

# Catalogue & servicing manual

## Engine type 889-10-208



### Technical data Engine type 889-10-208

|                   |                                                 |
|-------------------|-------------------------------------------------|
| Engine            | Air-cooled, four stroke single cylinder, 1x OHC |
| Swept volume      | 499 cm <sup>3</sup>                             |
| Bore x stroke     | 90 – 78,5 mm                                    |
| Compression ratio | 12,5 – 16:1                                     |
| Max.power         | 48 - 50 kW                                      |
| Max.speed         | 12 000 min-1                                    |
| Fuel              | Methanol                                        |
| Weight            | 28 - 30 kg                                      |



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# **Instructions for Maintenance of Speedway Engine**

## **JRM 889-10-208**

The speedway engine JAWA type 889-10-208 are intended for speedway, long and grass track racing events. The tuning of our engines for higher engine speed is to the detriment of their service life.

### **Description of engine JAWA type 889-10-208**

The air-cooled single-cylinder, four-valve OHC, stroke volume 499 cm<sup>3</sup>, the bore 90,00 mm and stroke 78,50 mm. The crankcase, cylinder head and cylinder are made of Aluminium-alloy. Cylinder has NICASIL only. We not supply the overbore cylinders.

The crankshaft and connecting rod big-end have cage-type needle bearings. The chain driven-camshaft is supported in the cylinder head on needle bearings. The valves operated by rocker arm are at an angle of 35°, the springs are single conical helical type. The valve seats are hot-pressed into the cylinder head.

The piston is a light alloy forging and carries two piston rings, first 1,2 mm compression ring and second 2,0 oil control ring. The circulation-system of lubrication is used. The oil tank is situated in the space between the valve gear cover and R. H. of the crankcase, the oil filling is 0,65 l for new engine, 0,6 l is refill between heats. The level can be checked by the oil level indicator.

The engine is intended for the carburettor of diameter 34 mm and provided with electronic ignition.

### **Technical data:**

|                       |                                          |
|-----------------------|------------------------------------------|
| Bore/stroke:          | 90 / 78,5 mm                             |
| Capacity:             | 499 cm <sup>3</sup>                      |
| Maximum power output: | 48-50 kW (65-68 bhp) at 8500 rpm         |
| Compression ratio:    | 14 : 1 standart (available from 12-16:1) |
| Ignition:             | electronic Selettra                      |
| Ignition Advance:     | 32° standart (adjustable 25° - 35° BTDC) |
| Sparking plug:        | NGK R0045G-10                            |
| Fuel:                 | Methanol                                 |
| Oil 0,6 l:            | Castrol R SAE 40, Castrol 353            |

Measured at valve lift of 1mm and at valve clearances inlet 0,1mm / exhaust 0,15mm (cold engine). Please note that camshaft No. 08 make 12 mm valve lift, and must be used only with new spring set Part No. 451 988 913 178 !

| <b>Valve timing-camshaft No.:</b> | <b>01</b> | <b>04</b> | <b>08</b> | <b>12</b> | <b>09</b> |
|-----------------------------------|-----------|-----------|-----------|-----------|-----------|
| Exhaust open/close                | 62°/30°   | 63°/30°   | 68°/27°   | 71°/29°   | 57°/27°   |
| Inlet open/close                  | 31°/69°   | 33°/79°   | 37°/72°   | 35°/81°   | 35°/66°   |

## Instructions for engine operation

Before putting an engine into operation and before each race are to be checked:

- valve clearance adjustment
- chain tension and tightening of screws on cam sprocket (in case of great chain clearance the valve timing is to be checked)
- oil filling

Using of adequate thermal values of sparking plugs:

- |         |                                              |
|---------|----------------------------------------------|
| colder: | Champion G 55 R (NGK RO 16-10 or RO 045G-11) |
| warmer: | Champion G 57 R (NGK RO 16-9 or RO 045G-10)  |

On the bike must be check:

- tension of primary and secondary chain
- clutch adjustment
- working order of ignition cut-out
- working order of carburettor (free motion of slide valve)

Before using the engine at full throttle, the warming up of the engine is necessary. The choke may be used only for a very short time. Starting is accomplished by pushing or rear wheel rotating. At cold engine the choke is pulled out and starting without throttle follows. The starting is made easier by "winding-up" the engine first, i.e. slight turning of the rear wheel against the direction of turning until turning resistance appears. Then the usual starting follows.

### Setting-up of ignition advance

The full engine power output depends on a suitable adjustment of advanced ignition. The advanced ignition of the engine occurs before the top dead center according to the table of technical data. The screw of checking hole on the L. H. crankcase will be loosed, the crankshaft moved round a slight amount to the advanced ignition mark in order to place it into the hole center. After releasing of screws turn slightly a stator in order to make the checking line of the stator aligned with that of rotor. Then tighten the screws of stator. The engine can run in 25°- 35° ignition advance, so adjusting the engine characteristic according the condition of track is possible.

### Lubrication of engine

The circulation-system lubrication is used. Oil is sucked through rough filter into pump and squeeze into crankshaft (connecting rod big-end bearing lubrication). The rough oil filter must be check after first running of new engine, and often clearing of this filter is recommended to avoid engine seizing. From crankshaft space is oil returned to oil tank through reed valve. Oil filling is recommended to be replaced after five or six heats.

# **Dismantling, assembly, adjustment and service life of engine**

## **Cylinder head and cylinder**

In this engine are installed double helicon springs with contact design. Therefore is not allowed to mix springs from different production runs – always the same color marks must be used together. Also only both spring together are supplied under Part No. 451 988 913 173 – like valve spring set. All data below is valid only for this springs. The installed length is 32.5mm (outer spring) for 12mm valve lift (camshaft No. 08). Minimum thrust of valve springs when assembled has to be 370 N – than in the full lift spring has about 950 N - this thrust ensure maximum engine speed 12000 rpm. Minimum allowed length for fully compressed springs is 20.5mm (measured on outer spring). Free length of outer spring should be not below 43,8mm, the inner spring not below 38,10mm.

- Width of intake seats 1,0-1,2 mm, round off the edges of valves and valve seats in the head.
- Rocker arm roller must run freely without grabbing
- Axial clearance of camshaft 0,2 - 0,4 mm
- Replace the valve upper plates approximately after 30 races
- Replace the camshaft drive chain approximately after 25 races
- Combustion pressure is sealed by silicon "O" ring .
- Please replace the O ring during every engine overhaul.
- Compression ratio is adjusted by steel plates of different thickness under cylinder.

For 889-10-208 engine is used only the 889-13-035 the 90.00mm bore Nicasil coated cylinders. Using the overbored cylinders is not allowed, as the capacity exceeds the 500cc limit. Therefore we are not supply the overbored piston.

## **Crank mechanism**

Repair works of crank mechanism are recommended to be made in specialized repair shops. The crank mechanism is pressed on cylindrical surfaces, the main pins are forged together with flywheels (one piece). Before pressing the interference size of pressed diameters has to be checked. The interference of crank pin at 0,155/0,17 mm. The crank mechanism can be pressed three times without using abnormal parts. The crank pin can be ordered in an abnormal modification with greater pin diameter for pressing by 0,025 mm. Axial clearance of crank mechanism in crankcase is 0,5-0,7 mm. Axial clearance of connecting rod in assembled crank mechanism should be 0,4-0,6 mm.

