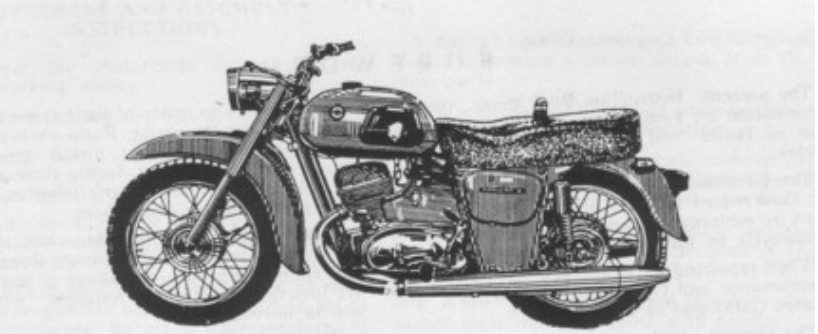
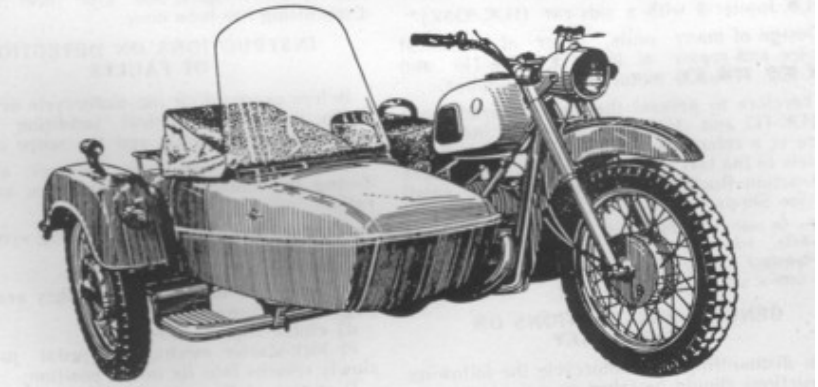
Izh Planeta-3 Jupiter-3 Repair Manual



ИЖ-PLANETA-3 (ИЖ-П3)



ИЖ-JUPITER-3K (ИЖ-Ю3К)

FOREWORD

The present Instruction Book gives concise information on assembling, dismantling, detection of faults and overhaul of "ИЖ" motorcycles.

The Overhaul Instructions serves as a guide for Guaranteed Repair Shops and it may be used by motorcycle owners when repairing the motorcycle by themselves.

When repairing the motorcycle use Motorcycle Maintenance and Operation Instructions and Spares Catalogue as well.

The present Instructions may be used for overhaul of the following motorcycle models:

ИЖ-Planeta-2 (ИЖ-П2), ИЖ-Jupiter-2 (ИЖ-Ю2),

ИЖ-Jupiter-2 with a side-car (ИЖ-Ю2К),

ИЖ-Planeta-3 (ИЖ-П3), ИЖ-Jupiter-3 (ИЖ-Ю3),

ИЖ-Jupiter-3 with a side-car (ИЖ-Ю3К)*

Design of many units, order of technical service and repair of ИЖ-П2, ИЖ-П3 and ИЖ-Ю2, ИЖ-Ю3 motorcycles are similar.

Therefore to present the material briefly one of ИЖ-П3 and ИЖ-Ю3 models is indicated. There is a reference to ИЖ-П2 and ИЖ-Ю2 models in the text if it is necessary. The present Instruction Book is designed only for small Service Shops.

* To be read: Izh-Planeta-2 (Izh-P2), Izh-Jupiter-2 (Izh-Ju2), Izh-Jupiter-2 with a side-car (Izh-Ju-2K), Izh-Planeta-3 (Izh-P3), Izh-Jupiter-3, (Izh-Ju-3), Izh-Jupiter-3 with a side-car (Izh-Ju-3K).

GENERAL INSTRUCTIONS ON DISASSEMBLY

On dismantling the motorcycle the following instructions should be taken as a guide:

1. Use a special tool and accessories (see pages 56—63) when carrying out the operations of dismantling and reassembly.

A set of tools, which is supplied with the motorcycle, may be also used in this case. It is recommended to have a mallet, a copper hammer, mandrels and copper drifts additionally.

2. Put parts in order of their removing while disassembling the units. Parts such as piston rings, pistons, cylinders, piston pins and the others may be confused during their assembly. To avoid this put these parts together with the conjugated ones or mark them.

3. Don't make great efforts when fastening the screwed joints. Don't damage thread, edges and splines, otherwise breakage of parts which are unscrewed or parts adjacent with them will be in result.

Pour over the parts with kerosene and strike against those parts which you are unable to unscrew with a hammer.

4. Avoid appearance of dints, scratches, dirt and rust on polished, grinded and rubbing parts.

5. Clean, wash units and parts in kerosene or white spirit and wipe them dry after dismantling has been done.

INSTRUCTIONS ON DETECTION OF FAULTS

Before overhauling the motorcycle detect the faults, determine technical condition of the motorcycle or its units and the scope of work.

The need of repairing becomes apparent during the motorcycle maintenance and operation.

It is determined by the following symptoms:

a) engine power reduced;
b) piston knocks amplified;
c) gears are not engaged or they are disengaged spontaneously;
d) clutch slips or drags;
e) kick-starter mechanism pedal jumps or slowly returns into its initial position;
f) engine fails to start or misses due to electrical equipment breakage;
g) lamps are burnt out or light up weakly;
h) pilot lamp (red colour) on the headlamp body is on with the engine running.

To prepair the motorcycle for detection of faults thoroughly clean it from dirt, wash it and make sure in presence of all parts and units.

ENGINES OVERHAUL

Remove the engine from the frame and set it on the table or bench to perform complete dismantling and assembling of the engine.

It is not necessary to remove the engine from the frame when repairing the following units and parts:

1. Cylinder-piston group (cylinder, piston, piston pin and rings).
2. Generator (armature, stator, breaker, condenser).
3. Crankshaft right-hand oil seal.
4. Clutch control mechanism.
5. Mainshaft sprocket.
6. Gearbox (only ИЖ-Planeta-3, ИЖ-Planeta-2 models).
7. Clutch.
8. Transmission from engine to clutch.
9. Kick-starter mechanism.
10. Exhaust system.
11. Air cleaner.
12. Carburettor.

When repairing some units simultaneously, it is better to remove the engine from the frame. Overhauling the crankshafts, main bearings, crankshaft oil seals, crankcase halves and gearbox of ИЖ-Jupiter-3 (Jupiter-2) motorcycle is done on the engine removed from the frame.

ИЖ-П3 (П2) ENGINE OVERHAUL

ENGINE REMOVAL FROM THE FRAME

Proceed as follows:

1. Remove carburettor guards.
2. Take off the saddle pressing a holddown catch (from the left, in the front part of the saddle) and disconnect wire plug connections.
3. Disconnect the fuel pipe hose and remove the fuel tank.
4. Loosen the clip screw and remove the air cleaner.
5. Disconnect a neutral position contact wire.
6. Take off a mixing chamber cover of the carburettor together with a throttle and needles and then take it aside.
7. Disconnect the cable from the decompressor.
8. Take a cap off the spark plug with a high tension wire.
9. Detach silencers and exhaust pipes.
10. Remove a crankcase right-hand cover and disconnect the clutch cable.
11. Disengage the rear wheel chain.
12. Take rubber guards off the engine manifolds.
13. Disconnect a wire bunch from the generator and pull it out of the engine slot.
14. Loosen rear fastening nuts of the engine.
15. Unscrew nuts, remove brackets and front fixing bolts of the engine.
16. Take the engine cylinder with one hand and kick-starter pedal with the other hand and moving the engine forward and to the left, remove it from the frame.

To reset the engine on the frame repeat this procedure in the reverse order.

Take care of the chain lock catch position. It should be set with its cut facing the reverse direction of the chain moving.

CYLINDER-PISTON GROUP

To dismantle a cylinder-piston group without removing the engine from the frame proceed as follows:

1. Remove carburettor guards, the saddle, the fuel tank, silencers and exhaust pipes, the air cleaner, the carburettor mixing chamber cover together with the throttle and needles. Take a high tension wire cap off the spark plug.
2. Disconnect the cable from the decompressor.
3. Take off the ignition coil.

Dismantling

1. When it is necessary to replace the spark plug or to repair the decompressor, unscrew them from the cylinder head.
2. Unscrew the cylinder head fastening nuts and take the head off the studs.

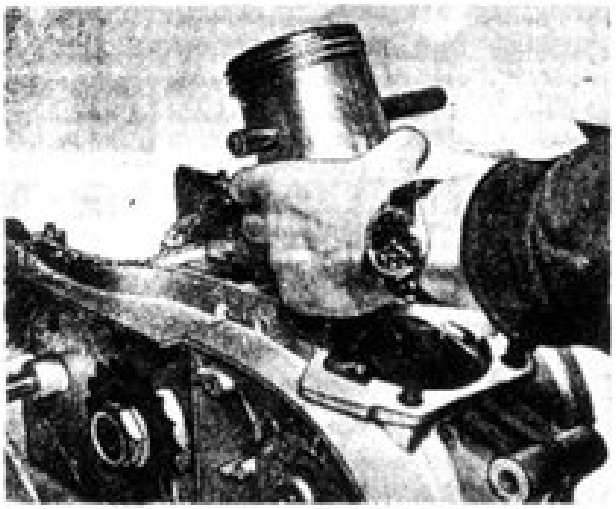


Fig. 1. Piston pin pressing-out.

3. Undo the nuts fastening the cylinder to the crankcase, set the piston in the lower position and then remove the cylinder. Don't damage the gasket when doing it.

4. Get the gasket off.

5. Cover the hole with a clean cloth to prevent the crank chamber from being clogged with foreign matters.

6. Take out piston pin lock rings.

7. Tap the piston pin by means of a hammer and mandrel or a drift (Fig. 1) holding the piston with a hand.

8. Remove piston rings with the aid of 5—6 steel or brass strips (length—30—40 mm, width—3—5 mm, thickness—0.2—0.3 mm).

Insert strips into the ring in the place of the ring gap and evenly dispose them round the periphery between the piston and the ring. Then take off the ring along the strips.

It is permissible to remove rings from the piston without using the strips. Remember that the ring may be broken if the ring ends are drawn aside greatly.

Bear in mind the location order of rings in the piston grooves to place the rings home while assembling.

Detection of Faults and Repair

1. Cylinder Head

Visually examine the thread in the head hole for the spark plug. In case of thread damaging replace or repair the head.

It is done in the following order:

Bore the hole up to 18.43 mm in dia. and cut the thread M20×1.5T; make a bronze bush according to Fig. 2; screw the bush in the cylinder head till the stop and after marking the bush see that a lower end sphere coincides with the head sphere; then screw the bush in and bead it from inside.

Visually examine the condition of the head and cylinder joint face. Scrape dints or roughnesses from the joint faces, if they are occured (it is determined by gas passing). Lap the faces on the lapping plate, if it is required. To remove carbon deposit from the head use a special solution (see Supplement No. 3). If there is no solution, take carbon deposit away with a metal scraper, then clean the surface with sandpaper and wash in kerosene.

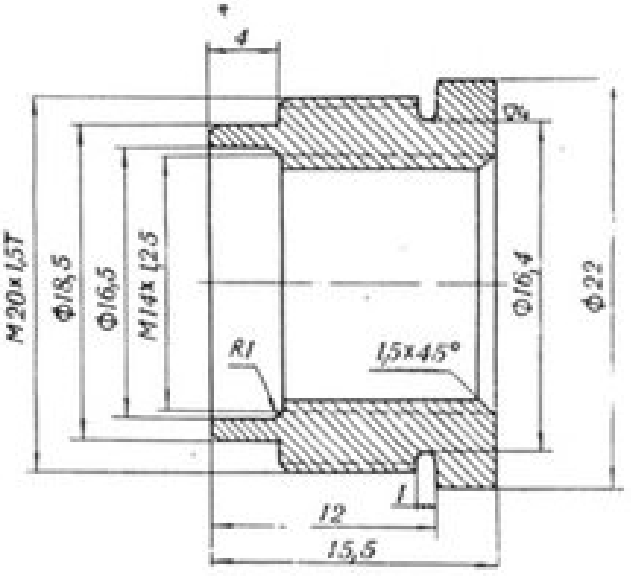


Fig. 2. Bush for repairing the cylinder heads.

2. Piston and Cylinder

To determine the wear rate of the piston and cylinder make their micrometering.

With the gap between the piston and the cylinder of more than 0.3—0.4 mm they should be repaired.

Cylinders with deep score marks and scuffs on their working surfaces need also repairing. They are overhauled by two ways:

a) by selecting and mounting a new set (cylinder, piston and piston rings) instead of worn ones;

b) by boring and honing an old cylinder and by setting the repair rings and piston. On replacing the pistons and cylinders see that they are of the same group. (Table 1).

Pistons and cylinders of four dimensional groups are included in the gridiron (spare parts, tools and accessories).

Table 1.

Group number	Piston diameter, mm	Cylinder diameter, mm
1	$71.94^{\ 0.01}$	$71.99^{+0.01}$
0	$71.95^{\ 0.01}$	$72.00^{+0.01}$
00	$71.96^{\ 0.01}$	$72.01^{+0.01}$
000	$71.97^{\ 0.01}$	$72.02^{\ 0.01}$

Group number is marked on the piston head and cylinder flange (Fig. 3).

Measuring of piston diameters, given in Tables 1 and 2 is done at a distance of 55 ± 1 mm from the piston lower end.

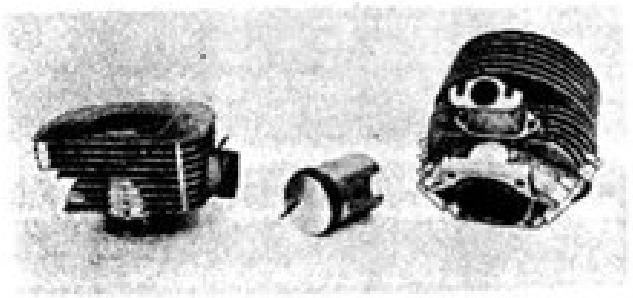


Fig. 3. Places of group number marking for pistons and cylinders.

In this case also set piston rings of the normal dimension. The ring diameter is $72^{\ 0.51}$ mm (with the ring gap being equal to 0.3—0.45 mm).

The second way of repair is as follows:

Substitute the worn rings and piston for repair ones.

Machine the cylinder according to piston repair size. Repair pistons and piston rings of two dimensions are supplied with the gridiron (Table 2).

Table 2.

Repair number	Piston marking	Dimensions	
		Piston diameter, mm	Ring diameter, mm
1	1P	$72.46^{\ 0.03}$	$72.5^{\ 0.01}$
2	2P	$72.96^{\ 0.03}$	$73.00^{+0.03}$

Group number is marked on the piston head (first repair—1P, second repair—2P).

Ring group is marked on the label in the package of a set of piston rings. The diameter of the machined cylinder should be equal to the actual diameter of the piston, plus 0.05—0.07 mm, ovality and conicity of the whole length should be not more than 0.03 mm, the fineness of cylinder face finishing— 9÷10 Class.

Machine the cylinder according to repair size by following methods:

a) boring the cylinder followed by finishing on a lap or by honing;

b) double honing (preliminary and final).

Cylinders are bored on special boring and turning machines.

When securing the cylinder it should be aligned relative to the lower face of the cylinder flange and the outer diameter of the sleeve; for boring the cylinder on the turning machine it is fastened with four studs, on a special faceplate in the same way as on the engine crankcase.

Boring is done for one pass, cutting speed is no less than 100 m/min; feed is 0.01—0.1 mm/rev.

Radial allowance for the following finishing is equal to 0.05—0.1 mm. Cylinder finishing is carried out on honing machines with carborundum honing stones, a grain size of which is 300÷500. Distance between

honing stone faces in the extreme (upper and lower) positions of the honing head should be 4—6 mm, and projection of honing stones out of cylinders should be 15—20 mm.

If there is no special equipment for honing, finishing may be performed on a lathe with an iron or wooden lapping tool using corundum powder or by hand with an expanding lapping tool. It is necessary to check regularly the cylinder dimensions. Allowance for finishing should be minimum. Cylinder machining for repair size may be effected by double honing. In the process of preliminary honing eliminate the barrel shape of a worn cylinder operating surface and traces of marks and scores.

For preliminary honing use stones with grain size of 150÷200, for final honing use stones with 300÷500 grain size. Allowance for final honing is 0.03—0.05 mm per side.

3. Piston Pin, Holes of Piston Bosses and Connecting Rod Small End Bush

When setting a new piston (of normal or repair sizes), choose a piston pin according to holes in the bosses.

Pins and holes of bosses are produced of three dimensional groups (Table 3).

Table 3

Colour index	Pin diameter, mm	Diameter of boss holes, mm
Green	$15.003_{-0.005}$	$15.001^{+0.005}$
White	$14.998_{-0.005}$	$14.996^{+0.005}$
Black	$14.993_{-0.005}$	$14.991^{+0.005}$

The mark colour on the pin face must be identical with the mark colour on the piston boss.

In case of wearing the holes in bosses and in the connecting rod small end bush, set the repair pin, reaming holes according to its dimension. Repair puns of the first and the second repair dimensions are supplied with the gridiron (Table 4).

Table 4

Repair number	Pin diameter, mm	Boss hole diameter, mm	Bush hole diameter, mm
1	$15.1_{-0.005}$	$15.1^{+0.003}_{-0.002}$	15.136÷15.150
2	$15.2_{-0.005}$	$15.2^{+0.003}_{-0.002}$	15.236÷15.250

Pin marking is done with a red enamel on the whole end area: 1-st repair—on one end, 2-nd repair—on two ends. When the connecting rod small end bush has been worn, replace it

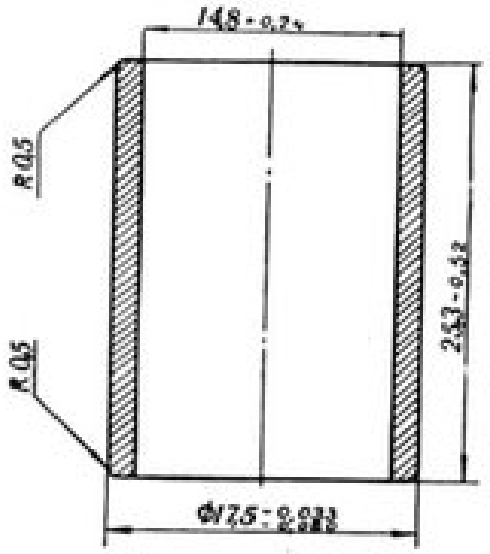


Fig. 4. ИЖ-П-3 (П-2) connecting rod small end bush.

with the repair one or with the bush made of bronze Бр. ОЦС 4—4—2.5 according to the sketch (Fig. 4).

Pressing the bush out and pressing it in is done with devices (Figs. 5, 6, 7).

After pressing has been done, ream the bush hole with the special adjustable reamer 13 from the set 3 (page 58, 62—63). Inner diameter of the bush must be equal to the pin diameter, plus 0.039—0.055 mm.

4. Piston rings

New piston rings are set when replacing the piston with the cylinder or when pistons and cylinders have safe wear and the clearance measured with a feeler gauge, inserted into the ring joint, exceeds 3 mm. The ring is set in the cylinder at a distance of 10—30 mm from the upper end.

Prior to setting a new ring on the piston it is required:

a) to insert the ring into the cylinder and

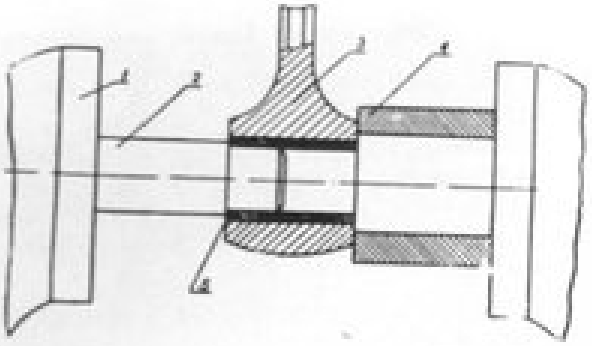


Fig. 5. Pressing-out the connecting rod small end bush in vice:
1—vice, 2—mandrel, 3—connecting rod, 4—bush, 5—connecting rod small end bush.

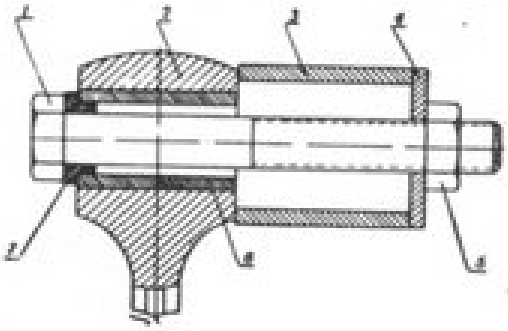


Fig. 6. Pressing-out the connecting rod small end bush by device:
1—bolt, 2—connecting rod, 3—bush, 4—washer, 5—nut, 6—connecting rod small end bush, 7—ring.

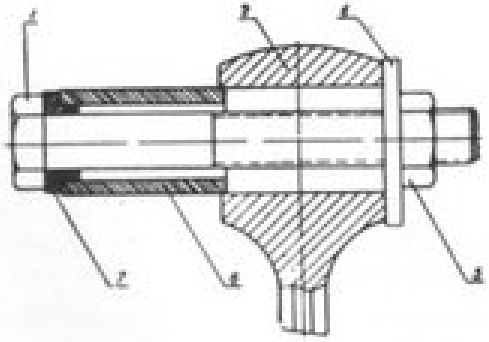


Fig. 7. Pressing-in the connecting rod small end bush by device:
1—bolt, 2—connecting rod, 4—washer, 5—nut, 6—connecting rod small end bush, 7—ring.

measure the clearance in the ring joint with a feeler gauge; in a new cylinder the clearance must be 0.3÷0.45 **mm**; with the gap less than above-mentioned one, ring ends need filing;

b) to set the ring into the cylinder so that the ring joint was in the direction corresponding to the operating position and determine its proper adjoining the cylinder by means of the bulb light.

Clearance is permitted on an arc of 90°, and it is not allowable in the ring joint area on an arc of ±30°.

Remove the carbon deposit from the piston grooves using a special solution (see Supplement No. 3) or a scraper.

Reassembling

1. Put rings on the piston with the help of strips so that the ring joints are set against the piston lockpins.

2. Check the ring mobility in the piston groove; the gap between the ring face and the groove must be within 0.065—0.1 **mm** and the ring should freely move in the groove without jamming.

3. Insert a lock ring into one of the piston bosses and insert a piston pin, greased with motor oil, into the hole of an opposite boss.

