

SECTION

C

SPECIFICATIONS FOR

K 241S AND K 301S

ENGINES

USED ON

THE

130 AND 180

GARDEN TRACTORS

K241S engine

K241S ENGINE SPECIFICATIONS

Type ----- Kohler, 1 Cylinder, 4 Stroke Cycle
Air Cooled, "L" Head Engine
Bore ----- 3.250 Inches
Stroke ----- 2.880 Inches
Piston Displacement ----- 23.9 Cubic Inches
Compression Ratio ----- 6 to 1
Max. Comp. at Cranking Speed (Engine at Operating Temperature) ----- 110 to 120 PSI at Sea Level
Crankcase Vacuum (Engine Running) --- 5 to 10 Inches Vacuum at Sea Level
Ignition ----- 12 Volt Coil, Breaker Point

CYLINDER BORE

Diameter of Cylinder Bore Std. A, B ----- 3.2505-3.2545 Inches
.010 Oversize A, B + 10 ----- 3.2605-3.2615 Inches
.020 Oversize A, B + 20 ----- 3.2705-3.2715 Inches
.030 Oversize A, B + 30 ----- 3.2805-3.2815 Inches
Cylinder Bore Must Be Bored or Honed Oversize If Taper or Out of Round Exceeds ----- .005 Inches

PISTON AND PISTON PIN

Diameter of Std. Piston at Bottom of Skirt ----- 3.2470-3.2480 Inches
Diameter of Std. Piston at Top of Skirt ----- 3.2425-3.2535 Inches
(Measured Just Below Oil Ring)
Diameter of Std. Piston at Top ----- 3.218-3.220 Inches
Piston Pin ----- Full Floating Type, Retained in Place With Two Retainer Rings.
Piston Pin Bore in Piston Std. ----- .8595-.8596 Inches
Piston Pin Diameter Std. ----- .8591-.8593 Inches
.005 Oversize ----- .8641-.8643 Inches
Piston Pin Length ----- 2.738-2.753 Inches
Piston Pin Fit in Piston (Select Fit) ----- .0000-.0003 Inches
Piston Pin Fit in Connecting Rod ----- .0003-.0008 Inches

PISTON RINGS

Rings Per Piston ----- (2 Compression-1 Oil)
1st (Top) Compression-Chrome, Taper Face. Relief Indicates Top Side
Side Clearance ----- .002-.004 Inches
Width ----- .093-.094 Inches
2nd Compression-Chrome, Relief Indicates Bottom Side
Side Clearance ----- .0015-.0035 Inches
Width ----- .093-.094 Inches
3rd Oil Ring ----- Cast W/ Expander
Side Clearance ----- .001-.003 Inches
Width ----- .1860-.1870 Inches
Ring End Gap - When Installed in Bore ----- .010-.020 Inches
Replacement Ring Width
1st. Comp. ----- .0925-.0935 Inches
2nd. Comp. ----- .0665-.0675 Inches
2nd. Comp. Rail ----- .0235-.0245 Inches
3rd. Oil Rail ----- .0235-.0245 Inches
3rd Oil Ring ----- .134-.135 Inches

CONNECTING ROD

Connecting Rod Length from Center of Pin Hole To Center of Bearing Journal ----- 5.560-5.562 Inches
Piston Pin Hole Diameter in Rod ----- .8596-.8599 Inches
Inside Diameter of Rod Journal, Std. ----- 1.5005-1.5010 Inches
Undersize ----- 1.4905-1.4910 Inches
Connecting Rod to Crank Journal Clearance ----- .0005-.0015 Inches
Connecting Rod to Crank End Play Clearance ----- .007-.016 Inches

CRANKSHAFT AND BEARINGS

Type Main Bearings ----- Ball Bearings
Crankshaft Rod Journal ----- 1.4995-1.5000 Inches

Crankshaft Rod Journal Width ----- 1.079-1.084 Inches
Crankshaft End Play ----- .003-.020 Inches
Measured at Bearing Plate and Shim to Proper End Play

CAMSHAFT

Camshaft End Play ----- .005-.010 Inches
Camshaft Pin Diameter ----- .4980-.4985 Inches
Camshaft Inside Diameter ----- .4995-.5015 Inches
Camshaft Pin to Camshaft Clearance ----- .001-.0035 Inches
Camshaft Pin to Breaker Cam Clearance ----- .001-.0025 Inches

VALVE LIFTERS

Valve Lifter Outside Diameter in Block ----- .6232-.6237 Inches
Valve Lifter Bore in Block ----- .6245-.6255 Inches
Valve Lifter to Block Clearance ----- .0008-.0023 Inches