The balancing of crank mechanism for horizontal engine has to be 52 % of balancing masses.

- Clearance of gudgeon pin in piston must be 0,007-0,017 mm

Clearance in piston ring lock 0,35 - 0,38 mm

The standard piston is now 889-12-061 – slipper type piston in „double bridge“ design. Only this new piston is recommended for use in our new engine. Piston carry two piston rings, top compression ring and second oil control rings. The very first break in must be done carefully as the oil control rings lower the amount of oil on the cylinders wall.

For safety reasons replace the big end connecting rod bearing and piston after 15 races. During this the checking of connecting rod dimensions is recommended, the big end diameter should be 42,00/42,008mm (min/max), the radial clearance between crank pin and big end should be 0,037/0,052mm. The clearance between piston pin and small end should be for connecting rod 889-12-120: 0,015-0,025 mm (163 mm). Also new lighter conrod with Part No. 889-12-130 has the same clearances

## **Assembly of crank mechanism**

Before assembly all parts must be cleaned. The crank pin must be oriented according the oil hole in right flywheel. During pressing the holes (pins) should be slightly oiled to prevent pressed surfaces from seizing. After pressing balancing is necessary. Measurements are made in points and the run-out is measured 5 mm from flywheel faces and it should not exceed 0,03 mm. The highest value of run-out must be at the end of crank pin.

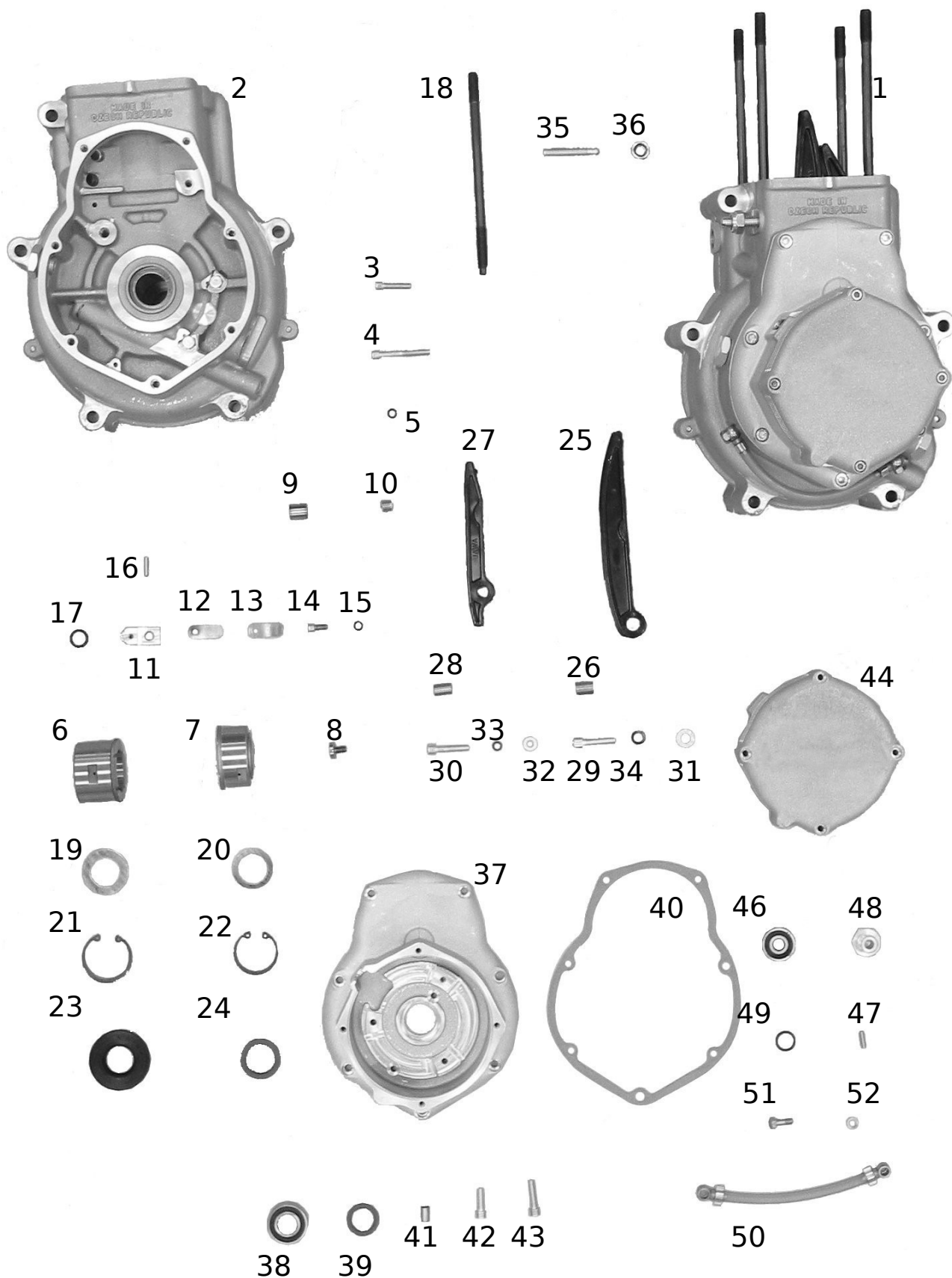
The shaft of ignition rotor is carried separately in two bearings and is connected with the crankshaft by a clutch. When dismantling the ignition the proper throwing of the shaft in the small valve gear during the reassembly must be observed.

## **Valve gear mechanism**

The camshaft is driven by chain directly from the crankshaft. The timing of valves is very easy; first by means of chain on cam sprocket and then final timing by means of oval holes on cam sprocket. The tightening of 4 screws on the sprocket must not be neglected. The values of cam timing are indicated in technical data.

*These our instructions are recommended. In reality, take account of the riding style of the rider. In order to ensure the smooth service of our motorcycles we are prepared to train mechanics directly in JAWA Divišov a.s.*

