

# RENAULT

## Technical Note 3566A

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Basic manuals: Workshop Repair Manuals 222 - 312 - 325 and 337,  
and Technical Note 2526A

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<i>Vehicle</i>	<i>Type</i>	<i>Engine</i>
Kangoo	XC0D - XC0E	F8Q 630 - F8Q 662
Clio II	XB0E - XB0R	F8Q 630 - F8Q 662
Mégane	XA09 - XA0J - XA0K - XA0Y	F8Q 788 - F8Q 790
Trafic	TXXJ	F8Q 606

## Advance solenoid valve Load potentiometer New coded solenoid valve shielding for DPCN diesel injection pumps

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This note cancels and replaces Technical Note 2990A

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OCTOBER 2001

EDITION ANGLAISE

"The repair methods given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The methods may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed.

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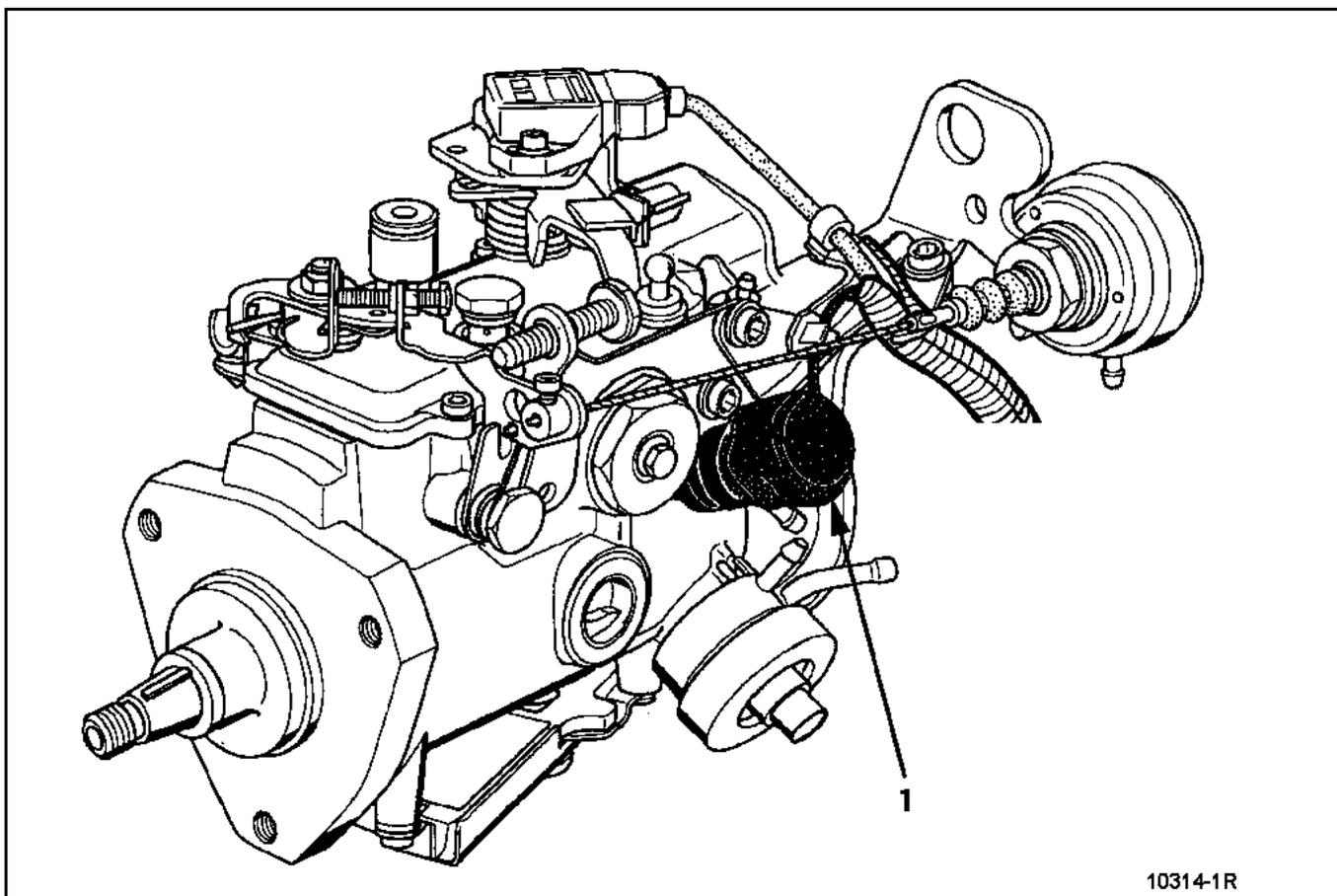
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10314-1R

**SPECIAL TOOLING REQUIRED**

Mot. 997-01 Tool for removing injector and advance solenoid valve

**TIGHTENING TORQUE (in daNm)**



Advance solenoid valve

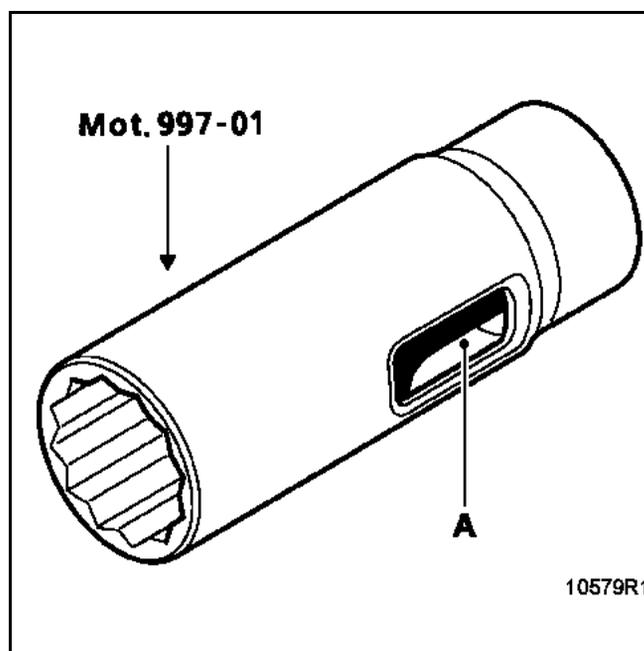
3

**REMOVAL**

Disconnect the electrical connector from the pump.

