Vehicle Engineering Series

LEYLAND MINI

1973 - 1978

Tony Cripps

Contents

Chapter 1. Introduction

1.1 History

Despite the market acceptance of the Morris Mini Clubman, introduced in 1971, Leyland Australia was facing stiff competition from Japanese cars which were generally better equipped with showroom-friendly features such as a radio, heater, rear window demister, carpets and the like. The days of vinyl flooring on a deluxe model were over. The Morris Mini Clubman GT was selling in low numbers, and unlikely to meet up-coming exhaust emissions regulations. A change was needed for Mini to remain competitive.

In June 1972, it was proposed that the existing three-car lineup, Morris Mini Clubman Standard, Morris Mini Deluxe and Morris Mini Clubman GT would be reduced to a two-car range (plus Van). Originally, the proposal was to keep the Clubman name and so the new lineup would consist of:

Mini Clubman

- Change from hydrolastic to rubber cone suspension
- Rod change gearshift
- Colour keyed carpets
- Sewn trim (in lieu of welded seams)
- Folding squab front seat frame
- 3.44:1 final drive ratio

Mini Clubman Super: As above and in addition:

- 3 pack instrument panel
- Radio
- Ro-Style wheels
- Mudguard flares
- Radial tyres
- Colour-keyed interior paint on exposed metal surfaces
- Metallic external paint
- GT grille panel

Mini-Van

- Rod gearshift with remove vertical gear change lever
- Twin pack instrument panel
- Carpets

Not all the above were implemented at first with early build models using up stock of older style seats and floor mats in the case of Van. Hydrolastic suspension would be phased out as a running change during 1973.

The Company had changed its name from The British Leyland Motor Corporation of Australia to the Leyland Motor Corporation of Australia in March 1972. The change in model then was an opportunity to introduce the Leyland marque to the passenger vehicle range which would be carried across to the Marina, and the up-coming P76. The Clubman name was thus discontinued.

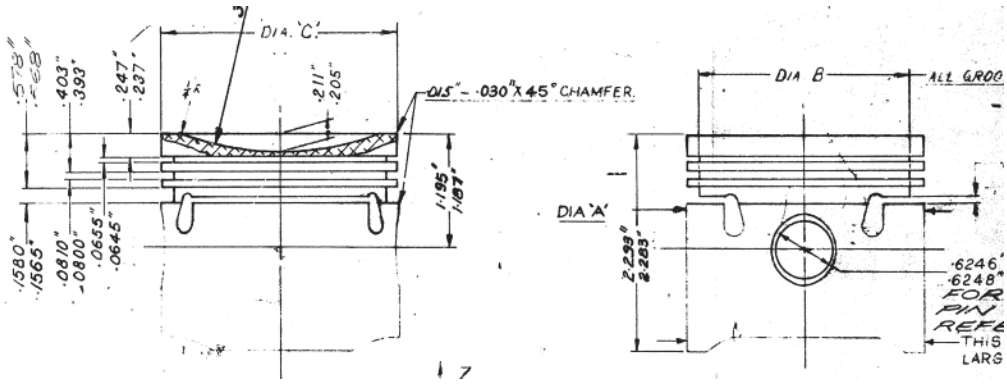


Fig. 2.2.1.1 *Piston – standard size shown AYG297.*

The volume of the piston cavity is calculated to be 6.7cc.

The weight of each piston is closely controlled:

Size	Finished weight
STD	197-190g
0.020	206-198g
0.030	209-202g
0.040	213-206g

Table 2.2.1.1 *Finished weight of piston*.

Pistons 12A673 for 998cc are of a three-ring design, solid skirt.[1] The volume of the piston cavity is 5.69cc. Although the radius of the piston cavity for both 1098cc and 998cc is the same at 3", the distance from the bottom of the cavity to the top of the piston for 1098cc is 0.21" whereas for 998cc it is 0.194".

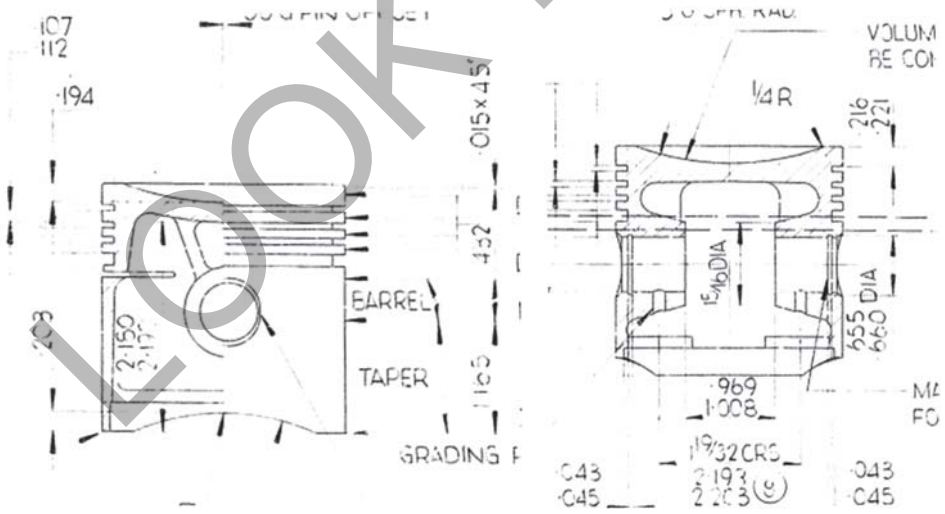


Fig. 2.2.1.2 *Piston – standard size shown 12A673.*

Gudgeon pins AYG208 are pressed into the connecting rods and held in the pistons via circlips AYG230.

[1] In 1981, new pistons ADU3922 with improved oil control ring were made available for cases where excessive oil consumption was reported.

The primary gear oil seal 13H150 (13H2934) is the same as that fitted to 1098cc.

Crankshaft primary gear DAM9290 29T is fitted to upgraded transmission[3] and is fitted with Deva bushes 22G770 and 22G109.

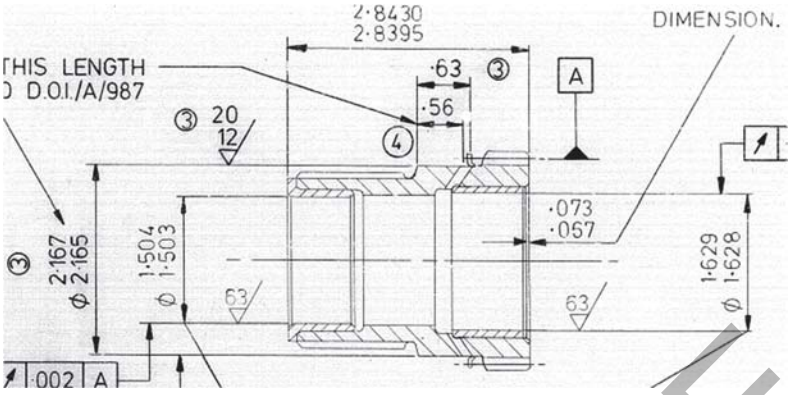
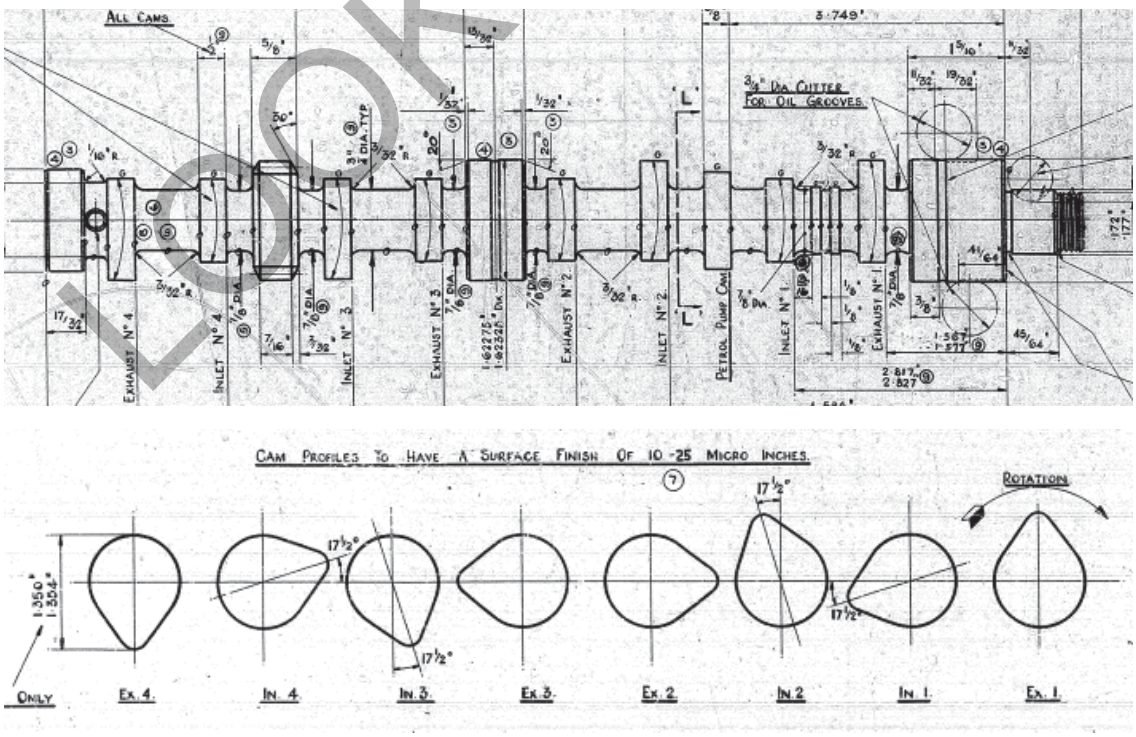


