

STADION S23

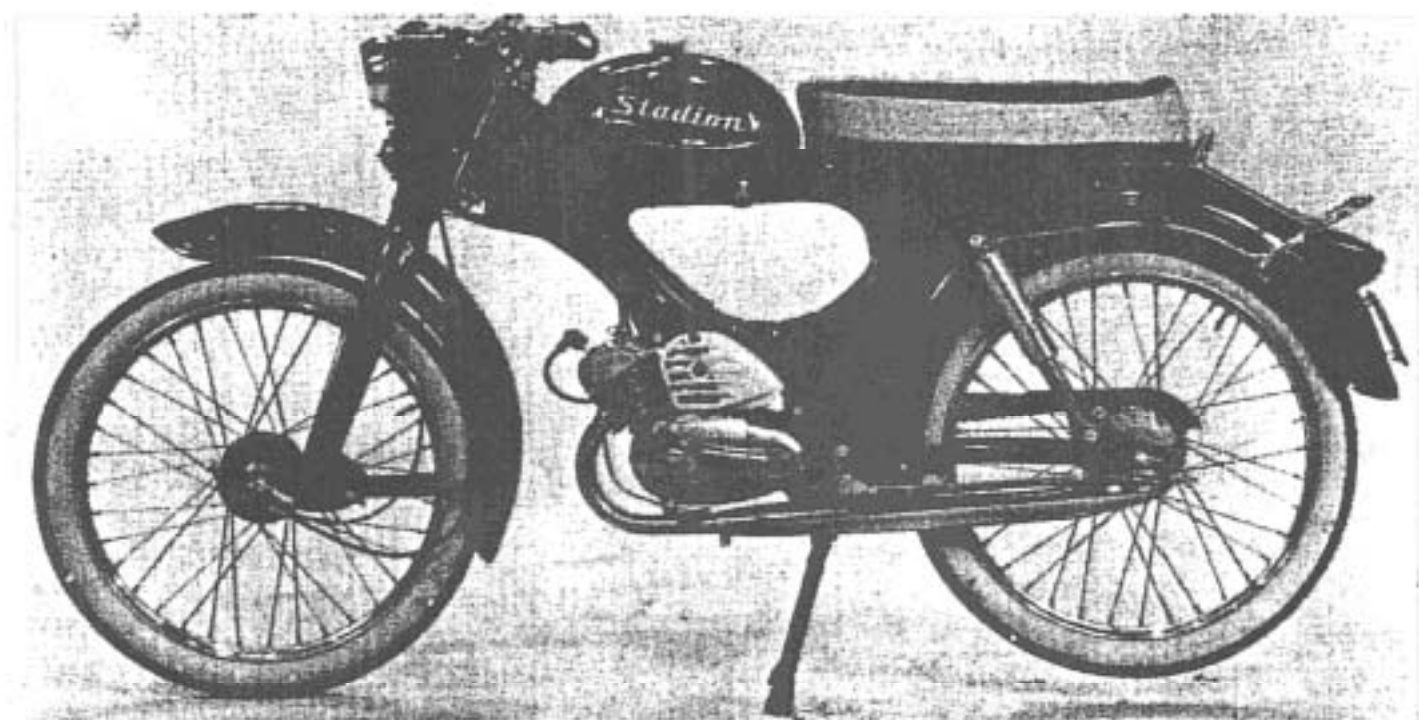
POWERED WITH



ENGINE

50 cc - type 552

OPERATORS MANUAL



SPIEGEL

Dear Stadion Moped Rider,

You have become a Stadion moped owner, having purchased the new model S 23.

This model of the Stadion moped was introduced into production after a long series of painstaking and very careful tests. It was built to be an economical vehicle, offering the maximum riding comfort and requiring the minimum maintenance.

It is, undoubtedly, your desire to make use of the moped as long as possible and in a trouble-free manner. Consequently, it is in your own interest to read this manual and follow the hints given.

We are convinced that trouble-free operation will result if you become well acquainted with the mechanical workings of this product. If assistance in repairing is necessary, we will gladly refer you to a local repair agency near you.

Most IMPORTED motorcycles, scooters and mopeds have been assembled with screws and nuts using the METRIC THREADS that will only fit other metric threads.

