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FAI 9/76 - Revised 8/2/82 - 6/82

INSTALLATION OF HEMI-SPHERICAL CROSS FLOW HEAD RENAULT ENGINES IN LOTUS EUROPA S1 & S2

Installation of a Renault all aluminium engine with cross flow head in place of the now out of production #697 and #821 Renault flat head stock unit is a very interesting conversion in view of the hemi-head higher power & torque available without impairing reliability. Due to the light weight of the Europa, power/weight ratios equalling or surpassing the most expensive sports cars can be obtained at lesser cost.

However, contrarily to representations made by some misinformed Renault or Lotus "experts", replacement of a stock flat head #697 or #821 engine by a hemi-head unit is not a bolt-on job and requires several modifications & adaptations as well as adjustments. These are minimal but they still require a mechanic with some ingenuity and, in some cases, availability of a properly equipped machine shop. It is also extremely important before acquiring a Renault hemi-head engine to know what model it is and what particular modifications it requires to be installed in the Europa. Due to the fact that nowhere it advertises its hemi-head engines as a "bolt-on" replacement, but, on the contrary, warns of the modifications which will have to be contended with, FAI has no OBLIGATION to supply any modification or adaptation parts FREE OF CHARGE, or on an EXCHANGE BASIS. Hemi-head Renault engines are sold as they come from the manufacturer for their particular application. As a result, any extra part necessary for installation in a particular chassis such as the Lotus will have to be ordered and purchased separately except if otherwise specified. However, in order to assist any customer to solve the various technical problems encountered, FAI will provide advice and supply supplementary or alternate parts & equipment at special lower prices for purchases of new engines.

Selection of an engine: Renault hemi-head engines come in two basic models:

Ø20mm pin **

- the 807 series now out of production with a displacement of 1565cc. Only one model, the 807-13 fuel injected is available in the U.S. This engine installed in the early R17TS GORDINI is detuned to meet US EPA specifications to 94bhp DIN. (see list)
- the 843 series still in production with a displacement of 1647cc. Available in the U.S. in two models:

-843/13 - 1647cc - 82bhp - fuel injection - compression ratio 9.25/1 -

-843/10/11/15/16 - 1647cc - 70 bhp - carburetor downdraft Weber two-barrel anti-emission - ratio 8/1

In order to "retune" these engines to original French specs, it is necessary to replace the pistons with higher compression units available from FAI as follows:

for #807-13 engine: 10.25/1 compression ratio Ø77mm GORDINI PISTON-LINER KIT (Liners-Pistons-Rings-Pins-seals) Ø21mm pin ** \$298,-

for #807-13 11.5/1 Ø77.8mm - - - - - Ø21mm pin ** 398,-

for #843-10/11/13/15/16/etc. engines: 9.5/1 compression ratio Ø79mm PISTON-LINER KIT Ø21mm pin 298,-

Larger displacement kits up to Ø84mm (1861cc) & 195 bhp can be ordered also from FAI.

*On 843-10/13/15/16 engines, it will be necessary also to replace camshaft with Gordini unit, and to modify motor mounts.

This is why it is more interesting to obtain an #807 engine than an #843.

**Some engines are fitted with 20mm pin pistons - Con rods will have to be machined or bused to install.

Fuel Systems: The following fuel systems are currently used on Renault hemi-head engines:

-one downdraft dual barrel Weber carburetor (32DIR/DAR/DARA - anti-emission) or 28/36DCDR as used in Europe)

-one side draft - - - - - (40DCOE or 45DCOE)

-twin - - - - - (45DCOE)

-Bosch Electronic Fuel Injection (807-13 and 843-13 engines only)

There is no clearance problem to install single downdraft or side-draft systems. However, it is necessary to do some internal body panel grinding to install twin carbs or fuel injection systems in Lotus Europa. Also make sure you have all the parts and external components necessitated by the fuel injection system (from fuel pump up and all electric parts) since they are extremely expensive if bought separately and cannot be substituted in the system. You will also need an experienced fuel injection expert to re-adjust the system to the new application (lighter car-different wheel and tire sizes-different transaxle-etc...) For all these reasons, it is advised to stay away from fuel injection and use carburetion. Single downdraft or side draft units are excellent for regular street and road driving while twin carb systems should be used only for competitions (rallies, various racing) where constant high regime is maintained, and regular maintenance is available.

No matter what fuel system is used, it will be necessary to reroute the Europa throttle cable and to install proper cable anchor. The Europa bell crank can be used if the hemi-head engine rocker cover is fitted with a pivot. FAI can also supply proper bell crank and rod in any length desired. The side draft systems are equipped with a totally different linkage which is supplied with engine or conversion (see list). Throttle cable should be inspected and replaced if not in perfect operating condition, since, in particular with side draft twin systems, additional load will be put on it.

Choke cable: Stock Europa cable is too large in diameter and will not fit Webers. A regular cable of 5" length which can be found at any auto parts store or that we can supply (see list) should be installed.

Air Filter: it is essential to protect the engine with an adequate filter. Unfortunately the space is restricted in the Europa engine compartment. For 28/36DCD or 36DCD Webers: re-use stock Renault air filter which is the best you can get by drilling holes in bottom plate and installing Conversion Kit sold by FAI (see list), or install a small Sports Chromed Filter which must be cleaned every 1,000 miles because of its small size otherwise it will clog.

For 32 DIR/DAR & 28/36DCDR fitted with studs top, FAI can supply a Sports Chromed Filter (see list)

For 32DIR/DAR Webers with clamp collar top (no studs): - - - - - modified (see list)

There are no larger air filters which will clear the Lotus deck available for these last two units. However, a nozzle can be supplied for top of carburetor (see list) to connect to larger remote air filter located on chassis with a flexible hose.

For single 40 or 45DCOE side draft carburetor, it is recommended to use the larger cast alloy LE LUXE Air Filter or a similar unit with elbow which protects from the water falling through the engine compartment deck opening of the Lotus.

For twin side drafts 45DCOE Webers, a problem of space is encountered and it might be necessary to grind some internal fiberglass panels on the right side to accommodate the second carb and its filter. Three kinds of air filters are available for this system:

- the original calibrated Renault-Gordini Twin Carb Air Filter designed specifically for the twin carb hemi-head Renault engine. Not only does this unit provides adequate volume of air and complete protection, but it features a large external air inlet allowing better engine breathing through a flexible hose and can be used as an air box for racing by removing the internal element (see picture). This is by far the best unit available
- a remote air filter which can be connected with proper inlet nozzle plate (see list) and flex hoses -minimum space required -
- twin small Sports Air Filter as sold by Weber distributors, requiring cleaning every 1,000 miles and protection from water from engine compartment lid.

FRANCO-AMERICAN IMPORTS

INSTALLATION OF HEMISPHERICAL CROSS FLOW HEAD RENAULT ENGINES IN LOTUS EUROPA S1 & S2 (2)

Important Recommendation for Twin Side Draft Weber set-ups: you are cautioned against the fact that all twin side draft set-ups are prone to air leaks due to the combined weight of both carbs & manifolds & filters, and it is therefore strongly recommended to install a Bracing Kit to prop them up (see list).

Velocity Stacks (Air Horns): first note that stacks are primarily for competition use and do not offer any protection against dust and other particles for your engine. As a result, a brand new unit can be worn within a few weeks if not protected adequately. However, since a while, a new gadget called velocity stacks "muffs" which is an industrial highly porous foam filter fitting on top of each stack as a glove has been offered and can be supplied by FAI (see list).

Oil Sump: None of the hemi-head sumps will fit the Europa rear suspension - You will have to transfer original Lotus sump or install flat cast alloy sump (see list).

Motor Mounts: The stock Lotus Europa Renault engine is suspended by 3 points:

- 2 motor mounts no. 054E6000 which are Lotus parts available only from Lotus dealers. These mounts are fitted by two L-shaped brackets, one right and one left. The right bracket has a hole through it for passage of shift rod. Both brackets bolt to the motor mount on one side and the engine case on the other side, with 3 bolts in a triangle pattern.
- 1 rear transaxle mount which is a Renault part.

First, make sure the mounts are all in good condition and replace them if necessary. Note that all early Renault hemi-head engines have the same bracket bolt pattern (807 series). However, on the latest 843 models, the side bolt pattern is different which necessitates to weld an additional plate to bracket drilled at proper places and add a spacer. A template is available to make this modification from FAI, as well as a brackets extension kit fitting new bolt pattern to be welded to Lotus brackets (see list). No modification to rear mount.

Bell Housing, Clutch & Flywheel: The bell housing of the 4-speed stock Lotus-Renault transaxle will fit all models of Renault hemis.

However, some hemi engines come with 200mm flywheel (same as Lotus stock flat head engine), some other come with a 215mm flywheel which has to be replaced with the stock wheel or fitted with a 215mm Ferodo clutch available from FAI.

When using the 200mm clutch, it is extremely important to utilize exclusively the special 200D325 reinforced clutch cover fitted stock on the Europa instead of the 200D unit from the Renault R-16 which is too weak for the additional power load. Also note the Europa 200mm clutch cover features a lined friction ring upon which the throw-out bearing comes in contact when the latest hemi engine clutches do not have this part, the throw out bearing going in direct contact with the diaphragm. If you get a hemi-head engine with the latest clutch cover as described, you will have to discard the clutch and install the original Lotus unit back on. In no case should the stock Europa throw-out ball bearing be used directly in contact with the diaphragm*. In order to use the latest cover, you need also the latest throw-out bearing. Unfortunately, it is rather difficult to attach it to the clutch control fork which is of a different design, and has a larger shaft. The only way to use therefore the late 200mm clutch and the 215mm unit is to replace the whole bell housing which is rather an expensive operation.

