

# ***moto cross***

250 ccm-968  
360 ccm-969

TECHNICAL DESCRIPTION





# MOTOCROSS

**250 ccm**

**360 ccm**

## TECHNICAL DESCRIPTION

MODEL	<b>968</b>	<b>969</b>
Number of cylinders	1	1
Swept volume	246,2 cm <sup>3</sup>	361 cm <sup>3</sup>

EDITION: **1965**



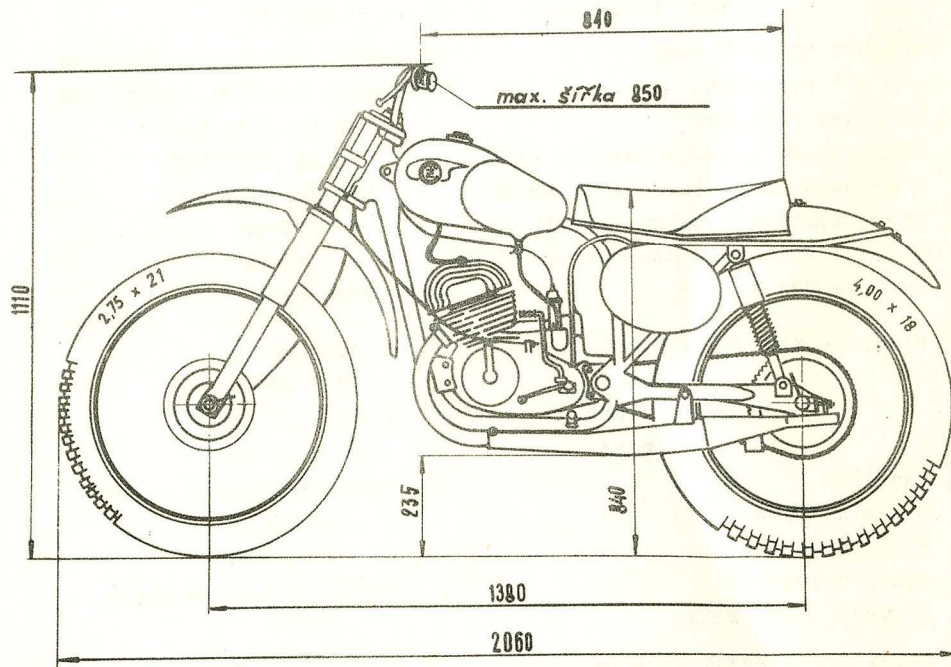




	250 c.c.	360 c.c.
Bottom gear	13 to 24	13 to 24
Second gear	15 to 22	16 to 22
Third gear	17 to 20	18 to 18
Top gear	19 to 18	20 to 17

Starter mechanism overall ratio 4.08 to 1  
 Internal expanding brakes dia 180 mm x 25 mm  
 Braking distance from 40 km p.h. both brakes applied 11 metres

