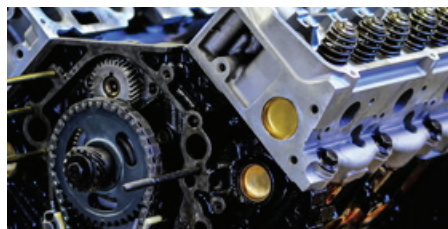
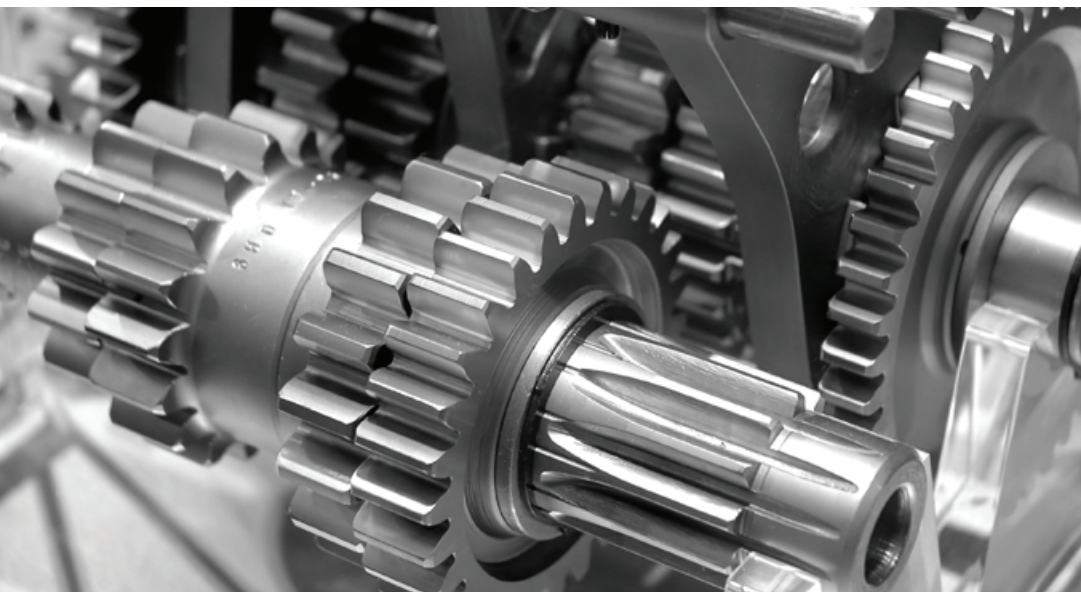


Engine Specifications Guide

The Engine Specifications Guide provides the engine specification parameters of the Power Systems Research market databases.



Introduction

Power Systems Research tracks the production and in-service population of various engines as well as the manufacturers producing them. This market data includes compression and spark ignition engines. For each engine model, over 30 engine specifications and performance parameters are compiled.

The Engine Specifications Guide is a reference tool used to define the engine specifications that are provided for each engine model.



Engine Specifications Guide

Engine Specification

Manufacturer: The organization responsible for an engine’s production (i.e., installing the crankshaft in the block)

Origin: The country in which the engine was manufactured or CKD kit assembled.

Mfg Model: The official designation of the engine given by the manufacturer.

PSR Reference: While the MFG Model designation is meaningful to the manufacturer, these designations frequently lose their significance when engines from more than one manufacturer are being reviewed. Consequently, Power Systems Research has developed a proprietary engine model reference system that provides a meaningful, yet unique, engine designation. While the Power Systems Research reference will typically only deviate from the MFG Model in the case of automotive gasoline engines, certain diesel models may be assigned a reference designation as well.

Power Systems Research Engine Model Reference Designation System					
Section 1	Section 2	Section 3	Section 4 (Optional)		Section 5 (Optional)
1.21	L4	F	TI		16V
Displacement (in liters)	Configuration & Cylinders	Fuel Delivery Method Equipment	Aspiration & Intercooling		Valve/Cam Variant
The designation above describes a 1210 cc, in-line, 4-cylinder, fuel injected gasoline engine with turbocharging, charge-air cooling and 4 valves per cylinder.					
The SOHC, naturally-aspirated version of this engine would have a Power Systems Research designation of 1.21L4F-OHC.					

Int HP: The intermittent horsepower rating per SAE J245 (gasoline) and DIN6270-B (diesel); also defined as the one-hour rating.

KW Rating: Metric conversion of the intermittent horsepower rating.

Cont HP: The continuous horsepower rating per DIN6270-A (diesel).

Engine Type: Designates the basic design/ignition process of the engine:

- (D) Diesel engine/compression ignition
- (G) Gas/gasoline engine/spark ignition

Fuel: Designates the specific fuel used:

- (D) Diesel
- (G) Gasoline
- (N) Natural Gas
- (L) LPG
- (H) Heavy Fuel
- (X) Dual Fuel
- (V) Vegetable Oil
- (Y) Hydrogen

HP/KW RPM: The engine crankshaft speed at which the intermittent horsepower/kW rating is measured.

Configuration: The cylinder arrangement:

- (I) Inline Arrangements
- (V) Angular Vee Alignment
- (H) Horizontal Cylinders
- (W) Twin Vee Engines Together
- (R) Rotary Engines
- (C) Integral Engine-compressors

Cylinders: The number of combustion cylinders per engine.

