

365 GTC4

ADDITIONAL INSTRUCTIONS
FOR THE USA VERSION



Ferrari

365 GTC4

ONLY THE MAIN FEATURES OF THIS CAR DIFFERING FROM STANDARD PRODUCTION 365 GTC 4 ARE DESCRIBED IN THIS SUPPLEMENT.

FOR ALL REMAINING PARTS, PLEASE REFER TO THE STANDARD INSTRUCTION BOOK.

Ferrari

I N D E X

	Page
IDENTIFICATION PARTICULARS	5
Vehicle weights and capacity	6
Tires	6
 INSTRUMENTS AND CONTROLS	 6
Seats	10
Safety belts	10
Defroster.	11
 STARTING PROCEDURES	 12
 SPECIFICATIONS	 12
Engine	13
Engine electrical	13
Air injection system	13
Evaporative emission control system	14
Exhaust system	14
 ENGINE	 14
General description	14
Periodical maintenance operations	14
Mechanical checks and adjustments	15
Fast idle devices	18
Crankcase emission control system.	20
 ENGINE ELECTRICAL	 21
Ignition system	21
Timing the distributor.	22
Air pump clutch control unit	25
 AIR INJECTION SYSTEM	 26
General maintenance	27
Air pump.	28
Diverter valve.	29

	Page
EVAPORATIVE EMISSION CONTROL SYSTEM	30
Maintenance	30
Activated carbon trap	30
Liquid vapor separator	30
General layout	31
Three way control valve	32
Sealed air intake	32
 EXHAUST SYSTEM	 33
 ELECTRICAL INSTALLATION	 35
Fuse boxes	37
Wiring diagram	40
 SPECIAL TOOLS	 41

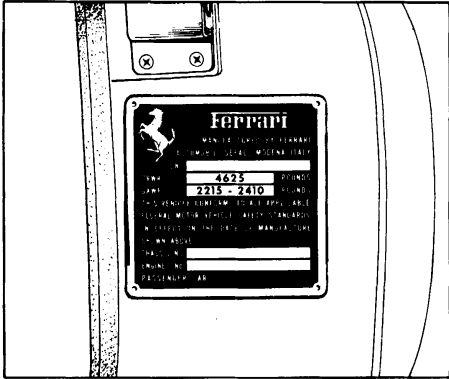
IDENTIFICATIONS PARTICULARS

In addition to the standard identification numbers and plates, the following tags are provided:



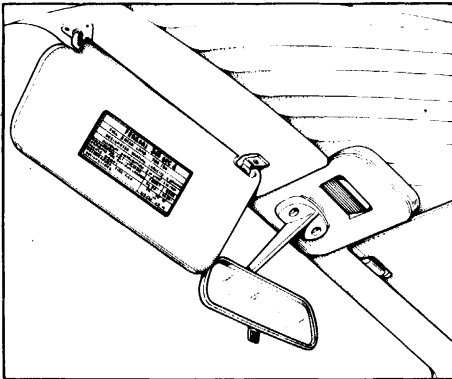
1) U.S. Safety standard 115 tag :

showing the type of the vehicle and chassis number is located on the top of the steering pillar cover.



2) U.S. Safety standard conformity tag :

showing the year and month of manufacture, the chassis number and car type, is applied on left side door pillar, below lock striker.



3) U.S. Safety standard 110 tag :

showing tire data and vehicle capacity, is located on driver's sun visor.

VEHICLE WEIGHTS AND CAPACITIES

Curb weight	3925 lbs
Vehicle load capacity(total 700 lbs)	4 adults(600 lbs)+ 100 lbs of luggage
Gross weight(fully laden)	4625 lbs
Designated seating capacity	4 persons
Occupant distribution	2 in front 2 in rear

TIRES

Michelin FR 70 VR 15
or 215/70 VR 15

Pressure :

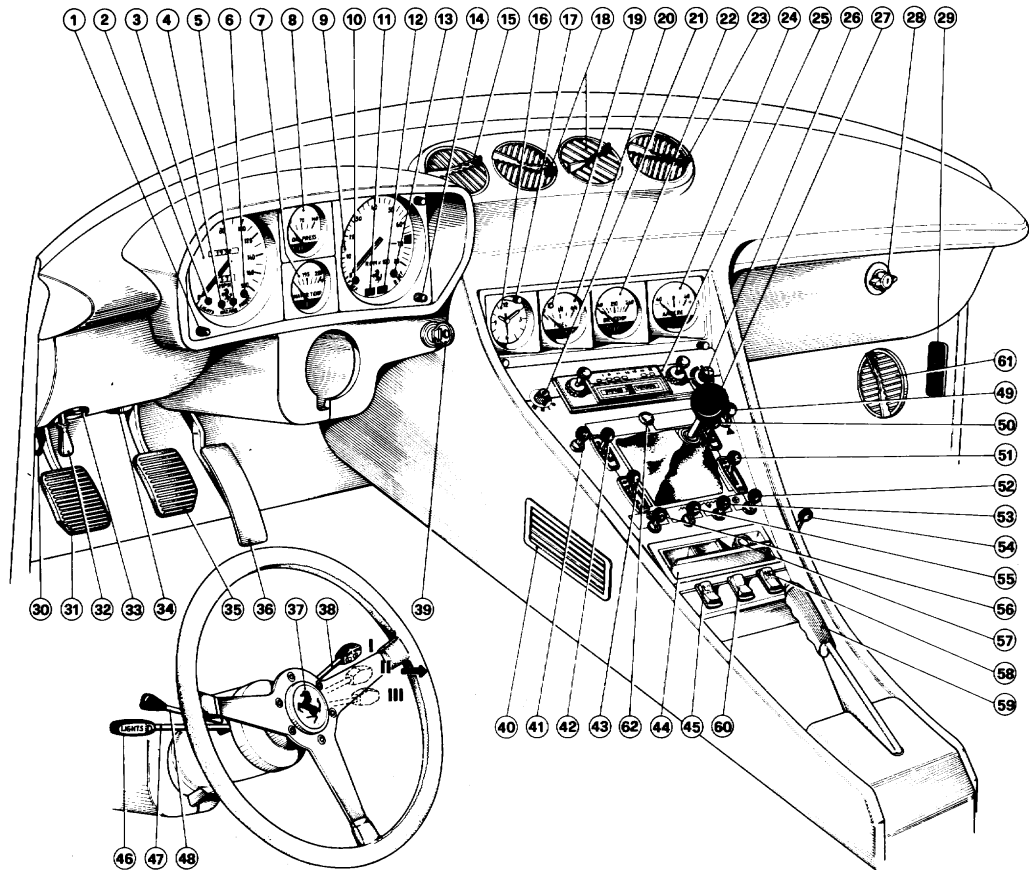
	On public road up to 80 mph	For use at higher speed not on public road.
front	34 p.s.i.	44 p.s.i.
rear	36 p.s.i.	44 p.s.i.

Rubber lugs are provided in tread grooves to serve as visual wear indicators:when tire

is worn down to their level it should be replaced.(U.S.Safety standard 109).

INSTRUMENT AND CONTROLS.

- | | |
|---|---|
| 1—Mileometer trip zero. | 16—Clock. |
| 2—Parking light indicator. | 17—Clock setting knob. |
| 3—Speedometer. | 18—Air outlets from air conditioner. |
| 4—5—Direction indicator and vehicular hazard warning lights: flash separately to show operation of RH or LH direction indicators;flash simultaneously to show operation of vehicular hazard warning signal. | 19—Fuel reserve warning light (red). |
| 6—Main beam warning light. | 20—Fuel level gauge. |
| 7—Water thermometer. | 21—Fan speed switch for air conditioner. |
| 8—Oil pressure gauge. | 22—Oil thermometer. |
| 9—Revolution counter with indication for maximum permitted R.P.M. | 23—Air outlet for warm or fresh air (right). |
| 10—Electrically heated windshield light(optional). | 24—Ammeter. |
| 11—Brake system effectiveness indicator:lights up as soon as the engine is switched on and goes out when the engine starts,to make sure that the bulb is operable.
If it lights up while the car is running,it shows a brake system failure. | 25—Radio. |
| 12—Parking brake warning light. | 26—Temperature control for air conditioner. |
| 13—Electrically heated rear window light. | 27—Gear lever. |
| 14—Instrument cluster light rheostat. | 28—Glove box lid lock. |
| 15—Air outlet for warm or fresh air (left). | 29—Interior courtesy lights.. |
| | 30—Ring for emergency opening of bonnet. |
| | 31—Clutch pedal. |
| | 32—Bonnet opening lever. |
| | 33—Power supply point. |
| | 34—Adjustable outlet, for conditioned air to driver's feet. |
| | 35—Brake pedal. |
| | 36—Accelerator pedal. |
| | 37—Horn button. |



4) Instruments and controls.

38—Windscreen wiper and washer lever with three positions:

1—Off.

2—Low speed (equal or more than 20 periods/ min.).

3—High speed (equal or more than 45 periods/ min.).

The wiped areas are obtained by mean of 19" blades fitted on special arms.

The windscreen washer tank contains two liters of glass cleaner and water solution.

(U.S. Safety standard 104).

Arms and blade supports are manufactured with non-glare metal.

(U.S. Safety standard 107).

39—Ignition, auxiliary services, starter and steering lock key.

40—Air inlet for air conditioner.

41—Radio antenna switch (only when Voxson radio is installed).

42—Right hand heater air distribution control.

43—Choke control.

44—Ash tray.

45—58—LH & RH Electrically operated window winder:

it is operable only with the ignition key in position II.

An emergency handle is provided to operate the window winder when the electric device fails.

46—Retractable headlights and outer lighting switch.

Turning the outer lighting switch on, the retractible headlights are put into working position automatically in not more than three seconds.

(U.S. Safety standard 112).

47—Main beam/dip beam control lever.

48—Direction indicator lever.

49—Vehicular hazard warning signal switch.

50—Right hand heater air distribution control.

51—Heater water.

(temperature control).

52—Right hand ventilation blower switch.

53—Electrically heated rear window switch.

54—Open/shut control lever for conditioned air outlet 67 at the passengers side bottom.

(fig.28-see standard instruction book).

55—Electrically heated wind - screen switch (on request).

56—Left hand ventilator blower switch.

57—Cigarette lighter.

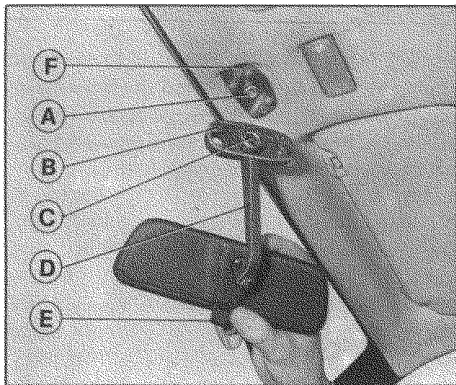
59—Hand brake lever.

60—Fog-lamp switch.

61—Air outlets for warm or fresh air to feet.

62—" Fasten seat belts " warning light.

(For cars from jan 1 , 1972).



5) Collapsible inner rear view mirror.

A-Stud ; B-Dowels ; C-Spring ; D-Base ; E-Antiglare lever ; F-Dowel seats.

COLLAPSIBLE INNER REAR VIEW MIRROR: comes off its seat following an impact; to refit, engage spring (C) on stud (A)-make sure the two location dowels (B) are properly registered with relevant seats-by pressing on mirror's base; Engagement is of the snap on type. (U.S. Safety standard 111).

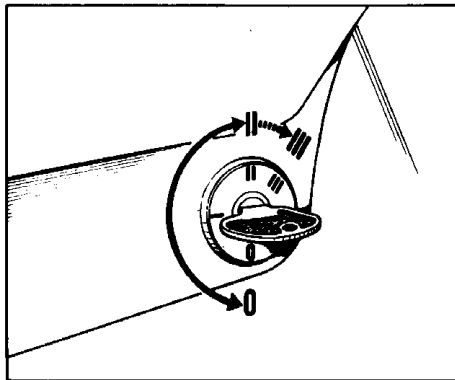
SWIVELLING REAR VIEW MIRROR on the outside of driver's door, adjustable from driver's seat.

COLLAPSIBLE STEERING WHEEL : the steering pillar is collapsible under the effects of a road accident. (U.S. Safety standard 204).

Steering wheel spokes, spacer and pillar cover are manufactured with non-glare metal. (U.S. Safety standard 107).

IGNITION AND STEERING LOCK :

The lock switch has no position I (garage); consequently, the key can be inserted or withdrawn exclusively when the switch is in position O according to U.S. Safety standard 114.

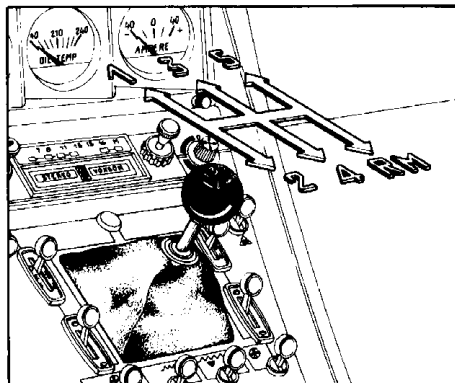


6) Ignition and steering lock.

REMOVE KEY INDICATOR: acoustic signal on when driver's door is opened to leave the car and the ignition key has been forgotten in lock switch.

GEAR LEVER POSITION.

The gearshift lever knob has a gating pattern engraved. (U.S. Safety standard 102). When reverse is engaged, with lock switch in position II, the back-up light is turned on. (U.S. Safety standard 107).



7) Gear lever positions.

