

ESTTA Tracking number: **ESTTA683632**

Filing date: **07/14/2015**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

Proceeding	91200832
Party	Plaintiff Briggs & Stratton Corporation and Kohler Co.
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Submission	Plaintiff's Notice of Reliance
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Filer's e-mail	robphillips@reedsmith.com, dkalahale@reedsmith.com, sherring@reedsmith.com
Signature	/s/ Robert N. Phillips
Date	07/14/2015
Attachments	2015-07-14 Opposers' Second Notice of Reliance with Exs G-I (REDACTED PUBLIC) - Part 1.pdf(5663069 bytes ) 2015-07-14 Opposers' Second Notice of Reliance with Exs G-I (REDACTED PUBLIC) - Part 2.pdf(5976135 bytes )

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD**

BRIGGS & STRATTON CORPORATION	)	
	)	
Opposer,	)	Opposition No. 91200832 (Parent)
vs.	)	
	)	
HONDA GIKEN KOGYO KABUSHIKI KAISHA,	)	
	)	
Applicant.	)	
	)	
KOHLER CO.	)	
	)	
Opposer,	)	Opposition No. 91200146
vs.	)	
	)	
HONDA GIKEN KOGYO KABUSHIKI KAISHA,	)	
	)	
Applicant.	)	
	)	

United States Patent and Trademark Office  
Trademark Trial and Appeal Board  
P.O. Box 1451  
Alexandria, Virginia 22313-1451

**OPPOSERS' SECOND NOTICE OF RELIANCE**  
**(Redacted – Public Version)**

Pursuant to 37 C.F.R. § 2.122, Opposers Briggs & Stratton Corporation (“Briggs”) and Kohler Co. (“Kohler”) (collectively, “Opposers”), by and through their attorneys, hereby submit their Second Notice of Reliance. Opposers’ First Second of Reliance includes the following attached materials:

1. Certain publicly available internet pages demonstrating third party use of engines with the same overall shape, orientation, configuration, and commercial impression as the

applied-for trademark, which are relevant to the functionality, genericness, lack of secondary meaning, and abandonment of the applied-for trademark, pursuant to 37 C.F.R. §2.122(e) and TBMP 704.08(b), included as **Exhibit G**;

2. Certain publicly available internet pages regarding Honda's marketing and sale of the engine it claims embodies the applied-for trademark, which are relevant to the functionality, abandonment, and lack of secondary meaning of the applied-for trademark, pursuant to 37 C.F.R. §2.122(e) and TBMP 704.08(b), included as **Exhibit H**; and

3. Excerpts from a deposition taken in a prior litigation regarding the functionality of the applied-for trademark, pursuant to stipulation of the parties filed on July 14, 2015 (tracking No: ESTTA683616) and TBMP 705, included as **Exhibit I** [filed under seal].

The attached exhibits are marked with sequential page numbers in the upper right corner in the form of [Exhibit Letter – Page Number]. For example, the first page of Exhibit G is “G1” and so forth. Where the upper right corner of a document does not allow for such marking, page numbers will be located along the right hand margin of the document. For briefing purposes, material within this Notice of Reliance will be identified as “O2NOR” (an acronym for Opposers' Second Notice of Reliance). For example, a reference to the first page of Exhibit G in the trial brief would be O2NOR G1.

Opposers intend to rely upon and hereby make of record the attached exhibits. Certain of the attached exhibits contain information that Applicant considers confidential pursuant to the Stipulated Protective Order entered into by the parties and approved by the Board. Accordingly, Opposers are simultaneously filing and serving an unredacted copy. Redactions are based on input from Applicant, and are not necessarily considered worthy of redaction by Opposers.

Respectfully Submitted,

Dated: July 14, 2015

By: /s/ Robert N. Phillips

Robert N. Phillips  
Seth B. Herring  
Reed Smith LLP  
101 Second Street  
San Francisco, CA 94105

Attorneys for Opposer Briggs & Stratton  
Corporation

Dated: July 14, 2015

By: /s/ Kenneth Nowakowski

Kenneth Nowakowski  
Elizabeth Townsend Bridge  
Melinda Giftos  
Whyte Hirschboeck Dudek S.C.  
535 East Wells Street, Suite 1900  
Milwaukee, WI 53202

Attorneys for Opposer Kohler Co.

**CERTIFICATE OF SERVICE**

I hereby certify that a true copy of the foregoing OPPOSERS' SECOND NOTICE OF RELIANCE (Redacted – Public Version) was served via first class mail, postage prepaid, this 14th day of July, 2015 upon:

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*/s/ Deborah Kalahale*

\_\_\_\_\_  
Deborah Kalahale

# **EXHIBIT G**



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# Small Engine Warehouse Open Now - Call 877-414-0525

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Made by **DeWalt**

**9HP 270cc Horizontal 1" x 3-21/32" Shaft, Fuel Tank, Muffler, Recoil Start, Low Oil Shutdown**

Product Number: **Dewalt-270-R**  
270cc 4-Cycle OHV  
Overhead Valve Design  
Cast Iron Cylinder Sleeve  
Mounting: **Horizontal**  
Electric Start: **No**  
Low Oil Shutdown  
Fuel Tank: **Included**  
Shaft Size: **1"Dx3-1/4"L**  
Muffler: **Included**  
Manifold:  
Height: **17"**  
Depth (Less Shaft): **13"**  
Width: **19"**  
Shipping Weight: **45 Pounds**  
Dimensional Weight: **73 Pounds**

Condition: **New (Scratch/Dent)**  
Warranty: **2-Year Manufacturer's Warranty**  
Returns: **Limited Allowed**

Will replace Vanguard and Honda engines on most applications. Note: The side bolt hole pattern is 3 1/2" square pattern around the shaft.

Our Low Price: **\$375.00**  
1 In Stock (Subject to Prior Sale)

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Residential Shipping Charges to 47336	
Ground Transit Times: FedEx Ground	\$40.95
3-Day Service : FedEx Express Saver	\$61.95
2-Day Service : FedEx 2Day	\$65.95
1-Day Service : FedEx Standard Overnight	\$93.95
Enter your zip code: <input type="text" value="47336"/> <input type="button" value="Go!"/>	
Address: <input type="radio"/> Commercial <input checked="" type="radio"/> Residential	

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Representative picture.

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Made by **DeWalt**

**13HP 389 cc Horizontal 1" x 3 1/4" Shaft, Fuel Tank,  
Muffler, Recoil Start, Low Oil Shutdown**



Product Number: **Dewalt-389-R**  
**389cc 4-Cycle OHV**  
**Overhead Valve Design**  
**Cast Iron Cylinder Sleeve**  
 Mounting: **Horizontal**  
 Electric Start: **No**  
**Low Oil Shutdown**  
 Fuel Tank: **Included**  
 Shaft Size: **1"Dx3-1/4"L**  
 Muffler: **Included**  
 Manifold:  
 Height: **17"**  
 Depth (Less Shaft): **13"**  
 Width: **19"**  
 Shipping Weight: **45 Pounds**  
 Dimensional Weight: **73 Pounds**

Condition: **New**  
 Warranty: **2-Year Manufacturer's Warranty**  
 Returns: **Limited Allowed**

Will replace Vanguard and Honda engines on most applications

Our Low Price: **\$425.00**  
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1-Day Service : FedEx Standard Overnight	<b>\$56.00</b>
Enter your zip code: <input type="text" value="47336"/> <input style="float: right;" type="button" value="Go!"/>	
Address: <input type="radio"/> Commercial <input checked="" type="radio"/> Residential	

*When will my item be delivered, and other shipping questions.*





Representative picture.

Repower Your Equipment Small Engines Pressure Washers Electric Generators Lawnmowers Snow Throwers



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### EARTHQUAKE LOG SPLITTER 27 TON 398CC VIPER ELECTRIC START W2813V

The Earthquake W2813V 27 ton log splitter delivers maximum log splitting power. With 27 tons of splitting force and a 389 cc high performance electric start Viper engine, there isn't a job this log splitter can't handle.

**EARTH AUGERS**

**STRING TRIMMERS - NEW!**

**MINI CULTIVATORS**

**FRONT TINE ROTOTILLERS**

**REAR TINE ROTOTILLERS**

**EDGERS**

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### Tons of Splitting Force!



#### Viper Power

The 389cc Viper engine delivers maximum power to handle 27 tons of splitting force.

#### Log Splitting Protection

Steel cage around the engine protects it from falling logs. Standard fenders and log cradle add even more protection where it's needed most.

#### Earthquake Log Splitter - 27 Ton with 389cc Viper engine Model #W2813V

- Large 26" log capacity makes for faster splitting
- Horizontal and vertical splitting positions
- Two-stage pump
- Pump kicks out up to 16 gallons per minute for fast splitting and minimum cycle time
- Large hydraulic oil capacity for cooler operation
- Auto return valve
- Offers 16 second cycle time
- Replaceable spin-on filter



#### Versatility

For heavy logs, the vertical orientation allows you to split logs without having to lift them up onto the

cradle.



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**REAR TINE ROTOTILLER CRT W/ 196CC ELECTRIC START VIPER ENGINE 6065VEC**

The Earthquake 6065VEC rear tine rototiller features counter rotating tines (CRT) which allow it to work through tough soil conditions. The CRT technology pulls forward against the counter rotating tines providing the power to tear up sod and heavy uncultivated soil.

[DETAILS](#)



**REAR TINE ROTOTILLER CRT WITH 206CC BRIGGS AND STRATTON ENGINE 5055C**

The Earthquake 5055c rear tine rototiller features counter rotating tines (CRT) which allow it to work through tough soil conditions. The CRT technology pulls forward against the counter rotating tines providing the power to tear up sod and heavy uncultivated soil. This tiller is ideal for preparing soil that has never been tilled previously.

[DETAILS](#)



**REAR TINE ROTOTILLER SRT WITH 206CC BRIGGS AND STRATTON ENGINE 7055C**

The Earthquake 7055C packs a 206 cc Briggs & Stratton Intek IC to deliver the power required for heavy duty tilling. Isovibe adjustable drag stake technology allows for tilling at three different depths making it easy to maintain the depth of tilling you require throughout your garden.

[DETAILS](#)



**REAR TINE ROTOTILLER CRT W/ 196CC VIPER ENGINE 6015V**

The new Earthquake 6015V delivers the ultimate combination of power and size. We have engineered a rear tine rototiller with the same 196cc Viper power as it's counterparts, but have been able to classify it as compact.

[DETAILS](#)

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**389cc Electric Start OHV Horizontal Replacement Engine**



Model #61301

**338cc Electric Start OHV Horizontal Replacement Engine**



Model #61151

**196cc OHV Horizontal Replacement Engine**



Model #66504

**118cc OHV Horizontal Replacement Engine**



Model #64001

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JD has become known as the leader in creating **four-stroke** engines that are reliable,technologically advanced and easy to start

Today,we offer a full line of engines,5.5 to 29 hp in both horizontal and shaft designs.

JD engines meet current **CARB** and **EPA** standards and offer enhanced performance,all with no change to existing external dimensions.And all JD engines are produced in manufacturing facilities that are certified to **ISO9001** standards

JD's Full Line of Engines				
<b>Gasoline Engine</b>				
JF120 4HP	JF168K 4HP	JFV120 4HP	JFV120 4HP	JF168K 4HP
JFV140 4.5HP	JFV140 4.5HP	JF200K 5HP	JF200K 5HP	JF168C 5.5HP
JFV160 5.5HP	JF168 5.5HP	JF168C 5.5HP	JF168 5.5HP	JFV160 5.5HP
JF200C 6.5HP	JF200 6.5HP	JF200 6.5HP	JF200C 6.5HP	JF240 8HP
JF240 8HP	JF270 9HP	JF270C 9HP	JF270 9HP	JF270C 9HP
JF340 11HP	JF340 11HP	JFV340 11HP	JFV340 11HP	JF390 13HP
JF390 13HP				
<b>Diesel Engine</b>				
TY395E3 22.1KW	TY395E2 22.1KW	TY395E2 22.1KW	TY395E2 22.1KW	TY395E1 25.7KW
TY395E1 25.7KW				
<b>Tradition series</b>				
JD186F/E	ZH1130	JD170F/E	ZH1125	ZH1120
ZH1115	ZS1115	ZH1110	ZS1110	ZH1105
ZH1100	S1100ND	S195	ZH195	JD195
JD190	JD185NLD	JD173	JD170	R175
R180NL	S195NL	JD165F	JD170F	
<b>SDF series</b>				
ZH1125	ZH1105			
<b>JD Series</b>				
JD230	JD330	JD350	JD300	
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ZH1105	ZH1120	ZH1110		
<b>ZS series</b>				
ZS1110	ZS1115			

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**PRODUCTS**

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General-purposed Engine Division Department, which belongs to Chongqing RATO Power Co., Ltd., was established in 2009. To meet the technology development requirements in current general-purposed machinery market, RATO has brought in modern manufacturing and management, implemented general quality management and been certified of ISO/TS16949 : 2002 Quality Management System, all of which are originated from practice. RATO products have been exported to 80 countries and regions including America, Germany, France, Spain, Mexico, Argentina, Turkey, and Nigeria, winning high international praise for "made in China."



**General Purposed Engine**

Through cooperation with foreign experienced professional R&D institutions and independent research and development of products, RATO products including 15-HP-22HP vertical-shaft, horizontal-shaft general-purposed gasoline engines make comprehensive progress on power, torque, fuel consumption, emission, noise and lightweighing, and meet the future competition demands of the middle and high end markets in North America and Europe. OHC and double-cylinder general-purposed gasoline engines, which are co-developed with foreign enterprises, have reached world-class levels.



**Generator**

With RATO high-quality engines and high-specification parts, RATO generators are easy to handle, of high safety performance and long service life, providing excellent, reliable power output for customers.



**Water Pump**

With RATO high-quality engines, RATO water pumps are of excellent reliability and high performance/price ratio. With free CEC technology, the rust protection of the frame had been enhanced greatly.



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## Suburban Mid-Tine® Tillers



The Suburban Tiller is the choice of serious gardeners. The Mid-Tine® Suburban offers superior handling and better weight balance when compared to front tine tillers. The Suburban is great for just about any size garden, whether you need to break new ground, expand or create a new garden, or if you have a mature garden, the Suburban is right for you.

The Suburban features a double gear reduction transmission allowing the tiller to bust through just about any ground. The drag bar and wheel are easily adjusted with the simple pull of a pin. Pull one pin to release the wheels, lift them to the up position and insert another pin. The drag bar can be adjusted for different soils.



Once the wheels are up and the drag bar is down, adjust the throttle from the operator's position, squeeze the clutch handle and start tilling. The Suburban tills a 26 inch wide swath and can till up to 12 inches deep.



Opportunities available for **Dealers, Distributors, and Rental...**  
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Model	ST800	ST800IC	ST6R	ST5.5H
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<b>Engine</b>	B&S 8.0 Gross Torque OHV	B&S 8.0 Gross Torque OHV IC	Subaru EX17 Industrial OH Cam	Honda GX160 Commercial
<b>Engine CC's</b>	205	205	169	163
<b>Tines</b>	Slasher	Slasher	Slasher	Slasher
<b>Tilling Depth</b>	12"	12"	12"	12"
<b>Tilling Width</b>	14", 26", or 37"	14", 26", or 37"	14", 26", or 37"	14", 26", or 37"
<b>Transmission</b>	Roller chain and sprocket	Roller chain and sprocket	Roller chain and sprocket	Roller chain and sprocket
<b>Frame</b>	Structural steel	Structural steel	Structural steel	Structural steel
<b>Drag Bar</b>	Adjustable	Adjustable	Adjustable	Adjustable
<b>Hitch</b>	Cast iron	Cast iron	Cast iron	Cast iron
<b>Start</b>	Manual	Manual	Manual	Manual
<b>Weight (lbs.)</b>	143	143	143	143
<b>Machine Warranty</b>	2 yrs. consumer, 90 day commercial	2 yrs. consumer, 90 day commercial	2 yrs. consumer, 90 day commercial	2 yrs. consumer, 90 day commercial
<b>Engine Warranty</b>	2 yrs. consumer, 90 day commercial	2 yrs. consumer, 1 yr. commercial	3 yrs. limited	2 yrs. limited
<b>MSRP*</b>	\$999.00	\$1,099.00	\$1,199.00	\$1,479.00

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\*Note: Prices shown are suggested retail and do not include freight, dealer set up, or applicable local taxes in US Dollars. Prices and specifications are subject to change as new developments and improvements are made.

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Quick Hitch

Roller Chain

UltraFork

Utility Jacks

Semi-Trash Pump

3 Point Hitch System

Log Splitter System

## Semi-Trash Pump



### Description

SpeeCo's Semi-Trash Pump is equipped with a powerful 6.5 H.P. Kohler engine to deliver maximum gallons per minute.

### Product Specs

- Engine: 6.5H.P. Kohler Engine
- Inlet and Outlet Connections: 2" NPT
- Handles Solids: Up To 1/2"
- Durable Ductile Iron Impeller and Diffuser
- Delivery Volume: 167 GPM
- Suction Head: 30 FT.
- Lift Head: 110 FT.
- Speed: 3600 RPM

### Photos





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**Engine Series:**



**Snow Power Series  
5.7-9.5 HP**



**Vertical Shaft OHC  
4.5-5.5 HP**



**SP Series  
5.7-7 HP**



**Micro  
1.1-1.6 HP**



**Overhead Cam  
4.3-14 HP**



**OHV for Rammer  
2.4-4 HP**



**OHV Slant Cylinder  
11.5-13.5 HP**



**OHV Vertical Cylinder  
6-11 HP**



**V-Twin  
18-28 HP**

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**Barreto Manufacturing Testimonial**

<http://www.barretomfg.com/>

Greg Barreto of Barreto manufacturing discusses how the features of the EX series engines have benefited his customers.



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3 Point Hitch System

Log Splitter System

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## S40151000 - 10 Ton Log Splitter

Fencing Products



Hardware

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Linkage Parts

Log Splitters

### Description

5 Ton Electric Splitter

SpeeCo's 10 Ton Log Splitter is equipped with a 212cc SpeeCo OHV engine to deliver maximum splitting force. A global leader in log splitting technology, SpeeCo offers the best features in the industry, making splitting wood quicker, easier and safer! A great value for the user who splits a few cords of wood a season. Including:

10 Ton

- Horizontal splitting
- Fast Cycle time for high production
- Balanced weight distribution for easy handling and smooth towing
- Cradle beam making splitting wood quicker, easier and safer

15 Ton

### Product Specs

22 Ton

#### 10-Ton Log Splitter Specs

25 Ton

- Engine: 6.5 H.P. SpeeCo OHV
- Pump: Single Stage, 2.5 GPM
- Cylinder: 2.75" diameter, 18" stroke
- Valve: Auto-Return
- Max Splitting Force: 10 tons
- Max Log Length: 18"
- Cycle Time: 19 Seconds
- Wheels: Low Speed Turf Tires
- Wedge: 5" High
- Hydraulic Capacity: 2.5 gallons
- Height: 36"
- Length: 65"
- Width: 34"

28 Ton

35 Ton

3-Point Hitch

Accessories

Post Hole Diggers

Quick Hitch

Roller Chain

UltraFork

Manual

Utility Jacks

- 10-Ton Manual

Semi-Trash Pump

Photos



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### Lifan LF168F-2BQ 6-1/2 HP OHV Recoil Shaft Engine

by Lifan

(3 customer reviews) | (14)

List Price: ~~\$249.00~~

Price: **\$145.00**

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- 5.5hp ohv industrial grade engine
- Compression release for e-z starting.
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- Almost All Construction Equipment
- Legend - q-keyway shaft, d-electric start, h-6:1 gear reduction, r-2:1 gear reduction, c-18amp charging system

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Hilliard Extreme-Duty Centrifugal Clutch - 3/4in. Bore, 12 Tooth, 35 Chain Size  
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(1)  
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**Product Details**

**Product Dimensions:** 16 x 15 x 16 inches ; 39 pounds  
**Shipping Weight:** 39 pounds ([View shipping rates and policies](#))  
**Shipping:** This item is also available for shipping to select countries outside the U.S.  
**Shipping Advisory:** This item must be shipped separately from other items in your order. Additional shipping charges will not apply.  
**ASIN:** B003FXM412  
**Item model number:** LF168F-2BQ  
**Average Customer Review:** [\(3 customer reviews\)](#)  
**Amazon Best Sellers Rank:** #16,795 in Patio, Lawn & Garden ([See Top 100 in Patio, Lawn & Garden](#))

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**Product Description**

Lifan offer industrial grade OHV engines that are quiet and provide dependable performance. All Lifan engines are built to meet and exceed industrial grade quality standards, true 1600 hours engines with cast iron sleeves, automotive grade rods, pistons, rings, crankshafts, cam shafts, and other internal parts. These replacement engines can be used for many applications including but not limited to pressure washers, air compressors, trenchers, concrete mixers, concrete saws, mortar mixers, go-karts and more.

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**Customer Reviews**

(3)  
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### LIFAN 15HP 420 cc OHV Recoil Start 1 in. Horizontal Shaft Engine

Model # LF190F-BQ Internet # 203277165

★ ★ ★ ★ ★ [Write The First Review](#)

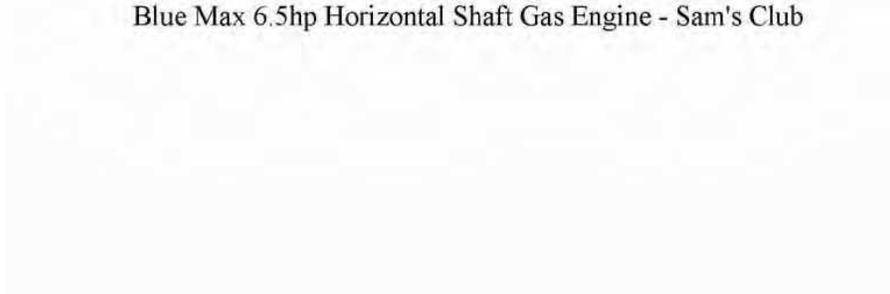
**\$299.00 /EA-Each**

Free Shipping

This item cannot be shipped to the following state(s):  
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[Product Description](#) | [Specifications](#) | [Customer Reviews](#) | [More Info](#) | [Shipping Options](#)

Blue Max 6.5hp Horizontal Shaft Gas Engine - Sam's Club



GO



Because proper game-watching  
requires a **proper hot dog.**



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## Blue Max 6.5hp Horizontal Shaft Gas Engine



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**Model:** 6783

**Item #:** 513574

Blue Max Engines are versatile, reliable, affordable.

See full details below.

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### GET ALL THE DETAILS

Description

Specifications

Warranty

## Blue Max 6.5hp Horizontal Shaft Gas Engine - Sam's Club

Assembled Country  
 Component Country  
 Shipping Info  
 Ratings & Reviews

## Description

Blue Max 6.5hp gas engine comes standard with an easy start recoil system. The side shaft and counterclockwise rotation of the tapered shaft make it versatile for a variety of applications. You can use it as a Go-Kart Engine, Log Splitter engine, etc so if your in need of a replacement engine then this unit might be exactly what your looking for.



[Back to top](#)

## Specifications

Starting: Recoil Pull Start  
 Fuel Consumption: 0.51 GPH  
 General Use Engine Oil: SAE 10W-30  
 Cooling System: Forced Air  
 PTO Shaft Rotation: Counterclockwise  
 Ignition System: Transistorized Magneto  
 Fuel Tank Capacity: 0.95 Gal  
 Displacement: 196cc  
 Engine Type: Single Cycle, 4 Stroke, OHV  
 Dimensions: 12"L x 14.3"W x 13.2"H  
 Crankshaft PTO: 2-7/16" x 3/4 Diameter Tapped 5/16 x 24 UNF  
 HP Rating: 6.5 HP @ 3600 RPM  
 Controls: Throttle/Fuel/Choke/On-Off  
 Engine Oil Capacity: 0.63Qt  
 Spark Plug: BP6ES  
 Idle Speed: 1400 RPM (+200/-150)  
 Fuel: 86 Octane or Higher Unleaded  
 Max Torque: 9.76 Ft/Lbs @ 2500 RPM  
 Engine block: Aluminum

*For additional questions or concerns regarding this product, please contact the Manufacturer's Customer Service Department at 1.800.348.5004.*

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**Warranty**

1 year limited  
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**Assembled Country**

China  
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**Component Country**

Imported  
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**Shipping Info**

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### Blue Max 13 HP OHV Horizontal Shaft Gasoline Engine

Model # 6787 Internet # 202342258

★ ★ ★ ★ ★ Write The First Review

**\$289.00 /EA-Each**

Free Shipping

This item cannot be shipped to the following state(s): GU,PR,VI

[Product Description](#) | [Specifications](#) | [Customer Reviews](#) | [More Info](#) | [Shipping Options](#)

**PRODUCT DESCRIPTION**

Blue Max is a leading brand for over 10 years in professional outdoor power equipment and includes Generators, Chainsaws, Snow Blowers and Log Splitters. Expect the very best quality components in Blue Max equipment so they won't let you down on your outdoor projects. Blue Max equipment is built to work and start the first time, every time.

