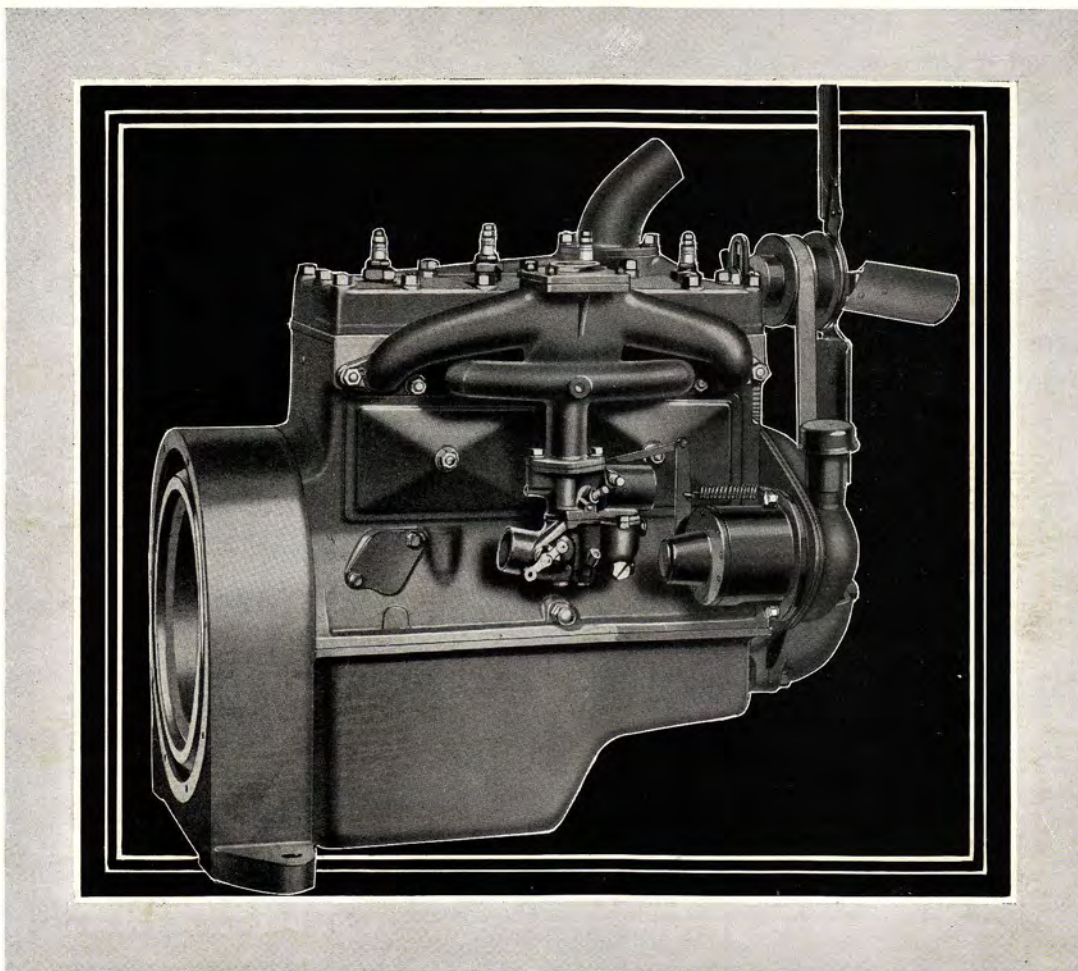


THE "F" SERIES  
INDUSTRIAL



FOUR-CYLINDER  
... **WAUKESHA ENGINES** ...

For Combine Harvesters, Material Mixers, Pumps,  
Air Conditioning Units, Agricultural and  
General Industrial Machinery

"FCS" - "FC"