Many of these parts can be obtained from local motorcycle dealers selling different brands of foreign bikes -- of course, in many cases where a machine screw or bolt is not threaded into a large casting, for example, fender bolts, where they go through several parts with a lockwasher and a nut holding all pieces together, the American Standard screws of similar size may be used for replacement and can be obtained from most any hardware or auto supply store.

Never try to thread an American Standard screw into a hole tapped for METRIC screws. When a substitution is made be sure the head is flat, oval or Hexagon like the original screw head.

If local motorcycle dealers cannot supply, write us. Mailing them will take but a short time.

SPIEGEL, INC.
Dept. 156
Chicago, Ill. 60609

KEEP THIS BOOK IN A SAFE PLACE
FOR FUTURE REFERENCE

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INSTRUCTIONS FOR ASSEMBLING

When unpacking the machine, the only assembly necessary is:

1. Thread the pedals on the pedal arms -- noting that the right-hand pedal has a right-hand thread and that the left-hand pedal has a left-hand thread. Tighten with the end wrench in the kit stored under the seat.
2. Loosen the handlebar shaft nut, and twist the handlebars to correct crossways position, at the same time, pull it up about 3 or 4 inches (otherwise the grips will hit your knees when making a sharp turn). Re-tighten securely when proper height and line-up are accomplished.
3. Check the oil level in the gear box, fill with oil if it is empty or until it runs out the oil level hole on the side. Replace the plug. The fill-cap is on the top rear part of the gear box cover (left side of moped), open with a broad blade screwdriver.

SUMMER - Use #50 SAE non-Detergent

WINTER - Use #20 SAE Non-Detergent

PLEASE NOTE: The odometer on the Moped you receive may be made to measure kilometers which are 6/10 of a U.S. mile -- as an example, if you have traveled 10 kilometers according to the odometer, the actual mileage is then 6 U.S. miles.

The speed indicated is 6/10 of the actual, so if the pointer turns to 15 KM, the actual speed is 9 m.p.h., approximately.

15 KM = 9 m.p.h. (approximately)
30 KM = 18 m.p.h. (approximately)
45 KM = 27 m.p.h. (approximately)
60 KM = 36 m.p.h. (approximately)
75 KM = 45 m.p.h. (approximately)

S T A D I O N M O P E D
M O D E L S 23
E N G I N E J A W A
(CC Model 552)

TECHNICAL DESCRIPTION
OPERATORS MANUAL AND INSTRUCTIONS FOR MAINTENANCE

No. of cylinders	1
Cubic capacity of cylinder	49.8 cc or 3.038 cu. in.
Bore of cylinder	38 mm
Stroke of piston	44 mm
Output of engine	2.4 HP at 5600 r.p.m.

NOTE:

This Operator's Manual is subject to alterations of design and equipment as well as accessories of the moped. The manufacturers are constantly improving their products and reserve; therefore, their right to carry out alterations necessary for this purpose as compared to illustrations or descriptions given in the present Manual.

SPIEGEL, INC.

T E C H N I C A L D A T A

Engine	Gasoline, two-stroke, air-cooled, with forward inclined cylinder
No. of cylinders	1
Bore of cylinder	38 mm
Stroke of piston	44 mm
Displacement	49.8 cc or 3.0389 cu. in.
Compression ratio	1 : 7.5
Maximum output of engine	2.4 HP \pm 10% at 5600 r.p.m.
Rated fuel consumption at a constant speed of 21.7 m.p.h.	190 m.p.g.
Rated fuel consumption at a constant speed of 24.85 m.p.h.	176.5 m.p.g.
Rated fuel consumption at a constant speed of 44.0 m.p.h.	132.0 m.p.g.
Weight of machine dry	105 lbs.
Weight of machine with fuel	113 lbs.
Maximum speed	44.8 m.p.h.
Maximum payload	220 lbs.
Maximum front wheel load	98 lbs.
Maximum rear wheel load	181 lbs.
Primary transmission	by means of gears
Secondary transmission	by means of roller chain
Transmission ratios - primary	1 : 4.75
- secondary	1 : 2.92
1st gear	1 : 2.01
2nd gear	1 : 1 (direct drive)
Overall transmission ratio 1	1 : 27.9
Overall transmission ratio 2	1 : 13.88

