

Ferrari 250/GTE

COUPE' PININFARINA 2+2



USO E MANUTENZIONE

ELECTRICAL

Ignition Point Gap	.014"
Ignition Capacitor	.18ufd
Spark Plug Type	N3 Champion
Spark Plug Gap	.020"
Timing	10° BTDC at 800 RPM
Voltage Regulator Setting	14.20 ± .20 volts

VALVE CLEARANCE (Lash)

Intake	.006" cold
Exhaust	.008" cold

CARBURETOR

Idle Speed	600 - 800 RPM
Fuel Pressure	3 PSI (min)
Float Level	3 MM
Main Jet	1.40 MM
Slow Run	.60 MM
Pump	.60 MM
Air Correctors	2.40 MM
Chokes	27 MM
Fuel Pump (Engine)	Fispa Sup. 150
Fuel Pump (Electric)	Fispa PBE 10

WHEEL ALIGNMENT

Toe Out	.06"
Camber	1/4" to 3/8" (1°)
Tire Pressure	28 PSI front, 33 PSI rear
Front Brake Pads	MINTEX VBO - 875/5201
Rear Brake Pads	MINTEX VBO - 875/5138

250GT SPECIFICATIONS (B-C-D)

ENGINE ASSEMBLY TORQUES:

Head Bolts	65-70 lb. ft.
Camshaft Bearings	20 lb. ft.
Spark Plugs	22 lb. ft.
Main Bearings	45 lb. ft.
Con Rod Bearings	35 lb. ft.
Flywheel	35 lb. ft.
Pressure Plate	35 lb. ft.
Bellhousing	20 lb. ft.
Universal Joints	20 lb. ft.

NOTE: Torques indicated are for clean lubricated threads, cold.

BEARINGS:

Con Rods	(+ .010)	- Vandervell 1589	
Main	(+ .010)	- Vandervell 1760	(5 pcs.)
Main	(+ .010)	- Vandervell 1758	(2 pcs.)
Thrust		- Vandervell PVW	

MISCELLANEOUS:

Distributor - Magnetti Marelli, # ST207/DTEM/A

Distributor Cap - Magnetti Marelli, # 703/884/01

ROUTINE MAINTENANCE

- | | |
|-----------------------|--|
| Before using the car: | <ol style="list-style-type: none">1. Check water level in the radiator.2. Check oil level in the sump.3. Check tire pressure.4. Check brake fluid level. |
| <hr/> | |
| Every 300 miles: | <ol style="list-style-type: none">5. Check or refill radiator fluid level.6. Adjust tire pressure. |
| <hr/> | |
| Every 1,500 miles: | <ol style="list-style-type: none">7. Check electrolyte in battery. |
| <hr/> | |
| Every 3,000 miles: | <ol style="list-style-type: none">8. Check tension of fan belt.9. Clean carburetor air filter.10. Check brake pads and pedal movement.11. Rotate tires.12. Clean and adjust breaker points. |
| <hr/> | |
| Every 6,000 miles: | <ol style="list-style-type: none">13. Replace spark plugs.14. Check valve clearance.15. Adjust timing chain tension.16. Replace brake pads and bleed.17. Check action of shock absorbers.18. Check starter motor brushes and commutator.19. Adjust clutch pedal movement.20. Take up steering play. |
| <hr/> | |
| Every 12,000 miles: | <ol style="list-style-type: none">21. Check wheel toe-in and camber.22. Clean fuel filters.23. Check carburetors and controls. |

Note:

Front wheel toe-in and camber must be checked whenever the car is involved in a collision. In the event of damage, the steering links should be replaced as their reconditioning is not possible.

LUBRICATION

Every 300 miles:

1. Check engine oil.

Every 3,000 miles:

2. Change engine oil and filters.
 3. Check gearbox oil.
 4. Check oil level in rear axel.
 5. Check oil level in the steering box.
 6. Grease the front suspension pivot points.
 7. Grease king pin assemblies.
 8. Grease all drive shaft fittings.
 9. Grease clutch shaft.
-

Every 6,000 miles:

10. Change the oil in the gearbox.
 11. Change the oil in the rear axel.
 12. Top up brake fluid reservoir.
 13. Grease front wheel bearings.
 14. Lubricate the wheel splines.
 15. Lubricate the locks and hinges.
 16. Wash the rear leaf springs with fuel oil and lubricate with oil.
-

NOTE:

In winter or wet weather, carry out operations 6, 7, and 8 more frequently.

Cambio Boite de vitesse (Gear Box)	Shell Spirax EP 90
(Overdrive)	Shell Spirax EP 90
Ponte posteriore Pont arriere (Rear Axle)	Shell Spirax EP 250 or SAE140
Scatola guida Boitier de direction (Steering box)	Shell Spirax EP 140
Impianto freni Freins (Brake System)	Shell Donax B SAE 70 R 3 Dunlop Racing Brake Fluid
Bracci sospensione anteriore Organes de suspension avant (Front suspension arms)	
Perni fusi a snodo Axes de fusées (Stub axle pins)	Shell Retinax A
Giunto cardanico trasmissione Gardan de transmission (Universal joint)	
Cuscinetti a sfere ruote Roulements à billes roues (Wheel ball bearings)	Shell Retinax AX
Ammortizzatori Ammortisseurs (Shock absorbers)	Shell Donax A 1

Filtro olio (oil filter)

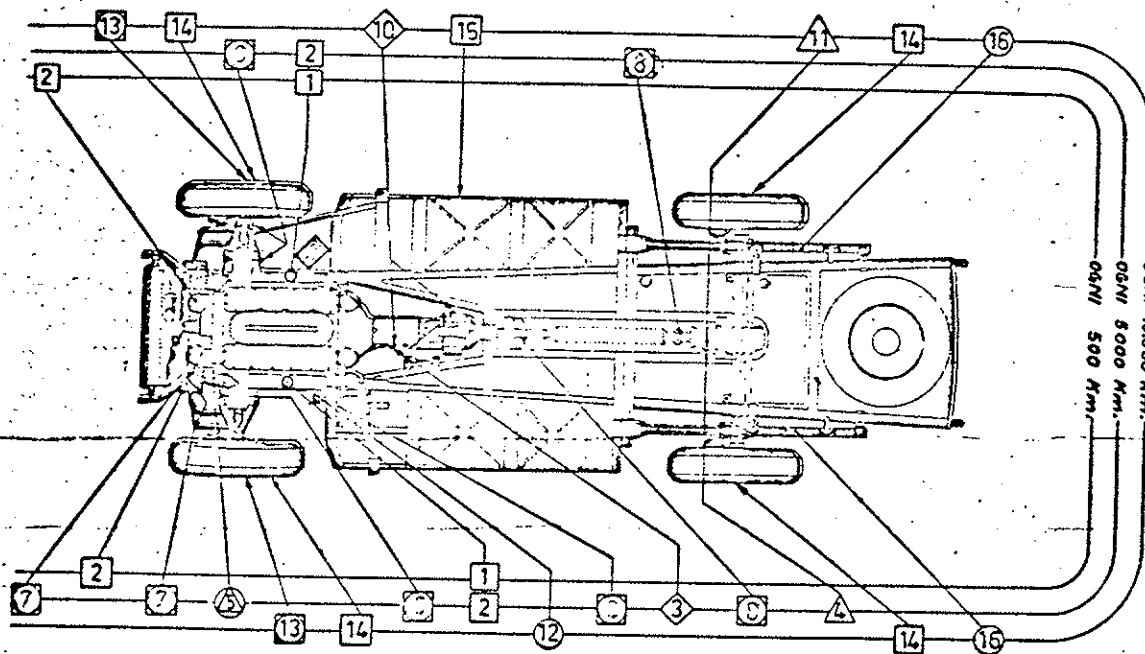
L'olio di lubrificazione del motore viene filtrato dalle impurità da un filtro FRAM PH3 a filtraggio totale e da un secondo a filtraggio parziale PB 50.

Ogni 5000 Km sostituirli entrambi usando lo speciale attrezzo per svitarli dalle proprie sedi.

Accertarsi che non vi siano perdite di olio dopo la sostituzione.

MOTORE Moteur Engine	Temperatura oltre i 15°C Saison d'été Temperature del plus de 15°C <u>Summer season</u> <u>Temperature above 59° F</u>	Shell X 100 SAE 40 Shell X 100 Multigrade 20 W 40
	Stagione intermedia Temperatura da - 5° a + 15°C Saison intermédiaire Temperature de -5° é + 15° C <u>Intermediate season</u> <u>Temperature between</u> <u>23° F to 59° F</u>	Shell X 100 SAE 30 Shell X 100 Multigrade 20 W 40
	Stagione invernale Temperatura inferiore a -5°C Saison hivernale Temperature inférieure a - 5°C <u>Winter season</u> <u>Temperature lower than 23° F.</u>	Shell X 100 SAE 20/20 W Shell X 100 Multigrade 10 W 30

Fig. 20 - Schema della lubrificazione generale.



- Shell X 100 motor oil
- ◇ Shell EP 90 Spirax
- △ Shell Dentax 250
- ⊙ Shell Dentax 140
- ⊞ Shell Retinax A (GREASE FITTINGS)
- 20W OIL

Operazioni periodiche

Lubrificazione



250GT SERIES ELECTRICAL SPECIFICATIONS

System Voltage:	12 Volts
Polarity:	Negative Ground
Battery:	65AH 12 Volt
Charging Voltage:	14.20V \pm .20V
Generator:	Marelli DN63B-400/12/2300S
Generator Rating:	30 Ampere 14 Volts
Voltage Regulator:	Marelli IR 19E/30012
Starter Motor:	Marelli MT 21T-1.8/12D9
Distributor:	Marelli S85A-12V-15 $^{\circ}$
Ignition Points:	Marelli H-710071-02
Ignition Capacitor:	Marelli CE-1E-8E-.18MFD
Ignition Coil:	Marelli 12V-B202A
Ignition Resistor:	Marelli 1.5 Ohm
Windscreen Wiper:	Lucas Two Speed
Fuses:	8A and 16A Lucas or Buss
Headlamp Assembly:	Marchal 7" No. 3-1263B
Headlamp Bulb:	Marchal 12 Volt No. 1263B
Dash Lamps	GE No. 363
Electric Fuel Pump	Fimac PBE-10

RESISTORE
Resistor 1.5 Ohms

To Distributor
AL DISTRIBUTORE

DALLA BATTERIA
From Battery

OLIO
Oil

MASSA
Ground

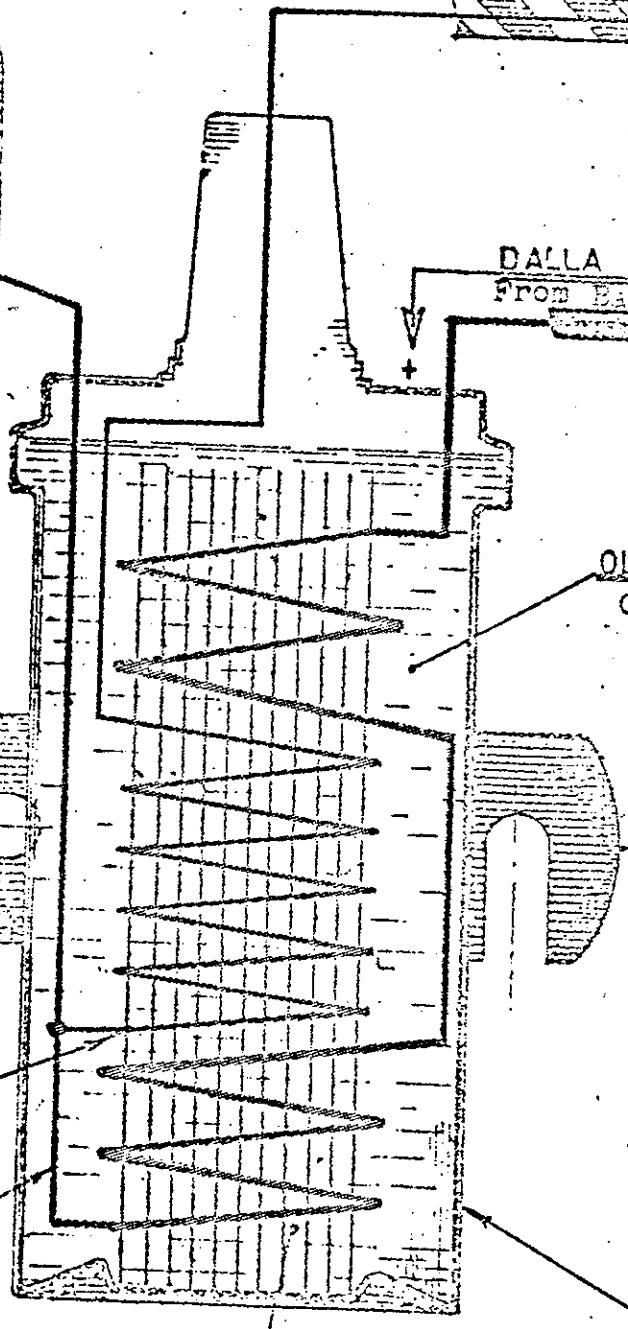
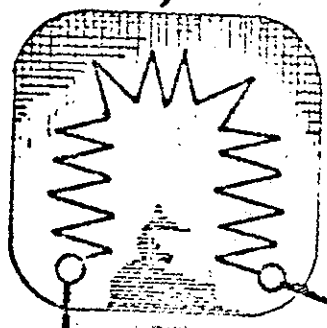
BOSINA
Coil

NUCLEO
Core

AL RUTTORE
To Points

SECONARIO
Secondary

PRIMARIO
Primary



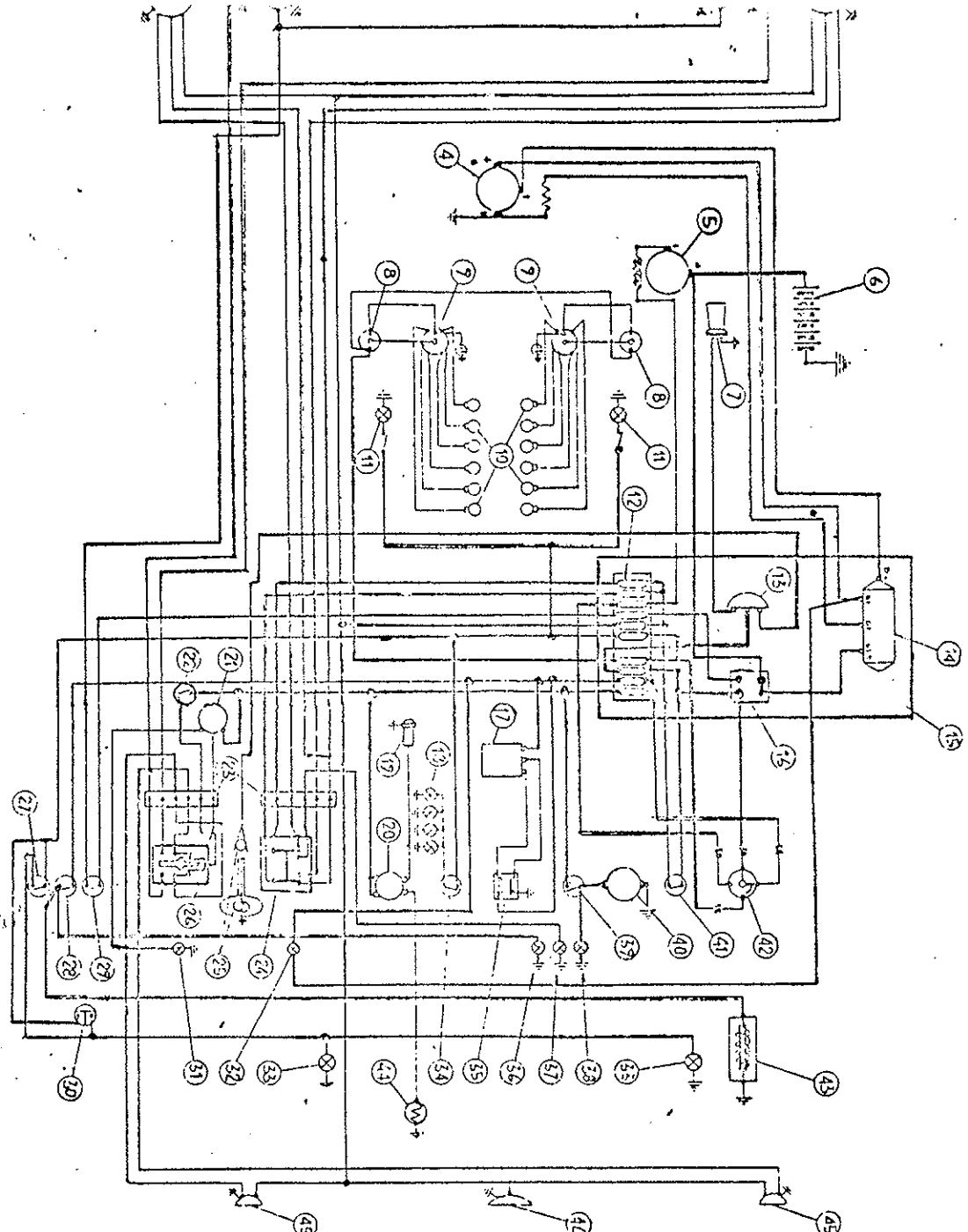
Coil Primary Current, 5A at 13V. High Voltage, 21KV Open circuit.

IDENTIFICATION OF FUSE BOX CIRCUITS

<u>LEFT FUSE BOX MARKINGS</u>	<u>FUSE SIZE</u>	<u>POSITION</u>	<u>CIRCUIT</u>
Spineterogeni	16A	1	Ignition Coils
Avviamento	8A	2	Starter Solenoid
Avvis. - Accendisigari, Servizi	16A	3	Horn, Cigar Lighter, Acces.
Spiadinamo - Ind. Livello, Overdrive - Ventilator	8A	4	Gen. Lamp, Fuel Level, Overdrive, Fan, Instruments
Tergicristallo - Electroflux, Illuminazione Quadro - Servizi	16A	5	Windshield Wipers, Electric Fuel Pump, Dash Lights, Acces.
Indicatori Direz - Stop Condizionatore	16A	6	Stop and Turn Signals, Air Conditioner

<u>RIGHT FUSE BOX MARKINGS</u>	<u>FUSE SIZE</u>	<u>POSITION</u>	<u>CIRCUIT</u>
Abbagliante - Dex.	8A	1	Right High Beam Lamp
Abbagliante - Sin.	8A	2	Left High Beam Lamp
Antiabbagliante - Des.	8A	3	Right Low Beam Lamp
Antiabbagliante - Sin.	8A	4	Left Low Beam Lamp
Posizione - Targa, Cofano - Retromarcia	8A	5	Side Lamps, License Plate Lamp, Engine Comp. Lamp, Trunk & Back-up Lamps
Antinebbia, Plafoniere	8A	6	Fog Lamps, Interior Lamps.

250 GT SCHEMATIC WIRING DIAGRAM



1. Turn signals - front
2. Driving or fog lamps
3. Generator
4. Starter motor and solenoid
5. 12 Volt battery
6. Horn
7. Ignition coils
8. Distributor
9. Spark plugs
10. Under hood lamps
11. Fuses
12. Horn relay
13. Voltage regulator
14. Electrical panel
15. Junction blocks
16. Windshield wiper motor
17. Instrument lamps
18. Instrument regulator
19. Fuel level gauge
20. Turn signal relay
21. Stop light switch
22. Junction blocks
23. Head lamp relay
24. Horn button
25. Turn signal switch
26. Interior light switch
27. Electric fuel pump switch
28. High beam headlight switch
29. Interior light door switch
30. Turn signal indicating lamp
31. Generator warning lamp
32. Interior lamp
33. Instrument lamp switch
34. Windshield wiper motor
35. Fuel pump indicator lamp
36. Headlamp indicator lamp
37. Defroster indicator lamp
38. Blower switch
39. Blower
40. Headlight switch
41. Ignition switch
42. Electric fuel pump
43. Fuel gauge float
44. Turn signals - rear
45. Stop and tail lamps
- 46.

FERRARI DISTRIBUTOR TIMING

To completely time a late model Ferrari, a timing light (electronic) and a feeler guage are required, along with a little patience.

First install all new point sets, or file (with an ignition point file) the old sets so that a smooth parallel surface remains. Then adjust the gaps to the spacing recommended in the owners manual. (.014") Connect a good quality timing light to the #1 spark plug. Start the engine and let it idle below 1000 RPM. The 10AF mark, which is just before the P1/6 on the flywheel, should be visible at engine idle as observed in the timing window. Now increase the RPM to 5000; 42AM should be visible on the flywheel. If the 10AF lines up with the pointer and the 42AM does not, advance the right distributor (by rotating the top) until the 42AM is at the pointer. It is generally preferred that the engine be in time at high speed more so than at idle. Next move the timing light to sparkplug #6 on the same bank. Start the engine and increase the RPM to 5000. The same 42AM (now 360° later) should be seen at the pointer. If it is not visible, stop the engine and adjust the position of the second point set by loosening the two screws and sliding the set forward or backward, thus the timing of the even number cylinder can be accomplished. To determine which points control the even and odd number cylinder crank the engine over until the rotor points to #1 on the cap. The set of points that are just opening are the even numbers set (the flywheel mark should be just coming up to the 10AF mark also). This "odd set" is not adjusted for position, only the "even number set" is moved to adjust the #6 firing position. This completes the timing of the right hand bank.

To time the left hand bank, connect the timing light to cylinder #7 (closest to the fire wall) and start the engine. At an idle (less than 1000 RPM), the 10AF mark should be visible at the pointer. This mark is located just ahead of the PM7/12 mark on the flywheel. Increase the engine speed to 5000 RPM and observe the timing mark; 42AM should be visible at the pointer. If this mark is not at the pointer, adjust the distributor (by rotating the top) so 42AM is at the pointer. Again, it is more important that the timing be correct at 42AM than at 10AF. Move the timing light to cylinder number 12. Start the engine and increase the RPM to 5000. The 42AM should again be visible at the pointer. If it is not, move the second or odd number points until the 42AM is obtained. To determine even #12 from the odd #7 point set, crank the engine until the rotor points to #7 on the distributor cap. The points should be just opening (10AM should be close to the pointer also); this set is the even number and should not be moved for cylinder number 12 adjustments.

It is always wise to repeat all timing checks again to double check their accuracy.

NOTES:

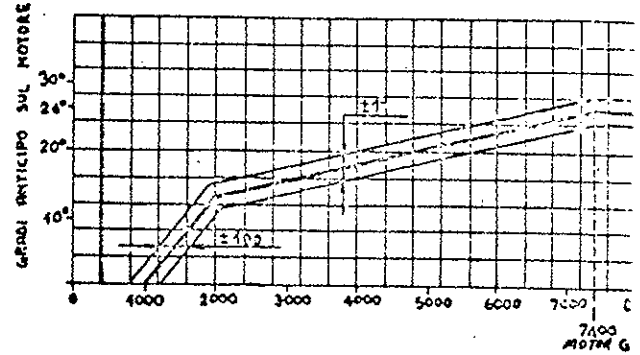
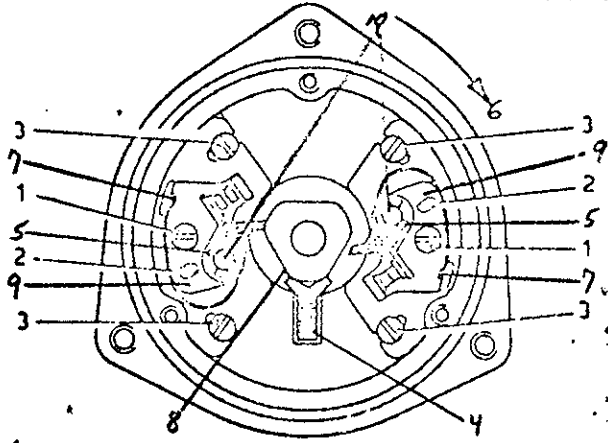
1. Be sure to retighten all of the 14mm nuts that hold the distributor top on to the base. These nuts should be just loose enough to move the distributor timing when adjusting #1 and #7 maximum advances (42AM).

