Engine parts
889

Technical data
889-10-013 offset 4
889-10-012 offset 8
889-10-011 normal

Engine	Air cooled, four stroke, single cylinder, 1× OHC
Bore × stroke	90 × 78,5 mm
Volume	499 ccm
Max. power	48–50 kW
Fuel	Methanol
Veight	28–30 kg

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JRM SPEEDWAY FACTORY

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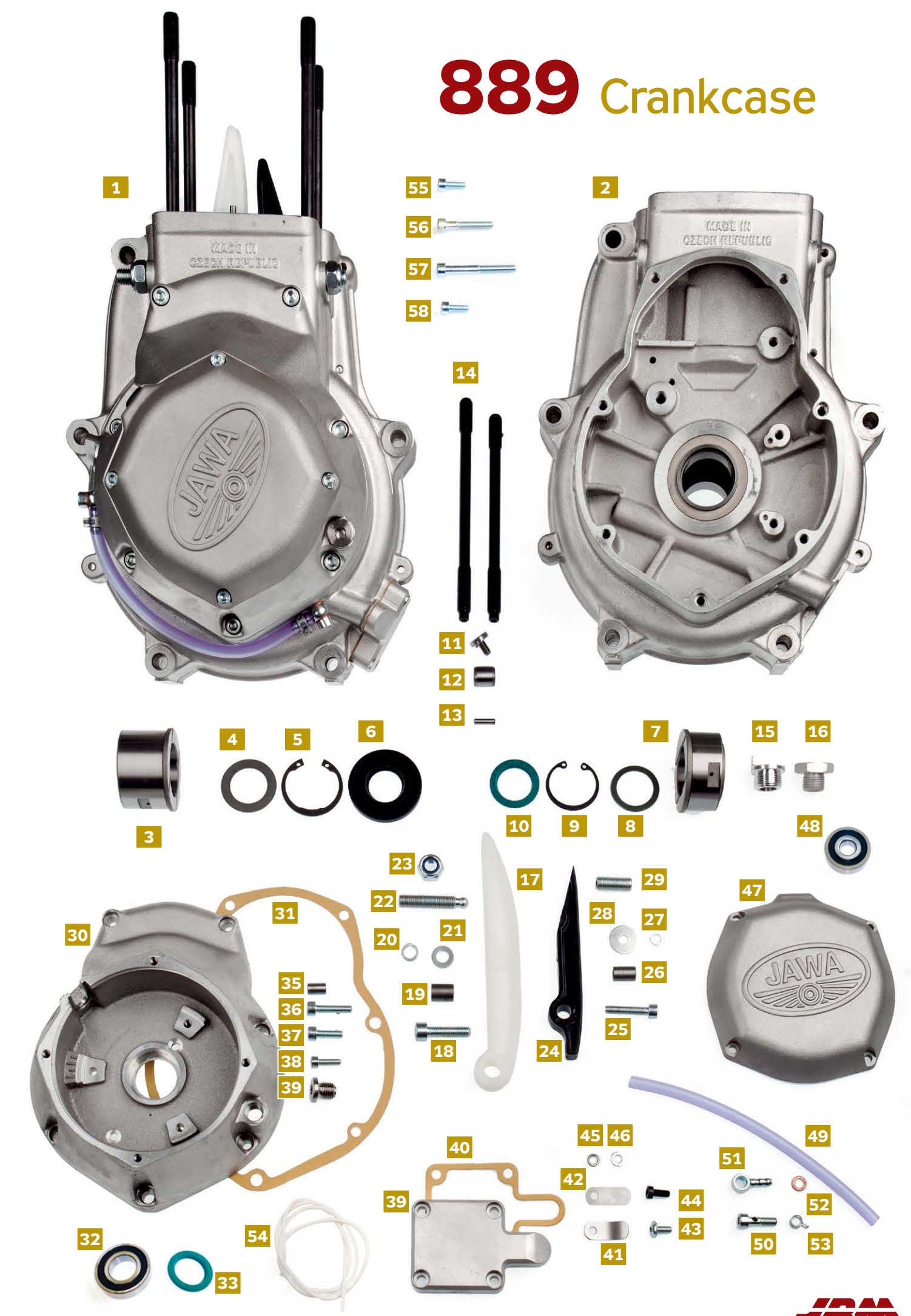
MOVES YOU INSIDE