Overall transmission of the starting mechanism 1 : 2⁴

Carburetor J1KOV 2912 PS

Wheels - dimension of rims 23" x 2.25"

 - dimension of tires 23" x 2.25"

Overall dimensions:

 length 71 1/2

 width over handlebars 25 1/4

 height 41 3/4

 ground clearance 6 3/4

 wheelbase 45 3/4

DESCRIPTION OF STADION MOPED

The MOPED STADION S 23 is one of the lightest European two-wheeled vehicle made for one passenger use. Its light weight permits carrying it from place to place as well as allowing easy maneuverability.

ENGINE of the moped is a two-stroke unit with reverse scavenging. Specification of the engine unit is indicated in the part "Technical Data".

CARBURETOR, J 1 K O V model 2912 PS semi-down draught, is provided with an intake silencer. Idling adjustment is done by means of a stop screw of the throttle valve and further by means of an adjusting screw of the throttle valve operating cable. It is protected against heating from the cylinder with an insulating pad.

CLUTCH of the vehicle is a multi-plate one, with asbestos-resin lining and is located at the L.H. side of the crank-shaft, under the engine cover.

GEARBOX of the engine is equipped with 2 gears. It is integral with the crankcase. Gears are shifted through the medium of a twist-grip, located on the L.H. side of the handlebars.

TORQUE from the engine to the gearbox is transmitted by the primary bevel gears, located under the L.H. side crankcase cover. All the gears of the primary transmission, gearbox and the clutch run in an oil bath. The secondary transmission between the gearbox and the rear wheel is by means of a 108 link roller-chain.

THE CHAIN GUARD is enamelled steel and cover pivots with the rear wheel, the center being the pivoted fork pin. It protects the rider from any dirt splashed by the transmission chain.

FRAME of the machine is of open, welded design, made of quality steel tubes, combined with a carrier case which is set up of steel sheets.

FRONT WHEEL SUSPENSION is carried in the fork, a welded assembly of steel stampings equipped with short pivoting arms and steel coil springs, into which rubber dampers are inserted.

SPRINGING OF THE REAR WHEEL is by means of a pivoted fork with wide mounting base. The sliding bushings of the pivoted fork are assembled on a steel pin. This assembly is to be lubricated every 5000 miles. At this time, take the fork assembly apart and after a thorough cleaning fill it with fresh grease, obtainable from any auto parts store or filling station.

TELESCOPIC MEMBERS are used for springing. They are provided with steel springs and rubber buffers.

WHEELS are assembled of rims having steel spokes. Dimensions of the rims and tires are 23" x 2.25", are interchangeable and can be easily detached. Spokes are made of steel wire, the wheel hubs are made of light alloy.

WHEEL BRAKES internal expanding type. The front one is governed by a cable on handle bars, the rear brake is operated with a tie-rod by means of a pedal. Brakes are adjusted with knurled nuts, no tools being required for this operation. The rear brake reaction buffer is a steel casting.

FUEL TANK capacity is 1.23 imp. gallons. It is closed with a filler neck cap made of plastic material. The cap is of a plug shape, designed with a double sealing ring reinforcement on its circumference. The fuel tank is elastically mounted in rubber pads. Its bottom part is provided with a drain cock equipped with a strainer, providing reserve fuel of a little over 1/10 of a U.S. gallon.

SEAT of the machine is made of formed foam rubber, covered with artificial leather. It is detachable after releasing the knurled nut at left front end of seat. Under the saddle there is a space for tools and tire pump.

HANDLE BARS are made of a single tube, adjustable to suit the individual rider.

STAND of the machine is a two-leg model, welded steel assembly.

BELL is single-tone.

LUGGAGE CARRIER, steel bar rack type.

EXHAUST SILENCER has interior baffles for effectively reducing the exhaust noise level (approximately 73 dB).

DESCRIPTION OF ELECTRIC EQUIPMENT

The flywheel magneto, supplies all of the electric appliances with 6-volt A.C. current. The magneto is located under the R.H. side cover of the engine.

