KOHLER TWO-CYCLE

ONE CYLINDER MODELS

KOHLER COMPANY
Kohler, Wisc. 53044

CONDENSED SERVICE DATA

Engine Model	K-295-1	K295-1T	K309-1	K335-1
Bore—(mm)	75	75	75	75
Inches	2.95	2.95	2.95	2.95
Stroke—(mm)	66.5	66.5	70	76
Inches	2.62	2.62	2.75	2.99
No. of Cylinders	1	1	1	1
Displacement—(cc)	294	294	309	335
Cubic Inches	18.0	18.0	18.9	20.5
Horsepower @ RPM	18 @ 5500	20 @ 6000	20 @ 5500	23 @ 5500
Cooling Type	Centrifugal Fan			
Carburetor Model	HR	HR or WR	HR	BDC
Number Used	1	1	1	1
Ignition:				
Type	BOSCH Magneto			
Point Gap—(mm)	....	....	....	....
Inch	0.014-0.018			
Timing Advance?	yes			
Timing BTDC (mm)	2.4-2.6	2.4-2.6	3.0	2.4-2.6
Inch	0.095-0.100	0.095-0.100	0.118	0.095-0.100
Degrees	Timing Marks			
Measured at	Advanced cam			
Spark Plug:				
Bosch	M225T1	M225T1	M225T1	M225T1
Champion	K7	K7	K7	K7
Electrode Gap (mm)	0.5	0.5	0.5	0.5
Inch	0.020	0.020	0.020	0.020
Fuel/Oil Ratio	20:1	20:1	20:1	20:1

MAINTENANCE

CARBURETOR. TILLOTSON diaphragm type carburetors are used on most models. Refer to Tillotson Carburetor Section for operation and overhaul information. An external impulse line is used to operate the fuel pump. Be sure all passages are open and that vacuum and pressure leaks are eliminated. Walbro BDC diaphragm type carburetors are used on some later engines.

NOTE: On some K335-1 models equipped with Walbro carburetors, a plastic insulator was used between carburetor and manifold which may melt when subjected to high temperatures. Remove insulator and install later insulator with part no. 37 168 01 and gasket no. 37 055 02. Both insulators are white but heat sensitive insulator has a metal plug as shown in Fig. 1.

IGNITION AND TIMING. Breaker point gap should be 0.016 in. Engines are equipped with a centrifugal timing advance which provides retarded timing for starting only. Advance timing position is marked by a chipped fan blade and an aligment mark on fan housing. Hold flyweight in advanced position as shown in Fig. 2, when checking ignition timing.

Refer to MAGNETO SERVICE Section of ENGINE SERVICE FUNDAMENTALS for overhaul data and service procedures.

LUBRICATION. The engine is lubricated by mixing oil with the fuel. The manufacturer recommends the use of Regular or Premium gasoline (92 octane) and SAE 40 (Diluted) 2-cycle (air cooled) engine oil mixed at a ratio of 20:1.

Mix fuel and oil thoroughly using a separate container before pouring mixture into fuel tank. For cold weather blending, pre-mix the oil with a small amount of gasoline and shake thoroughly until mixture is liquid, then blend with remainder of fuel. Do not use kerosene or fuel oil for premixing.

REPAIRS

TIGHTENING TORQUES. Recommended tightening torques are as follows: (All values are given in ft.-lbs.).

Cylinder head bolts	32
Crankcase screws (nuts), 8mm	18
Crankcase screws (nuts) 10 mm	32
Intake manifold	18
Cylinder nuts	32
Flywheel	90
Spark plug	25

NOTE: To determine type of threads used on engine, refer to engine specification number. If number has six digits, threads are U.S. standard. If specification number has seven digits, refer to suffix of two numbers. Numbers from 01 to 05 indicate metric threads while numbers from 06 to 20 indicate U.S. standard threads.

DISASSEMBLY AND REASSEMBLY. Refer to Figs. 3 and 4 for

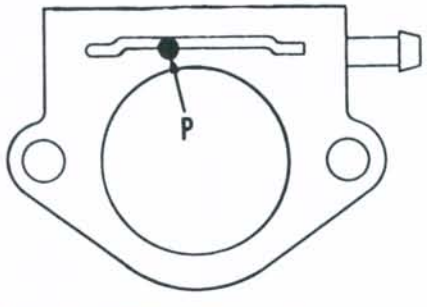


Fig. 1–Heat sensitive insulator is identified by presence of metal plug (P) which is absent and hole is filled on later insulators.

