



AUTO UNION G.M.B.H. · INGOLSTADT

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Subject to alterations



DKW

Works Manual for stripping
and refitting engine and trans-
mission

Motorcycle Models RT 200/250

The special tools described in this workshop manual for DKW Motorcycles RT 200 / RT 250 can be purchased from our SERVICE DEPARTMENT at INGOLSTADT / DONAU, Germany.

When ordering parts please note:

1. Address all correspondence to

AUTO UNION G.m.b.H.
Export-Service

Ingolstadt / Donau, Germany

Telephones: 2993, 2771-73

Cables: AUTOUNION INGOLSTADT Germany.

2. Always quote exact quantity of tools or parts required and do not omit also to quote the parts number.
3. Please quote whether the goods are to be dispatched by sample post, air freight, sea freight etc.
4. Always give exact address of destination, otherwise delays are unavoidable.
5. Please place your orders for tools and parts separately, not in connection with letters.
6. Terms of payment will be fixed individually. (Bankers cheque in advance, letter of credit etc.)
7. In case of inquiries please always quote our reference and order numbers.
8. Claims must be placed within 8 days on receipt of goods.
9. Place of settlement: Ingolstadt/Donau, Germany.
10. We reserve the right to make changes in design, to make additions or improvements on our products without previous notice and without incurring obligations to

to install the same on components or assemblies previously supplied.

AUTO UNION G. m. b. H.

NOTE: The photographs and drawings shown in the second part of this booklet will facilitate accurate reference to the described stripping and refitting work.

WORKSHOP MANUAL

DKW Motorcycle Engine, models RT 200 and RT 250

See descriptive illustration,
table 1

Single cylinder - DKW - Two-stroke Engine with DKW reverse-scavenging - flat top piston with three rings - special light alloy cylinder head.

RT 200: Performance: 10 BHP - r.p.m.: 4500 - Bore: 62 mm Ø - Stroke: 64 mm - cubic capacity: 244 c.c. - Compression ratio: 1: 6,3 - Combustion chamber: 46 c.c.

Ignition and generator system: RT 200:

DKW-battery-ignition and lighting system 6 volts 45/60 watts sparking plug: Bosch W 175/ T 1 or Beru 175/14.

RT 250:

As with RT 200, but with sparking plug, Bosch W 225/ T1 or Beru 225/14.

Carburettor:

RT 200:

Air set screw 2 1/2 turns open.

RT 250

Bing carburettor AJ 1/24 up to engine number 47005000 - fuel jet: 100 - needle position 2 (needle position 3 up to 1000 kilometers) - needle jet 270 - idling speed jet 50 - air screw: 1 1/2 turns open - mixing chamber insert: size 5

Together with the carburettor F 1/24 a new crankshaft with full counter-weights was introduced. If a crankshaft of former production is to be replaced by a crankshaft with full weights, the carburettor setting must be modified as follows:

Fuel jet 105/ - air set screw 2 1/2 turns open.

If on the other hand an engine fitted with flange carburettor F 1/24 without intermediate pipe) is to be equipped with a crankshaft of the old type, the carburettor setting should be modified in the following way:

Air set screw 2 1/2 turns open.

RT 250:

Big carburettor AJ 2/26 - Fuel jet 105 - needle position 2 (needle position 3 up to 1000 kilometers) - needle jet 270 - idling speed jet 60 - air set screw 1 1/2 turns open - mixing chamber insert size 5.

Clutch :

Multiplate clutch in oil bath - endless roller chain between engine and gear box - transmission ratio 1: 2.53 for RT 200 and RT 250

Three-speed gear box (foot lever control with electric neutral position indicator).

Gear box :

RT 200 and RT 250 :

Gear ratio : First speed 1 : 2.66 - second speed 1 : 1.378 - third speed 1 : 1

Chain drive :

RT. 200 :

Roller chain 1 1/2 x 5/16" - Solo : gear ratio 1 : 2,5 - drive sprocket 19 teeth - side car : gear ratio 1 : 3,2 - drive sprocket 14 teeth - wheel sprocket 45 teeth.

RT. 250:

Roller chain 1 1/2 x 5/16" - solo: gear ratio 1 : 2,5 - drive sprocket 19 teeth - side car : gear ratio 1 : 3 - drive sprocket 15 teeth - wheel sprocket 45 teeth.

