

Fig. AA.13

The correct valve rocker clearance is here shown. It must on no account be departed from

Remove the rocker assembly as in Section AA.9 and withdraw the push-rods, keeping them in their respective positions to ensure their replacement onto the same tappets. Remove the tappet covers and lift out the tappets, also keeping them in the same locations.

New tappets should be fitted by selective assembly so that they just fall into their guides under their own weight when lubricated.

Assembly is a reversal of the above procedure, but care should be taken to see that the tappet cover joints are oil-tight and that the rockers are adjusted to give the correct valve clearance.

Section AA.21

ROCKER ADJUSTMENT

If the engine is to give its best performance and the valves are to retain their maximum useful life it is essential to maintain the correct valve clearance. Accordingly it is recommended that the clearance be checked at the specified intervals and any necessary adjustments made.

The clearance for both the inlet and exhaust valves is .012 in. (.305 mm.) when the engine is cold. The engine has been designed to operate with this clearance and no departure from it is permissible.

Provision for adjusting the valve clearance is made in the rocker arm by an adjustable screw and locknut.

The rocker adjusting screw is released by slackening the hexagon locknut with a spanner while holding the screw against rotation with a screwdriver. The valve clearance can then be set by carefully rotating the rocker

AA 18

screw while checking the clearance with a feeler gauge. This screw is then re-locked by tightening the hexagon locknut while again holding the screw against rotation.

It is important to note that while the clearance is being set the tappet of the valve being operated upon is on the back of its cam, i.e. opposite to the peak.

As this cannot be observed accurately the rocker adjustment is more easily carried out in the following order, and this also avoids turning the engine over more than is necessary.

Adjust No. 1 rocker with No. 8 valve fully open

"	"	3	"	"	6	"	"	"
"	"	5	"	"	4	"	"	"
"	"	2	"	"	7	"	"	"
"	"	8	"	"	1	"	"	"
"	"	6	"	"	3	"	"	"
"	"	4	"	"	5	"	"	"
"	"	7	"	"	2	"	"	"

Section AA.22

CHECKING VALVE TIMING

Set No. 1 cylinder inlet valve to .024 in. (.61 mm.) clearance with the engine cold, and then turn the engine until the valve is about to open.

The indicating groove in the flange of the crankshaft pulley should then be opposite the pointer on the timing cover on early engines or the largest pointer below the crankshaft pulley on later engines, i.e. the No. 1 inlet valve should be about to open at T.D.C. and No. 4 piston will be at T.D.C. on its compression stroke.

NOTE.—Do not omit to reset the inlet valve clearance

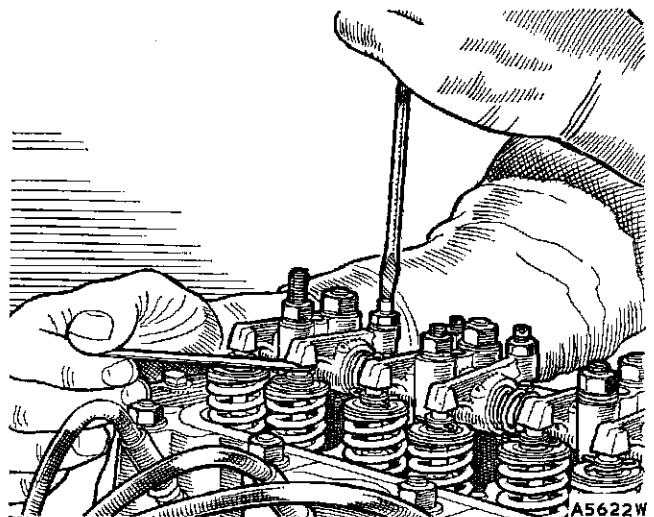


Fig. AA.14

Setting the valve clearance with a screwdriver and feeler gauge

to .012 in. (.305 mm.) with the engine cold when the timing check has been completed. A clearance of .019 in. (.48 mm.) brings the opening position of the valve to 5° B.T.D.C. It is not possible to check the valve timing accurately with the normal running valve clearance.

Section AA.23

REMOVAL AND REPLACEMENT OF TIMING COVER

Drain the cooling system (as in Section AA.10) and remove the radiator (see Section AA.26).

Slacken the dynamo attachment bolts and remove the belt.

Bend back the tab on the starting dog nut locking washer. Unscrew the starting dog nut and remove the locking washer.

Pull off the crankshaft pulley.

The timing cover is secured by four large bolts and six small ones. Each bolt has a shakeproof washer and a plain washer. Remove all 10 bolts with their washers and remove the timing cover.

Care should be taken not to damage the timing cover gasket. If it is damaged clean the face of the cover flange and the front engine mounting plate and fit a new gasket when reassembling.

The oil seal situated in the timing cover should also be renewed if necessary.

It should be noted that the oil thrower, which is

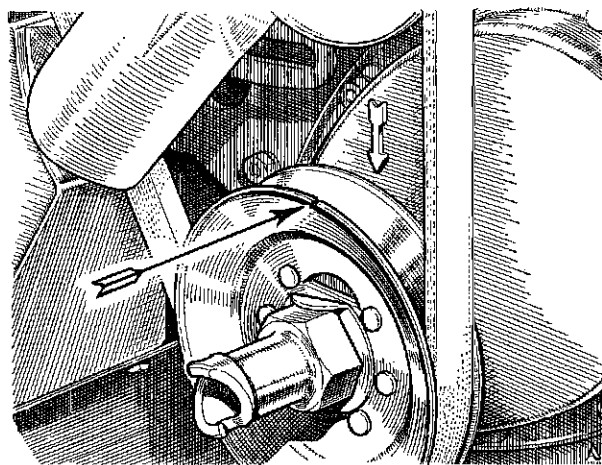
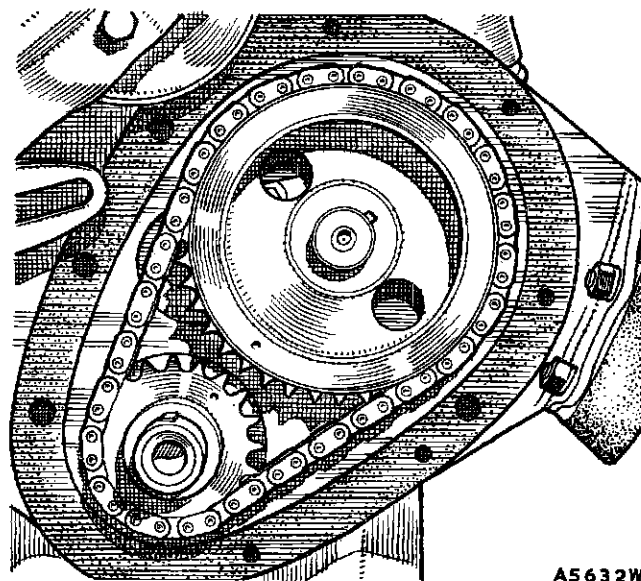


Fig. AA.15

The mark on the pulley flange and the pointer on the timing cover which indicate the T.D.C. position of No. 1 and No. 4 pistons on early models. Later engines have a bracket with three pointers below the pulley, the longest of which indicates T.D.C. and the others 5° and 10° B.T.D.C. respectively



A5632W

Fig. AA.16

The timing chain and chain wheel assembly, showing the location of the two keyways and the two timing marks on the rims of the chain wheels

located behind the crankshaft pulley, is fitted with its concave side facing forward.

When refitting the cover it is important to ensure that the seal is centralized on the crankshaft and Service tool 18G 138 is available for the purpose. In the absence of the tool, the crankshaft pulley can be used as follows: If a rubber seal is fitted to the cover fill the annular groove between the lips with grease. Lubricate the hub of the pulley and push it into the seal at the same time turning it to avoid damaging the felt or the lips of a rubber seal. Slide the pulley onto the shaft with the keyway in line with the key in the crankshaft. Turn the cover as necessary to align the setscrew holes with those in the crankcase taking care not to strain the cover against the flexibility of the seal; insert the cover setscrews and tighten up. Refit and tighten the pulley securing screw.