4. Put the piston on the connecting rod small end with the skirt split forward (in the direction of motorcycle running). Match holes of the bosses and connecting rod small end bush. Using a mandrel and holding the piston with a hand, press the pin in by light striking with the hammer. Reset the second lock ring.

5. Prior to installing the cylinder check the joint faces of the cylinder and the crankcase and file them, if necessary. Place a packing gasket made of cardboard or paronite on the crankcase flange.

6. Set piston rings with their joints against locking pins, compress them by a ring compressor **10** from Set No. 2 (page 57, 60—61).

7. Put the fork **11** (Set No. 2) under the piston, oil the cylinder face and put the cylinder on the piston, moving the ring compressor down (Fig. 8).

8. Take the ring compressor off, remove the fork and moving the cylinder down, place it home and secure. Set the cylinder head, fasten it, screw the decompressor in and connect the cable to the decompressor if they were removed.

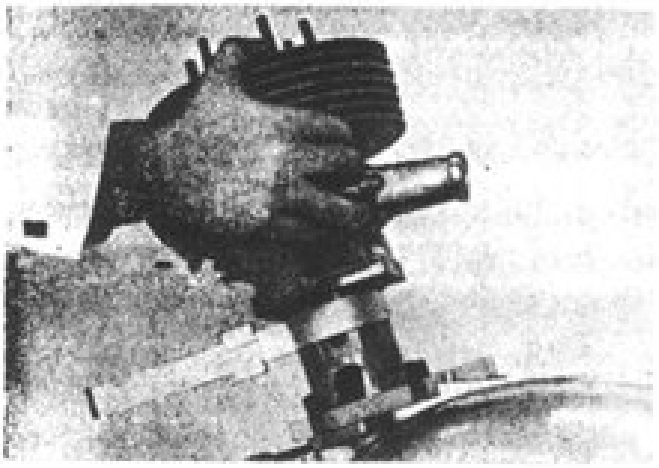


Fig. 8. Setting the cylinder, MK-II-3 motorcycle.

CRANKSHAFT RIGHT-HAND OIL SEAL, MAINSHAFT SPROCKET, CLUTCH OPERATING MECHANISM

For easy dismantling, repairing and assembling the said units without removing the engine from the frame disconnect the rod from the foot brake pedal.

Dismantling

1. Undo the screws of the crankcase right-hand cover and remove it. Detach the clutch cable.

2. Take off the clutch lever spring, release the nut and unscrew the clutch adjusting screw, take the ball out, remove the clutch worm cap and draw out the worm with clutch lever from the cover hole, rotating it clockwise.

3. Take out the rod from the primary shaft hole when it is necessary to replace the sprocket and the rubber cap without removing the gearbox cover, then take off the rubber cap from the mainshaft nut, unbend the lock washer. Unscrew the nut (left-hand thread) and take off the sprocket.

4. To detect the faults and to repair the right-hand oil seal, proceed as follows:

a) Remove the stator and generator armature (see Section "Repair of Electrical Equipment").

b) Take the key out of the half axle slot.

c) Undo the cover fastening screws remove the cover, oil seal and the gasket.

d) Press the oil seal out if it needs replacing.

Detection of Faults and Repair

The said units and parts are not repaired, they are replaced.

The oil seal is replaced if operating edges have lost their elasticity or have cracks, fractures, damages or great wear. The mainshaft sprocket is replaced in case of teeth wearing.

Replace the ball of clutch operating mechanism if it is worn out.

Reassembling

It is done in reverse order. For this:

a) Make sure that the operating edges of the oil seal are not bent when setting the cover and the oil seal.

b) Bend the locking washer at two rims of the mainshaft nut.

c) Insert the ball into the hole of a worm.

CLUTCH, KICK-STARTER MECHANISM, TRANSMISSION FROM ENGINE TO CLUTCH

Dismantling and reassembling the said units may be done without removing the engine from the frame. To do this proceed as follows:

a) Set the motorcycle on a central stand and drain the oil off, then remove the storage battery and put the motorcycle on the right side using wooden rests (it is not necessary to drain the oil off the crankcase).

b) Disconnect the left-hand silencer and driver's foot step.

If dismantling is carried out on the engine removed from the frame, drain the oil from the crankcase off through the drain hole or from the crankcase cavity itself after the left-hand cover has been removed.

Disassembling

1. Remove gear shift and kick-starter mechanism pedals.

2. Undo fastening screws of the crankcase left-hand cover and take it off. Don't damage the gasket while doing that.

3. Unscrew clutch shaped nuts. Remove the pressure plate with caps and springs.

4. Take out the pusher from the primary shaft hole. Take 3—5 clutch discs located at the ends out, advancing them from the bottom through ports of the outer drum.

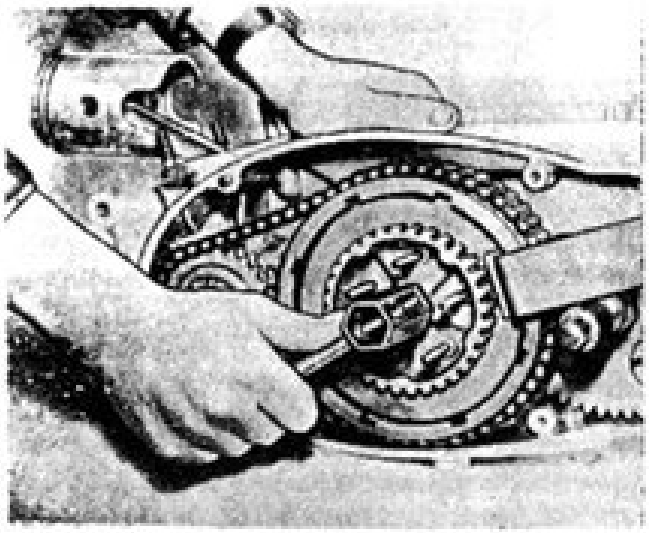


Fig. 9. Removal of clutch inner drum.

5. Lock the drum with special spanner , from Set No. 2 (Fig. 9) and unscrew a fastening nut of the clutch inner (driven) drum (left-hand thread).

6. Take off the toothed washer and the inner drum together with the rest discs.

7. Remove the lock cap of the crankshaft sprocket with a screwdriver or a tyre iron. Unscrew the sprocket bolt by sharp tapping against the spanner or unscrew it with the spanner; lock the piston with a wooden bar through the exhaust port.

8. Take off the sprocket and the clutch outer drum together with a chain (Fig. 24).

9. Take out the key from the half axle slot, remove corrugated washers from the crankshaft half axle, the outer drum distance bushing ar l adjusting washers from the primary shaft.

10. Remove the lock ring, washer, spring and kick-starter mechanism gear from the outer drum hub when repairing is required.

11. Holding a kick-starter sector put the kick-starter lever on the shaft splines, disengage the sector above the crankcase joint face a' l release the spring tension. Remove the shaft together with a sector, kick-starter spring and the washer.

Detection of Faults and Repair

Repairing (replacing) the parts of clutch, kick-starter and transmission from engine to clutch is carried out, if:

a) Teeth of the crankshaft sprocket and the clutch outer drum are worn out.

b) Teeth of the sector, kick-starter gear and kick-starter ratchet are sheared off or worn out.

c) Kick-starter spring has shrinkage (when starting the engine the lever slowly returns into its initial position).

d) Splines of the clutch inner drum are sheared off.

e) Clutch driven (steel) discs are warped (bent).

f) Chain is elongated (worn).

g) Clutch driven (plastic) discs are worn out or disc projections are sheared off.

Prior to reassembling the units examine the parallel displacement of the crankshaft sprocket tooth rims and the clutch outer drum.

For this purpose proceed as follows:

a) Put corrugated washers on the crankshaft half axle and insert the key into the key slot of the crankshaft half axle.

b) Set and fasten the crankshaft sprocket with a bolt.

c) Put the outer drum and the spacer on the primary shaft.

d) Tightly press the drum against the bearing inner race and check parallel displacement of sprocket teeth and the outer drum on external faces of tooth rims by means of a bevel rule. If displacement is more than 0.4 mm, select the required quantity of adjusting washers (0.2—0.5 mm in thickness). They are set on the primary shaft between the bearing inner race and clutch outer drum spacer. After adjustment has been done remove the drum, spacer and washers from the primary shaft. Unscrew the bolt, take the sprocket off, get the key from the slot out and remove corrugated washers.

Reassembling

1. Put the lever on kick-starter mechanism shaft splines. Set the kick-starter mechanism shaft with a washer, sector and the spring with the sector being higher than the crankcase joint face.

2. Insert the spring end loop into the crankcase boss, wind up the spring for 2.5 turns and move the shaft with a sector till the stop.

3. Holding the sector withdraw the lever from splines of kick-starter mechanism shaft.

4. Put two corrugated washers on the crankshaft half axle and insert the key into the half axle slot.

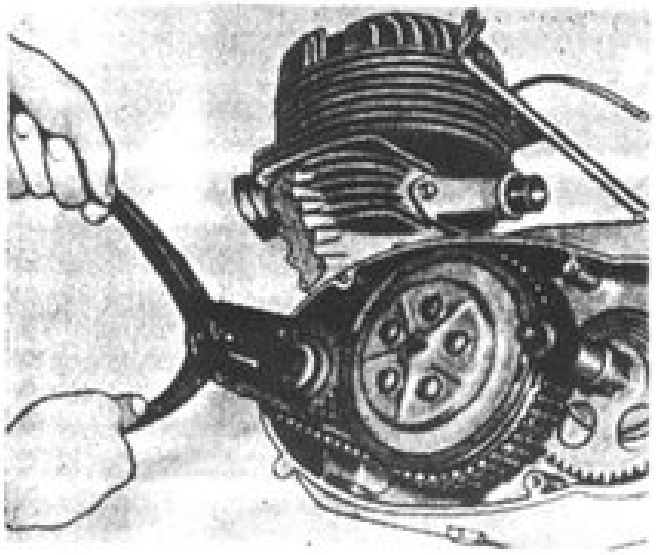


Fig. 10. Snapping the crankshaft sprocket lock cap.

5. Put the required number of adjusting washers and the clutch drum spacer on the primary shaft.

6. Set the crankshaft sprocket and the outer drum together with a chain being put on them.

7. Screw the sprocket fastening bolt sharply striking against a wrench with a hammer or tighten the bolt with the wrench having fixed the piston with a wooden bar through the exhaust port.

8. Set a new or repaired sprocket lock cap and fasten it with the snap 9, Set No. 2 (fig. 10) or punch it out.

9. Put the clutch inner drum on primary shaft splines.

10. Set the tooth washer and secure the drum.

11. Put a supporting (steel) disc on the inner drum in such a manner so that its groove is on the inner diameter in the direction of the gearbox.

12. Set plastic (driving) discs and steel (driven) ones (at 6 pieces) in turn.

13. Insert the clutch pusher into the primary shaft opening.

14. Set the pressure disc, complete with caps and springs so that dints on caps enter the slots of pressure disc holes.

15. Screw shaped nuts on the inner drum bolts. The nut faces should be at 3—4 mm higher than cap faces.

16. Set a gasket and the crankcase L.-H. cover, then tighten the latter by screws.

17. Reset a rubber ring and a bush of the kick-starter mechanism shaft.

18. Put gear shift and kick-starter pedals on shafts and fasten them.

GEARBOX

Disassembling

When the field stripping of the gearbox is done (without removing the primary shaft) and without removing the engine from the frame, proceed as follows:

disengage the right-hand silencer together with the exhaust pipe and driver's foot step and disengage the foot brake pedal; disconnect rubber chain guards from engine manifolds; remove the chankcase R.-H. cover, take the rod out of the primary shaft opening; disconnect the chain. In case of dismantling when the primary shaft and shafts of gear shift forks are removed, it is necessary to take off the left-hand silencer and the exhaust pipe, the crankcase L.-H. cover, disassemble the clutch, transmission from engine to clutch, remove the shaft together with a sector, spring and kick-starter mechanism washer. Further disassembling is done in the following sequence:

1. Undo eight fastening screws of the gearbox cover.

2. Remove the gearbox cover by means of a puller 13, from Set No. 2 (Fig. 11). When doing it don't damage the gasket. If the gear shift

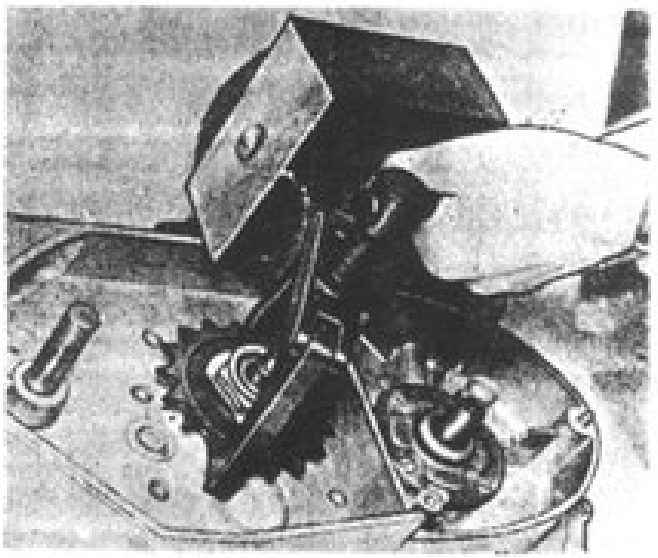


Fig. 11. Removal of gearbox cover, ИЖ-П-3 motorcycle.

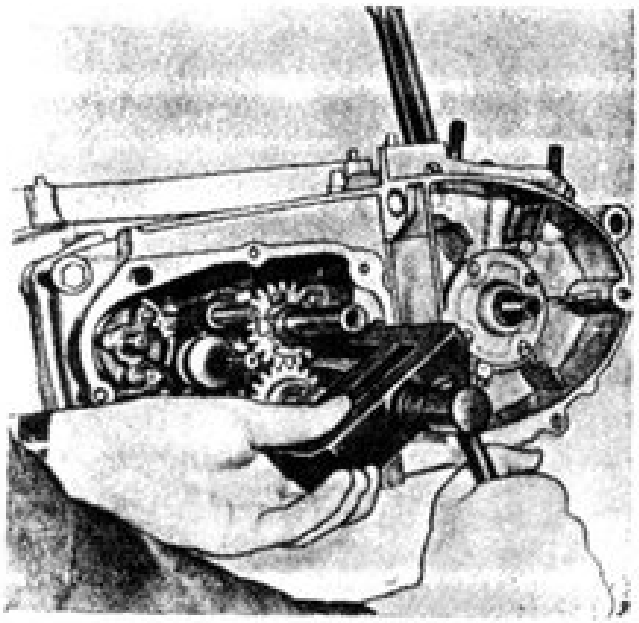


Fig. 12. Layshaft pressing-out, НЖ-П-3 motorcycle.

sector is removed together with the gearbox cover, supporting washer of the gear shift shaft is pulled out by the sector. When the washer is warped, it is rather difficult to remove the cover. In this case adjust the washer with the screwdriver through the gap between the cover and the crankcase.

3. Take the supporting washer off the gear shift shaft and the thrust washer off the primary shaft. Bear in mind that the washer of gear shift shaft sometimes stick to the cover boss.

4. Remove the cover gasket and gear shift sector.

5. Compress latches and take the gear shift mechanism out.

6. Get the layshaft out. Use the puller 14, Set No. 2 (Fig. 12), if it is necessary.

7. Take aside the retainer with a screwdriver extract the gear shift shaft and adjusting washers. Take care of the quantity of washers.

8. Remove the I—III and II—IV gears and gear shift forks. Extract the layshaft I gear out of the crankcase.

9. First remove the locking plate, then press out the primary shaft from the bearing and take shafts of gear shift forks out.

Dismantling the mainshaft is carried out in the following order:

1. Unbend the mainshaft sprocket locking washer.

2. Unscrew the nut (left-hand thread), take the washer and sprocket off; hold the shaft with a hand in order not to loose rollers.

3. Put the cover with the gear being down and take it off the mainshaft. Take care not to scatter rollers.

4. Press the oil seal out. Get the adjusting ring and thrust ring out of the cover hole.

5. Press the bearing outer race out.

Detection of Faults and Repair

Repairing and replacing the gearbox parts is done if:

1. Gear teeth are broken, working surfaces of teeth are crumbled, cams are worn out and deformed.

2. Gear shift forks are worn out.

3. The mainshaft oil seal is damaged or worn out (oil leaks).

4. Mainshaft bronze bushes are worn out.

5. Bearings are damaged or worn out (too much clearance).

Gearbox parts, useless for further service (shafts, gears, forks, springs, bearings) should be replaced.

Mainshaft bushes may be made of bronze ОЦС—6—6—3 according to the drawing (Fig. 13).

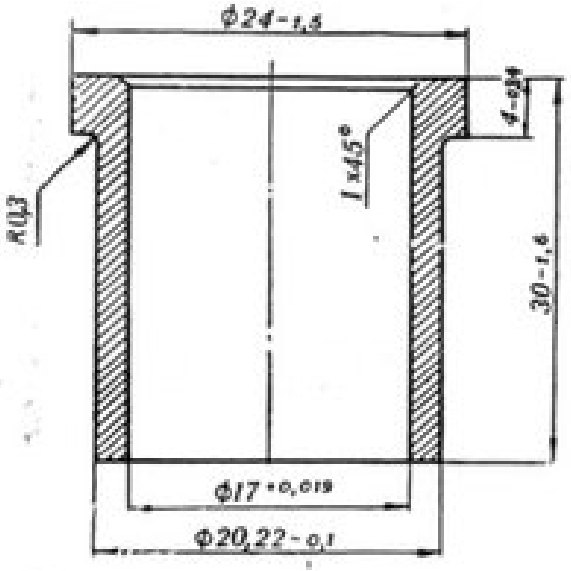


Fig. 13. Mainshaft bush, НЖ-П-3 motorcycle.

Drill the holes in the bushes after their pressing-in, insert the drill into the mainshaft hole to supply the lubricant and also ream bushes; coaxiality with the tooth rim is necessary.

Machine the bush holes until their diameter is equal to the actual diameter of the primary shaft, plus 0.030÷0.074 mm.

When resetting a new primary shaft see that diameter of bushes is equal to 17 $^{+0.018}$ mm.
A mainshaft, complete with a roller bearing and a mainshaft, complete with the gearbox cover are supplied in the gridiron. To fix the bearing outer race a special locking ring is provided on the mainshaft. It should be removed when assembling. If the mainshaft had been disassembled, replace the oil seal because of its damage when pressing out.

It is not allowable to set rollers or races from another set when reassembly is undertaken.

Prior to gearbox assembling control the proper adjustment of the gear shift shaft axial clearance and after the assembly has been done, control the proper adjustment of the mainshaft axial clearance.

To adjust the gear shift shaft it is necessary to:

1. Put adjusting washers on the shaft left end; to avoid falling the washers out during the shaft resetting smear the washers with grease lubricant.

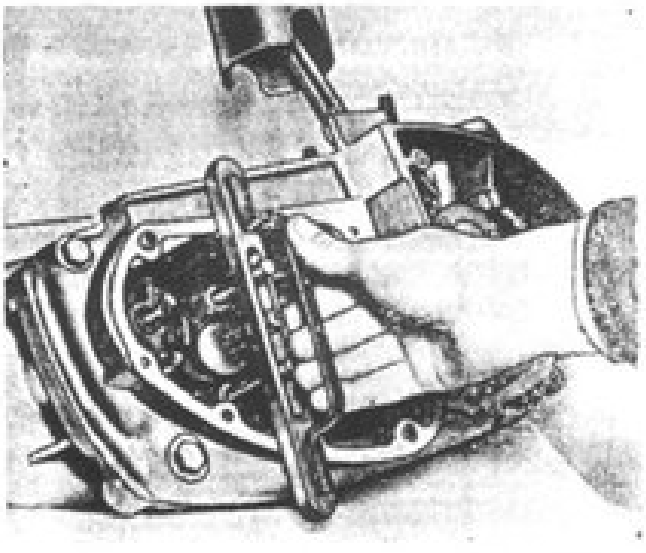


Fig. 14. Determination of the gear shift shaft axial clearance, ИЖ-П-3 motorcycle.

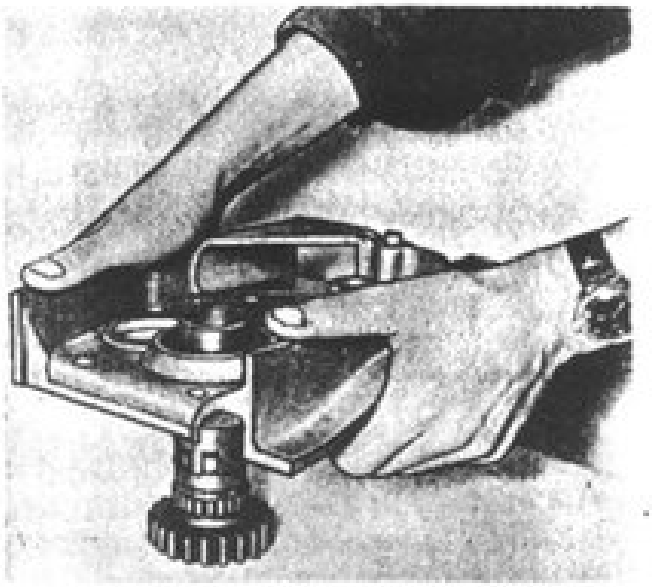


Fig. 15. Mainshaft mounting in gearbox cover.

2. Take the retainer aside and set the shaft till the stop.

3. Put the thrust washer on the shaft end and place the gearbox cover gasket home.

4. Control the adjustment by means of a feeler gauge 18, Set No. 2 (Fig. 14). In one position of the gauge the thrust washer is tightly pressed to it but it should rotate freely in the other position.

In this case the gap of 0.2—0.4 mm is provided between the thrust washer and cover boss.

Put adjusting washers on the shaft left end from the side of the clutch to adjust the gap, if necessary.

The gap is also checked with the aid of a metal ruler. For this purpose apply the ruler to the crankcase joint face without a gasket. The gap between the ruler and the thrust washer should not exceed 0.2 mm.

Assembling

The mainshaft and the gearbox cover is assembled in the following order:

1. Set the thrust and adjusting rings into the cover hole.

2. Press in the bearing outer race till the stop and centre-punch it in the cover at three or four points.

3. Press the mainshaft oil seal in.

4. To avoid falling the rollers out when assembling smear the mainshaft groove with the grease lubricant and put rollers into it.

5. Set a special bush **4**, Set No. 2 (Fig. 15), on the mainshaft to prevent damaging the oil seal operating edge. Insert the mainshaft into the cover, get the bush off.

