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WORKING GROUP ON ECONOMIES OF SCALE IN
THE LATIN AMERICAN AUTOMOTIVE INDUSTRY

Santiago, Chile, September 1970

THE MANUFACTURE OF DIESEL ENGINES

presented by

Cummins Engine Company

Note: The meeting of this Working Group is one phase of the project "Prospects and possible forms of regional integration in the automotive industry in Latin America" that is being carried out by the Economic Commission for Latin America (ECLA) and the Interamerican Bank (IDB), with the collaboration of the United Nations Industrial Development Organization (UNIDO).

1

2

CUMMINS ENGINE COMPANY
CASE STUDY - ECLA CONFERENCE
SANTIAGO, CHILE

1. Cummins Engine Company

- o Cummins Engine Company is a manufacturer of diesel engines in the 100 to 800 HP range. Its products are offered in automotive, construction, industrial, and marine applications in the United States and in overseas markets.
- o Attachment I contains information that will enable the conference participants to gain an understanding of the company:
 - Cummins At a Glance
 - 1969 Annual Report
 - product brochures (automotive, construction, industrial, and marine)
 - CEM/CEM application brochure
- o In summary, Cummins has its headquarters in Columbus, Indiana, but has manufacturing representation in the following countries:
 - United Kingdom - Wholly Owned Subsidiary
 - Australia - Wholly Owned Subsidiary
 - India - Joint Venture
 - Japan - License Agreement
 - Mexico - License Agreement
- o Up until the late 1950's, Cummins for the most part manufactured all its products in the United States and where possible exported them overseas. As marketing conditions warranted, assembly and/or manufacturing

operations were undertaken on a selected basis. For some time, Cummins has recognized the desires of developing and industrializing countries to not only satisfy their domestic requirements but also to participate in international markets through the export of locally manufactured products.

2. Product Selection for Case Study

- Within the LAFTA group, the major markets offering potential to Cummins are the automotive, construction and industrial, and marine markets. The most suitable products presently manufactured by Cummins for these markets are the NH series and Val/Vale series diesel engines (Attachment II provides a representative sample of the basic specifications of these two series).

3. Standardization

- The components which comprise a complete Cummins engine must be viewed in two different categories:

1. Basic Components

Parts which comprise the basic engine regardless of its intended end use. There is a high degree of standardization among these components listed below:

Power Train

Piston Assembly

(rings, pin, piston, insert, snap ring)

Connecting Rod Assembly

(rod, bushing, belts, nuts, lockplates)

Crankshaft

Crankshaft Damper

Balancer Shaft

Valve and Injector Train

Cylinder Head Valves
Valve Keepers
Valve Spring
Rocker Arm Assembly
Rocker Arm Shaft
Rocker Arm Shaft Mounting Parts
Push Tubes
Tappets or Cam Follower Assembly
Camshaft

Cylinder Head and Related Parts

Cylinder Head
Valve Seat Insert
Swirl Plate
Valve Guide
Intake Manifold
Exhaust Manifold
Rocker Arm Housing
Supercharger
Turbocharger

Cylinder Block and Related Parts

Cylinder Block
Main Bearing Cap
Cylinder Liner
Compressor to Fuel Pump Coupling
Air Compressor (Cummins)
Gears
Gear Cover

Bearings

All Engine Bearings and Bushing

Fuel System

Fuel Pump
Manual Fuel Valve
Electric Solenoid Fuel Valve
Fuel Lines and Fittings
Fuel Filter
Aneroid Control
Injector
Check Valve

Lubrication System

Oil Pump Assembly
Oil Pump Suction Tube and Screen Assembly
Full Flow Filter
Oil Pan and Baffle Assembly
Oil Pressure Regulator Assembly

Cooling System

Water Pump Assembly
Water Filter
Thermostat

Seals and Gaskets

Cylinder Head Gasket
Rocker Arm Housing Gasket
Oil Pan Gasket
Oil Cooler Gasket
Crankshaft Seals
O'Rings
Crevice Seals
Grommets and Ferrules
Valve Stem Seals
Thermostat Seal
Accessory Drive Seal

Hardware and Miscellaneous

Capscrews - All Grade 5 and above

2. Application and Minor Components

Items which are combined with the above mentioned category to up fit an engine for a specific piece of equipment. Standardization is largely confined to specific market segments, i.e. within the automotive market there is an attempt to standardize all components available. These components include but are not limited to:

Air Cleaner and Induction System
Crankcase Breather
Governor (other than Fuel Pump Assembly)
Flywheel
Sea Water Cooler
Engine Mounts
Heat Exchanger
Exhaust System
Fuel Supply System
Hoses
Belts
Torque Converter Cooler
Flywheel Housing
Valve Cover Gasket

- . Attachment III contains copies of the Standard Supplier Quality Evaluation Survey utilized by Cummins to evaluate a potential supplier's capabilities.

4. Manufacturing Operations

- . The traditional Cummins approach to the manufacture of Cummins engines where there exists a relatively low production volume has been to minimize the capital investment requirement through the utilization of local suppliers to a maximum degree. The growth of the investment to be undertaken by Cummins is viewed as a function of volume growth within the market which logically leads to a series of "make versus buy studies" on a component-by-component basis. The company accepts the fact that during the

initial stages of any low volume manufacturing program the company experiences a higher than normal unit cost. Time and volume working together will result in a reduction of unit cost. Once the program achieves a economically sound production level, the company can speed up the process by increasing its investment in the purchase of machine tools, etc., to increase local manufacture.

- o In keeping with the above objectives, while at the same time, utilizing local suppliers, our studies show that the major components making up a Cummins engine can be broken down into three categories as follows:

I. Parts and/or Components to be Imported

Complete Fuel System, including Injectors
Camshaft
Air Compressor

II. Parts to be Manufactured Locally

Cylinder Block, including Main Bearing Caps
Cylinder Head
Fabricated Brackets for Optional Components
Miscellaneous Screw Machine Items as needed

III. Parts and/or Assemblies to be Purchased Locally

A. Machined Castings - Cast Iron

Rear Cover Plate
Cam Box
Water Header Cover
Oil Pan Flange
Cylinder Liners
Flywheel, including Ring Gear
Pulleys
Thermostat Housing
Water Manifold
Exhaust Manifold

B. Machined Castings - Aluminum

Pistons
Flywheel Housing
Gear Case Cover
Intake Manifold
Air Intake Connection
Oil Pan
Rocker Arm Housing

C. Forgings - Machined Complete

Connecting Rods
Rocker Levers
Crossheads
Crankshaft Flange
Gears
Crankshaft
Valves

D. Complete Assemblies

Lub Pump
Lub Filter
Lub Oil Cooler
Water Pump
Push Tubes
Crankcase Breather
Vibration Damper
Generator
Starter
Voltage Regulator
Series Parallel Switch
Fuel Filter
Air Cleaner

E. Miscellaneous

Rings
Bearing Shells
Bushings
Rollers
Shafts

E. Miscellaneous (cont'd.)

Gaskets
Capscrews, Nuts, Bolts
Dowels
Tubing

5. Annual Production Volumes

- Depending on the engine or engines selected and the markets to be served, Cummins assumes for planning purposes production levels of five to twenty engines per day.
- Cummins Engine Company has attained and maintains its position of leadership within the diesel industry in the United States through a constant effort to upgrade its product line. Contrary to most industrial manufacturers, Cummins does not adopt a "frozen design" for any period of time. Product improvements and product innovations are introduced as they are proven by the Research and Engineering group.
- Attachment IV provides a copy of the Cummins International Warranty Certificate. This is attached to illustrate that Cummins adopts one set of quality standards which are applied throughout the world regardless of the manufacturing plant. Cummins has adopted the policy of utilizing the several sources of supply available on a world wide basis to attain production efficiencies and cost reductions wherever possible. This policy, however, dictates there be one constant world wide quality standard to insure complete interchangeability and product performance for the end user. Cummins recognizes the inherent higher costs that might be incurred in specific markets.

6. Manufacturing Technologies/Capacity Levels

- A low production volume operation dictates a more labor intensive and less sophisticated manufacturing base will be utilized. As the volume base increases over time,

the company, in order to speed up the process of reducing unit cost, commits to a bigger investment in terms of machine tools and sophisticated automated equipment.

- Good examples of the varying stages of technologies adopted can be seen in the operations in the United Kingdom and India. The Darlington plant in England is reputed to be one of the most modern and most highly automated diesel engine plants in the world. Presently capacity is set at over 100 engines per day. At the other end of the spectrum, the joint venture in India is currently producing approximately five engines per day with a local content value of 80 per cent. It is interesting to point out that the number of people involved in the manufacture of engines in India is approximately the same as those employed in Darlington.

7. Manufacturing Costs

- Cost reductions are a function of volume levels and the efficiency of local suppliers. The combined effect of these two necessary factors have not yet been fully analyzed. The volume levels realistically attainable by the company and supplier quotations based on these subsequent production levels have to be fully documented.

8. Capital Investment Requirements

- Excluding land and building costs for planning purposes, Cummins views the investment required to support say a five per day NH manufacturing program to be broken down as follows:
 - 35% - Local Vendor Tooling
 - 65% - Machine Tools
- The amount of money invested in local vendor tooling indicates the reliance Cummins will place on local suppliers.

9. Selling Costs

- We would anticipate average selling costs to run at approximately 7 per cent of sales. These costs are related to the following major areas:
 - Distribution System Development
 - Sales Force
 - OEM Level
 - Field Sales Level
(Distributors and End Users)
 - Market Research
 - Service Support
 - Parts Sales
 - Advertising and Promotion

10. Cross-Sourcing

- Consistent with the company's policy to adopt cross-sourcing to the maximum extent possible while at the same time maintaining a level of self-sufficiency at each individual manufacturing operation, specialization in terms of manufacturing is only considered feasible once the manufacturing program has achieved economic levels. From that point on, the company explores cross-sourcing as much as possible.

Summary

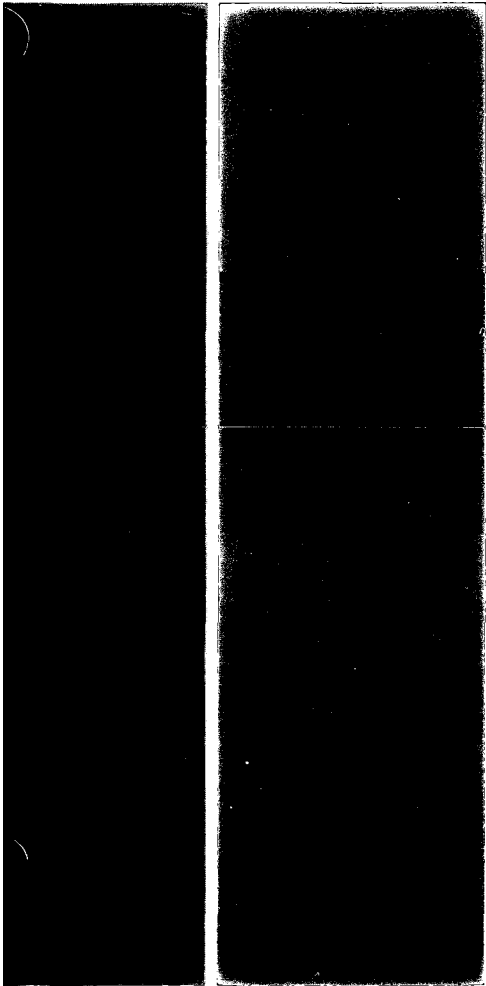
Cummins has a stated objective of obtaining a manufacturing posture within Latin America. Studies to obtain this objective within the short term are underway within the Cummins organization. Our attendance at this conference is one more facet of our overall program and probably the most important - to exchange with other

- 11 -

leading members of the automotive industry our views regarding the present status and future of the automotive industries within the Latin American region within the scope of the guidelines outlined by ECLA.

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Cummins at a Glance



10/10/2019
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Cummins at a Glance

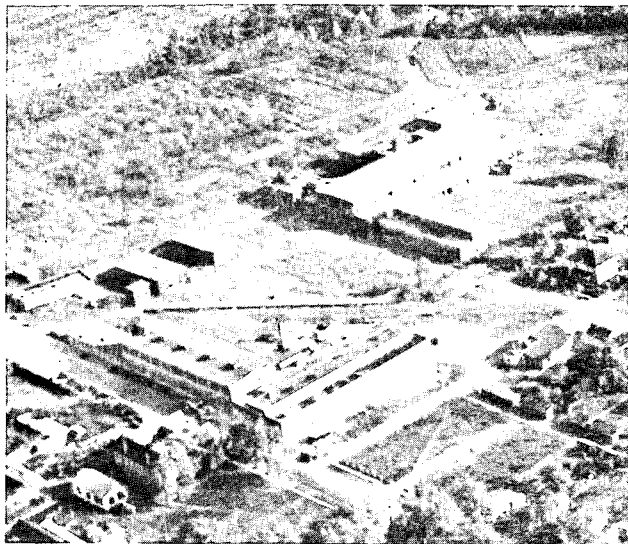
Contents:

History - Page 5

Markets - Page 7

Management - Page 11

Operating Units - Page 15



Cummins Engine Company as it appeared in 1932 . . .



. . . and in 1948.



In 1970, the main plant at Columbus is the headquarters for an international corporation that includes several wholly owned subsidiaries and joint manufacturing agreements.

Cummins Engine Company today:

- is the world's largest independent producer of diesel engines . . . for powering heavy- and medium-duty trucks, construction equipment, locomotives, marine, oil field, mining, agricultural and other industrial applications.
- employs over 14,000 people worldwide . . . on a total annual payroll of over \$100 million . . . in 12 operational facilities located in eight different countries.
- has the largest, most modern diesel service network in the world . . . an organization which includes nearly 2,000 sales and service outlets in 94 countries . . . and is represented in literally every country in the free world.
- has the most advanced technical center in the industry . . . completed in 1968 at a cost of \$22 million . . . 360,000 square feet devoted exclusively to research and engineering.
- is one of the country's 300 largest corporations.



Clessie L. Cummins



William G. Irwin

Cummins Engine Company, founded in 1919, celebrated 50 years of corporate growth in 1969. Beginning with the idea that a better diesel engine could be built, the Company succeeded because its two founders, Clessie L. Cummins, the mechanic with an idea, and William G. Irwin, the financial backer with confidence in the idea, persevered and were willing to take the risks associated with innovation and experimentation.

This same confidence in the future, a commitment to research and development, and a determination to provide a better product to satisfy customer requirements, characterize Cummins today.

These elements, plus aggressive development of markets for the product, have earned for Cummins its present stature as the world's largest independent manufacturer of diesel engines.

As Cummins moves energetically into its second 50 years, the outlook is for a rising demand for its pro-

ducts. The Company looks forward to both current and long-range growth in all markets presently served, penetration of new markets, an immediate expansion of its domestic manufacturing capacity (the first phase to be completed by year's end), and the start of planning for near-term capacity increases overseas.

The international power market represents a new and growing challenge to Cummins' management. The Company's international business is expanding and new opportunities are constantly being explored.

Cummins' planning for the future acknowledges that change is inevitable in business and that the company that takes the initiative to influence the course of change will be in the best position to succeed. This concept applies to business procedures, and especially to research and development activities aimed both at improving the Company's present line of conventional engines, and the successful commercial introduction of new forms of power, such as the gas turbine.

History

Since its founding in 1919, Cummins Engine Company has grown from a small one-plant operation to a worldwide international enterprise with 1969 sales of \$410 million. Over the years, this former one-product maker of diesel engines has diversified into a multi-product company providing not only engines, but also component parts and accessories for applications requiring modern, dependable power.

Cummins has pioneered most of the important developments in the diesel field with such introductions as the first fully-enclosed diesel engine, the first supercharged diesel, the most reliable and simply designed in-line engines, a lightweight, high-speed turbocharged engine capable of competing with the sophisticated gasoline engines racing at Indianapolis in the early 50's, the PT (pressure/time) fuel system and the "oversquare" engine which, based on a concept of a piston diameter larger than the piston stroke, yields more power in a smaller package.

Cummins Begins Operations

In its early form, the "oil" (later diesel) engine was an unwieldy piece of machinery, suitable only for stationary power. By the 'twenties, Cummins was moving into the marine business by supplying power for pleasure yachts. But this market toppled with the stock market in 1929. Through the first 17 years of its existence, therefore, Cummins invested only in future growth, for it showed no profits. It was a time when survival rested solely upon faith, perseverance and hard work.

In the 'thirties came a series of breakthroughs for the diesel. The Company, lacking the financial resources for advertising and market development, promoted its engines by dramatic stunts and barnstorming tours that attracted maximum attention from potential diesel customers to the technological leadership that Cummins offered then and retains today.

Clessie L. Cummins, drawing upon his engineering genius, fitted a "Model U" diesel into a 1930 Packard and drove it from Indianapolis to the New York Auto Show at a fuel cost of \$1.38. The headlines from this promotional triumph established the diesel as the most economical source of automotive power. In 1931 a Cummins-powered racer became the first car ever to finish the Indianapolis 500 Mile Race non-stop.

In the 'thirties, too, the Cummins diesel penetrated the on-highway truck market, where the company was to build its initial reputation. It came with the first sale of diesel engines to a truck fleet — that of Purity Foods. This had followed a 14-day, non-stop run on the Indianapolis track by a Cummins-powered truck.

Cummins Matures During World War II

World War II proved conclusively the durability of Cummins power and gave the small firm in Columbus, Indiana, valuable international exposure. Its engines

moved thousands of vehicles across the roads of Europe and Asia and the islands of the Pacific. These supply caravans went into the history books as the "Red Ball Express," and for many years after the war Cummins used the red ball as its corporate trademark.

As the era of post-war expansion began in 1946, Cummins had 300,000 square feet under roof in Columbus. This has now grown to over 2 million square feet. Sales of \$20 million in 1946 were to grow more than 20-fold by 1969, but in that first post-war year the Cummins market was already firmly established. The rising demand for "Cummins Dependable Diesels" was given further evidence in 1948 when the first public issue of Cummins common stock reached the over-the-counter market.

Company interest in using auto racing achievements as a means of product promotion was revived in 1952 when the Cummins Diesel Special, a turbocharged racer, entered the Indianapolis 500 and won the pole at a record 138.010 mph.

Cummins Diversifies, Grows Internationally

Up until the mid-1950's Cummins had been a one-plant, one-product company. However, through planned diversification, the Company now has four additional plants in the United States producing related products. Atlas Crankshaft Company in Fostoria, Ohio, produces crankshafts, valves, piston pins and precision machined capscrews. Frigiking division in Dallas, Texas, manufactures and markets truck cab and passenger car air conditioners. Frigiking is the largest producer of automobile air conditioners for after-the-market installation. Fleetguard division produces air, lube, and fuel filters for heavy-duty equipment and passenger cars, in Cookeville, Tennessee. Cummins ReCon division in Memphis, Tennessee, reconditions injectors, heads, water pumps, and other engine parts for distribution through the Cummins distributor organization.

Cummins began an aggressive international expansion program in 1956 with its first venture, Cummins Engine Company, Ltd., in Shotts, Scotland. Today, in addition to the plant at Shotts, Cummins has a two-plant facility at Darlington, England, producing engines and parts; a license agreement with Komatsu in Tokyo, Japan, for the production of engines for earth-moving equipment; a joint venture with Kirloskar in Poona, India, for the production of in-line engines; an assembly plant in Melbourne, Australia; and a license agreement with Diesel Nacional (DINA) in Sahagun, Mexico, for the production of both in-line and V engines.

Cummins Looks to the Future

Today, Cummins is embarking on a whole new world of engine technology. The \$22 million Technical Center in Columbus greatly increases the technological capabilities of the Company. Cummins European Technical Center at Essen, Germany, has already made significant contributions to the development and refinement of new families of engines. The work of this group will have a great impact on the Company's European sales as they develop power sources and provide technical support for the unique requirements of the European market.

Cummins' new research agreement with the Garrett Corporation, a major producer of gas turbines for the aerospace industry, will permit Cummins to determine both the technical and economic feasibility of gas turbine applications for heavy-duty trucks and other applications. The agreement's prime advantage is that it combines the skills in turbine technology of the recognized leader in the production of small gas turbines with Cummins' superior engine manufacturing know-how, as well as marketing and servicing capabilities.

The Garrett agreement typifies the Cummins corporate philosophy: the future depends on taking advantage of present strengths, while maintaining the capacity to capitalize on new opportunities as they develop.

Markets

Cummins now has production facilities in seven countries employing over 14,000 people. Cummins engines are now available as standard or optional equipment from over 300 different manufacturers of on-highway trucks, construction equipment, locomotives, marine, oil field, and other industrial applications.

The Company's major markets, automotive and construction, are described in this section along with new, but growing, sales opportunities. The discussion is primarily of U. S. activities because international markets vary from country to country and because overseas horsepower requirements are generally not so great as those in the United States.

Cummins Leads Automotive Field

Cummins' reputation in the diesel field results from the dominant position the Company occupies in the on-highway truck market. Since 1950, Cummins engines have powered over 50% of the heavy-duty transport trucks in the 33,000+ gross vehicle weight (GVW) class.

These are primarily semi- and double-trailer units hauling freight, produce, raw and finished materials and bulk commodities on regional and national routes. These trucks, currently 80% diesel powered, carry heavy loads over long distances at high speeds on the interstate highways. It is estimated that diesels will power 90% of these rigs by 1980.

A second automotive category, the 26,000-33,000 GVW class, includes lighter weight semi-trailers (moving vans, tank trucks and cattle trucks.) Because vehicles in this class are only 37% diesel-powered, significant growth potential for Cummins lies in increasing the percentage of diesel penetration.

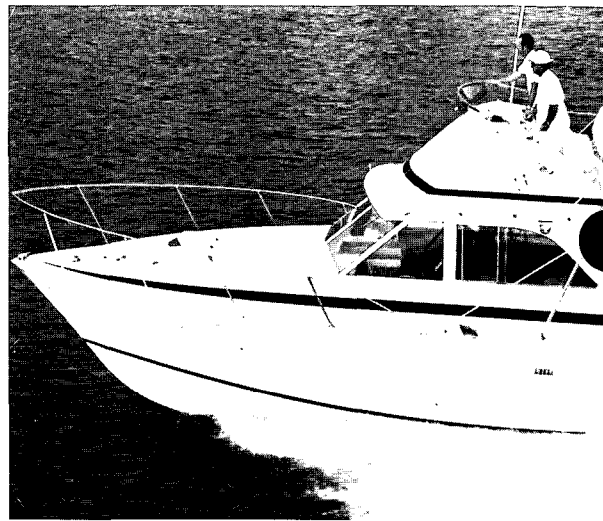
Diesel engines power less than 10% of the vehicles in

the under-26,000 GVW category, made up largely of short-haul, intra-city delivery trucks. The outlook, once again, is for greatly increased diesel penetration of this market within the next decade.

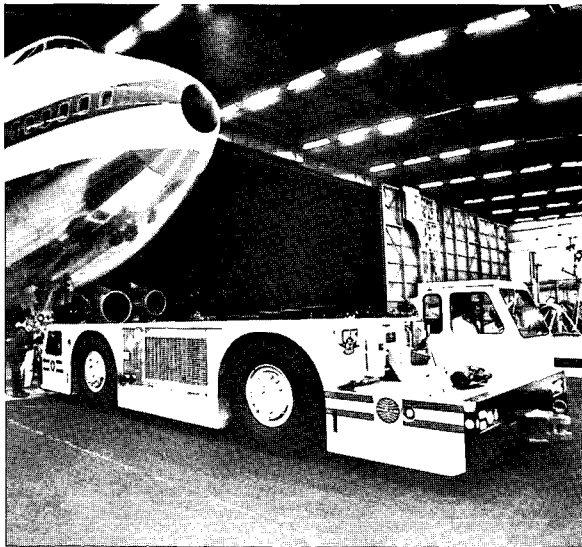
Cummins new small V engines, produced at Cummins' plant in Darlington, England, are direct competition for gasoline engines in the lighter-weight truck classes. These engines are currently rated at 185 horsepower in the eight-cylinder model and 140 horsepower in the six-cylinder version.

Cummins currently produces both in-line and "V" configuration engines covering the power ranges required by the heavier weight classes of on-highway trucks. In the heaviest vehicle category, the Company's NH-250 horsepower engine has long been the industry standard. In March, 1969, the Company was notified that the NH-250 had been selected by the Army as standard power for all versions of its new 5-ton truck. On the West Coast, where horsepower trends are established, the NTC-335 horsepower (turbocharged) engine is still the most popular Company product, although the new V-903 is quickly gaining acceptance.

The Wide World of Cummins Power

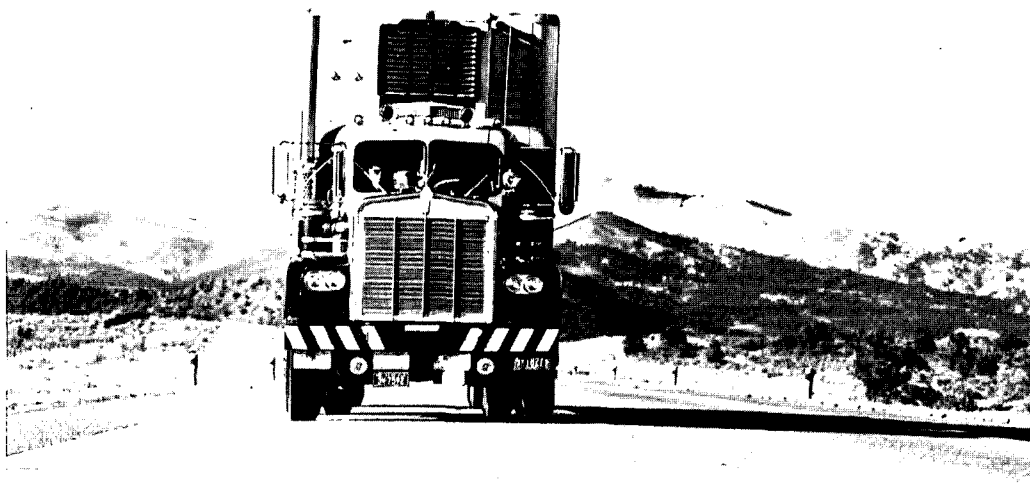


Cummins marine engines are gaining popularity in a wide variety of applications.



Powered by a specially designed, low-profile Cummins V-12 engine, this Unit Rig tow tractor maneuvers Pan-Am's huge 747 Jumbo Jet.





Cummins is the nation's leading supplier of engines for on-highway, heavy-duty trucks.



Small V engines manufactured at Cummins' Darlington, England, plant are becoming increasingly popular in Great Britain and on the continent.

The V-903 is rapidly developing into a customer favorite at the top of the horsepower spectrum and is now rated at 320 horsepower in the naturally aspirated version. It is the most powerful compact engine available for heavy-duty rigs.

The powerful V-903 best illustrates the two characteristics dominating diesel progress: (1) higher horsepower requirements and (2) compactness. Smaller, more powerful engines offer greater operating efficiency in the face of increased labor and vehicle costs.