Section AA.24

REMOVAL AND REPLACEMENT OF TIMING CHAIN

Remove the timing cover and oil thrower as in Section AA.23.

Unlock and remove the camshaft chain wheel nut and remove the nut and lock washer. Note that the locating tag on the lock washer fits into the keyway of the camshaft chain wheel.

The camshaft and crankshaft chain wheels may now be removed, together with the timing chain, by easing

each wheel forward a fraction at a time with suitable small levers.

As the crankshaft gear wheel is withdrawn care must be taken not to lose the gear packing washers immediately behind it. When reassembling, replace the same number of washers as was found when dismantling unless new camshaft or crankshaft components have been fitted which will disturb the alignment of the two gear wheels. To determine the thickness of washers required place a straight-edge across the sides of the camshaft wheel teeth and measure with a feeler gauge the gap between the straight-edge and the crankshaft gear.

When replacing the timing chain and gears set the crankshaft with its keyway at T.D.C. and the camshaft with its keyway approximately at the one o'clock position as seen from the front. Assemble the gears into the timing chain with the two marks on the gear wheels opposite to each other, as in Fig. AA.16. Keeping the gears in this position, engage the crankshaft gear keyway with the key on the crankshaft and rotate the camshaft until the camshaft gear keyway and key are aligned. Push the gears onto the shafts as far as they will go and secure the camshaft gear with the lock washer and nut.

Replace the oil thrower, concave side forward, and the remaining components as detailed in Section AA.23.

Section AA.25

REMOVAL AND REPLACEMENT OF ENGINE

The engine may be removed from the car, leaving the gearbox in the frame.

Remove the clevis pin securing the bonnet prop to the bonnet lid and secure the bonnet in the open position.

Drain the oil from the engine.

Drain the water from the cooling system as in Section AA.10. If anti-freeze mixture is in use it should be drained into a clean container so that it may be used again.

Disconnect the battery by removing the lead from the positive terminal. Release the flexible petrol pipe from the union on the petrol pump. Remove the carburetter and air cleaner as described in Section AA.7.

Disconnect and remove the bottom and top radiator hoses, and the heater pipe connection at the radiator (if the car is fitted with a heater). Remove the four set bolts and spring washers which attach the radiator to the grille and lift out the radiator. Disconnect the heater pipe from the control valve (on cars fitted with heaters).

Slacken the two exhaust flange clamp bolts and disconnect the exhaust pipe.

Disconnect the dynamo and starter leads, and the low-tension lead from the distributor. Remove the high-tension lead from the coil.

Disconnect the oil gauge pipe from the cylinder block.

AA.20

Support the engine with suitable lifting tackle. Remove the four nuts, bolts, and spring washers securing the left-hand front engine mounting bracket to the tie-plate. Remove the two nuts and washers which secure each of the two front engine mounting brackets to the mounting rubbers.

Disconnect the clutch lever return spring from the rear engine mounting plate.

Support the front end of the gearbox by means of a suitable support. Remove the set bolts and nuts and bolts which secure the gearbox to the engine, noting that two nuts and bolts also attach the starter.

Move the engine forward clear of the clutch and then lift it upwards, turning it at right angles to clear the radiator grille.

Replacement of the engine is a reversal of the above procedure.

Refill the engine with oil to Ref. A (page PP.2).

Section AA.26

REMOVAL AND REPLACEMENT OF POWER UNIT

Remove the clevis pin securing the bonnet to the bonnet prop and secure the bonnet in the open position.

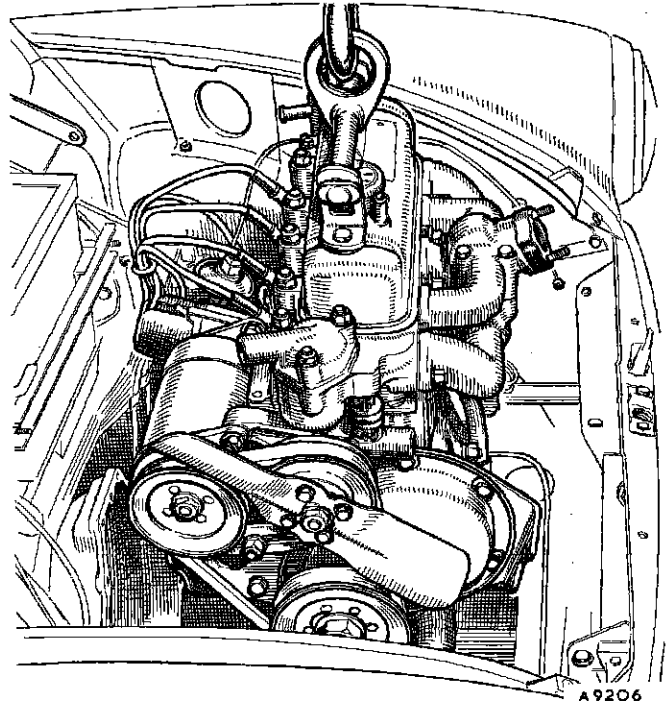


Fig. AA.17

The engine, without the gearbox, can be removed from the car without disturbing the radiator if it is carefully turned to lie across the car while it is being lifted out

Drain the oil from the engine and gearbox. Drain the water from the cooling system. If anti-freeze mixture is in use it should be drained into a clean container so that it may be used again.

Disconnect the battery by removing the lead from the positive terminal.

Release the flexible petrol pipe from the union of the petrol pump. Remove the carburetter and air cleaner as described in Section AA.7.

Slacken the two exhaust flange clamp bolts and disconnect the exhaust pipe.

Disconnect and remove the bottom and top radiator hoses. If the car is fitted with a heater disconnect the heater pipes from the radiator base tank and the control valve on the rear end of the cylinder head.

Disconnect the dynamo and starter leads and the low-tension lead from the distributor. Remove the high-tension lead from the coil.

On later models where the coil is mounted on the dynamo only disconnect the two low-tension wires to 'CB' and 'SW' on the coil.

Disconnect the oil gauge pipe from the cylinder block. Remove the front bumper assembly, which is secured to the frame by two nuts.

Release the radiator mask by removing the nuts, bolts, and washers securing the grille surround to the wings and frame. The plated surround each side of the radiator is secured by three 2 B.A. nuts, accessible beneath the wing.

Remove the split pin and spring washer from the bonnet catch-operating arm and disconnect the operating rod.

Disconnect the sidelamps from the snap connectors attached to the side valances.

Lift out the radiator and grille assembly.

Disconnect the clutch lever return spring from the rear engine mounting plate.