***We wish all our customers full success with  
JAWA engines.***

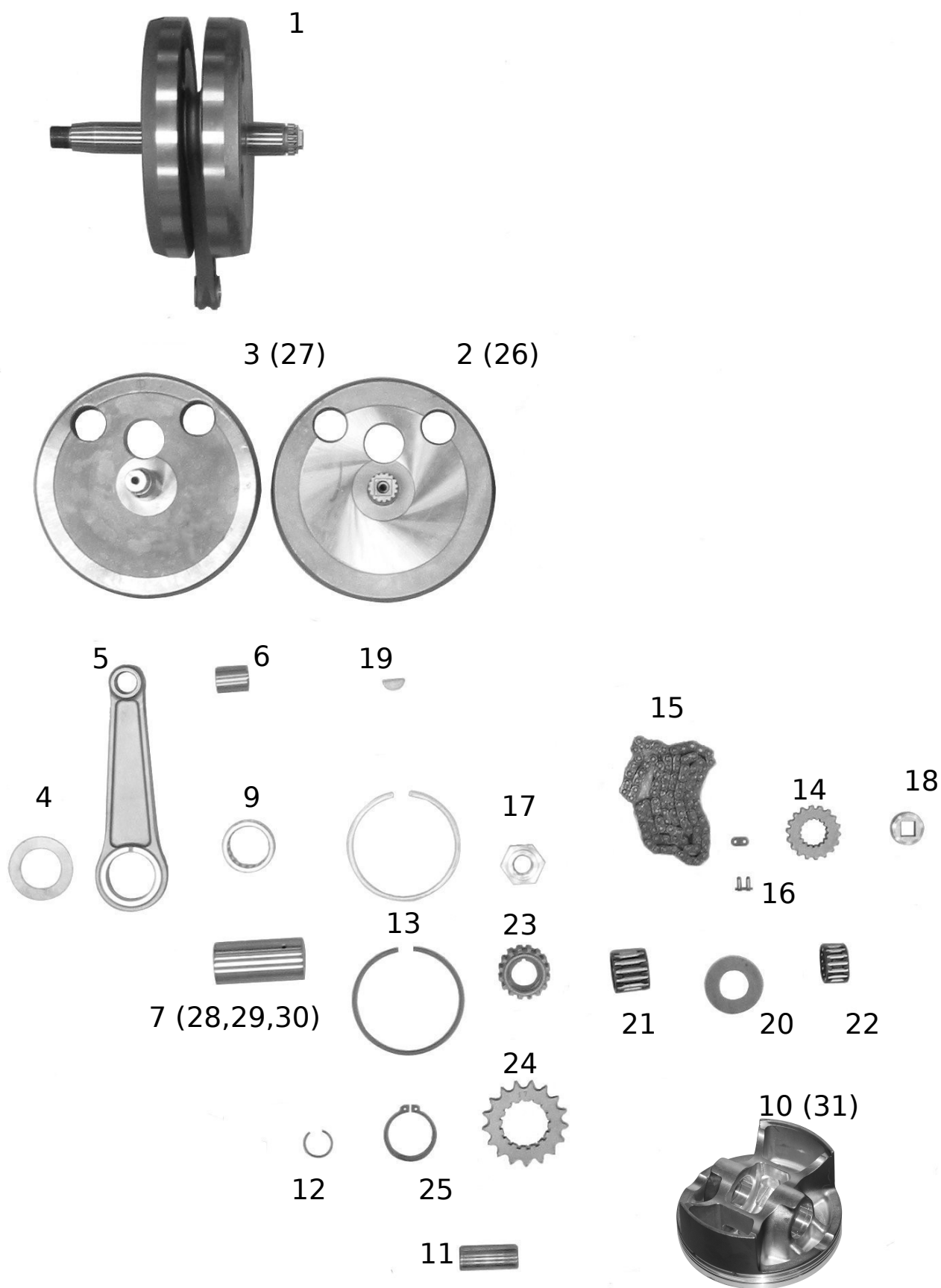


# Motorová skříň

## Crankcase

## Motorgehäuse

| #  | Poz.            | Název                               | Name                         | Name                       |
|----|-----------------|-------------------------------------|------------------------------|----------------------------|
| 1  | 889-11-006      | Motorová skříň                      | Crankcase                    | Motorgehäuse               |
| 2  | 889-11-510      | 1 Motorová skříň s pouzdry          | Crankcase with bushes        | Motorgehäuse mit Büchsen   |
| 3  | 309 543 210 618 | 2 Šroub M6x25 ČSN021143.59          | Screw M6x25                  | Schraube M6x25             |
| 4  | 309 543 210 626 | 3 Šroub M6x45 ČSN 021143.59         | Screw M6x45                  | Schraube M6x45             |
| 5  | 311 214 023 061 | 5 Pružná podložka 6,1 ČSN 021740.09 | Spring washer d6,1           | Federscheibe d6,1          |
| 6  | 875-11-056      | 1 Pouzdro hlavního ložiska levé     | Main bearing bushing left    | Büchse link                |
| 7  | 875-11-021      | 1 Pouzdro hlavního ložiska pravé    | Main bearing bushing right   | Büchse recht               |
| 8  | 875-11-057      | 2 Šroub M6                          | Screw M6                     | Schraube M6                |
| 9  | 875-11-058      | 2 Centrážní trubička D14            | Dowell pin                   | Centrierrohr               |
| 10 | 309 785 120 010 | 1 Zátka M12x10 FABORY 07850,120.010 | Plug                         | Blindstopfen               |
| 11 | 889-11-513      | 2 Vložka oddychu                    | Bush                         | Buchse                     |
| 12 | 889-11-514      | 3 Planžeta                          | Plate                        | Platte                     |
| 13 | 889-11-515      | 3 Opěra planžety                    | Stop of the plate            | Stütze                     |
| 14 | 309 543 210 512 | 3 Šroub M5x12 ČSN 021143.59         | Screw M5x12                  | Schraube M5x12             |
| 15 | 311 214 023 051 | 3 Pružná podložka 5,1 ČSN 021740.09 | Spring washer d5,1           | Federscheibe d51           |
| 16 | 889-11-516      | 2 Kolík D4x17.5 ČSN 022150.2        | Pin d4x17.5                  | Stift 4x17.5               |
| 17 | 273 111 016 012 | 2 "O" kroužek 16x2 ČSN 029280.2     | Rubber ring 16x2             | Gummiring 16x2             |
| 18 | 889-11-525      | 4 Závrtný šroub M10x175             | Studbolt                     | Stehlboltzen               |
| 19 | 897-11-057      | 1 Podložka                          | Washer                       | Scheibe                    |
| 20 | 898-11-022      | 1 Podložka                          | Washer                       | Scheibe                    |
| 21 | 311 733 100 400 | 1 Poj.kroužek D40x1,75 ČSN 022931   | Circlip 40x1,75              | Sicherungsring 40x1,75     |
| 22 | 311 733 100 350 | 1 Poj.kroužek D35x1,5 ČSN 022931    | Circlip 35x1.5               | Sicherungsring 35x1.5      |
| 23 | 273 521 106 205 | 1 Gufero s prachovkou 25x52x7       | Shaft seal 25x52x7           | Wellendichtringe 25x52x7   |
| 24 | 273 888 411 025 | 1 Gufero G 25x35x4                  | Shaft seal G 25x35x4         | Wellendichtringe G 25x35x4 |
