

WSM

WORKSHOP MANUAL

F2260, F2560(E), F3060, F3560

Kubota

A F3560 (Supplement)

Use this workshop manual together with workshop manual for F2260, F2560, F3060 issued already. And replace your WSM cover and card with newly provided ones.

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TO THE READER

This Workshop Manual has been prepared to provide servicing personnel with information on the mechanism, service and maintenance of KUBOTA F3560.

Covered here are additional sections for F3560.

As for the items which are not explained in these sections, refer to Workshop Manual for F2260, F2560, F3060 (F3060 Model).

All information and specifications contained in this manual are based on the latest production information available at the time of publication.

The right is reserved to make changes in all information at any time without notice.

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SPECIFICATIONS

Model			F3560
Maximum P.T.O. power			18 kW (24.7 HP)
Engine	Model		V1505-FM
	Type		Indirect injection, vertical, water cooled, 4-cycle diesel engine
	Number of cylinders		4
	Bore and stroke		78.0 × 78.4 mm (3.07 × 3.09 in.)
	Total displacement		1498 cm ³ (91.41 cu.in.)
	Rated revolution		2530 min ⁻¹ (2530 rpm)
	Combustion chamber		Spherical type (New-TVCS)
	Fuel injection pump		Bosch MD type mini pump
	Governor		Centrifugal mechanical governor
	Injection nozzle		Mini nozzle (DNOPD)
	Injection timing		0.30 to 0.33 rad. (17 ° to 19 °) before T.D.C.
	Injection order		1-3-4-2
	Injection pressure		13.73 MPa (140 kgf/cm ² , 1991 psi)
	Compression ratio		22 : 1
	Lubricating system		Forced lubrication by gear pump
	Cooling system		Pressurized radiator, forced circulation with water pump
	Lubricating oil		MIL-L-46152, MIL-L-2104C, quality better than CC class (API)
	Starting system		Electric starter (12 V, 1.1 kW)
	Battery		12 V (70 Ah) RC : 118 min, CCA : 529 A
	Fuel		Diesel fuel No.2-D (ASTM D 975) [No.1-D diesel fuel, if temperature is below -10 °C (14 °F)]
Capacities	Fuel tank		40 L (10.6 U.S.gals., 8.8 Imp.gals.)
	Engine crankcase		2.7 L (2.8 U.S.qts., 2.4 Imp.qts.)
	Engine coolant		3.9 L (4.1 U.S.qts., 3.4 Imp.qts.)
	Recovery sub tank		0.3 L (0.3 U.S.qts., 0.3 Imp.qts.)
	Transmission case		13.5 L (14.3 U.S.qts., 11.9 Imp.qts.)
	Rear axle differential case		1.3 L (1.4 U.S.qts., 1.1 Imp.qts.)
	Rear axle gear case		0.5 L (0.5 U.S.qts., 0.4 Imp.qts.)
Tires	Front		23 × 10.5-12 (4PR) Turf (For Europe 24 × 8.5-12 (4PR) Turf)
	Rear		18 × 7.0-8 (4PR) Turf
Travelling speeds	Forward	Low	0 to 9.0 km/h (0 to 5.6 mph) *2
		High	0 to 17.0 km/h (0 to 10.6 mph) *2
	Reverse	Low	0 to 4.8 km/h (0 to 3.0 mph) *2
		High	0 to 8.5 km/h (0 to 5.3 mph) *2

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Model		F3560
Dimensions	Overall length	2840 mm (92.1 in.)
	Overall width	1140 mm (44.9 in.) [1130 mm (44.5 in.)] * ³
	Overall height (with ROPS)	1910 mm (75.2 in.) [1920 mm (75.6 in.)] * ³
	Wheel base	1300 mm (51.2 in.)
	Minimum ground clearance	17.5 mm (6.9 in.)
	Treads	Front 875 mm (34.4 in.) [919 mm (36.1 in.)] * ³
	Rear	875 mm (34.4 in.)
Weight (Without mower deck)		630 kg (286 lbs)
PTO shaft		Front PTO, USA No.5 (KUBOTA 10-tooth) involute splines
Front PTO		1 speed 2530 min ⁻¹ (rpm) at 2700 engine min ⁻¹ (rpm)
PTO brake		Wet single plate
PTO clutch		Wet multiple discs
Steering		Power, Hydraulic
Transmission		Hydrostatic transmission, Hi-Low gear shift (2 forward, 2 reverse)
Minimum turning radius (Left turn)		750 mm (2.36 ft) w/o brake
Brake		Wet multiple discs
Differential		Bevel gear

(Specifications and design subject to change without notice)

Note *1 Manufacturer's estimate

*2 At 2700 engine min⁻¹ (rpm)

