OWNER'S MANUAL

390 Automatic

Owner's Manual

Husqvarna

390 Automatic


390

You and your Husqvarna

Welcome to the ranks of Husqvarna riders, in which we feel sure you will find yourself at home!

The experience gained both in the laboratory and on racing circuits throughout the world has been built into your machine. It has been manufactured with the greatest care in accordance with methods based on long experience, thereby the highest possible performance and maximum reliability.

In order to help you take proper care of your motorcycle we have complied the following instructions and advice. Please study this manual carefully—by doing so you will be assured of many pleasant hours with your Husqvarna.

Remember—Instructions and advices in this manual are given with the aim to insure the highest possible safety and success.

Good luck and good riding!

HUSQVARNA AB
HUSKVARNA – SWEDEN

Contents:

Technical data

Engine:

Displacement (cc)	384	
Bore std (mm)	83,00	Tolerance
1st over.	83,50	+0,02
2nd over.	84,00	−0,0
3rd over.	—	
Stroke (mm)	71,00	
Compression ratio	11,5:1	

Transmission:

Automatic 4-speeds gearbox controlled by 4 centrifugal clutches.

Number of cogs, gearbox:
1st: 20:46
2nd: 24:41
3rd: 28:38
4th: 31:35

Primary transmission ratio: 40:65
Secondary transmission ratio: 12:53

Total gear ratios (crankshaft: rear wheel):

1st	16,51:1
2nd	12,26:1
3rd	9,74:1
4th	8,10:1

Oil capacity in gearbox: 1,2 lit.
Oil recommendation: Esso Univis J-26.

Fuel System:

Fuel:	Gas
Lubrication:	Oil-gas-mixture 4 %
Gastank capacity:	11,8 lit
Oil recommendation:	Shell super M Castrol R

Carburettor:	Mikuni
Type:	Central float chamber
Venturi Ø:	38
Main jet:	430
Needle jet:	R 2
Idling jet:	45
Needle position:	4
Airscrew opening:	1,5 turn from bottom position

Air filter:

Twin-air high-effective foam filter.

Electrical system:

Type:	Motoplat
Ignition advance:	16°
Ignition adv. on piston before TDC:	1,61
Ignition adv. on flywheel before TDC:	16±1
Ignition coil:	35 W yell.
Spark plug:	Champion N2 Bosch W4G

Front fork:

Travel	240 mm
Lead distance:	152 mm
Fork angle (caster):	29°
Oil capacity per fork leg:	
Oil change:	0,24 l/leg
Disassembling leg:	0,25 l/leg
Oil recommendation:	Engine oil SAE 10–SAE 30

Rear suspension:

Travel	254 mm
Short spring	180 lb/inch
Long spring	140 lb/inch

Wheels and brakes:	**Front**	**Rear**
Tyres:	3,00×21″	4,50×17″
Spoke Ø:	4 mm	
Brake drum Ø:	160 mm	
Rims:	Low-edged	
Air pressure, min.	70 kPa	
Air pressure, max.	120 kPa	

Dimensions:

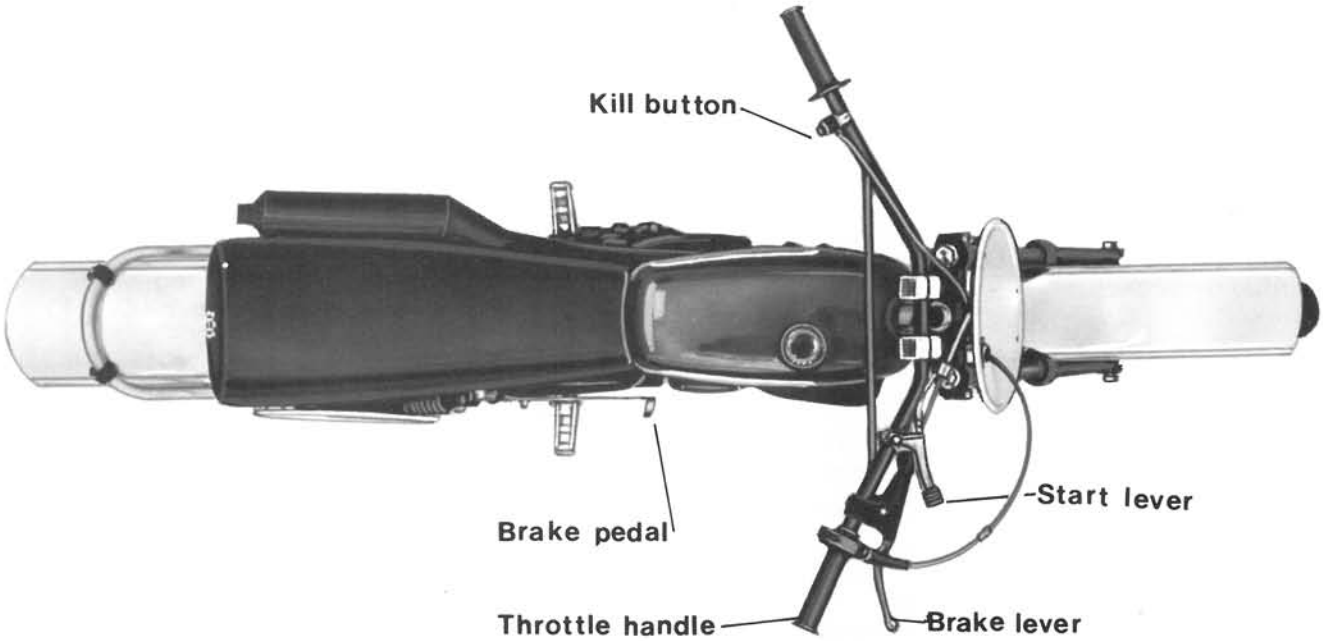
Length:	2155 mm
Height:	1200 mm
Handlebar width:	850 mm
Wheelbase:	1430 mm
Seat height:	940 mm
Ground clearance:	325 mm
Weight:	110 kg

Load, rear wheel: 55 %
Load, front wheel: 45 %

Screwed joints:

Nut 1:st clutch hub	90 Nm
Flywheel nut:	70 Nm
Cylinder head nuts:	25 Nm
Cylinder head screws:	20 Nm
Engine mounting bolts:	35 Nm
Crankcase screws:	8 Nm
Rear fork bolt nuts:	35 Nm
Reed valve housing screws:	2 Nm
Screws, reed valve housing cylinder:	8 Nm
Spark plug:	40 Nm

Controls



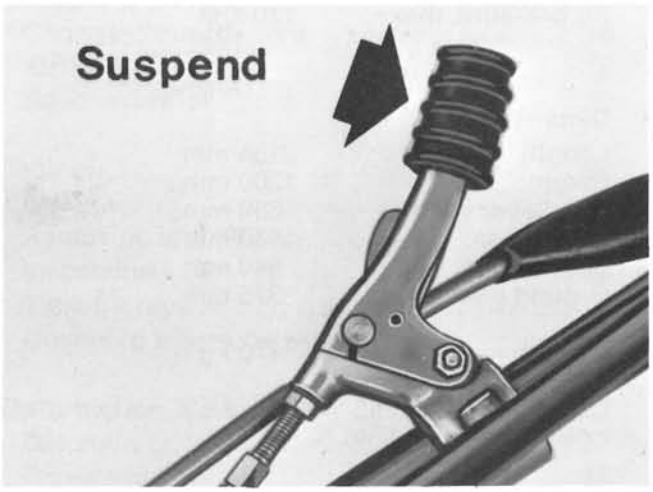


Fig. 6.2

Starting the engine

Disengage the gearbox from the crank shaft by locking the start lever in the suspended position. Open the fuel cock. Pull the choke lever downwards until the start valve is fully open. Open the throttle somewhat and pull the kick starter pedal sharply downwards. Let the engine run for a while with the start valve still open, then close the start valve by pulling the choke lever upwards. Engage the gearbox by releasing the start lever.
NOTE! When releasing the start lever must the engine idle at lowest possible r.p.m.
Turn on the throttle handle somewhat and the motorcycle starts to move.

Warning

This motorcycle is designed for off road competition. Port timing, exhaust system and carburation allows the engine to reach high r.p.m. very easy. Running for long time and light load (i.e. small throttle opening) at high r.p.m. may not give the engine necessary lubrication.
To avoid trouble the following is recommended:

1. Do not overrev with small throttle openings. More throttle at lower r.p.m. gives the engine better lubrication.
2. Let the engine pull instead of rev.
3. Ask your dealer for the correct carburettor setting for your area.
4. Use only well-known brands of oil. See page 5.

Breaking in

After the first ride with the motorcycle, you ought to check these things.

Tighten the spokes in both front and rear-wheel.

Fig. 7.1

Tighten the bolts in both front and rear-wheel.

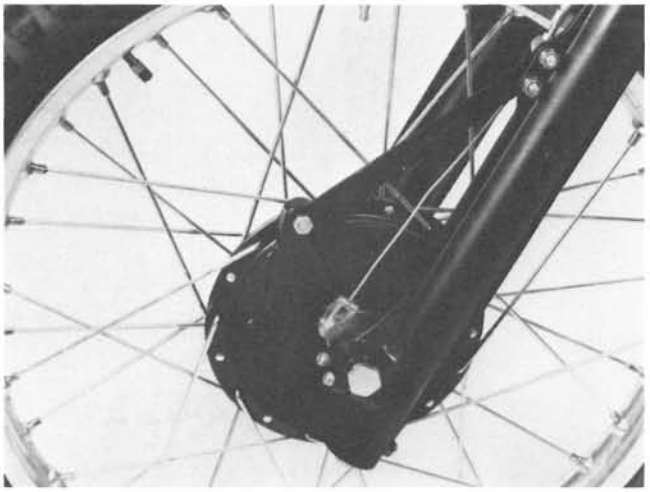


Fig. 7.2

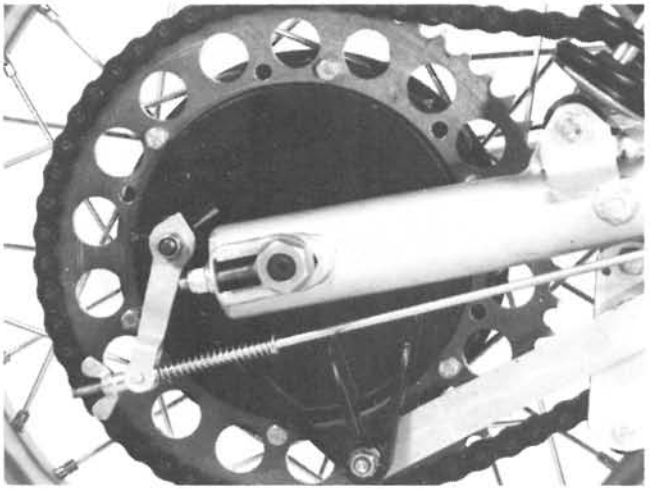


Fig. 7.3

Drive chain

The tension of the drive chain must be checked as follows:

1. Press down the machine until the three shafts in fig. 7.4 lie on a straight line. In this position the chain is maximally extended.

2. When the three shafts are in a straight line the play in the middle of the chain shall be 5–10 mm.

Both excessive and insufficient chain tension can cause unnecessary loading on the chain, sprockets, shafts and bearings.
In order to reduce wear, the chain should also be lubricated with engine oil every time before use.

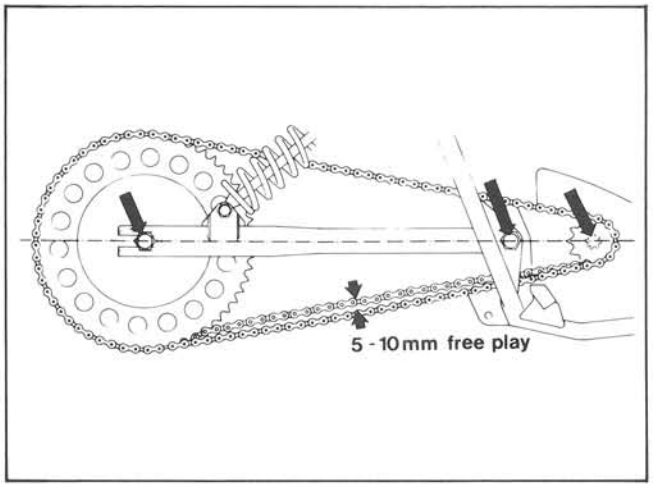


Fig. 7.4

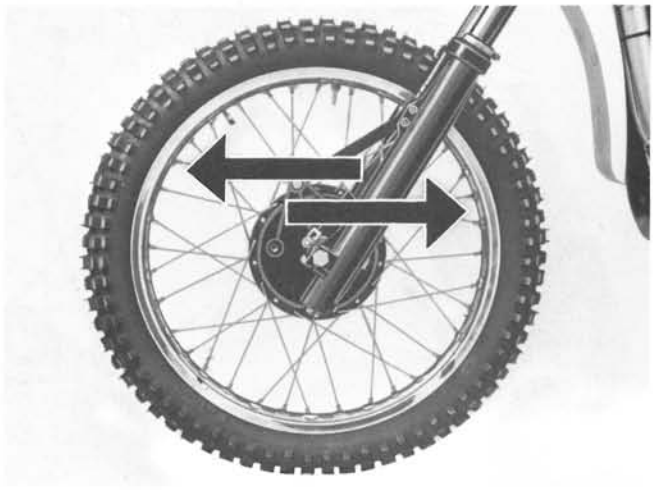


Fig. 8.1

Adjusting steering bearings

The play in the steering bearings is checked with the motorcycle blocked up so that the front wheel can rotate freely.

Grasp the lower part of the fork legs and try to move them backwards and forwards in the longitudinal direction of the machine.

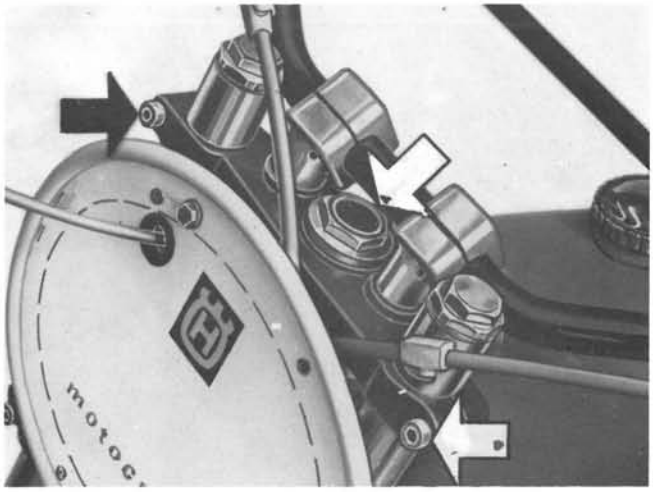


Fig. 8.2

If any play can be noticed, loose the cap nut and the two upper clamping bolts. See fig. 8.2.

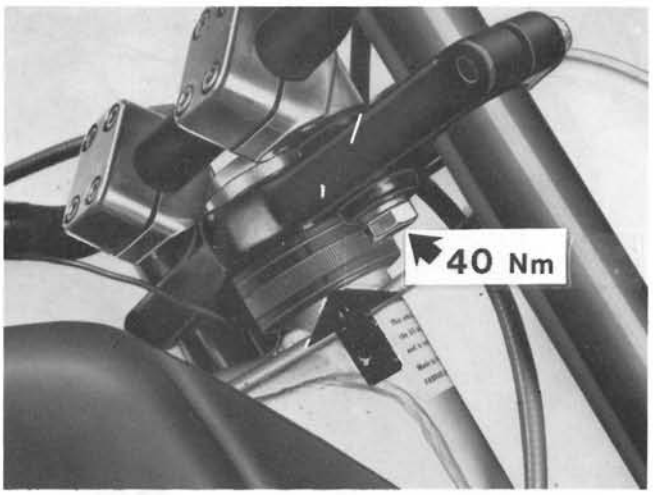


Fig. 8.3

Tighten the upper guide bearing shell with a polygrip pliers and then back it off about 1/8 of a turn.

Tighten the cap nut and the fork plate clamping bolts. Check that the bearings does not move stiffly.

Tighten the handlebar retainers to 40 Nm.

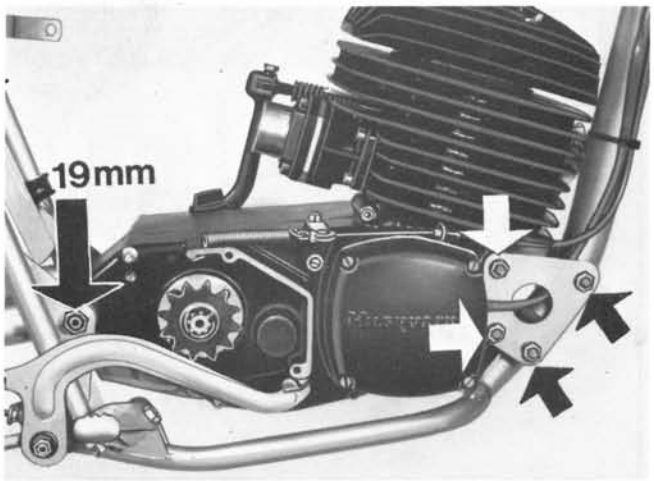


Fig. 8.4

Engine bolts.

Tighten the engine bolts, both front and rear, to 35 Nm.

Magneto flywheel
Tighten the flywheel nut to a torque of 70 Nm.

NOTE! Tighten the flywheel nut three times, by assembling, after about 2 min running and then after about 2 hours.

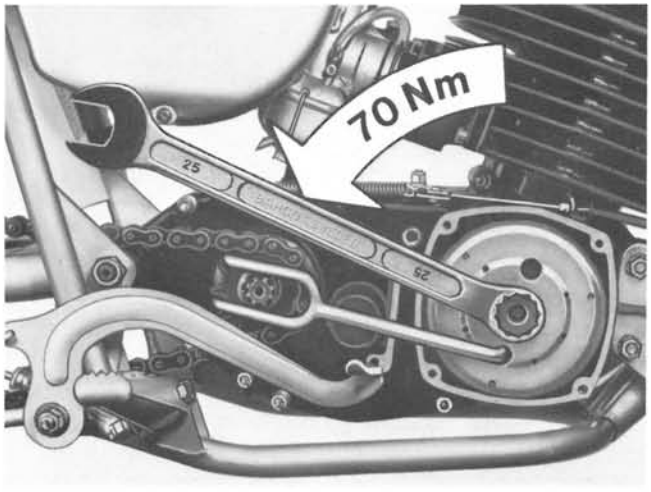


Fig. 9.1

Reed valve
Tighten the reed valve holding screws. See fig. 9.2.

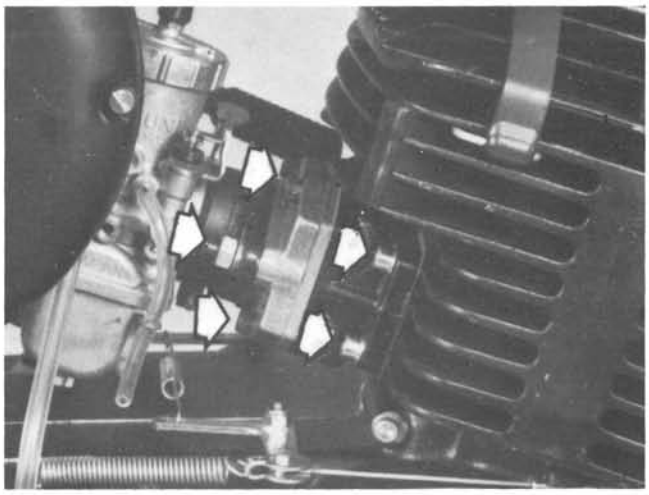


Fig. 9.2

Cylinder and cylinderhead
Tighten the cylinder and cylinderhead holding screws and nuts. Torque: Screws 20 Nm. Nuts 25 Nm. Tighten the screws alternately.

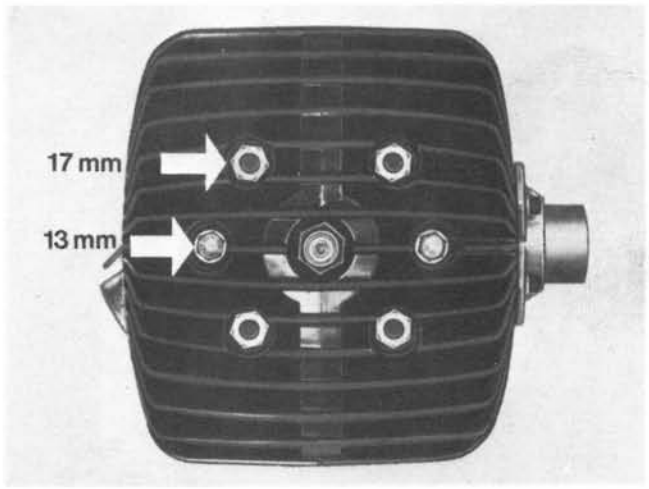


Fig. 9.3

First gear clutch
Tighten the nut to 90 Nm. See fig. 9.4.

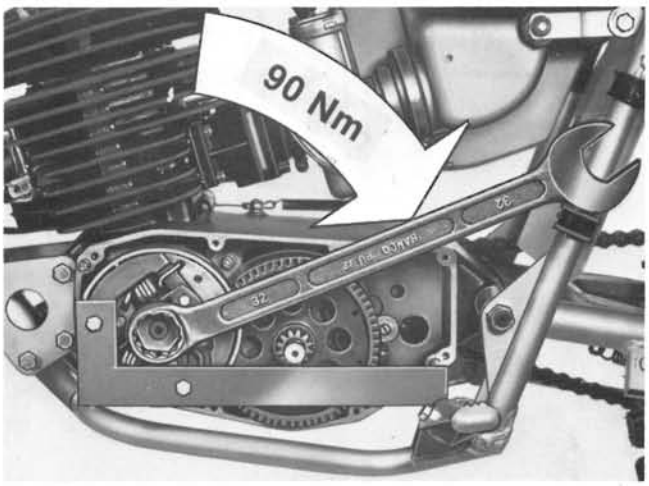


Fig. 9.4

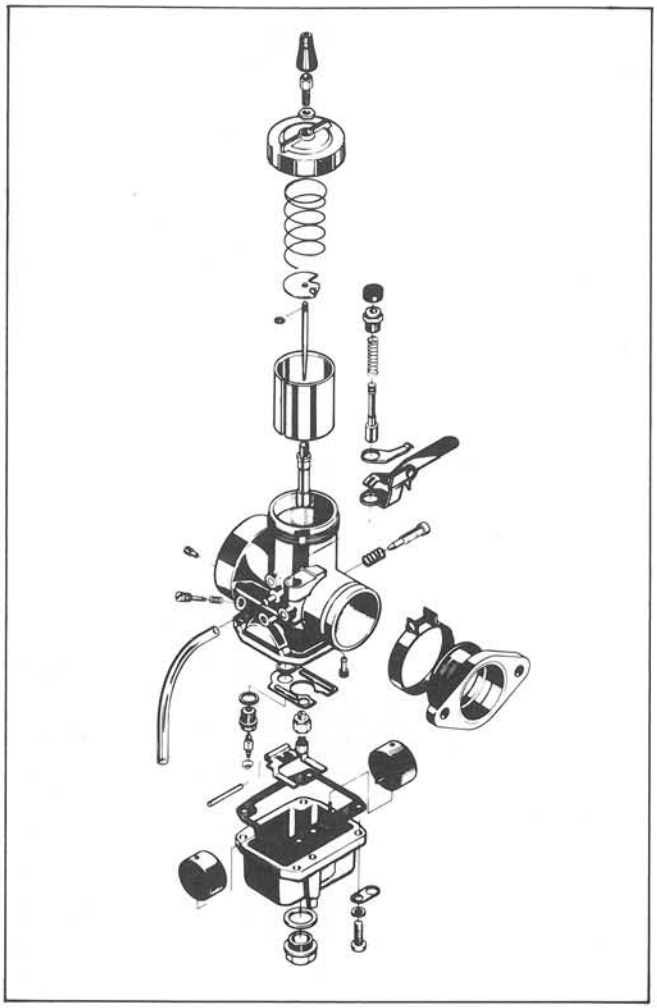


Fig. 10.1

Fuel system

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4. Use only well-known brands of oil. See page 5.

Functional range effectiveness of tuning parts in relation to the throttle valve opening.

The thickness of the arrows in fig. shows when the different tuning parts work.

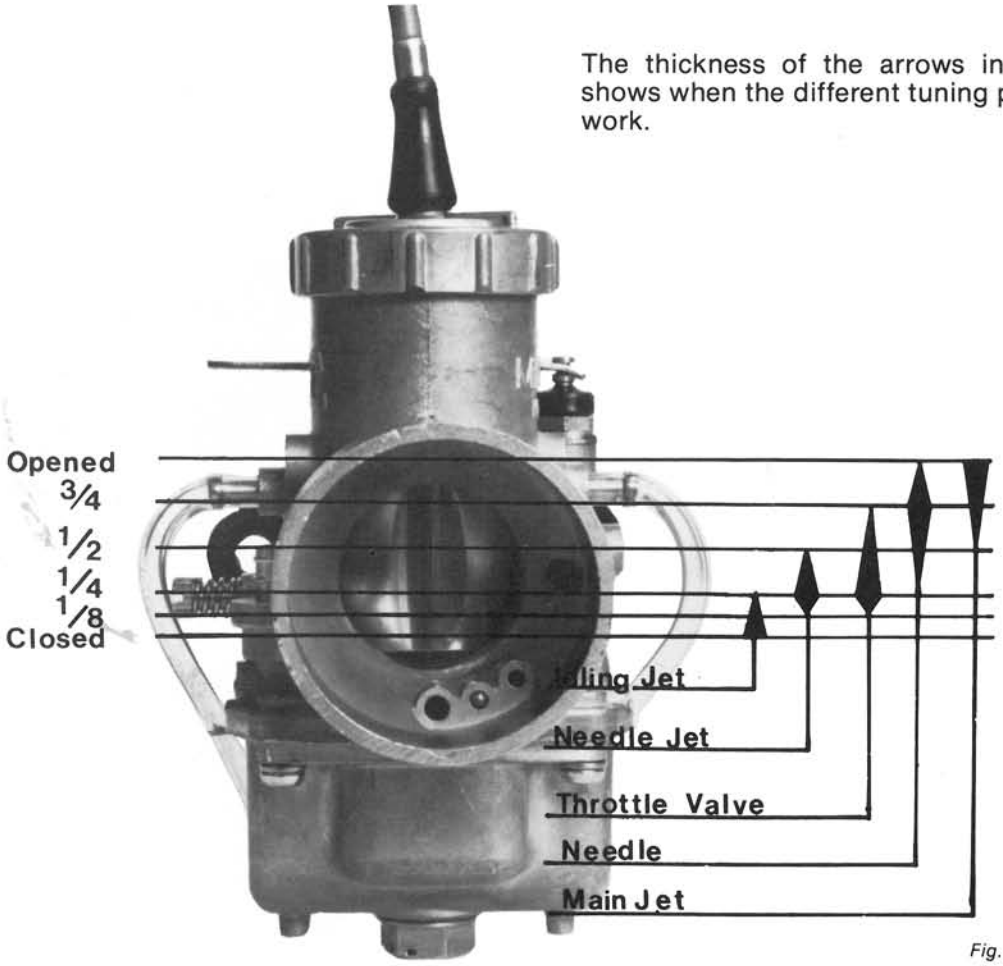


Fig. 10.2

Choke

The carburettor is provided with a choke. To get a richer fuel-air mixture to be sucked into the engine, press the choke-button down and turn the throttle-handle to zero.

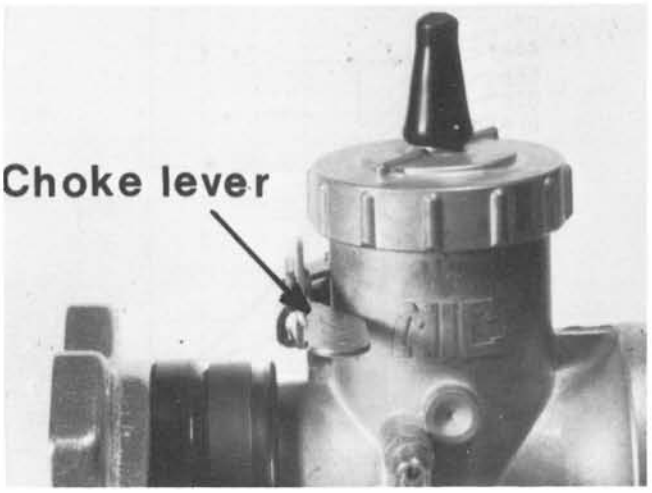


Fig. 11.1

Carburettor adjustment

Idling

Always warm up the engine before adjusting. Gently turn the air screw right home. Then screw it back 1,5 turn.

NOTE! Do not turn it too hard against the bottom.

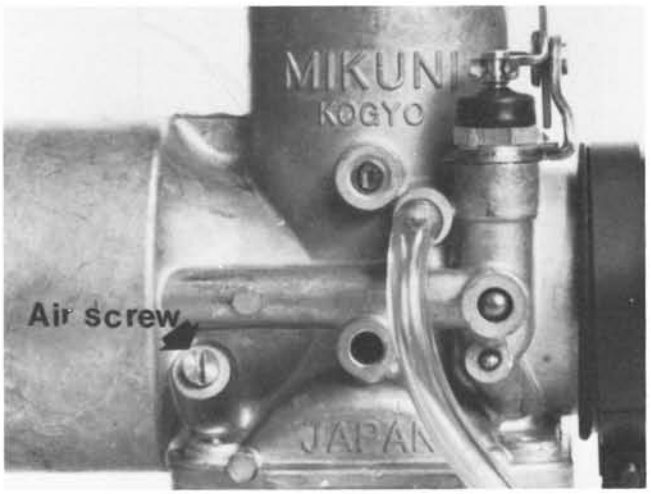


Fig. 11.2

Start the engine and adjust the throttle stop screw until a satisfactory slow running speed is achieved.

Adjust the air screw until the engine runs smoothly (turning clockwise gives a richer mixture, anti-clockwise gives a leaner mixture).

If necessary, re-adjust the throttle stop screw for a satisfactory, slow running speed.

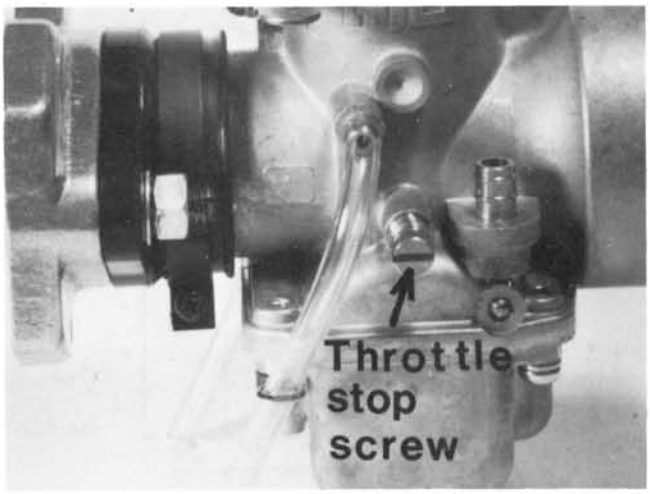


Fig. 11.3

The fig. shows the revolutions per minute in relation to air screw opening and the best opening range of the air regulating screw.

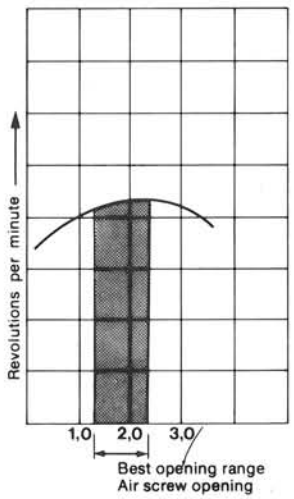


Fig. 11.4

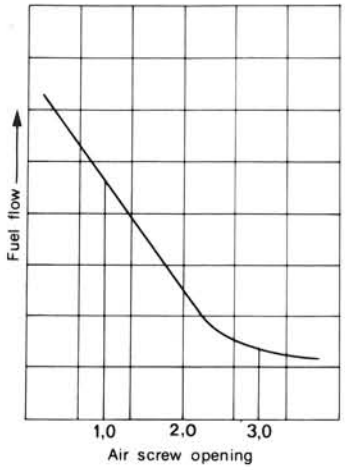


Fig. 12.1

The figure shows the fuel flow curve in relation to the opening of the air screw.

The selection of the opening of the idling jet and the air screw is important. Turn the grip a little at no-load operation and see if the engine revolution increases smothly.

If the idling jet, is too small, increase in the engine speed is slow and irregular. Too big idling jet, on the other hand, would give rise to heavy exhaust smoke as well as a dull exhaust noise. If you cannot maintain the speed in the range of 12–25 M.P.H. (30–40 km/h) with the grip held constant, the idling jet is too small.

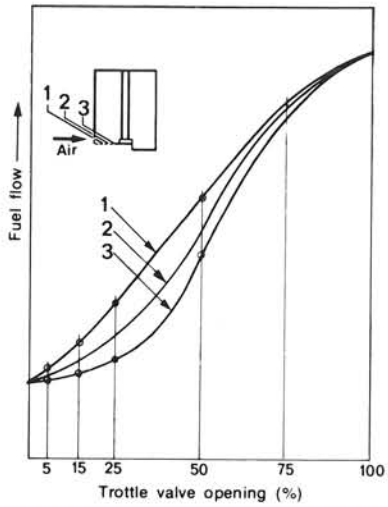


Fig. 12.2

The cutaway size of the throttle valve

The size of the cutaway of the throttle valve affects the air-fuel mixture ratio when the degree of the throttle valve opening is between 1/8 and 1/2. As the cutaway gets larger in size, with the throttle valve opening kept unchanged, air inflow resistance is reduced and causes the amount of air intake to increase, resulting in a lean mixture. On the other hand, the smaller the size of the cutaway, the richer the air-fuel mixture will become. Fig. shows the fuel flow curve in relation to the size of the cutaway.