- Assembled dimension: 17 in. W x 19 in. D x 19 in. H
- EPA approved
- Air Cooled
- 67 dBs for quiet operation
- Large fuel tanks for longer running time
- Tapered design for multiple applications
- Classic easy-start recoil system for reduced fatigue
- 1 Year warranty
- 13 HP commercial duty blue max engine
- MFG Brand Name : Blue Max
- MFG Model # : 6787
- MFG Part # : 6787

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**SPECIFICATIONS**

Assembled Depth (in.)	19 in	Assembled Height (in.)	19 in
Assembled Width (in.)	17 in	Brand/Model Compatibility	Universal
CSA Listed	Yes	ETL Listed	Yes
Engine Displacement (cc)	389	Engine Make	Blue Max
Engine Type	2 Cycle	Fuel tank capacity (gallons)	1.72
Oil capacity (oz.)	37.3	Orientation	Vertical
Product Weight (lb.)	80.6	Recommended Oil type	SAE; 10W-30; API; S.J; or SL
Returnable	30-Day	UL Listed	1-UL Listed

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**CUSTOMER REVIEWS**

Do you own this product? Be the first to rate it. Your feedback will help users like you to make informed decisions and will help us to improve our product offerings!

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**MORE INFO**

**Warranty**

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Most orders ship within 3 business days.

Please allow an additional 3-5 business days for **Standard Ground Delivery** in the U.S. Orders for this item may be expedited for an additional fee.

Other Delivery Options:

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**Product Details**

- [Gasoline Engines](#) > [YK Series](#) > [Yamakoyo](#)

**YK900 ( by: Yamakoyo )****Short Description :**

We provide a full range of PTO shaft for different kinds of applications. There are also options for electric start for each type of engine.

**Product Specifications**

<b>Engine Type :</b>	Air Cooled 4-Stroke OHV Single Cylinder
<b>Bore X Stroke (mm) :</b>	77x58
<b>Displacement :</b>	270
<b>Compression Ratio :</b>	8.2;1
<b>Max. Output :</b>	9.0HP/3600rpm
<b>Max. Torque :</b>	7.4N.m/2500rpm
<b>Ignition System :</b>	Solid State
<b>Starting System :</b>	Recoil
<b>Fuel Tank Capacity (Gal.) :</b>	1.6
<b>Fuel Consumption :</b>	230g/HP.h
<b>Oil Capacity (Gal.) :</b>	0.3
<b>Dimension (In.) :</b>	19.5x17x17.5
<b>Dry Weight (lbs) :</b>	55.1

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Pressure Washer 3000 PSI @ 2.5 GPM, Direct Drive

3 of 5 (2 reviews)

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GAS PRESSURE

### Product Features

- HONDA GX Commercial Series Engine Starts Easy, Runs Smoothly, and Delivers High Output
- Direct Drive Engine & Pump for Streamlined Power Transmission from Engine to Pump
- Triplex Pump Design with Ceramic Pistons and Thermal Relief Valve
- Welded Construction, 1-1/4" Tubular Steel with Steel Engine Plate and Solid Steel 5/8" Axle
- 5/16" x 25' Non-marring Hose with Easy Connectors for No Tools Assembly
- 5 Quick Connect nozzles (0°, 15°, 25°, 40°, & Soap) make switching applications easy and fast!
- Downstream Detergent Injection System

### SPECS & WARRANTY

### QUESTIONS & ANSWERS

### USER REVIEWS (2)

#### Specifications

Water Pressure	3000PSI
Flow Rate	2.5GPM
Engine Mfgr.	HONDA®
Pump Brand	FNA
Wheels	10" Premium Pneumatic
Pump/Hose Quick Connector	Easy Connectors
Hose	25' x 5/16" High Pressure Hose
Hose/Gun Quick Connector	Easy Connectors
Wand Type	Steel Wand with Quick Connect
Spray Patterns	0°, 15°, 25°, 40°, & Soap
Engine Orientation	Horizontal
Frame	1-1/4" Welded Steel
Frame Tube Style	Tubular Steel
Frame Handle Style	Tubular Steel
Accessory Storage	On Board
Gun	2 piece

#### Warranty Information

This DEWALT® High Performance Industrial Tool comes with a warranty package that includes:

- 3 Year Limited Warranty
- 2 Year Limited Warranty
- 1 Year Limited Warranty

[More information on the general DEWALT warranty](#)

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Generac Horizontal 212cc OHV Engine 3/4" x 2-27/64" #0H9561



Item condition: New other (see details)

Price: US \$195.00

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brandnewengine(15277) 99.6% Positive feedback

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Shipping: \$88.19 Standard Shipping | See details Item location: Iowa City, Iowa, United States Ships to: United States See exclusions

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Returns: 30 days money back, buyer pays return shipping | Read details

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Description Shipping and payments

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Item number: 380465008519

Seller assumes all responsibility for this listing.

Last updated on Aug 31, 2012 13:17:16 PDT View all revisions

Item specifics

Condition: New other (see details): A new, unused item with absolutely no signs of wear. The item may be missing the original packaging, ... Read more Brand: Generac Power: Gas Model: 212cc Generac Engine Product Type: Generac Engine MPN: 0H9561

Brand New Engines

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Generac Horizontal 212cc OHV Engine 3/4" x 2-  
27/64" #0H9561

Item Number:

**0H9561**

Manufacturer: Generac  
Item Condition: BRAND NEW



Service Link



Owner's Manual



Parts List

**212cc Generac Engine**  
Displacement 212cc  
3/4" x 2-27/64" keyed shaft tapped 5/16" w/ keyway  
**Replaces engines for pressure washers and other standard utility applications**

Specifications  
**Horizontal Shaft**  
**Single Cylinder**  
**Air Cooled**  
**OHV Design**

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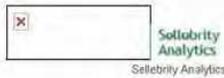
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Only new engines without gas or oil added will be eligible for returns. If you have added gas or oil to the engine you may not return the engine due to shipping regulations. All engine returns must be made within 30 days from the original purchase date. If an engine is returned and is not in original or new condition, the engine will be retained by Brand New Engines, Inc. The transaction will be final and the buyer will receive no compensation. Replacement parts and products other than engines are not eligible for returns including generators, pressure washers, etc. All authorized engine returns will

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## RESIDENTIAL POWER WASHERS

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14 questions | 14 answers

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### 2500PSI Power Washer (2.3 GPM)

With its large Generac OHV horizontal shaft engine and easy-access axial cam pump, the 2500PSI power washer is ideal for cleaning everything from patio furniture to siding to decks around the house.

#### Ergonomic Spray Gun



- Cushion grip for comfort
- Easy-to-pull trigger reduces fatigue
- Rear hose connection for maximum convenience

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NYSE: GNRC \$33.49 12/27/2012 3:37pm EST

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- + Easy-access axial cam pump
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- + Integrated spray gun holder



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# Products – Engines, Generators and Pumps

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## Engines

From 2.8 to 40.0, Subaru Industrial Engines offers a horsepower to suit your needs. But that’s just the beginning. We lead the industry in innovation and durability, and we back that up with an industry-first five-year warranty. They run great. They last. And we have a model to fit your needs.

### EX SERIES OVERHEAD CAM

Check out the wide range of efficient, low-emission, long-lasting EX engines.



### EA SERIES VERTICAL SHAFT OVERHEAD CAM

Subaru was the first company to employ chain-driven



**EA175V**  
4.5 HP



**EA190V**  
5.5 HP

### SP SERIES OVERHEAD CAM

Quickly replace any slant cylinder engine with a more powerful, easy starting, quieter SP Series engine.



**SP170**  
5.7 HP



**SP210**  
7.0 HP

### EH SERIES V-TWIN OVERHEAD VALVE

Get horizontal or vertical PTO shaft versatility in our commercial-grade V-twin engines.



**EH64**  
20.5 HP



**EH65**  
22.0 HP



**EH65V**  
22.0 HP



**EH72**  
25.0 HP



**EH72**

### RAMMER ENGINES

Our overhead valve rammer engines use upright cylinder technology to provide continuous power in high-stress applications.



**EH09**  
2.8 HP



**ER12**  
3.5 HP





Get more uptime, reduce maintenance and experience the best warranty in the business — only from Subaru. All of our portable generators have outputs ranging from 2,900 to 13,000 watts, they are EPA- and CARB-compliant and we back them with an industry-leading 5-year limited warranty. So power up with low emissions and robust durability.

### INDUSTRIAL GENERATORS

Get professional-grade power that handles loads up to 13,000 watts.



### COMMERCIAL GENERATORS

Get 3,500 to 7,500 watts of hard-working, dependable, easy-to-move power.



### INVERTER GENERATORS

Get quiet operation and safe output to power anything from sensitive electronics to jobsite tools.





From contractors to homeowners to do-it-yourselfers, Subaru offers a long-lasting pump that fits the need. The Subaru line includes centrifugal, semi-trash, trash, high-pressure and diaphragm pumps. All models are construction-grade and come equipped with Subaru's industry-leading industrial engines.

### CENTRIFUGAL PUMPS

Our durable, self-priming pumps are sized for a wide range of applications.



**PKV110**  
28 GPM



**PKX220**  
172 GPM



**PKX320**  
291 GPM



**PKX401**  
356 GPM

### SEMI-TRASH PUMPS

Take on murky water with ease



**PKX220ST**  
153 GPM



**PKX320ST**  
246 GPM

### TRASH PUMPS

Don't let debris slow down your pumping operations.





**PKX201T**  
185 GPM



**PKX301T**  
314 GPM



**PKX401T**  
499 GPM

### HIGH-PRESSURE PUMPS

Move fluid uphill or longer distances with a high-pressure construction pump.



**PKX201H**  
127 GPM

### DIAPHRAGM PUMPS

Take on abrasive fluids without shock to the pump with this rugged design.



**PTX301D**  
66 GPM

### SUBMERSIBLE PUMPS

Compact, light-weight, easy to carry and handle.



**RPX-65011**  
68.5 GPM



**RPKS-65011**  
79 GPM



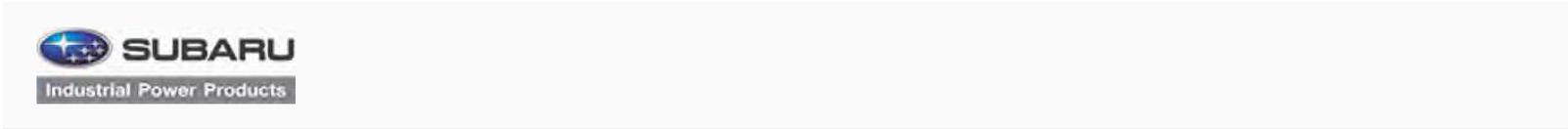
**RPB-65011**  
76.6 GPM



**RPS-65011**  
76.6 GPM



**RPXI**  
25



# EX13 – Overhead Cam Engine

## 4.5 HP

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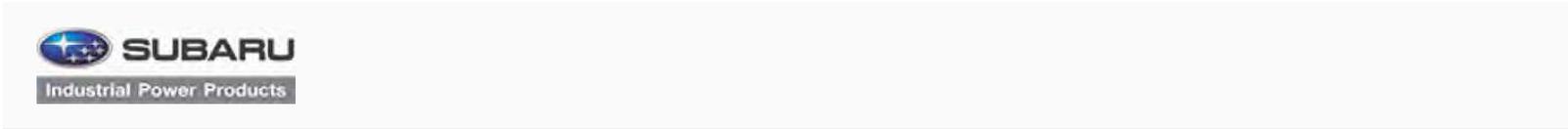


### EX Series





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# EX17 – Overhead Cam Engine

## 6.0 HP

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### EX Series





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# EX21 – Overhead Cam Engine

## 7.0 HP

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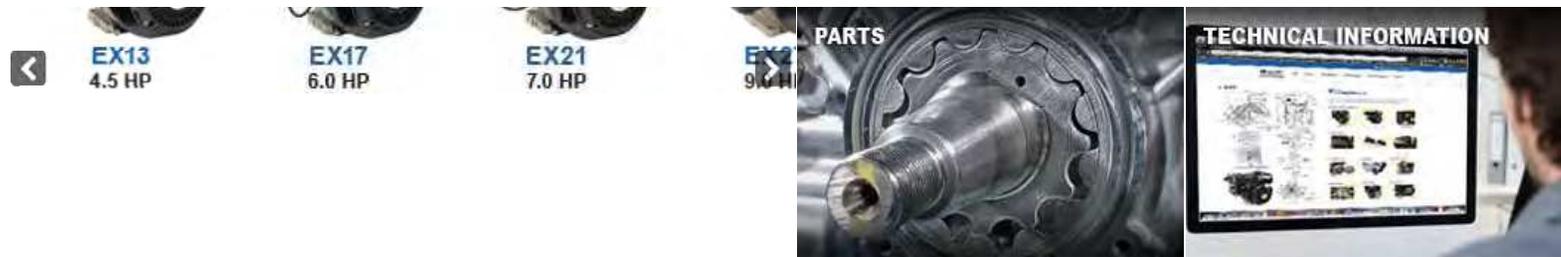
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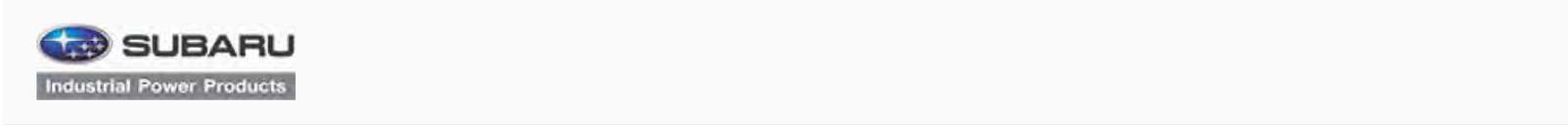


### EX Series





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# EX27 – Overhead Cam Engine

## 9.0 HP

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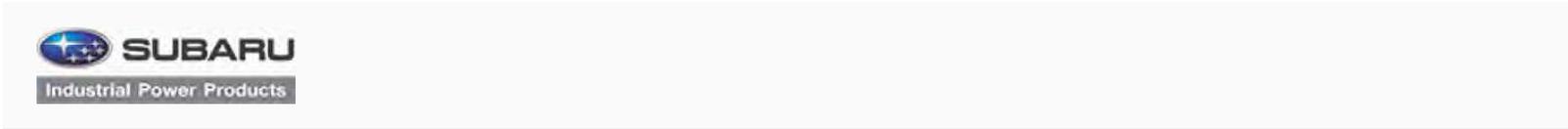


### EX Series





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# SP170 – Overhead Cam Engine

## 5.7 HP

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### SP Series





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# SP210 – Overhead Cam Engine

## 7.0 HP

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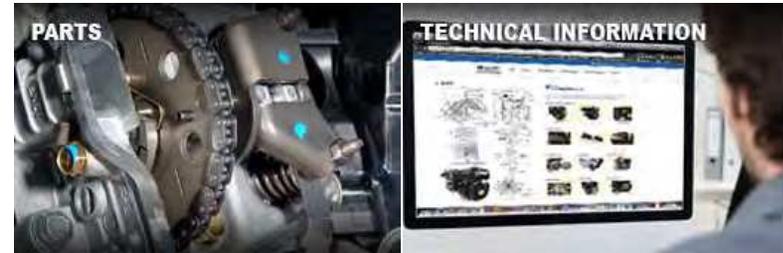
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### SP Series





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APE7015

420cc Engine  
Horizontal Shaft  
Electric Start

APE7009

291 cc Engine  
Horizontal Shaft

APE7007

208cc Engine  
Horizontal Shaft

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> Air Compressor

> Lawn Mowers

> Snow Blowers

> *Engines*

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 Corporate: +1 888.988.2299

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**B STYLE(188F-B/188FD-B)**



**B STYLE(182F-B/182FD-B)**



**B STYLE(177F-B/177FD-B)**



**B STYLE(173F-B/173FD-B)**



**B STYLE(170F-B/170FD-B)**





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E-mail: iec029@lifan.com; europe@lifan.com; latinamerica@lifan.com Website: www.lifan.com, www.lifanengine.ru

Add: Lifan Motorcycle Industrial Park, No.16, Fengxi Road, Caijiagang Town, Beibei District, Chongqing, P.R. China Zip: 400707





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Horizontal Shaft Gasoline Engine Product Series

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**B STYLE(168F-B/168FD-B)**



**B STYLE(160F-B)**



**A STYLE(190F-A/190FD-A)**



**A STYLE(188F-A/188FD-A)**



**A STYLE(182F-A/182FD-A)**



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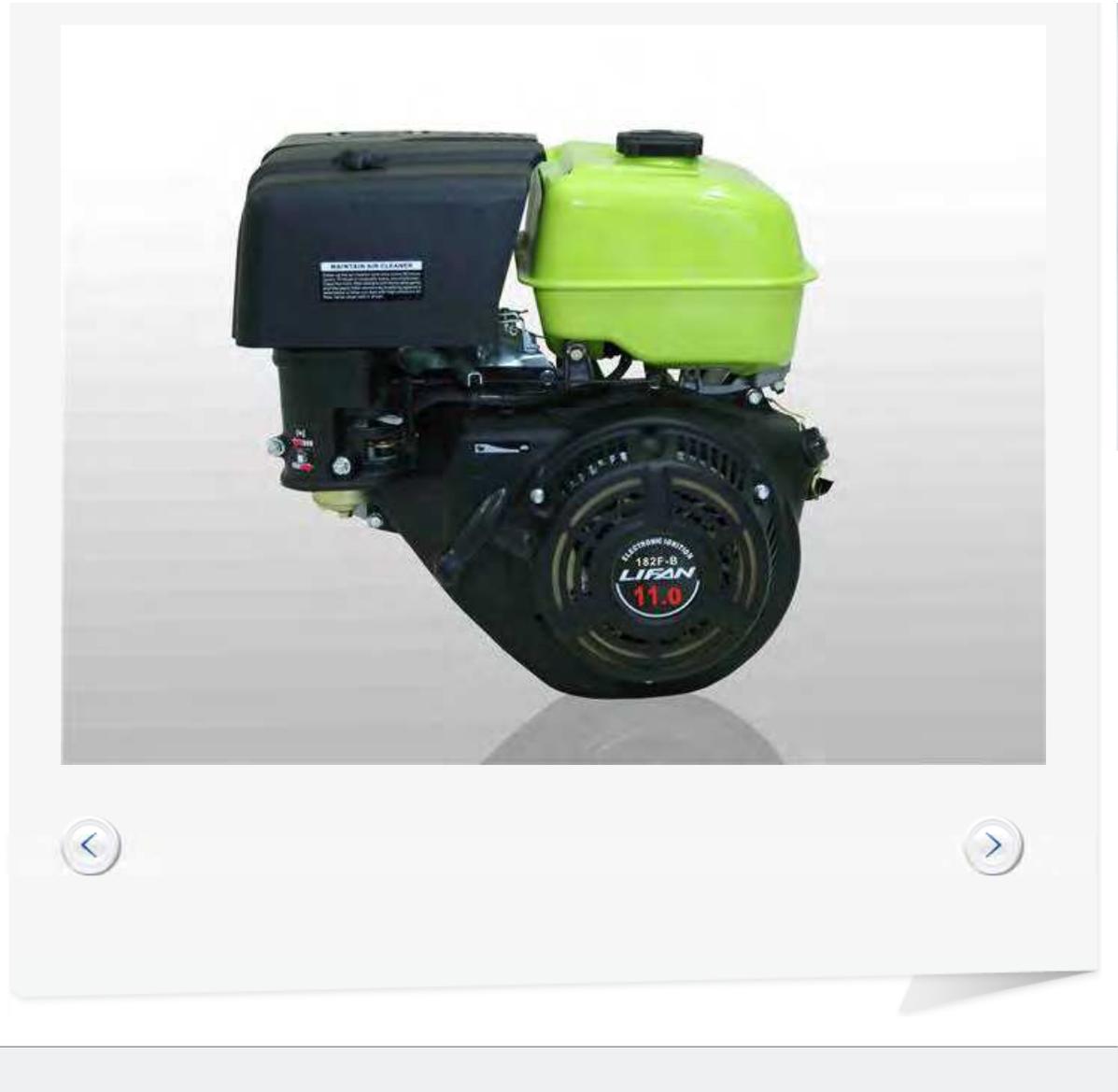


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## 182F-B/182FD-B

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Blue Max | Model # 6787 | Internet # 202342258  
**13 HP OHV Horizontal Shaft Gasoline Engine**

★★★★★ | [Write the First Review +](#) | [Questions & Answers \(1\) +](#)



**\$289.00** /each

 **OUT OF STOCK ONLINE**

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**PRODUCT OVERVIEW** | Model # 6787 | Internet # 202342258

Blue Max is a leading brand for over 10 years in professional outdoor power equipment and includes Generators, Chainsaws, Snow Blowers and Log Splitters. Expect the very best quality components in Blue Max equipment so they won't let you down on your outdoor projects. Blue Max equipment is built to work and start the first time, every time. The BLUE MAX 13 HP Gas Engine is an ideal choice for powering tools on the job site or at home. The OHV engine features an easy pull recoil start that powers the single cycle 4 stroke engine. The engine runs at 13 HP @ 3600 RPM and has an idle speed of 1400 RPM. A side shaft and counterclockwise rotation of the shaft make it versatile for a variety of uses.

- Assembled dimension: 17 in. W x 19 in. D x 19 in. H
- EPA approved
- Air Cooled
- 67 dBs for quiet operation
- Large fuel tanks for longer running time
- Tapered design for multiple applications
- Classic easy-start recoil system for reduced fatigue
- 1 Year warranty
- 13 HP commercial duty blue max engine
- Shaft size: 3.5 in. L x 1 in. D; 1/4 in. key and 7/16 in. x 20 NPT tapped end

## SPECIFICATIONS

### DIMENSIONS

Product Depth (in.)	19	Product Width (in.)	17
Product Height (in.)	19		

### DETAILS

Brand/Model Compatibility	Universal	Orientation	Vertical
Engine Displacement (cc)	389	Part Type	Engine

Engine Make	OEM Branded	Product Weight (lb.)	80.6 lb
Engine Type	2 Cycle	Recommended Oil type	SAE; 10W-30; API; SJ; or SL
Fuel tank capacity (gallons)	1.72	Returnable	30-Day
Oil capacity (oz.)	37.3	UPC	400999995910

**■ WARRANTY / CERTIFICATIONS**

Certifications and Listings	1-UL Listed,CSA Listed,ETL Listed	Manufacturer Warranty	1 Year Warranty
-----------------------------	-----------------------------------	-----------------------	-----------------

**SHIPPING AND DELIVERY OPTIONS**

**Standard Shipping** includes delivery by small parcel service. Processing time varies by product.

If product is eligible for shipping to AK, HI and US Territories additional transit time and remote surcharges may apply.



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## Blue Max GE65B 6.5 HP 4-Stroke Gas Powered Engine Horizontal Shaft

by [Blue Max](#)

[2 customer reviews](#)

Price: **\$225.00** & **FREE Shipping**

**In Stock.**

Ships from and sold by [50 Caliber Racing](#).

**Estimated Delivery Date:** July 17 - 22 when you choose Standard at checkout.

- Max Torque: 9.76 Ft/Lbs @ 2500 RPM
- Fuel: 86 Octane or Higher Unleaded
- Starting: Recoil Pull Start
- Easy to assemble--simply fill with fuel and oil to begin use
- This item is Non-CARB Compliant/Not For Sale In California

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Qty: 1 ▾

**\$225.00** + Free Shipping  
**In Stock.** Sold by **50 Caliber Racing**

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OH 43085

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(18)

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Engine - NOT Certified for  
California; Fuel Shut Off  
44

\$128.55



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Shaft Recoil Start Engine  
21

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DuroMax XP16HPE 16 hp  
Electric/Recoil Start Engine  
22

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DuroMax XP7HPE 7 hp  
Electric/Recoil Start Engine  
34

\$199.99



Lifan LF168F-2BQ 6.5 HP  
196cc 4-Stroke OHV  
Industrial Grade Gas  
Engine with Recoil Start  
16

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## Product Details

**Shipping Weight:** 37.4 pounds ([View shipping rates and policies](#))

**Domestic Shipping:** Item can be shipped within U.S.

**International Shipping:** This item is not eligible for international shipping. [Learn More](#)

**ASIN:** B001IDZ7XS

**Item model number:** GE65B

**Average Customer Review:** (2 customer reviews)

**Amazon Best Sellers Rank:** #462,624 in Patio, Lawn & Garden ([See Top 100 in Patio, Lawn & Garden](#))

#1060 in [Home Improvement](#) > [Rough Plumbing](#) > [Water Pumps, Parts & Accessories](#) > **Sump Pumps**

#312753 in [Home Improvement](#) > **Power & Hand Tools**

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18hp Horizontal Shaft,  
Conversion kit to fit  
Joh...

**\$1,350.00**

+ \$129.99 Est. shipping

**Small Engine**

**Warehouse**



STS1152R 2-Speed  
Pool Pump Motor 56J  
Frame 1.5 HP C-Face  
230V -...

(2)

**\$329.99**

No Shipping Info

**YourPoolHQ**



GN410-03010 15HP  
Horizontal 2-3/4"  
Tapered Shaft, Electric  
& Rec...

**\$495.00**

+ \$50.99 Est. shipping

**Small Engine**

**Warehouse**



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- 5 star 0%
- 4 star 0%
- 3 star 0%
- 2 star 50%
- 1 star 50%

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Horizontal 3/4"x2-5/16" Shaft,  
**\$350.00**  
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**Small Engine Warehouse**



LH358XA-34-Adj 10hp  
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Ad feedback

**Total JUNK**By [DrA53](#) on February 13, 2009**Verified Purchase**

This product arrived as promised by Amazon - great job! Packaging was also good. I removed the dipstick to add oil and the threads on the block and the overall condition were of horrible quality (hard to unscrew and replace the plastic dipstick). After adding the proper quantity of oil, I fueled it up and it started on first pull. It was quiet and responsive, so I thought that I had a good engine for a mid range pressure washer. I connected a pump that was designed for the output of the motor and again it started on the first pull - I was impressed. After running for a few minutes with the hose gun off and on, (running flawlessly), I shut it down to connect a guage to calibrate the pump. When I tried to start it again, there was no catch on the flywheel. Brand new engine and a problem such as that is unacceptable. I will stay with the H\*\*\*\*s in the future. If there are initial problems such as this, one can only imagine what the longevity of the product will be.