International markets have paralleled the pattern first developed in the United States. Cummins is the only U. S. diesel manufacturer with production facilities located to serve the dominant international markets. Today, European power requirements are lower than those in the U. S., and Cummins engines with long periods of dependable domestic service are now standard power plants in overseas markets. The trend toward higher horsepower favors Cummins products which are available in the complete power range used overseas.

Cummins Power Grows in Construction Markets

The total construction and industrial equipment market, the second largest for diesel engines over 100 horsepower, is projected to grow from the estimated 118,000 units produced in 1969 to 165,000 in 1980. Because this market already has a high concentration of diesel penetration, especially in the upper horsepower ranges, growth will come from the increase in equipment produced.

Construction equipment ranges from off-highway trucks hauling excavated materials, to crawler tractors, front-end loaders and semi-stationary drag lines, cranes and shovels. Engines powering this equipment often

operate in remote locations, with dust and dirt a prevalent condition, and must perform for long hours over rough terrain with greatly varying engine speeds.

Today the construction equipment industry requires a broad range of horsepower offerings, from the small engine powering a pneumatic hammer to the twin V-12's used on the huge "Pipemobile" — a newly developed vehicle that carries sections of concrete pipe measuring up to 20 feet in diameter and weighing 150 tons.

Horsepower requirements are moving toward Cummins' power ranges. Cummins' new V engines, coupled with improved in-line models, provide users with a variety of options for all types of equipment. The Company's V-12 engines in the 500-800 horsepower range are the construction industry's "big horsepower" standard. Cummins construction equipment program includes modification of these power plants for specific construction applications as well as development programs in the higher horsepower ranges (1,000 and above).

Cummins Power for Other Markets

The increasingly popular Cummins marine engines provide reliable power for both pleasure craft and workboat operations. In the latter applications, Cummins offers power from 120 to 550 horsepower, while in yachts and other pleasure boats, a product line of 150 to 800 horsepower is available.

Cummins powered generator sets ranging from 50 KW to 500 KW provide electricity in remote areas throughout the world and functioned effectively as emergency power sources for schools, hospitals, governmental facilities and airports during several recent power failures. The generator set market has increased dramatically during the past two years.

Management

Directors

J. Irwin Miller	Chairman of the Board of Directors
Eugene R. Black	Director and Consultant, The Chase Manhattan Bank
C. Raymond Boll	Executive Vice President
James B. Fisk	President, Bell Telephone Laboratories, Inc.
Harold H. Helm	Chairman of the Executive Committee, Chemical Bank
Henry L. Hillman	President, Pittsburgh Coke & Chemical Company
Paul L. Miller	President, The First Boston Corporation
George W. Newlin	President, Irwin Management Company, Inc.
Henry B. Schacht	President
Richard B. Stoner	Vice Chairman of the Board of Directors
E. Don Tull	Chairman of the Executive Committee

Officers

J. Irwin Miller
Chairman of the Board of Directors



Mr. J. Irwin Miller graduated from Yale in 1931. After receiving his Masters Degree in Politics at Oxford in 1933, he returned to Columbus and joined the management staff of Cummins Engine Company. Mr. Miller became Chairman of the Board in 1951.

E. Don Tull
Chairman of the Executive Committee



Mr. Tull started his career with Cummins in 1928. He became Vice President in 1952, Executive Vice President in 1955 and served as President from 1960 to 1969. Mr. Tull is a member of the Board of Directors.

Henry B. Schacht
President



Mr. Schacht joined Cummins in 1964 and assumed his present position in 1969. Before coming to Cummins, he was investment manager for the Irwin Management Company. He holds a B.S. in Industrial Administration from Yale and an M.B.A. from Harvard. He was born on October 16, 1934, in Erie, Pennsylvania.



Richard B. Stoner
Vice Chairman of the Board of Directors

Mr. Stoner joined Cummins in 1950 after a brief period of law practice. He was first promoted to a vice presidential position in 1955 and was elected to his present position in 1969. Mr. Stoner has been a member of the Board of Directors since 1955. He holds the B.S. from Indiana and the LL.B. from Harvard.

C. Raymond Boll
Executive Vice President



Mr. Boll joined Cummins in 1941. He was elected to his present position in 1967. Mr. Boll was elected to the Board of Directors in 1955. He received his bachelors degree from Purdue in 1941, and he did graduate work at Chicago, Harvard, and MIT. He was born on March 29, 1920, in Columbus, Indiana.



Marion C. Dietrich
Vice President — Marketing

Mr. Dietrich joined Cummins in 1961 and was named to a vice presidential position in 1964. He was elected to his present position in 1967. He received his bachelors degree in Economics from Yale and his M.B.A. from Harvard. Mr. Dietrich was born on July 7, 1922 in Billings, Montana.



John T. Hackett
Vice President — Finance and Treasurer

Mr. Hackett joined Cummins in 1965 after serving as an Economist and then as Vice President and Economist for the Federal Reserve Bank of Cleveland. He received his B.S. and M.B.A. from Indiana University and his Ph.D. from Ohio State. He was born in Fort Wayne, Indiana, on October 10, 1932.

Thomas W. Head
Vice President — Research & Engineering



Mr. Head joined Cummins Engine Company in 1964 after sixteen years with Caterpillar Tractor Corporation where he last served as Division Manager. Mr. Head, who holds the B.S. degree from Purdue, was elected to his present position in 1967. He was born in Decatur, Illinois, on March 17, 1925.



James A. Henderson
Vice President — Operations

Mr. Henderson joined Cummins in 1964. He received his bachelors degree from Princeton and his M.B.A. from Harvard. He was advanced to his present position in 1970 after serving as Vice President—Management Development and later as Vice President—Personnel. Mr. Henderson was born July 26, 1934, in South Bend, Indiana.

George T. Rehfeldt
Vice President — International



Mr. Rehfeldt joined Cummins as a vice president in 1967 from Ford Motor Company. He assumed his present position in 1968. He received his B.S. degree from Rutgers University. Mr. Rehfeldt was born November 24, 1931 in Berwyn, Illinois.

Neville H. Reiners
Senior Vice President



Mr. Reiners joined Cummins in 1938 and was named to a vice presidential position in 1957. He was elected to his present position in 1965. He received his bachelors degree in 1936 from North Dakota State University. He was born on July 10, 1914, in Fort Dodge, Iowa.

Henry W. Abts
R. Benjamin Bush
Paul M. D'Arcy
Lamont Eltinge
James L. Keyes
Thomas A. Lyon
Herschel E. O'Shaughnessey
Peter W. Schutz
William D. Schwab

Vice President — Secretary
General Counsel
Vice President — Market Development
Vice President — Research & Technology
Vice President — Engine Sales
Controller
Vice President — Parts, Advertising and Field Sales
Vice President — Planning & Program Management
Vice President — Product Development

Operating Units

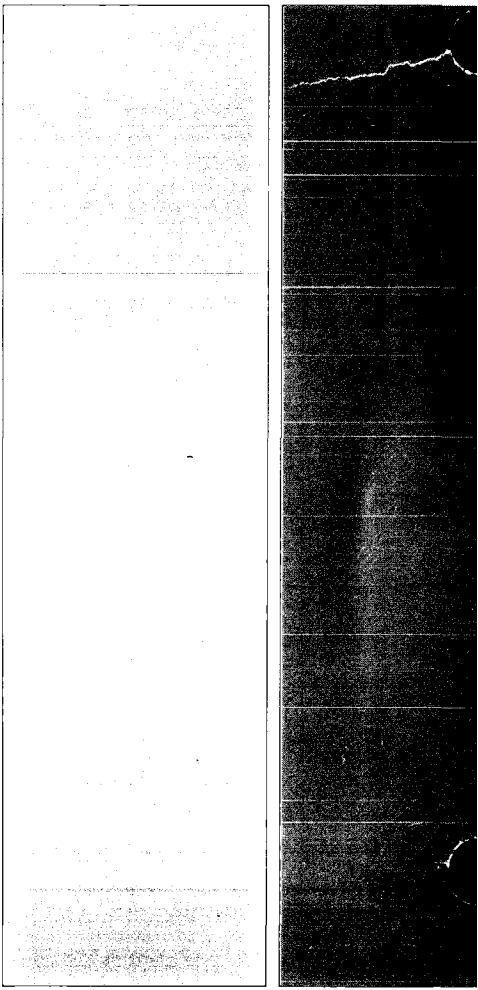
CORPORATE HEADQUARTERS — Columbus, Indiana

1. CUMMINS ENGINE COMPANY, INC. — Columbus, Indiana
Main production facility
In-line and V engines, 100 h.p. - 800 h.p.
Distribution through Cummins Diesel Sales Corporation, original equipment
manufacturers and independently owned distributors
2 million square feet . . . 8,300 employees
2. CUMMINS TECHNICAL CENTER — Columbus, Indiana
Research and engineering
360,000 square feet . . . 675 employees
3. CUMMINS EUROPEAN TECHNICAL CENTER — Essen, Germany
Research and engineering
22,000 square feet . . . 60 employees
4. CUMMINS ENGINE COMPANY, LTD.
Shotts, Scotland
Wholly owned subsidiary
In-line engines, 135 h.p. - 380 h.p.
145,000 square feet . . . 770 employees

Darlington, England
Wholly owned subsidiary
V engines, 140 h.p. and 185 h.p.
Fuel systems, air compressors, vibration dampers, injectors and other components
for United Kingdom and European manufacturing operations
Distribution of small V engines to world markets
440,760 square feet . . . 1,570 employees
5. KIRLOSKAR — CUMMINS LIMITED — Poona, India
Joint manufacturing agreement
In-line engines, 135 h.p. - 335 h.p.
Distribution to Indian OEM's and Cummins Diesel Sales and Service, a subsidiary
of Kirloskar-Cummins, for other sales
154,250 square feet . . . 925 employees
6. KOMATSU MANUFACTURING COMPANY, LTD. — Tokyo, Japan
Manufacturing agreement (license)
In-line engines, 130 h.p. to 335 h.p.
Distribution to Komatsu for Komatsu construction equipment only, and through
Komatsu-Cummins Sales Company, Ltd., for all other sales
152,000 square feet . . . 2,000 employees

7. CUMMINS DIESEL AUSTRALIA — Ringwood, Victoria, Australia
Wholly owned subsidiary
Assembly of in-line engines, 130 h.p. to 180 h.p. and V engines to 185 h.p.
Distribution for New Zealand and Australia
21,000 square feet . . . 80 employees
8. DIESEL NACIONAL (DINA) — Sahagun, Mexico
Manufacturing agreement (license)
V engines, 140 h.p. and 185 h.p. and in-line engines, 200 h.p. to 380 h.p.
26,600 square feet
9. ATLAS CRANKSHAFT CORPORATION — Fostoria, Ohio
Wholly owned subsidiary
Crankshafts, valves, piston pins and precision capscrews
Distribution to Cummins, other OEM's and Cummins Distributors and through
Cummins parts sales
373,395 square feet . . . 900 employees
10. CUMMINS RECON — Memphis, Tennessee
Division of Cummins Engine Company, Inc.
Reconditioned injectors, heads, water pumps, starters, rocker levers, rods
and other parts
Distribution to Cummins distributors as replacement parts
26,000 square feet . . . 100 employees
11. FLEETGUARD DIVISION — Cookeville, Tennessee
Division of Cummins Engine Company, Inc.
Air, lube and fuel filters for the automotive market
Distribution to Cummins for engine production, through Cummins distributors
and independent outlets for after-market, private branding for OEM's
137,000 square feet . . . 230 employees
12. FRIGIKING DIVISION — Dallas, Texas
Division of Cummins Engine Company, Inc.
Automotive and truck cab air conditioners
Distribution to Cummins distributors and independent outlets, sales to major
OEM's and private branding for retail chains
166,750 square feet . . . 500-800 employees (seasonal employment)

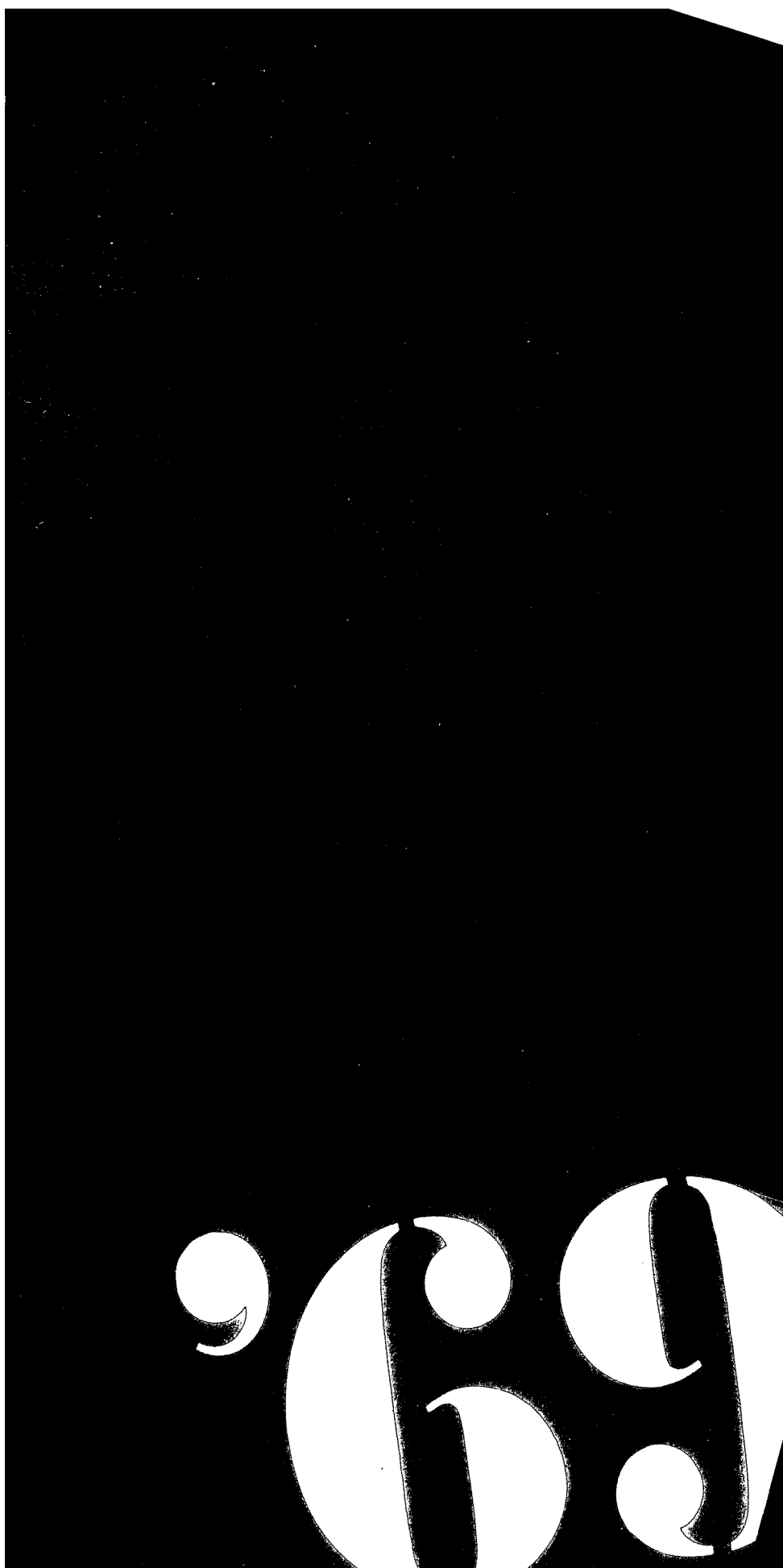




Cummins Engine Company, Inc.

1000 Fifth Street

Columbus, Indiana 47
Bulletin No. 9





C.D.S. 5
ES-997
MANILA
BELL

Box Size 39x39x39
Net Wt 19245
Gross Wt 30545

C.D.A.
FREEMANTLE

1989

BI
RICH
ERDAM

Box Size 39x39x39
Net Wt 10500
Gross Wt 11500

2003
CUMMINS
TORONTO

1968

Box Size 39x39x39
Net Wt 9500
Gross Wt 10800

2004
CUMMINS
TORONTO

RC

Box Size 39x39x39
Net Wt 9500
Gross Wt 10800

1879



'69

4	Summarized Results
5	Letter to the Shareholders
7	Cummins World-Wide Development
12	Changing Demands for Diesel Power
19	Financial Review
20	Comparative Charts
22	Auditors' Report
23	Statements of Earnings
24	Statements of Financial Condition
26	Statements of Earnings Retained and Capital Surplus
27	Statements of Sources and Uses of Funds
28	Notes to Consolidated Financial Statements
30	Ten Year Summary
32	Directors and Officers

Summarized Results

1969 1968

(Dollars in thousands, except per share amounts)

Operating Data:

Net sales	\$410,633	\$366,48
Net earnings	18,350	13,15
Net earnings per share (after 1969 10% stock dividend):		
Basic (average outstanding shares)	\$ 3.04	\$ 2.
Primary	2.98	2.
Fully diluted	2.83	2.
Cash dividends per outstanding share (current annual rate is \$.80 per share)	.73	.0
Earnings as a percent of sales	4.5%	3
Return on shareholders' average investment	14.9%	11
Interest expense	\$ 3,713	\$ 4,6
Costs of research and start-up	15,200	15,3
Depreciation	13,348	12,3
Capital expenditures	16,665	10,5

Financial Data:

Working capital	87,208	72,1
Property, plant and equipment—net	104,445	103,9
Long-term debt	61,861	61,6
Shareholders' investment	130,205	115,7
Capitalization	192,066	177,4
Shareholders' investment per outstanding share— after stock dividend	\$ 21.54	\$ 19.
Cash flow (net earnings and depreciation)	\$ 31,698	\$ 25,5

Year-End Data:

Number of shareholders	4,787	4,4
Number of employees	13,824	13,9
Number of shares outstanding (thousands)	6,046	5,4

To the Shareholders:

Nineteen sixty-nine results set many new records for the Company. The statistics on the opposite page express this record performance in dollar figures.

Of more importance and more interest to shareholders, is a credible answer to the question: What is ahead for Cummins in the 1970's—problems and opportunities? We should begin our answer with a statement as to the condition of the Company as it enters the 70's.

Market Base: Our customer base in all areas was strengthened in 1969. Every major manufacturer of heavy-duty trucks in the United States now offers Cummins engines, and the number of manufacturers of other kinds of Cummins powered equipment has been significantly increased.

Profits: Profit margins were improved in 1969, a year during which many companies were concerned about profit erosion. We accomplished this by improved efficiencies in American plants, by greater earnings from overseas investments and by selective price increases.

Products: With acceptance of the V-903 (320 horsepower V-8 engine), production of which will nearly double in 1970, the Company offers the most complete and varied line of V and in-line diesels from 100 to 800 horsepower.

Management: In June 1969, the senior management of the Company took an unusual step and recommended that the Directors elect, as the active operating management of the Company, a group of young men whose average age is under 40. We consider these men extraordinarily able, and it is our belief that companies today will be best led by younger men of energy and competence, who are at home in the new conditions of the industry and market, who know how to live with change and who welcome change and seek to exploit its opportunities.

Finance: For the first time since World War II, many American corporations find themselves in a credit squeeze. By planning and forethought, Cummins has adequate cash flow and debt capacity available for its projected needs, reasonable current debt costs, and more than adequate coverage for its projected debt retirement schedule.

Labor Contracts: An important development for personnel in 1969 was the renewal of three major 3-year labor contracts. After an 18-day strike, a new contract was signed with the Diesel Workers' Union which covers all production and maintenance employees at Columbus. A contract was also signed with the Office Committee Union which covers all hourly office and technical personnel in Columbus, and agreement was reached on a new contract with the UAW which covers all production and maintenance employees at the Atlas Crankshaft subsidiary. Approximately 7,500 Cummins employees are covered by these contracts. No major contracts remain to be negotiated in 1970.

Employee Development: A new concept in employee training was initiated in 1969 with establishment of the Employee Development Center in Columbus. It provides an integrated approach to employment, orientation, tool familiarization and training. A significant feature of the E.D.C. concept is an eight-week general remedial experience for prospective employees who might have heretofore been considered marginal from an economic and educational standpoint. This should enable the Company to provide an equal opportunity for job applicants who apply with less than ideal preparation for employment.

We feel we are on a solid base to build the Company in the 70's...what do we see ahead for the Company?

Technological Change: Two factors will determine the character of change in the decade ahead. The first of these is now called "sociability" and relates to pollution and the environment. We agree that the new national concern over pollution is proper and long overdue. The diesel engine has both advantages and drawbacks. Advantages are the minimal amounts of unburned hydrocarbons and carbon monoxide which characterize its exhaust. Drawbacks are its susceptibility to visible smoke and the presence of nitrogen compounds. We intend to eliminate visible smoke within the next 12 months on new engines, and to market a means to accomplish the same thing on engines now in service. In respect to nitrogen compounds, our aim is to reduce these to levels substantially below any figure determined to be harmful to human health. We enthusiastically support the new national emphasis on the environment.

Second only to the production of a socially acceptable power plant, the 1970's will, in our opinion, insist on the achievement of lowest total cost for the end user. High cost of money, rising capital costs and pressures on margins will compel this. The determination of lowest total cost will require a degree of sophistication and a depth of analysis never before available. It will involve a detailed knowledge of the conditions in which each unit will be required to operate. During the last four years, we have completed a computer model which permits a complete analysis and consequent specific determination of the ideal power system for each use. To this we have added our recent acquisition of Management Information Systems, Inc., Princeton, New Jersey, a computer software company which has developed the most advanced system for maintaining vehicle operating costs for both large and small users. We are now actively expanding the parts and engine reconditioning business in order to combine low rebuild costs with long life. These steps place the Company in a better position than that of any competitor to provide lowest total cost and to guarantee it to a user. In a period when cost and quality of service is under heavy pressure, we think that intelligent promotion of the lowest total cost concept can be a substantial and profitable growth business.

Finally, we are simultaneously pursuing radical developments of the diesel, gas turbine and other forms of power—but strictly under the disciplines of their social acceptability and their ability to lower total operating costs.

The Next Decade: In the 70's, a company will be prudent to plan on continued high cost of money and rising costs of all kinds of capital equipment. It is of highest importance to develop new expertise in the use of money, in seeking high return for each new investment, and in maintaining full utilization of existing capital investments.

It is our intention to enter new lines of business either by internal development or by acquisition. Such businesses must meet either of two criteria.

1. They must be such that we can enhance their value by bringing to them any of Cummins' worldwide or historical strengths.

2. They must represent important emerging industries of the future and must offer Cummins a chance to become a leader in the field.

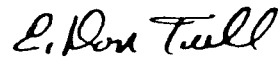
We are in active pursuit of opportunities of both kinds.

The balance of this report will give specific information about Company progress in 1969 and the overall range of the Company's activities. If its language seems optimistic and if the phrases "record sales" or "record earnings" appear an unusual number of times, you will have to forgive us. We are optimistic.

Entering 1970, we are currently operating with the largest backlogs we have ever known and are generally at full capacity. In view of the decline of the domestic economy, we feel it wise to anticipate a slackening in domestic demand, probably by midyear. Fortunately, we have contract business on the books scheduled for delivery in the last half of 1970 and throughout 1971. The Company should therefore be able to maintain stable employment and strong production. Our forecast of demand beyond 1970 is such that we have commenced the largest single expansion in the Company's history.

Nineteen sixty-nine was a year which demanded capacity production, close attention to customer needs, and a constant battle with increasing costs. The Company is extraordinarily fortunate to possess a work force of dedicated and concerned individuals who made the results of 1969 possible. It is a privilege to record here recognition and gratitude to all members of the Company.

We encourage each shareholder to attend the annual meeting and meet members of management. There, either in the meeting or with individuals, you may raise any question about the Company which is of concern.



Chairman of the Executive Committee



Chairman of the Board
Columbus, Indiana, March 11, 1970

Cummins on-highway engines are certified in accordance with the 1970 Federal Smoke Standard and research continues.



Cummins World-Wide Development

Cummins has manufacturing facilities in 11 locations around the world. During 1969, operations outside of Columbus made the greatest contributions to the Company's sales and profits to date.

Domestic Subsidiaries

Total domestic subsidiary operations had its most successful year. The Fleetguard Division achieved all-time records in sales. Profits were the second highest in the history of this division and highest since its relocation. Marketing of Fleetguard's products will be substantially expanded in 1970.

The Frigiking Division in Dallas, Texas, continues to be the largest maker of air conditioners for the passenger car after-market. Nineteen sixty-nine was a record year in both profits and sales for Frigiking, and they introduced

Cummins-powered log stackers help meet the ever increasing demand for paper and wood products.



a new product, the "Chiller," a specially designed air conditioner for the growing market in campers, trailers and houseboats.

Atlas Crankshaft in Fostoria, Ohio, continued to achieve new records in both sales and profits. They increased sales to companies other than Cummins to 26% of total business. An 80,000 square foot plant addition will be completed by the end of 1970. This will allow Atlas to add camshafts and gears to its product line, which already includes crankshafts, valves, piston pins and precision capscrews.

The ReCon Division in Memphis, Tennessee, achieved a record high in sales, though profits are not yet consistently satisfactory. ReCon, a new venture started in 1966, is putting Cummins in the market for reconditioned parts

in the diesel industry and will form an important part of the Company's "lowest total cost" efforts. Production the plant increased by 32% during 1969.

International

Cummins international operations made its greatest contribution to the Company's profits. All overseas activities are now profitable; 25% of the Company's 1969 sales were made outside the United States.

In England, sales increased 25% over the previous year. Cummins is the leading supplier of diesel engines for heavy-duty truck market in the United Kingdom. The manufacturing facility at Darlington, England, introduced higher horsepower versions of the small V engine. Capacity expansion at the Shotts, Scotland, facility, accomplished by addition of higher output machinery, v

Embasaki Airport, Nairobi, Kenya, is one of many international airports specifying Cummins-powered emergency fire trucks.



allow the plant to nearly double current daily production rates.

During 1969, the license agreement between Cummins and Komatsu in Japan was validated by the Japanese Government, permitting Cummins to bring back profits to the United States over a period of time. In the fall, Komatsu completed a new engine manufacturing plant which will increase 1970 Cummins production by nearly 20%.

The NH engine program at Diesel Nacional, S.A. (DINA), our licensee in Mexico, reached a new high in 1969 with a 13% increase over the previous year. DINA also achieved a 35% production increase of small V engines which they manufacture under license. DINA trucks, powered by Cummins, account for two-thirds of the medium-duty diesel truck market in Mexico.

