SERVICE

SIMCA

WORKSHOP MANUAL

Simca
Shop
Manual

SIMCA

AUTOMOBILES

SOCIETE ANONYME AU CAPITAL DE 360 000 000 DE F.

R. C. SEINE 60 B 5.911

SIEGE SOCIAL : 5, RUE BEAUJON, PARIS-VIII[e]

DIRECTION APRES VENTE

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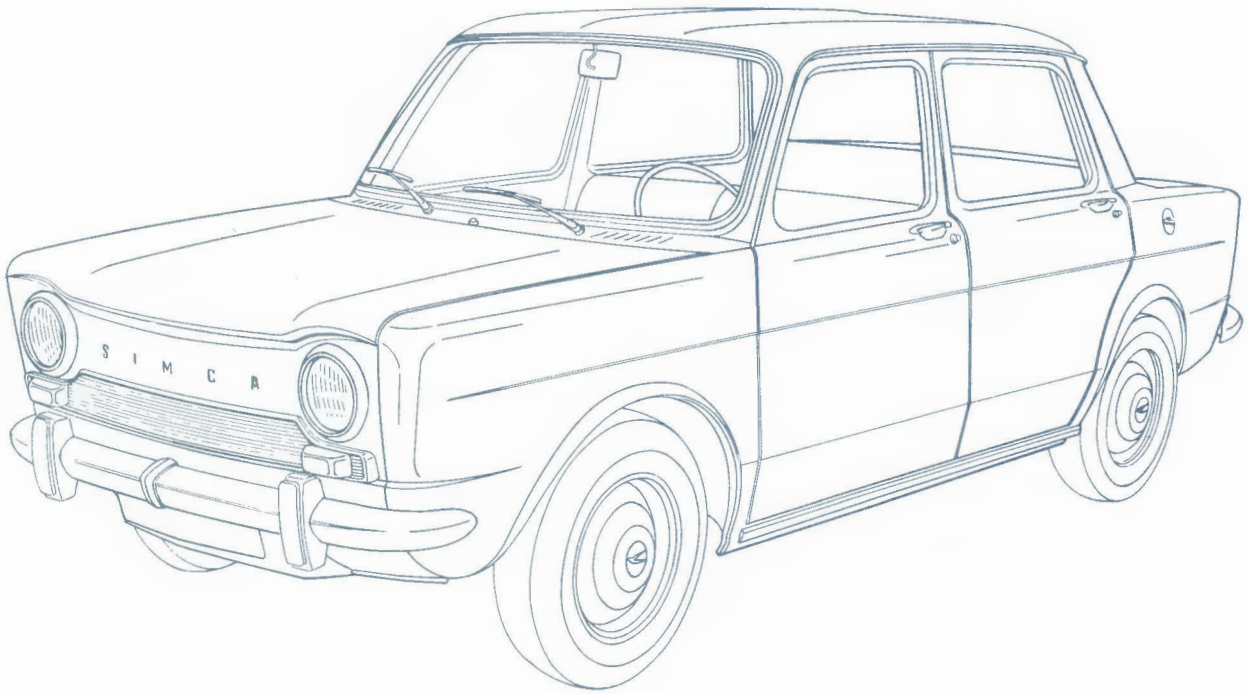
WORKSHOP MANUAL

Simca 1000



SERVICE SIMCA

FOREWORD

We know that you service and repair the cars of your customers with great care, such a care is the basic factor for the **good renown of**

Simca Service and the long confidence of our Customers.

This **Shop Manual** will help you by showing the repair methods worked out by our Engineering Office, thus you will avoid to proceed by trial and error, which is a costly operating process,

And your Customers will be satisfied in the shortest possible time.

We insist specially on the fact that such methods and this «know - how», even your own skill, could become worthless in case you do not use

Simca Genuine Spare Parts.

Do not forget that our engagements do not stop after the car is sold. . . . . the very moment you seize this «relay race stick», you will determine to handle it along the friendly Service way leading to increased sales.

SERVICE SIMCA

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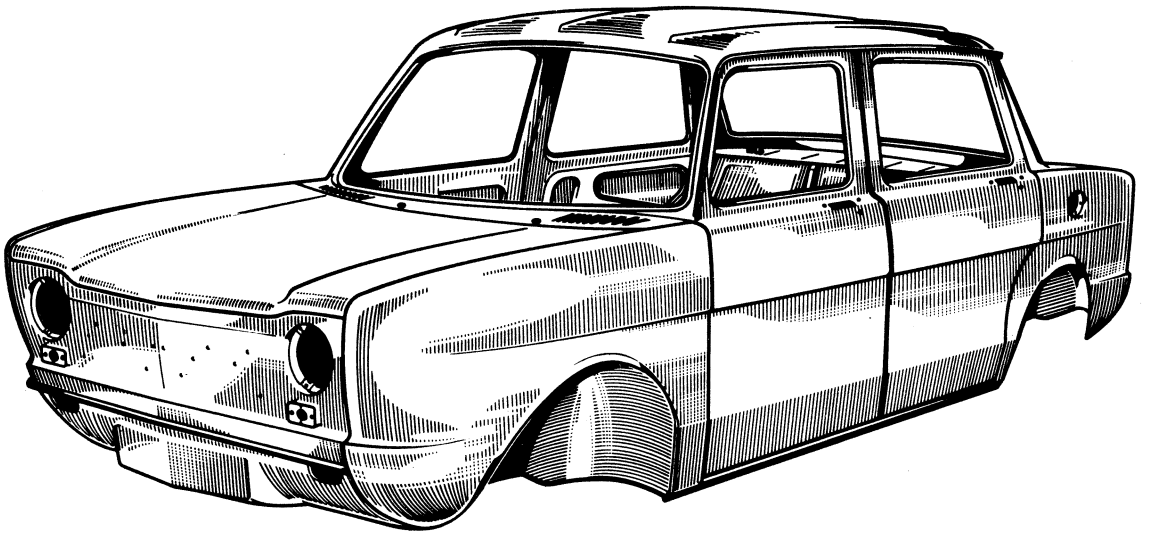
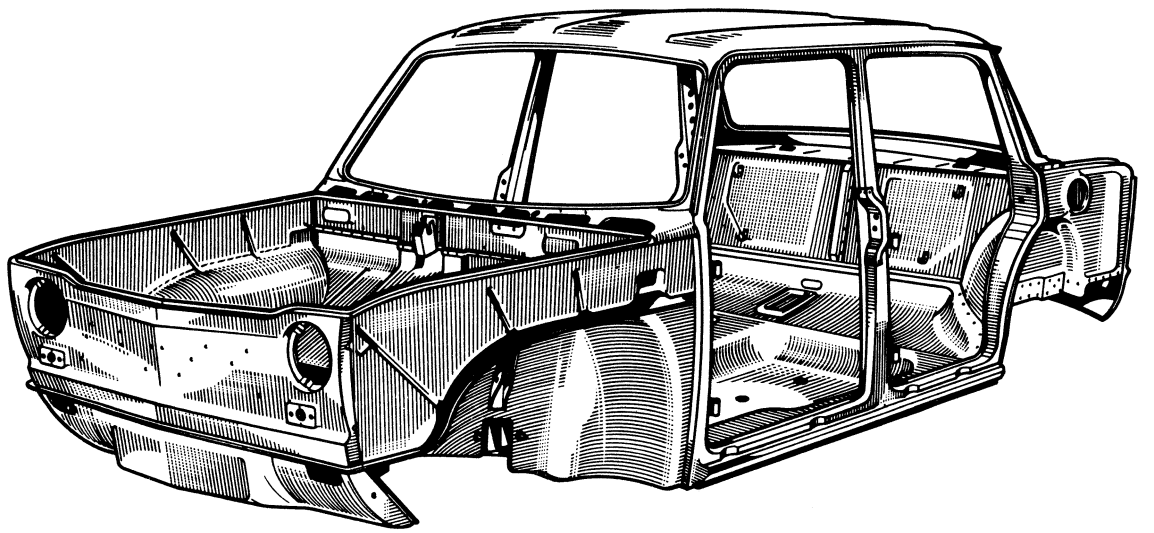




DESCRIPTION AND MODE OF OPERATION

The body of this car is of the «unitized body» type made of pressed and welded steel sheet. It is equipped with 4 doors, front and rear fenders are detachable.

The underbody, forming one piece with the chassis, is made of a main frame including:

- 2 side members of variable cross-section and reinforced at their rear end
- 2 cross-members welded under front seats and rear seat
- aprons

The floor panel, which has two depressions, a lengthwise and narrow tunnel covering controls towards engine compartment and hot water pipes of heater-defroster.

This tunnel is also used as reinforcement of the floor panel.

The passenger's compartment structure includes:

- the cowl panel and floor panel assembly forming a part of body which is the front compartment
- frames of door openings
- body pillars
- rear panel
- ribbed roof panel is also equipped with a reinforcing cross-member and is welded to roof panel reinforced rails

Detachable front and rear fenders are secured to body by screws.

The cowl panel underside includes a duct which collects outside air through 2 openings, this air being directed to heater-defroster inlet opening.

The front compartment lid is hinged at its front end to avoid any accidental and dangerous opening, it has a 70 degrees opening angle giving access to a luggage compartment of 173 dm^3 (or 5.2 cu-ft) capacity containing spare wheel and tools - the front compartment lid lock is controlled by a rod and a handle located under instrument panel, inside the car.

The front compartment lid is equipped with a hinged prop sliding in a retaining spring locking this lid when fully open.

Two series of louvers are located in the engine compartment lid, the LH louvers admit fresh air sucked by the engine fan.

The lock of this lid is located in the upper middle of the rear panel, its handle protruding J above the rear license plate lamp.

The whole engine compartment is easily accessible when its lid is fully open.

The front panel on which is secured the front grille, is made of 2 pressed and reinforced steel components, the body rear panel, welded to a cross-member and an upright reinforcement has a depression for the rear license plate and two other depressions for rear lights.

Front and rear doors, with outer and inner pressed steel panels, hinged at their front end, are retained by check arm with positive stop.

Front and rear doors opening angle : between 75 and 80 degrees.

They are equipped with new dual safety locks, this safety being obtained by side and lengthwise strikers.

These doors are easily and quietly locked by means of a reinforced nylon dog and guiding nylon roller.

Body outer trimming

Front and rear bumpers are made of 2 interchangeable blades with center fish plate.

They are secured in 4 points by means of supports fastened to body side members.

Glass panels

Wrap around windshield made of «bisécurit» glass with an area of 4820 cm^2 (or about 747 sq. inches).

The curved back light also made of «securit» glass has an area of 4200 cm^2 (or 651 sq. inches).

The door window glasses have a total area of 8266 cm^2 (or about 1281 sq. inches).

There is no mobile or stationary deflector in door windows.

Front door glass panels are fully lowered rear door glass panels are partially lowered.

Handles - door locks controls

The door outer handles made of polished aluminum are stationary.

From outside, doors are open by depressing a cylindrical push-button located under the door handle rear attachment.

This push-button controls directly the door lock.

The LH side front door push-button is equipped with a barrel lock which is locked and unlocked by a key.

Inner door handles are made of plastic material, they are also used as arm-rests.

From inside, doors are open by pulling a chromium plated ball lever, located at the arm-rest front end and controlling the door lock with a remote control.

From inside, doors are locked by pushing the ball lever downwards.

Floor panel trimming

Black rubber mats cover floor panel felts, these felts being used as sound deadener for passenger's compartment.

Cowl trimming

Cowl side panels are covered with black grained cardboard for all types of cars.

Wheel houses are covered with black rubber.

Roof headlining

The headlining cloth is held in position by 4 bows secured to roof side rails.

Front seats

They consist of two separate adjustable seats with curved back rests.

They are supported by a tubular framework with cushion frame and back rests with NO-SAG springs.

These two seats are supported by 7 position slides and rails with a backwards motion of 75 mm (or 2.95'') with regard to seat intermediate position (space between back-rest and steering wheel : 325 mm or 1.25'').

The seat position control lever is located near the car centerline.

Rear seat and back rest

This bench type seat consists of a framed cushion and a back rest with NO-SAG springs.

Instrument panel

It consists of 2 detachable components, the RH side supports the glove compartment, the LH side supports the instrument cluster.

The instrument panel assembly is coated with anti-dazzle black paint.

A flexible protective strip is fitted to lower part of this instrument panel, facing passenger's seat.

Rear view mirror

This mirror, supported by a plastic case, is located above the windshield upper edge, on car center-line.

Windshield pillars

The inner side of these pillars is covered with a painted steel sheet moulding of same color as body.

Center pillars

They are not garnished, their inner side being painted with same color as body.

Weatherstrips

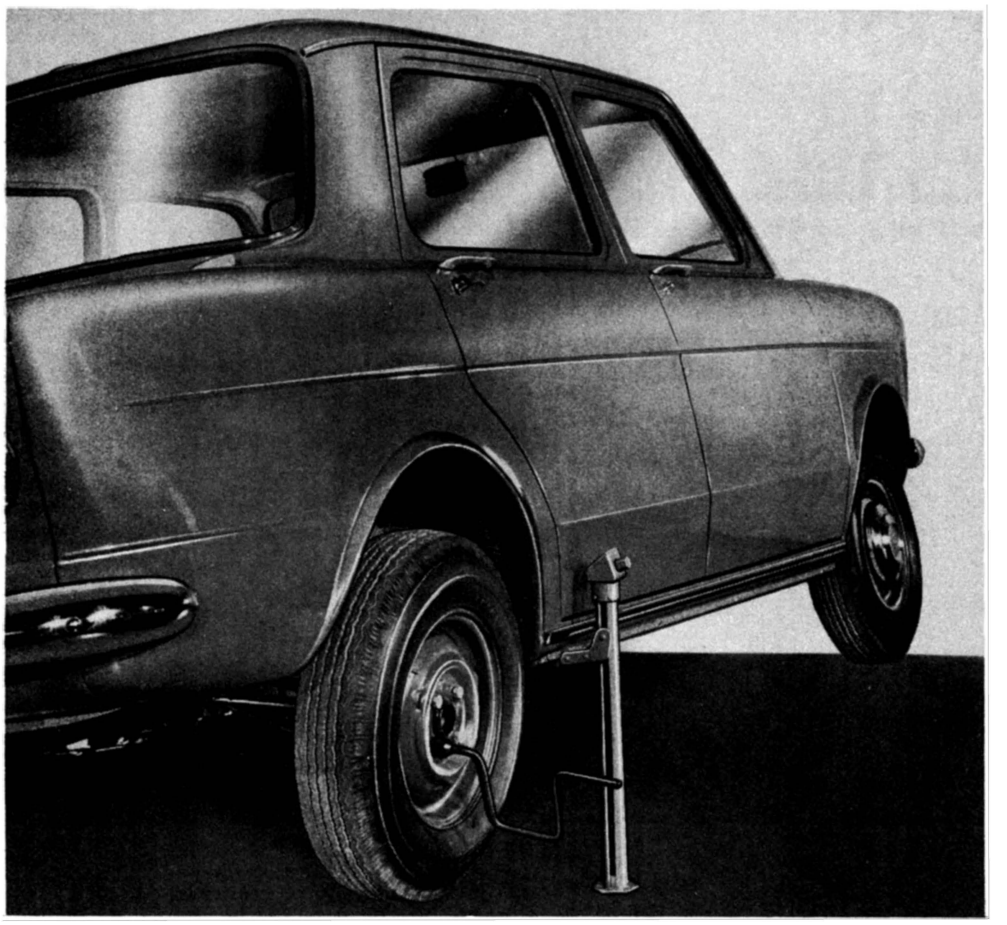
Doors are equipped with cemented rubber weatherstrips and supplementary clips near body angles, the door openings are edged with a finishing bead; on door sills the vinyl bead is replaced by an aluminum strip.