NOTES (continued)

2. To avoid the sparking between the top and base of the distributor while timing, a short length of wire should be permanently connected to the top section. This cable should then be connected to the fire wall at some convenient point. Thus a good electrical connection between the distributor and ground is always maintained. A typical connection would be between the capacitor mounting screw and the ignition coils' mounting bracket. A number 18 guage insulated wire is sufficient.
3. It is not always necessary to remove the metal cover plate on the bellhousing to expose the flywheel timing marks. A clear plastic (preferably Lexan) cover plate can be made by tracing the old piece and installing in its place. This way, the timing light can be shined through the "window" to check timing.
4. Lube the distributor cam lobes with a good quality grease such as Delco cam lube.
5. Definitions of the flywheel markings are:
 - PM1/6 - Punto Morto; this is top dead center for #1 cylinder.
 - PM7/12 - Punto Morto; this is top dead center for #7 cylinder.
 - 10AF - 10° Anticipo Fillo; this is 10° fixed advanced.
 - 42AM - 42° Anticipo Massimo; this is 42° maximum or full advance.

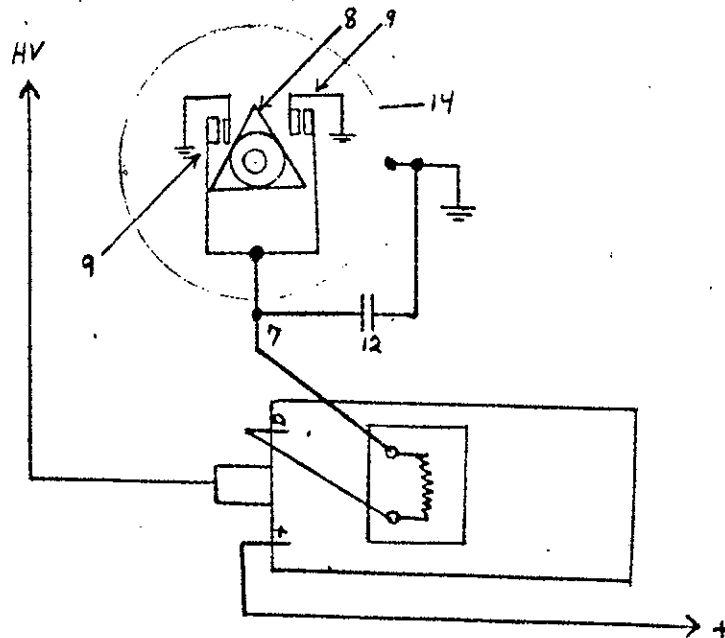
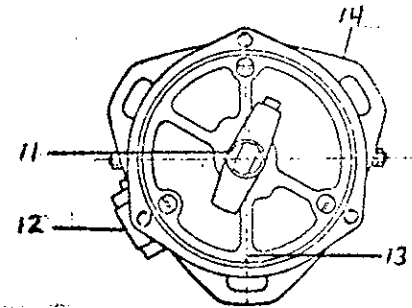
DISTRIBUTOR

Description: Magneti Marelli 985A Series.

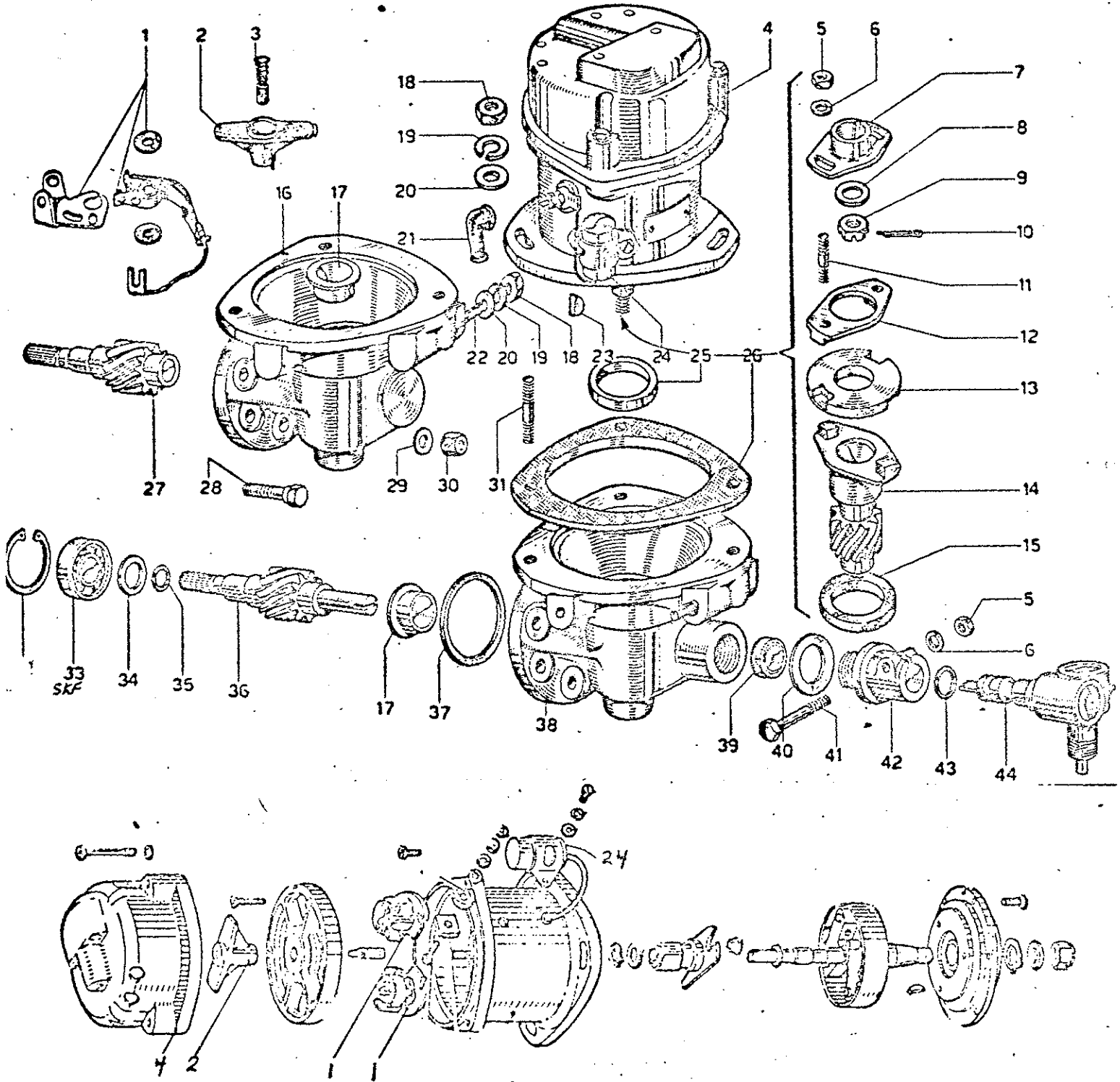


- | | |
|---------------------------------|-------------------------------|
| 1. Gap Adjusting Screw | 8. Cam |
| 2. Pivot for Gap Adj. | 9. Replaceable Point Assembly |
| 3. Synchronizing Screw | 10. Stationary Post |
| 4. Lube Wiper | 11. Rotor |
| 5. Circ Ring for Points Removal | 12. Capacitor |
| 6. Direction of Rotation | 13. Bearing Support |
| 7. Connection to Coil | 14. Base |

Point Gap .014"
 Capacitor .18MFD
 Points 4.71.0071.02



DISTRIBUTOR



NUMBER

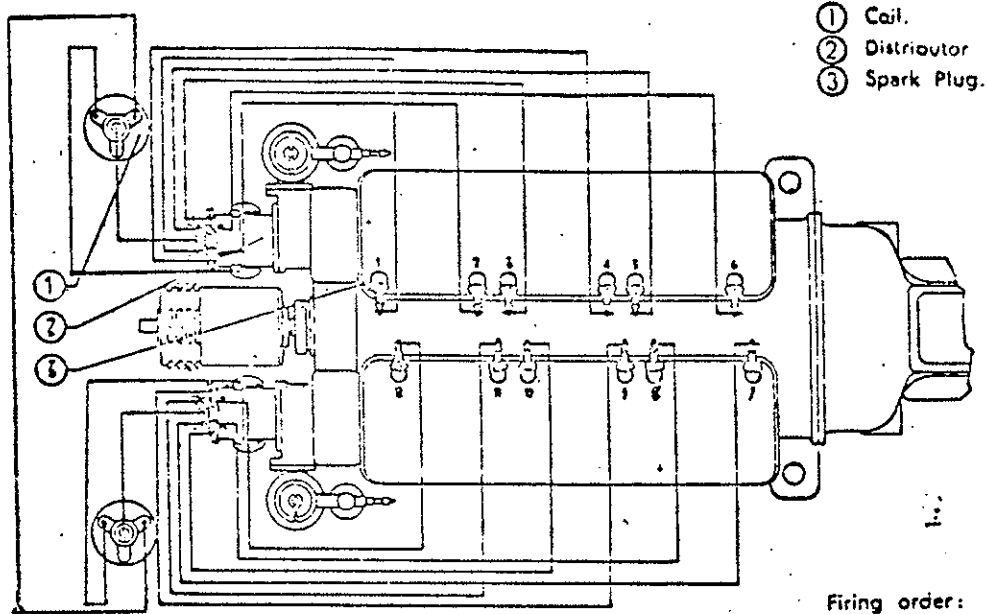
DESCRIPTION

PART NUMBER

MANUFACTURER

1	Point Assembly	H.71.0071.02	Marelli
2	Rotor	703.880.01	Marelli
3	Wiper Brush	91.006.01	Marelli
4	Cap	703.884.01	Marelli
24	Capacitor	CE1E.18MFD	Marelli
44	Tach Drive	50.0419.990.0	Borletti

IGNITION TIMING OF ENGINE



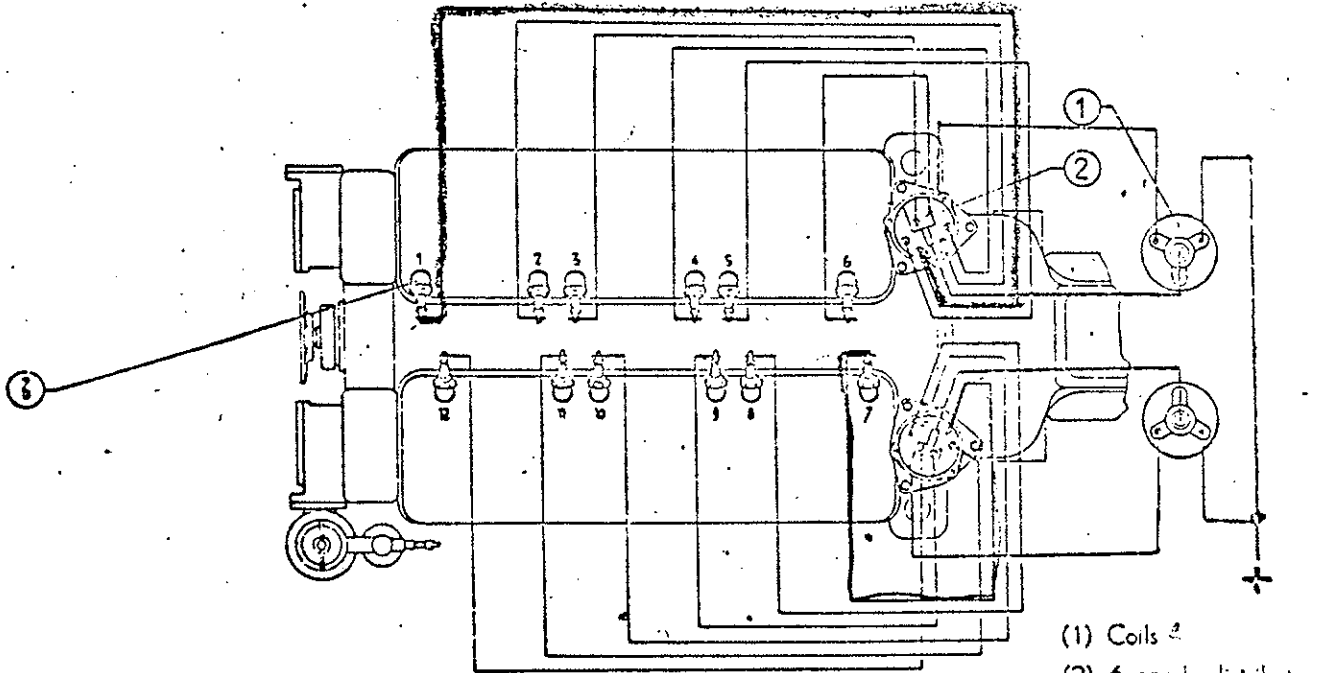
- ① Coil.
- ② Distributor
- ③ Spark Plug.

Firing order:

1-7-5-11-3-9-6-12-2-8-4-10

Right bank firing order: 1-5-3-6-2-4

Left bank firing order: 7-11-9-12-8-10



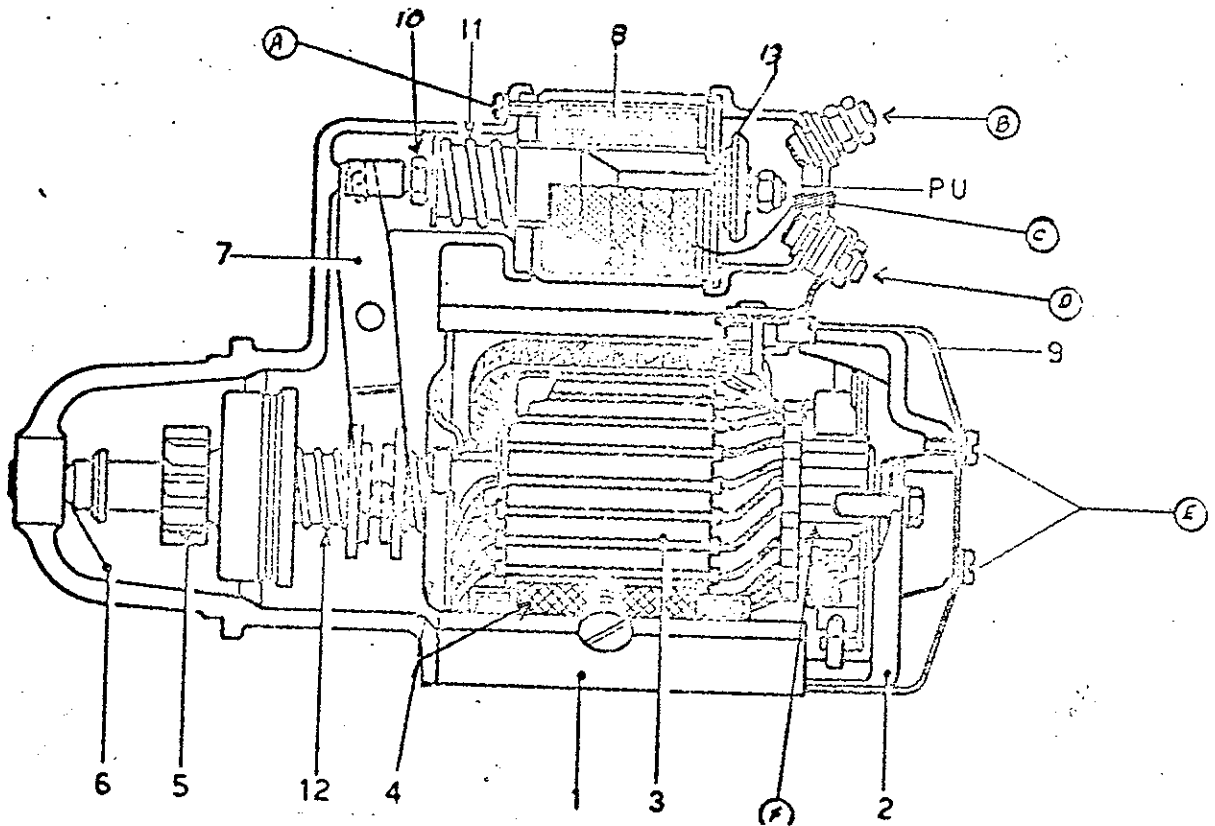
Cylinder ignition order:

1-7-5-11-3-9-6-12-2-8-4-10

- (1) Coils
- (2) 6 spark distributors
- (3) Spark plugs

STARTER MOTOR

DESCRIPTION: Magneti Marelli 12 Volt Cranking Motor MT Series.



- A - Solenoid Mounting through Bolts
- B - Battery Positive Cable
- C - Ignition Switch-Start Terminal
- D - Solenoid to Starter Motor Terminal
- E - End Cover Securing Screws
- F - Communtator

- 1 - Case or Frame
- 2 - Rear Bearing Support
- 3 - Armature
- 4 - Field Winding
- 5 - Drive Gear
- 6 - Front Bearing
- 7 - Actuating Link
- 8 - Solenoid Coil
- 9 - End Cover
- 10 - Stroke Adjustment
- 11 - Solenoid Disengagement Spring
- 12 - Starter Disengagement Spring
- 13 - Solenoid Contactor

PU - Fixed Contacts

STARTER MOTOR

To service a defective cranking motor, the following steps are suggested:

Removal

1. Remove the battery cables from the battery.
2. Remove the battery if it is on the starter motor side.
3. Remove all bolts at muffler-header connection.
4. Remove all header nuts and lock washers.
5. Carefully manipulate the exhaust header assembly out of the engine compartment.
6. Pull the clad gaskets off of the head.
7. Remove all cables from the starter motor.
8. Remove the two starter motor mounting nuts and lockwashers. (If the crossmember interferes with the removal of the mounting nuts, loosen the engine mounts and jack the engine up slightly.)
9. Carefully slide the startermotor out of the bellhousing.

Testing

Holding the starter motor securely on a bench, connect the negative cable of a fully charged 12 Volt battery to the case (1) on the motor and the positive lead to the solenoid terminal (B) where the heavy (vehicle) cable was connected. By temporarily connecting a test wire between the small (C) terminal of the solenoid and the positive (B) lead to the battery, the solenoid should engage and the motor begin to turn. If the solenoid does not produce a definite clunk, indicating engagement, it may be defective. Separate the solenoid from the starter by removing the two screws (A) securing it to the frame, and disconnecting the wire (D) to the motor. The coil can be removed from the solenoid and the contacts inspected.

STARTER MOTOR (continued)

If they are burned or dirty, file them flat and smooth. For severely damaged contacts, machine flat or replace. The contactor, 13, should be cleaned smooth. Inspect the coil for burnt wire or water damage. Re-assemble the solenoid into the housing, and tighten the through bolts (A) securely. The coil should energize when battery voltage is applied to the small terminal (C). A definite klunk should be heard and the engagement gear, 5, should move forward. Connect the lead from the starter motor to terminal (D), and repeat the test. With battery voltage applied to terminal (B) and a jumper wire connected from (B) to (C) the motor should spin rapidly, about 200-400 RPM. If the motor appears sluggish in performance, then an overhaul is indicated. Remove the two end cap screws (E), and pull the end cover, 9, off. Inspect the brushes and commutator for damage or wear. Replace worn brushes with new ones obtained from a dealer. Smooth the commutator (copper colored area) (F), with #400 sandpaper. Clean the slots between each segment of the commutator with a thin blade. Clean and lube the bearings on each end. Springs 11, and 12 should be in good condition, replace any broken or weak disengagement springs with new parts. Never use solvents or thinners to clean the inside of the starter, improper chemicals may soften the insulation on the windings. If the starter draws heavy current and still does not spin fast, the windings may be shorted. Remove the armature (3) and have it tested on a "growler" to find any damage. Replacement windings can be ordered through authorized dealers.

A SMOOTH IDLE

The carburetor tuning on most late model Ferraris can be accomplished without a great deal of effort. The only requirement is that the person doing the tuning be endowed with patience. Once one gets over the "never touch my Webers" complex, the rest is straight forward. This procedure deals with the adjustment of the idle or low speed settings only.

PREREQUISITES:

Ignition timing must be correct. Spark plugs should be in good condition or new. Engine should be warm or hot - 140°F oil temp. min. Air cleaners should be clean or new. Weather should be good - no rain or snow. Engine should be run hard prior to tuning - to blow out carbon, etc. Valve clearances should be set and correct. Exhaust system free from holes or leaks. Fuel filters clean. Float levels set to specification.

EQUIPMENT REQUIRED:

- 10mm wrench.
- Screwdriver with 1/4" blade.
- Electronic engine tachometer - such as Sears 28B2188 or equal.
- Uni-syn or equivalent.

If all of the prerequisites have been followed, the next step is to adjust the idle mixtures and throttle opening settings. As previously stated, this procedure is for obtaining a smooth idle only. High speed mixture problems or float settings are not dealt with. If your Ferrari is operating to your satisfaction don't disturb it. If it does need adjustment, here is the procedure:

1. Close the choke (keeps parts out of the engine).
2. Remove the aircleaner assembly and filters.
3. Carburetors are numbered as follows:
 - #1 - closest to radiator (front)
 - #2 - center
 - #3 - closest to fire wall (rear)
4. Remove the linkage clips from carburetors #2 and #3, and lift the linkage rods away from the carburetors.
5. Open the chokes and start the engine (still at warm operating temperature) and leave it idle.
6. Increase the engine RPM to approximately 1000 RPM with carburetor #1's throttle adjustment screw.
7. Completely close (CCW) the throttle adjustment screws on carburetors #2 and #3.

8. The engine's rpm should be adjusted with carburetor #1 throttle screw so an idle of about 800 RPM can be obtained.
9. Connect an electronic tachometer to either distributor.

NOTE: The RPM readings may not be correct, but we are only interested in meter movement, not readings.

