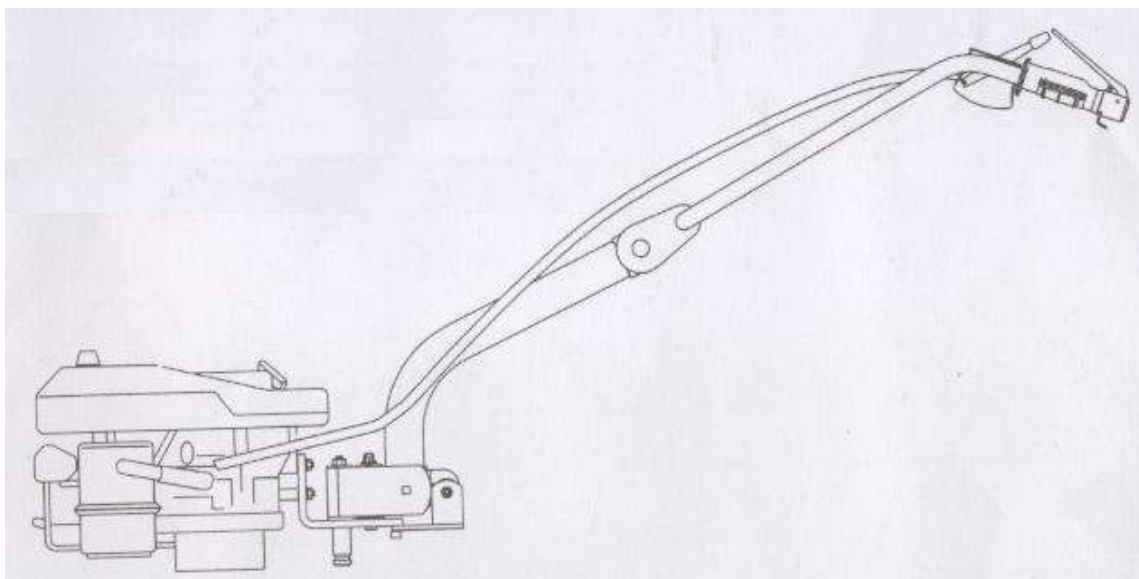




DRIVE UNIT JM 4 - 003 V

WITH THE 2-STROKE ENGINE JIKOV



Warranty for the drive unit is valid only with the use of geaboxes supplied by VARI, a.s. and Motor Jikov, a.s.

The product's design meets requirements of Law No. 22/1997 Gaz. and all related regulations. Manufacturer reserves the right of technical modifications and product innovations not included in the text and illustrations of this manual, which do not impact the machine's function, without any previous notification and with no exposure to any liabilities.

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Publication No.:VL - 056 – 2000

Put down the following data concerning your machine. The data are needed for ordering spare parts.
It is advisable to make a copy of this page with all data on the machine purchase for the case of loss or theft of the original record.

Model	JM 4 – 003 V	
Serial number	Engine:	Drive unit:
Date of delivery (sale)		
Supplier (Seller)		
Address		
Telephone/Fax		

Notes:

WARNING!

User **is obliged** to get acquainted with the Instructions for use and to follow all instructions for machine operation so that the user's and other persons' health and property do not suffer any harm.

Safety instructions contained in this manual do not describe all situations or conditions possibly occurring in practical use.

Safety factors such as common sense, diligence and scrupulousness are not included; it is assumed, however, that all persons authorized for machine operation or maintenance do possess the intelligence.

The machine can be operated only by persons at good mental and physical health.


For the professional use of the machine the machine owner is obliged to ensure a work safety training and provide instructions on machine control for operators and to keep records on these trainings and briefings.

Manufacturer bears no responsibility for damages resulting from unauthorized use, improper machine operation and damages resulting from any machine modifications not agreed with the manufacturer and for damages resulting from using the drive unit for other machines than approved by the drive unit manufacturer.

Should some instructions in the manual be unintelligible, you are encouraged to contact your seller or directly the manufacturer of the machine. Contact address and telephone/fax connections are to be found at the end of the manual.

Instructions for use supplied with the machine are an integral part of the machine. They have to be available at any time, placed at a well accessible place with no risk of their damage. In the case that the machine is sold to another person, the Instructions for use must be given to the new machine owner. If the above conditions are not met, the manufacturer bears no responsibility for incurred risks, accidents and injuries resulting from the machine operation.

To prevent injuries of yourself or other persons in the machine's vicinity, it is necessary to follow safety regulations marked in the manual with the following warning safety symbol:

	On seeing the symbol in the Manual, read the attached instructions carefully!
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I. INTRODUCTION

Dear customer,

Thank you for the trust you have shown by purchasing our product. You have become owner of one constituent from a wide range of machines and attachments made as a system of small farming and gardening technology by joint-stock company VARI a.s. The system is meant for gardeners, small growers and farmers on smaller plots and for companies involved in the provision of communal works.

Machines and implements made within the system can easily do all necessary work such as active and passive soil cultivation, pumping of fluids, cutting of stalky plants and grass, snow removal, dirt sweeping, and transport of materials on one-axle trailers.

Please read the manual thoroughly. If you adhere to instructions presented herein, you will have our products performing a reliable work for you for years.

II. SAFETY REGULATIONS

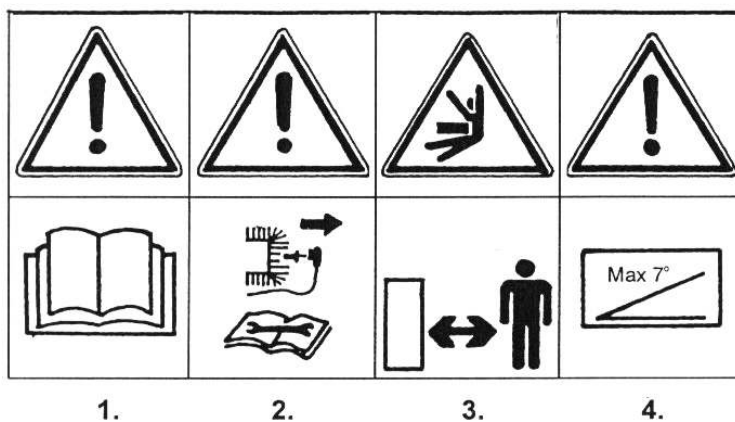
⚠ This international warning symbol is for important communications concerning safety. On seeing the symbol, be aware of a possible injury to yourself or to other persons and carefully read the following instructions:

1. Machine operator must be over 18 years of age. He/she is obliged to get acquainted with the instructions for use of the drive unit and engine and to have knowledge of general principles of work safety. At work, the machine operator should wear tight-fitting working clothes, sturdy shoes and working gloves. Working with adapters which have rotary working tools such as rotary drum mowers, mulchers, etc., he/she should use sight and hearing protectors (which have to be of approved types).
- ⚠ 2. Adhere to safety instructions in the instructional manual for engine use! Don't start the engine if it is not connected to adapter! Don't remove the engine while in operation! Don't start the engine in enclosed spaces! After the engine having been switched off, the engine exhaust silencer remains hot – be careful when handling the engine. Wait until it cools down before handling the drive unit. Make sure that there are no leakages or spills on engine parts when refuelling. Prior to another start, dry out the stained parts or wait until the petrol evaporates.
- ⚠ 3. While working with all machines of the system, all other persons and animals have to be outside the machine's working space. The machine operator is allowed to continue working only after they have been shown out to a safe distance.
- ⚠ 4. Removal of any protective equipment and machine casing is prohibited!
- ⚠ 5. User must adhere to traffic regulations of the country in which the machine is operated. Restrictions in force in the Czech Republic are as follows: All working implements must be transported on a semi-trailer. Operation of a set consisting of drive unit with tractor and trailer or implement carrier is permitted only under the following conditions:
 - ⚠ – driving these vehicles at impaired visibility is prohibited on all public roads;
 - driving these vehicles at non-impaired visibility is prohibited on communications of Class I and II with an exception of their perpendicular crossing. Driving the vehicles on roads of Class III and special-purpose roads is allowed.
 - Driver of the permitted set of vehicles must be holder of driving licence "A" or "B" or "T" or higher. According to stipulations of § 34, paragraph 4 of the Decree No. 99/89 Gaz. issued by the Federal Ministry of Interior, the operator is obliged to apply for a permission at district police traffic inspectorate which specifies further conditions for one-axle cultivating tractors in road traffic with an exception of special-purpose roadst, specifying them on the rear page of Technical certificate which can be purchased from the manufacturer.
 - Exemptions for the small farming tractor from stipulations of Decree No. 102/1995 Gaz. issued by the Ministry of Transport of the Czech Republic as amended are as follows (§/par.):
 - 57/1 - the set is not equipped with headlights
 - 58/1 - the set is not equipped with side-marker headlights
 - 60/1 – the set is not equipped with stop signal lamps
 - 61/1 – the set is not equipped with direction indicator lights, change of travel direction is to be indicated by driver's arm
 - 44 – neither drive unit nor semi-trailer are equipped with headlights.
- ⚠ 6. When working with adapters attached to small farming tractor of the DSK-316 series, pay increased attention to safety. These machine sets are prohibited to take part in road traffic except for their perpendicular crossing.
7. Safe slope accessibility of all working machines is 7 degrees.
8. The machines must not be operated in recreational and health-care zones at night from 21.00 to 07.00 o'clock.
- ⚠ 9. Prior to starting the operation of any working machine of the System, check the function of the safety engine switch by a switch installed on the left handrail of the engine unit. Function of the safety ignition switch is explained below in this manual.
- ⚠ 10. Working with the machines, use only Position II of the safety ignition switch! (see page ..., Figure 6). Driving across easily combustible materials such as hay or straw should be prevented.

11. Driving across easily combustible materials such as hay or straw should be prevented All kinds of machine repair, adjustment or lubrication should be made with the machine out of operation.

△ 12. All kinds of machine repair, adjustment or lubrication should be made with the machine out of operation.

There are the following pictographs on the machine



1. Instructions for use to be studied prior to machine operation.

2. During the machine maintenance, the conductor is to be disconnected from the spark plug.

3. Entry of exposed and other persons into the machine's working space is prohibited.

4. Keep a safe distance from the machine while in operation and a safe slope accessibility of the machine.

User is obliged to maintain the pictographs on the machine legible and to provide for their replacement in the case of their damage. The self-sticker is located on the carrier tube of handlebars.

RESTRICTION OF MACHINE WORKING TIME

1. Working with adapters for cutting your are encouraged to use the "RUBBER VIBRATION ABSORBER TG-2" which can considerably reduce vibration values at operator's site.

2. With respect to the fact that the highest tolerable values of vibrations at operator's site are to be exceeded, the product cannot be at a long-time operation. Exposure time must not exceed X minutes per an 8-hour shift or the machine operation must be interrupted so that its total duration does not exceed X minutes. Respective work procedures must be accommodated to the requirement. Noise and vibration values are to be found in the respective instruction manuals for individual adapters.

Drive unit Model JM 4-003 V	x minutes
in aggregation with rotary cultivator AKY T20 N,K	30
in aggregation with rotary weeder RP-T2	75
in aggregation with plough APJ-18, APH-352	60
in aggregation with mowing machine NM 4-009	20
in aggregation with counterdrive mowing machine NM 4-021	100
in aggregation with mulcher TAJFUN – 45	40
in aggregation with rotary drum mower SAMSON-56	70
in aggregation with sweeping brush ZK-850	200
in aggregation with mowing machines AZS - 345,AZS - 346	200

III. MACHINE USE, TECHNICAL DATA AND TECHNICAL DESCRIPTION.

MACHINE USE

Drive unit Model JM 4 - 003 V/T serves as an energy source to drive VARI-System gearboxes.

Machine sets consisting of this engine unit, gearboxes DSK - 317, T - 20 A, T2, AKY and DSK – 316 series and working attachments and implements of the VARI-System can make all kinds of farming works. Coupling to the gearboxes is ensured by two quick-operating clamps and a holding screw to secure guide pivot in the console and gearbox. This design solution enables a quick installation and dismounting of the drive unit onto/from the gearbox and its re-installation on another machine.

Drive unit JM 4 - 003 with engines JIKOV is made in the following models:

- with engine JIKOV 1453 ISKRA
- with engine JIKOV 1445 VAPE
- with engine JIKOV 1454 VAPE DV CE
- with engine JIKOV 1447 VAPE DV CE

(individual engine models differing at ignition, use of decompression valve and cylinder volume).

Torque transmission onto gearboxes is ensured by centrifugal clutch to facilitate smooth start of the machine.

The drive unit can be used with the following gearboxes:

DSK - 317: pfor transport in connection with one-axle semi-trailers of implement carriers, for work with the respective working implements for passive soil cultivation (harrows, ploughs, blade cultivators, ridging shares ...) and also for work with the machines for sowing, planting and harvest of crops.

T-20/A: identical use as that of DSK - 317, with an additional option of rotary cultivating mechanisms AKY - 357 / 8 the combination being rotary soil cultivator (the used type of soil cultivating mechanism should be adapted to soil quality). Maximum carrying capacity of one-axle semi-trailers to be adhered to is 350 kg including the operator!

DSK - 316 MA, DSK - 316 PA, DSK - 316 PZ: gearboxes designed to drive mowing machines AZS - 345, AZS - 346, NM 4 - 009, NM 4 - 021, hay tedders OP - 1.0 or OP-1.2, side-delivery hay rake and tedder NM 4 - 010, snow ploughs AFS - 351, M - 50, sweeping brush ZK - 850 S/O, OK-1000, mulcher TAJFUN - 45, rotary drum mower SAMSON - 56, tip cart MULA - 150. Connection of carrier AV-1 is possible.

RP - T2: rotary weeder for inter-row hoeing.

AZS - 349 , LTZ - 50 (P): rotary mower for cutting well-kept grass swards.

DZP - 003: pump for pumping and irrigation.

TORNADO: garden waste crusher.

Permitted one-axle trailers: HV-220
HV-220 S
HV-350-5
HV-350-7
ANV-366
ANV-350 U

Permitted implement carriers: AV-1
AV-3

TECHNICAL DATA.