VALVES

Intake Valve Tappet Clearance (Cold) ----- .008-.010 Inches
Exhaust Valve Tappet Clearance (Cold) ----- .017-.020 Inches
Angle of Valve Face - Intake and Exhaust ----- 44 Degrees
Valve Length - Intake and Exhaust ----- 4.572-4.582 Inches
Max. Valve Face Runout - Intake ----- .0015 Inches
Max. Valve Face Runout - Exhaust ----- .003 Inches
Valve Head Diameter - Intake ----- 1.370-1.380 Inches
Valve Head Diameter - Exhaust ----- 1.120-1.130 Inches
Valve Stem Diameter - Intake ----- .3105-.3110 Inches
Valve Stem Diameter - Exhaust ----- .3090-.3095 Inches
Intake Valve Stem to Guide Clearance ----- .001-.0025 Inches
Exhaust Valve Stem to Guide Clearance ----- .0025-.004 Inches

VALVE SEATS

Seat Angle - Intake and Exhaust ----- 45 Degrees
Max. Seat Runout - Intake and Exhaust ----- .002 Inches
Seat Width - Intake ----- .037-.045 Inches
Seat Width - Exhaust ----- .031-.062 Inches
Exhaust Seat Insert ----- Replaceable
Outside Diameter of Exhaust Insert ----- 1.2535-1.2545 Inches
Exhaust Insert Height ----- .219-.221 Inches

VALVE GUIDES

Valve Guide Length ----- 2.125 Inches
Valve Guide Outside Diameter ----- .6260-.6265 Inches
Valve Guide to Block (Press Fit) ----- .0005-.002 Inches
Valve Guide Inside Diameter - Before Installing ----- .307-.308 Inches
Ream Valve Guides After Installing to ----- .312-.313 Inches

VALVE SPRINGS

Spring Free Length ----- 1.793 Inches
Spring Pressure When Comp. to 1.469 In. (Valve Closed) --- 27 to 31 Lbs.
Spring Pressure When Comp. to 1.165 In. (Valve Open) --- 54 to 62 lbs.

GOVERNOR

Governor Stub Shaft Outside Diameter ----- .3735-.3740 Inches
Governor Gear Bore for Stub Shaft ----- .3745-.3755 Inches
Stub Shaft to Governor Gear Clearance ----- .0005-.002 Inches
Governor Spring Free Length With 2 Lbs. Pre-Load ----- 2.62 Inches
Governor Spring Extended to 2.88 Inches ----- 5.5 to 6.5 Pounds

K301S ENGINE SPECIFICATIONS

Type ----- Kohler, 1 Cylinder, 4 Stroke Cycle,
Air Cooled, "L" Head Engine
Bore ----- 3.380 Inches
Stroke ----- 3.250 Inches
Piston Displacement ----- 29.07 Cubic Inches
Compression Ratio ----- 6 to 1
Max. Comp. at Cranking Speed
(Engine at Operating Temperature) ----- 110 to 120 PSI at Sea Level
Crankcase Vacuum(Engine Running)--- 5 to 10 Inches Vacuum at Sea Level
Ignition ----- 12 Volt Coil, Breaker Points

CYLINDER BORE

Diameter of Cylinder Bore Std. A, B----- 3.3745-3.3785 Inches
.010 Oversize A, B + 10 ----- 3.3845-3.3855 Inches
.020 Oversize A, B + 20 ----- 3.3945-3.3955 Inches
.030 Oversize A, B + 30 ----- 3.4045-3.4055 Inches
Cylinder Bore Must Be Bored or Honed Oversize If Taper or Out of Round
Exceeds ----- .005 Inches

PISTON AND PISTON PIN

Diameter of Std. Piston at Top ----- 3.356-3.360 Inches
Diameter of Std. Piston at Top of Skirt
(Measured Just Below Oil Ring) ----- 3.369-3.370 Inches
Diameter of Std. Piston at Bottom of Skirt ----- 3.371-3.372 Inches
Piston Pin ----- Full Floating Type Retained In
Place With Two Retainer Rings.
Piston Pin Bore In Piston, Std. ----- .8752-.8754 Inches
Piston Pin Diameter Std. ----- .8752-.8754 Inches
.005 Oversize ----- .8802-.8804 Inches
Piston Pin Length ----- 2.735-2.750 Inches
Piston Pin Fit In Piston ----- One Thumb Push Fit
Piston Pin Fit In Connecting Rod ----- .0003-.0008 Inches

PISTON RINGS

Rings Per Piston ----- (2 Compression-1 Oil)
1st(Top)Compression-Chrome, Tapered Face. Relief Indicates Top Side.
Side Clearance ----- .002-.004 Inches
Width ----- .078 Inches
2nd - Compression ----- Chrome, Relief Indicates Bottom Side
Side Clearance ----- .002-.004 Inches
Width ----- .078 Inches
3rd - Oil Ring ----- Cast W/Expander
Side Clearance ----- .001-.003 Inches
Width ----- .1870 Inches
Ring End Gap When Installed In Bore ----- .010-.020 Inches
Replacement Ring Width
1st Comp. ----- .077-.078 Inches
2nd Comp. ----- .077-.078 Inches
3rd Oil Rail ----- .0235-.0245 Inches
3rd Oil Ring ----- .134-.135 Inches

