I

Pages

A - ENGINE ASSEMBLY
- Identification — A1.002 - 003
- Removal - refitting — A4.002 - 015

B - CYLINDER HEADS
- Checks - timing - counter weights — B2.002 - 005
- Removal - refitting — B4.002 - 021

E - VALVE GEAR
- Valve clearance adjustment — E2.002 - 005
- Removal - refitting — E4.002 - 009

F - FUEL SUPPLY SYSTEM
- Checks - Repairs - Adjustments — Refer to brochures
  . Engines with catalytic converter — Ref : 3621
  . Engines without catalytic converter — Ref : 3622

G - IGNITION SYSTEM
- Checks - Repairs - Adjustments — Refer to brochures
  . Engines with catalytic converter — Ref : 3621
  . Engines without catalytic converter — Ref : 3622

J - COOLING SYSTEM
- Cooling system
  - Draining - filling — J3.002 - 005

K - LUBRICATION SYSTEM
- Checking — K2.002 - 003

Z - EFFECTS OF «AIR CONDITIONING» ** — Z4.002 - 003

PRC CONCEPT



I

LEGISLATION PLATE (1)

Attached to the left-hand side of the cylinder block beside the oil filter.

It includes:

(a): number defining the engine family

(b): legislation index

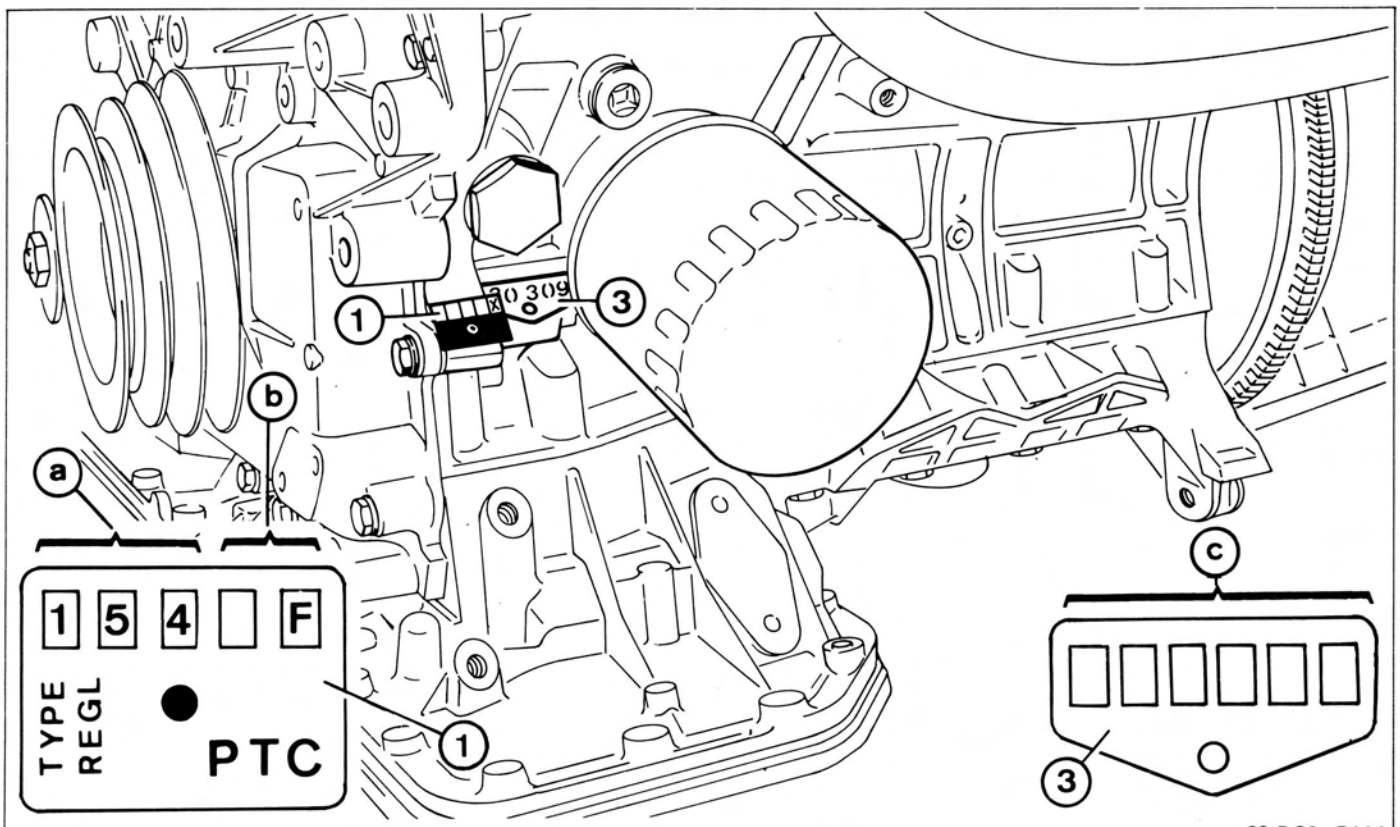
a	b	Engine
154	F	ZN3J without catalytic converter
	X	ZN3J with catalytic converter

The references **(a)** and **(b)** are also stamped on the front of the left-hand cylinder head at **(2)**.

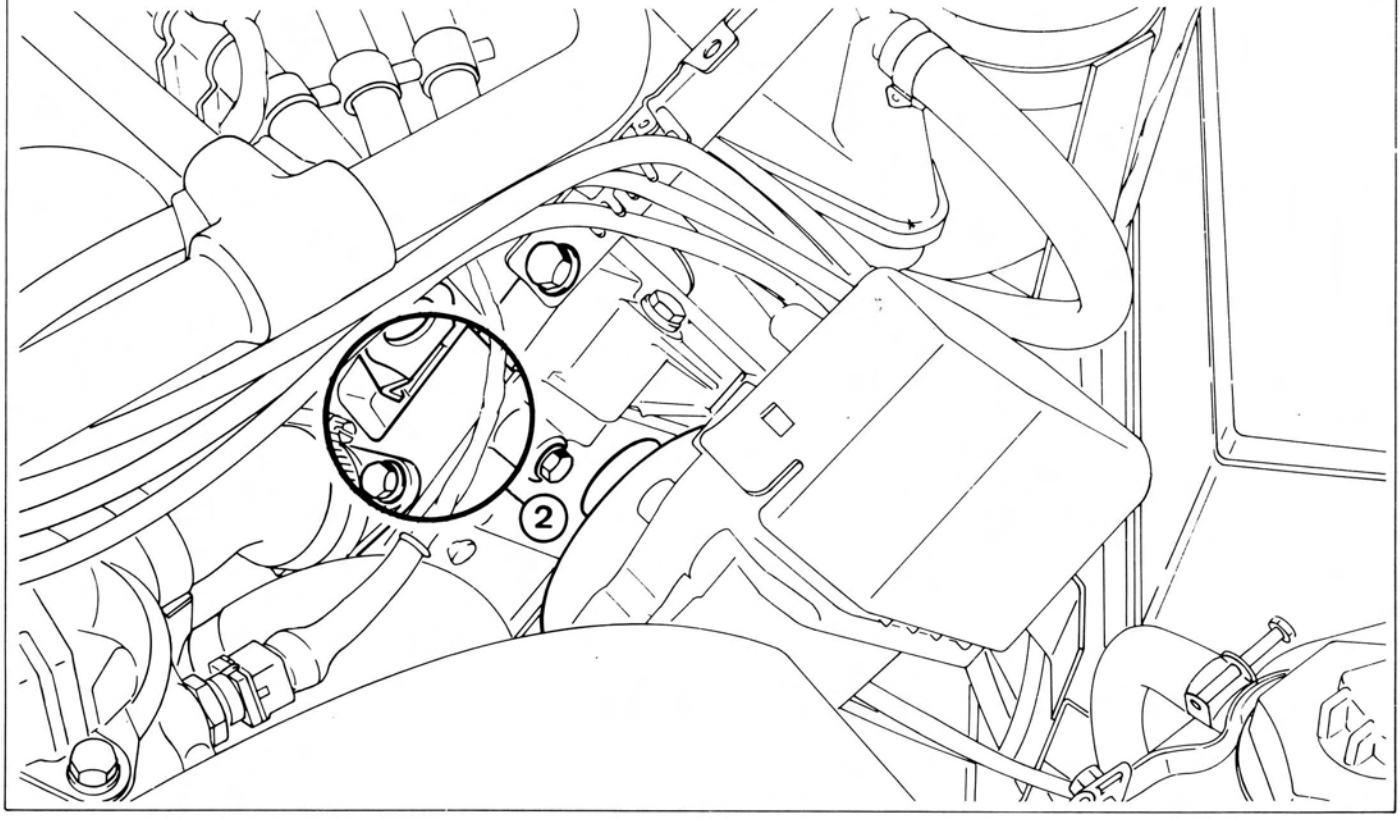
SERIAL NUMBER PLATE (2)

(c): serial number

I



20.5.86 B114



15.5.86 B155



I

SPECIAL TOOLS

(-).0134 A

- Engine stand

II

(-).0125

- Gearbox supporting fixture

(-).1511 C

- Engine cross member retaining bolt

III

(-).0135 ZZ

- Engine lifting equipment, comprising:

A - Cross beam

B - Set of two hooks

IV

(-).0318

- Converter retainer
  C - Retainer
  D - V6 bracket

(-).0118 PZ

- Crankshaft pulley wrench comprising:
  P1 - 35 mm socket
  P2 - Lever

(-).0134 Q

- Flywheel lock

V

TOOLS TO BE MADE LOCALLY

0.0155*

- Gearbox bearer for use with gearbox support (-).0125 (◄ section 15)

*: Made for 505 ZEJ - ZDJ

VI

TOOLS TO BE MODIFIED

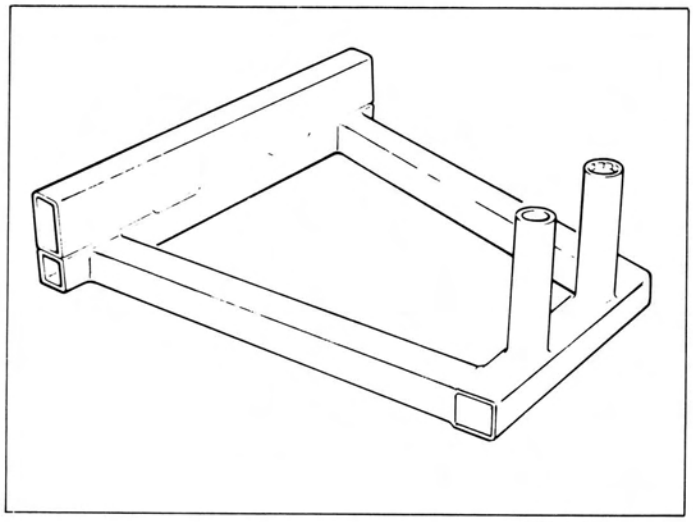
Hooks (-).0125 B

- Bevel the lower end to ease engagement in the lifting eyes.

: Modify a socket

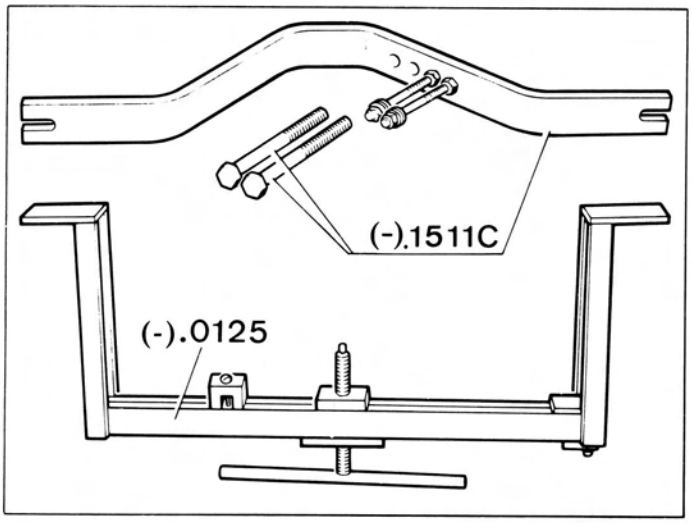
J16H (dimension **X = 16 mm,** dimension **Y = 8 mm)** (Engine/converter assembly bolts)

I

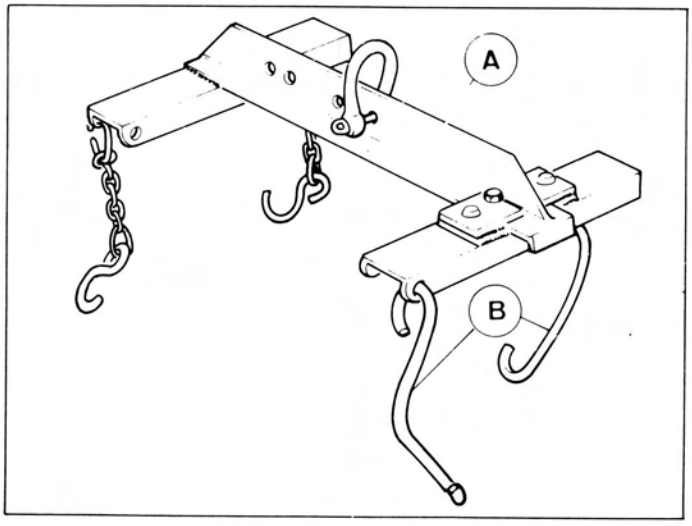


21.4.86 C107

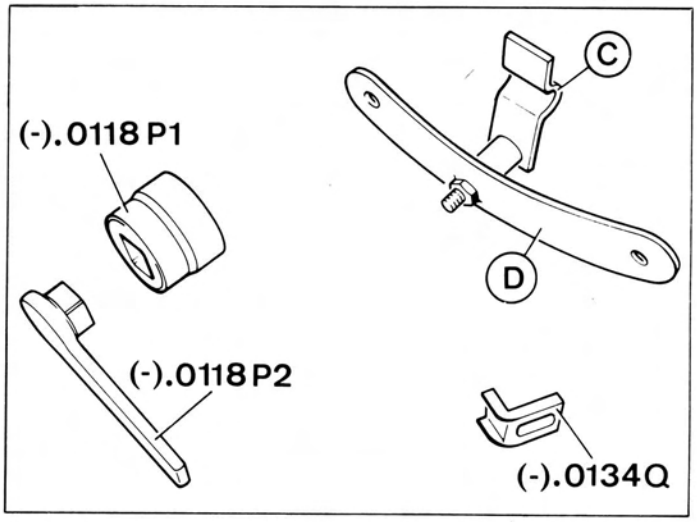
II



III

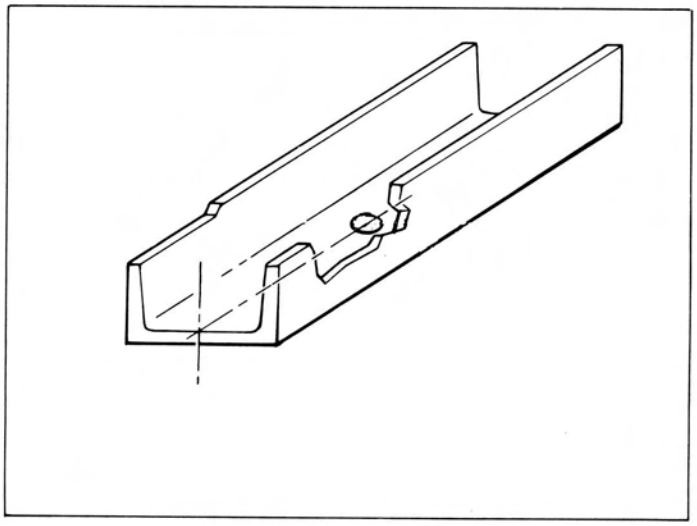


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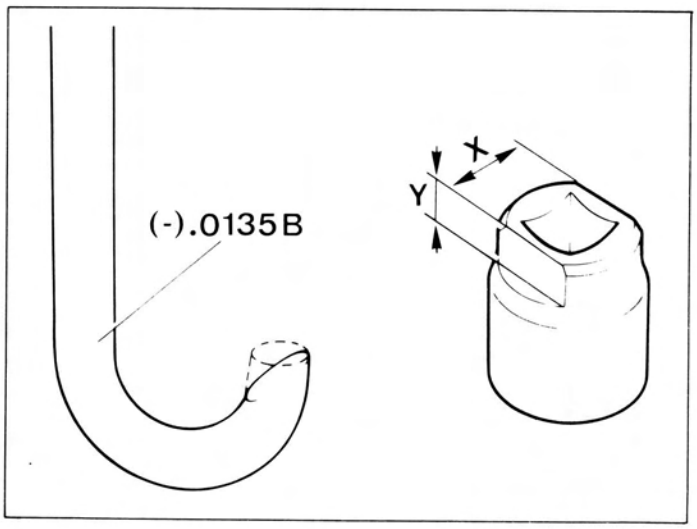


21.4.86 C110

V



VI

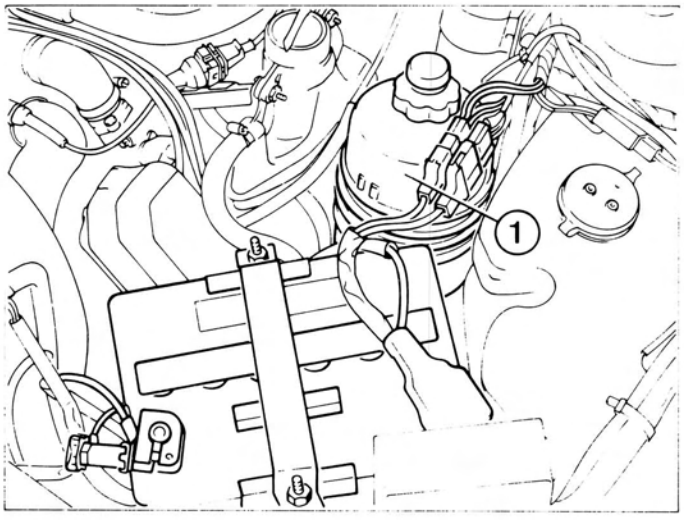


11.4.86 C86

A4.004	1	ZN3J		505

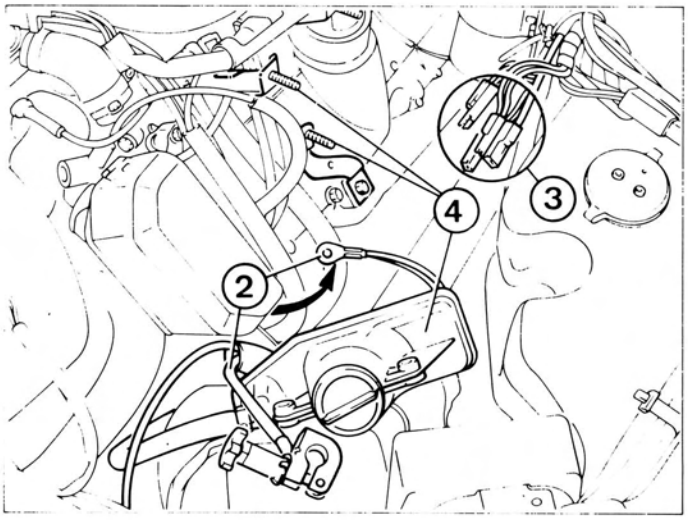
I

II



21.4.86 C34

III



21.4.86 C50

I

Engine removal requires:

- the removal of:
  - the bonnet
  - the air cleaner-air flow sensor-intake air heating assembly
  - the fan
  - the fan cowl
  - -ØØ: the transmission fluid cooler pipes at the radiator end
  - -**: the compressor without disconnecting the refrigerant pipes
- the power steering pump and reservoir **without disconnecting the pipes**
- the **left-hand** front exhaust pipe
- the engine cross member to be lowered to give clearance for the flywheel
- separation of the electrical harness at the multiple connectors, the harness remaining on the engine.

II

REMOVAL

- Drain the cooling system
(◄ relevant section)

Remove:

- the bonnet
- the battery
- the expansion bottle **(1)** and its bracket

III

Disconnect:

- the earth strap **(2)** from the cylinder head
- the starter motor cable connectors **(3)**

Remove the power steering reservoir **(4)** without disconnecting the pipes.

I

ØØ : Disconnect the transmission fluid cooler pipes **(1)**.

- Secure the pipes **(1)** in a high position to prevent fluid running out.

II

All models:

- Remove:

- the fan **(2)**
- the fan cowl **(3)**
- the radiator and its hoses
- the air cleaner-air flow sensor **(4)**

III

** : the compressor **(5)** with its belt tensioner assembly, without disconnecting the refrigerant pipes (◄ relevant section).

All models:

Withdraw the connectors:

- of the engine harness at the body.

IV

- of the idle speed regulating solenoid valve at the right-hand cylinder head.

Remove:

- the intake air heating device **(6)**.

V

- the power steering pump **(7)** without disconnecting the pipes (◄ relevant section).

VI

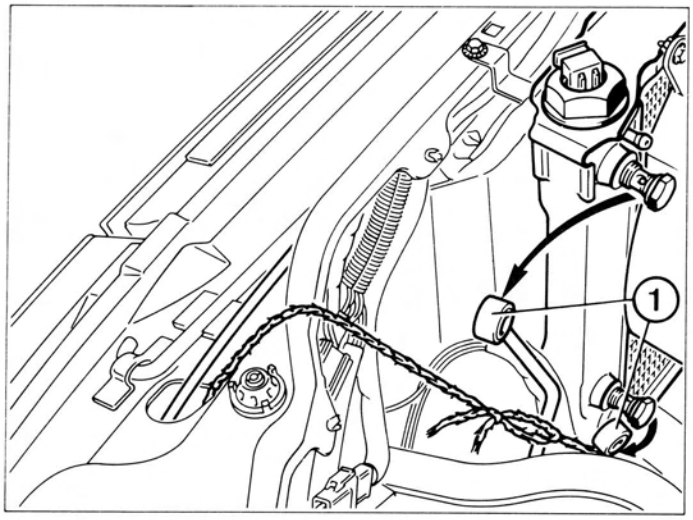
Disconnect:

- the accelerator cable **(8)**

ØØ : the throttle valve cable **(9)**

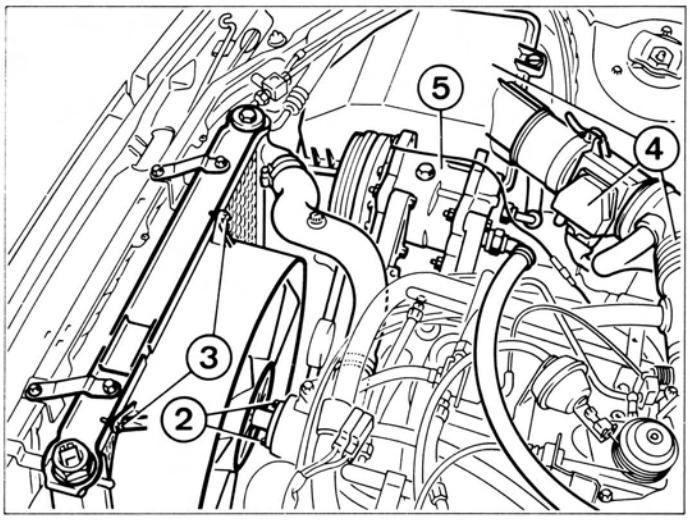
Do not disconnect the cruise control cable **(10)**.