Drive unit Model JM 4-003 V	Unit	Value
Engine JIKOV 1453 ISKRA , 1454 VAPE, 1454 VAPE DV CE:		
Bore	mm	56.0
Stroke	mm	54.0
Cylinder volume	cm ³	133.0
Max. output declared by manufacturer at rotations	kW / min ⁻¹	3.5/4800
Advance	mm	3.0 ±0.25

	Unit	Value
Engine JIKOV 1447 VAPE DV CE:		
Bore	mm	60.0
Stroke	mm	54.0
Cylinder volume	cm ³	153.0
Max. output declared by manufacturer at rotations	kW / min ⁻¹	3.8/4800
Advance	mm	3.0 ±0.25
All engines:		
No-load speed	min ⁻¹	1700±100
Maximum speed	min ⁻¹	4800±100
Engine rotations at controller position "1"	min ⁻¹	3700
controller position "2"	min ⁻¹	4200
controller position "3"	min ⁻¹	4800
Clutch switching rotations	min ⁻¹	2000-300
Fuel tank volume	litre	3.00
Fuel-petrol/oil mixture at running-in	--	1:33
after running-in	--	1:50
Petrol grade	--	SPECIAL91
Oil grade	API	TC
Spark plug (BRISK) (according to engine type)	--	D17YC, N17
Electronic ignition	--	6 V/17 W
Max.specific fuel consumption at 4000-4500 RPM.min ⁻¹	g/kWh	600
Length	mm	1500
Height	mm	560
Width	mm	670
Engine unit weight without fillings	kg	30.0

TECHNICAL DESCRIPTION OF ASSEMBLY GROUPS.

Engines made by JIKOV are vertical 2-stroke ignition one-cylinder engines with atmospheric filling and forced air cooling. Crankcase, cylinder, flange and case cap are aluminium castings worked on functional surfaces. Crank shaft is mounted in two antifriction bearings. Rotor of cooling system fan and cup of engine manual starter are mounted on the upper end of the shaft. Air cleaner has a high-quality cleaning insert and oil filling in the cleaner body enables operation even in a very dusty environment. Carburettor with control in on the left side of the engine. It is equipped with a fuel cock and starting air throttle for easier starting of the cold engine. **DV** engines are equipped with a decompression valve for easier start of the engine.

Ignition is located on the front engine face. Dynamo-magneto is on the rotor of ventilator which is under the plastic tank.

Plastic fuel tank is located above the engine. Fuel system is equipped with a fuel cleaner.

Engine is started by manual starter which is mounted so that the driver can start the engine from the machine operator's site. It consists of a cup with incisions, disk with pawls, winding cord and handle.

Exhaust silencer is on the right side and it is provided with a casing to prevent burning of the operator when handling the engine.

Engine rotations are controlled by an automatic speed-limit device. A lever which falls into incisions in the tank holder is to control engine rotations in three stages of regulation.

On the lower part of the engine an aluminium flange is screwed on inside which there is a twin-jaw centrifugal clutch whose design makes it possible to adjust a correct function of clutch switching in dependence on engine rotations by means of adjustment bolts. Clips of quick-operating clamps by means of which the engine unit is to be secured on the gearbox are screwed onto the flange.

IV. INSTRUCTIONS FOR USE.

MACHINE ASSEMBLY

The drive unit consists of a complete engine assembly (with clutch, steering members and flange) and handlebars.

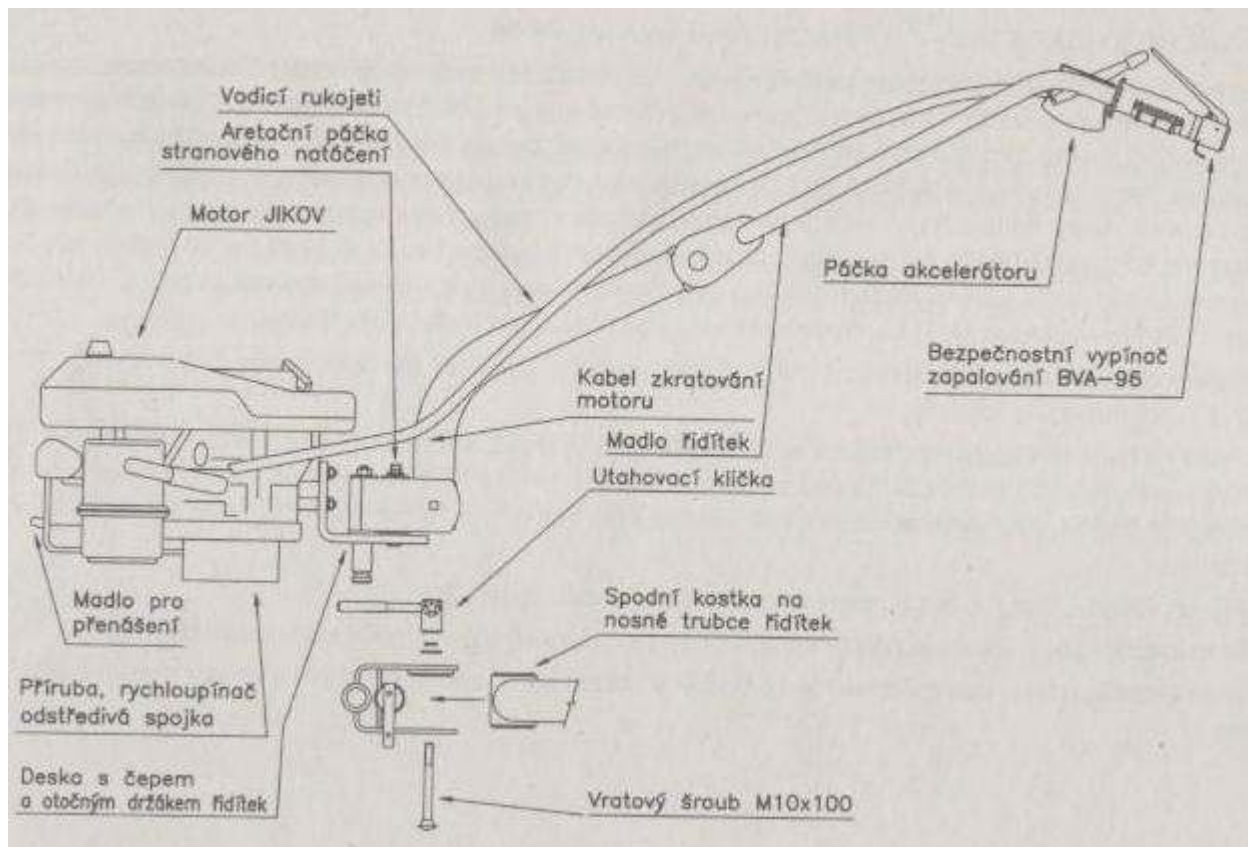
The complete engine assembly is first added a holder of handlebars, which is to be screwed onto bolts on the rear side of the engine by using nuts M8 and washers. Recommended tightening moment is 15.7 Nm.

Carrier tube of handlebars is to be slid into the lower swivel joint on the holder of guide handrails and the handlebars are to be secured with carriage bolt M10x100, flat and lock washers and tightening crank.

Accelerator lever is to be screwed onto the right handrail in front of the rubber grip with a bolt and nut which are parts of the accelerator lever. Mount the lever so that it does not bump into the rubber grip but is rather easy to reach even at the position of adjusted maximum rotations. Bowden of gas control should be led from above through the carrier tube of handlebars. Gas litz wire is to be set by means of adjustment bolt on the bowden so that the carburettor control has only a negligible backlash.

Figure 1: Drive unit assembly

Vodící rukojeti	Guide handlebars
Aretační páčka stranového natáčení	Arrestment lever of turning to sides
Motor JIKOV	Engine JIKOV
Madlo pro přenášení	Grip for displacement
Příruba, rychloupínač, odstředivá spojka	Flange, quick-operating clamp, centrifugal clutch
Deska s čepem a otočným držákem řídítek	Plate with pivot and swivelling holder of handlebars
Kabel zkratování motoru	Engine short-circuiting cable
Madlo řídítek	Handlebar rail
Utahovací klička	Tightening crank
Spodní kostka na nosné trubce řídítek	Lower box-angle plate on the carrier tube of handlebars
Vratový šroub M10x100	Carriage bolt M10x100
Páčka akcelérátoru	Accelerator lever
Bezpečnostní vypínač zapalování BVA-96	Safety ignition switch BVA-96



ASSEMBLING THE SAFETY IGNITION SWITCH BVA-96

Cable for the safety ignition switch BVA - 96 is a part of the complete engine assembly. Cable eye on the yellow cable is to be fixed under the left upper nut with which the holder of handlebars is screwed onto the engine. Pass flexible tubing 12x0.5x300 mm through both cables. Dismount the safety ignition switch BVA-96 from the handlebars. Draw the two cables through the lower hole in the handlebars carrier tube side up to the tube end. The insulation sleeving which protects the cables in their lower part should be slid into the carrier tube of handlebars ca. 10 cm deep. Then mount a plastic plug with hole onto the cables and knock it with its notched end into the upper part of the carrier tube of handlebars. Pass the insulation sleeving 12x0.5x300 through the two cables again. Tip the rail of handlebars down, pass the cables through it and mount the connectors into pins on cables leading from the body of the safety switch. Slide the flexible tubing which protects the cables ca. 10 cm into the tube of handlebars.

⚠ Cables must be reaching in the carrier tube of handlebars and rail to such a distance that they are not stressed at any of the extreme positions of the handlebars.

Connector on the yellow cable is to be mounted into the yellow cable on the switch and connector on the red cable is to be mounted into a shorter cable leading from the middle of the BVA-96 safety switch body. Cover the red cable coupling with insulation sleeving! Put the safety ignition switch into the tube of handlebar rail and secure it with bolt M5x10 with washer.

⚠ Correct functioning of the switch can be achieved only with the "live" contact of the two cables being prevented!

⚠ Prior to each machine use check also the function of the BVA-96 safety ignition switch!

Bowden of gas control should be fixed onto the handrail with the plastic tightening tape at the lower bending of handrail tube.

ASSEMBLING THE SHOCK ABSORBER

⚠ The use of shock absorber Model **TG-2** which considerably absorbs vibrations generated during the machine operation and transmitted onto the handlebars is compulsory for working with cutting adapters.

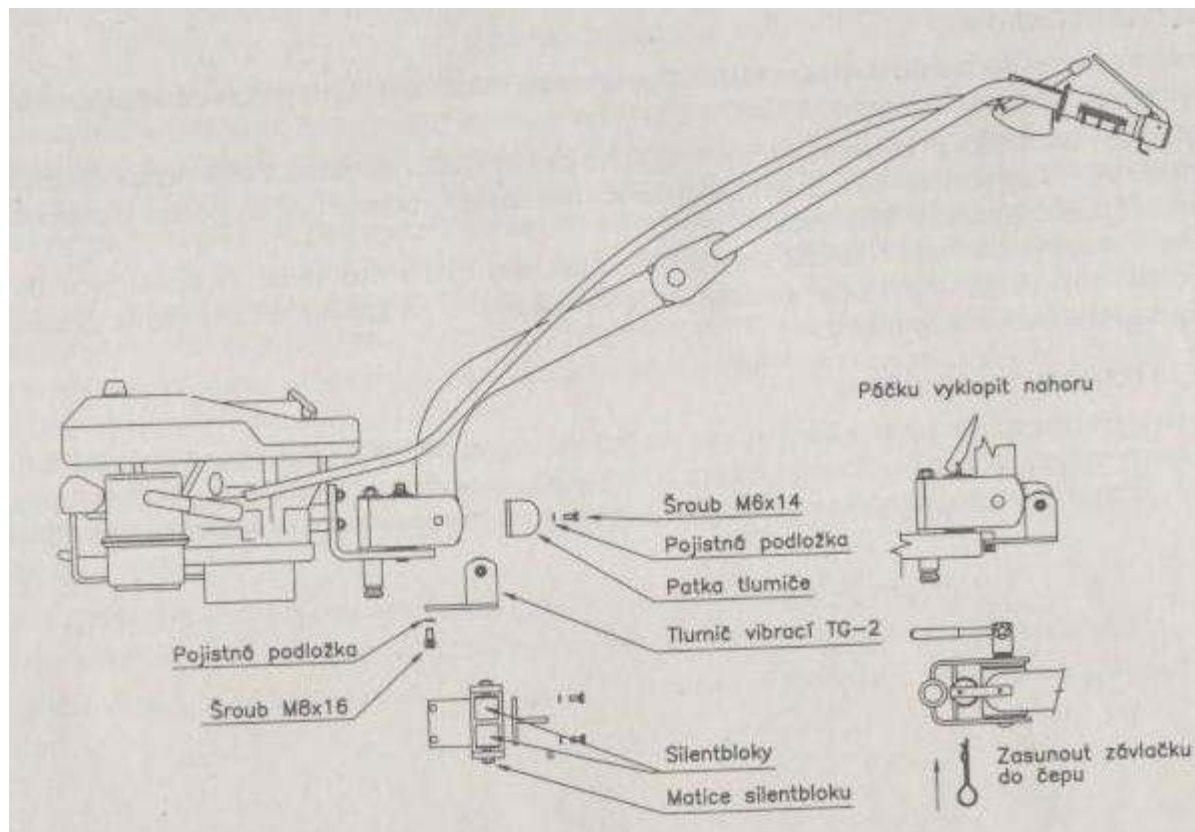
Assembly of the shock absorber "TG-2" is to be made according to Figure 2. Shock absorber foot is to be screwed onto the lower box-angle plate on the carrier tube of handlebars with two bolts M6x14 with lock washers. The shock absorber TG-2 (Position 2) is to be screwed onto the engine flange plate (Position 1) with bolts M8x16.

By tightening the rubber silent blocks set the position of handlebars so that it is in the machine axis. the tightening should be made so that the rubber silent blocks have only a light contact with the surface on the complete assembly of handrail holder (Position 1). the silent blocks are to be secured by tightening the counter-nuts.

ADJUSTING THE SHOCK ABSORBER TG-2

Basic setting of vibration dampers see the assembly of shock absorber onto handlebars. Correct functioning of the shock absorber requires de-arrestment of the pin on the swivel holder of handlebars. Tip the arresting-pin-controlling lever upwards and secure it with the retaining split pin (See Figure 2). The handlebars are in their movement to sides restricted only by the vibration dampers.