The flywheel magneto is composed of the base plate (stator) and the rotor made of special alloy, with sealed-in permanent magnets. The rotating mass of the rotor is fully utilized for the purpose of securing a smooth, uniform run of the engine.

The ignition and lighting parts of the electric system are mounted on the base plate.

The ignition part of the base plate comprises the ignition coil provided with dual winding, the contact breaker and the condenser, which is located beside the base plate proper. The contact breaker is driven by means of a cam in the center of the rotor. At the instant of disconnection of the contact breaker points an electric spark is produced at the ends of the spark plug electrodes.

Lighting 6-volt electric current of 18 watts is delivered from an independent coil.

A 3-1/4" DIAMETER HEADLAMP is provided with a double-filament electric bulb 6 V 15/15 watt CSN standard 30-4312.

It is built into the front fork cowling. Switching light from high to low beam is done by means of a switch located on the r.h. side of handlebars.

TAIL LIGHT of the rear mudguard is provided with electric bulb 12V 3 watt - E 10/13, model 5643.

Original spark plug #14-7RX PAL may be replaced by:

Champion #'s L85, L86 or H8J
A-C #'s, M44F and M43F

INSTRUCTIONS FOR OPERATION

In the first place, make sure that there is a sufficient quantity of mixed fuel in the fuel tank. The fuel tap is pulled upwards. Mix regular gasoline with regular SAE 50 oil, ratio of 1 : 20; i.e., for the quantity of 1 gallon of gasoline use 11 oz. of oil*.

Then test air pressure in tires. Open the fuel tap.

18 lbs. - front
21 lbs. - rear

There are two ways to start the STADION moped:

I - 1) Sit on the saddle.

- 2) Press the tickler pin on the carburetor to prime it (cold engine).
- 3) Set the left-hand grip in the forward or #1 speed position.
- 4) Squeeze the clutch lever.
- 5) Depress the decompression lever.
- 6) Be sure the gas control (right-hand grip) is in the 1/2 (approx.) advanced position.
- 7) Pedal the machine forward until it is going at a fairly good speed.
- 8) Still holding the decompression lever down, release the clutch lever -- the speed will turn the engine over.
- 9) Quickly release the decompression lever when one of the pedals is nearing its bottom dead center, and the engine will start running.

II - 1) Set the machine on its stand.

- 2) Press the tickler pin on the carburetor to prime it.
- 3) Sit on the seat -- lean forward to keep the drive wheel off the ground.
- 4) Engage the clutch by releasing the left-hand grip lever.
- 5) Turn the grip as far forward as it will go to #1 position.
- 6) Pedal with the feet, rotating the engine while the decompression lever is held down.

* 1 qt. = 32 oz.

- 7) Release the decompression lever when one of the pedals is nearing its bottom dead center, while pedaling at a fairly fast rate, and the engine will start running.
- 8) When it starts, hold on to the clutch lever, push the machine forward off its stand, "rev-up" the motor and release the clutch slowly to move forward, giving a little push with your feet. This will provide forward motion which is then regulated by the right-hand throttle control.

CAUTION: When starting warm engine, do not flood carburetor.

SHIFTING THE GEARS AND RIDING

Depress the clutch lever which is located on the l.h. side of the handle bars, turn the twist-grip in the direction away from the saddle (thus shifting in the 1st gear) and, accelerating uniformly by means of the r.h. side throttle twist-grip, release the clutch lever smoothly. As soon as approximately 9 m.p.h. speed has been attained, close throttle valve a little, depress the clutch lever and turn the clutch twist-grip towards the saddle, for 2nd speed. Then release the clutch lever and open throttle valve simultaneously. The speed of the vehicle is regulated by means of throttle valve opening. If speed of the vehicle decreases below 9 m.p.h., it is necessary to engage the 1st gear, using steps reversed to those described; i.e., down shift.

For the purpose of stopping the vehicle close throttle valve, depress the clutch lever and turn twist-grip to neutral; i.e., into its middle position. The engine is stopped by depressing the decompressor lever. When braking, make use of the rear brake first, only applying the front one if added braking is necessary. When storing the machine, close the fuel tap.

RUNNING-IN A NEW MOPED

When preparing the machine for use, inspect the gearbox oil level. The correct oil level height is determined by the inspection hole in the l.h. side crankcase cover which is sealed by means of a screw.

