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CUSTOMER SERVICES
AFTER-SALES TECHNICAL DEPARTMENT

REPAIR MANUAL No. MAN 00818

VOLUME 3

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N° 3 : .....

CX VEHICLES

DIESEL



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HOW TO USE THE MANUAL

PRESENTATION

This volume is divided into four sections, separated by indexed title pages as follows :

CHARACTERISTICS
REMOVAL AND FITTING
RECONDITIONING
ELECTRICAL SYSTEM

Only those operations which are specific to the **CX DIESEL** vehicle are treated in these different sections. For all other operations, which are common to **CX PETROL** vehicles, refer to the various volumes of the **818 MANUAL**

Volume **1** includes :
- CHARACTERISTICS - ADJUSTMENTS - CHECKS

Volume **2** deals with operations for :
- MECHANICAL COMPONENTS, BODYWORK

The above volumes are sold separately, ,

They are presented bound in orange Fibrex with a « MULTO » type mechanism to facilitate the insertion of supplements or the extraction of a particular operation required by the workshop.

Supplement No. 1 to Manual 818-3 (CORR)

COMPOSITION

- Every volume comprises :

  - the list of operations contained in the volume

  - these operations filed in numerical sequence

  - the list of all the tools mentioned in the operations and the manufacturing drawings for special tools which are not sold but are intended to be manufactured by the workshop itself (« MR » tools).

OPERATIONS

The sequence of operations has been devised in order to obtain the best standard of work in the shortest possible time.

The numbering of the operations is made up as follows :

a) The code letter for the car : « MA.Di. »

b) A number made up of three figures denoting the unit or its component :

c) A figure code designating the type of repair :

- the figures 0 0 0 indicate the characteristics of the car
- the figures 0 0 indicate the characteristics of the unit
- the figure 0 indicates checks and adjustments
- the figures 1, 4, 7 indicate removal or fitting
- the figures 2, 5, 8 indicate dismantling or reassembly and
- the figures 3, 6, 9 indicate reconditioning

TOOLING

Special tooling is denoted in the text by a number followed by the letter T.
The part-numbers inferior to the 6000 series concern tools already in use and common to vehicles previously introduced and to CX vehicles.
The 6000 series refers to tools specially designed for CX vehicles.
Additional tools of local manufacture are indicated in the text by a number preceded by the index MR : manufacturing drawings for these tools appear at the end of the particular volume filed in numerical order.

TIGHTENING TORQUES

Torques are expressed in :

- decanewton-metres (da Nm) the legal unit for measuring torque :

9.81 Nm = 1 m.kg = 0.981 da Nm

The numbers corresponding to the torque are « rounded off », i.e. :

1 da Nm = 1 m.kg

IMPORTANT : When a tightening torque figure is followed by the words « torque wrench » the operation must without fail be carried out with a torque wrench.

IMPORTANT : WITHOUT FAIL after each operation or group of operations , there is a chapter headed « TIGHTENING TORQUES » : the screws nuts or studs which are **underlined** indicate that they are of a special grade. « SECURITY HARDWARE ». When refitting it is ESSENTIAL to use this type of HARDWARE TO THE EXCLUSION OF ANY OTHER.

The tightening torques shown on drawings and preceded by an asterisk, also correspond to « SECURITY HARDWARE ».

ADVISORY SERVICE

For all technical information concerning these vehicles , please contact :

The Service Department
Citroën Cars Ltd.
Mill St.
Slough. Berks. GB. Tel. Slough 23808

or DEPARTEMENT TECHNIQUE APRES-VENTE
ASSISTANCE TECHNIQUE
92022 NANTERRE CEDEX - FRANCE Tél. 725-97-10

MANUAL N° 818-3

FIRST SECTION

CHARACTERISTICS

Manual 818-3 (CHARACTERISTICS)

LIST OF OPERATIONS (CHARACTERISTICS)
IN MANUAL 818-3

« CX Diesel » Vehicles

Operation number	DESCRIPTION
	GENERAL
MA.Di. 000	General characteristics
MA.Di. 00	Jacking and towing points
MA.Di. 00-800	Exterior and interior dimensions
MA.Di. 01	Protection of the electrical units
MA.Di. 03	Recommended materials
MA.Di. 04	Work on the injection system
MA.Di. 05	Fault finding system for the ROTO-DIESEL injection equipment
	ENGINE - INJECTION SYSTEM - COOLING SYSTEM
MA.Di. 100-00	Characteristics and special features of the engine
MA.Di. 112-0	Checking and adjusting the valve operation
MA.Di. 144-00	Characteristics of the injection system
MA.Di. 144-0	Checking and adjusting the ROTO-DIESEL injection system : I. Adjusting the calibration of an injector II. Checking and adjusting the ROTO-DIESEL injection pump timing III. Adjusting the ROTO-DIESEL injection pump controls IV. Checking and adjusting the BOSCH injection pump timing V. Adjusting the BOSCH injection pump controls
MA.Di. 145-0	Bleeding the injection system
MA.Di. 220-0	Checking the oil pressure *(on the vehicle)*
MA.Di. 230-00	Characteristics and special features of the cooling system
MA.Di. 230-0	Working on the cooling system I. Filling the system II. Filling and de-aerating the auxiliary heater unit on CX Ambulance vehicles
MA.Di. 236-0	Checking and adjusting the pulleys and belts : I. Aligning the pulleys II. Adjusting the belt tensions
	CLUTCH
MA.Di. 312-00	Characteristics and special features of the pedal-operated clutch
MA.Di. 314-0	Checking and adjusting the pedal-operated clutch controls : - Adjusting the clutch free-play
	GEARBOX
MA.Di. 330-00	Characteristics and special features of the gearbox
	SOURCE AND RESERVE OF PRESSURE
MA.Di. 390-00	Characteristics and special features of the source and reserve of pressure - General hydraulic system
	BRAKES
MA.Di. 450-00	Characteristics and special features of the braking system
MA.Di. 453-0	Checking and adjusting the hydraulic brake control I. Bleeding the brakes *(→ 9/1976)* II. Bleeding the brakes *(9/1976 →)*
	TOOLING
	Special « T » tools

« CX 2200 DIESEL » SALOON AND ESTATE
(Vehicles fitted with the M 22/621 - 2175 cc engine)

I. GENERAL CHARACTERISTICS

	« *CX 2200 Diesel* »	« *CX 2200 Diesel Estate* »
- Commercial symbol :	MA series MG	MA series MH
- Official symbol :	MG	MH
- Factory symbol *(Warranty symbol)* :	December 1975	February 1976
- Introduction date :	9 hp	9 hp
- French fiscal rating :	5	*Estate : 5* *Familiale : 8*
- Number of seats :		

Wheels and tyres :

- Wheelrims : 5 1/2 J × 14 FHA 5-49 C *(⟶ 8/1977)*
  5 1/2 J × 14 FHA 5-49 D *(8/1977 ⟶)*

CX 2200 Diesel Saloon :

MICHELIN TYRES		Type and pressure in bar (psi)		
		Front	Rear	Spare
Standard fitting	Manual steering	185 SR 14 ZX - TU	175 SR 14 ZX - TU	
		2.1 (30 1/2)	2.1 (30 1/2)	2.3 (33 1/2)
	Power steering	185 HR 14 XVS - TU	175 HR 14 XVS - TU	
		2 (29)	2.1 (30 1/2)	2.3 (33 1/2)
Authorized alternative	Manual steering	185 SR 14 XZ - TU		
		2.1 (30 1/2)	2.1 (30 1/2)	2.3 (33 1/2)
	Manual or Power steering	185 HR 14 XVS - TU		
		2 (29)	2 (29)	2.2 (32)
		185 R 14 X (M + S)		
		2 (29)	2 (29)	2.2 (32)

CX 2200 Diesel Estate :

MICHELIN TYRES		Types and pressures in bar (psi)		
		Front	Rear	Spare
Standard fitting	Manual steering	185 SR 14 ZX - TU		
		2.1 (30 1/2)	2.2 (32)	2.4 (35)
	Power steering	185 HR 14 XVS - TU		
		2 (29)	2.1 (30 1/2)	2.3 (33 1/2)
Authorized alternative	Manual or Power steering	185 R 14 X (M + S)		
		2 (29)	2.1 (30 1/2)	2.3 (33 1/2)

NOTE : - Vehicles are fitted with « TUBELESS » tyres as standard equipment.
- They can be fitted with tyres with inner tubes of the same type, the pressures remaining the same.
- The tyre pressures are indicated on a label located on the panel at the front of the door (on the driver's side).

From September 1976 onwards, MICHELIN ZX tyres are replaced by **XZX** tyres.
The sizes and pressures remain the same.
In case of replacement of 2 ZX tyres by 2 **XZX** tyres, it is preferable to fit the latter at the rear.

II. GENERAL DIMENSIONS :

Dimensions :

	Saloon	Estate
Rear track	1.360 m	1.390 m
Wheelbase	2.845 m	3.095 m
Overall length	4.630 m	4.920 m
Height of vehicle *(in normal driving position)*	1.360 m	1.465 m
Overall width	1.730 m	1.734 m

Saloon and Estate	
Front track	1.474 m
Front overhang	1.050 m
Ground clearance *(in normal driving position)*	0.155 m

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

Weights in kg (lb) :

	Saloon		Estate	
- Kerb weight *(with full tank of Diesel fuel)*	1330	(2932)	1450	(3197)
- Weight on front axle	910	(2006)	940	(2072)
- Weight on rear axle	420	(926)	510	(1124)
- G.V.W., Gross Vehicle Weight *(including all optional equipment)*	1800	(3968)	2110	(4652)
- Maximum authorized weight on front axle	1060	(2337)	1090	(2403)
- Maximum authorized weight on rear axle	750	(1653)	1030	(2271)

Towing :

- G.T.W., Gross Train Weight	2465 (5434) *(including a trailer without brakes weighing 665 kg (1466 lb)*		2835 (6250) *(including a trailer without brakes weighing 725 kg (1598 lb)*	
- Gross Train Weight *(with 1300 kg (2866 lb) trailer with brakes)*	3100	(6834)	3410	(7518)
- Maximum authorized trailer weight *(within limits of G.T.W.)*	1500	(3307)	1500	(3307)
- Maximum starting gradient *(at G.T.W.)*	12 % (1 in 8 1/2)		11 % (1 in 9)	

IMPORTANT NOTE : References to trailers without brakes DO NOT APPLY in U.K.

III. GENERAL INFORMATION

Capacities :

- Fuel tank : ..... 68 litres (15 galls)
- Cooling system *(including heater unit)* : ..... 12.3 litres (21.6 pts)
- Heater unit alone : ..... 0.6 litres (1.05 pts)
- Engine oil :
  - After draining and changing the oil filter cartridge : ..... 4.7 litres (8.25 pts)
  - Difference between Min. and Max. on dipstick : ..... 0.9 litres (1.60 pts)
- Hydraulic system (approx) : ..... 4 litres (7 pts)
- Gearbox :
  - after draining : ..... 1.6 litres (2.8 pts)
  - difference between Min. and Max. on dipstick : ..... 0.150 litres (0.26 pts)
- Usable volume of rear boot :
  - Saloon : ..... 325 dm^3 (11.48 cu.ft)
  - Estate :
    - with rear seat in position : ..... 1100 dm^3 (38.85 cu.ft)
    - with rear seat folded : ..... 2030 dm^3 (71.69 cu.ft)

« CX 2500 DIESEL » SALOON

(Vehicles fitted with the M 25/629 - 2500 cc engine)

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

I. GENERAL CHARACTERISTICS

- Commercial symbol : ..... « *CX 2500 Diesel* »
- Official symbol : ..... MA series MM
- Factory symbol *(Warranty symbol)* : ..... MM
- Introduction date : ..... February 1978
- French fiscal rating : ..... 10 hp
- Number of seats : 5

Wheels and tyres :

- Wheelrims ; ..... MICHELIN 5 1/2 J × 14 FHA 5.49 D

Tyres :

MICHELIN TYRES		TYPE AND PRESSURE IN BAR (psi)		
STANDARD FITTING	Manual steering or Power steering	Front	Rear	Spare
		185 SR 14 XZX - TU	175 SR 14 XZX - TU	
		2.1 (30 1/2)	2.1 (30 1/2)	2.3 (33 1/2)
AUTHORIZED ALTERNATIVE		185 SR 14 XZX - TU		
		2.1 (30 1/2)	2.1 (30 1/2)	2.3 (33 1/2)
		185 HR 14 XVS - TU	175 HR 14 XVS - TU	
		185 HR 14 XVS - TU		
		2 (29)	2 (29)	2.2 (32)
		185 HR 14 X (M + S)		
		2 (29)	2 (29)	2.2 (32)

NOTE : - Vehicles are fitted with TUBELESS tyres as standard equipment. They can be fitted with tyres with inner tubes of the same type, the pressures remaining the same.

- Tyre pressures are indicated on a label located on the panel at the front of the door (on the driver's side).

II. GENERAL DIMENSIONS :

- Front track : ..... 1.474 m (4 ft. 10 ins)
- Rear track : ..... 1.360 m (4 ft. 5 1/2 ins)
- Wheelbase : ..... 2.845 m (9 ft. 4 ins)
- Overall length : ..... 4.630 m (15 ft. 2 1/2 ins)
- Front overhang : ..... 1.050 m (3 ft. 5 1/2 ins)
- Overall width : ..... 1.730 m (5 ft. 8 1/4 ins)
- Height of vehicle *(in normal driving position)* : ..... 1.360 m (4 ft. 5 1/2 ins)
- Ground clearance *(in normal driving position)* : ..... 0.155 m (0 ft. 6.1 ins)

Weights in kg (lb) :

	CX 2500
- Kerb weight *(with full tank of fuel)* :	1330 (2932)
- Weight on front axle :	910 (2006)
- Weight on rear axle :	420 (926)
- Gross Vehicle Weight *(including all optional equipment)* :	1800 (3968)
- Maximum authorized weight on front axle :	1060 (2337)
- Maximum authorized weight on rear axle :	750 (1653)

Towing :

- Gross Train Weight *(with a 665 kg (1466 lb) trailer without brakes)* :	2465 (5434)
- Gross Train Weight *(with a 1300 kg (2866 lb) trailer without brakes)* :	3100 (6834)
- Max. trailer weight *(within limit of G.T.W.)* :	1500 (3307)
- Max. starting gradient *(at G.T.W.)* :	12 % (1 in 8 1/2)

IMPORTANT NOTE : References to trailers without brakes DO NOT APPLY in U.K.

III. GENERAL INFORMATION

Capacities :

- Fuel tank :	68 litres (15 galls)
- Cooling system *(including heater unit)* :	12.3 litres (21.6 pts)
- Heater unit alone :	0.6 litres (1.05 pts)
- Engine oil :	
- after draining and changing the oil filter cartridge :	4.7 litres (8.25 pts)
- difference between Min. and Max. on dipstick :	0.9 litres (1.6 pts)
- Hydraulic system (approx.) :	4 litres (7 pts)
- Gearbox :	
- after draining :	1.6 litres (2.8 pts)
- difference between Min. and Max. on dipstick :	0.150 litres (0.26 pts)
- Usable volume of rear boot :	325 dm^3 (11.48 cu.ft)

« CX 2500 DIESEL » ESTATE

(Vehicles fitted with the M 25/629 - 2500 cc engine)

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (ADD)

I. GENERAL CHARACTERISTICS

- Commercial symbol : ..... « *CX 2500 Diesel Estate* »
- Official symbol : ..... MA series MN
- Factory symbol (*Warranty symbol*) { Estate : ..... MN / Familiale : ..... MNF
- Introduction date : ..... February 1978
- French fiscal rating : ..... 10 hp
- Number of seats { *Estate :* ..... 5 / *Familiale :* 8

Wheels and tyres :

- Wheelrims : ..... MICHELIN 5 1/2 J × 14 FHA 5.49 D

MICHELIN TYRES	TYPE AND PRESSURE IN : bar (psi)		
	Front	Rear	Spare
STANDARD FITTING — Manual steering or Power steering	185 SR 14 XZX - TU		
	2.1 (30 1/2)	2.2 (32)	2.4 (35)
AUTHORIZED ALTERNATIVE	185 HR 14 XVS - TU		
	2 (29)	2.1 (30 1/2)	2.3 (33 1/2)
	185 R 14 X (M + S)		
	2 (29)	2.1 (30 1/2)	2.3 (33 1/2)

NOTE : - Vehicles are fitted with TUBELESS tyres as standard equipment. They can be fitted with tyres with inner tubes of the same type, the pressures remaining the same.

- Tyre pressures are indicated on a label located on the panel at the front of the door (on the driver's side).

II. GENERAL DIMENSIONS :

- Front track : ..... 1.474 m (4 ft. 10 ins)
- Rear track : ..... 1.390 m (4 ft. 6 3/4 ins)
- Wheelbase : ..... 3.095 m (10 ft. 1 3/4 ins)
- Overall length : ..... 4.920 m (16 ft. 1 3/4 ins)
- Front overhang : ..... 1.050 m (3 ft. 5 1/2 ins)
- Overall width : ..... 1.734 m (5 ft. 8 1/4 ins)
- Height of vehicle (*in normal driving position*) : ..... 1.465 m (4 ft. 9 3/4 ins)
- Ground clearance (*in normal driving position*) : ..... 0.155 m (0 ft. 6.1 ins)

Weights in kg (lb) :

« CX 2500 Diesel Estate »

- Kerb weight *(with full tank of fuel)* :	1450 (3197)
- Weight on front axle :	940 (2072)
- Weight on rear axle :	510 (1124)
- Gross Vehicle Weight *(including all optional equipment)* :	2110 (4652)
- Maximum authorized weight on front axle :	1090 (2403)
- Maximum authorized weight on rear axle :	1030 (2271)

Towing :

- Gross Train Weight *(with a 725 kg (1598 lb) trailer without brakes)* :	2835 (6250)
- Gross Train Weight *(with a 1300 kg (2866 lb) trailer with brakes)* :	3410 (7518)
- Max. trailer weight *(within limit of G.T.W.)* :	1500 (3307)
- Max. starting gradient *(at G.T.W.)* :	12 % (1 in 8 1/2)

IMPORTANT NOTE : **References to trailers without brakes DO NOT APPLY in U.K.**

III. GENERAL INFORMATION

Capacities .

- Fuel tank :	68 litres (15 galls)
- Cooling system *(including heater unit)* :	12.3 litres (21.6 pts)
- Heater unit alone :	0.6 litres (1.05 pts)
- Engine oil :	
- after draining and changing the oil filter cartridge :	4.7 litres (8.25 pts)
- difference between Min. and Max. on dipstick :	0.9 litres (1.6 pts)
- Hydraulic system (approx) :	4 litres (7 pts)
- Gearbox :	
- after draining :	1.6 litres (2.8 pts)
- difference between Min. and Max. on dipstick :	0.150 litres (0.26 pts)
- Usable volume of rear boot :	
- with rear seat in position :	1100 dm^3 (38.65 cu.ft)
- with rear seat folded :	2030 dm^3 (71.69 cu.ft)

« DIESEL » AMBULANCES
(« CX 2200 Diesel » vehicles fitted with the M 22/621 - 2175 cc engine)
(« CX 2500 Diesel » vehicles fitted with the M 25/629 - 2500 cc engine)

I. GENERAL CHARACTERISTICS

	« CX 2200 Diesel Ambulance »	*« CX 2500 Diesel Ambulance »*
- Commercial symbol :	MA series MH	MA series MN
- Official symbol :	MHA	MNA
- Factory symbol *(Warranty symbol)* :	September 1976	February 1978
- Introduction date :	9 hp	10 hp
- French fiscal rating :	4 *(sitting)* - 1 *(lying)*	4 *(sitting)* - 1 *(lying)*
- Number of seats :		

Wheels and tyres :

- Wheelrims : 5 1/2 J × 14 FHA 5-49 C *(⟶ 8/1977)*
  5 1/2 J × 14 FHA 5-49 D *(8/1977 ⟶)*

MICHELIN TYRES *(⟶ 2/1978)*		Type and pressure in : bar (psi)		
		Front	Rear	Spare
Standard fitting	Manual steering	185 SR 14 XZ - TU		
		2.2 (32)	2 (29)	2.4 (35)
	Power steering	185 HR 14 XVS - TU		
		2.1 (30 1/2)	1.9 (27 1/2)	2.3 (33 1/2)
Authorized alternative	Manual or Power steering	185 R 14 (M + S)		
		2.1 (30 1/2)	1.9 (27 1/2)	2.3 (33 1/2)

MICHELIN TYRES *(2/1978 ⟶)*	Type and pressure in : bar (psi)		
	Front	Rear	Spare
	185 HR 14 XZX - TU		
	2.2 (32)	2 (29)	2.4 (35)
Authorized alternative All types of steering	185 HR 14 XVS - TU		
	2.1 (30 1/2)	1.9 (27 1/2)	2.3 (33 1/2)
	185 R 14 X (M + S)		
	2.1 (30 1/2)	1.9 (27 1/2)	2.3 (33 1/2)

NOTE : - Vehicles are fitted with « TUBELESS » tyres as standard equipment.
- They can be fitted with tyres with inner tubes of the same type, the pressures remaining the same.
- The tyre pressures are indicated on a label located on the panel at the front of the door (on the driver's side).

From September 1976 onwards, MICHELIN ZX tyres are replaced by **XZX** tyres.
The sizes and pressures remain the same.
In case of replacement of 2 ZX tyres by 2 **XZX** tyres, it is oreferable to fit the latter at the rear.

II. GENERAL DIMENSIONS :

- Front track :	1.474 m (4 ft. 10 ins)
- Rear track :	1.390 m (4 ft. 6 3/4 ins)
- Wheelbase :	3.095 m (10 ft. 1 3/4 ins)
- Overall length :	4.984 m (16 ft. 4 1/4 ins)
- Front overhang :	1.050 m (3 ft. 5 1/2 ins)
- Overall width :	1.734 m (5 ft. 8 1/4 ins)
- Height of vehicle *(in normal driving position)* :	1.465 m (4 ft. 9 3/4 ins)
- Ground clearance *(in normal driving position)* :	0.155 m (0 ft. 6.1 ins)

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Interior dimensions of the driver's compartment :

- Distance between windscreen and separating panel :	1.330 m (4 ft. 4 1/4 ins)
- Width at elbow height :	1.400 m (4 ft. 7 ins)

Interior dimensions of patient compartment :

- Distance between separating panel and rear window (at stretcher height) :	2.180 m (7 ft. 1 3/4 ins)
- Width between rear side doors :	1.400 m (4 ft. 7 ins)
- Width of floor between rear wheelarches :	1.120 m (3 ft. 8 ins)
- Height between floor and roof :	
- at the front :	1.420 m (4 ft. 8 ins)
- at the rear :	1.175 m (3 ft. 10 1/4 ins)

Weights in kg (lb) :

- Kerb weight :	1575 (3472)
- Weight on front axle :	965 (2127)
- Weight on rear axle :	610 (1345)
- Gross Vehicle Weight (G.V.W.) :	2110 (4652)
- Maximum authorized weight on front axle :	1090 (2403)
- Maximum authorized weight on rear axle :	1030 (2271)

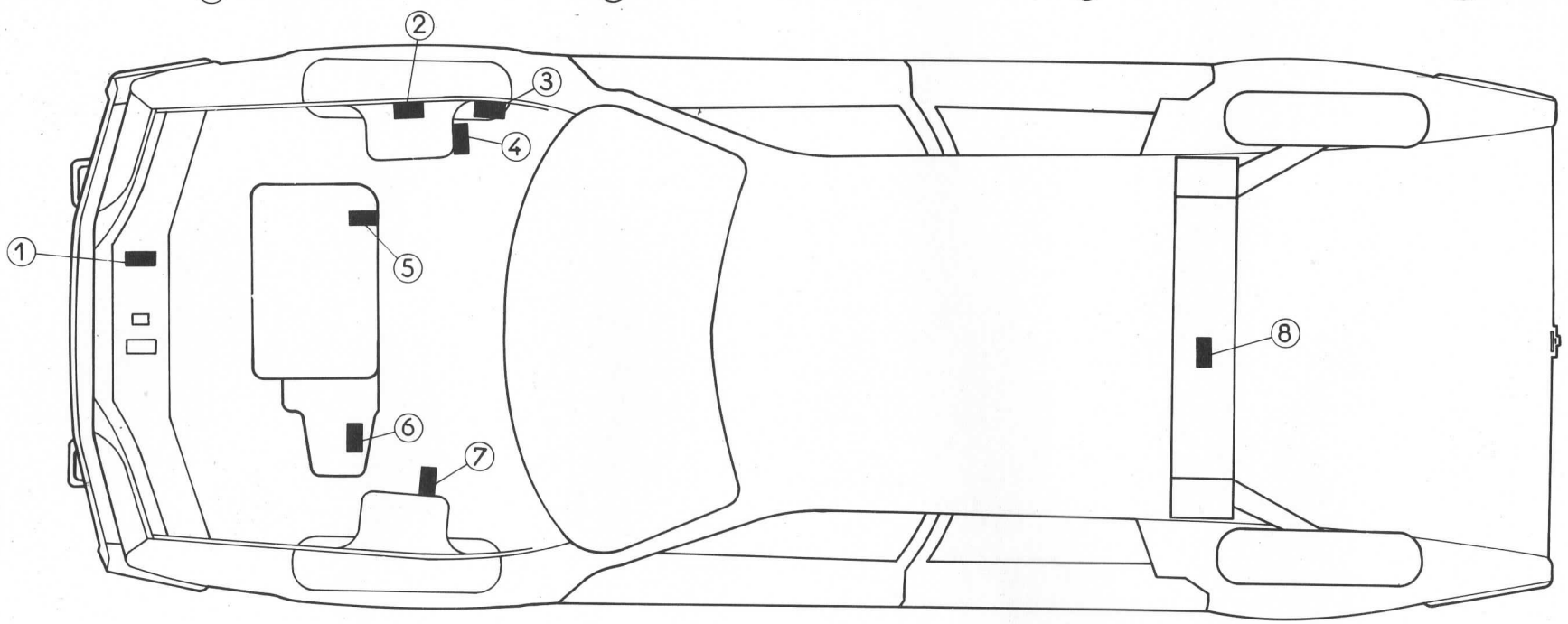
III. GENERAL INFORMATION

Capacities :

- Fuel tank :	68 litres (15 galls)
- Cooling system (including the heater units) :	13.9 litres (24.5 pts)
- Heater unit for driver compartment alone :	0.6 litres (1.05 pts)
- Auxiliary heater unit for patient compartment :	1.6 litres (2.8 pts)
- Engine oil :	
- after draining :	4.7 litres (8.25 pts)
- difference between Min. and Max. on dipstick :	0.9 litres (1.6 pts)
- Hydraulic system (approx.) :	4 litres (7 pts)
- Gearbox :	
- after draining :	1.6 litres (2.8 pts)
- difference between Min. and Max. on dipstick :	0.150 litres (0.26 pts)

IDENTIFICATION OF VEHICLE COMPONENTS

(FRANCE)



② MA-MB 0001

Repeat chassis number

③ 25 000002

Body shell No.

④ S.A.A. CITROEN
77 TYPE SERIE
N°
P.T.C P.T.R

Chassis No. plate

⑦ 00054

Front subframe No.

① S.A.A. CITROEN
0004 012345

Body code number

⑤ S.A.A. CITROEN TYPE
N° 0123456789

Engine number

⑥ 45
051628

Gearbox number

⑧ 00013

Rear subframe number

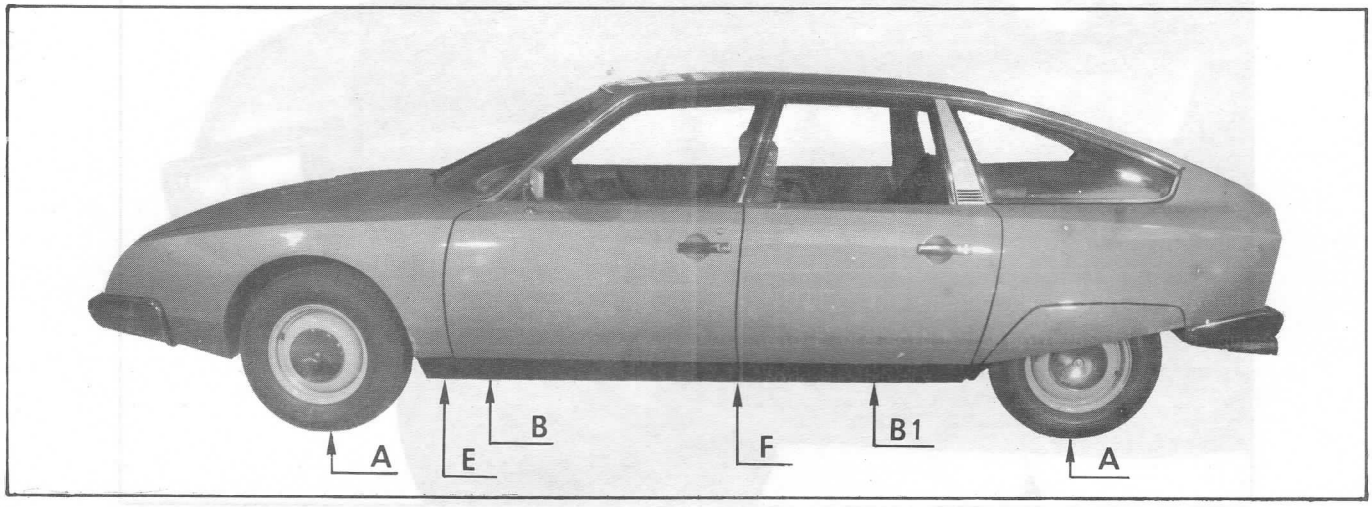
I. JACKING POINTS

It is imperative to use only the jacking points listed below

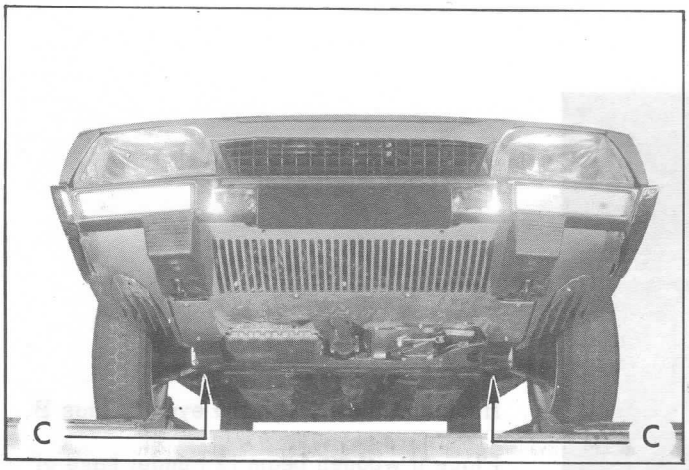
Under no circumstances must the sidemembers be used to raise the vehicle

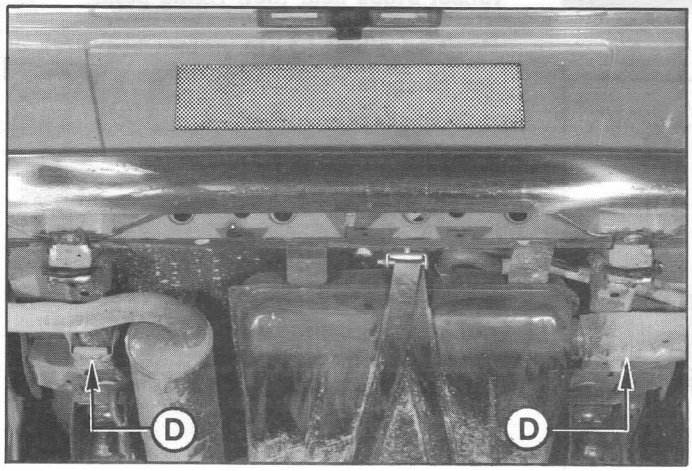
If the sidemembers are distorted this will inevitably result in :

- *defective alignment of axles*
- *deterioration of sound insulation and increase in drumming*
- *unbalanced braking.*



NOTE : The jacking points for the Estate are identical to those for the Saloon.





A : Lifting points under wheels.

B - B1 : Jacking points for car jack, on underside of vehicle (for wheel changing).

C : Jacking points under front axle (in line with engine mountings).

D : Jacking points under body.

E + B1 : Raising points for lifting by double-pillar lifting ramp (with chocks at E).

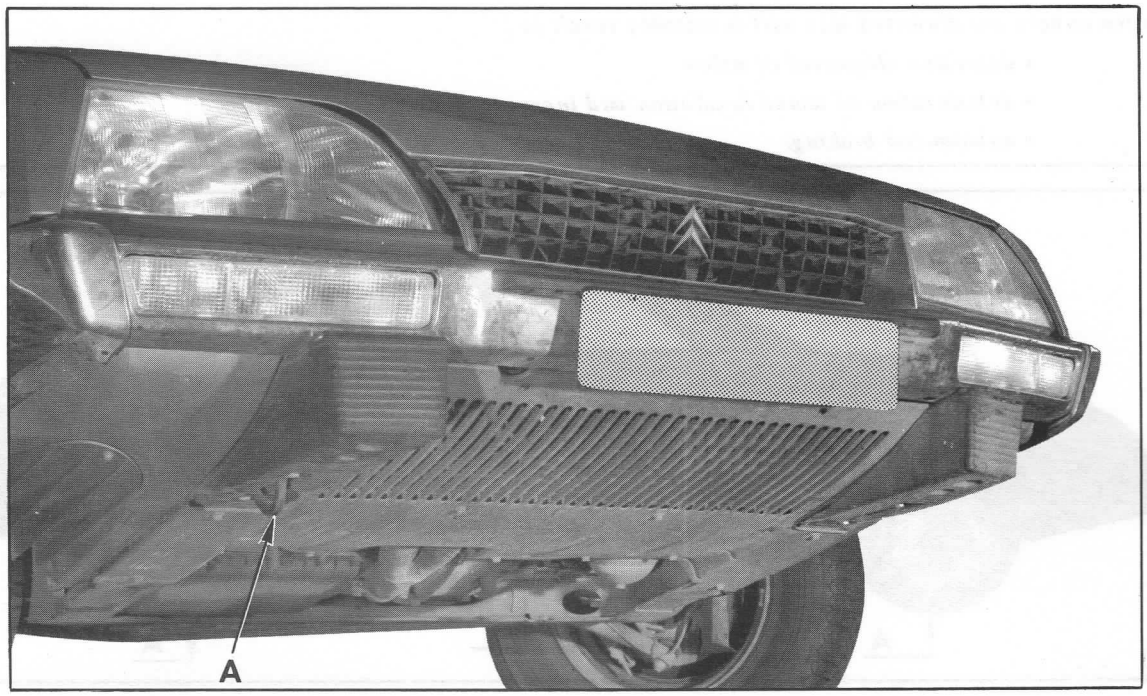
E + F : Raising points for fork lift (with chocks at E and F).

NOTE : The special chocks to be placed at E and F are sold by suppliers of lifting ramps or fork lift trucks.

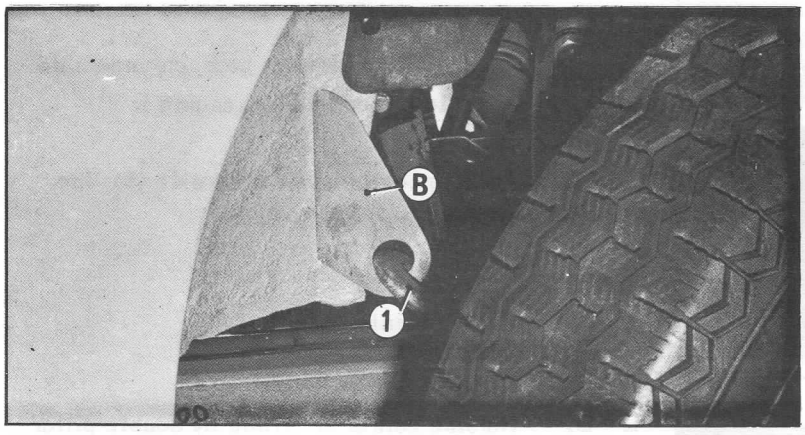
II. TOWING POINTS

1. Front towing points :

Vehicle on wheels, hydraulic circuit under pressure



Use towing eye A under front right-hand extension

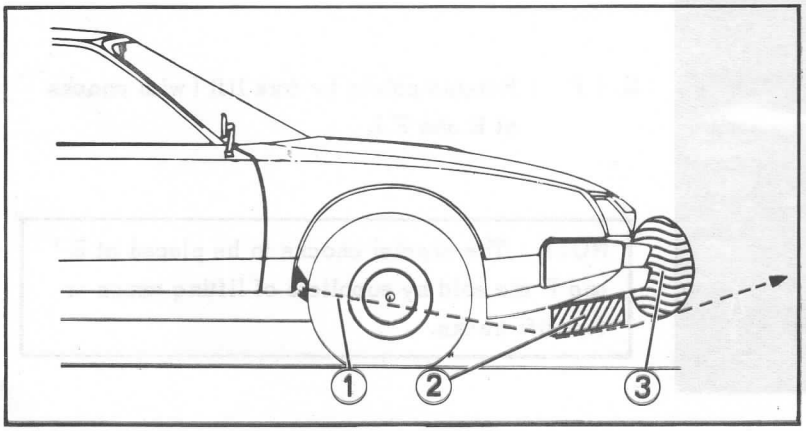


Vehicle with wheels raised :

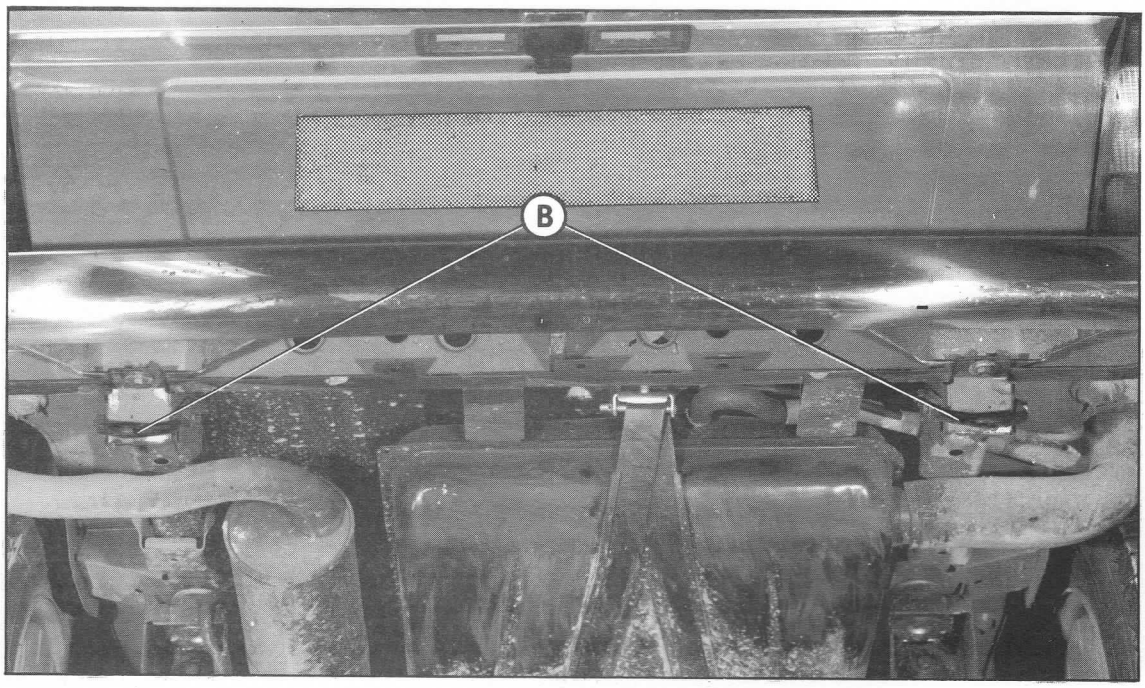
Hook a cable (1) in the eyes of lugs B.

Place a wooden beam (2) under base of rubber stops near their fixing point.

Position a belt (3) to protect bodywork and bumpers.



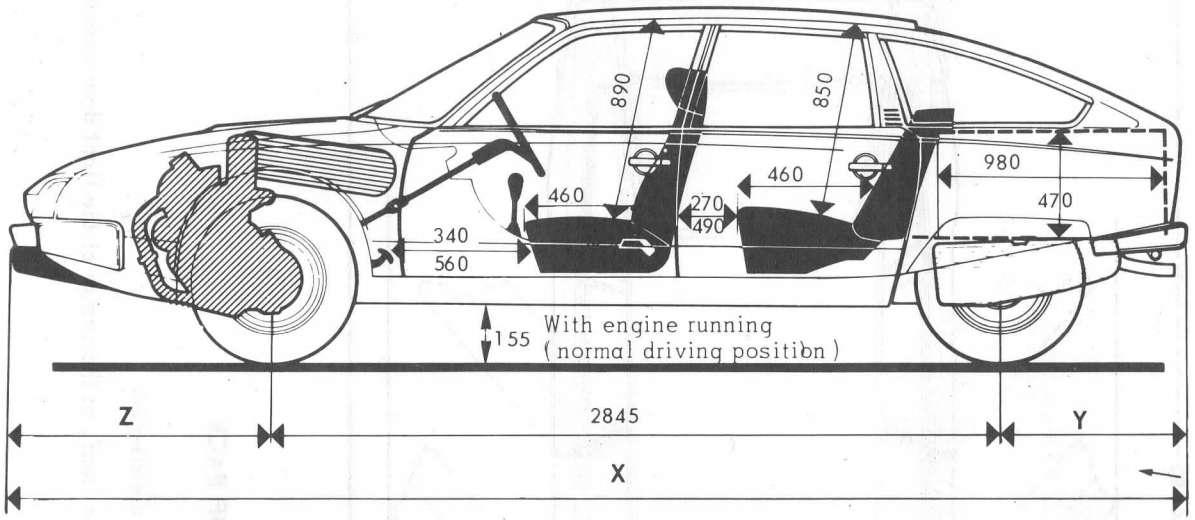
2. Rear towing points :

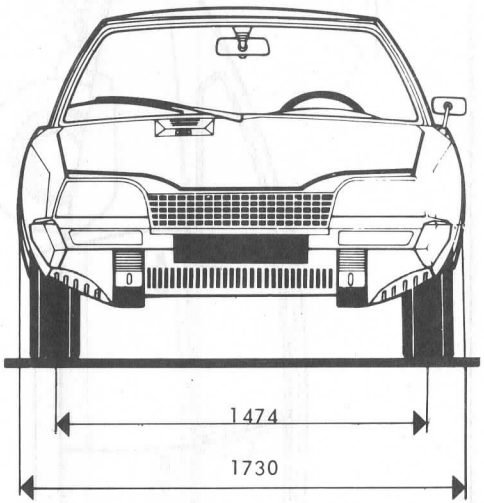


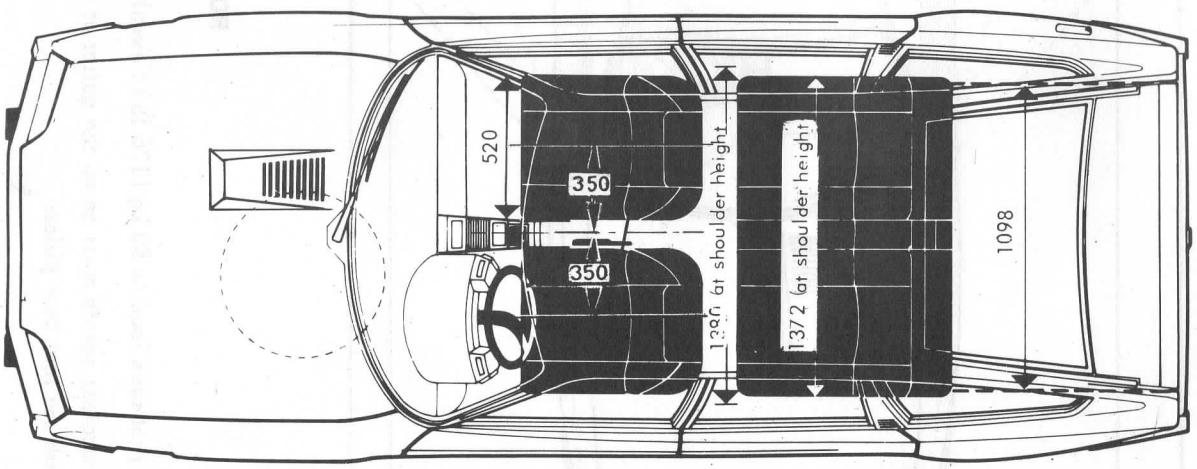
B - Towing rings at rear of body sidemembers

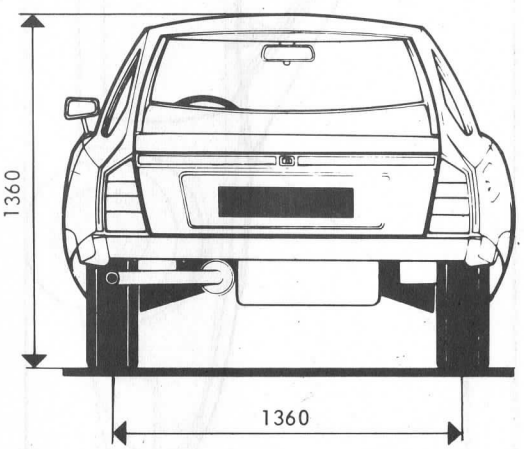
♦ I - EXTERIOR AND INTERIOR DIMENSIONS

(« CONFORT » - « SUPER » - « PALLAS » SALOONS)



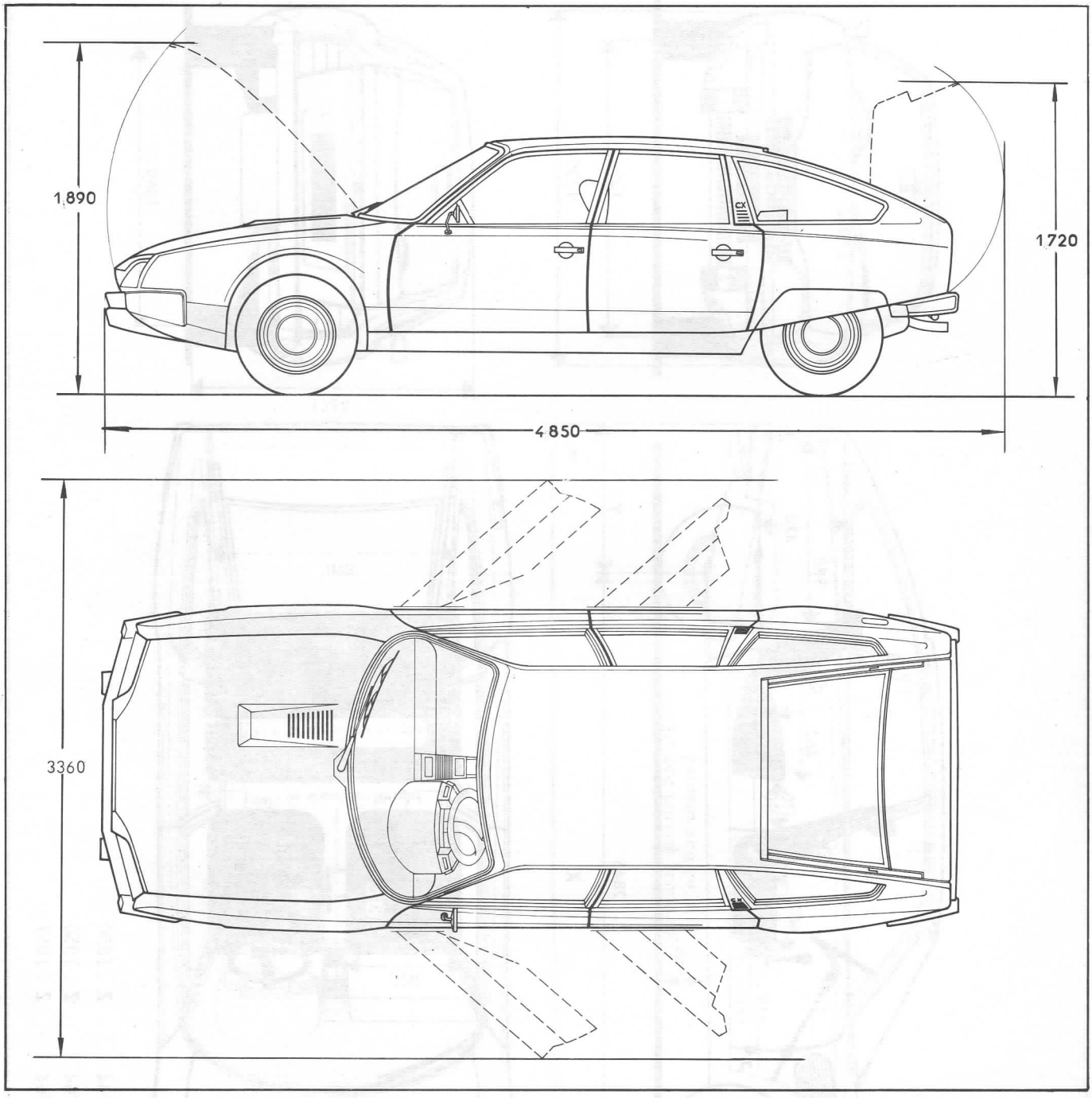






Confort :	**X** : 4629	**Y** : 734	**Z** : 1056
Super :	**X** : 4659	**Y** : 764	**Z** : 1050
Pallas :	**X** : 4666	**Y** : 764	**Z** : 1057

(« CONFORT » « SUPER » « PALLAS » SALOONS)



ROOF RACK

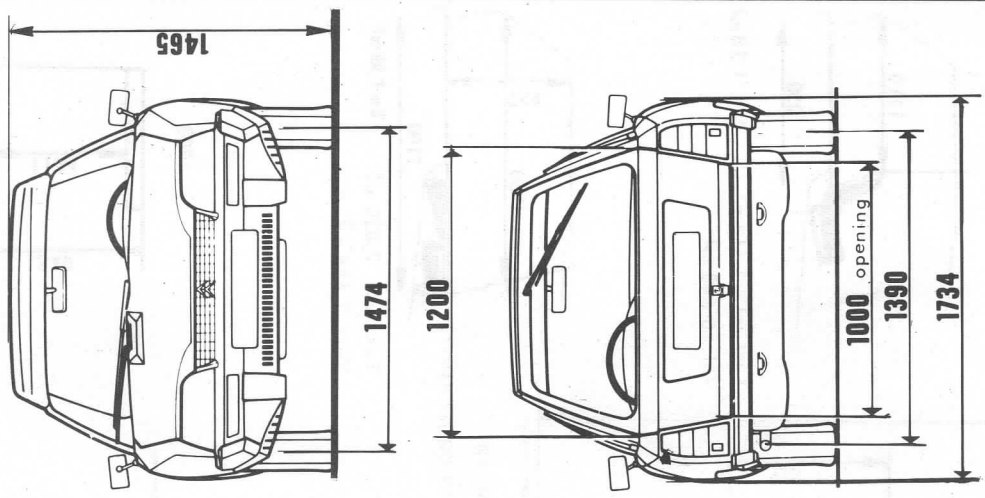
The maximum roof-rack load is 80 kg (176 lb) ; evenly distributed.

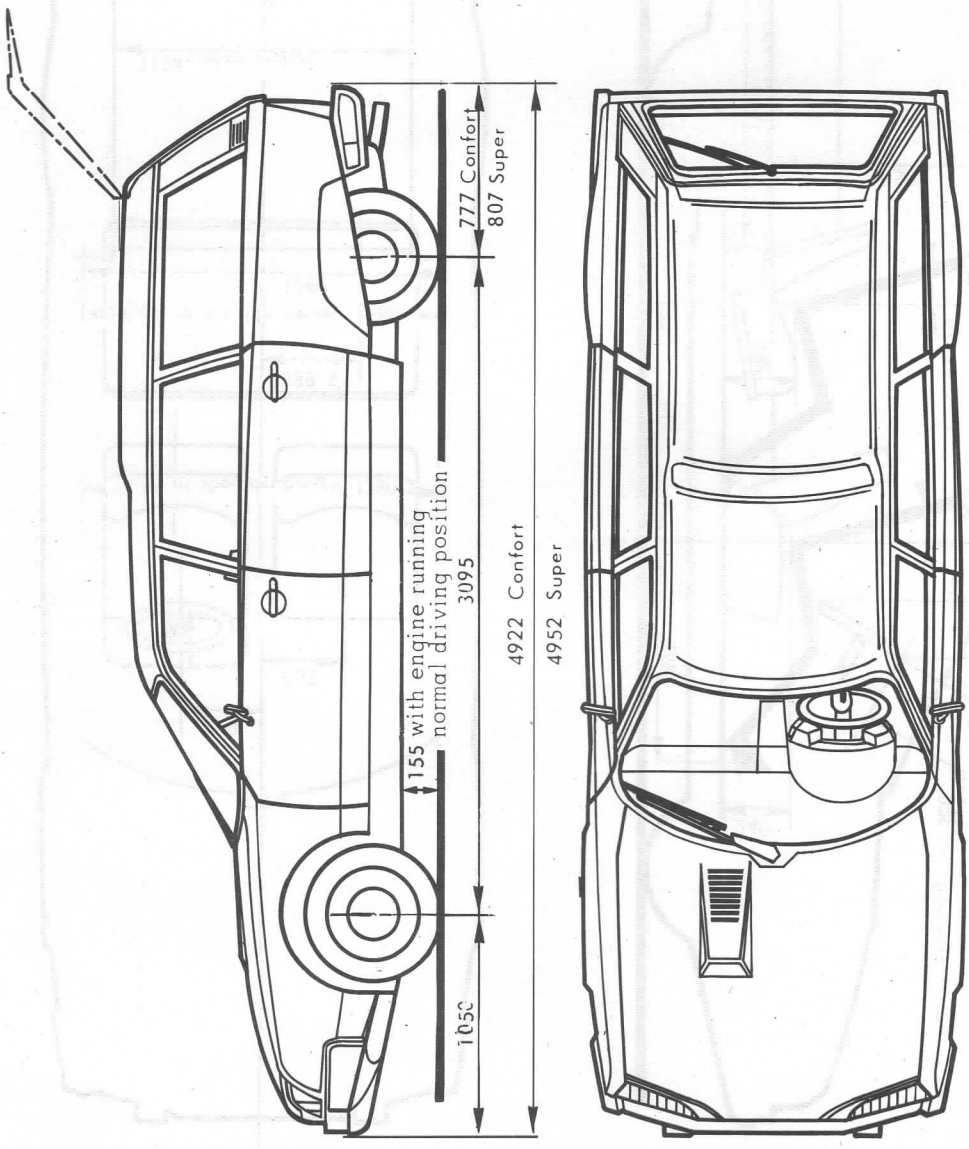
The roof-rack contact points must be on the gutter at the front , at the centre of the front door opening, and at the rear in line with the rear door pillar.

III. EXTERIOR AND INTERIOR DIMENSIONS

« ESTATE » and Estate variations

L. 80-12 et L. 80-44

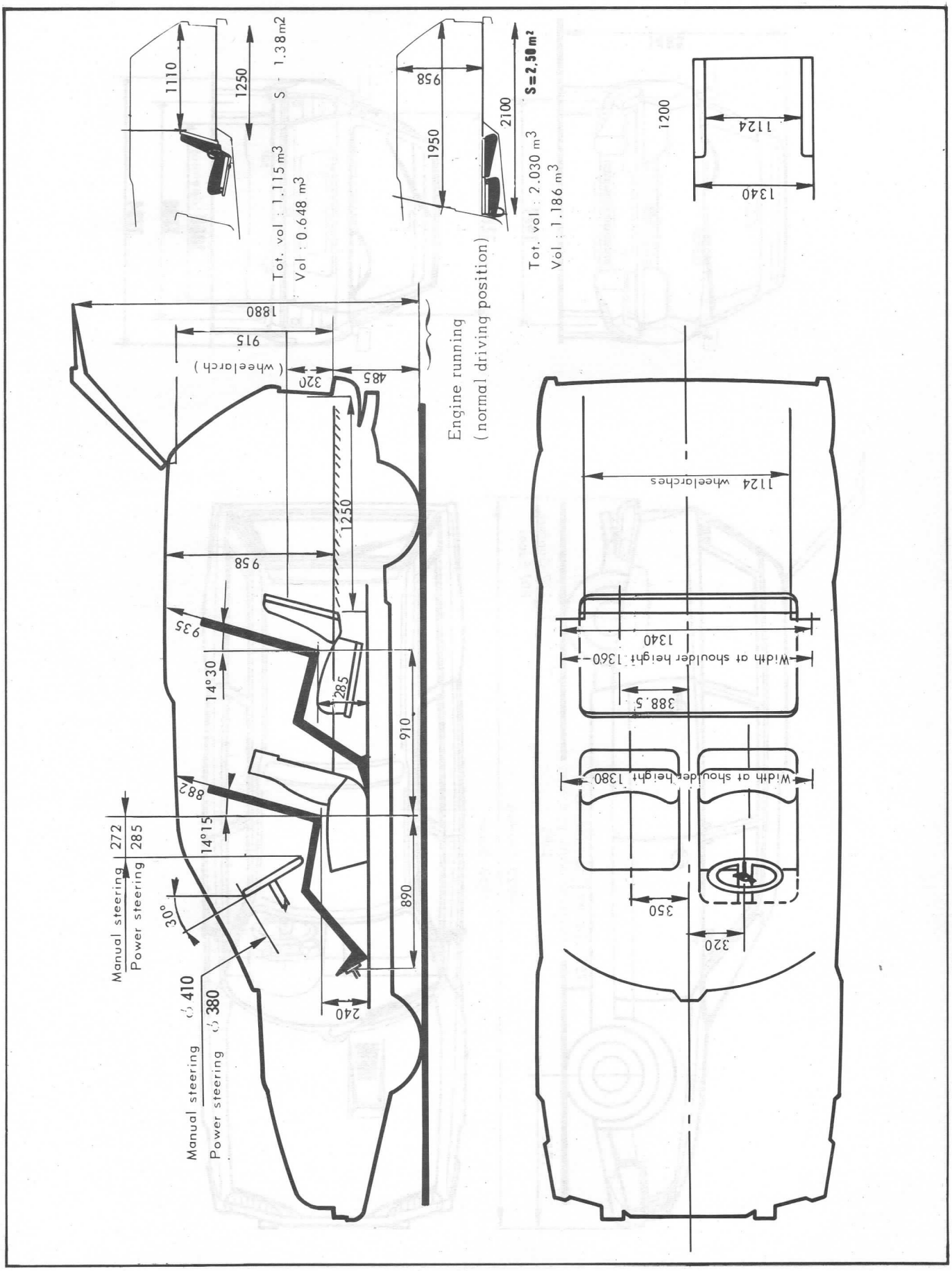


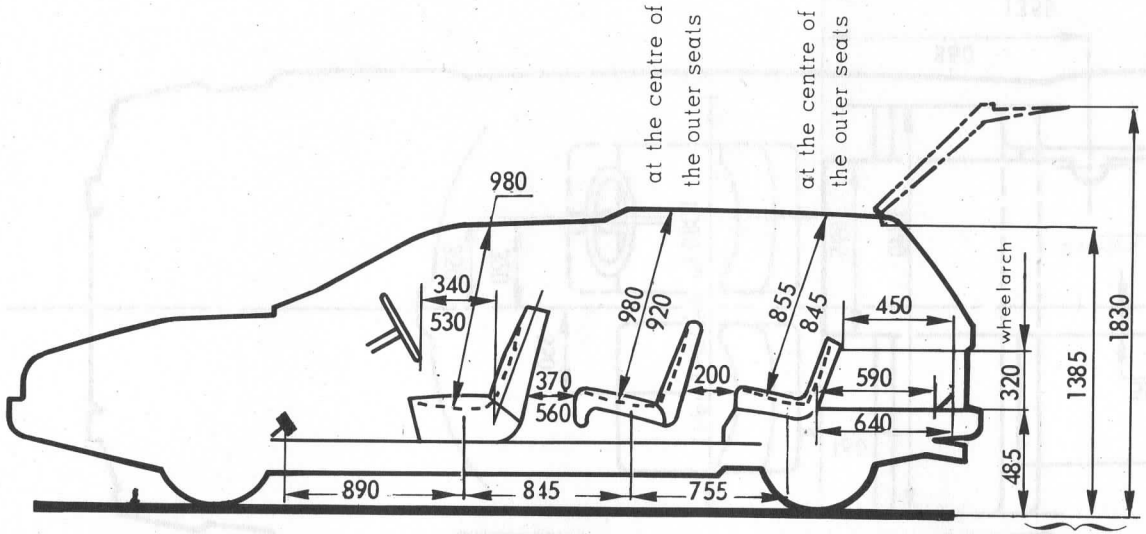


Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (ADD

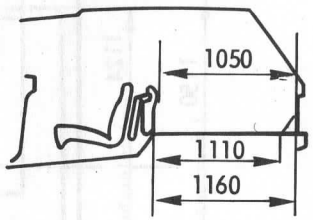
« *ESTATE* »

L.80-12 et L.80-43





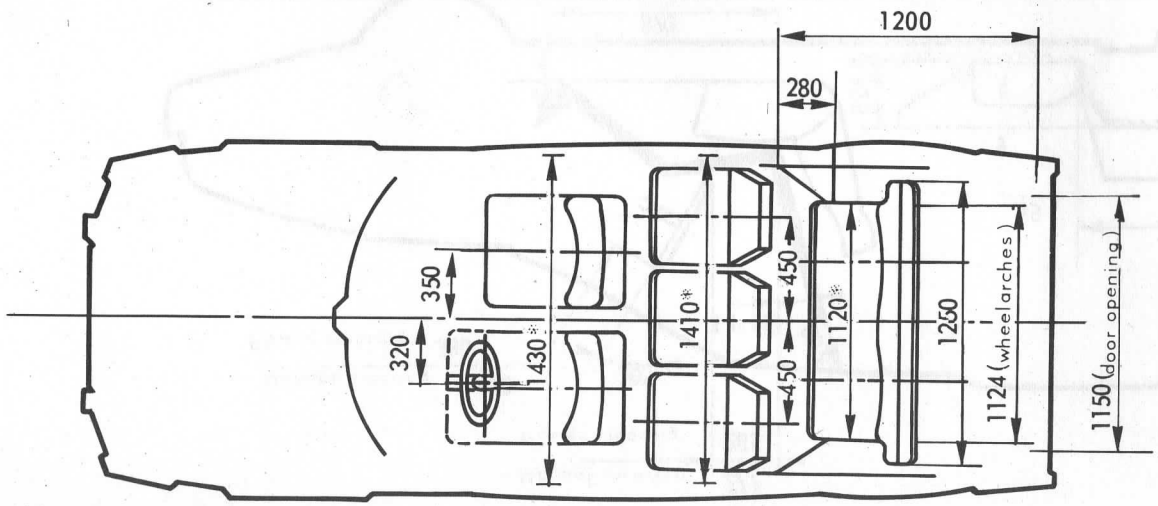
with engine running
(normal driving position)



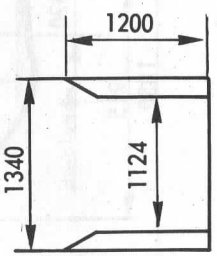
Volumes:

1°) Rear seat in position
458 dm3 (16.17 cu.ft.)

2°) Rear seat folded
1062 dm3 (37.50 cu.ft.)

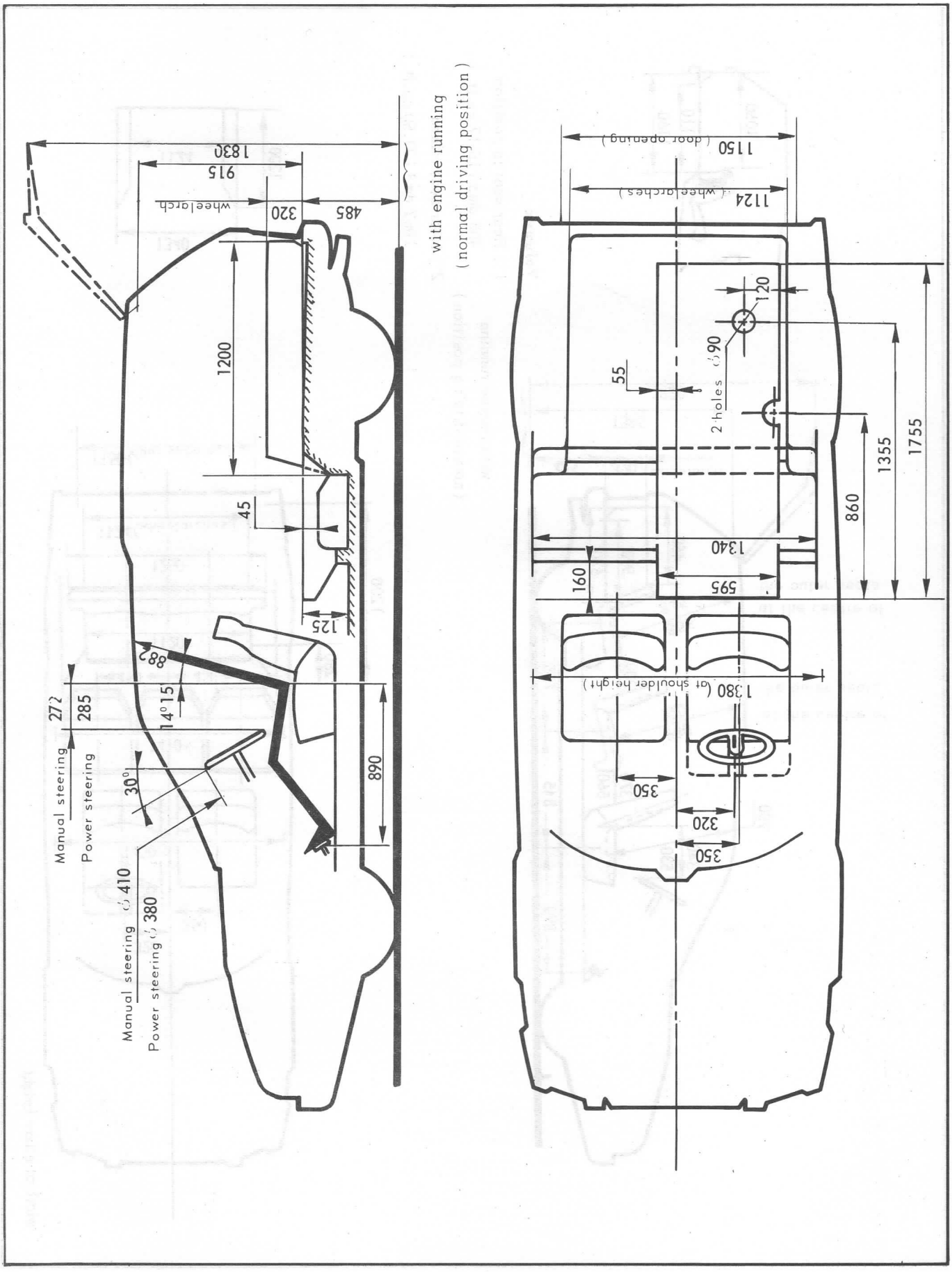


width at elbow height



« ESTATE » VEHICLE FOR TRANSFORMING INTO AMBULANCE

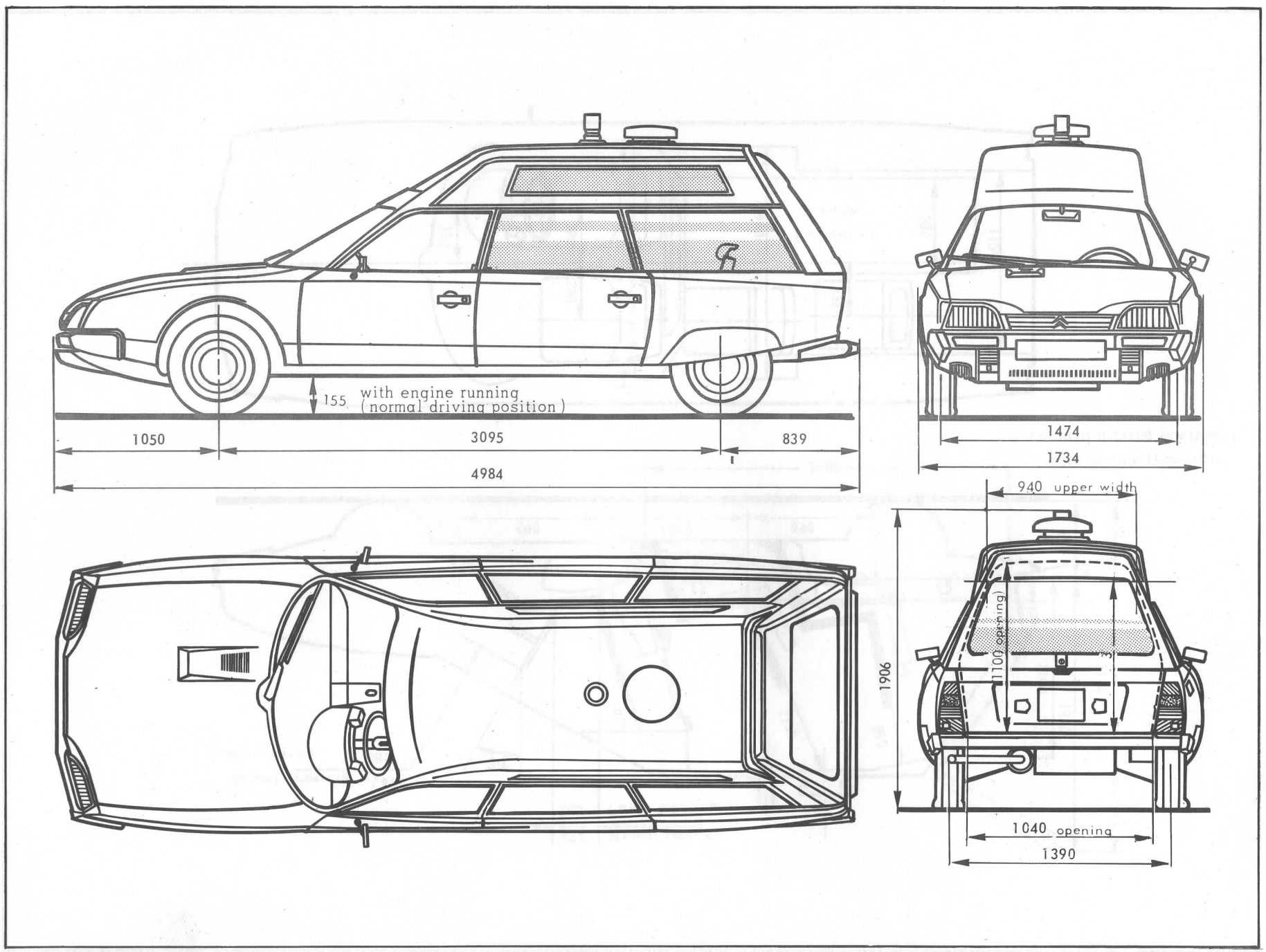
L 80 - 46



IV. EXTERIOR AND INTERIOR DIMENSIONS

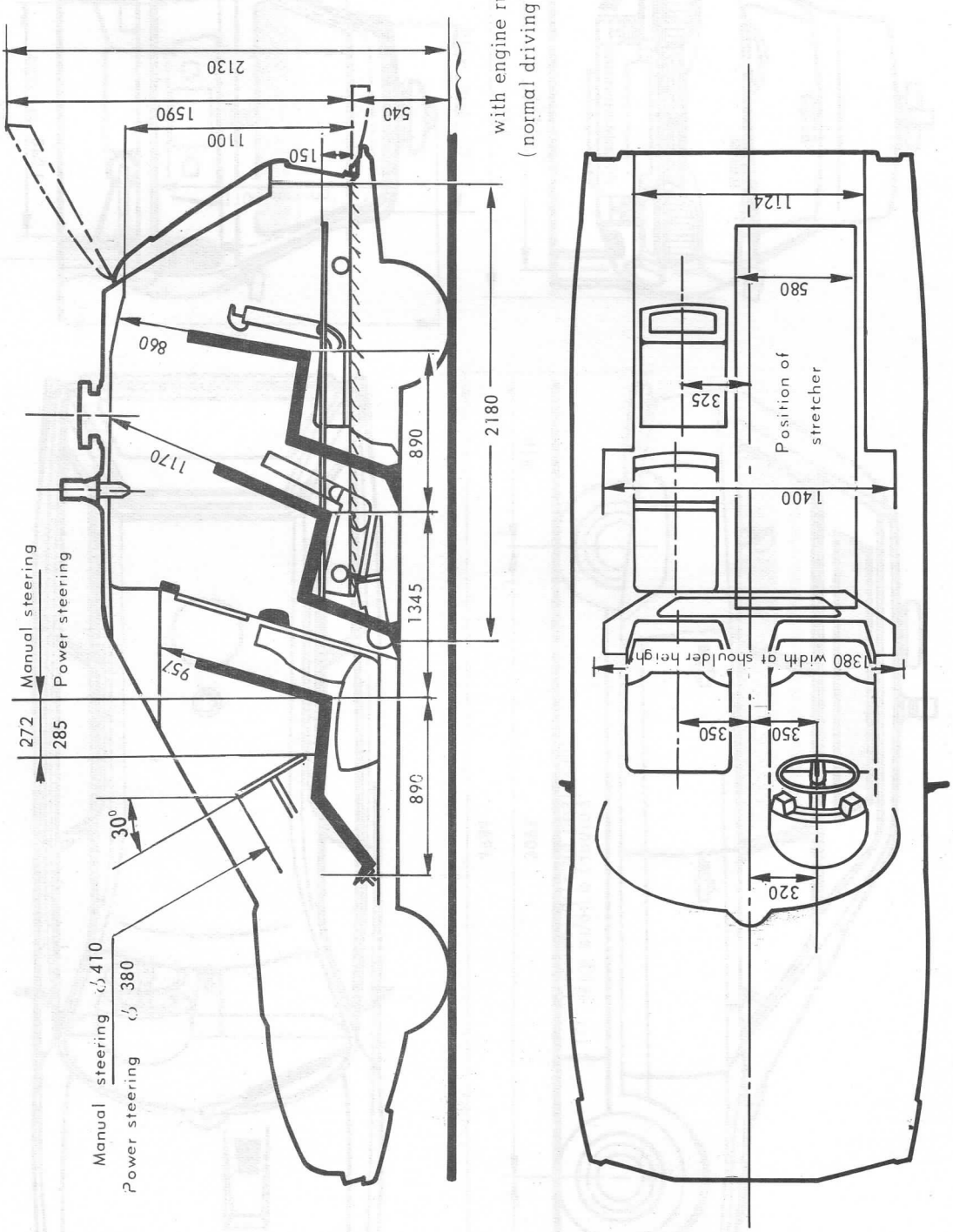
(CX AMBULANCE)

L 80-48



CX AMBULANCE

L 80-47



PROTECTION OF THE ELECTRICAL UNITS

PRECAUTIONS WHEN CARRYING OUT WORK ON THE CAR

It is absolutely essential to avoid action which may destroy certain of the electrical units or create a short-circuit (with consequent risk of fire).

1. Battery :

a) Disconnect the negative terminal first, then the positive one.

b) Ensure that the battery is properly connected, with the negative terminal being connected to earth.

c) Carefully connect both leads to the battery terminals, the negative lead being connected last.
Before connecting the negative lead ensure that there is no flow of current, This can be established by briefly touching the negative terminal with the lead end : sparks indicate a short circuit which must be corrected first.

d) Before using the starter ensure that the two leads are correctly tightened on their respective terminals.

e) Do not connect a charging unit to the battery and never carry out arc welding (or spot welding) on the car chassis unless both the positive and the negative leads are disconnected from the battery.

2. Alternator - Regulator :

a) Do not rotate the alternator unless it is connected to the battery.

b) Before connecting the alternator ensure that the battery is correctly connected (negative terminal to earth).

c) Do not check the operation of the alternator by short-circuiting either the positive or the « EXC » terminals and the earth terminal.

d) Take care not to reverse the leads connected to the regulator.

e) Do not attempt to re-energize the alternator : this is never necessary and in any case would damage both the alternator and the regulator.

f) Do not connect a suppressor capacitor at the « EXC » terminal of the alternator or the regulator.

3. Q.I. Headlamps :

a) Only replace a Q.I. bulb with the headlamps switched off. After having used the headlamps, it is wise to let them cool drown for five minutes before handling.

b) Do not touch a Q.I. bulb with bare fingers. Any fingerprints on the bulb must be cleaned off with soapy water and the bulb dried with a lint-free cloth.

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

MAIN RECOMMENDED PRODUCTS
I. ADHESIVES

BASE	MATERIALS TO BE BONDED	RANGE OF APPLICATION	TYPES OF ADHESIVE (Examples)	RECOMMENDED STAIN REMOVERS
Painted sheet metal	Imitation leather Rubber Finishing strip	Coating of support Coating of material Drying Positioning Smoothing	Neoprene REST-AGRAF Ref. Choisyprene S TEROSON Ref. Terokal 2444	F spirit Trichlorethane 111
	Vinyl	Coating of support Coating of material Drying Positioning Smoothing	MINNESOTA Synthetic rubber adhesive Ref. EC 1236 MIPLACOL Acrylo-nitrite Ref. HS 3688	Trichlorethane 111
Painted sheet metal Carboard Felt	Cloth Felt	Coating of support Drying Positioning Smoothing	S.B.R. ONFROY Ref. 306 BOSTIK Natural rubber adhesive Ref. 1313	F spirit
Glass	Aluminium (window base)	Preparation of adhesive Preparation of surfaces Coating of both faces Pressure Setting time	TEROSON Epoxy Ref. Terokal 221 COLFIX Ref. Maticol	Tepid water before polymerization
	Mirror base	Preparation of surfaces Coating of material Positioning Pressure	Special COMET Ref. glass/metal kit	Super-clean
	Rilsan (Slide)	Coating of support Coating of material Drying Positioning Pressure	Neoprene COLFIX Ref. 550 MINNESOTA Ref. EC 1099	F spirit Trichlorethane 111
	Klegecel	Coating of support Coating of material Drying 3 to 8 min. Positioning Pressure	Neoprene BOSTIK Ref. 1400 MINNESOTA Ref. EC 1099	Trichlorethane 111 Stain-remover S (P.C.A.S.)
Polyester	Polyurethane foam	Coating of support Drying Positioning Smoothing	Neoprene COLFIX Ref. 180 MINNESOTA Ref. Spray pavillon 77	F spirit Trichlorethane

II. CLEANING PRODUCTS

USES	PRODUCTS	SPECIAL FEATURES	SUPPLIERS
Rinsing of L.H.M hydraulic system	TOTAL hydraurincage	For complete rinsing, leave the product in the circuit for 1000 km	TOTAL C.F.R.
Degreasing of mechanical assemblies (When cold)	MAGNET 6	Insoluble in water, dries rapidly possesses high dielectric properties	MAGNUS
	OIL & GREASE REMOVER	Leave the product to work (pure or diluted with a solvent) when rinse thoroughly	MULLER & Co
	PROTOLAN 3 D	Use undiluted and rinse with water	N. BERGER & Co
	RAVITOL X		RAVICOLOR & Co
Cleaning of jointing surfaces	MAGSTRIP	Gelatinous liquid for cleaning of liquid and non-metallic joints	MAGNUS
	SUPER-CLEAN	Dry cleaner for use before applying Loctite products	COMET D.A.V.A. Department

III. SEALING PASTES

USES	PRODUCTS	SPECIAL FEATURES	SUPPLIERS
Sealing of jointing surfaces, screws, studs and nuts	PROTO-JOINT	Resists mechanical stresses and petroleum-base products	JEAN-BRASSANT
	CURTYLON	Clean with alcohol	CEFILAC Joint Curty Department
	LOWAC	Resists hydrocarbons	SEBIS
	FRENETANCH	Locking and sealing of threaded assemblies which may require dismantling later	COMET D.A.V.A. Department NOTA : These five products are sold in a kit, plus Scelbloc (for fixing bearings, bushes, etc.) and Super clean (cleaning product).
	FRENBLOC	Locking and sealing of studs, screws and nuts with maximum efficiency	
	FORMETANCH	Sealing of unions and joint surfaces	
	FORMAJOINT	Sealing of joint surfaces as a replacement for conventional type gaskets	
Sealing of door trim, windscreen	SILICOMET black		

SEALING PASTES (cont.)

USES	PRODUCTS	SPECIAL FEATURES	SUPPLIERS
Sealing of sump porosity	DEVCON F	Aluminium based	COMET D.A.V.A. Department
	METALIT		DISIMPEX
	METOLUX A	Light metal based	METOLUX
	SILASTIC 733 R.T.V.	Remains flexible after drying	DOWN-CORNING S.A.R.L.

IV. FREEING PRODUCTS

USES	PRODUCTS	SPECIAL FEATURES	SUPPLIERS
Rusted or corroded parts and assemblies which have seized	DEGRIPPANT	Aerosol spray	MOLYDAL
	DEGRIPPANT EMO	Aerosol spray or 5 litres can	SOFRALUS-BARDAHL

V. GREASES AND LUBRICANTS

USES	PRODUCTS	SPECIAL FEATURES	SUPPLIERS
Lubrication of suspension arms « fluidbloc » bushes	S.I. 33 RHONE POULENC	Silicon grease	LAMBERT-RIVIERE
	GREASE 33 (MEDIUM)		DOW-CORNING S.A.R.L.
Lubrication of transmissions	GREASE 1495	High tenacity multifunctional	MOLYDAL
	MOLYKOTE LONGTERM 2	Extreme pressure lubricant with good adhesive properties	DOW-CORNING S.A.R.L.
	TOTAL MULTIS M.S.	Multifunctional grease	TOTAL C.F.R.
Plastic rubber lubricant	REDEX-SILICONE	Aerosol	REDEX - FRANCE
Parts working in difficult conditions	HI - LUB - HTC	Aerosol spray lubricant resistant to soft & salt water & to high pressures & temperatures	COMET

LIST OF SUPPLIERS

SUPPLIER	ADDRESS	TELEPHONE
AGIR	69360 SEREZIN du RHONE	(78) 49.80.27
BOSTIK S.A.	5, route de St. Leu - 95360 MONTMAGNY	964.64.12
BRASSART J	44, rue de la Boétie - 75008 PARIS	359.54.82
BREGER N	Le Pasty St Aubin de Luigne - 49190 ROCHEFORT/LOIRE	(41) 41.73.03
CEFILAC	25, rue Aristide Briand - 69800 SAINT-PRIEST ou 7 à 11, rue de la Py - 75020 PARIS	(78) 20.08.94 797.01.49
C.F.R. (TOTAL)	11, rue du Docteur Lancereaux - 75381 PARIS CEDEX 08	267.15.00
COMET (Departement D.A.V.A.)	10, rue Eugène Cazeau - 60300 Z.I. de SENLIS	453.13.20
COLFIX (SCHULTZ	43, route de la Mertzau - 68100 MULHOUSE	42.10.84
DISIMPEX	1, rue Goethe - 75016 PARIS	727.89.59
DOW-CORNING S.A.R.L.	140, avenue Paul Doumer - 92500 RUEIL-MALMAISON	977.00.40
LAMBERT-RIVIERE	16, rue de Miromesnil - 75008 PARIS	265.16.50
MAGNUS	12, rue du Moulin de Cage - 92390 VILLENEUVE LA GARENNE	798.13.30
METOLUX S.A. FRANCE (Société Henri Lecocq)	167, rue de Fontenay - 94300 VINCENNES	808.55.11
MINNESOTA de FRANCE	135, boulevard Sérurier - 75019 PARIS	202.80.80
MIPLACOL	52, avenue de la Concorde - 93270 SEVRAN	939.85.96
MOLYDAL	60, rue des Orteaux - 75020 PARIS	797.28.30
MULLER & Cie	28, avenue de l'Opéra - 75002 PARIS	742.58.36
ONFROY	35, rue L. Sampaix - 75010 PARIS	206.84.70
P.C.A.S.	23, rue Bossuet - 91160 LONGJUMEAU	909.77.85
RAVICOLOR	32, rue de Mulhouse - 68304 St. LOUIS	(89) 67.13.37
REDEX FRANCE	86, avenue de la République - 93300 AUBERVILLIERS	352.75.94
REST-AGRAF	6, place du Général Leclerc - 92300 LEVALLOIS	757.67.34
S.E.B.I.S.	3 à 5, rue de Metz - 75010 PARIS	770.13.08
SOFRALUS-BARDAHL	27, bd. du Général Leclerc - BP 29 - 59051 ROUBAIX	(20) 70.02.12
TEROSON	175 à 179, avenue J. Jaurès - 75019 PARIS	202.50.72

WORKING ON THE INJECTION SYSTEM

FUEL

The long life of pumps and injectors depends basically on the cleanliness of the Diesel fuel. All precautions must therefore be taken to prevent any possible contamination of this fuel and notably to ensure that it does not contain any water.

The filter cartridge must be replaced at the recommended kilometer intervals as stated on the maintenance instructions.

INJECTORS

General hints :

The performance of a Diesel engine depends to a great extent on the efficient operation of the injection equipment. To obtain the finest performance, each injection of fuel must be made in conditions which ensure that all the fuel is burnt without producing excessive smoke at exhaust.
The role of the injector is therefore essential and it should be subjected to stringent checking in view of the frequency of injection which it must maintain.

In all cases, the maintenance of an injector is limited to cleaning and setting operations.

Cleaning an injector :

The use of an abrasive product is forbidden for grinding purposes and for rectification of the seat of the injector body or the needle. These operations will modify the characteristics of the injector, and produce poor combustion, smoke, loss of power, and overheating.

An injector must be cleaned with filtered Diesel fuel only, to the exclusion of petrol, rags or compressed air.

Storage of injectors :

New injectors are delivered with a coating of storage oil to avoid rust.
These parts must be carefully cleaned before they are put into service.

INJECTION PUMP :

All adjustment work and replacement of interior components of the pump must be carried out by qualified specialists, approved by the pump manufacturer.

These specialists possess the technical documentation drawn up in agreement with the manufacturer and have the essential special tools to carry out the work required rapidly and correctly.

In case of accident or poor operation which may be caused by an injection pump, contact should then be made with the official service stations of the pump manufacturer as indicated in the CENTRAL CITROEN GUARANTEE notes.

INJECTION TUBE :

The injection tubes must not be welded, brazed, or heated, in order to avoid formation of rust which would inevitably result in the failure of the injectors.

The tubes sold are all of the same length. This condition is essential for the efficient operation of the engine.

Clean them with Diesel fuel and blow them through thoroughly with compressed air before fitting.

ROTO DIESEL INJECTION EQUIPMENT : FAULT FINDING SYSTEM

GENERAL HINTS

When a Diesel engine is faulty or breaks down completely

THE PUMP MUST NOT IMMEDIATELY BE SUSPECTED

Indeed, the injection equipment is made up of various components and each may be at the root of the trouble.

The Diesel fuel, the fuel tank, the supply tubes or fuel pump return tubes, the filter unit, the ancillary pump controls (stop control, anti-stalling control etc..) are also accessories which are equally capable of causing operating faults.

Furthermore, the fundamental principle of a DIESEL engine must not be overlooked : the ignition of the injected fuel is caused by a rise in temperature within the combustion chamber during the compression stroke and any factor which does not contribute to this principle may be the cause of defective operation :

Defective or poorly adjusted injectors, badly adjusted timing, valves out of adjustment, lack of compression, excessive oil consumption may also cause excessive smoke and knocking in the engine.

Finally, when starting in very cold weather, and in spite of preheating, remember that the DIESEL engine must be turned over at an adequate speed. This implies efficient operation of the starter and complete absence of abnormal friction within the engine : e.g. engine oil of unsuitable viscosity.

The fault finding system indicated hereafter is, in fact, a detailed representation of the general principles just described.

P.T.O.

FAULT FINDING SYSTEM

P.T.O.

ROTO DIESEL INJECTION EQUIPMENT : FAULT FINDING SYSTEM

GENERAL HINTS

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P.T.O.

FAULT FINDING SYSTEM

P.T.O.

THE ENGINE DOES NOT START WHEN COLD

- Check operation of STOP lever with ignition on
  - Lever remains in « STOP » position → Check cable fixing → Check connections of the box and wiring harness → Check operation of servo box
  - The lever changes to « GO » position → Check starter box Preheating plugs and warning lamp : with the ignition on
    - Warning lamp does not come on → Warning lamp bulb has blown disconnected leads → Starter box does not operate
    - Warning lamp comes on → Warning lamp goes out after excessive delay → One or two preheater plugs faulty
    - Warning lamp remains on → No current to the plugs or faulty plugs → Starter box or wiring harness disconnected
- Check fuel supply
  Check if air filter is blocked
  - Check arrival of fuel at injection pump
    - Fuel does not reach injection pump → Fuel filter blocked or air leak → Pipeline blocked (foreign body or ice), or air leak → Check operation of priming pump (valves) → Check tank suction filter
    - Fuel reaches injection pump → Check arrival of fuel at injectors → If no flow → **Remove injection pump for check**
- Check engine starting speed
  - Engine starting speed insufficient
    - Battery insufficiently charged → Starter or electrical circuit defective
    - Quality (viscosity) of engine oil
  - Engine starting speed normal → Check cylinder compression figures

ENGINE STARTS, AND STOPS

- Check fuel system
- If there is no apparent fault
- Test, using gravity slave tank
  - If the operation is normal there is an air leak into the system → Check unions (condition and tightness) → Having checked the unions, bleed air and water → Check tank air inlet
  - If the result is the same → **Remove injection pump for checking**

ENGINE STALLS WHEN DECELERATING (no idling speed) DECELERATING TOO SLOW
→ Check and adjust idling speed, with slow running stop unscrewed → Adjust slow running stop → If the result is the same → **Remove injection pump for checking**

ENGINE PRODUCES BLUE SMOKE WHEN IDLING OR DECELERATING
→ Check slow running stop → Check adjustment of injectors → Check setting of injection pump → Note engine oil consumption → If engine is in good condition → **Remove injection pump for checking**

UNEVEN IDLING SPEED
→ Adjust slow-running stop → Check rocker arm clearance → Check fuel system for air leaks → Test the engine, using a gravity slave tank
- If operation is normal : there is an air leak in the system → Check unions, and joints (condition and tightness)
- If the result is the same → **Remove the injection pump for checking**

ENGINE VIBRATES AT IDLING SPEED
→ Check and adjust idling speed, with slow running stop unscrewd → Adjust slow running stop → Check for leaks on high pressure tubes → Check setting and air-tightness of injectors → Check the rocker arm clearance

ENGINE RUNS AT MAXIMUM R.P.M. AND DOES NOT PULL UNDER LOAD
→ Blocked air-filter unit → With contact on : Check clearance at end of STOP control sleeve → Check that return fuel system is not obstructed → Check setting of injection pump → If the result is the same → **Remove injection pump for checking**

ENGINE KNOCKS
- On one cylinder → Find defective injector → Recondition the injector or fit a new one
- On all cylinders → Possibility of petrol in tank : TEST the engine with a gravity slave tank → Check condition and setting of injectors → Check setting of injection pump → If the result is the same → **Remove injection pump for checking**

ENGINE BACKFIRES WHEN RUNNING FAST
→ Blocked air filter unit → Check the rocker arm clearance → If the result is the same → **Remove injection pump for checking**

FAULT FINDING SYSTEM

P.T.O.

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

I. CHARACTERISTICS

1. Engine :

Diesel engine with turbulence combustion chamber (RICARDO COMET V)

	CX 2000	CX 2500
- Type (on engine plate) :	M 22/621	M 25/629
- Cubic capacity :	2175 cc	2500 cc
- Number of cylinders :	4 *(in line)*	4 *(in line)*
- Bore :	90 mm	93 mm
- Stroke :	85.5 mm	92 mm
- Compression ratio :	22.25 / 1	22.25/1
- Injection order :	1-3-4-2	1-3-4-2
- Maximum power :	48.5 kW or 66 bhp at 4500 rpm	55.2 kW or 75 bhp at 4250 rpm
- Maximum torque :	12.8 m.kg (92.5 ft.lb) at 2750 rpm	15.3 m.kg (110.5 ft.lb) at 2000 rpm

- Direction of rotation : to the left *(anti-clokwise as seen from engine flywheel side)*
- Arrangement : transversely mounted, inclined 30° towards the front

2. Cooling system : water cooled.

3. Lubrication :

- under pressure, supplied an external gear-type oil pump, driven by the crankshaft.
- PURFLUX external oil filter cartridge.

4. Fuel supply :

Injection pump :

CX 2200	CX 2500
ROTO-DIESEL, Type : MA 200 Ref. R 34 43 380 *(→ 5/1976)* R 34 43 390 *(5/1976 →)* BOSCH, Type : MA 100 Ref. VA 4/90 H 2250 CL 186	ROTO-DIESEL, Type : MA 200 Ref. R 34 43 430

- Direction of rotation : to the left (as seen from drive side)
- Pintle-type injectors
- Fuel used : Diesel fuel
- Dry-type air filter with interchangeable element
- Fuel filter with interchangeable element and priming pump

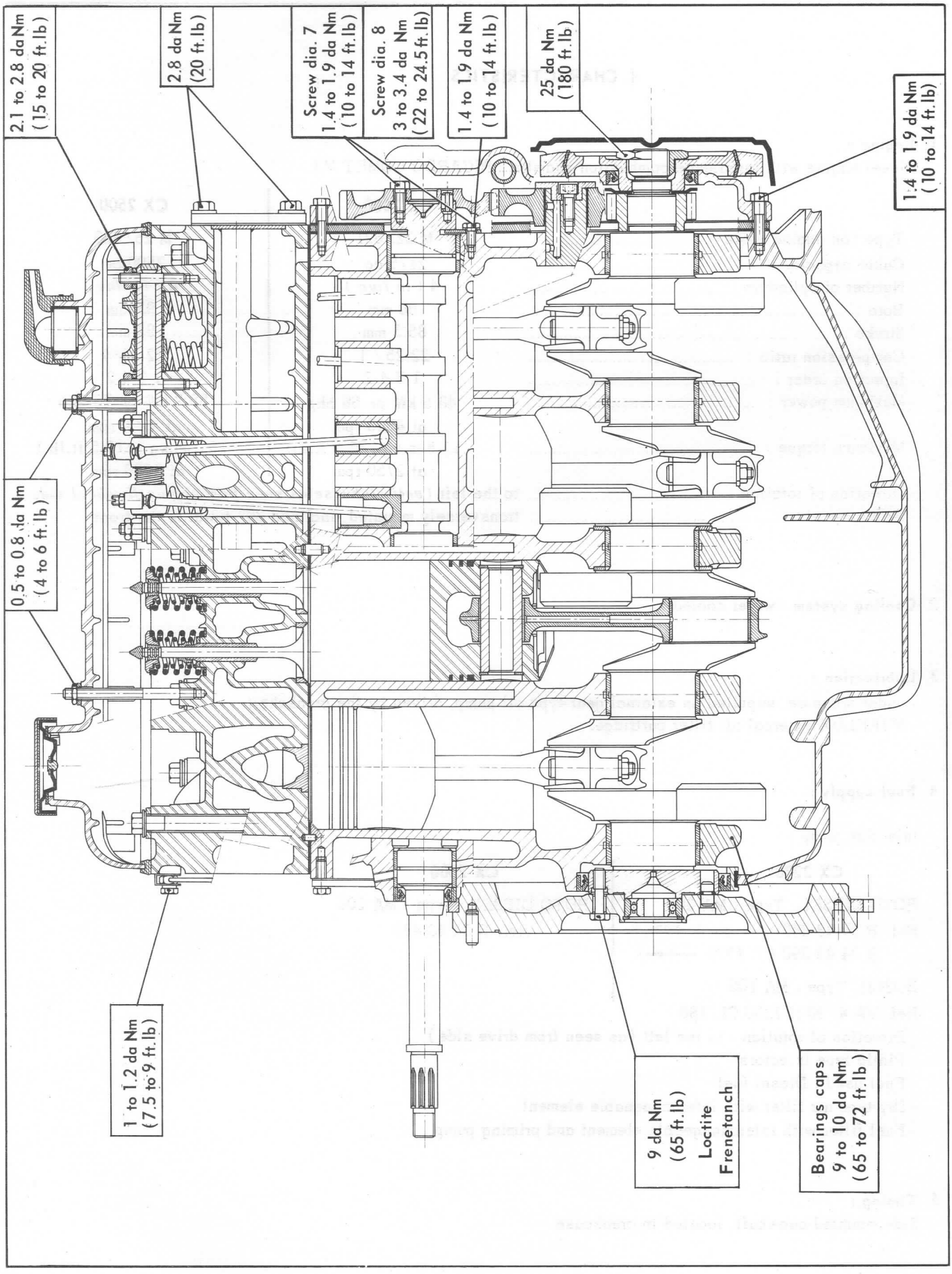
5. Timing :

Side mounted camshaft, located in crankcase.