Remove:

- the protective cover from the solenoid valve,
- the solenoid valve using tool **Mot. 997-01**.



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A Connector routing

### REFITTING

It is **VITAL** to remove small filter (3) located at the bottom of the well using a pair of thin nosed pliers, and replace it with a new one.

The outer part serves as a seal and locks on tightening the actuator.

Replace, in the following order: seal (4) of return connection (5); the new activator (1) fitted with an external filter, along with the two seals (6) and (7).

Tighten the actuator to a torque of **3 daNm** using socket **Mot. 997-01**.

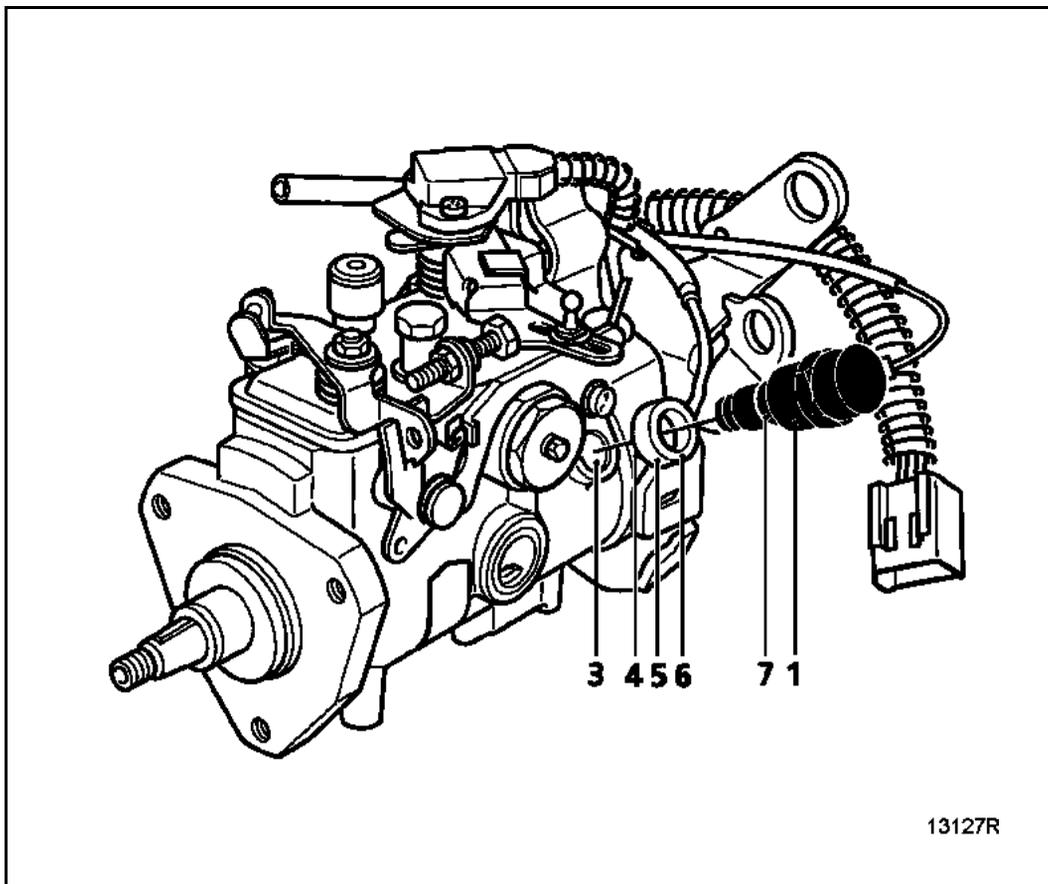
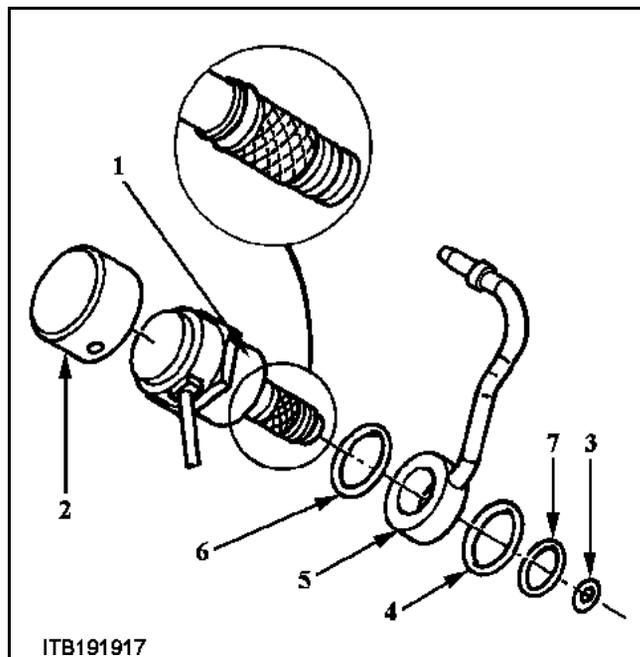
Place the new protective cover (2) on the actuator.

Reconnect the connector.

Bleed the diesel circuit using the priming pump before starting the engine.

The memory **MUST** be cleared by entering G0\*\*.

It is vital to road test the vehicle after the operation.



**IMPORTANT:** before replacing a load potentiometer, check that the residual flow screw is correctly adjusted; as the incorrect adjustment of this screw could cause the injection computer to store the load potentiometer fault.

There are two methods for replacing the load potentiometer depending on the generation of computer fitted to the engine.

There are two generations of injection computer according to the generation of injection computer fitted to the engine, use the relevant method.

**CLIO II, KANGOO** and **TRAFIC** vehicles have new generation computers, only the **MEGANE** has old generation computers.