2. Dimensional drawing



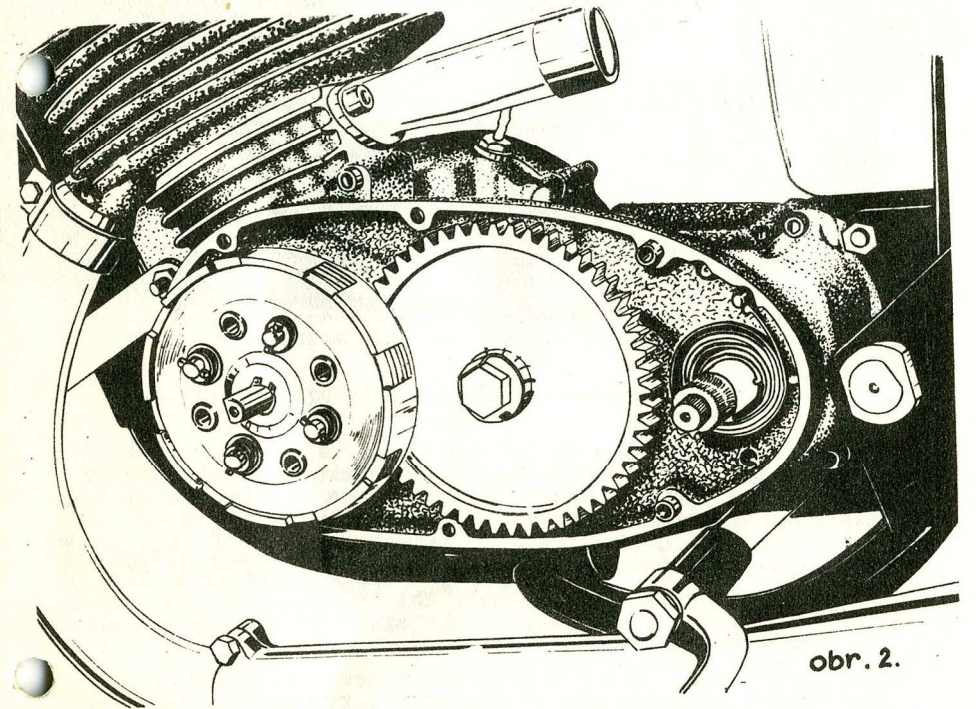
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3. Motorcycle description

ČZ motocross 250 - model 968 and 360 - model 969

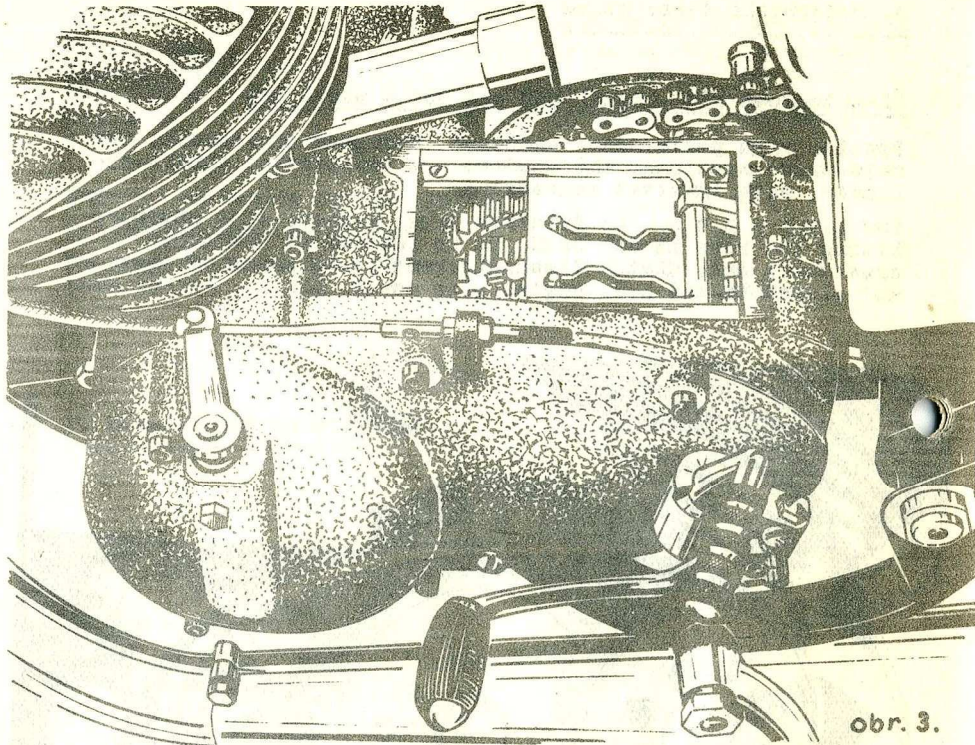
Special high performance machines, designed exclusively for moto-cross meetings. The engines are two-stroke, single-cylinder, with inverted scavenging.

The clutch is friction type, 4-plate with asbestos lining and runs in oil bath. It is located at the L.H. crankshaft end. Clutch disengagement is by means of rack and pinion in the L.H. engine side cover.