Total transmission ratio:

RT 200 :

First speed 1 : 16,8 - second speed 1 : 8,72 - third speed 1 : 6,34 .

RT 250 :

First speed 1 : 16 - second speed 1 : 8,3 - third speed 1 : 5,99 .

It is essential that in addition to the standard tools the following special tools be available for stripping and re-fitting RT 200/250 engines.

See illustration

table 2

No. 1 = Clutch counter support	No. 0100253-0
No. 2 = Chain sprocket extractor	No. 0100248-0
(can also be used for Rt 125 instead of No. 0	No.
No. 3 = Hook spanner for exhaust pipe collar nut 52 - 55	No. 0903
No. 4 = Extractor for con. rod bushes with 15 mm/Ø	No. 0969

No. 5 = Clutch spring puller	No. 0100161
No. 6 = Piston ring compressor	No. 0100251-0
No. 7 = Piston heater cap	No. 0100260-0
(without ill.) = Electric piston heater	No. 0100147
with heater element	No. 0100145
No. 8 = Con-rod bush reaming tool	No. 0100119-0
No. 9 = Punch for oil seals and ball bearings	No. 0100252-0
No. 10 = Holder for chain sprocket	No. 0100246-0
No. 11 = Clamping piece (to be used with No. 0100253-0)	No. 0100244-0
No. 12 = Reducing piece for ignition timing gauge	No. 0100265-0
No. 13 = Ignition timing gauge	No. 0785
No. 14 = Guide sleeve	No. 0100245-0
No. 15 = Armature extracting bolt	No. 0100027
No. 16 = Punch for piston pin	No. 0100249-0
No. 17 = Guide rod for piston pin	No. 0100249-01
No. 18 = Extractor rod for dowels	No. 0100243-0
No. 19 = Fork for counter weight support	No. 0100254-0
No. 20 = Wooden fork for piston mounting	No. 0100162
No. 21 = Ruler for aligning con-rod	No. 0100156

No. 22 = Aligning pin for con-rod	No. 0100213
No. 23 = Gauge pin for con-rod	No. 0100214
(without ill.) = Box spanner	No. 0100268-0
(without ill) = Piston ring expander	No. 0162

See illustration
table 3

Crank shaft extractor complete	No. 0100266-0
Engine support for use with engines RT 125, RT. 200 and RT 250 (see ill. 1)	No. 0100269-0

Before fixing engine in the support and mounting in vice, drain gear oil.
The engine support number 0100269-0 consists of a U-plate to be used for the models RT 125, RT 200 and RT 250, and which can be turned in all directions, with the aid of a joint-piece, further of a bracket holding the joint piece in the vice and of various - individually marked - bolts.

The markings on the bolts show which of them are needed for the RT 125 and which are intended for the RT 200 / 250 models.

See illustration
table 4

Place engine support in horizontal position and lay the engine - clutch side downwards on top, then fix with the bolts supplied. The bolts are also intended as supports for the crank shaft extractor (see ill. 17).

Now bring engine with support in a vertical position as shown in the ill.4, tighten handle securely in joint piece. Unscrew generator cover, extract the regulator with cam, remove the clutch thrust rod and rubber seal and also the switch for the neutral position indicator.

See illustration
table 5

Loosen connections 1,30 and D+ on regulator and generator switch spanner No. 0100268-0 and pull out wiring in the direction of the clutch side. Take out the rubber grommet. Unscrew the two bolts holding the generator and remove field winding together with regulator and contact breaker base plate.

Extract the armature with armature extracting bolt and removal key. Insert chain sprocket holder No. 0100246-0, loosen lock plate and nut. Attention ! Left hand thread ! Remove flange with paper gasket, washer and oil conducting disc. Extract chain sprocket and cover plate with paper gasket, oil seal and race.

See illustration
table 6

Turn engine support by 180° after loosening vice and then re-tighten.

See illustration
table 7

Remove the foot change and kickstarter crank with aid of a screw driver, having previously loosened the clamping bolts. Unscrew five cover bolts (Attention : Washers !) Remove cover and gasket, check chain slack (slack: Total width up and

down). If slack exceeds 15 mm (19/32 inch) replace chain. Remove washer from kickstarter shaft. If chain is to be re-used, mark same on the outside.

See illustration
table 8

Pull out the five clutch springs with puller No. 0100161, turn by 90° to the left and then let the springs snap back. Remove clutch components. Note position of lined- and steel plates ! Insert clamping piece No. 0100244-0 and remove chain sprocket nut (right hand thread).