Mix the fuel mixture in the following ratio:

The first 600 miles: (1 : 20) - i.e., for 5 qts. of gasoline use
1/3 qt. regular oil (SAE - 50)
After 600 miles: (1 : 25) - i.e., for 5 qts. of gasoline use
1/4 qt. of oil.

Prior to covering the first 300 miles, run the machine with only half-opened throttle.

From time to time tighten all the nuts and screws. Having covered 300 miles and then 900 miles respectively, change the oil in the gearbox. The moped can be considered "run-in" after covering 900 miles.

MAINTENANCE

TO CLEAN the machine, wash the moped with water, taking care that no water gets into the carburetor, headlamp or brakes of the vehicle. Then wipe its enamelled and chromium plated parts dry and polish. It is better to polish the enamelled parts with an enamel polishing paste. Water is removed from between the cylinder ribs when the engine is started and warmed up. Water evaporates in this way. All the rubber parts of the machine have to be protected from oil, kerosene, gasoline or other oils and grease.

LUBRICATION

THE ENGINE of the moped is lubricated directly by the oil in the gasoline.

THE GEARBOX is to be filled with #20 SAE oil for winter and #50 SAE for the summer. Change oil in the "run-in" engine every 3000 miles, directly after ending a run; i.e., while oil is warm. Do not rinse the gearbox with kerosene or diesel oil; this will dilute the lube oil and cause trouble.

THE SECONDARY CHAIN is to be taken off after covering 3000 miles, washed in kerosene and let drip off and dry. Then put the chain into a bath of warm (approximately 140° to 176° F) motorcar chassis grease for approximately an hour's time. Take the chain out of the bath after this period and wipe off excess lubricant. Then assemble back on the machine.

FLYWHEEL MAGNETO. Lubricate rocker-arm pin of the contact breaker with several drops of light machine oil each 1500 miles covered. Take care not to get oil on the contact breaker points. Felt of the contact breaker is to be soaked in automobile bearing grease. All the other spots are to be lubricated in accordance with the following table:

Mileage	Lubricated Spot Bearing	No. of Spots	Kind of Lubricant
300	Front suspension pins	2	Automobile chassis grease
600	Check oil level in gearbox	1	Winter - Oil SAE - 20 Summer - Oil SAE - 50
	Telescopes	2	Oil SAE - 90
1500	Contact breaker arm pin	1	Oil SAE - 90
	Felt of contact breaker	1	Automobile grease for bearing

Mileage	Lubricated Spot Bearing	No. of Spots	Kind of Lubricant
3000	Gearbox - change oil	1	Winter - Oil SAE - 20 Summer - Oil SAE - 50
	Twist-grips	2	Automobile chassis grease
	Secondary transmission chain	1	Automobile chassis grease
	Cables and cable guides	6	Oil SAE - 90
	Brake cams	2	Oil SAE - 90
	Stand pin	1	Automobile chassis grease
5000	Balls in head fittings of front fork	2	Automobile bearing grease
	Bearings of wheels	2	Automobile bearing grease
6000	* Mounting of the rear pivoted fork (after disassembly)		Automobile chassis grease

* Note: or at least once in three years.

TIRES

The tires of the moped should be adequately inflated. The life of tires is extended by correct inflation and by being kept free of oil. The inflation pressure of the front tire is 18 lbs. psi, that of the rear one is 21 lbs. (This is for riders of medium weight -- approximately 180 lbs.)

A leaky valve is detected by wetting it, after its cap has been unscrewed. The leaking air produces bubbles. To correct this defect, tighten the valve core by means of the reverse end of the valve covering cap. Should this operation fail, replace the valve core with a new one.

A defective tire tube is to be repaired by patching. Take the wheel out of the frame and remove the tire and tube from the rim in the following way: loosen the valve tightening nut. Press the tire area opposite the valve into the rim depression. Slip the tire over the rim by means of tire irons from the tool kit. Pull the tube out gently and firmly. Press the valve of the rim and take out the tube. Screw in the valve core, inflate the tube a little and dip into water. The damaged spot will show by leaking bubbles. Dry the tube and repair the puncture by vulcanizing or patching in accordance with the instructions given by the maker of the repair kit. Then powder the repaired spot with talcum to prevent it from getting stuck to the inside of the tire.

