Design	1-cyliner 4-stroke engine, water-cooled
Displacement (450 SX-F, 450 XC-F)	449.3 cm³ (27.42 cu in)
Displacement (505 SX-F, 505 XC-F)	477.5 cm³ (29.14 cu in)
Stroke	60.8 mm (2.39 in)
Bore (450 SX-F, 450 XC-F)	97 mm (3.82 in)
Bore (505 SX-F, 505 XC-F)	100 mm (3.94 in)
Compression ratio	12,5:1
Idle speed	1600…1650 rpm
Control	4 valves controlled by cam levers ad 2 camshafts, driven by helical gear pair and tooth-wheel chain
Valve diameter, intake	40.4 mm (1.59 in)
Valve diameter, exhaust	31.7 mm (1.25 in)
Valve clearance, cold, intake	0.07…0.13 mm (0…0.01 in)
Valve clearance, cold, exhaust	0.12…0.18 mm (0…0.01 in)
Crankshaft bearing	2 cylinder roller bearing
Conrod bearing	Needle bearing
Piston pin bearing (450 SX-F, 450 XC-F)	Bronze bush
Piston pin bearing (505 SX-F, 505 XC-F)	not a bearing bush - DLC-plated piston pins
Pistons	Forged light alloy
Piston rings	1 compression ring, 1 oil scraper ring
Engine lubrication	Pressure circulation lubrication with 3 rotor pumps
Primary transmission	29:74
Transmission ratio	
Transmission ratio (450 SX-F, 505 SX-F)	
1st gear	17:32
2nd gear	19:30
3rd gear	21:28
4th gear	23:26
Transmission ratio (450 XC-F, 505 XC-F)	
1st gear	16:34
2nd gear	19:31
3rd gear	20:26
4th gear	23:25
5th gear	26:24
Generator performance	
6000 rpm	42 W
Ignition	Contactless controlled fully electronic ignition with digital ignition adjustment, type Kokusan
Spark plug	NGK CR 9 EKB
spark plug electrode gap	0.7 mm (0.03 in)
Cooling	Water cooling, permanent circulation of coolant by water pump
Starting aid	Electric starter

Capacity- engine oil

Engine oil	1.35 l (1.43 qt.)	Engine oil (☞ 82)

Capacity- cooling liquid

Coolant	1.2 l (1.27 qt.)	Coolant (☞ 82)
		Coolant (mixed ready to use) (☞ 82)

Engine housing vent jet	M4		**Loctite® 243™** (☛ 84)
Oil jet, piston cooling	M4	4 Nm (2.95 lbf ft)	**Loctite® 243™** (☛ 84)
Oil jet, cam lever lubrication	M4	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Oil jet, clutch oil supply	M5x1	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, locking lever	M5	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, camshaft bearing re-taining bracket	M5	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, timing train axle retain-ing bracket	M5	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, ignition pulse generator	M5	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, ignition pulse generator adapter	M5	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, stator cable holder	M5	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, bearing bolt of oil pump idler shaft	M5	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Locking screw for bearing	M5	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, oil pump cover	M5	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, stator bracket	M5	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Oil jet, timing chain tensioner	M6x0,6	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Nut, water-pump wheel	M6	6 Nm (4.43 lbf ft)	**Loctite® 243™** (☛ 84)
Nut, cylinder head	M6	10 Nm (7.38 lbf ft)	Engine oil (any) (☛ 85)
Screw, exhaust flange	M6	10 Nm (7.38 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, starter motor	M6	10 Nm (7.38 lbf ft)	–
Screw, ignition pulse generator cable holder	M6	10 Nm (7.38 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, clutch cover	M6	10 Nm (7.38 lbf ft)	–
Screw, clutch spring	M6	10 Nm (7.38 lbf ft)	–
Screw, clutch slave cylinder	M6	10 Nm (7.38 lbf ft)	–
Screw, engine housing	M6	10 Nm (7.38 lbf ft)	–
Screw, oil filter cover	M6	10 Nm (7.38 lbf ft)	–
Screw, oil pump casing	M6	10 Nm (7.38 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, shift drum locating	M6	10 Nm (7.38 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, shift lever	M6	10 Nm (7.38 lbf ft)	**Loctite® 243™** (☛ 84)
Screw, valve cover	M6	8 Nm (5.9 lbf ft)	–
Screw, water pump cover	M6	10 Nm (7.38 lbf ft)	–
Screw, ignition cover	M6	10 Nm (7.38 lbf ft)	–
Stud, cylinder head	M6	10 Nm (7.38 lbf ft)	–
Screw, clutch cover	M7x1	14 Nm (10.33 lbf ft)	–
Screw, engine housing	M7x1	14 Nm (10.33 lbf ft)	–
Screw, camshaft bearing bridge	M7x1	14 Nm (10.33 lbf ft)	Engine oil (any) (☛ 85)
Plug, crankshaft location	M8	20 Nm (14.75 lbf ft)	–
Screw, unlocking of timing chain tensioner	M10x1	10 Nm (7.38 lbf ft)	–
Screw, camshaft gear	M10x1	50 Nm (36.88 lbf ft)	Engine oil (any) (☛ 85)
Screw, ignition rotor	M10x1	80 Nm (59.01 lbf ft)	Engine oil (any) (☛ 85)
Plug, oil channel	M10x1	10 Nm (7.38 lbf ft)	–
Plug, cam lever axle	M10x1	10 Nm (7.38 lbf ft)	–
Nut, cylinder head	M10x1,25	Tightening sequence: Tighten in diagonal sequence. Tightening stage 1 10 Nm (7.38 lbf ft) Tightening stage 2 30 Nm (22.13 lbf ft) Tightening stage 3 50°	Engine oil (any) (☛ 85)