[1 Comment](#) Was this review helpful to you?

**roto man**By [paul torgl](#) on May 31, 2013

I have the 6.5 the markings for the choke gas and throttle are pore donot leave out in rain because water will go through air filter into the block a nightmare after draining oil and getting all moisture out it did start overall get a honda

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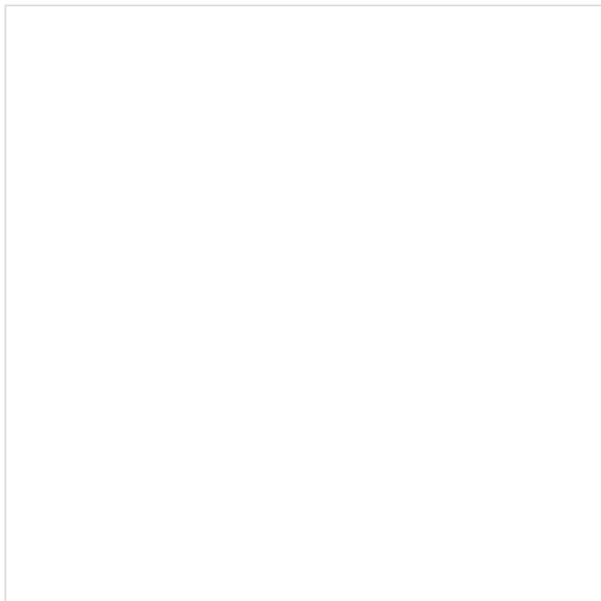
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Home / Lawn & Garden / Power Equipment / Small Engines & Accessories / Blue Max 11 HP 4-Stroke Gas Powered 340 CC Engine Horizontal Shaft 6785



### Blue Max 11 HP 4-Stroke Gas Powered 340 CC Engine Horizontal Shaft 6785

SKU: 31013100 | **Factory Shipped.**

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<b>DETAILS</b>	<b>SPECS</b>	<b>WARRANTY</b>	<b>REVIEWS</b>	<b>Q &amp; A</b>
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The Blue Max 11 HP Gas Engine is an ideal choice for powering tools on the job site or at home. The OHV engine features an easy pull recoil start that powers the single cycle 4 stroke engine. The engine runs at 11 HP @ 3600 RPM and has an idle speed of 1400 RPM. A side shaft and counterclockwise rotation of the shaft make it versatile for a variety of uses.

- Single Cylinder 340 CC 4- Stroke
- No Load 3600 RPM; Recoil Start
- Fuel Tank Capacity: 1.5 Gallons
- Engine oil capacity: 1.16 Quart
- Double walled heavy duty tank within tank fuel strainer
- This item is Non-CARB Compliant/Not For Sale In California



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Home / Engines / **Champion Series 389cc OHV Engine**



Model #61301

# CHAMPION SERIES 389CC OHV ENGINE

1 Year Limited Warranty

- Key switch electric start
- Easy pull recoil start
- Low oil shut-off

AVAILABLE AT THESE RETAILERS



**FEATURES**

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## **OVERVIEW**

The Champion 61301 gasoline powered, electric start, horizontal replacement engine provides reliable power for your small engine applications. The unit features an electric start 338cc Champion single cylinder, 4-stroke OHV engine with an automatic low oil shut-off switch, 100% copper wound alternator and horizontal shaft. It is perfect for a variety of applications: pressure washers, compressors, go-karts, log splitters, chippers/shredders and more!

## **FEATURES**

- Key switch electric start
- Easy pull recoil start
- Low oil shut-off
- 4-stroke engine
- Cast iron sleeve
- Air cooled



Home / Engines / **Champion Series 196cc OHV Engine**



Model #61151

# CHAMPION SERIES 338CC OHV ENGINE

1 Year Limited Warranty

- Key switch electric start
- Easy pull recoil start
- Low oil shut-off

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**FEATURES**

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## **OVERVIEW**

The Champion 61151 gasoline powered, electric start, horizontal replacement engine provides reliable power for your small engine applications. The unit features an electric start 338cc Champion single cylinder, 4-stroke OHV engine with an automatic low oil shut-off switch, 100% copper wound alternator and horizontal shaft. It is perfect for a variety of applications: pressure washers, compressors, go-karts, log splitters, chippers/shredders and more!

## **FEATURES**

- Key switch electric start
- Easy pull recoil start
- Low oil shut-off
- 4-stroke engine
- Cast iron sleeve
- Air cooled





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Item # 69736

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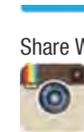


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### 6.5 HP (212cc) OHV Horizontal Shaft Gas Engine EPA

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Predator Engines - Item#69730

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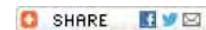
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Description

Specifications

This Predator 212cc gasoline engine has gas-saving overhead valves for cooler, cleaner performance and longer life. The horizontal shaft is ball-bearing mounted, making this gas engine an ideal replacement for most standard engine configurations. The powerful gas engine features a durable cast iron cylinder making it the perfect replacement engine for a lawn mower, log-splitter and dozens of other machines.

- Upgraded engineering and construction for improved lifespan
- Durable cast iron cylinder withstands wear and abuse
- User-friendly controls for easy starting and operation
- Fuel shut off for safe transport
- Ball bearing support shaft for long life
- For use on: pressure washers, cement mixers, compressors, mowers, log splitters, vacuums, tillers, water pumps, chipper/shredders, generators, blowers

Item for sale outside California only – please refer to item 69727 for California compliant model. This item can only be shipped within the 48 contiguous states via Standard Ground Shipping. In order to return this item for a refund or replacement, all fuel must first be drained.

Name	6.5 HP (212cc) OHV Horizontal Shaft Gas Engine EPA
SKU	69730
Brand	Predator Engines
Application	pressure washers, cement mixers, compressors, mowers, log splitters, vacuums, tillers, water pumps, chipper/shredders, generators, blowers
Certification	EPA

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### 13 HP (420cc) OHV Horizontal Shaft Gas Engine EPA

**PREDATOR**  
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Predator Engines - Item#60340

[Read 8 Reviews](#) [Write A Review](#)

Replacement for 13 HP Gasoline Engines

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Qty: 1

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22 HP (670cc) V-Twin  
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Engine EPA

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 <p><a href="#">6.5 HP (212cc) OHV Horizontal Shaft Gas Engine EPA</a></p> <p>Item # 69730 Only: <del>\$279.99</del> <b>Sale: \$119.99</b></p> <p><b>ADD</b> <a href="#">Add to Wishlist</a></p>	 <p><a href="#">18 Volt 3/8 In. Cordless Drill/Driver With Keyless Chuck, 21 Clutch Settings</a></p> <p>Item # 68239 Only: <del>\$34.99</del> <b>Sale: \$22.99</b></p> <p><b>ADD</b> <a href="#">Add to Wishlist</a></p>	 <p><a href="#">7 Function Digital Multimeter</a></p> <p>Item # 90899 Only: <del>\$14.99</del> <b>Sale: \$5.99</b></p> <p><b>ADD</b> <a href="#">Add to Wishlist</a></p>	 <p><a href="#">12 In. Double-Bevel Sliding Compound Miter Saw With Laser Guide System</a></p> <p>Item # 61969 Only: <del>\$299.99</del> <b>Sale: \$194.99</b></p> <p><b>ADD</b> <a href="#">Add to Wishlist</a></p>	 <p>4000 Peak/3200 Running Watts, 6.5 HP (212cc) Generator EPA III</p> <p>Only: <del>\$499.99</del> <b>Sale: \$339.99</b></p>
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**Description**



This Predator 420cc gasoline engine has gas-saving overhead valves for cooler, cleaner performance and longer life. The horizontal shaft is ball-bearing mounted, making this gas engine an ideal replacement for most standard engine configurations. The powerful gas engine features a durable cast iron cylinder making it the perfect replacement engine for a lawn mower, log-splitter and dozens of other machines.

- Upgraded engineering and construction for improved lifespan
- Durable cast iron cylinder withstands wear and abuse
- User-friendly controls for easy starting and operation
- Fuel shut off for safe transport
- Ball bearing support shaft for long life
- For use on: pressure washers, compressors, log splitters, vacuums, tillers, water pumps, chipper/shredders, blowers

Item for sale outside California only – please refer to item 69736 for California compliant model. This item can only be shipped within the 48 contiguous states via Standard Ground Shipping. In order to return this item for a refund or replacement, all fuel must first be drained.

**Specifications**

Name	13 HP (420cc) OHV Horizontal Shaft Gas Engine EPA
SKU	60340
Brand	Predator Engines
Application	pressure washers, compressors, log splitters, vacuums, tillers, water pumps, chipper/shredders, blowers
Certification	EPA
Diameter	90mm

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### 8 HP (301cc) OHV Horizontal Shaft Gas Engine EPA

**PREDATOR**  
ENGINES

Predator Engines - Item#61415

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**Replacement for 8 HP Gasoline Engines**

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13 HP (420cc) OHV Horizontal Shaft Gas Engine EPA  
~~Only: \$449.99~~  
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 <p><a href="#">6.5 HP (212cc) OHV Horizontal Shaft Gas Engine EPA</a></p> <p>Item # 69730 Only: <del>\$279.99</del> <b>Sale: \$119.99</b></p> <p><b>ADD</b> <a href="#">Add to Wishlist</a></p>	 <p><a href="#">13 HP (420cc) OHV Horizontal Shaft Gas Engine EPA</a></p> <p>Item # 60349 Only: <del>\$449.99</del> <b>Sale: \$359.99</b></p> <p><b>ADD</b> <a href="#">Add to Wishlist</a></p>	 <p><a href="#">13 HP (420cc) OHV Horizontal Shaft Gas Engine EPA/CARB</a></p> <p>Item # 69736 Only: <del>\$449.99</del> <b>Sale: \$359.99</b></p> <p><b>ADD</b> <a href="#">Add to Wishlist</a></p>	 <p><a href="#">18 Volt 3/8 In. Cordless Drill/Driver With Keyless Chuck, 21 Clutch Settings</a></p> <p>Item # 68239 Only: <del>\$34.99</del> <b>Sale: \$22.99</b></p> <p><b>ADD</b> <a href="#">Add to Wishlist</a></p>	 <p><a href="#">22 HP (670cc) V-Twin Horizontal Shaft Gas Engine EPA</a></p> <p>Only: <del>\$899.99</del> <b>Sale: \$699.99</b></p>
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Description

Specifications

This Predator 301cc gasoline engine has gas-saving overhead valves for cooler, cleaner performance and longer life. The horizontal shaft is ball-bearing mounted, making this gas engine an ideal replacement for most standard engine configurations. The powerful gas engine features a durable cast iron cylinder making it the perfect replacement engine for a lawn mower, log-splitter and dozens of other machines.

- Upgraded engineering and construction for improved lifespan
- Durable cast iron cylinder withstands wear and abuse
- User-friendly controls for easy starting and operation
- Fuel shut off for safe transport
- Ball bearing support shaft for long life
- For use on: pressure washers, compressors, log splitters, vacuums, tillers, water pumps, chipper/shredders, blowers

Item for sale outside California only – please refer to item 61563 for California compliant model. This item can only be shipped within the 48 contiguous states via Standard Ground Shipping. In order to return this item for a refund or replacement, all fuel must first be drained.

Name	8 HP (301cc) OHV Horizontal Shaft Gas Engine EPA
SKU	61415
Brand	Predator Engines
Application	pressure washers, compressors, log splitters, vacuums, tillers, water pumps, chipper/shredders, blowers
Certification	EPA
Engine displacement (cc)	301cc

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Hundreds of OEMs trust Honda to power their products on thousands of products throughout the world. Why should you be one of them?

### Honda's brand adds value to your product, instantly.

Honda is one of the most recognized and valued brands in America. In fact, we are consistently rated in the top 20 brands – higher than any other engine manufacturer.

When a customer sees "Honda" on your product, they immediately recognize the quality, reliability, and value. Adding Honda engines to your product instantly adds value to your product.

### Honda engines are preferred by users, year after year.

Ask rental and construction workers which engines they prefer on their equipment. You'll hear "Honda" time after time. And we've got the awards to prove it.

That's why we've been consistently the #1 engine supplier to the construction and rental industry for years.

### Durability. Period.

Honda sets the standard for reliable, hard-working engines. We build them with high quality components and rigorous manufacturing standards. You can trust that our engines will last, from top to bottom.

Sure, you can get another engine that costs less. But dollar for dollar, you can't find another engine that will last longer or be more reliable.

### Three year warranty for your customers' piece of mind.

Honda offers a full three year commercial warranty on all GX engines, 100cc and larger. We stand behind our product with an industry-leading warranty.

### Top notch product development support

Our corporate team and our distributor partners are ready and willing to work with you. Whether you're looking at millions of units or a few hundred, you'll get quality support to fill your needs.

### Rigorous application approval

Honda will work with you to make sure you get the right Honda engine to power your application – which leads to better customer satisfaction.

Honda's in house application engineers conduct a thorough review of every product powered by a Honda engine. We make sure the engine is operating properly in your specific application. This leads to a long lasting engine, which in turn, means you'll have a more satisfied and loyal customer.

With Honda on your side, you never have to worry if you've got the right engine. We make sure you've got the right model to supply your high quality power needs.

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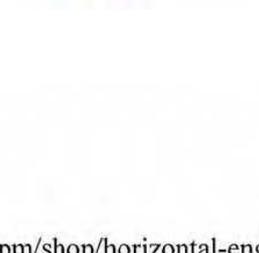
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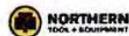
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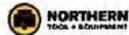
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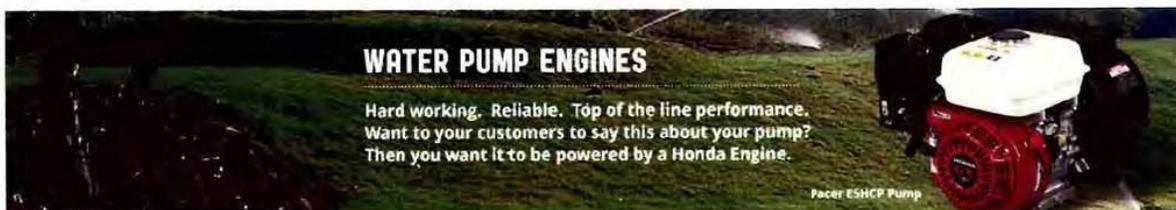
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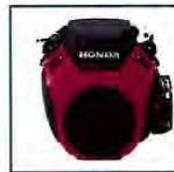
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We've got a well-earned reputation for our engine quality and performance. When you choose a Honda engine, or a product powered by Honda, you know what you're getting. An engine you can count on, now and in the future.

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Honda sets the standard for reliable, hard-working engines. Our engines are built with high-quality components designed for optimum performance in the harshest environments.

But don't just take our word for it. Honda stands behind our engines with an industry-leading three year commercial warranty on all GX engines, 100cc and larger.

Or ask a Honda engine owner. Next time you visit a rental center, see a landscape truck, or pass by a construction site, you'll probably see a Honda GX engine-powered piece of equipment. Stop and ask them what they think of the Honda engine. Chances are they'll tell you they wouldn't use anything else.

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In addition, Honda engines meet CARB exhaust emission requirements without the use of a catalytic converter.

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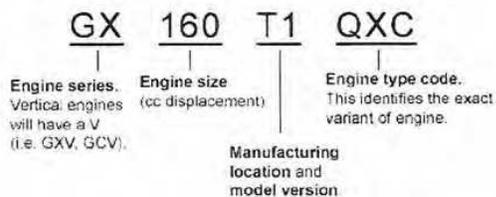
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## Engine Type Identification

Honda Engines use a standard model naming convention.



### Finding the Engine Model

To find the model number, look for a model number sticker on the engine.

All Honda engines model numbers start with the letter "G," such as "G100", "GX610", or "GXV160."

This is the base engine model. The engine model and serial number should be adequate for most of your needs.

However, if you need the detailed engine type, you can find an engine identification guide here.



### Finding the Engine Type Code

The engine type code is stamped into the side of the engine, usually close to the serial number. Engine type codes may be up to 4 characters. If a code is less than 4 characters, you may see asterisks as placeholders (i.e. an engine stamped with QX\*\* is a QX type engine.)



### Finding the Engine Serial Number

The engine serial number is stamped into the side of the engine. All Honda engine serial numbers have a 4 or 5 letter prefix followed by a 7 digit number.



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- Recalls/Updates



## Model and Serial Number Locations

### Finding the Engine Model

To find the model number, look for a model number sticker on the engine.

All Honda engines model numbers start with the letter "G," such as "G100", "GX610", or "GXV160."

This is the base engine model. The engine model and serial number should be adequate for most of your needs.

However, if you need the detailed engine type, you can find an engine identification guide [here](#).



### Finding the Engine Serial Number

The engine serial number is stamped into the side of the engine. All Honda engine serial numbers have a 4 or 5 letter prefix followed by a 7 digit number.

Honda Engines - Serial number locator



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Engine Series:



Snow Power Series 5.7-9.5 HP

Vertical Shaft OHC 4.5-5.5 HP



SP Series 5.7-7 HP

Micro 1.1-1.6 HP



Overhead Cam 4.3-14 HP

OHV for Rammer 2.4-4 HP



OHV Slant Cylinder 11.5-13.5 HP

OHV Vertical Cylinder 6-11 HP



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Barreto Manufacturing Testimonial

><http://www.barretomfg.com/>

Greg Barreto of Barreto manufacturing discusses how the features of the EX series engines have benefited his customers.

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# Why Choose a Honda Pump?

## **HONDA<sup>™</sup>** **PUMPS**

### **Powerful Honda 4-stroke engines**

It all starts with the legendary Honda 4-stroke engine. Because let's face it, that's the heart of any pump. Durable Honda GX series commercial grade engines are easy starting and provide ample power for the toughest conditions.

Honda engines have long been recognized by the construction and rental industries as the leader in providing reliable, quiet, fuel-efficient power. And of course, our pumps are no exception.

Why choose a Honda Pump?

## Outstanding performance



Honda pumps don't skimp on the features you need to achieve superior performance. From durable silicon carbide seals to cast iron impellers and rigid mounted volutes, our pumps are designed to provide unsurpassed performance and durability in a variety of applications.

## Unmatched quality and reliability

You want a pump that's going to be reliable, day in and day out. And with Honda, that's exactly what you get. Honda has a well-deserved reputation for reliability. Our pumps are designed to keep on going, year after year.

## 3 year warranty on most models

Need more assurance that Honda pumps don't quit? How about a 3 year warranty for residential, commercial, and rental use? [Learn more here.](#)



## Outstanding dealer support

Honda pumps are backed by a [comprehensive warranty](#) and the best dealer network in the country. With over 2000 authorized Honda dealers nationwide, [finding a local dealer](#) is easy. And getting the best in class service is never in doubt.

- Parts and service support are readily available across the country
- Our dealers offer trained staff ready to support you

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- [Accessories](#)

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- [Shop Manuals](#)
- [Parts Information](#)
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- [Product Registration](#)
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**Honda Horizontal OHV Engine — 160cc, GX Series, 3/4in. x 2 7/16in. Shaft, Model# GX160UT2QX2**

(Item# 6059)

**Only \$359.99**

Manufacturer's Warranty  
3 year limited warranty

**In Stock**

**Customer Product Rating**

★★★★★ 4.8 / 5

23 of 24 would recommend this product to a friend.

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**Description**

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**OVERVIEW**

The Honda 160cc GX Series OHV Commercial-Grade Horizontal Engine is designed for the most demanding commercial applications. It has set an industry standard for reliability and durability. Overhead Valve design offers cooler, fuel-efficient operation and cast iron cylinder sleeve provides longer service life. The GX is reliable, easy starting and quiet running. Meets EPA and CARB emission levels standards. This legendary engine has earned the reputation as the preferred engine for construction equipment. Common applications include pressure washers, compressors, log splitters and chipper/shredders.

**FEATURES + BENEFITS**

- Honda 160cc OHV air-cooled, 4-stroke, horizontal engine
- Fuel efficient, high-output operation with precision camshaft design and a high compression ratio
- OHV design delivers increased efficiency and optimal power transfer
- Smooth performance and reduced vibration from precision-balanced crankshaft and reduced piston weight
- Ball bearing-supported crankshaft offers greater stability
- Aluminum push rods reduce both valve clearance and noise level
- Muffler, breather valve, case cover, air intake system, rigid crankcase, helical-cut gears and lightweight materials are also designed to reduce noise level
- Oil alert protects engine
- Carburetor coating and filter help protect fuel from impurities
- Cast iron cylinder sleeve
- Reliability comes from high-quality materials, fit and finish

**KEY SPECS**

<b>Engine Displacement (cc)</b>	160
<b>Start Type</b>	Recoil
<b>Application</b>	Pressure washer, compressor, log splitter, chipper/shredder
<b>Engine Type</b>	GX series OHV--commercial duty
<b>Rated Power (HP)</b>	4.8
<b>Torque (ft./lbs.)</b>	7.80 at 2,500 RPM
<b>Shaft Output</b>	Horizontal
<b>Crankshaft</b>	Q-type
<b>Shaft Diameter (in.)</b>	3/4
<b>Shaft Length (in.)</b>	2 7/16
<b>Shaft Keyway (in.)</b>	3/16
<b>Shaft End Tapped (Diameter (in.)/Threads per inch)</b>	5/16-24
<b>Shaft Rotation (From PTO Shaft Side)</b>	Counterclockwise
<b>PTO Height (in.)</b>	4 11/64
<b>Bearing Type</b>	Ball
<b>Cylinders (qty.)</b>	1

Dual-element air cleaner

Easy to use and maintain with simple throttle control, large fuel tanks, wide-mouth automotive-style fuel cap, dual oil fills and drains, easy to use control box and easily accessible spark plug

Get quick starts with the heavy-duty recoil starter with ergonomic design and automatic decompression system

50-state compliant engine

**WHAT'S INCLUDED**

(1) Engine

<b>Cylinder Bore</b>	Cast iron
<b>Bore x Stroke (in.)</b>	2.7 x 1.8
<b>Compression Ratio</b>	8.5:1
<b>Cooling System</b>	Air cooled
<b>Air Cleaner Type</b>	Dual element
<b>Fuel Tank</b>	Standard (White)
<b>Fuel Type</b>	Gasoline
<b>Fuel Tank Capacity (qt.)</b>	3.3
<b>Oil Capacity (qt.)</b>	0.63
<b>Lubrication System</b>	Forced splash
<b>Low Oil Shutdown</b>	Yes
<b>Ignition System</b>	Electronic
<b>Governor System</b>	Centrifugal mechanical
<b>Carburetor</b>	Float, external vent
<b>Throttle Control</b>	Remote (wire)
<b>Choke Control</b>	Manual
<b>Max. RPM</b>	3,600
<b>Muffler Included</b>	Yes, (standard)
<b>Auto Compression Release</b>	Yes
<b>Bolt Circle (in.)</b>	3 5/8
<b>Mounting Base L x W (in.)</b>	6 3/8 x 3 5/32 to 3 11/32
<b>Dimensions L x W x H (in.)</b>	12 x 13 3/8 x 12 1/2
<b>EPA/CARB Approval (California Air Resource Board)</b>	Yes
<b>Manufacturer Warranty</b>	3 year limited warranty
<b>Ship Weight</b>	40.0 lbs
<b>Item#</b>	6059

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## Honda launches new mid GX engine lineup

Posted By [Tina Grady Barbaccia](#) On January 18, 2011 @ 9:37 pm In [Industry, Press Releases, Products and Innovations](#) | [No Comments](#)

**Honda** has launched its new mid GX engines line at the **2011 World of Concrete trade show** being held in Las Vegas Jan. 17-21, 2011.

Completely redesigned for 2011, the new **GX120**, the **GX160** and the **GX200** are **single-cylinder, horizontal-shaft engines** that replace the existing GX120, GX160 and GX200 models. The lineup is an ideal fit for an array of commercial turf applications and equipment including generators; **construction/industrial equipment**; agricultural equipment; water pumps; and pressure washers.

The **new Honda mid GX engines**, while being dimensionally equivalent and having the same power output of the models they replace, boast increased performance resulting, in part, from the incorporation of these innovative features:

- improved fuel economy through changes in valve timing, compression ratio, carburetor settings, and cooling system modifications;
- new, more stringent emissions standards met through changes in valve timing; carburetor settings; and other proprietary components;
- low noise levels achieved via a change in muffler structure design, breather valve, push rod materials, and crank/case cover rigidity; reduced vibration accomplished through use of a lighter engine piston.

The new mid GX engines also are equipped with a number of design enhancements, including a new carburetor chamber coating; a recoil rope design change; the addition of a carburetor filter; and an improved fuel tank guard – all of which improve their fuel economy, reliability and durability.

"As a global environmental leader, Honda developed our new mid GX engines with technologically advanced features that contribute to lower emissions, lower noise, lower vibration and nearly 100 percent installation capability for OEMs in the commercial power equipment market," **Mike Rudolph, senior manager of Honda Engines**, said in a written press statement. "Because the new engines essentially match the dimensions of the existing GX models they replace, original equipment manufacturers will not have to modify the designs of their commercial equipment."

### ***A Closer Look at Emissions Standards in 2011 and Beyond***

The new **Honda GX120, GX160 and GX200 mid GX engines** meet **EPA Phase 3 exhaust and evaporative emissions standards** – the most stringent emission regulations in the world. As background, the EPA has finalized a new emission control program to reduce hydrocarbon emissions from small spark-ignition engines by approximately 35 percent.

