Fiat hubcaps are clue to suspension's ancestry. Jordan took two Topolinos—one front end from each—as his starting point and ended up with this very attractively turned out Formula III contender.

TIME WAS NO OBJECT

But Money Was, When Herb Jordan Decided to go into Formula III Racing.

By ED MONROE

WHEN the Jordan Special arrived at the new sports car airport course at Harewood, Ontario, Canada, it immediately caused a sensation. "Isn't that a beauty!" and "What a beautiful car!", were spontaneous exclamations voiced by the crowd which quickly gathered around.

Herb Jordan, who is an Associate Engineer for the Toronto branch of I.B.M., devoted two years of his spare time to the building of this 500cc class car.

Although this is Herb's first try at Grand Prix racing, he is no newcomer to the racing game as he formerly raced motorcycles, and the engine used in the special has seen five years of racing in his motorcycle and has proven very reliable.

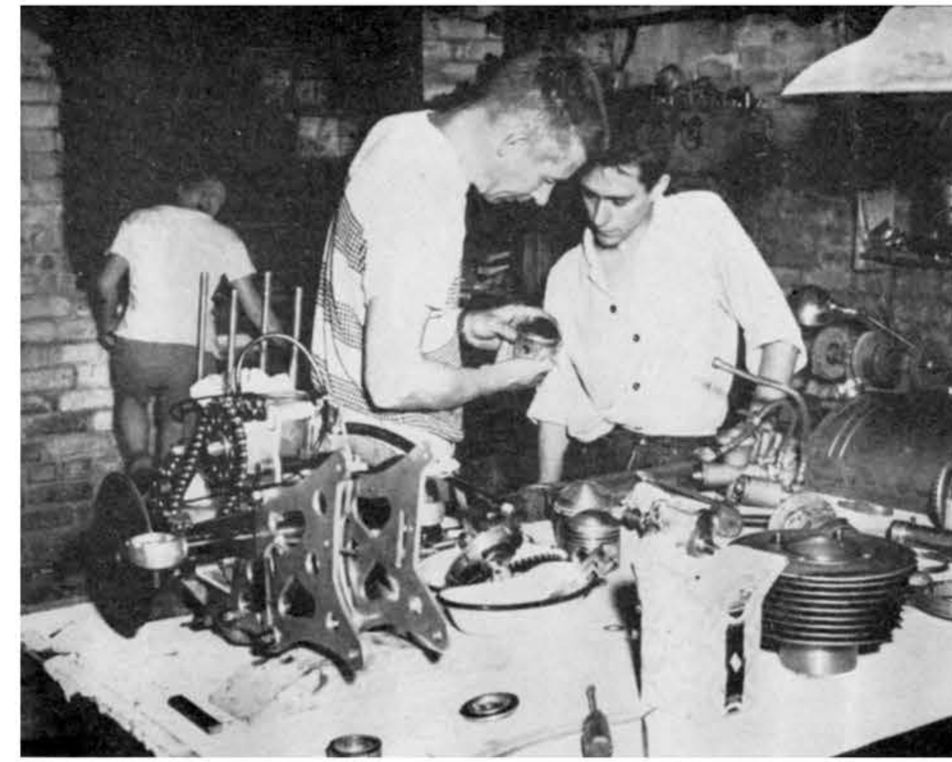
Herb built the special in his cellar. An old pool table was used as a surface plate for lining up the frame, etc.

Since Herb did not have welding equipment of his own, he did not use the modern tubular space frame, but rather chose the boxed channel type. With this type, he was able to line up and assemble the various parts of the frame with small screws. Then he took the frame to a welding shop where the tacking was done by arc welding.

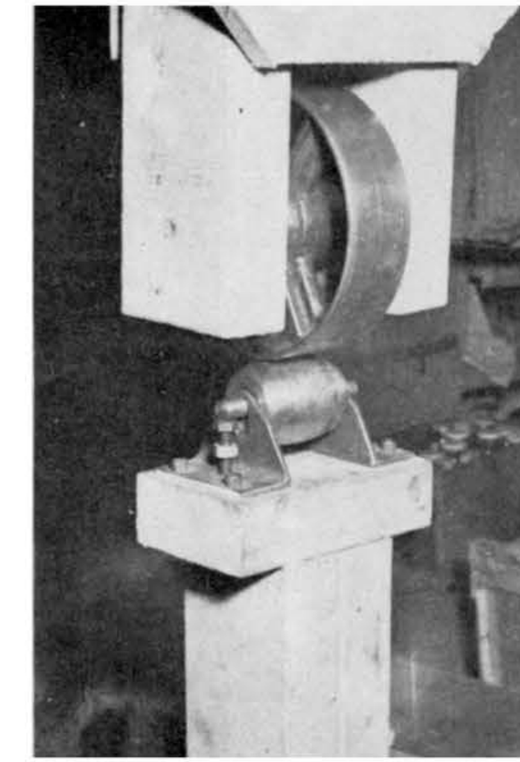
Herb used 16-gauge auto body steel for the main frame. The channel sections he had formed in a shop having a press plate. Next, he bent the channels to the desired curve. He made his own punch for punching and extruding the holes in the frame. These consisted of a male and female die pulled together with a bolt. The channel sections were boxed for added strength and stiffness. These sections were assembled by tack welding with an arc welder. The tacks are about 3/4 inch long and about 4 inches apart. Gussets made of 16-gauge steel did much to increase the stiffness of the frame, yet added very little weight. The tubular cross-members are 1 3/4 inches in diameter, 22-gauge seamless mild steel tube. These tubes extend completely through the frame and are spot welded on the inside of the frame with an arc welder, using about three small spots at each side. The tubes are brazed to the frame on the outside. Herb did all the brazing.