SEATS

Seats squabs with adjustable headrest.

The front seats are provided with reclinable squabs:

for fine adjustments turn knob A; for ample swings or complete lowering, push lever B downwards.

Front seats can be individually adjusted on floor after moving control lever C downwards.



8) Seat

A-Knob for fine adjustments of squab.

B-Lever for ample swings of squab.

C-Lever for seat position on floor.

D-Adjustable headrest.

SAFETY BELTS

(Up to 31 Dec. 1971)

Front seats are equipped with safety belts of the 3-point type (see standard Instruction Book-page 20).

Lap safety belts (2-point type) are provided, for rear seats.

Fastening and adjustment are obtained operating like on front seat lap belts (without shoulder belts).

(From Jan. 1, 1972).

Safety belts with retractor are provided as standard original equipment and are of the 3-point type for front seats and 2-point type (lap) for rear seat.

Fasten lap belts

Pull belt from retractor without stopping; if pulling motion is interrupted during extension of the belt, it will be necessary to return the belt completely to the stowed position to release the stop mechanism.

To fasten insert connector A into buckle B slot until a snap is heard. Adjust belt snugly around the hips-not the waist by allowing excess belt to return into retractor.

The indicator light and buzzer will go out only when, after extending the front belts the retractors begin recovery of excess length.

Note

Pilot lamp "Fasten seat belts" (fig. 4) and acoustic signal will not be switched on with safety belts NOT fastened only in the following cases:

- 1) Engine switched off.
- 2) Engine running and handbrake on.
- 3) Engine running and gears in neutral.

Fasten shoulder belts.

Free the belt from its storage retainer.

Position the belt over shoulder and across body to lap belt buckle. Insert pin of shoulder belt connector C into the slot of lap belt connector A and pull until the pin solidly engages in slot.

To shorten the belt, pull the plastic adjuster D but only after the connector C is properly engaged.

To lengthen the belt, tip and pull connector to allow extension of the belt.

To release the belts:

Simply press in the center button to release the buckle.

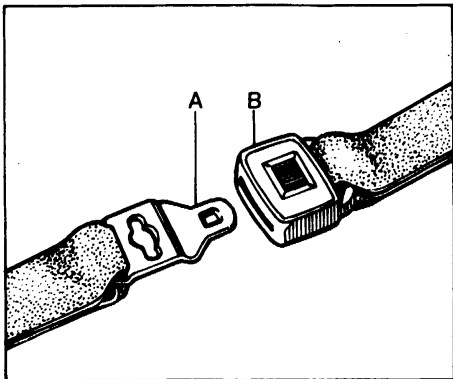
Warning.-The adjustment of seat belts must be made before starting the car and after having properly positioned the head-rests and rear view mirrors.

Each belt is intended for use by one adult or one child over 6 years of age.

Belt adjustments must be made with occupant sitting well back and erect in the seat: make-sure webbings are not twisted.

Shoulder belts are correctly tightened when a fist inserted between the harness and the occupant's body does not cause undue pressure on the body itself.

Occasionally, check that mounting bolts are tight, and that webbing is not cut or frayed.



In the event of an accident, even if the belt you were wearing is apparently undamaged it is recommended that you replace it with a new belt.

To keep belts clean, hand wash only, using warm water and mild soap. Rinse and dry thoroughly—out of direct sunlight.

Do not use strong detergents. Do not use bleaches or dyes. Avoid any chemical that may weaken the equipment.

To clean the retractor, blow with dry and clean compressed air into the retractor housing.

Users are warned to consult the manufacturers in case of doubt and not to make any alterations or additions to seat belt assemblies and/or anchorages.

DEFROSTER

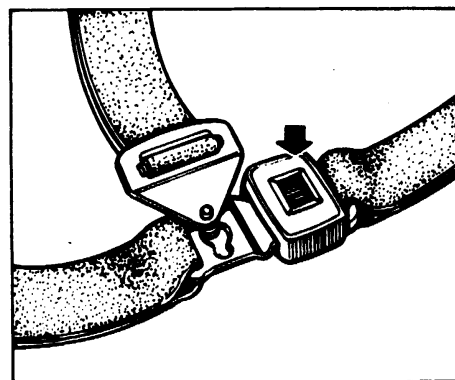
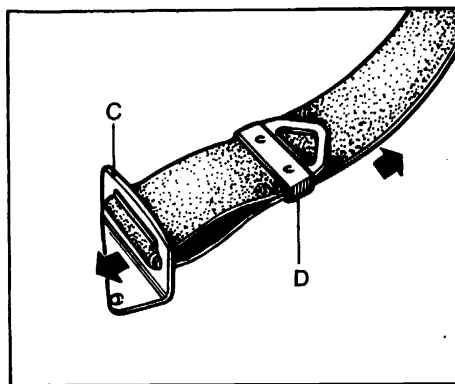
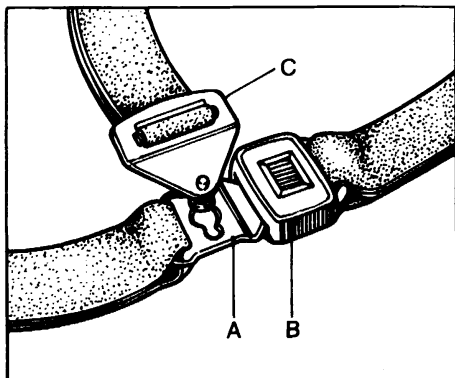
Defrosting of windscreen can be obtained when performing the following operations.

- a) Push levers DEF 42 and 50 into position ↑ (fig.4).
- b) Push lever 51 into position marked with red spot.
- c) Switch on blower by means of switches 52 and 56.
- d) Adjust direction to windscreen through suitable rotation of air outlets 15 and 23.

ATTENTION

The same interior heating temperature you have with car starting still, may be kept also increasing car speed by limiting the air entry e i moving the levers 42 and 50 (fig.4) to a mid position towards O, but without reach-

ing the O position that would be to stop completely the air entry.



9) Seat belts.

- A—Lap belt connector.
- B—Buckle
- C—Shoulder belt connector.
- D—Plastic adjuster.

STARTING PROCEDURES

Cold engine**Two Starting Procedures:**

- 1)When the car has been parked at ambient temperature above 60° F.
- 2)When the car has been parked at ambient temperature below 60° F.

1)Procedure (above 60° F).

- a)Make sure the gear lever is in neutral position.
- b)Turn the ignition key to position "0".
- c)Wait for 30 seconds until the electric fuel pumps have slowed down.
- d)Depress the clutch pedal.
- e)Press the throttle pedal fully open three times.
- f)Turn the key until it goes further than position "0" and at the same time give 2or3 partial accelerations for starting the engine.
- g)As soon as the engine fires,maintain the idle speed at 2000 - 2500 RPM during the first 20 seconds.
- h)If the engine doesn't start or stalls,it is necessary to turn the ignition key back to position II, the turn it further than position "0"and follow as at point f.

2)Procedure (below 60° F).

- a)Make sure the gear lever is in neutral position.
- b)Pull the choke lever all the way.
- c)Turn the ignition key to the position "0"
- d)Wait for 30 seconds until the electric fuel pumps have slowed down.
- e)Depress the clutch pedal and turn the key until it goes further than position "0"for starting the engine
- f)As soon the engine fires push all way forward the choke.

Hot engine

When the engine is hot it is not necessary to use the choke 62 fig.4.

When the engine is very hot it can be helpful to hold the throttle wide open until the engine fires.

Do not move the accelerator pedal up and down,as this operates the accelerator pumps and will make hot starting more difficult.

SPECIFICATIONS

ENGINE**Carburetors setting details.****Carb.type WEBER 38 DCOE 59 - 60/A**

Choke diameter	mm	30	Needle valve	mm	1,50
Main jet	mm	1,25	Float level:distance from float to underside of float		
Air correction jet	mm	2,10	bowl cover,including gasket	mm	6
Idle jet	F	9/55	Progression holes	1 of mm	0,85
Emulsion tube	F	29		1 of mm	0,85
Central diffusor	mm	4,50		1 of mm	0,90
Pump jet	mm	0,35		1 of mm	0,110
Pump stroke	mm	0,18	Starting jet		65/F5
Pump discharge		Closed	Starting mixture bush	mm	1,00

Idle mixture screw:

With friction ring which avoids screw movements.

Sealed air cleaner.**Fast idle cam setting:**

- a) in -15 position with oil temperature less than 160° F.
- b) after the + 15 position with engine oil temperature more of 140° F.

Fast idle r.p.m.:

1400, max. 2500, after starting from cold engine (oil at 86 ÷ 104° F).

Idle r.p.m. with warm engine:

950 with oil at 190,4° F (fast idle cam free)

Distributor microswitch setting:

The electric circuit controlled by the microswitch should be open with engine running at 2700rpm as explained at page 19.

ENGINE ELECTRICAL**Distributors:**

N° 2 Marelli S 138 B (61013802) 12V

Distr. timing:

2°—4° ATDC at 950 r.p.m. (secondary breaker points—see section 3).

Centrifugal advance:

26° (on primary points).

Distr. Microswitch:

N° 1 UNIMAX 2HB 58—1

Coils:

N° 2 Marelli BAE 200A

High voltage transistor unit:

N° 2 Marelli AEC 103A

Air pump clutch:

Baruffaldi EKM 1A electromagnetic

Air pump clutch control:

Bompard—Danieli unit

Pump circuit:

N° 2 Bendix electrical pumps

Generator:

N° 1 Marelli GCA 115A

AIR INJECTION SYSTEM**Saginaw air pump:**

N° 1 G.M. N° 340-CS-23-7806 286.

Air pump belt:

N° 1 Gates poliflex 7M600

Check valve:

N° 2 G.M. 5354987

Diverter valve:

N° 1 G.M. 7029196

Air pump clutch:

N° 1 Baruffaldi N° EKM 1A

Generator pulley:

Modified for air pump belt

Head cylinder cover:

Modified for air pump brackets

EVAPORATIVE EMISSION CONTROL SYSTEM**Sealed filler cap:**

N° 1 FIAT 124 A 100 104 030 418 1665

Limited filling tanks:

N° 2 Modified in order to have a empty room on the top of each tank.

Tank outlet pipes and a vapor liquid separator:

N° 1 Ferrari.

Three way valve:

N° 1 Borg Warner CUX 2219 or also FIAT 100GBC/1140/104806/4226204.

Activated carbon trap:

N° 1 Savara filter 5130/10A.

EXHAUST SYSTEM**Exhaust system:**

Ansa special exhaust system.

Exhaust manifolds:

With exhaust gas probes.

VEHICLE EMISSION CONTROL INFORMATION	
Ferrari s.p.a. SEFAC	
Engine family identification :	365
Model :	FERRARI 365 GTC/4
Engine displacement :	268 CU. IN.
Exhaust emission control type :	A.I.
ENGINE TUNEUPS SPECIFICATIONS AND ADJUSTMENTS	
Transmission position during tuneups :	neutral.
Accessories in operation :	none.
Basic ignition timing :	2°-4° ATDC at normal idle speed.
Normal idle speed :	950 ± 50 rpm.
Fast idle speed :	2400 ± 100 rpm.
Idle CO setting in each cylinder :	.60% + .90% at normal idle speed.
Spark plug gap :	.023-.035 in.
Gasoline type :	premium.
All check operations for emission control maintenance must be carried out by our agencies	
THIS VEHICLE CONFORMS TO U.S. DEPT. OF H.E.W. REGULATIONS APPLICABLE TO 1972 MODEL YEAR NEW MOTOR VEHICLES	

10)Air pollution tag:

showing the main data for correct engine adjustment, according to which the car meets the regulation on air pollution.

ENGINE**GENERAL DESCRIPTION**

For the cars equipped with an exhaust emission control system some engine modifications have been introduced, which concerns specially the fast idle system controlled by the oil temperature, a microswitch controlling a double breaker point distributors, a special carburetors tuning, and exhaust manifolds with analyzer connections.

All the devices ensure good emission limits provided that they are correctly checked and tuned.

PERIODICAL MAINTENANCE OPERATIONS.

In addition to the normal prescriptions, it is recommended that the Owner of a car equipped with the emission control system follows the emission service schedule printed on the air cleaner cover and listed hereafter.

ALL CHECKING AND MAINTENANCE OPERATIONS FOR THE EMISSION CONTROL SYSTEMS SHOULD BE CARRIED OUT BY FERRARI APPOINTED DEALERS.

The Owner is also entitled to free checks of the emission control systems during any free service coupon.

This is in addition to the normal maintenance under warranty which includes tappet clearance, spark timing and distributor dwell angle adjustments.

W A R N I N G	PERIODICAL MAINTENANCE OF EXHAUST, CRANKCASE AND EVAPORATIVE EMISSIONS CONTROL SYSTEMS		W A R N I N G
	periodical mileage	— EVENT —	
	3 000	check air pump belt tension. check and adjust plugs gap.	
	6 000	replace plugs. check high tension wires and plug caps. check air pump connections, pipes and valves.	
	10 000	check co% at normal idle speed in each cylinder and check revs. check fast idle revs and fast idle cam setting. check distributor microswitch operation. check Dinoplex unit, low tension wire and distributor circuit. check blow-by pipes and air filter. check air pump clutch working. check pipings and fittings of evaporative control device.	
	20 000	clean exhaust valves air injectors. check distributor advance	

11) Emission service schedule.

MECHANICAL CHECKS AND ADJUSTMENTS.

Spark plug service.

Remove plugs every 3000 miles, inspect each plug individually for badly worn electrodes glazed, broken on blistered porcelains and replace plug if necessary.