I



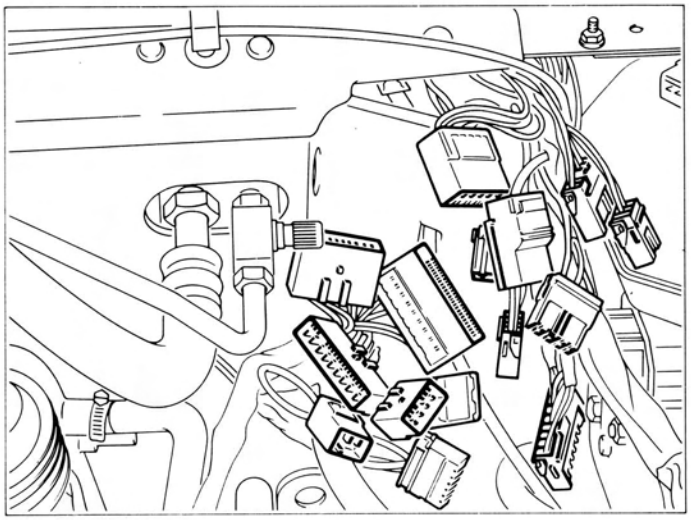
21.4.86 C84

II



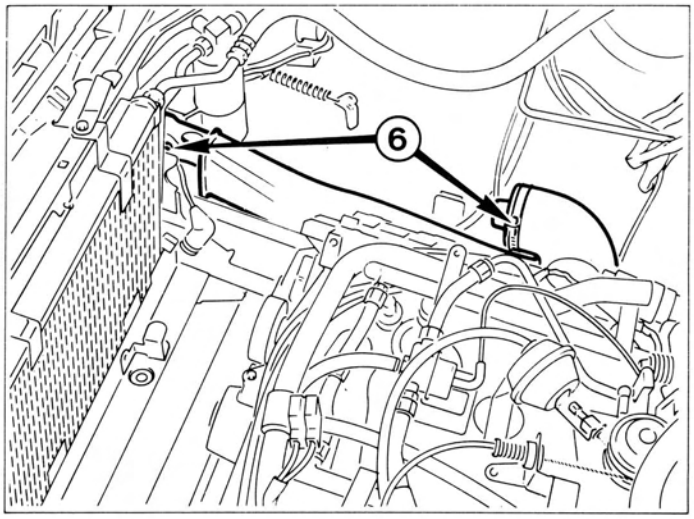
21.4.86 C46

III



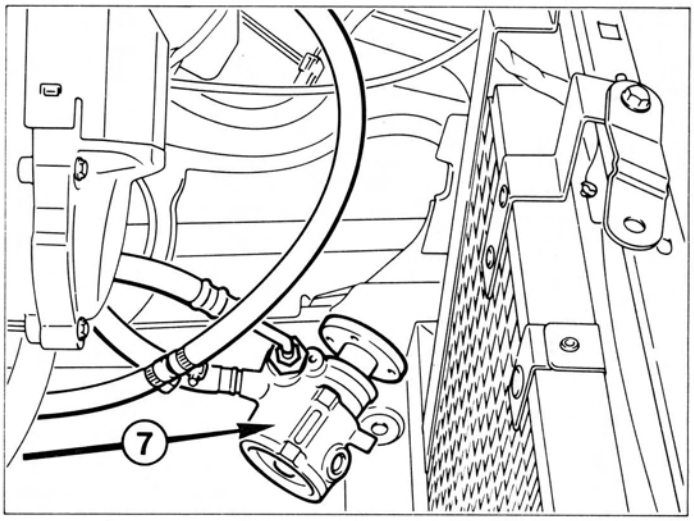
21.4.86 C36

IV



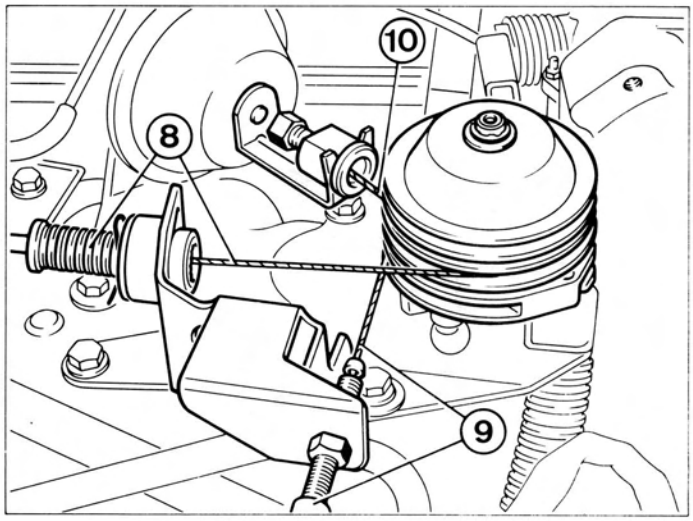
21.4.86 C48

V



21.4.86 C40

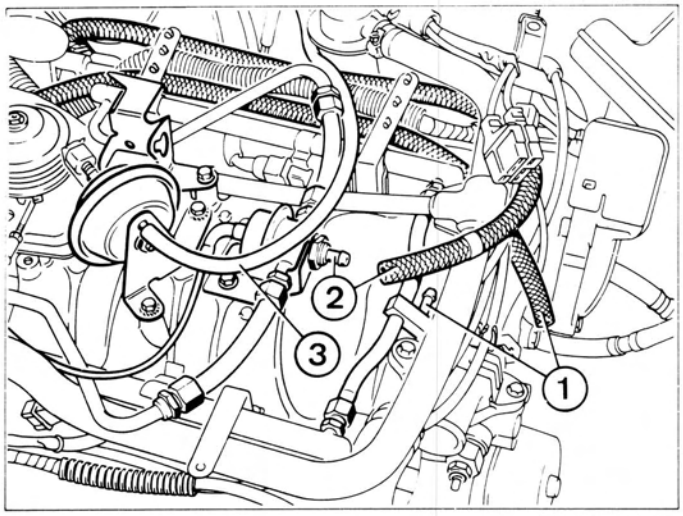
VI



21.4.86 C103

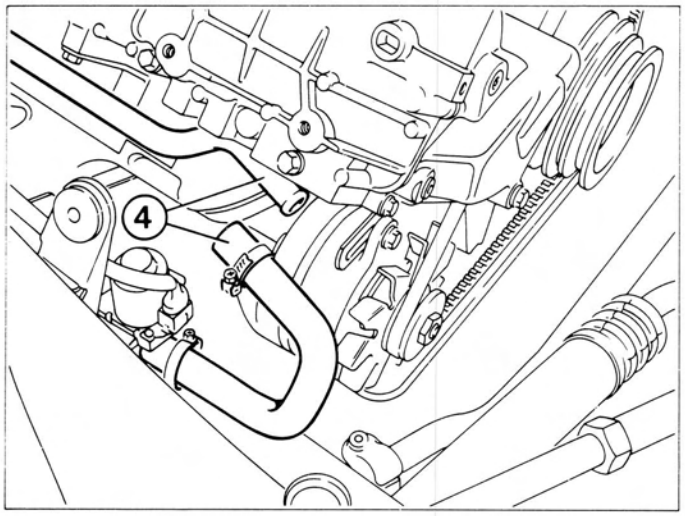
A4.008	1	ZN3J		505

I



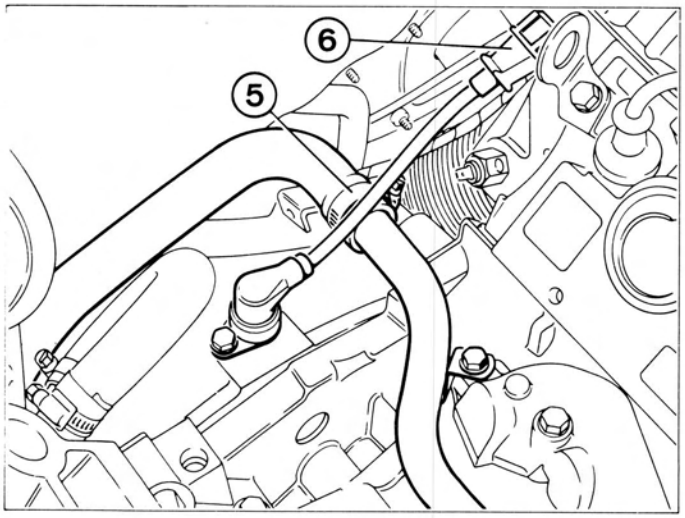
21.4.86 C42

II



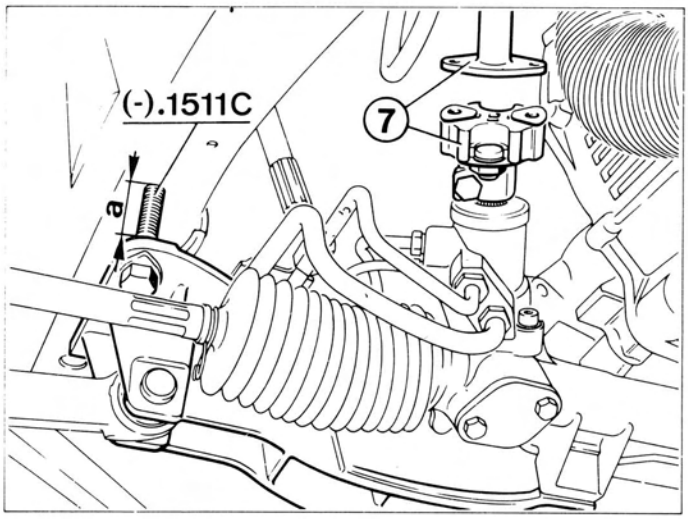
21.4.86 C38

III



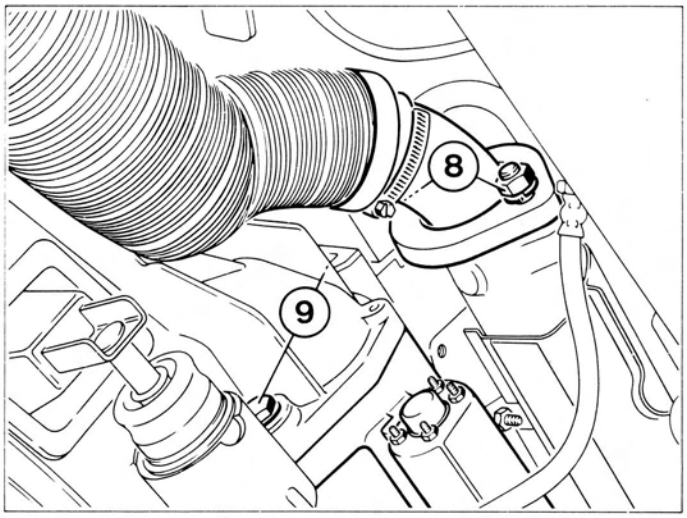
18.4.86 C7

IV



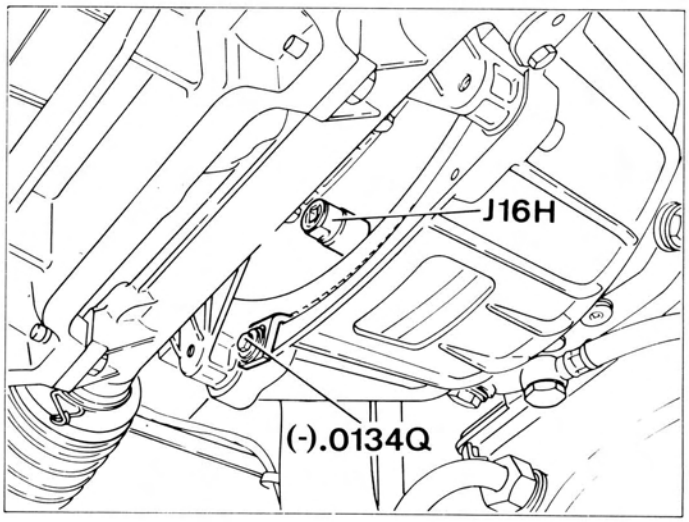
21.4.86 C74

V



18.4.86 C82

VI



21.4.86 C115

I

Disconnect pipes:

- fuel supply **(1)**
- return **(2)** from the injector distribution pipe,
- cruise control vacuum **(3)**.

II

- heater matrix supply:
  - **(4)** at the front of the right-hand cylinder head.

III

- **(5)** at the rear of the left-hand cylinder head.

Withdraw the ignition sensor connector **(6)**.

IV

- Disconnect the steering column **(7)**
- Lower the engine cross member (dimension « a » = 50 mm (2 in) approx.) and retain it with bolts **(-).1511 C.**

V

Remove:

- the two attachment nuts from the right-hand exhaust pipe **(8)**,
- the two attachment bolts **(9)** from the starter **without removing it,**
- the left-hand front exhaust pipe,
- the two closing plates from the clutch or converter housing.

VI

: Lock the flywheel (lock **(-).0134 Q**).

- Remove the four engine-converter assembly bolts **(high tightening torque** - use a modified J16H socket).

I

- Remove the flywheel lock **(-).0134 Q.**

- Retain the converter with tool **(-).0318** taking care not to damage the windowed ring on the flywheel.

II

All models:

Remove:

- the two upper engine-gearbox assembly bolts.

ØØ : the transmission dipstick tube attachment bolt **(1)** from the cylinder head.

III

All models:

- the two nuts securing the engine mountings to the engine cross member,

- raise the engine using lifting equipment **(-).0135 ZZ** until the gearbox contacts the tunnel.

IV

- Fit the support **(-).0125** under the gearbox using the bearer **0.0159** and a wooden block.

Height h = **30 mm** (1.2 in)

- Remove the two bolts **(2)**.

- Remove the engine and place it on the stand **(-).0134 A**.

V

REFITTING

- Preliminary operations.

ØØ : **Fit the ball thrust bearing (3)**

- Apply a thin coat of Molykote BR2 + to:

  - the gearbox input shaft splines **(4)**

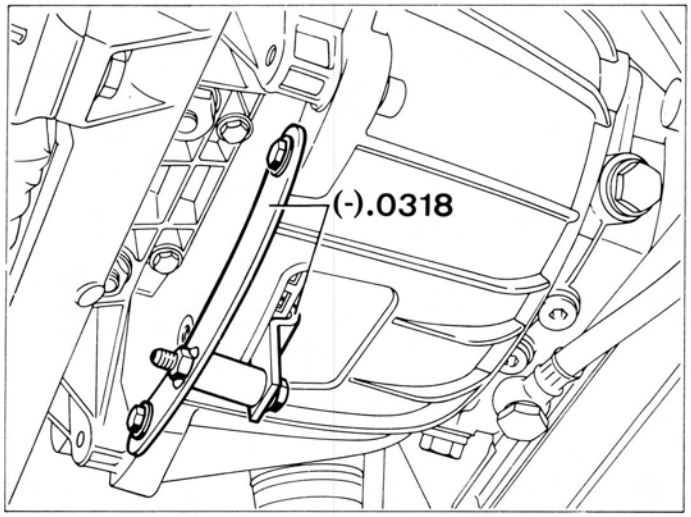
  - the release bearing guide tube **(5)**

  - the pads of the fork **(6).**

VI

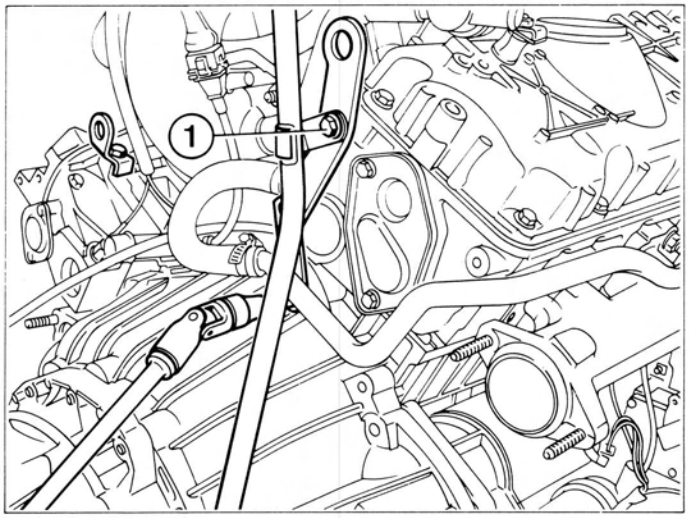
ØØ : Liberally lubricate the recess for the torque converter spigot **(CALYSOL grease).**

I



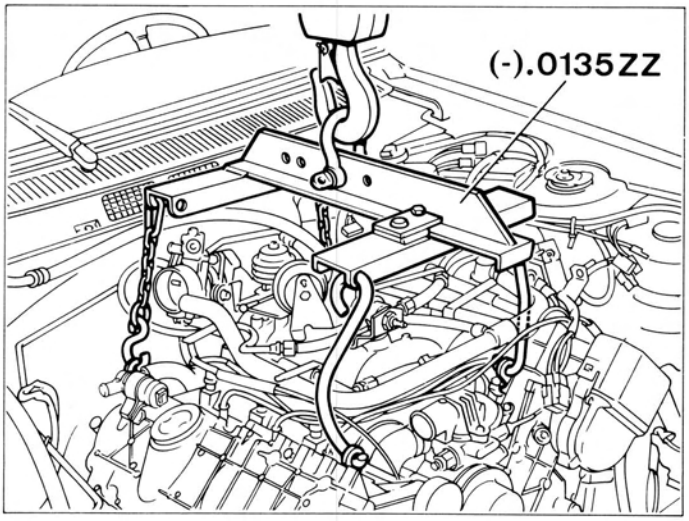
21.4.86 C111

II



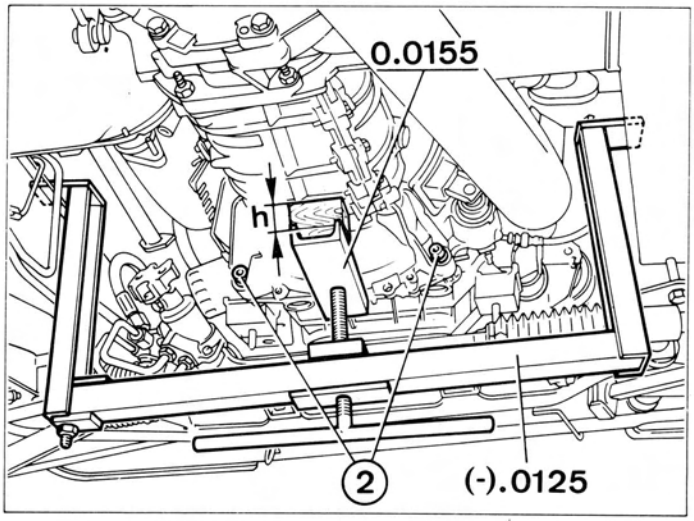
21.4.86 B6

III



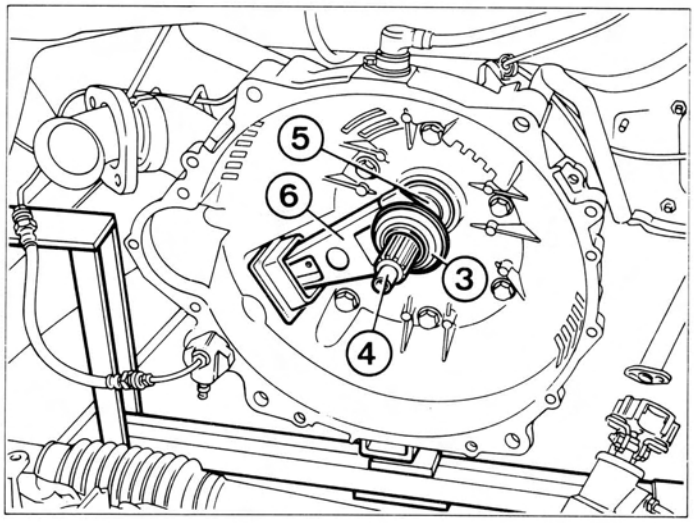
21.4.86 C60

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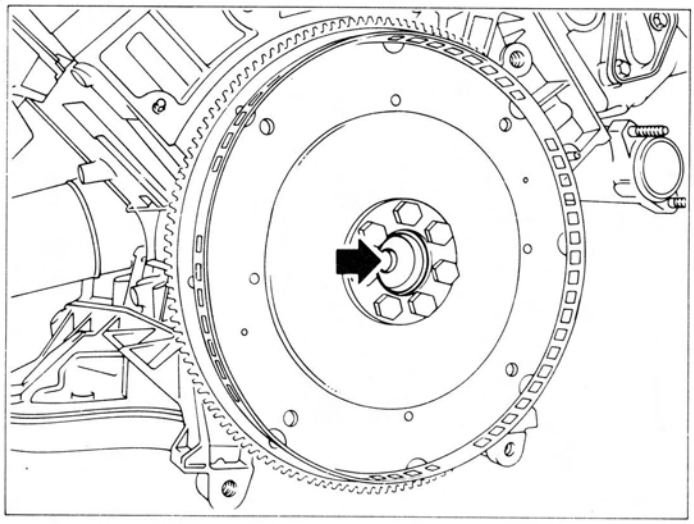
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V



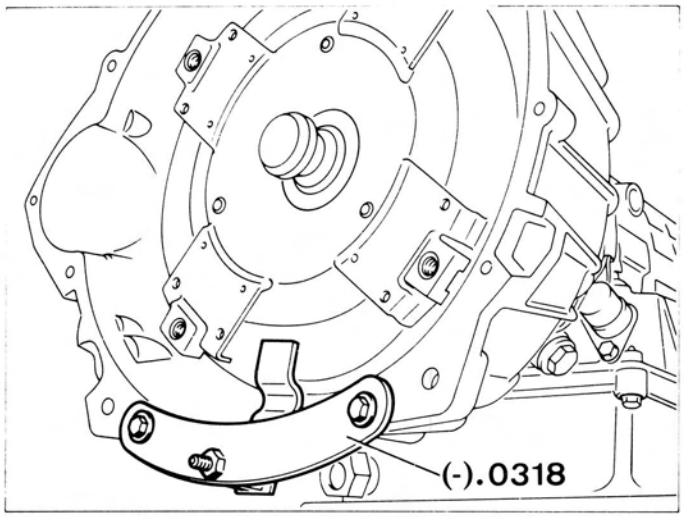
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VI



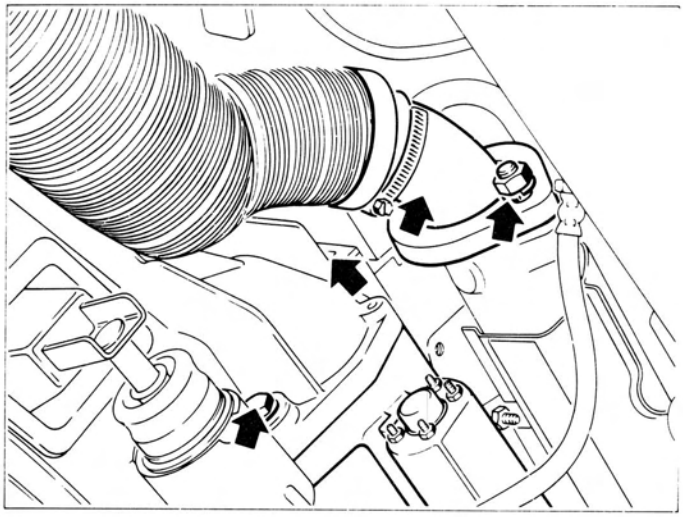
21.4.86 B7

I



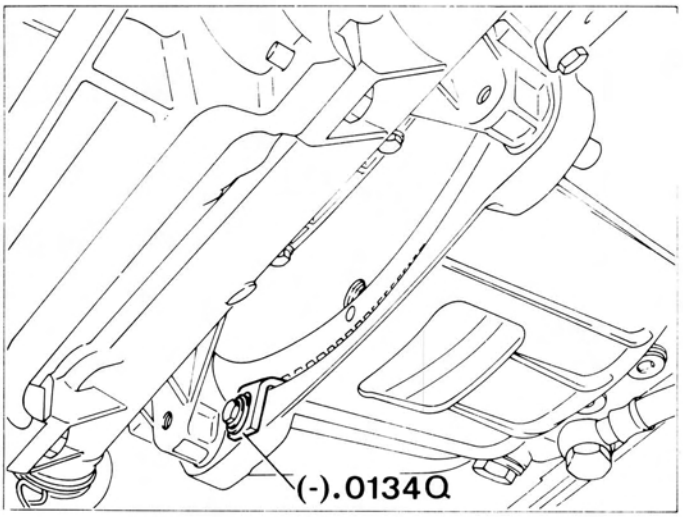
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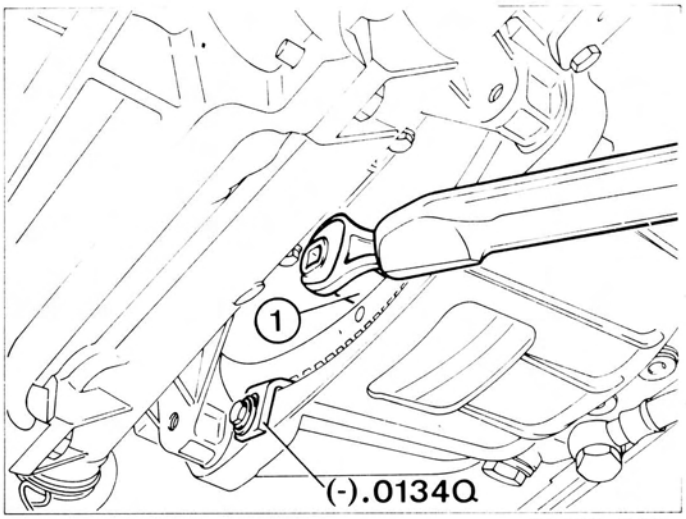
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III



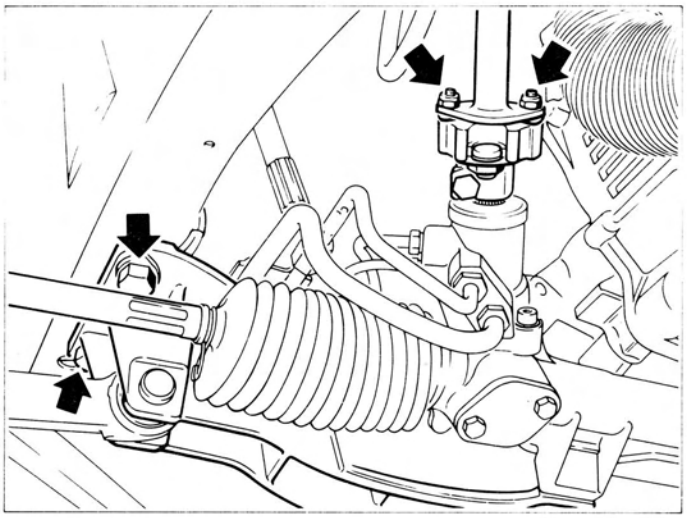
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IV



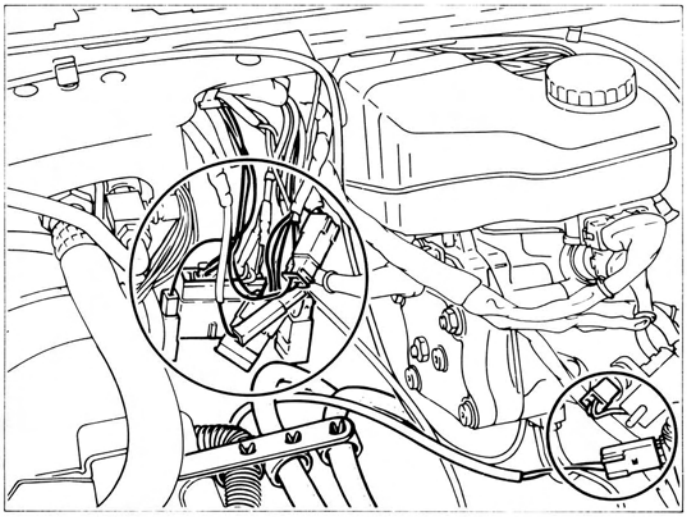
21.4.86 C106

V



21.4.86 C80

VI



21.4.86 C92

I

- Retain the converter with tool **(-).0318.**

III

- Coat the four engine-converter assembly bolts **(1)** with **THREADLOCK LOCTITE,** fit and tighten them.

Tightening torque: **6 m.daN** (44 lbf ft).

III

All models:

- Refit the gearbox in the reverse order to removal.

- Ensure the correct positioning of:

  - the right-hand front exhaust pipe

  - the starter motor.

Tightening torques

	m.daN	lbf ft
- engine-gearbox bolts	5	37
- front exhaust pipe nuts	3,5	26
- engine mountings to front cross member	3,5	26
- starter motor bolts	2	15

: Remove the tool **(-).0318**

- Lock the flywheel with tool **(-).0134 Q.**

IV

All models:

- Refit the two closing plats to the clutch or converter housing.

Re-attach:

- the engine cross member
  Tightening torque: **4,25 m.daN** (31 lbf ft)

- the steering column
  Tightening torque: **2,5 m.daN** (18 lbf ft)

V

- Re-make all connections between engine and body.

I

- **Re-connect the pipes:**

- return from the heater matrix **(1)** to the rear of the left-hand cylinder head,

- supply to the heater matrix to the front of the right-hand cylinder head.

- Re-connect the ignition sensor **(2)**.

II

ØØ: Hook the end of the throttle valve cable **(9)** to the bottom section of the control drum.