| 25 | 884-11-031      | 1 Napínák řetězu                    | Tightener of the chain       | Spanner                    |
| 26 | 884-11-032      | 1 Distanční trubička d 8,2          | Spacing tube d8,2            | Distanzrohr 8,2            |
| 27 | 884-11-034      | 1 Napínák řetězu krátký             | Tightener of the chain short | Spanner kurz               |
| 28 | 884-11-035      | 1 Distanční trubička d 6,2          | Spacing tube d6,2            | Distanzrohr 6,2            |
| 29 | 309 543 210 820 | 1 Šroub M8x30 ČSN 021143.59         | Screw M8x30                  | Schraube M8x30             |
| 30 | 309 543 210 620 | 1 Šroub M6x30 ČSN 021143.59         | Screw M6x30                  | Schraube M6x30             |
| 31 | 311 210 222 084 | 1 Podložka B 8.4 ČSN 021702.15      | Washer d8,4                  | Scheibe d8,4               |
| 32 | 311 210 222 064 | 1 Podložka B 6.4 ČSN 021702.15      | Washer d6,4                  | Scheibe d6.4               |
| 33 | 311 214 023 061 | 1 Pružná podl. 6,1 ČSN 021740.09    | Spring washer d6,1           | Federscheibe d6,1          |
| 34 | 311 214 023 082 | 1 Pružná podl. 8.2 ČSN 021740.09    | Spring washer d8.2           | Federscheibe d8.2          |
| 35 | 898-11-037      | 1 Šroub napínáku                    | Screw of the tensioner       | Spanerschraube             |
| 36 | 311 129 221 100 | 1 Matice samojist.M10 ČSN 021492.29 | Nut M10                      | Mutter M10                 |
| 37 | 889-11-021      | 1 Víko rozvodu                      | Cover of the timing gear     | Steuerungdeckel            |
| 38 | 324 160 030 026 | 1 Kul.ložisko 60032RSR              | Ball bearing 6003            | Kugellager 6003            |
| 39 | 273 888 020 284 | 1 Hřídelové těsnění GUFERO 20x28x4  | Shaft seal G 20x28x4         | Wellendichtringe G20x28x4  |
| 40 | 627 889 811 024 | 1 Těsnění víka rozvodu              | Gasket of the timing gear    | Dichtung                   |
| 41 | 889-11-023      | 2 Centrážní trubička                | Dowell pin                   | Zentralrohr                |
| 42 | 309 543 210 622 | 2 Šroub M6x35 ČSN 021143.59         | Screw M6x25                  | Schraube M6x25             |
| 43 | 309 543 210 630 | 1 Šroub M6x55 ČSN 021143.59         | Screw M6x55                  | Schraube M6x55             |
| 44 | 889-11-031      | 1 Víko zapalování                   | Cover of ignition            | Zündungdeckel              |
| 45 | 309 543 210 518 | 4 Šroub M5x25 ČSN 021143.59         | Screw M5x35                  | Schraube M5x35             |
| 46 | 324 162 000 020 | 1 Kul.ložisko 6200 2RSR             | Ball bearing 6200            | Kugellager 6200            |
| 47 | 311 515 004 014 | 1 Kolík 4x14 ČSN 022150.2           | Pin d4x14                    | Stift 4x14                 |
| 48 | 894-11-158      | 2 Šroub M16x1,5                     | Screw M16x1,5                | Schraube M16x1,5           |
| 49 | 273 111 014 054 | 1 "O" kroužek 14x2 ČSN 029281.2     | Rubber ring 14x2             | Gummiring 14x2             |
| 50 | 875-11-550      | 1 Olejznak -149 mm                  | Oil level indicator          | Ölstandmesser              |
| 51 | 875-11-552      | 2 Šroub přípojky                    | Screw of the connection      | Schraube (Anschluß)        |
| 52 | 898-11-056      | 4 Podložka d6,2                     | Washer d6,2                  | Scheibe d6,2               |