Clean plug electrodes with an abrasive cleaner, adjust plug gap to 0,60 mm.

With engine idling, inspect for plug cap's discharges.

With the high tension Dinoplex unit, any discharge will produce a noticeable noise and luminous sparks.

If necessary replace caps.

Each 6000 miles replace plugs with new ones.

Carburettors service.

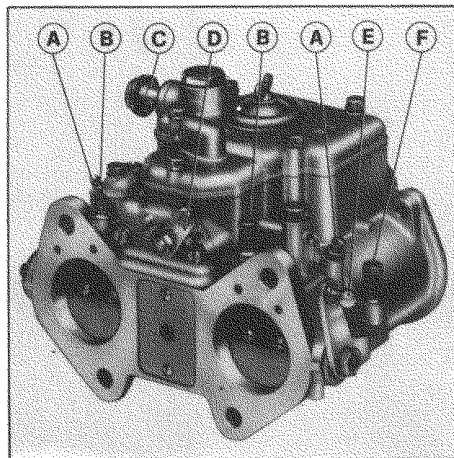
The client must bring the car to the dealer Agencies or Garages for the periodical carburettors service.

The carburettors are specially tuned for emission and no change should be made on the fixed tuning.

Special mixture screws are installed, which must be moved only during the periodical

mixture checks.

The mixture screws have friction rings and springs. They provide small enrichment with screw turn.



12) Carburettors.

A-Screw for balancing depression in carburettor chokes; B-Slow running mixture screw; C-Fuel inlet; D-Choke control lever; E-Throttle valve lever; F-Throttle opening adjusting screw.

Mixture check.

The mixture of the carburetors must be checked every 10.000 miles.

For no reasons the mixture screw will be moved after the checks.

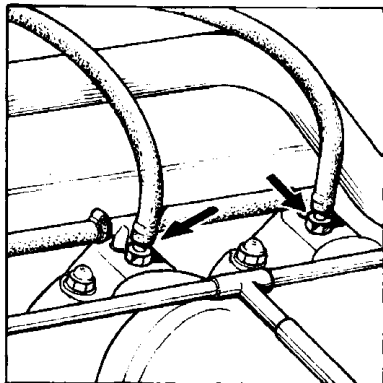
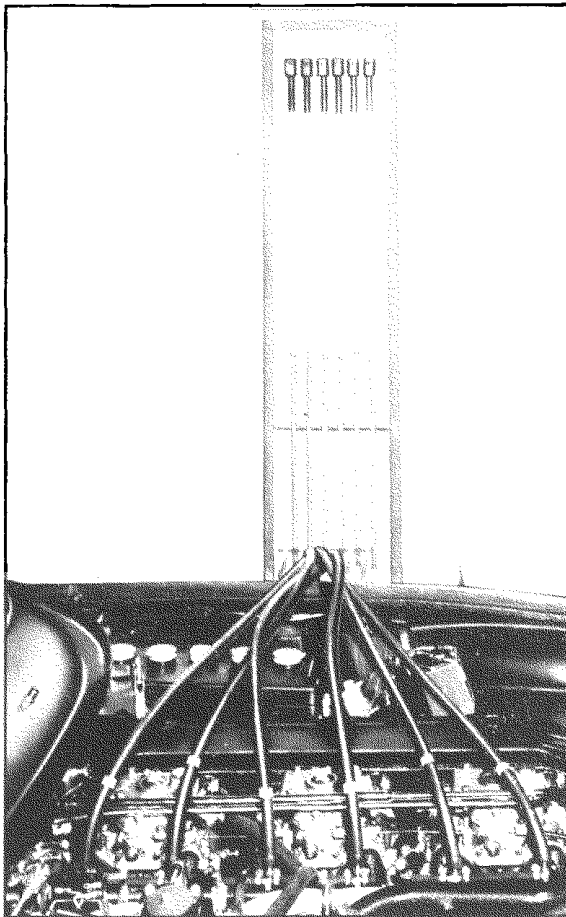
Provided normal air cleaner and fuel filters servicing is followed, the carburetors will perform the miles between the periodical checks without any other control.

Special tools (See fig.49 page 41).

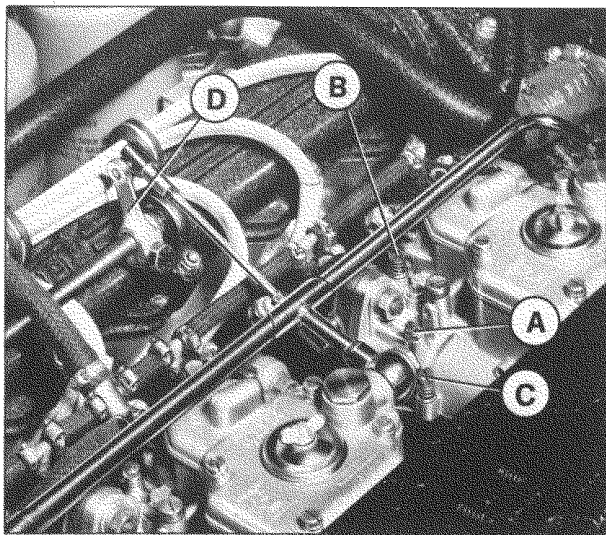
- Panel with six mercury-gauges and pipes, for depression measurement (it is better than air flow, meter which WC use in 365 GTC / 4.
- Twelve nipples to connect gauge pipes to intake manifolds.
- CO tester complete with heat exchanger.

Procedure.

- a) Start engine and warm it up (oil temperature 160° to 175° F) then switch it off. Screw out plugs on intake manifolds of one cylinder bank, replace them with provided nipples and connect gauges to intake manifolds (each carburettor will be connected to two gauges, one for each barrel). Fully screw-in by-pass screws (A) on carburetors (fig.14).
- b) Start engine and keep it idling at 900 to 1.000 rpm. operating on fast idle device adjusting nut (A) fig.17.
- c) Check that the two gauges connected to the two barrels of the first carburettor are showing equal measures. If this is not the case, unscrew the by-pass screw of the barrel where the depression



13) Checking mixture of carburetors.



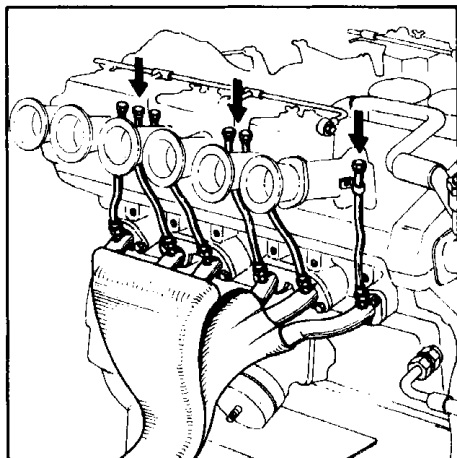
14) Carburettor balance adjusting screw.

- A-Screw for balancing depression in carburettor chokes.
- B-Slow running mixture screw.
- C-Throttle opening adjusting screw.
- D-Throttle control rod clamp fixing screw.

- is higher until the two gauges show equal measures, then tighten the lock nut.
- d) Repeat operation c) on the remaining two carburetors of the same bank.
- e) Check the depression on all three carburetors and equalize them, if necessary, operating on the slow running adjusting screws (C) after having loosened the throttle control rod clamp. Fixing screws (D).
- f) Change over to the other bank retaining a gauge connected to a barrel of the first one to be used as reference and repeat operations c) d) e).
- g) Release the fast idle cam and check that the engine is idling at 950 rpm.
If necessary operate on the slow running adjusting screws (C) to obtain the above engine speed then lock clamps (D) without altering the depressions shown on the gauges.
- h) Keep the engine running at $1500 \div 2000$ r.p.m. in neutral and check that the depression remains equal on each bank.
If differences are noticed, loosen again the throttle control rod clamps, move very slightly the position of the throttle valve lever, then re-tighten the clamps.
This last operation has to be carried out to eliminate possible plays in the throttle linkages.
- i) When the throttles have been equalized, check that the idle revs, with the fast idle

cam free, are still 950. If less, raise them to this value by means of the throttle screws (C).
Keep the engine cold with a fan.

Check that the CO analyzer be ready; connect the analyzer probe with the exhaust pipe relating to one barrel of the first carburettor.
With the analyzer probe connected, engine running 950 revs, air pump connected,



15) Pipes for CO control.

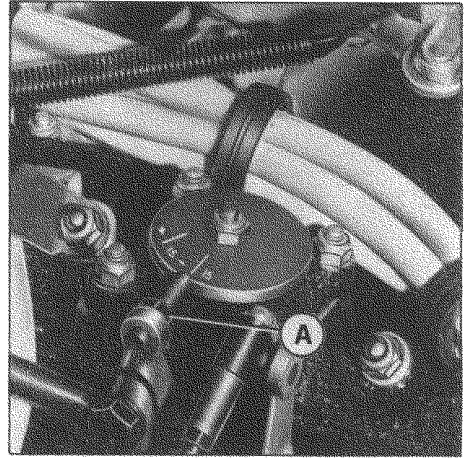
oil and water $176 \div 194^{\circ}\text{F}$. the CO% should be between 0,6% and 0,9%.

If the mixture is richer, close slowly the barrel mixture screw (awaiting each time that the analyzer indicator stands) and adjust the CO% to the prescribed value.

Repeat for all the twelve carburettor barrels, remove then the analyzer probe.

Accelerate the engine two or three times and check for the last time the idle revs and the CO% in each cylinder (it should be between 0,6% and 0,9%).

Warning: For no reason will the client enrich the mixture and move the screws. Setting of carburettors and periodical check of the mixture should be carried out by Ferrari appointed dealers.



17) Fast idle device fitted on the engine.

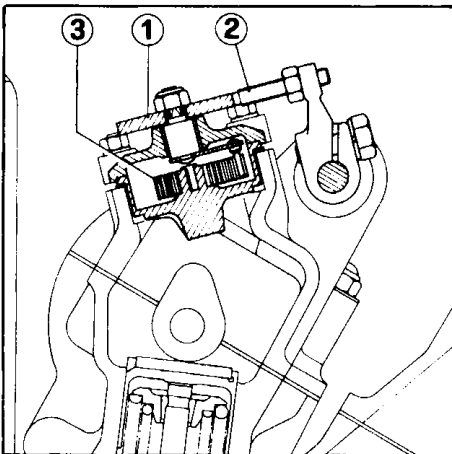
A-Adjusting nut.

FAST IDLE DEVICES.

The fast idle devices are two, one for each cylinder bank.

They are made of a bimetallic spring which moves a circular cam according to the distribution lubrication oil temperature (See fig. 16).

With oil temperatures less than 140°F the max. cam lift is in contact with a tappet connected through an arm with the carburettor.



16) Section of fast idle device.

1-Cam; 2-Adjusting nut; 3-Bimetallic spring.

throttles control rod. Therefore, the throttles are slightly opened and should the engine be started from cold with ambient temperature of 60°F , in this condition, a few seconds later, the speed will automatically reach $1400 \div 1800$ r.p.m..

As the engine warms up and the oil temperature increases, the cam turns and when the max. of 2400 r.p.m. is reached, the speed will decrease to $950 \div 1000$ r.p.m. (with oil temperature of about 176°F).

In this condition the cam is free, and the engine runs at idle speed.

Setting of the fast idle cam

(operation valid for RH&LH cylinder banks; always operate on both banks).

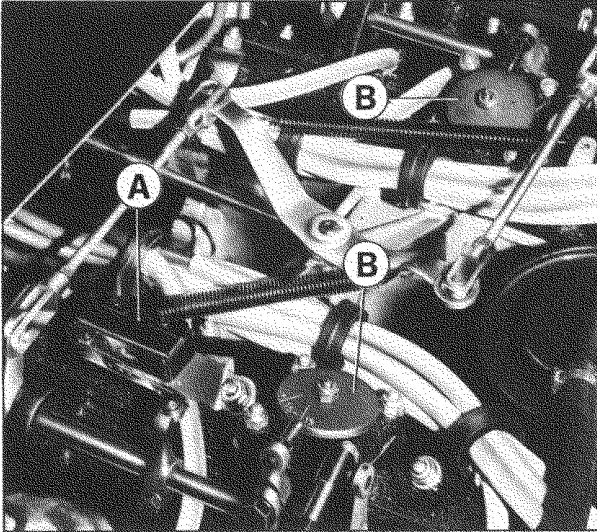
—With warm engine (oil temperature of about 194°F) the tappet does not touch the cam.

—With cold engine (oil temperature less than 140°F) and ambient temperature of 60°F , carry out the adjustment in this manner:

—Start the engine and after 30" check the speed.

—If the speed is more than 1700 r.p.m., adjust the tappet nut (A) shown in fig. 17 and slightly release the tappet.

Let the engine run for 5-10 minutes "flipping" the accelerator from time to time. Dur-



18) Fast idle device and distributor microswitch fitted on engine.

A—Distributor microswitch.
B—Fast Idle devices.

ing such period of engine heating the speed must not be over 2400 r.p.m. and not less than 2200 r.p.m..

If these conditions are not achieved operate on adjusting nut (A) fig.17.

When the oil temperature in the camshaft region is about 60° F, the tappet should be between the - 15 and + 15 written on the cam.

—During the maintenance strip the unit down and make sure there are no deposit and eventually proceed to a good cleaning operation and lubrication.

Reassembly must take place in the same position.

Adjustment of the fast idle device should be carried out by Ferrari appointed dealers.

The microswitch is installed on the cylinder head cover R.H. side.

The movement of the pushbutton is obtained by an arm having a wheel in contact with a small support (adjustable by two nuts) fitted on the rod driving the throttles on the RH bank carburetors.