**WAUKESHA MOTOR COMPANY**

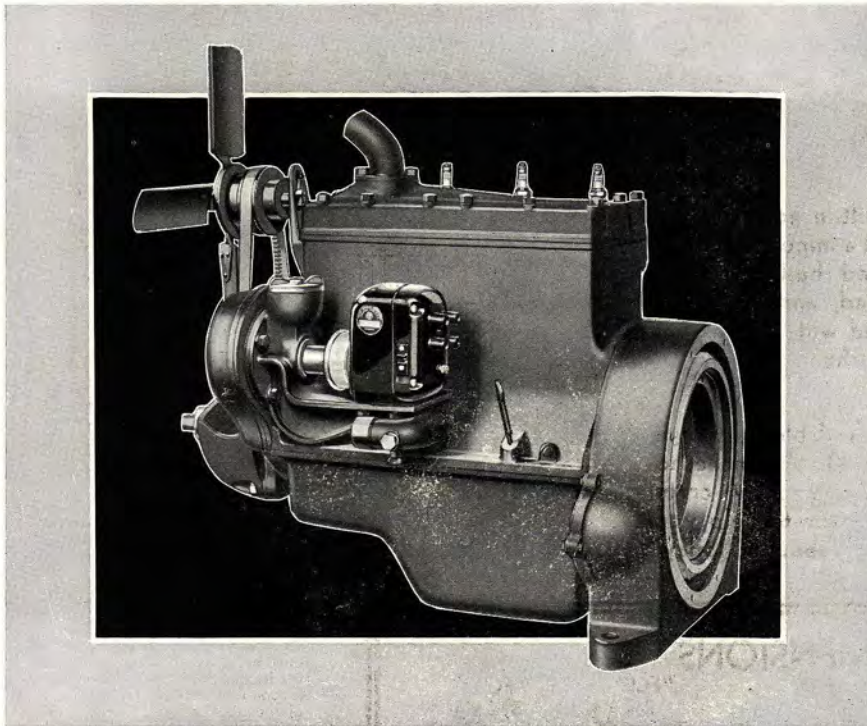
WAUKESHA » » » » » » » » WISCONSIN

Eastern Sales Office: Eight W. 40th Street, New York City

Mid - Continent Office: 313 East 2nd Street, Tulsa, Okla.

Pacific Coast Office: 939 Santa Fe Ave., Los Angeles, Calif.

ENGINE BULLETIN No. 846-J



Ignition Side "F" Series Engines for Industrial Duty. Showing Oil Filler, Thermo-Syphon Cooling, and Magneto Drive.

# THE AGILE FOUR

**Lively Performance** The Agile Four appears in the Waukesha line because of the many advantages of multi-cylinder power even in small sizes. The greatly improved performance—instant response to increased power demands, smoothness of operation, long life and high economy, both in fuel and upkeep—are all found in an unusual degree in these small fours. Their cost also makes them possible substitutes for the one and two-cylinder engines which have formerly been used in many small powered devices.

**Quick Acceleration** To secure that instant response to power and load requirements, the well known Waukesha Blue Flame Manifold principle has been applied in conjunction with the Waukesha Controlled Turbulence Combustion Chamber. The advantages of this combination are more power, quick acceleration, smooth operation, clean combustion, cool valves and a substantial saving in fuel. Engines equipped with this high compression cylinder head show exceptionally low fuel consumption at partial or varying loads under which the average engine operates.

**Rigid Design** The fundamental requirements for smooth operation are structural rigidity combined with nicely balanced moving elements. In these engines the cylinders are cast in one piece with the crankcase, and liberal well ribbed sections of iron are used to make this foundation rigid, and maintain the close alignments needed for smooth running.

**Very Large Crankshaft** The three-bearing crankshaft used is fitted with steel backed, babbitt lined, renewable bushings,  $2\frac{1}{8}$  inches in diameter. It is closely balanced and is fitted with accurately matched piston and rod assemblies. With such large bearings, extremely rugged crank cheeks, and close manufacturing limits, these engines are extremely smooth throughout their normal working speed range. This insures long life and economical upkeep.

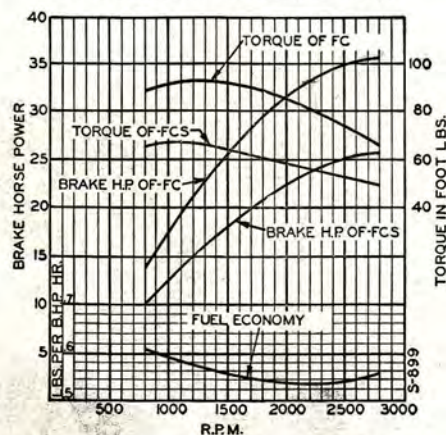
**Pressure Oiling** The oiling system, for engines of this size, is unusual. Full pressure by positively driven pump forces oil to the main, camshaft and connecting rod bearings, and timing gear spray. Oil mist thrown off by the

revolving parts drenches the cylinders, pistons and floating piston pins. An outside relief valve which can be adjusted even while the engine is running controls the oil pressure. The system also includes the Waukesha Oil Level Equalizer which prevents air-bound oil lines and insures positive lubrication at all levels and all temperatures.

