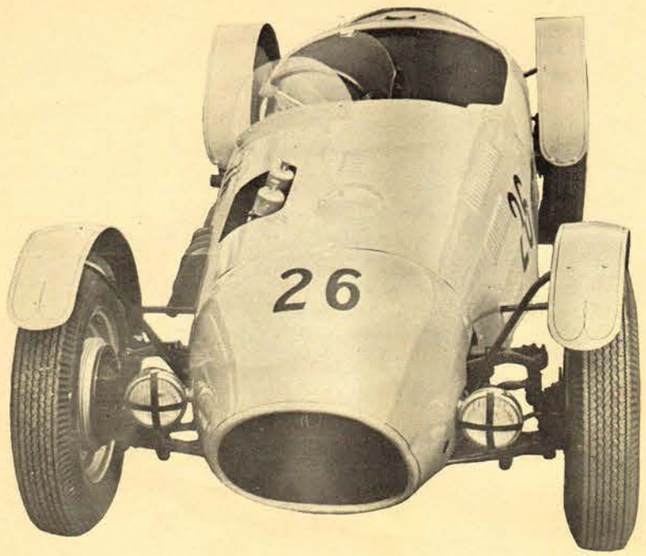
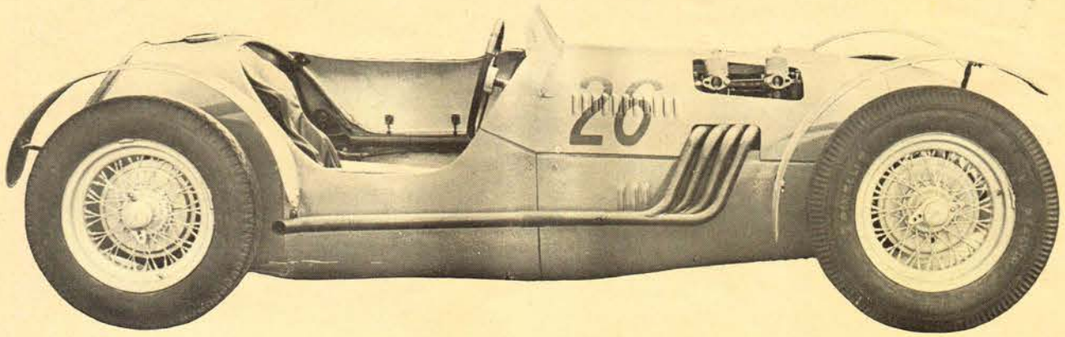
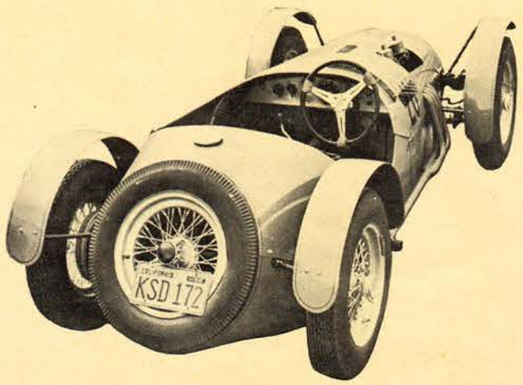
BUILT BY HAND



Front, side and rear views of the Bud Hand Special. Note excellent workmanship on exhaust headers.





By RUSS KELLY

WHEN the talk gets around to building specials, the statement, "and he did it all himself", usually puts the listener on guard for the apologies that are sure to follow. This doesn't apply, however, if the subject of conversation is the Bud Hand MG Special. From this car's tubular chassis to the hand rubbing of its bright orange paint job, Hand did it all and no apologies are called for.

Begun in 1953 and not completed until May of 1956 this car, like many specials, suffers race-wise from having been too long in the building. But Hand and his partner, Dr. Alan Kerns, feel that this seeming handicap is really an advantage. They have a race car. It's fast, plenty fast from all indications, and reliable. Content to let the Porsche Spyders, Maseratis and dual ignition OSCA's go, they have found that there is a tough and exciting race for them in the pack, made up of the cars that were winning last year. This race within a race is competitive enough to bring out cut and thrust tactics but happily lacks the pressures that come when that first place position is at stake.

It's plain that Hand's desire to establish his shop slowed the building of this first car. In spite of all these assurances of satisfaction, the impression is inescapable that now the shop is a going concern and if he should decide to build another, it would be with the idea of winning races.

Even though the car is very small dimension-wise, the weight is surprisingly low for an MG-engined Special using mostly production components. With eight gallons of gas, oil and water it tips the scales at 1175 pounds. This indicates that considerable paring and drilling have been done. The engine, a "factory" 1500, has been further modified from the stage four delivery specifications and now delivers 90 bhp at 6500 rpm. The wheelbase is 90 inches, front track is 54 inches; rear track, 49 inches.