Figure 2: TG-2 shock absorber assembly

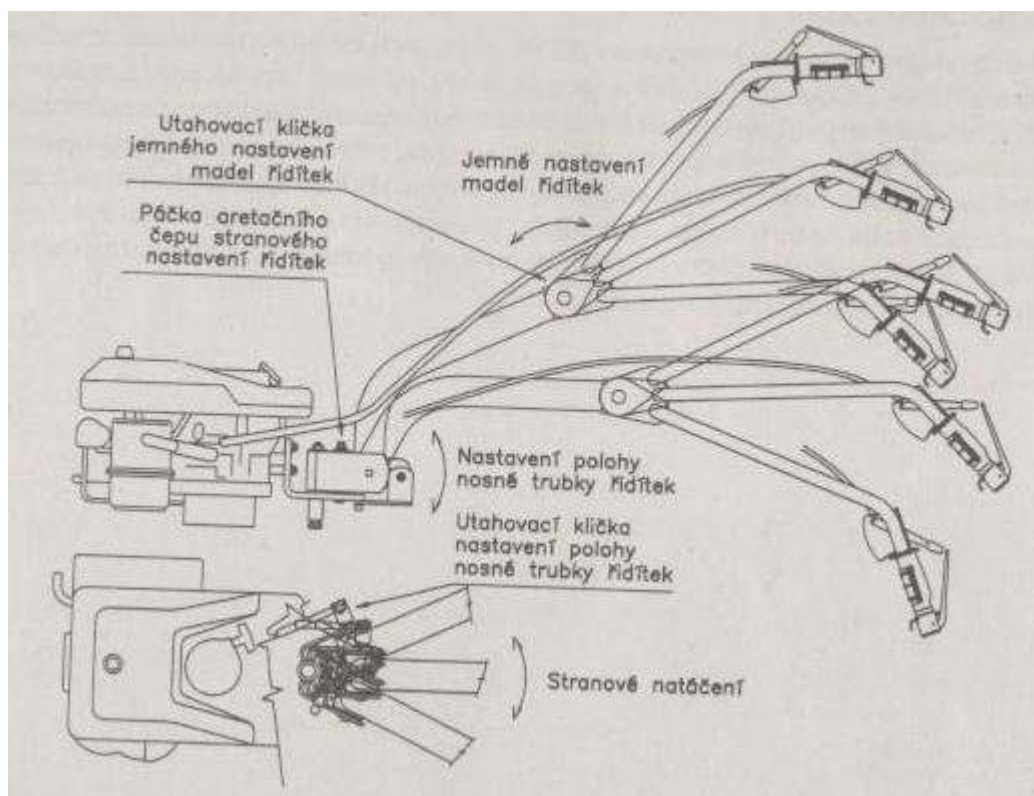


Pojistná podložka	Lock washer
Šroub M8x16	Bolt M8x16
Šroub M6x14	Bolt M6x14
Pojistná podložka	Lock washer
Patka tlumiče	Shock absorber foot
Tlumič vibrací TG-2	Shock absorber TG-2
Silentbloky	Silent blocks
Matice silentbloku	Silent block nut
Páčku vykllopit nahoru	Lever to be tipped upwards
Zasunout závlačku do čepu	Split pin to be slid into the pivot

ADJUSTING THE GUIDE HANDLEBARS

Design of handlebars enables their setting to sides and height. Side adjustment is possible by arrestment pivot in the lower joint of handlebars (Figure 3). There are three holes in the plate, into which the pivot falls thus arresting the position of guide handlebars. There positions are used in cases when it not desirable that the operator moves on the worked soil (e.g. at rotary cultivation). Height adjustment can be made at two places on the guide handlebars. Basic height setting is made by loosening the tightening crank in the lower joint, setting of the carrier tube of handlebars in the teeth on the carrier tube and lower joint, and by a subsequent tightening of the bolt. Finer height setting of handlebars height can be made by loosening the tightening crank in the upper joint, slight turning in the teeth on the carrier tube and in the upper joint of the rail, and by a subsequent tightening of the tightening crank.

Figure 3: Adjustment of guide handlebars



Utahovací klička jemného nastavení model řídítek
 Páčka aretačního čepu stranového nastavení řídítek
 Jemné nastavení model řídítek
 Nastavení polohy nosné trubky řídítek
 Utahovací klička nastavení polohy nosné trubky řídítek
 Stranové natáčení

Tightening crank for fine setting of handlebar rails
 Arrestment pivot lever for side setting of handlebars
 Fine adjustment of handlebar rails
 Setting the position of the carrier tube of handlebars
 Tightening crank for adjusting the handlebars carrier tube position
 Turning to sides

MOUNTING THE DRIVE UNIT ONTO GEARBOXES

Drive unit which is a power supply to prime all VARI-System machines is mounted into a flange in the upper part of the gearboxes.

On the lower face of the complete flange assembly there is a cylindrical part which is to be slid into the gearbox flange when mounting the drive unit onto the gearbox. A second part to seat the driving unit onto the gearboxes is a pivot on the holder of handlebar rails, which is to fall into a hole in the console on the gearbox flange. The pivot is to be secured by screwing in the crank which is a part of the gearbox.

In gearbox Model T - 20 A the drive unit can be installed in two directions, which makes it possible to properly use engine's power with respect to gearing of the gearbox.

Methods of drive unit installation for different works are described in the instruction manual for gearbox Model T - 20 A.

In gearbox Model T - 2 and pump Model DZP - 003 the drive unit position on the gearbox is to be secured not by means of the pivot in the handlebar rail holder but by means of a pin which is pressed into the gearbox flange and which falls into the hole in the complete flange assembly after the driving unit has been mounted onto the gearbox.

PROCEDURE OF DRIVE UNIT INSTALLATION

1. Get the gearbox with working implements or attachments you wish to use at work ready according to relevant instructions in the operating manuals for the given machines or implements.
2. Clean the connecting points for the gearbox and the inside of the clutch disk.
- ⚠ 3. Clutch disk in the gearbox must not be greasy since the centrifugal clutch might be slipping and the clutch lining and engine crankshaft sealing could suffer damage due to higher temperature!
3. Release the tightening crank which retains the pivot (which is a part of the holder of guide handlebars) in the gearbox.
4. Clean the surface of cylindrical flange and pivot on the holder of guide handlebars from dirt.
5. Hold the driving unit with one hand gripping on the holder located on the front face of the engine while holding it with the other hand by the upper joint of handlebar rail.

6. Put the drive unit on the gearbox so that the cylindrical part of engine flange falls into the gearbox flange and the pivot on the holder of handlebar rails falls into the hole in the console on the gearbox.
7. Move the drive unit slightly to and fro until it fully sits on the gearbox.
8. Then secure the drive unit by means of two clips of quick-operating clamps. Pawls on the clips of quick-operating clamps are to be hooked on pins in lugs on the gearbox flange. Lock the quick-operating clamps by pulling on the eye of the clip towards the engine case surface.
9. Finally, tight the tightening crank which secures the pivot on the holder of guide handlebars in the gearbox.

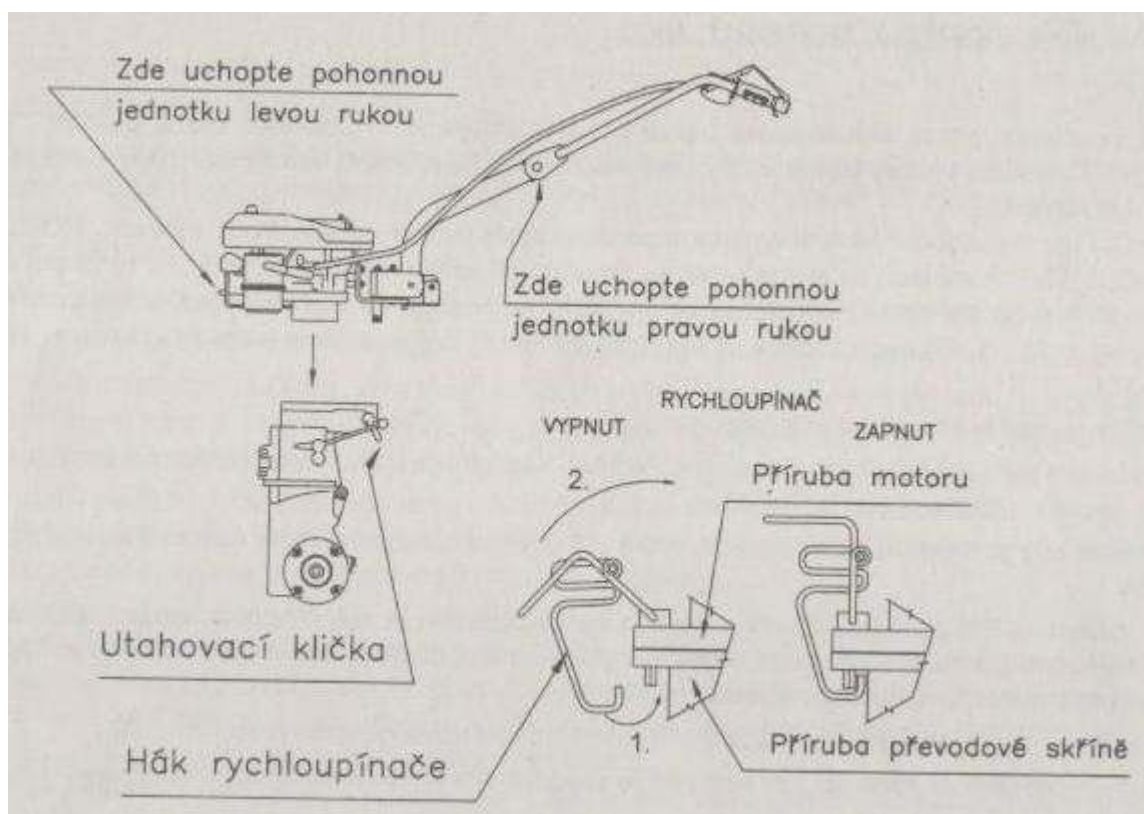
Removal of the drive unit is made as a reverse procedure. Loosen the clips of quick-operating clamps by disengaging the quick-operating clamp so that you take a hold of the clip eye from below and pull it upwards. Pawl of the clip is to be taken out from the pin and the quick-operating clamp should be pushed aside so that it does not stand in the way to the removal of the drive unit from the gearbox.

⚠ Be careful when engaging the quick-operating clamps. Your fingers might be injured. Clips have a high tension and engagement of them requires force.

⚠ Be careful at removing the drive unit and its displacement onto another machine since the exhaust silencer is hot while in operation.

⚠ During the removal or installation the machine should be approached from the left side, i.e. from the side of air cleaner and carburettor on the drive unit engine.

Figure 4: Procedure of drive unit installation



Hold the drive unit at this place with your left hand
Tightening crank
Hook of the quick-operating clamp
Hold the drive unit at this place with your right hand
Quick-operating clamp – disengaged – engaged
Engine flange
Gearbox flange

Zde uchopte pohonnou jednotku levou rukou
Utahovací klička
Hák rychloupínače
Zde uchopte pohonnou jednotku pravou rukou
Rychloupínač – vypnut – zapnut
Příruba motoru
Příruba převodové skříně

ADJUSTMENT AND MAINTENANCE OF THE JIKOV ENGINE

1. PREPARATION

a) Fuel: Use only automobile petrols of which the best is currently available Czech petrol grade SPECIAL 91. Two-stroke engine are lubricated with a fuel mixture consisting of petrol blended with oil at a recommended ratio.

For lubrication of this two-stroke engine the manufacturer recommends a mixture of petrol and oil. Use oil "MOGUL TS " or "MOGUL TSF" designed for heavy-duty engines, with excellent lubricating properties, at the use of which a well-set engine exhibits lower values of emissions and smoke density. Blending ratio of the mixture (petrol : oil) is **50 : 1**. For the time of running in the engine (ca. 10 hours) it is advisable to reduce the ratio to **33 : 1**.

The mentioned oils are currently available in the network of petrol stations.

⚠ Adhere to safety regulations when refuelling. Do not refuel the machine in enclosed spaces, do not smoke and do not do refuelling in a vicinity of open fire.

Fuel tank should be filled only up to 2.5 cm below the upper edge of the tank neck. Fuel tank volume is 3 litres.

b) Air cleaner: For the correct functioning of the oil air cleaner the body of the air cleaner must be filled with engine oil. Remove the lower part of oil air cleaner by releasing the tightening sleeve and fill it with engine oil which is normally used for petrol/oil mixture.

Oil surface is to be max. 0.5 cm above the bottom of the lower part of the oil air cleaner.

It is advisable to make regular checks of oil for its contamination in the lower part of the cleaner. If so, replace it with new oil without delay.

In the dry season (summer months and at cutting), check the air cleaner every day, otherwise once a week. Practical results from the machine use indicate that oil must be exchanged after **about 30** hours of operation.

⚠ Air cleaner should be checked with the engine switched off !

Air cleaner insert wash out in technical petrol –when dirty- and before mounting it back, let it dry properly. The check is to be made along with the check of oil volume in the oil air cleaner.

2. STARTING THE ENGINE

⚠ Start the engine only when it is coupled to a gearbox or another aggregate of the VARI-System!

⚠ Do not start the engine in enclosed rooms. Gases generated at fuel combustion are dangerous to life!

⚠ When starting the engine, shift the gear to neutral or disengage the travel clutch. Be very careful in aggregates without a possibility of disconnecting the drive from the machine since the machine may get into motion at increased starting rotations.

⚠ Start is to be made so that you will stand behind the machine in the direction of the starting cord, holding the handlebars and controlling the accelerator lever with your left hand and making start with your right hand by using the grip on the starter cord. Engine rotations should be reduced immediately after the start. Safety ignition switch is in Position 1 at starting.

a) Cold motor:

Open the fuel cock, shut the starting throttle (lever must point upwards) and set the accelerator lever to about a 1/3 of lever step. Put the starter gearing into engagement by slightly pulling the handle out and start the engine by a rapid pull on the handle of the self-returning starter. Right after start, open the starting throttle (lever in horizontal position), but do not load the engine with high rotations.

If the engine does not start at a second try, the starting throttle must be opened, accelerator lever set to full opening and the start should be repeated.

b) Warmed-up engine:

Open the fuel cock. Set the accelerator lever to about a 1/2 of lever step and start the engine.