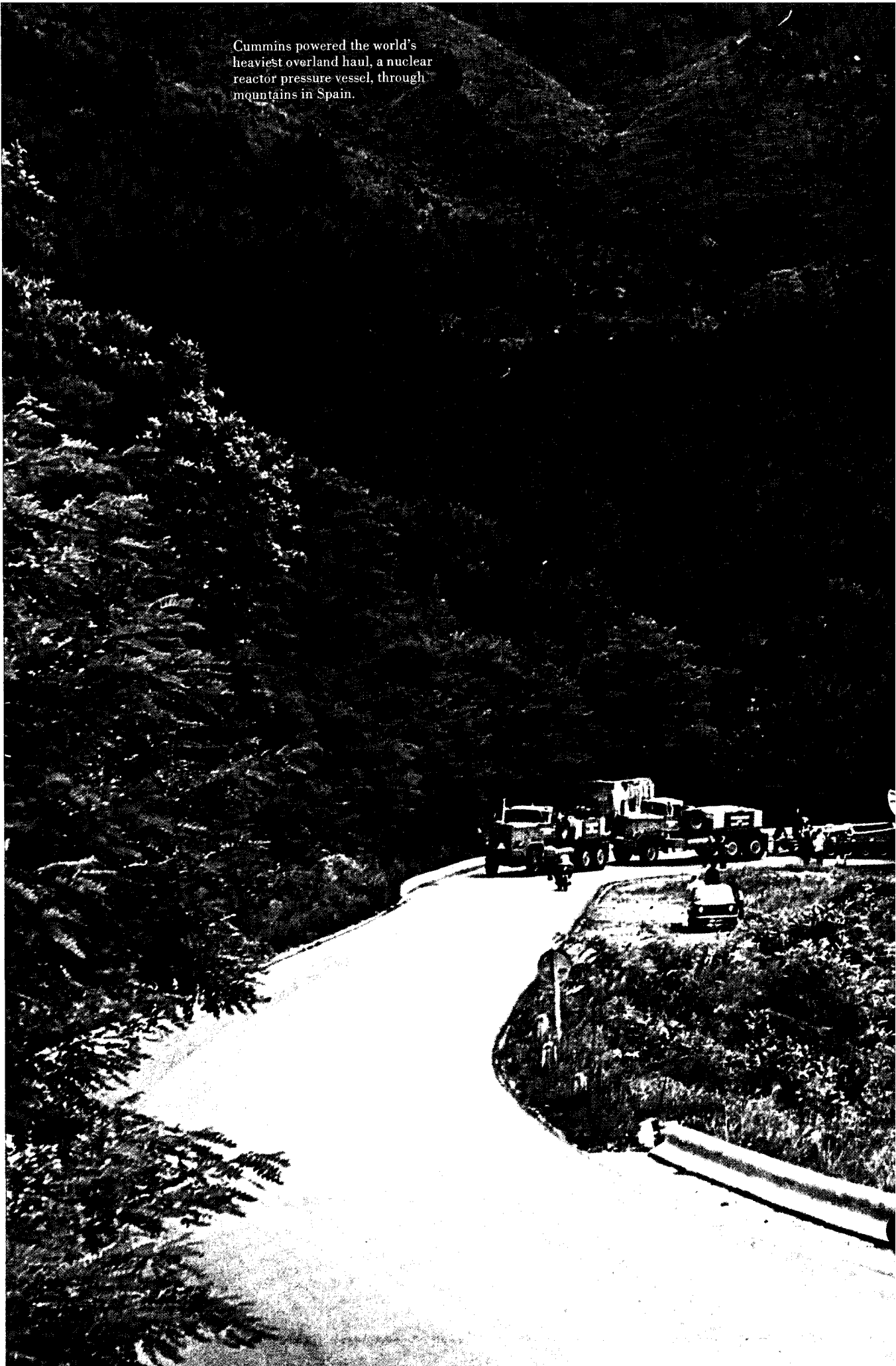
The joint venture manufacturing facility, Kirloskar-Cummins Ltd., in Poona, India, increased sales by nearly 25% while profits reached a record level. This operation paid its first cash dividend in 1969. At Cummins Diesel Australia, sales volumes continue to increase, and long-term potential looks bright.

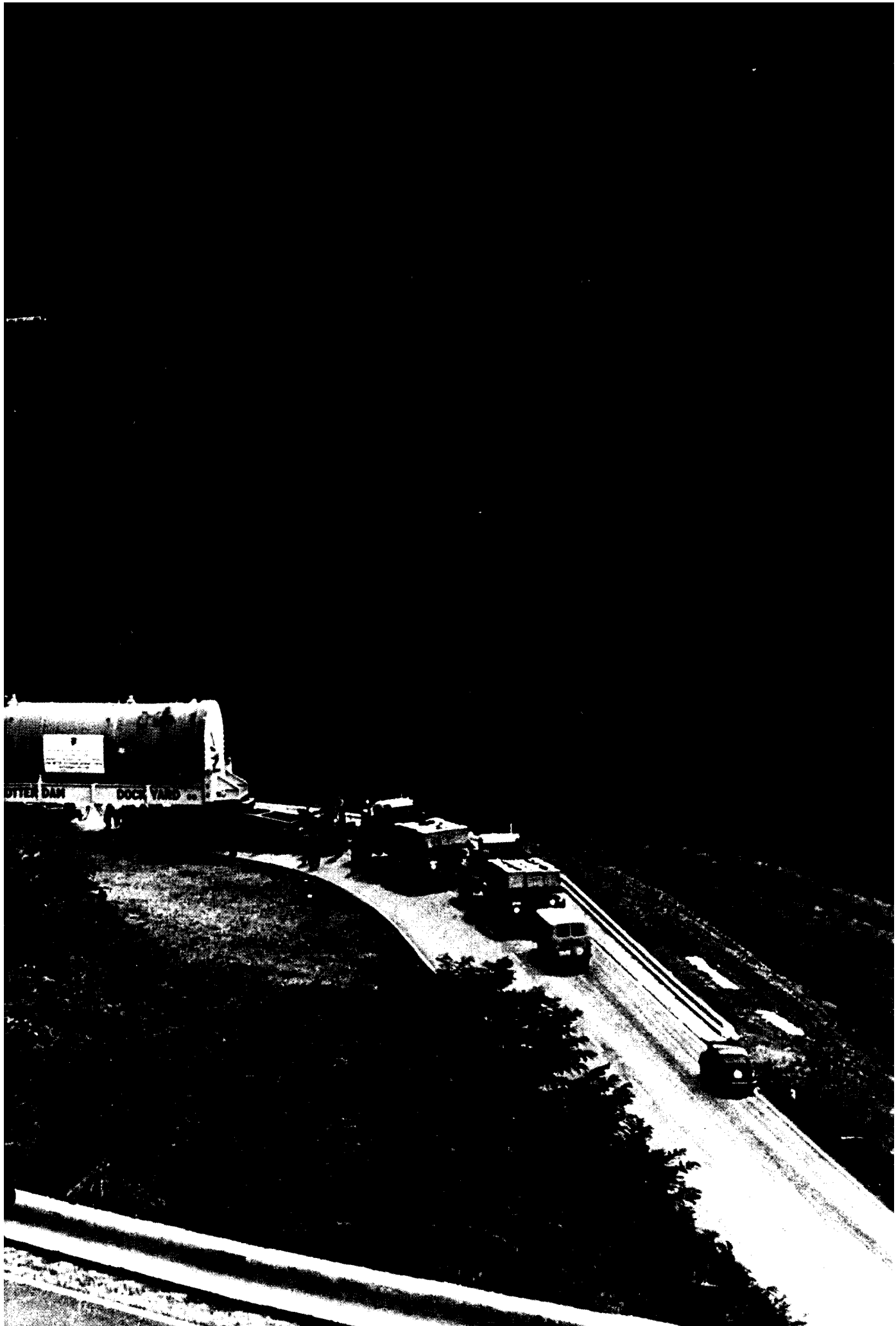
World-Wide Service

Cummins International sales and service network increased its overall size and coverage during 1969. Four new branches and 30 sub-dealers were added for a total of 455 international sales and service outlets.

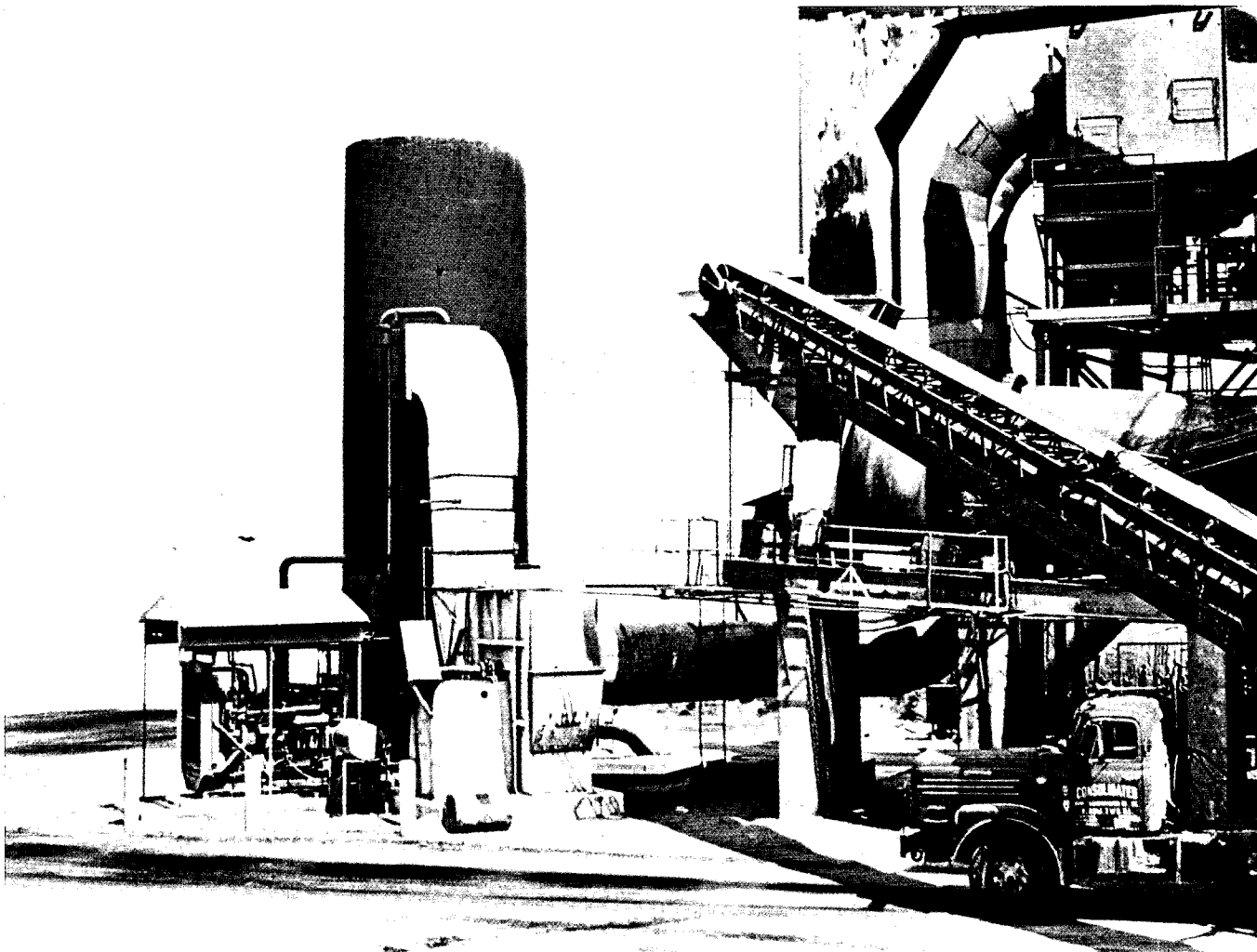
Including the U.S. and Canada, Cummins Engine Company now has 2,500 dealers in 98 countries, the world's largest diesel sales and service network.

Cummins powered the world's
heaviest overland haul, a nuclear
reactor pressure vessel, through
mountains in Spain.





The cleansing operation at one of the nation's largest asphalt plants in northern Illinois represents the increasing number of applications for Cummins stationary engines.



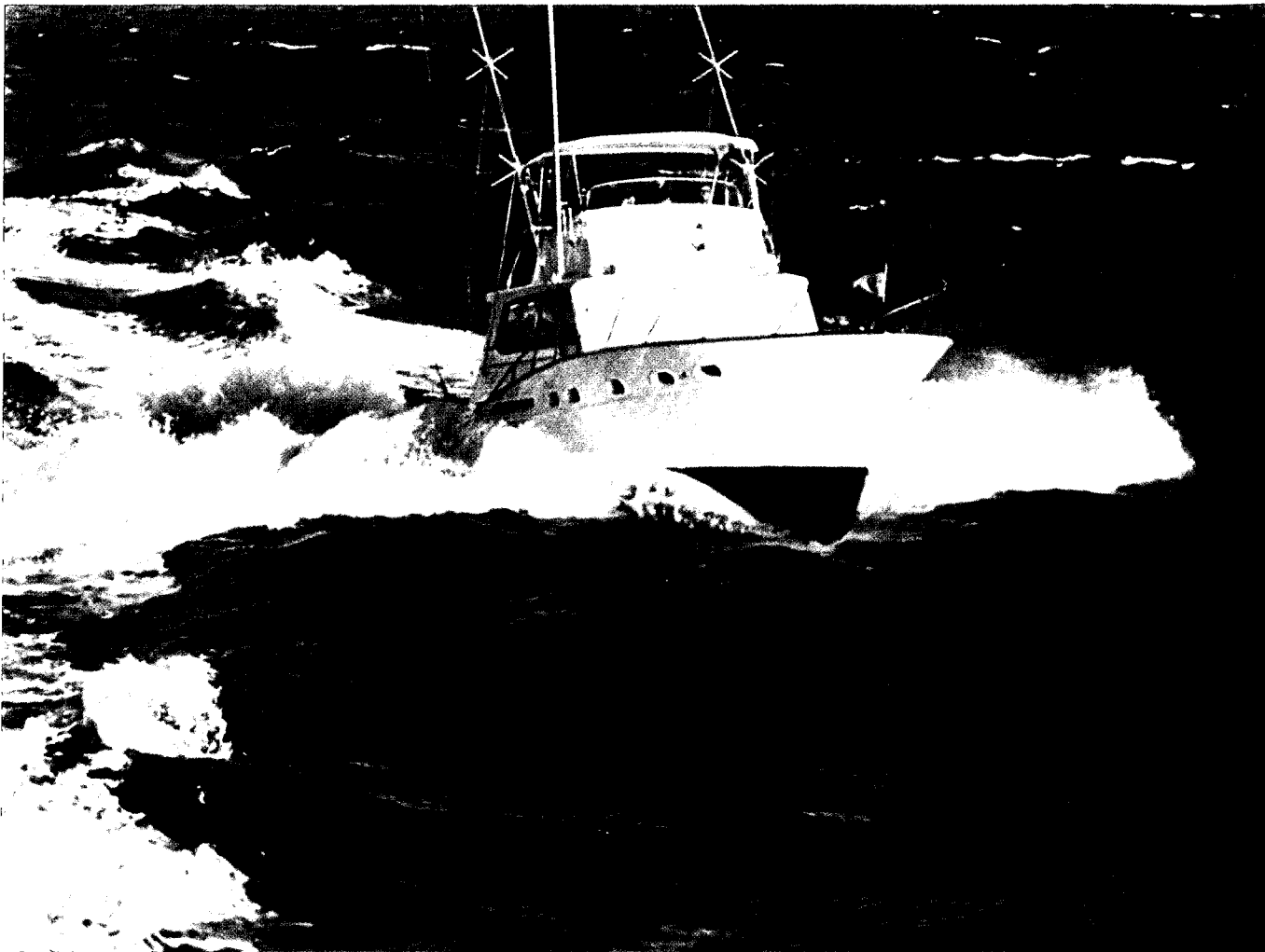
Changing Demands for Diesel Power

Cummins means power—in a growing number of varied applications. The Company's research and development programs are attuned to the power requirements of new and developing industries. In the coming decade, these industries will demand diesel power for applications heretofore undreamed of in addition to those which are standard today.

Transportation of Goods and People

Cummins powered vehicles range from soft drink trucks making deliveries in the city to the heaviest, on-highway long-distance haul ever accomplished. This haul was completed by four tractors, each powered by a 6-cylinder, 380 horsepower, in-line Cummins engine. A 793,000-pound nuclear reactor pressure vessel was moved 141 miles over mountainous roads in Spain. The gross train weight of the convoy was 1,322,440 pounds.

Cummins power is now available from all the top ten pleasure boat manufacturers.



The small V-6 and V-8 diesels manufactured in Cummins' Darlington, England, plant have opened up a new market in smaller transportation applications. These small V's power intracity delivery vehicles and such specialized vehicles as mobile home transporters.

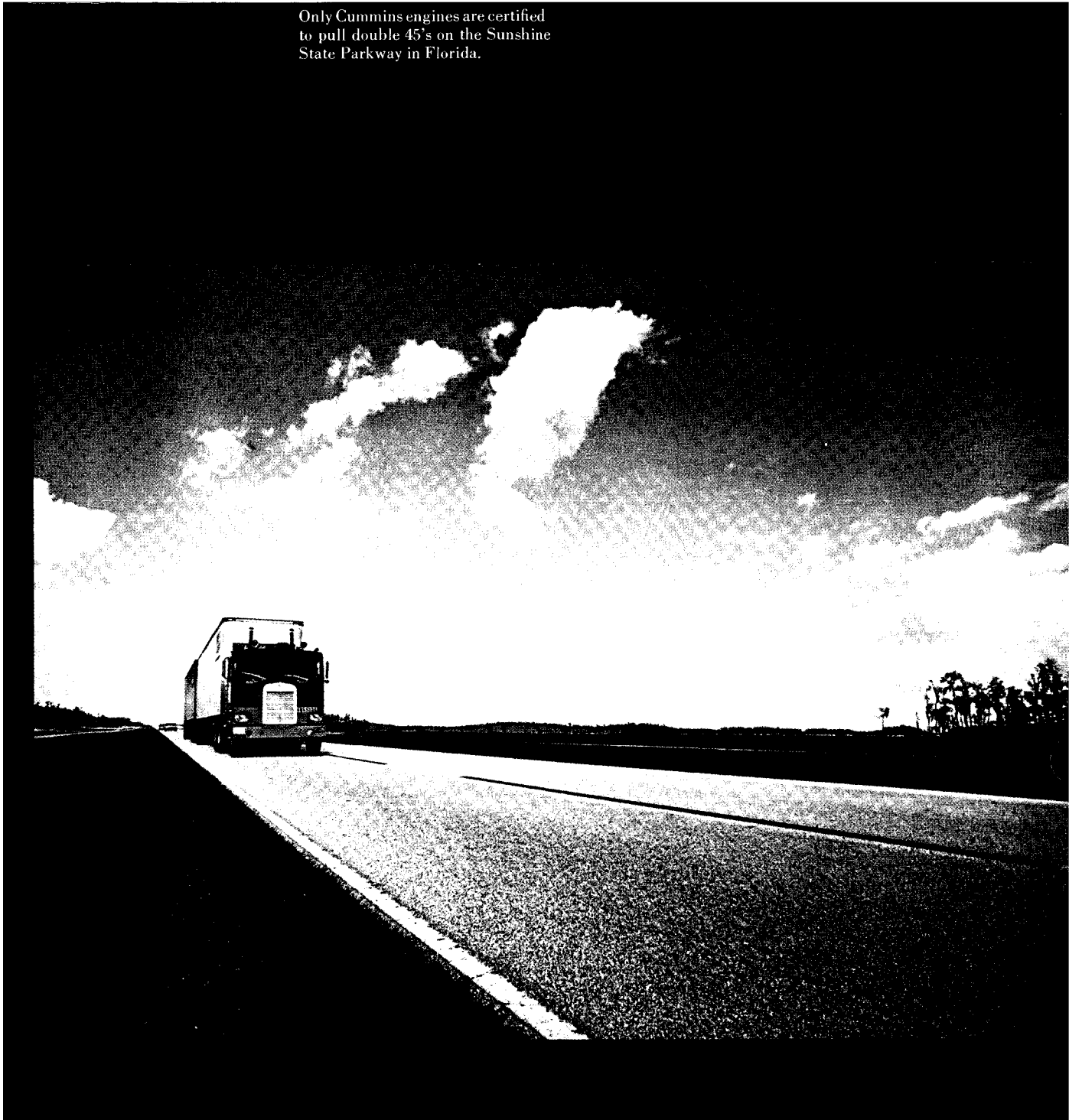
Cummins is a leader in off-highway transportation too. This market includes 100-ton dump trucks used in mining and earth-moving jobs, pipe-mobiles capable of carrying 150-ton sections of concrete pipe, and self-propelled transporter track units which earned Marks-Trans Western the "Heavy Hauling Job of the Year" award. The twin transporter units, powered by Cummins 335 horsepower pancake engines, moved a 954,000-pound refinery vessel six miles over both unimproved areas and highways.

Cummins is also playing an increasingly important role

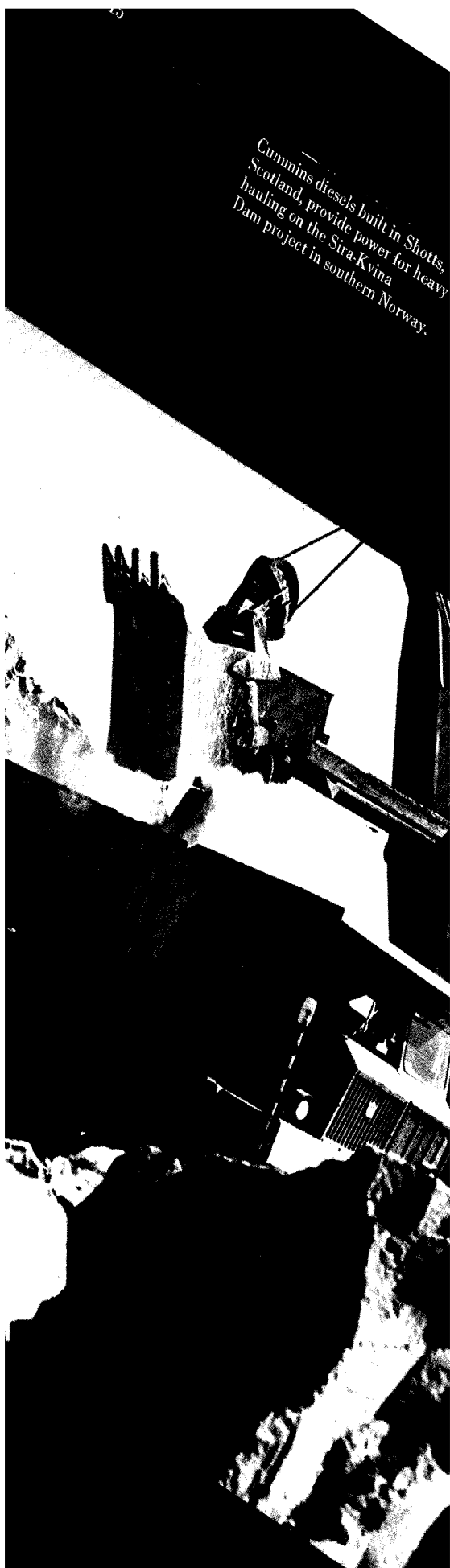
in the transportation of people. The Company's diesels provide the power source for a variety of on-highway and intracity buses. School bus applications provide a steadily growing opportunity. Cummins also transports a large number of people via such varied conveyance as tramways (Royal Gorge), ski-lifts, cog railroads (Pikes Peak) and railcars such as some currently operating in Sweden and Australia.

The air transportation industry relies on Cummins. The diesel provides electrical power, heat and air conditioning for planes on the ground. The U.S. Army's giant C-5 and the new jumbo Boeing 747 are towed and maneuvered by Cummins-powered tow tractors. Even the astronauts depend on the diesels. Prior to blastoff, Cummins engines power the auxiliary electrical systems, air conditioning and elevators on the giant

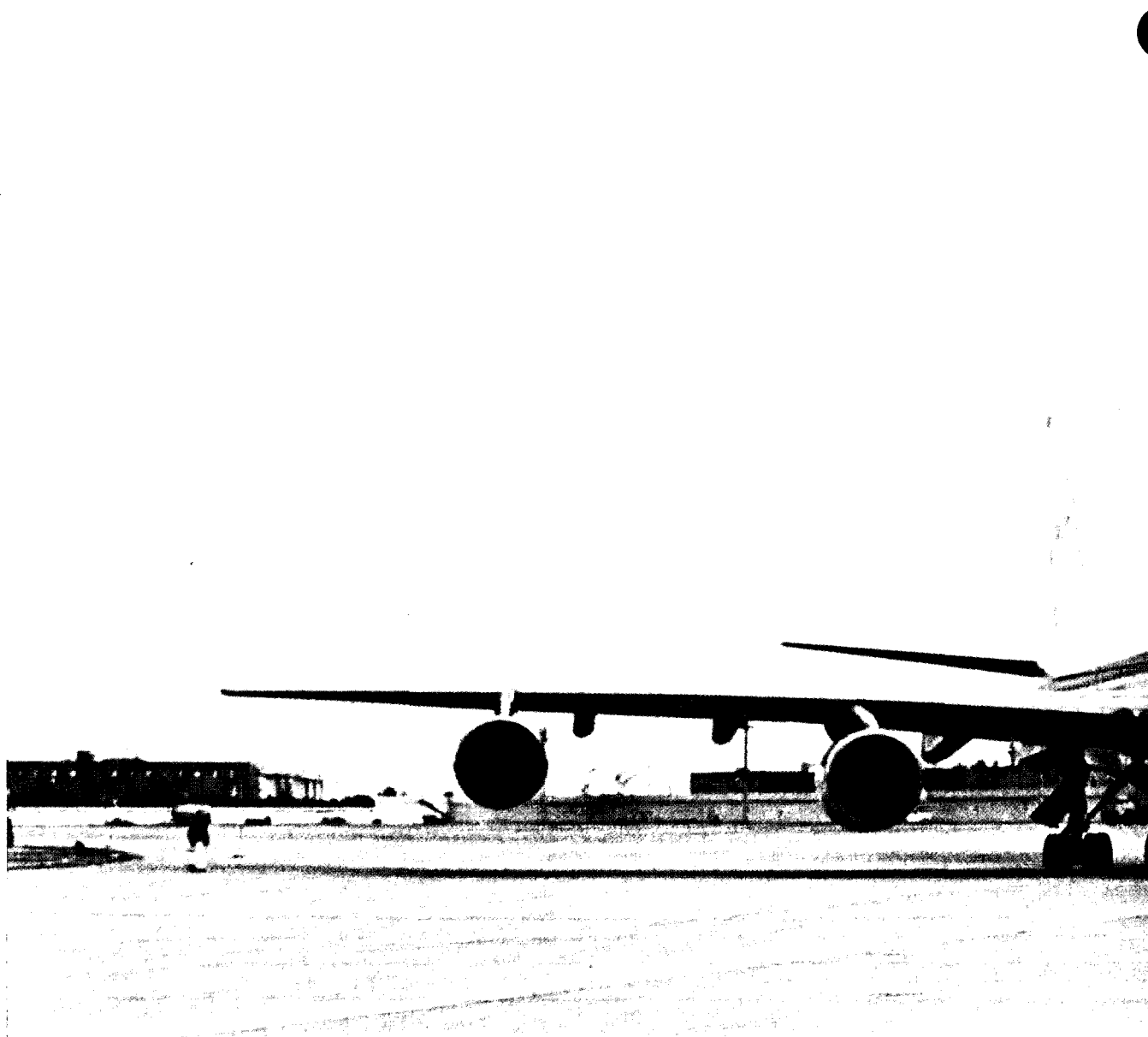
Only Cummins engines are certified
to pull double 45's on the Sunshine
State Parkway in Florida.



