

TECHNICAL DATA – ENGINE 400/520 SX, EXC RACING 2000

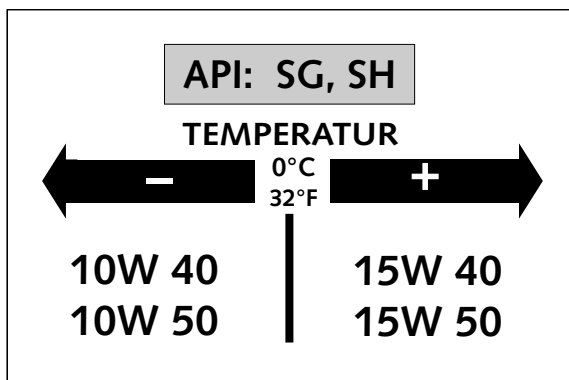
Type	400 SX RACING	400 EXC RACING	520 SX RACING	520 EXC RACING
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft			
Displacement	398 cm ³		510 cm ³	
Bore/Stroke	89 / 64 mm		95 / 72 mm	
Ratio	11 : 1			
Fuel	unleaded premium gasoline with at least RON 95			
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain			
Camshaft	01		55	
Valve diameter	Intake: 35 mm Exhaust: 30 mm			
Valve clearance cold	0.12 mm (feeler gage 0.10 mm light, feeler gage 0.15 mm should not be inserted)			
Crankshaft bearing	2 cylinder roller bearing			
Conrod bearing	needle bearing			
Top end bearing	bronze bushing			
Piston	aluminium alloy cast		aluminium alloy forged	
Piston rings	1 compression ring, 1 oil scraper ring			
Engine lubrication	pressure circulation lubrication with 2 rotor pumps			
Engine oil	fullsynthetic oil (Shell Advance Ultra4 SAE 10W40)			
Quantity of engine oil	1.25 liters			
Primary ratio	straight geared spur wheels 33:76 Z			
Clutch	multi disc clutch in oil bath			
Transmission	4-speed claw shafted	6-speed claw shafted	4-speed claw shafted	6-speed claw shafted
Gear ratio				
1 st Gear	14:34	14:34	14:34	14:34
2 nd Gear	18:30	17:31	18:30	17:31
3 rd Gear	20:28	19:28	20:28	19:28
4 th Gear	22:26	22:26	22:26	22:26
5 th Gear	–	24:23	–	24:23
6 th Gear	–	26:21	–	26:21
Ignition system	contactless DC-CDI ignition with digital advanced system by KOKUSAN			
Generator	12V 40W	12V 110W		
Spark plug	NGK CR8 EK			
Spark plug gap	0.60 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	kickstarter	kick - electric starter	kickstarter	kick - electric starter

BASIC CARBURETOR SETTING

	520 SX RACING	400 EXC RACING (12kW) 520 EXC RACING (12,5kW)	520 EXC RACING	400 EXC RACING 400 SX RACING
Type	MX-FCR39	MX-FCR39	MX-FCR39	MX-FCR39
Carb.-setting number	250899	130799	100699	031299
Main jet	175	175	175	175
Jet needle	OBDTM	OB DVR (OBDTM)	OBDTM	OBDTM
Idling jet	52	48	48	48
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle clip position	2. from top	3. from top	2. from top	4. from top
Starting jet	85	85	85	85
Mixture control screw open	2	1,25	2,5	2,25
Throttle valve	15	15	15	15
Performance restrictor	–	slide stop 24,5 mm	–	–
Stop pump membrane	055	055	055	055