See illustration
table 9

Remove extracting bolt, insert clutch counter support No. 0100253-0 and clamping piece 0100244-0 and also loosen clutch cage nut. (Left hand thread !) Remove drive bracket.

See illustration
table 10

Screw the chain sprocket extractor 0100243-0 to sprocket and extract from crank-shaft.

The entire drive unit incl. chain and kickstarter assembly can now be removed. Note position, quantity and thickness of washers behind the clutch drum. These are important for adjusting chain alignment.

See illustration
table 11

Now the four nuts securing the cylinderhead should be unscrewed. A suitable spanner No. 4701-28203-00 is supplied with the motorcycle tools. Remove cylinderhead, gasket,

cylinder and base gasket, and do not forget, immediately, to insert wooden fork No. 0100162, to avoid damaging the piston.

See illustration
table 12

Now heat the piston with the piston heater cap No. 0100260-0 or the electric piston heater 0100147 + 0100145 up to about 50°C. (125 deg F), having removed the circlips beforehand. Then press the gudgeon pin out by hand with the aid of a punch.

See illustration
table 13

Having removed the two bolts from the engine support, the dowels can be pressed out with help of the punch 0100243-0. Move con-rod to bottom dead centre position and insert support fork No. 0100254-0 between the counter weights, hereby applying a few light strokes so that the fork fits tightly. Turn the engine by 130°, tilt into horizontal position and remove the 12 case bolts on the clutch side and the thirteenth bolt on the generator side. For this operation a strong well-fitting screw driver is essential.

See illustration
table 14

Fix the thrust piece of crankshaft extractor with the three attached bolts on the shaft end (generator side). Then remove the support bolts from the extractor and by tightening the thrust bolts separate the halves of the case.

See illustration
table 15

See illustration
table 16

The gear components, the shift shaft and the gear lever with bearing, stop ball and spring can be easily removed after unscrewing the two bolts (loosen lock plates beforehand).

See illustration
table 17

After turning the engine accordingly so that it is in a horizontal position, fix the crankshaft extractor, having beforehand fixed the bolt from beneath and two further support bolts. The one half of the case with crankshaft now hangs beneath the extractor. Before fixing the plate insert the thrust piece from beneath so that the bead lies against the plate. The crankshaft can now be easily pressed out of the bearing by simply tightening the thrust bolt.

Now remove the crankshaft extractor. Should both ball bearings have remained in the case (clutch side) whilst extracting the crankshaft, then one of the bearings must be removed before pressing out the oil seal and the second bearing, so that the circlip - between the two bearings - can be removed. By warming the case carefully around the bearing seat with the aid of a gas flame and tapping the case on a wooden block, the bearing will drop out from its seat.

See illustration
table 18

After placing the case into the engine support again the oil seal and the second ball bearing can be pressed out with aid of the punch No. 0100252-0. This can of course

also be done without the engine support.

See illustration

table 19

The neutral position indicator shaft can then be removed without difficulty from the case (generator side) and with a rubber mallet the shaft gear can be driven out of the ball bearing seat.

If the ball bearings also have to be removed, the case must be heated and the bearings driven out with the punch No. 0100252-0.

When reassembling the engine

do not omit to heat the bearing seats to about $80 - 90^{\circ}\text{C}$ ($180 - 195$ deg. F) before inserting the ball bearings. Fix the oil seal so that the lip points in direction of the clutch. As far the oil seal is not rubber-covered, sealing compound should be applied to the circumference of the metal seal holder. Remove any remains of the sealing compound which may remain on the bearing seats before fixing the ball bearings.

See illustration

table 20

To avoid damage of the oil seal lip when fixing the crankshaft place guide sleeve 0100245-0 on the shaft end (clutch side). If the crankshaft is not to be pressed into the case by a special press, then use only rubber mallet or a piece of hardwood and do not forget the counter weight support 0100254-0. Having fixed the gears and shift mechanism, bring gears with aid of foot lever into second speed position and check as follows:

As shown in ill. 15 the jaws of the shift piece should be in equal distance from the

shift bracket edges and the points of the jaws must cover half the breadth of the shift bracket. Should the coverage not be correct, the support angle must be carefully adjusted. If the distance on both sides is not equal, then the ends of the return spring must be slightly bent with the aid of a tubular punch. Now rotate the gear shafts and ensure that all parts work smoothly.