Inspect the tire and remove the nail or any other sharp object that caused the puncture. Reassemble as follows: The partly inflated tube valve is slipped through its opening in the rim and the tube inserted into the tire. Slip the edge of the tire tube over the edge of the rim opposite the tube valve and continue uniformly slipping the edge over rim along both directions by means of tire irons until this operation is finished at the tube valve from both sides. Do this operation carefully to prevent pinching between the edges of the rim and of the tire cover. Then inflate the tire to the proper pressure.

TENSIONING THE SECONDARY CHAIN

Slacken the nut of the rear wheel spindle and the nut of the sprocket bushing. Then, tighten the chain adjuster nuts uniformly so that the chain is neither too tight nor too loose. The maximum slack of the secondary chain should be approximately $1/16''$ to $1/8''$. Then tighten both the nut of the sprocket and the spindle nut. Check adjustment of the rear brake.

ADJUSTING THE CLUTCH

Lengthening or stretching of the clutch operating cable is eliminated by means of its adjusting screw and safety nut located on the handlebars. There must be a clearance of approximately $3/32''$ between the lever and its bracket. If this clearance is neglected, the clutch linings will wear rapidly and cause trouble. A certain amount of wear can be taken up by adjusting the clutch cable lever at the bottom of the crankcase, thus shortening the cable.

CARBURETOR

The assembled carburetor, JIKOV model 2912 PS, is an up-to-date semi-down-draught carburetor equipped with an effective intake silencer, the front part of which constitutes the carburetor cover. The main jet, the idling jet, the throttle valve needle may be adjusted to improve the idling and running of the engine. The independent idle-run circuit with an interchangeable jet insures a regular idling run. The carburetor air cleaner should be cleaned every 1500 miles. The carburetor is to be taken apart and all its component parts are to be washed in pure gasoline, the air cleaner is to be wetted with a mixture of engine oil and gasoline (ratio 1 : 1). When reassembling the carburetor to the engine, take care that the gasket as well as the insulating pad between the carburetor flange and the engine are mounted in their correct location and, furthermore, that the gasket is undamaged.

ADJUSTING THE IGNITION

Having covered 3000 miles, check or adjust respectively the contact breaker point gap and the setting of ignition advance. The breaker point gap is checked by means of a feeler gauge which is riveted to the spanner in the tool kit of the machine. Piston of the engine must be in its top dead center. The correct distance of contact points is set by loosening the adjusting screw and turning the base plate. When checking the ignition advance, put a strip of cigarette paper between the opened contact points. Then, turn the rotor against its working direction. The crankshaft is then turned very slowly in working direction of the engine until the points start to go apart and the slip of paper is released. In this instant the piston is to be 3.0 mm (approximately $1/8''$) ($.118''$) below its top dead center. If the ignition advance is not in its prescribed position, the base plate of the ignition is to be turned to the correct position after its two adjustment screws have been loosened.

In the end, make sure once again that the ignition has been correctly adjusted and the contact points gap of contact breaker is in conformity with the factory tolerance.

DECARBONIZING THE ENGINE

Remove the carbon from the engine after every 3000 miles use. Remove deposits of carbon off the cylinder head, off the piston top part and out of its piston ring grooves as well as off the transfer ports. In the course of reassembly, take care to mount the piston rings into their original grooves and original gap position. Wash with solvent and reassemble.

After every 1500 miles covered with the moped, remove the carbon from the exhaust silencer by removing the silencer tube with pliers from the rear end of the muffler. The screw must be removed before pulling the tube out. The tube is to be thoroughly cleaned with a wire brush before reassembling.

DISASSEMBLY AND ASSEMBLY WITHOUT SPECIAL TOOLS *

REMOVING THE FRONT WHEEL

Release the front brake operating cable, unscrew the wheel spindle nut and take out its spring washer. Loosen the tightening screws of rockers, push out the spindle, remove two spacing inserts and take the wheel out.