The chassis frame is fabricated of 1.5 in. mild steel tubing with a .054 wall thickness and is gas welded throughout to avoid the possibility of joint fracture. Of double tube ladder or truss layout this unit is obviously strong both in beam and torsion. In plan view the double tube side members are approximately 20 inches apart at the front cross member and widen out to about 35 inches at the firewall. Here a hoop section of 1.5 tubing ties the side members together and serves as a rear engine mount carrier at the bottom and supports cowl, instrument panel and so on at the top. Another half hoop section is used at the rear of the cockpit. Made of heavier wall, .083, it serves also as a roll bar. The lower tubes of the side members terminate just aft of the cockpit and carry the hangers for quarter elliptic springs used in the rear suspension. This lower tube also serves as an air duct to the rear brakes. Funnels located on the front of the tube forward of the radiator pick up the cool air which passes through the tube and then is carried by supplementary flexible hoses to the rear backing plates. The upper side member tubes are joined in the rear by a deep "U" shaped cross member that carries the gas tank mounting brackets and the spare wheel mount.

Front suspension is by unequal length "A" arms and transverse leaf spring. The upper arms are regular MG TD Armstrong units well drilled for lightness. The spindle supports and spindles are also TD MG but carry TF backing plates. The lower "A" frames were fabricated of one-inch .083 wall tubing. The transverse leaf spring attaches to these lower "A" frames near their outer end. Made up from a shortened 1936 Ford unit, the transverse leaf spring attaches centrally to the lower front cross member tube. A Morris Minor steering box is used along with track rods of the same make. The location of the steering box to the rear of the axle center line made it necessary to reverse the MG steering arms and some bending was needed to get the proper steering geometry. This suspension layout is reminiscent of Ferrari. It certainly looks strong, simple, and troublefree an ideal setup for a special.

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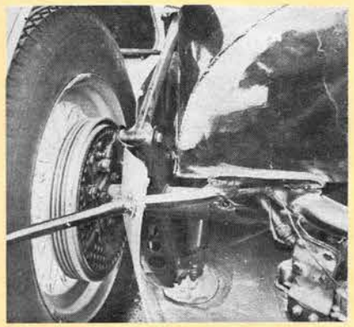
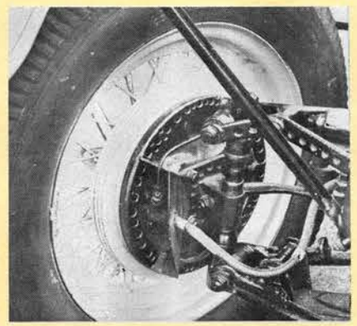
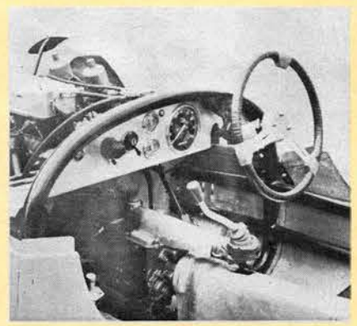


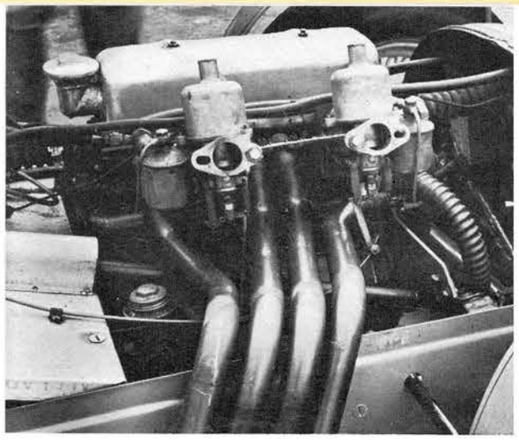
Detail of rear quarter shows radius arm, Watt's link, lower shock attachment, fuel pump.



Brake drums are aluminum finned. Upper "A" frame and backing plates are liberally drilled.



Tachometer is Stewart Warner, other instruments are MG TD. Steering wheel is hand made.



Detail shot of headers. Note how Hand just dodged master cylinder filler cap at lower left.

Plymouth Fury R.T.

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story. By the fifth stop there was a 42 per cent loss of braking power and only about one inch of pedal was left. After the sixth stop we let the brakes rest for exactly one minute and on the next stop they had bounced back to 85 per cent of their original effectiveness. They are good brakes; they're not fade-proof but they recuperate fast.

Our observer who reads the decelerometer during these tests is in the habit of bracing himself against being flung forward violently when the brakes are jammed on. But after our first emergency stop in the Fury he looked up with a broad grin. The instrument told him that we had braked very hard, but he had hardly needed to brace himself at all. Under the hardest braking the Fury did not nose down perceptibly.