The gearbox is four-speed. Gear change is designed to make quick changes without declutching possible. Checking the gear change mechanism and gearbox is possible after removal of the covering lid. The gearbox is of unit construction with the crankcase.





Engine starting is by kickstarter pedal with neutral engaged, starting being effected via the bottom gear pinions. Primary drive is by gears.

The carburetter for the 250 model JIKOV 2930 SZ 12 and 2932 SZ 12 for the 360 model is covered by a thin PVC sheet fastened by rubber bands. The induction silencer with double micron filter accessible after tilting up the saddle is connected with the carburetter.

The spoke wheels are removable, the front and rear wheel spindles are of the push out type. The front wheel hub is of electron casting with pressed-in cast iron liner for the front brake. The rear wheel hub is also of electron casting to which the steel brake drum is riveted and which forms the rear chainwheel. The 21 in. front wheel and the 18 in. rear wheel employ 36 spokes dia 3.5, thread M 4.

The full width hub rear wheel brake is pedal controlled on the R.H. side and employs an adjustable rod. The front brake is controlled by the R.H. handlebar lever. Both brakes are very efficient and their adjustment is possible without the use of tools.

The frame is tubular, closed and bifurcating under the saddle and engine for extra rigid pivoted rear fork support.

The fuel tank is made of reinforced fibre glass. The bearing sheet steel tunnel forming brackets at its front and rear portion is laminated into the tank. The fuel tank filler neck tap is light alloy and de-aeration is by special tube leading into the steering head.

The saddle is foam rubber padded and covered with plastic leather. It is fastened to the frame with two clamps in front and at the rear.

The footrests are sports type, adjustable, short.

The handlebars are extra wide, outside dia 22 mm, one-piece and reinforced with a crossbar. On the lever ends are welded dia 20 mm balls. The throttle twist grip is of the quickaction type.

The front fork with oil dampers has 170 mm suspension travel. Springing is by two coil springs located in stanchion tube holes along straight lines.

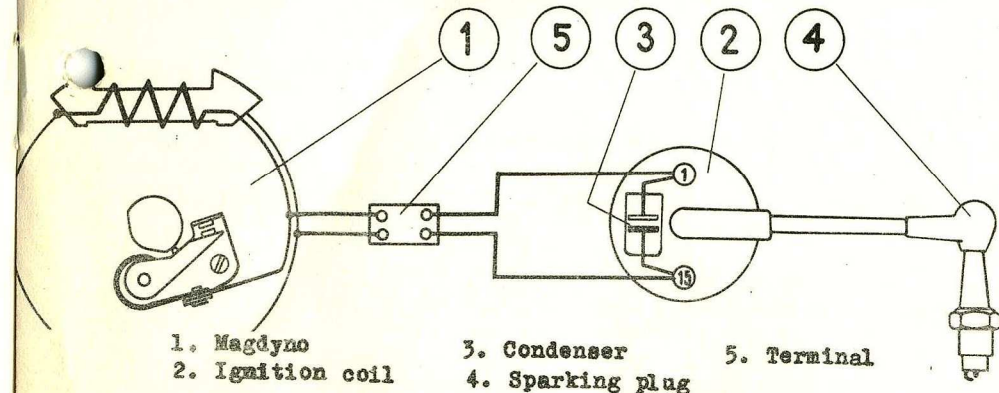
Each telescopic damper is filled with 170 c.c. of thin engine oil, lubricating also the bronze bushes.

The complicated telescopic damper provides progressive damping downwards and efficient damping upwards. The large amount of the circulating oil has a favourable influence on the damping characteristic which varies little during the race.

The pivoted rear fork is equipped with MP 22-90 telescopic suspension unit with 90 mm suspension travel.

#### 4. Electrical equipment description

The ignition is by special ČZ magdyno. The flywheel with magnets is fitted on the shaft taper so that the armature plate with contact breaker engages into the flywheel interior from the right and can be removed without removing the flywheel /1/. The cam is riveted to the flywheel. The advantage is easy access to the armature plate and contact breaker for ignition advance setting /see Fig. 5/.





## 5. Electrical accessories

The ignition coil is PAL-MAGNETON 6 V, specially impregnated.