Cummins diesels built in Shotts,
Scotland, provide power for heavy
hauling on the Sira-Kvina
Dam project in southern Norway.



Cummins-powered tow tractors maneuvered the world's largest passenger jet, Boeing's new 747, on its first landing in New York.



crawler transporter used to put the launch vehicle in place.

In marine markets, Cummins is now available in all the top ten pleasure boat manufacturers. The houseboat industry is also providing a rapidly growing market. Cummins supplies dependable power for the safety of thousands of passengers in the C-Line tour boats to the Statue of Liberty and the Maid of the Mist at Niagara Falls. And Cummins diesels power a large variety of tugs, tow boats, fishing boats and ferries.

Agriculture

Exploding population and higher operating costs place new kinds of burdens on farming. The need for larger, more efficient farm operations requires larger, more powerful tractors. The Versatile tractor, manufactured in Canada, uses the Cummins small V engines exclusively

in its large four-wheel drive model which has captured 47% of the four-wheel drive tractor market. Versatile is expanding its dealer network in the United States with marked success in both dealer interest and sales.

In addition to providing tractor power, the small V engines are the Company's leader in farm trucks, specialized farm vehicles and irrigation equipment. In Arizona, Cummins-powered pumping units are turning arid desert into productive land. In Florida, citrus growers rely on Cummins diesels to provide "rain" during dry periods.

Logging

Demand for paper and wood products is at an all-time high, and all indications are that the upward trend will continue, requiring more efficient and more specialized equipment. Once again, the small V engines cover a



package size and horsepower range that is new for Cummins. Logging operators can now get Cummins power in virtually all equipment.

In addition to powerful logging trucks often seen on highways in the Northwest, Cummins diesels power log loaders, tree skidders, mobile spars, tree harvesters, log stackers, yarders, log chippers and portable saw mills.

Construction

On the Yodo River near Osaka, Japan, a driverless Komatsu bulldozer moved down the bank and into the river. The Cummins-powered machine then demonstrated its dredging capabilities when submerged in 9 feet of water. It is the world's first amphibious and driverless bulldozer. The main applications for this remote controlled equipment are in land reclamation projects.

At Pier 17 on Staten Island, ships make use of the world's largest crane for handling containerized freight. The crane, capable of carrying loads of up to 50 tons, is powered by two Cummins generator sets which are operated using the Cummins Automatic Paralleling System.

In addition to new, unusual applications, demand for Cummins power is increasing in the broad range of construction and industrial equipment. Cummins is exclusive in the world's largest bulldozer, manufactured by Allis Chalmers. Front end loaders, crawler tractors, scrapers, graders, back hoes and shovels all call on Cummins for power. The V-903 is now used by Ingersoll Rand in some of their largest, latest model air compressors, and the small V engines put Cummins in the portable air compressor market for the first time.

Florida citrus growers rely on portable sprinkler units powered by Cummins small V's.



Protection

Cummins diesels offer elements of protection to people around the world. They power fire trucks in both the U.S. and abroad. The dependability and economy of the diesel have made this engine a favorite with fire fighting units for both trucks and boats.

The Company continues to serve in defense of the nation. Cummins-powered gunboats are currently being used by the Navy to patrol the waterways in Viet Nam. New U.S. Army 5- and 10-ton trucks, in all models and applications, are now Cummins powered.

One of the most widespread uses of Cummins engines for purposes of protection is the standby generator set. In schools, public buildings and hospitals, these engines "kick on" automatically in case of power failure. In those instances where only seconds delay could be

fatal, the diesels are standing quietly awaiting the call.

Waste Disposal

Few problems demand greater attention today than waste disposal. Cummins has entries in two applications which reflect this need. The small V engine has gained rapid acceptance in the newest garbage trucks and compactors. The largest single purchase of this equipment during 1969 was the purchase of 100 units by the city of Chicago

A Cummins-powered mobile car-crusher has been developed in Great Britain. The machine reduces a junked car to a neat package of two feet square and one foot thick in about three minutes. These packages are easier to transport and are better for land-fill purposes. Three of the units are currently traveling throughout Great Britain and are handling up to 1,000 cars a week.

Financial Review

Consolidated Sales and Earnings

Consolidated net earnings increased 40% in 1969 while net sales were 12% greater than in 1968.

	1969	1968
Net Sales (millions)	\$410.6	\$366.6
Net Earnings	18.4	13.2

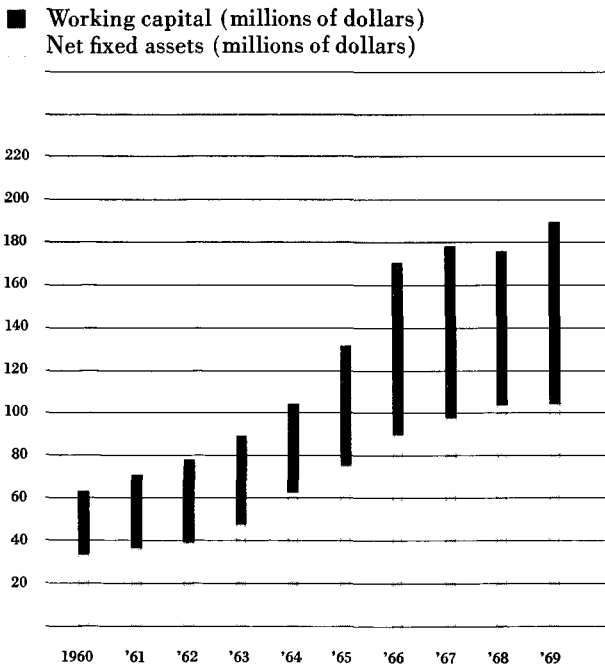
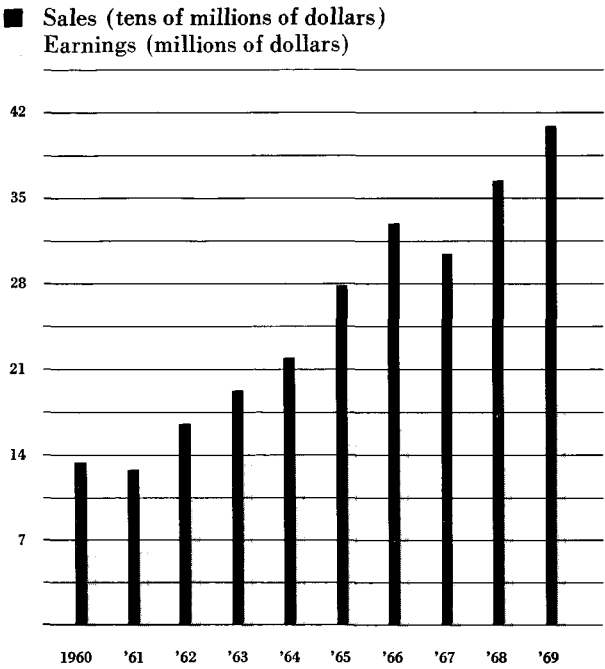
The major contributing factors to the higher earnings increase were—an improved product mix and selected price increases for Columbus-manufactured products—significantly better operating results of international and domestic subsidiary operations—and lower interest costs. Virtually all entities experienced cost increases for people, material and supplies.

Sales growth in the most important market sectors was uniform in 1969. As in 1968, the ratio of consolidated sales by geographic area was 75% domestic and 25% international, and the ratio of domestic engine sales by market was 72% automotive and 28% all other markets.

Sales and earnings in 1969 were essentially on the compound growth trends established in the previous 20 years. Earnings as a percent of sales in 1969 of 4.5% and return on shareholders' equity of 14.9% did not reach new records but continued the improvement shown last year.

Specific items of significance to 1969 results were:

1. Frigiking's earnings improved substantially after discontinuation in 1968 of transport refrigeration development.
2. Great Lakes Foundry operations were phased out and its assets sold in 1969 without material impact.
3. Results of operations of the engine manufacturing plants in the United Kingdom continue the improvement shown last year. They are expected to contribute importantly to after tax earnings in the future.
4. All active joint venture and licensee arrangements were profitable for the Company in 1969. Results for this group were depressed in 1968 by Chrysler-Cummins Ltd. Since its acquisition by Cummins in 1968, the plant has been operated as part of the wholly-owned engine complex in Darlington, England.



Sales to markets outside the United States were approximately \$100 million of which about 40% were produced by Cummins plants in the United Kingdom and Australia. The relationship of operating earnings to sales and asset employed for business in international markets improved markedly in 1969 but is still lower than for domestic markets after allocation of administrative and technical expense.

Dividends

The 20 cent quarterly dividend was maintained in 1969 on shares outstanding. In addition, a 10% stock dividend was declared payable to shareholders of record on December 29, 1969. A similar 10% stock dividend was declared in 1968.

Working Capital

Working capital increased 21% over the level at the end of 1968.

	1969	1968
Working Capital (millions)	\$87.2	\$72

Year-end receivables and inventories were higher than the 1968 balances by 21% and 16% respectively, which were consistent with rates of production and sales and level of backlog at the end of 1969.

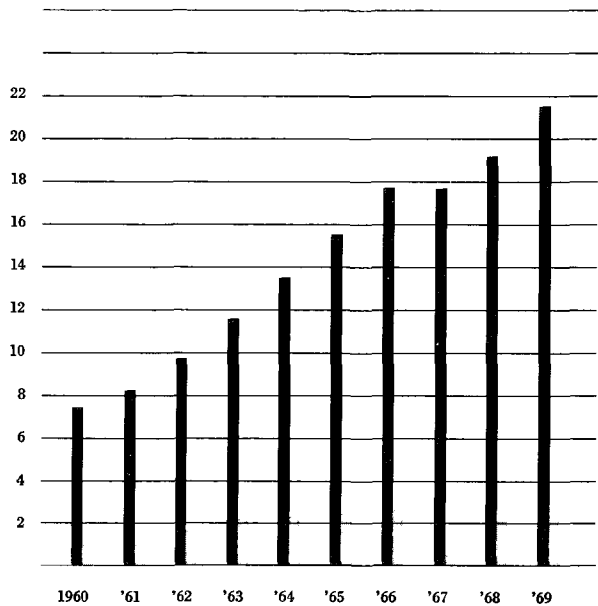
Capital Expenditures

In 1969, a three-year program to add required capacity to produce engines in the United States was begun. Additions were completed at Columbus and started at Fostoria amounting to a total of 200,000 square feet. While total capital expenditures were up 57% over the relatively low level of 1968, the continuation of the engine capacity expansion program is expected to increase capital outlay in 1970 and 1971 significantly.

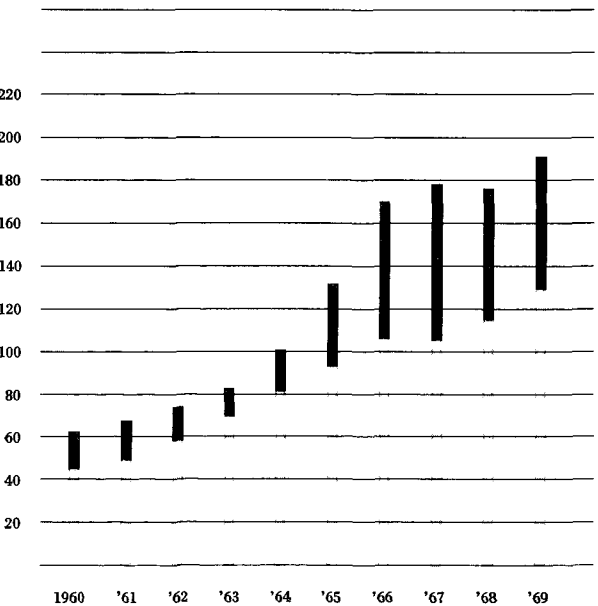
	1969	1968
Capital Expenditures (millions)	\$16.7	\$10

An increase in the capacity at the Shotts plant was started in 1969 and a further increase is under consideration.

■ Equity per share (dollars)
Earnings per share (dollars)



■ Long-term debt (millions of dollars)
Equity (millions of dollars)



Long-Term Debt

Both the amount of long-term debt and the proportion owed to domestic and international lenders remained essentially constant in 1969 and the Company's ratio of debt to capitalization was reduced from 35% to 32%.

	1969	196
Long-Term Debt (millions)	\$61.9	\$61.
Interest Expense	3.7	4.

In February, 1969, Cummins issued, through its wholly-owned United Kingdom subsidiary, £5 million (\$12 million) Convertible Unsecured Loan Stock at 3¾% interest. The proceeds were used to repay other higher cost long-term loans and to reduce short-term bank loans. The replacement of higher cost debt by the 3¾% loan stock in 1969 and the 5% convertible debentures in 1968 resulted in lower interest costs in 1969 of \$1.0 million.

Auditors' Report

To the Shareholders and Board of Directors,
Cummins Engine Company, Inc.:

We have examined the consolidated statement of financial condition of Cummins Engine Company, Inc. (an Indiana corporation) and its wholly owned subsidiaries as of December 31, 1969, and the related consolidated statements of earnings, earnings retained in the business, capital surplus and sources and uses of funds for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We have previously examined and reported on the financial statements for the preceding year.

In our opinion, the accompanying consolidated statements of financial condition, earnings, earnings retained in the business, capital surplus and sources and uses of funds present fairly the financial position of Cummins Engine Company, Inc. and its wholly owned subsidiaries as of December 31, 1969, and the results of their operations and the sources and uses of working capital for the year then ended, all in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Arthur Andersen & Co.
February 6, 1970
Chicago, Illinois

Consolidated Statements of Earnings
Cummins Engine Company, Inc.
and its Wholly Owned Subsidiaries

1969**1968**

Net sales	\$410,632,972	\$366,489,310
Cost of goods sold	283,025,197	257,668,130
Gross profit on sales	127,607,775	108,821,179
Selling, service, administrative, and research and development expenses ..	90,190,560	77,902,540
Profit on sales	37,417,215	30,918,639
Other (expense) or income:		
Interest expense	(3,713,291)	(4,687,070)
Equity in earnings and (losses) of partially owned international companies (Note 1)	607,373	(817,610)
Interest, royalties, and other income, net	2,889,289	2,314,830
	(216,629)	(3,189,850)
Earnings before provision for income taxes—after depreciation of \$13,348,216 in 1969 and \$12,382,079 in 1968 (Note 3)	37,200,586	27,728,779
Provision for income taxes:		
Current	17,162,151	13,981,210
Deferred (Note 4)	2,082,347	1,155,130
Investment tax credit	(394,065)	(561,000)
	18,850,433	14,575,340
Net earnings for the year	\$ 18,350,153	\$ 13,153,429
Net earnings per share (Note 2):		
Primary	\$ 2.98	\$ 2.18
Fully diluted	\$ 2.83	\$ 2.18

The accompanying notes are an integral part of these statements.

Consolidated Statements of Financial Condition
Cummins Engine Company, Inc.
and its Wholly Owned Subsidiaries

1969**1968**

Assets (December 31)

Current Assets:

Cash	\$ 4,137,438	\$ 7,446,91
Marketable securities and time deposits, at cost and same as market	11,479,487	4,000,00
Receivables (less reserves of \$1,195,000 in 1969 and \$1,297,000 in 1968)	67,923,202	56,291,21
Inventories, at the lower of (first-in, first-out) cost or market	68,419,438	58,738,97
Prepaid expenses and deferred tax effects (Note 4)	8,871,599	8,418,10
Total Current Assets	<u>160,831,164</u>	<u>134,895,30</u>

Investments and Other Assets:

Investments and advances, principally in partially owned international companies (Note 1)	1,962,184	1,218,30
Receivables due beyond one year, etc.	<u>7,294,615</u>	<u>7,740,81</u>
Total Investments and Other Assets	<u>9,256,799</u>	<u>8,959,11</u>

Property, Plant and Equipment, at Cost:

Land	5,674,668	4,739,10
Buildings	46,786,155	43,852,20
Machinery, equipment and fixtures	<u>123,010,865</u>	<u>117,686,00</u>
Total Property, Plant and Equipment	175,471,688	166,277,30
Less: Accumulated depreciation (straight-line method)	<u>71,027,146</u>	<u>62,322,60</u>
Net Property, Plant and Equipment	<u>104,444,542</u>	<u>103,955,20</u>

Intangible Assets:

Cost in excess of acquired net tangible assets of Frigiking Division (not being amortized)	3,532,226	3,532,20
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Total Assets	<u>\$278,064,731</u>	<u>\$251,341,90</u>
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The accompanying notes are an integral part of these statements.

	1969	1968
Liabilities and Shareholders' Investment (December 31)		
Current Liabilities:		
Loans payable (including current maturities of long-term debt) . .	\$ 10,199,563	\$ 6,473,92
Accounts payable and accrued expenses	52,897,594	43,861,52
Contributions to retirement trusts (Note 7)	1,764,783	1,358,80
Income taxes	8,761,307	11,048,07
Total Current Liabilities	<u>73,623,247</u>	<u>62,742,31</u>
Long-term Debt, Less Current Maturities (Note 6) :		
Payable to Domestic Lenders:		
4.6% notes payable under loan agreements, due in installments from 1971 to 1990	20,000,000	20,000,00
4½% to 6% mortgage notes and capitalized leases, due in installments to 1986	4,708,653	4,905,12
5¼% notes payable to insurance companies, due in installments to 1971	250,000	1,500,00
Payable to International Lenders:		
5% subordinated convertible debentures, due 1988	19,960,000	20,000,00
3¾% convertible unsecured loan stock, due 1994	12,000,000	-
9% notes payable, due in installments to 1972	2,942,302	-
6½% note payable to bank, due in 1971	2,000,000	2,000,00
5% to 5½% loans payable to U.K. Board of Trade, due in installments to 1977	-	6,768,00
7½% note payable to bank, due in 1970	-	4,500,00
7% purchase agreement, due in installments from 1972 to 1976	-	2,000,00
Total Long-term Debt	<u>61,860,955</u>	<u>61,673,12</u>
Reserves:		
Deferred income taxes (Note 4)	10,953,121	8,311,00
Accrued expenses, beyond one year	1,422,324	2,852,67
Total Reserves	<u>12,375,445</u>	<u>11,163,68</u>
Shareholders' Investment (Notes 5 and 6) :		
Common stock at par value	15,114,815	13,687,75
Capital surplus	58,411,862	39,185,39
Cost of treasury stock	(2,181)	-
Earnings retained in the business	56,680,588	62,889,65
Total Shareholders' Investment	<u>130,205,084</u>	<u>115,762,81</u>
Total Liabilities and Shareholders' Investment	<u>\$278,064,731</u>	<u>\$251,341,93</u>

Consolidated Statements of Earnings Retained in the Business and Capital Surplus Cummins Engine Company, Inc. and its Wholly Owned Subsidiaries	1969	1968
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Consolidated Statements of Earnings Retained in the Business:

(Exclusive of amounts transferred to capital accounts)

Balance, January 1	\$62,889,659	\$72,383,11
Addition: Net earnings for the year	<u>18,350,153</u>	<u>13,153,42</u>
	81,239,812	85,536,54
Deductions:		
Cash dividends paid	4,388,023	3,981,74
Stock dividends issued in January, 1970 and 1969, (excess of approximate market value over \$2.50 par value transferred to capital surplus) 549,624 shares at \$36.70 per share in 1969; 497,737 shares at \$37.50 per share in 1968	20,171,201	18,665,13
	<u>24,559,224</u>	<u>22,646,88</u>
Balance, December 31 (Note 6)	<u>\$56,680,588</u>	<u>\$62,889,65</u>

Consolidated Statements of Capital Surplus:

(Primarily transfers from earnings retained in the business for stock dividends)

Balance, January 1	\$39,185,393	\$21,746,13
Additions:		
Excess of net proceeds over par value of common stock issued upon conversion of convertible subordinated debentures: 1969—1,004 shares	36,164	
Excess of proceeds over par value of common stock issued under stock option plans: 1969—20,195 shares; 1968—549 shares	377,809	18,46
Excess of proceeds over cost of treasury stock sold under key employee stock investment plan: 1969—9,537 shares	15,339	-
Excess of approximate market value over par value of shares issued in connection with common stock dividends	<u>18,797,157</u>	<u>17,420,79</u>
	<u>19,226,469</u>	<u>17,439,26</u>
Balance, December 31	<u>\$58,411,862</u>	<u>\$39,185,39</u>

The accompanying notes are an integral part of these statements.

**Consolidated Statements of Sources and
Uses of Funds
Cummins Engine Company, Inc.
and its Wholly Owned Subsidiaries**

1969 1968

Working Capital, beginning of year	<u>\$72,152,994</u>	<u>\$79,756,581</u>
Sources of Funds:		
Net earnings for the year	18,350,153	13,153,427
Provision for depreciation	13,348,216	12,382,079
Sale of convertible debentures	12,000,000	20,000,000
Other long-term debt	2,942,302	6,100,400
Decrease in investments and advances (Note 1)	—	3,525,573
Increase in deferred taxes	2,642,112	2,169,319
Decrease in receivables, due beyond one year	446,239	—
Plant and equipment disposals	2,827,061	1,161,258
Stock options exercised and other capital transactions	480,144	19,839
Total	<u>53,036,227</u>	<u>58,511,895</u>
Uses of Funds:		
Property, plant and equipment additions, at cost	16,664,600	19,025,431
Payments made or due within one year on long-term debt	14,754,473	37,357,915
Decrease in accrued expenses, due beyond one year	1,430,354	3,112,477
Increase in receivables, due beyond one year	—	2,637,913
Increase in investments and advances	743,854	—
Cash dividends paid	4,388,023	3,981,746
Total	<u>37,981,304</u>	<u>66,115,482</u>
Working Capital, end of year	<u>87,207,917</u>	<u>72,152,994</u>
Increase (decrease) in Working Capital	<u>\$15,054,923</u>	<u>\$(7,603,587)</u>
Represented by:		
Increase (decrease) in current assets:		
Cash and securities	\$ 4,170,008	\$ 8,219,581
Receivables	11,631,949	3,498,315
Inventories	9,680,468	5,279,077
Prepaid expenses	453,430	1,331,103
Refundable income taxes	—	(4,384,031)
	<u>25,935,855</u>	<u>13,944,045</u>
Decrease (increase) in current liabilities:		
Loans payable	(3,725,642)	(300,062)
Accounts payable and accrued liabilities	(9,036,071)	(11,345,481)
Retirement trusts	(405,982)	508,246
Income taxes	2,286,763	(10,410,335)
	<u>(10,880,932)</u>	<u>(21,547,632)</u>
Increase (decrease) in Working Capital	<u>\$15,054,923</u>	<u>\$(7,603,587)</u>

The accompanying notes are an integral part of these statements.

Notes to Consolidated Financial Statements

Note 1: Consolidation:

The consolidated financial statements include the accounts of all wholly owned domestic and international subsidiaries.

Investments in and advances to partially owned companies are recorded at cost, adjusted to reflect the Company's share of undistributed earnings and losses. Cummins equity in the losses of Chrysler-Cummins Limited accounted for the major portion of the equity in net losses of partially owned international companies in 1968. As of April 30, 1968, Cummins acquired all of the outstanding equity securities of Chrysler-Cummins Limited (formerly 50% owned). Since that time, the accounts of this Company are included in the consolidated financial statements.

Net assets of international subsidiaries and branches and investments in partially owned companies (including advances) outside the United States aggregated approximately 30% of consolidated net assets at December 31, 1969, and 26% at year end 1968.

Sales to customers located outside the United States amounted to \$100 million in 1969 (of which approximately 40% were products manufactured or assembled by international subsidiaries and branches) and \$89 million in 1968.

Note 2: Earnings Per Share:

Net earnings per share, based on the weighted average number of shares outstanding, was \$3.04 for 1969 and \$2.18 for 1968 (adjusted for subsequent stock dividends). Primary earnings per share of common stock assumes conversion of the U.K. loan stock (258,823 shares) at its date of issue, and exercise of stock options at the beginning of the period or dates of grant, whichever is later. Fully diluted earnings per share assume, in addition, conversion of the subordinated guaranteed debentures (552,038 shares) at their date of issue.

In computing the per share effect of assumed conversions (a) interest (less income tax effect) on the loan stock and debentures has been added to earnings; (b) it has been assumed that funds obtained from the exercise of options have been used to purchase common shares at the current market price; and (c) the related additional common shares have been added to average outstanding common shares.

Note 3: Discontinued Operations:

In 1969, the Company secured long-term commitments for key casting requirements and discontinued operations at the Gr Lakes Foundry. The foundry properties were disposed of during the year. Closing cost, termination pay and disposition losses charged to 1969 earnings before tax aggregated approximately \$1,450,000 (\$684,000 after tax).

In 1968, earnings before tax were reduced by approximately \$1,300,000 (\$614,000 after tax), principally inventory write-down as a result of discontinuation of the Frigiking Division transport refrigeration line. This product line was not significant to Cummins consolidated operations.

Note 4: Deferred Income Taxes:

Deferred income taxes are provided on the excess of accelerated tax depreciation over straight-line book depreciation and for the Federal income taxes on the net earnings of a foreign subsidiary which are payable upon repatriation. Cummins provides for estimated costs of product warranty, inspection and related costs, and for certain other costs in advance of the period in which these costs are deductible for Federal income tax purposes. The tax effects of these costs are recognized in the periods in which the costs are charged to earnings.

Cummins subsidiaries have unused tax losses of approximately \$16,100,000 (principally in the United Kingdom) of which the effect of \$7,400,000 will increase income in the year realized and of \$8,700,000 will result in adjustment of property, plant and equipment, and reserve accounts. Net income for 1969 includes approximately \$575,000 of realized income tax reductions from the utilization of loss carryforwards in the United Kingdom.

**Note 5: Shareholders' Investment,
Stock Plan and Options:**

Shares of common stock (\$2.50 par value) at December 31:

	1969	1968
Authorized	<u>10,000,000</u>	<u>7,000,000</u>
Issued at beginning of year	5,475,103	4,976,817
Options exercised	20,195	549
10% stock dividend	549,624	497,737
Debt conversion	1,004	—
Issued at end of year	6,045,926	5,475,103
Held in treasury for key employee stock investment plan	62	—
Outstanding at end of year	<u>6,045,864</u>	<u>5,475,103</u>

A 10% stock dividend was issued January 29, 1970, to shareholders of record as of December 29, 1969. A total of 810,861 shares of common stock are reserved for issuance upon conversion of the subordinated debentures and loan stock.