Another key to the new Plymouth's improved handling is the adoption of ball-joints in place of pivot pins in the front suspension. The old style suspension allowed only slight positive or negative caster adjustment, and this no doubt involved a certain amount of binding at the pins. But a ball joint is virtually impossible to bind and the new front suspension permits as much as 2.5 degrees of positive caster.

The more positive caster you have, the stronger the car's self-righting tendency on coming out of turns and the more resistance there is to putting it into a turn. As a concession to the lazy driver Detroit generally favors negative caster, which implies less effort to begin the turn. Other factors, such as king pin inclination, can ease the chore of getting out of the turn.

In the past, the average Chrysler product has had an available range of caster running from minus 0.5 to minus 1.75 or 2.0 degrees. With manual steering the adjustment was set well on the negative side but, even with power steering to do the work, little positive caster was available. This contributed to the dead and flaccid character of Chrysler-product steering response as we've known it in recent years.

With the new setup and with power steering Plymouth uses 0.75 degrees of positive caster, which livens the steering response. Manual-steering cars are set at 0.75 degrees negative caster. However, the owner who wants strong self-righting action coming out of turns can have up to at least 2.5 degrees of positive caster by simply adding dealer-available shims between the upper control arm inner pivot brackets and the frame sub side-member brackets. It's easy to tailor this part of the steering to your personal preference.

Plymouth's '57 bodies are very controversial and we were showered with unsolicited opinions on the Fury's styling. All observers were in agreement on the attractive cleanness of the design. But there were no vague opinions on the fins: they excited either strong acceptance or total rejection. Sales figures are proving that the wedge profile of the Chrysler family of cars is a hit on the market.

The Plymouth is styled to "read" as long and wide as possible, the body dimensions at the fender line being very close to the outer bumper dimensions. The greenhouse comes very close to matching the full body width and consequently there's adequate interior space for seven or even eight occupants of average size. Padding is necessarily thin over the shaft tunnel. The steeply-raked wraparound windshield is pleasantly free from distorting effects. The windows are almost flush with the outside of the windshield and roof pillars, which is a factor in reducing wind noise. It's possible to drive this car at 100 mph with the windows down and *not* be buffeted unpleasantly by the wind. In a great many cars wind-drumming can become unbearable in the passenger space at 50 mph if one window is partially open.

Eyebrows over headlights are used widely because they make cars seem longer. This is their only excuse for existence and it must be admitted that, as used on the Plymouth, they make for a well-balanced composition. But they exact a heavy price in terms of wind drag at high speeds and just sit there consuming power and fuel. We'd like to see this basically-clean body evolve into a shape similar to that of Chrysler's experimental Dart.

In our opinion the '57 Plymouth is a beautiful car, designed with excellent taste. The Fury is the best-handling U. S. production sedan we know of. It is a fast car but not grotesquely so. It has very strong acceleration with automatic transmission but must be re-cammed if optimum performance is to be enjoyed with a manual-shift box. Its fuel consumption is moderate at steady low speeds but this is not a car that wants to be driven with a light foot; you'll do well to get 14 mpg on an average run. The brakes are better than average for Detroit, the ride is superlative. Like all the rest, the car has a bug or two. And it has some virtues that its competitors are unable to match.

—Griff Borgeson

By Hand

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The rear suspension follows a practice that is well proved, although perhaps not as popular as it once was. Two trailing quarter elliptic springs carry the solid MG rear axle and final drive unit. Torque and braking reactions are controlled by outboard radius rods. The method of attaching the springs and radius rods to the rear axle is of special interest. Box-type brackets are fabricated of sheet stock and welded to the axle housing top and bottom, at the same point that originally carried the stock spring hangers. The upper brackets, about six inches in length, carry the trailing end of the radius rods. The lower brackets, slightly longer than those at the top, accommodate the spring eyes of the quarter elliptics. This is in effect a Watt's link and its action under braking and acceleration is easy to evaluate. Under acceleration the tendency is for the axle housing to rotate in the opposite direction of the wheel. The forces exerted against the radius rod are, of course, to the rear and have the effect of transfering the weight to the rear. Weight transferance under severe braking is to the front, but

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Last Mille Miglia?

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time he arrived at the next control at Pescara, was leading the German by two minutes and 41 seconds! Collins managed to hold the Italian off all the way to Rome —the gap between second place being 5 minutes and 27 seconds. Portago held fourth position with Gendebien screaming along in the 3 liter Gran Tourismo Ferrari in 5th spot. The race was turning into a parade of Ferraris. Collins got to Rome in 5 hours, 3 mins., 11 secs.; Moss had taken just 5 hours, 3 mins., 5 seconds in 1955.