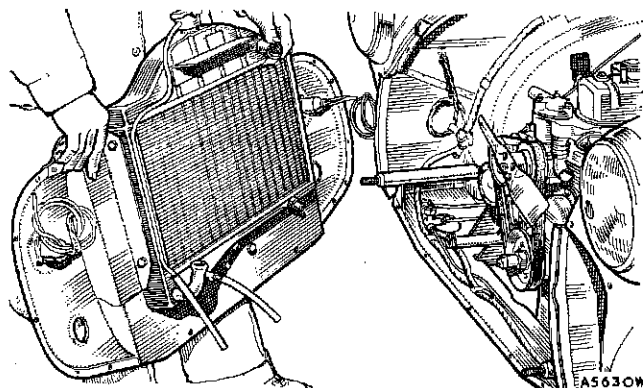


Fig. AA.18

Withdrawing the radiator and radiator grille assembly prior to withdrawing the power unit

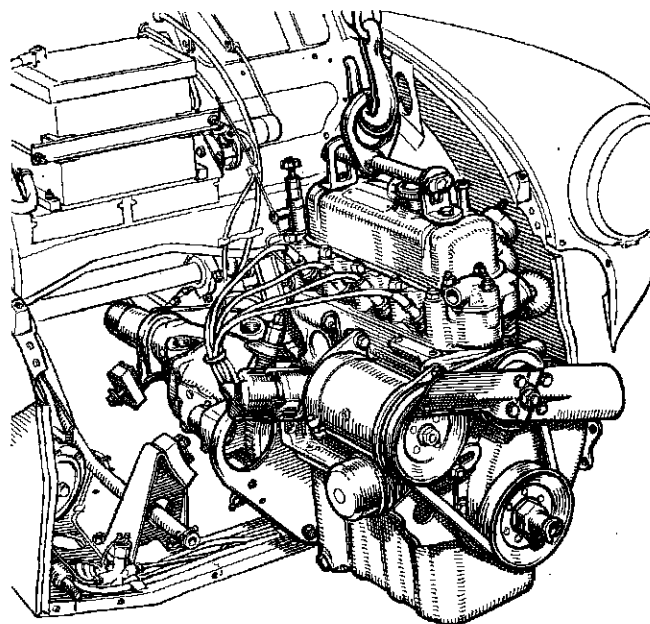


Fig. AA.19

Withdrawing the power unit, complete with gearbox in position, by means of suitable lifting tackle

Disconnect the two operating rods from the clutch relay lever by removing the split pins and anti-rattle washers. Withdraw the operating rod from the clutch lever. Disconnect the speedometer cable from the gearbox.

Take out the two set bolts and spring washers securing the relay lever bracket to the main frame. Remove the packing plate, bracket, and bushes. Take care not to lose the washer between the inner bush and the lever. Remove the thrust spring from the opposite end of the lever.

Support the weight of the power unit with suitable lifting tackle. Remove the front carpet and felt and the gearbox cover-plate. Note that the two innermost screws on either side of the gearbox tunnel are longer than the rest and screw into the gearbox support member.

Take out the three set bolts and remove the gear lever assembly.

Remove the engine steady cable (see Section AA.36).

Remove the nuts with spring and flat washers which secure the rear mounting rubbers to the cross-member. Take out the four set bolts securing the cross-member to the frame, noting that the forward one on the left-hand side also secures the earthing cable.

Lower the rear of the power unit carefully until the cross-member can be removed.

Remove the four nuts, bolts, and spring washers which secure the front left-hand engine mounting bracket to the tie-plate.

Remove the nuts and washers which secure the front engine mounting rubbers to each side of the mounting plate. Raise the power unit and remove the left-hand mounting bracket and rubber assembly. Move the unit sideways to clear the right-hand mounting rubber studs, then raise the unit and manoeuvre it forward clear of the car.

Reassembly is carried out in the reverse order to that of dismantling. It should be noted, however, that when reconnecting the clutch-operating mechanism the longest end of the relay lever shaft carries the thrust spring as it is fitted into the spherical bush.

It will be found to be easier to re-engage the gear-box mainshaft splines with the propeller shaft if the car is rolled backwards as the power unit is offered into position. Do not fully tighten the engine mounting rubber bolts until the mountings are supporting the full weight of the power unit.

Refill the engine and gearbox with oil to Ref. A (page PP.2.)

Section AA.27

REMOVAL AND REPLACEMENT OF CAMSHAFT

Remove the radiator (see Section AA.26) and take off the rocker assembly (see Section AA.9).

Remove the inlet and exhaust manifold assembly (see Section AA.8).

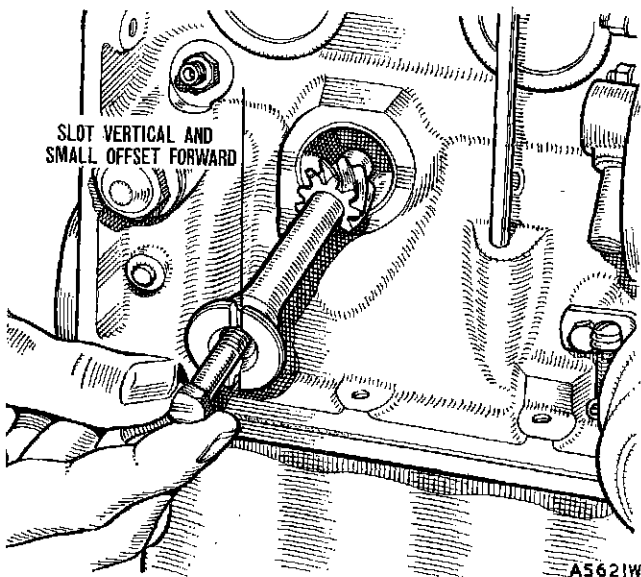


Fig. AA.20

Withdrawing the distributor drive spindle by screwing a tappet cover bolt into its tapped end. The position of the drive slot when replacing the drive spindle with No. 4 cylinder at T.D.C. on the firing stroke

AA.22

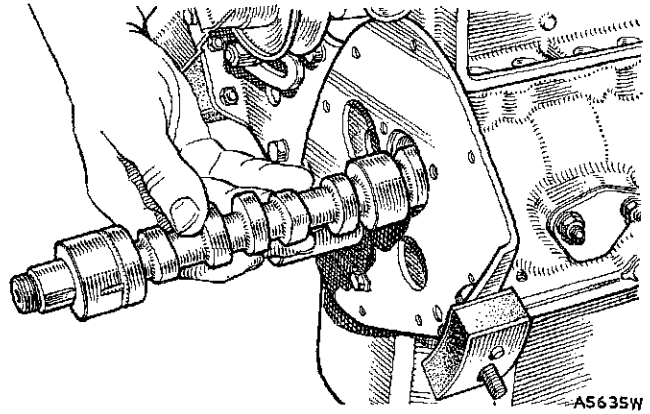


Fig. AA.21

Withdrawing the camshaft from the engine after removing the timing chain tappets and distributor drive

Remove the push-rods and take out the tappets (see Section AA.20).

Remove the timing cover, timing chain, and gears (see Sections AA.23 and AA.24).

Disconnect the high-tension leads from the coil and sparking plugs and the low-tension wire from the side of the distributor.

Disconnect the suction advance unit pipe from the distributor and take out the two bolts with flat washers securing the distributor to the housing. Do not slacken the clamping plate bolt or the ignition timing setting will be lost.

Withdraw the distributor.

Take out the bolt securing the distributor housing to the cylinder block. Using one of the tappet cover bolts as an extractor screwed into the tapped end of the distributor drive spindle, withdraw the spindle.

Take out the three set screws and shakeproof washers which secure the camshaft locating plate to the cylinder block and withdraw the camshaft.

If the front camshaft bearing clearance is excessive a new bearing should be fitted. To do this drift out the old bearing towards the rear of the engine and press in a new one. Ensure that the oil holes in the bearing line up with the oil passages in the cylinder block. The front bearing must be reamed to give .001 to .002 in. (.025 to .051 mm.) diametral clearance. The centre and rear camshaft bearings are cast in the block and are therefore non-renewable.

Replacement of the camshaft is a reversal of the above procedure. Remember to align and engage the drive pin in the rear end of the camshaft with the slot in the oil pump drive shaft when replacing the camshaft in its housing.

Section AA.28

TO REFIT THE DISTRIBUTOR DRIVE GEAR

Turn the engine until No. 4 piston is at T.D.C. on its compression stroke. When the valves on No. 1 cylinder are 'rocking' (i.e. exhaust just closing and inlet just opening) No. 4 piston is at the top of its compression stroke. If the engine is set so that the groove in the crankshaft pulley is in line with the pointer on the timing chain cover, or the 'dimples' in the crankshaft and camshaft gears are in line, the piston is exactly at T.D.C.