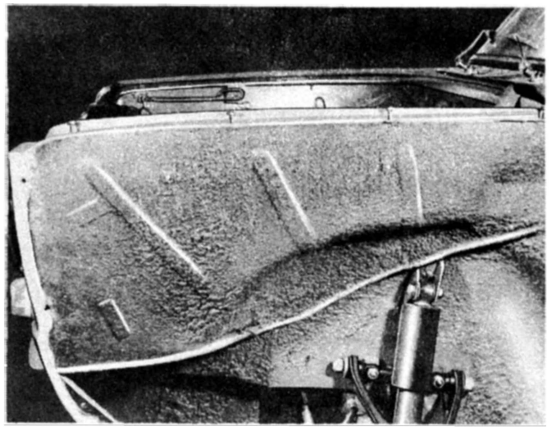
How to lift the car

HOW TO CHANGE A WHEEL

This operation is performed by means of 2 tubular supports (or gussets) for inserting the jack extension arm, these gussets are located under the lower front end of each rear wheel house.

These gussets are positioned in such a manner that they can be used to lift rear or front wheels of car.

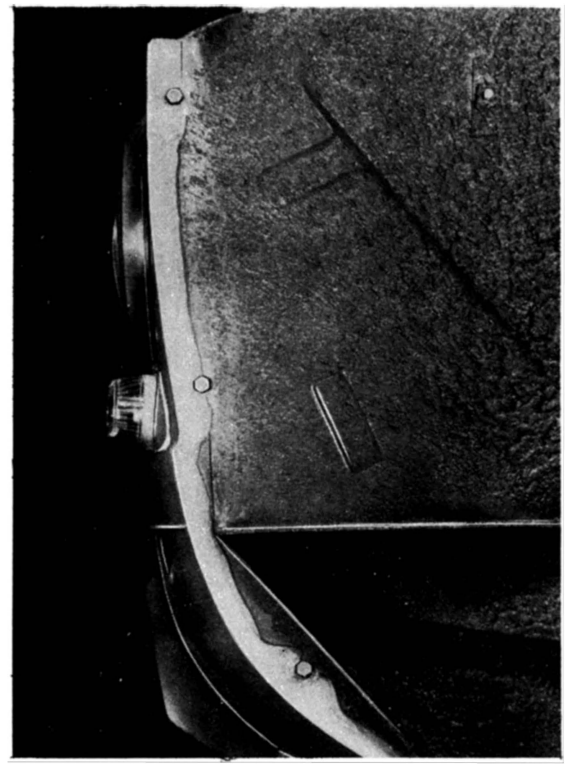




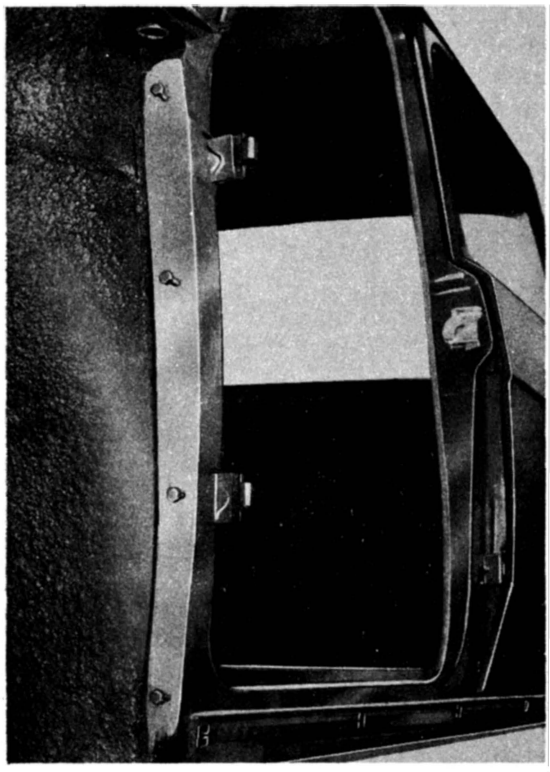
How to remove a front fender

- Remove front bumper

- In drip rail, unscrew 4 screws (10 mm or .39") and Philips screw (Fig. 1).

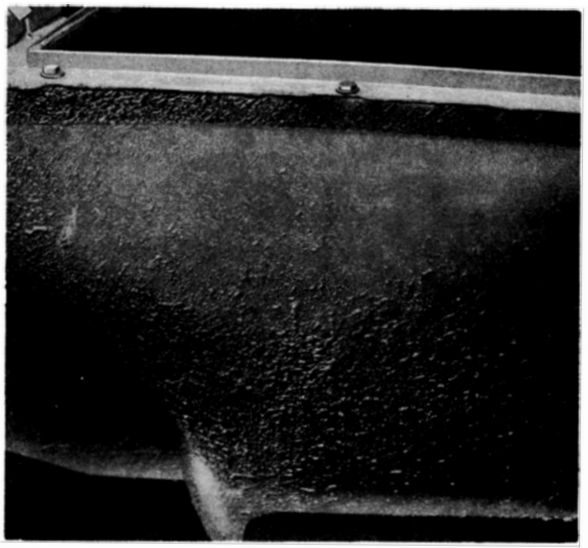


- On front wheel house face, unscrew 3 screws (10 mm or .39") (Fig. 2).



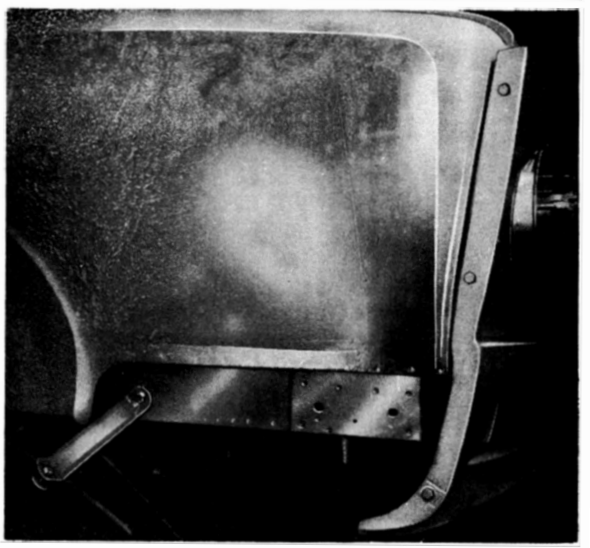
- On front pillar, unscrew 4 screws (10 mm or .39") (Fig. 3).

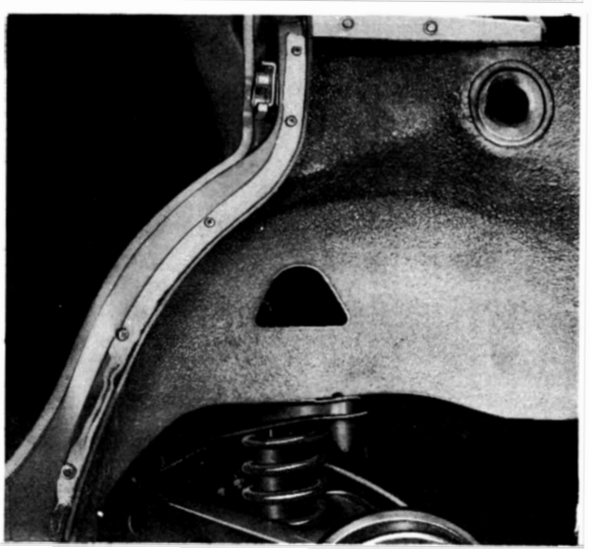
- Remove front fender.



How to remove a rear fender

- Remove rear bumper
- Remove parcel tray, remove trimming from body corner
- Free metal wire to lift headlining cloth
- Unscrew 2 screws (10 mm or .39") (Fig. 4).
- In drip rail, unscrew 3 screws (10 mm or .39") (Fig. 5).
- On wheel house face, unscrew 3 screws (10 mm or .39") (Fig. 6).
- On door opening, unscrew 5 Philips screws (Fig. 7).
- Unscrew lower strip securing screw on rear fender.
- Disconnect fuel filling neck.
- Remove rear fender.



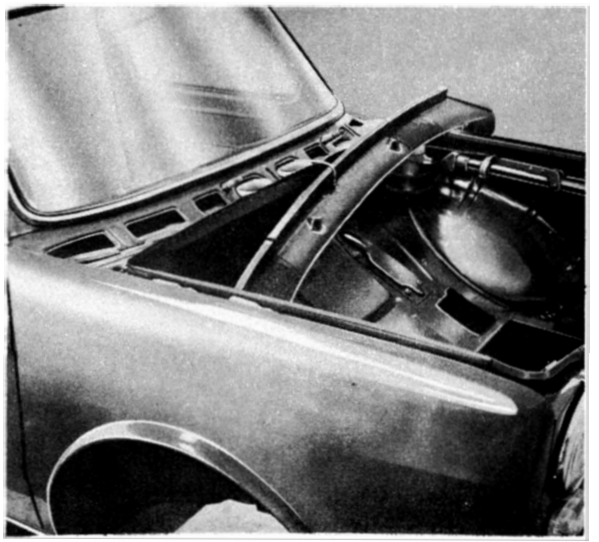


How to reinstall a front or a rear fender

To reinstall a front or a rear fender, you should follow the reverse sequence of previous operations after following operations are performed:

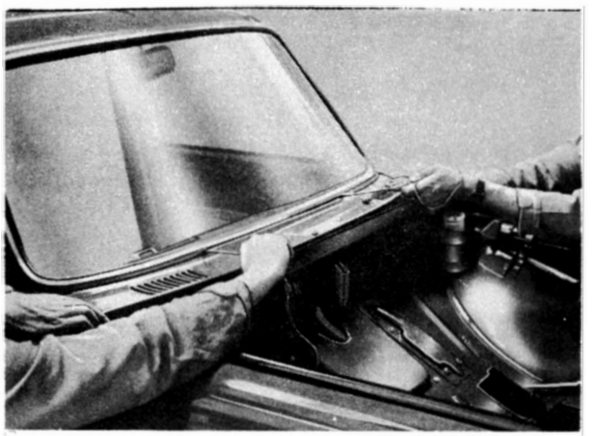
- Cleaning of bearing faces
- Bearing faces are coated with heat hardening cement.

Primer coated fender is painted.



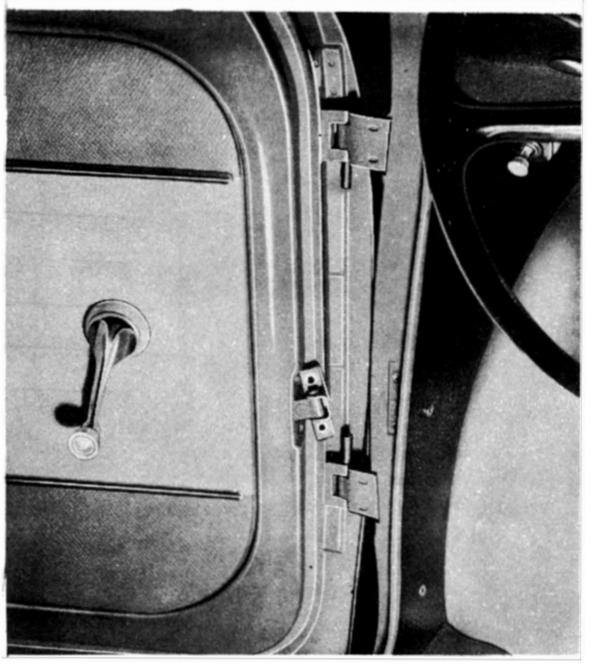
How to remove the air inlet panel

- Remove windshield wipers
- Remove nuts
- Remove sheet steel cups
- Remove sealing bushes
- Unscrew securing screws of panel to body
- Remove air inlet panel (Fig. 8).



When reinstalling this air inlet panel, insert a string under the windshield weatherstrip lower lip.

- Position air inlet panel
- Pull string to place weatherstrip lip on body edge (Fig. 9).



HOW TO REMOVE A DOOR

- Unscrew 2 securing screws of door check arm
- Remove 2 «mecanindus» pins
- Remove door (Fig. 10).

HOW TO LIFT THE CAR

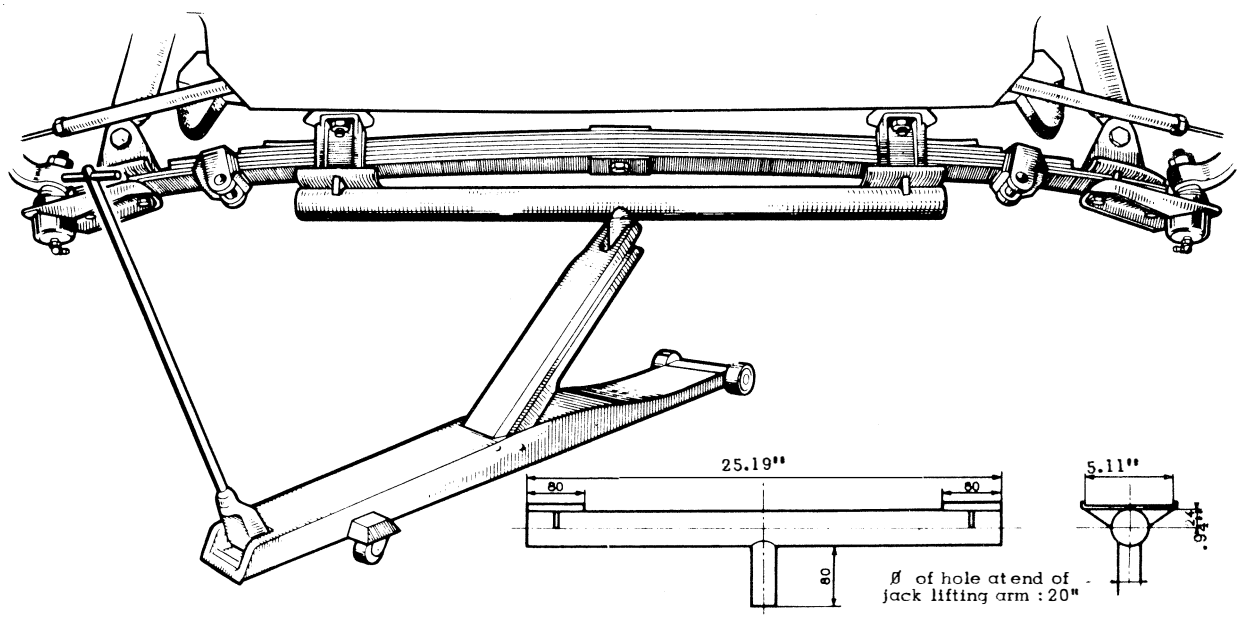
You should strictly comply with the following directions to lift the car with a workshop jack.

1 - To lift the front end

It is mandatory to have the jack bearing on the LH side and the RH side front spring supports fastened on the side members.

For this purpose, the lifting arm end of the jack should be fitted with a tubular bar as shown hereunder.

You should never lift the car by placing the end of the jack lifting arm under the middle of the front spring, as the front spring main leaf could be marked, such a mark being a possible cause of breaking. This tool is available in our Spare Parts Department under Part Number : 39.975 - Q



2 - To lift the rear end

Place the jack lifting arm end exactly under the center of the rear cross-member supporting the engine.