Fig. 2.4.2.6 *Primary gear DAM2920.*

2.5 Camshaft

The single-row chain-driven camshaft 8G712 (998cc), AEA630 (1098cc) and AEG523 (1275cc) runs in the block casting via the tin based bi-metal bearings 28G133 for 998 and 1098cc, and 8G2392 for 1275cc.

The camshaft has two partially machined grooves axially along its front bearing surface. The front groove supplies oil to the thrust surface of the sprocket, while the rear slot provides a pulsed supply of oil to a gallery which feeds the rocker gear. It is important that the bearing be fitted with the slot and the hole in their correct positions so that oil feed to the cylinder head gallery occurs intermittently as the axial groove passes the hole in the bearing.



[3] 99H889AJ 3826, 12H879U 2715, 12H902U onwards.

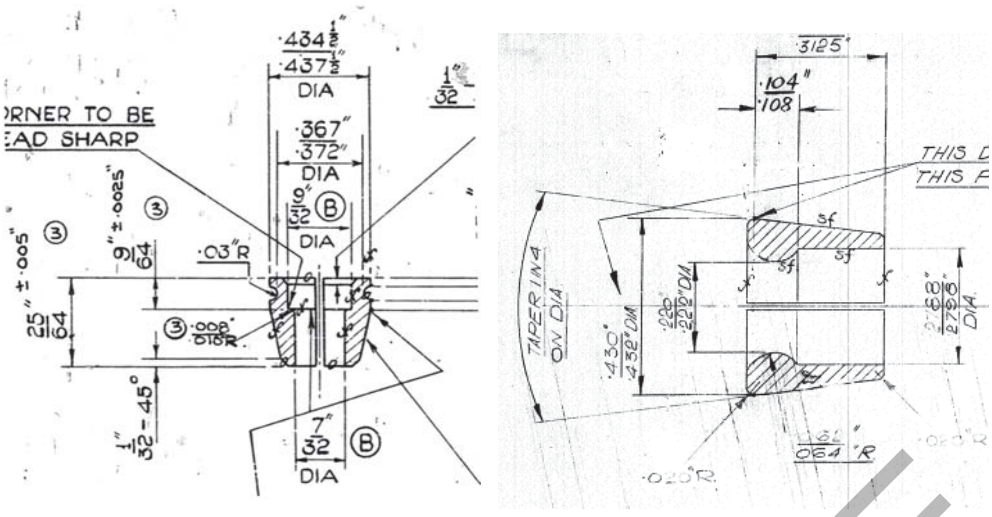


Fig. 2.8.3.6 *Valve collet 2A11 and 12G2197.*

2.8.4 Valve Rocker Cover

For 1098cc, the valve rocker cover AYG253 has an oil filler at the top and a non-vented polypropylene cap 12A402. There is an oil separator AYG112 in the rocker cover.

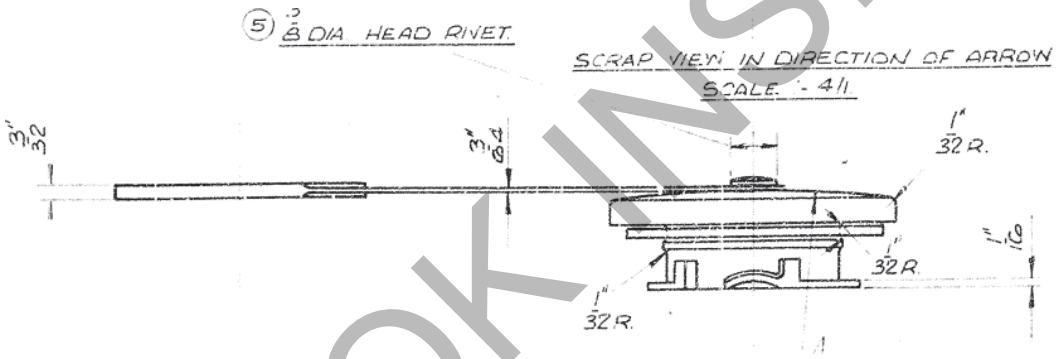


Fig. 2.8.4.1 *Oil filler cap non-vented 12A402.*

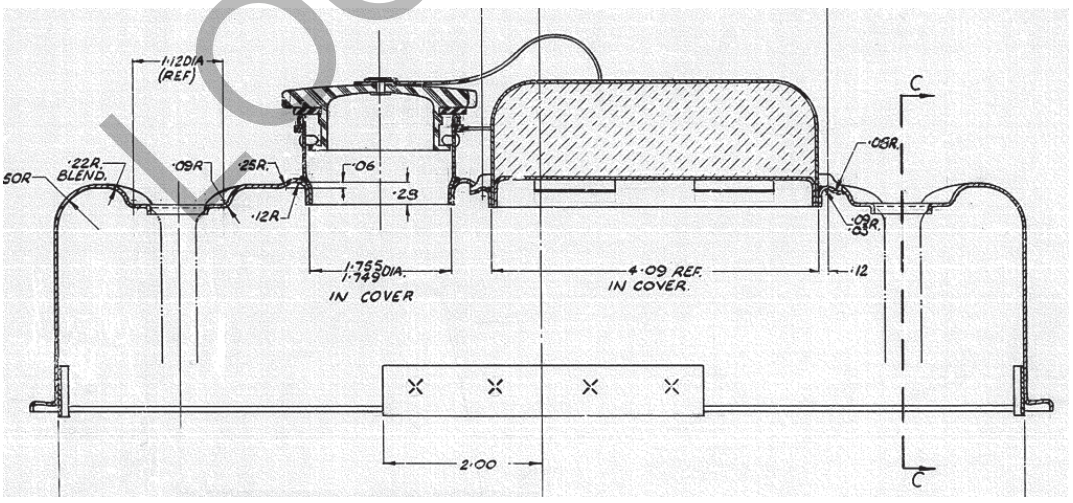


Fig. 2.8.4.2 *Valve rocker cover AYG529 (AYG109).*

The water pump seal AYD303 has a steel backing.