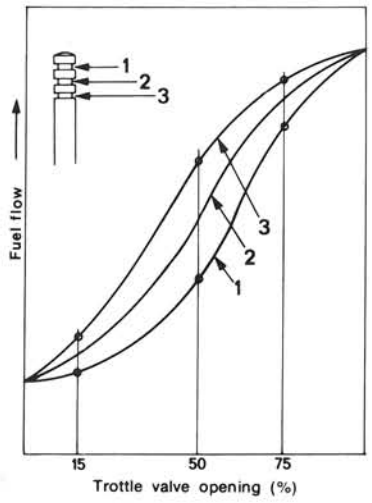


Fig. 12.3

Needle and needle jet

The needle jet and the needle serve to control a proper air-fuel mixture ratio during the so-called medium throttle valve opening (between 1/4 and 3/4 opening).
The needle has five of settings, the uppermost (no. 1) giving the leanest and the lowest (no. 5) the richest mixture.
As you see on fig, the needle setting is mostly noticeable at 50 % throttle opening.

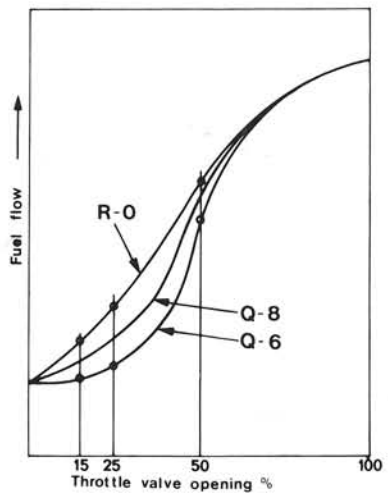


Fig. 12.4

By changing needle jet you can get richer or leaner air-fuel mixture. A small needle jet will give you a leaner mixture and on the other hand a big needle jet gives you a richer air-fuel mixture.
As you can see on fig, the changing of the needle jet is mostly noticeable at 25 % throttle valve opening.

Main jet

The surest way to determine the right size of main jet is to try an obviously large number. Run at full throttle in 6th gear and reduce jet size by one number at a time, until 4-stroking is eliminated. If the main jet is too small, acceleration may suffer. Use the largest possible size without 4-stroking at high revs.

The fig. shows the throttle valve opening in relation to fuel flow, with different kinds of main jets. In the range 50–100 % throttle opening is the fuel mostly noticeable. The straight line in the middle is a zero line.

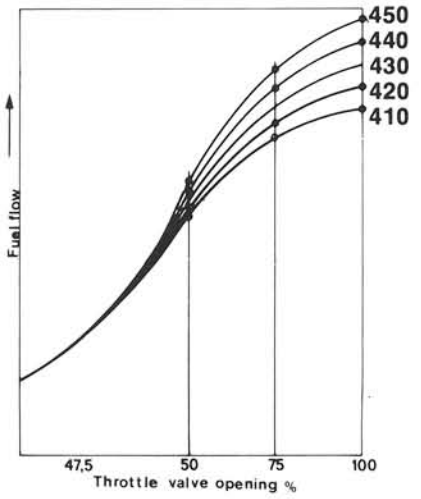


Fig. 13.1

Finally

High temperature, high elevation above sea level and lower barometric pressure generally require leaner settings. However, remember to restore the richer setting when conditions are normal again. If settings are too lean, acceleration and top speed will be less and there will be risk of engine damage.
The fig. shows the amount of air decreases in proportion to a rise in elevation.
Reduction in the amount of air sucked into the cylinder changes the air-fuel mixture ratio, with the result that the power output drops markedly.

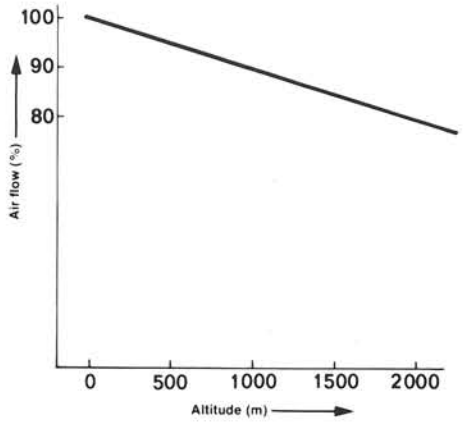


Fig. 13.2

The fig. shows the relations between a rise in temperature and the amount of air drawn into the cylinders.
In the case of the engine is for racing where the maximum output is constantly called for, it is best to tune up the engine by making a matching test of the carburettor in accordance with the temperature and other conditions on the racing course.

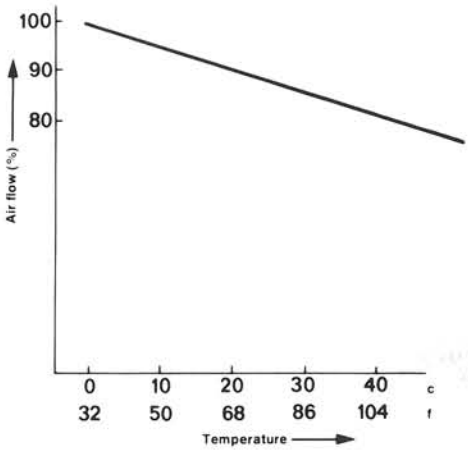


Fig. 13.3

Fuel level

The fuel level can be checked by removing the float chamber from the carburettor.
Hold the carburettor horizontal, and move the float lever with your finger.
When the float lever is 17–19 mm from the carburettor flange, the needle should just close the valve. See fig. 13.4.

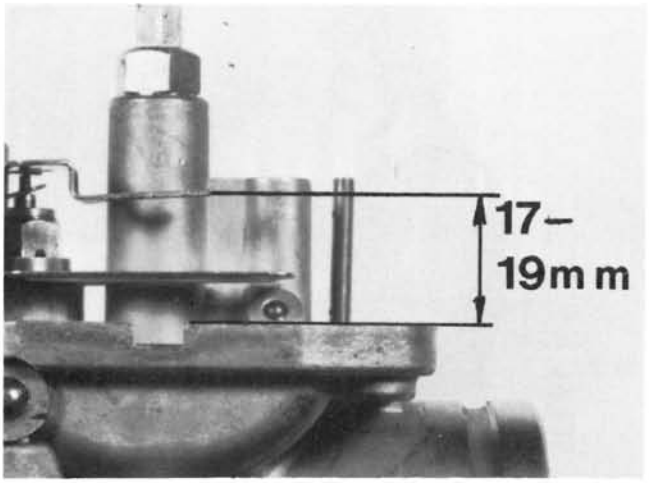


Fig. 13.4

Engine trouble-shooting

When the carburettor setting is not correct for the engine, various irregularities are noticed. These can be traced to two main reasons.

(1) When the air-fuel mixture is too rich:
  (a) The engine noise is dull and intermittent.
  (b) The condition grows worse, when the starter is opened.
  (c) The condition grows worse, when the engine gets hot.
  (d) Removal of the air cleaner will improve the condition somewhat.
  (e) Exhaust gases are heavy.
  (f) Spark plug is fouled.
(2) When the air-fuel mixture is too lean:
  (a) The engine gets overheated.
  (b) The condition improves, when the starter is opened.
  (c) Acceleration is poor.
  (d) Spark plug burns.
  (e) The revolution of the engine fluctuates and lack of power is noticed.

Ready fuel mixture	Fuel at least 94 oct.	Vedgetable Oil
5 l	4,8 l	0,2 l
10 l	9,6 l	0,4 l
15 l	14,4 l	0,6 l
20 l	19,2 l	0,8 l

Fig. 14.1

Fig. 14.2

Fuel mixture

The engine is lubricated by oil mixed with the fuel. Always use high-quality petrol with an octane rating of at least 94 oct.

Vegetable type of racing oil should be used. If no vegetable type oil is available we recommend a two-stroke type mineral oil with a weight of SAE 50 for 4 % mixture proportion.
A two-stroke oil intended for 2 % mixture proportion is not recommended. Fuel additives offered for sale on the market should be avoided. No special oil or mixture proportion is required in the case of a completely new engine.

Octane number

The octane number assigned to a fuel is a measure of its anti-knock quality. Generally speaking, engines with higher compression ratios require fuels with higher octane ratings. There is no point in using fuel of a higher octane rating than an engine requires, as no extra power will be obtained. To use fuel with too low an octane rating is uneconomical and possibly dangerous. This can lead to detonation which wastes power and can cause engine damage.

Carefully mix the oil and petrol in a separate vessel before filling it into the fuel tank of the machine. Shake the vessel thoroughly for a few minutes to make sure that the fuel is properly mixed. This is particularly important when using vegetable oil, since this does not mix so easily with the petrol as mineral oil. At temperatures below freezing point it has also a tendency to separate out, so that extra care should be taken in such circumstances.

Carburettor function

Idling speed

The vacuum in the engine crankcase sucks air through the carburettor. Partly pass the throttle which is adjusted by means of the large screw. Partly through the throat (B) pass the adjustment screw; this air breaks up the fuel in the mixing section of the idling jet to facilitate carburation.

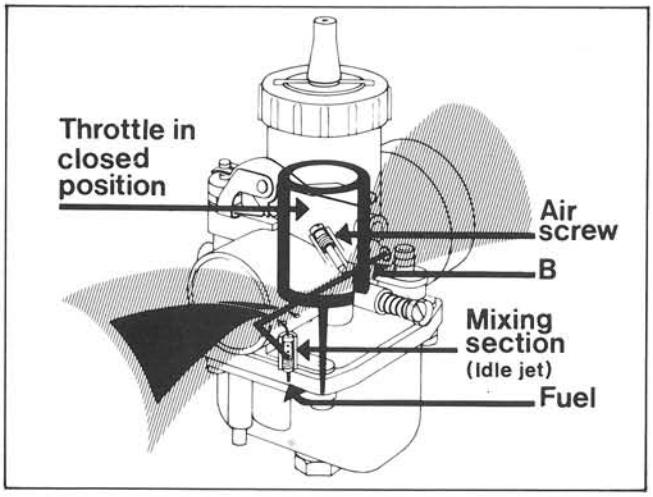


Fig. 15.1

High speed

Air is sucked through the passage (B). This air breaks up the fuel in the mixing tube. The atomized fuel is then sucked up into the venturi of the carburettor and mixed with the air flowing through the throttle opening.

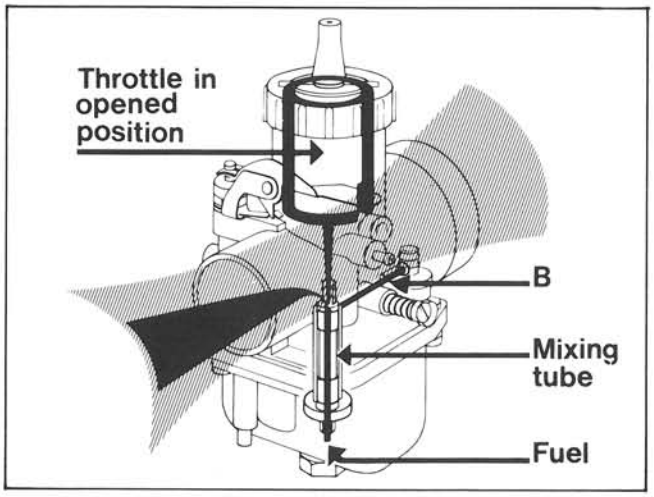


Fig. 15.2

Cold start system

When the cold start valve is open, fuel is sucked directly from the float chamber through the channel, into the venturi.

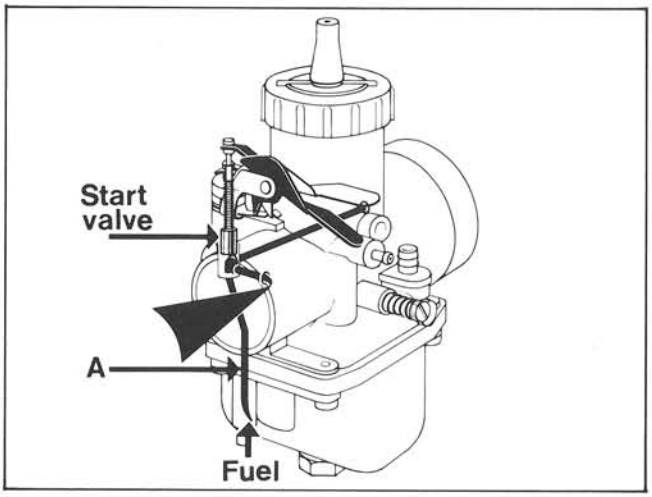


Fig. 15.3

Fuel supply system

Fuel flows through the needle valve (G) when the float is below the pre-set position. As the fuel level rises, so does the float and closes the needle valve. This procedure is repeated with the result that the fuel level in the float chamber of the carburettor remains constant.

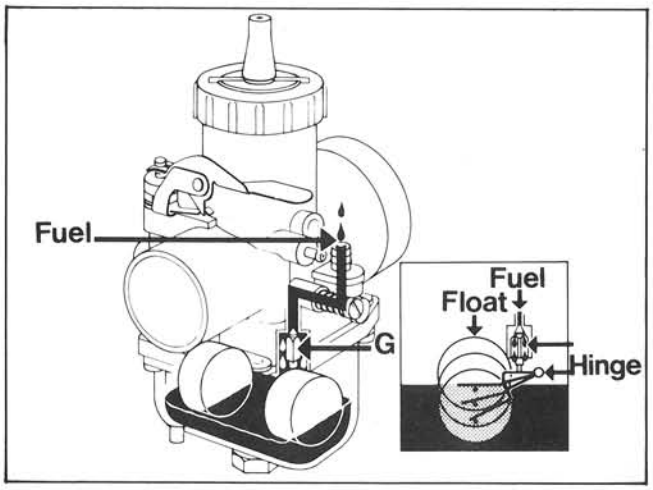


Fig. 15.4

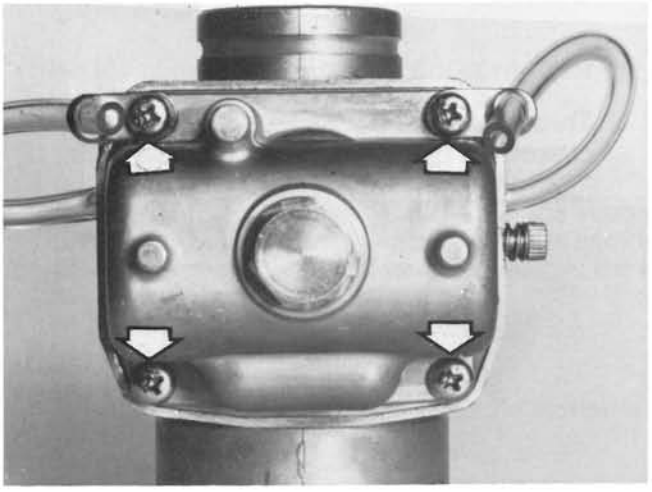


Fig. 16.1

Dismantling and cleaning the carburettor

Lift out the throttle from the carburettor. Loosen the carburettor attaching clamps and remove the carburettor from the intake manifold, and air filter housing. Remove the float chamber from the carburettor by loosening the four screws.

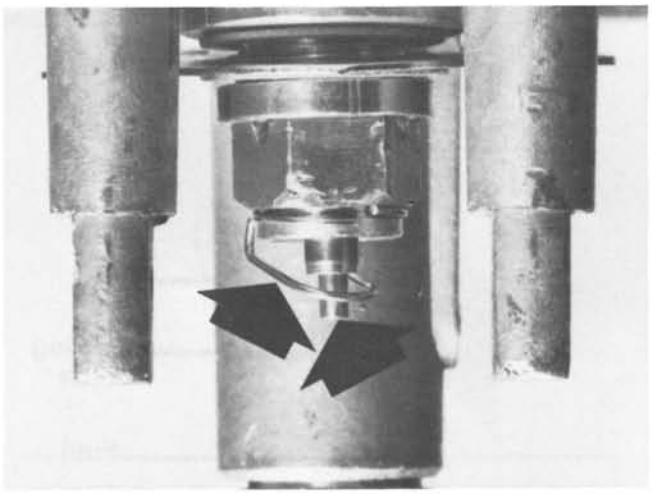


Fig. 16.2

Remove the peg and take out the float lever.

Remove the spring and take out the float needle. Thoroughly clean all parts in petrol and blow dry with compressed air.
Assemble the carburettor in the reverse order. See fig. 10.1.

NOTE! Make sure that the float chamber is fitted correctly on the carburettor housing and that the rubber hose between the carburettor and air filter holder is intact.

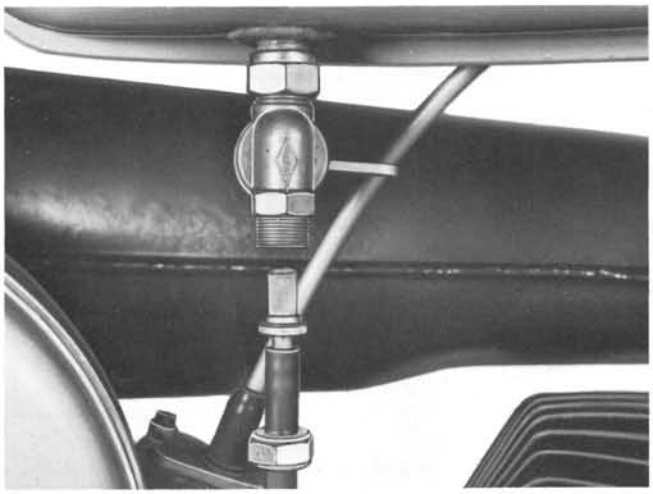


Fig. 16.3

Clean the fuel cock filter free from dirt.

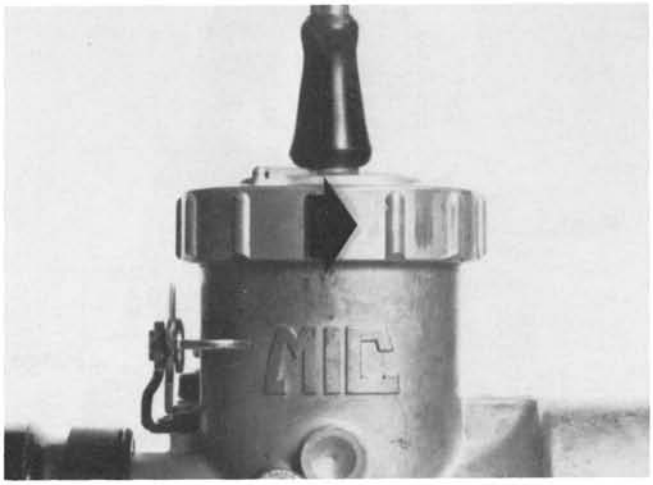


Fig. 16.4

Changing throttle wire

1. Remove carburettor cover and take out the throttle.

2. Compress throttle spring, take out the wire lock and unhook the wire.

Fig. 17.1

3. Remove the cover of the throttle handgrip and remove the wire.

4. Fix a new wire in handlegrip and the throttle in reverse order.

NOTE! Don't forget the wire lock.

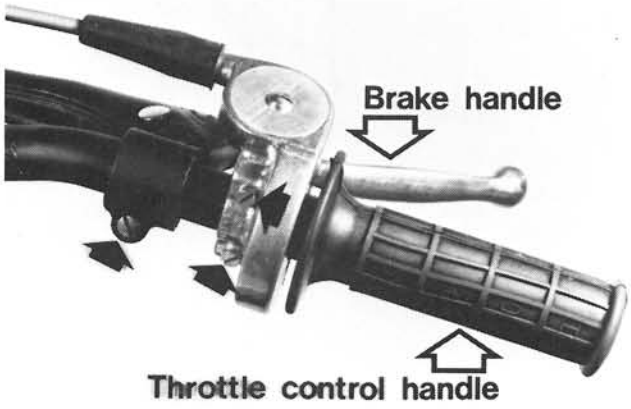


Fig. 17.2

Throttle cable adjustment

Screw in the carburettor adjusting screw fully and screw it back until there is no play at the throttle handle.

NOTE! Don't forget to lock up the carburettor adjusting screw.

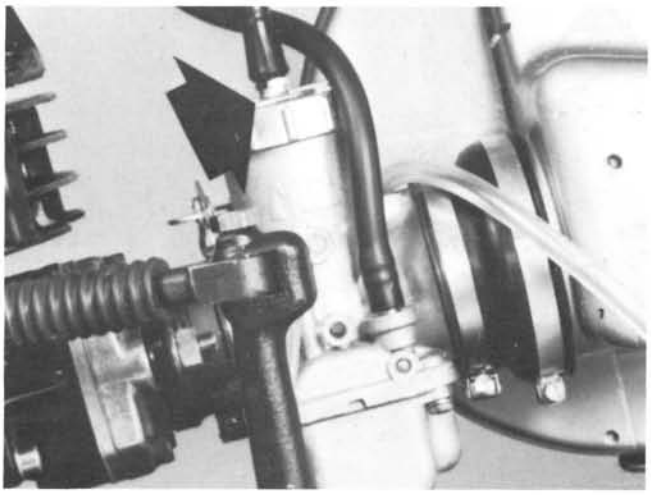


Fig. 17.3

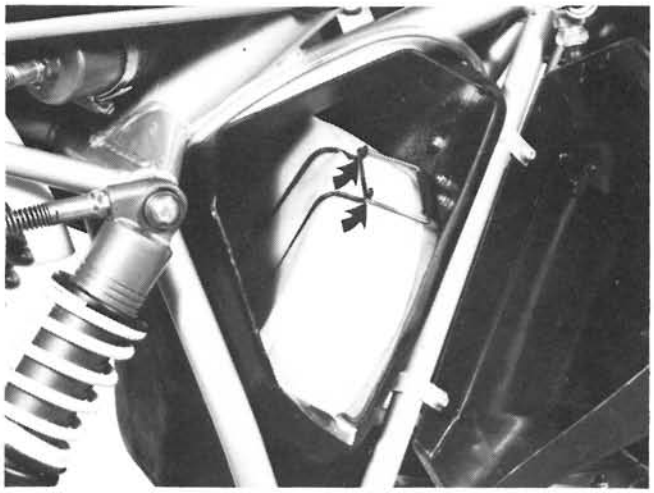


Fig. 18.1

Dismantling and cleaning the air filter

1. Press down and unhook the air filter cover from the saddle bridge. See fig. Open the filter cover.

Fig. 18.2

2. Unhook the air filter holder and remove the filter with its case.

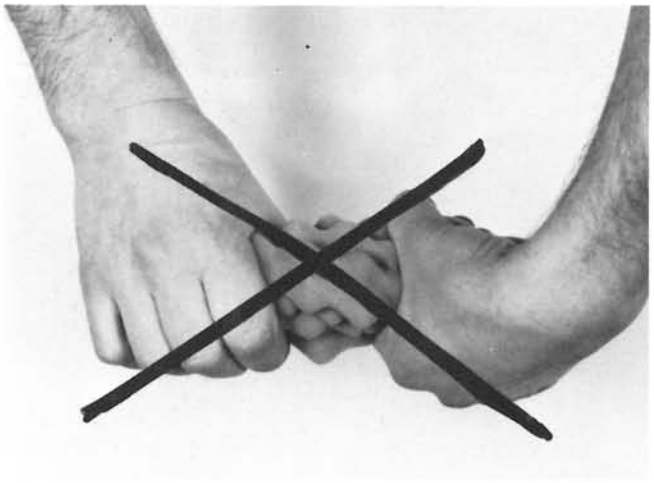


Fig. 18.3

3. Clean the filter in petrol or kerosine by squeezing it easily in the fluid a few times. At last squeeze it free from solvent.

NOTE! Never twist the airfilter as fig. 18.4 shows.

4. Oil in the filter with a few cc of Twin air action oil.

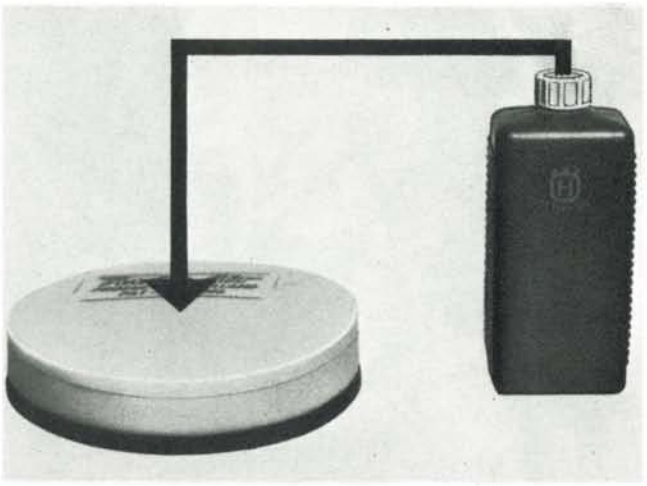


Fig. 19.1

5. Squeeze the filter lightly between your palms to get even oil absorption. See fig. 19.1, 19.2 and 19.4.

Fig. 19.2

6. Mount the filter and wait ca 10 minutes until the oil solvent has vaporated. Then start the engine.

NOTE! The engine cannot be started before the solvent in the oil has vaporated.

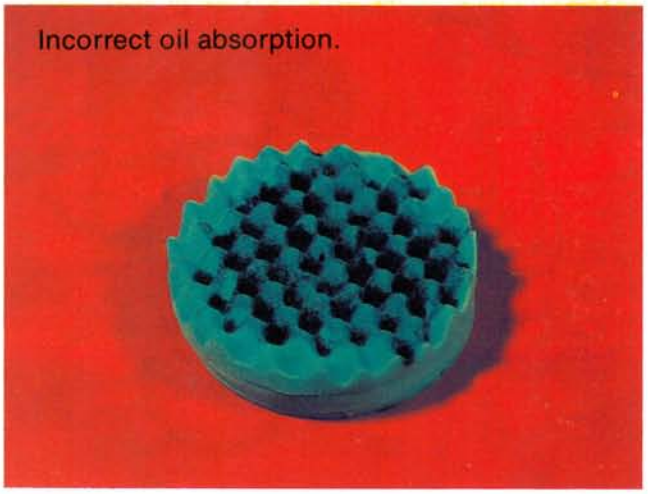


Fig. 19.3

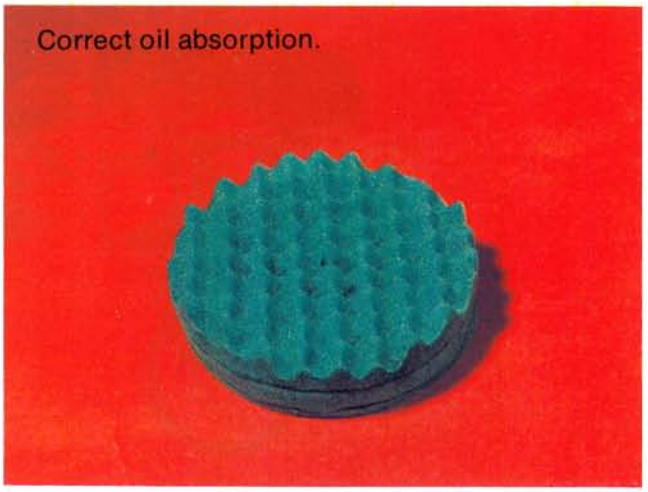


Fig. 19.4

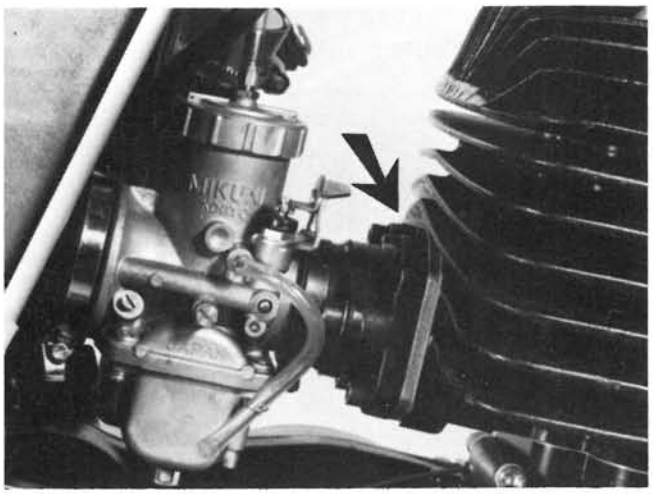


Fig. 20.1

Reed valves

The motorcycle features a valve system which prevents the fuel-air mixture from being forced back through the carburettor. The valves are located between the cylinder and the carburettor.

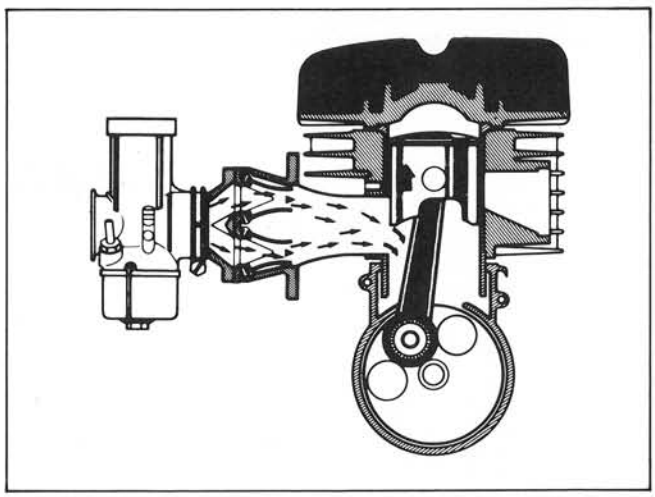


Fig. 20.2

Operation

1. When the piston uncovers the induction port the fuel-air mixture is sucked through the valves into the crankcase.

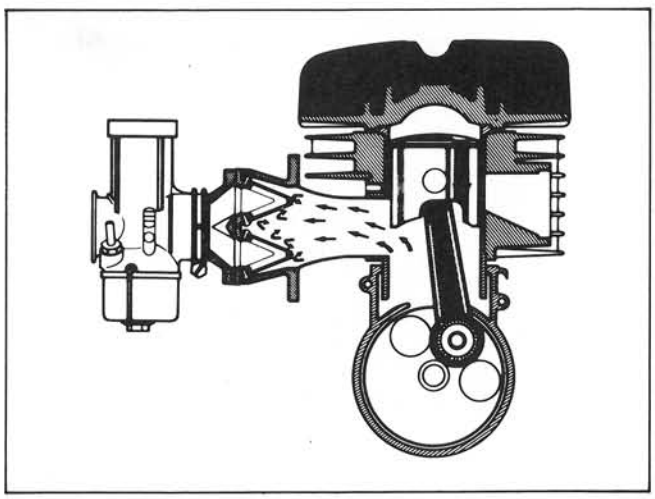


Fig. 20.3

2. To keep the fuel-air mixture in the crankcase there are reed valves as standard which keep the gas inside when the pressure in the crankcase rises.

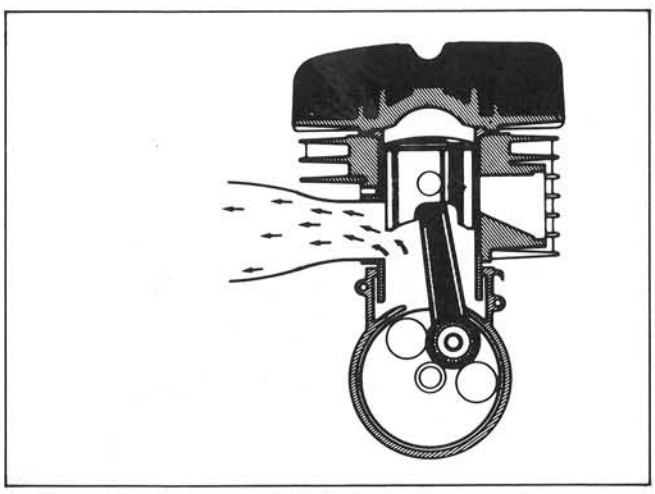
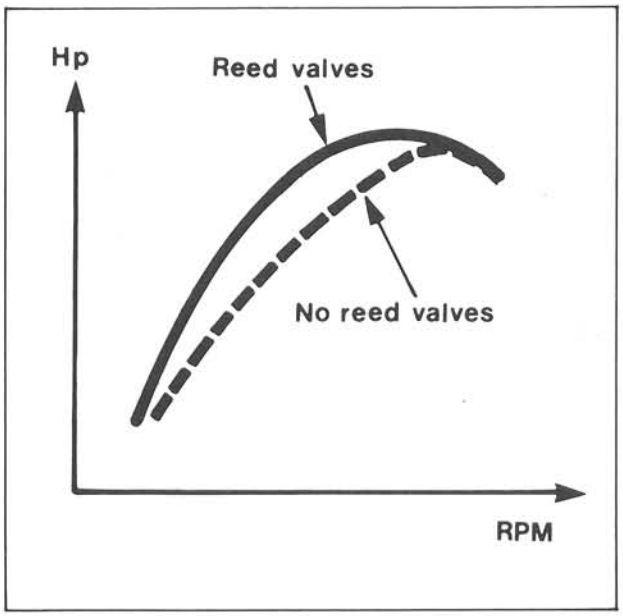


Fig. 20.4

3. Without these reed valves some of the fuel-air mixture would be forced back through the carburettor.

NOTE! To give you a better view of its function, the valve housing is turned 90° in the drawings. See fig. 20.1.

4. The following improvements have been obtained:
a) lower fuel consumption
b) flatter torque curve, i.e. more power at lower rpm.
c) more efficient carburation and less risk of flooding the engine.



