Locking Actuators
- Bonnet Switch (Optional)
- Driver's Door Key Switch
- Door Switches
- Boot Door Switch
- Hazard Lights
- Battery Backed up Alarm Sounder (Optional)
- Alarm Sounder and Relay (Optional)
- Alarm LED and Engine Immobiliser Lamp (Instrument Cluster)
- Engine Immobiliser ECU

The 10AS offers a number of protection functions including Perimetric protection, Engine immobilisation (Crank Inhibit), Engine Immobilisation (ECU Inhibit) and ultrasonic protection within the vehicle passenger compartment.

Central locking is also controlled by the 10AS Alarm system. The vehicle can be locked using the key, Door Locking button or Plip key. The vehicle can only be unlocked using the Plip key or the emergency access code (EKA).

PERIMETRIC PROTECTION

This part of the system is enabled whenever the vehicle is manually locked using the drivers door key.

VOLUMETRIC PROTECTION

This part of the system is only activated using the Plip Key, which enables protection for the bonnet, boot and ignition switch. Also the internal Alarm sensor is activated.

ALARM SOUNDER

If the vehicle is detected as having an unauthorized access, the alarm sounder and hazard lights will start for around 30 seconds. The alarm must be triggered again before the sounder and hazards will start. There are two sounders used, normal sounder and battery back up sounder.

GENERAL OPERATION

B

The battery backed up sounder is charged via the ignition feed, and if disconnected or wires cut it will operate for approximately 3 minutes. To disconnect the battery backed up sounder follow the following procedure :-

1.   Turn Ignition ON, Turn Ignition OFF
2.   Disconnect Sounder within 15 seconds
3.   If Triggered, Re-connect.
4.   Disarm Alarm system
5.   Turn Ignition on and repeat steps above.

INERTIA SWITCH
The inertia switch has been incorporated into the alarm system to activate the central locking mechanism's if the vehicle is involved in an accident.

ENGINE IMMOBILISER (Optional)
When the alarm system is armed, the Passive Immobilisation function is enabled. Two types of immobilisation are used :-

1. Electronic Engine Immobiliser (Used on MFI-T16 and 300TDi with EDC engines)

This system is controlled by the Engine Management ECU and the Alarm ECU. When the vehicle is immobilised, the alarm ECU sends a signal to the EMS ECU which prevents starting, and until it receives a de-immobilise signal it will not start.

2. Remote Smart Spider (Used on MFI-T16 and 300TDi without EDC engines)

This system is controlled by the alarm ECU and the Engine immobilisation ECU (Spider).
The alarm ECU sends a signal to the spider ECU to disable vehicle start, which then interrupts the starter circuit, fuel pump circuit and ignition coil (If fitted) or the fuel pump shut off solenoid in the case of the 300TDi engine (without EGR).

NOTE : The vehicle can only be started using the Plip key or the EKA code.

PASSIVE IMMOBILISER
The immobiliser system will be enabled when the following conditions apply :-

•   30 seconds after ignition is switch off and drivers door has been opened.
•   5 minutes after ignition is switched off.
•   5 minutes after disarming the alarm system.

PASSIVE IMMOBILISER COIL
A coil is mounted in the steering column which sends a magnetic field which is picked up by the plip key, and if received, it sends a signal to the alarm ECU to mobilise the vehicle.

GENERAL OPERATION

VEHICLE STATUS INDICATION

The vehicle status is indicated by the Alarm LED as follows :-

- Slow flash - Immobilised or Armed and Immobilised
- Rapid Flash - Internal sensor system armed
- Intermittent Rapid Flash - Doors, Boot and Bonnet armed
- No flash for 10 seconds - Miss lock
- Continuous - Drivers door open or ignition on and system immobilised

PLIP KEY RESYNCHRONISATION
Procedure.
1. Unlock the drivers door using the key.
2. Ensure all doors, bonnet and boot are shut, and if Central Locking is fitted, make sure both front doors are unlocked.
3. Press the Plip key (Lock button) four times quickly, until the vehicle locks are enabled.