It is recommended that the fuel cock on the carburettor is closed even at a shorter break in machine operation.

3. OPERATION

After having been started, the engine can be fully loaded after about a minute. Speed limit governor on the rear face of the tank serves to set engine rotations according to the used machines or implements or works to be carried out (see instructions for use of respective implements and machines of the VARI-System).

4. STOPPING THE ENGINE

If you wish to stop the machine, shift the accelerator lever into Position "MIN", the centrifugal clutch will be disconnected and the machine will come to a stop.

If you wish to switch off the engine, release the lever of safety ignition switch on the left handlebar and the engine will switch off. This switch will provide for engine switch-off and machine stop in critical situations with danger of collision or injury to operator.

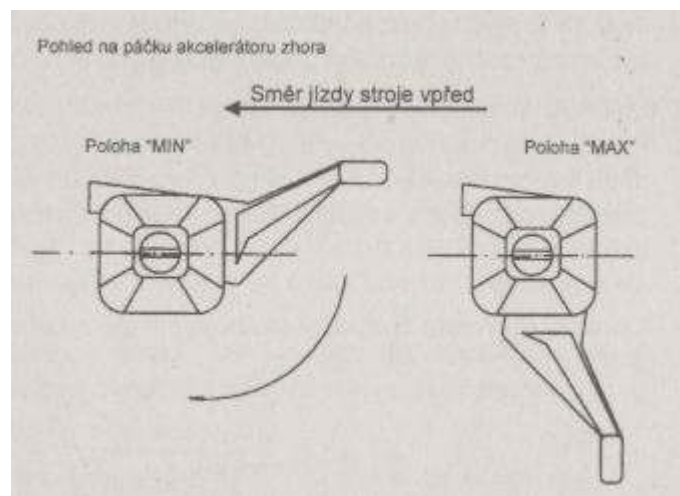
5. TECHNIQUE OF CONTROLLING THE JIKOV ENGINE WITH AUTOMATIC CENTRIFUGAL CLUTCH

Coupling of the centrifugal clutch depends on engine rotations. This is why steering of this type of engine requires technique which differs from that applied in controlling for example an engine with multiple-disk clutch. Two working positions of accelerator lever are illustrated in Figure 5:

- **"MAX"** : with accelerator lever in this position the engine has maximum output and the clutch is in full engagement (provided that the engine is not overloaded and is not running at low rotations)
- **"MIN"** : with accelerator lever in this position the engine has no-load speed and the clutch is out of engagement. Engine working speed is between 2500 to 4800 RPM. Use maximum engine rotations so that clutch slippage and hence its damage cannot occur.

Engine rotations should be increased fast so that the engine has higher speed than the rotations at which the clutch gets into engagement in order to prevent clutch slippage. Centrifugal clutch has a smooth engagement at a rapid increase of engine rotations.

Figure 5: Working positions of accelerator lever



Pohled na páčku akcelérátoru zhora
Směr jízdy stroje vpřed
Poloha „MIN“
Poloha „MAX“

View of the accelerator lever from above
Direction of machine drive forward
„MIN“ Position
„MAX“ Position

TECHNIQUE OF CONTROLLING THE SAFETY IGNITION SWITCH

Safety ignition switch Model **BVA - 96** meets the standard of safety ignition switches used by manufacturers of small gardening technology abroad. This switch ensures switching of engine ignition system and hence stoppage of engine operation immediately after the operator has left its site in a critical situation or for putting the machine out of operation. The safety ignition switch has three functional positions as follows:

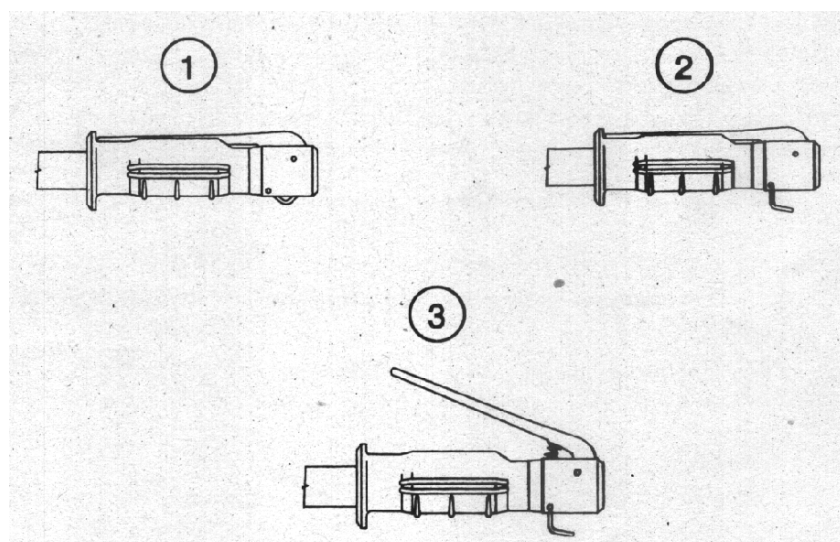
Position **1** is to be used for starting the engine, setting engine speed or for a short-time putting of the machine out of operation while the engine is still on.

⚠ At this position of the safety ignition switch, always shift on neutral gear on the gearbox or switch off the clutch of travel wheels and disconnect the drive of working implements!

Position **2** is to be used for machine operation. If the machine is in operation, the wire dog has to be always released!

Position **3** is to be used for switching the engine off in critical situations or for putting the machine out of operation. The engine will switch off after the lever of the safety ignition switch on the left handlebar rail has been released. Putting the hand away from the handlebar will do to stop the engine on the condition that the wire pawl is released.

Figure 6: Positions of the safety ignition switch



V. HANDLING AND MAINTENANCE

Regular treatment of the engine is very important for its long service life and correct functioning. If you adhere to these fundamental maintenance instructions, the engine will serve you long without any greater problems.

It is advisable to have records on fuel mixture consumption and time of engine operation. The information is a good indicator of the technical condition of the engine.

Thorough cleaning of the engine is recommended after **50** hours of operation. However, if your engine works in dusty environment and under high temperatures (such as at rotary cultivation or cutting), the intervals of engine cleaning should be shorter. Particularly important is to check the oil air cleaner (see page 26), vicinity of the upper part of cooling fan rotor and fuel cleaner. Should these places be soiled or clogged, the engine output is reduced and the wear of parts increased.

Take care that the stalks of plants do not get between fan blades and cylinder and head lamination when cutting high-grown swards. Insufficient engine cooling results in overheating and danger of engine seizure.

⚠ To clean the engine use only the "environment-friendly" detergents !

Recommended Czech-made detergents are for example " ARVA - EKO " or " EKOLAN 93 ".

⚠ Clean the engine only when it is cold.

Proper engine operation needs correctly adjusted spark plugs. Spark plugs recommended for engines 1453 ISKRA, 1454 VAPE, and for engines 1447 VAPE DV CE, 1454 VAPE DV CE are **BRISK N17** (**BRISK N17 C**) and **BRISK D17YC** respectively.

Spark plug should be cleaned with a wire brush after **50** hours of operation and the spark contact gap should be set to **0,6 - 0,7 mm** by using feeler gauges.

MAINTENANCE PLAN:

Interval	daily	monthly 20 hrs	3 months 50 hrs	6 months 100 hrs	once a year 300 hrs
Check, adjustment					
Air cleaner		•			•
Fuel cleaner			•		•
Engine cooling	•	•			•
Spark plug			•		
Fuel hose	to be replaced every three years				

DIAGNOSTICS OF DEFECTS AND REMEDIAL ACTIONS

Problem: Cold engine cannot be started:

Reason:

- a) Defect in fuel piping
- b) Spark plug does not spark
- c) Blocked main carburetter jet

Rectification:

ad a) Make sure whether there is enough petrol in the tank, check whether the fuel cock is open and fuel flows through the feeding hose. If not so, clean the fuel system completely.

ad b) Screw out the spark plug, clean electrodes and insulator with a steel brush, set the gap between the electrodes, check the ignition spark, fix the spark plug to the cable terminal and put the hexagonal block on the spark plug to the exhaust. there must be a visible sparking to be seen on the spark plug electrode at a trial start. If not so, use a new spark plug a test it according to the prescribed procedure. If the defect cannot be rectified even after the spark plug has been exchanged, check the condition of the cable terminal and cable itself. Should the sparking not occur even now, contact an authorized service shop for repair.

ad c) If the fuel gets into carburetter, the sparking occurs but the engine does not start, the reason may be a clogged main jet. Dismount the float chamber, screw out the main jet and clean it by blowing it through.

- Problem:** Engine is warm but cannot be started
Reason: Engine is oversaturated with fuel mixture
Rectification: a) Turn the accelerator lever into Position "MAX"
b) Screw out the spark plug
c) 5times to 6times pull on the starter cord; this makes the engine turning while the excessive mixture is blown out through the spark plug hole
d) Screw on the spark plug (cleaned) and start the engine
- Problem:** Engine warming up, not performing well
Reason: Clogged suction channel to carburetter and oil air cleaner, or dirty exhaust piping or clogged engine cooling system
Rectification: a) Clean the oil air cleaner and piping
b) Clean the cooling system fan and lamination on the cylinder
c) Burn out the exhaust piping
d) Check the contents of tank and carburetter for possible water (water condensate may occur in drops at the tank bottom or in the lower part of the carburetter).

VI. STORAGE

The machine should be kept at a dry place. Access of unauthorized persons to the machine should be prevented. The drive unit must be installed onto one of adapters or secured so that its turning upside down and oil getting into the exhaust or into the air filter and carburetter is prevented. At preparing the drive unit ready for storage, adhere to the below instructions.

PROCEDURES TO BE CARRIED OUT PRIOR TO THE LONG-TERM STORAGE OF THE ENGINE

- Wash the engine and clean it from all dirt and dust
- Tighten all bolts on the flange and on the cylinder head
- Check the function of spark plug and/or reset the distance of electrodes of the spark gap
- Clean the carburetter and fuel piping, empty the fuel tank
- Coat or spray the thoroughly cleaned engine and accessories with a preservative
- During the long-term storage, put the engine into operation for about 30 minutes at least once in three months. Before the start, remove all preservatives from the engine.
- After the test, carry out operations described under items b), d), e).
- Cover the engine with a suitable material (e.g. canvas or paper).

VII. DISPOSAL OF PACKAGING AND MACHINE

- Paper packaging** - secondary raw materials to be offered for sale
- to be placed in containers at collecting points
- incineration
- other use
- Plastic materials** - to be placed in containers at collecting points
- Wood** - incineration, crushing, chopping

After the product's service life has expired, you are obliged to provide for the disposal of the machine with taking into account the use of secondary raw-materials according to Waste Law No. 238/91 Gaz. and its possible amendments.

The procedure to be recommended for machine disposal after the end of its service life is as follows:

- Dismount all parts from the machine that can still be used.
- Dismount machine parts made of plastic materials and arrange for their disposal according to Waste Law No. 238/91 Gaz. as amended.
- Dismount parts made of non-ferrous metals. The stripped machine remainder including the dismantled parts of non-ferrous metals are to be disposed according to Law No. 238/91 Gaz. and its possible amendments.

VIII. LIST OF COMPONENTS

JIKOV ENGINES

Spare parts supplied by the engine manufacturer:

MOTOR JIKOV trading

Lipenská 37

370 04 ČESKÉ BUDĚJOVICE

Mail orders- Telephone 038/27801

Note: Tables include common parts for all engines. Position/s with * hold/s only for engine Model 1447 VAPE DV CE (and if mentioned in the note below the Table also for engine Model 1454 VAPE DV CE); Position/s ** hold/s only for engine Model 1454 VAPE DV CE. If the Position No. is listed as * or **, the above engines are not to be added positions without this supplementary marking.

1. Crankshaft with piston

Pos.	JKPOV	Ordering No.	Part	Pcs
1.	273 521 003 717	997-3224	Gufero 17x35x10 ČSN 0294010	2
2.	324 163 020 383	994-3145	Bearing UR 6203 ČSN 024630	1
3.	482 060 102 236	601-0226	Shim block	2
4.	482 996 906 331	969-0631	Crankshaft assembly	1
5.	311 728 504 065	540-0408	Feather 3x5 ČSN 301385.11	1
6.	324 163 038 300	994-3144	Bearing 6303 UR ČSN 024630	1
7.	319 237 140 505	301-1971	Piston pin	1
8.	311 733 100 140	602-1802	Retaining ring 14 ČSN 022931	2
9.	326 070 701 310	304-3026	Piston ring 56x2 ČSN 27011.70	2
9*.		304-3048	Piston ring 60x2 ČSN 27011.70	2
10.	482 060 102 239	601-0229	Shim block	2
11.	319 231 211 290	723-0217	Piston A 56 mm	1
11*.		723-0267	Piston A 60 mm	1
12.	532 888 200 080	994-3136	Needle bearing KBK 14x17x20 INA	1
13.	482 079 304 035	793-0425	Connecting rod	1
14.	324 162 050 000	994-3130	Bearing 18x24x13	1
15.	482 030 119 832	301-1982	Crank pin	1

