

# “Australian Hydrolastic Displacers”

by Tony Cripps

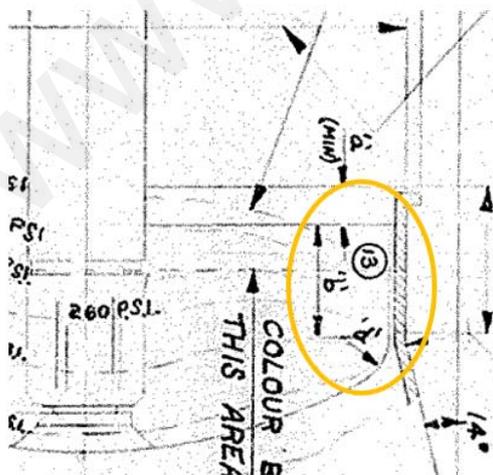
One of the more unique features of BMC vehicles of the mid-sixties is the hydrolastic suspension system developed by Alex Moulton.

This type of suspension was introduced in Australia in 1964 for YDO16 Morris 1100 and was carried over to the Mini range in 1965, and also the Austin 1800/Tasman/Kimberley. It was phased out in 1973 with the introduction of the Leyland Mini. In Australia, the hydrolastic units were manufactured by Dunlop.

It should be realised that although the movement of the suspension causes fluid to be displaced within the unit from the lower chamber to the upper chamber, and vice versa, the actual springing medium is the rubber cone insert just as in the case of the dry suspension fitted to ADO15.

The damping and rubber characteristics are tuned for each application. Identification of particular specification is usually made by painted bands on the outside of the unit which are easily seen (when new), but somewhat difficult to find in more modern times. Part numbers stamped into the casing can also be used in some cases to identify specifications. The coloured bands may be either near the top outside edge, or near the circumferential swage towards the middle.

In this article, for the Mini range, we refer to distance  $b$  as that measured from the edge of the mould line of the rubber at the top inside of the unit to the centre point of the blend radius  $d$  with the rubber spring (in the unpressurised condition) as shown in Fig. 1. Although internally there are different specifications for the flap valve bleed diameters, the units cannot be dismantled for inspection and the distance  $d$  and the coloured bands are probably the only external means of identification available.



**Fig. 1** Hydrolastic unit detail showing distance  $b$ , 21A1477.

Drawings show that Australian-made hydrolastic units have a different shape to the upper spring surface to those with UK part numbers, the former having a pronounced raised portion near the hose attachment.

## 1. ADO16 Morris 1100

For both front and rear suspension, hydrolastic unit AYG4076A is specified for YDO16. This is identified by a green spot. It has a nominal 6" diameter. The same displacer (but with different hose connection) is used for the rear of Austin 1800 models.

## 2. YDO5/YDO22 Morris Mini

YDO5 uses the same displacer unit front and rear, and is specified as 21A1703 (no band), 21A1477 (no band) and then 21A1804 (AYA4090) (from YMA2S2 16758) with single orange (white) band, all with distance  $b = 0.77$ " for both front and rear displacers. The displacer has an outside diameter of 4.84".

## 3. YDO6/YDO23 Morris Cooper S, Morris Mini Clubman GT

Several hydrolastic spring units are specified for the front suspension of YDO6, those being 21A1705 (single yellow band), 21A1811 (twin orange band), 21A1872 (single blue band), 21A2012 (single silver band), and 21A2010 (twin green bands) as well as AYG4113 (single brown band). All differ from that used in YDO5. The outside diameter is 4.84".

Part No.	Identification Bands	Distance (b) (inches)	Change Point
<b>Front</b>			
21A1705	Single yellow	0.77	To YKG2S2 1219
21A1811	Twin orange	0.77	YKG2S2 1220 – YKG2S2 1917
21A1872	Single blue	0.47	YKG2S2 1918 - YKG2S2 3716
21A2012 or AYG4113	Single silver Brown	0.47	YKG2S2 1317 on
21A2010	Twin green	0.77	
<b>Rear</b>			
21A1705	Single yellow	0.77	To YKG2S2 1219
21A1811	Twin orange	0.77	YKG2S2 1220 – YKG2S2 1917
21A1874	Twin blue	0.41	YKG2S2 1918 - YKG2S2 3716
21A2014 or AYG7061	Twin silver Brown	0.41	YKG2S2 1317 on

**Table 1** YDO6 displacer details, 21A1477.

## 4. ADO17/YDO13/YDO19 Austin 1800, Austin Tasman/Kimberley

The displacer for the rear suspension for the Austin 1800 range differs from that of the front for the saloon models. The 6" rear displacer is AYG4076A (same as Morris 1100) up to MKII models YAHS5 8944 and AYH7195 (identified with a yellow dot) thereafter. These are equivalent to UK parts 47H9543. For Tasman/Kimberley, the rear displacer unit AYB7107 is specified. This is similar to ADO17 but with a different bump/rebound characteristic and is identified by an orange spot.

For the front suspension, 6 ½" displacer unit 11H1128 is specified for Austin 1800 MKI models, and 11H1887 for MKII models (same as AYH4194 as used for Tasman/Kimberley), either of which can be replaced by 11H2158. The same displacer is used on the rear suspension for Austin 1800 utility

models. For the Tasman/Kimberley range, the front 6 ½" displacer units are AYH4194. Displacers are identified by an orange spot.

## 5. Hose Data

A final word should be made about the hydrolastic hoses. Hoses can be replaced, but it is important to do so with a high pressure hydraulic fitting, not crimped dog-eared clips or screwed clamps. The hoses are of single braid type, and it is important not to replace hoses with those overly stiff. The hoses are required to bend in an arc when fitted and if overly-stiff hoses are used, they are likely to put undue strain on the fittings at either end or may chafe on other surfaces.

For the Mini range, the hose connection has 5/8 x 18 UNF thread for connection to the interconnecting bundy pipes. The hose has OD 0.680-0.710" and ID 0.365 – 0.380". The recommended minimum working bend radius is 2.5" and minimum burst pressure of 2000 psi.

For ADO16 and ADO17, the drawing indicates a hose connection with ¾ x 16 UNF thread. The recommended minimum working bend radius is 2.5". The hose is rated with a minimum burst pressure of 2000 psi, OD 0.870 – 0.900" and ID 0.5209 – 0.535".

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