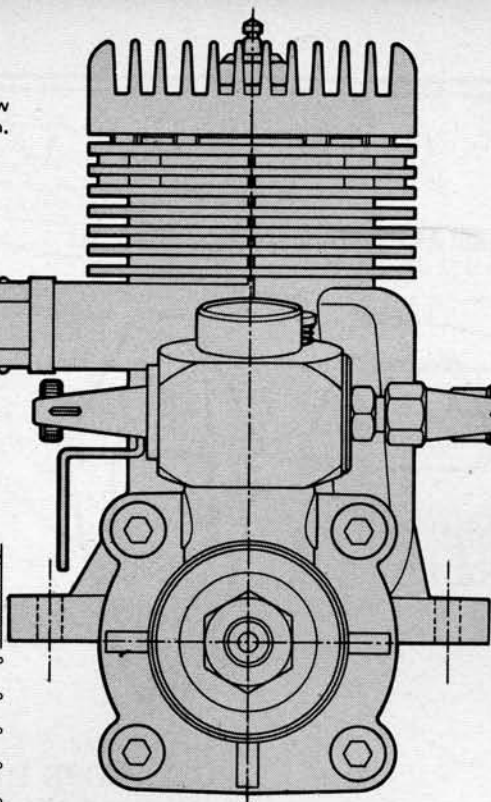
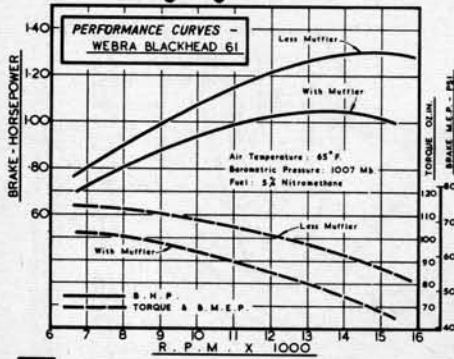
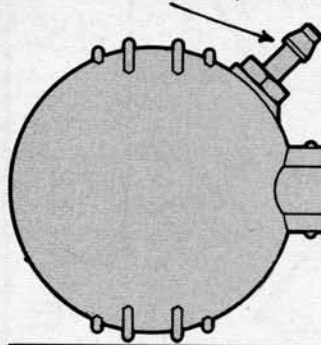
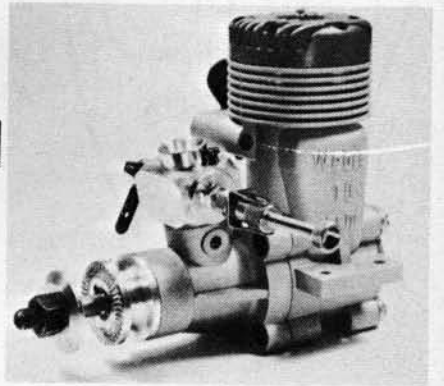


By PETER G. F. CHINN

Optional extra is the Webra muffler, now available with outlet for pressurized system.



