



Service bulletin

C. 216
E. P. 3

THE BRITISH MOTOR CORPORATION (AUSTRALIA) PTY. LIMITED

FOR THE ATTENTION OF SERVICE AND PARTS MANAGERS

ENGINE OIL CONSUMPTION AND LEAKAGE

Whenever complaints are received from owners under the above heading, it is most important that a systematic approach be made in order to avoid the carrying out of an unnecessary work and possibly not rectifying the actual complaint that may exist, both possibilities leading to an increased amount of customer dissatisfaction. This Bulletin has been compiled with the objective of defining a line of action to be taken in such cases and providing information on all the latest technical developments at the Factory.

As soon as such a complaint is received, the first step to be taken is an accurate diagnosis. This will fall largely into two categories - (a) consumption due to oil passing into the combustion spaces and burning with the characteristic emission of smoky exhaust after prolonged idling. (b) leakage from seals, joints, plugs, etc., i.e. external leakage.

The external appearance of the engine should be first examined for any obvious indications of leakage. It should then be cleaned at appropriate places in order to permit further observation under running conditions and when the oil has reached its normal operating temperature. Leaks from sump drain plugs, oil filter joints, side cover plates, oil relief valve plug, valve rocker cover, etc., can then be easily identified and rectified.

In cases where oil is leaking from the rear main bearing, this is apparent by the trace of oil running down the front of the engine back plate, it will be necessary to carry out rectification as described in detail below. It should be borne in mind in your investigation that the appearance of oil at the clutch housing drain hole (split pin) can indicate either a leakage at the rear main bearing or from the front cover of the gearbox.

(a) Oil Consumption (Burning). It is necessary to establish clearly the actual amount of oil consumption and, in the absence of accurate records, the owner should be requested to continue to operate his vehicle under control conditions for at least 1000 miles for the addition of oil - preferably this should only be done by the Dealer concerned.

An initial opportunity should be taken to explain to the owner the circumstances which effect the accurate recording of oil consumption figures and how errors can occur as the result of over-filling, measurement on uneven surfaces, or whilst the oil is still hot and in suspension in the engine etc.

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Our recommendation as to an acceptable degree of oil consumption is 1-3 pints per one thousand miles but it must be noted that with present day materials this point might only be reached after up to 6,000 miles running, depending on the nature of operation. In this respect, we point out that after carrying out the usual running in procedure up to 500 miles, as quoted in the Driver's Handbook and Workshop Manual, "For the first 500 miles, vary speed through the whole gear range up to 50 m.p.h. in top gear". Bedding-in of the rings may be assisted by making the car work fairly hard, by driving it at approximately the maximum engine torque speed, for 20-30 miles under load, say 30-35 m.p.h. in top gear, using full throttle where this is possible.

This allows the maximum gas pressure behind the piston rings to accelerate the bedding-in process. In cases where oil consumption from burning exceeds 4 pints per 1000 miles, the vehicle has run at least 3,000 miles, and the rings have been bedded-in as above, replacement pistons rings of the standard type as fitted at the factory may be fitted. If, when the pistons are removed for the fitting of these new rings, doubt exists as to the surface finish of the bores, the advice of the State Service office or Distributor should be sought regarding any attention to be given to the cylinder bores.

Under no circumstances will claims be paid for oil consumption due to burning before the vehicle has cover at least 3000 miles, of which at least 1000 miles must have been run under control to establish the true consumption. In cases where the consumption is less than 4 pints per 1000 miles the vehicle should be run on to 6000 miles before action as above.

Confirmation of action along the above lines will be required when application is made to the Factory or Distributor Service Department or Service Engineer for further instruction on such a problem.

It is emphasised in cases where dismantling of the engine is necessary for this complaint under warranty, the replacement piston rings fitted must be the standard set part no. HYL 2736 supplied through the B.M.C. Parts organisation and special forms of oil control ring must not be used.