Changes during 1969 in the status of options granted under the Stock Option Plans, expiring at various dates from 1970 to 1974, were as follows:

	Shares
Issuable under outstanding options at the beginning of the year	36,805
Options issued	62,000
Increase for 10% stock dividend	7,806
Options exercised	20,195
Options and fractional shares dropped	551
Issuable under outstanding options at the end of the year at an aggregate amount of \$2,862,250	<u>85,865</u>

An additional 48,599 shares of common stock are reserved for options not yet granted.

The key employee stock investment plan adopted in 1969 provides that the Company may acquire up to 2% of the issued shares of common stock for sale to designated officers and employees at fair market value. The employees may pay for the shares over a period not to exceed ten years with interest at a rate fixed by the directors.

Note 6: Long-Term Debt:

The 5% subordinated debentures, due 1988, are convertible into the common stock of the parent company (guarantor), at \$36.16 per share, the price being subject to adjustment for stock distributions of 10% or more and under a formula for other events. The debentures may be redeemed from 1970 to 1981 under certain conditions. Beginning in 1979, the Company is required to make annual sinking fund payments (or retire an equivalent principal amount of debentures) equal to 5% of the aggregate principal amount of debentures then outstanding. The Company has agreed to pay to the holders who are nonresidents of the United States such amounts as may be withheld as taxes by the United States.

On February 27, 1969, Cummins Engine Company Limited, a wholly owned United Kingdom subsidiary, issued £5,000,000 (\$12,000,000) 3¾% Convertible Unsecured Loan Stock due 1994. The loan stock carries a subordinated guarantee by, and is convertible after March 1, 1973, at \$46.36 (adjustable for certain events) into shares of common stock of the parent company. The issue may be redeemed from 1978 to 1993 under certain conditions.

Certain of the loan and note agreements contain restrictive covenants relating to the payment of dividends, distributions on stock, and maintenance of working capital. At December 31, 1969, the amount of consolidated earnings retained in the business free of the most restrictive limitation under various loan and note agreements was \$32,143,643.

Note 7: Retirement Plans:

The Company and its subsidiaries have several pension plans (some of which were amended in 1969), covering substantially all of their employees, including certain employees in foreign countries. The total pension expense was \$2,017,000 in 1969 and \$1,502,000 in 1968, including cost of current service plus amortization of prior service costs over periods not to exceed 40 years. The Company's policy is to fund pension costs accrued. The value of the retirement trust funds exceeded the actuarially computed value of vested benefits under the various plans at the date of the most recent actuarial determination in 1969.

Note 8: Acquisition:

The Company announced on February 6, 1970, that substantial agreement had been reached with Management Information Systems, Inc., of Princeton, New Jersey, a service company in the computer software systems field, whereby the Company will exchange approximately 90,000 shares of Cummins stock for the business of Management Information Systems, Inc. (eighteen shares of Cummins stock for each 100 shares of Management Information Systems, Inc. stock). The agreement is subject to approval by the directors of both companies and the shareholders of Management Information Systems, Inc. The transaction will not have a significant effect on the financial statements of the Company.

**Consolidated Ten Year Summary
Cummins Engine Company, Inc.
and its Wholly Owned Subsidiaries**

1969**1968**

Dollars in thousands, except per share amounts

Operating Data:

Net sales	\$410,633	\$366,400
Cost of goods sold	283,025	257,000
Gross profit on sales	127,608	108,400
Other operating expenses	90,191	77,400
Profit on sales	37,417	30,400
Other income or (expense)	(217)	(3,400)
Earnings before income taxes	37,200	27,000
Provision for income taxes	18,850	14,400
Net earnings	<u>\$ 18,350</u>	<u>\$ 13,600</u>

Basic earnings per share	\$ 3.04	\$ 2.90
Primary earnings per share	2.98	2.80
Fully diluted earnings per share	2.83	2.60
Cash dividends per share (current rate—80¢)	.73	.70
Stock dividends and splits	10%	10%

Financial Data:

Working capital	\$ 87,208	\$ 72,400
Property, plant and equipment, at net book value	104,445	103,400
Total assets	278,065	250,400
Long-term debt	61,861	61,400
Shareholders' investment	130,205	115,400
Capitalization	192,066	177,400
Shareholders' investment per share	21.54	19.40

Other Data:

Earnings as a percent of net sales	4.5%	4.5%
Earnings as a percent of shareholders' average investment	14.9	14.9
Cash flow (net earnings and depreciation)	\$ 31,698	\$ 25,400
Capital expenditures	16,665	10,400
Depreciation	13,348	12,400
Interest expense	3,713	4,400
Costs of research and start-up—new products and operations	15,200	15,400
Number of shareholders	4,787	4,400
Number of employees	13,824	13,400

Ten year data is considered valid for general information purposes; however, no restatement has been made to assure year-to-year comparability of all data. Per share data has been adjusted for subsequent stock dividends and stock splits.

1967	1966	1965	1964	1963	1962	1961	1960
\$306,082	\$331,114	\$280,779	\$221,706	\$194,334	\$167,346	\$129,298	\$135,835
226,598	229,914	192,829	146,784	126,824	111,768	89,531	95,444
79,484	101,200	87,950	74,922	67,510	55,578	39,767	40,391
71,828	71,308	58,545	46,647	39,448	32,634	24,296	25,963
7,656	29,892	29,405	28,275	28,062	22,944	15,471	14,428
(3,694)	(1,738)	(1,582)	(389)	100	(84)	(696)	(700)
3,962	28,154	27,823	27,886	28,162	22,860	14,775	13,728
330	11,899	12,712	13,661	14,647	12,236	8,460	7,702
\$ 3,632	\$ 16,255	\$ 15,111	\$ 14,225	\$ 13,515	\$ 10,624	\$ 6,315	\$ 6,026
\$.60	\$ 2.70	\$ 2.52	\$ 2.37	\$ 2.25	\$ 1.77	\$ 1.05	\$ 1.02
.60	2.70	2.52	2.37	2.25	1.77	1.05	1.02
.60	2.70	2.52	2.37	2.25	1.77	1.05	1.02
.66	.60	.52	.44	.37	.30	.27	.25
—	—	—	4 for 3	—	5 for 4	10%	2 for 1; 5%
\$ 79,757	\$ 79,870	\$ 54,941	\$ 40,582	\$ 41,341	\$ 37,451	\$ 34,093	\$ 29,366
98,473	90,829	76,976	63,825	48,582	41,199	37,535	34,540
232,803	233,462	190,154	151,993	118,562	104,809	91,609	87,833
72,931	63,900	38,067	19,317	12,675	15,780	17,904	17,143
106,571	106,914	93,843	81,805	70,153	58,817	49,938	45,047
179,502	170,814	131,910	101,122	82,828	74,597	67,842	62,190
17.69	17.75	15.64	13.64	11.70	9.82	8.35	7.58
1.2%	4.9%	5.4%	6.4%	7.0%	6.3%	4.9%	4.4%
3.4	16.2	17.2	18.7	21.0	19.5	13.1	14.1
\$ 14,054	\$ 24,645	\$ 22,604	\$ 20,411	\$ 18,787	\$ 15,309	\$ 10,593	\$ 10,281
18,241	24,422	22,319	21,638	12,974	9,085	6,605	8,006
10,422	8,390	7,493	6,186	5,272	4,685	4,278	4,255
4,213	2,547	1,664	974	845	1,029	1,067	1,150
17,125	17,910	15,854	12,593	7,371	6,627	5,517	5,966
4,566	4,902	4,923	4,865	3,916	3,376	3,010	2,872
11,982	13,024	11,135	9,905	7,550	6,900	5,512	5,018

Directors and Officers

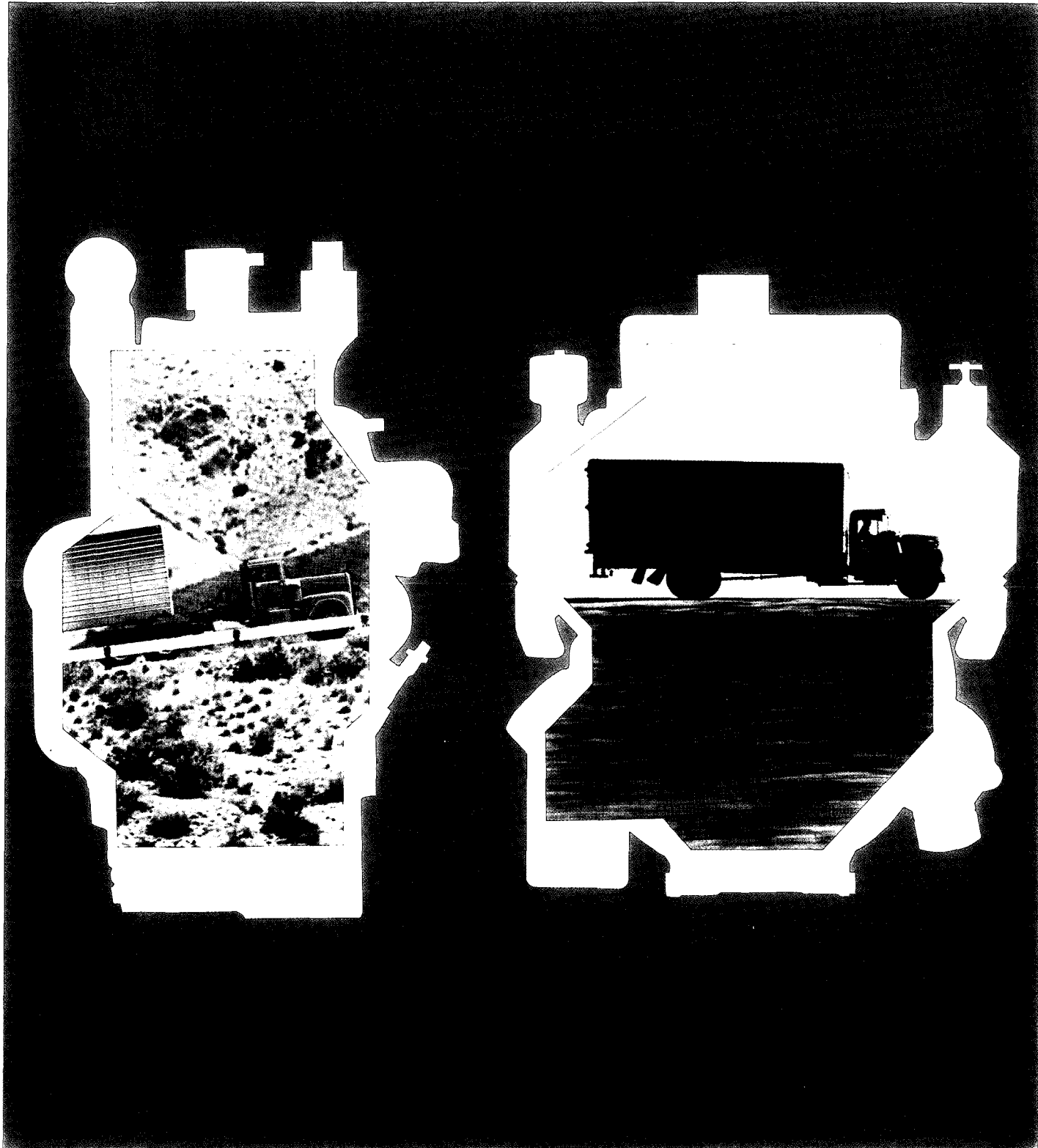
Directors		Officers	
J. Irwin Miller	Chairman of the Board of Directors	J. Irwin Miller	Chairman of the Board of Directors
Eugene R. Black	Director and Consultant, The Chase Manhattan Bank	E. Don Tull	Chairman of the Executive Committee
C. Raymond Boll	Executive Vice President	Richard B. Stoner	Vice Chairman of the Board of Directors
James B. Fisk	President, Bell Telephone Laboratories, Inc.	Henry B. Schacht	President
Harold H. Helm	Chairman of the Executive Committee, Chemical Bank	C. Raymond Boll	Executive Vice President
Henry L. Hillman	President, Pittsburgh Coke & Chemical Company	Henry W. Abts	Vice President--Secretary
Paul L. Miller	President, The First Boston Corporation	R. Benjamin Bush	General Counsel
George W. Newlin	President, Irwin Management Company, Inc.	Paul M. D'Arcy	Vice President--Market Development
Henry B. Schacht	President	Marion C. Dietrich	Vice President--Marketing
Richard B. Stoner	Vice Chairman of the Board of Directors	Lamont Eltinge	Vice President--Research and Technology
E. Don Tull	Chairman of the Executive Committee	Charles L. Grace	Vice President--Field Sales
		John T. Hackett	Vice President--Finance, and Treasurer
		Thomas W. Head	Vice President--Research and Engineering
		James A. Henderson	Vice President--Operations
		James L. Keyes	Vice President--Engine Sales
		Thomas A. Lyon	Controller
		William J. Manning	Assistant Secretary and Assistant Treasurer
		Herschel E. O'Shaughnessey	Vice President--Parts and Special Products
		George T. Rehfeldt	Vice President--International
		Neville H. Reiners	Senior Vice President
		Peter W. Schutz	Vice President--Planning and Program Management
		William D. Schwab	Vice President--Product Development

Transfer Agents:
Chemical Bank, New York, New York
Continental Illinois National Bank and Trust Company of Chicago,
Chicago, Illinois

Registrars:
The Chase Manhattan Bank, New York, New York
The First National Bank of Chicago, Chicago, Illinois



Cummins Automotive Diesels



Cummins diesels

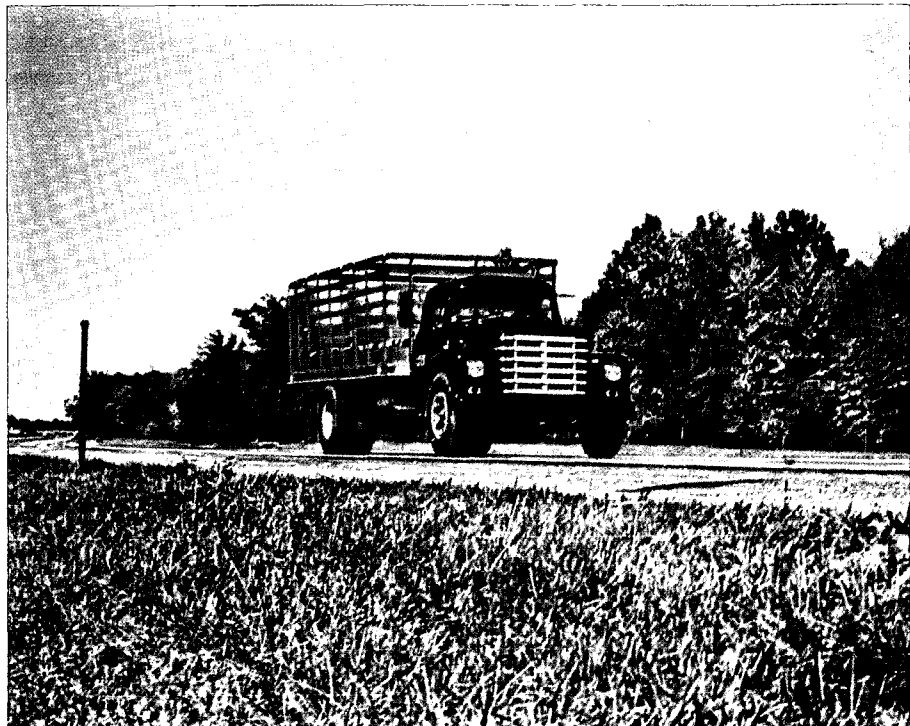
... for intercity and short haul service

Cummins in-line and Small v diesels have proven to be the most profitable power for all types of on-highway applications, from short haul vans to intercity double bottom tractors. These diesels provide maximum flexibility for both high speed and stop and go driving. You can select from V models of 140 to 320 horsepower, and in-line models from 160 to 380 horsepower. In any practical application these engines can provide a perfect match of power for your on-highway vehicles.

Cummins compact, heavy duty diesels now afford medium duty truck operators all the economical benefits of diesel power that were not possible before. In city and suburban service, for example, Cummins diesels are four times more efficient at part load and idling than gasoline engines. Since diesels do not have electrical ignition systems, the major cause of road failures and downtime is eliminated.

You will have scrapped two gasoline engines by the time a Cummins diesel will need its first major out-of-frame overhaul. In addition, your Cummins can then be rebuilt to new engine standards to continue to serve throughout the life of the chassis.

Cummins has proven its profitability in ready-mix, refuse, and dump trucks. Time after time, the use of Cummins power in these units reduced operating costs, improved equipment availability, and speeded schedules.





... for long haul and special applications

For over 16 years Cummins has powered more intercity trucks and tractors than any other makes of diesels. Dependability, top fuel economy, minimum maintenance, and long engine life have made Cummins the number one diesel on the highway.

In recent years, Cummins Custom Rated big bore engines have been the preferred power for truckers. With a custom rated diesel, all that is needed to increase or decrease the horsepower to match varying gross commercial weights is to change a button in the PT fuel pump. This means unexcelled versatility in powerful, yet economical high horsepower diesel engines.

Cummins small v diesels (V6-140 to V8-210) have achieved proven durability in expressway applications involving city to city deliveries. Every bit as rugged as their larger in-line counter parts, the small v's give truck operators both the economy and reliability to be the real "work horses" in any medium duty truck fleet.

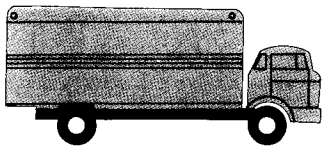
Cummins has diesels for all trucking applications. Models are available for special applications such as logging, oil field trucks, and 57,789 Kg. (127,400 lb.) double bottom units. From in and around the city, to high country, high horsepower rigs, Cummins models can match the needs of your operation perfectly.



Cummins diesel applications

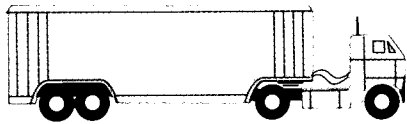
GVW IN METRIC AND (U.S.) TONS		HP @ KM/H AND (M/H)					
2 AXLE VAN TRUCK	64 (40)	72 (45)	80 (50)	89 (55)	97 (60)	105 (65)	

9.1 (10.0) GVW	52	66	82	101	124	145	
13.6 (15.0)	67	83	100	120	145	171	
18.1 (20.0)	81	98	118	140	168	195	
22.7 (25.0)	96	117	136	160	190	219	
27.2 (30.0)	111	132	155	181	212	254	



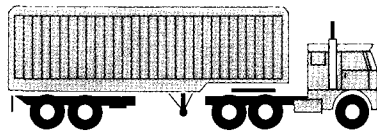
GVW IN METRIC AND (U.S.) TONS		HP @ KM/H AND (M/H)					
2 AXLE TRACTOR — 2 AXLE VOLUME VAN SEMI- TRAILER	64 (40)	72 (45)	80 (50)	89 (55)	97 (60)	105 (65)	

18.1 (20.0) GCW	87	105	130	156	186	217	
20.4 (22.5)	95	114	138	165	197	228	
22.7 (25.0)	102	124	147	175	207	240	
24.9 (27.5)	109	131	156	185	217	253	
27.2 (30.0)	117	138	166	195	230	267	
29.5 (32.5)	124	148	175	206	240	276	

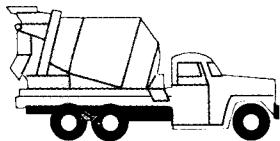


GVW IN METRIC AND (U.S.) TONS		HP @ KM/H AND (M/H)					
6 WHEEL TRACTOR — 4 WHEEL VOLUME VAN TRAILER	64 (40)	72 (45)	80 (50)	89 (55)	97 (60)	105 (65)	

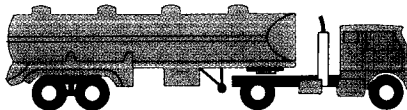
22.7 (25.0) GCW	106	128	152	181	214	248	
24.9 (27.5)	114	137	163	192	226	260	
27.2 (30.0)	122	145	172	202	236	272	
29.5 (32.5)	130	154	182	213	247	284	
31.8 (35.0)	138	163	191	224	259	297	
34.1 (37.5)	144	171	200	233	271	309	



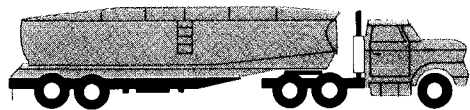
3 AXLE VAN TRUCK	64 (40)	72 (45)	80 (50)	89 (55)	97 (60)	105 (65)	
9.1 (10.0) GVW	53	68	83	103	126	150	
13.6 (15.0)	69	85	103	124	149	175	
18.1 (20.0)	85	102	122	145	173	210	
22.7 (25.0)	101	120	142	166	196	225	
27.2 (30.0)	116	137	160	187	219	252	



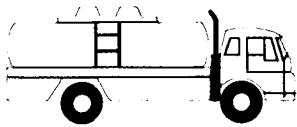
2 AXLE TRACTOR — 2 AXLE TANKER TRAILER	64 (40)	72 (45)	80 (50)	89 (55)	97 (60)	105 (65)	
18.1 (20.0) GCW	81	98	117	140	164	194	
20.4 (22.5)	89	107	129	150	176	206	
22.7 (25.0)	96	117	137	160	187	218	
24.9 (27.5)	104	123	145	170	198	230	
27.2 (30.0)	110	130	154	180	209	242	
29.5 (32.5)	118	140	163	190	221	255	



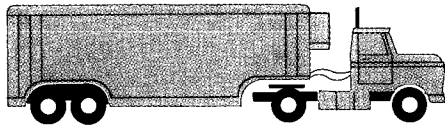
6 WHEEL TRACTOR — 4 WHEEL TANKER TRAILER	64 (40)	72 (45)	80 (50)	89 (55)	97 (60)	105 (65)	
22.7 (25.0) GCW	100	120	142	165	193	225	
24.9 (27.5)	108	128	161	176	205	238	
27.2 (30.0)	118	137	160	187	217	250	
29.5 (32.5)	123	146	170	198	228	262	
31.8 (35.0)	131	154	180	209	240	276	
34.1 (37.5)	139	163	190	219	252	288	



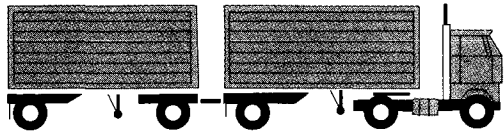
2 AXLE TANK TRUCK	64 (40)	72 (45)	80 (50)	89 (55)	97 (60)	105 (65)	
9.1 (10.0) GVW	45	57	70	84	100	119	
13.6 (15.0)	61	73	88	104	121	143	
18.1 (20.0)	76	88	105	125	144	166	
22.7 (25.0)	90	106	124	143	166	190	
27.2 (30.0)	104	123	142	163	187	214	



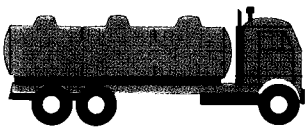
4 WHEEL TRACTOR — 4 WHEEL VOLUME VAN SEMI-TRAILER	64 (40)	72 (45)	80 (50)	89 (55)	97 (60)	105 (65)	
18.1 (20.0) GCW	87	105	130	156	186	217	
20.4 (22.5)	95	114	138	165	197	228	
22.7 (25.0)	102	124	147	175	207	240	
24.9 (27.5)	109	131	156	185	217	253	
27.2 (30.0)	117	138	166	195	230	267	
29.5 (32.5)	124	148	175	206	240	276	



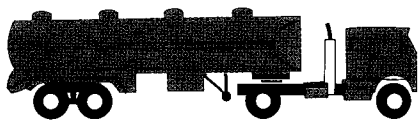
DOUBLE BOTTOM UNITS VAN TRAILERS	64 (40)	72 (45)	80 (50)	89 (55)	97 (60)	105 (65)	
31.8 (35.0) GCW	138	163	191	224	259	297	
34.9 (38.4)	148	176	205	239	276	316	
36.4 (40.0)	153	181	211	245	283	342	
40.9 (45.0)	168	198	230	267	307	350	
50.0 (55.0)	200	233	269	309	353	400	
59.1 (65.0)	231	268	309	352	399	449	



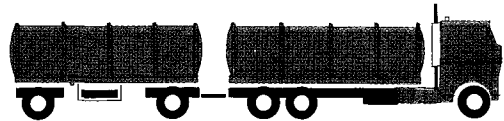
3 AXLE TRUCK WITH TANK OR DUMP BODY	64 (40)	72 (45)	80 (50)	89 (55)	97 (60)	105 (65)	
9.1 (10.0) GVW	48	59	72	86	102	122	
13.6 (15.0)	63	76	91	107	125	148	
18.1 (20.0)	79	93	110	129	149	172	
22.7 (25.0)	94	111	129	149	172	198	
27.2 (30.0)	108	127	149	170	195	222	



4 WHEEL TRACTOR — 4 WHEEL TANKER TRAILER	64 (40)	72 (45)	80 (50)	89 (55)	97 (60)	105 (65)	
18.1 (20.0) GCW	81	98	117	140	164	194	
20.4 (22.5)	89	107	129	150	176	206	
22.7 (25.0)	96	117	137	160	187	218	
24.9 (27.5)	104	123	145	170	198	230	
27.2 (30.0)	110	130	154	180	209	242	
29.5 (32.5)	118	140	163	190	221	255	



DOUBLE BOTTOM UNITS TANKER TRAILERS	64 (40)	72 (45)	80 (50)	89 (55)	97 (60)	105 (65)	
31.8 (35.0) GCW	131	154	180	209	240	276	
34.9 (38.4)	141	166	193	223	255	292	
36.4 (40.0)	147	172	200	230	263	301	
40.9 (45.0)	162	189	218	251	287	326	
50.0 (55.0)	193	224	257	294	334	377	
59.1 (65.0)	234	259	297	337	382	427	
68.2 (75.0)	255	293	335	380	426	476	



Cummins diesel power selection

Most units in short haul service are straight trucks but tractors are also used for pick up and delivery operations and some specialized operations. The selection tables (left) cover all types of chassis. Cummins in-line and V diesels match all long haul application needs. For maximum equipment utilization and maximum payloads buy the power agreeing with the

highway conditions on the routes your equipment operates. After determining the weight and speed desired, the horsepower requirements can be found in the selection tables as follows:

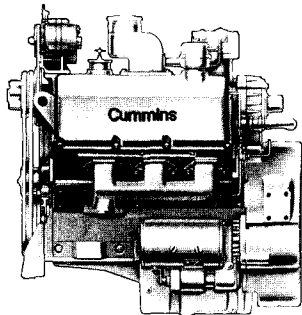
1. Select the type of unit.
2. Select the gross vehicle weight for trucks or gross combination weight for tractors that corresponds

to the maximum loads to be hauled.