These **new exhaust emissions standards** will take effect in 2011 or 2012, depending on the size of the engine. The final rule also includes new standards to reduce evaporative emissions from these fuel systems. Ultimately, these standards will serve to reduce the ozone and carbon monoxide levels produced by these engines.

The design configuration of the new Honda mid GX models reduces pollutants such as hydrocarbons (HCs) and nitrous oxide (NOx) while maintaining the same level of output power as the previous Honda GX models they replace. "The engines reduce HCs by reducing oil consumption via a redesigned piston shape and piston ring along with a modified carburetor setting. In addition, the engine designs reduce NOx emissions through an

adjustment in ignition timing which reduces combustion temperature and pressure," explained Rudolph.

#### **Reduction of Noise and Vibration and in the New Honda Mid GX Models**

In the new mid range GX160 engines, the composition of the push rods has been changed from steel to aluminum. Because the cylinder heads also are constructed from aluminum, this design change equalizes the linear expansion coefficient (the ratio at which the length of the push rod changes from reaction to engine heat) of the push rods. This improvement reduces the valve clearance (caused by the thermal expansion of the push rods and the cylinders) which reduces the tappet noise. The new engines also exhibit three primary design enhancements that contribute to class-leading low noise operations. Enhancements to the muffler, the breather valve and the case cover (GX160/200 models only) result in lower noise levels:

**Current Honda GX120:** 101 dBA **New Honda GX120:** 99 dBA – dual silent spec

**Current Honda GX160:** 102 dbA **New Honda GX160:** 99 dBA – dual silent spec

**Current Honda GX200:** 103 dbA **New Honda GX200:** 101 dBA – dual silent spec

Turning to the issue of vibration, any engine generates vibration through the reciprocal movement of the pistons. In the new mid GX models, the piston weight has been reduced and the crank weight has been adjusted according to the piston weight and connecting rod weight. As a result, the crankshaft rotates to counterbalance the reciprocal movement force of the pistons – reducing primary engine vibration.

All three new mid GX models – the GX120, the GX160 and the GX200 – carry the Honda industry-competitive, three-year warranty.

Comprehensive details about this warranty offering and other consumer information can be found at [www.honda.com](http://www.honda.com).

<b>Specifications for Honda Mid GX Engines</b>			
	<b>GX120</b>	<b>GX160</b>	<b>GX200</b>
<b>Engine Type</b>	Air-cooled, 4-stroke, OHV, single cylinder		
<b>Bore X Stroke (inches/mm)</b>	2.4" X 1.7" (60 mm X 42 mm)	2.7" X 1.8" (68 mm X 45 mm)	2.7" X 2.1" (68 mm x 54 mm)
<b>Displacement</b>	7.2 cubic in. (118 cm <sup>3</sup> )	9.9 cubic in. (163 cm <sup>3</sup> )	12 cubic in. (196 cm <sup>3</sup> )
<b>Compression Ratio</b>	8.5 : 1	9.0 : 1	8.5 : 1
<b>Net Power (kW/rpm)*</b>	3.5 hp (2.6 kW)	4.8 hp (3.6 kW)	5.5 hp (4.1 kW)
<b>Net Torque*</b>	5.4 lbs. ft. (7.3 Nm)	7.6 lbs. ft. (10.3 Nm)	9.1 lbs. ft. (12.4 Nm)
<b>PTO Shaft Rotation</b>	Counterclockwise (from PTO shaft side)		
<b>Ignition System</b>	Transistor Magneto		
<b>Starting System</b>	Recoil Starter		
<b>Carburetor</b>	Butterfly		
<b>Lubrication System</b>	Splash		
<b>Governor System</b>	Mechanical		
<b>Air Cleaner</b>	Dual Element		
<b>Oil Capacity</b>	0.59 US qt. (0.56 L)	0.61 US qt. (0.58 L)	0.63 US qt. (0.60 L)
<b>Fuel Tank Capacity</b>	2.1 US qt. (2.0 L)	3.3 US qt. (3.1 L)	3.3 US qt. (3.1 L)



MEDIA NEWSROOM

Published At: 01/24/2012

Printed At: 10/02/2012

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## Honda Engines Background Information

Honda is the world's largest manufacturer of engines, producing and marketing approximately 27 million units globally in 2010 for a diverse array of automotive, motorcycle, marine, and power equipment products. Honda Engines offers a complete line of small, general purpose engines for commercial, rental industry, and consumer applications. Honda engines supply smooth and dependable power for more than 3,000 different product applications including pressure washers, lawnmowers, and rescue and construction equipment.

Additionally, Honda engines are some of the quietest and easiest to start of their kind, even in harsh commercial and construction environments. Such attributes have made Honda engines the popular choice for original equipment manufacturers looking to add value to their own brands.

### One Engine for All

Honda continuously works to meet future, lower EPA and CARB standards regarding the performance of its products. In January 2007, Honda Engines began certifying its models to the new, lower California Air Resources Board (CARB) 2007 standards, existing EPA Phase 2 emission requirements and offering 50 state compliant engines. Investing in meeting the strictest of environmental requirements in the development of one engine for use in all 50 states reflects Honda's forward thinking on emission regulations, air quality and the needs of its customers. Moreover, Honda engines meet the new CARB exhaust and evaporative emissions requirements without the use of a catalytic converter.

As a result, the overall emission levels from Honda engines have been reduced by more than 32 percent compared to 1995. Further, the EPA implemented a new emission control program to reduce hydrocarbon emissions from small spark-ignition engines by approximately 35 percent. Honda engines are in compliance with the current EPA Phase 3 standards (for both exhaust and evaporate emissions).

### Defining Net Power in Honda Engines

The SAE J1349 standard measures net horsepower with the manufacturer's production muffler and air cleaner in place. Net horsepower more closely correlates with the power the operator will experience when using a Honda engine powered product. The power rating of the engines indicated in this document measures the net power output at 3600 rpm (7000 rpm for model GXH50, GXV50, GX25 and GX35) and net torque at 2500 rpm, as tested on a production engine. Mass production engines may vary from this value.

Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operation speed of the engine in application, environmental conditions, maintenance and other variables.

### Product Line

Honda produces 37 models in four basic series:

Series	Primary Uses
Mini Four-Stroke – 2 models	Hand-held portable equipment
GX (Overhead Valve) – 26 models iGX (Overhead Cam) 3 models	Commercial and rental equipment  Commercial and rental equipment

GS (Overhead Cam) 2 models	Premium residential and light-duty commercial markets
GC (Overhead Cam) – 4 models	Premium residential power equipment

Starting with these 37 basic models, Honda offers more than 400 variations to meet a wide variety of needs and applications.

**Mini Four-Stroke Technology for Better Performance, Cleaner Air**

The advanced design of Honda's mini-four stroke engines, including a cross-flow combustion chamber, provides a wide, smooth range of torque unique to four-stroke technology. State-of-the-art design and manufacturing techniques have reduced the number of moving parts. Many of these techniques have resulted in reduced engine weight and smoother operation for the end user.

The Honda GX35 mini four-stroke engine is Honda's most powerful engine for handheld applications. Based on the same Honda 360-degree-inclinable mini four-stroke technology as the GX25, the 35.8cc GX35 features an oil-immersed timing belt and overhead-cam (OHC) architecture.

Unlike many two-stroke competitors, the GX35 delivers powerful output across a wide range of operating speeds with ample low-speed torque, which means that it does not always need to be operated at wide open throttle. This reduces noise and operator fatigue while substantially increasing fuel economy.

**Honda GC Series of Overhead Cam Engines**

The GC Series is Honda's solution to the need for quiet, efficient engines specifically designed for home-use power equipment applications. Honda's innovative design features – including the world's first internal timing belt on an engine of this kind, a tough nylon overhead cam, and uniblock construction – make the engines lighter and more compact than other engines in their class with significantly reduced noise, fuel and oil consumption.

Combined with Honda's innovative Dualube™ lubrication system, the result is a simple, sophisticated design that minimizes the number of parts and can reduce some potential maintenance needs.

The GC Series includes the GC160/GC190 (horizontal shaft) and the GCV160/GCV190 (vertical shaft) models. Honda GC Series engines are designed specifically for premium, high volume residential power equipment applications. Horizontal shaft models are ideal for a variety of consumer products, including pressure washers, water pumps, compressors, and portable generators. Vertical shaft models typically power devices like lawnmowers and pressure washers but also find applications in other residential uses.

Additionally, Honda also introduced electric start options on the GC/GCV160 and GC/GCV190 models, available nationally through Honda Engine distributors and to OEMs.

**Honda GS Series of Overhead Cam Engines**

The Honda GS Series is positioned squarely between the GC Series premium residential and the GX Series commercial engines.

The GS190 horizontal shaft and GSV190 vertical shaft models are designed to serve both premium residential and light-duty commercial markets. Intended for use on such popular applications as pumps, blowers, mowers, and tillers, these Honda models satisfy the homeowner seeking ultimate performance, and the contractor seeking a lightweight, compact package.

Capitalizing on the same basic OHC architecture as Honda's extremely popular GC engines, the GS features uniblock construction and a unique internal timing belt design that results in the lightest and most compact package in its class. With 187 cubic centimeters of displacement, this efficient design also delivers an unparalleled power-to-weight ratio with quiet operation, and easy starting.

To further enhance performance and durability, the Honda GS engines incorporate a cast iron cylinder sleeve and a redesigned piston with a three-piece oil control ring. Adding to the engine's commercial character, the GSV190 features ball bearings on the flywheel side of the crankshaft, while the GS190 utilizes ball bearings at



## Engines

### Honda Power Equipment launches its redesigned GX120, GX160 and GX200 mid GX engines at CONEXPO-CON/AGG 2011

Completely redesigned for 2011, Honda's new GX120, the GX160 and the GX200 are single-cylinder, horizontal-shaft engines that replace the existing GX120, GX160 and GX200 models. Honda Power Equipment said that the lineup is an ideal fit for equipment including generators, construction and industrial equipment, water pumps and pressure washers.

The new Honda mid GX engines have equivalent dimensions and the same power output as the models they replace, but boast increased performance, according to Honda. They incorporate features including improved fuel economy through changes in valve timing, compression ratio, carburetor settings, and cooling system modifications. New, more stringent emissions standards are met through changes in valve timing, carburetor settings and other proprietary components, said the company. Low noise levels are achieved via changes including the muffler structure while reduced vibration is accomplished through use of a lighter engine piston, said Honda.



Honda has revealed its newly redesigned GX engines

[www.honda.com](http://www.honda.com)

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Lawn Mowers

Lawn Spreaders

Lawn Sweepers + Vacuums

Leaf Blowers

Rain Barrels

Shovels

Sprayers



NorthStar Compact Stump Grinder - Honda GX160 Engine

Item# 296026

The highly portable NorthStar Compact Stump Grinder quickly removes entire tree stumps. Its commercial-grade Honda GX engine and carbide-tipped teeth let anyone do a professional job. Designed to go where larger grinders cannot and fits through narrow paths, walkways, doorways or gates and is light enough to be lifted over retaining walls but doesn't sacrifice power. The grinder fits into cars, trucks and vans, eliminating the need to trailer it. The side discharge design allows smooth forward advancement by directing cuttings away from the wheels and frame while grinding. Tire Size in, 12 x 6, Walk or Pull Walk, Engine Honda GX160, Application Stump grinder. Dependable Honda GX160 Engine Compact design fits through narrow doorways, gates and paths and makes the grinder small enough to be transported in cars, trucks and vans 9 2/3in. dia. x 3/8in. cutting wheel with 4 long life carbide-tipped teeth Grinds stumps from 10in. above grade to 9in. below grade Side discharge directs cuttings away from wheels and frame for smooth forward advancement Light enough to lift over retaining walls Handle and frame are designed with a balance point engineered to reduce operator fatigue Tri-Power molded Gates belt made with exclusive EPDM construction for higher heat resistance, smoother operation and a longer service life Folding handle has easy grip operating controls 12in. dia. wheels for easy maneuvering and positioning

Average Customer Rating:



2 of 2 (100%) would recommend this product to a friend



Customer Reviews for NorthStar Compact Stump Grinder- Honda GX160 Engine

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Overall Rating: 5 / 5

compact stump grinder works great!, April 5, 2012  
By ButchW from Madisonville KY

"This is an easy machine to use and runs smoothly. You have to give the project time and you can grind fresh stumps easily, I've used mine three times now and can mow where the tree was without worries. Easy to unfold move around and operate. Honda engine is easy to start and strong. Controls are also simple and easy to use. Chip discharge is like a lawn mower. You will need a little funnel to put in oil before you start it. Three stumps and no sign of wear as yet! Nice machine!"

Describe Yourself: Home Handyman

7 out of 7 found this review helpful.

Share this Review:

REVIEW 2 FOR NORTHSTAR COMPACT STUMP GRINDER - HONDA GX160 ENGINE

Overall Rating: 5 / 5

Easy to use, August 13, 2012  
By AJGR from McDade Texas

"I have ground around 16 stumps, these were mostly oak around 2-6 years old. They were very hard. The carbide cutting teeth show that they have been used, but do not need to be sharpened at this time. I thought that the machine would work me to death(I am 69), but to my surprise the machine was easy to use did not make me tired using it. Great value."

Describe Yourself: Home Handyman

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### WB20XT



Honda Water Pumps offer a level of uncompromising performance to a wide variety of water transfer applications. Designed for easy starting, priming and dependable service, used throughout the world for over 20 years, Honda water pumps have earned a reputation for unsurpassed reliability and performance.

This powerful Honda water pump comes with a better design and top performance.

The Honda GX120 engine ensures easy starting, easy usage, outstanding fuel economy, low emission and long-lasting durability as well as compact designs. The rubber mount system on full frame type provides stability and delivers smooth running with less vibration.

**Features**

- GX120 OHV engine
- Full frame design
- With oil alert and rubber mounts
- 600 Litres/min
- Maximum 32m total head

### WB30XT



Honda Water Pumps offer a level of uncompromising performance to a wide variety of water transfer applications. Designed for easy starting, priming and dependable service, used throughout the world for over 20 years, Honda water pumps have earned a reputation for unsurpassed reliability and performance.

This powerful Honda water pump comes with a better design and top performance.

The Honda GX engine ensures easy starting, easy usage, outstanding fuel economy, low emission and long-lasting durability as well as compact designs. The rubber mount system on full frame type provides stability and delivers smooth running with less vibration.

**Features**

- GX160 OHV engine
- Maximum 28m total head
- 1,100 Litres/min
- With oil alert and rubber mounts

- Full frame design

### WX10



Honda Water Pumps offer a level of uncompromising performance to a wide variety of water transfer applications. Designed for easy starting, priming and dependable service, used throughout the world for over 20 years, Honda water pumps have earned a reputation for unsurpassed reliability and performance.

These pumps are known for their durable construction, quality engines and easy portability. These features apply to all categories of pumps that are offered by Honda.

The WX10 Volume Pump is an economical 1" volume pump with a 36m head that delivers 140litres per minute. A portable and versatile pump, it is suitable for many applications.

N.B Honda Volume Pumps are able to handle large volumes of clean water, making them ideal for irrigation, drainage, general purpose cleaning etc.

#### Features

- Now powered by Honda's Generation II mini 4-stroke engine
- Economical 1" volume pump
- Big 36m head
- Delivers 140L/min capacity

### WX15



Honda Water Pumps offer a level of uncompromising performance to a wide variety of water transfer applications. Designed for easy starting, priming and dependable service, used throughout the world for over 20 years, Honda water pumps have earned a reputation for unsurpassed reliability and performance.

These pumps are known for their durable construction, quality engines and easy portability. These features apply to all categories of pumps that are offered by Honda.

The WX10 Volume Pump is an economical 1" volume pump with a 36m head that delivers 140litres per minute. A portable and versatile pump, it is suitable for many applications.

N.B Honda Volume Pumps are able to handle large volumes of clean water, making them ideal for irrigation, drainage, general purpose cleaning etc.

#### Features

- Now powered by Honda's Generation II mini 4-stroke engine
- Economical 1" volume pump
- Big 36m head
- Delivers 140L/min capacity



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[Honda Worldwide Home](#) > [About Honda](#) > [Heritage](#) > [Honda History](#) > [Challenge](#) > [The ME Engine \(G100 / 150 / 200 / 300 / 400 Series\) / 1977](#)



## The ME Engine (G100/150/200/300/400 Series)

A Million-Selling Engine Opens the Door to "Tomorrow" for Honda Power Products

1977

## Reviving the Power Products Business

Honda began manufacturing power products in 1952, just four years after the company was founded. Naturally, motorcycles created a technological base for those power products. For example, the company's first general-purpose engine, the Type H, was a modified version of the Type F engine used in the Cub. Therefore, in a way the company's new business in power products was propelled by technology acquired through the manufacture of motorcycles.



The ME engine series, G150

The road to success in power products would not be easy, though. While Honda was already enjoying a reputation as a premier maker of motorcycles, it had no experience with power products. Moreover, the value the customers looked for in power products varied according to their particular applications. Added to that was the fact that many more types of power products had to be manufactured in order to satisfy market expectations. These elements combined to create a far more complex business than the one involving motorcycles. A key aspect of the business is that power products are generally divided into two categories: engines and complete machines. Accordingly, how a company might operate can vary depending on the category. Engines are supplied mainly to OEM companies as single units, while complete machines include a range of end-user products such as tillers.

Motorcycles and cars are like complete machines. Ever since the 1959 introduction of its F150 tiller, Honda had focused on complete machines. There was a strong conviction that the significance of being in that business was the ability to build and sell complete machines. With complete machines, Honda could satisfy its customers directly. However, along with that came

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- 
Products Emerging From Technology and Innovation
- 
The Oval Piston Engine / 1979
- 
The Hondamatic Transmission / 1968
- 
The Car Navigation System / 1981
- 
The Airbag System / 1987
- 
Four-Wheel Steering System (4WS) / 1987
- 
The VTEC Engine / 1989
- 
The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977
- 
The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983

various points of feedback from Honda customers. Listening to that feedback would lead to new products and technologies.

General-purpose engines, on the other hand, are supplied to OEM companies, so it is difficult to relate those products to their end users. The staff involved in the development of Honda power products had a definite sense of passion for their work.

They would not be satisfied with just making general-purpose engines. Therefore, it was natural for the company to focus on complete machines.

Another challenge inherent in power products is that the manufacturer must offer a range of models for each product in order to meet different needs. If it fails to do so, the manufacturer cannot meet customer expectations or sustain its retail operations. This applies to all work machines, including agricultural equipment, power generators and outboard marine engines, necessitating the small-volume production of multiple varieties. For these reasons Honda required a certain amount of time to build sufficient strength in the areas of development, cost competitiveness and marketing, in order to compete in the marketplace.

Honda's struggle to develop and market complete machines continued for two straight decades. However, as long as it remained in business the company would not be satisfied with less than absolute performance. As the 1970s began, there was a thirst throughout the organization; a hunger for the vision and direction that would revive the flagging power products business.

Next Page 

- 1
- 2
- 3
- 4
- 5
- 6
- 7

	The Dream CB750 FOUR / 1969
	CG125 / 1975
	Road Pal / 1976
	City / 1981
	The NSX / 1990
	Odyssey / 1994
	Honda EV Plus: The Dream of an Electric Vehicle / 1988
	The E300 Portable Generator / 1965
	The HR21 Lawn Mower / 1978
	The F200 "Komame" Mini-Tiller / 1980

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 Honda History Top





Honda Worldwide Home > About Honda > Heritage > Honda History > Challenge > The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977



## The ME Engine (G100/150/200/300/400 Series)

A Million-Selling Engine Opens the Door to "Tomorrow" for Honda Power Products

1977

### Listening to the Users, and Incorporating Their Ideas

"Create a million-selling engine": this was the new target for the Power Products development staff. That figure was consistent with the Three-Pillar Initiative announced by Kiyoshi Kawashima following his appointment as company president in 1973. The initiative reflected Honda's decision to direct its entire corporate effort toward three areas of activity: an expanded motorcycle business, entry into the auto business, and a boost in performance for Power Products. The target, though, also raised concern among the staff with regard to the future of Honda's Power Products operation.

"One million units?" they wondered. The development staff could not believe their ears when they first heard it. That astonishment was understandable, since the total production volume at Power Products was at that point merely 200,000 units a year. They had to bring the number up, not just to 300,000 or 500,000 units but to 1 million. And they had to do it quickly. Everyone was surprised by the request, thinking the achievement of such a target would be impossible. However, one person among them thought it was not at all impossible. He was Hiroyuki Hatakeyama, the man appointed acting leader for the new engine project.

"It's true that we're selling only 200,000 units each year," Hatakeyama said, "but that number is the total of all types and models of complete machines. The goal will look much more attainable if we attempt it with a single-unit engine. First, we must identify the markets that can absorb a million units, then find ideas that are appropriate to the task. After all, we've been putting too much emphasis on engineering [the functions of complete machines]. Therefore, it wouldn't be such a bad idea to focus on the engine instead."

Hatakeyama, though, could sense an impending crisis. One reason was the difficulty of running such a business while focusing on complete machines. With such an emphasis the company would be unable to respond to market needs [using the existing models], because priority had to be given to new-model development. However, quality products would always sell, he thought, and quality products are ones that satisfy the customers who buy them. Technology and ideas are just the tools by which we create quality products.

According to Hatakeyama, the most important point in developing the new engine was to "accurately understand market needs for general purpose engines, then define the requirements for the new product." Doing so, he believed, would ultimately open doors for Honda's Power Products operation. The key to success lay in the determination to listen to the end users' honest opinions, and thus reflect them in the product offerings.

The development project members were assembled from various fields outside the realm of power products. Those involved in motorcycle and automobile development, not to mention experts from Honda Engineering (EG), were included as part of the group. Under the able supervision of Kimio Shinmura, the managing director of Honda R&D and manager of the development project, a team of unprecedented scope and skill was organized, drawing upon the vast expertise from throughout the Honda organization.

The ME project was officially launched, named after its target of a million units, marking Honda's acceptance of the challenge to create an engine representing the next generation in general-purpose products.

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 The VTEC Engine / 1989

 **The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977**

 The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983

[◀ Previous Page](#)

Next Page [▶](#)

- 1
- 2
- 3
- 4
- 5
- 6
- 7

- 
The Dream CB750  
FOUR / 1969
- 
CG125 / 1975
- 
Road Pal / 1976
- 
City / 1981
- 
The NSX / 1990
- 
Odyssey / 1994
- 
Honda EV Plus: The  
Dream of an Electric  
Vehicle / 1988
- 
The E300 Portable  
Generator / 1965
- 
The HR21 Lawn  
Mower / 1978
- 
The F200 "Komame"  
Mini-Tiller / 1980

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The Essence of Creative  
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Coexisting in Harmony  
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- ▶ Limitless Dreams -  
An Outpouring of Passion
- ▶ Honda History Top





Honda Worldwide Home > About Honda > Heritage > Honda History > Challenge > The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977



## The ME Engine (G100/150/200/300/400 Series)

A Million-Selling Engine Opens the Door to "Tomorrow" for Honda Power Products

1977

### An Engine to Beat the Industry's Goliath

The search for engine development concepts had already begun in 1972, well before the establishment of the target million units. However, at that time the world market for general purpose engines was around 10 million units. Of this, around 8 million were accounted for by Briggs & Stratton, a respected U.S. company. That organization was able to maintain highly competitive pricing through mass production, selling engines for less than \$100. To find ways to beat the Briggs products, Honda's development staff conducted field studies and interviewed users. Moreover, they studied the difference between Briggs engines and past products developed by Honda. The challenge, though, was to find the trump card that could beat an industry giant. However, the ultimate conclusion was a rather solemn one: Honda could never win in the same arena.

Briggs' engines were popular among home users. They were relatively less durable, but they were low-priced. Honda engines, on the other hand, offered much greater durability since they were based on motorcycle engines. It was said that with Honda engines the core parts such as cylinders and pistons could last more than ten years without failing. There was a world of difference between the Briggs approach to engines and that of Honda, just as there was a fundamental difference between a cotton undershirt and a silk hat.

The "quality products" Honda sought were, of course, more expensive. They were also more difficult to sell in the general purpose market. When asked to choose between a three-year engine costing 10,000 yen and a ten-year engine costing 30,000 yen, the consumer will choose the less-expensive one. Users of general purpose engines simply have different perceptions of value than users of motorcycles or cars.

Let it not be said that Briggs & Stratton engines were not good products, though. They were very good indeed, with a simple style of construction that was perfectly matched to market requirements. Honda, even with its own technologies in place, could not have made the same engines. However, again, Honda had no wish to replicate the engines of Briggs & Stratton.

In order to obtain the winner's edge, Honda had to offer a feature that would dramatically enhance the performance of its engine. Therefore, in September 1973, Honda examined the possibility of applying its CVCC technology to the general purpose engine. Changes in social awareness had already made "ecology" a key element in product development. Since Honda had already adopted the CVCC technology to its automobile models, the general purpose engine was an appropriate candidate for testing. With that the concept of an environmentally-friendly general purpose engine became a feature that would set Honda apart from Briggs and its imitators. It would not be easy adapting the CVCC technology, though, due to the prevalence of the SV (side valve) configuration. Moreover, studies had been conducted with both SV and OHV engines, without achieving the anticipated results. On the contrary, negative aspects had been identified, including a significant decrease in output. Ultimately, the CVCC technology was not used.