889 Crankcase



1	889-11-011		Crankcase complete – straight
	889-11-012		Crankcase compl. – Off set 8 mm
	889-11-013		Crankcase compl. – Off set 4 mm
2	889-11-610	1	Crankcase with bushes straight
	889-11-650		Crankcase-bushes – Off set 8 mm
	250-11-520		Crankcase-bushe – Off set 4 mm
3	875-11-056	1	Main bearing bushing left
4	897-11-057	1	Washer 26–35
5	311 733 100 400	1	Circlip 40×1,75
6	273 521 106 205	1	Shaft seal 25×52×7
7	875-11-021	1	Main bearing bushing right
8	898-11-022	1	Washer 20–27
9	311 733 100 350	1	Circlip 35×1.5
10	273 888 411 025	1	Shaft seal G 25×35×4
11	875-11-057	2	Screw M6×10
12	875-11-058	2	Dowell pin D14
13	311 515 004 014	2	Pin d4×14
14	889-11-525	4	Studbolt M10×175
	889-11-625	4	Studbolt M10×162
15	894-11-158	1	Screw M16×1,5
16	889-11-048	1	Screw M20×1,5
17	884-11-031	1	Tightener of the chain
18	309 543 210 820	1	Screw M8×30
19	884-11-032	1	Spacing tube d8,2
20	311 214 023 082	1	Spring washer d8.2
21	311 210 222 084	1	Washer d8,4
22	898-11-037	1	Screw of the tensioner
23	311 129 221 100	2	Nut M10
24	884-11-034	1	Tightener of the chain short
25	309 543 210 620	1	Screw M6×30
26	884-11-035	1	Spacing tube d6,2
27	311 214 023 061	1	Spring washer d6,1
28	311 210 222 064	1	Washer d6,4
29	309 785 010 025	1	Screw of the tensioner M10×25
30	889-11-047	1	Cover of the timing gear
31	627 889 811 024	1	Gasket of the timing gear
32	324 160 030 026	1	Ball baering 6003
33	273 888 020 284	1	Shaft seal G 20×28×4
34	889-11-039	1	Screw with magnet
35	898-11-023	2	Dowell pin
36	309 543 210 618	4	Screw M6×25
37	309 543 210 616	9	Screw M6×20
38	309 543 210 514	4	Screw M5×16
39	889-11-613	1	Lower cover
40	627 888 911 619	1	Gasket of lower lid
41	889-11-515	3	Stop of the plate
42	889-11-514	3	Plate
43	309 714 105 012	1	Screw M5×12
44	309 708 050 012	2	Screw M5×12
45	311 214 023 051	2	Spring washer d5,1
46	311 210 222 053	2	Washer d5.3
47	889-11-032	1	Cover of ignition
	889-11-033		Cover of ignition black (On request)
48	324 162 000 020	1	Ball baering 6200
49	286 121 231 609	1	Oil level pipe
50	875-11-552	2	Screw of the connection
	889-11-055	2	Oil level indicator
51	875-11-553	2	Connection
52	898-11-056	4	Washer d6,2
53	311 750 076 083	2	Hose clamp
54	889-11-618	1	Sealing silicone cord
55	309 543 210 618	2	Screw M6×25
56	309 543 210 624	2	Screw M6×40
57	309 543 210 628	1	Screw M6×50
58	309 543 210 614	4	Screw M6×16

889 Crankshaft mechanism

1	889-12-510	1	Crankshaft mechan. (STD186)
2	889-12-501	1	Flywheel right 186×27
3	889-12-502	1	Flywheel left 186×27
4	889-12-210	1	Connecting rod compl. 163mm
5	324 588 912 507	1	Needle bearing 35×42×20 AG
6	889-12-105	1	Crankshaft journal
7	886-12-106	2	Washer copper
8	889-12-023	2	Spacing washer
9	889-12-207		Bush of connecting rod
10	890-12-017	1	Sprocket 17t
11	311 733 000 400	2	Circlip 40×1,75
12	890-12-006	1	Nut of the main journal left
13	895-12-014	1	Carrier chain conveyer
14	324 589 712 015	1	Needle bearing 25×35×30
15	895-12-104	1	Main journal left
16	889-12-103	1	Main journal right
17	324 588 412 017	1	Needle bearing 25×33×20
18	888-12-015	1	Sprocket 16 t
19	311 728 504 018	2	Key 4×7,5
20	889-12-017	1	Shaft carrier
21	889-12-061	1	Piston 90
22	326 988 912 091	1	Piston rings 90 – set
23	885-12-014	1	Piston pin
24	451 989 012 003	3	Circlip
25	889-12-060	/1/	Piston set JRM D90
26	888-12-015	1	Chain 100 Rollers (pitch – 7,77)