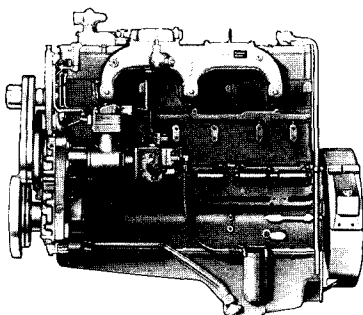
3. Read across the weight line selected to the kilometers per hour (miles per hour) column. Use the column five to ten kilometers (miles) per hour above normal cruising range for selecting power required. This permits cruising in the maximum economy range and provides fast acceleration in top gear.

4. Match the horsepower required to the rated power of the engines shown below.

5. Horsepower requirements shown in the selection tables are for operation on level roads and in still air. These figures take into consideration fan, accessories, and gear losses. Special accessories such as power take-off drive units for ready-mix drums are not included. Different ratings may be required for turnpike or other special applications — consult your Dealer or Cummins Distributor.



Small v

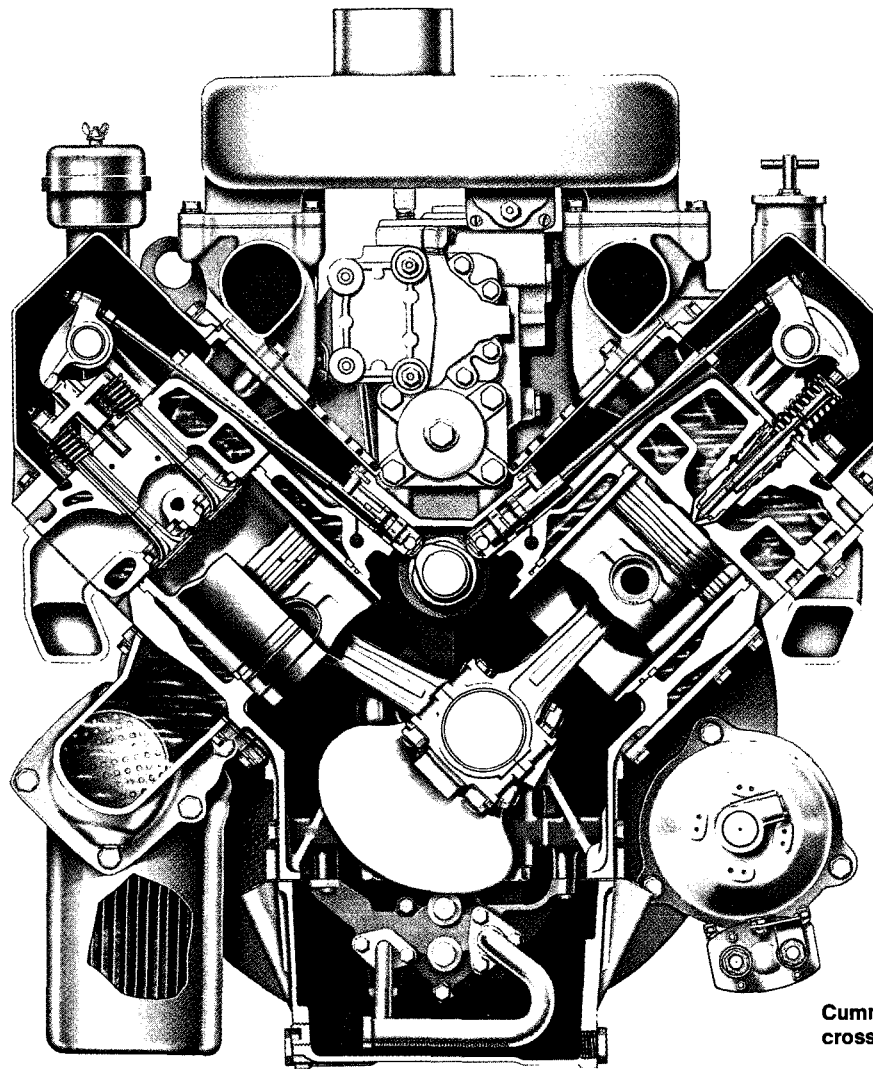


v6-140 Custom Rated

NTC-335

Model	Horsepower	Gov'n RPM	Displacement Litres (inches)	Bore and Stroke mm (inches)	No. of Cylinders	Aspiration	Net Weight Kilograms (pounds)	Kg/HP (Lb/HP)
V6-140	140	3300	5.7 (352)	117.5 x 88.9 (4 ⁵ / ₈ x 3 ¹ / ₂)	6	Natural	549 (1210)	3.9 (8.6)
V6-155	155	3300	6.2 (378)	117.5 x 95.2 (4 ⁵ / ₈ x 3 ³ / ₄)	6	Natural	537 (1185)	3.5 (7.6)
V8-185	185	3300	7.7 (470)	117.5 x 88.9 (4 ⁵ / ₈ x 3 ¹ / ₂)	8	Natural	658 (1450)	3.5 (7.8)
V8-210	210	3300	8.2 (504)	117.5 x 95.2 (4 ⁵ / ₈ x 3 ³ / ₄)	8	Natural	662 (1460)	3.2 (6.9)
V-903	320	2600	14.8 (903)	139.7 x 120.6 (5 ¹ / ₂ x 4 ³ / ₄)	8	Natural	980 (2160)	3.1 (6.8)
	300	2600	14.8 (903)	139.7 x 120.6 (5 ¹ / ₂ x 4 ³ / ₄)	8	Natural	980 (2160)	3.3 (7.2)
	280	2600	14.8 (903)	139.7 x 120.6 (5 ¹ / ₂ x 4 ³ / ₄)	8	Natural	980 (2160)	3.5 (7.7)
C-160	160	2500	7.6 (464)	112.7 x 127.0 (4 ¹ / ₂ x 5)	6	Natural	726 (1600)	4.5 (10.0)
CF-160	160	2800	7.6 (464)	112.7 x 127.0 (4 ¹ / ₂ x 5)	6	Natural	726 (1600)	4.5 (10.0)
C-180	180	2500	7.6 (464)	112.7 x 127.0 (4 ¹ / ₂ x 5)	6	Supercharged	753 (1660)	4.1 (9.20)
NH-200	200	2100	12.2 (743)	130.2 x 152.4 (5 ¹ / ₈ x 6)	6	Natural	1096 (2415)	5.5 (12.01)
NH-220	220	2100	12.2 (743)	130.2 x 152.4 (5 ¹ / ₈ x 6)	6	Natural	1096 (2415)	4.9 (11.0)
NHC-250	250	2100	14.0 (855)	139.7 x 152.4 (5 ¹ / ₂ x 6)	6	Natural	1115 (2460)	4.4 (9.80)
	225	2100	14.0 (855)	139.7 x 152.4 (5 ¹ / ₂ x 6)	6	Natural	1115 (2460)	4.9 (10.9)
NHCT-270	270	2100	14.0 (855)	139.7 x 152.4 (5 ¹ / ₂ x 6)	6	Turbocharged	1139 (2510)	4.2 (9.4)
	255	2100	14.0 (855)	139.7 x 152.4 (5 ¹ / ₂ x 6)	6	Turbocharged	1139 (2510)	4.6 (9.8)
	240	2100	14.0 (855)	139.7 x 152.4 (5 ¹ / ₂ x 6)	6	Turbocharged	1139 (2510)	4.7 (10.4)
NTC-335	335	2100	14.0 (855)	139.7 x 152.4 (5 ¹ / ₂ x 6)	6	Turbocharged	1216 (2680)	3.6 (8.0)
	320	2100	14.0 (855)	139.7 x 152.4 (5 ¹ / ₂ x 6)	6	Turbocharged	1216 (2680)	3.7 (8.3)
	300	2100	14.0 (855)	139.7 x 152.4 (5 ¹ / ₂ x 6)	6	Turbocharged	1216 (2680)	4.0 (8.9)
	280	2100	14.0 (855)	139.7 x 152.4 (5 ¹ / ₂ x 6)	6	Turbocharged	1216 (2680)	4.3 (9.50)
	260	2100	14.0 (855)	139.7 x 152.4 (5 ¹ / ₂ x 6)	6	Turbocharged	1216 (2680)	4.6 (10.3)
NT-380	380	2300	14.0 (855)	139.7 x 152.4 (5 ¹ / ₂ x 6)	6	Turbocharged	1230 (2710)	3.2 (7.10)

Cummins V diesel design features



Cummins V8-185 diesel
cross section

1. Oversquare design decreases piston speed, lowers cylinder pressures, and reduces exhaust temperatures for longer piston, ring and liner life.
2. Direct injection fuel system eliminates gasoline carburetor and ignition system. Cummins PT fuel system provides accurate fuel metering and makes Cummins the most efficient power source available.
3. Dual intake and exhaust valves provide free breathing characteristics, and introduces maximum air charge in the cylinder for clean burning and top fuel economy.
4. Replaceable, wet type cylinder liner transfers combustion heat to coolant

- rapidly. Liners are replaceable without rebor-ing the block, making in-frame overhauls practical.
5. Alloy cast iron cylinder block has the design and material specifications proven in Cummins famous in-line engines.
 6. Induction hardened crankshaft journals have material for several regrinds. The V diesel crankshaft is the most rigid Cummins has ever produced. Main caps are cross-bolted.
 7. I-beam section connecting rods are forged from high tensile strength alloy steel. Tapered piston pin end is used for superior load distribution and maximum piston crown material.

8. Open type combustion chamber allows air and fuel to mix thoroughly for smooth, complete burning of low cost diesel fuel or furnace oil.
9. A single induction-hardened camshaft actuates all valves and injectors through a conventional push rod and rocker level arrangement.
10. Cam-ground pistons assure perfect fit at operating temperatures. Cummins pistons are manufactured from strong light weight aluminum alloy.
11. Roller type cam followers provide long life with nearly friction free action. Followers have positive lock guides for extended push rod and rocker lever life.

Cummins V diesels

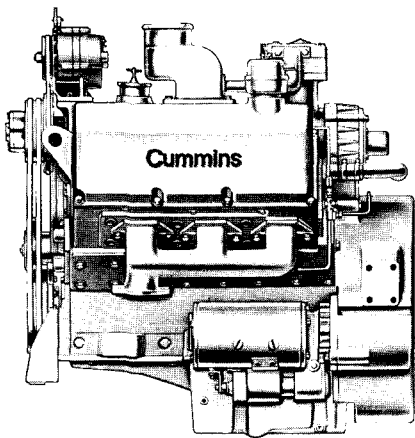
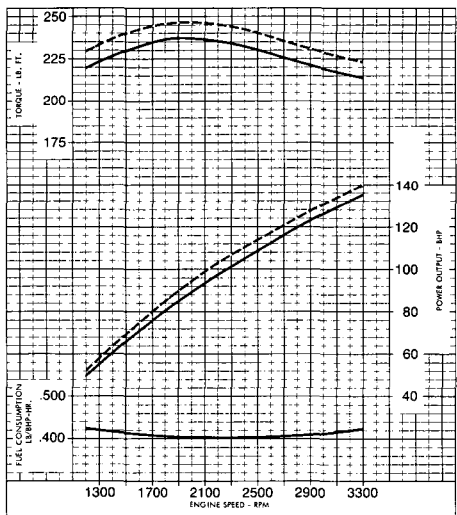
Oversquare concept	Cummins compact V diesels are designed to match the power requirements of heavy-duty trucks while increasing payloads and revenue. The compact size is achieved while retaining the proven materials of the in-line models. Cummins achieved this compact package by using the oversquare cylinder concept in a 90° V configuration.	The oversquare concept enables Cummins to put high horsepower into a small, lightweight package. Oversquare means that the bore diameter is larger than the length of stroke. This design gives top fuel economy and high horsepower with slower piston speeds, lower cylinder pressures, and lower exhaust temperatures than other engines.
Versatility	The small v series diesels of 140, 155, 185, and 210 horsepower match the power requirements of two and three axle trucks and three and four axle tractor semi-trailer combinations hauling up to 29,484 Kg. (65,000 lbs.) GCW. For the first time, medium truck users get all the benefits of Cummins fuel economy, reliability, and long life.	A larger V series diesel, the V-903, is custom rated at 280, 300 and 320 HP. It is a heavy duty engine designed to haul large payloads and increase revenue with fuel economy and maintenance costs comparable to big in-line diesels. All Cummins V diesels incorporate the proven NH design features and materials to transport bigger payloads for less.
Standard equipment	The standard accessories on Cummins V diesels are accessible for ease of service. Standard on every Cummins V diesel are PT fuel system, mechanical flyball type governor, Cummins air compressor, starter, alternator, air cleaner, crankcase breather, Fleetguard oil filter.	Fleetguard fuel filter, water pump, corrosion resistor, and rear sump oil pan. A complete line of optional components is available to meet special requirements. See your truck dealer or Cummins distributor for assistance in selecting the correct V diesel and accessories for your truck.

V diesels

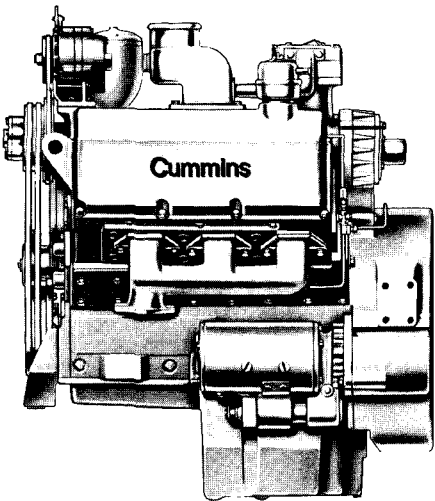
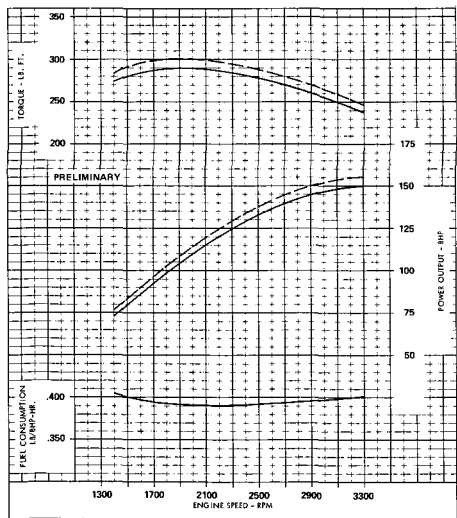
Performance

Horsepower, torque, and fuel consumption curves for all V models are shown on the following pages. Solid lines represent performance at S.A.E. standard conditions of 152m. (500 ft.) altitude and 29.4°C (85°F) intake air temperature. Dotted lines indicate performance corrected to sea level and 15.6°C (60°F) intake air temperature.

Curves represent performance of No. 2 diesel fuel or furnace oil with fuel system, water pump, lubricating oil pump, and air cleaner operating. Alternator, compressor, fan, and optional equipment are not included.



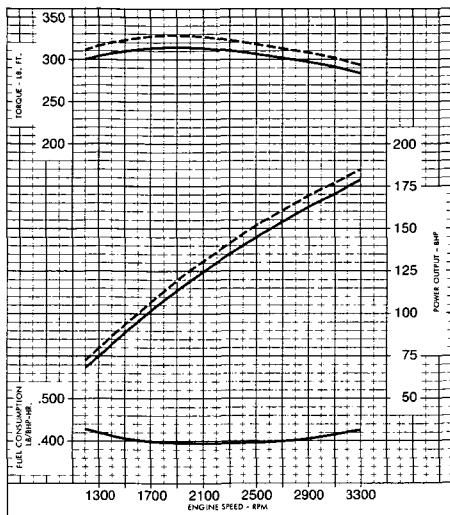
V6-140 140 HP



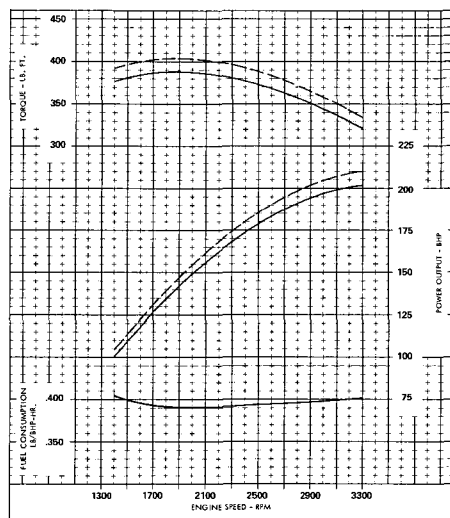
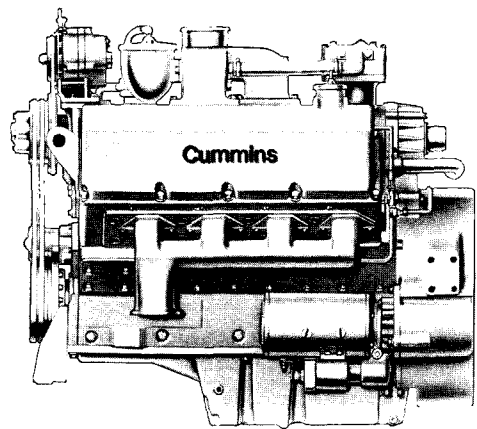
V6-155 155 HP

Solid line — 152 m. (500 ft.) Altitude and 29.4° C (85° F.)
Dotted line — Sea level and 15.6° C (60° F.)

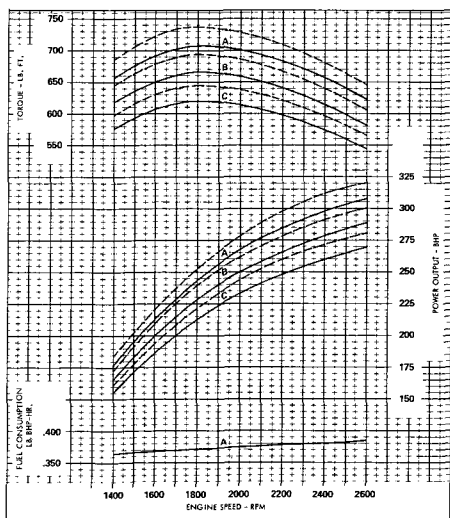
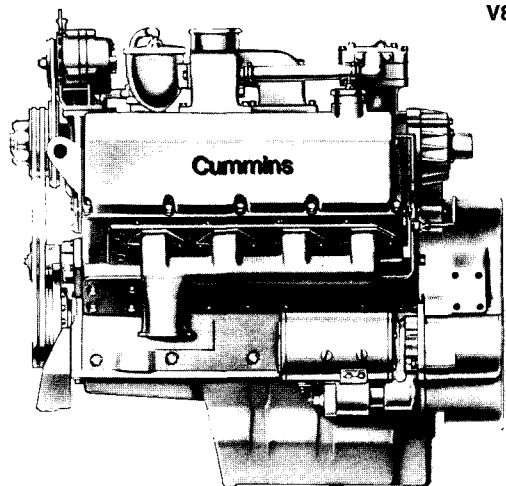
V Diesels



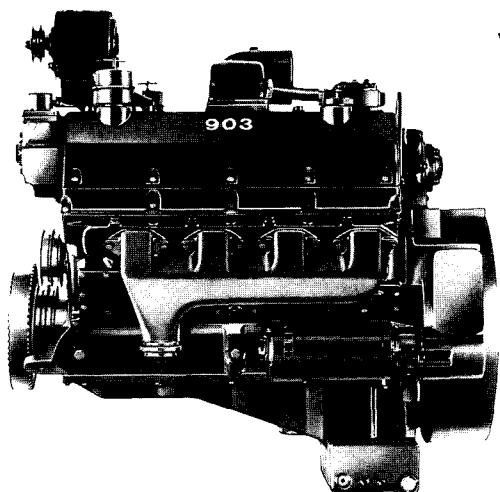
V8-185 185 HP



V8-210 210 HP

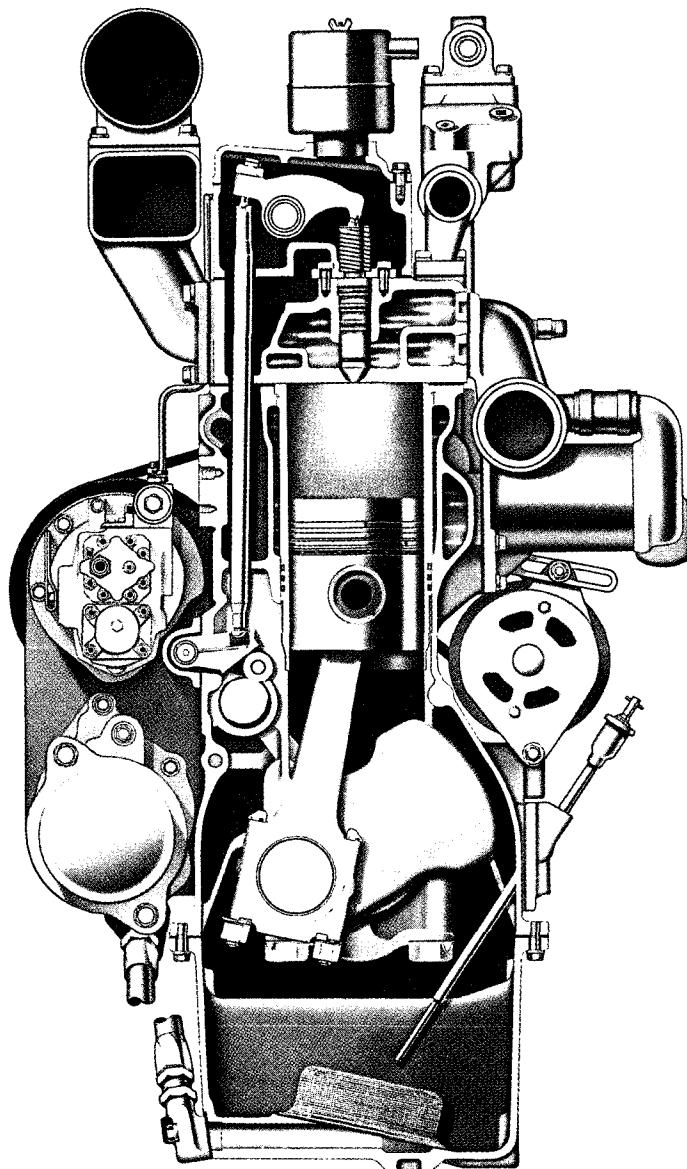


V-903 320 HP



Solid line — 152 m. (500 ft.) Altitude and 29.4° C (85° F.)
Dotted line — Sea level and 15.6° C (60° F.)

Cummins in-line diesel design features



Cummins NHC-250 diesel cross section

1. Big displacement design utilizes a larger bore than other engines and allows use of bigger valves for improved breathing and better fuel economy. Big displacement reduces cylinder pressures and temperatures for long life.

2. Pressure-Time PT fuel system is a unique method of fuel metering and injection eliminating fuel racks, plunger pump, timing adjustments, injection valves, and high pressure fuel lines of other fuel systems.

3. Dual overhead valves provide free breathing. Intake valves are silichrome steel and exhaust valves are stellite faced nitrogen steel for high temperature strength. Exhaust valve seats are stellite inserts.

4. Replaceable, wet type liners are easily replaceable without reboring the block. Combustion chamber heat is dissipated to coolant rapidly.

5. Open type combustion chamber mixes air and fuel thoroughly for smooth, complete burning of low cost diesel fuel or furnace oil.

6. Induction hardened crankshaft journals have material for several regrinds. Precision machined from high tensile strength alloy steel.

7. Induction hardened camshaft actuates valves and injectors through a conventional push rod and rocker lever arrangement.

8. Cam-ground pistons assure a perfect fit at operating temperatures. Cummins pistons are manufactured from strong light weight aluminum alloy.

9. Roller type cam-followers provide long life with nearly friction free action.

Cummins in-line diesels

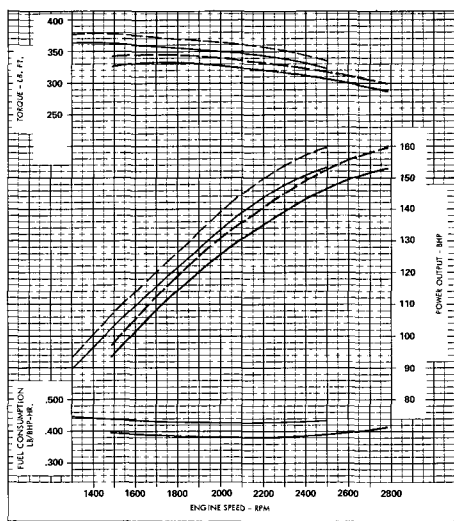
Most proven	Cummins in-line diesels are the most specified diesels ever built. Advanced design and proven materials give greater reliability and longer life than other engines. Cummins NH diesels have traveled	over 161 billion Kilometers (100 billion miles) in heavy-duty trucking service. Models from 160 to 380 horsepower match the power needs of all over-the-road combinations.
Compact in-line models	All the features that have made the NH diesels the best are also used in the smaller C in-line diesels. The C diesels from 160 to 180 horsepower bring diesel reliability and low cost to a wide variety of equipment types and horsepower requirements in medium and heavy trucks, and medium tractors.	C series engines were largely responsible for converting the ready mix industry from gasoline to diesel because of reliability and low operating costs. They are giving similar benefits in refuse haulers, city delivery trucks, fuel delivery trucks, and other short haul service.
Custom rated models	Cummins intercity diesels are the standard diesel for heavy duty applications. The new custom rated engines bring versatility and profit to intercity truckers by permitting the horsepower of an engine to be increased to meet new schedules or loads. Three models are available — the NHC-250 at	225 and 250 horsepower, the NHCT-270 at 240, 255 and 270 horsepower, and the NTC-335 at 260, 280, 300, 320, and 335 horsepower. Three other NH models complete a range of 200 to 380 horsepower to match your power needs.
Standard equipment	Standard equipment on every Cummins in-line diesel includes PT fuel system, mechanical flyball type governor, Cummins air compressor, starter, alternator or generator, air cleaner, crankcase breather, vibration damper, Fleetguard oil filter, Fleetguard fuel filter, water	pump, corrosion resistor, and rear sump pan. A complete line of optional components are also available to meet special requirements. Your truck dealer or Cummins distributor will help you select the in-line diesel that produces the most profit.

In-line diesels

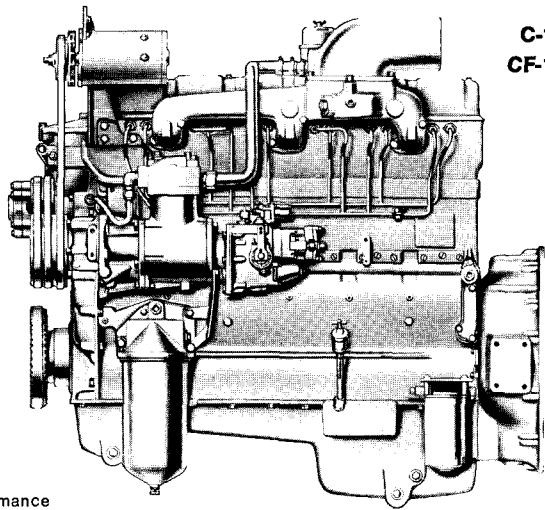
Performance

Horsepower, torque, and fuel consumption curves for all in-line models are shown on the following pages. Solid lines represent performance at S.A.E. standard conditions of 152 m. (500 ft.) altitude and 29.4°C (85°F) intake air temperature. Dotted lines indicate performance corrected to sea level and 15.6°C (60°F) intake air temperature.