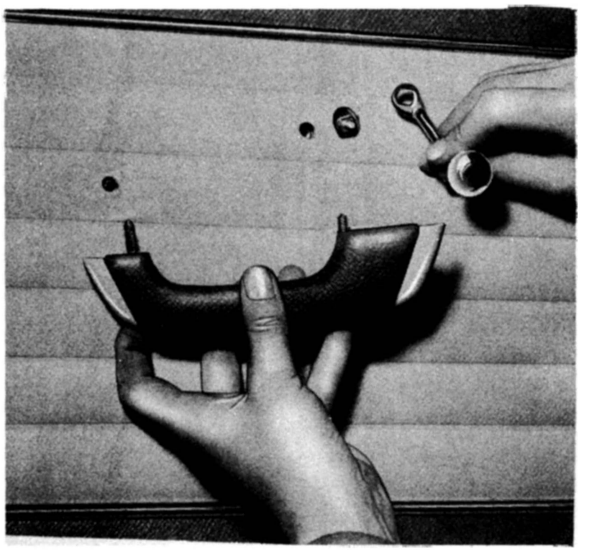
How to disassemble a door

- Remove 2 screws under arm rest attaching ends

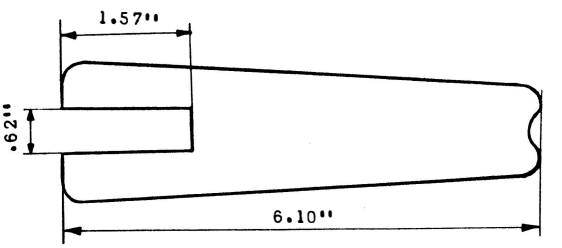
- Remove arm rest

- Remove nut (10 mm or .39'') securing door lock remote control handle.

- Remove handle (Fig. 11). ▶



- Remove window regulator handle with a tool made as shown on the figure in the margin:



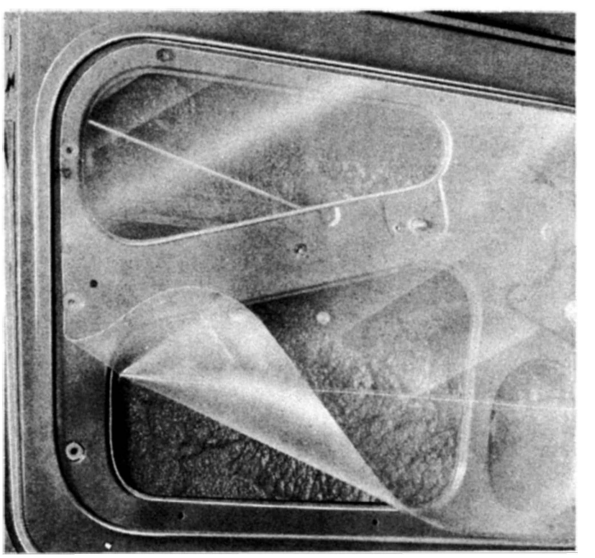
This tool, preferably cut in tempered sheet steel, 1| mm (or .39'') thick, has a notch at each end; one is 40 mm (or 1.57'') long and 16 mm (or .62'') wide, the other is only a small rounded depression.

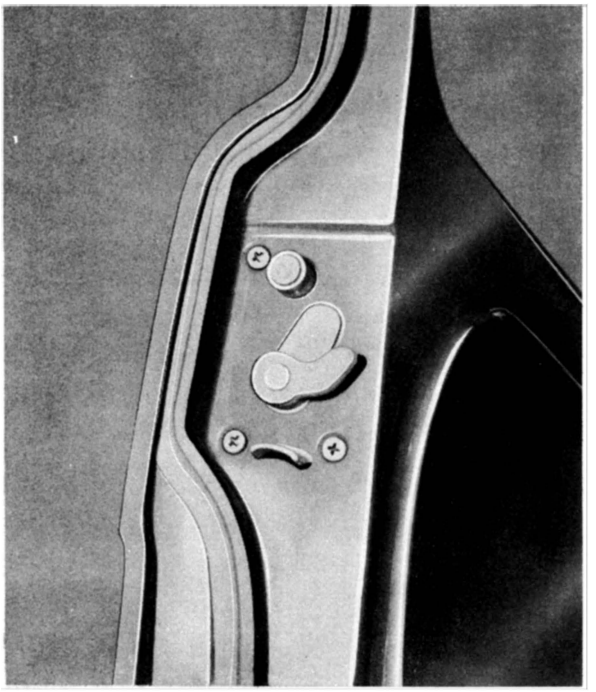
Press on escutcheon and insert under door window regulator the tool longer notch. The two ends of this notch will rest on retainer two ends, consequently this retainer will be easily removed.

- Remove window regulator handle.

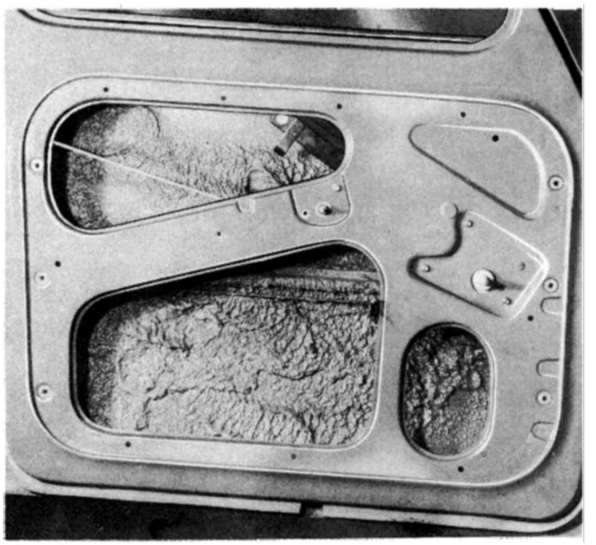
- Remove door trim cardboard by means of a screwdriver inserted behind it for disengaging fasteners.

- Remove vinyl sheet (Fig. 12). ▶

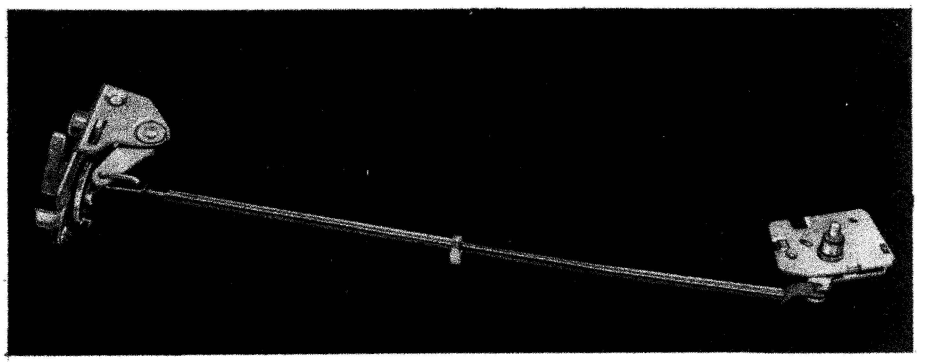




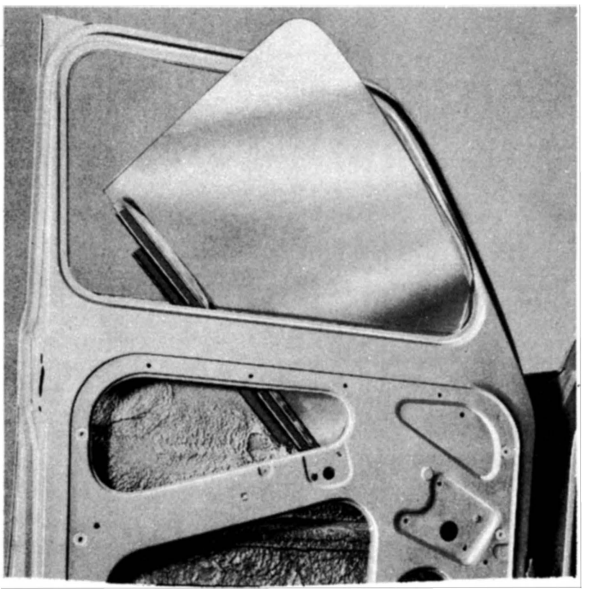
- Remove three screws securing lock to door side (use a Philips screwdriver) (Fig. 13).



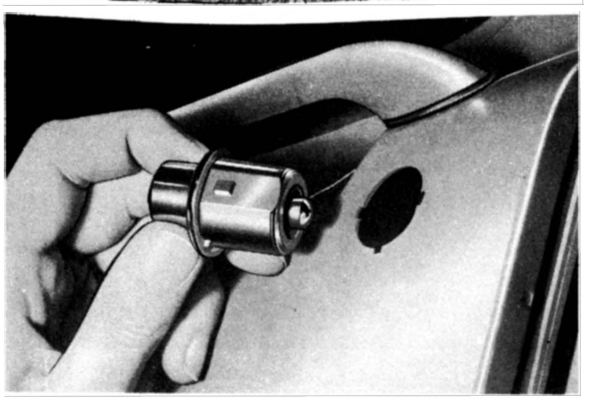
- Remove securing screws of lock control (Fig. 14).
- Remove lock and control assembly (Fig. 15).
- Remove 3 securing screws of window regulator control (Fig. 14).
- Remove glass from its run
- Remove control by pulling it downwards
- Remove window outside lip to ease removal of glass.



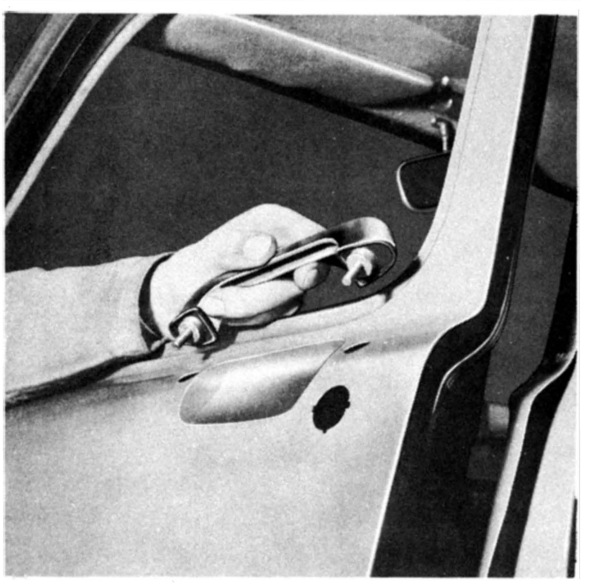
- Remove glass by pulling it upwards and vertically (Fig. 16).



- Remove door lock inner retainer.
- Remove door lock (Fig. 17).



- By door inside, remove 2 securing screws of outer handle.
- Remove door outer handle (Fig. 18).



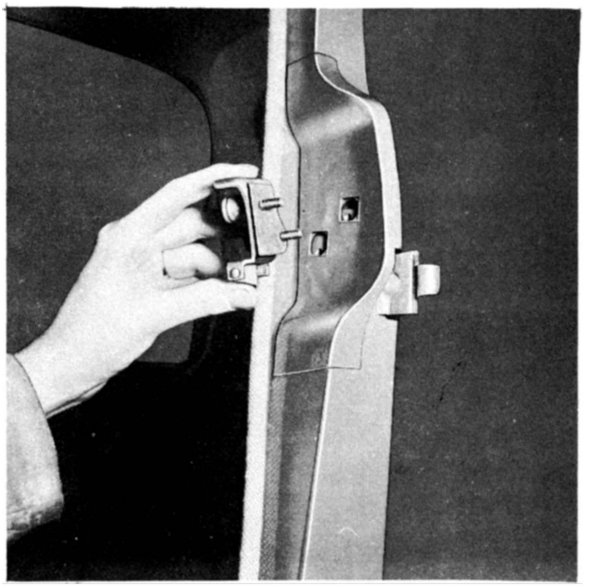
HOW TO REASSEMBLE THE DOOR

- To reassemble the door, you should follow the reverse sequence of previous operations.

How to remove and disassemble a rear door

- For these operations, you should follow the same procedure as for the front door.

How to remove the front door lock striker



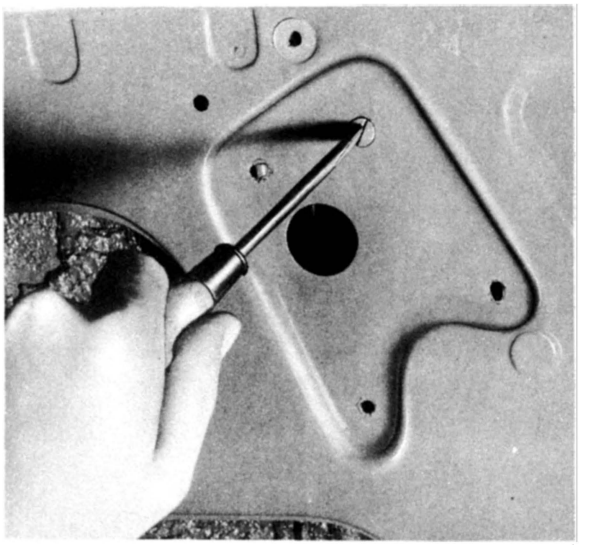
- Remove 2 securing screws
- Remove striker (Fig. 19).

How to remove the rear door lock striker

- Remove 2 securing screws
- Remove door lock striker
- Remove securing plate (Fig. 20).

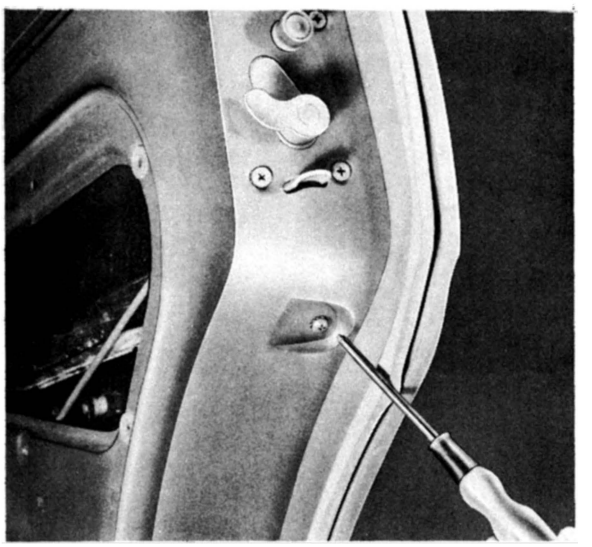
How to adjust the front door glass run

- Loosen adjusting screw
- Adjust glass run
- Tighten adjusting screw (Fig. 21).



How to adjust the rear door glass run

- Loosen adjusting screw
- Adjust glass run
- Tighten adjusting screw (Fig. 22).



Headlining cloth

This headlining cloth is stretched by means of a metal wire which is itself stretched at end of assembling operation.

This metal wire runs through headlining cloth hem.

This wire should be inserted under back light garnish moulding after it is stretched on two lugs fastened to body, on RH and LH side of backlight (Fig. 4).