The small tubular members are made of half-inch diameter 16-gauge mild steel tubing. They were bent around a V pulley having the desired radius. These tubes extend completely through the main channels from top to bottom and are brazed on top and on the bottom. Mathematical calculations show this frame has a very high safety factor.

The front spring, wishbone, steering arms, spindles and wheel assemblies are from a 1948 Fiat, which had a tread of 44 inches. The wishbones were polished and cadmium plated. Proper alignment was obtained by means of shims between the wishbone bearings and the frame.



Most all the work took place in Herb's cellar, which shows that, for 500's at least, you don't need grandiose facilities: just ingenuity, determination, and perhaps a friend or two to lend a hand.



This simple tool is responsible for the delightful smoothness of the aluminum body (and the delighted neighbors, who heard no hammering).

Front brake cooling was improved by shrinking finned, aluminum rings (or muffs) on the Fiat brake drums. Front wheels have one degree of positive camber (copied from Cooper specifications) and 1/8 inch toe-in is used. Handling is excellent.

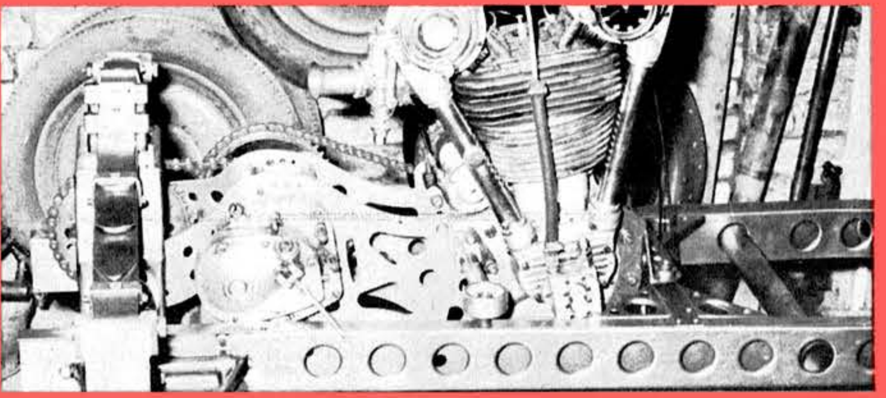
Tie-rod ends are Fiat. These ends were cut off about 1 1/2 inches back from the ball and turned down to a press fit in a piece of tubing. They were then pinned and silver-soldered to the tubing, thus saving considerable weight over the original solid Fiat tie rods.

Steering box is Fiat and gives two turns lock to lock. Herb does not consider this nearly quick enough, but has not had time so far to make the necessary modifications to achieve faster steering. Steering wheel was handmade from Dural and wood.

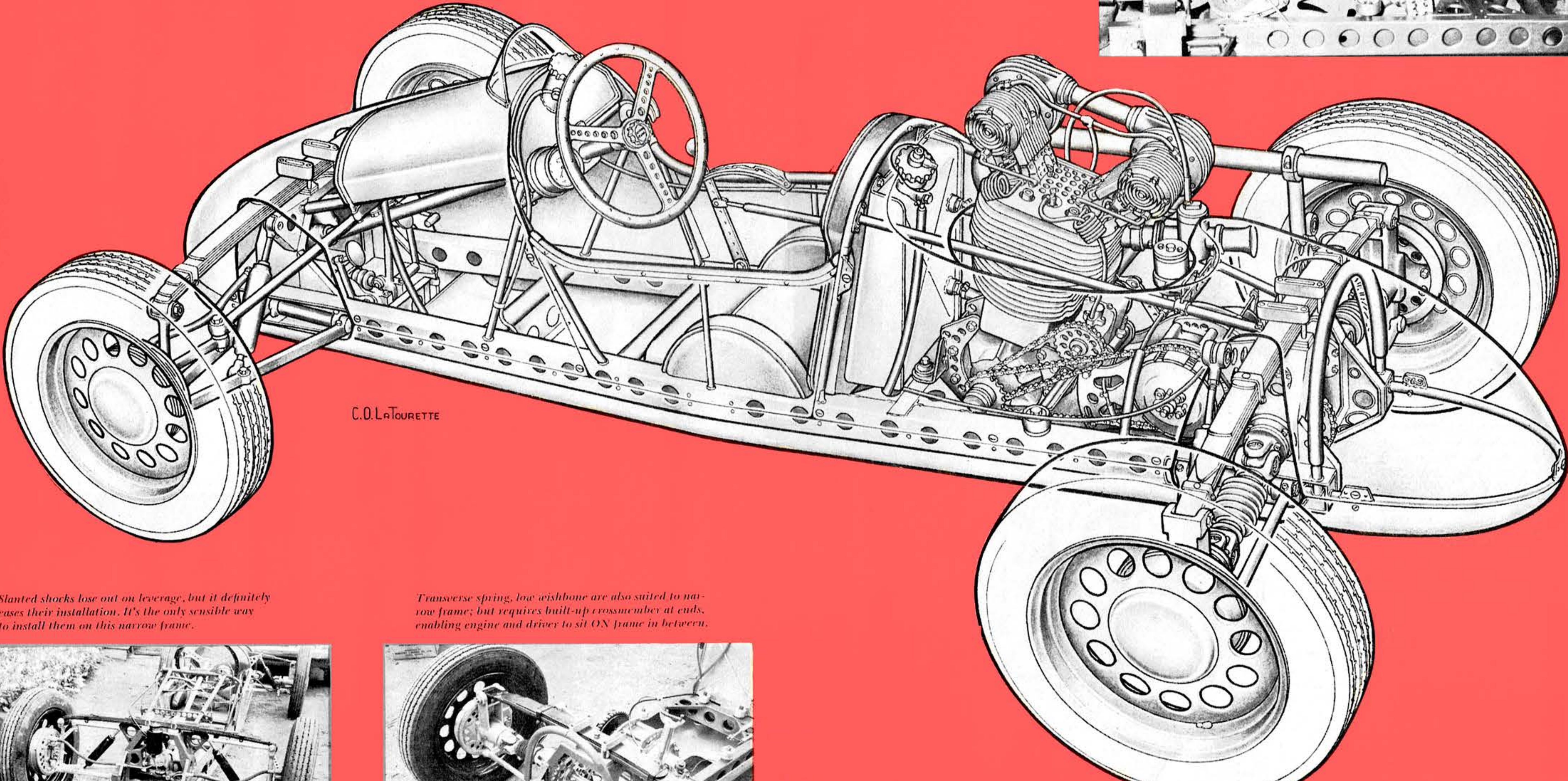
Rear spring and rear wishbones were from another Fiat front end (Parts from two Fiat front ends were used). These wishbones were also polished and cadmium plated. The outer ends of the rear spring and the outer ends of the rear wishbones attach to rear axle support plates which are machined from a casting of Herb's own design.