- Position the outer cable end **(10)** in its bracket to obtain a clearance « b » of **0,5 mm MAXIMUM.**

- Tighten the lock nut.

II

- **Re-connect the pipes:**

- supply **(3)** and return **(4) (white identification),**

- vacuum **(5)** to the cruise control (according to specification).

V

**: Refit the compressor (◄ relevant section)

All models:

- Refit the power steering pump **(11)** and its reservoir **(12)** (◄ relevant section).

III

- Fit the accelerator cable **(6)** to the centre section of the control drum.

Adjustment
- butterfly against the idle stop: pull gently on the outer cable (7),
- fit the pin **(B)** to obtain a small clearance « a ».

VI

- **Refit:**

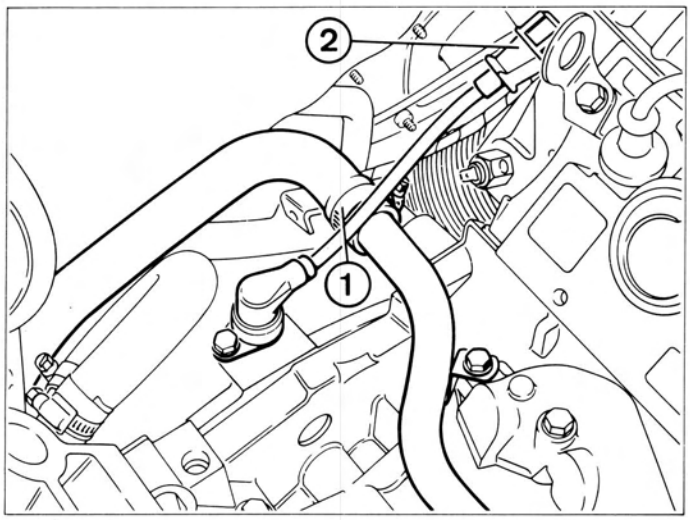
- the radiator
- the fan cowl
- the fan

and all ancillaries connected to the engine.

- Fill the cooling system (◄ relevant section).

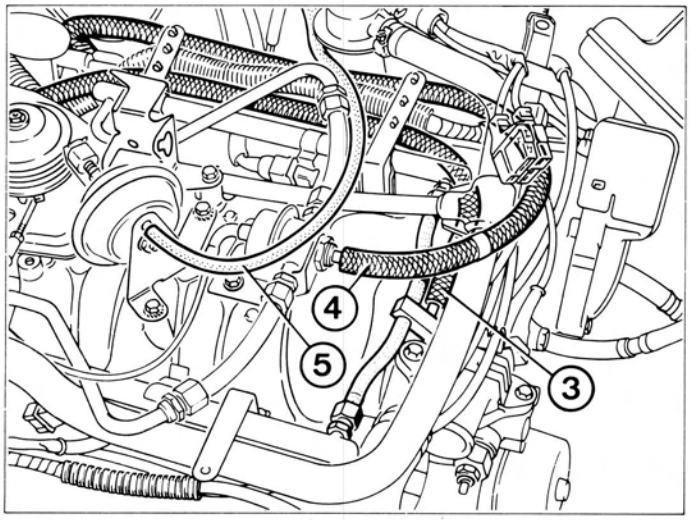
- Check and top up if necessary all oil and fluid levels.

I



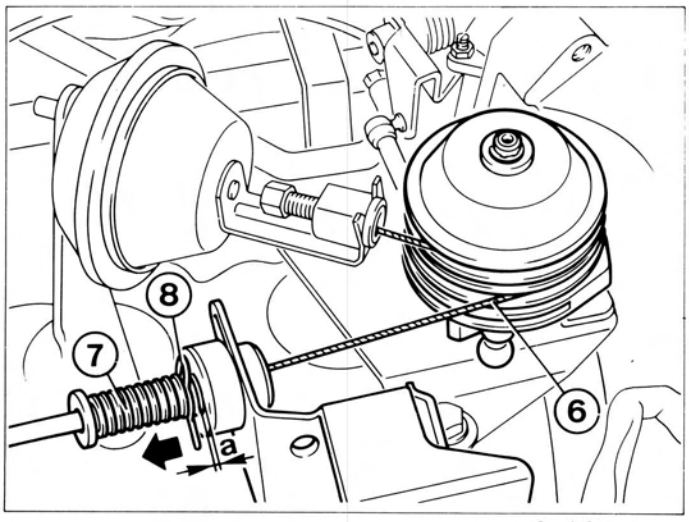
18.4.86 C7

II



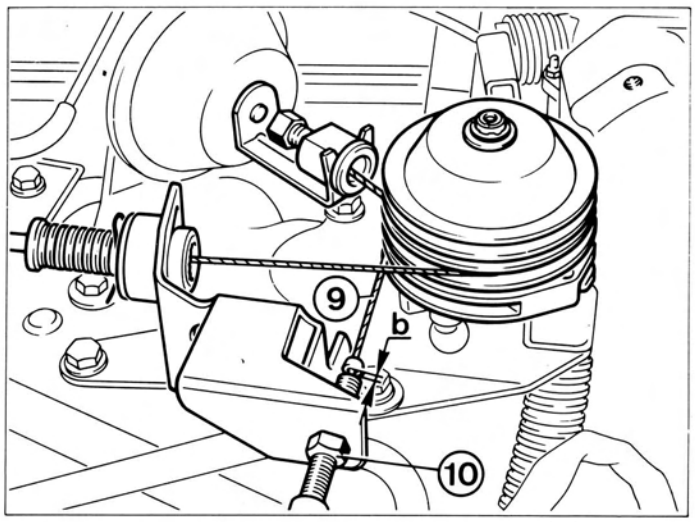
21.4.86 C44

III



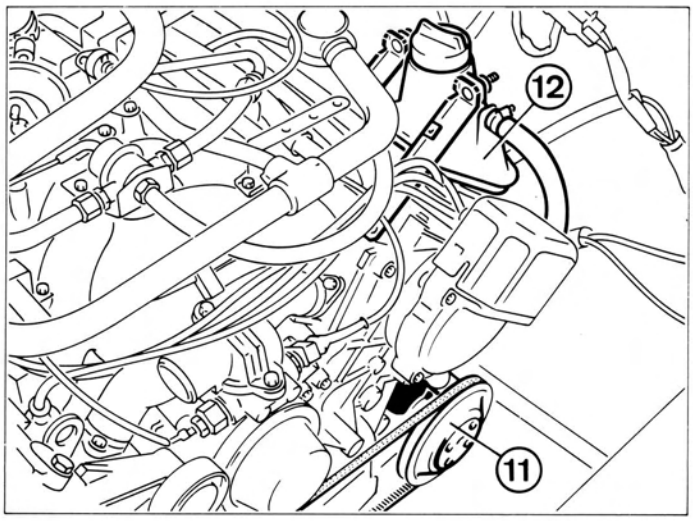
21.4.86 C102

IV



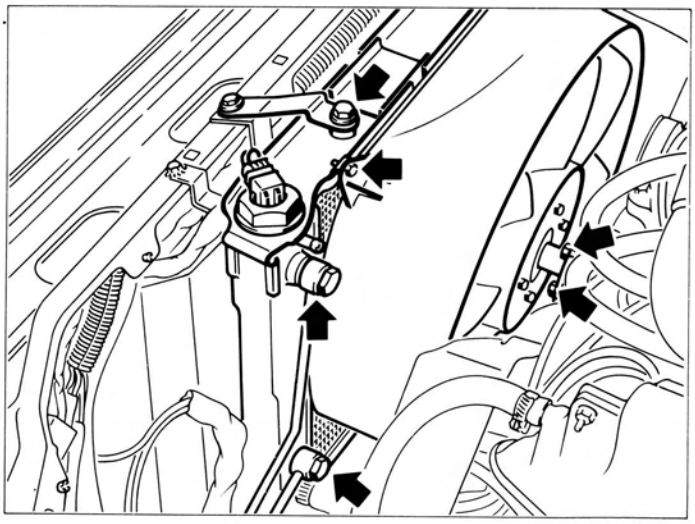
21.4.86 C103

V



21.4.86 C88

VI



21.4.86 C98



I

TOOLS TO BE MADE LOCALLY

0.0167

Checking gauge

(< section 15)

II

- Remove the air cleaner **(3)**, air flow sensor **(4)**, air intake hose **(5)**.

- ****** : Detach the air conditioning compressor without disconnecting the pipes (<******).

- Remove the right-hand cylinder head cover.

III

- Turn the crankshaft clockwise to bring the rockers of the middle cylinder **(No.5)** on the rock.

- Line up the mark **(6)** on the pulley with the zero mark on the timing cover (no.1 cylinder at TDC).

IV

CHECKING

- Front balance weight

- Place the plain end of the checking gauge **0.0167** on the face **(A)** of the balance weight **(7)**.

- Rear balance weight

- Place the bent end of the checking gauge **0.0167** against the face **(B)** of the balance weight **(8)**.

- Check the dimension W between the face **(A)** or **(B)** of the balance weight and the cylinder head cover joint face.

- This dimension should be between the marks **(1)** and **(2)** on the gauge.

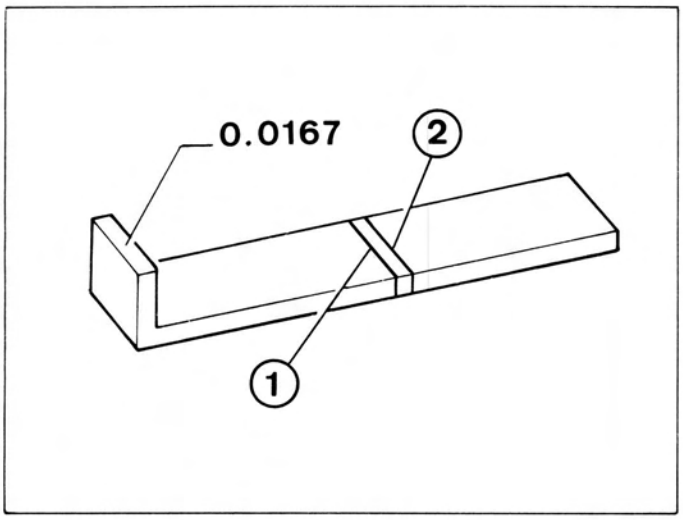
NOTE

A balance weight timing error of one tooth will produce a variation of **5 to 10 mm** in this dimension depending on the point of measurement on the balance weight counterweight.

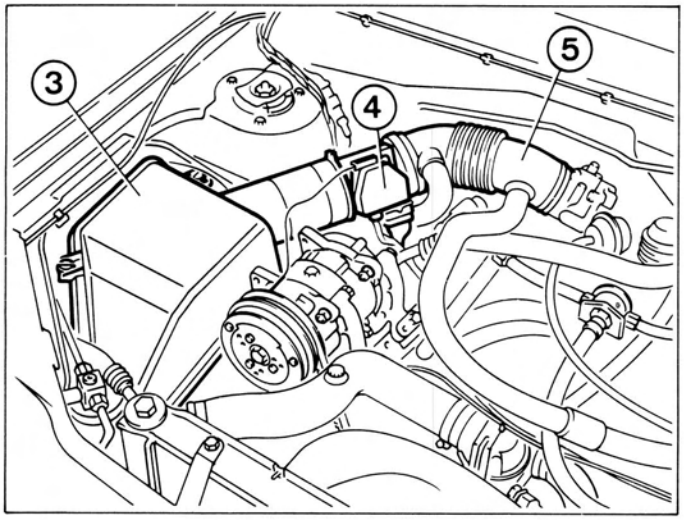
- If the dimension is not correct, RE-TIME THE BALANCE WEIGHTS.

PRO CONCEPT

I

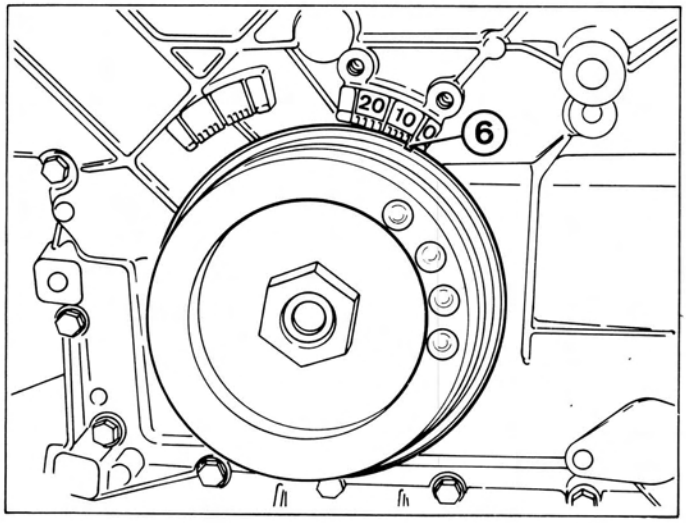


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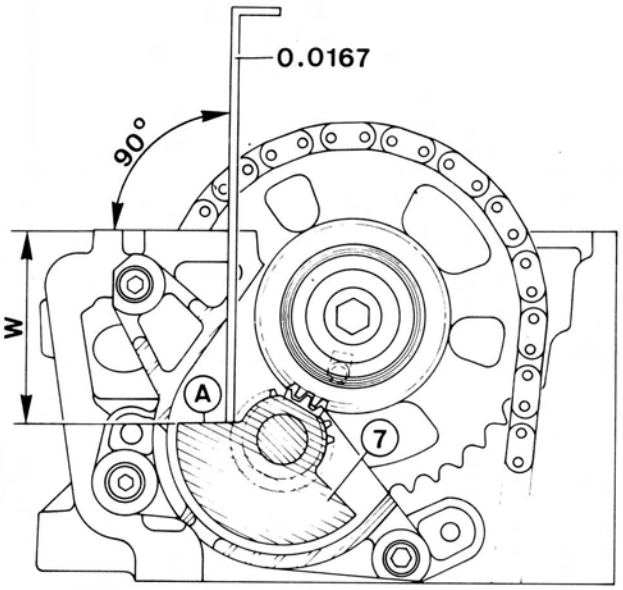
29.3.86 C54

III

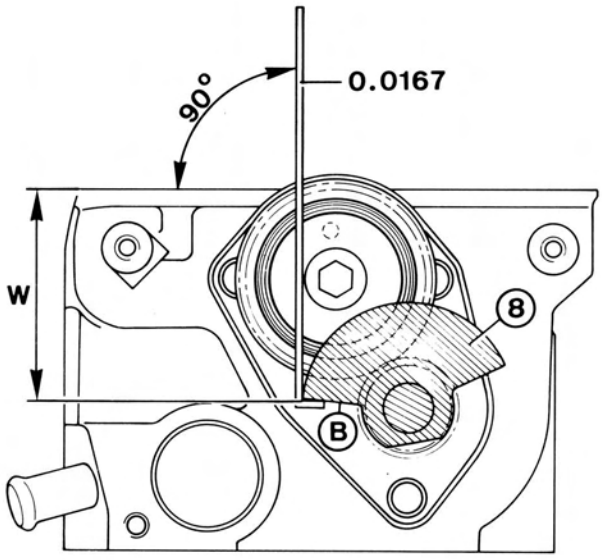


2.4.86 C65

IV



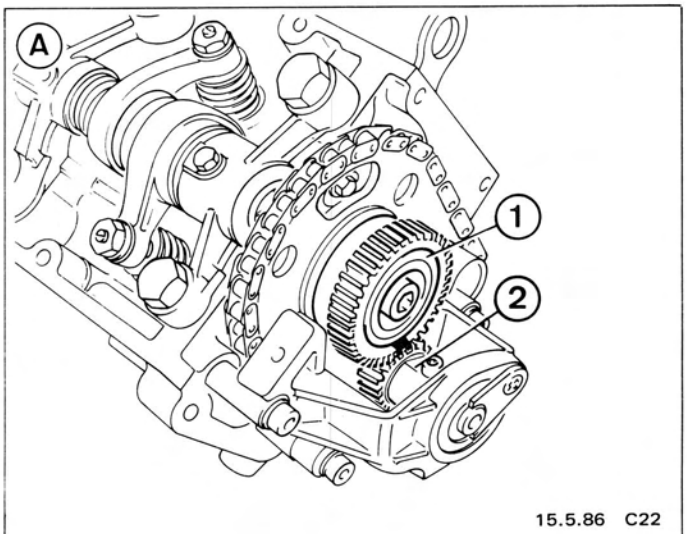
13.5.86 C22



13.5.86 C6

B2.004	1	ZN3J		505

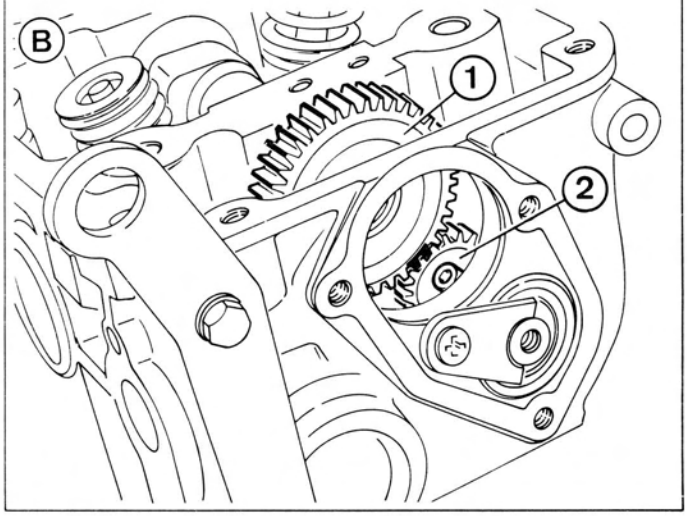
I



15.5.86 C22

IV

V



15.5.86 C6

III

VI

I

TIMING THE BALANCE WEIGHTS

- Timing must be carried out with the balance weights **at the bottom.**

- The driving pinion **(1)** and the balance weight **(2)** have reference marks.

- Timing the balance weights requires the removal of:

  - at the front, the timing cover: illustration **(A)**

  - at the rear, the cylinder head closing plate: illustration **(B).**

II

- Remove the drive pinion **(1)**

- Time the pinions

- Refit the balance weight drive pinion

  Tightening torque: **8 m.daN** (59 lbf ft).

III

- Refit the components in the reverse order to removal.

****** - Refit the air conditioning compressor (<*******).

Belt tension

new: **45-50 daN/run** (101-112 lbf/run)
used: **30-40 daN/run** (68-90 lbf/run).

IV



I

SPECIAL TOOLS

(-).0134

L: Cylinder head dowel extractor

N: Left-hand camshaft pinion support comprising:

N1: Support
N2: Bolts
N3: Nuts

P: Camshaft pinion bearing comprising:

P1: Body
P3: Set of 2 shims 30 mm thick
P4: Set of 2 shims 60 mm thick

W: Right-hand camshaft pinion support.

X: Drive pinion retainer, rear balance weight.

II

(-).0132 AZ

Cylinder liner retaining clamps comprising:

A1Z - Set of four clamps

A2Z - Set of eight bolts

III

(-).0118 PZ

Pulley nut wrench comprising:

P1 - 35 mm socket

P2 - Lever

IV

TOOLS TO BE MADE LOCALLY

0.0149

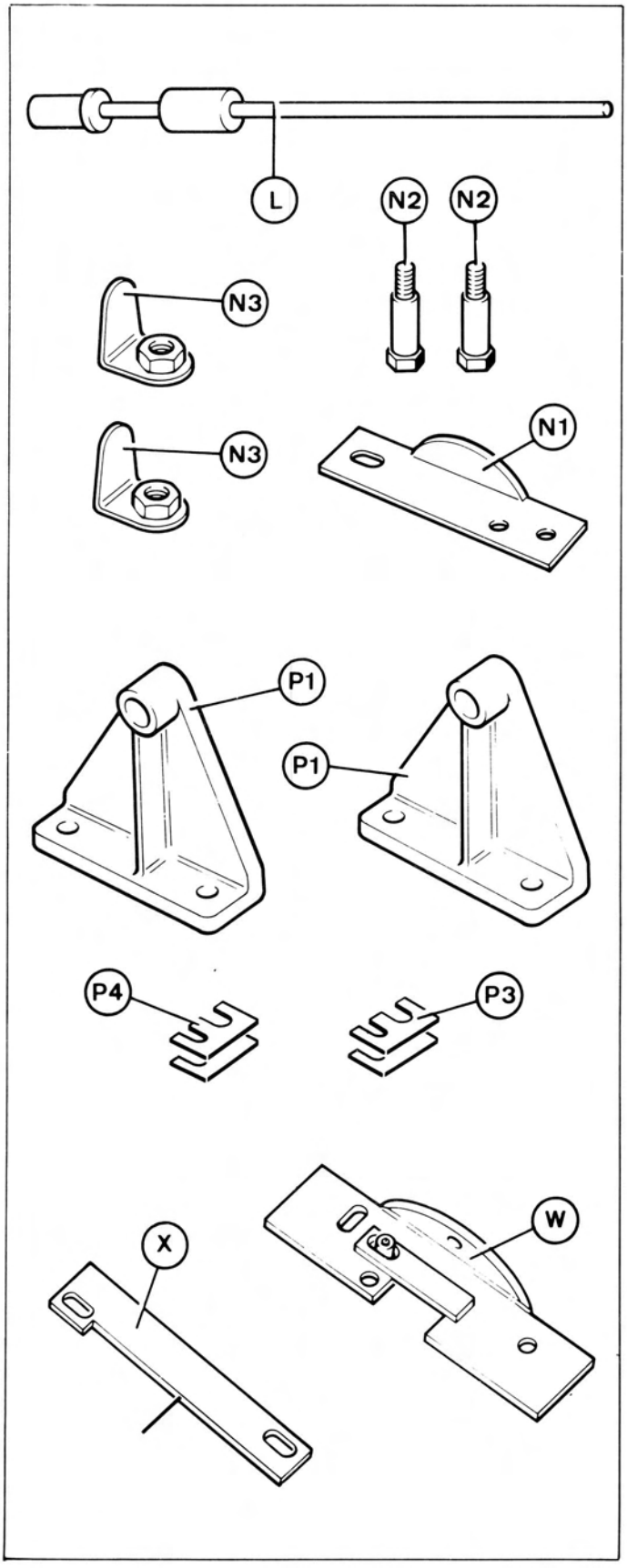
- Set of two cylinder head releasing levers (◄ section 15)

TOOLS TO BE MODIFIED

- For cylinder head tightening, modify an S 19 socket (FACOM type) to a dimension × **26 mm** (◄ section 15).

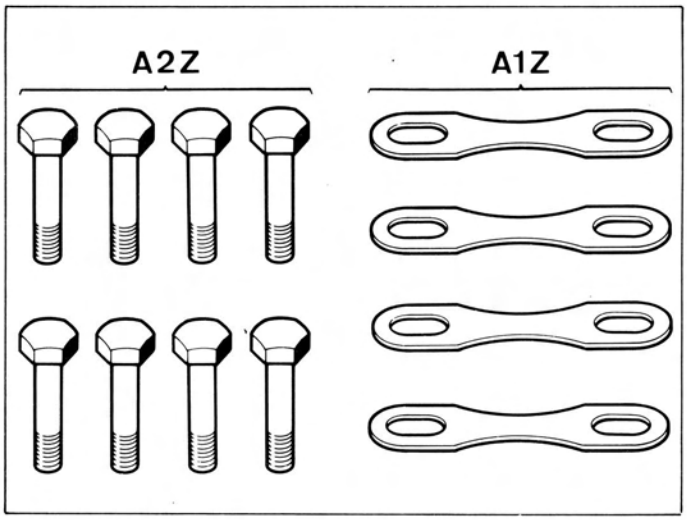
505		ZN3J	1	B4.003

I

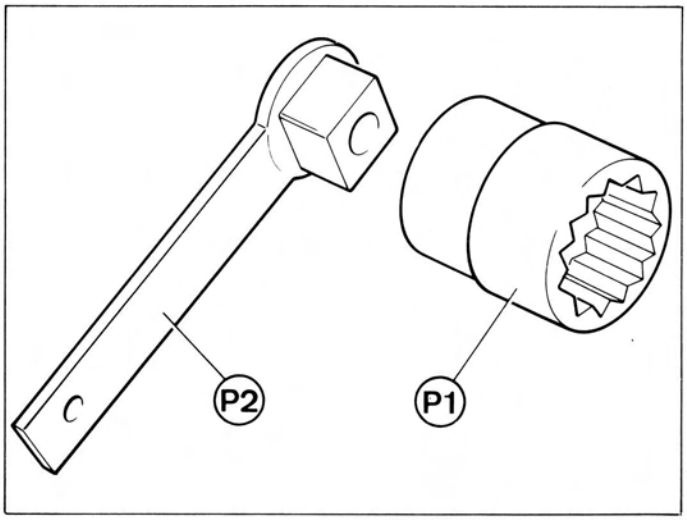


2.1.86 C62

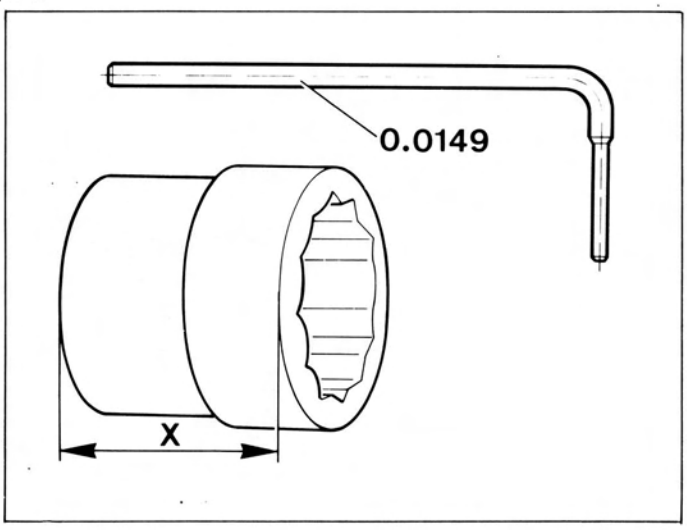
II



III



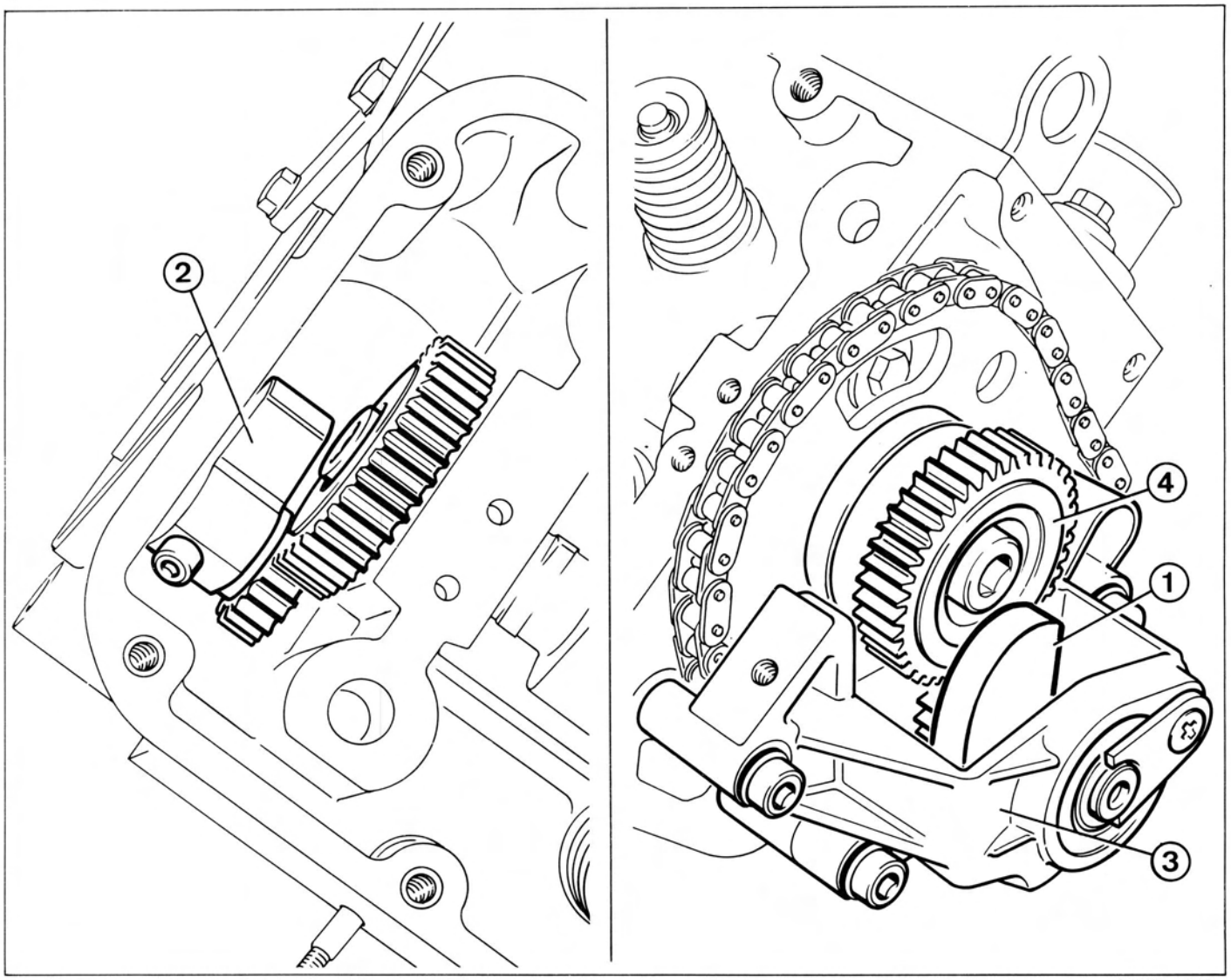
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8.4.86 C12