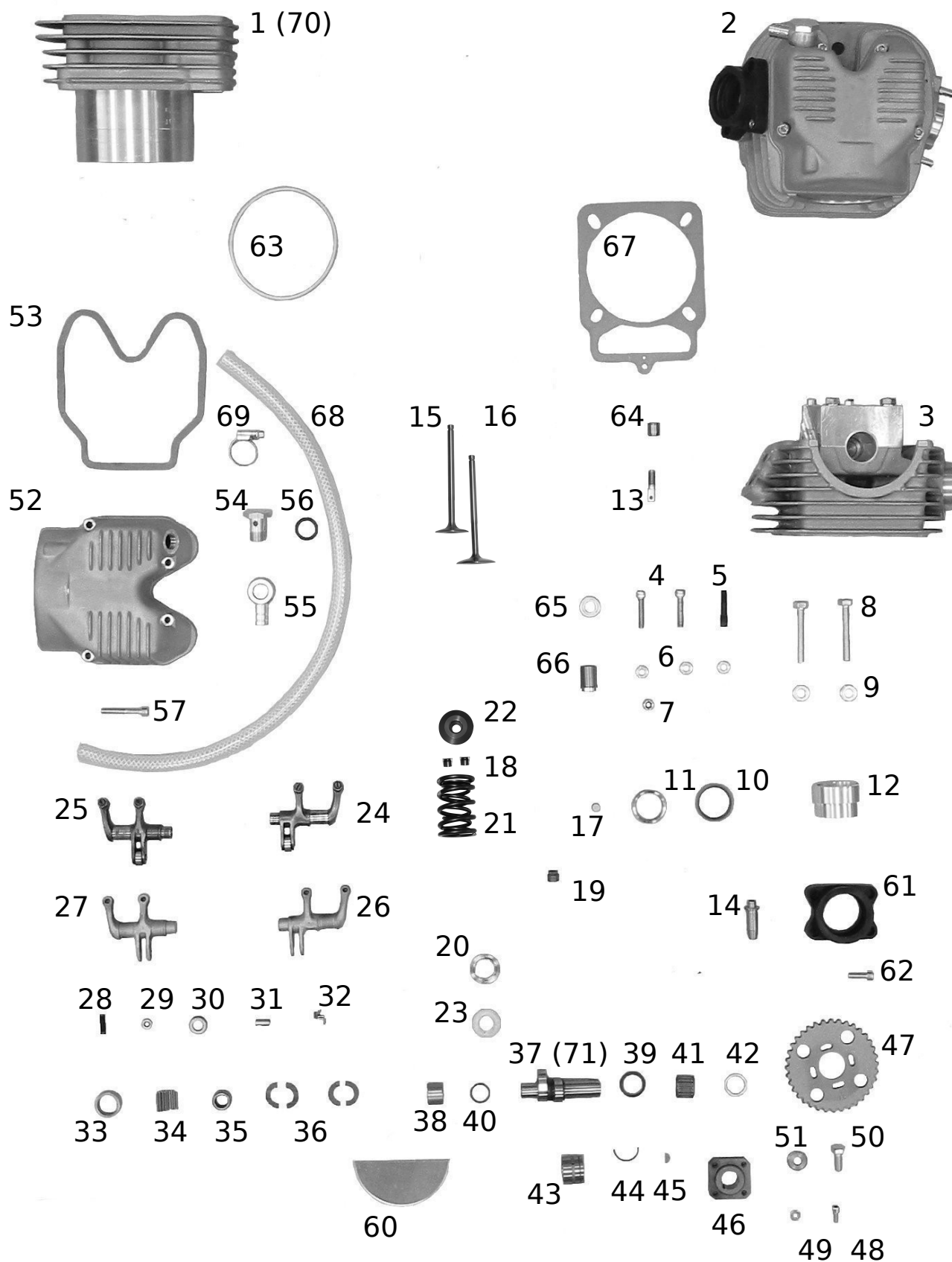


# Klikové ústrojí

## Crankshaft mechan.

### Kurbelgetriebe

| #                       | Poz.            | Nazev                             | Name                         | Name                   |
|-------------------------|-----------------|-----------------------------------|------------------------------|------------------------|
| 1                       | 889-12-525      | 1 Klikový mechanismus             | Crankshaft mechan.           | Kurbelgetriebe(186)    |
| 2                       | 889-12-521      | 1 Setrvačník pravý d 188          | Flywheel right 188           | Schwungrad rechts 188  |
| 3                       | 889-12-522      | 1 Setrvačník levý d 188           | Flywheel left 188            | Schwungrad links 188   |
| 4                       | 886-12-106      | 2 Podložka                        | Washer                       | Scheibe                |
| 5                       | 889-12-140      | 1 Ojnice ocelová úplná            | Connecting rod compl.        | Pleuelstange kompl.    |
| 6                       | 885-12-112      | 1 Pouzdro ojnice                  | Bush                         | Büchse                 |
| 7                       | 884-12-105      | 1 Klikový čep                     | Crankshaft journal           | Pleuelzapfen           |
|                         | 309 785 060 008 | 1 Šroub M6x8 Fabory 07 840        | Screw M6x8                   | Schraube M6x8          |
| 9                       | 324 588 912 507 | 1 Jehlová klec 35x42x19.8 S-1 AG  | Needle bearing 35x42x19.8    | Nadellager 35x42x19.8  |
| 10                      | 889-12-061      | 1 Píst 90.0                       | Piston 90,0                  | Kolben 90,0            |
| 11                      | 885-12-014      | 1 Pístní čep                      | Gudgeon pin                  | Kolbenbolzen           |
| 12                      | 890-12-003      | 1 Pojistka                        | Circlip                      | Seeger-Ring            |
| 13                      | 326 988 912 092 | 1 Pístní kroužek d 90.00 sada     | Piston ring set 90.00        | Kolbenringsatz 90.00   |
| 14                      | 886-12-013      | 1 Malé kolo rozvodu 15z           | Sprocket 15 t                | Zahnrad klein 15       |
| 15                      | 884-12-015      | 1 Řetěz 102 rolniček t=7.77       | Chain(pitch-7,77)            | Steuerkette            |
| 16                      | 884-12-016      | 1 Nýťovací spojka t=7,77          | Chain joint                  | Kettenglied            |
| 17                      | 890-12-006      | 1 Matice levého čepu              | Nut of the main journal left | Mutter M18x1           |
| 18                      | 889-12-017      | 1 Unašeč hřídele                  | Shaft coupling               | Wellen kupplung        |
| 19                      | 311 728 504 017 | 1 Pero 4x7,5 ČSN 301385.21        | Key 4x7,5                    | Keil 4x7,5             |
| 20                      | 889-12-023      | 1 Distanční podložka              | Spacing washer               | Distanztscheibe        |
| 21                      | 324 589 712 015 | 1 Jehlová klec K 25x35x30         | Needle bearing 25x35x30      | Nadellager 25x35x30    |
| 22                      | 324 588 412 017 | 1 Jehlová klec K 25x33x20         | Needle bearing 25x33x20      | Nadellager 25x33x20    |
| 23                      | 895-12-014      | 1 Unašeč řetězového kola          | Carrier chain conveyer       | Mittnehmer             |
| 24                      | 890-12-017      | 1 Řetězové kolo 17 z              | Sprocket 17t                 | Kettenrad 17Z          |
| 25                      | 311 733 000 420 | 2 Poj. kroužek 42x1.75 ČSN 022930 | Circlip 42x1,75              | Sicherungsring 42x1,75 |
| Díly na přání zákazníka |                 |                                   | Optional parts               | Wunsch teile           |
| 26                      | 889-12-541      | 1 Setrvačník pravý d 184          | Flywheel right 184           | Schwungrad rechts 184  |
| 57                      | 889-12-542      | 1 Setrvačník levý d 184           | Flywheel left 184            | Schwungrad links 184   |
| Abnormální díly         |                 |                                   | Abnormal parts               | Abnormal teile         |
| 28                      | 884-12-115      | 1 Klikový čep abn.(abn.po bokách) | Cranksh.journ. abn.          | Pleuelzapfen abn.      |
| 29                      | 884-12-116      | 1 Klikový čep abn.(abn.uprostřed) | Cranksh.journ. abn.          | Pleuelzapfen abn.      |
| 30                      | 884-12-117      | 1 Klikový čep abn.( celý abn.)    | Cranksh.journ. abn.          | Pleuelzapfen abn.      |
| 31                      | 889-12-062      | 1 Píst 90,03                      | Piston 90,03                 | Kolben 90,03           |

