

RYOBI OUTDOOR PRODUCTS

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November 20, 1992

Mr. Robert Cross
Assistant Division Chief
State of California
Air Resources Board
Mobile Source Division
9528 Telstar Avenue
El Monte, California 91731

Dear Bob,

I am enclosing a recent news release by Ryobi Outdoor Products indicating we fact that we have developed a clean air engine that meets the proposed 1999 regulations for hand held products.

You may want to circulate this to your staff.

Very truly yours,

Bela I. Csonka
Director, Engineering Services

RYOBI NEWS

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NEW ENVIRONMENTAL TECHNOLOGY DEVELOPED FOR PORTABLE LAWN & GARDEN ENGINES

First To Meet New Clean Air Standards

EASLEY, SC, NOVEMBER 17, 1992 - Ryobi North America today announced a major breakthrough in the development of a new type of portable gasoline engine that is the first to meet all proposed clean air emissions standards, including 1999 California Air Resources Board (CARB) regulations.

Ryobi made the announcement to coincide with a U.S. Environmental Protection Agency public meeting being held November 16-17 in Ann Arbor, Michigan. The EPA meeting is the agency's first public forum to discuss regulations to control emissions from non-road power sources, including lawn and garden equipment. Representatives from environmental groups, industry associations and regulatory agencies were invited to participate.

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Ryobi America Corporation
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The new engine, called the Ryobi CleanAir Engine, is designed to power portable utility and lawn and garden tools, such as grass and weed trimmers. The new engine does not require converters or special fuels to achieve reduced emission levels. Ryobi prototypes have already proven themselves in performance and air quality tests. Testing completed on November 6 confirmed that the engine can meet 1999 CARB emission standards. Ryobi grass and weed trimmers with the new engine will be available in early 1994 at a price comparable to other top-of-the-line trimmers.

Development of the CleanAir Engine began in earnest in 1989 as part of a Ryobi corporate initiative to produce a line of environmentally-friendly products. The timing was right because, in 1991, California became the first state to propose regulating emissions from small engines. Other states are now expected to follow the California lead.

Ryobi Senior Vice President William McLay said, "This new CleanAir Engine demonstrates that there is practical technology available today to meet even the toughest clean air standards for utility and lawn and garden equipment. It also demonstrates the value of adopting standards, like California's, that focus on engine function rather than engine design. That kind of approach opens the door to innovation and lets the marketplace respond.

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The Ryobi CleanAir Engine is a 1-horsepower, 26.2 cc, 4-cycle engine weighing under 8 pounds. It is the first 4-cycle engine small enough for practical hand-held utility use. Other engines of comparable size (smaller than 50 cc) generally fall into the 2-cycle category. Current 2-cycle engine design does not meet CARB standards without expensive or impractical modifications.

Besides producing fewer emissions than other comparable engines, the Ryobi CleanAir Engine also produces less noise, uses 30% less fuel, and does not require oil and gas mixing.

Ryobi's American and Japanese designers and engineers worked together to develop the CleanAir Engine. An American created the engine design and Japanese engineers refined it using precision technology. It will initially be manufactured in the U.S. using mainly American components, and will be sold here as well as abroad as a U.S. export.

Ryobi employs 3,100 American workers. The company produces power tools, outdoor power equipment, builders' hardware and floor care products at manufacturing facilities in South Carolina and Arizona. Ryobi is based in Easley, South Carolina.

A Brief History of the Ryobi CleanAir Engine

Ryobi's announcement that its new CleanAir Engine is the first of its kind to meet 1999 California Air Resources Board (CARB) standards clearly demonstrates how new technology can be put to work to solve environmental problems. But it is people who make technology, and the story of the CleanAir Engine is a story about the cooperation between people from both rims of the Pacific.

The CleanAir Engine was conceived by engineer and entrepreneur Robert Everts in 1988. Mr. Everts at that time was president of an Arizona company that produced the first working model of the engine. He was impressed with Ryobi's precision manufacturing technology and began to explore ways it could be applied to production of the CleanAir Engine.

Based on his original design, he thought it might be possible to make a commercially viable, one-horsepower four-cycle-gasoline engine for about the same cost as two-cycle engines of similar horsepower. He thought such an achievement was possible by coupling his low-cost engine design with Ryobi's highly efficient manufacturing processes. He approached Dr. Akio Urakami, chairman and president of Ryobi North America, about the possibility of such a venture and Dr. Urakami agreed in 1989 to make it a high priority research project.