B4.004	1	ZN3J		505

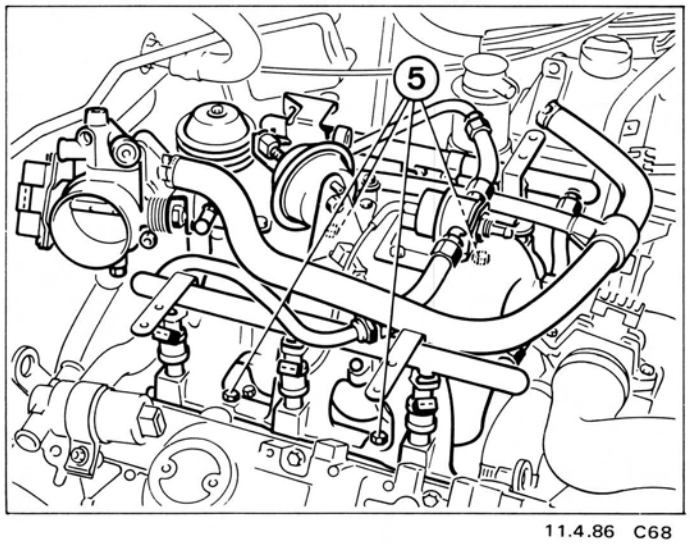
I



13.5.86 C32

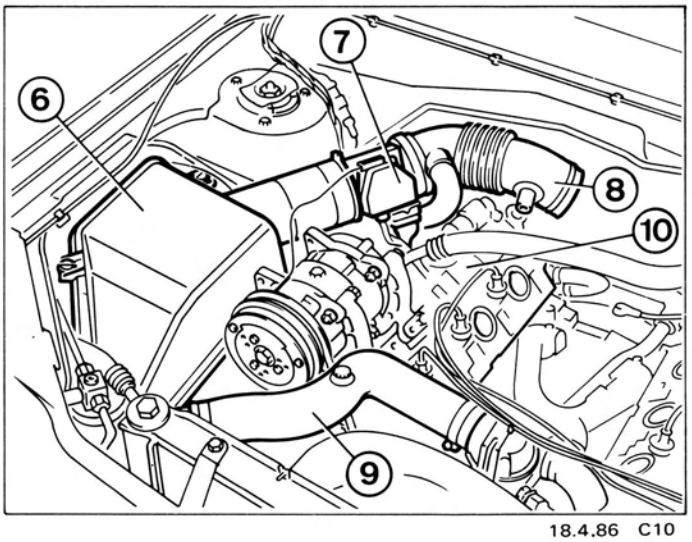
13.5.86 C22

II



11.4.86 C68

III



18.4.86 C10

I

This engine has the special feature, at the ends of the right-hand cylinder head, of balance weights **(1)** and **(2)** driven by the camshaft and timed to it (paint reference marks on the pinions).

The balance weights are mounted :

- at the front, in an outrigger bracket **(3)** attached to the cylinder head
- at the rear, within the cylinder head

To avoid removal of the timing cover, removing a cylinder head requires :

- for the right- or left-hand cylinder head
  - retention of the timing sprocket and chain, without stretching the latter
  - disengagement of the camshaft from the timing sprocket

- for the right-hand cylinder head
  - preventing the front balance weight drive pinion **(4)** rotating
  - disengagement of the bracket **(3)** from the dowels in the cylinder head without taking the pinion teeth out of mesh

Taking the pinion teeth out of mesh

NOTE : When removing
- both cylinder heads, it is essential to start with the right-hand one
- one cylinder head, to ignore the operations related to the other head

SPECIAL FEATURES **
- It is not necessary to disconnect the pipes, as the compressor should remain on the vehicle : ◄***

II

- **Drain the cooling system** (◄ relevant section)

- Disconnect or detach :
  - the hoses
  - the mechanical and electrical connections between the inlet manifold and its accessories, the engine or the body

- Remove :
  - the four bolts (5)
  - the inlet manifold with its accessories

III

TO REMOVE THE RIGHT-HAND CYLINDER HEAD

- Remove :
  - the air cleaner (6), the air flow sensor (7) and the intake hose (8)
  - the grille
  - the intake air heating device
  - the top hose (9)
  - the clamp at the silencer end of the left-hand front exhaust pipe

- Detach the right-hand front exhaust pipe

I

- **Remove :**

- the fan **(1)**

- the fan cowl **(2)**

- the hose **(3)** with its coolant outlet stub

- ** Detach the air conditioning compressor without disconnecting the pipes and place it on the scuttle (< **)

II

- **Remove :**

- the cylinder head cover

- the plugs **(4)**

- the bolts **(5)**

- Slacken the timing sprocket bolt on the camshaft

III

- Rotate the crankshaft clockwise until the valves **(6)** of cylinder no.6 rock.

IV

- Continue to rotate the crankshaft to position the timing sprocket as shown opposite (rocker shaft **(7)** in the left-hand side of the slot)

V

- Position the camshaft support **(-).0134 W** on the timing cover, locating the lug of the plate **(B)** in the sprocket

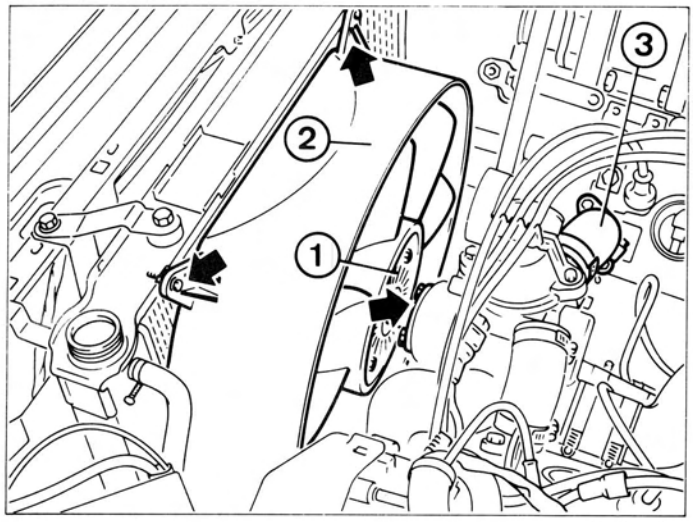
- Hand tighten the two bolts **(9)**

- Lock the camshaft sprocket with the bolt **(-).0134 N2** and the nut **(-).0134 N3**

- Tighten the bolts **(9)** and **(10)**

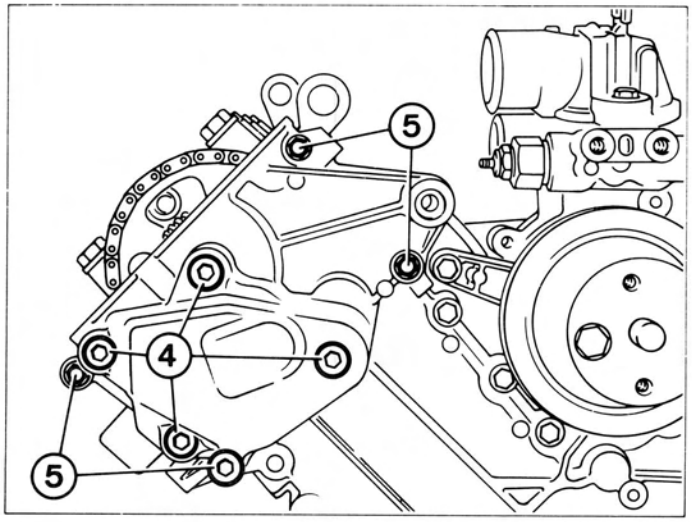
- Screw the bolt **(11)** into the balance weight bracket without fully tightening it

I



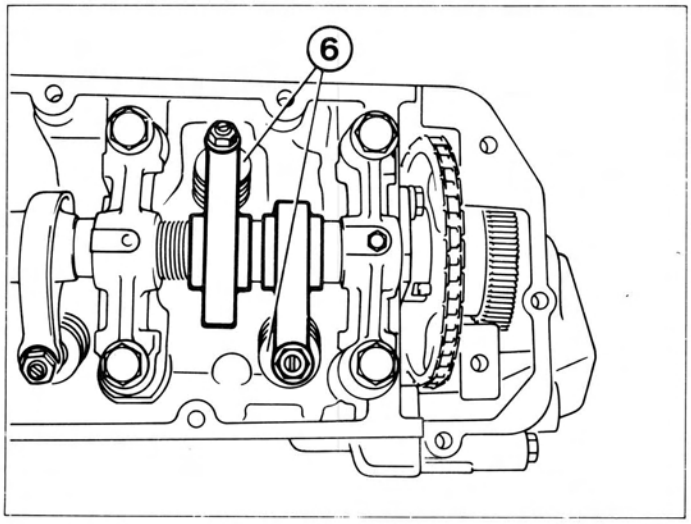
18.4.86 C6

II



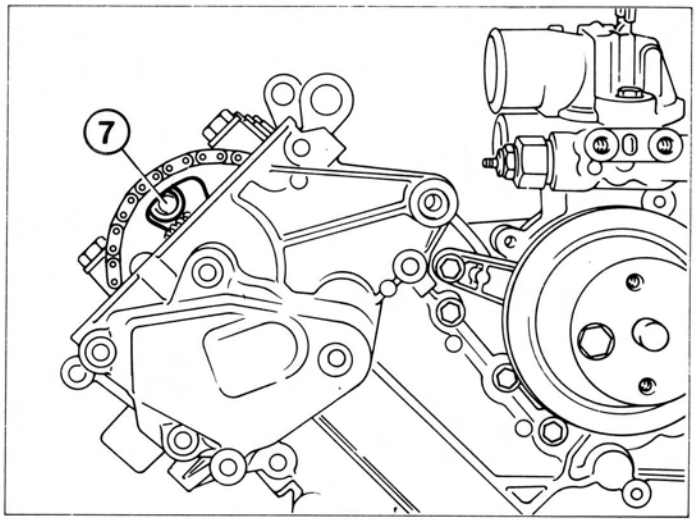
7.3.86 C39

III



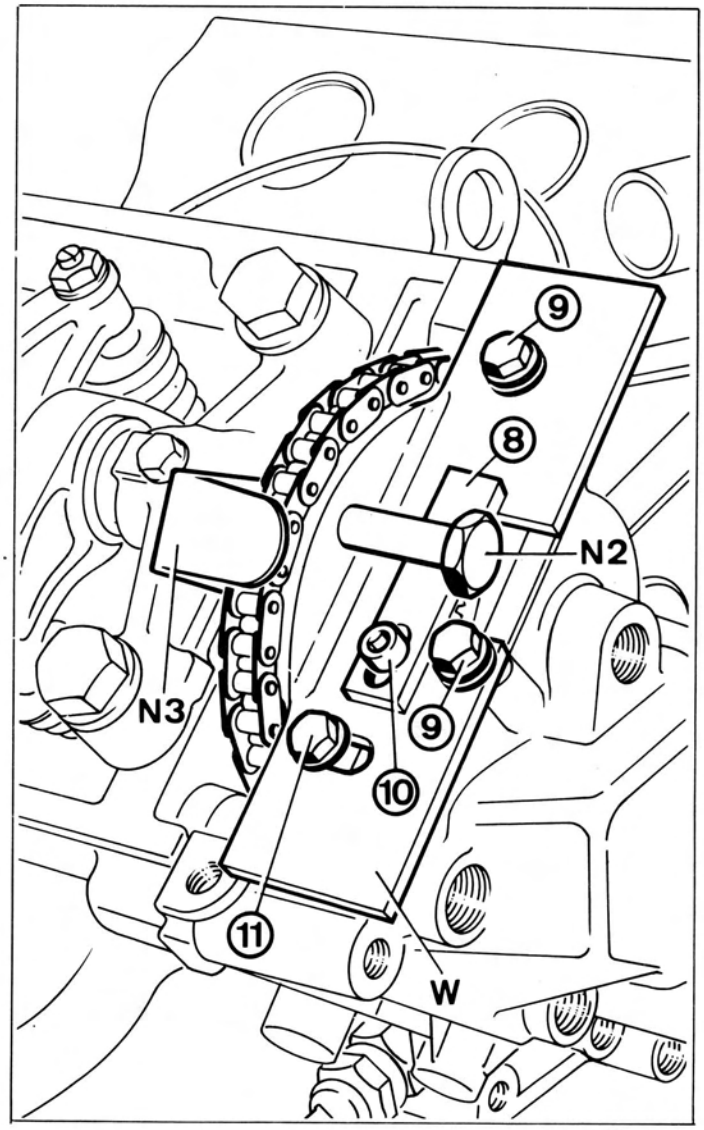
2.4.86 C64

IV



7.3.86 C39

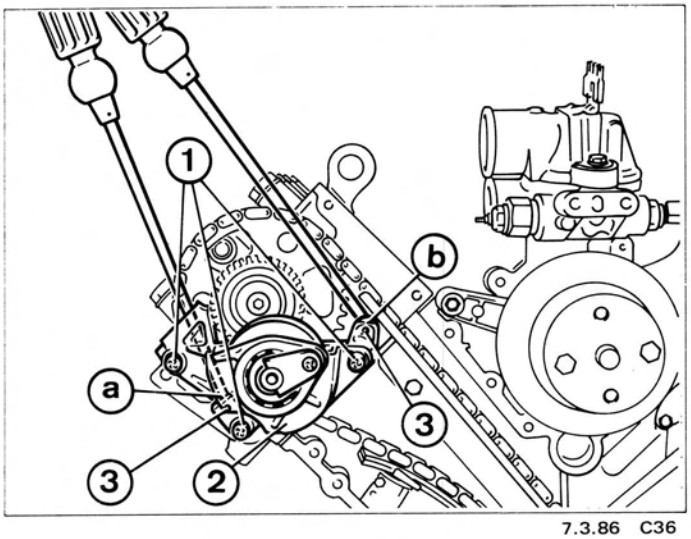
V



7.3.86 C38

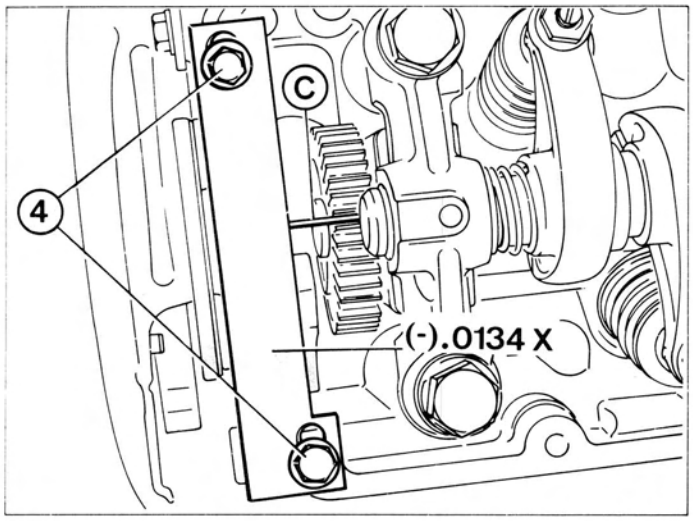
B4.008	1	ZN3J		505

I



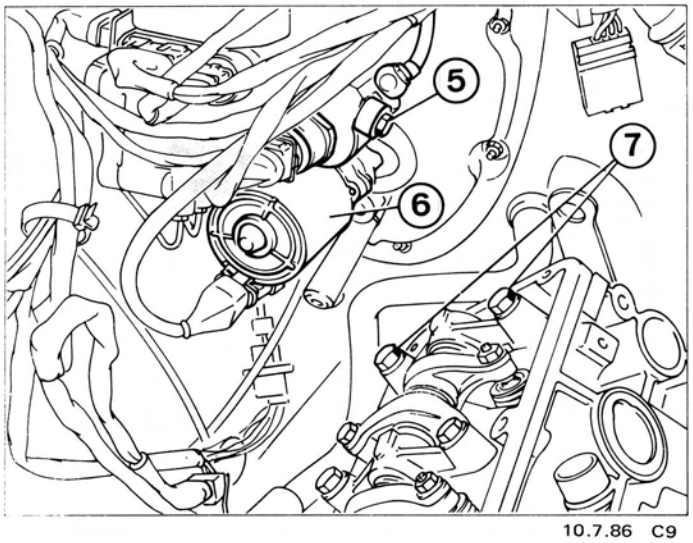
7.3.86 C36

II



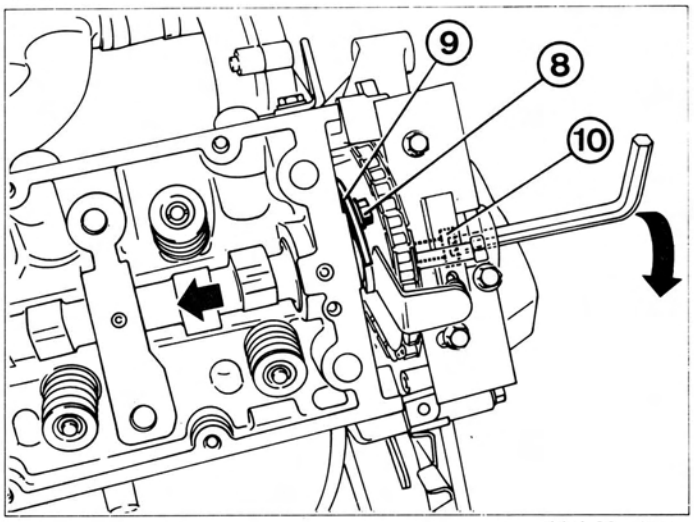
7.3.86 C44

III



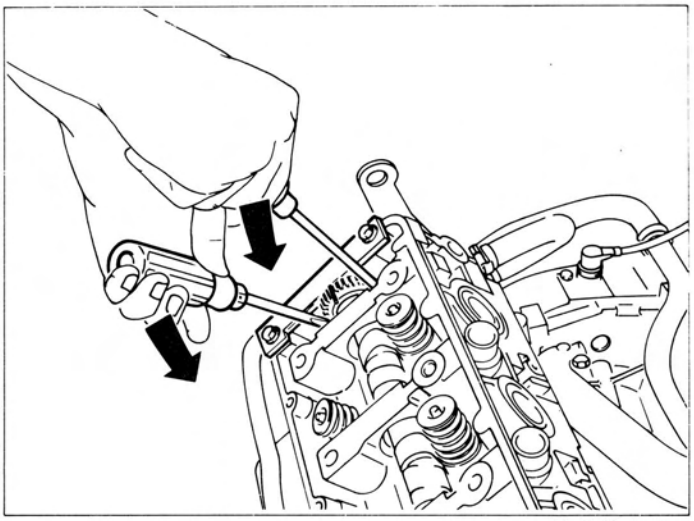
10.7.86 C9

IV



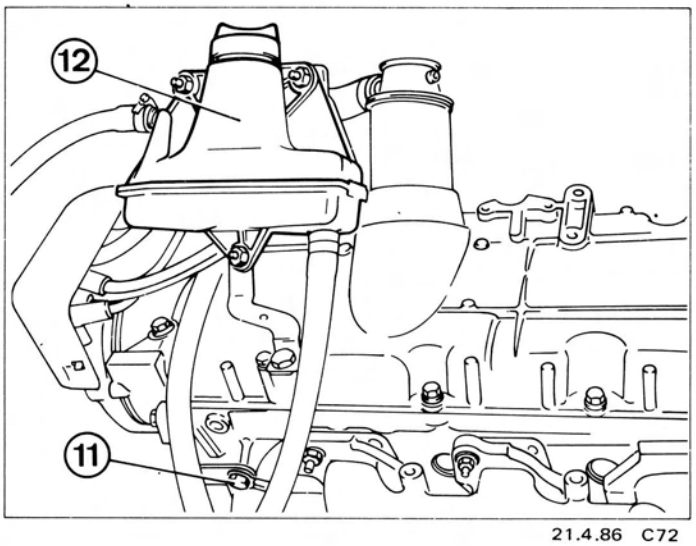
11.4.86 C76

V



11.4.86 C82

VI



21.4.86 C72

I

- **Remove the bolts (1)** from the balance weight bracket **(2)** through the holes in the timing cover

- Detach the bracket **(2)** from its dowels **(3)** using two screwdrivers located in slots **(a)** and **(b)**

II

- Position the tool **(-).0134 X** at the rear of the cylinder head, with the peg (c) between two pinion teeth

- Tighten the two bolts **(4)**

- Remove :

  - the cylinder head bolts

  - the rocker shaft

III

SPECIAL FEATURE

- Remove the bolt **(5)**

- Detach the high pressure pump **(6)** from the hydraulic unit

- Withdraw the bolts **(7)** as far as possible and retain them with an elastic band.

IV

- Unscrew the bolt **(8)**

- Disengage the thrust plate **(9)** from the groove in the camshaft

- Fully unscrew bolt **(10)** to disengage the camshaft from the sprocket

V

- Using two screwdrivers, move the camshaft back until it contacts tool **(-).0134 X**

NOTE : For the remaining removal operations, refer to panel VI 6 on page B4010

VI

TO REMOVE THE LEFT-HAND CYLINDER HEAD

- Remove :

  - the battery
  - the expansion bottle and its bracket
  - the earth bolt **(11)**
  - the left-hand front exhaust pipe

- Detach the power steering pump reservoir **(12)**

- Remove the cylinder head cover

I

- Using socket **(-).0118 P1,** lever **(-).0118 P2** and an extension, turn the crankshaft clockwise until the valves of **No.2** cylinder are rocking.

- Turn one additional turn then continue to turn it to position the camshaft sprocket as illustrated opposite

II

- Remove :
  - the distributor cap **(1)**
  - the rotor **(2)**
  - the two bolts **(3)**
  - the four bolts **(4)**
  - the camshaft sprocket retaining bolt
  - the hose **(5)** and its coolant stub **(6)**

III

- Position the camshaft sprocket support **(-).0134 M** on the timing cover.

- Hand tighten the bolts **(7)**

- Lock the camshaft sprocket with bolt **(-).0134 N2** and nut **(-).0134 N3.**

- Tighten the bolts **(7)**

IV

- Remove the cylinder head bolts

- Disengage the bolts **(8)** as far as possible and retain them with an elastic band

V

- **Unscrew the bolt (9)** securing the camshaft thrust plate **(10)**

- Disengage the thrust plate from the camshaft groove

- Lever with a screwdriver against the camshaft to disengage it from its sprocket.