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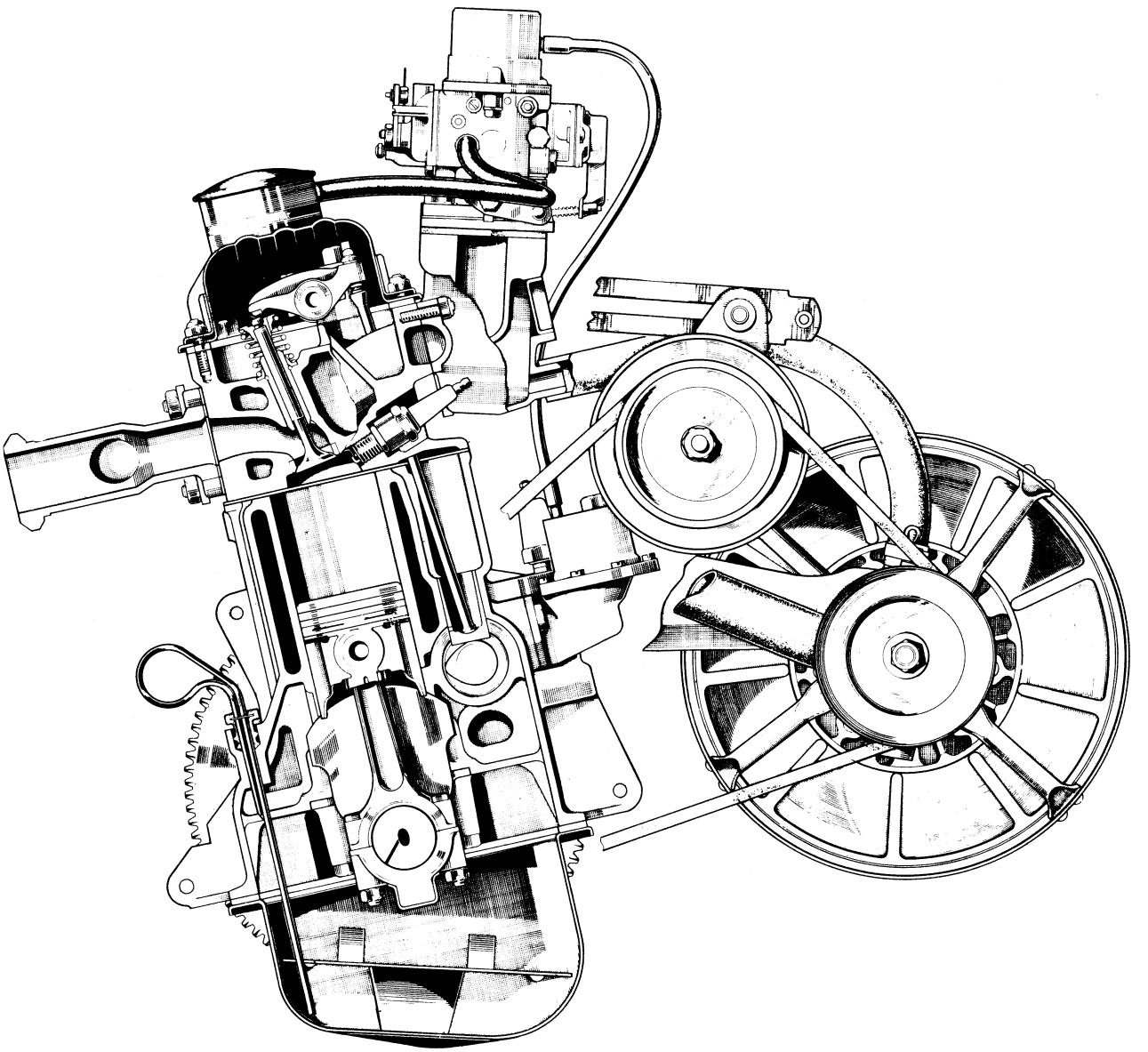
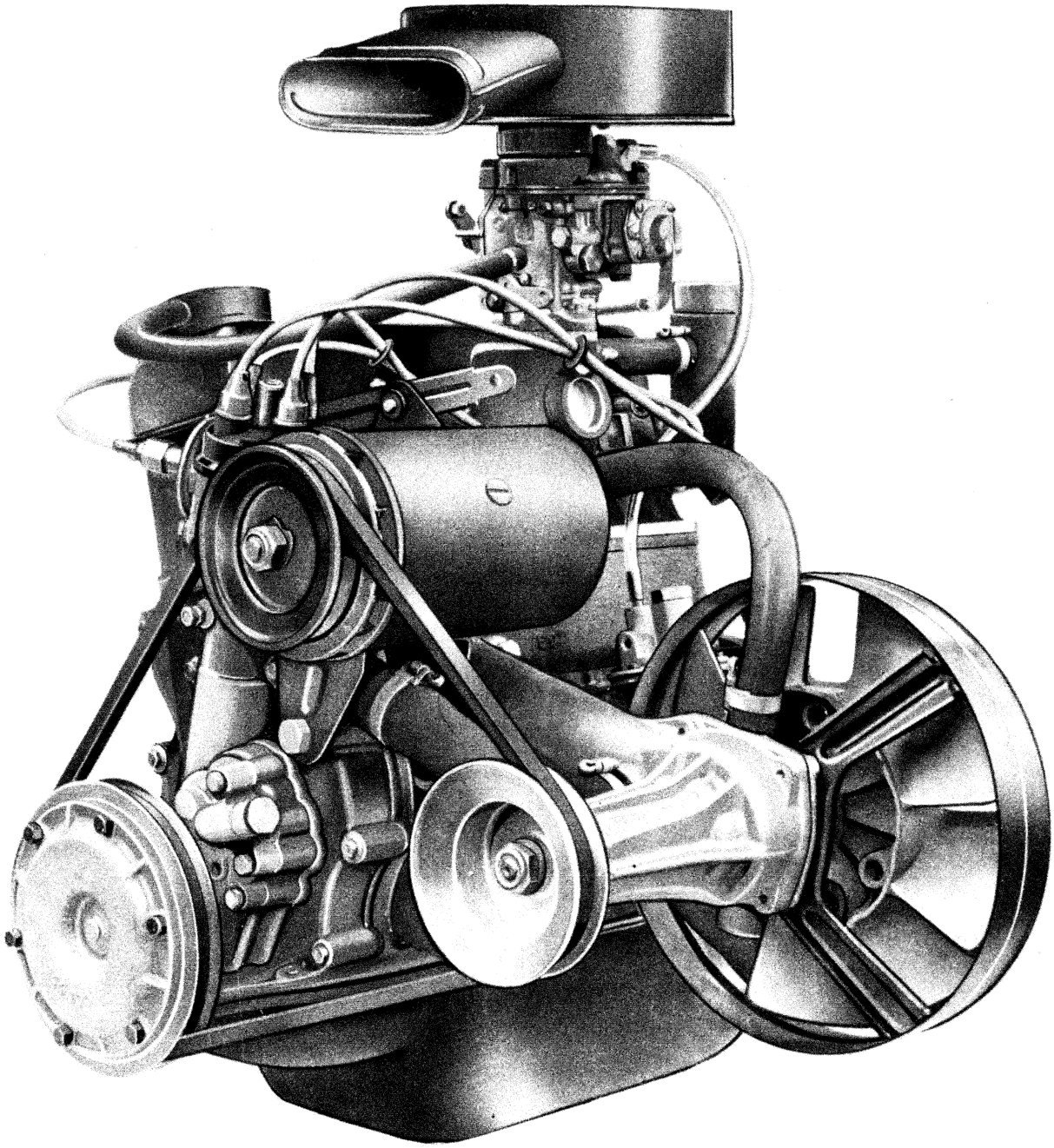
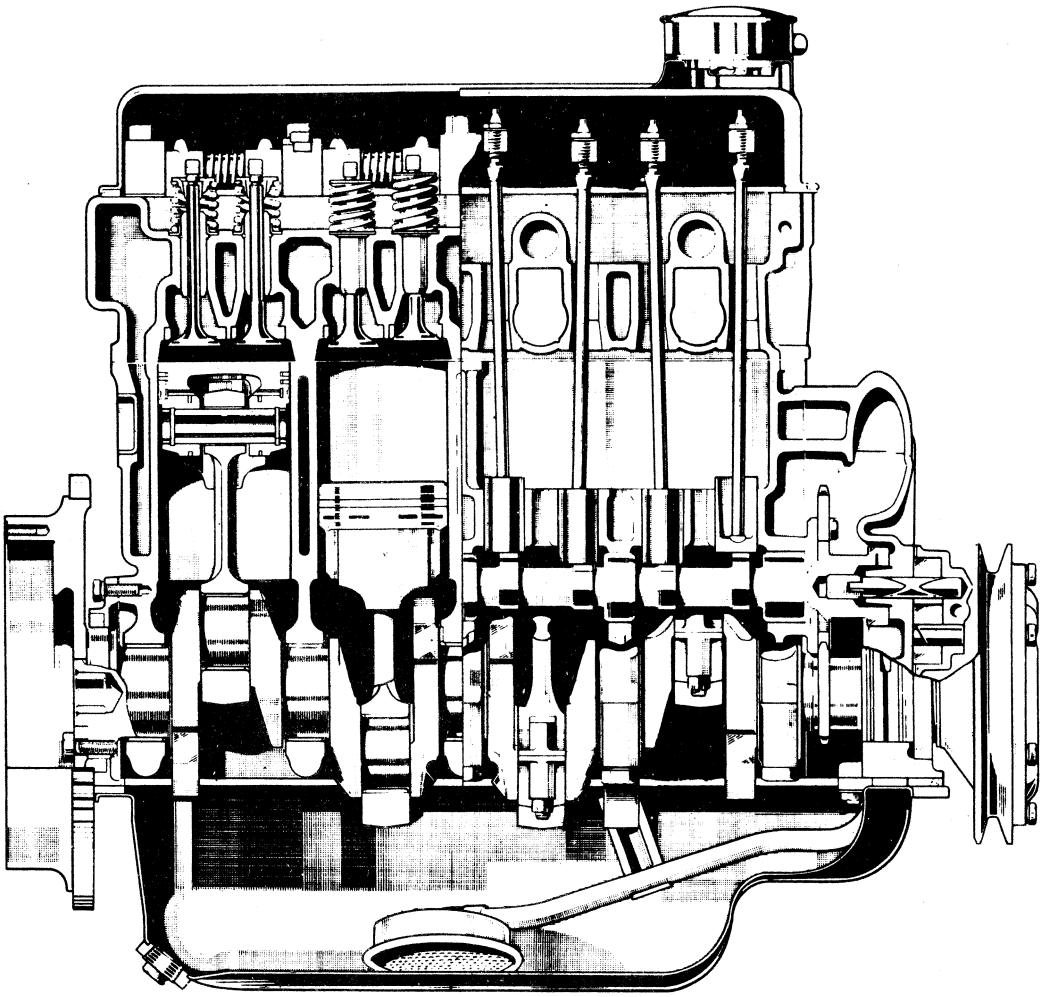


CROSS-SECTION





LONGITUDINAL SECTION

ENGINE SPECIFICATIONS

• Type	: internal combustion - 4 stroke
• Number & disposition of cylinders	: 4 - in-line - tilted 15° to the left
• Engine location in car	: rear of the car
• Bore	: 68 millimeters or 2.67 inches
• Stroke	: 65 millimeters or 2.55 inches
• Piston displacement	: 944 cubic centimeters or 57.60 cub. inches
• Compression ratio	: 7,8 to 1 7 to 1 - for areas where the octane number is below 86 (RM)
• Maximum power output (SAE rating)	: 45CV at 5,000 r.p.m
• SAE maximum torque	: 7.5 m/kg or 54.24 ft. lb at 2,800 r.p.m.
• Firing order	: 1 - 3 - 4 - 2
	: inlet opens before TDC 16°30
	: inlet closes after BDC 58°
• Distribution data	: exhaust opens before BDC 60°30'
	: exhaust closes after TDC 14°
• With a theoretical cam clearance of the valve stem theoretical clearance should be	: 0.37 mm or 014" : 0.487 mm or 188"
• Ignition initial advance	: 8°, that is : 11 mm or 434"
• Overall length (including Flywheel, oil pump and fan)	: 540 millimeters or 21.25 inches
• Overall width	: 635 millimeters or 24.90 inches
• Overall height (less air filter)	: 580 millimeters or 22.83 inches
• Weight (with accessories, dry engine oil pan, less clutch)	: 89 kilos or 196.21 lbs
• Suspension of power plant	: 3 points : - front of engine : 1 point - rear of engine : 2 points
• Engine oil pan capacity	: 2,5 litres or 0.65 US Gal. or 4.37 UK. pts.

TIGHTENING TORQUES

	Metric kgm (Average figures)	English lb. ft (Average figures)
Cylinder head		
Screws, cylinder head to cylinder block attaching	6.2	45
Nuts, intake manifold attaching	1.6	12
Nuts, exhaust manifold attaching	2.0	15
Screws & nuts, rocker arm adjusting	1.6	12
Screws, rocker arm shaft adjusting	1.0	7
Sparking plugs to cylinder head	2.8	20
Thermocontact, water temperature	1.5	11
Screw, water outlet elbow attaching	1.0	7
Screw, cap to water outlet elbow attaching	1.0	7
Screw, generator adjusting arm to bracket attaching	4.7	34
Cylinder block		
Screws & nuts, gear box attaching	4.7	34
Screws, crankshaft main bearing cap attaching	6.5	47
Switch, oil pressure	3.5	25
Plug, cylinder block drain	2.0	15
Screws, oil pan attaching	1.0	7
Screws, crankshaft rear bearing sealing shell attaching	1.0	7
Screws & nuts, timing gear cover attaching	1.0	7
Screws & nuts, stay bracket attaching	1.0	7
Screws & nuts, water pump supporting arm attaching	2.0	15
Screws, fuel pump attaching	2.0	15
Screws, generator to cylinder block attaching	4.7	34

	Metric kgm (Average	English lb. ft figures)
Engine suspension		
Screw, supporting leaf to bracket attaching	2.4	17
Screws, leaf & bracket to rear cross member attaching	2.4	17
Screws, leaf stop & bracket to rear suspension cross member attaching	2.4	17
Screws, suspension yoke to gear box rear cover attaching	7.2	52
Nut, leaf to engine front suspension yoke attaching	5.2	38
Nuts & screws, engine support c/member to body attaching	4.7	34
Screws, engine supports to cylinder block attaching	2.2	16
Nuts, engine support shaft upper attaching	1.2	9
Nuts, engine support shaft upper attaching	1.2	9
Nuts, suspension stay to engine & to cross member attaching	2.0	15
Crankshaft		
Screws, flywheel to crankshaft attaching	3.0	22
Screw, oil centrifugal separator center	8.0	58
Miscellaneous		
Screws, connecting rod cap attaching	2.3	17
Screw, timing gear to camshaft attaching	1.0	7
Screws, oil pump cover attaching	1.0	7
Plug, oil pump relief valve	3.2	23
Screw & nut, oil strainer to timing gear cover attaching	2.0	15
Screw, oil strainer to bracket attaching	1.0	7
Screws, cover to oil centrifugal separator attaching	1.0	7
Screws & nuts, water pump cover attaching	2.0	15
Nut, radiator fan attaching	5.7	41
Nut, pulley to water pump shaft attaching	5.7	41
Screws, engine flywheel cover plate attaching	2.2	16
Nuts, carburetter attaching	2.0	15
Screw, generator adjusting arm to bracket attaching	2.0	15
Screw, generator to adjusting arm attaching	2.0	15
Screw, starter motor attaching	2.0	15

TIGHTENING TORQUES APPLICABLE ONLY TO COUPE SIMCA 1000

Screw, oil pressure feeler connecting ring to engine attaching	2.7	20
Oil pressure feeler to connector attachment	2.0	15
Feeler, water temperature to engine	2.5	18