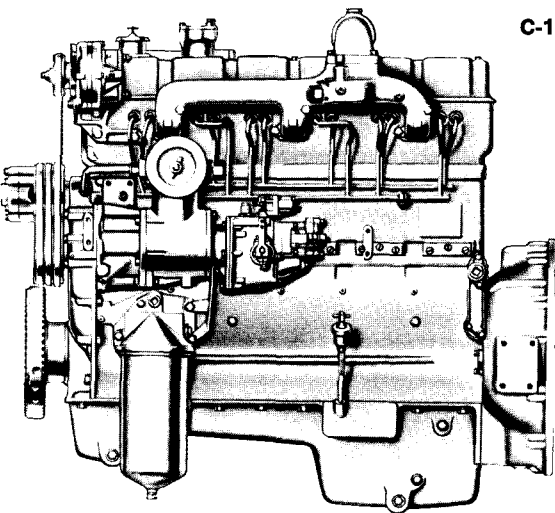
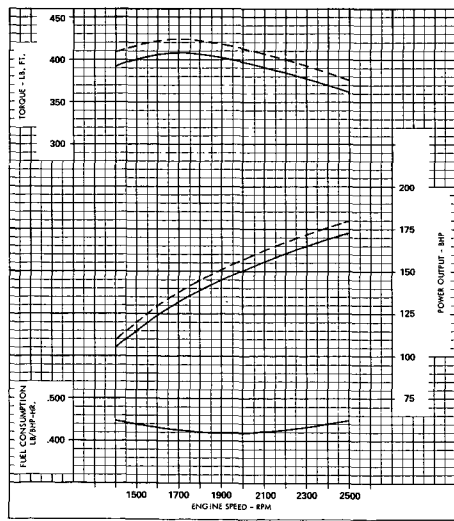
Curves represent performance of No. 2 diesel fuel or furnace oil with fuel system, water pump, lubricating oil pump, and air cleaner operating. Alternator, compressor, fan, and optional equipment are not included.



— CF-160 Performance



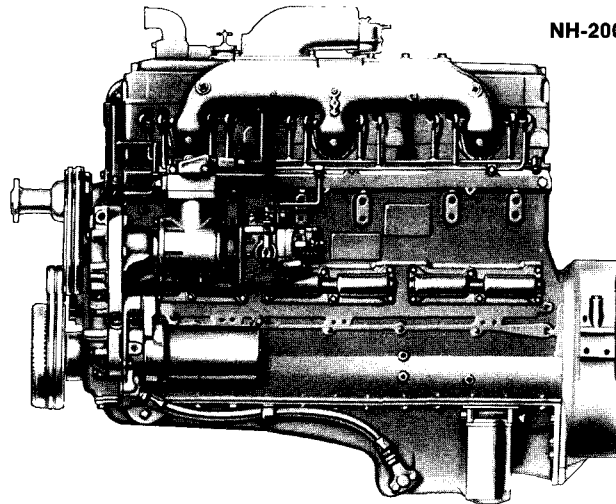
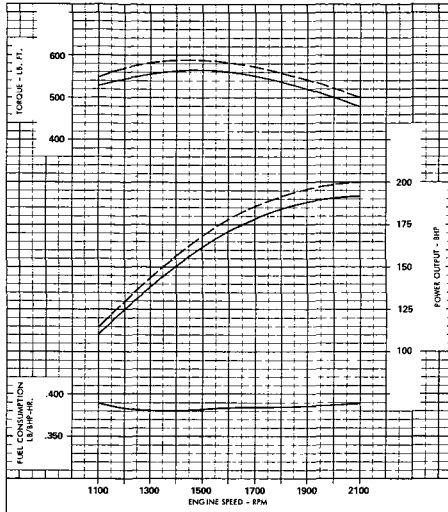
C-160 160 HP
CF-160 160 HP



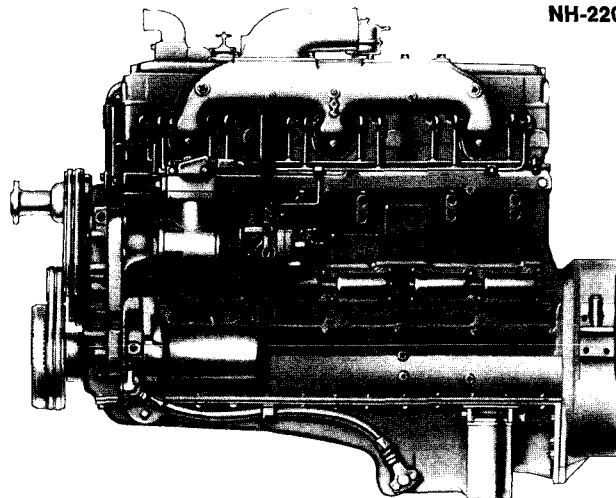
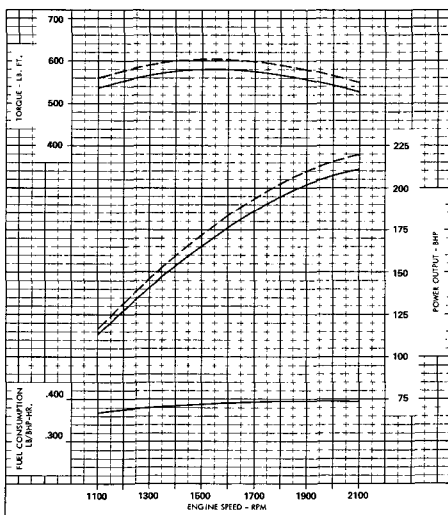
C-180 180 HP

Solid line — 152 m. (500 ft.) Altitude and 29.4° C (85° F.)
Dotted line — Sea level and 15.6° C (60° F.)

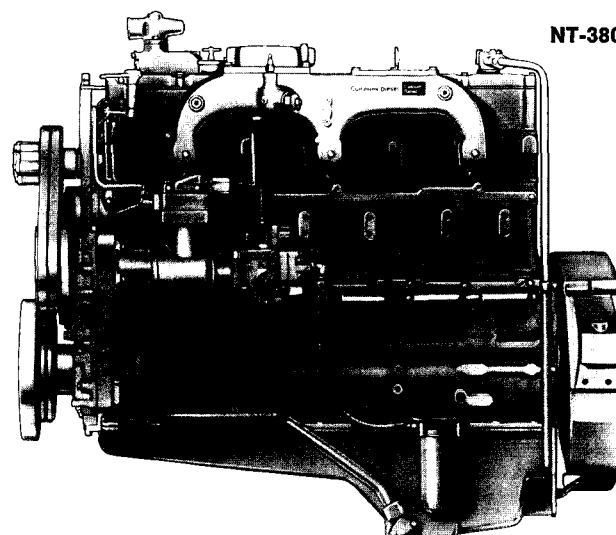
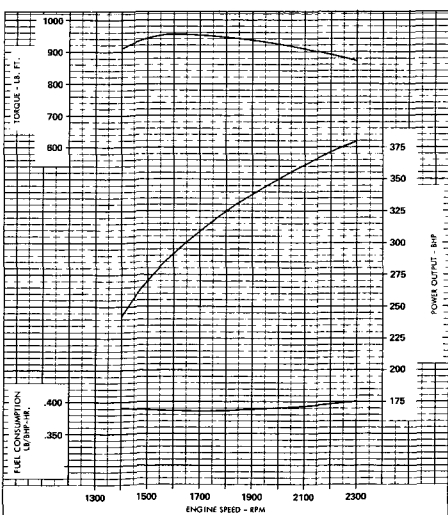
In-line diesels



NH-200 200 HP



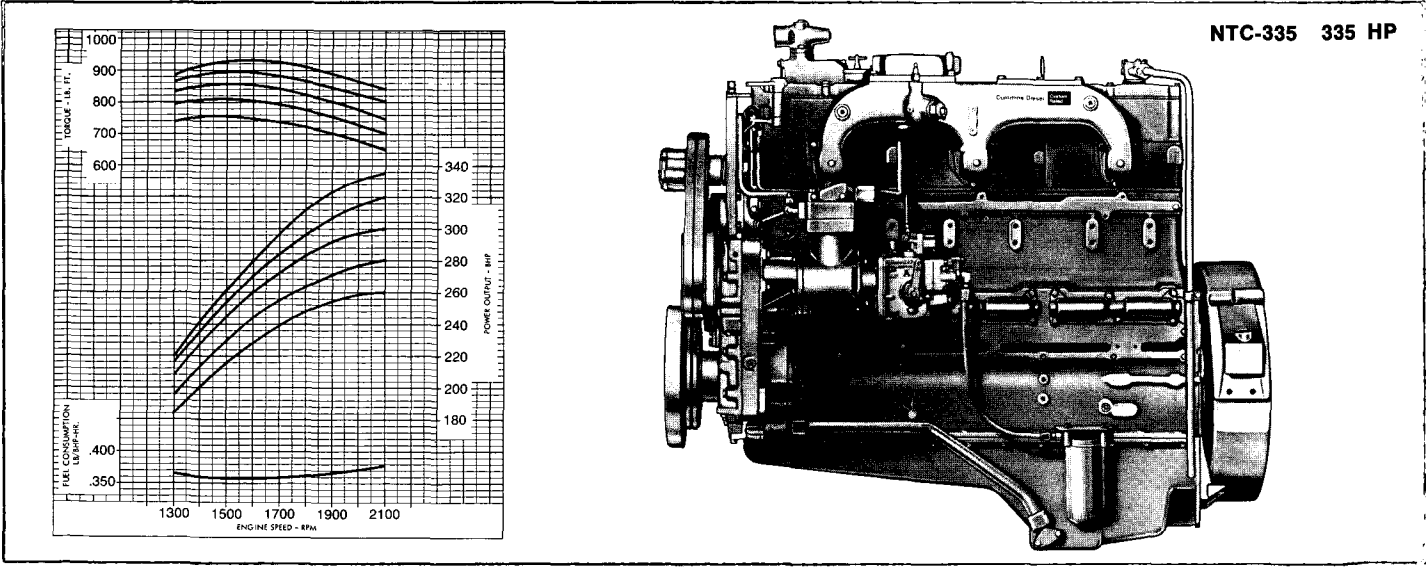
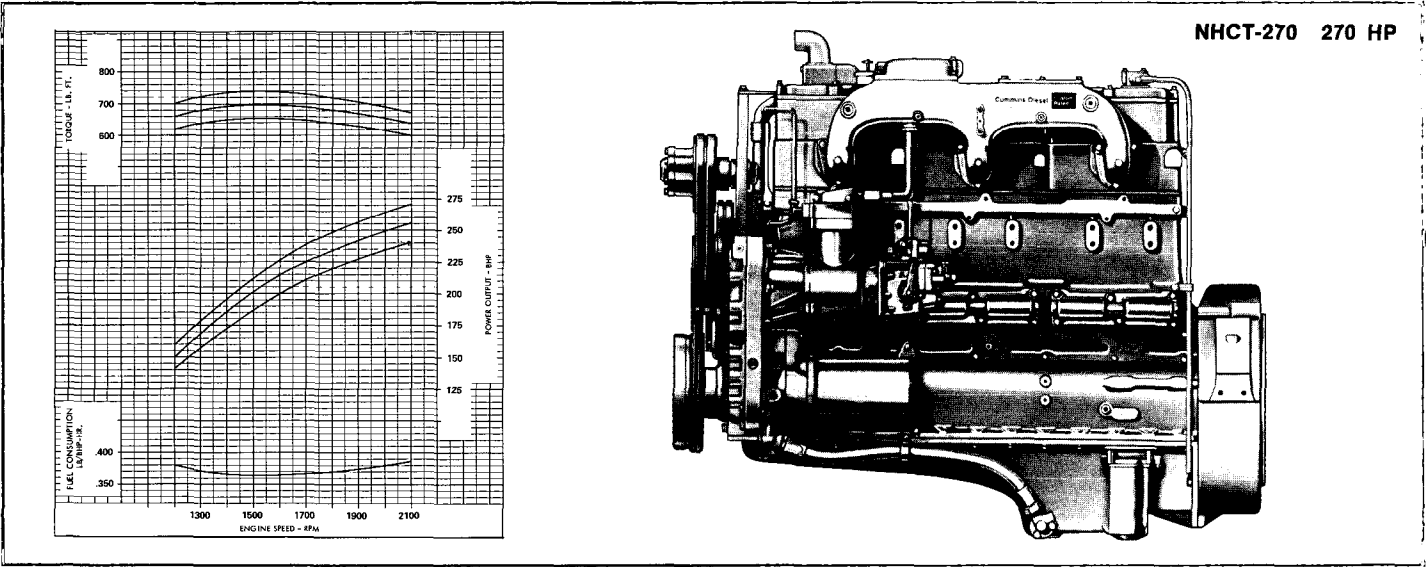
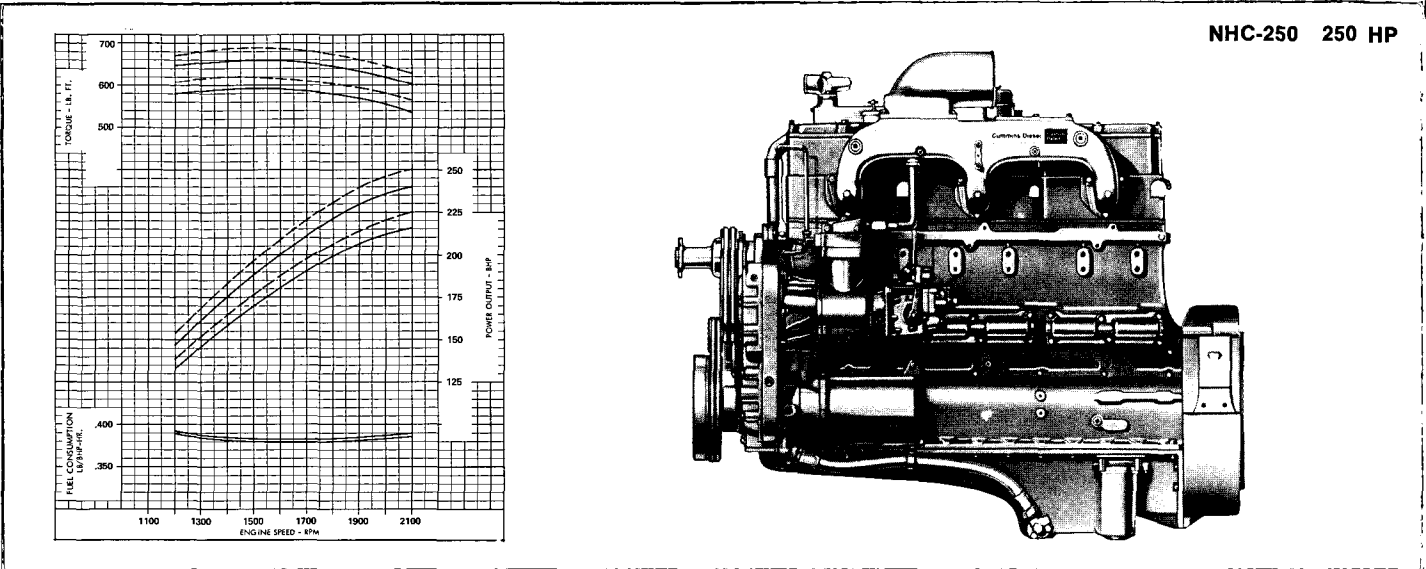
NH-220 220 HP



NT-380 380 HP

Solid line — 152 m. (500 ft.) Altitude and 29.4° C (85° F.)
Dotted line — Sea level and 15.6° C (60° F.)

Custom rated In-line diesels



Solid line — 152 m. (500 ft.) Altitude and 29.4° C (85° F.)
Dotted line — Sea level and 15.6° C (60° F.)

Cummins custom rating concept

How the buttons work

With a custom rated diesel from Cummins, you won't have to trade trucks to meet heavier loads or faster schedules — just change a button. One small button is all — no resetting or changing of injectors, no manifold changes, no extensive fuel system modifications are necessary with Cummins. A few minutes in the shop and your rig is ready with more horsepower. As you can see from the pictures, changing buttons is no trouble at all.

Each of the buttons used with custom rated engines has a different diameter recess. The recess diameter by-passes a different quantity of fuel. A small button allows less fuel to by-pass and provides higher pressure at the injector. A large diameter button recess decreases the pressure. The amount of fuel metered by the injector and the horsepower developed is determined by the pressure, controlled by the button.

Four models — thirteen ratings

The ability to match horsepower to loads and schedules minimizes fuel waste often occurring when drivers have either too much or too little power. No longer are truckers forced to choose between overpowering with resulting high investment and excessive fuel consumption and underpowering with resulting high maintenance costs and short engine life. Cummins offers four custom rated diesels with thirteen different power ratings.

V-903

The V-903 is a rugged V series diesel, custom rated at 280, 300 and 320 HP. It is a dependable engine designed for heavy duty, high horsepower applications. No matter where it operates, the V-903 will meet tough schedules; and meet them profitably.

NHC-250

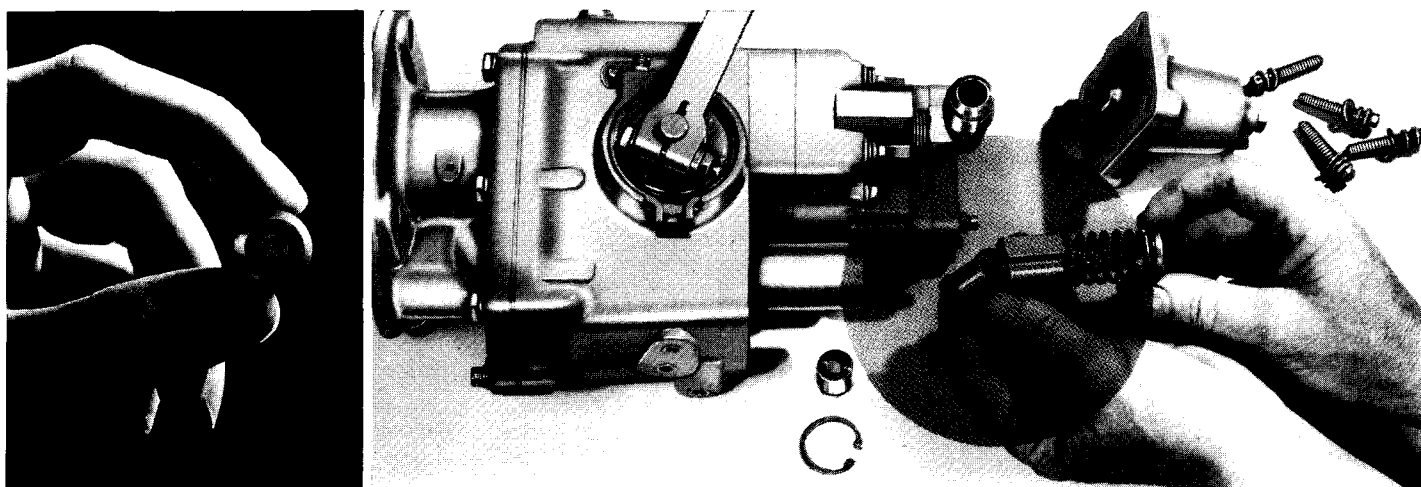
The NHC-250 is the custom rated model of Cummins' famous NH diesel. It is available at ratings of 225 HP and 250 HP, both at 2100 RPM.

NHCT-270

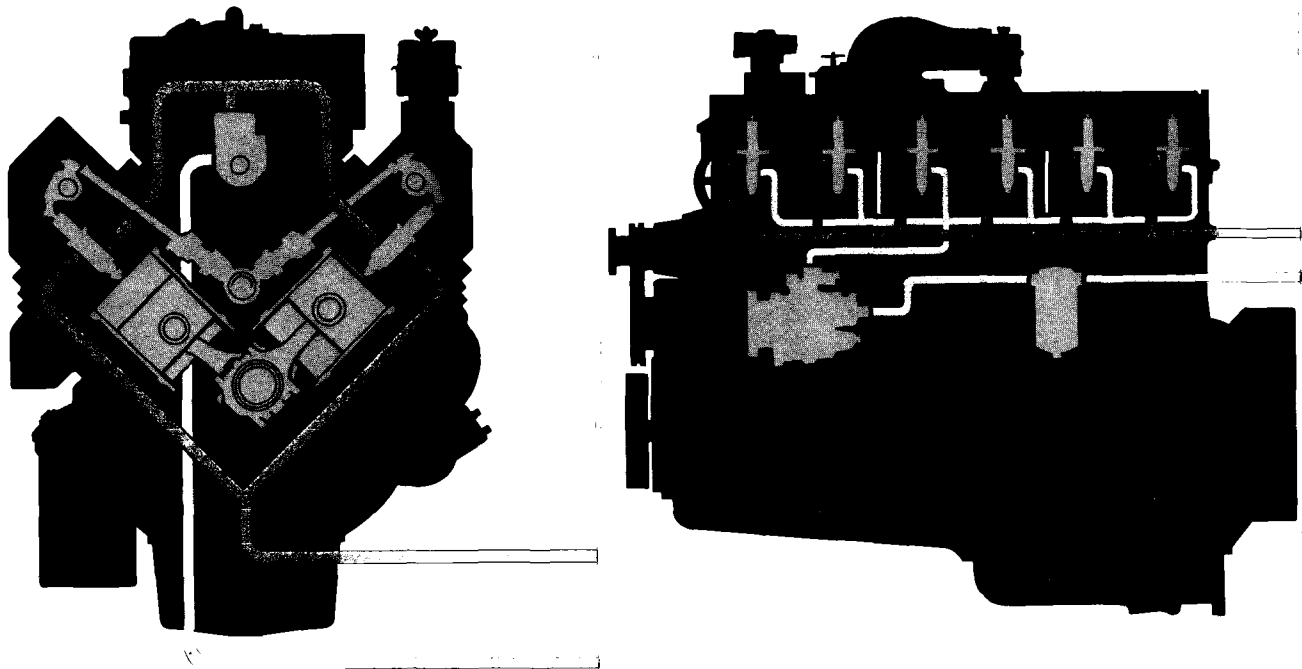
The NHCT-270 is available at 240 HP, 255 HP, and 270 HP. You get full horsepower at high altitudes, top fuel economy, and fast acceleration without smoke. No aftercoolers, aneroids, nozzle rings, or diffusers are needed.

NTC-335

The NTC-335 is the original custom rated diesel. This model is designed for high horsepower applications. It features the T-50 turbocharger, oil cooled pistons, large capacity oil cooler, extra strength alloy block, and other extra heavy-duty components. The NTC-335 is the most dependable high horsepower diesel ever built.



Cummins PT fuel system



Cummins PT fuel system is a proven concept of diesel fuel metering and injection. The simplicity of the system results in low maintenance costs, ease of service, top fuel economy, and superior performance with lowest priced diesel fuels.

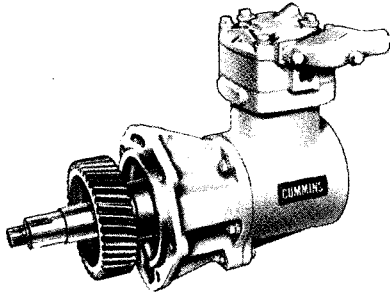
The simplified system is based on a Pressure-Time principle of fuel metering. A fixed size opening in a simple injector and variable pressure are utilized to meter the fuel charge. The pressure control function is in the fuel pump and the metering function in the fuel injector. Pressure is regulated at the metering orifice by the throttle and governor. The time interval during which the metering orifice is uncovered is determined by the camshaft and the engine's rotative

speed. Fuel is forced into the cylinder by the downstroke of the injector plunger.

The governor design of the PT pump makes it self-adjusting for wear. This eliminates the need for fuel pump adjustments between engine overhauls.

The PT system delivers fuel through a common rail at low pressure. This has permitted the newest models to be simplified by using drilled passages in the cylinder heads for fuel supply and return lines.

Cummins accessories



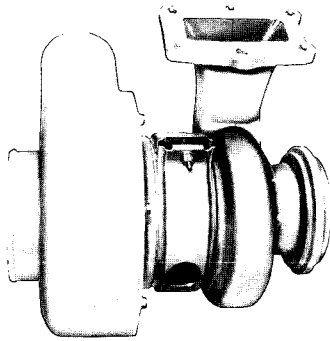
Air compressor

Compact one or two cylinder Cummins air compressors are available. This single cylinder compressor is as much as 10 Kg. (22 lbs.) lighter than some competitive automotive compressors. It is only 14.9 cm. (5 $\frac{7}{8}$ inches) long compared to 36.8 cm. (14 $\frac{1}{2}$ inches) for other compressors and height is reduced by as much as 5.08 cm. (2 inches).

With fewer parts Cummins compressors are much easier and less expensive to maintain. The exclusive inlet-outlet valve mechanism can be replaced without removing the compressor from the engine.

Other maintenance savings features are the direct drive which eliminates belts and chain drives and the integral crankshaft and accessory drive which permits removal and replacement of the compressor unit without removal of the drive from the engine.

A Cummins compressor, like all Cummins products, is simple, easy to maintain, and earns more profit for you. Specify Cummins air compressors on your next purchase.



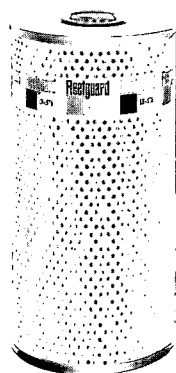
Turbocharger

A Turbodiesel is a Cummins Diesel that uses the normally wasted exhaust energy to drive a turbocharger. With a turbocharger four important things happen.

1. Fuel economy is improved. By forcing a greater weight of air into the cylinders more fuel can be burned completely for more power.
2. More power without increasing the size of the basic engine package.
3. More power from the same engine means less pounds per horsepower.

4. Less power loss at high altitudes. Naturally aspirated engines or engines using a mechanical blower lose power at high altitudes. The pressure on the manifold side of the turbine remains constant but the pressure on the outlet side decreases at altitudes allowing the turbine to rotate faster. The faster turbine rotation compensates for loss of air density and power is maintained.

Cummins designed and manufactured turbochargers provide a perfect match of engine and turbocharger performance characteristics.



Fleetguard Filters

Standard on all Cummins Diesels are Fleetguard fuel and lubricating oil filters, and corrosion resistors.