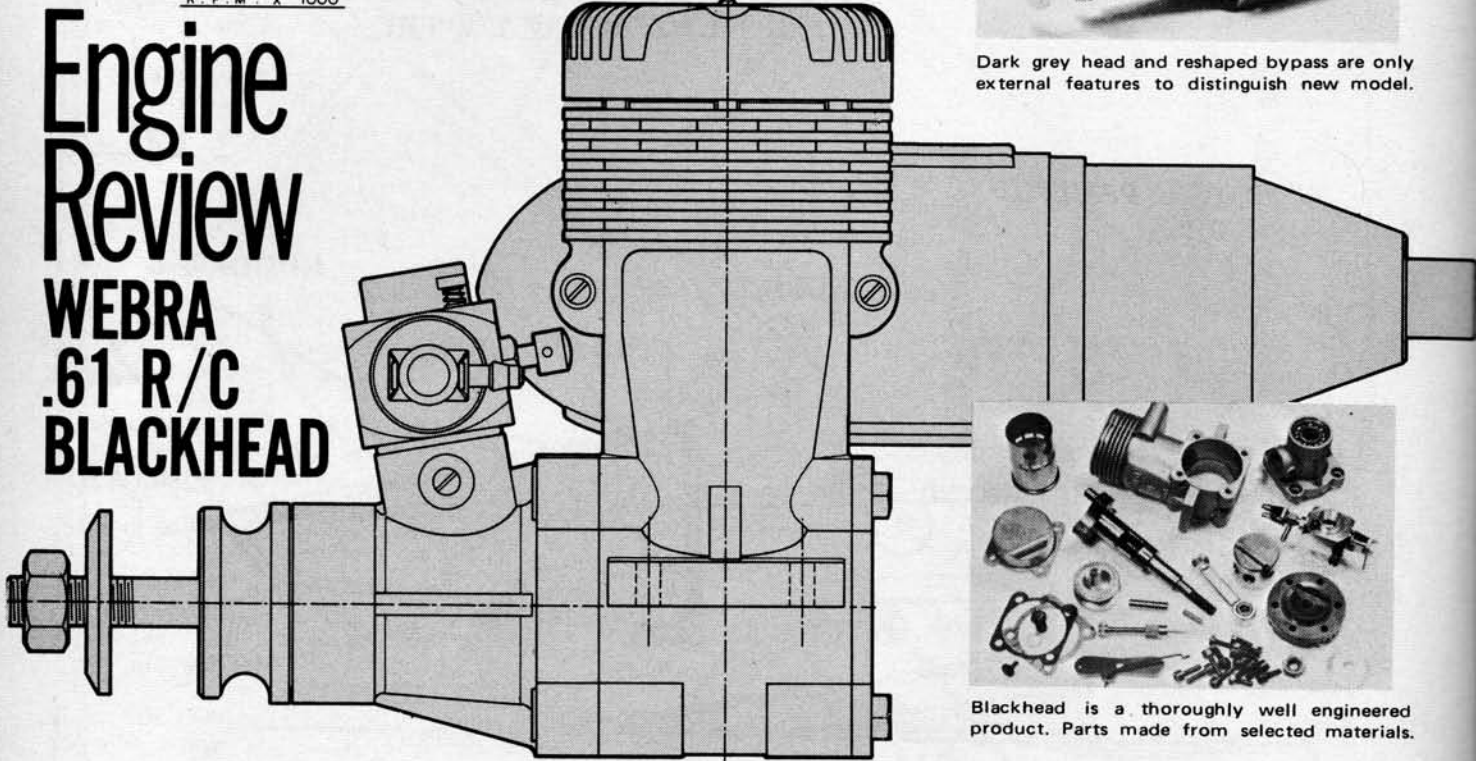
Heart of Blackhead is its piston and cylinder assembly. Piston of hi-strength Mahle alloy.



Dark grey head and reshaped bypass are only external features to distinguish new model.

Engine Review

WEBRA .61 R/C BLACKHEAD



Blackhead is a thoroughly well engineered product. Parts made from selected materials.

Big increase in power puts MRC-Webra 61 among the very top performers in R/C 60 engine class. Because of the increased power, more in some cases with muffler than standards without mufflers; it should be well received by those who need extra power for their heavier scale and pattern planes.

Last year, Kurt Bauerheim, one of Germany's top R/C flyers (he placed third, behind Phil Kraft and Pierre Marrot in the '67 World Championships) put up some impressive performances and was unlucky not to qualify for the '69 German team. In the final selection trials, Bauerheim was comfortably in the lead after setting the highest scores

in the first and second rounds of 1249 and 1207 points. Then, in the third and final round, came disaster as his wing broke in an outside loop at only 253 points, knocking him down to eighth place in the final reckoning.

According to one report of the event, this tragedy was due to the fact that Bauerheim's light *Kompromiss* design

was "overpowered" with the engine he was using. From which you might deduce (a) that Bauerheim doesn't build strongly enough and/or (b) that he must have had a pretty hot motor. We will opt for (b).

Bauerheim's motor was, in fact, a prototype of the new "Blackhead" Webra 61, the subject of our Engine

Continued on page 60

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4. Charles Powell—19 pts.—2:08.6—Minnow
5. Bobby Langley—19 pts.—2:22.8—Mustang

Jack Beauchamp was voted the outstanding sportsmanship award in a close ballot over several others for his fine display of finesse and true sportsmanship. The Torks also fixed up NMPRA Vice President, Bob Lutker, with a special "TORKS back door prize". Bob hasn't been having the best of the luck pot this year so they felt he deserved it even though he finished up tenth in this meet. My thanks to Curtis Brownlee for sending in the information for this meet—don't know what I would do without guys like him.