**Accurate Governor** The Waukesha built-in governor is a major feature—not a minor accessory. It is designed and built with the engine, entirely enclosed, sealed, and lubricated by the engine oiling system, and with big parts it provides close regulation without hunting.

**Other Sizes** Waukesha Engines are available in a range of fours and sixes from 100 cubic inches to 2900 cubic inches displacement. A corps of skilled engineers is at your service to help you with your power problem. Tell us about it today!

### Performance Characteristics



Models "FCS" and "FC"

### DIMENSIONS

	"FCS"	"FC"
Bore and stroke.....	2 3/4 x 4	3 1/4 x 4
Piston displacement, cubic inches.....	95	133
Valve diameter, clear.....	1 1/16	1 1/16
Connecting rod bearing, diameter x length.....	1 3/4 x 1 1/16	1 3/4 x 1 1/16
Front main bearing, diameter x length.....	2 1/8 x 1 1/16	2 1/8 x 1 1/16
Center main bearing, diameter x length.....	2 1/8 x 1 1/4	2 1/8 x 1 1/4
Rear main bearing, diameter x length.....	2 1/8 x 1 1/16	2 1/8 x 1 1/16
Piston pin, floating, diameter x length.....	7/8 x 2 3/8	7/8 x 2 3/8
Connecting rod, length cc.....	7 1/4	7 1/4
Timing gears, face.....	7/8	7/8
Up-draft carburetor flange, S.A.E.....	7/8	7/8
Flywheel diameter.....	12 1/4	12 1/4
Flywheel housing, S.A.E., number.....	5	5
Lower water connections, diameter.....	2	2
Top water connections.....	To suit	To suit
Fan diameter (extra equipment).....	16	16
Approximate weight, pounds.....	280	290

(All dimensions are given in inches.)

#### I. C. E. I. "Standard Net Stripped Engine" Curve.

The manufacturer guarantees that production engines, after a run to reduce the friction to the same as that on the laboratory standard, will develop 95% of the horsepower shown above. Curves are corrected to 29.92" of mercury (sea level, barometer reading), and a temperature of 60 degrees F.

**CONTINUOUS SERVICE**—For continuous full load service, use a load factor of not more than 80 per cent of the power shown on the curve.

**Horsepower shown was obtained with following equipment:** Compression ratio—6 to 1. Fuel—60 Octane gasoline. Carburetor—Zenith 94-T0. Ignition—Magneto. Fan—None. Electric Generator—None. Air Cleaner—None. Muffler—None.

**Permissible Speeds**—Governors will be set to carry full load at 1800 rpm maximum for continuous stationary duty. No-load settings will be 2600 rpm maximum for agricultural and industrial drives and for intermittent stationary duty.

Consult the Waukesha Motor Company regarding advisable speed for your service.

### SPECIFICATIONS

**Crankshaft**—S.A.E. 1045 steel, heat treated.

**Crankcase**—Cast iron—cast in block with cylinders—removable head.

**Pistons**—Light weight cast iron.

**Connecting Rods**—S.A.E. 1045 steel, heat treated. Precision type steel backed babbit bushings in big end; upper end is bronze bushed.

**Main Bearings**—Precision type bushings, steel backed, babbit lined.

**Valves**—Intake, chrome-nickel; exhaust, chrome-silicon.

**Push Rods**—Large diameter, hollow, case-hardened and ground, mushroom type, lock nut adjustment.

**Cylinders**—Waukesha Alloy cylinder iron.

**Cylinder Heads**—Detachable, Waukesha controlled turbulence combustion chambers.

**Timing Gears**—Helical, mild steel and close grained cast iron.

**Cooling System**—Thermo-syphon, standard. Belt drive water pump available at extra cost.

**Lubrication**—Force feed to all main, connecting rod and camshaft bearings and to idler gear stud.

**Ignition**—Provision for mounting standard magneto or distributor with special shaft, if engine mounted. These are not

furnished, but customers' ignition will be installed and timed if desired.