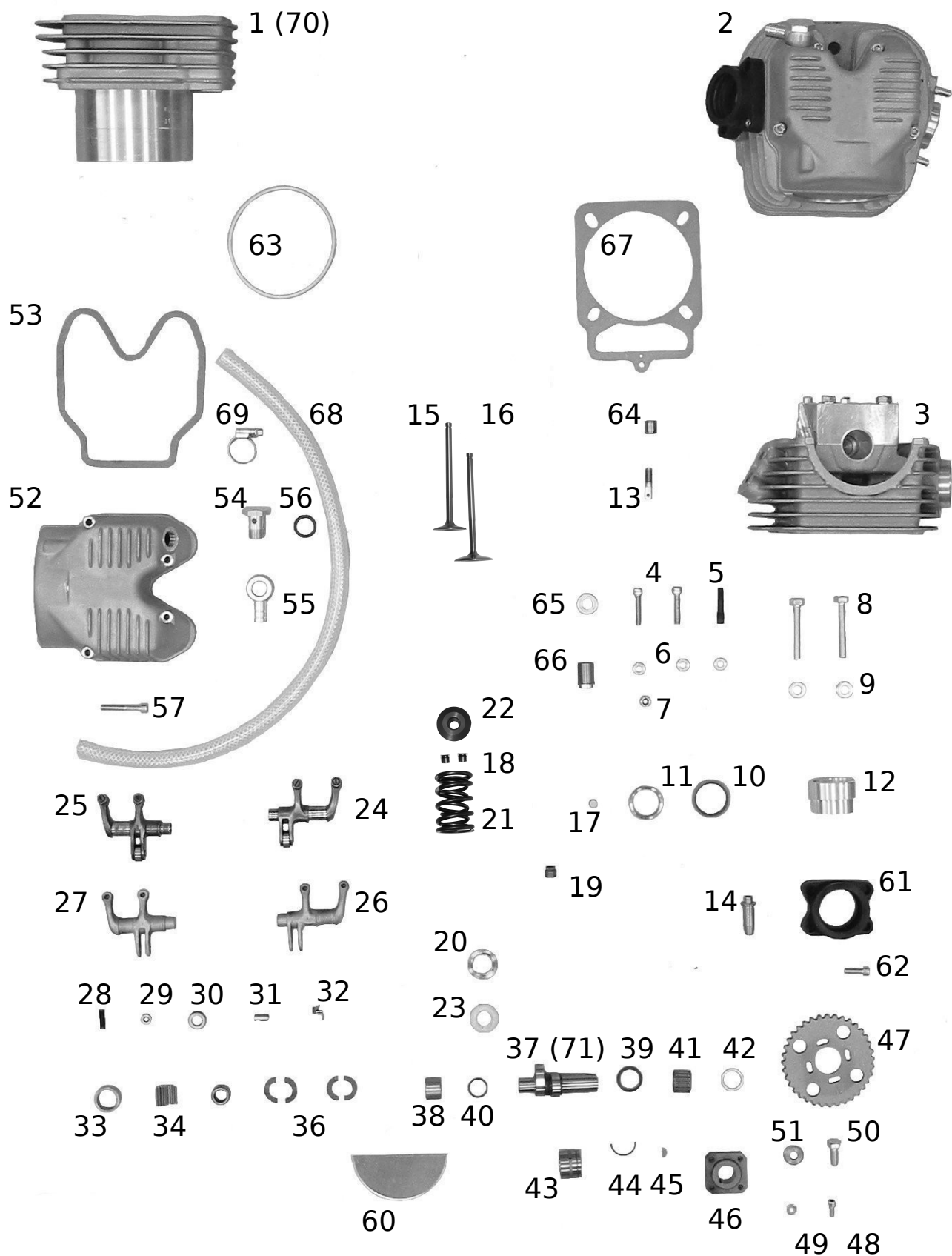


# Válec s hlavou

## Cylinder with head

## Zylinder mit Kopf

| #  | Poz.            | Název                           | Name                          | Name                     |
|----|-----------------|---------------------------------|-------------------------------|--------------------------|
| 1  | 889-13-035      | 1 Válec nikasil                 | Cylinder nicasil compl.       | Zylinder nicasil kompl.  |
| 2  | 889-13-200      | 1 Hlava úplná                   | Head compl.                   | Zylinderkopf kompl.      |
| 3  | 889-13-210      | 1 Hlava s pouzdry               | Head with bushes              | Zylinderkopf mit Büchsen |
| 4  | 309 543 210 620 | 2 Šroub M 6x30ČSN 021143.59     | Studbol M6x30                 | Stiftschraube M6x30      |
| 5  | 889-13-116      | 1 Závrtný šroub M6/M8           | Studbolt M6/M8                | Stiftschraube M6/M8      |
| 6  | 311 213 320 064 | 4 Podložka 6,4 ČSN 021733.09    | Washer d6,4                   | Scheibe 6,4              |
| 7  | 311 129 221 060 | 4 Matice M 6 ČSN 021492.29      | Nut M6                        | Mutter M6                |
| 8  | 309 501 000 832 | 2 Šroub M8x60 ČSN021101.59      | Screw M8x60                   | Schraube M8x60           |
| 9  | 311 210 320 084 | 2 Podložka 8,4 ČSN 021733.09    | Washer d8,4                   | Scheibe 8,4              |
| 10 | 889-13-223      | 2 Sedlo sacího ventilu          | Seat of the intake valve      | Einlassventilsitz        |
| 11 | 889-13-224      | 2 Sedlo výfukového ventilu      | Seat of the exhaust valve     | Auslassventilsitz        |
| 12 | 889-13-119      | 1 Výfukové hrdlo                | Exhaust branch                | Auslassflansch           |
| 13 | 871-13-124      | 2 Záchyt pružiny                | Holder of the exhaust spring  | Halter                   |
| 14 | 889-13-222      | 4 Vedení ventilu d6             | Guide of the valve d6         | Ventilführung d6         |
| 15 | 889-13-225      | 2 Ventil sací d6                | Intake valve d6               | Einlaßventil d6          |
| 16 | 88913-226       | 2 Ventil výfukový d6            | Exhaust valve d6              | Auslaßventil d6          |
| 17 | 884-13-127      | 4 Opěrka d6                     | Washer d6                     | Scheibe d6               |
| 18 | 451 988 913 121 | 4 Klínek                        | Valve stem key                | Keil                     |
| 19 | 273 588 413 128 | 4 Těsnění ventilového vedení d6 | Valve seal d6                 | Dichtung d6              |
| 20 | 889-13-262      | 4 Dolní miska pera              | Lower spring plate            | Federschalle untere      |
| 21 | 451 988 913 173 | 4 Ventilová pružina             | Valve spring                  | Ventilfeder              |
| 22 | 889-13-264      | 4 Horní miska pera              | Upper spring plate            | Federschalle obere       |
| 23 | 897-13-157      | 4 Distanční podložka            | Spacing washer                | Distanzscheibe           |
| 24 | 889-13-130      | 1 Vahadlo sací úplné            | Rocker arm for intake compl.  | Einlasskipphebel kompl.  |
| 25 | 889-13-140      | 1 Vahadlo výfukové úplné        | Rocker arm for exhaust compl. | Auslasskipphebel kompl.  |
| 26 | 889-13-131      | 1 Vahadlo sací                  | Rocker arm for intake         | Einlasskipphebel         |
| 27 | 889-13-141      | 1 Vahadlo výfukové              | Rocker arm for exhaust        | Auslasskipphebel         |
| 28 | 884-13-172      | 2+2 Seřizovací šroub            | Adjusting screw               | Stellschraube            |
| 29 | 311 150 221 060 | 2+2 Matice M6                   | Nut M6                        | Mutter M6                |
| 30 | 897-13-133      | 1+1 Rolnička                    | Roller                        | Role                     |
| 31 | 897-13-134      | 1+1 Čep                         | Pin                           | Bolzen                   |
| 32 | 892-14-023      | 13+13Jehlový váleček            | Needle roller                 | Nadel                    |
| 33 | 889-13-132      | 2 Pouzdro d 20                  | Bush d 20                     | Buhse d20                |
| 34 | 324 988 913 312 | 36 Jehlový váleček              | Needle roller                 | Nadel                    |
| 35 | 889-13-133      | 2 Jehlové pouzdro d12           | Needle bearing d12            | Nadellager d12           |
| 36 | 889-13-134      | 2 Pojistka dělená               | Safety fuse circlip           | Sicherung(blech ring)    |
| 37 | 889-13-150      | 1 Vačkový hřídel č.08           | Camshaft n.08                 | Nockenwelle n.08         |
| 38 | 897-13-146      | 1 Jehlové pouzdro d15           | Needle bearing d15            | Nadellager d15           |
| 39 | 894-14-024      | 1 Distanční podložka            | Spacing washer                | Distanzscheibe           |
| 40 | 897-13-149      | 1 Podložka d15                  | Washer d15                    | Scheibe 15               |
| 41 | 884-13-139      | 1 Jehlová klec K 18x22x17       | Needle bearing 18x22x17       | Nadellager 18x22x17      |
| 42 | 884-13-149      | 1 Kroužek                       | Ring                          | Ring                     |
| 43 | 894-14-023      | 1 Pouzdro s drážkou             | Bush with slot                | Buhse mit Schlitz        |
| 44 | 894-14-026      | 1 Pérová pojistka               | Circlip                       | Seeger-Ring              |
| 45 | 311 728 503 009 | 1 Pero 3x 3,7 ČSN 301385.21     | Key 3x3,7                     | Keil 3x3,7               |
| 46 | 889-13-121      | 1 Náboj kola vačky              | Hub of wheel                  | Nockenradnabe            |
| 47 | 886-13-135      | 1 Kolo vačky 30z                | Cam sprocket 30 T             | Nockenwellenkettenrad    |
| 48 | 309 701 050 012 | 4 Šroub M5x12 FABORY 07 015     | Screw M5x12                   | Schraube M5x12           |
| 49 | 311 210 222 053 | 4 Podložka B 5.3ČSN 021702.15   | Washer B5.3                   | Scheibe B5.3             |
| 50 | 309 411 080 020 | 1 Šroub M 8x20 FABORY 04110     | Screw M8x20                   | Schraube M8x20           |
| 51 | 884-13-144      | 1 Podložka d 8,2                | Washer d8,2                   | Scheibe d8,2             |
| 52 | 889-13-261      | 1 Víko hlavy                    | Cover of the head             | Ventildeckel             |
| 53 | 889-13-166      | 1 Těsnění                       | Gasket                        | Dichtung                 |
| 54 | 898-13-166      | 1 Šroub oddychu                 | Breather screw                | Lüftungsschraube         |
| 55 | 898-13-169      | 1 Přípojka                      | Connection                    | Anschluß                 |