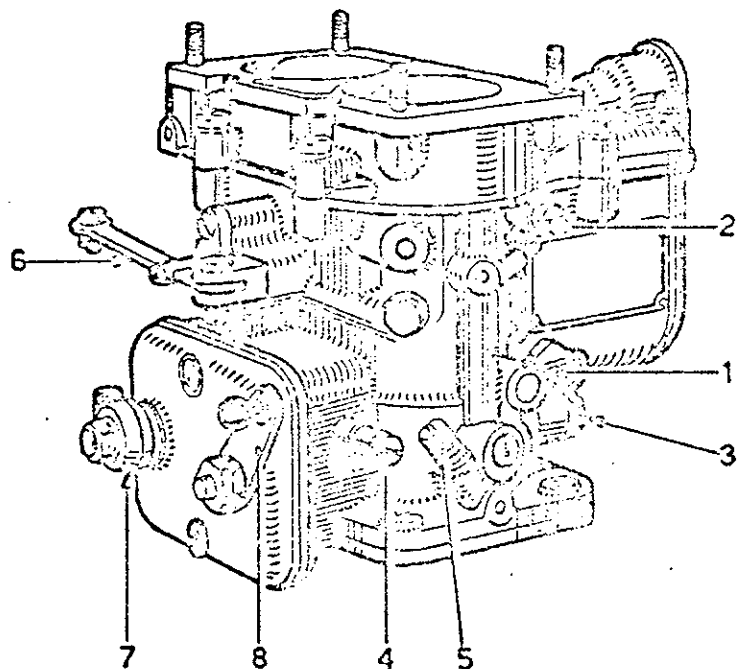
10. Adjust both of carburetor #1's idle mixture screws until a maximum RPM indication is obtained on the electronic tachometer. (Engine is running rough because only one carburetor is in operation)
11. Increase the engine RPMs (3000-4000) by blipping (pressing) the linkage of carburetor #1 with your hand. There should be no spitting (backfiring) through the carburetor or crackling at the exhaust when released. If so, repeat step ten with greater accuracy.
12. Increase the RPM of the engine via the throttle adjustment screw on carburetor #2, 1000 RPM is o.k.
13. Close the throttle adjustment screw on carburetor #1. #1 and #3 are now closed.
14. Adjust the throttle adjustment screw on carburetor #2 so that an idle of about 800 RPM is obtained.
15. Adjust both of carburetor #2's idle mixture screws until the maximum RPM indication is obtained on the electronic tachometer. Engine will continue to run rough because only one carburetor is operating the engine.
16. Increase the engine's RPMs (3000-4000) by blipping (pressing) the throttle linkage of carburetor #2 with your hand. There should be no spitting (backfiring) through the carburetor or crackling at the exhaust when the linkage is released. If so, repeat step fifteen with greater accuracy.
17. Increase the RPM of the engine via the throttle adjustment screw on carburetor #3, 1000 RPM is o.k.
18. Close the throttle adjustment screw on carburetor #2; #1 and #2 are now closed.
19. Adjust the throttle adjustment screw on carburetor #3 so that an idle of about 800 RPM is obtained.
20. Adjust both of carburetor #3's idle mixture screws until the maximum RPM is obtained on the electronic tachometer. The engine will continue to run rough, because only one carburetor is operating the engine.
21. Increase the engine RPMs (3000-4000) by blipping (pressing) the throttle linkage of carburetor #3 with your hand. There should be no spitting (backfiring) through the carburetor or crackling at the exhaust when the linkage is released. If so repeat step twenty with greater accuracy.

NOTE: Exhaust leaks will cause crackling at the exhaust as though the mixture were too lean. All holes should be plugged as tight as possible; try muffler cement as a quick fix.

22. Balancing of the throttle openings. With the engine still idling, turn each of the throttle adjustment screws in (CW) until each carburetor contributes to an increase in engine RPM. (NOTE: Linkages are still disconnected, and the engine warm).
23. Place the UNI-SYN instrument on top of carburetor number three. Adjust the UNI-SYN until the cork is at a readable line. (NOTE: On carburetors that have chokes that prevent the placement of the UNI-SYN atop of the venturi, a small plastic or sheetmetal adaptor will need to be fabricated to clear the choke butterflies.
24. Place the UNI-SYN on carburetor number one and adjust the throttle adjustment screw until the same reading (cork level) is indicated.
25. Place the UNI-SYN on carburetor #2 and adjust the throttle adjustment screw until the same reading (cork level) is indicated.
26. The engine should idle smooth at about 800 RPM. To properly adjust for this RPM, adjust the throttle adjustment screws on all carburetors until this RPM is indicated and the cork levels in the UNI-SYN are the same on all carburetor venturi.
27. Stop the engine. Loosen all of the adjustments of carburetor #2 and #3's throttle linkage rods so that they are free to be lengthened or shortened. Loosen the actuating lever arms that operate carburetors #2 and #3 so that they are free to move. (These are located on the main linkage bar).
28. Place the lever arms (that actuate the linkage rods) so that they are in line with the lever arm of carburetor #1's linkage arm. Tighten the bolts that secure these arms.
29. Adjust the lengths of the carburetor linkage rods until they slip loose over the ball on the lever arm. Secure the jam nuts, and replace the spring clips.
30. Start the engine, recheck the idle; it should steady at about 800 RPM on the engine's tachometer. If it does not, repeat steps 22 to 29.
31. Drive the vehicle in second gear, at about 3000 RPM, release the accelerator pedal; there should be no crackling heard at the exhaust as the engine slows down (in gear) to 1000 RPM. If crackling is heard, repeat steps 10, 15, 20 and 22 to 29.
32. Close the chokes, replace the aircleaner, filter elements and top plate. Open the choke (this is done to prevent any loose hardware from falling into the carburetor).

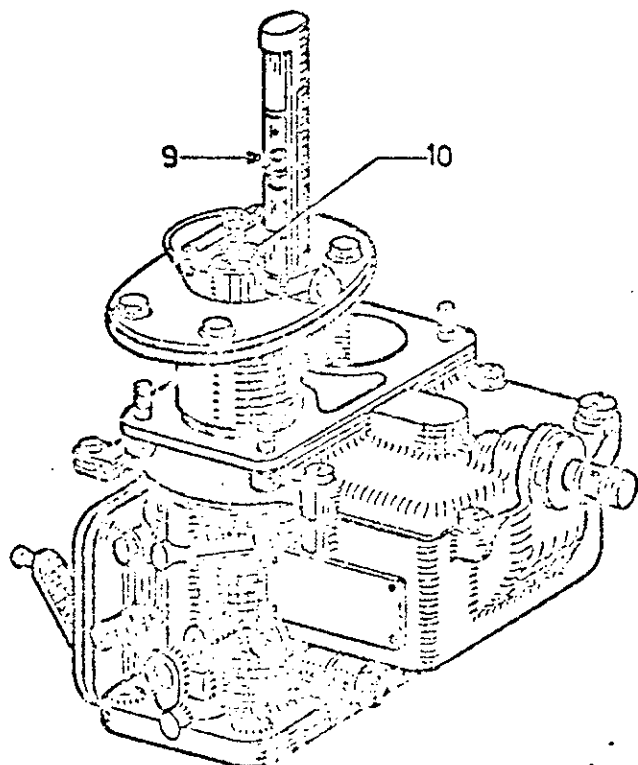
Some carburetors and adjustment details may differ greatly from the systems described (250GT and 330GT engines), therefore, apply the same techniques, but adapt them to your particular engine. Good luck.

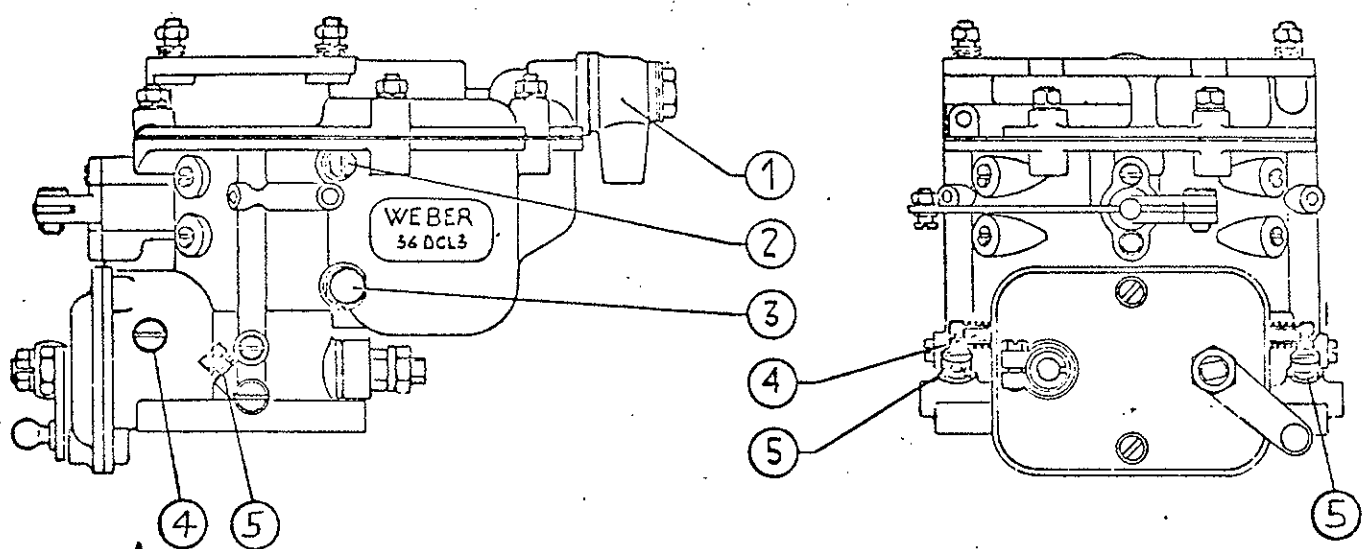
Fig. 5



- 1 - Getto principale.
- 2 - Getto del minimo.
- 3 - Comando pompa di accelerazione
- 4 - Vite di regolazione apertura minima della farfalla.
- 5 - Vite di regolazione miscela al minimo.
- 6 - Leva comando starter.
- 7 - Morsetto per sincronizzazione seconda farfalla.
- 8 - Leva di comando.

- 1. PRINCIPLE JET
- 2. LOWEST (SMALLEST) JET
- 3. ACCELERATION PUMP LEVER
- 4. REGULATION SCREW OF MINIMUM APERTURE OF BUTTERFLY
- 5. REGULATION SCREW OF THE MIXTURE TO THE MINIMUM
- 6. STARTER - CHOKE
- 7. SMALL VICE TO SYNCHRONIZE THE SECOND BUTTERFLY
- 8. THROTTLE ACTUATING LINKAGE





- (1) Fuel filter
- (2) Idling jet screw
- (3) Main jet screw
- (4) Throttle opening screw
- (5) Idling mixture screw

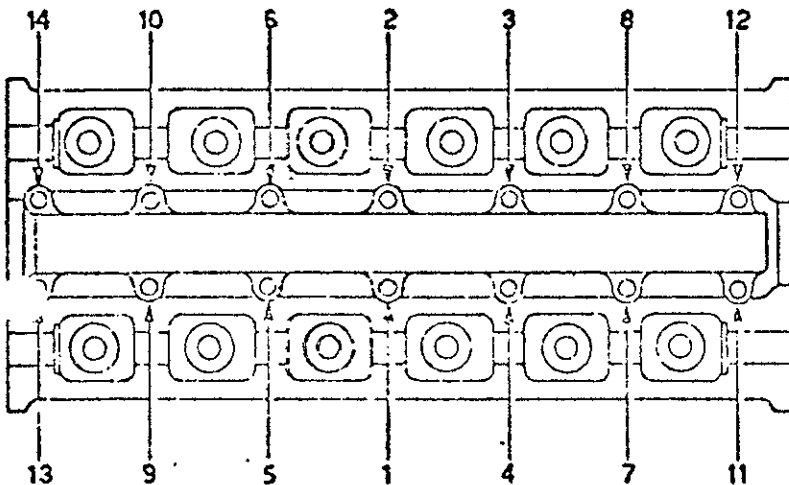
CYLINDER HEADS

When replacing head gaskets, always use new replacements, and do not apply "Permatex" or other materials to the surfaces. The word "Alto" should be installed facing upward and toward the inside of the Vee (or toward the carburetors). The block deck should be smooth clean, and dry before installation. Studs and threads should be greased or lubricated before the head is put on. Threads on the stud and nuts must be clean and free from burrs. Washers should be flat and free from burrs; do not substitute washers or nuts other than original replacement parts. Nuts must be brought up to the indicated torques in at least three steps, following the patterns shown below. Example: If the torque specified is 60 lb. ft., on the first pass torque to 25 lb. ft., 45 lb. ft. on the second retorquer or pass, and then finally, bring all nuts in the indicated sequences up to their final value. Always consult the owners manual or a qualified expert before attempting to torque the heads. Heads should be torqued cold. Heads should be retorqued or checked after three hundred miles of operation.

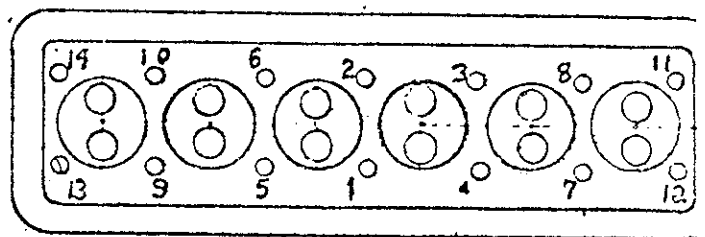
Suggested torques are:

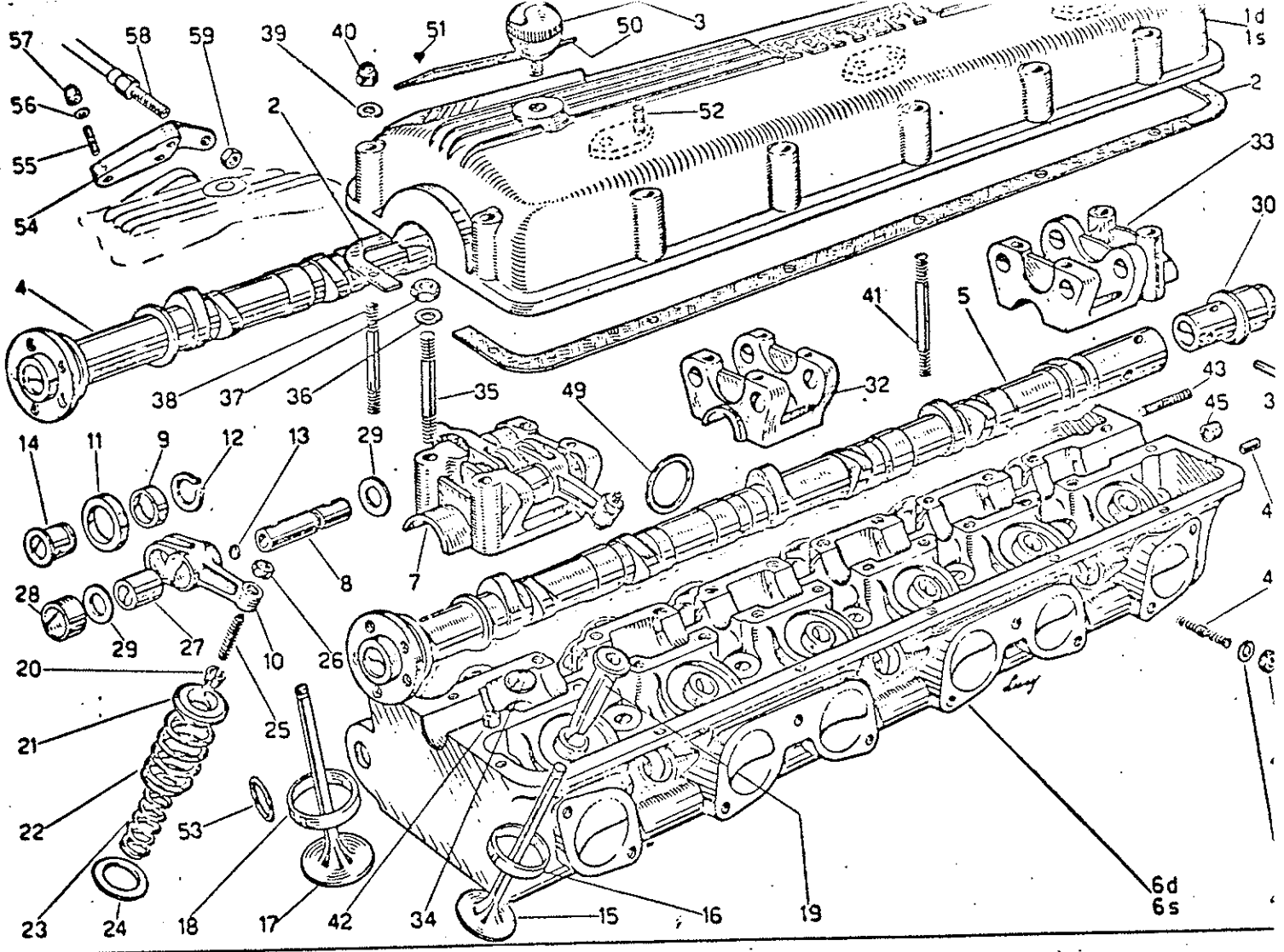
250GT, GTE, GT1
275GTB, GTB/4,
330GT, 2+2

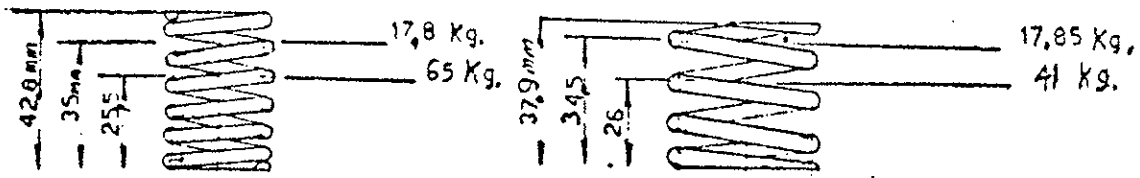
60-62 lb. ft.
57-59 lb. ft.
59-60 lb. ft.



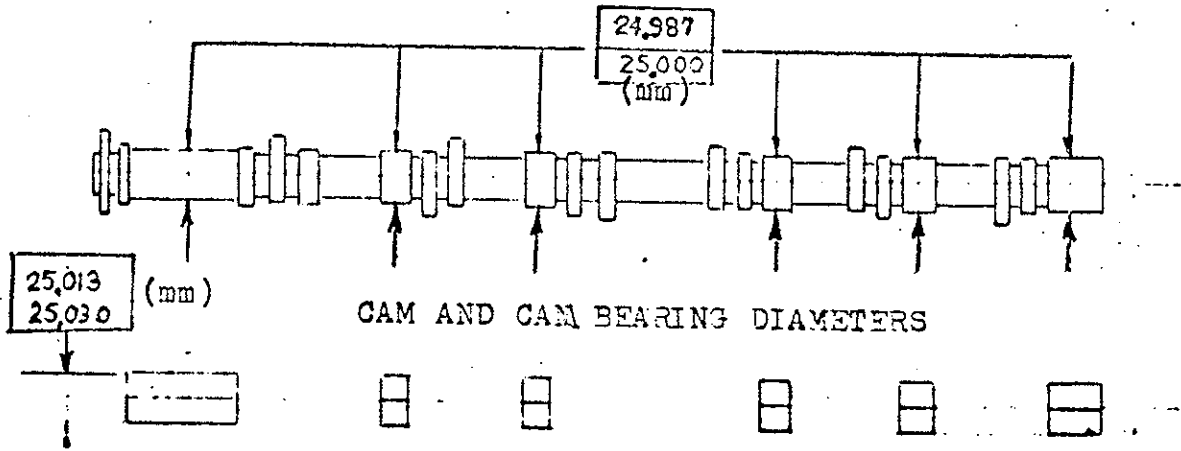
CYLINDER HEAD BOLT TIGHTENING SEQUENCE



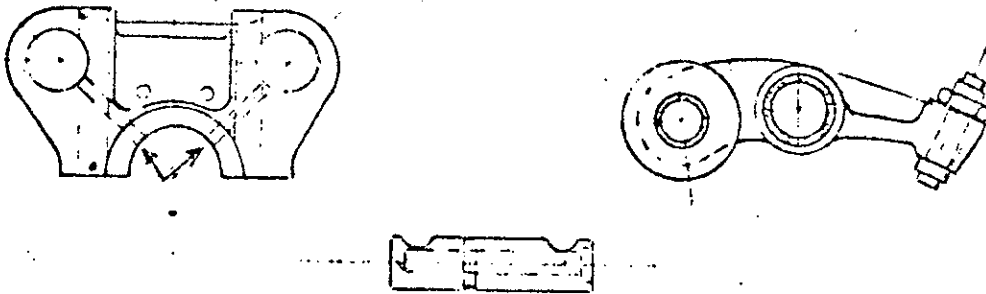




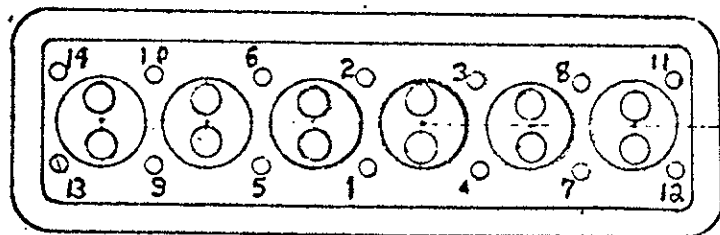
SPRING HEIGHTS AND PRESSURES



CAM AND CAM BEARING DIAMETERS

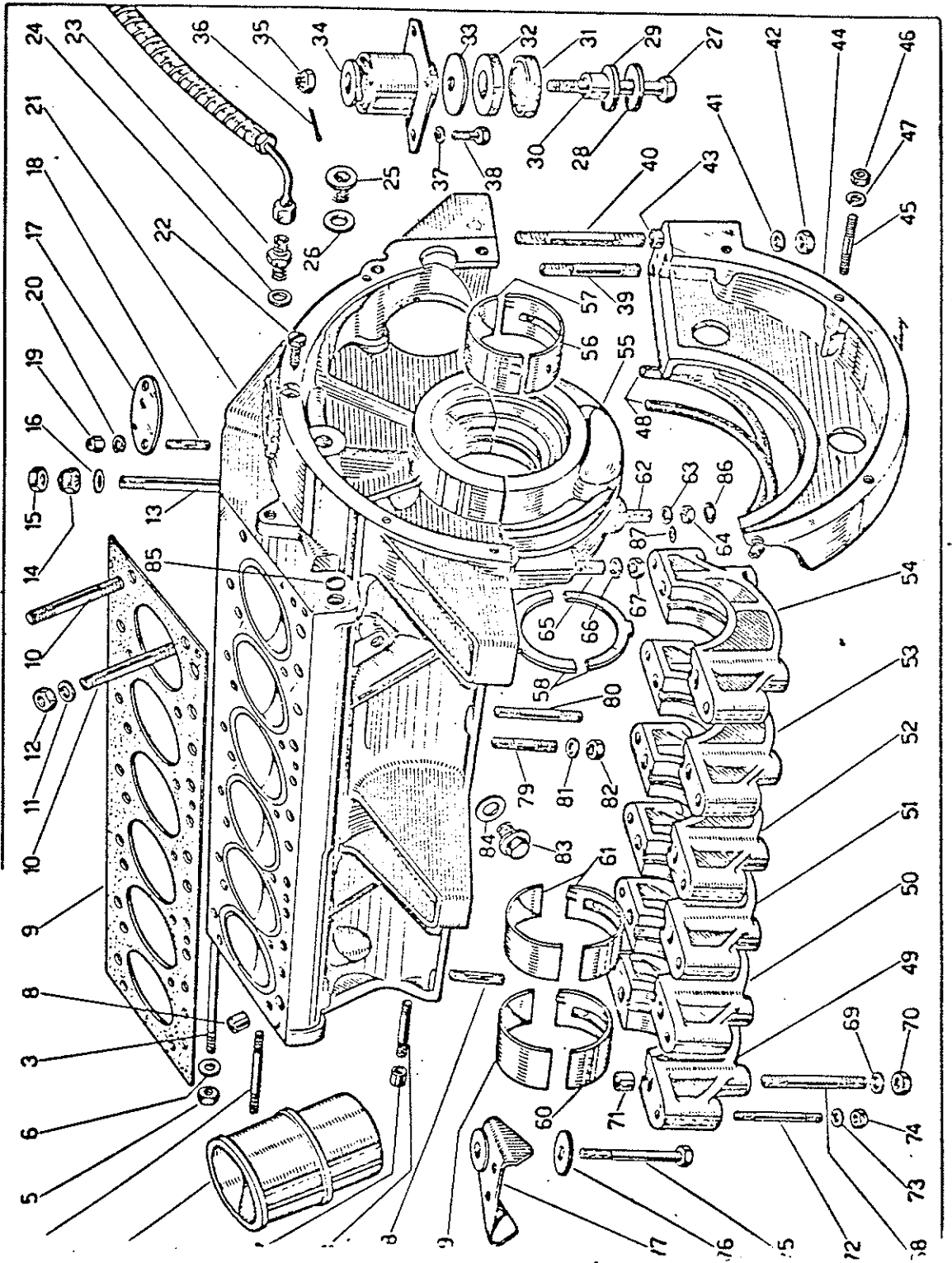


CYLINDER HEAD BOLT TIGHTENING SEQUENCE



60 lb. ft.