ENGINE

Longitudinal section

L.10-3

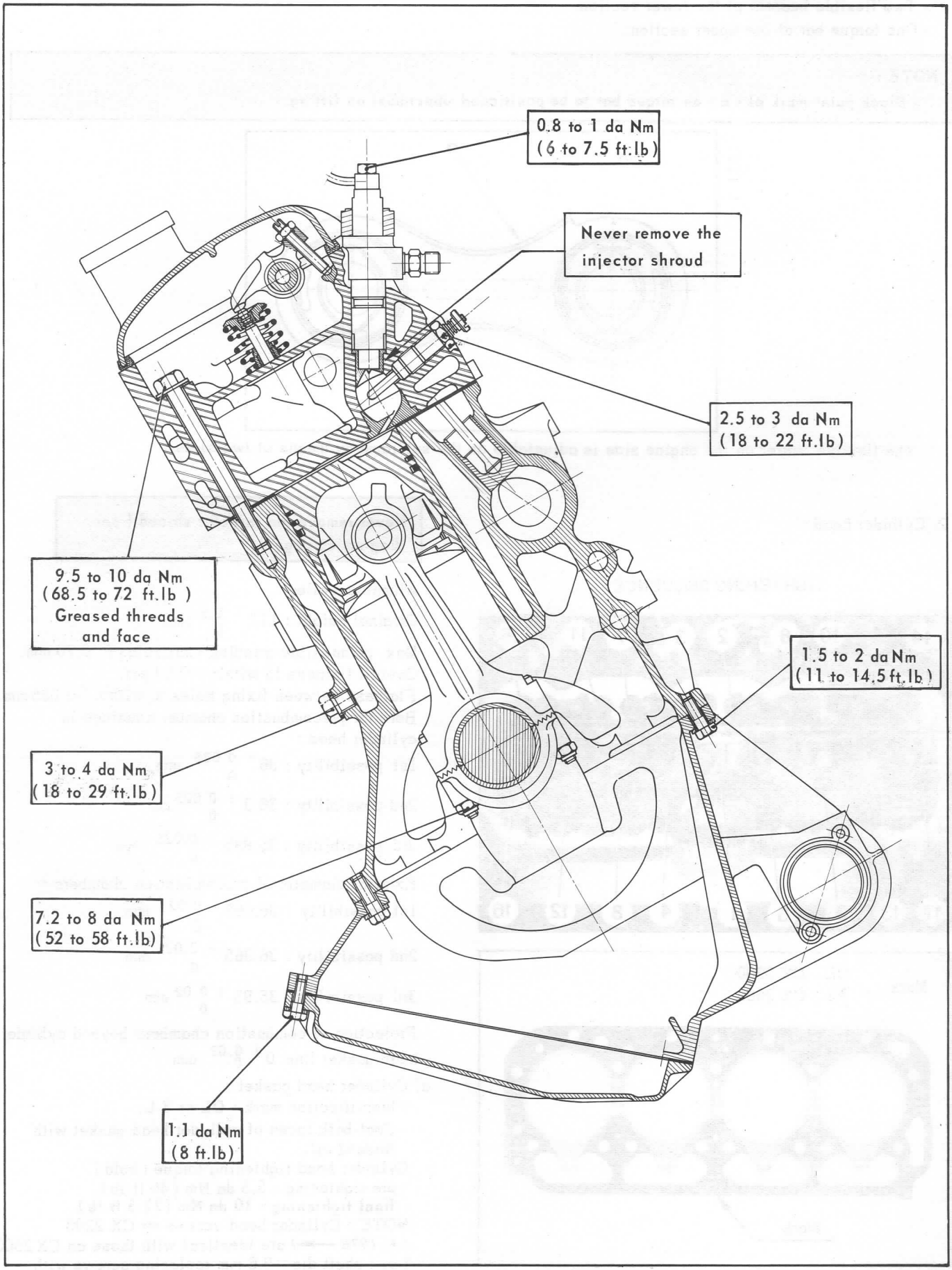


Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

ENGINE

Cross-section

♦ L. 10-4



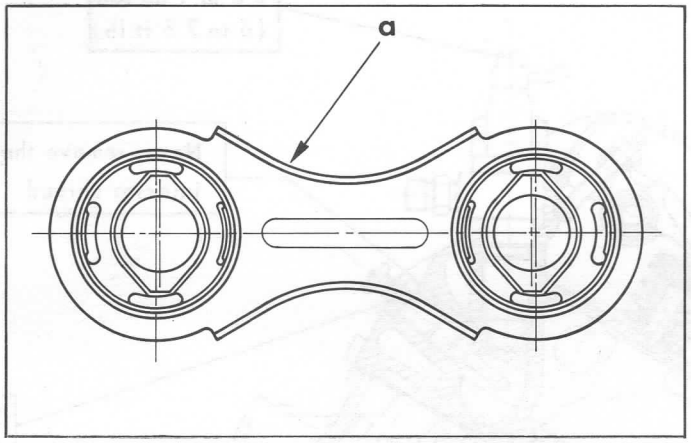
II. SPECIAL FEATURES.

1. Engine suspension :

- Two flexible bearers at the lower section.
- One torque bar at the upper section.

NOTE :
- Black paint mark at « a » on torque bar to be positioned uppermost on fitting.

L 13-2



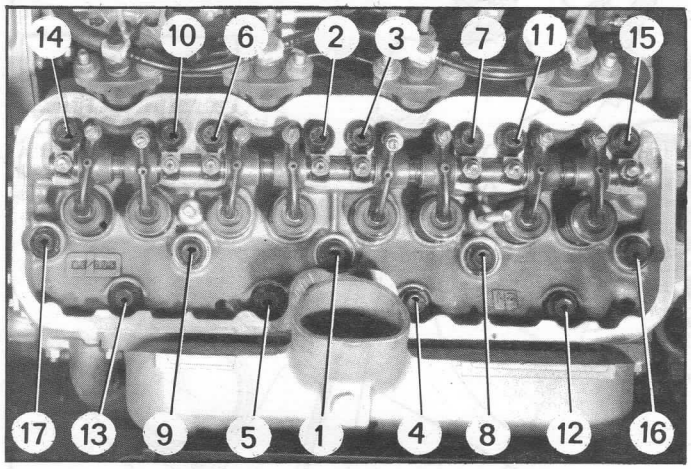
- The flexible bearer on the engine side is adjustable on the subframe by means of two slots.

2. Cylinder head :

Never remove the injector shroud (see diagram on page 3).

TIGHTENING SEQUENCE

14 863



- Aluminium alloy
- Original height : $117 \, ^{+ \, 0.5}_{0}$ mm.
- Max. permissible grinding (surfacing) : 0.70 mm.
- Overall flatness to within : 0.10 mm.
- Flatness between fixing holes to within : 0.025 mm.
- Bore for precombustion chamber housings in cylinder head :

  1st possibility : $36 \, ^{+ \, 0.025}_{0}$ mm

  2nd possibility : $36.3 \, ^{+ \, 0.025}_{0}$ mm

  3rd possibility : $35.885 \, ^{+ \, 0.025}_{0}$ mm

- Exterior diameter of precombustion chambers :

  1st possibility : $36.065 \, ^{+ \, 0.02}_{0}$ mm

  2nd possibility : $36.365 \, ^{+ \, 0.02}_{0}$ mm

  3rd possibility : $35.95 \, ^{+ \, 0.02}_{0}$ mm

- Projection of combustion chambers beyond cylinder head gasket line $0 \, ^{+ \, 0.03}_{0}$ mm

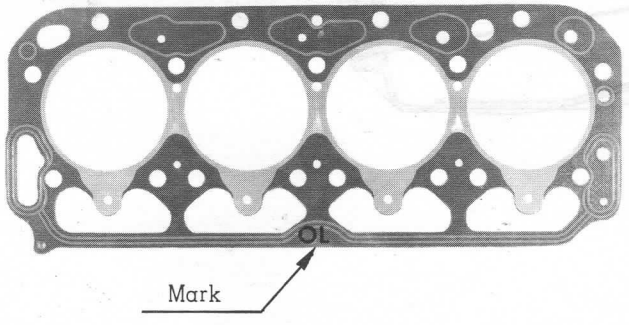
a) Cylinder head gasket :
- Identification mark : **OL** or **3 L.**
- Coat both faces of cylinder head gasket with linseed oil.

Cylinder head tightening torque (cold)
- pre-tightening : 5.5 da Nm (40 ft.lb).
- **final tightening : 10 da Nm (72.5 ft.lb).**

NOTE : Cylinder head screws on CX 2200 *(3/1978 ⟶)* are identical with those on CX 2500 i.e. : shaft dia = 9.6 mm, replacing screws with shaft dia = 9.2 mm

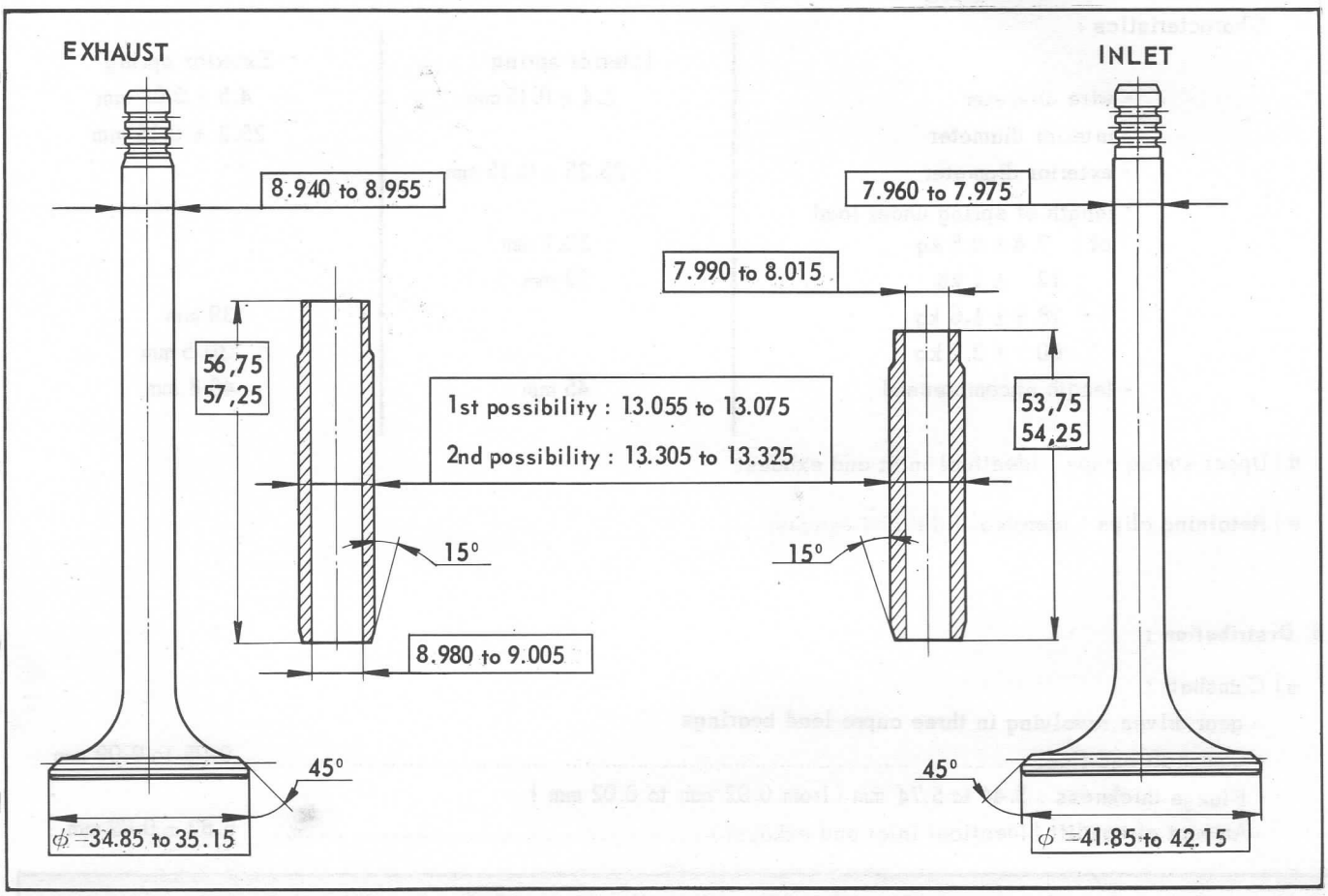
Mark : OL. CX 2200
3 L. CX 2500

15 051

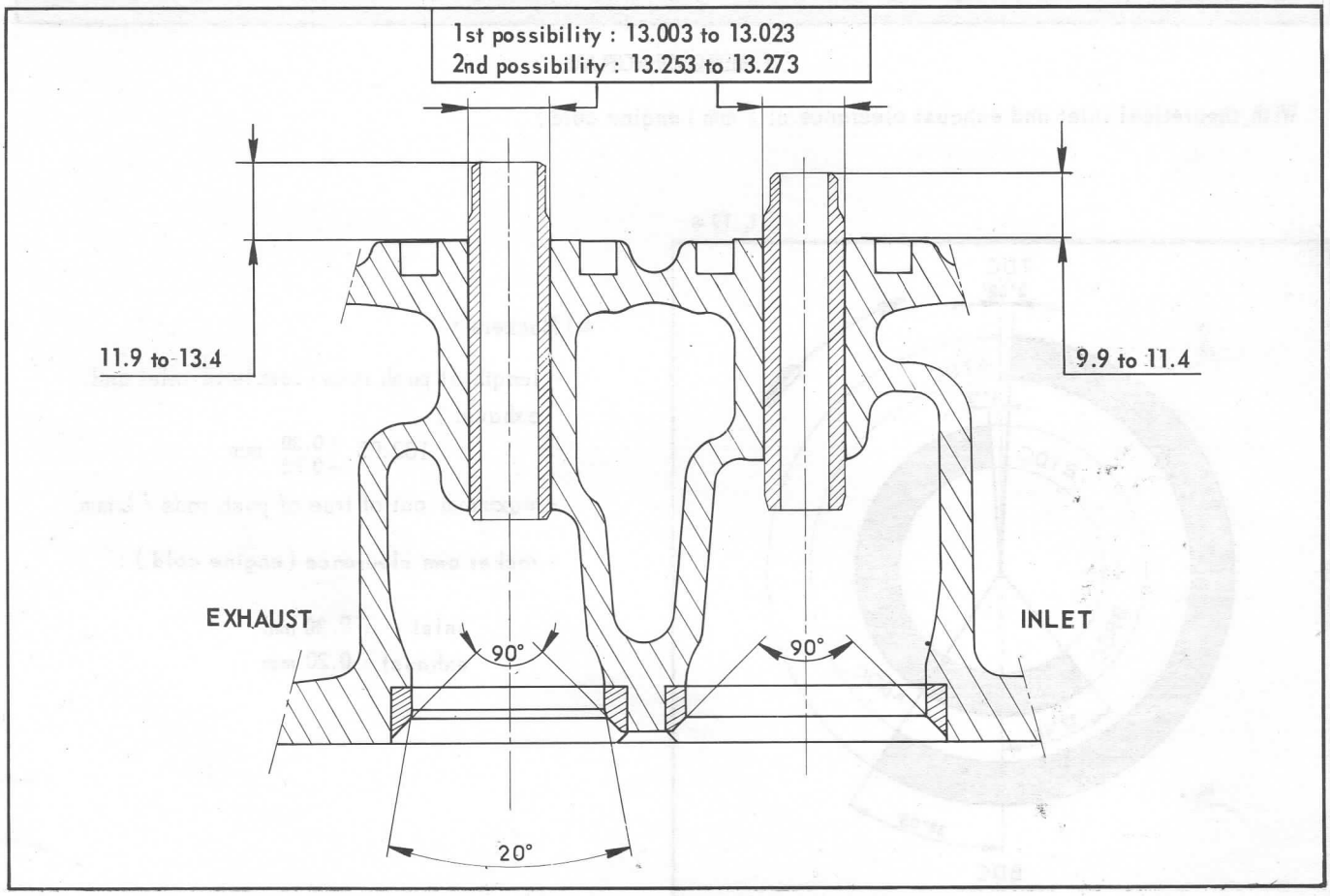


b) Seats, valve guides and valves

B.12-5



Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)



B.11-8

c) Valve springs

Inlet and exhaust valve springs are identical.

Characteristics :

	Interior spring	Exterior spring
- wire diameter	2.4 ± 0.15 mm	4.5 ± 0.02 mm
- interior diameter		25.2 ± 0.15 mm
- exterior diameter	25.35 ± 0.15 mm	
- length of spring under load of : 7.4 ± 0.5 kg	30.7 mm	
12 ± 1 kg	22 mm	
28.9 ± 1.6 kg		39 mm
60 ± 3.2 kg		30.5 mm
- length uncompressed	45 mm	46.8 mm

d) Upper spring cups : identical inlet and exhaust

e) Retaining clips : Identical inlet and exhaust

3. Distribution :

a) Camshaft :

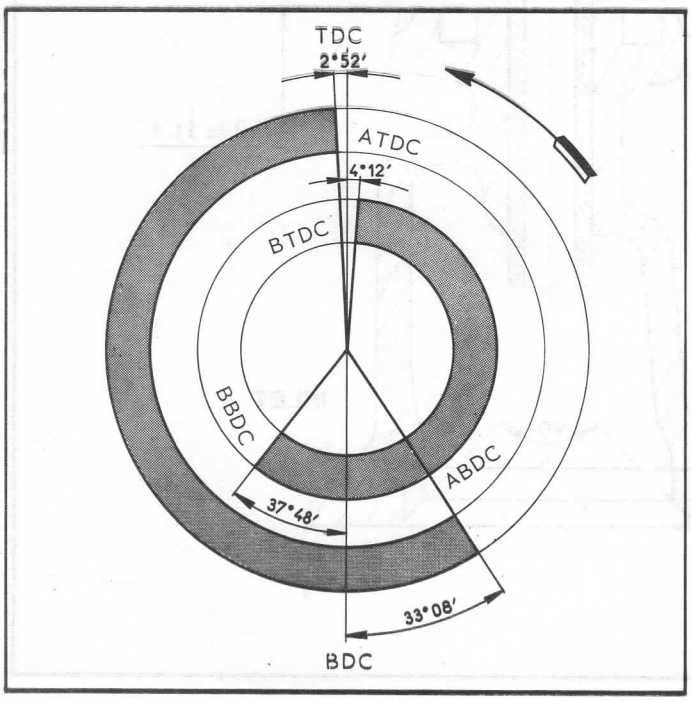
- gear driven, revolving in three cupro-lead bearings
- Camshaft end-float : ..... 0.05 to 0.09 mm
- Flange thickness : 5.44 to 5.74 mm (from 0.02 mm to 0.02 mm)
- Amount of camlift (identical inlet and exhaust) : ..... 6.83 ± 0.02 mm

Never attempt to rotate the engine by means of the camshaft pulley fixing nut.

TIMING DIAGRAM

With theoretical inlet and exhaust clearance of 1 mm (engine cold)

L.12-8



b) Rockers :

- length of push rods (identical inlet and exhaust)

$$182.85 \ ^{+0.30}_{-0.75} \text{ mm}$$

- maximum out of true of push rods : 1 mm
- **rocker arm clearance (engine cold) :**

inlet : 0.30 mm
exhaust : 0.20 mm

(2175 cc ENGINE)

4. Cylinder-block and pistons :

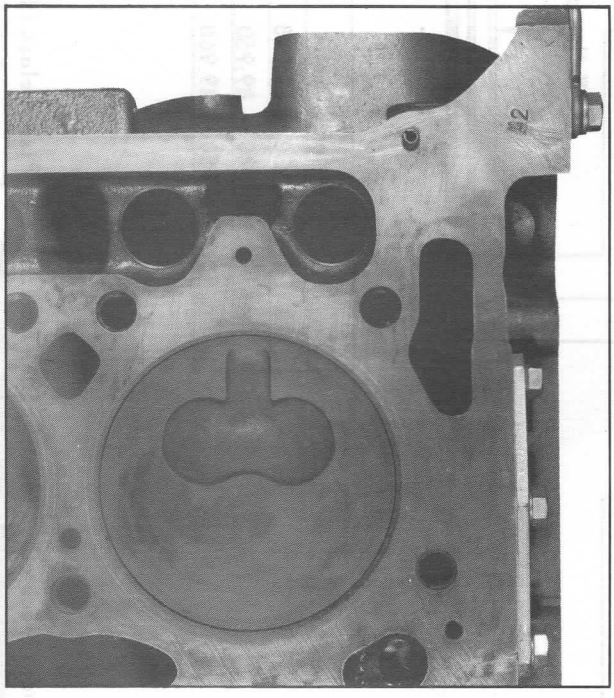
a) Cylinder-block :

Cylinder machined in a cast iron housing.

b) Pistons :

- in lead-coated aluminium
- correct fitting :
  - the clover-shaped recess in the piston must face the camshaft side.

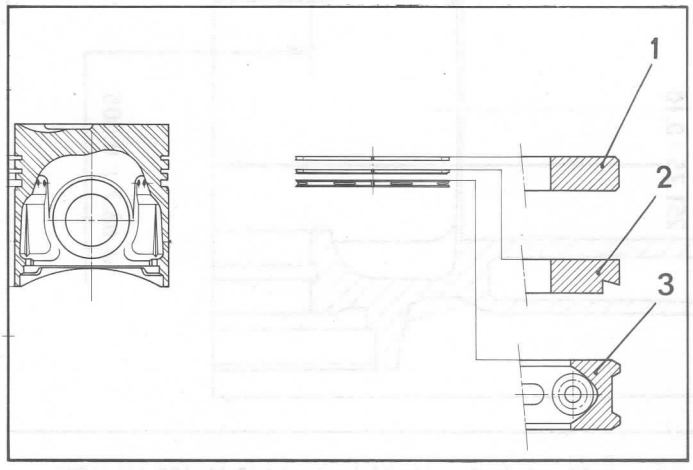
15 050



c) Piston rings :

Correct fitting of piston rings

B.12-15a



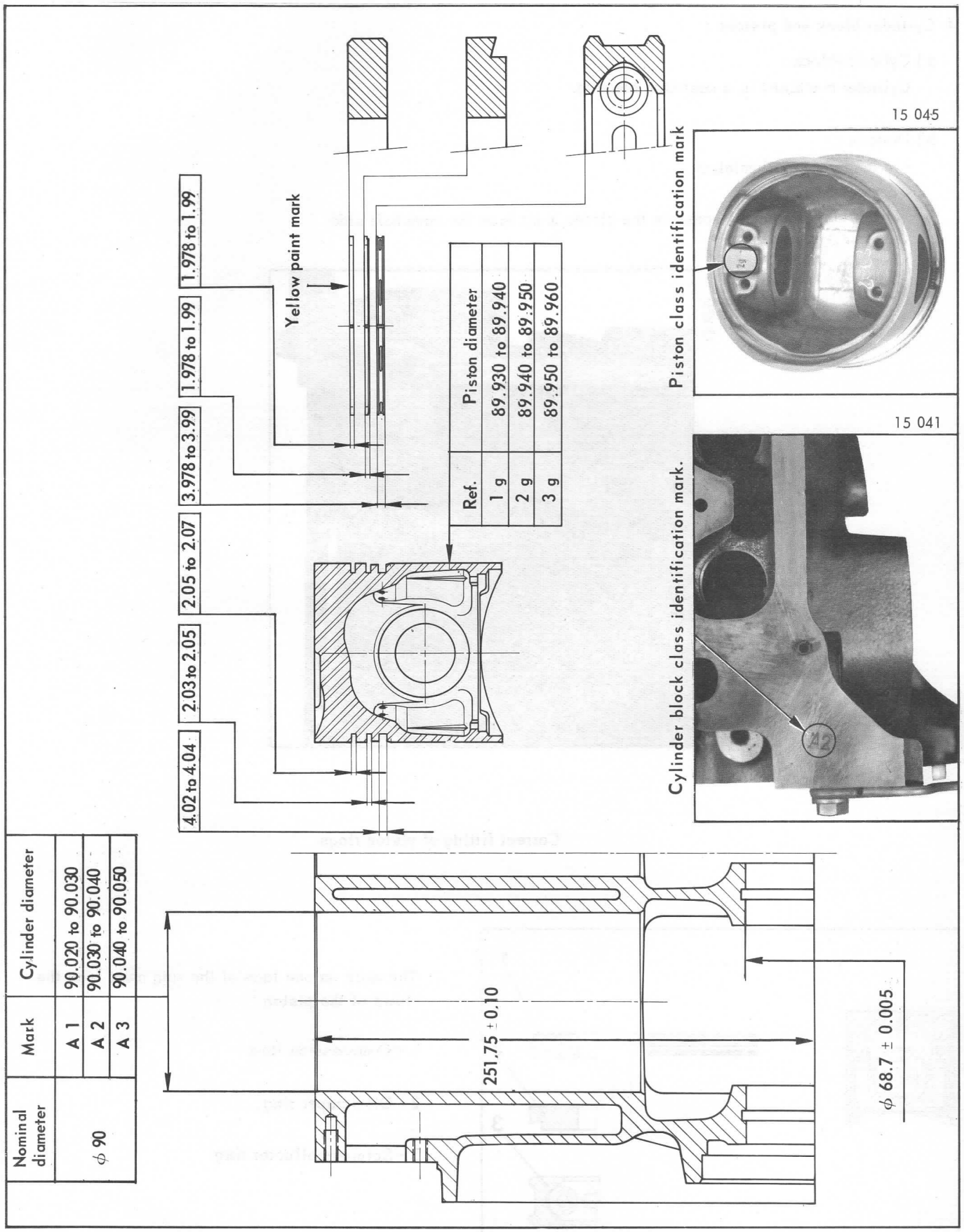
The mark on one face of the ring must face the crown of the piston

1 - Compression ring

2 - Oil scraper ring

3 - Scraper-collector ring

CYLINDER BLOCK - PISTONS (Production fitting) *(2175 cc engine)* B.12-15a



Nominal diameter	Mark	Cylinder diameter
ϕ 90	A 1	90.020 to 90.030
	A 2	90.030 to 90.040
	A 3	90.040 to 90.050

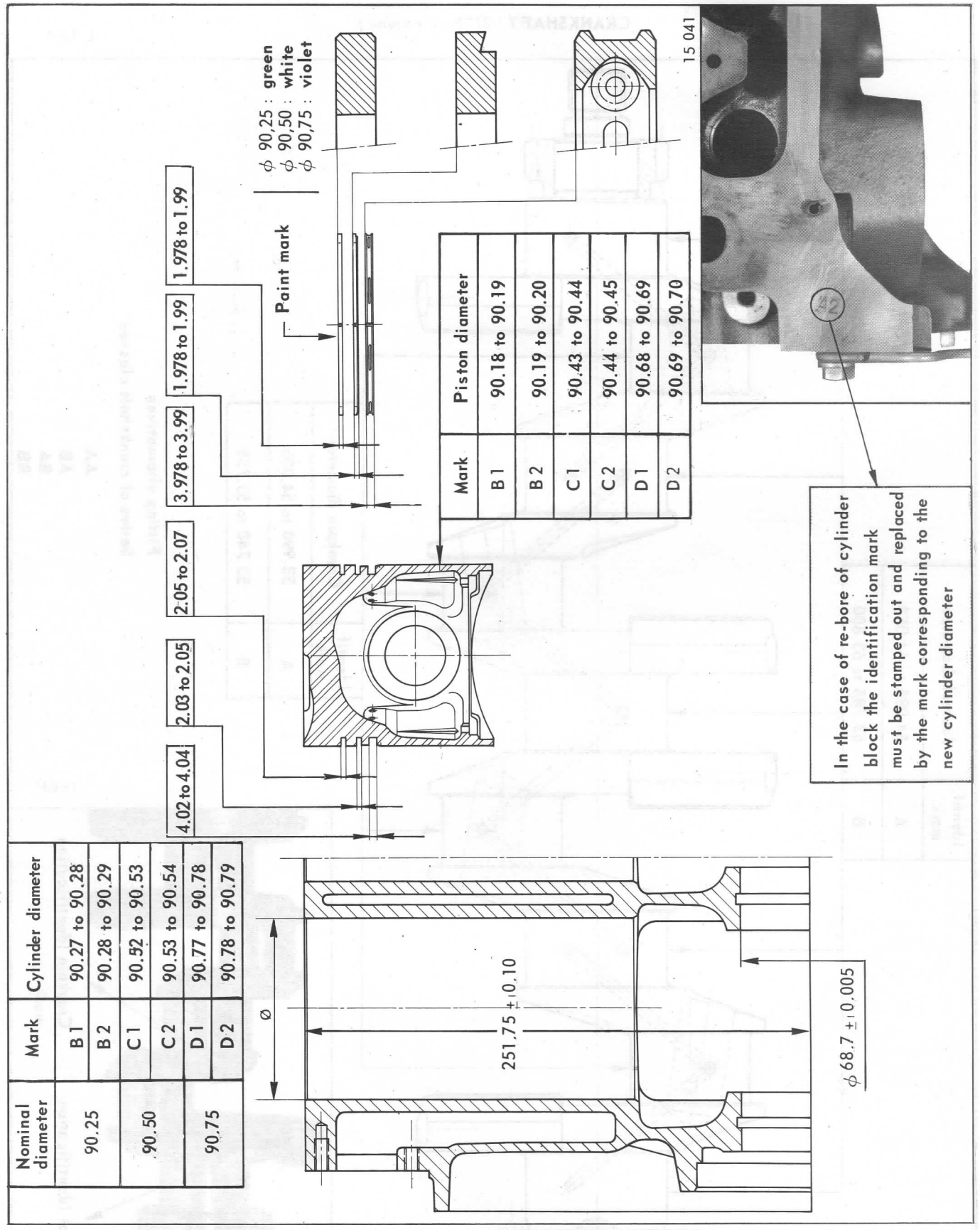
Piston protrusion, from upper face of the cylinder-block : $0.5 \; ^{+\,0.05}_{\;0}$ mm (adjustment to be made by the repairer whenever the piston is changed).

Gudgeon pin offset : 0.5 mm

The Replacement Parts Department only supplies piston, gudgeon pin and piston ring assemblies in sets of four.

NOTE : *(7/ 1977 ⟶)* a graphite-coated piston **(black skirt)** is fitted in cylinder No. 4 (side opposite to water

CYLINDER-BLOCK - PISTONS (Repair fitting) *(2175 cc engine)*



To be carried out by the repairer :

Piston protrusion, from upper face of cylinder-block : *(according to nominal diameter) :*

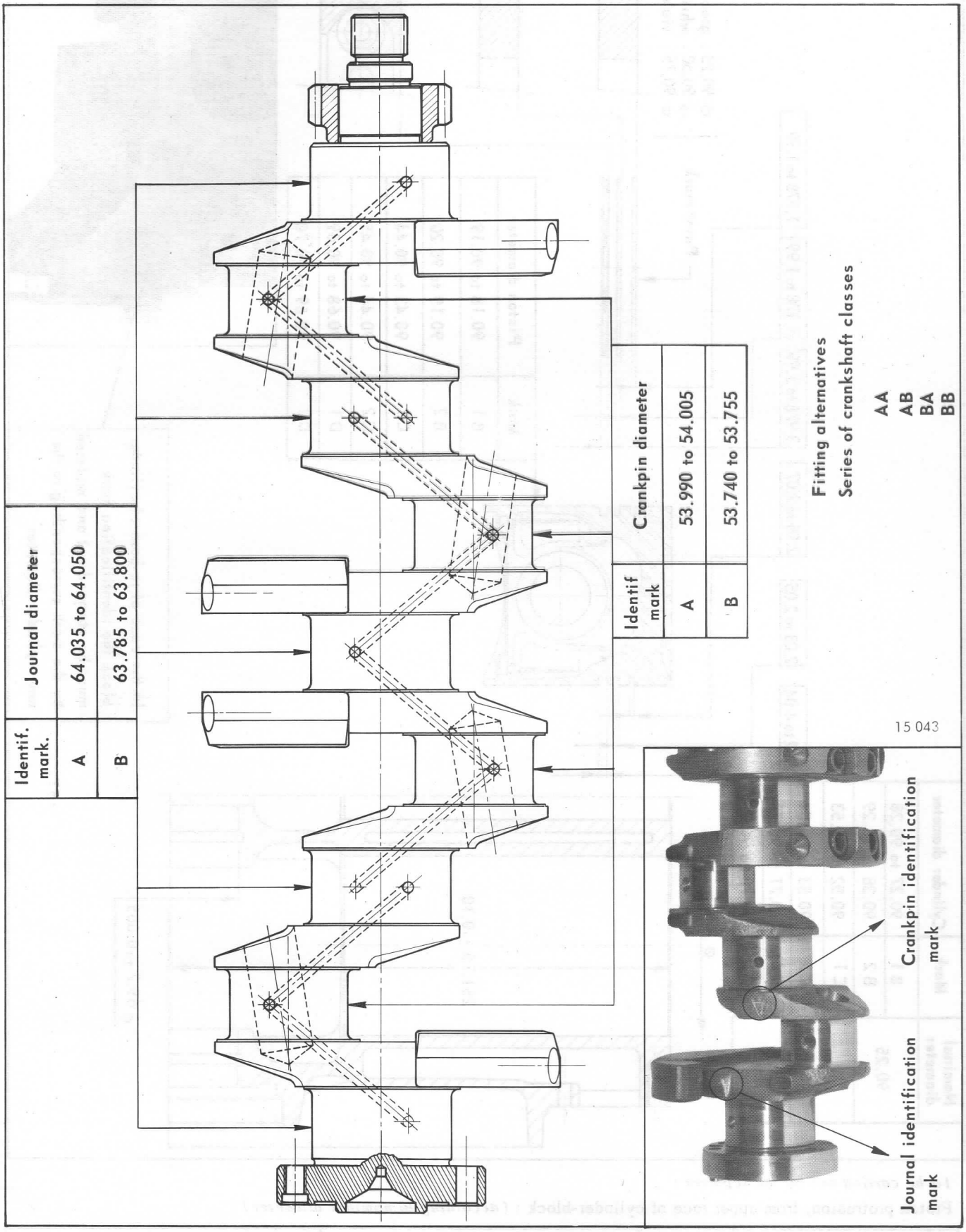
ϕ 90.25 ⟶ $0.47^{+0.05}_{0}$ mm	ϕ 90.50 ⟶ $0.44^{+0.05}_{0}$ mm	ϕ 90.75 ⟶ $0.41^{+0.05}_{0}$ mm

NOTE : *(7/1977* ⟶) a graphite-coated piston **(black skirt)** is fitted in Cylinder No. 4 (side opposite to water

5. Crankshaft :

CRANKSHAFT *(2175 cc engine)*

L.12-9



Identif. mark.	Journal diameter
A	64.035 to 64.050
B	63.785 to 63.800

Identif mark	Crankpin diameter
A	53.990 to 54.005
B	53.740 to 53.755

Fitting alternatives
Series of crankshaft classes

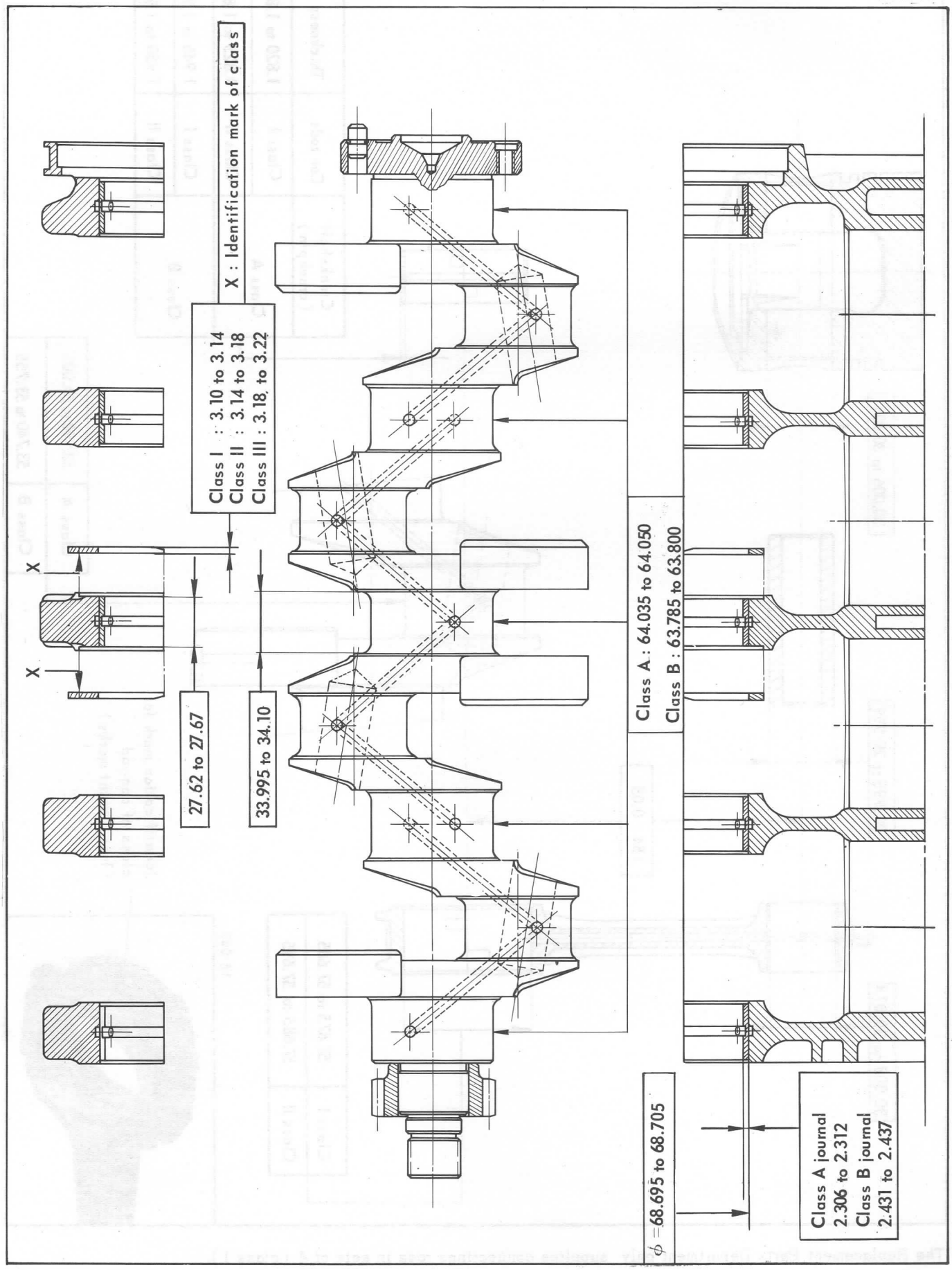
AA
AB
BA
BB

15 043

- The Replacement Parts Department only supplies one class of crankshaft : AA.
- Tightening torque for the balance-weight fixing screws : **7.2 to 8 da Nm (52 to 57 3/4 ft.lb)**

CRANKSHAFT BEARINGS AND RINGS *(2175 cc engine)*

L.12-10

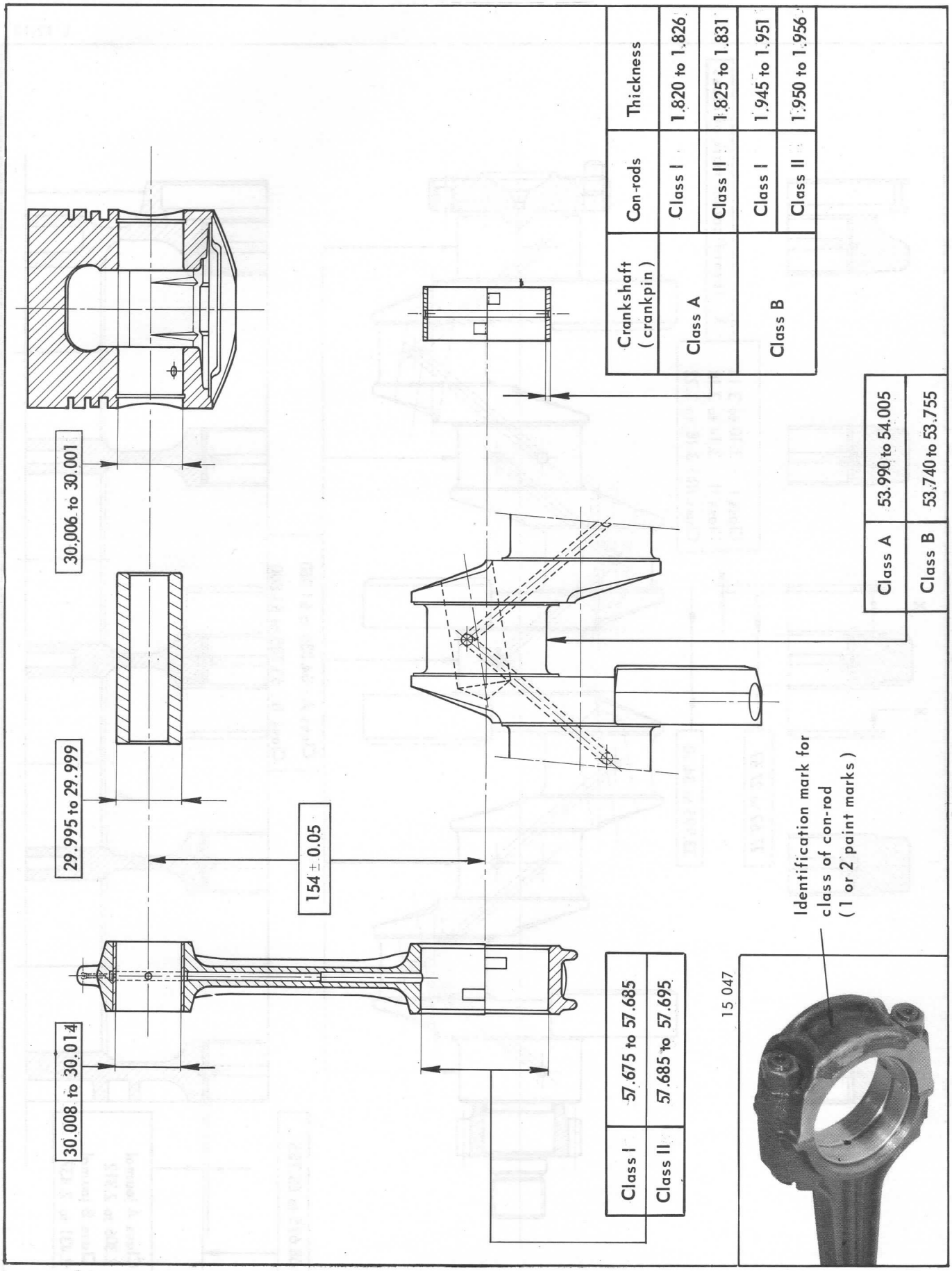


Crankshaft end-float : 0.07 to 0.17 mm

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

CRANKSHAFT - CONNECTING RODS - PISTONS *(2175 cc engine)*

B. 12-13



The Replacement Parts Department only supplies connectings rods in sets of 4 (class 1).

End-float of connecting rods on crankshaft : 0.037 to 0.247 mm

Variation in the weight of the connecting rods on the same engine : 7 g max.

(2500 cc ENGINE)

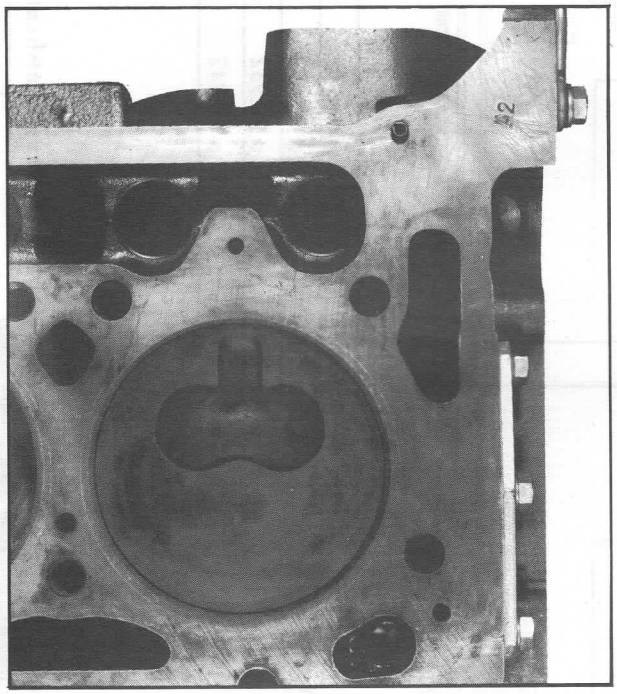
6. Cylinder-block and pistons :

a) Cylinder-block :

Cylinder machined in a cast iron housing.

b) Pistons :

- in lead-coated aluminium,
- correct fitting :
  - the clover-shaped recess in the piston must face the camshaft side.

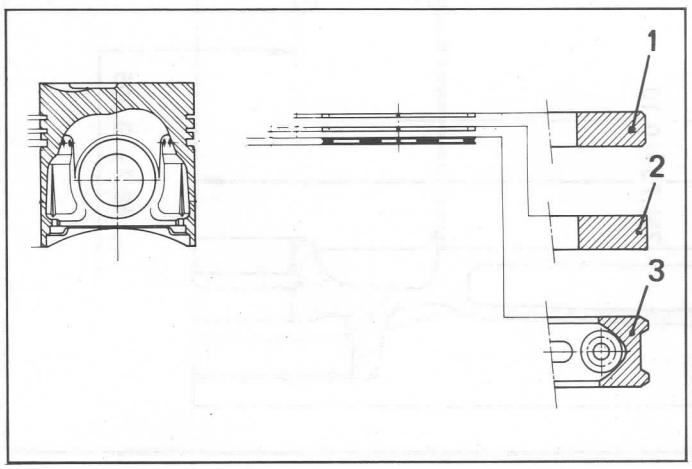


c) Piston rings :

Correct fitting of piston rings

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

B.12-21



The mark on one face of the ring must face the crown of the piston.

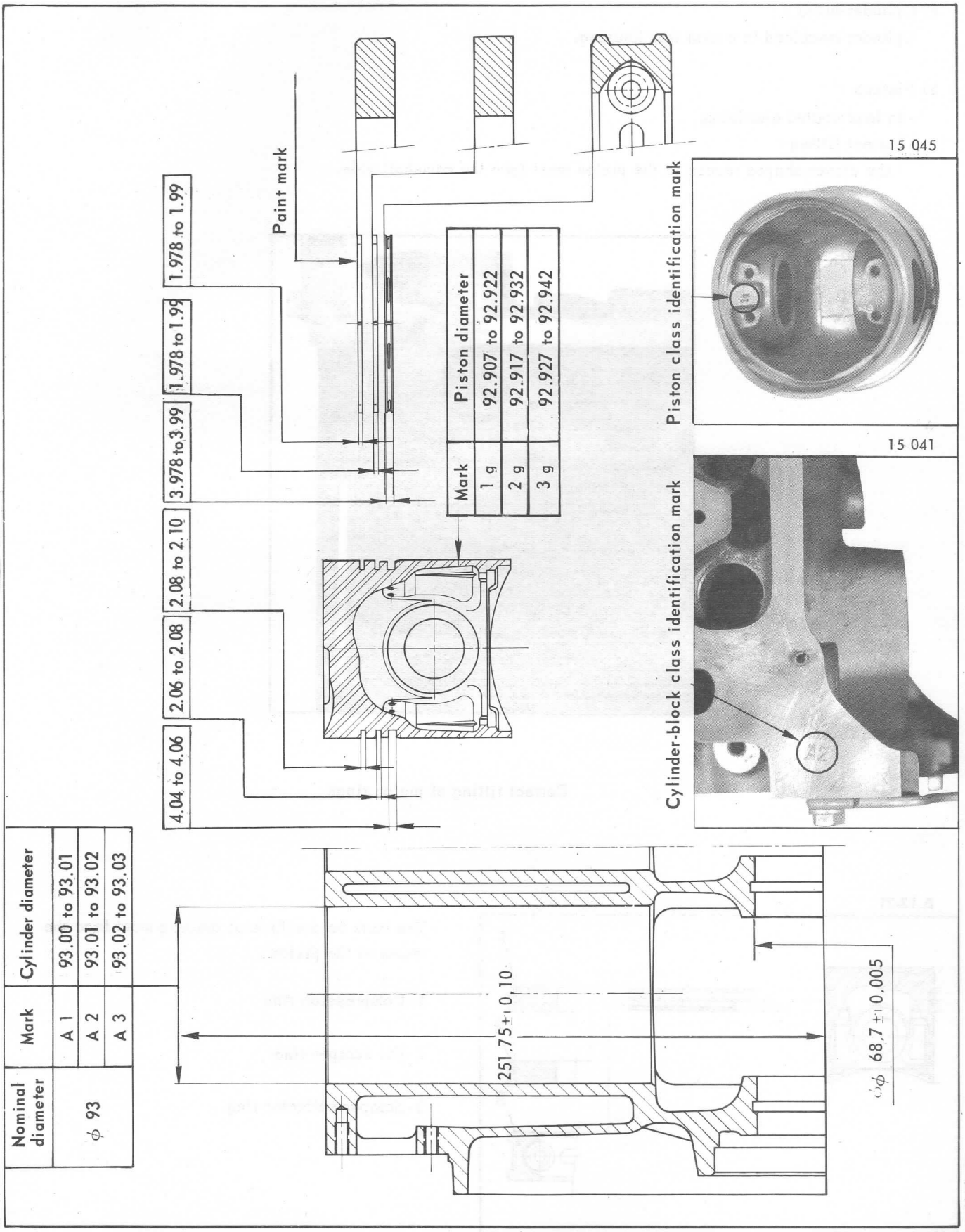
1 - Compression ring

2 - Oil scraper ring

3 - Scraper-collector ring

CYLINDER-BLOCK - PISTONS (Production fitting) *(2500 cc engine)*

B 12-21



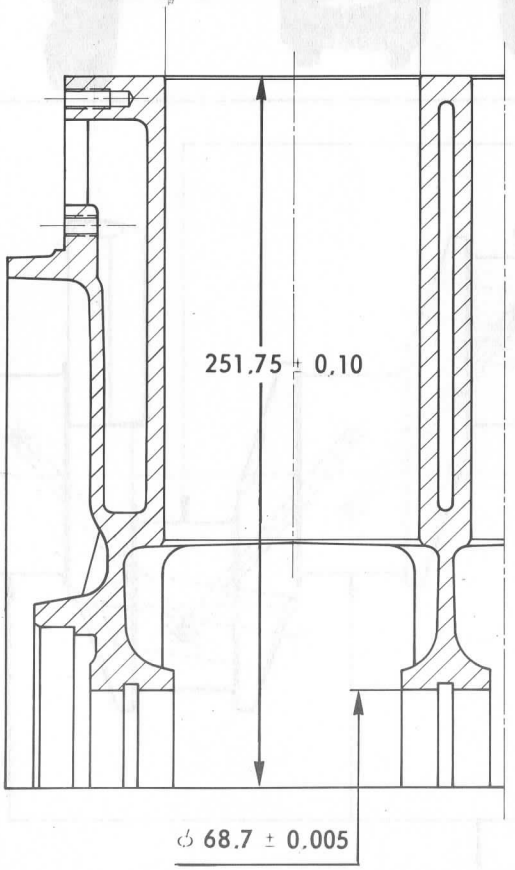
Nominal diameter	Mark	Cylinder diameter
ϕ 93	A 1	93.00 to 93.01
	A 2	93.01 to 93.02
	A 3	93.02 to 93.03

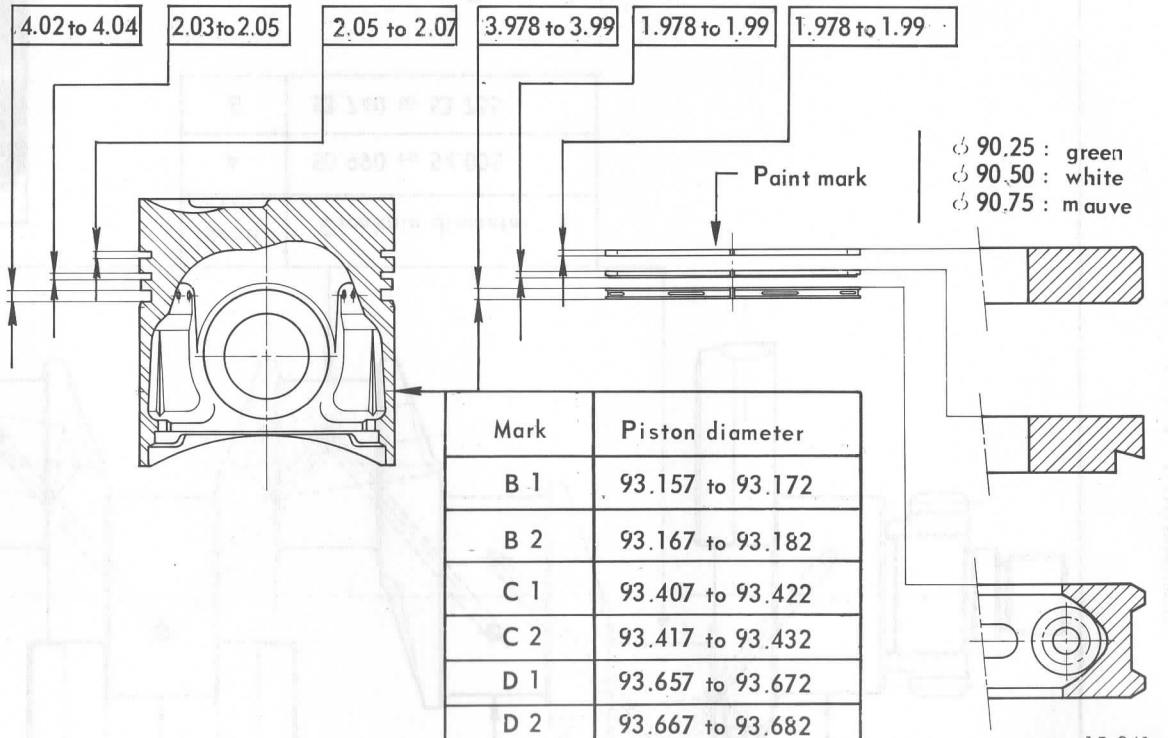
Piston protrusion, from upper face of the cylinder-block : $0.5 \, ^{+\,0.05}_{\;\;0}$ mm (adjustment to be made by the repairer whenever the piston is changed).

The Replacement Parts Department only supplies piston, gudgeon pin and piston ring assemblies in sets of four.

CYLINDER-BLOCK - PISTONS (Repair fitting) (2500 cc engine)

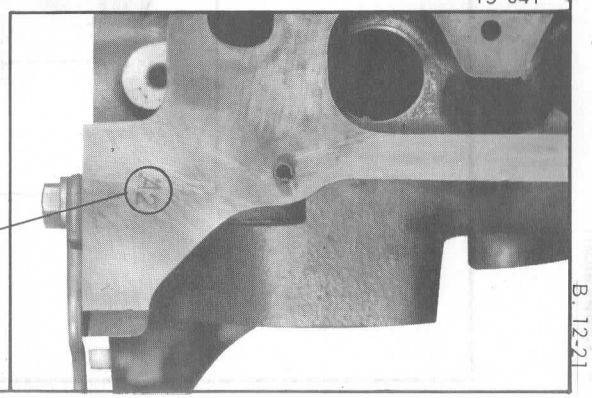
Nominal diameter	Mark	Cylinder diameter
93.25	B 1	93.25 to 93.26
	B 2	93.26 to 93.27
93.50	C 1	93.50 to 93.51
	C 2	93.51 to 93.52
93.75	D 1	93.75 to 93.76
	D 2	93.76 to 93.77





Mark	Piston diameter
B 1	93.157 to 93.172
B 2	93.167 to 93.182
C 1	93.407 to 93.422
C 2	93.417 to 93.432
D 1	93.657 to 93.672
D 2	93.667 to 93.682

15 041



In the case of re-bore of cylinder block the identification mark must be stamped out and replaced by the mark corresponding to the new cylinder diameter.

To be carried out by the repairer

Piston protrusion from upper face of cylinder-block : *(according to nominal diameter)* :

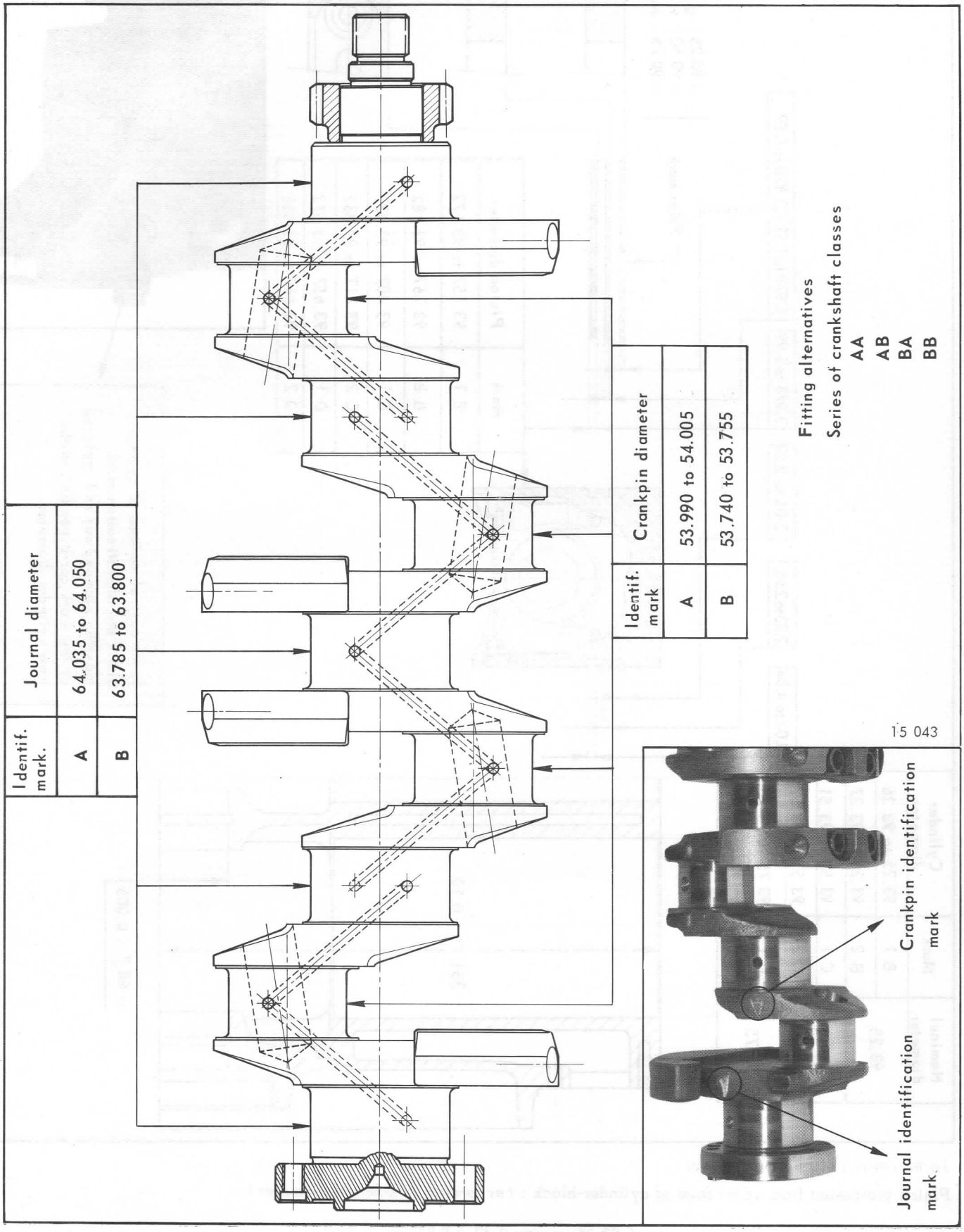
ϕ 93.25 ⟶ 0.47 $^{+0.05}_{0}$ mm

ϕ 93.50 ⟶ 0.44 $^{+0.05}_{0}$ mm

7. Crankshaft :

CRANKSHAFT *(2500 cc engine)*

L.12-9



Identif. mark.	Journal diameter
A	64.035 to 64.050
B	63.785 to 63.800

Identif. mark	Crankpin diameter
A	53.990 to 54.005
B	53.740 to 53.755

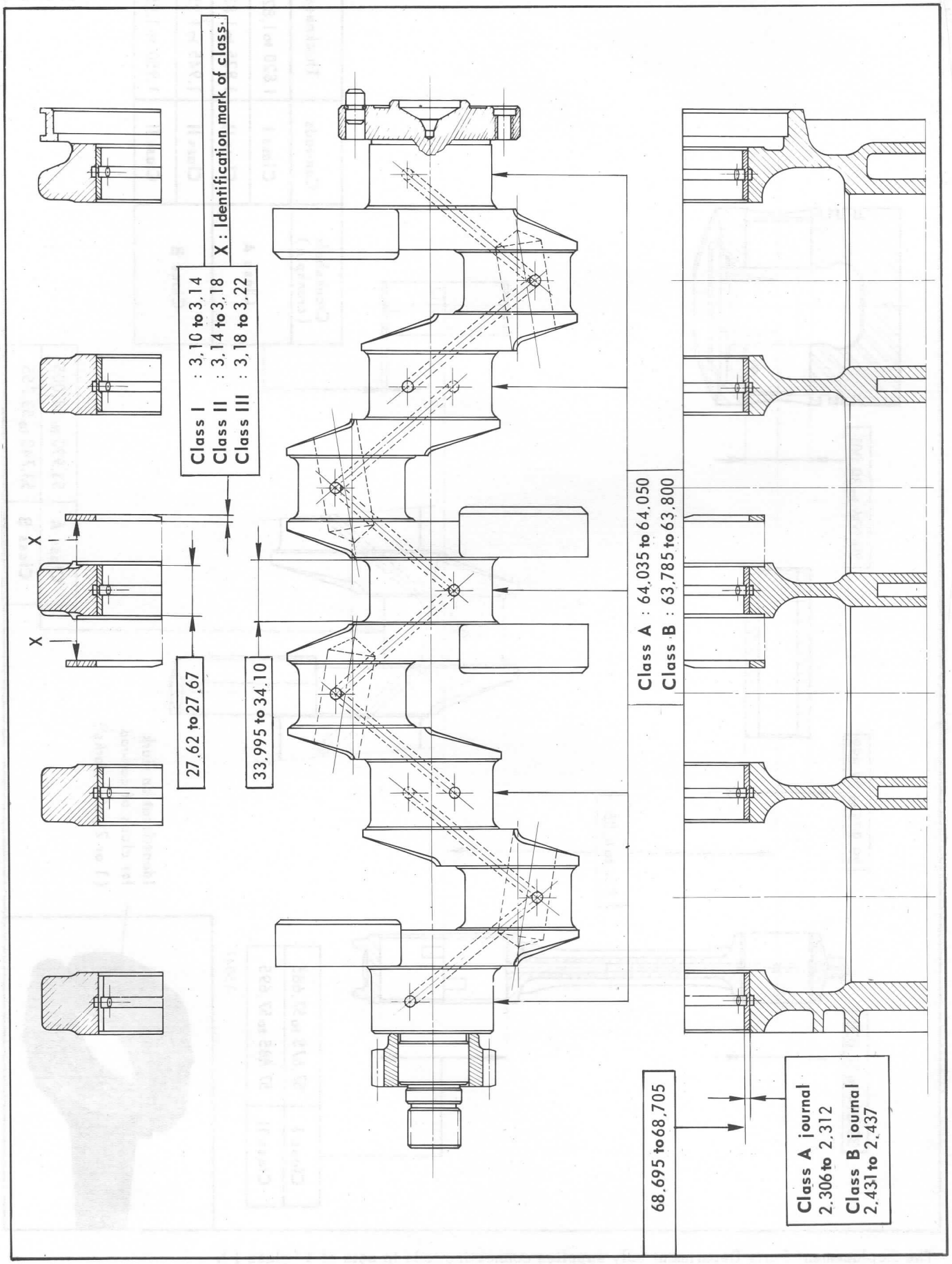
Fitting alternatives
Series of crankshaft classes
AA
AB
BA
BB

15 043

- The Replacement Parts Departement only supplies one class of crankshaft : AA.

CRANKSHAFT BEARINGS AND RINGS *(2500 cc engine)*

L 12-10



Crankshaft end-float : 0.07 to 0.17 mm.

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (ADD)

CRANKSHAFT - CONNECTING RODS - PISTONS *(2500 cc engine)*

B.12-13

Crankshaft (crankpin)	Con-rods	Thickness
Class A	Class I	1.820 to 1.826
	Class II	1.825 to 1.831
Class B	Class II	1.945 to 1.951
	Class II	1.950 to 1.956

Class A	53.990 to 54.005
Class B	53.740 to 53.755

30.006 to 30.001

29.995 to 29.999

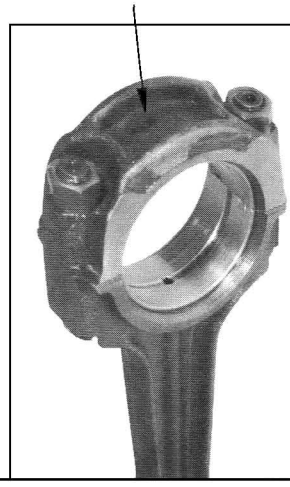
154 to 0.05

30.014 to 30.020

Class I	57.675 to 57.685
Class II	57.685 to 57.695

15047

Identification mark for class of con-rod (1 or 2 paint marks)



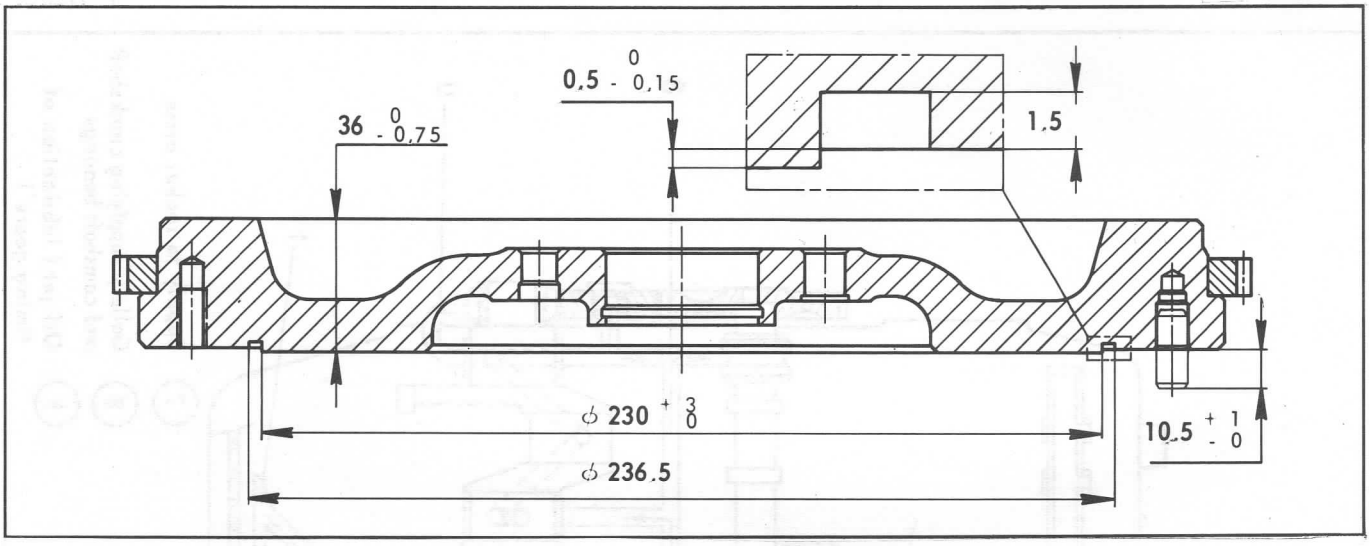
The Replacement Parts Department only supplies connecting rods in sets of 4 (class 1).

End-float of connecting rods on crankshaft : 0.037 to 0.247 mm.

Variation in the weight of the connecting rods on the same engine : 7 g. max.

8. Flywheel :

L. 12-11



Correct fitting of starter ring : non machined face of the ring facing the flywheel shouldering.

9. Lubrication circuit :

- Grade of oil :
  Temperature below - 6° C : TOTAL Super Diesel HD 3 C Multigrade 20 W 40
  Temperature from 0° C to - 15° C : TOTAL Super Diesel HD 3 C Multigrade 10 W 30
  Temperature **always** below - 12° C (Northern countries) : TOTAL HD 3 C 10 W Monograde.

- Capacity :
  - after dismantling (engine dry) : 5.8 litres (10.2 pts)
  - after draining and changing the filter : 4.7 litres (8.3 pts)

  Difference between max. and min. marks on dipstick : 0.9 litres (1.6 pts)

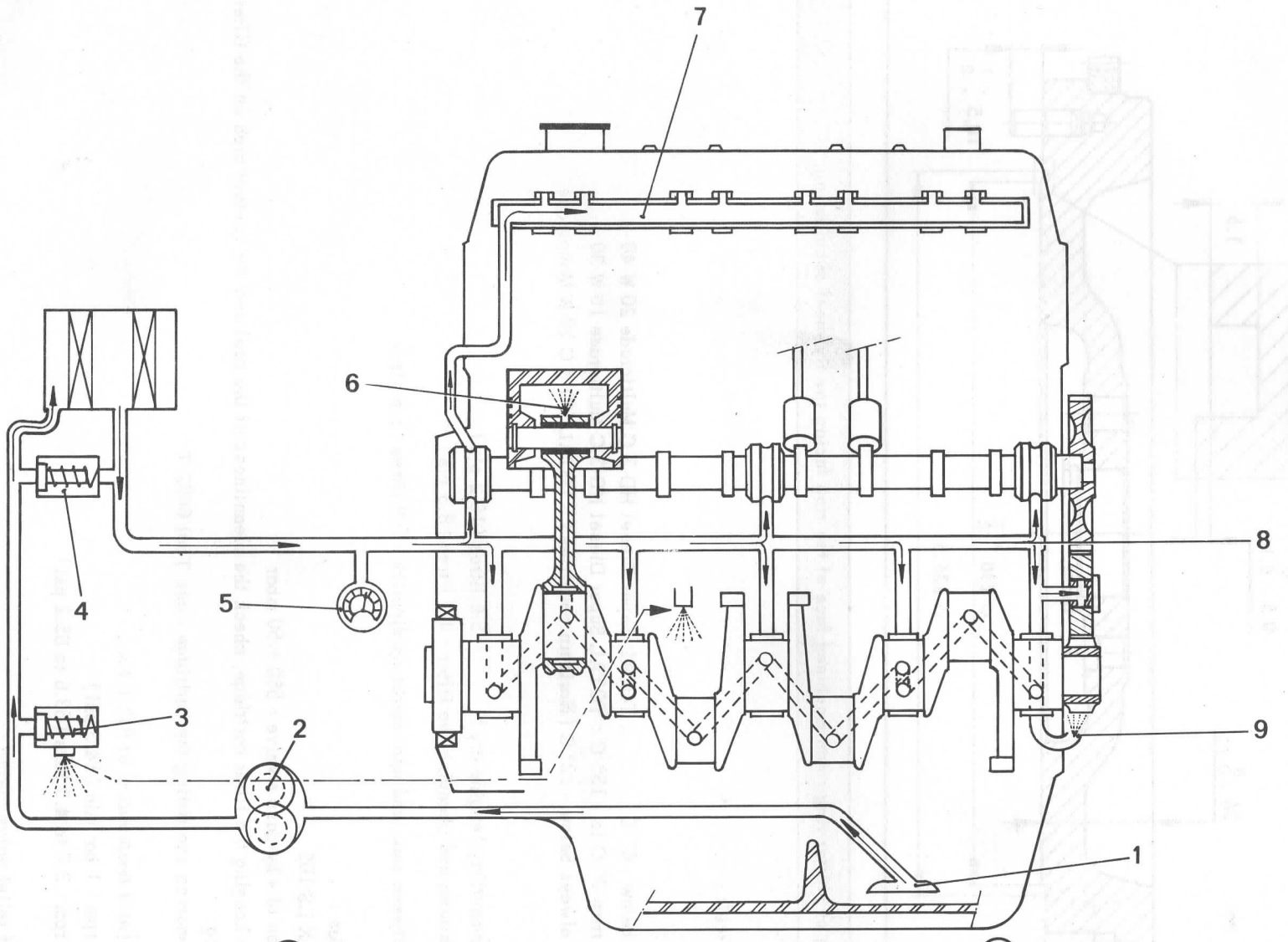
- Filter cartridge :
  PURFLUX LS 105
  Calibration of « by-pass » valve : 550 ± 50 mbar

NOTE : When changing the filter cartridge, check the cleanliness of the seal and the contact area on the filter housing.
For removing and fitting the cartridge : use Tool 6002-T.

- Oil pressure *(at a temperature of 95° C)* :
  - at 1000 rpm : 1 bar min (14.5 psi)
  - at 3500 rpm : 3.7 to 4.5 bars (53.6 to 65.2 psi)

- Calibration of relief valve spring :
  - length of spring fully compressed : 31 mm
  - length of spring under load of 10.9 kg : 42 mm

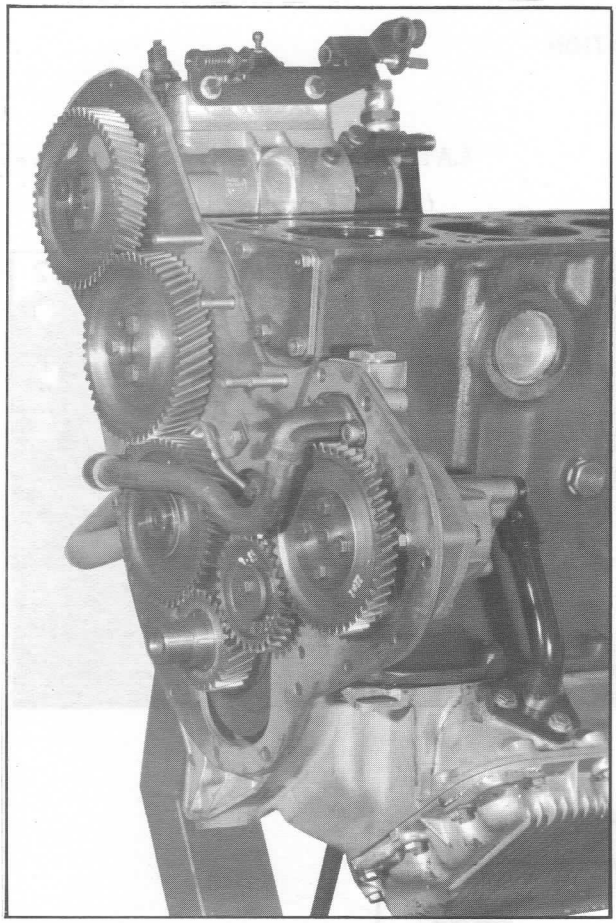
- Calibration of pressure switch :
  - Increase in pressure : warning lamp goes out for a pressure in excess of 0.800 bar
  - Pressure drop : warning lamp comes on between 0.575 and 0.475 bars



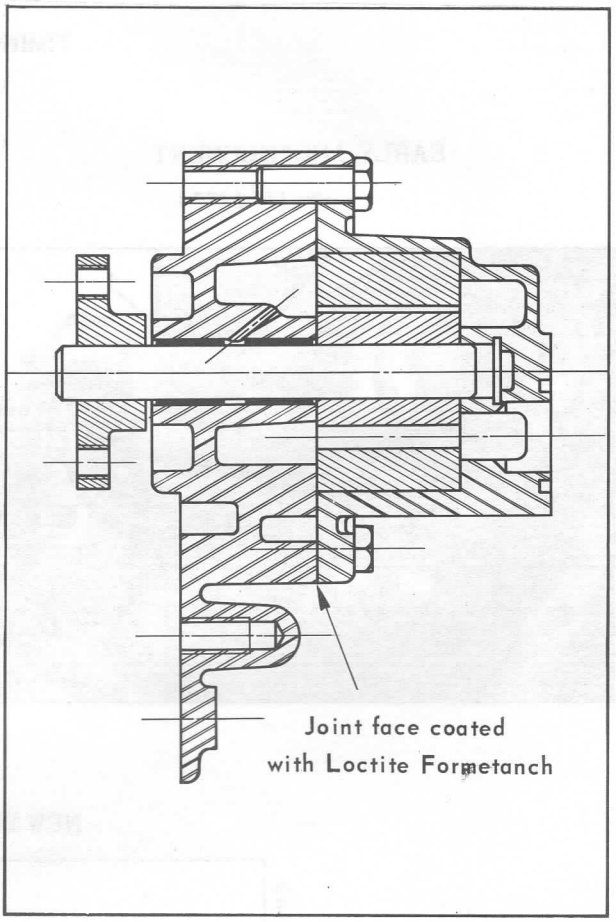
1. Suction strainer
2. Oil pump
3. Pressure relief valve
4. By-pass valve (incorporated in filter cartridge)
5. Oil-pressure switch
6. Oil cooling inside piston
7. Supply to rocker arms
8. Gallery supplying crankshaft and camshaft bearings
9. Oil jet (lubrication of timing gears)

OIL PUMP

15140

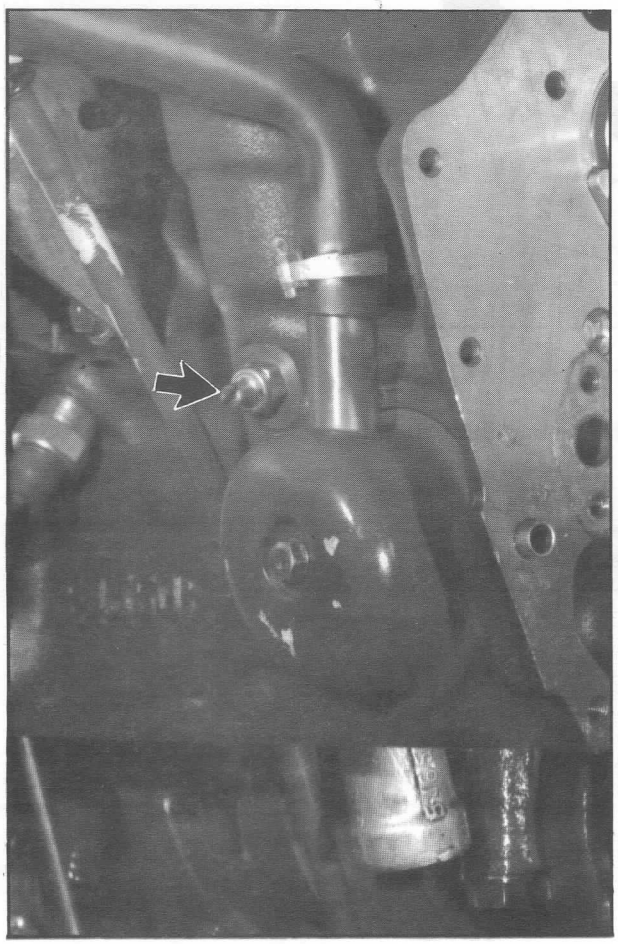


L. 22-2



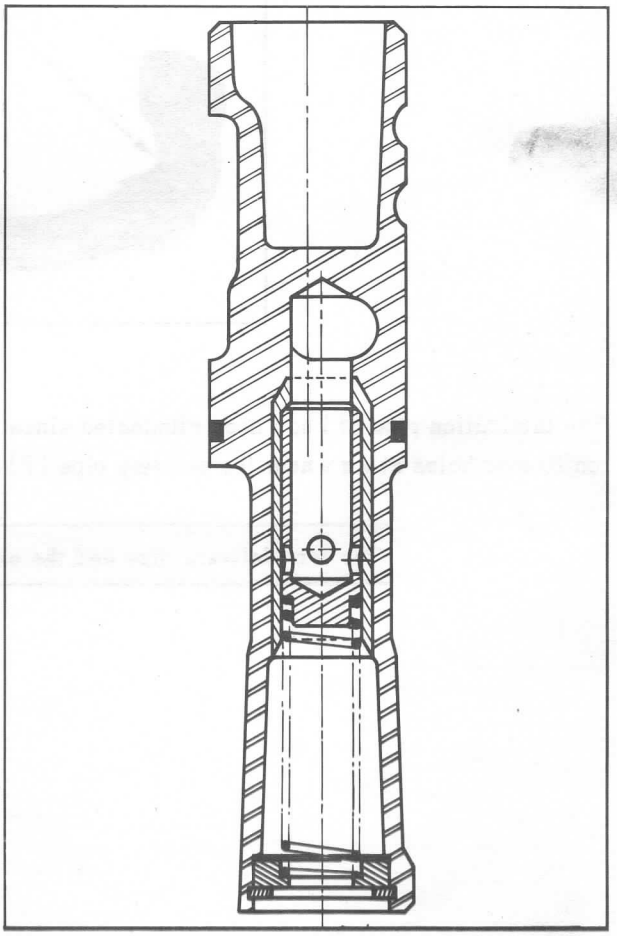
PRESSURE RELIEF VALVE

15094



➡ Set screw for fixing the pressure relief valve

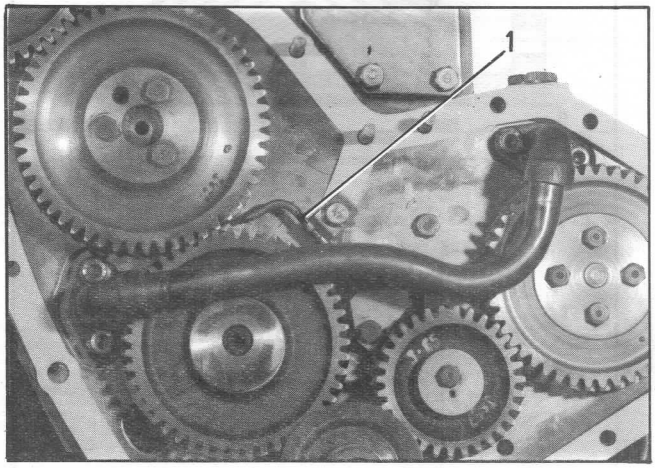
L. 22-4



TIMING LUBRICATION

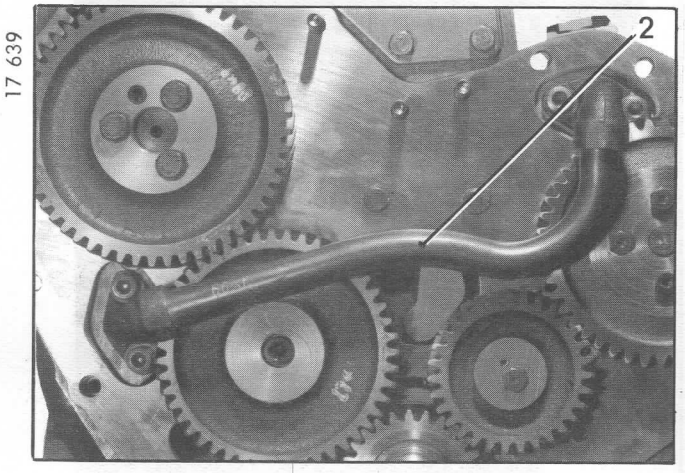
EARLY ARRANGEMENT

(⟶ 11/1977)

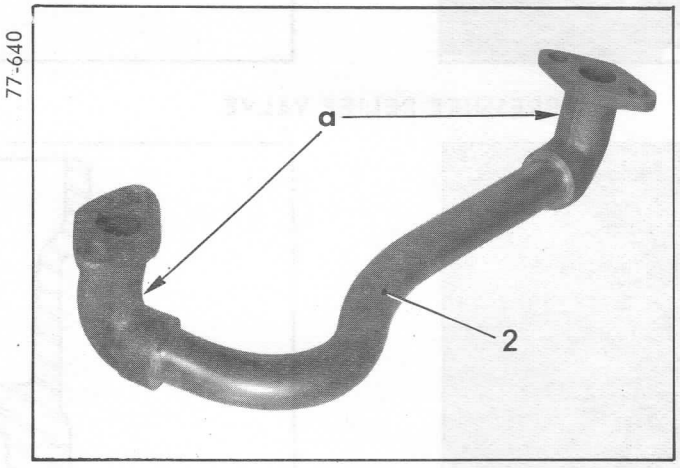


LATE ARRANGEMENT

(11/1977 ⟶)



NEW DELIVERY PIPE

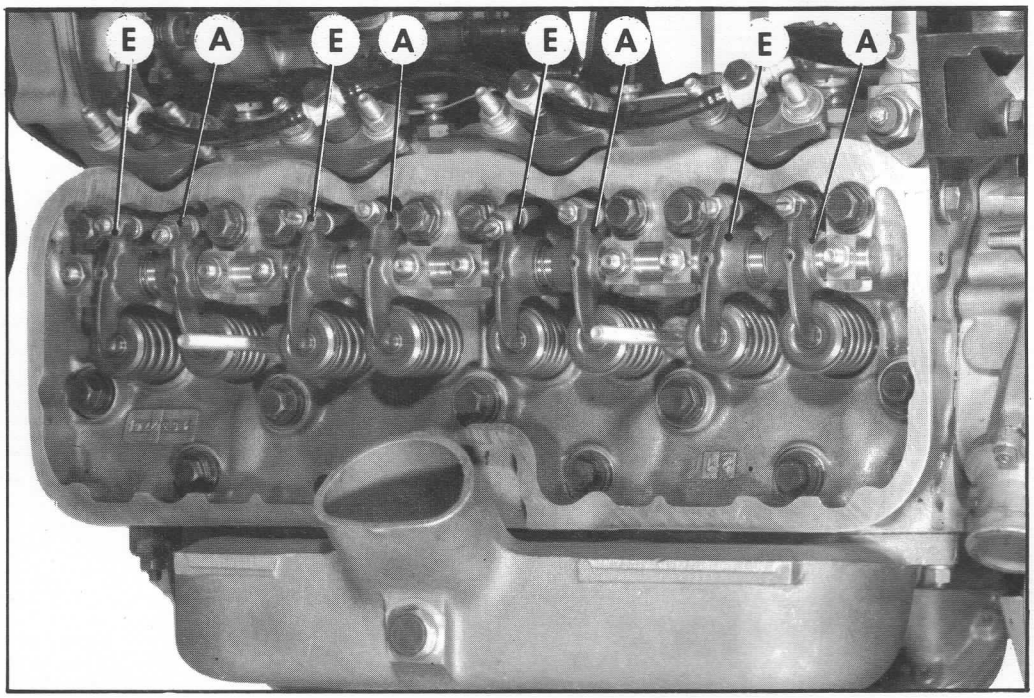


The lubrication pipe (1) has been eliminated since *11/1977*. The timing lubrication is now provided through two calibrated holes at « a » near the delivery pipe (2) flanges.

The late delivery pipe and the one of the early type cannot be interchanged.

ADJUSTING THE ROCKER ARMS

15185



Rotating the crankshaft :

Vehicles fitted with a manual gearbox :
Raise one front wheel of the vehicle, and engage 4th ou 5th gear in order to rotate the crankshaft by means of the raised wheel.

Vehicles fitted with a torque converter :
There are two methods for rotating the crankshaft :
- feed the starter using a 6-volt battery,
- remove the protective plate under the converter casing, and rotate it using a screwdriver.

Never attempt to rotate the engine using the camshaft pulley locknut.