ENGINEERING DATA

		Metric	English
Engine oil pressure		: 4 kg/cm2 at 3000 R P M	56.89 lb.s.i.
Engine oil pan capacity		: 2.5 liters	2.6 US liq. qts 4.3 UK pts
Valves, intake	head diameter	: 29 mm	1.14"
	stem diameter	: 6.985 to 7 mm	.275 to .276
	bearing angle	90°	
Valves, exhaust	head diameter	: 26 mm	1.02"
	stem diameter	: 6.946 to 6.966 mm	.273 to .275"
	bearing angle	90°	
Lift of cams		: 5.72 mm	.225"
Lift of valves		: 7.49 mm	.295"
Seats of valves	intake, outer Ø	: 31.1 to 31.185 mm	1.227" to 1.2275"
	exhaust, outer Ø	: 28.1 to 28.125 mm	1.111" to 1.112"
	intake bore Ø	: 26mm	1.02"
	exhaust bore Ø	: 23 mm	.905"
	bearing angles	88° to 88°30'	
Valve springs	free length	: 35.4 mm	1.393"
	outer Ø	: 28 mm	1.102"
	inner Ø	: 20 mm	.787"
	wire Ø	: 3.6 mm	.142"
	length	: 29 mm	1.141"
	under a load of	: 21 kg	46.29 lbs
Valve push rods	length	: 40 mm - 0.005	1.574" - .0001
	diameter	: 22 mm - 0.020	.867" - .0007
Valve guides	length	: 44.5 mm	.1.752"
	(up to engine Number	: 5.042.729)	
	length	: 42.5 mm	.1.674"
	(from engine Number	: 5.042.730)	
	outer Ø	: 13.9 to 14.0 mm	.550" to .552"
	bore after fitting	: 7.02 to 7.04 mm	.276" to .277"
Rocker arms clearance (cold)		: 0.30 to 0.35 mm	.012" to .014"
Rocker arms clearance (warm)		: 0.35 mm	.014"
Sparking plugs	MARCHAL 35 H	: up to engine Number	: 5.039.491
	AC 44 XL	: from engine Number	: 5.039.492
	MARCHAL 35 HS1	: from engine Number	: 5.039.492

	Metric (millimeters)	English (inches)
CYLINDERBLOCK		
Bore of cylinders	67.9925 to 68.0225	2.676 to 2.678
Class A	67.992 to 68.002	2.676 to 2.677
Class B	68.002 to 68.012	2.677 to 2.678
Class C	68.012 to 68.022	2.678 to 2.679
Camshaft - bearings inner diameters		
Front	35.504 to 35.534	1.397 to 1.398
Middle	36.504 to 36.534	1.437 to 1.438
Rear	37.504 to 37.534	1.476 to 1.477
CAMSHAFT		
Journals outer diameters		
Front	35.454 to 35.469	1.395 to 1.396
Middle	36.454 to 36.469	1.435 to 1.436
Rear	37.454 to 37.469	1.474 to 1.475
Diametral clearance (of camshaft bearings)	0.035 to 0.080	.014 to .0315
PISTONS		
Diameter at skirt base, perpendicularly to centerline		
Ø	67.935 to 67.965	2.674 to 2.675
Class A	67.935 to 67.945	2.674 to 2.6745
Class B	67.945 to 67.955	2.6745 to 2.6746
Class C	67.955 to 67.965	2.6746 to 2.575
Bore of piston hole for pin	19 - 0.007 - 0.011	.749 - .0003 - .0004
Piston pin offset	1.5	.059
Width of piston ring grooves		
Compression ring	1.75 + 0.050 + 0.035	.069 + .002 + .0014
Upper oil control ring	2 + 0.050 + 0.035	.079 + .002 + .0014
Lower oil control ring	4 + 0.035 + 0.015	.1575 + .0014 + .0006

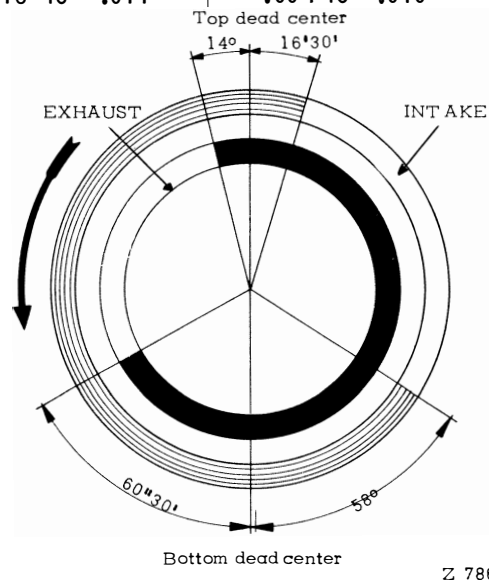
	Metric (millimeters)	English (inches)
Piston pin		
Length	54	2.12
Outer diameter	19 - 0.005 - 0.010	.749 - .0002 - .0004
Fitting of pin in piston :		
from clearance	0.003	- .00012
to grip	0.006	- .00024
Connecting rods		
Distance between centers	108.5 + 0.05	4.272 + .002
Width of big end	24.5 to 24.53	.965 to .966
Width of small end	24.5 to 24.53	.065 to .966
Bore of big end	41.10 + 0.023 + 0.039	1.6175 + .0009 + .00015
Bore of small end	20.939 to 20.982	.824 to .826
Weight tolerance	± 3 grammes /	± .105 ozs
Inner bore of bushing after press fitting :	19.002 to 19.008	.749 to .750

Piston rings data

		Compression	Upper oil control	Lower oil control
Gap between ends	mm	0.20 to 0.35	0.20 to 0.35	0.20 to 0.35
	in	.008 to .014	.008 to .014	.008 to .014
Height	mm	1.75 - 0.010 - 0.022	2 - 0.010 - 0.022	4 - 0.010 - 0.022
	in	.069 - .0004 - .0009	.079 - .0004 - .0009	.158 - .0004 - .0009
Side play	mm	0.045 to 0.27	0.045 to 0.27	0.025 to 0.255
	in	.0018 to .011	.0018 to .011	.001 to .010

Distribution diagram : refer to figure.

Inlet opens before TDC 16°30
Inlet closes after BDC 58°
Exhaust opens before BDC 60°30
Exhaust closes after TDC 14°



Z 786

CRANKSHAFT	Metric (millimeters)	English (inches)
Width of main bearing	25 + 0.08 + 0.12 - 0.014	.985 + .0035 + .005 - .0005
Ø of journals	47.9 - 0.030	1.888 - .0012
Side clearance	0.09 to 0.27	.0036 to .011
Diametral clearance	0.031 to 0.084	.0013 to .0033
Width of crankpins	24.75 ± 0.05	.974 ± .002
Diameter of crankpins	38 - 0.025 0.041	1.496 - .001 .0016
Side clearance	0.12 to 0.25	.005 to .010
Diametral clearance	0.020 to 0.070	0008 to .003

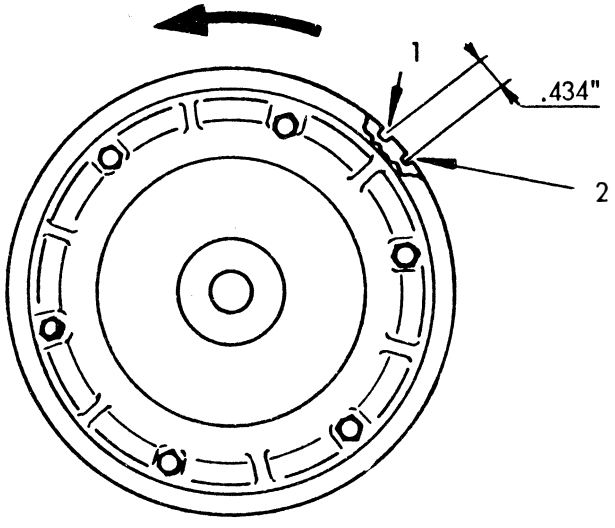
IDLING ADJUSTMENT AND DISTRIBUTOR FIRST TIMING

1 - Idling

The engine idling speed should be adjusted at 600 RPM imperatively. This is roughly the engine speed obtained to cut off the generator charge warning light.

2 - Distributor first timing

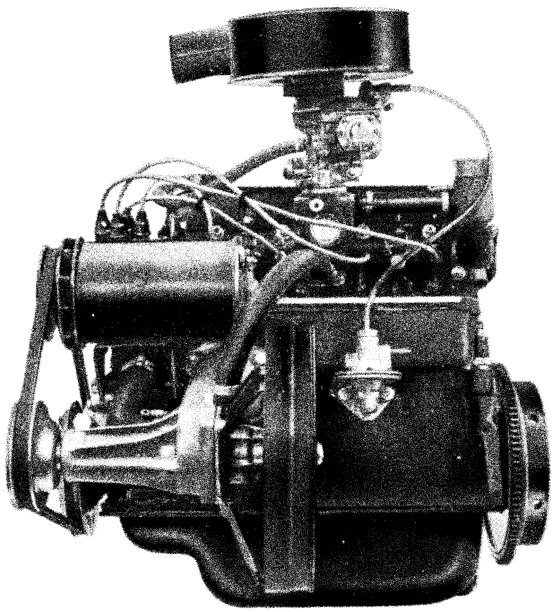
For the first timing of the distributor, the first mark of the pulley should be used. Do not forget that the pulley rotates counterclockwise.



If the timing of the distributor is performed with the engine turning and if you use a stoboscopie light, you should not omit to disconnect the sucking tube to perform the first timing. Plug the end of this tube after the checking operation is performed.

A WRONG SETTING OF THE IGNITION FIRST TIMING MAY LEAD TO EXCESSIVE FUEL CONSUMPTION.

IMPORTANT REMARK

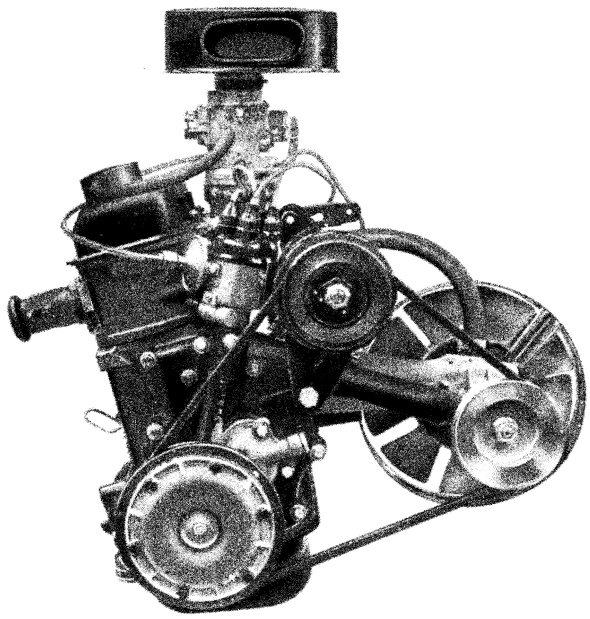


The engine being located at the rear end of the car, it is mandatory to remember the following points :

a - **The front end of the engine** is located towards the front of the car, that is towards the **transmission.**

b - **the right side of the engine** is located towards the **radiator.**

c - **the left side of the engine,** is located towards the **exhaust manifold.**



d - the first cylinder is located at the engine **front end,** that is towards the **transmission.**

e - the engine rotary motion is **counterclockwise** when one looks the engine towards the **oil centrifugal separator,** that is the **engine rear end.**

DESCRIPTION AND MODE OF OPERATION

Cylinder block

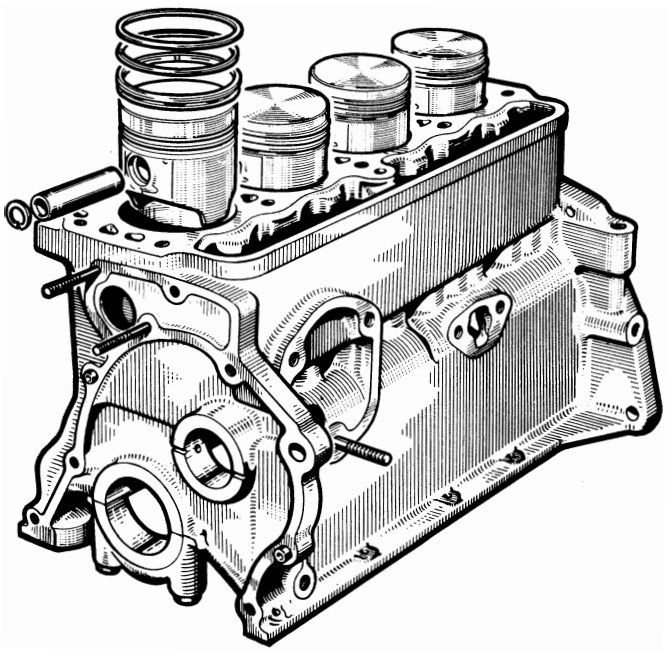
The cylinderblock is made "nickel-chromium-cooper" cast iron, cooling water flow being well distributed around each cylinder.

The sand holes are obturated by five sheet steel plugs.

A cock located on the cylinderblock left side is used for draining the cooling system.

The five main bearings are machined so that to be equipped with thin inserted type bearings. It is worth to be noted that the crankshaft rotation axis and the cylinders axes are in the same plane.

The camshaft supported by three bearings, rotates directly in the cylinderblock cast iron.



The engine oil flows towards the camshaft bearings through pipes running from the crankshaft front, middle and rear main bearings.

An oil pressure feeler is connected at the system end, on the pipe running from the crankshaft front main bearing.

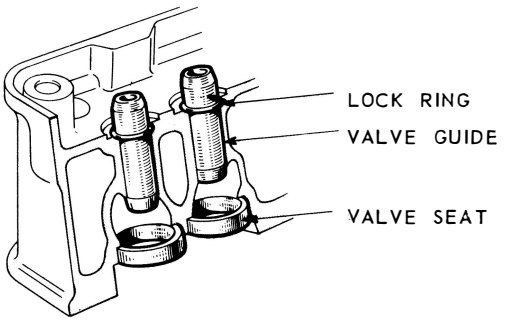
After the rocker arms are lubricated, the engine oil flows back to the oil pan through two vertically drilled pipes located in the cylinderblock and cylinderhead left side. This is the reason why the engine is tilted to the left.

A hole fitted with a flexible pipe emerges from the water pump supporting arm to ventilate the crankcase. This device is used as breather, up to engine Number : 5.025.655. An other device is presently fitted to pump oil fumes from valve rocker cover, from engine Number : 5.025.656.

On cylinderblock right side face, there is a shoulder to support the fuel pump driven by the camshaft.

Cylinderhead

In this cylinderhead, made of aluminum alloy, are inserted the valves cast iron guides held by a locking ring.