6. Set the sprocket, the stop washer and tighten the nut, then bend the washer at two nut edges.

To reassemble the gearbox after field stripping, proceed as follows:

1. Put the I gear **29** (Fig. 16) with its circular notch directed to the bearing.

2. Set the gear shift fork and the I and I'' gear **32** with its recess being up.

3. Set the gear shift fork and the II and IV gear **42** with its recess being down.

4. Put the required quantity of adjusting washers **30** on the gear shift shaft **35**.

5. Lift the fork and the II and IV gear up with the left-hand and insert the fork pin into the shaft upper groove, holding the gear shift shaft with the right hand.

6. Then lift the fork and the I and III gear up with the left hand and insert the fork pin into the shaft lower groove.

7. Take the retainer aside and set the gear shift shaft home.

8. Place layshaft **41** and the third gear **39** home.

9. Turn the gear shift shaft so that teeth base is pointed in the direction of the gear shift mechanism.

10. Set the gear shift mechanism with return spring ends having been placed behind the stop lug.

11. Set the gear shift sector in such a manner that a sector tooth with a mark enter the teeth cavity against the mark on the gear shift shaft.

12. Put gear **40** on the layshaft and washers **50** and **38** on the primary shaft and on the gear shift shaft.

13. Apply the gasket, set the gearbox cover and fasten it with screws. See that packing washers should be set under heads of two screws.

After dismantling the gearbox, reassemble it in the following order:

1. Place the layshaft together with all gears home.

2. Assemble gears on the primary shaft and set it into the bearing.

3. Put the required quantity of adjusting washers **30** on the gear shift shaft end **35**.

4. Take the retainer aside and install the gear shift shaft.

5. Insert the gear shift fork legs into the gear recesses and insert fork pins into gear shift shaft grooves: the II and IV gear fork pin—into the upper groove, the I and III gear fork pin—into the lower groove.

6. Insert shaft **36** of gear shift forks into the fork and crankcase holes, apply adjusting washers on the primary shaft bearing, set the stop plate and secure it with screws.

7. Mount the gear shift mechanism.

8. Set the gear shift sector so that a sector tooth with a mark on it enters the teeth cavity of the gear shift shaft against the mark.

9. Put the thrust washer **38** on the gear shift shaft and the thrust washer **50**—on the primary shaft.

10. Apply the gasket, place the gearbox cover with the aid of a mallet and tighten it with screws.

11. After the gearbox has been assembled check the mainshaft axial clearance (the gap between the thrust washer and the mainshaft).

The axial clearance should be within 0.4—0.6 **mm**.

If clearance is less than 0.4 **mm**, move the primary shaft till the stop, striking with a hammer against the mainshaft face **45**. When doing it, put the gasket on the mainshaft face.

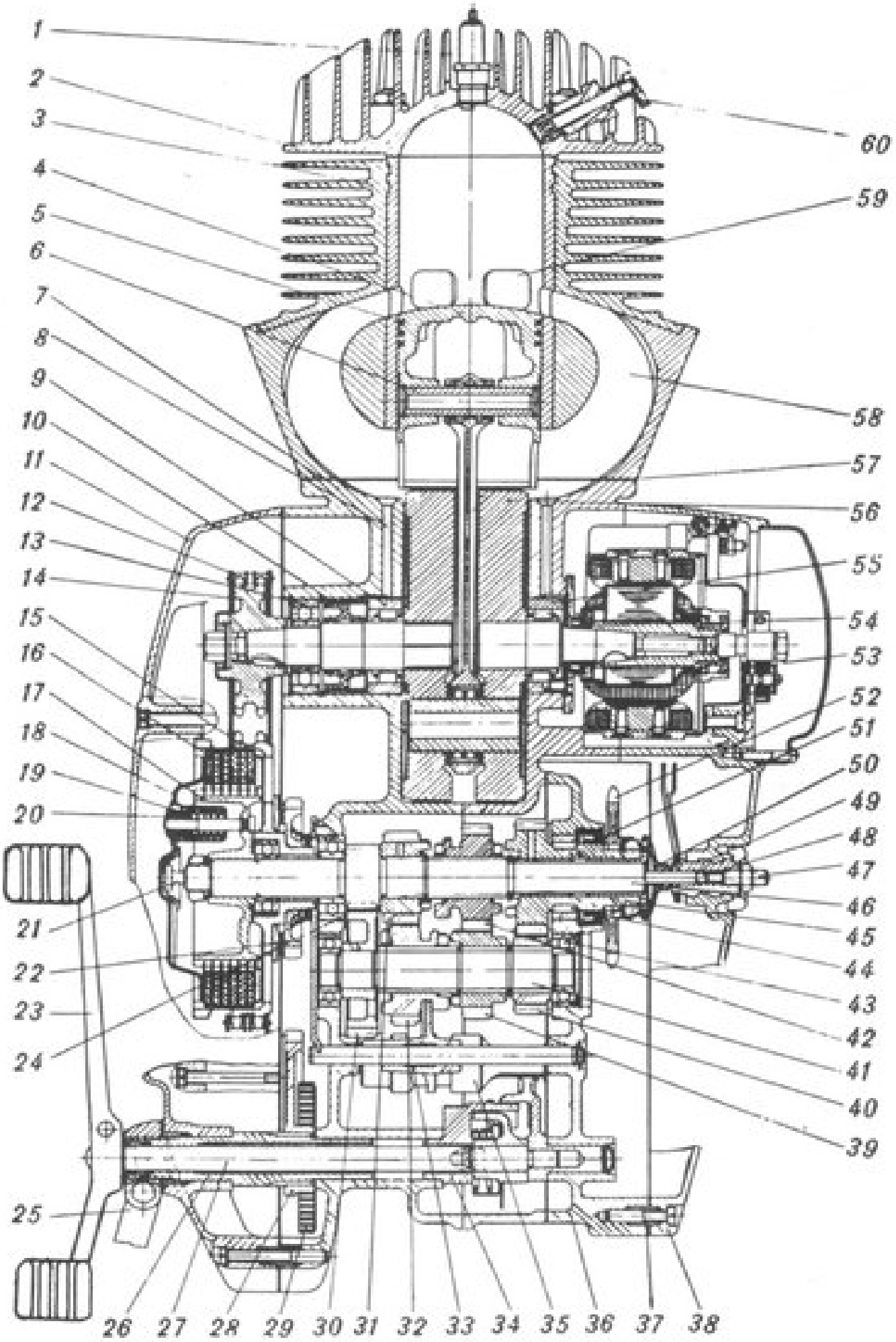
If clearance is more than 0.6 mm, set the required quantity of adjusting washers with thickness of 0.2—0.5 **mm** between the stop plate and primary shaft ball bearing outer race. Their outer diameter is $47^{-0.17}_{-0.34}$ **mm** and the inner one is $38^{+0.02}_{+0.02}$ **mm**.

12. Assemble units, located under the crankcase left-hand cover, set the cover, kick-starter and gear shift pedals.

CRANKCASE, CRANKSHAFT AND OIL SEALS

Dismantling

The crankshaft, bearings and oil seals are repaired only with the engine removed from the frame, for which purpose drain oil from the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crankcase off, remove the generator and dismantle:

1. Gearbox (without removing the clutch shaft and gear shift fork shafts).

2. Clutch with transmission from the engine to the clutch.

3. Kick-starter mechanism.

4. Cylinder-piston group (piston may not be taken off).

These units are dismantled as described above. Further dismantling is made in the following order:

1. Remove the bolts fastening the engine in the rear part by unscrewing the nuts.

2. Knock set bushes out at ½ of the length with the help of a drift and a hammer (rear set bush should be knocked out in the direction of the right-hand half of the crankcase).

3. Unscrew five screws fastening the crankcase halves.

4. Disconnect the crankcase halves using a mallet and a tyre iron which is inserted into the slots of the rear and front parts of the engine.

5. Separate the left-hand half of the crankcase from crankshaft by gentle tapping against the joint face (Fig. 17).

6. Extract the adjusting ring and washers from the hole of the crankcase L.-H. half.

7. Press off bearing 304 in the outer side through a seal hole using a drift.

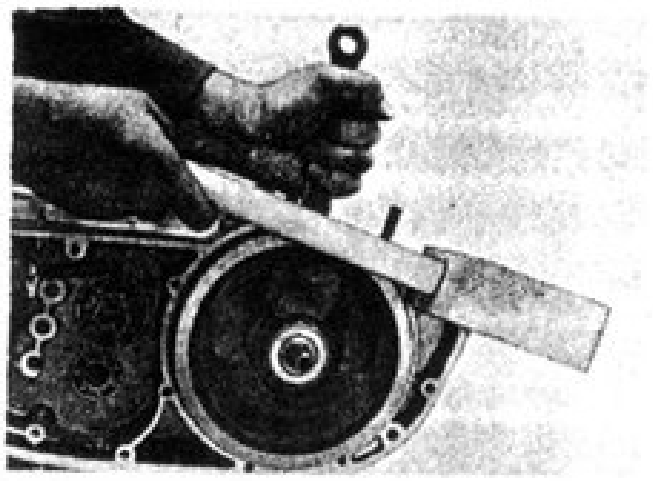


Fig. 17. Removal of crankcase left-hand half from crankshaft half axle, ИЖ-П-3 motorcycle.

8. Remove the adjusting ring.

9. Using a drift press off the oil seal together with the bearing race from the crankcase left-hand half in the direction of the crank chamber.

10. Undo screws and take off the crankshaft oil seal and gasket from the crankcase R.-H. half.

11. Press off the outer race of the crankshaft bearing from the crankcase R.-H. half.

12. With the help of a puller 15 and device 12 (Set No. 2) remove the bearings from the crankshaft half axles (Fig. 18).

Fig. 16. Sectional view of И К-П-3 engine with gearbox:

1—spark plug; 2—cylinder head; 3—cylinder; 4—piston; 5—piston ring; 6—piston pin; 7—crankcase; 8—duct for lubrication of main bearing; 9—roller bearing No. 2505K; 10—crankshaft left-hand oil seal; 11—crankcase left-hand cover; 12—engine chain of transmission from engine to clutch; 13—ball bearing No. 304; 14—crankshaft sprocket; 15—clutch outer drum; 16—clutch discs; 17—clutch inner drum; 18—clutch pressure plate; 19—clutch spring; 20—clutch shaped nut; 21—pusher; 22—outer drum ratchet; 23—gear shift pedal; 24—ball bearing No. 204; 25—kick-starter pedal; 26—kick-starter shaft; 27—gear shift mechanism shaft; 28—kick-starter sector; 29—kick-starter spring; 30, 31, 32, 39, 40, 42—gearbox gears; 33—gear shift fork; 34—gear shift mechanism rest; 35—gear shift shaft; 36—gearbox cover; 37—set bushing; 38—right-hand cover; 41—layshaft; 43—ball bearing No. 203; 44—roller bearing No. 192906K1; 45—mainshaft; 46—primary shaft; 47—clutch adjusting screw; 48—ball; 49—worm; 50—mainshaft nut cap; 51—mainshaft oil seal; 52—mainshaft sprocket; 53—generator; 54—right-hand oil seal; 55—roller bearing No. 2505K; 56—crankshaft; 57—gasket; 58—by-pass duct; 59—exhaust port; 60—decompressor.

Fig. 18. Removal of bearing from crankshaft half axle, ИЖ-П-3 motorcycle.

Detection of Faults and Repair

The crankshaft bearings are replaced if they are worn or the cage is broken.

The oil seals are replaced in case of their solidification, wearing the operating edges or damage.

The crankshaft is non-detachable and is not subjected to repair, with the exception of a connecting rod small end bush (see Section "Cylinder and Piston Group Repair").

The crankcase is repaired or replaced when the following faults take place:

a) Bearing fit became loose.

b) Cracks and holes.

c) Joint face damage.

Replace both crankcase halves if one of them is damaged.

Halves are delivered in gridiron as one assembly.

Dints and unevernesses on the joint faces are removed with a scraper. If a necessity arises, lap the faces on the lapping block.

Reassembling

Clean joint faces before reassembling the engine.

When reassembling take care the screws are tightened uniformly. Avoid distortion of parts.

Reassembly is carried out in the following order:

1. Press the inner races (together with cages and rollers) of the bearings Ser. 2505K onto the crankshaft half axles with the aid of a press using device **12**, from Set No. 2, (Fig. 19) or a mandrel and a hammer.

The gap between the races and the flywheel should be no more than 0.1 mm.

2. Set a lock ring into the crankcase left-hand half.

3. Press an oil seal into the crankcase left-hand half from the crank chamber side, set an oil directing washer and press in the outer race of the bearing on a press with the help of bush **17**, Set No. 2, (Fig. 20).

Press in the bearing race into the crankcase R.-H. half.

4. Put tip **5**, (Set No. 2) on the crankshaft L.-H. half axle, set the crankshaft into the crankcase L.-H. half (Fig. 21). Take off the tip.

5. Coat joint face of the crankcase L.-H. half with a thin layer of bakelite varnish СБС-1, БФ-4 or varnish ВК-1 in mixture with 10—15 per cent aluminium powder and 3—5 per cent nitro-enamel.

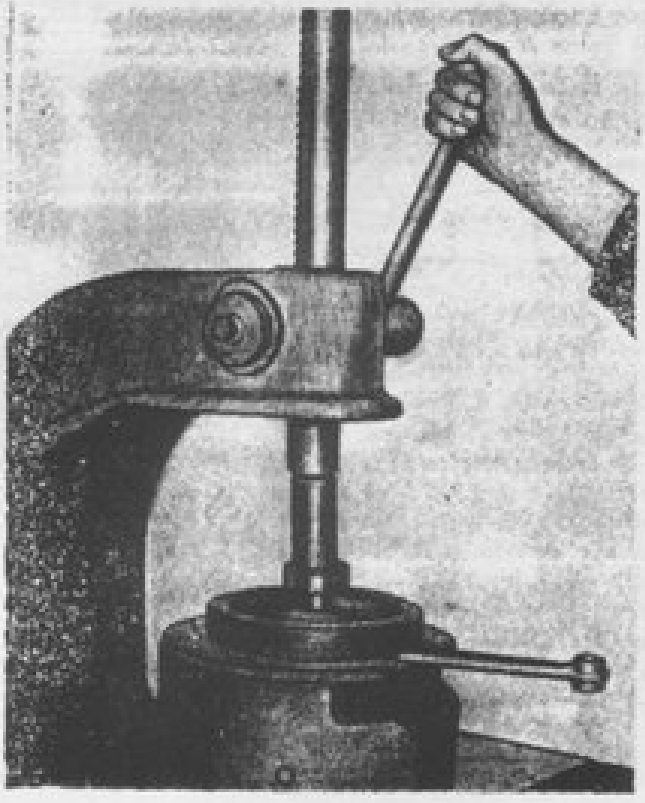


Fig. 19. Pressing the bearing onto crankshaft half axle, ИЖ-П-3 motorcycle.

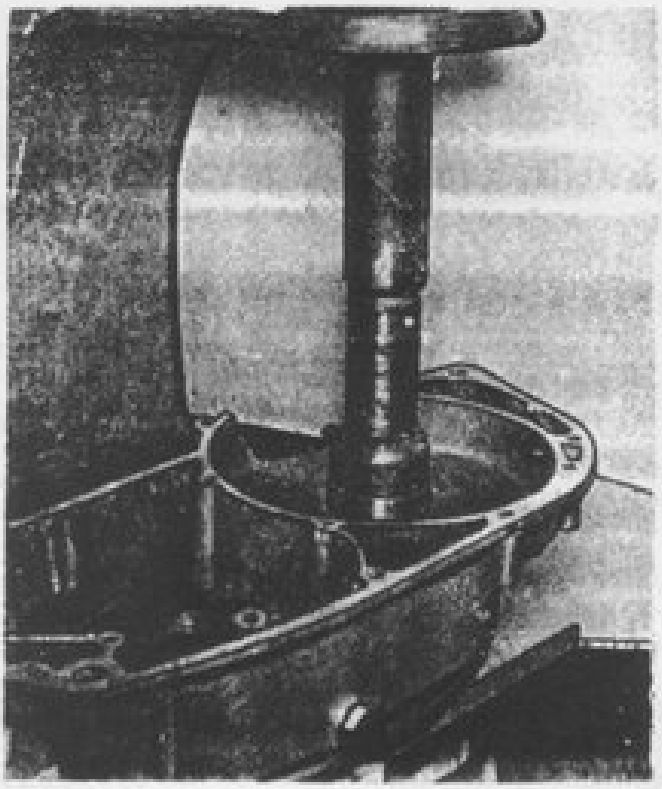


Fig. 20. Pressing the crankshaft bearing outer race into crankcase half, ИЖ-П-3 motorcycle.

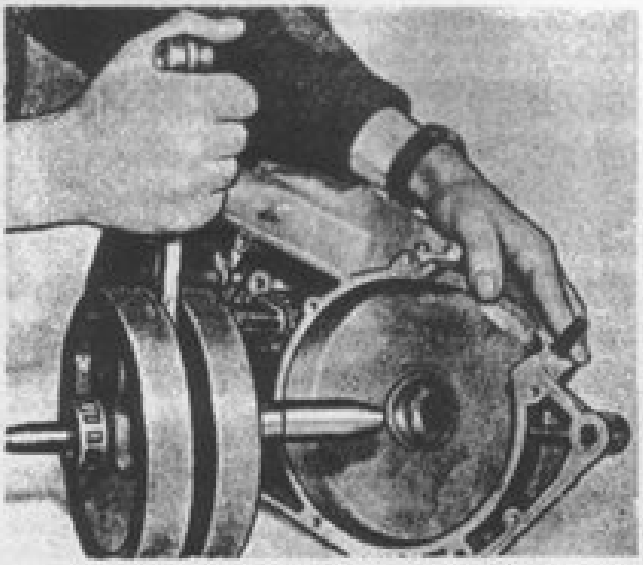


Fig. 21. Crankshaft mounting in crankcase left-hand half, ИЖ-П-3 motorcycle.

6. Couple the crankcase halves so that their contours are matched.

7. Press in two set bushes and tighten the crankcase halves with five screws.

8. Set and tighten the bolts fastening the engine in the rear part (loosen the bolts before placing the engine on the frame).

9. Press bearing Ser. 304 in the adjusting ring till the stop using a mandrel and a hammer.

10. Set another adjusting ring and check the gap between the ring and the face of the ball bearing outer race. If the gap exceeds 0.25 mm, insert some washers (0.2—0.3 mm) between the adjusting ring and ball bearing outer race.

11. Set the right-hand oil seal. After assembling check the crankshaft for easy rotation. Gaps between the flywheel and crank chamber walls should be no less than 0.5 mm.

SILENCERS, EXHAUST PIPES

Dismantling

1. Unscrew the nut fastening the exhaust pipe to the cylinder and nuts fastening the silencer to the frame. Remove the silencer with the pipe and packing rings.

2. Unscrew the nut connecting the pipe with the silencer.

Remove the pipe.

3. Unscrew the silencing end nut and take off the silencer.

4. Unscrew the nut fastening the sound damper from the rod.

Withdraw it out of the pipe with the help of a mallet.

The above-mentioned dismantling may be done without disconnecting the silencer from the frame.

Detection of Faults and Repair

In case of gas escape from the connection of the exhaust pipes with the cylinder check the condition of the packing rings and exhaust pipe shoulders.

If there are roughnesses or dents on the shoulder, straighten it by means of a hammer or smooth with a file. Replace the deformed packing rings. If there are no rings, seal the connection with an asbestos cord.

Remove carbon deposits from pipes and silencer parts in the following manner:

a) Calcinate the sound damper in the flame of a gas burner, a torch or in open fire and remove scale.

b) Clean the holes in the webs with a metal rod.

c) Place pipes and silencer body into a special solution (see Supplement No. 3) and then clean them with a brush or a scraper.

Reassembly

Reassembly is carried out in the reverse manner. During reassembly attach the exhaust pipe to the cylinder by means of a captive nut. Bolts fastening the silencer to the frame or the nut, connecting the pipe to the silencer should be slackened.

ИЖ-JUPITER-3, ИЖ-JUPITER-2 ENGINE OVERHAUL

Engine removal from the frame

The process of removing the engine from the frame, dismantling the cylinder-piston group, detection of faults and required repair is the same as for the ИЖ-П-3 engine (see page 11).

Some differences are given below.

In case of replacing the cylinder heads, measure the amount of the piston head projection in the top dead centre over the upper cylinder surface (Fig. 22).

The cylinder head of a corresponding group is chosen by an amount of projection (Table 5).

Marking of the head group number is made on the surface of the head horizontal rib from below.

Table 5

ИЖ-Ю3 engine		ИЖ-Ю2 engine	
Dimension, mm	Head number marking	Dimension, mm	Head number marking
$3.26^{+0.18}$	1	up to 3.6	1
$3.44^{+0.17}$	2	3.6—3.9	2
$3.61^{+0.18}$	3	exceeds 3.9	3
$3.79^{-0.17}$	4		
$3.96^{+0.18}$	5		

Pistons and Cylinders

To determine the wear rate, make micrometering (measuring) of pistons and cylinders. If the gap between the piston and cylinder is more than 0.25—0.3 mm, the pair needs repairing. Cylinders with deep marks and scuffs on the face should be also repaired.

Repair is made in two ways:

1. By selecting and setting a new normal set of cylinders, pistons and piston rings instead of worn ones.

2. By boring and honing cylinders and setting repair rings and pistons.

A new set (piston and cylinder) must be of the same group.

Because of difference in the by-pass channels cylinders of ИЖ-Ю-3 motorcycles may be used in engines of ИЖ-Ю-2 motorcycles only with pistons of ИЖ-Ю-3 engines. Pistons of ИЖ-Ю-3 motorcycle may be installed in the cylinders of ИЖ-Ю-2 motorcycle.

Pistons and cylinders of three dimensional groups are delivered in the gridiron (Table 6).

A group number is marked on a piston head and on the cylinder outlet manifold. (Fig. 3).

Table 6.

Group marking	Piston diameter, mm	Cylinder bore, mm
2	$61.65^{0}_{-0.01}$	$61.72^{+0.01}$
1	$61.66^{0}_{-0.01}$	$61.73^{+0.01}$
0	$61.67^{0}_{-0.01}$	$61.74^{+0.01}$

Measuring of piston diameters, given in Tables 6 and 7 is performed at a height of 42 mm from the lower face.

In this case piston rings should be normal too.

A diameter of the normal ring should be $61.75^{+0.015}$ mm with the ring gap being equat to 0.1—0.35 mm.

The second method of repair consists in the following:

Set the repair rings and pistons instead of worn ones and machine the cylinders to piston size.

Repair pistons and piston rings of two sizes are delivered in a gridiron. Each piston repair group of ИЖ-Ю-3 engine is divided into three size groups (Table 7).