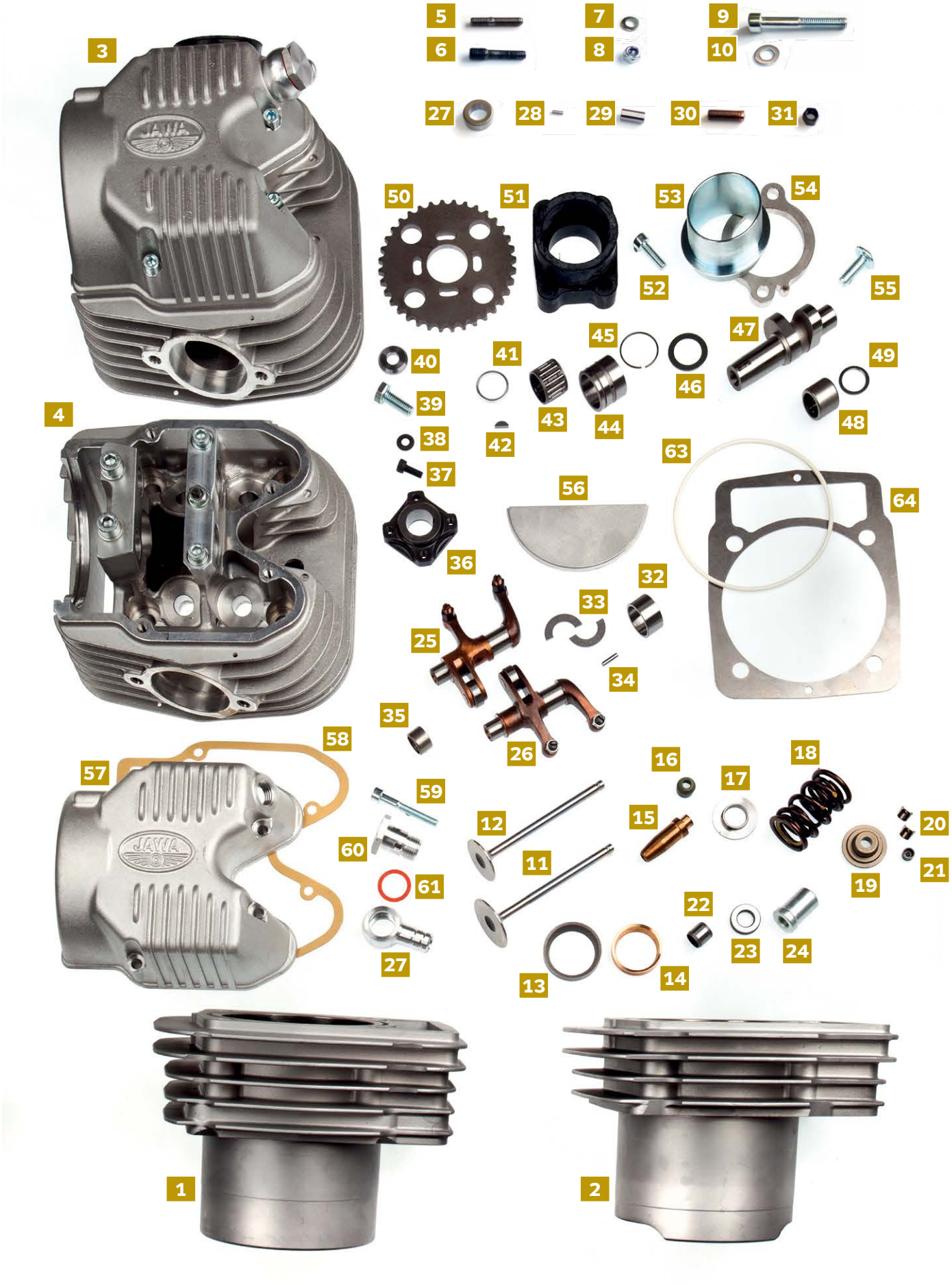
Parts on customer request

27	889-12-526		Flywheel right 188×29 – heavy
	889-12-527		Flywheel left 188×29 – heavy
	889-12-511		Flywheel right 182×27
	889-12-512		Flywheel left 182×27
	889-12-531		Flywheel right 184×27
	889-12-532		Flywheel left 184×27
28	889-12-516		Flywheel right 184×27 – exc.
	889-12-517		Flywheel left 184×27 – exc.
	889-12-536		Flywheel right 184×27 – exc.
	889-12-537		Flywheel left 182×27 –exc.
29	889-12-551		Flywheel right 182×27 – milling
	889-12-552		Flywheel left 182×27 – milling
	889-12-556		Flywheel right 184×27 – milling
	889-12-557		Flywheel left 184×27 – milling
	889-12-561		Flywheel right 186×27 – milling
	889-12-562		Flywheel left 186×27 – milling
	889-12-566		Flywheel right 188×27 – milling