**THE LOAD POTENTIOMETER CANNOT BE REPLACED IF THE OLD GENERATION COMPUTER IS FITTED**

VEHICLE TYPE	COMPUTER PART NUMBER
XA0Y XA09	77 00 101 400
	77 00 101 912
	77 00 101 913
	77 00 102 258
	77 00 102 792
	77 00 102 794
	77 00 102 796
	77 00 102 798
	77 00 103 511
	77 00 103 512
XA0K	77 00 101 402
	77 00 101 911
	77 00 101 914
	77 00 102 259
	77 00 102 793
	77 00 102 795
	77 00 102 797
	77 00 102 799
	77 00 103 513
	77 00 103 514

**THE LOAD POTENTIOMETER CAN BE REPLACED IF THE NEW GENERATION COMPUTER IS FITTED**

All those not listed above.

The computers have operational functions for full throttle and potentiometer discharge adjustment (G32\*).

### Old generation computer

If the computer is the old generation type, the load potentiometer full load position cannot be stored. You must therefore:

### REPLACE THE LOAD POTENTIOMETER (operation to be carried out by two people).

Access **# 1 7** and accelerate fully using the accelerator pedal.

### NEVER ACCELERATE DIRECTLY BY HAND USING THE PUMP LEVER.

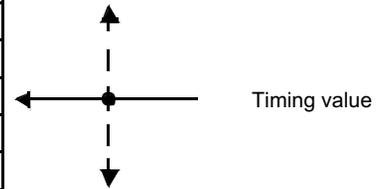
Check that the injection pump lever reaches the maximum speed stop, and that the latter has not become unsealed.

**Note down the potentiometer decoding value** (it should be included in the table, if not, then the pump must be removed for adjustment on the bench or replacement).

Example: **80.73** for a vehicle being examined.

### Potentiometer decoding values

75.66
76.05
76.44
76.83
77.22
77.61
78
78.39
78.78
79.17
79.56
79.95
80.34
80.73
81.12
81.51
81.9
82.29
82.68
83.07
83.46
83.85
84.24
84.63
85.02
85.41
85.8
86.19
86.58
86.97
87.36



### REMOVING A FAULTY POTENTIOMETER

Disconnect **3-track** connector (8).

Remove faulty potentiometer (9) by removing the two paint-sealed mounting screws (5).

Open retaining clip (3) and release the protective sheath wire.

Loosen the two mounting bolts (6) of the angle bracket mounting to release the potentiometer control plunger (fitting a new potentiometer will therefore be easier).

*Old generation computer*

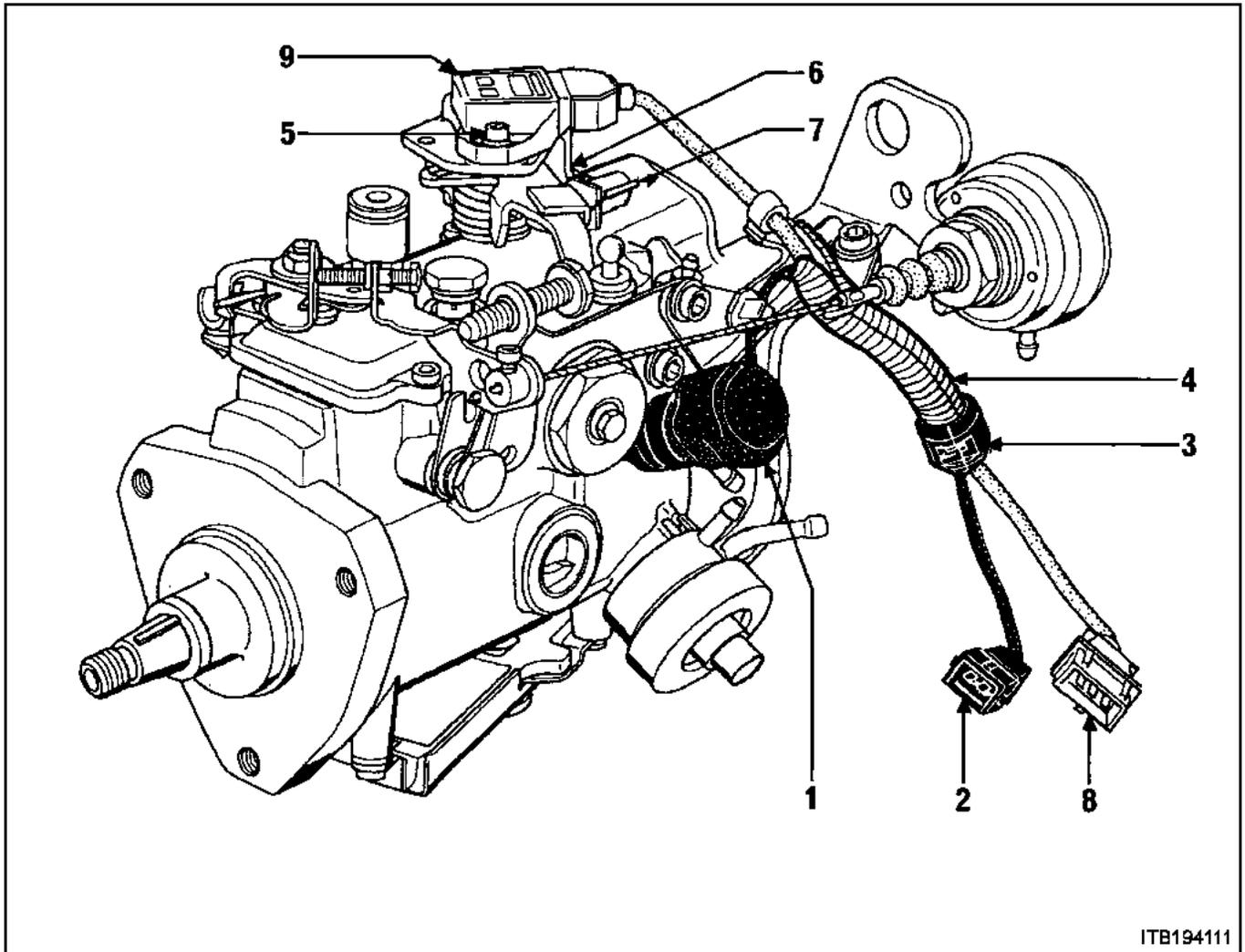
**FITTING THE NEW POTENTIOMETER**

Fit the potentiometer to its mounting and finger tighten the two screws (5) without locking them.