Before fixing the right half of the case apply a good sealing compound to the joint surfaces. All bolts must be equally tightened with a well-fitting screw-driver. Do not remove counterweight support until this work has been completed.

See illustration

table 21

Finally control the con-rod alignment with aid of gauge No. 0100213, ruler No. 0100156 and one aligning rod No. 0100213. We also refer to the illustrations in our Special Tools Booklet No. 77, where the handling of these tools is described. Should the replacement of the con-rod bush appear necessary, use bush extractor No. 0969 and ream the new bush with reaming tool No. 0100119-0.

The adjustable reamer is - we should like to point out - the same as used for the DKW car engine. The reamer is available under No. 0100109-3.

Gudgeon pin clearance should be 0,02 to 0,03 mm. When reaming the gudgeon pin can be used as gauge.

For inserting the gudgeon pin into the piston which has been previously heated to 50°C (125 deg F), use the guide rod No. 0100249-01 and for pressing the pin by hand into its final position use guide pin No. 0100249-0, which automatically ensures the correct location of the gudgeon pin in the piston. Piston clearance: 0,05 mm.

When assembling clutch and chain sprockets, check chain alignment. First fit sprockets without chain, as this facilitates checking of the correct position of the tooth flanges, which must be in one plane. Adjustment can be made by the washers behind the clutch cage, already mentioned against ill. 11. Further make sure that the bush protrudes about 0,1 to 0,2 mm so that the inner clutch plate drum runs perfectly free.

Although the cover on the clutch side carries a paper gasket, use sealing compound when fixing.

See illustration
table 22

When fitting generator, always remove the carbon brush caps and withdraw the brushes to avoid damage. The angle of the contact breaker arm must be greased beforehand (i.e., Shell Donax P, Callypsol etc.). The felt wiper itself should not be greased. Felts which have become hard must be replaced to avoid undue wear of the cam.

When reconnecting the wiring, take care that the rubber seals are properly fitted in the case.

To adjust ignition timing :

1. Set contact gap at 0,4 mm when cam is at highest position.
2. Screw ignition timing gauge No. 0786 with reducing piece 0100265-0 (see ill. 23) into sparking plug aperture and raise piston by means of the kickstarter to 5,5 mm (1/32 inch) before top dead centre. T.D.C. is positioned automatically by the gauge slide when rotating the engine. Do not turn the ignition regulator ! Connect test lamp. When engine is out of the frame the lamp must be connected in series with the contact breaker points, i.e., the lamp should be connected exactly

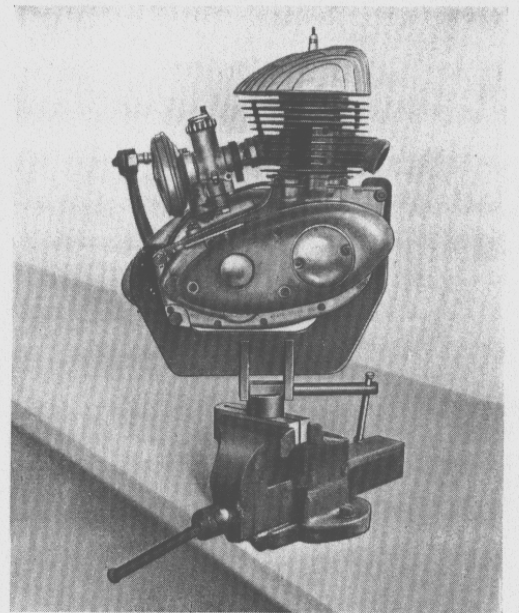
like an ampermeter, either in the positive or negative lead. The lamp will go out as soon as the breaker points begin to open.

3. Expand the fly weights by hand and insert a small piece of wood or a match in the corner between plate and fly weight to prevent the weights from returning. In this position the test lamp should just go out, if not, the contact breaker base plate must be adjusted until the correct ignition point is reached.

For this purpose first loosen screw A and with aid of a corner screw-driver, the screw B is partly covered by the ignition regulator. Now turn base plate to right or left as necessary and re-tighten both screws. Repeat operation if necessary.

