

# RENAULT

Régie nationale des usines Renault

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## Amendment n°1

December 1971

# Workshop manual

## M.R. 156 1st Edition

**RENAULT 15** R 1300, R 1302

**RENAULT 17** R 1312, R 1313, R 1322, R 1323

Édition Anglaise

77 01 433 143

◆ F.A.D.D.K.E.It.NL.S.

" The repair methods given by the manufacturer in this manual are based on the technical specifications current when it is compiled.

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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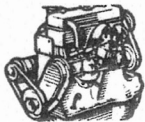
ENGINE

**B**

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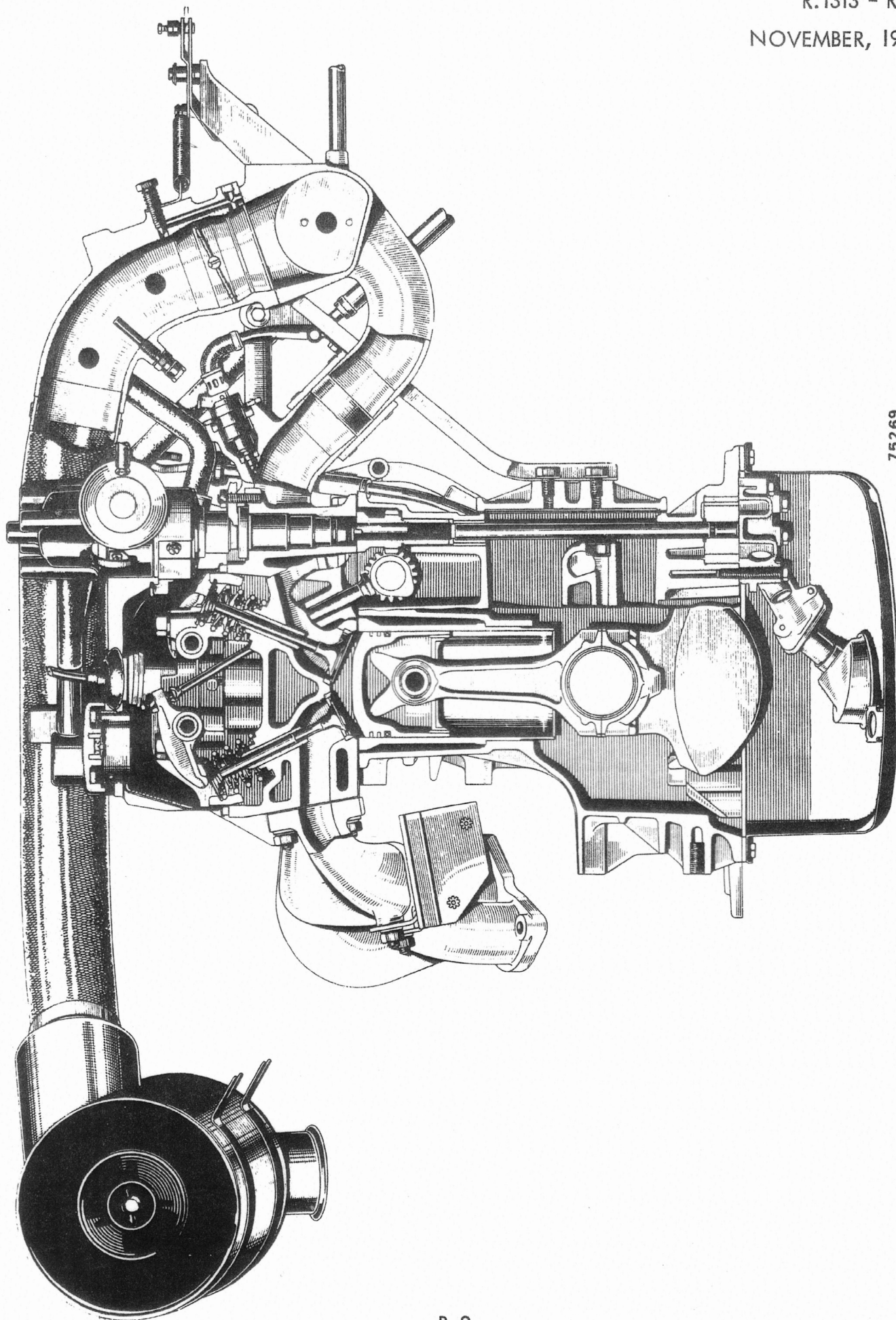




## SPECIFICATIONS

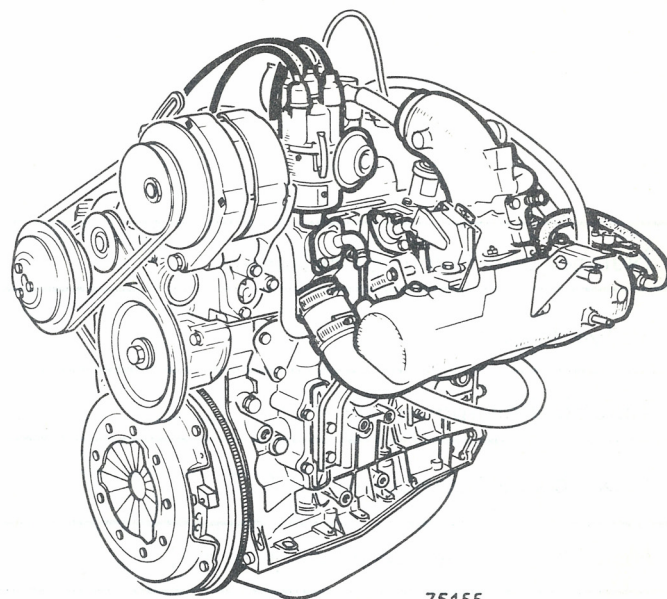
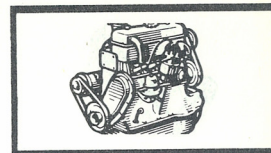
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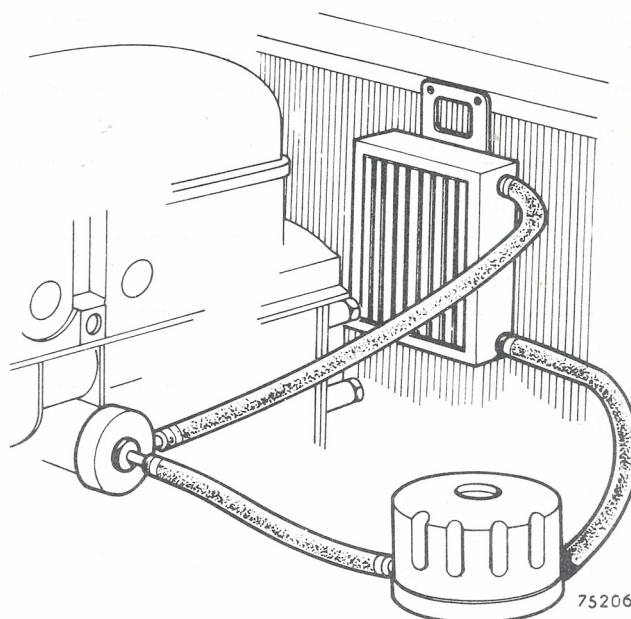
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R.1313 and R.1323 vehicles are fitted with an 807-12 engine having electronic fuel injection. Cooling is by means of a cooling fan motor unit attached to the radiator.



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This engine is fitted with an oil filter mounted on the R.H. cowl side and an aluminium oil cooler mounted behind the radiator.





Number and layout of cylinders	4 in line
Valve layout	Vee form
Taxable horsepower (France)	9 h.p.
Max. brake horsepower (S.A.E.)	120 b.h.p.
Max. b.h.p. delivered at (r.p.m.)	6250 r.p.m.
Max. torque (S.A.E.)	14 m.da N (100 lb/ft)
Max. torque delivered at (r.p.m.)	4500 to 5500 r.p.m.
Compression ratio	10,25 to 1
Bore	77 mm (3,032")
Stroke	84 mm (3,307")
Cubic capacity	1565 cc (95,5 cu. in.)
Idling speed	1100 to 1150 r.p.m.
Cooling system capacity	7 litres (12.1/4 Imp. pts - 14.3/4 U.S. pts)
Oil capacity	
- sump (oil pan)	4 litres (7 Imp. pts - 8.1/2 U.S. pts)
- filter and base	0,30 litre (1/2 Imp. pt - 1/2 U.S. pt)
- oil cooler	0,50 litre (1 Imp. pt - 1 U.S. pt)





The main differences when compared with the 807-10 engine (fitted to R.1302, R.1312, R.1322 vehicles) are as follows :

### CYLINDER HEAD

Machining of 3 tapped holes for fitting various sensors on the injection control system.

Fuel pump locating boss modified for fitting the auxiliary air control.

Rocker arm clearances, hot or cold :	
- Inlet	0,25 mm (.010")
- Exhaust	0,35 mm (.014")

### Valve seats

Seat angle	90° (included)
Seat width :	
- Inlet	1,3 to 1,6 mm (.051 to .063")
- Exhaust	1,7 to 2 mm (.067 to .079")
Outside diameter	
- Inlet	43 mm (1.693")
- Exhaust	37 mm (1.457")

### Valves

Stem diameter	8 mm (.315")
Valve free angle	90° (included)
Head diameter	
- Inlet	42,10 mm (1.658")
- Exhaust	35,35 mm (1.392")





### Valve springs

	Outer	Inner
Wire diameter	4,2 mm (.166")	3 mm (.118")
Coil internal diameter	27,6 mm (1.087")	19,8 mm (.780")
Free length (approx.)	46 mm (1.13/16")	41,5 mm (1.41/64")
Length under a load of : 25 da N (50 lbs) 47 da N (103 lbs)	31,5 mm (1.1/4")	25,5 mm (1")

### VALVE TIMING

Inlet valve opens :	40° B.T.D.C.
Inlet valve closes :	72° A.B.D.C.
Exhaust valve opens :	72° B.B.D.C.
Exhaust valve closes :	40° A.T.D.C.

### CONNECTING RODS

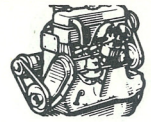
The connecting rod small end is fitted with a 21 mm (.827") dia. bush.

As spare parts, the connecting rods are sold in sets of 4.

### PISTONS :

Gudgeon pin fitting :	Fully floating
Direction of fitting :	Arrow pointing towards the flywheel
Gudgeon pin length :	66,4 mm (2,614")
Gudgeon pin diameter :	21 mm (.827")





R. 1313 - R. 1323

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Only the method of refitting the pistons differs from that on an 807-10 engine.

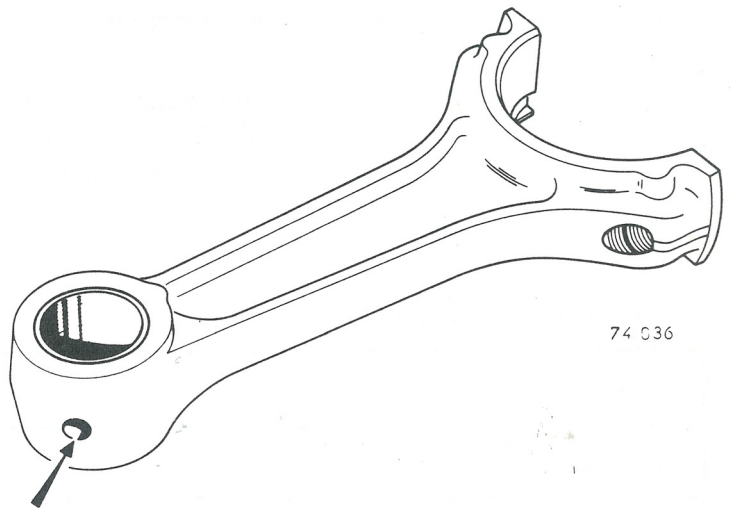
Remove one gudgeon pin retaining circlip.  
Push out the gudgeon pin and separate the piston from the connecting rod.

The gudgeon pin is fully floating, free turning in the connecting rod and piston.

There is a bush in the connecting rod small end.  
If the new gudgeon pin has excessive clearance, fit a new bush, taking care to line up its oil hole with that on the connecting rod.

Ream it so as to obtain a sliding fit of the gudgeon pin.

Check that the connecting rod is square and free from twist.



### Fitting the gudgeon pin

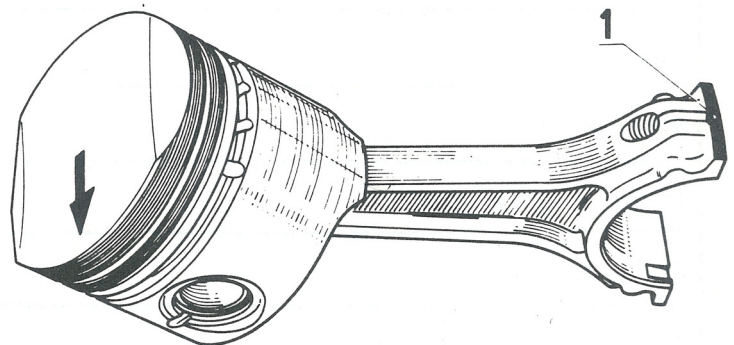
Fit one circlip to the piston.

Insert the gudgeon pin into the piston and connecting rod.

Fit them the right way round :

- arrow on the piston pointing downwards
- number on the connecting rod big end towards the right, with the piston crown facing the operator.

Fit the second circlip and make sure that no tight spots exist.





## DRIVE BELT

### Tension



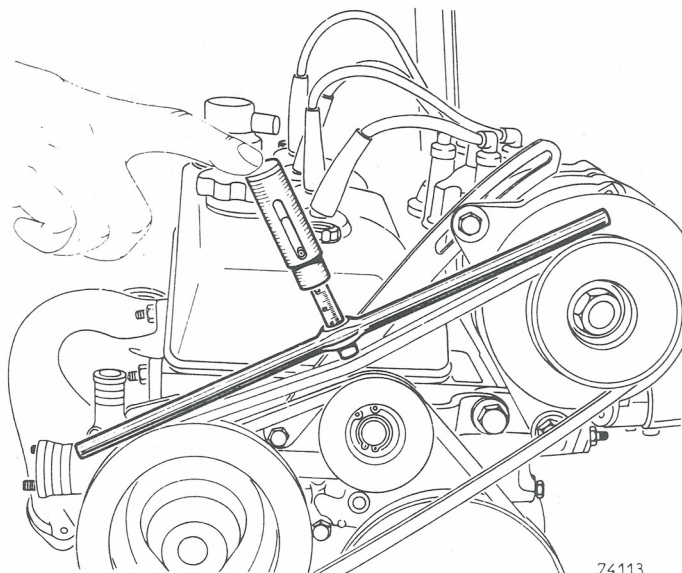
R. I302-R. I312-R. I313-R. I322-R. I323

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The drive belt tensions are checked with the Ele.346 tool.

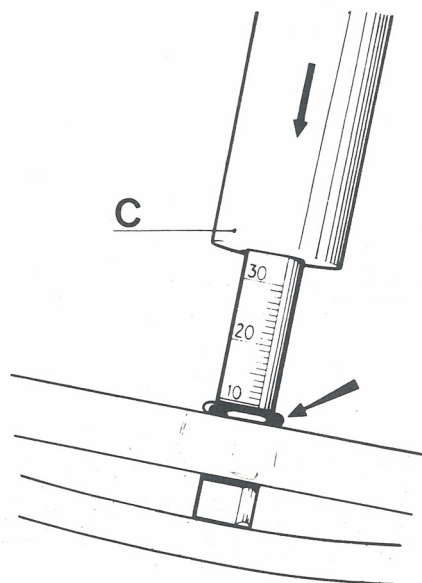
### CHECKING METHOD

Check that the underside of the rubber ring is opposite the zero graduation on the plunger. Lay the bar along the drive belt, with the plunger equi-distant between the pulley centres.

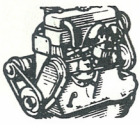


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Press the sliding portion of the plunger until the shoulder (C) is flush with the plunger body. Remove the tool and read off the value of the deflection on the underside of the rubber ring.

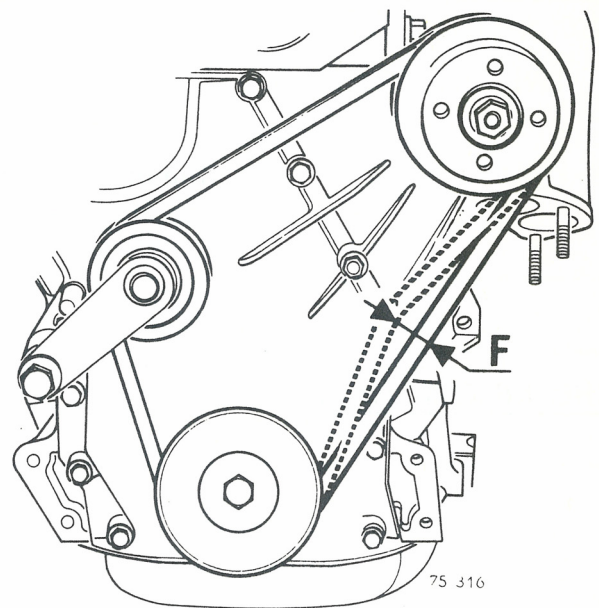


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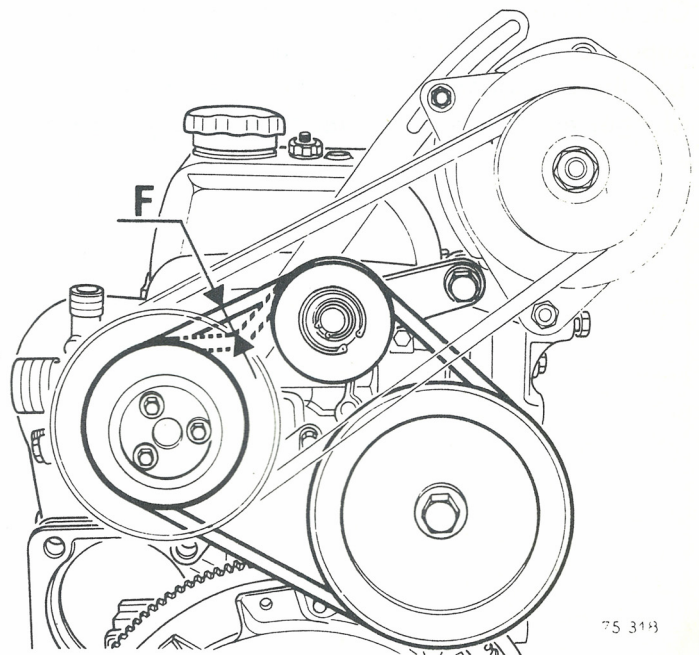
## FAN BELT

The deflection (F) must be measured on the taut side between the crankshaft and fan pulleys :  
Value of deflection : 2,5 to 3,5 mm ( $3/32$  to  $9/64$ " )



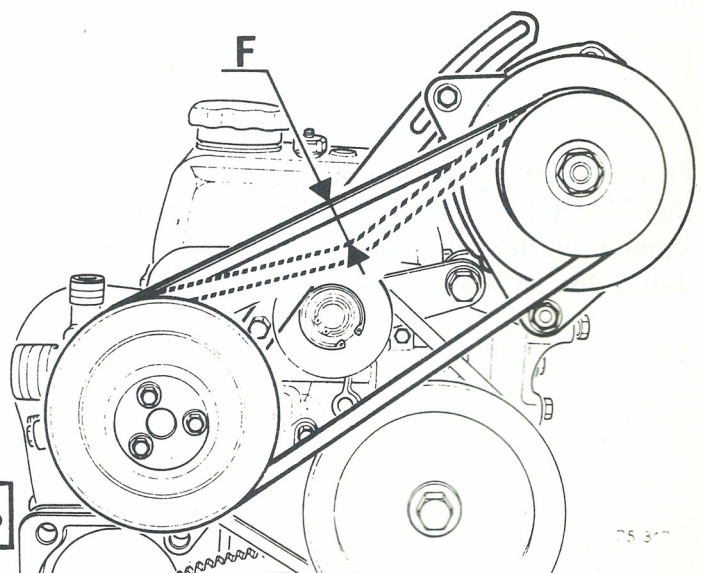
## WATER PUMP BELT

The deflection (F) must be measured on the slack side between the tensioner and water pump pulleys.  
Value of deflection : 1,5 to 2,5 mm ( $1/16$  to  $3/32$ " )



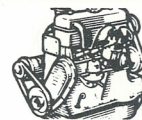
## ALTERNATOR BELT

The deflection (F) must be measured on the taut side between the alternator and water pump pulleys.  
Value of deflection : 4,5 to 5,5 mm ( $11/64$  to  $7/32$ " )



All the above values replace those given on page B-6



DESCRIPTION

The electronic injection system consists of two main parts :

- The fuel supply system, consisting of :

The electric fuel pump  
The fuel filter  
The pressure regulator  
The injectors  
The cold start injector

- The control system, consisting of :

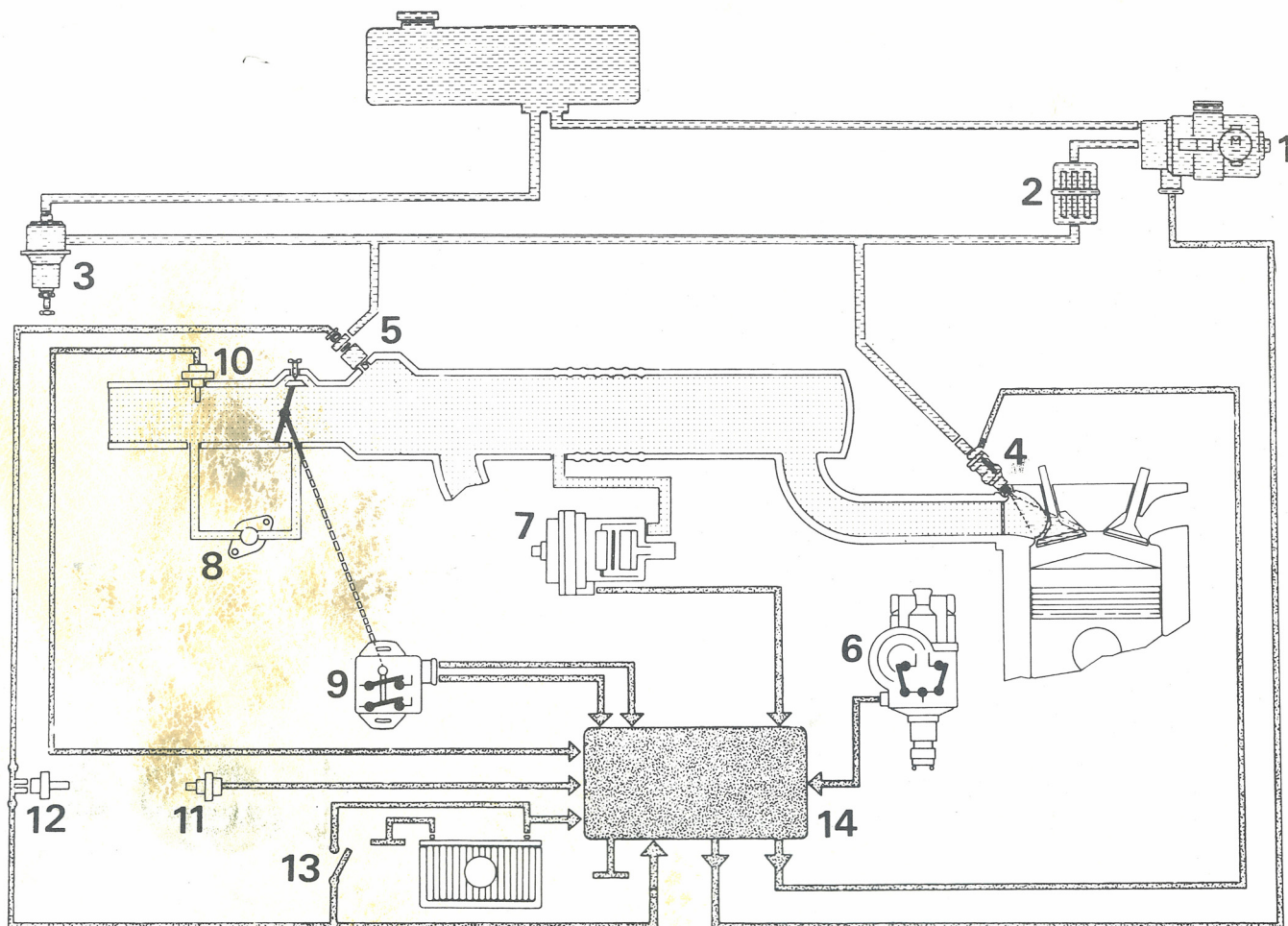
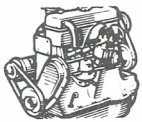
The distributor  
The pressure sensor  
The auxiliary air control  
The throttle switch  
The air temperature sensor  
The water temperature sensor  
The temperature time switch  
The ignition starter switch  
The control box  
The main relay  
The pump relay

OPERATION

The electric fuel pump sucks fuel and pumps it via a filter to the ring main and its branches up as far as the injectors.

At the end of the ring main there is a pressure regulator which automatically keeps the fuel pressure to approximately 2 bars (28.1/2 p.s.i.) The various values sensed by all the indicators in the control system are fed into the control box, this converts them into electric impulses and transmits them to the injectors.

In this way they enable a precise metered quantity of fuel to be obtained at any given time according to the engine's requirements.

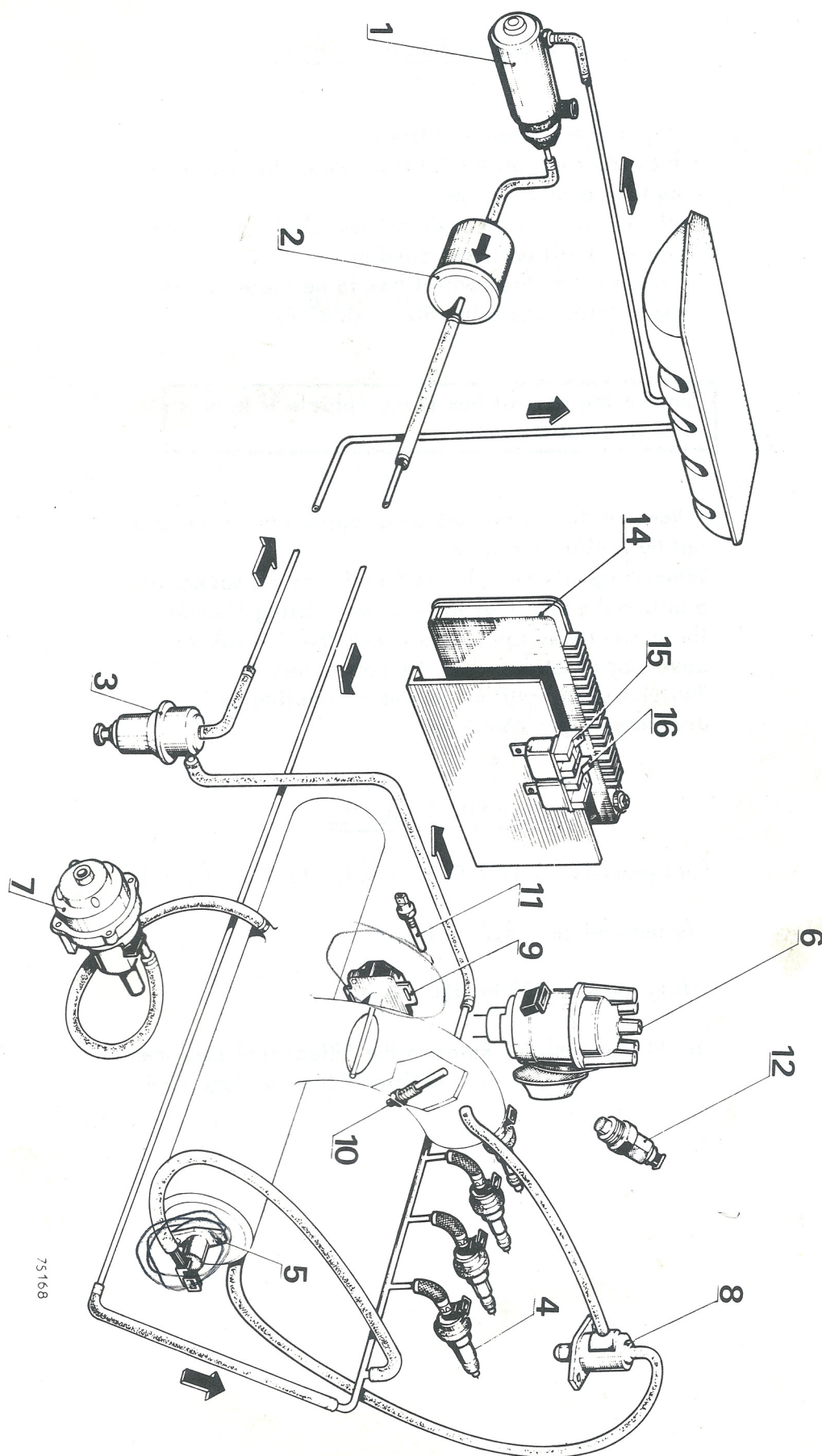
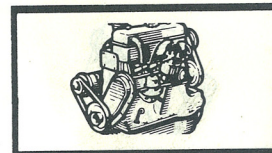


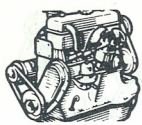
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- 1 - Electric fuel pump
- 2 - Fuel filter
- 3 - Pressure regulator
- 4 - Injectors
- 5 - Cold start injector
- 6 - Distributor
- 7 - Pressure sensor
- 8 - Auxiliary air control
- 9 - Throttle switch

- 10 - Air temperature sensor
- 11 - Water temperature sensor
- 12 - Temperature time switch
- 13 - Ignition starter switch
- 14 - Control box
- 15 - Main relay
- 16 - Pump relay







### SPECIAL PRECAUTIONS

- Never run without a battery
- Never switch on the ignition when the battery is coupled up to a charger
- Never connect up or disconnect the control box when the ignition is switched on
- Never allow the control box to be subjected to temperatures exceeding 80° C (176° F)

Remove the control box if the vehicle is to pass through a paint oven

- Remove the connectors by gripping their sides and not by pulling the wires.

When a connector is being fitted into the socket of a unit make sure that the one way fitting chamfer is the correct way round and check that the rubber covers completely cover the connectors.

Switch off the ignition before connecting or disconnecting a connector.

### ADJUSTING VALUES

Fuel pressure : 2 to 2,05 bars (28,5 to 29,2 p.s.i.)

CO percentage : 2,5 to 4

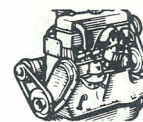
Idling speed : 1100 to 1150 r.p.m.

Distributor timing : Refer to the "Electrical Equipment and Ignition" chapter Page C-4



## ADJUSTMENTS

### Idling speed



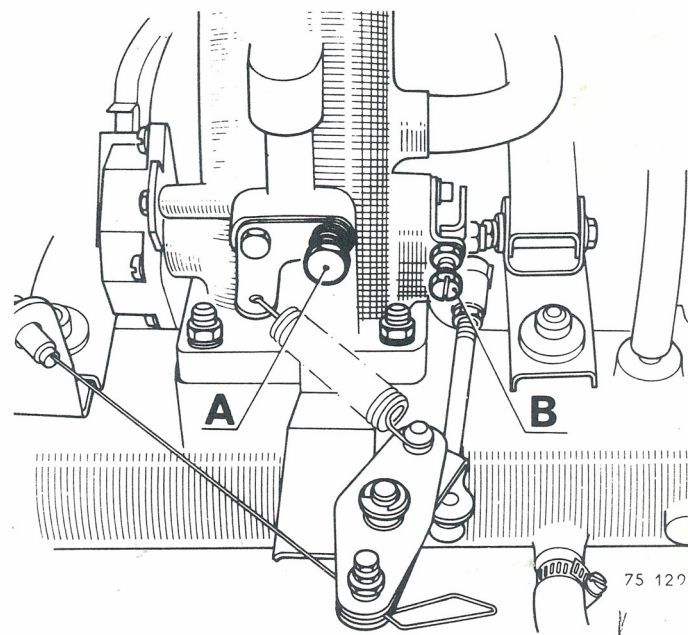
R.1313 - R.1323

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- Two adjustments have to be made :
- The idling speed with the air screw (A) and the throttle stop screw (B)
  - The CO percentage with the control box potentiometer (I).