|    |                 |   |                                |                      |                           |
|----|-----------------|---|--------------------------------|----------------------|---------------------------|
| 56 | 898-13-171      | 3 | Těsnění                        | Gasket               | Dichtung                  |
| 57 | 309 543 210 624 | 2 | Šroub M6x40 ČSN 021143.59      | Screw M6x40          | Schraube M6x40            |
| 60 | 889-13-118      | 1 | Víčko                          | Lid                  | Deckel                    |
| 61 | 443 788 913 139 | 1 | Sací hrdlo pryžové 35x29       | Intake branch gum    | Einlassflansch gummi      |
| 62 | 309 543 210 615 | 4 | Šroub M 6x18 ČSN 021143.59     | Screw M6x18          | Schraube M6x18            |
| 63 | 273 111 014 399 | 1 | "O" kroužek 99.5x3 VMQ         | Rubber ring 99.5x3   | Gummiring 99.5x3          |
| 64 | 870-13-174      | 2 | Centrážní trubička             | Dowell pin           | Centrierrohr              |
| 65 | 889-13-169      | 4 | Podložka d 10,5                | Washer d10,5         | Scheibe d10,5             |
| 66 | 889-13-168      | 4 | Matice hlavy                   | Nut of the head      | Mutter des Zylinderkopfes |
| 67 | 624-13-014      | 1 | Podložka válce d 107           | Washer d 107         | Deckel d 107              |
| 68 | 898-13-172      | 1 | Hadice d13/d18-600 mm          | Tubing d13/d18-600mm | Schlauf d13/d18-600mm     |
| 69 | 893-13-152      | 1 | Objímka Torro 12-29/9 - C 6 W1 | Sleeve 12-29/9       | Muffe TORRO 12-29/9       |

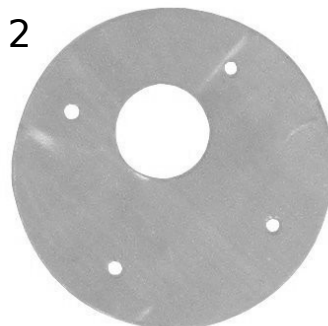
|    |            |   | <b>Díly na přání zákazníka</b> | <b>Optional parts</b>   | <b>Wunsch teile</b>     |
|----|------------|---|--------------------------------|-------------------------|-------------------------|
| 70 | 889-13-050 | 1 | Válec nicasil d 89,94          | Cylinder nicasil compl. | Zylinder nicasil kompl. |
| 71 | 889-13-155 | 1 | Vačkový hřídel č.12            | Camshaft n.12           | Nockenwelle n.12        |

|  |            |  | <b>Díly na přání zákazníka</b>   | <b>Optional parts</b>     | <b>Wunsch teile</b>       |
|--|------------|--|----------------------------------|---------------------------|---------------------------|
|  | 889-13-583 |  | Sedlo sacího ventilu abn.(+0,25) | Intake valve's seat abn.  | Einlassventilsitz abnorm. |
|  | 889-13-584 |  | Sedlo výf. ventilu abn.(+0,25)   | Exhaust valve's seat abn. | Auslassventilsitz abnorm. |
|  | 889-13-229 |  | Výfukové hrdlo abn.(+0,25)       | Exhaust branch abn.       | Auslassflansch abnorm.    |
|  | 889-13-582 |  | Vedení ventilu d6abn.(+0,1)      | Guide of the valve abn.   | Ventilführung abnorm.     |

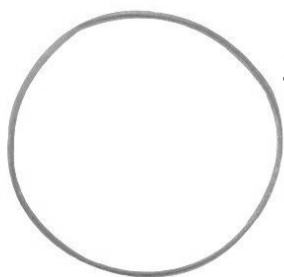
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# Mazání

## Lubrication

## Schmierung

| # | Poz.            | Název                          | Name              | Name           |
|---|-----------------|--------------------------------|-------------------|----------------|
| 1 | 889-15-012      | 1 Kolo čerpadla                | Wheel of oil pump | Pumpenrad      |
| 2 | 889-15-013      | 1 Víko čerpadla                | Cover             | Deckel         |
| 3 | 889-15-014      | 1 Síto čerpadla                | Oil filter        | Ölfilter       |
| 4 | 899-22-123      | 1 Distanční podložka d20       | Spacing washer    | Distanzscheibe |
| 5 | 309 543 210 511 | 4 Šroub M 5x12 ČSN 02 1143.59  | Screw M5x12       | Schraube M5x12 |
| 6 | 889-15-022      | 1 Trubička dl. 23.5            | Tube              | Röhrchen       |
| 7 | 273 111 010 014 | 2 "O" kroužek 8x4 ČSN 029280.2 | Rubber ring 8x4   | Gummiring 8x4  |



4 (20,21)