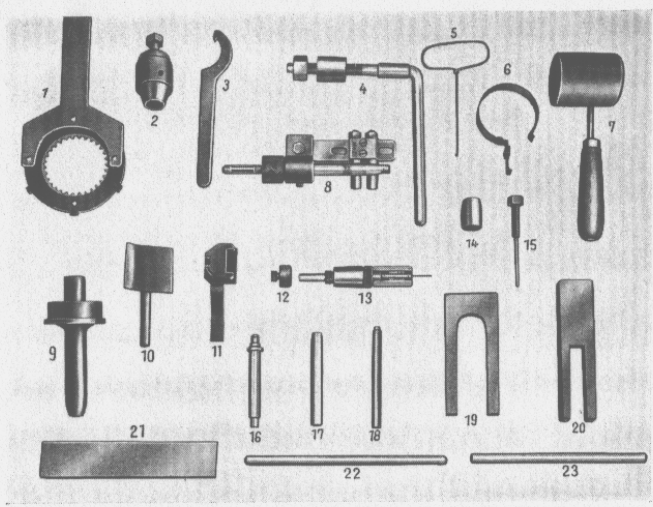
For setting the ignition the cover on the generator side must be removed in order to reach screw B with a corner screw-driver. If the ignition is only to be checked, without any adjustment, this can be done by way of the control aperture, having beforehand removed the lid. If the ignition gauge No. 0786- designed for the DKW car engine - is to be used for the RT 200/250 engine, the reducing piece must be screwed on and furthermore the pointer bolt must be shortened at the lower end by 5 mm to 30 mm, so that the bolt reaches far enough into the cylinder. In spite of this modification the gauge can still be used for the car engine.

(In future the gauges will be supplied with a lengthened pin, so that the above operation will become unnecessary.)