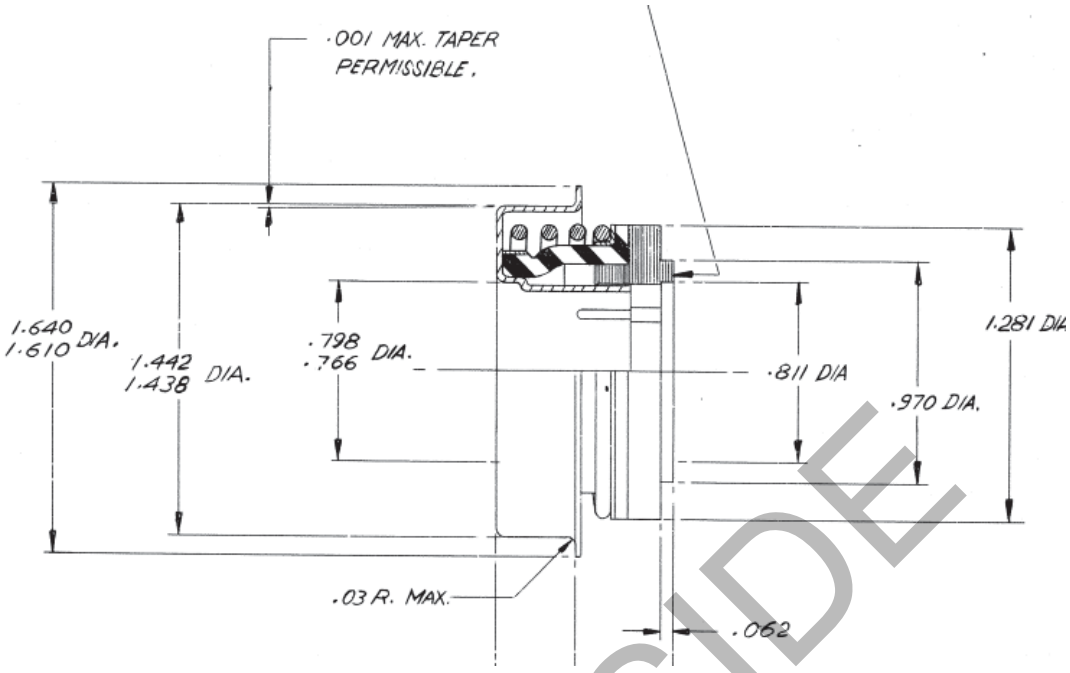


Fig. 2.14.1.4 *Water pump seal AYD303.*

Water pump GWP132 is specified for 998cc from 1977 and has an alloy body. GWP134 is specified for 1275cc and has a larger impeller.

2.14.2 Fan Pulley

The water pump shaft is connected to the pressed steel fan pulley 2A601 of outer diameter 3 7/8" via flange AYG25. The thread in the flange is ¼" 28 TPI UNF.

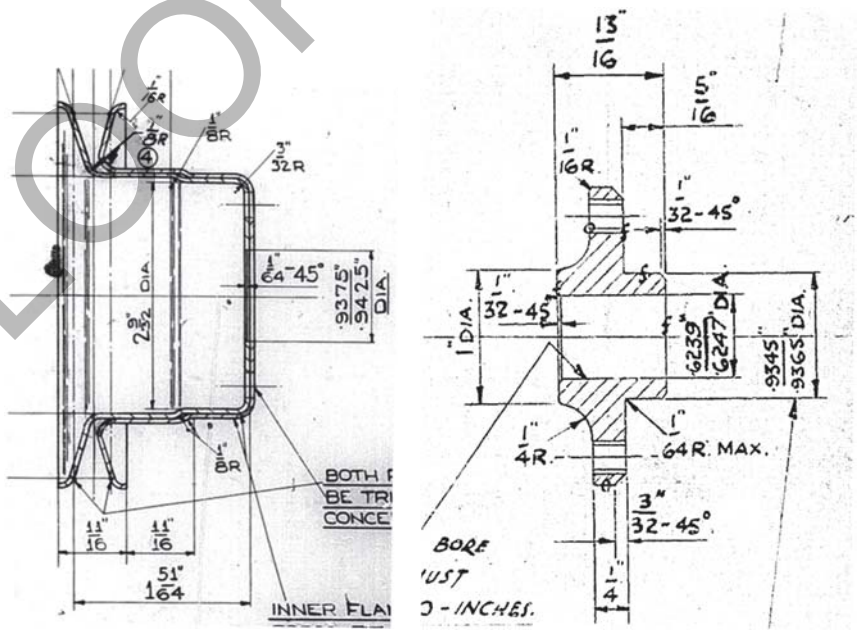


Fig. 2.14.2.1 *Fan pulley 2A601 and flange AYG25.*

A bobbin type mounting AYG3208 at the very rear. AYG3208 is identical to the previously used AYA2070 but has a longer stud length.

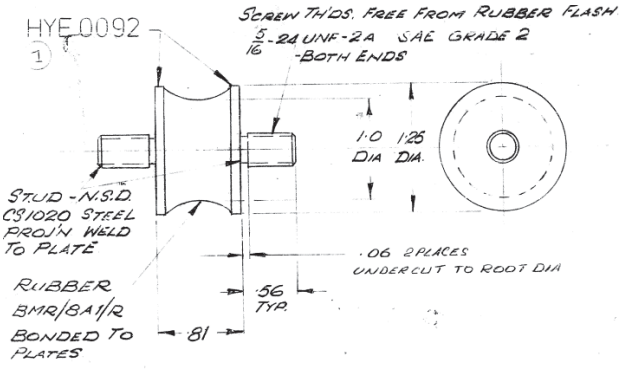


Fig. 2.18.24 *Exhaust mounting AYG3208.*

This attaches to the tail pipe via clip AYA2274 and strap or AYA2212 (998cc) AYG2402 and strap (1275cc).

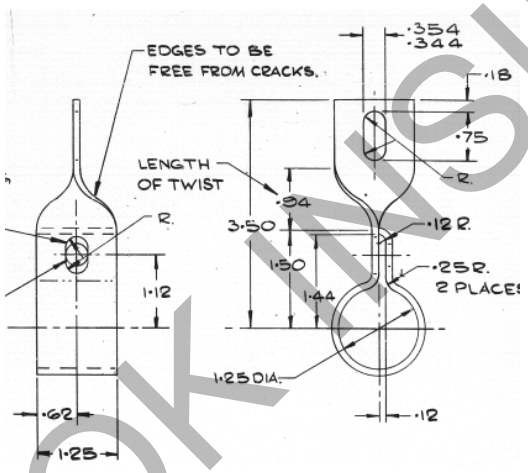


Fig. 2.18.25 *Clip AYA2212.*

2.19 Engine Mountings

The engine is mounted on two rubber bonded steel-backed mountings 21A1902 on the right and left-hand side of the power unit.