### Idling speed

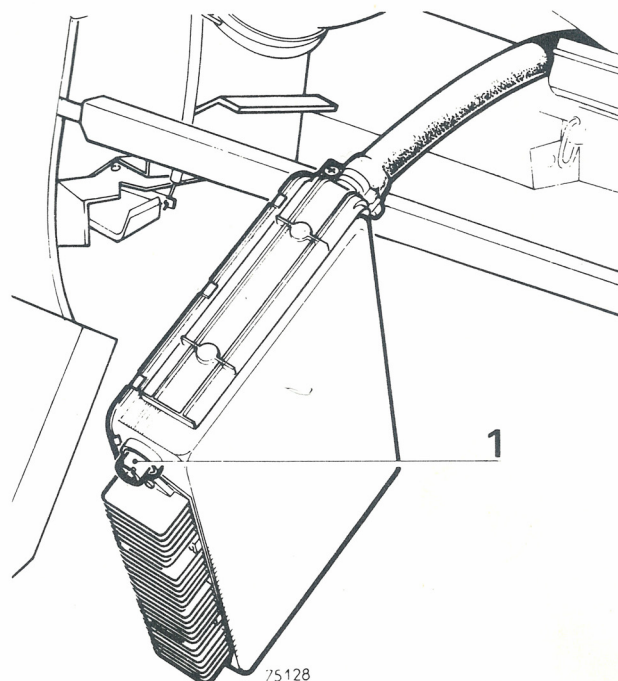
Screw the air screw (A) right in.  
Turn screw (B) to obtain an engine speed of between 900 and 1000 r.p.m.  
Finalise the adjustment by unscrewing the air screw (A) to obtain an engine speed of between 1100 and 1150 r.p.m.



### CO percentage

Adjust the CO percentage, using the control box potentiometer (I), so that it is between 2,5 and 4.  
The CO percentage is reduced by turning the potentiometer (I) anti-clockwise.

Correct any speed variations by turning screw (A) to obtain an engine idling speed of 1100 and 1150 r.p.m.  
If it is impossible to correct the CO percentage check the adjustment of the throttle switch.



## FUEL PUMP-FILTER

Removing-Refitting

15.801

15.800

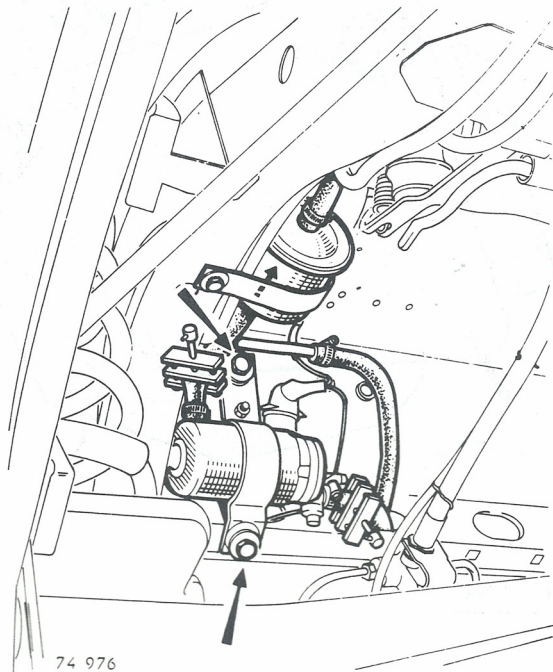


R.1313 - R.1323

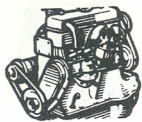
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Remove the cover and electrical connector.  
Clamp the fuel pipes with the Mot.453 clamps and remove the pipes.  
Unscrew the mounting points and remove the pump.  
When refitting the pump, take care to fit the connector correctly and refit its cover.

When refitting the filter, take care to align the arrow so that it faces in the direction of fuel flow.







## THROTTLE SWITCH

15.820

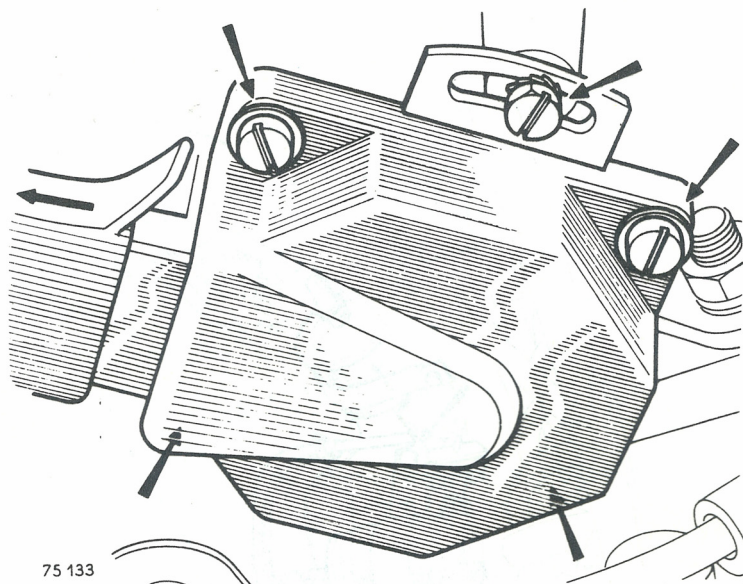
Removing-Refitting-Adjusting

R.1313 - R.1323  
NOVEMBER 1971

### REMOVING

Withdraw :

- the connector
  - the 4 switch cover screws and remove the cover.
- Unscrew the 2 switch fixing screws and free it from its spindle by pulling it off endways.

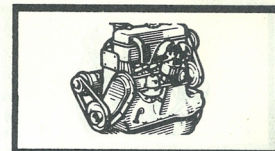


### REFITTING

Refit the switch and its cover, but do not tighten the 2 fixing screws so that an adjustment can be made.

Push the connector back in position.

Adjust the switch.



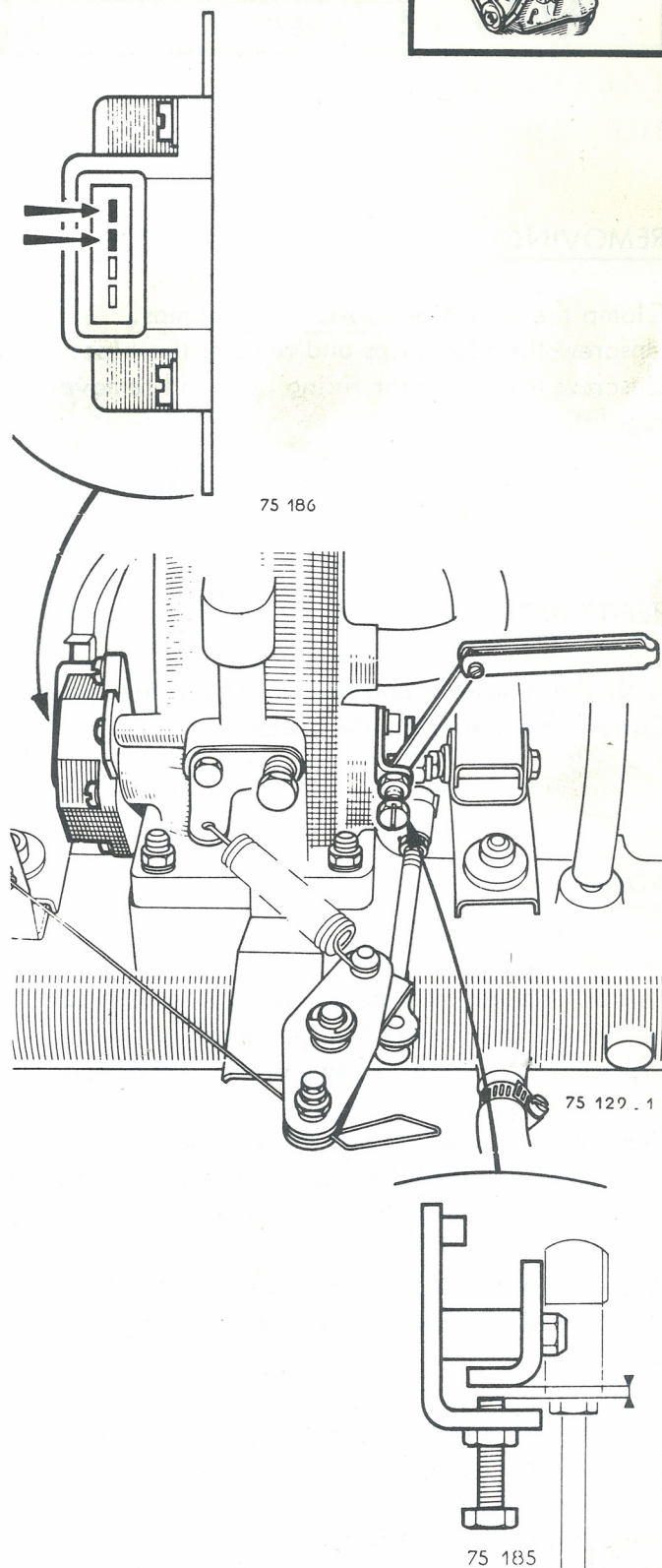
## ADJUSTING

This adjustment may be carried out, either :  
by connecting an ohm-meter to the top two terminals  
on the switch, after having removed the connector  
(see drawing) :

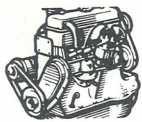
- or by connecting up on the test box and setting  
it up to check the switch.

Insert first one feeler gauge, 0,10 mm (.004") thick  
then another 0,20 mm (.008") thick between the  
throttle stop screw and the operating lever.

Unscrew the two switch fixing screws slightly and  
turn the switch so that the contacts are closed  
(0 resistance) when the 0,10 mm (.004") feeler  
gauge is inserted and open ( $\infty$  resistance) when  
the 0,20 mm (.008") feeler gauge is inserted.  
Tighten both fixing screws.







## PRESSURE REGULATOR

15.870

Removing-Refitting-Adjusting

R.1313-R.1323

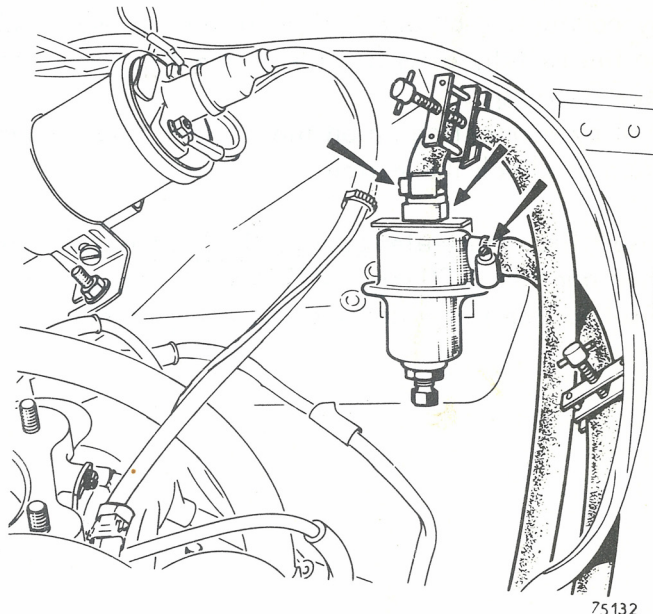
NOVEMBER 1971

### REMOVING

Clamp the fuel pipes : Mot.453 clamps.  
Unscrew the pipe clips and remove the pipes.  
Unscrew the regulator fixing nuts and remove the regulator.

### REFITTING

Refit the regulator and reconnect the fuel pipes.  
Carry out a fuel pressure check.



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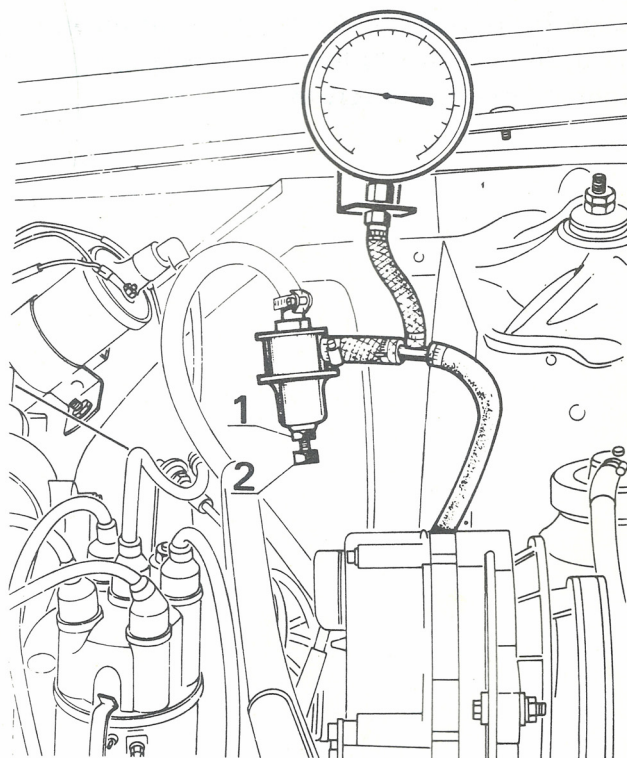
### ADJUSTING

This adjustment must be carried out with great precision because the fuel pressure has a great influence on fuel consumption and the composition of exhaust gases.

Connect up the B.Vi.466 pressure gauge, fitted with the B.Vi. 466-01 hoses, between the injector ring main and the pressure regulator.

Pressurise the circuit, either by running the engine at idling speed (1000 r.p.m.) or by using the test box.

Unscrew the locknut (1) and adjust the pressure : 2 to 2,05 bars (28,5 to 29,2 p.s.i.) with screw (2).  
Carry out a pressure check at fast idling speed.  
If the pressure exceeds 2,2 bars (31,3 p.s.i.) check that the fuel return pipe to the fuel tank is neither blocked nor pinched.

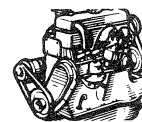


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## INJECTOR

Removing-Refitting

15.880

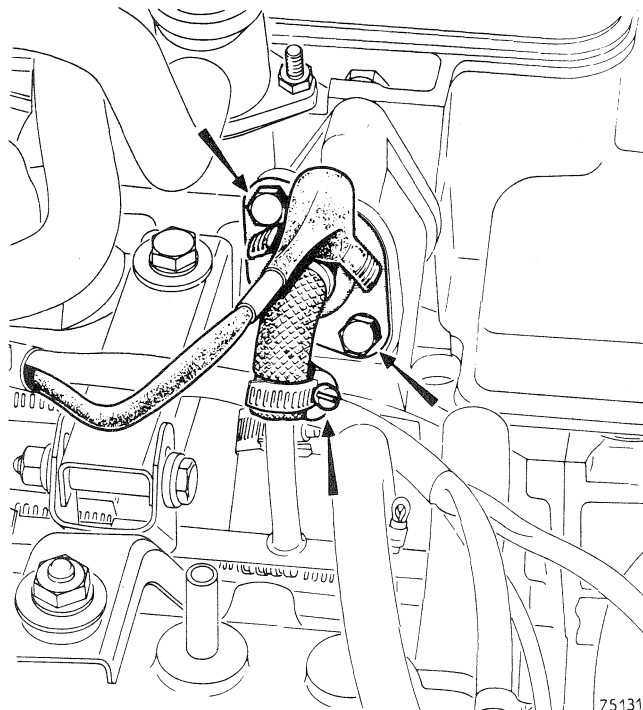


R.1313 - R.1323

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### REMOVING

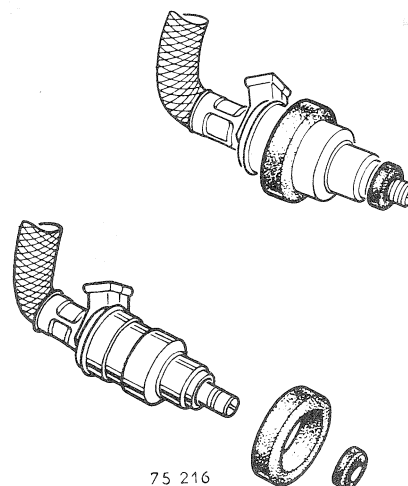
Remove the injector connector.  
Remove the fuel pipe fixing clip and free the pipe from the ring main.  
Unscrew the 2 injector fixing bolts and remove the injector with its support plate.



75131

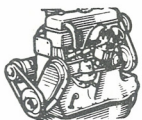
### REFITTING

Clean the area of the joint seal thoroughly before refitting the injector.  
Inspect the seals and change them if necessary.  
Refit the connector correctly and fit its protective cover.



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## CHECKING METHOD

15.910

The system is checked by :

- either the MS.542 instrument
- or the MS.546 and MS.547 instruments

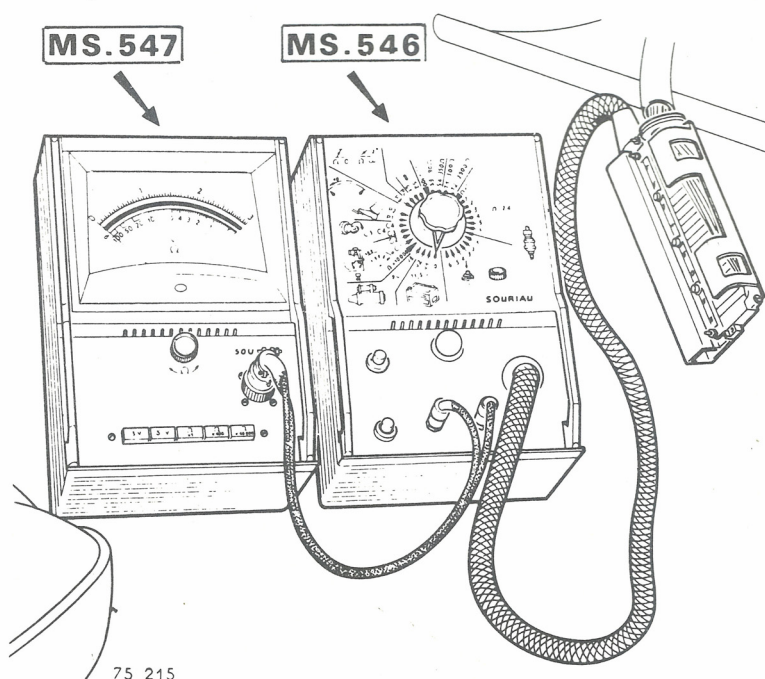
### CONNECTIONS

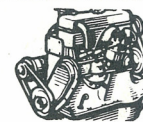
- For MS. 546 and MS.547

Remove the control box.

Attach the connector from the MS.546 instrument to that on the vehicle wiring harness.

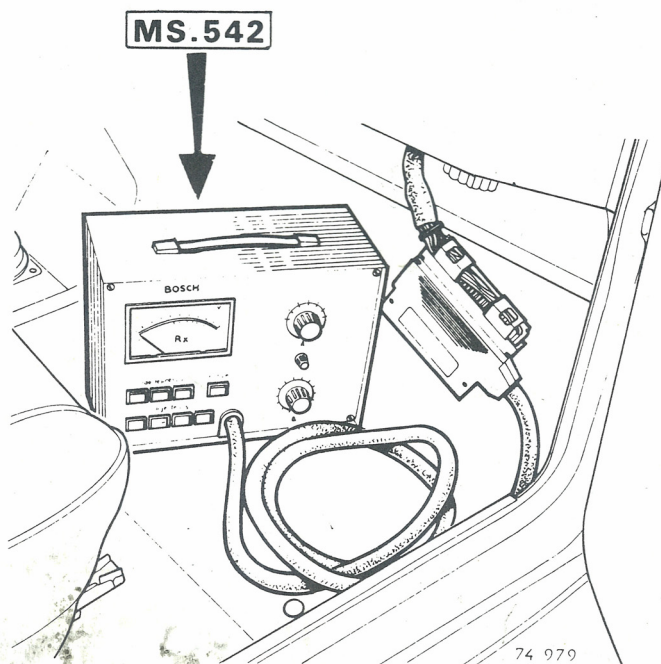
Then connect up the M.S. 547 instrument (ohm-meter-voltmeter) to the MS.546 instrument.





- For MS.542

Remove the control box.  
Attach the connector from the checking instrument to that on the vehicle wiring harness.



SPECIAL INSTRUCTIONS

Before any check, make sure that :

- the incidents do not arise from a component which is not part of the injection system (spark plugs, distributor, distributor advance setting, etc.)
- fuel is reaching the injectors.

To do this, remove one injector, leaving it connected to the ring main.

Pressurise the circuit by switching on the ignition.

Press the injector needle to lift it off its seat and check the fuel flow.

Do not connect up or disconnect a unit without first switching off the ignition.

Disconnect the ignition coil l.t. wire to prevent it from overheating.

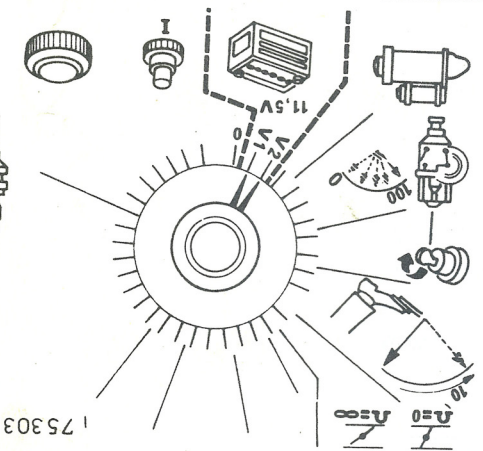
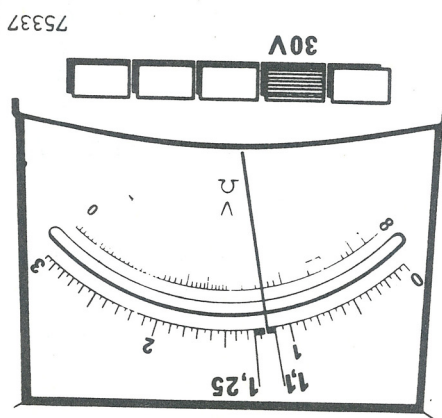




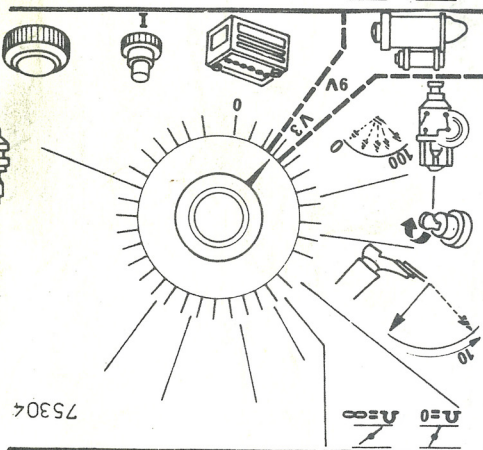
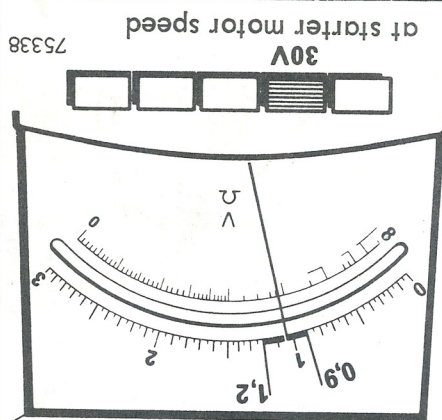
# CHECKING

MS. 546 - 547

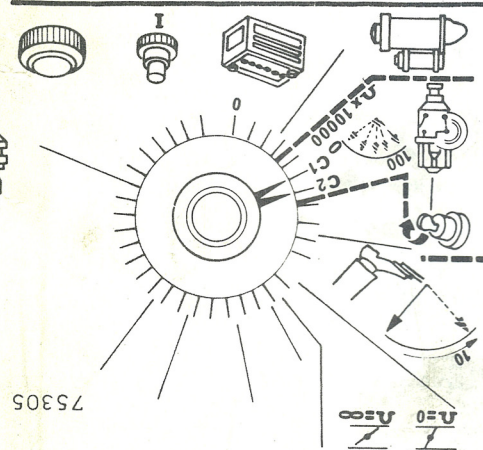
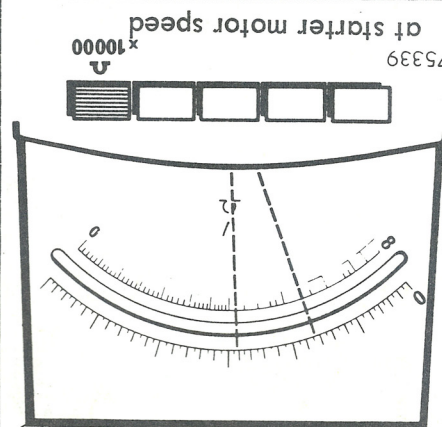
Control box supply voltage



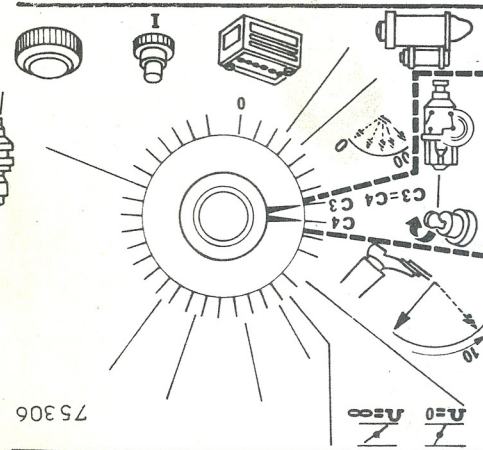
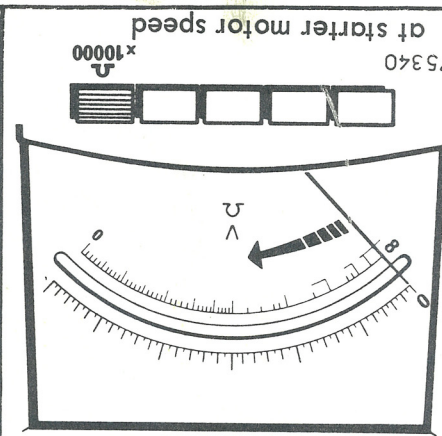
Starter voltage



Operation of the distributor's triggering contacts



Triggering contacts phase difference

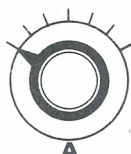
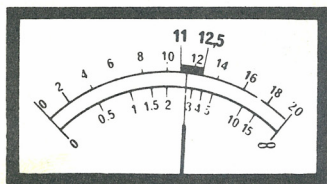




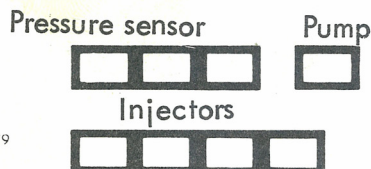


MS.542

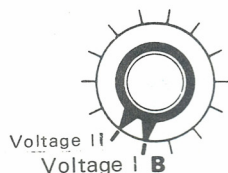
REMARKS



Adjustment ∞



75279



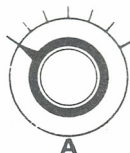
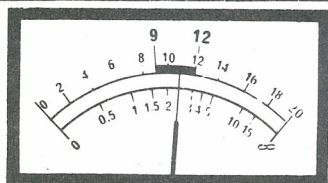
Nil voltage :

# 1

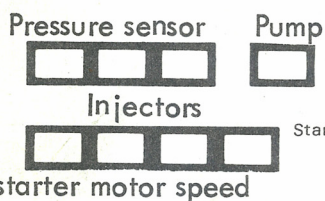
Check the control box feed cables, also the main relay.

Voltage less than 11v. :

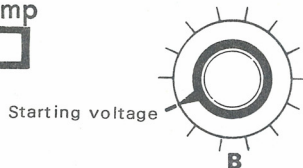
Check the state of battery charge. If it is correct, check the control box feed wire.



Adjustment ∞



75280



Nil voltage, starter operating :

# 2

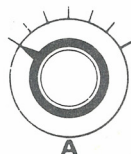
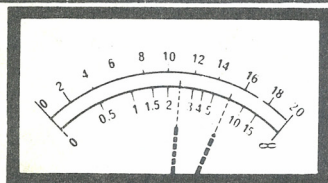
Check the cable between the starter and control box.

Nil voltage, starter not operating :

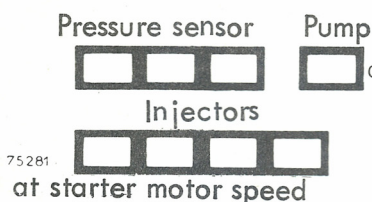
Check the ignition-starter switch and the starter feed cable.

Voltage less than 9 v :

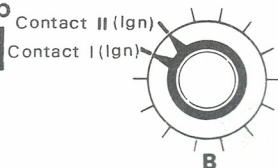
Check the state of battery charge and the starter feed cable.



Adjustment ∞

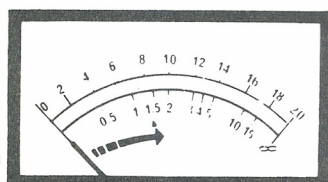


75281



If the needle does not oscillate, check the connections and wires in the contacts compartment. If they are sound, change the contacts compartment.

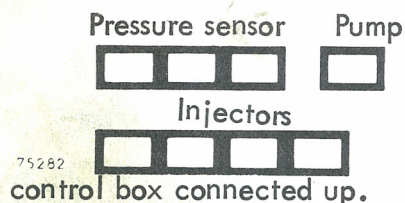
# 6



Contact II (Ign)  
Contact I (Ign)



Adjustment ∞



75282

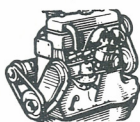


The needle should stabilise itself to an average value which is equal for both contacts.

If it does not, change the contacts compartment.

Adst Test

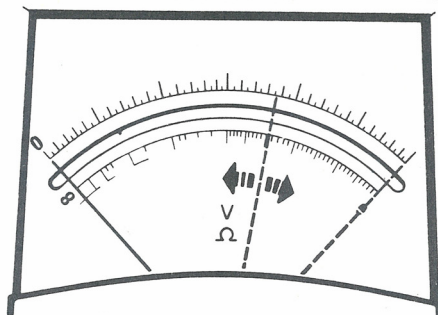




# CHECKING

MS.546 - 547

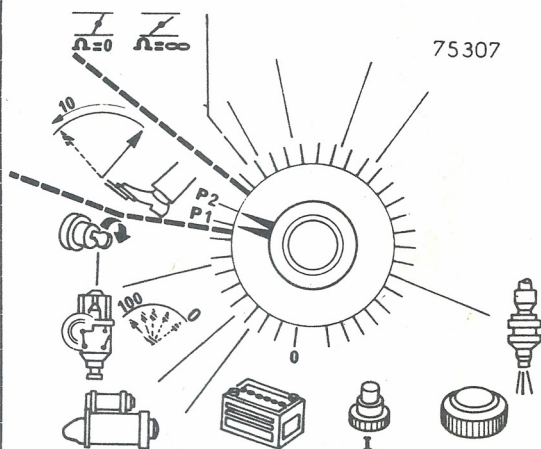
## Temporary enrichment



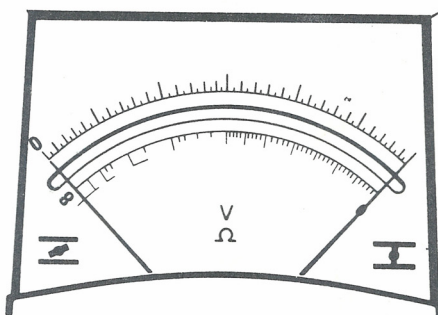
75341

$\times 10000$

Press the accelerator pedal lightly

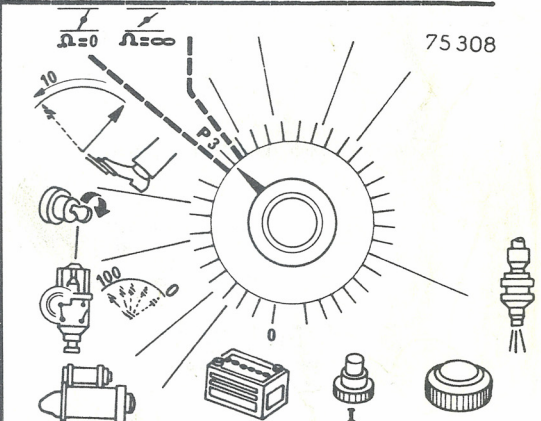


## Throttle switch operation and adjustment

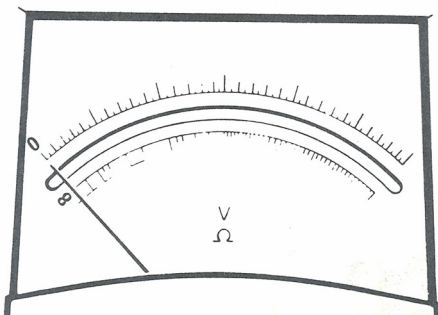


75342

$\times 10000$

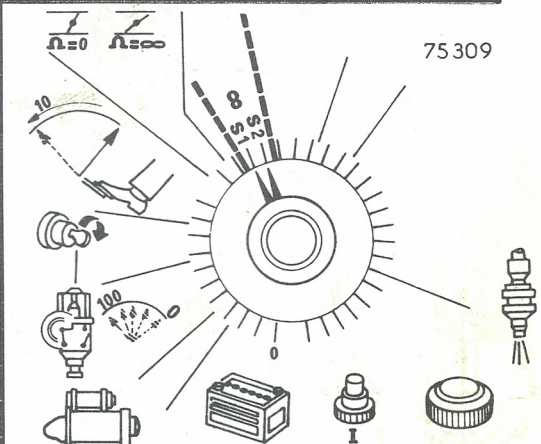


## Resistance between the pressure sensor windings and earth (ground)

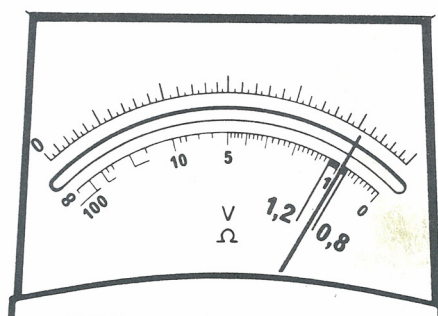


75343

$\times 10000$

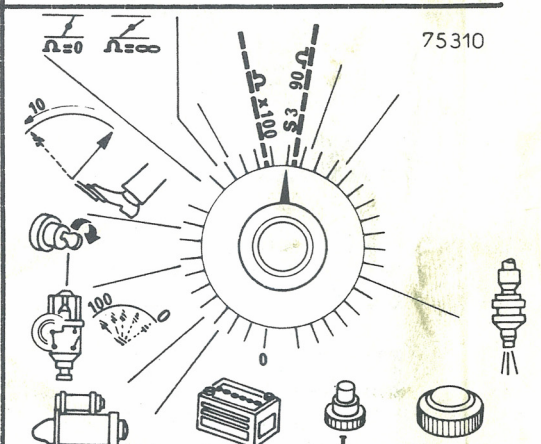


## Primary winding resistance

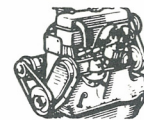


75344

$\times 100$

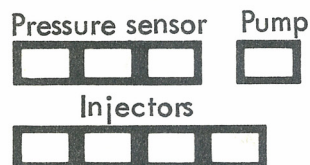
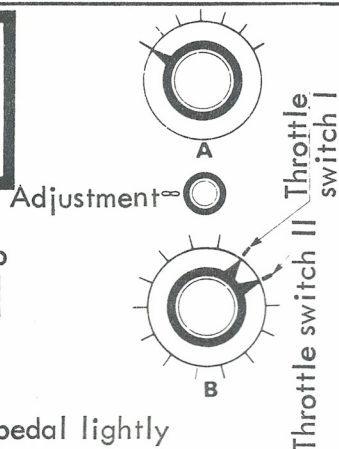
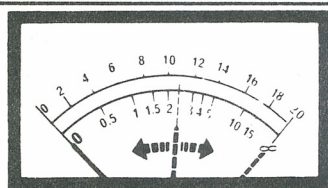






MS. 542

REMARKS

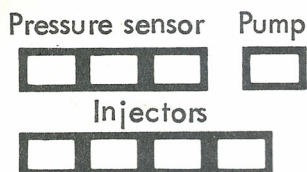
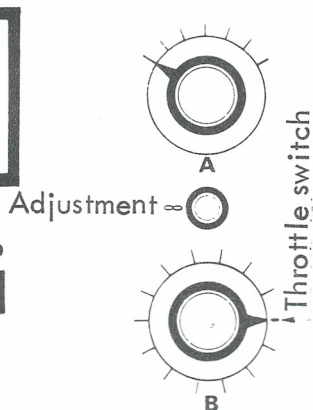
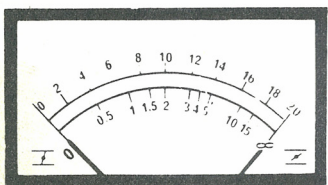


75283

press the accelerator pedal lightly

#7

If the needle fails to oscillate ten times or if it fails to return to " $\infty$ " when idling, change the throttle switch.