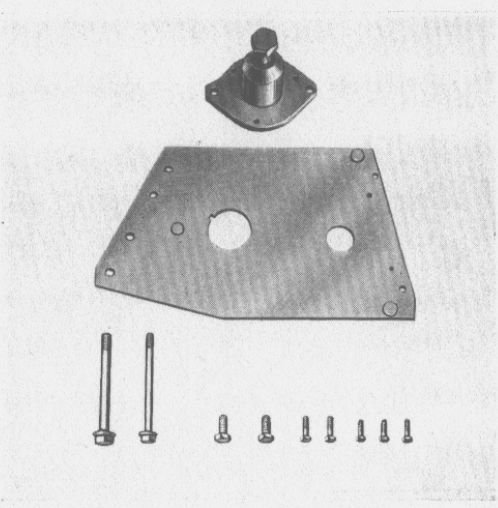


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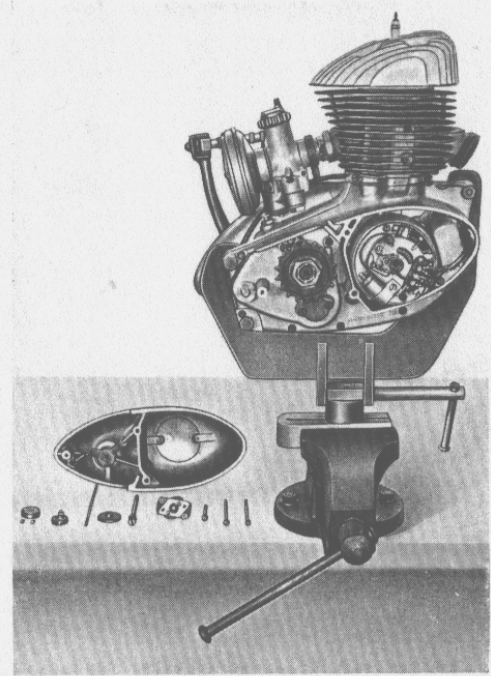
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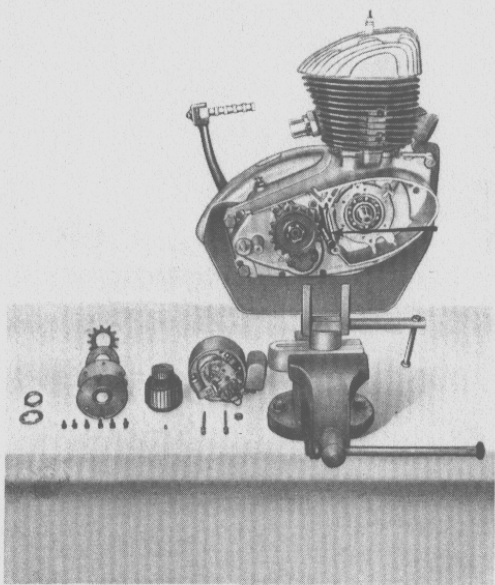
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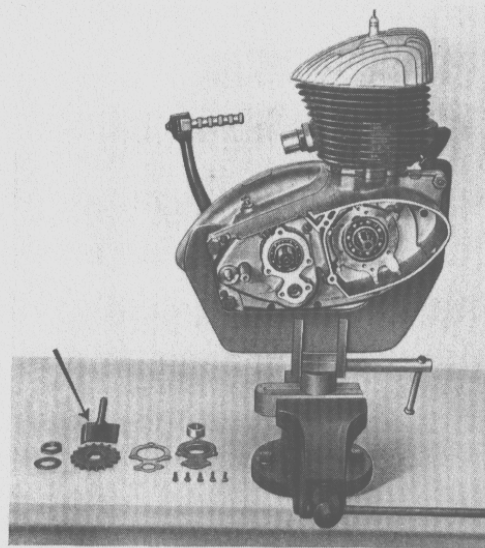
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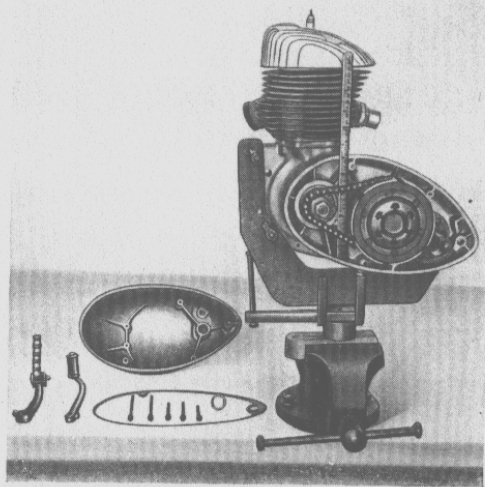
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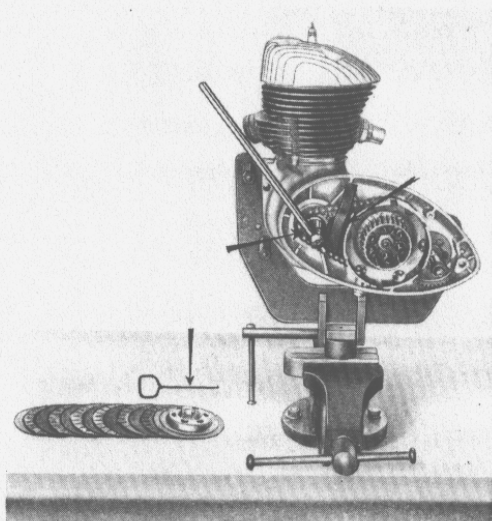
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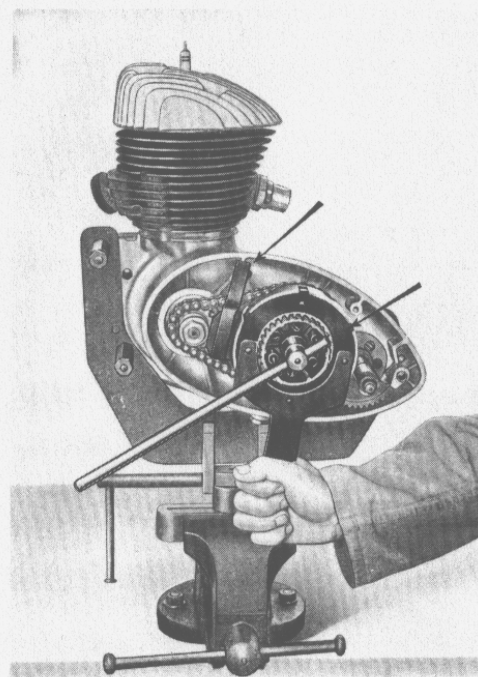