Ak, meanwhile, was having a ball of his own—albeit a short one. Nevertheless he was treating the populace to the violent noise of El Caballo's hustling Chrysler. Running like a top, El Caballo was passed once by Taruffi, and Ak, forgetting himself for the moment, accelerated to keep up with the flying Roman. The Chrysler fairly leaped ahead and with Doug shooting the gun camera, practically ran up over Taruffi's tail. Ak decided then that it was the better part of valor to let Taruffi show him the way, rather than the other way around. Just about then, however, things started happening. Ak heard a "clunk"—a brake drum had broken. Continuing slowly along the Adriatic coast, the exhaust manifold suddenly came adrift. It was then that he realized what a pounding the car was taking from the horrible roads. Slowing now considerably, they had no real hope of finishing within the maximum time allowed, so they stopped, found a small garage, and did some spot welding. Then, turning around, they motored back to Brescia—the race for them over. They had only covered approximately 300 miles, but they were not alone. A strong Mercedes team of privately entered 300SL's all went out in the early stages of the race due to the failure of a bolt holding on the generator – said bolt entering the water jacket—it got loose and all the water came out.

The race among the Ferraris continued North from Rome: Collins continually in the lead, guided by his co-driver, Louis Klementaski. This particular stretch of the route is considered by some to be the most difficult; you traverse the Radicofani pass, the road winding incessently over the main highway north. Viterbo, Siena then on to Florence. Near Siena, Taruffi began to have trouble with his rear axle; Collins still led but Von Tripps moved up into second place while Taruffi was stationary by the side of the road. Collins was maintaining an average speed superior to that of Moss in 1955; the old record was 99.5 and Collins was maintaining 100.3 mph, but from Florence on, his speed dropped.

The Futa and Raticosa passes were crossed and the roaring Ferraris flew into Bologna—Collins still holding a good margin over Taruffi of 10 min. 43 seconds. Seven min. and 16 seconds farther back came Von Tripps and after him Gendebien, in the Gran Tourismo Ferrari, who was even leading Portago at this point. Gendebien was driving a fantastic race—up to Rome he had averaged 101.9 mph —at one point he even led Flockhart's D

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apparently this has little noticeable adverse effect.

The rear shock absorbers are Ford telescopic units and for convenience of mounting are tilted forward. The quarter elliptic springs are made up of Ford front springs cut so that the center bolt holes could be used in hanging them in the new position.

The braking system is hydraulic with two leading shoes used front and rear. A TC MG master cylinder is mounted on the firewall and is operated by a pendant type lever. The front brakes are TF MG and incorporate Al-Fin drums. In the rear TC units are modified to two leading shoe and Al-Fin drums are used.

The MG engine is of the type that is known as the "factory competition" model. Specially cast, the block comes as close to 1500 cc's as is mechanically possible. The water passages through the head and block have been rerouted, eliminating the head gasket and the overheating problems that were encountered with the earlier engines. Rated by the factory at 82 BHP @ 6500 RPM in stage four tune, it has wonderful reliability but is handicapped by its weight. By raising the compression ratio, lightening the valve train and very careful assembly, Hand has managed to squeeze 90 bhp from this unit.

The low mounting position of the engine made it necessary to construct a new oil sump. This was made as flat as possible, is very wide and has a capacity of nine quarts. An ingenious system is used to cool the oil that employs the core from a regular car heater as an oil radiator. To avoid pumping oil at high pressure through this core, which was not designed for it, Hand built a separate pumping system. A regular MG dual gear pump was cut in half and attached to the stock pump. This picks up from the sump and delivers oil to the radiator after passing through a pressure regulator valve set for thirty pounds. Engine oil pressure is maintained at 75 pounds per sq. in. Trouble was experienced with leaking rear main seals. This was cured by turning the crankshaft and modifying the block to accept a Ford 60 seal. The flywheel is alloy, machined from a heat treated aluminum plate.

An interesting fact about this engine, in common with a good number of the better engines running on the West Coast, is that the highly stressed parts are shot peened. It is felt that shot peening greatly improves resistance to metal fatigue and in some instances is more effective than the time honored high polish in preventing premature failures.

The body paneling consists of seven separate pieces, most of them easily removable by Dzus fasteners. The belly pan runs the full length of the car and is in two pieces to make the underside of the car a little more accessible. Sixteen gauge half-hard aluminum stock is used throughout.

This car leaves an indelible impression of the all-round ability of Bud Hand. None of the various techniques necessary in building a car seem to snow him. He says he just couldn't buy a racing car to sit in and drive, so perhaps his Santa Monica shop will soon turn out that front running Bud Hand Special.

Russ Kelly