On reassembly do not forget to mount the spacing inserts taking care that the larger one is to be located on the l.h. side (viewed in the riding direction). The spindle and rocker nuts are tightened after several hard impacts of the front wheel (by hard "pumping" the fork). Then adjust the front wheel brake.

* NOTE: The tools in the kit are METRIC sizes, use these in preference to any other.

REMOVING THE REAR WHEEL

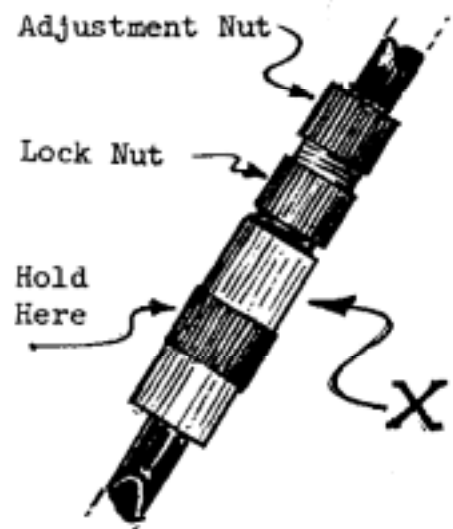
Release the rear wheel tie-rod of the brake, unscrew the spindle nut, take out the spring washer and push out the spindle to the r.h. side. Then, push out the brake reaction catch/stop rearwards and take the wheel off the driving dog. On reassembly take care to readjust the rear brake.

REMOVING THE CYLINDER HEAD AND THE CYLINDER BARREL

Remove the spark plug wire terminal, disconnect the exhaust silencer and the decompressor control cable. Unscrew the nut of the cylinder block screw in the cylinder head and push the screw out. Then remove the carburetor, complete. By means of a box spanner, OK 10, the nuts of the cylinder head are unscrewed and the cylinder head is removed. Put the piston into its bottom dead center and push the cylinder barrel upwards. The opening in the crankcase thus released must be covered with a clean cloth to prevent dirt, dust and other impurities from penetrating into the crankcase cavity. Use a brand new cylinder barrel gasket and cylinder head gasket for reassembly. Having reassembled, start the engine and let it warm up. Then, tighten the cylinder head nuts after "warm-up".

ADJUSTING THE GEAR SHIFT MECHANISM

1. Set the machine on its stand.
2. Set the left hand twistgrip in 2nd gear position.
3. Check to see if rear drive wheel is in gear.
4. If in gear, adjustment should not be necessary.
5. If wheel spins adjustment is necessary. This adjustment assembly is on the gear shift cable where cable comes out of the frame just above the spark plug. It is a threaded tube within a tube secured by a lock nut. Loosen the lock nut by turning it RIGHT (viewed from the RIGHT side of the machine) so the knurled nut travels upwards. See X on illustration below.



6. Turn the adjusting knurled nut at the top of the tube 4 to 6 complete turns to the LEFT, the nut travels down.
(Turning nut LEFT, ENGAGES gear -- turning nut RIGHT, DISENGAGES gear)
7. Then turn the left hand twistgrip to neutral pos. (0).
8. With the twistgrip in neutral try turning the rear wheel---if the adjustment has been made correctly, the gear will not engage---and the wheel will turn freely; if gear engages, turn the adjusting nut back to the RIGHT two complete turns.
9. Retighten the lock nut.

TOOLS

The current servicing and maintenance operations can be done with the following tools:

- | | |
|------------------------------|---------------------------------------|
| 1) Box spanner 21/22....1 pc | 4) Double-sided spanner 14/17....1 pc |
| 2) Box spanner 10.....1 pc | 5) Screwdriver No. 2.....1 pc |
| 3) Multihole spanner....1 pc | 6) Tire Lever.....1 pc |