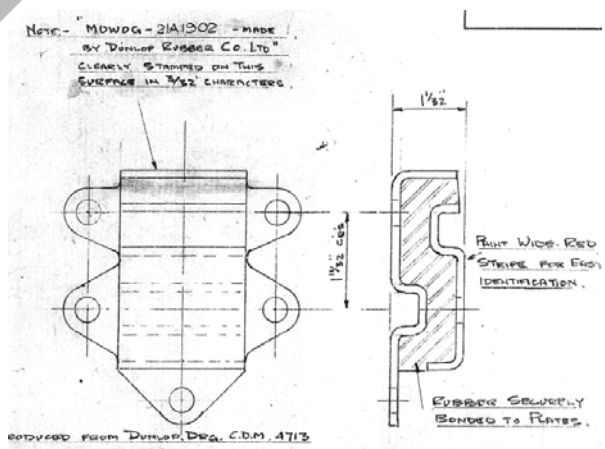


Fig. 2.19.1 *Engine mounting 21A1902.*

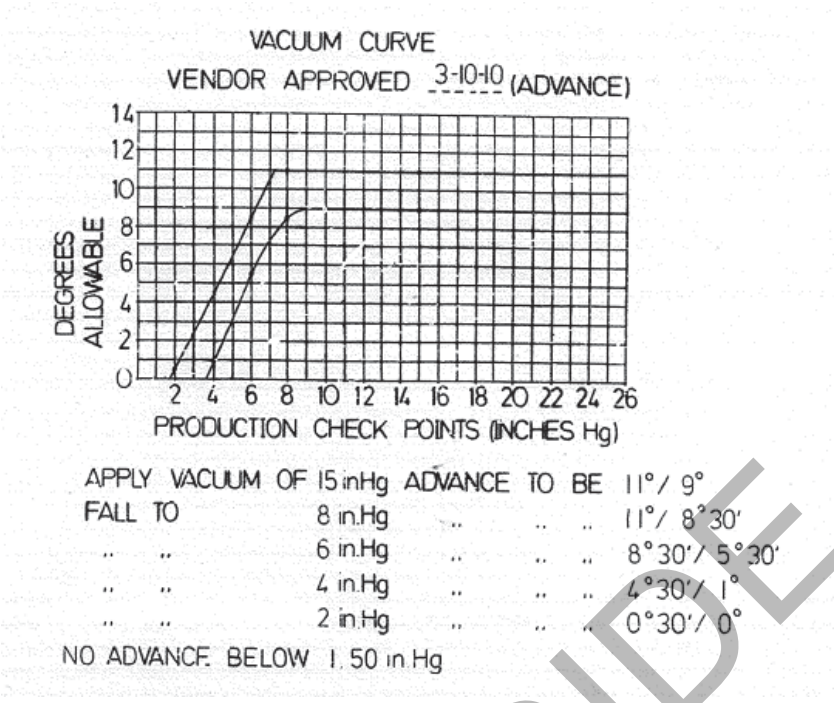


Fig. 3.1.3 *Vacuum advance AAU9143.*

3.2 Vacuum Control

For 1098cc, 29D4 distributor employs a semi-rigid low pressure nylon tube AYA144 (AYH2140) 20” long with a rubber connector AYA2132 at the distributor end.

For 998cc and 1275cc, the vacuum pipe AEA579 id 1/8” bundy tube with an olive and nut 6K650 5/16” 24 ANF and connection rubber 12B2062.

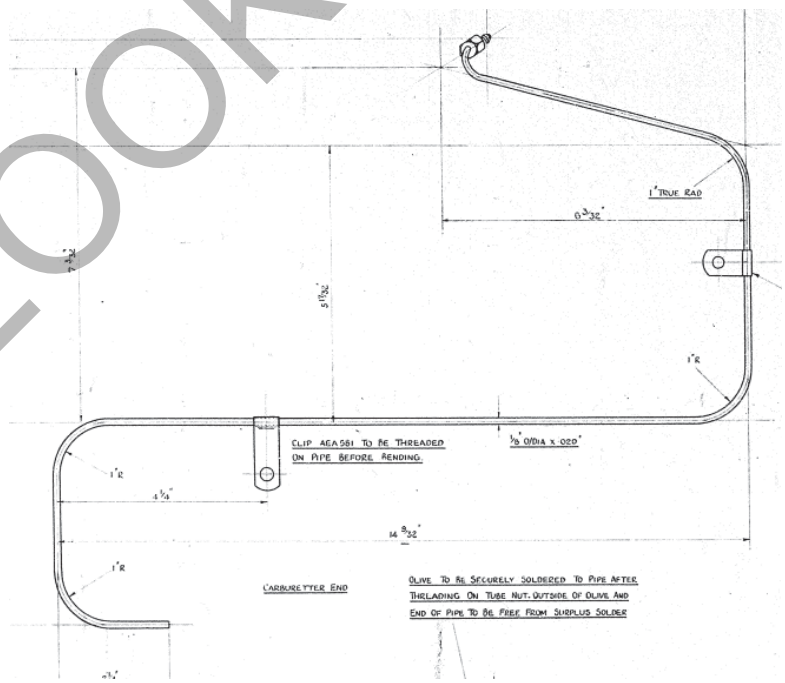


Fig. 3.2.1 *Vacuum advance tube AEA579.*

The volume of unrecorded fuel at the bottom of the tank is 0.47 gallons and 0.6 gallons at the top. The tank sender unit is sealed by a 0.093" nitrile rubber sealing washer.

5.1.2 Fuel Tank ADR27A 998cc 1275cc

Upon the introduction of ADR27A, the fuel system was designed to limit the amount of evaporative emissions from the fuel tank AYG2321 and the carburetter[19]. This involved a change of fuel tank and piping with the tank now having a fuel vapour pipe at the filler neck and all venting passed through a charcoal cannister mounted in the engine bay.

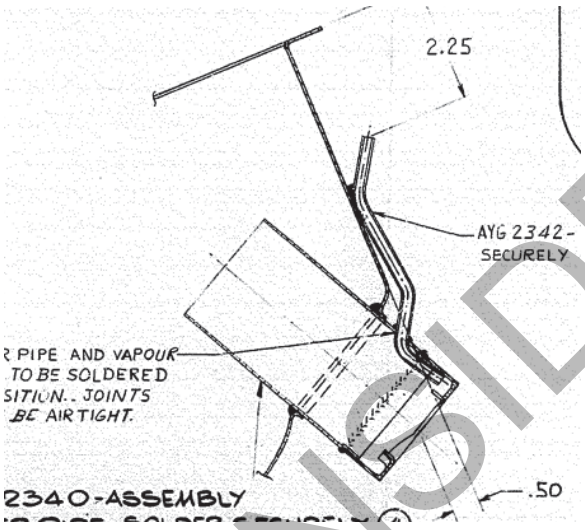


Fig. 5.1.2.1 *Vapour pipe in filler neck AYG2321 (AYG2339)*.

Filler cap AYG2343 has a pressure release valve designed to vent the fuel tank in the event of pressure within reaching between 0.73 and 1.23 psi. The filler cap for the Mini Van has a bar across the upper surface to assist in fitment.

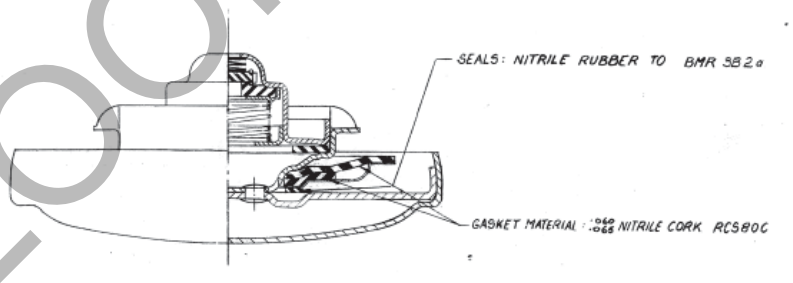


Fig. 5.1.2.2 *Fuel tank filler cap AYG2343*.

The adsorption cannister FAM1389 is mounted in the engine compartment. It consists of a filer bed of activated charcoal with an enclosed space above and below. The vent pipes from the carburetter and fuel tank, as well as the purge line, are connected to the upper space. The lower space is vented to atmosphere.

Vapour vented to the cannister is adsorbed by the charcoal when the engine is not running. When the engine is running, crankcase depression purges the cannister by drawing in filtered air through the charcoal bed into the rocker cover through a 0.089" restrictor. Running

[19] Introduced at Saloon Car No. 13042 and Van Car No. 4222 with some earlier fitments to 12213, 12214, 12241 YDO21 Saloon and 12242 12272 12273 YDO22 Saloon. C26/74

7.1.2 Idler Gear

Idler gear 22G943[32] 31T runs in needle roller bearings 22G788 with ID 0.75" OD 1.0625" (1 1/16").

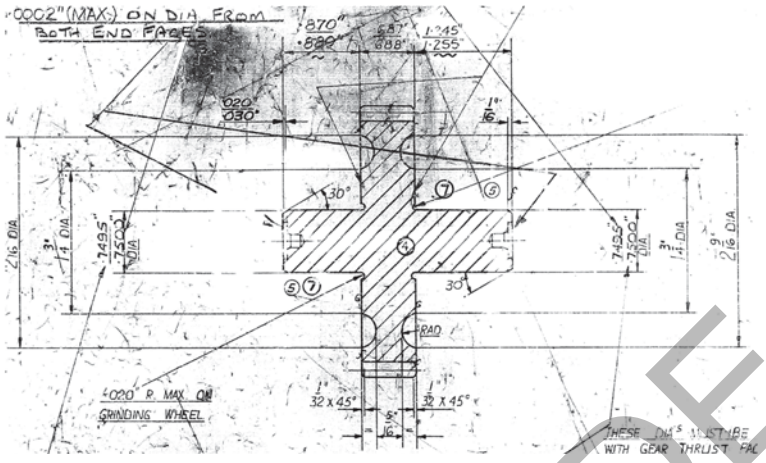


Fig. 7.1.2.1 *Idler gear 22G943.*

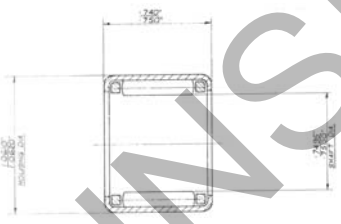


Fig. 7.1.2.2 *Idler gear bearing 22G788.*

Late model vehicles[33] use idler gear DAM2924 37T with larger spigot is used with AAU5128 roller bearing.