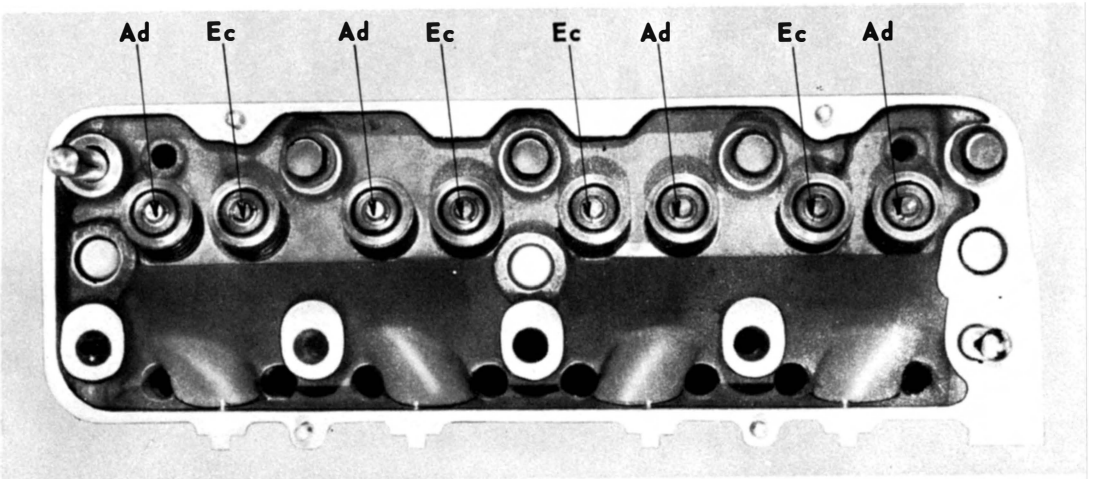


The valve seats, also in cast iron, are fitted in the cylinderhead before being machined.

The cylinderhead is assembled with the cylinderblock by means of 10 screws symetrically distributed with regard to cylinders axes.

Furthermore, these screws are used to secure the rocker arms shaft brackets.

Each combustion chamber has its own inlet and exhaust ports. The valves are distributed as follows :



Ad = Int. **Ec = Exh.**

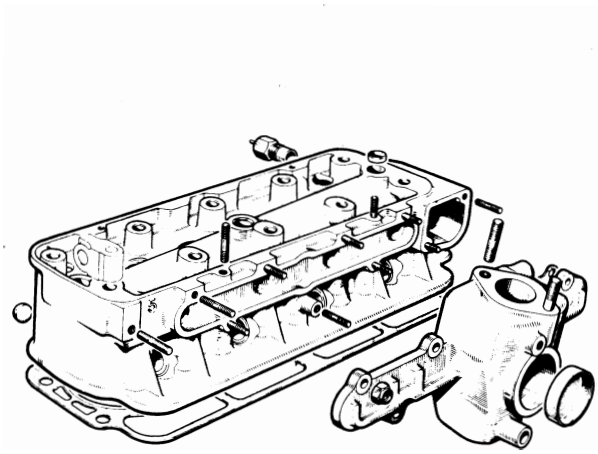
The exhaust manifold is assembled on the cylinderhead left side. The inlet manifold, located on the right hand side is partially cast with the cylinderhead.

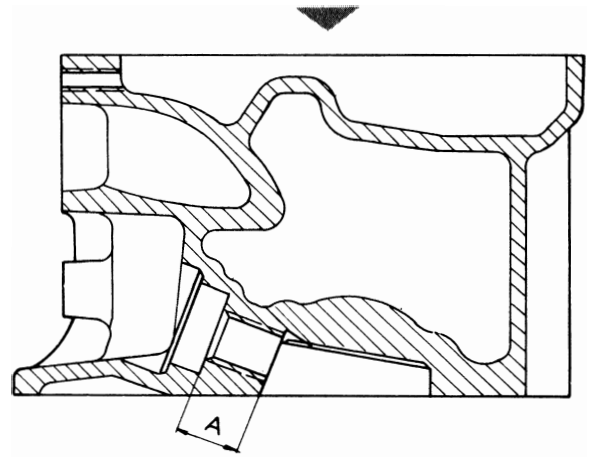
On the cylinderhead left hand side is a hole drilled to fit a temperature feeler which will warn the driver by means of one of the instrument cluster warning lights when the engine temperature goes beyond the maximum limit.

The rocker arms and their shaft are lubricated by means of a pipe running from the hole of the center screw securing the rocker arms bracket.

Spark plugs

Up to engine Number : 5.039.491 the cylinder head is machined to be fitted with MARCHAL 35 - H spark plugs. From engine Number : 5.039.492 the cylinder head is modified to be fitted with AC 44 XL or MARCHAL 35 H S1 spark plugs ; threaded part of hole being longer. Consequently, these engines should not be fitted with MARCHAL 35 - H spark plugs. But it is possible to equip former cylinder heads with AC 44 XL or MARCHAL 35 H S1 spark plugs under the condition they are fitted with a copper washer 1 mm or .040" thicker.





Up to engine nº 5.039.491
A = 16,6 mm (.061")

From engine nº 5.039.492

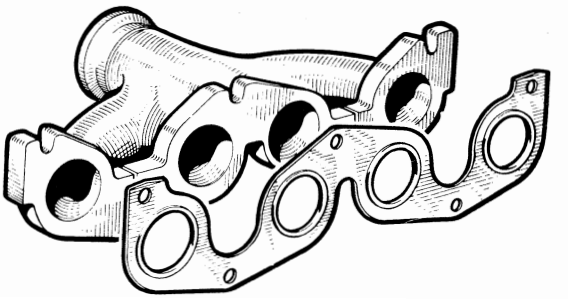
Intake manifold

This aluminum alloy inlet manifold, is made of two half shells, one of these shells being machined in the cylinderhead, the other, which is detachable, is secured by 7 stud bolts assembled with the cylinderhead. There is a gasket between these two shells.

The carburetor fitting shoulder located on the inlet manifold is heated by a water pipe flowing from the cylinderhead.

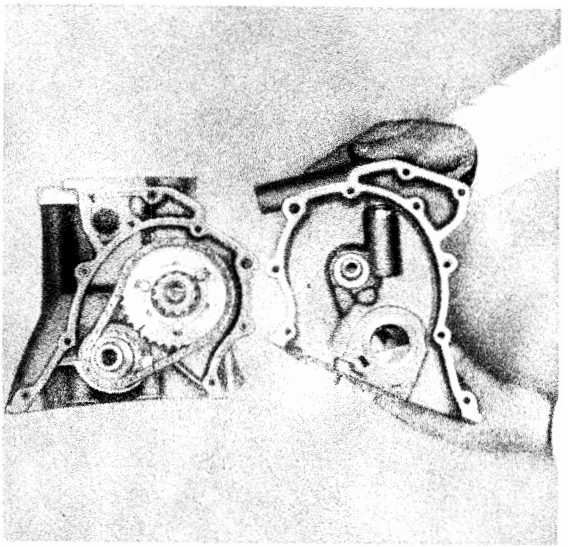
Exhaust manifold

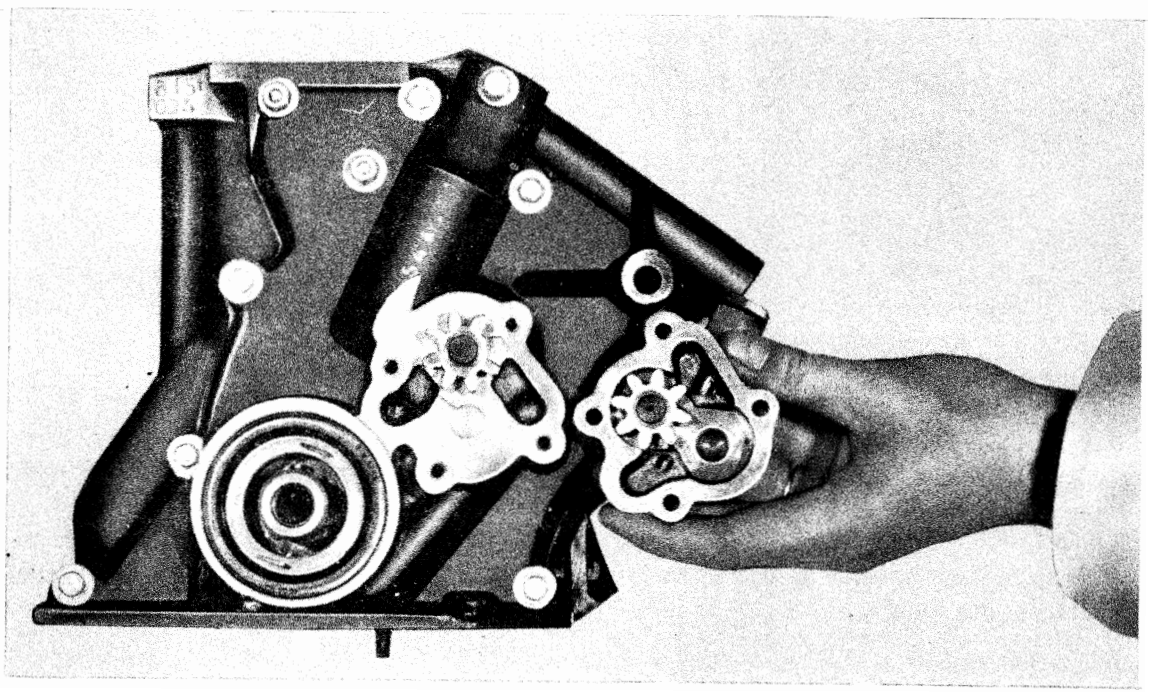
This cast iron exhaust manifold is located on the left hand side of the cylinderblock, and secured by 5 stud bolts.



Timing gear cover

This cover is made of aluminum alloy. It supports the oil pump, the distributor and the oil centrifugal separator seal. This cover is cast with a water pipe for cooling.



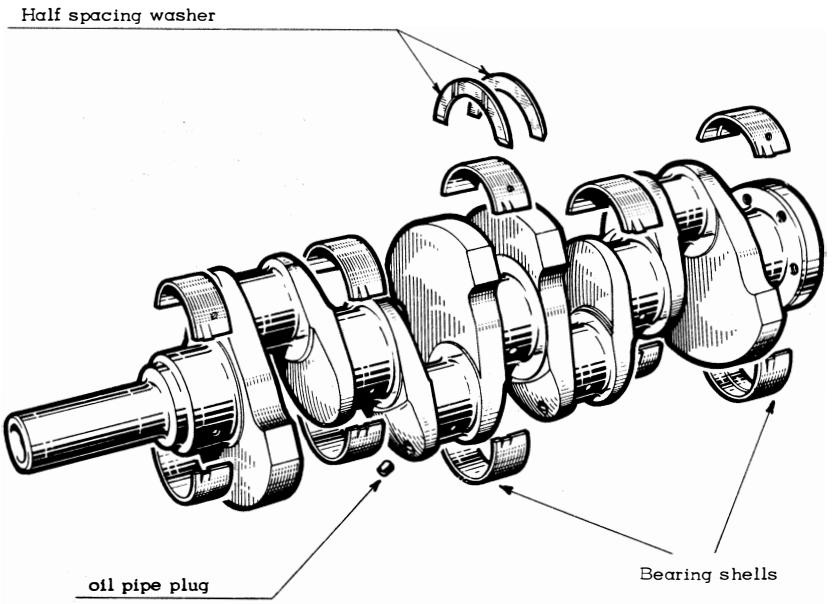


Crankshaft

This crankshaft is made of stamped and heat treated steel. The oil pipes are obturated on the counter-weights by means of press fitted cup plugs.

The crankshaft is supported on the main bearings by means of "trimetal" bearing half shells (trimetal = 1 steel layer + 1 copper lead layer + 1 indium-lead electrolytic layer).

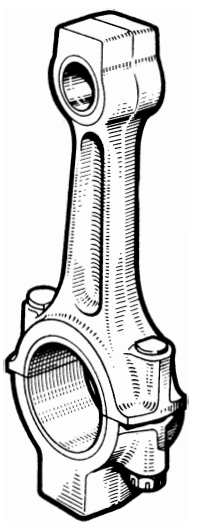
Two half spacing washers made of "bimetal" (bimetal = 1 layer steel + 1 layer babbitt) will limit the play in the center main bearing.



Connecting rods

The connecting rods are made of stamped and heat treated steel, their cap has a boss enabling to adjust their correct weight during machining operations.

The connecting rod small end is fitted with a bronze bushing.



Pistons

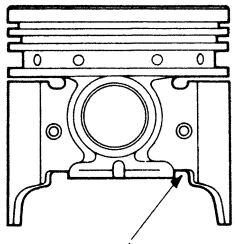
These pistons are made of aluminum alloy, and are of the "autothermic with deep inserts" type.

The skirt, cone shaped and oval, is tinned after machining

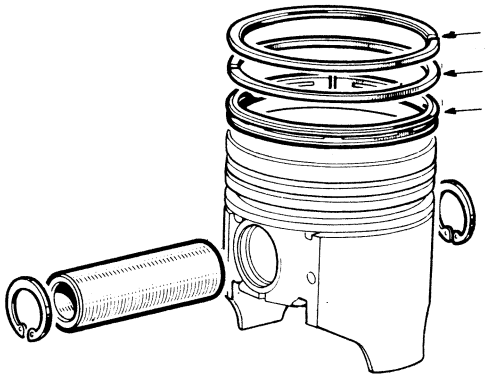
The piston pin hole bore is offset by 1.5 mm (.060").

The pistons are fitted with three cast iron rings, as follows :

- one chromium plated compression ring
- one upper oil control ring
- one lower oil control ring with 8 equidistant holes.

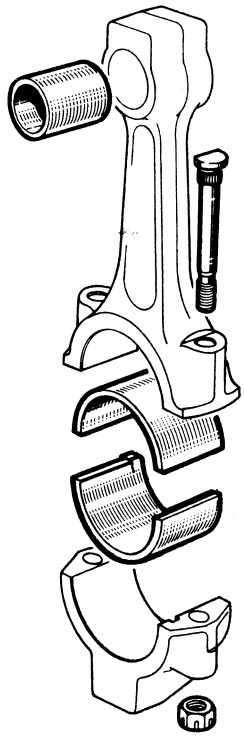


Metal removed down to pad base to improve flexibility of skirt base.



SIMCA 1000 engines were successively equipped with 3 types of pistons, as follows :

1 - Up to engine serial number : 5.000.700 : piston with hollowed out top.
2 - From engine serial number : 5.000.701 : up to 5.004.584 piston with flat top.
3 - From engine serial number : 5.000.585 : up to 5.059.253 piston with flat top machined in a different rough metal.
4 - From engine serial number : 5.059.254 : piston with flat, oval being modified : 0.25 - 0.27 mm or.010 - .011".



Connecting rod bearings

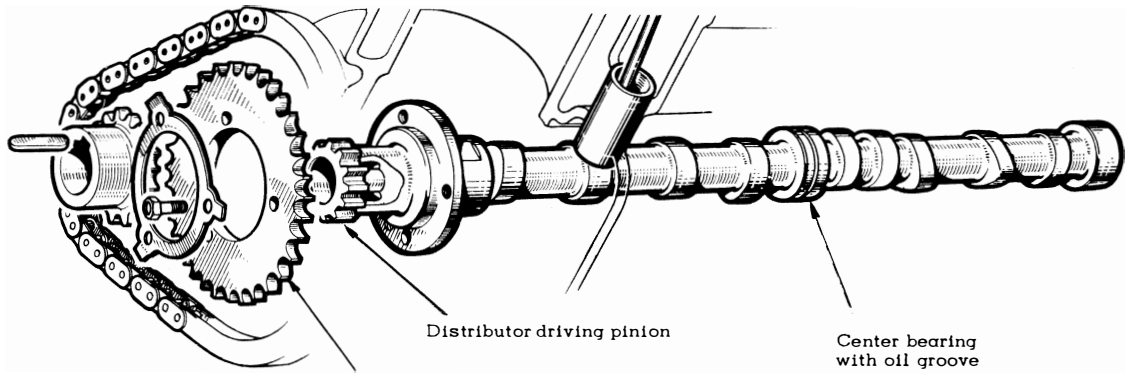
They are of the "trimetal" (refer to page "15-Engine" upper paragraph) type and made of 2 half shells, one shell having a snug fitting into the connecting rod, the other one with a snug fitting into the connecting rod cap.