Retighten angle bracket mounting bolts (6).

Reinsert the wire into the sheath and close the retaining clip.

Reconnect and refit the connector.



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- 1 Advance actuator
- 2 2-track connector
- 3 Retaining clip
- 4 Protective sheath
- 5 Potentiometer mounting screws
- 6 Potentiometer angle bracket mounting bolts
- 7 Full load stop (full speed)
- 8 Potentiometer 3-track connector
- 9 Load potentiometer

*Old generation computer*

**POTENTIOMETER ADJUSTMENT**

- Access **# 1 7**.
- Accelerate fully using the accelerator pedal.
- Recalibrate the new potentiometer to the same value as the old one with a tolerance of  $\pm 2$  entries (see table), therefore for **80.73 in the example, entered values from 79.95 to 81.51 can be read on the unit.**
- Tighten the two mounting screws (5).

**NOTE:** if the values are outside the limits (77.66 and 87.36), the pump must be removed for adjustment on the bench or replacement.

- At the end of the operation, release the accelerator then check for the visual absence of the fault. Clear the stored fault.

*New generation computer - Old generation potentiometer*

### REMOVE - REFIT - ADJUST LOAD POTENTIOMETER

**IMPORTANT:** removing the potentiometer is a delicate task. It is essential to follow the method below if the vehicle is fitted with a 2<sup>nd</sup> generation coded solenoid valve protective screen (7 keys). Removing the potentiometer is not problematic if the pump is fitted with a 1<sup>st</sup> generation protective screen (4 keys).

#### REMOVAL

Disconnect the connector from the injection pump.

Remove the three load potentiometer terminals from the connector.

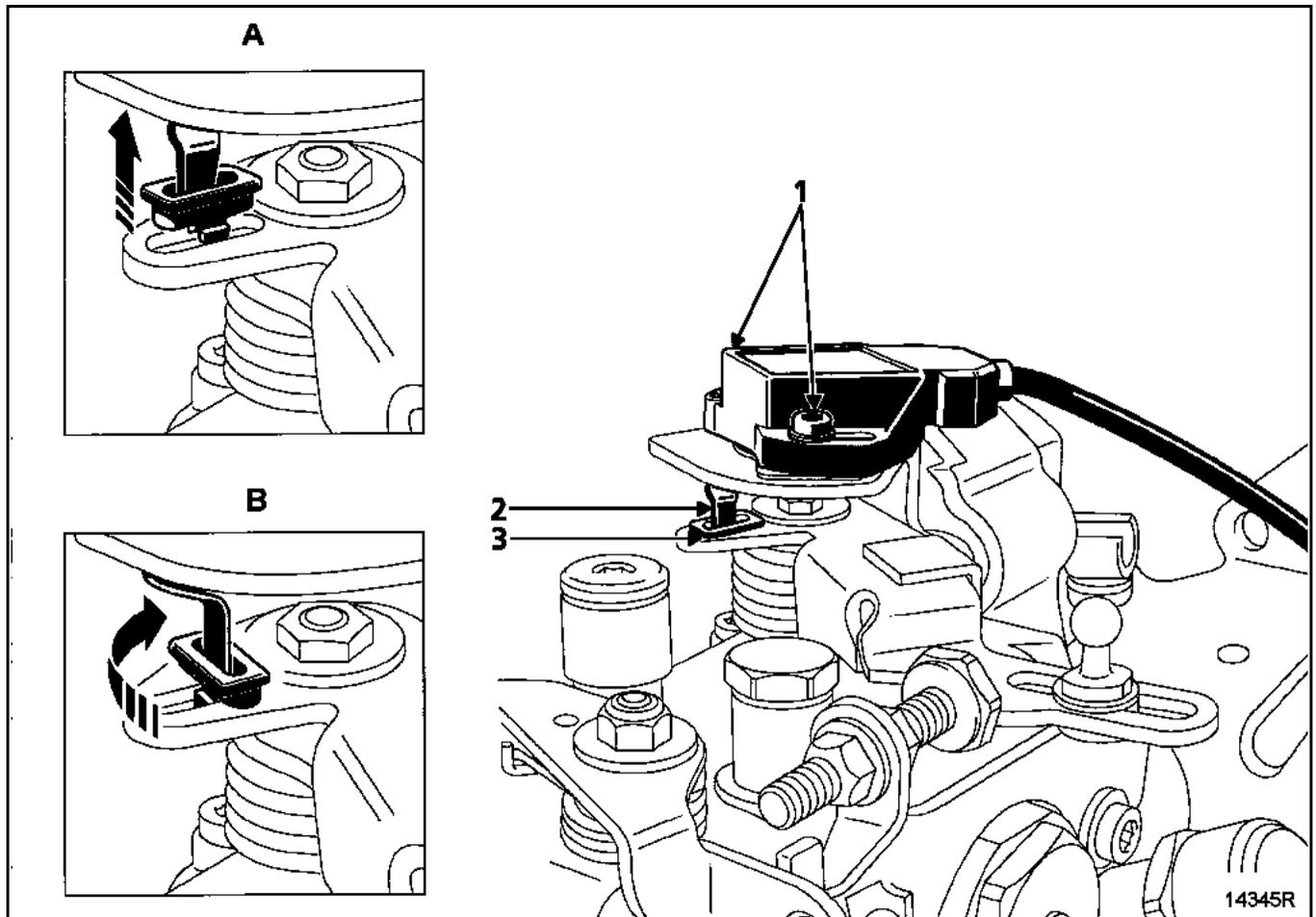
Remove the electrical wires from the plastic sheath.

Remove the two potentiometer mounting screws (1).

The potentiometer slide is retained in load lever (2) by a plastic insert (3).

Extract the plastic insert from its housing in load lever (A) using a screwdriver.

Rotate plastic insert (B) through a quarter of a turn.