*Use of the stock Europa properly adjusted throw-out bearing will operate the clutch but is left entirely to the installer's responsibility.

IMPORTANT: some very early 1967 S1 Europas (up to motor #066) are equipped with a 5 holes flywheel which cannot be mounted on any hemi-head engine. It will be necessary in this case to install a later 7 holes 200 or 215mm wheel.

Exhaust System: Europas are fitted stock with a clamp collar type exhaust manifold connected to an exhaust pipe on the left side of the car. Hemi-head exhaust manifolds are also attached to the left of the engine but they come in two basic models:

- one, denominated TX manifold, which is a 4-into-1 design terminating by a clamped collar type flange connecting with an exhaust pipe and muffler of larger diameter. This is the only manifold which clears the Lotus frame without modifications.
- others which are 4-into-2 designs and terminate by a flat bolted flange connecting to exhaust pipe. These models do not clear the Lotus frame and require cutting and welding of a new flange which is a difficult job since the material is cast iron.

Exhaust pipe: if you are using the TX clamped manifold, FAI can supply the following:

- TX Exhaust Pipe connection . Length : 20" ID:40mm (1.532") -will connect to TX manifold with a pair of clamps and extends down 20" with a flat side allowing clearance of Lotus left V-frame member. This connecting pipe can be heat-bent and welded to any exhaust system chosen by yourself.
- TX primary Exhaust Pipe - same design as above but with an elbowed tube extending 700mm(8 1/2') towards rear of car. will fit stock hemi-head muffler.

If you are using the 4-into-2 manifold shortened to clear Lotus V-frame member, the muffler shop will have to build its own exhaust system and flanges. The only part we can supply is the exhaust fork 2-into-1 shown in picture sheet.

Silencers/Mufflers: you can use either Renault exhaust components & parts which are properly calibrated to the hemi-engine or have a good muffler shop put together an exhaust system. The only requirements are to use 42mm ID (2"OD) exhaust pipe and muffler. For the muffler itself, a straight-thru unit will increase the performance but might be too noisy. Check with your local noise regulations. In view of the fact there was never an exhaust system designed for this engine in the Europa, you still will have to perform some cutting, welding and bending to make or adapt a Renault system to the Europa.

Note that the original flat head exhaust system has to be totally discarded since it is both too small in ID and not fitting the manifold.

Fuel Pump: all Renault hemi-head engines available in the U.S. are fitted with an electric fuel pump. The stock Europa flat head pump cannot be used with the hemi-head camshaft.

You will therefore have to install an electric fuel pump flexibly mounted on frame or body. Any electric pump can be used as long as the pressure is comprised between 2.5 & 4 psi. (for all models of carburetors). Installation of a fuel filter before pump is also recommended.

Breather Device : both hemi-head and flat head Renault engines are fitted with oil vapors recirculating devices located on rocker covers and connected with inlet systems. These devices can be retained by selecting an air filter with proper spout(inlet tube) or by brazing one. The OD of the inlet tube should be 1/2"OD in order to take hose of same size.

Other recirculating and anti-pollution devices: depending on model and application of engine, there will be more or less systems and devices. It is advised to stay with original system of the engine you bought or by-pass it completely by plugging all lines. For hemi-engines such as the 843 which are fitted with an air pump, this device should be removed and all connected lines and devices plugged and removed or bypassed since it will absorb some unwarranted power. Front cover pulley should also be removed and hole plugged.

Ignition: the stock distributor of the Europa flat head engine cannot be used for the hemi-head which comes with a different unit. All hemi-head distributors delivered with our engines are statically timed, but final adjustment of the advance can be done only with engine installed and running. Factory procedures and specs sheets supplied with every new engine should be followed. However, if you have your own engine, FAI can supply specs after proper identification of unit has been made.

VERY IMPORTANT: the stock DUCEL coil used in Europas with flat head engines is marginal to use with hemi-head units especially twin carb models requiring a more powerful spark at high regimes. Therefore it would be an excellent idea to replace the stock coil by a Heavy Duty or Racing unit of same make as distributor preferably. (see list).

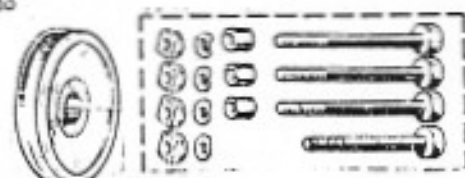
ELECTRONIC IGNITION DEVICES are interesting only if breakerless (no points wearing out) - see list

Starter Motor: the stock Europa flat-head starter will fit all Hemi-Heads. However it would be a good idea to check condition of crank unit and have it reconditioned if necessary, since higher compression engines are harder to turn and a worn starter might not be able to do the job. Latest Renault hemi-heads are fitted with a heavy duty larger starter which might be interesting to acquire but which

INSTALLATION OF HEMISPHERICAL CROSS-FLOW HEAD RENAULT ENGINES IN LOTUS EUROPA S1 & S2 (3)

Alternator & Pulleys: the Europa stock alternator is located more towards the block than the hemi-head units. Also most recent hemi-heads are fitted with a belt tensioning system which does not exist in the Europa. The cheapest and easiest way to install the stock Europa alternator is to discard the tensioning system and replace the water pump pulley by another unit fitting the hemi-head pump, so that the pulleys will line up. FAI can supply the modified pulley or you can make your own. It will also be necessary to transfer the stock alternator bracket and camshaft pulley from old to new engine to obtain proper line up. However, if your engine is equipped with the belt tensioning system, it is much better to retain it though it requires several additional parts:

- special alternator pulley (will fit stock Europa unit)
- bolt-spacer kit to lengthen alternator front support frame
- 2 spacers 6mm long, : -1 with 10mm diameter
- 1 with 6mm



Oil Cooler: it is imperative to install an oil radiator for twin carb hemi-heads engines. On single carb engines, it is strongly recommended in view of the diminutive stock Europa cooling system. The oil cooler(radiator) can be installed either in conjunction with a larger external oil filter(see picture) or by itself. If installed in rear, generally under luggage compartment on top of transaxle, it should be larger than if fitted in front next to water radiator. It is also preferable to use safety fitting hoses and components which are safer and the only ones accepted for competition, though they are more expensive than the clamped systems. FAI can supply a complete system which was designed specifically for the hemi-head Renault engine. If you want to use your own oil radiator or/and filter, you need only the oil engine take off and return kit (see list) and eventually the corresponding connecting fittings.

Note also that a Gordini High Volume Oil Pump is available for engines equipped with standard oil pump. (see list) - **Cooling system:** the Europa original system is already deficient because of poor location and size of radiator. It will therefore be IMPERATIVE when changing engines to CHECK THOROUGHLY not only radiator condition but all hoses, pipes, clamps, etc. . .

If a larger radiator can be installed by your local radiator shop, this would be still better but you can keep the water temperature under control with the stock radiator in excellent condition

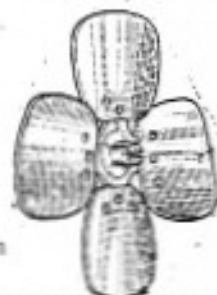
& eventually by replacing small nylon plastic fan by larger heavy duty steel fan sweeping 33% more air volume. (fits readily) see list

Also be informed that Europa's radiator have an interior welded baffle plate which should be inspected since it gets corroded or unbrazed very often and let coolant run directly from inlet to outlet pipe without going through radiator core. If you have your radiator reconditioned, caution radiator shop accordingly.

Stock
Fan
Plastic



High
Volume
Fan
Aluminium



Final adjustments: all initial adjustments of carburetion and ignition should be made along engine specs which are supplied with each FAI engine. However these specs are for general use and might have to be altered due to particular conditions such as climate, altitude, weight of car, size of wheels and tires, kind of driving (city, highway, rallying or various kinds of racing) and particularly FUEL. These final adjustments or modifications should be done by an experienced mechanic equipped with proper checking instruments. FAI carries a complete assortment of carburetor parts available upon demand.

Installation of Hemispherical Cross-Flow Head Renault Engines in Lotus-Europas S1 & S2 (4)

List of Parts (ctd.)