Camshaft

The camshaft, made of cast iron and phosphate coated for avoiding jamming, is driven by one single chain ; the driving pinion is secured on the camshaft by 3 screws. This camshaft drives also the engine oil pump by means of a mortise and tenon joint.

On the other hand, the distributor is driven by a pinion cut in the camshaft end near the timing gears.

Valve rockers are lubricated by oil passing through a circular groove machined in camshaft center bearing.



Valve tappets

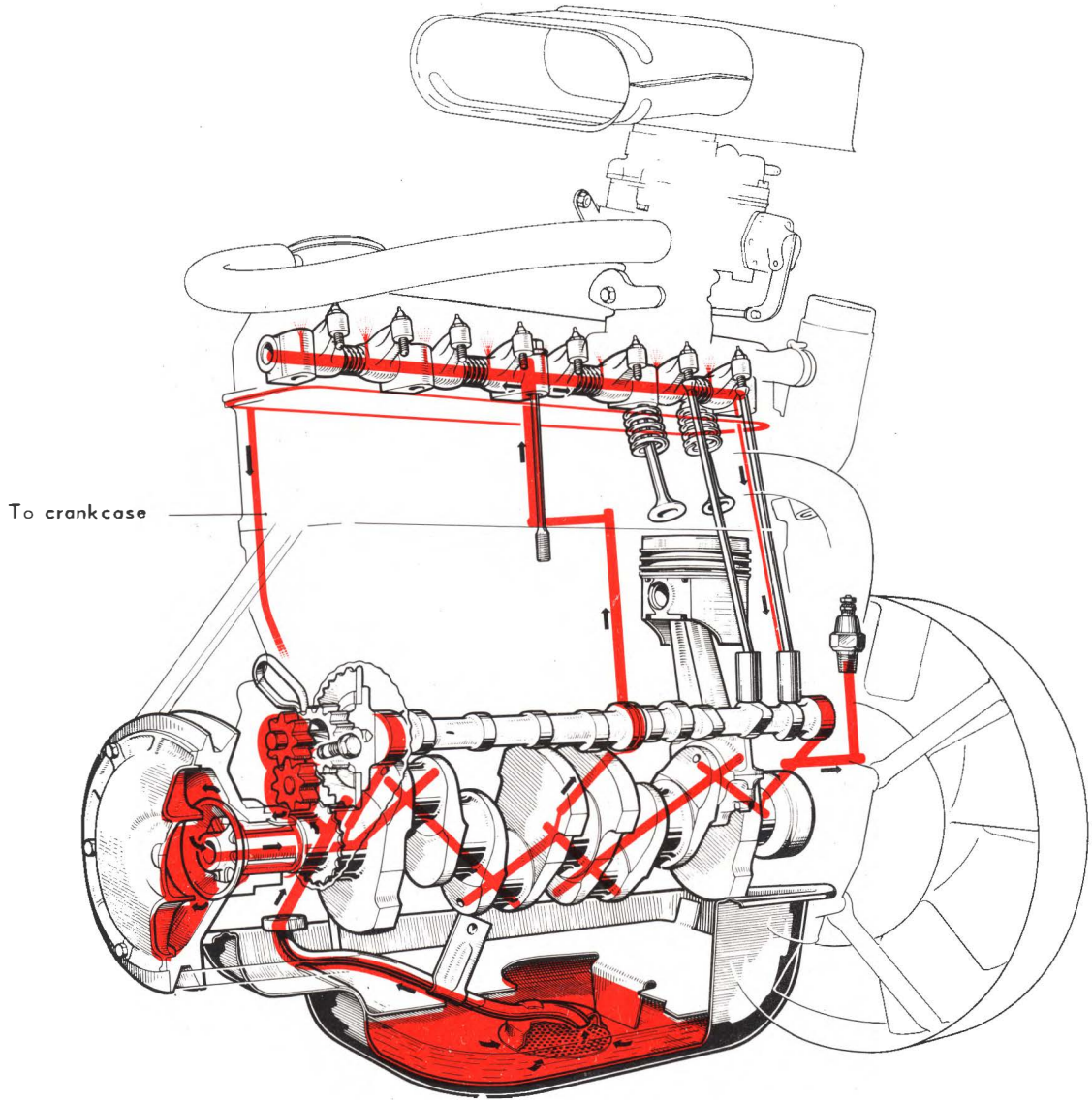
The valves push rods are made of cast iron phosphate coated to avoid jamming.

Oil pump

The engine components are lubricated as follows :

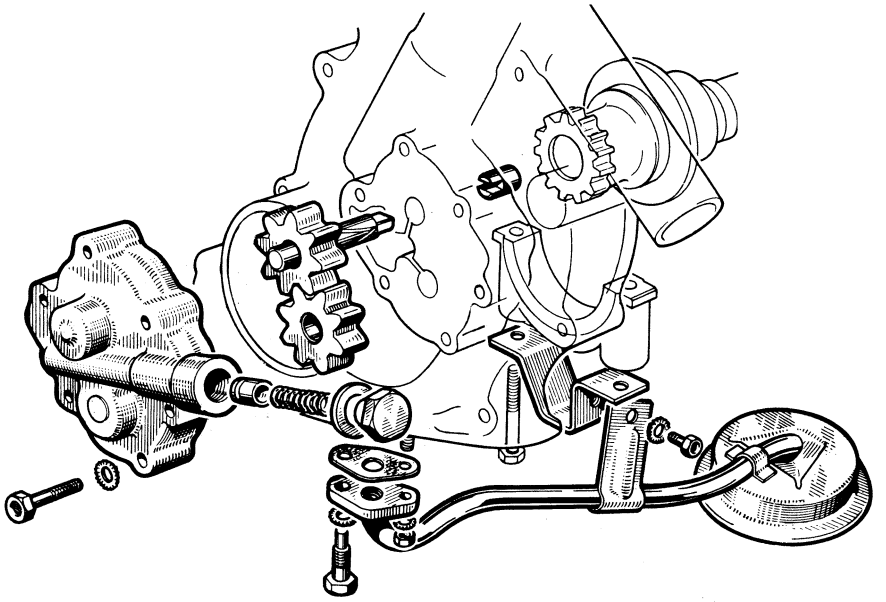
1° - Pressure fed lubricated	:	connecting rods bearings, main bearings, camshaft bearings, rocker arms shaft.
2° - Splash lubricated	:	connecting rods big ends, cylinders, cams, push rods, etc....

1) - DO NOT LOCK IT THOROUGHLY
The feeler has a cone shaped thread for a good sealing ; an excessive locking would damage the cylinderblock.



The oil fed by the pump flows through the timing gear cover, through the oil centrifugal separator, then through the grooves machined in the oil centrifugal separator hub bore which is itself centred on the crankshaft rear end. After it is purified, the oil lubrificates the crankshaft bearings and then flows towards the other engine working components.

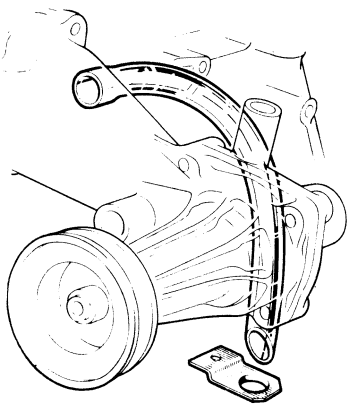
We remind you that the camshaft middle bearing has a groove for distributing the oil along the rocker arms shaft.

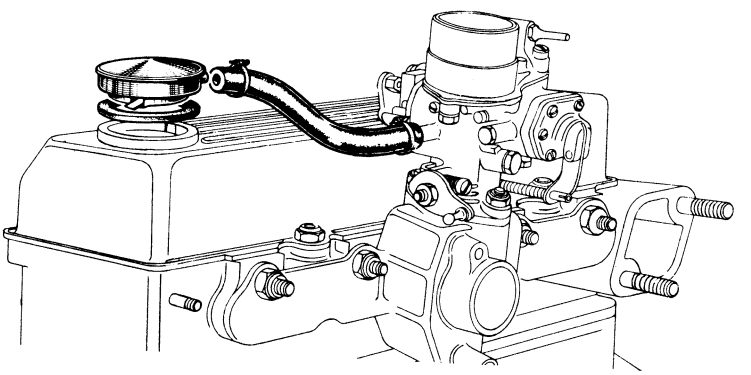


The gear type oil pump is secured on the timing gear cover, in prolongation of the camshaft axis, which drives it by means of a mortise and tenon joint; the tenon is machined at the end of the oil pump driving gear shaft.

The proper lubricating pressure is obtained by means of a discharge valve located on the oil pump body.

The oil is sucked up to the pump by means of a pipe fitted with a perforated sheet steel strainer immersed in the oil of the engine pan.





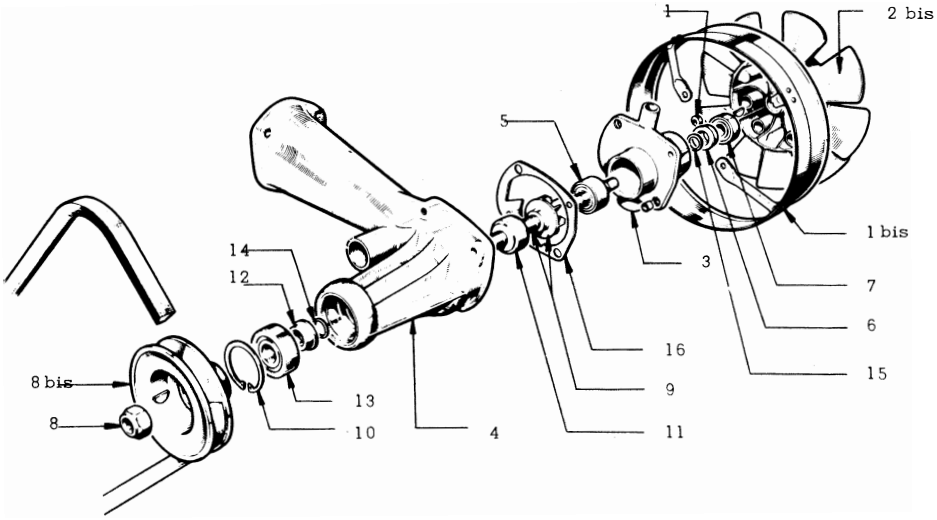
Crankcase ventilation

1st Solution : Up to engine N° : 5.025.655. The engine crankcase ventilation is obtained by means of the water pump supporting arm on which is fitted a flexible tube directing the oil fumes under the car.

2nd Solution : From engine N° : 5.025.656. Oil fumes are collected from oil filling cap located on rocker arms cover and directed to carburetor through a rubber hose.

Water pump

The water pump is located at the end of an aluminum alloy supporting arm on the engine right side and it faces the radiator. This pump is equipped with a pulley forming one piece with its shaft, this pulley being driven by a belt driving also the oil centrifugal separator, on the other end of this shaft is fitted a blower which sucks fresh air through the cooling radiator.



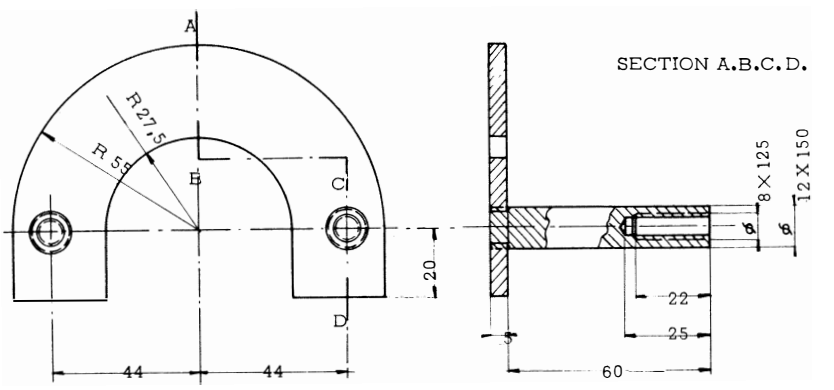
How to recondition the water pump

I - DISASSEMBLING THE WATER PUMP -

a) Remove two nuts located on each end (pipe wrench, 19 & 17 mm or .748 & .669" A/F)
Remove pulley, fan and keys.

b) ***Disassembling the cover (3)***

- Remove cover from main body (4) by bearing on pump shaft (use Puller P.N.: 39962-K with above mentioned assembly)
- Remove bearing (7) with a bar, Ø 16 mm or .629", inserted through inner diameter of graphited seal.
- Remove seal (5) with a bar, Ø 22 mm or .866"



STEEL : XC 38 F

c) *Disassembling the body (4)*

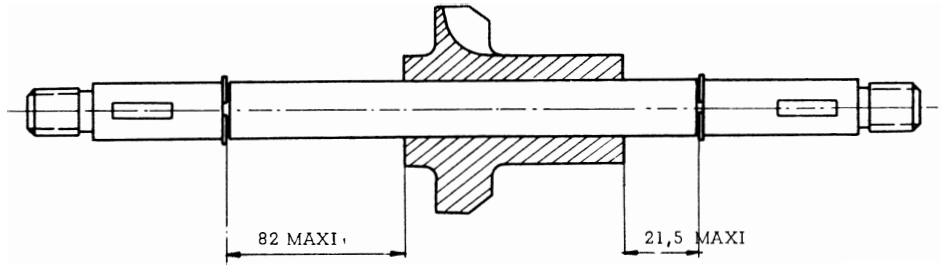
- Remove shaft (9) with Puller P.N. : 39962-K
- Remove circlip (10) with circlip pliers
- Remove bearing (13) with a bar, Ø 16 mm or .629" inserted through inner diameter of seal
- Remove seal (11) with a bar, Ø 22 mm or .866"

II - HOW TO RECONDITION SHAFT & IMPELLER - SEAL

Shaft : Sandpaper shaft on area between circlips (14) & (15) until rust is completely removed.
Impeller : For the bearing face of graphited seal, you should proceed as follows :

a) If bearing face is dirty or oxided (but not pitted) it should be sandpapered with grade 800 paper until bearing face is bright.

b) If bearing face is pitted or corroded, shaft must be replaced by a new one (Part N° : 22084 - G). Fit circlips (14) & (15), P.N°. : 22091 - F on shaft. Check for proper positioning of impeller on shaft as shown on figure hereunder.



Seals : It is mandatory to replace graphited seals (marks 5 & 11) Part N° 22085 - H by new ones.

III - REASSEMBLING THE WATER PUMP

- Place bearing (7) and shorter spacer (6) on cover.
- Fit bearing (13), circlips (10) and spacer (12) to body.
- Coat lightly with sealing compound outer side of seals as well as their housing.
- Fit seals until seal frame dog comes into contact with pump body or with cover.
- Fit pump body on longer part of shaft.
- Place cover on which the paper seal is fitted ; then fit two rings (17) to obtain a proper positioning of cover on body.
- Fit fan shroud (1 bis) & tighten its 4 screws at a torque of 2m/kg or 14.46 ft.lbs.
- Place two keys, fit pulley, fan and tighten two Nylstop nuts located at each end at a torque of 4m/kg or 28.93 ft.lbs.

NOTE : It is mandatory to replace Nylstop nuts (Part N° : 22097-D) by new ones.

