

SECTION 1

SAFETY AND GENERAL INFORMATION

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Oil Filter

Some engines are equipped with an oil filter. Replace the oil filter every other oil change, in accordance with the "Oil Change Intervals" table. Always use a genuine Kohler replacement oil filter.

Refer to the "Periodic Maintenance" Section for detailed oil checking and changing procedures.

FUEL RECOMMENDATIONS



WARNING: Explosive Fuels!

Gasoline is extremely flammable, and its vapors can explode if ignited. Store gasoline only in approved containers, in well-ventilated, unoccupied buildings, away from sparks or flames. Do not fill fuel tank while the engine is hot or running since spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Do not start engine near spilled fuel; wipe up spills immediately. Never use gasoline as a cleaning agent.

General Recommendations

Purchase gasoline in small quantities and store in clean, approved containers. A container with a capacity of 2 gallons or less with a pouring spout is recommended. Such a container is easier to handle and helps eliminate spillage during refueling.

Do not overfill the fuel tank. Leave room for the fuel to expand.

Do not use gasoline left over from the previous season, to minimize gum deposits in your fuel system and to insure easy starting.

Do not add oil to the gasoline.

Fuel Type

For best results, use only clean, fresh, unleaded gasoline with a pump sticker octane rating of 87 or higher. In countries using the Research method, it should be 90 octane minimum.

Unleaded gasoline is recommended, as it leaves less combustion chamber deposits. Leaded gasoline may be used in areas where unleaded is not available and exhaust emissions are not regulated. Be aware however, that the cylinder head will require more frequent service.

Gasoline/Alcohol blends

Gasohol (up to 10% ethyl alcohol, 90% unleaded gasoline by volume) is approved as a fuel for Kohler engines. Other gasoline/alcohol blends are not approved.

Gasoline/Ether blends

Methyl Tertiary Butyl Ether (MTBE) and unleaded gasoline blends (up to maximum of 15% MTBE by volume) are approved as a fuel for Kohler engines. Other gasoline/ether blends are not approved.