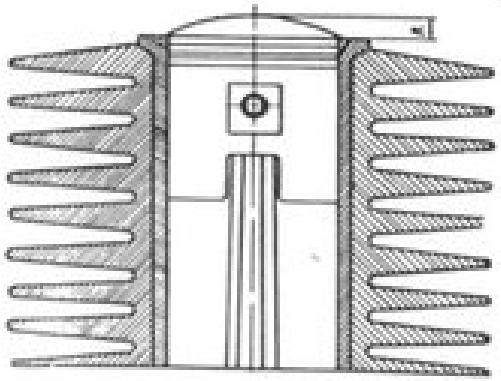


Fig. 22. Determining the "R" dimension to choose cylinder head group, ИЖ-КО-3 motorcycle.

Marking of the piston repair group number is made on a piston head. The colour index is marked on the piston ring inner diameter near the joint.

Table 7

Repair No.	Piston ring		ИЖ-К03 piston		ИЖ-К02 piston	
	Ring colour index	Ring diameter, mm	Repair No. marking	Piston diameter, mm	Repair No. marking	Piston diameter, mm
1	Red	$62^{-0.15}$	1P2	$61.90_{-0.01}$	1P	$61.92_{-0.01}$
			1P1	$61.91_{-0.01}$		
			1P0	$61.92_{-0.01}$		
2	Yellow	$62.25^{+0.15}$	2P2	$62.15_{-0.01}$	2P	$62.17_{-0.0}$
			2P1	$62.16_{-0.01}$		
			2P0	$62.17_{-0.01}$		

The diameter of the machined cylinder should be equal to the actual diameter of the piston, plus 0.07÷0.09 **mm**, ovality and conicity on the whole length should be no more than 0.03 mm, the fineness of cylinder face—9—10 Class.

Cylinder machining for repair size is effected by two methods:

a) Boring the cylinder followed by finishing on a lap or by honing.

b) Double honing (preliminary and final).

Cylinders are bored on special boring or turning machines.

The cylinder should be based relative to the lower face of the cylinder flange and the outer diameter of the sleeve when fastening it.

For boring the cylinder on a turning machine it is fastened on a special face plate in the same manner as on the engine crankcase.

Radial allowance for the following finishing is 0.025—0.003 **mm.**

Boring is performed for one pass, with cutting speed of no less than **100 m/min** and feed of 0.01—0.1 **mm** for a revolution.

Cylinder finishing is effected on honing machines with carborundum honing stones, a grain size of which is 300÷500.

Distance between faces of honing stones in the extreme (upper and lower) positions of the honing head should be 4—6 **mm**, and projection of stones out of cylinders should be 15—20 **mm.**

If there is no special equipment for honing, finishing may be performed on a lathe with an iron or wooden lapping tool using corundum powder or by hand with an expanding lapping tool. It is necessary to check regularly the cylinder dimensions. Allowance for finishing should be minimum.

Cylinder machining for repair size may be effected by double honing.

In the process of preliminary honing eliminate the barrel shape of a worn cylinder and traces of marks and scores.

For preliminary honing use stones with grain size of 150÷200, for final honing — with 300—500 grain size.

Radial allowance for final honing is 0.03—0.04 **mm.**

PISTON PINS, PISTON BOSS HOLES AND CONNECTING ROD SMALL END BUSHES

When setting a new piston (normal or repair), select a piston pin according to the holes in the bosses.

Piston pins and boss holes are produced of three dimensional groups (Table 8).

Table 8.

Colour index	Piston pin diameter, mm	Boss holes diameter, mm
Green	$14.004_{0.005}$	$14.005^{+0.005}$
White	$13.999_{0.005}$	$14.000^{+0.005}$
Black	$13.994_{0.005}$	$13.995^{+0.005}$

Colour of the piston pin mark should be identical with the colour of the piston mark.

Piston pin is marked on the inner diameter near the face; piston is marked on the boss inside the piston.

If the boss holes and connecting rod small end bush are worn, set a repair pin having reamed the holes for it size with a special expanded reamer.

Piston pins of first and second repair sizes are delivered in the gridiron (Table 9).

Table 9.

Repair No.	Colour index	Piston pin diameter, mm	Boss hole diameter, mm	Connecting rod small end bush hole diameter, mm
I	Red	$14.15^{+0.005}_{-0.006}$	Pin diameter plus 0.001÷0.011	Pin diameter, plus 0.032÷0.058
II	Yellow	$14.25^{-0.005}_{-0.006}$	ditto	ditto

When the connecting rod small end bush is worn, replace it with a repair one or with a bush made of bronze Бр. ОЦС 4—4—2.5 according to a sketch (Fig. 23).

Pressing the bushes in and off is performed with devices (Figs. 5,6 and 7).

After pressing in ream the bush with a special expanded reamer.

The bush inner diameter should be equal to the pin diameter, plus 0.032÷0.058 **mm**, in case of setting a new normal pin, the diameter should be $14^{-0.005}_{+0.006}$ **mm**.

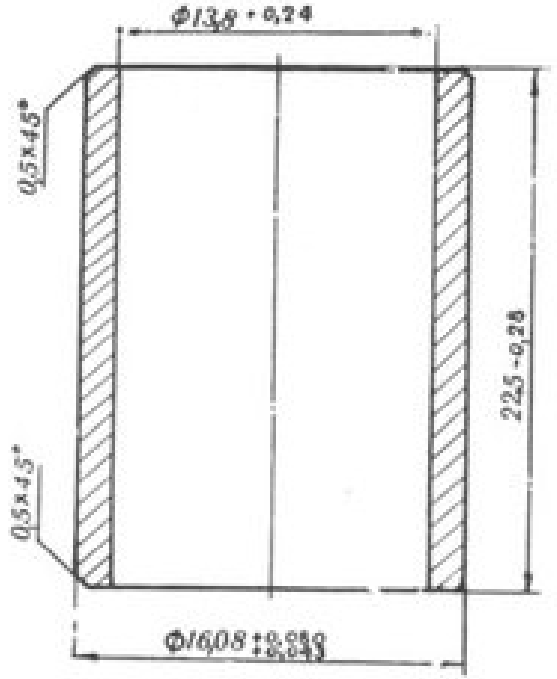


Fig. 23. Connecting rod small end bush, ИЖ-ЮЗ motorcycle.

Piston Rings

New piston rings are set on replacing (or repairing) pistons and cylinders or when a piston and a cylinder have a safe wear but a gap in the ring joint inserted in the cylinder at a distance of 10—30 **mm** from the rear end face, exceeds 2.5 **mm**. The gap is measured with a feeler gauge.

Prior to set a new ring:

1. Insert a ring into a cylinder and measure the ring gap with a feeler gauge. In a new cylinder the gap should be in the range of 0.1—0.35 **mm**; if the gap is less, file the joints of the rings.

2. Insert a ring into the cylinder with the joint direction being corresponding to a working position and determine its proper adjoining the cylinder by means of the bulb light.

The gap is allowed on an arc of 20°and it is not permitted in the ring joint area on the arc of 30° (in either direction).

3. Check mobility of the ring in the piston groove. The gap between the ring end face and the groove should be within 0.075—0.1 **mm**. The ring should move in the groove freely without jamming.

Remove carbon deposit from piston grooves using a special solution (see Supplement No. 3) or a scraper.

Reassembly

1. Set spring rings into piston lower grooves.

2. Put the rings on the pistons using strips.

3. Insert a lock ring into a piston boss hole groove, and a pin lubricated with motor oil insert into a hole of an opposite boss.

4. Put the piston on the connecting rod small end, so that the arrow provided on the piston head is directed backwards (in the direction opposite to the motorcycle movement). Match holes of the bosses and connecting rod small end bush. Place the pin home by means of a mandrel and a hammer holding the piston with a hand.

5. Insert the second locking ring.

6. Place the second piston.

7. Before setting the cylinders check joint faces of the cylinders, manifold, crankcase and scrape them if necessary.

8. Set packing gaskets made of cardboard or paronite.

9. Set the piston ring joints against the locking pins, compress rings with a compressor (as for ИЖ-П-3, Fig. 8).

10. Place stand 11 (Set No. 2) under the piston, lubricate the cylinder face with motor oil, put the cylinder on the piston and studs, moving the compressor down.

11. Remove the compressor, take the stand out and moving the cylinder place it home.

12. Set the second cylinder, carburettor manifold with a gasket and cylinder heads.

CRANKSHAFT RIGHT-HAND OIL SEAL, CLUTCH OPERATING MECHANISM, MAINSHAFT SPROCKET

Processes of dismantling, detection of faults and reassembly of units are the same as for ИЖ-П-3 engine (see page 16).

When disassembling the clutch operating mechanism, it is necessary to bore in mind that the lever axle and automatic declutching device bracket screws are center-punched, and the clutch cable lever and lever axle are removed after taking the automatic declutching device bracket off.

On reassembling make sure the ball is in the hole of the primary shaft.

Grease the pusher, lever and clutch operating mechanism cam with a consistent grease.

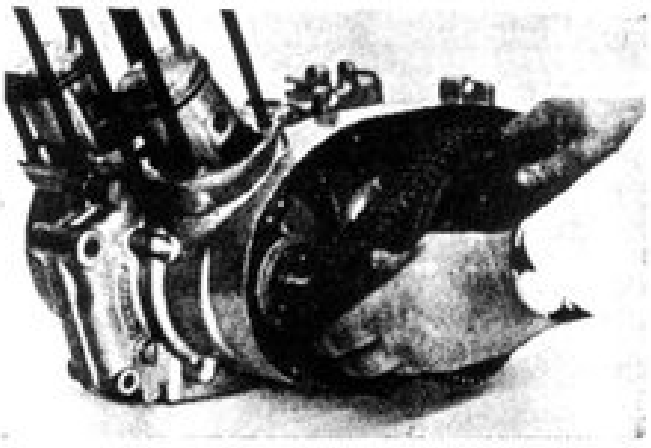


Fig. 24. Removal of clutch outer drum and crankshaft sprocket.

CLUTCH, KICK-STARTER MECHANISM, TRANSMISSION FROM ENGINE TO CLUTCH

Processes of dismantling, detection of faults and reassembly of given units are the same as for ИЖ-П-3 engine (see page 16).

Removal of a sprocket and clutch outer drum together with a chain is shown in Fig. 24.

GEARBOX

The gearbox may be disassembled and reassembled only when the engine is removed from the frame. The cylinder-piston group may not be disassembled, but the inlet manifold should be disconnected from the cylinders.

Before disassembling drain oil from the crankcase.

Disassembly

1. Remove the pedals of the kick-starter mechanism and of gear shift, crankcase L.-H. cover and a gasket.

2. Disassemble the clutch, transmission from engine to clutch and kick-starter mechanism.

3. Disconnect the lower manifold from the engine crankcase (Fig. 25).

4. Drift out the set bush which is in the front part of the engine at ½ of its length.

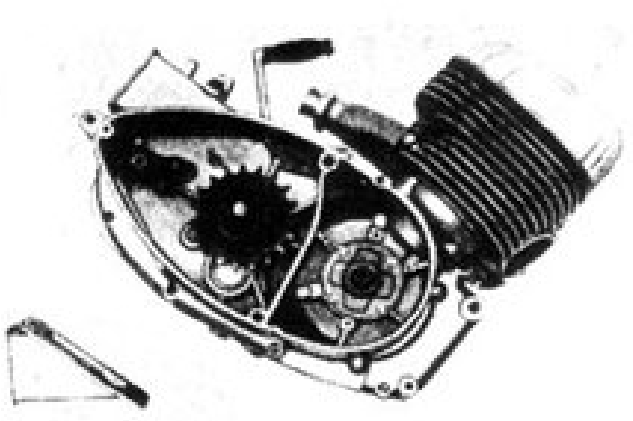


Fig. 25. ИЖ-10-3 engine with manifold, removed for unscrewing the fastening screw of crankcase halves.

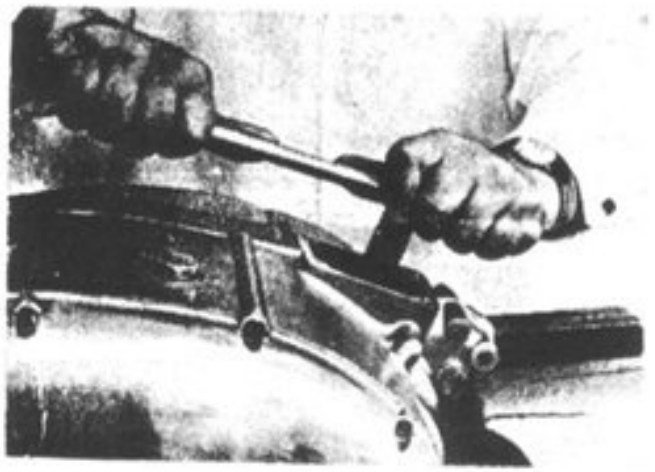


Fig. 26. Unscrewing the outboard flywheel fastening screw, ИЖ-Ю-3 motorcycle.

5. Undo 7 screws fastening the crankcase halves, unscrew nuts and remove the bolt fastening the engine in the rear part.

6. Take off the outboard flywheel cavity hatch cover together with a gasket; drain oil.

7. Slacken the bolt tightening the outboard flywheel using a box spanner (Fig. 26).

8. Separate the crankcase halves by means of a screw clamp 6 (Set No. 1), set in the slots of the crankcase rear part, or by means of a hammer and a drift.

9. Take off the outboard flywheel and keys.

10. Take the primary shaft, and layshaft together with gears and washers, a shaft with gear shift forks out of their seats.

Mark places of setting and quantity of washers.

11. To dismantle the gear shift mechanism it is necessary:

a) To take off the automatic declutching mechanism cam and remove the key from the slot of the gear shift shaft.

b) To remove the gear shift shaft, anchor and sector. Be careful when doing it, as the spring ends are set behind the anchor stop.

c) To take the spring and retainer out of the anchor stop hole.

12. The mainshaft is dismantled in the following order:

a) Unbend the lock washer of the mainshaft sprocket.

b) Unscrew the nut (left-hand thread), remove the washer and the sprocket, holding the mainshaft.

c) Remove the shaft, taking care not to scatter the rollers.

d) Press off the oil seal, take the adjusting and supporting rings out of the crankcase half hole.

e) Press off the outer race of the roller bearing.

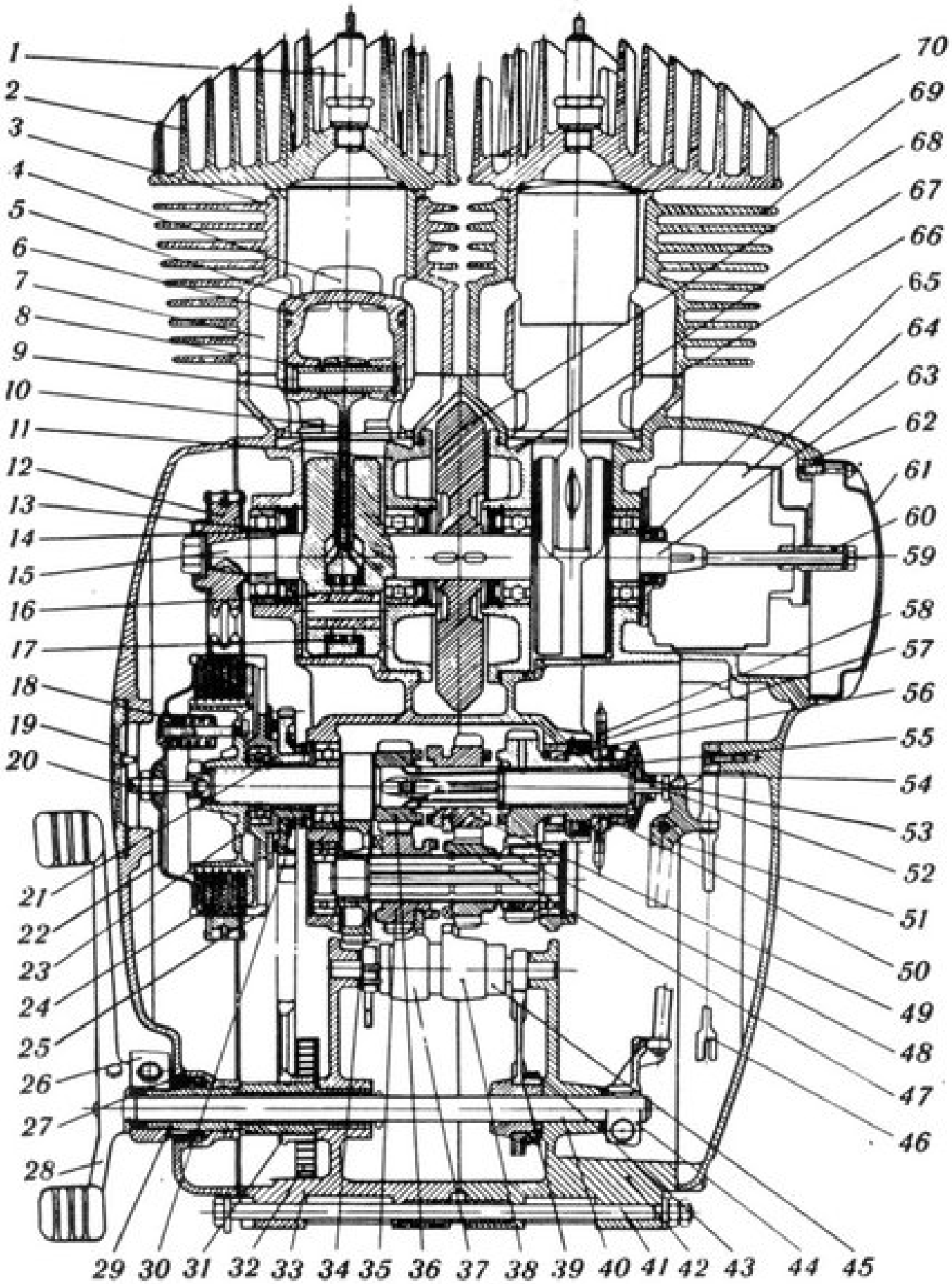
Detection of faults and repair

The gearbox is repaired or replaced if the following faults take place:

1. Broken teeth of gears; crumbling the working surfaces of the teeth; wearing or crumpling the cams.

Fig. 27. Sectional view of ИЖ-Ю-3 engine with gearbox:

1—spark plug; 2—cylinder head, L.-H.; 3—cylinder, L.-H.; 4—exhaust port; 5—piston; 6—piston ring; 7—by-pass duct; 8—piston pin; 9—connecting rod small end bush; 10—connecting rod; 11—crankcase chamber left-hand cover; 12—crankshaft sprocket; 13—ball bearing No. 304; 14—seal, L.-H.; 15—crankshaft left-hand half axle; 16—crankpin; 17—connecting rod big end roller bearing; 18—clutch spring; 19—hatch cover; 23—clutch adjusting screw; 21—ball bearing No. 104; 22—clutch pressure plate; 23—clutch inner drum; 24—clutch discs; 25—clutch outer drum; 26—kick-starter pedal; 27—crankcase left-hand cover; 28—gear shaft pedal; 29—kick-starter shaft; 30—kick-starter gear; 31—kick-starter sector; 32—spring; 33—crankcase left-hand half; 34, 35, 36, 47, 48, 49—gearbox gears; 37—I and III gear shift forks; 38—II and IV gear shift forks; 39—gear shift sector; 40—gear shift mechanism shaft; 41—bolt; 42—crankcase right-hand half; 43—spring; 44—automatic declutching mechanism cam; 45—gear shift shaft; 46—clutch cable lever; 50—sprocket fastening nut; 51—automatic declutching lever; 52—declutching mechanism rod; 53—primary shaft; 54—cap; 55—mainshaft; 56 — roller bearing No. 192906; 57 — mainshaft oil seal; 58—mainshaft sprocket; 59—armature fastening centre bolt; 60—breaker cam; 61—generator cover; 62—crankcase right-hand cover; 63—crankshaft right-hand half axle; 64—generator; 65—crankshaft oil seal, R.-H.; 66—cylinder gasket; 67—crank chamber right-hand cover; 68—flywheel, 69—cylinder, R.-H.; 70—right-hand cylinder head.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2. Gear shift forks wearing.

3. Mainshaft oil seal wearing or damage (oil leaks from the gearbox).

4. Mainshaft bushes wearing.

5. Bearings wearing (too much clearance) or breakage.

Parts of the gearbox (shafts, gears, forks, springs, bearings) useless for further service should be replaced.

Bushes may be made of bronze OIIC—6—6—3 according to the drawing (Fig. 13).

Press in bushes, drill holes in them for which purpose insert the drill into a mainshaft hole for feeding lubricant, ream bushes preserving coaxiality with the tooth rim.

Diameters of the bush holes should be equal to the diameter of the primary shaft plus 0.030 ÷ 0.074 **mm**.

When a new primary shaft is mounted, a bush diameter should be $17^{+0.089}$ **mm**.

A mainshaft is delivered in a gridiron, complete with roller bearing and supporting ring.

A special lock ring is provided for retaining the outer race on the mainshaft. This ring should be removed on installing the mainshaft.

If the mainshaft was disassembled, replace the oil seal, because it became damaged during pressing off. On assembling it is prohibited to set rollers and races from the other set.

Before assembly check an axial clearance of the gear shift shaft, and after assembly check an axial clearance of the mainshaft.

To check the clearance of the gear shift shaft do the following:

a) Put the support washer against the hole of the crankcase right-hand half and mount the gear shift shaft with the slots for retainer being upward.

b) Measure the height of projecting the shaft support surface over the crankcase joint face by means of a rule and a depth gauge of callipers.

c) On the left-hand half of the crankcase measure an overfall between a supporting surface of the shaft seat and the joint face. From the received value subtract the previous value to receive an axial clearance of the shaft.

d) If the axial clearance exceeds 0.4 **mm**, take the necessary quantity of washers of 0.2÷0.4 **mm** in thickness in order to put them on the shaft end under the retainer from the side of slots during assembling.

An axial clearance of the shaft should be within 0.2—0.4 **mm**.

e) Take off the gear shift shaft and support washer.

Reassembly

Reassembly of the mainshaft and installing it in the crankcase right-hand half is performed in the following order:

1. Install the supporting and adjusting rings into a hole of the crankcase right-hand half.

2. Press in the roller bearing outer race and oil seal till the stop.

3. Punch the bearing race in 3—4 points.

4. In order rollers do not scatter during assembling, grease a groove of the mainshaft and place rollers in this groove.

5. Put a special bush **4** from Set No. 2 on the mainshaft to prevent an oil seal edge from damage during installing the shaft.