Fuel oil mixture: Two stroke engines

Since the crankcase of a two-stroke engine is part of the fuel induction system, it is necessary to mix a small amount of lubricating oil with the petrol. At this fuel/oil mixture is carried through the crankcase, it lubricates the engine's internal moving parts. Lubrication requirements for two-stroke engines differ somewhat from four-stroke engines. Oils especially prepared for two-stroke air-cooled engines are highly recommended because they reduce exhaust port deposits, piston and cylinder wall scuffing and spark plug fouling. The ratio of petrol to oil may vary from one engine to another, but in all cases, recommended fuel/oil mixtures must be carefully followed. Too much oil results in excessive smoking and spark plug fouling. Too little oil will cause cylinder wall, piston and piston rings scuffing and bearing damage. Premix the petrol and oil before putting it into the fuel tank. Pour half the petrol into a clean container; then pour in all the oil. Shake this partial mixture well. Then add the rest of the petrol and shake the mixture again. Do not use paraffin or fuel oil as mixing agents.
Mixing should be done where temperatures are above freezing (preferably at room temperature). Oil and petrol will not mix well at 0°C or below ... and incomplete mixing will cause engine damage from lack of lubrication. However, in many countries pre-mixed two-stroke fuel is readily available at service stations.

Engine

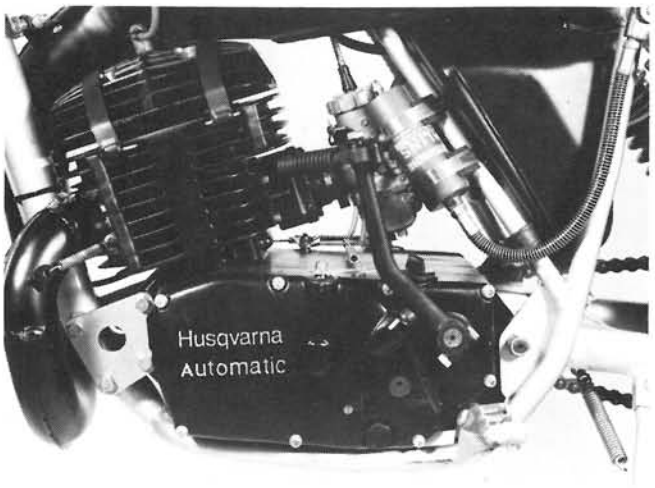


Fig. 22.1

General

The engine is a single-cylinder, air-cooled, two-stroke unit. The engine and gearbox form an integral unit. The piston ring is made of hard-chromed steel for long life and high strength.

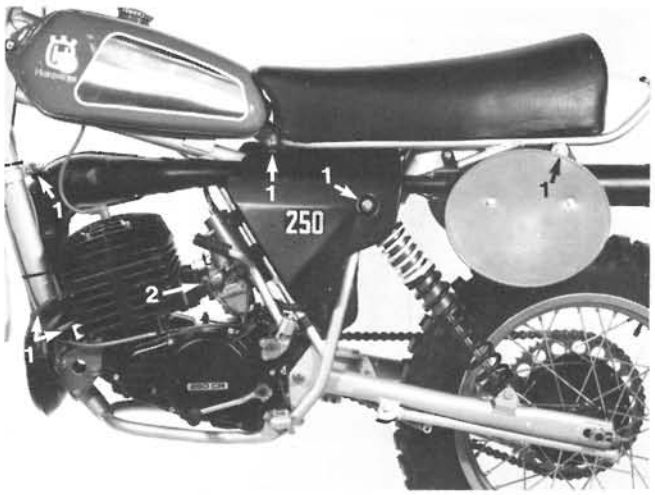


Fig. 22.2

Removing and fitting

1. Remove the exhaust system by loosening the screws and unhook the springs holding exhaust pipe.
2. Screw out the two screws holding carburettor. See fig. 9.1.

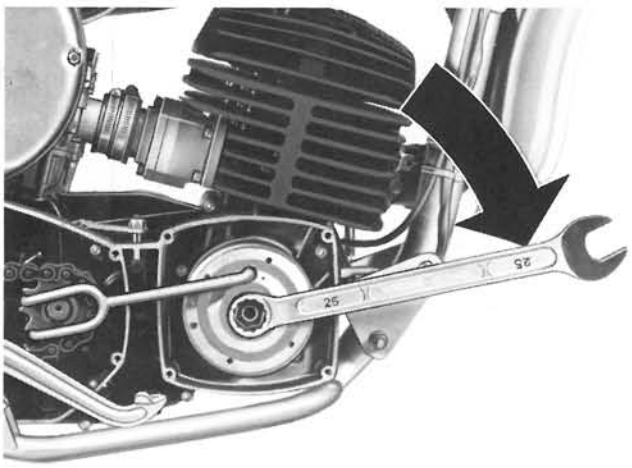


Fig. 22.3

3. Remove the right-hand crankcase cover and the chain cover.
4. Apply the holding spanner and screw off the flywheel nut.
   (Note: left-hand thread).
5. Place the flywheel puller in position. Make sure that the puller is screwed in fully.
6. Place the holding spanner in position (see figure) and pull off the flywheel.

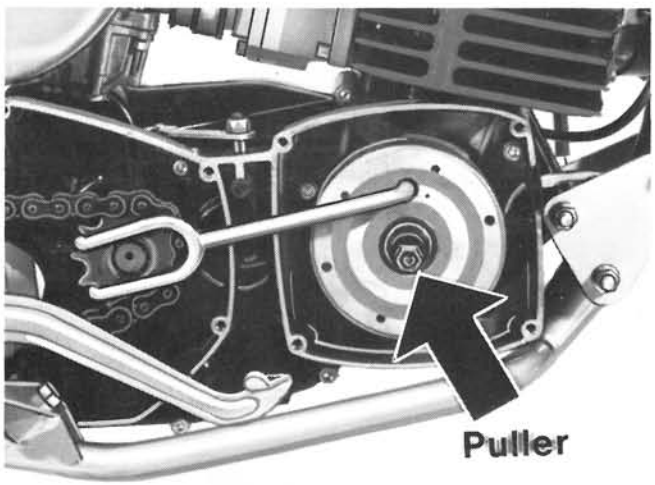


Fig. 22.4

7. Remove the mounting plate holding magneto and let it hang down in the cables.
8. Loosen the brake- and gear wires.

Take off the chain masterlink and remove the chain. See fig. 23.1.

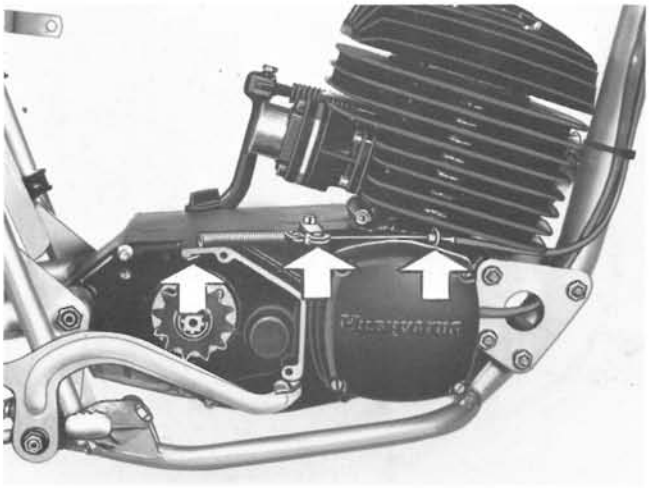


Fig. 23.1

Remove the screws holding the front mounting plates. Loosen the nut on the swing-arm shaft. Pull out the shaft, but not further than it holds one part of the swing-arm in order to prevent the arm to fall down. Use another shaft to hold the other part of the swing-arm. Remove the engine.

NOTE! Before mounting, make sure the cover is free from dirt.

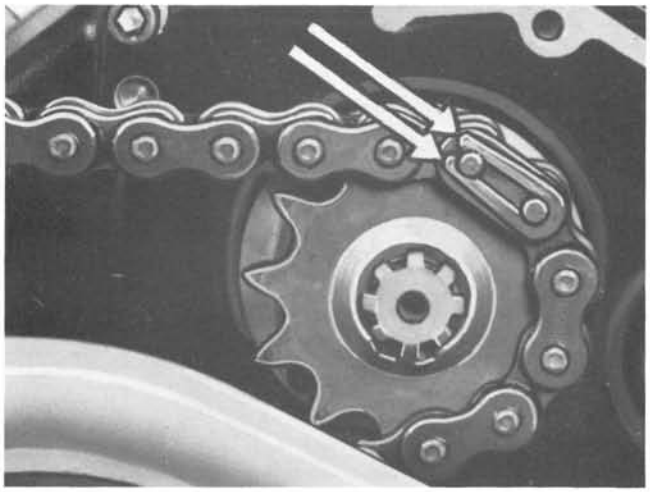


Fig. 23.2

Inspecting and changing piston ring, piston and cylinder

The cylinder and piston can be removed with the engine still in the frame.

1. Loosen the four cylinder head retaining nuts (17 mm) and the two screws (13 mm) and take off the cylinder head.

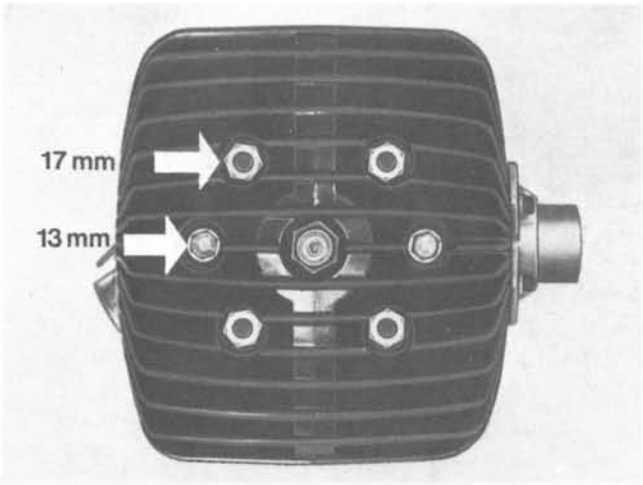


Fig. 23.3

2. Lift up the cylinder about 5 cm from the crankcase and place a piece of clean cloth in the crankcase opening to prevent dirt from entering the crankcase. See fig. 23.4.

3. Lift off the cylinder.

Fig. 23.4

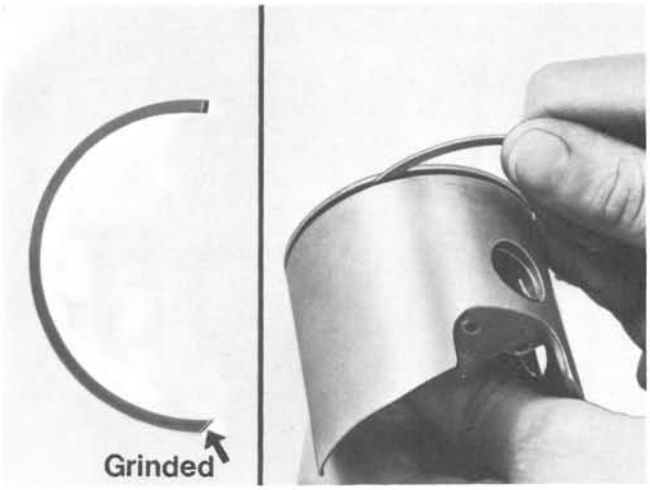


Fig. 24.1

Remove the piston ring from the piston. See fig. 24.1.

Before fitting the piston ring, carefully remove any carbon deposits from the grooves in the piston.
This is preferably done with an old piston ring which is grinded apart. See fig. 24.1.

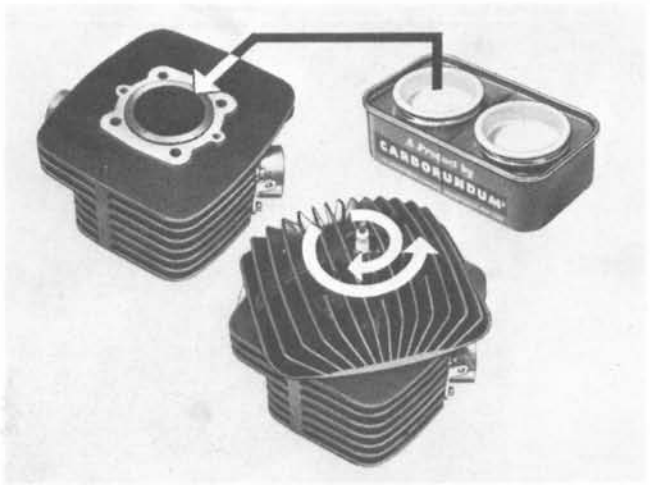


Fig. 24.2

Lap in the cylinder head against the cylinder with fine grinding paste.

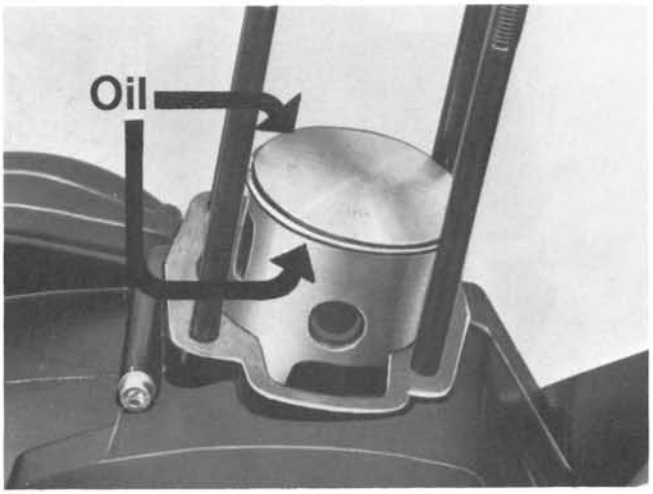


Fig. 24.3

Place the piston at bottom dead centre.

Fig. 24.4

Carefully oil the cylinder bore and piston ring and fit the cylinder over the piston.

NOTE! Make sure that the piston ring is placed correctly in relation to its locking pins and carefully push on the cylinder so as not to damage the piston ring.

Fit the cylinder head and tighten the four retaining nuts and the two screws moderately.

Then tighten the screws alternately.

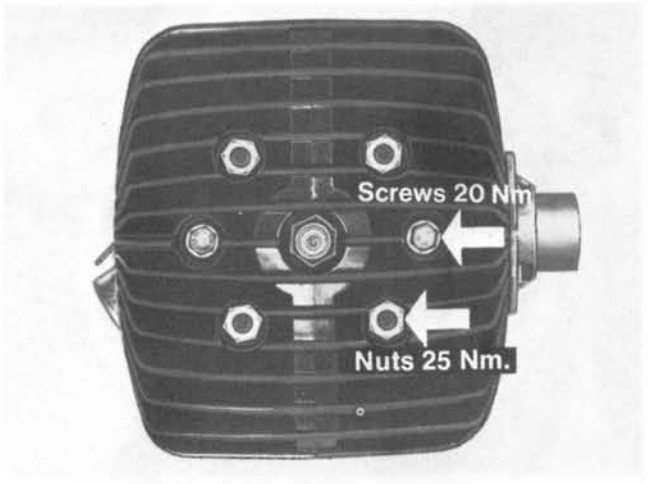


Fig. 25.1

Time for repairs

Big-end bearing

Replace this bearing when the radial play amounts to 0,07–0,10 mm. Radial play can be measured by a dial indicator.

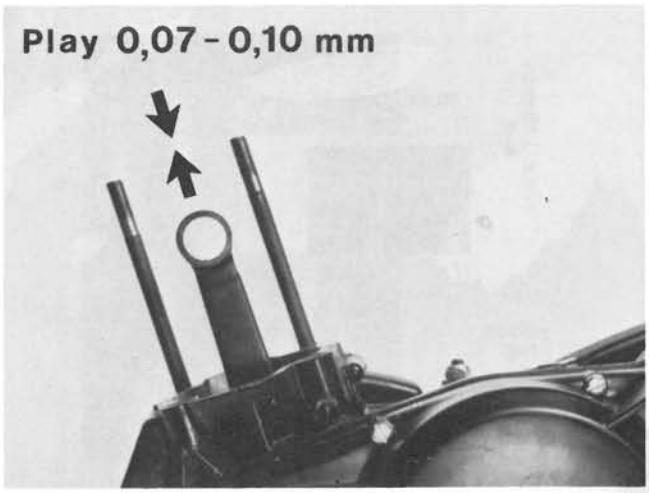


Fig. 25.2

Main bearings

Replace these bearings as soon as any play is detected. Check for play by pulling at the two ends of the crank-shaft in the radial direction.

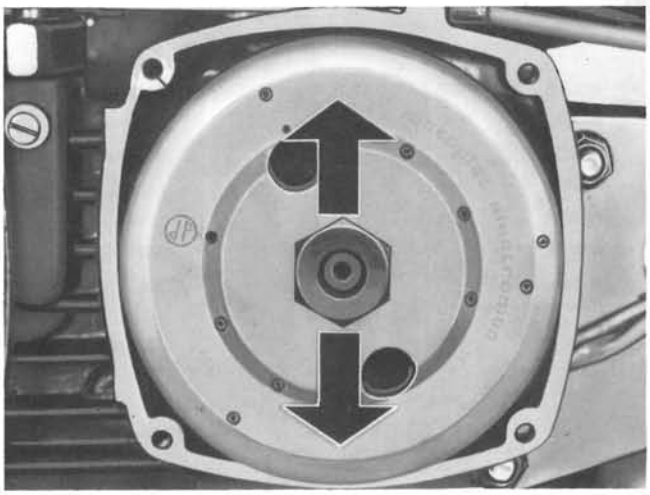


Fig. 25.3

Cylinder

The cylinder should be bored up to oversize when the wear on its top section amounts to 0,15 mm, i.e. when the difference between measurements A and B in fig. 25.4 amounts to 0,15 mm.

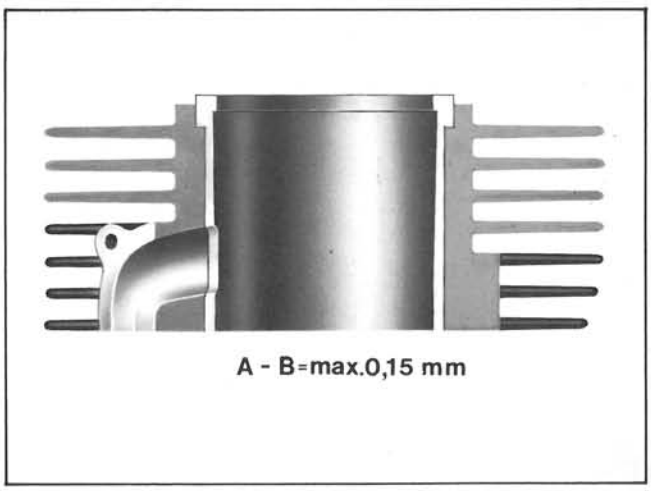


Fig. 25.4

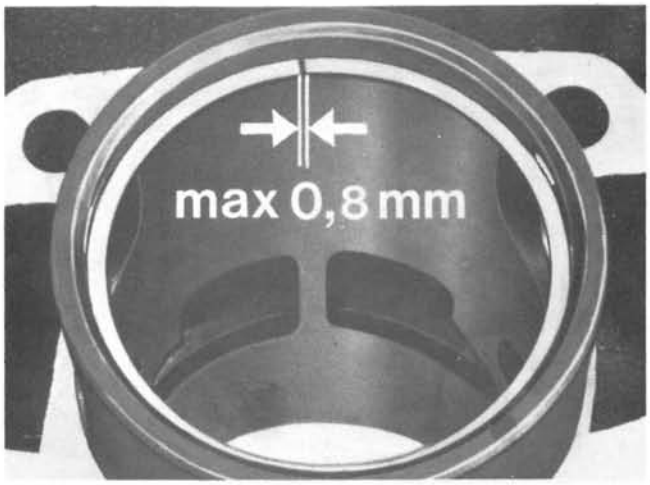


Fig. 26.1

Piston ring

Check the wear on the piston ring by placing it in the lower part of the cylinder bore. Measure the distance between the piston ring ends with a feeler gauge. If this exceeds 0,8 mm it is recommended that a new piston ring should be fitted. See fig. 26.1.
Before fitting the piston ring, carefully remove any carbon deposits from the grooves in the piston.
Also scrape clean the piston crown and combustion chamber.

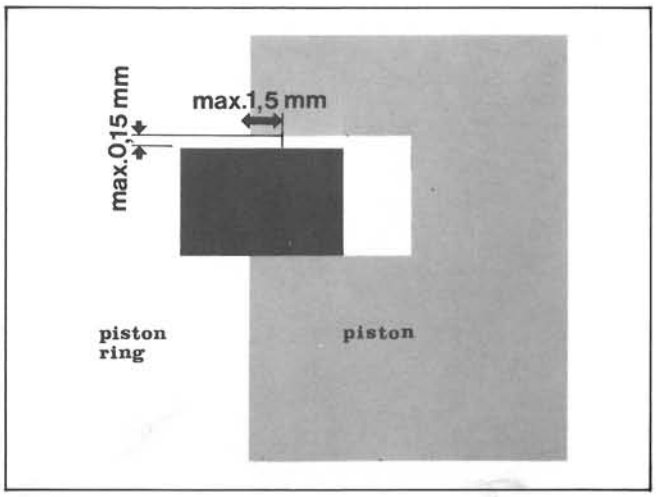


Fig. 26.2

Piston

The piston has two points of wear: its ring groove and its skirt.

A. When the play in the ring groove amounts to 0,15 mm to a depth of approx 1,5 mm, replace the piston.

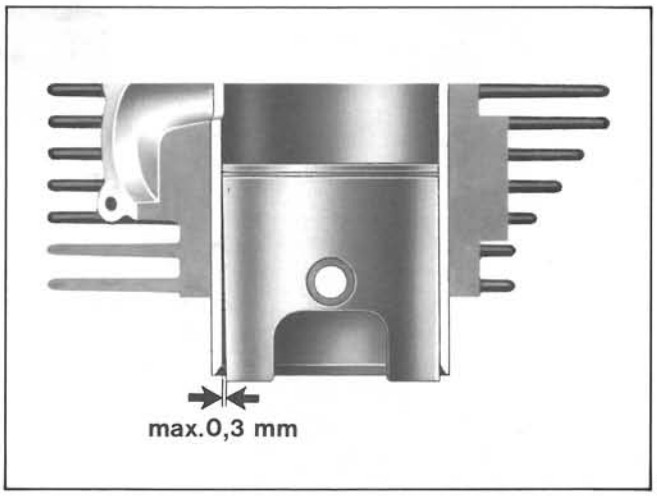


Fig. 26.3

B. When the piston skirt is worn down so that a measurement of approx 0,3 mm can be taken as illustrated in fig. 26.3, scrap the piston.

For taking the crankcase halves apart or for other serous mechanical works, we recommend you to take contact with your dealer. Regarding service tools see page 59.

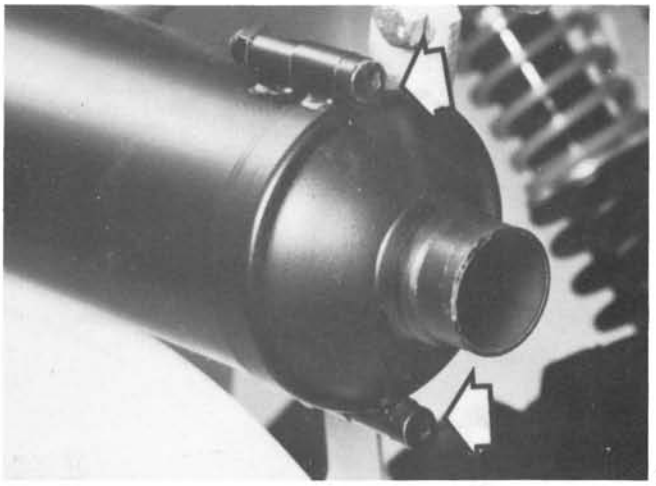


Fig. 26.4

Changing innertube-silencer

The exhaust system is equipped with an extra absorber.
Remove the two screws and nuts and take away the cover. Now you can change the absorber.

Transmission

General

The power from the engine is transmitted to the gearbox through a centrifugal clutch and a primary transmission. See fig. 27.1.

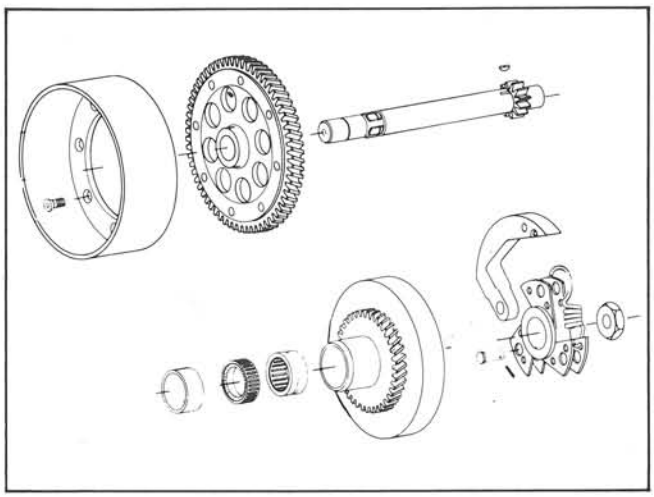
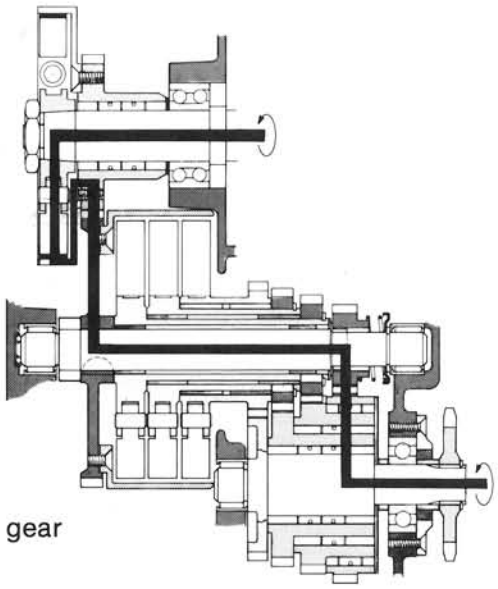
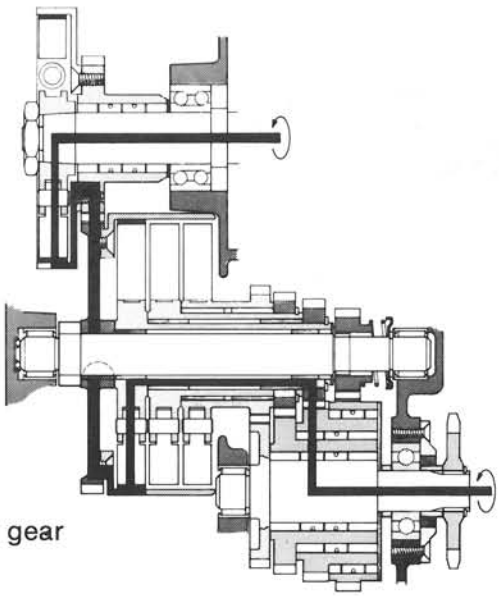


Fig. 27.1

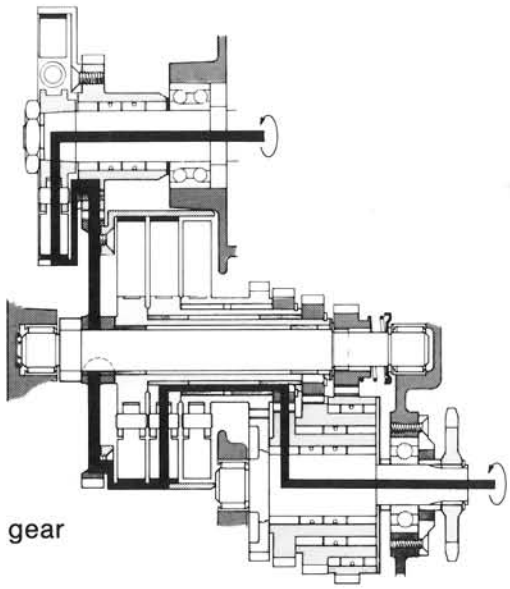
The function of the gearbox is shown in the figure below.



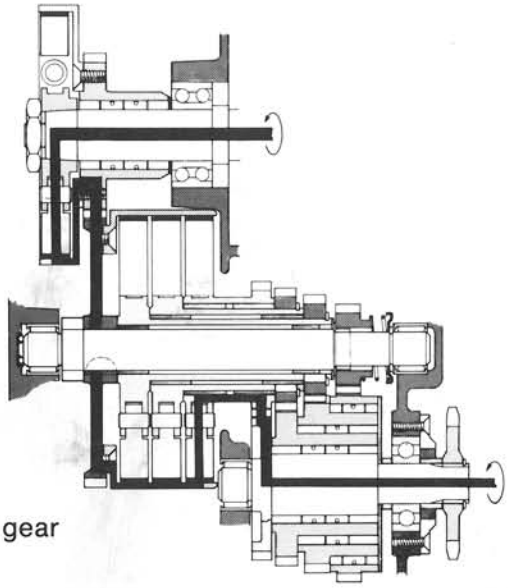
1:st gear



2:nd gear



3:rd gear



4:th gear

Disassembling

Remove the nut and the washer. Take off the lever and unhook it from the spring.

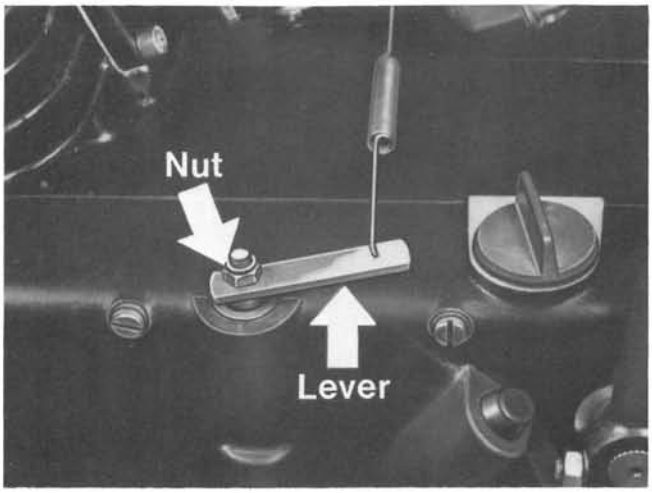


Fig. 28.1

Remove the transmission cover by loosening the eight screws (M 6×60). See fig. 28.2.

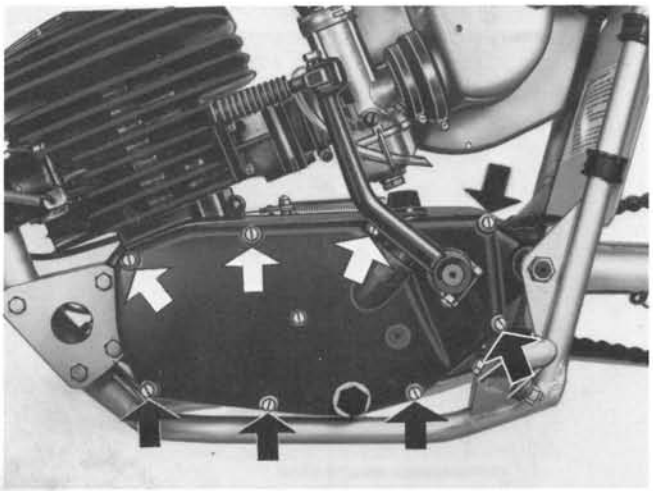


Fig. 28.2

Mount the holding tool and remove the transmission clutch center nut. See fig. 28.3.

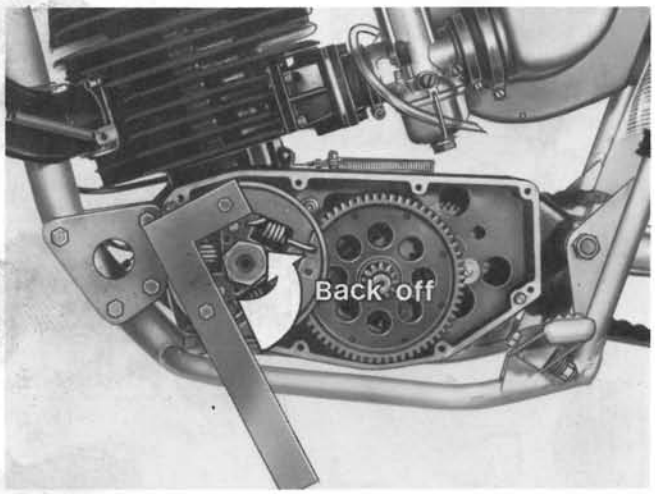


Fig. 28.3

Mount the puller and remove the clutch. See fig. 28.4.

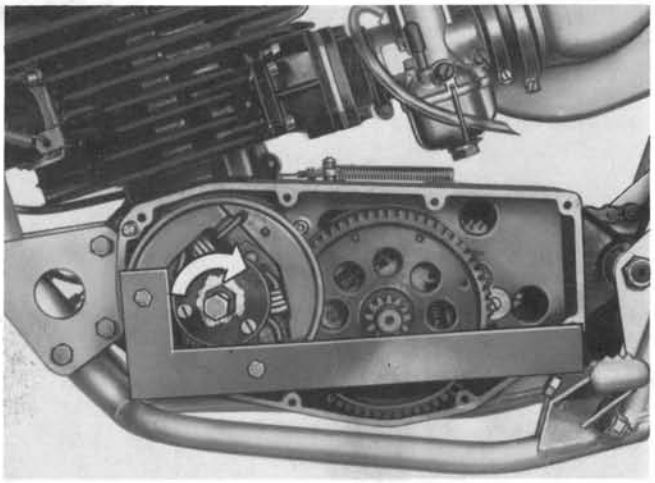


Fig. 28.4

Pull out the clutch drum. See fig. 29.1.

NOTE: the key!