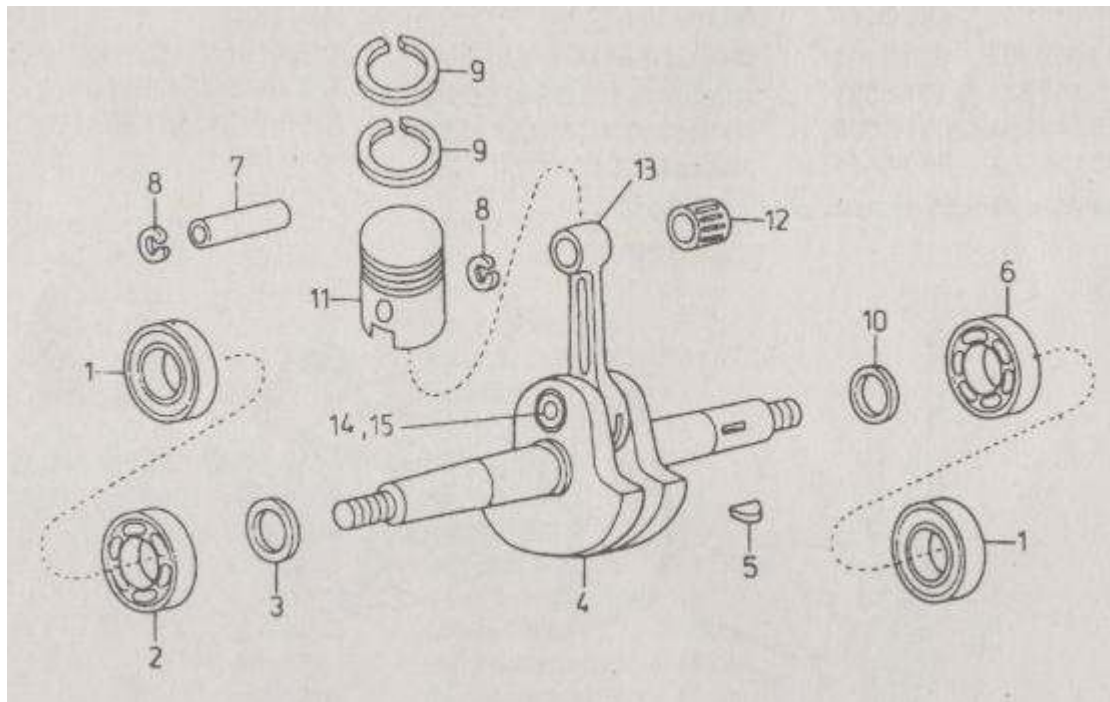
Parts available for engines 1453 ISKRA, 1454 VAPE, 1454 VAPE DV CE are as follows:

piston I. re-bore Drawing no.:723 0242

piston ring I. re-bore Drawing no.:304-3060

piston II. re-bore Drawing no.:723-0261

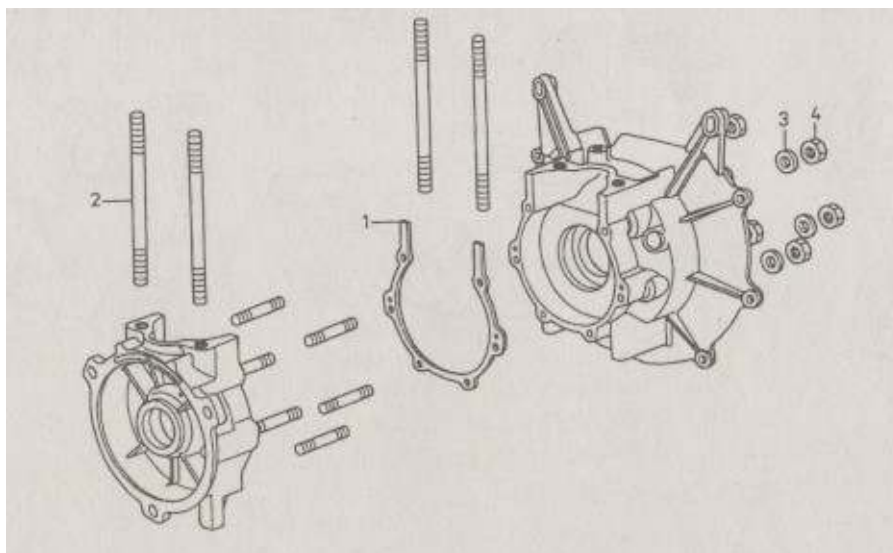
piston ring II. re-bore Drawing no.:304-3061



2. Crankcase

Pos.	JKPOV	Ordering No.	Part	Pcs
1.	627 832 019 003	626-2903	Crankcase sealing	1
2.	482 010 155 831	101-5581	Bolt M 8x153 ČSN 426518.52	4
3.	311 213 310 064	601-1605	Washer 6.4 ČSN 021733.05	6
4.	311 120 114 060	180-0141	Nut M 6 ČSN 021401.25	6

obligatory order: crankcase-assembly: ordering no.: 960-3919

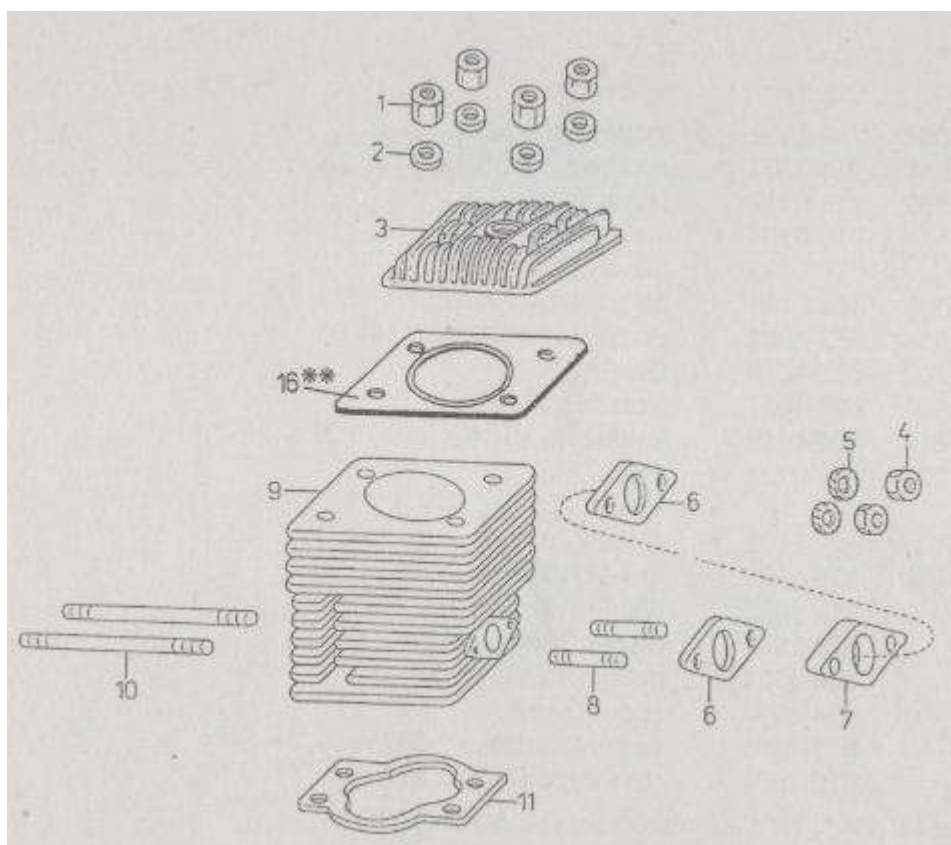


3. Cylinder with head

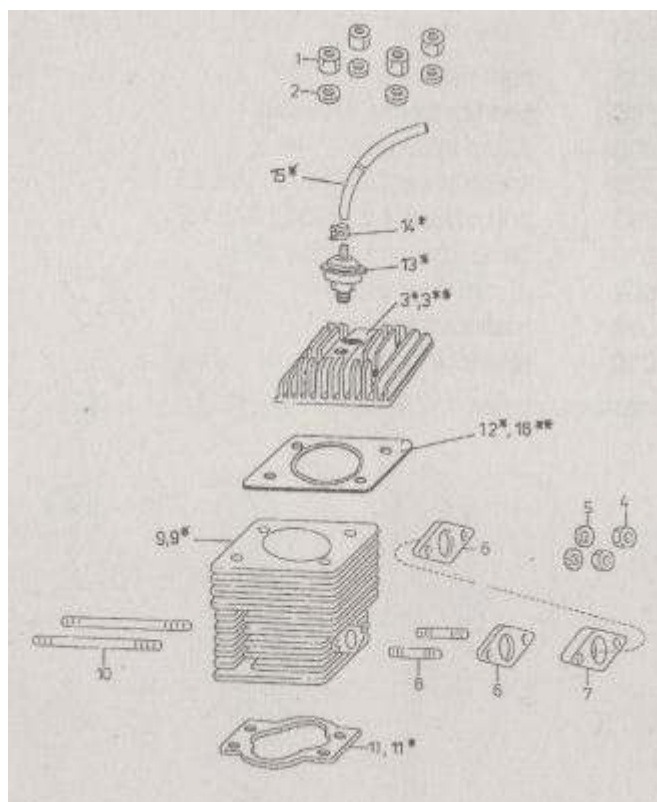
Pos.	JKPOV	Ordering No.	Part	Pcs
1.	482 013 066 032	130-6602	Cylinder head nut	4
2.	311 210 211 084	354-0253	Washer 8.4 ČSN 021702.15	4
3.	482 071 603 132	716-0312	Cylinder head	1
3*.		716-0324	Cylinder head	1
3**.		716-0323	Cylinder head	1
4.	311 120 114 060	180-0141	Nut M 6 ČSN 021401.25	2
5.	311 214 510 064	652-1602	Washer 6.4 ČSN 021745.05	2
6.	278 432 510 097	625-1018	Sealing	2
7.	321 162 111 516	625-1017	Insulation pad	1
8.	309 276 140 620	101-5626	Bolt M 6x30 ČSN 021176.25	2
9.	482 071 607 234	716-0724	Cylinder	1
9*.			Cylinder	1
10.	482 010 155 533	101-5553	Cap screw	2
11.	627 832 011 030	625-5002	Cylinder sealing	1
11*.		625-5003	Cylinder sealing	1
12*.		626-2605	Sealing under head	1
13*.		934-3103	Decompression valve	1
14*.		994-3014	Clip Gorbin	2
15*.		913-2563	Fuel hose 5x360mm	1
16**.		626-2604	Sealing under head diam. 56 mm	1

Note: Positions 13*, 14*, 15* also for engine 1454 VAPE DV CE
positions 3**, 16** only for engines 1454 VAPE DV CE

For engines 1453 ISKRA, 1454 VAPE



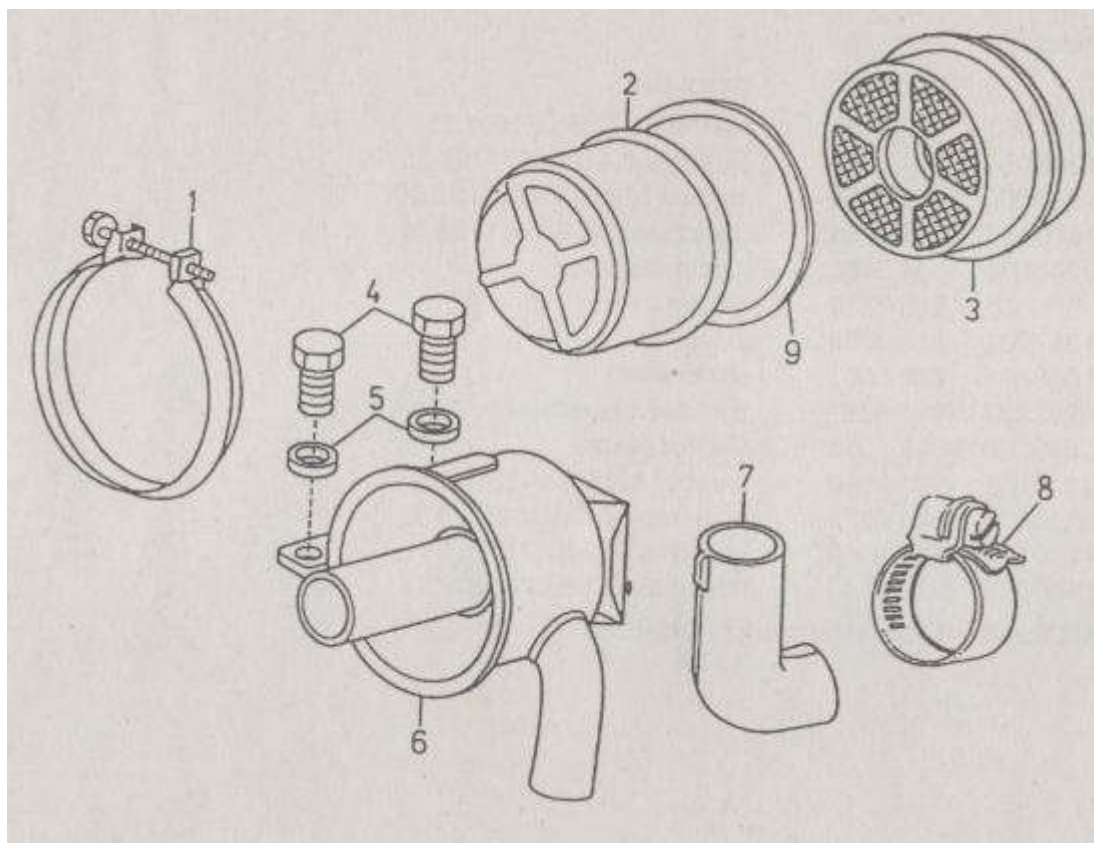
For engines 1454 VAPE DV CE, 1447 VAPE DV CE



4. Air cleaner

Pos.	JKPOV	Ordering No.	Part	Pcs
1.	482 996 052 035	960-5205	Sleeve	1
2.	482 060 655 036	606-5510	Air cleaner- lower part	1
3.	482 994 619 033	946-1903	Cleaning insert	1
4.	309 203 140 811	101-2536	Bolt M 8x12 ČSN 021103.25	2
5.	311 210 211 084	354-0253	Washer 8.4 ČSN 021702.15	2
6.	482 994 648 130	946-4810	Air cleaner-upper part	1
7.	273 133 010 424	913-7602	Rubber coupling	1
8.	548 241 571 421	994-3008	Hose clip	1
9.	273 111 351 074	913-1010	Sealing ring	1