Herb took the Fiat springs apart (before installing them on his special) and polished away all rust and pits. He then loaded the car with weights which would be approximately equal to that of the driver and engine. Then, by trial and

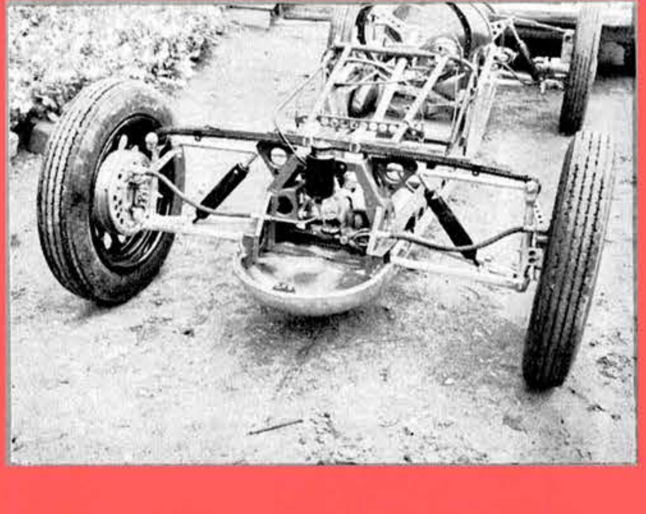
Highly modified AJS has given no trouble, as it was developed during five years of motorcycle racing.



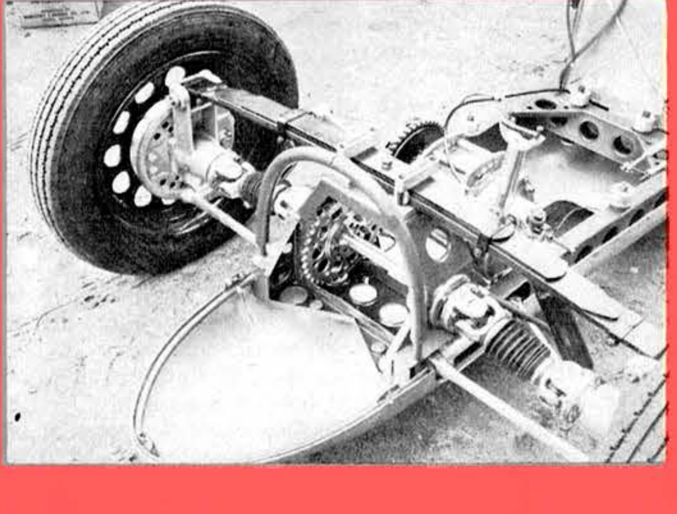
Jordan had no welding equipment at home, so all frame components were first carefully located, then fastened with small screws. Later, a trip to the welding shop saw to more permanent attachments.

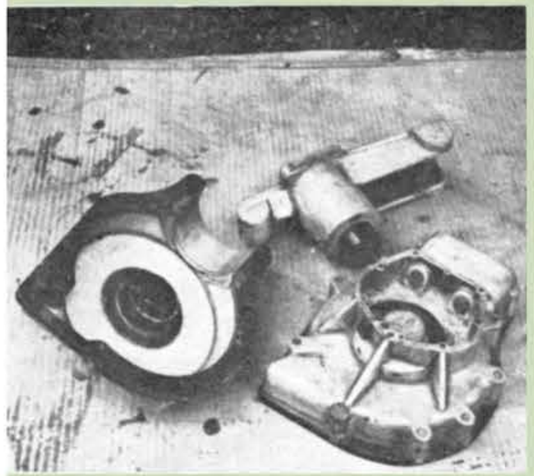


Slanted shocks lose out on leverage, but it definitely eases their installation. It's the only sensible way to install them on this narrow frame.