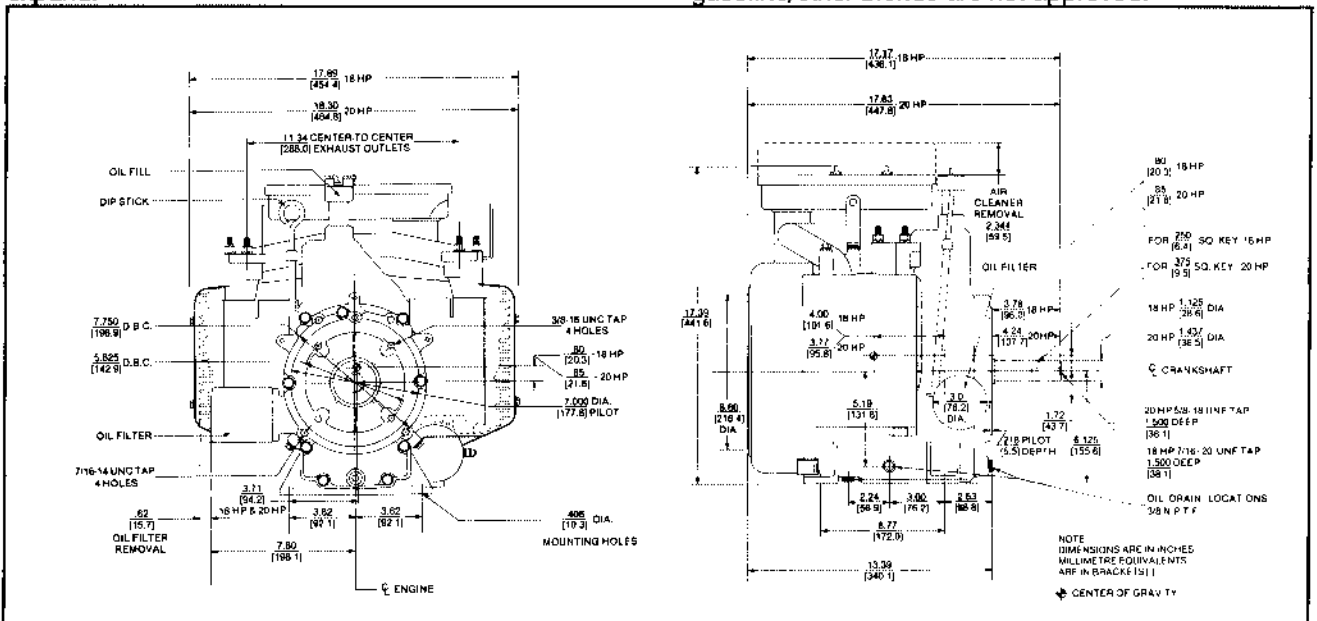


Figure 1-3. Overall Dimensions--Model M18 and M20.

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SPECIFICATIONS, TOLERANCES, AND SPECIAL TORQUE VALUES²

DESCRIPTION	Model	Model
	M18	M20
General Specifications		
Horsepower (@ 3,600 RPM)	18	20
Displacement (cu. in.)	42.18	46.98
Bore	3.12	3.12
Stroke	2.75	3.06
Compression Ratio	6.0:1	6.6:1
Approx. Weight (lb.)	130	130
Approx. Oil Capacity* (U.S. Quarts)	1.5	1.5

* For best results, fill to "F" mark on dipstick as opposed to adding a given quantity of oil. Always check level on dipstick before adding more oil. On engines equipped with oil filter, an additional 1/2 U.S. pint of oil is required when oil filter is replaced.

Angle of Operation – Maximum (At Full Oil Level; Intermittent Operation)

Carb. Side Up	#1 Cyl. Up 35°	#1 Cyl. Up 35°
Carb. Side Down	#1 Cyl. Down 35°	#1 Cyl. Down 35°
Flywheel End Up	30°	30°
Flywheel End Down	30°	30°

Camshaft

End Play .....	.003/.013	.003/.013
Camshaft to Camshaft Bearing		
Running Clearance0010/.0025	.0010/.0025

Carburetor

Preliminary Main Fuel

Screw Setting (Turns)	2-1/2	2-1/2
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Preliminary Idle Fuel

Screw Setting (Turns)	1	1
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Float Level	11/64 (+ or - 1/32)	11/64 (+ or - 1/32)
Float Drop	1-1/32	1-1/32
Fuel Inlet Seat Torque (in. lb.)	35	35
Bowl Retaining Screw Torque (in. lb.)	50	50
Float to Float Pin Tower Clearance010	.010

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	Model M18	Model M20
Connecting Rod (Posi-Lock)		
New Service Rod Nut Torque (in. lb.) ^{4,6}	140	140
Used Rod Nut Torque (in. lb.) ^{4,6}	100	100
Rod to Crankpin Running Clearance – New .....	.0012/.0024	.0012/.0024
Rod to Crankpin Max. Wear Limit .....	.0029	.0029
Rod to Piston Pin Running Clearance – New .....	.0006/.0011	.0006/.0011
Rod to Side Play on Crankpin .....	.005/.016	.005/.016
Crankcase/Cylinder Barrel		
Intake and Exhaust Manifold Fastener		
Torque (in. lb.)	150	150
Closure Plate Fastener Torque (in. lb.) ⁷	150	150
Closure Plate Oil Gallery Pipe Plug		
Torque (in. lb.)	65/80	65/80
Cylinder Barrel Nut Torque (in. lb.) ⁷	200	200
Crankcase Nut Torque (in. lb.) ⁷	260	260
5/16" Crankcase Screw Torque (in. lb.) ⁷	200	200
3/8" Crankcase Screw Torque (in. lb.) ⁷	260	260
Crankshaft		
Crankshaft End Play .....	.002/.014	.002/.014
Main Bearing Surface Max. Wear Limit	1.7407	1.7407
Sleeve Bearing Max. Out of Round .....	.0005	.0005
Sleeve Bearing Max. Taper .....	.001	.001
New Sleeve Bearing Max. Running Clearance .....	.0049	.0049
Sleeve Bearing Running Clearance Max. Wear Limit .....	.0059	.0059
New Sleeve Bearing I.D. (installed)	1.7439/1.7461	1.7439/1.7461
Crankpin O.D. – New	1.3733/1.3738	1.4993/1.4998
Crankpin O.D. Max. Wear Limit	1.3728	1.4988
Crankpin O.D. Max. Out of Round0005	.0005
Crankpin O.D. Max. Taper001	.001