	889-12-567		Flywheel left 188×27 – milling
/4/	889-12-145		Con. Rod163/20.6 JRM
	889-12-210		Con. Rod150/20.0 JRM
	889-12-215		Con. Rod150/20.6 JRM
	326 988 912 230		Con. Rod Carrillo163/20.6
	326 988 912 225		Con. Rod Carrillo164.5/20.6
	992-12-120		Con. Rod 152/20.6 JRM
/25/	326 988 912 360		Piston CP Carrillo 89,92 – d20,0 set
	326 988 912 370		Piston CP Carrillo 89,92 – d20,6 set
	326 988 912 160		Piston set Wiseco D90 – pin 20,0
	326 988 912 260		Piston set Wiseco D90 – pin20,6

Abnormal parts

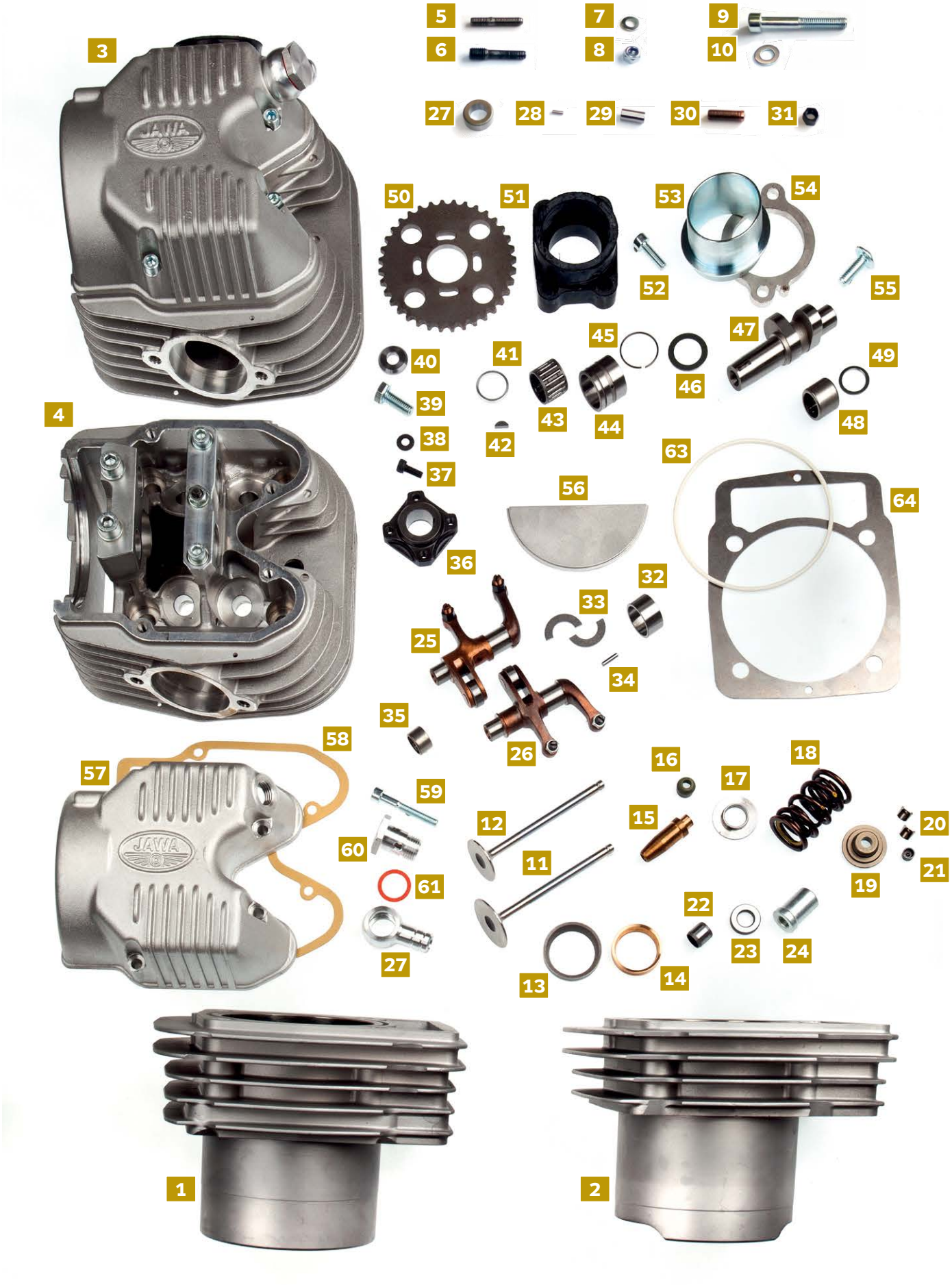
/21/	889-12-062	Piston JRM bore 90,03
/6/	889-12-115	Cranksh.journ. abn. – on the sides +0,03
	889-12-116	Cranksh.journ. abn. – In the middle +0,03
	889-12-117	Cranksh.journ. abn. – whole +0,03
	889-12-118	Cranksh.journ. abn. – whole +0,06