(B) Oil Leakage Rear Main Bearing

If leakage is diagnosed to this origin, it must first of all be ascertained that the leakage is sufficient to necessitate attention. It will be appreciated that in the modern high performance engine with pressure lubrication system, it is not reasonable to expect complete freedom from traces of oil at certain points. Smears of oil or a drop hanging on the back plate or the underside of the clutch housing do not therefore constitute a leakage. However, if a regular succession of drops occurs whenever the car is stopped after running for a period, then it must obviously be recognised as a leakage.

Before commencing any rectification, note should be made of the running oil pressure with the engine at normal operating temperature and it should be borne in mind that it is acceptable if the maximum reading is 40 p.s.i. at 3000 r.p.m. and the minimum 10 p.s.i. at idling speed. It is desirable that a master gauge be used for these checks rather than the vehicle gauge.

The first action to be taken when a confirmed diagnosis has been made is for unit removal to a stage at which the engine back plate can be dismantled. This can be effected by leaving the engine in situ and removing the gearbox assembly or preferably, the complete power unit can be removed. The engine back plate should then be removed observing the condition of the gasket. Oil Gallery plugs can be examined for leakage and if this exists, satisfactory sealing can be achieved by applying a suitable jointing compound, such as "Stag" to the rear face of the gallery plugs and cleaning off flush with the rear face of the block.

It should be noted that as from engine no. 24Y/ZA/L/10273 an improved form of gallery plug sealing was introduced, the difference being that the holes were enlarged and plugs of 17/32" diameter fitted. As a further assurance against oil leakage at these points a thicker type rear engine plate gasket was fitted on assembly. This thicker gasket, part no. AYB.0137 was introduced at engine no. 24Y/ZA/L11455.

Commencing at engine no. 24Y/ZA/L4426, the running clearance of the main bearings was reduced by fitting bearing shells having .0005" increase in wall thickness, thus reducing the clearance by .001". At engine number 24Y/ZA/L5753, the crankshaft main bearing journal diameter was increased by .001" and the original bearing shell size reintroduced. The new running clearance is .001" to .0027" as quoted in the General Data section of the Workshop Manual (TP.654).

Main bearing shells are available under part no. HYL.2264 and are obtainable in Standard, .001" and .002" U/S.

It is of the utmost importance when fitting these bearings to ensure that the running clearance of .001" to .0027" is obtained and by selecting the correct bearing shells the minimum running clearance should be achieved. This reduced clearance will control the flow of oil at the rear main bearing and thus reduce the possibility of leakage.

When checking clearance it is recommended that the following method using "PLASTIGAGE" be adhered to.

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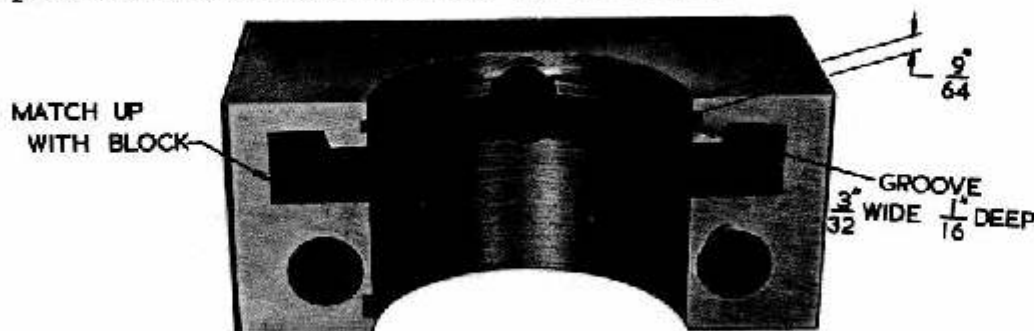
NOTE:

1. Remove the bearing cap and wipe the oil from the bearing insert and crankshaft journal.

When checking main bearing clearances, with the engine in a position where the main bearing caps are supporting the weight of the crankshaft and the flywheel, an erroneous reading, due to the weight of the crankshaft and flywheel, can be eliminated by supporting the weight of the crankshaft by means of a jack under the counterweight adjoining the bearing being checked, or by placing a thin rubber pad, between the main bearing or bearing adjacent to the one being checked.
2. Place a piece of plastigage the full width of the bearing insert about $\frac{1}{4}$ " off centre.
3. Rotate the crank about 30° from bottom dead centre and re-install the bearing cap. Tighten bolts to the recommended pressure with a torque wrench.
4. Remove the bearing cap. The flattened Plastigage will be found adhering to either the bearing shell or the crankshaft.
5. Compare the width of the flattened Plastigage at its WIDEST point with the graduation on the envelope. The number within the graduation on the envelope, indicates the bearing clearance in thousandths of an inch, or in millimeters depending on which side of the envelope is used.