1. Remove the rocker cover.

2. Adjust the rocker arms :

With the engine cold { **Inlet : 0.30 mm**
Exhaust : 0.20 mm

3. Fit the rocker cover and its gasket :
Tightening procedure :
Screw up each nut by hand until it comes into contact with the copper washer, then, using a spanner, tighten the nut by turning it by 1 1/2 turns.
This tightening corresponds to a torque of **0.5 to 0.8 da Nm (3.5 to 6 ft.lb).**

ACCEPTABLE METHODS

I. « Rocking the valves :

(Inlet valve starting to open, and exhaust valve closing)

Bring No. 1 in « rocking position » adjust No. 4
" No. 3 " " " " No. 2
" No. 4 " " " " No. 1
" No. 2 " " " " No. 3

II. Exhaust valves fully open :

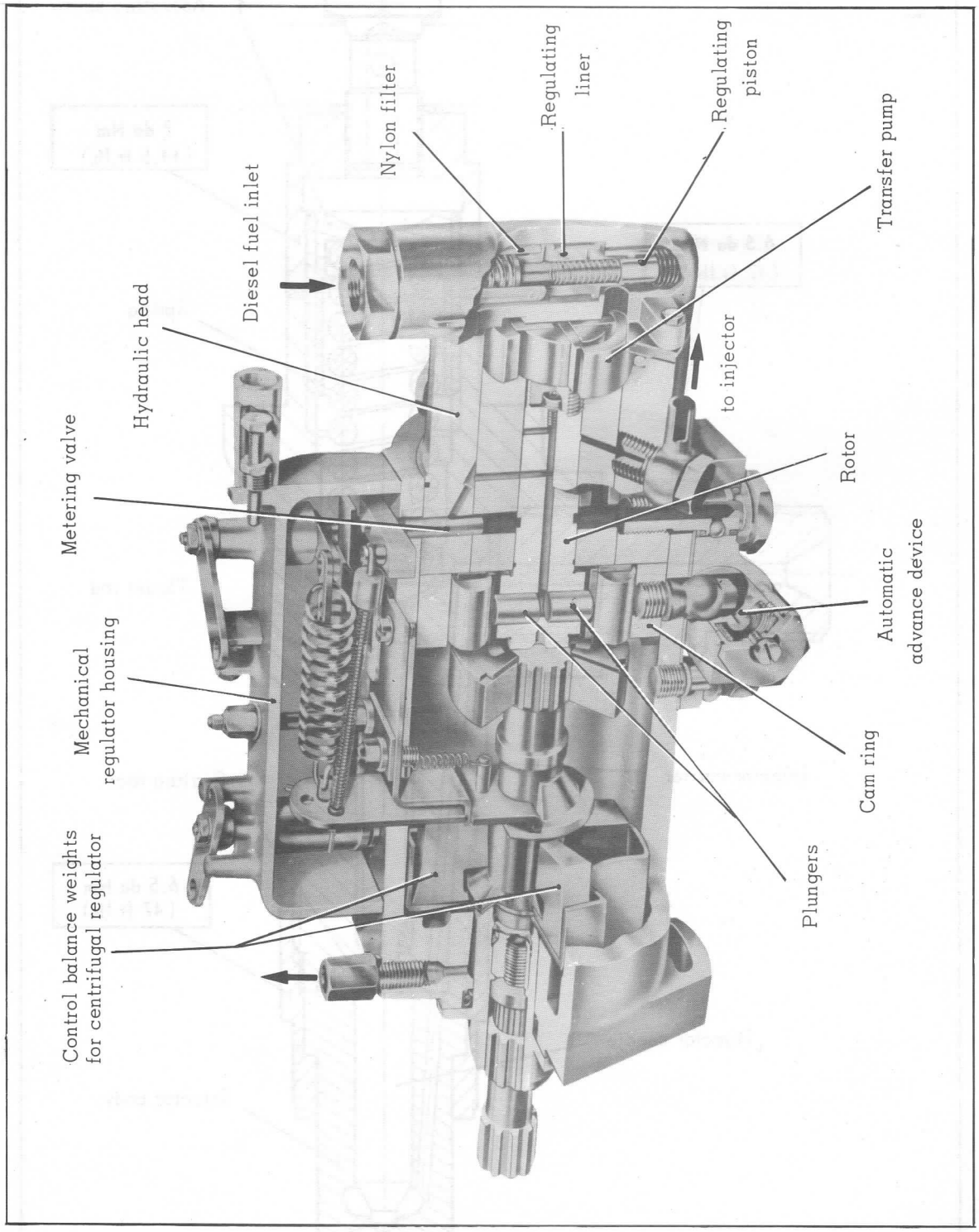
Valve to be opened fully :	Adjustment of rocker arm clearance	
	Inlet	Exhaust
Exhaust valve No. 1	No. 3	No. 4
" " No. 3	No. 4	No. 2
" " No. 4	No. 2	No. 1
" " No. 2	No. 1	No. 3

OPERATION No. MA.Di. 144-00 : *Characteristics of the injection system.* **Op. MA.Di. 144-00** 1

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

14 699

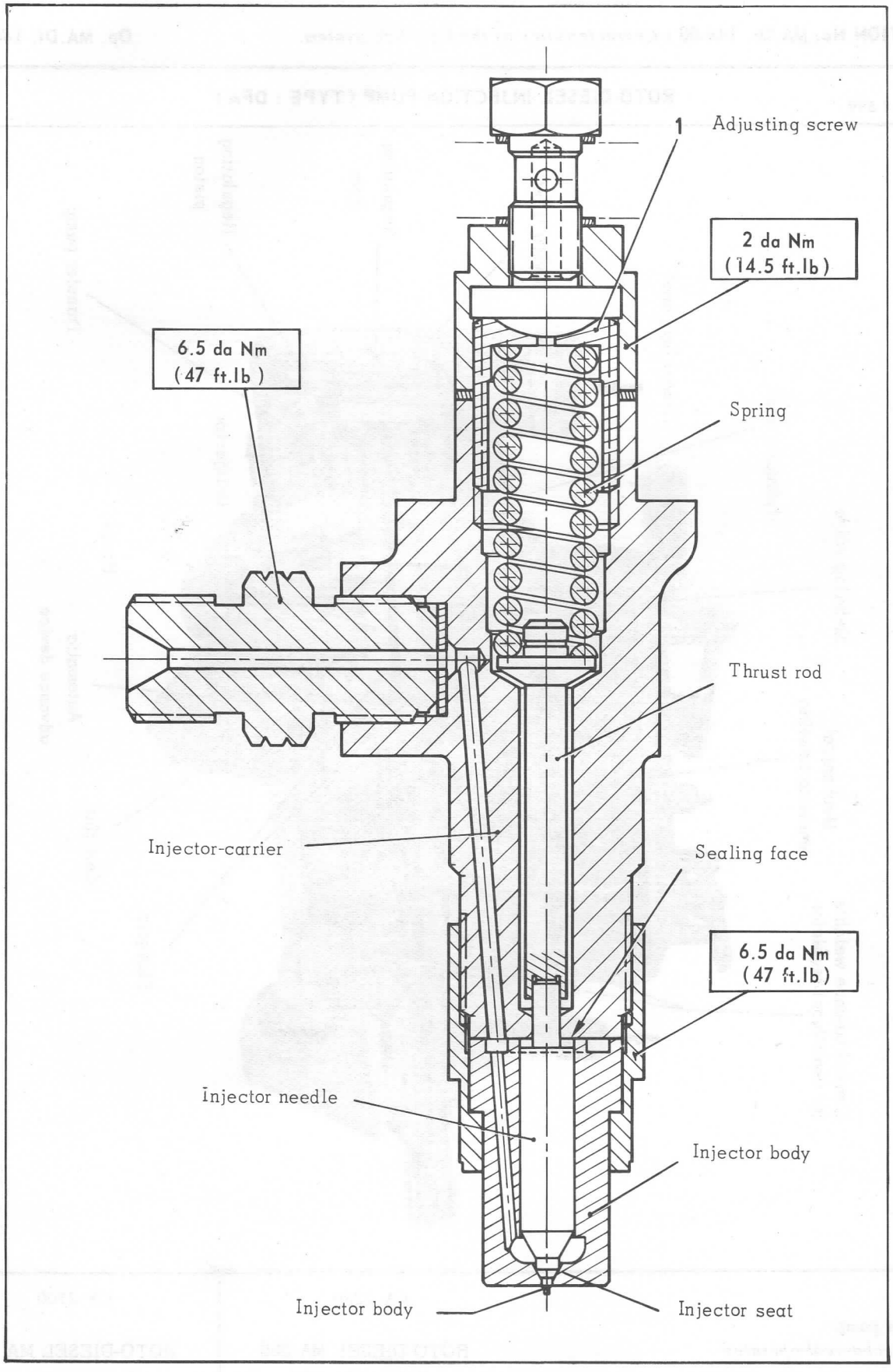
ROTO-DIESEL INJECTION PUMP (TYPE : DPA)



	CX 2200	*CX 2500*
Injection pump :		
- *with mechanical-operated stop control (⟶ 6/1976)*	ROTO-DIESEL MA 200 R 34 - 43 - 380	ROTO-DIESEL MA 220
- *with electrically-operated stop control (6/1976 ⟶)*	ROTO-DIESEL MA 200 R 34 - 43 - 390	ROTO-DIESEL MA 220 R 34 - 43 - 430
Injection static advance	24° or 4.68 mm before TDC	24° or 5.12 mm before TDC
Engine regulating speed (loadless)	4950 ± 50 rpm	4700 ± 50 rpm

SECTION OF INJECTOR-CARRIER AND ROTO-DIESEL INJECTOR

L 14-2



Injector carrier ..... RKB 45 SD 5413

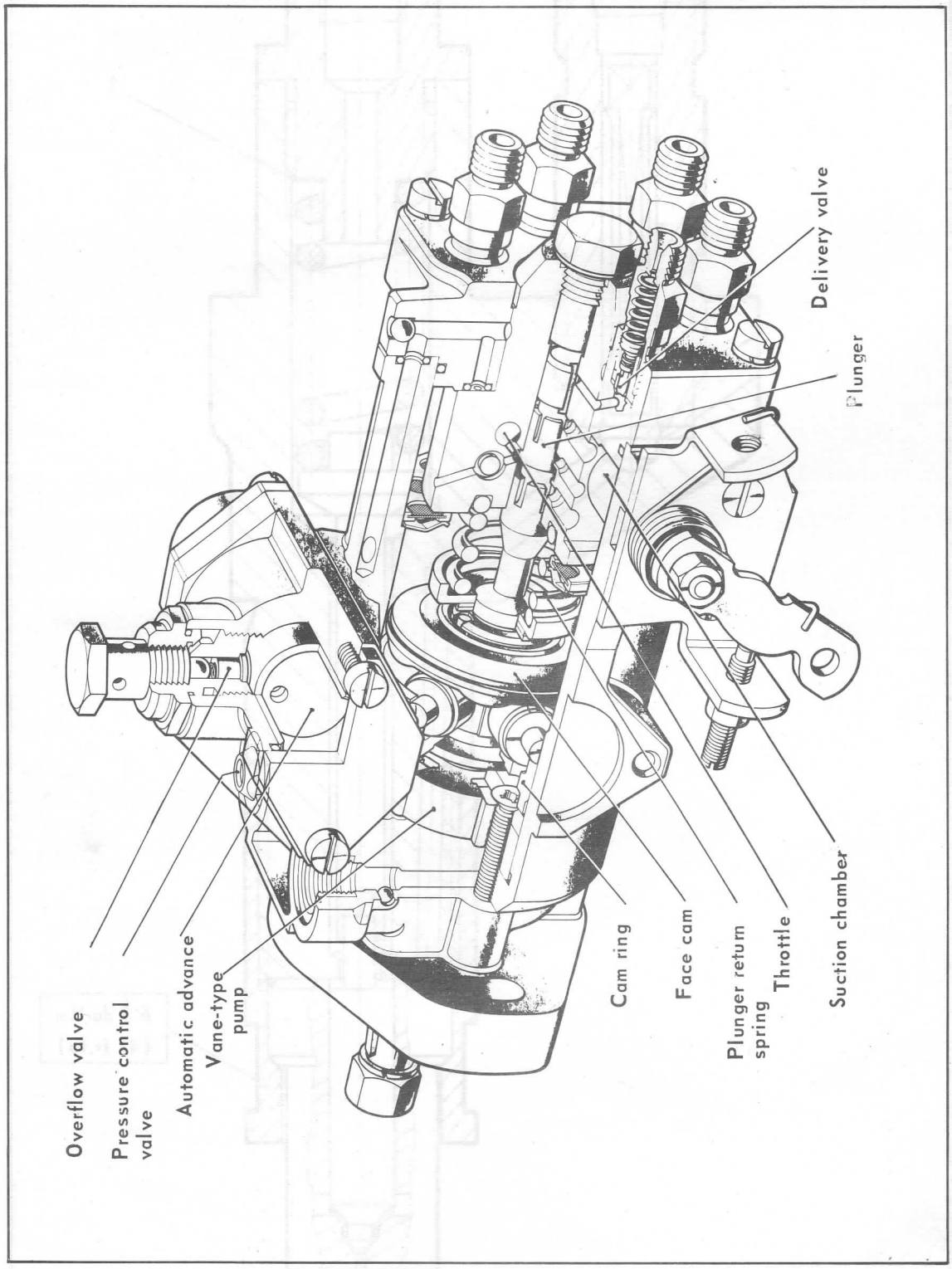
Injector ..... RDN OSDC 6577

Calibration : *Adjustment by screw (1)*

- new injector carrier ..... 122^{+5}_{0} bar ($1769^{+72.5}_{0}$ psi)
- used injector carrier ..... 112^{+5}_{0} bar ($1624^{+72.5}_{0}$ psi)

BOSCH DISTRIBUTOR-TYPE INJECTION PUMP (TYPE : MA 100)

B. 14-2 a



Injection pump : ..... BOSCH, Type MA 100 - Ref. VA 4/90 H 2250 CL 186

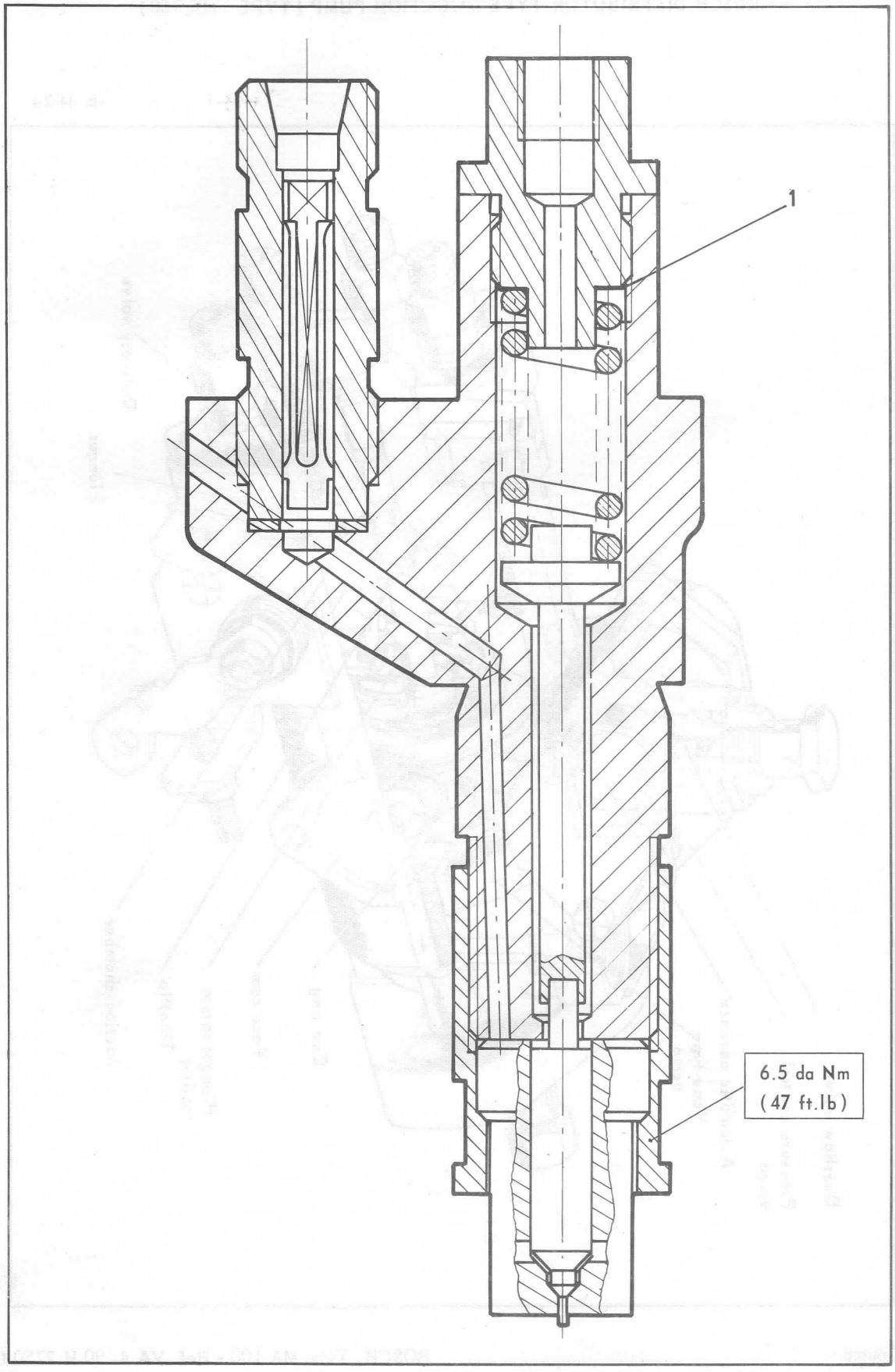
Injection static advance

(for a pump piston lift of 0.45 ± 0.01 mm) : ..... 12° or 1.19 mm before TDC

Engine regulating speed (loadless) : ..... 5050 ± 50 rpm

SECTION OF A BOSCH INJECTOR-CARRIER AND INJECTOR

B. 14-4



Injector carrier — BOSCH Type KB 50 S 621/ 13

Pintle type injector — BOSCH Type DNSO 5 D 189

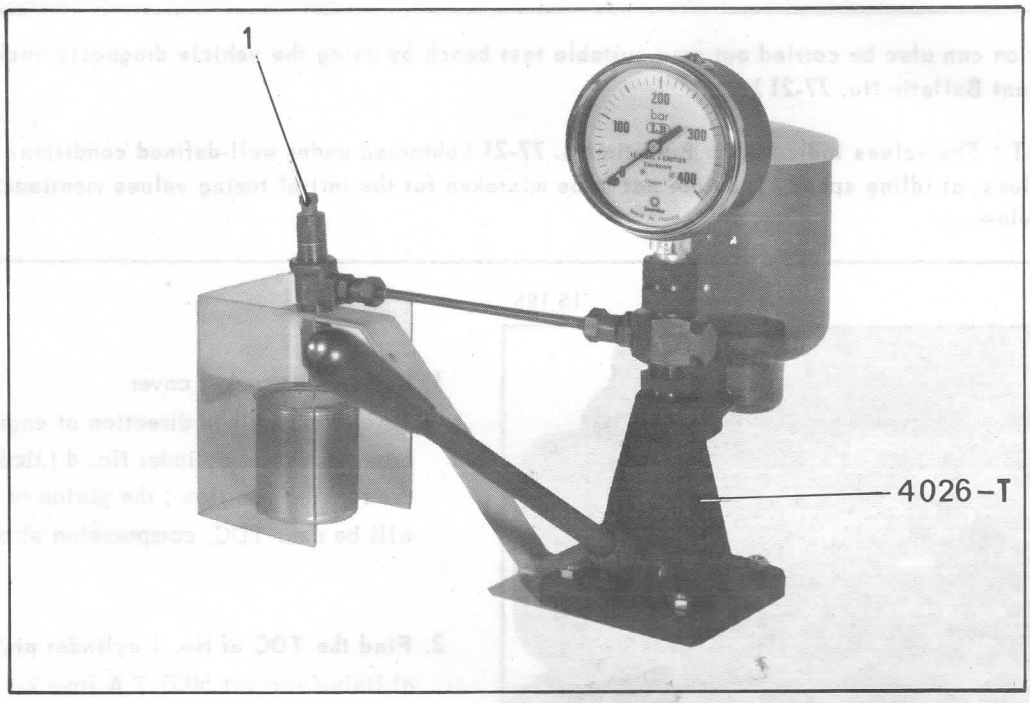
Calibration : *Adjustment by washer (1) from 1 to 1.95 mm in steps of 0.05 mm*

130^{+8}_{0} bars for new parts (1885^{+116}_{0} psi)

120^{+8}_{0} bars for used parts (1740^{+116}_{0} psi)

I. ADJUSTING THE CALIBRATION OF AN INJECTOR

78-228



Testing liquid : Refined paraffin - Kerdanne or Dilutine
Viscosity : 1 to 2.5 centistocks at 20° C
Density : 0.77 to 0.81 at 20° C

As paraffin has a flash point of 45° C, it is essential to take the necessary precautions and ensure that the required fire regulations are observed.

Keep hands away from the paraffin jets (*use a transparent protective screen*). The penetrating force of these jets is such that they could cause serious injury and cause blood poisoning.

The calibration adjustment screw (1) of the injector must only be screwed up or unscrewed on bench 4026-T. The pump lever must be actuated continuously in order that the seating and needle are continually lubricated and cleaned.

1°) Calibration pressure :

Adjust spring pressure to recommended value

	Roto-Diesel	Bosch
New injector carrier	$122\ ^{+5}_{0}$ bars	130^{+8}_{0} bars
Used injector carrier	$112\ ^{+5}_{0}$ bars	$120\ ^{+8}_{0}$ bars

If the pump lever is actuated with a brisk sharp action, the injector should produce a very fine and homogeneous spray.

2°) Tightness of needle seating :

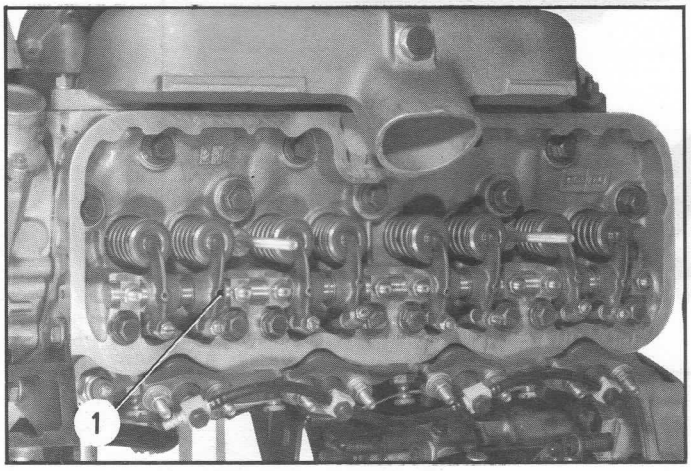
Tests should be carried out with the injector-carrier assembly in a vertical position and the injector positioned downwards.
Wipe the end of the injector so that it is dry.
By actuating the calibrating pump lever, maintain a pressure 10 bars below calibration pressure.
The injector **should not drip** within 30 seconds.
Moistening should not be regarded as a reason for rejection.

II. CHECKING AND TIMING THE INJECTION PUMP (ROTO-DIESEL)

This operation can also be carried out on a suitable test bench by using the vehicle diagnosis socket (See Tools and Equipment Bulletin No. 77-21).

IMPORTANT : The values indicated in Bulletin No. 77-21 (obtained under well-defined conditions) are injection advance values, at idling speed. They are not to be mistaken for the initial timing values mentioned in the operation below.

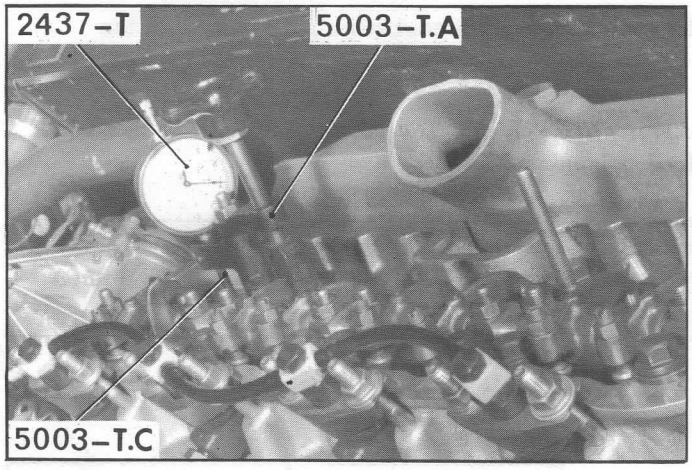
15 185



1. Remove the rocker cover.
   Turn crankshaft in direction of engine rotation to bring valves of cylinder No. 4 (timing end) into the rocking position ; the piston of **cylinder No. 1** will be near TDC, compression stroke.

2. **Find the TDC of No. 1 cylinder piston :**
   a) Using support 5003-T.A from kit 5003-T a , remove exhaust valve springs from No. 1 cylinder.
   Free push rod and tilt rocker arm (1).

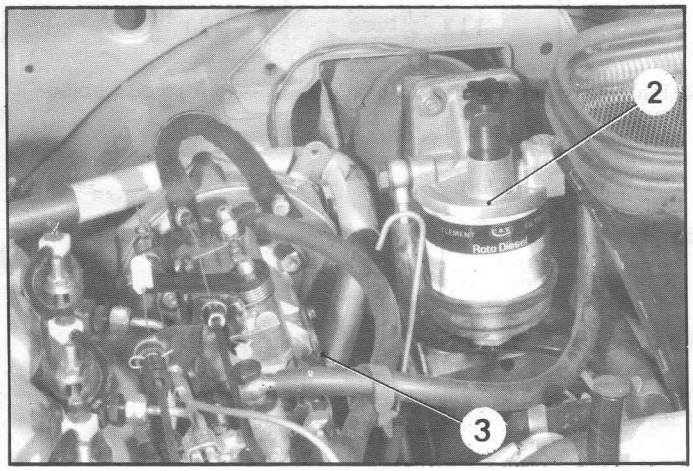
76-39



Take care that the valve does not fall into the cylinder when piston is at BDC.
Accompany the movement of the valve to maintain it in contact with the piston head ; hold the valve if the crankshaft is to make a complete rotation.

   b) Find TDC of No. 1 cylinder.
   Position support 5003-T.A equipped with dial gauge 2437-T fitted with extension 5003-T.C.
   Turn crankshaft (a quarter of a turn) in the opposite direction to normal engine rotation then in the normal direction of rotation to the precise point when the large needle of the dial gauge changes direction, which corresponds to TDC of the piston.
   Set the zero mark of the movable dial of the dial gauge in line with the large needle and note position of totalizer needle.

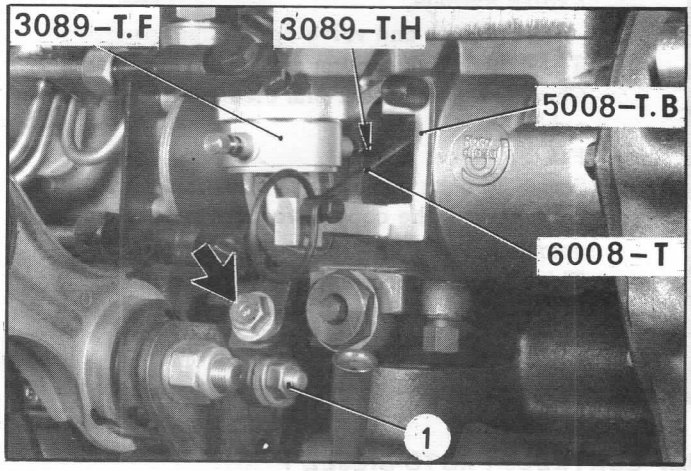
15 089



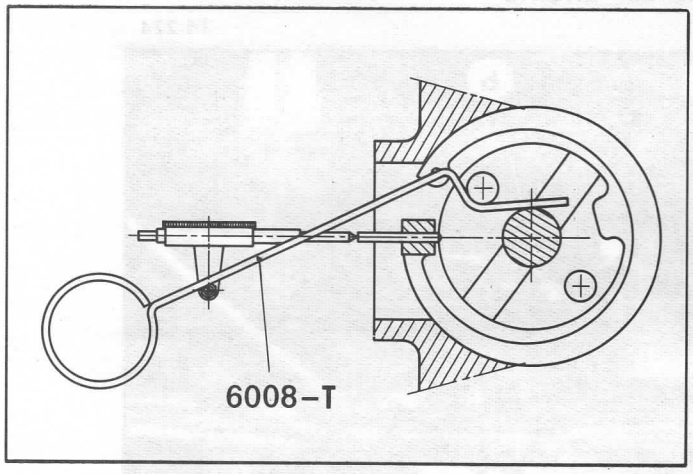
3. Turn the crankshaft in the opposite direction to engine rotation to lower the piston by 7 mm (7 turns of the large needle of the 2437-T dial gauge).

4. Remove Diesel fuel filter (2).
   Remove the dipstick.
   Remove the inspection cover (3) of the injection pump.

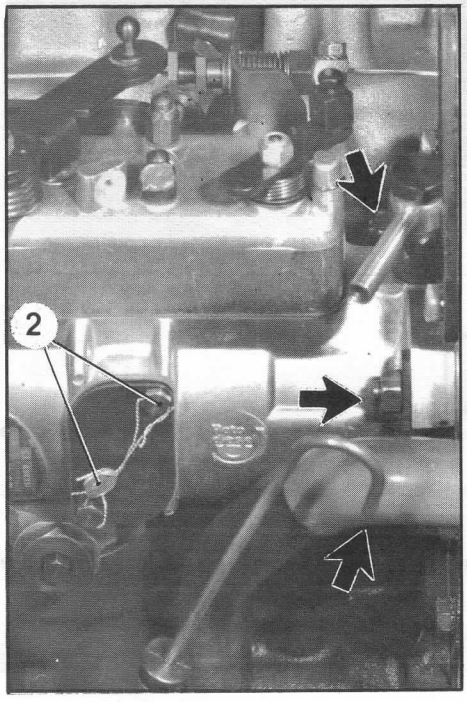
76-13



L 17-1



15 186



For nuts (➡), use a 13 mm open spanner

5. Find internal timing point of pump :

a) Position :
- support 5008-T.B,
- probe 3089-T.H,
- dial-gauge 3089-T.F,
- play take-up rod 6008-T.

b) Turn the crankshaft in the normal direction of engine rotation up to the precise point when large needle of dial gauge 3089-T.F changes direction (probe being at the deepest point in the groove of the distributor rotor).
Set zero mark of movable dial opposite large needle and note position of totalizer needle.

6. Check the timing of the injection pump :

a) Return piston to TDC.

b) Turn crankshaft in the opposite direction to engine rotation until the piston has dropped 7 mm before TDC (i.e. 7 complete turns of large needle of dial gauge 2437-T).

c) Turn crankshaft in the normal rotation of engine rotation until pump internal timing point is reached. In this position the dial gauge 2437-T must indicate the correct setting i.e.

CX 2200 : **4.68 ± 0.03 mm before TDC**
CX 2500 : **5.12 ± 0.03 mm before TDC**
if not, re-time pump.

7. Adjusting the timing of the injection pump :

a) Reset piston at TDC.

b) Turn crankshaft in the opposite direction to engine rotation until piston has dropped 7 mm before TDC.
Turn the crankshaft in the normal direction of engine rotation to bring piston to point of initial timing ,
i.e. : *CX 2200 :* **4.68 mm before TDC**
CX 2500 : **5.12 mm before TDC**

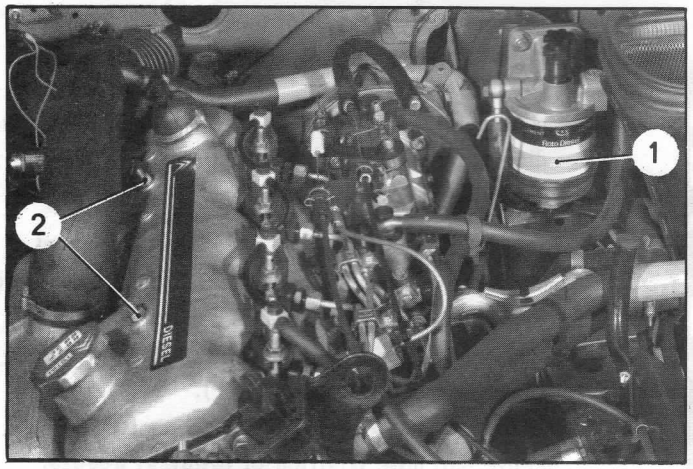
b) Loosen screw (1) (6 mm hexagonal Allen Key) and screws and nuts (➡).
Turn injection pump until large needle of dial gauge 3089-T.F changes direction (probe inserted to maximum extent).
Tighten screws and nuts (➡) and screw (1) checking that needle of dial gauge 3089-T.F does not move.

8. Check timing.

9. Remove :
- play takeup rod 6008-T,
- dial gauge 3089-T.F and support 5008-T.B,
- probe 3089-T.H

Refit inspection plate.
Seal screws (2) (sealing pliers 5008-T.D).

15 089



10. Remove dial gauge 2437-T.
Using support 5003-T.A fit :
- valve springs,
- split collets and valve-spring cup.

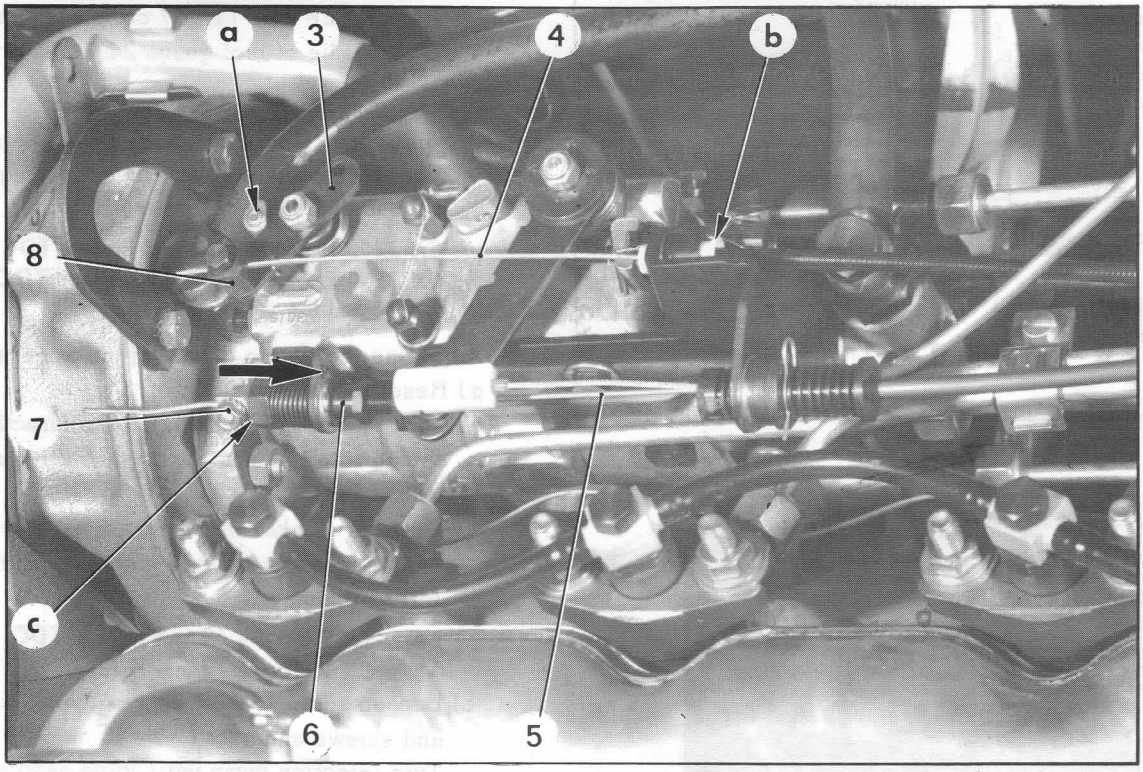
Tilt exhaust rocker arm and position push rod.
Check exhaust rocker arm clearance (0.20 mm cold).
Fit the rocker cover :
Screw up each nut by hand until it comes into contact with the copper washer, then, using a spanner, screw up the nut by 1 1/2 turns.
This tightening corresponds to a torque of
0.5 to 0.8 da Nm (3.5 to 6 ft.lb)

11. Fit fuel filter (1).
Bleed the injection system.

III. ADJUSTING THE INJECTION PUMP CONTROLS (ROTO-DIESEL)

A - CX 2200 - M 22/621 ENGINE

15 224

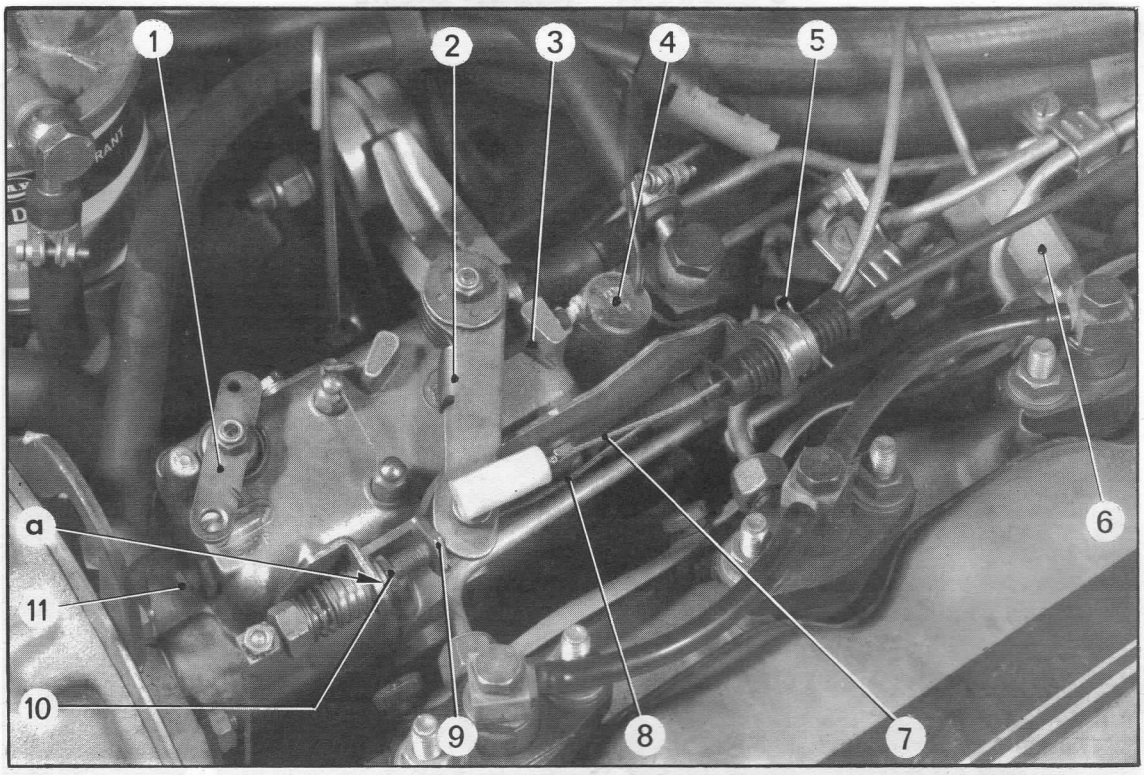


ENGINE COLD

1. Adjusting the shut-off control (⟶ *6/1976*) :
Switch the ignition on.
With lever (3) against its stop at « a » there should be a clearance of 3 ± 1 mm at the end of the cable sleeve at point « b ».
If not, adjust tension of cable (4) by means of cable tightener (8).

2. Adjusting the fast-idle control :
a) Check that control cable (5) is tensioned and that piston (6) is at the « MAX » position (by pushing in the direction of the arrow (➡).
If not, push piston (6) as far as it will go in the direction of the arrow (➡), ensure cable (5) is taut and tighten cable tensioner (7) on its stop at point « c ».

77-544



ENGINE WARM

Wait for the fans to cut-in, and then to cut-out.

b) Check that control cable (8) is slack and that nut (10) is against its stop at point « a ».
If not, check the operation of thermostatic sensor (6) controlling the fast idle : with cable (8) disconnected, there should be a difference of more than 6 mm in the length of the cable between its « engine cold » and « engine warm » positions.

3. Adjusting the accelerator control :

a) Check that lever (2) is against the idling speed stop (9) and that cable (8) is slack. If not, adjust accelerator control by moving pin (5).

b) With the engine stopped, fully depress the accelerator pedal and check that lever (2) is against screw (3). If not, move pin (5).

4. Adjusting the idling speed :

Engine idling speed : 800 ± 25 rpm

PROCEDURE.

Loosen nut (10) and adjust stop (9) to obtain the required idling speed.
If the required speed cannot be obtained, loosen anti-stall stop screw (11).

5. Adjusting the anti-stall stop :

Accelerate the engine several times to its maximum r.p.m. and release the accelerator ; the engine must not stall.
If it does, screw in stop screw (11) to increase idling speed by 50 rpm then unscrew by one turn.
Ensure that idling speed remains within tolerances (800 ± 25 rpm).

6. Checking the stop control :

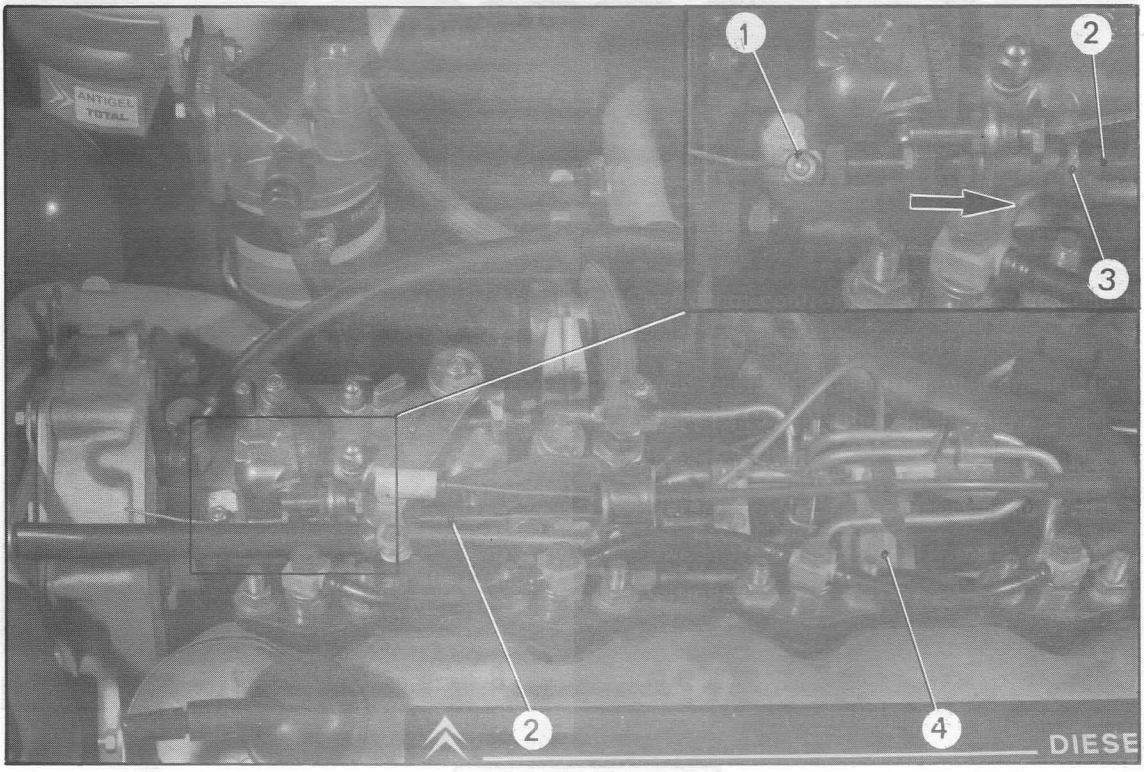
Check that engine stops when switched off.
If not, check the operation of electrically-operated stop control (4) (electrovalve).
- Check the operation of mechanically-operated stop control (1).

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

B - CX 2500 - M 22/629 ENGINE

77-757

77-755



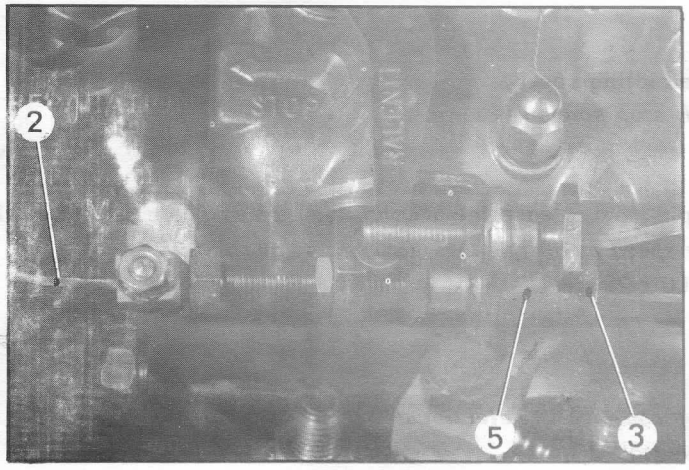
ENGINE COLD

1. Adjusting the fast-idle control :

a) Check that control cable (2) is tensioned and that piston (3) is at the « MAX » position (by pushing in the direction of the arrow (➡).
If not, push piston (3) as far as it will go in the direction of the arrow (➡), ensure cable (2) is taut and tighten cable tensioner (1) on its stop.

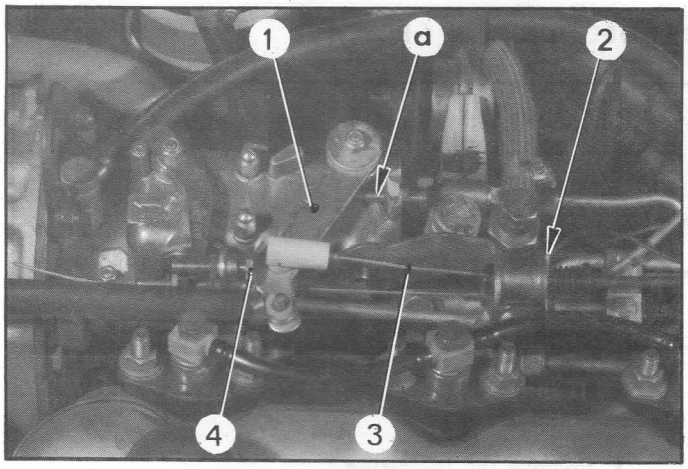
ENGINE WARM

77-759

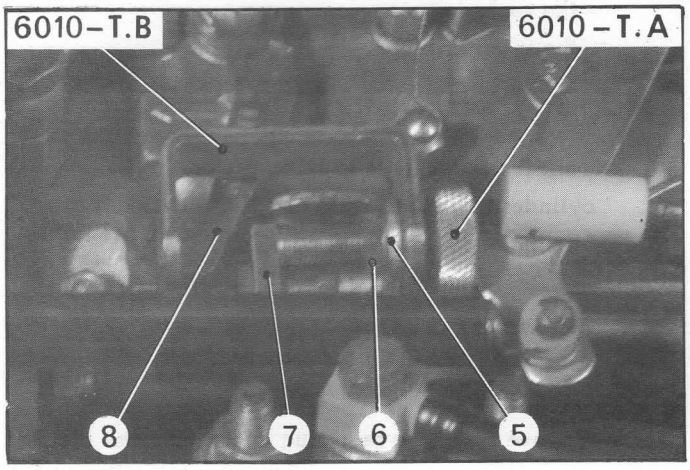


Check that control cable (2) is slack and that piston (3) is against its stop (5).
If not, check the operation of thermostatic sensor (4) controlling the fast idle : with cable (2) disconnected, there should be a difference of more than 6 mm in the length , between its « engine cold » and « engine warm » positions.

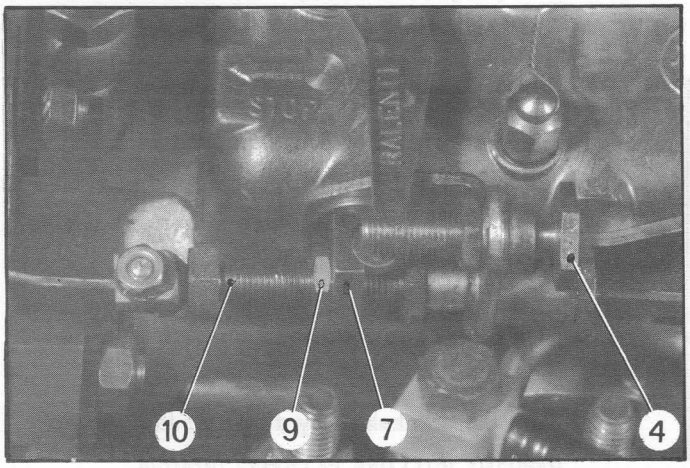
77-757



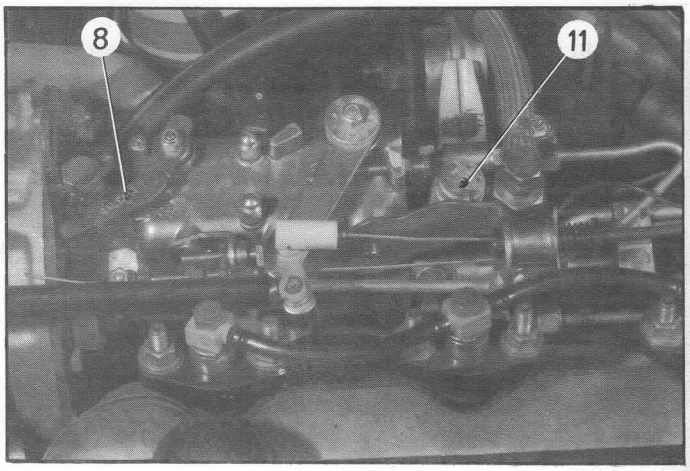
77-758



77-759



77-756



2. Adjusting the accelerator control :

a) With the engine stopped, fully depress the accelerator pedal and check that lever (1) is against the screw at « a ». If not, move pin (2) to obtain this condition.

b) With the accelerator pedal released, check that lever (1) is against stop (4) and that cable (3) is slack. If not, adjust the stop-screw of the accelerator pedal.

3. Adjusting the slow running :

A - Residual output (anti-stalling) :

a) Place shim 6010-T.A against stop (4). (A 2 mm shim can be used in place of shim 6010-T.A).

b) Free idling lever (8) by swivelling stop (7) by 90°. Limit travel of idling lever (8) with stirrup 6010-T.B placed on bracket (5).

c) With engine running, slacken locknut (6), set engine speed at **800 ± 50 rpm** by swivelling the shim 6010-T.A. Then, tighten the locknut.

d) Remove the shim and stirrup, let idling lever rest against its stop (7).

B - Idling speed :

- Slacken locknut (9).
- Set idling speed at : **800 ± 25 rpm** by turning fast idle assembly (10), tighten locknut (9).

4. Testing engine deceleration :

Accelerate the engine fully, then release the accelerator lever. If there is too important a « dive » or too slow a deceleration, (« dive nil »), reset the adjustment, If the malfunction continues to exist, use stop-screw (4) as follows :

- unscrew by a quarter turn if there is too important a « dive »,
- screw up by a quarter turn in case the deceleration is too slow,
- check the idling speed.

5. Check the stop controls :

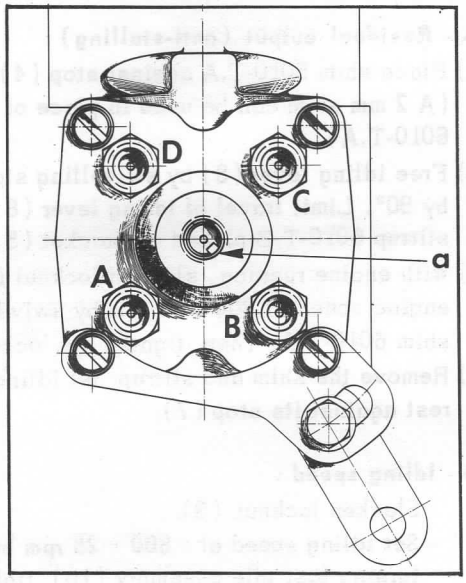
- Check that the engine stops when switching off the ignition.
  If is does not, check the operation of the electrically-operated stop control (11) (electro-valve).
- Also check, if the mechanically-operated stop is working, by disengaging idling lever (8) from shim (7) and by allowing it to come to rest against the engine timing gear casing.

IV. CHECKING AND TIMING THE INJECTION PUMP (BOSCH)

This operation can also be carried out on a suitable test bench by using the vehicle diagnosis socket (See Tools and Equipment Bulletin No. 77-21).

IMPORTANT : The values indicated in Bulletin No. 77-21 (obtained under well-defined conditions) are injection advance values, at idling speed. They are not to be mistaken for the initial timing values mentioned in the operation below.

B.17-1

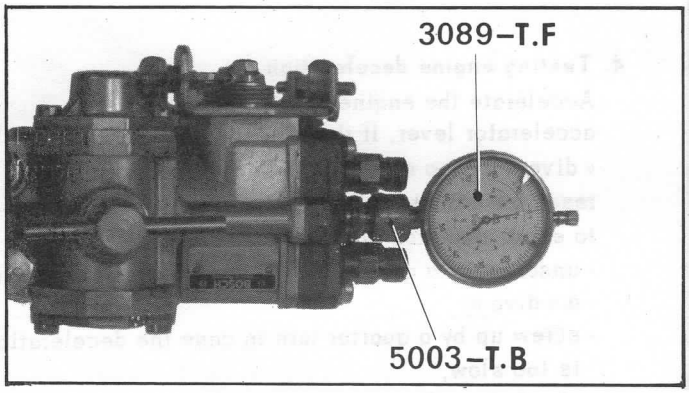


1. Remove the following :
   - the rocker cover,
   - the injector pipes.

2. Turn the crankshaft to bring pistons of No. 1 cylinder (flywheel end) and No. 4 cylinder (timing end) near TDC. *As No. 1 cylinder is on the compression stroke, the valves of No. 4 cylinder are in the rocking position.*

3. Remove the pump rear plug and check that groove « a » of pump distributor piston faces feed outlet **(B)** of No. 1 cylinder.

12107



4. Fit support-grip 5003-T.B, equipped with dial gauge 3089-T.F fitted with contact point 5003-T.D *(from kit 5003-T bis)* in place of pump rear plug.

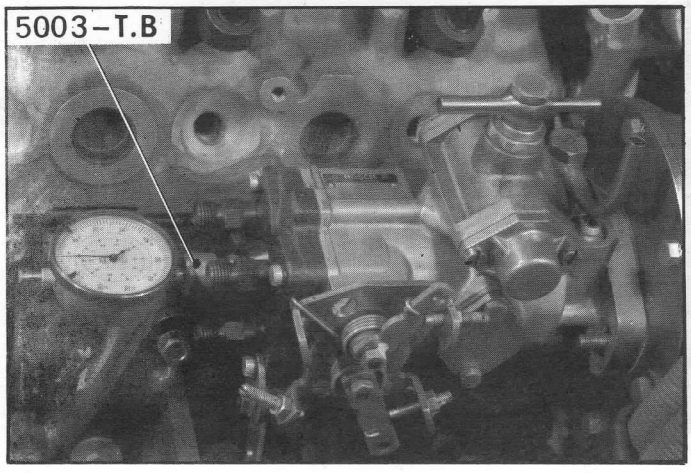
5. **Find BDC of pump distributor piston :**

   a) Turn the crankshaft by a quarter turn *in the opposite direction to engine rotation.*

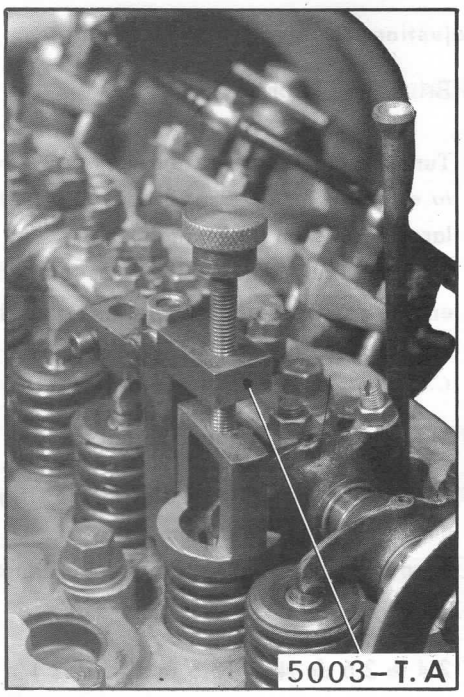
   b) Turn the crankshaft in the engine direction of rotation up to the precise point when the large needle of the dial gauge, once stabilized, starts moving.

   c) Set the zero mark of the movable dial of the dial gauge in line with the large needle and note the position of the totalizer needle.

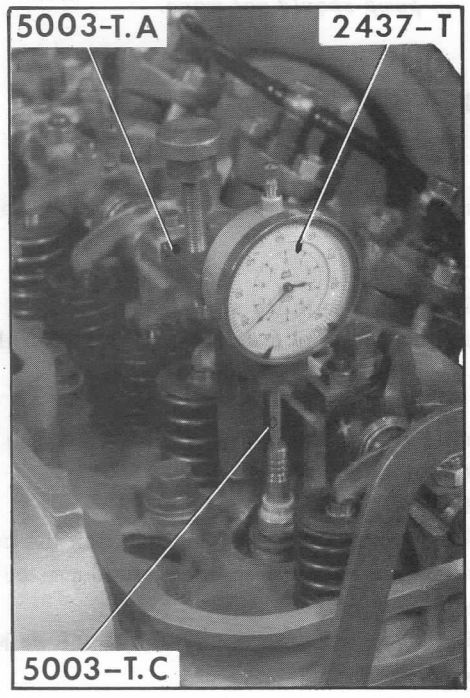
12108



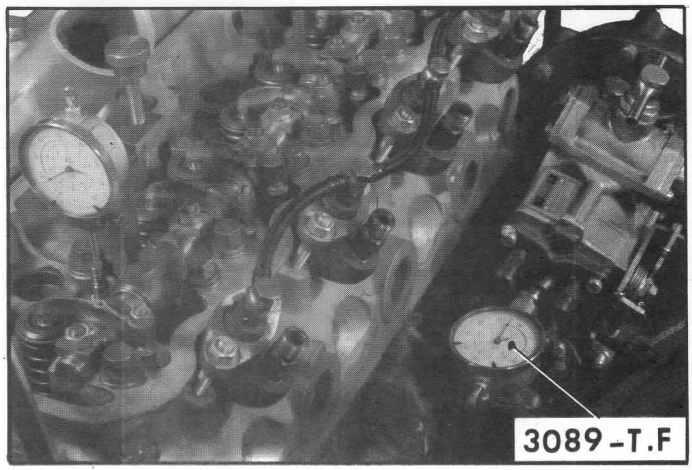
12112



12106



12105



6. Find TDC of No. 1 cylinder piston :

a) Using bracket 5003-T.A from kit 5003-T bis, remove springs of No. 1 cylinder exhaust valve.
Disengage the pushrod and tilt the rocker arm.

Take care that the valve does not fall into the cylinder when the piston is at BDC. Accompany the movement of the valve to maintain it in contact with the piston crown ; hold the valve if the crankshaft is to make a complete rotation.

b) Find TDC of No. 1 cylinder piston.
Position bracket 5003-T.A equipped with dial gauge 2437-T fitted with extension 5003-T.C.
Turn the crankshaft by a quarter turn in the opposite direction to the proper engine rotation, and then, in the proper direction of rotation, up to the precise point when the large needle of the dial gauge changes direction, which corresponds to TDC of the piston.
Set the zero mark of the dial-gauge rotatable dial in line with the large needle and note the position of the totalizer needle.

7. Find static timing point for No. 1 cylinder :

a) Slowly turn the crankshaft in the *opposite direction to engine rotation* until the dial gauge large needle has travelled 3 complete turns, i.e. : 3 mm

b) Slowly turn the crankshaft in the *direction of engine rotation* to bring the piston to the static timing point, i.e. :
CX 2200 : **1.19 mm before TDC**

Take in the reading on dial gauge 3089-T.F fitted to the pump. This reading corresponds to the lift of distributor piston. It should be :

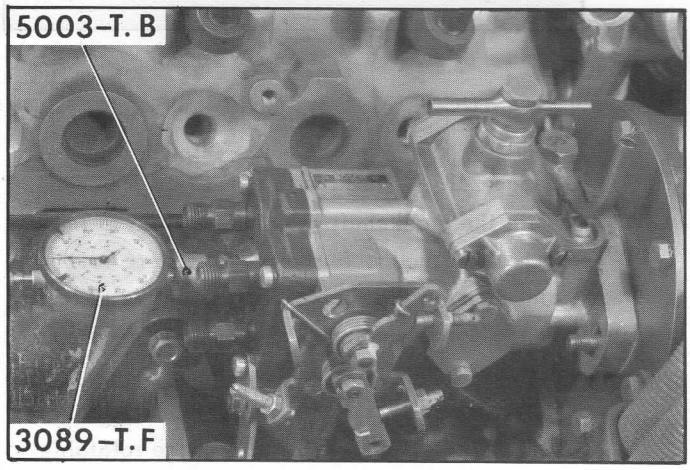
0.45 ± 0.01 mm

If not, re-time the pump.

14652



12108



12112



8. Adjusting the injection pump timing :

a) Bring the piston to TDC.

b) Turn the crankshaft in the *opposite direction to engine rotation* (i.e. 3 complete turns of large needle on dial gauge).
Turn the crankshaft in the normal direction of engine rotation to bring the piston to the point of static timing, i.e. :
CX 2200 : **1.19 ± 0.01 mm before TDC**

c) Slacken the pump securing nuts.

d) Bring the needle of the dial gauge fitted to the pump to : **0.45 ± 0.01 mm.**
Turn the pump casing towards the inner section of the engine.
Tighten the securing nuts to :
2.4 to 2.6 da Nm (17.5 to 19 ft.lbs)
When tightening, the needles of the dial gauge on pump should not move.

9. Check the injection pump timing.

10. Remove the dial gauges and the bracket 5003-T.B.

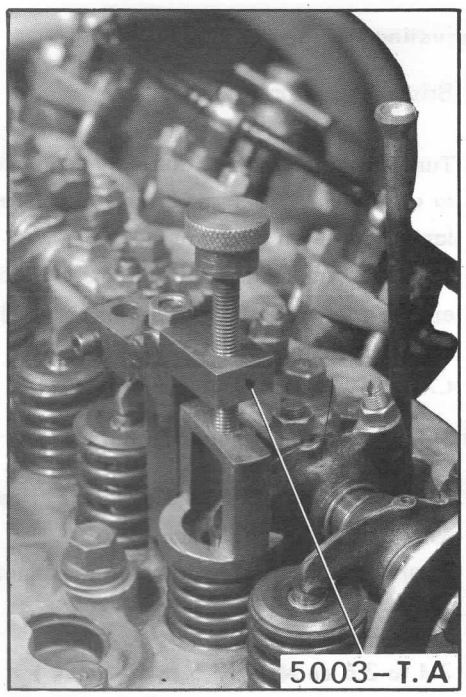
11. Fit the plug with its seal to the injection pump
Tightening : **4 to 6 da Nm (29 to 43.5 ft.lbs).**

12. Using bracket 5003-T.A, fit the following :
- the valve springs,
- the split collets.

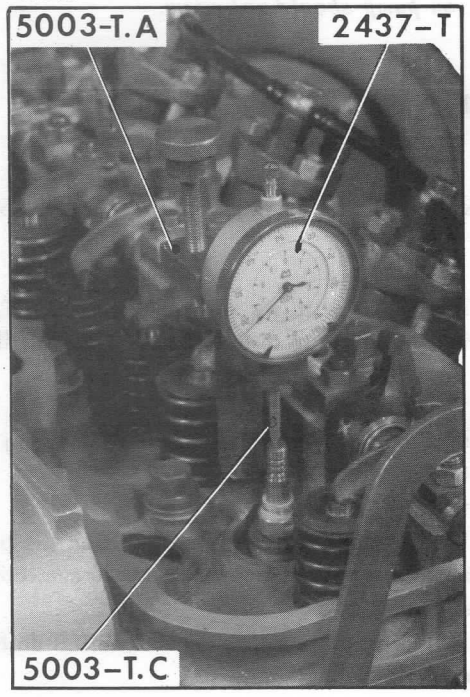
Tilt the exhaust rocker and position the pushrod.
Adjust the rocker clearance (0.20 mm, cold), fit the rocker cover.
Tightening torque of nuts : **0.5 to 0.8 da Nm (3.5 to 6 ft.lbs)**
(See tightening procedure on page 4, par. 10).

13. Fit the injector pipes.
Bleed the injector system.

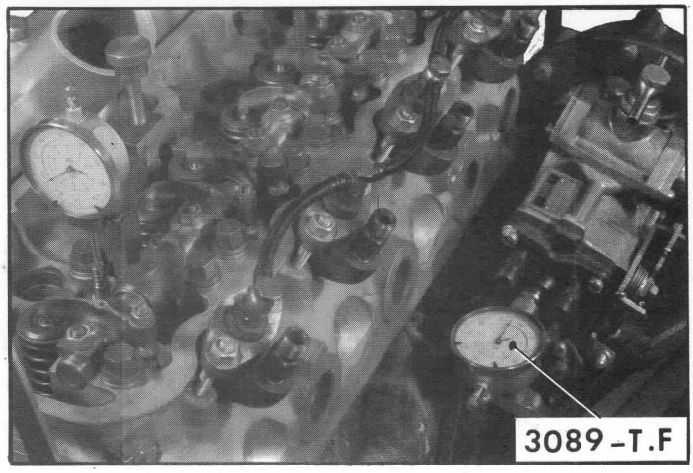
12112



12106



12105



6. Find TDC of No. 1 cylinder piston :

a) Using bracket 5003-T.A from kit 5003-T bis, remove springs of No. 1 cylinder exhaust valve.
Disengage the pushrod and tilt the rocker arm.

Take care that the valve does not fall into the cylinder when the piston is at BDC. Accompany the movement of the valve to maintain it in contact with the piston crown ; hold the valve if the crankshaft is to make a complete rotation.

b) Find TDC of No. 1 cylinder piston.
Position bracket 5003-T.A equipped with dial gauge 2437-T fitted with extension 5003-T.C.
Turn the crankshaft by a quarter turn in the opposite direction to the proper engine rotation, and then, in the proper direction of rotation, up to the precise point when the large needle of the dial gauge changes direction, which corresponds to TDC of the piston.
Set the zero mark of the dial-gauge rotatable dial in line with the large needle and note the position of the totalizer needle.

7. Find static timing point for No. 1 cylinder :

a) Slowly turn the crankshaft in the *opposite direction to engine rotation* until the dial gauge large needle has travelled 3 complete turns, i.e. : 3 mm

b) Slowly turn the crankshaft in the *direction of engine rotation* to bring the piston to the static timing point, i.e. :
CX 2200 : **1.19 mm before TDC**

Take in the reading on dial gauge 3089-T.F fitted to the pump. This reading corresponds to the lift of distributor piston. It should be :

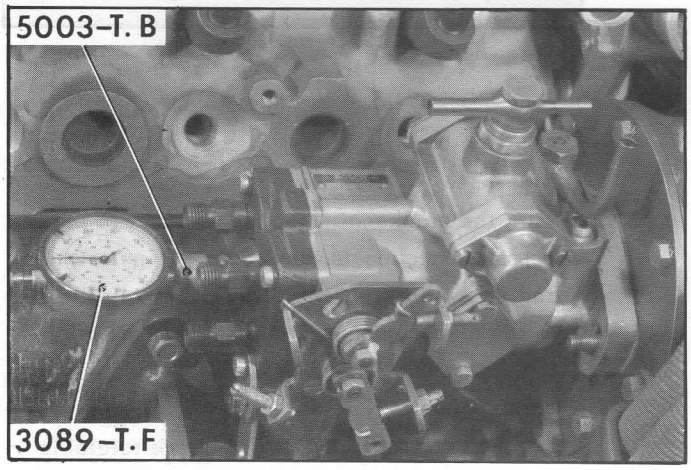
0.45 ± 0.01 mm

If not, re-time the pump.

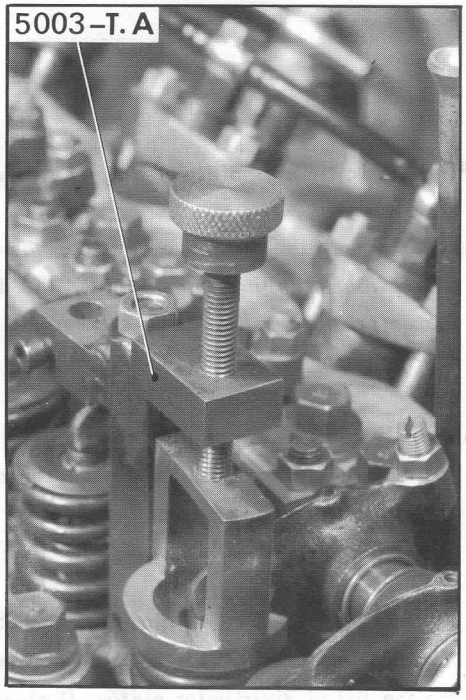
14652



12108



12112



8. Adjusting the injection pump timing :

a) Bring the piston to TDC.

b) Turn the crankshaft in the *opposite direction to engine rotation* (i.e. 3 complete turns of large needle on dial gauge).
Turn the crankshaft in the normal direction of engine rotation to bring the piston to the point of static timing, i.e. :
CX 2200 : **1.19 ± 0.01 mm before TDC**

c) Slacken the pump securing nuts.

d) Bring the needle of the dial gauge fitted to the pump to : **0.45 ± 0.01 mm.**
Turn the pump casing towards the inner section of the engine.
Tighten the securing nuts to :
2.4 to 2.6 da Nm (17.5 to 19 ft.lbs)
When tightening, the needles of the dial gauge on pump should not move.

9. Check the injection pump timing.

10. Remove the dial gauges and the bracket 5003-T.B.

11. Fit the plug with its seal to the injection pump
Tightening : **4 to 6 da Nm (29 to 43.5 ft.lbs).**

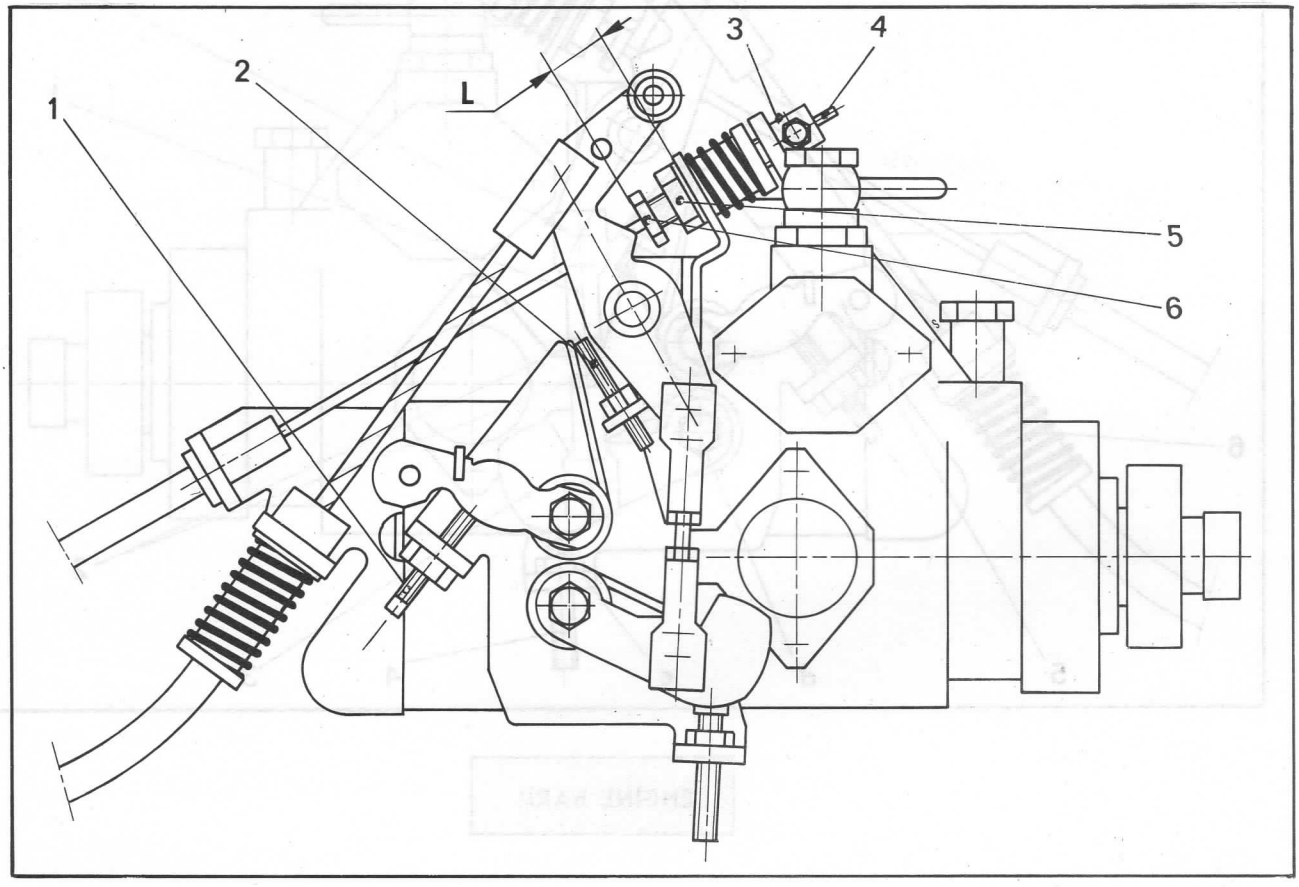
12. Using bracket 5003-T.A, fit the following :
- the valve springs,
- the split collets.

Tilt the exhaust rocker and position the pushrod.
Adjust the rocker clearance (0.20 mm, cold), fit the rocker cover.
Tightening torque of nuts : **0.5 to 0.8 da Nm (3.5 to 6 ft.lbs)**
(See tightening procedure on page 4, par. 10).

13. Fit the injector pipes.
Bleed the injector system.

V. ADJUSTING THE « BOSCH » INJECTION PUMP CONTROLS.

L. 14-3



ON NO ACCOUNT must the position of screws (9) and (10) be altered

ENGINE COLD

1. Adjusting the fast idle control :

1°) Set the idling manual control to zero (min. idling). To do that, turn the button, located under the dash-board, in the opposite direction to the arrow mark on it.

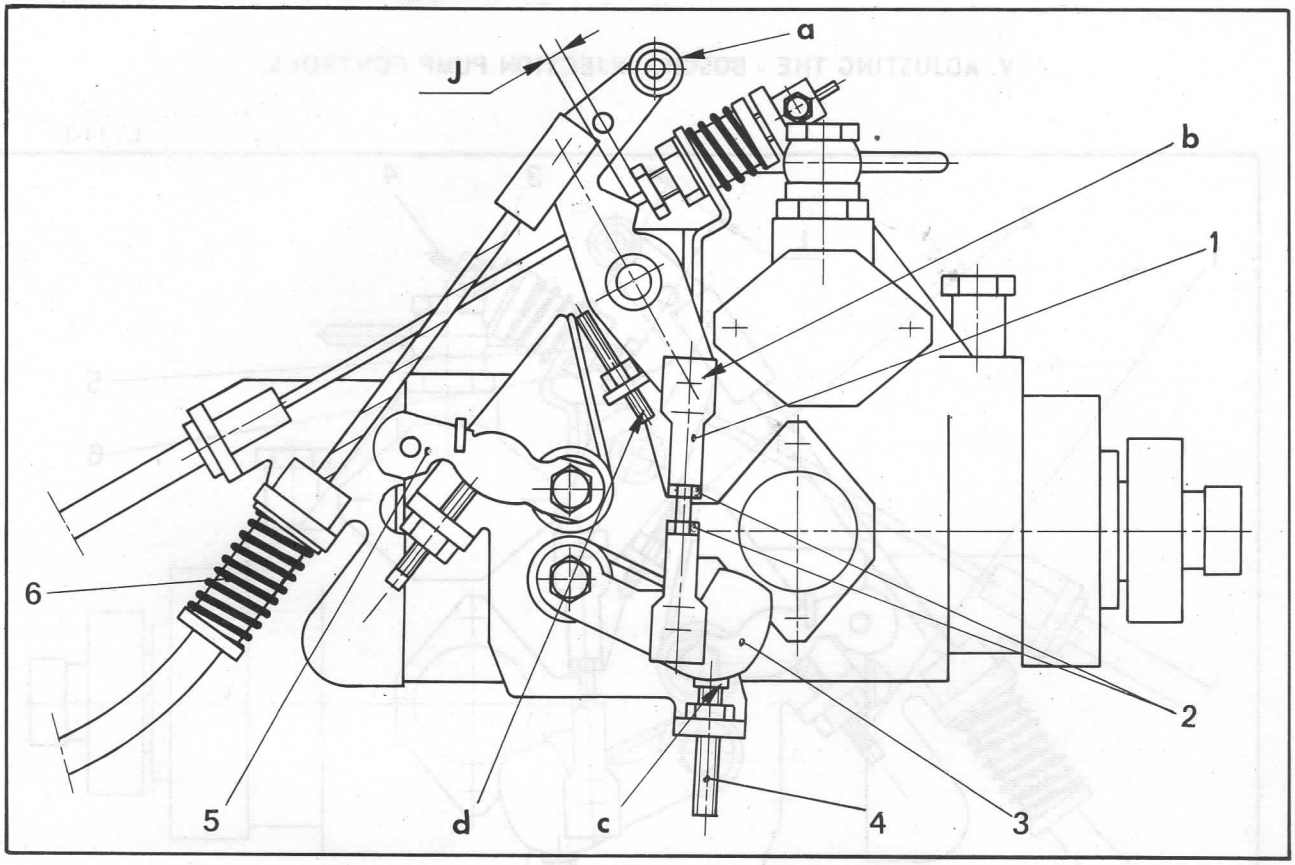
2°) Make sure that cable (4) is slack.
If not, actuate cable tensioner (3),

3°) Set the idling manual control to fast-idle position.
To do that, turn the button fully in the direction of arrow.

4°) Check measurement (L) which should be 14^{+1}_{0} mm.

If not, slacken locknut (5) and actuate screw (6).

L. 14-5



ENGINE WARM

2. Adjusting the idling speed :

Engine idling speed : **800 ± 25 rpm**

PROCEDURE.

Disconnect :
- the return spring of the accelerator control from « a »,
- the linkage rod (1) from « b »,
- Adjust the idling by actuating screw (4), tighten the locknut.

3. Adjusting the controls :

Connect :
- the return spring of the accelerator control to « a »,
- the linkage rod (1) to « b » so as to obtain clearance **J = 0.1 to 0.4 mm.**

If not, alter the length of rod (1). Tighten locknuts (2).

Make sure that lever (3) still abuts on its stop at « c ».

4. Accelerator control :

With the accelerator pedal fully depressed (full acceleration), check that lever (3) abuts against « d ».

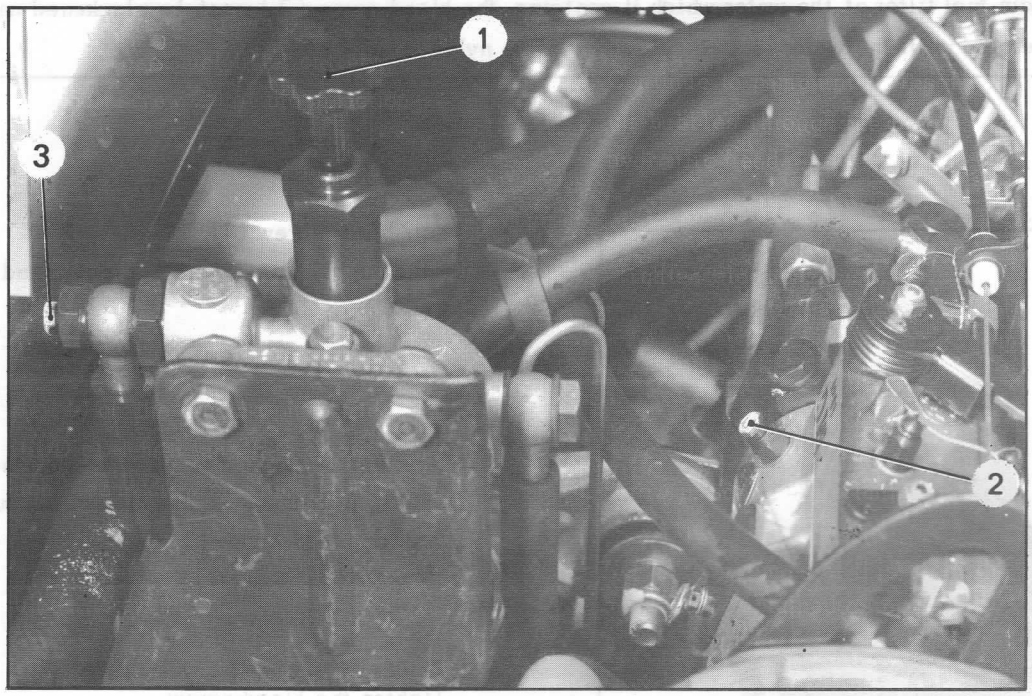
If not, move the clip in the grooves of sleeve stop (6).

5. Checking the stop controls :
- Check that the engine stops when the ignition is switched off.

  If not, check the operation of electrically-operated stop control (4) (electrovalve).
- Check the operation of mechanically-operated stop control (5).

I - BLEEDING THE DIESEL-FUEL SYSTEM
(ROTO-DIESEL)

15 225



NOTE : In order to drain the fuel filter of the water which it contains, slacken draining plug under bowl. After draining the water, tighten draining plug under bowl, loosen bleed-screw on union (3) and evacuate the air by actuating pump primer handle (1).

NOTE : It is essential that the work be carried out in the sequence indicated below.

1. Loosen the following bleed-screws :
- on union (3) at Diesel-fuel filter outlet
- on hydraulic head (screw 2) of the injection pump.

Bleeding the filter

2. Loosen handle (1) on the priming pump and actuate it until Diesel-fuel runs free of air bubbles through bleed-screw on union (3).

Tighten the bleed-screw.

Bleeding the pump.

3. Continue to pump until Diesel fuel runs free of air bubbles through the bleed-screw (2) on the hydraulic head.

Tighten bleed-screw.

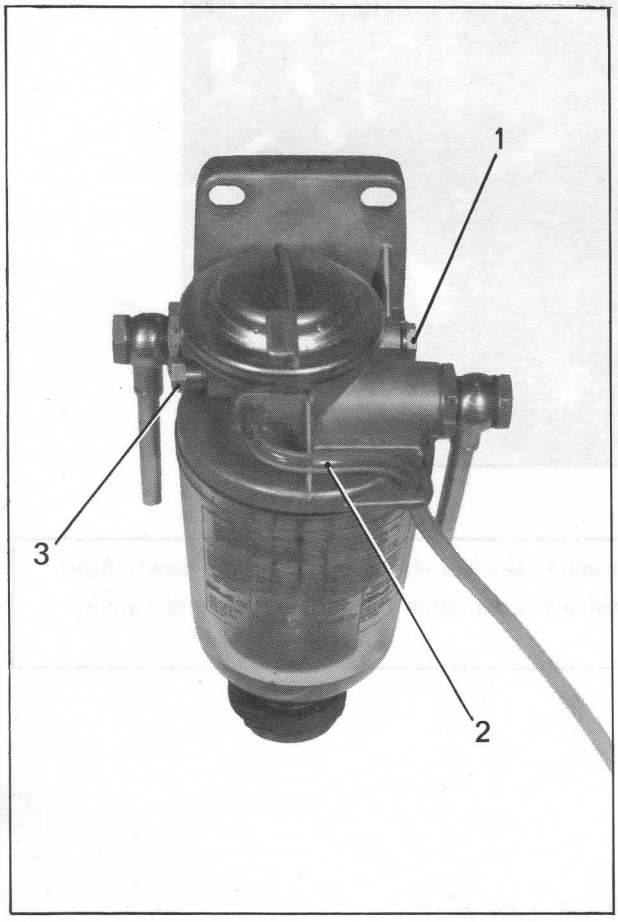
4. Screw in handle on priming pump.

NOTE : On pumps of this type, the injectors bleeding is obtained automatically.

II - BLEEDING THE DIESEL-FUEL SYSTEM
(BOSCH)

NOTE : To drain fuel filter of the water which it contains, the bleed-screw (2) must be slackened and the priming pump lever operated until the water is drained away via the nylon tube (3).

78-126



1. Slacken :

   - air bleed-screw (1),
   - the supply line unions (injector end).

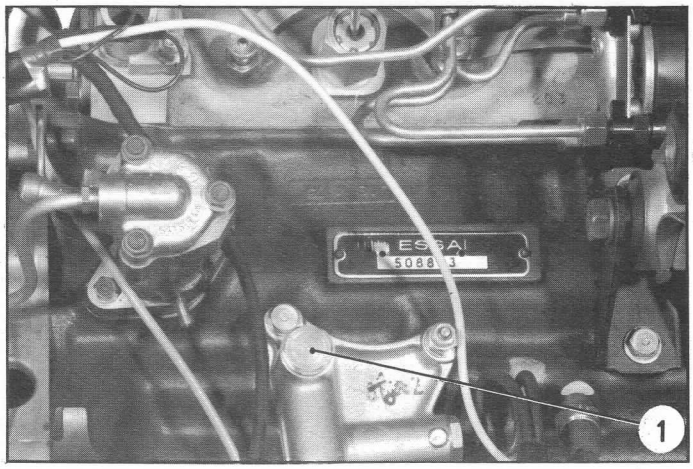
2. Operate the priming pump lever (on the fuel filter) until the fuel runs free of air bubbles through bleed-screw (1).

   Tighten the bleed-screw.

3. Hold accelerator pedal in semi-depressed position and actuate starter until Diesel fuel flows through the unions.

   Tighten the unions.

CHECKING OIL PRESSURE ON THE VEHICLE



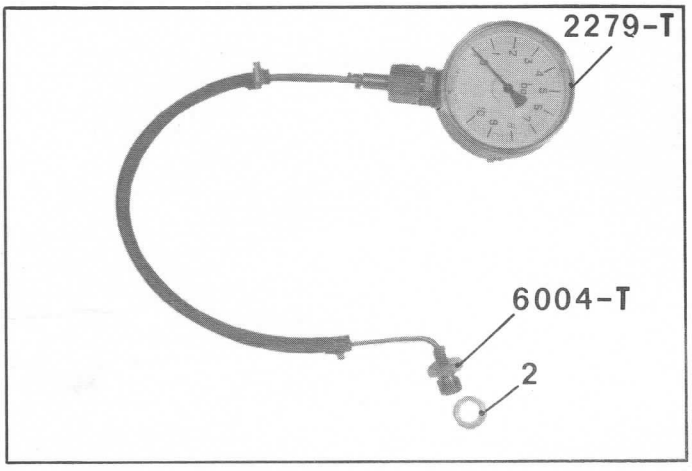
1. Remove the spare wheel.

2. Top up oil level if necessary.

3. Remove plug (1) *(from oil filter support plate).*

4. Set-up a pressure gauge assembly :

   Connect pressure gauge 2279-T *(graduated from 0 to 10 bars* (0 to 150 psi) to union 6004-T.



5. Connect union 6005-T to location for the plug *(copper washer (2) under head).*

   Tighten union screw (3).

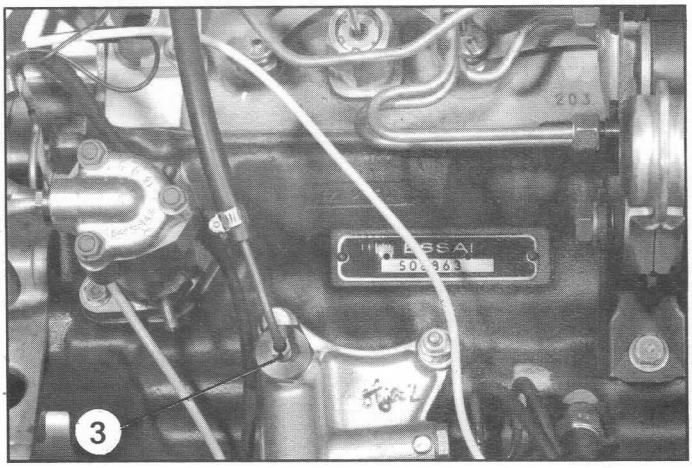
6. Run the engine.

   With oil at 100° C, the pressure should be :
   - 1 bar (14.5 psi) minimum at 1000 rpm
   - 3.7 to 4.5 bars (53.5 to 62 psi) at 3500 rpm

7. Remove unions 6004-T and pressure gauge Refit plug (1) *(copper washer).*

   Tightening torque : 30 to 35 mΛN (21.7 to 25.9 ft.lb).

   Refit spare wheel.



NOTE : This operation may also be carried out using the MULLER kit (ref. 451).

CHARACTERISTICS.

1. Water circuit :

« Self de-aerating » type with header tank.

- Filling ..... Cap on header tank
- Level *(cold, in de-aerated state)* ..... See mark in header tank
- Coolant (water + antifreeze) ..... 12.5 litres
- Circuit protection (indicated by a label) { - 15° C i.e. 28 % of antifreeze / - 30° C i.e. 50 % of antifreeze
- Surface of radiator 23 dm2
- Calibration of pressure cap ..... 0.5 bars (7.25 psi)
- Thermostat :
  - Make ..... CALORSTAT
  - Reference No ..... V 24 - Ref V 6532
  - Begins to open ..... 78° $^{0°}_{3°}$ C
  - Minimum opening at 90° C ..... 7.5 mm

Water temperature switch (on cylinder head outlet tank)

- Lighting of warning lamp *(on instrument panel)* - Critical temperature : 104° ± 1.5° C
- Tightening torque .....2.5 to 3 da Nm (18 to 21.5 ft.lb)

NOTE : The coolant return hose for the heater unit has a white identification mark painted on it. Make sure heater hoses are correctly fitted to the heater unit.

2. Electric cooling fans :

2 10-blade **fans** (controlled by a thermal switch) :

Make : DUCELLIER - Ref. 3708

- Power rating of electric fan ..... 150 W
- Direction of rotation *(seen from electric motor side of fan)* ..... Clockwise

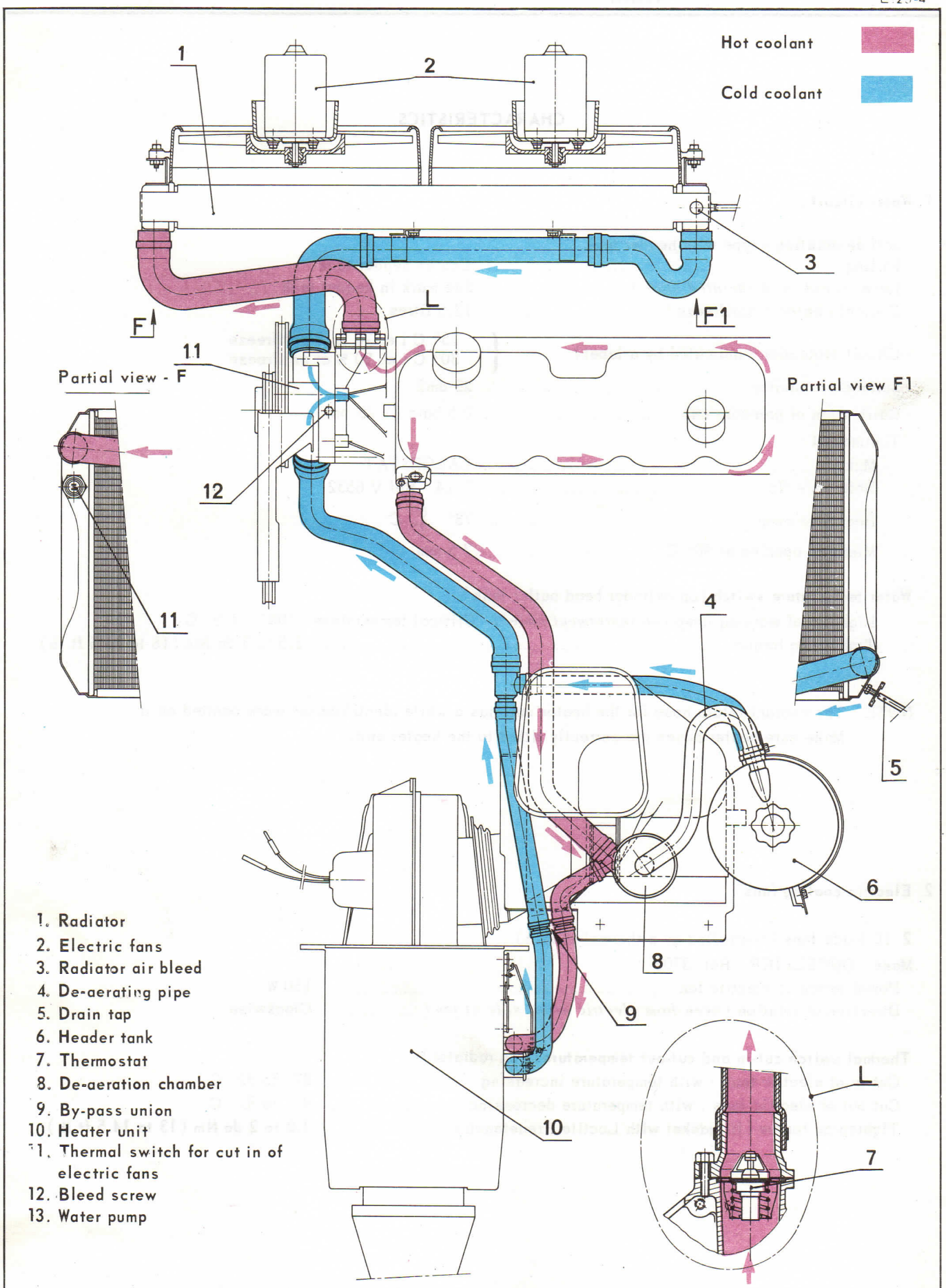
Thermal switch cut-in and cut-out temperatures (on radiator)

- Cut-in of electric fans : with temperature increasing ..... 87° to 92° C
- Cut-out of electric fans : with temperature decreasing ..... 87° to 82° C
- Tightening torque (fit gasket with Loctite Frenetanch) ..... **1.8 to 2 da Nm (13 to 14.5 ft.lb)**

COOLING SYSTEM

Thermostat and heating unit open

L 23-4



1. Radiator
2. Electric fans
3. Radiator air bleed
4. De-aerating pipe
5. Drain tap
6. Header tank
7. Thermostat
8. De-aeration chamber
9. By-pass union
10. Heater unit
11. Thermal switch for cut in of electric fans
12. Bleed screw
13. Water pump

I. FILLING THE WATER SYSTEM.

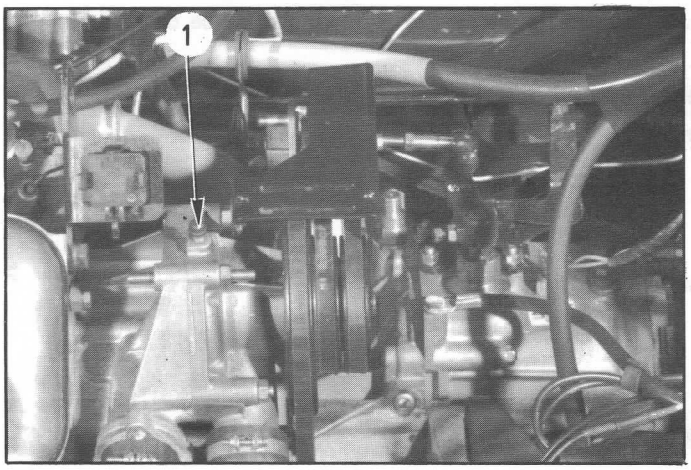
Care must be taken to **protect alternator** from water when working on cooling system fitted **close to this unit.**

Draining the radiator does not involve draining the heater unit.
Two operations are involved :

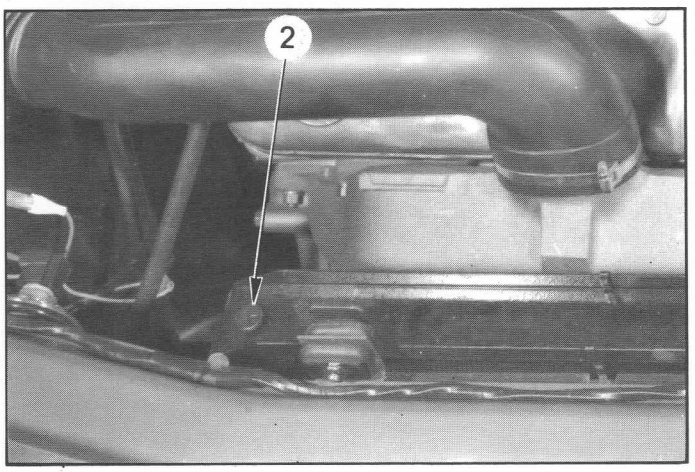
- partial filling : 7.5 litres (radiator and engine block),
- complete filling : 12.5 litres.

In both cases, filling is effected via the header tank.

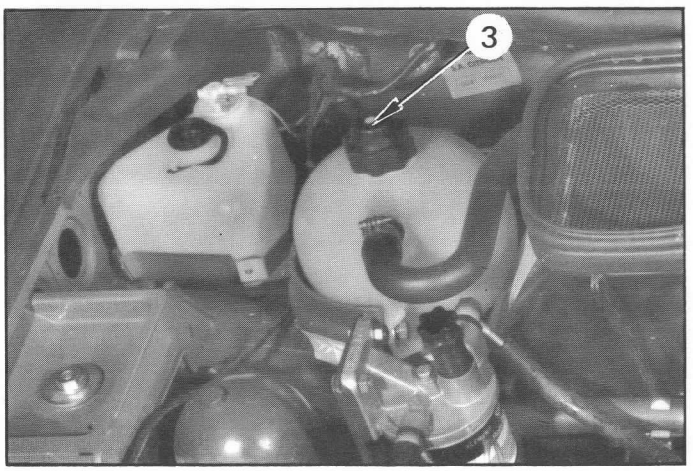
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FILLING

1. Open heater control to fullest extent inside the vehicle (complete filling).

2. Remove bleed-screw covers (1) and (2).
Connect to each bleed-screw (1) a transparent tube enabling a level of 400 mm above that of the header tank to be obtained.
Loosen bleed-screws (1) and (2).

3. Fill circuit slowly through the header tank.

4. After releasing air, tighten bleed-screws.
Remove the transparent tubes.
Refit bleed screw covers.

5. Close header tank ; screw cap (3), tighten a quarter of a turn after the gasket comes into contact with its seat.

6. Start the engine.
Run for 6 min. at 2000 rpm.
Ensure that water circulation is normal, if not, drain again and assist priming of pump by pressurizing circuit (0.5 bar - 7.25 psi) through filling orifice.

Do not open the bleed screw when the engine is running.
Do not open header tank when the fans are rotating.
Check level of header tank when the engine is cold.

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

II. FILLING AND DE-AERATING THE AUXILIARY HEATER UNIT ON CX AMBULANCE VEHICLES

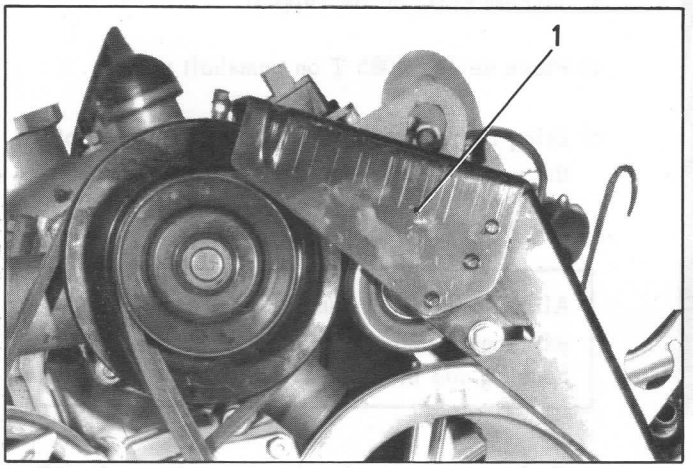
Before connecting the auxiliary heater unit water system to the main system, the following must be carried out :

- Fill up the auxiliary heater unit and its hoses (with heater control open) with 1.6 litres (2.8 pts) of coolant liquid of the same type as that used in the main system.
- Connect all hoses, and tighten all hose clips.
- Start the engine, and wait for the electric fans to cut in (De-aeration time).
- Check the operation of the auxiliary heater unit.
- WHEN THE ENGINE IS COLD, check the level and top up if necessary.