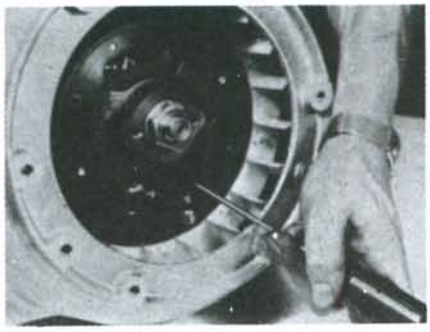


Fig. 2–Breaker cam must be held in advanced position when checking timing.

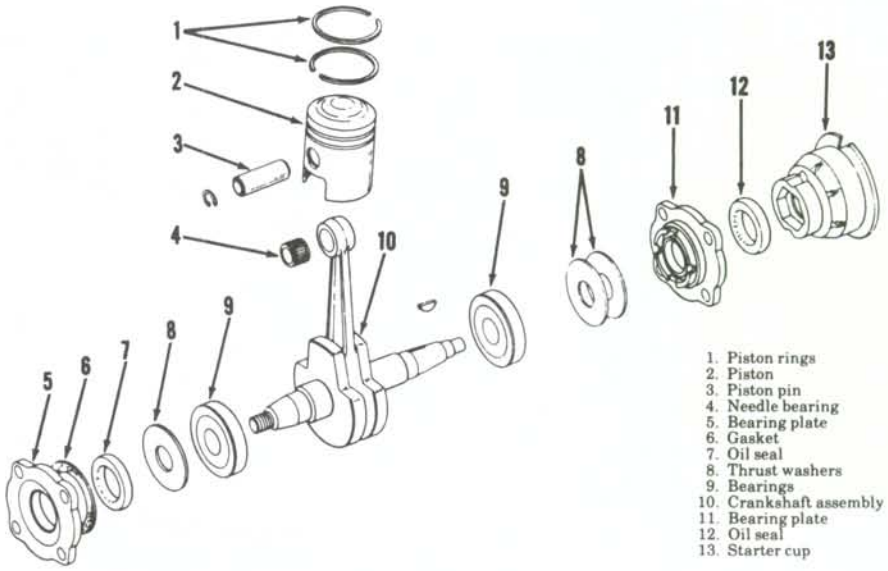
exploded views of engines. With engine removed from machine, remove carburetor, manifolds, drive sheave, starter, air shroud and flywheel.

Mark cylinder heads with relation to cylinders and note that intake manifold ports in cylinder blocks are on same side of engine as pulse passage fitting in crankcase.

When reassembling engines, crankshaft end play should be 0.006-0.012 (in.). End play is controlled by thrust washers (8—Fig. 4). Thrust washers are all 0.006 in. thickness. Refer to Fig. 8 for tightening sequence of crankcase screws.

PISTONS, RINGS AND CYLINDERS. Cylinder heads can be installed in any position. Head should be marked before removal and when reinstalling, note that fins run in direction of air flow on single cylinder models. Refer to Fig. 5. Piston pin is a floating fit in piston bosses and retained by snap rings.

Top piston ring is Moly-Coated and darker in appearance than bottom ring. Piston ring end gap should be 0.012-0.016 (in.). Piston ring side clearance should be 0.0035-0.0048 in. for top ring and 0.003-0.004 in. for bottom ring. Piston rings are pinned in place in piston grooves. Pistons are marked "EHC" on top of piston crown. Marking must be installed toward exhaust port side of cylinder. Pistons and rings are available in oversizes of 0.010, 0.020 and 0.040 (in.).



1. Piston rings
2. Piston
3. Piston pin
4. Needle bearing
5. Bearing plate
6. Gasket
7. Oil seal
8. Thrust washers
9. Bearings
10. Crankshaft assembly
11. Bearing plate
12. Oil seal
13. Starter cup

Fig. 4–Exploded view of crankshaft, piston and associated parts used on single cylinder models.