Screw one of the tappet cover bolts into the threaded end of the distributor drive gear and, holding the drive gear with the slot vertical and the small offset towards the front of the engine, enter the gear. As the gear engages with the camshaft the slot will turn in an anti-clockwise direction until it is approximately in the 11 o'clock position.

Remove the bolt from the gear and insert the distributor housing and secure it with the special bolt and washer. Ensure that the correct bolt is used and that the head does not protrude above the face of the housing.

Refit the distributor, referring to Section CC.7 if the clamp plate has been released.

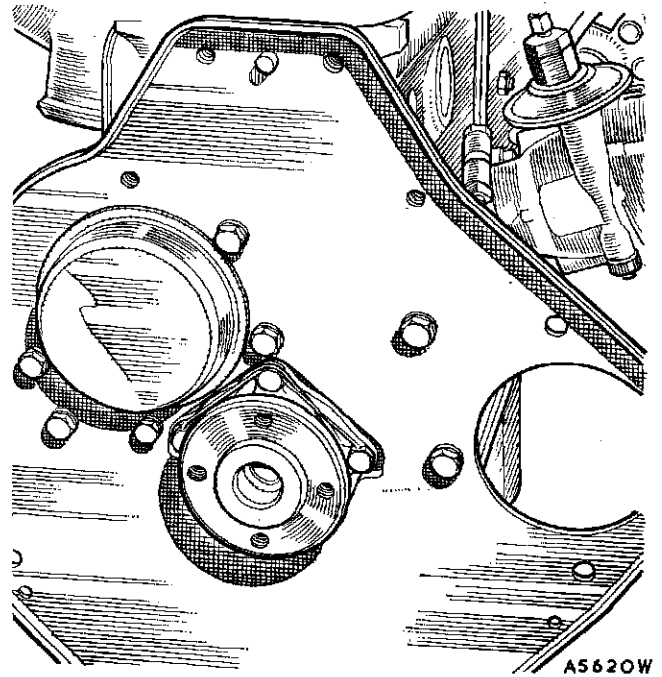


Fig. AA.22

The flywheel removed, exposing the mounting plate and its seven attachment bolts

Section AA.29

REMOVAL AND REPLACEMENT OF FLYWHEEL

(Engine Out of Car)

Remove the clutch by unscrewing the six bolts and spring washers securing it to the flywheel. Release the bolts a turn at a time to avoid distortion of the cover flange. Two dowels locate the clutch cover on the flywheel. Note that on later models these dowels are stepped.

Unlock and remove the four bolts and lock plates which secure the flywheel to the crankshaft and remove the flywheel.

When replacing the flywheel ensure that the 1/4 timing mark on the periphery of the flywheel is in line with and on the same side as the first and fourth throws of the crankshaft.

Section AA.30

REMOVAL AND REPLACEMENT OF OIL PUMP

Take out the engine (see Section AA.25) and remove the flywheel (see Section AA.29).

The rear engine mounting plate is attached by means of seven bolts and spring washers, which are shown in Fig. AA.22. Remove these bolts and washers and take off the mounting plate.

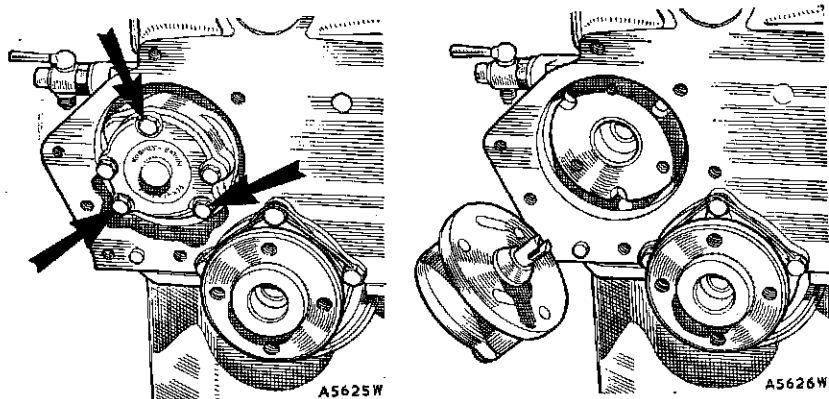
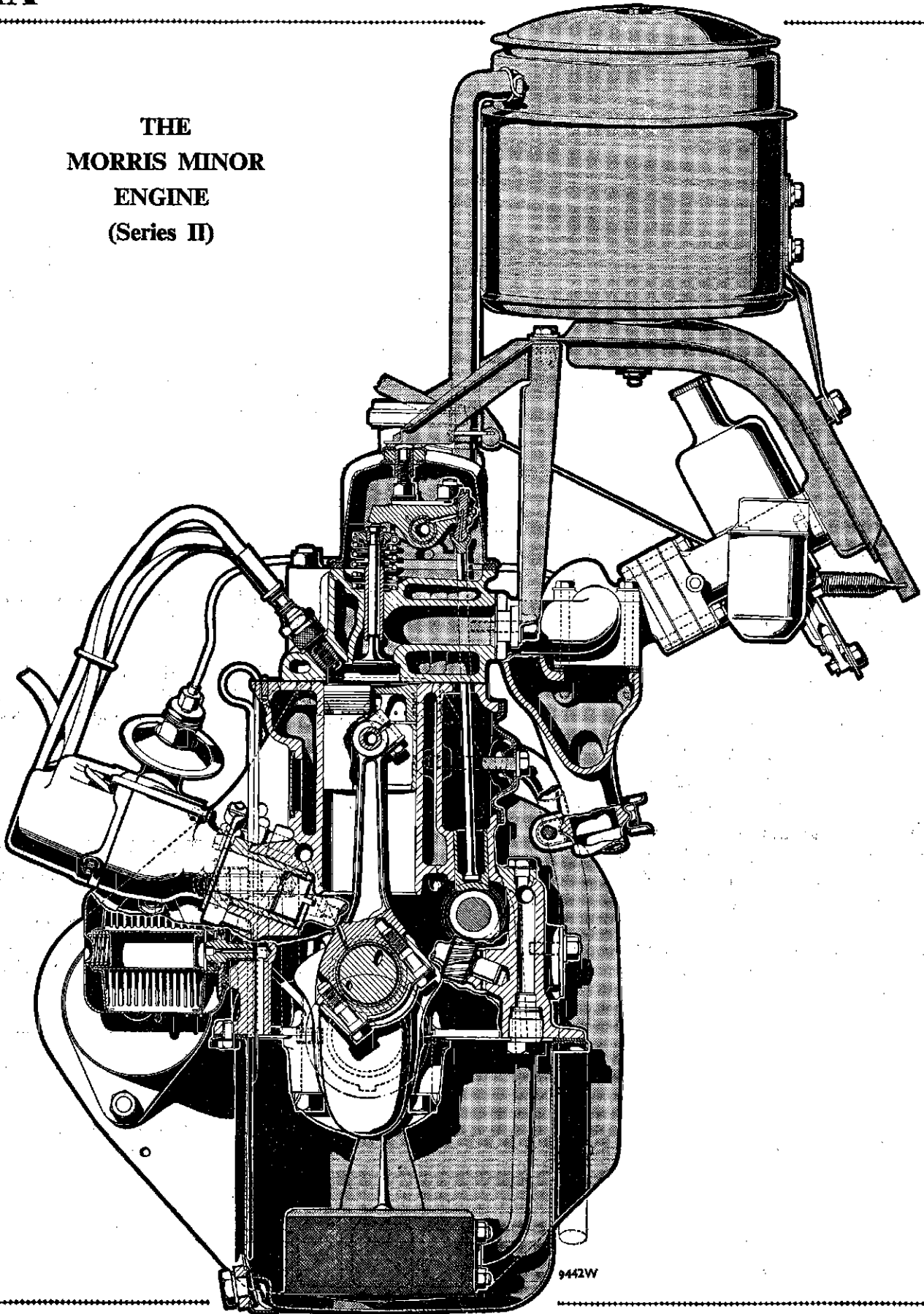


Fig. AA.23

The three bolts attaching the oil pump to the cylinder block are shown in the left-hand illustration. The right-hand illustration shows the pump withdrawn

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The oil pump is now exposed. Bend back the locking tabs from the three outer bolts and remove these bolts. The oil pump may now be withdrawn. It will be noticed that a gasket is fitted between the pump face and the cylinder block, and this should be renewed if it is damaged.