PLIP KEY LOW BATTERY WARNING
When the Plip key battery is low, the alarm unit will enter low battery mode. The alarm LED will flash to indicate low battery, and also the hazard lights will not flash when the alarm is disarmed.

POWER UP MODE
The alarm will always power back up in the mode it was disabled. So if the battery is disconnected and the alarm is activated, then it will remember and when re-connected will enter the same state.

EMERGENCY ACCESS CODE

If the Plip key is lost or does not function, the emergency access code can be used to override the system as follows :-

1. Using the code turn the key to the unlock the number of times of the first digit.
2. Now turn the key to the lock position the number of times of the second digit.
3. Repeat for the last two digits.

After the code has been entered, turn the key to the unlock position, and check to see whether the Alarm LED has stopped flashing, and the engine will start.

If the wrong code has been entered a warning sound will be heard. After 3 wrong attempts a period of 30 minutes must pass before the next attempt is made. If a mistake is made part way through, hold the key in the lock position for at least 5 seconds and then begin the code entry again.

SYSTEM DESCRIPTION (27VT (BCM) SECURITY SYSTEM)

INTRODUCTION

The 27VT and BCM (Body Control Module) is a sophisticated alarm system and central locking control, which has a number of associated components that make up the system, which includes :-

- Remote Handset (Plip Key)
- RF Receiver
- Passive Coil
- Volumetric sensor
- Door Lock actuators
- Drivers door key barrel
- Central door key barrel
- Central Door Locking switch (CDL)
- Door switches
- Tail door switch
- Bonnet switch
- Horn
- Alarm LED
- Starter Relay
- Inertia switch
- Engine Immobilisation

CENTRAL LOCKING

The vehicle can be locked in three ways, Central Door locking switch (CDL), vehicle key or remote Plip key. The CDL switch is located inside the vehicle, normally in the centre console. This allows the locks to be operated without arming the alarm system. If the inertia switch is operated, then the CDL is overridden and the locks are opened automatically.

The vehicle can be CDL locked by using the key in the drivers door. Turning the key anti-clockwise will lock all the doors, turning the key a second time will super lock the doors (Note second turn must be within 1 second of the first turn).

If the vehicle has an alarm and is CDL locked or super locked, turning the key clockwise will only mechanically unlock the drivers door. The system then enters EKA access mode.

If the vehicle has no alarm system, then turning the key clockwise once will open all doors. If the vehicle is super locked then the drivers door will open, and a second turn of the key will open the other remaining doors. If the remote control unit is used to unlock the vehicle, pressing the unlock button once will unlock the drivers door only, pressing the button for the second time makes all other doors will unlock.

GENERAL OPERATION

INERTIA SWITCH
The inertia switch is located within the engine bay, on the bulkhead. With the ignition ON and the alarm disarmed, if the switch is operated then all the doors will be unlocked.
Further locking of all doors is disabled until the ignition is switched off and the drivers door opened and closed or the drivers door opened and closed and the switch is manually reset by pressing the button.

ALARM/IMMOBILISATION—KEY OPERATION
The alarm system can be armed and disarmed with an EKA code, which can be used if the Plip key is lost or becomes faulty. The system has a number of components which control different alarm functions. These include Volumetric which monitors movement within the passenger compartments, in case of possible intrusion. The second is perimetric sensing which uses switches on all doors, bonnet, roof and tail door.

Arming and disarming using the vehicle key will be ignored if the ignition is already in the ON state. In certain countries the alarm is programmed not to arm under any circumstance, and the key only unlocks the mechanical lock.

The alarm can be fully armed by turning the key anticlockwise once with all doors closed. The hazard warning lights should flash 3 times. The alarm LED will flash very fast for 10 seconds and then slowly. If the key is turned for a second time within 1 second of the first turn the system will be super locked, and the alarm LED will flash for 10 seconds and then flash slowly.

To disarm the system with the key, the EKA code must be entered using the sequence described later in this section.