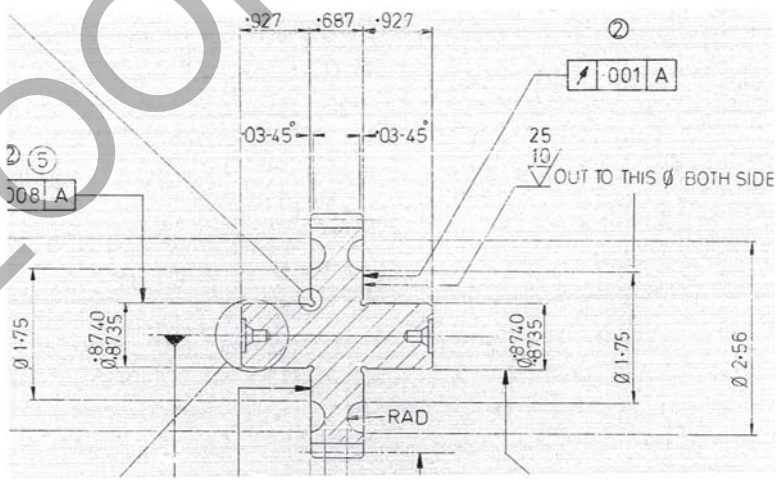


Fig. 7.1.2.3 *Idler gear DAM2924.*

[32] Workshop Manual TP832A states that the 4-speed synchromesh transmission is fitted with an idler gear of a larger diameter spigot in conjunction with the larger diameter needle roller bearings 13H7848, but the drawing for 13H7848 shows an ID of 19.05mm (0.75") which is the same as that as specified for the 3-speed transmission. Both transmissions use 31T idler gear 22G943 of 0.75" spigot diameter.

[33] 99H889AJ 3826 99H905AJ 3826 12H879U 1715 12H902U on

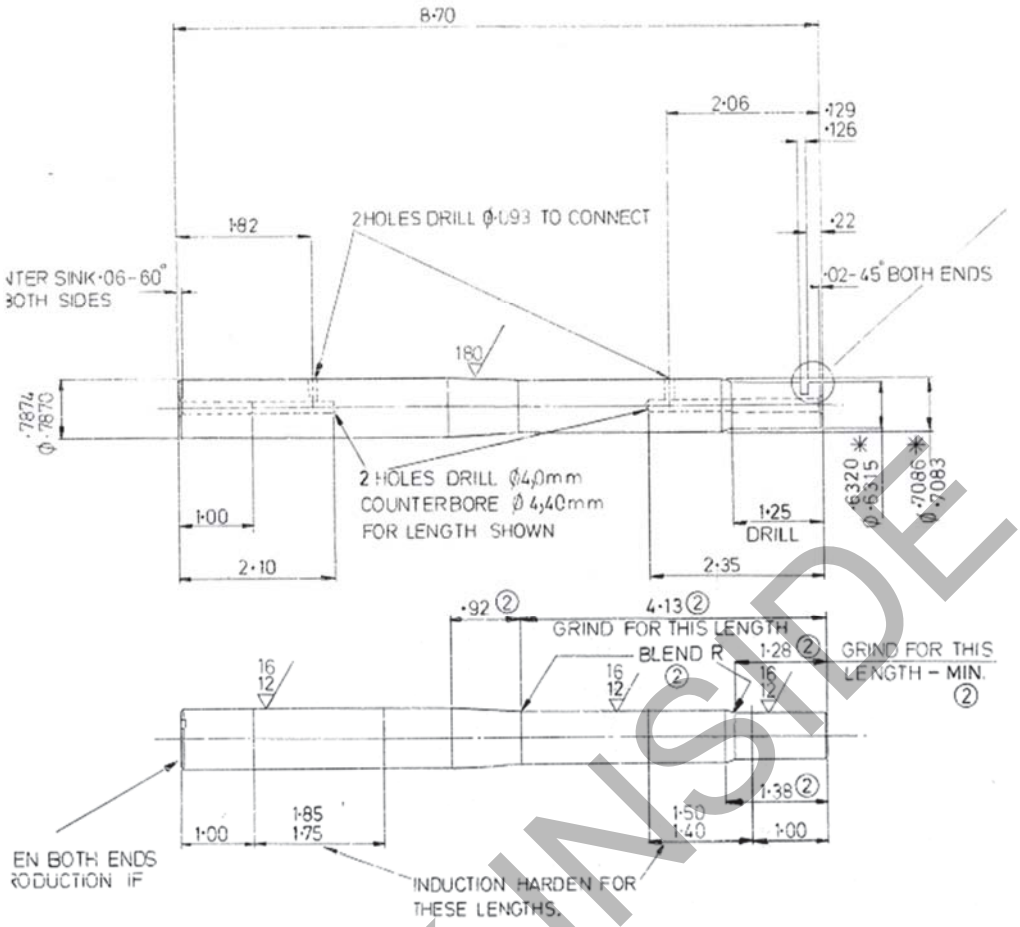


Fig. 7.1.3.2.4 Layshaft DAM3187.

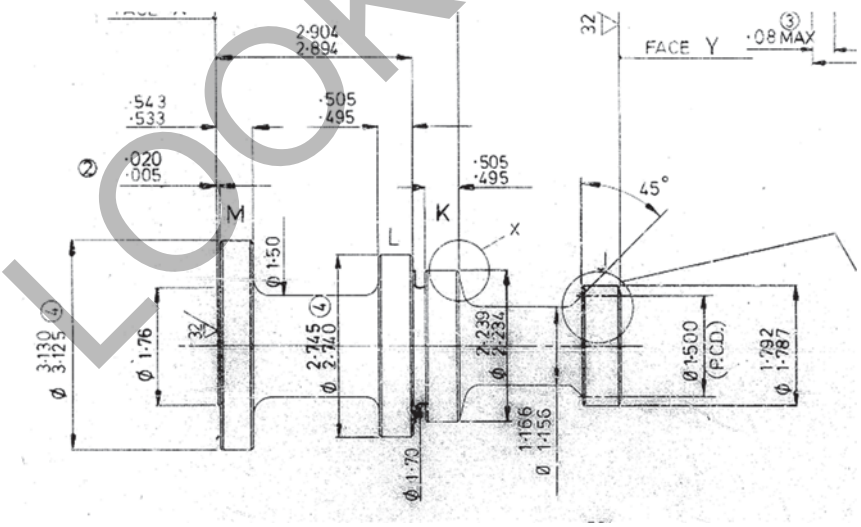


Fig. 7.1.3.2.5 Laygear DAM3169.

	Gear	Teeth	Laygear Mating teeth
22G1096	1st/Rev	31/17	15
22G1094	2nd speed	26	20
22G1095	3rd speed	21	25
22G849	Input	17	29

Table 7.1.3.1 *Teeth on each gear*.