TIGHTENING TORQUES - ENGINE

Hexagon collar screw engine case, clutch cover, ignition cover	M6	8 Nm	(6 ft.lb)
Oil drain plug	M12x1,5	20 Nm	(15 ft.lb)
Allan head plug oil screen short	M16x1,5	10 Nm	(7 ft.lb)
Hexagon plug oil screen long	M20x1,5	15 Nm	(11 ft.lb)
Plug pressure valve	M12x1,5	20 Nm	(15 ft.lb)
Jet screw and hollow screw oil line	M8	10 Nm	(7 ft.lb)
Screws oil pump cover	M5	Loctite 243 + 6 Nm	(5 ft.lb)
Hex.collar screw cylinderhead top section, water pump cover	M6	8 Nm	(6 ft.lb)
Hexagon collar screw exhaust flange	M6	Loctite 243 + 8 Nm	(6 ft.lb)
Cylinder head screw	M10	40/50 Nm	(30/35 ft.lb)
Allan head screw camshaft gear	M8	Loctite 243 + 28 Nm	(21 ft.lb)
Stop screw autodecompression	M5	Loctite 243 + 6 Nm	(5 ft.lb)
Allan head screw cap rocker arm	M5	5 Nm	(4 ft.lb)
Counter nuts valve adjustment screw	M6x0,75	13 Nm	(10 ft.lb)
Allan head screw primary gear, free wheel	M6	Loctite 243 + 18 Nm	(13 ft.lb)
Hexagon nut primary gear	M20x1,5	Loctite 243 + 150 Nm	(132 ft.lb)
Allan head screw balancer shaft gear	M6	Loctite 243 + 8 Nm	(6 ft.lb)
Hexagon collar screw clutch spring	M6	8 Nm	(6 ft.lb)
Allan head screw shift roller locking piece	M6	Loctite 243 + 8 Nm	(6 ft.lb)
Hexagon collar screw locking lever	M5	Loctite 243 + 6 Nm	(6 ft.lb)
Hexagon collar screw securing guide, chain guide, chain tensioner	M6	Loctite 243 + 8 Nm	(6 ft.lb)
Hexagon collar screw chain adjuster	M6	8 Nm	(6 ft.lb)
Hexagon collar screw stator EXC	M6	Loctite 243 + 8 Nm	(6 ft.lb)
Hexagon collar screw stator SX	M5	Loctite 243 + 6 Nm	(5 ft.lb)
Hexagon collar screw pulser coil	M5	Loctite 243 + 6 Nm	(5 ft.lb)
Hexagon collar nut flywheel	M12x1	60 Nm	(44 ft.lb)
Hexagon collar screw bump part kickstarter	M6	Loctite 243 + 8 Nm	(6 ft.lb)
Hexagon collar screw spring hanger kickstarter	M6	Loctite 243 + 8 Nm	(6 ft.lb)
Hexagon collar screw cover E-starter, only SX	M6	Loctite 243 + 8 Nm	(6 ft.lb)
Hexagon collar screw hanger vent hose	M6	Loctite 243 + 8 Nm	(6 ft.lb)
Allan head screw kickstarter	M8	Loctite 243 + 25 Nm	(19 ft.lb)
Hexagon collar screw shift lever	M6	Loctite 243 + 8 Nm	(6 ft.lb)
Hexagon screw engine sprocket	M10	Loctite 243 + 60 Nm	(44 ft.lb)



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.

ASSEMBLY CLEARANCE, WEAR LIMIT	
Crankshaft	axial play 0.03 - 0.15 mm
	run out of crank studmax. 0.08 mm
Conrod bearing	radial playmax. 0.05 mm
	axial playmax. 1.10 mm
Cylinder 400	bore diametermax. 89.04 mm
Cylinder 520	bore diametermax. 95.04 mm
Piston forged	assembly clearancemax. 0.08 mm (new 0.05 mm)
Piston cast	assembly clearancemax. 0.1 mm (new 0.07 mm)
Piston ring end gap	compression ringmax. 0.80 mm
	oil scraper ringmax. 1.00 mm
Valves	seat sealing intakemax. 1.50 mm
	seat sealing exhaustmax. 2.00 mm
	run out of valve headsmax. 0.05 mm
	valve guides diametermax. 6.05 mm
Oil pumps	clearance outer rotor - housingmax. 0.20 mm
	clearance outer rotor - inner rotormax. 0.20 mm
Bypaß valve	minimum spring length25.00 mm
Clutch	Length of springsmin. 41,5 mm (new 43 mm)
	wear limit organicmin. 1.70 mm
Transmission shafts	axial play0.10 - 0.40 mm