ALARM/IMMOBILISATION—REMOTE PLIP KEY
The vehicle can be fully armed and disarmed using the plip key. If the vehicle is locked using the plip key lock button, the system is super locked and the alarm LED and hazard lights will flash as described above.

BATTERY BACKED UP SOUNDER (BBUS)
This system is not fitted to all vehicles, but when fitted is mounted above the wheel arch liner on the drivers side. If the system is tampered with the BBUS will sound, and will only stop if the power is re-connected and the system armed and disarmed. It also sounds when the system is miss-locked. The battery life of the unit is around 3 years.

EMERGENCY ACCESS CODE (EKA)
The EKA code allows arming and disarming of the alarm system when the remote key fob(Plip) is lost or broken. If the vehicle is opened without using the EKA code, then the alarm system enters the following states :-

- Drivers door is unlocked, other doors remain locked.
- Alarm LED flashes slowly
- Perimetric protection is de-activated
- Volumetric protection is de-activated
- Engine and crank functions remain disabled.

The EKA code is a four number code, and each number can be up to 15. This code is entered by turning the drivers door lock to the numbers of the code.

Procedure for 5-2-9-14
1. Turn the key to the unlock position and wait for 6 MINUTES before proceeding.
2. Turn the key to the unlock position 5 times.
3. Turn the key to the lock position 2 times.
4. Turn the key to the unlock position 9 times.
5. Turn the key to the lock position 14 times.
6. Finally turn the key to the unlock position once only.

If entered correctly the alarm system will unlock all the doors, fully disarm all systems and allow the vehicle to be started.

If the code is entered incorrect 3 times the system will lock out any further attempts for 30 minutes. If a code is entered incorrectly, then the system can be reset by opening and closing the drivers door, or turning the ignition on and off.

REMOTE HANDSET (PLIP KEY)
Two plip keys are supplied with the vehicle from new, and if the battery is replaced or the vehicle battery is removed the plip keys will require synchronisation. This is achieved by switching on the ignition, which enables the alarm system to send a re-synchronisation code to the handset automatically. Alternatively it can also be achieved by pressing either handset button 5 times quickly with the ignition OFF.

If the plip key battery is low, then when the signal is sent from the plip key the alarm will send a signal which sounds a buzzer for 10 seconds and the alarm LED flashes for 10 seconds to notify the owner.

ENGINE IMMOBILISATION
The engine immobiliser feature disables the starter relay and also the enable code sent to the MEMS engine management ECU. The passive immobilisation occurs 5 seconds after the ignition is turned off and the drivers door opened. If the ignition is just turned off then it will immobilise after 5 minutes. Re-immobilisation will occur if the plip key unlock button is pressed or the key is inserted and ignition turned on with the Plip key within 70 mm of the ignition lock. If 2 hand sets are in close proximity it will not re-immobilise because of interference.

SPECIAL FUNCTIONS

PROGRAMMING REMOTE PLIP KEYS (27VT)

VEHICLE SELECTION MENU

FREELANDER
DISCOVERY
RANGE ROVER CLASSIC
DEFENDER

PRESS ENTER KEY

At the VEHICLE SELECTION menu select the required vehicle.

Then press the **ENTER** key.

TURN IGNITION ON

PRESS ENTER KEY

Turn Ignition ON and press the **ENTER** key.

**PLEASE WAIT
TRYING TO COMMUNICATE**

The tester will now attempt to communicate with the ECU.

ECU IDENTIFICATION

PRODUCT CODE : 27
DIAG.VERS.:11
SOFTWARE VERSION:15
HARDW.VERS:382
ECU NO.: 064112

PRESS ENTER KEY

If communication is successful the system information will be displayed as shown.