X: DISCONTINUED : - price valid only until out of stock - S: SPECIAL ORDER-see Terms -

Velocity Stacks/ Air Flows

For 28/36DCD or 36DCD downdraft Webers: twin model-polished with protection grille -bolts on top of carbs wo. modif. 24. -

For 40DCOE & 45DCOE side draft : two models available : bolted on top of carburetor -no modifications necessary
(specify) slide-in -requires special centering device

Bolted models : chromed with protective grille - comes in 3 lengths: 50mm-80mm-120mm pair 24.00

Slide-in : turned finish- no grille - sizes from 16mm to 97mm- straight or bent conduits - pair : from \$20.00 to \$30.00

Polyfoam Velocity stacks muffs - mounts on stacks up to 80mm long with molded clamp pair 24.95

For 32DIR/DARA downdraft Webers(stud models): Racing Calibrated cast alu base velocity stacks - pair 45.00

can also be used with 28/36DCD or 36DCD side drafts or 32 DAR/DIR/DARA clamp collar model(with slight grinding)

Exhaust Systems:

TX Exhaust Manifold 4-into-1 - with clamped exhaust flange 198. -

TX Exhaust connecting pipe - for above -Length : 20" -straight - flattened for clearance of chassis -ID40mm 45. -

TX - - - clamps - necessary to mount connecting pipe or exhaust pipe 10. -

TX - - pipe ,straight - length : 1500mm (50' -ID:40mm - fits TX connecting pipe - 24. -

S TX - - ,with - - Length : 700mm(27 ") ID:40mm - with flange collar-replaces connecting & exhaust pipe 53. -

4-into-2 Gordini exhaust manifold - with bolted flange - needs cutting and welding to fit Lotus frame - gasket \$3.00 148. - X

S - - - fork - - - bolts on 4-into-2 Gordini manifold -L:28" - ID40mm 70. -

S Renault-Alpine Racing Exhaust Manifold 4-into-1-Dyno Tuned, with muffler 580. -

Silencers:

Primary Gordini Straight Thru Resonator ID40mm - track only 56. -

Muffler for all hemi-heads Renault - ID40mm - road 79. -

S Racing Headers: 4-into-1 - exit at bottom -needs bending to fit Europa - N/A

- - - top - requires suppression of rear luggage compartment - DYNO-TUNED 298.00 X

Rear Transaxle Mount Europa 28. -

Motor Mounts modification kit (only for latest #843 engines with new offset threads). Needs to be welded in place & drill 48. -

Bell Housing for 215mm clutch with clutch control shaft -necessitates replacement of throw-out bearing(see under) 190. -

215mm Competition Gordini Lightened and Balanced Steel Flywheel 348. -

200mm Europa stock flywheel 118. -

200mm reinforced FERODO Clutch Cover -original equipment on Europa 90. -

- - - Disc - - - 36.00

- - - Ball Bearing - - - 20.90

215mm Competition Clutch FERODO with disc 148.00

- - - Ball Bearing - 24.00

Centrifus

ALSO AVAILABLE : Competition Camshafts, Heavy Duty Main and Rod Bearings, Ported & Polished Cylinder Heads, Extra large Valves, Competition Valve Springs, Valve cups, Cast and Forged Pistons & liners up to 84mm (1861cc).

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French Sports Car Specialists since 1958

Ref. : Installation of Hemispherical Head Renault Engines in Lotus Europas S1 & S2 - Additive #843 engines

Motor Mounts : Flat engines #843 only : The motor mount bolt pattern on the block of the late Renault hemi-head units such as the #843 have been modified in such a way that it is necessary to extend the Lotus right and left brackets no. 046E0377 & 046E0378 by welding a plate a a spacer. FAI makes available a blueprint showing the parts to make and weld or supplies a set of prepared plates as per list .

Gauges : Lotus Europas S1 and S2 are fitted with THREE instruments which necessitates sender units on engine:

- Water Temperature gauge sender unit which is located on cylinder head (left side) behind water pump. This unit should be transferred to the hemi cylinder head on the other side (inside alternator support) , where a hole of similar Ø14mm x1,5 thread is available. This unit has to be the original Lotus unit to match the Smiths instrument.
- Oil Pressure warning lite : can be either the flat head or hemi-head unit. Located on oil galley towards engine Timing Cover on left side of block.
- Oil Pressure gauge sender unit: this unit is special to the Lotus Smiths instrument and has to be re-used with the new hemi-head engine . However, if it does not fit the same hole as the flat head engine, move it towards the Timing Cover where you will find an Allen wrench square fitting plug which will be removed and replaced by the original Lotus Oil Pressure Sender unit assembly as it came out of the old engine. The Hemi-head instruments can be kept as oil plugs but cannot be used with other instruments than French Jaegers, except for the oil pressure warning lite. On all #843 engines, the last oil galley plug towards the Timing cover has to be used to install the Lotus Oil Pressure Sender unit.

Throttle cable : all 843 engines with carburetor are equipped with a Turret throttle linkage which will necessitate rerouting of Lotus cable and for which no extra parts are available . However, any mechanic with ingenuity should be able to attach easily the cable to the turret.

No choke cables are necessary on the #843 carburetion engines since they are equipped with a Weber DARA carburetor with electric choke.

FAI 11/78 - Additive no. 2

Installation of 5-speed Renault transaxle in LOTUS Europa S1 & S2 : Two types of 5-speed transaxles are available on the U.S. market which will fit the stock Lotus Renault flat head engine or the Renault hemi-heads :

- the 365-07 transaxle as used in the Lotus Twin Cam with following ratios : 1st : 3.61/1 - 2nd: 2.33/1 - 3rd: 1.61/1 - 4th: 1.21/1 - 5th : .87/1 - Final Drive : 3.78/1 . Installation of this unit which is controlled by a selector shaft located in rear cover of gearbox requires a completely different linkage all the way to the shift knob. (see picture). It will also be necessary to replace or modify the driveshaft inboard yokes & the lower link mount , the rear mounting plate and supports and to add the reverse idler mechanism which is strictly Lotus . All these parts can be purchased from Lotus only and are extremely costly. You can also have a custom linkage made up by a specialized shop .
- the #395 transaxle used in Renault-Gordini R17 sold in the U.S. which features the following ratios: 1st: 3.45/1 - 2nd: 2.24/1 - 3rd : 1.48/1 - 4th: 1.21/1 - 5th : .94/1 - Final Drive : 3.78/1 - This transaxle is fitted with a rear cover transverse selector shaft for which no usable linkage exists, requiring complete modification or outright fabrication of the S1/S2 linkage. Also note this transaxle is not equipped with the reinforced differential of the 365 units and therefore cannot accept as much torque as the #365. The same other components listed with the #365 unit will also be necessary .

Bell Housing : note that #395 bell housing will fit any Aluminium Renault engine where the 365-07 Lotus unit will require a new bell housing to replace the original part designed to fit the Twin Cam Ford engine. The stock S1/S2 bell housing can also be used with stock 200mm clutch but will have to be machined or replaced to take the 215mm clutch because of a different clutch cover and clutch release bearing. Also note clutch cable will have to be re-routed to right side of bell housing if using #395 unit. Also clutch shaft and lever will have to be turned of 190 ° to face down instead of up.