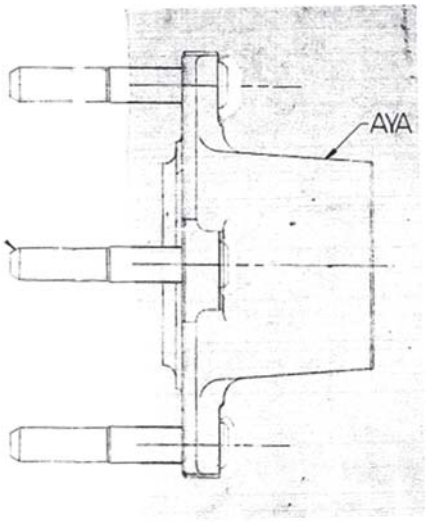


Fig. 8.1.15 *Hub assembly Leyland Mini S AYG7065.*

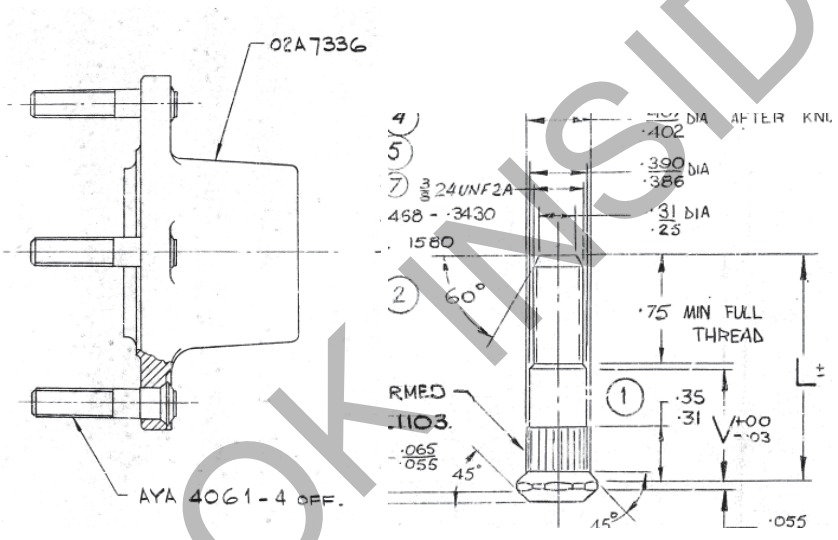


Fig. 8.1.16 *Hub assembly Leyland Mini SS and Leyland Mini LS AYG7065 and wheel bolt AYA4061.*

The hubs rotate on two identical 14LJT 7/8 ball bearings. The bearings are separated by a spacer 2A7354 which provides the correct preload.

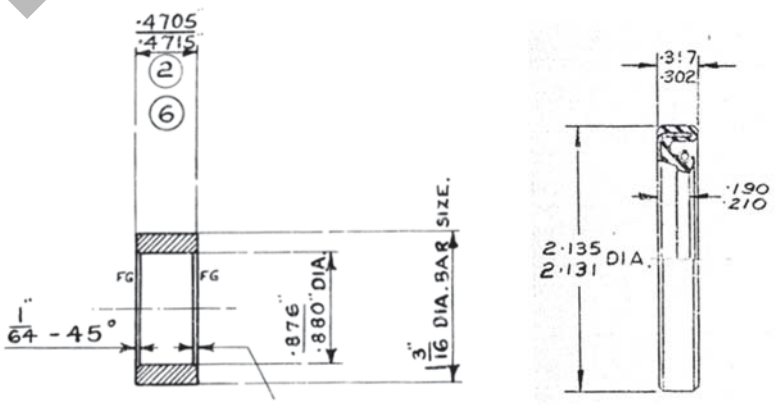


Fig. 8.1.17 *Bearing space rear hub 2A7354 and seal AYA4018.*

For 1275cc, the drive shaft is secured by collar BTA243 and nut BTA249 7/8” 14 UNF.

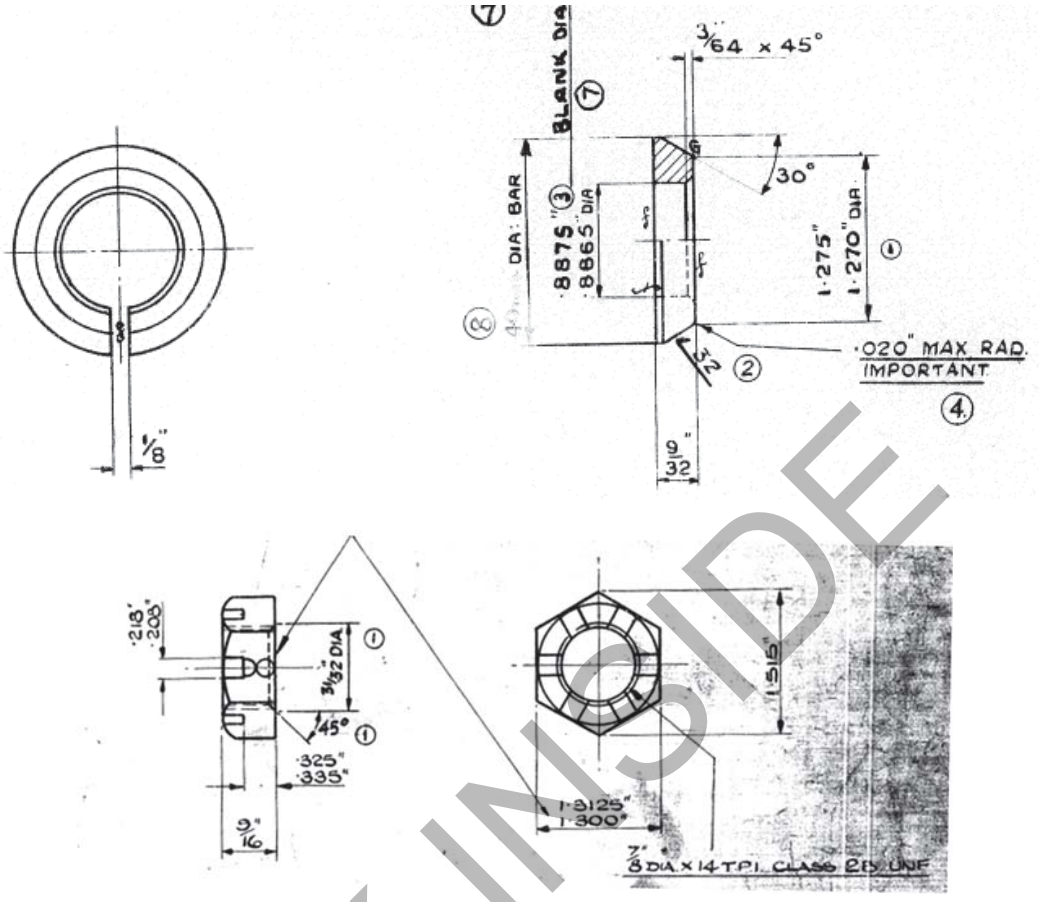


Fig. 10.2.7 *Collar BTA243 and nut 1275cc BTA249.*

The upper and lower swivel ball joints are secured by forged retainers 21A616 of 1 ½” AF with 1 1/8” UNF 20 TPI thread with hardened surfaces.