6. Place the mainshaft home, remove the bush.

7. Set the sprocket, locking washer and tighten the nut. Bend the washer at 1—2 edges of the nut.

The gearbox is reassembled on the crankcase right-hand half. Before this assemble the gear shift mechanism, for which purpose:

1. Insert the spring and the lock into the anchor stop hole.

2. Set the return spring ends behind the anchor stop and place the spring against the shaft hole in the crankcase.

3. Place the gear shift shaft with a sector and an anchor home. The anchor should be put on the dog pin with its slots being directed to the anchor stop. Insert the lock into the anchor slot.

4. Put a textolite washer on the shaft end, insert a key into a slot, set the automatic declutching device cam and fasten it.

Further assembling of the gearbox and joining the crankcase halves is performed in the following succession:

1. Set the gear **48** (Fig. 27) against the hole under the layshaft and install the shaft with III gear **47**.

2. Set thrust washer **50** on the end of the mainshaft gear, and thrust washer **46** of the gear shift shaft place against a hole in the crankcase wall.

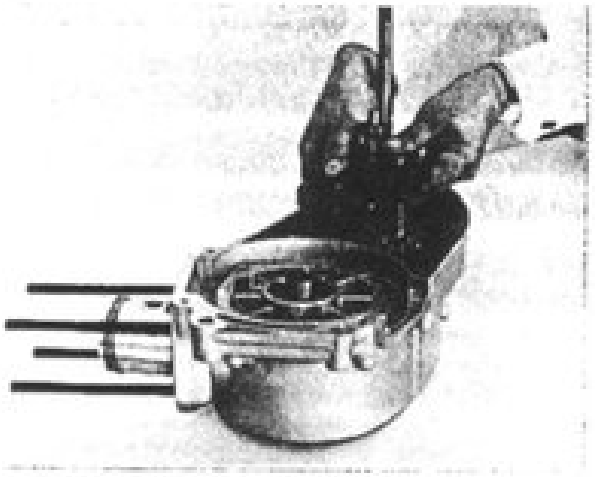

Fig. 28. Mounting the shaft with gear shift forks and gears, ИЖ-Ю-3 motorcycle.

3. Assemble forks with gear shift shaft **45**, locating fork **37** with a short hub from the side of shaft slots for retainer. (The length of gear shift fork hubs of the II and IV gears is 23 **mm**, and of the I and III gears is 21 mm). The forks are to be installed with their hubs directed to different sides.

4. Fill a teeth cavity of shaft **45** against which a point is marked with grease (for matching with a mark on a sector tooth.).

5. Bring the forks apart so that the pins are turned to opposite sides. Put gears on them. Gear **49** (21 teeth) of II and IV gears of the primary shaft **53** put on lower fork **38**, gear **35** of the I and III gears of the layshaft put on upper fork **37** (from the side of slots for retainer).

6. Put a gear of I and III gears on the layshaft and place the gear shift shaft home. The cavity filled with grease should be matched with the marked shift sector tooth. Simultaneously put the gear of II and IV gears on the mainshaft gear (Fig. 28).

7. Set the primary shaft taking care not to drop the thrust washer from the mainshaft end (Fig. 29).

8. Put a proper quantity of adjusting washers **34** on the gear shift shaft end.

9. Scrape the crankcase joint faces.

10. By means of a brush coat the crankcase right-hand half with a thin layer of БФ-4, СБС-1 bakelite lacquer or ВК-1 lacquer in mixture with 10—15 p. c. of aluminium powder and 3—5 p. c. of nitroenamel. Remove excessive lacquer from the crankcase walls.

11. Insert keys into slots of half axles and set the outboard flywheel on the half axle of the crankcase right-hand half.

12. Holding gear **33** of the I gear against a hole in the cavity of the crankcase left-hand half (ring groove should be directed to the crankcase wall), joint the crankcase halves matching hole axes with shaft axes and a key on the half axle with the flywheel key slot (Fig. 30).

13. If a clearance between crankcase halves is 5—10 **mm**, retract the retainer through the left-hand half hole and joint the crankcase halves.

14. Press the set bush into the front part of the crankcase and place a bolt, fastening the engine in the rear part home.

15. Tighten the crankcase halves with screws and check gear shifting.

16. Shifting the crankshaft and the outboard flywheel in an axial direction, find a position in which clearances between the flywheels of crankshafts and crankcase side walls are equal. Tighten the outboard flywheel with a bolt.

17. Set a hatch cover with a gasket and fasten it.

18. Assemble the clutch, transmission from engine to clutch, kick-starter mechanism and pour **11** of oil into the crankcase. Set the

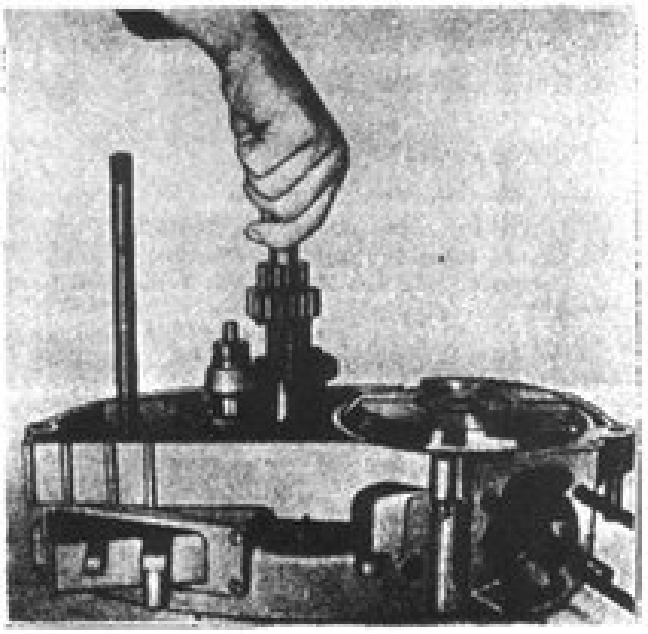

Fig. 29. Setting the ИЖ-Ю-3 motorcycle primary shaft.

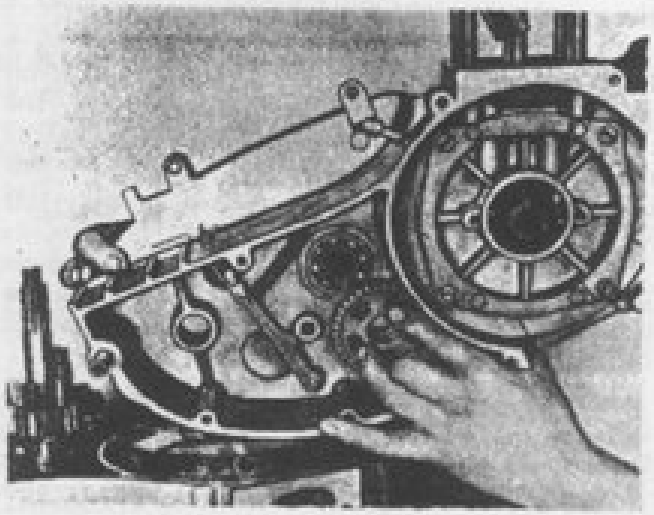

Fig. 30. Jointing the crankcase halves, HЖ-КО-3 motorcycle.

crankcase left-hand cover. Place home and fasten the pedals of gear shift and kick-starter mechanisms.

CRANKCASE, CRANKSHAFT AND OIL SEALS

Disassembly

To disassemble the mentioned units it is necessary to do the following:

a) Remove the engine from the frame and drain the oil.

b) Remove stator and generator armature (See Section "Electrical Equipment Repair"), take off a key from the half axle slot.

c) Disassemble the cylinder-piston group.

d) Take off the crankcase left-hand cover, disassemble the clutch, transmission from engine to clutch, and kick-starter mechanism.

e) Disconnect the crankcase halves and disassemble the gearbox.

Further disassembling is done in the following order:

1. Undo screws fastening the crank chamber covers and remove the cover with packing rings using remover 5, Set No. 1 (Fig. 31). If there is no remover, use a wrench 24—27 from the tool set for a purpose. In this case insert two cover fastening screws into the wrench openings and screw them into the crank chamber cover. In the middle opening of the wrench screw in the armature remover. While screwing in, the remover rests against the crankshaft half axle and tightens the crank chamber cover (Fig. 32).

2. Remove crankshafts from the crankcase halves by drifting them out of bearings with a mallet (Fig. 33).

3. Undo screws and remove the cover with a crankshaft right-hand oil seal. Press off the oil seal.

4. Press bearings off the covers and crankcase left-hand half through the oil seal holes using a mandrel and a mallet.

5. Take off the adjusting rings and press out the oil seals.

6. Press out the bearing from the crankcase right-hand half.

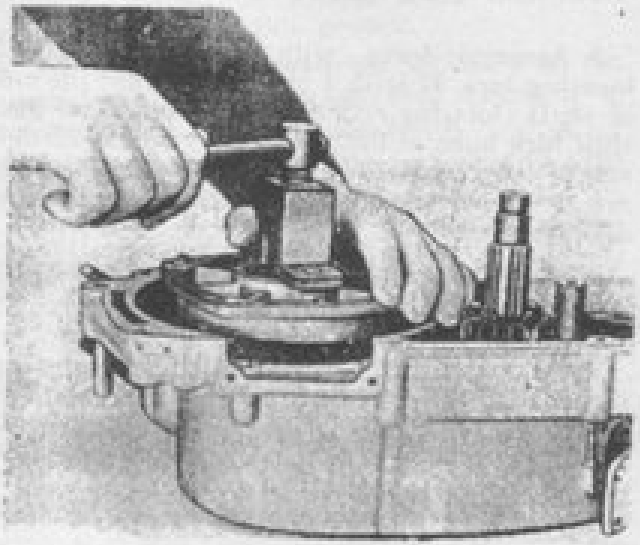

Fig. 31. Pressing-off the HЖ-КО-3 motorcycle crank chamber cover (I-st method).

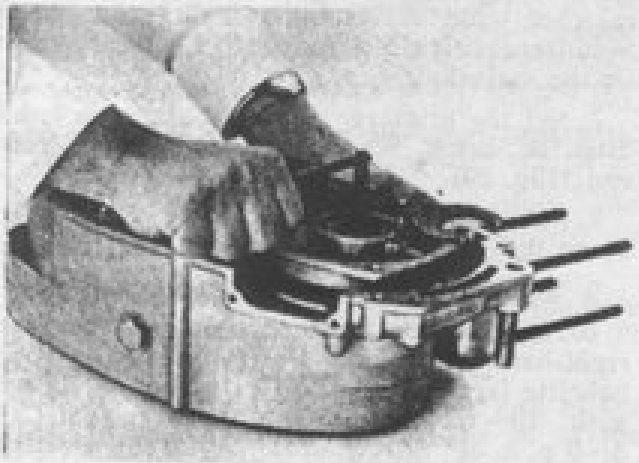

Fig. 32 Pressing-off HЖ-КО-3 motorcycle crank chamber cover (II-nd method).

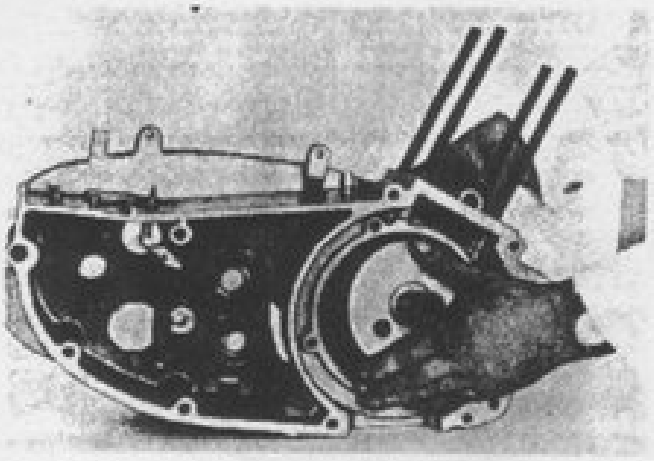

Fig. 33. Removal of crankshaft, ИЖ-10-3 model.

Detection of Faults and Repair

Repair or replace the crankcase if the following faults take place:

a) Fit of bearings became loose.

b) Cracks and holes.

c) Joint faces of crankcase halves got damaged.

If one crankcase half is damaged, replace both of them together with crank chamber covers delivered in a gridiron as one assembly.

Dints and unevennesses on the joint faces are removed with a scraper. If a necessity arises, lap the faces on a lapping plate.

The crankshafts are non-detachable and are not subjected to repair, with the exception of a connecting rod small end bush, which may be renewed (See Section "Cylinder and Piston Group Repair"). The crankshafts are replaced if the connecting rod big end bearing is worn or broken. To provide safe connection of R.-H. and L.-H. crankshaft half axles with a outboard flywheel, diameters of connected half axles are divided into groups (table 10).

Table 10

Group number marking	Crankshaft half axle diameter, mm
1	$21.980_{-0.002}$
2	$21.982_{-0.002}$
3	$21.984_{-0.002}$
4	$21.986_{-0.002}$
5	$21.988_{-0.002}$

The L.-H. and R.-H. crankshafts of one engine should be of the same group. Group number is marked on a cylindrical surface of the flywheels from a side of a crankpin (connecting rod big end).

The crankshaft bearings are replaced in case the working surfaces of races and balls begin to crumble, or when a cage is broken. Oil seals are to be changed when they are damaged, or their working edges are worn away.

Assembly

Prior to assemble the engine scrape joint surfaces. During assembly pay attention at uniform tightening of screws.

Smear bearings with a grease lubricant before pressing them in.

Reassembly is done in the following order:

1. Press in bearing 205 into the crankcase right-hand half.

2. Insert the adjusting ring into the crankcase left-hand half from the side of bearing seat.

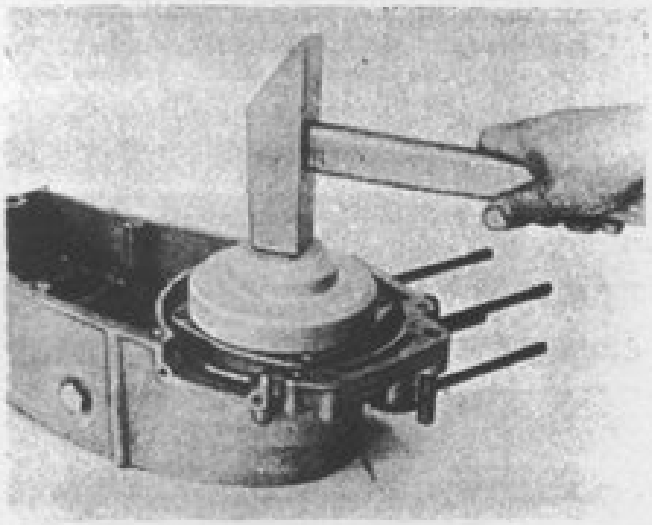

Fig. 34. Pressing-in the crank chamber cover, ИЖ-10-3 motorcycle.

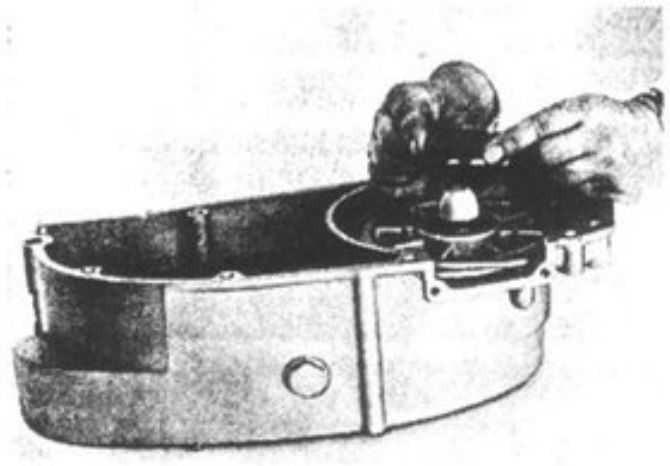

Fig. 35. Setting the ИЖ-Ю-3 motorcycle oil seal.

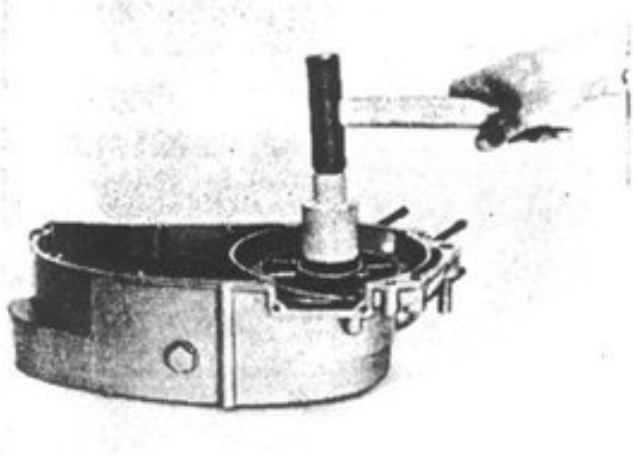

Fig. 36. Pressing-in the ИЖ-Ю-3 motorcycle oil seal.

press in an oil seal from the side of the crank chamber, install the second ring.

3. Assemble the crank chamber covers, for which purpose insert adjusting rings into the grooves from the side of bearing seats, press in bearings 205 and put packing rubber rings.

4. Put a conical bushing **4**, Set No. 1, onto the left-hand half axle of the left-hand crankshaft to prevent the working edges of the oil seal from damaging, and set the left-hand crankshaft. By means of pusher **1**, Set No. 1, and a hammer press in the crank chamber cover (Fig. 34). Fasten the cover with screws and centre punch them (tighten screws with a maximum effort).

5. Mount the right-hand crankshaft into the crankcase right-hand half, press in the crank chamber cover.

6. Set tip **2**, Set No. 1, on the crankshaft half axle (Fig. 35) and place an oil seal on it; then press in oil seals into the crank chamber covers using mandrel 3, Set No. 1 (Fig. 36), and insert adjusting rings.

7. Press in ball bearing 304 into the crankcase left-hand half.

8. Place a gasket and a cover with a crankshaft oil seal on the crankcase right-hand half, fasten it with screws.

For further reassembly refer to Section "Gearbox Repair".

SILENCERS, EXHAUST PIPES

Silencers of ИЖ-П-3 (П2) and ИЖ-Ю-3 (Ю2) are interchangeable.

Repair and service silencers and exhaust pipes as it is described in "Silencers and Exhaust Pipes Repair" in Section "ИЖ-П-3 (П2) Engine Overhaul".

Nominal Dimensions, Tolerances and Negative Allowances in Main Conjugated Parts

Part number and description (shaft)	Nominal diameter (dimension and tolerance)	Number and description of conjugated parts (hole)	Nominal diameter (dimension and tolerance)	Margin tolerance			
				Clearance		Negative allowance	
				minim.	max.	minim.	max.
Engine							
IЖ-IO 1-59-1 Primary shaft (seating place for ball bearing 204)	$20^{-0.008}_{-0.022}$	Ball bearing 204 GOST 8336—57 (inner diameter)	$20_{-0.010}$		0.022		0.002
Ball bearing 204 GOST 8336—57 (outer diameter)	$47_{-0.011}$	IЖ-IO 1—31—1 Crankcase left-hand half (seat for primary shaft ball bearing)	$47^{-0.042}_{-0.087}$			0.006	0.042
IЖ-IO 1-59-1 Primary shaft (diameter for mainshaft bush)	$17^{-0.040}_{-0.070}$	IЖ-П2 1—405—2 mainshaft bush (inner diameter)	$17^{+0.089}$	0.040	0.089		
IЖ-П 1-405-2 Mainshaft bush (outer diameter)	$20.22^{-0.1}$	IЖ-П 1—49 Mainshaft (inner diameter for mainshaft bush)	$20^{-0.045}$			0.12	0.265
IЖ-49 1—43 Layshaft (neck for ball bearing 203)	$17_{-0.012}$	Ball bearing 203 GOST 8338—57 (inner diameter)	$17_{-0.010}$		0.012		0.010
Ball bearing 203 GOST 8338—57 (outer diameter)	$40_{-0.011}$	IЖ-IO 1—31—1 Crankcase left-hand half (seat for layshaft ball bearing)	$40^{-0.042}_{-0.087}$			0.006	0.042
IЖ-49 1—43 Layshaft (neck for 1 gear)	$20^{-0.040}_{-0.070}$	1 gear (inner diameter)	$20^{+0.024}$	0.040	0.094		
Ball bearing 304 GOST 8338—57 (outer diameter)	$52_{-0.013}$	IЖ-IO 1—31—1 Crankcase left-hand half seat for ball bearing 304,	$52^{-0.051}_{-0.021}$			0.008	0.051
IЖ-IO 1—12 Crankshaft left-hand web (neck for ball bearing 304)	$20^{-0.020}_{-0.070}$	Ball bearing 304 (inner diameter)	$20_{-0.010}$	0.010	0.070		
IЖ-П2 assy 1—7 Crankshaft (neck for roller bearing)	$25^{+0.017}_{+0.002}$	Roller bearing 3ГП3-2505K (inner diameter)	$25_{-0.010}$			0.002	0.027
Roller bearing 2505 K (outer diameter)	$52_{-0.013}$	IЖ-П 1—210—1 Crankcase right-hand half (seat for roller bearing 2505K)	$52^{-0.033}_{-0.074}$			0.001	0.033
Ball bearing 304 (outer diameter)	$52_{-0.013}$	IЖ-П 1—209—2 Crankcase left-hand half (seat for ball bearing 304)	$52^{-0.033}_{-0.074}$			0.001	0.033
IЖ-П assy 1—7 Crankshaft (neck for ball bearing) 304	$20^{+0.006}_{-0.003}$	Ball bearing 304 (inner diameter)	$20_{-0.010}$		0.003		0.016

Part number and description (shaft)	Nominal diameter (dimension and tolerance)	Number and description of conjugated parts (hole)	Nominal diameter (dimension and tolerance)	Margin tolerance			
				Clearance		Negative allowance	
				minim.	max.	minim.	max.
Crankshaft right-hand web (neck for ball bearing 205)	$17^{-0,020}_{-0,070}$	Ball bearing 205 (inner diameter)	$17_{-0,010}$	0.010	0.070		
Ball bearing 205 (outer diameter)	$52_{-0,013}$	ИЖ-10 1—31—1 Crankcase left-hand half (seat for ball bearing 205)	$52^{-0,051}_{-0,021}$			0.008	0.051
ИЖ-10 1—13 Crankshaft middle web (neck for ball bearing 205)	$25.988_{-0,010}$	Ball bearing 205 (inner diameter)	$25_{-0,010}$	0.002	0.022		
Ball bearing 205 (outer diameter)	$52_{-0,013}$	ИЖ-10 1—14 Crankcase right-hand half (seat for ball bearing 205)	$52^{-0,051}_{-0,021}$			0.008	0.051

Running Gear

Ball bearing 203 GOST 8338—57 (outer diameter)	$40_{-0,011}$	ИЖ-П2 4—207 Hub bush (seating place for bearing)	$40^{-0,000}_{-0,012}$		0.002		0.012
ИЖ-П2 4—219 Half axle (outer diameter for bearing)	$25^{+0,017}_{+0,002}$	Ball bearing 205 GOST 8338—57 (inner diameter)	$25_{-0,010}$			0.002	0.027
ИЖ-56 2—75 Shock absorber rod (outer diameter)	$9.915^{-0,015}_{-0,055}$	ИЖ-56 2—78—3 Rod bush (inner diameter)	$9.915^{+0,03}$	0.015	0.085		
ИЖ-56 2—76 Shock absorber piston (outer diameter)	$19.85_{-0,045}$	ИЖ-56 2—83 Shock absorber cylinder (inner diameter)	$20^{+0,045}$	0.150	0.210		
ИЖ-49 3—29 Rod valve (outer diameter)	$15.8_{-0,120}$	ИЖ-49 3—27 Shock absorber tube (inner diameter)	$16^{+0,120}$	0.200	0.440		
ИЖ-49 3—4 Carrying tube (outer diameter, seating place for piston)	$32_{-0,050}$	ИЖ-49 3—31 Carrying tube piston (inner diameter)	$32^{+0,050}$	0.000	0.100		
ИЖ-10-2 2—21—1 Spacer (outer diameter)	$24^{-0,020}_{-0,053}$	ИЖ-10 2 2—21—1 Spacer (inner diameter)	$24^{+0,045}$	0.020	0.098		
ИЖ-10 2 2—29 Pendulum fork axle (outer diameter)	$12_{-0,070}$	ИЖ-10 2 2—21—1 Spacer (inner diameter)	$12^{+0,120}$	0.000	0.190		
Speedometer reducer gear (neck for bush)	$8^{-0,035}_{-0,185}$	ИЖ-10 4—55 Bush (inner diameter)	$8^{+0,030}$	0.035	0.115		
ИЖ-10 4—55 Bush (outer diameter)	$11^{+0,075}_{+0,040}$	ИЖ-10 4—57 Speedometer reducer bush (diameter for bush)	$11^{+0,035}$			0.005	0.075

RUNNING GEAR OVERHAUL

REAR WHEEL SUSPENSION SPRING HYDRAULIC SHOCK ABSORBERS

A shock absorber repair should be undertaken when the need for same becomes apparent because of hydraulic mixture leakage, spring and rod breakage, barrel damage, silentblock (rubber bumpers) breakage or shock absorber parts wearing.