Meanwhile, a concept prototype of the engine was produced in Arizona. Mr. Everts took this early effort to Japan in 1990 for refinement, and Ryobi engineers, led by Katsumi Kurihara, produced five new working units of the prototype. These new engines incorporated all of the improvements Mr. Everts and Dr. Urakami were looking for. Compared to two-cycle engines, the new Ryobi 4-cycle CleanAir Engine produced fewer emissions, made less noise, was

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easier to start, had a better power/weight ratio, achieved better fuel economy a factor of 30%, and required no mixing of oil and gasoline. Perhaps most importantly, the engine was also able to meet 1999 CARB standards. No other engine of this size currently meets those standards.

These prototype engines have now withstood two years of refinement and testing for performance and durability. Ryobi is now moving to the production development stage and plans to introduce the CleanAir Engine as the power source for a new grass and weed trimmer to be introduced in early 1994. Ryobi's American and Japanese engineers continue to work together as part of a formal project team charged with responsibility for bringing the engine to market. David Asher, vice president for manufacturing of Ryobi Outdoor Products, heads up the project team. Mr. Everts continues to serve as an advisor to the project.

The project team has decided that most engine components will be manufactured at Ryobi facilities in Arizona, although a few components, such as the cylinder head, may be manufactured in Japan. Finished engines and trimmers assembled at the Arizona site will be sold in the U.S. and exported to Canada and Australia. Some engines for Japanese and European use will be manufactured and assembled in Japan.

Dr. Urakami recently commented on the importance of this global venture. He said, "This project is exciting for Ryobi because it is a good example of how well technical cooperation across the Pacific can work when we all have a common goal. For instance, advanced precision manufacturing technology has now been introduced at our plant in Arizona. Also, we will soon have a new cutting-edge product that will be a U.S. export. Finally, this new CleanAir Engine is truly environmentally friendly, and we are all proud of that."

RYOBI FACT SHEET

Company Background

Ryobi North America and its group companies produce outdoor power equipment, power tools, builders' hardware and floor care products at manufacturing and assembly plants in South Carolina and Arizona. Headquarters are located in Easley, South Carolina. Ryobi was established in America in 1974 as the first overseas venture of Japan-based Ryobi Ltd., a diversified global manufacturer. Ryobi employs 3,100 men and women at its U.S. manufacturing and sales facilities.

Innovative Products

Ryobi tools are known for power, performance and innovation.

- C *Ryobi CleanAir Engine* - World's first hand-held 4-cycle utility engine; first to meet 1999 emission standards for lawn & garden equipment.
- C *Mulchinator™ Cordless Mulching Mower* - The first truly effective battery-powered mulching mower. Winner of Popular Science Magazine's 1992 'Best of What's New' award.
- C *TrimmerPlus™ Gas and Electric Grass Trimmers* - Four add-on garden tools give this uniquely designed system great versatility.
- C *BT3000 Precision Benchtop Cutting System* - Winner of Popular Mechanics Magazine's 1992 Design & Engineering Award.
- C *TorqueForce® Driver/Drills* - The most powerful line of cordless driver/drills in the world.

Special Expertise

Ryobi executives are available to comment on these topics:

- C Power tool & outdoor power equipment industry trends
- C New technology for environmentally-friendly products
- C New applications for cordless technology
- C Global cooperation in product design, engineering and manufacturing
- C Precision engineering and QFD manufacturing processes

Media Contact

For information about Ryobi and its products, or to arrange interviews with company executives, contact Frank- Coots at Elisco & Herrmann PR

412/824-8010 Fax 412/824-8019

FACT SHEET

Ryobi CleanAir Engine

Engine Background

The Ryobi CleanAir Engine is a technically advanced 4-cycle utility engine. It is the first portable, hand-held gasoline engine to meet all proposed U.S. exhaust emission standards for lawn and garden equipment, including 1999 California standards. Final engine refinements are now being made at Ryobi engineering facilities in Chandler, Arizona. Weed trimmers powered by the CleanAir Engine will be the first practical product application. They will be introduced to trade groups in 1993 and will be available for purchase by consumers in early 1994 at a price comparable to other top-of-the-line trimmers. Other product applications for the CleanAir Engine include brush cutters, blower/vacs, small cultivators and other hand-held tools.

Specifications

- C Displacement -- 26.2 cc
- C Bore x Stroke -- 32 mm x 32.6 mm
- C Power -- 1 brake/horsepower at 7000 rpm
- C Configuration - Overhead valve, push rod
- C Rocker Arm Type -- Stamped steel, ball swivel, adjustable
- C Cylinder Bore -- Chrome plated
- C Lubrication -- Splash type
- C Oil Requirements -- Standard 30 weight
- C Fuel Requirements -- Regular unleaded gas, 87 octane
- C Weight -- under 8 lb.