Crank Plane: Crankshaft plane:

- (V) Vertical Shaft
- (H) Horizontal

Cycle: The number of piston strokes in the engine combustion cycle.

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Cooling: The engine cooling associated with each engine:

- **(A)** Air
- **(W)** Water
- **(O)** Oil

Aspiration: Indicates what the engine air flow is:

- **(T)** Turbocharged - powered by engine exhaust.
- **(S)** Supercharged - powered by engine crankshaft.
- **(N)** Naturally-aspirated.

Intercooled: Descriptive of the treatment of the charge air:

- **(W)** Water-air Cooling
- **(A)** Air-air Cooling
- **(N)** None

Fuel Delivery: Fuel delivery method:

- **(D)** Direct Injection Diesel - fuel injected directly into cylinder chamber.
- **(I)** Indirect Diesel or Swirl - fuel injected into side before entering cylinder chamber.
- **(C)** Carbureted Gasoline - fuel put through carburetor before entering cylinder chamber.
- **(F)** Gasoline Fuel Injection - fuel put through injector before entering cylinder chamber.
- **(G)** Direct Gasoline Injection - fuel injected directly into cylinder chamber.
- **(P)** Pressurized Natural and LPG Gas - special injection for non-liquid fuel.
- **(B)** Throttle-body Gasoline - fuel put through throttle body before being put into cylinder chamber.

Valve/Cam Configuration: Designates the basic design of the engine intake and exhaust valve system:

- **(D)** Double Overhead Cam - valves powered by twin set of overhead camshafts, one camshaft for intake valves and the other for exhaust valves.
- **(C)** Overhead Cam - valves powered by single overhead camshaft.
- **(V)** Overhead Valve (i.e., pushrod) - valves powered by camshaft located on the side of cylinder chambers.
- **(S)** Side Valve - valves located on cylinder side.

Valve/Cam Configuration (continued):

- **(R)** Reed Valve - a flap fastened along one edge that when pressure inside the cylinder chamber is highest the reed is closed and when the pressure inside the cylinder chamber becomes less than atmospheric pressure the valve opens.
- **(M)** Metering Diaphragm - small diaphragm used in high rpm 2 cycle engines.
- **(K)** Rotary Disk Valve - a rotating disk on top of cylinder chamber with single opening for intake and exhaust when aligned with the proper air duct.
- **(H)** Hydraulic Loop - hydraulic oil loop system in place of a camshaft powering the valves.

Valves per Cylinder: Total number of intake and exhaust valves per cylinder.

Cylinder Liners: Indicates whether the engine has:

- **(N)** No Cylinder Liners
- **(D)** Dry Liners
- **(W)** Wet Liners

Torque: Maximum rated torque per SAE J245 (gasoline) and SAE J270 (diesel) (Nm).

Torque RPM: Engine speed at which the maximum torque is measured.

Bore: The cylinder bore measured in millimeters (mm).

Stroke: The piston stroke measured in millimeters (mm).

Displacement: The symbol used to represent the metric displacement for each engine model. These figures have been carried to two decimal places and rounded to the last significant digit.

Length: The maximum axial (length) dimensions in millimeters for the standard engine through the axis of the crankshaft (fan to flywheel).

Width: The maximum horizontal dimension (width) in millimeters perpendicular to the engine crankshaft.

Height: The maximum engine height in millimeters as normally equipped; does not include air cleaners or other readily demountable equipment.

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Weight: The dry shipping weight in kilograms for that engine model.

SOP: Start of production year. The year during which the engine was first produced under the engine model designation shown.

EOP: End of production year. The year during which the engine was last produced.

Former ID: Several possible entries; a model designation previously associated with the engine; the model designation of the engines if other than the designation under which it is being marketed.

Licensors: The organization granting the manufacturing rights to the engine.

Series: The common “family” designation of the engine.

Notes: Any appropriate comments concerning the design or production of the engine. May also include application limiting comments.

VVT: Variable Valve Technology; technology to vary the intake & exhaust valves independent of the camshaft.

Fuel Injection Equipment; Diesel Only

Equipment Type: Designates the specific fuel injection equipment used:

- **(I)** Inline Pump - a fuel pump where the cylinder pumps and fuel lines are powered by an internal shaft.
- **(R)** Rotary Pump - a fuel pump where rotary motion is used to pressurize fuel to the individual fuel feed line to each cylinder.
- **(C)** Unit Pump - individual pump for an individual fuel line to each cylinder.
- **(U)** Mechanical Unit Injector - fuel pump built into injector powered by mechanical means.
- **(E)** Electronic Unit Injector - fuel pump built into injector powered by electrical motor.
- **(H)** Hydraulic Unit Injector - fuel pump built into injector powered by hydraulic means.
- **(O)** Common Rail - a single pump pressurizing fuel through a common fuel line to individual injectors.

Note: Engines with I, R, or C equipment type codes will have data entered in all FIE fields. Those with U, E, H, or O equipment types will have data entered only in nozzle fields.

The Pump Supplier and Nozzle Supplier names (and codes) follow the same country codes and descriptions as elsewhere in **EnginLink™**, **OE Link™** & **PartsLink™**.

The Turbocharger names (and codes) follow the same country codes and descriptions as elsewhere in **EnginLink™**, **OE Link™** & **PartsLink™**.