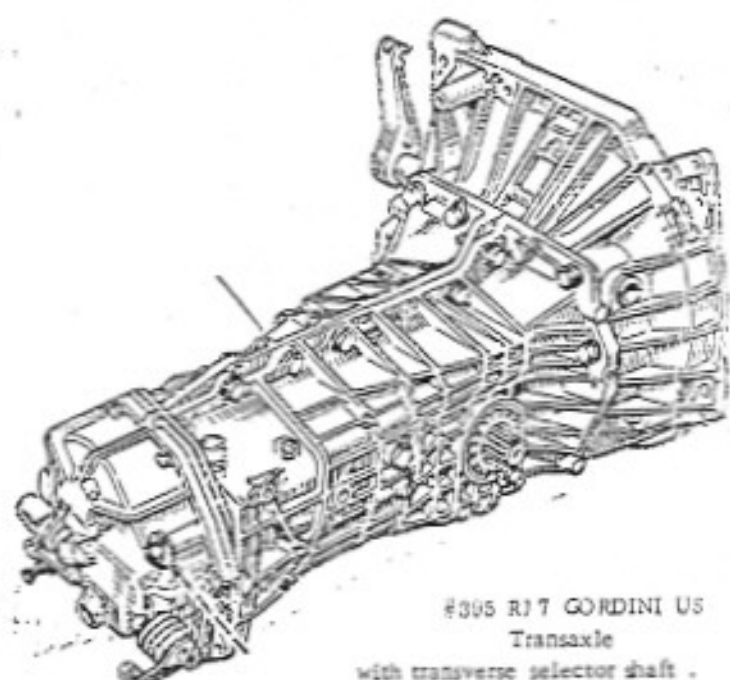
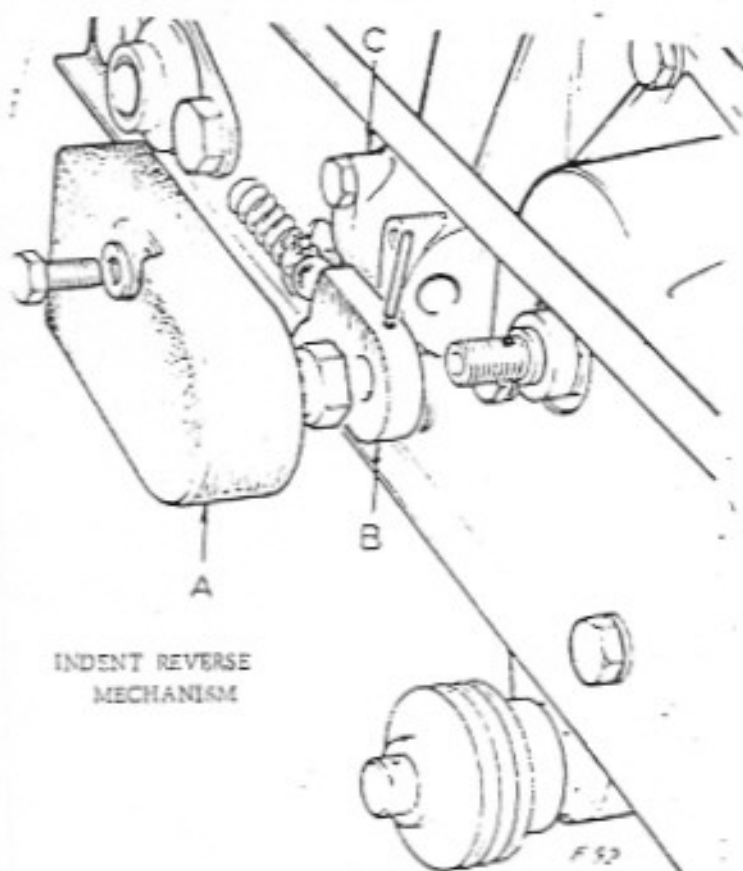
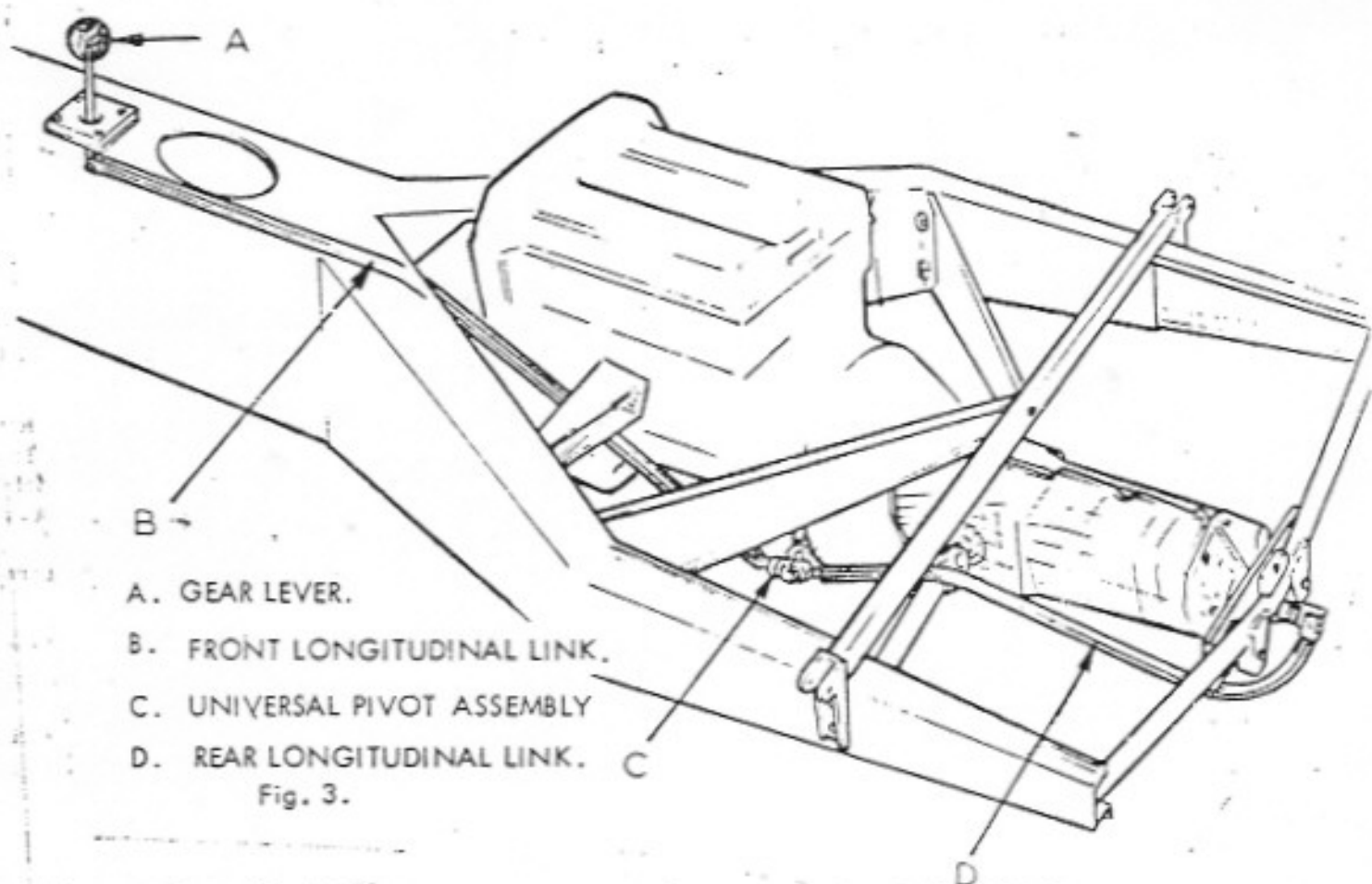
*FRANCO-AMERICAN can supply list of Lotus conversion parts upon demand . Cost \$3.00

FAI 11/80 - Additive no. 3

Please note #843 engines available in the U.S. & Canada as well as earlier #807 engines have been fitted with Ø20mm and Ø21mm piston pins. Some of these pins are mounted free into the con rod small end , some have to be pressed in, some con rods a.e bushed, some are not in the 21mm ID. Unfortunately, the engine identification number stamped on a plate attached to the block under the cylinder head is not always sufficient to identify the kind of rods used. Therefore, if you do not have the vehicle identification nos. stamped on an oval plate in the front engine compartment, you will have to be careful when ordering piston-liner kits or con rods. Modifications of con rods from 20mm pins to 21mm costs \$30. - if non-bushed and \$96. -- with bushings. If you want to have this job done in your own machine shop, we can supply the 21mm Gordin brass bushings for \$2.50 ea. or \$10 .-for a set of 4.

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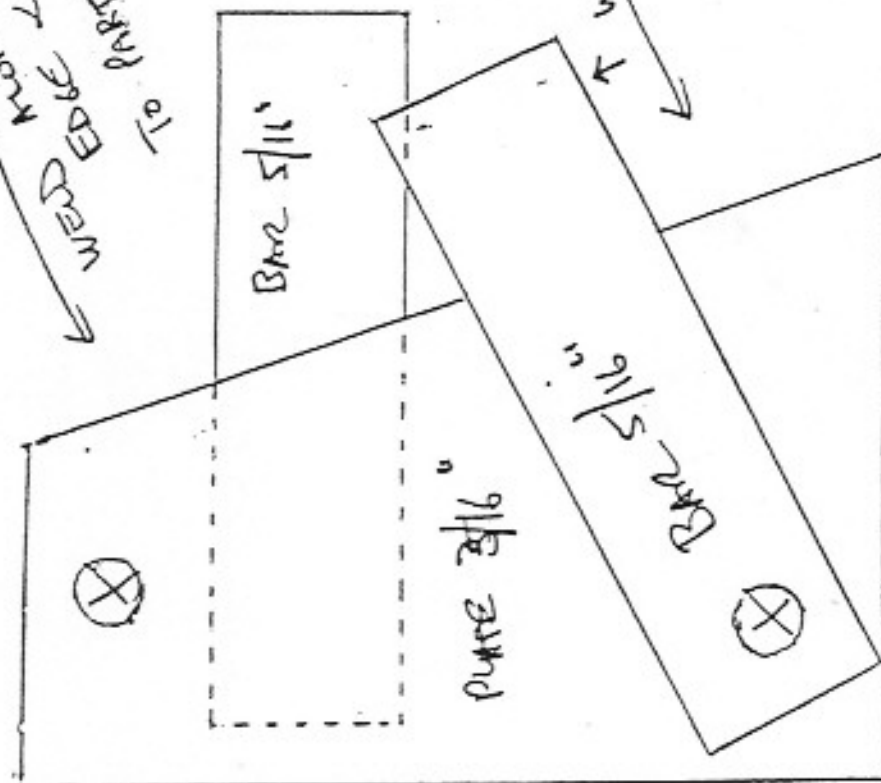
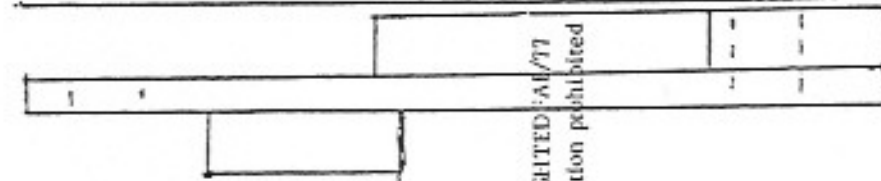
- French Sports Car Specialists since 1968



For 365-07 unit, see illustration under Equipment for
Renault all aluminium engines .