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	Model M18	Model M20
Cylinder Bore		
I.D. – New	3.1245/3.1255	3.1245/3.1255
I.D. Max. Wear Limit	3.128	3.128
I.D. Max. Out of Round .....	.002	.002
I.D. Max. Taper .....	.0015	.0015
Cylinder Head		
Cap Screw Torque (ft. lb.) ⁴	15/20	15/20
Max. Out of Flatness .....	.003	.003
Fan/Flywheel		
Fan Fastener Torque (in. lb.)	115	115
Flywheel Fastener Torque (ft. lb.) ⁴	40	40
Fuel Pump		
Mounting Screw Torque (in. lb.)	40/45	40/45
Ignition		
Ignition Module to Magnet Air Gap .....	.008/.012	.008/.012
Spark Plug Type (Champion® or Equiv.)	RV17YC	RV17YC
Spark Plug Gap	0.035	0.035
Spark Plug Torque (ft. lb.)	10/15	10/15
Oil Fill/Oil Filter¹⁰		
#52 173 01 Oil Fill Cap Torque (in. lb.)	30/45	30/45
Engine Mtd. Filter Adapter Fastener Torque (in. lb.)	125	125
Remote Oil Filter Cover Fastener Torque (in. lb.)	125	125
Remote Oil Line Fitting Nut Torque (in. lb.)	65/80	65/80
Remote Oil Line Reducing Connector Torque (in. lb.)	65/80	65/80
Remote Oil Line Flare Nut Torque (in. lb.)	100/120	100/120
Remote Oil Filter Adapter Fitting Torque (in. lb.)	90/130	90/130
Oil Filter Installation Torque (in. lb.)	50/80	50/80
Oil Filter Bypass Cover Fastener Torque (in. lb.)	125	125
Oil Pump		
Pump Shaft to Crankcase Running Clearance0010/.0026	.0010/.0026
Pump Drive Gear End Play010/.029	.010/.029

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	Model M18	Model M20
Piston and Piston Rings (Style "D" Pistons)		
Thrust Face O.D. @ D1 – New ⁹	3.1203/3.1210	3.1208/3.1215
Thrust Face O.D. @ D1 – Max. Wear Limit ⁹	3.1181	3.1186
Thrust Face to Bore Clearance @ D1 – New ⁹ .....	.0035/.0052	.0030/.0047
Piston Ring End Gap – New ⁸ .....	.010/.023	.010/.023
Piston Ring End Gap – Used (Max.) ⁸ .....	.032	.032
Piston Ring Side Clearance – Max. ....	.006	.006
Piston Pin O.D. – New .....	.6247/.6249	.7499/.7501
Valves and Tappets		
Intake Valve to Tappet Clearance – Cold .....	.003/.006	.003/.006
Exhaust Valve to Tappet Clearance – Cold		
(Serial No. 1816500646 and earlier) .....	.016/.019	.016/.019
(Serial No. 1816500656 and later) .....	.011/.014	.011/.014
Intake Valve Minimum Lift – Zero Lash .....	.274	.274
Exhaust Valve Minimum Lift – Zero Lash .....	.274	.274
Intake Valve Minimum Stem O.D. ....	.3103	.3103
Exhaust Valve Minimum Stem O.D. ....	.3088	.3088
Nominal Valve Seat Angle		
(Serial No. 1816500646 and earlier)	45°	45°
(Serial No. 1816500656 and later)	30°	30°
Valve Guide Reamer Size .....	.3125	.3125
Intake Valve Guide I.D. Max. Wear Limit005	.005
Exhaust Valve Guide I.D. Max. Wear Limit007	.007