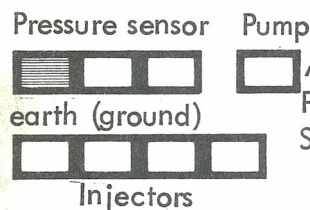
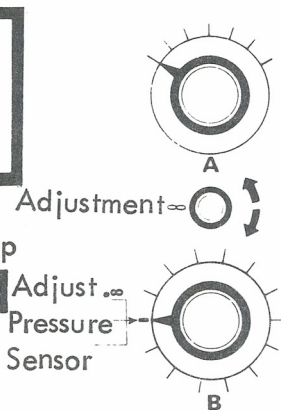
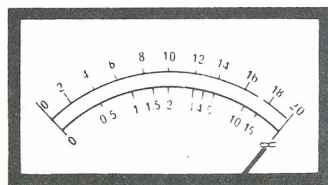


75284

Resistance " $\infty$ " when idling (#8)  
(0,10 mm (.004") feeler gauge inserted between the throttle stop screw and lever).  
Check the switch adjustment, check condition of cables. If the needle is still on " $\infty$ ", change the switch.

Resistance on fast idle  
(0,20 mm (.008") feeler gauge inserted between the throttle stop screw and the lever).

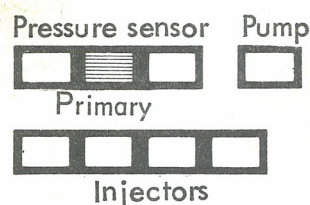
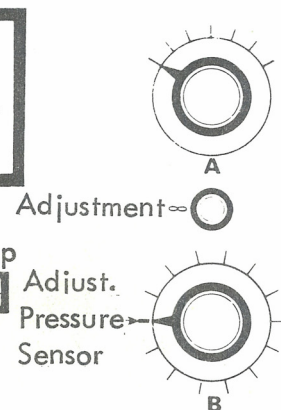
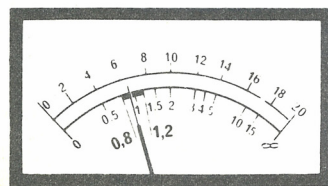
Check the switch adjustment and the cables.



75285

Nil resistance or less than infinity : (#3)

Check the cable harness.  
If it is sound, change the pressure sensor.



75286

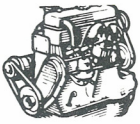
Resistance lower or nil : (#4)

Remove the connector, then, if the needle moves to " $\infty$ ", change the sensor.

Resistance higher or " $\infty$ "

Remove the connector and connect a short wire across the two outer terminals ; if the needle now swings to " $\infty$ " change the cables, if it swings to "0", change the sensor.

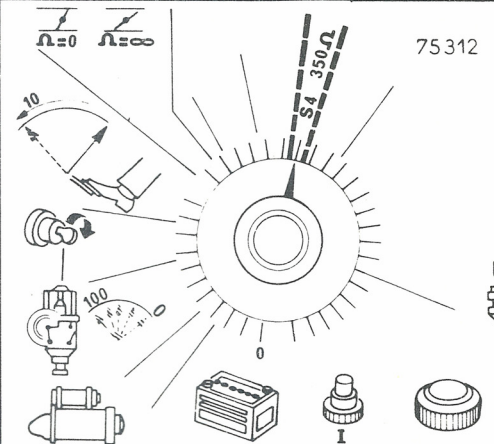
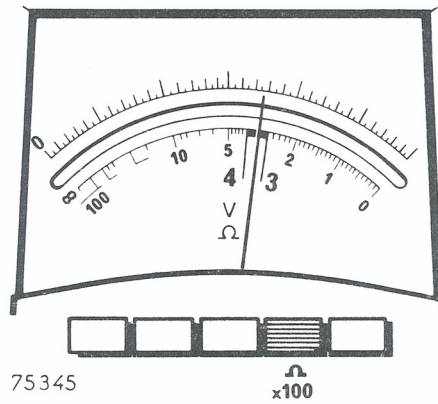




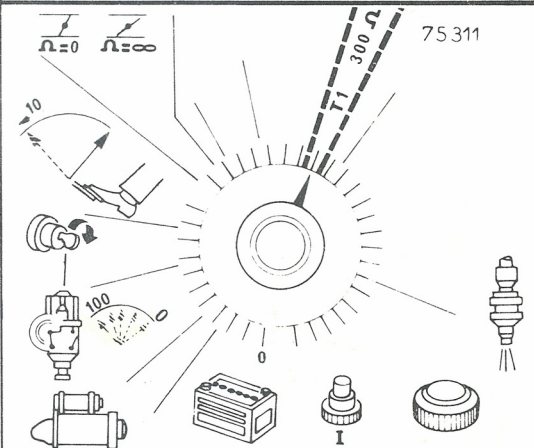
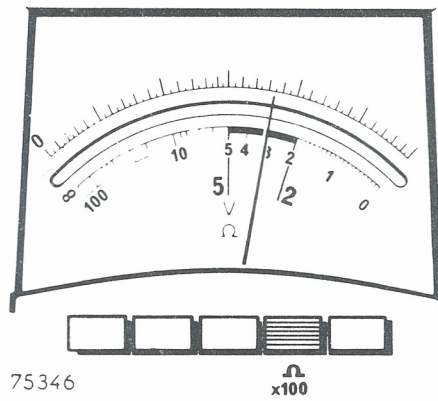
# CHECKING

MS.546 - 547

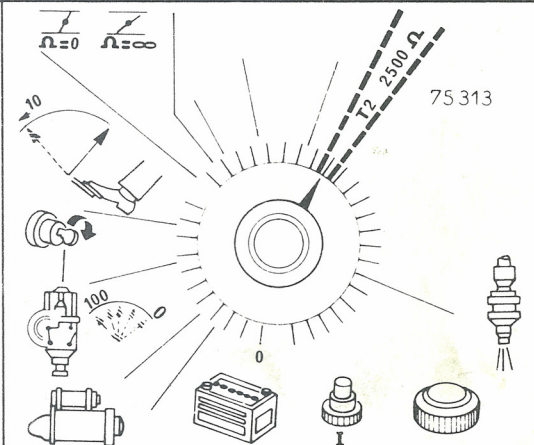
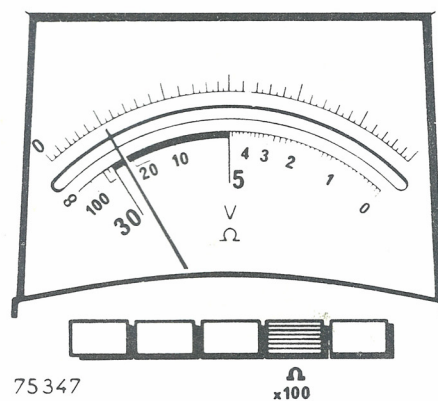
Secondary winding resistance



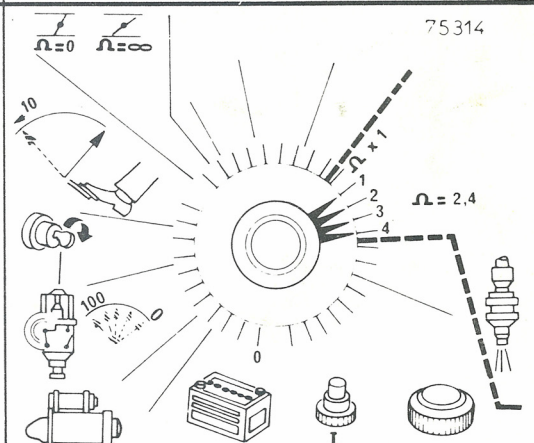
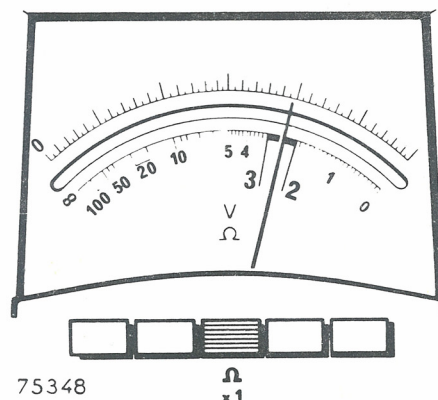
Air temperature sensor resistance

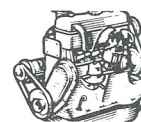


Cooling liquid temperature sensor



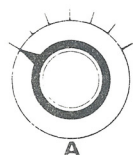
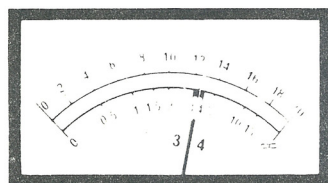
Injector windings



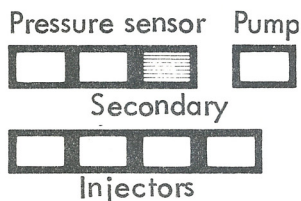


MS.542

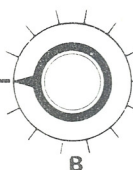
REMARKS



Adjustment ∞



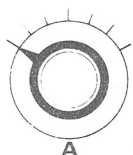
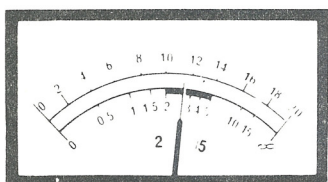
Adjust Pressure Sensor



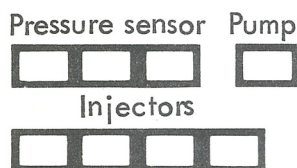
B

#5

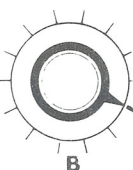
As for the primary but connect a short wire across the two inner terminals



Adjustment ∞



Temp. sensor I



B

The set value is valid at + 20°C (see table)

Needle reaches "0" or "∞"

Check the wires; if they are sound, change the sensor.

#9

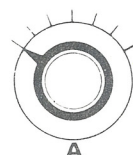
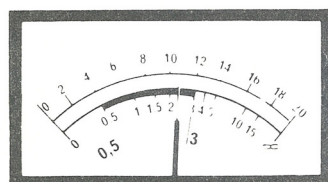
#10

Air temperature

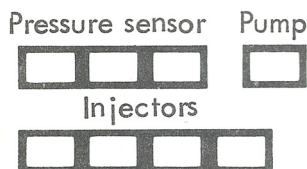
Water temperature

- 10°C	960 Ω
0°C	640 Ω
10°C	435 Ω
20°C	300 Ω
30°C	210 Ω
40°C	150 Ω
50°C	108 Ω
60°C	80 Ω

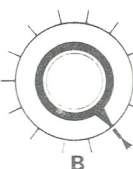
- 10°C	9200 Ω
0°C	5900 Ω
10°C	3700 Ω
20°C	2500 Ω
30°C	1700 Ω
40°C	1180 Ω
50°C	840 Ω
60°C	600 Ω
70°C	435 Ω
80°C	325 Ω
90°C	250 Ω
100°C	190 Ω



Adjustment ∞



Temp. sensor II



B

The resistance varies from 2 to 3 Ω depending on the temperature :

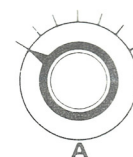
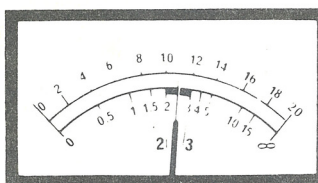
#11

Nil or infinite resistance :

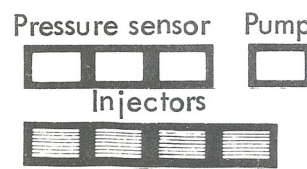
Check the wires ; if they are sound, change the injector.

Resistance more than 3 Ω !

Check the alternator earth (ground)



Adjustment ∞



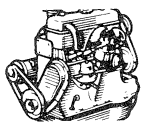
B Injectors



B

Key 1 = No. 1 cyl. Key 3 = No. 2 cyl. ) MS.542  
Key 2 = No. 4 cyl. Key 4 = No. 3 cyl. )



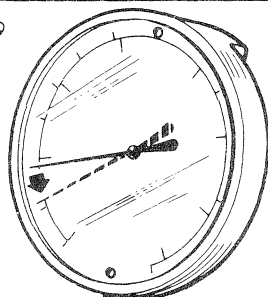


## CHECKING

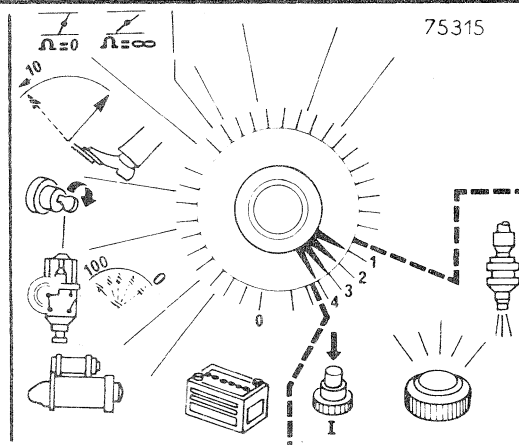
MS.546 - 547

### Operation of injectors

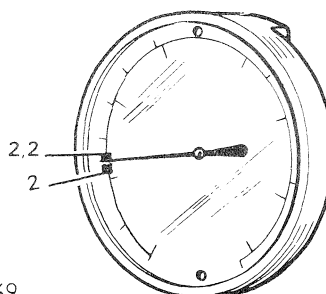
75349



To follow this test, connect up a pressure gauge between the pressure regulator and the injectors' ring main



### Fuel pressure



75349

Press the "pump" pushbutton and check the pressure.  
It should lie between 2 and 2,2 bars.

### Return pipe sealing

Pressurise the circuit.  
The pressure may fall rapidly down to 1 bar, but should fall only very slowly after that.

### Cold start injector and temperature time switch

Cooling liquid temperature below 35°C.

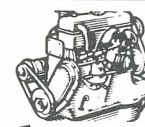
Switch on the pump, operate the starter for a short while.

The pressure should drop slowly.

Cooling liquid temperature above 35°C.

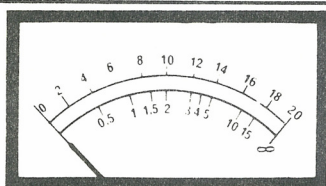
Switch on the pump, then operate the starter.  
No pressure drop present

Remove the temperature switch connector and earth (ground) the No. 36 wire.  
Visible pressure drop present.



MS.542

REMARKS



Sonde de Pression Pompe



Injecteurs

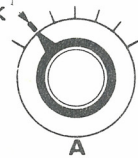


75291

Key 1 Key 2 Key 3 Key 4

To follow this test, connect up a pressure gauge between the pressure regulator and the injectors ring main.

Injector check



A

Adjustment

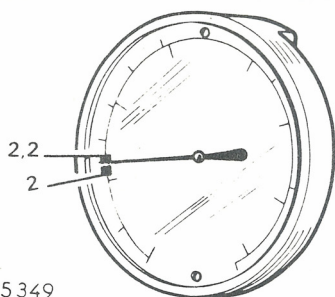


B

# 12

Make the injectors work only very briefly, to avoid flooding the cylinders.

If there is no pressure drop : make the test after removing the injector concerned.



75349

Press the "pump" pushbutton and check the pressure. It should lie between 2 and 2,2 bars.

If no pressure, and the pump operates :  
There is a leak in the fuel return pipe or a fault in the pressure regulator. Check them.

If no pressure and the pump does not operate :  
Check the wires, relays and pump  
If the pressure is incorrect, adjust the pressure regulator.

Pressurise the circuit.  
The pressure may fall rapidly down to 1 bar, but should fall only slowly after that.

# 13

If the pressure continues to fall very rapidly, check the fuel lines and pressure regulator.

Cooling liquid temperature below 35°C.  
Switch on the pump, operate the starter for a short while.  
The pressure should drop slowly

If the pressure is not seen to drop, change the temperature switch or check the cold start injector : Windings resistance 4,2  $\Omega$  at + 20°C.  
Carry out a test with the injector removed.

Cooling liquid temperature above 35°C.  
Switch on the pump, then operate the starter.  
No pressure drop present.

# 14

If pressure drop is present, change the temperature switch

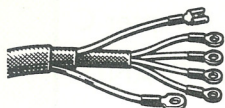
Remove the temperature switch connector and earth (ground) the No. 36 wire.  
Visible pressure drop present.

If pressure drop is not present : check the wires and the cold start injector.



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## SPECIFICATIONS

R.1313 - R.1323  
NOVEMBER 1971

### — ENGINE ELECTRICAL —

#### DISTRIBUTOR

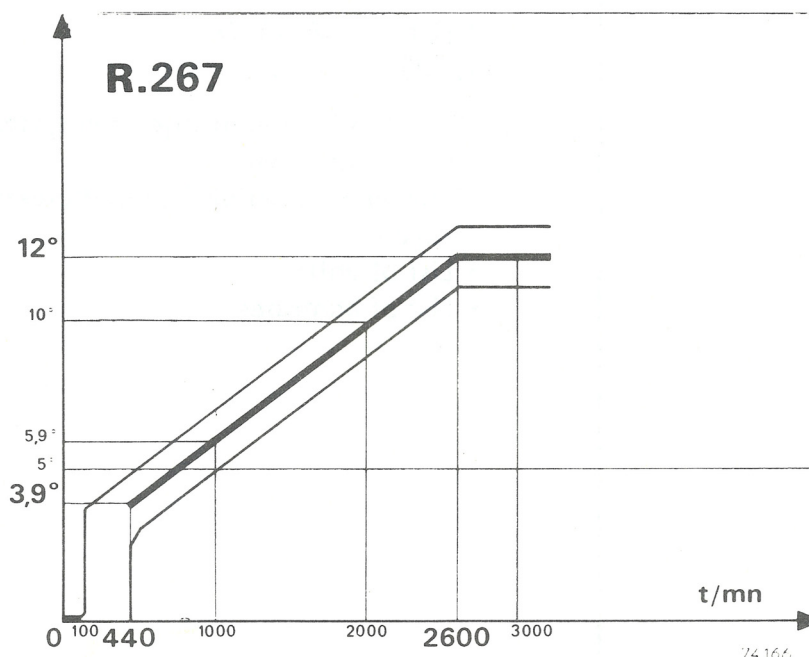
Bosch, with triggering contacts.  
This distributor has a vacuum capsule fitted  
which is used on certain versions only.

Centrifugal advance curve	Dwell per- centage (%)	Cam angle (degrees)	Crankshaft setting (degrees)	
			Initial Static	* Engine running at 1100 r.p.m.
R.267	$63 \pm 3$	$57 \pm 3$	$8 \pm 1$	* $16 \pm 2$

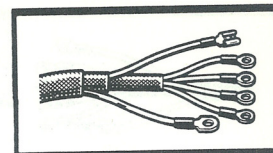
\* Obligatory check using a stroboscopic lamp

#### Curve

Curve drawn in distributor degree and distributor r.p.m.







### SPARK PLUGS

Champion	Electrode gap
N2	0,6 mm (.024")

### IGNITION COIL

Ducellier, with additional resistance on primary winding.

### ALTERNATOR

Drive belt tension :  
with Ele.346 tool  
4,5 to 5,5 mm (11/64 to 7/32") on the taut side.

## GENERAL ELECTRICAL

### WINDSCREEN WIPER

The assembly consists of a switch, a motor and an electronic control box.

A 3-position switch is used :

- Off
- Continuously on (rheostat speed adjustment)
- On, with variable cadence operation.

Single speed Bosch motor.  
Electrifil electronic control box.

### WINDSCREEN WASHER

Electronic windscreen washer controlled by the windscreen wiper switch on the dash panel.

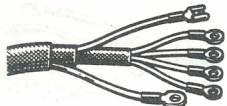
### COOLING FAN MOTOR

The assembly consists of an electric motor, a "Mosta" temperature switch and a relay.

Motor : Bosch or Ducellier

"Mosta" temperature switch on the radiator

- contacts close at :  
 $92^{\circ}\text{C} \pm 1,5^{\circ}$  ( $197,50^{\circ}\text{F} \pm 2,5$ )  
- contacts open at :  
 $82^{\circ}\text{C} \pm 1,5$  ( $179,5^{\circ}\text{F} \pm 2,5$ )



## DISTRIBUTOR

18.020

Adjusting the contact points and advance setting (on the vehicle)

R.1313 - R.1323

NOVEMBER 1971

### CONTACT POINTS

Either by the Dwell percentage method (Ele.12A) or by the cam angle

Dwell percentage :  $63 \pm 3$

Cam angle :  $57^\circ \pm 3^\circ$

The contact points gap must not be reset after this adjustment

### SETTING

The flywheel has two lines :

- One marked "0" : this is Top Dead Centre, firing stroke

- One marked "8" : this is  $8^\circ$  of advance in relation to Top Dead Centre.

Initial static setting : Fig. A

(engine switched off)

Turn the flywheel so that the "8" line on it is opposite the "0" line on the clutch housing.

This method gives an approximate setting only.  
Follow up by setting using a stroboscopic lamp.

Setting with a stroboscopic lamp : Fig. B.

(engine running at 1100 r.p.m.)

Loosen the distributor clamp.

Connect up the stroboscopic lamp.

Start the engine and let it run at 1100 r.p.m.

Turn the distributor so that the "8" line on the flywheel is opposite the "8" line on the clutch housing.

You now have  $16^\circ$  of advance, that is to say,  $8^\circ$  initial advance plus  $8^\circ$  of advance under the influence of a centrifugal advance mechanism.

After tightening the distributor clamp, recheck the setting.

Fig. A.

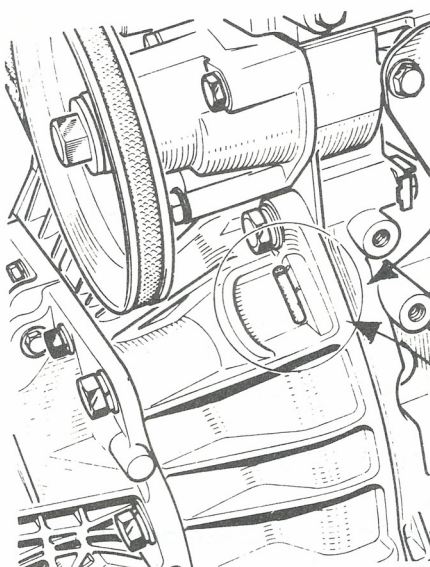
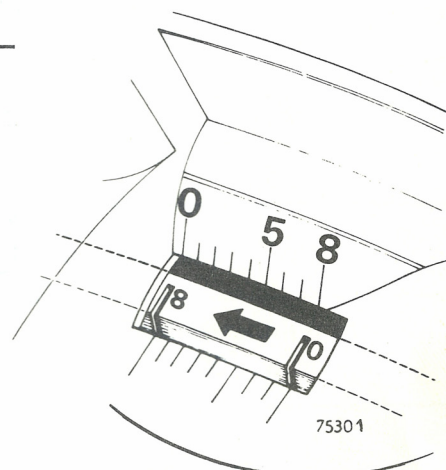
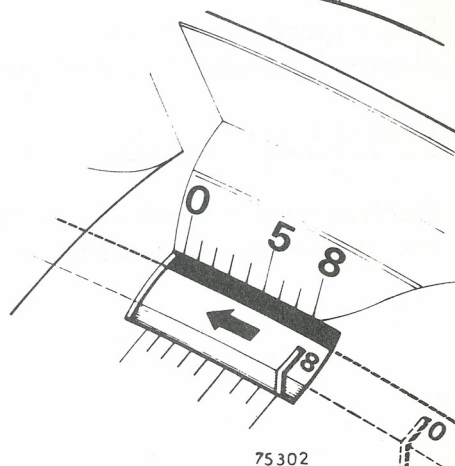
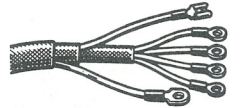


Fig. B.





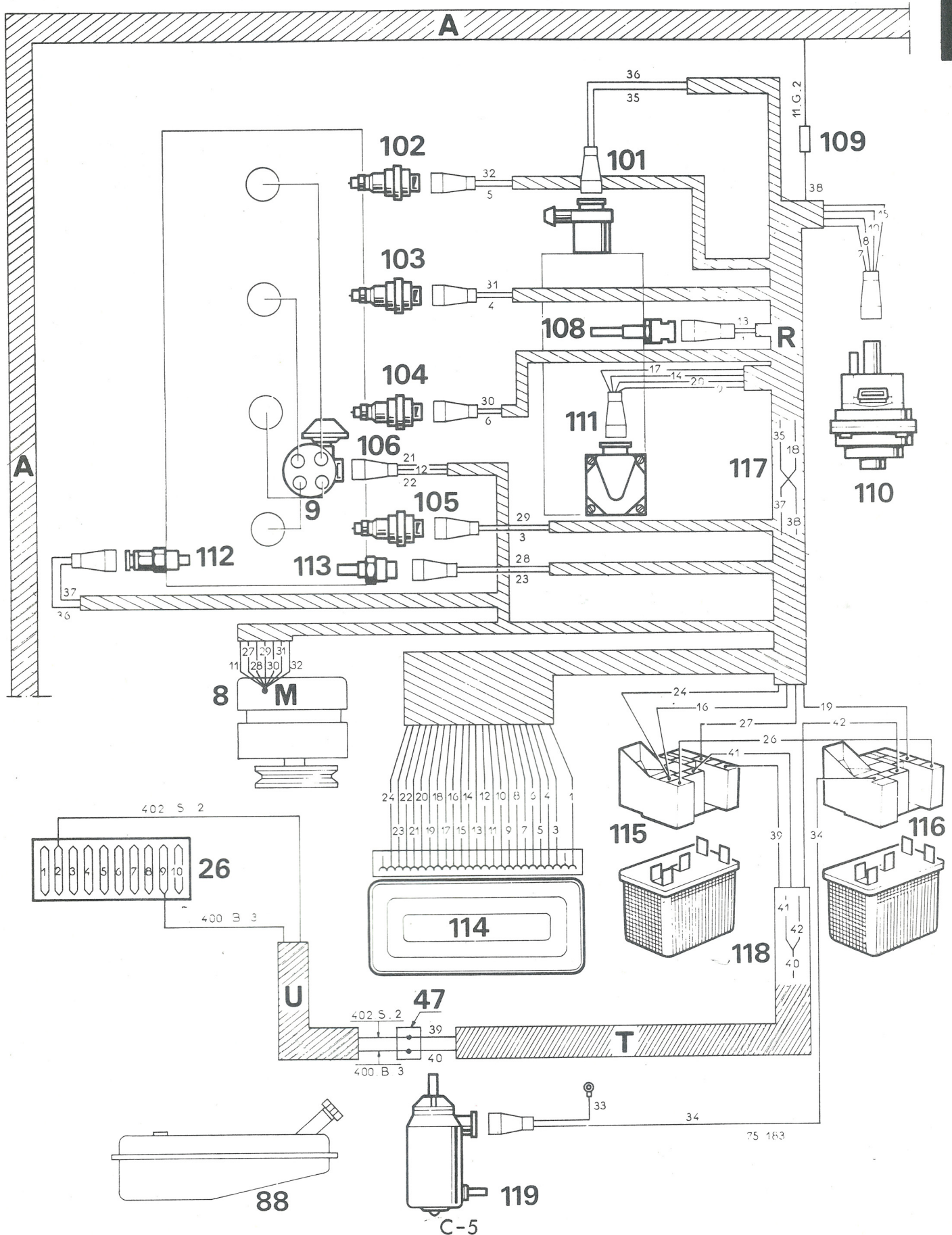
# WIRING DIAGRAM



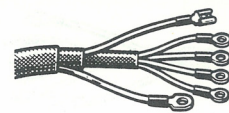
Wiring diagram of injection system

R.1313 - R.1323

NOVEMBER 1971



## SPECIFICATIONS



R.1302 - R.1312 - R.1322

NOVEMBER 1971

### DISTRIBUTOR

Contrary to the information given on page C-3, the distributors fitted to 807-10 engines are as follows :

#### 1st assembly

Ducellier 4381 (normal) and 4382 (sealed)

Curves : R.243 - D60

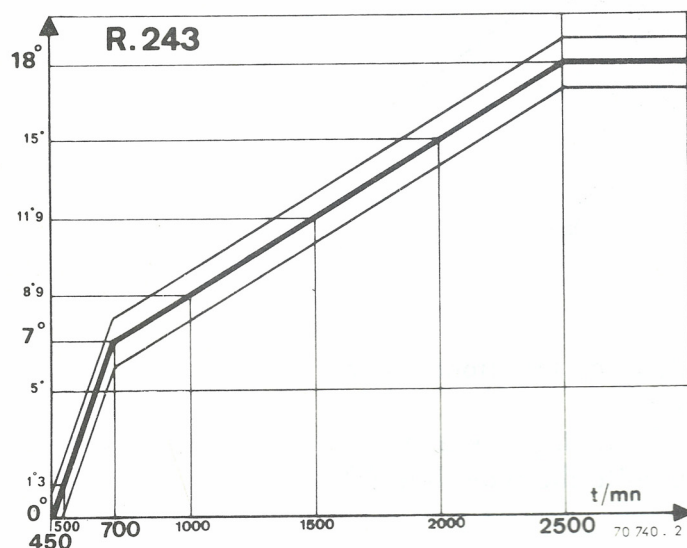
#### 2nd assembly

Ducellier 4348 (normal) and 4349 (sealed)

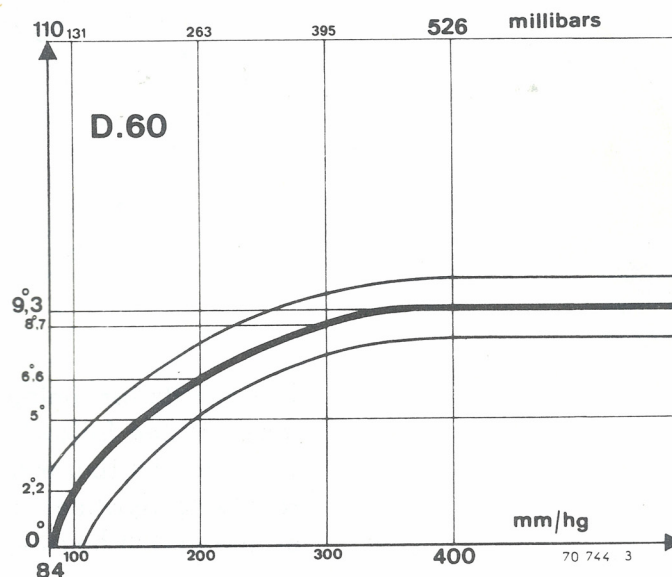
Curves R.266 - D.59

### Curves

The curve is drawn in distributor degrees and distributor r.p.m. (centrifugal)



The curve is drawn in millimetres of mercury, and distributor r.p.m. (vacuum).