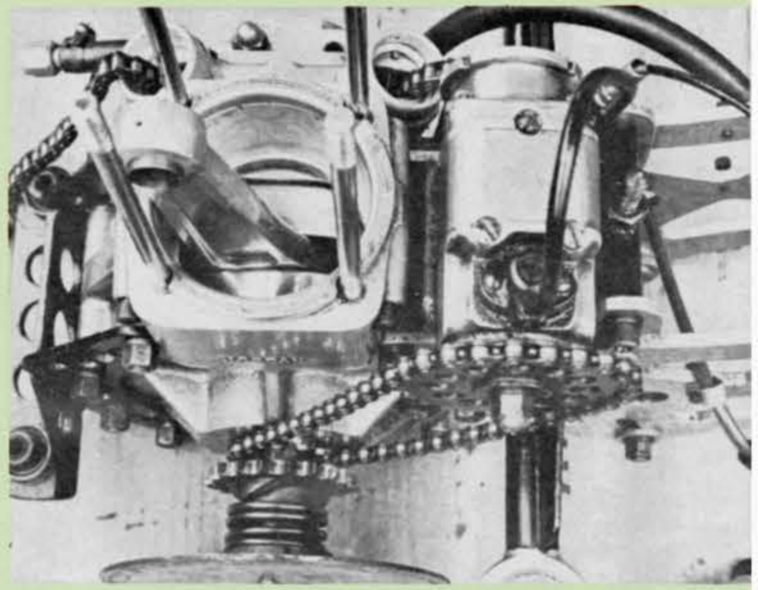


Transverse spring, low wishbone are also suited to narrow frame; but requires built-up crossmember at ends, enabling engine and driver to sit ON frame in between.





Using part of the original crankcase, Herb made new patterns himself. Another pattern he made was for the rear axle support.



The connecting rod was made of Dural (an aluminum alloy) to improve heat transfer at the bearings, but much larger dimensions were then necessary. Even magneto is chain-driven.

error, he selected the proper number of leaves for each spring which would hold the spring perfectly level. These springs are dampened by Gabriel double-acting shock absorbers. Herb made special bushings which fit on the threaded ends of these shock absorbers to facilitate attachment.

The rear sprocket shaft is machined from an axle shaft and has a one inch outside diameter. It is tapered and threaded at both ends. Each taper has two keyways. The plate to which the sprocket is attached was pressed on the shaft and then welded to it, after which the final machining was done. This shaft is held in position in the frame by ball bearings, which in turn fit in housings in the upright (bridge-like) portion of the rear frame. Special tough steel plates are attached to each end of this shaft by means of the tapers, keyways and nuts. Morris Minor drive shaft universal joints, having a male sliding spline, are bolted to these plates (These are the inner universals). These male splines, in turn, fit into Morris Minor universals having a female spline. These sliding splines compensate for slight changes in tread which occur as the suspension flexes.

Two more plates similar to the ones holding the universal joints to the sprocket shaft are used to attach these outer universals to the axle shafts. These axle shafts were made by cutting off the outside end of Fiat rear axle shafts and machining a taper, keyways and thread on their inner end. Each of these axle shafts is supported by two ball bearings which are housed in Herb's special back axle support casting previously mentioned. The dust shields are Harley-Davidson front fork shields.

Rear brake backing plates are drilled for cooling and weight reduction. Rear tread is 42". Rear camber is adjusted to one degree negative (copied from Cooper practice). 15x4¼ Fiat wheels and tires are used. The wheelbase is 7 feet.

The engine was taken from Herb's racing motorcycle and had been running for five years in its present form. The original engine was an AJS, which Herb soon found to be deficient in both power and durability. He began a series of modifications which were so extensive that very little of the original engine remains. Herb did all the designing, pattern making and machining on these modifications and they are a tribute to his ingenuity and versatility.

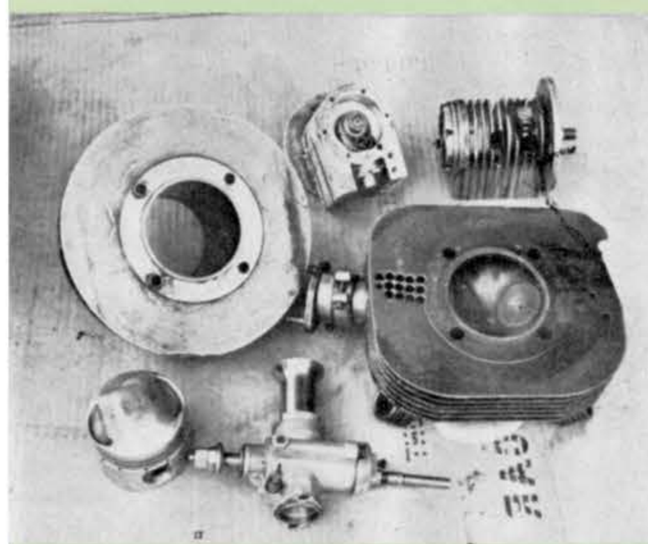
After several bottom-end failures, Herb decided to design a new crankcase. He made a new pattern for a casting, using the original casting as a part of the pattern and making provision for larger (3-inch diameter) main bearings, for better crankshaft support, thicker flanges for added rigidity. He also provided a collar to accept the lower portion of the cylinder barrel. The casting was made according to this pattern.