889 Cylinder with head



1	889-13-035	1	Cylinder nikasil std. D90
2	889-13-055		Cylinder nikasil-low D90
3	889-13-200	1	Head compl.
4	889-13-210		Head with bushes
5	889-13-117	2	Screw M6×30
6	889-13-116	1	Studbolt M6
7	311 210 222 064	3	Washer d6,4
8	311 120 121 060	3	Nut M6
9	309 501 000 832	2	Screw M8×60
10	311 210 320 084	2	Washer d8,4
11	889-13-245	2	Intake valve d6
12	889-13-246	2	Exhaust valve d6
13	889-13-223	2	Seat of the intake valve
14	889-13-224	2	Seat of the exhaust valve
15	889-13-222	4	Valve guide d6
16	273 588 413 128	4	Valve seal d6
17	889-13-262	4	Lower spring plate
18	451 988 913 173	4	Valve spring set
19	889-13-264	4	Upper spring plate
20	451 988 913 121	4	Groove collets
21	884-13-127	4	Valve cap d6
22	870-13-174	2	Dowell pin
23	889-13-169	4	Washer d10,5
24	889-13-168	4	Nut of the head
25	889-13-230	1	Rocker arm for intake compl.
	889-13-231		Rocker arm for intake
26	889-13-240	1	Rocker arm for exhaust compl.
	889-13-241		Rocker arm for exhaust
27	897-13-133	2	Rockerarm roller
28	324 989 214 023	13	Needle roller d2×6.3
29	897-13-134	1	Pin
30	889-13-172	2	Adjusting screw M6×0.75
31	311 188 913 138	2	Nut M6×0,75
32	889-13-132	2	Bush d20
33	889-13-134	4	Circlip
34	324 988 913 312	36	Needle roller
35	324 588 813 145	2	Needle bearing d12
36	889-13-121	1	Sprocket wheel carrier
37	309 701 050 012	4	Screw M5×12
38	311 236 450 056	4	Washer B5.3
39	309 503 210 816	1	Screw M8×20
40	884-13-144	1	Washer d8,2
41	884-13-149	1	Ring of camshaft
42	311 728 503 009	1	Key 3×3,7
43	324 588 413 139	1	Needle bearing 18×22×17
44	894-14-023	1	Bush with groove
45	451 989 414 026	1	Circlip
46	894-13-024	1	Spacing washer
47	889-13-150	1	Camshaft n.08
48	324 589 713 146	1	Needle bearing d15
49	897-13-149	1	Washer d15
50	886-13-132	1	Cam sprocket 32T
51	889-13-139	1	Intake branch gum
52	309 543 210 615	4	Screw M6×18
53	889-13-319	1	Exhaust branch
54	889-13-318	1	Holder exhaust throat
55	309 714 108 020	2	Screw M8×20
56	889-13-118	1	Lid