[Previous Page](#)

[Next Page](#)

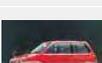
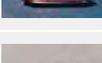
- 1
- 2
- 3
- 4
- 5
- 6
- 7

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-  Products Emerging From Technology and Innovation
-  The Oval Piston Engine / 1979
-  The Hondamatic Transmission / 1968
-  The Car Navigation System / 1981
-  The Airbag System / 1987
-  Four-Wheel Steering System (4WS) / 1987
-  The VTEC Engine / 1989
-  **The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977**
-  The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983



	The Dream CB750 FOUR / 1969
	CG125 / 1975
	Road Pal / 1976
	City / 1981
	The NSX / 1990
	Odyssey / 1994
	Honda EV Plus: The Dream of an Electric Vehicle / 1988
	The E300 Portable Generator / 1965
	The HR21 Lawn Mower / 1978
	The F200 "Komame" Mini-Tiller / 1980
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<b>A Neverending Passion for Racing</b> <input data-bbox="1372 1323 1396 1354" type="button" value="+"/>	
<b>Creativity - The Way to Work Harder, Play Harder</b> <input data-bbox="1372 1396 1396 1428" type="button" value="+"/>	
<b>People and Society Coexisting in Harmony with Nature</b> <input data-bbox="1372 1470 1396 1501" type="button" value="+"/>	
<p>› Limitless Dreams - An Outpouring of Passion</p> <p>› Honda History Top</p>	





Honda Worldwide Home > About Honda > Heritage > Honda History > Challenge > The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977



## The ME Engine (G100/150/200/300/400 Series)

A Million-Selling Engine Opens the Door to "Tomorrow" for Honda Power Products

1977

### Identifying Problems Using Key Criteria

The new engine concept was ready to assume a more concrete form by the spring of 1974. However, thanks to the study of Briggs & Stratton engines, attempts to apply CVCC technology and extensive market research, the development team was beginning to perceive a direction. In the ME project, Hatakeyama had led the effort to define specific product requirements. Unlike previous development projects, in which engineering functions took priority, the ME project intended to identify the product requirements in an engine for which there would be market demand, and subsequently employ Honda technology to those requirements. To do that, Hatakeyama knew it was essential that any existing problems be examined against the same criteria.

The same criteria, according to Hatakeyama, meant "the satisfaction of every customer who purchases the product." After all, general purpose engines were being used in many different ways, so there might be more elements that could not simply be examined on paper. However, Hatakeyama believed that having the greatest possible amount of data on actual engine use would allow Honda to employ that technological capability more effectively. If they could do that, the results would follow suit.

Hatakeyama himself traveled extensively in order that more information could be gathered. He also visited many OEM companies. Combining his experience developing general purpose engines, with his eye as a development engineer, and his five senses, Hatakeyama took as his personal quest the attainment of a million-selling engine. Though he had yet to find it, Hatakeyama was beginning to feel confident that the impossible could indeed be achieved.



A longtail boat with ME engine instead of outboard marine engine in Thailand. The development staff traveled the world defining product requirements.

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-  Products Emerging From Technology and Innovation
-  The Oval Piston Engine / 1979
-  The Hondamatic Transmission / 1968
-  The Car Navigation System / 1981
-  The Airbag System / 1987
-  Four-Wheel Steering System (4WS) / 1987
-  The VTEC Engine / 1989
-  **The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977**
-  The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983

Summer came at last, and the development team decided to camp in the mountains for a month in order to devise a list of target requirements based on their research. There in camp the nights were long and filled with heated discussions:

- "Costwise, we can't compete with Briggs."
- "What's the highest we can go and still maintain our price-competitiveness?"
- "Are there any selling features that can compensate for the price?"
- "What kinds of engines do the OEM companies want?"
- "Can we solve the problems regarding mass production?"
- "How about making it a two-cycle design?"
- "What about sales strategies?"
- "It should be an engine that's unique to Honda."

The Research Center staff, along with personnel from EG and sales, joined the discussions, analyzing various points from every possible angle. Finally, the target requirements were defined. For the sake of strategy, it was decided that the engine would target the industrial market. That target was specifically defined as the one in which Honda could make use of a key characteristic in its engines [durability] thereby avoiding direct price competition with Briggs in the home-user market. The development concept, too, was decided: "Tough, durable and costing only half." These words could not fully express the exact desires of each individual involved, but the important thing was that all had come to share a goal through the process of identifying and openly discussing problems. At last they had a banner with which to carry the project.

[◀ Previous Page](#)

[Next Page ▶](#)

- 1
- 2
- 3
- 4
- 5
- 6
- 7

- 
The Dream CB750 FOUR / 1969
- 
CG125 / 1975
- 
Road Pal / 1976
- 
City / 1981
- 
The NSX / 1990
- 
Odyssey / 1994
- 
Honda EV Plus: The Dream of an Electric Vehicle / 1988
- 
The E300 Portable Generator / 1965
- 
The HR21 Lawn Mower / 1978
- 
The F200 "Komame" Mini-Tiller / 1980

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▶ [Honda History Top](#)





Honda Worldwide Home > About Honda > Heritage > Honda History > Challenge > The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977



## The ME Engine (G100/150/200/300/400 Series)

A Million-Selling Engine Opens the Door to "Tomorrow" for Honda Power Products

1977

### Defining Toughness and Durability

"Mr. Hatakeyama, how long must the engine last in order to qualify it as 'tough and durable?'" This was a question asked by several staff members after the design process had begun. They said they couldn't actually design the product without specific references. Hatakeyama, though, was often asked similar questions, so his answer was the same as always: "You shouldn't be asking me such questions. How can I answer something like that?"

The target concept of "toughness and durability" could not be quantified as a specific number, since such terms and their interpretations vary according to how the product is used. For example, the same shoes will have different degrees of wear and soiling, depending on whether the person wearing the shoes usually walks, drives or rides a train. In other words, a product is tough and durable if the person who uses it feels it is. For this reason the customer's perceptions serve as the standard of reference. Therefore, it became their objective to make the customer feel that way about the new Honda engine.

Each time a problem was raised, Hatakeyama would gather his staff for a serious brainstorming session. Discussions were held regarding how the engine would be used in the market and how the customer would feel about it. A comment was once raised concerning the problem of seizing, which was of course the biggest headache imaginable. No matter how tough the construction was, the engine would not work if a seizure occurred. Now, the team knew the user might often neglect routine checking, even though it was clearly important. This was as true with power products as it was for cars. Moreover, with an industrial product like a general purpose engine the user would often be different from the person servicing it. Therefore, to make the engine tough and durable it was important to ensure that seizure could not occur even if the engine were to run out of oil. Based on such reasoning, the staff thought of making the engine stop before a seize-up could occur. That idea led to an oil-alert mechanism that automatically stops the engine when the engine oil runs out. Of course, such a mechanism had to do more than simply stop the engine. A winch engine would be useless, after all, if it were to stop while the line was being reeled in or out. Therefore, a repeated trial-and-error was employed to find the ideal point at which the engine could be stopped.

This is a good example of how the staff tackled product development. Rather than emphasizing engineering-oriented ideas, they truthfully satisfied product requirements that reflected real world market needs. This was a complete reversal of Honda's prior approach to development, leading to key innovations such as the point-less ignition system.

[Previous Page](#)

[Next Page](#)

- 1
- 2
- 3
- 4
- 5
- 6
- 7

### The Challenging Spirit of Honda

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**A Dream Come True: Car Builder for the World** +

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 The Hondamatic Transmission / 1968

 The Car Navigation System / 1981

 The Airbag System / 1987

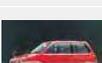
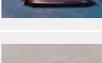
 Four-Wheel Steering System (4WS) / 1987

 The VTEC Engine / 1989

 **The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977**

 The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983



-  The Dream CB750 FOUR / 1969
-  CG125 / 1975
-  Road Pal / 1976
-  City / 1981
-  The NSX / 1990
-  Odyssey / 1994
-  Honda EV Plus: The Dream of an Electric Vehicle / 1988
-  The E300 Portable Generator / 1965
-  The HR21 Lawn Mower / 1978
-  The F200 "Komame" Mini-Tiller / 1980

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Coexisting in Harmony  
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- [› Limitless Dreams - An Outpouring of Passion](#)
- [› Honda History Top](#)





Honda Worldwide Home > About Honda > Heritage > Honda History > Challenge > The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977



## The ME Engine (G100/150/200/300/400 Series)

A Million-Selling Engine Opens the Door to "Tomorrow" for Honda Power Products

1977

### The Challenge: Cutting the Cost in Half

The other target (reducing the cost by half) was going to be a difficult one. However, while Hatakeyama labored in his search for a clue, Tadashi Kume, the senior managing director of Honda R&D, gave him a bit of advice: "Why don't you assign a person to be in charge of each function?"

Hatakeyama described the system this way: "For example, if there were twenty functions, we would divide them into groups, each containing an equal number of functions, then assign a person to each function group, such as the tank, carburetor, crank, dynamo, plug, and bearing. Then, based on current cost levels, we would tell them how much they have. For example, if a tank usually costs 800 yen, we assign a person to the tank and tell him, 'You are in charge of the tank. You have a budget of 400 yen.'"

It was a rather forceful approach, but not out of line considering their rather daunting target. They knew they had to transcend the limits of common sense in order to achieve it. Yet, even Hatakeyama thought the costs could never be halved for many of those items. For example, cost-reduction measures for the plug would be limited to minimizing the purchase cost by standardizing the specifications or adopting the most popular size. Still, such measures could only save 3 or 4 percent, and the person in charge of plugs hit a wall. He couldn't cut the cost, because there was simply no room left.

"In such cases, he could get a credit from another group," said Hatakeyama. "After all, there were many groups, so he simply had to find one that was doing well and ask for help."

Halving the cost was difficult for some groups and relatively easy for others. With a reasonable effort some groups could even reduce the cost to less than half. The group that was unable to halve the cost was allowed to get a credit from such a group. Of course, these credits weren't free for the asking. The process was that the struggling group would provide ideas for the collaborating group in order to help them halve their cost. The requesting group would then get the portion saved beyond the 50-percent mark as credit of its own. Through this collaborative process all of the team members were able to pool their efforts on behalf of the same goal. Finally, the team was able to pull off an amazing feat, cutting the overall cost by approximately half.

The cost-cutting struggle, though, meant having to give up some durability. However, Honda engines were already respected for their durability. Since motorcycle engines had long been the basis of such design work, and because the development team was too ambitious in trying to create the best, they would often create products having durability far in excess of what the market expected. Such overzealous efforts were reflected in the cost, making the products technologically superior, but too expensive. Therefore, to achieve its cost-cutting objective the team had to change its mindset and explore ways to squeeze costs while satisfying the requirement for "toughness and durability." Many ideas were attempted in order to achieve it, including a bold plan to change the needle bearings to the plain type. Even pressed flywheels were made through plastics processing and were tested, but never used. Another significant contribution to the effort was the participation of EG personnel in development. This facilitated a collaborative effort between the production engineering side and the design side.

[◀ Previous Page](#)

[Next Page ▶](#)

#### The Challenging Spirit of Honda

**A System that Fosters Expertise** +

**A Dream Come True: Car Builder for the World** +

**Marketing Globally, Producing Locally** +

**A Refreshing New Development** +

**Products Emerging From Technology and Innovation** -

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 The Oval Piston Engine / 1979

 The Hondamatic Transmission / 1968

 The Car Navigation System / 1981

 The Airbag System / 1987

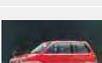
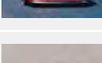
 Four-Wheel Steering System (4WS) / 1987

 The VTEC Engine / 1989

 **The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977**

 The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983

- 1
- 2
- 3
- 4
- 5
- 6
- 7

-  The Dream CB750 FOUR / 1969
-  CG125 / 1975
-  Road Pal / 1976
-  City / 1981
-  The NSX / 1990
-  Odyssey / 1994
-  Honda EV Plus: The Dream of an Electric Vehicle / 1988
-  The E300 Portable Generator / 1965
-  The HR21 Lawn Mower / 1978
-  The F200 "Komame" Mini-Tiller / 1980

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The Essence of Creative  
Manufacturing** [+](#)

**A Neverending Passion for  
Racing** [+](#)

**Creativity - The Way to  
Work Harder, Play Harder** [+](#)

**People and Society  
Coexisting in Harmony  
with Nature** [+](#)

- > Limitless Dreams - An Outpouring of Passion
- > Honda History Top





Honda Worldwide Home > About Honda > Heritage > Honda History > Challenge > The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977



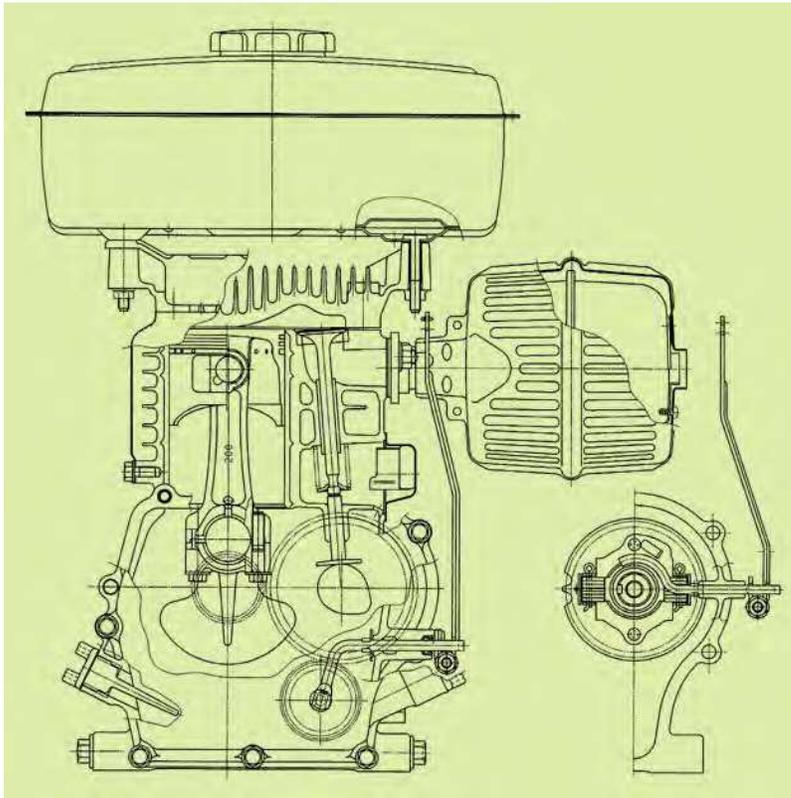
## The ME Engine (G100/150/200/300/400 Series)

A Million-Selling Engine Opens the Door to "Tomorrow" for Honda Power Products

1977

### The ME Engine: Combining Honda's Expertise

The ME engine was released in June 1977, finally achieving the sales target of a million units annually, five years later, in 1982. This success, which almost everyone had originally thought impossible, was ultimately realized through a strategy of shifting the development focus from engineering to market-driven requirements and establishing a reachable goal. Moreover, it paved the way for Honda's original general purpose engines, which were no longer limited by the context of motorcycle engines. In this sense, the ME engine fulfilled the purpose of helping achieve the goal stated in Honda's Three-Pillar Initiative.



A structural diagram of the G200, the first in a series of engines derived from the ME unit

Personnel from Sales and EG were instrumental in the drive to succeed. Particularly, the joint development effort with EG personnel made it possible to put the project in clearer perspective. The ability to discuss issues of mass production and cost reduction helped the team achieve an optimal product balance for the ME engine concept. That kind of thinking eventually grew into the S/E/D system.

#### The Challenging Spirit of Honda

A System that Fosters Expertise

A Dream Come True: Car Builder for the World

Marketing Globally, Producing Locally

A Refreshing New Development

Products Emerging From Technology and Innovation

 Products Emerging From Technology and Innovation

 The Oval Piston Engine / 1979

 The Hondamatic Transmission / 1968

 The Car Navigation System / 1981

 The Airbag System / 1987

 Four-Wheel Steering System (4WS) / 1987

 The VTEC Engine / 1989

 **The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977**

 The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983

The ME engine therefore represented the combined expertise of the Honda organization. It would not be unreasonable to say the engine opened the door to "tomorrow" on behalf of Honda Power Products. By defining a new approach to development focusing on product requirements, the ME engine became the context for leadership in the field of power products.

Hatakeyama discussed the reasons behind the success of his team in ME engine development: "The ME engine would never have materialized if the target had been any less than 1 million units. With that target, we were able to identify various ideals and adopt a new approach. Certainly, it was an outrageous number, and ideas were the only resource we had available to us. Of course, we had a great deal of difficulty reaching this seemingly impossible goal, but we didn't think of the target as a number, but the one million customers we would satisfy. We believed that was necessary in order to reach the goal."

[◀ Previous Page](#)

- 1
- 2
- 3
- 4
- 5
- 6
- 7

	The Dream CB750 FOUR / 1969
	CG125 / 1975
	Road Pal / 1976
	City / 1981
	The NSX / 1990
	Odyssey / 1994
	Honda EV Plus: The Dream of an Electric Vehicle / 1988
	The E300 Portable Generator / 1965
	The HR21 Lawn Mower / 1978
	The F200 "Komame" Mini-Tiller / 1980

**Production Technology: The Essence of Creative Manufacturing** [+](#)

**A Neverending Passion for Racing** [+](#)

**Creativity - The Way to Work Harder, Play Harder** [+](#)

**People and Society Coexisting in Harmony with Nature** [+](#)

› Limitless Dreams - An Outpouring of Passion

› [Honda History Top](#)





[Honda World Links](#) |

Honda Worldwide

World News
Products & Technology
Motor Sports
Environment
Investor Relations
About Honda

Honda Worldwide Home > About Honda > Heritage > Honda History > Challenge > The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983



## The ZE Engine (GX110/140/240/270/340 Series)

The Concept: An OHV + Inclined Cylinder that Changed the World of General Purpose Engines

1983

### The Reality: Learning from Damaged Parts

Traveling upstream on the Menam (Chao Phraya) River past Bangkok reveals many "longtails" floating on Thailand's giant river. Longtails are small boats equipped with general purpose engines instead of outboard marine engines. This type of engine has a long propeller shaft that sticks out of the boat, resembling a dragonfly's tail. The boat is called a "longtail" because of this propeller shaft. Longtails are indispensable to the lives of people in Thailand, as well as to those in other developing nations in Southeast Asia. They are an important means of livelihood, facilitating transportation and fishing.



The longtail's engine operates with its body kept at an angle. Understanding the actual conditions of engine use had led to many of the features employed in the ZE engine. (Photographed in Indonesia)

"I found one! Let's go after that boat!"

Running ahead in the direction the voice had indicated was a longtail with an engine painted red and white. That particular color combination meant that it was an ME, the engine developed by Honda in 1977. The voice came from Yoshinobu Yamaguchi, who had been involved in the engine's testing. He and his colleagues wanted to verify how their engine was being used, and whether or not there were any problems regarding its real world use. They were chasing the boat ahead of them, searching for the kind of information they could not obtain simply by analyzing data in the cold environs of a distant office. They had managed to make time during their business trip in order to travel up the Menam, all the while hoping they would make contact with users and obtain some feedback.

General purpose engines are used in a number of ways, meaning one cannot develop a truly applicable product unless its conditions of use are understood. Therefore, the ME engine's notable success was largely attributable to the efforts of a development staff that had traveled

### The Challenging Spirit of Honda

- A System that Fosters Expertise**
+
- A Dream Come True: Car Builder for the World**
+
- Marketing Globally, Producing Locally**
+
- A Refreshing New Development**
+
- Products Emerging From Technology and Innovation**
-
- 

Products Emerging From Technology and Innovation
- 

The Oval Piston Engine / 1979
- 

The Hondamatic Transmission / 1968
- 

The Car Navigation System / 1981
- 

The Airbag System / 1987
- 

Four-Wheel Steering System (4WS) / 1987
- 

The VTEC Engine / 1989
- 

The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977
- 

The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983

the world identifying its requirements. They had the ability to see things and analyze them from the standpoint of engineering. For example, during a visit to a retailer the staff would go to the repair area and search the drums and other waste containers filled with damaged engine parts. It was a noisy process going through the parts, but in the process they could usually find worn cylinders and other clues. They would examine the oil deposits and find them to be filled with dust, proving there was a need to improve the air cleaner. In this way, every damaged part would tell its own story, often inferring a great deal about the harshness of use and the environment surrounding it. Ultimately, improvements would be made and ideas for new models proposed. This indeed symbolizes the Honda's principle of "focusing on real-world, on-site operations while facing up to the challenges inherent in reaching a goal."

"It didn't matter that we couldn't speak the language," said Yamaguchi. "As engineers we knew what kinds of data we'd need to apply in our workstations. We simply had to watch the users as they brought their products in for repair. That way we could find out more about the problems they'd been having."

Yamaguchi held firmly to the belief that such a strategy was of paramount importance in the development of reliable, high-performance products. Each time he went abroad, he would make time available in which to study the market. He would journey through the dry cattle lands of Australia, visit busy rental shops in America, and wade into the rice paddies of Thailand. The world market was to Yamaguchi the very soul of research, and knowing something of his customers and their lives kindled in him a sense of ambition. It was the desire to build an engine that would satisfy the needs of each customer who bought it.

Next Page 

- 1
- 2
- 3
- 4
- 5
- 6
- 7

	The Dream CB750 FOUR / 1969
	CG125 / 1975
	Road Pal / 1976
	City / 1981
	The NSX / 1990
	Odyssey / 1994
	Honda EV Plus: The Dream of an Electric Vehicle / 1988
	The E300 Portable Generator / 1965
	The HR21 Lawn Mower / 1978
	The F200 "Komame" Mini-Tiller / 1980

**Production Technology: The Essence of Creative Manufacturing** 

**A Neverending Passion for Racing** 

**Creativity - The Way to Work Harder, Play Harder** 

**People and Society Coexisting in Harmony with Nature** 

-  Limitless Dreams - An Outpouring of Passion
-  Honda History Top





Honda Worldwide Home > About Honda > Heritage > Honda History > Challenge > The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983



## The ZE Engine (GX110/140/240/270/340 Series)

The Concept: An OHV + Inclined Cylinder that Changed the World of General Purpose Engines

1983

### When the Customer Says, "It Has to Be Honda"

Honda's ME engines proved popular throughout Southeast Asia, particularly in Thailand, where the demand was so strong that some retailers stopped displaying the engine because it would easily sell right out of the box. In fact, other manufacturers began finishing their products in red and white, because so many customers had specified "that red-and-white engine." However, it was not all roses for Honda. Out in the OEM market there were harsher realities to face.



The chassis-only tillers displayed at a retailer in Thailand. They are sold after being fitted with a separate, general purpose engine. Engines lacking installation compatibility are shut out of the retail sales channel.

The ME engine, developed through a series of efforts intended to reduce its cost by half, was as much as 2,000 yen cheaper than other manufacturers' engines of the same class. The ME engine was also 10 percent cheaper than its rivals in the OEM market, where the price would vary according to the number of units ordered. Therefore, cost was the key selling point for general purpose engines, and everyone knew Honda, with its lower price point, had the advantage. As it turned out, though, a low price didn't benefit the company to the expected degree.

Yamaguchi himself also visited OEM companies in Japan, where he promoted the ME engine. However, he was on the receiving end of critical comments:

"Although the engine itself costs less," they would say, "it costs extra to install and test it in our machine. It also requires a lot of difficult, cumbersome work. We don't think we want your engine."

#### The Challenging Spirit of Honda

- A System that Fosters Expertise +
- A Dream Come True: Car Builder for the World +
- Marketing Globally, Producing Locally +
- A Refreshing New Development +
- Products Emerging From Technology and Innovation -

-  Products Emerging From Technology and Innovation
-  The Oval Piston Engine / 1979
-  The Hondamatic Transmission / 1968
-  The Car Navigation System / 1981
-  The Airbag System / 1987
-  Four-Wheel Steering System (4WS) / 1987
-  The VTEC Engine / 1989
-  The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977
-  The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983

Others would say things like, "It's a great-looking product, but we cannot adopt it unless your products are designed to fit our machines with the absolute assurance there won't be any problems. That's what the other suppliers do."

Yamaguchi gave demonstrations amply proving the engine's performance, sometimes out in the snow and bitter cold. However, following a series of disappointments his once-abundant optimism had been left shattered in pieces. One comment he received from a manufacturer of construction machinery was a particularly heavy blow:

"Mr. Yamaguchi, it's true that a savings of 2,000 yen would add to our company's profits. However this saving wouldn't be passed on to the completed machines as a significant price advantage in the market. In other words, there would be no benefit for the customer who used the product to choose one with the Honda engine."

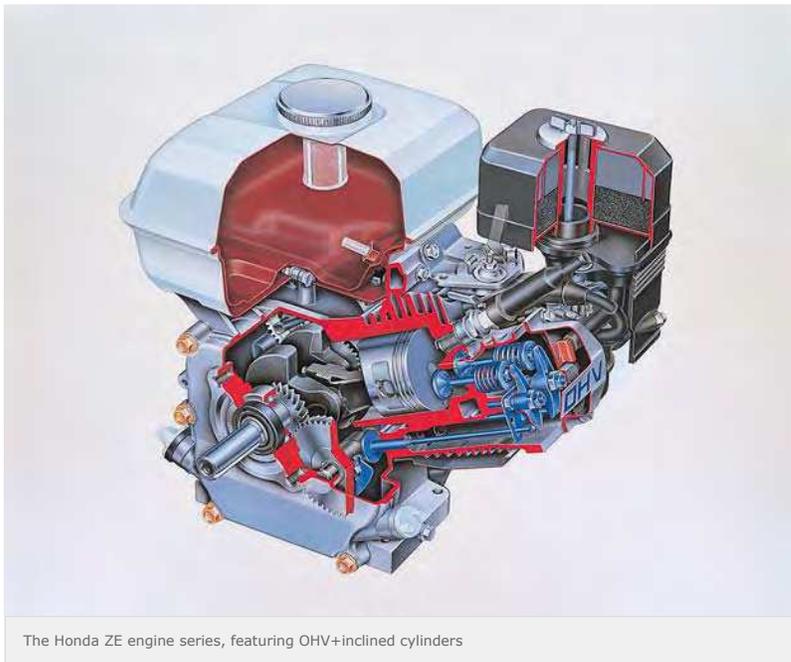
Those words had come as a shock to Yamaguchi. After all, he and his colleagues had studied regional markets with their own eyes, observing engine uses and identifying problems. He was confident they had created a price-competitive engine that met all the requirements.