The AJS cylinder barrel had cast iron fins. Herb turned these fins off in a lathe and in their place shrunk an aluminum muff on the upper part of the cylinder barrel (where most of the heat is concentrated). The lower part of the barrel was left naked to enable it to be slid into the crankcase mounting pad or collar.

Herb designed and made a special cylinder head of aluminum bronze. This is considerably heavier than aluminum and proved rather difficult to machine, but has the advantage that no valve seat inserts are required (most inserts in this type of engine are aluminum bronze). This eliminates the poor heat transfer which sometimes occurs when inserts are used and it permits the valve seat to come very close to the edge of the combustion chamber. This enables larger valves to be used than would be possible if seat inserts had been employed.

Herb uses a 10mm spark plug instead of a larger size to get the plug more nearly in the center of the combustion chamber (for shorter flame travel) and still use big valves. Herb uses KLG plugs and has no trouble with them.

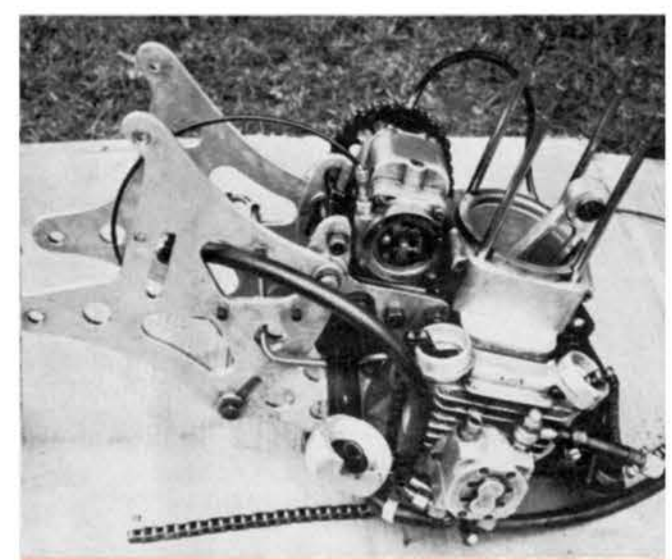
(Continued on page 58)



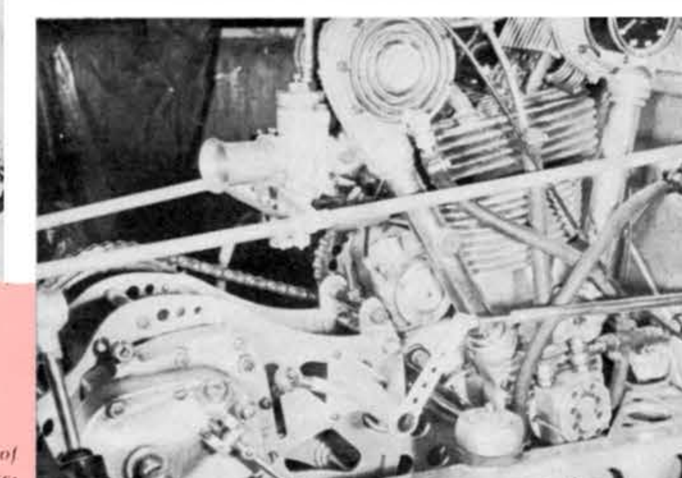
Alloy muff with immense fins was shrunk onto remachined iron barrel. Aluminum bronze head allows larger valves (no inserts), while 10 mm plug permits single ignition because of more nearly central plug location.

To increase surface area per volume and to reduce weight, the heavy aluminum-bronze cylinder head is liberally drilled.

Chain drive to camshafts is enclosed within tubes. Spring loaded button at center fits in left tube, its friction brakes the chain to prevent low-speed flutter.



Stainless steel studs run from case to head. Oil pump maintains oil pressure and keeps sump dry. Slotted brackets permit adjustment of engine position and tension in driving chains to transmission.



Detail finish of engine and chassis are worthy of Earls Court display cars. Bellcrank in center foreground turns the progressive shift linkage neatly around a corner. Tachometer can be installed directly on exhaust camshaft when desired.

Le Mans

continued from preceding page

and quite possibly on top speed, despite the Jag's superior aerodynamics. Phil Hill had nothing but good things to say about the car and apparently it will supersede the Testa Rossa as Ferrari's "production" sports car in 1957-58. Prancing horse retirements were due to engine seizure and failure of oil supply on the two 4 liters, while the 3.1 went out with a blown piston. The Severi-Lewis-Evans car finished in fifth position. General opinion was that bad fuel caused most of the trouble, for the von Frankenberg-Herrmann Porsche also went out with a blown piston. More than likely these cars were "pinking" or "knocking" all the way down Mulsanne straight and the drivers, unable to hear it, did not lift their feet.