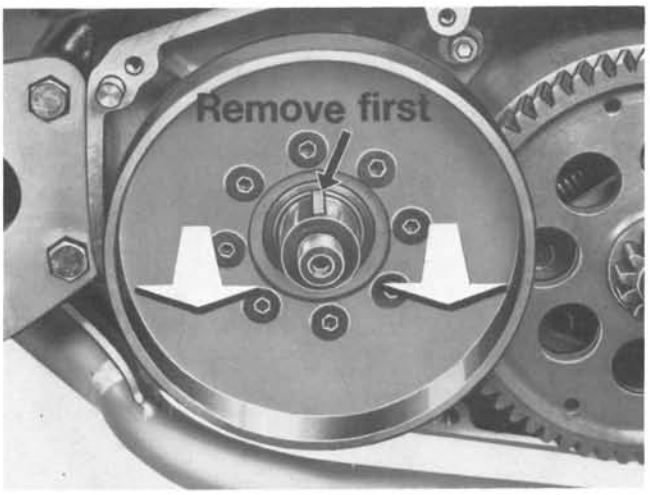


Fig. 29.1

Remove the stop screw on the right hand side and pull up the lever shaft. See fig. 29.2.

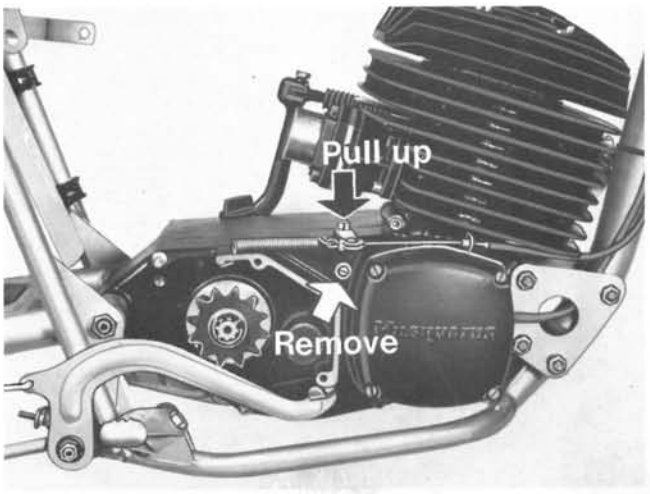


Fig. 29.2

Pull out the main shaft unit. See fig. 29.3.

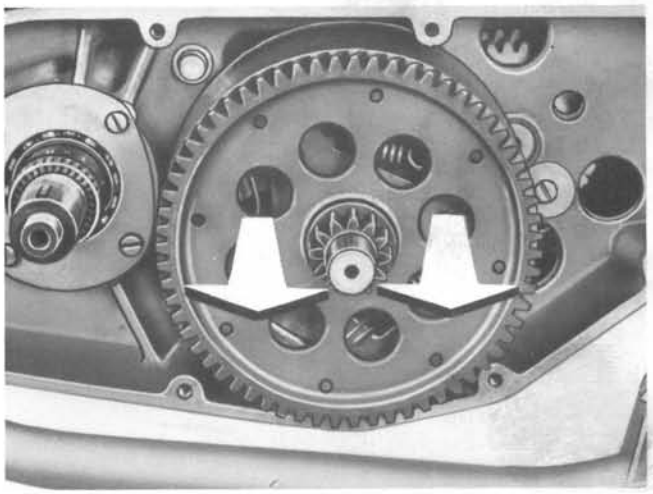


Fig. 29.3

Take away the washer, circlip, washer, spring and 1:st wheel. See fig. 29.4.

NOTE! The axial play is controlled by the number of washers.

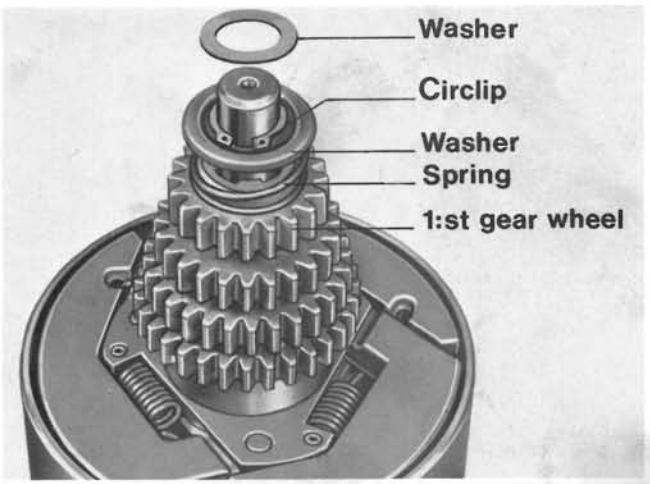


Fig. 29.4

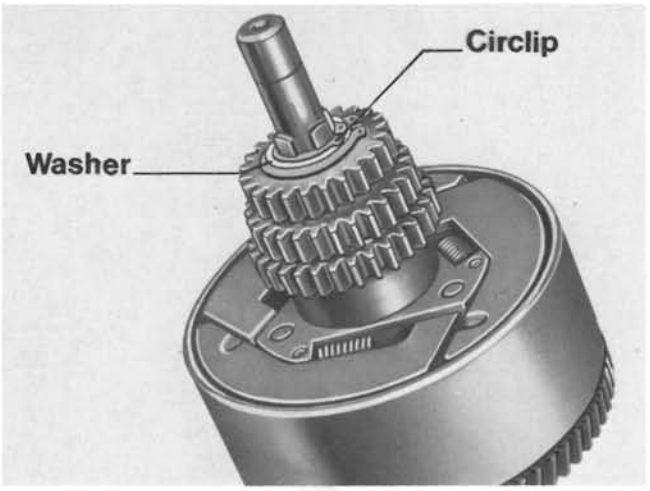


Fig. 30.1

Take away the circlip and washer and lift up the gear-unit out of the clutch-drum. See fig. 30.1.

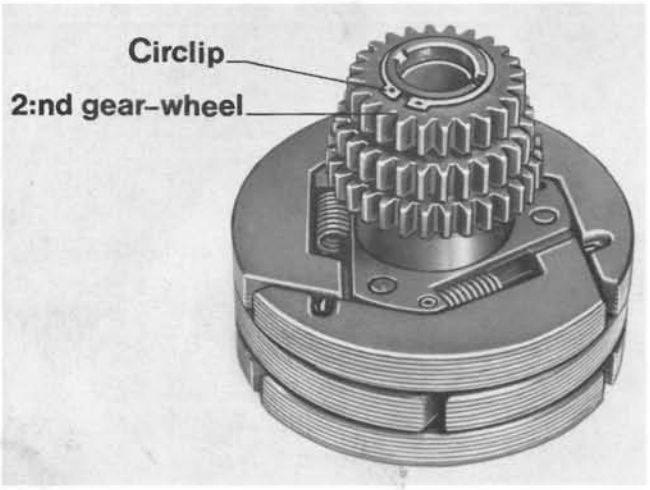


Fig. 30.2

Remove the circlip and 2:nd gearwheel (with the help of two screwdrivers), and pull out the clutch hub. See fig. 30.2.

NOTE: the key!

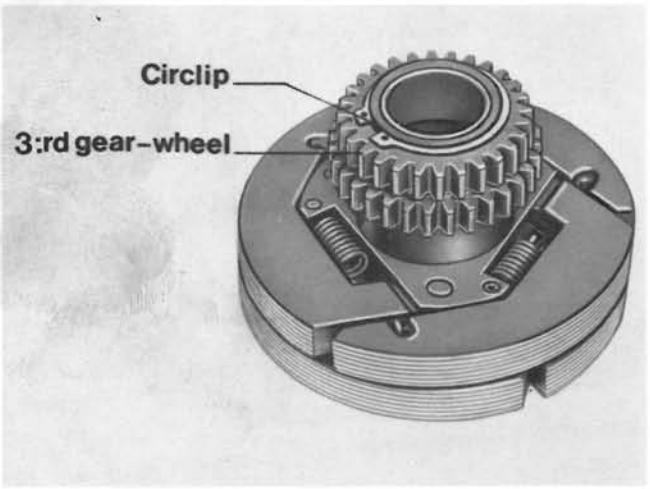


Fig. 30.3

Remove the circlip and 3:rd gearwheel (with the help of two screwdrivers), and pull out the clutch hub. See fig. 30.3.

NOTE: the key!

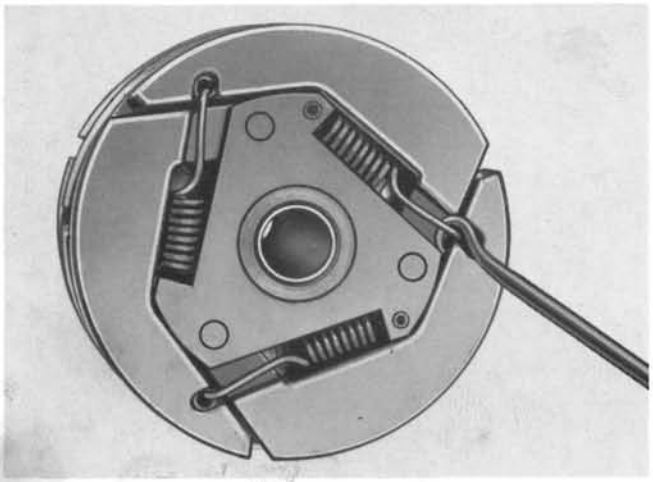


Fig. 30.4

The springs can be changed by help of a hook. See fig. 30.4.

Assembling

Mounting is done in the reverse order, but note the following.

When 2:nd, 3:rd and 4:th gearwheels are mounted, take a screw-driver and press the wheels one by one against the circlip in fig. 30.2. Do it in this order, 2:nd, 3:rd and 4:th.

The springs can be mounted or removed as shown in figure 31.1.

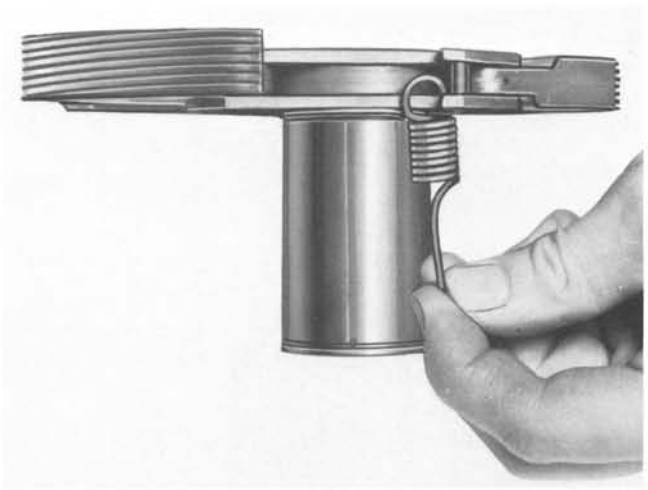


Fig. 31.1

Check that the gear lever shaft is in the upper position and turned anti-clockwise. See fig. 31.2.

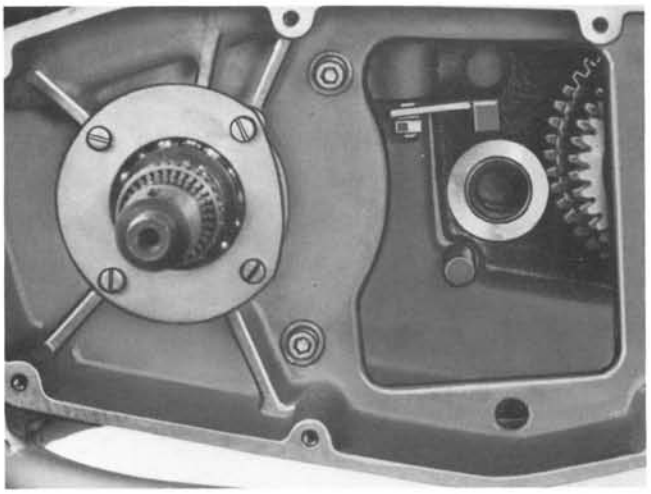


Fig. 31.2

The free-wheel on the crankshaft shall be mounted as shown in figure 31.2 and 31.3.

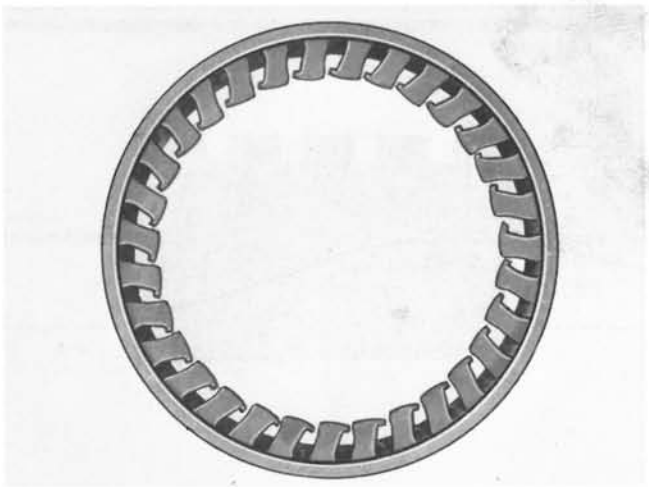


Fig. 31.3

Tighten the nut to 90 Nm. See fig. 31.4.

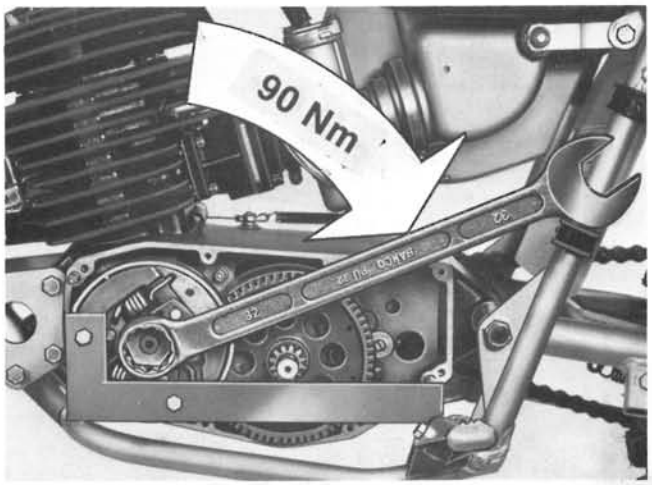


Fig. 31.4

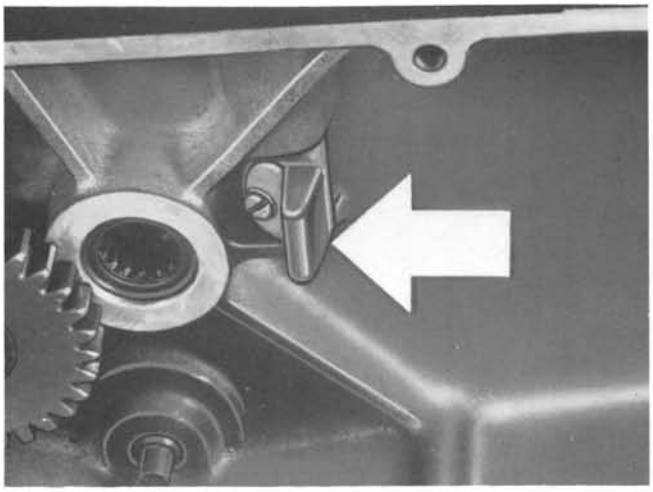


Fig. 32.1

Before mounting the transmission cover, check that the brake shoe on the cover is turned as shown in fig. 32.1.

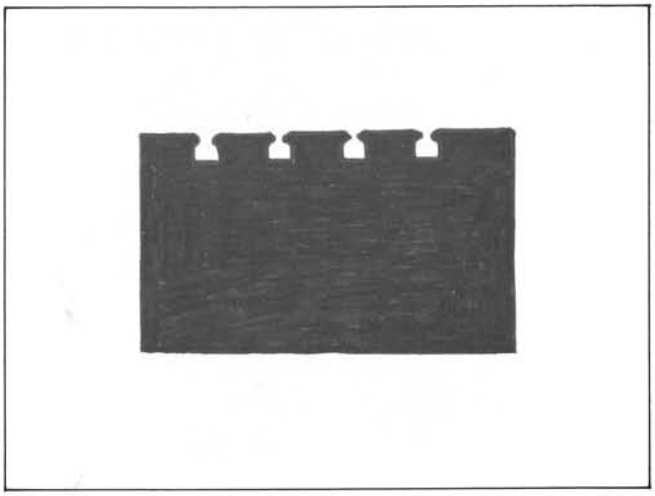


Fig. 32.2

Time for repairs – clutch shoes

The clutch shoes can be worn down so that the grooves get closed. See fig. 32.2.

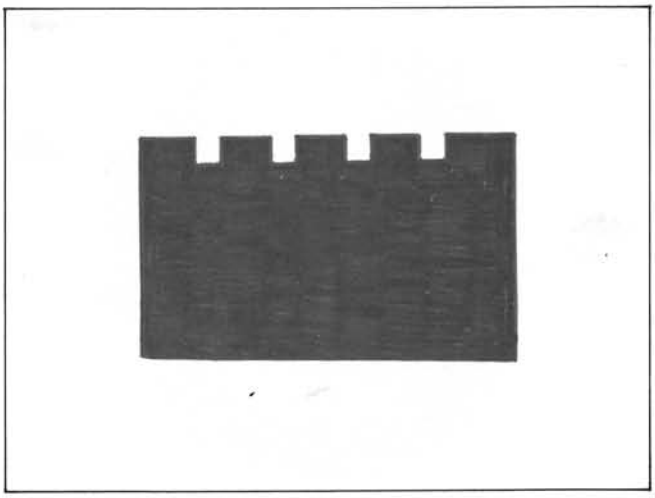


Fig. 32.3

The grooves can be opened with help of a hack-saw.
The grooves should have the shape as shown in the figure 32.3.

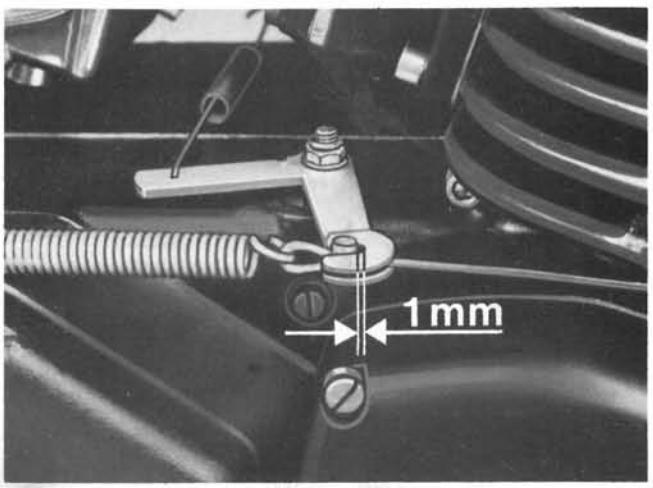


Fig. 32.4

Adjusting start lever

When the start lever in fig. is actuated, the play between gear-lever and gear-cable should be 1 mm. See fig. 32.4.

Time for repairs

Chain sprockets

Replace the sprockets when the teeth begin to approach the appearance illustrated in fig. 33.1.

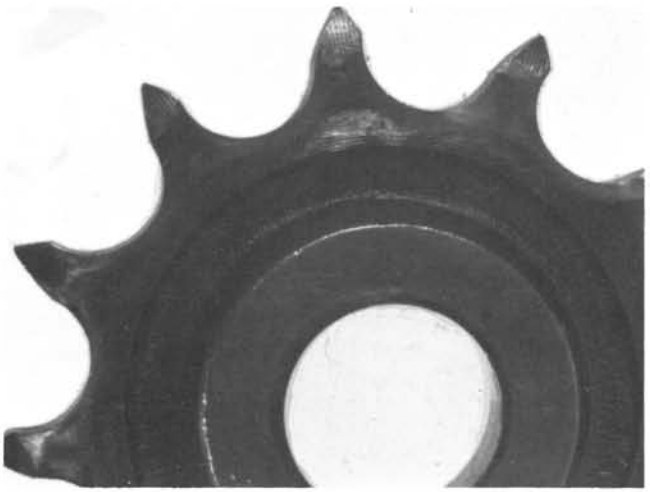
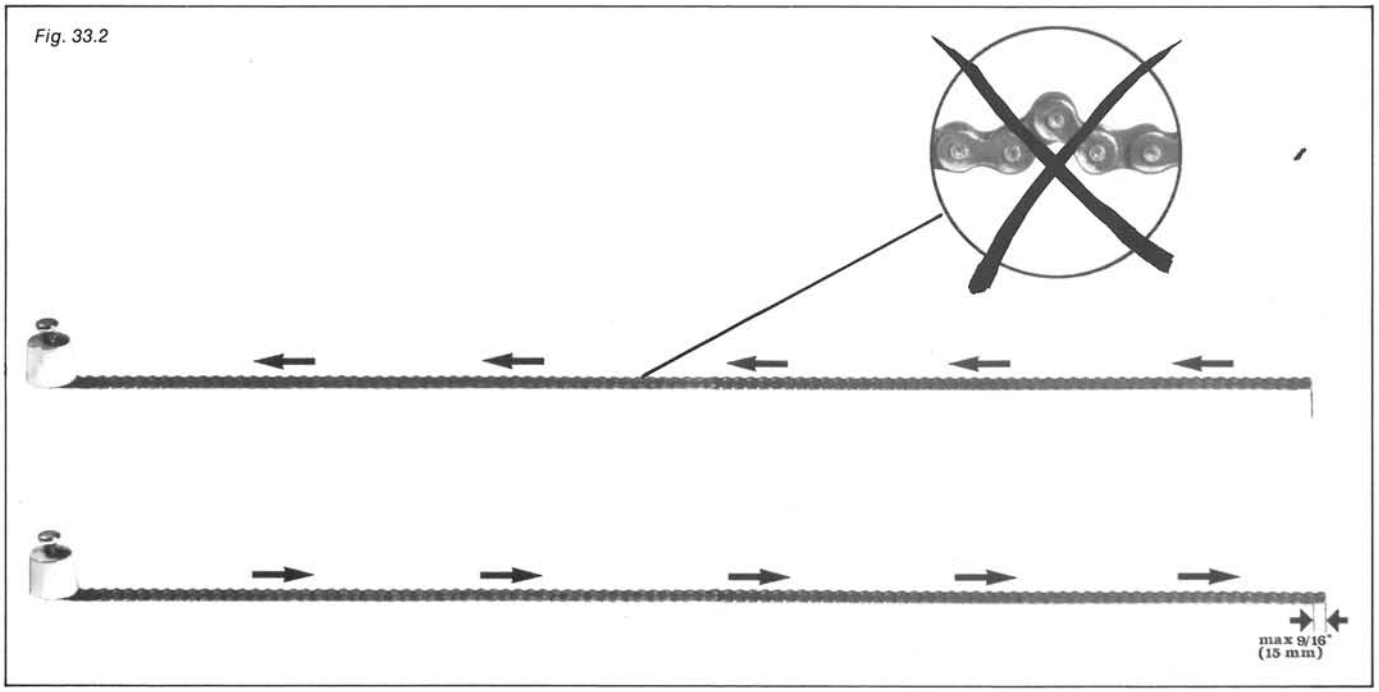


Fig. 33.1

Chain

Replace the chain when the difference between its length contracted and extended begins to approach 15 mm. See fig. 33.2.

Fig. 33.2



Adjusting chain tension

1. Loosen the right shaft nut.
2. Tension the chain by screwing in the chain adjuster nut an equal amount on both sides.
3. Check the chain tension.
   See also page 7.
4. Check the rear wheel and chain alignment.
   See page 34.
5. Tighten the shaft nut.

Check the foot brake adjustment. See page 34.

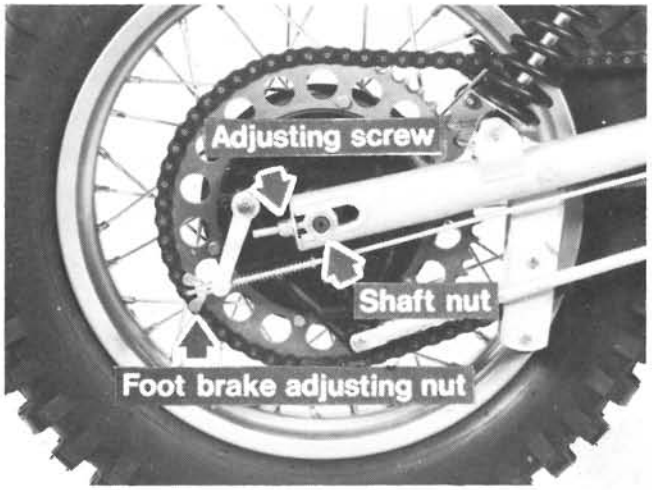


Fig. 33.3

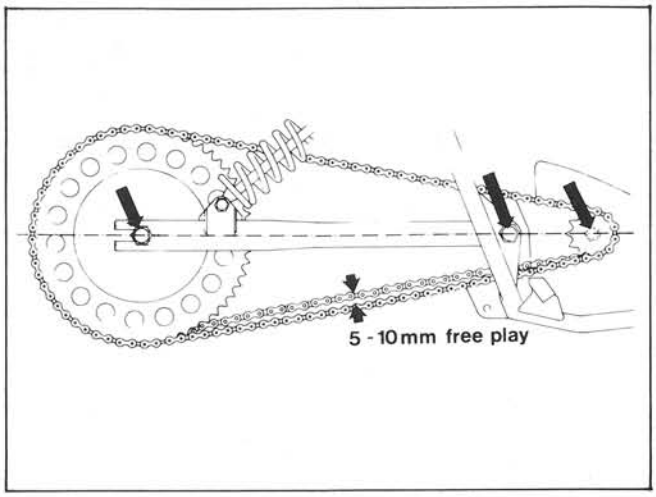


Fig. 34.1

The tension of the drive chain should be checked as follows:

1. Press down the machine until the three shafts in fig. 7.4 lie on a straight line. In this position the chain is maximally extended.

2. When the three shafts are in a straight line there shall be a play in the middle of the chain on 5–10 mm.

Both excessive and insufficient chain tension can cause unnecessary loading on the chain, sprockets, shafts and bearings.
In order to reduce wear, the chain should also be lubricated with engine oil every time before use.

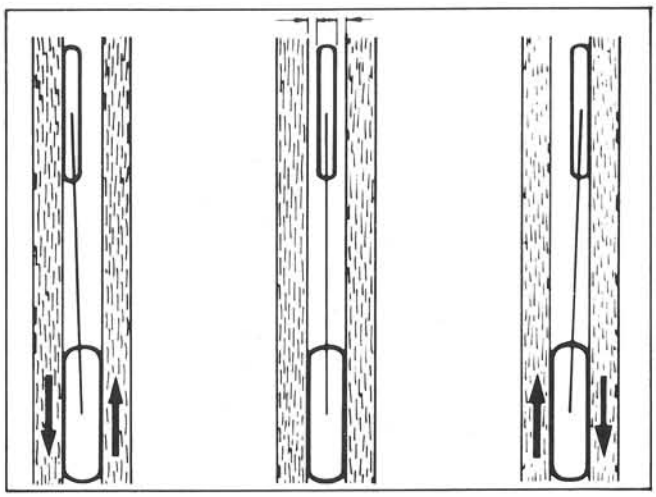


Fig. 34.2

Front and rear wheel alignment

Wheel tracking is best checked with the aid of two wooden planks about 2 m long. Position the planks on either side of the motorcycle about 10 cm above the ground, making sure that they are close up against the tyre on the rear wheel.
The front wheel should now be exactly in the center of the space between the planks and parallel with them. See fig. 34.2.
If adjustment of wheel tracking is required, it is also necessary to check the tension of the chain.

Chain track

Also check the chain tracking by looking from the back of the machine. See fig. 34.3.

Fig. 34.3

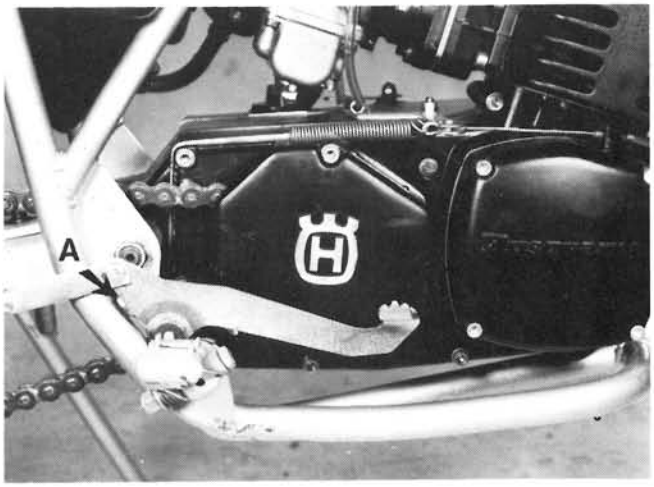


Fig. 34.4

Adjusting foot brake

The foot brake pedal should have a play of at least 15 mm measured at the front edge of the pedal.
The upper position of the pedal can be adjusted by the screw (A) behind the pedal.

Chain masterlink

The chain masterlink should be mounted so that the closed part of the clip faces in the direction of rotation of the chain.

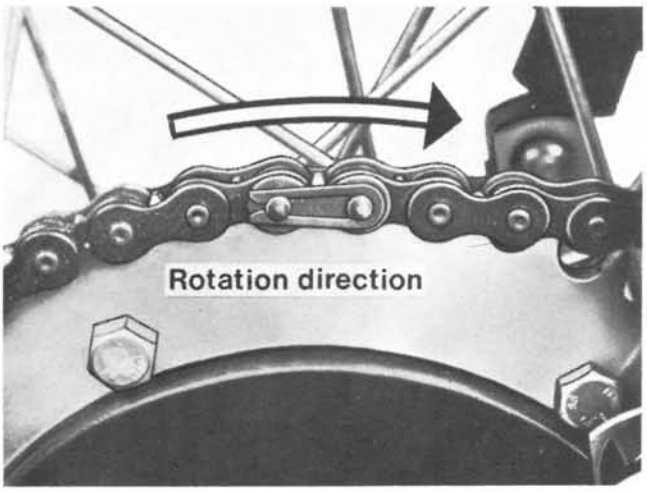


Fig. 35.1

Oil changing

Unscrew the filling cap at the top of the transmission cover and the drain screw in the bottom and let the oil run out. Clean the magnetic plug of the drain screw and check its washer.

Mount the drain screw and fill up with new oil through the filling hole.

When the level is correct, oil should run out through the level hole when the motorcycle is held upright and standing on a horizontal surface. See fig. 35.2. Oil capacity in gearbox 1,2 lit.

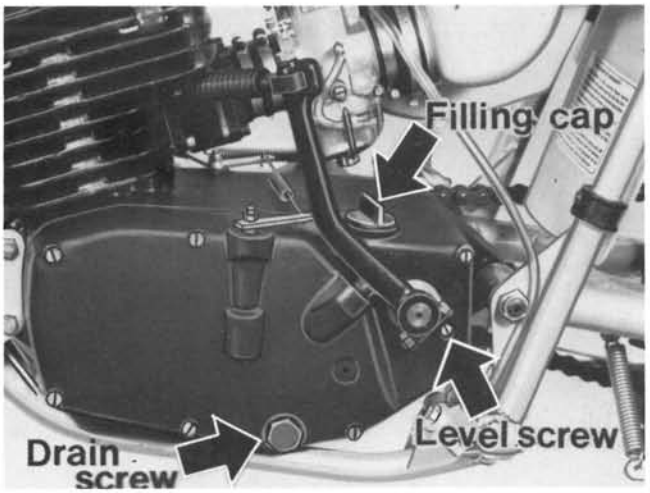


Fig. 35.2

Electrical and ignition system

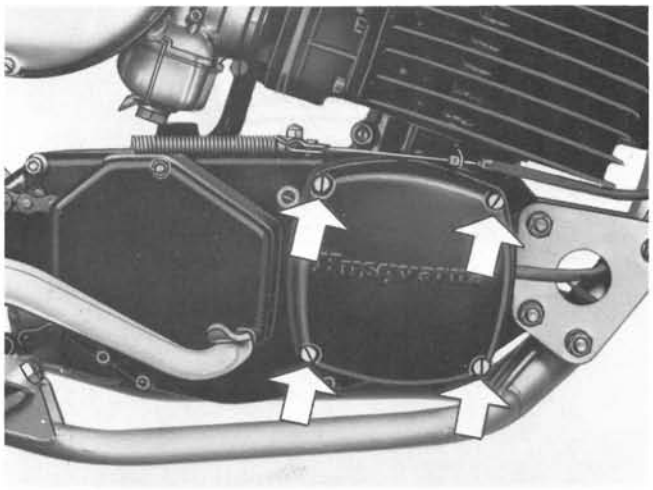


Fig. 36.1

Removing and fitting

1. Remove the right-hand crankcase cover and the chain cover.

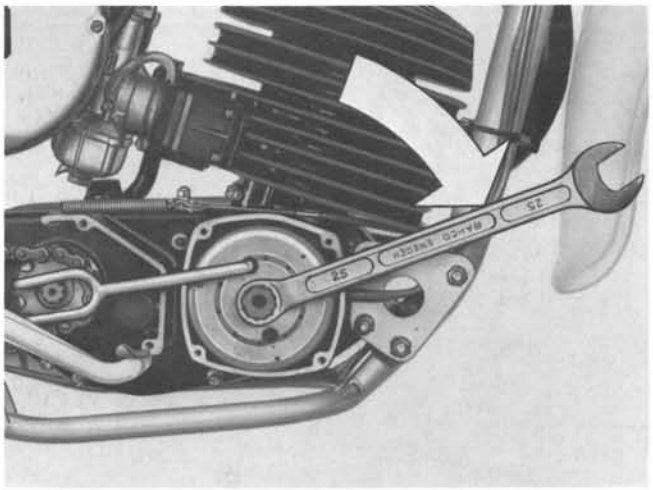


Fig. 36.2

2. Apply the holding spanner and screw off the flywheel nut.

(Note: left-hand thread)

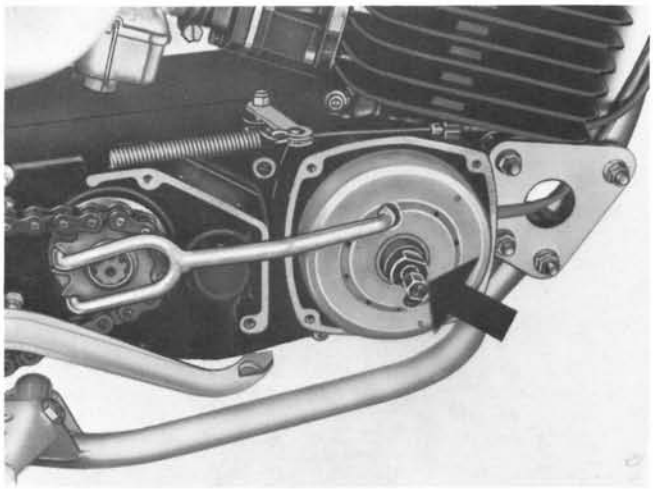


Fig. 36.3

3. Place the flywheel puller in position. Make sure that the puller is screwed in fully.

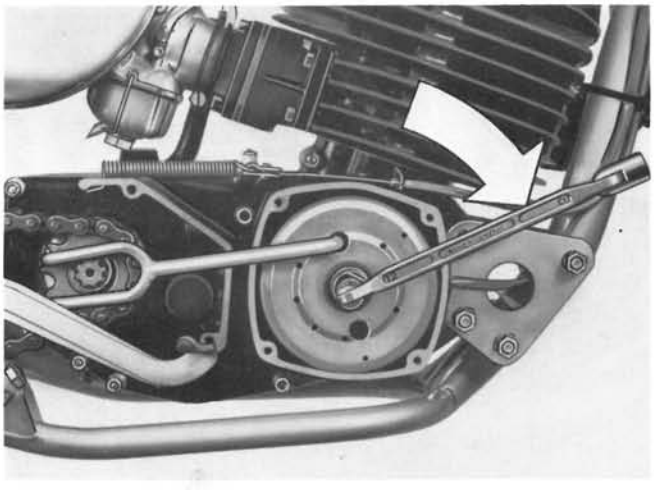


Fig. 36.4

4. Place the holding spanner in position (see figure) and pull off the flywheel.

5. Before fitting a new flywheel, grind it in with grinding compound.

NOTE! Don't forget to wipe the cone on shaft and flywheel free from grinding compound.