The sparking plug is PAL S 14-15, corresponding for example to Lodge R 49.

For ignition advance setting proceed as follows:  
a/ Unscrew the sparking plug and insert a millimeter rule into the hole or screw in a special gauge. In case the cylinder head has been removed measure with a vernier caliper the piston position from the cylinder edge.

b/ Rotating the crankshaft clockwise /the direction of the engine running/ find the top dead centre.

c/ In this position adjust with the adjusting screw the contact breaker point gap. Check the gap with the gauge supplied with the tool kit /for roadster motor cycles/ - the thinner feeler gauge /0.3 mm/ should be a sliding fit while the thicker feeler gauge /0.4 mm/ may not pass between the points. Grease has to be removed from the points /with clean petrol/ and if necessary the point faces evened out with a fine file. The points should sit with their full face.

d/ Rotating the crankshaft anticlockwise bring the piston down 2.8 to 3 mm for the 250, and 3.2 to 3.5 mm for the 360 c.c. machine.

e/ Check again the contact breaker gap in this position; the gap may not exceed 0.05 mm.

f/ If the ignition advance is smaller or bigger, slacken the 3 screws of the armature plate /2/ and rotate the plate clockwise /if smaller/ or anti clockwise /if bigger/. When setting, the arrow on the flywheel has to point between the two tally marks on the armature at the moment the points open. In this position the spark on the plug is most powerful.

g/ After setting retighten all the screws.

h/ Having tightened the screws check once more the ignition advance setting because the armature plate might have moved while the screws were being tightened.

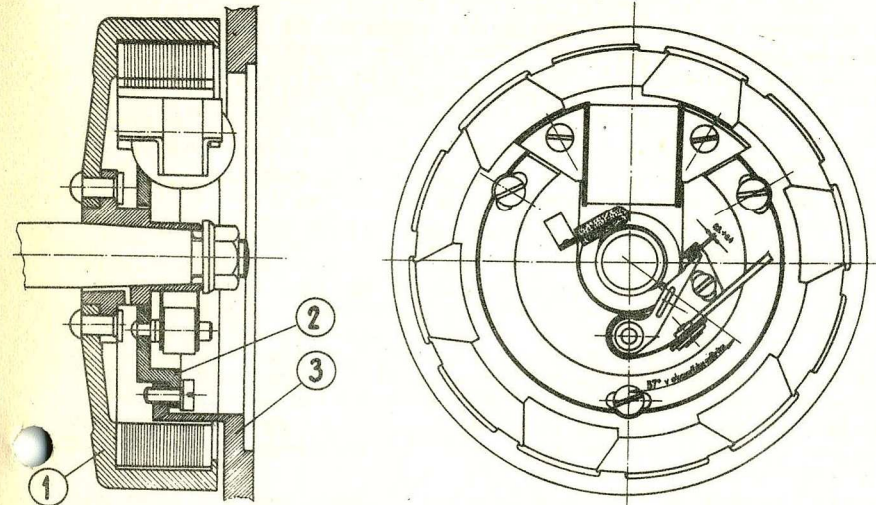


Fig. 5

1. Flywheel
2. Armature
3. Armature bracket

## 6. Lubrication

The engine is automatically lubricated with the oil in the petrol mixture, the mixing rate being 1 to 20. Recommended are CASTROL TWO STROKE SAE 50 or CASTROL SAE 50 GRAND PRIX oil. If possible it is recommended to use SAE 50 GRAND PRIX oil, which is standard motor car engine oil.

The gearbox should be lubricated with approx. 0.5 litres of CASTROL X L SAE 20 W/40 oil.

The front fork should be filled with CASTROL XL SAE 20 W/40, in summer also with CASTROL XL /SAE 30/ oil; if other oils are used, these should be of corresponding value. Capacity of each damper is approximately 170 c.c.

Each rear suspension unit employs 70 c.c. damper oil - either CASTROL SHOSKOIL, SHELL DAMPER OIL or Gg ARCTIC Oil Light.