### SPARK PLUGS

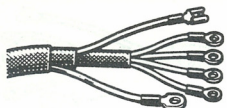
Contrary to the information given on Page C-4 the spark plugs specified for 807-10 engines are as follows :

AC 42 X LS and Champion N 7 Y/170

### ALTERNATOR

Contrary to the information given on Page C-8 the alternator drive belt tension is 4,5 to 5,5 mm (11/64 to 7/32") (on the taut side).





## DISTRIBUTOR

18.020

Adjusting the contact points and advance setting (on the vehicle)

R. I300

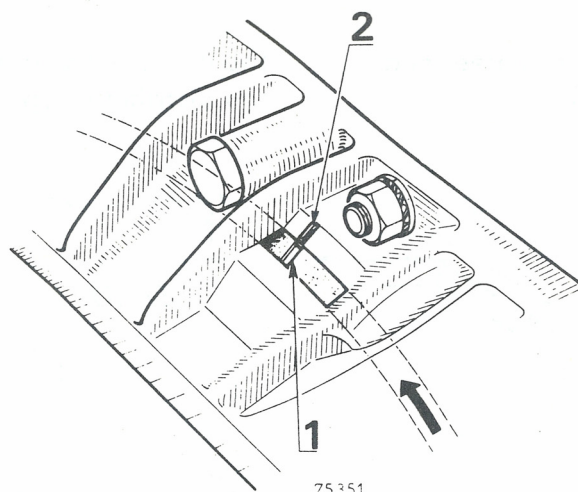
NOVEMBER 1971

### SETTING THE DISTRIBUTOR

The type 810-10 engine on the R. I300 vehicle is now fitted with :

- a flywheel with the Top Dead Centre line marked on it
- a clutch housing with a timing line.

As a result, the pointer on the timing cover is discontinued but the notch on the crankshaft pulley remains.

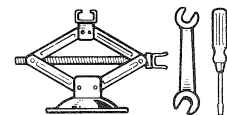


75 351

The distributor timing is set, using the stroboscopic lamp, in the following way :

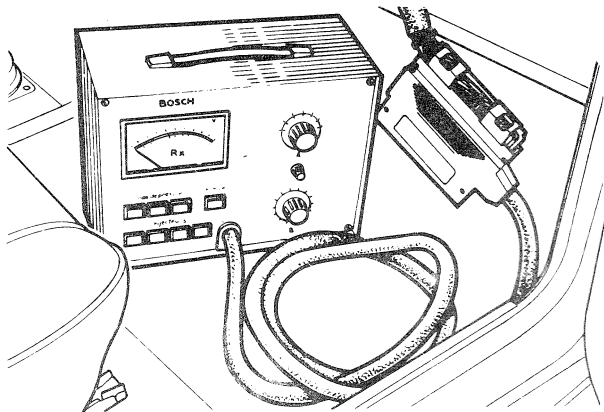
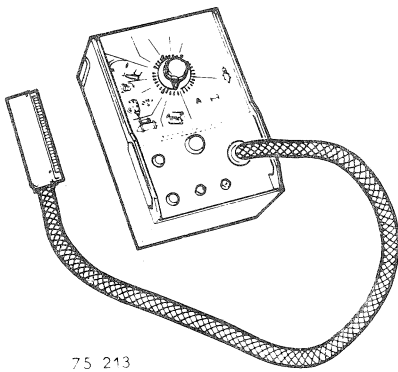
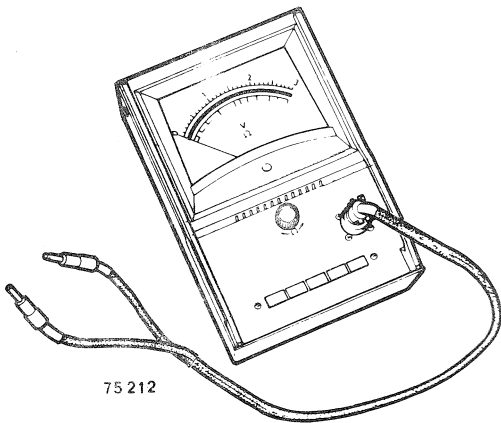
Turn the distributor so that the timing line on the revolving flywheel (1) is opposite the fixed line (2) on the clutch housing.

# SPECIAL EQUIPMENT



NOVEMBER 1971

C.S.

 <p>74 979</p>	<p>MS.542</p> <p>C.S.S. 00 00 054 200</p> <p>Electronic injection checking instrument (BOSCH)</p>
 <p>75 213</p>	<p>MS.546</p> <p>C.S.S. 00 00 054 600</p> <p><b>X</b></p> <p>Electronic injection checking instrument (SOURIAU)</p>
 <p>75 212</p>	<p>MS.547</p> <p>C.S.S. 00 00 054 700</p> <p><b>X</b></p> <p>Voltmeter- Ohm-meter (SOURIAU) (All types)</p>



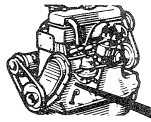
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\* For U.S. vehicles only.

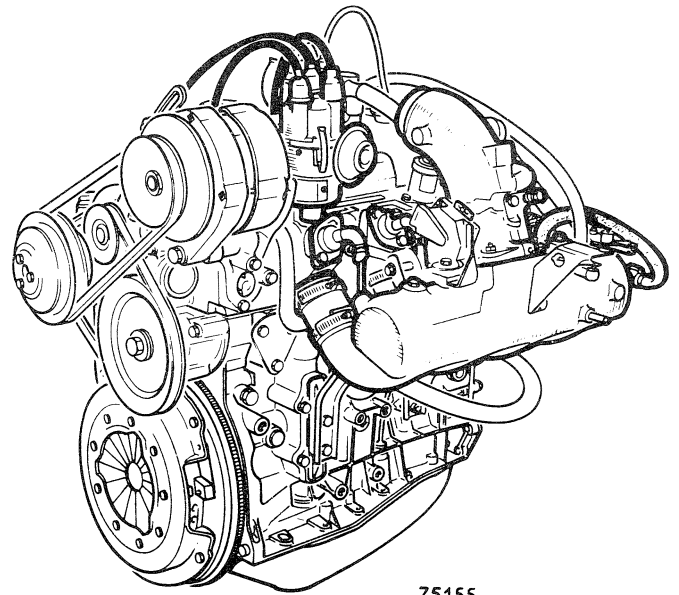




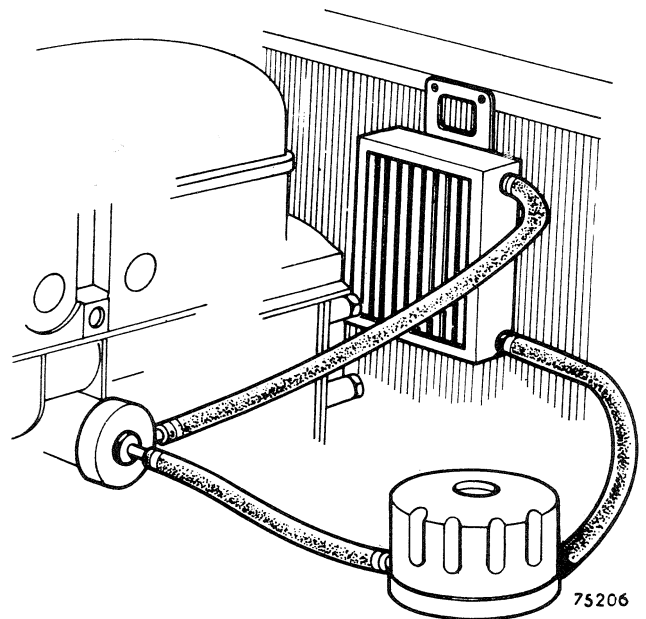
R. 1313 - R. 1323

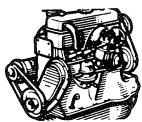
NOVEMBER 1971

The R. 1313 and R. 1323 vehicles are fitted with the electronically controlled fuel injection 807-12 engine. Cooling is by means of a fan motor unit fixed to the radiator.



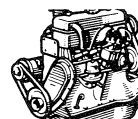
This engine is fitted with an oil filter located on the R.H. cowl side and an aluminium oil cooler fitted behind the cooling radiator.





Number and layout of cylinders	4 in line
Valve layout	Vee form
Taxable horsepower (France)	9 h.p.
Max. brake horsepower (S.A.E.)	120 b.h.p.
Max. b.h.p. delivered at (r.p.m.)	6250 r.p.m.
Max. torque (S.A.E.)	14 m.da N (100 lb/ft)
Max. torque delivered at (r.p.m.)	4500 to 5500 r.p.m.
Compression ratio	10,25 to 1
Bore	77 mm (3.032")
Stroke	84 mm (3.307")
Cubic capacity	1565 cc (95,5 cu. in.)
Idling speed	1100 to 1150 r.p.m.
Cooling system capacity	7 litres (12.1/4 Imp.pts - 14.3/4 US pts)
Oil capacity	
- sump (oil pan)	4 litres (7 Imp pts - 8.1/2 US pts)
- filter and base	0,30 litre (1/2 Imp pts - 1/2 US pt)
- oil cooler	0,50 litre (1 Imp pt - 1 US pt)





The main differences when compared with the 807-10 engine (fitted to R.1302, R.1312, R.1322 vehicles ) are as follows :

### CYLINDER HEAD

Machining of 3 tapped holes for fitting various sensors on the injection control system.

Fuel pump locating boss modified for fitting the auxiliary air control.

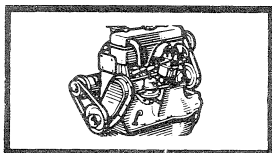
Rocker arm clearances, hot or cold :		
- Inlet	0,25 mm	(.010")
- Exhaust	0,30 mm	(.012")

### Valve seats

Seat angle :	90° (included)
Seat width :	
- Inlet	1,3 to 1,6 mm (.051 to .063")
- Exhaust	1,7 to 2 mm (.067 to .079")
Outside diameter :	
- Inlet	42 mm (1.693")
- Exhaust	37 mm (1.457")

### Valves

Stem diameter :	8 mm (.315")
Valve face angle	90° (included)
Head diameter :	
- Inlet	42,10 mm (1.658")
- Exhaust	35,35 mm (1.392")



### Valve springs

	Outer	Inner
Wire diameter	4,2 mm (.166")	3 mm (.118")
Coil internal diameter	27,6 mm (1.087")	19,8 mm (.780")
Free length (approx.)	46 mm (1.13/16")	41,5 mm (1.41/64")
Length under a load of : 25 da N (55 lbs) 47 da N (103 lbs)	31,5 mm (1.1/4")	25,5 mm (1")

### VALVE TIMING

Inlet valve opens :	40° B.T.D.C.
Inlet valve closes :	72° A.B.D.C.
Exhaust valve opens :	72° B.B.D.C.
Exhaust valve closes :	40° A.T.D.C.

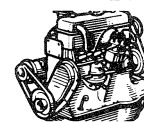
### CONNECTING RODS

The connecting rod small end is fitted with a 21 mm (.827") dia. bush.  
The connecting rods are sold as spare parts in sets of 4.

### PISTONS

Gudgeon pin fitting : Directing of fitting : Gudgeon pin length : Gidgeon pin diameter :	Fully floating Arrow pointing towards the flywheel 66,4 mm (2.614") 21 mm (.827")
---	--





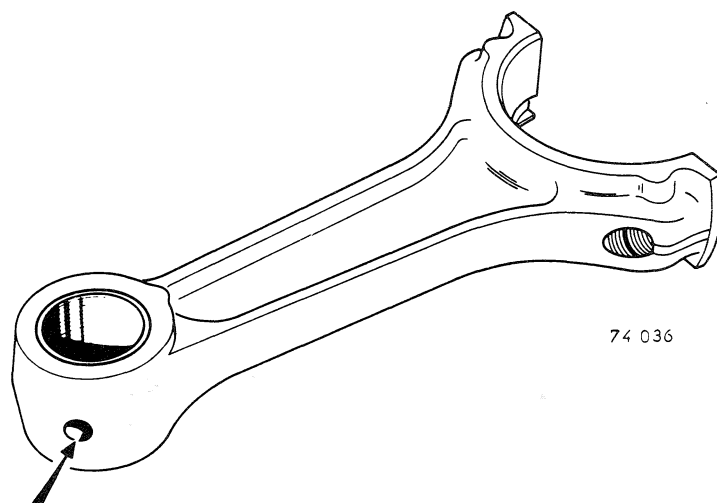
R.1313 - R.1323  
NOVEMBER 1971

Only the method of refitting the pistons differs from that on an 807-10 engine.

Remove one gudgeon pin retaining circlip.  
Push out the gudgeon pin and separate the piston from the connecting rod.

The gudgeon pin is fully floating, free turning in the connecting rod and piston.

There is a bush in the connecting rod small end.  
If the new gudgeon pin has excessive clearance, fit a new bush, taking care to line up its oil hole with that on the connecting rod.  
Ream it so as to obtain a sliding fit of the gudgeon pin.  
Check that the connecting rod is square and free from twist.

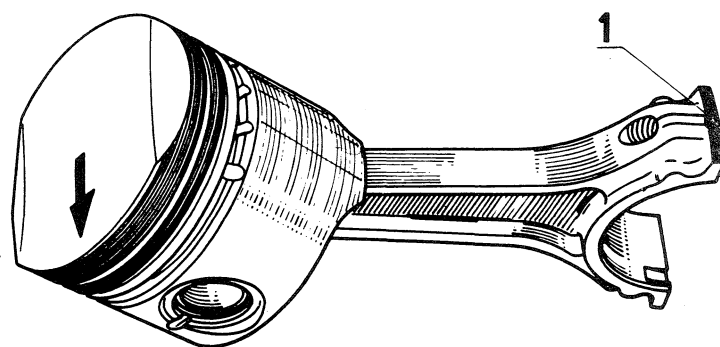


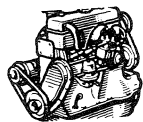
#### Fitting the gudgeon pin

Fit one circlip to the piston.  
Insert the gudgeon pin into the piston and connecting rod.

Fit them the right way round :  
- arrow on the piston pointing downwards  
- number on the connecting rod big end towards the right, with the piston crown facing the operator.

Fit the second circlip and make sure that no tight spots exist.





## DRIVE BELT

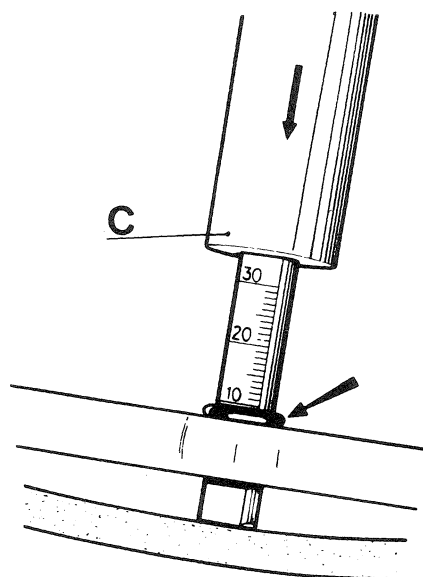
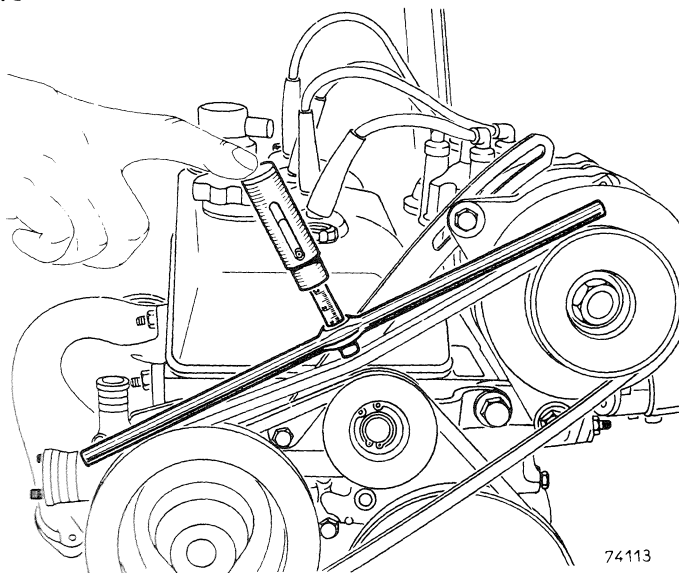
Tension

R. 1302-R. 1312-R. 1313-R. 1322-R. 1323  
NOVEMBER 1971

The drive belt tensions are checked with the Ele.346 tool.

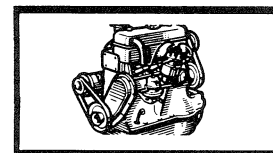
### CHECKING METHOD

Check that the underside of the rubber ring is opposite the zero graduation on the plunger. Lay the bar along the drive belt, with the plunger equidistant between the pulley centres.



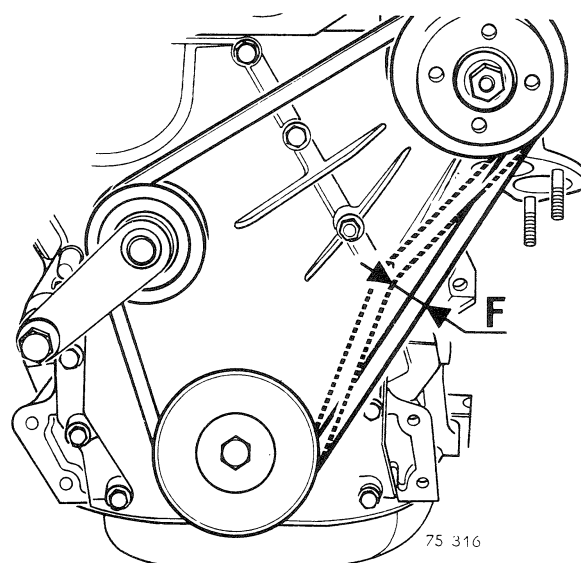
Press the sliding portion of the plunger until the shoulder (C) is flush with the plunger body. Remove the tool and read off the value of the deflection on the underside of the rubber ring.





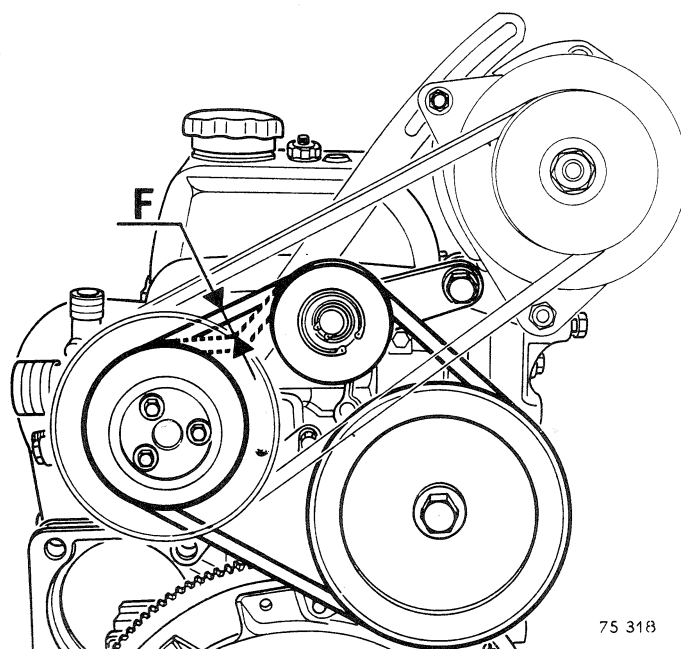
## FAN BELT

The deflection (F) must be measured on the taut side between the crankshaft and fan pulleys :  
 Value of deflection : 2,5 to 3,5 mm ( $3/32$  to  $9/64$ )



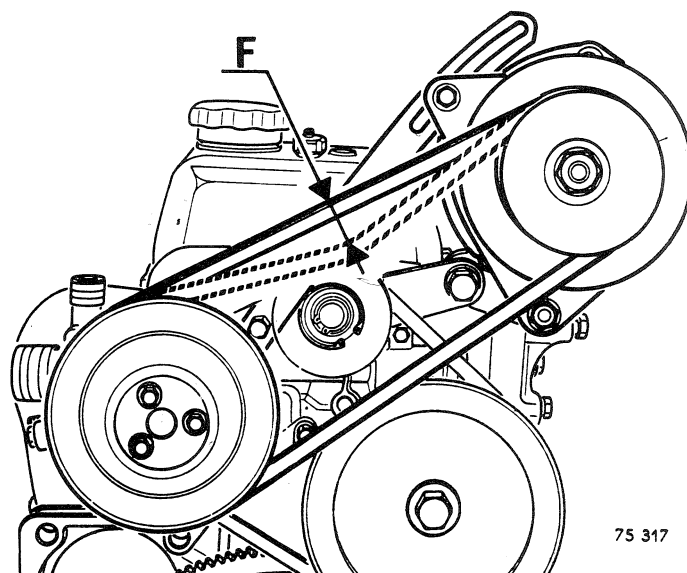
## WATER PUMP BELT

The deflection (F) must be measured on the slack side between the tensioner and water pump pulleys.  
 Value of deflection : 1,5 to 2,5 mm ( $1/16$  to  $3/32$ " )

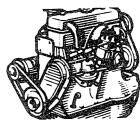


## ALTERNATOR BELT

The deflection (F) must be measured on the taut side between the alternator and water pump pulleys.  
 Value of deflection : 5,5 to 6,5 mm ( $7/32$  to  $1/4$ " )



All the above values replace those given on B-6



## ELECTRONIC INJECTION

### Specifications

R.1313 - R.1323  
NOVEMBER 1971

### DESCRIPTION

The electronic injection system consists of two main parts.

- The fuel supply system, consisting of :

The electric fuel pump  
The fuel filter  
The pressure regulator  
The injectors  
The cold start injector

- The control system, consisting of :

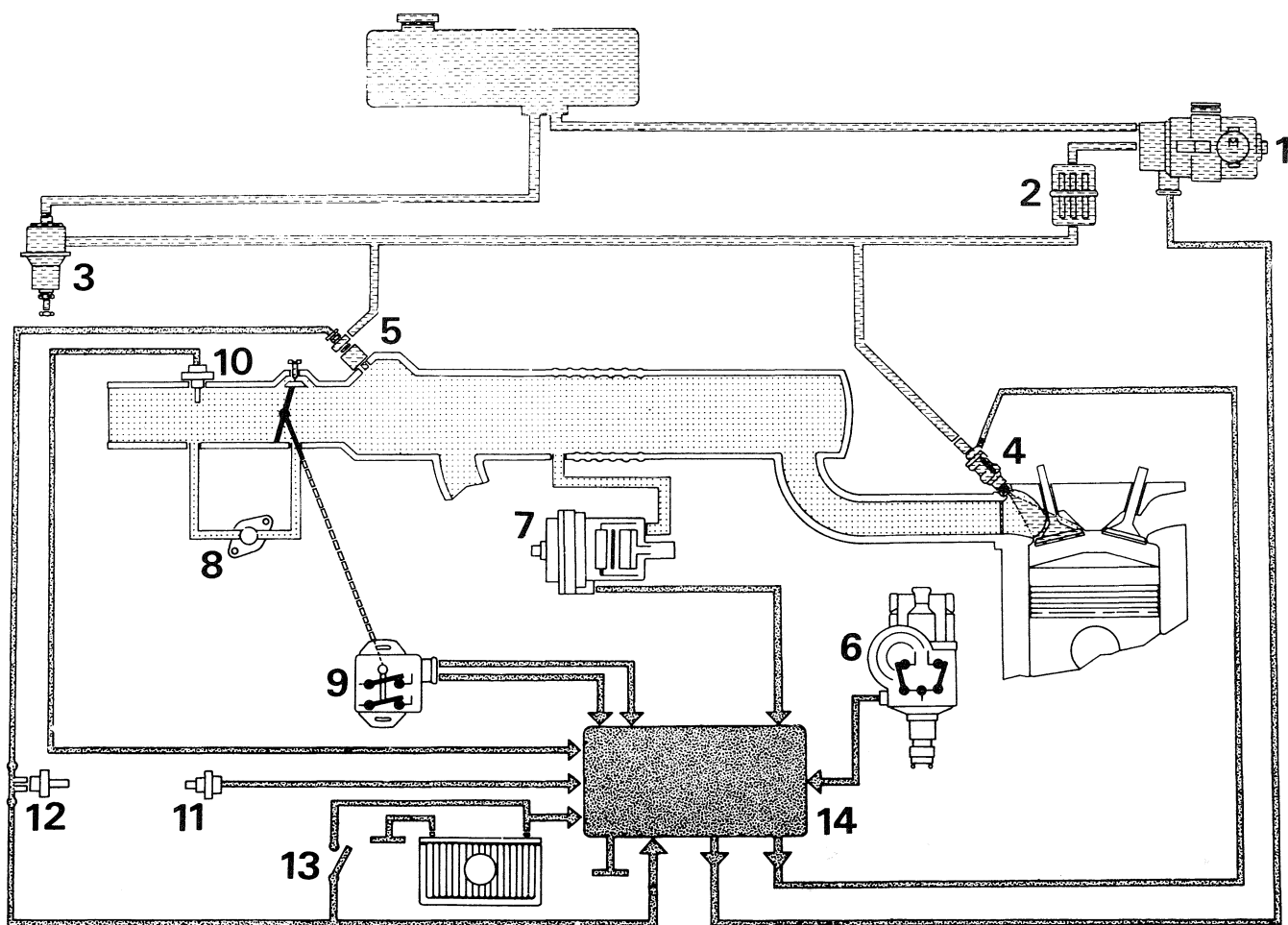
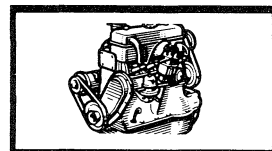
The distributor  
The pressure sensor  
The auxiliary air control  
The throttle switch  
The air temperature sensor  
The water temperature sensor  
The temperature time switch  
The ignition starter switch  
The control box  
The main relay  
The pump relay.

### OPERATION

The electric fuel pump sucks fuel and pumps it via a filter to the ring main and its branches up as far as the injectors.

At the end of the ring main there is a pressure regulator which automatically keeps the fuel pressure to approximately 2 bars (28.1/2 p.s.i.). The various values sensed by all the indicators in the control system are fed into the control box, this converts them into electric impulses and transmits them to the injectors.

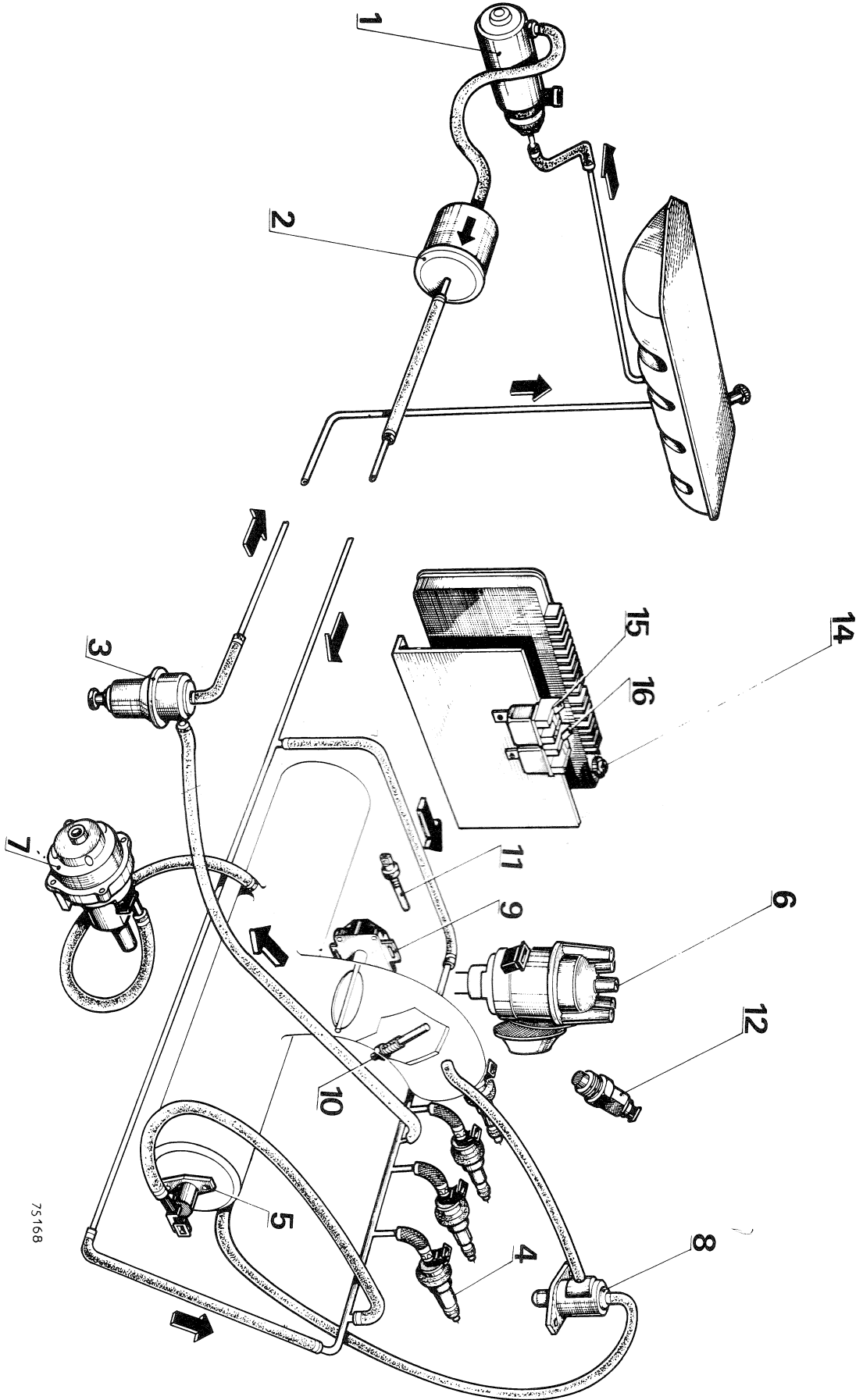
In this way they enable a precise metered quantity of fuel to be obtained at any given time according to the engine's requirements.



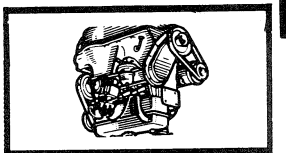
74 957 .1

- |                           |                               |
|---------------------------|-------------------------------|
| 1 - Electric fuel pump    | 10 - Air temperature sensor   |
| 2 - Fuel filter           | 11 - Water temperature sensor |
| 3 - Pressure regulator    | 12 - Temperature time switch  |
| 4 - Injectors             | 13 - Ignition starter switch  |
| 5 - Cold start injector   | 14 - Control box              |
| 6 - Distributor           | 15 - Main relay               |
| 7 - Pressure sensor       | 16 - Pump relay               |
| 8 - Auxiliary air control |                               |
| 9 - Throttle switch       |                               |





75168





### SPECIAL PRECAUTIONS

- Never run without a battery
- Never switch on the ignition when the battery is coupled up to a charger
- Never connect up or disconnect the control box when the ignition is switched on
- Never allow the control box to be subjected to temperatures exceeding 80° C (176° F).

Remove the control box if the vehicle is to pass through a paint oven.

- Remove the connectors by gripping their sides and not by pulling the wires.
- When a connector is being fitted into the socket of a unit make sure that the one-way fitting chamfer is the correct way round and check that the rubber covers completely cover the connectors. Switch off the ignition before connecting or disconnecting a connector.

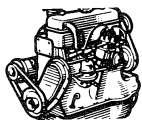
### ADJUSTING VALUES

Fuel pressure : 2 to 2,05 bars (28,5 to 29,2 psi)

CO percentage : 2,5 to 4

Idling speed : 1100 to 1150 r.p.m.

Distributor timing : Refer to the "Electrical" chapter Page C-II.