"Our goal is to create an engine that satisfies the customers who use it," Yamaguchi would say. "I want to hear them say, 'It has to be Honda' the next time they purchase an engine. This feeling is shared by all the engineers at Honda."

This man, though, was saying their effort was not being appreciated by the consuming public. Moreover, price had nothing to do with it. As Yamaguchi said, "It was a tremendous shock to me as an engineer."

The ME engine was undoubtedly a success, though, and because of that Honda was able to compete with other manufacturers who were active in the same arena. Although their comments were rather harsh, those OEM companies would not have even looked at Honda engines if it had not been for the ME model. Still, Honda needed a decisive edge in order to lead the competition and make the customer say, "It has to be Honda."

One comment stood out in Yamaguchi's mind: "Don't depend on (price) difference alone, but make use of the product's uniqueness." This painful experience ultimately became the foundation for development of the ZE engine.



	The Dream CB750 FOUR / 1969
	CG125 / 1975
	Road Pal / 1976
	City / 1981
	The NSX / 1990
	Odyssey / 1994
	Honda EV Plus: The Dream of an Electric Vehicle / 1988
	The E300 Portable Generator / 1965
	The HR21 Lawn Mower / 1978
	The F200 "Komame" Mini-Tiller / 1980

**Production Technology: The Essence of Creative Manufacturing**

**A Neverending Passion for Racing**

**Creativity - The Way to Work Harder, Play Harder**

**People and Society Coexisting in Harmony with Nature**

> Limitless Dreams - An Outpouring of Passion

> Honda History Top

[◀ Previous Page](#)

Next Page [▶](#)

- 1
- 2
- 3
- 4
- 5
- 6
- 7

[Page Top](#)

Honda Worldwide site  
[Home](#) | [Site Map](#) | [Site Index](#) | [About this Site](#)  
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Honda Worldwide Home > About Honda > Heritage > Honda History > Challenge > The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983



## The ZE Engine (GX110/140/240/270/340 Series)

The Concept: An OHV + Inclined Cylinder that Changed the World of General Purpose Engines

1983

### Initiating the ZE Project: From SV to OHV

Honda ordered the development of a consumer-oriented engine in October 1980 with the intention of having a successor to the popular ME model. When the decision was made, the ME's yearly sales volume was still under the 1 million mark, but it was only a matter of time before the figure would pass it. However, the ME engine had been developed for the industrial market, so in order to expand its overall market share for general purpose engines Honda had to gain a foothold in the consumer arena. To do this, the new engine's yearly sales target was to be three million units.

To develop a new engine that was small, economical and maintenance-free, Honda's development staff analyzed vast collections of data gathered from the many ME engine units that had found their way into the world. And with that analysis a research project was started with two possible directions, the first being a side-valve (SV) engine with smaller displacement but higher performance, and the second being an overhead valve (OHV) engine.

The oil crises of the 1970s had made society more conscious of the need to conserve energy resources, and through its ME experience Honda knew it had to find a decisive feature unavailable with competing engines. Accordingly, the research effort began to focus on a fuel-efficient, high-output OHV engine. In 1981, Honda officially decided to adopt the OHV design as the mainstay of its next-generation engine line. Research was specifically directed to identify a structure and concept suitable for lawnmowers and general purpose applications.

Honda's interest in lawn mowers reflected a desire to reach out to customers for power products in the U.S. With regard to lawnmowers, Honda's engines were already respected among professionals for their superior performance, even prior to the ME's introduction. However, to meet current expectations and build sales, the OHV configuration was absolutely necessary. Therefore, the ZE project began with a two-prong approach, aiming to develop the ZE01 general-purpose engine and the ZE5 for lawnmowers.

[Previous Page](#)

[Next Page](#)

- 1
- 2
- 3
- 4
- 5
- 6
- 7

#### The Challenging Spirit of Honda

**A System that Fosters Expertise** +

**A Dream Come True: Car Builder for the World** +

**Marketing Globally, Producing Locally** +

**A Refreshing New Development** +

**Products Emerging From Technology and Innovation** -

 Products Emerging From Technology and Innovation

 The Oval Piston Engine / 1979

 The Hondamatic Transmission / 1968

 The Car Navigation System / 1981

 The Airbag System / 1987

 Four-Wheel Steering System (4WS) / 1987

 The VTEC Engine / 1989

 The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977

 The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983



	The Dream CB750 FOUR / 1969
	CG125 / 1975
	Road Pal / 1976
	City / 1981
	The NSX / 1990
	Odyssey / 1994
	Honda EV Plus: The Dream of an Electric Vehicle / 1988
	The E300 Portable Generator / 1965
	The HR21 Lawn Mower / 1978
	The F200 "Komame" Mini-Tiller / 1980
<b>Production Technology: The Essence of Creative Manufacturing</b> <input data-bbox="1372 1249 1396 1281" type="button" value="+"/>	
<b>A Neverending Passion for Racing</b> <input data-bbox="1372 1323 1396 1354" type="button" value="+"/>	
<b>Creativity - The Way to Work Harder, Play Harder</b> <input data-bbox="1372 1396 1396 1428" type="button" value="+"/>	
<b>People and Society Coexisting in Harmony with Nature</b> <input data-bbox="1372 1470 1396 1501" type="button" value="+"/>	
<p>› Limitless Dreams - An Outpouring of Passion</p> <p>› Honda History Top</p>	





Honda Worldwide Home > About Honda > Heritage > Honda History > Challenge > The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983



## The ZE Engine (GX110/140/240/270/340 Series)

The Concept: An OHV + Inclined Cylinder that Changed the World of General Purpose Engines

1983

### OHV: Benefits and Disadvantages

Most general purpose engines were in those days of the SV type. Accordingly, new OHV engines were expected to give the edge to Honda, since SV engines consumed more gasoline and oil, and were noisy and hot. In addition, they had shown themselves to be subject to problems in initial quality. The OHV configuration, on the other hand, was more powerful, economical, cleaner, quieter, and more durable. However, despite the OHV's obvious benefits, the SV configuration remained the mainstream in general purpose applications.

The reasons for that were as follows:

First, the OHV engine was larger because its valve had to be mounted above the cylinder. The OEM companies would not accept any engines exceeding their standard installation dimensions, which were for the most part based on SV engines. To find a market, a general purpose engine had to ensure "installation compatibility."

Second, the larger number of parts made the OHV heavier and more costly. Portability and economy are basic requirements in the world of general purpose engines. No matter how well one might perform, no engine would be accepted as a commercial product if the basic requirements - again, portability and economy - were not satisfied. For these reasons the OHV engine design had been studied by most manufacturers, but never seriously developed.

The ZE5 lawn mower engine would have a certain amount of latitude in dealing with these characteristics, because it was developed as part of a complete machine. However, the ZE01 general-purpose engine targeting OEM companies found itself up against a wall. The problems of size, weight, and cost necessitated engineering targets that had to be achieved in order to develop a successful product. Such problems also meant they would have to depart from common sense thinking with regard to general purpose engines.

[Previous Page](#)

[Next Page](#)

- 1
- 2
- 3
- 4
- 5
- 6
- 7

#### The Challenging Spirit of Honda

**A System that Fosters Expertise** +

**A Dream Come True: Car Builder for the World** +

**Marketing Globally, Producing Locally** +

**A Refreshing New Development** +

**Products Emerging From Technology and Innovation** -

 Products Emerging From Technology and Innovation

 The Oval Piston Engine / 1979

 The Hondamatic Transmission / 1968

 The Car Navigation System / 1981

 The Airbag System / 1987

 Four-Wheel Steering System (4WS) / 1987

 The VTEC Engine / 1989

 The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977

 **The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983**



	The Dream CB750 FOUR / 1969
	CG125 / 1975
	Road Pal / 1976
	City / 1981
	The NSX / 1990
	Odyssey / 1994
	Honda EV Plus: The Dream of an Electric Vehicle / 1988
	The E300 Portable Generator / 1965
	The HR21 Lawn Mower / 1978
	The F200 "Komame" Mini-Tiller / 1980
<b>Production Technology: The Essence of Creative Manufacturing</b> <input data-bbox="1372 1249 1396 1281" type="button" value="+"/>	
<b>A Neverending Passion for Racing</b> <input data-bbox="1372 1323 1396 1354" type="button" value="+"/>	
<b>Creativity - The Way to Work Harder, Play Harder</b> <input data-bbox="1372 1396 1396 1428" type="button" value="+"/>	
<b>People and Society Coexisting in Harmony with Nature</b> <input data-bbox="1372 1470 1396 1501" type="button" value="+"/>	
<p>› Limitless Dreams - An Outpouring of Passion</p> <p>› Honda History Top</p>	





Honda Worldwide Home > About Honda > Heritage > Honda History > Challenge > The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983



## The ZE Engine (GX110/140/240/270/340 Series)

The Concept: An OHV + Inclined Cylinder that Changed the World of General Purpose Engines

1983

### Confidence in the Search for an Ideal Design

Two engines were developed under the ZE01 project heading - one with 3.5 horsepower and another with 5 horsepower - and each was to share parts with the other. Yamaguchi, now the project leader, wanted to reflect in the new engines everything he had learned from his own experience. He understood what the ME had failed to achieve, but he understood equally well the weakness of engines from other manufacturers. Further, he knew why the customers had not been satisfied. Therefore, he was confident the new OHV engines would solve the problems inherent in the previous models. He was willing to introduce various ideas, as long as they did not raise the cost, and in this task he applied himself through long hours at the drawing board.

Yamaguchi's initial challenge was engine size, since with a general purpose engine the fuel tank is normally found on top. However, with an SV engine the tank can be mounted directly to the body. Moreover, an OHV engine has its cylinder head and valves positioned between the body and tank, thus increasing the height of the engine assembly. Increased height means a higher center of gravity and more significant amounts of vibration. It also affects engine manageability when installed in a work machine. Detachment of the fuel tank requires an extra function in order to feed fuel to the engine. Thus, the tank should remain connected to the engine, ideally above the body. However, installation compatibility was the most important issue of all, and most companies were still loyal to SV engines. No matter how good the performance was, no OEM company would adopt an OHV engine if it meant a change in specifications. The Honda engine, which lacked installation compatibility, had already made that clear.

Yamaguchi solved this problem with the help of the ME engine. First, he drew an outline of an ME, then he tried to fit the OHV engine into it. After all, the ME's dimensions had been determined through intensive studies of installation compatibility. Thus, an OHV that could fit within the ME's dimensions would ensure installation compatibility. After drawing many designs with different cylinder positions, Yamaguchi finally came up with the idea of setting the cylinder at an incline.

The idea was not so convincing to other staff members, though. In fact, the ZE engine would not be the first Honda engine for which an inclined cylinder had been attempted. The G25 engine released in 1966 had adopted this design with a cylinder placed almost horizontally. However, that engine design was fraught with problems, including heat damage. The staff, who remembered the experience, was very skeptical. "We've already had enough anguish," they said. "Why the inclined cylinder now? What's wrong with the vertical layout?"

Yamaguchi was in fact involved with development of the G25 engine, so he knew well the struggles it had produced. "There was no meaning in developing OHV engines that couldn't promise installation compatibility," Yamaguchi recalled. "If the ideal design for a general purpose engine means an inclined cylinder, we must face the obstacles and overcome them. We had already had the facts of engineering. We couldn't afford to hesitate, now. We had to make the best use of that experience."

A series of long discussions took place, and through Yamaguchi's articulate passion, a consensus was finally found. Following the decision, the staff members visited farms in mountain areas in order to study how cultivators and other machines were used on the slopes and apply that data to laboratory tests. Consequently, the angle was set to 25 degrees to prevent the backflow of oil. With that, the inclined cylinder's specifications were at last determined.

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A Refreshing New Development +

Products Emerging From Technology and Innovation -

 Products Emerging From Technology and Innovation

 The Oval Piston Engine / 1979

 The Hondamatic Transmission / 1968

 The Car Navigation System / 1981

 The Airbag System / 1987

 Four-Wheel Steering System (4WS) / 1987

 The VTEC Engine / 1989

 The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977

 The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983

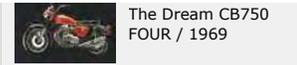


A local market-compatibility test for the ZE Series model CX140, held in Thailand (Photograph on those days courtesy of Yoshinobu Yamaguchi)

[◀ Previous Page](#)

[Next Page ▶](#)

- 1
- 2
- 3
- 4
- 5
- 6
- 7



The Dream CB750 FOUR / 1969



CG125 / 1975



Road Pal / 1976



City / 1981



The NSX / 1990



Odyssey / 1994



Honda EV Plus: The Dream of an Electric Vehicle / 1988



The E300 Portable Generator / 1965



The HR21 Lawn Mower / 1978



The F200 "Komame" Mini-Tiller / 1980

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Honda Worldwide Home > About Honda > Heritage > Honda History > Challenge > The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983



## The ZE Engine (GX110/140/240/270/340 Series)

The Concept: An OHV + Inclined Cylinder that Changed the World of General Purpose Engines

1983

### Integrating Parts through Usage

The OHV configuration, while it offered key advantages, also necessitated more parts, a problem that was eventually solved through an exhaustive program of integration. For example, the fuel cock located between the fuel tank and carburetor serves the purpose of preventing fuel leaks during transportation and overhauling. With the ZE engine, the need for a separate fuel cock was eliminated through integration with the carburetor. Adopting the bonding technique of caulking three plates allowed the fuel tank to be mounted directly on the head, further contributing to a reduction in parts. As a result, the number of parts in the new OHV engine, which a normal design would have increased by about 20 percent, was reduced to a number even lower than found in the ME engine.

A key point in the reduction of parts, in addition to the effective ideas incorporated through new mechanisms, was that the development team had achieved such a thorough understanding of the ways general-purpose engines were used. They not only consolidated the parts from an engineering perspective, but also distinguished the necessary parts from unnecessary ones based on product usage. Their experience in field-testing had been put to maximum use. The 20 percent reduction in parts had undoubtedly led to a drop in cost, but more importantly doing so did not sacrifice the functionality of the engine. This was a real advantage for the ZE engine.

Various ideas had been adopted in order to make the OHV engine easier to handle, one such innovation being the mechanical decompression mechanism. An OHV engine offers a better compression ratio due to higher fuel-combustion efficiency. However, this leads to higher pressure, so greater force is required to start the engine. Therefore, a decompression mechanism was added in order to reduce the starting pressure. During the mechanism's development several different ideas were attempted and abandoned, since it was essential that the team avoid any patent infringements. Their effort finally led to the establishment of a proprietary Honda technology.

[Previous Page](#)

[Next Page](#)

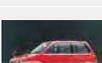
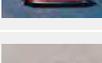
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- 2
- 3
- 4
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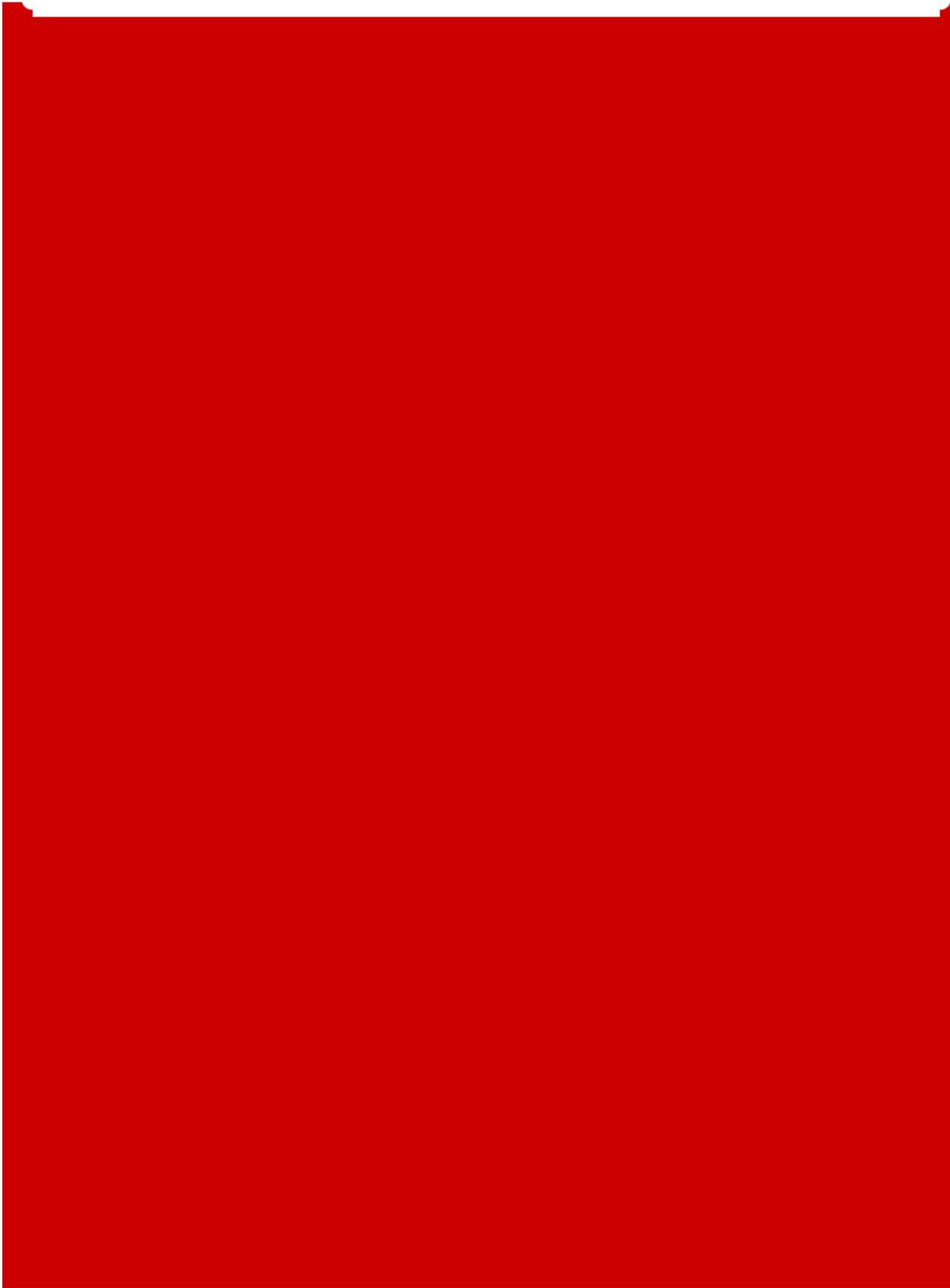
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- Products Emerging From Technology and Innovation** -

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-  The Hondamatic Transmission / 1968
-  The Car Navigation System / 1981
-  The Airbag System / 1987
-  Four-Wheel Steering System (4WS) / 1987
-  The VTEC Engine / 1989
-  The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977
-  The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983



	The Dream CB750 FOUR / 1969
	CG125 / 1975
	Road Pal / 1976
	City / 1981
	The NSX / 1990
	Odyssey / 1994
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## The ZE Engine (GX110/140/240/270/340 Series)

The Concept: An OHV + Inclined Cylinder that Changed the World of General Purpose Engines

1983

### OHV + Inclined Cylinder as de facto Standard

The 3.5-hp GX110 engine and the 5-hp GX140 were released as ZE Series engines in January 1983, taking Honda's international competitors by surprise. The new engines offered all the advantages of OHV engines - namely, higher performance and better fuel economy - along with the added benefits of an inclined cylinder, such as a lower center of gravity and reduced vibration. Moreover, their compact size - 30 percent smaller than the target installation dimensions - enhanced design flexibility for the base machines in which they had been installed. For these reasons, the sales of ZE Series engines grew steadily after their official launch. Although the original target of 3 million units a year has been closely approached but not yet met, Honda's ZE models have become an important base of support for the company's power product operations.

The ZE engine's overall excellence is demonstrated by the fact that since its release manufacturers of general purpose engines around the world have adopted the OHV/inclined cylinder concept, making it the de facto standard. However, when it comes to OHV technology, every manufacturer has had an equal opportunity to apply it. Therefore, there are several reasons for Honda's dominance in that regard, one being the technological capabilities accrued through years of motorcycle and automobile development. The development staff, too, had worked tirelessly to achieve its goals. However above all, the engine's success was driven by "Hondaism," a unique set of philosophies shared by company employees, for whom customer satisfaction is the ultimate objective. They had decided to go with the OHV configuration at a time when no other manufacturer could, simply because they desired a way to please the consumer. They wanted to combine technology and real-world information in a way no one before them had.

[Previous Page](#)

- 1
- 2
- 3
- 4
- 5
- 6
- 7

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 Products Emerging From Technology and Innovation

 The Oval Piston Engine / 1979

 The Hondamatic Transmission / 1968

 The Car Navigation System / 1981

 The Airbag System / 1987

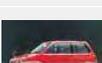
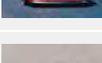
 Four-Wheel Steering System (4WS) / 1987

 The VTEC Engine / 1989

 The ME Engine (G100 / 150 / 200 / 300 / 400 Series) / 1977

 The ZE Engine (GX110 / 140 / 240 / 270 / 340 Series) / 1983



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• CRANKSHAFT DIRECTION

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- Horizontal shaft
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- OHV, 118 cc engine
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- OHV, 163 cc engine
- Horizontal shaft
- Commercial use

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## . GXV160



- OHV, 163 cc engine
- Vertical shaft
- Commercial use

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## . **GX200**



- OHV, 196 cc engine
- Horizontal shaft
- Commercial use

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## . **GX240**



- OHV, 270 cc engine
- Horizontal shaft
- Commercial use

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## . GX270



- OHV, 270 cc engine
- Horizontal shaft
- Commercial use

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## . GX340



- OHV, 389 cc engine
- Horizontal shaft
- Commercial use

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## . GXV340



- OHV, 337 cc engine
- Vertical shaft
- Commercial use

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## . **GX390**



- OHV, 389 cc engine
- Horizontal shaft
- Commercial use

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## . **GXV390**



- OHV, 389 cc engine
- Vertical shaft
- Commercial use

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**Quality and performance come standard.**

## GX120

Honda's GX series engines are legendary for superior reliability and performance. And there's no doubt about it: the GX120 lives up to the legend. Lower noise levels, lower vibration, and lower emissions – without sacrificing power output or performance.

### Common Applications

- Commercial lawn and garden equipment
- Tillers / cultivators
- Generators
- Construction / industrial equipment
- Agricultural equipment
- Water pumps

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- Features
- Specs
- Performance Curve



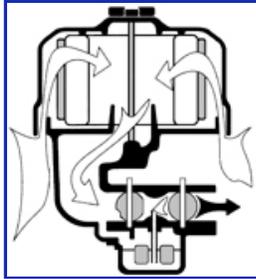
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GX series engines offer premium features and quality



- 

Precision camshaft design



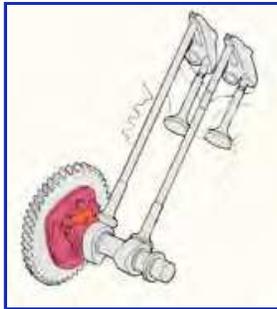
• Superior air filtration systems



• Ball bearing supported crankshaft



• Dual oil drains and fill



Automatic mechanical decompression for easier starting

## Fuel Efficient, High Output Operation

- Precision camshaft design offers precise valve timing and optimal valve overlap for better fuel efficiency
- OHV design for increased efficiency and optimal power transfer
- High compression ratio for better fuel efficiency

## Smooth Performance

- Precision engineered components result in lower vibration
- Ball bearing supported crankshaft for greater stability

## Exceptionally Quiet

- Even quieter than previous model!
- Large capacity, multi-chamber exhaust system
- Reduced mechanical noise due to light weight, noise-reducing materials
- Forged steel crankshaft and rigid crankcase
- Helical cut gears
- Sophisticated air intake system

## Proven Reliability

- Oil Alert | [Learn More](#)
- New carburetor chamber coating and carburetor filter help to protect against fuel impurities
- Cast iron cylinder sleeve
- High quality materials, fit, and finish
- Dual element air cleaner

- Fuel Valve
- 3-Year Limited Warranty

## Easy to Use and Maintain

- Simple throttle control
- Large fuel tanks
- Large automotive type fuel cap
- Dual oil drains and fill
- Easy, convenient, heavy duty control box
- Easily accessible spark plug

## Easy Starting

- Heavy duty recoil starter
- Ergonomic, easy to grip recoil rope design
- Automatic mechanical de-compression system | [Learn More](#)

## Emissions Compliant

- Lower emissions, same power output!
- CARB and EPA certified
- No catalyst necessary

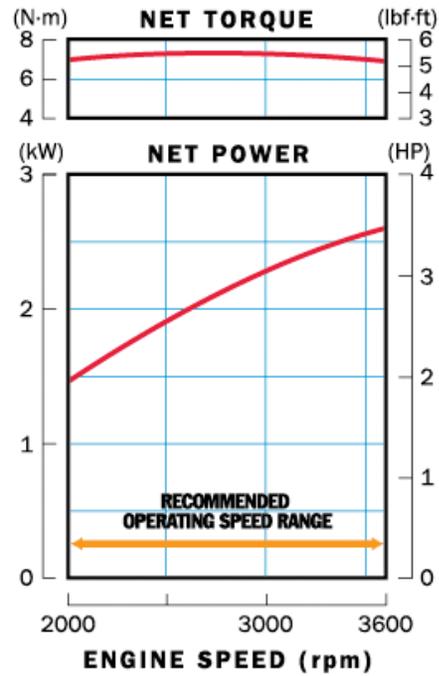
## Available Options

- Gear reduction options
- Spark arrester available

Engine Type	Air-cooled 4-stroke OHV
Bore x Stroke	60 X 42 mm
Displacement	118 cm <sup>3</sup>
Net Power Output*	3.5 HP (2.6 kW) @ 3,600 rpm
Net Torque	5.4 lb-ft (7.3 Nm) @ 2,500 rpm
PTO Shaft Rotation	Counterclockwise (from PTO shaft side)
Compression Ratio	8.5:1
Lamp/Charge coil options	25W, 50W
Carburetor	Butterfly
Ignition System	Transistorized magneto
Starting System	Recoil
Lubrication System	Splash
Governor System	Mechanical
Air cleaner	Dual Element

Oil Capacity	0.59 US qt. (0.56 L)
Fuel Tank Capacity	2.1 U.S. qts (2.0 liters)
Fuel	Unleaded 86 octane or higher
Dry Weight	29 lbs. (13.0 kg)
Dimensions	
Length (min)	11.7" (297 mm)
Width (min)	13.6" (346 mm)
Height (min)	13.0" (329 mm)
PTO Shaft Options	
L type	Reduction type PTO
Q type	Straight shaft
S type	Straight shaft (metric)
T type	Straight shaft
AR type	Rammer

\*The SAE J1349 standard measures net horsepower with the manufacturer's production muffler and air cleaner in place. Net horsepower more closely correlates with the power the operator will experience when using a Honda engine powered product. The power rating of the engines indicated in this document measures the net power output at 3600 rpm (7000 rpm for model GXH50, GXV50, GX25 and GX35) and net torque at 2500 rpm, as tested on a production engine. Mass production engines may vary from this value. Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operation speed of the engine in application, environmental conditions, maintenance and other variables.



