

This Auster Bushmaster features many interesting modifications and is an all-round improvement on original Autocar.

The Auster Bushmaster

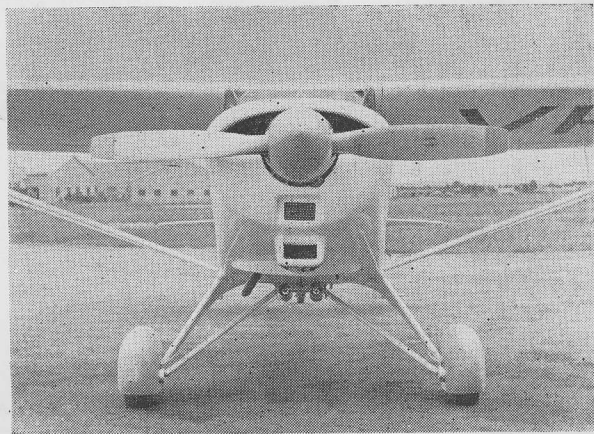
Conversion details and handling characteristics are assessed here by Keith Robey.

FOLLOWING the successful conversion of an Auster agricultural Autocar to take the 225 hp Continental 0-470 engine (see February issue of AIRCRAFT) a second conversion of the Autocar has emerged from Kingsford Smith Aviation Services' Bankstown workshop. This aircraft, now known as the KSAS Auster Bushmaster, is powered by a 180 hp Lycoming 0-360 engine driving a Hartzell constant speed propeller and features a number of interesting modifications to the standard airframe.

The Bushmaster conversion has been designed by KSAS to cater for the needs of the Autocar private owner or charter operator wishing to modernise and improve the performance of his aircraft. It is felt that the 225 hp Continental conversion will mainly appeal to the agricultural operator and that the 180 hp Lycoming will offer a better combination of economy and performance where load lifting capabilities are not of prime importance.

Auster Autocar VH-KCD was originally powered by a 155 hp Cirrus Major III engine, the aircraft being purchased new by a NSW private owner, Mr W. A. Davey, of Cobar. Prior to its conversion to the Bushmaster configuration it had flown a total of 700 hours. Since conversion VH-KCD has been re-registered in Class 3 and is now used by Mr Davey as a charter aircraft.

Installation of the Lycoming 0-360 engine in the Autocar airframe proved more complicated than that of the



The 180 hp Lycoming-Hartzell CP installation enhances appearance and performance, as do the streamlined spats.

larger Continental 0-470 previously described in AIRCRAFT. The new engine mounting frame attaches to the existing fuselage fittings and terminates in an inclined circular section at the dynafocal engine mount pick-up points. Comparative weights of the Cirrus Major III and Lycoming 0-360 engines are 345 lb. and 285 lb. respectively and it was therefore necessary to place the new engine well forward to achieve the necessary balance. This requirement has given the Bushmaster a slightly extended nose and as the engine thrust line has been lowered to provide a sloping cowl line and full forward vision the appearance of the aircraft has changed considerably.

A large spinner has been fitted to cover the hub of the constant speed propeller and this feature adds to the attractive lines of the new configuration. Electric starter, generator, engine exhaust muffler and a full flow oil cooler are fitted and provision has been made for hot air for carburettor and cabin heating. The Lycoming 0-360 engine is neatly enclosed in snugly fitting fibre glass cowlings. The main engine cowling is of semi cantilever construction and is attached at the front door frame and firewall only. This form of cowling gives exceptionally clean lines from the cabin forward and permits the engine to move freely on its mounting independently of cowling attachment. The new cowlings permit easy access to the engine for servicing and hinged duralumin doors have been provided at appropriate locations to ensure that access at important points can be obtained without the removal of the main cowlings. The electrical system is 12V and a 55 amp. hour battery is fitted on a convenient quick release mounting attached to the engine firewall.

The main undercarriage has been slightly modified and is now equipped with Goodyear Hydraulic disc brakes which are actuated by means of toe pedals. The pedals are of similar design to those in use in the various models of Cessnas and actuate individual hydraulic master cylinders which control each brake unit. The parking brake is operated by means of a push-pull knob on the instrument panel in conformity with common American practice. The hydraulic brakes provide much more effective braking and it is claimed that they remain equally efficient when wet.

The original tailwheel unit has been replaced by a fully castoring and steerable Scatt pneumatic tailwheel of a similar type to that fitted to the Cessna 180. The new tailwheel unit lifts the tail of the Auster slightly and the resulting change in attitude assists in providing better forward vision while taxiing.