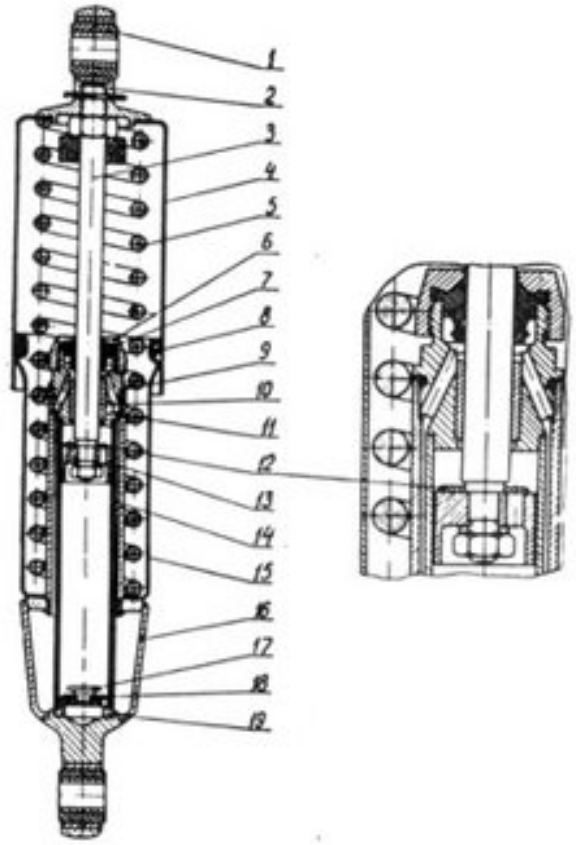

Fig. 37. Rear wheel suspension spring hydraulic shock absorber of ИЖ-П-3, ИЖ-Ю-3 motorcycles: 1—rubber bumper; 2—upper tip; 3—rod; 4—upper barrel; 5—spring; 6—oil seal housing; 7—seal; 8—seal; 9—packing ring; 10—rod bush; 11—rod bush body; 12—valve; 13—shock absorber piston; 14—shock absorber cylinder; 15—lower barrel; 16—suspension casing; 17—lower valve retainer; 18—valve; 19—lower valve body.

Removing and Dismantling

1. Set the motorcycle on a central stand and take off the shock absorbers.

2. Remove splint (Fig. 37) from the upper tip **2**. Compress the spring in device **16**, Set No. 2, release nut and unscrew tip (Fig. 38).

3. Remove barrel **4**, spring and barrel **15**.

4. Clamp lower tip in a vice, unscrew body **6** of the oil seal, remove rod **3** in assembly with piston **13**, oil seal **7**, bush **10** and its body **11**.

5. Drain hydraulic mixture from the casing and remove cylinder **14**.

Further disassembly is carried out only if it is necessary to change worn-out or failed parts.

Detection of Faults and Repair

Examine parts, measure diameters of piston and cylinder.

Repair or replace the parts, if:

a) The rod is bent or there are marks, dents, rust, thread damage on its working surface.

b) Oil seal working edges are worn-out or broken.

c) Rubber packing ring is damaged.

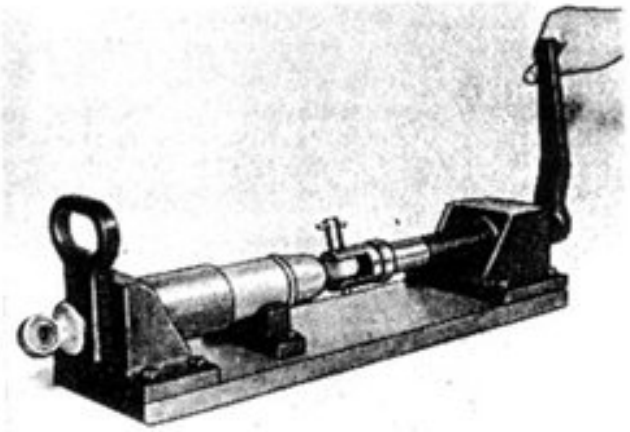

Fig. 38. Dismantling the spring hydraulic shock absorber.

d) Silentblocks are failed.

e) Valve yawns to the piston.

f) Clearance between the piston and cylinder exceeds 0.2÷0.25 mm.

Felt oil seal of the lower barrel should be renewed. Prior to setting an oil seal, impregnate it with motor oil.

Reassembly

The shock absorber reassembly is carried out in the reverse order. Pour hydraulic mixture into the shock absorber according to the "Maintenance and Operation Instructions" and Supplement No. 4.

When assembling the oil seal body with the rod, put tip 6, Set No. 2, on the rod end to prevent oil seal edges from damaging. After inserting the splint into the upper tip, lock the rod with a nut.

WHEELS

Wheels of "ИЖ" motorcycles are interchangeable. Take off wheels if it is necessary:

1. To interchange wheels.
2. To repair (to replace) tyre tube and tyre.
3. To replace bearings.
4. To replace or tension spokes, to eliminate rim beating.

To remove wheels, place the motorcycle on a central stand.

Front Wheel Removal

Loosen the bolt fastening tip of a telescopic fork left-hand sliding tube and unscrew a wheel axle (L.-H. thread) using a hand-screwing tool for this purpose.

Take off the brake drum cover from the wheel hub.

Don't disconnect the hand brake cable and speedometer flexible shaft from the cover.

Rear Wheel Removal

Disconnect tail lamp and turn indicator wires, then remove the saddle.

Unscrew wheel axle nut (L.-H. thread), drift the axle out, take off a distance bushing. Remove the wheel by moving it to the left, forward and upward.

Disassembly

1. Unscrew the oil seal body, remove the decorative cover and washer.
2. Take the lock ring and washer out of the hub.
3. If it is necessary to replace bearings, press them off.

The necessity of replacing the bearings is determined by wheel clearance when the assembled motorcycle is set on a central stand.

The left-hand bearing is pressed off through the opening of the right-hand bearing and distance bushing with a help of a hammer and a mandrel.

To press off the right-hand bearing, remove the distance bushing.

Detection of Faults and Repair

Examine parts and replace:

a) Oil seal, if it is damaged or its working edge is worn-out or has cracks.

b) Bearing, if it has a large clearance or a damage.

c) Support bush, if it is worn-out to a great extent.

To change spokes and to check wheel rim beating remove the tyre from the rim. Put the wheel on the axle fastened vertically in a vice. Replace failed spokes. Check the rim for beating. Allowable beating is: radial—1 mm, side—1.5 mm.

The hub may protrude over the wheel rim at 11.3±1.5 mm.

Side beating is eliminated in the following manner:

Rotating the wheel on its axle, mark places where side beating takes place. If beating takes place in the upper part of the rim, slacken spokes running from area of beating to the upper part of the hub, and tighten lower spokes. In such a manner eliminate beating all over the rim face.

To prevent the tyre from damaging, cut spoke ends protruding out of nipples with an emery-grinding wheel or with a file.

Reassembly

Fill a cavity between bearings, and also bearings and oil seal labyrinth with grease lubricant before reassembling them.

Reassembly and mounting the wheels is effected in the reverse order. When mounting the rear wheel, make certain the distance bushing end face with its smaller diameter is directed to a wheel hub side.

TRANSMISSION TO REAR WHEEL

Rear wheel sprocket housing is removed or dismantled in case of repairing (replacing):

1. sprocket and chain;

2. sprocket bearing;
3. brake cam;
4. housing cover and body.

Dismantling

1. Set the motorcycle on a central stand, remove the saddle, wheel and crankcase right-hand cover, disconnect the chain, separate the rear brake rod from the pedal.

2. Unscrew a half axle nut and remove the housing together with the guards and the chain.

3. Take out the chain from the housing and take off the guards.

4. Undo the screws and remove the housing cover, take off the sprocket with a half axle and felt oil seal from the housing.

5. Remove a lock wire from the bolt head, unscrew the bolt and take off the brake pedal.

6. Withdraw the splint, remove a washer from the hinge pin. Take off the brake shoes and extract the cam.

7. Withdraw the adjusting ring, press off the bearing with a half axle from the sprocket and press off the half axle from the bearing.

Detection of Faults and Repair

Replace parts if:

1. Sprocket splines or teeth are worn-out.

2. Cage, races, balls are damaged or there is a clearance in the bearing.

3. Chain rubber guards are worn-out.

4. Rollers are failed or elongation of the chain is in excess of 3 p. c. (a length of a new chain is $1651^{+2.45}$ mm).

Reassembly

Reassembly is the reverse of disassembly.

Coat the sprocket bearing, brake cam axle and oil seal with a grease lubricant before assembling them. Fill the rubber guard cavity with grease too.

Pay special attention to setting the chain lock catch. The split end of a catch is to be set in the direction opposite to the chain movement.

Be careful not to damage the oil seal when installing the sprocket with a half axle into the housing.

FRONT WHEEL BRAKE DRUM COVER WITH SPEEDOMETER REDUCER, BRAKE SHOES

The cover, speedometer reducer and brake shoes need repairing if brake cam, brake shoe linings, gears, wheels or speedometer reducer bushes are worn-out.

Dismantling

Removal and dismantling are done in the following order:

1. Disconnect the hand brake cable and speedometer drive flexible shaft from the brake drum cover.

2. Remove the wheel and brake drum cover.

3. Loosen the bolt and take off the brake pedal.

4. Take out the bush and speedometer reducer gear together with the washer. Take off the lock ring and reducer wheel from the wheel hub.

5. Take out the splint from the hinge pin, remove the washer, collar, brake shoes and take out the brake cam.

Detection of Faults and Repair

Replace worn-out speedometer reducer bush and also the gear and wheel if the teeth are worn-out or deformed.

Wash oiled brake shoes in gasoline.

In case linings are worn-out not to a great extent put some adjusting washers under the brake shoe heels to improve braking effect.

If the brake shoes are worn-out till the limit, replace them with new ones, which are delivered in the gridiron complete with linings.

Reassembly

Reassembly is done in the reverse order. For mode of setting the brake linings refer to Fig. 39.

Before assembly coat the gear, speedometer reducer wheel and brake cam with grease.

Fig. 39. Setting the brake shoes.

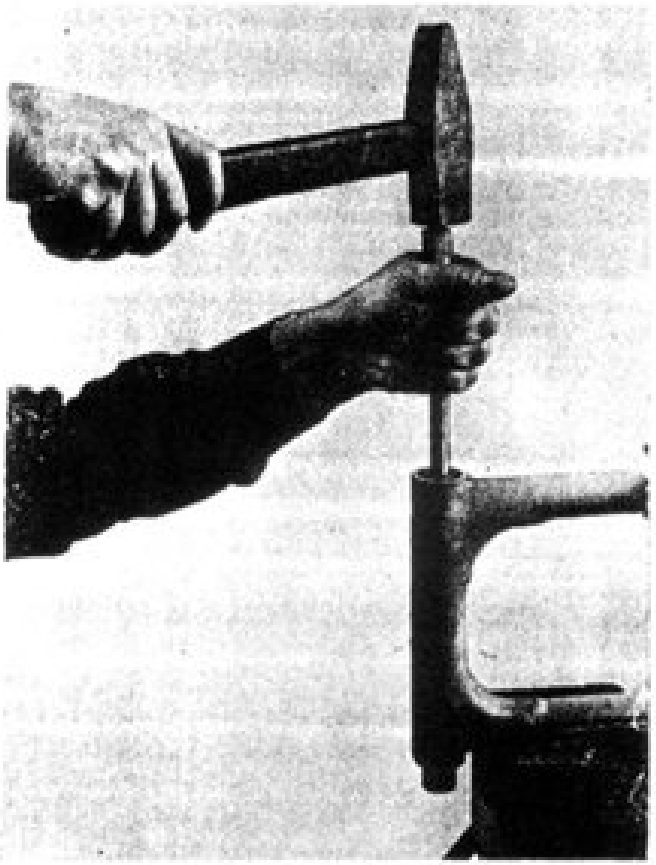

Fig. 40. Pressing-out the pendulum fork bushes.

PENDULUM FORK

Remove and dismantle the pendulum fork if some clearance or knocks appear in it.

Removal and Dismantling

1. To remove the pendulum fork proceed as follows:

a) Remove the saddle, rear wheel, wheel guard.

b) Disconnect the brake rods, rear wheel sprocket housing and shock absorbers from the fork.

c) Undo the nuts of the pendulum fork axle, drift the axle out, take off the fork.

2. Withdraw the packing rings, distance bushes and spacing tube.

3. Clamp the fork in a vice and drift out bushes and washers using a drift and a hammer (Fig. 40).

4. Take the splint out, unscrew the nut, remove the washer, lever and shaft with a lever.

Detection of Faults and Repair

Main faults of the pendulum fork are:

a) Wearing the bushes.

b) Damage of axle thread.

c) Wearing the axle because of loose fastening.

Worn-out or damaged parts need replacing.

Bushes and a pendulum fork complete with bushes and an axle are delivered in a gridiron.

Reassembly

Pendulum fork is reassembled and set in the reverse order.

Coat the brake lever shaft with grease before setting it.

TELESCOPIC FORK LEGS

Repair telescopic fork legs if hydraulic mixture escapes constantly from under the seal body or when the rod is broken and also if the parts are worn-out.

Removal and Dismantling

1. Remove the wheel together with the brake drum cover.

2. Unscrew tie plug **3** (Fig. 41) using spanner **5**, Set No. 3, loosen lock nuts, and unscrew the plug from the rod.

3. Screw-in the plug into the carrying tube at a half of its thread, but do not screw it on rod **16**. Slacken the bolt fastening carrying tube **12** in lower bridge **7**.

4. By light taps with a hammer against the tie plug protected with a wooden pad, knock the carrying tube out of connection with upper bridge **4**. Unscrew the plug and take out the leg.

5. Remove the second leg in the same manner.

6. Unscrew and remove the oil seal. Take out the carrying tube together with a packing gasket and textolite bush **15**. Remove the lock ring, piston **20**, textolite bush and gasket from the carrying tube. Drain the oil.

7. Clamp the leg in a vice by the sliding tube lower tip **21**. Unscrew hydraulic shock absorber bolt **24** (Fig. 42), and get the shock absorber out.

8. Clamp the hydraulic shock absorber by its lower tip **22** in a vice.

9. Unscrew nuts from the rod, remove a bush (which is provided only on a motorcycle with a side-car), a washer and a spring.

10. Unscrew upper tip **18** and remove the rod, assembled, from the shock absorber stay.

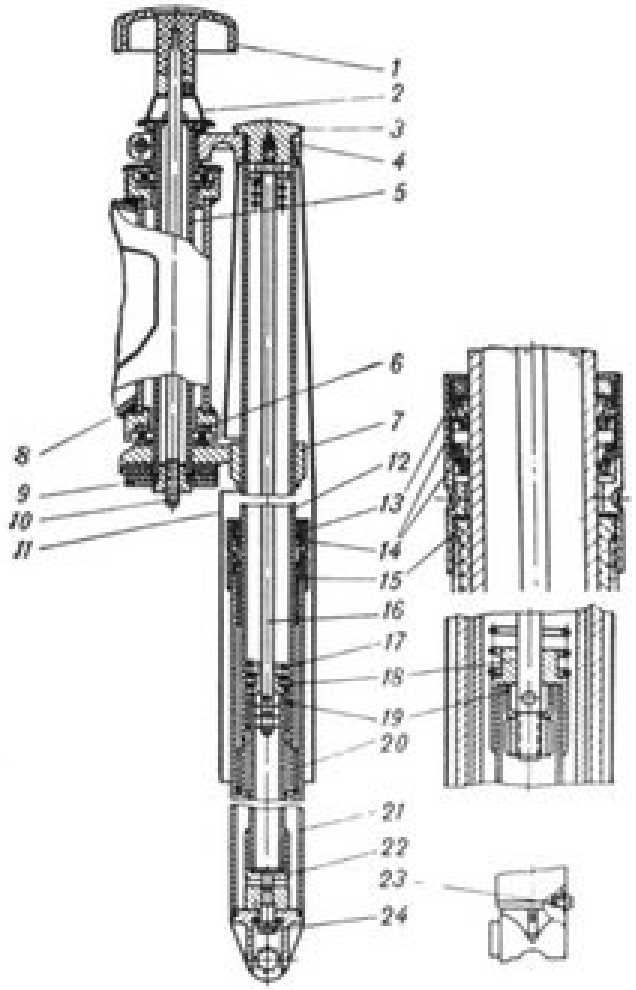

Fig. 41. Front fork:

1—damper knob; 2—damper spring; 3—clamp plug; 4—upper bridge; 5—steering column shaft; 6—ball bearing No. 778706; 7—lower bridge; 8—motorcycle frame; 9—damper disc; 10—splint; 11—casing; 12—carrying tube; 13—seal housing; 14—seal; 15—sliding tube bush; 16—rod; 17—spring; 18—hydraulic shock absorber tip; 19—rod valve; 20—carrying tube piston; 21—sliding tube; 22—hydraulic shock absorber stay; 23—screw; 24—bolt

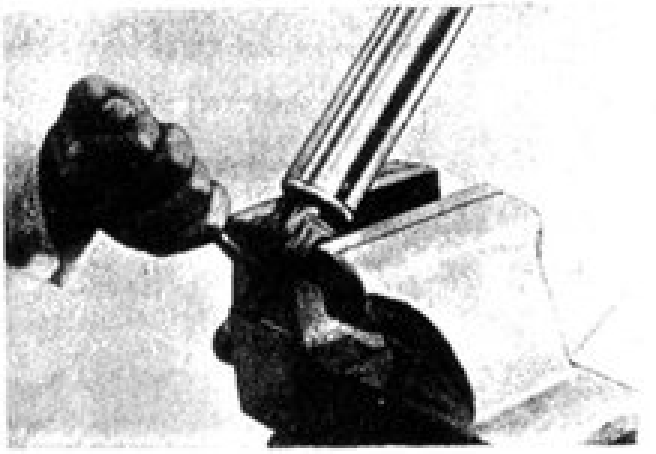

Fig. 42. Unscrewing the hydraulic shock absorber fastening bolt.

Detection of Faults and Repair

Examine the parts. Pay attention to a state of oil seal working edges. Replace oil seals together with their housings if there are cracks, any damage or wearing of the working edges.

Measure the carrying tube diameter, textolite bush inner diameter, sliding tube inner diameter and carrying tube piston outer diameter.

Table 11

Group number	Sliding tube bush	
	Outer diameter, mm	Inner diameter, mm
1	$38.00_{-0.05}$	$33.00^{+0.05}$
2	$38.05_{-0.05}$	$32.95^{+0.05}$
3	$38.10_{-0.05}$	$32.90^{+0.05}$
4	$38.15_{-0.05}$	

Table 12

Group number	Carrying tube piston outer diameter, mm	Sliding tube inner diameter, mm
1	$37.95_{-0.05}$	$38.00^{+0.05}$
2	$38.00_{-0.05}$	$38.05^{+0.05}$
3	$38.05_{-0.05}$	$38.10^{+0.05}$
4	$38.10_{-0.05}$	$38.15^{+0.05}$

Piston and bushes should be replaced if a clearance between the sliding tube bush and the carrying tube is more than 0.3÷0.4 mm and a clearance between the piston and the tube exceeds 0.25 mm.

When replacing conjugated parts, be attentive to select them from one and the same group (Tables 11, 12, 13). The sliding tube bush is classified in groups according to the outer and inner diameters. Marking is given in a fractional number. A numerator designates a group corresponding to the outer diameter, and denominator — to the inner diameter.

Table 13

Group number	Carrying tube outer diameter, mm	Group colour index
1	$32.968_{-0.050}$	None
2	$32.918_{-0.050}$	Red
3	$32.868_{-0.050}$	Black

Marking of the carrying tube group number is made on the end face from the side of a cone. The sliding tube is marked on an outer surface near the thread. The carrying tube piston is marked on the piston end face.

During reassembly pay attention to the following:

1. A pin of the shock absorber lower tip should enter the hole of the sliding tube tip.

2. To avoid bending the oil seal edges, smear the carrying tube with an oil and put the oil seal on it very carefully.

3. Prime the fork leg with a hydraulic mixture according to the Instructions.

STEERING COLUMN BEARING, STEERING DAMPER

The need in repairing (or replacing) is determined by the following symptoms:

1. Partial fixation on turning the handlebar in definite positions because of bearing seizing.

2. Insufficient braking with a damper on turning the handlebar. Adjustment has no effect.

Dismantling

1. Remove the front wheel, telescopic fork legs, wheel guard, flexible shaft holder.

2. Dismantle the steering damper.

3. Remove the headlamp from brackets, but don't disconnect the flexible shaft and wire strand.

4. Unbend the lock washer, unscrew the upper bridge nut, slacken the tie bolt, remove the bridge (together with the handlebar) and guards.