INTAKE SIDE (RIGHT)

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Glendale, California 91204
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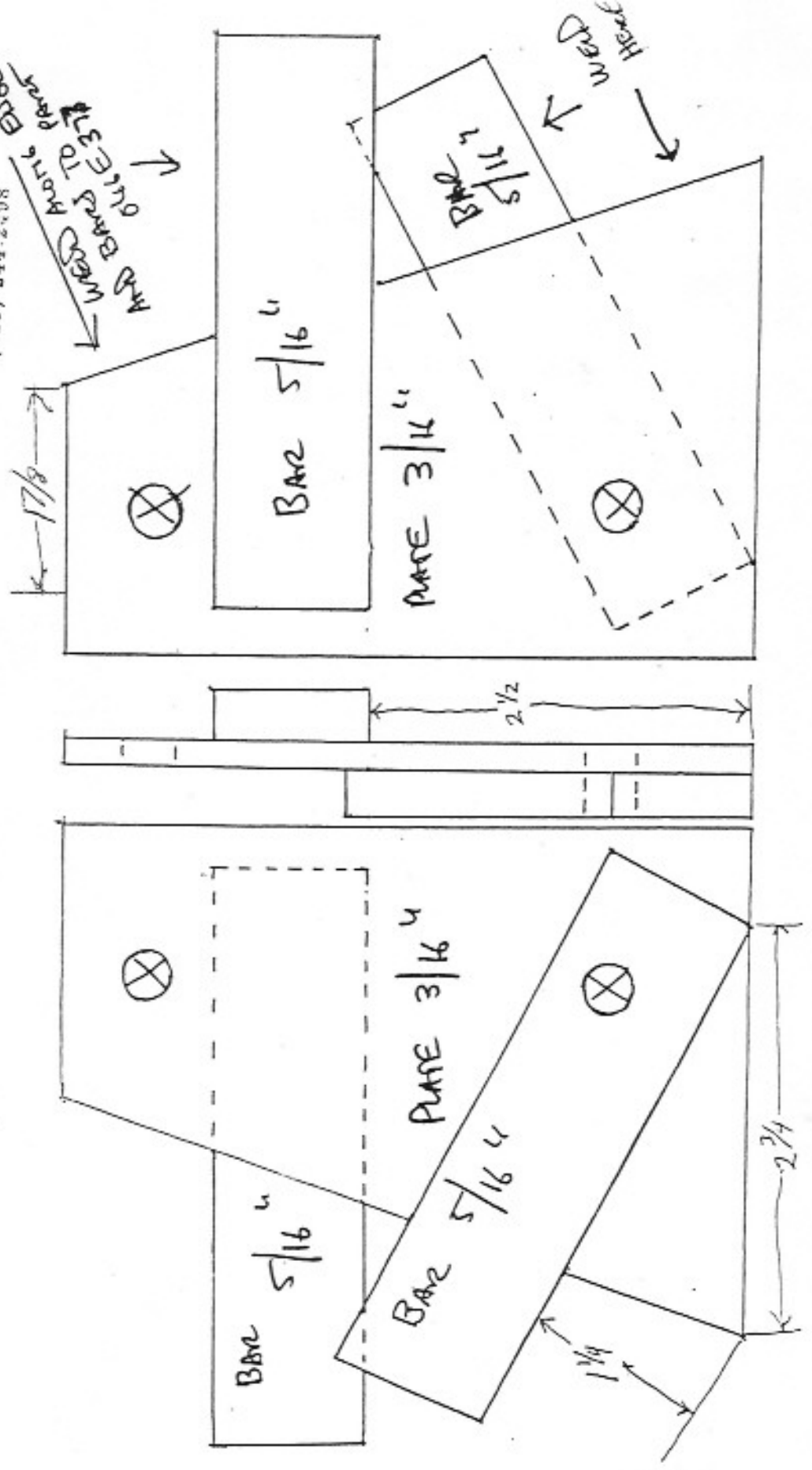
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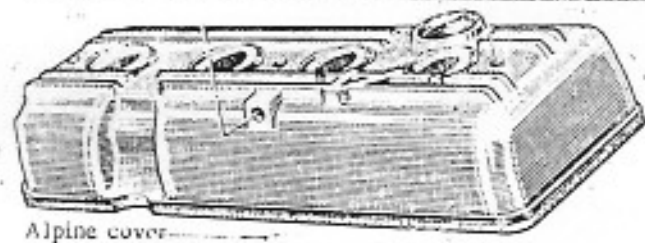
EXHAUST SIDE (LEFT)

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Los Angeles, Calif. 90039
(213) 244-2408

- 1) MAKE PLATE AS PER DRAWING OR RECHARGE FROM FAX
- 2) WELD ALONG EDGE < BARS
- 3) DRILL X HOLES ($11/32"$) TO MATCH CRANKCASE HOLES





Alpine cover

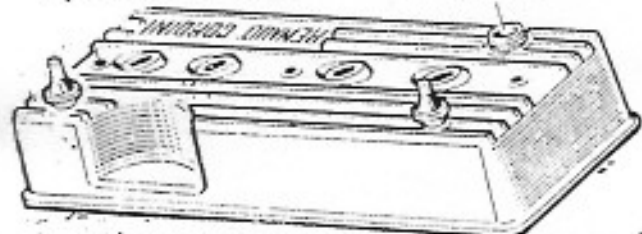


Dual 45DCOE
remote filter nozzle

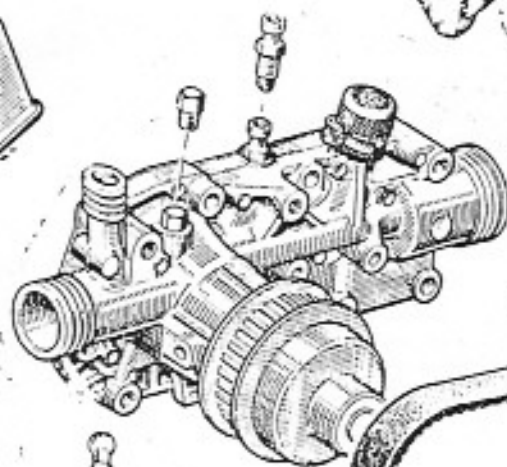


FRE (Formula Renault Europe)
GORDINI RACING WATER PUMP

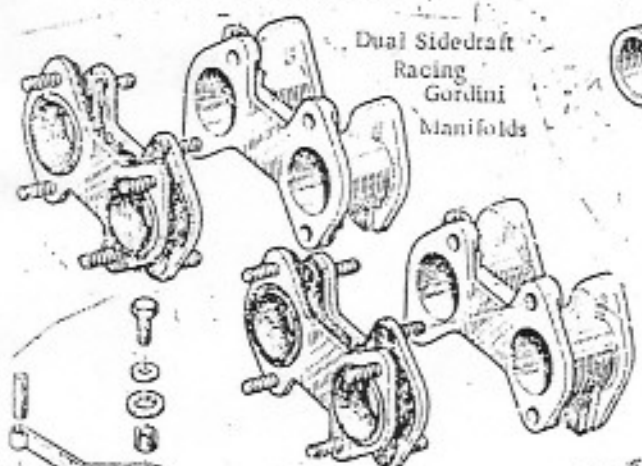
with pulleys
& belt



Renault-Gordini alloy cover



Dual Sidedraft
Racing
Gordini
Manifolds



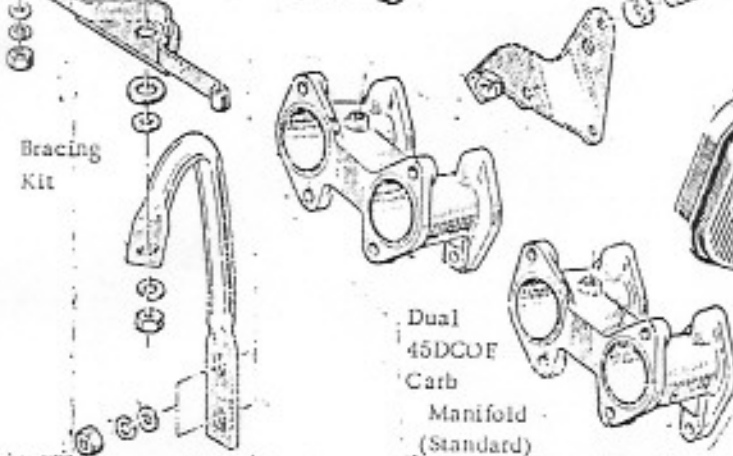
Bracing
Kit

Side Draft
Linkage

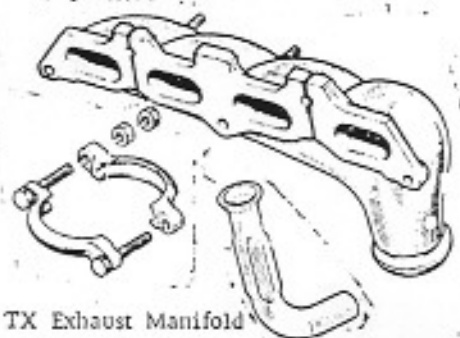


Calibrated Air Filter
for 2 carb. system

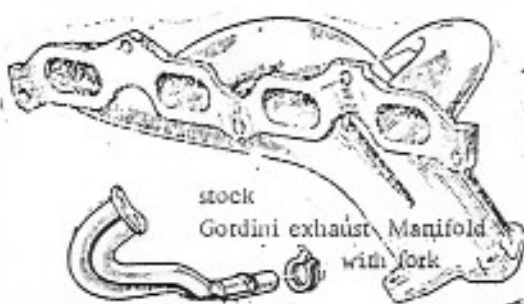
with external air inlet



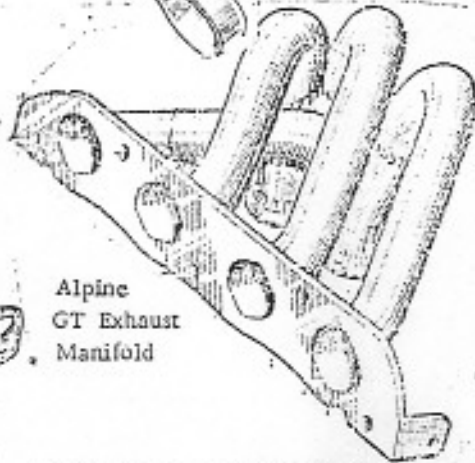
Dual
45DCOE
Carb
Manifold
(Standard)