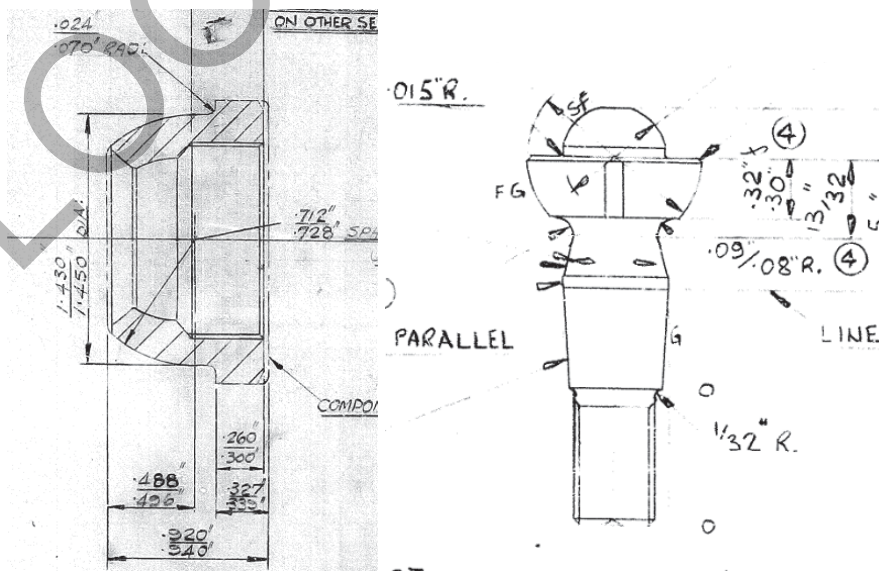


Fig. 10.2.8 *Swivel hub ball joint retainers 21A616 and ball pin BTA445.*

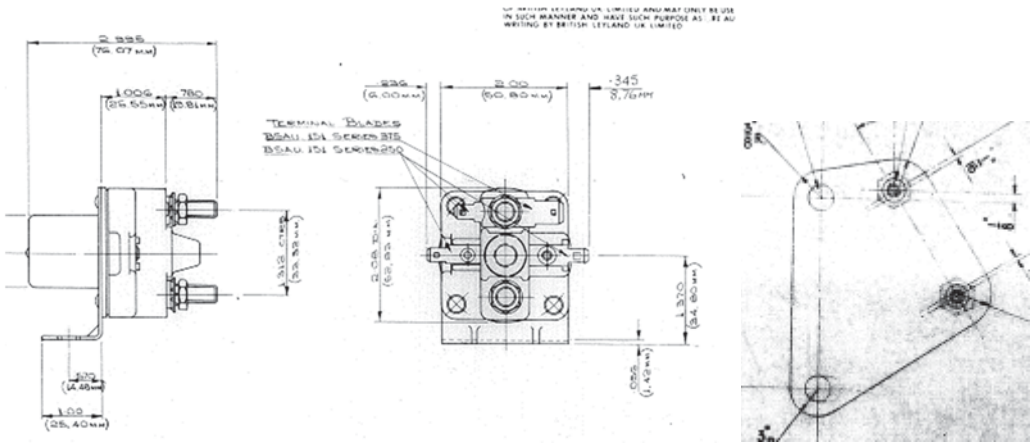


Fig. 12.2.2 *Starter solenoid 13H5952 and bracket 12A369*.

12.3 Alternator

A Lucas 15AC alternator with external regulator 8TR Lucas is fitted for early 1098cc and 15ACR alternator 23748 rated at 28A 1098cc. From 998cc, a Lucas 17ACR 23748 alternator is fitted.

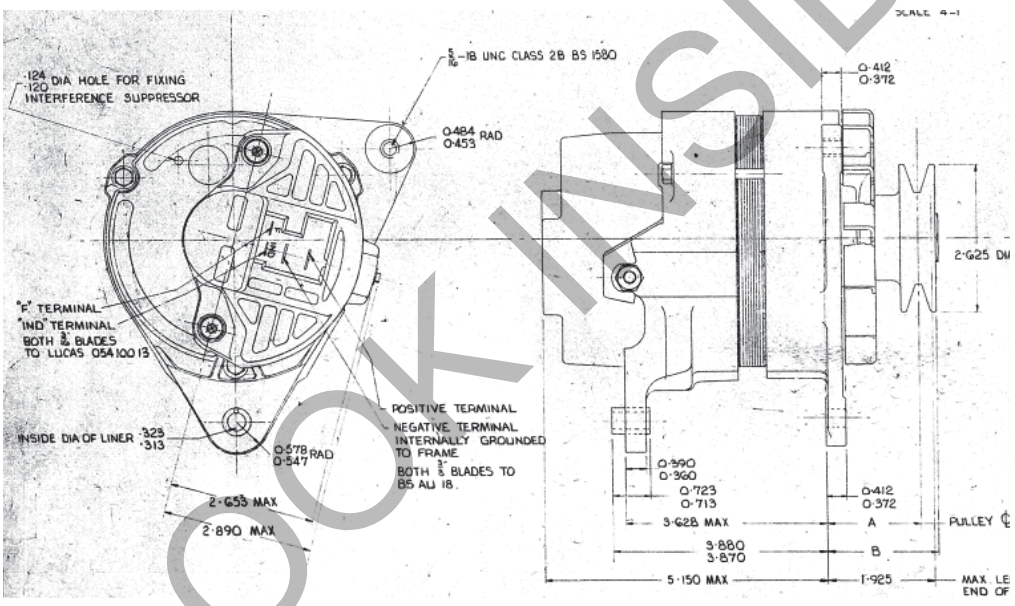


Fig. 12.3.1 *Lucas 15AC Alternator MYH4066*.

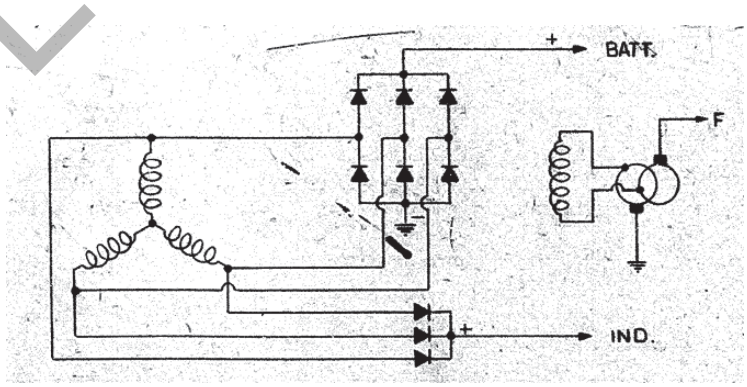


Fig. 12.3.2 *Internal wiring Lucas 15AC Alternator MYH4066*.

16.3 Boot Lid and Fittings

The locally pressed boot lid HYA3325 was introduced on ADO15 in 1964 to accept the Australian short number plate and is retained for the Leyland Mini range, the only difference being the location of holes for the badges.

The boot lid is attached by hinges HYA3954/HYA3955 different left and right-hand. Studs in the moving half are fixed into position, and the 3/16” diameter hinge pin 14A5556 is knurled at one end to grip into the fixed part of the hinge. The lower part of the hinge is attached to the chassis by screws RMA0410.

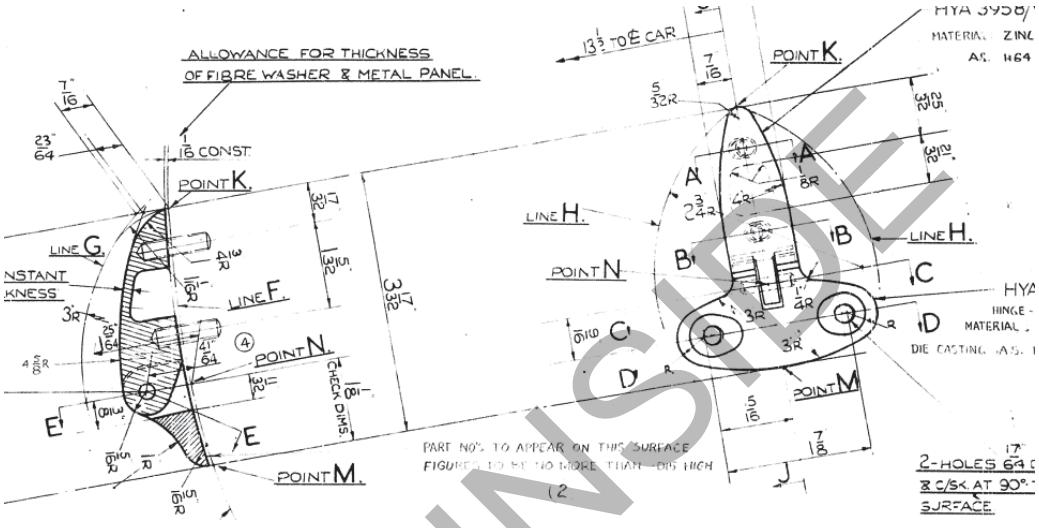


Fig. 16.3.1 *Boot lid hinge HYA3954*.