It will also be noticed that the pump shaft is slotted to engage the driving pin in the hollow end of the camshaft.

To replace the oil pump reverse the above process.

Section AA.31

DISMANTLING AND REASSEMBLING OIL PUMP

Remove the oil pump from the engine (see Section AA.30).

The oil pump cover is attached to the body of the pump by two bolts and spring washers, and when these bolts are removed the oil pump cover, the outer rotor, and the combined oil pump shaft and inner rotor may be extracted. The component parts are shown on page AA.10, items 70 to 77.

Reassembly is a reversal of the above procedure.

Section AA.32

REMOVAL AND REPLACEMENT OF CRANKSHAFT

(Engine Out of Car)

Remove the engine from the car (see Section AA.25). Take off the clutch and the flywheel (see Section AA.29), the timing cover (see Section AA.23), the timing wheels

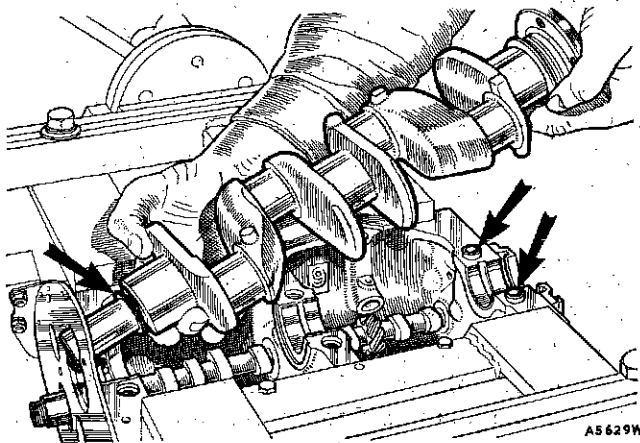


Fig. AA.24

The crankshaft partly withdrawn, showing the packing washers behind the crankshaft chain wheel and the two tubular dowels locating the rear main bearing cap

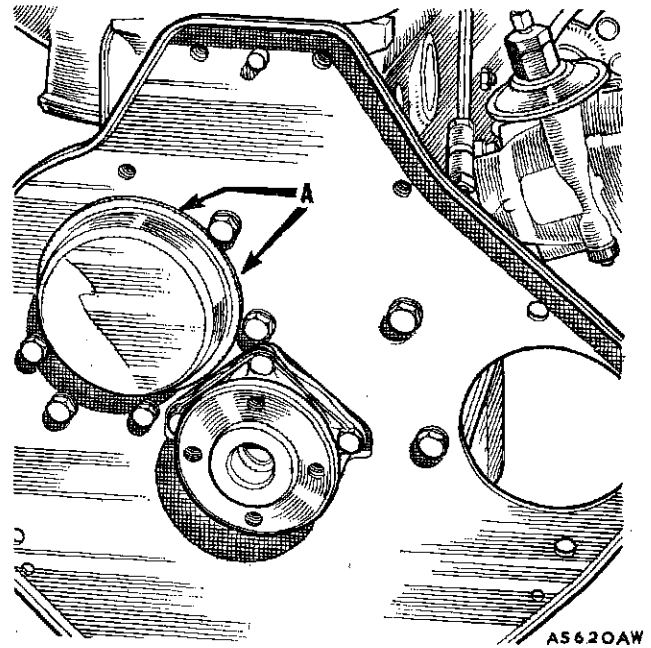


Fig. AA.25

The rear engine mounting plate and its pump protecting cover, indicating the point of oil leakage when the joint is defective

and chain (see Section AA.24), the sump and the oil pump pick-up (see Section AA.2), and the rear engine mounting plate (see Section AA.30).

Remove the big-end bearings and then take off the main bearing caps (see Section AA.5).

NOTE.—Mark each big-end, bearing cap, and bearing to ensure that they are reassembled to the correct journal, taking care, in the case of the bearings, that they are not damaged or distorted when marking. Punches should not be used for this purpose.

Lift the crankshaft out of the bearings.

Replacement of the crankshaft is a reversal of the above operations.

IMPORTANT.—Before replacing the crankshaft thoroughly clean out all oilways.

Note that each main bearing is stamped with a common number which is also stamped on the centre web of the crankcase near the main bearing.

Remember to fit the packing washer behind the crankshaft chain wheel (see Section AA.24).

Section AA.33

LEAKAGE OF OIL INTO CLUTCH HOUSING

Where leakage of oil into the clutch housing takes place it has been established that this is sometimes due to leakage between the oil pump protecting cover and

the engine mounting plate as a result of an imperfect joint between these two components. This joint should therefore be examined before disturbing the rear main bearing.

If the leak proves to be at this joint it must be rectified by removing the rear mounting plate and resoldering the joint between the pump cover and the mounting plate.

Section AA.34

OIL LEAKS FROM SUMP AND TO CLUTCH COMPARTMENT

In dealing with cases of engine oil leakage at the rear face of the sump or from the clutch housing drain pin an external visual examination should first be made to ascertain if possible at which of the two points mentioned the oil is appearing.

If leakage appears to be at the rear face of the sump only the sump should be withdrawn and all trace of old gasket and front and rear cork packings removed.

The sump top face at the corners of the semicircular seal housing should be checked for truth and any undue irregularities removed. The length of the front and rear cork packings is critical, since they must be long enough when overlapped by the ends of each side of the sump gasket to give compression at these four points when the sump is bolted up, but not so long that the cork is spread and trapped between the top face of the sump and the bottom face of the cylinder block.

If necessary, the new cork packings should be shortened so that when they are placed in position in their retainers on the sump they stand proud at each corner by approxi-

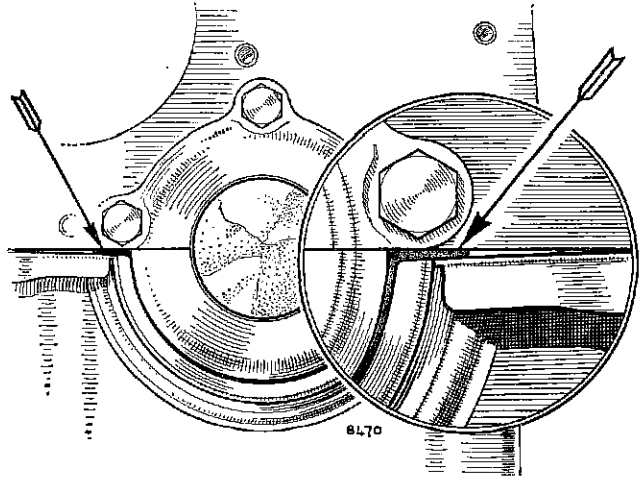


Fig. AA.27

If the rear cork packing is too long it may spread and prevent the sump seating correctly as here

mately $\frac{1}{8}$ in. (3.2 mm.). Grease the cork packings and make sure that they are pushed fully down in their retaining grooves. The two halves of the sump gasket may now be placed in position and the unit bolted up to the under side of the block. It is essential that the sump retaining bolts should be tightened evenly and diagonally to pull the sump squarely against the bottom face.