I. PULLEY ALIGNMENT.

Remove the protective plate (1) and the belts.

76-5



1. Aligning the camshaft pulley :

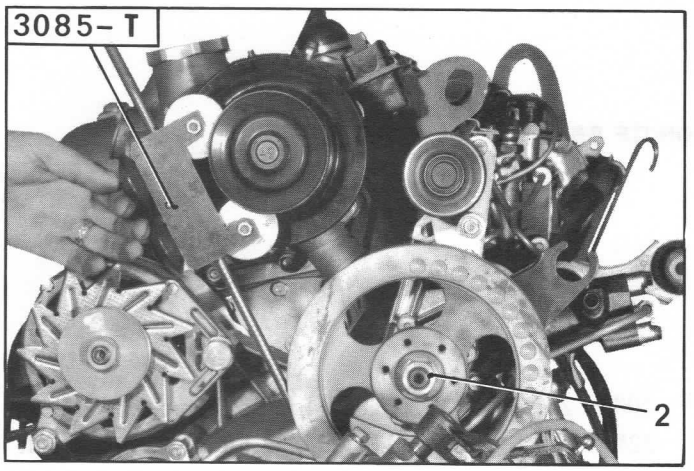
a) Position device 3085-T **on the water pump pulley.**

b) Bring its rod into contact with the groove of the camshaft pulley.

(⟶ 02/1978) : Aligning the camshaft pulley is carried out by placing shims behind the pulley.

Tightening torque for nut (2) for the camshaft pulley : 8 da Nm (58 ft.lb).

76-7



(02/1978 ⟶) : Aligning the camshaft pulley is carried out by placing a spacer behind the pulley.

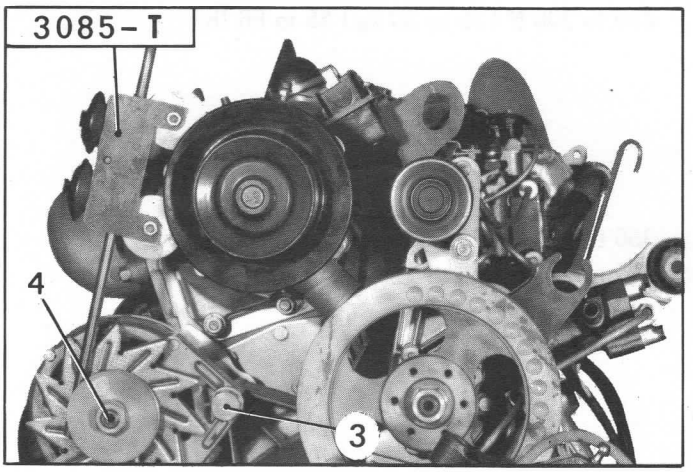
Thickness of available spacers :

10.60 mm - 11.50 mm
12.40 mm - 13.30 mm

Place a bead of LOCTITE FRENETANCH at the end of the pulley splines, prior to the final fitting.

Tightening torque for nut (2) : 9 to 10 da Nm (65 to 72 ft.lb).

76-6



2. Aligning the alternator pulley :

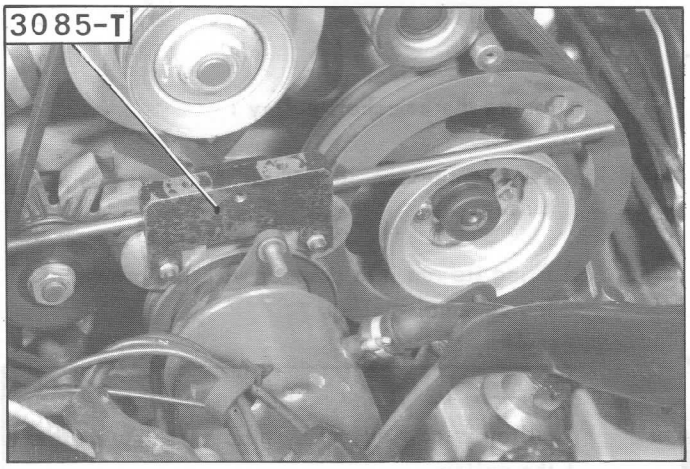
Proceed as for camshaft pulley *(with securing screw (3) for the alternator screwed in).*

Aligning the alternator pulley is carried out by placing shims behind the pulley.

Tightening torque for nut (4) for the alternator pulley : 4 da Nm (29 ft.lb).

Vehicles equipped with a 7-piston pump :

♦ 78-193



3. Aligning the high pressure pump :

a) Tighten pump on its support.

b) Place device 3085-T on camshaft pulley.

c) Bring its rod into contact with the groove of the pump pulley.

Aligning the H.P. pump is carried out using adjustment shims placed between the pump housing and the support plate.

Tightening torque for the nut securing the HP pump : 4 da Nm (29 ft.lb).

II. TENSION OF BELTS.

RECOMMENDED TENSIONS *(for information).*

Water pump belt :

New belt : ..... 200 to 250 N (20 to 25 kg) 44 to 55 lb per belt
Run-in belt : ..... 125 to 175 N (12.5 to 17.5 kg) 27.5 to 38.5 lb per belt

Alternator belt :

New belt : ..... 400 to 450 N (40 to 45 kg) 88 to 99 lb
Run-in belt : ..... 250 to 300 N (25 to 30 kg) 55 to 66 lb

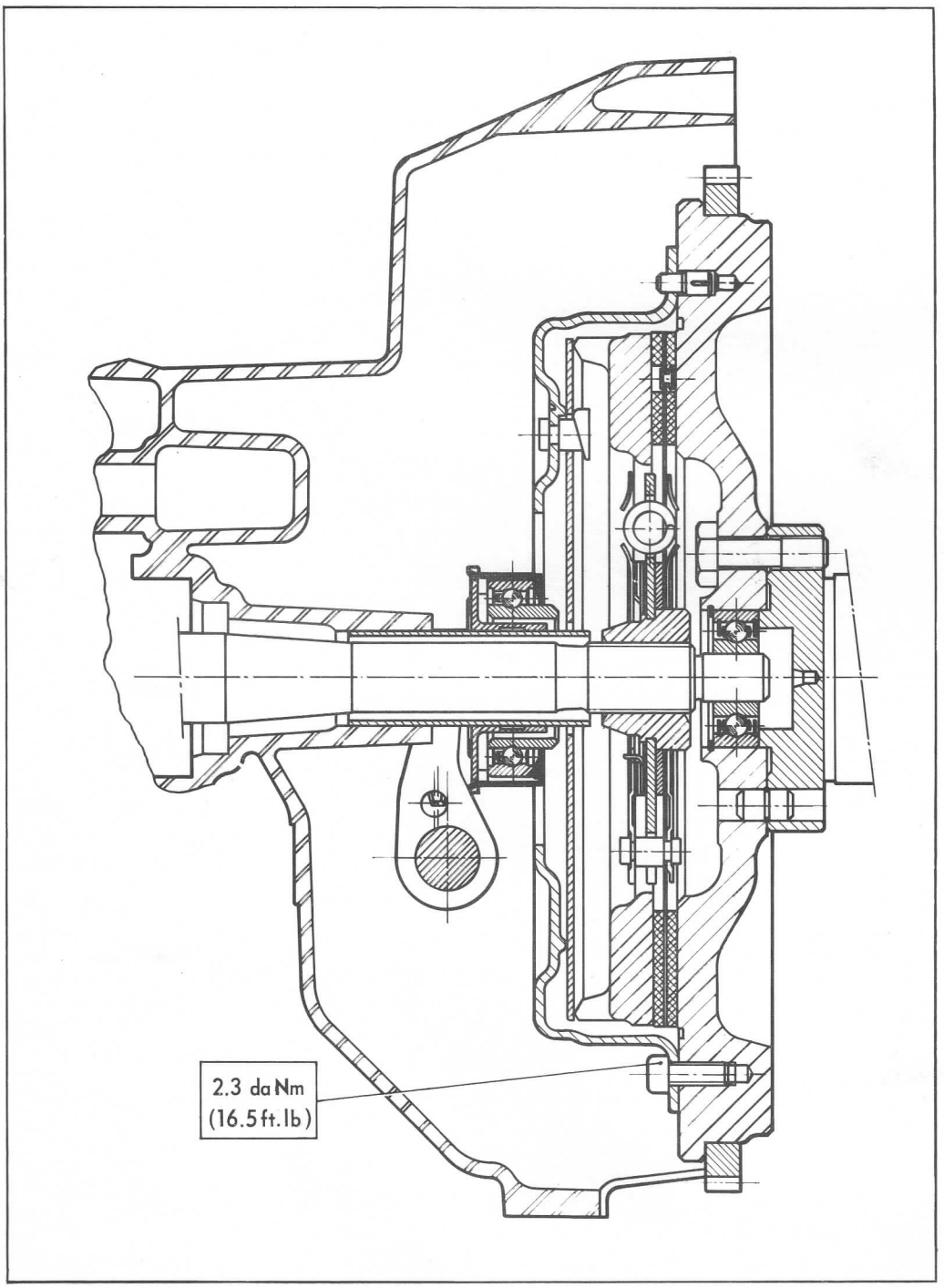
Vehicles with power steering :

HP pump belt :

New belt : ..... 350 to 400 N (35 to 40 kg) 77 to 88 lb
Run-in belt : ..... 200 to 225 N (20 to 22.5 kg) 44 to 50 lb

OPERATION No. MA.Di. 312-00 : *Characteristics and special features of the pedal operated clutch mechanism.* **Op. MA.Di. 312-00** 1

L. 31-2



Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

I. CHARACTERISTICS.

Mechanism : diaphragm-type

- Reference : ..... { 235 DBR 410 (⟶ 7/1976) / 235 DBR 450 (7/1976 ⟶)

Disc : « VERTO » with shock absorbing hub

- Reference : ..... { MS 33 AX *CX 2200* / M 44 BBY *CX 2500*

Thrust bearing : ..... Self-centering, ball-type

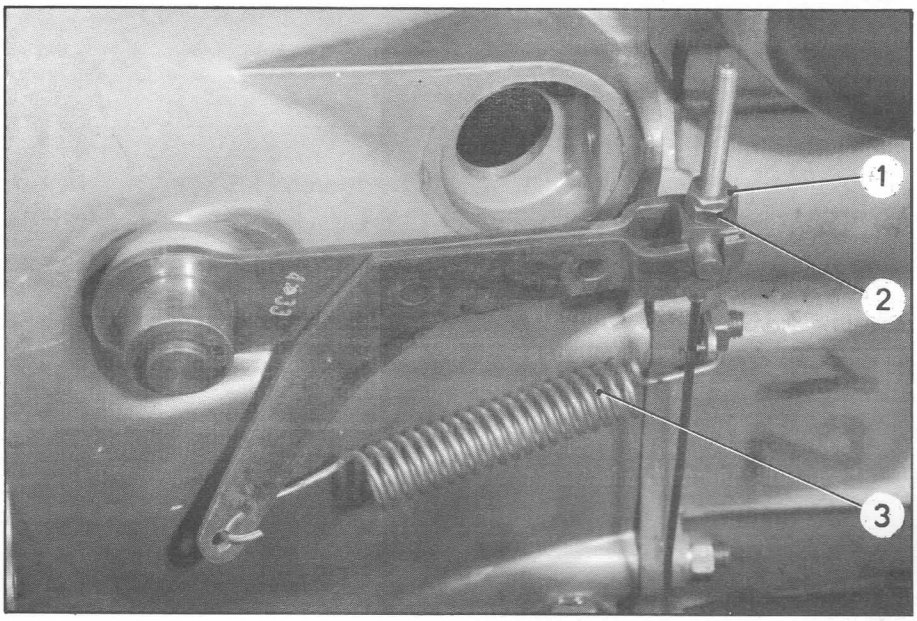
II. SPECIAL FEATURES.

Clearance between thrust bearing and diaphragm : ..... 1 to 1.5 mm

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

ADJUSTING THE CLUTCH FREE-PLAY

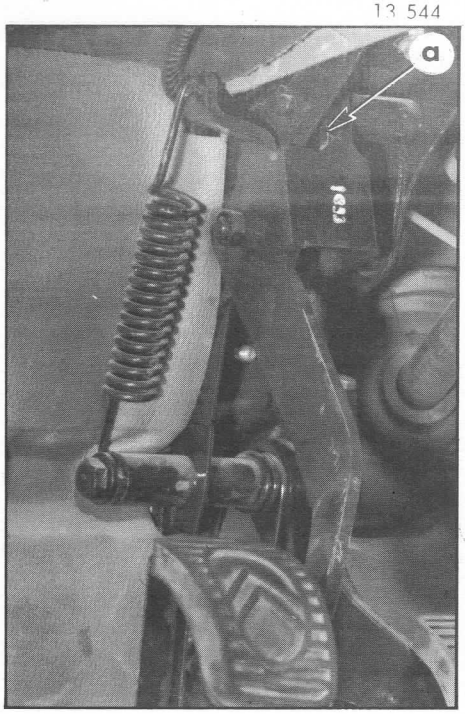
13 455



Put the vehicle on a lift or over a pit.

Adjust the clutch free-pay :

13 544



Remove spring (3).

Slacken lock nut (1).

Tighten nut (2) until the thrust bearing is in contact with the diaphragm *(hard point).*

NOTE : The clutch pedal should be in contact with its upper stop at « a ».

Unscrew nut (2) two turns and a half to obtain **a clearance of 1 to 1.5 mm between thrust bearing and diaphragm.**

NOTE : A 2.2 mm clearance for nut (2) corresponds to a 1 mm clearance for the thrust bearing.

Tighten lock nut (1).

Fit spring (3).

OPERATION No. MA.Di. 330-00 : *Characteristics and special features of the gearbox.* **Op. MA.Di. 330-00** 1

4-SPEED MANUAL GEARBOX

I. CHARACTERISTICS

1. Gear ratios :

NOTE : Speeds are given for vehicles equipped with 185 SR 14 ZX, 185 SR 14 XZX or 185 HR XVS tyres, the rolling circumference of which is 1.970 m under load.

a) « CX 2200 » gearbox :

Gears	Gearbox ratios	Final drive ratio	Overall ratios	Speed at 1000 rpm in km/h	(mph)
1st	(12/38) 3.1666 : 1	(13/62) 4.7692 : 1	15.1025 : 1	7.826	(4.86)
2nd	(18/33) 1.8333 : 1		8.7435 : 1	13.518	(8.40)
3rd	(30/34) 1.1333 : 1		5.4051 : 1	21.868	(13.59)
4th	(35/28) 0.8 : 1		3.8153 : 1	30.979	(19.25)
Reverse	(13/41) 3.1538 : 1		15.0414 : 1	7.858	(4.88)
Speedometer drive ratio : 5 × 12					

b) « CX 2500 » gearbox :

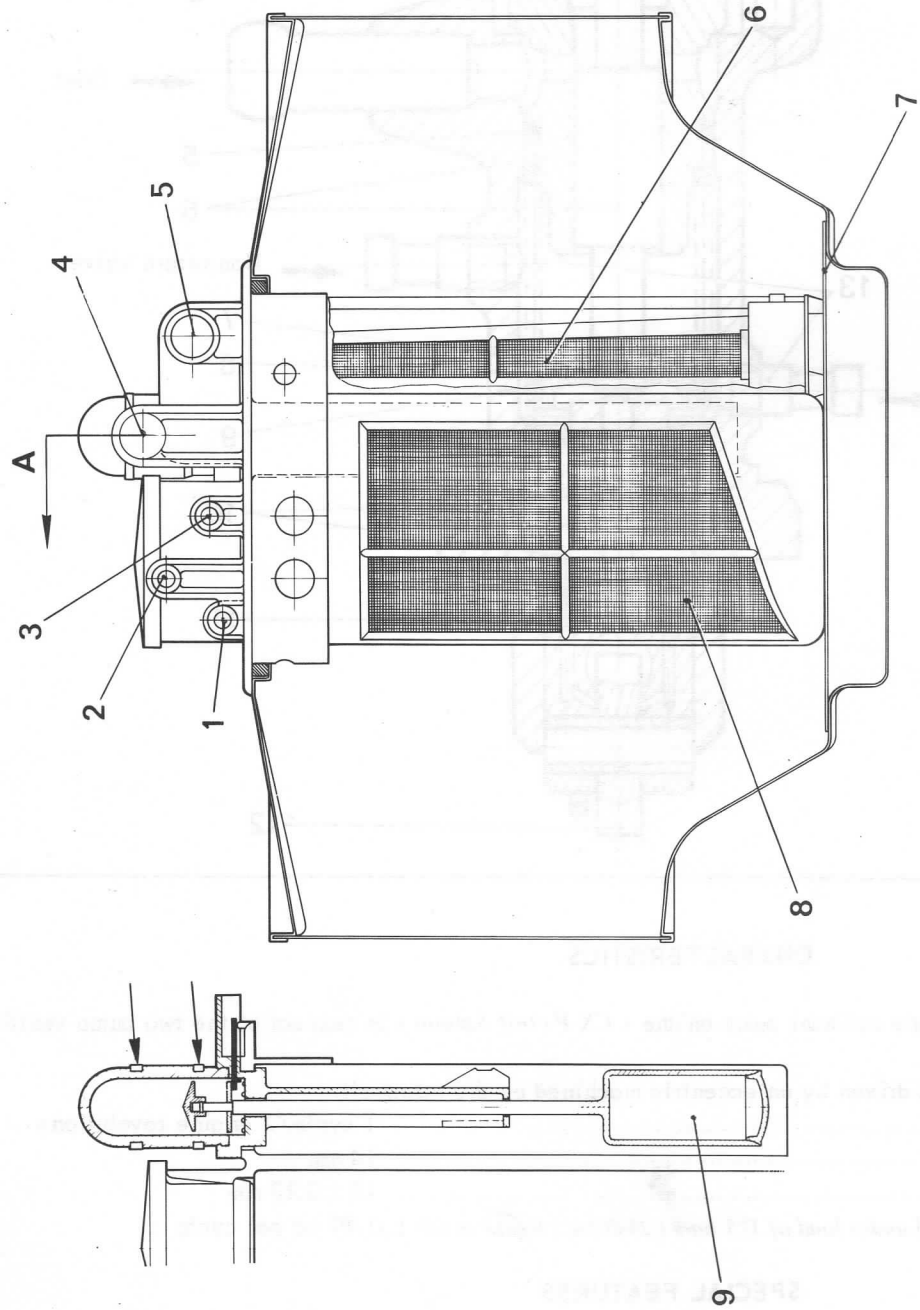
Gears	Gearbox ratios	Final drive ratio	Overall ratios	Speed at 1000 prm in km/h	(mph)
1st	(12/38) 3.1666 : 1	(13/59) 4.5384 : 1	14.3717 : 1	8.224	(5.11)
2nd	(18/33) 1.8333 : 1		8.3205 : 1	14.205	(8.83)
3rd	(30/34) 1.1333 : 1		5.1435 : 1	22.980	(14.28)
4th	(35/28) 0.8 : 1		3.6307 : 1	32.555	(20.23)
Reverse	(13/41) 3.1538 : 1		14.3136 : 1	8.257	(5.13)
Speedometer drive ratio : 7 × 16					

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (ADD)

SOURCE AND RESERVE OF PRESSURE

RESERVOIR

L 39-3



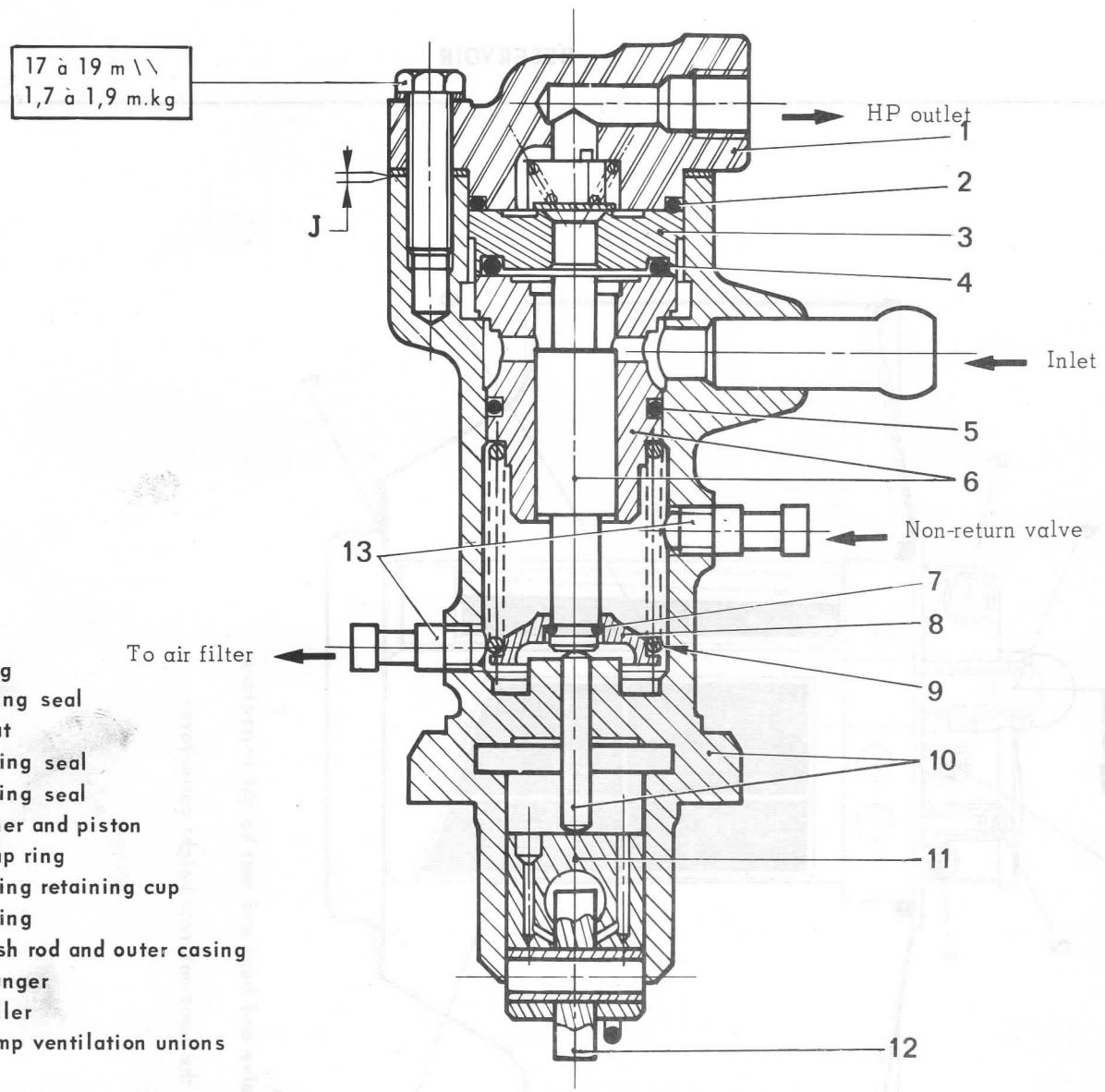
1. Front and rear suspension cylinder overflow return
2. Overflow return from brake control valve, safety valve and front and rear height correctors
3. Operational return from brake control valve
4. Operational return from the pressure-regulator and the front and rear height correctors
5. HP pump suction hose
6. HP pump suction filter
7. Deflector
8. Overflow and operational return filter
9. Level indicator float

NOTE : The reservoir of the « CX Diesel Saloon » with manual steering only differs from that of the « CX Petrol » model in respect of the type of filler-cap (*Additional connection for the ventilation system of the single cylinder pump*).

SINGLE CYLINDER HIGH-PRESSURE PUMP

(Saloon with manual steering)

39-8



1. Plug
2. O-ring seal
3. Seat
4. O-ring seal
5. O-ring seal
6. Liner and piston
7. Snap ring
8. Spring retaining cup
9. Spring
10. Push rod and outer casing
11. Plunger
12. Roller
13. Pump ventilation unions

CHARACTERISTICS

This pump only differs from the single cylinder pump on the « *CX Petrol Saloon* » in respect of the two pump ventilation unions (13).

Reciprocating single cylinder pump, driven by an eccentric machined on the camshaft.

- Operating ratio ..... 1 cycle/2 engine revolutions
- Piston diameter ..... 14 mm
- Piston stroke *(eccentric lift)* ..... 10 ± 0.10 mm

For indication purposes : flow rate (*under load of 175 bars (2540 psi) liquid at 60° C*) 1.07 cc per cycle

SPECIAL FEATURES

Adjustment :

- Clearance J between pump body and plug *(before tightening)* ..... 0.05 to 0.09 mm
- *Clearance obtained using shims of various thickness* ..... 0.05 - 0.10 - 0.15 - 0.20 mm

Tightening torque :

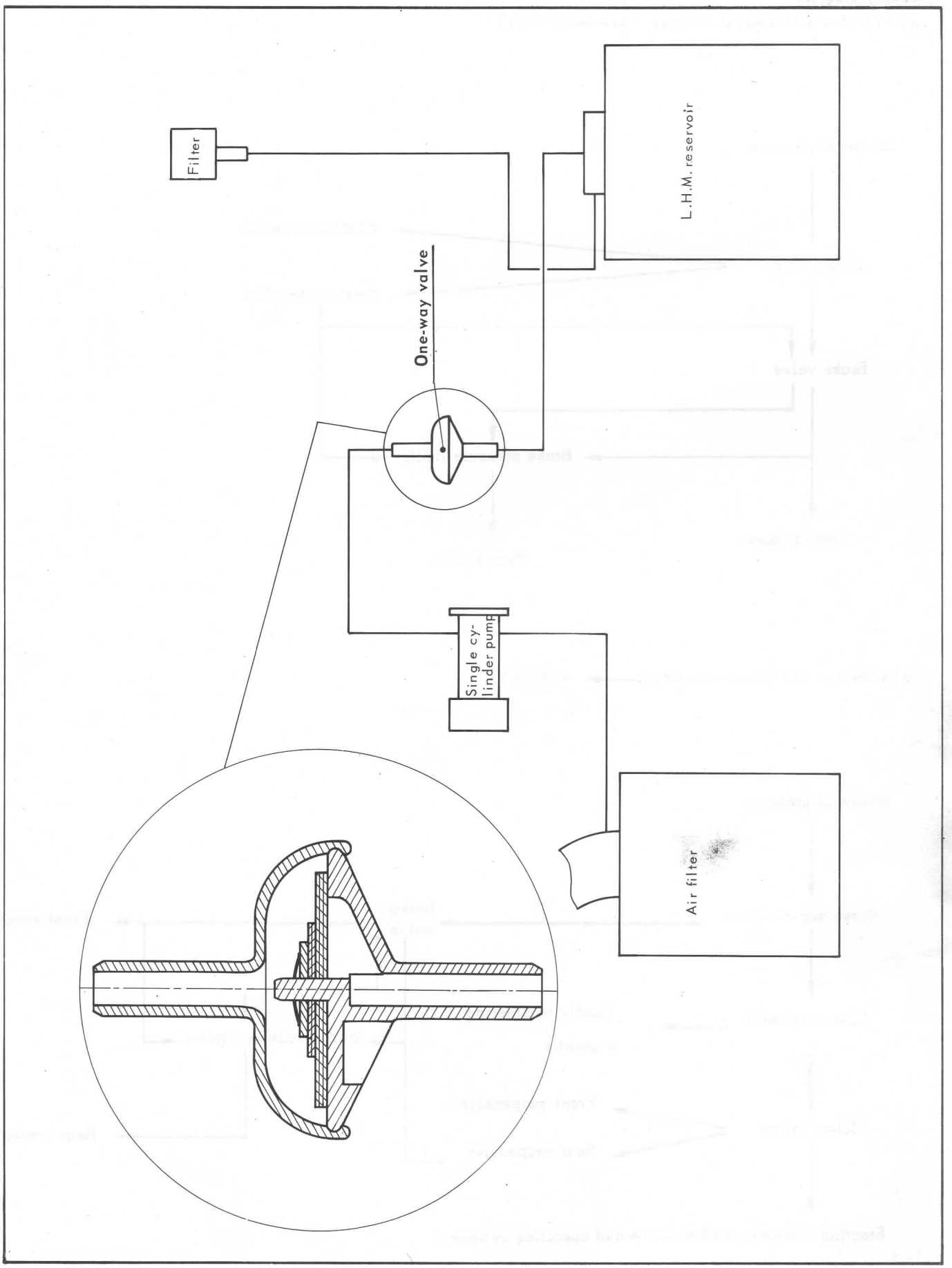
- Pump fixing screw on crankcase ..... 19 mAN (13.7 ft.lb)

(Insert a new paper gasket whenever pump is dismantled).

DIAGRAM OF BREATHER CIRCUIT FOR SINGLE-CYLINDER PUMP

(« CX Diesel Saloon » vehicles with manual steering)

L. 39-11

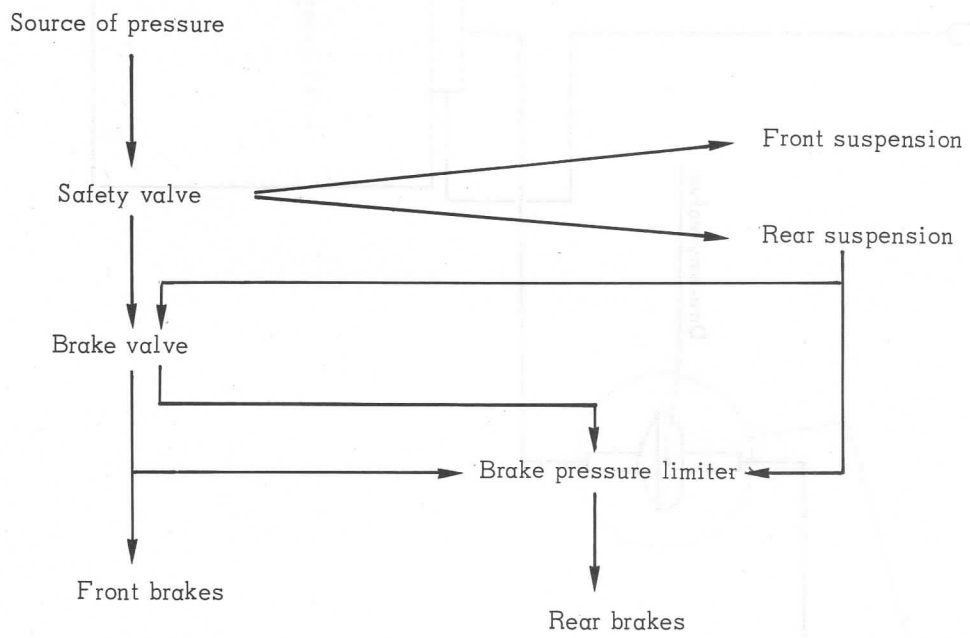


Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

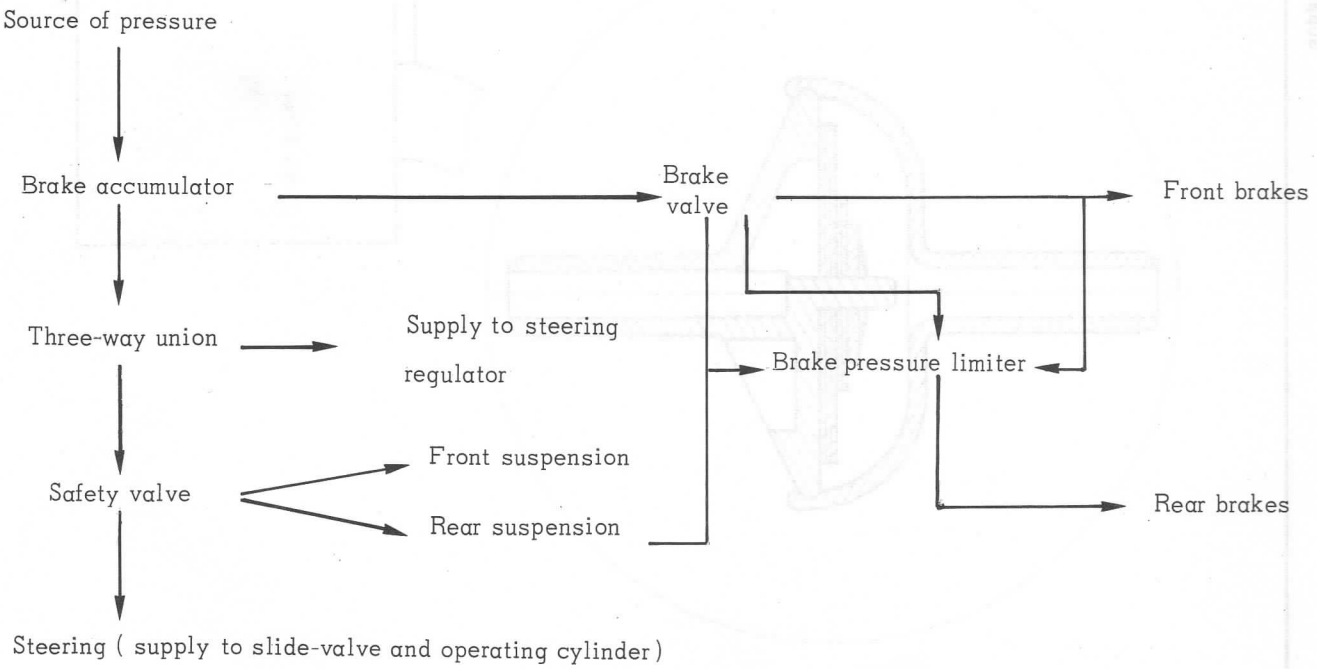
HYDRAULIC SYSTEM SUPPLY DIAGRAMS.

1. Supply diagram :

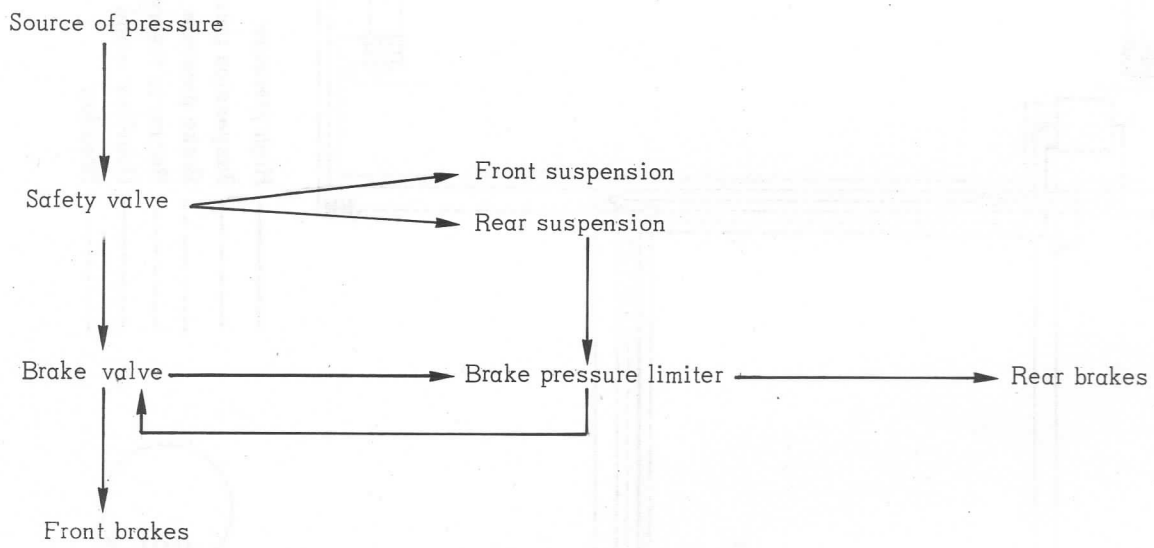
a) *Vehicles with manual steering (⟶ 9/1976) :*



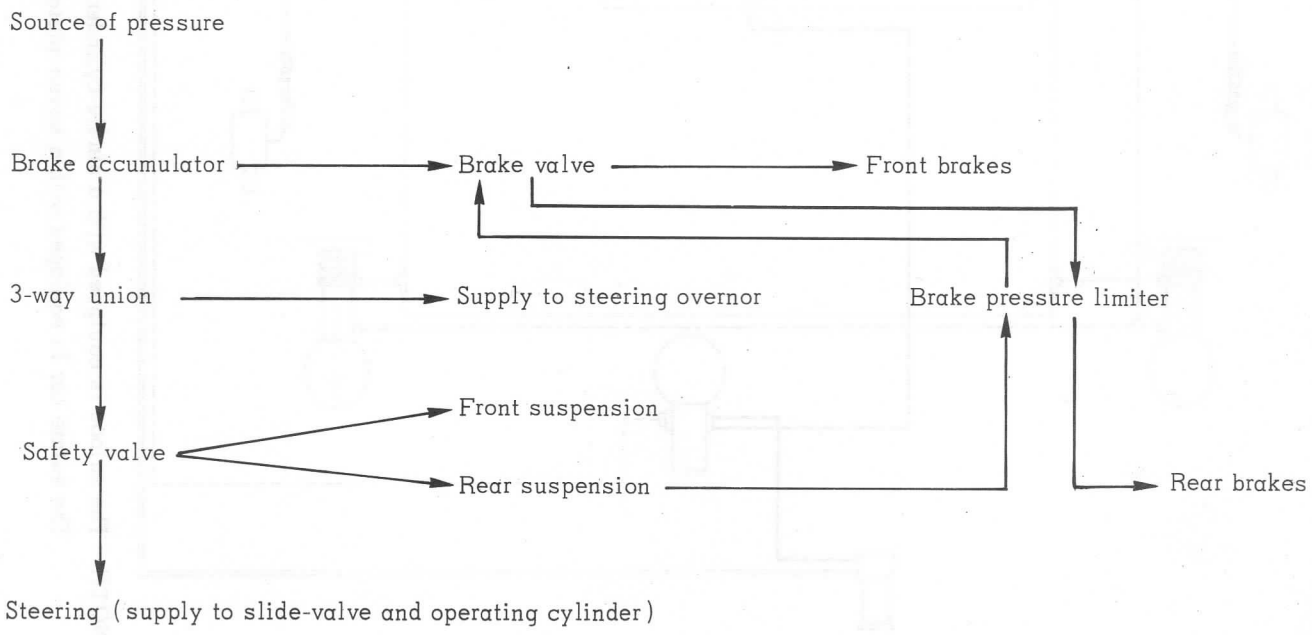
b) *Vehicles with power steering (⟶ 9/1976) :*



c) *Vehicles with manual steering (9/1976 ⟶) :*



d) *Vehicles with power steering (9/1976 ⟶) :*

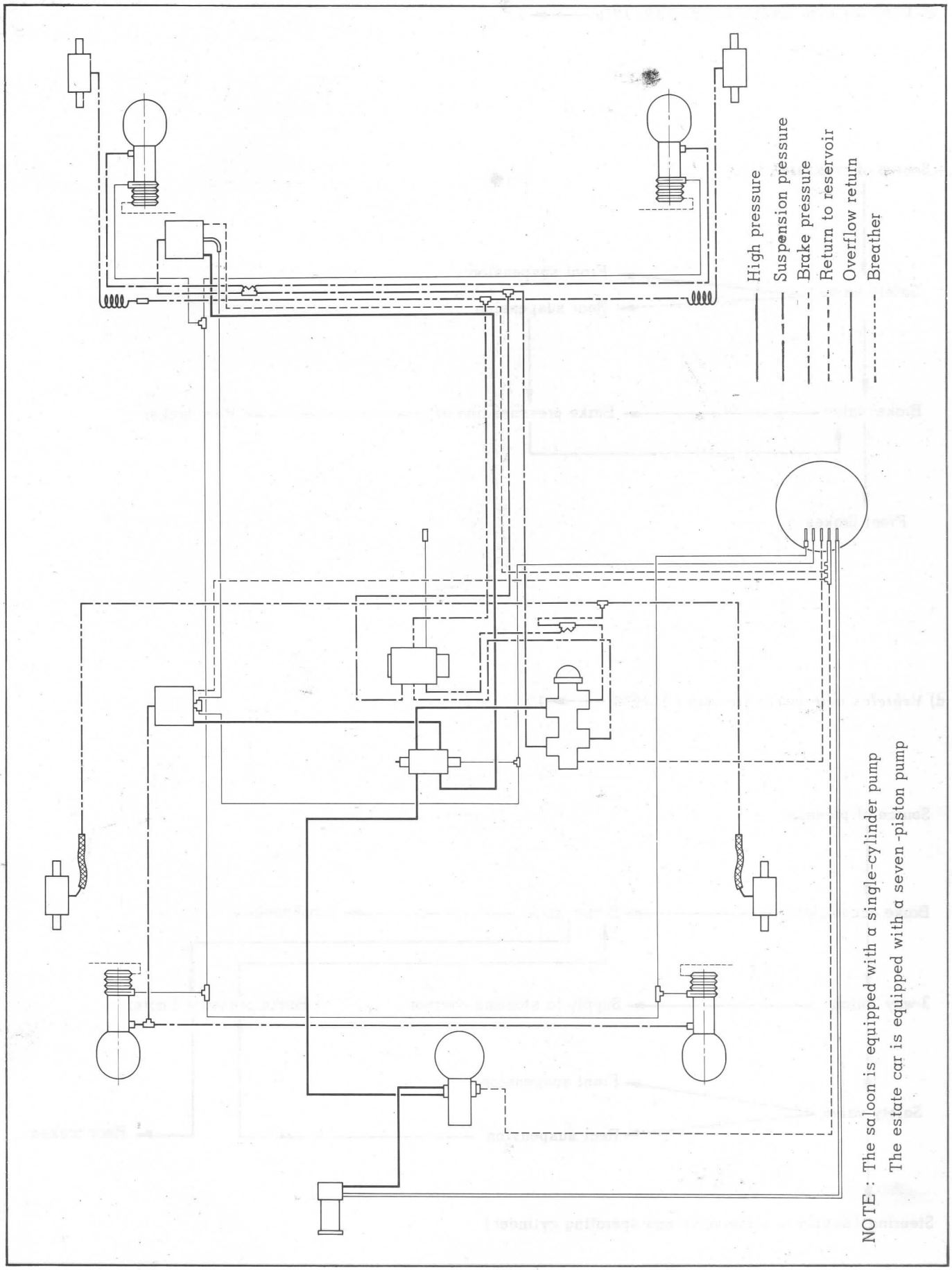


Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

2. Assembly diagram :

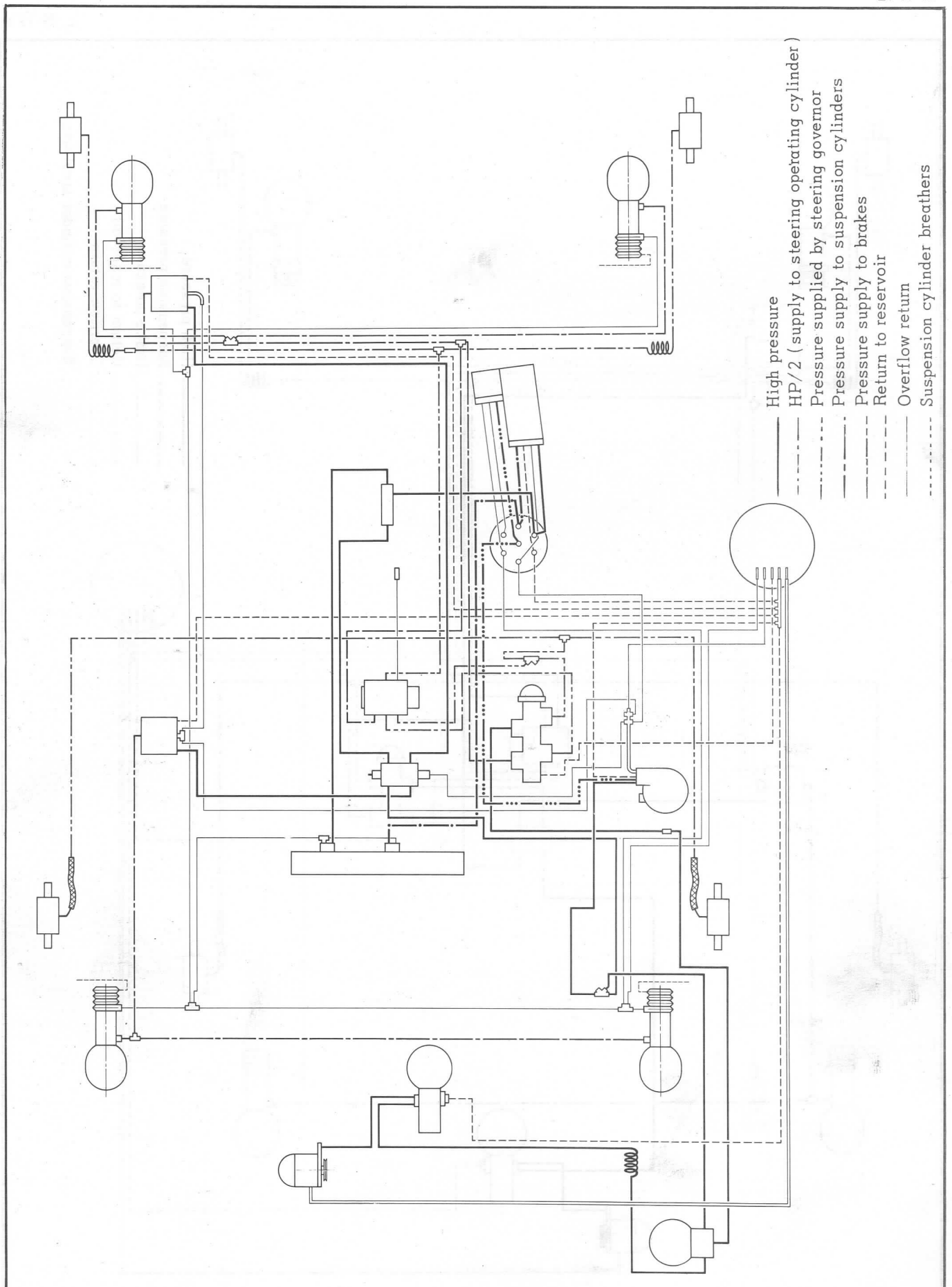
a) *Vehicles with manual steering (⟶ 9/1976) :*

L. 39-9



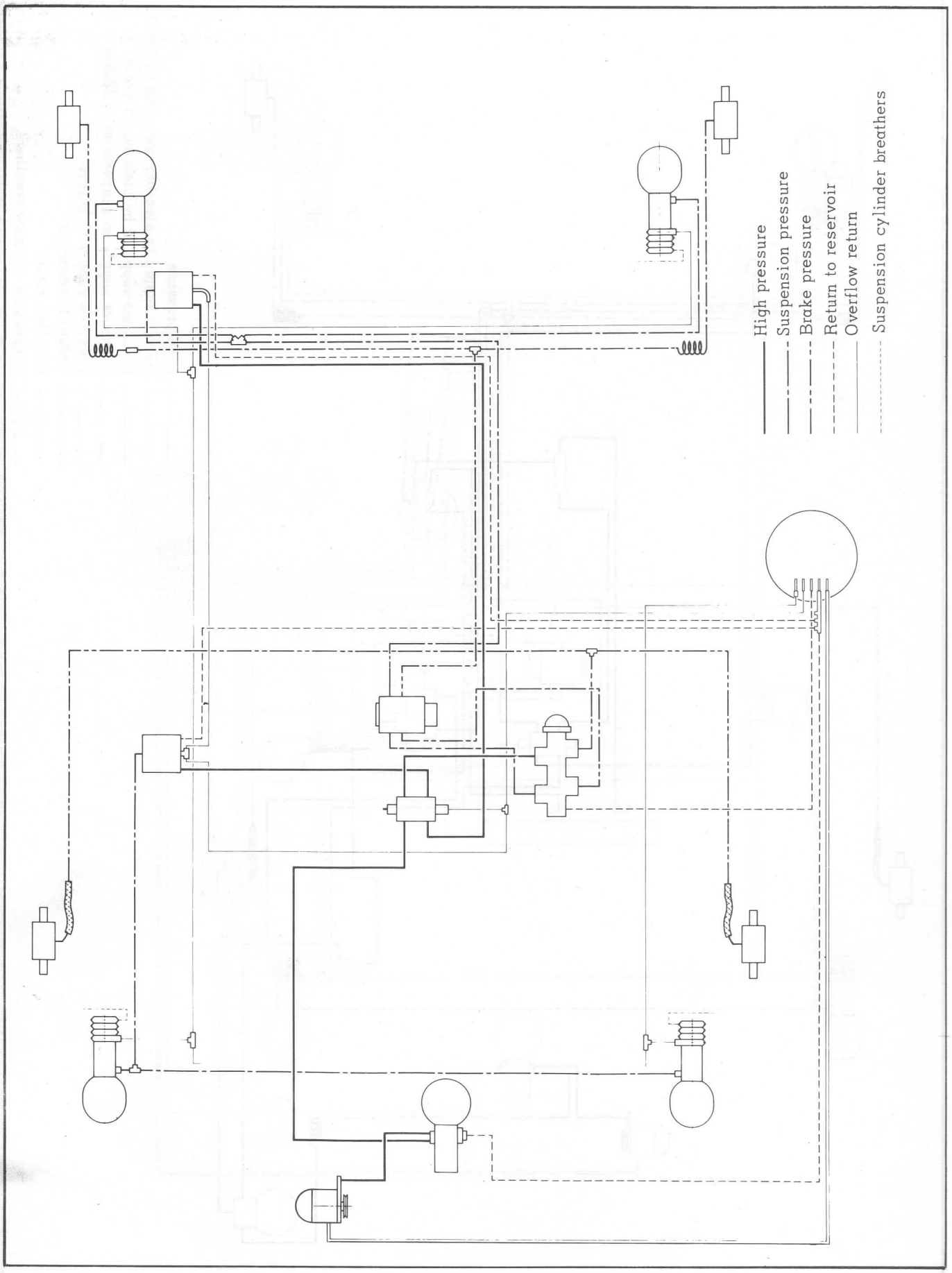
b) *Vehicles with power steering (⟶ 9/1976) :*

L. 39-10



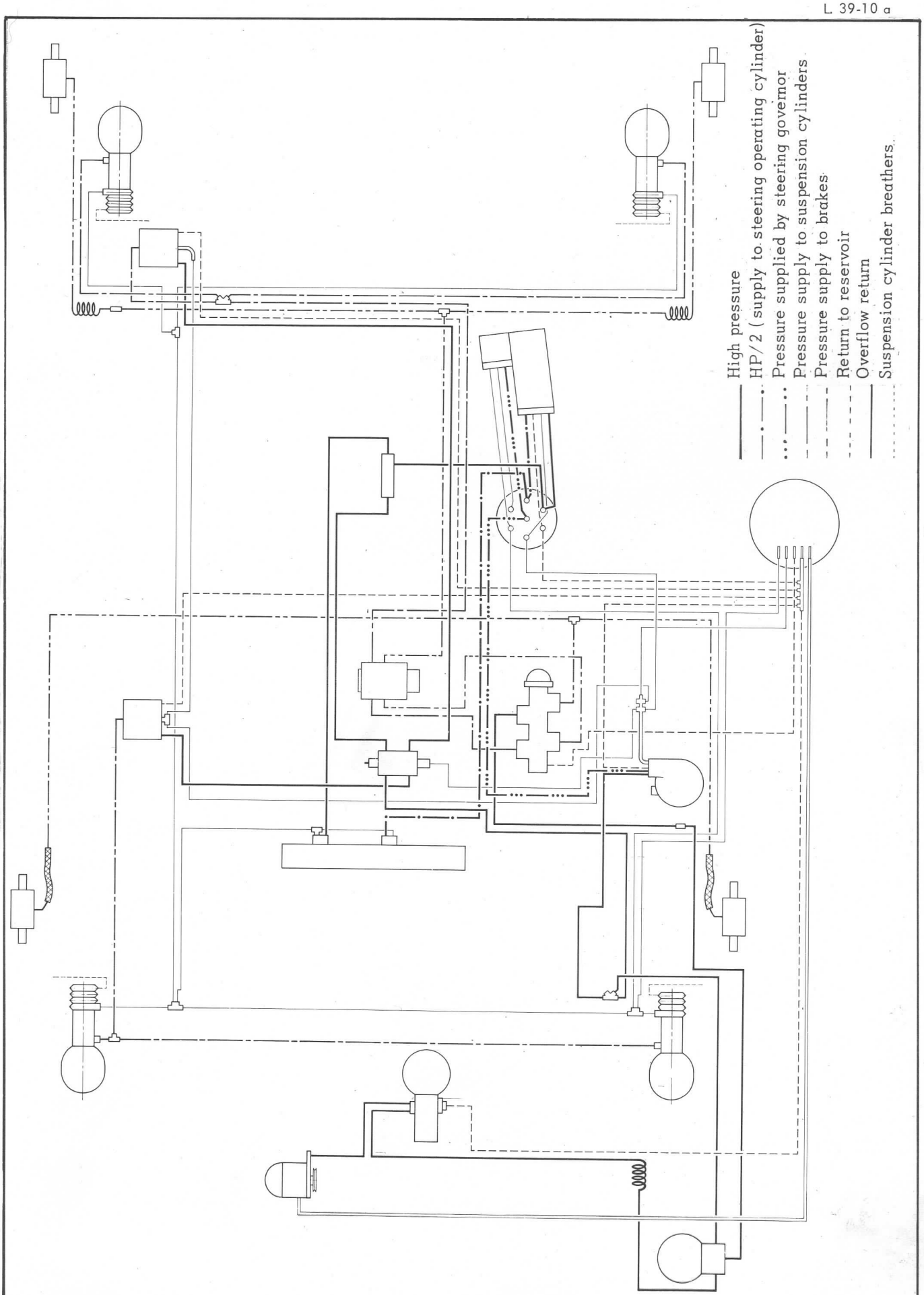
c) *Vehicles with manual steering (9/1976 ⟶) :*

L.39-12 a



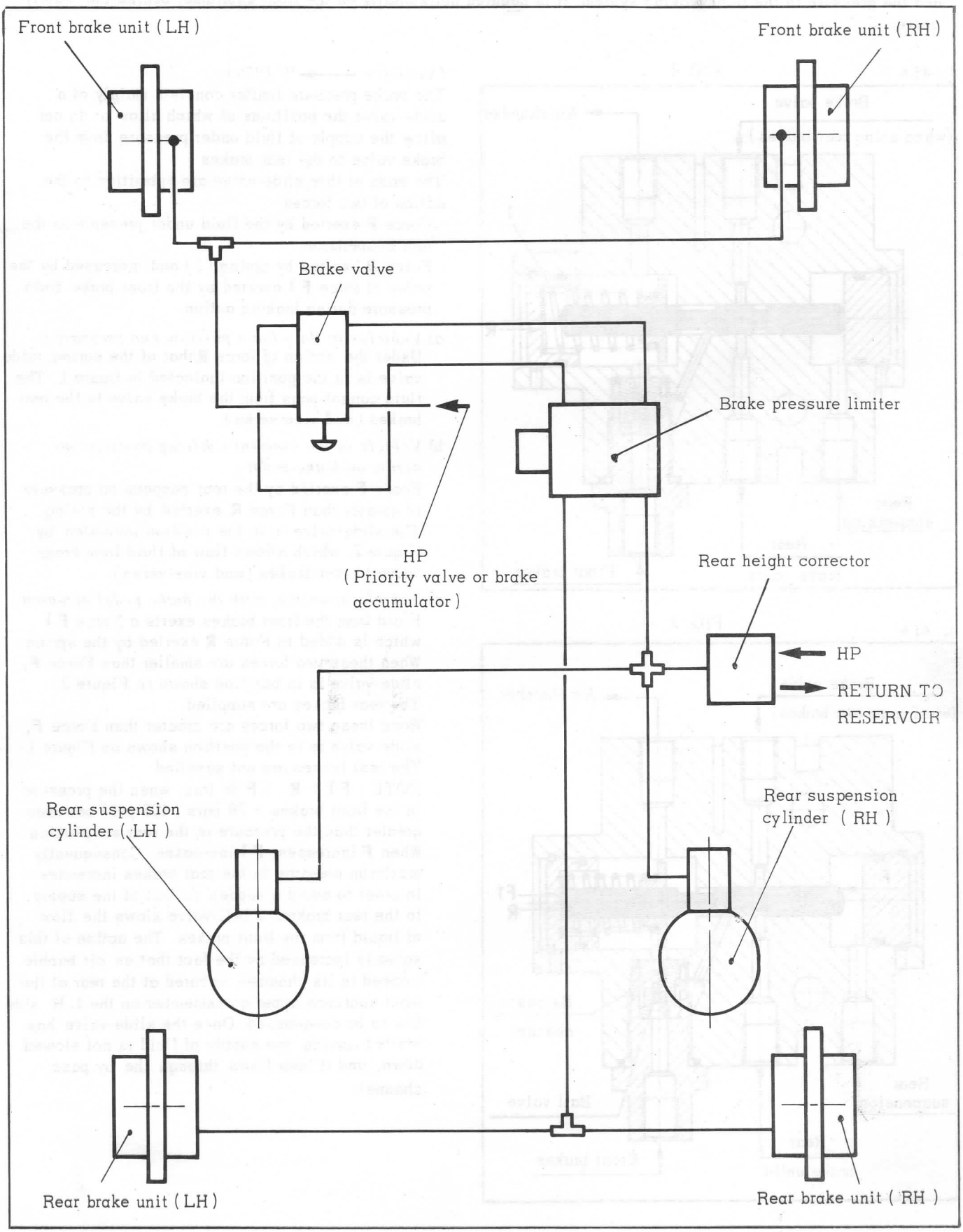
d) *Vehicles with power steering (9/1976 ⟶) :*

L. 39-10 a



SUPPLY DIAGRAM FOR BRAKING SYSTEM WITH BRAKE PRESSURE LIMITER.

L. 45-7



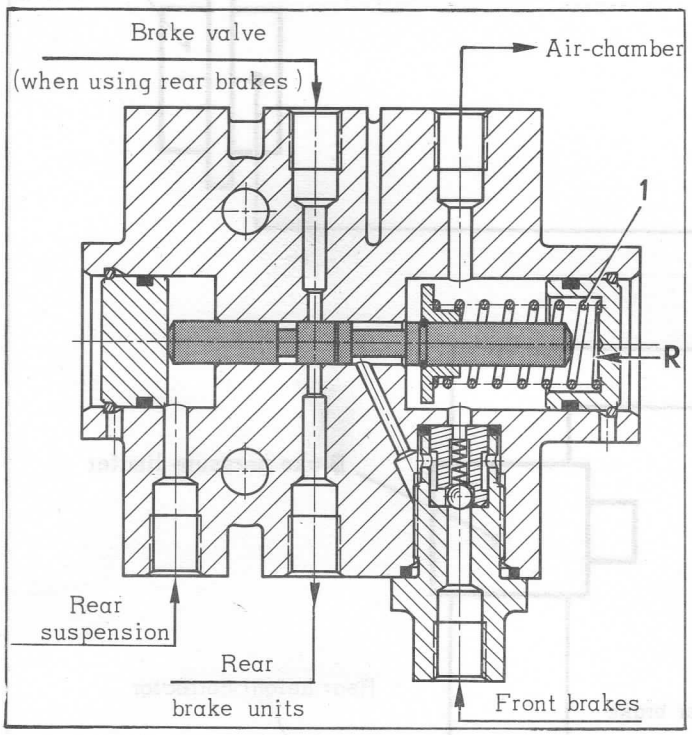
Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

I. CHARACTERISTICS.

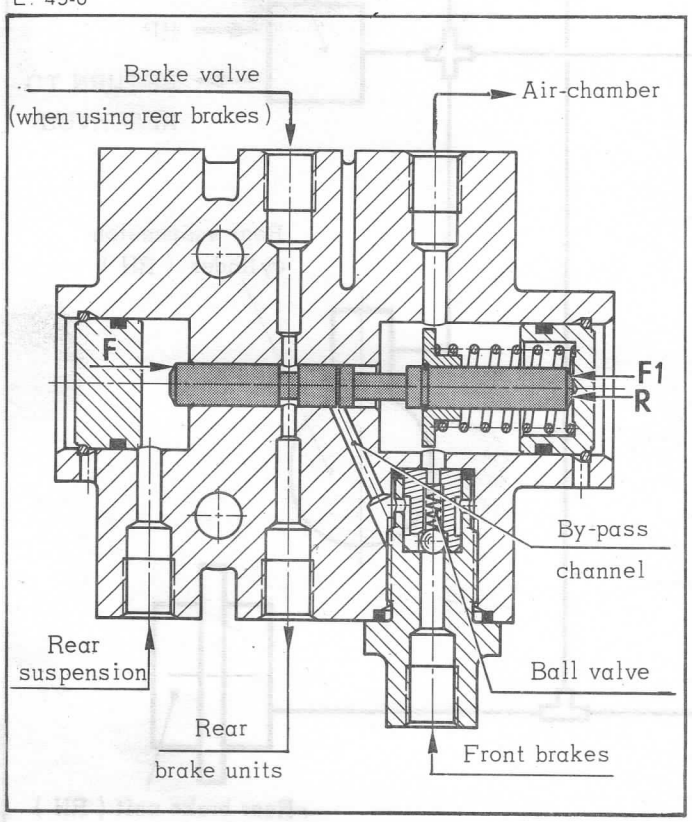
The characteristics and special features of the braking system on Diesel Estate vehicles are identical to those on Petrol Estate vehicles.

The characteristics and special features of the braking system on Diesel Saloon vehicles only differ from those on Petrol Saloon vehicles in the braking circuit. Diesel Saloons are fitted with a brake pressure limiter. Its object is to vary the maximum pressure in the rear braking system as a function of the load imposed on the rear suspension and the pressure in the front braking system. It is secured horizontally on the front subframe, behind the safety valve.

L. 45-6 FIG. 1



L. 45-6 FIG. 2



(Vehicles ⟶ 9/1976) :

The brake pressure limiter consists mainly of a slide-valve, the positions of which allow or do not allow the supply of fluid under pressure from the brake valve to the rear brakes.

The ends of this slide-valve are submitted to the action of two forces.

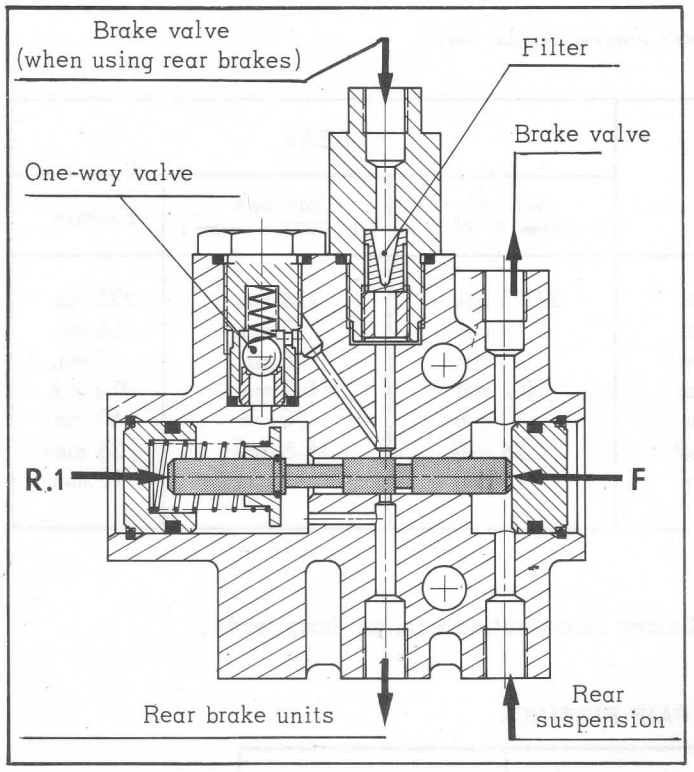
- Force **F** exerted by the fluid under pressure in the rear suspension
- Force **R** exerted by spring (1) and increased by the value of force **F1** exerted by the front brake fluid pressure during braking action.

a) *Vehicles in the « low » position (no pressure) :*
Under the action of force **R**, that of the spring, slide-valve is in the position indicated in figure 1. The fluid cannot pass from the brake valve to the rear brakes (and vice-versa).

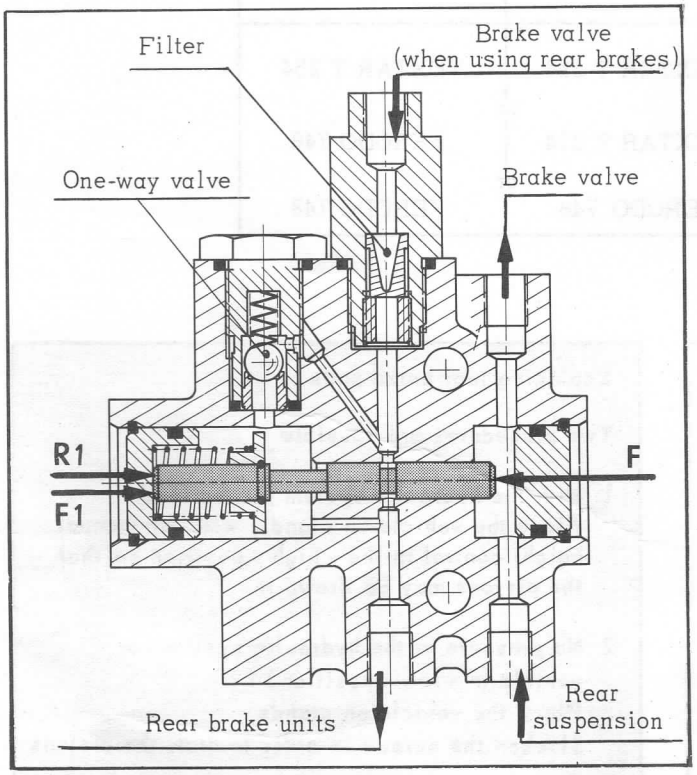
b) *Vehicle in the « normal » driving position, no action on brake pedal :*
Force **F** exerted by the rear suspension pressure is greater than Force **R** exerted by the spring. The slide-valve is in the position indicated by Figure 2, which allows flow of fluid from brake valve to rear brakes (and vice-versa).

c) *Vehicle in motion, with the brake pedal actuated :*
Fluid from the front brakes exerts a Force **F1** which is added to Force **R** exerted by the spring. When these two forces are smaller than Force **F**, slide-valve is in position shown in Figure 2. The rear brakes are supplied.
When these two forces are greater than Force **F**, slide-valve is in the position shown on Figure 1. The rear brakes are not supplied.
NOTE : **F1** + **R** > **F** is true, when the pressure in the front brakes + 28 bars (406 psi) becomes greater than the pressure in the rear suspension. When **F** increases, **F1** increases. Consequently, maximum pressure in the rear brakes increases.
In order to avoid a sudden cut-out of the supply to the rear brakes, a ball-valve slows the flow of liquid from the front brakes. The action of this valve is increased by the fact that an air bubble trapped in its chamber, secured at the rear of the front subframe upper crossmember on the L.H. side has to be compressed. Once the slide-valve has started moving, the supply of fluid is not slowed down, and it then flows through the by-pass channel.

FIG. 1 L. 45-8



FIG« 2 L. 45-8



(9/1976 ⟶) vehicles :

The brake pressure limiter consists mainly of a slide-valve, the position of which allows or does not allow supply of fluid under pressure from the brake valve to the rear brakes.

- one end of the slide-valve is constantly subjected to the pressure of the rear suspension fluid (which varies according to the load)
- the other end of the slide-valve is subjected to force **R1,** increased during braking action by force **F1** exerted by the fluid under pressure from the rear brakes.

a) *Vehicle in the « low » position (no pressure) :*
Under the action of force **R1** alone, the slide-valve is in the position shown on Fig. 1.
The fluid cannot flow from the brake valve to the rear brakes.
On the other hand, the one-way valve allows fluid to flow from the rear brakes to the brake-valve.

b) *Vehicle in the « normal » driving position with no action on the brake pedal :*
Force **F** exerted by the rear suspension fluid under pressure is greater than force **R1** produced by the spring. The slide-valve is in the position shown on Fig. 2 which allows fluid to flow from the brake valve to the rear brakes and vice-versa.

c) *Vehicle in motion, with the brake pedal being actuated :*
Fluid flowing from the rear brakes, exerts a force **F1** which is added to force **R1** produced by the spring.

Before « cut-out » :
At the start of the brake pedal movement, force **F1** being still very small, we have **F1** + **R1** < **F.** The slide-valve allows liquid to flow to the rear brakes.

After « cut-out » :
Force **F1** having increased, and being added to Force **R1,** we have **F1** + **R1** > **F.** The slide-valve interrupts the flow of fluid to the rear brakes.
The « easing » of the braking at the rear is then allowed to proceed via the one-way valve.

NOTE : **F1** + **R1** > **F** is true when the rear brake pressure + **28 bars (406 psi)** becomes greater than the rear suspension pressure. If **F** increases, **F1** increases as well until cut-out occurs.
Consequently, maximum pressure in the rear brakes increases.

III. SPECIAL FEATURES.

- Clearance between pedal and brake-valve : ..... 0.05 to 3 mm
- Stoplamp switch : *Lamp must light up as soon as pedal touches brake valve.*

Main braking system :

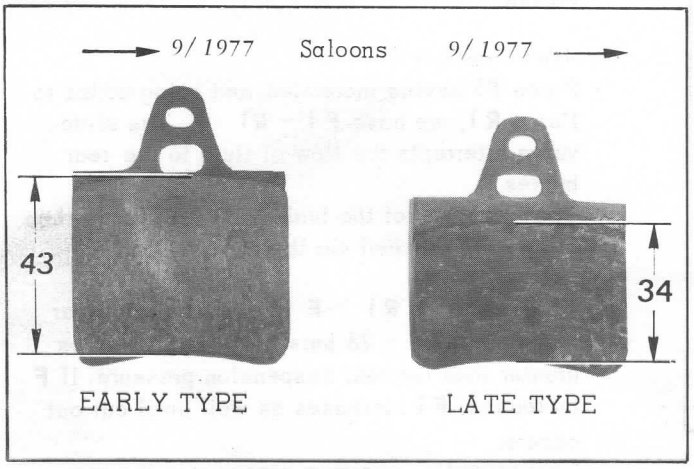
	FRONT	REAR		
	(all vehicles)	Saloons (→ 9/1977)	Saloons (9/1977 →)	Estates
- Diameter of disc	260 mm	233.5 mm	224 mm	235 mm
- Thickness of disc	20 mm	9 mm	7 mm	18 mm
- Minimum thickness after wear	18 mm	7 mm	5 mm	16 mm
- Max. run-out of disc	0.2 mm	0.2 mm	0.2 mm	0.2 mm
- Diameter of operating pistons	42 mm	30 mm	30 mm	40 mm
- Aera of one pad	55 cm^2	24 cm^2	18.5 cm^2	36 cm^2
- Thickness of lining on the pad	11.5 mm	12 mm	13 mm	12 mm

TYPE OF BRAKE PAD LINING (Front linings incorporating warning-lamp leads)

AUTHORIZED REPAIR FITTINGS

VEHICLE	FRONT	REAR
Saloon	TEXTAR T 254 or FERODO 748	FERODO 748 FERODO 748
Estate	TEXTAR T 254 or TEXTAR T 254 or FERODO 748	TEXTAR T 254 FERODO 748 FERODO 748

REAR BRAKE PAD



Replacing rear brake pads :

Two procedures are possible :

1. **With the hydraulic system pressurized :**
   Place the vehicle on stands, with the manual height control in the « high » position so that the pistons may be drawn in.

2. **No pressure in the hydraulic system (or vehicle in « low » position) :**
   Place the vehicle on stands.
   Slacken the screws in order to draw the pistons in.

Handbrake (Emergency brake) :

- Thickness of the lining on one pad : ..... 4.15 mm
- Type of lining : ..... TEXTAR T 270
- Area of one pad : ..... 12 cm2 (1.86 sq.in)
- Adjusting the pad : the pads must just contact the disc at its highest points.

Tightening torques :

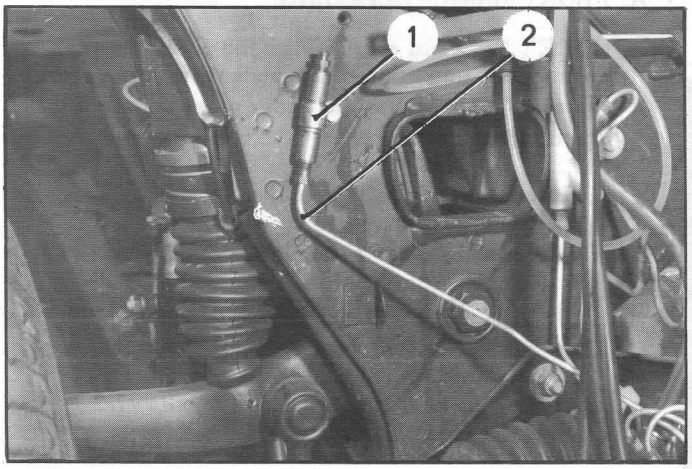
- Flexible brake pipe on front brake unit tube : ..... 3.6 to 4 da Nm (26 to 29 ft.lb)
- Nut securing front brake pipe on subframe : ..... 2.1 to 2.4 da Nm (15 to 17 1/2 ft.lb)
- **Brake valve securing point :** ..... 1.8 da Nm (13 ft.lb)
- Pedal assembly securing point : ..... 0.5 da Nm (3 1/2 ft.lb)

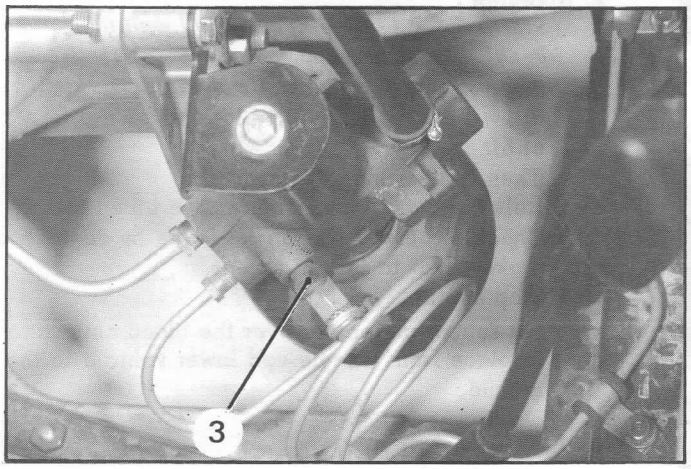
REPAIRS.

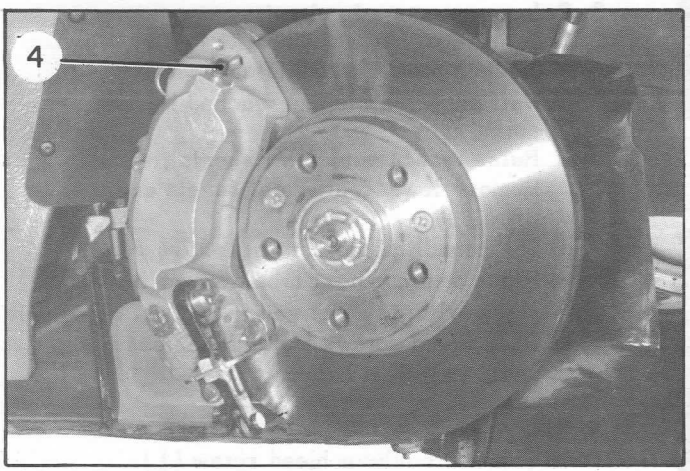
It is of the utmost importance that the vehicle original fitting should be maintained.
The following conditions are prohibited :
- mixing unit of the early type with units of the late type for LH and RH fittings,
- fitting early type pads to a late brake unit,
- fitting late type pads to an early brake unit.

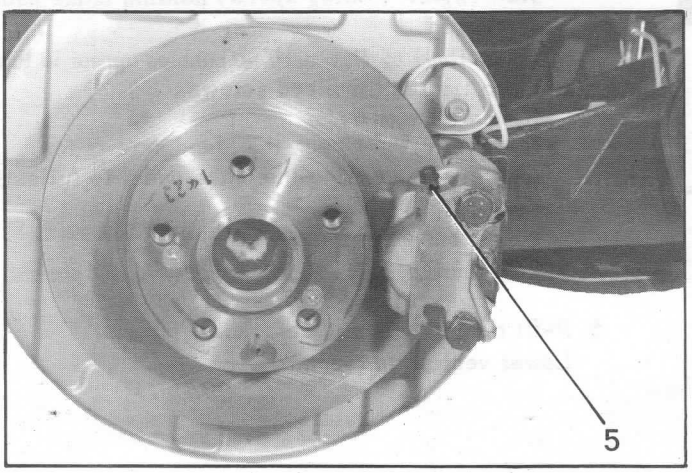
Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (ADD)

I - BLEEDING THE BRAKES (⟶ 9/1976)









Response time of the brake pressure limiter depends on the bleeding of the front brakes.
- **Too much air in air-chamber (1) slows down the cut-out of supply to the rear brakes,**
- **No air in air-chamber (1) causes cut-out of supply to rear brakes to occur too suddenly.**

A. BLEEDING THE FRONT BRAKES AND THE AIR CHAMBER (1)

NOTE : **This bleeding must be carried out with no pressure in the system** in order to avoid any emulsifying of the liquid, and consequently the possible formation of air-bubbles in the system.

1. Release pressure in the system :

a) Raise front of vehicle (wheels free).
b) Slacken release screw (3) on pressure regulator. Remove the front wheels.
c) Place on each bleed screw (4) a transparent tube with its other end in a clean container
d) *Maintain brake pedal fully depressed,* and slacken bleed screws (4).
e) Remove air chamber (1). Place a transparent tube on the end of pipe (2).

2. Bleed the brakes :

a) *Start engine, (idling speed) and maintain brake pedal, fully depressed.*
b) Tighten release screw on pressure regulator, and let fluid flow until there are no more air bubbles in the bleed tubes.
Then tighten the bleed screws.
c) Release brake pedal,and remove bleed tubes.
d) *Fit air chamber (1) after having blown it through with compressed air.*
e) Check bleed screws and air chamber (1) are properly sealed by fully depressing brake pedal. stop engine. Place rubber protective caps over bleed screws.
f) Fit front wheels and lower vehicle to the ground.

B. BLEEDING THE REAR BRAKES.

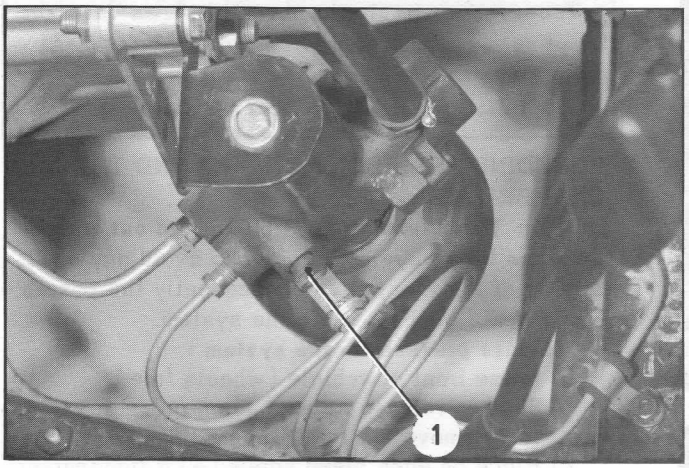
3. Bleed the rear brakes :

a) Raise rear of vehicle (wheels free).
Remove removable panels and rear wheels.
b) Place manual height control lever in « *high position* » (Release screw on pressure regulator tightened).
c) Place on each bleed screw (5) a transparent tube with its other end in a clean container.
Slacken bleed screws (5).
d) *Start engine (idling speed).*
Depress brake pedal slightly.
e) Let fluid flow until it is free of air bubbles.
Then tighten bleed screws.
Release brake pedal.
f) Remove bleed tubes.
Check bleed screws are properly sealed by fully depressing brake pedal.
Fit rubber protective caps.
Stop engine.

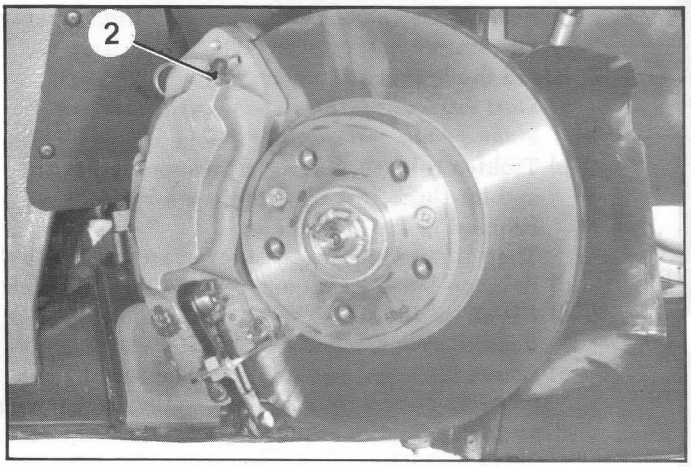
4. Fit rear wheels and removable panels.
Lower vehicle to the ground.

II - BLEEDING THE BRAKES *(9/ 1976 ⟶)*

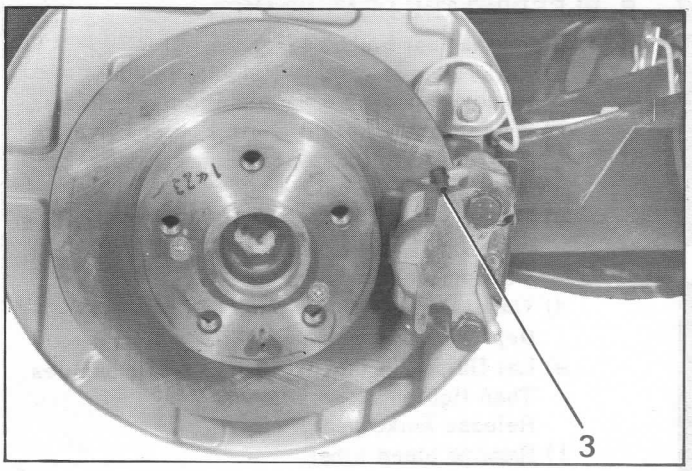
13 379



13 398



13 409



A. FRONT BRAKE BLEEDING.

NOTE : To avoid emulsifying the fluid and the consequent formation of air-pocket in the system, **the circuit should not be under pressure** when this operation is carried out.

1. Release pressure in circuits :

a) Raise front of vehicle (wheels free).
b) Slacken pressure regulator bleed screw (1). Remove front wheels.
c) Place a transparent tube over each bleed screw (2) with its other end in a clean container.
d) *Hold down brake pedal and loosen bleed screws (2).*

2. Bleeding :

a) *Start engine (idling speed) and maintain brake pedal fully depressed.*
b) Tighten pressure regulator bleed screw and allow fluid to flow until bleed tubes are free of air bubbles.
Then tighten bleed screws (2).
c) Release brake pedal and remove bleed tubes.
Check the bleed screws for leaks by depressing brake pedal to fullest extent.
Stop engine.
Fit rubber protectors over the bleed screws.
d) Replace front wheels and lower vehicle to the ground.

B. REAR BRAKE BLEEDING.

3. Release pressure in circuits :

a) Set manual height control to *low position.*
b) Slacken pressure regulator bleed screw (1).
c) Wait until vehicle has reached its lowest point.
Raise rear of vehicles (wheels free).
Remove lower rear wheel panels and rear wheels.
d) Set manual height control to *high position.*
e) Place a transparent tube over each bleed screw with its other end in a clean container.
f) Open bleed screws (3) and depress brake pedal to fullest extent.

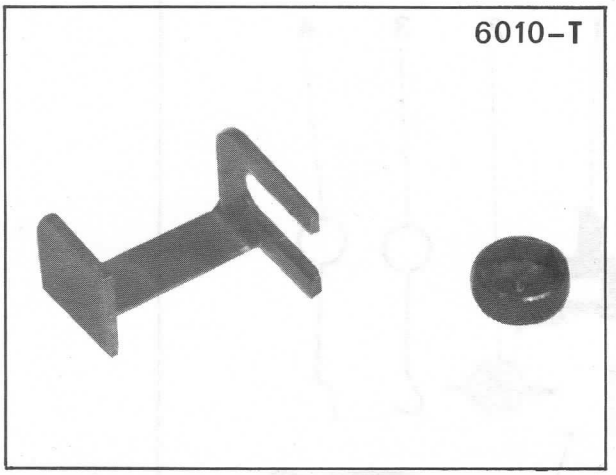
4. Bleeding :

a) Tighten regulator bleed screw (1).
Start engine, (idling speed) holding brake pedal depressed.
b) Allow fluid to flow until no bubbles appear in tube.
Then tighten the bleed screws.
Release brake pedal.
c) Remove tubes. Check the bleed screws for leaks by depressing the brake pedal to fullest extent.
Fit rubber protectors.
Stop engine.

5. Refit rear wheels and detachable panels.
Lower vehicle to ground.

77-760

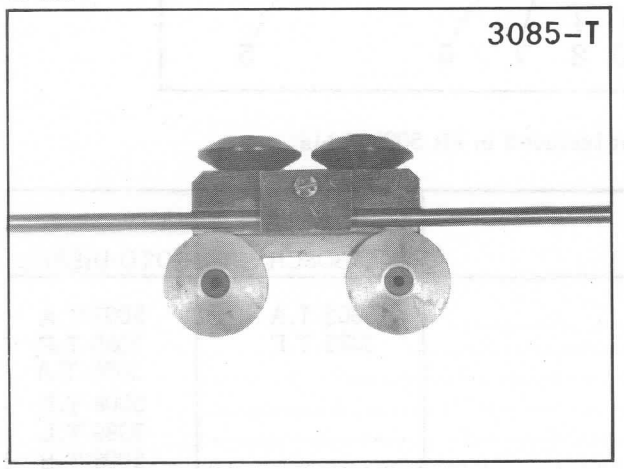
6010-T



Clamp + bush for adjusting slow-running on CX 2500 (ROTO-DIESEL)

12 533

3085-T



Pulley alignment rod

15 278

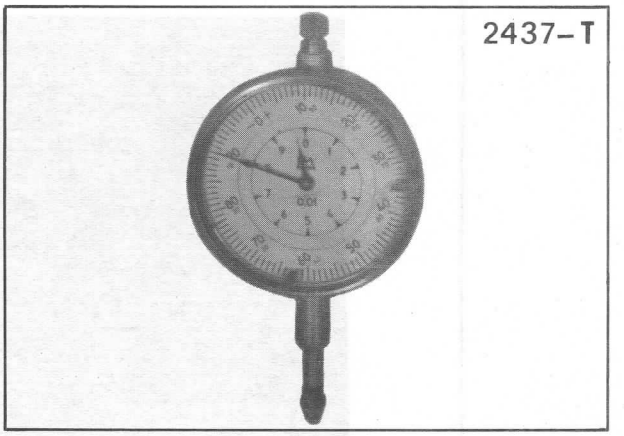
4026-T



Pump + connection pipe assembly for calibration of injectors

12 827

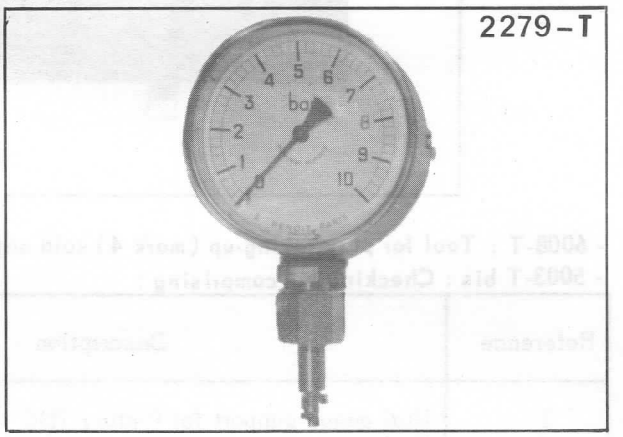
2437-T



Dial gauge

13 462

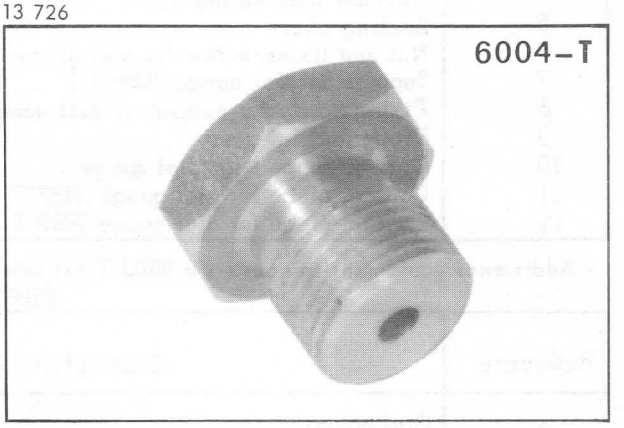
2279-T



0-10 bar (0-145 psi) pressure gauge

13 726

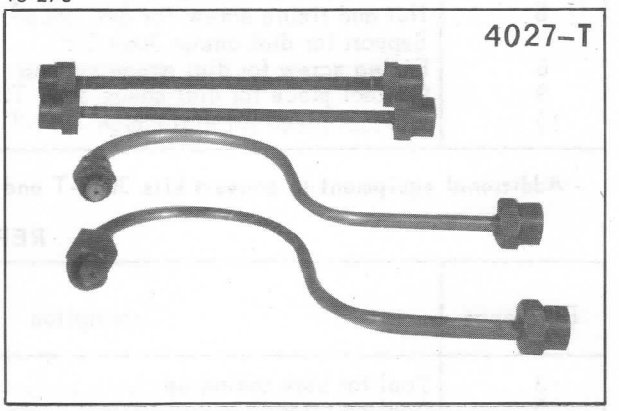
6004-T



Union for checking oil pressure

15 278

4027-T



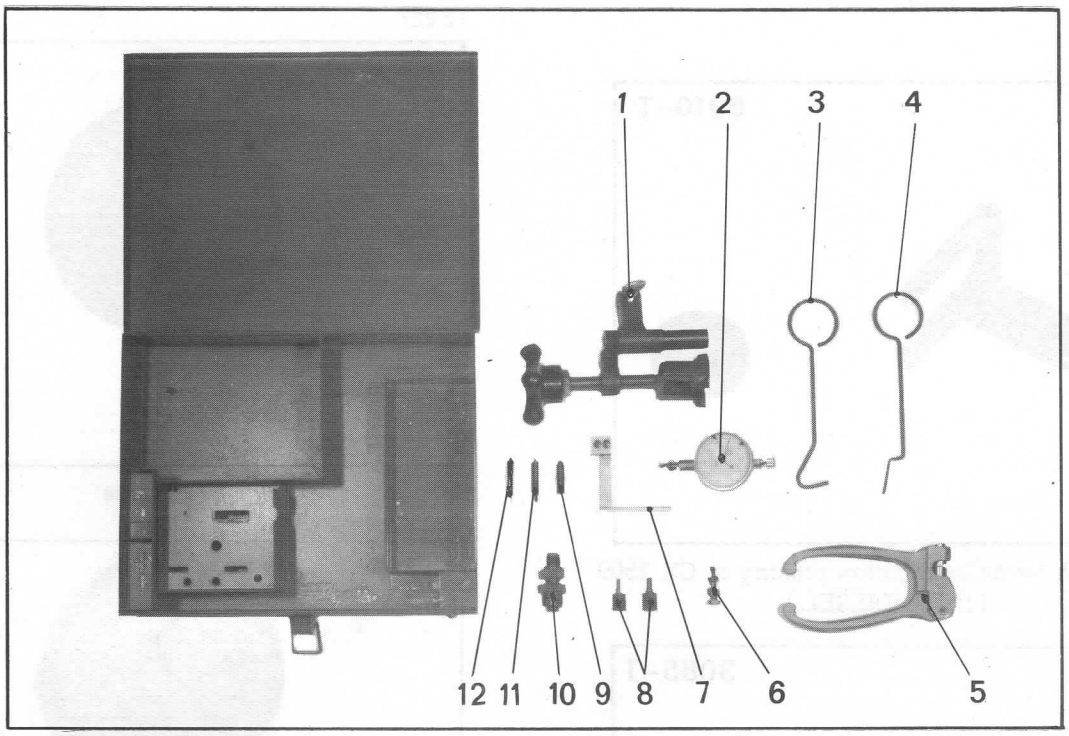
Set of four connecting pipes (if repairer already possesses a calibration pump)

Supplement No. 1 to Manual 818-3 (CHARACTERISTICS) (CORR)

SPECIAL RECOMMENDED TOOLS (continued)

Tools required for timing the injection pump

15 222



- **6008-T : Tool for play taking-up (mark 4)** sold separately, not included in kit 5003-T bis.
- **5003-T bis : Checking kit comprising :**

Reference	Description	Use and reference	
		BOSCH	ROTO-DIESEL
1	Dial gauge support for finding TDC	5003-T.A	5003-T.A
2	Dial gauge	3089-T.F	3089-T.F
3	Tool for play taking-up		5008-T.A
5	Sealing-pliers		5008-T.D
6	Nut and fixing screw for dial gauge 3089-T.F		3089-T.L
7	Support for dial gauge 3089-T.F		5008-T.B
8	Fixing screw for support of dial gauge 3089-T.F		5008-T.C
9	Probe for dial gauge		3089-T.H
10	Gripper-support for dial gauge	5003-T.B	
11	Contact piece for dial gauge 2437-T	5003-T.C	5003-T.C
12	Contact piece for dial gauge 3089-T.F	5003-T.D	

- **Additional equipment to convert a 5003-T kit into a 5003-T bis kit :**

REFERENCE 5009-T

Reference	Description	Use and reference	
		BOSCH	ROTO-DIESEL
2	Dial gauge	3089-T.F	3089-T.F
3	Tool for play taking-up		5008-T.A
5	Sealing pliers		5008-T.D
6	Nut and fixing screw for dial gauge 3089-T.F		3089-T.L
7	Support for dial gauge 3089-T.F		5008-T.B
8	Fixing screw for dial gauge support		5008-T.C
9	Contact piece for dial gauge 3089-T.F		3089-T.H
12	Contact piece for dial gauge 3089-T.F	5003-T.D	

- **Additional equipment to convert kits 3089-T and 5003-T into a 5003-T bis kit**

REFERENCE 5008-T

Reference	Description	Use and reference	
		BOSCH	ROTO-DIESEL
3	Tool for play taking-up		5008-T.A
5	Sealing pliers		5008-T.D
7	Support for dial gauge 3089-T.F		5008-T.B
12	Contact piece for dial gauge 3089-T.F	5003-T.D	

MANUAL N° 818-3

SECOND SECTION

REMOVAL and FITTING

Manual 818-3

LIST OF OPERATIONS (REMOVAL AND FITTING) IN THE SECOND SECTION OF MANUAL 818-3

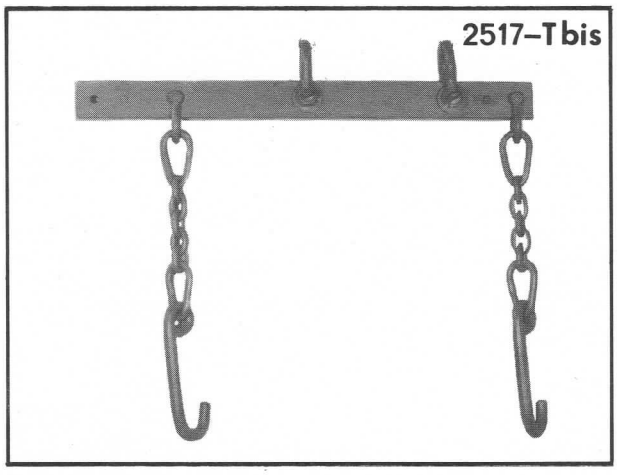
« CX Diesel » Vehicles

Operation number	DESCRIPTION
	ENGINE - INJECTION SYSTEM
MA.Di. 100-1	Removing and fitting the engine gearbox assembly
MA.Di. 100-2	Uncoupling and coupling the engine-gearbox assembly
MA.Di. 144-1	Working on the injection system :
	I. Replacing an injector-carrier
	II. Replacing an injector
	III. Removing and fitting an injection pump (ROTO-DIESEL)
	IV. Removing and fitting an injection pump (BOSCH)
MA.Di. 145-1	Working on the injection circuit :
	I. Replacing a « CAV Roto-Diesel » fuel filter cartridge
	II. Replacing a « Purflux » fuel filter cartridge
	III. Replacing « Purflux » fuel filter valves

SPECIAL RECOMMENDED TOOLS

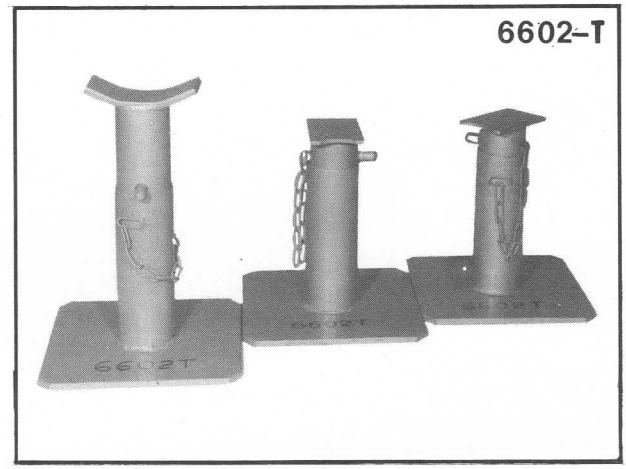
TOOLS SOLD

13 555



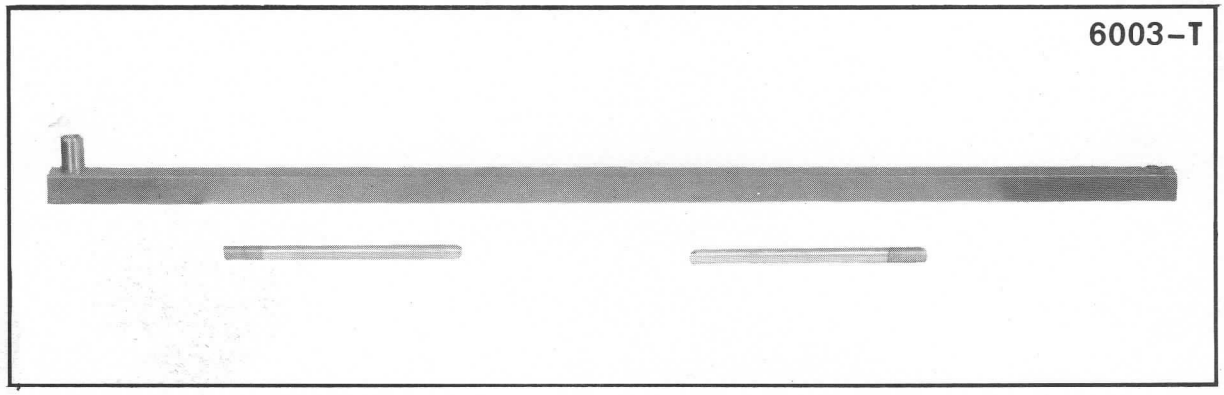
Sling for removal and fitting of engine-gearbox assembly.