GX120

\*The SAE J1349 standard measures net horsepower with the manufacturer's production muffler and air cleaner in place. Net horsepower more closely correlates with the power the operator will experience when using a Honda engine powered product. The power rating of the engines indicated in this document measures the net power output at 3600 rpm (7000 rpm for model GXH50, GXV50, GX25 and GX35) and net torque at 2500 rpm, as tested on a production engine. Mass production engines may vary from this value. Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operation speed of the engine in application, environmental conditions, maintenance and other variables.

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- USE

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**Quality and performance come standard.**

## GX160

Honda's GX series engines are legendary for superior reliability and performance. And there's no doubt about it: the GX160 lives up to the legend. Lower noise levels, lower vibration, and lower emissions – without sacrificing power output or performance.

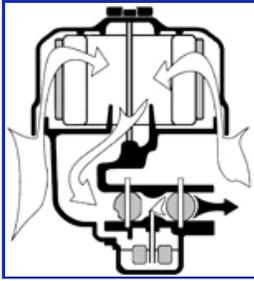
### Common Applications

- Pressure washers
- Commercial lawn and garden equipment
- Tillers / cultivators
- Generators
- Construction / industrial equipment
- Agricultural equipment
- Water pumps

Owners Manual 







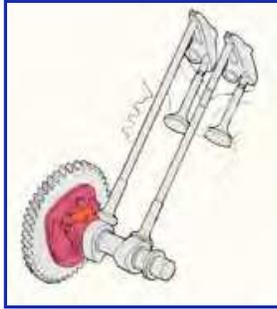
• Superior air filtration systems



• Ball bearing supported crankshaft



• Dual oil drains and fill



• Automatic mechanical decompression for easier starting



• Multiple charging coil options

## Fuel Efficient, High Output Operation

- New design offers even better fuel economy than before!
- Precision camshaft design offers precise valve timing and optimal valve overlap for better fuel efficiency
- OHV design for increased efficiency and optimal power transfer
- High compression ratio for better fuel efficiency

## Smooth Performance

- Precision engineered components result in lower vibration
- Reduced piston weight and precision balanced crankshaft result in lower engine vibration
- Ball bearing supported crankshaft for greater stability

## Exceptionally Quiet

- Aluminum push rods reduce both valve clearance and noise level.
- New enhancements to the muffler, breather valve, and case cover reduce noise level
- Reduced mechanical noise due to light weight, noise-reducing materials
- Forged steel crankshaft and rigid crankcase
- Helical cut gears
- Sophisticated air intake system

## Proven Reliability

- Oil Alert | [Learn More](#)
- New carburetor chamber coating and carburetor filter help to protect against fuel impurities
- Cast iron cylinder sleeve
- High quality materials, fit, and finish
- Dual element air cleaner
- Fuel Valve
- 3-Year Limited Warranty

## Easy to Use and Maintain

- Simple throttle control
- Large fuel tanks
- Large automotive type fuel cap
- Dual oil drains and fill
- Easy, convenient, heavy duty control box
- Easily accessible spark plug

## Easy Starting

- Heavy duty recoil starter
- Ergonomic, easy to grip recoil rope design
- Automatic mechanical de-compression system | [Learn More](#)

## Emissions Compliant

- Lower emissions, higher power output!
- CARB and EPA certified
- No catalyst necessary

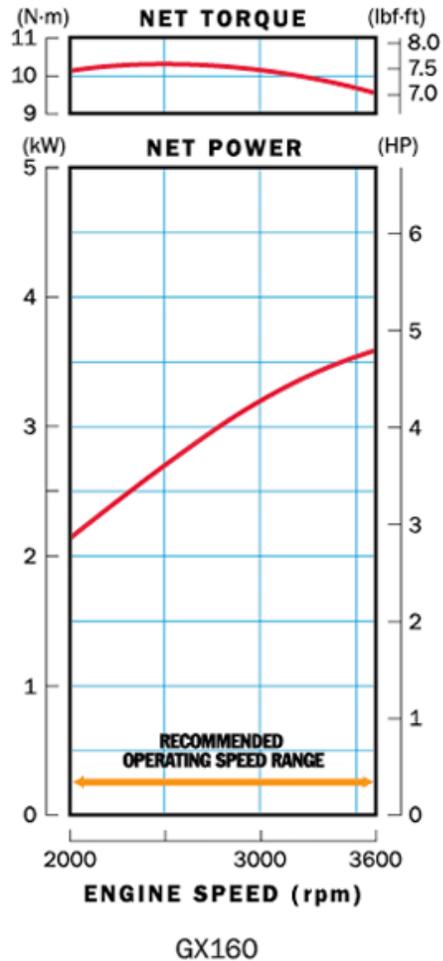
## Available Options

- Low profile versions
- Gear reduction options
- Electric start
- Spark arrester available
- Charge and lamp coils with multiple output options available
- Cyclone Air Cleaner available

Engine Type	Air-cooled 4-stroke OHV
Bore x Stroke	68 X 45 mm

Displacement	163 cm <sup>3</sup>
Net Power Output*	4.8 HP (3.6 kW) @ 3,600 rpm
Net Torque	7.6 lb-ft (10.3 Nm) @ 2,500 rpm
PTO Shaft Rotation	Counterclockwise (from PTO shaft side)
Compression Ratio	9.0 : 1
Lamp/Charge coil options	25W, 50W / 1A, 3A, 7A
Carburetor	Butterfly
Ignition System	Transistorized magneto
Starting System	Recoil Starter
Lubrication System	Splash
Governor System	Centrifugal Mechanical
Air cleaner	Dual Element
Oil Capacity	0.61 US qt. (0.58 L)
Fuel Tank Capacity	3.3 U.S. qts (3.1 liters)
Fuel	Unleaded 86 octane or higher
Dry Weight	33 lbs. (15.1 kg)
Dimensions	
Length (min)	12.2" (312 mm)
Width (min)	14.3" (362 mm)
Height (min)	13.6" (346 mm)
PTO Shaft Options	
<b>H type</b>	Reduction type PTO
<b>L type</b>	Reduction type PTO
<b>Q type</b>	Straight shaft
<b>R type</b>	Reduction type PTO
<b>S type</b>	Straight shaft (metric)
<b>T type</b>	Straight shaft
<b>V type</b>	Tapered shaft

\*The SAE J1349 standard measures net horsepower with the manufacturer's production muffler and air cleaner in place. Net horsepower more closely correlates with the power the operator will experience when using a Honda engine powered product. The power rating of the engines indicated in this document measures the net power output at 3600 rpm (7000 rpm for model GXH50, GXV50, GX25 and GX35) and net torque at 2500 rpm, as tested on a production engine. Mass production engines may vary from this value. Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operation speed of the engine in application, environmental conditions, maintenance and other variables.



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**Quality and performance come standard.**

## **GX200**

Honda's GX series engines are legendary for superior reliability and performance. And there's no doubt about it: the GX200 lives up to the legend. Lower noise levels, lower vibration, and lower emissions – without sacrificing power output or performance.

### **Common Applications**

- Pressure washers
- Commercial lawn and garden equipment
- Tillers / cultivators
- Generators
- Construction / industrial equipment
- Agricultural equipment
- Small vehicles
- Water pumps

Owners Manual 



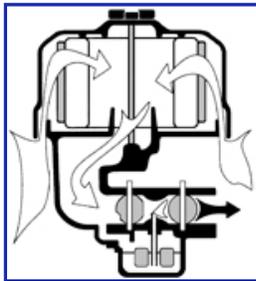
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- GX series engines offer premium features and quality



• Precision camshaft design



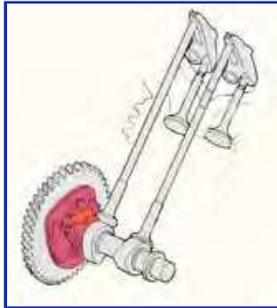
• Superior air filtration systems



• Ball bearing supported crankshaft



• Dual oil drains and fill



• Automatic mechanical decompression for easier starting



• Multiple charging coil options

## Fuel Efficient, High Output Operation

- Precision camshaft design offers precise valve timing and optimal valve overlap for better fuel efficiency
- OHV design for increased efficiency and optimal power transfer
- High compression ratio for better fuel efficiency

## Smooth Performance

- Precision engineered components result in lower vibration
- Ball bearing supported crankshaft for greater stability

## Exceptionally Quiet

- Large capacity, multi-chamber exhaust system
- Reduced mechanical noise due to light weight, noise-reducing materials
- Forged steel crankshaft and rigid crankcase
- Helical cut gears
- Sophisticated air intake system

## Proven Reliability

- Oil Alert | [Learn More](#)
- New carburetor chamber coating and carburetor filter help to protect against fuel impurities
- Cast iron cylinder sleeve
- High quality materials, fit, and finish
- Dual element air cleaner
- Fuel Valve
- 3-Year Limited Warranty

## Easy to Use and Maintain

- Simple throttle control
- Large fuel tanks
- Large automotive type fuel cap
- Dual oil drains and fill
- Easy, convenient, heavy duty control box
- Easily accessible spark plug

## Easy Starting

- Heavy duty recoil starter
- Ergonomic, easy to grip recoil rope design
- Automatic mechanical de-compression system | [Learn More](#)

## Emissions Compliant

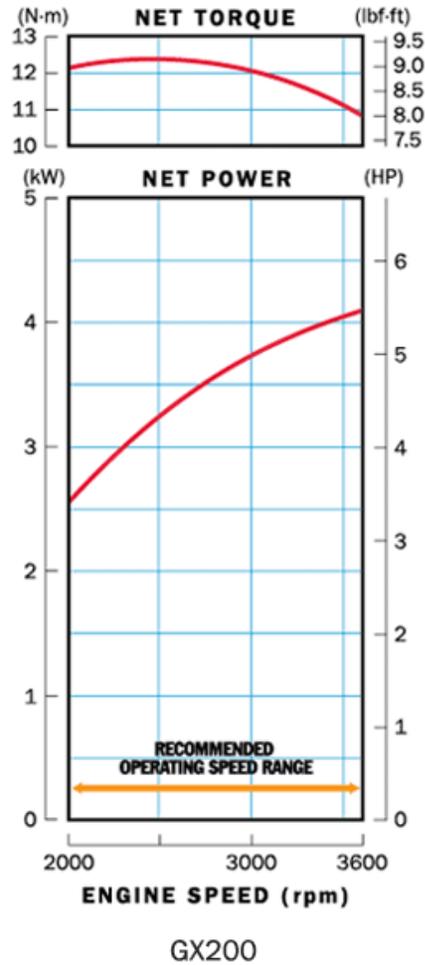
- Lower emissions, same power output!
- CARB and EPA certified
- No catalyst necessary

## Available Options

- Low profile versions
- Gear reduction options
- Electric start
- Spark arrester available
- Charge and lamp coils with multiple output options available
- Cyclone Air Cleaner available

Engine Type	Air-cooled 4-stroke OHV
Bore x Stroke	68 X 54 mm
Displacement	196 cm <sup>3</sup>
Net Power Output*	5.5 HP (4.1 kW) @ 3,600 rpm
Net Torque	9.1 lb-ft (12.4 Nm) @ 2,500 rpm
PTO Shaft Rotation	Counterclockwise (from PTO shaft side)
Compression Ratio	8.5:1
Lamp/Charge coil options	25W, 50W / 1A, 3A, 7A
Carburetor	Butterfly
Ignition System	Transistorized magneto
Starting System	Recoil Starter
Lubrication System	Splash
Governor System	Mechanical
Air cleaner	Dual element
Oil Capacity	0.63 US qt (0.6l)
Fuel Tank Capacity	3.3 U.S. qts (3.1 liters)
Fuel	Unleaded 86 octane or higher
Dry Weight	35 lbs. (16.1 kg)
Dimensions	
Length (min)	12.6" (321mm)
Width (min)	14.8" (376mm)
Height (min)	13.6" (346 mm)
PTO Shaft Options	
<b>H type</b>	Reduction type PTO
<b>L type</b>	Reduction type PTO
<b>Q type</b>	Straight shaft
<b>R type</b>	Reduction type PTO
<b>T type</b>	Straight shaft
<b>V type</b>	Tapered shaft

\*The SAE J1349 standard measures net horsepower with the manufacturer's production muffler and air cleaner in place. Net horsepower more closely correlates with the power the operator will experience when using a Honda engine powered product. The power rating of the engines indicated in this document measures the net power output at 3600 rpm (7000 rpm for model GXH50, GXV50, GX25 and GX35) and net torque at 2500 rpm, as tested on a production engine. Mass production engines may vary from this value. Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operation speed of the engine in application, environmental conditions, maintenance and other variables.



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## The Next Generation of GX Engines.

### GX240

With the GX240, you're looking at one of the best engines in the business. More power. Quieter performance. Lower fuel consumption. Lower emissions. Better features. Exceptional performance. Honda's GX series lives up to the legend, and then some.

#### Common Applications

- Pressure washers
- Commercial lawn and garden equipment
- Tillers / cultivators
- Generators
- Construction / industrial equipment
- Agricultural equipment
- Small vehicles
- Water pumps

Owners Manual 



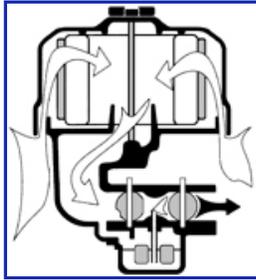
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• GX series engines offer premium features and quality.



Digital CDI Ignition Coil



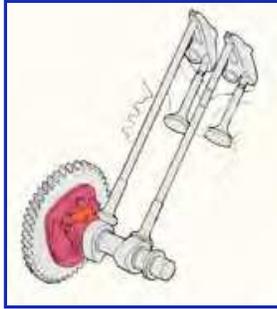
Superior air filtration systems



Ball bearing supported crankshaft



Dual oil drains and fill



• Automatic mechanical decompression for easier starting



• Multiple charging coil options

## Fuel Efficient, High Output Operation

- Digital CDI ignition system with variable timing | [Learn More](#)
- Increased compression ratio
- Precision camshaft design offers precise valve timing and optimal valve overlap for better fuel efficiency
- OHV design for increased efficiency and optimal power transfer

## Smooth Performance

- Precision engineered components result in lower vibration
- Ball bearing supported crankshaft for greater stability
- Heavy duty balancer shaft
- Improved piston design

## Exceptionally Quiet

- Large capacity, multi-chamber exhaust system
- Improved camshaft and muffler reduce overall engine noise by up to 5 dB
- Reduced mechanical noise due to piston design
- Forged steel crankshaft and rigid crankcase
- Helical cut gears

- Sophisticated air intake system

## Proven Reliability

- Oil Alert | [Learn More](#)
- Cast iron cylinder sleeve
- High quality materials, fit, and finish
- Dual element air cleaner
- Fuel Valve
- 3-Year Limited Warranty

## Easy to Use and Maintain

- Simple throttle control
- Large fuel tanks
- Large automotive type fuel cap
- Dual oil drains and fill
- Easy, convenient, heavy duty control box
- Easily accessible spark plug

## Easy Starting

- Heavy duty recoil starter
- Automatic mechanical de-compression system | [Learn More](#)
- Variable ignition timing

## Emissions Compliant

- CARB and EPA certified
- No catalyst necessary

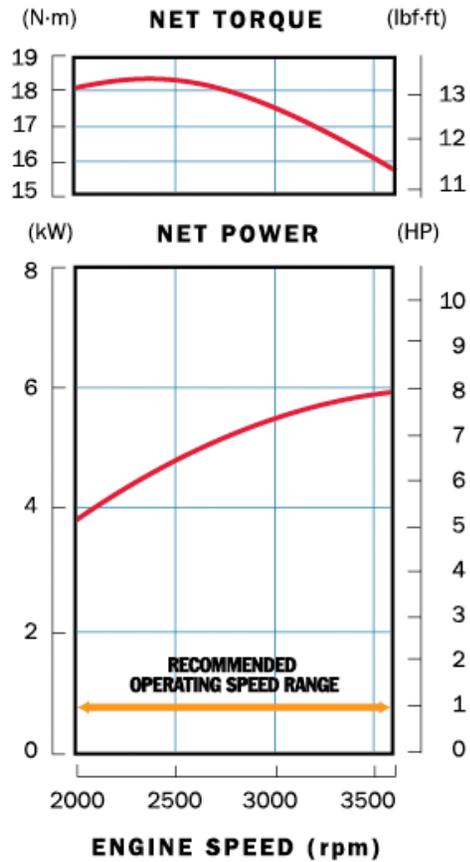
## Available Options

- Low profile versions
- Gear reduction options
- Electric start
- Spark arrester available
- Charge and lamp coils with multiple output options available
- Cyclone Air Cleaner available

Engine Type	Air-cooled 4-stroke OHV
Bore x Stroke	73 X 58 mm

Displacement	270 cm <sup>3</sup>
Net Power Output*	7.9 HP (5.9 kW) @ 3,600 rpm
Net Torque	13.5 lb-ft (18.3 Nm) @ 2,500 rpm
PTO Shaft Rotation	Counterclockwise (from PTO shaft side)
Compression Ratio	8.5:1
Lamp/Charge coil options	25W, 50W / 1A, 3A, 10A, 18A
Carburetor	Butterfly Float Type
Ignition System	Digital CDI with variable ignition timing
Starting System	Recoil/electric
Lubrication System	Splash
Governor System	Centrifugal Mass Type
Air cleaner	Dual element
Oil Capacity	1.16 US qt (1.1 L)
Fuel Tank Capacity	5.6 U.S. qts (5.3 liters)
Fuel	Unleaded 86 octane or higher
Dry Weight	55.1 to 66.1 lb (25 to 30 kg)
Dimensions	
Length (min)	15.0" (380 mm)
Width (min)	16.9" (429 mm)
Height (min)	16.6" (422 mm)
PTO Shaft Options	
<b>E type</b>	Tapered shaft
<b>H type</b>	Reduction type PTO
<b>L type</b>	Reduction type PTO
<b>P type</b>	Threaded type (SAE)
<b>Q type</b>	Straight shaft
<b>R type</b>	Reduction type PTO
<b>V type</b>	Tapered shaft

\*The SAE J1349 standard measures net horsepower with the manufacturer's production muffler and air cleaner in place. Net horsepower more closely correlates with the power the operator will experience when using a Honda engine powered product. The power rating of the engines indicated in this document measures the net power output at 3600 rpm (7000 rpm for model GXH50, GXV50, GX25 and GX35) and net torque at 2500 rpm, as tested on a production engine. Mass production engines may vary from this value. Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operation speed of the engine in application, environmental conditions, maintenance and other variables.



**GX240**

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## The Next Generation of GX Engines.

### GX270

With the GX270, you're looking at one of the best engines in the business. More power. Quieter performance. Lower fuel consumption. Lower emissions. Better features. Exceptional performance. Honda's GX series lives up to the legend, and then some.

#### Common Applications

- Pressure washers
- Commercial lawn and garden equipment
- Tillers / cultivators
- Generators
- Construction / industrial equipment
- Agricultural equipment
- Small vehicles
- Water pumps

Owners Manual 



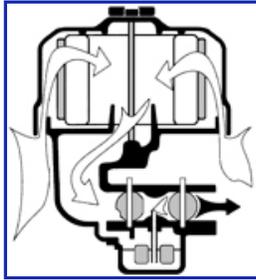
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• GX series engines offer premium features and quality



Digital CDI Ignition Coil



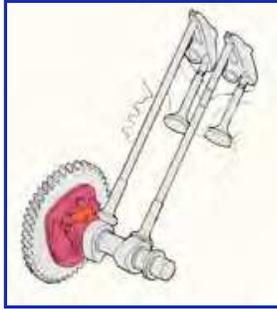
Superior air filtration systems



Ball bearing supported crankshaft



Dual oil drains and fill



• Automatic mechanical decompression for easier starting



• Multiple charging coil options

## Fuel Efficient, High Output Operation

- Digital CDI ignition system with variable timing | [Learn More](#)
- Increased compression ratio
- Precision camshaft design offers precise valve timing and optimal valve overlap for better fuel efficiency
- OHV design for increased efficiency and optimal power transfer

## Smooth Performance

- Precision engineered components result in lower vibration
- Ball bearing supported crankshaft for greater stability
- Heavy duty balancer shaft
- Improved piston design

## Exceptionally Quiet

- Large capacity, multi-chamber exhaust system
- Improved camshaft and muffler reduce overall engine noise by up to 5 dB
- Reduced mechanical noise due to piston design
- Forged steel crankshaft and rigid crankcase
- Helical cut gears

- Sophisticated air intake system

## Proven Reliability

- Oil Alert | [Learn More](#)
- Cast iron cylinder sleeve
- High quality materials, fit, and finish
- Dual element air cleaner
- Fuel Valve
- 3-Year Limited Warranty

## Easy to Use and Maintain

- Simple throttle control
- Large fuel tanks
- Large automotive type fuel cap
- Dual oil drains and fill
- Easy, convenient, heavy duty control box
- Easily accessible spark plug

## Easy Starting

- Heavy duty recoil starter
- Automatic mechanical de-compression system | [Learn More](#)
- Variable ignition timing

## Emissions Compliant

- CARB and EPA certified
- No catalyst necessary

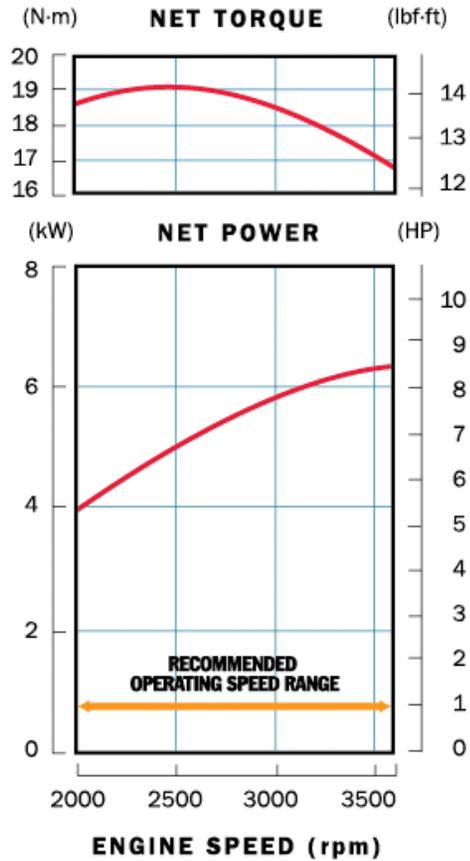
## Available Options

- Low profile versions
- Gear reduction options
- Electric start
- Spark arrester available
- Charge and lamp coils with multiple output options available
- Cyclone Air Cleaner available

Engine Type	Air-cooled 4-stroke OHV
Bore x Stroke	77 X 58 mm

Displacement	270 cm <sup>3</sup>
Net Power Output*	8.5 HP (6.3 kW) @ 3,600 rpm
Net Torque	14.1 lb-ft (19.1 Nm) @ 2,500 rpm
PTO Shaft Rotation	Counterclockwise (from PTO shaft side)
Compression Ratio	8.5:1
Lamp/Charge coil options	25W, 50W / 1A, 3A, 10A, 18A
Carburetor	Butterfly Float Type
Ignition System	Digital CDI with variable ignition timing
Starting System	Recoil/electric
Lubrication System	Splash
Governor System	Centrifugal Mass Type
Air cleaner	Dual element
Oil Capacity	1.16 US qt (1.1 L)
Fuel Tank Capacity	5.6 U.S. qts (5.3 liters)
Fuel	Unleaded 86 octane or higher
Dry Weight	55 lb (25 kg)
Dimensions	
Length (min)	15.0" (380 mm)
Width (min)	16.9" (429 mm)
Height (min)	16.6" (422 mm)
PTO Shaft Options	
<b>E type</b>	Tapered shaft
<b>H type</b>	Reduction type PTO
<b>L type</b>	Reduction type PTO
<b>P type</b>	Threaded type (SAE)
<b>Q type</b>	Straight shaft
<b>R type</b>	Reduction type PTO
<b>V type</b>	Tapered shaft

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**GX270**

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## The Next Generation of GX Engines.