If there is engine oil leakage from the clutch housing drain pin, to deal with this adequately the engine unit should be removed and the clutch and flywheel taken off together with the rear mounting plate and oil pump.

The sump also should be removed, followed by the main bearing caps. The connecting rod caps should also be extracted so that the crankshaft can be removed.

The following items must be checked and receive attention as necessary. The upper half of the housing for the crankshaft oil thrower is secured by three set screws to the rear face of the block and has a paper gasket interposed between it and the rear face. This gasket must be in perfect condition and the half-housing itself must be secured flush with the bottom face of the block both laterally and vertically. After the screws have been inserted to just more than finger tightness the housing may be finally tapped into its correct location and the screws then finally tightened. Check the position again for flush fitting.

Examine the crankshaft oil return thread for condition. Replace the crankshaft and ensure that there is a radial clearance of .0015 to .004 in. (.038 to .101 mm.).

Replace the rear main bearing cap with which the lower half of the oil thrower housing is integral and check the joint between the two halves of the housing.

Radial clearance between the crankshaft oil thrower and the lower half of the housing may be checked by

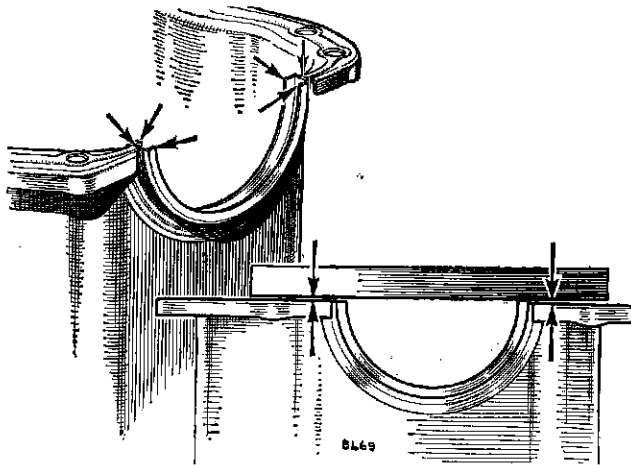


Fig. AA.26

Use a straight-edge to check that the seal housing does not stand above the sump face at the points indicated here

applying blue to the thrower on the crankshaft and assembling the rear main bearing cap and rotating the crankshaft.

The gasket between the pump body and the rear face of the cylinder block must be in perfect condition, as must the joint between the oil pump cover and pump body and also the soldered cover joint on the gearbox mounting plate.

The face of the mounting plate adjacent to the block must also be true and the gasket interposed at this joint in perfect condition. Both these points are vitally important, since if there is any oil leakage from the pump the escaping oil is liable to leak past the narrow portion of the gasket either down the mounting plate or into the clutch housing.

It is, of course, also important to make sure that the pump cover-plate is properly soldered to the mounting plate as indicated in Section AA.33.

When all these points have been dealt with satisfactorily reassembly can take place, followed by reinstallation of the unit in the chassis.

Section AA.35

OIL LEAKAGE FROM CYLINDER HEAD SEAL

Should oil leak from the front end of the joint between the cylinder block and cylinder head, the cylinder head assembly must be removed as detailed in Section AA.10.

Thoroughly clean the mating faces of the cylinder head and cylinder block and fit an improved cylinder head joint seal (Part No. 2A 521) without using sealing compound. The gasket is marked 'TOP' and 'FRONT' to ensure correct replacement and has increased corrugation around the oil hole to improve sealing.

After replacing the cylinder head as detailed in Section AA.10 the cylinder head stud nuts should be securely tightened and the rocker clearance set while the engine is hot.

After approximately 250 miles (400 km.) the rocker cover should be removed and the cylinder head stud nuts tightened again to the recommended torque of 40 lb. ft. (5.5 kg. m.) and the rocker clearance should then be re-checked.

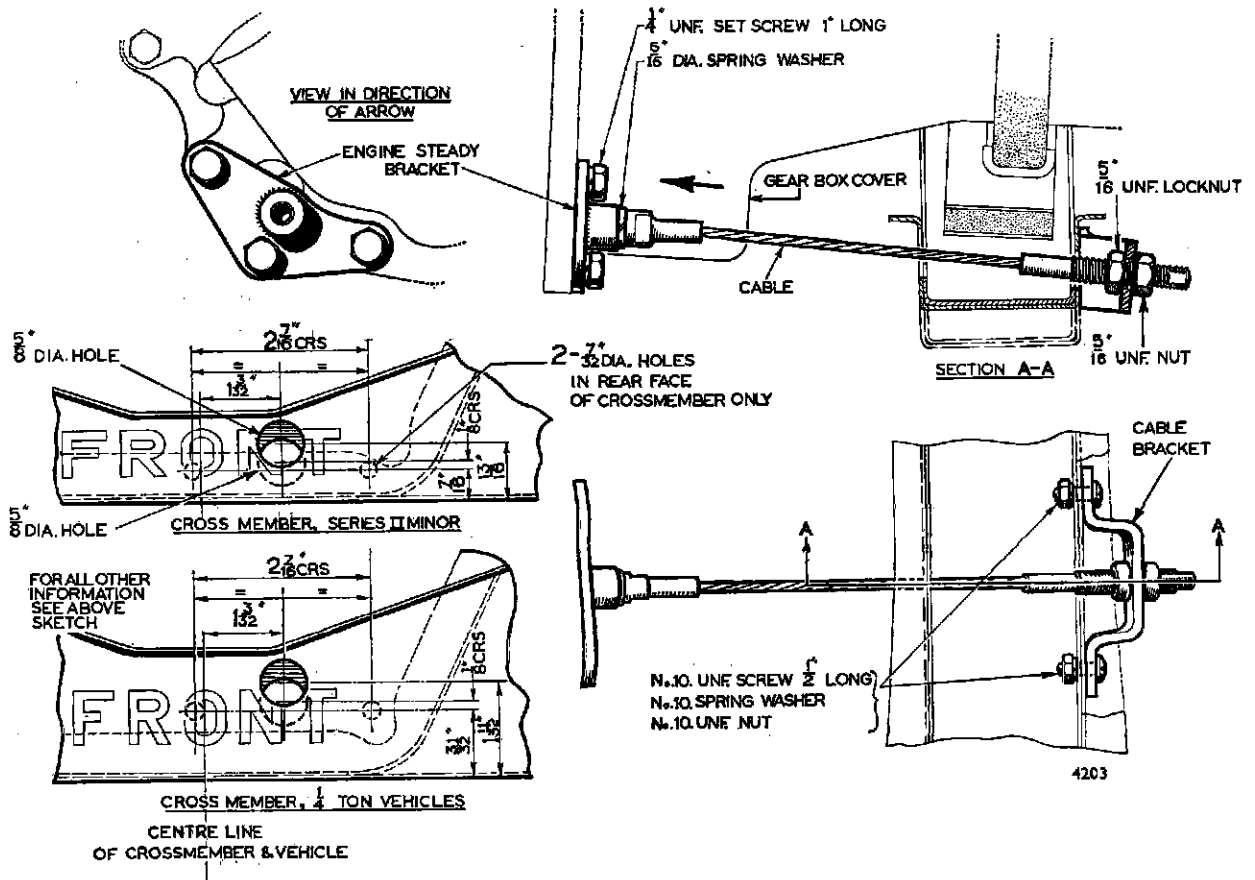


Fig. AA.28
Diagram of engine rear steady

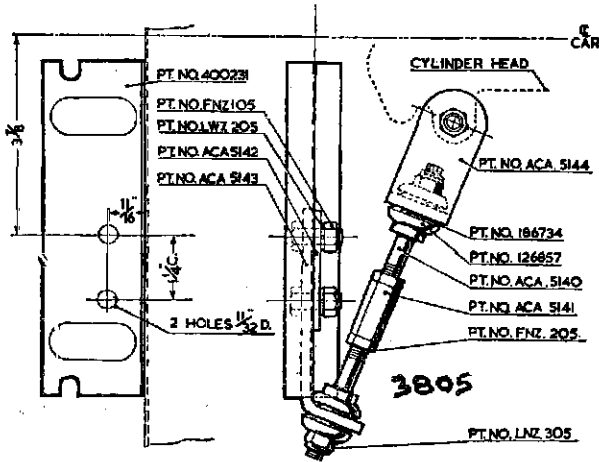


Fig. AA.29

The position in which the holes should be drilled in the right-hand battery box support, together with a plan of the assembled tie-rod in position

Section AA.36

ENGINE STEADY CABLE

On models later than Car No. 264013 an engine steady cable is fitted between a bracket on the left-hand side of the gearbox rear cover and the rear cross-member to provide longitudinal anchorage for the engine, and adjustment of the cable is by means of a $\frac{1}{16}$ in. UNF. nut and locknut.