## ADJUSTMENTS

### Idling speed

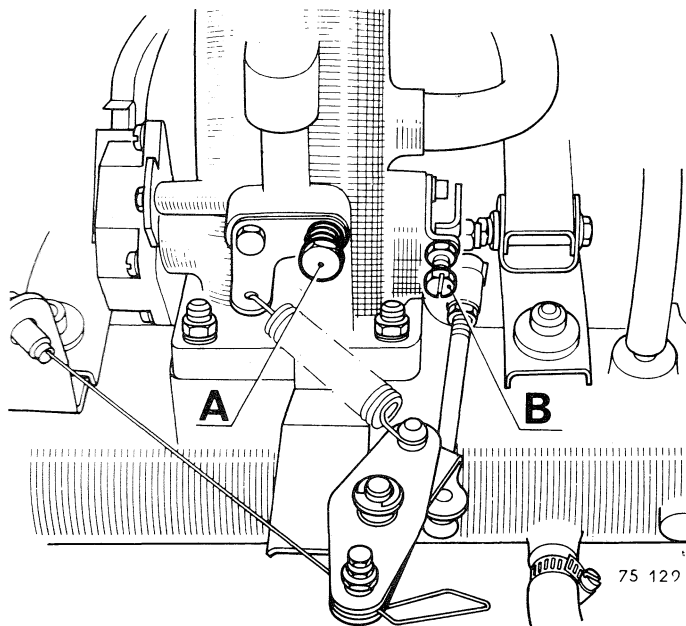
R. 1313 - R. 1323  
NOVEMBER 1971

- Two adjustments have to be made :
- The idling speed with the air screw (A) and the throttle stop screw (B)
  - The CO percentage with the control box potentiometer (I).

#### Idling speed

Screw the air screw (A) right in.  
Turn screw (B) to obtain an engine speed of between 900 and 1000 r.p.m.  
Finalise the adjustment by unscrewing the air screw (A) to obtain an engine speed of between 1100 and 1150 r.p.m.

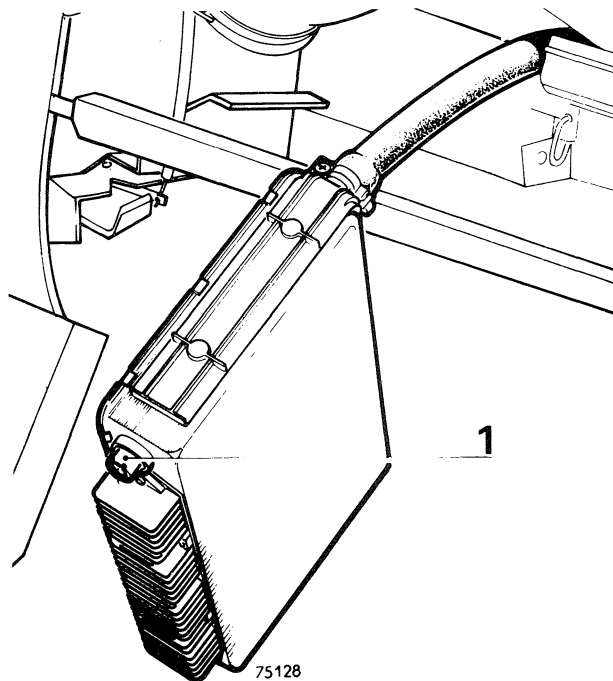
If it is impossible to correct the idling speed check the adjustment of the throttle switch.



#### CO Percentage

Adjust the CO percentage, using the control box potentiometer (I), so that it is between 2,5 and 4.  
The CO percentage is reduced by turning the potentiometer (I) anti-clockwise.

Correct any speed variation by turning screw (A) to obtain an engine idling speed of 1100 and 1150 r.p.m.  
If it is impossible to correct the CO percentage check the adjustment of the throttle switch.



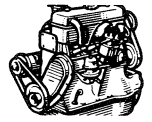


## FUEL PUMP-FILTER

Removing-Refitting

15.801

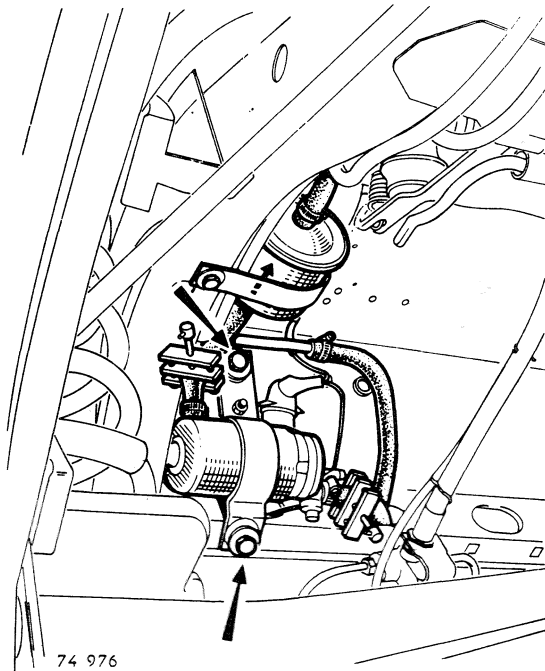
15.800



R.1313 - R.1323  
NOVEMBER 1971

Remove the cover and electrical connector.  
Clamp the fuel pipes with the Mot.453 clamps and remove the pipes.  
Unscrew the mounting points and remove the pump.  
When refitting the pump, take care to fit the connector correctly and refit its cover.

When refitting the filter, take care to align the arrow so that it faces in the direction of fuel flow.





## THROTTLE SWITCH

15.820

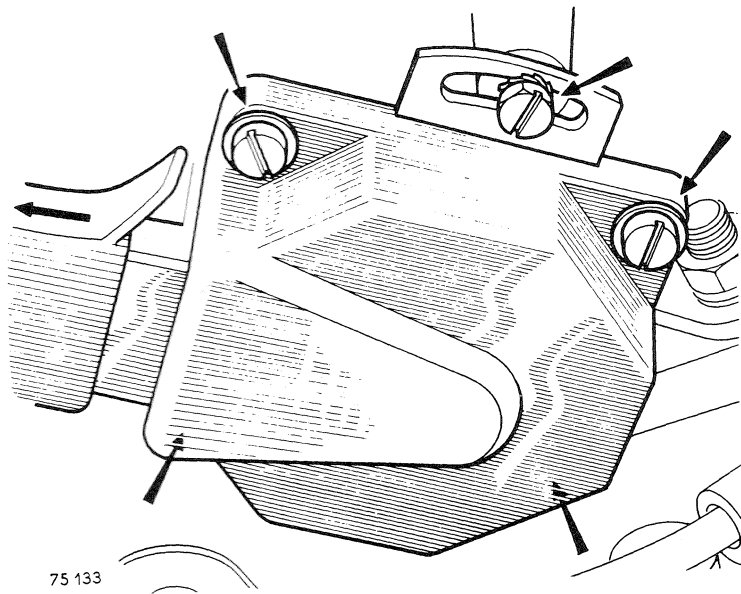
Removing-Refitting-Adjusting

R.1313 - R.1323  
NOVEMBER 1971

### REMOVING

Withdraw :

- the connector
  - the 4 switch cover screws and remove the cover.
- Unscrew the 2 switch fixing screws and free it from its spindle by pulling it off endways.



### REFITTING

Refit the switch and its cover, but do not tighten the 2 fixing screws so that an adjustment can be made.

Push the connector back in position.  
Adjust the switch.



## ADJUSTING

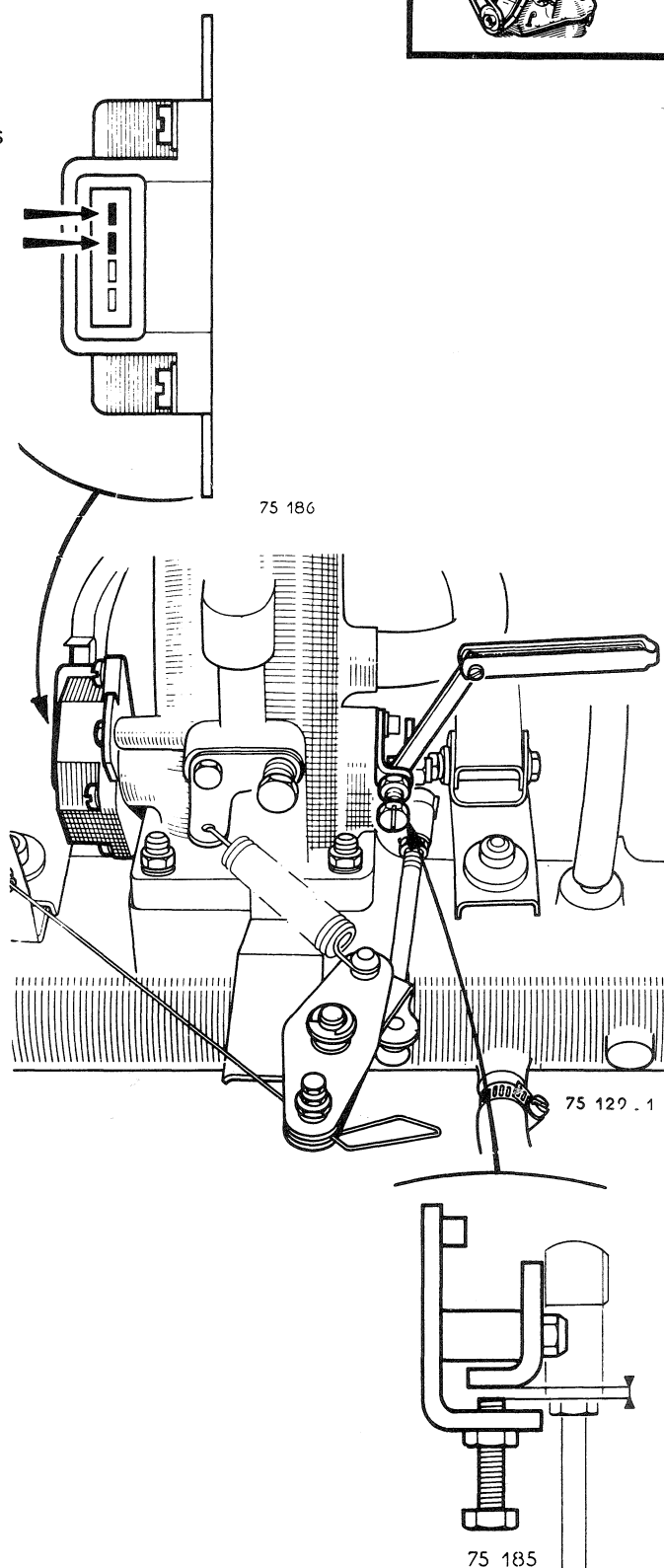
This adjustment may be carried out, either :  
by connecting an ohm-meter to the top two terminals  
on the switch, after having removed the connector  
(see drawing) :

- or by connecting up on the test box and setting  
it up to check the switch.

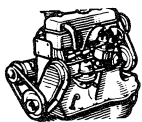
Insert first one feeler gauge, 0,10 mm (.004") thick  
then another 0,20 mm (.008") thick between the  
throttle stop screw and the operating lever.

Unscrew the two switch fixing screw slightly and  
turn the switch so that the contacts are closed  
(0 resistance) when the 0,10 mm (.004") feeler  
gauge is inserted and open ( $\infty$  resistance) when  
the 0,20 mm (.008") feeler gauge is inserted.  
Tighten both fixing screws.

Check the idling speed and adjust it if necessary.







## PRESSURE REGULATOR

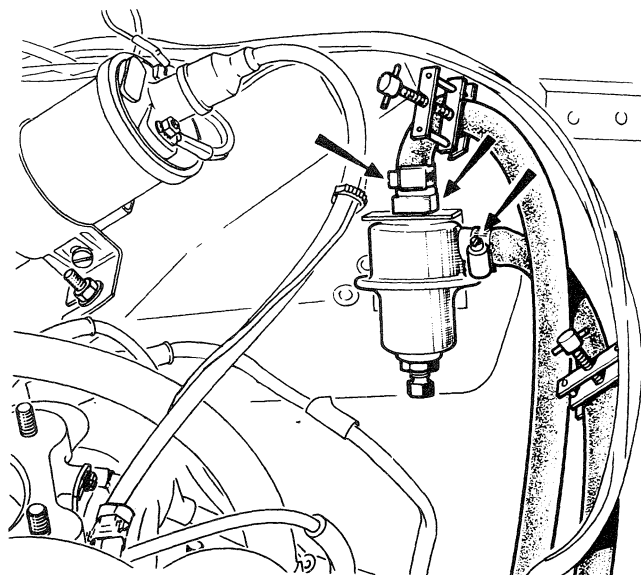
15.870

Removing-Refitting-Adjusting

R.1313 - R.1323  
NOVEMBER 1971

### REMOVING

Clamp the fuel pipes : Mot. 453 clamps.  
Unscrew the pipe clips and remove the pipes.  
Unscrew the regulator fixing nuts and remove the regulator.



75132

### REFITTING

Refit the regulator and reconnect the fuel pipes.  
Carry out a fuel pressure check.

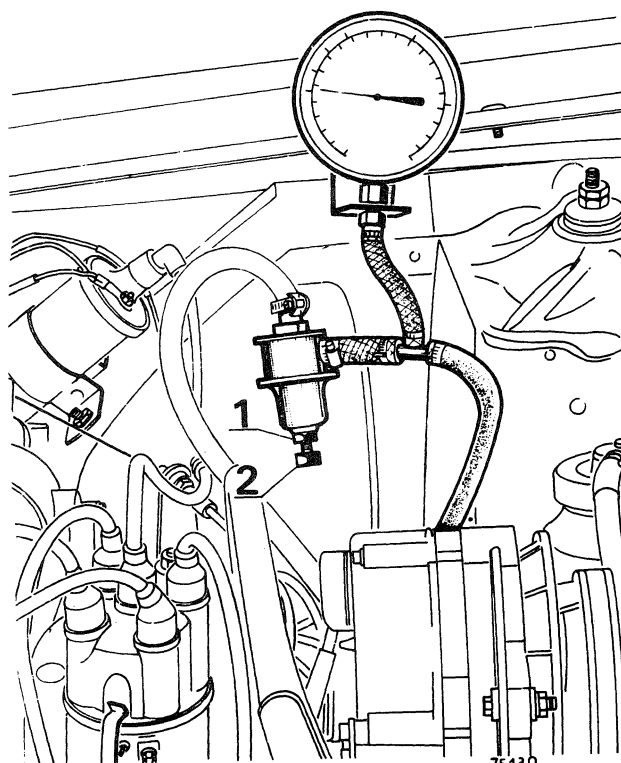
### ADJUSTING

This adjustment must be carried out with great precision because the fuel pressure has a great influence on fuel consumption and the composition of exhaust gases.

Connect up the B.Vi.466 pressure gauge, fitted with the B.Vi. 466-01 hoses, between the injector ring main and the pressure regulator.

Pressurise the circuit, either by running the engine at idling speed (1000 r.p.m.) or by using the test box.

Unscrew the locknut (1) and adjust the pressure : 2 to 2,05 bars (28,5 to 29,2 p.s.i.) with screw (2).  
Carry out a pressure check at fast idling speed.  
If the pressure exceeds 2,2 bars (31,3 p.s.i.) check that the fuel return pipe to the fuel tank is neither blocked nor pinched.



75130

## INJECTOR

Removing-Refitting

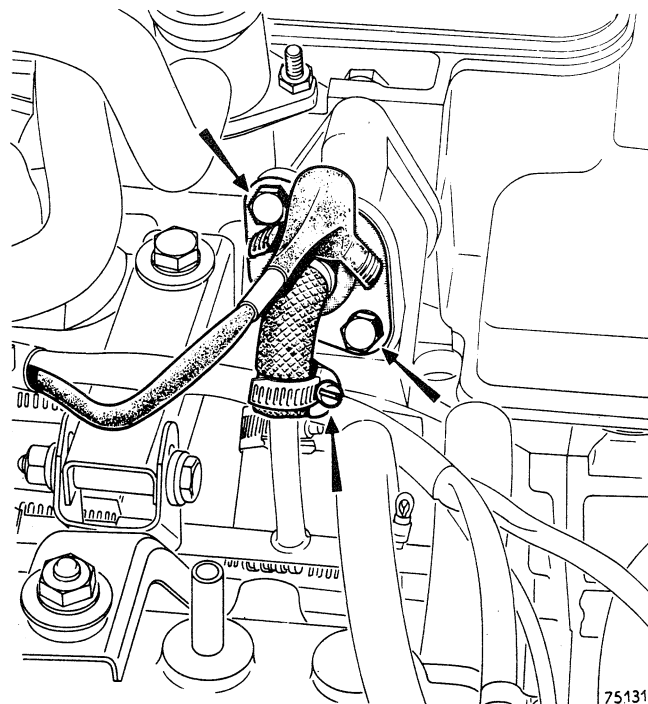
15.880



R.1313 - R.1323  
NOVEMBER 1971

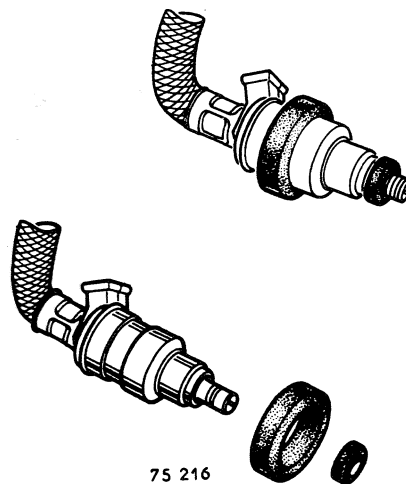
### REMOVING

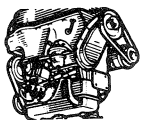
Remove the injector connector.  
Remove the fuel pipe fixing clip and free the pipe from the ring main.  
Unscrew the 2 injector fixing bolts and remove the injector with its support plate.



### REFITTING

Clean the area of the joint seal thoroughly before refitting the injector.  
Inspect the seals and change them if necessary.  
Refit the connector correctly and fit its protective cover.





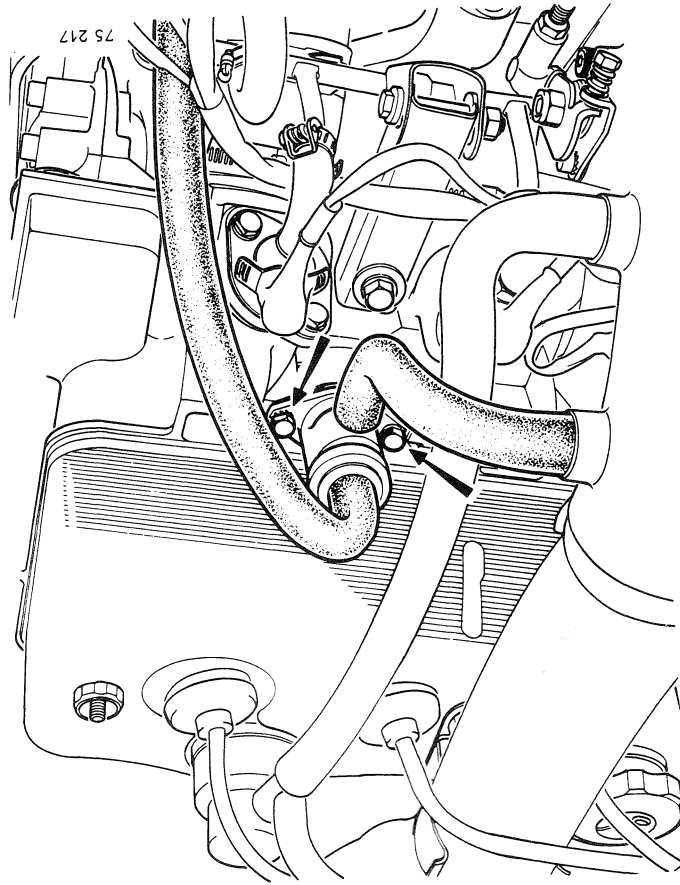
15.830

Removing-Refitting

## AUXILIARY AIR CONTROL

R.1313 - R.1323  
NOVEMBER 1971

Partially drain the cooling system.  
Remove the air hoses, also the two fixing bolts and  
remove the unit.  
Before refitting, clean the area of the joint seal  
thoroughly and fit a new seal.  
Top up the cooling system and bleed it.

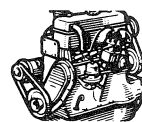




## CONTROL BOX

Removing-Refitting

15.900



R.1313 - R.1323  
NOVEMBER 1971

The control box is located under the dash panel on the R.H. side of the vehicle.

### REMOVING

Remove the two fixing hooks on the rubber bands, tilt the control box and free it from its tray.

Undo the retaining clip (1) on the cover (2) and remove the latter by sliding it along in the direction of the arrow as shown on the drawing.

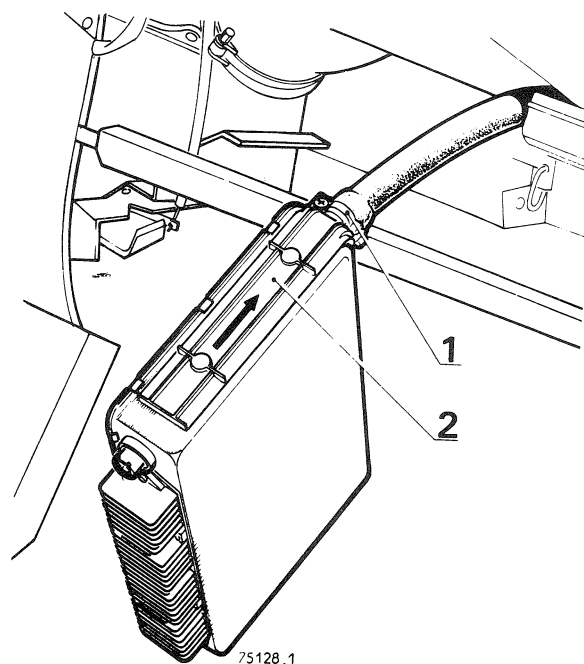
Disconnect the connector.

### REFITTING

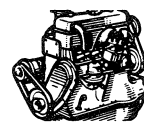
Refit the connector carefully.

Refit the cover and retaining clip.

Place the box back on its tray and secure the bands.



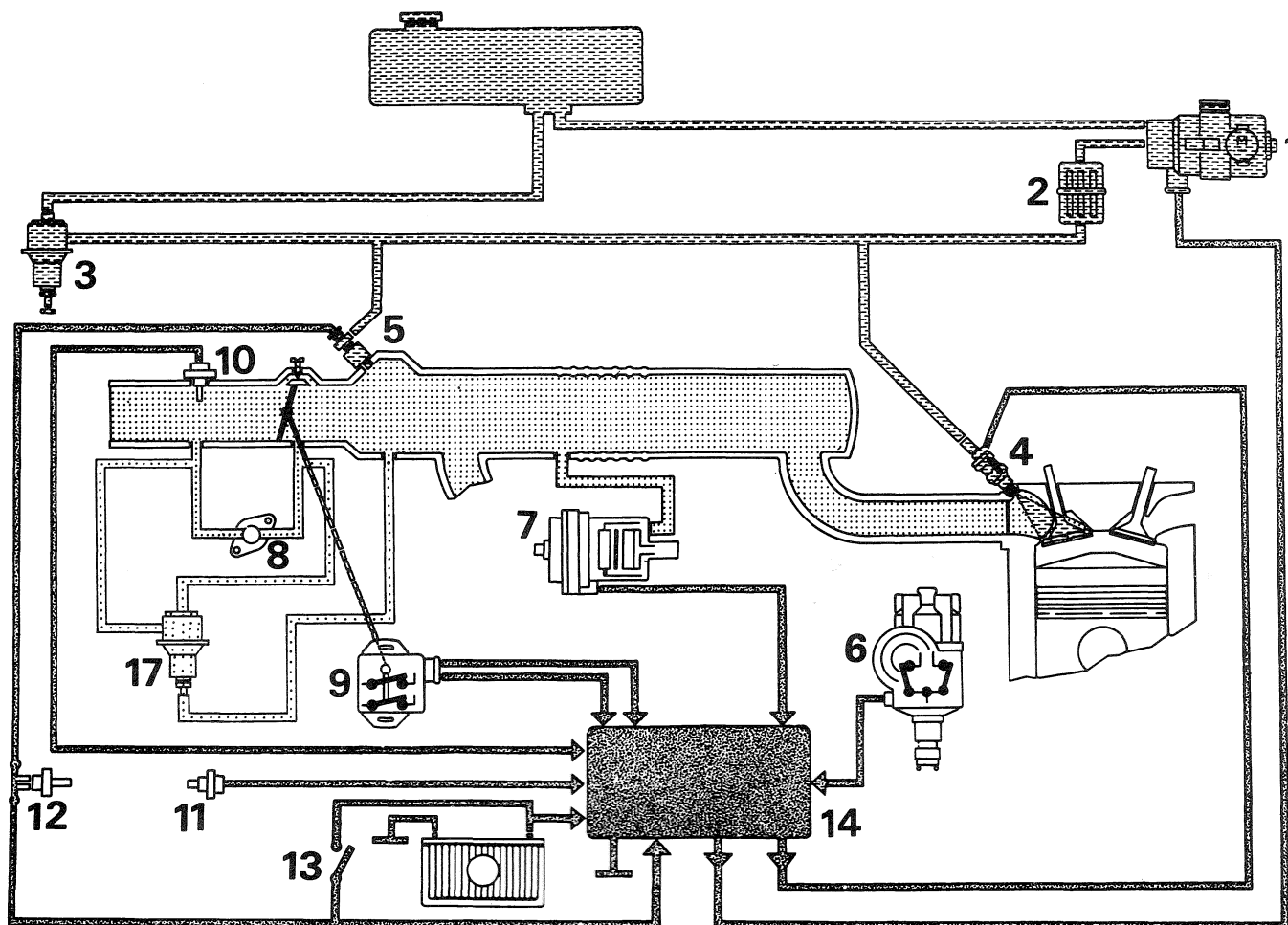
# ELECTRONIC INJECTION



R.1313 - R.1323  
Germany - Sweden  
US - California - Canada  
MARCH 1972

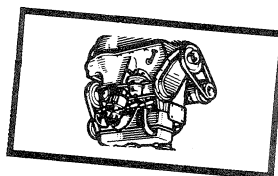
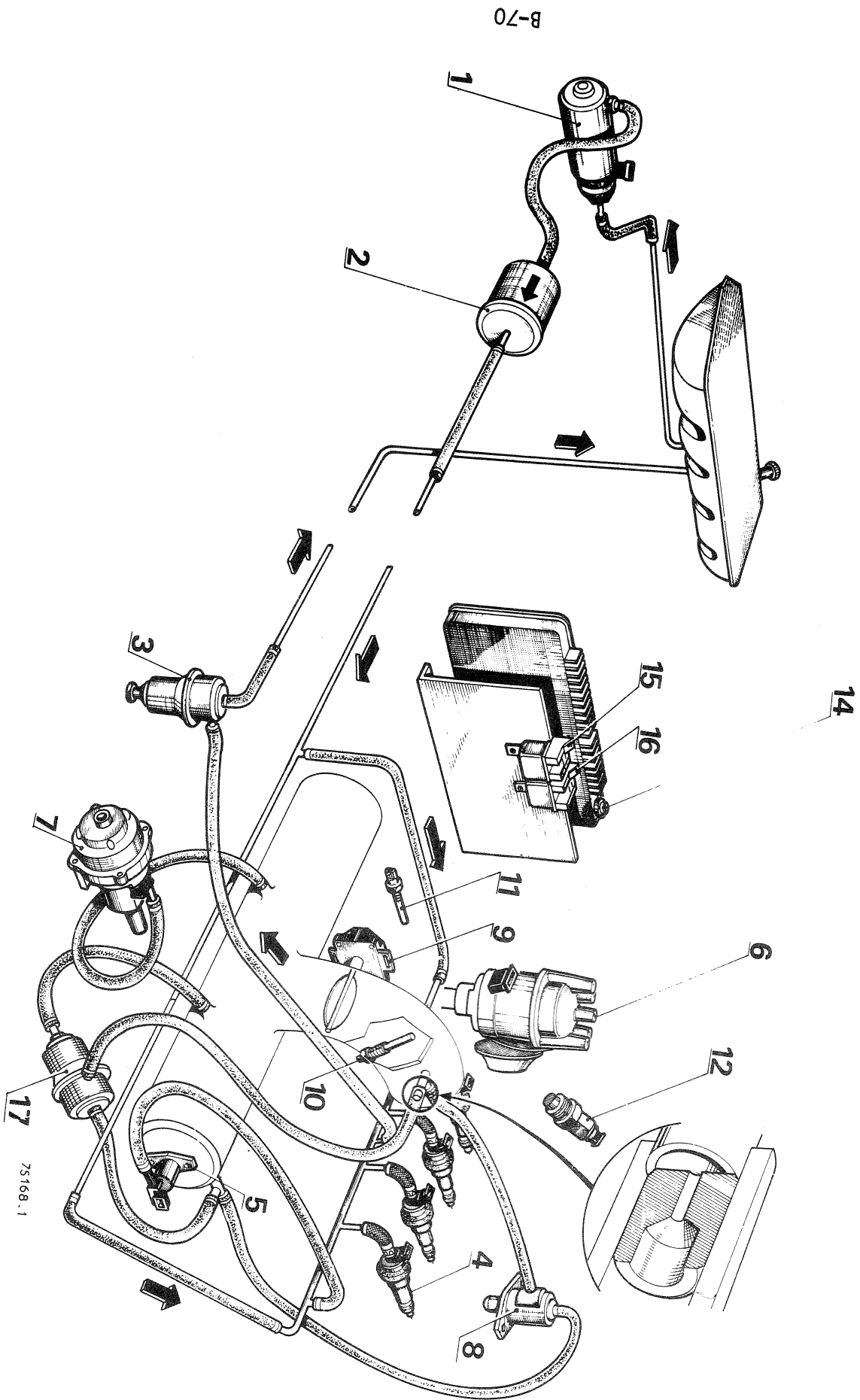
The injection system fitted to these vehicles is identical to that fitted to Metropolitan France vehicles, however, it has been extended to include :

- A pneumatic valve (17) for auxiliary air which enables 'fast idle' to be obtained on deceleration
- A vacuum advance control system for anti-pollution.



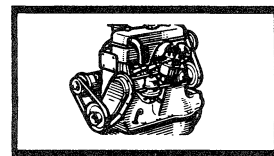
74 957 . 2

- |                           |                                    |
|---------------------------|------------------------------------|
| 1 - Electric fuel pump    | 10 - Air temperature sensor        |
| 2 - Fuel filter           | 11 - Water temperature sensor      |
| 3 - Pressure regulator    | 12 - Temperature time switch       |
| 4 - Injectors             | 13 - Ignition-starter switch       |
| 5 - Cold start injector   | 14 - Control box                   |
| 6 - Distributor           | 15 - Main relay                    |
| 7 - Pressure sensor       | 16 - Pump relay                    |
| 8 - Auxiliary air control | 17 - Auxiliary air pneumatic valve |
| 9 - Throttle switch       |                                    |





## Adjusting values



Engine speed - air  
screwed right in : 800 to 900 r.p.m.

Idling speed : 950 to 1000 r.p.m. for ➡ US - California - Canada

975 to 1025 r.p.m. for ➡ Germany - Sweden

C.O percentage :

2,5 to 3% for ➡ US - California - Canada

2,25 to 2,75 for ➡ Germany - Sweden

### AUXILIARY AIR PNEUMATIC VALVE

This valve makes use of the vacuum in the inlet manifold (during deceleration) in order to work. It opens a channel between that portion of the throttle housing which is above the throttle and the inlet manifold.

The increase of auxiliary air obtained in this way gives 'fast idle'.

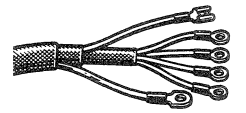
In the hose connecting the pneumatic valve to the throttle housing there is a calibrated jet of the following diameter :

- 3,5mm (.138") for German and Swedish vehicles
- 4,5mm (.177") for US - Californian and Canadian vehicles.