TAV. 1 - BASAMENTO MOTORE



CAMSHAFTS.

When installing camshafts in an overhauled engine, the following steps should be adhered to:

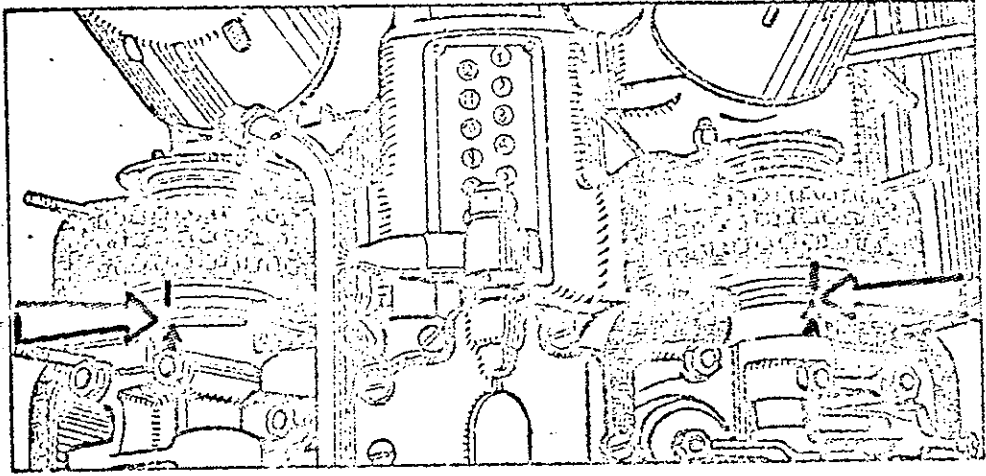
1. Rotate engine until PM 1/6 on the flywheel is exactly on the pointer. Cylinder #1 should be at TDC.
2. Clean all cam bearing surfaces, and heavily lubricate them with SAE20W motor oil. Slacken or remove chain tensioner.
3. Carefully place the camshafts back in their original locations (intake-exhaust L & R) on the head. Mark or tag each cam prior to removal.
4. Place all of the cam bearing-roller assemblies on the cams*
NOTE: Each assembly should be returned to the location it was removed from. Check the numbers.
5. Finger tighten the nuts on these assemblies to hold the cam in place.
6. Align** the lightly scribed marks at the front of each camshaft (see diagram) with the arrow stamped in the center of the front cam bearing assembly.
7. Tighten each bearing-roller assembly to the prescribed torque.
8. Place chain tightly over each sprocket.
9. Adjust chain tensioner to take up the slack in the chain.
10. Check to be sure that the arrows still point to the scribed marks on the cam; correct any great error**.
11. Rotate the engines crankshaft two complete turns until PM1/6 is again at the pointer; the cam marks should be at the arrows. Adjust if necessary to correct any great error**.

* NOTE: Valves must not be actuated (loosen all lash adjustments) when aligning the cam marks for the first time.

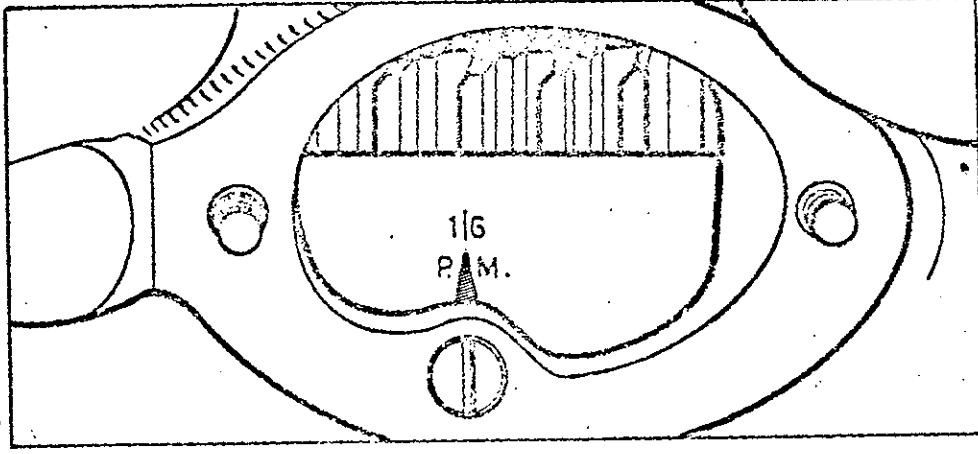
** Used or worn chains may not line up exactly - replace chain if great error is noted.

TWO CAM

SCRIBED
MARKS

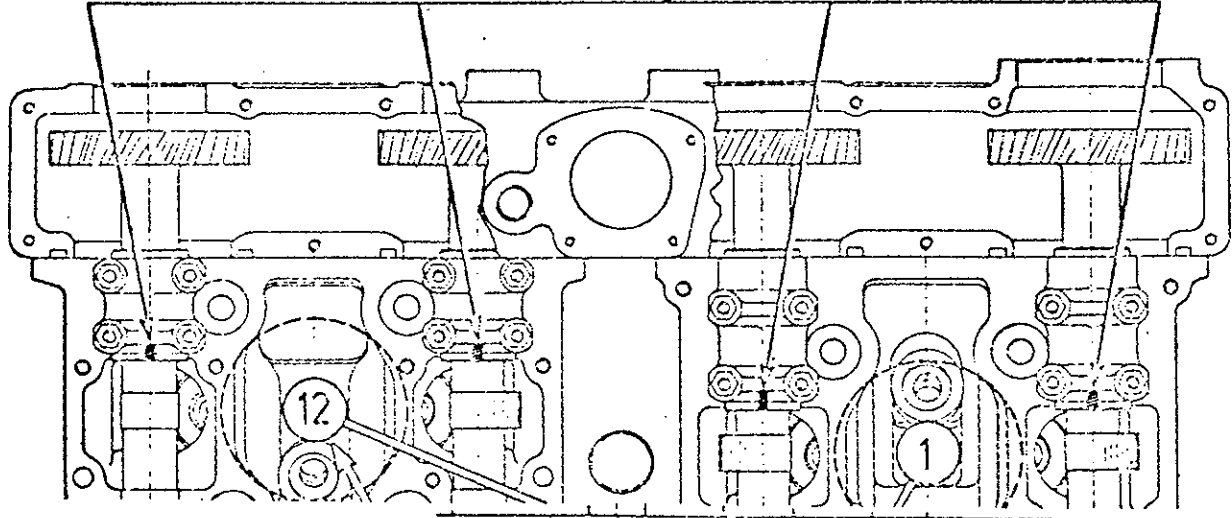


SCRIBED
MARKS



FOUR CAM

ALIGNMENT, MARKS



P.M. 1/6

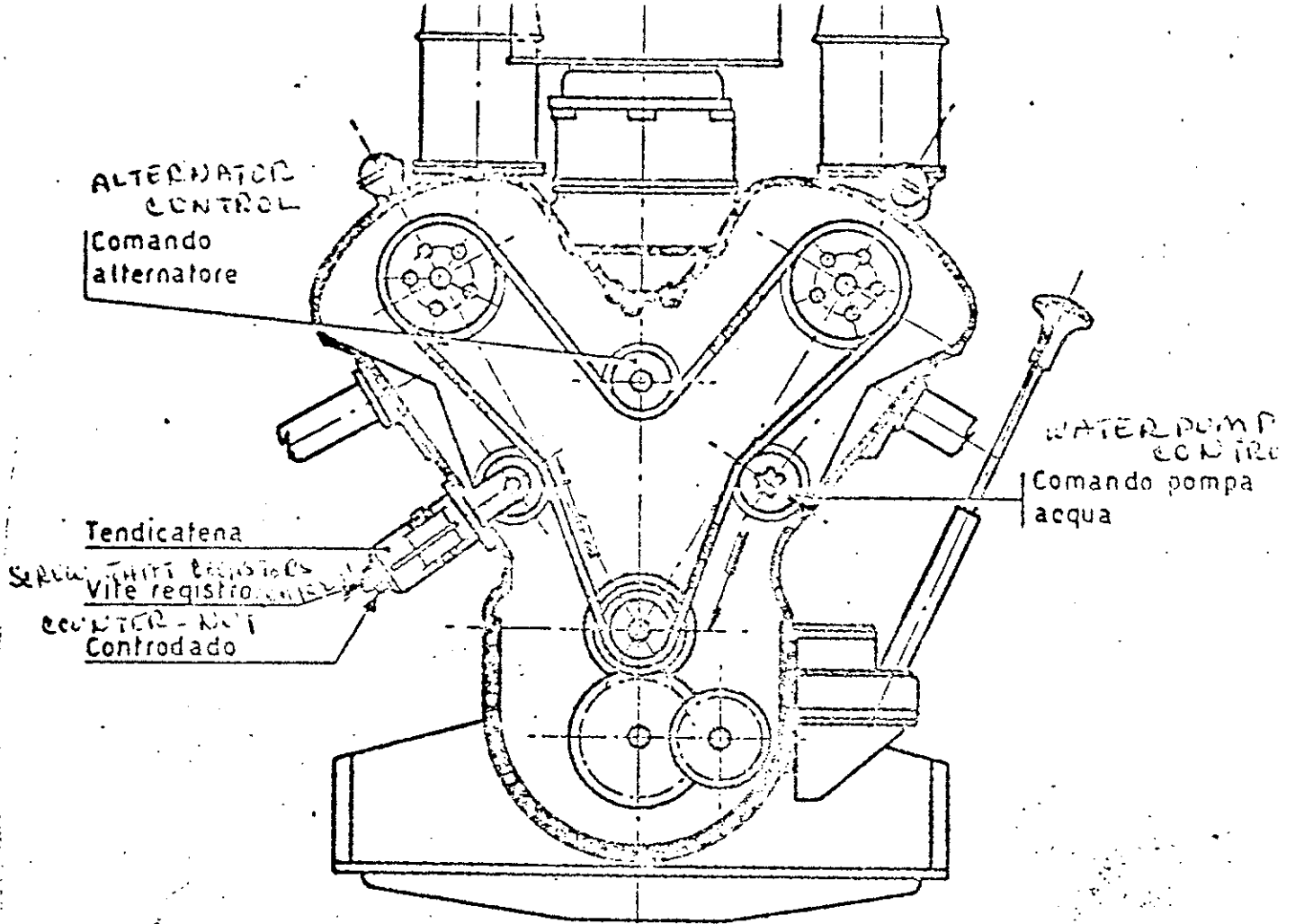


Fig. 3 - CATENA DISTRIBUZIONE
(CHAIN DISTRIBUTION)

Riferimento PM

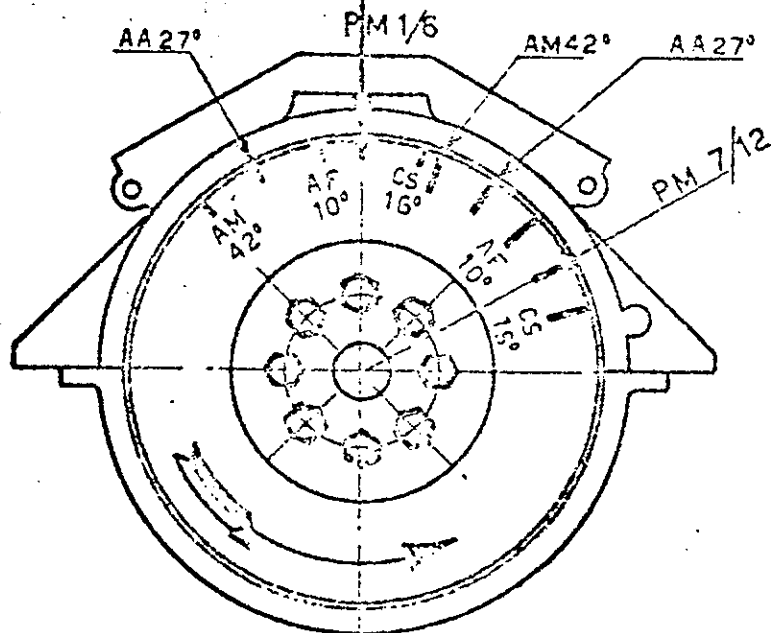
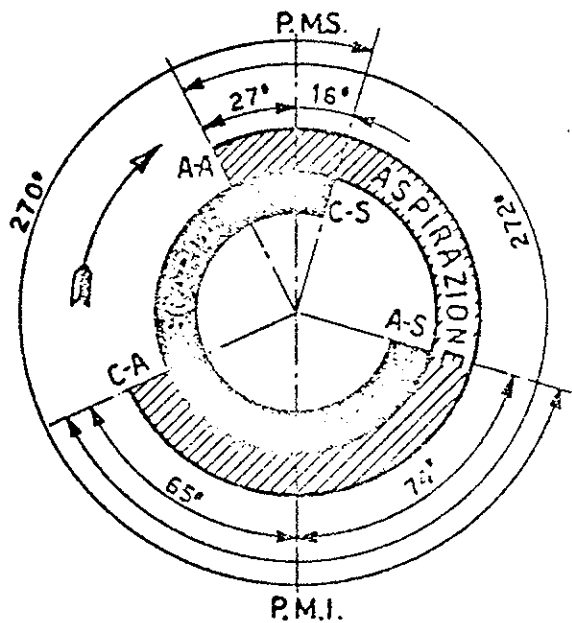


Fig. 4 - DATI DI FASATURA Timing
vista posteriore lato volano
rear of flywheel



(B. 250 GT/E)

Aspirazione (Intake)	inizio apertura fine chiusura	prima del P.M.S. 27° dopo il P.M.I. 65°
Scarico (Exhaust)	inizio apertura fine chiusura	prima del P.M.I. 74° dopo il P.M.S. 16°
Cambio valvole (lash adj con motore freddo)	(Intake) aspirazione (Exhaust) scarico	mm. 0,15 .006" mm. 0,20 .008"

Fig. 8 - Diagramma della distribuzione.

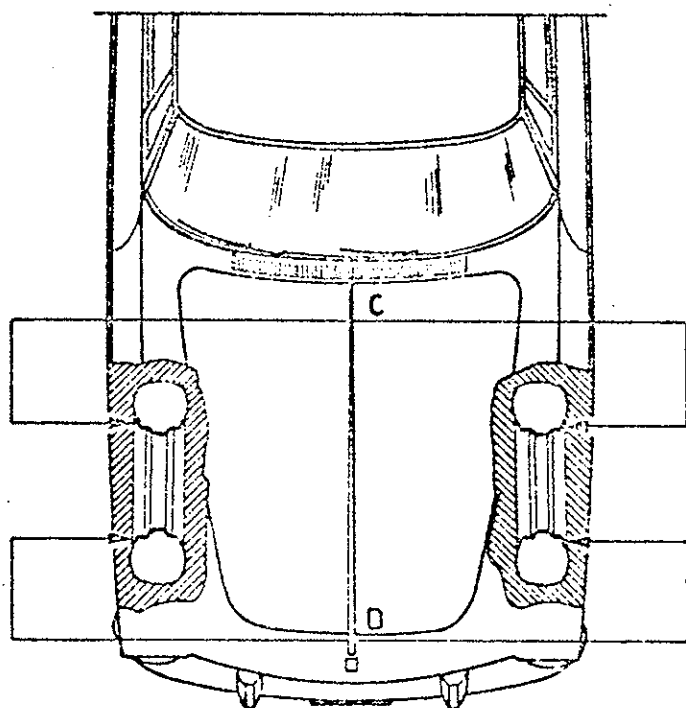
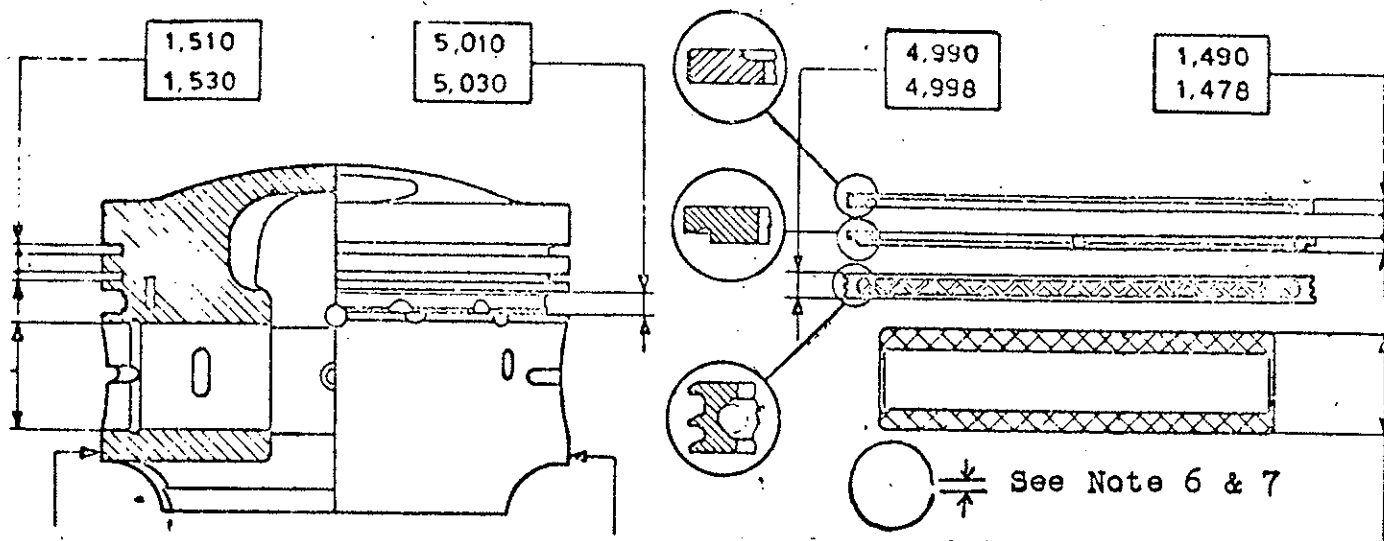


Fig. 9 - Controllo della divergenza delle ruote anteriori.

$$D = C + 0 \div 2 \text{ mm.}$$

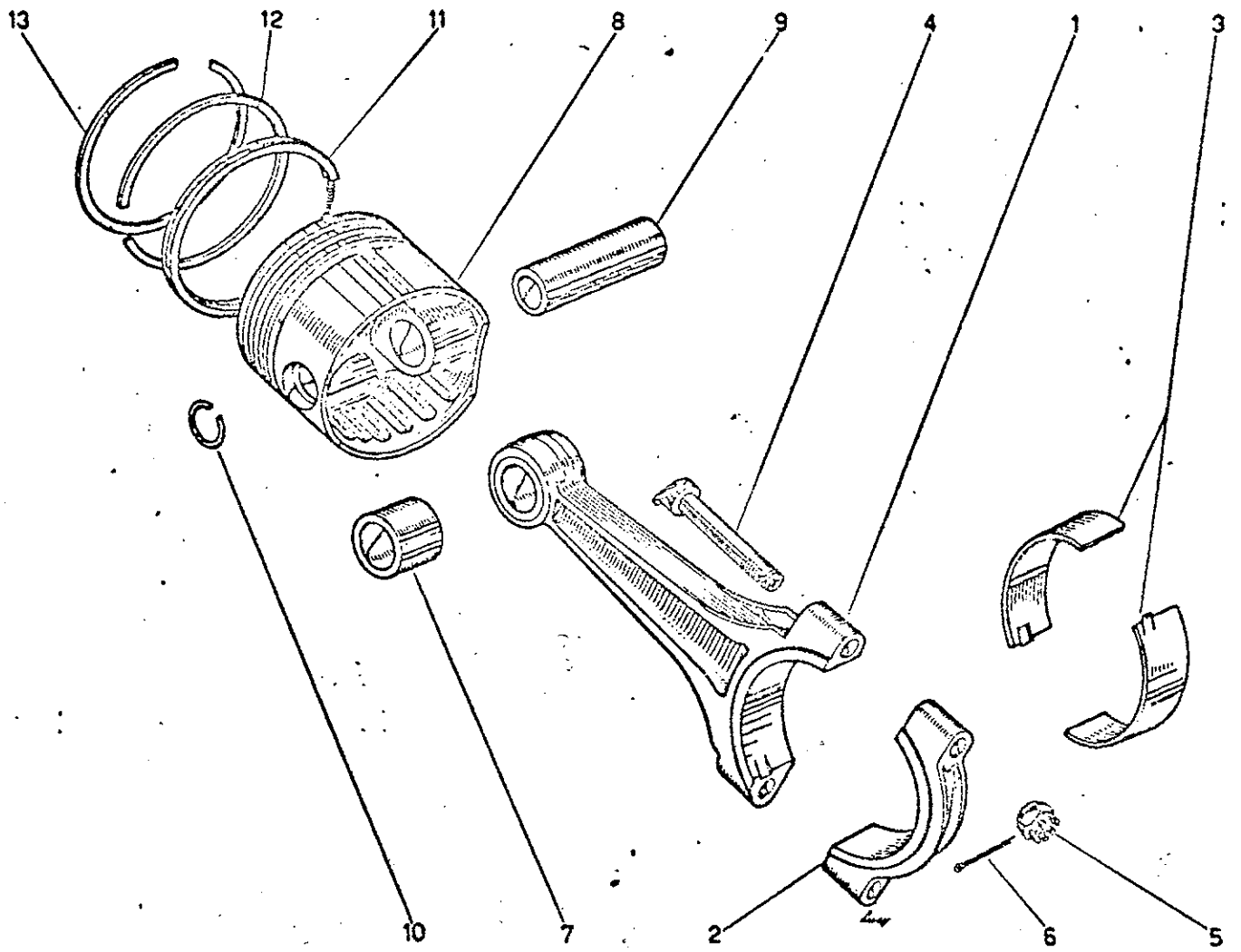
PISTON RINGS



Piston Rings should be installed as shown above.