LIST OF DEFECTS AND THEIR REMEDY

SYMPTOMS	DEFECT	REMEDY
Engine stops or cannot be started	Carburetor cannot be flooded	No fuel in fuel tank Fill fuel tank Fuel tap closed Open fuel tap Fuel tap insufficiently open Open fully fuel tap Strainer over fuel tap stopped up Clean strainer, after fuel tap has been unscrewed first Fuel supply hose stopped up Clean fuel supply hose Filler cap air slot stopped up Clean filler cap air hole
	Carburetor can be flooded	Carburetor jet plugged Clean carburetor jet Dirt or water in carburetor Clean carburetor Carburetor is flooded Float needle valve is loose or bent or float is pierced - replace faulty part
	Spark at the cable end	Oiled spark plug (carbon or sparkbridge) Clean spark plug or replace, check gap spacing Defective spark plug Replace with new one Defective or loose ignition wire Have cable repaired in exper shop
		Soiled contact breaker Clean and check breaker points gap Faulty condenser Replace with new one
	No compression in the cylinder	Spark plug gasket is not tight enough Replace gasket with new one Cylinder head gasket blown Replace with new one Broken or carbon - stuck Disassemble piston ring and replace with new one
	Engine runs irregularly and stops	Insufficient quantity of fuel Fill fuel tank Fuel supply partly stopped Clean fuel supply hose Carburetor dirty Clean carburetor thoroughly Faulty spark plug Replace spark plug with new one Ignition wire loosened Fix ignition wire properly or replace

SYMPTOMS	DEFECT	REMEDY
Engine runs irregularly and stops (continued)	Soiled contact breaker	Clean contact points and adjust gap to .016" (0.4 mm)
	Loosened condenser	Tighten condenser
	Defective condenser	Replace with new one
	Poor mixture	Clean carburetor jet & adjust
	Water or oil in carburetor	Clean carburetor properly
Jerky running (engine operates diesel-like)	Oversize jet (eroded)	Replace with jet 45
	Defective carburetor float	Replace float with new one
	Worn float needle and seat	Replace float with needle valve
	Fuel mixture not as indicated, i.e., wrong ratio	Adhere to mixing ratio, gasoline : oil (see the directions)
	Oiled spark plug (soiled)	Clean or replace spark plug with new one, check electrode gap, use prescribed plug
	Stopped air cleaner	Clean thoroughly
Engine performance insufficient (low output)	Engine is not run-in; heats	Let cool down, run-in carefully
	Air cleaner stopped	Disassemble carburetor; clean
	Non-adjusted carburetor	Adjust jet & idling run cable
	Defective gasket between carburetor and cylinder barrel	Tighten or replace gasket
	Air leaks into engine	Separate crankcase halves, clean faces, apply sealing compound, pull screws down tightly (operation for expert repair shop)
	Defective cylinder head gasket	Replace with new one
Engine performance insufficient (low output)	Badly adjusted ignition advance	Adjust ignition advance correctly
	Too much carbon deposit in cylinder and exhaust pipe	Remove carbon
	Worn cylinder barrel wall and piston	Replace piston & piston rings, carry out cylinder barrel,

SYMPTOMS	DEFECT	REMEDY
Engine performance insufficient (low output) (cont.)	Worn cylinder barrel wall and piston (cont.)	rebore, check bearings (expert shop)
	Faulty spark plug	Replace with new one
	Brake shoes rub brake drums	Adjust brakes properly
Engine fires into carburetor	Late spark in cylinder head	Adjust advance of ignition
	Faulty or defective spark plug	Clean, adjust or replace with new one
	Spark plug of low thermal value	Use recommended spark plug
	Insufficient fuel supply	Adjust carburetor, clean fuel hose
Engine gets overheated	The gasoline oil mixture unsuitable or ratio wrong	Do not use hi-test gasoline
	Stopped-up fuel jet	Clean thoroughly
	Late spark from spark plug	Adjust ignition properly
	Too much speed in 1st gear	Engage 2nd gear in time
	Exhaust pipe and silencer clogged with carbon	Remove carbon
	Plugged cooling fins of cylinders barrel and cylinder head	Clean with water and dry (running engine will evaporate)
Excessive fuel consumption	Defective fuel supply line, loosened connections, tank loose, loose carburetor	Repair, clean carburetor, check parts and replace faulty ones
	Oversize carburetor jet	Replace with jet 45
	Carburetor not adjusted	Adjust jet and idling run
	Exhaust pipe and silencer clogged with carbon	Remove carbon
	Defective gaskets (cylinder head, carburetor)	Replace with new ones
	Spark plug too cool	Use plug with higher thermal value
	Dirt clogged air cleaner	Clean thoroughly