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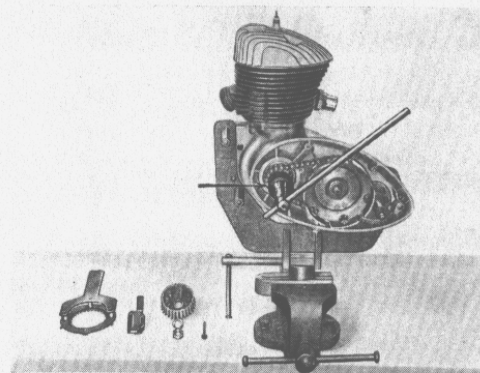
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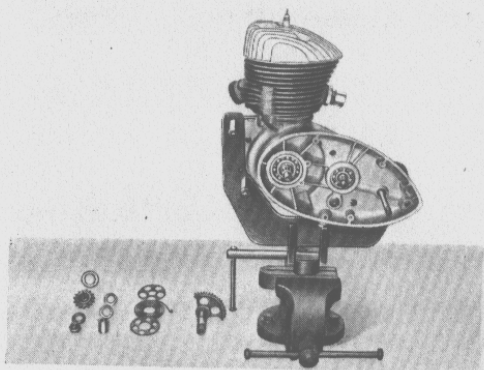
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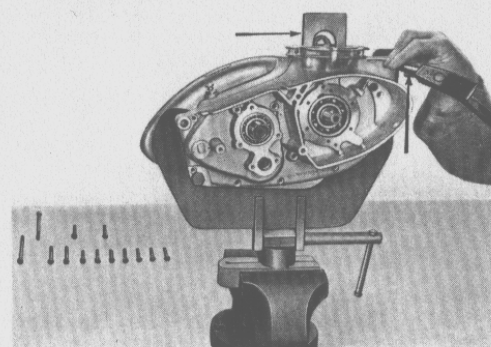
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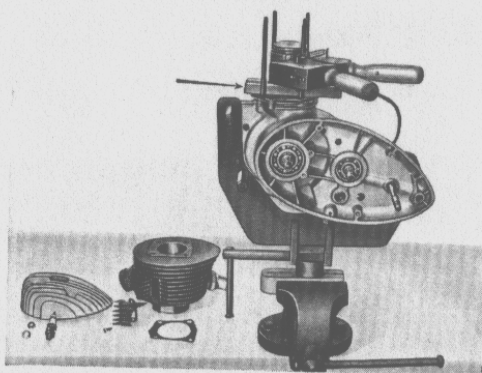
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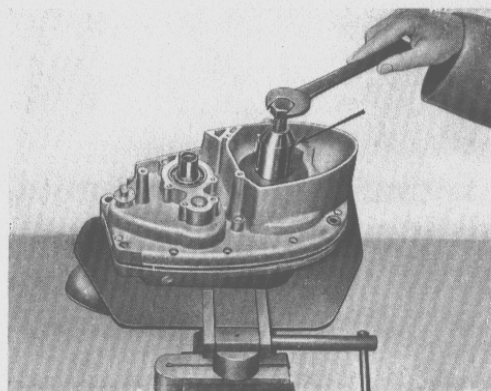
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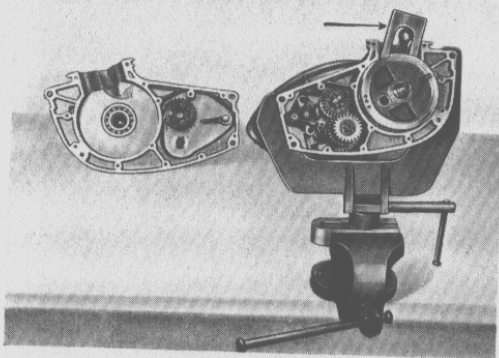