13 815



Set of three stands

13 554



Positioning gauge for engine bearer

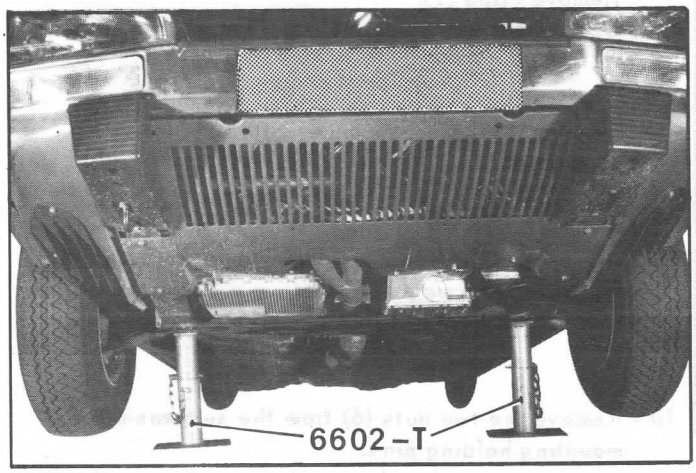
TIGHTENING TORQUES

Recommended tightening torques.

Item to be tightened	Torque in m.N	Torque in ft.lb
Fixing screw for lower engine support on unit *(Contact washer)*	21	15.2
Assembly screw for lower engine support *(Serrated washer)*	100	72.5
Nuts for suspension torque link pins engine-gearbox *(Flat washer)*	100	72.5
Exhaust clamp nuts	14 to 18	10 to 13
Alternator fixing screw *(Contact washer)*	61	44.1
Cooling circuit drain-plug *(Copper gasket)*	30 to 40	21.5 to 29
Assembly screw for left-hand flexible support *(Serrated washer)*	160 to 170	115.7 to 123

REMOVING AND FITTING THE ENGINE-GEARBOX ASSEMBLY

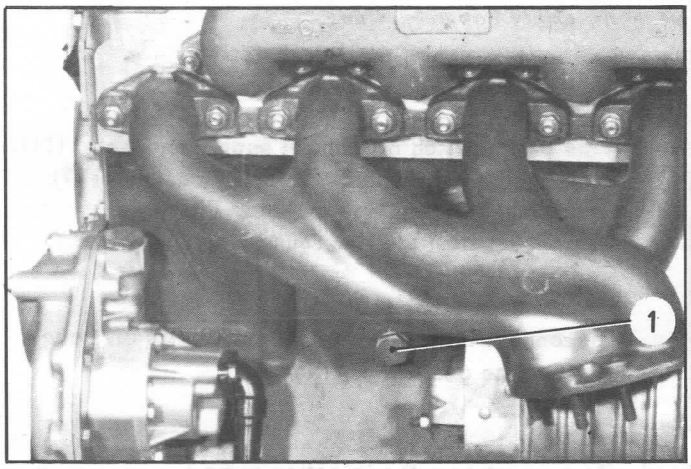
15 211



REMOVING THE UNIT

1 - Place the front of the vehicle on stands *(Use stands 6602-T).*
Disconnect negative and positive terminals from battery.
Release the pressure in the hydraulic system.
Vehicles with power steering :
(Do not forget to empty brake accummulator).

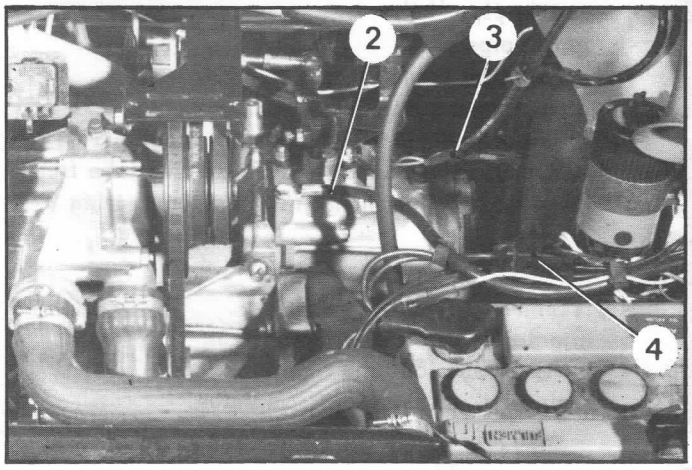
15 203



2 - **Remove :**
- bonnet,
- front wheels,
- spare wheel.

3 - **Drain cooling system :**
- Remove header tank cap.
- Open radiator tap.
- Remove plug (1) from cylinder block.

15 087

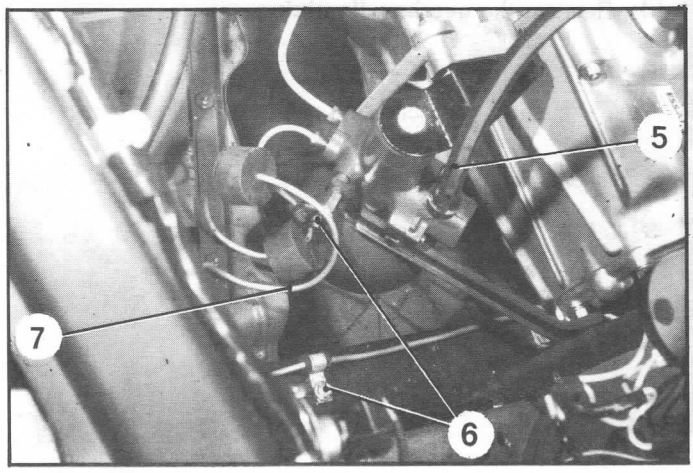


4 - **Remove the transmission units :**
(Transmissions identical to those of CX petrol vehicles).

5 - **Disconnect :**
- earth lead (2) from the gearbox,
- wiring harness (3) from the reversing lamp switch and the brake pad wear warning lamp,
- the connector (4),

Remove the battery *(remove left-hand headlamp bulb).*

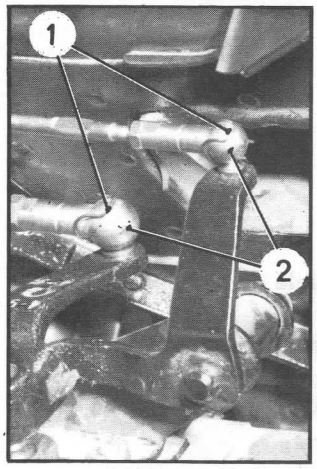
76-14



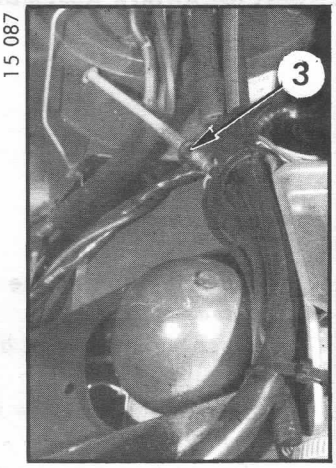
6 - **Disconnect from the pressure regulator :**
- the H.P. outlet pipe, and free it from its fixings,
- return tube (5) to reservoir.

Vehicles with power steering :
Remove brake pressure accumulator and its support plate.

13 345



15 087



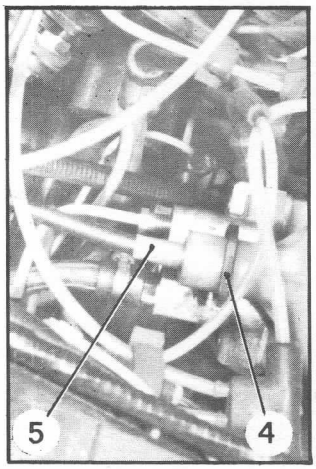
7 - Disconnect the gear lever :
Remove clips (1).
Disconnect ball joints (2) from the gear lever.

8 - Disconnect the speedometer cable at connection (3).

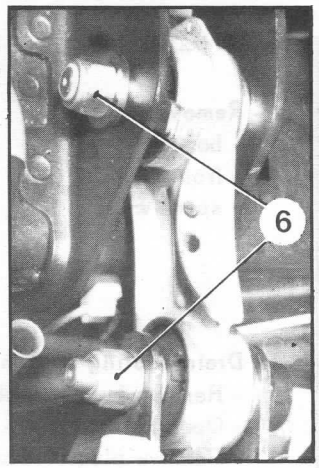
9 - Disconnect the centrifugal governor drive-cable *(on power steering vehicles).*
Remove clip (4) and free cable (5).

10 - Remove the two nuts (6) from the suspension mounting holding pins.
Do not remove the pins until the engine-gearbox assembly has been slung.

14 899



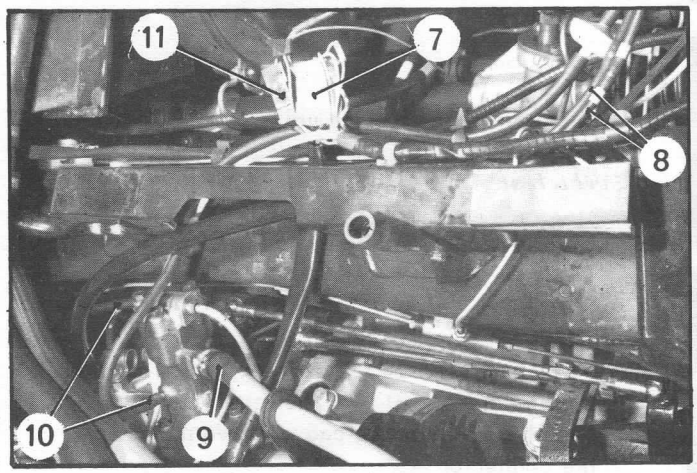
76-41



11 - Disconnect :
- the pump switch-off control supply connector (11),
- the engine wiring harness supply connector (7),
- the preheater plug supply lead.

Disconnect from the H.P. pump :
- suction tube (9),
- ventilation tubes (10).

Disconnect tubes (8) from the pneumatic oil gauge.
Remove the gearbox dipstick.

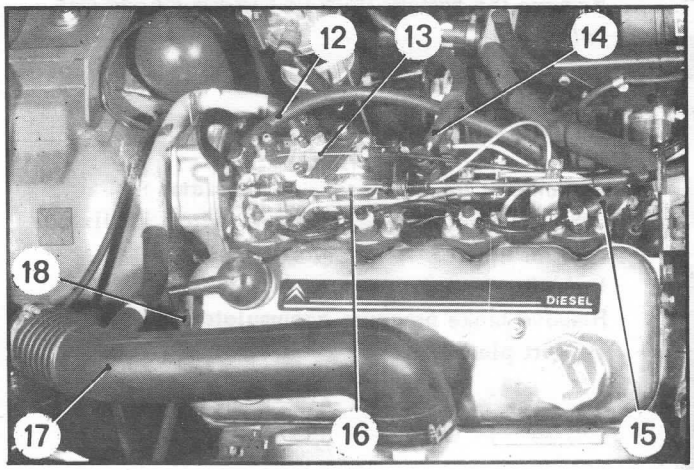


76-38

12 - Disconnect from the injection pump :
- supply pipe (14),
- return pipe (12),
- accelerator cable (16),
- stop control cable (13).

Remove fixing nut from fuel return tube holding lug (on the oil filter support plate) and free tube from plate fixed on right-hand transmission bearing.

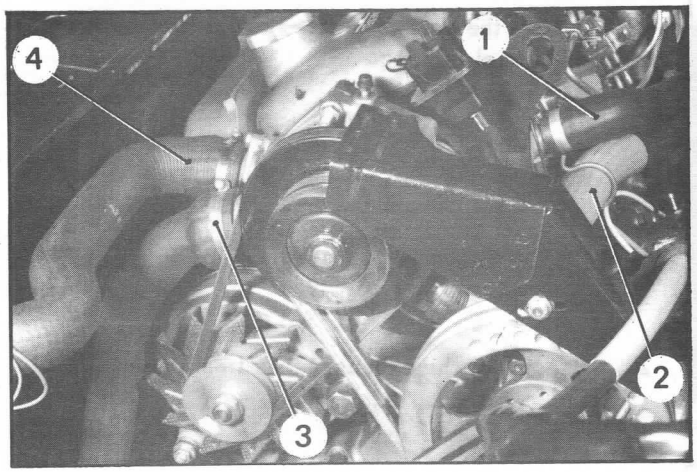
13 - Disconnect :
- injector overflow return pipe (15),
- air filter suction tube (17),
- recirculating tube (18), from union.



15 087

14 - Remove the gearbox dipstick.

76-29

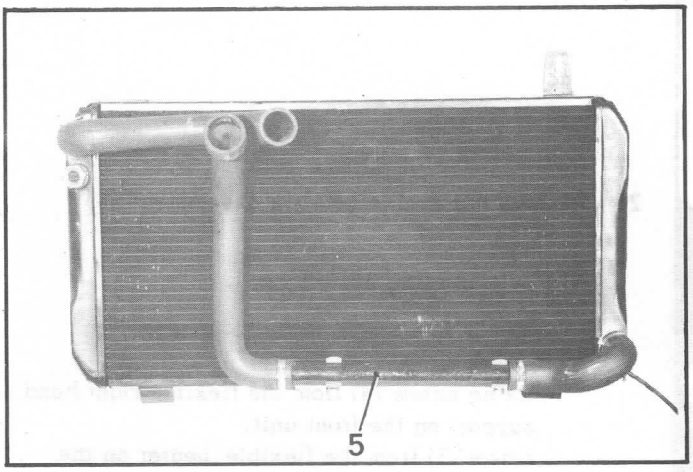


15 - Remove the alternator

16 - Uncouple from the water pump :
- the suction hose (3),
- the delivery hose (4),
- the heating hose (2).

Uncouple hose (1) from cylinder head.

76-17



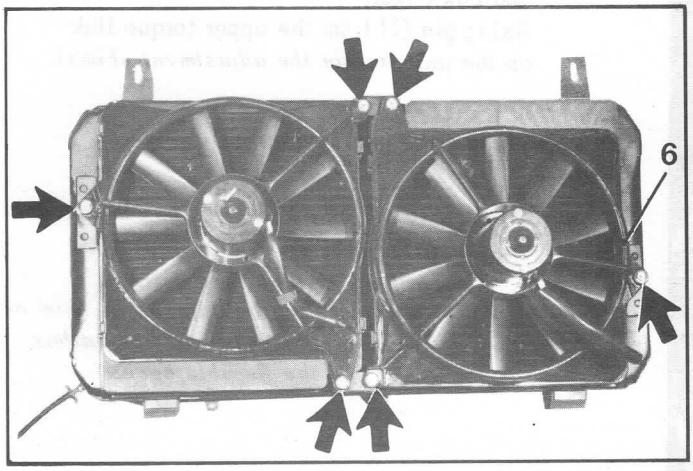
17 - Remove the radiator

a) Remove radiator grille (two clips at lower part).

b) Remove the hose and pipe assembly (5) from the radiator,
Disconnect thermal switch wires on radiator.

c) Remove screws (⟶) *(flat washers between support (6) and radiator).*

76-18

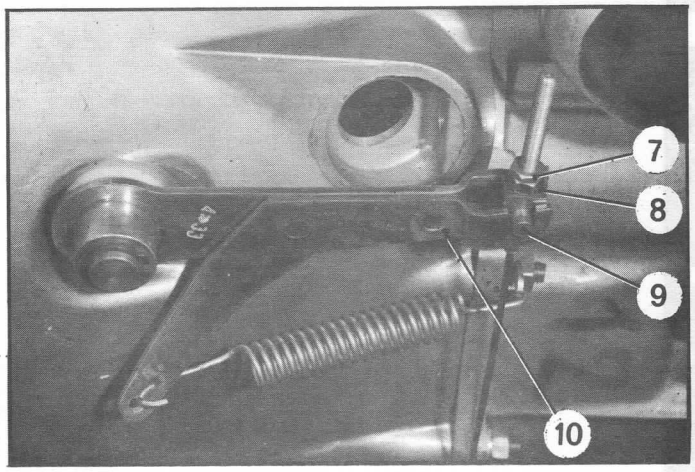


d) Remove the two radiator fixing screws.
Free the radiator.

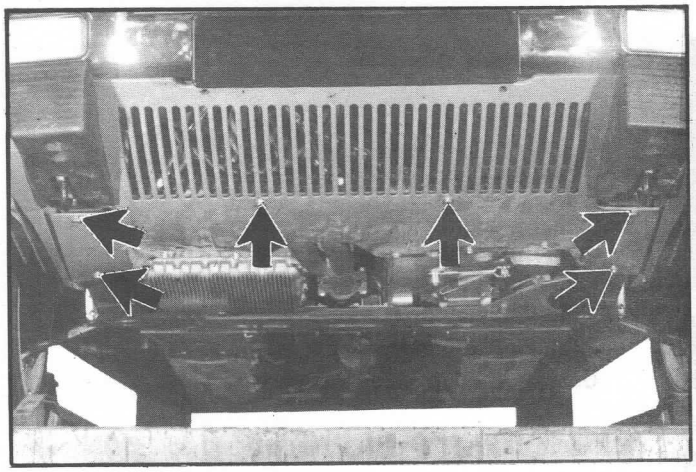
18 - Uncouple clutch control :

- Loosen locknut (7) and nut (8).
- Free rod (9) from lever (10).
- Free sleeve from its position on gearbox casing.

13 455

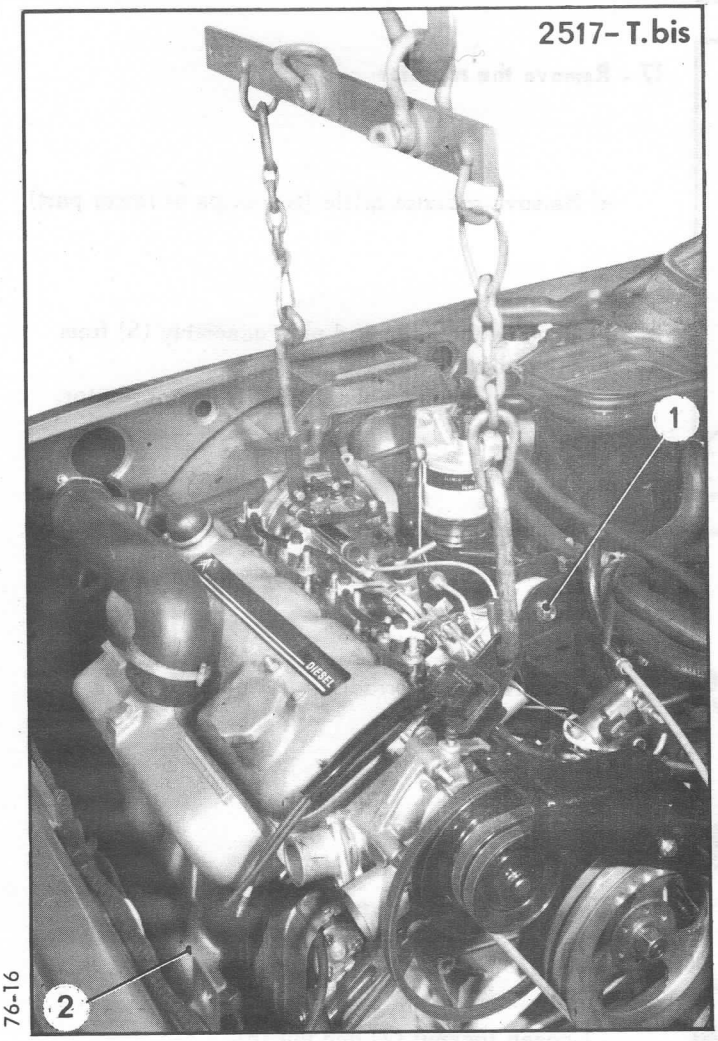


13 274



19 - Remove the screws (⟶) and allow the lower body panel to hang.

20 - Disconnect the exhaust tubes from the manifold (2).



76-16

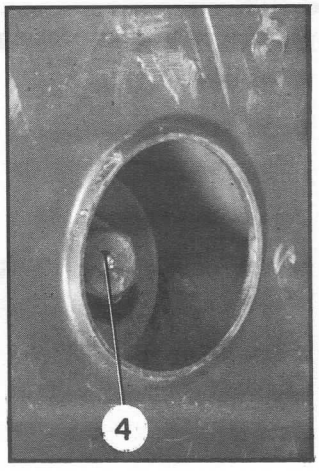
21 - **Remove the engine-gearbox assembly :**

a) Position sling 2517-T bis).

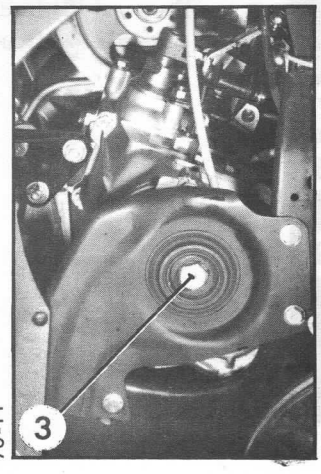
b) Remove :
- fixing screw (4) from the flexible right-hand support on the front unit,
- screw (3) from the flexible bearer on the gearbox cover,
- fixing pin (1) from the upper torque link on the unit *(retain the adjustment shims).*

c) Withdraw the engine-gearbox unit.

WARNING : *Do not knock the gearbox dipstick guide tube nor the engine filter cartridge against the unit.*
Do not mislay the adjustment shim or shims located between the gearbox cover and the flexible bearer.

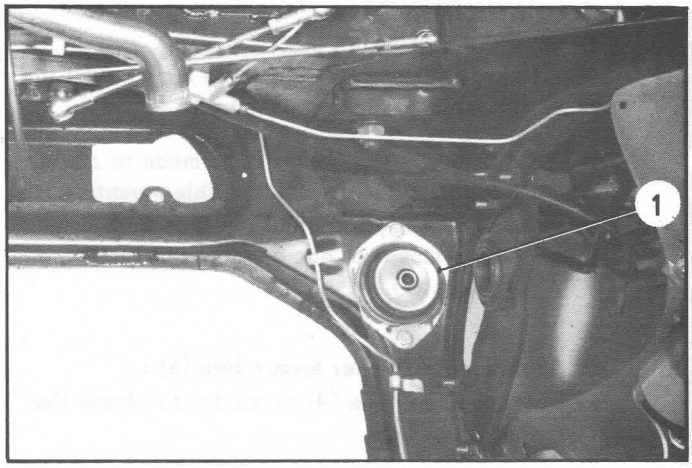


13 454

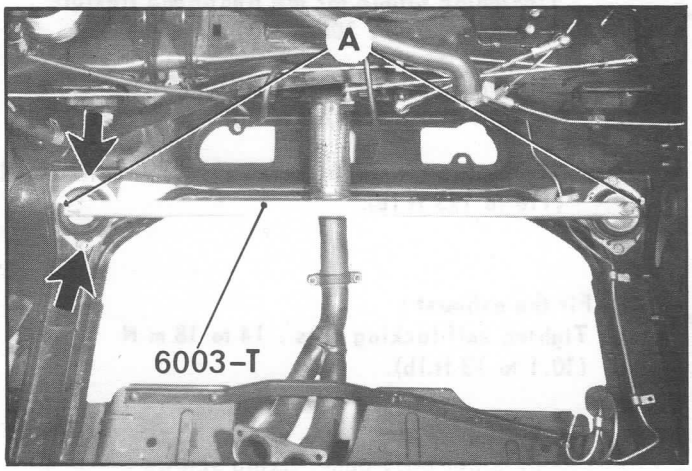


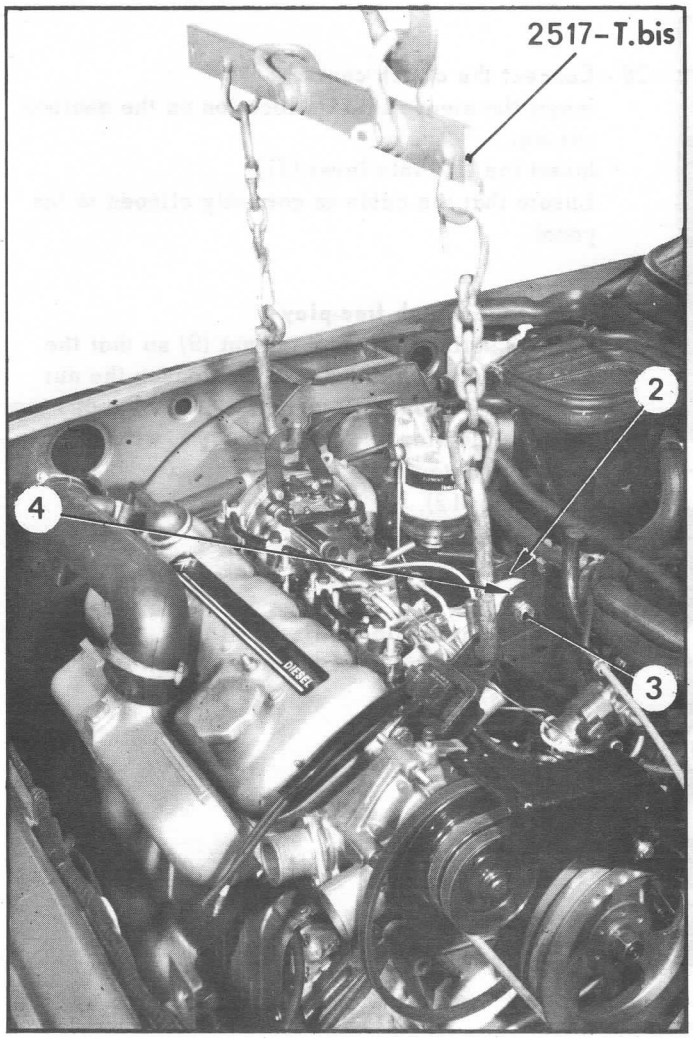
76-11

15 075



15 076





76-16

FITTING

22 - Position right-hand engine mounting :

This operation is only necessary when a unit has been replaced.

Position a non adjustable engine mounting (1) (No PR : 1 L 5 451 139 L) on the left-hand side and secure it.
Loosen screws (⟶) from right-hand flexible mounting.
Offer up gauge 6003-T fitted with its measuring rods **A**, in the flexible mountings.
Tighten fixing screws (⟶) of right-hand support to **21 m.N (15.2 ft.lb).**
Remove gauge 6003-T and its measuring rods **A**, as well as the left-hand side flexible bearer.

NOTE :
The flexible mounting fitted on the gearbox cover side must be adjusted after the engine-gearbox assembly has been fitted. If this adjustment is not to be carried out, position the adjustment shim or shims found during removal in the flexible mounting.

23 - Fit the engine-gearbox assembly :

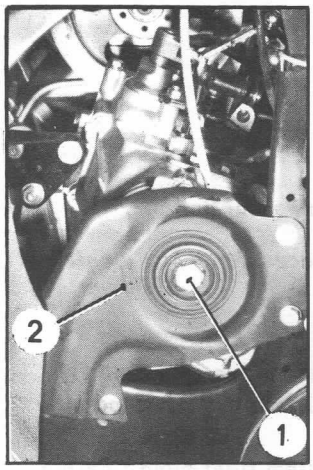
a) Position the engine-gearbox assembly (Sling 2517-T bis).

WARNING : *Do not knock the gearbox dipstick guide tube nor the engine filter cartridge again the unit.*

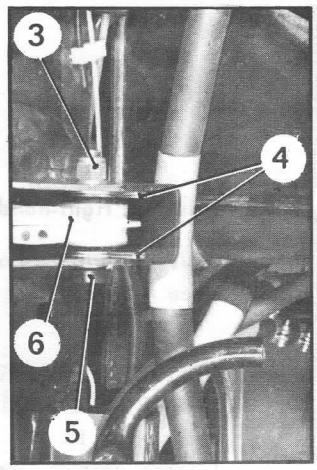
NOTE : If there is no adjustment to be made to the flexible mountings, position the adjusting shims (2) and (4) in the same position as they were before removal.

b) **Adjust left-hand flexible mounting :**
Position upper link-rod pin (3) *(without shims).*
Fit the right-hand flexible mounting assembly screw.

76-11



15 174



Remove the unit fixing plate (2).
Insert shims (7) *(single thickness 1 mm)* until the plate (2) «**evenly**» contacts the unit.

NOTE : If the plate (2) cannot be made to contact the unit evenly, the flexible mounting may be slightly stressed, by less than 1 mm, by removal of one of the adjustment shims (7).

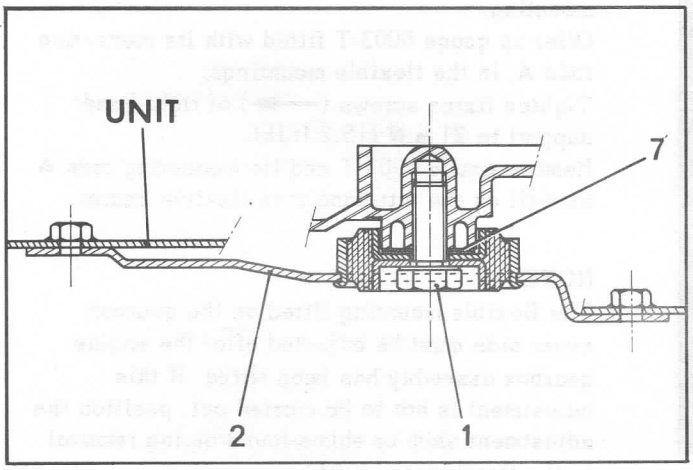
c) **Adjustment of upper torque link (6) :**
Position the shims (4) so as not to stress the torque link.

Tightening torque for the right-hand flexible mounting screw : 100 m.N (72.3 ft.lb).

Tightening torque for the NYLSTOP nut (3) of pin (5) : 100 m.N (72.3 ft.lb).

Tightening torque for screw (1) : 160 to 170 m.N (116 to 123 ft.lb).

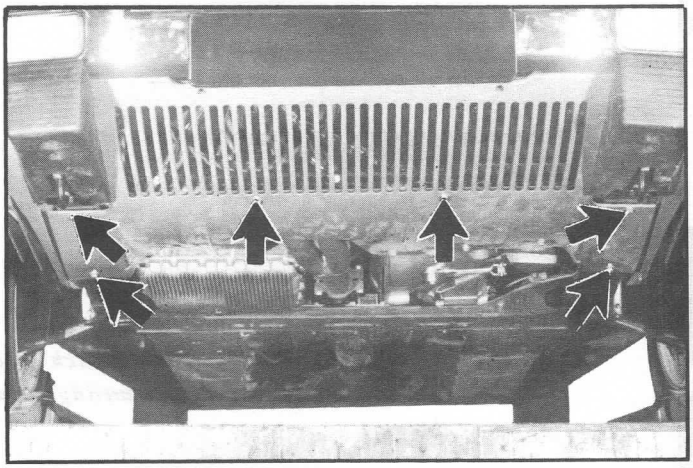
L. 13-3



24 - **Fit the exhaust :**
Tighten self-locking nuts : 14 to 18 m.N (10.1 to 13 ft.lb).

25 - Fit the lower body panel fixing screws (⟶).

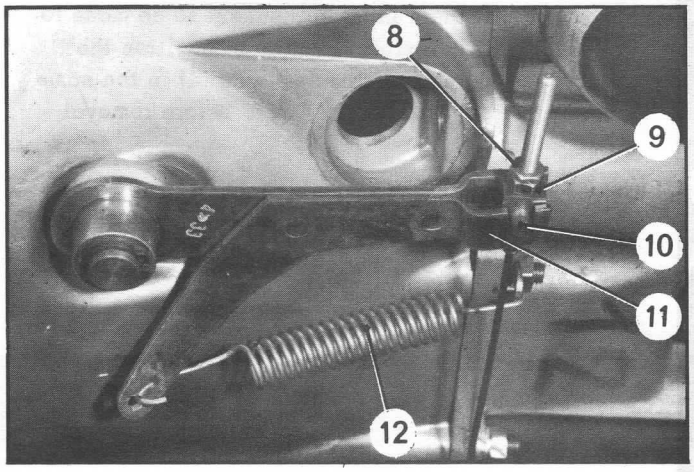
13 274



26 - **Connect the clutch control :**
Insert the sleeve into its location on the gearbox casing.
Insert rod (10) into lever (11).
Ensure that the cable is correctly clipped to the pedal.

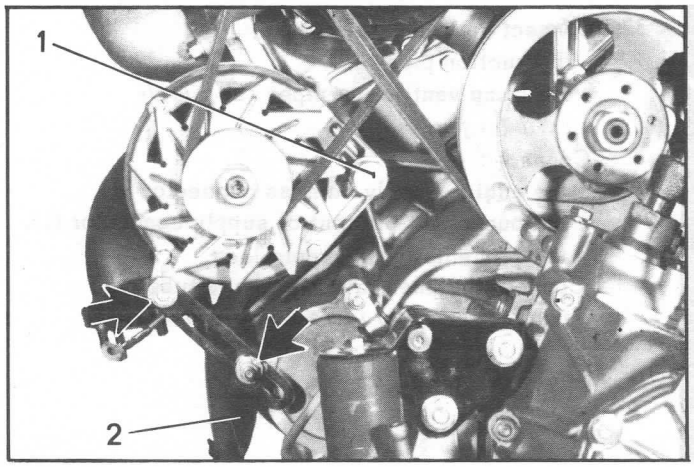
27 - **Adjust the clutch free-play :**
Remove spring (12). Tighten nut (9) so that the stop contacts the diaphragm and loosen the nut two and a half turns to obtain a clearance of 1 mm between the stop and the diaphragm, with *the pedal in contact with its upper stop.*
Fit spring (12).
Tighten lock-nut (8).

13 455



28 - **Fit the transmission units :**
(They are identical to those of CX petrol vehicles).

76-5



29 - Fit the alternator :

Connect lug (2) on the lead from the battery.

Fit the screws and the nuts (⟶) and (1).

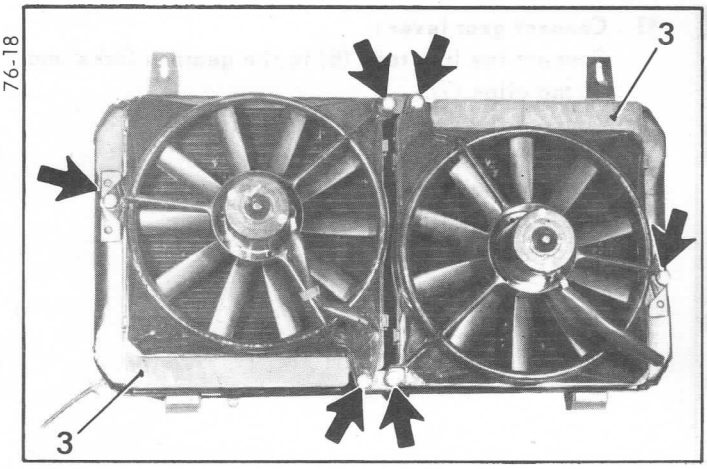
Tighten the belt moderately.

Tighten the screws and the nuts (⟶).

Tightening torque for screws (1) = 61 m.N (44.1 ft.lb) *(contact washer).*

Connect up the supply leads.

76-18



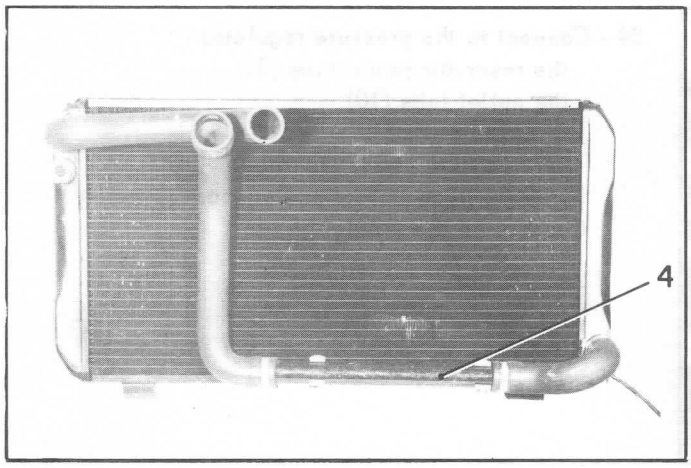
30 - Fitting the radiator :

a) Position the radiator.

b) Fit the electric fans, having first inserted the collectors (3).

Tighten screws (⟶) *(contact washer) (flat washer between support for the electro fans and the radiator).*

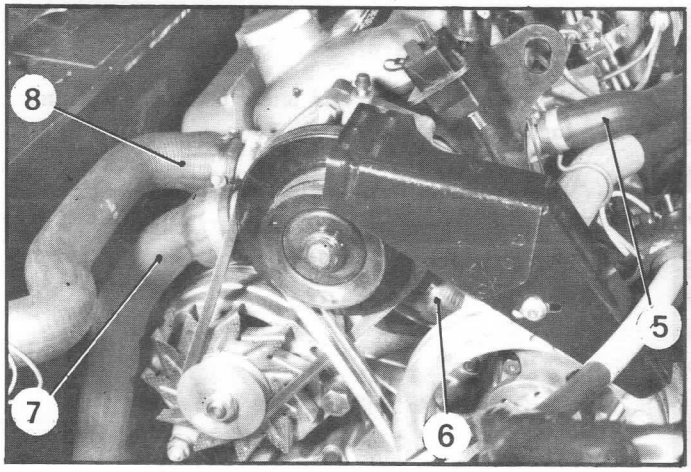
76-17



c) Position the tube (4) on the radiator.

d) Connect to the water pump :
- suction hose (7),
- delivery hose (8),
- heating hose (6).

76-29

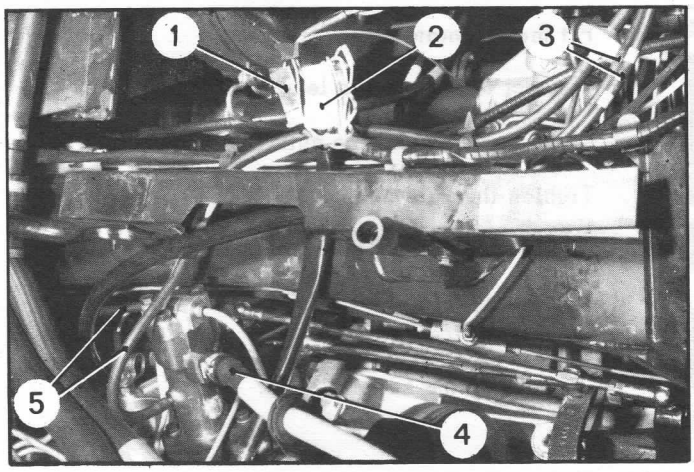


e) Connect hose (5) to the cylinder head.

f) Fit and tighten the radiator fixing screws *(contact washer).*

31 - Fit the radiator grille.

76-38

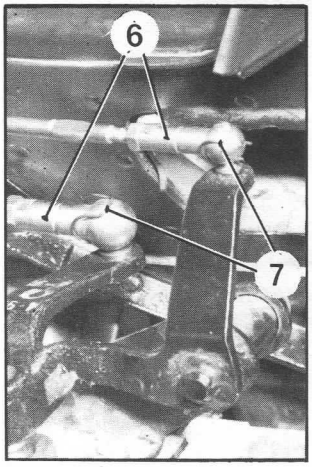


32 - Connect up to the H.P. pump :
- the suction pipe (4),
- the pump ventilation pipes (5) *(single cylinder pump only)*.

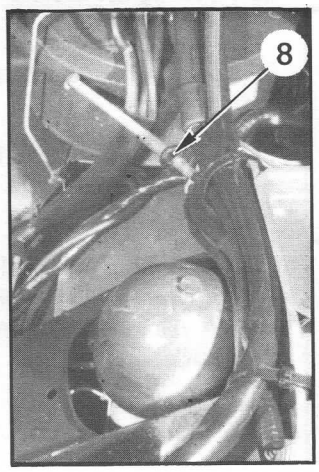
Connect :
- the engine supply harness connector (2),
- the pump shut-off control supply connector (1),
- the preheater plug supply lead.

Connect the pneumatic oil gauge tubes (3) *(observe the color identification marks)*.

13 345

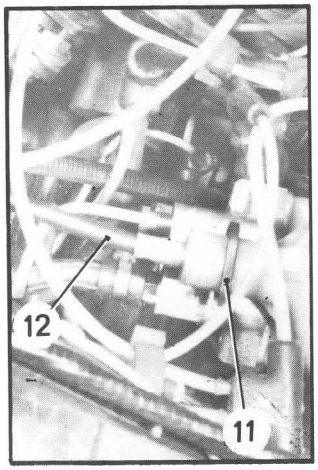


15 087

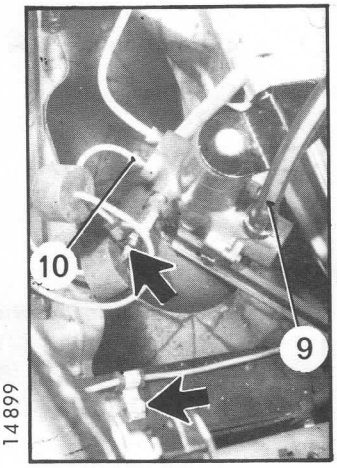


33 - **Connect gear lever :**
Connect the link rods (6) to the gearbox forks and fit the clips (7).
Connect the speedometer cable (8).
Vehicles with power steering :
Connect the drive cable (12) for centrifugal regulator and fit the clip (11).
Fit gearbox dipstick.

76-14



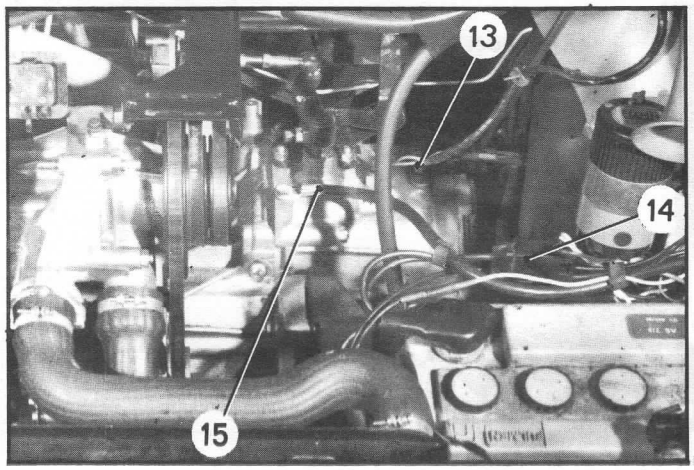
14 899



34 - **Connect to the pressure regulator :**
- the reservoir return tube (9),
- the outlet tube (10).

Fix lugs (⟶).
Vehicles with power steering :
Fit brake accumulator and support assembly.
Connect up the piping.

15 087



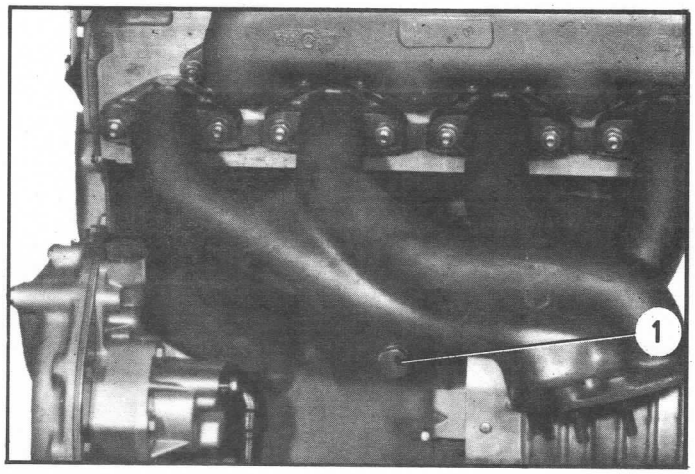
35 - Fit the battery.
Connect :
- the reversing lamp and brake pad wear warning lamp harness (13),
- connector (14).

Connect the earth lead (15) to the gearbox.
Fit the left-hand headlamp bulb. Connect thermal switch on the radiator.

36 - Fit the cooling system drainplug (1) on the engine block (copper washer).

Tightening torque = 30 to 40 m.N (21.7 to 28.9 ft.lb).

15 203



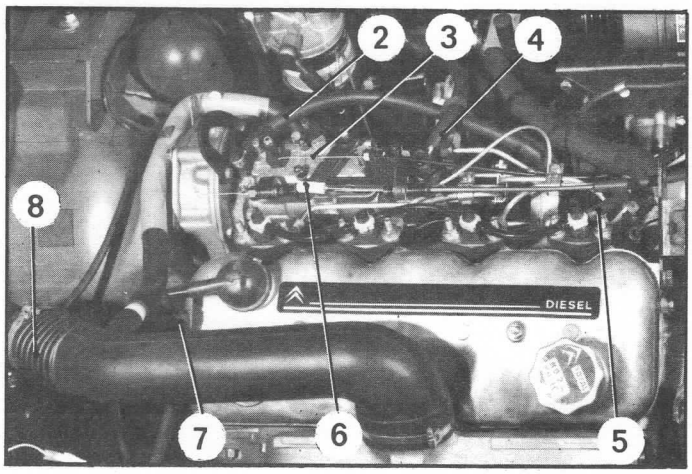
37 - Connect up to the injection pump :
- the supply tube (4),
- the return tube (2).

Connect the injector overflow return tube (5) to the injector.
Fix the Diesel fuel return pipe retaining lug to the oil filter support plate.
Clip the return pipe to the plate fixed to the right-hand transmission bearing.

38 - Connect :
- the suction tube (8) to the air filter,
- the recirculating tube (7) to the union.

39 - Top up and drain the cooling system (See Op. MA.Di. 230-1).

15 087



40 - Check the levels of :
- the engine oil,
- the gearbox oil,
- the cooling fluid.

41 - Connect up the battery.

42 - Bleed the Diesel fuel system (See Op. MA.Di. 145-0)
Connect and adjust :
- the stop control (3),
- the accelerator control (6).

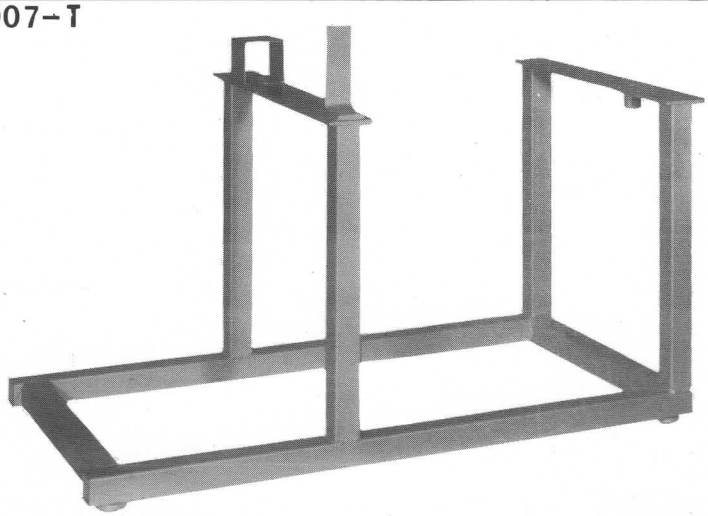
43 - Lower vehicle to ground.
Replace bonnet.

SPECIAL RECOMMENDED TOOLS

TOOLS SOLD

13935

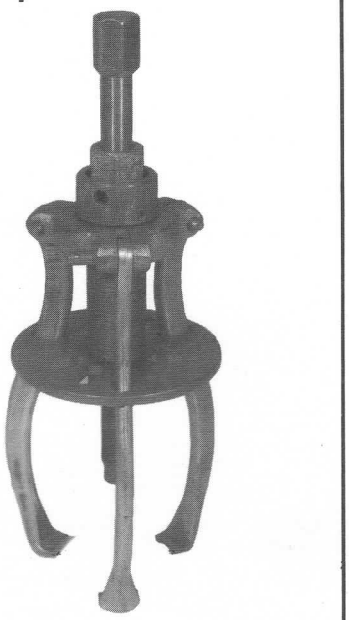
6007-T



Stand for engine-gearbox unit

12762

2400-T



Universal puller

TIGHTENING TORQUES

I. Mandatory tightening torques (torque spanner) :

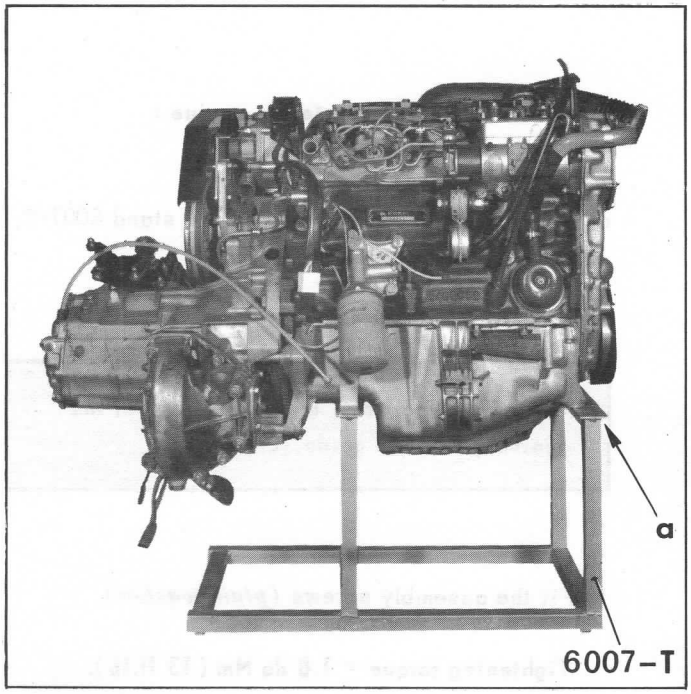
Item	Torque in da Nm (ft lb)	Remark
Camshaft pulley locking nut (→ *2/1978*)	8 (58)	Plain washer Spring washer Nut (« half-height » type)
Camshaft pulley locking nut (*2/1978* →)	9 to 10 (65 to 72)	Nut (normal type)

II. Recommended tightening torques :

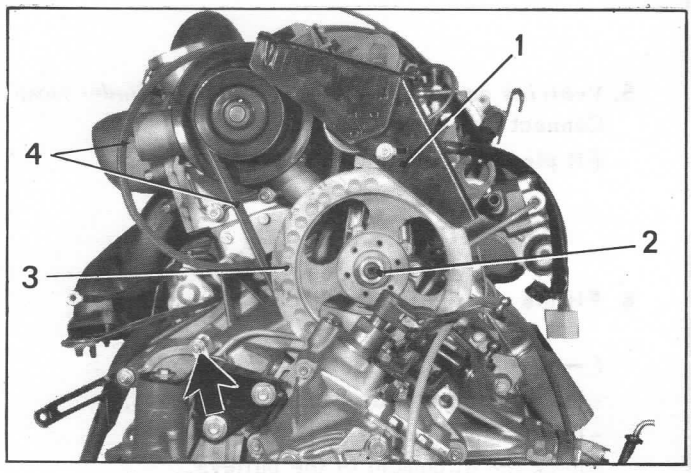
Item	Torque in da Nm (ft lb)	Remark
Engine-gearbox assembly screw	1.8 (13)	Plain washer

UNCOUPLING AND COUPLING THE ENGINE-GEARBOX ASSEMBLY

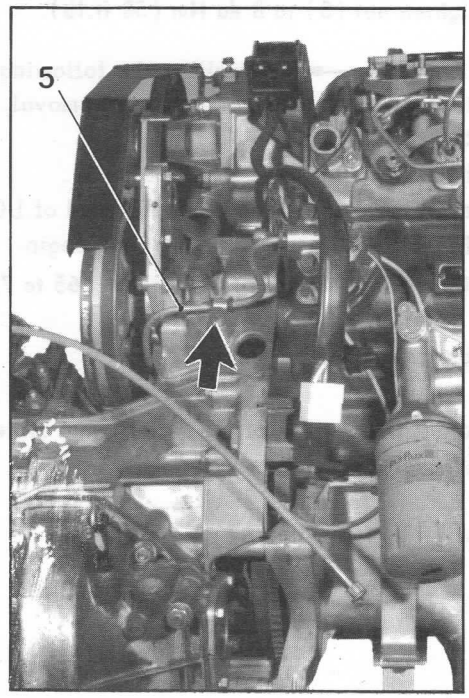
15 201



15 202



15 201



UNCOUPLING.

1. Place the engine-gearbox assembly on stand 6007-T :

Secure the engine at « a ».

2. Remove the following :

- the protective plate (1),
- the nut (2),
- the belts (4) *(after having slackened them)*,
- the pulley (3) *(retain alignment adjustment shims)*.

(2/1978 ⟶) the camshaft pulley (3) is fitted with LOCTITE FRENETANCH.
Use universal puller 2400-T for the removal operation.

Vehicles equipped with a HP single cylinder pump :

Disconnect the HP outlet tube (5) from the high pressure pump and free it from its retaining lugs (➡)

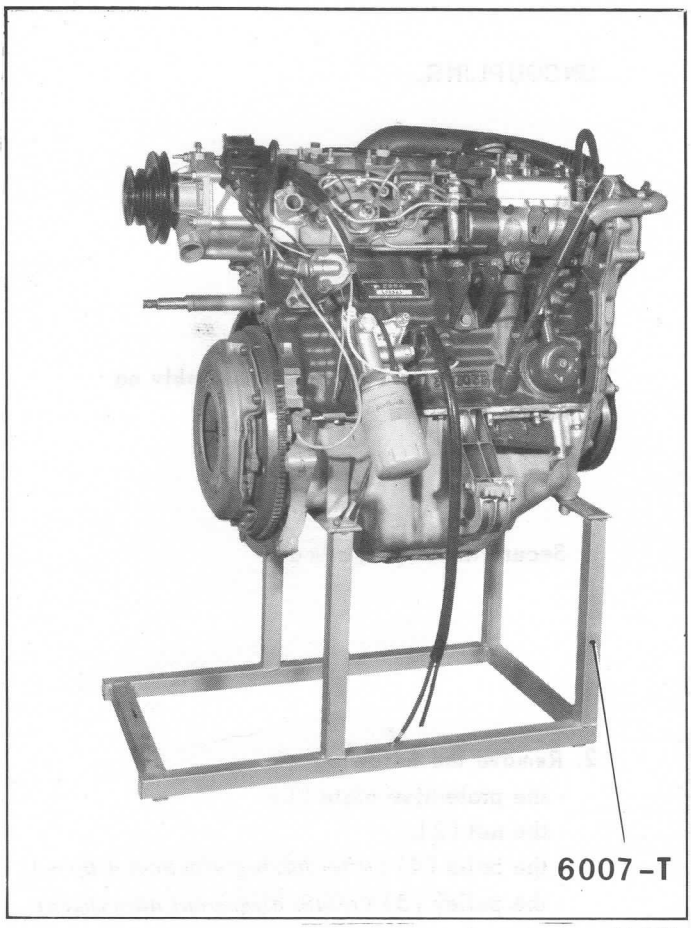
3. Disconnect the gearbox from the engine :

Remove the engine-gearbox assembly screws.

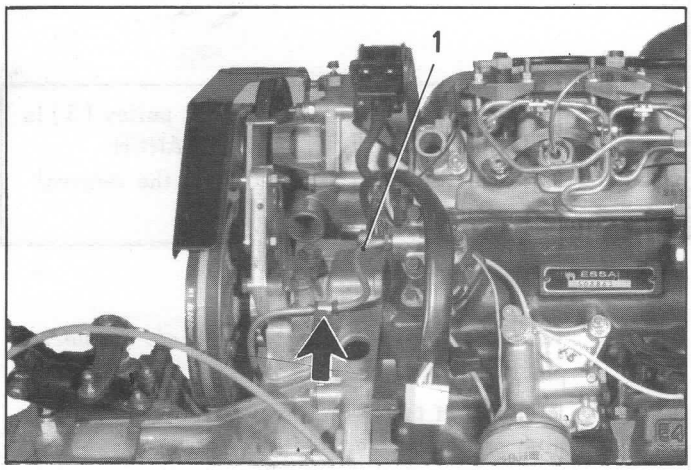
Free the gearbox from the engine.

COUPLING.

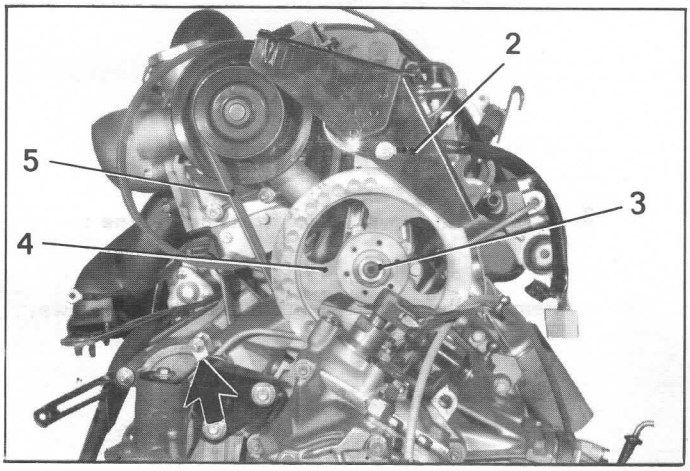
15 187



15 201



15 202



4. Connecting the gearbox to the engine :

a) With the engine in position on the stand 6007-T, position the gearbox.

NOTE : To facilitate the positioning of the gearbox, use two guide screws.

b) Fit the assembly screws *(plain washer).*

Tightening torque = 1.8 da Nm (13 ft.lb).

5. *Vehicles equipped with a HP single cylinder pump :*
Connect pipe (1) to HP pump.
Fit pipe (1) securing lugs (➡).

6. Fit the camshaft pulley :

(⟶ 2/1978) : Position the following :
- the adjustment shims found on removal,
- the camshaft pulley (4).

Check the alignment of the pulleys.
Tighten nut (3) to 8 da Nm (58 ft.lb).

(2/1978 ⟶) : Position the following :
- the adjustment spacer found on removal,
- the camshaft pulley (4).

Check the alignment of the pulleys.
Remove pulley (4) and place a bead of LOCTITE FRENETANCH where the splines begin.
Tighten nut (3) to 9 to 10 da Nm (65 to 72 ft.lb).

Position the three belts.

Adjust the tension of the water pump drive belts (5).

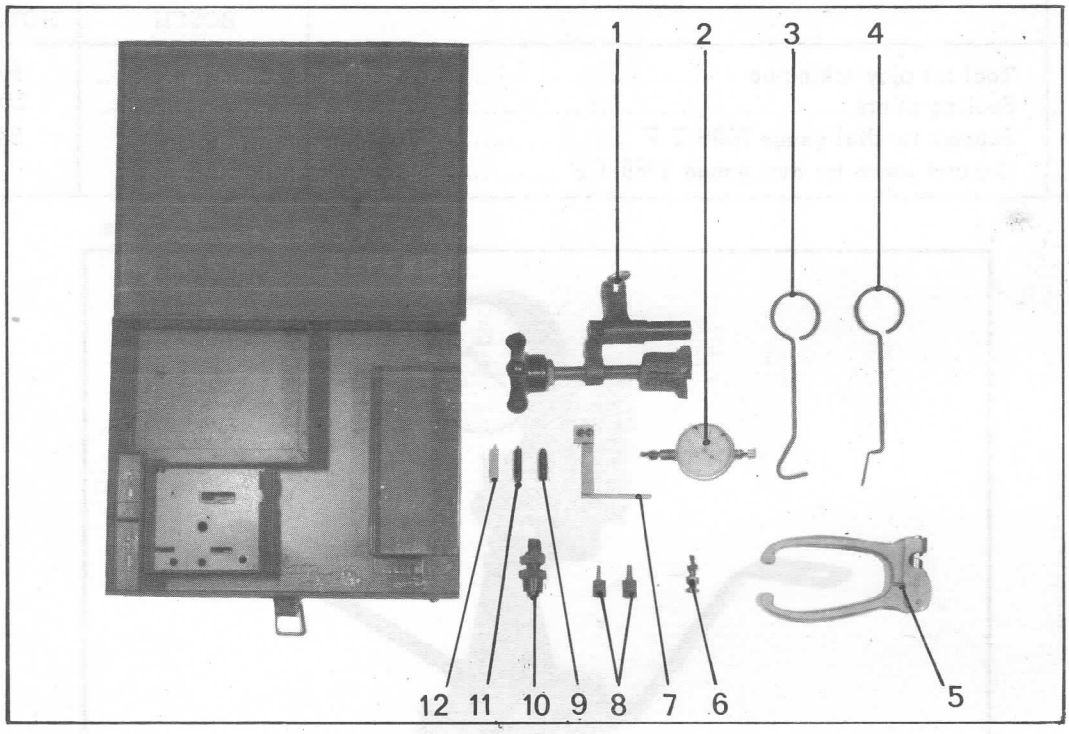
Fit protective plate (2).

SPECIAL RECOMMENDED TOOLS

TOOLS SOLD

Tools required for timing the injection pump

15 222



- **6008-T : Tool for play taking-up (4)** is sold separately and not included in kit 5003-T bis
- **5003-T bis : Checking kit comprising :**

Mark	Description	Use and reference	
		BOSCH	ROTO-DIESEL
1	Dial gauge support for finding TDC	5003-T.A	5003-T.A
2	Dial gauge	3089-T.F	3089-T.F
3	Tool for play taking-up	.....	5008-T.A
5	Sealing pliers	.....	5008-T.D
6	Nut and fixing screw for dial gauge 3089-T.F	.....	3089-T.L
7	Support for dial gauge 3089-T.F	.....	5008-T.B
8	Support fixing screw for dial gauge 3089-T.F	.....	5008-T.C
9	Probe for dial gauge 3089-T.F	.....	3089-T.H
10	Support grip for dial gauge	5003-T.B	
11	Contact piece for dial gauge 2437-T.F	5003-T.C	5003-T.C
12	Contact piece for dial gauge 3089-T.F	5003-T.D	

- **Additional equipment to convert a 5003-T kit into a 5003-T bis kit**

REFERENCE 5009-T

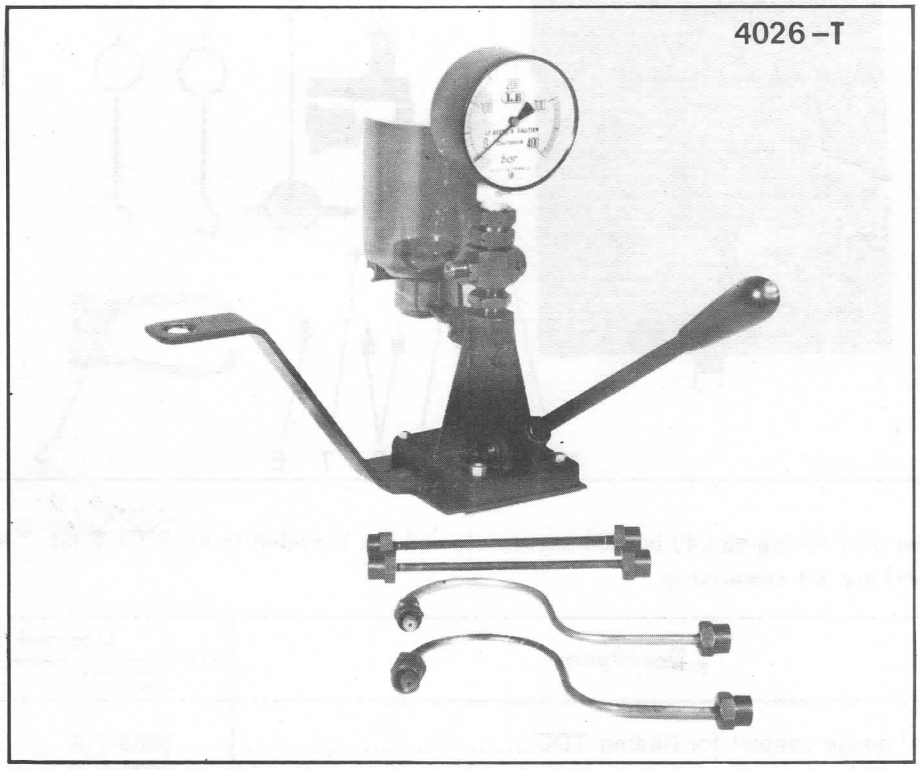
Mark	Description	Use and reference	
		BOSCH	ROTO-DIESEL
2	Dial gauge	3089-T.F	3089-T.F
3	Tool for play taking-up	.....	5008-T.A
5	Sealing pliers	.....	5008-T.D
6	Nut and fixing screw for dial gauge 3089-T.F	.....	3089-T.L
7	Support for dial gauge 3089-T.F	.....	5008-T.B
8	Support fixing screw for dial gauge 3089-T.F	.....	5008-T.C
9	Probe for dial gauge 3089-T.F	.....	3089-T.H
12	Contact piece for dial gauge 3089-T.F	5003-T.D	

- Additional equipment to convert tool kits 3089-T and 5003-T into a 5003-T bis kit
REFERENCE 5008-T

Mark	Description	Use and reference	
		BOSCH	ROTO-DIESEL
3	Tool for play taking-up	.....	5008-T.A
5	Sealing pliers	.....	5008-T.D
7	Support for dial gauge 3089-T.F.....	.....	5008-T.B
12	Contact piece for dial gauge 3089-T.F	5003-T.D	

15 278

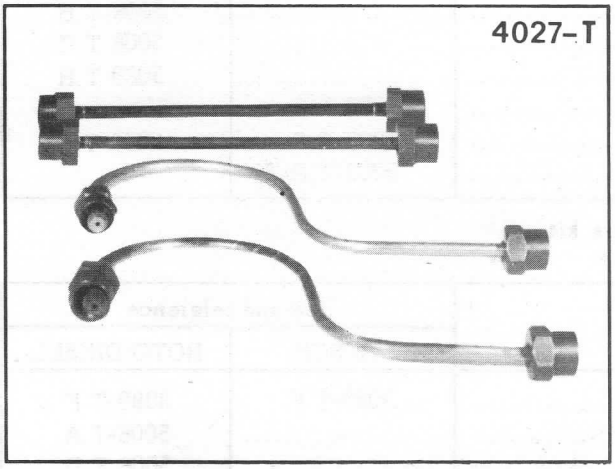
4026-T



Pump and connection pipes for calibration of injectors

15 278

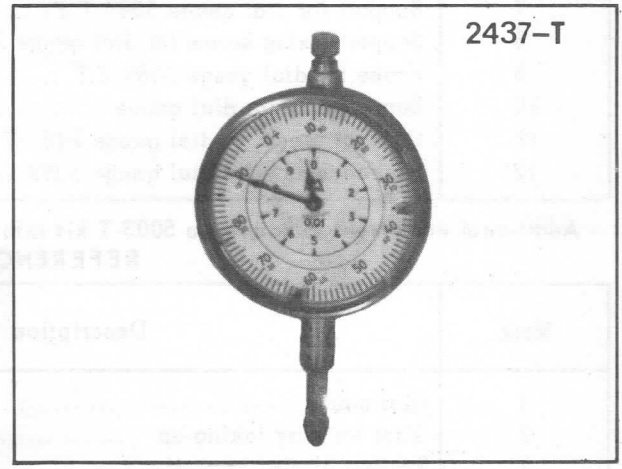
4027-T



Set of four connection pipes
(for repairer already possessing a calibration pump)

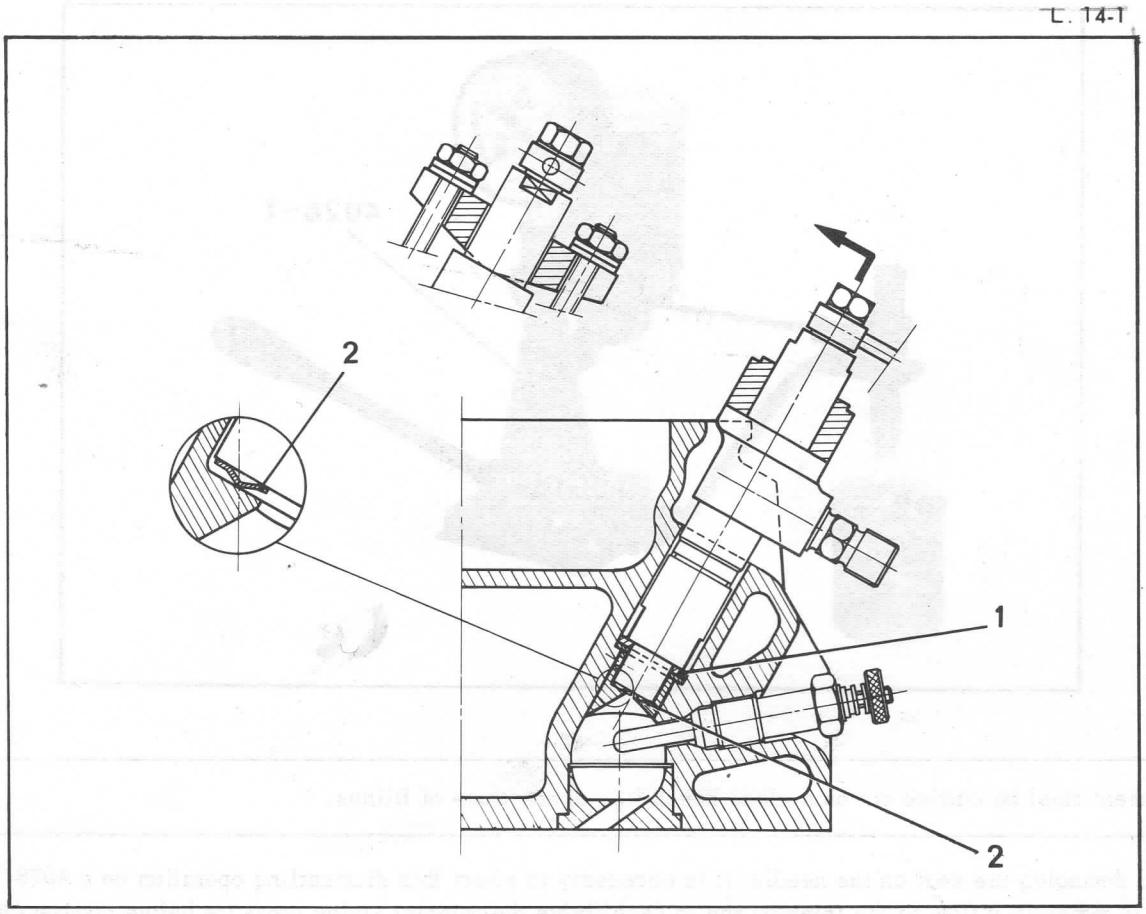
12 827

2437-T



Dial gauge

I - REPLACEMENT OF AN INJECTOR-CARRIER



The copper gasket (1) and corrugated washer (2) must be renewed after each removal operations.

Observe the fitting position of the washer (2) (see inset).

Lightly grease the copper gasket (1) and corrugated washer (2) before placing them on the injector-carrier.

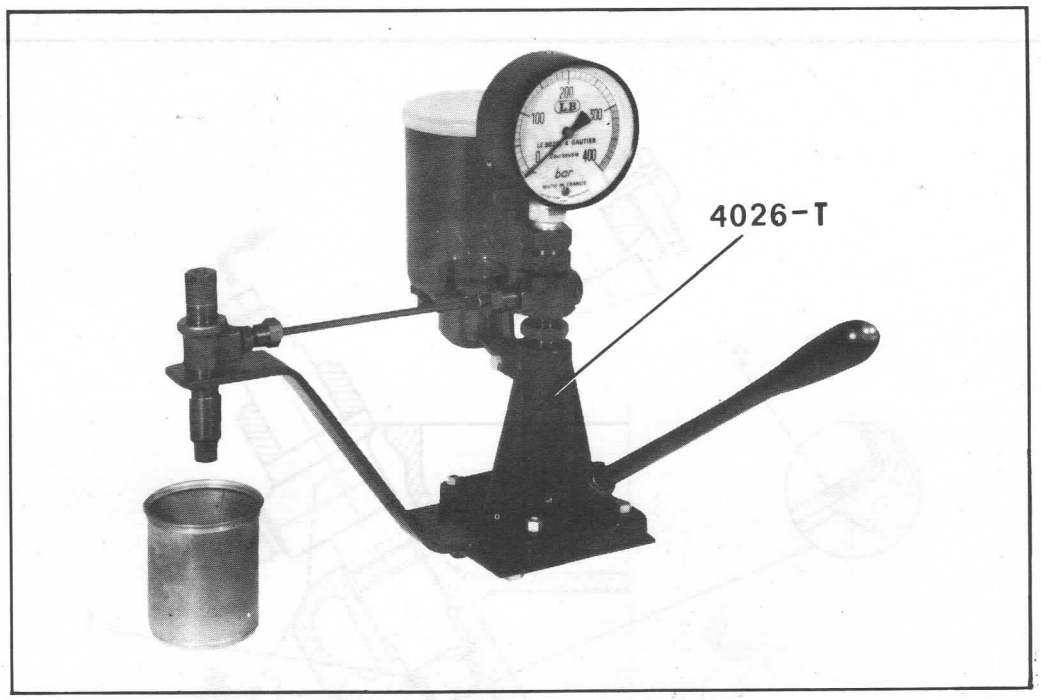
Fit the injector supply tubes without tightening them.

Tighten the injector-carrier fixing nuts 22 to 25 m.N (16 to 18 ft.lb) *(flat washer and contact washer).*

Bleed the injectors.

II - REPLACEMENT OF AN INJECTOR

15 277



Replacement must be carried out on a clean bench free of any trace of filings.

To avoid damaging the seat on the needle, it is necessary to effect this dismantling operation on a 4026-T bench in order to maintain a flow to the injector and to decalibrate the injector spring pressure before commencing work.

Each assembly must be kept separate, because the components are not interchangeable.

When dismantling injectors, the components must be kept immersed in Diesel fuel while awaiting refitting.

An injector must never be refitted dry.

Before carrying out an adjustment with the calibration pump, a visual examination of the injector must be made to ensure :

1) On the needle :
- that the seating is not distorted, worn or pitted,
- that the needle point (pintle-type) is not worn or damaged.

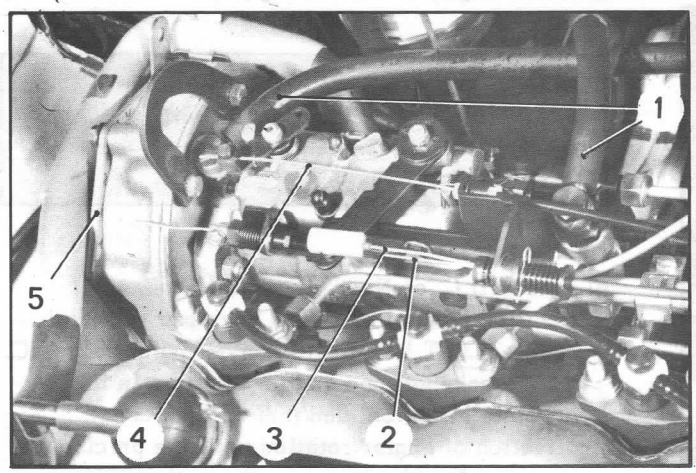
2) On the body (using a magnifying glass) :
- that the seating is correct and not worn,
- that the injection hole has not become oval.

3) On the body needle assembly :
- that the needle slides properly within the body,
- that the injector sealing face is not damaged.

Tightening torque : See section of injector *(Operation MA.Di. 144-00).*

III - REMOVING AND FITTING THE INJECTION PUMP (ROTO-DIESEL)

15 224

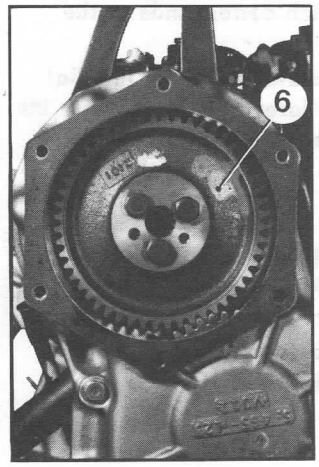


1 - Disconnect the following from the injection pump :
- fuel supply and return hoses (1),
- shut-off control (4) (⟶ *5/1976*),
- feed wire for the electric cut-out control (*5/1976* ⟶),
- accelerator control (3),
- fast idle control (2).

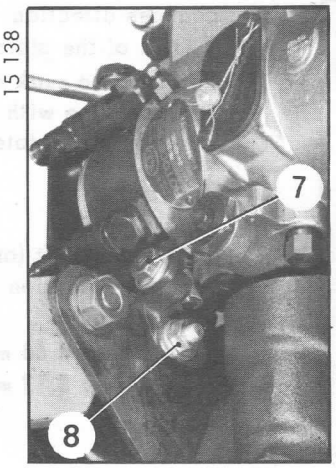
Remove the injector pipe assembly.

2 - Remove the dipstick

Remove the fuel filter from the side.



15 138



3 - **Remove the injection pump :**

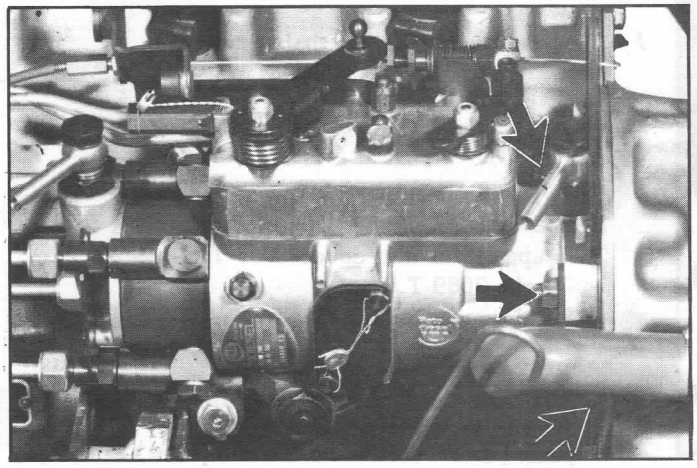
a) Remove :
- the end plate (5),
- the pump drive pinion (6).

b) Remove the connecting lug fixing screw (7). Slacken nut (8) (hold the screw head with a 6 mm hexagonal allen key).

c) Remove pump fixing nuts (➡) (use 13 mm open spanner).
Withdraw the injection pump.

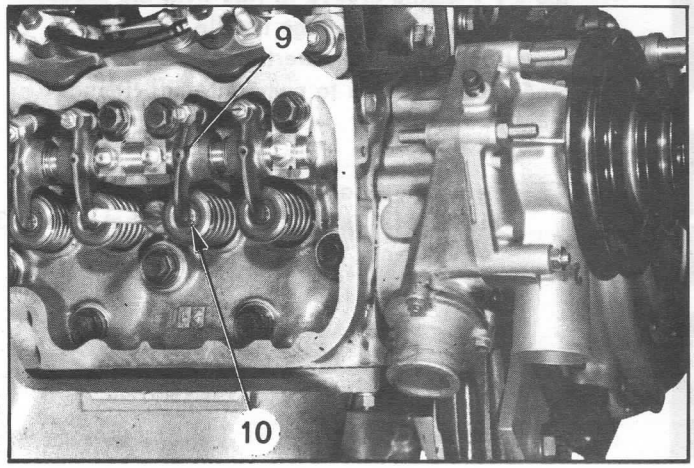
FITTING

15 186 Supplement No. 1 to Manual 818-3 (REMOVAL AND FITTING) (CORR) 76-12



4 - Remove the rocker-cover

Turn the crankshaft in the normal direction of engine rotation to bring piston of No. 1 cylinder **(flywheel end)** near T.D.C. on the compression stroke *(valves of No. 4 cylinder in the rocking position).*

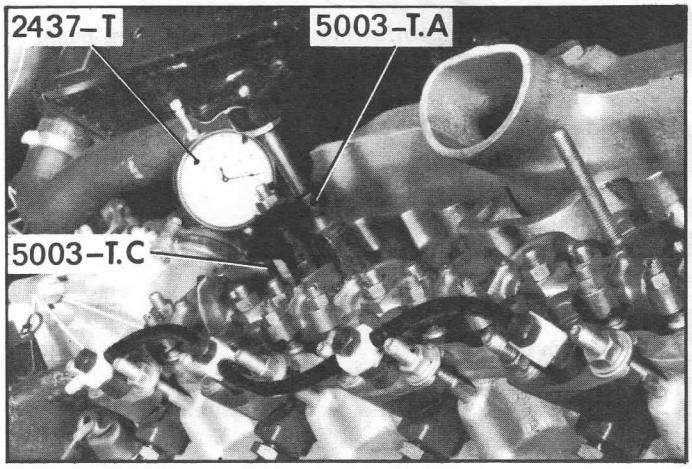


15 185

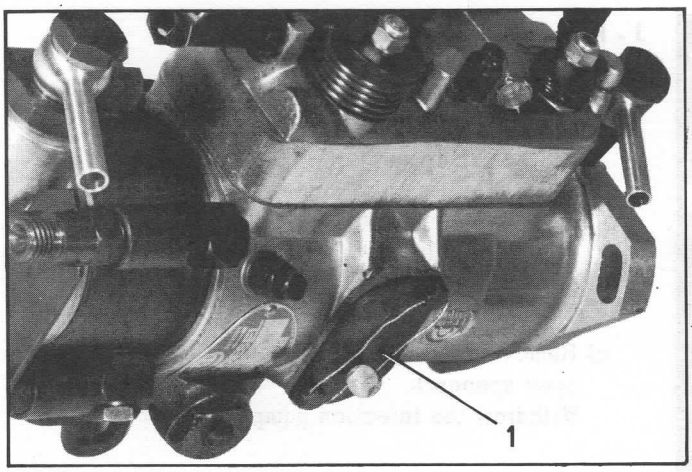
5 - Using support 5003-T.A, remove from exhaust valve (10) of No. 1 cylinder :
- the split collets and valve-spring cups,
- the valve springs,
- the push-rod.

Tilt exhaust valve rocker arm (9).

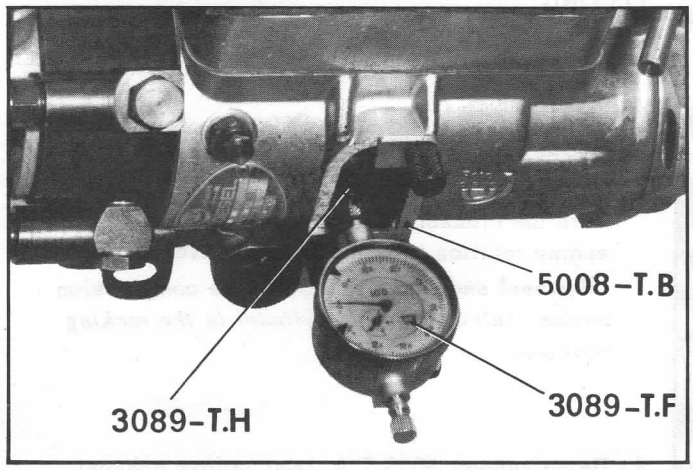
70-39



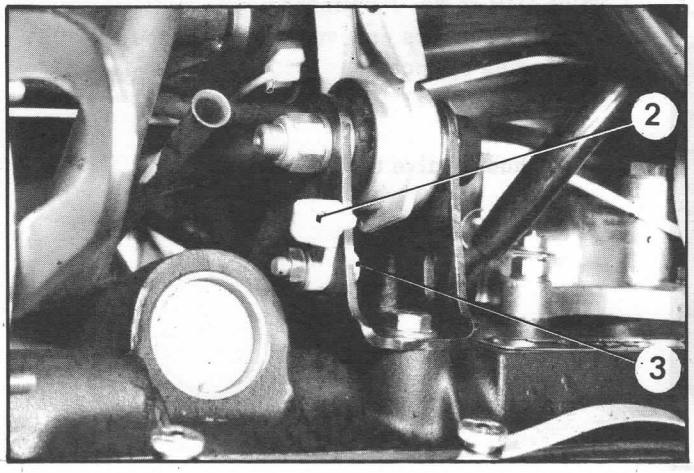
15 134



15 135



76-41



6 - Find the engine initial timing point :

In order to prevent the exhaust valve from falling into the cylinder, do not turn the crankshaft more than one quarter of a turn in either direction.

a) Find T.D.C. of No. 1 cylinder piston.
Position bracket 5003-T.A equipped with dial gauge 2437-T fitted with contact point 5003-T.C.
Turn crankshaft one quarter of a turn in the opposite direction, and then in the normal direction of engine rotation until the precise moment when the large needle on the dial gauge changes direction, which corresponds to the T.D.C. of the piston.
Set the zero mark of rotatable dial of the dial gauge in line with the large needle and note the position of the total reading pointer needle.

b) Turn crankshaft (one quarter of a turn) in the opposite direction to normal engine rotation to bring piston to :
- *CX 2200 :* **4.68 mm before TDC,**
- *CX 2500 :* **5.12 mm before TDC.**

7 - Find the pump internal timing point :

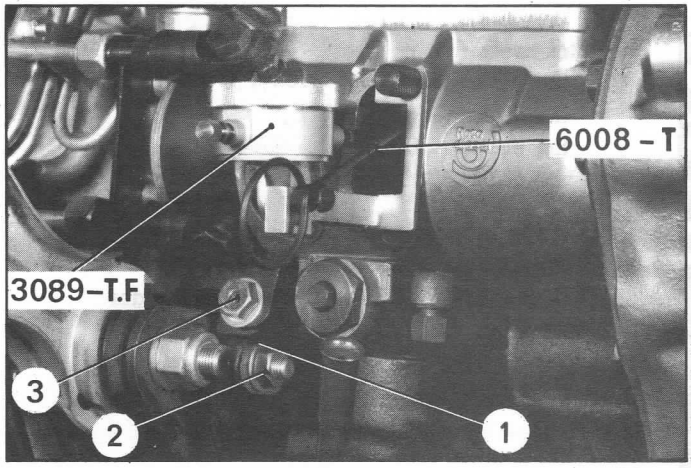
a) Remove inspection cover (1).

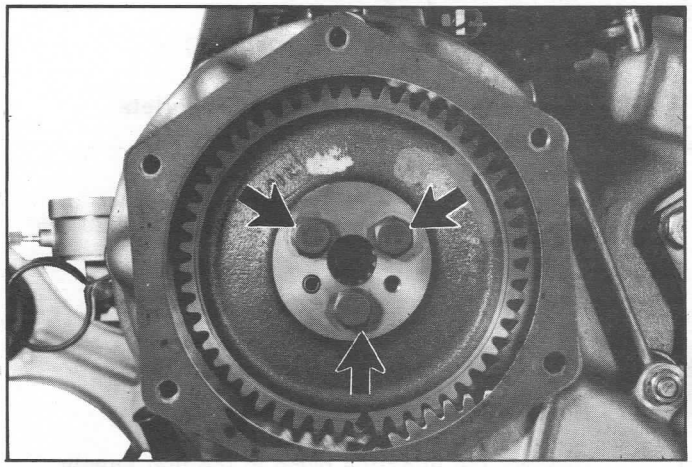
b) Position :
- support for dial gauge 5008-T.B.
- probe 3089-T.H,
- dial gauge 3089-T.F.

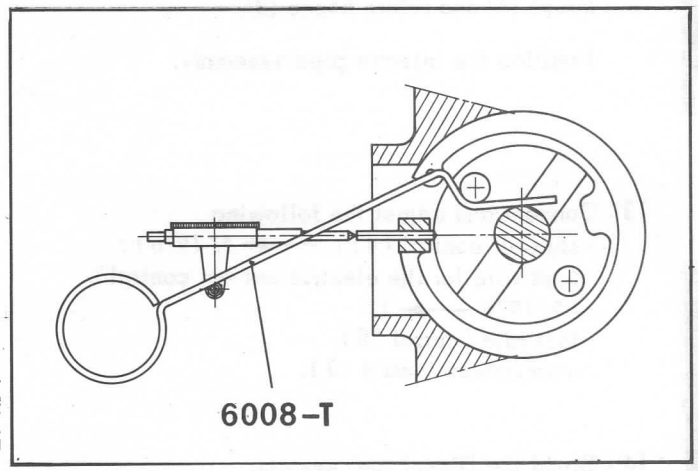
c) Turn rotor in the direction of rotation of the pump (arrow on manufacturer's plate) to bring the « V » timing groove in line with the probe. Stop when the dial gauge needle changes direction. (Maximum insertion of probe into the groove corresponds to pump internal timing point).

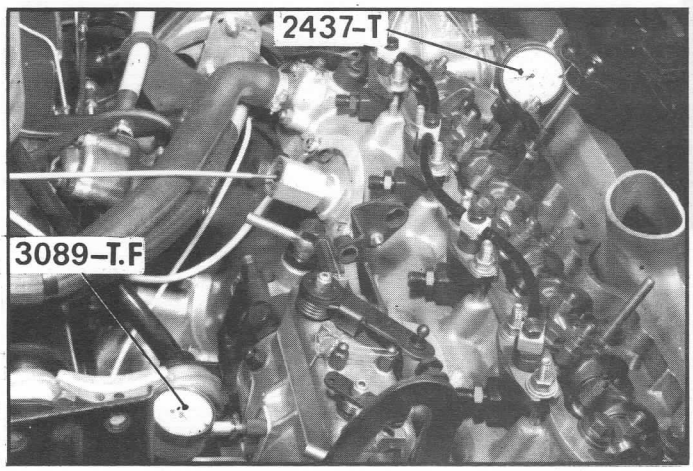
NOTE : Before positioning injection pump, check that lug (2) is in position and that screw (3) is slackened (6 mm A/F allen key).

76-13









76-40

8. Fitting and timing the injection pump :

a) Position the pump, fitted with a new gasket, on the front engine plate ; position it in centre of slots.
Do up the nuts without excessively tightening them (spacer plates).
Fit screw (3) of the connecting lug between the rear pump support and the engine mounting.
(Hand tighten screws (2) and (3).
Make sure the pump is set on timing point.

b) Fit the pump pinion.
Tightening torque screws (➔) : 2.2 to 2.5 da Nm (16 to 18 ft.lb).

c) Reset piston to T.D.C.

d) Turn the crankshaft in the opposite direction to engine rotation to lower piston by 7 mm.
Position play take-up rod 6008-T in injection pump.
Turn the crankshaft in the direction of engine rotation and bring piston of No. 1 cylinder to initial timing point, i.e. :
- *CX 2200 :* **4.68 mm before TDC,**
- *CX 2500 :* **5.12 mm before TDC.**

e) Turn the pump towards the engine until the needle in dial gauge 3089-T.F changes direction (probe inserted to maximum extent).
Tighten the pump fixing nut to **3 da Nm (21.7 ft.lb).**
Tighten the fixing screws on lug (1) of the rear support connection.
During the tightening operation, the dial gauge needle of the pump should not move.