- up to engine N° 5.017.145, the fan shroud has 4 brackets, 3 of them being fitted to water pump body, 4th bracket being fitted to water pump arm.
- from engine N° 5.017.146, 4 brackets of this shroud are fitted to water pump body.

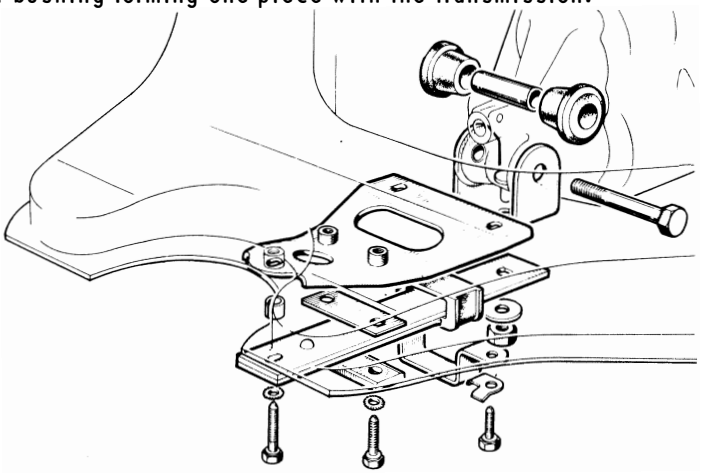
In case the 1st type shroud is replaced by a 2nd type shroud, following items should be replaced :

- water pump lower stud bold
- water pump cover stud bolt ; previously, this stud bolt was not used to secure the fan.

Mounting components of power plant

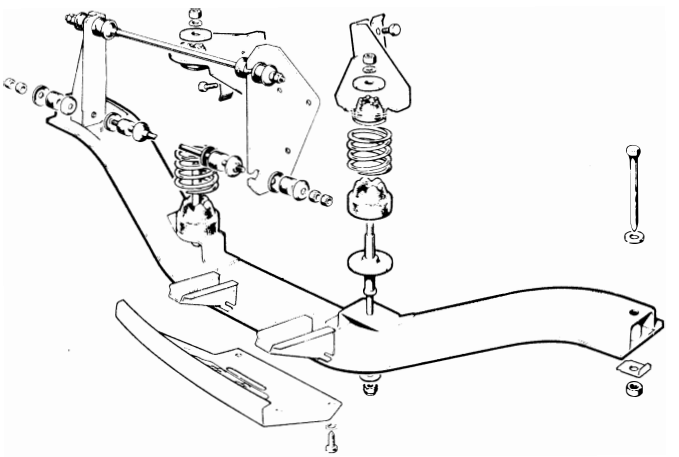
The power plant unit is mounted on three points :

a) - 1 mounting point on the front of the rear suspension cross member by means of a flexible metal support and a rubber bushing forming one piece with the transmission.



b) 2 mounting points on the rear cross member with interposition of special flexible supports

c) two side stays fitted with rubber bushings connect the engine with the rear cross-member



From body N° : C 17716, engine support securing to rear crossmember is as shown on opposite figure.
It is possible to replace the former assembly by a new one under the condition to fit modified engine support pins.
This mounting method will enable you to disassemble fastly engine from under the car by means of following equipments :

1° - One car lift or any lifting equipment to lift the car and place it on 4 props of suitable height.

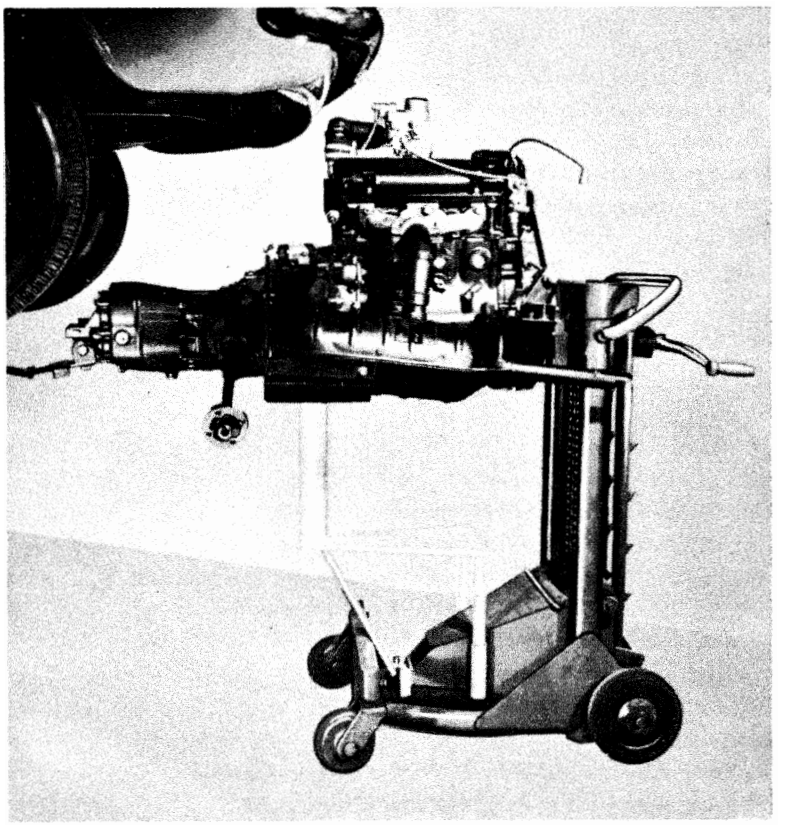
2° - A mobile hydraulic or mechanical lift with enough lifting travel to remove the power unit from under the car

Note : This equipment will enable you also to remove and re-install all rear mechanical components of the car.

How to remove the power plant

The power plant can be easily removed from under the car, the car being placed on props or on a raised lift.

For this purpose, a special pedestal is made, which is adaptable for a mobile hydraulic or mechanical lift.



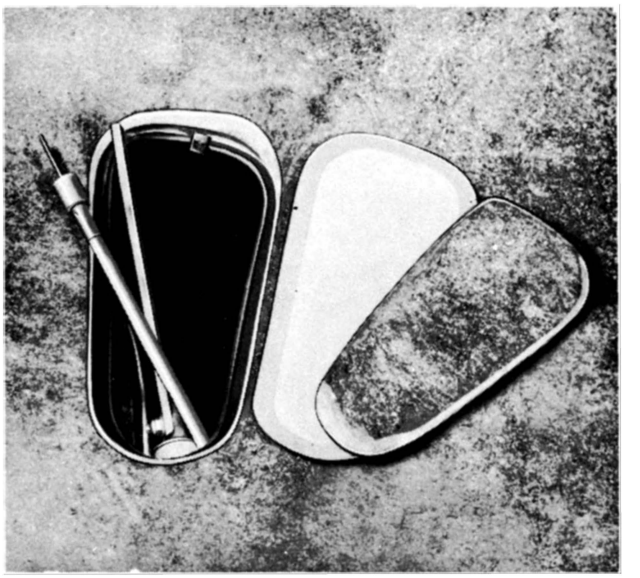
TOOLS :

- Special pedestal P.N° : 39971 - L
- Wrenches of 8mm or .314" A/F
- 10mm or .393" A/F
- 12mm or .472" A/F
- 13mm or .511" A/F
- 17mm or .669" A/F
- Tube wrenches of 13mm or .511" A/F
- 17mm or .669" A/F
- Pliers
- special retaining tool for the 2 half shafts.

OPERATION MODE

From inside the car, you will be able to reach the joints of the gearshift control rod and of the speedometer cable drive on the trans-axle housing. Consequently, you should proceed as follows :

The car being on the ground, covered inside and outside with protective covers.



I - Drain the cooling system by turning on the cock located at the radiator lower water box. In case the cooling water is mixed with SIMCAGEL (antifreeze fluid) this mixture should be collected in a clean container.

II - Operations inside the car :

a) - remove the rear seat.
b) - remove the cover of the hole.
c) - disconnect the speedometer cable, it will be sufficient to unscrew the nut on the key to remove completely this key before disassembling the cable stub.
d) - disconnect the gearshift control rod.

III - Operations under the engine compartment lid

Disconnect :

1°) - the battery negative cable
2°) - the high and low tension wires of the coil
3°) - the wires of the generator electric circuit
4°) - the feeding wires of the starter solenoid
5°) - the fastening collar of bellows between the fan and the radiator shrouds
6°) - the upper water pipe from its base on the cylinderhead
7°) - the heater feeding pipe, on the cylinderhead
8°) - the fuel feeding pipe on the fuel pump
9°) - the accelerator control cable and its cover
10°) - the starter control cable
11°) - the temperature feeler feeding wire, on the cylinderhead
12°) - the feeding wire of the oil pressure feeler.

IV - Operations under the rear floor panel

The car should be sufficiently lifted for an easy work :

1°) - Remove the protective panel of the engine compartment RH side
2°) - Disconnect the water pipe between the water pump and the radiator.

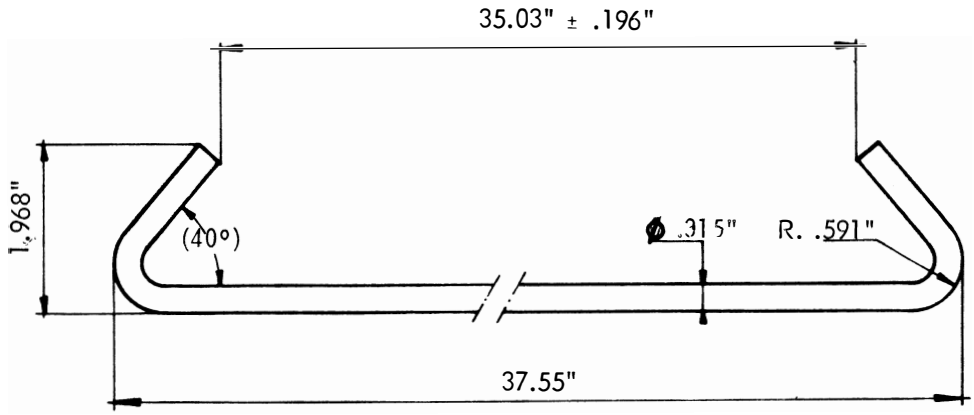
Caution :

it is possible that a small quantity of cooling water may still flow out.

3°) - Disconnect the RH and LH side half drive shafts at their joint with the wheel shaft bushing. It is necessary to turn the wheel progressively of a quarter turn to reach easily each screw.

Caution ! Hold each half shaft in position so that it does not leave its inserting hole of the planetary gear. For this purpose, you should use a metal rod of 8 mm (or .315") diameter formed as shown in figure.

At first, you should remove the thrust springs or rubber buffers inserted in a hole located at the bushing end of each half drive shaft.



4°) - Under the power-plant, place the lift fitted with the special head so that its rear fork comes around the engine oil pan and its front fork comes around the trans-axle houding. Raise the lift head to lift slightly the power-plant, thus reducing the strain on the power-plant mountings.

5°) - Disassemble the power-plant front mounting from the rear suspension cross-member (remove the 3 securing screws).

6°) - Disassemble the engine rear supporting cross-member from the RH and LH side members.

Caution ! After this operation is finished there is no rigid link between the power-plant and the car; then it will suffice to disconnect the hydraulic clutch control.

7°) - For this purpose :

a) - lower the power-plant by about 15 cm (or 6 inches) with the lift (avoid to lower it too fast so that not to break the flexible pipe between the master-cylinder and the clutch cylinder).

b) - remove the clutch cylinder from the clutch housing. This will avoid any possible loss of fluid or any bleeding of the system when reassembled.

8°) - Remove the whole power-unit.

How to reinstall the power plant

The power-plant should be reinstalled by following the reverse sequence of the removing operation with the proper tightening torques and the following precautions :

I - HOW TO PLACE THE ENGINE AFTER THE REAR CROSS-MEMBER IS SECURED

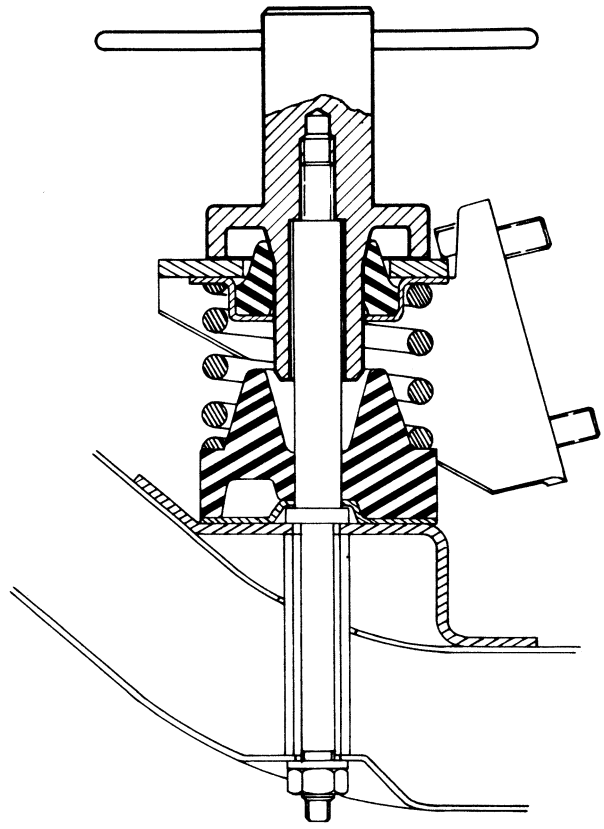
It is mandatory to make sure there is no side stress in the engine mountings between the bushings bores and their shafts. To avoid any stress when reinstalling the cross-member on the engine and when reinstalling the whole assembly on the car, it is necessary to proceed as follows :

A) - To reinstall the cross-member on the engine

1°) - Unlock the securing nuts of the rubber bushing shaft on the cross-member lower part.

2°) - The cross-member being fitted with its rubber bushings and their spring, place it on the engine.

3°) - Secure the rubber bushings with the two spring compressors specially designed for the proper positioning of the shafts.



B) - Reinstalling the whole unit on the car :

1°) - Insert and lock the engine rear suspension cross-member securing screws on the RH and LH. side members.
2°) - Lock the rubber bushing shaft securing nuts on the lower part of the rear cross-member.
3°) - Remove the spring compressors from the engine mountings, place the washers and lock the nuts
4°) - Lock the securing screws of the engine front mounting on the rear cross-member.
5°) - Lock the securing screws of the engine side stays.

II - CARBURETOR CONTROL

Make sure of that :

a) - the choke closes properly
b) - the inlet butterfly valve opens and closes properly.

III - CLUTCH CONTROL

a) - Bleed it in case the feeding pipe was disconnected from the clutch cylinder.
b) - Check the clutch fork clearance.

How to disassemble the engine

TOOLS

	SIZE A/F						
mm	10	11	13	14	17	20	21
in.	.393	.433	.511	.551	.669	.787	.826
-Bent socket wrenches	●		●	●	●		●
- "T" wrenches	●	●		●			
- Wrenches	●			●		●	●
- Sockets	●	●	●	●(×)	●		●

- Wrench for oil centrifugal separator screw, P.N : 31175 - H
- Wrench for drain plug
- Tool for valve removing and reinstalling
- Tool for cylinderhead centering, P.N. : 39951 - Q
- Torque wrench
- Adjusting shims, in set
- Wrench, valve rocker adjusting
- Wrench with collar
- Extension
- Wrench, spark plug
- Screwdriver, hammer, mallet
- Pliers for piston rings
- Pan for oil

(×) Special, ERS type