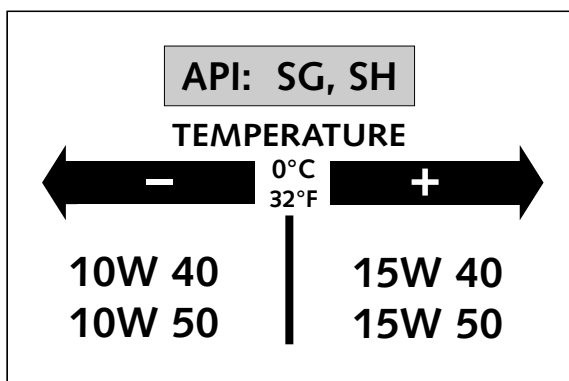


TECHNICAL DATA – ENGINE 400/640 LC4-E, 640 ADVENTURE, DUKE 2001

Type	400 LC4-E	640 LC4-E
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft and electric starter	
Displacement	398 ccm	624,6 ccm
Bore / Stroke	89 / 64 mm	101 / 78 mm
Ratio	10,8 : 1	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	249/1	
Valve diameter	Intake: 36 mm Exhaust: 30 mm	
Valve clearance cold	Intake: 0.20 mm Exhaust: 0.20 mm	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	forged/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 DPR8 EA9	
Spark plug gap	0.9 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 400	bore max. 89.04 mm
Cylinder 640	bore max. 101.04 mm
Piston forged	assembly clearance max. 0.12 mm
Piston cast	assembly clearance max. 0.05 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. 34.5 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

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



Engine oil

Use only oil brands, which meet quality requirements (Shell Advance Ultra 4) of API-classes SG or SH (informations on bottles) or higher.

! CAUTION !

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

BASIC CARBURETOR SETTING			
	400 LC4-E 25 kW	400 LC4-E 31 kW	400 LC4-E USA
Type	PHM 38 ND	PHM 38 ND	BST40-225
Carb.-setting number	100197	100197	090298
Main jet	130	130	142,5
Needle jet	AR 264	AR 264	689 X-6
Idling jet	50	50	45
Jet needle	K 23	K 23	6G5
Needle clip pos. f. top	2. from top	2. from top	3. from top
Mixt. adj. screw open	1.5 turns	1,5 turns	2,25 turns
Throttle valve	50/1	50/1	—
Starting jet	45(50,55)	45(50,55)	—
Performance restrictor	slide stop 51mm	—	—

BASIC CARBURETOR SETTING			
	640 LC4-E, Adventure 25 kW	640 LC4-E, Adventure 36 kW	640 Duke 40 kW
Type	BST40-225	BST40-225	BST40-225
Carb.-setting number	080298	090298	100299
Main jet	142,5	142,5	145
Needle jet	689 X-6	689 X-6	689 X-6
Idling jet	45	45	45
Jet needle	6G5	6G5	6G5
Needle clip pos. f. top	3. from top	3. from top	3. from top
Mixt. adj. screw open	2,25	2,25	2,25
Throttle valve	—	—	—
Starting jet	—	—	—
Performance restrictor	slide stop 17mm	—	—