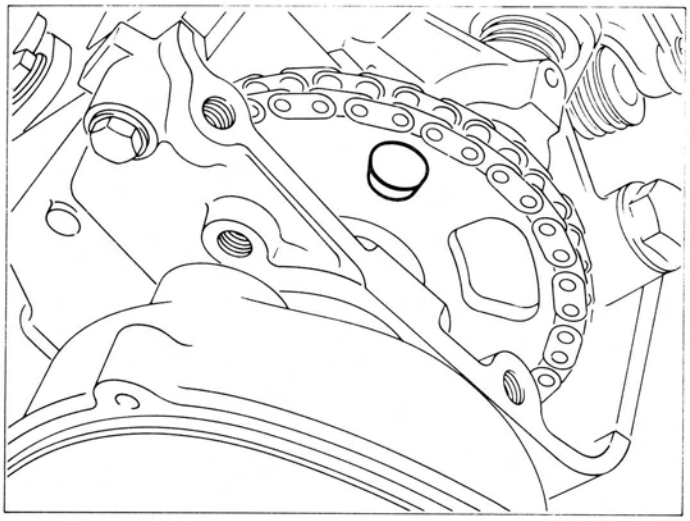
VI

COMMON OPERATIONS FOR REMOVING RIGHT-OR LEFT-HAND CYLINDER HEAD

- Remove the cylinder head by rocking it using levers **0.0149**

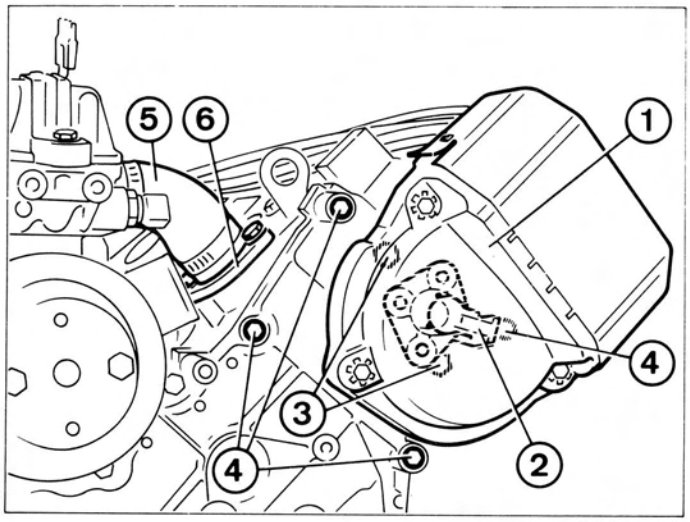
- Clean the gasket face with DECAPLOC

I



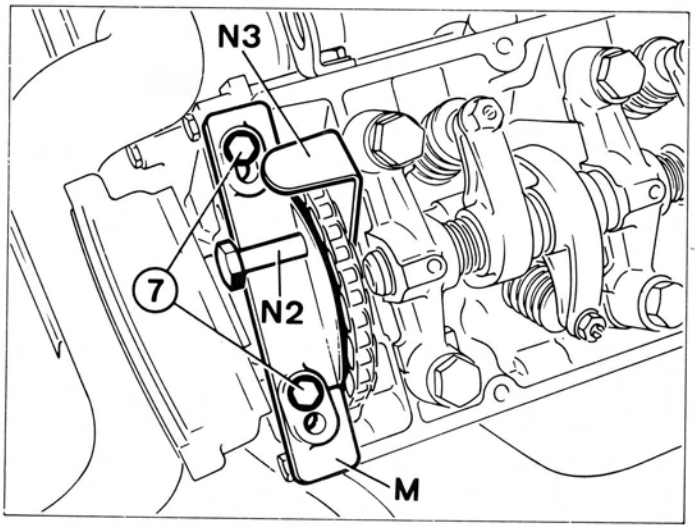
23.5.86 C17

II



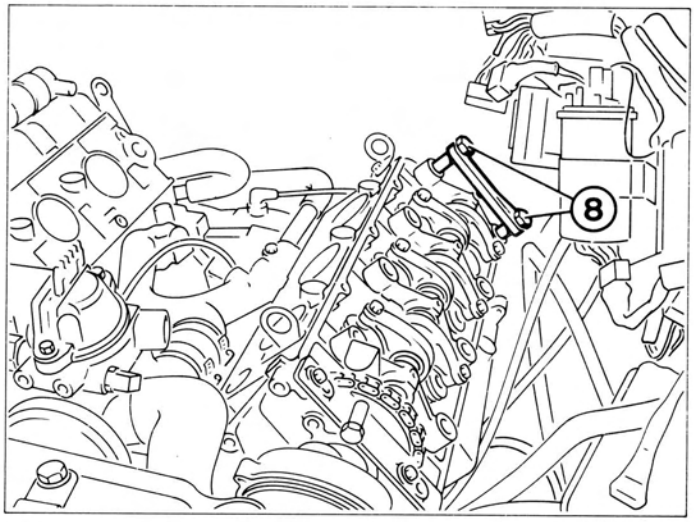
7.3.86 C36

III



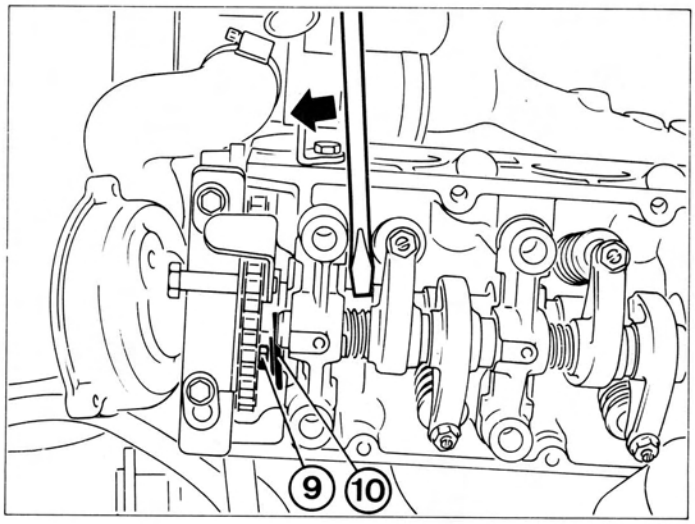
11.4.86 C74

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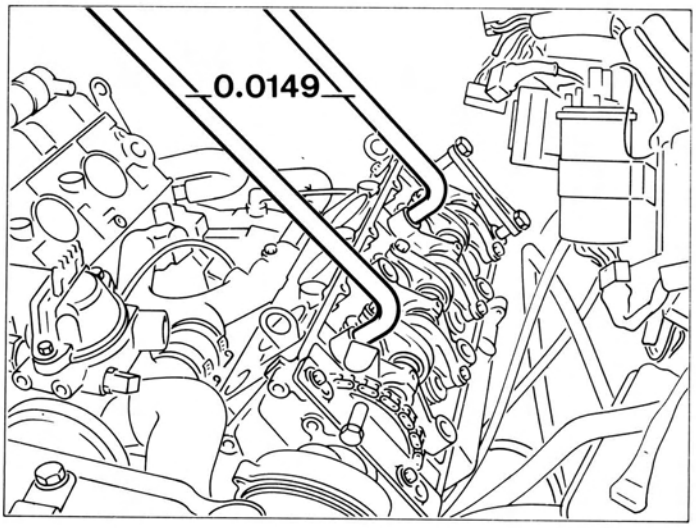
11.4.86 C70

V



11.4.86 C62

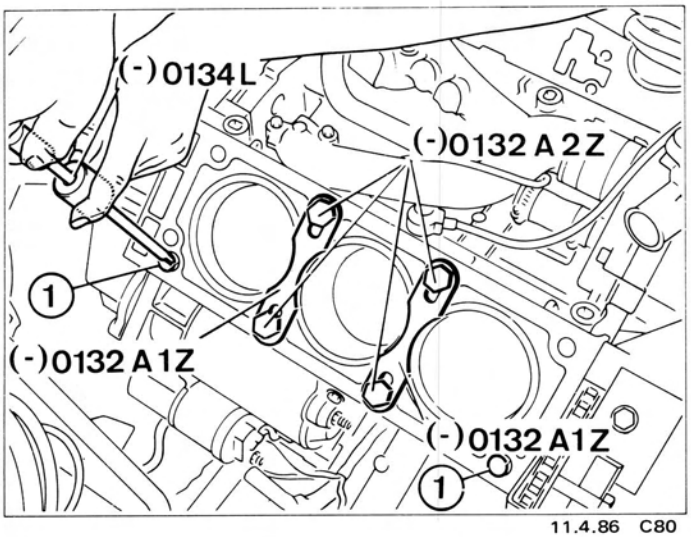
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11.4.86 C64

I

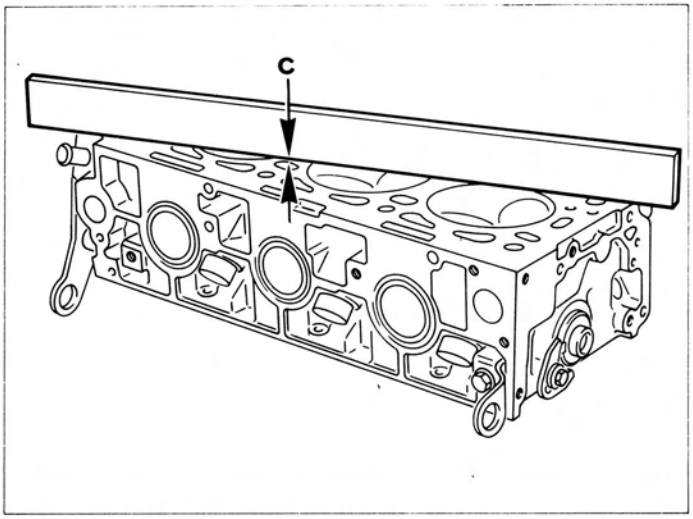
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11.4.86 C80

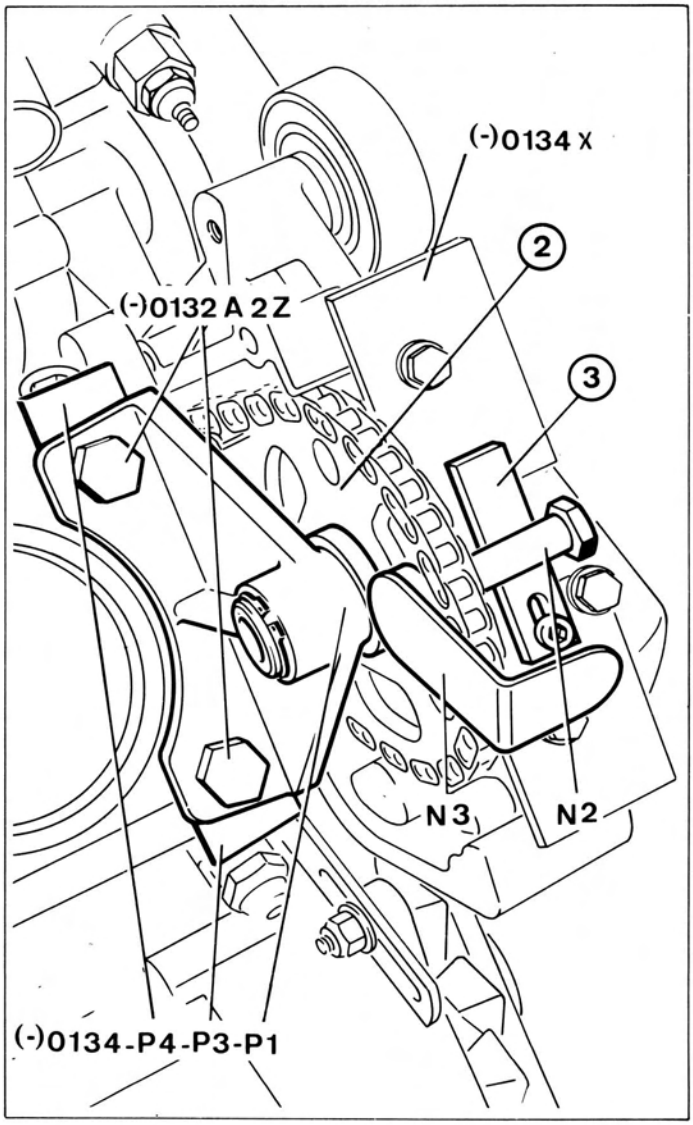
III

IV



13.5.86 C30

V



11.4.86 C66

I

- If necessary, check the liner protrusion

- Protrusion from the block : **0,13 to 0,20 mm**

- Variation in protrusion between two adjacent liners : **0,04 mm MAXIMUM**

II

- Retain the liners with clamps **(-).0132 A1Z** and bolts **(-).0132 A2Z**

- Extract the dowels **(1)** from the cylinder head with extractor **(-).0134 L**

III

CLEANING

- Use DECAPLOC 88 for the gasket faces.

- Brush and clean the cylinder head bolts.

- Run a tap (M12 × 1,50) down the bolt holes in the block and blow them out.

IV

CHECKING

- Cylinder head bow

c = **0.05 mm MAXIMUM**

MACHINING OF THE CYLINDER HEADS IS NOT PERMISSIBLE

V

If the crankshaft has been turned :

- Fit the dummy camshaft bearing **(-).0134 P1** to the sprocket.

- Moderately tighten the sprocket bolt **(2)**

- In some cases there will be a clearance which can be taken up by interposing shims **(P2-P3)**

- Tighten the two bolts **(-).0132 A2Z**

- Disengage the movable plate **(3)**

- Remove the nut **(-).0134 N3** and the bolt **(-).0134 N2.**

IMPORTANT

- **Leave the tool (-).0134 X in place on the timing cover.**

I

REFITTING

If the crankshaft has been turned :

- Ensure that the driving lug of the camshaft sprocket is positioned as shown opposite.

  right-hand side : **position A**
  left-hand side : **position B**

- Lock the sprocket again using the bolt **(-).0134 N2** and the nut **(-).0134 N3.**

- Refit the movable plate of tool **(-).0134 W**

- Remove the dummy bearing **(-).0134 P1.**

II

COMMON OPERATIONS FOR REFITTING THE RIGHT- OR LEFT-HAND CYLINDER HEAD

- Insert a 3 mm diameter rod **(1)** at **(a)** and **(b).**

- Position the dowels **(2)** against the rods to prevent their accidental retraction.

- Fit **a new gasket, dry,** and centralise it on the dowels. **ENSURE** it is fitted the right way.

III

- Coat the bolt **(3)** with THREADLOCK LOCTITE

- Refit the thrust plate **(4)** without tightening the bolt **(3).**

- Refit the cylinder head and retain it with the timing cover bolts hand tightened.

- Screw in the bolt **(5)** to engage the camshaft fully in the camshaft sprocket.

- Refit the thrust plate **(4)** and tighten the bolt **(3).**

Tightening torque : 1,3 m.daN (10 lbf ft).

IV

- Degrease the rocker pads

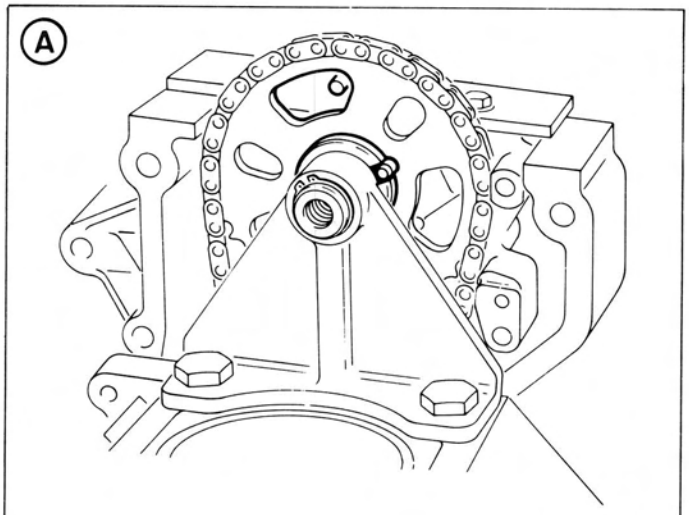
- Protect the jets and spray « MOLYKOTE SPRAY 321R » thinly on to the pads.

- Refit :

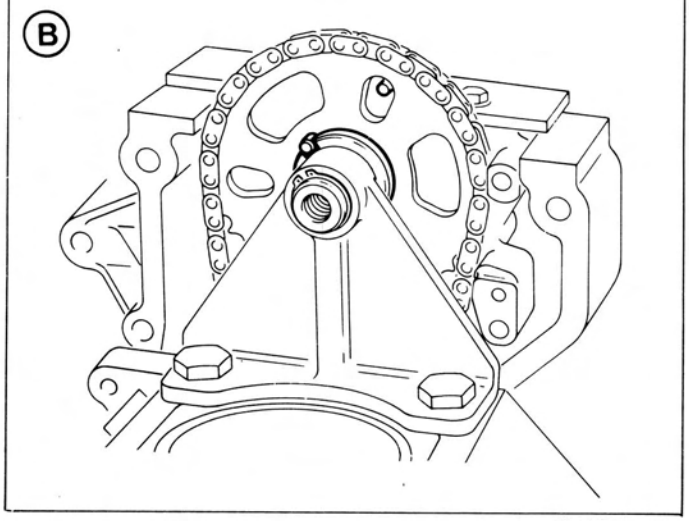
  - the rocker shaft

  - the cylinder head bolts (oil the threads and the contact faces of the bolts and washers)

I

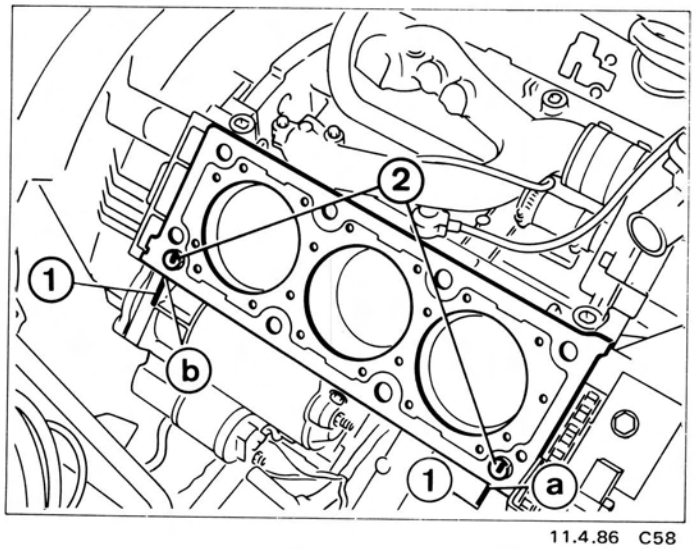


13.5.86 C26



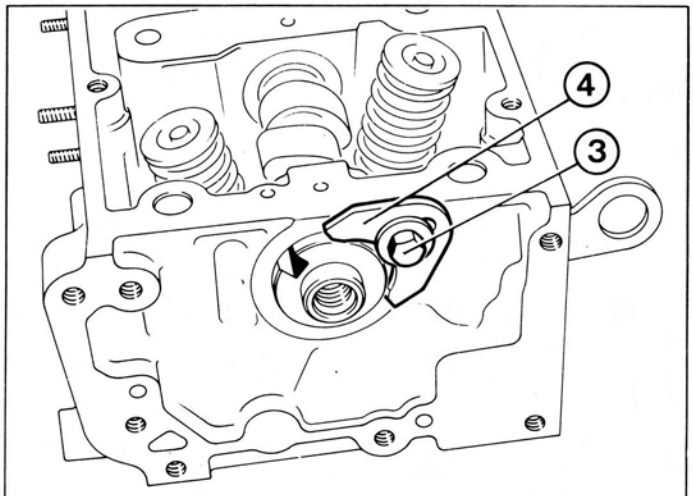
13.5.86 C26

II

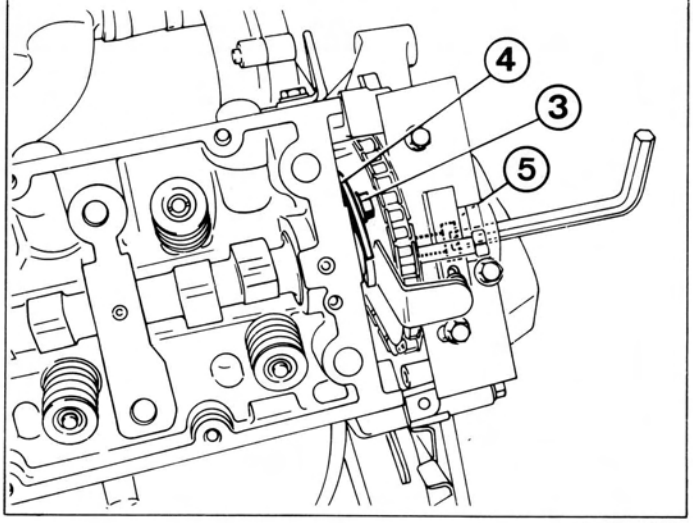


11.4.86 C58

III

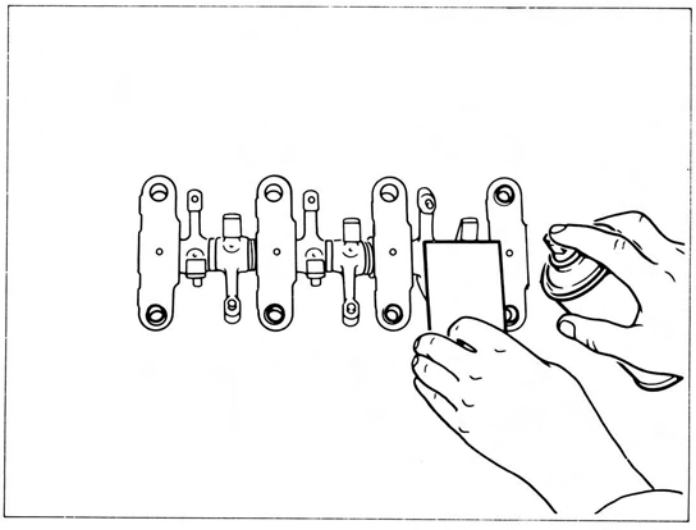


13.5.86 C24



11.4.86 C76

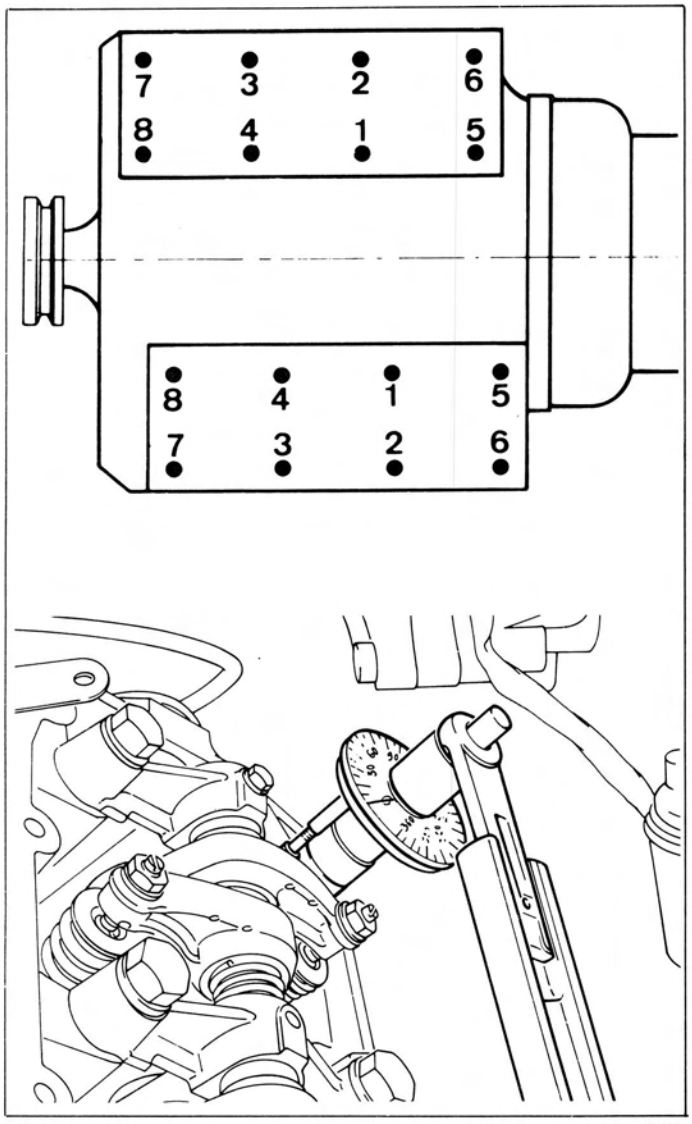
IV



10.2.79 C104

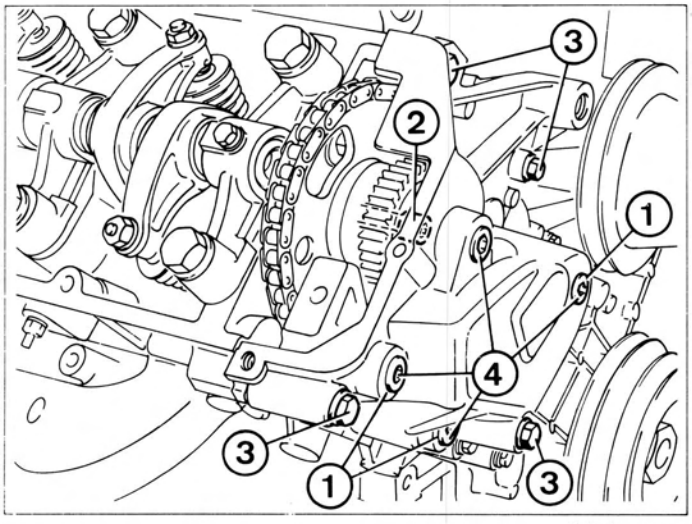
B4.016	1	ZN3J		505

I



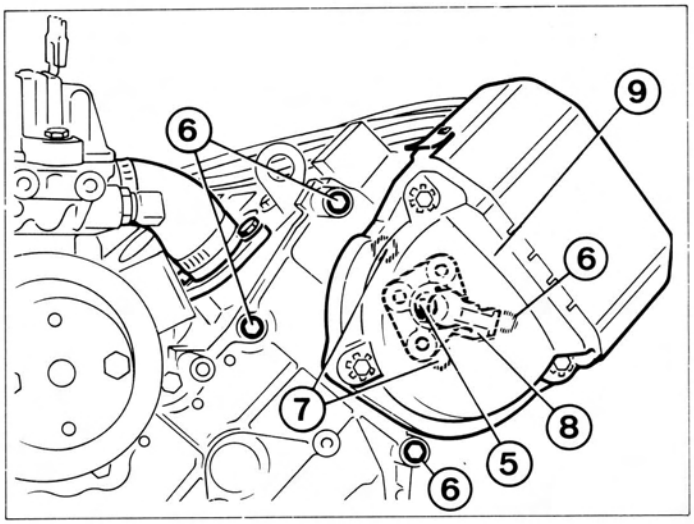
23.5.86 C25

II



7.3.86 C33

III



IV

I

In the order shown :
- pre-tighten the cylinder head bolts to **6 m.daN** (44 lbf ft)

- bolt by bolt

- slacken a bolt completely

- re-tighten to **2 m.daN** (15 lbf ft)

- tighten a further **105°** (FACOM wrench D360).