INSTALLATION AS FOLLOWS:

1. Remove the ridge at the top of the bore.
2. Hone the bore rough.
3. Measure the bore at the top, center, and bottom.
4. Machine to a standard diameter if wall damage or heavy taper is measured.
5. Insert a piston ring into the smallest part of the bore and measure the end butt gap.
6. Piston ring end butt gap should be approximately .004" for each 1.00" of bore diameter., i.e. 3" dia. bore, Gap = .012".
7. Piston ring ends (butt gap) should never touch each other in the smallest part of the bore; excessive gap causes loss of pressure.
8. Use only new rings for rebuilding engine.
9. The piston must be free from all deposits, especially in the ring groove area.
10. Rings are available in three over sizes from dealers; check the bore diameter and order the proper size.
11. Using a ring expander, install all rings in the order shown in the diagram.
12. Measure the ring to land spacing as shown.
13. Rings must turn free by hand in the grooves.
14. Space the ring end openings 120° from each other.
15. Soak the piston, rings and bore with 20W oil.
16. Each piston must return to the bore from which it was removed.
17. Compress the rings on the piston using a ring compressor.
18. Align the pistons in their original position in the bore.
19. Slowly tap the piston into the bore from above (on late engines) with a wood or rawhide hammer or block.
20. Take care as not to allow the connecting rod to touch the crankshaft (if installed).
21. Check for broken or chipped material from the rings in the bore, after the piston is through the compressor.
22. Replace any rings that chip on insertion.
23. Heavily oil the bore and check for freedom of piston movement in the bore; no binding should occur.
24. Do not push the pistons out of the bore as the rings may be damaged.



CLUTCH

DESCRIPTION

250GT - 8-3/4" Diameter Fitchel & Sachs, part no. 1861-084-002
330GT2+2 - 9.5" Diameter Textar, part number 505/17
330GTC - 9.5" Diameter Borg & Beck
365GTB/4 - 10-1/2" Diameter Borg & Beck, part number BB9/445A

MAINTENANCE

Every 500 miles - Check free play.
Every 1,000 miles - Adjust linkage and pedal free play.
Every 2,000 miles - Grease linkage.
Every 5,000 miles - Bleed brake fluid if hydraulic actuated type.
Every 10,000 miles - Check disc and pressure plate for damage or wear.
Every 15,000 miles - Rebuild hydraulic cylinder.
20,000 miles - Replace clutch disc.
20,000 miles - Recondition flywheel and pressure plate.
20,000 miles - Replace throw out bearing.

ADJUSTMENT

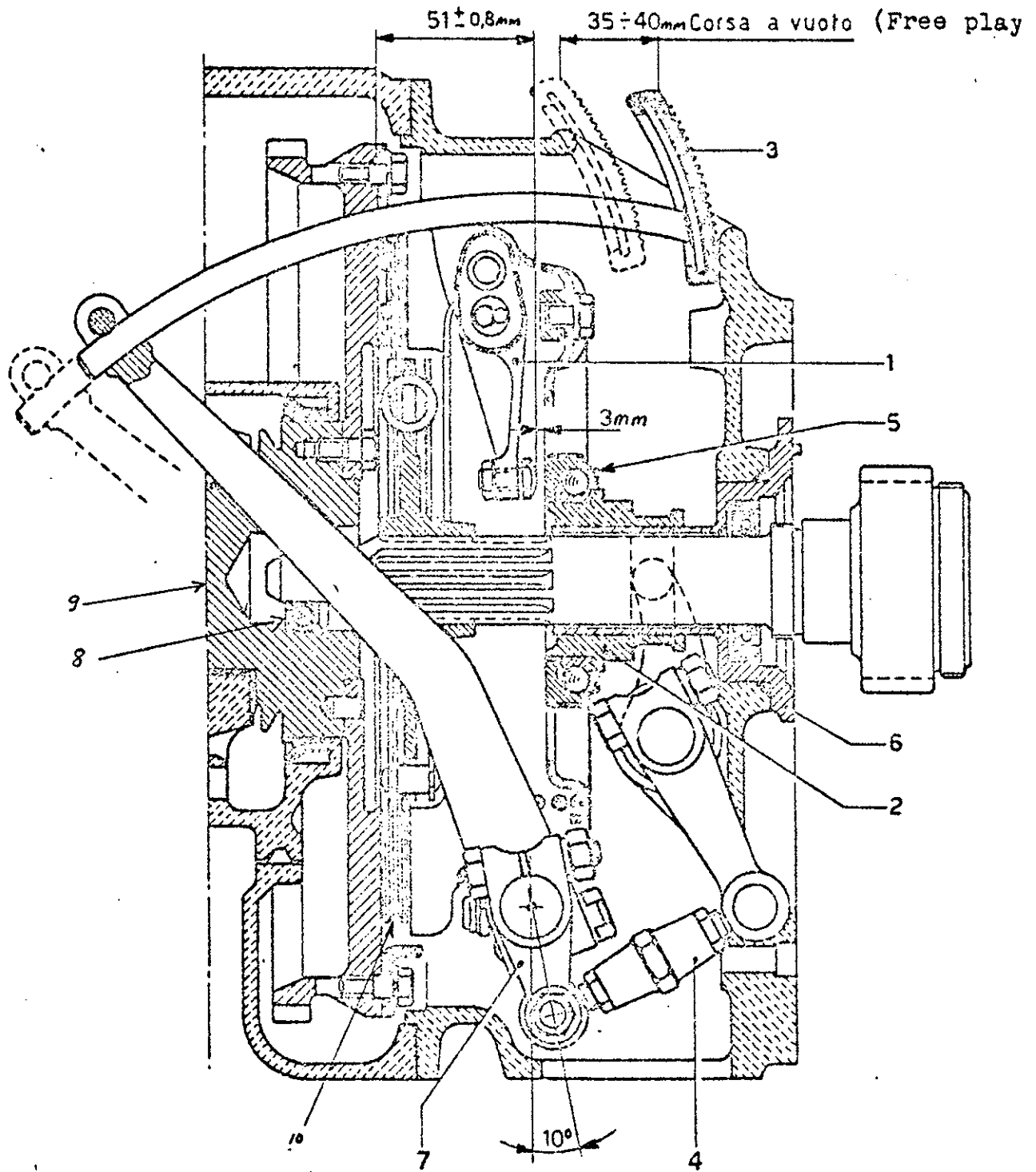
Pedal free play - 1/3/8" to 1-9/16"
Pressure plate finger clearance - 3mm
Actuating arm angle - 10°

PRECAUTIONS

Do not disengage the clutch rapidly when vehicle is at rest.
Do not rest foot on clutch pedal while driving.
Do not keep clutch disengaged for long periods of time.
Do not tow trailers or push other vehicles.

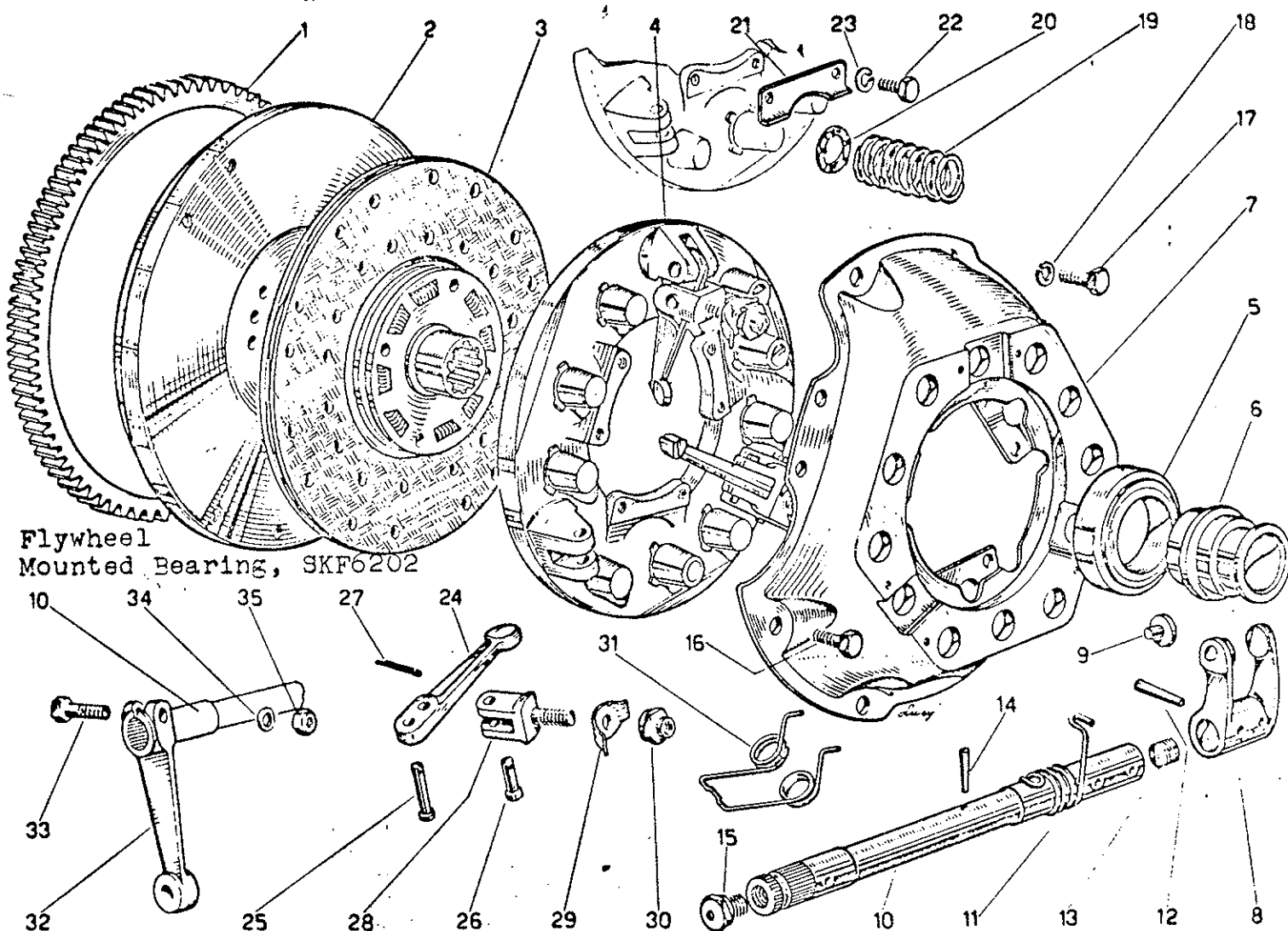
Ferrari

FRIZIONE (CLUTCH)



- | | |
|-------------------------------|----------------------------|
| 1. Activating Fingers | 6. Bellhousing |
| 2. Sleeve | 7. Link |
| 3. Clutch Pedal | 8. Pilot Bearing (SKF6202) |
| 4. Pedal Free Play Adjustment | 9. Crankshaft |
| 5. Throw Out Bearing | 10. Clutch Disc |

CLUTCH ASSEMBLY



DESCRIPTION

- 1 - Starter Ring
 - 2 - Flywheel
 - 3 - Clutch Disc
 - 4 - Pressure Plate Face
 - 5 - Throw Out Bearing
 - 6 - Sleeve
 - 7 - Pressure Plate Cover
- Pilot Bearing SKF6202

Flywheel Bolts Torque to 35 lb. ft.
 #16 Pressure plate bolts torque 35 lb. ft.

Pedal Free Play 1-3/8" to 1-9/16"

<u>#</u>	<u>PART</u>	<u>MODEL USED ON</u>	<u>MANUFACTURE</u>	<u>MANUFACTURER'S PART NO.</u>
3	Clutch Disc.	250GT	Fitchel & Sachs	1861-084-002
4	Pressure Plate	250GT	Fitchel & Sachs	--
3	Clutch Disc.	330GT2+2	Textar	505/17
4	Pressure Plate	320GT2+2	Fitchel & Sachs	--
3	Clutch Disc.	330GTS	Borg & Beck	9.5"
3	Clutch Disc.	365GTB/4	Borg & Beck	BB9/445A

BRAKE SYSTEM

MILEAGE

MAINTENANCE

Daily	Check pedal pressure before driving at speed.
Every 500 Miles	Check brake fluid, top up if necessary. (Use new fluid)
Every 1,000 Miles	Check and adjust parking brake.
Every 1,500 Miles	Bleed entire brake system, starting from the boosters then each wheel. Never reuse old brake fluid.
Every 5,000 Miles	Clean disc rotors, sand paper any surface rust or glaze with #400 emery.
Every 5,000 Miles	Change all brake fluid, replacing with approved racing disc fluid from new sealed cans.
Every 7,500 Miles	Inspect rubber brake hoses.
Every 10,000 Miles	Replace all disc pads.
20,000 Miles	Rebuild disc actuating cylinders, and master cylinder.
30,000 Miles	Rebuild vacuum booster(s).
40,000 Miles	Replace rotor discs.
50,000 Miles	Replace all flexible brake hoses.

DISC BRAKE PADS

<u>MODEL</u>	<u>PAD MANUFACTURER</u>	<u>PAD NO. FRONT</u>	<u>PAD NO. REAR</u>
250GT	Mintex	875/5201	875/4138
330GT	Mintex	875/5201	875/5138
365GTB/4	Textar	T252	T252

RECOMMENDED BRAKE FLUID

Dunlop Racing Brake Fluid

Shell Donax-B-SAE 70 R3

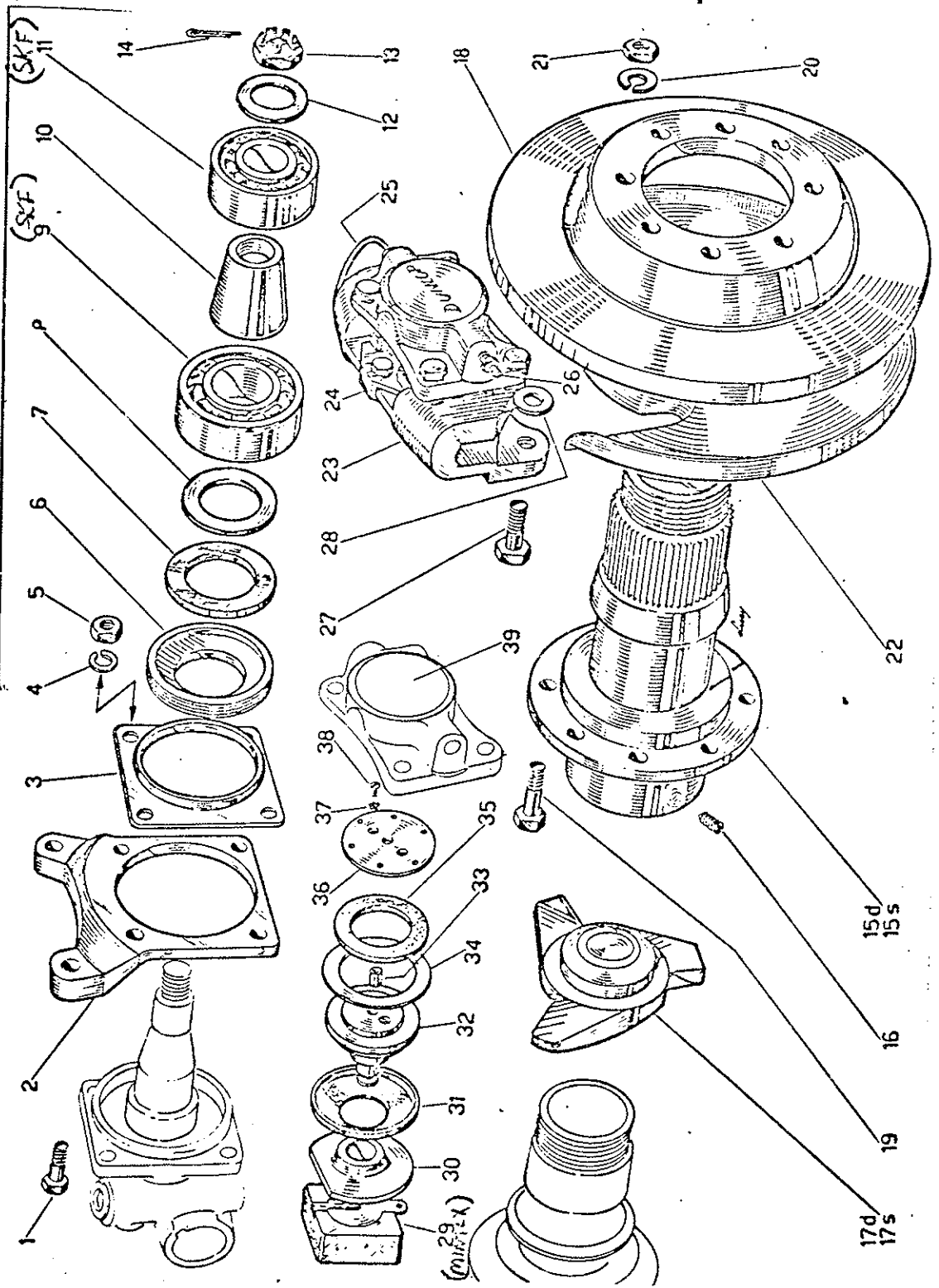
Kelsey-Hayes Kelstar Disc Brake Fluid No. 7999

ATE Tipo H

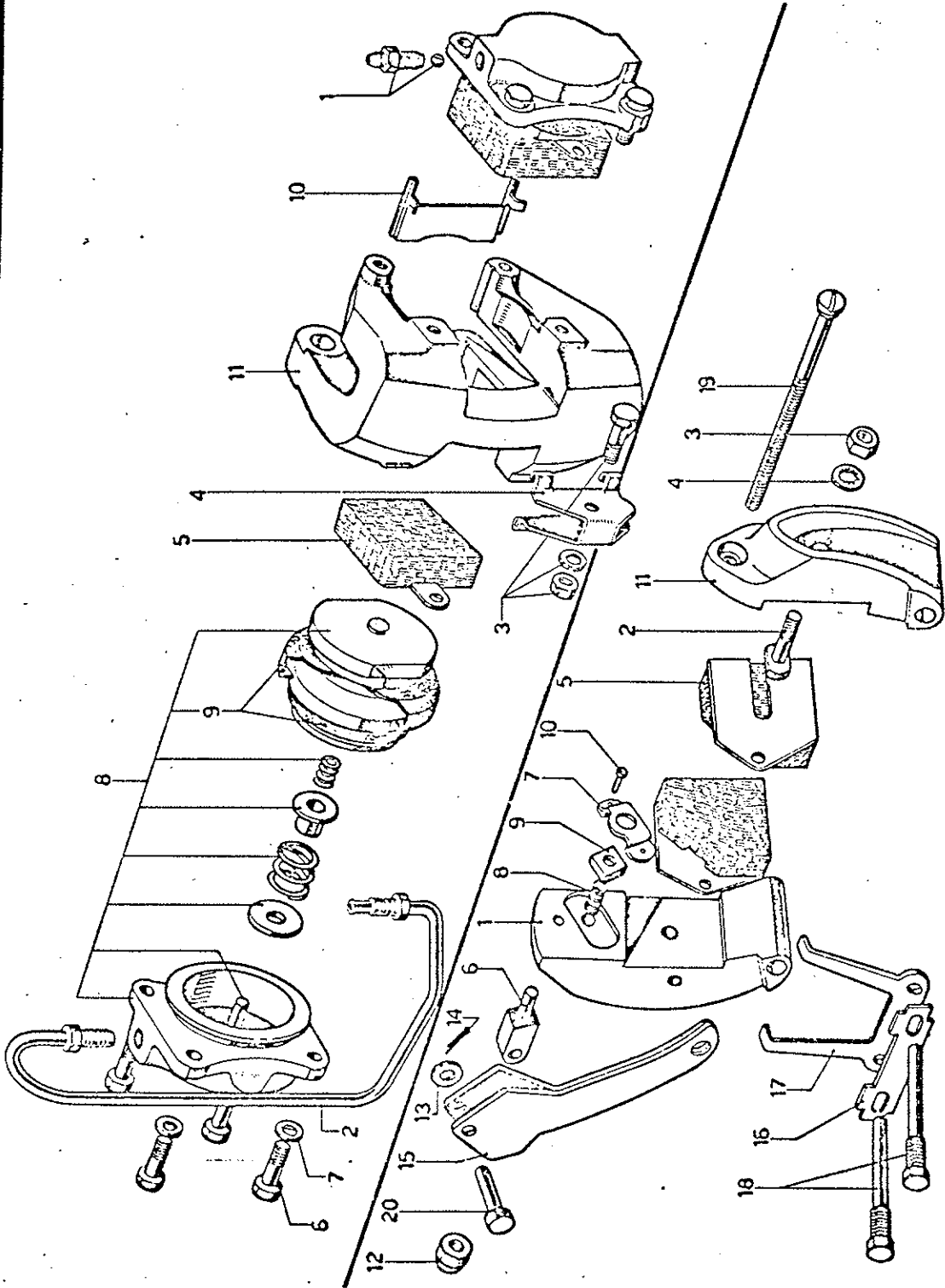
(Brake fluids other than above should be disc type, and exceed SAEJ1703)

NOTE: Always maintain fluid reservoir at least 1/4 full at all times, and never more than 1/4" from top. Never mix different types of fluid in system.

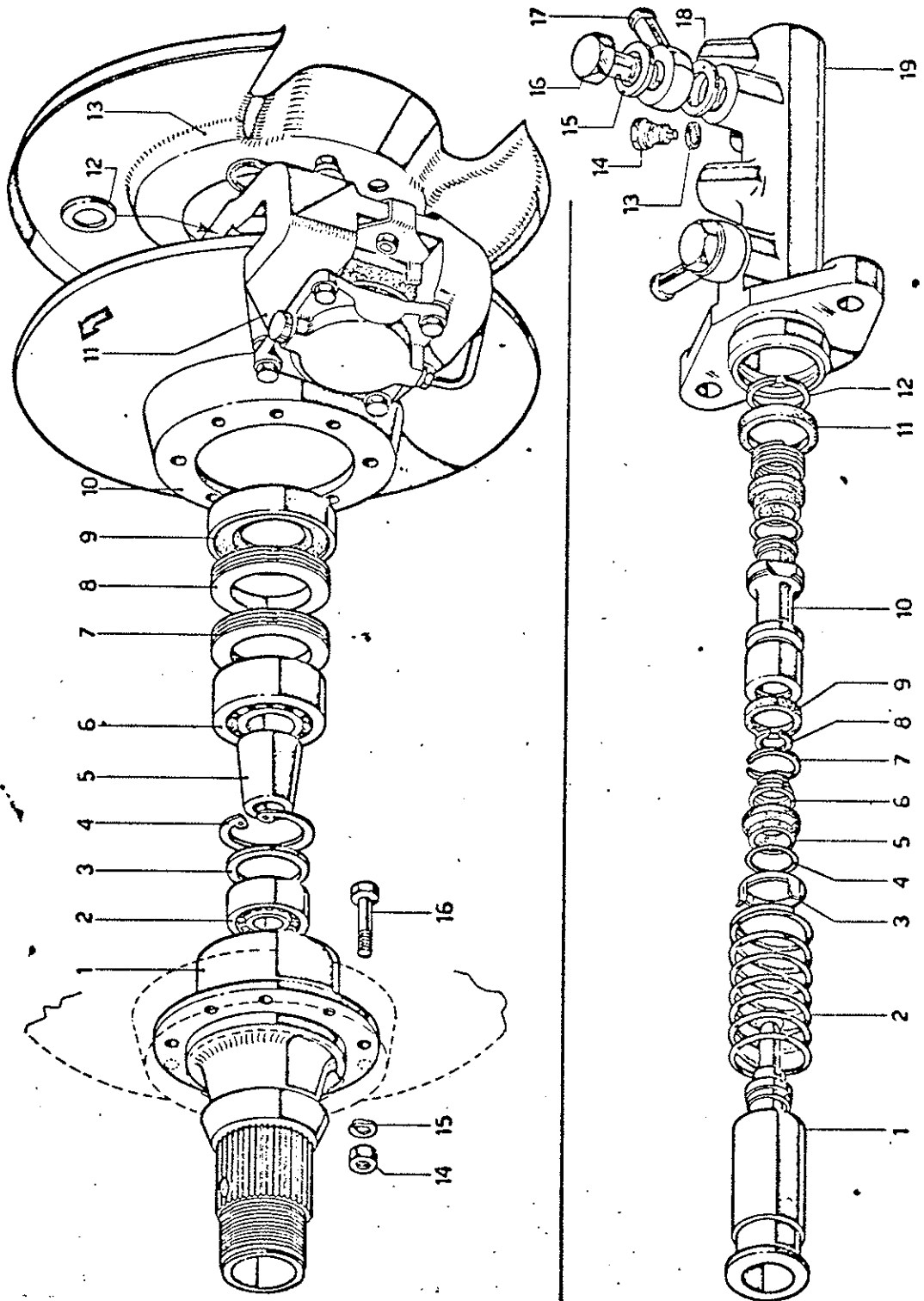
TAV. 33 - FRENO E MOZZI ANTERIORI



TAV. 30 - CALIPER ANTERIORI, POSTERIORI E PER FRENO A MANO



— TAV. 29 - MOZZI - DISCHI FRENO E POMPA DI COMANDO



ENGINE LUBRICATION (continued)

This adjustment will not increase the oil pressure at low speeds, but rather limit the maximum pressure to a safe level. Pressures above the recommended limits can cause damage to the engine. Should the pressure fall below 38 to 45 PSI at high RPMs, do not continue running the engine for long periods of time. Recommended pressures are:

<u>ENGINE SPEED</u>	<u>OIL TEMPERATURE</u>	<u>OIL PRESSURE(PESI)</u>	<u>OIL PRESSURE(METR)</u>
6600 RPM	212°F/100°C	80PSI (Normal)	60 (Normal)
6600 RPM	212°F/100°C	55PSI (Minimum)	40 (Minimum)
6600 RPM	ALL	38-45PSI (Danger)	35-40 (Danger)
800 RPM	(Depends on oil)	14-21PSI (Normal)	10-15 (Normal)

NOTE: Never open the throttle full out until the oil reaches a temperature of 140°F (60°C).