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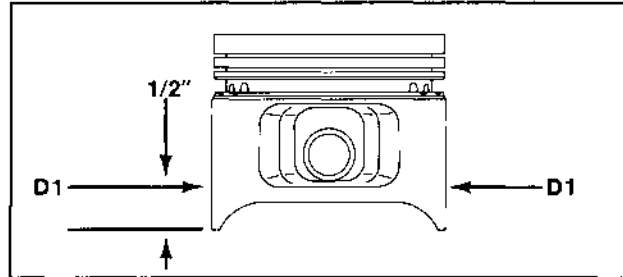
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NOTES:

1. Use standard torque values when specific values are not given. Standard values have a tolerance of (+ or -) 20%.
2. All dimensions are in inches unless otherwise specified.
3. Also applies to self-tapping screws.
4. Lubricate with oil at assembly.
5. 3/8-16 thread with hex. head nut and fiber gasket.
6. Torque in increments to the value specified. Do not overtorque—do not loosen and retorqued hex. nuts on Posi-Lock connecting rods.
7. Refer to the "Reassembly" Section for instructions and tightening sequence.

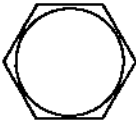


8. Top and center compression rings.

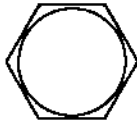
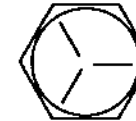

9. Measurements @ D1 on Style D pistons are made perpendicular to piston pin in the position shown.



10. Refer to the "Lubrication System" Section for additional information.

STANDARD TORQUE VALUES¹

Bolts, Screws, Nuts and Fasteners Assembled Into Cast Iron or Steel			
			
Size	Grade 2	Grade 5 ³	Grade 8
#8-32	20 in. lb.	25 in. lb.	---
#10-24	32 in. lb.	40 in. lb.	---
#10-32	32 in. lb.	40 in. lb.	---
1/4-20	70 in. lb.	115 in. lb.	165 in. lb.
1/4-28	85 in. lb.	140 in. lb.	200 in. lb.
5/16-18	150 in. lb.	250 in. lb.	350 in. lb.
5/16-24	165 in. lb.	270 in. lb.	30 ft. lb.
3/8-16	260 in. lb.	35 ft. lb.	50 ft. lb.
3/8-24	300 in. lb.	40 ft. lb.	60 ft. lb.
7/16-14	35 ft. lb.	55 ft. lb.	80 ft. lb.
7/16-20	45 ft. lb.	75 ft. lb.	105 ft. lb.
1/2-13	50 ft. lb.	80 ft. lb.	115 ft. lb.
1/2-20	70 ft. lb.	105 ft. lb.	165 ft. lb.
9/16-12	75 ft. lb.	125 ft. lb.	175 ft. lb.
9/16-18	100 ft. lb.	165 ft. lb.	230 ft. lb.
5/8-11	110 ft. lb.	180 ft. lb.	260 ft. lb.
5/8-18	140 ft. lb.	230 ft. lb.	330 ft. lb.
3/4-10	150 ft. lb.	245 ft. lb.	350 ft. lb.
3/4-16	200 ft. lb.	325 ft. lb.	470 ft. lb.

Bolts, Screws, Nuts and Fasteners Assembled Into Aluminum			
			
Size	Grade 2	Grade 5	Grade 8
#8-32	20 in. lb.	20 in. lb.	20 in. lb.
#10-24	32 in. lb.	32 in. lb.	32 in. lb.
1/4-20	70 in. lb.	70 in. lb.	70 in. lb.
5/16-18	150 in. lb.	150 in. lb.	150 in. lb.

Oil Drain Plugs⁴

Size	Into Cast Iron Pans	Into Aluminum Pans
1/4"	150 in. lb.	100 in. lb.
3/8"	180 in. lb.	120 in. lb.
1/2"	20 ft. lb.	13 ft. lb.
3/4"	25 ft. lb.	16 ft. lb.
X-708-1 ⁵	20/25 ft. lb.	20/25 ft. lb.

Conversions

ft. lb. = in. lb. x 0.083
 in. lb. = ft. lb. x 12
 kgm = ft. lb. x 0.1383
 N•m = ft. lb. x 1.3558