

TECHNICAL DATA – ENGINE 640 Duke, Adventure '98

Type	640 LC4	
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft and electric starter	
Displacement	624,6 ccm	
Bore / Stroke	101 / 78 mm	
Ratio	11,0 : 1	
Fuel	unleaded premium gasoline with a least RON 95	
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain	
Camshaft	249° (249/1)	
Valve timing by 1 mm	IO 13° BTDC	EO 53° BBDC
valve clearance	IC 51° ABDC	EC 11° ATDC
Valve diameter	Intake: 36 mm	Exhaust: 30 mm
Valve clearance cold	Intake: 0.15 mm	Exhaust: 0.15 mm
Crank shaft bearing	2 cylinder roller bearing	
Connecting rod bearing	needle bearing	
Top end bearing	bronze bushing	
Piston	cast aluminium alloy	
Piston rings	1 compression ring, 1 taper face ring, 1 oil scraper ring	
Engine lubrication	2 Eaton-Oilpumps	
Quantity of engine oil	see table	
Engine oil	2.1 liters including frame	
Primary ratio	straight geared spur wheels 30 : 81 teeth	
Clutch	multi disc clutch in oil bath	
Transmission	5-speed claw shifted	
Ignition system	contactless DC- CDI ignition with digital advanced system type KOKUSAN	
Ignition timing	adjustment to max. 38° BTDC at 6000 rpm	
Generator	12V 200W	
Spark plug	NGK DR8EA	
Spark plug gap	0.7 mm	
Cooling system	liquid cooled, permanent rotation of cooling liquid through mechanic driven water pump	
Cooling liquid	1 liter, 40% antifreeze, 60% water, at least -25° C (-13° F)	
Starting equipment	electric starter, kick starter	

ASSEMBLY CLEARANCE, WEAR LIMIT

Crank shaft	axial play	0.03 - 0.12 mm
	run out of crank stud	max. 0.08 mm
Connecting rod bearing	radial play	max. 0.05 mm
	axial play	max. 1.10 mm
Cylinder	bore	max. 101.04 mm
Piston	assembly clearance	max. 0.12 mm
Piston rings end gap	compression rings	max. 0.80 mm
	oil scraper ring	max. 1.00 mm
Valves	seat sealing intake	max. 1.50 mm
	seat sealing exhaust	max. 2.00 mm
	run out of valve heads	max. 0.05 mm
	valve guides diameter	max. 7.05 mm
Oil pumps	clearance outer rotor - housing	max. 0.20 mm
	clearance outer rotor - inner rotor	max. 0.20 mm
Bypaß valve	minimum spring length	25.00 mm
Clutch	Length of springs	min. 35.00 mm (new 37.00 mm)
	wear limit organic	min. 2.50 mm
Camshaft	diameter of bearing bolt (needle bearing)	min. 19.97 mm
Transmission shafts	axial play	0.10 - 0.40 mm

TIGHTENING TORQUES - ENGINE			
Hexagon nut at primary gear	M20x1.5	Loctite 242 + 170 Nm	(125 ft.lb)
Collar nut flywheel	M16x1.25 LH thread	80° C + 150 Nm	(132 ft.lb)
Hexagon nut for inner clutch hub	M18x1.5	80 Nm	(60 ft.lb)
Kickstarter stop screw	M12x1.5	50 Nm	(35 ft.lb)
Allan head screws oil pump	M6	Loctite 242 + 8 Nm	(6 ft.lb)
Allan head screws freewheel hub	M6x12/M6x12.5	Loctite 648 + 18 Nm	(13 ft.lb)
Hexagon screw camshaft gear	M10	Loctite 242 + 35 Nm	(26 ft.lb)
Allan head screw cylinder head top sect.	M6x25/M6x65/M6x70 (8.8)	8 Nm	(6 ft.lb)
Allan head screw cylinder head top sect.	M6x50/M6x55 (12.9)	20 Nm	(15 ft.lb)
Cylinder head screws	M10	50 Nm	(37 ft.lb)
Collar nuts at cylinder base	M10	40 Nm	(30 ft.lb)
Hexagon screw chain sprocket	M10	Loctite 242 + 40 Nm	(30 ft.lb)
Oil drain plug	M22x1.5	30 Nm	(22 ft.lb)
Magnetic plug	M12x1.5	20 Nm	(15 ft.lb)
Plug bypass valve	M12x1.5	20 Nm	(15 ft.lb)
Hollow screws oil lines	M8x1	10 Nm	(7.4 ft.lb)
Hollow screws oil lines	M10x1	15 Nm	(11 ft.lb)
Jet screw clutch cover	M8	10 Nm	(7,4 ft.lb)
Screw plug timing-chain tensioner	M12x1.5	20 Nm	(15 ft.lb)
Counternuts valve adjusting screws	M7x0.75	20 Nm	(15 ft.lb)
Crankshaft locking bolt	M8	25 Nm	(19 ft.lb)
Engine mounting bolt	M8	40 Nm	(30 ft.lb)
Engine mounting bolt	M10	70 Nm	(50 ft.lb)

GEAR RATIOS				
Primary ratio	Transmission	Original final drive ratio	Available chain drive sprockets	Available final drive sprockets
30:81	1st gear 14:35 2nd gear 15:24 3rd gear 18:21 4th gear 20:19 5th gear 22:18	17:38	15 t 16 t for chain 17 t 5/8 x 1/4"	38 t 40 t for chain 42 t 5/8 x 1/4" 45 t 48 t

BASIC CARBURETOR SETTING		
	640 LC4 25 kW	640 LC4 37 kW
Type	PHM 40 SD	PHM 40 SD
Carb.-setting number	210198	210198
Main jet	155	155
Needle jet	DR 268	DR 268
Idling jet	45	45
Jet needle	K 51	K 51
Needle clip pos. f. top	4. from top	4. from top
Mixt. adj. screw open	1.5 turns	1,5 turns
Throttle valve	40	40
Starting jet	55	55
Performance restrictor	slide stop 28mm	-

API: SF, SG, SH	
TEMPERATURE	
← -	0°C 32°F
+	→
10W 40	15W 40
10W 50	15W 50
10W 60	15W 60

Engine oil

Use only oil brands, which meet quality requirements of API-classes SF, SG or SH (informations on bottles) or higher. Both, mineral and synthetic oils with above specifications can be used.

! CAUTION !
POOR OIL QUALITY OR MINOR QUANTITY EFFECT EARLY ENGINE-WEAR.