Clean filter screen (20) if pressure is low. The screen should be cleaned at least every 30,000 miles. If full oil pressure is not restored, check for a damaged oil pump, clogged filter or lines, excessive bearing clearances, broken oil lines, or a defective pressure guage.

MAINTENANCE

Change oil and filters every 3,000 miles (sooner in dusty conditions). Lubricate the rubber gasket on the filter before installing, and do not over tighten.

VALVE CLEARANCE ADJUSTMENT

Every 6,000 miles, check the valve lash clearances and if necessary, reset them to the recommended clearance.

REQUIRED MATERIAL:

- 10mm Wrench or Socket
- 11mm Box Wrench
- Small Adjustable Wrench
- .006" (.15mm) Feeler Gauge
- .008" (.20mm) Feeler Gauge
- Small Piece of Thin Sheet Metal
- Cam Cover Gaskets (if required)

CAM COVER REMOVAL:

1. Remove all acorn nuts from the cam covers.
2. Remove all flat washers from the studs.
3. Loosen, (at least half way) all nuts on the chain covers.
4. Remove the bolts that secure the distributor to the cam cover.
5. Lift the ignition wire looms away from the cam covers.
6. Tap the chain covers to be sure they are loose.
7. Remove all carburetor linkages by snapping the clip from the ball joint on the rod.
8. Remove the throttle cable connection at the cam cover. On 330s, remove the air cleaner.
9. Carefully lift the cam cover off of the head, lift upward by the black knobs on the cover (do not force).
10. If the cover hesitates, tap it with a rubber mallet to loosen.

ADJUSTMENT:

NOTE: The engine must be cold when adjusting clearances.

1. Crank the engine over until PM1/6 is indicated at the flywheel timing mark.

VALVE CLEARANCE ADJUSTMENT (continued)

2. Intake and exhaust valves on cylinder 1 and 6 should be closed, and can be checked or adjusted at this point.
3. Check the clearance on a cold engine; the gaps for a 250 or 330 are:

<u>.006" on intake</u>
<u>.008" on exhaust</u>
4. The intake valves are the ones closest to the carburetors; the exhaust valves are the ones just above the exhaust pipes.
5. To adjust the clearances, loosen the 11mm jam nut on the top of the rocker arm, insert the correct feeler gauge between the valve stem and the adjuster. Turn the adjuster screw with a small adjustable wrench until the gauge can be removed with a slight pull (a small pressure on the feeler gauge is o.k.)
6. Tighten (securely) the jam nut - taking caution not to disturb the setting of the adjuster screw. Check the clearance again to determine if the adjuster screw had been moved, repeat if it is not correct. (Holding the adjuster screw while tightening the jam nut will prevent this problem). Adjust one valve at a time, but complete both adjustments on each cylinder before turning engine over.
7. With a flashlight, observe the position of the cam lobe on the next cylinder to be checked. Rotate the engine until the lobe is pointing away from the rocker arm; the valve is fully closed at this time. Each valve may be adjusted on each cylinder in this manner. (A pushbutton switch connected from the starter fuse box to battery will speed up cranking the engine over each time. Intake and exhaust valves have different clearances; do not mix the measurement up.
- 7a. Another method of determining if the valves are closed is to crank the engine through the normal firing order and adjust each valve lifter when the piston is at TDC. Starting with cylinder #1 with PM 1/6 on the flywheel mark, crank the engine slightly to the next cylinder in the firing order, then check the clearance. The firing order on 250 and 330 cars is as follows: 1-7-5-11-3-9-6-12-2-8-4-10. (When a cylinder is at TDC in the firing cycle, both valves of that cylinder are closed and adjustments of the clearances on the intake and exhaust valves can be made at this time.)
8. With either method 7 or 7a, recheck each valve again to double check the clearances. Also, double check the tightness of the jam nuts.
9. The engine can be run with the cam covers off to check for any noisy adjustments. Do not run the engine at high RPM or oil may splash about the engine compartment.

VALVE CLEARANCE ADJUSTMENT (continued)

10. If readjustment of a particular valve clearance is indicated, wait until the engine is cold, before setting.

REASSEMBLY:

1. If the large cover gasket appears dry, cracked, decomposed, or broken in any way, replace it with a new one. Remove the chain covers and lift the old gasket off (avoid damaging the front oil gasket). Do not drop any pieces into the engine. Clean the area under the gasket and remove all adhesives if they were applied. Install a new gasket, cutting off (carefully) the small section of gasket over the distributor drive. The oil gasket between head and chain cover should be carefully inserted through the small punched squares in the gasket. Push the gasket down on the head, do not use adhesives to hold the gasket.
2. Clean the gasket area on the cam case (and chain cover if a new gasket is to be installed) removing all adhesives or traces of gasket material. Check the oil drain holes for blockages; clean them if it is required.
3. Install the chain cover if it was removed. Place a thin sheet metal piece against the oil ring, holding it against the chain cover.
4. Using the sheetmetal piece to hold the oil gasket against the chain cover, carefully slide the cam cover down on the head. Slowly remove the sheetmetal, apply oil from above if it is difficult to remove. (Do not use adhesives to hold gaskets in place.)
5. Place the flat washers on the studs, then place the four spacers on the longer studs. Fit the ignition wire harness over the proper studs.
6. Install the 6mm acorn nuts on all of the studs and run them down finger tight. Be sure the covers are down flat on the heads.
7. Torque each nut down to about 6 lb. ft. Tighten nuts in order from the center to the ends of each cover.
8. Install the distributor securing bolts and tighten down.
9. Install the carburetor linkages and throttle cable. Do not adjust the throttle cable taut, or it may change the idle setting. Install the air cleaner if it was removed.
10. Start the engine and check for oil leaks and loose cover nuts.

COOLING SYSTEM

MAINTENANCE:

Every 300 Miles	Check the level of water in the radiator, top up 3/4" from cap seat with distilled water if required.
Every 3,000 Miles	Check electric fan drive for operation, check or set gap to .014". Fan(s) should activate at 185°-194°F. Check dynamo belt tension, set tension to 3/8" deflection with 9 lb. pressure on belt.
Every 12,000 Miles	Check water pump glands and ball bearings, replace if leaky or noisy. Test radiator cap to 5 PSI relief pressure. Check all hoses and heater circuits for leaks. Drain and flush entire cooling system. Check fan armature brush and slip ring for wear. Replace fan belt.

SPECIFICATIONS:

Radiator Cap	Type R9 - 5-6 PSI Relief
Thermostat	185°F Opening
Peugeot Switch	185°F Opening, 167°F Closing
Fan Belt	3/8" HD Automotive Type
Cooling System Capacity	12 Quarts
Drain Plugs	Two in block, one in radiator

ANTIFREEZE:

<u>Temperature</u>	<u>Quantity of Antifreeze</u>	<u>Percent</u>
Down to + 14°F	5 Pints	22%
Down to + 5°F	6 Pints	28%
Down to - 4°F	8 Pints	34%
Down to - 22°F	10 Pints	44%

PRECAUTIONS:

To prevent freezing, drain the water from the cooling system if antifreeze is not used.

Flush system before adding antifreeze.

Keep antifreeze in winter and summer to prevent oxidation of the cooling system.

Do not allow water temperature to rise above 203-212°F (95-100°C).

Do not use pressure cap with relief pressure higher than the specified 5PSI.

If Peugeot electric fan will not energize, tighten the three adjusting screws until the fan functions.

Carry a spare fan belt for emergencies.

Do not operate vehicle without coolants.

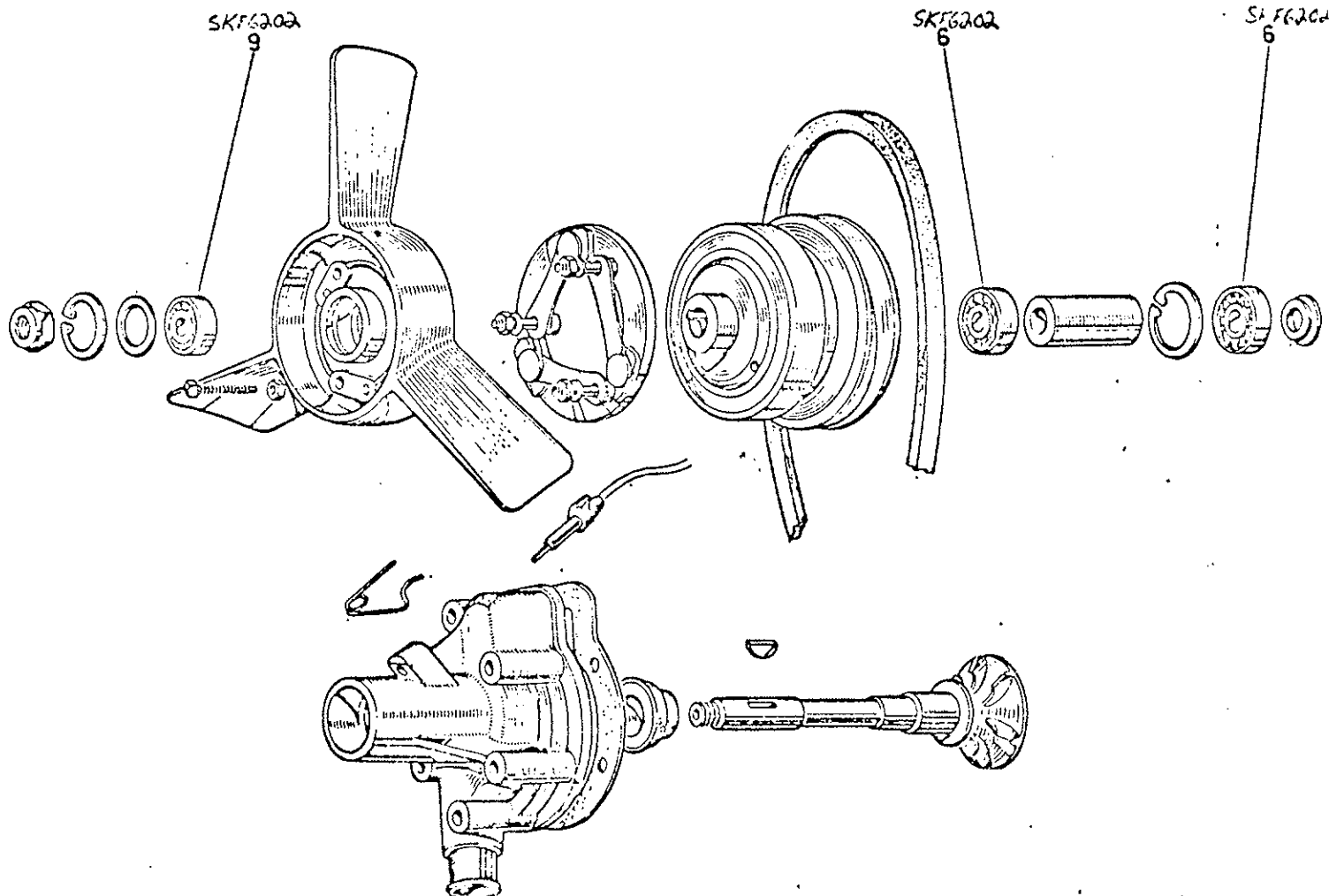
Do not operate vehicle for long periods with a fan belt.

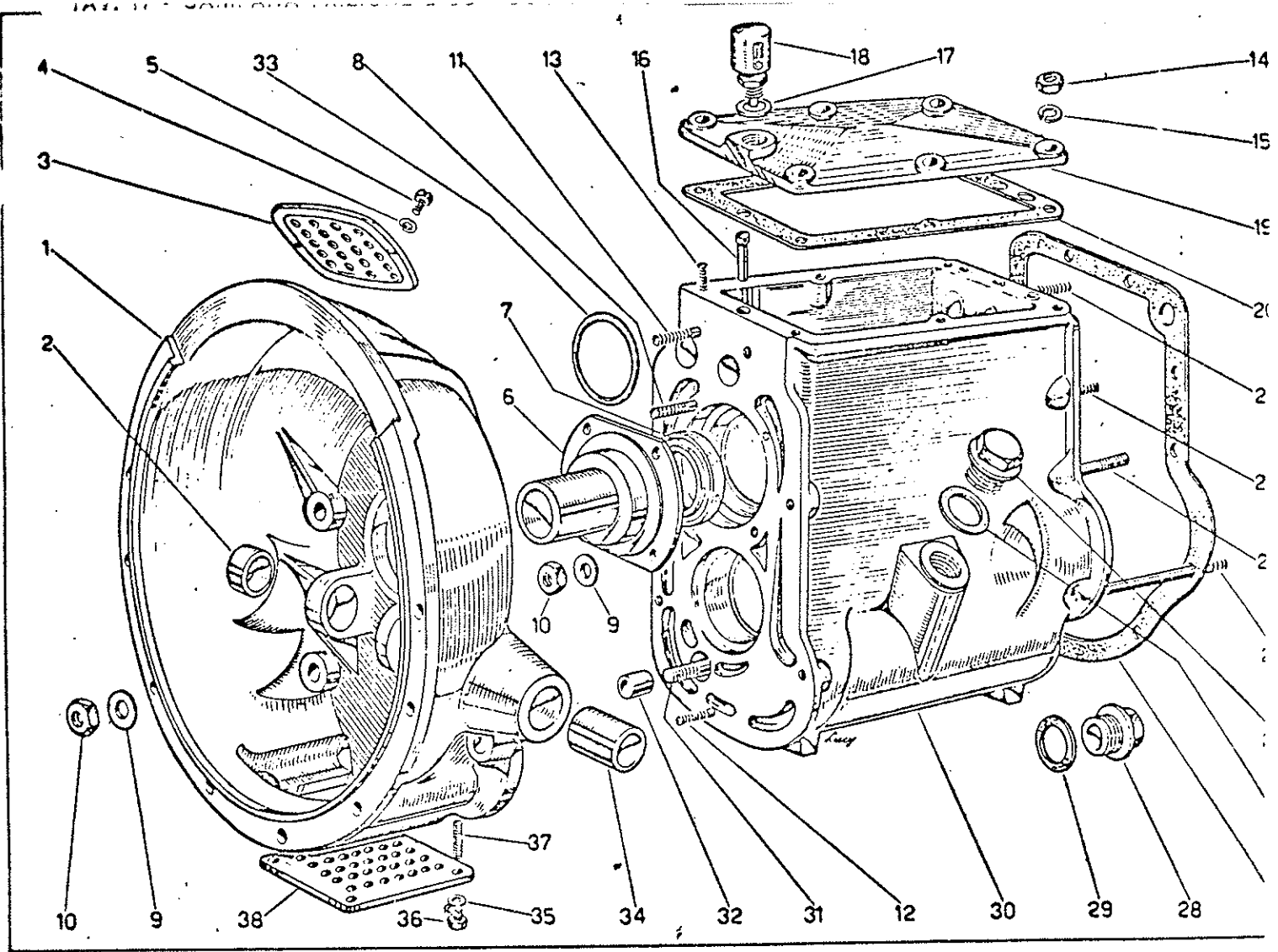
Do not release pressure cap when water temperature is above 190°F.

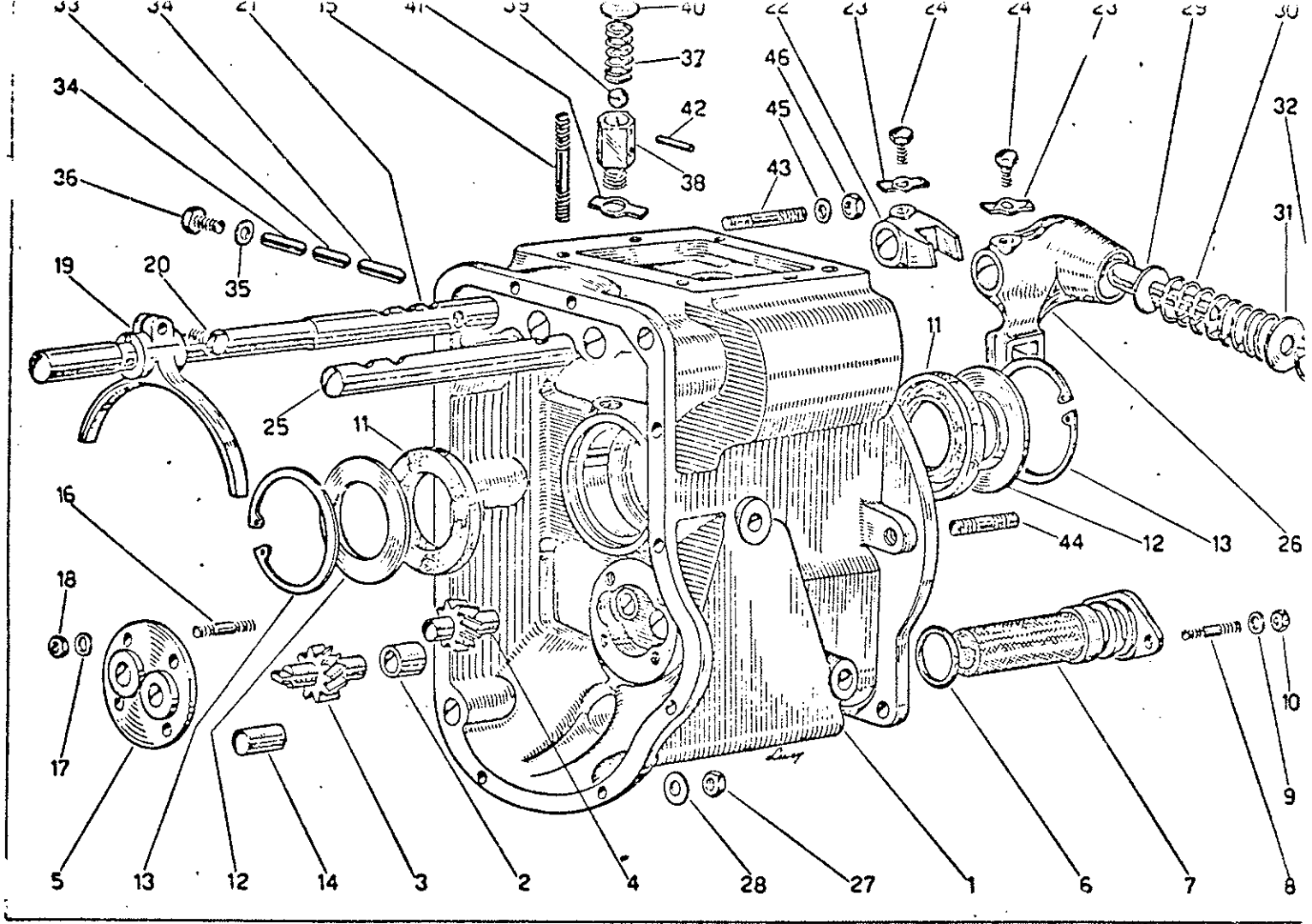
Do not add water to the radiator if engine is hot.

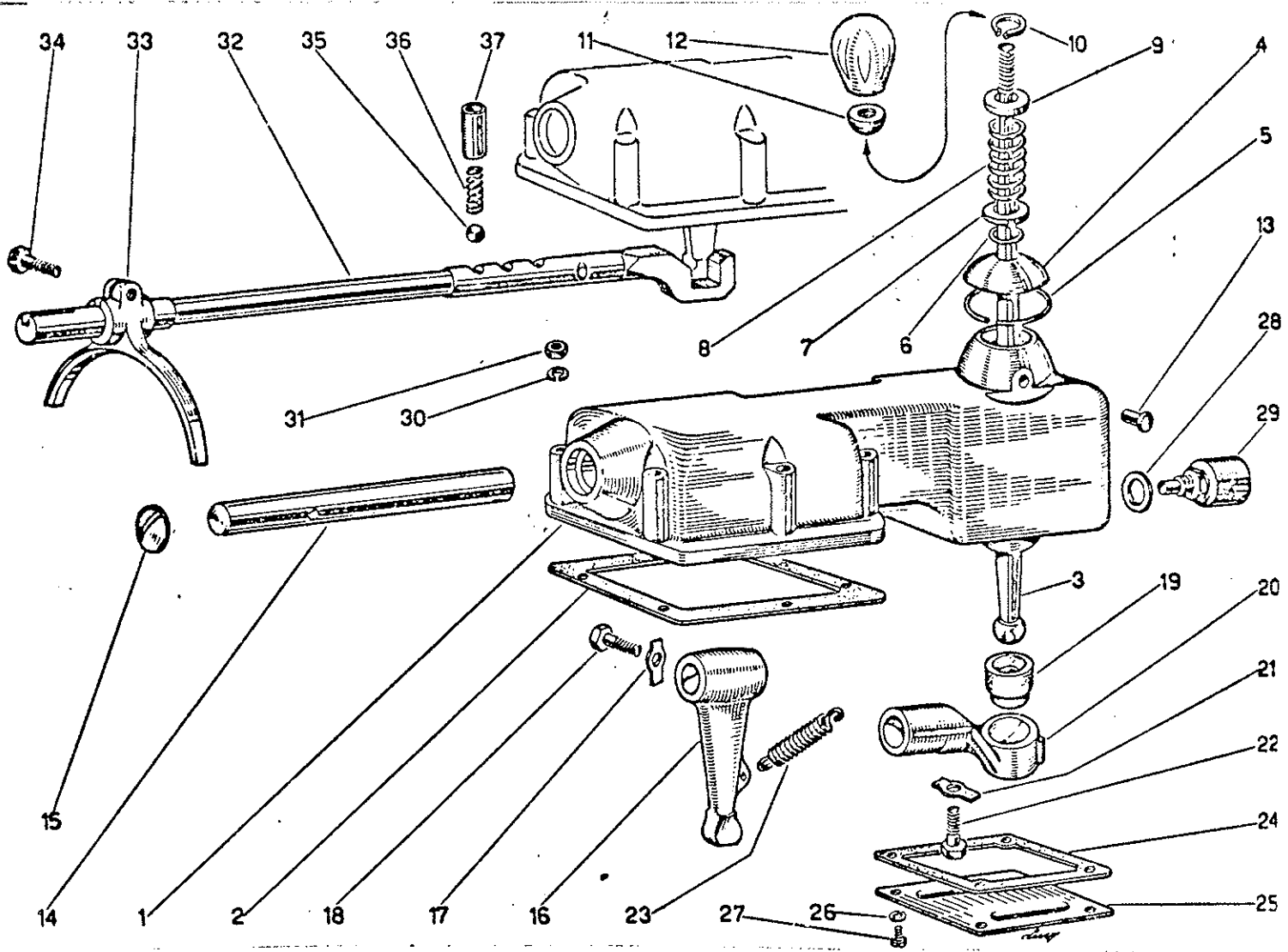
Do not over-tighten fan belt as this may cause damage to the dynamo bearings.

