

## BRONZE ROCKER BOX

### FITS CAST IRON SQUARE FOUR ENGINE



These pictures are of a bronze rocker box that fits cast iron Square 4 engines. These rocker boxes were made before WWII for the South Australian or Victorian Police bikes to combat the oil leaking problems around the push rod guide tubes that the alloy rocker boxes suffer. The main problem with the alloy on cast iron head is the different expansion rate, plus the alloy is prone to cracking (particularly when removing valve guides) and is more susceptible to cracking through thermal cycling with age. Although bronze has a greater expansion rate than cast iron, bronze was the preferred material because of its lower heat capacity and is considerably tougher than cast iron. This example is nickel plated but bronze may also be zinc plated. High temperature o-rings can be used in lieu of paper gaskets to achieve a better seal (push rod guide tubes may need to be opened slightly with a tapered drift to prevent damage to o-rings when mating the box to the head). The added 'ears' on the outside of the rocker box enables much firmer attachment to the head via head bolts and does not rely on fixing by valve guides as does the alloy rocker box. The larger flat base around the valve guide and head/rocker bolt holes allows for better sealing using Viton o-rings.

Unfortunately, only a small quantity was made and the whereabouts of the original pattern is unknown. The Secretary of the Australian Ariel Register (AAR) is arranging to have a new pattern made for casting in CX3 bronze and machined to finish as per the picture example. Bronze may be zinc plated to resemble the original alloy box. The pictured rocker box will be at the Euroa Rally for interested persons to examine.

Cost per item is dependent on the number boxes made. Production costs for casting and machining (not including tooling costs or plating) has been quoted as \$352 per box (including GST), for a minimum quantity of 10. Set-up cost for tooling (pattern, special drills and supporting jigs) has been quoted as \$4290 (including GST). The more items made, the lower the cost will be per item.

Anyone interested in replacing their alloy rocker box with a bronze rocker box should contact Col Hill, Secretary AAR by e-mail at [secretary@australian-ariel-register.com](mailto:secretary@australian-ariel-register.com).