*3 With 24 × 8.5-12 Tire

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G GENERAL

LUBRICANTS, FUEL AND COOLING WATER

	Place		Capacity	Lubricants, fuel and cooling water
			F3560	
1	Fuel		40 L 10.6 U.S.gals. 8.8 Imp.gals.	[ASTM D 975] No.2-D diesel fuel No.1-D diesel fuel if temperature is below – 10 °C (14 °F)
2	Coolant	Cooling system	3.9 L 4.1 U.S.qts. 3.4 Imp.qts.	Fresh clean water (soft water) with anti-freeze
		Recovery tank	0.3 L 0.3 U.S.qts. 0.3 Imp.qts.	
3	Engine crankspace		2.7 L 2.8 U.S.qts. 2.4 Imp.qts.	Engine oil : MIL-L-46152, MIL-L-2104C, API Service Classification CC or CD Below 0 °C (32 °F) SAE10W, 10W-30 or 10W-40 0 to 25 °C (32 to 77 °F) SAE20, 10W-30 or 10W-40 Above 25 °C (77 °F) SAE30, 10W-30 or 10W-40
4	Transmission case		13.5 L 14.3 U.S.qts. 11.9 Imp.qts.	KUBOTA SUPER UDT fluid * (Reference) Maker Brand name Exxon Torque Fluid 56 Shell Donax TD Union Hydraulic / Tractor Fluid Mobil Mobil Fluid 424
5	Rear axle differential case		1.3 L 1.4 U.S.qts. 1.1 Imp.qts.	KUBOTA SUPER UDT fluid * or SAE85W, SAE90 gear oil (API Service Classification :better than GL-3)
6	Rear axle gear case		0.5 L 0.5 U.S.qts. 0.4 Imp.qts.	
7	Speed control pedal shaft		Until grease overflows	SAE multipurpose type grease
	Link pivots (Left and right)			
	Seat adjuster			
	Speed change link			
	Universal joint			
	Rear wheel drive shaft (Front and rear for 4WD)			
	Knuckle arm (Left and right for 4WD)			
	Kingpin (Left and right for 2WD)			
8	Accelerator cable		Moderate amount	Oil

* KUBOTA original transmission hydraulic fluid.

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1 ENGINE

SERVICING SPECIFICATIONS

ENGINE BODY

Item		Factory Specification	Allowable Limit
Cylinder Head Surface	Flatness	—	0.05 mm 0.0020 in.
Compression Pressure (When Cranking with Starting Motor)		2.84 to 3.24 MPa 29 to 33 kgf/cm ² 412 to 469 psi	2.26 MPa 23 kgf/cm ² 327 psi
Difference among Cylinders		—	10 % or less
Top Clearance		0.55 to 0.70 mm 0.0217 to 0.0276 in.	—
Valve Clearance (When Cold)		0.18 to 0.22 mm 0.0071 to 0.0087 in.	—
Valve Seat	Width (Intake)	2.12 mm 0.0835 in.	—
	Width (Exhaust)	2.12 mm 0.0835 in.	—
Valve Seat	Angle (Intake)	1.047 rad. 60°	—
	Angle (Exhaust)	0.785 rad. 45°	—
Valve Face	Angle (Intake)	1.047 rad. 60°	—
	Angle (Exhaust)	0.785 rad. 45°	—
Valve Stem to Valve Guide	Clearance	0.035 to 0.065 mm 0.00138 to 0.00256 in.	0.10 mm 0.0039 in.
Valve Stem	O.D.	6.960 to 6.975 mm 0.27402 to 0.27461 in.	—
Valve Guide	I.D.	7.010 to 7.025 mm 0.27599 to 0.27657 in.	—
Valve Recessing	Protrusion	0.05 mm 0.0020 in.	—
	Recessing	0.15 mm 0.0059 in.	0.40 mm 0.0157 in.
Rocker Arm Shaft to Rocker Arm	Clearance	0.016 to 0.045 mm 0.00063 to 0.00177 in.	0.10 mm 0.0039 in.
Rocker Arm Shaft	O.D.	11.973 to 11.984 mm 0.47138 to 0.47181 in.	—
Rocker Arm	I.D.	12.000 to 12.018 mm 0.47244 to 0.47315 in.	—

ENGINE BODY (Continued)