To remove this cable the nut and locknut at the rear end should be removed and the cable screwed out of the bracket on the rear gearbox cover, using the flats machined on the front end of the cable. Reinstallation is a reversal of the above, and the cable should be tensioned so as just to prevent any forward movement of the power unit relative to the chassis. Care must be taken not to impose too great a tension or roughness will be felt with engine vibration. When tightening, the end of the cable must be held with a spanner engaging the flats at the rear end to prevent twisting and damage to the cable.

Section AA.37

ENGINE TIE-ROD

To deal with cases of clutch judder an engine tie-rod and bracket assembly, to be fitted between the cylinder head and dash panel, is obtainable under Part No. AJA 5054.

The engine anchor bracket is secured below the right-hand rear cylinder head stud nut after fitting the lengthened stud provided.

AA.28

The body anchor bracket is secured to the right-hand battery box support by two $\frac{1}{8}$ in. bolts, with nuts and spring washers, after drilling two $\frac{1}{8}$ in. (8.75 mm.) holes in the support in the position indicated in Fig. AA.29. Fit the anchor bracket behind the support and the reinforcement plate in the front.

The sequence of assembling the tie-rods, cups, rubbers, and anchor plates is illustrated in Fig. AA.29. It is essential that the length of the tie-rod is adjusted so that it is free of tension or compression load when the nuts are tightened. Ensure that the tie-rod rubbers are not unduly compressed when tightening the self-locking retaining nuts.

Section AA.38

OIL CONSUMPTION

Commencing at Engine No. 121585, a tapered piston ring is fitted in the third groove of the pistons in place of the original plain ring, making the order of the rings, from the top of the piston, (1) plain, (2) taper, (3) taper, (4) scraper. This alteration is made to improve the oil consumption, and the new piston assemblies may be used to service the earlier type singly or in sets.

Commencing at the same engine number, a new valve guide shroud (Part No. 2A 544) is fitted. This later shroud is $\frac{3}{16}$ in. (16.7 mm.) deep and approximately $\frac{1}{16}$ in. (2.4 mm.) shorter than the type fitted to engines from No. 50792 to No. 121585. When valve guide shrouds are suspected of causing oil pumping and increasing the oil consumption of engines between the above serial numbers the latest shrouds should be fitted.

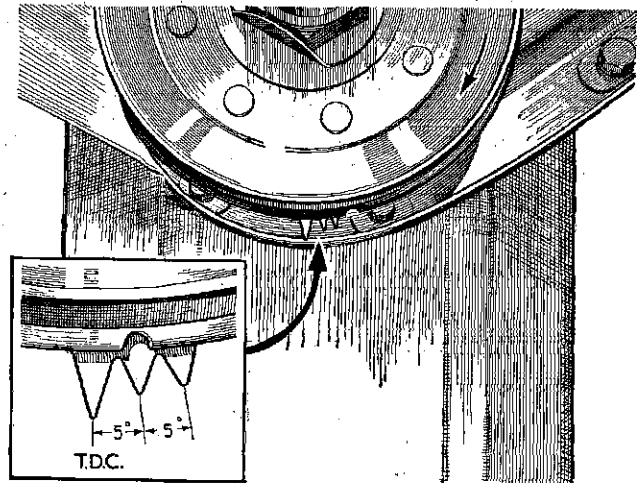


Fig. AA.30

The three-pointed timing indicator fitted to later models

Section AA.39

VALVE ROCKER MODIFICATION

A new valve rocker assembly with the screwed boss increased in depth from $\frac{7}{16}$ to $\frac{9}{16}$ in. (11.1 to 14.3 mm.) and a lengthened rocker adjusting screw with the over-all length increased from $1\frac{1}{8}$ in. to $1\frac{3}{8}$ in. (32.5 to 34.9 mm.) has been introduced at Engine No. 122704 to ensure that the valve rocker screw does not work loose.

The old and new rocker adjusting screws are interchangeable, but the later-type rocker with thickened boss must only be used in conjunction with the longer screw.

Section AA.40

MODIFIED TIMING MARKS

Commencing at Engine No. 145881 and on Engines 143904 to 144000 inclusive, a new timing indicator consisting of a bracket with three pointers is fitted to the timing case underneath the pulley. The longest pointer indicates T.D.C. and the other two pointers 5° and 10° advance respectively. The timing mark on the pulley is a notch on the rim as before. The correct timing is 2° advance.

Section AA.41

ACCELERATOR CABLE ADJUSTMENT

From Car No. 319429 a modified accelerator cable abutment bracket has been fitted to reduce tappet noise which on some earlier cars is transmitted by the accelerator cable to the inside of the car. Reference to Fig. AA.31 clearly shows the new run of the cable and the abutment bracket.

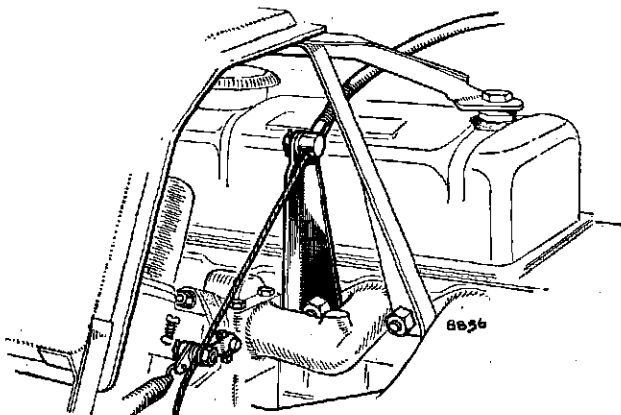


Fig. AA.31

Showing the run of the accelerator cable and new abutment bracket (Part No. ACA 5123)

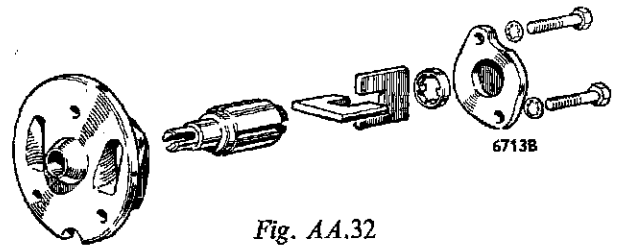


Fig. AA.32

Details of the rotary-vane-type oil pump which may be fitted on some engines

Section AA.42

ROTARY-VANE-TYPE OIL PUMP

From Engine No. 194195 a Burman rotary-vane-type oil pump may be fitted to some engines as an alternative to the concentric rotor type fitted earlier.

Instructions for removing this later-type pump from the engine remain the same as those detailed in Section AA.30.

To dismantle the oil pump remove the two bolts securing the cover to the pump body.

With the cover-plate removed the vane assembly may be extracted.