DIAGNOSTIC MENU

ECU IDENTIFICATION
SPECIAL FUNCTIONS

Select **SPECIAL FUNCTIONS.**

SPECIAL FUNCTIONS

PROGRAMMING REMOTE PLIP KEYS (27VT)

```
    DIAGNOSTIC MENU
       PROGRAM PLIP
       READ EKA CODE
```

Select PROGRAM PLIP and press **ENTER** .

```
       PROGRAM PLIP

     PRESS PLIP UNLOCK
      AT LEAST 8 TIMES
     UNTIL HORN SOUNDS
      OR LIGHTS FLASH
```

Press the unlock button on the PLIP key quickly up to 8 times, or until horn sounds.

```
   KEYS PROGRAMMED : 1
    PRESS BACK TO EXIT
  ENTER—PROG MORE KEYS
```

If key has been programmed successfully the screen opposite should display how many PLIP keys have been programmed. Repeat for up to 4 Plip keys by pressing **ENTER** or **BACK** to exit.

READING EKA CODE

```
    DIAGNOSTIC MENU
       PROGRAM PLIP
       READ EKA CODE
```

Select READ EKA CODE from menu and press **ENTER**

EKA should be displayed.

```
      READ EKA CODE
   UNLOCK 6 TURNS
   LOCK    1 TURNS
   UNLOCK 11 TURNS
   LOCK    11 TURNS

     PRESS ENTER KEY
```

NOTE : The turn numbers can go as high as 15.

SPECIAL FUNCTIONS

PROGRAMMING REMOTE PLIP KEYS (10AS)

VEHICLE SELECTION MENU

FREELANDER
DISCOVERY
RANGE ROVER CLASSIC
DEFENDER

PRESS ENTER KEY

At the VEHICLE SELECTION menu select the required vehicle.

Then press the **ENTER** key.

TURN IGNITION ON

PRESS ENTER KEY

Turn Ignition ON and press the **ENTER** key.

**PLEASE WAIT
TRYING TO COMMUNICATE**

The tester will now attempt to communicate with the ECU.

ECU IDENTIFICATION

LUCAS 10AS

PRESS ENTER KEY

If communication is successful the system information will be displayed as shown.

DIAGNOSTIC MENU

ECU IDENTIFICATION
SPECIAL FUNCTIONS

Select **SPECIAL FUNCTIONS**.

DIAGNOSTIC MENU
PROGRAM PLIP
READ EKA CODE

Select PROGRAM PLIP and press **ENTER** button.

SPECIAL FUNCTIONS

PROGRAMMING REMOTE PLIP KEYS (10AS)

PROGRAM PLIP

**PRESS PLIP UNLOCK
AT LEAST 8 TIMES
UNTIL HORN SOUNDS
OR LIGHTS FLASH**

Press the unlock button on the PLIP key quickly up to 8 times, or until alarm/ horn sounds or lights flash.

Repeat for up to 4 Plip keys.

**TO RE-SYNCHRONISE
PLIPS PRESS THE UNLOCK
BUTTON 4 TIMES**

As a reminder, if the Plip keys are not synchronised, then please synchronise all keys as previously explained.

NOTE : Exit from MENU and disconnect tester before testing PLIP keys.

REMOTE CONTROL PROGRAMMING

Land Rover 1996 (single Button oval shape)

1.   Ensure ignition is OFF, doors unlocked, bonnet switch closed.
2.   Ensure procedure from 3 to 9 is completed within 8 seconds.
3.   Switch Ignition ON
4.   Switch Ignition OFF
5.   Lock Doors and Unlock Doors
6.   Release Bonnet Switch
7.   Switch Ignition ON
8.   Switch Ignition OFF

IIf alarm is set, horn will sound and LED light. Now programming of plips can be completed.

10.   Press and hold down button on Plip until LED flashes.
11.   Repeat for additional plips.
12.   The Dash LED will extinguish if both plips have been programmed successfully.

Procedure for 2002 models (BMW remote in key)

1.   With the doors shut and from inside the vehicle.
2.   Turn ignition to position 1 and back to off within 5 seconds
3.   Remove key from ignition and press and hold the unlock button (has an arrow on it) for 15 seconds during this time press the key lock button (has Land Rover logo)3 times within 5 seconds
4.   Release both buttons
5.   Doors will lock and unlock to show correct programming has occurred