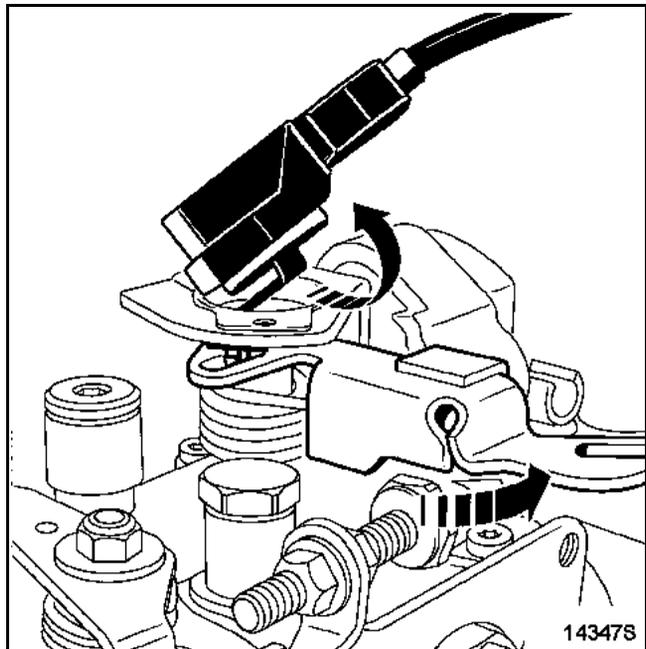
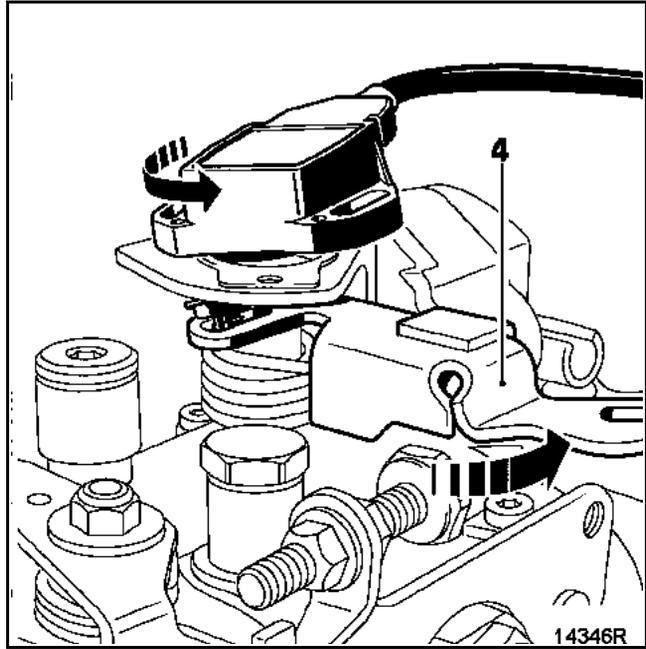


***New generation computer - Old generation potentiometer***

Put load lever (4) in the full load position.

Rotate the potentiometer anti-clockwise through a quarter of a turn.

Lift the potentiometer from the wiring side.



*New generation computer - Old generation potentiometer*

**REFITTING**

Rotate the plastic insert through a quarter turn from its original position (A), bring it as close as possible to the load lever rotation shaft.

Put load lever in the full load position.

Insert the load potentiometer slide into the plastic insert.

Fit the load potentiometer.

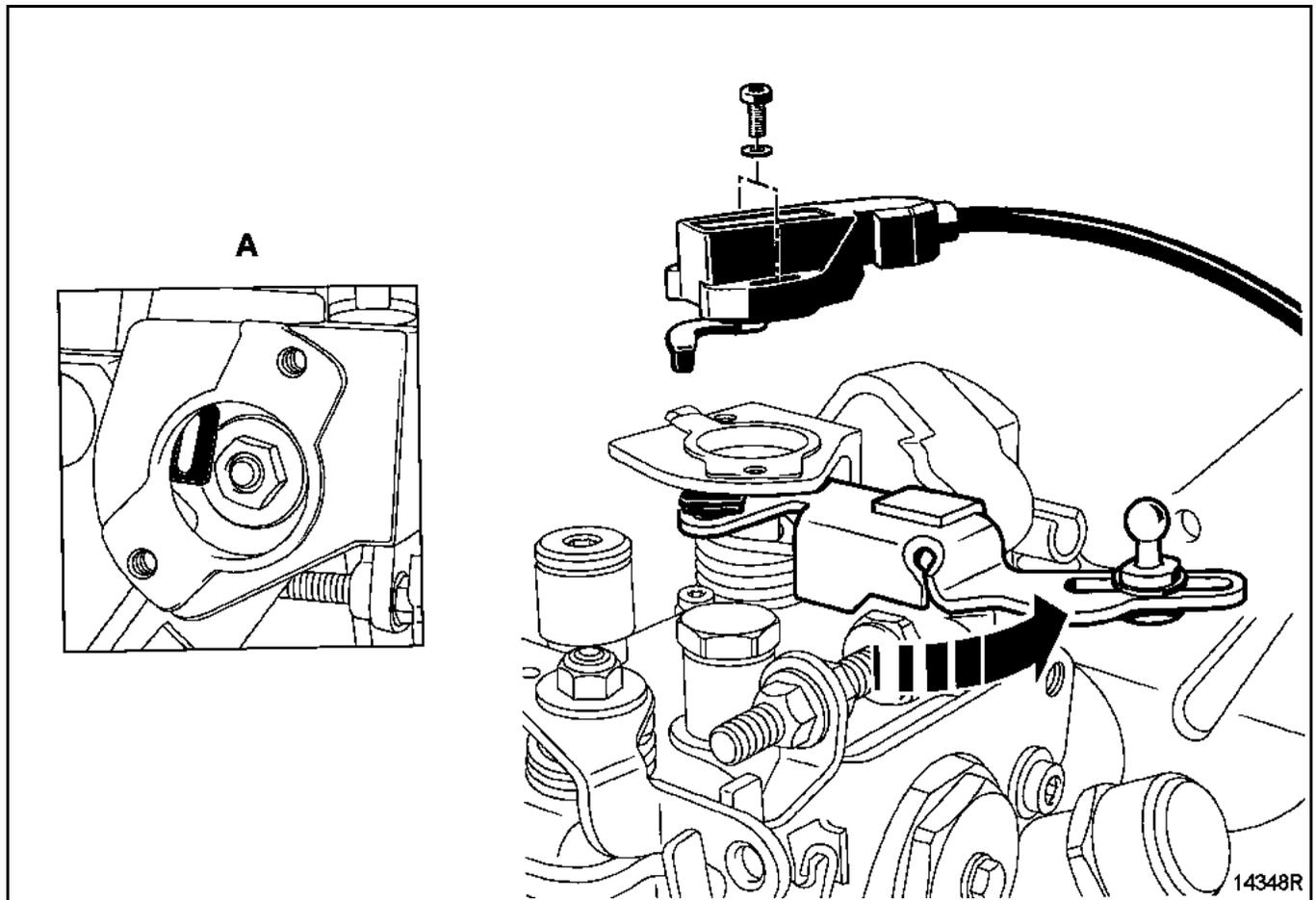
Allow the load lever to find its no load position.