CRANKSHAFT AND CONNECTING ROD ASSEMBLY. The crankshaft and connecting rod are available only as a complete unit and should not be disassembled.

Check for wear of the connecting rod big end by measuring the play at the connecting rod small end. Move the small end laterally as shown in Fig. 7. Small end play should be 0.006-0.016 in. Renew crankshaft assembly if play is excessive.

Bearings (9—Fig. 4) are a press fit on their shafts and will not normally need to be removed unless renewal is indicated. If bearings must be removed, support the shaft behind counterweight as shown in Fig. 6 when reinstalling.

Whenever crankshaft assembly has been removed, check for runout before installation. Runout should not exceed

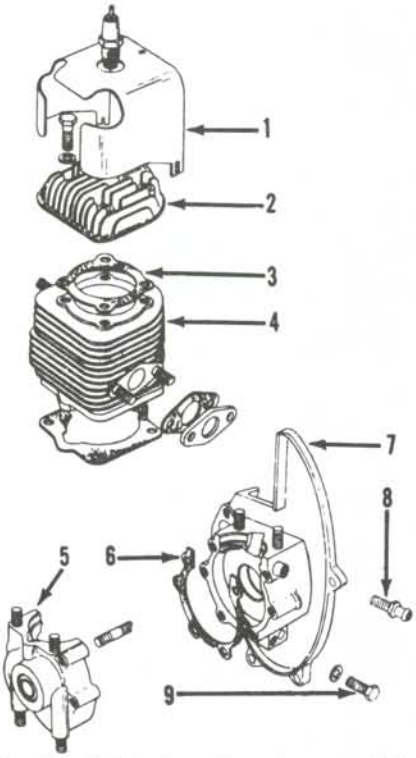


Fig. 3–Exploded view of crankcase, cylinder and associated parts on single cylinder models.

1. Shroud
2. Cylinder head
3. Gasket
4. Cylinder
5. Crankcase half
6. Gasket
7. Crankcase half
8. Pulse passage fitting
9. Plug

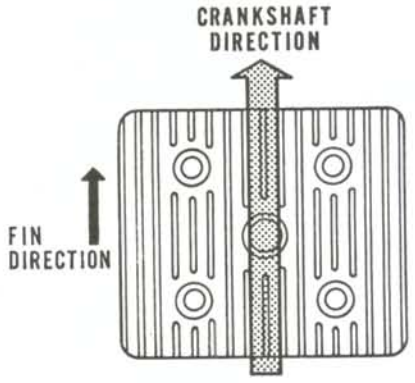


Fig. 5–Cylinder head fins are installed parallel with crankshaft on single cylinder models.

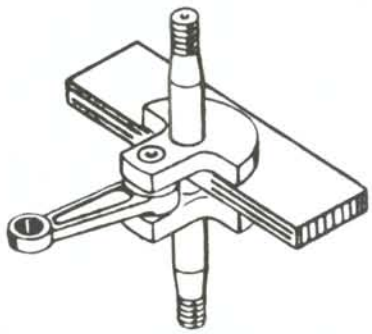


Fig. 6–Support crankshaft behind counterweight when pressing on bearings.

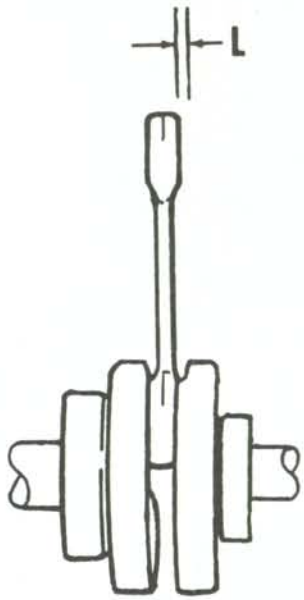


Fig. 7–Axial play of connecting rod is determined by moving connecting rod small end laterally. Axial play (L) should be 0.006-0.016 in.

0.001 (in.). If runout is excessive and remainder of unit is reusable, the unit may be straightened by a machine shop, motorcycle engine rebuilder or others experienced with this type of construction. If bearings, shafts or connecting rods are unserviceable, renew the complete unit.