CONTENTS

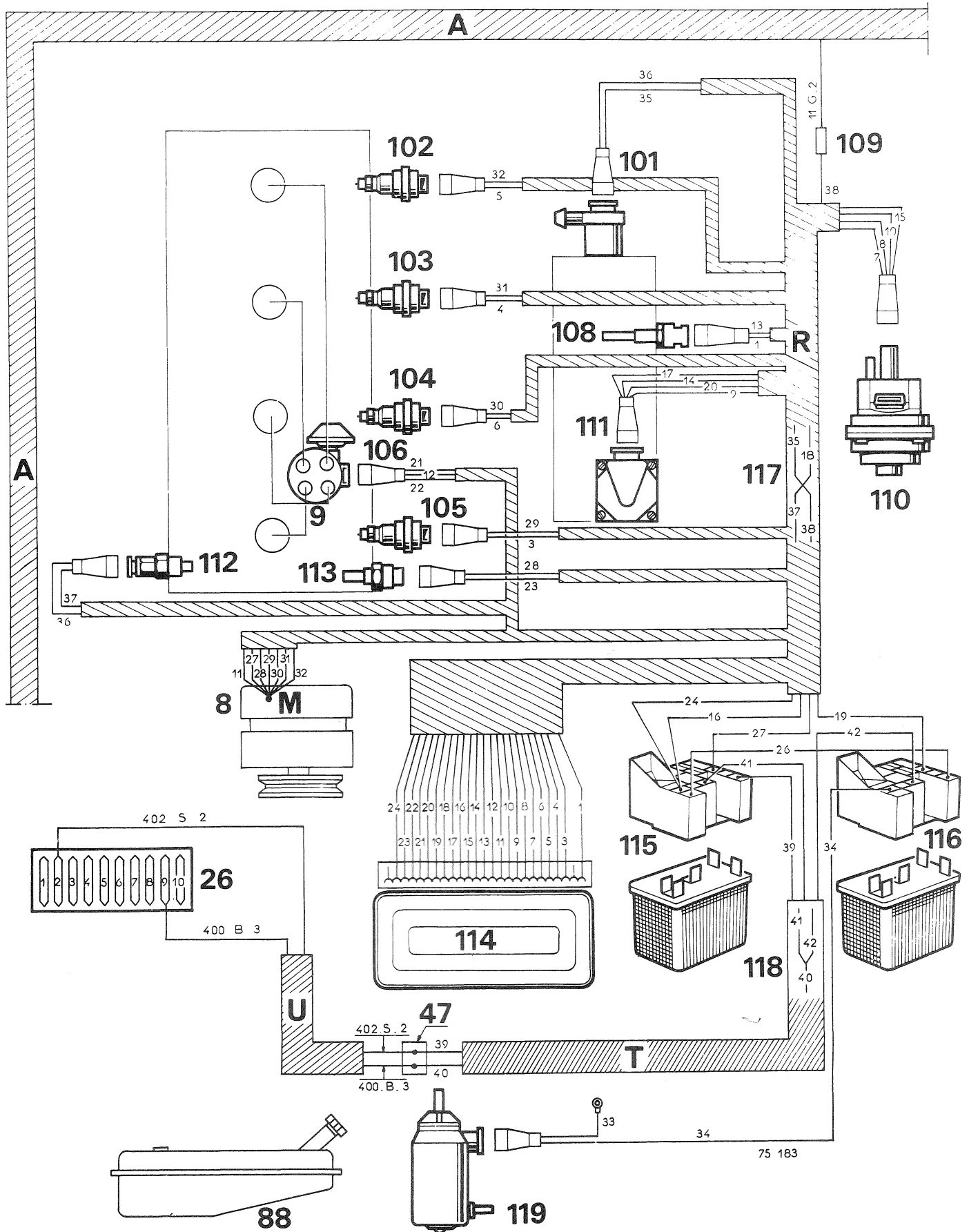
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# WIRING DIAGRAM



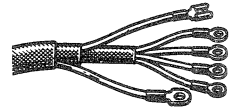
## Injection system wiring diagram

R.1313 - R.1323  
NOVEMBER 1971





# SPECIFICATIONS



R.1313-R.1323  
MARCH 1972

## ENGINE ELECTRICAL

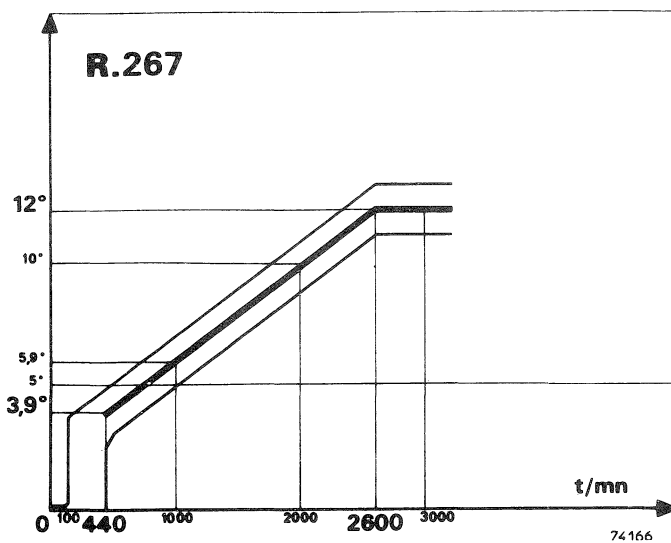
### DISTRIBUTOR

Engine type	Make	Curves		Dwell %	Cam angle degrees	Flywheel setting (degrees)	
		Centrifugal	Vacuum			Initial static	engine running at 1100 rpm*
807-I2	Bosch 02 31 16 3026	R 267	D 63 (capsule disconnected)	$63 \pm 3$	$57 \pm 3$	$8 \pm 1$	$16 \pm 2$
807-I2 Germany Sweden	Bosch 02 31 16 3026	R 267	D 63				

\* Stroboscopic lamp must be used for this check.

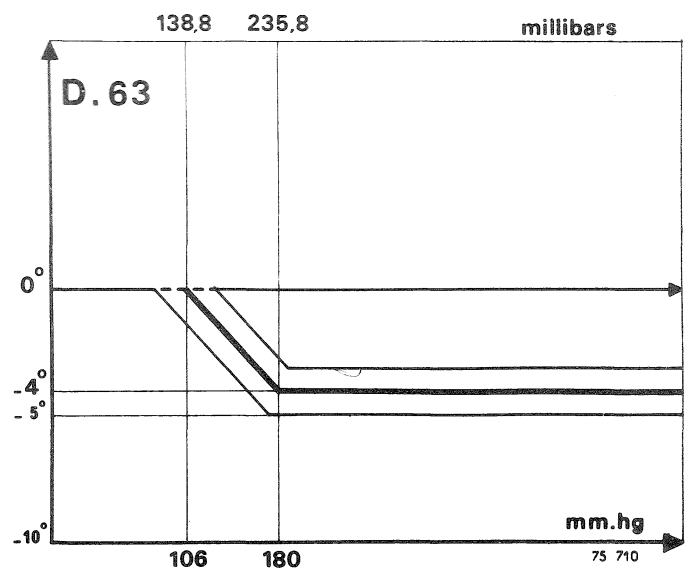
### Curves

#### Centrifugal

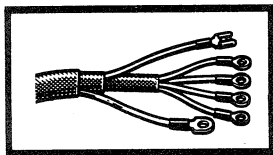


Curve drawn in distributor degrees and distributor r.p.m.

#### Vacuum



Curve drawn in distributor degrees and millimetres of mercury or millibars.



### SPARK PLUGS

Champion	Electrode gap
N2	0,6 mm (.024")

### IGNITION COIL

Ducellier, with additional resistance on primary winding

### ALTERNATOR

Drive belt tension :  
with Ele.346 tool  
5,5 to 6,5 mm (7/32 to 1/4") on the taut side

## GENERAL ELECTRICAL

### WINDSCREEN WIPER

The assembly consists of a switch, a motor and an electronic control box.

- a 3-position switch is used :
- Off
  - Continuously on
  - On, with variable cadence operation.

Single speed Bosch motor  
 Electrifi electronic control box.

### WINDSCREEN WASHER

Electronic windscreen washer controlled by the windscreen wiper switch on the dashpanel.

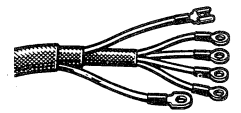
### COOLING FAN MOTOR

The assembly consists of an electric motor, a "Mosta" temperature switch and a relay.

Motor : Bosch or Ducellier

"Mosta" temperature switch on the radiator

- contacts close at :  
 $92^{\circ}\text{C} \pm 1,5^{\circ}$  ( $197,50^{\circ}\text{F} \pm 2,5$ )
- contacts open at :  
 $82^{\circ}\text{C} \pm 1,5$  ( $179,5^{\circ}\text{F} \pm 2,5$ )



R. I313-R. I323  
MARCH 1972

### CONTACT POINTS

Either by the Dwell percentage method (Ele. 12A) or by the cam angle

Dwell percentage :  $63 \pm 3$

Cam angle :  $57^\circ \pm 3^\circ$

The contact points gap must not be reset after this adjustment.

### SETTING

The flywheel has two timing lines :

- One marked "0" : this is Top Dead Centre, Firing Stroke
- One marked "8" : this is  $8^\circ$  of advance in relation to Top Dead Centre.

Initial static setting : Fig. A

(engine switched off)

Turn the flywheel so that the "8" line on it is opposite the "0" line on the clutch housing.

This method gives an approximate setting only.  
Follow up by setting using a stroboscopic lamp.

Setting with a stroboscopic lamp :

Fig. B.

(engine running at 1100 r.p.m.)

Disconnect the vacuum capsule.

Loosen the distributor clamp.

Connect up the stroboscopic lamp.

Start the engine and let it run at 1100 r.p.m.

Turn the distributor so that the "8" line on the flywheel is opposite the "8" line on the clutch housing.

You now have  $16^\circ$  of advance, that is to say,  $8^\circ$  initial advance plus  $8^\circ$  of advance under the influence of the centrifugal advance mechanism. After tightening the distributor clamp, recheck the setting.

Reconnect the vacuum capsule.

Figure A

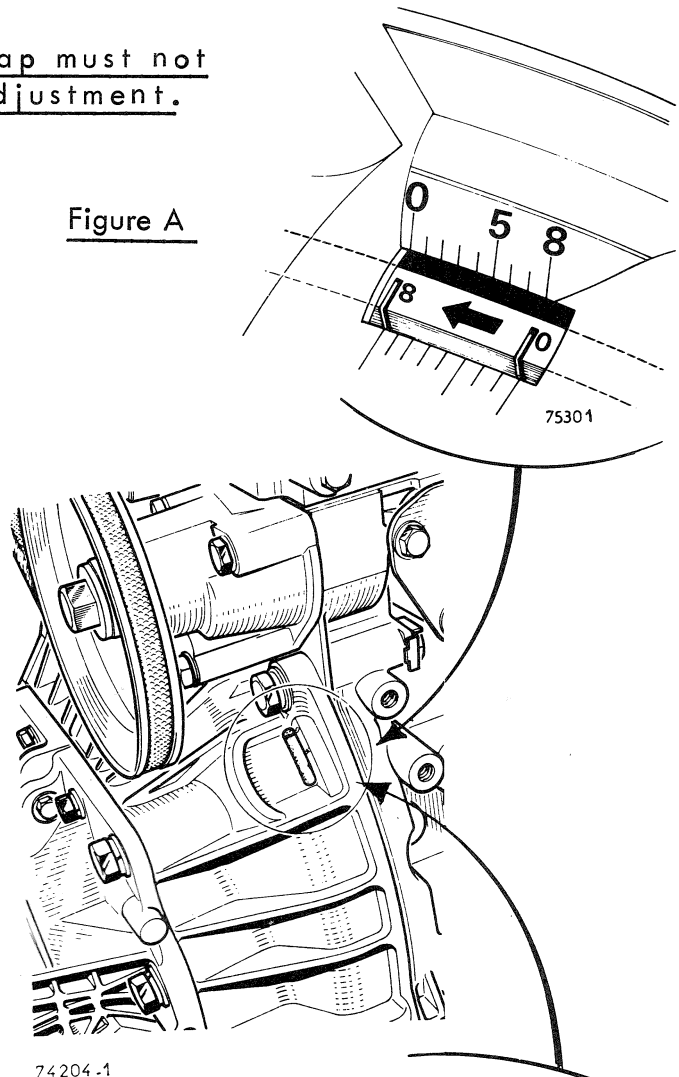
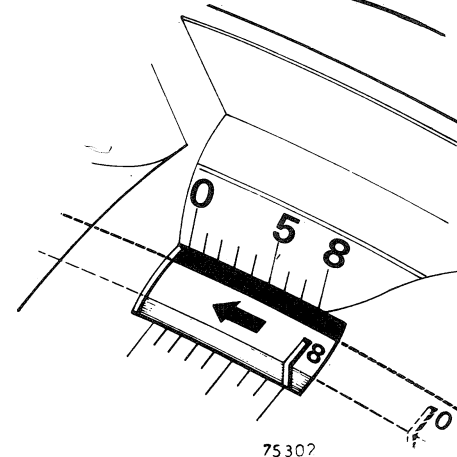
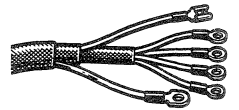


Figure B





# SPECIFICATIONS



## DISTRIBUTOR

## ENGINE ELECTRICAL

R. 1301-R. 1304-R. 1313  
US - California - Canada  
MARCH 1972

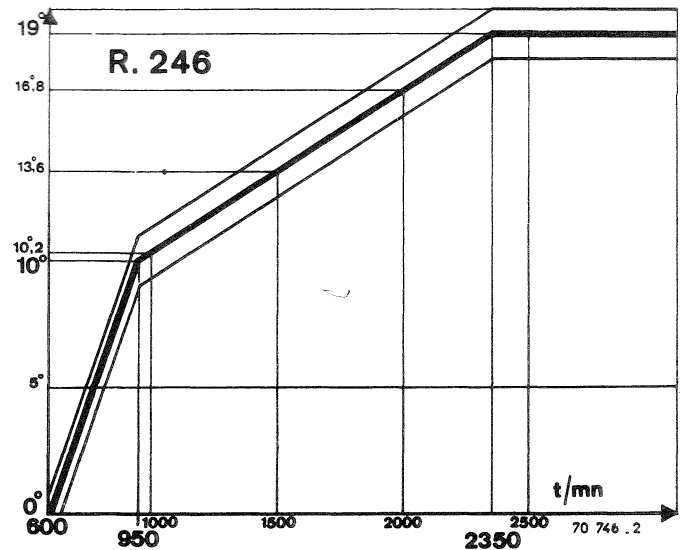
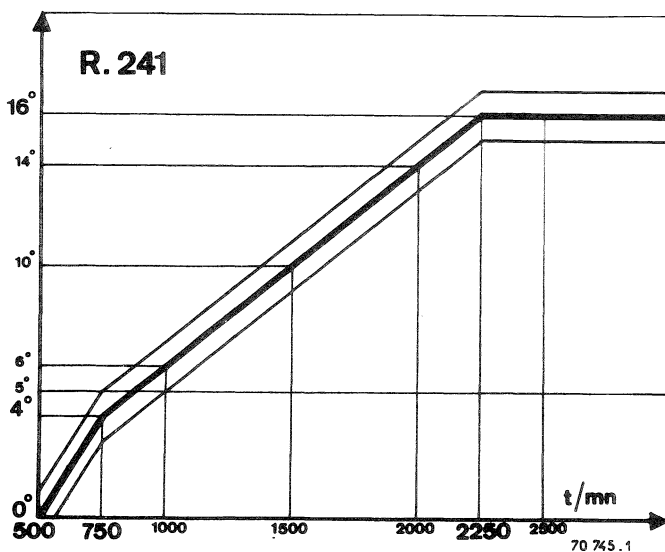
Type	Engine	Make	Curves		Dwell %	Cam angle (degrees)	Flywheel setting	
			Centri-fugal	Vacuum			Degrees	mm
R. 1301	821-15	Ducellier 4240	R 246	D 59	63 $\pm$ 3	57 $\pm$ 3	0 to -3	0 to -7 (0 to -17/64")
	821-16	Ducellier 4380	R.258				6 $\pm$ 1	13 $\pm$ 2,2 (33/64" $\pm$ 3/32)
R. 1304	841-16	Ducellier 4220	R.241	D 60	63 $\pm$ 3	57 $\pm$ 3	5 $\pm$ 1	11 $\pm$ 2,2 (7/16" $\pm$ 3/32)
R. 1313	807-13	Bosch 0231163024	R.272	D 62	63 $\pm$ 3	57 $\pm$ 3	initial static	* engine running at 1100 r.p.m.
							8° $\pm$ 1	14° $\pm$ 2

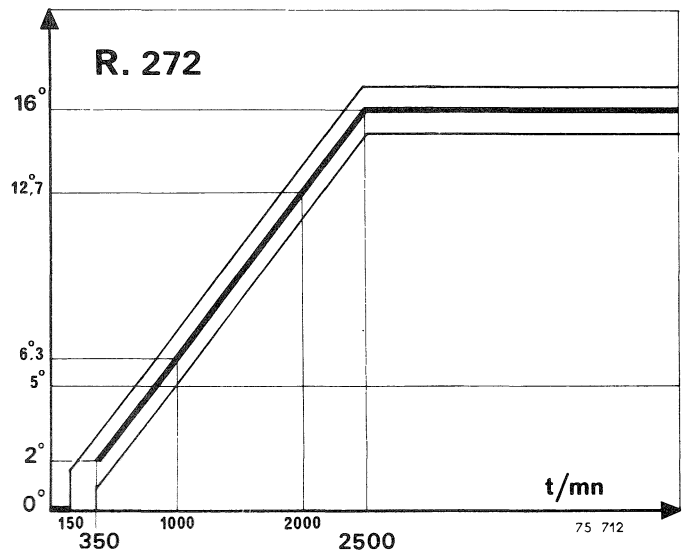
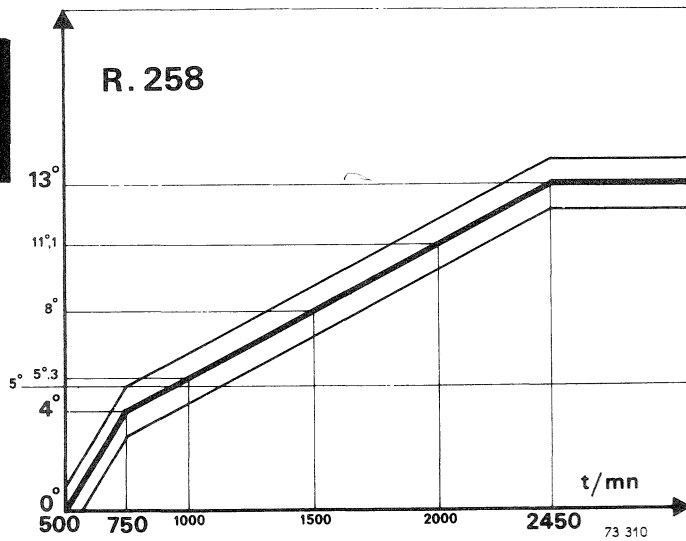
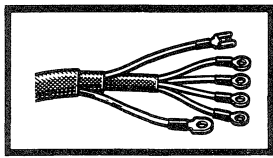
\* Stroboscopic lamp must be used for this check.

## Curves

### Centrifugal

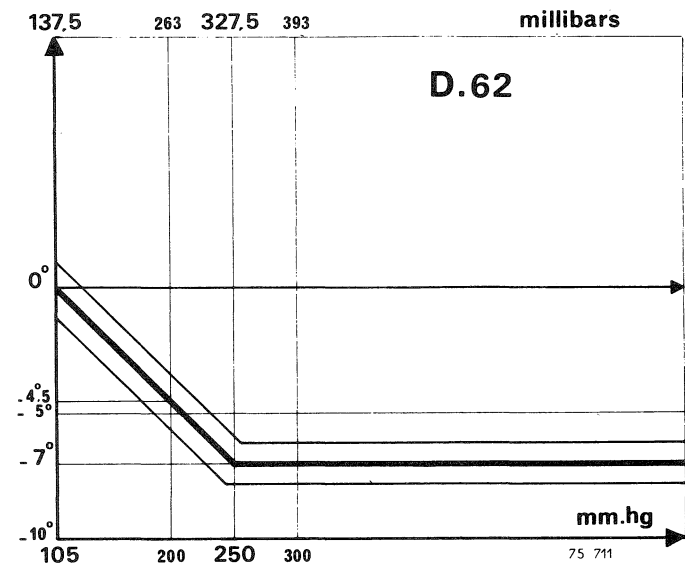
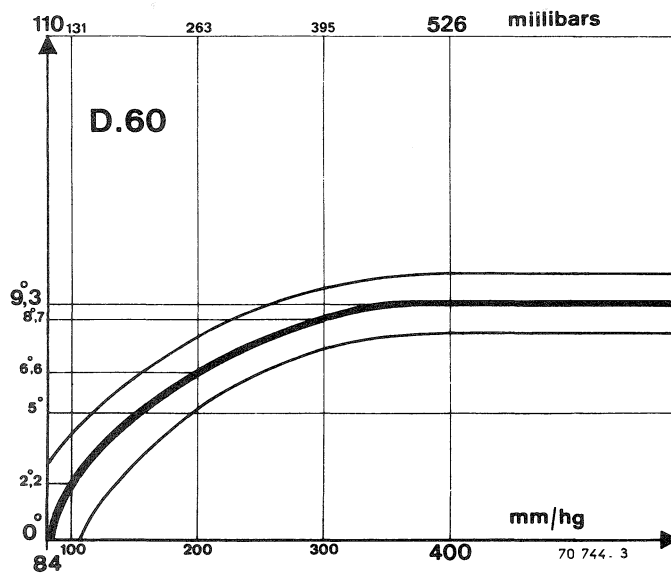
Curves drawn in distributor degree and distributor r.p.m.





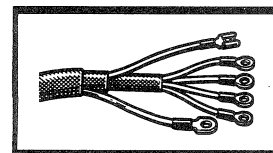
Vacuum

Curves drawn in distributor degrees and millimetres of mercury or millibars.



## SPARK PLUGS

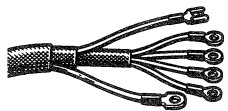
Type	Engine	AC	Champion	Electrode gap
R. 1301	821-15 821-16	44 XL	N5	0,6 mm (.024")
R. 1304	841-16	45 XL	N5	
R. 1313	807-13	-	N3	



### CURRENT CONSUMPTION OF VARIOUS COMPONENTS

Component	Amperage
Ignition	1,2 A
Side and tail lights	3 A
Dipped beams	7,8 A
Main beams	8,5 A
Heater fan	5 A
Heated rear screen	8 A
Cooling fan motor	8,5 A
Windscreen wiper	4,5 A
Cigar lighter	7 A
Control box + Injectors	2 A
Injection pump	3 A





## DISTRIBUTOR

18.020

Adjusting the contact points and advance setting (on the vehicle)

R.1301-R.1304-R.1313  
US-California - Canada  
MARCH 1972

### CONTACT POINTS

Either by the Dwell percentage method (Ele.12A) or by the cam angle.

Dwell percentage :  $63 \pm 3$

Cam angle :  $57^\circ \pm 3$

The contact points gap must not be reset after this adjustment.

### SETTING

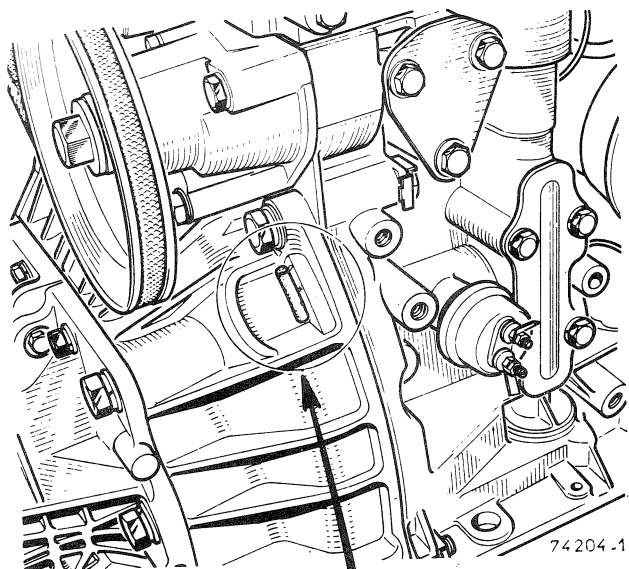
R.1301 (manual gearshift)

The flywheel has two timing lines :

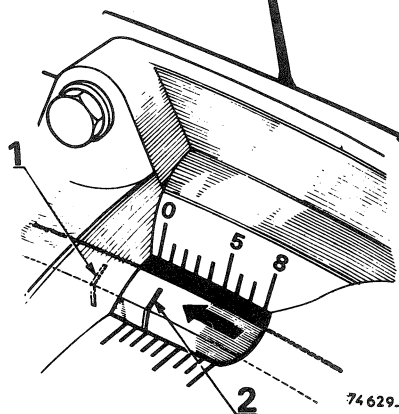
- line 1 : is Top Dead Centre - Firing stroke
- line 2 : to be used for setting the distributor to its max. limit ( $-3^\circ$ ).

Carry out the setting using a stroboscopic lamp.  
Disconnect the vacuum capsule.  
Loosen the distributor clamp.  
Connect up the stroboscopic lamp.  
Start the engine and let it run at its normal idling speed.

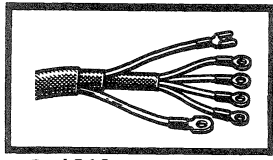
Turn the distributor so that the fixed timing line "O" lies between lines 1 and 2 on the flywheel.  
After tightening the distributor clamp, recheck the setting.  
Reconnect the vacuum capsule.



74204-1.



74629-3



R.1313

The flywheel has two timing lines :

- One marked "O" : this is Top Dead Centre Firing Stroke
- One marked "8" : this is  $8^{\circ}$  of advance in relation to Top Dead Centre.

Initial static timing : fig. A  
(engine switched off)

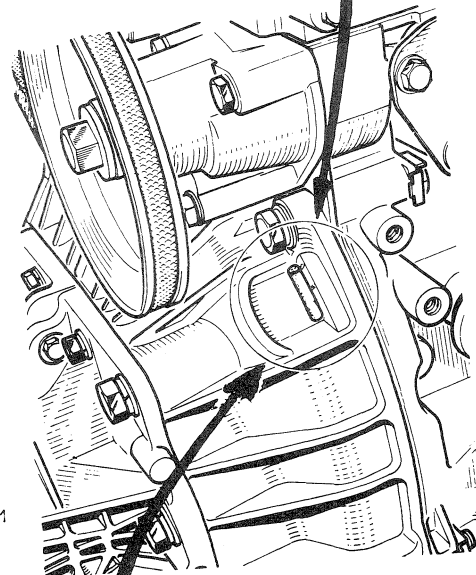
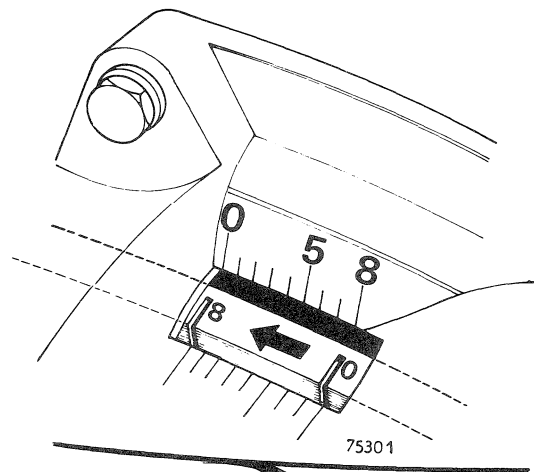
Turn the flywheel so that the "8" line on it is opposite the "0" line on the clutch housing.

This method gives an approximate setting only.  
Follow up by setting using a stroboscopic lamp.

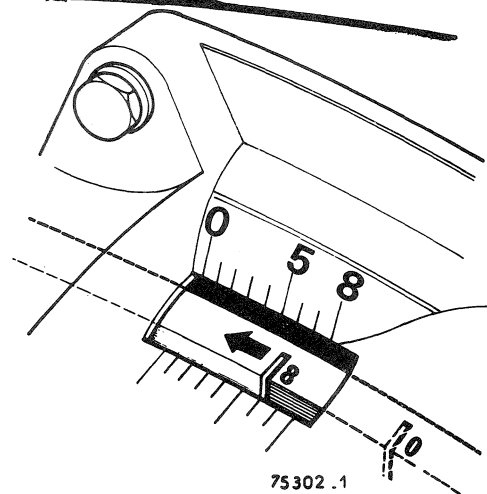
Setting with a stroboscopic lamp : fig. B.  
(engine running at 1100 r.p.m.).

Disconnect the vacuum capsule.  
Loosen the distributor clamp.  
Connect up the stroboscopic lamp.  
Start the engine and let it run at 1100 r.p.m.  
Turn the distributor so that the "8" line on the flywheel is opposite the "6" line on the clutch housing.  
You now have  $14^{\circ}$  of advance, that is to say  $8^{\circ}$  of initial advance plus  $6^{\circ}$  of advance under influence of the centrifugal advance mechanism.  
After tightening the distributor clamp, recheck the setting.  
Reconnect the vacuum capsule.

Fig. A



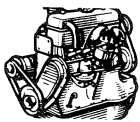
74204.1



75302.1

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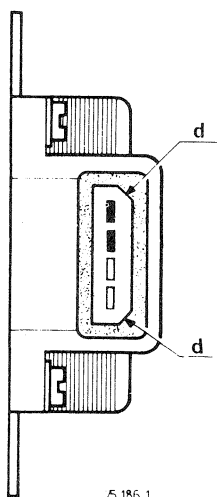
## ELECTRONIC INJECTION

R.1313 - 1973 Model

### THROTTLE BUTTERFLY SWITCH

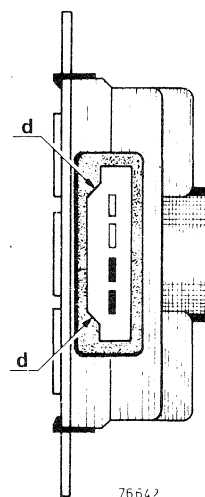
Two types of throttle butterfly switch are fitted.

1 - Throttle butterfly switch assembled with 4 screws



The ohm-meter for checking purposes must be connected to the two top terminals (harness wires marked I7 and I4).

2 - Throttle switch assembled by crimping

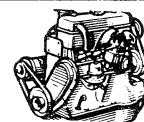


The socket on this switch has been turned round  $180^{\circ}$ . The ohm-meter therefore must be connected to the bottom two terminals (harness wires marked I7 and I4).

Both types of switch are interchangeable provided that offset (d) on the harness plug is lined up opposite offset form (d) on the switch.



## ADJUSTING THE IDLING SPEED



The following method cancels and supercedes that given on page B-14 in Amendment No.2 of M.R.156.

Before making any adjustments, take the following precautions :

- the engine must have attained normal working temperature.
- make certain that the distributor timing is correct.
- disconnect the retard capsule at the solenoid flap valve end and block the outlet on this valve.

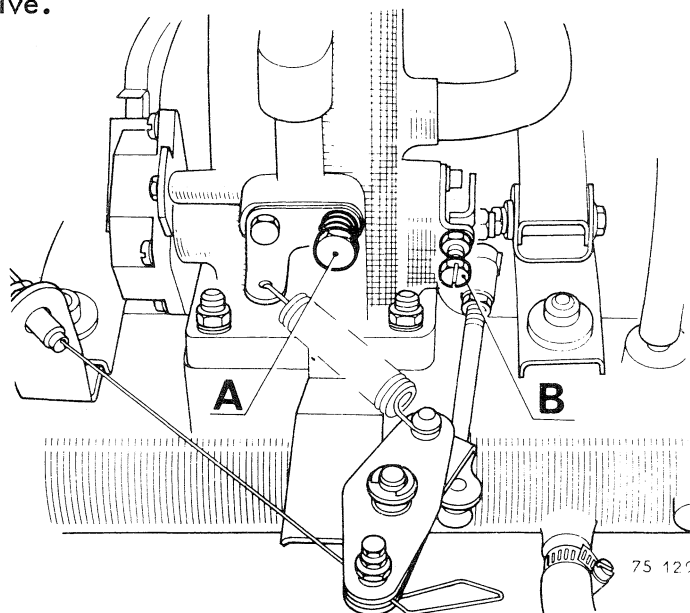
### Adjusting the throttle stop

Screw in bypass screw (A) fully.  
Adjust stop screw (B) so as to obtain an idling speed of between 900 and 1000 r.p.m.

### Adjusting the final idling speed

Reconnect the retard capsule at the solenoid flap valve end.

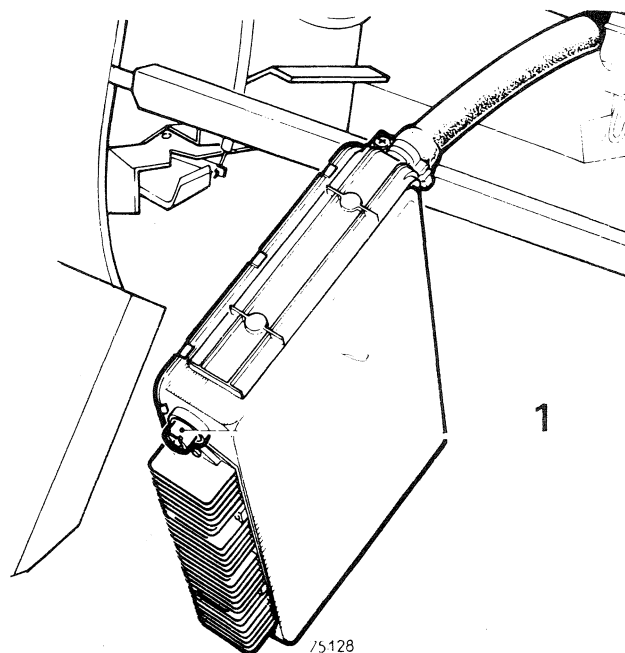
Unscrew bypass screw (A) so as to obtain an idling speed of 1000 r.p.m.  $\pm$  50.