NOTE : For bolt no.6 on the left-hand side, use a modified S19 socket (the angle of 105° can be obtained in several stages).

II

TO REFIT THE RIGHT-HAND CYLINDER HEAD

- Refit the balance weight bracket by access through the holes **(1)**

Tightening torque : **1,25 m.daN** (9 lbf ft)

- Remove the tools from the front and rear of the cylinder head

- Tighten :

- the camshaft sprocket bolt **(2)**
Tightening torque : **8 m.daN** (59 lbf ft)

- the bolts **(3)**
- the plugs **(4)** coated with THREADLOCK LOCTITE

III

TO REFIT THE LEFT-HAND CYLINDER HEAD

- Remove the tool from the front of the cylinder head

- Tighten :

- the camshaft sprocket bolt **(5)**
Tightening torque : **8 m.daN** (59 lbf ft)
- the bolts **(6)**

- Refit :

- the bolts **(7)**
- the rotor **(8)**
- the cap **(9)**

IV

VALVE CLEARANCE ADJUSTMENT

(◄ relevant section)

V

- Refit and re-connect components in the reverse order to removal.

Alternator belt tension

new **45-50 daN/run** (101-112 lbf/run).
used **30-40 daN/run** (68-90 lbf/run).

I

ENGINE ELECTRICAL CIRCUITS

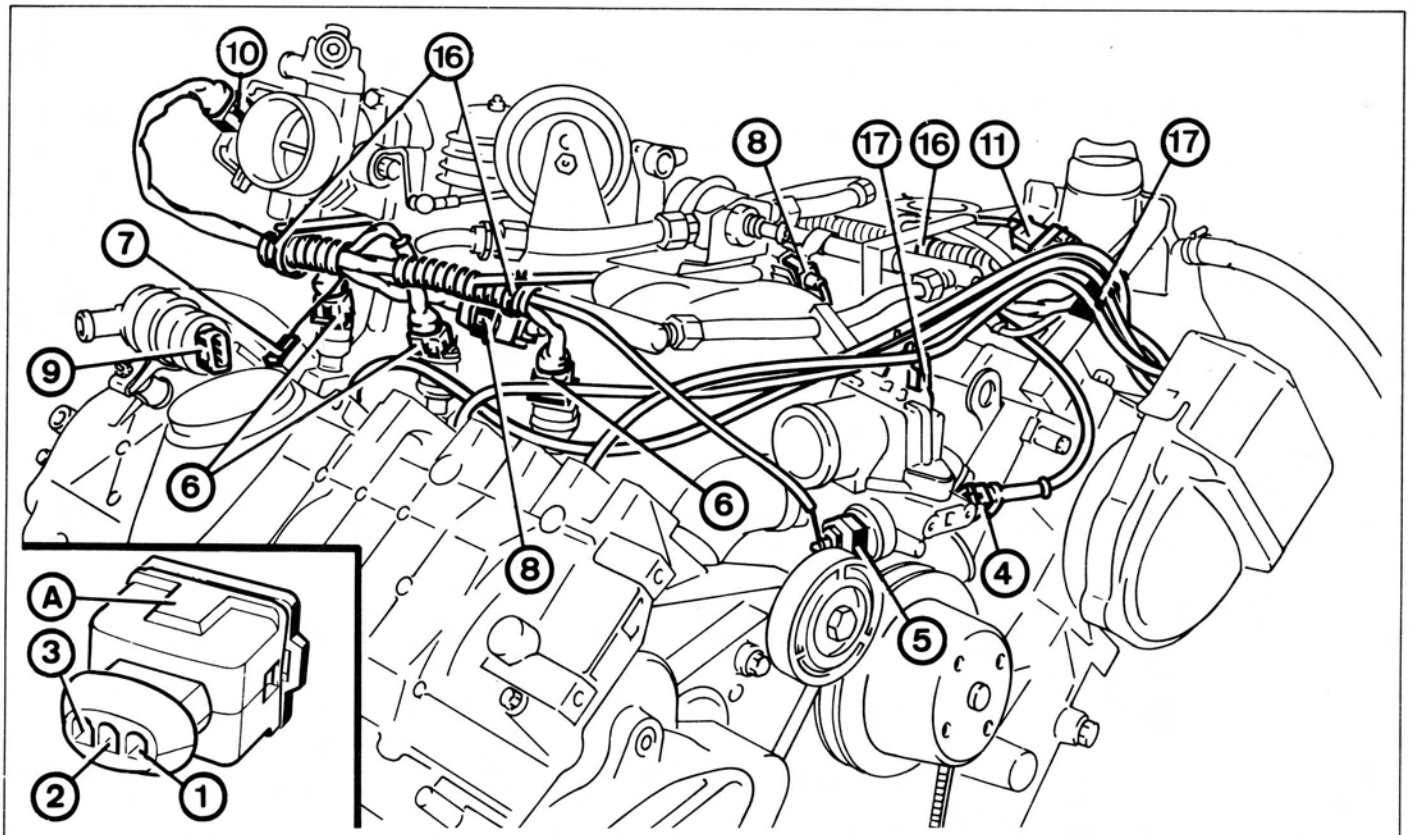
- Connections

Reference	Component	Connector-Wire number			
4	Injection thermistance	* 2-way connector			
		Socket	1	2	
		Wire	2	25	
5	110° warning thermal switch	Wire 47 (**only)			
6	Injectors	2-way connector			
7	Air conditioning compressor	Wire 135			
8	Knock detectors	* 3-way connector			
		Socket	1	2	3
	Right	Wire	M12	12	13A
	Left	Wire	M24	24	25A
9	Idle regulation solenoid valve	Wire	23	751	10
10	Throttle switch unit	Wire	121	M48	3
11	No. 1 cylinder sensor	Wire	19	18	M2
12	Speed and TDC sensor	Wire	10	23	M11
13	Thermistance	Wire 47A			
	105° warning thermal switch or air conditioning cut-out	Wire 47 (except **) Wire 47B (**)			
14 (**)	Harness connector for the engin compartment (near the coil)	* 2-way connector			
		Socket	1	2	
		Wire	135	47B	
15	Engine earth	Wire M2 - M4 - M6			

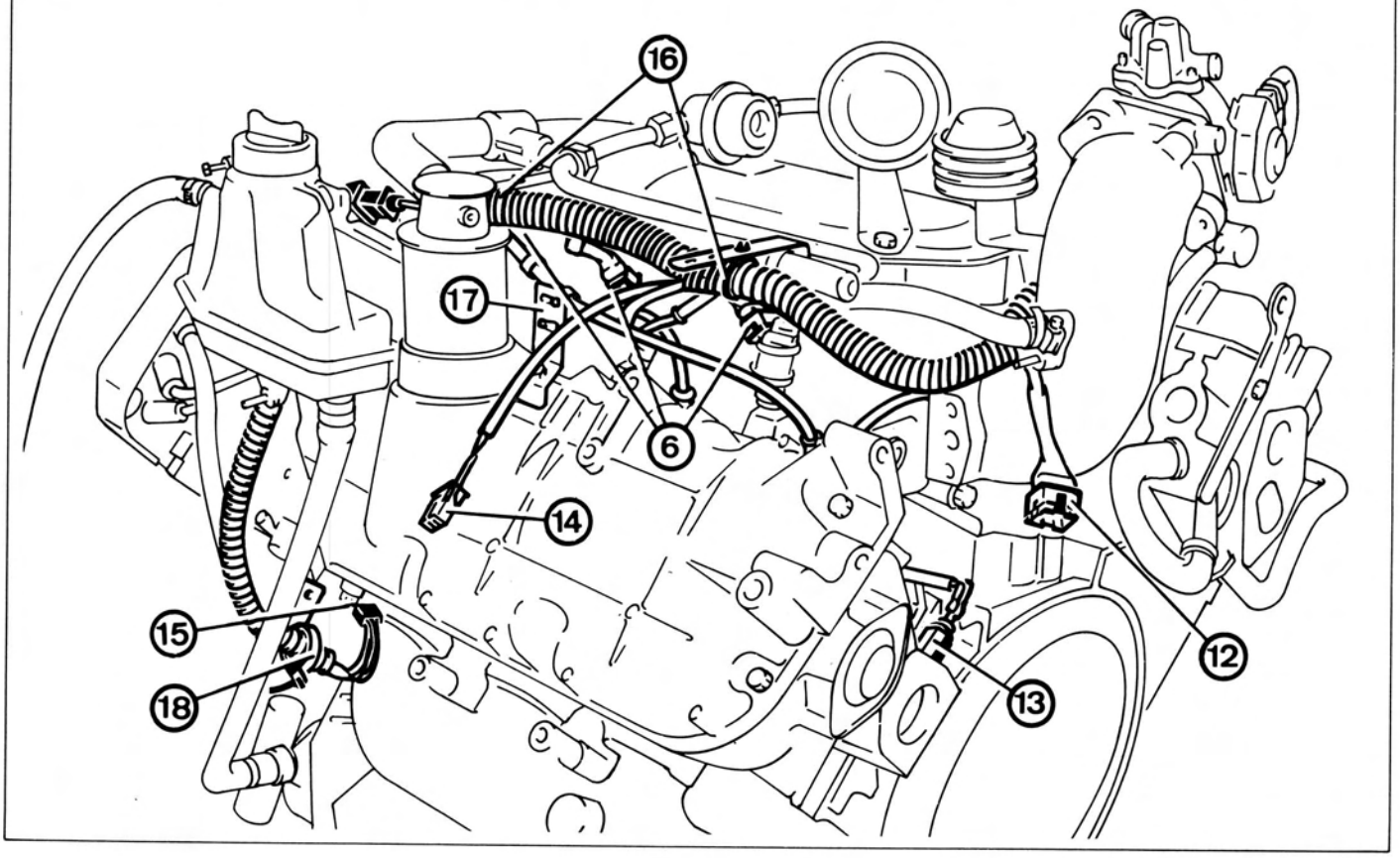
NOTE : For connectors marked with *, observe the position in sockets **(1), (2)** and **(3)** in relation to the inhibitor lug **(D)** (◄ diagram opposite).

- Clips
- plastic collar **(16)**
- plug lead retaining clips **(17)**
- plastic tie **(18)**

I



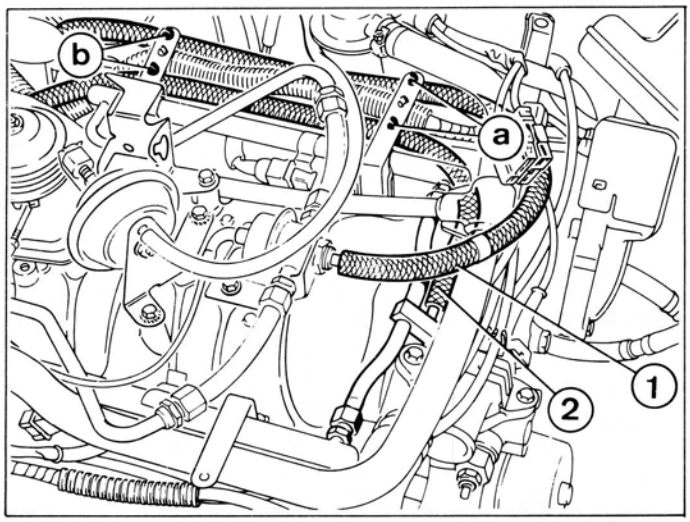
21.4.86 C78



21.4.86 C70

B4.020	1	ZN3J		505

I



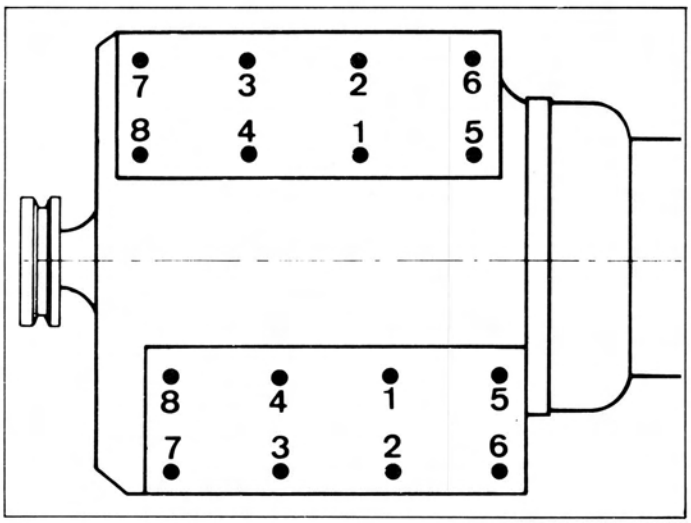
2.4.86 C44

IV

II

V

III



VI

I

FUEL SYSTEM

- Re-connect :

  - the return pipe **(1)** **(white dentification** on pipe and on regulator)

  - the supply pipe **(2)**

- **Secure these pipes with plastic collars at (a)** and **(b)**

II

- Fill the cooling system (◄ relevant section)

- Adjust the controls (◄ engine refitting)

III

RETIGHTENING THE CYLINDER HEAD

- Run the engine for 12 minutes at 2000 rpm.

- Allow the engine to cool for at least two hours.

- In the order shown, bolt by bolt, tighten a further **45°**

- Check, and if necessary adjust the valve clearances (◄ relevant section)

IV

REFITTING THE AIR CONDITIONING COMPRESSOR (◄ relevant section)

V

VI



I

Valve clearance (mm), cold :

- ● Inlet 0,10
- ⊗ Exhaust 0,25

Note : For removing-refitting cylinder head covers

◄ cylinder head removal section

II

FIRST METHOD Adjustment by individual cylinder heads

Left-hand cylinder head

Valves rocking	Adjust valves	
● 1 - ⊗ 1	● 3	⊗ 2
● 2 - ⊗ 2	● 1	⊗ 3
● 3 - ⊗ 3	● 2	⊗ 1

III

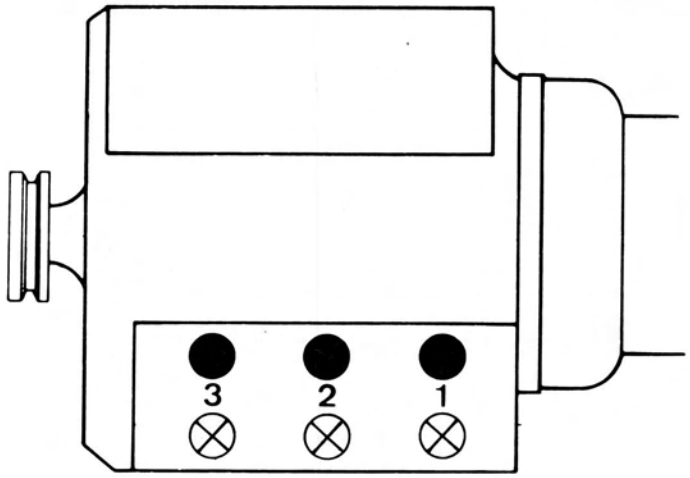
Right-hand cylinder head

Valves rocking	Adjust valves	
● 4 - ⊗ 4	● 6	⊗ 5
● 5 - ⊗ 5	● 4	⊗ 6
● 6 - ⊗ 6	● 5	⊗ 4

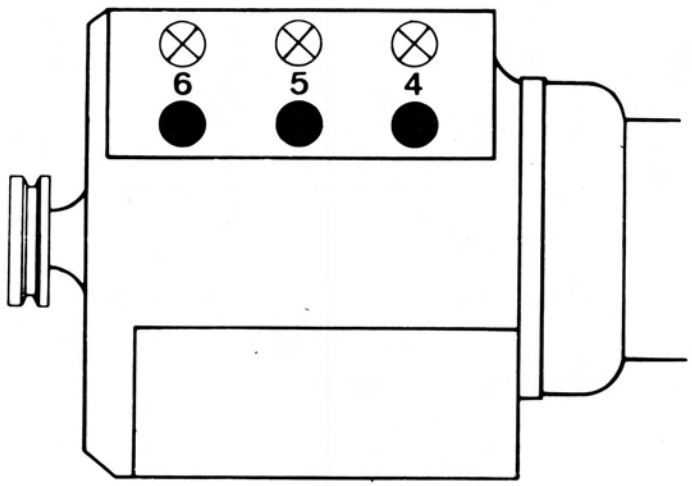
505		ZN3J	1	E2.003

I

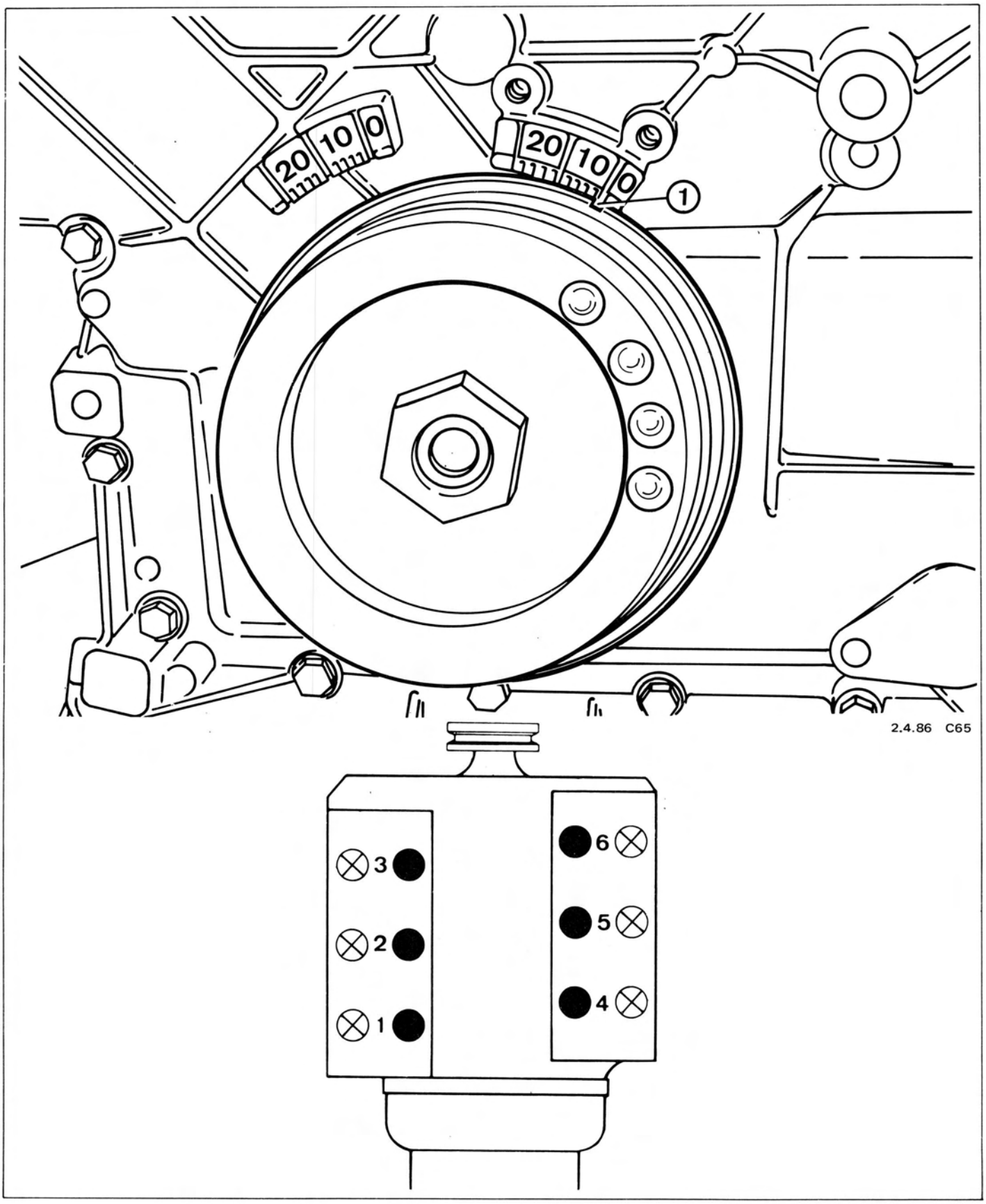
II



III



E2.004	1	ZN3J		505



SECOND METHOD Adjustment on both cylinder heads

- Set **no.1 cylinder to TDC on the firing stroke,** which corresponds to :
  - valves of no.5 cylinder rocking
  - reference **(1)** on the crankshaft pulley opposite the 0 mark on the timing cover

	Valves to adjust	
	Inlet	Exhaust
Firing stroke	● 1	⊗ 1
No.1 cylinder	● 2	⊗ 3
	● 4	⊗ 6

- Rotate the crankshaft one revolution clockwise to the point where the valves of **no.1** cylinder rock or **no.5** cylinder is at TDC on the firing stroke.

	Valves to adjust	
	Inlet	Exhaust
No.1 cylinder	● 3	⊗ 2
end of exhaust stroke	● 5	⊗ 4
- start of induction	● 6	⊗ 5

505		ZN3J	1	E4.001(1)



I

- Remove the battery
- Drain the cooling system
- Disconnect the hoses from the coolant pump and remove the radiator
- Remove the fan, the belts
- Detach the fluid reservoir from the power steering pump

II

- Remove the bottom closing plate from the clutch or converter housing
- Lock the flywheel using the toothed sector **(–).0134 Q**
- Remove the crankshaft pulley

III

** Remove the air conditioning compressor without disconnecting the refrigerant pipes

(◁ relevant section)

IV

- Remove :
  - the distributor cap **(1)**
  - the distributor rotor **(2)**
  - the bolt **(3)** from the left-hand camshaft sprocket

V

VALVE GEAR REMOVAL

- Remove :
  - the cylinder head covers
  - the timing cover
  - the key from the end of the crankshaft

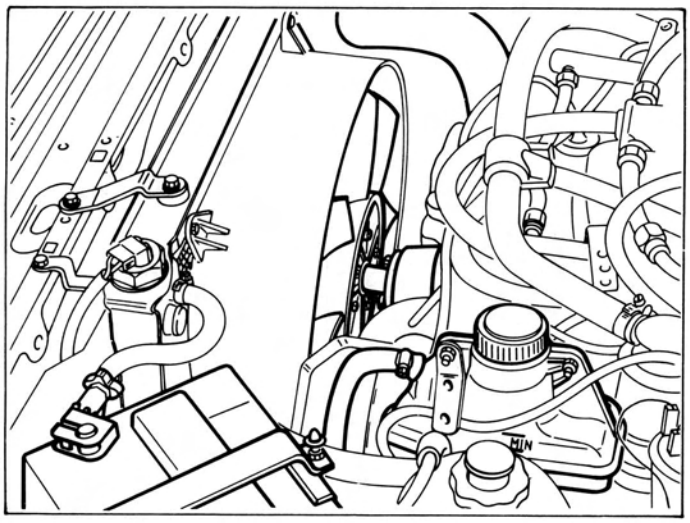
NOTE

Check the dimension **X** on the oil pump chain.