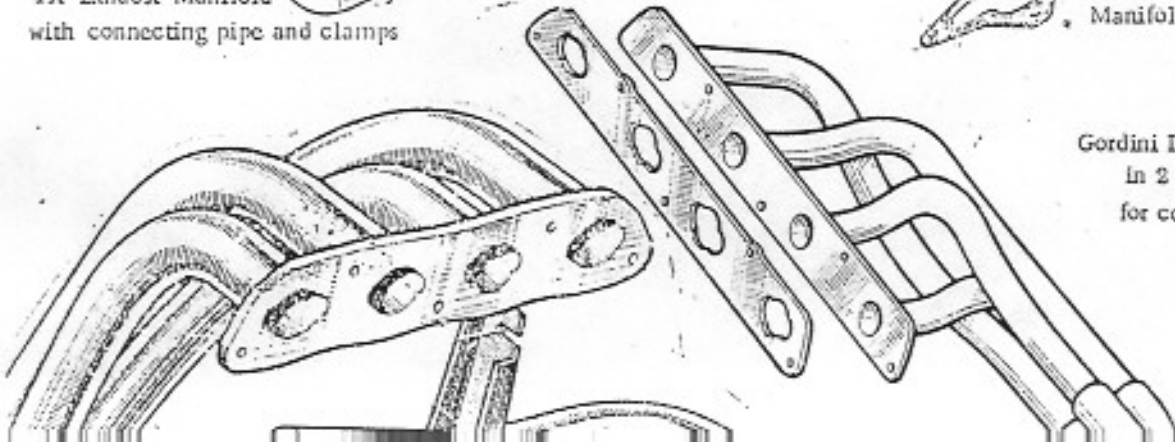
TX Exhaust Manifold
with connecting pipe and clamps



stock
Gordini exhaust Manifold
with fork



Alpine
GT Exhaust
Manifold



Gordini Dyno Tuned Headers
In 2 pcs. Formula Renault
for center rear engine



Renault-Gordini alloy cover

Dual Sidedraft
Racing
Gordini
Manifolds

PRE (Formula Renault Europe)
GORDINI RACING WATER PUMP

with pulleys
& belt

Side Draft
Linkage

Calibrated Air Filter
for 2 carb. system

with external air inlet

Dual
4SDQOE
Carb
Manifold
(Standard)

stock
Gordini exhaust Manifold
with fork

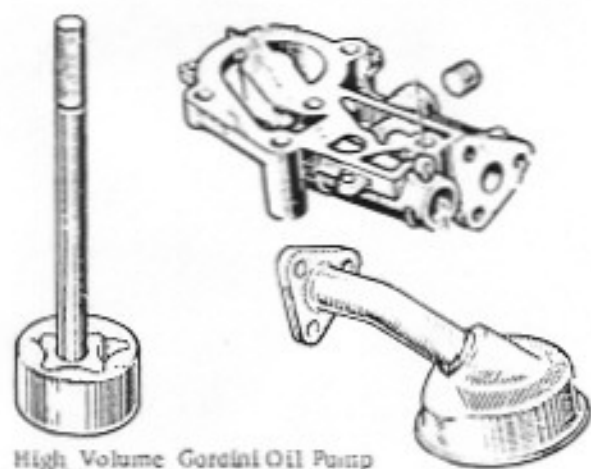
Alpine
GT Exhaust
Manifold

TX Exhaust Manifold
with connecting pipe and clamps

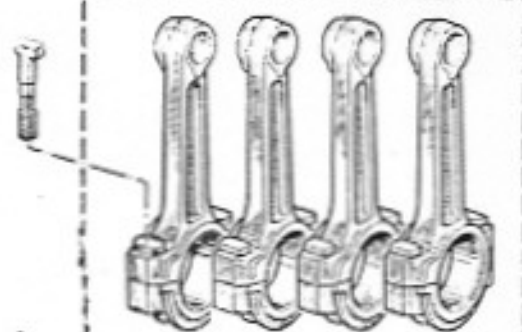
Gordini Dyno Tuned Headers
in 2 pcs. Formula Renault
for center rear engine

Gr. 4 Dyno Tuned Exhaust
Headers (for rear or mid engines only)

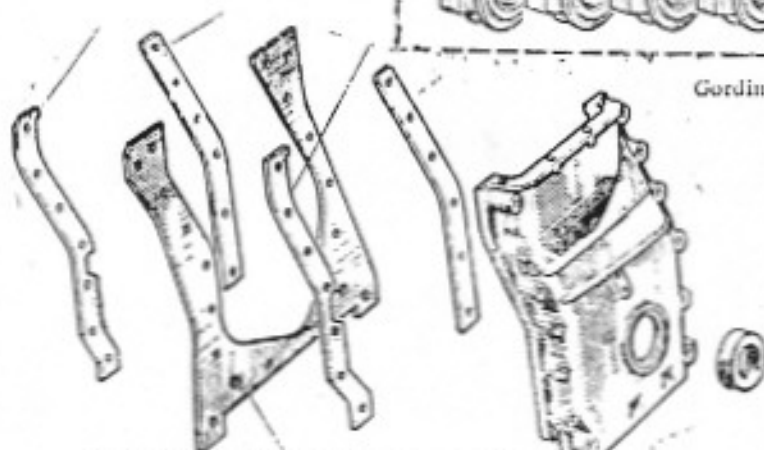
100
Devil
Headers



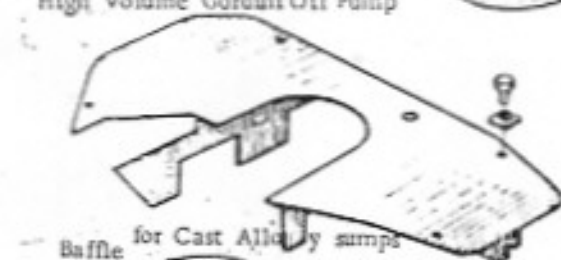
High Volume Gordini Oil Pump



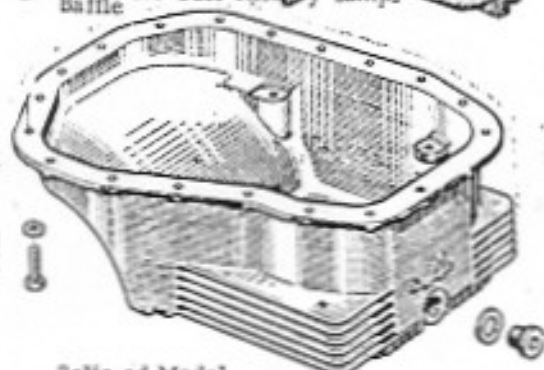
Gordini Rods



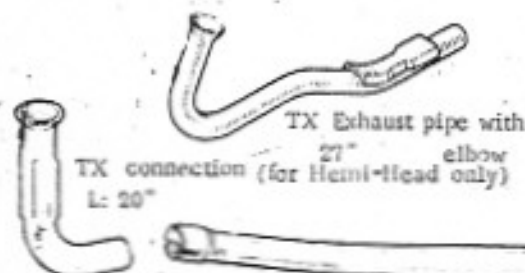
Front Timing Cover Sandwich mounting plate



Baffle for Cast Alloy sump



Relieved Model
RENAULT-ALPINE CAST ALLOY SUMP



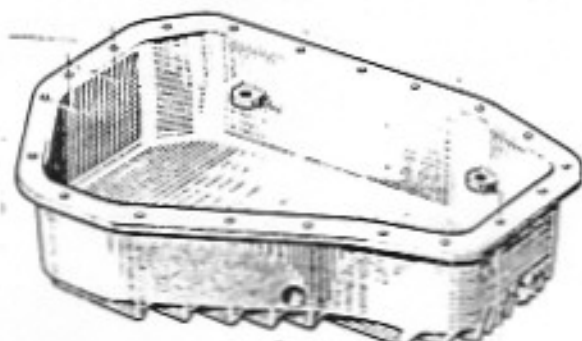
(Hemi-Heads only)



Gordini
Resonator
(straight)



TX exhaust pipe Muffler to fit all 40mm
exhaust pipes
(hemi or flat heads)

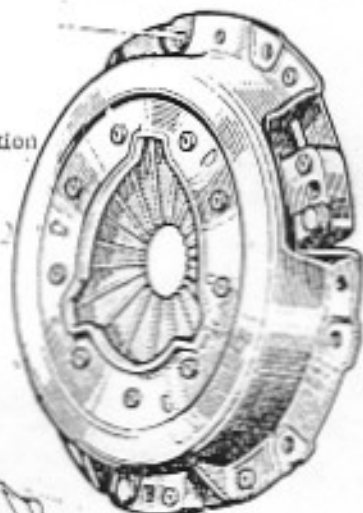


RENAULT-ALPINE CAST ALLOY SUMP (flat model)