9. Check the timing :

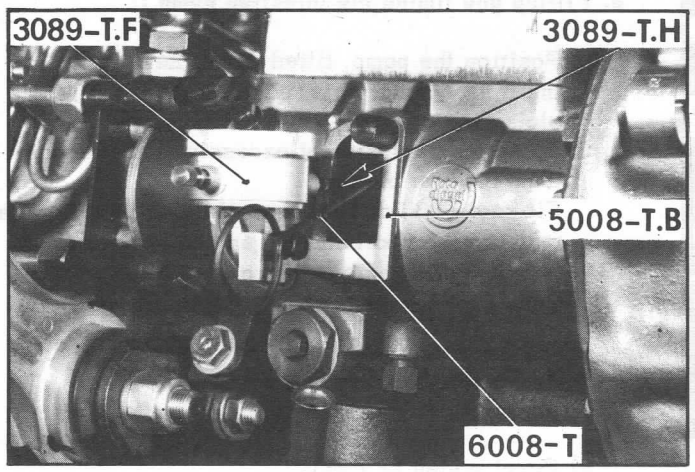
a) Reset piston to T.D.C.

b) Turn the crankshaft in the opposite direction to engine rotation until piston is lowered by 7 mm.

c) Turn the crankshaft in the normal direction of engine rotation until the pump reaches pump internal timing point. In this position, the dial gauge 2437-T should indicate the **initial timing value,** i.e. :
- *CX 2200 :* **4.68 ± 0.03 mm before TDC,**
- *CX 2500 :* **5.12 ± 0.03 mm before TDC.**
If not, re-time the pump.

NOTE : If the pump is in contact with its mounting slots and the desired timing value cannot be obtained, the pump must be refitted.

76-13



10 - Remove :
- the play take-up rod 6008-T,
- the dial gauge 3089-T.F,
- the support 5008-T.B,
- the probe 3089-T.H.

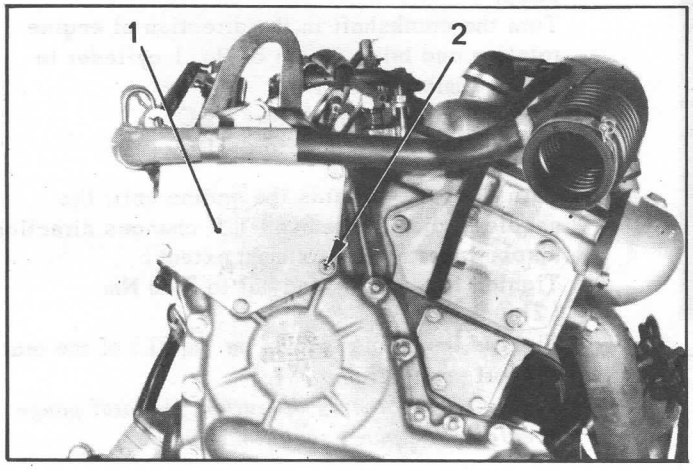
Fit the inspection cover and its gasket.
Seal fixing screws of plate (pliers 6008-T.D).
Fit cover plate (1) (copper washer) under screw (2).

11 - Remove dial gauge 2437-T

Using support 5003-T.A, position :
- the valve springs,
- the valve-spring cups and split collets,
- the push-rod,
- the rocker.

Check exhaust valve rocker clearance (0.20 mm cold).

T4 894

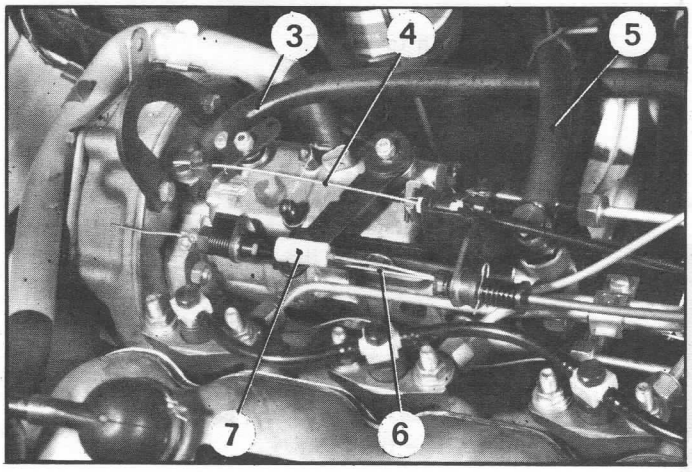


12 - Replace the Diesel fuel filter.

Connect the injection pump to the fuel supply hoses (5) and return hoses (3).

Position the injector pipe assembly.

15 224



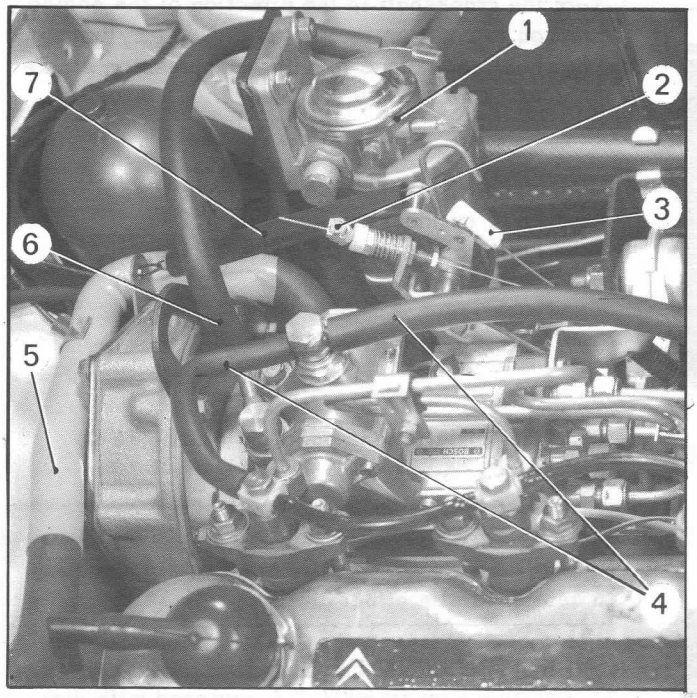
13 - Connect and adjust the following :
- shut-off control (4). *(⟶ 5/1976) :*
- feed wire for the electric cut-out control *(5/1976 ⟶) :*
- fast idle control (6),
- accelerator control (7).

14 - Bleed the Diesel fuel system.

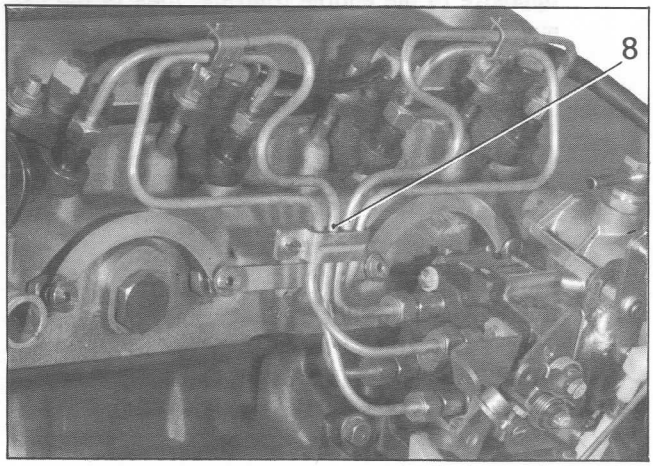
15 - Adjust the idling speed.

IV. REMOVING AND FITTING THE INJECTION PUMP (BOSCH)

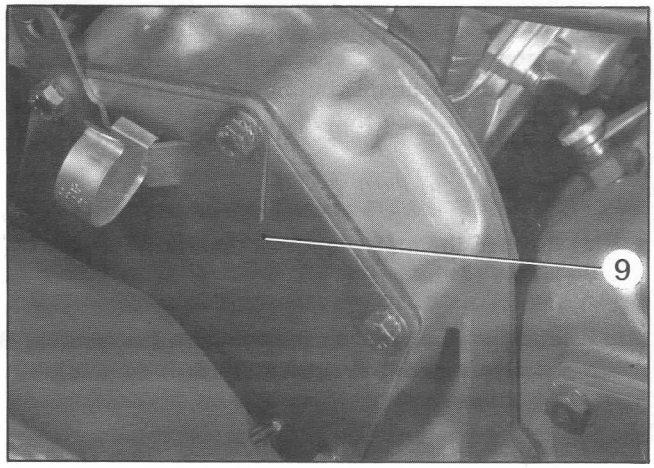
76-347



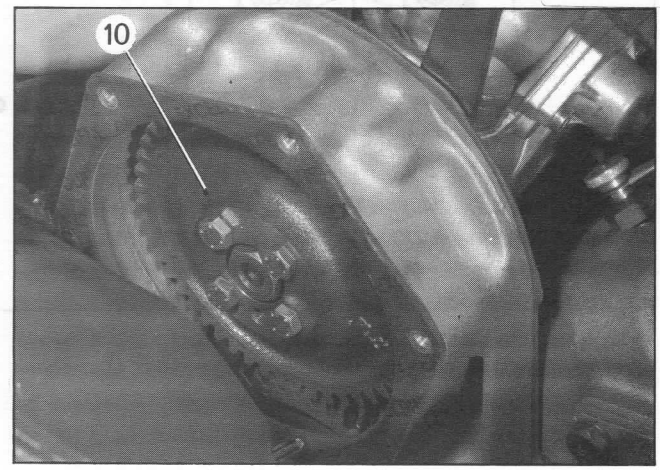
14 984



14 858



14 859



REMOVAL.

Disconnect the negative lead from battery.

1. **Disconnect from the injection pump :**
   - the accelerator control (3),
   - the fast idle control (2),
   - the fuel supply hoses (4) and return hoses (6),
   - the accelerator control return spring (7),
   - the feed wire of the electric cut-out .

2. Remove the injector pipe assembly (8).
   (Place the plastic caps on the injectors).

3. Remove the dipstick and withdraw the fuel filter (1) and the gas recycling hose (5).

4. **Removing the injection pump :**

   a) Remove :
   - the closing plate (9),
   - the pump drive pinion (10).

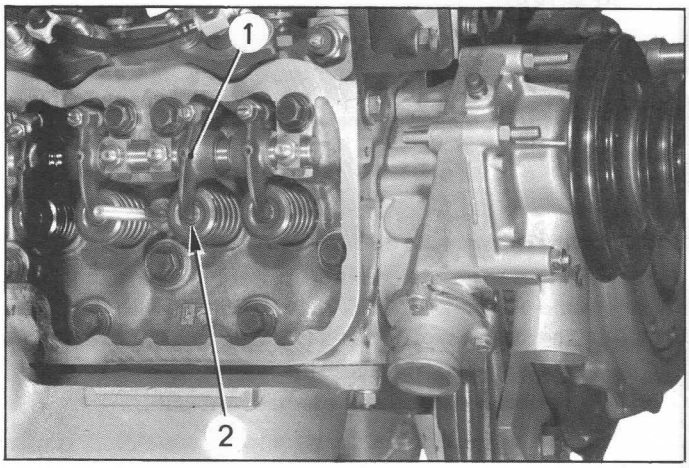
   b) Remove the pump mountings :
   - on the torque link,
   - on the timing gear flange.

   Disengage the injection pump.

Supplement No. 1 to Manual 818-3 (REMOVAL AND FITTING) (CORR)

FITTING.

15 185



5. Remove the rocker cover.
Turn the crankshaft in the direction of the engine rotation to position the piston of No. 1 cylinder **(flywheel end)** close to TDC, compression stroke *(valves of No. 4 cylinder in rocking position).*

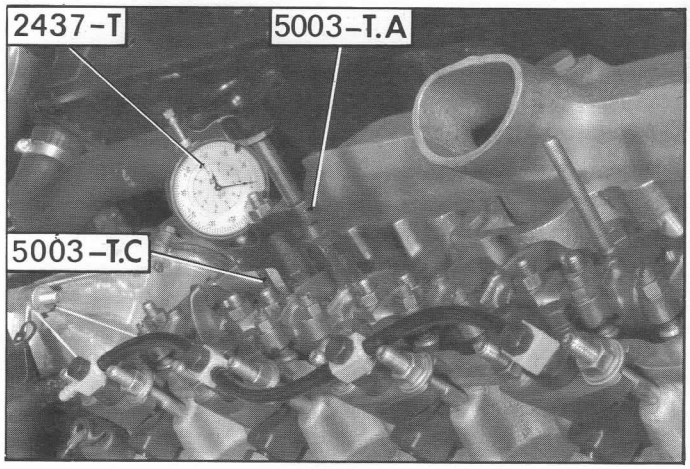
6. Use support No. 5003-T.A to remove the following from No. 1 cylinder exhaust valve (2) :
- the split collets and the valve-spring cup,
- the springs,
- the push rod,

Tilt the exhaust rocker (1).

7. Find the initial timing point on the engine :

To prevent the exhaust valve from falling into the cylinder do not turn the crankshaft more than a quarter turn in either direction.

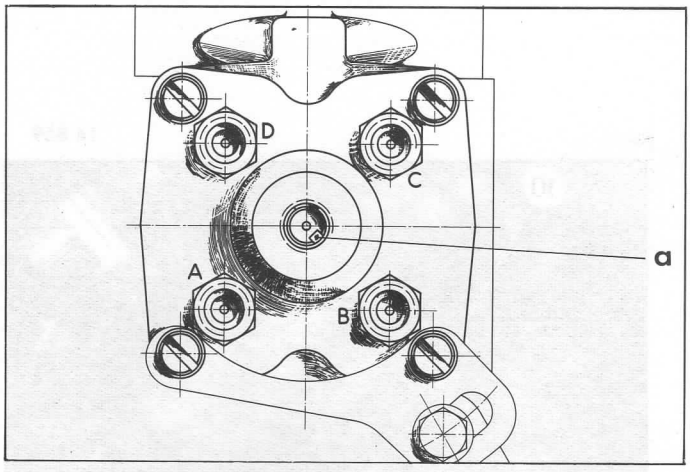
76-39



a) Find TDC of No. 1 cylinder.
Position support 5003-T.A equipped with dial gauge 2437-T and contact point 5003-T.C.
Turn the crankshaft (1/4 turn) in the direction opposite to the engine rotation, then in the normal direction, up to the point where the large needle on the dial gauge changes direction, which corresponds to TDC of piston.
Place the « 0 » of the turning dial of the gauge in line with the large needle and take in the position of the rev counter needle.

b) Turn the crankshaft a quarter turn in the direction opposite to that of the engine, then in the normal direction of rotation, so as to bring the piston to nitial timing point, i.e. :
CX 2200 : **1.19 ± 0.01 mm before TDC.**

B. 17-1



8. Preparing the injection pump :

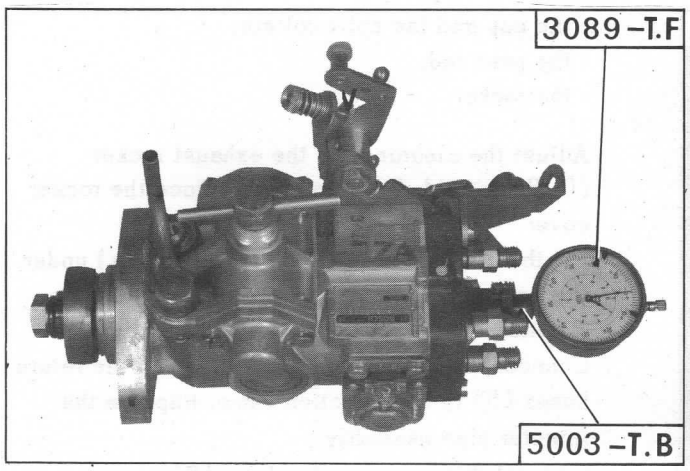
NOTE : The injection pumps supplied by the Replacement Parts Department are fitted with an anti-corrosion liquid. Before putting into service the liquid must be flowed out.

Find B.D.C. of pump piston.

a) Remove the stop plug from the distributing piston of the pump.

b) Position the groove « a » opposite the marking B (delivery outlet of No. 1 cylinder) by turning the drive shaft.

14 869



c) Fit the clamp support of the dial gauge 5003-T.B with contact point 5003-T.C, on the pump. Find the B.D.C. of the pump distributing piston by turning the drive shaft (to the left, seen from drive side). At the precise moment when the hand having been stabilized starts to move again, place the « 0 » of the dial in line with the large needle.

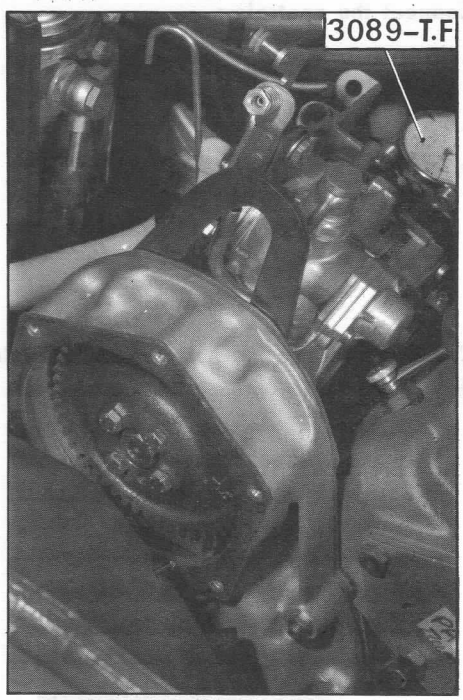
9. Timing the pump :

Offer up the pump equipped with a new gasket, position it :

- at about the middle of the fixing slots length *(if the drive pinion fitting is tight onto the pump shaft hub)*,
- at the farthest position of the fixing slots length towards the housing *(if the drive pinion fits freely onto the pump shaft hub)*.

Tighten the nuts without locking (plain washer).
Fix the drive pinion, tighten the screws to 1.8 da Nm (13 ft.lb).
Bring the needle of the pump dial gauge to 0.45 ± 0.01 mm by turning the pump casing towards the interior of the engine *(pump timing point)*.
Tighten the securing nuts of the pump to 2.4 to 2.6 da Nm (17.5 to 19 ft.lb).
While tightening, the dial gauge needle should not more.

14 859



10. Check the pump timing :

a) Reset the piston to TDC.

b) Turn the crankshaft in the reverse direction to the engine rotation until the piston is lowered by 3 mm.

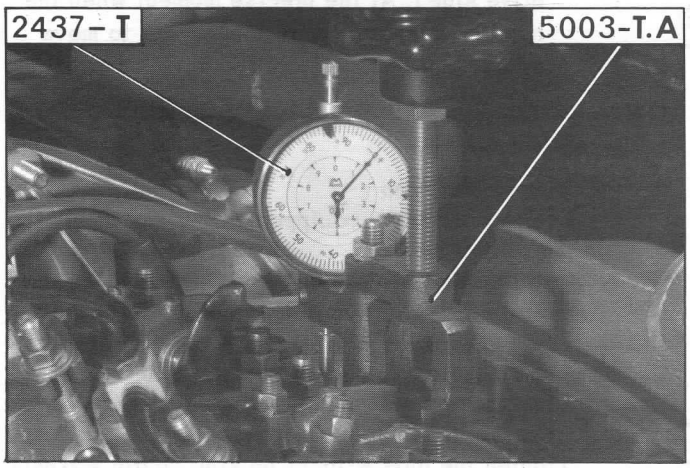
c) Turn the camshaft in the normal rotation direction to the point **of the pump timing.**
In this position the dial gauge 2437-T *(on the valve)* must indicate the **initial timing value i.e., 1.19 ± 0.01 mm (0.046 in) before TDC,** if not, re-time the injection pump.

NOTE : If the pump is in contact with the extreme end of its slots, and one cannot obtain the timing values, the pump itself must be re-positioned.

11. Remove dial gauge 2437-T and support 5003-T.B.

12. Fit the obturating cap with its joint washer onto the injection pump. Tighten it to **4 to 6 da Nm (29 to 43.5 ft.lb).**
Fit the pump retaining lug to the torque link.

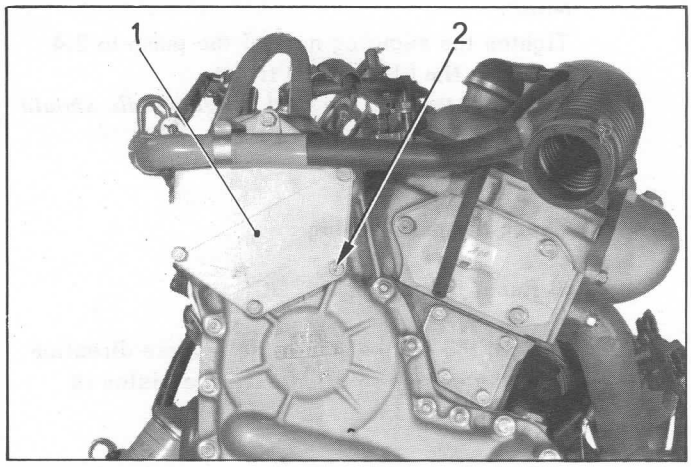
14 860



13. Remove dial gauge 2437-T *(on the valve)* using support 5003-T.A. Position the following :
- the valve springs,
- the cup and the split collets,
- the push rod,
- the rocker.

Adjust the clearance of the exhaust rocker (0.20 mm cold, 0.008 in) and replace the rocker cover.
Fit the closing plate (1) (copper washer) under the screw (2).
Replace the diesel fuel filter and the dipstick.
Connect the fuel supply hoses (7) and the return hoses (5) to the injection pump. Replace the injector pipe assembly.
Connect the gas recycling hose (6).
Connect the feed wire of the electric cut-out.

14 894

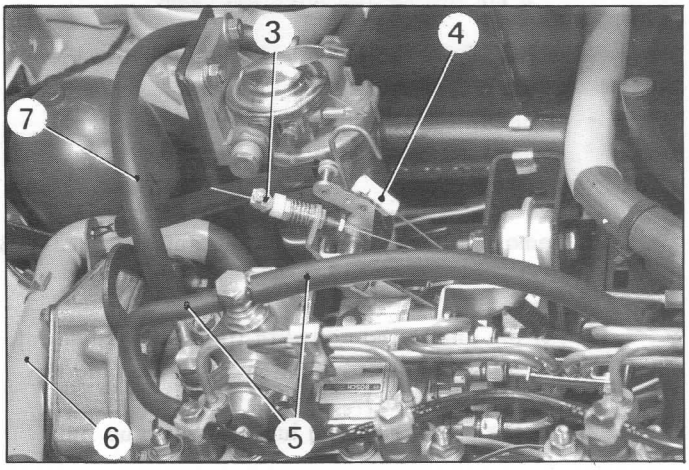


14. Connect the controls :

- for the fast idle (3),
- for the accelerator (4).

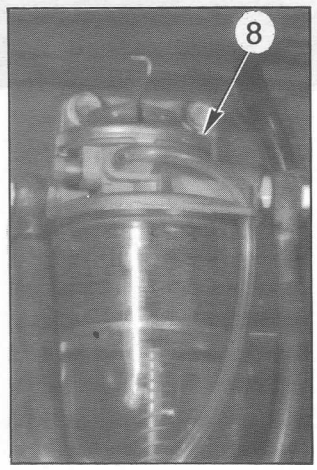
Fit the accelerator control return spring.

76-347

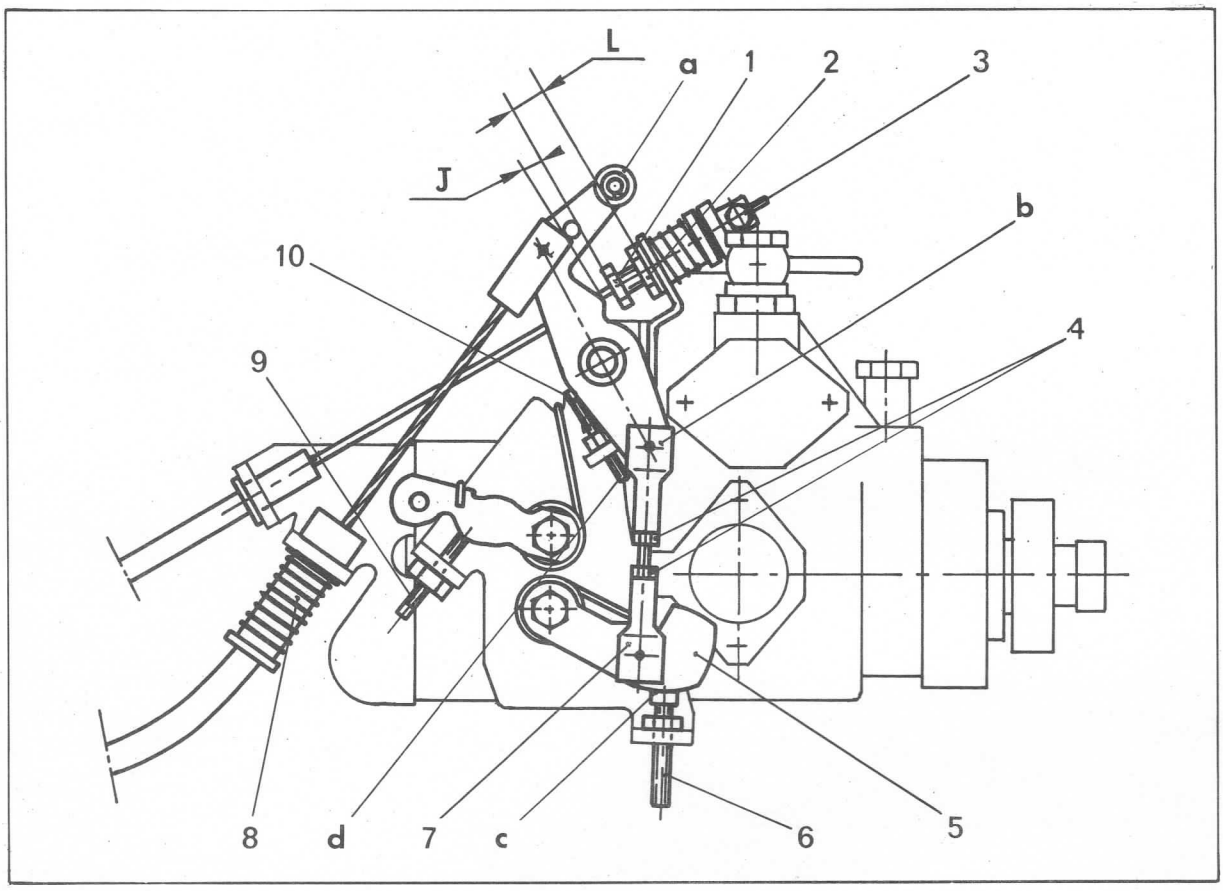


15. Connect the negative battery lead and bleed the Diesel fuel system :
- the filter (bleed screw (8)),
- the injectors.

13 072



L.14-5



16. Adjust the idling (engine warm) :

Uncouple :

- link rod (7) at « b »,
- the accelerator control return spring at « a ».

Adjust the idling at 800 ± 25 rpm by actuating screw (6) (re-tighten the lock-nut).

Adjust the fast idle :

1°) Set the fast idle manual control in position « zero » (min. idling speed). To do that, turn the button in the direction opposite to the one indicated by the arrow engraved on the button located under the dashboard.

2°) Check value (L) which must be $14\ ^{+1}_{0}$ mm; if it is not, release lock-nut (2) and actuate screw (1)

3°) Couple :

- accelerator control return spring at « a »,
- the link-rod at « b » to obtain a clearance J = 0.1 to 0.4 mm by modifying the link-rod length. Tighten lock-nuts (4). Make sure lever (5) is still resting at « c ».

17. Adjust the controls :

A. Fast idle control :

With the control in position « zero » (min. idling speed), check that the cable is free but without clearance. if this is not the case, actuate cable clamp (3).

B. Accelerator control :

- When the accelerator is fully depressed, make sure lever (5) is resting at « d ».
- When the accelerator is released, lever (5) must return to « c ».

If it does not, move the clip inside the grooves of sleeve stop (8).

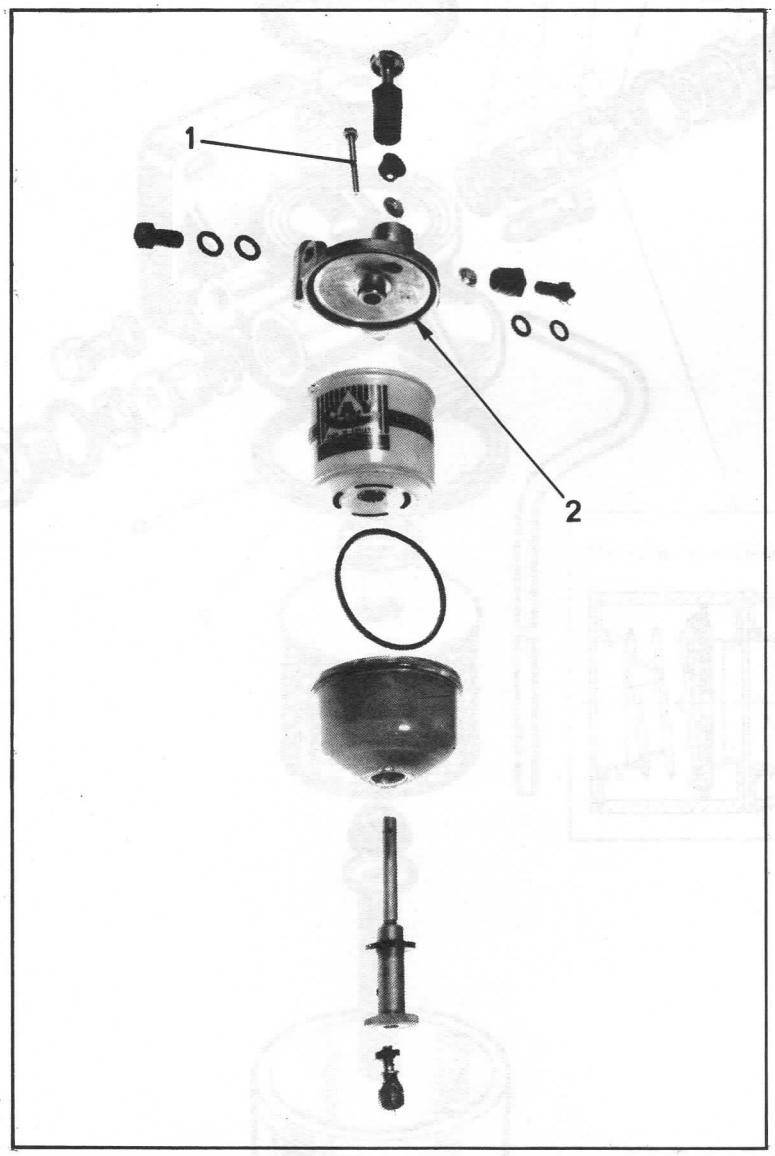
In no case, should the position of screws (9) and (10) be modified.

Supplement No. 1 to Manual 818-3 (REMOVAL AND FITTING)

I. REPLACING A « C.A.V. ROTO-DIESEL » FUEL FILTER CARTRIDGE

NOTE :
The cartridge must not be cleaned. It must be REPLACED (in accordance with the Maintenance Guide).

2143



This operation presents no difficulty.

Do not forget to remove sealing ring (2) and to check the cleanliness of its housing.

On fitting, it is ESSENTIAL that the sealing rings and bowl be correctly positioned.

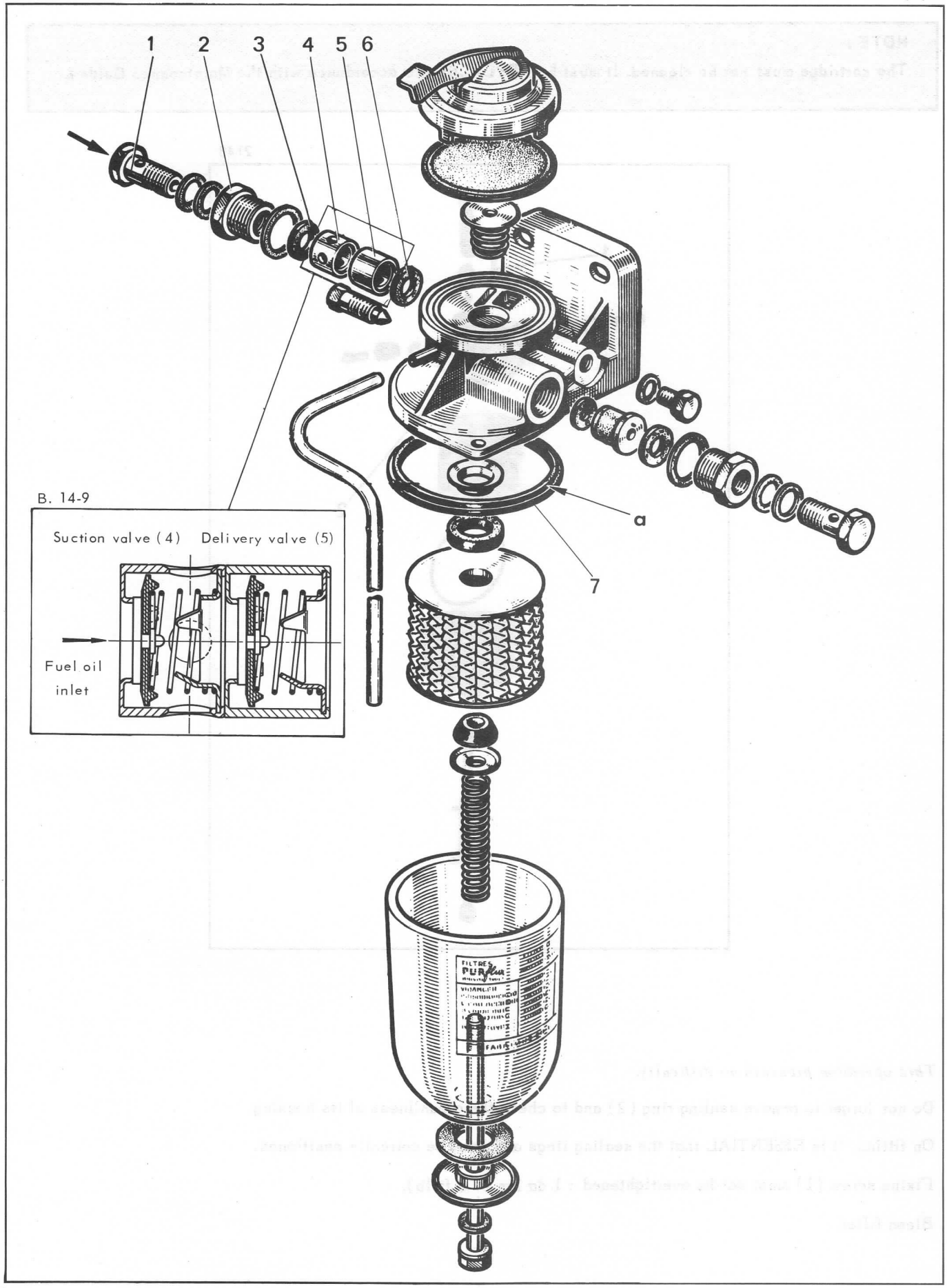
Fixing screw (1) must not be overtightened : 1 da Nm (7.2 ft.lb).

Bleed filter.

Supplement No. 1 to Manual 818-3 (REMOVAL AND FITTING) (CORR)

II. REPLACING A « PURFLUX » FUEL FILTER CARTRIDGE.

14 803



NOTE :
The cartridge must not be cleaned but REPLACED (as indicated in the Maintenance Guide).

This operation presents no difficulty.
Do not forget to remove sealing ring (7) and check the cleanliness of its housing.

When fitting, it is IMPORTANT to ensure that the bowl and the sealing rings are correctly positioned.
Collar « a » of sealing ring (7) in filter body groove.

The securing rod should be moderately tightened to **0.5 to 0.8 da Nm (3.5 to 5.8 ft.lb).**

Supplement No. 1 to Manual 818-3 (REMOVAL AND FITTING) (ADD)

III. REPLACING « PURFLUX » FUEL FILTER VALVES.

(under the fuel inlet union)

REMOVAL.

Remove the following :
- fuel inlet union-screw (1),
- valve retaining plug (2),
- rubber sealing ring (3),
- suction valve (4),
- delivery valve (5),
- rubber sealing ring (6).

FITTING.

Fit the following :
- rubber sealing ring (6),
- delivery valve (5) *(without holes)* : the movable part of the valve should be positioned fuel inlet end (outwards),
- suction valve (4) *(with holes)* : the movable part of the valve should be positioned fuel inlet end (outwards),
- rubber sealing ring (3) ,
- valve retaining plug (2) fitted with its copper washer,
- fuel inlet union screw (1) (copper washer).

MANUAL N° 818-3

THIRD SECTION

Manual 818-3

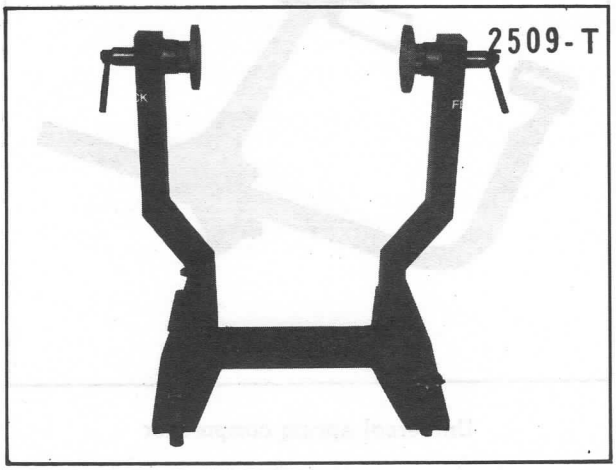
RECONDITIONING

Operation number	DESCRIPTION
	ENGINE
MA.Di. 100-3	Reconditioning the engine
	TOOLS
	Manufacturing drawings for tools not sold

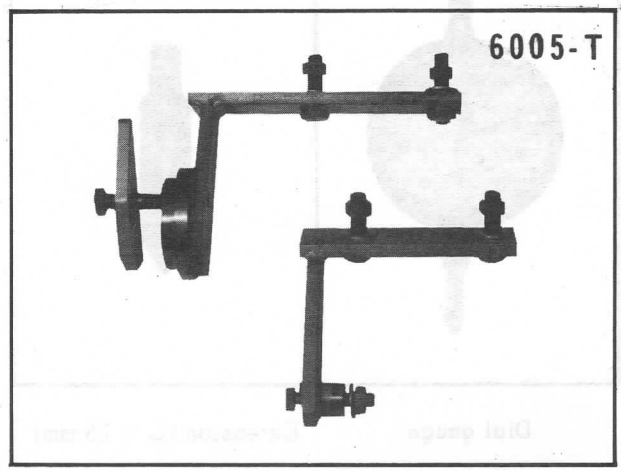
SPECIAL RECOMMENDED TOOLS

I - TOOLS SOLD

12612

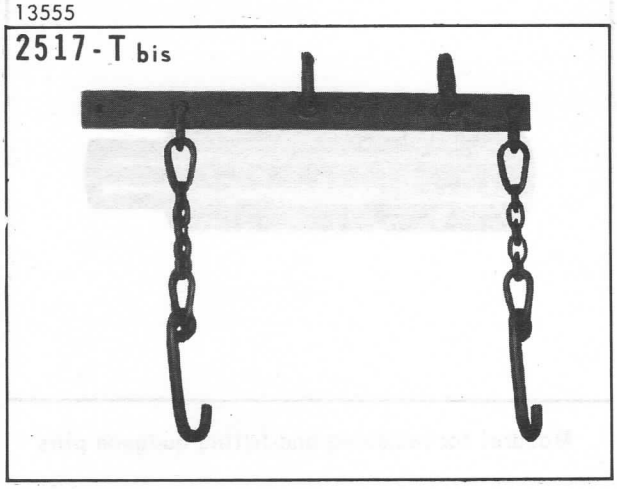


Support-stand for removed engine



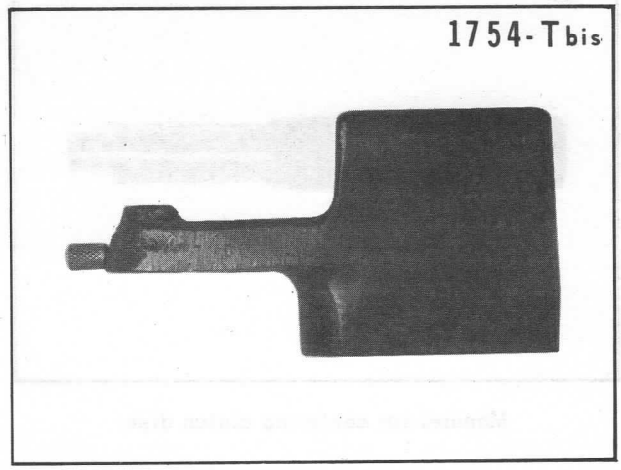
Adaptor for fitting engine on support-stand 2509-T

13555



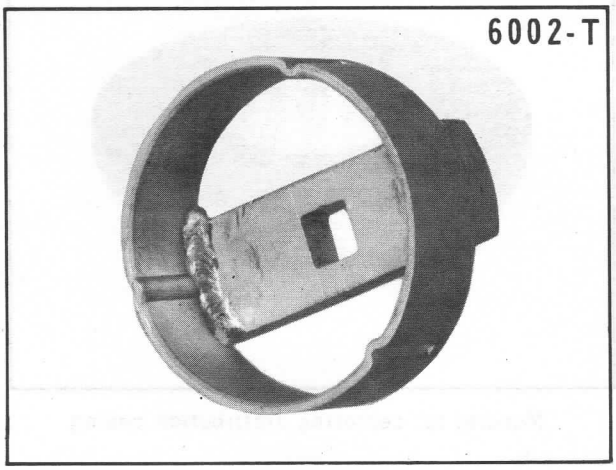
Hoisting sling

12511



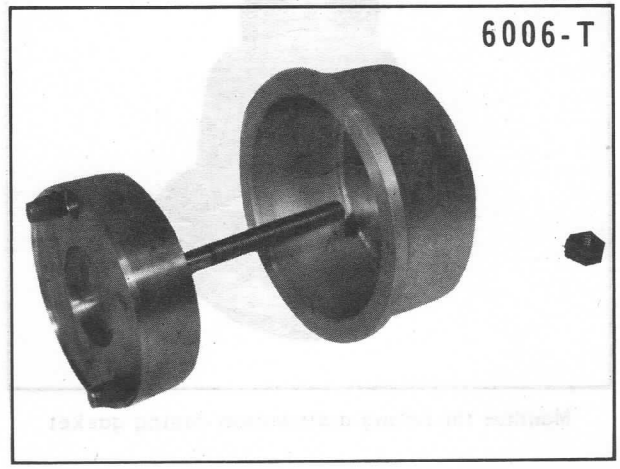
Dial gauge rule-support

13739



Spanner for the removal and fitting of the oil filter cartridge

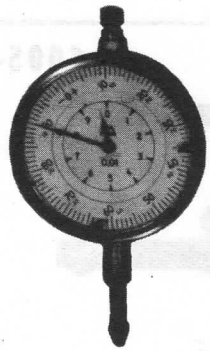
13812



Tool for fitting the bearing sealing ring on clutch side

12827

2437-T



Dial gauge

12834

2443-T



Extension (L = 15 mm)

14029

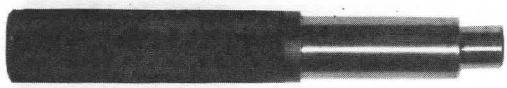
4024-T



Universal spring compressor

12694

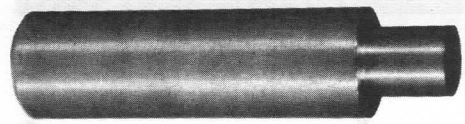
3106-T



Mandrel for centering clutch disc

12668

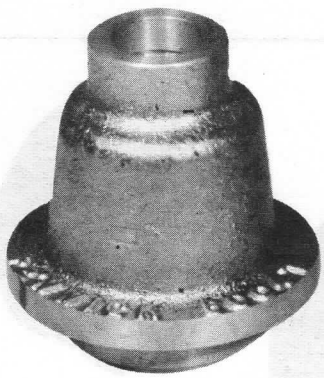
5002-T



Mandrel for removing and fitting gudgeon pins

15175

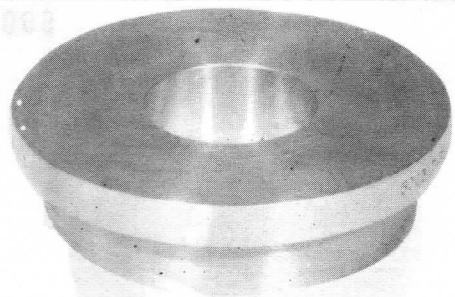
5004-T



Mandrel for fitting distribution casing gasket

15175

5005-T

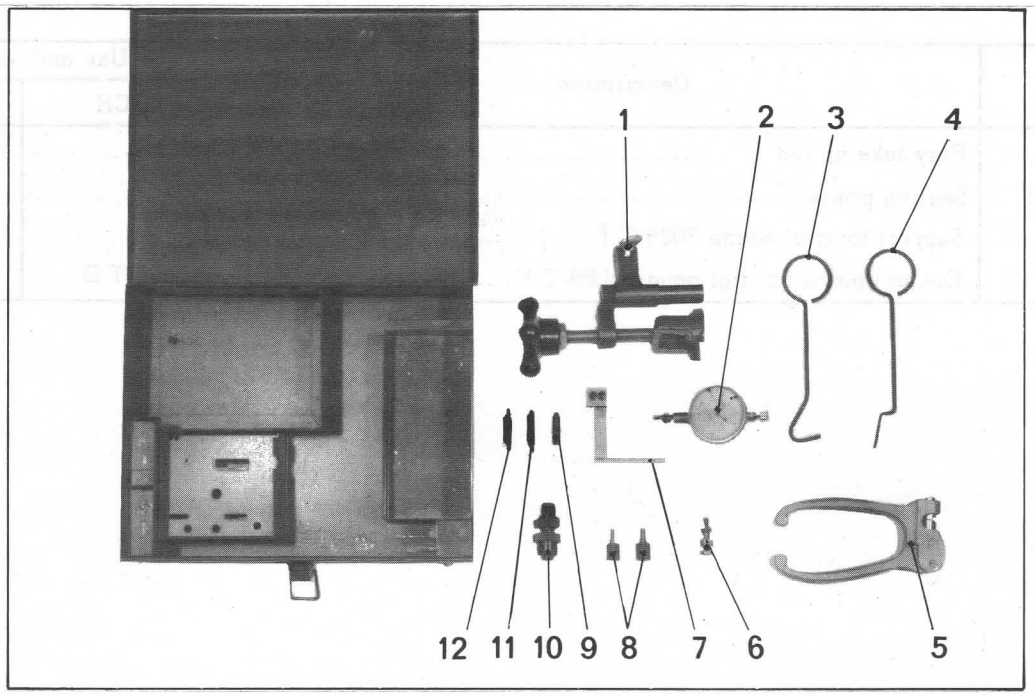


Mandrel for centering distribution casing

SPECIAL RECOMMENDED TOOLS (continued)

Tools required for timing the injection pump

15 222



- 6008-T : Play take-up rod (4) is sold separately and not included in kit 5003-T bis
- 5003-T bis : Checking kit comprising :

Mark	Description	Use and reference	
		BOSCH	ROTO-DIESEL
1	Dial gauge support for finding TDC	5003-T.A	5003-T.A
2	Dial gauge	3089-T.F	3089-T.F
3	Play take-up rod	.....	5008-T.A
5	Sealing pliers	.....	5008-T.D
6	Fixing nut and screw for dial gauge 3089-T.F	.....	3089-T.L
7	Support for dial gauge 3089-T.F	.....	5008-T.B
8	Support fixing screw for dial gauge 3089-T.F	.....	5008-T.C
9	Probe for dial gauge 3089-T.F	.....	3089-T.H
10	Dial gauge support grip	5003-T.B	
11	Contact piece for dial gauge 2437-T	5003-T.C	5003-T.C
	Contact piece for dial gauge 3089-T.F	3089-T.D	

- Additional equipment to convert a 5003-T kit into a 5003-T bis kit :

REFERENCE 5009-T

Mark	Description	Use and reference	
		BOSCH	ROTO-DIESEL
2	Dial gauge	3089-T.F	3089-T.F
3	Play take-up rod	.....	5008-T.A
5	Sealing pliers	.....	5008-T.D
6	Fixing screw and nut for dial gauge 3089-T.F	.....	3089-T.L
7	Support for dial gauge 3089-T.F	.....	5008-T.B
8	Dial gauge support fixing screw	.....	5008-T.C
9	Probe for dial gauge 3089-T.F	.....	3089-T.H
12	Contact piece for dial gauge 3089-T.F	5003-T.D	5003-T.D

Supplement No. 1 to Manual 818-3 (RECONDITIONING) (CORR)

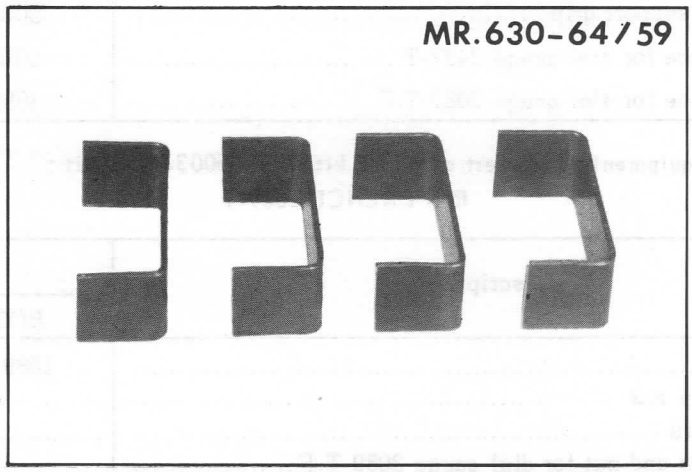
- Additional equipment to convert combined kits 3089-T and 5003-T into a 5003-T bis kit
REFERENCE 5008-T

Mark	Description	Use and reference	
		BOSCH	ROTO-DIESEL
3	Play take-up rod	.....	5008-T.A
5	Sealing pliers	.....	5008-T.D
7	Support for dial gauge 3089-T.F	.....	5008-T.B
12	Contact piece for dial gauge 3089-T.F	5003-T.D	

II - M.R. TOOLS NOT SOLD (to be manufactured by the repairer)

12674

MR.630-64/59



Set of four securing clamps for fitting the assembly of shaft, springs and rocker arms

TIGHTENING TORQUES

I - Mandatory tightening torques (torque spanner) :

Item to be tightened	Torque in da Nm	Torque in ft.lb	Remark
Connecting rod cap screws	7.2 to 8	52 to 58	To be renewed after each dismantling operation
Bearing cap screws	9 to 10	65 to 72	To be renewed after each dismantling operation
Flywheel fixing screws	9	65	To be renewed after each dismantling operation and fitted with LOCTITE Frénétanch
Cylinder head fixing screws *(plain washer)*	9.5 to 10	68 1/2 to 72	Oil faces and threads Shank dia. = 9.6 instead of 9.2 mm
Vibration damper fixing screws	25	180	
Fast idle thermostatic sensor *(copper washer)*	4 to 5	29 to 36	Fit with LOCTITE Formétanch

II - Recommended tightening torques :

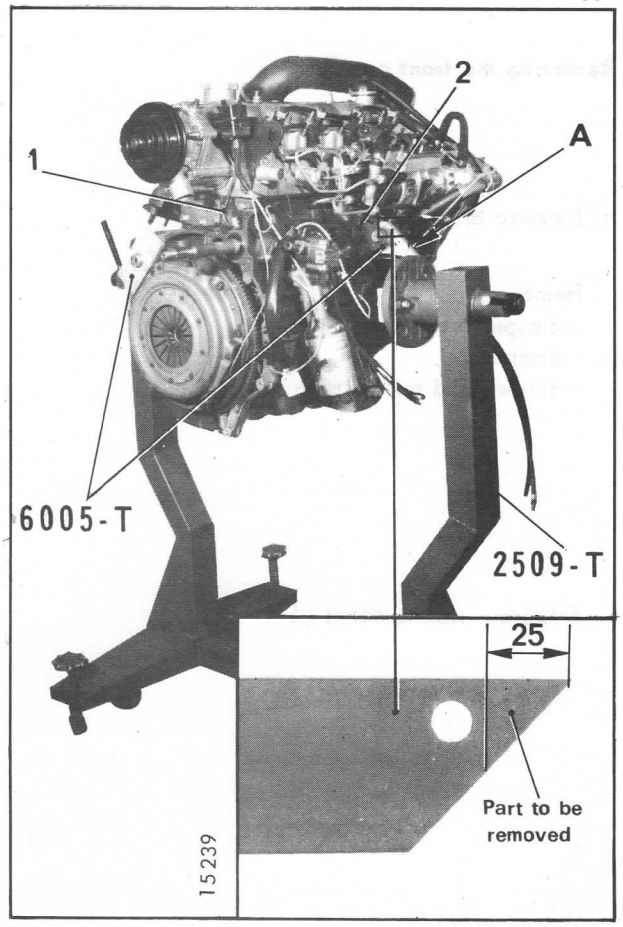
Item to be tightened	Torque in da Nm	Torque in ft.lb	Remark
Camshaft chainwheel fixing screws	dia. 7 mm screw		
	1.4 to 1.9	10 to 14	Plain washer
	dia. 8 mm screw		
	3 to 3.4	21 1/2 to 24 1/2	Shouldered screw
Camshaft stop fixing screws *(serrated washer)*	1.4 to 1.9	10 to 14	
Plugs on front panel	1.4 to 1.5	10 to 11	Fit with LOCTITE Frénétanch
Locknuts on fixing studs for ROTO-DIESEL injection pump	1.4 to 1.9	10 to 14	Fit with LOCTITE Frenbloc
Lower crankcase fixing screws	1.4 to 1.9	10 to 14	
Sump fixing screws	1.1	8	
Engine oil drain plug *(annealed copper washer)*	3.5 to 4.5	25 to 32 1/2	
Rocker cover fixing nuts *(annealed copper washer)*	0.5 to 0.8	4 to 6	
Cylinder block coolant drain nut *(copper washer)*	3 to 4	21 1/2 to 29	

Supplement No. 1 to Manual 818-3 (RECONDITIONING) (CORR)

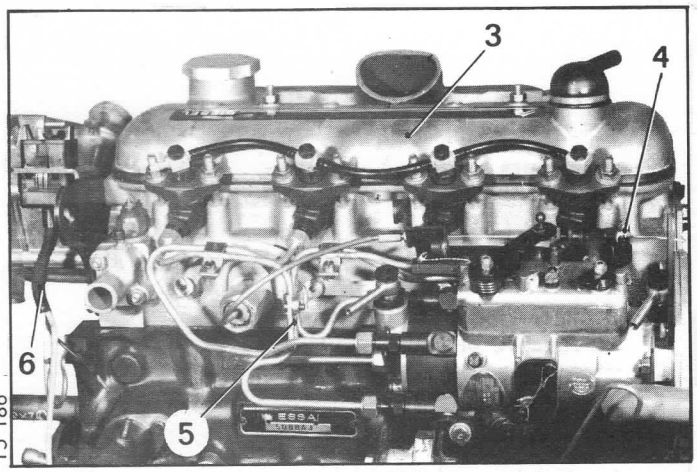
II - Recommended tightening torques (continued) :

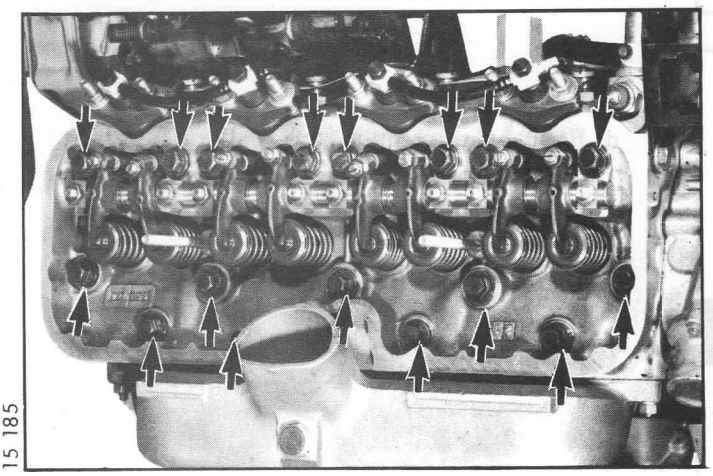
Item to be tightened	Torque in da Nm	Torque in ft.lb	Remark
Cylinder head lubrication pipe union-screw *(double copper washer)*	1 to 1.2	7 to 8 1/2	
Oil filter cartridge mounting	1 to 1.5	7 to 11	Fit with LOCTITE Frénétanch
Injector supply pipe nuts	2.2 to 2.5	16 to 18	
Injector overflow return union screws	0.8 to 1	6 to 7	
Heater plugs	2.5 to 3	18 to 21 1/2	
Injector fixing nuts *(plain washer + contact washer)*	2.2 to 2.5	16 to 18	
Injection pump pinion fixing screw ROTO-DIESEL	2.2 to 2.5	16 to 18	
Injection pump pinion fixing screw BOSCH	1.8	13	
Injection pump fixing nuts ROTO-DIESEL	3	21 1/2	Spacer plates
Injection pump fixing nuts BOSCH *(plain washer)*	2.4 to 2.6	17 1/2 to 19	
Studs fitted in cylinder head	0.4 to 0.6	3 to 4 1/2	Fit with LOCTITE Frénétanch

15 188



Supplement No. 1 to Manual 818-3 (RECONDITIONING) (CORR)





RECONDITIONING THE ENGINE

DISMANTLING

Before positioning adaptor "A" it must be modified as shown on photo opposite.

1 - Set engine on support stand 2509-T fitted with adaptors 6005-T.

Insert between adaptor "A" and clamp (2) the washers found on removal of the torque link.

Drain the engine.

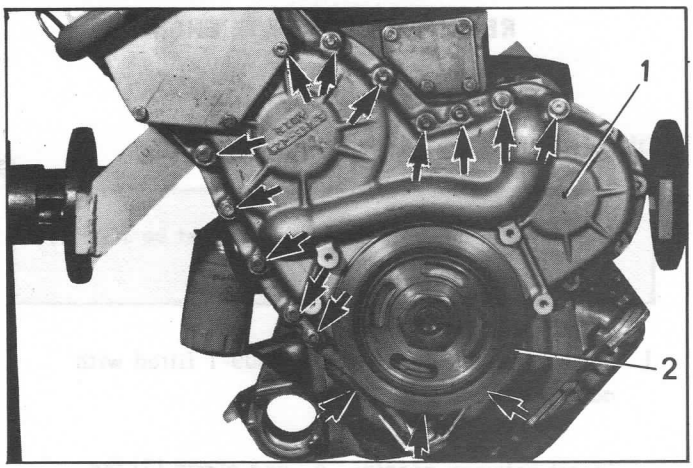
2 - Removing the cylinder head :

a) Remove :
- cable clamp (4),
- injector pipe assembly (5),
- fault-finding harness (6),
- lubrication pipe (1),
- rocker cover (3).

b) Remove screws (➡),
Free the cylinder head and the cylinder head gasket.

c) Remove the push-rods and the tappets *(mark their respective positions).*

15 180

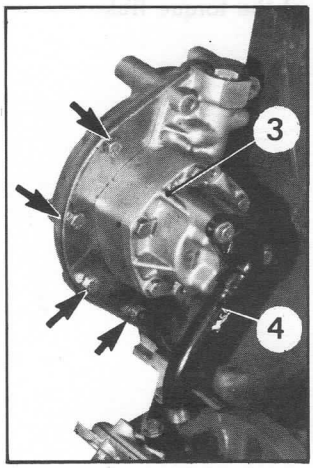


3 - Removing the front panel :

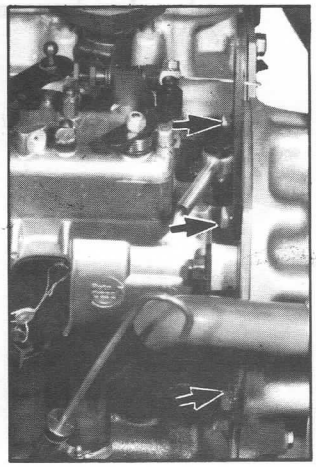
a) Remove the timing cover.

Remove :
- damper protective plate,
- damper (2),
- screws and nuts (➡).

14 980

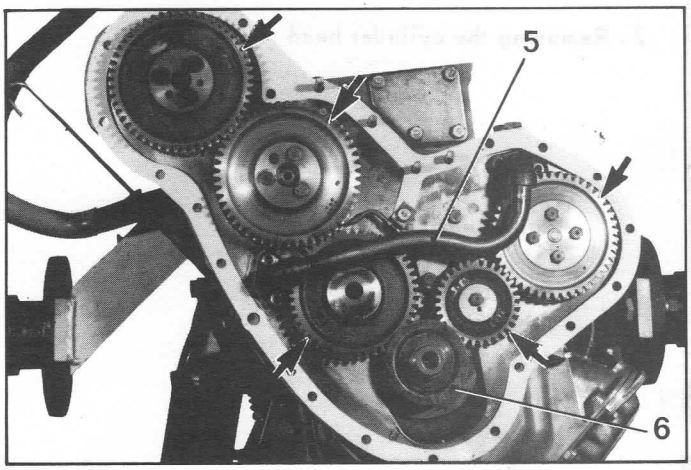


15 186



Withdraw timing cover (1).

15 141

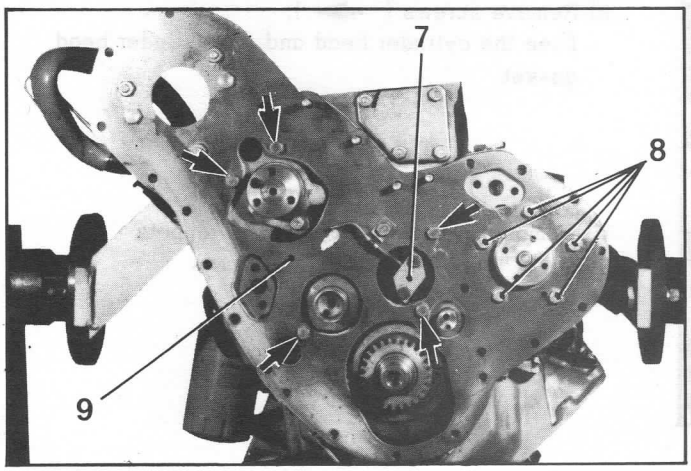


b) Remove :
- baffle (6),
- gears (➡),
- *(⟶ 11/1977) :* lubrication pipes (5) and (7),
- *(11/1977 ⟶) :* lubrication pipe (5).

c) Remove oil pump
Remove :
- pipe (4),
- screws (8).

Withdraw oil pump (3).

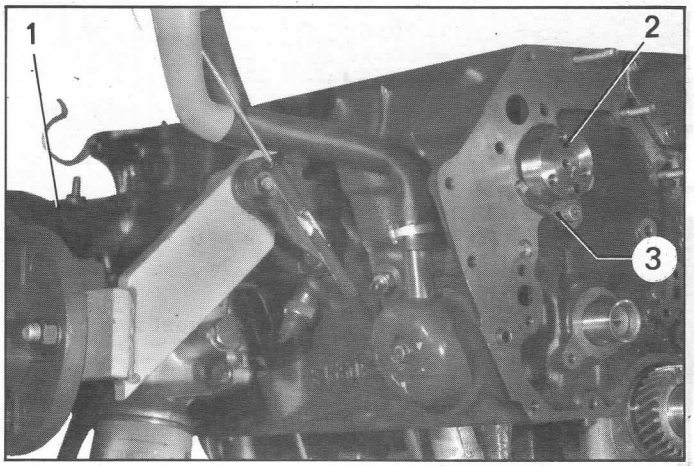
15 092



d) Remove the injection pump.

e) Remove screws (➡).
Withdraw front panel (9).

15 094

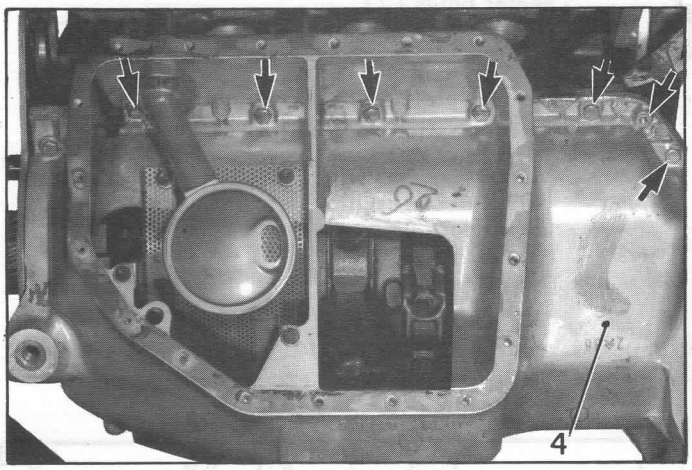


4 - Removing the camshaft :

Remove :

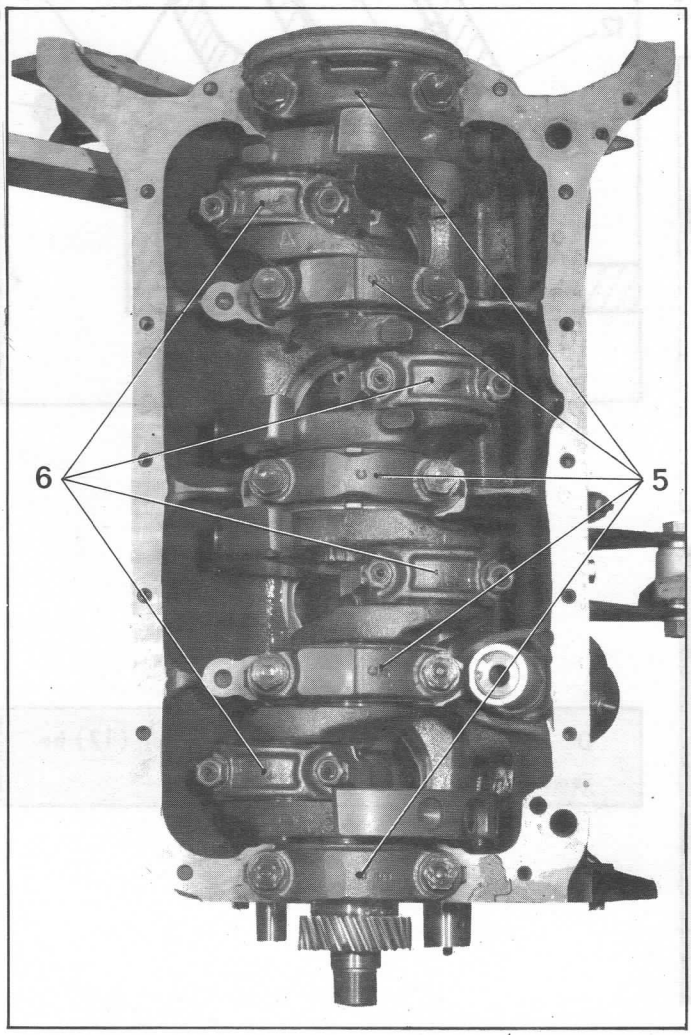
- HP pump (1) *(manual steering)*,
- bracket (3),

Free camshaft (2).



5 - Remove :

- the clutch,
- the flywheel,
- the lower crankcase cover (sump),
- lower crankcase (4) (screws ➡).



15 044

6 - Removing the connecting rod-piston assemblies :

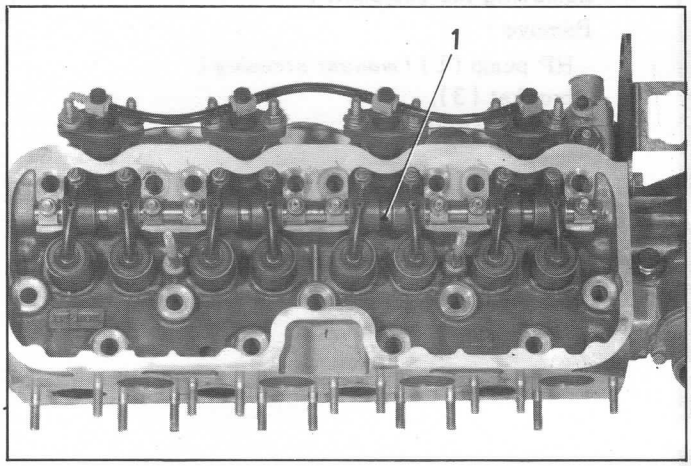
- Do not interchange connecting rod caps.
- Mark positions of pistons in relation to cylinder blocks.

- Remove connecting rod caps (6).
- Remove each connecting rod-piston assembly when it is at TDC.

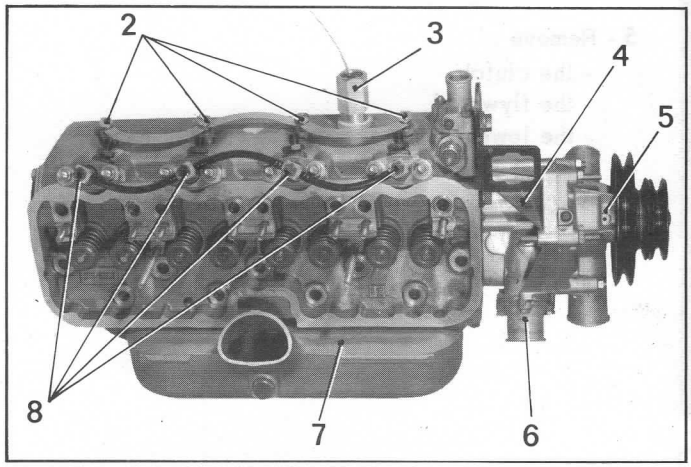
7 - Removing the camshaft :

- Remove bearing caps (5).
- Free the crankshaft.
- Remove the bearing shells.

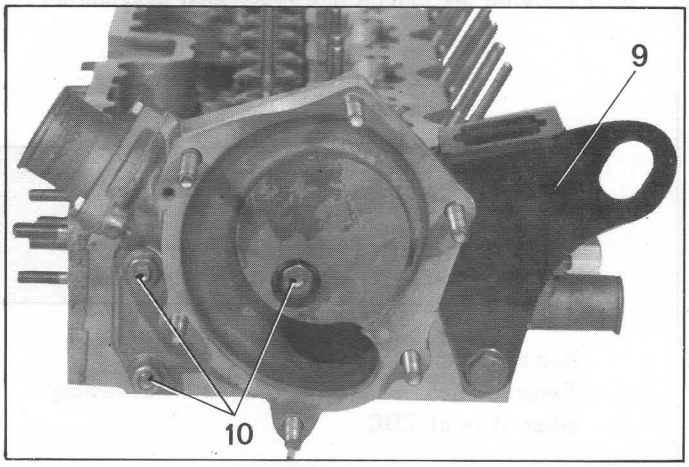
15082



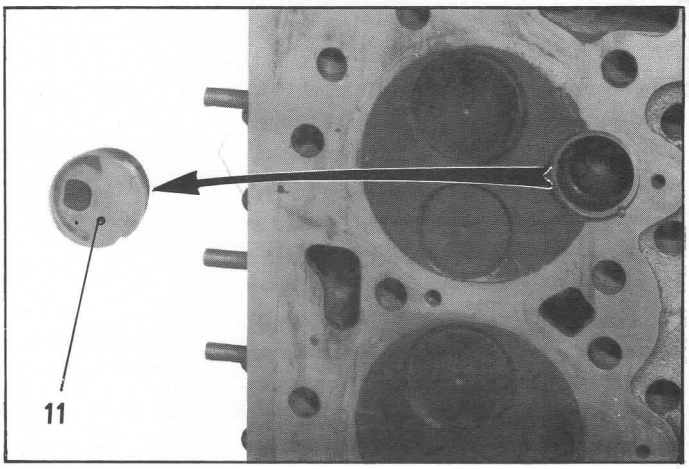
15183



15079



15083

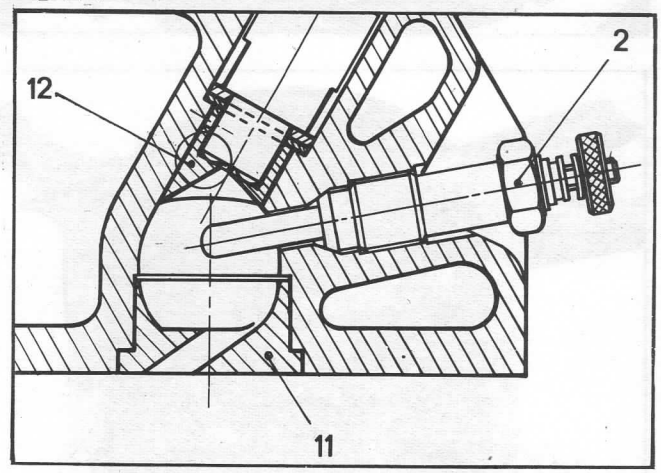


8 - Strip the cylinder head :

a) Remove rocker arm and shaft assembly (1) complete.

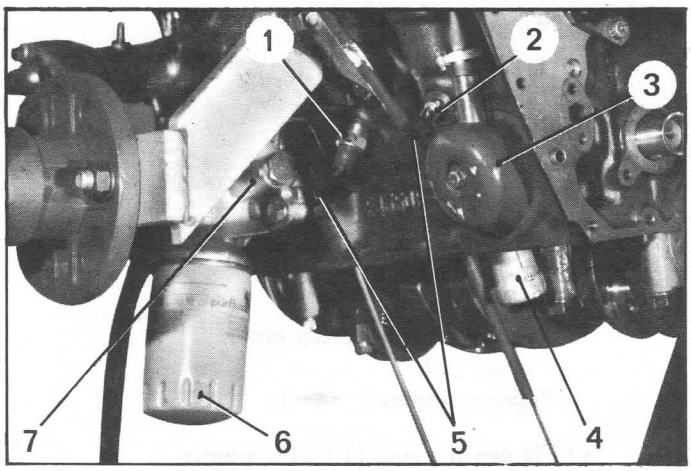
b) Remove *(if necessary)* :
- inlet manifold (7) and the exhaust manifold,
- water pump casing (5),
- water pump cover (4) and the nuts (10),
- flange (6) and the thermostatic unit,
- injectors (8),
- heater plugs (2),
- thermostatic unit (3) of fast idle control,
- sling attachment (9),
- the rear plate with the coolant duct,
- precombustion chambers (11) through the orifice of the injectors, using a rod, dia. = 5 mm, length = 150 mm,
- the valves, using spring compressor 4024-T.

L 14-1



On no account must the injector shroud (12) be removed.

15 094

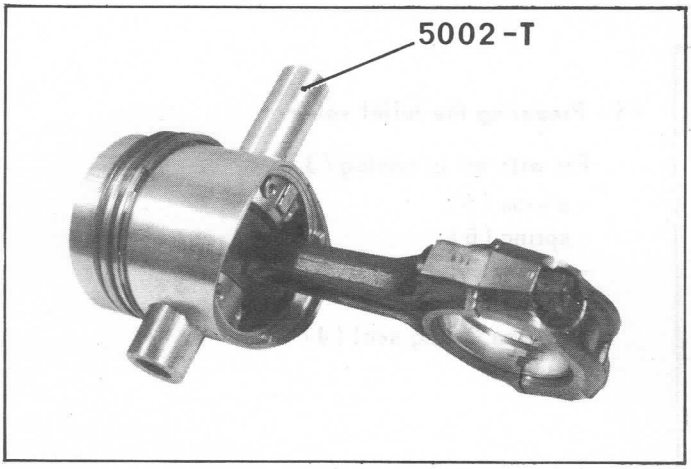


9 - Stripping the cylinder block :

a) Remove oil filter cartridge (6) using spanner 6002-T.

b) Remove *(if necessary)* :
- breather (3),
- screw (2) and free relief valve casing (4),
- oil filter cartridge mounting (7),
- oil pressure switch (1),
- dipstick guide tubes (5),
- the cylinder block water circulation plates, front and rear.

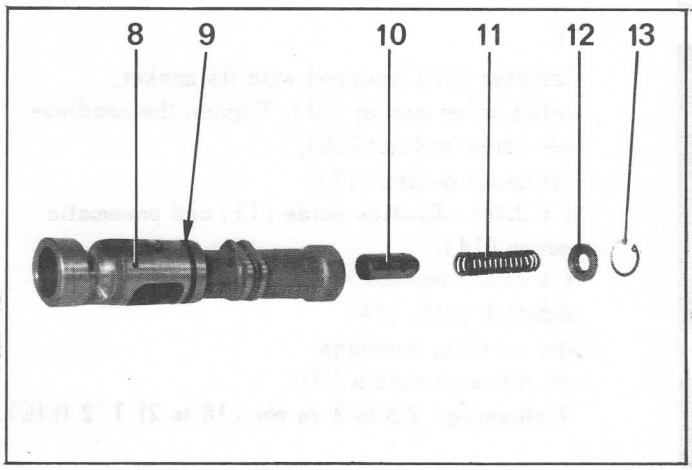
12 426



10 - Disconnecting the pistons from the connecting rods :

- Remove the snap rings.
- Drive out the gudgeon pins using mandrel 5002-T.
- Remove the piston rings.

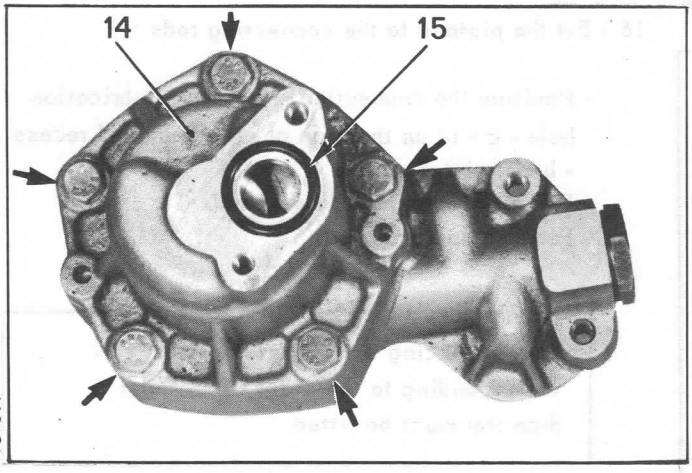
15 081



11 - Dismantling the relief valve :

Remove from the casing (8) :
- O-ring seal (9),
- snap ring (13),
- washer (12),
- spring (11),
- piston (10).

15 097

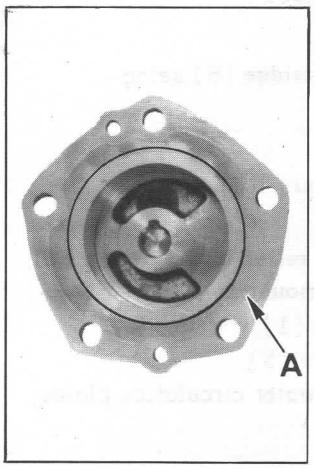


12 - Dismantling the oil pump :

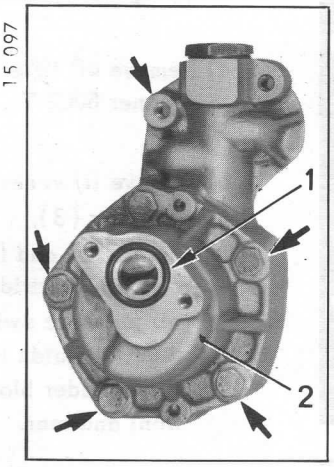
Remove :
- screws (➡),
- cover (14),
- sealing ring (15).

FITTING

15 096



15 097



13 - Preparing the oil pump :

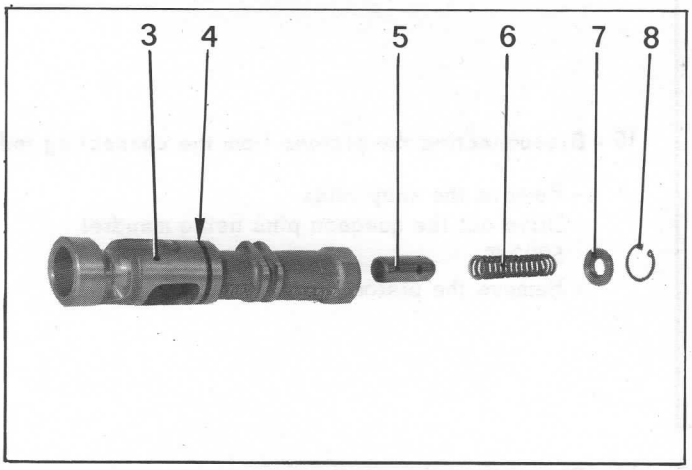
a) Smear zone "A" of oil pump cover (2) with LOCTITE Formétanch.

b) Position :
- the exterior oil pump pinion,
- cover (2),

Tighten screws (➡).

c) Fit sealing ring (1) with grease.

15 081

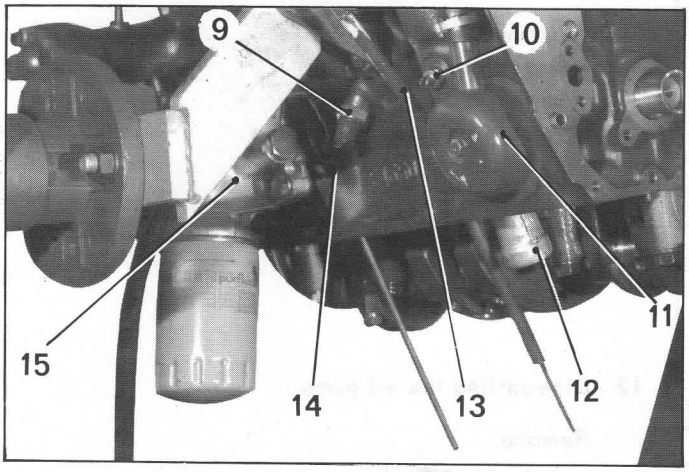


14 - Preparing the relief valve :

Fit with oil in casing (3) :
- piston (5),
- spring (6),
- washer (7),
- snap ring (8),

Position O-ring seal (4).

15 094

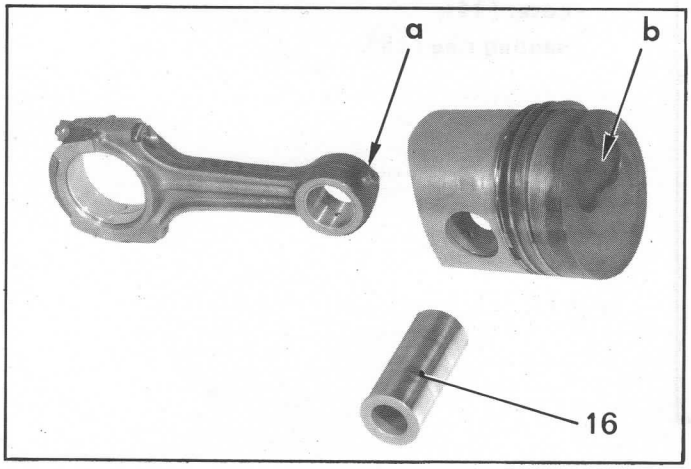


15 - Re-assembling the cylinder block :

Fit :
- breather (11) equipped with its gasket,
- relief valve casing (12). Tighten the headless set screw and nut (10),
- oil gauge guides (13) :
  CX 2200 : dipstick guide (13) and pneumatic gauge (14).
  CX 2500 : pneumatic gauge guide (13) and dipstick guide (14),
- the oil filter cartridge,
- oil pressure-switch (9),

Tightening : 2.5 to 3 da Nm (18 to 21 1/2 ft.lb).

15 046

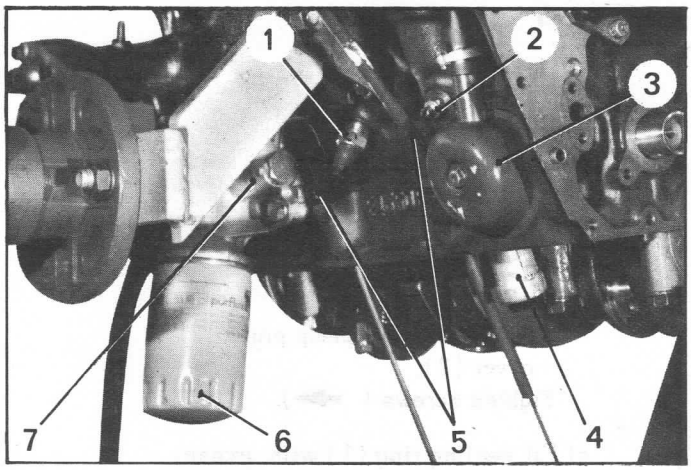


16 - Fit the pistons to the connecting rods :

- Position the connecting rod so that lubrication hole « a » is on the side of clover-shaped recess « b » of piston.
- Fit pin (16) using mandrel 5002-T.
- Fit the snap rings.

When replacing a piston, the piston corresponding to the class of cylinder diameter must be fitted.

15 094

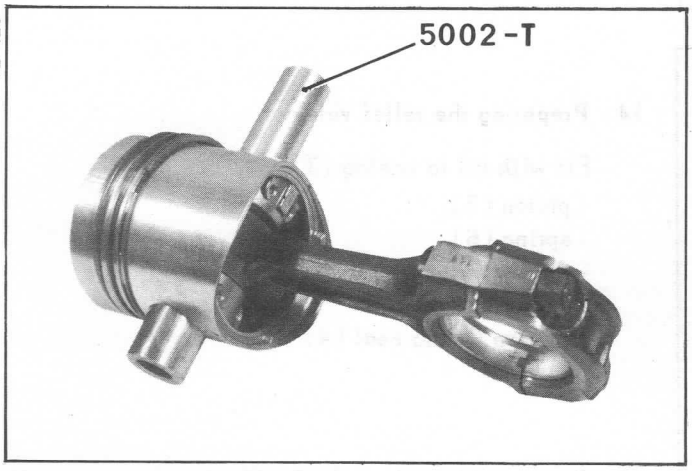


9 - Stripping the cylinder block :

a) Remove oil filter cartridge (6) using spanner 6002-T.

b) Remove *(if necessary)* :
- breather (3),
- screw (2) and free relief valve casing (4),
- oil filter cartridge mounting (7),
- oil pressure switch (1),
- dipstick guide tubes (5),
- the cylinder block water circulation plates, front and rear.

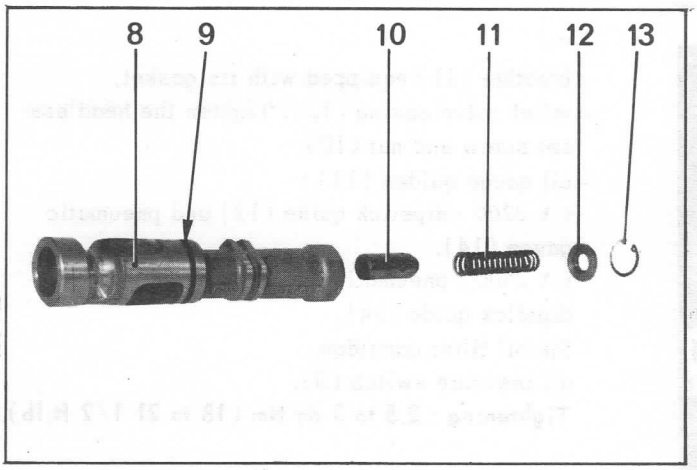
12 426



10 - Disconnecting the pistons from the connecting rods :

- Remove the snap rings.
- Drive out the gudgeon pins using mandrel 5002-T.
- Remove the piston rings.

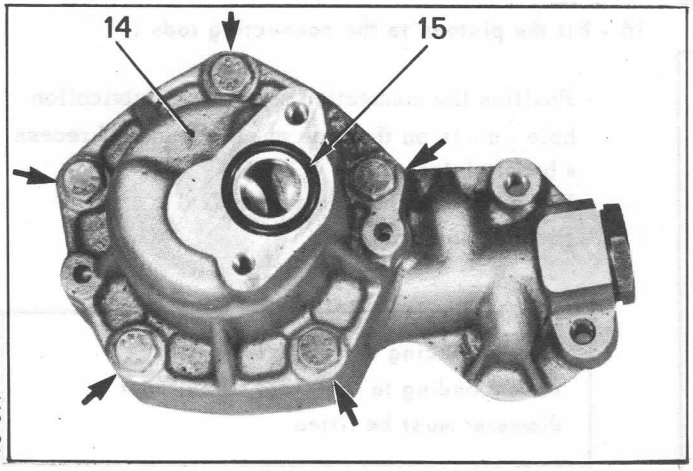
15 081



11 - Dismantling the relief valve :

Remove from the casing (8) :
- O-ring seal (9),
- snap ring (13),
- washer (12),
- spring (11),
- piston (10).

15 097

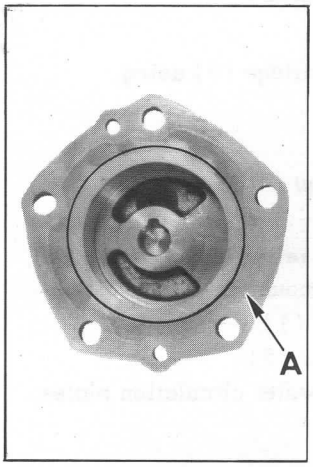


12 - Dismantling the oil pump :

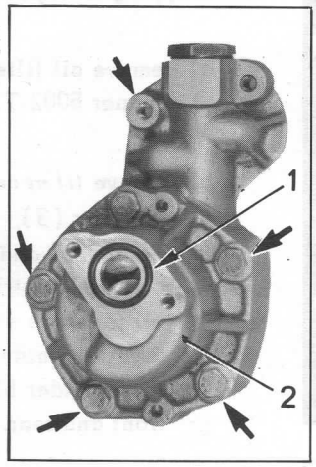
Remove :
- screws (➡),
- cover (14),
- sealing ring (15).

FITTING

15 096



15 097



13 - Preparing the oil pump :

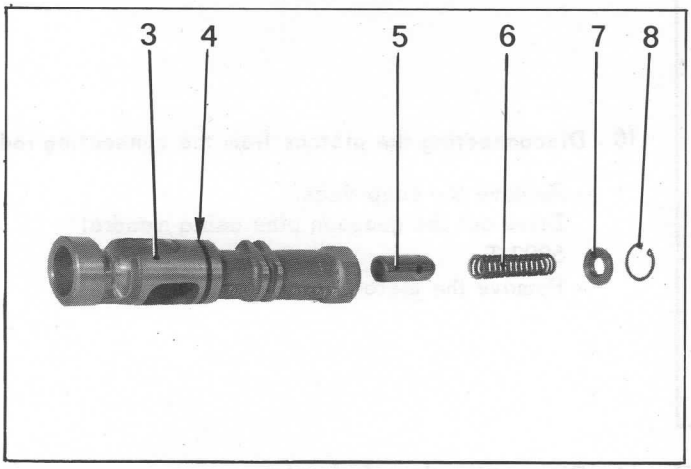
a) Smear zone "A" of oil pump cover (2) with LOCTITE Formétanch.

b) Position :
- the exterior oil pump pinion,
- cover (2),

Tighten screws (➡).

c) Fit sealing ring (1) with grease.

15 081

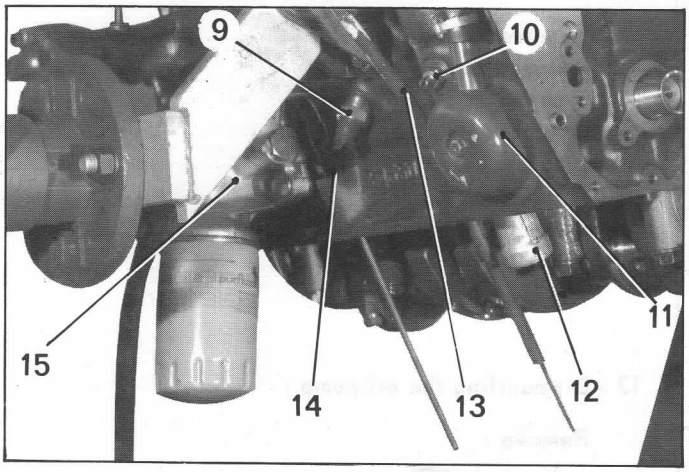


14 - Preparing the relief valve :

Fit with oil in casing (3) :
- piston (5),
- spring (6),
- washer (7),
- snap ring (8),

Position O-ring seal (4).

15 094



15 - Re-assembling the cylinder block :

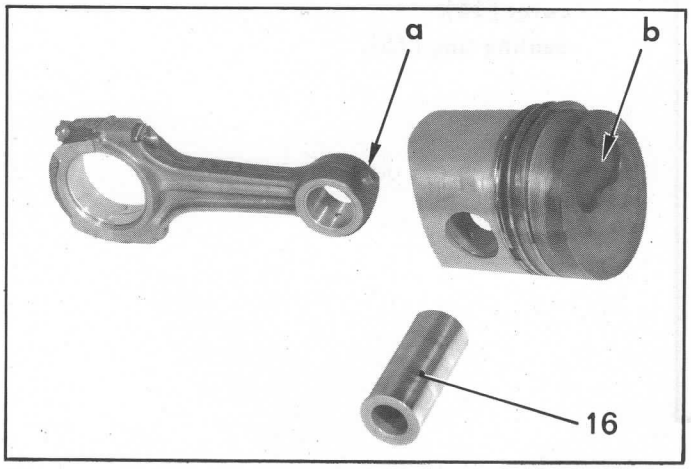
Fit :
- breather (11) equipped with its gasket,
- relief valve casing (12). Tighten the headless set screw and nut (10),
- oil gauge guides (13) :

CX 2200 : dipstick guide (13) and pneumatic gauge (14).

CX 2500 : pneumatic gauge guide (13) and dipstick guide (14),
- the oil filter cartridge,
- oil pressure-switch (9),

Tightening : 2.5 to 3 da Nm (18 to 21 1/2 ft.lb).

15 046

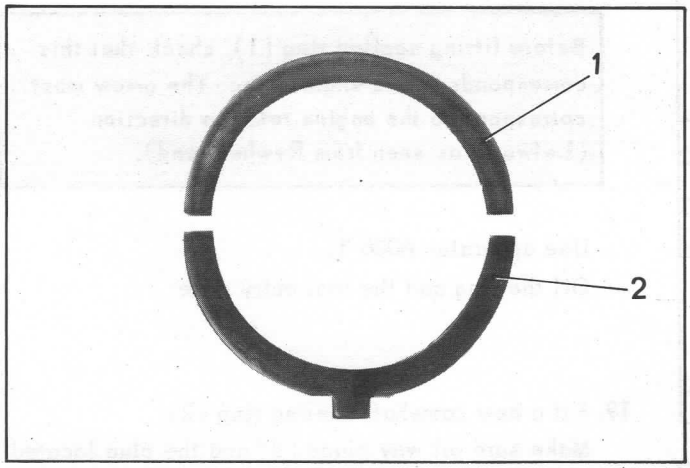


16 - Fit the pistons to the connecting rods :

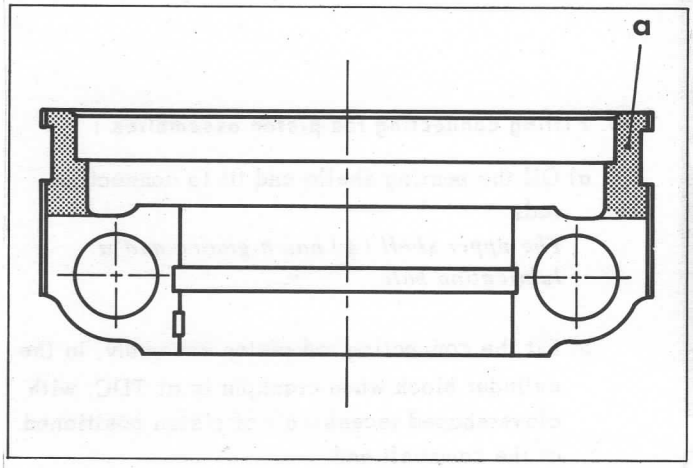
- Position the connecting rod so that lubrication hole « a » is on the side of clover-shaped recess « b » of piston.
- Fit pin (16) using mandrel 5002-T.
- Fit the snap rings.