X must be less than **7 mm.**; if it is not, renew the chain

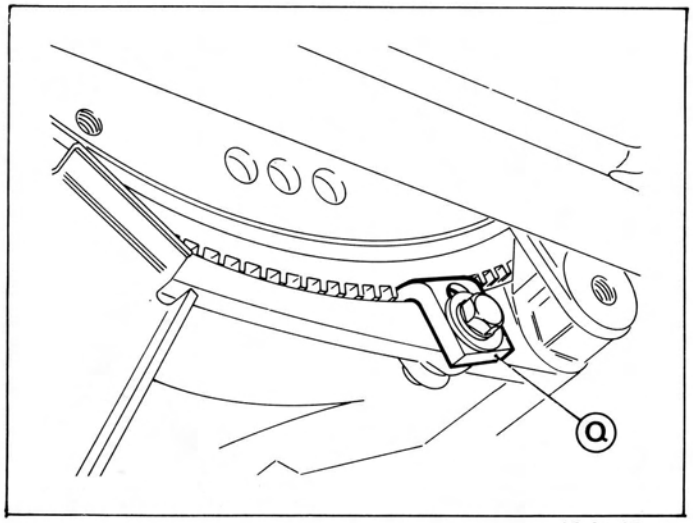
- Remove :
  - the oil pump sprocket **(4)** and the chain
  - the oil pump drive sprocket **(5)**
  - the distance piece and the key
  - the oil pump

I



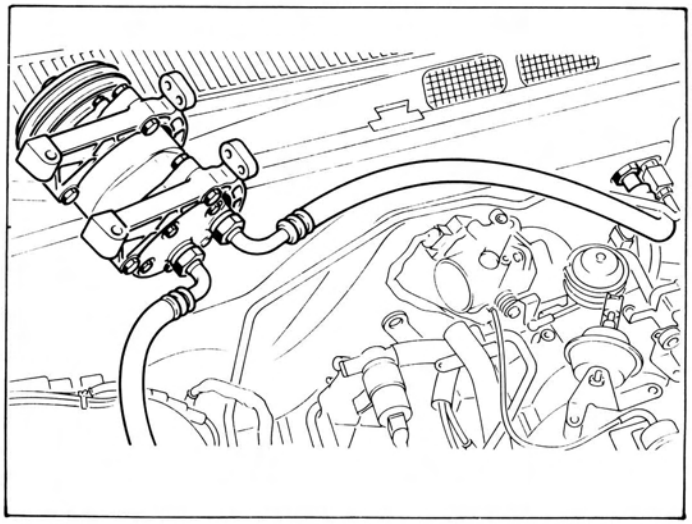
16-02-87 C40

II



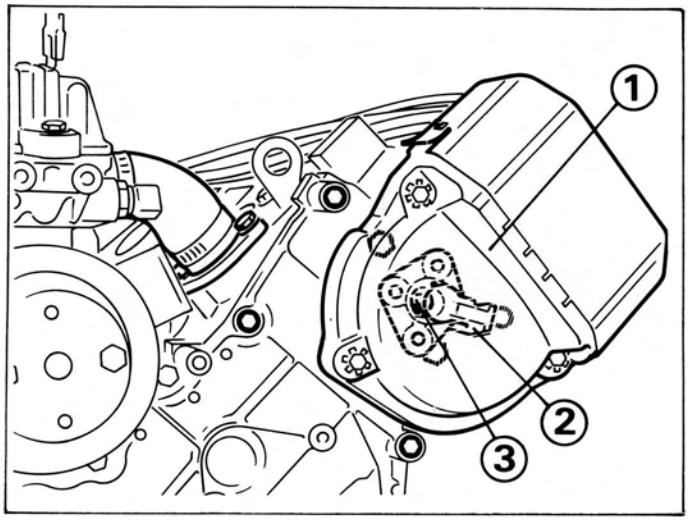
16-02-87 C41

III

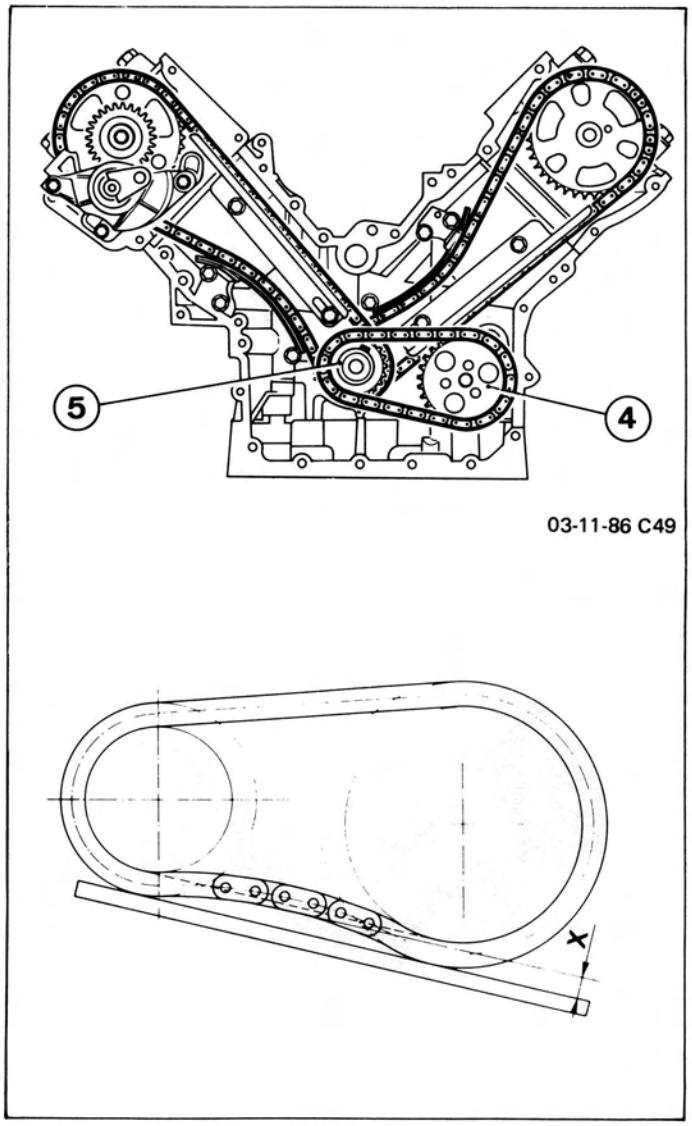


21-04-87 C54

IV

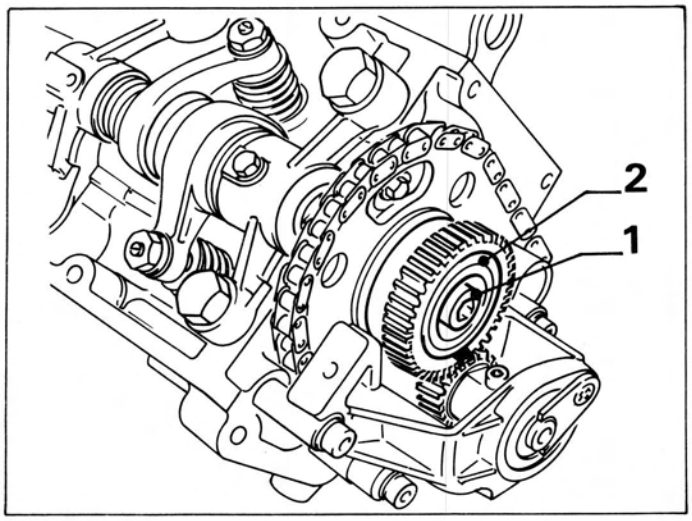


V

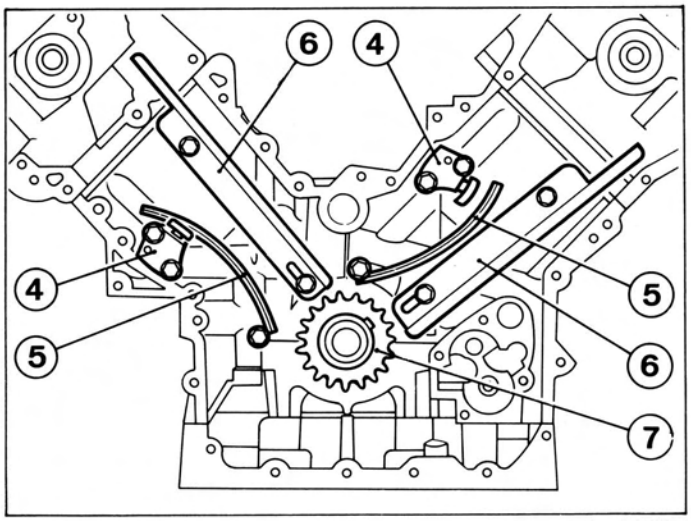


03-11-86 C49

I

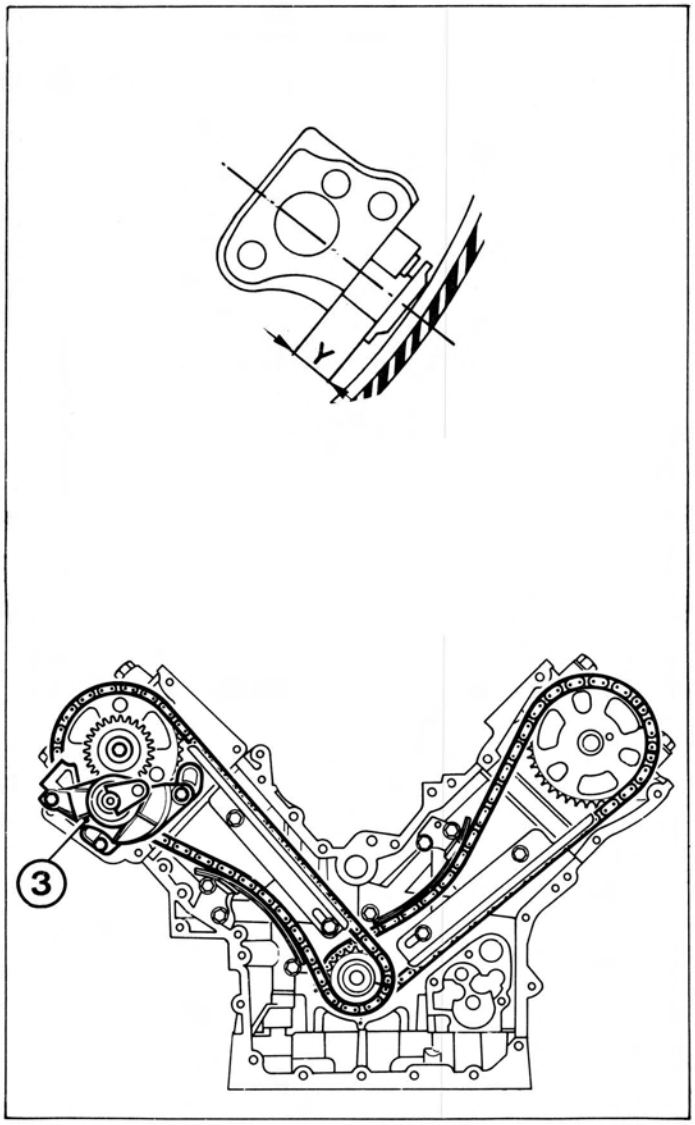


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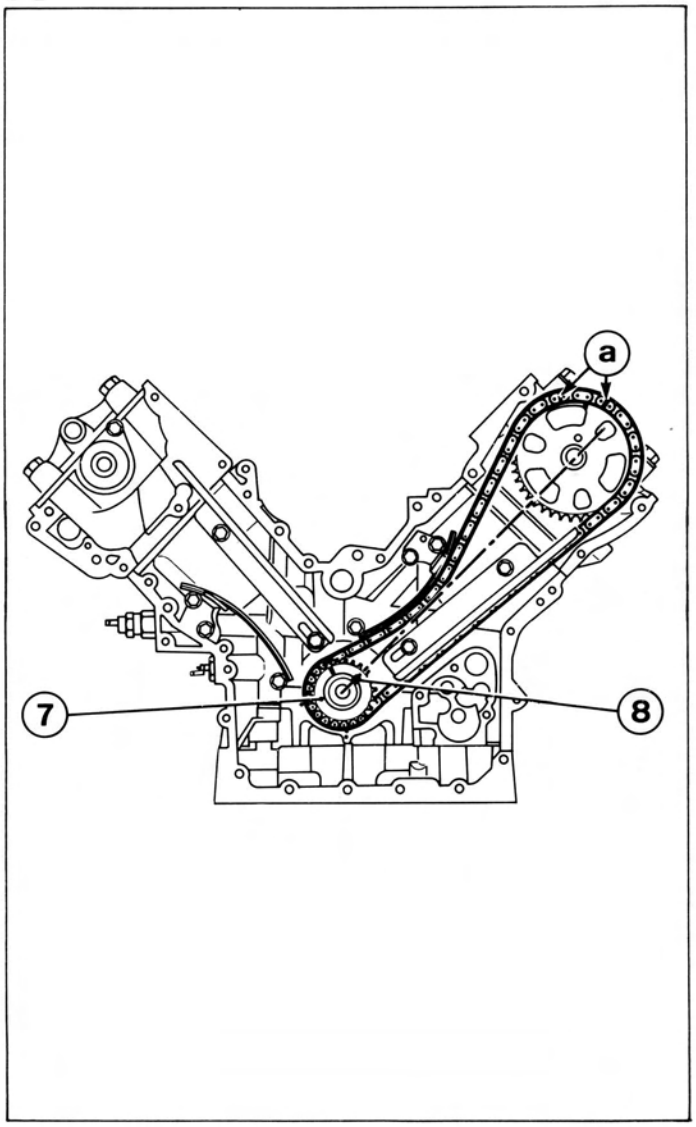


03-11-86 C35

II



IV



03-11-86 C31

03-11-86 C33

I

Right-hand cylinder head

– Remove :
  - the bolt **(1)** and the front counter-weight gear **(2)**

II

– Check the protrusion of the tensioners : if **Y** is more than **9,5 mm**, renew the timing chains. Disarm the two tensioners.

– Remove :
  - the counter-weight bracket **(3)**
  - the right-hand camshaft sprocket and chain
  - the left-hand camshaft sprocket and chain

NOTE

Mark the camshaft sprockets and the chains if they are to be re-used

The counter-weight bracket is matched to the right-hand cylinder head.

If one is renewed, the other must also be renewed

III

– Remove :
  - the tensioners **(4)** and the RILSAN filters
  - the slippers **(5)**
  - the blades **(6)**
  - the crankshaft sprocket **(7)**
  - the key

V

REFITTING

VALVE TIMING

– Fit :
  - the RILSAN filters
  - the tensioners : bolts tightened to **0,8 m.daN** (6 lbf ft)
  - the blades : bolts fitted with threadseal LOCTITE and tightened to **1,3 m.daN** (10 lbf ft)
  - the tension pads : bolts tightened to **0,8 m.daN** (6 lbf ft)

– Remove the flywheel lock

– Fit :
  - the key **(8)**
  - the crankshaft sprocket **(7)**

– Fit the pulley bolt and turn the crankshaft clockwise to bring the key **(8)** in line with the centre line of the left-hand cylinder bank

– Fit the left-hand camshaft sprocket and chain (double marking **(a)** on the sprocket)

I

- Turn the crankshaft to bring the mark **(a)** in line with the oil pump attachment hole
- Fit the right-hand camshaft sprocket and chain (double marking **(b)** on the sprocket)
- Arm the chain tensioners

II

- Fit :
  - the flywheel lock
  - the bracket **(3)** fitted with its counter-weights
  - the driving gear **(1)** with the mark **(4)** in lne with the counter-weight bolt **(2)**
- Tighten the retaining bolt **(5)** of the gear **(1)** to **8 m.daN** (59 lbf ft)

III

- Fit :
  - the oil pump
    tighten the bolts to **1,3 m.daN** (10 lbf ft)
  - the crankshaft sprocket **(6)**
  - the oil pump chain and sprocket **(7)** Use threadseal LOCTITE and tighten to **0,6 m.daN** (4.5 lbf ft)

IV

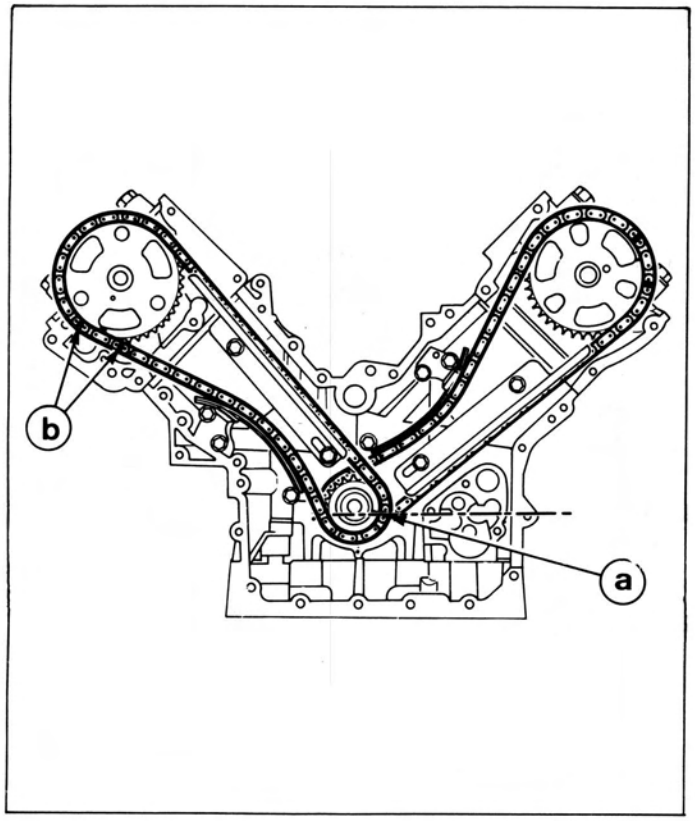
- Fit the oil seals **(8)** and **(9)** to the timing cover
- Use tool **(–).0134 G** to position the oil seal **(8)**

V

- Fit :
  - the distributor body **(10)** to the timing cover
  - the rotor support **(11)** and its driving dog **(12)**

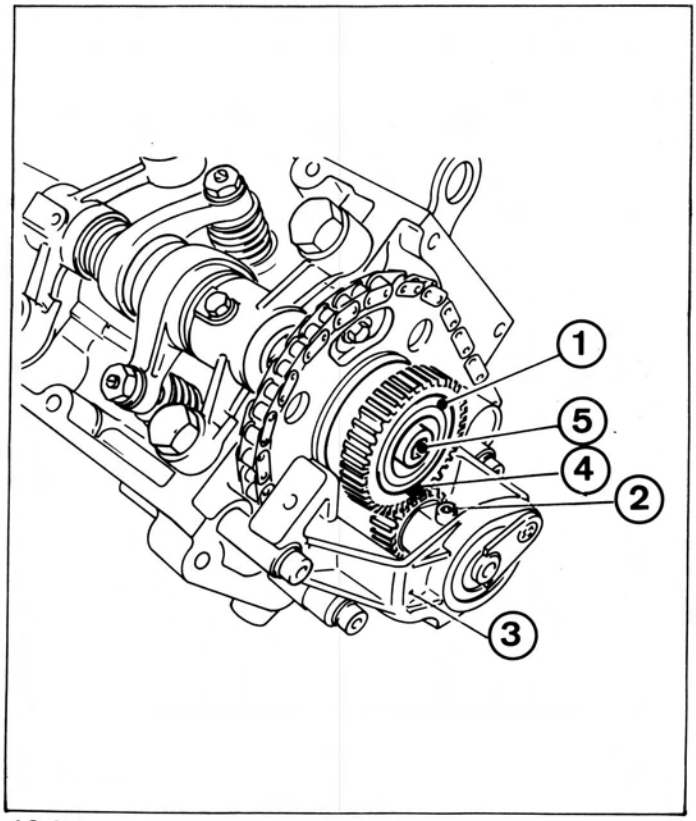
PRC CONCEPT

I

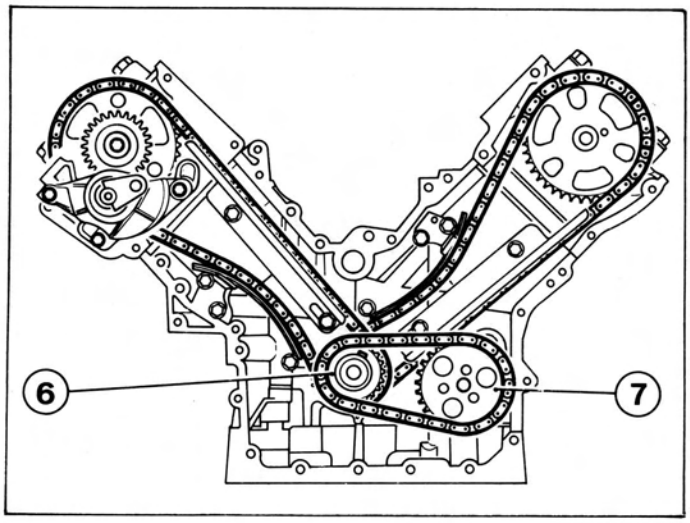


03-11-86 C29

II

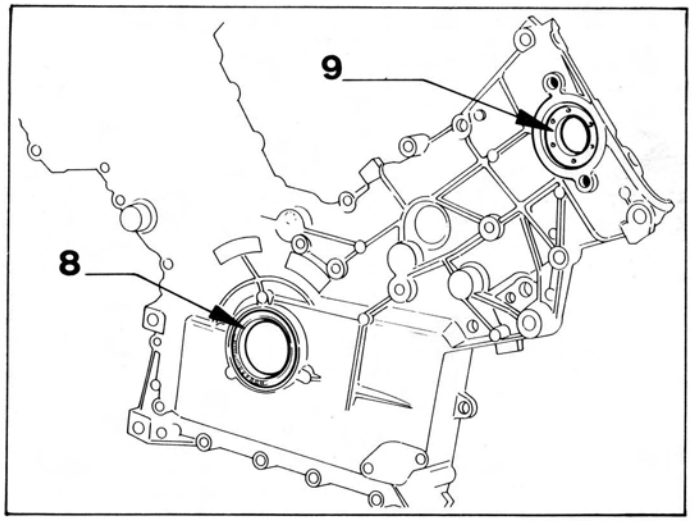


III



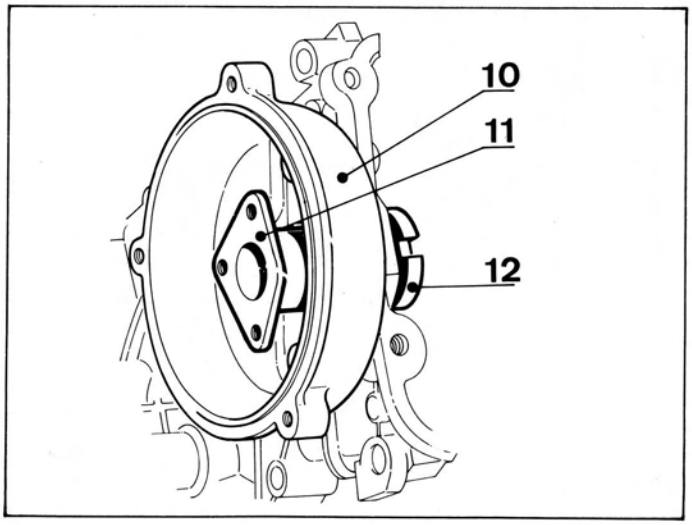
03-11-86 C49

IV



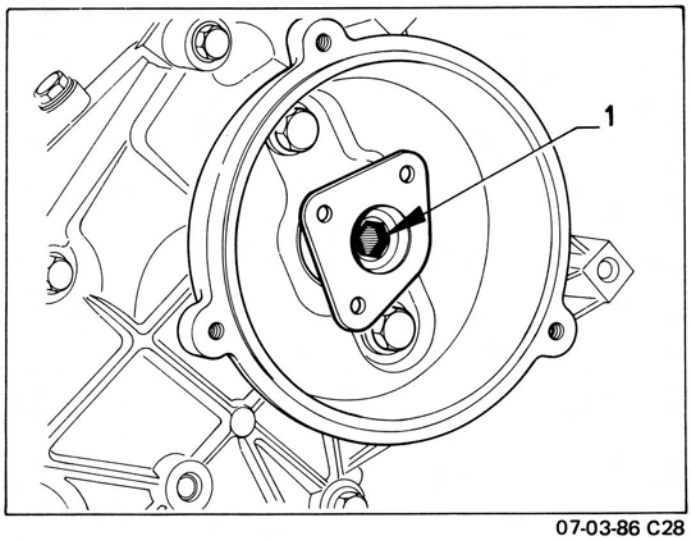
11-12-86 C3

V



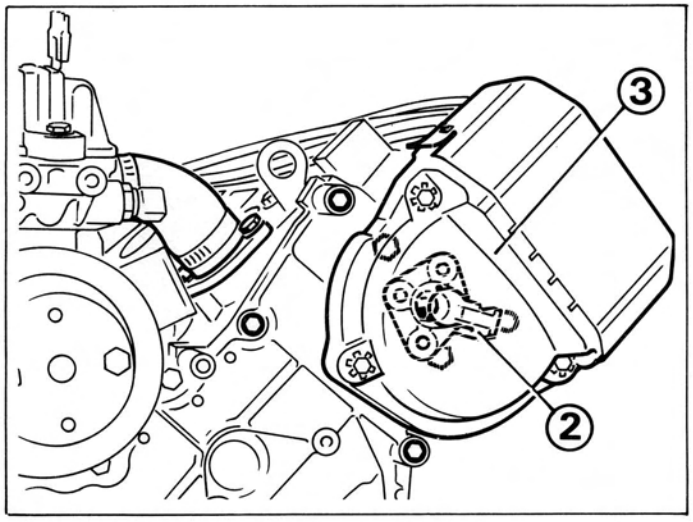
11-12-86 C2

I

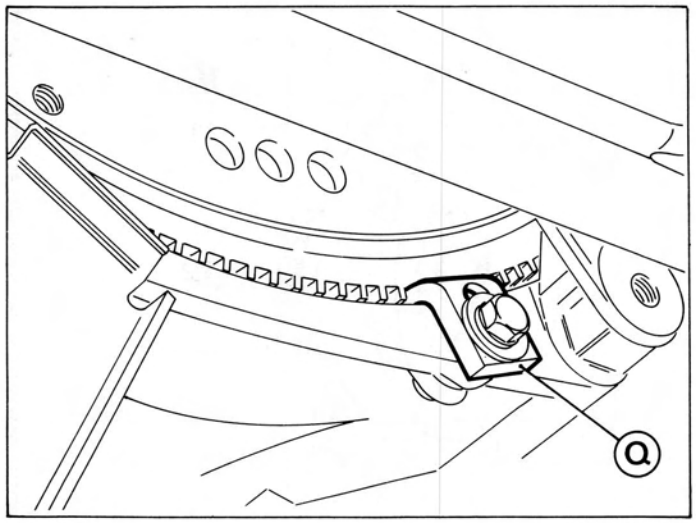


07-03-86 C28

II

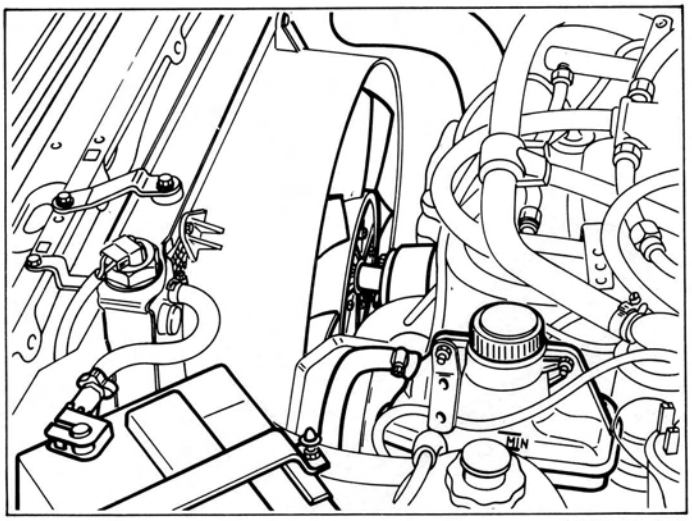


III



16-02-87 C41

IV



16-02-87 C40

I

- Fit the timing cover

  Tighten the bolts to **1,3 m.daN** (10 lbf ft)

  Tighten the camshaft bolt **(1)** to **8 m.daN** (59 lbf ft)

- Fit the crankshaft pulley

  Use threadseal LOCTITE and tighten the nut to **17,5 m.daN** (129 lbf ft)

II

- Fit :
  - the cylinder head covers
  - the rotor **(2)**
  - the distributor cap **(3)**

III

- Remove the flywheel lock **(–).0134 Q**
- Fit the bottom closing plate to the clutch or converter housing

IV

** Fit the air conditioning compressor
(◁ relevant section)

- Fit :
  - the fan and cowl
  - the radiator
  - the battery
- Fill the cooling system
  (◁ relevant section)

PRO CONCEPT



I

DRAINING

- Set the heater temperature control **(1)** fully to the **top**

II

- Detach the expansion bottle **(2)** from its bracket : empty it.

- Attach the expansion bottle to the bonnet as high as possible.

- Remove :

  . the coolant level sensor **(3)**

  . the radiator drain plug

III

- Unscrew the taps **(4)** on each side of the cylinder block (tubes can be fitted for coolant to run out).