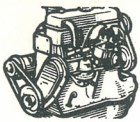


### Adjusting the CO percentage

Once the idling speed is correct, adjust the potentiometer (1) in the computer unit so as to obtain a CO percentage of 2,5%  $\pm$  0,5.

If the above adjustments fail to produce the correct results, check the setting of the throttle switch and adjust if necessary.

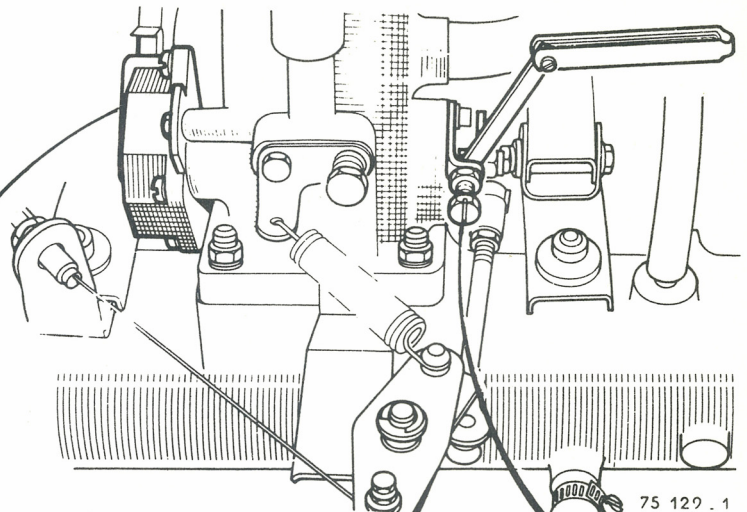
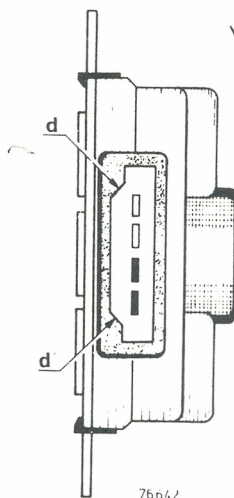
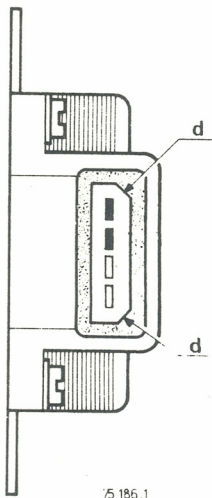




## Adjusting the throttle butterfly switch

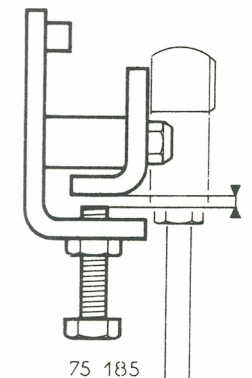
First assembly

Second assembly



This adjustment can be carried out either :

- by connecting an ohm-meter to the top or bottom 2 terminals, depending on the type of switch fitted, after pulling out the connector.
- or by connecting up the M.S.546 control box in the switch checking position.



First assembly : switch assembled with screws.

Second assembly : switch assembled by crimping

Having first adjusted the idling speed, pull out the connector and connect an ohm-meter across the top 2 terminals on the switch.

Partly unscrew the 2 switch mounting screws and insert a feeler gauge between the throttle stop screw and the operating lever.

Turn the switch so that :

- the contacts are closed (0 resistance) when an 0,15 mm (.006") feeler gauge is inserted.

- the contacts are open (∞ resistance) when an 0,25 mm (.010") feeler gauge is inserted.

Tighten the 2 mounting screws.

Having first adjusted the idling speed, pull out the connector and connect up an ohm-meter across the bottom 2 terminals on the switch.

Partly unscrew the 2 switch mounting screws and insert an 0,70 mm (.028") feeler gauge between the throttle stop screw and the operating lever.

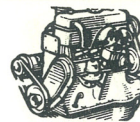
Turn the switch clockwise so that it is hard against the mounting screws.

Then turn the switch anti-clockwise until the contacts close (0 resistance).

Tighten the 2 mounting screws.

Reconnect the connector, lining up the offsets (d) on connector and switch.  
Then check the idling speed and adjust if required : during this operation the retard vacuum capsule must be connected.





### R.1313 - R.1323 - 1974 Models

The above vehicles have the following special points when compared with the 1973 models.

#### For US - California and Canada

Fitting of a cam operated throttle instead of a throttle controlled by link and swivel.  
Fitting of a crimped throttle butterfly switch.  
Heated throttle butterfly body.

#### For US

Addition of a 5th speed switch on the transmission case.

#### For California

3rd - 4th speed switch on the transmission case and light throttle (P.L.) switch on the accelerator pedal discontinued.

#### Adjusting the throttle butterfly switch

Due to the fitting of a cam operated throttle (c) in conjunction with a crimped throttle butterfly switch, the following method of adjustment must be used.

Having first adjusted the idling speed, pull out the connector and connect up an ohm-meter across the bottom 2 terminals.

Partly unscrew the 2 switch mounting screws and insert a 1 mm (.040") feeler gauge between the throttle stop screw and the fixed stop on the throttle body.

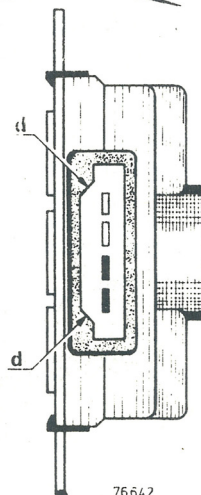
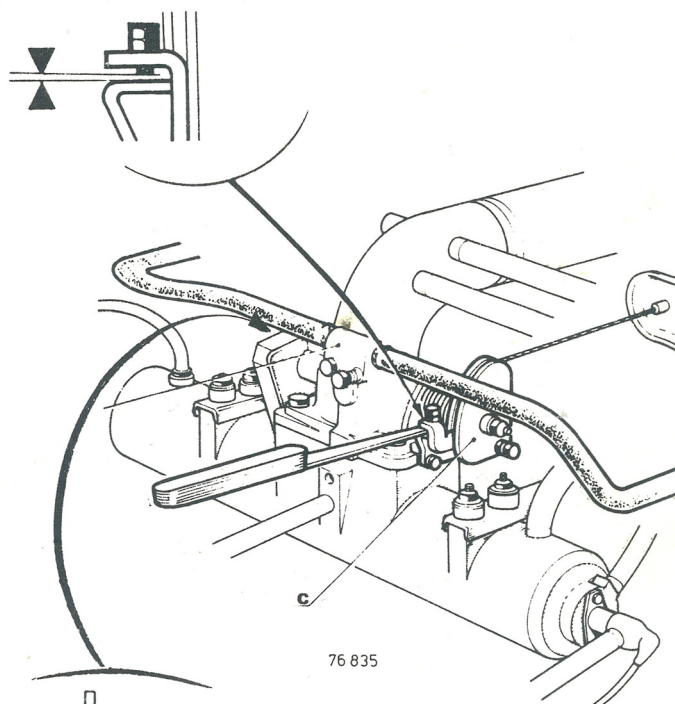
Turn the switch clockwise so that it is hard against the mounting screws.

Then turn the switch anti-clockwise until the contacts are closed (0 resistance).

Tighten the 2 mounting screws.

Reconnect the connector, lining up the off-sets (d) on connector and switch.

Then check the idling speed and adjust if required: during this operation the retard vacuum capsule must be connected.





## SPECIFICATIONS

R. 1308 - R. 1318 - R. 1328  
R. 1316 - R. 1326 1975 Models US-CALIFORNIA

The above mentioned vehicles are fitted with engine types :

- 843-15, for vehicles with manual shift transmission.
- 843-16, for vehicles with automatic transmission.
- 843-13, for vehicles with electronic Injection (except california).

The general specifications are identical to those of the 1974 model 841 engine.

### MAIN DIFFERENCES COMPARED WITH 841 ENGINES

#### CYLINDER HEAD

It is similar on the whole to that fitted to the type 807 engine.

	843-15, 843-16	843-13
Cylinder head bolt torque : (m.da N)		
- when cold	7,75 to 8,25	(55 to 60 lb/ft)
- when hot (50 minutes after engine has stopped)	8,5 to 9	(60 to 65 lb/ft)
Rocker arm clearance, hot or cold		
- Inlet (mm)	0,20 (.008")	0,25 (.010")
- Exhaust (mm)	0,25 (.010")	0,30 (.012")
Max. distortion of cyl. head gasket face (mm)	0,05 (.002")	
Max. permitted metal removal (mm)	0,50 (.020")	
Cylinder head height (mm)		
- Nominal	93,50 (3.681")	
- Repair size	93 (3.661")	
Combustion chamber volume (cc)	43,45 (2.652 cu.in)	
Compression ratio	8 to 1	8.6 to 1



## VALVE SEATS



Seat angle	90°
Seat width : - Inlet - Exhaust	1,3 to 1,6mm (.051 to .063") 1,7 to 2mm (.067 to .079")
External diameter : - Inlet - Exhaust	43mm (1.693") 37mm (1.457")

## VALVES

## TAPPETS

Stem diameter	8mm (.315")
Face angle	90°
Head diameter : - Inlet - Exhaust	42,10mm(1.658") 35,35mm(1.392")

External diameter : - Nominal - Repair size	12 mm (.472") 12,20mm (.480")
---	----------------------------------

## PUSHRODS

## CAMSHAFT

Length : - Inlet - Exhaust Diameter	78 mm (3 1/8") 110mm (4 11/32") 6 mm (.236")
--	--

No. of bearings End play	4 0,05 to 0,12mm(.002 to .004")
-----------------------------	------------------------------------

## VALVE TIMING

	843-15, 843-16	843-13
Inlet valve opens - B.T.D.C.	21°	24°
Inlet valve closes - A.B.D.C.	59°	68°
Exh. valve opens - B.B.D.C.	59°	68°
Exh. valve closes - A.T.D.C.	21°	24°

## PISTONS

	841 1975 Model - 843
Piston pin length	69mm (2 11/16")
Piston pin dia. - external - internal	21mm (.827") 12mm (.473")

## MANIFOLDS

Tightening torque of fixing bolts : - Inlet - Exhaust	3 m da N (25 lb/ft)
--	---------------------



## CYLINDER HEAD

### ADJUSTING ROCKER ARM CLEARANCES

Once the tappets are inserted in the cylinder head they may appear slightly tight in their bores.

Tap each adjusting screw lightly before adjusting the corresponding rocker arm so as to be certain that the tappet is resting on the back of the cam.

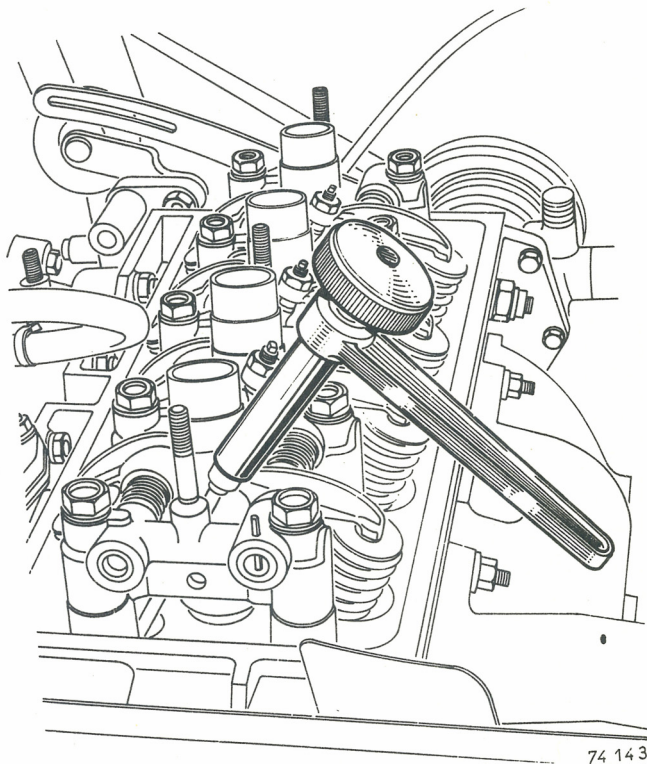
- Mot. 443 wrench.
- connect remote control starter switch : MS.511.
  - . green wire to battery +
  - . red wire to starter solenoid.
  - . black wire to ignition coil, Bat. +
- press plunger button (P) intermittently to turn the engine.

Switch (1) enables the engine to be started for a possible check.

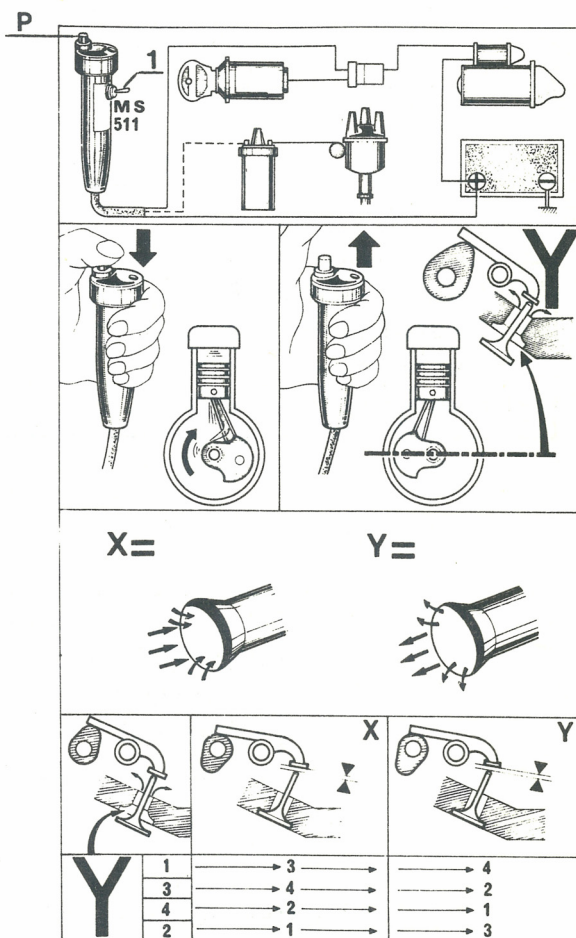
Before using the MS.511 remote control make sure that the manual shift transmission is in neutral or that the automatic transmission is in the "Park" position.

Proceed as follows (spark plugs in position). Turn the engine by quick presses of the plunger button so that an exhaust valve (Y) is fully open and adjust the corresponding rocker arm clearances (see table).

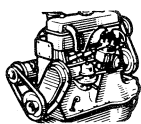
On an engine in good condition, after the point of compression has passed, the engine stops with an exhaust valve (y) fully open (the pistons being approximately half way along their bores).



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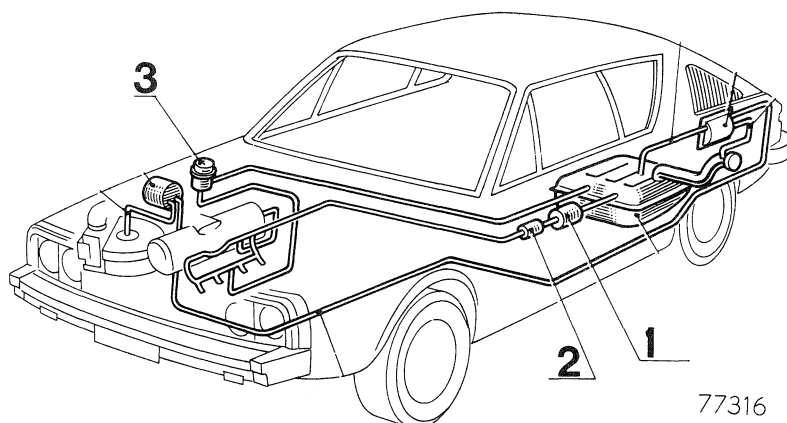


## ELECTRONIC INJECTION

R. 1316 - R. 1326 - US 1975 Models

The above mentioned vehicles are fitted with an 843-13 engine which comprises :

- A BOSCH-JETRONIC-L fuel injection system.
- A system for injecting air into the exhaust.



### JETRONIC - L ELECTRONIC INJECTION SYSTEM

It consists of :

- a fuel feed system having :

An electric fuel pump (1).

A fuel filter (2).

A pressure regulator (3).

4 injectors coupled in series with resistances fixed to the R.H. cowl side adjacent to the R.H. shock absorber.

A cold-start injector (5).

- a control system comprising :

An airflow meter (7).

An auxiliary air control.

A control unit (14)(electronic)

A thermal cut-out time switch (12).

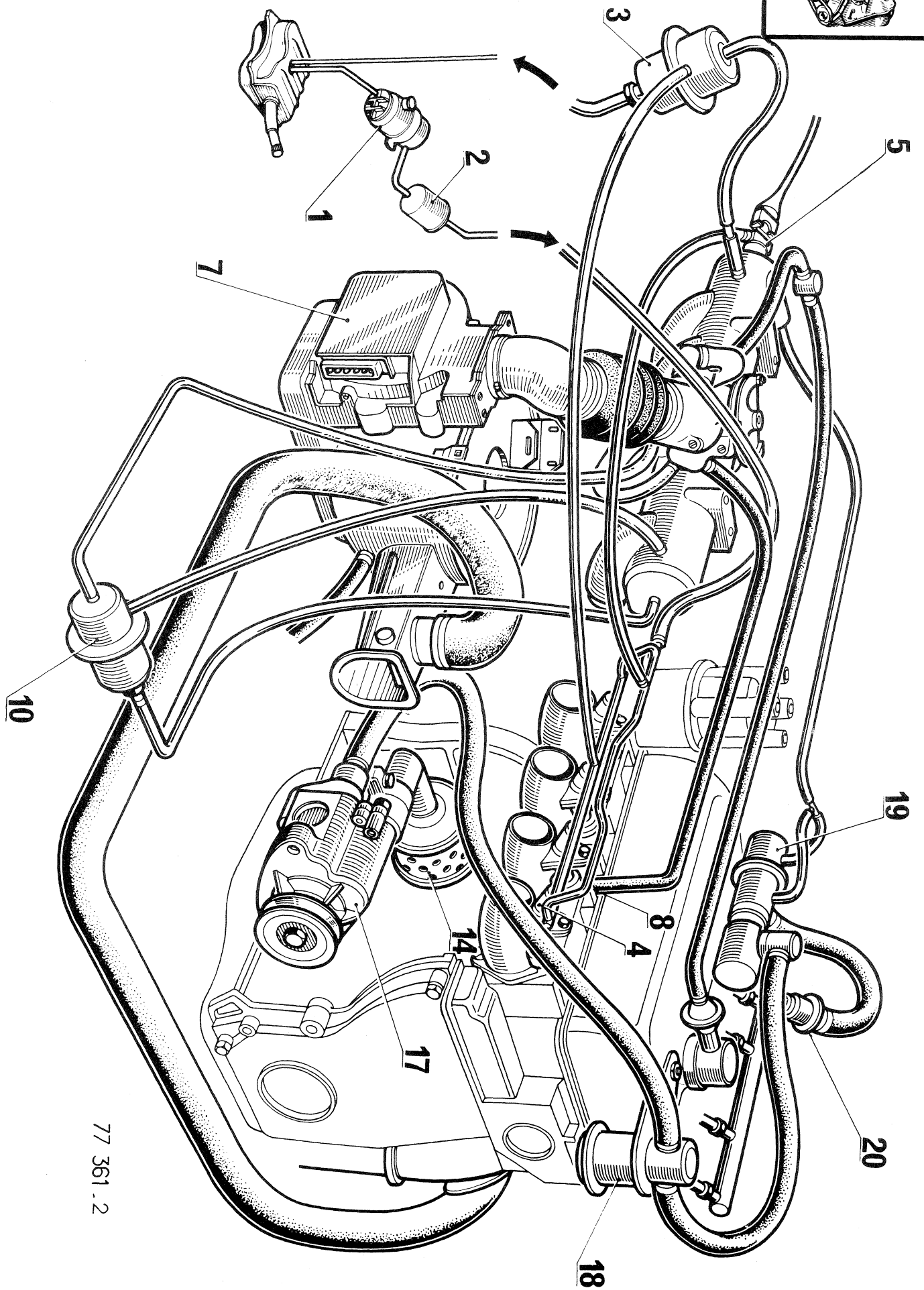
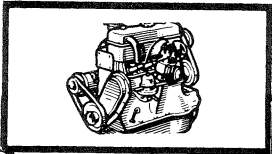
A throttle butterfly switch (9).

An auxiliary air pneumatic valve for deceleration (10).

A coolant temperature sensor (11).

The above parts differ from those fitted to the "D" electronic injection system in the 1974 Models.





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## OPERATION

- The electric fuel pump draws fuel from the fuel tank and delivers it to the injectors fuel pump via a filter.

A pressure regulator, fitted on the fuel tank return line, maintains the pressure in the injector fuel pump at 2,5 bars (35 psi). It is connected to the intake manifold to effect a correction depending on the intake vacuum pressure.

The electro-magnetic injectors are operated by an electronic control unit. They deliver twice simultaneously per engine cycle, which allows a standard ignition distributor to be used without additional contacts for triggering of the fuel injection system.

Current feed to the electric fuel pump depends, on one hand, on the ignition switch, and, on the other hand, on a contact on the flowmeter which remains open as long as the airflow is insufficient to start the engine.

The electronic control unit controls the time that the injectors are open and meters the injected fuel flow as a result of information which it receives :

- from the measuring plate in flowmeter which continuously measures the amount of air drawn in by the engine by means of a potentiometer located on the end of the plate spindle.
- from the distributor, the rotor arm which is used to indicate engine r.p.m.
- from the coolant temperature sensor located in the cylinder head, so as to enrichen the mixture during the cold start and warm up period.

- from the switch located on the throttle plate spindle, so as to indicate the idling and full throttle positions.

The cold start injector is controlled by a thermal cut-out time switch. It gives mixture enrichment necessary for cold starting.

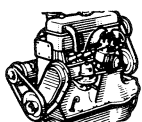
The auxiliary air valve is controlled by a bi-metal spring warmed by the engine's ambient temperature and an electrical resistance. It increases the quantity of intake air admitted to give fast idling as long as the engine is cold.

A vacuum valve, controlled by the existing vacuum the intake air distributor, introduces air from upstream to downstream of the throttle plate when the vacuum pressure is high (deceleration).

## SYSTEM FOR INJECTING AIR INTO THE EXHAUST

It comprises :

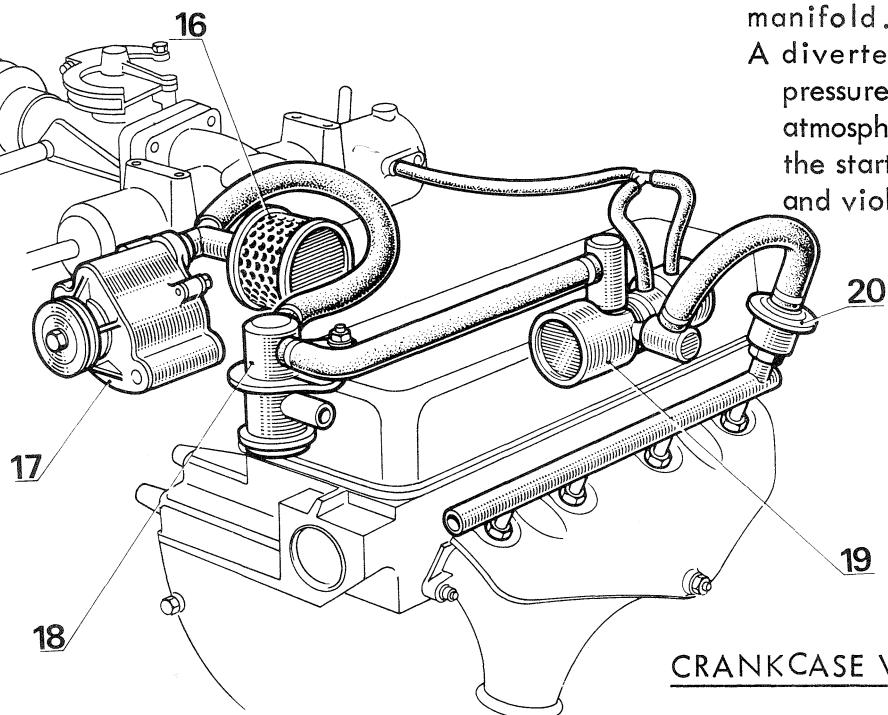
- an air filter (16)
- an air pump (17)
- a relief valve (18)
- a diverter valve (19)
- a check valve (20).



## OPERATION

Air from the pump (17), at a pressure of 0,330 bars (4,7 psi) controlled by relief valve (18), is directed to the exhaust manifold.

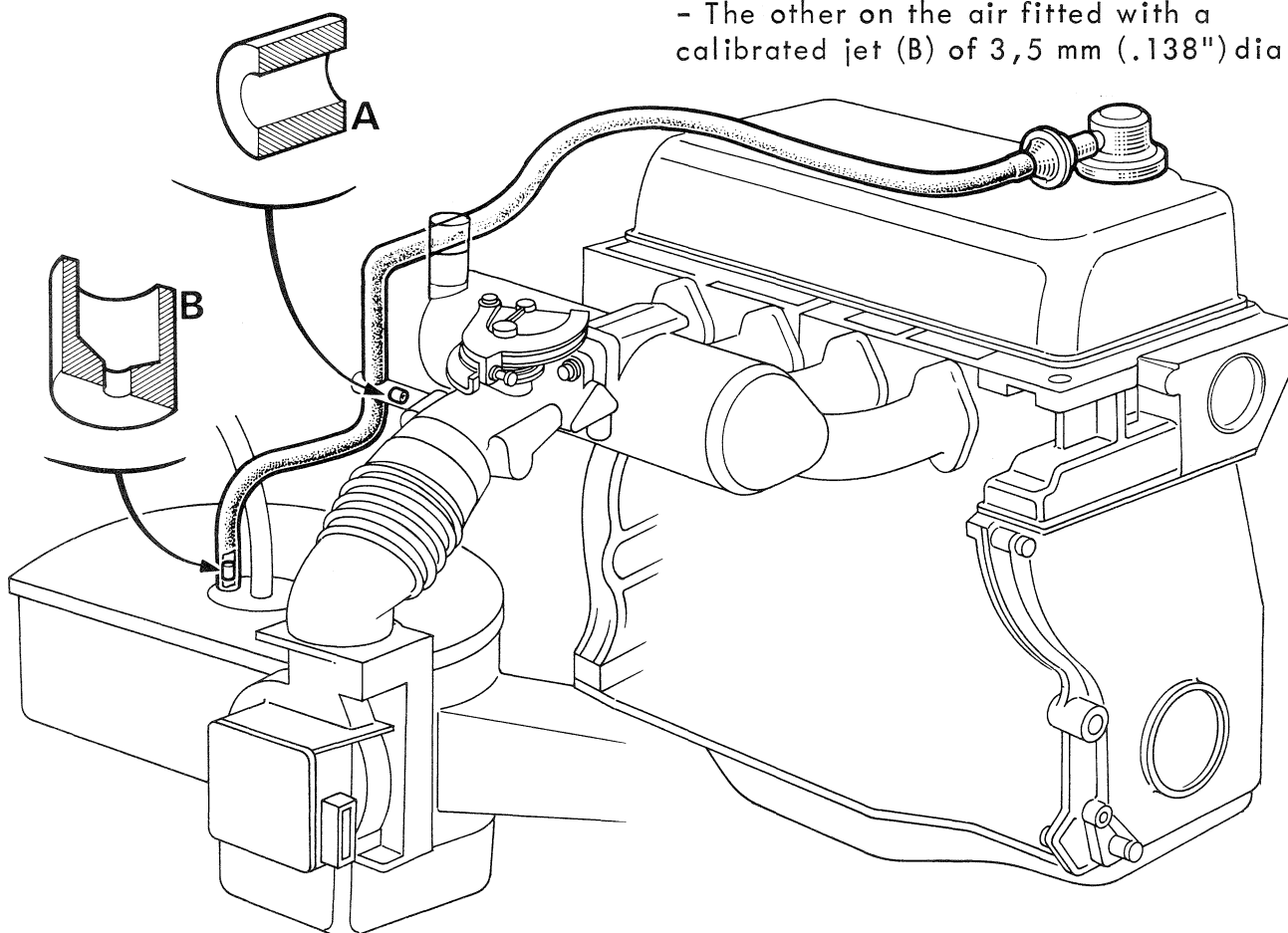
A diverter valve (19), controlled by vacuum pressure, directs the air from the pump to atmosphere for approximately 2,5 seconds at the start of deceleration so as to prevent noisy and violent combustion of the exhaust gases.



## CRANKCASE VENTILATION SYSTEM

The oil vapor ventilation circuit has two take-off points :

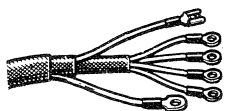
- One on the housing upstream of the throttle plate, fitted with a calibrated jet (A) of 4 mm (.158") dia.
- The other on the air fitted with a calibrated jet (B) of 3,5 mm (.138") dia.



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## SPECIFICATIONS

### — ENGINE ELECTRICAL —

#### DISTRIBUTOR

R. I304 - 1973 Model

R. I304 - R. I314 - R. I324 - 1974 Model

Model year	Vehicle type	Engine type	Curves		Flywheel setting	
			Centrifugal	Vacuum	Degrees	mm
1973	R. I304	84I - 15	R. 24I	D 60	$5 \pm 1$	$11 \pm 2,2$ ( $7/16 \pm 3/32$ " )
		84I - 16	R. 24I	D 64	$3 \pm 1$	$6,5 \pm 2,2$ ( $1/4 \pm 3/32$ " )
1974	R. I304 R. I314 R. I324	84I - 15	R. 24I	-	$10 \pm 1$	$22 \pm 2,2$ ( $7/8 \pm 3/32$ " )
		84I - 16	R. 24I	D 64	$10 \pm 1$	$22 \pm 2,2$ ( $7/8 \pm 3/32$ " )

R. I313 - R. I323 - 1973 and 1974 Models

Model year	Vehicle type	Engine type	Curves		Flywheel setting	
			Centrifugal	Vacuum retard	Approx. static	Dynamic - retard capsule connected
1973 1974	R. I313 R. I323	807 - 13	R. 272	D 62	$12^{\circ}$	$0^{\circ} \pm 1$

On the above vehicles the curves are marked on a self-adhesive label placed :

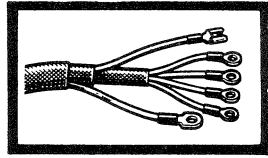
- on the distributor body for the centrifugal curve,
- on the vacuum capsule for the vacuum retard capsule.



## Curves

### Centrifugal

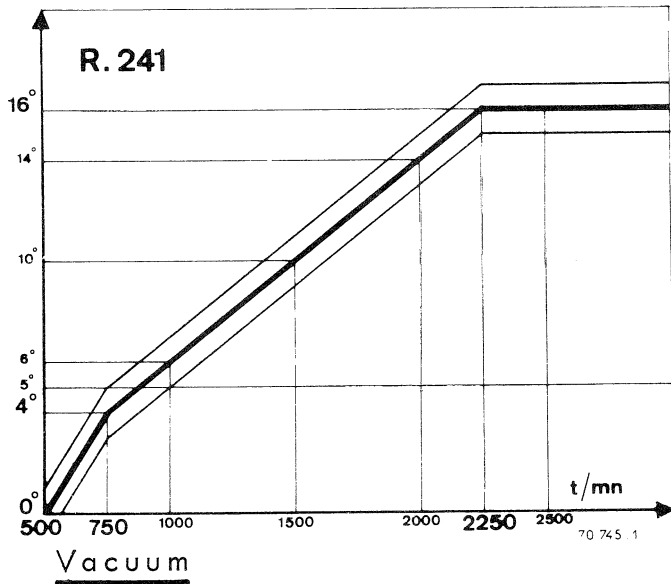
Curves drawn in distributor degrees and distributor r.p.m.