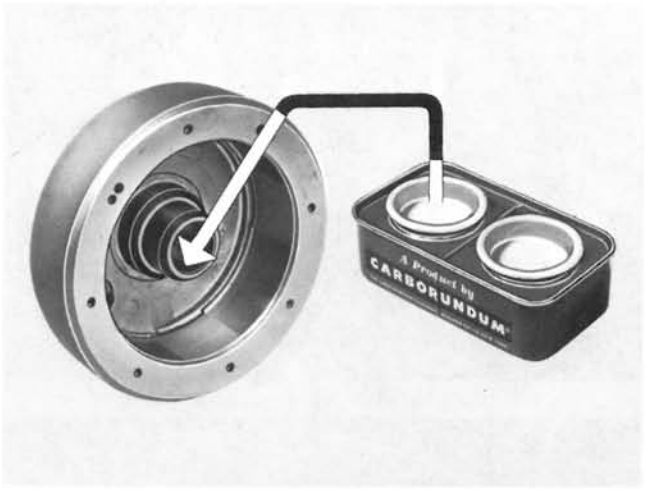


Fig. 37.1

6. Fit in the reverse order and tighten the flywheel nut to a torque of 70 Nm.

NOTE! Tighten the flywheel nut three times, by assembling, after about 2 min running and then after about 2 hours.

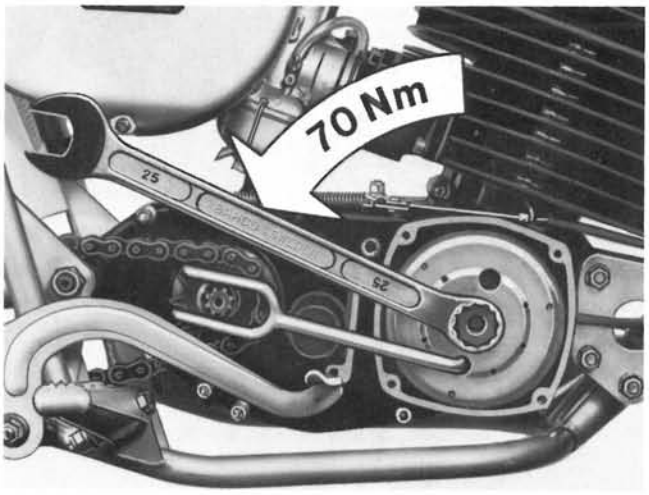


Fig. 37.2

Ignition system

This ignition system has no mechanical contact breaker. Instead, the current is interrupted by a transistor which is magnetically actuated by the flywheel via a coil.
Since this ignition system has no moving parts (except the flywheel, of course), it is less sensitive to moisture and dirt and is more reliable than common conventional systems.

1. Alimentation coil condenser charging
2. Pick-up coil
3. Limiting resistor
4. Rectification diode
5. Thyristor
6. Condenser
7. Return diode damped waves
8. High Tension coil
9. Spark plug

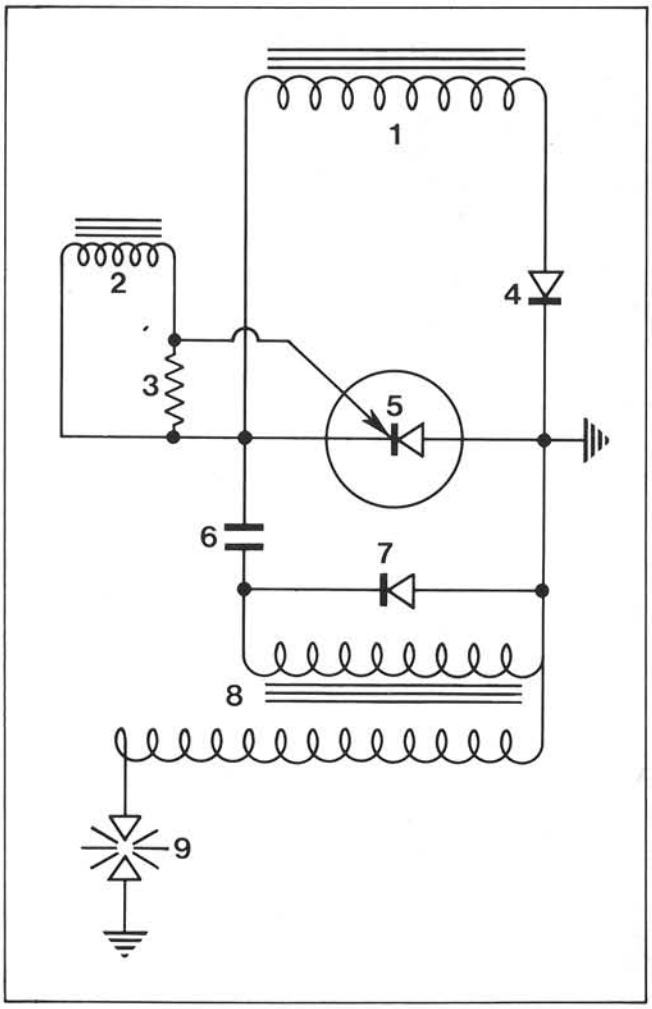


Fig. 37.3

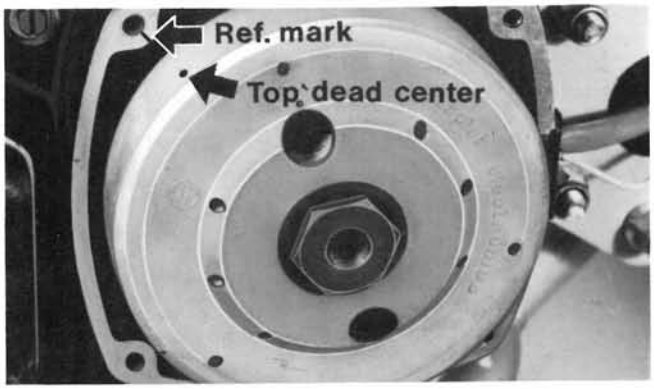


Fig. 38.1

Searching ignition point

1. Place the piston in the upper dead center.
2. Put a mark on the flywheel and a reference mark on the mounting plate. See fig. 38.1.

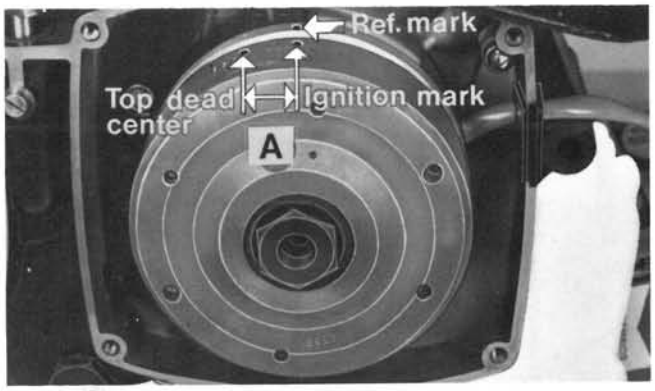


Fig. 38.2

3. Turn the flywheel (the ignition advance A) backwards and put a new mark in the flywheel, beside the reference mark in the crankcase. See fig. 38.2.

NOTE! Also see technical data, concerning ignition advance.

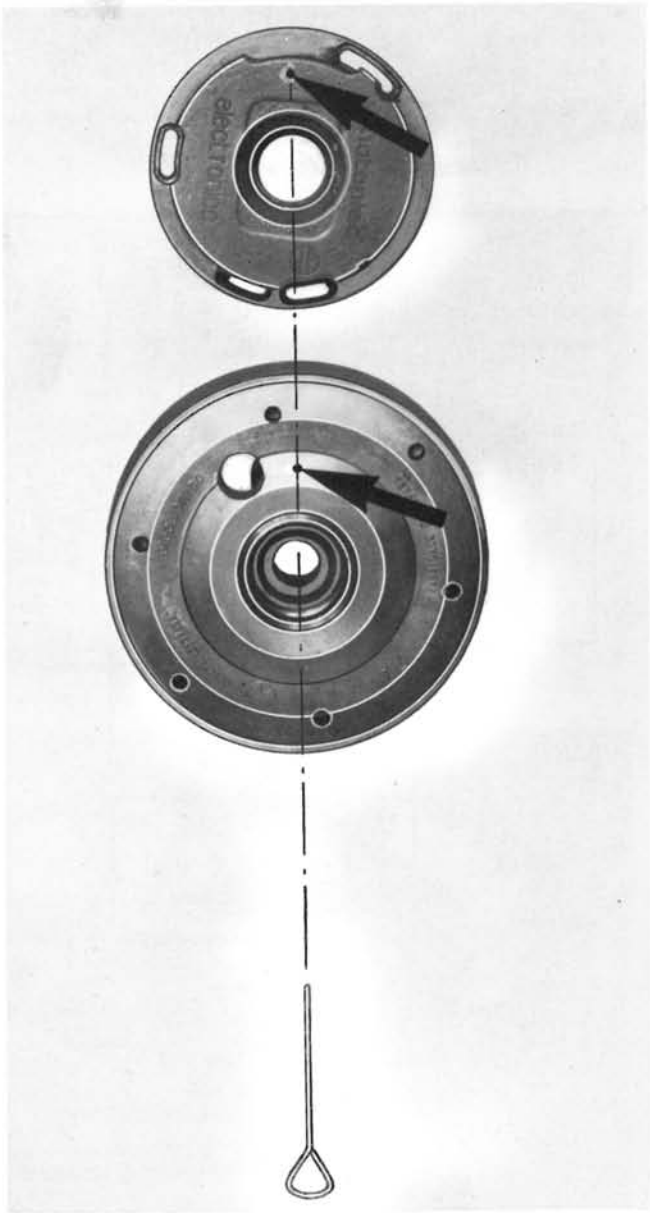


Fig. 38.3

Timing will be done by introducing the attached 2 mm pin through the hole in the flywheel and the hole in the stator (see fig. 38.3). As these holes coincide this will indicate the moment at which the spark jumps.

1. Put the pin through the flywheel into the hole of the armature plate and turn the whole ignition system until the ignition mark in the flywheel and the mark in the crankcase are beside each other.

NOTE! See to it that the armature plate moves easily so that the pin is not being deformed.

4. Remove the flywheel and fix the armature plate in this position.

Spark plug

Use a Champion spark plug N2 or plug of another make with equivalent heat range.
When running for long periods at full output or in hot weather it is advisable to use a sparking plug with a higher heat range.

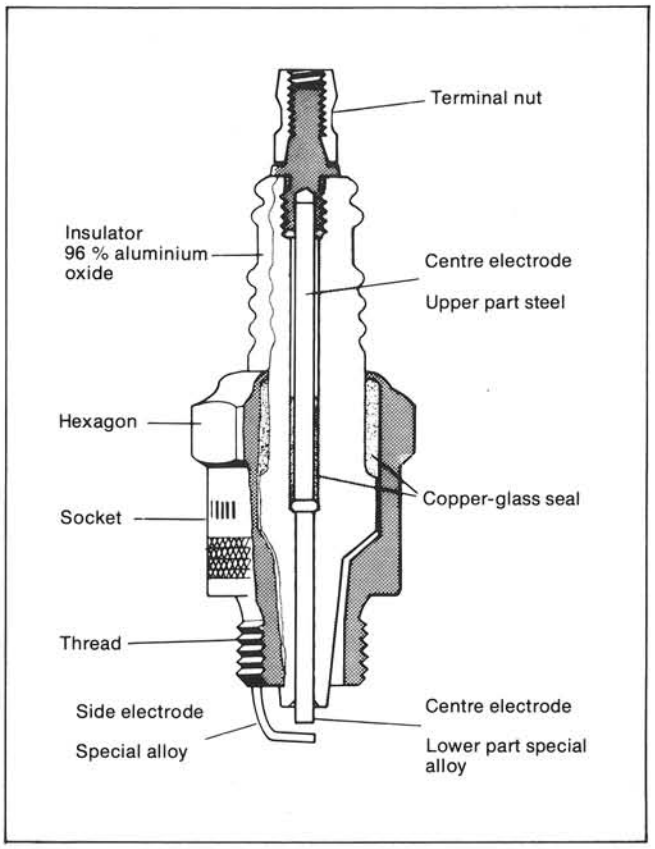


Fig. 39.1

Heat rating of the spark plug

The heat rating indicates the degree of heat load which a spark plug can withstand. A plug with a high heat rating can withstand a higher heat load than one with a lower heat rating. The higher the heat rating, the greater the resistance to glow ignition and the less the resistance to carbonizing and oiling up.
The working temperature of the spark plug should be between 500° and 850°C. 500°C is the self-cleaning temperature, i.e. the temperature which the plug must obtain in order not to carbonize or oil up. At above 850°C the spark plug can cause glow ignition which will reduce the engine output and may cause damage to the engine.
A plug with too low a heat rating and which glows, usually causes overheating and piston seizure. In doubtful cases it is better to fit a plug with too cold a rating than one with too hot a rating.

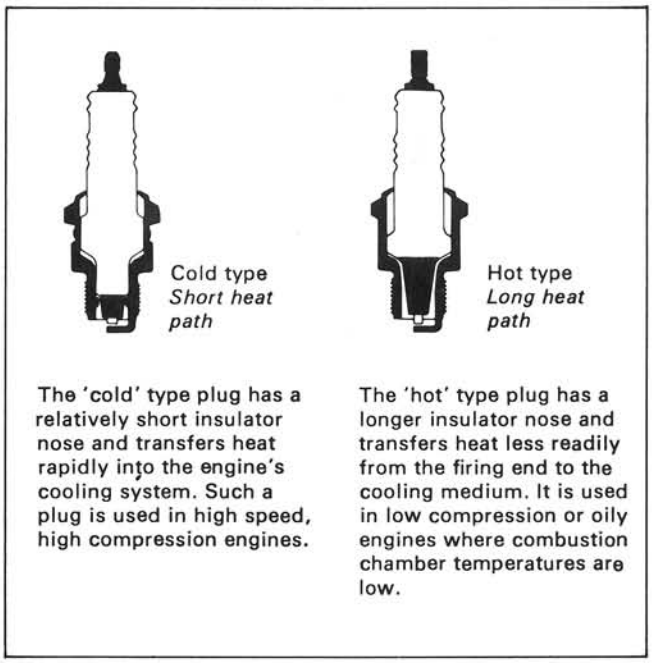


Fig. 39.2

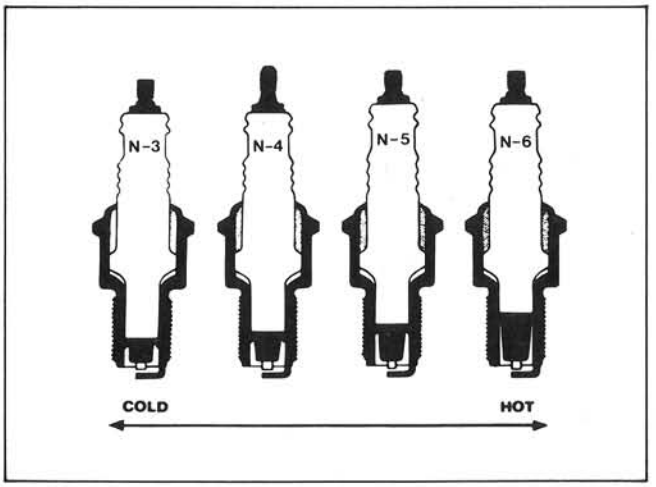


Fig. 39.3

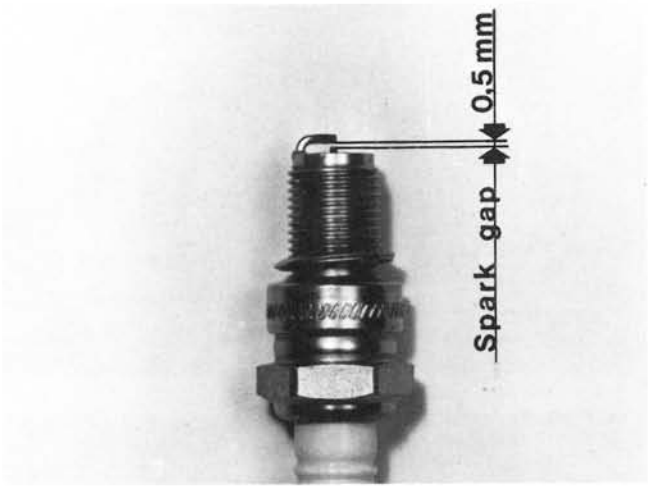


Fig. 40.1

Spark gap

The spark gap should be 0,5 mm. Too large a spark gap can cause starting difficulties as well as overloading and burning-out of the ignition coil. On the other hand, too small a spark gap can impair the acceleration, idling and low-speed characteristics.

The gap is checked with a wire gauge (not feeler gauge). Adjustment should be done on the side electrode, which is bent towards or away from the central electrode.

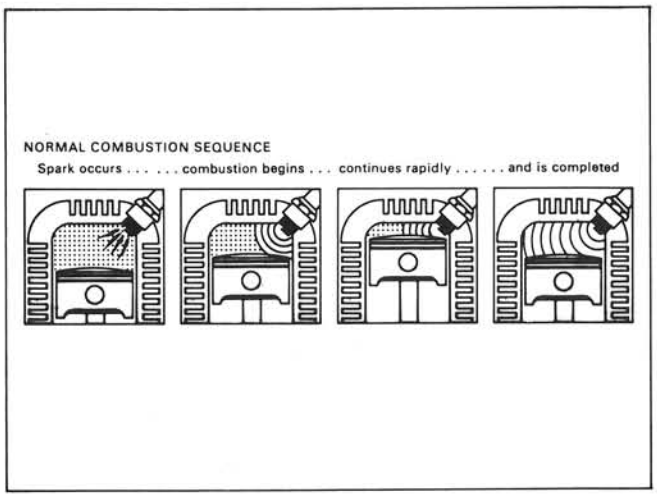


Fig. 40.2

Normal combustion

The power in an internal combustion engine is developed by the expanding gases resulting from the burning of the air/fuel charge. If the ignition timing is correct and the anti-knock quality of the fuel meets the engine requirements, the burning process should progress steadily across the combustion chamber until completed.

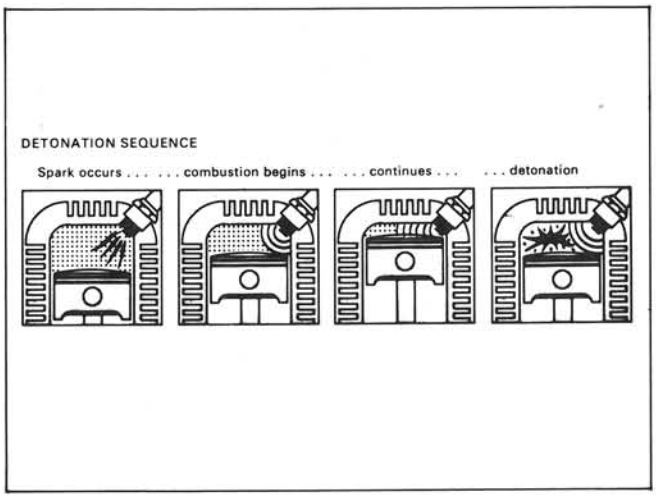


Fig. 40.3

Detonation

Detonation can occur when the anti-knock quality of the fuel does not meet the engine requirements.
Apart from the use of fuel with a lower octane value than recommended, there can be other reasons for this, e.g. over-advanced ignition timing, or build-up of deposits in the combustion chamber which will affect the rate of heat transfer to the cooling medium.
Detonation can occur in various ways but probably the most common is that in which combustion is initiated normally from the spark plug, the flame front advances part way across the combustion chamber – when the remaining fuel/air charge "explodes". This explosion imparts a hammering pressure to the piston crown, and combustion is completed too early. Together with the abnormal stresses, detonation causes greatly increased combustion chamber temperatures.

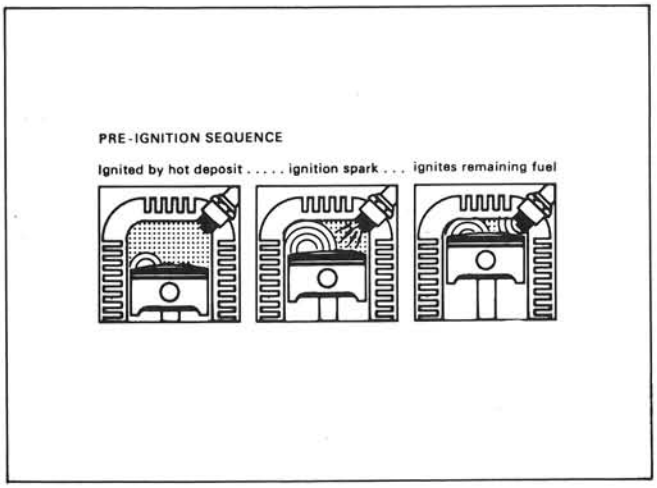


Fig. 40.4

Pre-ignition

Pre-ignition is the term used to define the ignition of the fuel/air charge before the spark occurs. Any hot-spot within the combustion chamber, such as carbon deposits, rough metallic edges, improperly seated valves, or overheated spark plugs can be capable of starting combustion.
As a result of this early combustion, the piston compresses the already expanding as, causing an abnormal increase in combustion chamber temperature and pressure which may ultimately damage engine components and spark plugs.

Appearance of the spark plug

Correct appearance:
Medium-brown insulator base, dark grey socket with grey carbon deposit. No excessive burning of the electrodes.

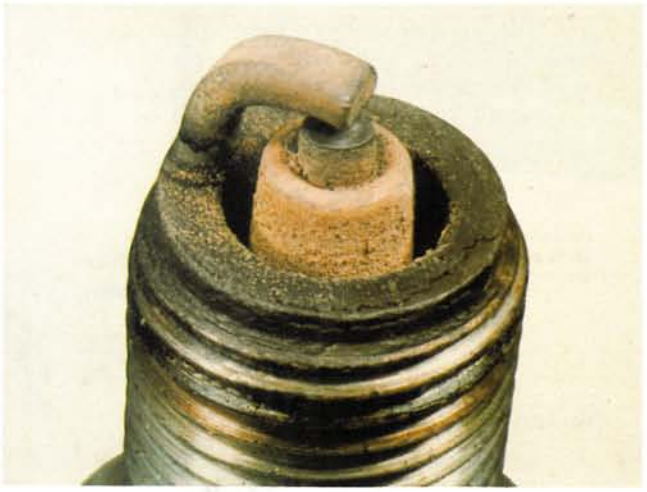


Fig. 41.1

Incorrect appearance:
Beads on insulator base, which is burnt white. Electrodes "blued".

Possible fault: Heat rating too low. Fuel/air mixture too lean. Ignition too early. Sparking plug insufficiently tightened.

Fig. 41.2

Insulator base, socket and electrodes coated with oil and carbon deposits.

Possible fault: Heat rating too high. Too much oil in the petrol.

Fig. 41.3

Insulator base, socket and electrodes coated with dry, black soot.

Possible fault: Heat rating too high. Fuel/air mixture too rich. (Air cleaner blocked).

Fig. 41.4

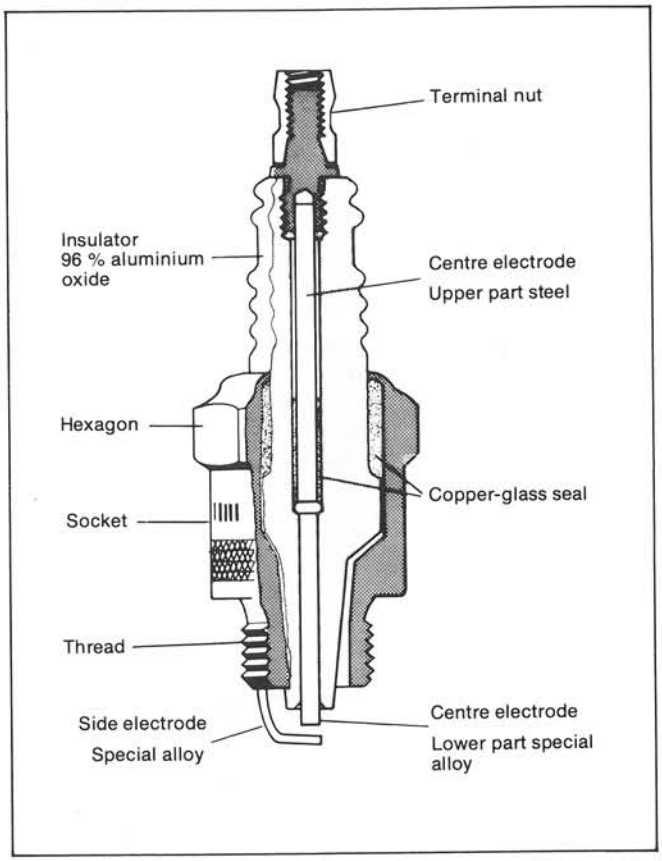


Fig. 42.1

If your motorcycle will not start, the fault will most probably lie either in the Ignition System or in the Fuel System. A few simple checks may help to pinpoint the problem.

Ignition system

Check that the plug cover is unbroken and making good contact.
Inspect the H.T. lead for signs of wear. Cracked cable should be replaced.
Remove and inspect the spark plug. Look for the conditions described under "Appearance of the spark plug." Page 41.
Check to see that enough voltage is reaching the spark plug. Disconnect the high-tension lead from the spark plug terminal and while kicking the engine over, hold the end about 1/4" to 3/8" (6 to 8 mm) from the engine block. A flat blue spark across the gap between the lead and block while kicking the engine over indicates that the ignition system is working properly.
If the spark is weak, yellow or reddish, the ignition system should be checked by a qualified technician.

Light system

Fig. 42.2

Some models are equipped with a light system. On european models the system also include a dimmer switch and a horn.
See the separate technical data sheet.

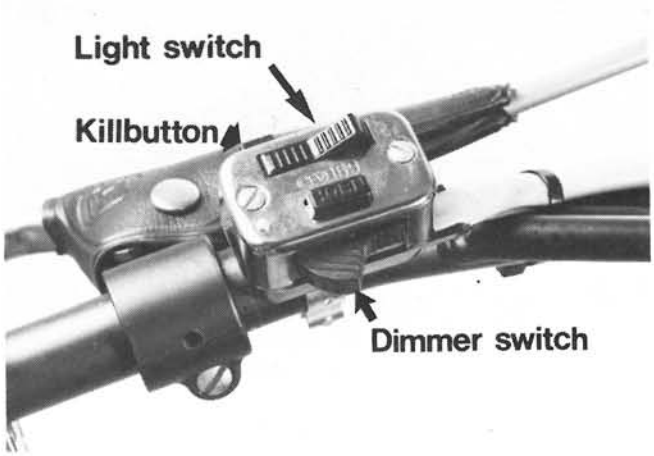


Fig. 42.3

To prevent a too high voltage to the bulbs the light system also include a voltage regulator.

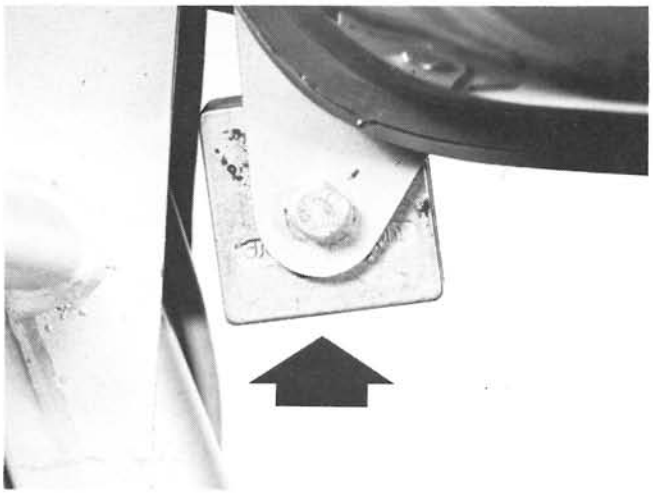


Fig. 43.1

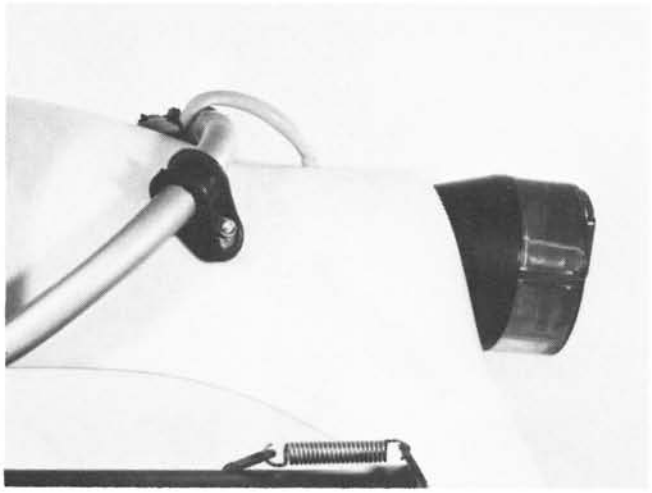


Fig. 43.2

Speedometer (Acc)

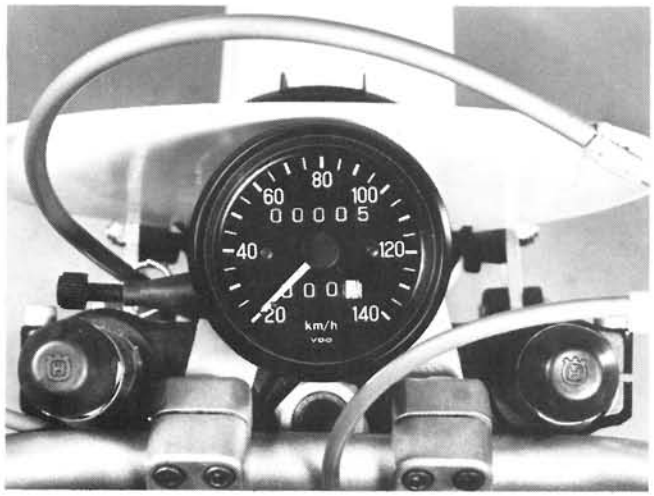


Fig. 43.3

Fig. 43.4

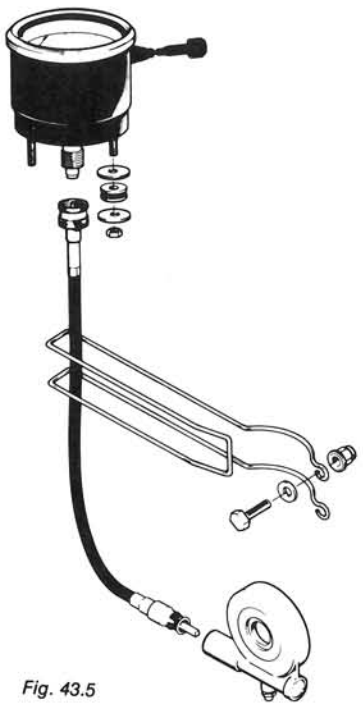


Fig. 43.5

Front fork

Fig. 44.1

Function
The front fork is of the telescopic type with hydraulic damping.
The damping action is obtained by means of a damping spindle which is attached to the fork leg in such a way that the fork tube runs over the spindle. The oil in the fork is thereby forced to pass through an area which alternates with the spring movement of the machine and which is dimensioned so that the correct oil flow resistance is obtained for each particular position of the suspension system.
This means that heavier oil increases the damping effect (harder suspension), whereas a thinner oil reduces the damping effect (softer suspension).
Each forkleg is equipped with an air nipple.