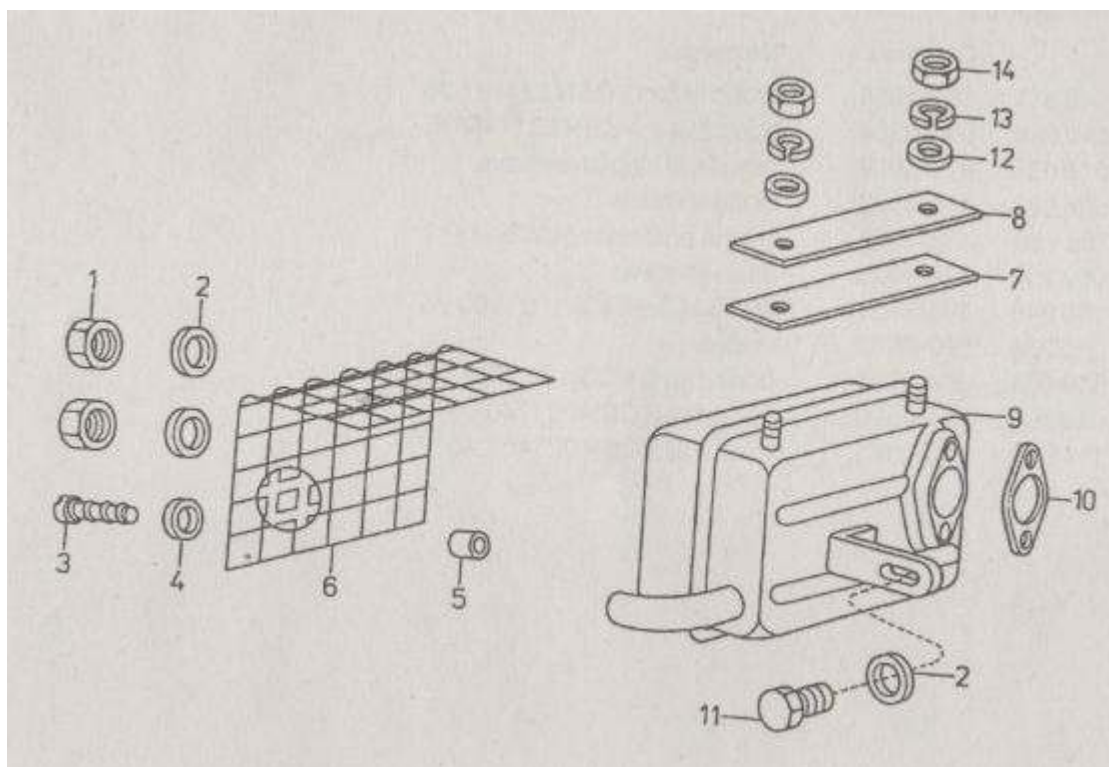
optional order: air cleaner assembly (positions 1-7), ordering no.: 984-1011



5. Exhaust silencer

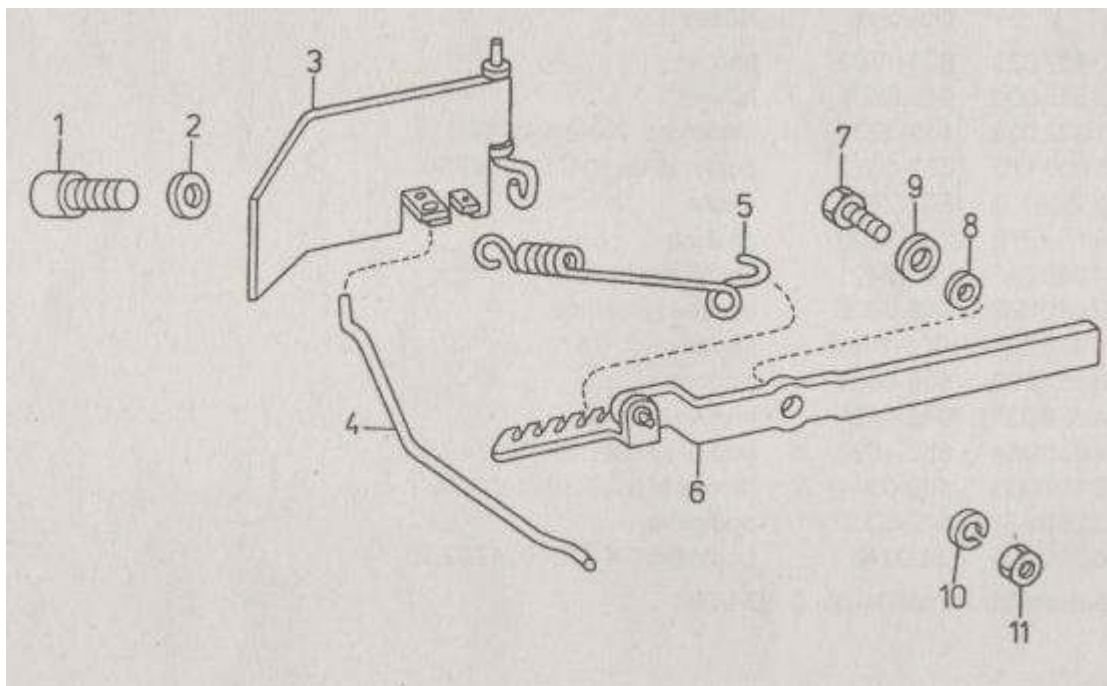
Pos.	JKPOV	Ordering No.	Part	Pcs
1.	311 120 114 080	180-0185	Nut M 8 ČSN 021401.25	2
2.	311 210 200 084	354-0253	Washer 8.4 ČSN 021702.15	3
3.	309 332 000 000	102-0304	Bolt B 3,9x19 PN 021232.05	1
4.	311 212 610 053	304-0254	Washer 4.3 ČSN 021726.15	1
5.	482 030 203 034	304-3701	Spacer tube	1
6.		946-7815	Grid	1
7.	482 091 357 033	913-5703	Screen	1
8.	482 061 605 031	616-0501	Screening metal plate	1
9.	482 994 682 137	946-8217	Exhaust silence-assembly	1
10.	278 432 510 098	625-1016	Exhaust sealing	1
11.	309 203 140 811	101-2536	Bolt M 8x12 ČSN 021103.25	1
12.	311 212 610 053	304-0278	Washer 5.3 ČSN 021726.15	2
13.	311 214 010 050	651-0919	Washer 5 ČSN 021740.05	2
14.	311 201 140 050	180-0143	Nut M 5 ČSN 021401.25	2

optional order: Exhaust silencer-Assembly, ordering no.: 948-0738



6. Pneumatic governor

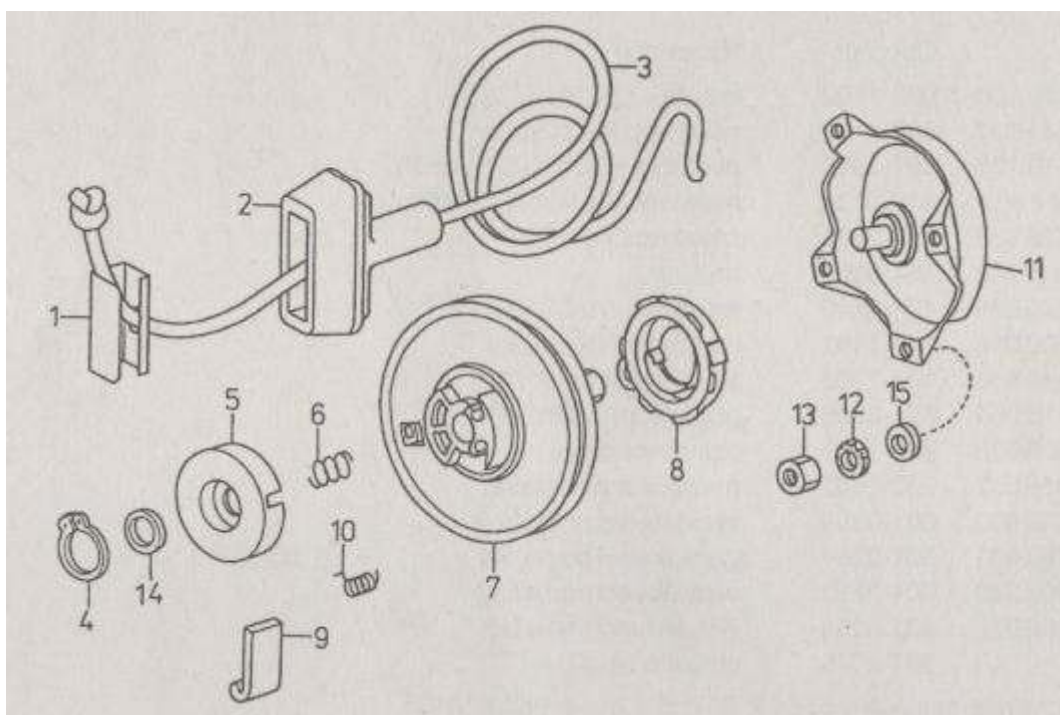
Pos.	JKPOV	Ordering No.	Part	Pcs
1.	309 231 140 811	101-1655	Bolt M 8x12 ČSN 021131.25	1
2.	311 214 610 084	601-0804	Washer 8.4 ČSN 021746.05	1
3.	482 993 039 034	930-3904	Regulation flap-Assembly	1
4.	482 013 535 032	135-3502	Steering linkage	1
5.	315 111 702 480	134-2501	Return spring of the regulator	1
6.	482 992 003 239	920-0329	Lever-Assembly	1
7.	309 203 140 615	101-2521	Bolt M 6x18 ČSN 021103.25	1
8.	482 060 250 338	602-5038	Insert	1
9.	311 212 610 064	304-0501	Washer 6.4 ČSN 021726.15	1
10.	311 214 010 060	651-0920	Washer 6 ČSN 021740.05	1
11.	311 120 114 060	180-0141	Nut M 6 ČSN 021401.25	1



7. Starter

Pos.	JKPOV	Ordering No.	Part	Pcs
1.	482 060 417 033	604-1703	Catcher	1
2.	273 993 815 000	913-6501	Handle	1
3.	482 091 332 035	913-3205	Starting cord A 4x1520	1
4.	311 733 000 110	602-1517	Retaining ring 10 ČSN 022930	1
5.	482 060 722 032	607-2202	Cup	1
6.	315 116 159 370	134-2630	Spring	1
7.	321 841 008 049	746-3401	Starting drum	1
8.	482 929 630 302	963-0302	Cup with spring	1
9.	482 060 474 035	604-7405	Pawl	1
10.	315 116 152 800	134-0805	Spring	1
11.	482 994 668 035	946-6805	Casing-Assembly	1
12.	311 214 510 064	652-1620	Washer 6.4 ČSN 021740.05	4
13.	311 120 114 060	180-0141	Nut M 6 ČSN 021401.25	4
14.	482 060 250 538	602-5058	Washer	1
15.	311 210 211 064	54-0246	Washer 6.4 ČSN 021702.15	4

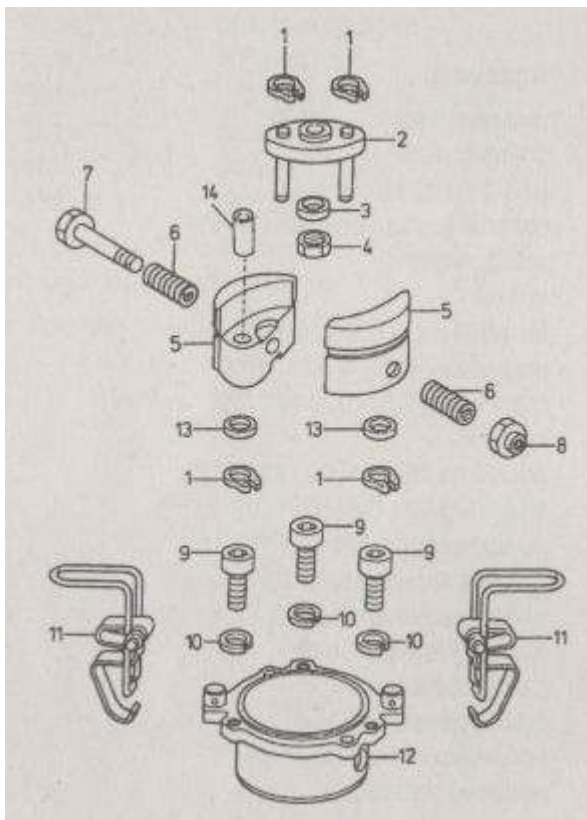
optional order: starter complete ordering no.: 984-0821



8. Clutch

Pos.	JKPOV	Ordering No.	Part	Pcs
1.	311 733 000 120	602-1502	Ring 12 ČSN 022930	4
2.	482 993 741 033	937-4103	Clutch hub - Assembly	1
3.	311 213 310 105	601-1608	Washer 10 ČSN 021733.05	1
4.	311 150 115 100	130-0184	Nut M 10x1 ČSN 021401.55	1
5.	482 993 726 033	937-2603	Clutch weight complete	2
6.	315 110 004 040	134-0361	Spring	2
7.	309 501 140 636	101-2440	Bolt M 6x70 ČSN 021101.55	1
8.	465 990 800 018	130-1302	Nut M 6 ONL 3248	1
9.	309 573 140 816	103-7203	Bolt M 8x20 ČSN 021143.55	3
10.	311 214 010 080	651-0906	podložka 8 ČSN 021740.05	3
11.	482 993 026 033	930-2603	Closure-Assembly	2
12.	482 993 056 032	930-5602	Interflange-Assembly	1
13.	482 060 102 930	601-0290	Shim block	-
13.	482 060 102 931	601-0291	Shim block	-
13.	482 060 102 932	601-0292	Shim block	-
13.	482 060 102 933	601-0293	Shim block	-
14.		301-2076	Weight sleeve	4