RECOIL STARTER. Refer to Fig. 9 for exploded view of starter. To disassemble starter, remove from engine. Pull rope handle and tie a temporary knot in rope. Remove rope handle, untie temporary knot and allow rope to slowly wind on pulley until recoil spring tension is released. Remove retaining screw (1) and components (2 thru 8). Remove pulley (9) being careful to disengage recoil spring (13) before withdrawing pulley. If necessary to remove spring (13), remove carefully to prevent personal injury.

To assemble starter, insert recoil spring on lug (L—Fig. 10) of cover and wind in a counterclockwise direction. If rope was removed from pulley, install rope on pulley so that washer (W—Fig. 11) fits between knot and pulley. Position pulley on spring and cover so that knotted end of rope is up. Insert a piece of stiff wire or a nail through hole in pulley to guide inner end of spring onto pulley hub so pulley will drop in place. Install remainder of components. Tighten retaining screw to 50 in.-lbs. This will create a slight drag causing dogs to move readily into engaged position. If retaining screw is loose, dogs may not fully engage resulting in damage to teeth in starting cup.

If rope has a tendency to come off pulley during operation, Kohler Starter Repair Kit No. 33 757 01 is available which includes a flange attached to starter cover that guides rope into pulley.

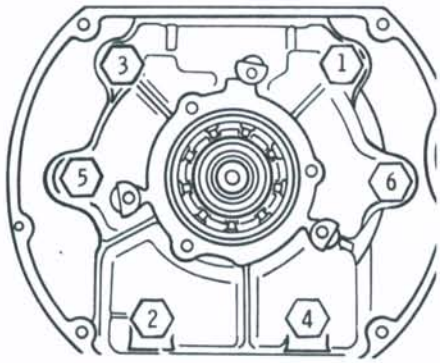


Fig. 8–View of tightening sequence for crankcase screws. Tighten to 16 ft-lbs.

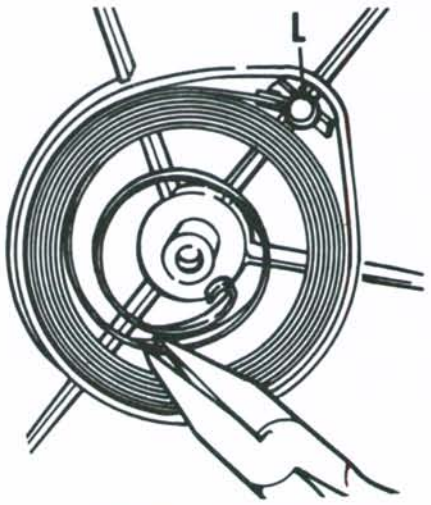


Fig. 10–Install recoil spring in outer cover so that outer end of spring is around lug (L) of cover. Wind spring in counterclockwise direction.

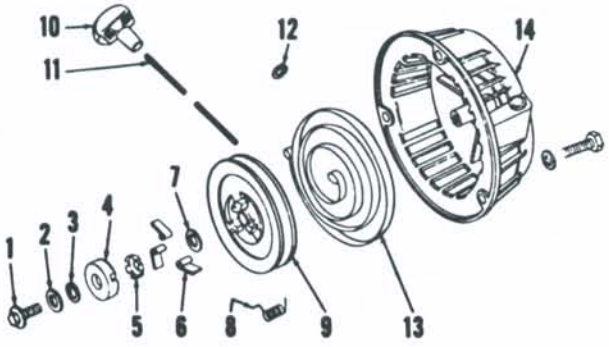


Fig. 9–Exploded view of recoil starter used on Kohler two cycle engines.

1. Retaining screw
2. Washers
3. Washers
4. Retainer
5. Brake spring
6. Dogs
7. Washer
8. Dog spring
9. Pulley
10. Handle
11. Rope
12. Washer
13. Recoil spring
14. Cover

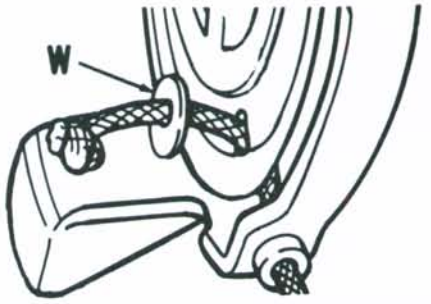


Fig. 11–Install rope on pulley so that washer (W) is between rope knot and pulley.