Rotate the plastic insert through a quarter of a turn.

Fit the plastic insert back into the load lever using a small screwdriver.

Screw the potentiometer mounting screws back in without tightening them.

Adjust the potentiometer.



### *New generation computer - New generation potentiometer*

#### REMOVE - REFIT - ADJUST LOAD POTENTIOMETER

**IMPORTANT:** removing the potentiometer is a delicate task. It is essential to follow the method below for injection pumps fitted with a 2<sup>nd</sup> generation coded solenoid valve protective screen (7 keys). Removing the potentiometer is not problematic if the pump is fitted with a 1<sup>st</sup> generation protective screen (4 keys).

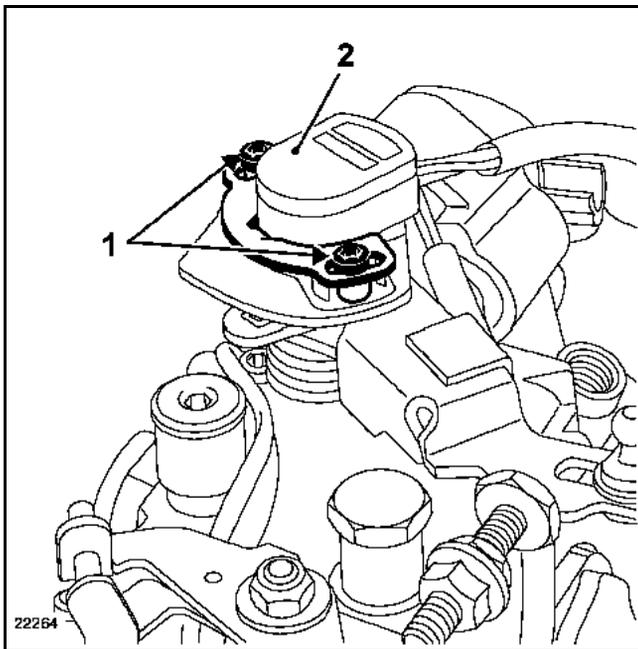
#### REMOVAL

Disconnect the connector from the injection pump.

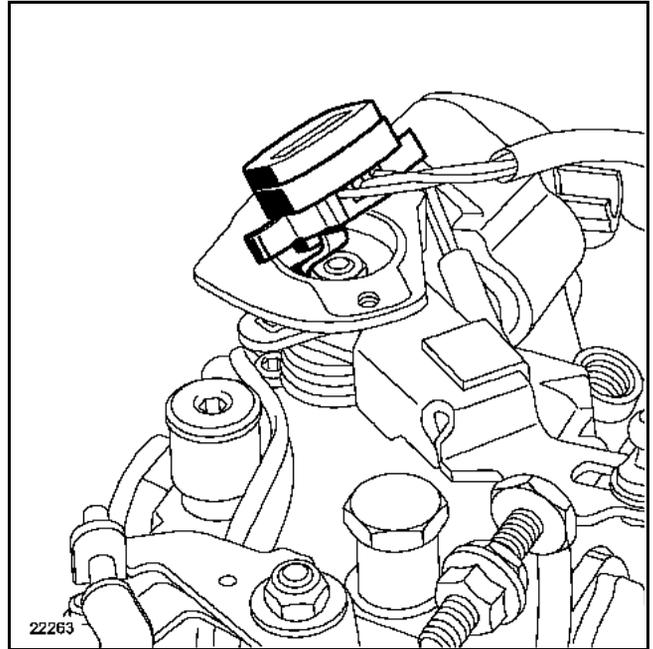
Remove the three potentiometer terminals from the connector.

Remove the electrical wires from the plastic sheath.

Unscrew the mounting screws (1) for potentiometer (2).



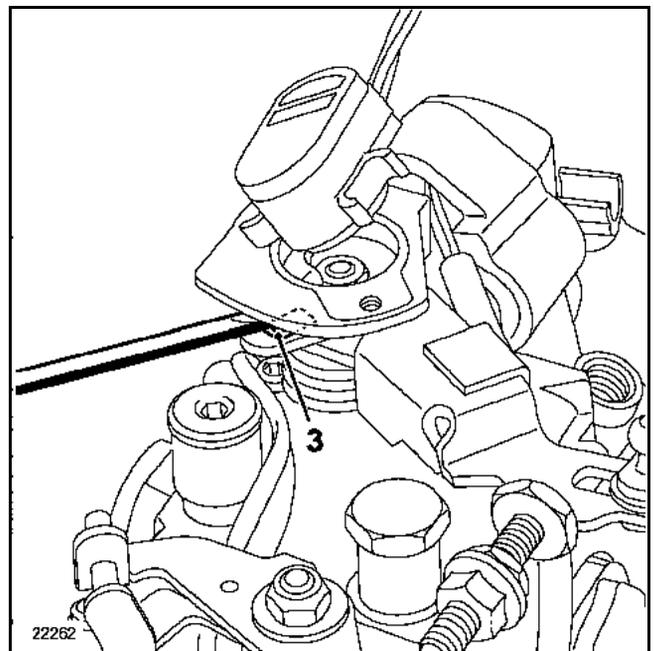
Rotate the potentiometer anti-clockwise through a quarter of a turn.