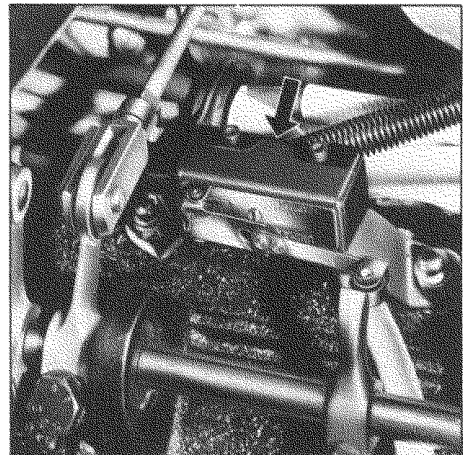
On the distributors there are 2 breaker points: the R2 retards of 14° engine in comparison to the R1.

The R2 operates until the microswitch opens the circuit (2700 to 3000 r.p.m.) and

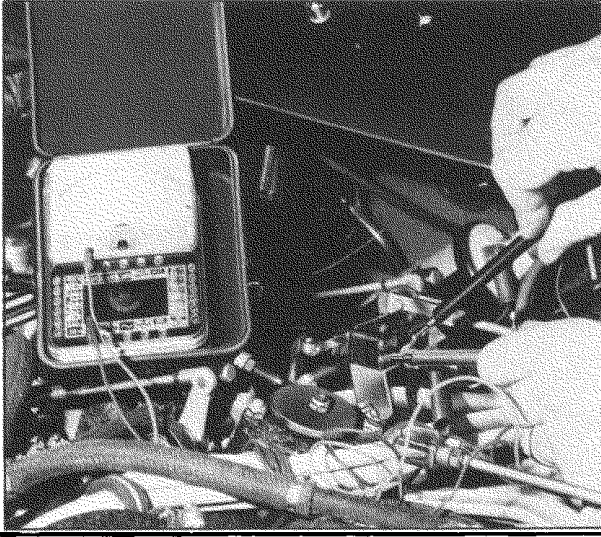
the R1 begins to operate over the above engine speed.

The microswitch opens the circuit causing the R1 breaker point to operate, when the accelerator is pressed and the engine speed is 2700 to 3000 r.p.m..

To verify the correct functioning of the switch, use an ohmmeter connecting one of its poles on the ground wire of the microswitch (as shown in fig.20) and the other on the wire coming from the distributor.



19) Distributor microswitch.

20) Ohmmeter layout.

Having the accelerator in "rest" position, the ohmmeter arm points almost towards the full scale value position. Pressing the accelerator pedal to run at 2700 to 3000 r.p.m., ohmmeter arm will move towards the "O" position: this shows the opening of the circuit.

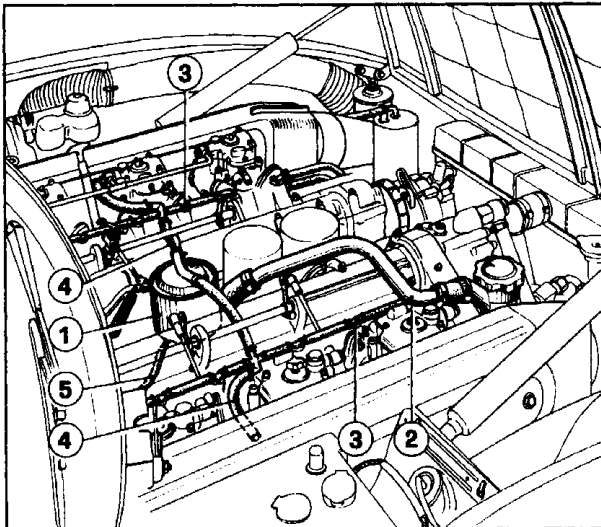
If not, operate on the nuts next to the support mounted on the carburettor arm, moving it towards the microswitch in order to obtain a regular adjustment.

No maintenance is required for the switch

provided that each 10000 miles the wire and connections are inspected to make sure there is continuity and cable insulation.

Warning:

The car should not be run with the microswitch pushbutton faulty blocked in, because the ignition timing of the distributors should then be retarded of some 14° crankshaft degrees and bad running of the engine will follow.

**21) Crankcase emission control system.**

1-Oil vapor condenser; 2- Tube connecting condenser to filling neck; 3-Calibrated ducts; 4-Tubes from condenser to intake manifolds and air intakes; 5-Drain tube from condenser to sump.

ENGINE ELECTRICAL

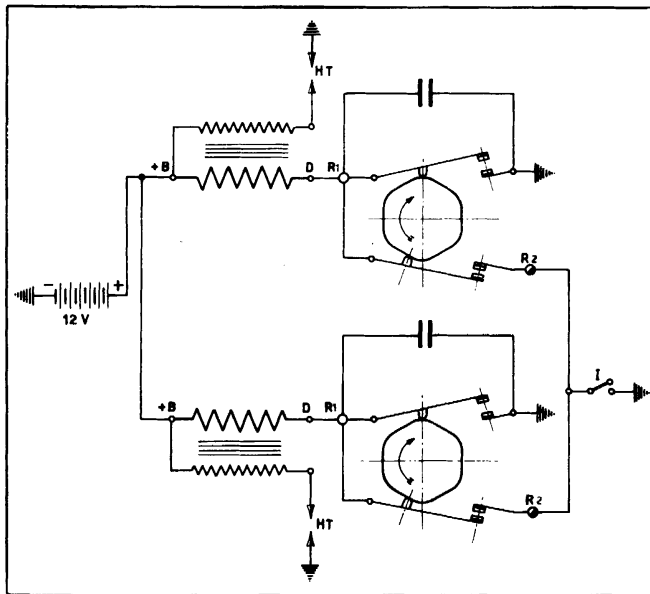
IGNITION SYSTEM

The ignition system is fed from a 12 volt 77 ampere hour battery.

The two distributors are of a special type. There are two sets of breaker points in each one, which will be called primary R1 and secondary R2 breaker points.

Contact breaker gap: $\text{mm } 0.32 \div 0.38$
($0.012'' \div 0.015''$).

- Basic ignition timing: 2° to 4° ATDC with R1 breaker points.
- 10° to 12° BTDC with R2 breaker points.
- Total advance: $36^\circ \pm 2^\circ$ over 6,000rpm.
- Ignition firing order: 1-2-5-11-3-9-6-12-2-8-4-10.
- Coils: two Marelli type BAE 200A.
- High tension transistor units: two Marelli AEC 103A.
- Sparking plugs: Champion N6Y only.



22) Double breaker points distributors circuit.

Marelli distributors type 50.10.141.2 or S 138 B. (50.10.141.2 is the experimental number, S138 B is the production number).

Running at normal revs: R1.

○ Opening angle $28^\circ \pm 2^\circ$ closing angle $32^\circ \pm 2^\circ$.

Running at low revs (R1 connected to R2): angles altered of $7^\circ \pm 1^\circ$.

● Opening angle $21^\circ \pm 2^\circ$ closing angle $39^\circ \pm 2^\circ$.

I: Micro switch moved by carburettor shaft lever.

R1: Main contact breaker.

R2: Auxiliary contact breaker.

○ Dwell • 53,5% (R1)

● Dwell • 65 % (R2)

The secondary R2 breaker point retard of 7° distributor in comparison to the primary R1 breaker point. To adjust in this way the R2 breaker point it is possible to use a proper system of screws and holes in the distributor casing.

The ignition impulse is generated from the R1 or R2 breaker point according to the movement of the microswitch I which is controlled by the carburettor lever shaft.

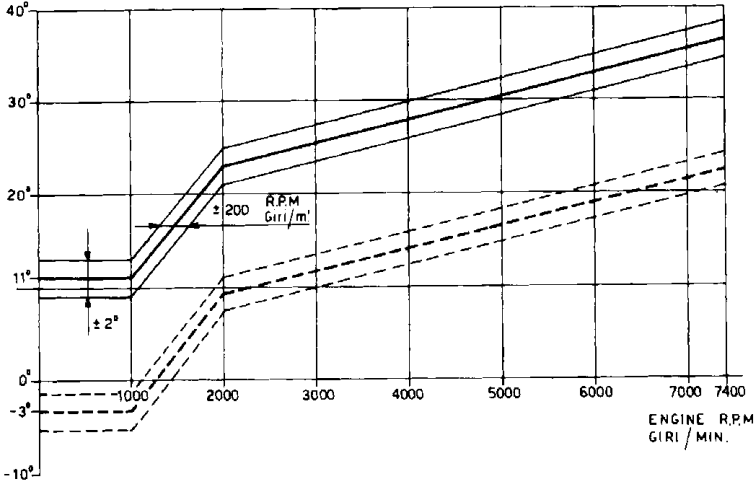
The distributor does not require special maintenance and for the service look on the general service book.

Timing:

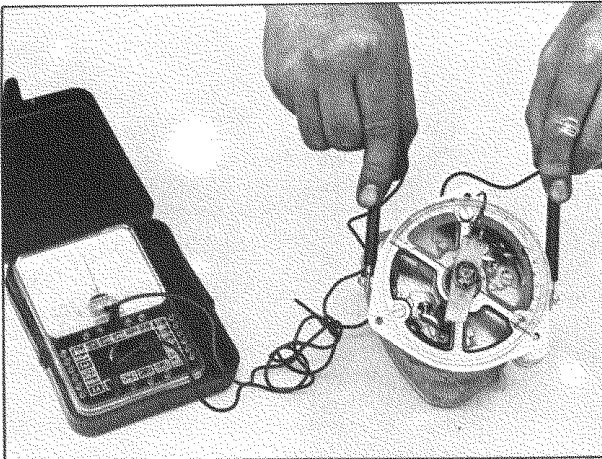
Time the distributor as a normal one, provided the microswitch I has been disconnected. At 950—1000r.p.m. of idling engine the timing will be 11° of engine BTDC. (microswitch I disconnected).

With the microswitch I connected and well adjusted (see engine section) the timing should be 3° ATDC at 950 ÷ 1000 revs of idling engine.

ENGINE DEGREES
GRADI ANTICIPO SUL MOTORE

**23) Distributor Marelli 50.10.141.2 (S 138 B).**

- Ignition advance full power carried out with normal point.
- Ignition advance during the cycle carried out with retarded point.

Timing of the breaker point R2 with regard to R1.**24) Timing the distributor.**

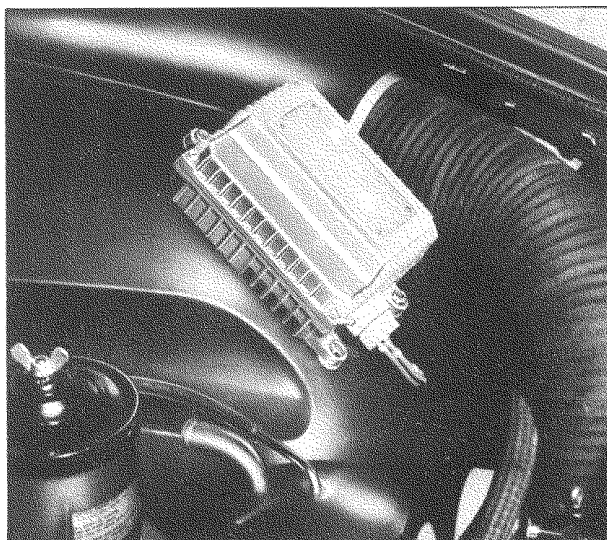
Replace the distributor rotor with special modified rotor with an indicator needle. Fasten a protractor to the distributor housing.

Connect an ohmmeter between R1 primary point and the distributor casing. Rotate the distributor shaft to the point where the ohmmeter shows that R1 point starts opening the circuit.

Note the protractor degrees. Insert the ohmmeter between R2 and the distributor casing. Turn more the distributor shaft to the point where R2 starts opening the circuit.

The protractor degree on that position should differ of 7° by those on the R1 position. If different values are obtained change the relative R1 - R2 position by loosening the screw on the distributor housing and recheck. All the service should be performed without dismantling the distributor from the car provided that the breaker points are disconnected from the car electrical circuit and the rotors replaced by the special one.

The rotation of the distributor shaft will be obtained by moving the car with a gear on.

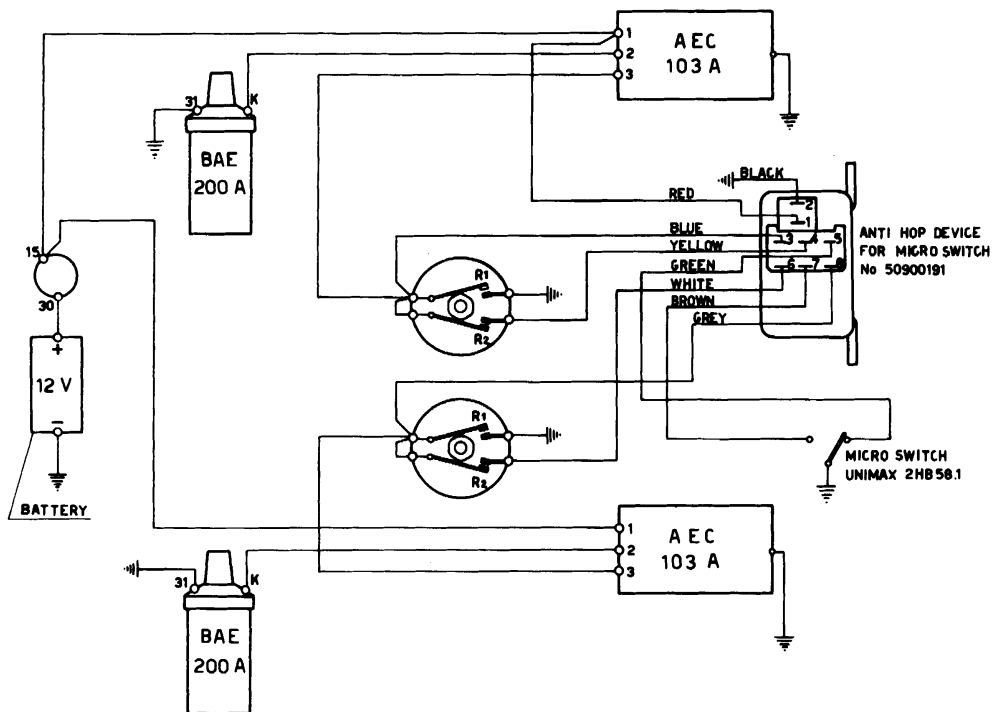


25) High tension ignition unit fitted on the car.