CONNECTING ROD

Connecting Rod Length From Center of Pin Hole
To Center of Bearing Journal ----- 5.295-5.297 Inches
Piston Pin Hole Diameter In Rod ----- .8757-.8760 Inches
Inside Diameter of Rod Journal, Std. ----- 1.5005-1.5010 Inches
Undersize ----- 1.4905-1.4910 Inches
Connecting Rod To Crank Journal Clearance ----- .0005-.0015
Connecting Rod To Crank End Play Clearance ----- .007-.016 Inches

CRANKSHAFT AND BEARINGS

Type Main Bearings ----- Ball Bearings
Crankshaft Rod Journal ----- 1.4995-1.5000 Inches
Crankshaft Rod Journal Width ----- 1.079-1.084 Inches
Crankshaft End Play ----- .003-.020 Inches
Measured at Bearing Plate and Shim to Proper End Play.

CAMSHAFT

Camshaft End Play ----- .005-.010 Inches

Camshaft Pin Diameter ----- .4980-.4985 Inches
Camshaft Inside Diameter ----- .4995-.5015 Inches
Camshaft Pin to Camshaft Clearance ----- .001-.0035 Inches
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VALVE LIFTERS

Valve Lifter Outside Diameter In Block ----- .6232-.6237 Inches
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Valve Lifter To Block Clearance ----- .008-.0023 Inches

VALVES

Intake Valve Tappet Clearance (Cold) ----- .008-.010 Inches
Exhaust Valve Tappet Clearance (Cold) ----- .017-.020 Inches
Angle of Valve Face - Intake and Exhaust ----- 44 Degrees
Valve Length - Intake and Exhaust ----- 4.572-4.582 Inches
Max. Valve Face Runout - Intake ----- .0015 Inches
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Valve Head Diameter - Intake ----- 1.370-1.380 Inches
Valve Head Diameter - Exhaust ----- 1.120-1.130 Inches
Valve Stem Diameter - Intake ----- .3105-.3110 Inches
Valve Stem Diameter - Exhaust ----- .3090-.3095 Inches
Intake Valve Stem to Guide Clearance ----- .001-.0025 Inches
Exhaust Valve Stem to Guide Clearance ----- .0025-.004 Inches

VALVE SEATS

Seat Angle - Intake and Exhaust ----- 45 Degrees
Max. Seat Runout Intake and Exhaust ----- .002 Inches
Seat Width - Intake ----- .037-.045 Inches
Seat Width - Exhaust ----- .031-.062 Inches
Exhaust Seat Insert ----- Replaceable
Outside Diameter of Exhaust Insert ----- 1.2535-1.2545 Inches
Exhaust Insert Height ----- .219-.221 Inches

VALVE GUIDES

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VALVE SPRINGS

Spring Free Length ----- 1.793 Inches
Spring Pressure When Comp. to 1.469 In. (Valve Closed) - 27 to 31 Lbs.
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Governor Spring Extended to 2.88 Inches ----- 5.5 to 6.5 Inches

GENERAL TORQUE SPECIFICATION TABLE (Revised 5-64)

USE THE FOLLOWING TORQUES WHEN SPECIAL TORQUES ARE NOT GIVEN

NOTE: These values apply to fasteners as received from supplier, dry, or when lubricated with normal engine oil. They do not apply if special graphited or moly-disulphide greases or other extreme pressure lubricants are used. This applies to both UNF and UNC threads.

SAE Grade No.	5		8 *	
Bolt head identification marks as per grade Note: Manufacturing Marks Will Vary				
	Torque Foot Pounds		Torque Foot Pounds	
Bolt Size	Min.	Max.	Min.	Max.
1/4"	9	11	12	15
5/16	15	18	24	28
3/8	35	40	45	50
7/16	54	60	70	80
1/2	80	90	110	125
9/16	110	120	160	180
5/8	150	165	220	240
3/4	260	280	380	420
7/8	360	400	600	660
1"	540	600	900	1000
1-1/8	720	800	1280	1440
1-1/4	1000	1100	1800	2000
1-3/8	1460	1680	2380	2720
1-1/2	1940	2200	3160	3560

* Thick nuts must be used with Grade 8 bolts

GENERAL ENGINE TORQUE SPECIFICATION TABLE

Thread Size	Torque Inch Pounds		Torque Foot Pounds	
	UNC	UNF	UNC	UNF
Bolt Size				
1/4"	70	85		
5/16	150	165		
3/8			22	25
7/16			35	45
1/2			50	70

SPECIAL ENGINE TORQUE SPECIFICATIONS

- Cylinder Head Bolts* ----- Torque to 280 Inch Lbs., Loosen, Retorque to 300 Inch Lbs.
- Connecting Rod Bolt* ----- Torque to 300 Inch Lbs.
- Flywheel Nut ----- Torque to 100 Ft. Lbs.
- Spark Plug ----- Torque to 27 Ft. Lbs.

*Lubricate With Grease Upon Assembly