Item		Factory Specification	Allowable Limit
Valve Timing (Intake Valve)	Open	0.24 rad. 14° before T.D.C.	—
	Close	0.52 rad. 30° after B.D.C.	—
Valve Timing (Exhaust Valve)	Open	0.96 rad. 55° before B.D.C.	—
	Close	0.24 rad. 14° after T.D.C.	—
Valve Spring	Free Length	37.0 to 37.5 mm 1.457 to 1.476 in.	36.5 mm 1.437 in.
	Setting Load	117.6 N 12.0 kgf 26.4 lbs	100.0 N 10.2 kgf 22.5 lbs
	Setting Length	31.0 mm 1.220 in.	—
	Tilt	—	1.0 mm 0.039 in.
Push Rod	Runout	—	0.50 mm 0.0196 in.
Tappet to Tappet Guide	Clearance	0.020 to 0.062 mm 0.00079 to 0.00244 in.	0.07 mm 0.0028 in.
Tappet	O.D.	19.959 to 19.980 mm 0.78579 to 0.78661 in.	—
Tappet Guide	I.D.	20.000 to 20.021 mm 0.78740 to 0.78823 in.	—
Idle Gear	Side Clearance	0.20 to 0.51 mm 0.0079 to 0.0201 in.	0.90 mm 0.0354 in.
Idle Gear Shaft to Idle Gear Bushing	Clearance	0.020 to 0.054 mm 0.00079 to 0.00213 in.	0.10 mm 0.0039 in.
Idle Gear Shaft	O.D.	25.967 to 25.980 mm 1.02232 to 1.02283 in.	—
Idle Gear Bushing	I.D.	26.000 to 26.021 mm 1.02362 to 1.02445 in.	—

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ENGINE BODY (Continued)

Item		Factory Specification	Allowable Limit
Timing Gear	Crank Gear to Idle Gear	Backlash 0.032 to 0.115 mm 0.00120 to 0.00453 in.	0.15 mm 0.0059 in.
	Idle Gear to Cam Gear	Backlash 0.036 to 0.114 mm 0.00142 to 0.00449 in.	0.15 mm 0.0059 in.
	Idle Gear to Injection Pump Gear	Backlash 0.034 to 0.116 mm 0.00134 to 0.00457 in.	0.15 mm 0.0059 in.
	Injection Pump Gear to Governor Gear	Backlash 0.030 to 0.117 mm 0.00118 to 0.00461 in.	0.15 mm 0.0059 in.
Camshaft	Side Clearance	0.07 to 0.22 mm 0.0028 to 0.0087 in.	0.30 mm 0.0118 in.
Camshaft	Runout	—	0.02 mm 0.0008 in.
Cam	Height (Intake)	28.80 mm 1.1339 in.	28.75 mm 1.1319 in.
	Height (Exhaust)	29.00 mm 1.1417 in.	28.95 mm 1.1398 in.
Camshaft Journal to Cylinder Block Bore	Oil Clearance	0.050 to 0.091 mm 0.00197 to 0.00358 in.	0.15 mm 0.0059 in.
Camshaft Journal	O.D.	35.934 to 35.950 mm 1.41473 to 1.41535 in.	—
Cylinder Block Bore	I.D.	36.000 to 36.025 mm 1.41732 to 1.41830 in.	—
Piston Pin Bore	I.D.	22.000 to 22.013 mm 0.86614 to 0.86665 in.	22.05 mm 0.8681 in.
Second Ring to Ring Groove	Clearance	0.085 to 0.112 mm 0.00335 to 0.00441 in.	0.20 mm 0.0079 in.
Oil Ring to Ring Groove	Clearance	0.020 to 0.055 mm 0.00079 to 0.00217 in.	0.15 mm 0.0059 in.
Top Ring and Second Ring	Ring Gap	0.30 to 0.45 mm 0.0118 to 0.0177 in.	1.25 mm 0.0492 in.
Oil Ring	Ring Gap	0.25 to 0.45 mm 0.0098 to 0.0177 in.	1.25 mm 0.0492 in.
Connecting Rod	Alignment	—	0.05 mm 0.0020 in.

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ENGINE BODY (Continued)