To remove the vanes from the rotor carefully prise off the rotor sleeve, which is a press fit on the rotor, and extract the vanes.

Reference to Fig. AA.32 will facilitate dismantling and reassembly of the pump.

Section AA.43

MODIFIED EXHAUST VALVES AND GUIDES

Shorter valve guides with a plain reamed bore and exhaust valves with smaller-diameter stems are fitted to the cylinder heads of later engines.

The new valves and guides are interchangeable with the old and the guides are now the same for inlet and exhaust.

When fitting new valve guides they must be driven in from the top of the cylinder head with the larger chamfer end uppermost. The valve guides should be driven into the combustion spaces until they are $\frac{3}{16}$ in. (15.1 mm.) above the machined surface of the valve spring seating.

Section AA.44

FITTING FLYWHEEL STARTER RINGS

To remove the old starter ring from the flywheel flange split the ring gear with a cold chisel, taking care not to damage the flywheel. Make certain that the bore of the

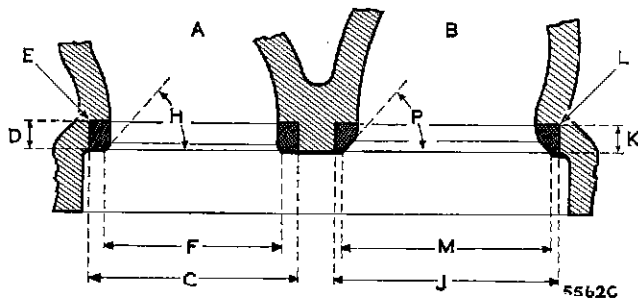


Fig. AA.33

Valve seat machining dimensions

Exhaust (A)	Inlet (B)
C. 1.124 to 1.125 in. (28.55 to 28.58 mm.).	J. 1.187 to 1.188 in. (30.16 to 30.17 mm.).
D. .186 to .188 in. (4.72 to 4.77 mm.).	K. .186 to .188 in. (4.72 to 4.77 mm.).
E. Maximum radius .015 in. (.38 mm.).	L. Maximum radius .015 in. (.38 mm.).
F. 1.0235 to 1.0435 in. (25.99 to 26.50 mm.).	M. 1.0855 to 1.1055 in. (27.58 to 28.07 mm.).
H. 45°.	P. 45°.

new ring and its mating surface on the flywheel are free from burrs and are perfectly clean.

To fit the new ring it must be heated to a temperature of 300 to 400° C. (572 to 752° F.), indicated by a light-blue surface colour. If this temperature is exceeded the temper of the teeth will be affected. The use of a thermostatically controlled furnace is recommended. Place the heated ring on the flywheel with the lead of the ring teeth facing the flywheel register. The expansion will allow the ring to be fitted without force by pressing or tapping it lightly until the ring is hard against its register.

This operation should be followed by natural cooling, when the 'shrink fit' will be permanently established and no further treatment required.

Section AA.45

FITTING VALVE SEAT INSERTS

Should the valve seatings become so badly worn or pitted that the normal workshop cutting and refacing tools cannot restore them to their original standard of efficiency, special valve seat inserts can be fitted.

The seatings in the cylinder head must be machined to the dimension given in Fig. AA.33. Each insert should have an interference fit of .0025 to .0045 in. (.063 to .11 mm.) and must be pressed and not driven into the cylinder head.

After fitting, grind or machine the new seating to the dimensions given in Fig. AA.33. Normal valve grinding may be necessary to ensure efficient valve seating.

AA.30

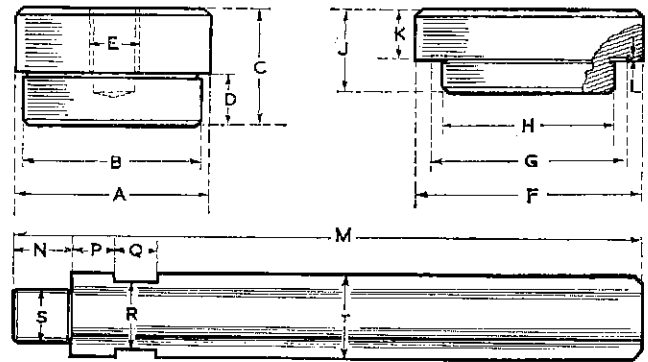


Fig. AA.34

Cylinder liner pilots should be made to the above dimensions from case-hardening steel and case-hardened. The pilot extension should be made from 55-ton hardening and tempering steel, hardened in oil and then tempered at 550° C. (1,020° F.)

Dimensions for 803-c.c. engines

Pressing-out pilot

- A. $2\frac{1}{8} \pm .005$ in. ($60.33 \pm .127$ mm.).
- B. $2.270 \pm .000$ in. ($57.75 \pm .000$ mm.).
- C. $1\frac{1}{2}$ in. (44.45 mm.).
- D. $\frac{3}{4}$ in. (19.05 mm.).
- E. $\frac{3}{4}$ in. B.S.W. thread.

Pressing-in pilot

- F. $2\frac{1}{8}$ in. (71.44 mm.).
- G. $2\frac{1}{16}$ in. (61.91 mm.).
- H. $2.255 \pm .000$ in. ($57.27 \pm .000$ mm.).
- J. $1\frac{1}{2}$ in. (31.75 mm.).
- K. $\frac{3}{4}$ in. (19.05 mm.).
- L. .015 in. (.38 mm.).

Pilot extension

- M. $14\frac{1}{2}$ in. (36.83 mm.).
- N. $\frac{7}{8}$ in. (22.22 mm.).
- P. $\frac{1}{4}$ in. (15.87 mm.).
- Q. $\frac{1}{4}$ in. (15.87 mm.).
- R. 1 in. (25.4 mm.) flats.
- S. $\frac{3}{4}$ in. B.S.W. thread.
- T. $1\frac{1}{2}$ in. (31.75 mm.).

Section AA.46

FITTING CYLINDER LINERS

Should the condition of the cylinder bores be such that they cannot be cleaned up to accept standard oversize pistons, dry cylinder liners can be fitted. This operation may be carried out by the use of specialized proprietary equipment or with a power press using pilot adaptors to the dimensions shown in Fig. AA.34. The press must be capable of 3 tons (3048 kg.) pressure to fit new liners and 5 to 8 tons (5080 to 8128 kg.) to remove old liners.

Remove the engine from the vehicle as detailed in Section AA.25. Dismantle the engine and remove the

cylinder head studs. If liners have not previously been fitted the bores must be machined and honed to the dimensions given in the table below.

To remove worn liners

Place the cylinder block face downwards on suitable wooden supports on the bed of the press, making sure that there is sufficient space between the block and the bed of the press to allow the worn liner to pass down. Insert the pilot in the bottom of the liner and carefully press the liner from the bore.

To press in new liners

Thoroughly clean the inside of the bores and the outside of the liners. Stand the cylinder block upright on the bed of the press, insert the pilot guide in the top of the liner, and position the liner with its chamfered end in the top of the bore. Make certain that the liner is square with the top of the block and that the ram of the press is over the centre of the pilot. Press the liner fully into the bore.

Each liner must be machined to the dimensions given in the table below after pressing into position.

<i>Engine type</i>	<i>Liner Part No.</i>	<i>Machine bores of cylinder block to this dimension before fitting liner</i>	<i>Outside diameter of liner</i>	<i>Interference fit of liner in cylinder block bore</i>	<i>Machine liner bore to this dimension after fitting</i>
'A' (803 c.c.)	2A 518	2.406 to 2.4065 in. (61.11 to 61.125 mm.)	2.4085 to 2.40925 in. (61.176 to 61.194 mm.)	.002 to .00325 in. (.05 to .08 mm.)	2.2795 to 2.281 in. (57.899 to 57.937 mm.)