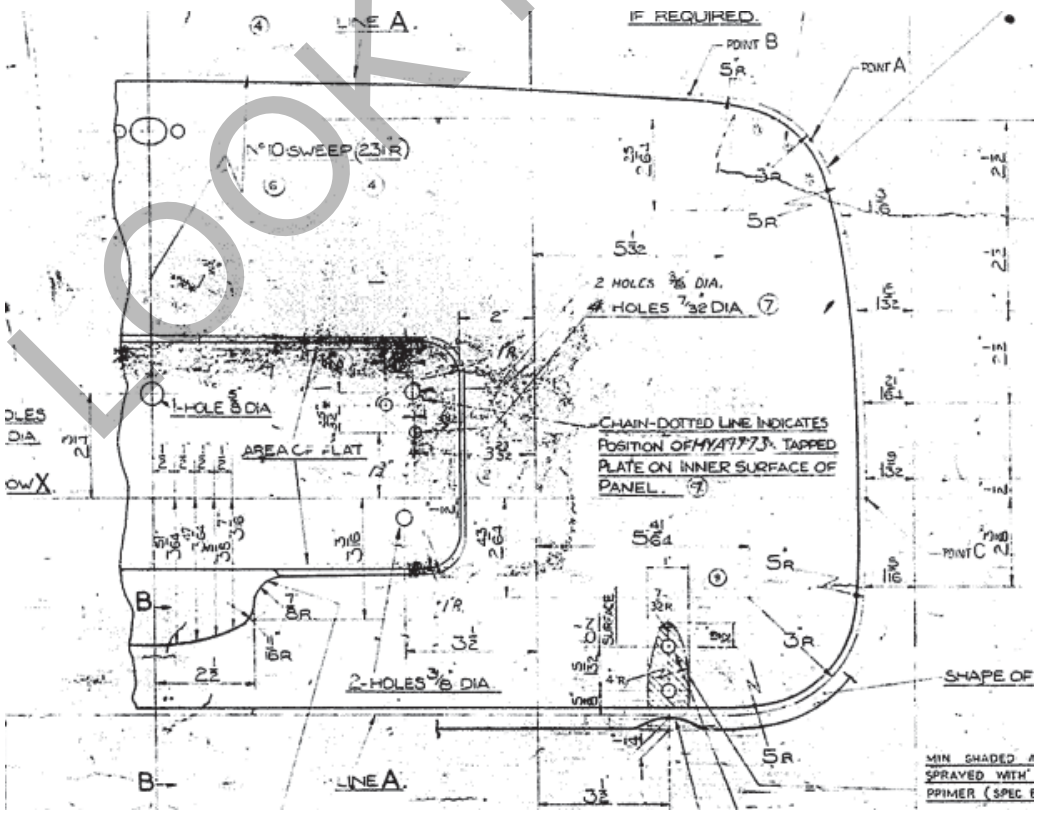


Fig. 16.3.2 *Boot lid HYA1771*.

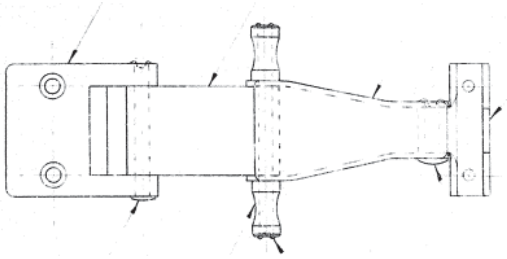


Fig. 16.5.13 *Over centre catch HYA1942*.

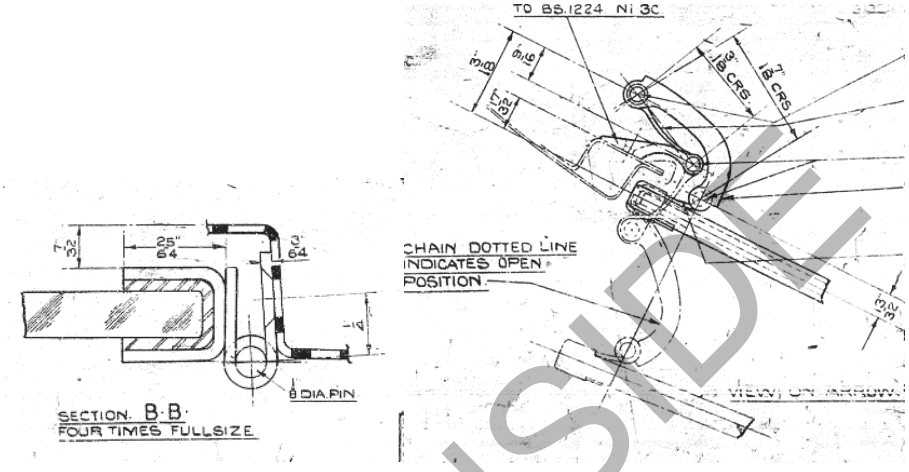


Fig. 16.5.14 *Rear quarter light hinge detail and catch 24A684*.

The window glass HYA1595 is 0.218 – 0.189" toughened glass. Leyland Mini SS, Leyland Mini Sunshine and Leyland Mini LS have tinted glass.

16.6 Glass, Mirrors and Washer

16.6.1 Glass

For the Leyland Mini range, the front windscreen glass HYB4687 has thickness 0.217" – 0.189" with a modified toughened zone in front of the driver.

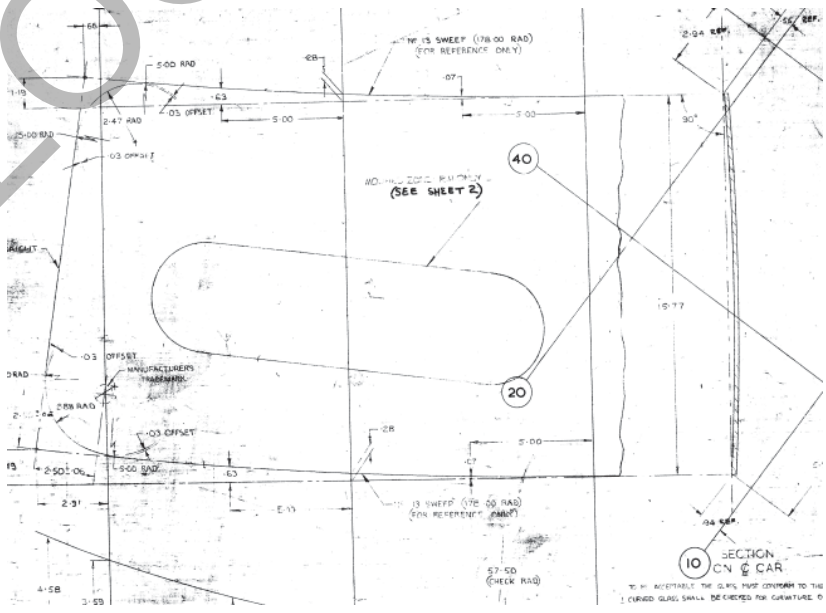


Fig. 16.6.1.1 *Windscreen glass HYB4687*.

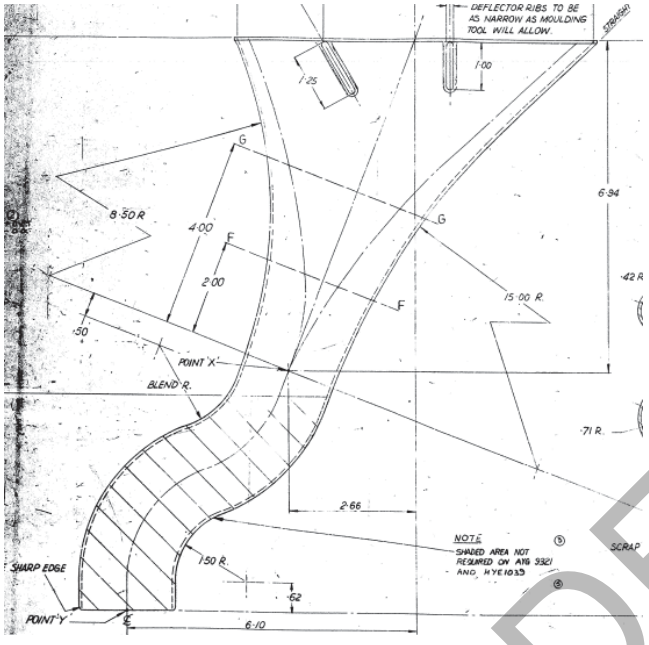


Fig. 16.12.4 *Demister duct AYG9320.*

16.13 Striping

Leyland Mini SS and Leyland Mini LS featured striping along the body side panels. Leyland Mini SS striping is gold only.

Fig. 16.13.1 *Decorative striping HYE868.*

Leyland Mini Sunshine featured decal HYE403 at the waist line at the rear side panel and pin striping along the waist line.

Fig. 16.13.2 *Sunshine decal HYE403.*

Striping was to be supplied on adhesive backed tape such as M3 Scotchcal 3669.