## 7. To prepare ČZ 250 and ČZ 360 moto-cross for meetings

ČZ 250, model 968 and ČZ 360, model 969 are motorcycles made and intended exclusively for moto-cross meetings and therefore their preparation is very simple.

Before the first race the rider should first get well acquainted with the qualities of the machine in the field and adjust the handlebars and footrests to suit his build.



Each motorcycle has been run-in and adjusted by the manufacturers but the quality of petrol, the temperature and altitude above sea level have considerable influence on the setting of high performance sports machines and that is why it is necessary to adjust every motorcycle before a meeting.

The moto-cross motorcycle will be handled by riders who without doubt are acquainted with the normal carburetter setting according to the sparking plug points.

In the following a few tips concerning the ČZ 250 and ČZ 360 engines are given.

It is not recommended to interfere with the cylinder barrel porting, the shape of the combustion chamber in the head, to increase the compression ratio or to change the exhaust pipes and silencers. All these have been tested during extensive tests by the manufacturers and the setting on production models is identical with that on the works rider machines and to give optimum values. Neither will modified ignition advance bring improvement; it is important only to check the condition and contact breaker point gap.

When determining the optimum size of the main jet one must not forget that it is always necessary to proceed from a larger size jet downwards to avoid possible engine seizure.

Before every moto-cross meeting check the individual groups of the motor cycle, proceeding as follows:

Cylinder barrel and piston. The cylinder barrel with piston usually has a decisive bearing on success or failure in a race. Correct preparation before a meeting consists mainly in checking the resistance against seizure. Only a run-in and correctly set engine should be tested, however a moto-cross machine should never be tested on a road because its gearing is not suitable for such a test. Check the moto-cross engine during practice rides in the field and try to ride at maximum power.

The test of resistance against seizure has its importance in that should a seizure occur the cylinder and piston can be repaired without more serious consequences and it will be possible to compete in the meeting with a well prepared machine. After fitting the spare cylinder barrel with piston should be first thoroughly checked in practice riding. If you have a cylinder with piston that has not been run-in it is necessary to cover at least 300 km /190 miles/ and in case of minor seizure the cylinder barrel should be removed and the piston repaired.

Then it is usually necessary to fit new piston rings and to cover again at least 150 km /100 miles/.

Crankshaft assembly.

Before fitting it is necessary to check the big end play and the run-out of the crankshaft web in assembled condition; this may not exceed 0.01 mm.

Carburetter.

After the described careful setting cover the carburetter with a thin PVC sheet and fasten it with rubber bands.

Ignition.

Tighten the flywheel nut and check the condition of the contact breaker points. Adjust with particular care the contact breaker point gap and the ignition advance as this has considerable bearing on the running and power output of the engine. Cover the ignition coil with condenser with a PVC sheet securing it with rubber bands to the frame tube.

Clutch.

Adjust carefully clutch operation and check whether the clutch does not tend to slip. In case of clutch slip tendency remove the clutch and fit new asbestos plates and possibly springs as well. If new springs are not available, washers under the springs will do.

Frame.

Recent frames require no attention. On machines that have competed in a number of hard events remove the tank before a meeting and check carefully the top brace welded to the steering head. Should a crack be found - which is quite exceptional - it is preferable to replace the frame. Only a specialist should be entrusted with the repair by electric welding.

Rear mudguard.

It may happen that when the machine rears the rear portion of the fibre glass mudguard extending beyond the rear frame tube will break. In that case the mudguard need not be replaced or removed, all that is necessary is to make a short rear portion /so-called tongue/ of the mudguard of aluminium sheet and bolt it on instead of the broken fibre glass end piece.

Saddle.

The saddle cover and the saddle fastening which is subject to great stress at moto-cross meetings require checking from time to time.

Rear suspension.

Remove the MP 22 rear suspension units; after compressing springs unlock them and remove and check the dampers for correct operation. If faulty or if an oil leak is found replace the suspension unit. Check also the condition of the rubber bushes in the suspension unit top and bottom eye.

Footrests.

The footrests should be as short as possible in order not to hinder riding in the field.