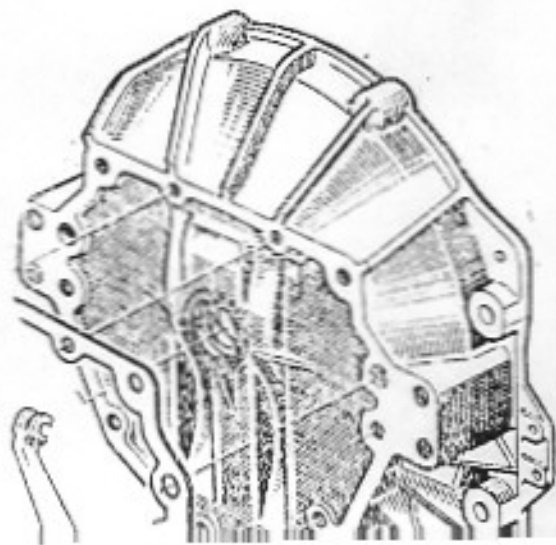
Racing engine mounts

FERODO Competition
215mm Clutch



Release
Bearing

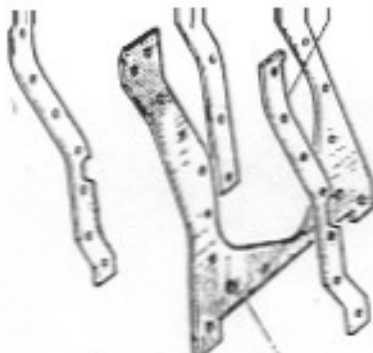
Disc 215mm



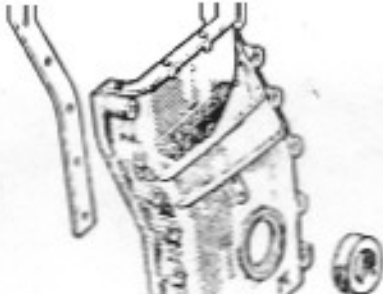
5 Speed #365 Transaxle



High Volume Gordini Oil Pump

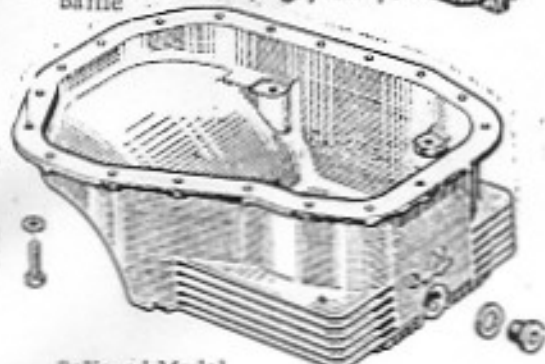


Front Timing Cover Sandwich mounting plate

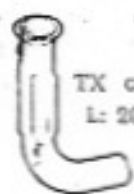


Gordini Resonator (straight)

Baffle for Cast Alloy sumps



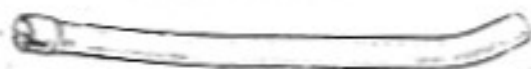
Relieved Model
RENAULT-ALPINE CAST ALLOY SUMP



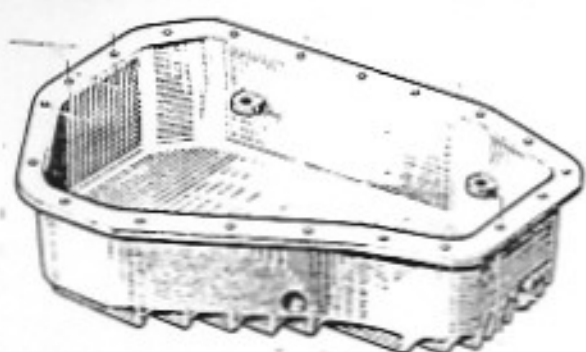
TX Exhaust pipe with 27" elbow L: 20"



(Hemi-heads only)



TX exhaust pipe Muffler to fit all 40mm exhaust pipes (hemi or flat heads)



RENAULT-ALPINE CAST ALLOY SUMP (flat model)

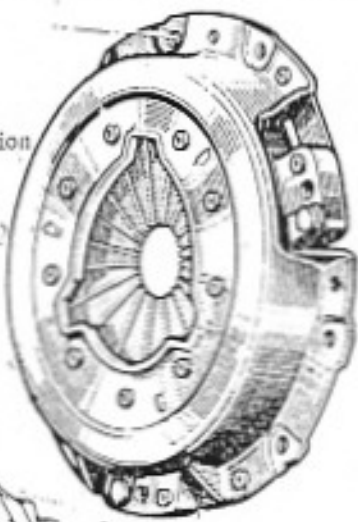


Transaxle Rear Racing Mounts



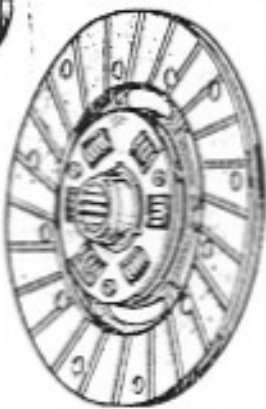
Racing engine mounts

FERODO Competition 215mm Clutch

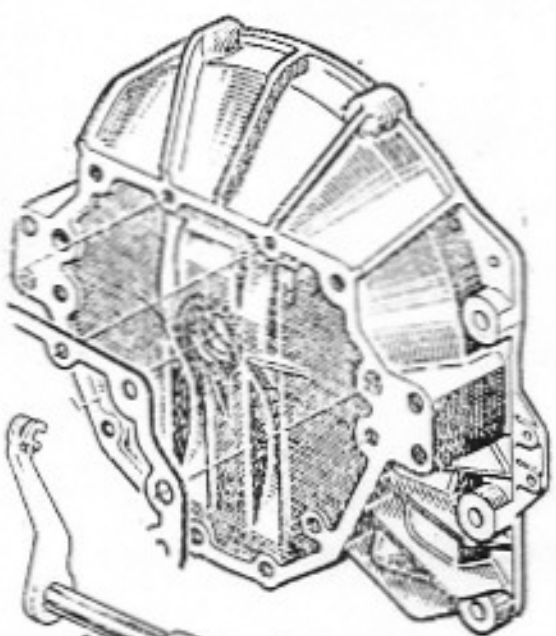
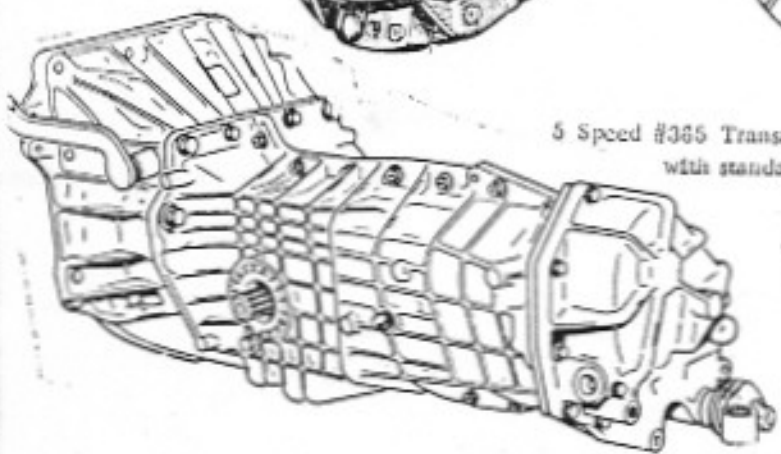


Release Bearing

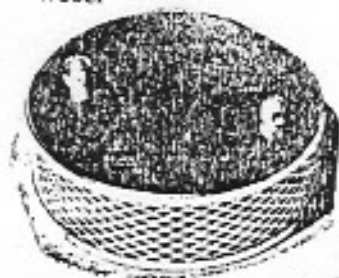
Disc 215mm



5 Speed #365 Transaxle with standard Bell Housing



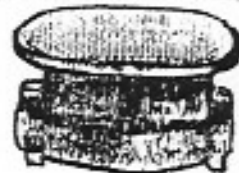
Inverted Bell Housing with clutch control to invert transaxle (reverse engine)

Sports Air Filter for 28/36DCD
WeberTop Nozzle for use
of remote air filter

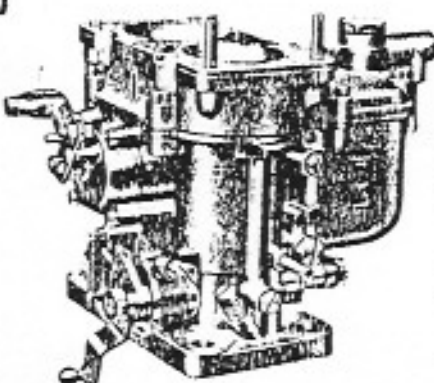
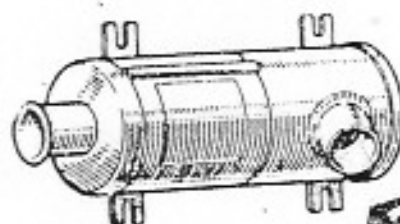
Velocity Stacks for 28/36DCD