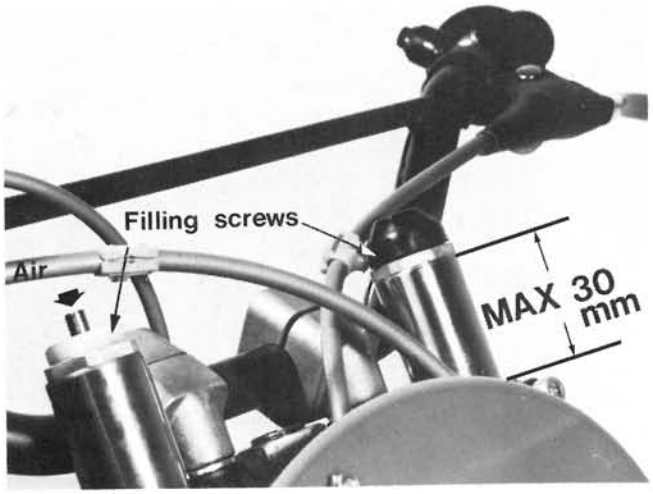


Fig. 44.2

Front fork adjustments

Changing fork angle
The fork angle and the lead distance can be altered by moving the fork up in the fork crown. We recommend a maximum distance of 10 mm.
Moving the fork legs upwards through the fork crowns gives a small fork angle.

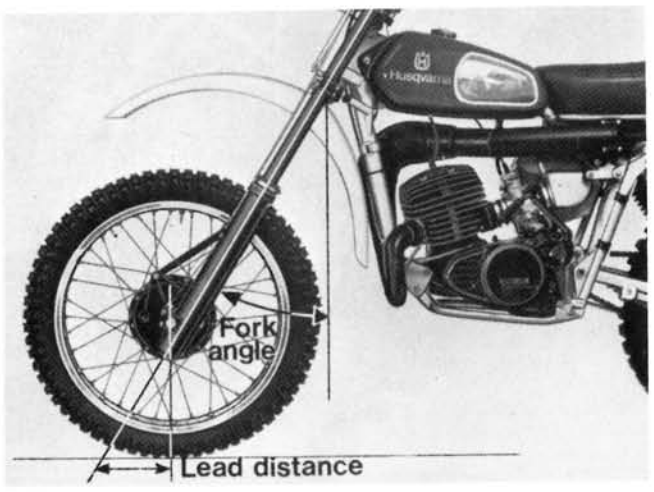


Fig. 44.3

Character:
Big fork angle (fork down as standard) gives even ride in bumpy tracks, but difficulties in sharp bends. Small fork angle (fork upwards, max 10 mm) makes the machine easy to go round sharp bends, but difficult to ride on bumpy straights.

NOTE! Don't push up the fork through the fork crown so the wheel can be able to hit the mudguard!

Oil changing

Remove both the drain screws and filling screws. Screw in the drain screws again after the oil has run out. Fill up with 0,24 l of a suitable type of oil in each fork leg.
Screw in and tighten up the filling screws.

Oil recommendation: Engine oil SAE 10–SAE 30 depending on temperature, rider and course.

NOTE! Oil change 0,24 l/leg. (8.11 oz U.S.).
Disassembling leg 0,25 l/leg. (8.45 oz U.S.).

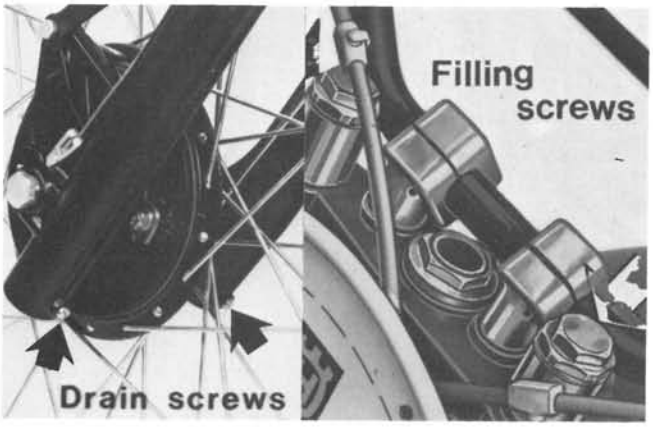


Fig. 45.1

Adjustment of front fork parallelism

In a crash, the fork shanks may be distorted in relation to one another as shown in fig.

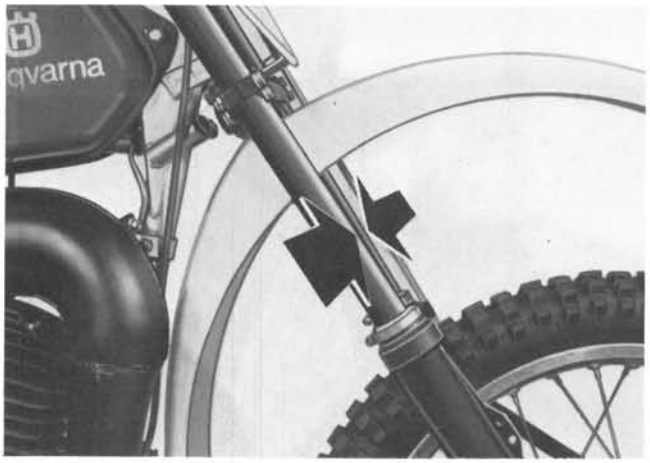


Fig. 45.2

This can be corrected by slackening the two clamping bolts.

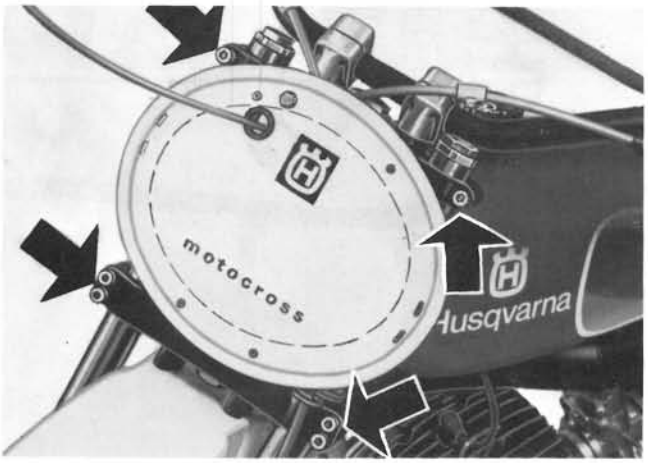


Fig. 45.3

Adjust the fork until the shanks are parallel again.

Fig. 45.4

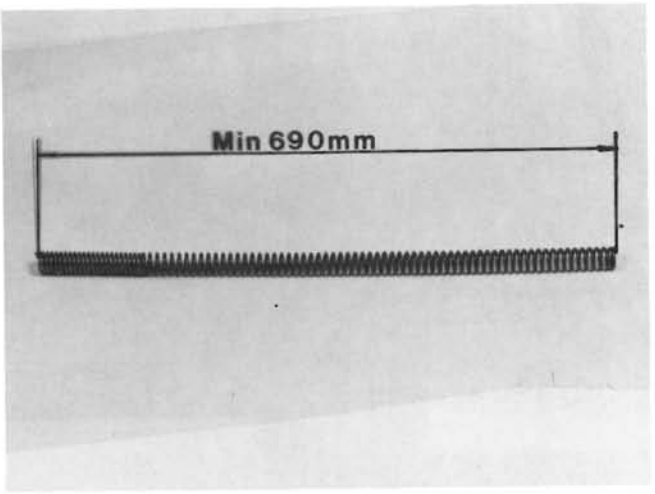


Fig. 46.1

Spring "time for change".

Put the two springs in each forkleg together on a flat surface. When the springs are shorter than 690 mm they must be changed.

NOTE! Always replace the springs in both fork legs at the same time.

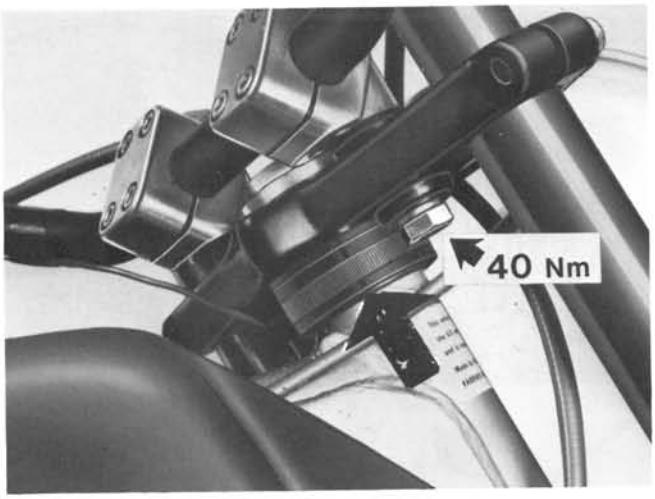
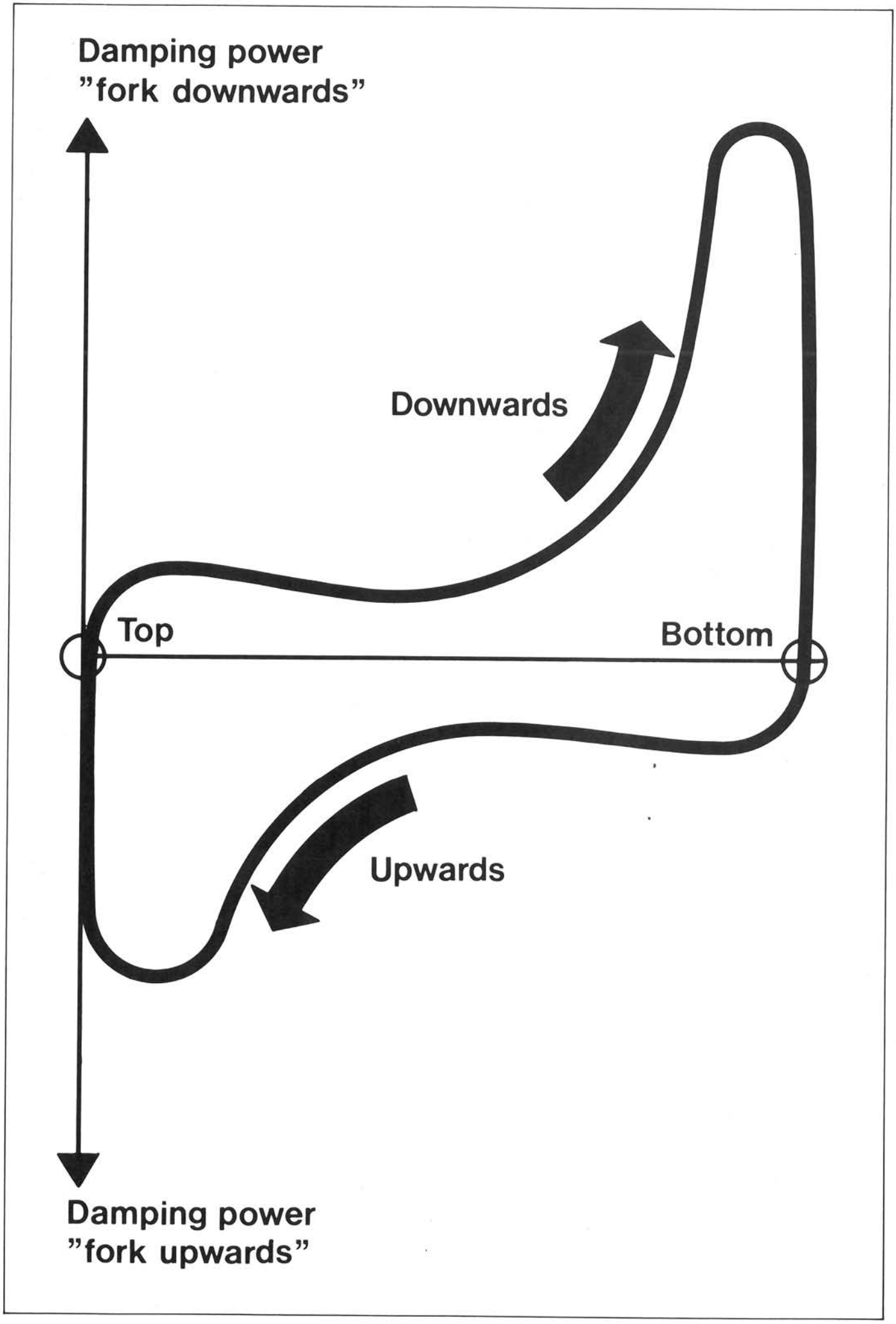


Fig. 46.2

Rubber mounted handle bar

The handle bar is connected with rubber element and mounted to the fork-crown.

Rubber mounted handle bar gives you less vibrations.


Damping power
"fork downwards"
Downwards
Top
Bottom
Upwards
Damping power
"fork upwards"

Rear suspension

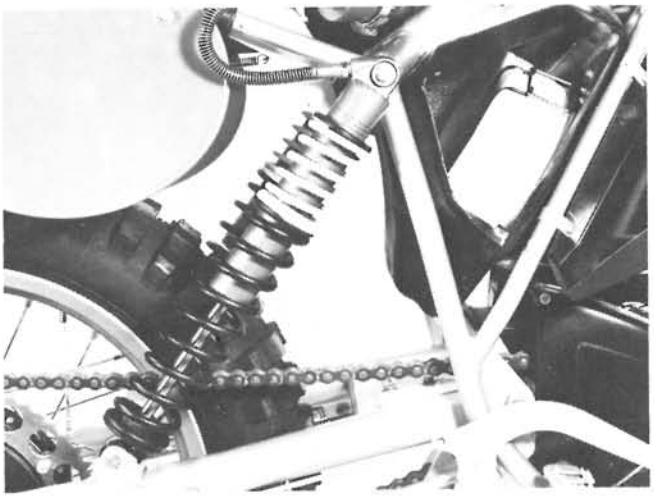


Fig. 48.1

General

The shock absorber is of gas-damping-type. The damping system works in oil, but the pressure is controlled by a gas volume in the upper part of the shock absorber.

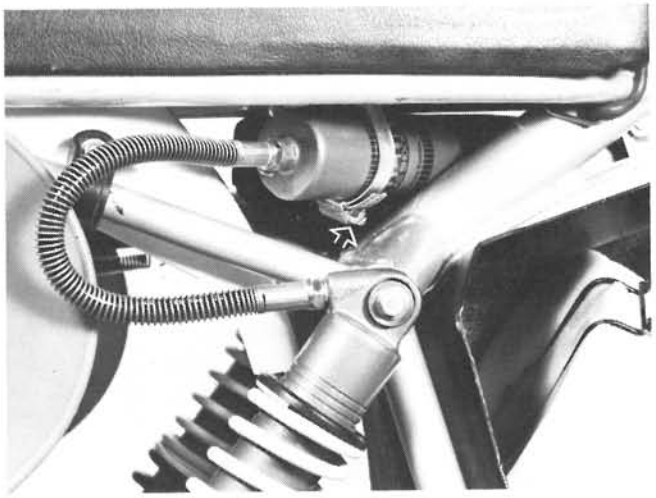


Fig. 48.2

Function

When the unit compresses, the oil flow will bend the membran and only pass the big holes in the piston. That gives a small damping resistance at compressing.

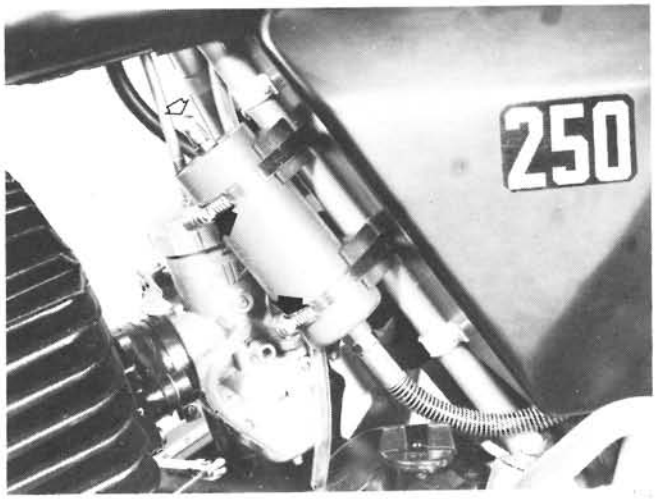


Fig. 48.3

When the unit releases, the membran lies tight to the piston and the oil must flow through the small holes in the membran when piston is moving downwards. That gives a hard damping resistance.

The shock absorber is equipped with two springs. The upper one is soft and absorbes the small shocks while the lower and stronger spring absorbes the hard shocks.

Mounting

It is very important to keep the gas volume in the upper part of the unit. Therefore, always mount the shock absorber as fig. shows.

Shock absorbers with separate reservoirs are mounted as shown on fig.
N.B. For service and disassembly of reservoir shocks see your local dealer.

Rear-fork

Rear fork bearings

The rear fork is equipped with needlebearings. Two in each leg.
Inside the bearings there is a sleeve and around the sleeve there are also two O-rings.

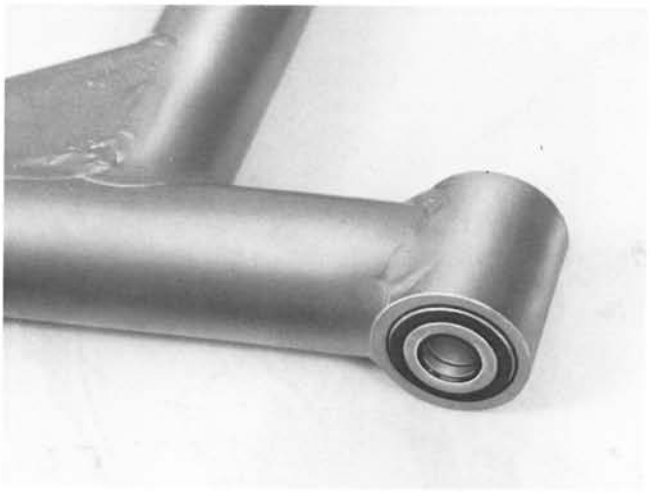


Fig. 49.1

Changing needle bearings

Remove the bearings with help of a support 15 19 855-01 and press with help of the drift 15 19 856-01.

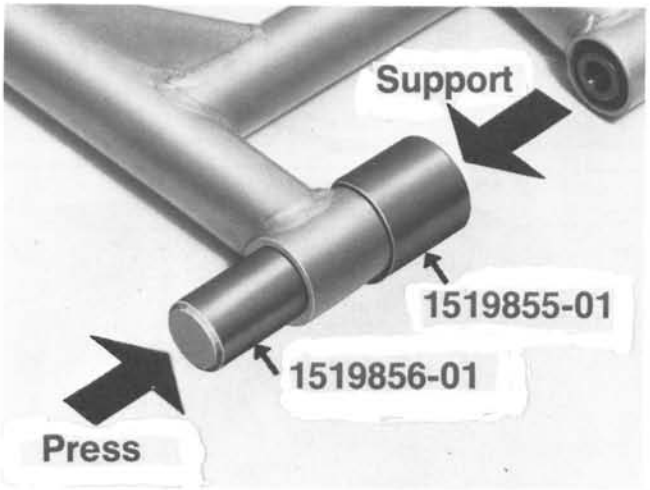


Fig. 49.2

Mounting of new bearings is done in the following order.

1. Take the drift 15 19 857-01.
2. Put a new needlebearing on the drift.
   NOTE! Text on the edge of the bearing shall be out.
3. Put the stearing-sleeve 15 19 854-01 on the drift, and then press the bearing into the swing-arm with help of a hydraulic press.
4. Put another bearing on the drift and press it in from the other side of the leg.

NOTE! Text shall be out. See fig. 49.3.

5. Mount the sleeve and the two O-rings. See fig. 49.1.

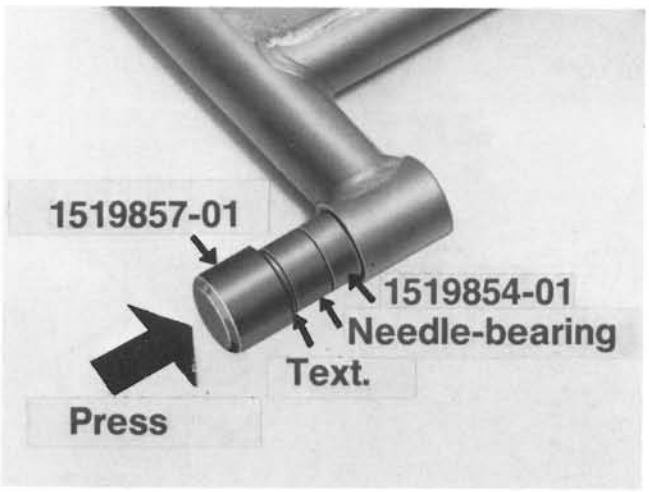


Fig. 49.3

Wheels and brakes

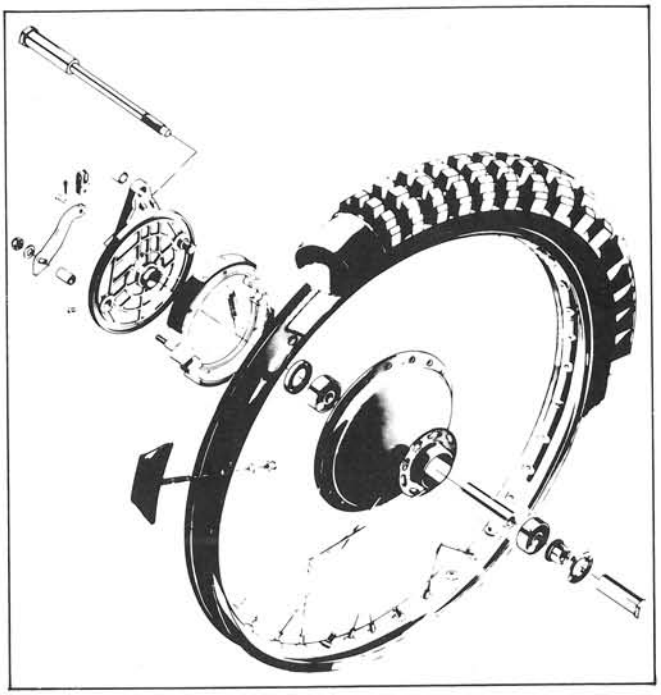


Fig. 50.1

Front wheel

General

The front wheel has a solid hub and is fitted on a removable axle. The wheel has a brake hub, the shoes which are actuated by a control cable attached to the brake handle.

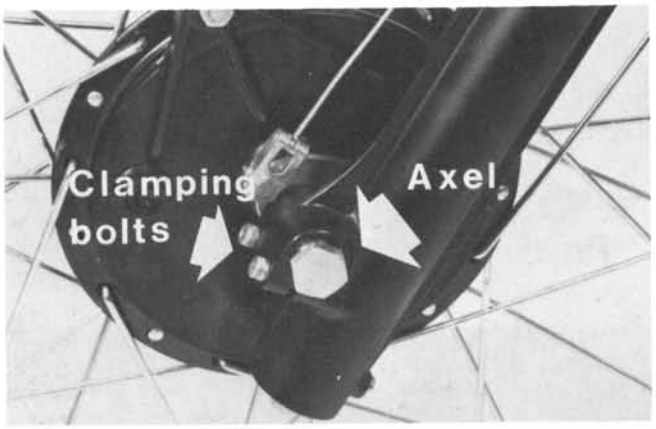


Fig. 50.2

Removing the front wheel

Block up the motorcycle so that the front wheel can rotate freely.
Loosen the right-hand fork leg clamping bolt and screw out the axle.
Pull out the axle.

N.B. Do not loosen the left-hand fork leg clamping bolt or axle nut.

Lift the front wheel out of the fork and remove the brake shield. Fitting is done in the reverse order.

NOTE! Don't forget to tighten up the clamping bolt.

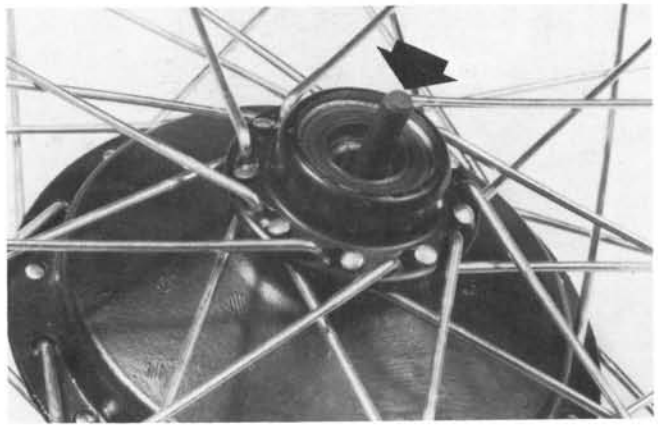


Fig. 50.3

Replacing bearings

Apply a plain drift on the edge of the inner track on one bearing. Drive out the bearing by alternating the position of the drift.

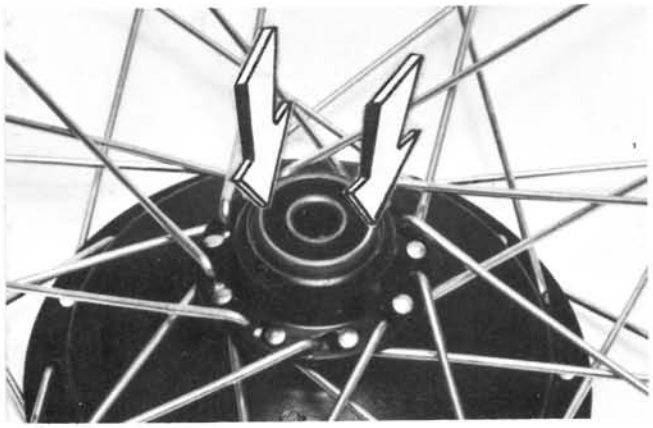


Fig. 50.4

When mounting the bearing put the drift on the outer track. See fig. 50.4.

NOTE! Remember to fit the spacing sleeve between the bearings.

Rear wheel

The rear wheel has a conical hub of Husqvarna's own design. The hub is connected to a "low-edged" rim with extra strong spokes.

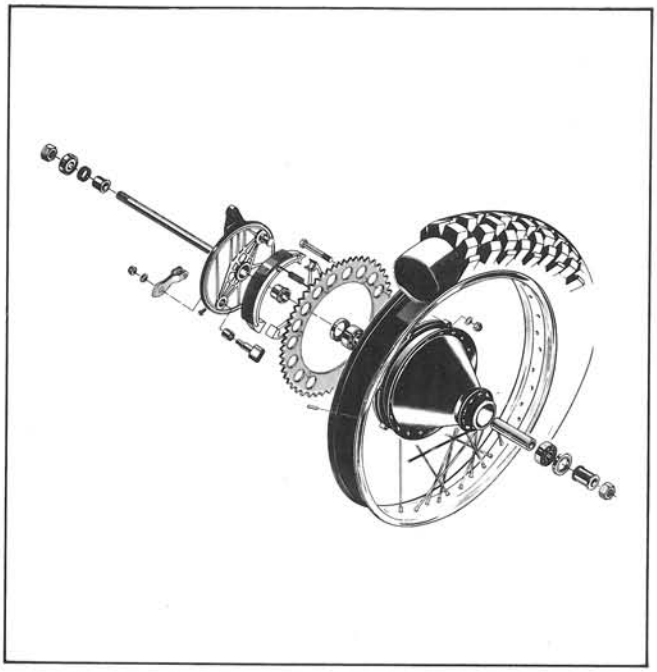


Fig. 51.1

Removing rear wheel

Block up the machine so that the rear wheel can rotate freely.

a) Part the drive chain by opening the chain master link.
b) Disconnect the brake link.
c) Screw off the wing nut from the brake rod and remove its return spring.
d) Remove the axle and pull out the wheel.

Lift off the brake shield and distance pieces. Watch out fot the spacing sleeve in the brake shield.

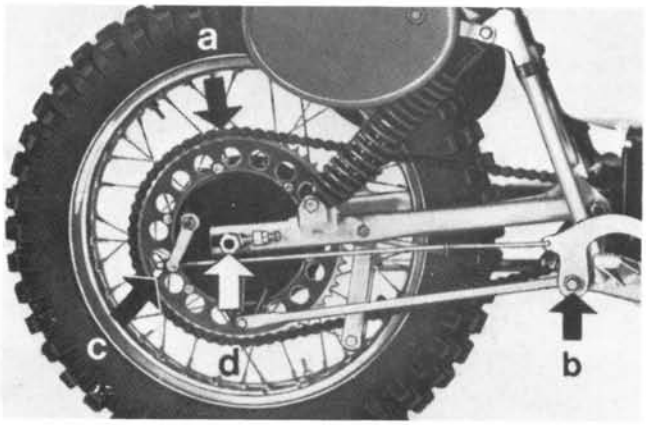


Fig. 51.2

Replacing wheel bearings

Check the bearing play by grasping the rear wheel with one hand and the rear part of the frame with the other. See fig. 51.4. Push the wheel backwards and forwards alternately. If any play can be noticed, the wheel bearings should be replaced with new ones. Bearing replacement is carried out in the same way as for the front wheel, but note the spacing washer between the ball bearing and oil seal on the brake drum side.

Lubricate the spacing sleeve in the brake shield bearing and fit the brake shield.

Fig. 51.3

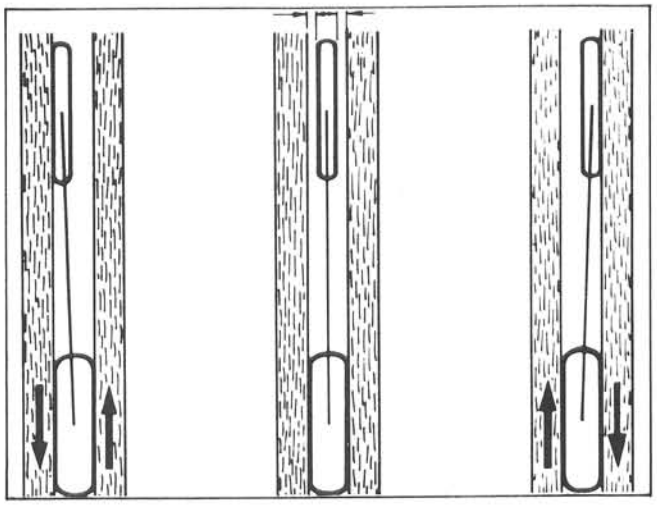


Fig. 52.1

Wheel alignment

Fitting rear wheel in rear fork

Place the wheel in the rear fork and fit the distance pieces, axle and axle nuts.
Tighten the axle nuts loosely and fit on the brake linkage and brake rod with the pedal.
Check the drive chain tension. See page 7.
Adjust the chain tension if necessary with the tensioning screws.
Check that the rear wheel tracks with the front wheel.
Tighten up the axle nuts.

Fig. 52.2

Front and rear wheel alignment

Wheel tracking is best checked with the aid of two wooden planks about 2 m long. Position the planks on either side of the motorcycle about 10 cm above the ground, making sure that they are close up against the tyre on the rear wheel.
The front wheel should now be exactly in the center of the space between the planks and parallel with them. See fig. 52.1.
If adjustment of wheel tracking is required, it is also necessary to check the tension of the chain.

Chain track

Also check the chain tracking by looking from the back of the machine. See fig. 52.2.

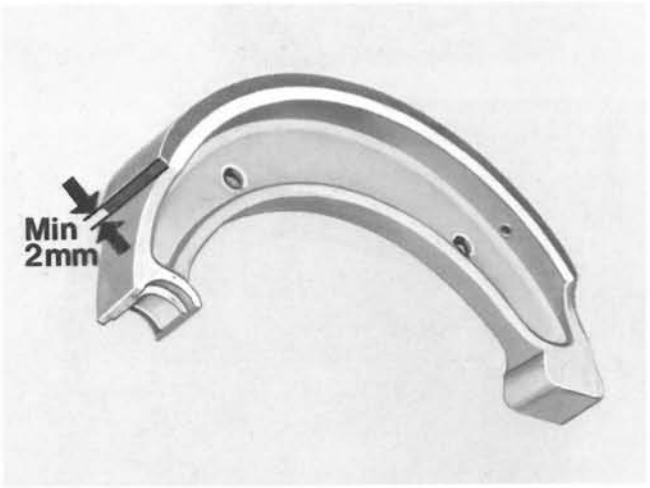


Fig. 52.3

Brakes

Replacing brake shoes

If the brake linings are worn down to 2 mm, replace the brake shoes with new ones.

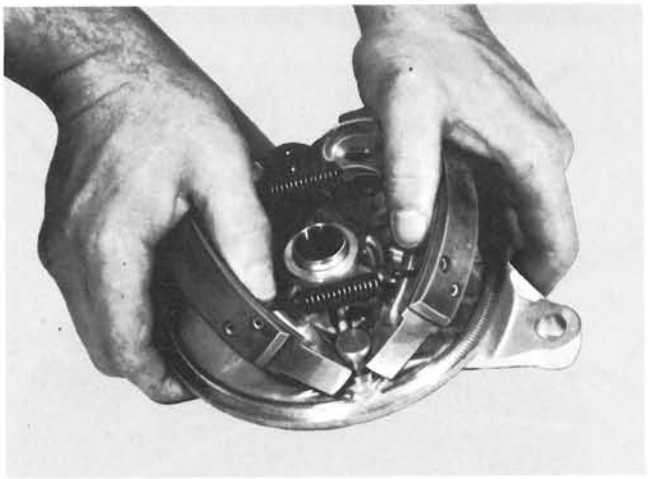


Fig. 52.4

Clean all the parts and make sure that no oil comes into contact with the brake linings.
Check that the return springs are intact and that there is no excessive play on the brake cam bearing. Replace the bush in the event of excessive play. Lubricate the bearing lightly with grease oil.
Mounting is done as per fig. 52.4.

Adjusting brake cable

The handle play should be 1–3 mm.