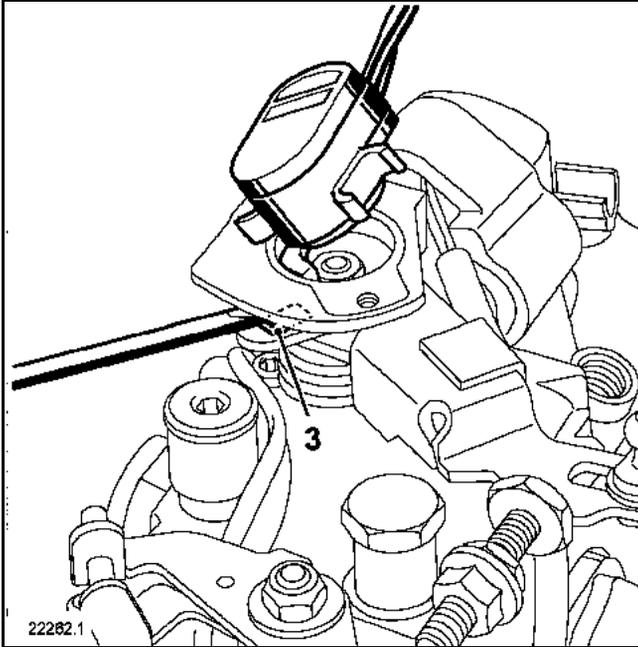
Extract the potentiometer.

#### REFITTING

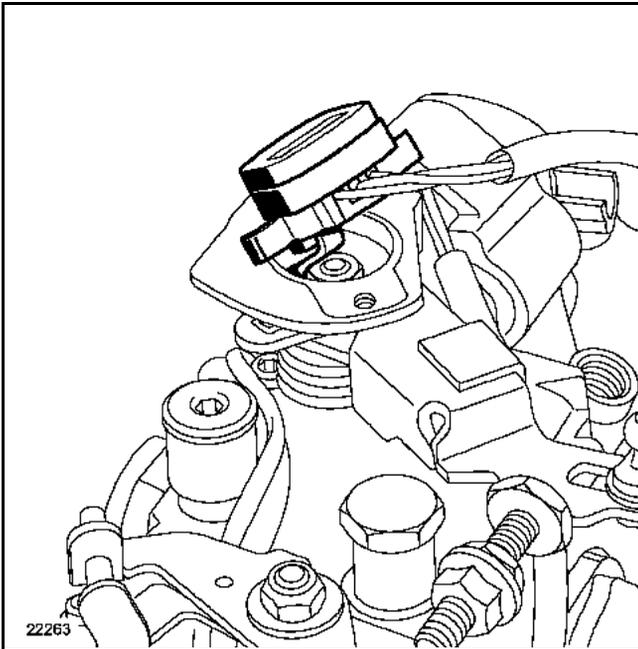
Keep plastic insert (3) fully inserted in the bottom of the groove using a screwdriver.



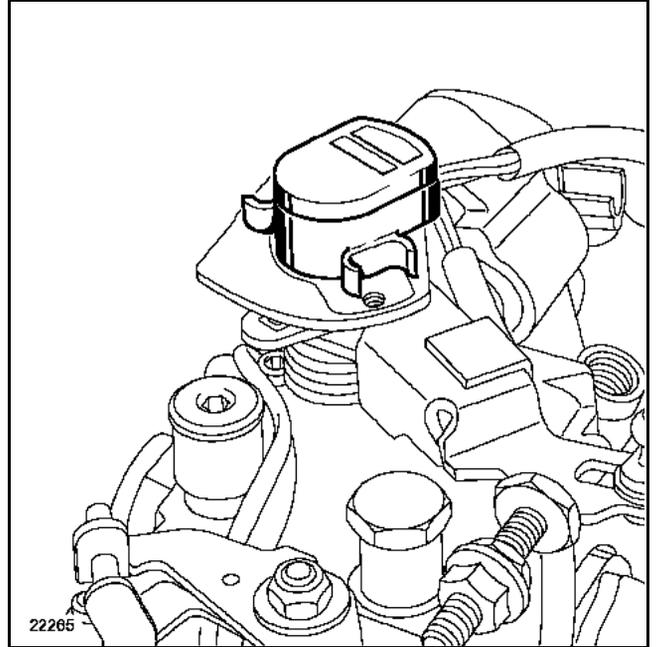
Position the potentiometer slide so that it is touching plastic insert (3).



Rotate the potentiometer clockwise through a quarter of a turn.



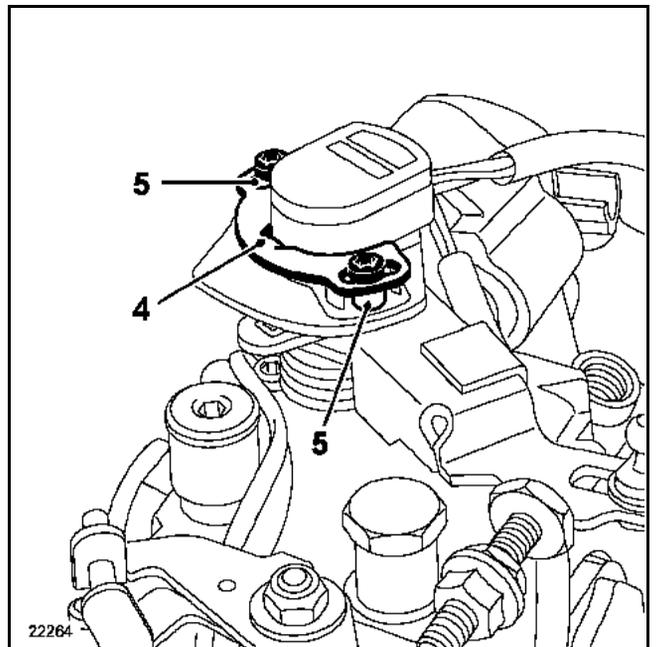
Fit the potentiometer.



Fit:

- retaining block (4),
- the two spacers (5).

Screw the potentiometer mounting screws back in without tightening them.



Clip the pins into the pump connector.

Adjust the potentiometer.