Reminder :

1 distributor degree = 2 engine degrees

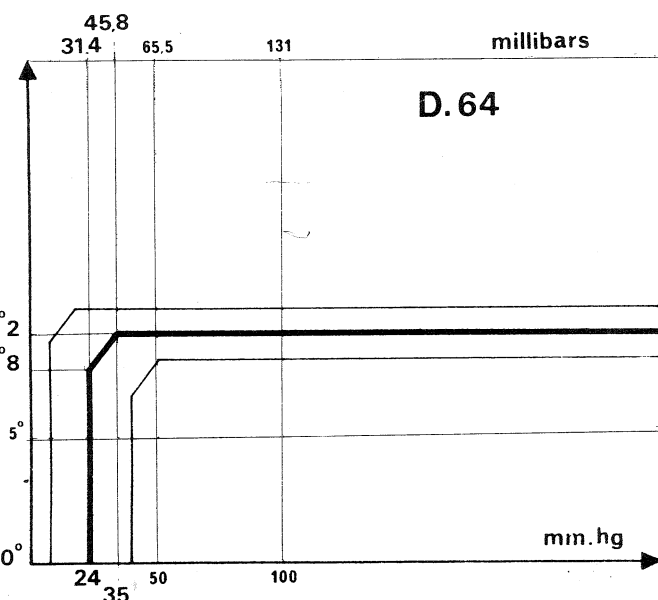
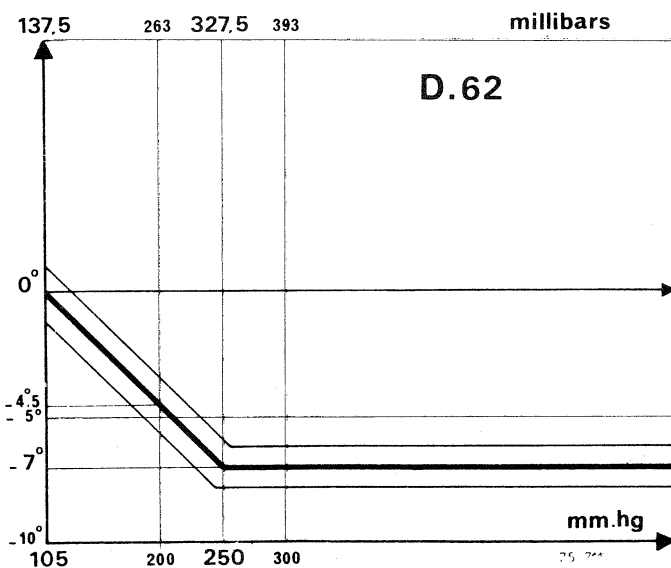
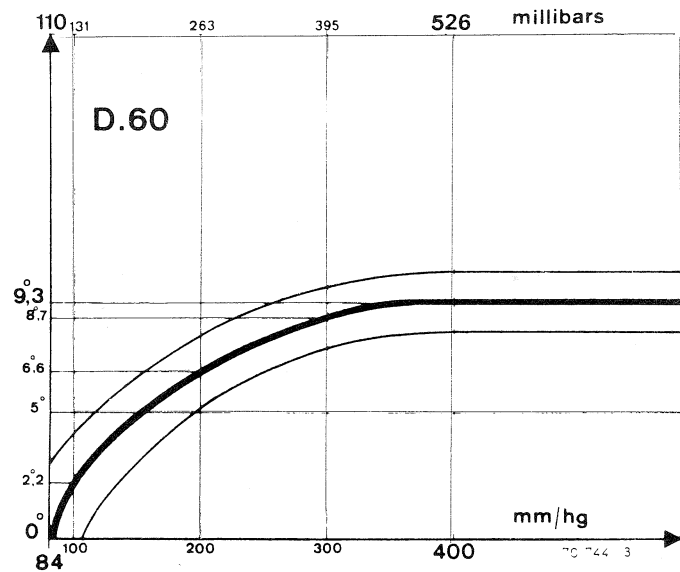
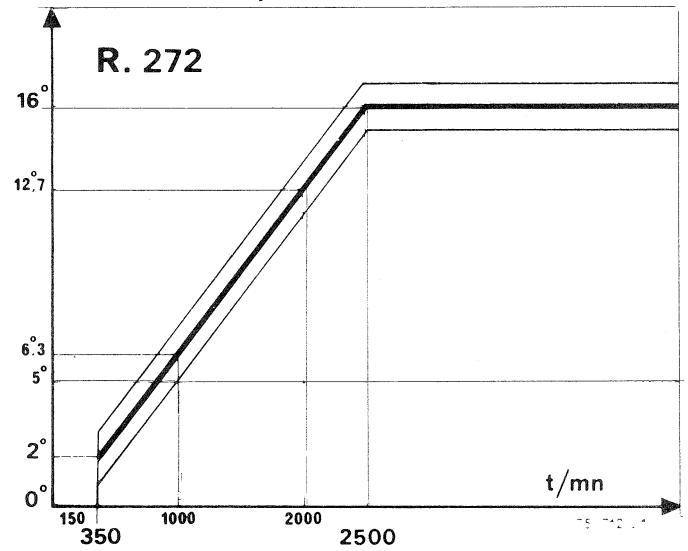
1 distributor r.p.m. = 2 engine r.p.m.

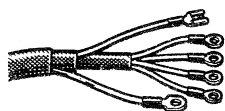


Curves drawn in millimetres of mercury or millibars and distributor degrees.

Reminder :

1 distributor degree = 2 engine degrees,  
the vacuum remaining unchanged.





## SPARK PLUGS

Vehicle type	Engine type	A.C.	Champion	Electrodes gap
R. I304 R. I314 R. I324	84I - I5 84I - I6	45 XL	N 5	0,6 mm (.024")
R. I313 R. I323	807 - I3	--	N 3	

## ALTERNATOR

### R. I304 - 1973 Model

A Paris-Rhône 50 amp. alternator is fitted instead of an SEV 40 amp. alternator.

## - GENERAL ELECTRICAL -

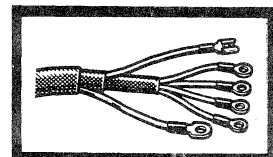
## INTERDICTION SYSTEM FOR ENGINE STARTING (Interlock-System)

### R. I304 - R. I314 - R. I324 - 1974 Models - US - California (except Canada).

These vehicles are fitted with a system which prevents the engine being started when the safety belts are not fastened (driver and front passenger).

### List of units

- |   |   |
|---|---|
| 1 - Battery   | 9 - Passenger's seat switch                                       |
| 2 - Starter   | 10 - Passenger's safety belt switch                               |
| 3 - Starter relay                                   | 11 - Driver's safety belt switch                                  |
| 4 - Starter authorisation relay                     | 12 - Starting interdiction case                                   |
| 5 - Ignition starter switch                         | 13 - Fuse   |
| 6 - { Switch on transmission case (manual shift)    | 14 - Connector - interdiction case harness to car harness (white) |
| { Switch on selector lever (automatic transmission) | 15 - Connector - interdiction case harness to car harness (green) |
| 7 - Warning light on instrument panel               | 16 - Connector - interdiction case harness to car harness (black) |
| 8 - Driver's seat switch                            |   |



The method below cancels and supersedes that given on page C-26 in Amendment No.2 of M.R.156.

The flywheel has two timing marks :  
- Line "0" indicates T.D.C. - firing stroke.  
- Line "8" indicates 8° of advance in relation to T.D.C.

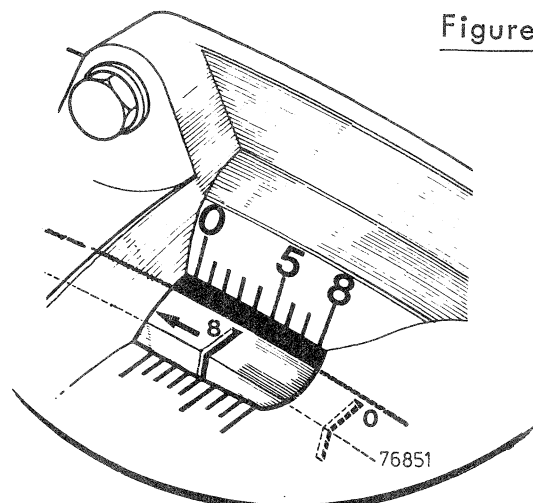
Figure A

Initial static setting : figure A

The initial static setting is only valid for the approximate positioning of the distributor (engine stopped).

Bring the flywheel timing line "8" into line with graduation "4" on the clutch housing.

Then carry out the final setting with the stroboscopic lamp (engine running).



Final setting using the stroboscopic lamp :  
figure B (engine running at 1000 r.p.m.  $\pm$  50)

Do not disconnect the vacuum capsule

Loosen the distributor clamp.

Connect up the lamp.

Start the engine and let it run at 1000 r.p.m.  
Turn the distributor so that the flywheel timing line "0" is brought into line with the fixed graduation "0" on the clutch casing.

Check the timing again after tightening the distributor clamp.

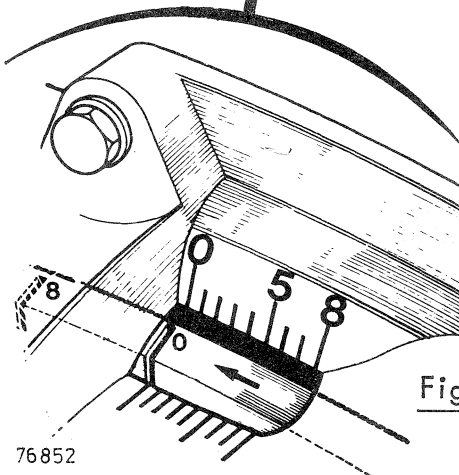
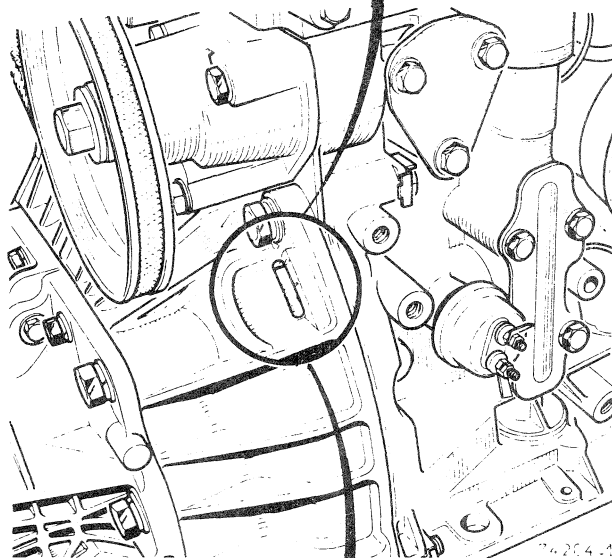
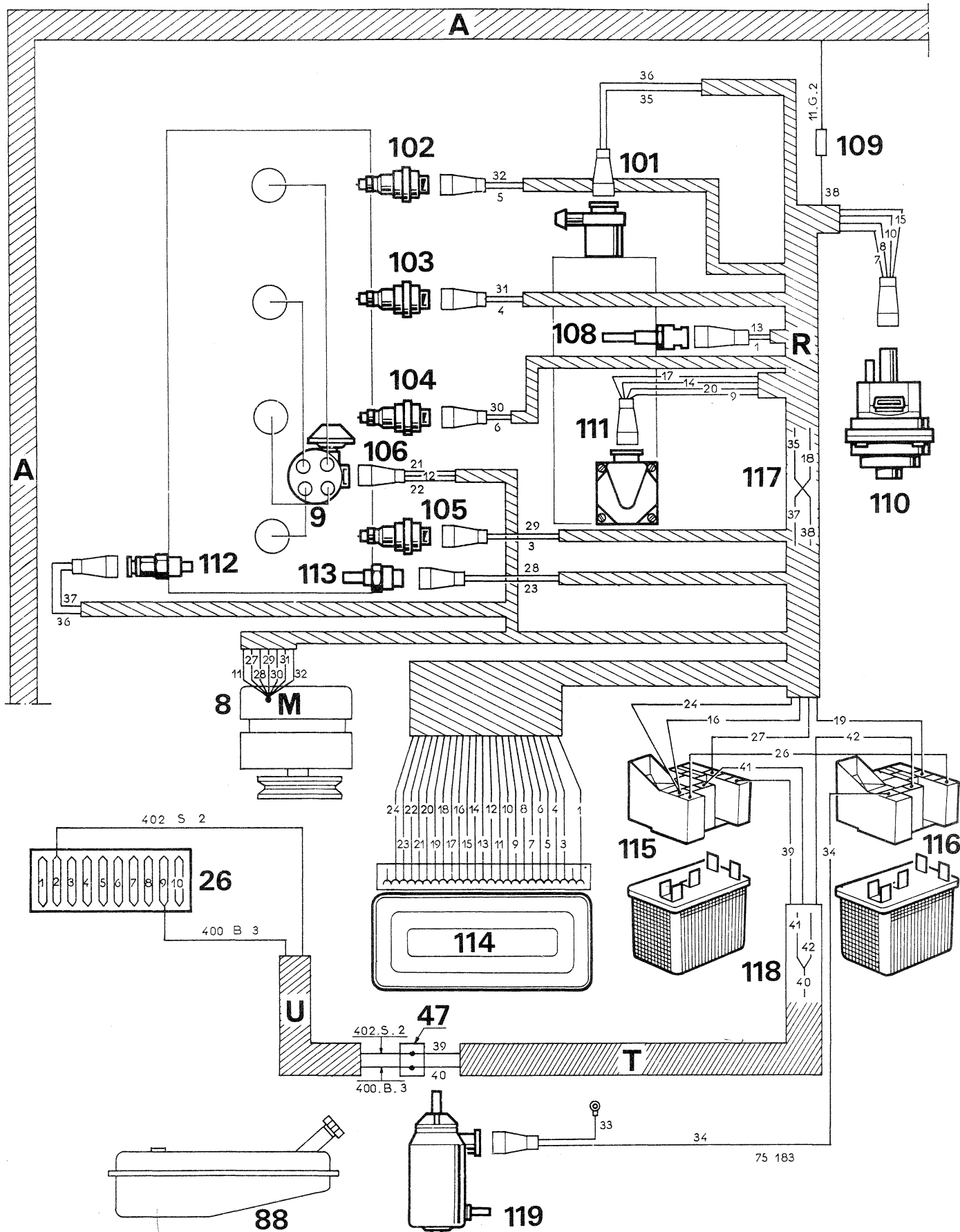
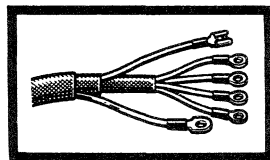


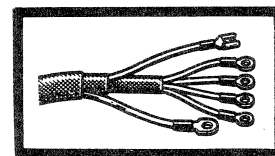
Figure B

R.1313 - 1973 Model

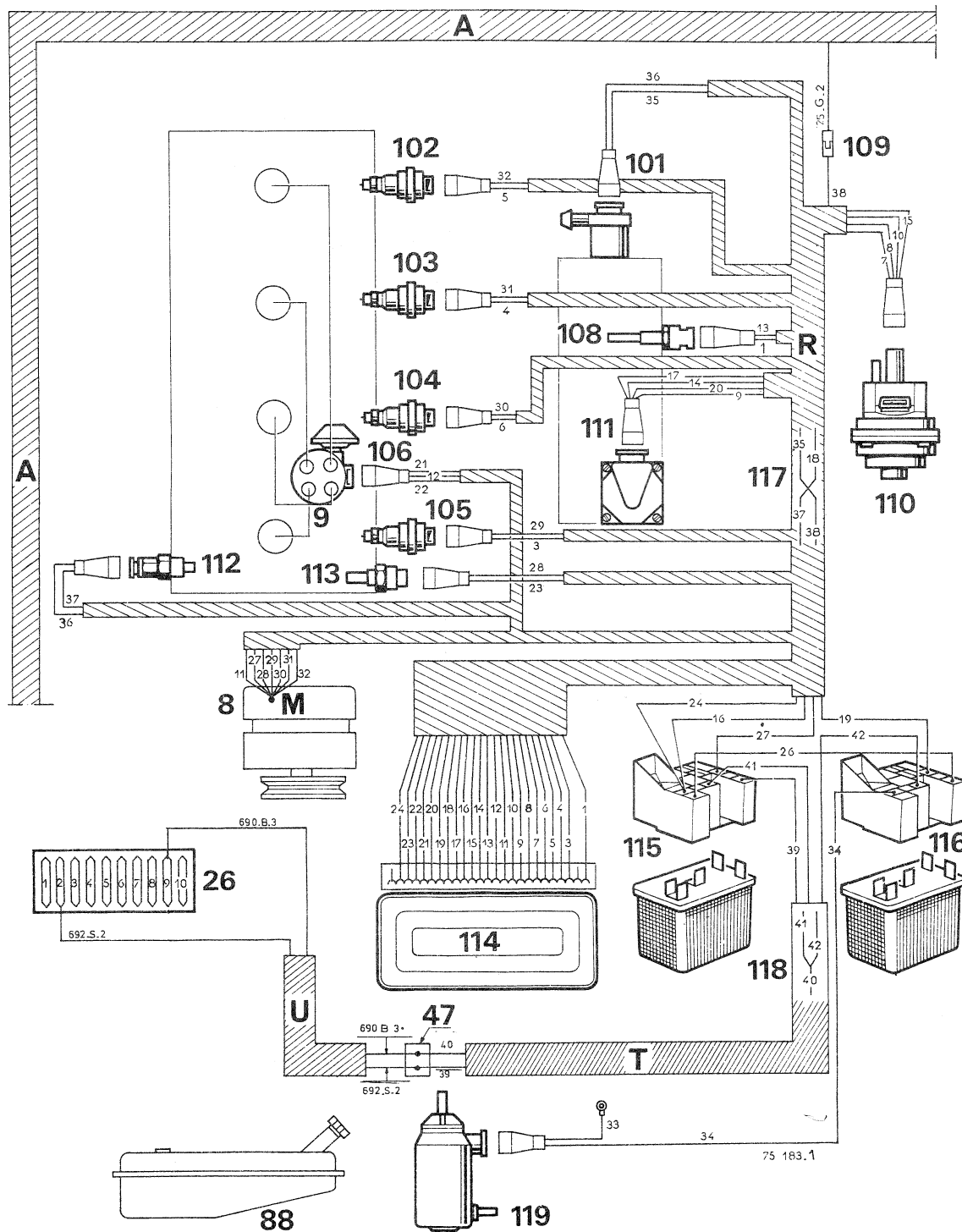
Wiring diagram of electronic injection system

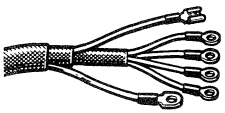






Wiring diagram of electronic injection system





## SPECIFICATIONS

### ENGINE ELECTRICAL

US - CALIFORNIA - 1975 Model

R.1308 - R.1318 - R.1328 - 1975 Models

Model year	Vehicle type	Engine type	Curves		Flywheel setting	
			Centrifugal	Vacuum	Degrees	mm
1975	R.1308 R.1318 R.1328	843 - 15	R.243	D.64	$10 \pm 1$	$22 \pm 2,2$ ( $55/64 \pm 3/32$ " )
		843 - 16	R.243	D.64	$10 \pm 1$	$22 \pm 2,2$ ( $55/64 \pm 3/32$ " )

R.1316 - R.1326 - 1975 Models (except California)

Model year	Vehicle type	Engine type	Curves		Flywheel setting	
			Centrifugal	Vacuum	Degrees	mm
1975	R.1316 R.1326	843 - 13	R.258		$12 \pm 1$	$26,4 \pm 2,2$ ( $1 \frac{1}{32} \pm 3/32$ " )

Distributor advance curves

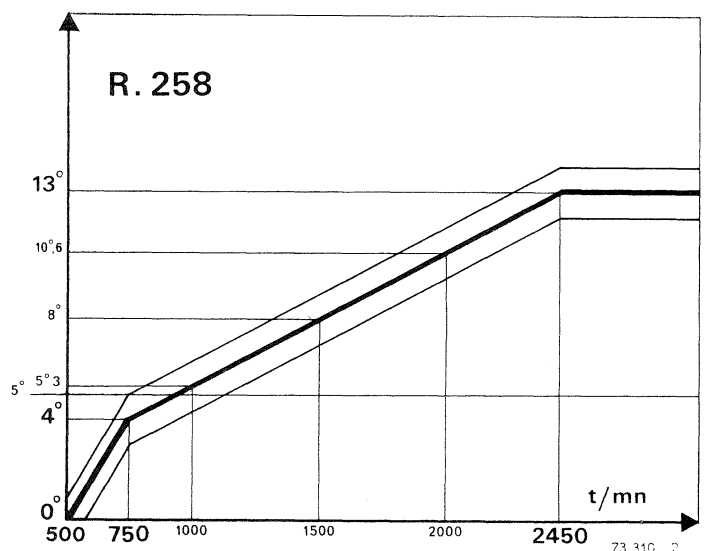
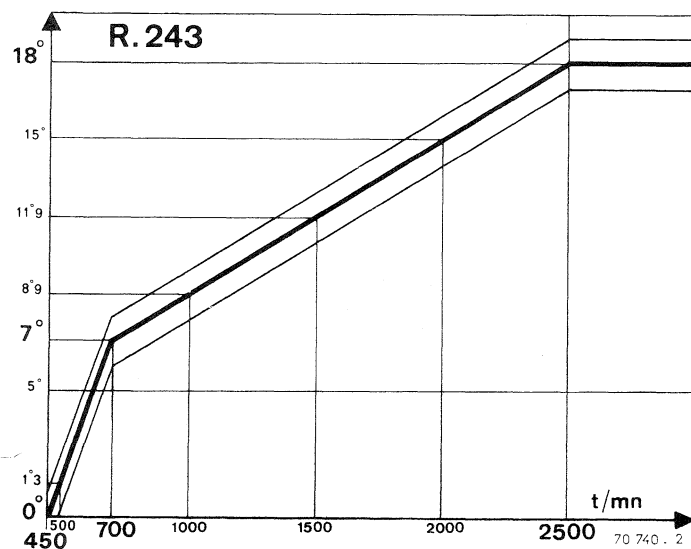
Centrifugal

Curves drawn in distributor degrees and distributor r.p.m.

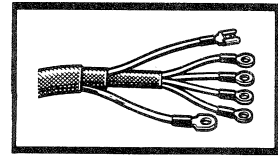
Reminder :

1 distributor degree = 2 engine degrees

1 distributor r.p.m. = 2 engine r.p.m..



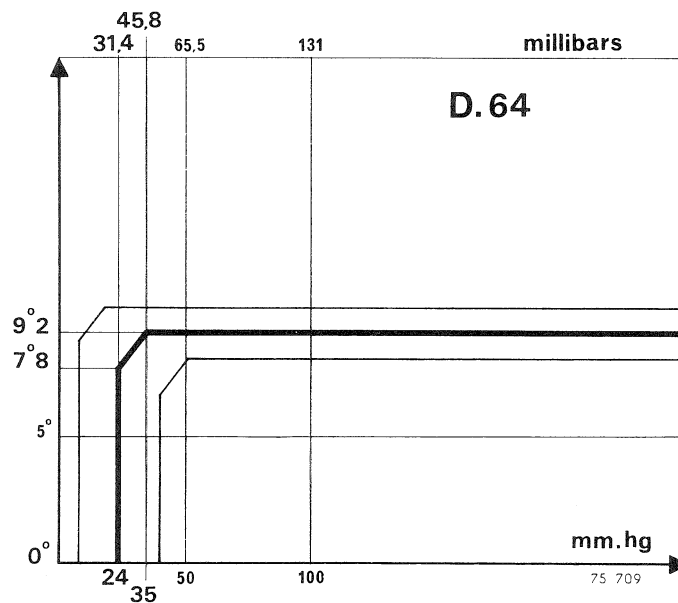
## Vacuum



Curves drawn in millimetres of mercury or millibars and distributor degrees.

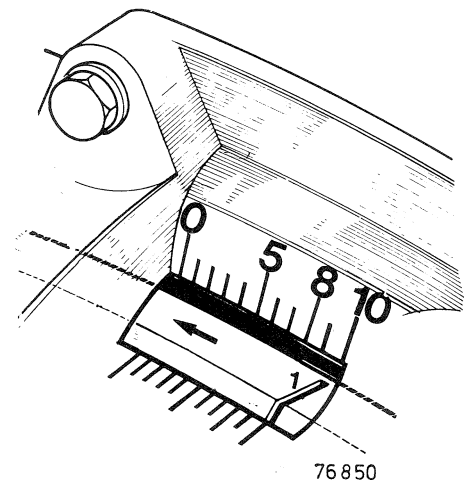
Reminder :

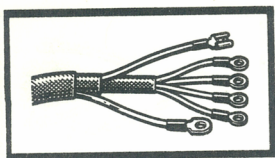
1 distributor degree = 2 engine degrees,  
the vacuum remaining unchanged.



### R.1308 - R.1318 - R.1328 - US - CALIFORNIA - 1975 Models

Timing should be set with a strob lamp.  
Disconnect the vacuum advance system.  
Loosen the distributor plate.  
Connect strob lamp.  
Start the engine, be sure engine is running  
at idle speed.  
Turn the distributor so that flywheel timing  
mark "1" is in line with graduation "10"  
on the clutch housing.





## R.1316 - R.1326 - US 1975 Models

Use a strob lamp for setting.

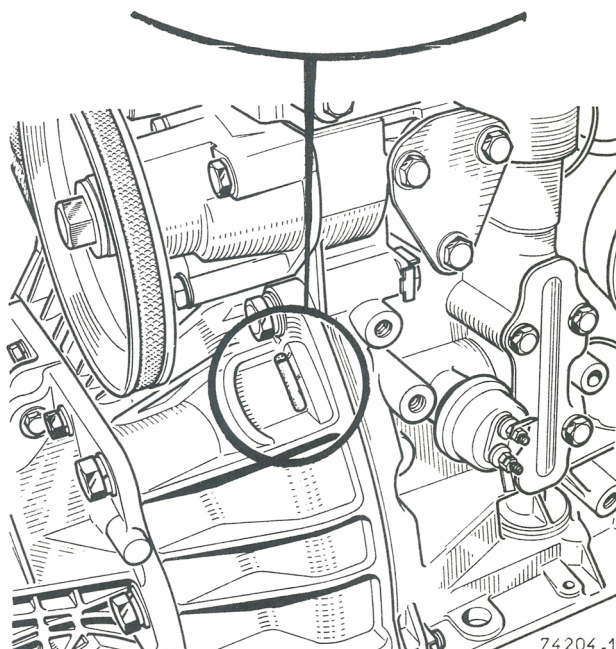
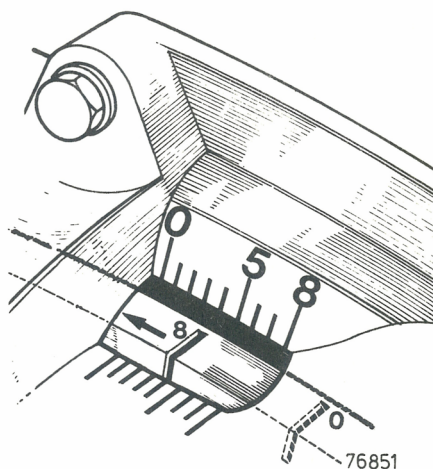
Loosen the distributor plate.

Connect strob lamp.

Start the engine be sure engine is running at idle speed.

Tum the distributor so that flywheel timing mark "8" is in line with graduation "4" on the clutch housing.

Check the timing again after tightening the distributor plate.



74 204 -1.

## CANADA - 1975 Models

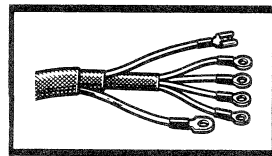
The distributor timing setting (commencement of advance and curves) for vehicles in the 1975 model range remains the same as for models in the 1974 range.

## SPARK PLUGS

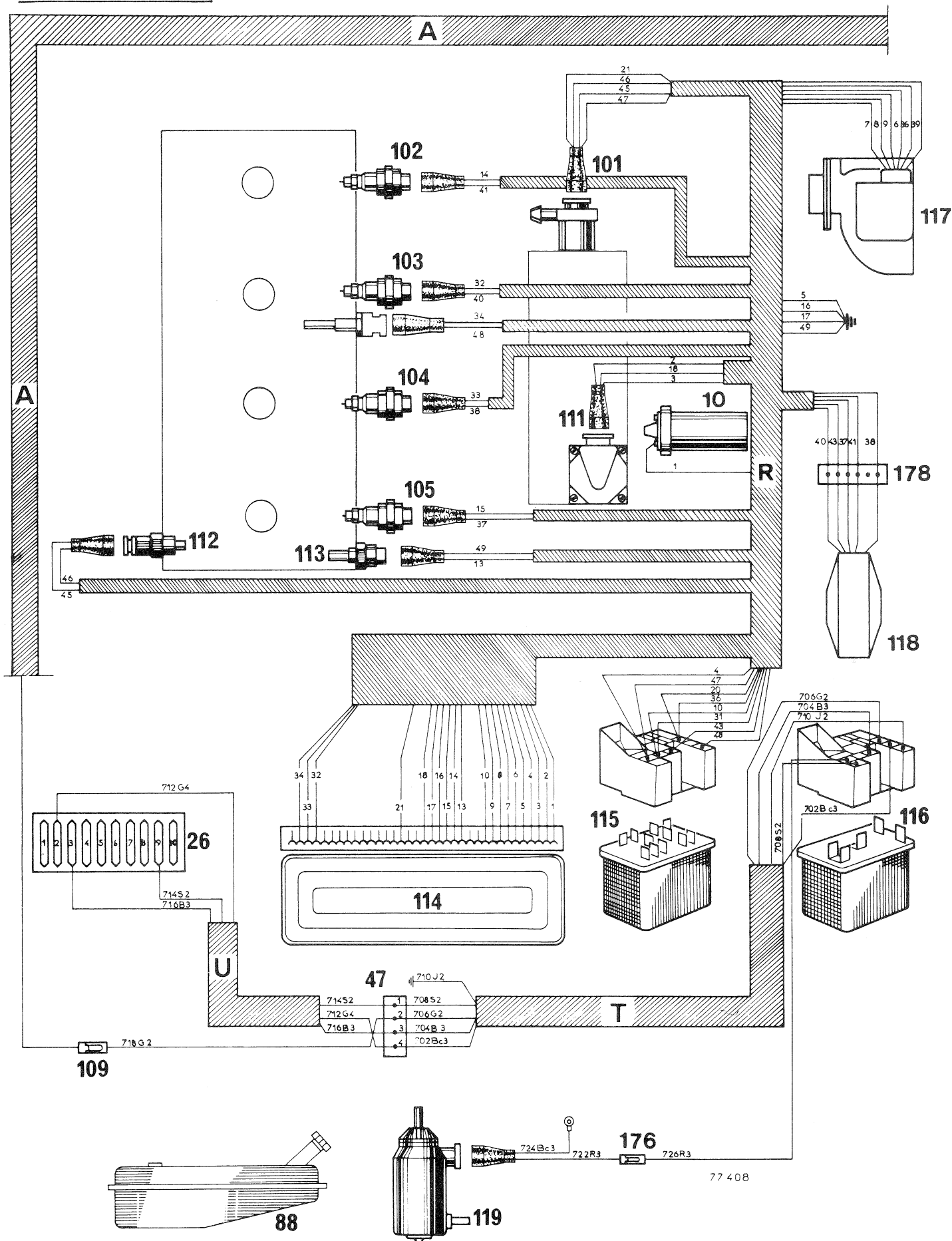
vehicle type	Engine type	A.C.	Champion	electrodes gap
R.1308 R.1318 R.1328	843-15 843-16	42 XLS	N7 Y	0,625 to 0,75 mm (.025" to .028")
R.1316 R.1326	843-13		N 3	

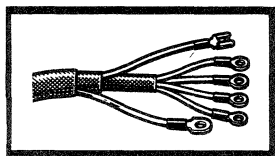


# WIRING DIAGRAM FOR ELECTRON INJECTION SYSTEM



R. 1316 - 1975 Model





## AUTOMATIC TRANSMISSION

- |   |                           |
|---|---------------------------|
| 122 Solenoid flap valve for distributor vacuum control    | 152 Sealed multiple plug  |
| 124 Cam switch on throttle butterfly spindle              | 154 Kick-down switch      |
| 131 Solenoid flap valve for exhaust gas recycling control | 155 Selector illumination |
| 150 Governor  | 156 Neutral switch        |
| 151 Computer  | 177 Recycling valve       |

## ELECTRONIC INJECTION

- |  |                                 |
|--|---------------------------------|
| 100 Injection system   | 112 Thermal cut-out time switch |
| 101 Cold start injector  | 113 Coolant temperature sensor  |
| 102 No.4 cylinder injector   | 114 Control box                 |
| 103 No.3 cylinder injector   | 115 Main relay                  |
| 104 No.2 cylinder injector   | 116 Fuel pump relay             |
| 105 No.1 cylinder injector   | 117 Flowmeter                   |
| 108 Auxiliary air control  | 118 Resistance                  |
| 109 <del>Push-on</del> spade plug and socket - cold start injector | 119 Fuel pump                   |
| 111 Throttle butterfly spindle switch                              | 178 Junction block              |

## LIST OF HARNESSES

- |   |                                   |
|---|-----------------------------------|
| A Front harness   | I Fuses harness                   |
| B Rear harness  | J Fuses harness                   |
| C Interior light harness                                      | N Automatic transmission harness  |
| D Directional signal and "main-dipped beam" changeover switch | P Negative lead                   |
| E Safety belts harness  | Q Positive lead                   |
| F Licence plate light wiring                                  | U Fuses harness (injection relay) |
| G Cigar lighter wiring  | T Feed wires (injection relay)    |
| H Gear selector harness (automatic transmission)              | R Injection harness               |