The high voltage units are two Marelli AEC 103A, located in the engine compartment (right and left).

The unit should not require any maintenance. If necessary, this should be performed only by the Marelli agencies.

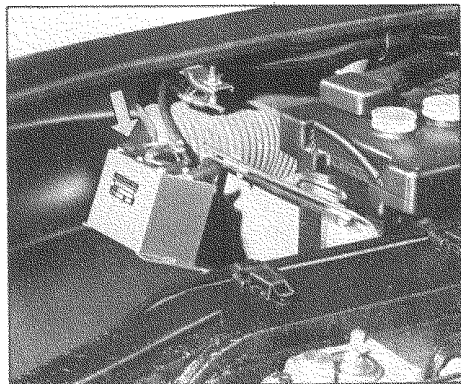
With the key turned in I1 position, the unit makes a very thin noise, which can be noticed approaching the car to it.



26) High tension transistor unit connections.

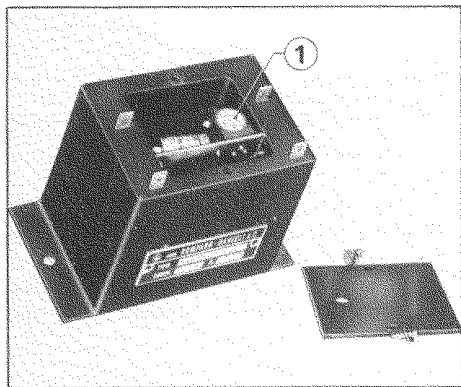
AIR PUMP CLUTCH CONTROL UNIT

This electronic unit is located in the engine compartment in front of the battery, on the RH engine bay valance.



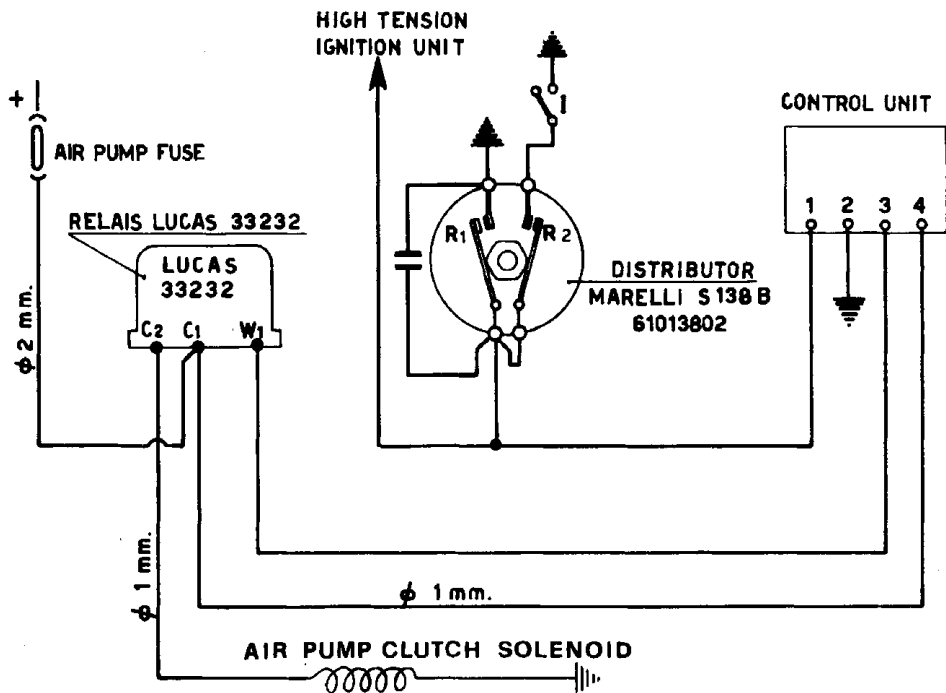
27) Bompard-Danieli electronic unit fitted in the engine compartment.

The unit controls the air pump clutch, which is released, disconnecting the air pump from the engine, when the speed reaches 3200 r.p.m.



28) Bompard Danieli electronic block.

1—Speed control screw.



29) Air pump clutch electrical connections.

The unit does not require maintenance, if necessary adjust the clutch release speed by rotating the screw (1) using a screwdriver. The clutch release speed will be increased rotating the screw (1) clockwise and will be decreased rotating it anti - clockwise.

Warning:

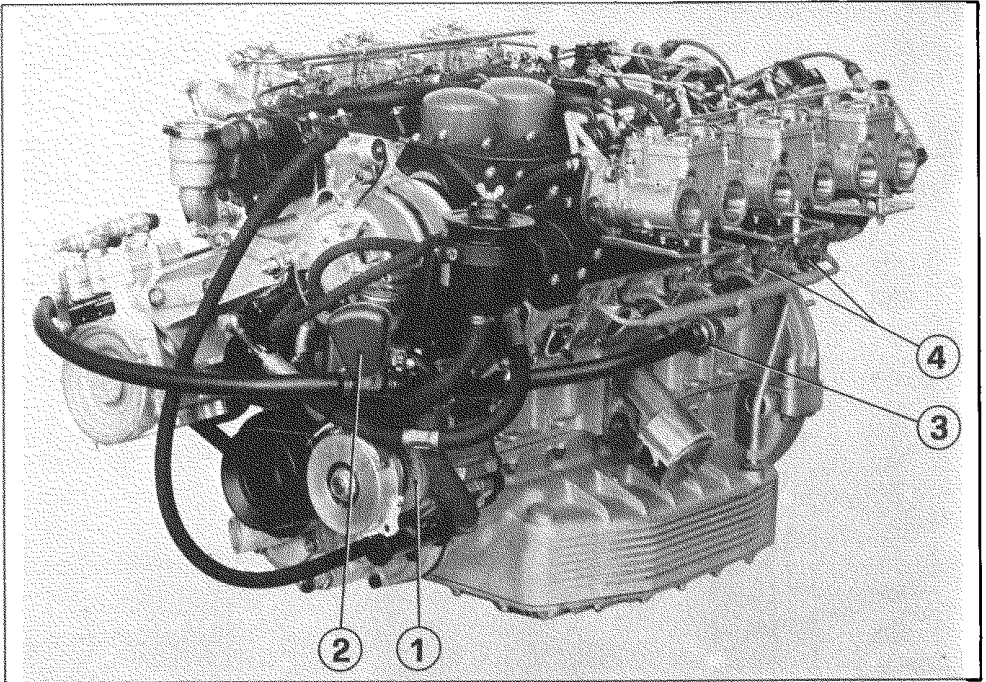
Avoid the clutch disconnecting over 3200 r.p.m..

At this speed the pump could be damaged. If the unit is to be replaced connect the new one following the schematic diagram shown in fig.29.

AIR INJECTION SYSTEM

The air injection system consists: of air injection pump (including the necessary brackets and attachments), air pump electromagnetic clutch, air injection pipes (one for each

cylinder), air diverter valve, check valves (two), air manifold assembly, tubes and hoses for the connection of the various components.



30) General layout.

1-Air pump; 2-Diverter valve; 3-Check valve; 4-Injectors.

GENERAL MAINTENANCE.

Accurately check tension and state of the air pump belt every 3,000 miles.

The tension is correct when pressing with a 22 lbs. pressure in the middle between generator and air pump pulleys, the corresponding slack is of $0.275 \div 0.393$ in. Also make sure that the belt is in good working conditions (without any crack, wear or fraying). When necessary, replace it.

To replace the belt, release the pump bracket's nuts, slack off the pump and remove the clutch stop taking off the belt.

Every 6,000 miles make sure there are no leakages through connections and valves.

If exhaust explosions are detected check the vacuum pipe to diverter valve and make sure there are no occlusions.

The check valve must not allow the exhaust gas to come back to the pump.

Every 10,000 miles check air pump clutch release.

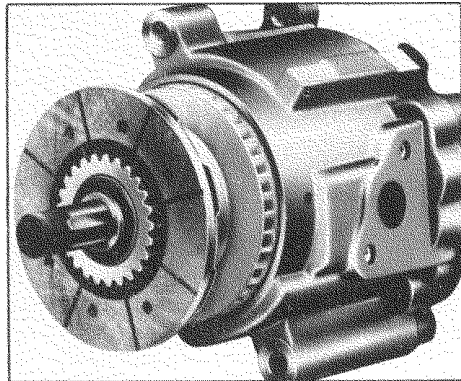
Accelerate until the engine reaches 3200 r.p.m. and make sure the clutch is engaged all the time.

Over 3,200 r.p.m. the clutch must be disconnected.

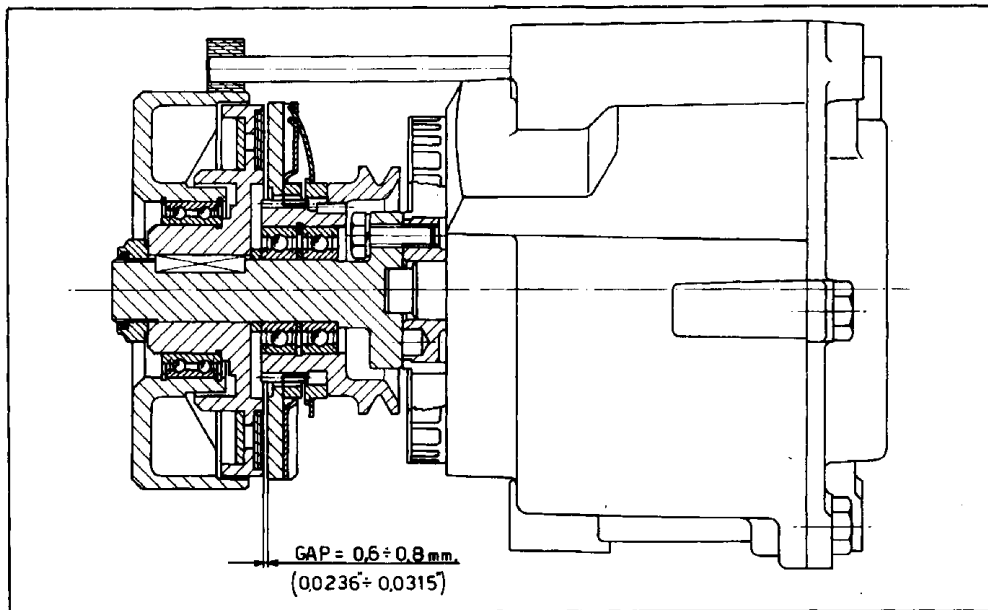
If necessary adjust disconnection speed as explained in the electrical section.

Clutch gap: the gap should be between 0,6 and 0,8 mm (0.0236" and 0.0315").

If the gap is greater, remove the magnetic part of the clutch using the special key; remove the spacer on the clutch shaft replacing this with a thinner one, so that the gap is reduced.



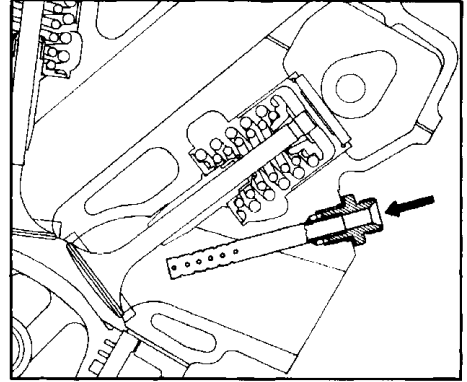
31) Electromagnetic clutch.



32) Scheme of the clutch.

Every 20,000 miles : remove the air reflux manifold releasing the nipples, remove the nipples, remove the air nozzles on the heads. Clean and reinstall new ones if necessary.

Checks and maintenance services of the air injection system should be carried out by Ferrari appointed dealers.



33) Air nozzle.

AIR PUMP

The air injection pump (fig. 34) with an integral filter, compresses the air through the manifolds in injection tubes into the exhaust system in the area of the exhaust valves. This fresh air burns the unburnt portion of the exhaust gases in the system, thus reducing exhaust contamination.

Replacement of pump filter.

- Remove drive belt and pump pulley as previously outlined.
- Pry loose outer disc of filter fan.
- Pull remaining portion of filter off with pliers (fig. 35).

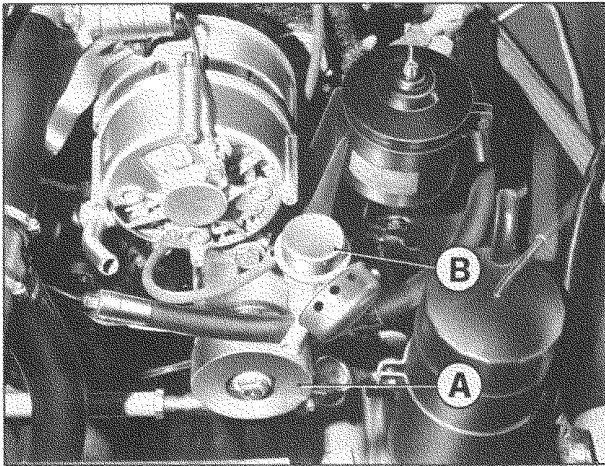
Warning :

Care should be taken to prevent fragments from entering the air intake hole.