After only six hours the Ecosse D types had it all their own way, running steadily but conservatively. The 4.5 Maser coupe had long ago folded up with a seized rear end, as had the open 4.5 that Behra had driven so nobly for such a short time. The rubber boot over the joint from the half-shaft at the rear wheel came off, all the oil came out, and pieces letting go from the half shaft flew into the fuel tank. Simone was at the wheel when it happened, and he managed to stop the car at Mulsanne before any fire could start. The Scarlatti-Bonnier 3 liter Maserati went out with clutch trouble before twelve hours were up. Thus, to all intents and purposes, the race was over early on the morning of Sunday the 23rd when the D Jags took the lead, holding it till 4PM Sunday afternoon, 24 hours after they started.

The Italian "challenge" just never materialized. Possibly it *could* have, particularly among the Ferraris, if Collins and Hawthorn had lifted their feet occasionally to make it a 24 hour race instead of a two hour sprint. For the English, Le Mans once more became an automobile showroom. What a pity that neither Chevrolet nor Ford had the courage to bring a team to France for this internationally famous event. Even if they didn't even finish, the fact that they were *there and entered* would have been a step in the right direction. And Le Mans is not that difficult a race to win, according to Jaguar.

Jesse L. Alexander

RESULTS—1957 LE MANS 24 HOUR RACE

1. Flockhart–Bueb; Jaguar "D"; 3781 cc; averaged 113.85 mph for the 2732.36 miles covered in the 24 hours.
2. Sanderson–Lawrence; Jaguar "D"; 3781 cc; averaged 111.16 mph for 2665.51 miles.
3. Lucas–"Jean Marie"; Jaguar "D"; 3442 cc; averaged 110.17 mph for the 2644.15 miles.
4. Frere–Rousselle; Jaguar "D"; entered by the "Ecurie Nationale Belge"; averaged 107.95 mph for 2590.76 miles.
5. Lewis-Evans–Severi; Ferrari; 3117 cc.
6. Hamilton–Gregory; Jaguar "D".
7. Bianchi–Harris; Ferrari "Testa Rossa".
8. Hugus–de Beaufort; Porsche RS; 1498 cc.
9. Mackay-Fraser–Chamberlin; Lotus; 1098 cc.
10. Rudd–Bolton; AC Bristol; 1971 cc.

INDEX OF PERFORMANCE WINNER

1. Lotus 750 cc; Allison–Hall.
2. Lotus 1098 cc; Mackay-Fraser–Chamberlin.
3. DB 745 cc; Cornet–Perrier.

Fastest lap (record)
Ferrari; 4023 cc; Hawthorn; 3 min 59.6 seconds; 125.67 mph

Alfa

(Continued from page 31)

straights of the high desert country. I took the wheel. The seating position felt fine: high, with plenty of room for everything but my feet, which tended to get tangled in the tight-packed cluster of pedals. The throttle pedal was tucked between the two big pedals in typical old-continental style—good for heel-and-toe work but easy to make mistakes with at first.

I found it surprising that this car was very reluctant to get off the line in spite of its close power to weight ratio and fast idle. But with higher revs it would shudder, charge and peak out all within four seconds. First speed was at the far left of the H-shaped gate, second was straight back. In this cog, the 2.3 delivered a solid whack-in-the-back and hurried powerfully up to 60 mph. Here I popped the lever across to third, and began to get some idea of the passions this purebred carries locked under its long hood. There are plenty of road machines that will do 75 in third, but not many will do it with such fierce eagerness.

It was also surprising to discover that the 2.3 handles heavily, like an old truck, at low speeds. But at 40 mph there's an easy, fluid quality to everything it does; and from about 60 mph onward the heavy, pedestrian side of its character vanishes completely. It becomes supple as a whip and its road behavior is far above average, even by modern sports car standards.

Alfas of this period were celebrated for their "sentient steering," which, in the words of a road-tester of the '30's, "seems to anticipate turns before you reach them." This description has the ring of superstitious folklore, but it's well-grounded. It's possible, more or less to *will* a motorcycle around a bend by body or muscle movements that are practically imperceptible. The Alfa, thanks largely to its full ball-bearing almost frictionless steering, can be guided the same way. Too tight a grip on the wheel at speed can produce symptoms of wander; but these are caused by the driver's own minor body movements being telegraphed to the front wheels through its super-sensitive steering.

The 2.3's cornering behavior is no less uncanny. It has been called an oversteering car; but, judging by the Zipper specimen, this is not exactly the case. The effect of common oversteer is that the car pulls to the inside of a curve and has to be steered away from the inside for it to follow the radius of the curve accurately. The Alfa is not like this; it's weird. The front wheels follow any curve as though on rails, and need none of the correction required by over- or under-steer. But the rear wheels don't follow the same invisible track. They slide outward, following a trajectory of their own until their alignment puts them parallel again with the front wheels. It feels as though the rear wheels need a moment to catch up with the front wheels, and the sensation is a little disquieting until you learn that this outward swing of the rear end *always* stops as soon as the rear wheels point in the same direction as the front wheels.

The rear-end slide sets in at fairly low cornering speeds, but no matter how fast we cornered there was *no* trace of tire squeal. The slide isn't sudden, and has no slippery broken-loose feel. Like the slide of the modern Porsche, it probably helps the 2.3 get through turns a shade faster than it otherwise could. This effect probably was an important factor in the 2.3's racing successes.

Otto and I spent the first few hours of our test day taking care of the basic road-testing preliminaries: weighing the car, calibrating its speedometer, taking pulling power and drag readings, and just getting the feel of the machine. It was a ball. And then the clutch went out.