Stud, cylinder head	M10x1,25	20 Nm (14.75 lbf ft)	–
Screw, engine sprocket	M10	60 Nm (44.26 lbf ft)	**Loctite® 243™** (☛ 84)
Spark plug	M10	10…12 Nm (7.38…8.85 lbf ft)	–
Screw-in studs for clutch cover	M12x1,5	20 Nm (14.75 lbf ft)	–
Oil drain plug with magnet	M12x1,5	20 Nm (14.75 lbf ft)	–
Axle guide rail for timing chain	M14x1	15 Nm (11.06 lbf ft)	–
Axle tension rail for timing chain	M14x1	15 Nm (11.06 lbf ft)	–
Nut, compensating sprocket	M14x1	20 Nm (14.75 lbf ft)	**Loctite® 243™** (☛ 84)
Oil suction pipe	M14x1	15 Nm (11.06 lbf ft)	**Loctite® 243™** (☛ 84)
Plug, excess pressure valve	M14x1,5	18 Nm (13.28 lbf ft)	–
Nut, inner clutch hub	M18x1,5	80 Nm (59.01 lbf ft)	**Loctite® 243™** (☛ 84)
Plug, timing chain tensioner	M24x1,5	25 Nm (18.44 lbf ft)	–
Nut, freewheel hub	M27x1	80 Nm (59.01 lbf ft)	**Loctite® 243™** (☛ 84)
Nut, primary gear	M27x1	80 Nm (59.01 lbf ft)	**Loctite® 243™** (☛ 84)
Plug, oil screen	M32x1,5	30 Nm (22.13 lbf ft)	–

Carburetor type	KEIHIN FCR-MX 41
Carburetor identfication number (450 SX-F, 450 XC-F)	4125I
Carburetor identfication number (505 SX-F, 505 XC-F)	4125J
Needle position (450 SX-F, 450 XC-F)	4th position from top
Needle position (505 SX-F, 505 XC-F)	5 th position from top
Idle mixture adjusting screw	
Open	1.5 turns
Pump membrane stop	2.15 mm (0.08 in)
Hot start button	
Diameter of bore in carburetor body	2.5 mm (0.1 in)
Main jet	185
Jet needle (450 SX-F, 450 XC-F)	OBDTR
Jet needle (505 SX-F, 505 XC-F)	OBDTP
Idling jet	42
Main air jet	200
Idle air jet	100
Cold start jet	85
Throttle slide	15