- When the flow stops, tighten the taps. **(4)**

IV

FILLING - BLEEDING

- Open the bleed screw **(5)**

- Fill the **system through the radiator**

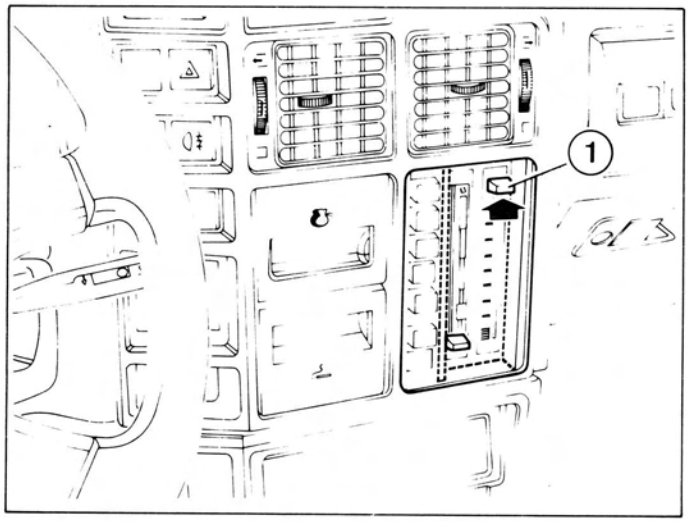
- Continue to fill the radiator through the expansion bottle until coolant overflows from the filler orifice.

- Refit the coolant level sensor **(3)**

- **Tighten** firmly

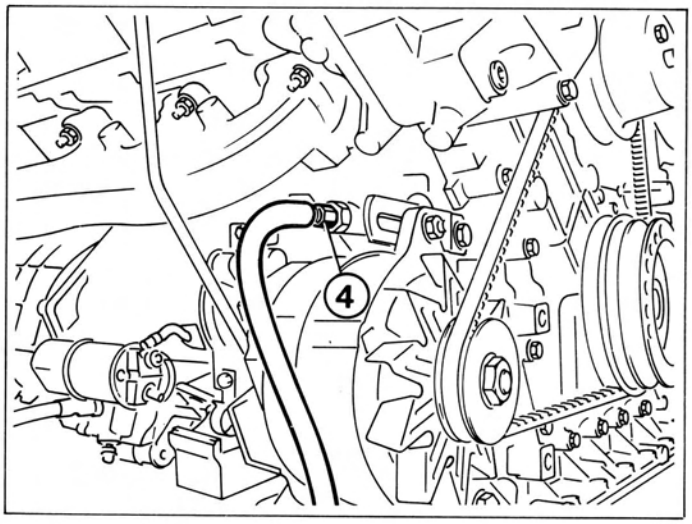
- Close the bleed screw **(5)** as soon as coolant runs out in a continuous stream.

I



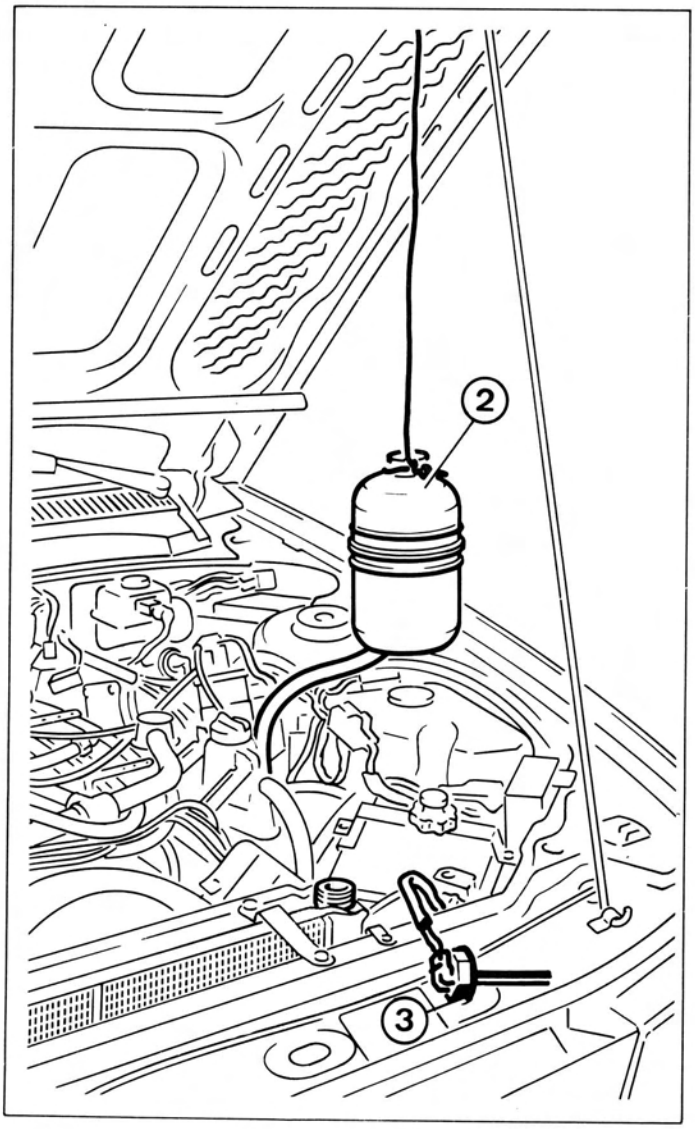
21.3.85 C56

III



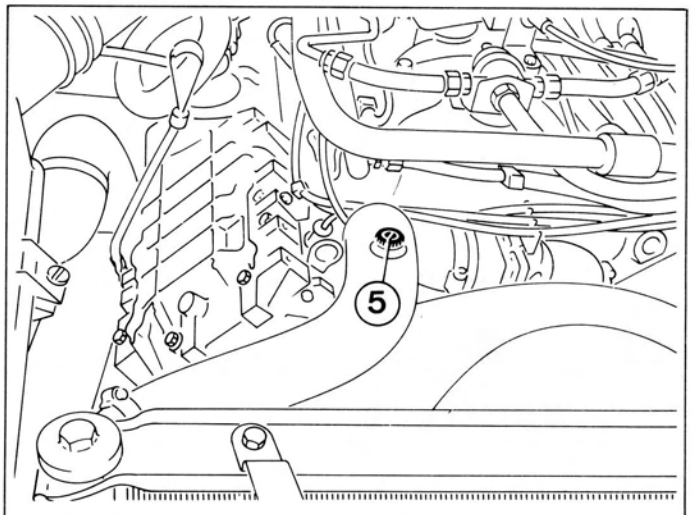
4.2.86 B2

II

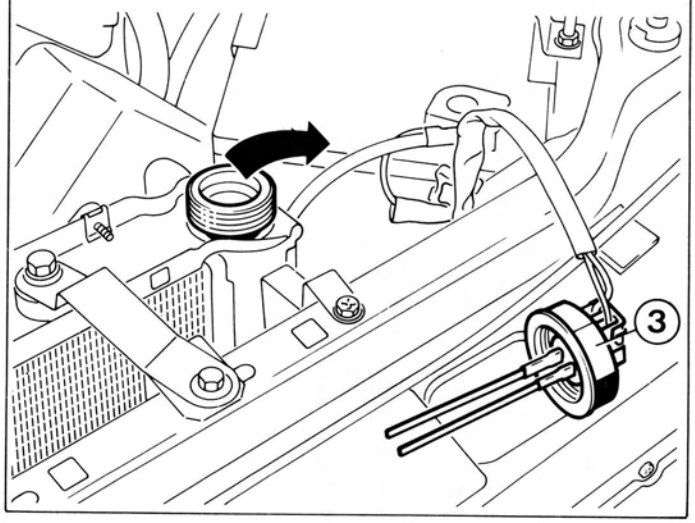


18.4.86 C1

IV



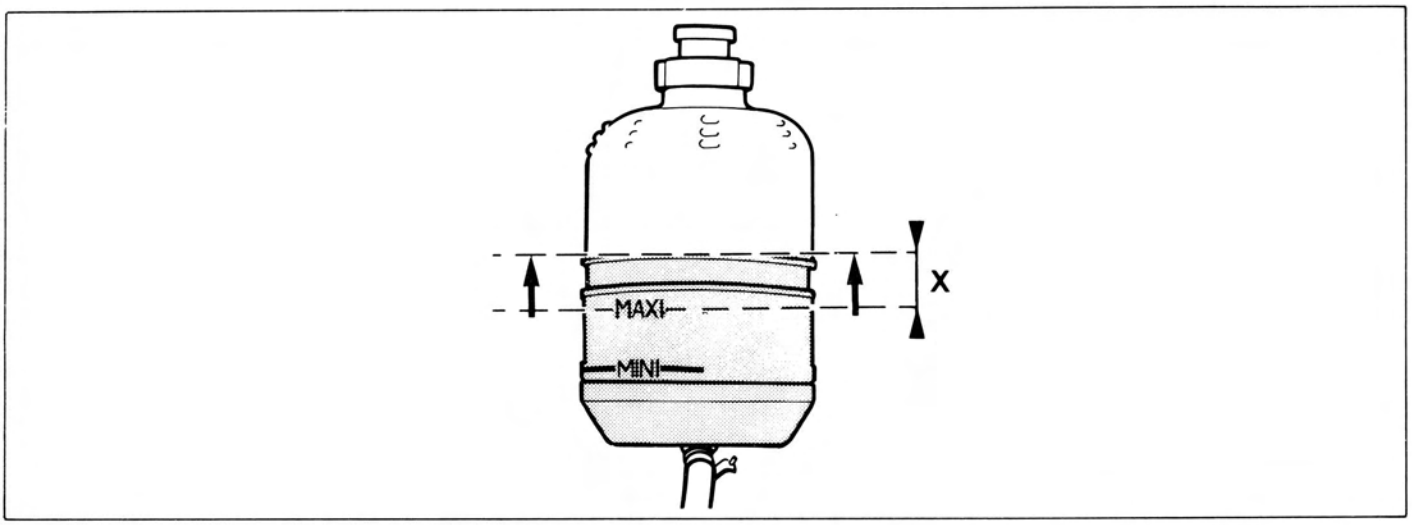
11.2.86 B4



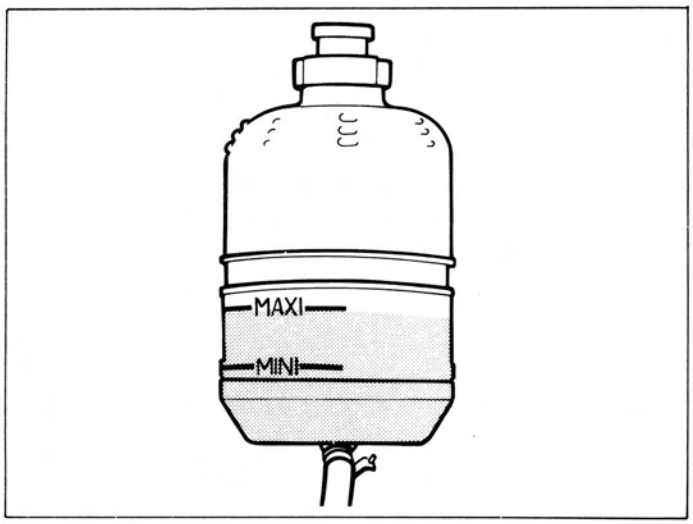
14.4.86 C4

J3.004	1	ZN3J		505

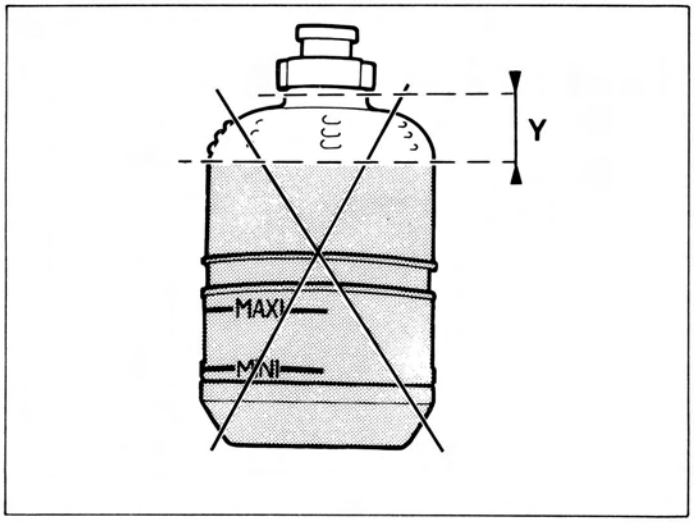
I



II



III



I

- Continue to fill to bring the level in the expansion bottle to between 0 and 40 mm (1.5 in) above the MAXI mark (zone X)

- Refit the expansion bottle cap (tighten with slip-joint pliers).

IMPORTANT - Do not run the engine with bleed screw or plugs open.

- Warm up the engine until the thermometer needle is in the central zone. Allow it to run for 5 minutes at idling speed.

- Accelerate several times to low speed to aid bleeding. Allow the engine to settle at idling speed after each acceleration.

II

- Stop the engine

- Refit the expansion bottle to its bracket

When the engine has cooled completely :

- the level in the expansion bottle should be near the **MAXI** mark

- a level slightly higher than the **MAXI** mark is normal

- top up the level to the **MAXI** mark if necessary

III

NOTE

If, after running, the level in the expansion bottle rises abnormally (to within 3 cm (i in) (Y) of the upper part of the expansion bottle), check the system for air locks and repeat the bleeding procedure.

IV

V

505		ZN3J	1	K2.001(1)



I

TOOLING

(-).1503 ZZ

Kit for pressure/vacuum checking, comprising :

A – Pressure gauge

B – Flexible hose

C – Union

a – Stop pin

II

CHECKING OIL PRESSURE

– Screw the union **(–).1503 C** in place of the oil pressure switch **(1)**

– Fit the flexible hose **(B)** and secure it with the pin **(a)**

– Check with the engine hot, oil at approximately 80° C

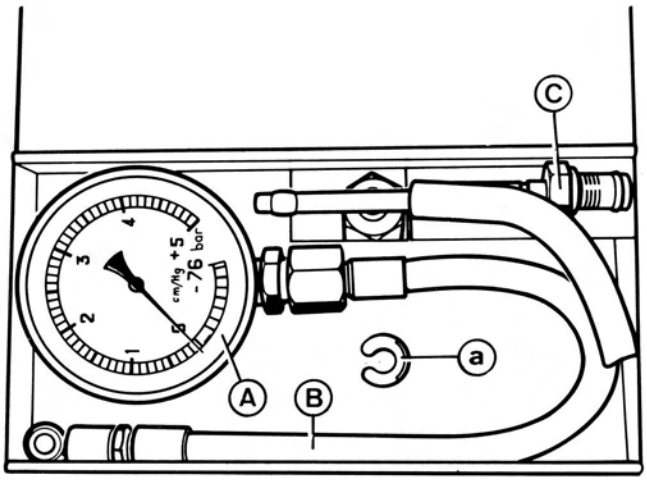
– Minimum pressures :

- at 900 rpm **2 bars** (200 Kpa, 30 lbf/in^2)
- at 2000 rpm **4,2 bars** (420 Kpa, 60 lbf/in^2)
- at 6000 rpm **5,5 bars** (550 Kpa, 80 lbf/in^2)

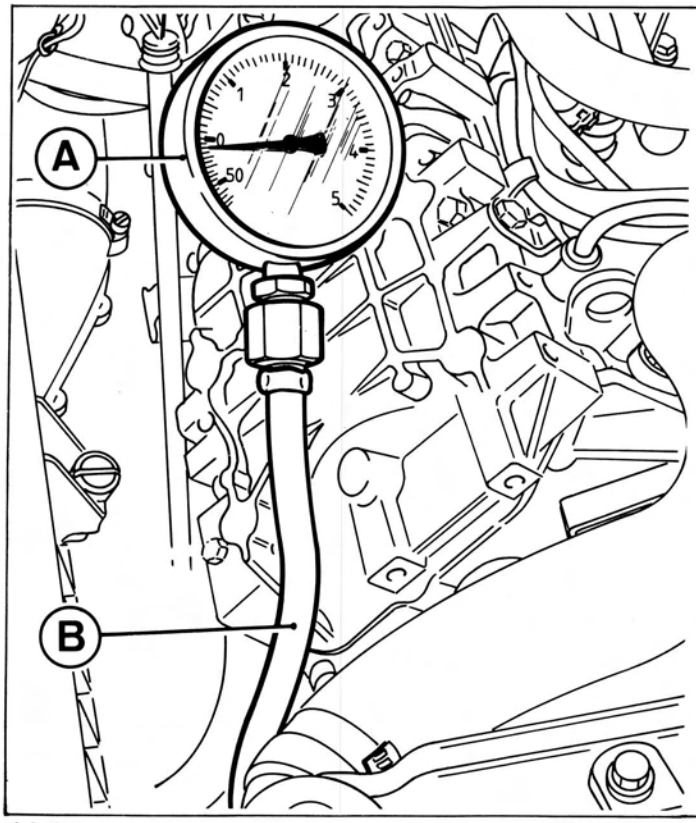
– Refit the oil pressure switch

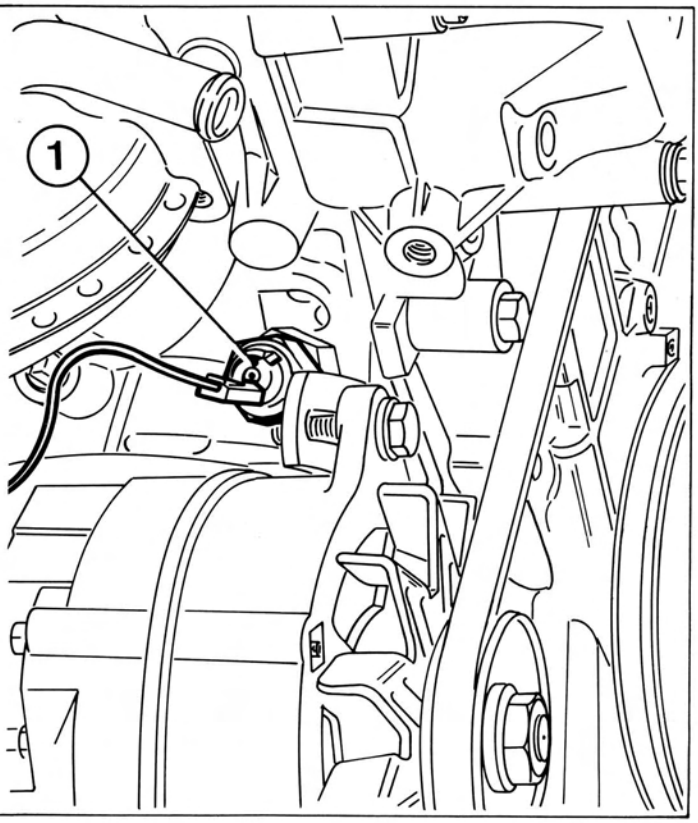
PRV CONCEPT

I



II





16-02-87 C34

21-04-86 C58



I

REMOVING THE COMPRESSOR

- This cas be removed without disconnecting the refrigerant pipes

- Remove :
  - the drive belt
  - the bolts (1) and (2)

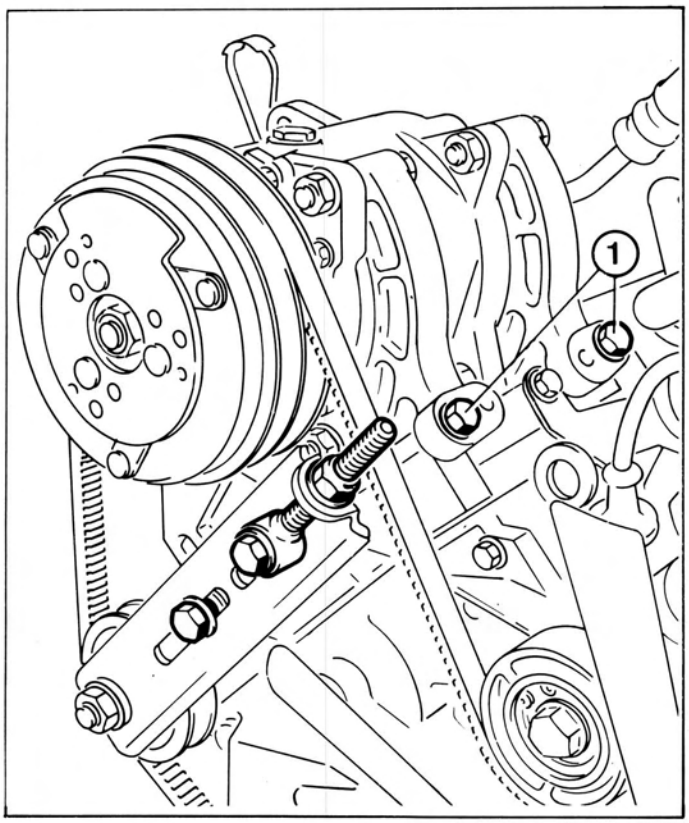
- Detach the compressor and place it on the scuttle

REFITTING THE COMPRESSOR

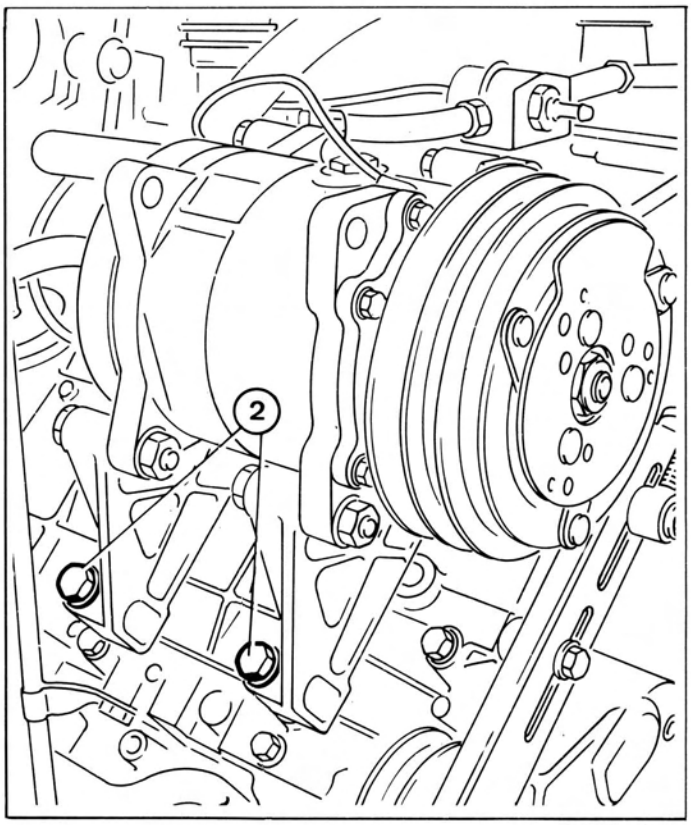
Belt tension

- new : 45-50 daN/run (101-112 lbf/run)
- used : 30-40 daN/run (68-90 lbf/run)

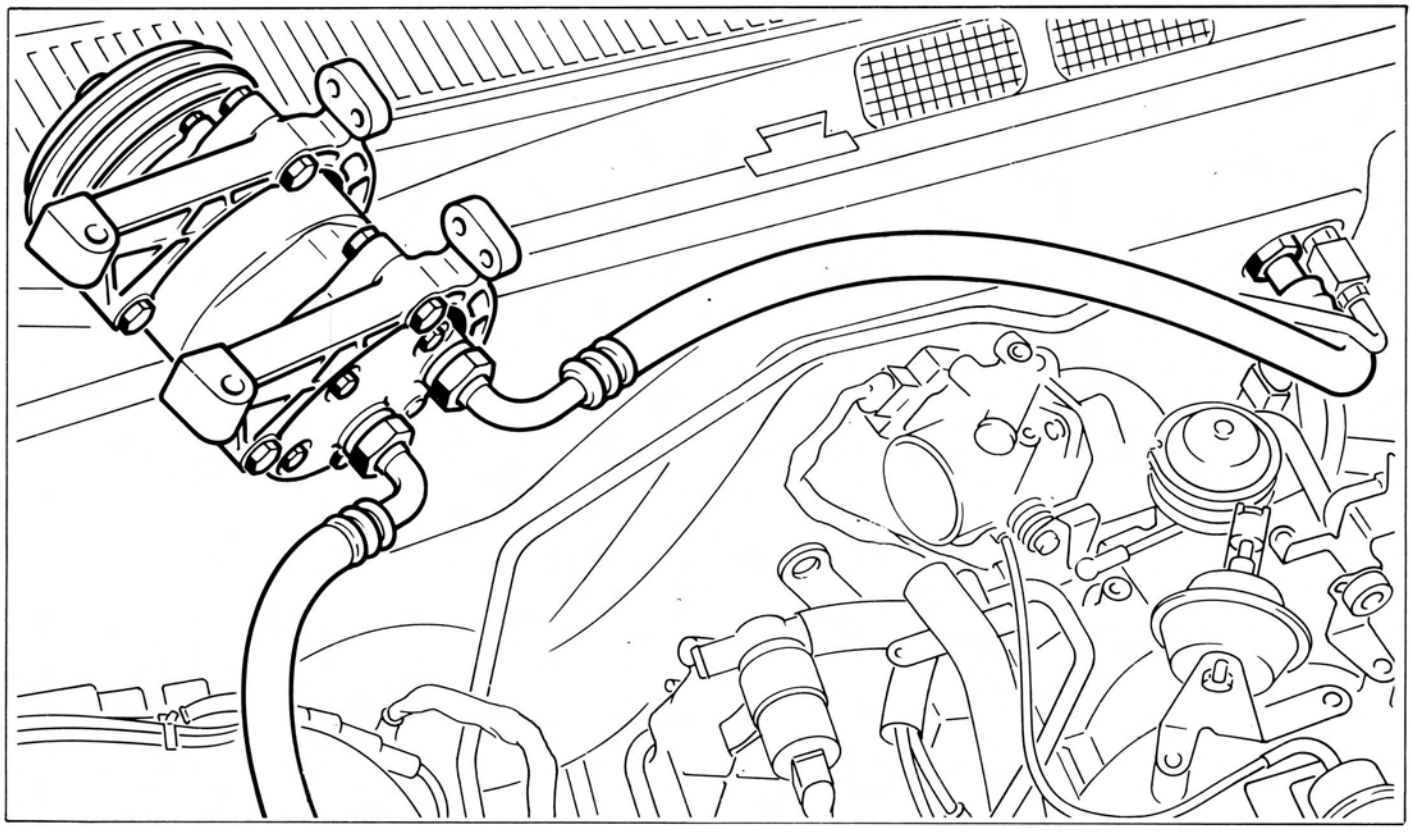
Tightening torque for bolts **(1)** and **(2)** : **2,5 m.daN** (18 lbf ft).



2.4.86 C60



2.4.86 C79



21.4.86 C54