At the very outset Zipper had announced that he wasn't happy with the clutch; he'd hoped to rebuild it before this but the needed springs had not arrived. So we nursed the clutch carefully. During high-speed gear changes it would slip momentarily and we learned to avoid this by not applying throttle until the multiple disc unit had established a good bite. But the time came when depressing the clutch pedal suddenly had no effect.

Worse things can happen than being 50 miles from civilization in a '34 Alfa without a clutch, Zipper assured me cheerfully. Then, with great gusto, he proceeded to pick his way through the spur-cut gears. His first few changes were just a bit noisy, but by the fifth change he had established such control over engine speed and gear

continued on next page

Jordan

(Continued from page 37)

Special stainless-steel studs (having a low coefficient of expansion) are screwed into the crankcase with a very long thread. These studs extend through the cylinder muff and through the cylinder head. Special nuts at the upper end of these studs hold the cylinder head against the barrel which in turn is held firmly on the crankcase.

A special copper washer serves as a gasket between the cast iron portion of the cylinder barrel and the head. This is annealed each time the head is removed. The muff does not extend quite to the upper end of the barrel to avoid interference which might otherwise occur due to the difference in expansion between the cast iron and the aluminum.

Norton Manx hairpin valve springs are used. These give 180 pounds pressure when the valve is on its seat.

One of the most outstanding features of this engine and one that evokes much comment is the special double overhead camshaft setup. These camshafts are supported by ball bearings held in special

(Continued on page 62)

Jordan

(Continued from page 58)

aluminum cages, which are secured to the head by Allen head cap screws. The camshafts are chain driven.

Since the chain must be quite slack when the engine is cold to allow for expansion of the parts, some means for taking up the slack was necessary. This is accomplished by a Weller-type chain tensioner. This was made from a coil spring and a flat spring from an alarm clock. One end of the flat spring is attached to the end of a tube enclosing the coil spring, and the other end is free to slide back and forth in the tube. The pressure of the flat spring bearing against the chain eliminates the slack. A brake consisting of a tapered steel button held against the other side of the chain by a light spring prevents undue flexing of the chain at low RPM. The cam drives have a vernier adjustment which consists of an uneven number of holes (12 & 13) in the driving and driven plates which form the coupling. The cams actuate hollow steel tappets which have one flat side which bears against a bronze plate. This stops the tappet from turning.

Inlet valve lift is ½ inch, while exhaust valve lift is 7/16 inch. Inlet valve opens 60 degrees BTDC, and closes 80 degrees ABDC. Exhaust valve opens 75 degrees BBDC, and closes 50 degrees ATDC. This gives an intake duration of 320 degrees and overlap of 110 degrees. The cam lobes are so big that they're drilled for lightness.

Oil is piped to the cam cages through a tube into the hollow camshafts and out through a hole in each side of the cam. The cams and tappets are made of case-hardened steel having .040 inch case. Herb uses Castrol R oil and feels that this is responsible for the absence of any measurable wear on the cams or chain.

Herb machined the very stiff Dural connecting rod from a piece of a scrapped airplane propeller.

The piston is reworked from a Harley 61. The skirt having been shortened. It was relieved to give about 1/16 inch clearance under the valves at the wide open position and some metal was turned off the crown to bring the compression ratio down to 9¼ to 1 for 100 octane gas, which is what Herb was using when the engine was in the bike. However, Herb now plans to convert to alcohol and intends to raise the compression ratio to about 14 to 1. This increase will be brought about by using another piston. This one, also made from a Harley 61, will not have any metal removed from the top except in the area directly under the valves which is necessary to prevent interference.

The engine is equipped with a dry sump lubrication system. This system has several advantages in that it permits better oil cooling and enables an adequate amount of oil to be carried. Also, by eliminating the deep oilpan necessary on a wet sump engine, the overall height of the engine can be reduced. Following general practice in dry sump engines, the oil pump has two sets of gears: the pressure gears and the scavenging gears. The pressure gears take the oil from the outside tank and pump it into the oil galleries and passages of the engine under pressure. These gears are comparatively narrow. The scavenging gears are much wider. It is the duty of the scavenging gears to draw the oil out of the sump as fast as it arrives after being circulated through the engine, and return it to the outside tank. Since these gears are comparatively wide, they are capable of pumping a much greater volume of oil than the pressure gears. There is thus no danger of the sump becoming flooded with oil while the engine is running. In practice the scavenging gears pump some slugs of air from the sump as the oil is low. This air is sent along with the oil to supply tank.

In dry sump systems, the supply tank or reservoir should not be completely filled with oil, since space must be allowed for the expansion of the oil due to the increase in temperature and the frothing due to the air being mixed with it. These reservoirs should also be provided with a vent to prevent pressure building up on top of the oil, first, as a result of the air being pumped into the tank, second, due to the decreasing space on top of the oil resulting from the expansion of the oil and third, from the tendency of the pressure of the air itself to increase due to its own increase in temperature.

Herb decided to make use of this air pressure in the oil reservoir to pressurize the top of his gas tank and force the fuel to the engine. In this way he eliminated the necessity for a mechanical fuel pump or an air pump such as is often employed on midget and sprint cars.