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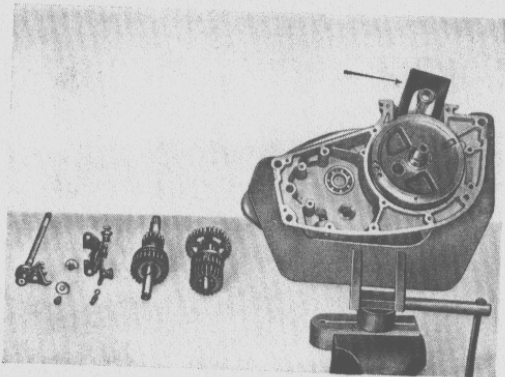


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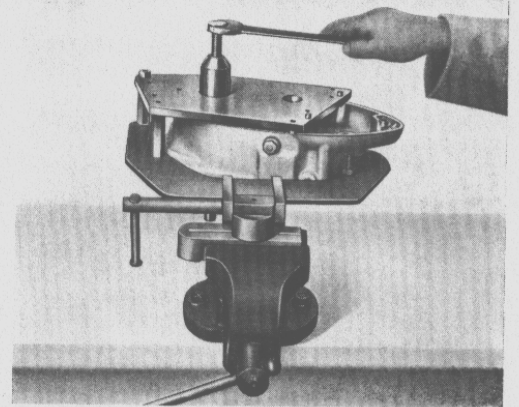




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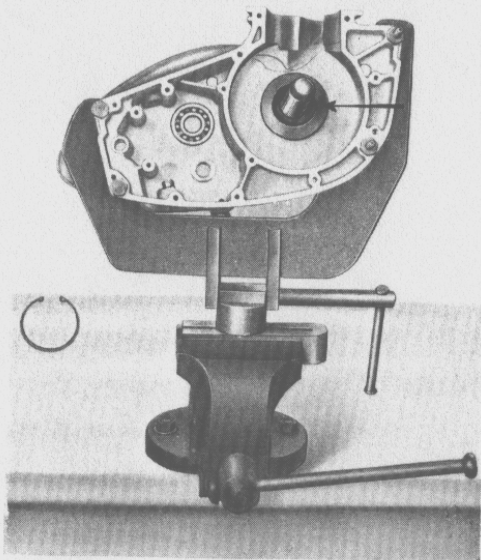


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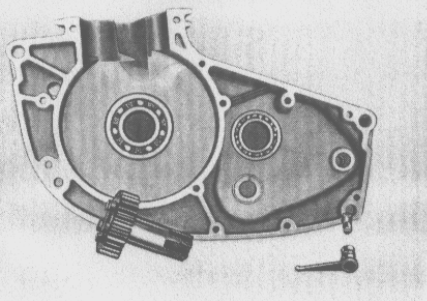


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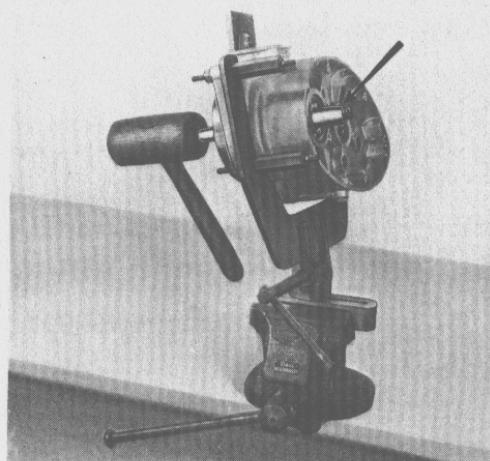
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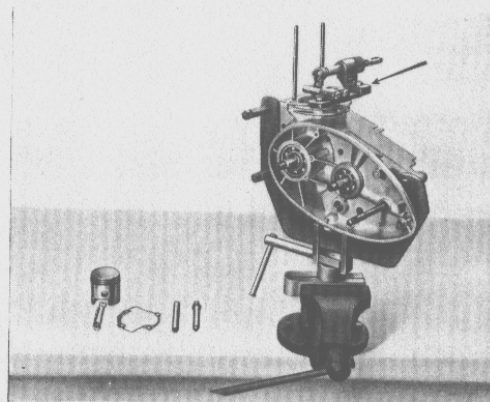
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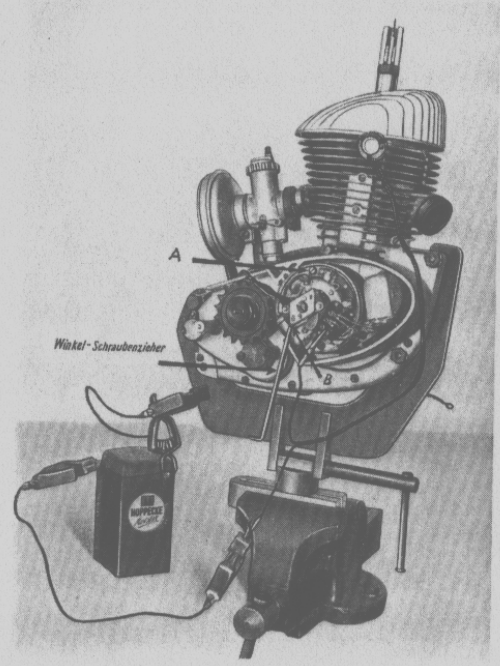
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