5. Holding the lower bridge, unscrew the nut with the upper bearing protective cap and remove the bridge taking care not to scatter the balls.

Detection of Faults and Repair

Replace bearings (No. 778706) if there are dents on race-ways or cracks in races.

Oiled friction discs of the steering damper wash in gasoline or replace them.

Reassembly

Reassembly is carried out in the reverse order. Before placing the balls, fill the races with grease. Tighten the bearing nut with a protective cap till the stop, then slacken it at $^1/_8$-$^1/_4$ of a turn to provide a normal axial clearance.

SIDE-CARS, БП-1 * AND БП-65 MODELS

A side-car is repaired in case the parts are worn-out or damaged. Parts of a torsion suspension of БП-65 model are repaired or replaced if during running you hear knocks which are the result of wearing the bushes or damaging the torsion shaft.

Dismantling

The side-cars, models БП-1 and БП-65 are dismantled rather simply.

A torsion suspension of БП-65 is a more complicated unit and is dismantled in the following order:

1. Take out the splints, unscrew the nuts and lift the front part of the wheel guard.

2. Remove the cap, take out the splint, unscrew the wheel axle nut.

3. Put a support under the side-car frame and remove the wheel.

4. Unscrew the bolts fastenihg the flange and take out the swinging lever assembled with the flange and bushes and the torsion shaft.

5. Unscrew the bolts fastening the swinging lever and remove it. Take out keys from the slots and remove the body with the oil seal.

Remove the lock and thrust rings, take out the swinging lever bush.

* БП — read BP, it stands for a side-car.

Detection of Faults and Repair

If there are dents on the side-car body, dress them. Weld cracks and holes.

Frame repairing consists in replacing worn-out or broken parts, straightening, cracks welding or setting reinforcing gussets or linings.

For local painting or repainting of the side-car use enamel МЛ-12 type which needs hot drying.

For mode of repairing the spring-hydraulic shock absorber, installed in the side-car, model БП-1 and for repairing a side-car wheel, refer to Sections I and II (Running Gear).

Replace the БП-65 swinging lever bush and bushes pressed into the flange. The flange is delivered in the gridiron complete with bushes. The swinging lever is delivered complete with a flange and bushes.

Replace the torsion shaft if it is broken or its splines are damaged. Check a good repair of parts conjugated with it.

Reassembly

Reassembly is the reverse of dismantling. Lubricate the oil seal and bushes, fill the cavity between the flange bushes with grease before reassembling the БП-65 torsion suspension. Pay special attention to the safe tightening of fastening parts and presence of splints.

ELECTRICAL EQUIPMENT OVERHAUL

GENERATOR, BREAKER, CONDENSER

Generator main troubles:

1. Jamming the generator brushes in the holder.

2. Dirty interlamellar slots or commutator wearing.

3. Closing the generator windings on body or their coil closing; breaking or closing the wires.

4. Armature and stator contacting due to their improper setting or crankshaft bearing wear.

5. Condenser failing.

6. Misadjustment of ignition advance or gaps between breaker contact points; burnt or dirty contacts.

7. Generator reverse polarity, wrong connection of wires.

8. Impossibility of ignition advance because of wrong setting of armature (without a key), breaker cam or stator (with a warp), great wearing of textolite pads of the breaker lever.

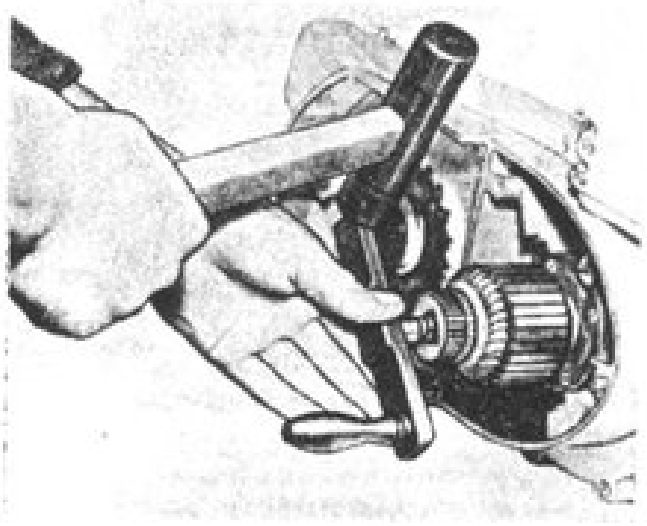

Fig. 143. Unscrewing the generator armature fastening bolt.

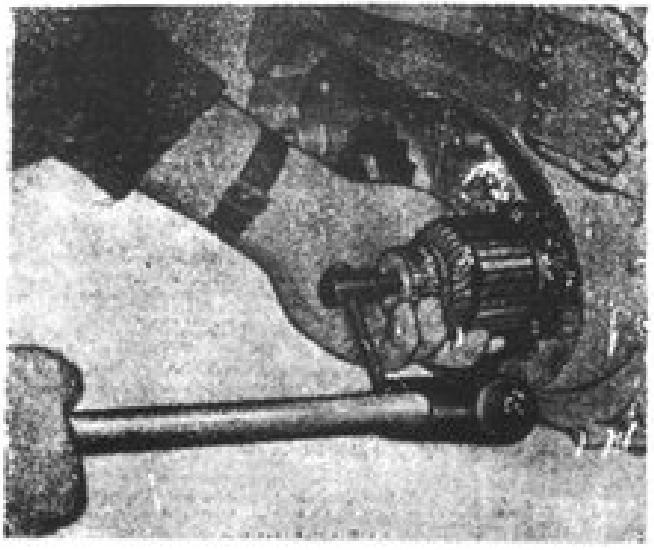

Fig. 44. Removal of the armature from crankshaft half axle.

Fig. 46. Breakers of ИЖ-П-3, ИЖ-П-2 motorcycles: 1—eccentric; 2—contact plate base fastening screw; 3, 4—breaker base fastening screws.

Turn the crankshaft till the contact points are fully open. Check the gap with a gauge and, if necessary, set the gap between the contact points within 0.4—0.6 **mm** (Fig. 46).

Loosen screw 2, adjust the gap with an eccentric 1 and tighten the screw. Set the piston in the top dead centre (T. D. C.) marking this position on the device scale. Turn the crankshaft in the anticlockwise direction till the contact points are open. The lamp bulb will not light up with the ignition switched "ON" and contact points closed, but it will light up, as soon as the contact points begin to open.

At the moment of contact points opening the piston should be at 3.5—4 **mm** below the T. D. C.

Ignition advance is adjusted as follows:

a) Slacken screws 3 and 4.

b) Turn the breaker base till the moment of contact points opening.

c) Tighten the screws.

After setting the ignition advance check the gap between the breaker contact points.

IGNITION ADVANCE ADJUSTMENT OF ИЖ-Ю-3 (ИЖ-Ю-2) MOTORCYCLE ENGINE

To adjust the ignition advance use gauge 7, Set No. 1, which is screwed into the openings for spark plugs provided in the heads. A lamp for checking the moment of opening the contact points is connected to the "body" with one wire. The second wire is connected to the terminal of the breaker lever corresponding to the cylinder on which the ignition advance is set (Fig. 47).

Check the gaps between the breaker contact points of one of the breakers are fully open. points of one of the breakers are totally open. Check with a gauge and adjust, if necessary, the gap between the contact points within 0.4—0.6 **mm**. Adjust the gap between the contact points of the second breaker in a similar way.

Loosen screw 2, adjust the gaps with eccentrics 1 (Fig. 48) and tighten the screws.

Screw the gauge into the right-hand cylinder head (in the direction of the motorcycle running), connect the lamp to the "body" with one wire and to the left-hand breaker terminal with the other wire.

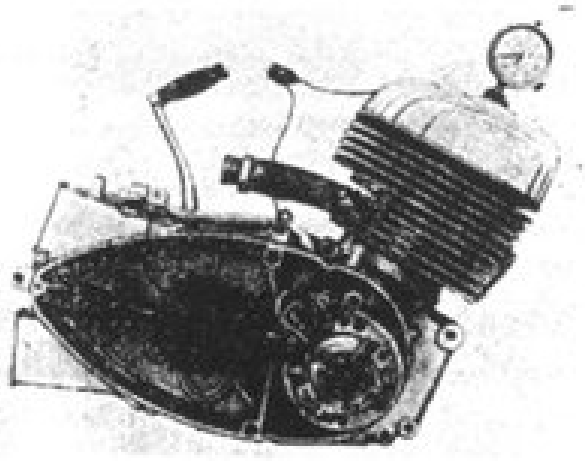

Fig. 47. Ignition advance adjustment of ИЖ-Ю-3, ИЖ-Ю-2 and ИЖ-П-3 motorcycles with a feeler gauge.

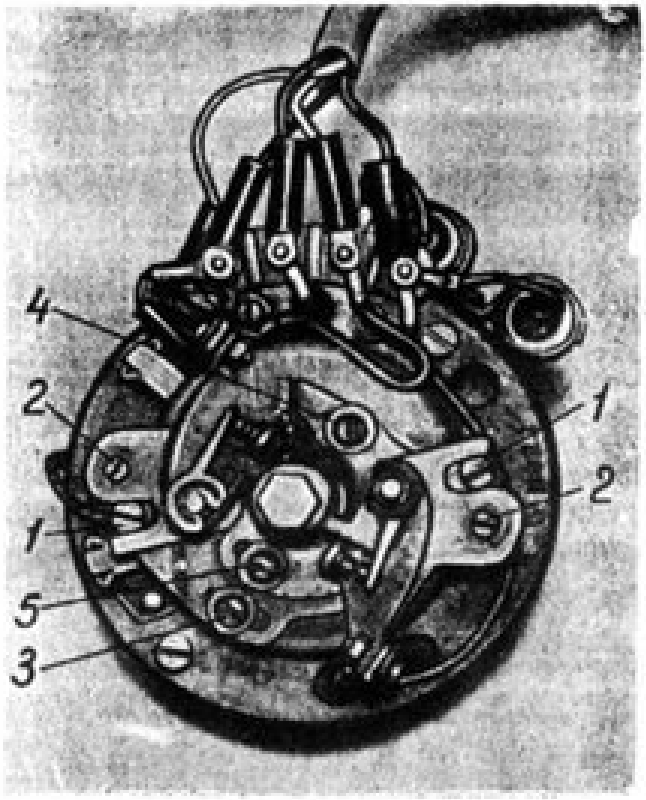

Fig. 48. Breakers of ИЖ-Ю-3, ИЖ-Ю-2 motorcycles: 1—eccentrics; 2—fastening screws of contact plate bases; 3, 4, 5—fastening screws of breaker bases.

Set the right-hand piston in the T. D. C. marking this position on the gauge scale.

Turn the crankshaft in the anticlockwise direction until the contact points begin to ope . The lamp will not light up, if the contact points are closed and ignition is "On", but it will light up as soon as the contact points begin to open.

At the moment of contact points opening the piston should be at 2—2.6 **mm** below the T. D. C.

If necessity arises, ignition advance is adjusted in the following way:

a) Slacken screws **3** and **4**.

b) Turn the breaker base till the moment of contact points opening.

c) Tighten screw **3**.

Screw the gauge into the head of the left-hand cylinder and connect the lamp wire to the right-hand breaker terminal.

Slacken screws **4** and **5** and set the ignition advance, after adjustment fasten the screws and check the gaps between the contact points of the breakers.

When adjusting the ignition be sure the ignition advance is identical in both cylinders or difference is no more than 0.1 **mm**.

REGULATING RELAY

Main troubles of the regulating relay are the following.

1. With the engine running the storage battery is discharged (pilot lamp is on).

The causes: misadjusted voltage relay (reduced voltage); break of wires between "III" and "M" terminals of the generator and regulating relay; improper connection of wires to the terminals; burnt or oxidized contacts; disturbed adjustment of reverse current relay (switching on takes place at increased voltage).

2. Lamps and bulbs of headlamp light with overheating or burn out. Electrolyte boils away from the storage battery.

The cause: Voltage relay is misadjusted (increased voltage).

Removal of Regulating Relay from Motorcycle

1. Remove the saddle.

2. Unscrew the bolts fastening the regulating relay and remove it.

3. Disconnect wires from the regulating relay terminals.

Detection of Faults and Repair

Check the regulating relay for damage of terminal stays, resistors, a casing and a panel (base).

The voltage relay and reverse current relay are not dismantled.

Clean the contacts from dirt with a cloth wetted in spirit or with clean paper. Clean burnt contacts with a blade of a safety razor and polish with fine emery paper.

Check the gaps between contact points and between armatures and cores.

The gaps should be:

a) 0.25—0.35 **mm** between the contact points.

b) 0.9—1.1 **mm** between the armature and voltage relay core when the upper pair of contact points is closed.

c) 0.6—0.8 **mm** between the armature and reverse current relay core.

Adjustment of gaps between the contact points is achieved by bending their holders, the gaps between the armature and the core are adjusted by moving the armature holders.

After checking and adjusting the gaps control electrical parameters of the regulating relay on a special stand or directly on the motorcycle with the engine working.

The regulating relay parameters are adjusted by changing the tension of cylindrical springs.

At the temperature of +25° +5°C the regulating relay should have the following parameters:

a) Voltage of switching the reverse current relay is equal to 6.2±0.2 V (it is controlled on a stand);

b) Regulating relay voltage under the load of 7 A is 6.5±0.5 V. When checking is performed directly on the motorcycle, switch on the headlamp "dim" or "bright" light and the tail lamp as a load, connect the voltmeter to regulating relay terminals "Я" and "М";

c) When operating without a load adjustable voltage should not exceed 7.8 V (it is adjusted on the stand).

Electrical parameters and regulating relay gaps are adjusted in Repair Shops. If it is impossible to adjust the regulating relay, replace it. Otherwise other units of electrical equipment may be failed.

Resetting the Regulating Relay on Motorcycle

1. Connect wires to regulating relay terminals as per wiring diagram.

2. Fit the regulating relay up and secure it with bolts.

3. Re-mount the saddle.

STORAGE BATTERY

Main troubles are:

1. Discharging the storage battery with the engine running (pilot lamp is on).

Causes: confused polarity when connecting the storage battery or the latter has reversed polarity while its charging.

2. Storage battery is discharged.

Causes: loose fastening of wires on terminals, oxidation of contact points, insufficient electrolyte quantity in cans because of its boiling away or damaged storage battery body, sulphation of grids, grid closing or dirty surface of priming mass.

3. Priming mass bulging or cracks on the body. Cause: storage battery plugs are not provided with vent holes.

Detection of Faults and Repair

Examine the storage battery. Melt the priming mass to eliminate cracks in it. Replace the storage battery if there are cracks in its body through which electrolyte leaks. Stop small cracks with epoxide resin .

Clean terminals and fastening parts from dirt and oxides then coat them with commercial petrolatum.

If there is a lack of electrolyte in cans, fill them with electrolyte or distilled water up to the level as it is instructed in Storage Battery Maintenance Instructions. When sulphating the grids, do the following:

a) pour electrolyte out of cans;

b) prime the battery with distilled water, then charge and discharge it for several times at a current of 0.5A;

c) discharge the storage battery and empty it from distilled water;

d) pour electrolyte and charge the storage battery.

WIRING

For easy connecting of wires on the motorcycle they are of different colours and combined in bunches.

Their main faults—insulation of wires and polychlorvinyl tubes is damaged, wires and their terminals are broken.

To disconnect wires for their repairing and replacing dismantle the corresponding motorcycle units:

1) The light change-over switch bunch and turn indicator bunch.

Remove light change-over switches from the handlebar, a lamp sealed beam unit from the headlamp and disconnect wires from the socket of the lamp sealed beam unit, from master switch, turn relay and switches.

2) Main wire bunch.

Remove the saddle, carburettor guards, fuel tank, lamp sealed beam unit, regulating relay and disconnect wires.

3) Generator wire bunch.

Take off the saddle, fuel tank, carburettor guards, crankcase right-hand cover, regulating relay and disconnect the wires.

4) Tail lamp wire bunch.

Remove and dismantle the saddle. To repair the wires proceed as follows:

Solder the terminals, insulate stripped wires or renew them if the terminals are broken or they are poorly connected to wires.

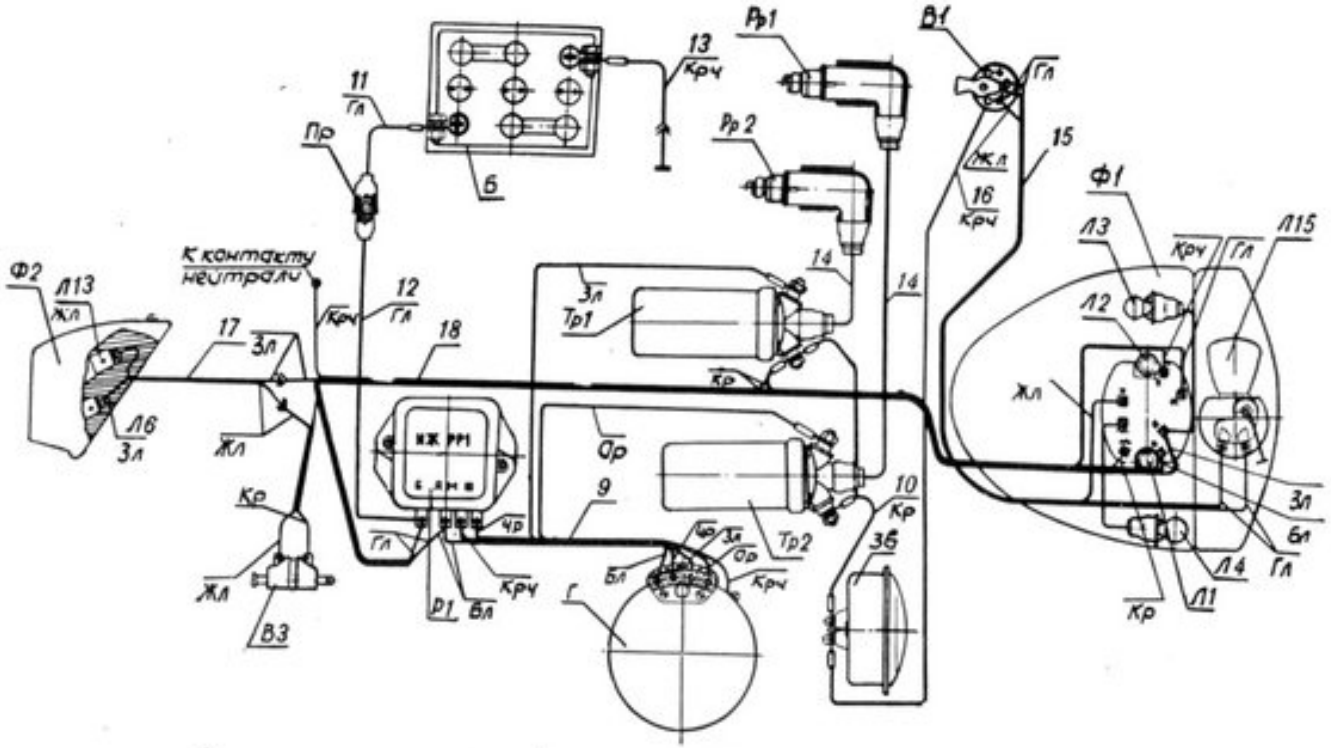

Fig. 49. Wiring diagram of ИЖ-Ю-2 motorcycle.
К контакту нейтрали — to neutral contact.