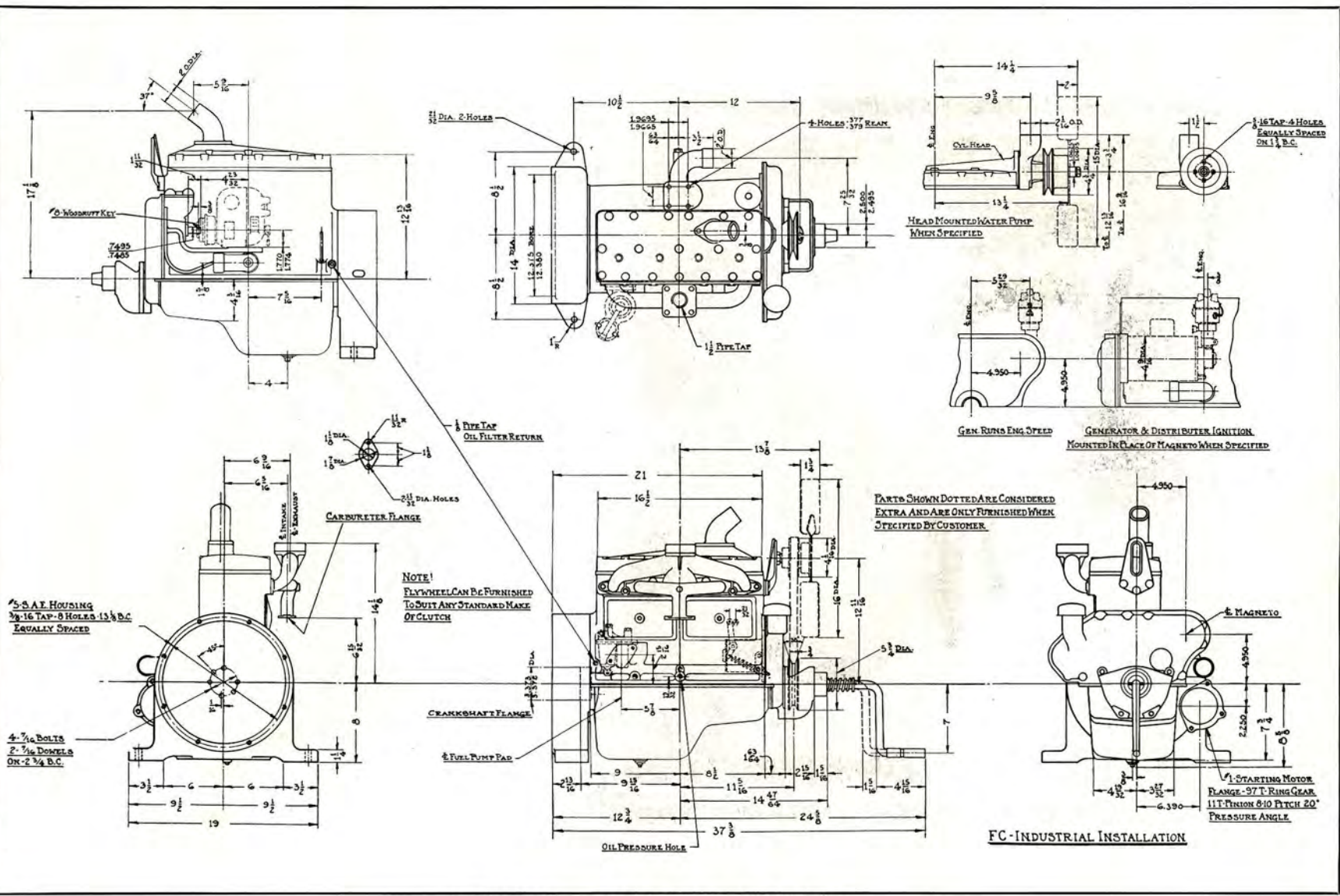
**Starting Motor and Generator**—No. 1 S.A.E. starting motor flange and belted generator drive provided when magneto is used; ignition generator is flange mounted. Electric units are "extra."

**Flywheel Housing**—Removable, No. 5 S.A.E. standard. Other sizes are "extra."

**Starting Crank (Extra)**—Hand crank and trunion assembly when ordered.

**Fuel Pump (Extra)**—Fuel pump and mounting available when specified.

**Governor (Extra)**—Waukesha patented built-in type. Sealed, self-lubricated and non-hunting.



Installation Diagram Models "FCS" and "FC" Engines  
(Send for certified print for lay-out work.)