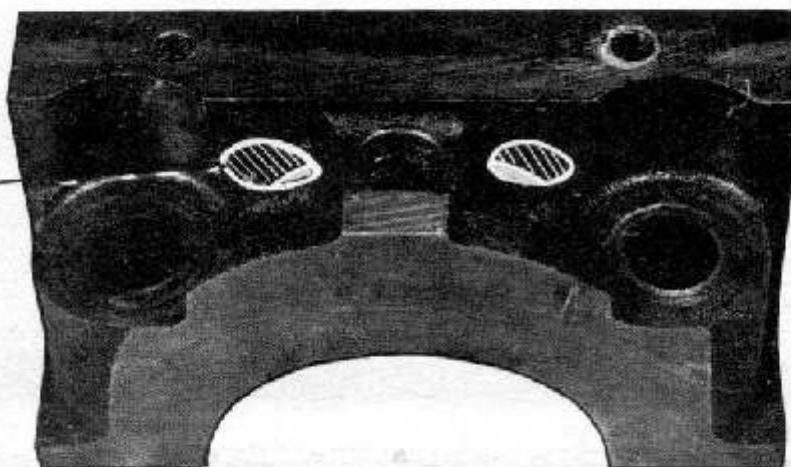
A groove has been added in Production to the scroll bore of the rear main bearing cap which materially assists in preventing the leakage of oil at this point. This was included at engine nos. 8471 -8520 inclusive, 11025 - 11208 inclusive, and 11781 onwards.

In cases of rear main bearing leaks, engines not covered by the above serial numbers should have the groove incorporated and the full details are shown on the illustration. The operation can be carried out by a skilled machinist on a normal workshop lathe, but should not be attempted where such facilities are not available.



It is essential after carrying out this grooving operation to ensure that there is a proper break through into the scallop which returns the oil into the slinger trough. At the same time the two oil drain holes beneath the rear main bearing cap should be cleaned out by filing so as to permit an easier flow of oil returning from the trough below the crankshaft slinger. It is also recommended that a similar operation be carried out by filing to form the profile of the slinger trough at the butt face so as to mate more precisely with the upper half of the trough in the cylinder block.

CLEAN OUT
OIL DRAIN HOLES



The utmost care must be taken during assembly to ensure complete cleanliness and the correct fitting of all bearing shells with tangs properly located in their slots. Care should also be taken when fitting the rear main bearing cap, to ensure that the rear face is flush with the back of the engine block, by tapping slightly as necessary.

When refitting the engine rear plate, full precautions should again be taken in regard to cleanliness and gasket cement should be applied evenly and judiciously on both sides of the gasket. Excessive application of gasket cement at certain points around the bearing cap may only lead to distortion of the gasket sealing and the entry of gasket cement into the oil return channels, etc.

The remainder of the assembly is in accordance with normal practice and finally, if excessive oil pressure above the specification has been noted previously, it can be reduced by an additional fibre washer under the relief valve cap nut and the pressure checked on a master gauge. The maximum oil pressure of 40 p.s.i. at 3000 r.p.m. quoted is quite adequate for all circumstances and the prime necessity at idling (500 r.p.m) is merely to ensure that there is at least 5 p.s.i. pressure.

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As 5 p.s.i. may not register on the gauge and thus give risk to doubt by the owner, it is desirable to have at least 10 p.s.i. available and showing on the gauge.

We feel sure that if you act along the lines indicated in above, you will be able to achieve owner satisfaction in your area. However, if any further guidance is needed at any time, we would ask you to consult your local Factory Service Department or Distributor.



N. Prescott
Service Manager.