Fuel tank.

The fibre glass tanks of recent motor cycle models are very reliable. The preparation for a meeting consists particularly in thorough washing of the tank with petrol to remove any impurities. Check also the filler neck cap seal and if necessary replace it.

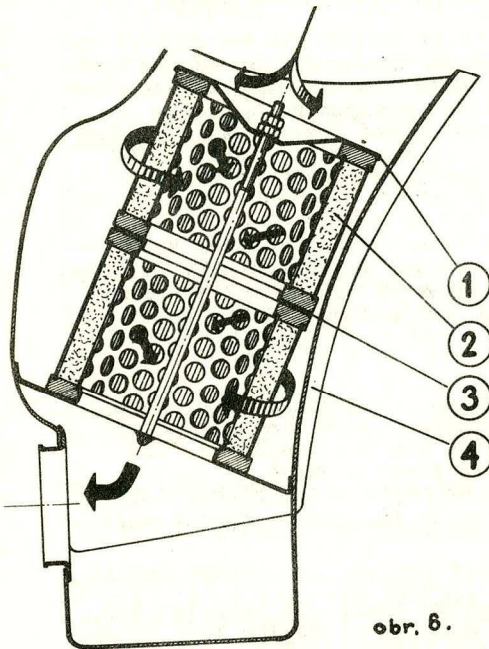


### Induction silencer

Before a meeting remove the two micronic filters and knock lightly all the dirt out of them and blow them through with air. Use a tyre inflator or compressed air with care.

Wipe all the dirt out of the induction chamber and seal the micronic filters on the seating faces with grease. Older or damp micronic filters should be replaced by new ones. After servicing always check the rubber sleeve between the induction silencer and carburettor for tightness.

1. Top
2. Micronic filter
3. Insert
4. Induction silencer body



obr. 6.

### Front fork.

The front fork of the latest CZ moto-cross motor cycles possesses outstanding qualities but its servicing requires some attention, chiefly the adjustment of the play in the steering head and checking all the bolts and nuts for tightness.

Damping efficiency can be regulated by the choice of damper oil. The amount /170 c.c. in one tube/ remains constant, but the quality of the oil can be changed. In warm weather CASTROL SAE 30 engine oil has proved best, in spring and autumn CASTROL SAE 20. This type of oil is not prescribed but merely recommended; it is possible to try out other oils according to the rider's wishes. CASTROL has proved itself very well because of its flat viscosity curve in dependence on temperature.

Check further the front fork for oil leaks. Remove leaks after dismantling the bottom sliders and replacing the sealing rings /dia 47 x 35 x 7/.

There are no other defects that will occur on the fork. The springs are of high quality material and do not become distorted, the same applies to the slider bronze bushes supported on the chromium surface of the stanchion tube, which are generously dimensioned.

A damaged plastic cover sleeve can be easily replaced with a new one.

### Front mudguard

The fibre glass front mudguard can be left on for the next race even if it is cracked after a spill. The crack can be repaired by gluing a layer of glass fibre over the crack. Nevertheless the cracked mudguard will last for only a few meetings. A spare mudguard is supplied with every motorcycle.

### Handlebars

Distorted handlebars should be straightened. Check thoroughly all control cables and replace even those that show minor breaks. All control cables have to be carefully lubricated.

### Exhaust tubes and silencers

The exhaust system has a decisive influence on the engine power output and therefore should be properly serviced. Clogged pipes should be burnt with the flame of a gas welder, which of course will damage chromium plating and therefore it is preferable to replace the pipes. Damaged exhaust pipes also reduce the engine power. Straightening is necessary.

### Wheels

Checking and preparation of wheels before a moto-cross meeting requires much more care than most riders are used to giving them. CZ moto-cross motorcycle wheels are very resistant. Nevertheless many young riders frequently have to retire from an event because of wheel trouble. Here applies the following principle: The wheels will safely stand a meeting only if they are accurately centered, if there are no damaged spokes and if all spokes are evenly tightened. Before a meeting, therefore, damaged wheels should be provided with a new rim and new spokes.