Pappy deBolt has been hitting the eastern circuit flying and winning in Formula II with his Cobra and a K&B RR 40. Pappy says that most of the sites up in that part of the country just are not suitable for Formula I and therefore Formula II is coming on strong. The big reason is that there just isn't as much repair work to be done between meets because they can be landed on those short fields without busting them up. The overall entries in these meets have been considerably smaller than the meets held in Oklahoma, Texas and California but the Formula II entries have been higher than anticipated when the event was set up. By the way—the Nats Pre-entry, with a week to go before closing, has more Formula II entries than Formula I. I know that this will be history by the time you read this but I am really looking forward to seeing how the totals come out after they are all in.

The NMPRA Championship Season is moving along already and it is only June. Gil Horstman has advised me that six more men have earned the classification of Certified Exhibition Pilot and four of them earned their fifty points this year. New members are Chuck Jones No. 48B—Van Nuys, Ca., Jack Hertenstein No. 76B—San Gabriel, Ca., Wayne

Wainwright No. 57C—Granada Hills, Ca. (2 yr.), John Jennings No. 21—Dallas, Tex. (2 yr.), Bror Faber No. 11B—Westminster, Ca., and Roger Allard No. 72B—San Marcos, Ca. This brings the total members with a CEP rating to 59, not very many for a country this big. The season Championship Standings at this time are:

Formula I

- | | |
|-------------------|---------|
| 1. Joe Bridi | 82 pts. |
| 2. Mike Bridges | 76 pts. |
| 3. Whit Stockwell | 71 pts. |
| 4. Jim Witt | 68 pts. |

Formula II

- | | |
|-------------------|---------|
| 1. Hal deBolt | 13 pts. |
| 2. Tom Protheroe | 9 pts. |
| 3. Whit Stockwell | 7 pts. |
| 4. Maurice Woods | 6 pts. |

That about closes it up for this month, remember if you are having a big contest or if you have something going for you that you would like to share with other contestants—send it in. The address is 729 Falcon Way, Livermore, Ca. 94550.

Engine Review

Continued from page 20

Review this month. This engine was a standard 61 with certain modifications carried out by Webra designer Guenther Bodemann. Apparently, there was no firm intention, at that time, to bring out a new model but, as a result of Bauerheim's demonstration, the factory quickly found itself faced with an insistent demand for this hopped-up version and so, in February of this year, after further development work, the Blackhead 61 was announced.

Outwardly, there is little to distinguish the Blackhead 61 from the Webra 61 dealt with in this series in the December 1967 issue. The cylinder casting is slightly different in that the bypass bulge is a bit wider at the top. The main identifying feature is, as its name suggests, the blackish color of the cylinder head, now color-anodised a dark grey instead of being left bright aluminum as on the older model. The actual head and combustion chamber shape are unchanged.

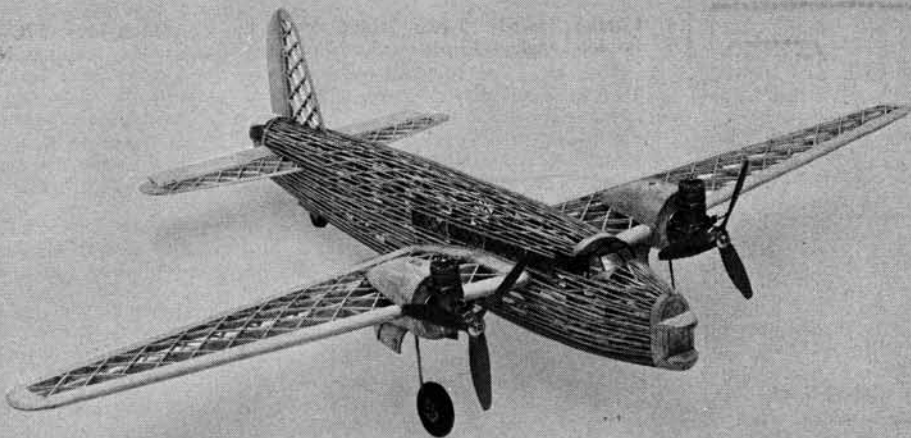
On taking the engine apart, rather more is revealed. The purpose of the new casting, for example, is seen in the reshaping of the bypass passage which widens out quite considerably at the top and avoids the partial restriction of the two outer bypass ports that was evident in the older engine. The actual area of the four bypass ports in the cylinder sleeve is unaltered.