optional order: Weight-Assembly (positions 5,6,7,8), ordering no.:960-6701



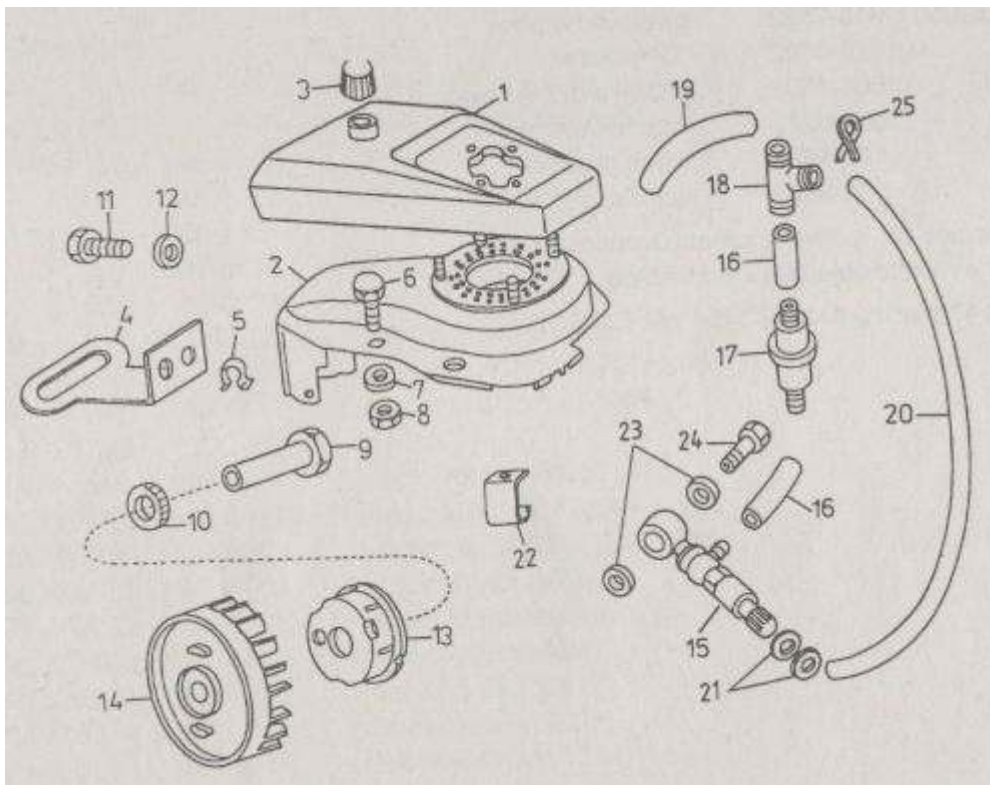
9. Fuel system

Pos.	JKPOV	Ordering No.	Part	Pcs
1.	482 994 329 035	943-2905	Fuel tank + Cap	1
2.	482 994 659 136	946-5916	Cooling mantle	1
3.		846-1702	Plastic tank cap	1
4.	482 060 913 031	609-1301	Handle (only for 1454 VAPE)	1
4*.		946-8604	Holder weldment	1
5.	482 013 502 032	135-0202	Clip	1
6.	309 203 140 612	151-2506	Bolt M 6x14 ČSN 021703.15	4
7.	311 214 010 060	651-0920	Washer A6 ČSN 021740.05	4
8.	311 120 114 060	180-0141	Nut M 6 ČSN 021401.25	4
9.	482 013 027 033	130-2703	Nut	1
10.	311 214 510 150	602-1607	Washer 15 ČSN 021745.05	1
11.	309 203 140 812	101-2533	Bolt M 8x14 ČSN 021103.25	4
12.	311 210 211 084	354-0253	Washer 8.4 ČSN 021702.15	5
13.	482 060 754 031	947-5902	Starter ratchet	1
14.	482 071 810 232	718-1025	Fan runner	1
15.	443 761 287 300	000-2873	Fuel cock 2873	1
16.	482 091 325 333	913-2533	Fuel hose	2
17.	532 928 470 178	943-1428	Fuel cleaner V 6004	1
18.	286 519 000 000	994-6014	Connecting neck TS5	1
19.	482 091 325 334	913-2534	Fuel hose	1
20.	482 091 325 332	913-2532	Fuel hose	1
21.		913-0102	"O" ring	2
22.		604-1503	Connection wire-Bowden holder	1
23.		601-0272	Ring-Sealing	2
24.		105-1504	Connection wire bolt	1
25.		135-3102	Sleeve gorbin	4

option for ordering: position 15. – two-way fuel cock 3395

fuel hose can be ordered in meters ordering no.: 286 121 030

Note: position 4* holds also for engine 1454 VAPE DV CE

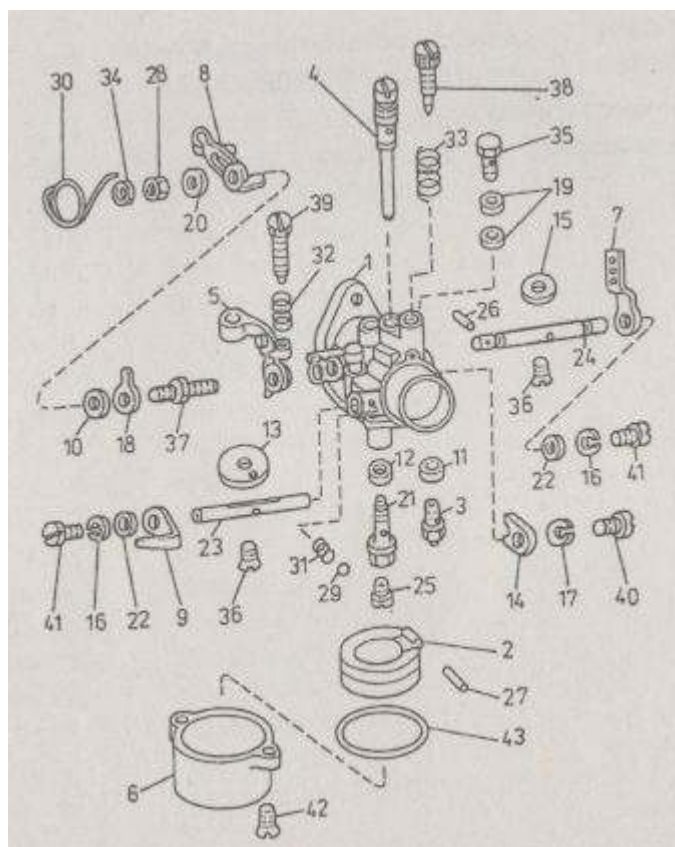


10. Carburetter

Pos.	JKPOV	Ordering No.	Part	Pcs
1.		974-1718	Carburetter body-Complete assembly	1
1*.		974-1453	Carburetter body-Complete assembly	1
2.	443 919 460 134	946-0134	Float complete assembly	1
3.	443 919 340 113	934-0113	Needle valve complete assembly	1
4.	443 919 341 602	934-1602	No-load run jet complete	1
5.	443 915 702 803	720-2803	Bowden support	1
6.	443 915 611 313	711-1313	Float chamber	1
7.	443 916 449 301	644-9301	Throttle flap lever	1
8.	443 916 443 201	644-3201	Stop lever	1
9.	443 916 441 102	644-1102	Starting flap lever	1
10.	722 923 110 102	625-9006	Friction washer	1
11.	722 923 110 101	625-0248	Sealing 5.5/2.5	1
12.	722 923 110 201	625-0164	Sealing 10/7.1/1	1
13.		601-9202	Starting flap	1
14.	443 916 013 809	601-3809	Fuse	1
15.		601-1502	Throttle disk	1
16.	311 214 010 030	601-0917	Washer A3 ČSN 021740.05	2
17.	311 214 000 040	601-0903	Washer 4 ČSN 021740.00	1
18.	482 060 105 035	601-0505	Washer with lip	1
19.	443 916 010 272	601-0272	Sealing	2
20.	482 060 102 438	601-0248	Washer	1
21.	443 913 065 901	306-4506	Emulsion tube	1
22.	11 210 211 032	304-0239	Washer A 3.2 ČSN 021702.15	2
23.		250-5802	Starting flap axis	1
24.		250-5801	Throttle valve axis	1
25.	443 911 122 082	220-8200	Main jet 22-075-00	1
26.		207-5802	Pin 2x12 ČSN 022156	1
27.	443 912 010 154	201-0154	Hinge axis	1
28.	311 120 114 050	180-0143	Nut M 5 ČSN 021401.25	1
29.		149-0103	Ball IV. ČSN 023680	1
30.	443 911 341 602	134-1602	Spring	1
31.		134-0351	Spring	1
32.	315 110 020 310	134-0155	Spring	1
33.	315 116 095 070	134-0123	Lock spring	1
34.	311 120 314 050	130-0171	Nut M 5 ČSN 021403.25	1
35.	443 911 051 504	105-1504	Connection wire bolt	1
36.		103-0702	Axis bolt	2
37.	443 911 017 004	101-7004	Steering bolt	1
38.	443 911 014 902	101-4902	Regulation screw	1
39.	443 911 013 606	101-3606	Stop screw	1
40.	309 231 140 408	101-1632	Bolt M 4x8 ČSN 021131.25	1
41.	309 231 140 306	101-1631	Bolt M 3x6 ČSN 021131.25	2
42.	443 911 010 801	101-0801	Button-headed screw M 4x14	2
43.	273 111 014 194	913-0150	Ring 42x2 ČSN 029281.2	1

Note: position 1* also for engine 1454 VAPE DV CE

Positions 13, 15, 29, 31, 36 are not supplied



12. Ignition for 1453 ISKRA

Pos.	JKPOV	Ordering No.	Part	Pcs
1.		994-1710	Spark plug N 17	1
2.	371 511 221 432	998-0404	Cable shoe OKS-14.3.G	1
3.		994-2225	Flywheel magneto	1
4.		304-0241	Washer 4.3 ČSN 021702.15	3
5.		101-1657	Bolt M4x14 ČSN 021131.25	3
6.		913-4308	Bushing	1
7.		994-605	Condenser	1
8.		998-1224	Contact	1
9.		998-1309	Ignition reel	1
10.		998-0113	High voltage conductor	1

Option for ordering: ignition system ISKRA-complete, ordering no.: 994-2255

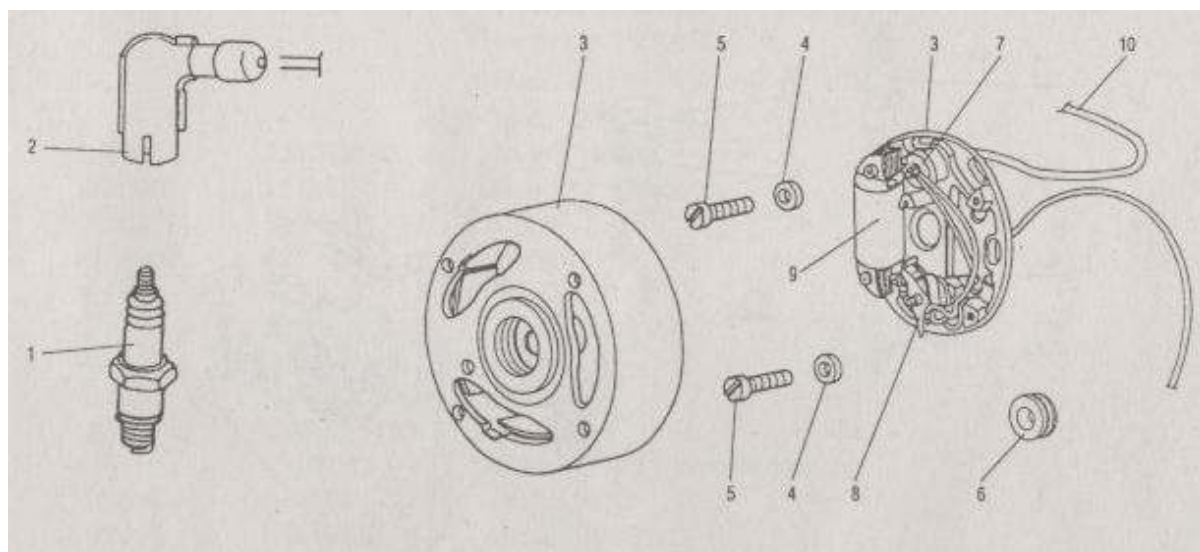
12. Ignition for 1454 VAPE

Pos.	JKPOV	Ordering No.	Part	Pcs
1.		994-1710	Spark plug N 17	1
2.	371 511 221 432	998-0404	Cable shoe OKS-14.3.G	1
3.	443 211 261 080	994-2222	Non-contact flywheel magneto	1
4.				
5.		101-1331	Bolt M 4x12 ČSN 021151.25	3
6.		994-0906	Electric switch VAPE	1
7.			Holder (part of the switch)	1
8.		101-1618	M 5x16 ČSN 021131.25	2
9.		304-0234	Washer 5 ČSN 021740.05	2
10.				
11.				
12.				
13.		998-0112	High voltage conductor	1

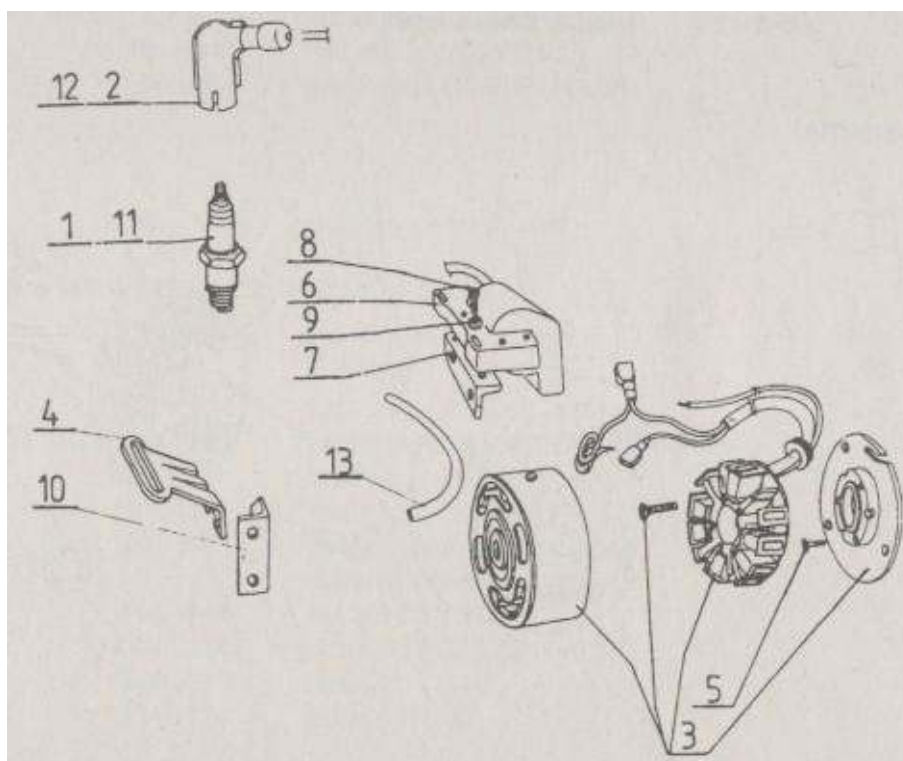
12. Ignition for 1454 VAPE DV CE, 1447 VAPE DV CE