### *New generation computer*

### ADJUSTMENT

NOTE: in the factory, vehicles are programmed with the full load position (memorising the voltage delivered by the potentiometer in the full load position). This value is used to adjust the load potentiometer after it has been replaced. When replacing the injection computer during the vehicle's life it is therefore essential to carry out this programming (command mode - full throttle programming).

If it is necessary to replace the load potentiometer, in order to adjust it we compare the voltage delivered by the potentiometer in full load position, with the value memorised. The new potentiometer is said to be correctly adjusted when the two voltages are equal. This can be shown on the diagnostic tool. The **Load potentiometer adjustment** command mode (G32\*) indicates the difference between the value stored and the value sent by the potentiometer. The adjustment is correct if this value is between **0.000** and **0.040** in full load position.

The potentiometer and the computer cannot be replaced at the same time (if necessary, replace the potentiometer first and then the computer).

**IMPORTANT: the load potentiometer can only be replaced if the full load position has been stored by the injection computer. It is possible that the full load programming has not been carried out. Consequently, the potentiometer can only be changed when right-hand bargraph 12 is not lit (programming performed). If the right-hand bargraph 12 is lit (programming not performed), check that under full load the value at 0.17 is between 75.66 and 87.36:**

- if it is, perform the full load position programming (see Replacing the computer), then replace the potentiometer,
- if the value is not between the two values, the pump must be removed for adjustment on the bench or replaced.

Remove the two bolts mounting the faulty potentiometer, extract this, and fit the new potentiometer. Hand tighten the two bolts mounting the potentiometer but do not lock them - it should be possible to turn the potentiometer body.

Connect the diagnostic tool then switch on the ignition.

Select **Diesel injection** in the scroll-down menu.

Press down on the accelerator pedal (full load position). Do not act directly on the load lever.

Select **Load potentiometer adjustment** from the command modes.

Still at the full load position, rotate the potentiometer body so that a value between **0.000** and **0.040** is shown on the unit display (if you are too far from the value **0**, the display indicates HL which means Off limits). You just have to turn the potentiometer body to display a decimal value.

Tighten the two mounting screws of the potentiometer at full load position when the value indicated is between **0.000** and **0.040**.

*New generation computer*

**REPLACING THE COMPUTER**

Switch off the ignition.

Replace the computer.

Carry out the programming of the full load position; in order to do this:

Switch on the ignition.

Connect the diagnostic tool.

Select **Diesel injection** in the scroll-down menu.

Select **full load programming** from the command mode.

Perform full load programming.

The **12 right-hand** bargraph should not be lit.

Switch off the ignition.

The **DPCN LUCAS** injection computers are supplied pre-configured to **with air conditioning**. If the vehicle is not fitted with an air conditioning system, use the diagnostic tool command to perform the **without air conditioning** programming.

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**REPLACING THE COMPUTER**

**A** It is now necessary to perform load lever full load position programming on computers sold by the Parts Department (this value is necessary for replacing the load lever position potentiometer).

**Programming procedure:**

- select **full load programming** from the command mode.
- perform the programming operation

**B** The Lucas **DPC** digital computers are sold pre-configured to **with air conditioning**.

If the vehicle is not fitted with an air conditioning system, use the command modes to perform the **without air conditioning** programming.

The engine immobiliser system installed on the **LUCAS** diesel injection pumps is advanced. This now meets with the **7 keys** classification issued by the approval organization.

The advancements are:

- a modified protective screen; kept in place by five self-shearing bolts,
- fitting a pin to the protective screen (the protective screen cannot be removed unless the pin has been removed),
- a modified coded solenoid valve; built into the electrical solenoid.

SPECIAL TOOLING REQUIRED	
<b>Mot. 1372</b>	Kit for removing self-shearing bolts on coded solenoid valves
<b>Mot. 1372-02</b>	Drilling tube for self-shearing bolts
<b>Mot. 1441</b>	Socket for removing the coded solenoid valve
EQUIPMENT REQUIRED	
Ø 3.3 mm HSS drill bit Ø 4 mm screw-tap Ratchet screw-tap holder	

TIGHTENING TORQUES (in daNm)	
<b>Coded solenoid valve</b>	<b>1.75 ± 0.25</b>
<b>Self-shearing bolt</b>	<b>0.1 ± 1.2</b>

**Removal of the protective screen to access the coded solenoid valve must be carried out with the pump removed.**

**IMPORTANT: the threaded hole of the pin is delicate, use oil during the operation.**

### REMOVAL

Plug the pump high pressure outlets.

Drill the pin with a Ø 3.3 mm, **HSS** drill bit.

Tap the pin using a 4 mm set of screw-taps (**important:** much care must be taken when performing this operation, use oil when tapping).

Screw a Ø 4 mm and 30 cm long threaded rod into the pin.

#### Making a specific extraction tool:

Bore out a 4 mm diameter piece of metal.

Insert the metal piece into the threaded rod.

Fit a washer, a nut and a lock nut.

Extract the pin using the specific tool.

Drill the five self-shearing bolts to a depth of 4 mm using the drilling tube **Mot. 1372-02** and the Ø 4 mm drill bit supplied in kit **Mot. 1372**.

Use the **Mot. 1372** extraction tool and handle to remove the bolts (or any other type of extraction tool).

The bolts can also be removed using a hammer and chisel.

**NOTE:** before removing the diesel fuel arrival spacer, it is essential to ensure that the pump is clean, as metal particles from the shear bolts or the pin may be found around it.

Remove the diesel fuel arrival spacer.

Remove the protection fitting and the rear mounting fitting.

Remove the coded solenoid valve terminals from the pump connector.

Use the **Mot. 1441** socket to release the advance solenoid valve.

**REFITTING**

All removed seals must be replaced.

Fit the coded solenoid valve then tighten it to torque.

Fit the pump protective screen.

Check that the coded solenoid valve wire is not pinched.

Fit the diesel fuel arrival spacer.

Reposition the five self-shearing bolts, tighten them to a torque of **1.2 daNm** then shear them by bending them using a pipe locked onto the bolt heads.

Fit a new pin into its housing.

Reconnect the coded solenoid valve terminals.