Exhaust port area has been increased by 50 percent. Originally, four 5x5 mm. ports were used. Now an extra port has been added at each end and the exhaust extends to a full 180 degrees around the bore. Incidentally, this does not seem to have resulted in the excessive fuel consumption that sometimes accompanies substantial increases in exhaust port area. The original Webra 61 had a quite modest fuel consumption and, from our own observations, we would say that, on a specific fuel consumption basis, the Blackhead is probably as good. According to the factory, the extra area was found to definitely increase power. On some of the prototypes, five ports were found to give equally good performance, but after allowing for the cumulative effect of various manufacturing tolerances that could conceivably add up to the occasional hot running engine, it was judged better to avoid any risk of trouble and go for six ports.

Changes have also been made to the piston. It may be recalled that the Webra 61 is unique, among current production R/C 60's, in employing a needle roller bearing in the wristpin end of the connectingrod. The idea here was to use an extremely finely ground wristpin having a firm push fit in the piston (and located by snap rings) and to concentrate movement at the conrod bearing instead. To take care of wear at this point, the rod was

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fitted with a small Duerrkopp caged needle roller bearing. In this way, Webra hoped to overcome the rapid bearing surface wear in the piston bosses and conrod that had beset many other manufacturers of large R/C engines.

In practice, this has worked out extremely well during the past two years of Webra 61 production. Even so, the increased performance of the Blackhead prototypes emphasized hitherto hidden weaknesses in the piston, including enlargement of the piston ring groove on the exhaust side. Webra therefore adopted a new specially-selected piston material. This is a high silicon content aluminum supplied by Mahle who make pistons for a large section of the automotive industry in Germany. It has the very desirable combination of a low coefficient of expansion with improved strength at high temperature. In the initial production batch (including our two test engines) of Blackhead 61's, these Mahle-Aluminium pistons are machined from bar stock. Future engines, however, will have pistons made from forgings.

The connecting rod is also now a forging. Actually, the forged rod is not strictly a new item exclusive to the Blackhead. It replaced the original machined rod in the standard 61 nearly a year ago. Apart from being less costly to produce, the forged rod has been found to be more satisfactory in that the risk of seizure of the plain big end has been eliminated. (The Webra uses an unbushed lower conrod eye and seizure did sometimes occur with the old machined rod.)

Although the manufacturer does not list any changes in port timing for the Blackhead 61, a comparison between our test samples of the Blackhead and the standard 1967 model Webra 61, showed that the intake, bypass and exhaust periods have all been increased. According to our measurements, the rotary-valve now opens five degrees earlier at 30 deg. ABDC and closes five degrees later at 55 deg.

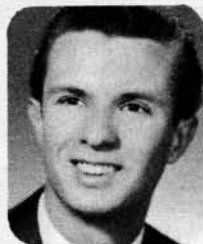
ATDC. The bypass period is extended by eight degrees for a total of 112 degrees of crank angle and the exhaust duration is increased by a similar amount for a total of 134 degrees.

In all other respects, the engine remains unaltered. To recapitulate the main points of its design, it is a shaft rotary-valve motor using orthodox scavenging, a twin ball-bearing crankshaft and a barrel throttle type carburetor with automatic mixture control. The cylinder casing has a drop-in steel liner and is in unit with the crankcase which has a detachable front housing and a detachable backplate. The crankshaft features the 15 mm. dia. main journal now common to most 0.60 cu. in. shaft-valve motors and runs in two SKF ball-bearings, the o.d. of the rear bearing serving to align the front housing with the crankcase. An 11 mm. dia. gas passage and rectangular valve port are featured, together with a very highly finished pressed-in crankpin.

The carburetor is equipped with two adjusting needles. The main one is the usual needle-valve for controlling high speed mixture strength. The second one, installed in the actual throttle barrel, is located so that its tip enters the main jet at low speeds and reduces fuel flow. No airbleed is used and, as a result, suction at the main jet always remains high.

Detailed descriptions of the carburetor and of the design and construction of the engine itself are contained in our original article on the Webra 61—see December 1967 issue of M.A.N.

Two samples of the Blackhead 61 were submitted by the factory for review. They had received no more than a brief factory check but compression was really excellent on both engines, giving virtually instantaneous starting straight out of the box. Neither engine appeared to be in need of much break-in time and could probably have been safely operated almost immediately in a leaned out condition.



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