Pos.	JKPOV	Ordering No.	Part	Pcs
1.				
2.	371 511 221 432	998-0404	Cable shoe OKS-14.3.G	1
3.	443 211 261 080	994-2222	Non-contact flywheel magneto	1
4.		946-8604	Holder weldment	1
5.		101-1331	Bolt M 4x12 ČSN 021151.25	3
6.		994-0906	Electric switch VAPE	1
7.			Holder (part of the switch)	1
8.		101-1618	M 5x16 ČSN 021131.25	2
9.		304-0234	Washer 5 ČSN 021740.05	2
10.		529-0313	Angle	1
11.		934-1724	Spark plug D17YC	1
12.		998-0412	Cable shoe	1
13.		998-0112	High voltage conductor	1

Ignition for 1453 ISKRA



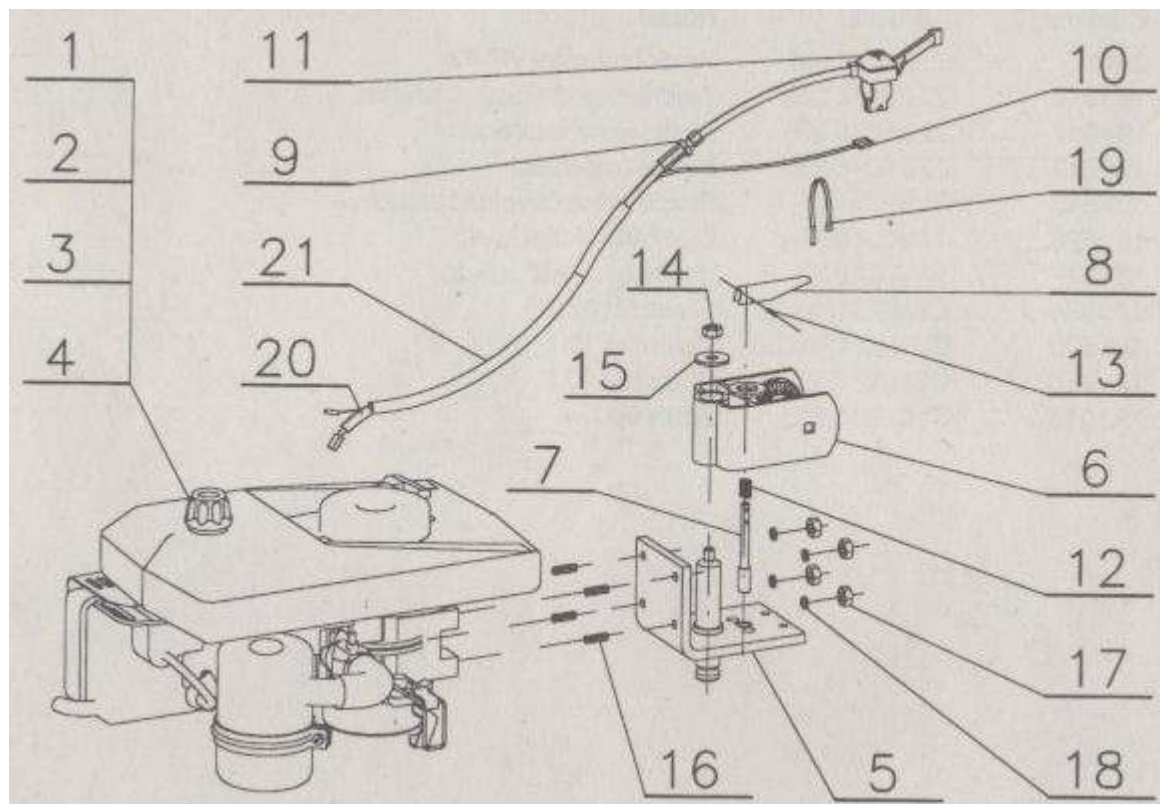
Ignition for 1454 VAPE , 1454 VAPE DV CE , 1447 VAPE DV CE



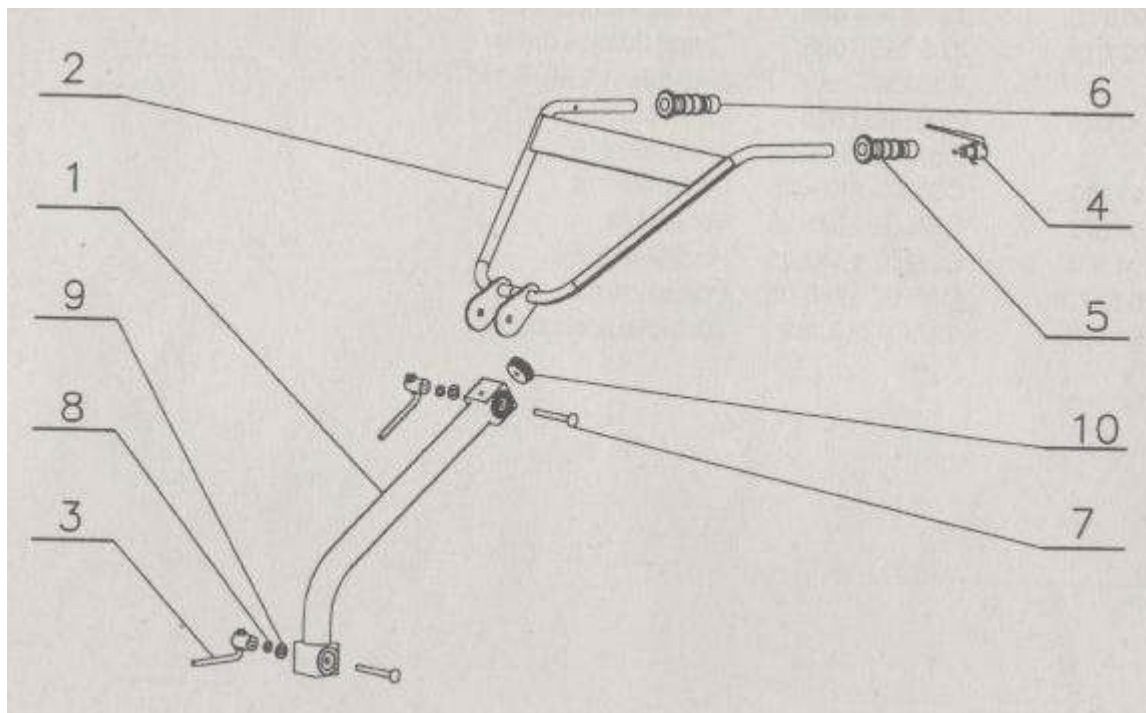
Pos.	Trading No.	Part No.	Name	Pcs
	3926		Engine assembly 1453 ISKRA	
	3922		engine assembly 1454 VAPE	
	3923		Engine assembly 1454 VAPE DV CE	
	3924		Engine assembly 1447 VAPE DV CE	
1			Engine JIKOV 1453 ISKRA	1
2			Engine JIKOV 1454 VAPE	1
3			Engine JIKOV 1454 VAPE DV CE	1
4			Engine JIKOV 1447 VAPE DV CE	1
5	192 016	22 9 8040 024	Handlebars plate	1
6	192 006	22 9 8053 009	Swivel holder of handlebars	1
7	192 007	32 0 9311 103	Pivot	1
8	192 008	32 0 8041 015	Lever	1
9	101 641	622 9 8074 012	Bowden JM 4-003	1
10		632 0 8610 004	Short-circuiting cable	1
11	101 630	START 1AG 235	Gas lever	1
12	124 500	1.25x11.25x28x8.5	Spring	1
13	127 504	ČSN 02 2156	Pin 3x18	1
14		ISO 7042	Nut M10 12910 self-locking	1
15	195 528	ČSN 02 1727.15	Washer 11	1
16	101 655	ČSN 02 1178.25	Bolt M8x25	4
17	104 572	ČSN 02 1401.25	Nut M8	4
18	104 574	ČSN 02 1740.05	Washer 8	4
19	189 525	3,6x200	Tightening tape black	1
20	101 653	5x0,5	Insulation sleeving	1
21	101 651	12x0,5	Insulation sleeving	1
22	101 647	0,8x5,5	Core	1
22	101 648		Insulation tube	1

engine accessories:

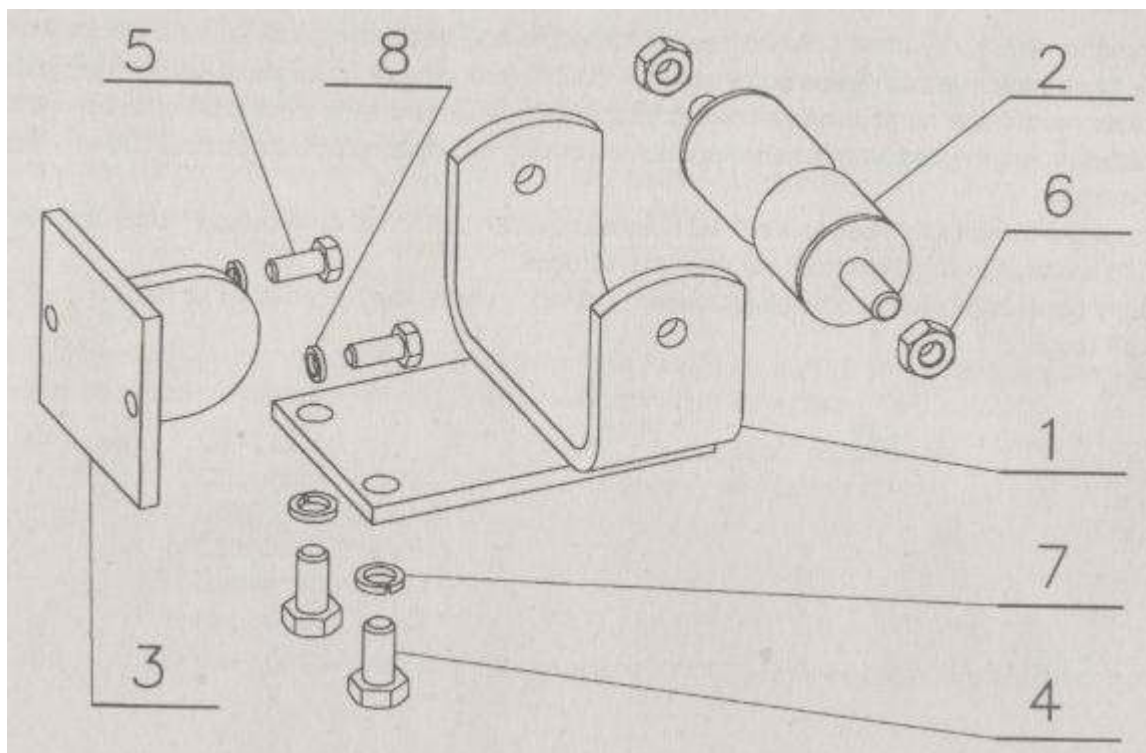
Spanner 8x10 , spanner for spark plug OK 21 , spanner for spark plug OK 16 (only for engines 1454 VAPE DV CE , 1447 VAPE DV CE), screwdriver York C 700 , spanner 13x16 , handle 8 mm á 1 pc , wrapped in plastic bag.



Pos.	Trading No.	Part No.	Name	Pcs
	3916	22 9 8078 037	Guide handlebars VR-02	
1	192 010	22 9 8045 035	Carrier tube of handlebars-Weldment	1
2	192 011	22 9 8045 055	Complete handrail-Weldment	1
3	192 012	22 9 9016 010	Tightening nut	2
4	101 643	BVA-96	Safety ignition switch	1
5	101 628	1 MA 04 005	Left rubber grip	1
6	104 627	1 MA 02 005	Right rubber grip	1
7	171 534	ČSN 02 1319.05	Bolt M10x100	2
8	106 530	ČSN 02 1740.05	Washer 10.2	2
9	131 518	ČSN 02 1702.15	Washer 10.5	2
10	192 013	32 0 3915 003	Plug modification	1



Pos.	Trading No.	Part No.	Name	Pcs
	3915	12 9 8565 086	Shock absorber TG-2	1
1	192 014	22 9 1436 006	Absorber yoke-Complete	1
2		T 16437	Silentblok ULMER TECHNIK	2
3	192 015	22 9 8032 025	Absorber lug-Weldment	1
4			ČSN 02 1143.55 Bolt M8x16	2
5	1512506	ČSN 02 1103.25	Bolt M6x14	2
6	104 572	ČSN 02 1401.25	Nut M8	2
7	104 574	ČSN 02 1740.05	Washer 8.2	2
8	6510920	ČSN 02 1740.05	Washer 6.1	2
9	195 501	632 0 9245 009	Pivot arrestment split pin	1



IX. WARRANTY TERMS

1. Manufacturer answers for product's design, function, quality and completeness of the machine and implements only on the condition that the machine is handled according to the instructions presented in the manual which is an integral part of the delivery of all machines and implements.
2. Warranty does not apply to safety devices against machine overloading, to defects from natural wear of the machine or implement, improper storage or unskilled operation and/or to damages caused by the customer or by a third person.
3. Warranty extincts by a breakdown of the machine or working implement, which did not result from a defect incurred at the manufacturer's or from any intervention into construction of the machine or implement not agreed by the manufacturer.
4. Detailed description of warranty terms is to be found in the Letter of guarantee which is attached to the machine or implement and which is given to the customer at purchase.

X. INSTRUCTIONS FOR ORDERING SPARE PARTS:

The following data are to be used for easier identification when ordering the spare parts:

- Machine type, engine type, machine serial number and year of manufacture;
- Ordering number given by manufacturer and its name in the component list;
- Number of ordered pieces separately for each item;
- Precise address, telephone number, fax number or e-mail address;
- If you are not certain about the correct identification of the component, send the damaged component either to the nearest service shop or to the manufacturer;
- All components should be ordered in the nearest service shop or at your dealer's.

In the case of any confusions concerning the spare parts or technical issues, the VARI a.s. commercial, customer-service or technical departments are prepared to answer all your inquiries.

Contact to manufacturer:

VARI,a.s.	Telephone: (+420) 325 607 111
Opolanská 350	Fax: (+420) 325 607 264
Libice nad Cidlinou	(+420) 325 637 550
CZECH REPUBLIC	E-mail: vari@vari.cz
289 07	internet: http://www.vari.cz/
	http://techweb.vari.cz

Address of the nearest service workshop will be provided by any outlet with VARI products or directly by VARI, a.s.