When replacing a piston, the piston corresponding to the class of cylinder diameter must be fitted.

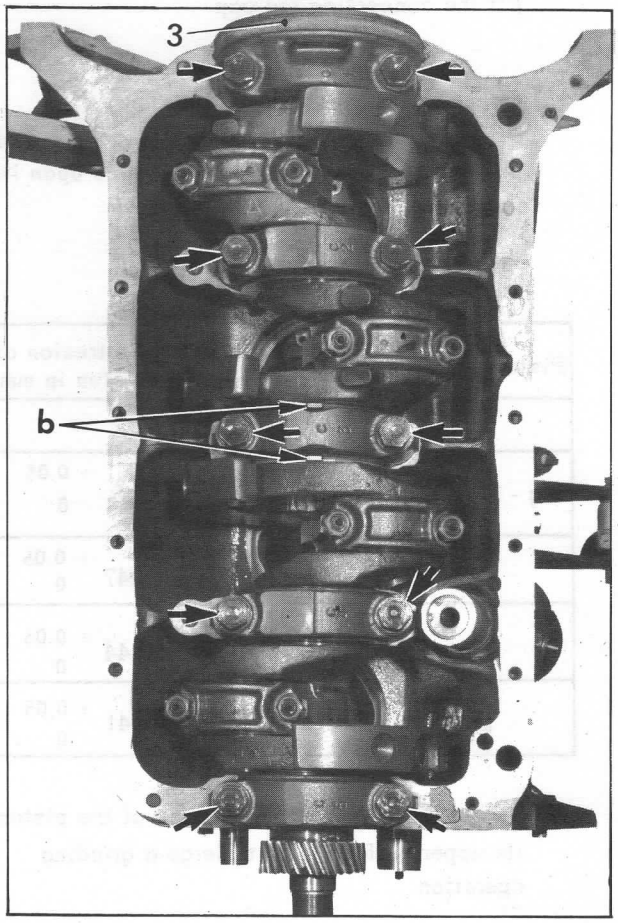
15 048



L.11-7



15044



17. Fitting the crankshaft :

a) Position :
- the bearing shells on the cylinder block and on the bearing cap (oil the shells),
- the crankshaft.

b) *Adjust the crankshaft end-float :*
Fit on either side of the central bearing upper half-rings (1) in order to obtain :
crankshaft end-float = 0.07 mm to 0.17 mm.

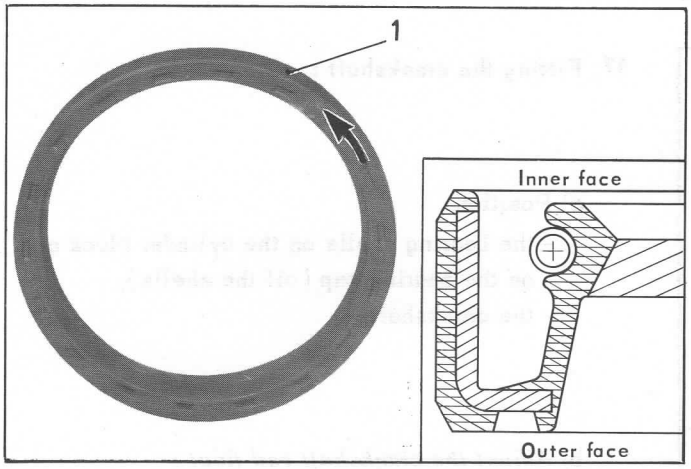
The half-rings positioned on one side of a bearing must be of the same thickness. The half-rings placed on one side of a bearing may have a different thickness to those placed on the other side.

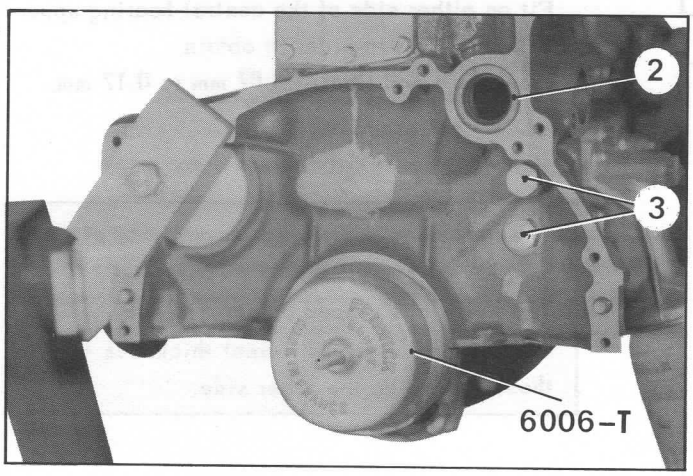
c) Fit the bearing caps.

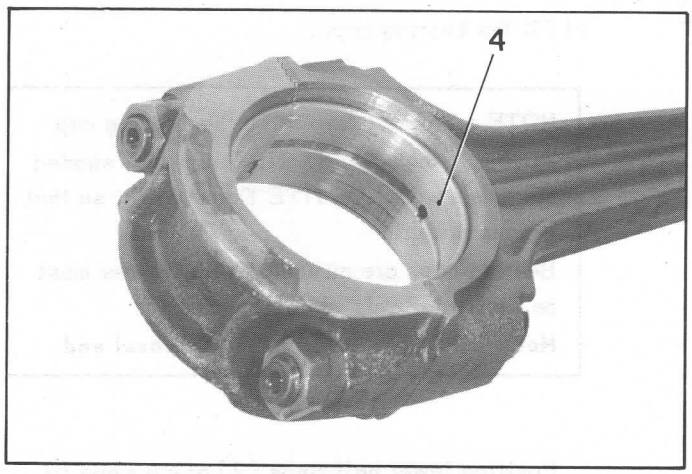
NOTE : Before positioning the bearing cap *(at the flywheel end)*, slightly smear shaded area « a » with LOCTITE Formétanch, so that it does not drip.
Bearing caps are numbered, the figures must be facing towards the camshaft.
No. 1 bearing is fitted at the flywheel end.

Position lower half-rings (2) at « b » and fit the bearing caps.
The bearing cap screws (➔) must be renewed after each dismantling.
Tightening torque for screws (➔) = 9 to 10 da Nm (65 to 72 ft.lb).

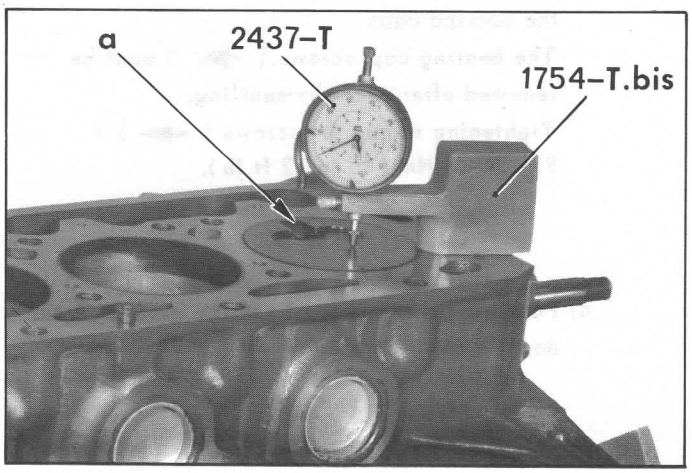
d) Position cork gasket (3) in the groove of No. 1 bearing cap *(flywheel end)*.







15 047



15 091

18. Fitting the sealing ring *(flywheel end) :*

Before fitting sealing ring (1), check that this corresponds to the engine type. The arrow must correspond to the engine rotation direction (Lefward, as seen from flywheel end).

Use apparatus 6006-T.

Oil the ring and the tool entry cone.

19. Fit a new camshaft sealing ring (2).

Make sure oil way plugs (3) and the plug, located at camshaft clamp fork end, are fitted.

20. Fitting connecting rod-piston assemblies :

a) Oil the bearing shells and fit to connecting rods.

The upper shell (4) has a groove and a lubrication hole.

b) Fit the connecting rod-piston assembly, in the cylinder block when crankpin is at TDC, with clovershaped recess « a » of piston positioned at the camshaft end.

Fit the connecting rod cap.

c) **Check the protrusion of the piston :**

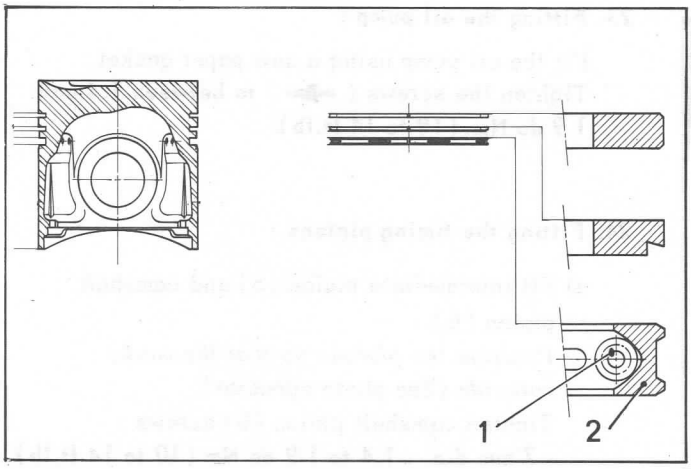
Use dial gauge 2437-T and support 1754-T bis.

The protrusion of the piston depends upon its nominal diameter.

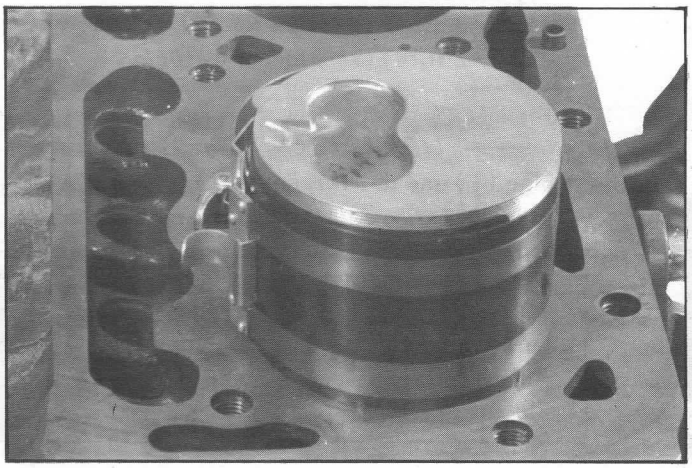
Piston marking	Nominal diameter of piston in mm		Protrusion of piston in mm
	CX 2200	CX 2500	
1 g - 2 g - 3 g	90	93	0.5 $^{+\ 0.05}_{0}$
Bg	90.25	93.25	0.47 $^{+\ 0.05}_{0}$
Cg	90.50	93.50	0.44 $^{+\ 0.05}_{0}$
Dg	90.75	93.75	0.41 $^{+\ 0.05}_{0}$

To obtain the correct protrusion of the piston, its upper surface must undergo a grinding operation.

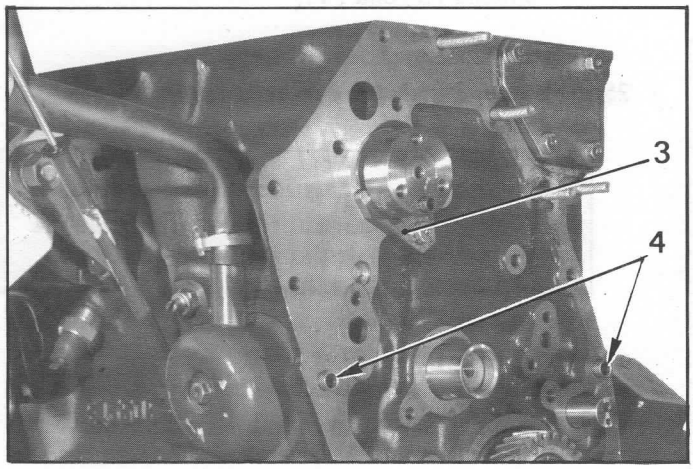
B 12-15



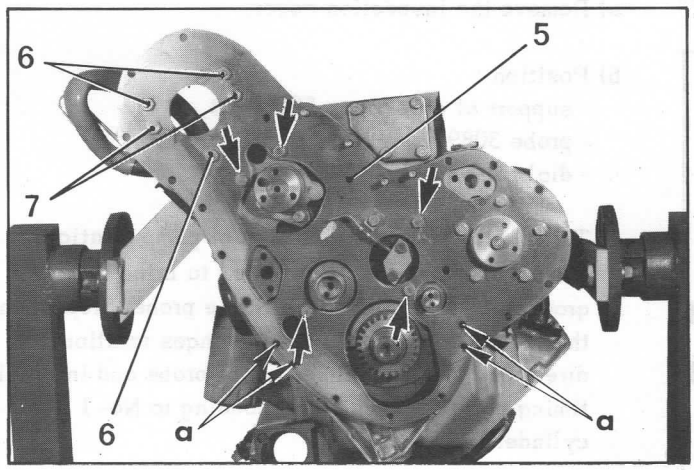
12 428



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15 092



d) Remove the connecting rod-piston assemblies :

Fit the rings on the piston ; the gap of the expander (1) must be positioned 180° in relation to the gap of the ring (2).

NOTE : A mark is engraved on one face of each ring near the gap.
When fitting, this mark must be positioned upwards.

Space the gaps in piston rings 120° apart.

Fit the connecting rod-piston assembly when the crankpin is at TDC, with the clover shaped recess in the piston head at the camshaft end.
Use a piston ring clamp.

Tighten the connecting rod nuts to 7.2 to 8 da Nm (52 to 58 ft.lb).

21. **Fitting the camshaft :**

Position the camshaft.
Engage clamp fork (3) in the groove of the camshaft.
Using a feeler gauge measure the existing clearance.
The camshaft end-float should be between 0.05 and 0.09 mm inclusive.
Select from those brackets which are supplied by the Replacement Parts Department the part which will give the required clearance.

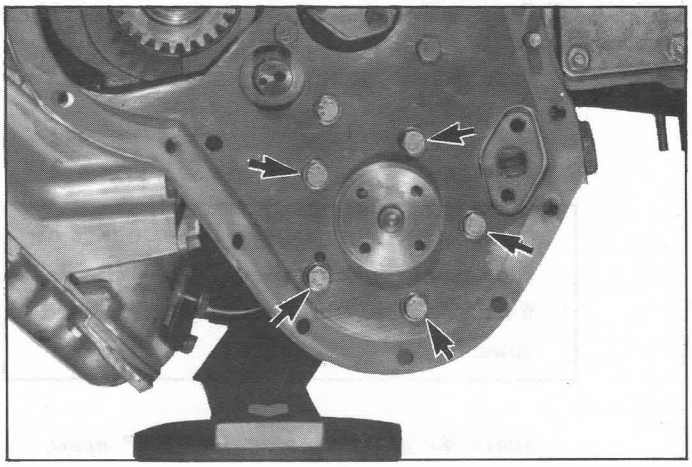
22. Make sure centring bushes (4) are fitted on the crankcase :

Fit :
- the lower crankcase, *without tightening the screws*, after smearing the bearing thrust faces and cork gasket with sealing paste.,
- front plate (5) with a new paper gasket.

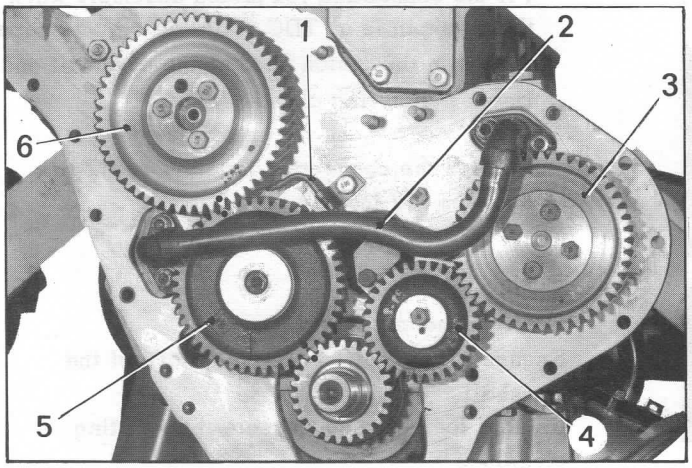
Fit 4 screws at « a » so as to align the crankcase and lower crankcase. Tighten the front plate and lower crankcase screws (➡). **Tightening torque : 1.4 to 1.9 da Nm (10 to 14 ft.lb).**
Remove the 4 screws located at « a ».

NOTE :
- Plugs (7) should be fitted with LOCTITE Frénétanch.
- Lock-nuts (6) should be fitted with LOCTITE Frenbloc.

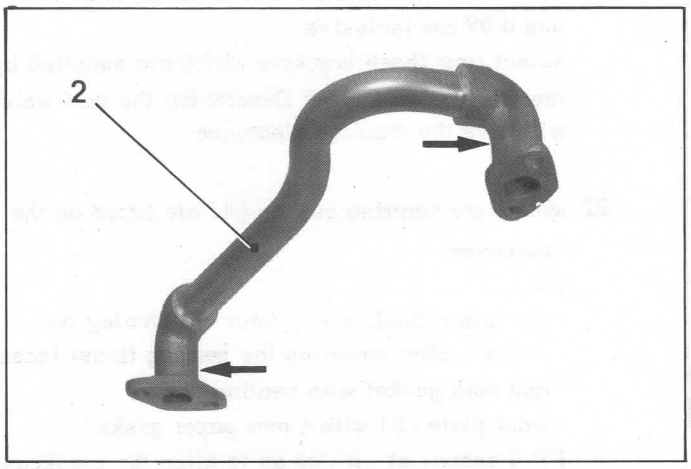
14981



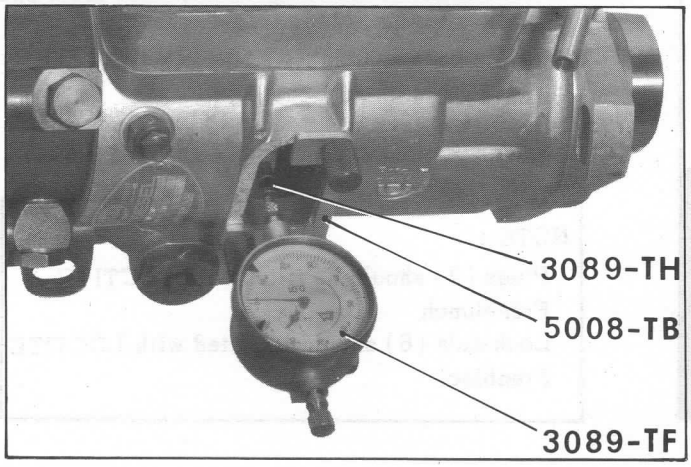
15090



77-640



15135



23. Fitting the oil pump :

Fit the oil pump using a new paper gasket. Tighten the screws (➡) **to between 1.4 and 1.9 da Nm. (10 to 14 ft.lb).**

24. Fitting the timing pinions :

a) Fit intermediate pinion (5) and camshaft pinion (6).
Position the pinions so that the marks coincide (See photo opposite).
Tighten camshaft pinion (6) screws :
- **7 mm dia. : 1.4 to 1.9 da Nm (10 to 14 ft.lb)** *(plain washer)*,
- **8 mm dia. : 3 to 3.4 da Nm (21 1/2 to 24 1/2 ft.lb)** *(shouldered washer)*.

b) Fit :
(⟶ 11/1977) « CX 2200 » : lubrication pipe (1) and delivery pipe (2) *(paper gaskets)*
(11/1977 ⟶ All Types) : the delivery pipe.

Two calibrated holes (➡) drilled in new delivery pipe (2) permit the pinions lubrication. This new pipe is not interchangeable with the old one.

- pinions (3) and (4).

25. Fitting and timing the injection pump :

The Replacement Parts Department supplies pumps fillet with anti-corrosion fluid. Drain the pump before putting it into service.

A - ROTO-DIESEL pump.

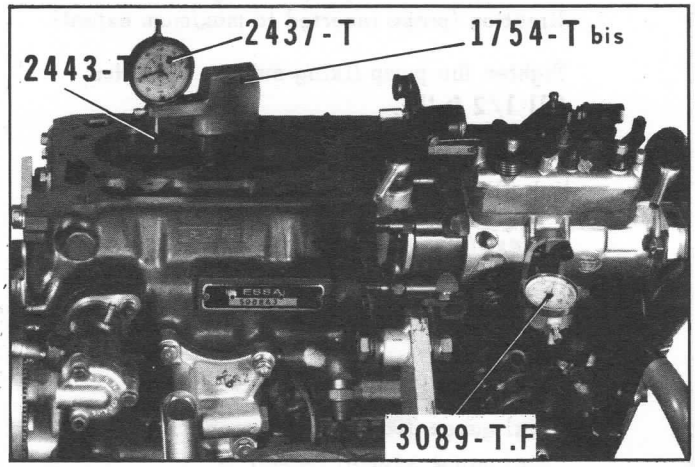
Find internal timing point of pump :

a) Remove the inspection cover.

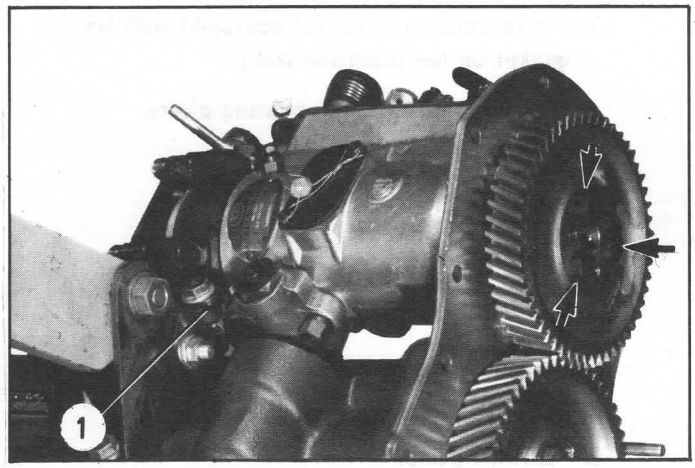
b) Position :
- support of dial gauge 5008-T.B,
- probe 3089-T.H,
- dial gauge 3089-T.F.

c) Turn the rotor in the direction of pump rotation (arrow on manufacturer's plate) to bring the « V » groove of setting in line with the probe. Stop when the needle in the dial gauge changes rotation direction (maximum insertion of probe and internal timing point of pump corresponding to No- 1 cylinder).

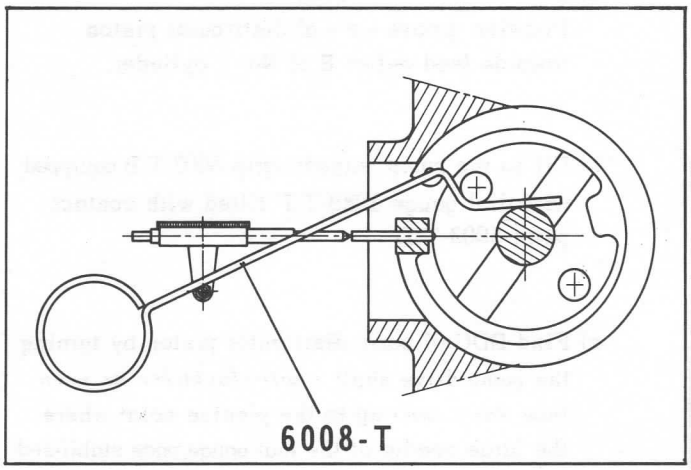
15 139



15 138



L 17-1



Find the initial timing point of engine :

d) Check that the timing marks are aligned, which corresponds *to compression stroke of No. 1 cylinder.*

e) Place support 1754-T bis fitted with dial gauge 2437-T and extension 2443-T on the cylinder, block with contact piece of the dial gauge bearing against the piston of No. 1 cylinder (flywheel end). Find piston TDC.

f) Turn back about one quarter of a turn and bring **No. 1 piston to 24° advance initial timing point i.e. :**
- *CX 2200 :* **4.68 mm before TDC,**
- *CX 2500 :* **5.12 mm before TDC.**

Fitting and timing the injection pump :

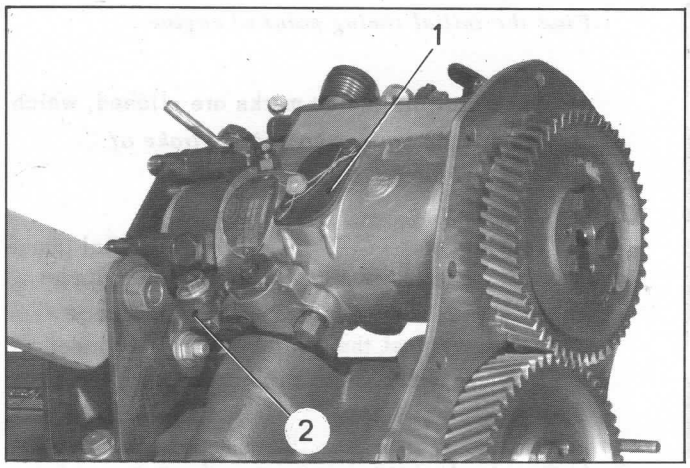
g) Position the pump fitted with a new gasket on the front plate of engine ; position in centre of slots.
Tighten nuts without locking them (spacer plates).
Fit connecting strip (1) between the rear pump support and the engine mounting (hand-tighten screws).
Check that the pump is set at the internal timing point.

h) Fit the pump pinion.
Tighten screws (➔) : 2.2 to 2.5 da Nm (16 to 18 ft.lb).

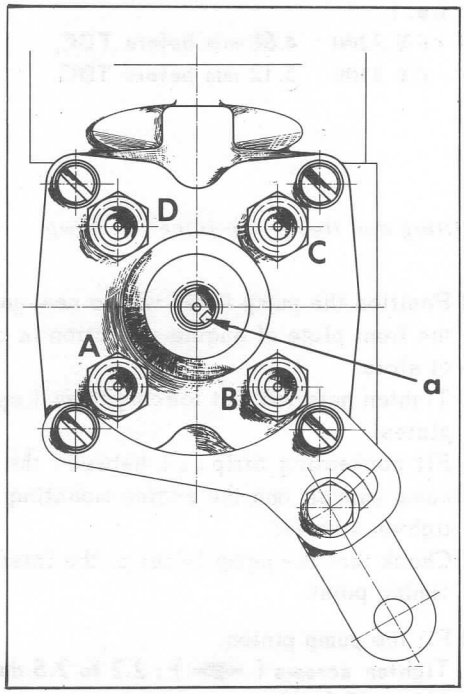
i) Rotate the engine in the opposite direction of normal engine rotation to lower the piston by 7 mm.
Place play take-up rod 6008-T in the injection pump.
Turn the engine in the normal direction of rotation and bring it to initial timing point i.e. :
- *CX 2200 :* **4.68 mm before TDC,**
- *CX 2500 :* **5.12 mm before TDC.**

Supplement No. 1 to Manual 818-3 (RECONDITIONING) (CORR)

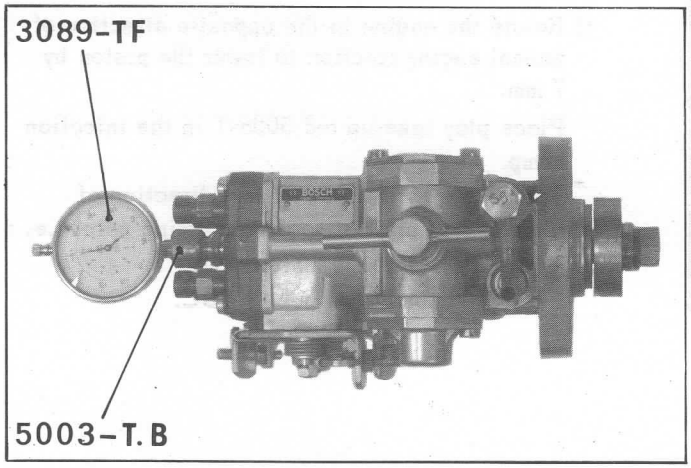
15138



♦ B 17-1



♦ 12107



j) Turn the pump towards the engine until the needle of the dial gauge changes rotation direction (probe inserted to maximum extent).

Tighten the pump fixing nuts to **3 da Nm (21 1/2 ft.lb).**

Tighten the fixing screws of rear support link (2).

During tightening, the needle of the pump dial gauge should not move.

k) Remove :
- take-up rod 6008-T,
- dial gauge 3089-T.F and probe 3089-T.H,
- dial gauge support 5008-T.B,
- support 1754-T a and dial gauge 2437-T.

l) Fit inspection cover (1) equipped with its gasket on the injection pump.

Seal the screws using sealing pliers 5008-T.D.

B - BOSCH pump.

a) *Remove the centre plug :*

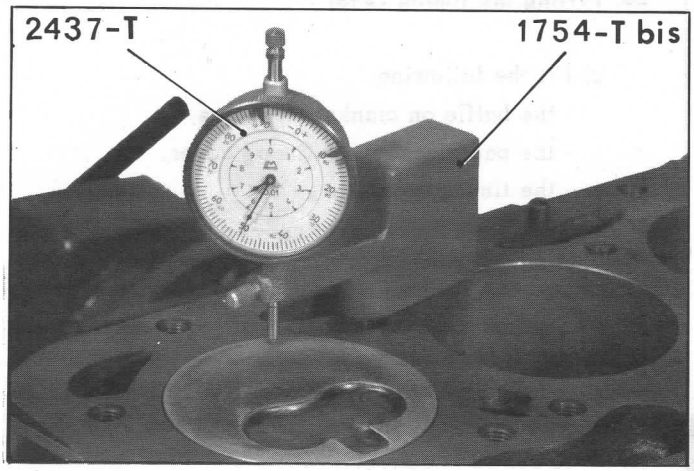
Position groove « a » of distributor piston towards feed outlet **B** of No. 1 cylinder.

b) Fit to the pump : support-grip 5003-T.B equipped with dial gauge 3089-T.F fitted with contact point 5003-T.D.

c) Find BDC of pump distributor piston by turning the pump drive shaft *(anti-clockwise as seen from drive end)* up to the precise point where the large needle of the dial gauge, once stabilized, starts moving.

Set the zero mark of the dial in line with the large needle.

12514

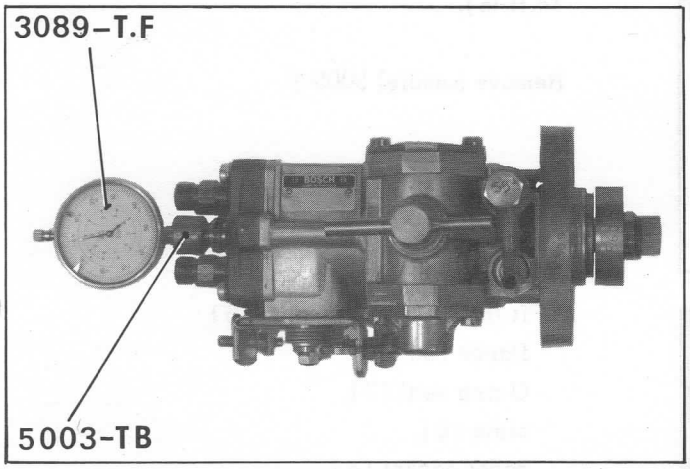


d) Bring piston of No. 1 cylinder *(flywheel end)* near TDC by turning the crankshaft in engine direction of rotation *(anti-clockwise, as seen from the flywheel)*.
Check the alignment of the timing marks, which corresponds to No. 1 cylinder *compression stroke*.

e) Place support 1754-T bis fitted with dial gauge 2437-T on the block cylinder top face, with the dial gauge contact point resting on No. 1 cylinder top face *(flywheel end)* and find piston TDC.

f) At the precise moment when the dial gauge needle changes its direction of rotation, set zero mark on dial in line with the large needle and note short needle position.

12107

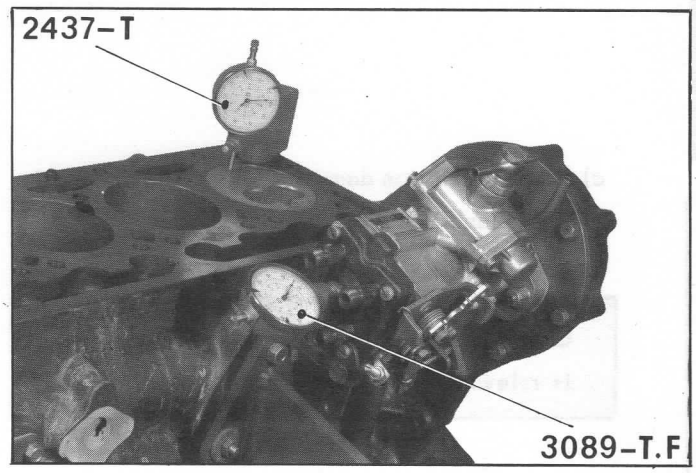


g) Turn back about a quarter turn, then bring **No. 1 piston to the 12° advance initial timing point, i.e. : 1.19 mm before TDC.**

h) Offer up the pump fitted with a new gasket and position as follows :
- half-way of the slotted holes length, approx. *(when the drive pinion does not easily fit to the pump shaft hub)*,
- fully against the end of the slotted holes, towards the engine *(when the drive pinion fits easily to the pump shaft hub)*.

Tighten pump fixing nuts without fully tightening them.
Fit the pump drive pinion.
Tighten the fixing screws to **1.8 da Nm (13 ft.lb).**

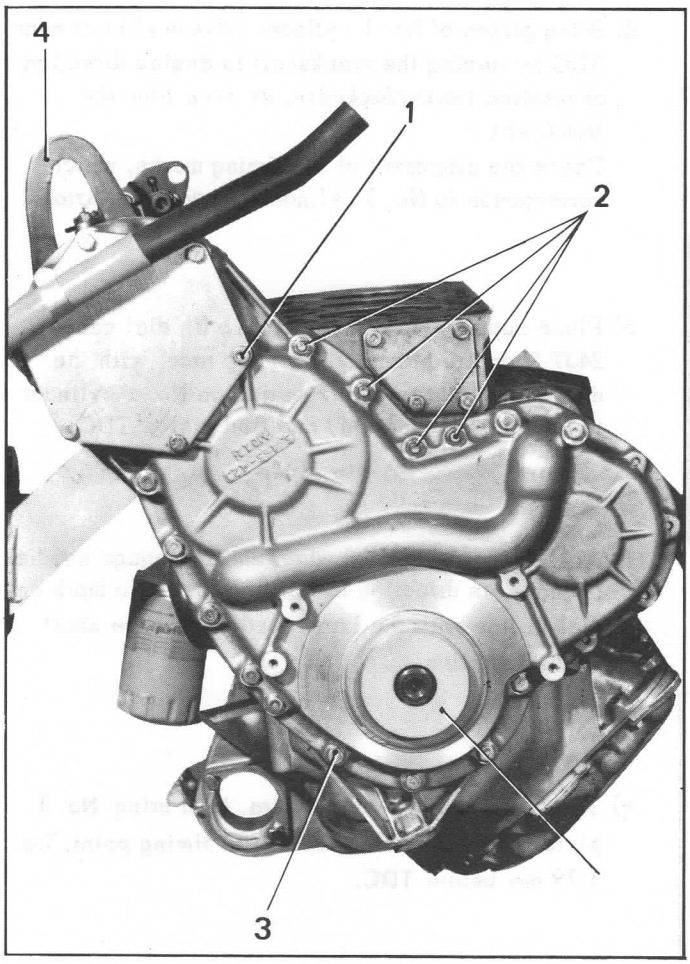
12513



i) Bring the needle of dial gauge 3089-T.F placed, on pump to **0.45 ± 0.01 mm** by swivelling the pump casing inwards.
Tighten the pump fixing nuts.
Tightening torque = 2.4 to 2.6 da Nm (17 1/2 to 19 ft.lb).

j) Remove the supports and dial gauges.
Fit the pump plug.
Tightening torque = 4 to 6 da Nm (29 to 43 1/2 ft.lb).

15 184



26. Fitting the timing cover :

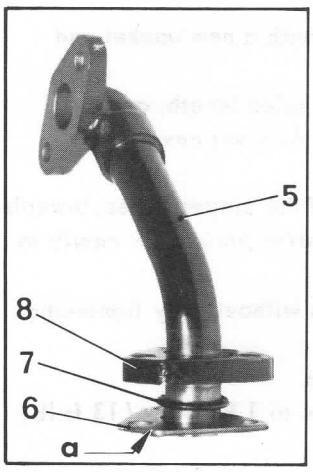
a) Fit the following :
- the baffle on crankshaft pinion,
- the paper gasket for timing cover,
- the timing cover,
- the serrated washers under nuts (2),
- the copper washer under screw (1),
- the contact washer under screw (3).

Fit hooking bracket (4) for sling.
Position timing cover, using mandrel 5005-T to centre it correctly.

Tighten fixing screws and nuts for timing cover **to between 1.4 and 1.9 da Nm (10 to 14 ft.lb).**

Remove mandrel 5005-T.

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14 980

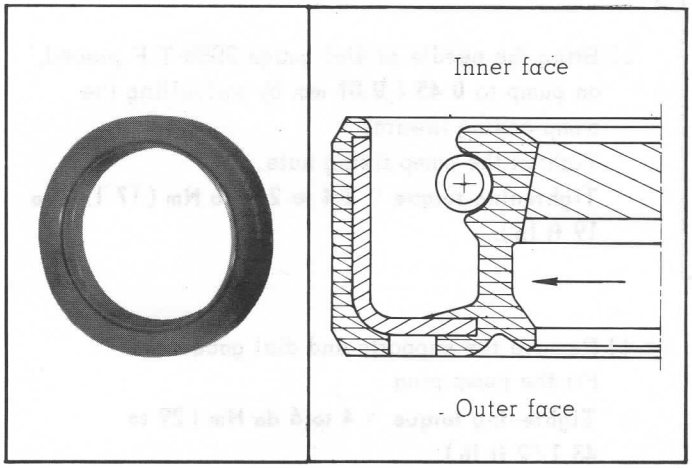


L 11-6

b) Fit the suction pipe :
- Fit the following to pipe (5) :
  - flange (8),
  - O-ring seal (7),
  - plate (6),
  - paper gasket (a).

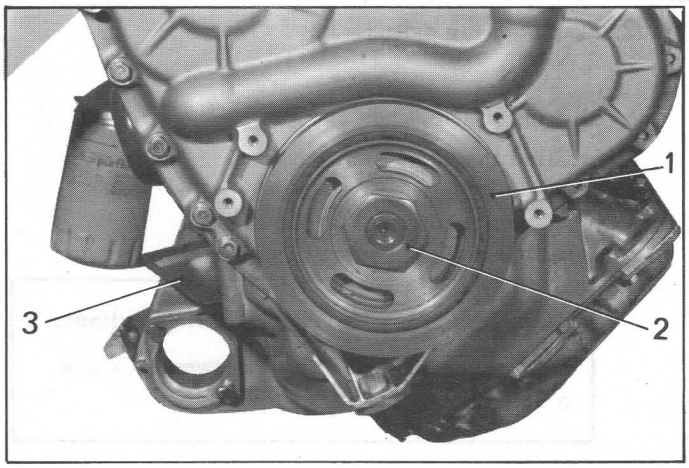
- Position the suction pipe, tighten screws (➡).

15 176



c) Fit the vibration damper sealing ring :
(Use mandrel 5004-T).

Check that the direction shown by the arrow is relevant to the engine direction of rotation.



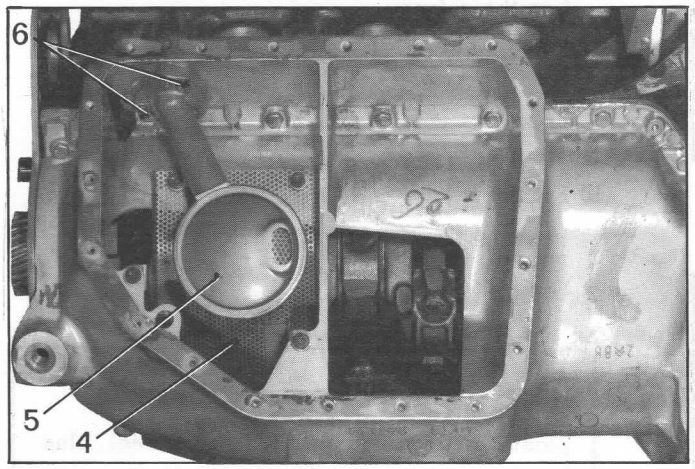
27. Fitting the vibration damper :

Fit damper (1).

Tightening torque for nut (2) = 25 da Nm (180 ft.lb).

Fit shield (3).

Fit the damper cover.

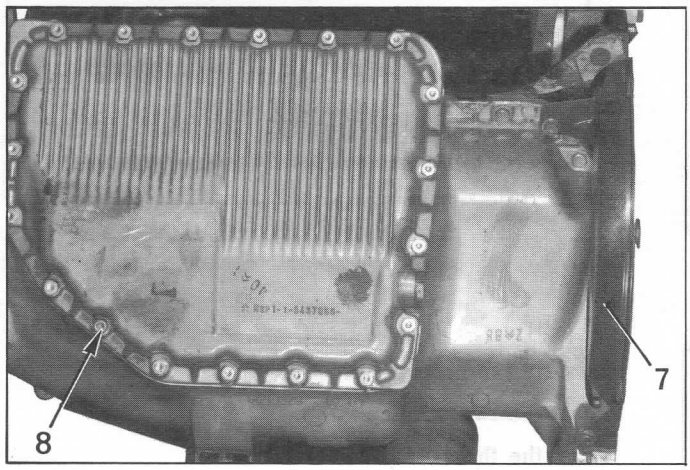


28. Fitting the oil strainer :

Fit anti-emulsion plate (4).

Fit strainer (5) together with its O-ring seal.

Fully tighten screws (6).

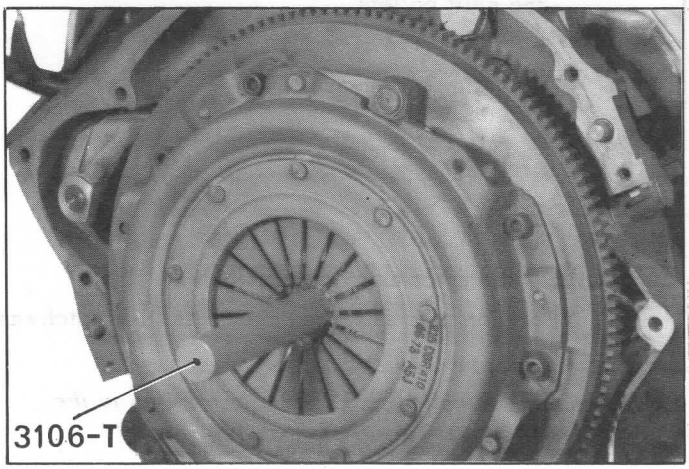


29. Fit lower crankcase cover (sump), fitted with a new gasket. Tighten the screws *(screw (8) is of the 6-point socket type).*

30. Fitting the flywheel :

Tightening torque : 9 da Nm (65 ft.lb) (use LOCTITE Frénétanch).

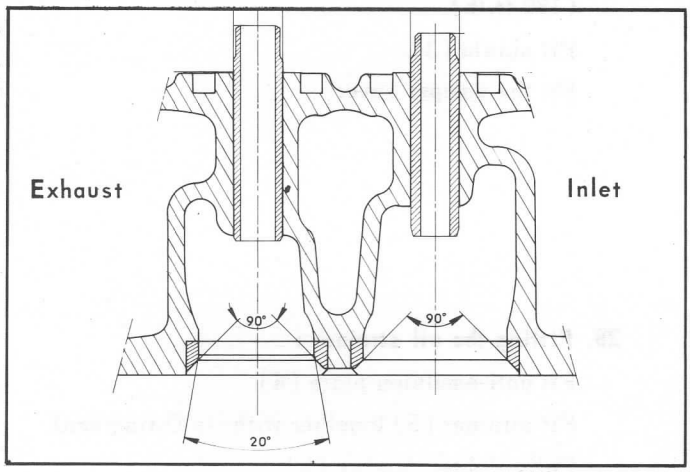
Fit plate (7).



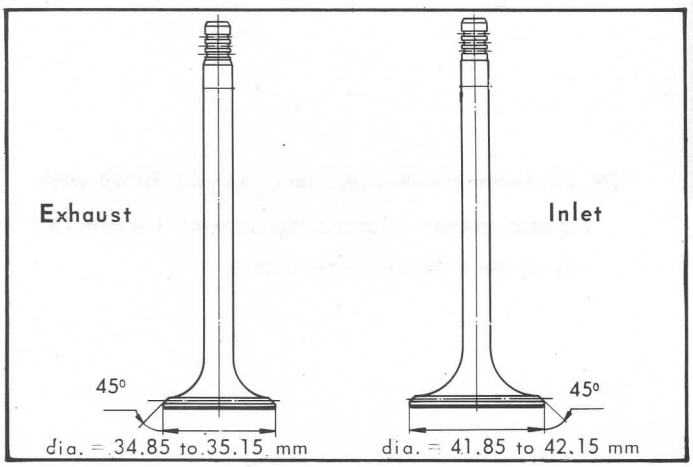
31. Fit the clutch disc and mechanism (use mandrel 3106-T).

Tightening torque : 3.5 da Nm (25 1/2 ft.lb).

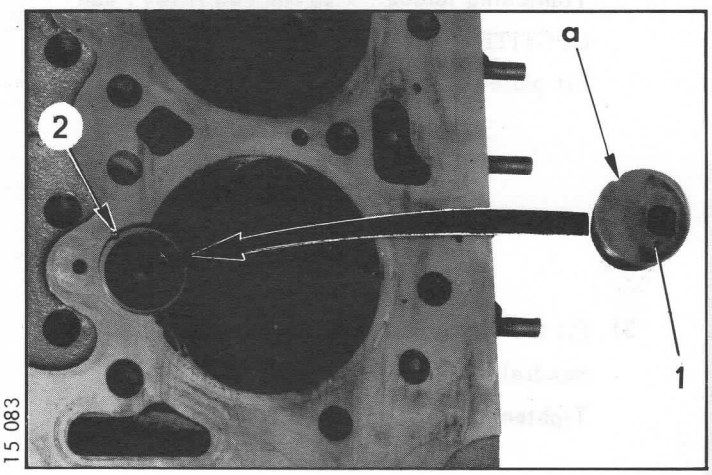
B. 11-8



B. 12-5



15 083



32. Preparing the cylinder head :

a) Grind the seatings and valves :
Grind the valve seatings.
Grind the valves.

As an indication, valve recess from cylinder head gasket line should be between 0.7 and 0.9 mm.

Lap the valves.
Thoroughly clean the cylinder head.

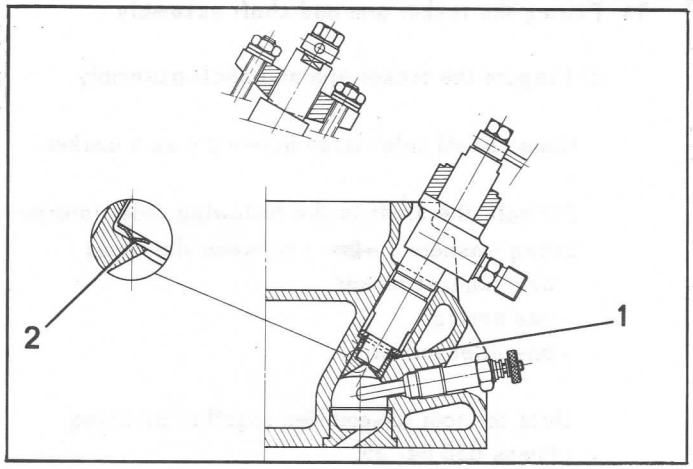
b) Fit the valves :
Position the valves with their oil-seals.

NOTE : To fit the valve oil-seals use the plastic fitting head sold with each seal, plus the VSIT tool *(FLOQUET reference)*.
To make the fitting easier, smear the seal and the fitting head with grease. When a seal is worn or incorrectly fitted, it must be renewed.
Never re-use a seal previously fitted.

Fit :
- the thrust washer,
- the two springs,
- the thrust cup,
- the split collets.

Use spring compressor 4024-T.

c) Fit the precombustion chambers.
Position precombustion chambers (1), notch « a » facing pin (2).
Protrusion $= 0 \begin{smallmatrix} +0.03 \\ 0 \end{smallmatrix}$ *mm in relation to the cylinder head joint face.*

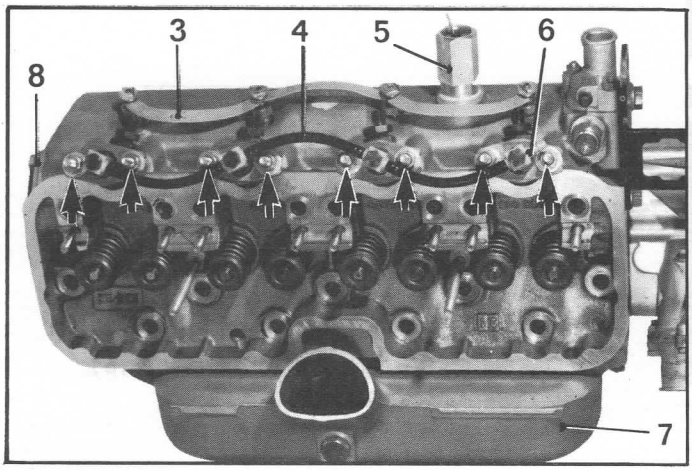


d) Fit the injectors.

Fit to each injector, in succession :
- a wavy washer (2),
- a ring seal (1).

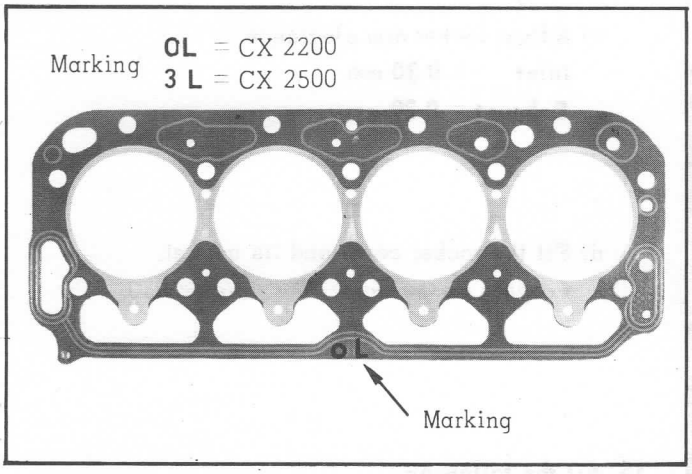
Engage the assembly in the cylinder head and fit clamp (6).
Do not tighten nuts (➔).

Fit overflow return piping (4) without tightening the unions screws.



e) Fit the following :

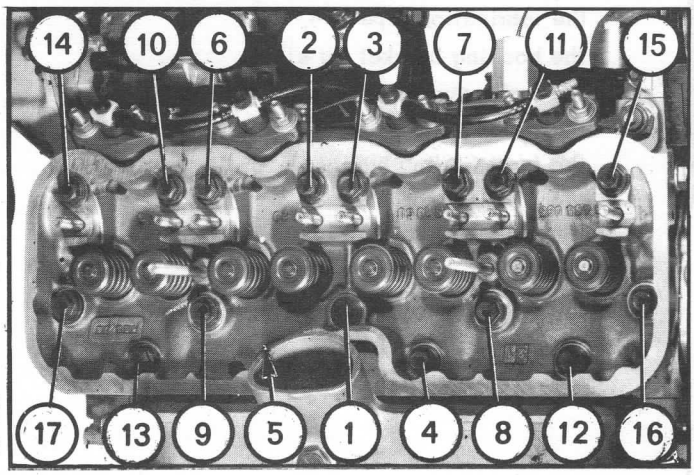
- inlet manifold (7) and the exhaust manifold,
- the heater plugs,
  Tightening torque = 2.5 to 3 da Nm (18 to 2 1/2 ft.lb).
- thermostatic sensor (5),
  Tightening torque = 4 to 5 da Nm (29 to 36 ft.lb) *(fit with LOCTITE Formétanch),*
- the coolant duct and the closing plate (8).



33. Fitting the cylinder head :

a) Fit the tappets.

b) Check presence of OL (CX 2200) or 3 L (CX 2500) marking on cylinder head gasket. Oil both faces of cylinder head gasket with linseed oil.



c) Fit the cylinder head.

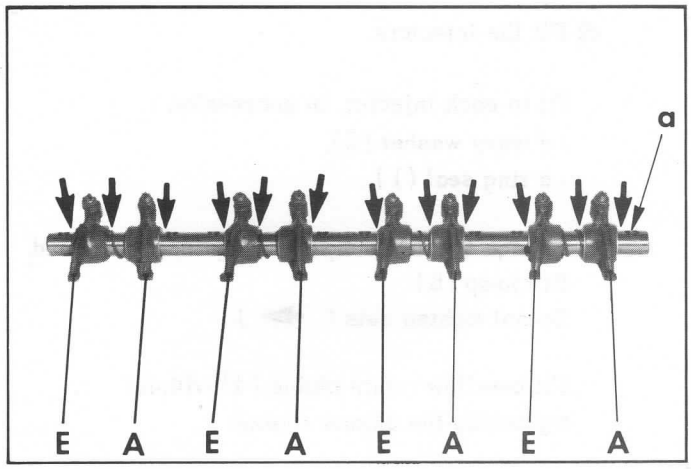
Fit a plain washer under screw heads.

Pre-tightening = 5.5 da Nm (39 1/2 ft.lb).

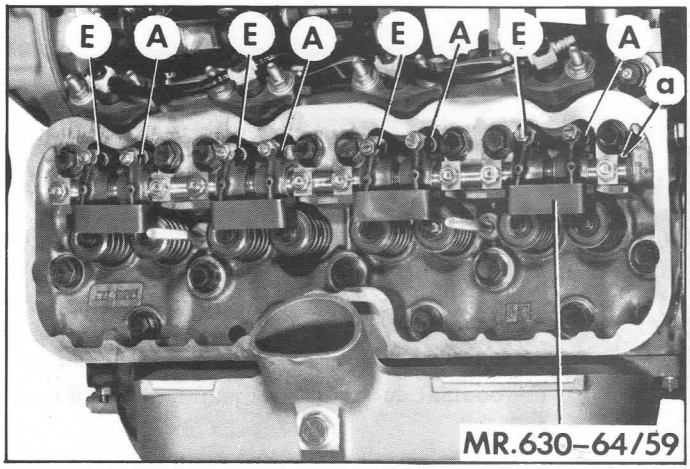
Final tightening = 10 da Nm (72 ft.lb).

Supplement No. 1 to Manual 818-3 (RECONDITIONING) (CORR)

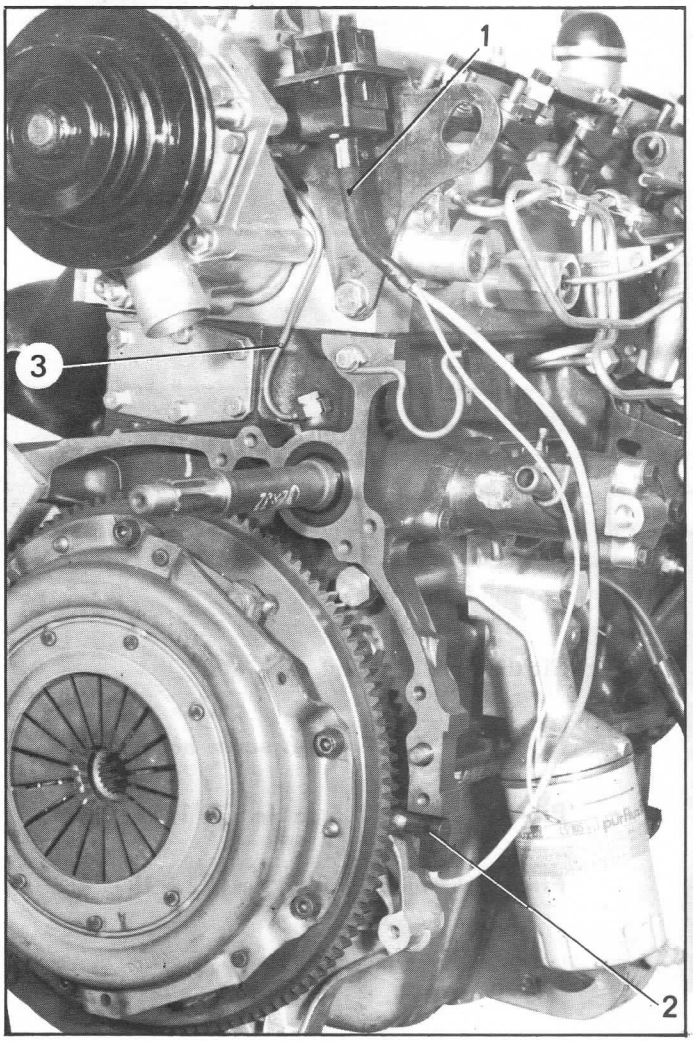
15 077



15 177



15 179



34. Fitting the rocker arm and shaft assembly :

a) Prepare the rocker arm and shaft assembly.

Consider oil inlet large hole « a » as a marker.

Fit onto the shaft, in the following order, interpolating washers (➡) between the items :
- one exhaust rocker,
- one spring,
- one inlet rocker.

Hold the four assemblies together by using clamps 630-64/ 59.

b) Fit the rocker arm and shaft assembly.

Fit the rocker pushrods.

Fit the complete assembly of rocker arms and shaft, the rocker oil holes facing the valves.

Fit the U-brackets and tighten the nuts.
Tightening torque = 2.8 da Nm (20 ft.lb).
Remove clamps MR. 630-64/ 59 .

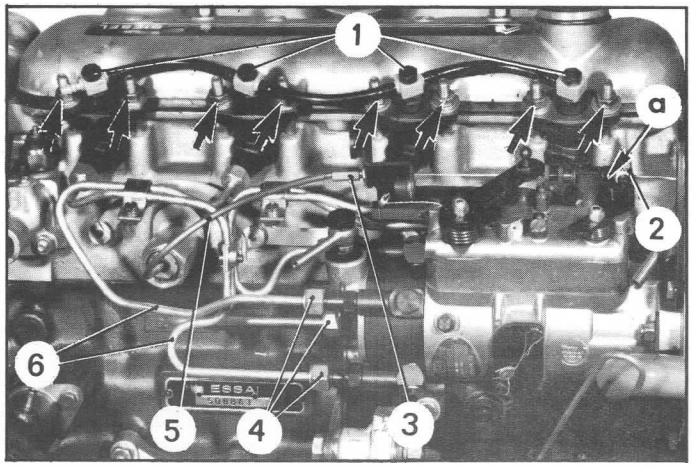
c) Adjust rocker arm clearance :
Inlet = 0.30 mm
Exhaust = 0.20 mm

d) Fit the rocker cover and its gasket.
(copper washer under the fixing nuts).

35. Fit the following :
- the lubrication pipe (3),
- the hooking bracket for sling,
- the water pump casing with its gasket,
- the water pump with its gasket,
- the fault-finding harness (1),
- the TDC sensor (2).

Connect :
- the oil pressure-switch wire,
- the thermal switch wire.

15 186



36. Connecting the fast idle cable :

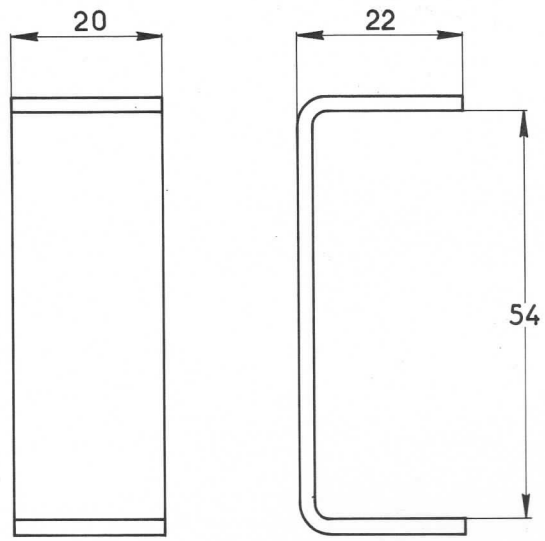
Fit sheath (5) and sheath stop (3).
Pass the cable through the fast idle stop and fit cable clamp (2).
Fully push in the cable clamp at « a » and tighten its nut, holding the cable taut.

37. Fit the injector pipe assembly :
Fit pipe assembly (6) and position the injectors so that the pipes are not stressed.
Tighten screws (➡) **to 2.2 to 2.5 da Nm (16 to 18 ft.lb).**
Tighten union-screws (1) **to 0.8 to 1 da Nm (6 to 7 ft.lb).**
Tighten supply pipe unions (4).
Tightening torque = 2.2 to 2.5 da Nm (16 to 18 ft.lb).

BOSCH pump

Do not tighten the unions at injector end (the system should be bled before starting the engine.

MR 630_64/59



Full length approximately 96

Material : Sheet metal thickness 2 - Quantity : 4

MANUAL N° 818-3

FOURTH SECTION

Manual 818-3

ELECTRICAL SYSTEM

LIST OF OPERATIONS (ELECTRICAL SYSTEM) IN THE FOURTH SECTION OF MANUAL 818-3

"CX Diesel" Vehicles

	Operation number	DESCRIPTION
		ELECTRICAL SYSTEM
	MA. Di. 510-00	Arrangement of the electrical installation *(All CX Diesel vehicles (⟶ 9/1976)*
	MA. Di. 510-00 a	Arrangement of the electrical installation *(All CX Diesel vehicles (9/1976 ⟶)*
♦	MA. Di. 510-00 b	Arrangement of the electrical installation *(All CX Diesel vehicles (5/1978 ⟶ 7/1979)*
♦	MA. Di. 510-00 c	Arrangement of the electrical installation *(All CX Diesel vehicles (7/1979 ⟶ 7/1980)*
♦	MA. Di. 524-00	Characteristics of the electrical controls
	MA. Di. 530-00	Characteristics of the electrical components
	MA. Di. 530-0	Checking the electrical components : I- Checking the alternator output II- Checking the voltage regulator III- Checking the starter motor IV- Checking the heater plugs
♦	MA. Di. 533-00	Characteristics and checks of a starter motor.

Supplement No. 1 to Manual 818-3 (ELECTRICAL SYSTEM) (CORR)

Supplement No. 1 to Manual 818-3 (ELECTRICAL SYSTEM) (CORR)

All CX Diesel vehicles (⟶ 9/1976)

ARRANGEMENT OF THE ELECTRICAL INSTALLATION

The diagrams shown are those of the Diesel Estate vehicle. The front harness is identical with that of the Saloon. The rear harness of the Diesel vehicle is identical with that of the Petrol vehicle with the addition of a supply lead for the low fuel level warning lamp.

1. CIRCUIT DIAGRAM.

a) **Special feature** : The various circuits are presented in a functional way, therefore, where a unit is connected to several circuits, its various sections are shown in « exploded » form on different vertical grid lines.

b) **Method of identification** : Identification marks are divided into three sections :
- figures which identify components (and not leads),
- letters LG, TB, AR etc ... identifying wiring harnesses,
- other letters (Bc, F, Gr, FN, Bl ...) identifying the colour of the extremity of the insulating sleeve.

NOTE : For the last group of identification marks, four cases may occur :
- *coloured sleeve on a lead the colour of which is irrelevant :*
  marks on diagrams : Bc, Bl, Ve, Gr, ...
- *no sleeve on a lead the colour of which serves as identification mark :*
  marks on diagram : F, Gr, F.Ve, F.Bc ....
- *coloured sleeve on a lead the colour of which serves as identification mark as well :*
  marks on diagram : FN-Bl, F.Ve-Bc ....
- *unidentified lead :* its position cannot give rise to any confusion.

IMPORTANT : Identification marks for components and wiring harnesses are arbitrary : they have been chosen for the sole purpose of facilitating the use of the diagrams.
The colour of the sleeves and the leads are the only identification marks actually used on the leads making up the electric system of the vehicle.

2. WIRING DIAGRAM.

This is a schematic diagram of the components as they are fitted on the vehicle.
It indicates the layout of the leads, and the approximate location of the components.
The methods of identification is the same as for the circuit diagram.

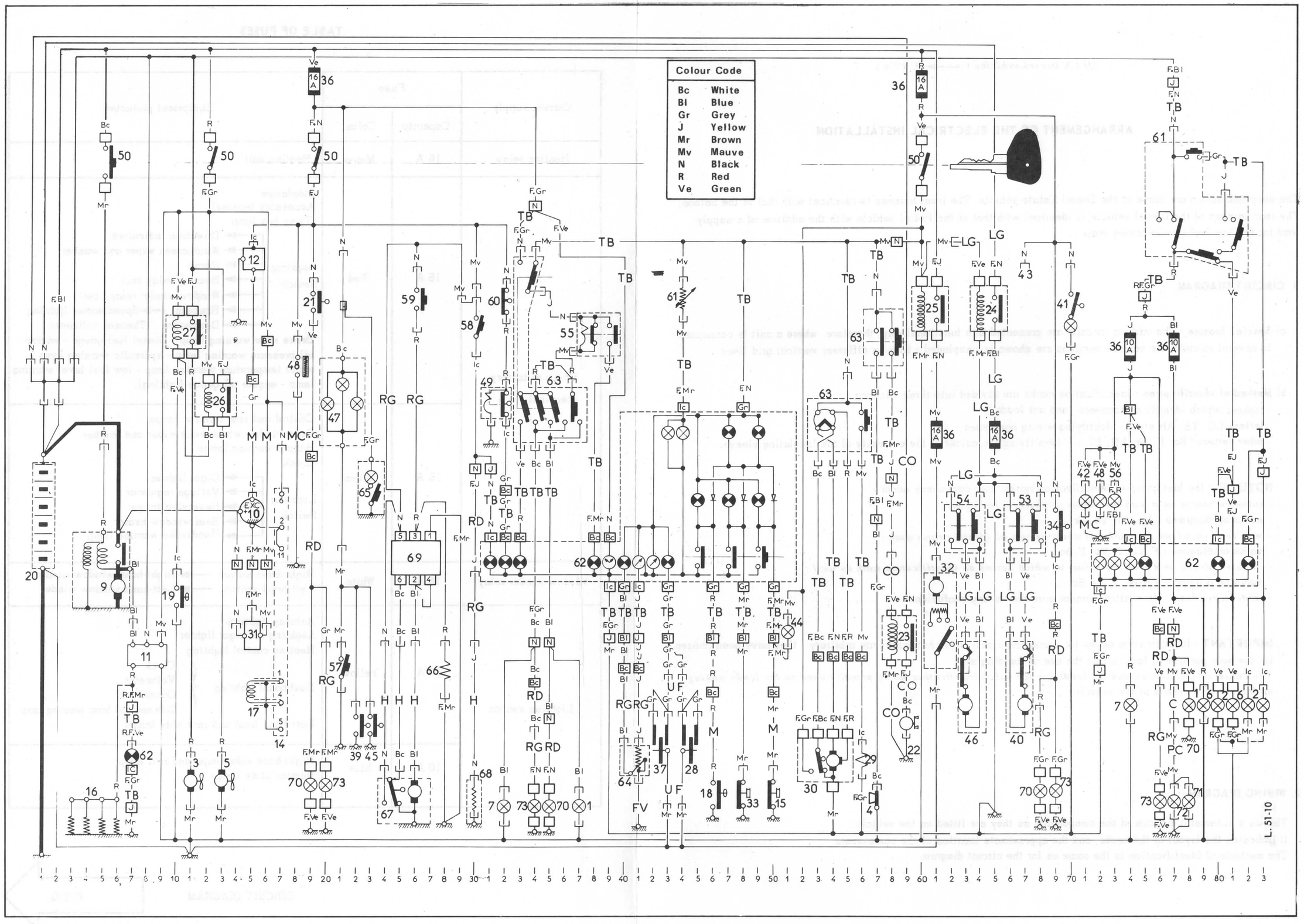
TABLE OF FUSES

Current supply	Fuse		Equipment protected
	Capacity	Colour	
Heating relay	16 A	Mauve	Heating unit
Positive battery terminal « + »	16 A	Red	Stoplamps Accessory terminal Glove box lamp Lighting Switch → Direction indicators → Windscreen wiper and washer → Horns → Heating relay coil → Window winder relay (coil) → Rheostat → Speedometer lighting → Dashboard : (Thermal voltmeter - Brake wear warning lamp - Diesel fuel gauge - engine oil pressure warning lamp - hydraulic warning lamp - water temperature warning lamp - low fuel level warning lamp - engine oil gauge lighting).
	16 A	Green	Central and rear interior lamps Rear window windscreen wiper and washer Hazard warning lamps Clock Lighting Switch → Cigar lighter → Voltage regulator → Reversing lamps → Rear window heater → Handbrake warning lamp
Window winder relay	16 A	White	Right-hand switch → Right-hand window winder Left-hand switch → Left-hand window winder
Lighting switch	10 A	Yellow	Ashtray lighting Lighting for cigar lighter Heating control lighting Dashboard lighting → Clock, Voltmeter, Odometers, Side and tail lamp warning lamp Left-hand front and rear side lamps
	10 A	Blue	Right-hand side lamps and rear lamps Number plate lamps

CIRCUIT DIAGRAM P.T.O.

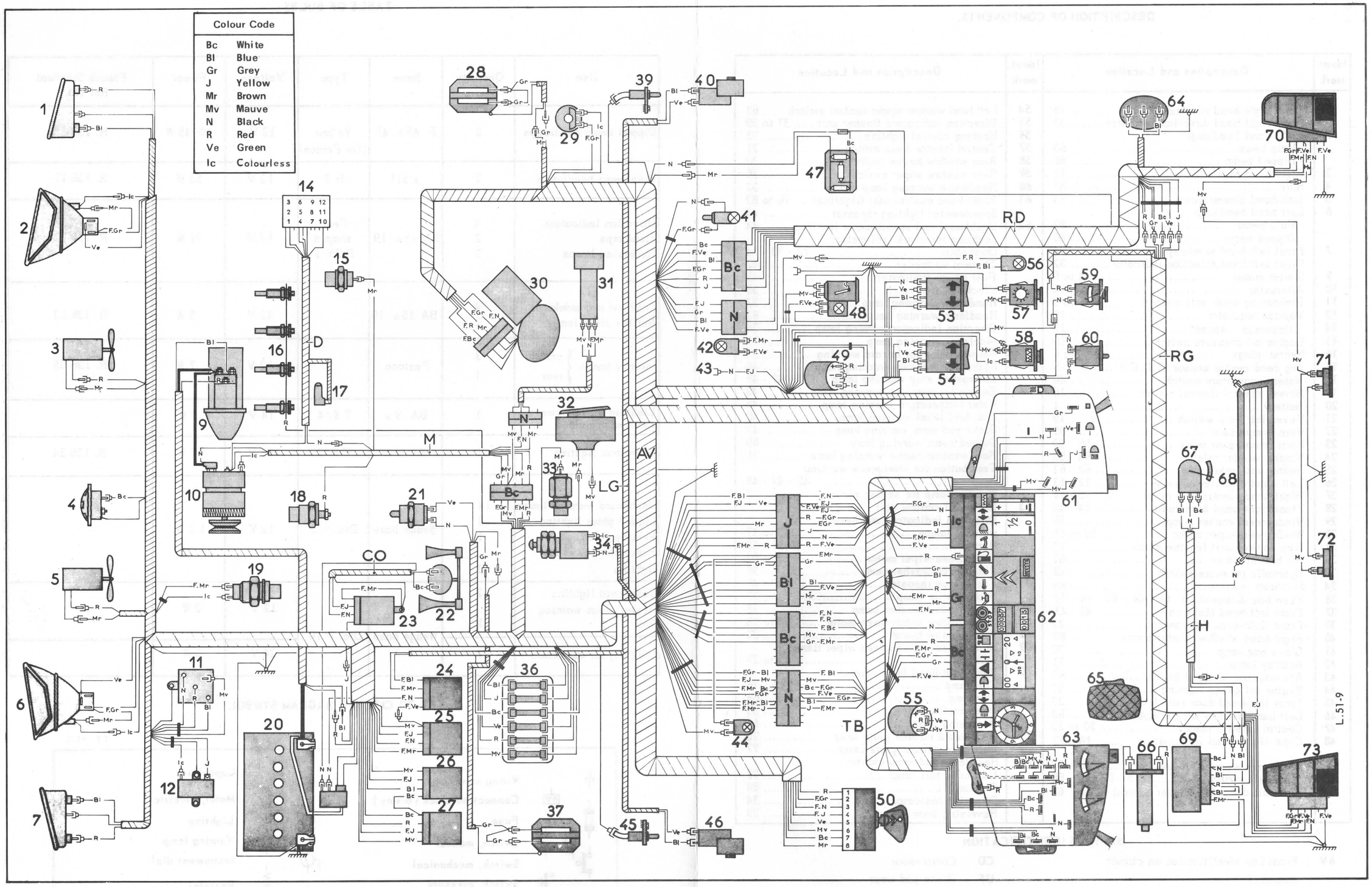
CIRCUIT DIAGRAM

Diesel Estate French market vehicles (1/1976 → 9/1976)



CIRCUIT DIAGRAM

Diesel Estate French market vehicles (1/1976 ⟶ 9/1976)



DESCRIPTION OF COMPONENTS.

Ident. mark	Description and Location	Ident. mark	Description and Location
1	Front right-hand sidelamp 78	54	Left-hand window winder control switch 63
	Front right-hand direction indicator 37	55	Direction indicators flasher unit ..... 37 to 39
2	Right-hand headlamp :	56	Heating control lighting 73
	- Main beam 83	57	Central interior lamp switch 21
	- Dipped beam 81	58	Rear window heater switch 30
3	Right-hand blower motor 11	59	Rear window wiper switch 26
4	Horn 57	60	Handbrake warning lamp switch 32
5	Left-hand blower motor 13	61	Right-hand control unit (lighting) .... 76 to 82
6	Left-hand headlamp :		Speedometer lighting rheostat 44
	- Main beam 82	62	Dashboard and speedometer lighting 44
	- Dipped beam 80		Lighting for clock, voltmeter,
7	Front left-hand sidelamp 74		Odometers ..... 72 - 73 - 74
	Front left-hand direction indicator 32		Thermal voltmeter 42
9	Starter motor ..... 4 to 6		Fuel gauge (indicator) 41
10	Alternator 15		Clock 39
11	Preheating timer unit control ..... 7 to 9		Handbrake warning lamp 32
12	Voltage regulator 15		Headlamp warning lamp 82
14	"Diagnosis " socket 17		Direction indicator warning lamp 38
15	Engine oil pressure switch 50		Sidelamp warning lamp 75
16	Heater plugs ..... 3 to 6		Warning lamp for hazard warning 33
17	Top dead centre sensor (T.D.C.) 16		Hydraulic pressure warning lamp 48
18	Water temperature switch 46		Emergency stop warning lamp ..... 47 - 49
19	Blower control thermal switch 10		Engine oil pressure warning lamp 49
20	Battery 1		Water temperature warning lamp 45
21	Reversing lamp switch 19		Low fuel level warning lamp 40
22	Horn compressor 59		Brake pad wear warning lamp 43
23	Horn compressor relay ..... 58 - 59		Dipped beam warning lamp 80
24	Window winder relay ..... 64 - 65		Rear window heater warning lamp 31
25	Heater unit relay ..... 60 - 61		Test button for emergency warning lamp ..... 45 - 47 - 49
26	Left-hand electric-fan relay ..... 12 - 13		Warning lamp for heater plugs 7
27	Right-hand electric-fan relay ..... 10 - 11	63	Left-hand control unit :
28	Front right-hand brake unit ..... 44 - 45		Direction indicators and hazard warning lamps ..... 33 to 37
29	Windscreen washer pump 56		Horns ..... 57 - 58
30	Windscreen-wiper motor ..... 52 to 55		Windscreen-wiper motor ..... 53 to 55
31	Stop control unit (engine stop) 15		Windscreen-washer pump 56
32	Air blower motor 61	64	Fuel gauge rheostat ..... 40 - 41
33	Hydraulic pressure switch 48	65	Rear interior lamp 23
34	Stoplamp switch 69	66	Rear window washer pump 28
36	Fuse box (6 fuses). 19 - 60 - 61 - 65 - 74 - 77	67	Rear window windscreen motor ..... 24 to 26
37	Front left-hand brake unit ..... 42 - 43	68	Rear window heater 30
39	Front right-hand door switch 22	69	Rear window windscreen-wiper timer unit ..... 25 to 27
40	Right-hand window winder motor 67	70	Rear right-hand lamp cluster :
41	Glove box lamp 70		Tail lamp 78
42	Ashtray lamp 71		Stoplamp 68
43	Accessories terminal (radio) 67		Direction indicator 35
44	Engine oil gauge lighting 51		Reversing lamp 19
45	Front left-hand door switch 23	71	Right-hand number plate lamp 78
46	Left-hand window winder motor 63	72	Left-hand number plate lamp 77
47	Central interior lamp ..... 20 to 22	73	Rear left-hand lamp cluster :
48	Cigar lighter and illumination ..... 18 - 72		Left-hand tail lamp 76
49	Handbrake warning flasher unit ..... 31 - 32		Stoplamp 69
50	Anti-theft switch ..... 5 - 12 - 19 - 60		Direction indicator 34
53	Right-hand window winder control switch 67		Reversing lamp 20

HARNESS IDENTIFICATION

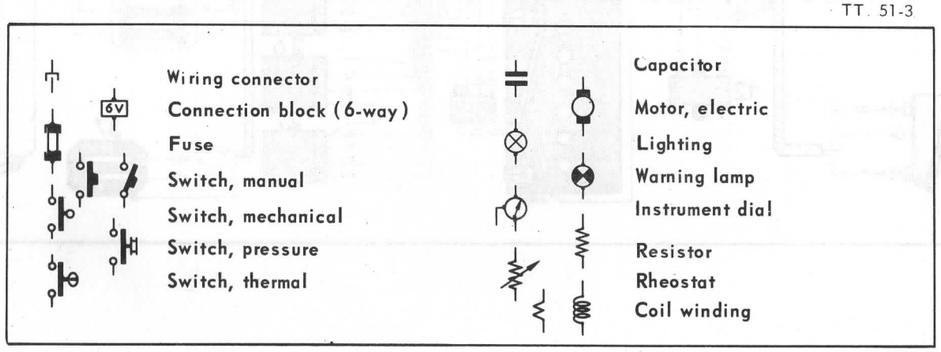
AV : Front (no identification on circuit diagram)
RD : Rear, RH
RG : Rear, LH
M : Engine
D : Fault finding (diagnosis)
CO : Compressor
UF : Brake pad wear
LG : Window winder
H : Tailgate
FV : Flying lead
TB : Instrument panel

TABLE OF BULBS

Use	Quantity	Base	Type	Voltage	Power	French Standard Ref. No.
Dipped beam headlamps	2	P. 45 t. 41	Yellow (for France)	12 V	40/45 W	R. 136-15
Main beam headlamps	2	x 511	H 2	12 V	55 W	R. 136-17
Direction indicators Stoplamps Reversing lamps	4 2 2	BA. 15s/19	Pear-shaped P 25/1	12 V	21 W	R. 136-12
Front and rear sidelamps Number plate lamps	4 2	BA. 15s/19		12 V	5 W	R. 136-13
Interior lamps { central rear	3 1	Festoon		12 V	7 W	R. 136-05
Lighting for tachometer and speedometer	1	BA. 9 s	T 8/4	14 V	4 W	
Glove box lighting	1	BA. 9 s	T 8/2	12 V	2 W	R. 136-34
Dashboard warning lamps Cigar lighter lighting Ashtray lighting Pneumatic oil gauge lighting	14 1 1 1	Wedge base	Dia. = 5	12 V	1.2 W	
Dashboard lighting Heater plugs warning lamp	2 1	Wedge base	Dia. = 10	12 V	2 W	
Lighting for odometers	1			24 V	3 W	

KEY TO CIRCUIT DIAGRAM SYMBOL

TT. 51-3



Supplement No. 1 to Manual 818-3 (ELECTRICAL SYSTEM) (ADD)

ALL CX DIESEL VEHICLES (9/1976 ⟶)

ARRANGEMENT OF THE ELECTRICAL INSTALLATION

The diagrams overleaf are relevant to « Pallas » Saloon vehicles since September 1977.
These electrical system diagrams include the additional accessories fitted to 1977 models (from September 1976) i.e. lighting for anti-theft device, outside rear-view mirror on left-hand front door and sun-roof (optional). Moreover, the cigar lighter is no longer cut-off by the combined « Anti-theft-Ignition and preheating-Starter » switch.
The CX Estate electrical system diagrams are identical with those on Saloon vehicles, with regard to the front section of the vehicle. For rear section, refer to operation MA.Di. 510-00 :

PRESENTATION OF THE DIAGRAMS

CIRCUIT DIAGRAM

The various circuits are presented in a functional way, for repair purposes, therefore, where a unit is connected to several circuits, its various sections are shown in « exploded » form on different vertical grid lines.

WIRING DIAGRAM

This is a schematic diagram of the components as they are fitted on the vehicle. It indicates the layout of the leads, and the approximate location of the components. Harness inner connections, out of reach, are not indicated. The method of identification is the same as for the circuit diagram.

DESCRIPTION OF THE PARTS

It makes it possible to quickly refer from one diagram to another one.
Ref. = Identification No. of component on wiring diagram.
Position = Figure of vertical line numbered along lower edge on circuit diagram.

IDENTIFICATION OF LEADS AND HARNESSES

Besides identification on diagrams, leads can be identified as follows :
Lead colour - e.g. : Yellow lead (Fj)
Sleeve colour or identification mark on lead at connection : e.g. : Green (Ve)
The leads can be identified by their location on a connection box between harnesses, or on a unit (e.g. relay). The unidentified leads cannot give rise to any confusion.
Harnesses are identified by one or several capital letters, located approximately on middle part of lead length on circuit diagram. Unidentified leads on circuit diagram are relevant to front main harness or to harnesses or flying leads which cannot give rise to any confusion.

DESCRIPTION OF WIRING HARNESSES

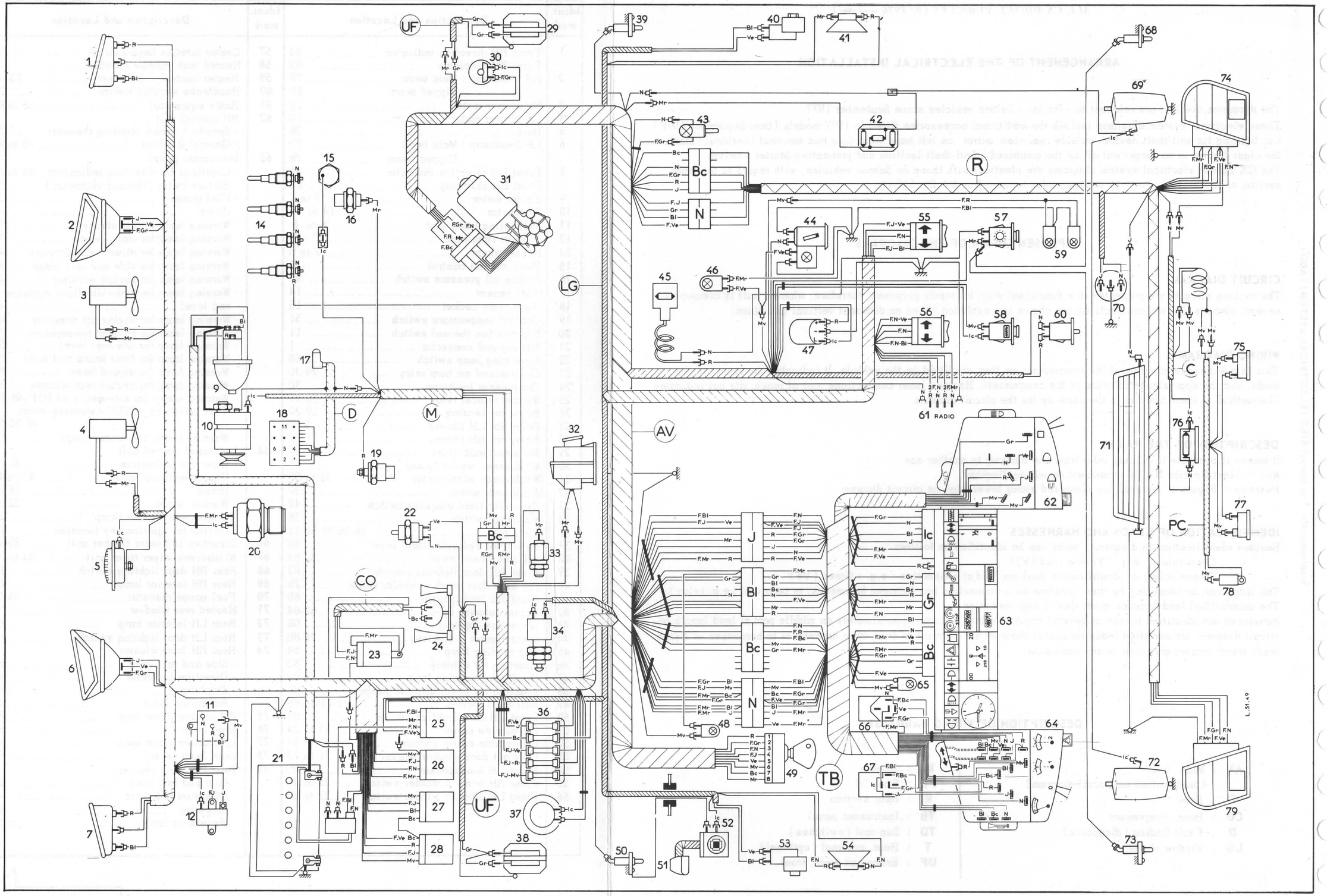
AV : Main, front (unidentified on circuit diagram)
C : Boot
CO : Horn, compressor
D : Fault finding (diagnosis)
LG : Window winder
M : Engine
PC : Boot lid
R : Rear section
TB : Instrument panel
TO : Sun-roof (switches)
T : Rear, sun-roof (optional)
UF : Brake pad wear, front

DESCRIPTION OF COMPONENTS

Ident. mark	Description and Location	Ident. mark	Description and Location
1	Front RH direction indicator 44	57	Centre interior lamp switch 63
	Front RH sidelamp 83	58	Heated rear window switch 75
2	RH headlamp : Main beam 79	59	Heater control + lightings 85-86
	Dipped beam 80	60	Handbrake warning switch 77
3	RH blower motor 12	61	Radio equipment ..... 58 to 60
4	LH blower motor 10	62	RH control unit :
5	Horn 28		- Speedo.+ tacho. lighting rheostat 53
6	LH headlamp : Main beam 77		- General lighting ..... 78 to 82
	Dipped beam 78	63	Instrument panel :
7	Front LH direction indicator 41		- Lightings for direction indicators 84 to 86
	Front LH sidelamp 82		- Battery meter (thermal voltmeter) 55
9	Starter motor ..... 2 to 4		- Fuel gauge 56
10	Alternator ..... 14 to 17		- Clock 46
11	Preheating timer unit ..... 6 to 8		- Warning lamp for handbrake 77
12	Voltage regulator ..... 17 - 18		- Warning lamp for main beam 79
14	Heater plugs ..... 2 to 5		- Warning lamp for direction indicators 40
15	Pump cut-out control 13		- Warning lamp for side and tail lamps 83
16	Engine oil pressure switch 47		- Warning lamp for hazard warning 45
17	TDC sensor 14		- Warning lamp for hydraulic fluid pressure and level 49
18	Diagnostic socket 16		- Warning lamp for engine oil pressure 47
19	Coolant temperature switch 51		- Warning lamp for coolant temperature 51
20	Electric fan thermal switch 11		- Warning lamp for low fuel level 57
21	Battery and connector 1		- Warning lamp for front brake pad wear 54
22	Reversing lamp switch 68		- Warning lamp for dipped beam 81
23	Compressed air horn relay 29-30		- Warning lamp for heated rear window 76
24	Compressor for horns 30		- Warning lamps for emergency «STOP»48-50
25	Window winder relay 26-27		- Test button for «STOP» warning lamps 48-50-52
26	Relay for heating 19-20		- Warning lamps for heater plugs 6
27	Relay for LH blower 9-10	64	Left-hand control unit :
28	Relay for RH blower 11-12		- Direction indicators 41-42
29	RH brake unit, front 54-55		- Hazard warning lamps ..... 43 to 45
30	Windscreen washer pump 31		- Horns 28-29
31	Windscreen wiper motor ..... 32 to 36		- Window wiper 32-33
32	Air blower motor 20		- Windscreen washer pump 31
33	Hydraulic fluid pressure switch 49	65	Lighting for ignition key location 82
34	Stoplamp switch 38	66	Direction indicator flasher unit 39-40
36	Fuse box 20-26-38-61-82	67	Windscreen wiper timer unit .....34 to 36
37	Switch for hydraulic fluid level 50	68	Rear RH door lighting switch 65
38	LH brake unit, front 52-53	69	Rear RH interior lamp 65
39	Front RH door lighting switch 63	70	Fuel gauge rheostat 56-57
40	RH front door window winder motor 26	71	Heated rear window 75
41	Front RH loudspeaker 60	72	Rear LH interior lamp 64
42	Centre interior lamp 62-64	73	Rear LH door lighting switch 64
43	Glove-box lighting 66	74	Rear RH lamp cluster :
44	Cigar lighter + lighting 70-86		- Side and tail lamp 87
45	Map reading lamp 84		- Direction indicator 43
46	Lighting for ashtray 85		- Stoplamp 68
47	Handbrake warning lamp 76-77		- Reversing lamp 38
48	Lighting for pneumatic oil gauge 37	75	RH number plate lamp 85
49	Anti-theft switch 3-13-34-68	76	Boot lamp 61
50	Front LH door lighting switch 62	77	LH number plate lamp 84
51	LH outside mirror ..... 21 to 24	78	Boot lamp switch 61
52	LH outside mirror switch ..... 21 to 24	79	Rear LH lamp cluster :
53	LH front door window winder motor 21 to 23		- Side and tail lamp 86
54	Front LH loudspeaker 59		- Direction indicator 42
55	Front RH window winder switch .....25 to 27		- Stoplamp 67
56	Front LH window winder switch .....21 to 23		- Reversing lamp 37

P.T.O.

CIRCUIT DIAGRAM - Diesel - Saloon *(9/1977 ⟶)*



CIRCUIT DIAGRAM for CX Saloon - Diesel *(9/1977 ⟶)*

L. 51-50

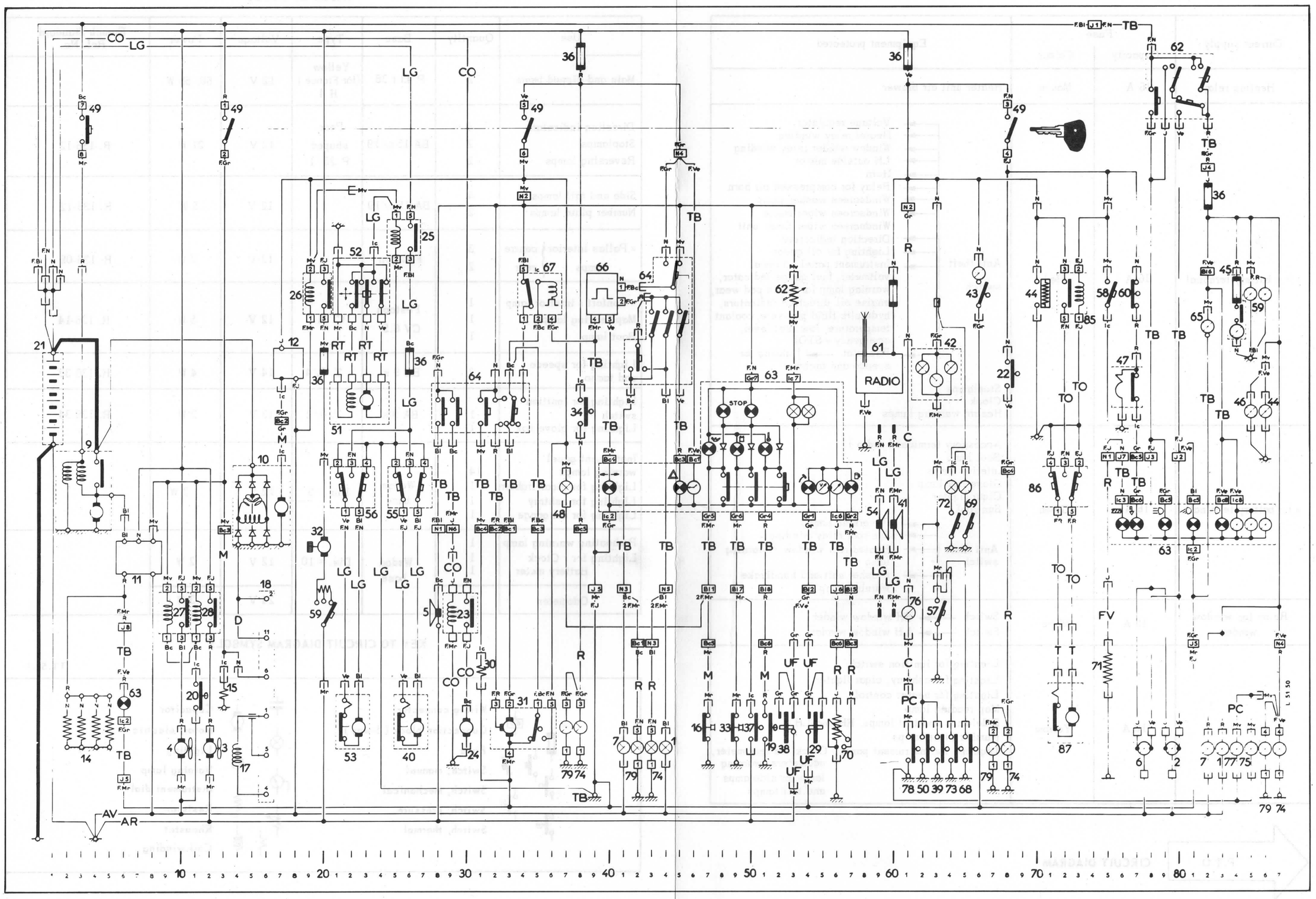


TABLE OF FUSES

Current supply	Fuse: Capacity	Fuse: Colour	Equipment protected
Heating relay	16 A	Mauve	Heater unit air blower
« + » battery terminal	16 A	Red	Voltage regulator Heater relay winding Window-winder relay winding LH outside mirror Horn Relay for compressed air horn Windscreen washer pump Windscreen wiper motor Windscreen wiper timer unit Direction indicators Lighting for oil gauge Anti-theft switch → Instrument panel (thermal voltmeter, fuel gauge indicator, warning lamp for brake pad wear, engine oil, direction indicators, hydraulic fluid pressure, coolant temperature, low fuel level, emergency « STOP » Rheostat ⟶ lighting for speedo and tacho Stoplamps Clock Hazard warning lamps
« + » battery terminal	16 A	Green	Accessory terminal (radio) Boot lamp Interior lamps Glove box lamp Cigar lighter Sun-roof Anti-theft switch → Reversing lamps Sun-roof relay winding Heated rear window + warning lamp Flasher unit and handbrake warning lamp
Relay for window winder	16 A	White	Switch ⟶ RH window winder Switch ⟶ LH window winder
	10 A	Yellow	Lighting for ignition switch Lighting for ashtray, cigar-lighter Lighting for heater control Map reading lamp Sidelamps and tail lamps, RH and LH Number plate lamps Lighting for instrument panel : Clock, battery meter, odometers, warning lamp for sidelamps and tail lamps

P.T.O.