The main wheels and brake units are enclosed in streamlined moulded fibre glass spats which greatly enhance the appearance of the aircraft and improve performance slightly. The spats are fabricated in the form of a rigid shell and do not require any form of internal bracing. They are extremely light but will withstand the full weight of a heavy person without distortion.

The Bushmaster is equipped with a completely redesigned instrument panel and modern push-pull type throttle and pitch controls. The instrument panel is of more attractive appearance than the original Auster panel and features a full blind flying layout which is located to the left of the panel in front of the pilot. Engine

instruments are in the centre and electrical and radio controls on the right. A SunAir H/F radio fits neatly into the main instrument panel, and a loud speaker is fitted in the cabin roof where the trailing aerial controls are also located.

The magneto switches are of the key operated type and, together with mixture, carburettor heat and cabin heat controls, are located on the centre instrument panel adjacent to the throttle and pitch controls. The parking brake is operated in the familiar American fashion by a knob on the instrument panel which is pulled out when the toe brake pedals are depressed.

Interior trim on VH-KCD remains almost standard and only small modifications have been made to windows and doors to keep out draughts and noise. It is planned at a later date to install precut soundproofing cells behind the scuttle and firewall, but at the time of my flight this work had not been carried out.

General handling characteristics of VH-KCD in its new Bushmaster configuration are similar to those of the 225 hp Continental powered Autocar described in our February issue, although performance is of course slightly inferior. Starting up procedure follows normal Lycoming practice, except that no priming pump is fitted and the engine is primed for a cold start by pumping the throttle. No priming is required if the engine is warm. Taxying is easier in the Bushmaster than in the standard Autocar, the toe brakes are effective and easy to use and together with the steerable tailwheel give good directional control. The low nose and slightly more tail high attitude have improved forward visibility while taxying to a very satisfactory degree.

On takeoff acceleration is rapid and the swing, which is noticeable but easily checked with rudder, to the left instead of the right. With two up and full tanks the initial rate of climb at full throttle was approximately 900 ft./min. while climbing at an IAS of 60k. Official DCA performance tests have disclosed that best rate of climb speed for the Bushmaster is 60k. with flap retracted and best angle of climb speed 48k. with takeoff flap extended.

Cruising at 1500 feet the Bushmaster indicated 105k. at a high cruise power setting of 25 in. x 2450 revs and at economical cruise power 23 in. x 2300 revs (65% power), 95k. Fuel consumption at this power setting is 7 gal./hr. Noise level in VH-KCD is higher than one might have

expected, but the addition of the sound proofing planned for this aircraft and all subsequent conversions will undoubtedly result in an improvement. The Bushmaster flies level in quite a nose down attitude and forward visibility over the new low nose is much better. Aileron control on VH-KCD at the higher speeds at which the aircraft now cruises is heavier than it was originally, but it is planned to correct this at a later date by fitting the newer double slotted ailerons found on the later series Autocars.

Stalling characteristics remain practically unchanged and with engine off and flaps up the stall occurred at an IAS of 34k. In the powered approach configuration with full flap and power set at 15 in. the Bushmaster stalled at an IAS of 22k. With full flap and power the port wing dropped quite sharply but normal recovery action resulted in full control being regained with little loss of height. Position error at the low end of the speed range is approximately 8-10k. and corrected stalling speeds for the Bushmaster, as with other marks of Auster, would be approximately that much higher.

Approach characteristics are little different from those of the standard Autocar, except a slightly improved view of the ground and the illusion of a steeper angle of descent, due to the lower nose position. The actual landing remains unchanged and there is no difficulty in effecting a three pointer even with the rear seats unoccupied.

The maximum permissible all up weight of the Bushmaster remains the same as for the standard Autocar, 2450 lb., but the empty weight of VH-KCD after conversion is approximately 40 lb. lighter than before. Considering the additional equipment which has been added, such as radio, constant speed propeller, spinner, spats, etc., it must be agreed that the final result is most satisfactory.

The Bushmaster conversion scheme represents an effective effort to modernise the Autocar which in past years has established itself a reputation as a reliable, economical workhorse capable of earning the small operator a reasonable margin of profit without a large capital outlay. The last issue of the Australian Aircraft Register listed 48 of these aircraft in service in Australia and the potential market for the Bushmaster conversion would appear promising. Kingsford Smith Aviation Services quote £2165 as a firm price for the conversion of a standard Auster Autocar in average condition to the new Bushmaster configuration. **END.**



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