



Small 4-cycle engines operate on the same principles as other 4-cycle engines such as those found in automobiles and light trucks. These engines fire every other stroke, and have valves, camshafts and oil in the crankcase. They typically are air-cooled, which keeps cost, maintenance and weight to a minimum. This type engine operates at low RPM's, makes excellent torque, is quiet, and is capable of long dependable service if maintained properly. Four-cycle engines are the overwhelming choice of OEM's manufacturing lawn mowing equipment of all types of engine powered equipment such as pumps, welding machines and generators.

Entry level engines typically are L Head (side valve) designs, have no cylinder liners, and use splash crankcase lubrication. All these features invite oil consumption, especially when compared to upscale models which may have full pressure lubrication, spin on oil filters, external oil coolers, overhead valves, cast iron liners, hydraulic lifters or even overhead cams in one line from Kohler.

The dominant manufacturers of small engines are Briggs & Stratton (air and water cooled models from 3-25 HP), Tecumseh Products Company (air cooled only in 3 to 24 HP), Kohler Co. (air cooled only in 6 HP to 25 HP), American Honda (air and water cooled 2.5 to 24 HP) and Kawasaki Motor Company (air and water cooled up to 22 HP). Smaller makers include Robin USA, Onan (Cummins), Kubota, Generac and Yanmar.

The lubrication requirements of small 4-cycle engines are critical due to their small capacities, often extreme operating conditions and high temperatures. A typical 3-5 HP lawn mower engine from Briggs & Stratton or Tecumseh operates at temperatures that may be 100-150°F higher than a passenger car engine, operates six inches off the ground in an environment full of dirt and dust, has an oil capacity of only 20-21 ounces and receives little or no regular maintenance.

Obviously, keeping the crankcase full is critical to engine life. Consumption and "coking" of oil at such elevated temperatures may be extreme, particularly in the smaller, low cost engines found in most entry level mowers.

4-CYCLE ENGINE OILS

Because they are so commonly available, small 4-cycle gasoline engines generally use the same type lubricants used in passenger cars, and oil recommendations from OEM's such as Briggs & Stratton, Tecumseh and Kohler generally follow the same course as domestic automobile oils. When the domestic auto manufacturer's upgraded their quality levels (from SF to SG in 1989, or from SG to SH in 1993) the industrial engine manufacturers generally followed suit.

Today's current API (American Petroleum Institute) service level "SJ" oils offer very high levels of performance and can give amazingly long life to small engines when the engine is properly maintained. Whether these passenger car, mileage oriented oils are the best lubricants for small air-cooled 4-cycle engines is debatable.

VISCOSITY GRADES FOR SMALL ENGINES

Oil viscosities for small engines are generally limited to SAE HD 30 or 10W30, and for very cold weather, 5W30.

SAE HD 30 is the primary recommendation for most manufacturers when temperatures are above 32°F. As the overwhelming majority of lawn and garden work is done in the summer months, HD 30 is by far the most popular viscosity grade in the industry. Straight 30 weight oils contain no viscosity index improvers and maintain their viscometric properties for long periods. Because the straight grades are heavier to begin with, oil consumption is reduced when compared to multi-weights. With crankcase capacities of as little as 20 oz., high oil consumption can easily be fatal.

SAE 10W30 is recommended for year round use in climates where temperatures may dip below 32°F. and is also the primary recommendation for Kohler Command engines which have hydraulic lifters. Multi-viscosity oils such as 10W30 pump more easily than straight grades at start up temperatures, while assuming the full bodied characteristics of the straight grades at operating temperatures. Unless an engine is specifically designed for multi-viscosity oils, consumption will tend to be higher than straight grades.

SAE 5W30 oils are used in very cold conditions such as snow throwers or generators used in sub zero conditions. The use of 5W30 oils in summer conditions, in air-cooled engines, should be done only when specifically recommended by the engine manufacturer.

Other oils such as 20W50, 15W40 and 10W40 may be used where recommended by specific manufacturers. SH or SJ level should always be selected, whether the engine is gasoline or diesel powered. It cannot be emphasized too strongly that when straight grade oils such as SAE 10, 20 or 30 are recommended, they are HD (Heavy Duty) or High Detergent oils and not non-detergent or low detergent types.

LAWN & GARDEN 4-CYCLE SAE 30

LAWN & GARDEN SAE 30 is a straight 30 weight engine oil suitable for use in any gasoline or gaseous fuel engine where SAE 30 is a recommended grade. LAWN & GARDEN may be expected to stay in grade for extended periods, compared to any multi-viscosity oil.

LAWN & GARDEN meets API Service SJ, SH the highest rating available for SAE 30 gasoline engine oils.