5



6



7



8



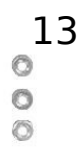
9



10



11



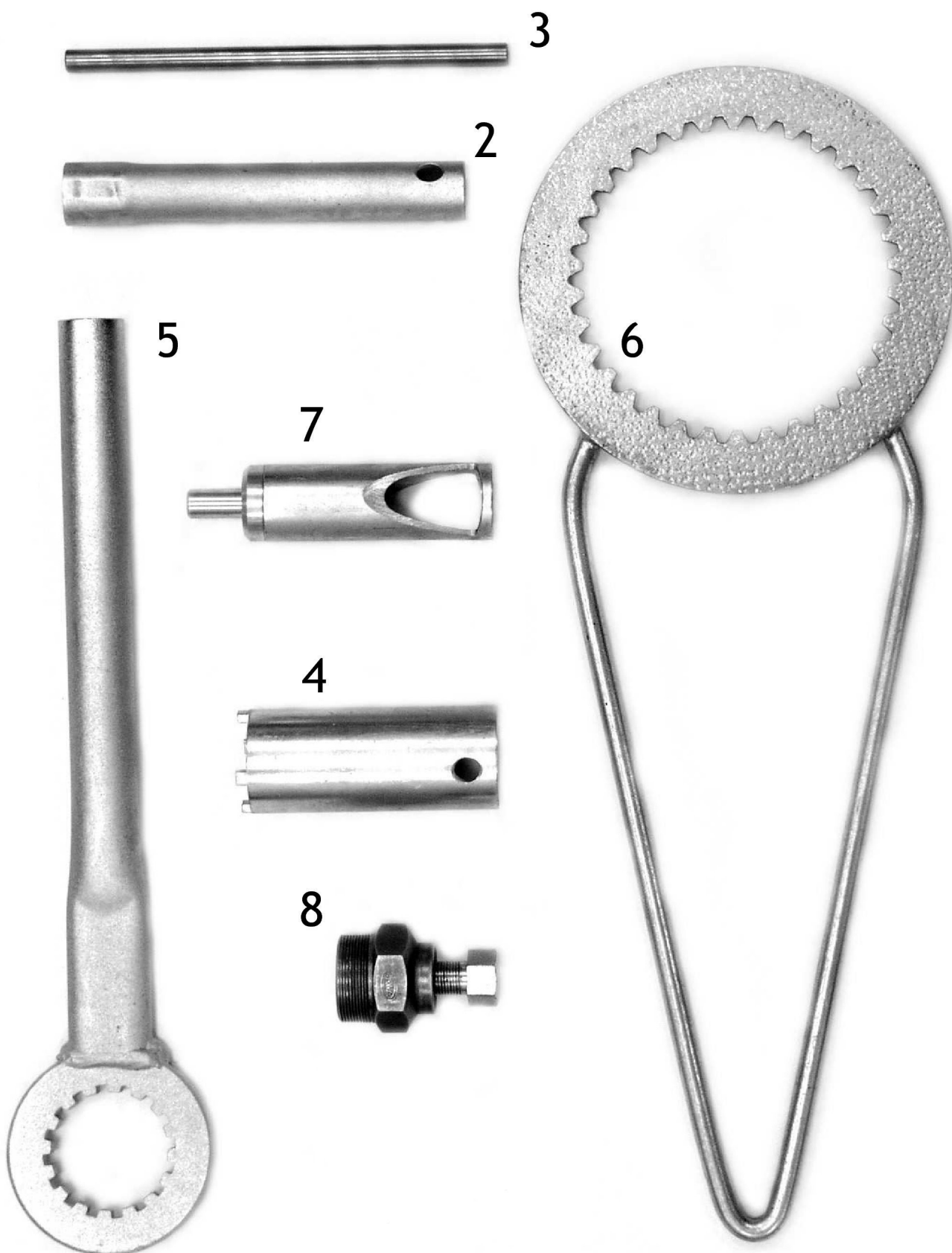
# Zapalování

## Ignition

## Zündung

| #  | Poz.            | Název                               | Name                            | Name                     |
|----|-----------------|-------------------------------------|---------------------------------|--------------------------|
| 1  | 888-19-010      | 1 Zapalování SELETTTRA úplné        | Ignition SELETTTRA compl.       | Zündung SELETTTRA kompl. |
| 2  | 888-19-011      | 1 Zapalování SELETTTRA              | Ignition SELETTTRA              | Zündung SELETTTRA        |
| 3  | 888-19-014      | 1 Zapalovací cívka (Selletra)       | Ignition coil                   | Zündspule                |
| 4  | 443 221 045 010 | 1 Svíčka NGK RO 045G-10             | Sparking plug NGK 045G-10       | Zündkerze NGK 045G-10    |
| 5  | 889-19-011      | 1 Hřídel zapalování                 | Shaft of the ignition           | Zündungswelle            |
| 6  | 311 728 503 003 | 1 Pero 2,5x3,7 ČSN 301385.11        | Key 2.5x3.7                     | Keil 2,5x3,7             |
| 7  | 898-19-036      | 2 Distanční podložka 10,2           | Spacing washer d10,2            | Distanzscheibe 10,2      |
| 8  | 273 111 014 016 | 1 "O" kroužek 16x2 ČSN 029281.2     | Rubber ring 16x2                | Gummiring 16x2           |
| 9  | 898-19-132      | 1 Matice M 12x1 levý                | Nut M 12x1 left                 | Mutter M 12x1 links      |
| 10 | 898-19-134      | 1 Podložka 12,2                     | Washer d12,2                    | Scheibe 12,2             |
| 11 | 309 543 210 518 | 1 Šroub M 5x25 ČSN 021143.59        | Screw M5x25                     | Schraube M5x25           |
| 12 | 309 543 210 522 | 2 Šroub M 5x35 ČSN 021143.59        | Screw M5x35                     | Schraube M5x35           |
| 13 | 311 210 222 053 | 3 Podložka B 5,3 ČSN 021702.15      | Washer B5,3                     | Scheibe B5,3             |
| 14 | 311 214 023 051 | 3 Pružná podložka 5,1 ČSN 021740.09 | Spring washer d5,1              | Federscheibe 5,1         |
| 15 | 893-19-010      | 1 Uzemňovací kabel úplný            | Earth cable compl.              | Erdanlage komp.          |
| 16 | 898-19-040      | 1 Vypínač zapalování                | Ignition switch                 | Auslöser                 |
| 17 | 443 900 500 400 | 1 Krytka svíčky PVL P 18            | Cover of sparking plug PVL P 18 | Abdeckung PVL P 18       |
| 18 | 443 936 106 197 | 1 Průchodka                         | Bushing                         | Durchführung             |
| 19 | 443 936 106 197 | 1 Vložka krytky                     | Cover of the sparking plug      | Stecker                  |

|    |              | Díly na přání zákazníka  | Optional parts            | Wunsch teile         |
|----|--------------|--------------------------|---------------------------|----------------------|
| 20 | 443221045011 | 1 Svíčka NGK RO 045G-11  | Sparking plug NGK 045G-11 | Zündkerze NGK045G-11 |
| 21 | 444221000055 | 1 Svíčka Champion G-55 R | Sparking plug G-55R       | Zündkerze G-55R      |



# Nářadí

## Lubrication

## Schmierung

| # | Poz.       | Název                               | Name                         | Name                    |
|---|------------|-------------------------------------|------------------------------|-------------------------|
| 2 | 897-75-025 | 1 Klíč na svíčku                    | Spanner for sparking plug    | Kleinsteuerrad-abzieher |
| 3 | 897-75-026 | 1 Tyčka 8                           | Rod 8                        | Zündkerzeschüssel       |
| 4 | 894-71-002 | 1 Klíč zátky                        | Spanner for lock             | Stange 8                |
| 5 | 897-71-020 | 1 Džák unašeče                      | Holder                       | Verschluss-schüssel     |
| 6 | 897-71-030 | 1 Gžák náboje spojky                | Clutch hub puller            | Mitnehmerhalter         |
| 7 | 894-71-010 | 1 Montážní trubka ventilové pružiny | Box spanner for valve spring | Ventil-feder-Drückrohr  |
| 8 | 895-71-020 | 1 Stahovák unašeče                  | Extraktor for driving lug    | Mitnehmerabzieher       |

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