TIGHTENING TORQUES - ENGINE			
Hexagon nut at primary gear	M20x1,5	Loctite 243 + 170 Nm	(125 ft.lb)
Collar nut flywheel (LC4, ADVENT, DUKE)	M16x1,25 left	80° C + 150 Nm	(110 ft.lb)
Collar nut flywheel (SC, SXC)	M12x1 left	60 Nm	(44 ft.lb)
Hexagon nut for inner clutch hub	M18x1,5	Loctite 648 + 80 Nm	(59ft.lb)
Kickstarter stop screw	M12x1,5	50 Nm	(37ft.lb)
Allan head screw freewheel hub (E-STARTER)	M6x12/M6x12,5	Loctite 648 + 18 Nm	(13ft.lb)
Allan head screw oil pumps	M6	Loctite 243 + 8 Nm	(6ft.lb)
Hexagon screw camshaft gear	M10	Loctite 243 + 35 Nm	(25ft.lb)
Allan head screw cylinder head top sect.(SC, SXC)	M6x25	8 Nm	(6ft.lb)
Allan head screw cylinder head top sect.(LC4,ADVENT,DUKE)	M6x25/M6x65/M6x70 (8.8)	8 Nm	(6ft.lb)
Allan head screw cylinder head top sect.	M6x50/M6x55 (12.9)	20 Nm	(15ft.lb)
Allan head screw cylinder head top sect.(SC, SXC)	M6x65/M6x70 (8.8)	8 Nm	(6ft.lb)
Cylinder head screws	M10	50 Nm	(37ft.lb)
Collar nuts at cylinder base	M10	40 Nm	(30ft.lb)
Hexagon screw chain sprocket	M10	Loctite 243 + 40 Nm	(30ft.lb)
Oil drain plug	M22x1,5	30 Nm	(22ft.lb)
Magnetic plug	M12x1,5	20 Nm	(15ft.lb)
Plug bypass valve	M12x1,5	20 Nm	(15ft.lb)
Hollow screws oil lines	M8x1	10 Nm	(7ft.lb)
Hollow screws oil lines	M10x1	15 Nm	(11ft.lb)
Jet screw clutch cover	M8	10 Nm	(7ft.lb)
Screw plug timing-chain tensioner	M12x1,5	20 Nm	(15ft.lb)
Counternuts valve adjusting screws	M7x0,75	20 Nm	(15ft.lb)
Crankshaft locking bolt	M8	25 Nm	(19ft.lb)
Spark plug	M12x1,25	20 Nm	(15ft.lb)
Engine mounting bolt	M8	40 Nm	(30ft.lb)
Engine mounting bolt	M10	70 Nm	(52ft.lb)

TIGHTENING TORQUES - CHASSIS			
Collar nut front axle	M16x1,5, M17	40 Nm	(30ft.lb)
Collar nut front axle (400 SXC)	M10	40 Nm	(30ft.lb)
Collar nut rear axle	M20x1,5	80 Nm	(59ft.lb)
Shock absorber top	M10	45 Nm	(33ft.lb)
Shock absorber bottom	M10	45 Nm	(33ft.lb)
Collar screws brake disk front	M6	Loctite 243 + 10Nm	(7ft.lb)
Collar screws brake disk rear	M6	Loctite 243 + 10Nm	(7ft.lb)
Screw brake caliper front	M8	Loctite 243 + 25 Nm	(19ft.lb)
Allan head screw brake caliper front (DUKE)	M10x1,25	Loctite 243 + 45 Nm	(33ft.lb)
Allan head screw brake caliper support rear (DUKE)	M10	40 Nm	(37ft.lb)
Bearing bolt linkage arm/frame	M12	60 Nm	(44ft.lb)
Collar nuts rocker arm bolts	M14x1,5	100 Nm	(74ft.lb)
Engine mounting screw	M10	45 Nm	(33ft.lb)
Ball joint for push rod	M8	Loctite 243 + 25 Nm	(19ft.lb)
Sprocket screws on nuts	M8	Loctite 243 + 35 Nm	(25ft.lb)
Collar nut swingarm bolt	M14x1,5	100 Nm	(74ft.lb)
Clamping screws top triple clamp (USD 43)	M8	20 Nm	(15ft.lb)
Clamping screws top triple clamp (EXTREME)	M8	15 Nm	(11ft.lb)
Clamping screws top triple clamp (USD 48)			
Clamping screws bottom triple clamp (USD 43)	M8	15 Nm	(11ft.lb)
Clamping screws bottom triple clamp (EXTREME)	M8	20 Nm	(15ft.lb)
Clamping screws bottom triple clamp (USD 48)			
Clamping screws fork stubs	M8	10 Nm	(7ft.lb)
Collar nut for eccentric chain adjuster (DUKE)	M10	40 Nm	(30ft.lb)
Screws handlebar clamp	M8	Loctite 243 + 20 Nm	(15ft.lb)
Allan head screw handle bar support	M10	Loctite 243 + 40 Nm	(30ft.lb)
Other screws on chassis	M6	10 Nm	(7ft.lb)
	M8	25 Nm	(19ft.lb)
	M10	45 Nm	(33ft.lb)
Other collar nuts on chassis	M6	15 Nm	(11ft.lb)
	M8	30 Nm	(22ft.lb)
	M10	50 Nm	(37ft.lb)