Item		Factory Specification	Allowable Limit
Piston Pin to Small End Bushing	Clearance	0.014 to 0.038 mm 0.00055 to 0.00150 in.	0.15 mm 0.0059 in.
Piston Pin	O.D.	22.002 to 22.011 mm 0.86622 to 0.86657 in.	—
Small End Bushing	I.D.	22.025 to 22.040 mm 0.86713 to 0.86771 in.	—
Crankshaft	Runout	—	0.04 mm 0.0016 in.
Crankshaft	Side Clearance	0.15 to 0.31 mm 0.0059 to 0.0122 in.	0.50 mm 0.0197 in.
Crankshaft Sleeve	Wear	—	0.10 mm 0.0039 in.
Crankpin to Crankpin Bearing	Oil Clearance	0.029 to 0.091 mm 0.00114 to 0.00358 in.	0.20 mm 0.0079 in.
Crankpin	O.D.	39.959 to 39.975 mm 1.57319 to 1.57382 in.	—
Crankpin Bearing	I.D.	40.004 to 40.050 mm 1.57496 to 1.57677 in.	—
Crankshaft Journal to Crankshaft Bearing 1	Oil Clearance	0.034 to 0.114 mm 0.00134 to 0.00449 in.	0.20 mm 0.0079 in.
Crankshaft Journal	O.D.	47.934 to 47.950 mm 1.88717 to 1.88779 in.	—
Crankshaft Bearing 1	I.D.	47.984 to 48.048 mm 1.88913 to 1.89165 in.	—
Crankshaft Journal to Crankshaft Bearing 2	Oil Clearance	0.034 to 0.095 mm 0.00134 to 0.00374 in.	0.20 mm 0.0079 in.
Crankshaft Journal	O.D.	47.934 to 47.950 mm 1.88716 to 1.88779 in.	—
Crankshaft Bearing 2	I.D.	47.984 to 48.029 mm 1.88913 to 1.89091 in.	—
Crankshaft Journal to Crankshaft Bearing 3	Oil Clearance	0.034 to 0.098 mm 0.00134 to 0.00386 in.	0.20 mm 0.0079 in.
Crankshaft Journal	O.D.	51.921 to 51.940 mm 2.04413 to 2.04488 in.	—
Crankshaft Bearing 3	I.D.	51.974 to 52.019 mm 2.04622 to 2.04799 in.	—

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ENGINE BODY (Continued)

Item		Factory Specification	Allowable Limit
[Standard] Cylinder	I.D.	78.000 to 78.019 mm 3.07086 to 3.07161 in.	78.169 mm 3.07751 in.
[Oversize : 0.5 mm (0.0197 in.)] Cylinder	I.D.	78.500 to 78.519 mm 3.09055 to 3.09129 in.	78.669 mm 3.09720 in.

LUBRICATING SYSTEM

Engine Oil Pressure	At Idle Speed	49 kPa or more 0.5 kgf/cm ² or more 7 psi or more	—
	At Rated Speed	196 to 441 kPa 2.0 to 4.5 kgf/cm ² 36 to 64 psi	147 kPa 1.5 kgf/cm ² 27 psi
Inner Rotor to Outer Rotor	Clearance	0.06 to 0.18 mm 0.0024 to 0.0071 in.	—
Outer Rotor to Pump Body	Clearance	0.100 to 0.180 mm 0.0039 to 0.0071 in.	—
Rotor to Cover	Clearance	0.030 to 0.085 mm 0.0012 to 0.0033 in.	—

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COOLING SYSTEM

Item		Factory Specification	Allowable Limit
Fan Belt	Tension	7 to 9 mm (0.28 to 0.35 in.) deflection at 98 N (10 kgf, 22 lbs) of force	—
Radiator	Water Leakage Test Pressure	No leaks at 137 kPa 1.4 kgf/cm ² 20 psi	—
Radiator Cap	Pressure Falling Time	10 seconds or more for pressure falling from 88 to 59 kPa from 0.9 to 0.6 kgf/cm ² from 13 to 9 psi	—
Thermostat	Valve Opening Temperature (At Beginning)	80.5 to 83.5 °C 176.9 to 182.3 °F	—
	Valve Opening Temperature (Opened Completely)	95 °C 203 °F	—

FUEL SYSTEM

Injection Pump	Injection Timing	0.30 to 0.33 rad. 17 to 19° before T.D.C.	—
Pump Element	Fuel Tightness	—	14.7 MPa 150 kgf/cm ² 2133 psi
Delivery Valve	Fuel Tightness	10 seconds or more for pressure falling from 14.7 to 13.7 MPa from 150 to 140 kgf/cm ² from 2133 to 1990 psi	5 seconds for pressure falling from 14.7 to 13.7 MPa from 150 to 140 kgf/cm ² from 2133 to 1990 psi
Injection Nozzle	Injection Pressure	13.73 to 14.71 MPa 140 to 150 kgf/cm ² 1991 to 2133 psi	—
Injection Nozzle Valve Seat	Valve Seat Tightness	When the pressure is 12.75 MPa (130 kgf/cm ² , 1849psi), the valve seat must be fuel tightness.	—

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EDITOR:

KUBOTA FARM & INDUSTRIAL MACHINERY SERVICE, LTD.

64, ISHIZU-KITAMACHI, SAKAI-KU, SAKAI-CITY, OSAKA, 590-0823, JAPAN

PHONE : (81)72-241-1129

FAX : (81)72-245-2484

E-mail : ksos-pub@kubota.co.jp