Check further the play in the wheel bearings and the condition of the brake shoe lining. Before a meeting a sufficiently thick brake lining layer is necessary. If the front or rear wheel brake tends to lock the wheel file off an approximately 3 cm /1 3/16 in/ wide strip of the leading shoe lining at the brake cam. The leading shoe is the rear one on the front brake and the front one on the rear brake - it is that shoe which is pressed against the brake drum by friction effect during wheel rotation. Spare shoes are supplied with every machine.

Check with care the teeth of chainwheels and sprockets, the chain guides and the chain. The chain guides have to lead the chain exactly onto the centre of the rear chainwheel and they should not be worn.

### Chain.

Never fit an entirely new chain for a moto-cross meeting because this will stretch considerably at first during running in. The chain will safely last throughout 5 meetings or in case of deep mud throughout 2 meetings. A spare chain will be found in the



spare parts case.

### Tyres.

Pay particular attention to the condition of the tyres and do not use tyres with worn thread or repaired inner tubes. It should be noted that in important events on muddy ground works riders use entirely new rear tyres, the sharp edges of which give better grip; frequent tyre changes are of course costly. Check the correct position of the inner tube valve and the tyre holder for tightness. The front tyre pressure should be 0.8 Atm.g./11 psi/, the rear tyre pressure 1 Atm.g./14 psi/.

### Maintenance Spare Parts - delivered with the machine to special order.

Ref. No.	Part No.	Description	Number per set	
			968	969
1	968-75-010	Case	1	1
2	6 29 08 00	Chain 5/8 x 1/4 in. reinforced		
		112 links	1	-
		Chain 5/8 x 1/4 in. reinforced		
		108 links	-	1
3	6 29 08 86	Connecting link reinforced 5/8x1/4in.	1	1
	6 28 08 82	5/8 x 1/4 half-link	1	1
4	968-12-001	Piston	1	-
	969-12-054	Piston	-	1
5	964-13-021	Cylinder	1	-
6	967-12-006	Piston ring	2	-
	969-12-065	Piston ring	-	2
7	968-12-012	Key	1	1
8	964-13-022	Cylinder head gasket	1	-
	969-13-026	Cylinder head gasket	-	1
9	964-13-024	Cylinder barrel gasket	2	-
	969-13-027	Cylinder barrel gasket	-	2
10		Needle bearing dia 18x22x13 ZKL	2	1
11		Needle bearing dia 18x22x17 ZKL	-	1
12		Needle bearing dia 20x26x17 ZKL	-	1
13	968-24-010	Foot gear change lever	1	1
14	968-28-513	Steel plate	3	-
	970-28-300	Steel plate	-	3
15	964-28-514	Friction plate	4	4
16	968-28-020	Clutch spring	4	-
	970-28-150	Clutch spring	-	5
17	961-37-051	Footrests	2	2
18	967-37-020	Brake lever	1	1
19	968-43-110	Front mudguard	1	-
20	956-46-060	R.H. lever	1	1
21	956-46-010	Brake cable	1	1
22	964-46-230	Clutch cable	1	1
23	967-46-040	Throttle cable	1	1
24	964-51-510	Rim 21 in.	1	-
25	964-51-541	L.H. spoke	20	5
26	964-51-542	R.H. spoke	20	5
27	961-56-123	Spoke nipple	20	-
28	967-56-660	Brake shoe complete	4	2
29	964-56-541	L.H. spoke	10	2
30	964-56-542	R.H. spoke	10	2
31	967-61-100	Armature plate	1	-
32	956-61-200	Ignition coil	1	-
33	956-61-220	Condenser	1	1
34	968-22-053	Sprocket 15 T	1	-
35	968-22-054	Sprocket 16 T	1	-
36	980-22-051	Sprocket 13 T	-	1
37	980-22-053	Sprocket 15 T	-	1
38	968-22-020	Washer	2	-
39	968-22-021	Washer	2	-
40	968-22-022	Washer	2	-
41	968-22-023	Washer	2	-
42	968-22-024	Washer	2	-