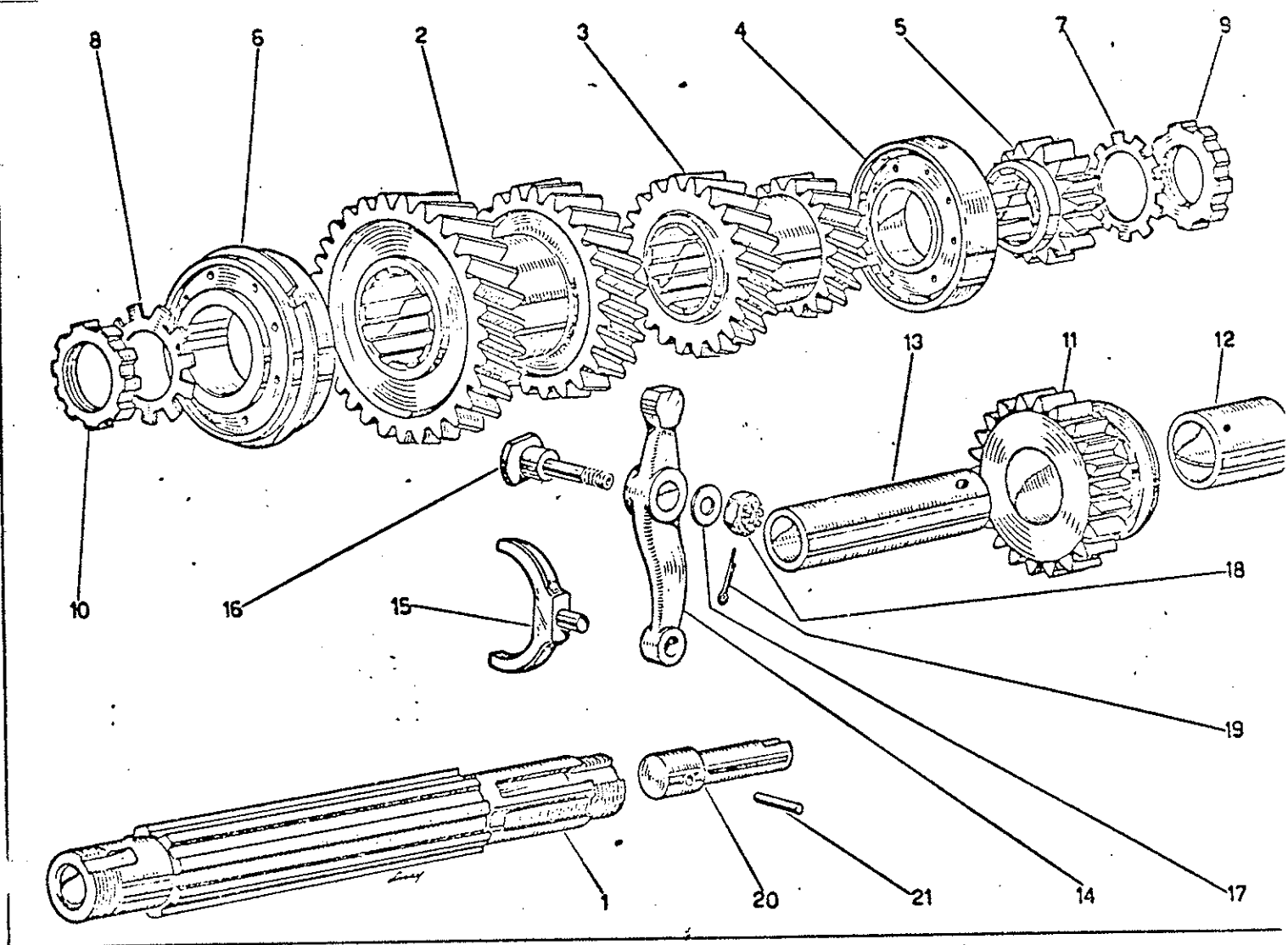
Always use soft or distilled water in the cooling system.

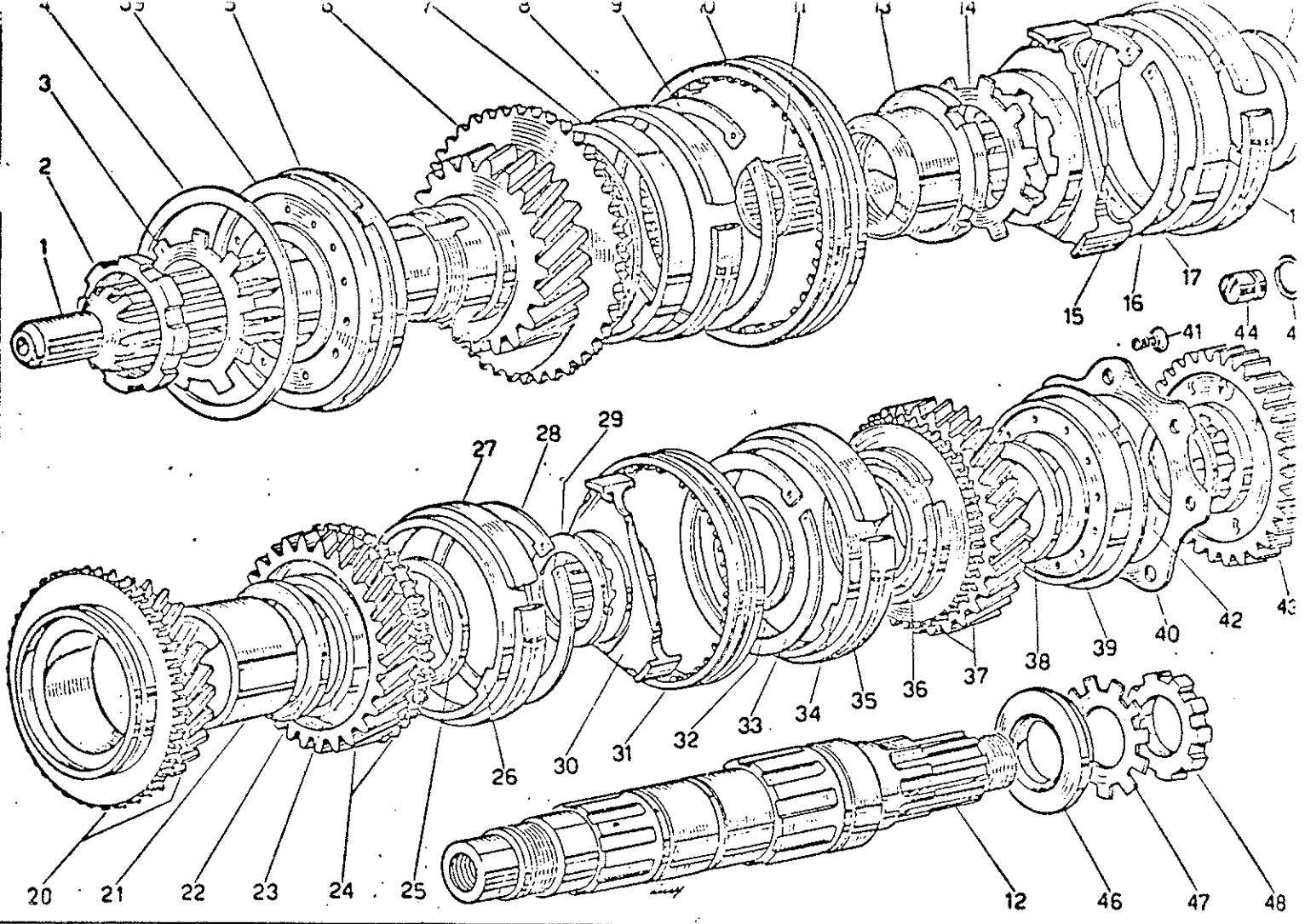


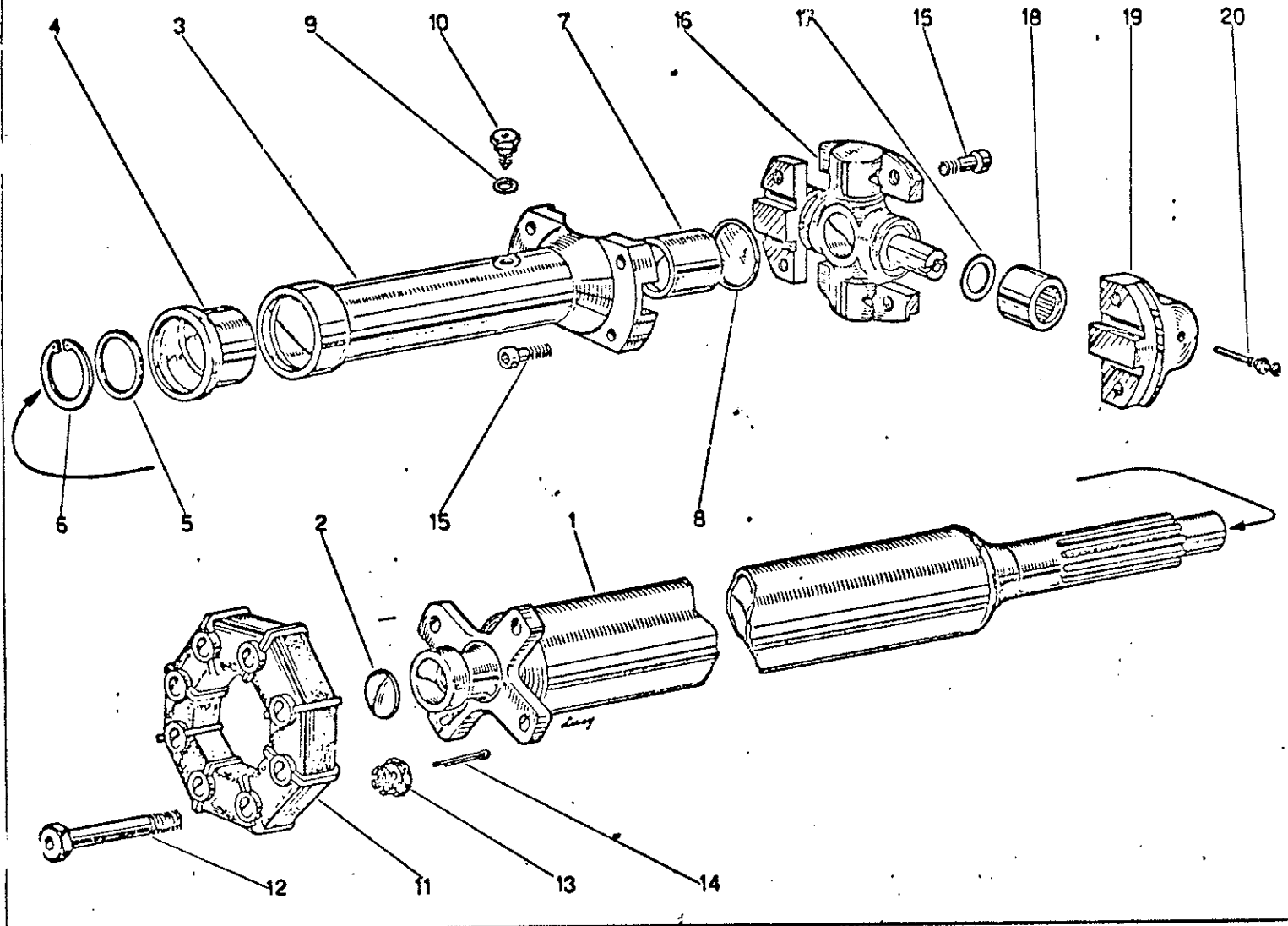




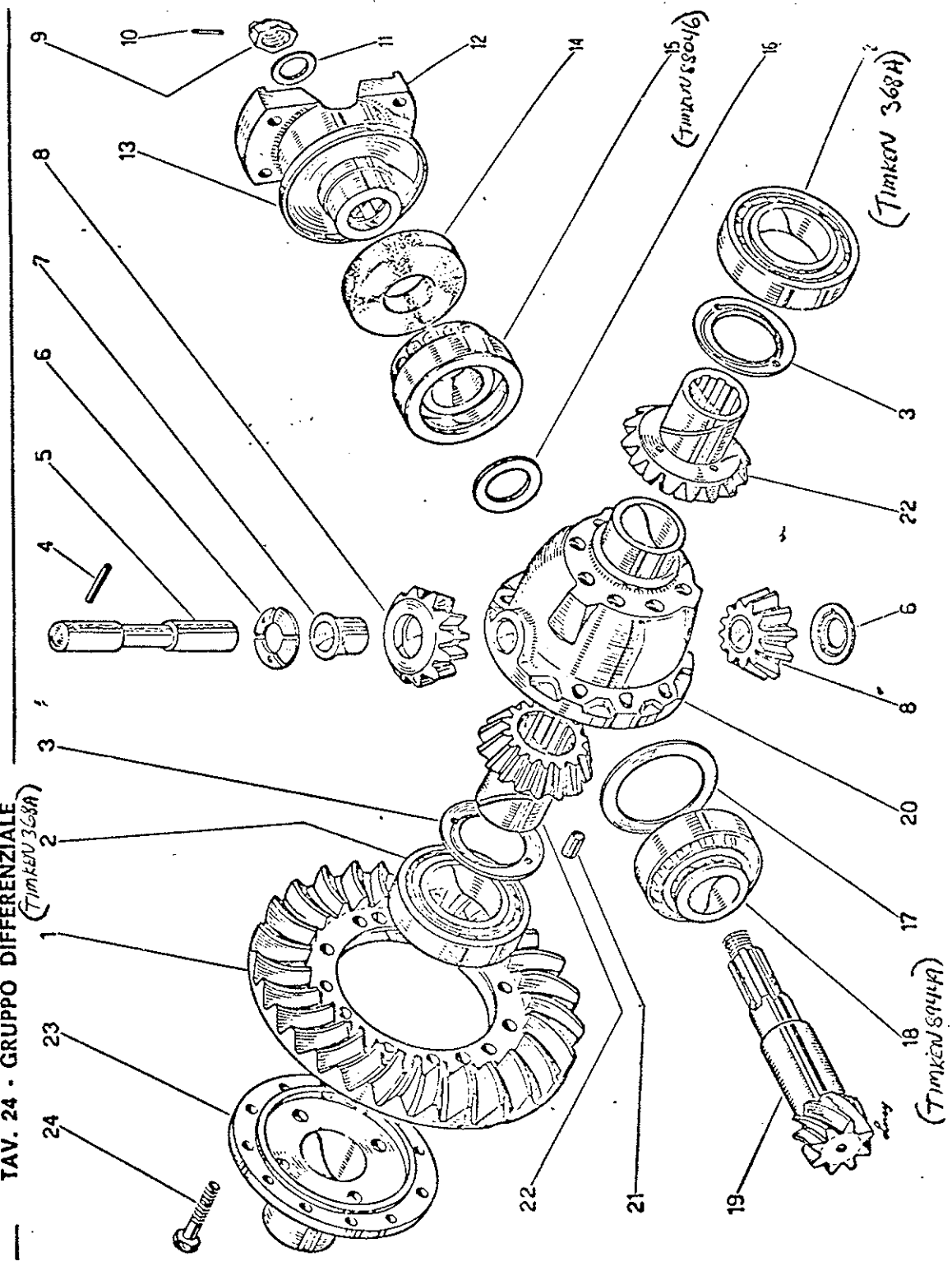


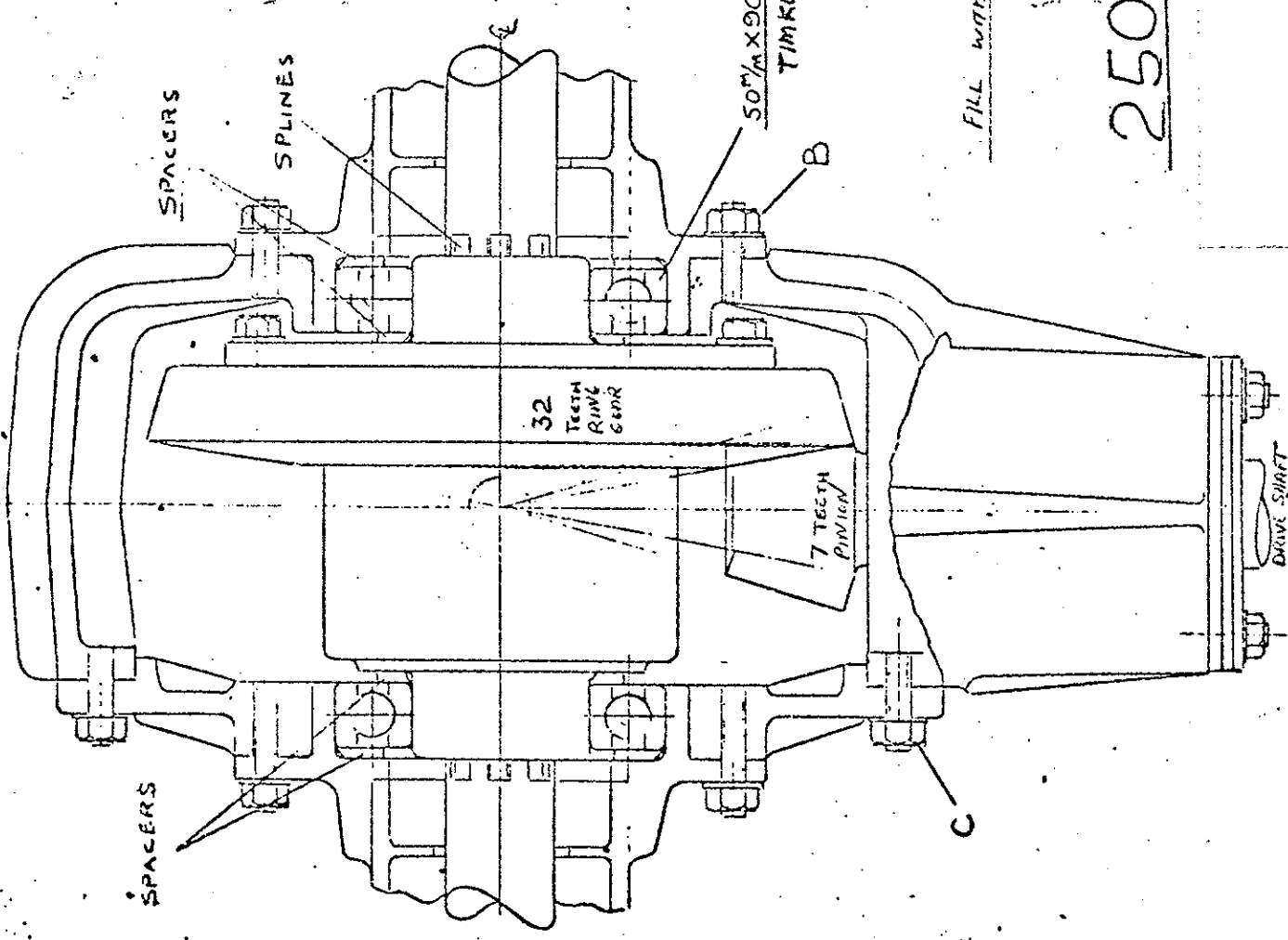






TAV. 24 - GRUPPO DIFFERENZIALE
(TIMKEN 368A)