- Install new filter together with pulley and pulley belts. Do not install filter by hammering on it or using any pressure.
- Insert the filter evenly by alternatively torquing the bolts.

Be sure the outer edge of filter slips into the housing.

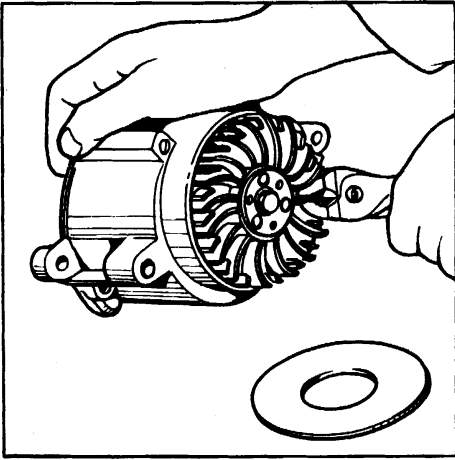
A slight interference with the housing bore is normal.



34) Air pump with clutch and diverter valve.

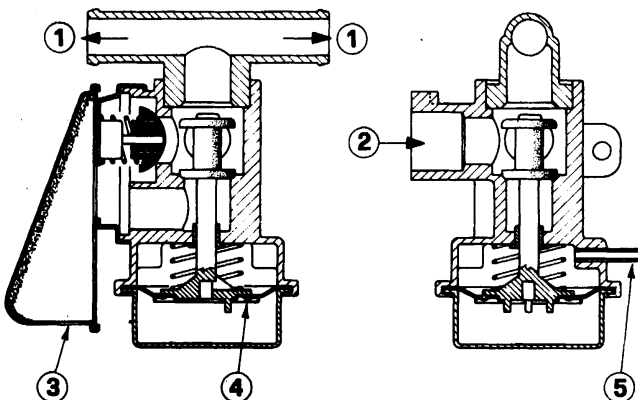
A-Air pump.

B-Diverter valve.

35) Removing of centrifugal filter.**DIVERTER VALVE**

The diverter valve (fig. 36) when triggered by a sharp increase in manifold vacuum, stops the air to get to the exhaust port areas thus preventing backfiring during this richer period.

The diverter also includes a relief valve that could by-pass the air out of the pump if the air pump clutch fails to disconnect the pump at high speed.

**36) Diverter valve in open position.**

- 1-Outlet.
- 2-Inlet.
- 3-Diverted air outlet.
- 4-Diaphragm spring.
- 5-Signal line connection.

EVAPORATIVE EMISSION CONTROL SYSTEM.

To prevent that fuel vapors coming from tank be released into the atmosphere, they are conveyed through a proper pipe system to an active carbon trap arranged into the engine compartment where they are absorbed.

During engine operation a hot air stream regenerates the active carbon from which the gasoline vapors are extracted and conveyed to the intake manifolds.

See general layout in the next page fig.39. The system consists essentially of:

- Sealed filler cap.
- Limited filling tank.
- Tank outlet line and vapor-liquid separator.
- Three way valve performing the following tasks : (see fig.40).

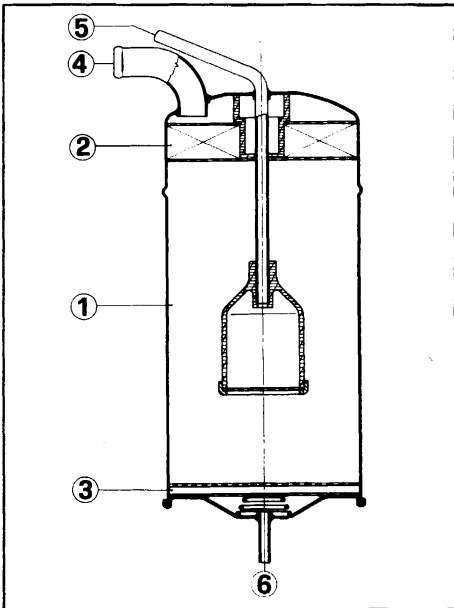
- Slight tank pressurization; air inlet into tank to prevent any possible vacuum; safety exhaust to prevent undue overpressures in tank.

- Sealed air intakes with no-return valve.

MAINTENANCE

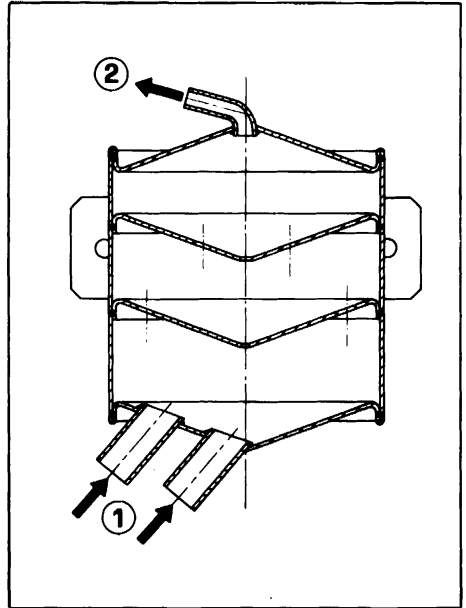
A periodical visual inspection of the condition of pipings and fittings is recommended. There should be no leakages in the tubes and in the connectors.

Make sure that the tube of the hot air purge inlet of the activated carbon trap be close to the left exhaust manifold because otherwise the scavenging hot air would not have a sufficiently high temperature to purify the filter.



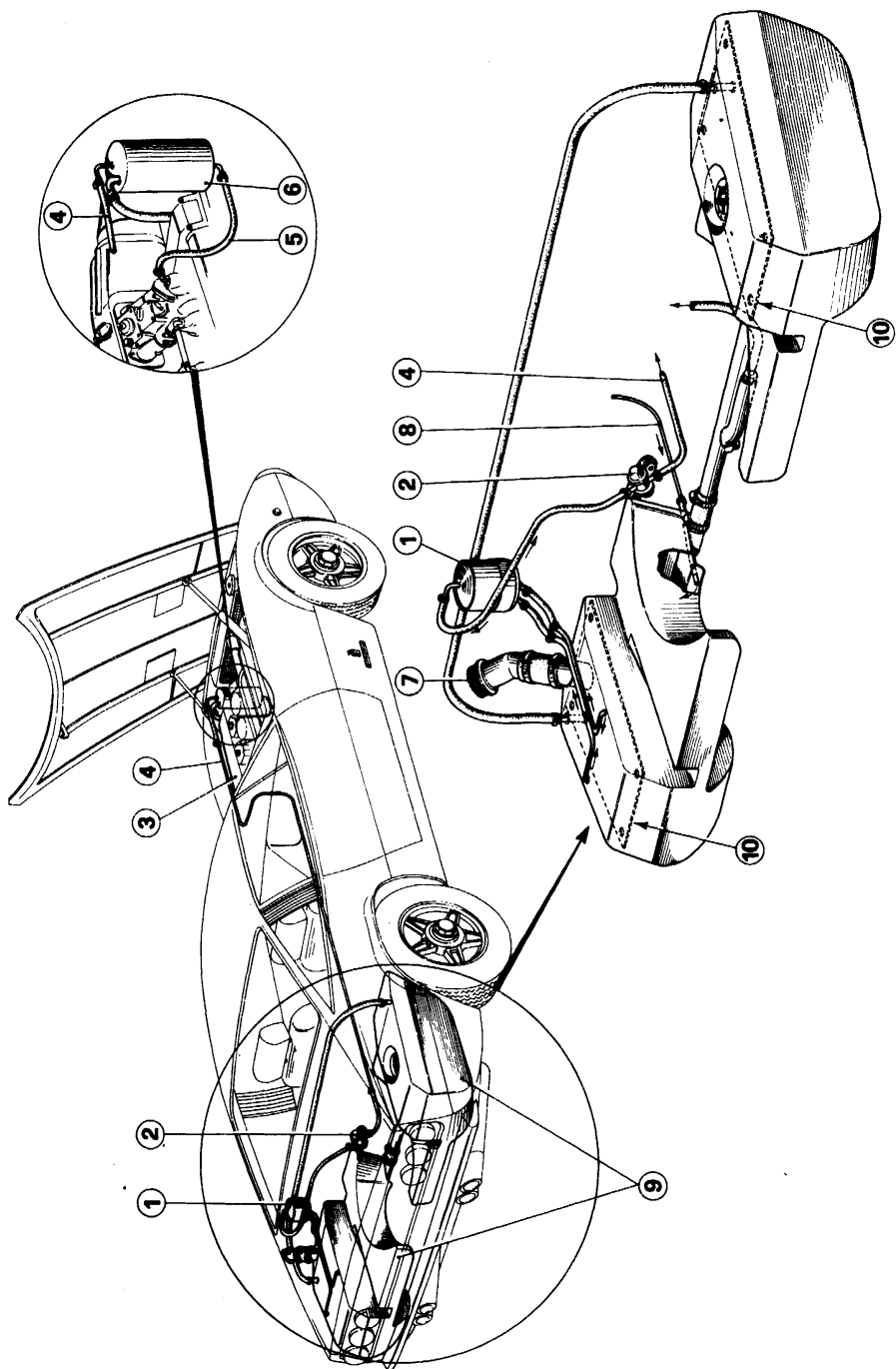
37) Activated carbon trap.

1-Activated carbon; 2-Air purge filter; 3-Synthetic filter; 4-Hot air purge inlet; 5-Fuel vapors inlet; 6-To engine intake manifold.



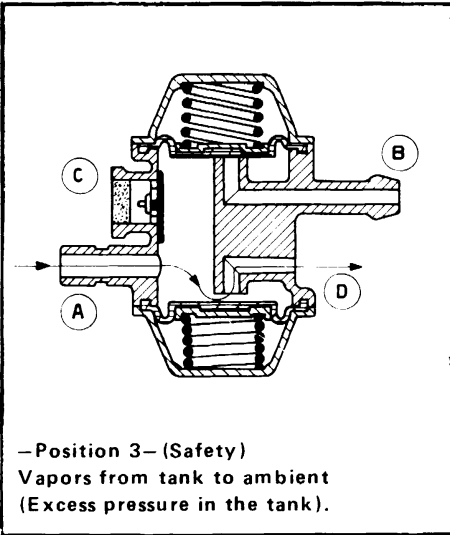
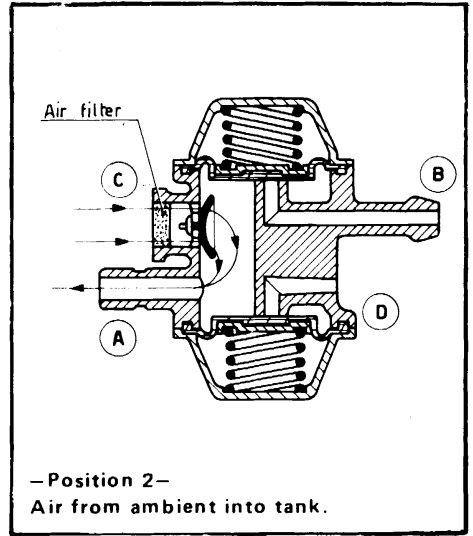
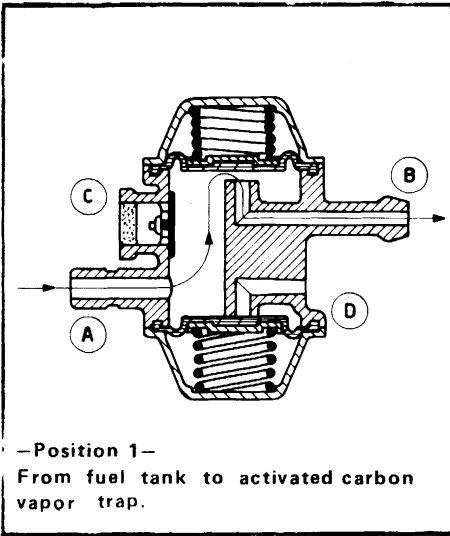
38) Liquid vapor separator.

1-Vapor inlet; 2-Vapor outlet.



39) Fuel evaporative emission control system — General layout.

1-Liquid vapor separator ; 2-Three way control valve ; 3-Scaled air intake ; 4-Vapor vent line ; 5-Depression intake first carburettor manifold under right hand ; 6-Activated carbon trap ; 7-Scaled cap ; 8-Fuel return pipe from carburettors ; 9-Fuel tank ; 10-Maximum fuel level.



40) Three way control valve
"BORG WARNER CORPORATION"
(Type CUX 2219).

- A-From fuel tank.
- B-To activated carbon trap.
- C-Fuel tank air inlet.
- D-Safety outlet.

SEALED AIR INTAKE.