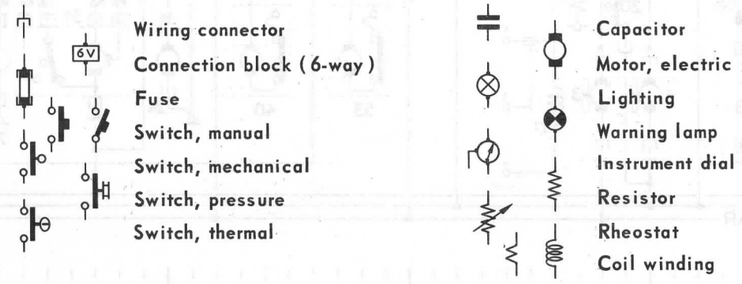
CIRCUIT DIAGRAM

TABLE OF BULBS

Use	Quantity	Base	Type	Voltage	Power	French Standard Ref. No.
Main and dipped beam	2	P 43 t 38	Yellow (for France) H 4	12 V	60/55 W	
Direction indicators Stoplamps Reversing lamps	4 2 2	BA 15s/19	Pear-shaped P 25/1	12 V	21 W	R. 136-12
Side and tail lamps Number plate lamps	4 2	BA 15s/19		12 V	5 W	R. 136-12
« Pallas interior lamps centre « Pallas interior lamps rear	3 2	Festoon		12 V	7 W	R. 136-05
« Confort » interior lamp Map reading lamp Boot lamp	1 1 1	Festoon CV 8.5	C. 11	12 V	5 W	R. 136-14
Lighting for speedo and tacho	2	BA 9 s	T. 8/4	14 V	4 W	R. 136-33
Lighting for ignition switch Lighting for glove box	1 1	BA 9 s	T. 8/2	12 V	2 W	R. 136-34
Instrument panel warning lamps Lighting for cigar-lighter Lighting for ashtray Lighting for oil gauge	14 1 1 1	Wedge base	Dia.= 5	12 V	1.2 W	
Preheating warning lamp Lighting for : Clock Battery meter	1 1 1	Wedge base	Dia. = 10	12 V	2 W	
Odometer	1			24 V	3 W	

KEY TO CIRCUIT DIAGRAM SYMBOLS

TT.51-3



ALL CX DIESEL VEHICLES (5/1978 → 7/1979)

ARRANGEMENT OF THE ELECTRICAL INSTALLATION

NOTES :

When dealing with the « sun-roof », refer to Operation MA.Di. 510-00 a.

For Estate version, refer for the rear section, to Operation MA.Di. 510-00.

Operation published together with Information Bulletin No. 80-60 MA

DESCRIPTION OF COMPONENTS

Ident. mark	Description and location	Ident. mark	Description and location
1	Front direction indicator, RH 44	56	Front loudspeaker, LH 61
	Front sidelamp, RH 74	57	Front window-winder control switch,RH 24 to 26
2	Headlamp, RH :	58	Front window-winder control switch,LH 21 to 23
	- Main beam 71	59	Heating control lighting 76-77
	- Dipped beam 72	60	Handbrake warning lamp switch 55
3	Electric cooling fan, RH 17-18	61	Radio 61-62
4	Electric cooling fan, LH 14	62	Right-hand control unit :
5	Horn 28		- Speedometer lighting rheostat 53
6	Headlamp, LH :		- General lighting ..... 69 to 73
	- Main beam 69	63	Dashboard :
	- Dipped beam 71		- Lighting for instruments ..... 75 to 77
7	Pre-heating unit ..... 5 to 7		- Thermal voltmeter 55
8	Front direction indicator, LH 41		- Fuel gauge indicator 56
9	Thermal switch for air temperature 13		- Clock 46
10	Starter motor ..... 2 to 4		Warning lamp for :
11	Alternator ..... 8 to 12		- Handbrake 55
12	Fan thermal switch 16		- Main beam 70
13	Regulator ..... 11 to 12		- Direction indicators 40
14	Fan relay 13-14		- Side and tail lamps 74
15	Battery 1		- Hazard warning 45
16	Electric cut-out control 9		- Hydraulic fluid level and pressure 49
17	Engine oil pressure switch 47		- Engine oil pressure 47
18	Heater plugs ..... 2 to 5		- Water temperature 51
19	Top Dead Centre sensor 10		- Low fuel level in tank 57
20	« Diagnosis » socket 12		- Front brake pad wear 54
21	Water temperature switch 51		- Dipped beam 72
22	Reversing lamp switch 66		- Heated rear window 57
23	Horn compressor relay 29-30		- Emergency STOP ..... 48 - 51
24	Horn compressor 30		Check button for warning lamps 48-50-52
25	Window winder relay 26-27		Warning lamps for heater plugs 6
26	Heater unit relay 19-20	64	Left-hand control unit :
27	Electric fan relay 14-15		- Direction indicators 41-42
28	Electric fan relay 16-17		- Hazard warning lamps ..... 43 to 45
29	Front brake unit, RH 54-55		- Horns 28-29
30	Windscreen washer pump 31		- Windscreen wiper 32-33
31	Windscreen wiper motor ..... 32 to 36		- Windscreen washer pump 31
32	Air blower 20	65	Ignition keyhole lamp *(Pallas)* 73
33	Hydraulic pressure switch 49	66	Direction indicator flasher unit 39-40
34	Stoplamp switch 38	67	Windscreen wiper timer ..... 32 to 34
36	Fuse box 20-26-32-69-73	68	Rear door switch, RH *(Pallas)* 66
37	Hydraulic fluid level switch 50	70	Fuel gauge rheostat 56-57
38	Front brake unit, LH 52-53	71	Heated rear window 58
39	Front right-hand door switch 64	73	Rear door switch, LH *(Pallas)* 65
40	Front window winder motor, RH 26	74	Rear lamp cluster, RH :
41	Front loudspeaker, RH 62		- Tail lamp 78
42	Glove locker lamp 67		- Direction indicator 43
43	Interior lamp switch 63		- Stoplamp 38
44	Heated rear window switch 58		- Reversing lamp 60
45	Directional interior lamp *(Pallas)* 66	75	Number plate lamp, RH 76
46	Centre interior lamp ..... 63 to 65	76	Boot lamp 68
47	Cigar lighter and illumination 60-76	77	Number plate lamp, LH 75
48	Socket-Map reading lamp *(Pallas)* 75	78	Boot lamp switch 68
49	Handbrake warning flasher unit 55-56	79	Rear lamp cluster, LH :
50	Hydraulic gauge lamp 37		- Tail lamp 77
51	Anti-theft switch ..... 3 - 13 - 32-59		- Direction indicator 42
52	Front left-hand door switch 63		- Stoplamp 37
53	Exterior rear view mirror,LH *(Pallas)* 21 to 24		- Reversing lamp 59
54	Rear-view mirror switch, *(Pallas)* 21 to 24		
55	Front window winder motor, LH ..... 21 - 22		

WIRING DIAGRAM P.T.O.

Colour Code	
Bc	White
Bl	Blue
Gr	Grey
J	Yellow
Mr	Brown
Mv	Mauve
N	Black
R	Red
Ve	Green
Ic	Colourless

TABLE OF FUSES

Current supply	Fuse: Capacity	Fuse: Colour	Equipment protected
Heating relay	16 A	Mauve	Heater unit air blower
Positive battery terminal « + »	16 A	Red	Anti-theft switch → Voltage regulator Heating relay coil Window winder relay coil Exterior rear-view mirror, LH Horns Compressor horn relay Windscreen washer pump Windscreen wiper motor Windscreen wiper timer Lighting for oil gauge Instrument panel (voltmeter, fuel gauge indicator, warning lamps for : brake pad wear, engine oil, direction indicators, hydraulic system, water temperature, low fuel level in tank, emergency STOP Rheostat → Lamps for speedometer and tachometer Stoplamps Clock Hazard warning device and warning lamp
Positive battery terminal « + »	16 A	Green	Radio accessories terminal Boot lamp Interior lighting (interior lamps) Glove locker lamp Cigar lighter Sun-roof Anti-theft switch → Reversing lamps Relay coil for sun-roof Heated rear window and warning lamp Handbrake flasher and warning lamp
Window-winder relay	16 A	White	Control switch → window winder (RH) Control switch → window winder (LH)
Lighting switch	10 A	Yellow	Ignition keyhole lamps Lighting for cigar lighter Lighting for heater unit control Map reading lamp Side and tail lamps Number plate lamps Instrument panel lamps : Clock, battery meter, odometers

P.T.O.

CIRCUIT DIAGRAM

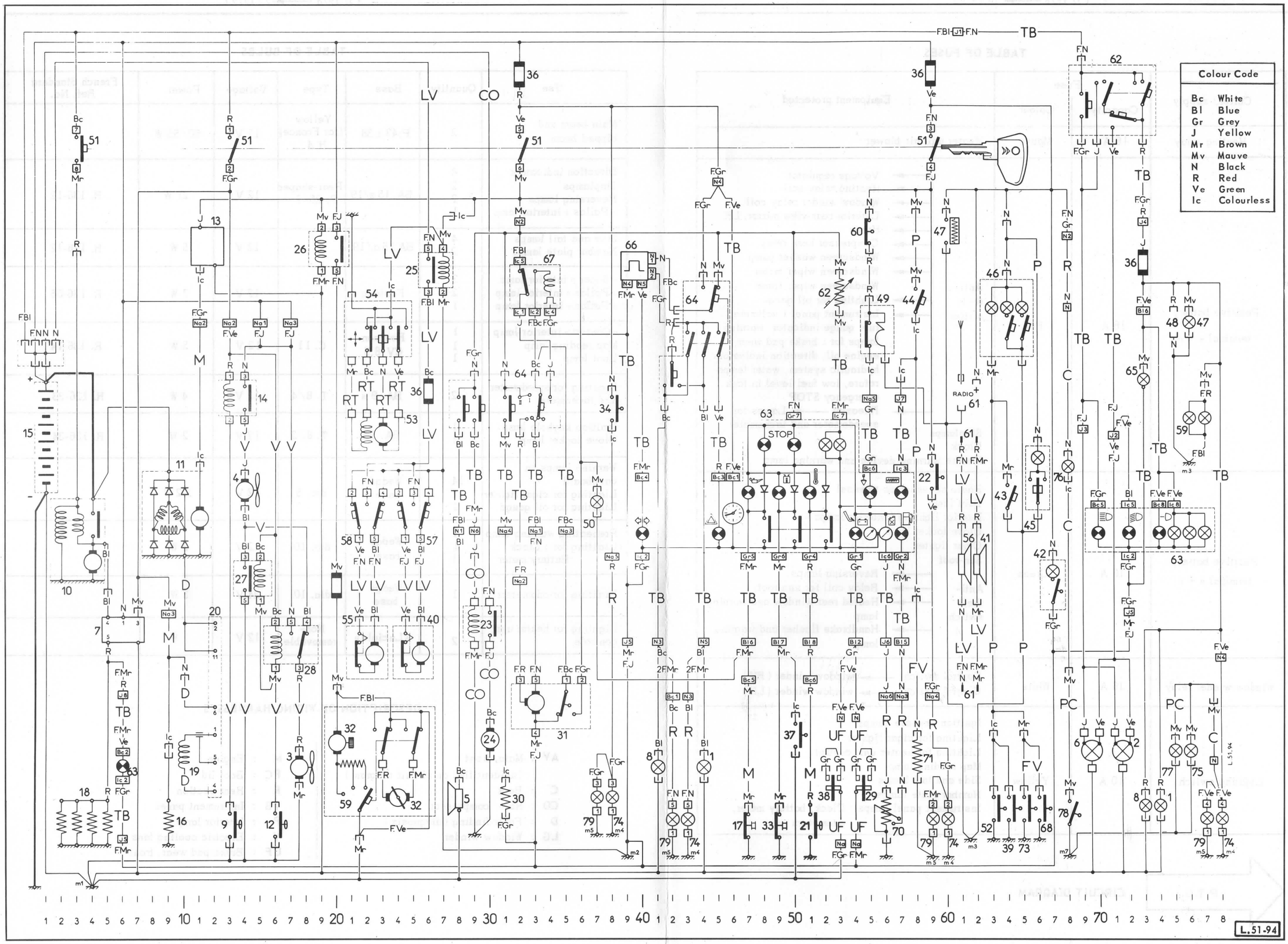
TABLE OF BULBS

Use	Quantity	Base	Type	Voltage	Power	French Standard Ref. No.
Main beam and dipped beam	2	P.43 t.38	Yellow (for France) H 4	12 V	60/55 W	
Direction indicators Stoplamps Reversing lamps « Pallas » interior lamp	4 2 2 1	BA. 15 s/19	Pear-shaped P. 25/1	12 V	21 W	R. 136-12
Side and tail lamps Number plate lamps	4 2	BA.15 s/19		12 V	5 W	R. 136-12
« Super » interior lamp « Pallas » interior lamp « Pallas » interior lamp	3 2 1	Festoon		12 V	7 W	R. 136-05
« Confort » interior lamp Map reading lamp Boot lamp	1 1 1	Festoon CV 8,5	C. 11	12 V	5 W	R. 136-14
Lighting for speedometer and tachometer	2	BA. 9 s	T. 8/4	12 V	4 W	R. 136-33
Ignition keyhole lamp Glove locker lamp	1 1	BA. 9 s	T. 8/2	12 V	2 W	R. 136-34
Warning lamps on dashboard Lighting for cigar lighter Lighting for oil gauge	14 1 1	Wedge base	dia. 5	12 V	1.2 W	
Preheating warning lamp Lighting for : Clock Battery meter	1 1 1	Wedge base	dia. 10	12 V	2 W	
Lighting for odometers	1	Wedge base	dia. 10	24 V	3 W	
Lighting for heater unit controls	2	« Luciole »	Non-removable	12 V	1 W	

DESCRIPTION OF WIRING HARNESSES

AV : Main, front (unidentified on circuit diagram)
C : Boot
CO : Horn, compressor
D : Fault finding (diagnosis)
LG : Window winder
M : Engine
PC : Boot lid
R : Rear section
TB : Instrument panel
P : Interior lamp
V : Electric cooling fans
UF : Brake pad wear, front

Operation published together with Information Bulletin No. 80-60 MA



ALL CX DIESEL VEHICLES (7/1979 ⟶ 7/1980)

ARRANGEMENT OF THE ELECTRICAL INSTALLATION

Operation published together with Information Bulletin No. 80-60 MA

NOTES :

When dealing with the « sun-roof », refer to Operation MA.Di. 510-00 a and to Operation MA.Di. 510-00 b for Pallas vehicles « interior lighting ».

For Estate version, refer for the rear section, to Operation MA.Di. 510-00.

TABLE OF BULBS

Use	Quantity	Base	Type	Voltage	Power	French Standard Ref. No.
Main beam and dipped beam	2	P.43 t. 38	Yellow (for France) H 4	12 V	60/55 W	
Rear fog lamps Direction indicators Reversing lamps « Pallas » interior lamp	2 4 2 1	BA.15s/19	Pear-shaped P. 25/1	12 V	21 W	R. 136-12
Stoplamps and tail lamps	2	BA. 15 d		12 V	21/5 W	
Sidelamps Number plate lamps	2 2	BA.15s/19		12 V	5 W	R. 136-12
« Super » interior lamp « Pallas » interior lamp « Pallas » front interior lamp	3 2 1	Festoon		12 V	7 W	R. 136-05
« Confort » interior lamp Map reading lamp Boot lamp	1 1 1	Festoon CV 8,5	C. 11	12 V	5 W	R. 136-14
Lighting for speedometer and tachometer	2	BA. 9 s	T. 8/4	14 V	4 W	R. 136-33
Ignition keyhole lamp Glove locker lamp	1 1	BA. 9 s	T. 8/2	12 V	2 W	R. 136-34
Warning lamps on dashboard Lighting for cigar lighter	16 1	Wedge base	dia. 5	12 V	1.2 W	
Lighting for indicator lamps and clock	2	Wedge base	dia. 10	12 V	2 W	
Lighting for odometers	1	Wedge base	dia. 10			
Lighting for heating controls	2	« Luciole »	non-removable	12 V	1 W	

DESCRIPTION OF WIRING HARNESSES

AV : Main, front (unidentified on circuit diagram)
C : Boot
D : Fault finding (diagnosis)
K : Air conditioning
LV : Window winder
M : Engine
PC : Boot lid
R : Rear section
TB : Instrument panel
T : Water thermometer
UF : Brake pad wear, front
V : Electric fans

Operation published together with Information Bulletin No. 80-60 MA

TABLE OF FUSES

Current supply	Fuse		Equipment protected
	Capacity	Colour	
Relay for air conditioning and heating	16 A	Mauve	Air blower for air conditioning and heating units Air-conditioning compressor
Positive battery terminal « + »	16 A	Red	Heating relay coil Relay coil for window winder Horns Windscreen wiper motor and timer unit Windscreen washer pump Direction indicators Anti-theft switch → Instrument panel : (warning lamps for : battery charge, engine oil temperature, low fuel level, hydraulic fluid, engine coolant temperature, oil pressure, fuel gauge, emergency « STOP ») Rheostat → Lighting for speedometer and tachometer Electric oil gauge Hazard warning device Clock Stoplamps
Positive battery terminal « + »	16 A	Green	Radio accessories terminal and door locking Boot lamp Interior lamp Glove locker lamp Cigar lighter Sun-roof Anti-thef switch → Voltage regulator Reversing lamps Coil for sun-roof relay Heated rear-window and warning lamp Handbrake flasher and warning lamp Coolant temperature
Window-winder relay	16 A	White	Control switch → window winders
Lighting switch	10 A	Yellow	Ignition keyhole lamp Lighting for cigar lighter Water thermometer lighting Lighting for heating control Map reading lamp Tail lamps and lighting for number plate Lighting for instrument panel : Clock, oil gauge, and odometer
Lighting switch	10 A	Blue	Rear fog lamps and warning lamp

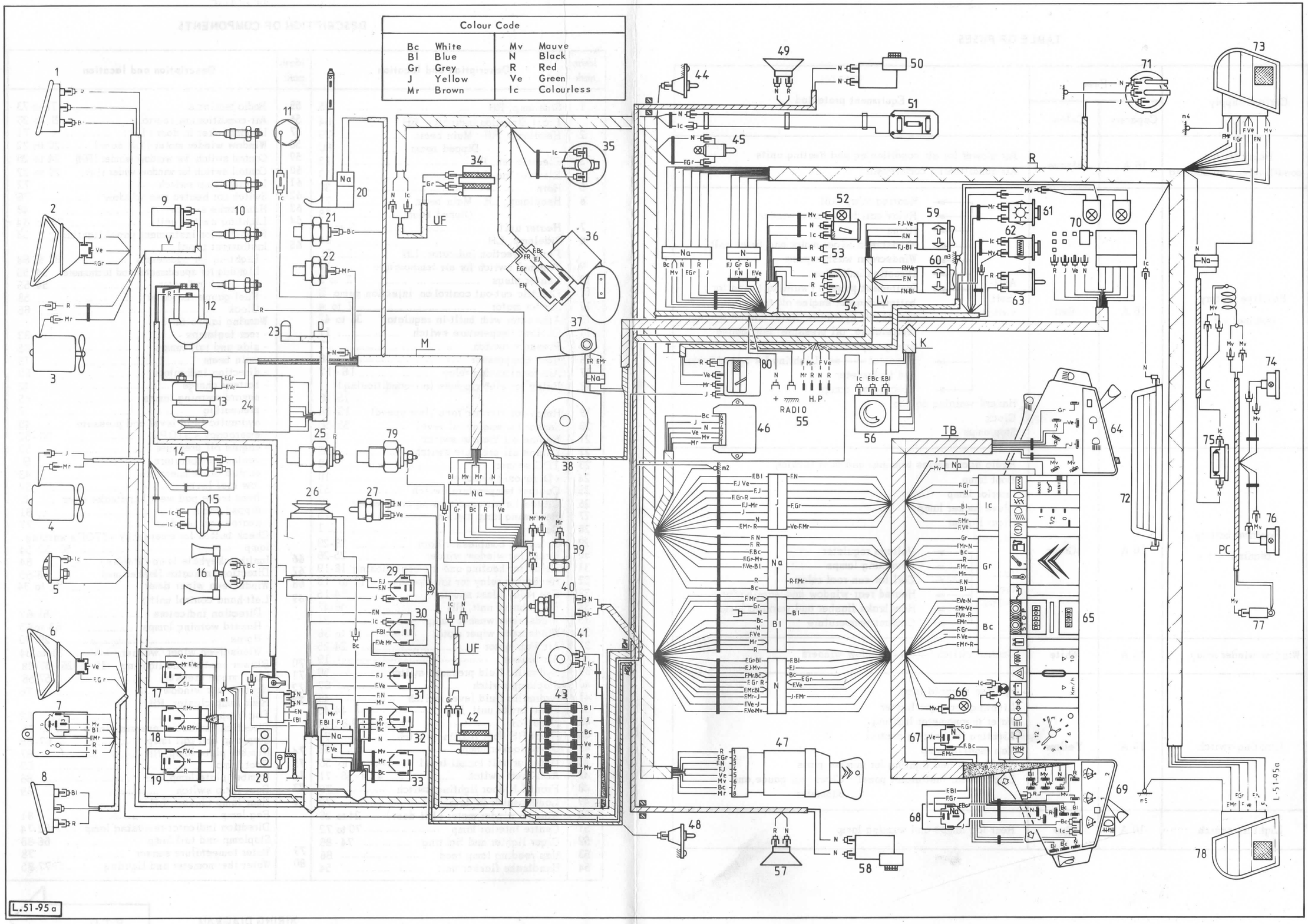
DESCRIPTION OF COMPONENTS

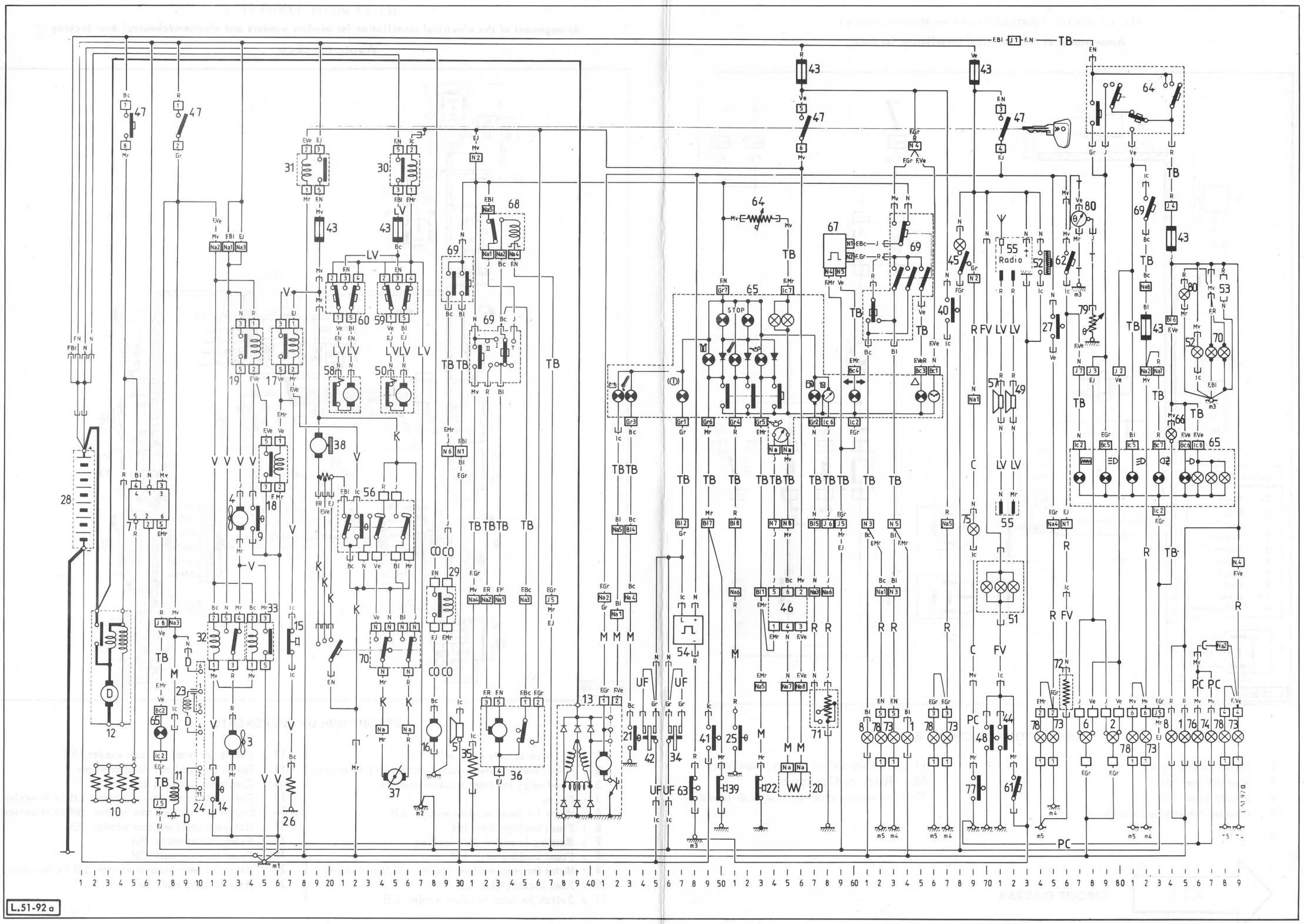
Ident. mark	Description and location	Ident. mark	Description and location
1	Sidelamp, RH 85	55	Radio terminals ..... 71 to 73
	Front direction indicator, RH 64	56	Air-conditioning controls ..... 21 to 26
2	Headlamp, RH : Main beam 79	57	Loudspeaker in door (LH) 71
	Dipped beam 80	58	Window winder motor (LH door) ..... 20 to 22
3	Electric fan, RH 13	59	Control switch for window winder (RH) 24 to 26
4	Electric fan, LH 13	60	Control switch for window wider (LH) 20 to 22
5	Horn 30	61	Interior lamp switch 72
6	Headlamp, LH : Main beam 77	62	Switch for heated rear window 76
	Dipped beam 78	63	Handbrake switch 48
7	Heater unit ..... 5 to 7	64	Lighting switch unit ..... 78 to 84
8	Sidelamp, LH 84		Rheostat for instrument panel lighting 53
	Front direction indicator, LH 61	65	Instrument panel :
9	Thermal switch for air temperature 14		- Lighting for odometers ..... 86 to 88
10	Heater plugs ..... 2 to 5		- Lighting for speedometer and tachometer 54-55
11	Electric cut-out control on injection pump 8		- Oil level indicator 54-55
12	Starter motor ..... 2 to 4		- Fuel gauge indicator 58
13	Alternator with built-in regulator 38 to 42		- Clock 66
14	Coolant temperature switch 11		Warning lamps for :
15	Pressure switch 17		- rear foglamps 83
16	Horn compressor 28		- side and tail lamps 85
17	Air-conditioning relay ..... 16 - 17		- main beam 79
18	Relay for electric fans (air-conditioning) 15-16		- direction indicators 60
19	Relay for electric fans (low speed) 13-14		- battery charge 42
20	Sensor for engine oil level 55-56		- hazard warning lamps 65
21	Engine oil thermal switch 43		- preheating 7
22	Engine oil pressure switch 53		- hydraulic fluid level and pressure 49
23	TDC sensor 9		- emergency « STOP » ..... 50 - 52
24	« Diagnosis » socket 10		- engine oil pressure 53
25	Coolant temperature switch 51		- coolant temperature 51
26	Clutch for air-conditioning compressor .. 17		- engine oil temperature 43
27	Reversing lamp switch 75		- low fuel level 57
28	Battery 1		- front brake pad wear, handbrake wear 47
29	Relay for compressor horn 28-29		- dipped beam 81
30	Relay for window winder 25-26		- heated rear window 77
31	Relay for heating and air-conditioning 18-19		Check button for emergency «STOP» warning lamp ..... 50 - 52 - 54
32	Reversing relay for fan speed ..... 11 to 13	66	Ignition keyhole lamp *(Pallas)* 84
33	Fan relay (fast speed) 14-15	67	Direction indicator flasher unit 58-59
34	Front brake unit, RH 46-47	68	Windscreen wiper timer ..... 32 to 34
35	Windscreen washer pump 31	69	Left-hand control unit ;
36	Windscreen wiper motor ..... 32 to 36		- Direction indicators 61-62
37	Air flap motor 24-25		- Hazard warning lamps ..... 63 to 65
38	Air blower 19		- Horns 29-30
39	Hydraulic fluid pressure switch 50		- Windscreen wiper/washer ..... 31 to 34
40	Stoplamp switch 67	70	Blower control and lighting 19 to 26 - 87-88
41	Hydraulic fluid level switch 49	71	Fuel gauge rheostat 57-58
42	Front brake unit, LH 44-45	72	Heated rear window 76
43	Fuse box 19-25-56-69-82-84	73	Rear lamp cluster, RH :
44	Front RH door lighting switch 71		Fog lamp 82
45	Glove locker lamp 68		Direction indicator-reversing lamp 63-75
46	Detector unit for oil level ..... 54 to 56		Stoplamp and tail lamp 67-89
47	Anti-theft switch ..... 4 - 8 - 56 - 71	74	Number plate lamp, RH 87
48	Front LH door lighting switch 70	75	Boot lamp 69
49	Loudspeaker in door, RH 72	76	Number plate lamp, LH 86
50	Window winder motor (RH door) .... 24 to 26	77	Boot lamp switch 69
51	Centre interior lamp ..... 70 to 72	78	Rear lamp cluster, LH :
52	Cigar lighter and lighting 74-86		Fog lamp 81
53	Map reading lamp feed 88		Direction indicator-reversing lamp 62-74
54	Handbrake flasher unit 54		Stoplamp and tail lamp 66-88
		79	Water temperature sensor 78
		80	Water thermometer and lighting 77-85

WIRING DIAGRAM P.T.O.

WIRING DIAGRAM (7/1979 ⟶ 7/1980)

Colour Code			
Bc	White	Mv	Mauve
Bl	Blue	N	Black
Gr	Grey	R	Red
J	Yellow	Ve	Green
Mr	Brown	Ic	Colourless

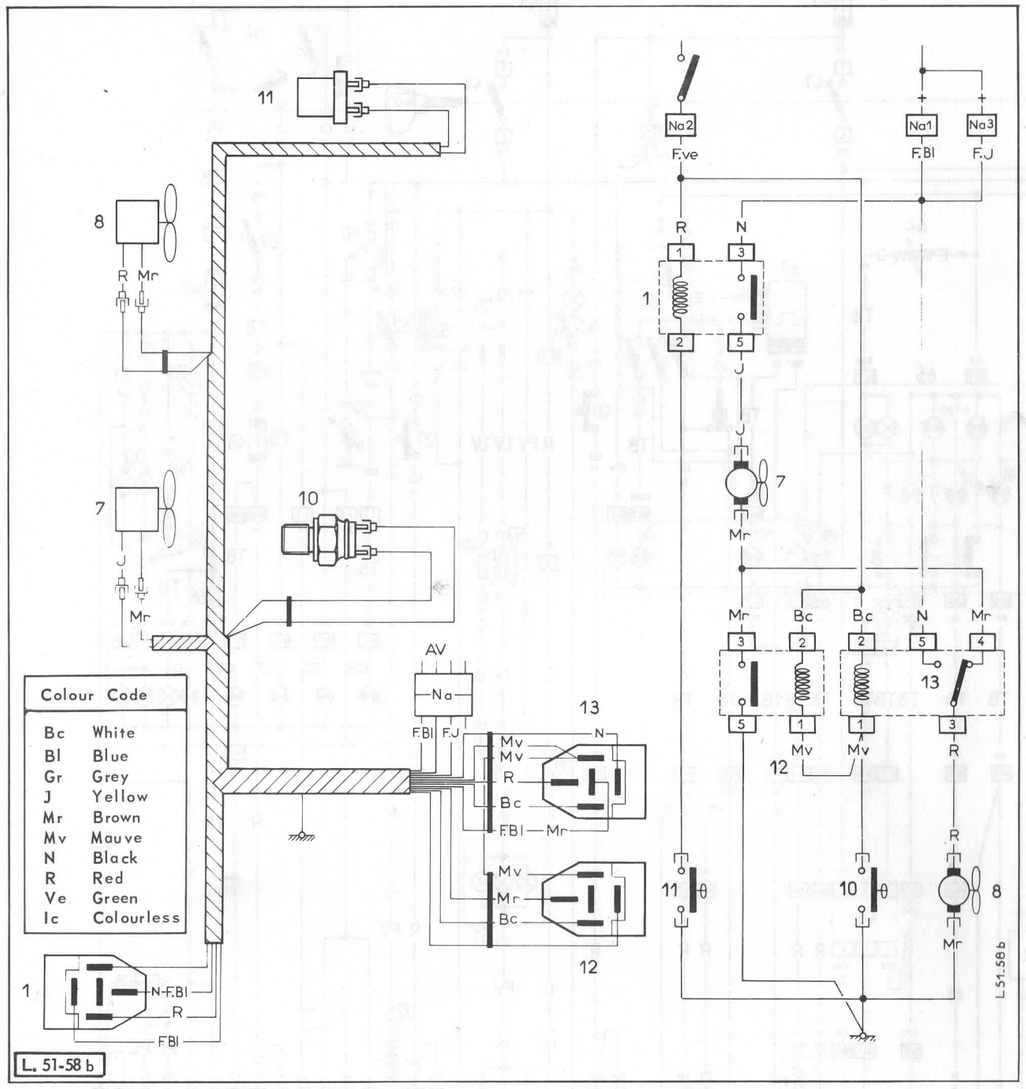




Operation published together with Information Bulletin No. 80-60 MA

ALL CX DIESEL VEHICLES (with no air-conditioning)

Arrangement of the electrical installation for fans



L. 51-58 b

DESCRIPTION OF COMPONENTS

1 : Relay for low speed
7 : Electric fan, LH
8 : Electric fan, RH
10 : Coolant temperature switch
11 : Thermal switch for air temperature
12 : Relay for high speed
13 : Reversing relay for low/high speed

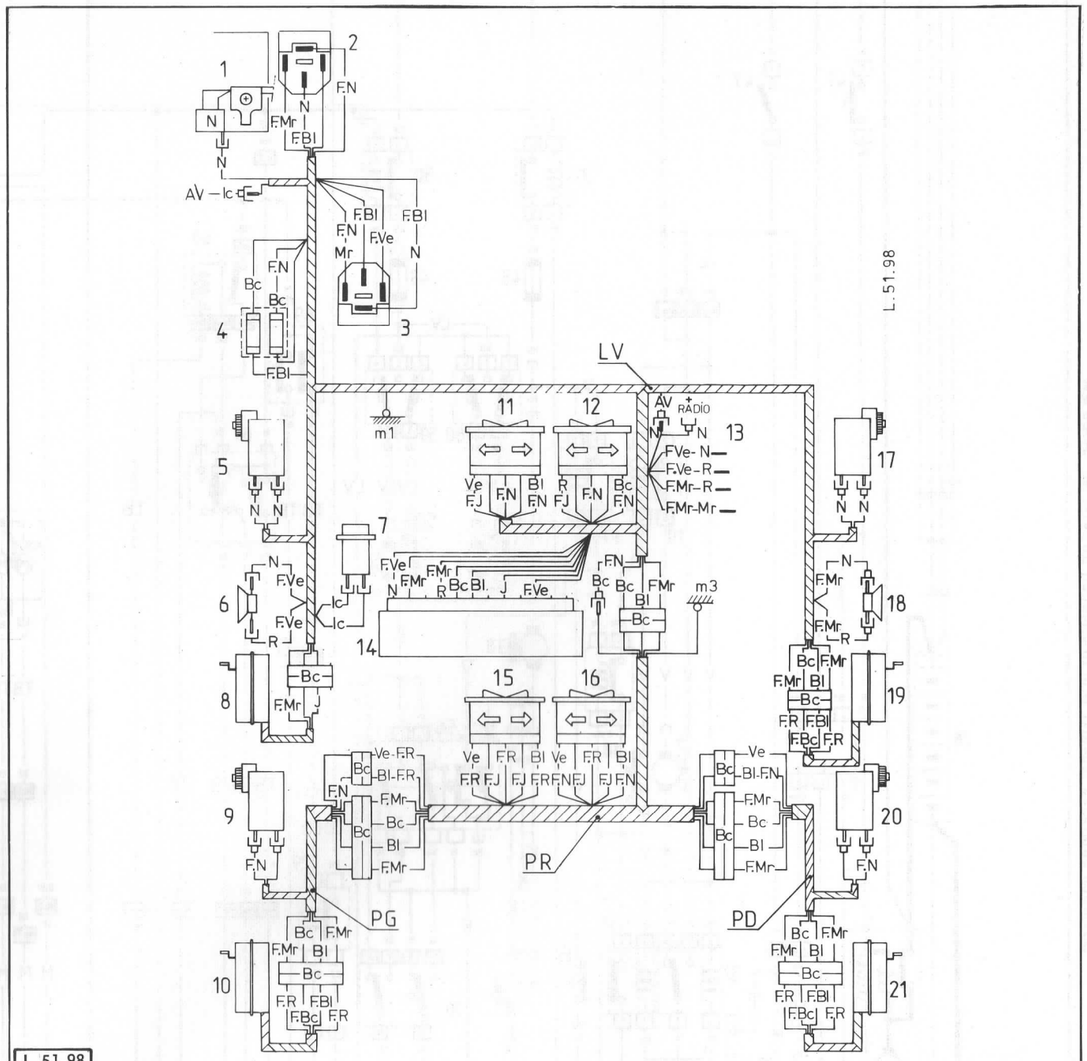
P.T.O.

CIRCUIT DIAGRAM

ALL CX DIESEL VEHICLES

Arrangement of the electrical installation for window winders and electromechanical door locking

WIRING DIAGRAM



L.51-98

DESCRIPTION OF COMPONENTS

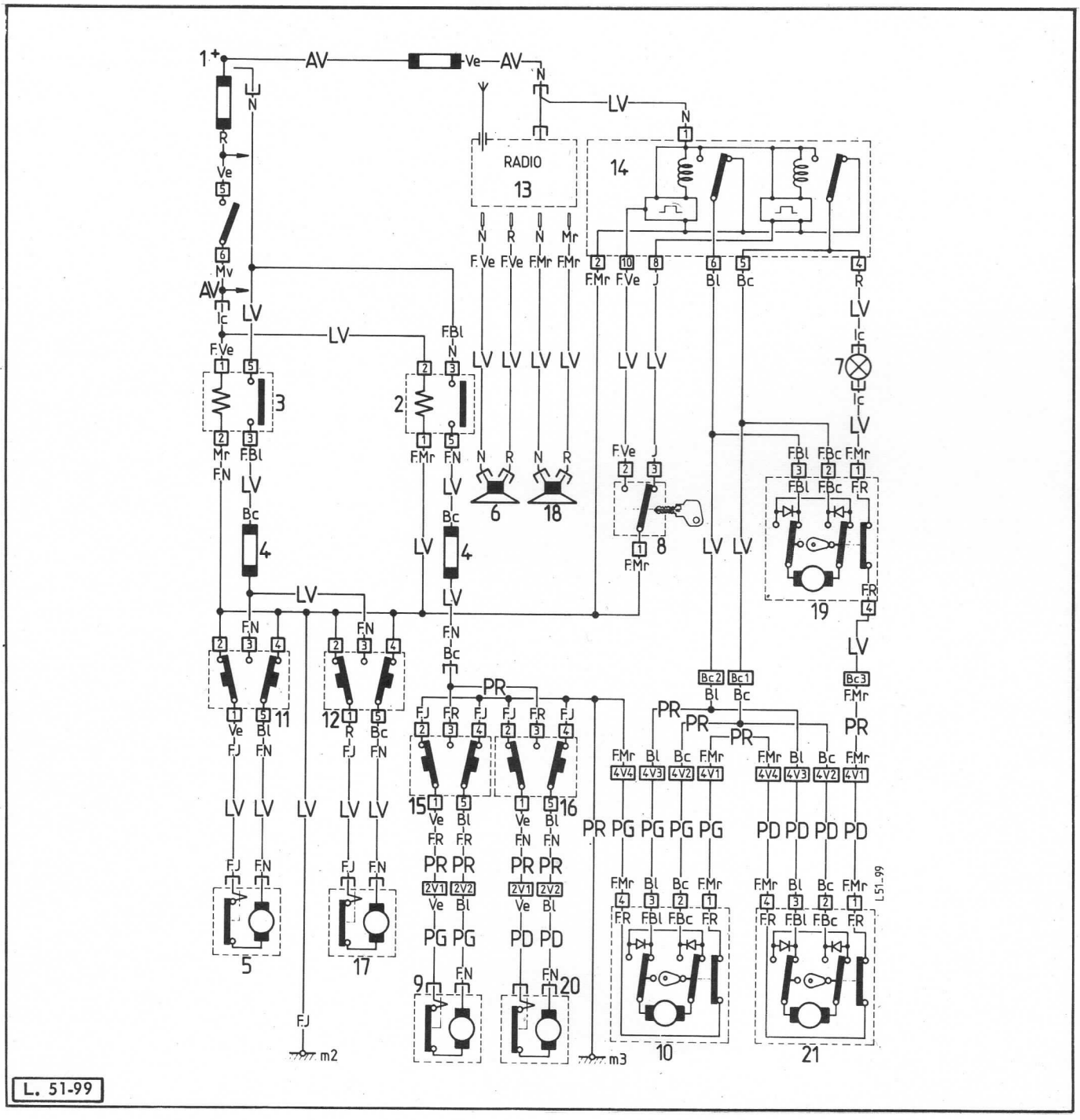
1 : Positive battery terminal « + »
2 : Feed relay for rear window-winders *(Limousine)*
3 : Feed relay for front window-winders
4 : Fuses
5 : Motor for front window winder, LH
6 : Front loudspeaker, LH
7 : Warning lamp for door locking
8 : Front locking unit, LH
9 : Motor for rear window winder, LH *(Limousine)*
10 : Rear locking unit, LH
11 : Switch for front window winder, LH
12 : Switch for front window winder, RH
13 : Radio terminal and loudspeakers
14 : Electronic locking unit
15 : Switch for rear window winder, LH *(Limousine)*
16 : Switch for rear window winder, RH *(Limousine)*
17 : Motor for front window winder, RH
18 : Front loudspeaker, RH
19 : Front locking unit, RH
20 : Motor for rear window winder, LH *(Limousine)*
21 : Rear locking unit, RH

Operation published together with Information Bulletin No. 80-60 MA

ALL CX DIESEL VEHICLES

Arrangement of the electrical installation for window winders and electromechanical door locking

CIRCUIT DIAGRAM



DESCRIPTION OF WIRING HARNESSES

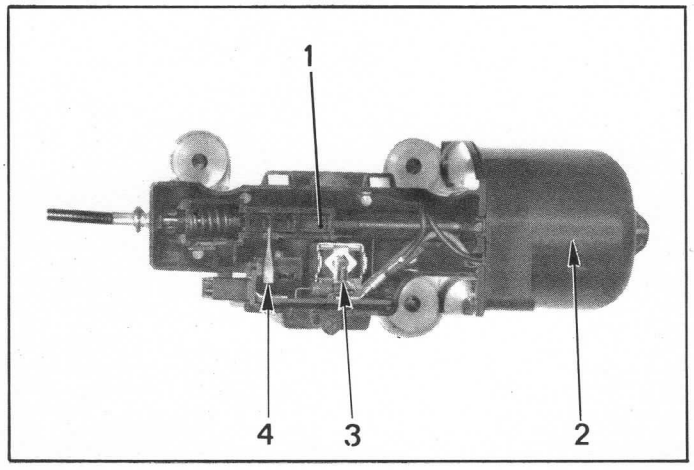
AV : Front
LV : Front window winder
PD : Rear door, RH
PG : Rear door, LH
PR : Rear doors

PUMP SHUT-OFF CONTROL

MODEL ⟶ *7/1976*

The Diesel engine is stopped by interrupting the flow of Diesel fuel to the injectors. The injection pump is fitted with a lever for this purpose. A cable traction device operates this shut-off lever. The cable is controlled by a nut-screw system and activated by an electric motor which rotates in both directions. This unit is located on the bulkhead, on the right-hand side of the engine near the windscreen-wiper motor.

76-45



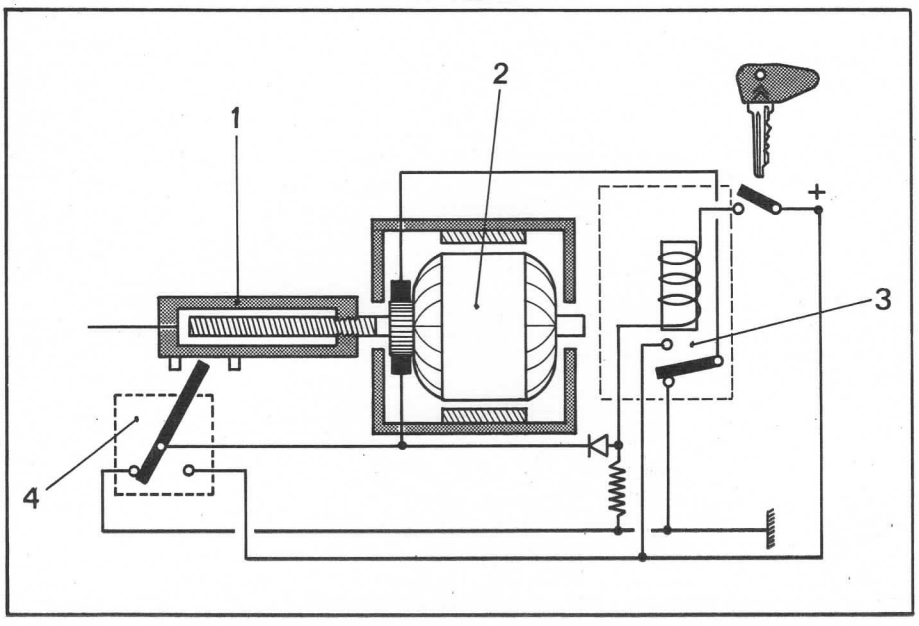
OPERATION.

When current is supplied to relay (3) it controls electric motor (2) which releases the cable attached to the shut-off lever of the pump.
Contact blade (4) located between the two studs of nut (1) stops motor (2) *(injection pump in One position).*

When the contact is cut, relay (3) is once more energized and drives the motor in the opposite direction by means of a permanent supply, contact blade (4) stops the motor at the end of its travel (cable stretched) *(injection pump in stop position).*

If the stop control is disconnected when the engine is turning, it cannot be stopped by the ignition key.
Operate the shut-off pump lever by hand.

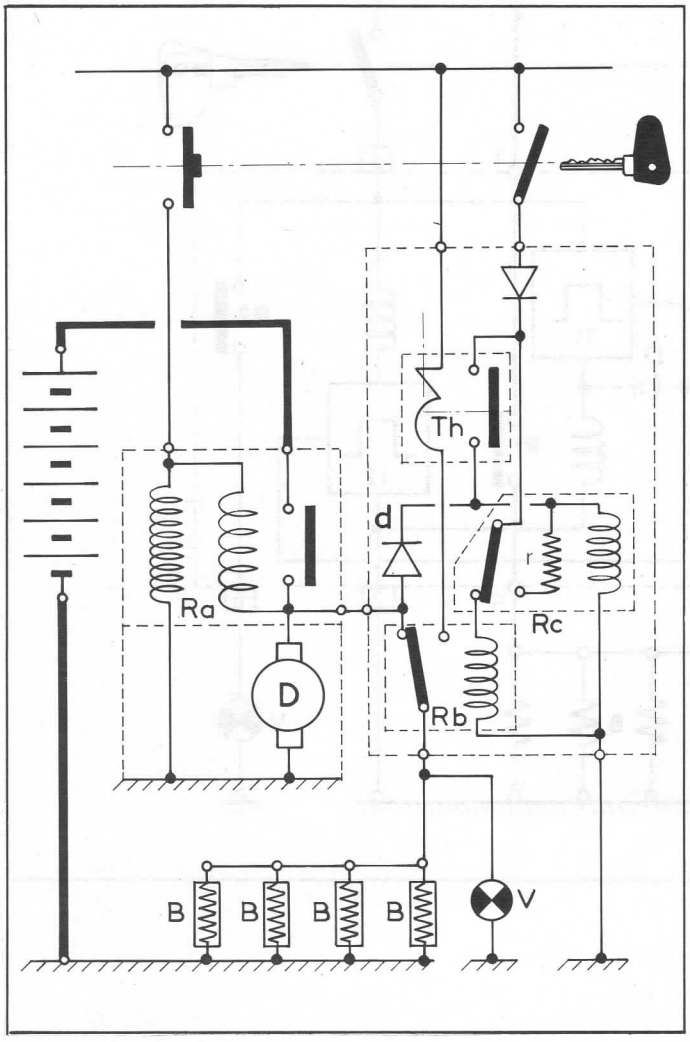
L 53-5



Operation published together with Information Bulletin No. 80-60 MA

I. STARTER BOX

L 53-3



The starter box located under the left-hand headlamp, provides good starting conditions with a cold engine, by using heater plugs.

Starting with preheating :

- Switch on the ignition.
  Current is supplied to the relay « Rb » winding, and provides current to the plugs B through bimetal strip « Th » ; warning lamp V is illuminated.
  After an interval for heating which varies as a function of ambient temperature (40 to 70 s at 20° C, 90 to 120 s at - 15° C), the bimetal strip « Th » closes its contact ; current supplied to the relay winding « Rc » cuts off that of relay « Rb » ; the plugs are no longer heated and the warning lamp goes out.

  The relay « Rc » is supplied via the economy resistor « R » as long as the ignition is switched on even when the contact of the bimetal strip opens on cooling.

- Turn the key to « Starting position ».
  The energized solenoïd « Ra » supplies current to the starter and heater plugs.
  The warning lamp comes on again.

Starting without preheating :

The solenoïd « Ra » is energized immediately after current is supplied to the preheater control unit and powers the starter and relay « Rc » via the diode « d » ; warning lamp V comes on.
Relay « Rc » neutralizes the thermal delay action of « Th ». The plugs will only heat when the starter motor turns.

Heater plugs :

BOSCH ref. 0.250 - 200 - 048

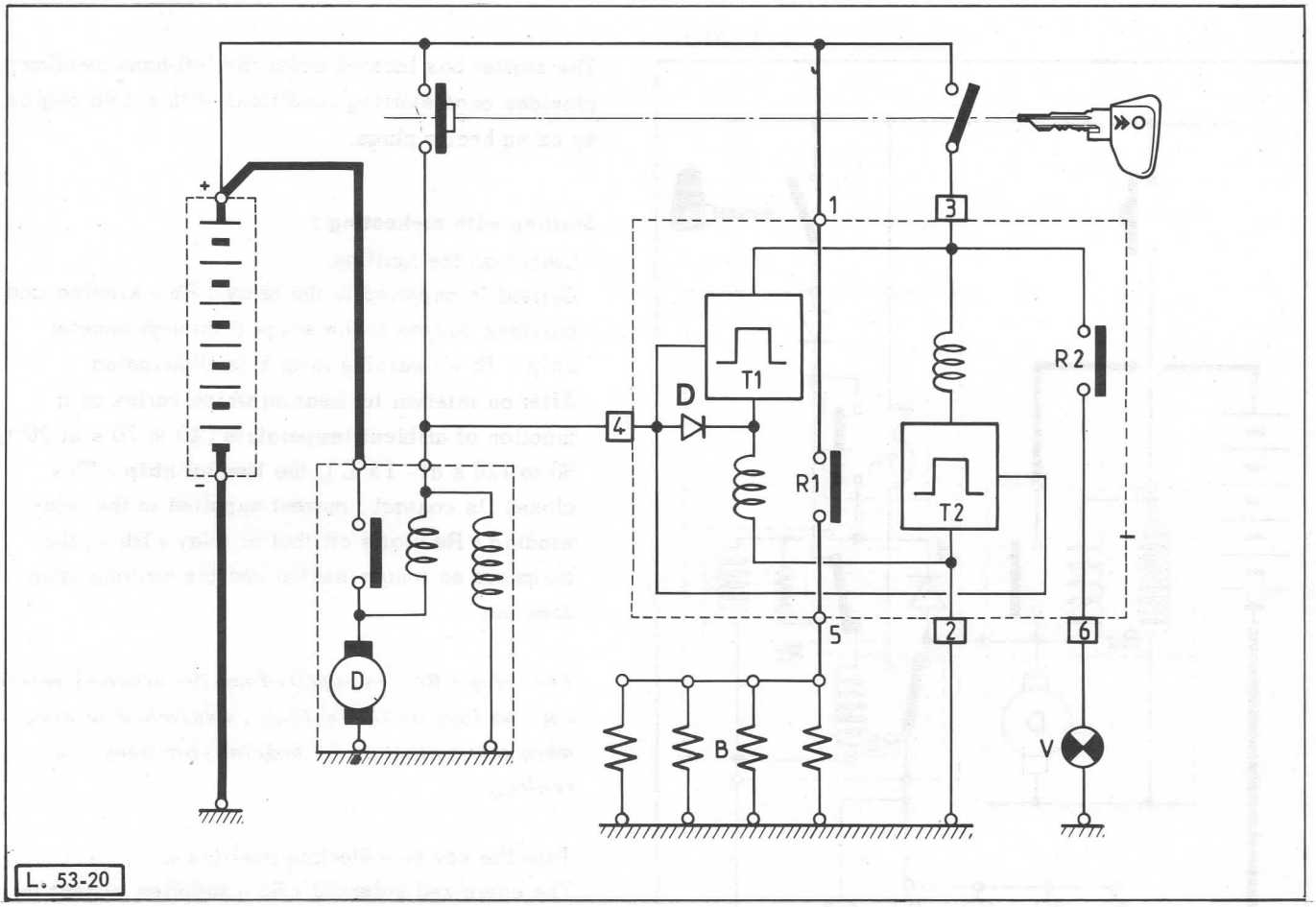
Tightening torque : 0.25 to 0.30 m.daN

Absorbed current during preheating : 50 to 60 A for the 4 plugs connected in parallel.
Resistance for one heater plug : 1 Ω approx.
Feed voltage : 9.5 V.
Base diameter : 14 mm.

Pre-heating unit :

S.E.I.M. ref. 41 52 000

Operation published together with Information Bulletin No. 80-60 MA



L. 53-20

Starting with preheating :

- Switch on the engine :

Timer T2, which cuts in as soon as the current is supplied, provides the earthing of relay R2 winding via No. 2 terminal. Warning lamp « V » lights up.

Timer T1 which has also cut in, provides supply of current for relay R1 winding. Plugs « B » will heat.

After an interval for heating which varies as a function of ambient temperature (40 sec. at - 10° C, 25 sec. at 25° C approximately) timer T2 connects the circuit of relay R2 winding. The warning lamp goes out.

15 to 20 seconds after warning lamp « V » has gone out, timer T1 cuts off the supply in current of relay R1 winding The plugs are no longer heated.

- Operate the starter motor :

Current is provided in relay R1 via No. 4 terminal, then through diode « D ». Plugs « B » are supplied in current while the starter motor is operating.

Starting without preheating :

- Switch on the ignition :

With timers T1 and T2 set. Warning lamp « V » lights up. The plugs are supplied with current.

- Operate the starter motor :

Timers T1 and T2 are neutralized via No. 4 terminal. The current supply of the plugs is provided by relay R2 during the starter motor operation.

Heater plugs :

BOSCH ref. 0250 - 020 - 059 BERU ref. 0100 - 221 - 106

Tightening torque : **0.25 to 0.30 m.daN**

Absorbed current during preheating : 80 A approximately for the 4 plugs connected in parallel.

Resistance for one heater plug : 0.5 Ω approximately , at 20° C.

Current voltage : 11 V

Base diameter : 12 mm

Preheating unit :

CARTIER ref. 02 386.

III - ALTERNATORS

	PARIS-RHONE A 14 R 3 or A 14 R 17	MOTOROLA 510-4
Rated voltage	14 V	14 V
Rated amperage	72 A	70 A
Maximum power (from 8000 rpm)	1120 W	1050 W
Rotation direction (from drive end)	Anti-clockwise	Anti-clockwise
Maximum mechanical power consumption	3600 W	
Cut-in speed (at 14 V)	1100 rpm	1150 rpm
Inductor resistance	4.5 ± 0.3 Ω	4 ± 0.2 Ω
Rated length of brushes	14 mm	9.4 mm
Minimum length of brushes after wear	6 mm	3 mm
Pulley alignment adjustment	1 x 1 mm washer	1 x 1 mm washer
Alternator/engine rotation speed ratio	2.18/1	2.18/1

IV - BATTERIES

Battery : 12 V 88 Ah/440 A
Supplier : FULMEN - Ref. AS 713-12

V - VOLTAGE REGULATORS

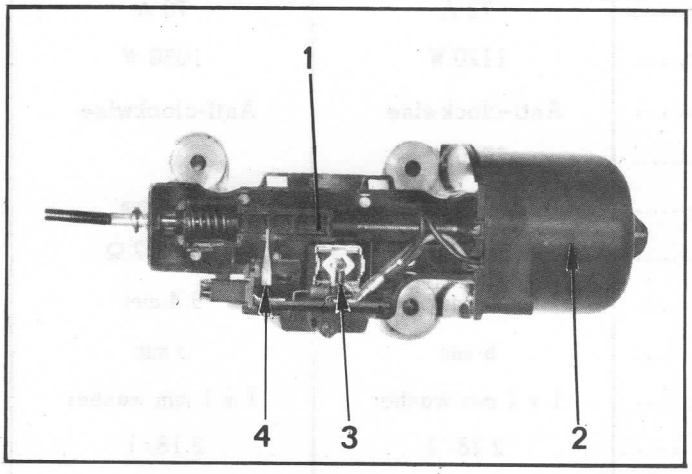
Suppliers { PARIS-RHONE - Reference AYB 2118
DUCELLIER - Reference 510-002 A

Regulated voltage : 13.6 to 14.2 V.

VI - PUMP SHUT-OFF CONTROL

The Diesel engine is stopped by interrupting the flow of Diesel fuel to the injectors. The injection pump is fitted with a lever for this purpose. A cable traction device operates this shut-off lever. The cable is controlled by a nut-screw system and activated by an electric motor which rotates in both directions. This unit is located on the bulkhead, on the right-hand side of the engine near the windscreen-wiper motor.

76-45



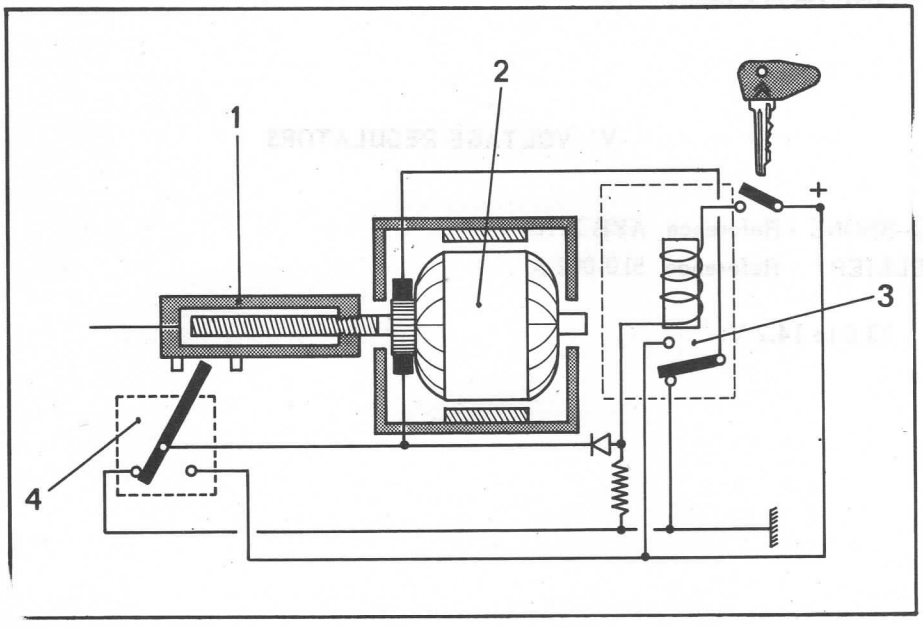
OPERATION

When current is supplied to relay (3) it controls electric motor (2) which releases the cable attached to the shut-off lever of the pump.
Contact blade (4) located between the two studs of nut (1) stops motor (2) *(injection pump in One position.*

When the contact is cut, relay (3) is once more energized and drives the motor in the opposite direction by means of a permanent supply , contact blade (4) stops the motor at the end of its travel (cable stretched) *(injection pump in stop position).*

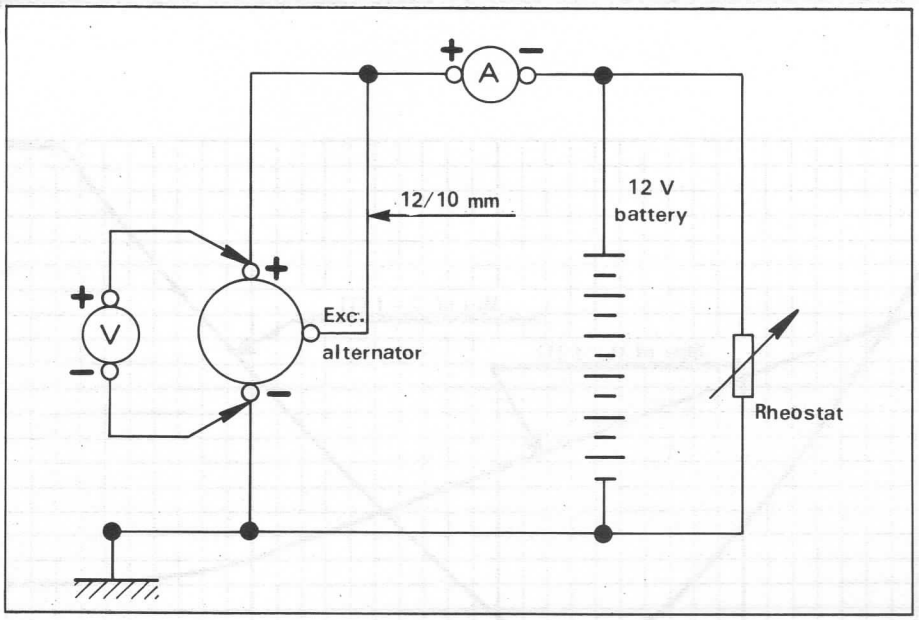
If the stop control unit is disconnected when the engine is turning, it cannot be stopped by the ignition key.
Operate the shut-off pump lever by hand.

L.53-5



I - CHECKING THE ALTERNATOR OUTPUT

TT. 53-2



The alternator output should be checked with a fully charged battery.

Connect as shown above, with **a voltmeter V, an ammeter A and a rheostat,** or better, using a combined **voltmeter-ammeter-rheostat.**

To measure the alternator output, **increase progressively the engine speed** and adjust rheostat to **maintain a voltage reading of 14 volts.**

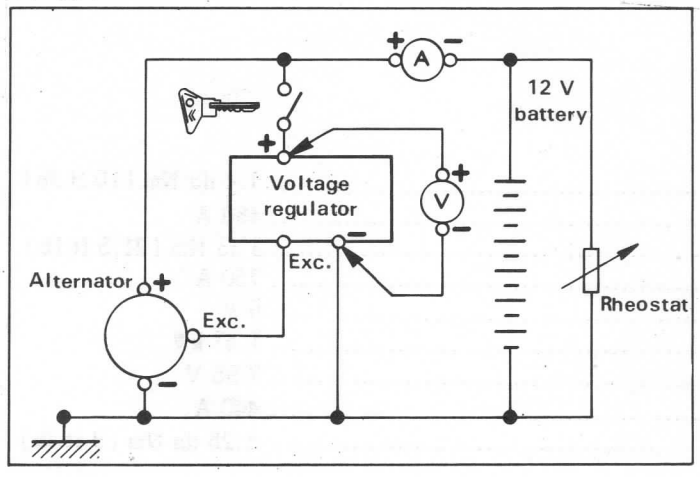
12 V - 72 A Alternators : PARIS-RHONE : A 14 R 3 or A 14 R 17 and MOTOROLA : 510-4.

Cut-in speed at 14 volts : **1100 rpm** (alternator)
Alternator output at 14 volts : **33 A to 1480 rpm** (alternator), **680 rpm** (motor)
62 A to 3300 rpm (alternator), **1510 rpm** (motor)
70 A to 6000 rpm (alternator), **2750 rpm** (motor)
72 A to 8000 rpm (alternator), **3670 rpm** (motor).

If these output figures are not obtained, check the belt and its tension.
If the belt is in good condition and properly tensioned, overhaul the alternator.

II - CHECKING THE VOLTAGE REGULATOR.

TT 53-1



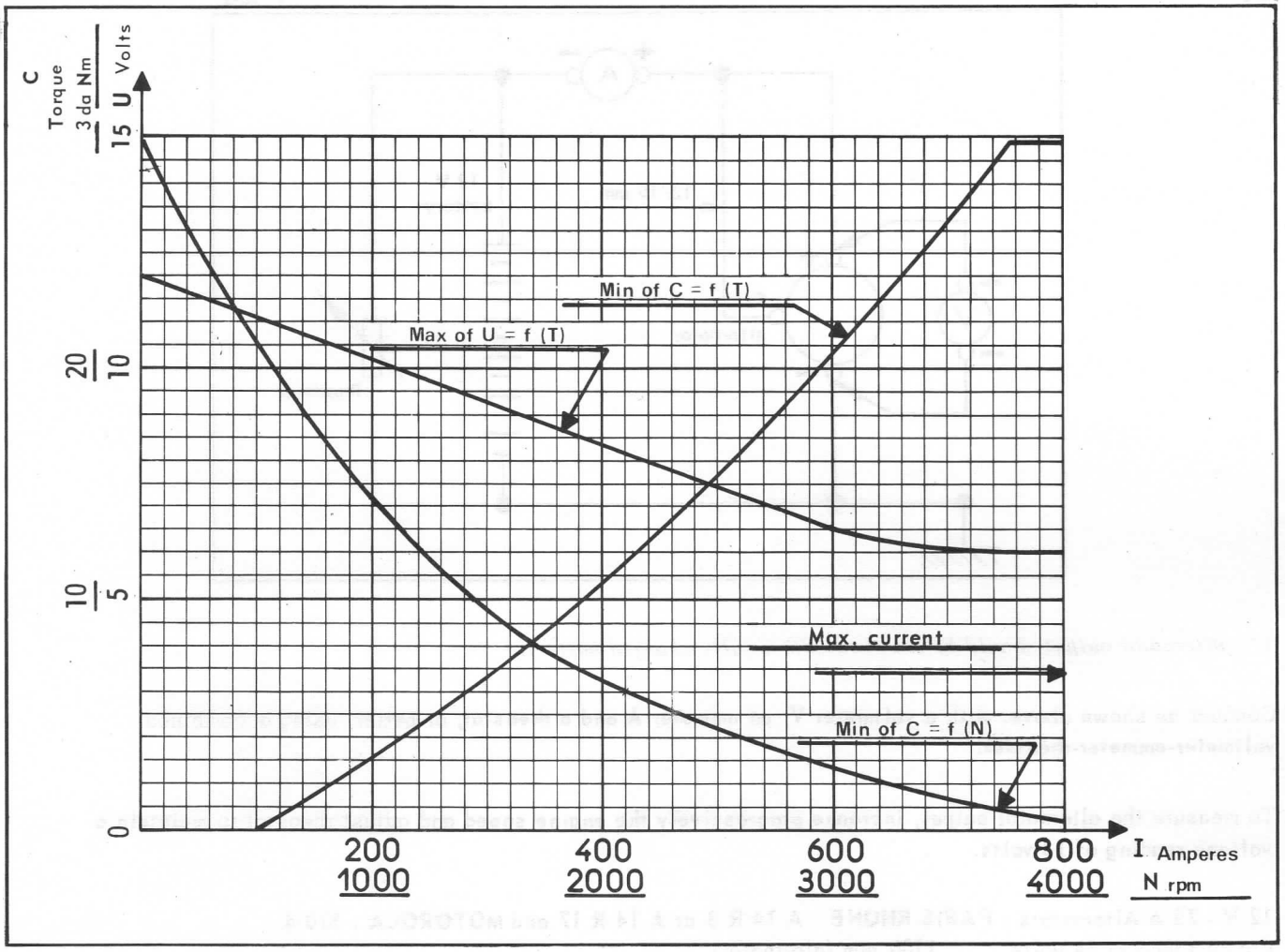
Connect as shown opposite, inserting regulator in circuit.
Check that : voltage at regulator terminals remains between 13 V and 14.2 volts at 20° C, irrespective of amperage output.

Correction in function of the temperature.
Voltage drops by approximately 0.15 volts for a temperature increase of 10° C and the other way round.

III - CHECKING A STARTER MOTOR.

1. PARIS-RHONE D 11 E 163

B. 53-2



TEST ON VEHICLE

Ensure that the battery is correctly charged and measure the following :

a) Current consumed (pinion locked) ..... 750 A max.
b) Current consumed when starting ..... 280 to 300 A
c) Current consumed with no load (starter removed) ..... 100 A

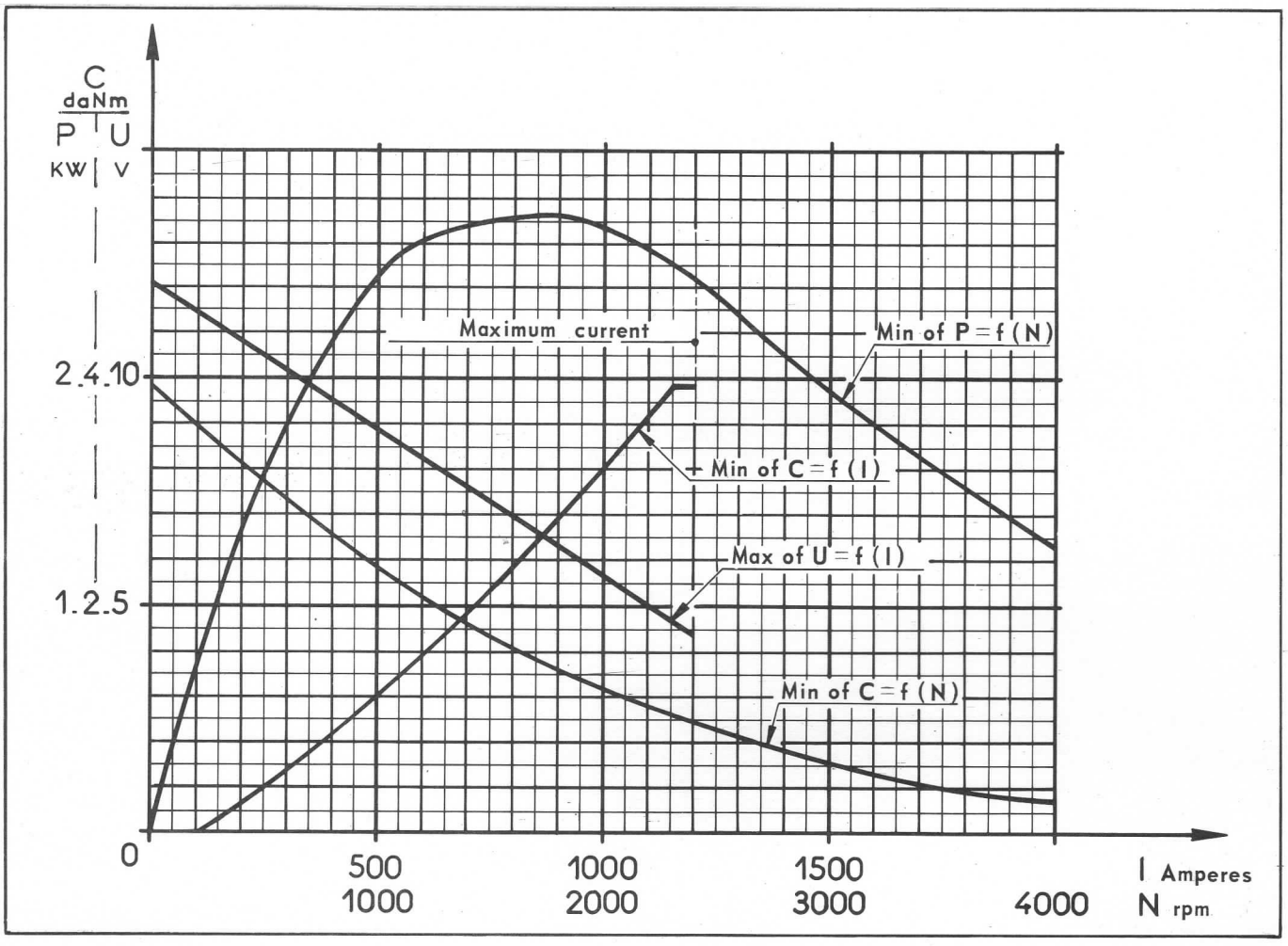
BENCH TEST

Use a 12 V 88 Ah/440 A fully charged battery :

- Minimum torque at 1000 rpm ..... 1.4 da Nm (10 ft.lb)
- Maximum corresponding current ..... 480 A
- Locked torque ..... 3 da Nm (21.5 ft.lb)
- Maximum corresponding current ..... 750 A
- Voltage ..... 6 V
- Maximum power ..... 1.47 kW
- Voltage ..... 7.95 V
- Current ..... 440 A
- Torque ..... 1.25 da Nm (9 ft.lb)

2. PARIS-RHONE D 11 E 169

L. 53-8



TEST ON VEHICLE.

Ensure that the battery is fully charged, and measure the following :

a) Current consumed (pinion locked) ..... 1150 A maximum
b) Current consumed when starting ..... 400 to 450 A
c) Current consumed with no-load (starter removed) ..... 90 A

TEST ON BENCH.

Use a 12 V 88 Ah/440 A fully charged battery :

- Minimum torque at 1000 rpm ..... 2.26 da Nm (16.5 ft.lb)
- Maximum corresponding current ..... 790 A
- Torque locked ..... 3.95 da Nm (28.5 ft.lb)
- Maximum corresponding current ..... 1,150 A
- Voltage ..... 4.75 V
- Maximum power ..... 2.750 kW
- Voltage ..... 8 V
- Current ..... 630 A
- Torque ..... 1.75 da Nm (12.5 ft.lb)

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PARIS-RHONE D 11 E 163 and D 11 E 169 STARTER MOTORS

CHARACTERISTICS.

12-volt solenoid starter with a positive control.
Pinion : 9 teeth
Direction of rotation (seen from drive end) : Clockwise
Number of contacts : 4

Starter reference :	D 11 E 163	D 11 E 169
Nominal output :	1.4 kW	2.7 kW
Length of brushes :	14 mm	17 mm
Min. length after wear :	7 mm	10 mm
Brush reference (set of 4) :	92 694	72 631
Diameter of armature commutates :	45 ± 0.2 mm	45 ± 0.2 mm
Solenoid reference :	CED 511 (12 V)	CED 511 (12 V)
Starter pinion reference :	96 507	97 843

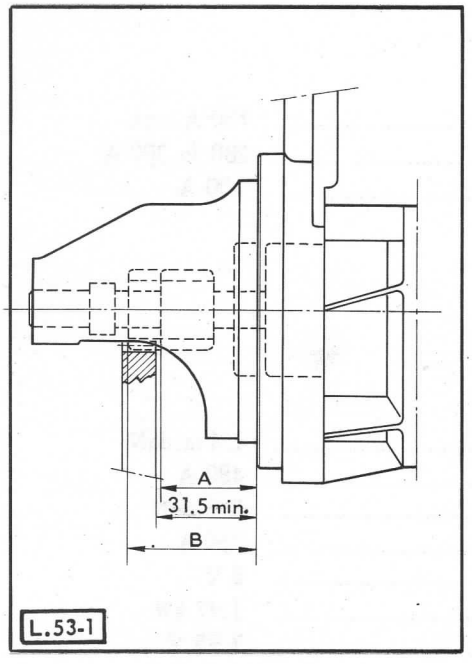
ADJUSTMENT.

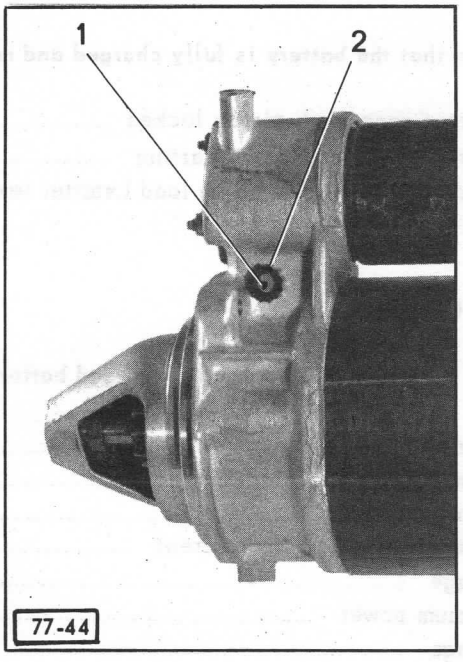
Starter pinion travel adjustment :

Adjustment distance with pinion in free position (solenoid not energized) **A = 29.92 mm**

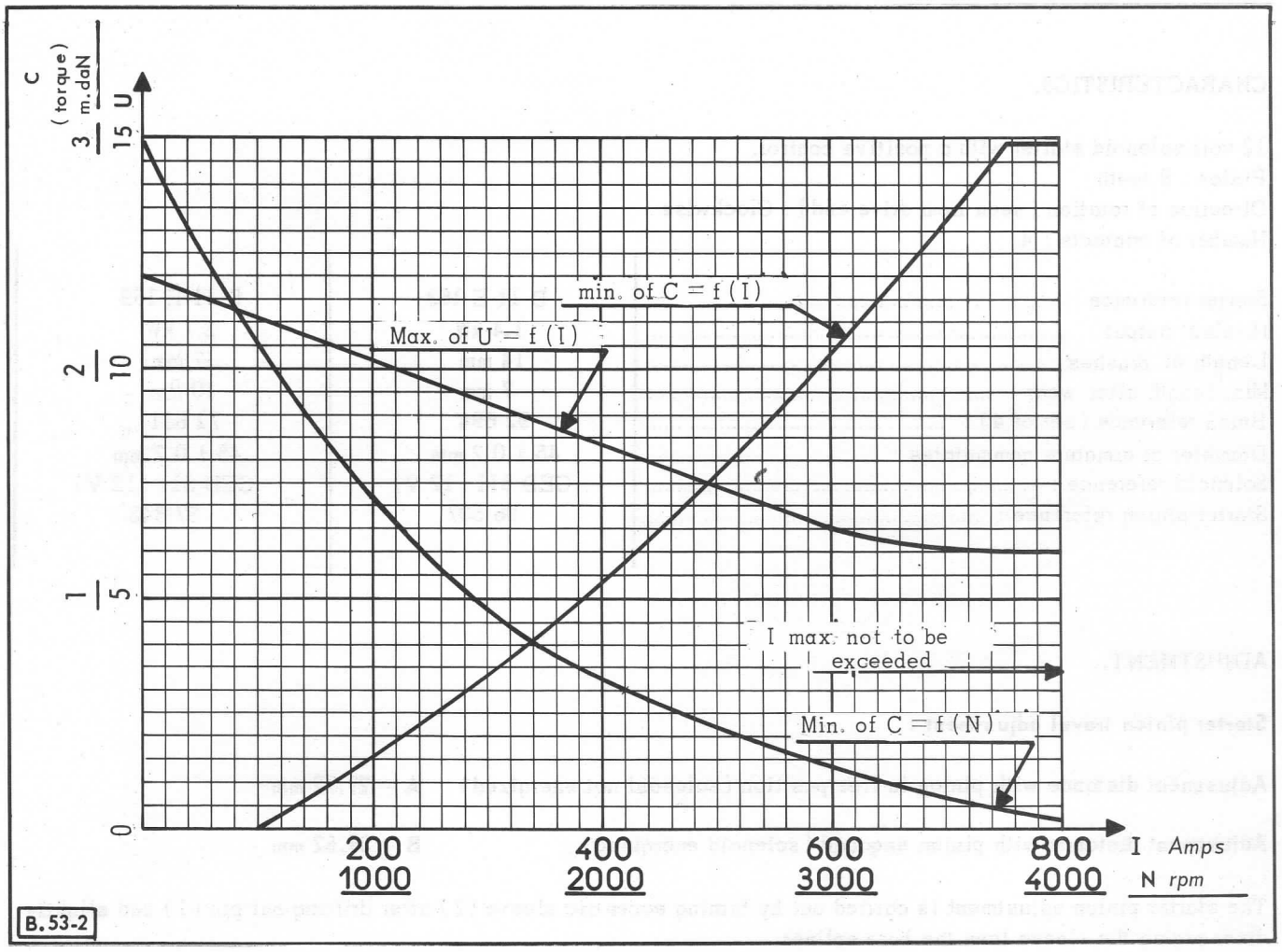
Adjustment distance with pinion engaged (solenoid energized) **B = 39.52 mm**

The starter pinion adjustment is carried out by turning eccentric sleeve (2) after drifting out pin (1) and slightly disengaging the sleeve from the bore splines.





CHECKING A PARIS-RHONE **D 11 E 163** STARTER MOTOR



TEST ON THE VEHICLE.

Ensure that the battery is fully charged and measure the following :

a) Current consumed, pinion locked	750 A max.
b) Current consumed when starting	280 to 300 A
c) Current consumed, with no load (starter removed)	100 A

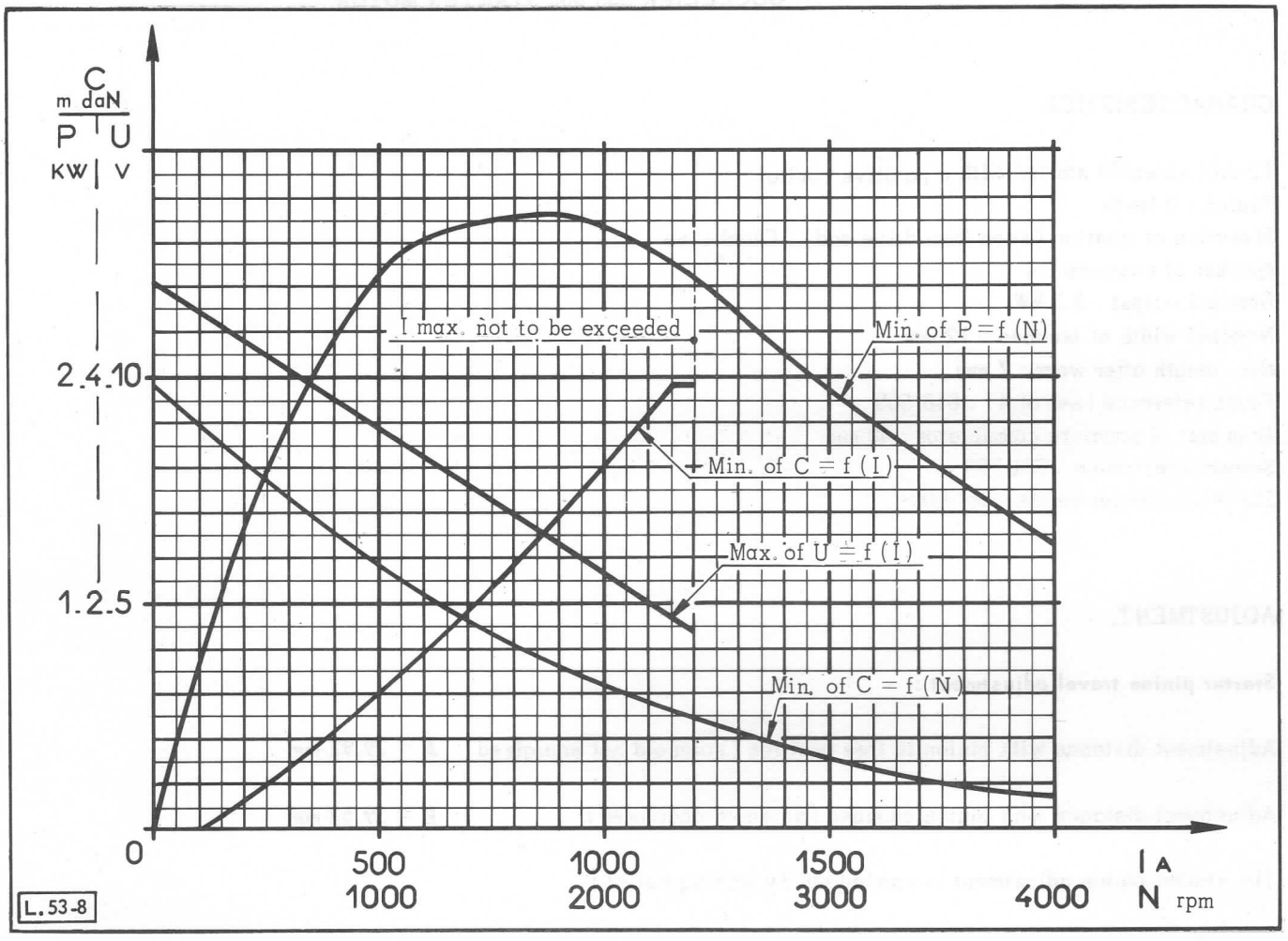
TEST ON BENCH.

Use a 12 V 88 Ah/440 A fully charged battery :

- Minimum torque at 1,000 rpm	1.4 m.daN
- Maximum corresponding current	480 A
- Locked torque	3 m.daN
- Maximum corresponding current	750 A
- Voltage	6 V
- Maximum power	1.47 kW
- Voltage	7.95 V
- Current	440 A
- Torque	1.25 m.daN

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CHECKING A PARIS-RHONE **D 11 E 169** STARTER MOTOR



TEST ON THE VEHICLE.

Ensure that the battery is fully charged and measure the following :

a) Current consumed, pinion locked ..... 1150 A max.
b) Current consumed when starting ..... 400 to 450 A
c) Current consumed, with no load (starter removed) ..... 90 A

TEST ON BENCH.

Use a 12 V 88 Ah/440 A fully charged battery :

- Minimum torque at 1,000 rpm ..... 2.4 m.daN
- Maximum corresponding current ..... 800 A
- Locked torque ..... 4. m.daN
- Maximum corresponding current ..... 1,150 A
- Voltage ..... 4.75 V
- Maximum power ..... 2.6 kW
- Voltage ..... 7 V
- Current ..... 900 A
- Torque ..... 1.8 m.daN

DUCELLIER 538 006 STARTER MOTOR

CHARACTERISTICS.

12-volt solenoid starter with a positive control
Pinion : 9 teeth
Direction of rotation (seen from drive end) : Clockwise
Number of contacts : 4
Nominal output : 2.3 kW
Nominal width of brushes : 12 mm
Min. length after wear : 7 mm
Brush reference (set of 4) : 618 509
Diameter of armature commutator : 40 mm
Solenoid reference : 681 726
Starter pinion reference : 681 898

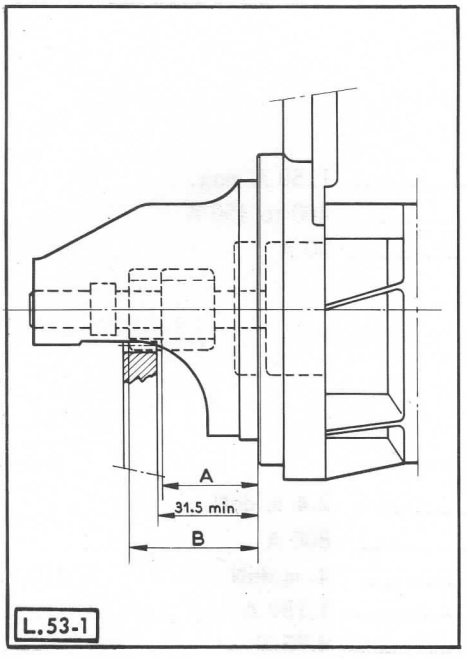
ADJUSTMENT.

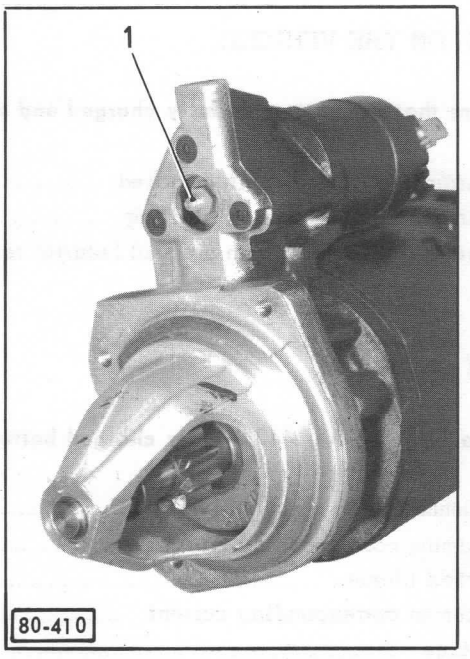
Starter pinion travel adjustment :

Adjustment distance with pinion in free position (solenoid not energized) **A = 29.92 mm**

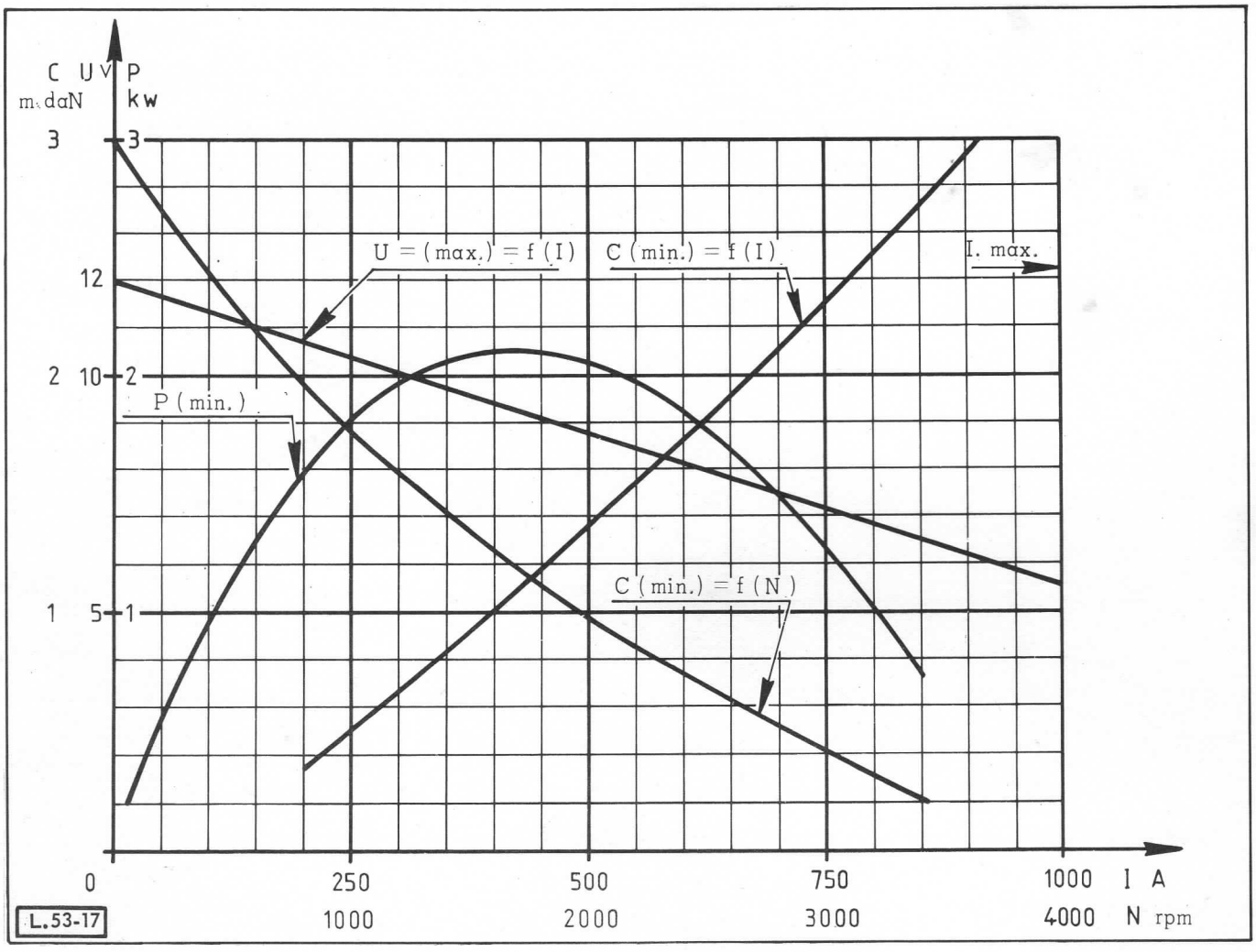
Adjustment distance with pinion engaged (solenoid energized) **B = 39.52 mm**

The starter pinion adjustment is carried out by turning nut (1).





CHECKING A DUCELLIER **538 006** STARTER MOTOR



Operation published together with Information Bulletin No. 80-60 MA

TEST ON THE VEHICLE.

Ensure that the battery is fully charged and measure the following :

a) Current consumed, pinion locked ..... 1,000 A
b) Current consumed when starting ..... 400 to 450 A
c) Current consumed, with no load (starter removed) ..... 100 A approx.

TEST ON BENCH

Use a 12 V 88 Ah/440 A fully charged battery :

- Minimum torque at 1,000 rpm ..... 1.8 m.daN
- Maximum corresponding torque ..... 625 A
- Locked torque ..... 4 m.daN
- Maximum corresponding current ..... 910 A
- Voltage ..... 6 V
- Maximum power ..... 2.1 kW
- Voltage ..... 9 V
- Current ..... 450 A
- Torque ..... 1,2 m.daN