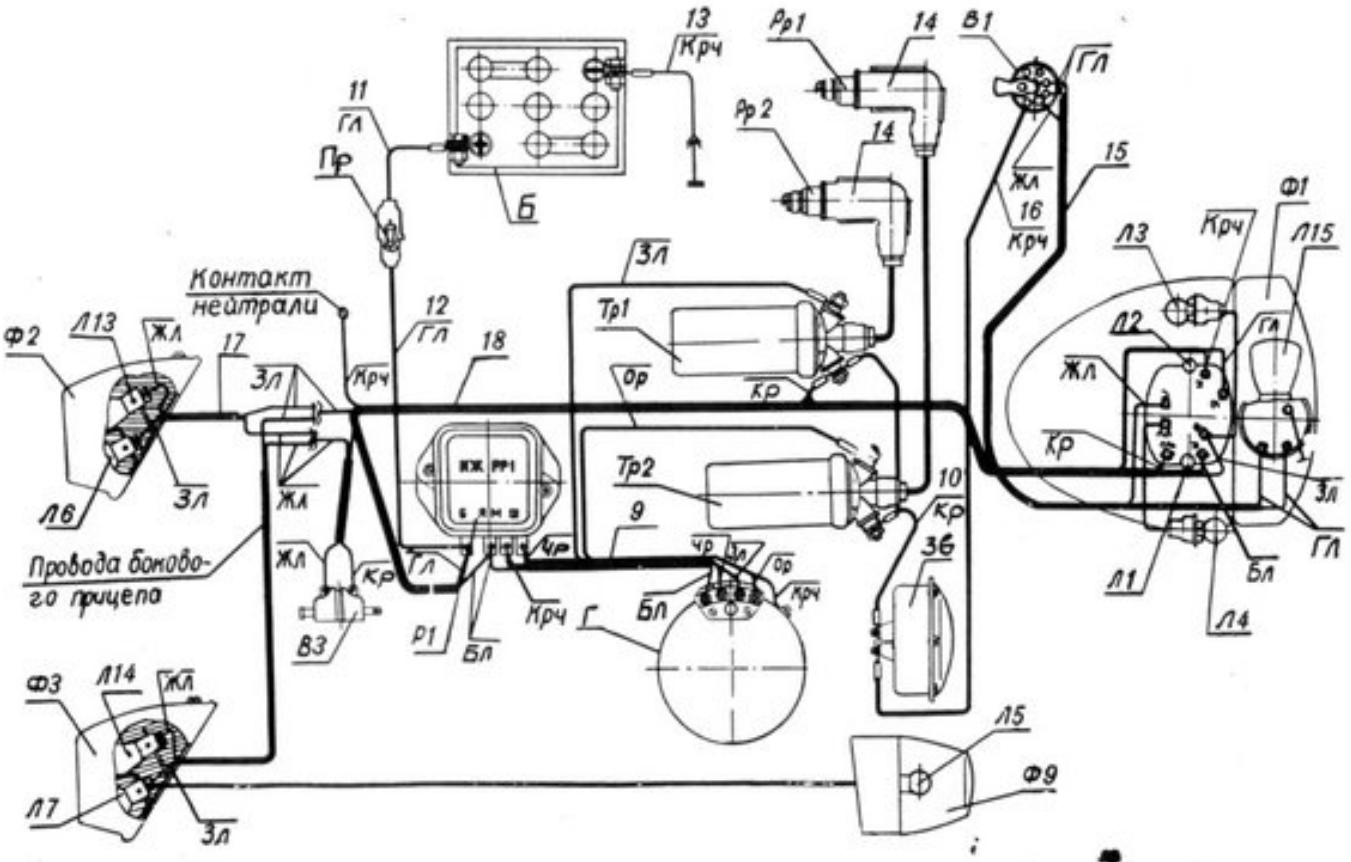

Fig. 50. Wiring diagram of ИЖ-Ю-2К motorcycle.
Контакт нейтрали — neutral contact
Провода бокового прицепа — side-car wires

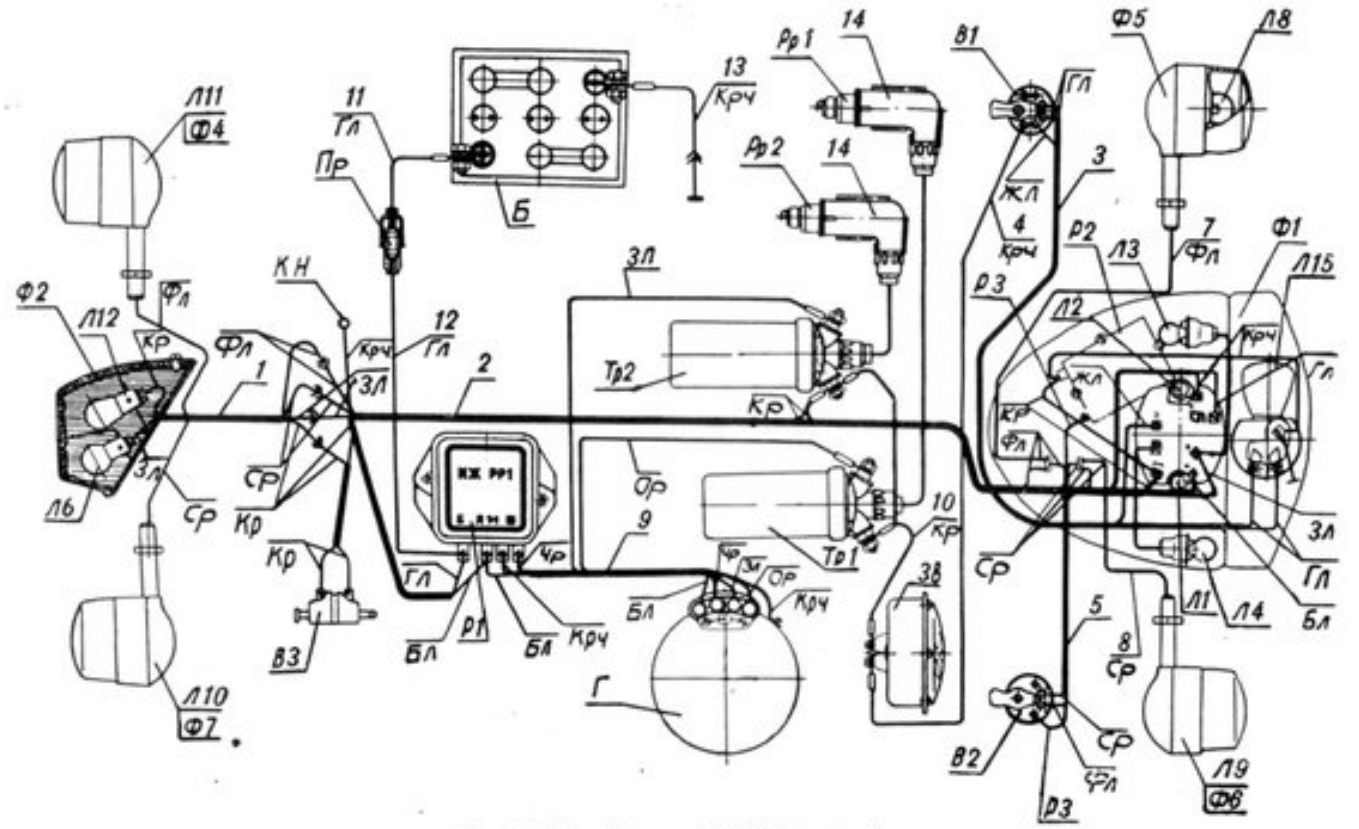

Fig. 51. Wiring diagram of ИЖ-Ю-3 motorcycle.

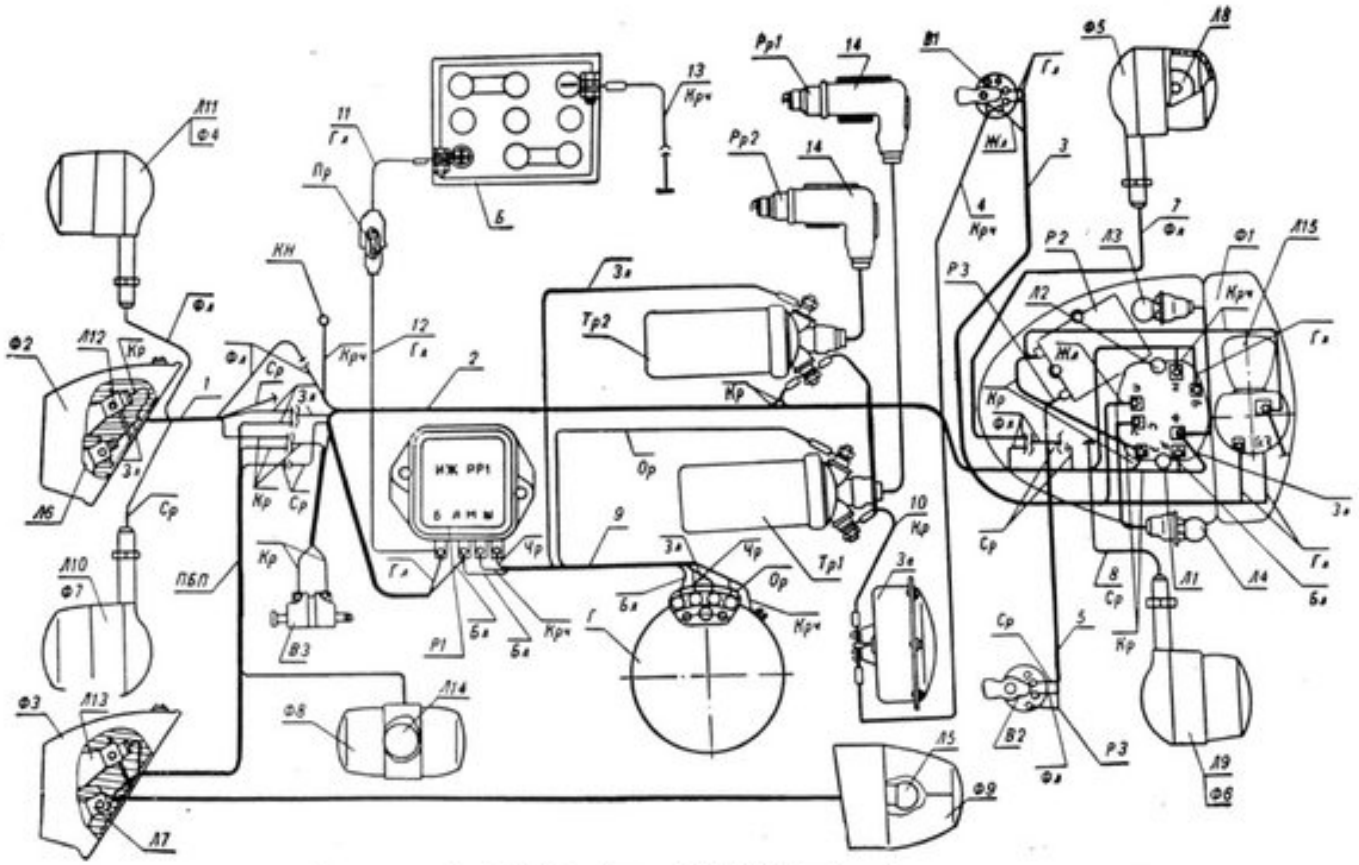

Fig. 52. Wiring diagram of ИЖ-Ю-3К motorcycle.

SYMBOLS ON WIRING DIAGRAMS OF ИЖ-Ю2, ИЖ-Ю2К, ИЖ-Ю3 AND ИЖ-Ю3К MOTORCYCLES

Conventional symbol	Part No.	Description	Application	
			ИЖ-Ю2 К ИЖ-Ю2	ИЖ-Ю3 К ИЖ-Ю3
Б	3-МТР-10	Storage battery	—	+
Б	3-МТ-6	Storage battery	+	—
В1	П25-А	Light change-over switch	+	+
В2	П201	Turn indicator	—	+
В3	ИЖ assy 38—0	"Stop" light switch	+	+
Г	Г36М8	Generator	+	+
Зв	С-37	Horn	+	+
Л1	А6-0.25	Pilot l np	+	+
Л2	А6-0.25	Neutral lamp	+	+
Л3	А6-2	Speedometer face light	+	+
Л4	А6-2	Parking light bulb	+	+
Л5	А6-2	Side-car front light	+	+
Л6-Л7	А6-3	Tail lamp bulb	+	+
Л8-Л11	А6-6	Turn indicators bulb	—	+
Л12-14	А6-15	Side-car "stop" light bulb and turn indicator bulb	+	+
Л15	А6-32+32	Two-filament bulb	+	+
Р1	ИЖ-РР1 assy 0	Regul: ng relay	+	+
Пр	П135.1202 assy 40	Fuse	+	+
Р2	ИЖ РП-1с	Turn indicator relay	—	+
Рр1-Рр2	А7.5УС	Spark plug	—	+
Рр1-Рр2	ИЖ-56 assy 39	Spark plug	+	—
Тр1-Тр2	А11У	Ignition coil	+	+
Ф1	ФГ138-Б	Headlamp	+	+
Ф2-Ф3	ФП230	Tail lamp	+	+
Ф4-Ф7	ИЖУП-1	Turn indicator	—	+
Ф8	ИЖУП	Side-car turn indicator	—	+
Ф9		Side-car front light	+	+
1	ИЖ-Ю3 assy 24—3	Tail lamp wire	—	+
2	ИЖ-Ю3 assy 24—4	Main wire bunch	—	+
3	ИЖ-Ю3 assy 24—9	Light change-over switch wires	—	+
4	ИЖ-Ю3 assy 24—11	"Horn-button" wire	—	+
5	ИЖ-Ю3 assy 24—20	Turn indicator switch wires	—	+
7	ИЖ-Ю3 assy 24—22	Left-hand turn indicator wire	—	+
8	ИЖ-Ю3 assy 24—23	Right-hand turn indicator wire	—	+
9	ИЖ-Ю assy 24—8	Generator wire bunch, complete	+	+
10	ИЖ-Ю assy 24—15—1	Ignition and horn wire	+	+
11	ИЖ-56 assy 24—1—4	Storage battery wire, complete	+	+
12	ИЖ-56 assy 24—3—2	Fuse lower wire	+	+
13	ИЖ-56 assy 24—4—2	Plug socket, complete	+	+
14	ИЖ-56 assy 24—17—2	Spark plug wire, complete	+	+
15	ИЖ-56 assy 24—9	Light change-over switch wire bunch	+	—
16	ИЖ-56 assy 24—11	"Horn-button" wire	+	—
17	ИЖ-Ю assy 24—3—1	Tail lamp wire bunch	+	—
18	ИЖ-Ю assy 24—4—2	Main wire bunch	+	—

Note: Sign "+" means that the part is used in the motorcycle.

Sign "—" means that the part is not used in the motorcycle.

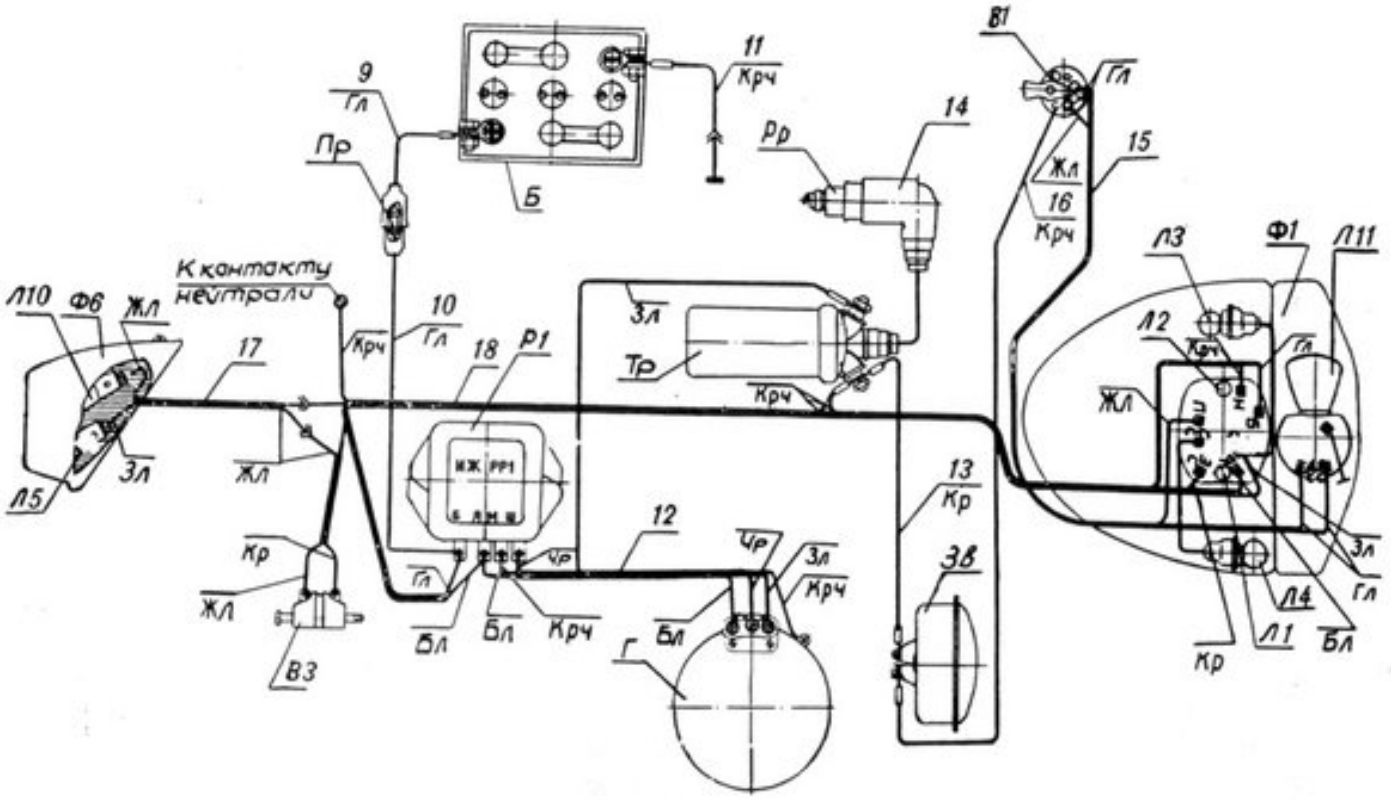

Fig. 53. Wiring diagram of ИЖ-П-2 motorcycle.
К контакту нейтрали — to neutral contact

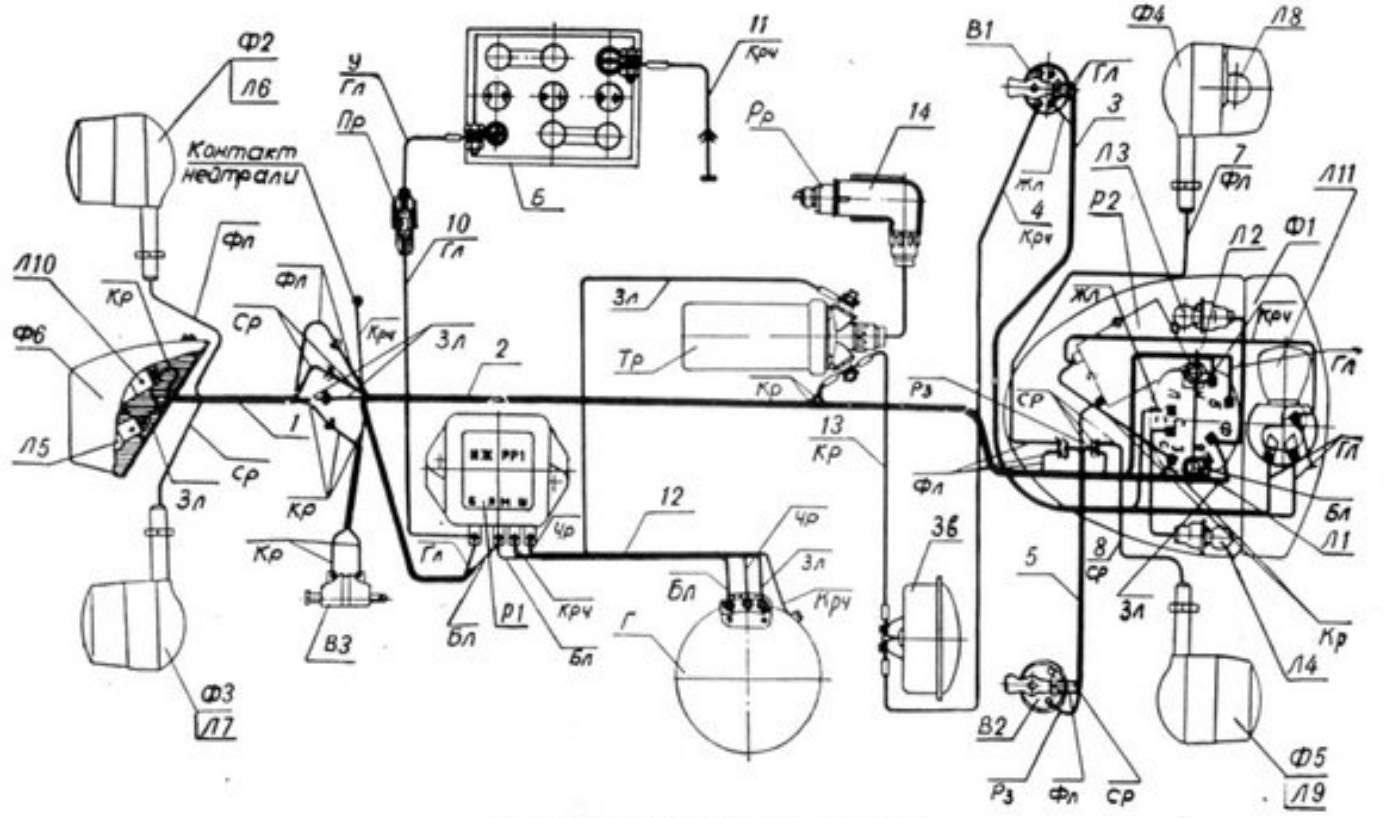

Fig. 54. Wiring diagram of ИЖ-П-3 motorcycle.
Контакт нейтрали — neutral contact

SYMBOLS ON WIRING DIAGRAMS OF ИЖ-П-2 AND ИЖ-П-3 MOTORCYCLES

Conventional symbol	Part No.	Description	Application	
			ИЖ-П-2	ИЖ-П-3
Б	3 МТР-10	Storage battery	—	+
Б	3-МТ-6	Storage battery	+	—
В1	П 23-А	Light change-over switch	+	+
В2	П 201	Turn indicator switch	—	+
В3	ИЖ assy 38—0	"Stop" light switch	+	+
Г	Г 36М7	Generator	+	+
Зв	С-37	Horn	+	+
Л1	А6-0.25	Pilot lamp	+	+
Л2	А6-0.25	Neutral lamp	+	+
Л3	А6-2	Speedometer face light	+	+
Л4	А6-2	Parking light bulb	+	+
Л5	А6-3	Tail lamp bulb	+	+
Л6-Л9	А6-6	Turn indicators bulb	—	+
Л-10	А6-15	"Stop" light bulb	+	+
Л-11	А6-32+32	Two-filament bulb	+	+
Пр	П 35.1202 assy 40	Fuse	+	+
Р1	ИЖ-РР1 assy 0	Regulating relay	+	+
Р2	ИЖРП-1с	Turn indicator relay	—	+
Рр	А7.5 УС	Spark plug	—	+
Рр	А11 У	Spark plug	+	—
Тр	ИЖ-56 assy 39	Ignition coil	+	+
Ф1	ФГ 138-Б	Headlamp	+	+
Ф2-Ф5	ИЖ УП-1	Turn indicator	—	+
Ф6	ФП-230	Tail lamp	+	+
1	ИЖ-Ю3 assy 24—3	Tail lamp wires	—	+
2	ИЖ-Ю3 assy 24—4—1	Main wire bunch	—	+
3	ИЖ-Ю3 assy 24—9	Light change-over switch wires	—	+
4	ИЖ-Ю3 assy 24—11	"Horn-button" wire	—	+
5	ИЖ-Ю3 assy 24—20	Turn indicator switch wires	—	+
7	ИЖ-Ю3 assy 24—22	Left-hand turn indicator wire	—	+
8	ИЖ-Ю3 assy 24—23	Right-hand turn indicator wire	—	+
9	ИЖ-56 assy 24—1—4	Storage battery wire, complete	+	+
10	ИЖ-56 assy 24—3—2	Fuse lower wire	+	+
11	ИЖ-56 assy 24—4—2	Plug socket, complete	+	+
12	ИЖ-56 assy 24—8—1	Generator wire bunch, complete	+	+
13	ИЖ-56 assy 24—12	Horn wire	+	+
14	ИЖ-56 assy 24—17—2	Spark plug wire, complete	+	+
15	ИЖ-56 assy 24—9	Light change-over switch wire bunch	+	—
16, 17	ИЖ-56 assy 24—11	"Horn-button" wire	+	—
17	ИЖ-Ю assy 24—3—1	Tail lamp wire bunch	+	—
18	ИЖ-Ю assy 24—4—1	Main wire bunch	+	—

CONVENTIONAL SYMBOLS OF WIRE COLOURS FOR DIAGRAMS OF ИЖ-П-2, ИЖ-П-3, ИЖ-Ю-2, ИЖ-Ю-3, ИЖ-Ю-2К AND ИЖ-Ю-3К MOTORCYCLES

Symbol	Colour	Symbol	Colour
Бл	White	Гл	Blue
Кр	Red	Ор	Orange
Зл	Green	Фл	Violet
Жл	Yellow	Ср	Grey
Чр	Black	Роз	Rosy
Крч	Brown		