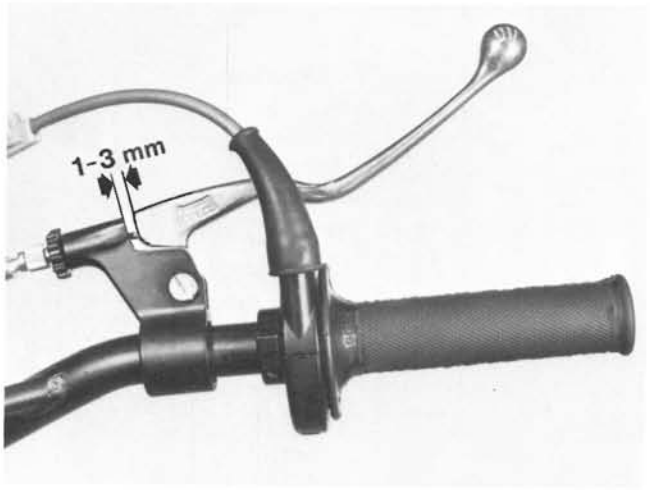


Fig. 53.1

Full braking effect should be obtained when the handle is parallel to the handle bar.

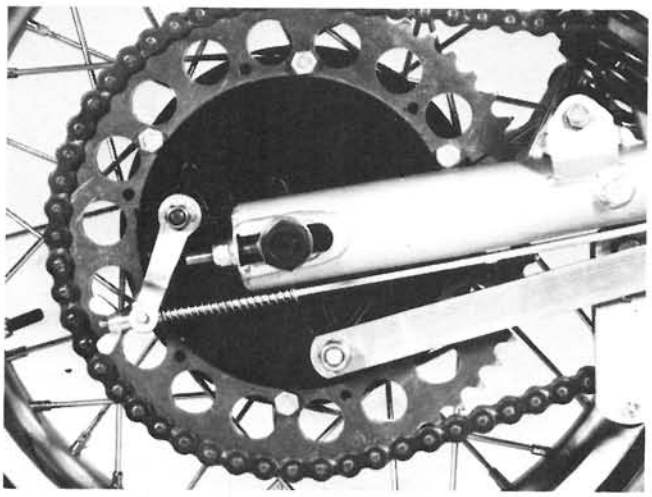


Fig. 53.2

The handle clearance is adjusted in the first place by means of the adjusting screw on the brake handle, and in the second place with the adjusting screw on the lower cable attachment.

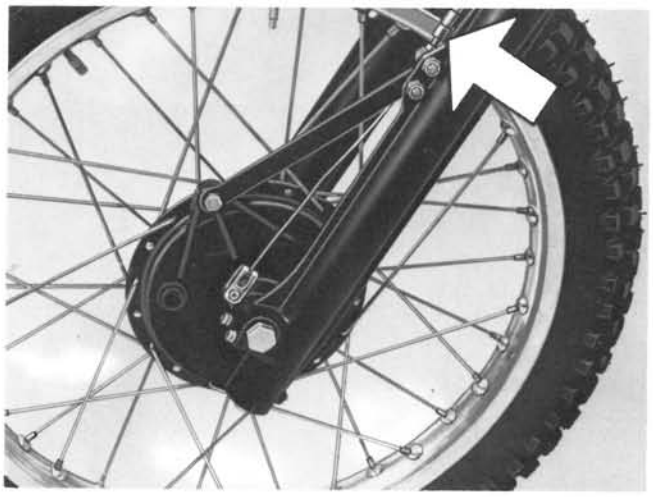


Fig. 53.3

Adjusting foot brake

The foot brake pedal should have a play of at least 15 mm measured at the front edge of the pedal.

The upper position of the pedal can be adjusted by the screw (A) behind the pedal.

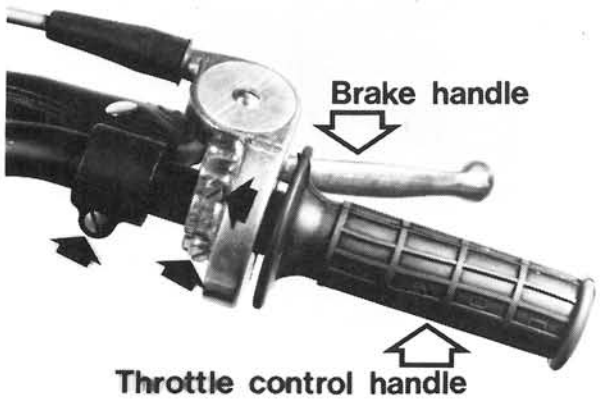


Fig. 53.4

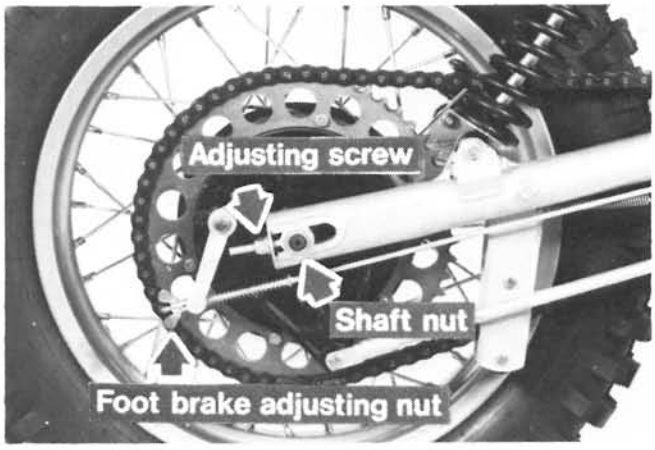


Fig. 54.1

Adjust by turning the wing nut on the end of the brake rod.

Also check that the lever on the brake shield does not hit the rear fork. There should be a clearance of at least 2 mm when the brake pedal is pressed hard down.

Fig. 54.2

Removing and fitting the tyres

Removing

1. Remove the wheel and let the air out of the tire by unscrewing the valve. Put the parts of the valve in a place where they will not get dirty or lost.

2. Protect the wheel bearings with a piece of cloth or cotton waste.

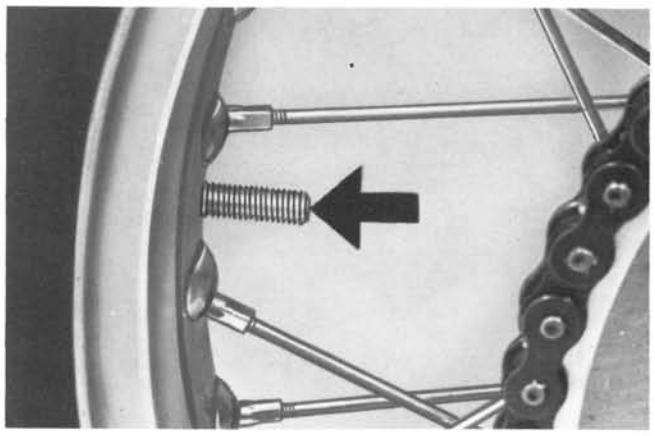


Fig. 54.3

3. Loosen the tire retainer and push it inwards.

4. Loosen the tire from the rim and lay the wheel down.

5. Insert one of the tire irons close to the valve. Pry up the bead of the tire carefully, at the same time pressing the opposite side down into the well of the rim with your knees.

Fig. 55.1

6. Insert the other tire iron about 10 cm from the first one and pry the tire off the wheel rim. Move the iron round the rim 5–10 cm at a time and lever off the tire about one-third of the way round the wheel. Remove the tire the rest of the way round the wheel, using your hands.

7. Remove the tire retainer.

8. Push the valve out of the wheel rim and remove the inner tube.

9. Stand the wheel upright and, from the inside of the rim, insert a tire iron between the other tire bead and the rim.

10. Lever the tire off the rim.

11. Remove the rim band and check that the rim is free from rust and dirt etc. which may damage the tube.

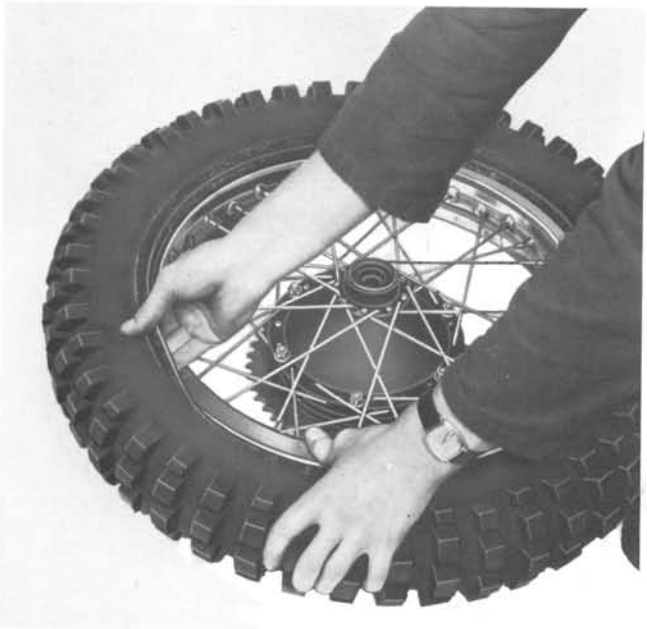


Fig. 55.2

Fitting

1. Fit the rim band, making sure that it is correctly positioned and covers all spoke nipples.
2. Pull one side of the tire in place on the wheel rim. This will be facilitated if the beading is coated with a soap solution.

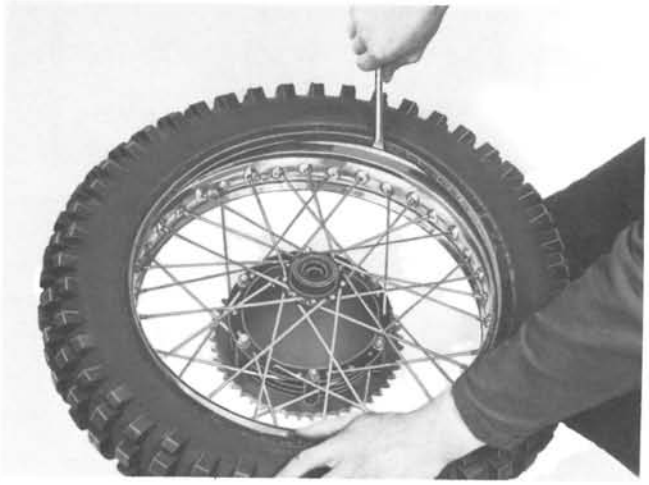


Fig. 55.3

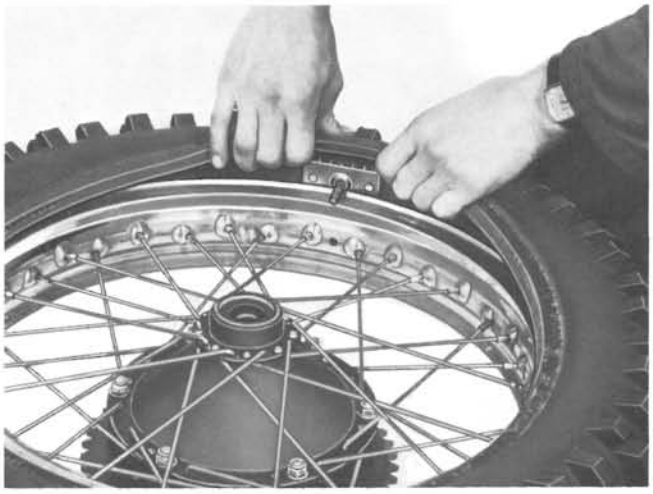


Fig. 56.1

3. Insert the tire retainer and screw the nut on a few turns. See fig. 56.1.
4. Inflate the tube partially so that when held from the hand it forms an ellipse with two folds, one at top and one at bottom. Powder the inside of the type with talc and the tube as well, if necessary.
5. Fit the valve in the rim and push the tube into the tire. Check that the valve is at right angles to the rim.

Fig. 56.2

6. Press the tire retainer into the tire and push the tire over the rim of the wheel by hand. Begin at the side opposite the valve and finish off at the valve position with the aid of tire irons.
7. Push the valve inwards and check that the hose is not pinched against the rim.
8. Inflate the tire and check that the marking on the tire is concentric with the wheel rim.
9. Bounce the wheel several times at the point where the tire retainer bolt is fitted and then tighten the nut.
   NOTE! Do not overtighten the retainer bolt as this may cause excessive distortion.

Fig. 56.3

Framenumber

The framenumber of the bike is placed on the steering-head. See fig. 56.3.

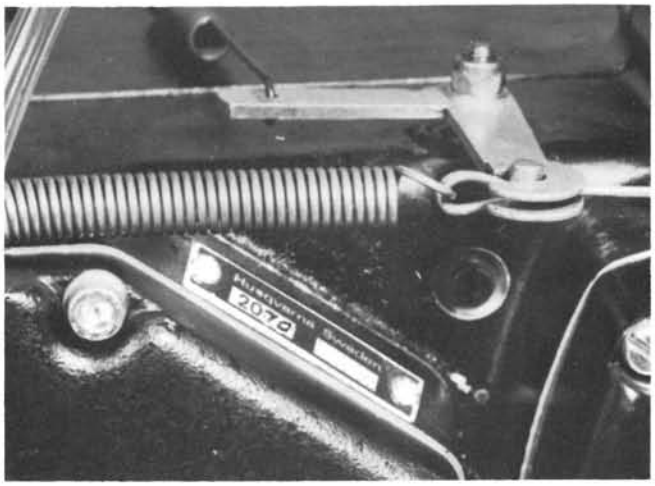


Fig. 56.4

Enginenumber

The enginenumber is placed on the top of the right crankcase. See fig. 56.4.

Controls

Kill button

By using the button on the left side of the handle bar you short circuit the ignition and the engine stops.

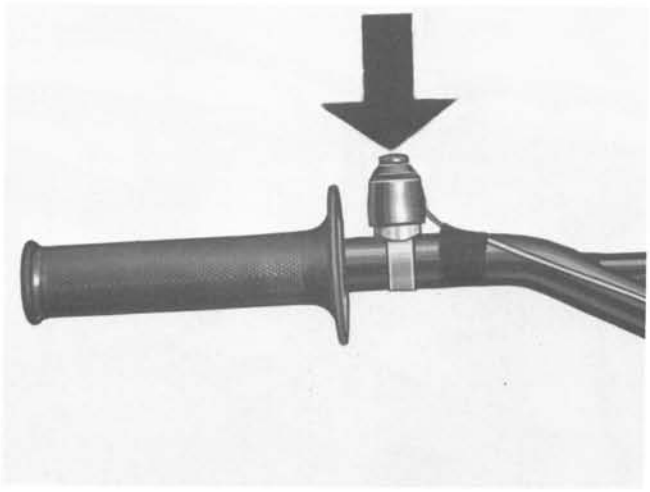


Fig. 57.1

Brake handle

The front wheel brake is actuated when pulling the lever towards the handlebar. See fig. 57.2.

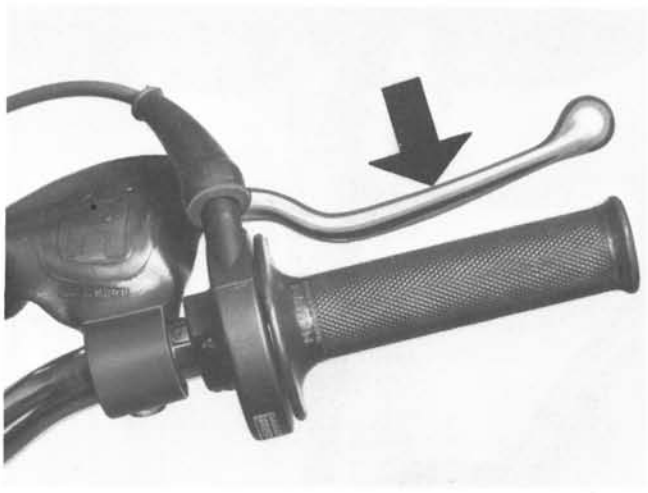


Fig. 57.2

The handles can be twisted on the handlebar by loosening the screws.
Don't forget to tighten the screws.

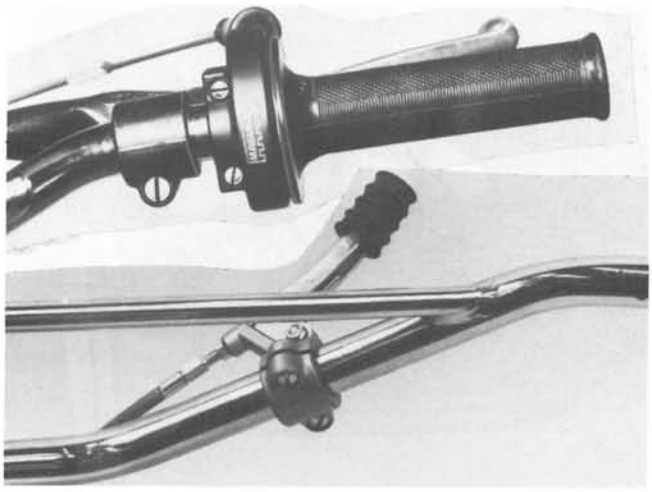


Fig. 57.3

Throttle control handle

The throttle control handle is fitted on the right part of the handle bar. It can be adjusted after the screws have been loosened.

Fig. 57.4

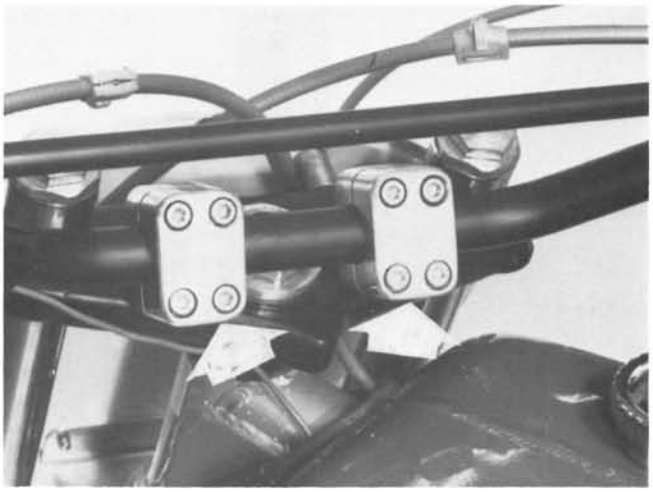


Fig. 58.1

Handle bar

Adjust the handle bar to suit your riding posture. An angle of about 120–160° at the elbows is generally to prefer. A straight-arm riding posture should be avoided.

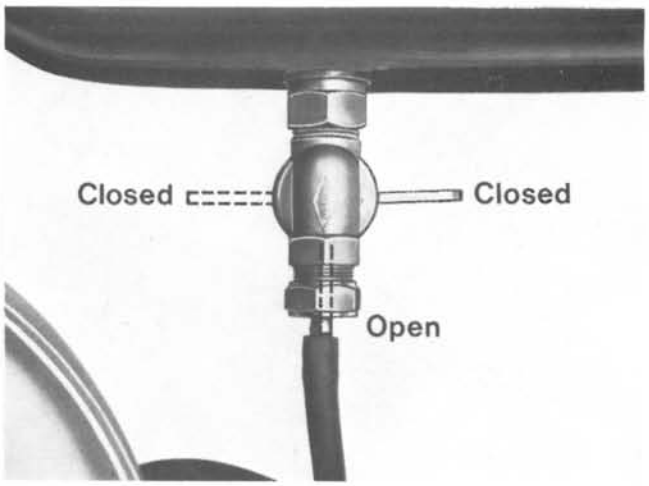


Fig. 58.2

Fuel cock

The fuel cock is located underneath the tank.

NOTE! There is no reserve fuel supply.

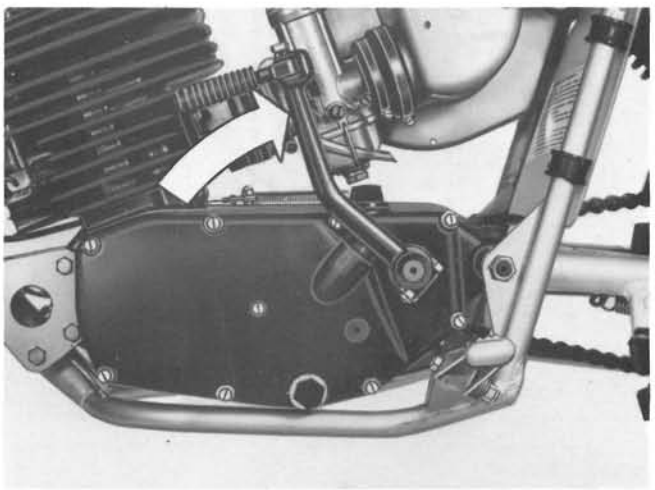


Fig. 58.3

Kick-starter pedal

The engine is started by kicking the pedal sharply downwards and backwards. See to it that your toes are under the foot pedal when starting the engine.

NOTE! Do not alter the position of the starter crank on the shaft in order to get an earlier meshing, as there is then a risk that the pedal-stop on the motor cover is broken at back firing.

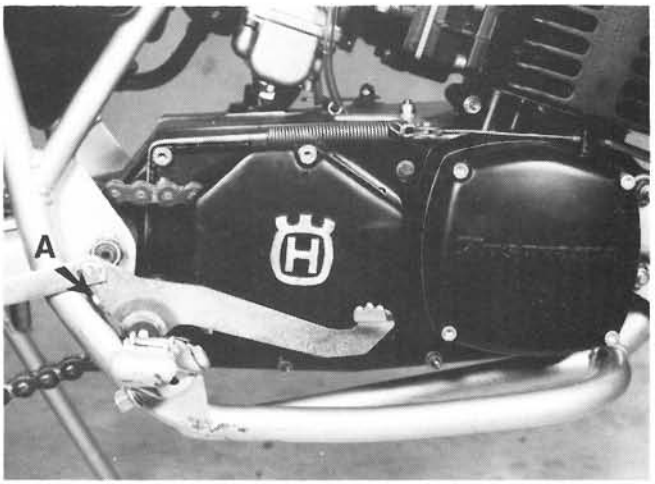
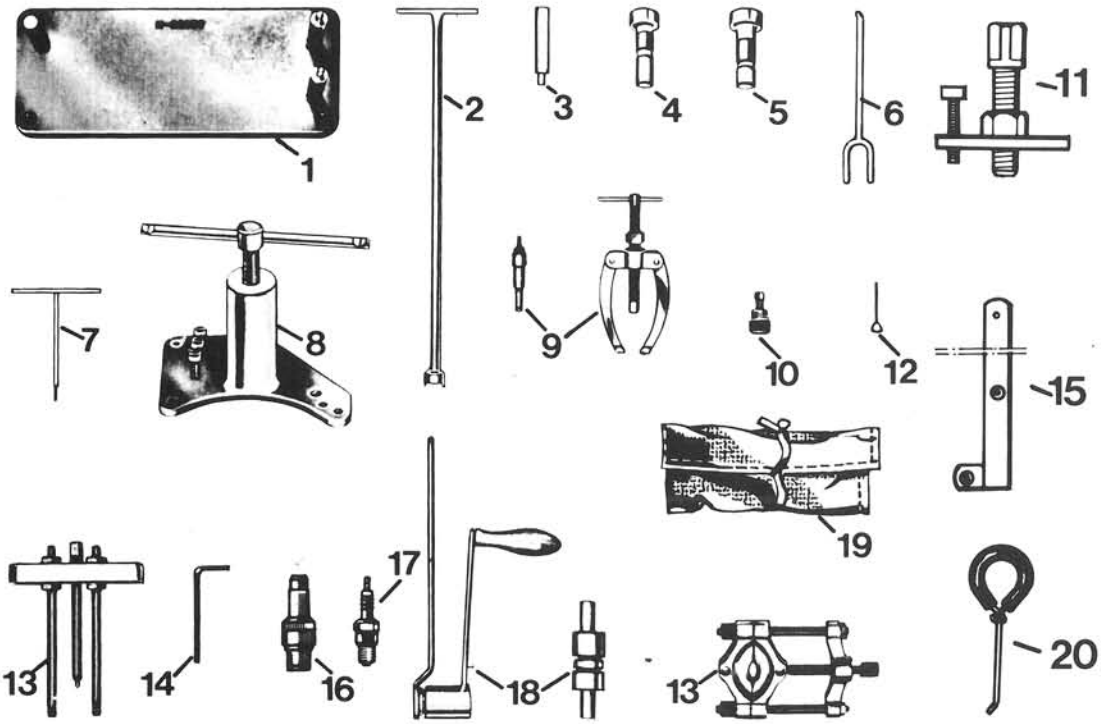


Fig. 58.4

Brake pedal

The brake pedal controls the rear wheel brake through a pull rod.



Pos	Part Number	Description
1	15 19 243-01	Mounting stand
2	15 19 122-01	Holder, damping spindle
3	15 19 249-01	Drift piston pin
4	15 19 178-01	Drift Ø=40 mm
5	15 19 179-01	Drift Ø=44 mm
6	15 19 344-01	Holder for flywheel
7	17 10 229-01	Allen key M6
8	15 19 837-01	Puller crankcase
9	15 19 105-01	Puller ball bearings
10	15 19 324-01	Puller "Motoplat"

Pos	Part Number	Description
11	15 19 840-01	Puller clutchhub
12	15 19 322-01	Timing tool "Motoplat"
13	50 11 930-01	Puller ball bearing
14	95 02 67-109	Allen key nr 5
15	15 19 843-01	Holding tool
16	50 11 953-01	Spark plug cover
17	12 27 233-03	Spark plug Bosch W 260 T2
18	15 19 251-01	Mounting tool crankcases
19	15 19 349-01	Tool set
20	15 19 847-01	Hook

SPARE PARTS MANUAL

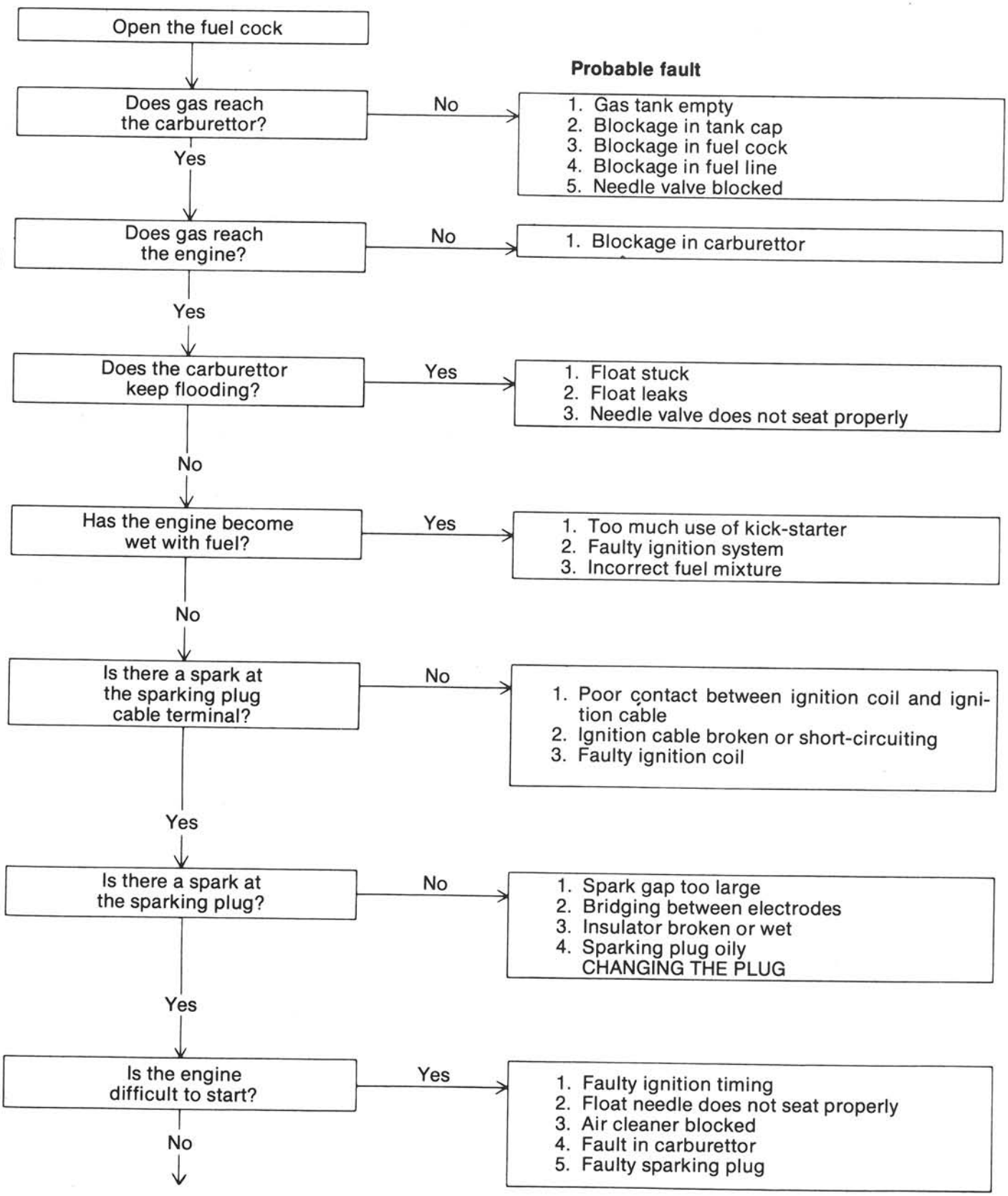
For every motorcycle we have also a SPARE PARTS MANUAL. If you want every number of the details and a exploded view of the bike the spare parts manual is the best thing. Ask your dealer for the book and the book number is 10 12 064-96.

Accessories

Fig.	Part number	Description
1		Coats, size
	50 19 992-01	48
	50 19 991-01	50
	50 19 990-01	52
	50 19 989-01	54
	50 19 988-01	56
	50 19 987-01	58
	50 19 986-01	60
2		Coverall, size
	50 19 999-01	48
	50 19 998-01	50
	50 19 997-01	52
	50 19 996-01	54
	50 19 995-01	56
	50 19 994-01	58
	50 19 993-01	60
3		Coverall blue, size
	15 19 833-46	46
	15 19 833-48	48
	15 19 833-50	50
	15 19 833-52	52
4		2-Piece coverall, size
	15 19 865-46	46
	15 19 865-48	48
	15 19 865-50	50
	15 19 865-52	52
5	10 15 019-26	Poster
6	15 19 048-01	Decal, air filter

Fig.	Part number	Description
8	10 93 007-01A	Textile badge, coverall
9	10 96 038-96	Textile badge
10	15 19 835-01	Textile badge
		Decal air filter cover
11	16 19 618-01	125 cc
11	16 19 619-01	175 cc
11	16 19 620-01	250 cc
11	16 19 621-01	360 cc
		Jackets, blue w. yellow sides, size
12	15 19 828-46	46
	15 19 828-48	48
	15 19 828-50	50
	15 19 828-52	52
	15 19 828-54	54
		Jerseys, yellow w. blue arms, size
13	15 19 821-03	3
	15 19 821-04	4
	15 19 821-05	5
	15 19 821-06	6
14	10 96 041-96	Training suit, size
		4
		5
		6
		7

Fault-tracing schedule



Does the engine run well at high "revs"?

No

1. Engine "four-strokes"

a) Air cleaner element dirty
b) Needle jet worn
c) Jets too large
d) Too much oil in the petrol
e) Faulty ignition timing
f) Exhaust port and exhaust pipe blocked
g) Needle position too high.

2. "Spitting" in carburettor

a) Fuel filter blocked
b) Dirt in carburettor
c) Dirt in needle valve
d) Carburettor not secured properly
e) Needle position too low
f) Faulty ignition timing
g) Sparking plug loose or dirty
h) Incorrect spark gap
i) Incorrect heat rating of sparking plug
j) Ignition cable loose or poorly insulated
k) Piston rings stuck
l) Crankshaft oil seal worn out

3. Engine "knocks"

a) Faulty ignition timing
b) Poor fuel supply
c) Heavy carbon deposits in cylinder ports (Glow ignition)
d) Play in gudgeon pin
e) Big-end bearing or cylinder bore worn

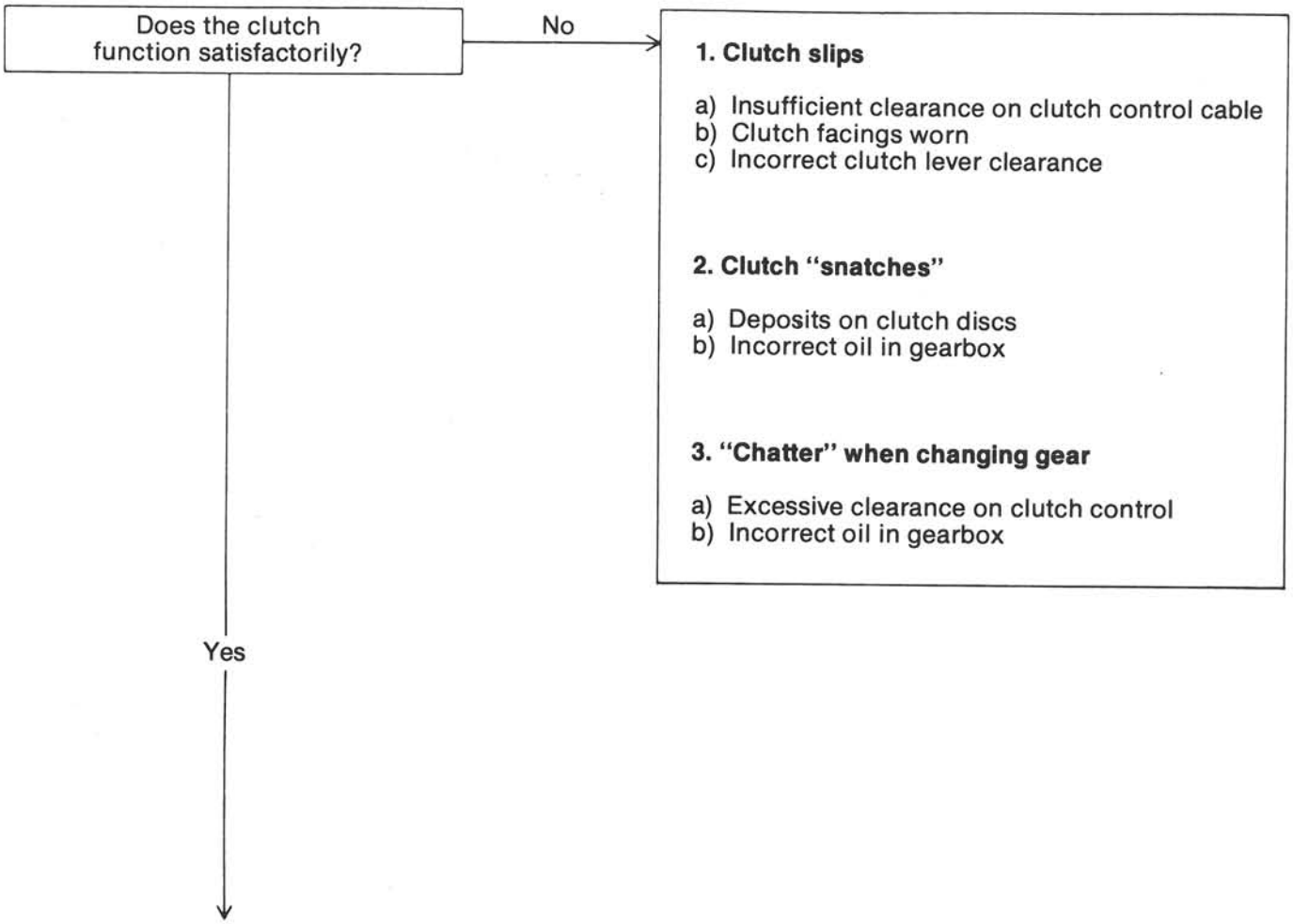
Yes

Does the engine run well when idling?