### GX340

With the GX340, you're looking at one of the best engines in the business. More power. Quieter performance. Lower fuel consumption. Lower emissions. Better features. Exceptional performance. Honda's GX series lives up to the legend, and then some.

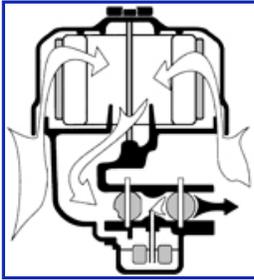
#### Common Applications

- Pressure washers
- Commercial lawn and garden equipment
- Tillers / cultivators
- Generators
- Forestry equipment
- Construction / industrial equipment
- Agricultural equipment
- Small vehicles
- Water pumps

Owners Manual 



Digital CDI Ignition Coil



Superior air filtration systems



Ball bearing supported crankshaft



Dual oil drains and fill



Multiple charging coil options

## Fuel Efficient, High Output Operation

- Digital CDI ignition system with variable timing | [Learn More](#)
- Increased compression ratio
- Precision camshaft design offers precise valve timing and optimal valve overlap for better fuel efficiency
- OHV design for increased efficiency and optimal power transfer

## Smooth Performance

- Precision engineered components result in lower vibration
- Ball bearing supported crankshaft for greater stability
- Heavy duty balancer shaft
- Improved piston design

## Exceptionally Quiet

- Large capacity, multi-chamber exhaust system
- Improved camshaft and muffler reduce overall engine noise by up to 5 dB
- Reduced mechanical noise due to piston design
- Forged steel crankshaft and rigid crankcase
- Helical cut gears
- Sophisticated air intake system

## Proven Reliability

- Oil Alert | [Learn More](#)
- Cast iron cylinder sleeve
- High quality materials, fit, and finish
- Dual element air cleaner
- Fuel Valve
- 3-Year Limited Warranty

## Easy to Use and Maintain

- Simple throttle control
- Large fuel tanks
- Large automotive type fuel cap
- Dual oil drains and fill
- Easy, convenient, heavy duty control box
- Easily accessible spark plug

## Easy Starting

- Heavy duty recoil starter
- Automatic mechanical de-compression system | [Learn More](#)
- Variable ignition timing

## Emissions Compliant

- CARB and EPA certified
- No catalyst necessary

## Available Options

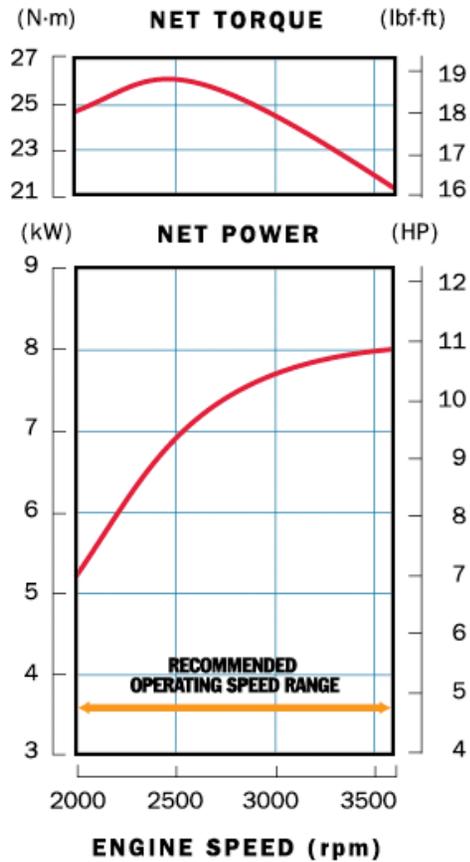
- Low profile versions
- Gear reduction options
- Electric start
- Spark arrester available
- Charge and lamp coils with multiple output options available
- Cyclone Air Cleaner available

Engine Type	Air-cooled 4-stroke OHV
Bore x Stroke	88 X 64 mm
Displacement	389 cm <sup>3</sup>
Net Power Output*	10.7 HP (8.0 kW) @ 3,600 rpm
Net Torque	19.5 lb-ft (26.4 Nm) @ 2,500 rpm
PTO Shaft Rotation	Counterclockwise (from PTO shaft side)
Compression Ratio	8.2:1
Lamp/Charge coil options	25W, 50W / 1A, 3A, 10A, 18A
Carburetor	Butterfly Float Type
Ignition System	Digital CDI with variable timing
Starting System	Recoil/electric
Lubrication System	Splash
Governor System	Centrifugal Mass Type
Air cleaner	Dual element
Oil Capacity	1.16 US qt (1.1 L)
Fuel Tank Capacity	6.4 U.S. qts (6.1 liters)
Fuel	Unleaded 86 octane or higher
Dry Weight	69 lb (31.5 kg)
Dimensions	
Length (min)	16.0" (407 mm)
Width (min)	19.1" (485 mm)
Height (min)	17.7" (449 mm)
PTO Shaft Options	
<a href="#">E type</a>	Tapered shaft
<a href="#">H type</a>	Reduction type PTO

PTO Shaft Options

- L type Reduction type PTO
- P type Threaded type (SAE)
- Q type Straight shaft
- R type Reduction type PTO
- V type Tapered shaft

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**GX340/iGX340**

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## The Next Generation of GX Engines.

### GX390

With the GX390, you're looking at one of the best engines in the business. More power. Quieter performance. Lower fuel consumption. Lower emissions. Better features. Exceptional performance. Honda's GX series lives up to the legend, and then some.

#### Common Applications

- Pressure washers
- Commercial lawn and garden equipment
- Tillers / cultivators
- Generators
- Forestry equipment
- Construction / industrial equipment
- Agricultural equipment
- Small vehicles
- Water pumps

Owners Manual 



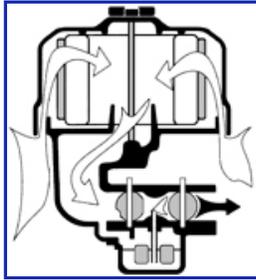
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• GX series engines offer premium features and quality.



Digital CDI Ignition Coil



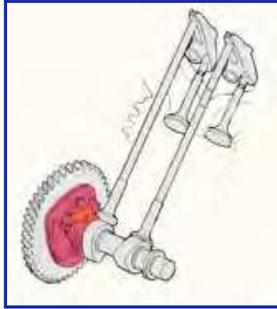
Superior air filtration systems



Ball bearing supported crankshaft



Dual oil drains and fill



• Automatic mechanical decompression for easier starting



• Multiple charging coil options

## Fuel Efficient, High Output Operation

- Digital CDI ignition system with variable timing
- Increased compression ratio | [Learn More](#)
- Precision camshaft design offers precise valve timing and optimal valve overlap for better fuel efficiency
- OHV design for increased efficiency and optimal power transfer

## Smooth Performance

- Precision engineered components result in lower vibration
- Ball bearing supported crankshaft for greater stability
- Heavy duty balancer shaft
- Improved piston design

## Exceptionally Quiet

- Large capacity, multi-chamber exhaust system
- Improved camshaft and muffler reduce overall engine noise by up to 5 dB
- Forged steel crankshaft and rigid crankcase
- Helical cut gears
- Sophisticated air intake system

## Proven Reliability

- Oil Alert | [Learn More](#)
- Cast iron cylinder sleeve
- High quality materials, fit, and finish
- Dual element air cleaner
- Fuel Valve
- 3-Year Limited Warranty

## Easy to Use and Maintain

- Simple throttle control
- Large fuel tanks
- Large automotive type fuel cap
- Dual oil drains and fill
- Easy, convenient, heavy duty control box
- Easily accessible spark plug

## Easy Starting

- Heavy duty recoil starter
- Automatic mechanical de-compression system | [Learn More](#)
- Variable ignition timing

## Emissions Compliant

- CARB and EPA certified
- No catalyst necessary

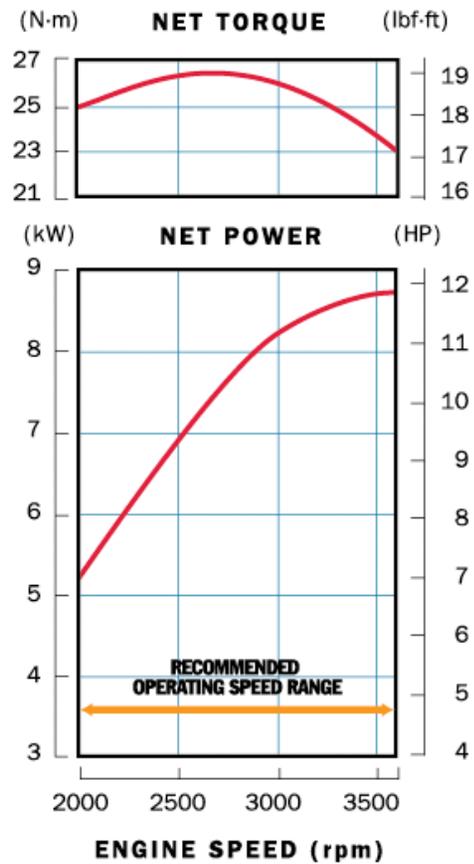
## Available Options

- Low profile versions
- Gear reduction options
- Electric start
- Spark arrester available
- Charge and lamp coils with multiple output options available
- Cyclone Air Cleaner available

Engine Type	Air-cooled 4-stroke OHV
Bore x Stroke	88 X 64 mm
Displacement	389 cm <sup>3</sup>
Net Power Output*	11.7 HP (8.7 kW) @ 3,600 rpm

Net Torque	19.5 lb-ft (26.4 Nm) @ 2,500 rpm
PTO Shaft Rotation	Counterclockwise (from PTO shaft side)
Compression Ratio	8.2:1
Lamp/Charge coil options	25W, 50W / 1A, 3A, 10A, 18A
Carburetor	Butterfly Float Type
Ignition System	Digital CDI with variable timing
Starting System	Recoil/electric
Lubrication System	Splash
Governor System	Centrifugal Mass Type
Air cleaner	Dual element
Oil Capacity	1.16 US qt (1.1 L)
Fuel Tank Capacity	6.4 U.S. qts (6.1 liters)
Fuel	Unleaded 86 octane or higher
Dry Weight	69 lb (31.5 kg)
Dimensions	
Length (min)	16.0" (407 mm)
Width (min)	19.1" (485 mm)
Height (min)	17.7" (449 mm)
PTO Shaft Options	
<b>E type</b>	Tapered shaft
<b>H type</b>	Reduction type PTO
<b>L type</b>	Reduction type PTO
<b>P type</b>	Threaded type (SAE)
<b>Q type</b>	Straight shaft
<b>R type</b>	Reduction type PTO
<b>V type</b>	Tapered shaft

\*The SAE J1349 standard measures net horsepower with the manufacturer's production muffler and air cleaner in place. Net horsepower more closely correlates with the power the operator will experience when using a Honda engine powered product. The power rating of the engines indicated in this document measures the net power output at 3600 rpm (7000 rpm for model GXH50, GXV50, GX25 and GX35) and net torque at 2500 rpm, as tested on a production engine. Mass production engines may vary from this value. Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operation speed of the engine in application, environmental conditions, maintenance and other variables.



**GX390/iGX390**

\*The SAE J1349 standard measures net horsepower with the manufacturer's production muffler and air cleaner in place. Net horsepower more closely correlates with the power the operator will experience when using a Honda engine powered product. The power rating of the engines indicated in this document measures the net power output at 3600 rpm (7000 rpm for model GXH50, GXV50, GX25 and GX35) and net torque at 2500 rpm, as tested on a production engine. Mass production engines may vary from this value. Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operation speed of the engine in application, environmental conditions, maintenance and other variables.

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**Honda GX340 10.7 HP GX Horizontal OHV 389cc, w/ 1-inch PTO Shaft, 6:1 Reduction, Recoil Start, Oil Alert**



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**HONDA ENGINES** **GX340UT2HA2**

*Honda's GX series engines are legendary for superior reliability and performance. No doubt about it - The GX340 lives up to its name.*

**Quality and Performance are standard with Honda GX Series Engines.**

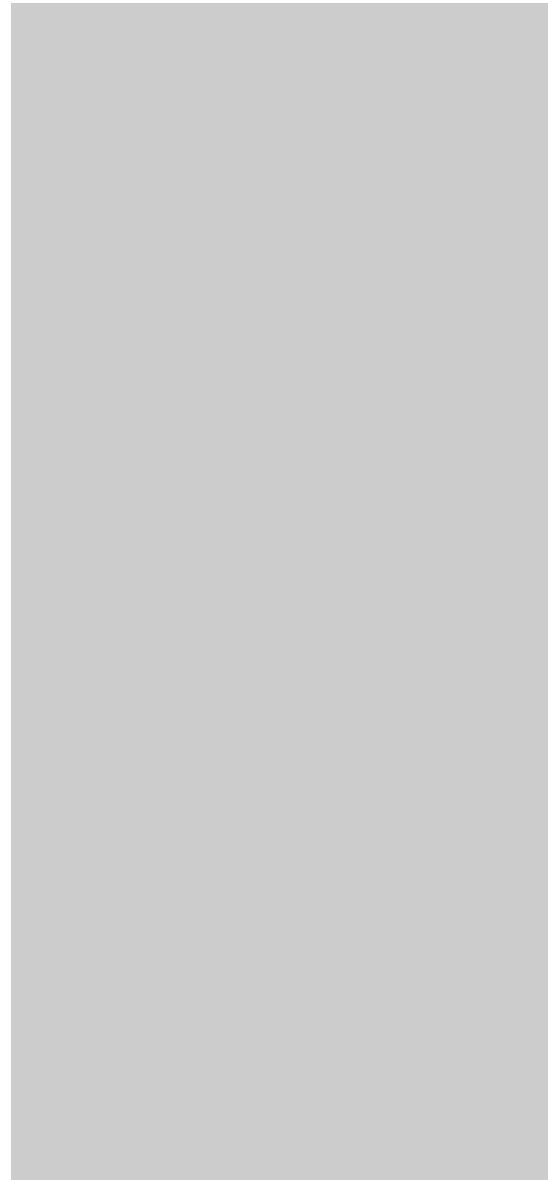
There are many reasons to insist on genuine Honda engines. As the world's largest engine manufacturer, Honda offers more engine experience than anyone. Experience born on racetracks and roadways around the globe. Experience that keeps us on the cutting edge of engine performance technology and crosses our entire product line. We've got a well-earned reputation for our engine quality and performance. When you choose a Honda engine, or a product powered by Honda, you know what you're getting. An engine you can count on, now and in the future.

**The Big GX, Now Even More Powerful.**

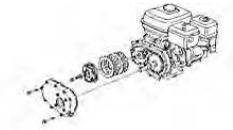
The new Honda GX Series (GX240-GX390) engines offer up to 6% more power over the original models. The increase in power is achieved through several innovative improvements. First, the new GX series now employs a digital CDI ignition system to dramatically improve ignition timing. Second, the compression ratio has been increased and finally, combustion air flow has been enhanced through a more efficient air cleaner design that reduces air flow restriction.

Item Number: **GX340UT2HA2**

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<b>HORIZONTAL-OHV-389CC-ENGINE-6-1-REDUCTION#</b>	
1000w - 2000w ( <a href="http://www.electricgeneratordepot.com/watts/1000-2000w-duromax-portable-generators/">http://www.electricgeneratordepot.com/watts/1000-2000w-duromax-portable-generators/</a> )	



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**6 to 1 Gear Reduction Units**

The 6-to-1 Reduction Units are chain driven and do not include a clutch. These units may be used with a centrifugally operated clutch, or a wet clutch.  
**This model does NOT include a clutch.**

**The GX Series Engines have reliability written all over them**

Honda GX Series Engines have long been recognized as the industry leader in providing reliable, easy-starting and fuel efficient small engines. You'll find Honda GX Series overhead valve engines on a wide variety of construction, maintenance and premium power equipment.

The rental industry - where power equipment is subjected to the ultimate test of durability, relies heavily on Honda OHV engines to ensure customer satisfaction and a minimal level of maintenance and repair. When it comes to reliability, trust the engines with the Honda name.

**Less Noise**

The operator will enjoy noise reduction levels ranging from 2.5 to 8db thanks to Honda's redesigned air cleaner and muffler. Vibration levels have also been reduced through the use of an all new, light weight piston.

**Same "Footprint"**

OEMs can pass along new improvements and features without having to worry about costly and time consuming product modifications. New GX Series models have

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4000w - 6000w ( <a href="http://www.electricgeneratordepot.com/watts/4000-6000w-duromax-portable-generators/">http://www.electricgeneratordepot.com/watts/4000-6000w-duromax-portable-generators/</a> )	
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the exact footprint and fit into the same envelope as their similarly sized predecessors.

**EPA Phase 3 Ready!**

Once again, Honda leads the way in offering power solutions that meet EPA Phase 3 emission regulations. Even more importantly, Honda GX engines meet these regulations without the need for a catalyst.

**Environmentally Conscious**

Environmental responsibility has been an integral part of our product development philosophy years before emission levels were established.



SPECIFICATIONS	
CRANKSHAFT DIRECTION	HORIZONTAL ORIENTATION
ENGINE TYPE	AIR-COOLED 4-STROKE OHV
BORE X STROKE	88 X 64 MM
DISPLACEMENT	389 CM3
NET POWER OUTPUT*	10.7 HP (8.0 KW) @ 3,600 RPM
NET TORQUE	19.5 LB-FT (26.4 NM) @ 2,500 RPM
PTO SHAFT ROTATION	COUNTERCLOCKWISE (FROM PTO SHAFT SIDE)
COMPRESSION RATIO	8.2:1
CARBURETOR	BUTTERFLY FLOAT TYPE

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IGNITION SYSTEM	DIGITAL CDI WITH VARIABLE IGNITION TIMING
STARTING SYSTEM	RECOIL SYSTEM
LUBRICATION SYSTEM	SPLASH
GOVERNOR SYSTEM	CENTRIFUGAL MASS TYPE
AIR CLEANER	DUAL ELEMENT
OIL CAPACITY	1.16 US QT (1.1 L)
FUEL	UNLEADED 86 OCTANE OR HIGHER
FUEL TANK CAPACITY	6.4 U.S. QTS (6.1 LITERS)
DRY WEIGHT	69 LB (31.5 KG)
<b>DIMENSIONS</b>	
LENGTH (MIN)	16.0" (407 MM)
WIDTH (MIN)	19.1" (485 MM)
HEIGHT (MIN)	17.7" (449 MM)
<b>PTO SHAFT</b>	
<a href="http://www.electricgeneratordepot.com/honda-10-7-hp-gx-horizontal-ohv-389cc-engine-6-1-reduction#gx340_htype">H TYPE (HTTP://WWW.ELECTRICGENERATORDEPOT.COM/HONDA-10-7-HP-GX-HORIZONTAL-OHV-389CC-ENGINE-6-1-REDUCTION#GX340_HTYPE)</a>	REDUCTION TYPE PTO

**Overhead Valve (OHV) Engines**

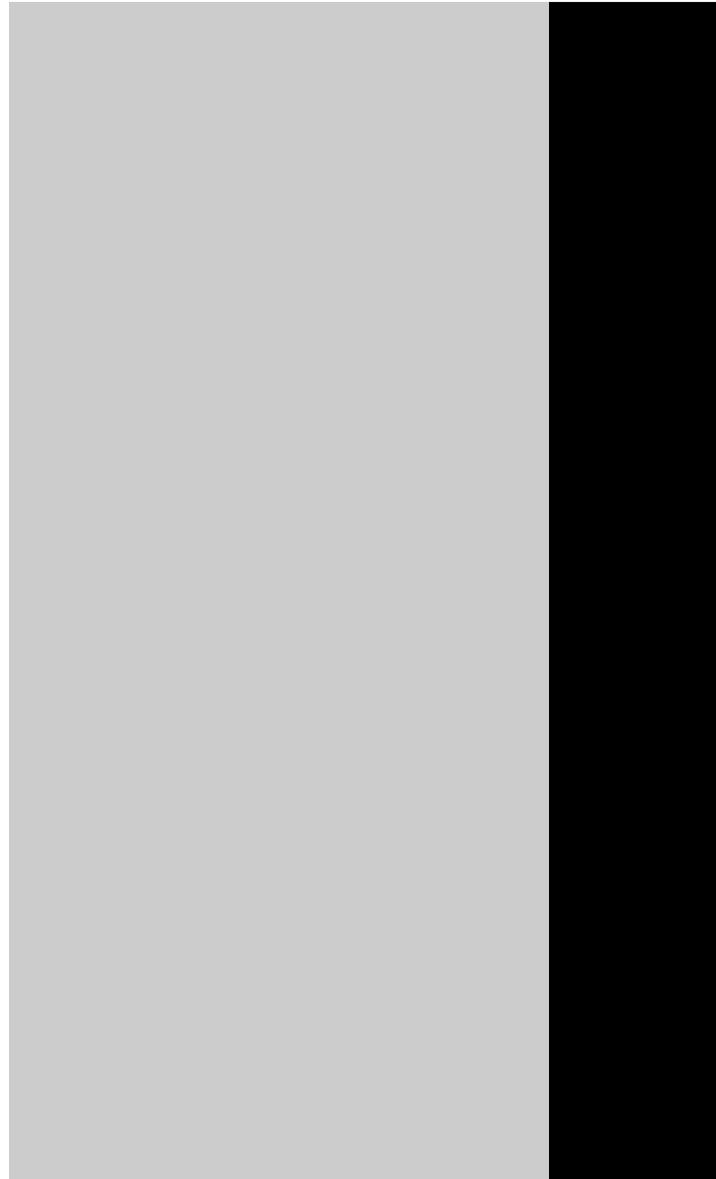
The OHV layout permits smoother fuel mixture intake, quicker and more complete exhaust. The increased combustion efficiency enables a higher compression ratio to be used. This makes it possible to obtain a greater power output and to avoid the build-up of carbon. The OHV-design gives also an excellent thermal balance, which contributes to reduced cylinder distortion, improved emissions performance, decreased oil consumption and increased engine service life.

**Air Filtration Systems**

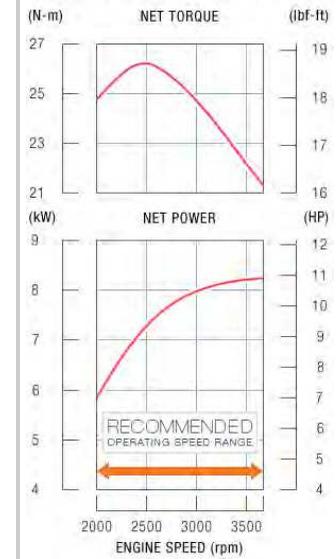
Honda offers a variety of air filters rematch your application, including dual-element, semi-dry, oil-bath and Cyclone Air Cleaner with inner-vent carburetor "Inner-vent" carburetors are now available on specific models with dual-element filters. Honda's inner-vent carburetor places the float bowl vent on the "clean side" of the air filter elements no that the airfuel ratio remains snore constant as the elements become dirty. This allows the length of the service interval for air filter maintenance to be more thou doubled.

**Low Noise & Vibration**

In addition to the milder operating noise of 4-Stroke engines in general, the engine reduced mechanical noise due to light weight, noise-reducing materials, Large capacity, multi-chamber exhaust system



**GX340 OUTPUT COMPARISON**



and Forged steel crankshaft and rigid crankcase. Strong materials and ingenuity is what makes Honda so reliable.

**Clean Burning Performance**

Honda's environmentally conscious technology results in significantly lower HC and NOx emissions compared to 2-stroke engines. Honda's GX series engines meet these regulations without the need for a catalyst.

**Reduced Fuel & Oil Consumption**

Efficient 4-Stroke technology not only offers superior fuel economy, it also requires no mixing of oil in the engine's fuel supply, thus substantially reducing both oil consumption and the emission of unburned oil in the exhaust. The results include better all-around environmental performance and operating costs that actually decrease the more the engine is used and allows the engine to run even longer than intended.

**HONDA ENGINE DOCUMENTATION**

- [Download Manual](http://www.electricgeneratordepot.com/honda-engine-owners-manual/)
- [Download Brochure](http://www.electricgeneratordepot.com/honda-engine-brochure/)
- [Warranty Information](http://www.electricsg.com/honda-engine-warranty/)
- [Fuel Recommendations](http://www.electricgeneratordepot.com/honda-engine-fuel-recommendation/)
- [Honda Technology](http://www.electricgeneratordepot.com/honda-engine-technology/)
- [Why Choose Honda](http://www.electricsg.com/choose-honda-engines)

**FUEL EFFICIENT, HIGH OUTPUT OPERATION**

Digital CDI ignition system with variable timing [Learn More](#)  
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 Increased compression ratio  
 Precision camshaft design offers precise valve timing and optimal valve overlap for better fuel efficiency  
 OHV design for increased efficiency and optimal power transfer

**SMOOTH PERFORMANCE**

**PROVEN RELIABILITY**

Oil Alert [Learn More](#)  
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 Cast iron cylinder sleeve  
 High quality materials, fit, and finish  
 Dual element air cleaner  
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 3-Year Limited Warranty

**EASY TO USE AND MAINTAIN**

Simple throttle control  
 Large fuel tanks  
 Large automotive type fuel cap



# **EXHIBIT I**

**PAGES I-1 TO I-54**  
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