OIL DRAIN HOLES

TIMKEN
30MM X 72MM X 17MM

FELT OIL SEAL

SPLINES

AXLE NUT
KNOCK OFF
TIGHTEN

AXLE HALF SHAFT

COTTER PIN

RUBBER OIL SEAL

50MM X 90MM X 19MM
TIMKEN

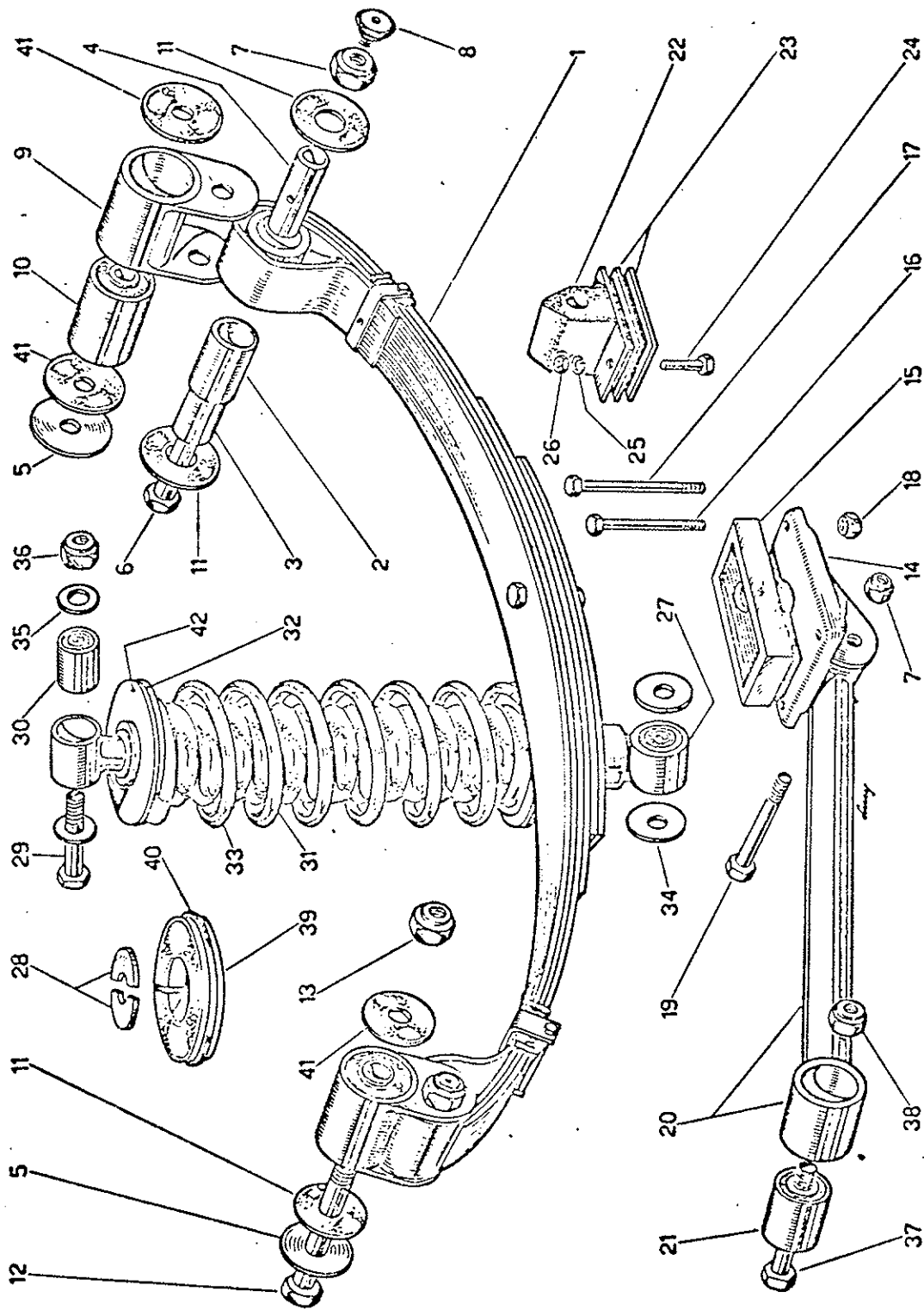
BACK PLATE

BRAKE DRUM
OR DISC ROTOR

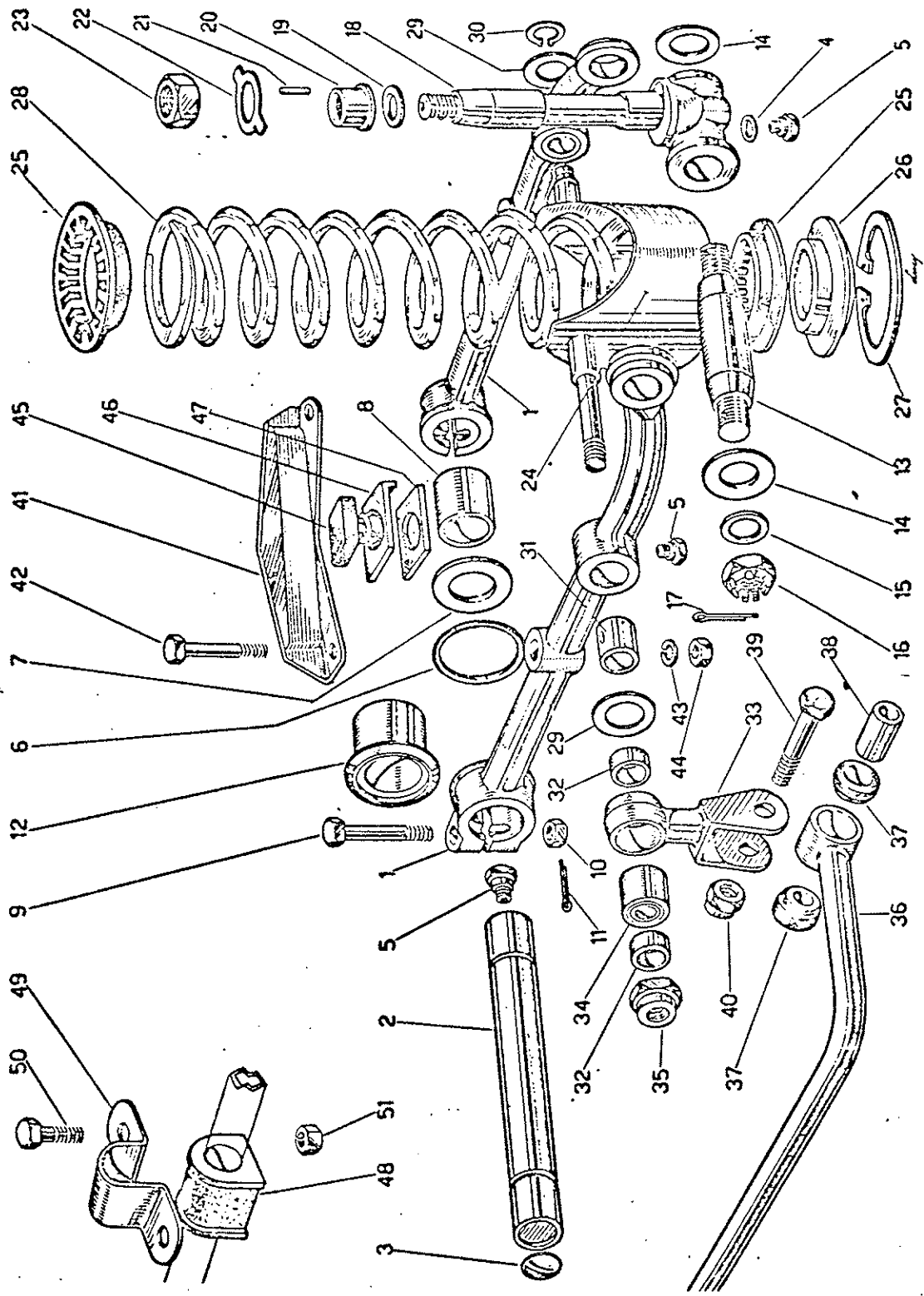
FILL WITH SHILL DENTAL 350 GEAR OIL

250GT FERRARI REAR AXLE ZF

TAV. 26 - SOSPENSIONE POSTERIORE



— TAV. 29 - SOSPENSIONE ANTERIORE - BRACCI INFERIORI



METRIC STANDARDS

Some Ferraris intended for European delivery have gauges and specifications measured in the metric system. Except for the oil pressure gauges (*), which are calibrated in meters of head pressure, the other systems are straight forward.

<u>METRIC STANDARD</u>	<u>INTO U.S. STANDARD</u>	<u>MULTIPLY METRIC BY</u>	<u>USE</u>
Atmospheres (ATM)	Lbs. per sq. in.(PSI)	14.70	Tire Pressure
Centigrade (°C)	Fahrenheit (°F)	$(C \times \frac{9}{5}) + 32$	Temperature
Cubic Centimeters (CC)	Cubic Inches (Ci)	.06102	Displacement
Kilometers (Km)	Miles (Mi)	.6214	Distance
Kilograms (KG)	Pounds (Lbs.)	2.205	Weight
Kilometers per Hour (KPH)	Miles per Hour (MPH)	.6214	Speed
Kilogram Meters (KGM)	Pound Feet (Lb. Ft.)	7.233	Torque
Liter (L)	Quarts (Qts.)	1.057	Liq. Measure
Meter Pressure* (Oil)	Lbs. per sq. in.(PSI)	1.42	Oil Pressure
Millimeters (MM)	Inches (In.)	.03937	Dimensions

CONVERSION CHART/Fraction Inch to Decimal Inch to mm

Frac. Inch	Dec. Inch	mm.	Frac. Inch	Dec. Inch	mm.	Frac. Inch	Dec. Inch	mm.	Frac. Inch	Dec. Inch	mm.
	.002100	.0109	13/32	.464250	10.3157		.384259	25.0000		1.500000	45.7196
	.002200	.0200	27/64	.421875	10.7156	63/64	.984375	25.0000		1.311937	46.0000
	.001200	.0300		.433974	11.0000	1	1.000000	25.4001	1-13/16	1.812500	46.0376
	.001600	.0400	7/16	.437500	11.1125		1.023529	26.0000	1-27/32	1.843750	46.5313
	.002000	.0500		.450000	11.4300	1-1/32	1.031250	26.1928		1.850000	46.9826
	.002400	.0600	29/64	.453125	11.5094		1.050000	26.6699		1.860407	47.0900
	.002800	.0700	15/32	.466750	11.9062	1-1/16	1.062500	26.9576	1-7/8	1.875000	47.6251
	.003100	.0800		.472444	12.0000		1.062909	27.0000		1.889777	48.0000
	.003500	.0900	31/64	.484375	12.3031	1-3/32	1.093750	27.7813		1.900000	48.2596
	.003900	.1000	1/2	.500000	12.7000		1.100000	27.9397	1-29/32	1.906250	48.4155
1/125	.004200	.1000		.511514	13.0000		1.102369	28.0000		1.929147	49.0000
	.011000	.1000	33/64	.515625	13.0967	1-1/8	1.125000	28.5751	1-15/16	1.937500	49.2126
1/64	.015625	.1000	17/32	.531250	13.4937		1.141739	29.0000		1.950000	49.5296
	.015700	.1000	35/64	.546875	13.9306		1.150000	29.2007		1.968522	50.0000
	.015750	.1000		.550000	13.9700	1-5/32	1.156250	29.3608	1-31/32	1.968750	50.0000
	.023600	.1000		.551104	14.0000		1.161113	30.0000	2	2.000000	50.8001
	.027600	.1000	9/16	.562500	14.2875	1-3/16	1.187500	30.1626		2.007892	51.0000
1/32	.031250	.1000	37/64	.578125	14.6844		1.200000	30.4797	2-1/32	2.031250	51.5929
	.031500	.1000		.590554	15.0000	1-7/32	1.218750	30.2563		2.047262	52.0000
	.035100	.1000	19/32	.593750	15.0812		1.220481	31.0000		2.050000	52.0693
	.039370	1.0000		.600000	15.2400	1-1/4	1.250000	31.7501	2-1/16	2.052500	52.3876
3/64	.045875	1.1000	39/64	.609375	15.4741		1.259853	32.0000		2.086632	53.0000
	.050000	1.2700	5/8	.625000	15.8750	1-9/32	1.281250	32.5438	2-3/32	2.093750	53.1814
1/16	.062500	1.5875		.629924	16.0000		1.292223	33.0000		2.100000	53.3375
5/64	.071250	1.9844	41/64	.640625	16.2719		1.300000	33.0197	2-1/8	2.125000	53.9751
	.078740	2.0000		.650000	16.5100	1-3/16	1.312500	33.3376		2.126602	54.0000
3/32	.083750	2.1212	21/32	.656250	16.6687		1.328593	34.0000		2.150000	54.6095
	.100000	2.5400		.669204	17.0000	1-11/32	1.343750	34.1313	2-5/32	2.156250	54.7683
7/64	.109375	2.7791	43/64	.671875	17.0656		1.350000	34.2807		2.165372	55.0000
	.118110	3.0000	11/16	.687500	17.4625	1-3/8	1.375000	34.9251	2-3/16	2.181250	55.5626
1/8	.125000	3.1750		.700000	17.7800		1.377963	35.0000		2.200000	55.8795
9/64	.130625	3.5719	45/64	.703125	17.8394		1.400000	35.5597		2.204742	56.0000
	.150000	3.8100		.708664	18.0000	1-13/32	1.406250	35.7188	2-7/32	2.218750	56.3584
5/32	.156250	3.9887	23/32	.718750	18.2562		1.417333	36.0000		2.244112	57.0000
	.157418	4.0000	47/64	.734375	18.6531	1-7/16	1.437500	36.5126	2-1/4	2.250000	57.1501
11/64	.171875	4.3456		.743034	19.0000		1.450000	36.8297	2-9/32	2.281250	57.9439
3/16	.187500	4.7625	3/4	.750000	19.0500		1.456703	37.0000		2.281482	58.0000
	.186650	5.0900	49/64	.765625	19.4469	1-15/32	1.468750	37.3063		2.300000	58.4195
	.200000	5.0800	25/32	.781250	19.9437		1.496073	38.0000	2-5/16	2.312500	58.7376
13/64	.203125	5.1591		.787400	20.0000	1-1/2	1.500000	38.1091		2.32852	59.0000
7/32	.218750	5.5562	51/64	.796875	20.2406	1-17/32	1.531250	38.8938	2-11/32	2.333750	59.5314
15/64	.234375	5.9531		.800000	20.3200		1.535443	39.0000		2.350000	59.5595
	.236220	6.0000	13/16	.812500	20.6375		1.550000	39.3696		2.362126	60.0000
1/4	.250000	6.3500		.826779	21.0000	1-9/16	1.562500	39.6876	2-3/8	2.375000	60.3251
17/64	.265625	6.7169	53/64	.828125	21.0344		1.574817	40.0000		2.400000	60.9594
	.275590	7.0000	27/32	.843750	21.4312	1-19/32	1.592750	40.4813		2.401596	61.0000
9/32	.281250	7.1137		.850000	21.5000		1.600000	40.6396	2-13/32	2.406250	61.1169
19/64	.296875	7.5408	55/64	.859375	21.8261		1.614187	41.0000	2-7/16	2.437500	61.9126
	.300000	7.6200		.866149	22.0000	1-5/8	1.625000	41.2751		2.440956	62.0000
5/16	.312500	7.9375	7/8	.875000	22.2250		1.650000	41.9096		2.450000	62.2294
	.314950	8.0000	57/64	.890625	22.6219		1.653557	42.0000	2-15/32	2.468750	62.7064
21/64	.325125	8.3344		.900000	22.8600	1-21/32	1.656250	42.0688		2.490316	63.0000
11/32	.343750	8.7312		.905519	23.0000	1-11/16	1.687500	42.8626	2-1/2	2.500000	63.5001
	.350000	8.8900	29/32	.906250	23.0187		1.692927	43.0000		2.519706	64.0000
	.364330	9.0000	59/64	.921875	23.4156		1.700000	43.1796	2-17/32	2.531250	64.2939
23/64	.369375	9.1261	15/16	.937500	23.8125	1-23/32	1.718750	43.6563		2.530000	64.7691
3/8	.375000	9.5250		.944389	24.0000		1.732297	44.0000		2.559076	65.0000
25/64	.390625	9.9219		.950000	24.1300	1-3/4	1.750000	44.4591	2-7/16	2.562500	65.0876
	.392704	10.0000	61/64	.953125	24.2094		1.771667	45.0000	2-19/32	2.593750	65.8014
	.400000	10.1600	31/32	.965750	24.6062	1-25/32	1.781250	45.2435		2.598146	66.0000

M E C H A N I C A L P R O P E R T I E S O F B O L T S

Thread Size →	MAX. TIGHTENING TORQUES IN POUND FEET - REGULAR PITCH (NC)														
	4 mm	5 mm	6 mm	7 mm	8 mm	10 mm	12 mm	14 mm	16 mm	18 mm	20 mm	22 mm	24 mm	27 mm	30 mm
Grade 2	1.1	2.3	3.9	6.5	10	20	34	54	80	114	162	202	245	360	500
Grade 3	1.7	3.5	5.8	9.4	14	29	50	79	122	170	220	318	410	606	815
Grade 5	2	4	7	11	18	32	58	94	144	190	260	368	470	707	967
Grade 8	2.9	6	10	16	25	47	83	133	196	269	366	470	664	996	1357
Super/Allen	3.6	7	11	20	29	58	100	159	235	323	440	628	794	1205	1630

Torques Indicated are for Clean, Lubricated, Threads - Cold.

MECHANICAL PROPERTIES

GRADE (US)	1	2	3	5	8	ALLEN	SUPER
Tensile Strength	p.s.i. Min. 56,000	70,000	85,000	113,000	142,000	170,000	200,000
	p.s.i. Max. 78,000	100,000	113,000	142,000	170,000	200,000	230,000
Yield Stress	p.s.i. 45,000	56,000	76,000	91,000	128,000	153,000	180,000
Hardness	Brinell HB 110-170	140-215	170-245	225-300 18-31	280-365 27-38	330-425 33-44	390- + 40-49

GRADE MARKING (QUALITY)

New Before US Grade Approx.	3.6	4.6	4.8	5.6	5.8	6.6	6.8	6.9	8.8	10.9	12.9	14.9		
	4A	4D	4S	5D	5S	6D	6S	6G	8G	10K	12K	-		
	1			2		3			5	8				

SCREW THREAD LENGTHS ISO METRIC STANDARD

SCREW LENGTH	THREAD LENGTH
FROM	TO
125 MM	2x Diameter plus 6 MM
200 MM	2x Diameter plus 12 MM
200 MM	2x Diameter plus 25 MM

Ditzler[®]

IMPORTED CAR COLORS

FERRARI

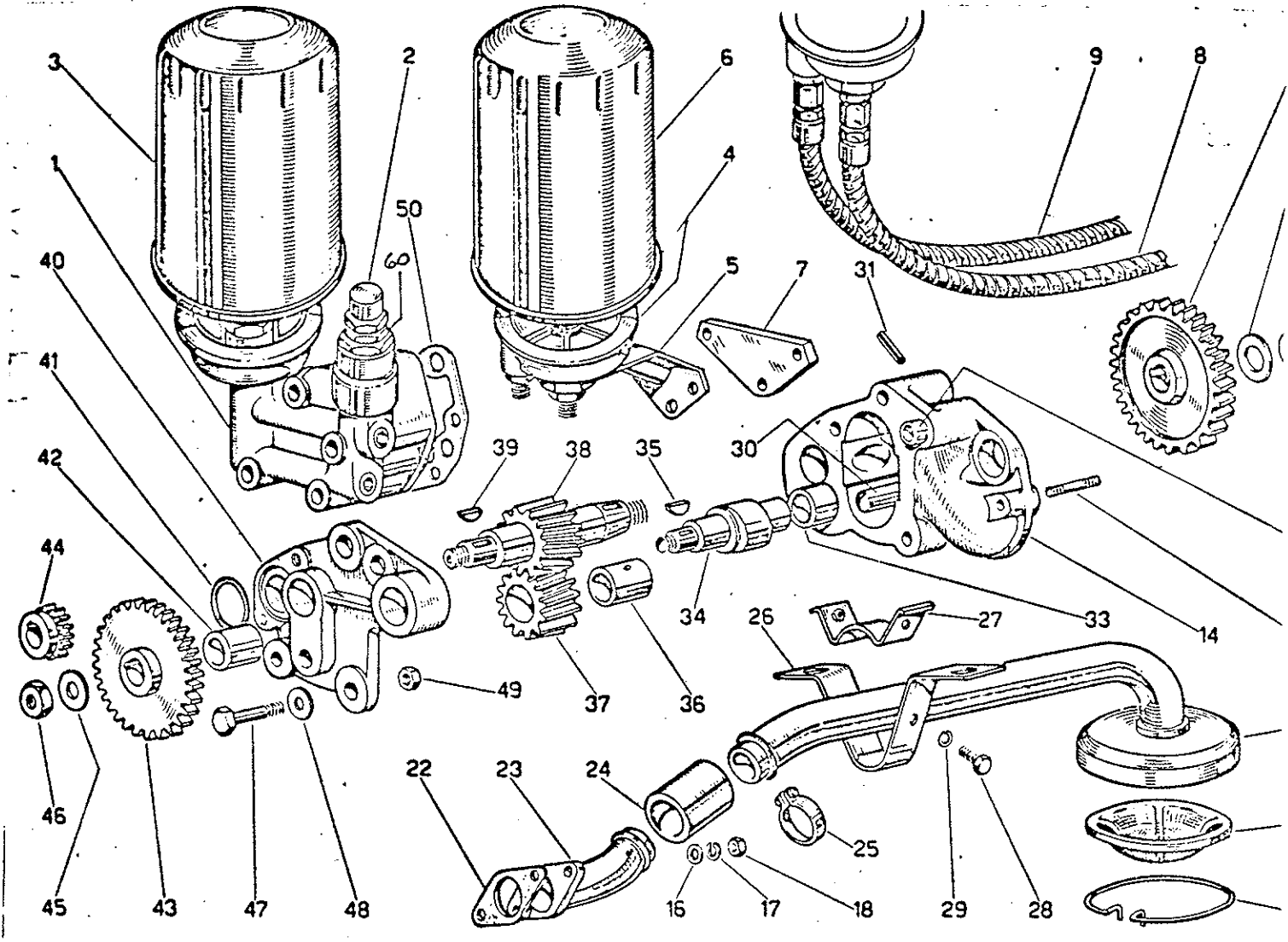
 ORIGINAL FINISH - ENAMEL
& ACRYLIC LACQUER

MADE IN ITALY

YEAR	PAINT CODE	COLOR NAME	GENERAL DESCRIPTION	CHIP NO.	DITZLER CODE	YEAR	PAINT CODE	COLOR NAME	GENERAL DESCRIPTION	CHIP NO.	DITZLER CODE
1963-71	20414.A BIA	Off White (Tetratema Bianco)	Gray White - much lighter and cleaner than	6	8625	1963-67	19249 36	Medium Gray (Grigio Medio)	Medium Gray - lighter than	62	32497
1971 & Prior		Dark Ronald Black			9000	1968-71	330	LeSancy Silver-Gray Poly	Medium Gray - lighter than	67	32771
1963-71	2033.6A AZZ	Blue Poly (Hyperion Azzurro)	Medium Gray Blue - much cleaner, lighter than (with Poly)	14	13093	1968-71		Mahmoud Gray Poly	Medium Gray - darker (with Poly)	70	32779
1963-71	48	Ribot Blue Poly	Medium Blue - lighter, bluer than (with Poly)	3	13094	1968-71		Ortello Gray Poly	Medium Dark Gray - darker (with Poly)	37	32780
1963-67	45	Silver Blue Poly	Medium Silver Blue Gray - lighter, bluer than	16	13095	1968-71		Molvedo Turquoise	Medium Dark Green - slightly lighter	114	43997
1968-71		Gainsborough Celeste Poly	Silver Blue - slightly lighter than	16	13770	1968-71		Blenheim Green Poly	Medium Dark Green - darker, richer than	52	43998
1968-71		Tourbillon Blue Poly	Dark Blue - darker, bluer than	47	13771	1968-71		Bahram Green Poly	Medium Light Green - darker, richer than	64	43999
1968-71		Caracalla Blue Poly	Dark Blue - deeper blue	25	13772	1968-71		Seabird Green	Dark Green	65	44000
1968-71		Bright Blue Poly (Gladiateur Azzurro)	Bright Blue - much brighter and bluer than	96	13773	1963-69		Bull Lea Maroon	Maroon	75	50710
1963-67	20325.S MAR	Cordovan (Marrone)	Dark Brown - browner than	84	22612	1968-71		Blandford Violet	Purple Violet		50814
1963-67	20451.S NOC	Tan (Nocciola)	Medium Tan - darker - no Poly	113	22614	1968		Race Car Red	Light Red - slightly darker than	33	70797
1968-71		Colorado Brown Poly	Bronze Gold - darker, richer, browner than	19	23149	1963-68		Red	Bright Red - richer, darker	99	71508
1968-71		Kelso Gold Poly	Dark Gold - darker than	89	23150	1968		Red	Dark Red - much darker	33	71727
1968-71		Nashrullah Gold Poly	Medium Beige - darker (with Poly)	24	23151	1968-71	19374	Rosso Red	Medium Dark Red - (redder than 71727)		71745
1963-67	20152.S GRI	Dark Gray (Grigio Scuro)	Dark Gray - darker than	69	32496	1968-71		The Tetrarch Cream	Pale Cream - lighter than	13	81729
						1968-71		Man O'War Yellow	Pale Yellow - cleaner than	105	81730



OIL SYSTEM



PARTS DESCRIPTION

- | | |
|------------------------|--------------------|
| 1. Oil Pump | 6. Fram PB-50 |
| 2. Pressure Adj. Cover | 20. Pick Up Screen |
| 3. Fram PH3 Filter | 60. Lock Nut |

ENGINE LUBRICATION

A gear pump is used to provide oil to the engine. The maximum oil pressure can be adjusted by means of a by-pass valve located on the oil pump. To increase the oil pressure, remove the large brass cover nut (#2) with a 15/16 or 24mm socket, slacken the thin lock nut (60) just below the cover nut. To increase the maximum oil pressure, screw the large slotted screw down (clockwise), to decrease turn counter clockwise.