No

1. Incorrect idle adjustment
2. Faulty ignition timing
3. Faulty sparking plug
4. Poor cylinder sealing

Yes



NOW ALL SHOULD BE WELL – GOOD LUCK!!!
but REMEMBER

to work in a methodical sequence when tracing faults!

Think before acting and don't just fiddle about with the engine parts!

Finally: Don't leave any tools lying about!

KEEP CLEAN!

Training program

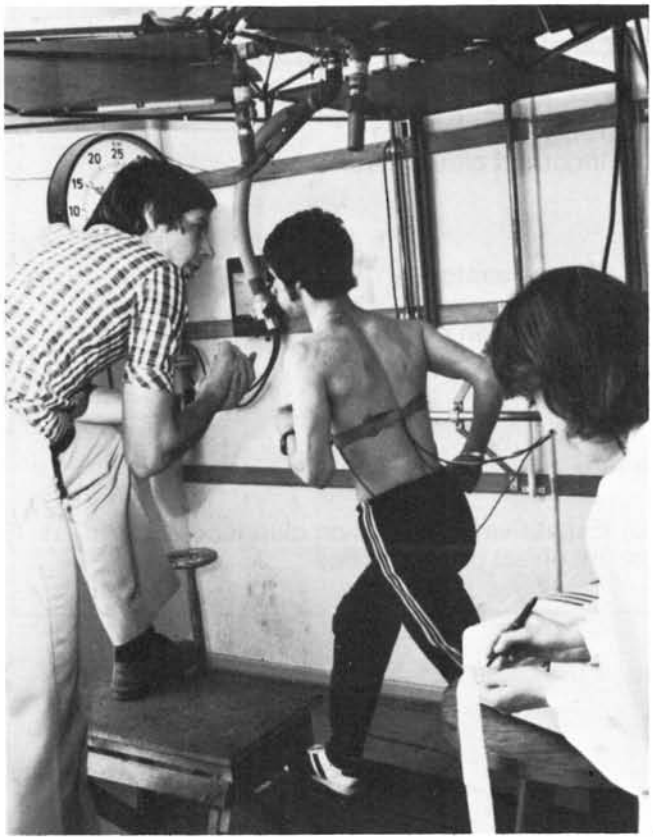


Fig. 64.1

When Swedish doctors began to study the physical demands on various sportsmen in 1965, they did their main tests on motocross riders. Some of the human guinea pigs who volunteered at the dawn of this research were Rolf Tibblin, Torsten Hallman, Sten Lundin and a youthful Åke Jonsson.

Professor Bengt Saltin of the Swedish physiological Institution and Chief Instructor Göran Agnevik of the Gymnastics and Sports Training College compared top motocross racers against an equal number of student physical training teachers – men of the same age and in the pink of physical condition. After a series of tests, the results were astonishing.

Although there was not much difference in actual strength and stamina between the two groups, the motorcycle racers had the ability to work at their peak for twice, or even three times as long as the Phys. Ed. students. In particular the tests put the strain on legs, arms and wrists with intense pressure on and of, alternately for long periods. The tests closely reproduced the physical demands of long cross-country races.

As a result of these studies and the experiances gained from Team Husqvarna, the traditional ideas of physical conditioning had to be revised drastically, where they concerned training motorcycle riders. Flat-out endurance training, like running for long periods at a time, for instance, does not really build the muscles you need for motocross racing, or fast trail riding.

There are many fine books on the market that tell you how to be a top-notch motorcycle racer, but most do not deal sufficiently with the rider's mind and body. Your psychological and physical condition are equally important to winning motocross as your riding technique and the performance of your motorcycle.

In brief, the most important elements in a riders success are:

A. Psychological (will, power, motivation).
B. Maximum conversion of energy (oxygen absorption, muscle endurance capacity).
C. Teamwork between nerves and muscles (talent, strength)
D. Riding technique (smoothness, ability to develop thinking and technique, reasoning power).

Difference in isometric leg strength under the same conditions as above.

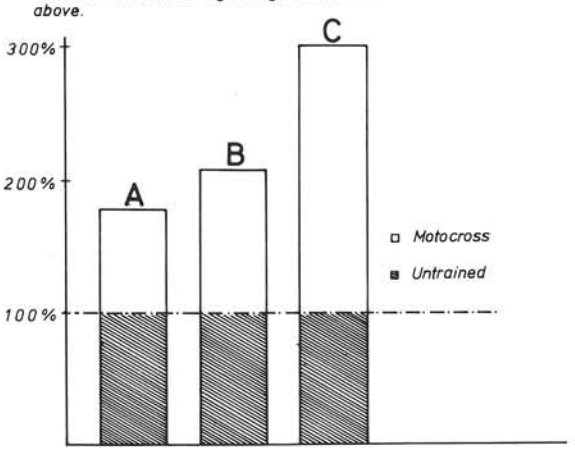


Fig. 64.2

Difference between trained motocross riders and a control group of untrained 20-25 year olds, isometric handstrength under the following conditions:

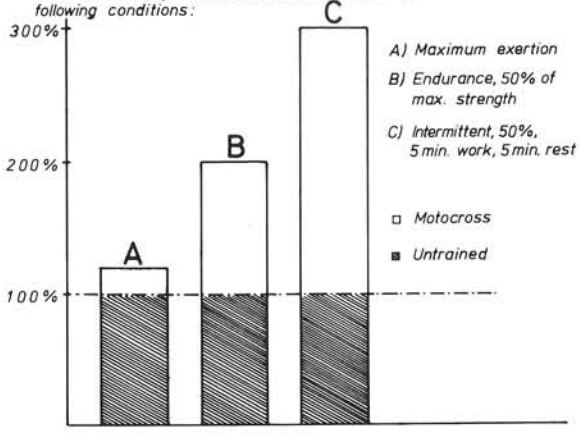


Fig. 64.3

The amount of these elements varies a great deal depending on an individual's native character.

A rider with developed riding technique blessed by native physical and mental talents burns up less energy during a race and needs less physical training than those of us who are less fortunately endowed.

Whether your goal is to wear the number one on your jersey or just be able to ride cowtrails faster, safely, for a few minutes longer, the information in this chapter will guide your efforts to that achievement by the most direct route, without wasting any effort on your part.

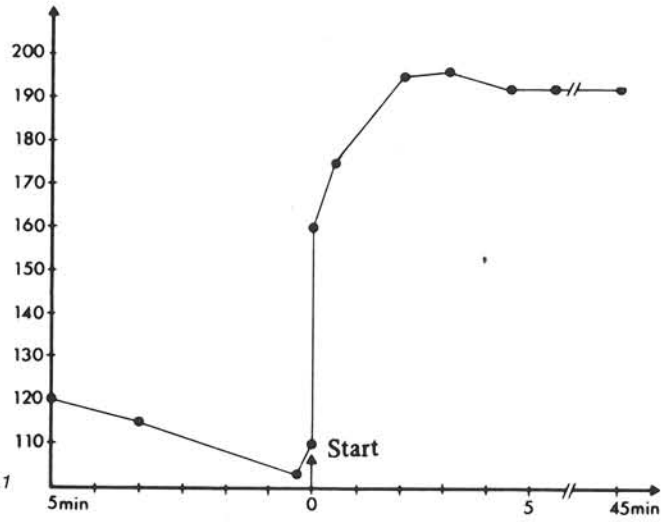


Fig. 65.1

General advice

Know your body. One might say that like a motorcycle, your body has an engine that demands maintenance, tuning and service. To make your training more effective, you must know how your body is functioning and what happens to it during training or racing.

The training must be adjusted to the individual and not the other way around. We are all different in many ways. Each rider must draw up his own training program, but it must include the following points:

A. Interval training (physical condition).
B. Muscle endurance training (Circletraining)
C. Special training (riding)

To get improved condition from your training, you need a constant increase in intensity of training, as the body always adjusts to the demands put on it. This also implies that you must not start training too intensely, or with too heavy a load. Increase your training slowly and step-by-step. Otherwise parts of your body will be overstressed.


Fig. 65.2

Begin each training period with **Warmup exercises** to get ready for training proper, so that you obtain the maximum benefit from it and also to prevent injuries.
Remember you are not properly warmed up until you are all in sweat.

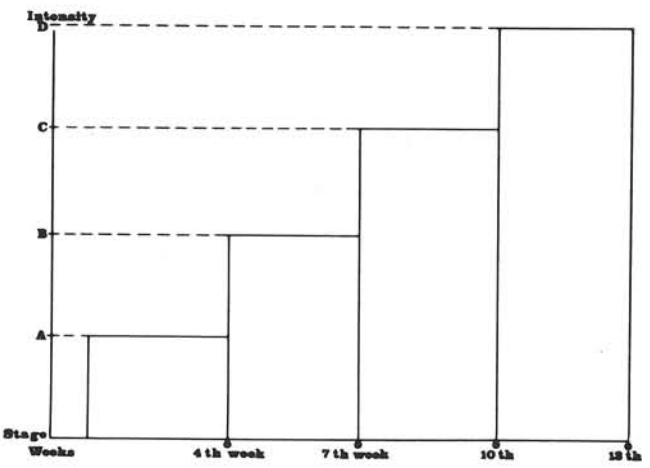


Fig. 65.3

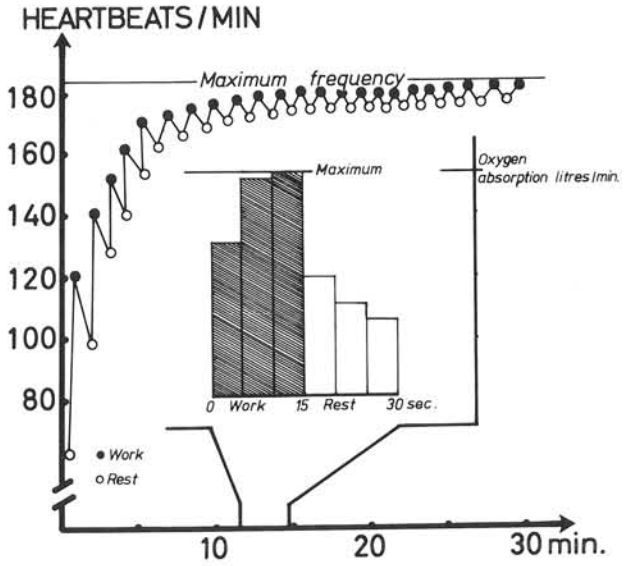


Fig. 66.1

Interval training (physical condition)

This training must be carried out in a way that demands great lung ventilation and high heartbeat frequency. Many muscle groups are put in dynamic work (the muscle alternately growing longer or shorter through movement).

Short-short intervals

Run 15 seconds, rest 15 seconds, over a period of 20 to 30 minutes.
If the tempo is not too hign and/or the rest periods too short, the muscles have a chance to get enough oxygen and hold the lactic acid level down.

Without a watch and good ambition (or a scrupulous coach), it's difficult to carry out this exercise properly.

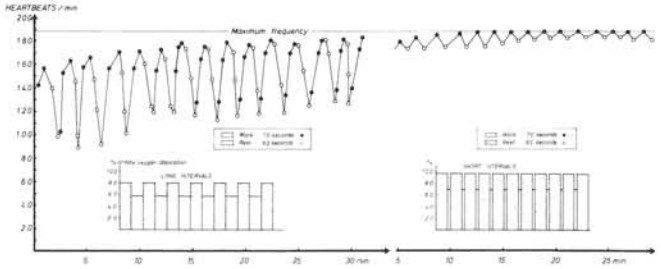


Fig. 66.2

Short intervals

Run 60 to 90 seconds, rest 20 to 30 seconds five to nine repetitions.

The rest periods must be within the prescribed limits (See fig. 00.0 for why).

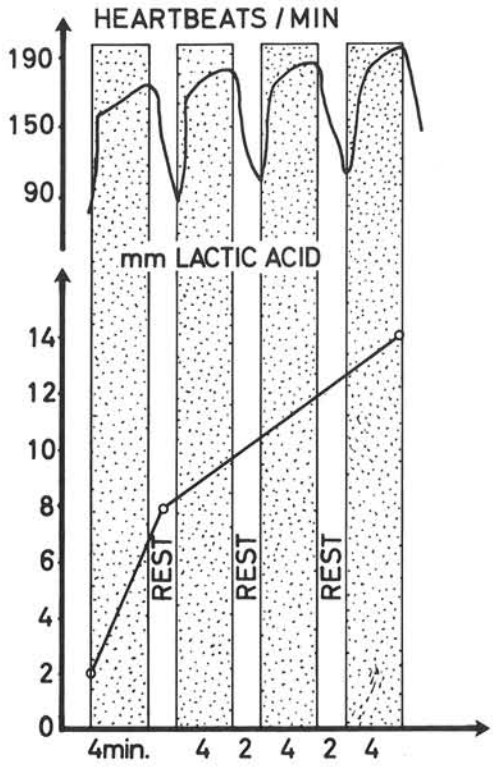


Fig. 66.3

Long intervals

Run 2 to 10 minutes, rest 1 to 4 minutes, five to nine repetitions.

Fig. shows effects of four minutes running, two minutes rest. This method (adjusted to your body characteristics) creates maximum demand for oxygenation, but is painful, as you usually choose too high a speed at first.

70–20 cross-country intervals

Mark out a cross-country track 200–600 yards long. Run at high speed for 70 seconds. After exactly 70 seconds, rest for exactly 20 seconds, then go into another 70 second sprint. Do this four to eight times.
Taken together with the above-described interval training, this method develops the best condition (measured in oxygen absorption liters/minute) in the shortest time.

2–10 minute cross-country intervals

Lay out a cross-country circuit of 500–2 000 yards lap length.
Start from point "A" (any convenient place) and run at the highest speed you can keep up during the work period. Mark where you finished, and go back to "A". Take as much time walking to the start as the workperiod.
In your next workperiod, you will try to reach the same point on the track as before. If you succeed and go farther, move your mark. If not, try again. Do this three to five times.

Sprinting

This develops speed and muscle strength. Run uphill at maximum speed, 10 to 60 seconds. Walk or limber up while going back downhill. Do this five to ten times.

Fig. 67.1

Muscle endurance training

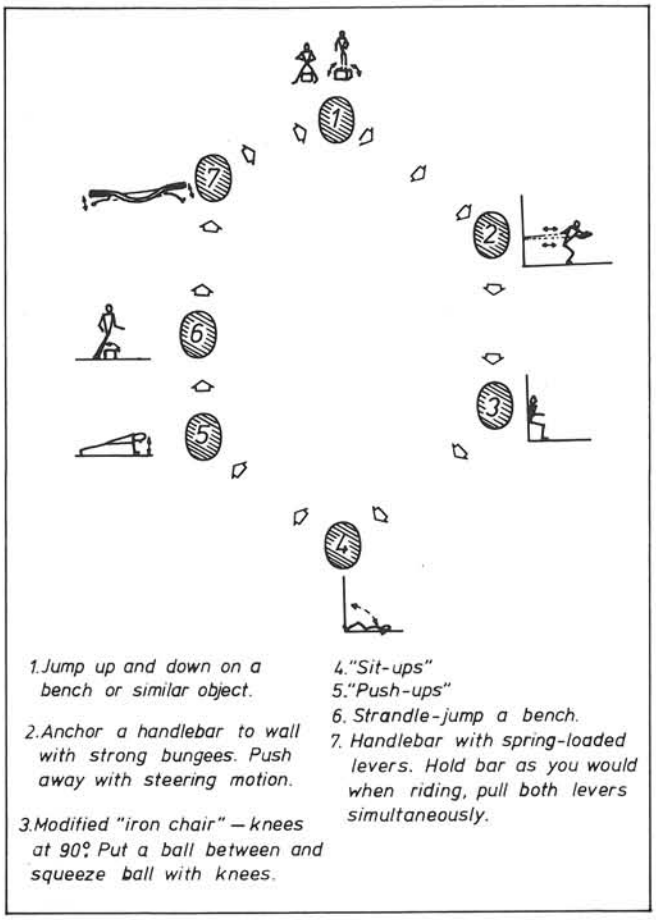
Perhaps you have noticed after a hard ride, some muscles stiffen up and refuse to respond with any precision. This "partial seizure" is due to insufficient oxygen supply and blood flow at the same time as residues of lactic acid and other fatigue substances have accumulated in the muscle.

Therefore the aim of this training is to delay the appearance of these symptoms as long as possible, and to harden your muscles and yourself.
This training is the hardest and the cruelest for the rider, as he must force himself to continue even when he feels an intense fatigue and is ready to give up.

Muscle training is also a training of the nerve-muscle function (coordination) and therefore depends on the pattern of movements and contractions used. If you use the wrong exercises, much work will give very little or no effect when riding.

The do-it-yourself method is called "Circeltraining". Here is how to do it.

Fig. 67.2



1. Jump up and down on a bench or similar object.
2. Anchor a handlebar to wall with strong bungees. Push away with steering motion.
3. Modified "iron chair" — knees at 90°. Put a ball between and squeeze ball with knees.
4. "Sit-ups"
5. "Push-ups"
6. Strandle-jump a bench.
7. Handlebar with spring-loaded levers. Hold bar as you would when riding, pull both levers simultaneously.

Fig. 68.1

Circel Training

Mark out an indoor or outdoor circle with seven to ten stations. On each station you will do one exercise for a separate muscle group. In this example, we have chosen the exercises for you (see Fig. 68.1). Again warm up for at least 10 minutes first.

Maximum test

Before you start the real training, you have to do a maximum test to find out what load to use during the following week's training.

Start at station One. Do as many workouts as possible during exactly 60 seconds. (If you are welltrained, 120 seconds.) Rest for 60 (120) seconds, while at the same time you write down the number of workouts you did at Station One, and move to Station Two.

After exactly 60 (120) seconds rest, you start on Station Two, doing your maximum of that exercise for exactly 60 (120) seconds. Rest as before, writing down the result and move on . . .

When you have completed all the stations you have ten minutes of rest. During that time take your notebook and divide the result from each station by two to get a figure showing your 50 percent capacity for the work period. This is the load you will carry during the following sessions.

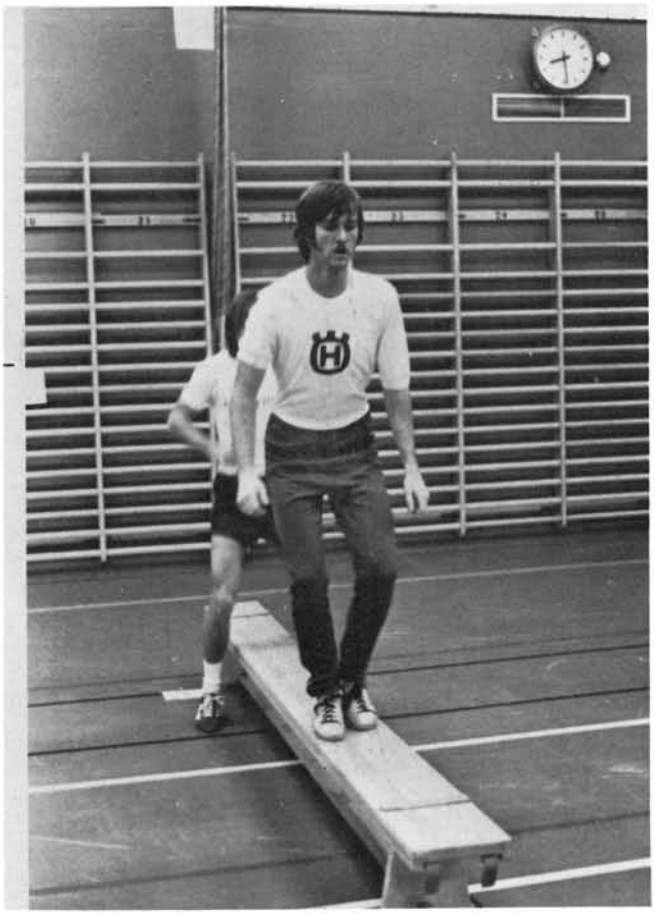


Fig. 68.2

Training

After the rest period, start a stopwatch as you begin at Station One. Now you have to do half of your maximum capacity on each station as fast as possible and without rest between sessions. Three laps of your circle must be completed, after which you stop your watch and record the time in your workbook.

The next day you do the same, but now try to reduce the time for three laps.

After one week with three to five training sessions, you will have reduced the time by 15 to 20 %, and it's time for a new maximum test. After this test, you will check your figures against the previous week and notice a 15 to 25 % improvement. This should stimulate you to continue the following week, using the new 50 % digures derived from the second maximum capacity test. And so on. . .

This training is for individuals. You are only competing against yourself, and the intensity of the training increases automatically with the weekly tests.

"Circle Training" is extremely hard, and if beginning or in poor condition, you may have to use fewer stations or work two laps.

Fig. 69.1

Special training (riding)

To be a good pianoplayer you need musicality – to be a good tennis player you need ball sense. Independent of natural ability, training implies an improvement of your efficiency. "Special training" means coordinating of movements while riding.

Your aim during this training must be to get a smooth riding technique. With smoothness, you don't need to work so hard – you can do the work with less energy loss.

Movements and frame of mind affect each other, meaning that impulses coming from your surroundings have a great influence on the functioning of your central nervous system. Your race results will be affected by (for example) temperature, weather conditions, track condition, noise-level, and the influence of your surrounding friends and mechanics.

During practice you may have good command of your techniques, but with competition, spectators, noise, and other stresses have been added. This means that a very important part of your training is real racing. Your goal must be a top placing no matter what competition you have.

Fig. 69.2

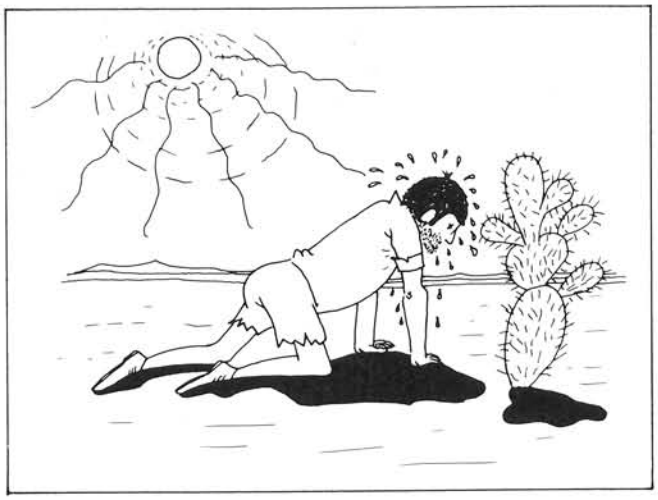
Fig. 69.3

Training schedule

After the race season is over – put your bike in the garage and forget about it for at least a month or so!
Relax and do all the other things you didn't do during the season. Go out for a two-mile corss-country run once or twice a week to keep fit.

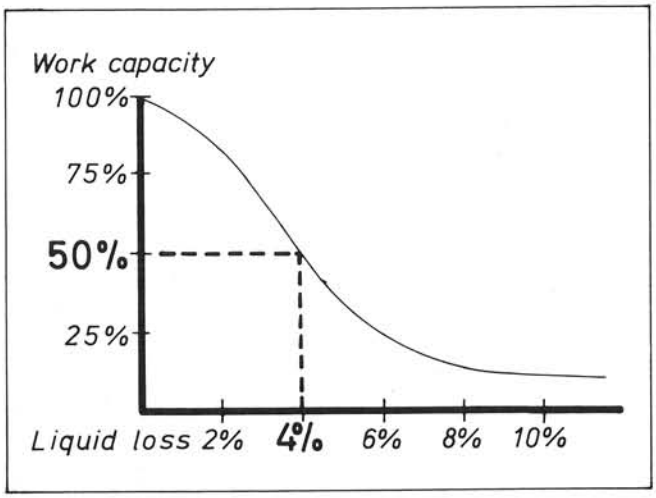
After a while you will get hungry for a ride again, and now it's time to begin your preparations for next season. Start to tune-up your body. After a while also include your "special training" by practicing on your bike.

Fig. 69.4



The first races you enter are to be included in your schedule as training. You have to decide by yourself when, and with what race, your season actually starts.

During the season, between races, you also need some training, because racing itself is not enough to keep one really fit during a (compared to other sports) very long season.



The body fluid balance

The body is cooled down by perspiration, among other things. Your perspiration can during a motocross race, sweat out at the rate of up to two or three liters/hour depending on how high the outside temperature is and how hard the track makes you work.

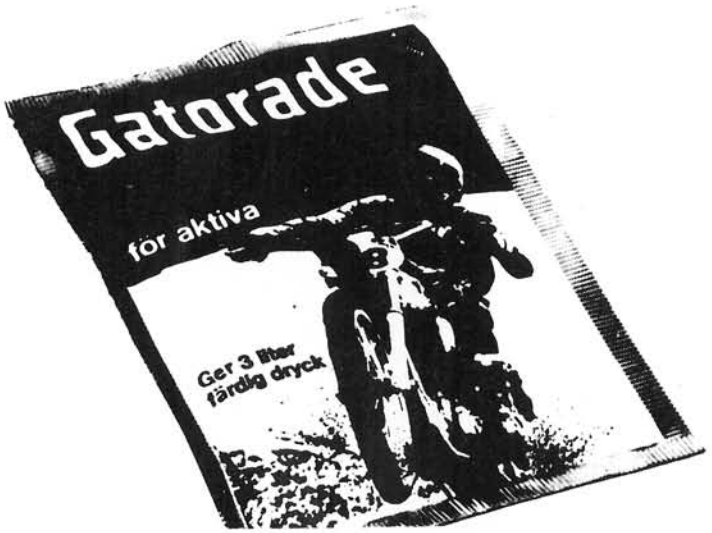
This perspiring reduces the body fluid balance. When the body fluid is reduced by two percent of the body weight, physical capacity goes away considerably.

To keep up the capacity you must compensate the liquid loss by drinking enough that the weight of the body is kept on a constant level. Otherwise you will tire quickly in the second heat and blow the whole competition.

Therefore, find out how much you lose in weight during a normal race, and afterwards take it as a good rule to drink the same quantity during competition.

Many sportsmen take sugar water, while others have discovered that there is another more suitable special mixed drink to take, namely Gatorade. Gatorade contains just the substance that the body has lost during the work.

Carbonic acid drinks are quite unsuitable.



Testing physical condition

Heart capacity is often the factor determining the ability of persons to perform heavy work for long periods. Measuring heart activity is therefore a fully satisfactory yardstick of maximum work capacity. This test is based on the fact that after a correct program of training the ability to absorb oxygen increases and the pulse rate is slower for the same amount of work. The most common methods of measurement are the ergometer cycle test and the step test. Of these, the step test is the most suitable for the individual motocross rider, since with this simple method it is possible for anybody to test himself without the use of special equipment or instruction.

Fig. 71.1

General rules for testing

1. You should have slept soundly and be well rested. It is best to carry out the test in the morning.
2. You should not eat anything within two hours before the test.
3. You should not smoke within one hour before the test. (Smoking is not conducive to good physical condition and motocross riders are advised to abstain.)
4. Light clothing should be worn.
5. Do not carry out the test if you are sick.

Materials

Chair, bench, box or the like about 0,4 m height. Watch or clock with second hand.

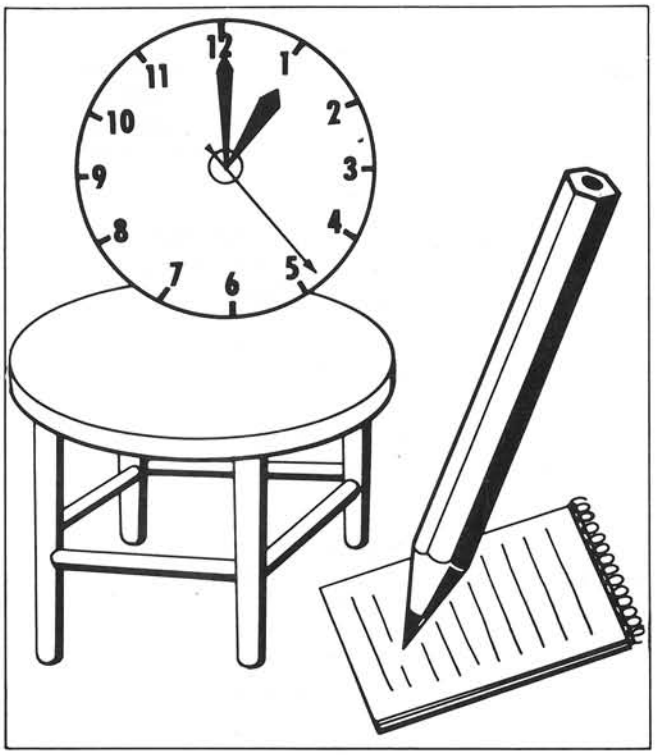


Fig. 71.2

Work

To carry out a step test, step up and down from the chair continuously for five minutes, each time with the same foot first and at a rate of 30 step-ups and 30 step-downs per minute.
This can be timed in such a way that you are standing on the chair with both feet after the first second, and are back down on the floor with both feet after the second second etc.
Carry out each step-up and step-down with the left foot first.
When standing up on the chair your knees should be straight, your hips slightly thrust forward and your head held high in a relaxed stance. Hold your arms naturally.
It is extremely important to learn these movements correctly from the start, so that the work involved in each test is as identical as possible. This is in order that the results of several tests can be compared.

Fig. 71.3

Pulse

After five minutes, sit down and rest for precisely one minute. Then take your pulse for 30 seconds. Double the result and make a note on the test sheet. (Best way of feeling your pulse is to lay the flat of your hand against your heart on the left side of your chest or place your fingertips over the carotid artery which you will find just behind the larynx.)

Assessing test results

The test method described above provides a measure of the work capacity of the heart, taking into account the weight of the body, as the body is lifted up each time you step onto the chair. You could also enter the results on a graph (see fig. 66.2) so that you can see at a glance how your physical condition improves.

Intellectual capacity

Physical tiredness impairs the capacity of thinking. Therefore a rider in poor physical condition must either ride at a lower speed or else take more risks than a rider with the same competence only in better condition, especially during the later part of the race.

To get the best results a very strong determination to win is demanded as motivation.

Better effort of will gives, as a rule, better results – to a point. Beyond that point, the result will be the opposite. That means I have "over-motivation", which means that I want more than the capacity I have.

The bad results comes from the fact that the over-motivated person works too hard and commits his energy reserves too fast.

The spectators often find the over-motivated nonchalant, apathetic, clumsy or ruthless.

Over-motivation can also arise from concentration on difficulties, unfavorable cirsumstances or bad condition.

To get the right motivation, (a balance between will and results) you must clearly evaluate both yours and the competitors' and realistically estimate the chances to win.

Your riding tactics should be planned in detail before the start.

Where shall I line up at the start gate? If I win the start, which speed shall I keep?
Can I keep this tempo all the time?

One of the most important things to keep in mind is that a motocross race is not decided until the finish of the last heat. It's not only the rider who must manage, also the motorcycle must be able to make the whole distance.

Physical condition	Test pulse	
Poor	120	
Fair	110	
Fairly good	100	
Good	90	
Very good	80	
Excellent		

1st 2nd 3rd 4th week

Fig. 72.1

Test sheet

Date	Weight	Pulse	Notes

Fig. 72.2

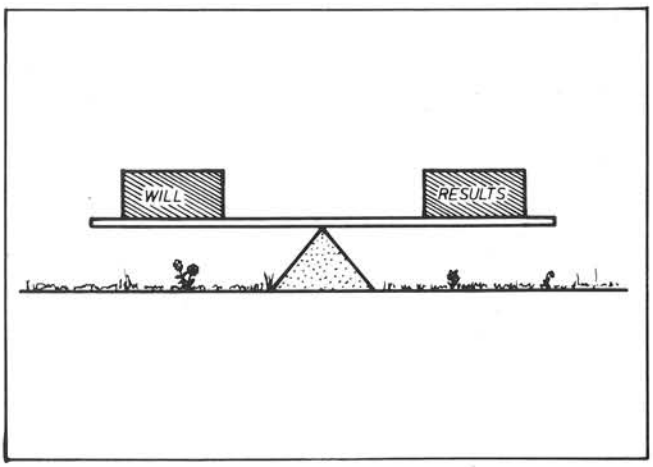


Fig. 72.3

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