889 Cylinder with head



57	889-13-261	1	Cover of the head
	889-13-263		Cover of the head – black
58	627 888 913 166	1	Gasket head cover
59	309 543 210 624	4	Screw M6×40
60	898-13-166	1	Breather screw
61	722 989 813 171	3	Gasket
62	898-13-169	1	Connection
63	273 111 014 399	1	Rubber ring 99.5×3
64	624-13-405	1	Cylinder gasket th. 0.5
/64/	624-13-408		Cylinder gasket th. 0.8
/64/	624-13-410		Cylinder gasket th. 1.0
/64/	624-13-412		Cylinder gasket th. 1.2
/64/	624-13-415		Cylinder gasket th. 1.5
/64/	624-13-430		Cylinder gasket th. 3.0

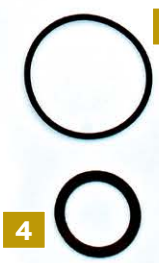
Parts on customer request

/17/	250-13-362	4	Lower spring plate HQS1
/18/	451 925 013 273	4	Valve spring HQS1
/19/	250-13-364	4	Upper spring plate HQS1
/47/	889-13-155	1	Camshaft n.12
/47/	451 988 913 270	2	Camshaft Tornado 5,2
/47/	451 988 913 271	3	Camshaft Tornado 5,4
/47/	451 988 913 272	4	Camshaft Tornado 74

Abnormal parts

/13/	889-13-583	Intake valve's seat abn.
/14/	889-13-584	Exhaust valve's seat abn.
/15/	889-13-582	Guide of the valve abn.

889 Lubrication, Ignition



Lubrication

1	889-15-011	1	Body of the oil pump
2	889-15-013	1	Cover of oil pump
3	273 111 014 164	1	Rubber ring 36×2
4	899-22-123	1	Spacing washer
5	889-15-012	1	Wheel of oil pump
6	889-19-011	1	Shaft of the ignition
7	898-19-132	1	Nut M 12×1 left
8	311 214 023 051	2	Spring washer d5,1
9	311 210 222 053	2	Washer d5,3
10	451 988 919 043	1	Circlip d17
11	309 543 210 522	2	Screw M5×35
	309 543 210 545	1	Screw M5×45
12	309 543 210 518	1	Screw M5×25
13	309 691 205 012	6	Screw M5×12
14	889-15-022	1	Tube 23,7 mm
15	273 111 010 014	2	Rubber ring 8x4
16	273 121 995 610	1	Bushing
17	889-15-014	1	Oil filter

Ignition

18	443 221 045 010	1	Sparking plug NGK -10
19	443 288 419 016	1	Ignition coil PVL – digital
20	443 288 419 014	1	Ignition coil PVL – analog
21	443 288 419 012	1	Ignition PVL – rotor
22	443 288 419 013	1	Ignition PVL – stator
	443 288 419 010	1	Ignition PVL compl.
23	443 900 500 400	1	Cover of sparking plug PVL P18
24	443 288 919 014	1	Ignition coil SELETTRA – analog
25	443 288 919 016	1	Ignition coil SELETTRA – digital
26	443 288 919 012	1	Ignition SELETTRA – rotor
27	443 288 919 013	1	Ignition SELETTRA – stator
	443 288 919 030	1	Ignition SELETTRA compl. Analog
28	443 900 602 140	1	Spring of the spark plug Selettra
29	443 900 500 400	1	Cover spark plug Selettra
30	889-19-010	1	Ignition switch
31	893-19-010	1	Earth cable compl.

/18/	443 221 045 011	1	Sparking plug NGK RO 16-11
/18/	443 221 045 012	1	Sparking plug NGK RO 373-10
/18/	443 221 045 013	1	Sparking plug NGK RO 373A 11

889 Instructions

Instructions for Maintenance of Speedway Engine JRM

The speedway engine JAWA type 889-10-009 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

The air-cooled single-cylinder, four valve OHC, stroke volume 499 ccm, the bore 90,00mm 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 35⁰. The valve seats are hot-pressed into the cylinder head.