Since only 1½ to 2 pounds of air pressure are required to supply fuel to the Amal carburetor, Herb devised a simple and ingenious check valve on top of the oil reservoir. It consists of a square piece of fiber fitting in a cylinder. This piece of fiber normally covers a drilled hole or passage leading from the top of the reservoir, and serves as a valve. A light spring holds this valve down, closing the passage until the air pressure reaches about 2 pounds. Then it opens, venting the excess air to the atmosphere, thus preventing further buildup of pressure. To get the initial pressure necessary to start, Herb uses an air pump to put a little pressure in the top of the tank. The gas tank is made from 22-gauge steel with bulkheads.

The engine now has a bore of 84.5 mm and a stroke of 87.3 mm giving a displacement of 490 cc. An Amal TT carb having a 1-7/32 inch venturi is used.

Ignition is supplied by a BTH racing magneto driven by an open chain. Ignition advance is 43 degrees BTDC for gasoline. Herb considers that 7000 rpm is about the top safe operating limit. However, the engine has turned 8000 when the clutch slipped.

Engine plates and mounting brackets are made of Dural. Engine has four-point mounting provided with rubber cushions, but trial runs showed the engine to be vibrating excessively so Herb decided to eliminate the cushion effect and also added a stay rod to the top of the cylinder.

The close-ratio gearbox is from a Triumph TT Cycle. This box is attached to

continued on next page

200 mph

(Continued from page 41)

special order by any of the European companies that make sports casings. (I see where Dunlop have made up a set for the coming M.G. Class F record attempts in the 240-mph range, with practically no tread layer at all.) Inflation pressure can run 60 to 80 pounds on all these tires.

The general problem of wind resistance, or air drag, is a little easier to picture. The whole idea here is to get your car to slip through the air mass with just as little disturbance of the mass as possible. You're all familiar with the terms "drag coefficient" and "frontal area." The former is a measure of the relative aerodynamic *cleanness* of a body, while frontal area gives us a yardstick for the relative *size* of the body presented to the air mass (it is actually the maximum cross-sectional area of the vehicle viewed from the front). Total air drag is directly proportional to both drag coefficient and frontal area—so a reduction in either, or both, will cut the drag proportionally.

Space won't permit any detailed discussion of aerodynamic design here; but the major tricks are well known. At any speed event you'll see cars with the headlight openings taped up, door handles masked off, windscreens stripped off, underpans, skirted wheel openings, radiator grilles partially blanked off, etc. Every little bit helps when you're struggling for that last mph. Two tricks are especially effective, however: Removal of the windscreen on open cars, and masking off part of the grille opening. An upright windscreen sets up a huge "suction area" behind it where the air flow is swept up over the top and then swirls and eddies down behind the screen. Sometimes you can reduce air drag to less than half by merely ripping off the whole windscreen and getting rid of the suction area (this also reduces frontal area). Some of the later super-speed cars are going to bubble canopies over the driver's head; this increases the frontal area a little, but the drag coefficient is reduced enough to more than compensate. (In fact, this is the reasoning behind the theory that a well-designed coupe body will have less air drag than a well-designed open car. It has never been conclusively proved, however.)

continued on next page

Jordan

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arms which pivot around the center rear sprocket shaft bearings. The purpose of this design was to put all torque reactions and engine shock at the back axle instead of on the frame. It also permits sprockets to be changed quickly.

Herb felt that the conventional foot shift was undesirable in that during the stress of a race a gear might not be completely engaged. Then when the accelerator was tromped on, it would pop out of gear and allow the engine to overrev dangerously. Time would also be lost while attempting to reengage the gear. He therefore designed a gate shift with positive stops to prevent this contingency.

An interesting feature of the shift linkage was the very ingenious bell crank. Herb had to deal with two arcs in this case so he designed the end which carries the universal ball bearing on a stem which is a sliding fit inside the tube. A coil spring is used to return this arm to its shortest position.

Herb used half-hard sheet aluminum .040 thick for making the body. To form the aluminum to the desired shape, he built a simple metal forming device in his cellar patterned after a wheeling and raising machine. It consists of a flat pulley which is free to turn on a shaft. This shaft is supported on a wooden framework built down from the joist. Another small diameter pulley having a crowned or convex surface is free to turn on a shaft which is supported by adjusting screws, which in turn are held by a wooden framework built up from the cellar floor. To use the machine, the metal is placed between the rollers and the lower roller is raised by means of the adjusting screws until there is a light pressure on the metal. The metal is then slid back and forth between the pulleys and is thus made thinner, the idea being to thin the metal in from the edge itself. In this way, as the metal inside becomes thinner, it has to bow out.

With this machine, it is possible to get an absolutely smooth surface on the metal. Herb did no sanding or other smoothing on the body. As the metal is worked in the machine, it tends to become work hardened. Therefore, Herb annealed the metal once during the forming process, after he had worked the metal to about half the required curve. To anneal it, he used a torch operating on ordinary kitchen gas. He would heat an area and test it with an ordinary kitchen match. When aluminum is hot enough to char a pine splinter or match, it is hot enough for annealing. When one area reached this temperature, he moved to another and so on until the entire piece had been annealed. The body sections were welded together by a man experienced in aircraft welding.

Herb has had the satisfaction of building a car which is a prize winner for workmanship and appearance and I am sure he will soon have the added satisfaction of winning many trophies.

Ed Monroe