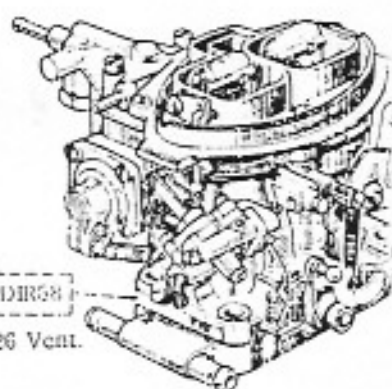
Velocity Stacks for 32DAR



Remote Air Filter

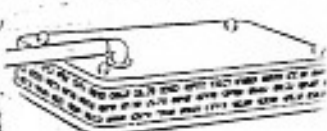
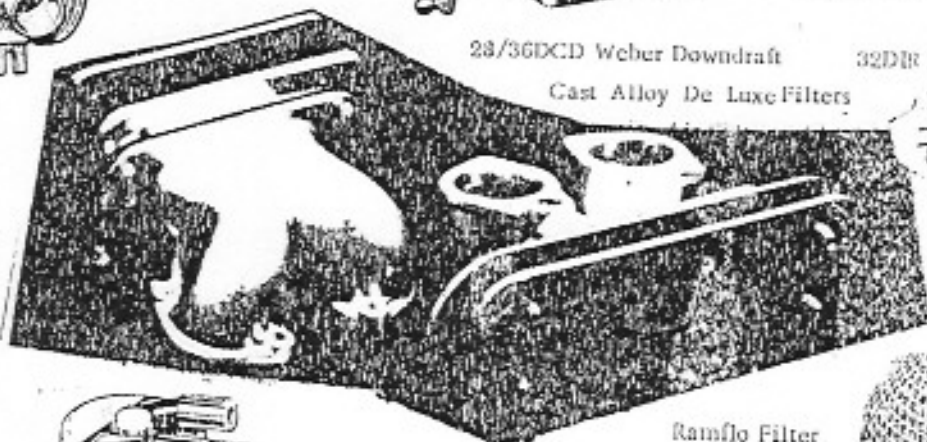


28/36DCD Weber Downdraft

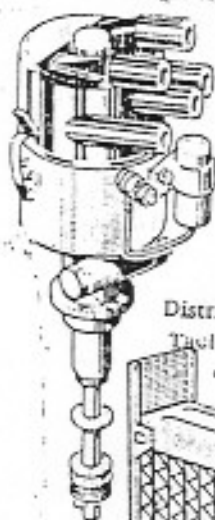
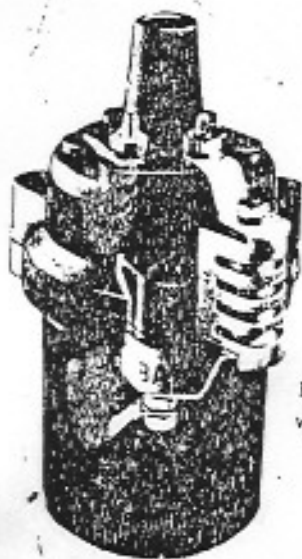
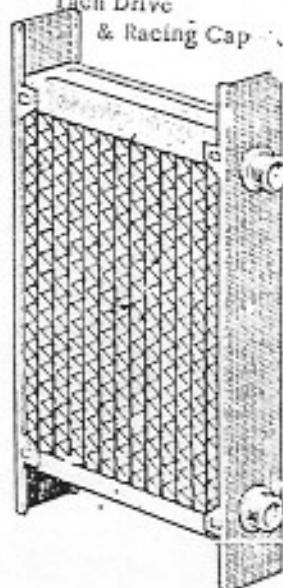
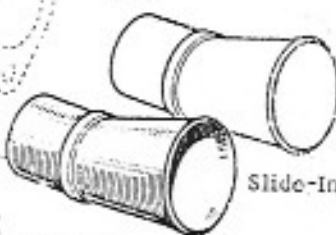


32DAR Weber Downdraft

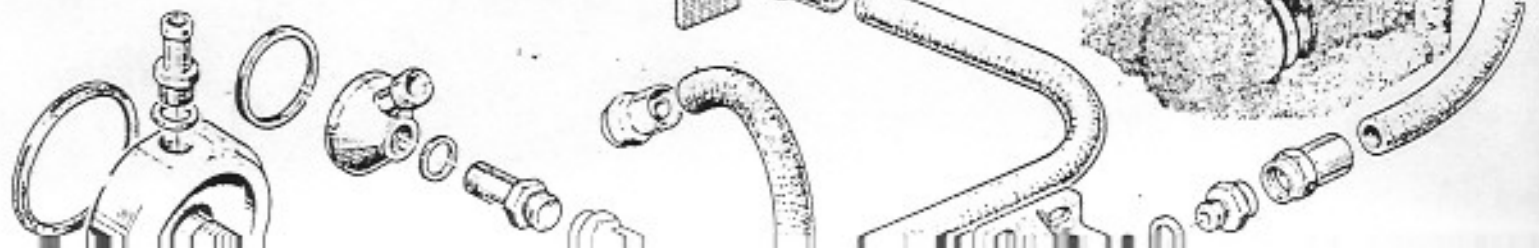
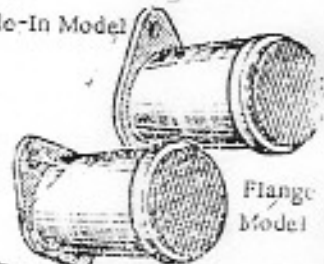
Cast Alloy De Luxe Filters



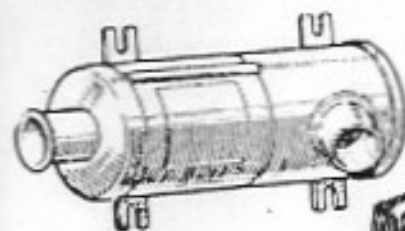
Sports Filter 40 or 45D

Racing Water Expansion
TankDistributor with
Tach Drive
& Racing CapRamflo Filter
40/45DCOERacing Coil
with External
ResistorRACING SAFETY OIL
COOLER & LARGE CAPACITY OIL
FILTER KIT
with engine take-off & returnVelocity Stacks
Filter muffs.Velocity Stacks for
Side-Draft Webers

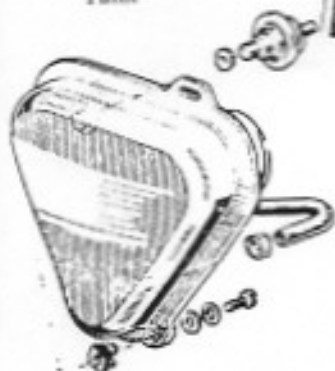
Slide-In Model

Flange
Model

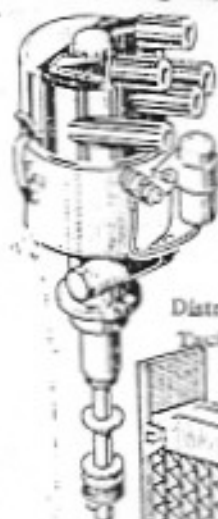
Remote Air Filter



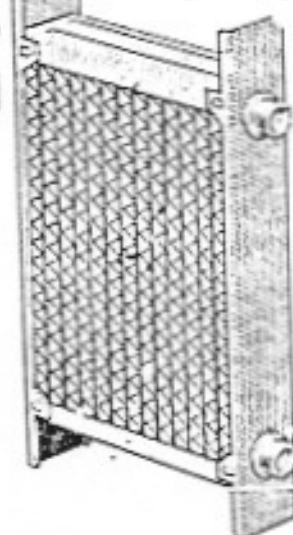
Racing Water Expansion Tank



Racing Coil with External Resistor

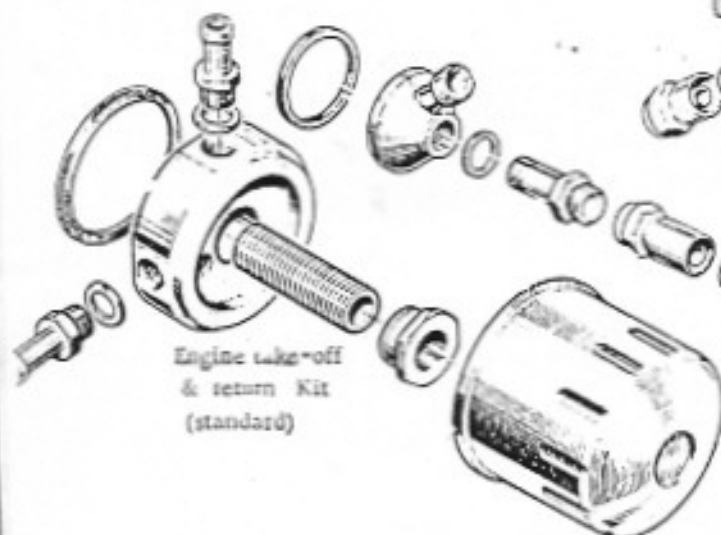


Distributor with Tach Drive & Racing Cap



RACING SAFETY OIL COOLER & LARGE CAPACITY OIL FILTER KIT with engine take-off & return

Velocity Stacks Filter muffs



Engine take-off & return Kit (standard)

28/36DCD Weber Downdraft

Cast Alloy De Luxe Filters

32DIR Weber Downdraft

Sports Filter 40 or 45Dx

Ramflo Filter 40/45DCOE

Velocity Stacks for Side-Draft Webers

Slide-In Model

Flange Model

Replacement cartridge