The air intakes, in the inlet nose, feature a valve controlled by the engine oil pressure. With engine running, the oil pressure caused the valve to open, allowing the air to flow into the carburetors; when the engine stops, the valve closed following the oil pressure

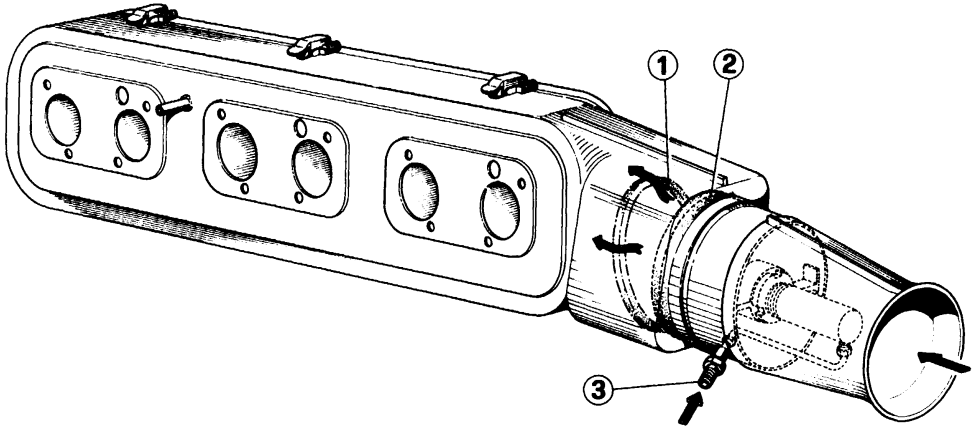
drop, not allowing the fuel vapors to go into the atmosphere. When starting the engine, the depression caused by the starter motor makes to open a little valve located inside the bigger one in order to allow the air needed for the starting operation to flow through.

Warning :

If during engine operation, a sudden oil pressure drop is noticed, this could be caused by an oil leakage from the air intake valve circuit.

A considerable loss of engine power will be noticed due to the close position of the valve not allowing the air flowing into the carburetors.

Stop the engine at once, plug the pipe delivering oil from engine to air intake valve, check that the oil level is not low, then apply to the nearest Ferrari Authorized Dealer and have the installation checked and repaired.



41) Air intake and valves.

1-Valve in open position; 2-Valve in closed position; 3-Oil Inlet.

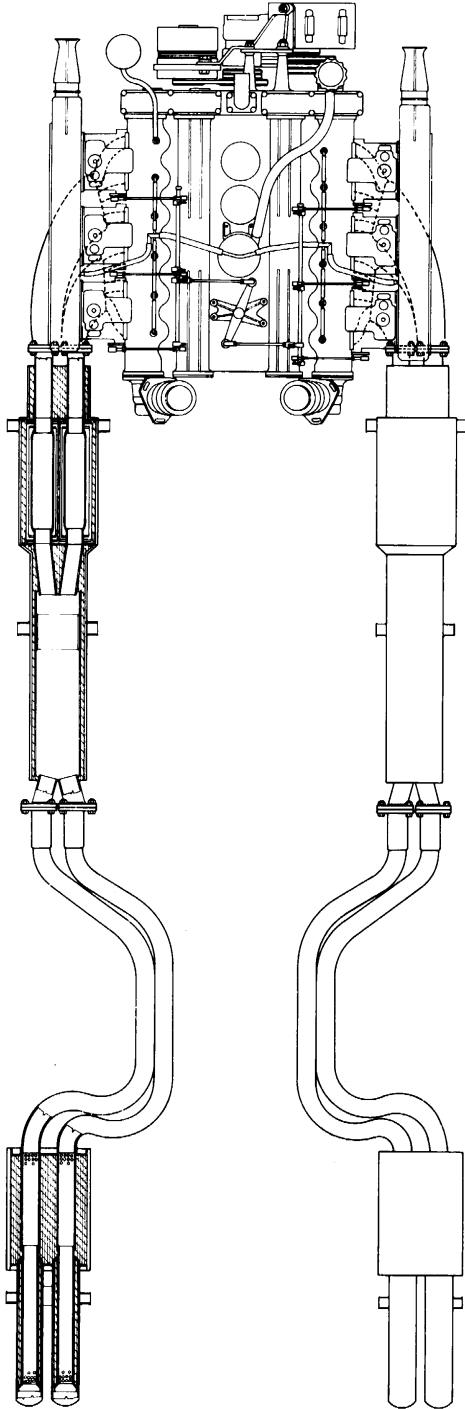
EXHAUST SYSTEM

The exhaust system has been specially developed to comply with emission limits.

Check exhaust pipes if explosions are detected during throttle release.

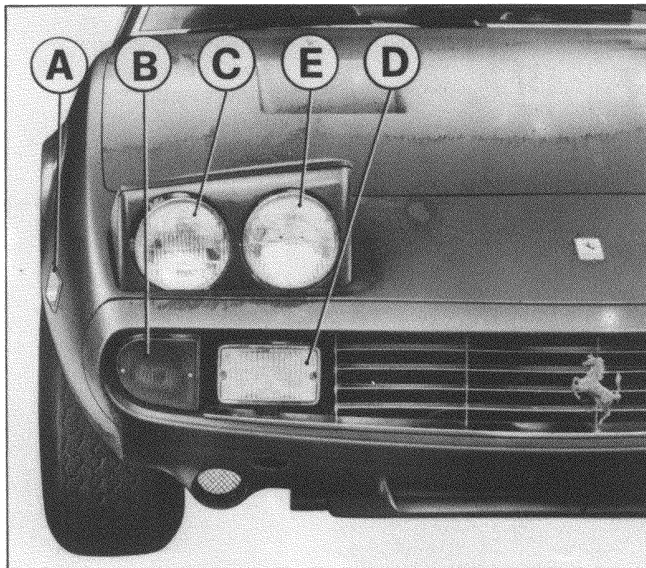
The connections with exhaust manifolds must be sealed and no gas leakage must occur.

Insulating material must be placed between pipes and floor and kept in good condition to avoid danger due to overheating.



42) Exhaust system.

ELECTRICAL INSTALLATION

**43) Front lights.**

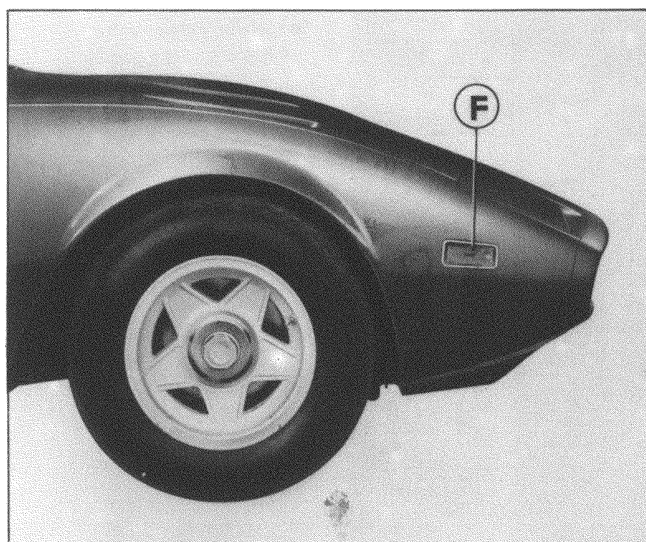
A-Front side marker (bayonet-coupled bulb-4W).

B-Parking and direction indicator light (twin filament bulb 5/21W).

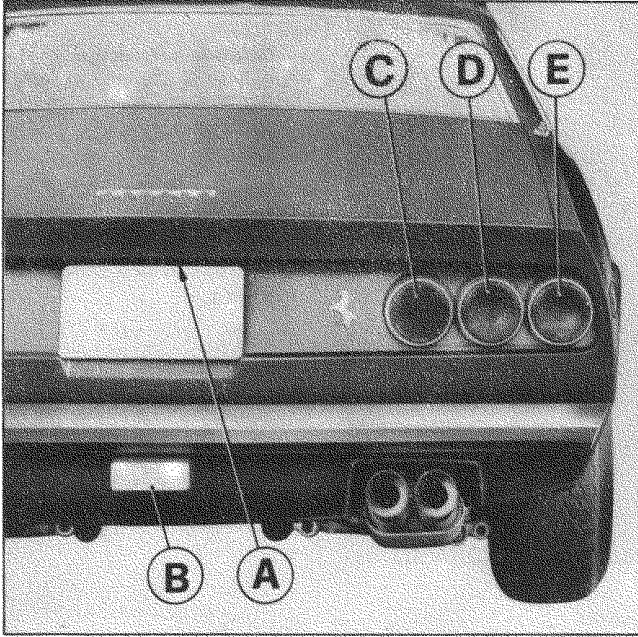
C-Sealed main and dip beam (main beam bulb 37,5W-dip beam bulb 50 W).

D-Fog lamp (iodine vapor bulb -55 W).

E-Sealed main beam (37,5 W bulb).

**44) Front side marker.**

F-Front side marker light (bayonet-coupled bulb 4W).



45)Rear lights.

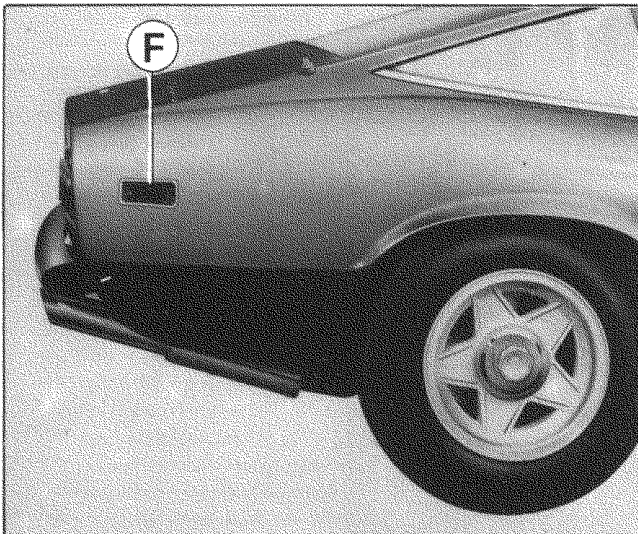
A-Number plate lamp.
(two 5W bulbs)

B-Reverse light.
(21W bulb)

C-Reflex reflector.

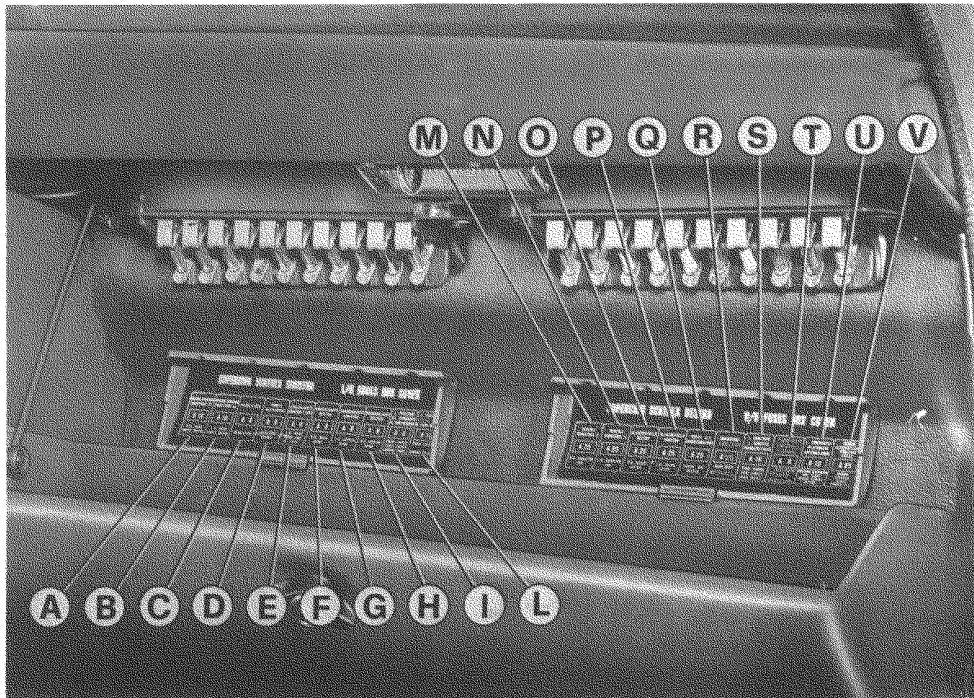
D-Parking and stop lights.
(twin filament bulb5/21W)

E-Direction indicator light.
(21W bulb)



46)Rear side marker.

F-Rear side marker light.
(bayonet-coupled bulb 4W)



47) Fuse boxes (Circuits protected by fuses).

LEFT BOX

A-A16 R.H.headlights motor.
 B-A16 L.H.headlights motor.
 C-A8 Regulator.
 D-A8 Electric pumps.
 E-A8 L.H.main beam and warning light.
 F-A8 R.H.main beam.
 G-A8 L.H.dipped beam.
 H-A8 R.H. dipped beam.
 I-A8 Parking lights-Panel lights-Ashtray light
 L-A16 Parking lights-Engine lamp-Fog lights

RIGHT BOX

M-A25 R.H.radiator fan.
 N-A25 L.H.radiator fan.
 Q-A25 R.H.glass lifter.
 P-A25L.H.glass lifter.
 Q-A25 R.H.&L.H.fans-Air conditioner.
 R-A25 Heated rear screen-Reverse light.
 S-A16Turn signal-Stop lights-Windshield wiper.
 T-A8 Air pump-Safety harness circuit-Instruments.
 U-A16- Vehicular hazard warning light-Interior light-Radio aerial motor.
 V-A25 Horns-Lighter-Clock-Power supply point-Remove key indicator acoustic signal.