The pistons is a light alloy forging and carries two piston rings, first 1mm compression ring and seconnd 2 mm 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. ofthe crankase, the iol filing is 0,7 l for new engine and 0,65 l is refill between heats. The level cam be checked by the oil level indicator.

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

Bore/stroke:	90 / 78,5 mm
Capacity:	499 ccm
Maximum power output:	48 –50 kW (45 – 68 bhp) at 8500 rpm
Compression ratio:	14 : 1 standart (available from 12 - 16 : 1)
Ignition:	electronic Selettra
Ignition Advance:	32⁰ (adjustable 25⁰ –35⁰ BTDC)
Sparking plug:	NGK ROO45G - 10
Fuel:	metanol
Oil 0,7 l	Castrol R40 Silkolene Castorene R 50 S

Measured at valve lift of 1 mm and at valve clearances inlet 0,1mm/ exhaust 0,15 mm (cold engine).

Valve timing– camshaft No.:	01	08
Exhaust open/close	62⁰/30⁰	68⁰/27⁰
Inlet open/close	31⁰/69⁰	37⁰/72⁰

Valve timing – camshaft No.:	12	09
Exhaust open/close	71⁰/29⁰	57⁰/27⁰
Inlet open/close	35⁰/81⁰	35⁰/66⁰

JRM SPEEDWAY FACTORY

Instructions for engine operation

Before putting an engine operation and before each race are to be checked:
_ valve clearence adjustment
_ chain tension and tichtening of screw on cam sprocket (in case of great chain clearence the valve timing is to be checked)
_ oil filling

Using of adequate thermal values of sparking plugs:
colder: Champion G 55R, NGK RO 16 -11 or RO045G-11
warmer: Champion G 57R, NGK RO 16 -10 or RO045G-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 thorttle, the warming up the engine is necessary. The chocke 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 technikal data.

The screw of checking hole the L.H. crankcase wil be loosed, the crankshaft moved round a slight amount to the advanced ignition mark in order to place it into the hole center. After relasing of screws turn slightly a stator in order to make the checking line of the stator aligned with that of rotor. Then tighten the screw of stator. The engine can run in 25⁰- 35⁰ ignition advance, so adjusting the engine charakteristic according the condition of track is possible.

Lubrication if engine

The circulation-systém 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 instaled double helicon springs with contact design. Therefor is not allowed to mix springs from different production runs - always the some 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 instaled leght is 32,5mm (outer spring) for 12 mm valve lift (camshaft No. 08).Minimum thrust of valve springs when assembled has to be 370N - than in the full lift spring has about 950N - this thrust ensure maximum engine speed 12 000 rpm. Minimum allowed leght for fully compressed springs is 20,5 mm (measured on outer spring). Free lenght of outer spring should be not below 43,8mm, the inner spring not below 38,1 mm.

_ Width of intake seats 1,0 –1,2 mm, round off the adges of valves and seats in the head.
_ Rocker Arm roller must run freely without grabbing
_ Axial clearence 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 in sealet by silicin "O" ring
_ Place replace the O ring during every engine overhaul.
_ Compression ratio is adjustment by steel plates of different thickness under cylinder.

CRANK MECHANISM

Repair works of crank mechanism are recommended to be made in specialized repair shops. The crank mechan. is presed on cylindrical surfaces. Before presing the interference size of pressed diameters has to be checked. The interference of crank pin at 0,13 /0,15 mm. The crank mechanism can be pressed three times without using abnormal parts. The crank pin can be ordered in an abnormal modifikation with greater pin diameter for pressing 0,03 mm. Axial clearence of crank mechanism in crankase is 0,5 – 0,7 mm.
Axial clearence 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.
Clearence of gudgeon pin in piston must be 0,007– 0,17 mm.
Clearence in piston ring lock 0,35 – 0,38 mm.
The standard piston is 889-12-061 – slipper type piston in "double bridge" design. Only this piston is recommended for use in our 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/ 42,008 mm (min/ max), the radial clearence between crank pin and big end should be 0,04 / 0,052. The clearence between piston pin and small end should be for conecting rod 889-12-140: 0,02–0,03.

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 them final timing by means of oval holes on cam sprocket. The tightening of 4screws on the sprocked must not be neglected. The values of cam timing are indicated in technikal data.