WIRING DIAGRAM LEGEND:

- 1-Fog lamp (Iodine vapor bulb 55W).
- 2-Main sealed beam (37.5W bulb).
- 3-Main and dip sealed beams(dip:50W bulb - main:37.5W bulb).
- 4-Parking and direction indicator lights(twin filament bulb 5/21W).
- 5-Front and rear side markers (4W bulbs).
- 6-Alternator Marelli GCA 115A.
- 7-Regulator Marelli RTT 101C.
- 8-Distributor Marelli S 138B.
- 9-Ignition coil Marelli BAE 200A.
- 10-Starter motor Marelli MT 21T.
- 11-Horn relay FIAMM (20A-12V).
- 12-Water thermoter sender unit.
- 13-Oil thermometer sender unit.
- 14-Oil pressure gauge sender unit.
- 15-Engine compartment light (5W bulb).
- 16-Engine compartment light jam switch (2A—12V).
- 17-Battery (77 Ah-12V).
- 18-Back-up light switch (5A - 12V).
- 19-Stop light switch (6A-12V).
- 20-Fuse boxes (6x8A;7x16A;7x25A).
- 21-Flasher for direction indicator (SIPEA DLBS -L4361/12V-46W).
- 22-Windshleld wiper (Lucas 12V-16W).
- 23-L.H.electrofan motor (Smith).
- 24-L.H.electrofan switch
- 25-R.H.electrofan motor (Smith).
- 26-R.H.electrofan switch.
- 27-L.H.radiator cooling fan motor(Marelli MTX 7 B).
- 28-R.H.radiator cooling fan motor(Marelli MTX 7 B).
- 29-Relay switch for L.H.radiator cooling fan motor (12V-20A).
- 30-Relay switch for R.H.radiator cooling fan motor (12V-20A).
- 31-
- 32-Rheostat(4.5 Ω) and switch for Instrument lights.
- 33-Direction indicator switch.
- 34-Main-dip beam change-over and flash switch.
- X 35-Windshleld wiper and washer pump three positions switch lever.
- 36-Parking light switch.
- 37-Ignition switch with remove-key indicator connections.
- 38-Vehicular hazard warning signal switch.
- 39-Electrically heated rear window switch.
- 40-Speedometer (lighting bulb 3W).
- 41-Oil pressure gauge (lighting bulb 3W).
- 42-Oil thermometer (lighting bulb 3W).
- 43-Water thermometer (lighting bulb 3W).
- 44-Rev counter (lighting bulb 3W).
- 45-Fuel level gauge (lighting bulb 3W).
- 46-Clock (lighting bulb 3W).
- 47-Ammeter (lighting bulb 3W).
- 48-Spare warning light(3W)-Used when electrically heated windshield (optional)is fitted.
- 49-Fuel reserve warning light (3W).
- 50-Brake system failure warning light (3W).
- 51-L.H.direction indicator warning light (3W).
- 52-R.H.direction indicator warning light (3W).
- 53-Parking light indicator (3W).
- 54-Handbrake warning light (3W).
- 55-Headlamp main beam warning light (3W).
- 56-Glove box light (5W).
- 57-Glove box light jam switch (2A).
- 58-Open-door marker light (4W).
- 59-Cigarette lighter (lighting bulb 4W).
- 60-Ash-tray light (5W).
- 61-Courtesy lights (5W).
- 62-Handbrake warning light switch (2A).
- 63-Vehicular hazard light flasher.
- 64-Electrically heated rear window warning light (3W).
- 65-Horn button.
- 66-Power supply point.
- 67-Remove-key indicator buzzer.
- 68-Screen washer pump.
- 69-Jam switch (2A) between door and pillar, for interior lights.
- 70-Interior light and switch.
- 71-Fuel level sender unit.
- 72-Luggage compartment light (5W).
- 73-Jam switch (2A) between lid and body,for luggage compartment light.
- 74-Rear direction indicator,parking and stop lights with reflex-reflector(twin-filament bulbs 5/21 W for parking and stop light,21W bulbs for direction indicator lights).
- 75-Number plate lamp (5W bulbs).
- 76-Back-up light (21W bulb).
- 77-Thermostatic control switch for radiator fan motor relays
- 78-Radio noise suppressor capacitor(3 μ F)for alternator.
- 79-Radio noise suppressor capacitor(1 μ F)for fuel pumps.
- 80-Radio.
- 81-Electric motor for radio aerial.
- 82-Radio receiver protection fuse (5A).
- 83-Remove-key indicator push button.

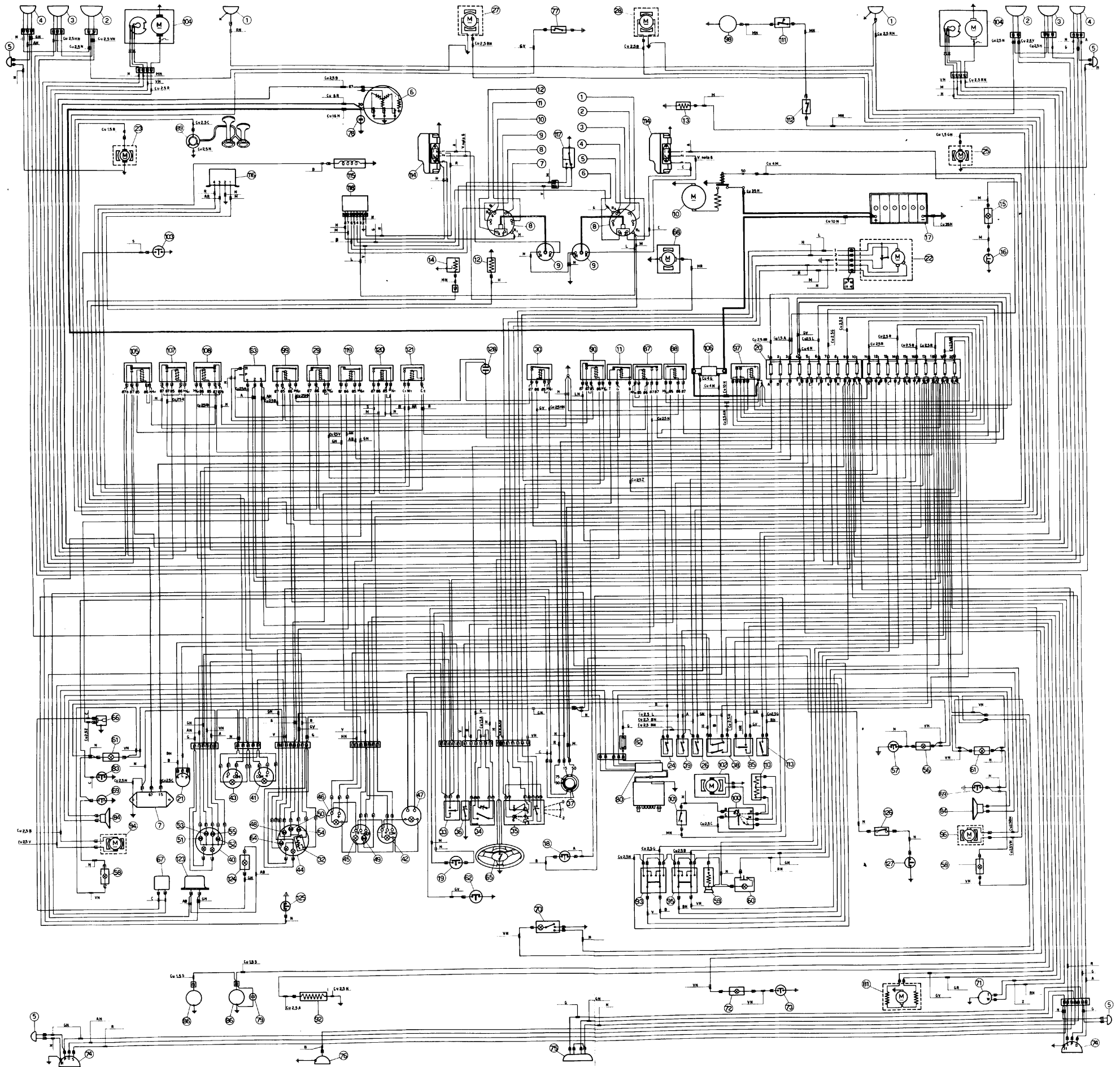
- 84-Front loudspeakers.
- 85-Electrically operated aerial switch.
- 86-Electric fuel pumps.
- 87-Head lamp relay (12V-20A).
- 88-Main beam/dip beam relay(12V-20A).
- 89-Horn compressor motor.
- 90-Relay switch for polarity reversal of windshield wiper motor (12V-20A).
- 91-
- 92-Electrically heated rear window.
- 93-L.H.window open /shut control switch.
- 94-L.H.window operating motor.
- 95-R.H.window open/shut control switch.
- 96-R.H.window operating motor.
- 97-Electric system main relay switch(12V-60A).
- 98-Air conditioner compressor.
- 99-Relay switch for R.M. radiator fan motor(When air conditioner is engaged).
- 100-Rotary knob to control air conditioner fan speed.
- 101-Air conditioner cooling unit temperature control knob.
- 102-Cooler unit fan motor.
- 103-Control switch for different oil pressure in the brake circuits.
- 104-Head lamp lifting motors.
- 105-Relay switch(12V-20A)for headlamp lifting motors.
- 106-Shunt for ammeter.
- 107-Relay switch(12V-20A)for L.H.headlamp lifting motor.
- 108-Relay switch(12V-20A)for R.H.headlamp lifting motor.
- 109-Radio noise suppressor capacitor(1 μ F).
- 110-Rheostat for air conditioner fan speed control
- 111-Max pressure switch for air conditioner.
- 112-Min.pressure switch for air conditioner.
- 113-Fog lamp switch.
- 114-High tension ignition unit (Marelli AEC103A)
- 115-Air pump electromagnetic clutch.
- 116-Air pump clutch control unit.
- 117-Distributor microswitch.
- 118-Anti-hop device for microswitch 117.
- 119-Safety belt relay switch controlled by and brake lever(see note).
- 120-Relay switch for checking efficiency of brake system failure warning light.
- 121-Relay switch for air pump clutch control unit
- 122-Control pushbutton in the gearbox for safety belt electric circuit(see note).
- 123-Fasten-seat belts acoustic signal(see note).
- 124-Fasten-seat belts warning light(see note).
- 125-Switch on driver's safety belt-closed with unfastened belt(see note).

- 126-Switch on passenger's seat close with passenger seated (see note).
- 127-Switch on passenger's safety belt close with unfastened belt(see note).
- 128-Radio noise suppressor capacitor 0,47 μ F-300 V Marelli CE 38A for Ignition.

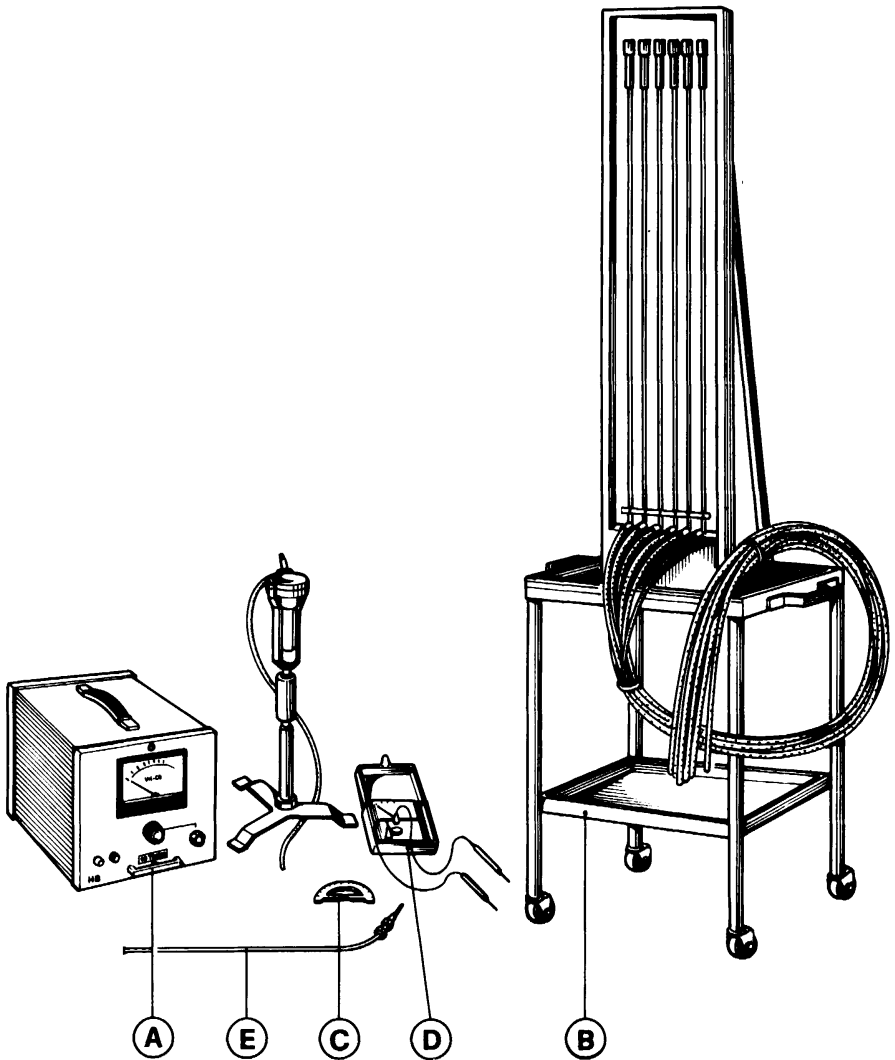
Note.

Items 119-122-123-124-125-126-127 will be introduced starting from chassis number 15181 included

48) Wiring diagram.



SPECIAL TOOLS

**49) Special tools.**

A- CO analyzer with heat exchanger ; B- Mercury gauges ; C- Protractor ; D- Ohmmeter ; E- CO probe connection for exhaust pipes.