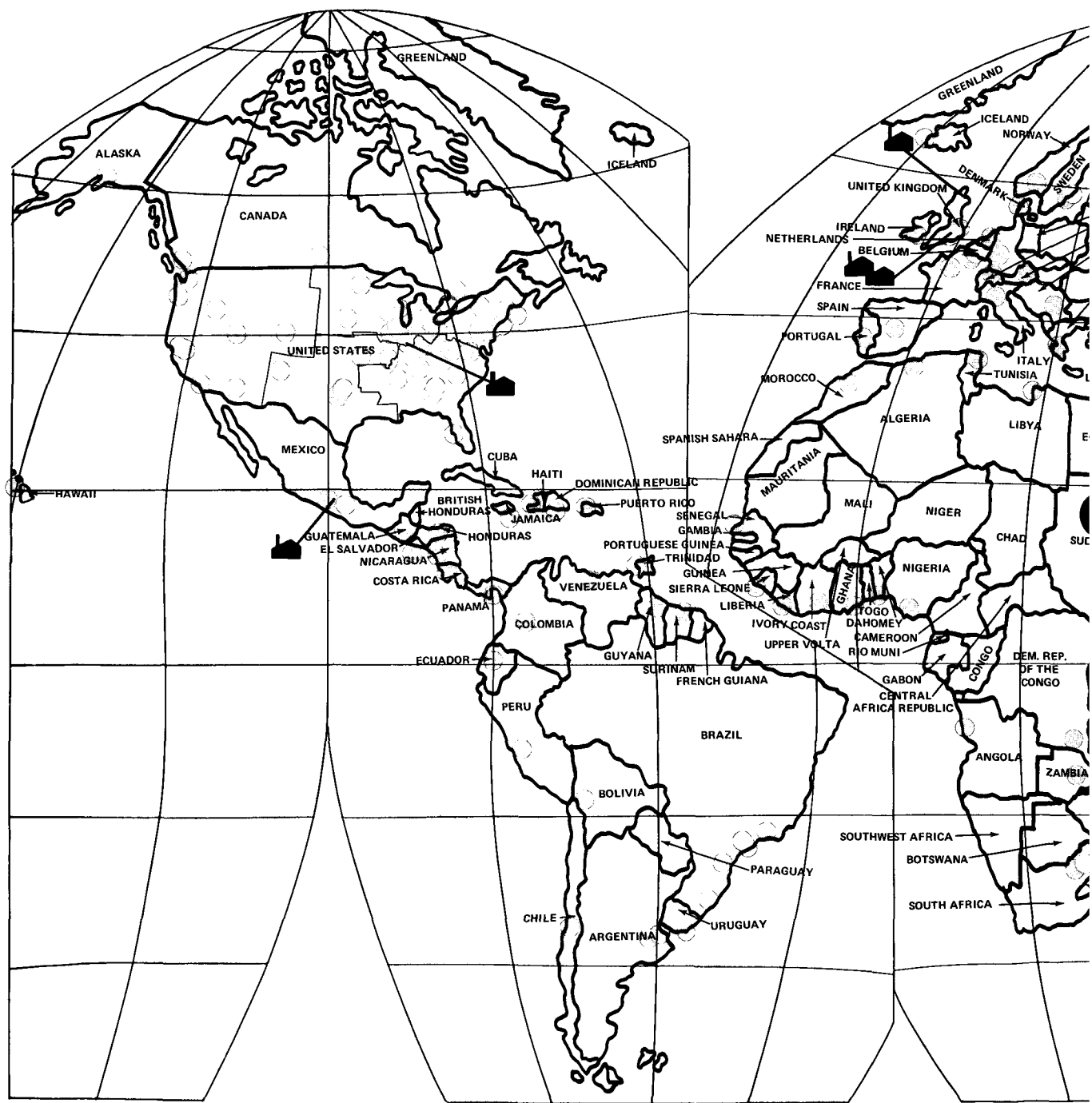
The fuel filter protects against dust particles that are entrained in the fuel supply. Clean fuel gives top fuel economy and low maintenance.

The full-flow lubricating oil filter protects engine bearings, journals, rocker arms, and other moving parts against dirt that may enter the lubricant. This filter utilizes a low cost, throw-away element for maximum filtration at lowest maintenance cost.

The corrosion resistor checks rust and corrosion, controls coolant acidity, prevents scale formation, counteracts electrolysis, and removes dirt, impurities, loose rust, and scale from the coolant.

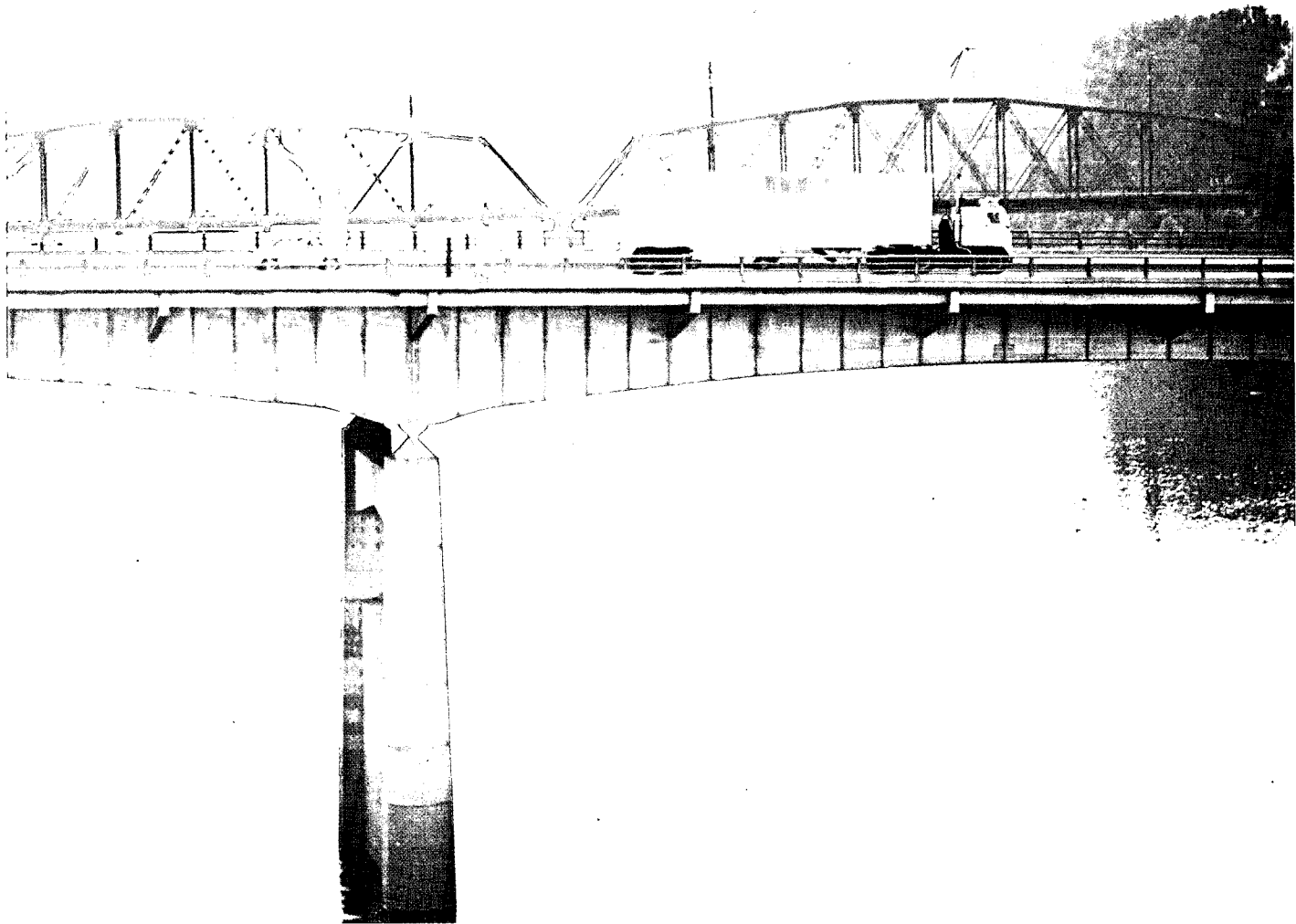
Fleetguard is a division of Cummins Engine Company, Inc. producing filters for all makes of engines. Contact your Cummins distributor or an authorized Fleetguard dealer to find out how Fleetguard can give your engine extra protection.

Cummins World Wide Operations





- Distributors
- Regional Offices
- Manufacturing Operations



Cummins Engine Company, Inc., Columbus, Indiana 47201
Cummins Americas, Inc., Columbus, Indiana, U.S.A.
Cummins Diesel Australia, Ringwood, Australia
Cummins Diesel International Ltd.
Cummins Engine Company Ltd., London, England

**Cummins
mining
power**



Cummins leads in mining power

For over 50 years Cummins has set the pace in the diesel industry, consistently leading in the development of efficient, economical power. Cummins engineers and technicians work in the most advanced research and engineering facilities to provide the best power for an ever-growing variety of mining and aggregate applications.

Lowest total cost concept

Many factors affect the total cost of an engine. Among these are initial price, fuel economy, maintenance and repair costs, parts prices, service availability, and warranty protection. Over 50 years of power leadership enables Cummins to influence these factors to get your payload out at the *lowest total cost*.

Superior engine design

Cummins engines have been tested and proven in all types of mines, pits, and quarries—and under the most adverse conditions. Superior engine design is a big reason these rugged diesels perform so well.

Among these proven design features are open-type combustion chamber, high tensile strength components, efficient four-cycle operation, internal lubricating oil lines, and the exclusive PT™ fuel system with internal fuel lines.

Built to last

Cummins diesels are durable. Depending upon the application and maintenance, these rugged engines run many thousands of hours before an overhaul is

necessary. Many operators report that they get much longer engine life than with other “premium” diesels.

When rebuilding eventually becomes necessary, features such as replaceable cylinder liners and regrindable crankshafts permit economical repair of the engine so that many more years of highly productive life can be realized. This long life helps make Cummins the *lowest total cost* engine.

Trouble-free operation

In addition to long life, superior design features ensure that day-to-day operation will be trouble-free. A Cummins diesel will not trouble its owner with countless minor repairs. This continuous operation greatly increases equipment availability—a must to meet production requirements.

Cummins ReCon™

Reconditioned sub-assemblies are also available to get your equipment back to work faster—another reason Cummins offers the *lowest total cost* in mining power.

Beats the dust

To maintain cleanliness for optimum engine life, Cummins engineers have provided superior dust control elements as standard equipment on mining diesels. These components include full flow lubricating oil filters, corrosion inhibitors that also provide coolant filtration, heavy-duty fuel filters, by-pass lubricating oil filters, positive seal oil filler caps and dipsticks, composite dry-type air cleaners, and molded rubber air intake connections.

Flywheel horsepower— performance where it counts

Cummins performance ratings are conservative and realistic. The flywheel horsepower rating for an engine is power actually available to drive the equipment. You always have plenty of power available without overloading or overworking the engine—reserve stamina you need in mining equipment.

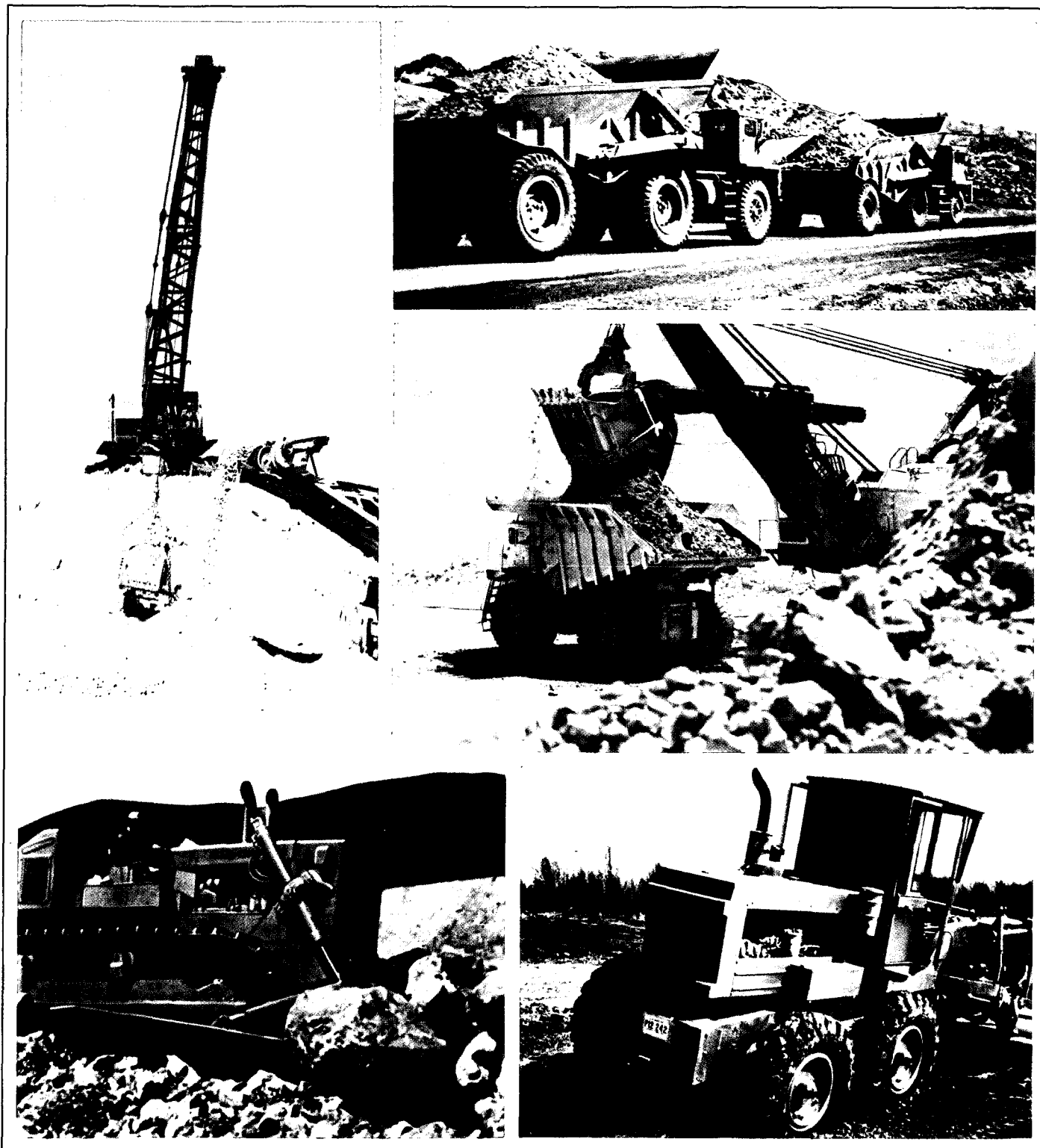
Every engine is dynamometer tested to ensure it will deliver the certified horsepower, torque, and fuel consumption.

Benefits of turbocharging

Top performance is assured in turbocharged models. Cummins designs and builds its own turbochargers to match engine performance and application. With turbocharging you continue to get rated horsepower even at high altitudes, a higher power-to-weight ratio, and reduced smoke and noise levels.

Exactly the power you need

Cummins provides 100 to 800 horsepower in a minimum of basic engine series. This complete range gives you exactly the power you need in any type of mining equipment—power to remove, load, haul, and process materials.



Cummins mining diesels

Engine Series	Engine Model	*60°F Sea Level 21°C Sea Level HP & RPM	85°F 500 Feet 29°C 152 Meters HP & RPM	Aspiration	No. Cylinders	Bore and Stroke Inches Millimeters	Displacement Cu. In. Liters		
Compact v	V-352-C	140 @ 3300	134 @ 3300	Natural	6	4¾ x 3½	117.5 x 88.9	352	5.8
	V-378-C	155 @ 3300	149 @ 3300	Natural	6	4¾ x 3¾	117.5 x 95.2	378	6.2
	V-470-C	185 @ 3300	178 @ 3300	Natural	8	4¾ x 3½	117.5 x 88.9	470	7.7
	V-504-C	210 @ 3300	202 @ 3300	Natural	8	4¾ x 3¾	117.5 x 95.2	504	8.3
	V-785-C	265 @ 2600	255 @ 2600	Natural	8	5½ x 4¾	139.7 x 104.8	785	12.9
	V-903-C	320 @ 2600	307 @ 2600	Natural	8	5½ x 4¾	139.7 x 120.6	903	14.8
464	C-464-C	160 @ 2500	153 @ 2500	Natural	6	4⅞ x 5	112.7 x 127.0	464	7.6
	CT-464-C	175 @ 2500	175 @ 2500	Turbocharged	6	4⅞ x 5	112.7 x 127.0	464	7.6
	CS-464-C	195 @ 2600	187 @ 2600	Supercharged	6	4⅞ x 5	112.7 x 127.0	464	7.6
743	H-743-C	175 @ 1800	168 @ 1800	Natural	6	5¼ x 6	130.2 x 152.4	743	12.2
	H-743-C	190 @ 2000	182 @ 2000	Natural	6	5¼ x 6	130.2 x 152.4	743	12.2
	N-743-C	220 @ 2100	212 @ 2100	Natural	6	5¼ x 6	130.2 x 152.4	743	12.2
	NS-743-C	320 @ 2100	307 @ 2100	Supercharged	6	5¼ x 6	130.2 x 152.4	743	12.2
855/1710	N-855-C	250 @ 2100	240 @ 2100	Natural	6	5¼ x 6	139.7 x 152.4	855	14.0
	NT-855-C	310 @ 2100	310 @ 2100	Turbocharged	6	5¼ x 6	139.7 x 152.4	855	14.0
	NT-855-C	335 @ 2100	335 @ 2100	Turbocharged	6	5¼ x 6	139.7 x 152.4	855	14.0
	NTA-855-C	420 @ 2300	420 @ 2300	Turbocharged	6	5¼ x 6	139.7 x 152.4	855	14.0
	V-1710-C	500 @ 2100	480 @ 2100	Natural	12	5½ x 6	139.7 x 152.4	1710	28.0
	VT-1710-C	635 @ 2100	635 @ 2100	Turbocharged	12	5½ x 6	139.7 x 152.4	1710	28.0
	VTA-1710-C	700 @ 2100	700 @ 2100	Turbocharged	12	5½ x 6	139.7 x 152.4	1710	28.0
	VTA-1710-C	800 @ 2100	800 @ 2100	Turbocharged	12	5½ x 6	139.7 x 152.4	1710	28.0

Turbocharged engines deliver the horsepower shown from sea level to high altitudes, as specified on engine performance curves. Naturally aspirated and supercharged engines should be derated for altitude operation at the rate of 3 percent per 1000 feet above 500 feet.

*Valves shown for naturally aspirated engines are derived by adjusting the horsepower @ 85°F & 500 ft. altitude by about 4% to indicate approximate performance at sea level & 60°F intake air temperature.

Cummins automotive diesels

Engine Model	*60°F Sea Level 21°C Sea Level HP & RPM	85°F 500 Feet Peak Torque @ RPM	Aspiration	No. Cylinders	Bore and Stroke Inches Millimeters	Displacement Cu. In. Liters		
C-175	175 @ 2500	405 @ 1725	Turbocharged	6	4 7/16 x 5	112.7 x 127.0	464	7.6
C-180	180 @ 2500	408 @ 1700	Supercharged	6	4 7/16 x 5	112.7 x 127.0	464	7.6
C-190	190 @ 2500	446 @ 1800	Turbocharged	6	4 7/16 x 5	112.7 x 127.0	464	7.6
NH-200	200 @ 2100	566 @ 1500	Natural	6	5 1/4 x 6	130.2 x 152.4	743	12.2
NH-220	220 @ 2100	580 @ 1550	Natural	6	5 1/4 x 6	130.2 x 152.4	743	12.2
NHD-230	230 @ 2100	656 @ 1400	Natural	6	5 1/2 x 6	139.7 x 152.4	855	14.0
NH-230	230 @ 2100	605 @ 1500	Natural	6	5 1/2 x 6	139.7 x 152.4	855	14.0
NHC-250*	250 @ 2100	658 @ 1500	Natural	6	5 1/2 x 6	139.7 x 152.4	855	14.0
NHCT-270*	270 @ 2100	741 @ 1500	Turbocharged	6	5 1/2 x 6	139.7 x 152.4	855	14.0
NHCT-CT	240 @ 2100	900 @ 1200	Turbocharged	6	5 1/2 x 6	139.7 x 152.4	855	14.0
NTC-335*	335 @ 2100	927 @ 1600	Turbocharged	6	5 1/2 x 6	139.7 x 152.4	855	14.0
NT-350	350 @ 2100	975 @ 1600	Turbocharged	6	5 1/2 x 6	139.7 x 152.4	855	14.0
NTA-370	370 @ 2100	1015 @ 1500	Turbocharged	6	5 1/2 x 6	139.7 x 152.4	855	14.0
V6-140**	140 @ 3300	238 @ 1900	Natural	6	4 1/8 x 3 1/2	117.5 x 88.9	352	5.8
V6-155	155 @ 3300	289 @ 1900	Natural	6	4 1/8 x 3 3/4	117.5 x 95.2	378	6.2
V8-185**	185 @ 3300	316 @ 1900	Natural	8	4 1/8 x 3 1/2	117.5 x 88.9	470	7.7
V8-210	210 @ 3300	387 @ 1900	Natural	8	4 1/8 x 3 3/4	117.5 x 95.2	504	8.3
V-903*	320 @ 2600	706 @ 1800	Natural	8	5 1/2 x 4 1/4	139.7 x 120.6	903	14.8

*Optional lower power ratings available.

Turbocharged engines deliver the horsepower shown from sea level to high altitudes, as specified on engine performance curves.

**Optional higher peak torque power setting available.

Naturally aspirated and supercharged engines should be derated for altitude operation at the rate of 3 percent per 1000 feet above 500 feet.

*Values shown for naturally aspirated engines are derived by adjusting the horsepower @ 85°F & 500 ft. altitude by about 4% to indicate approximate performance at sea level & 60°F intake air temperature.

Cummins generator sets

Kilowatt Rating @ .8 P.F.

Model Diesel Powered	Auxiliary Power		Prime Power	
	60 Hz.	50 Hz.	60 Hz.	50 Hz.
NH-4-GS/GC	60	50	50	45
NHC-4-GS/GC	75	60	60	50
HR-6-GS/GC	100	85	75	65
NH-220-GS/GC	125	100	100	85
NT-270-GS/GC	150	125	125	100
NT-310-GS/GC	175	150	150	125
NT-335-GS/GC	200	165	175	150
NT-400-GS/GC	230	190	200	170
V12-500-GS/GC	300	250	250	210
VT12-635-GS/GC	350	300	300	250
VT12-700-GS/GC	400	335	350	300
VT12-800-GS/GC	450	375	400	330
Natural Gas Powered				
GNHC-4-GC			75	60
GNH-220-GC			100	85
GNH-250-GC			125	100
GV12-525-GC			250	205

Standardize on Cummins

A complete power range not only makes standardization possible, but also highly desirable. Having Cummins in all your equipment results in many benefits:

- high parts interchangeability
- lower parts inventory cost
- lower maintenance and repair costs
- less equipment downtime
- more efficiency from mechanics

When your horsepower requirements increase, merely specify the next engine in the series—without a need to change your parts inventory or maintenance requirements.

The computer . . . to analyze, to solve, to predict

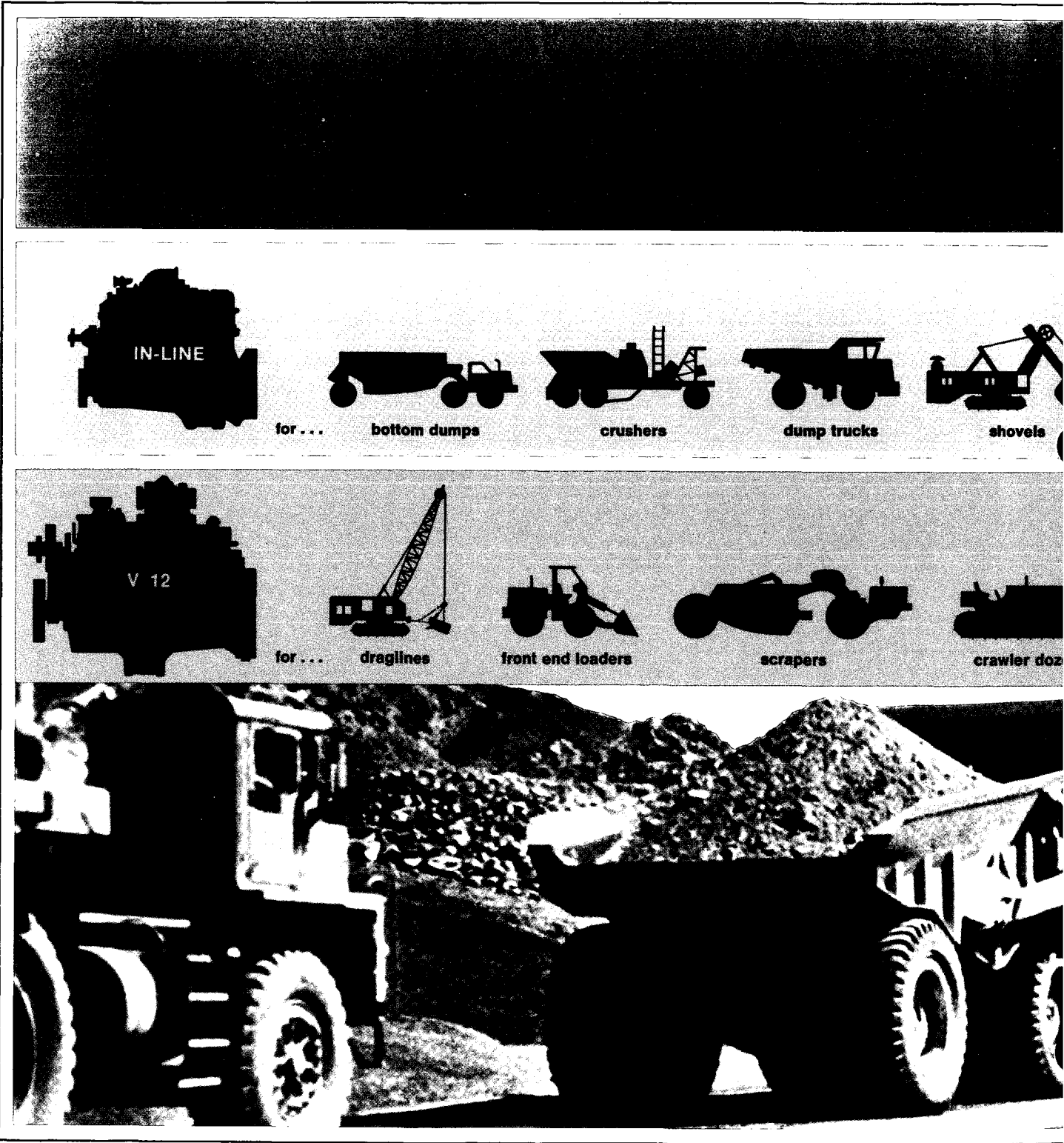
Computers play an important role in Cummins research and engineering program. They compile facts and analyze data. They solve problems and make predictions. They are especially valuable for predicting the performance of a particular engine model under a given set of circumstances.

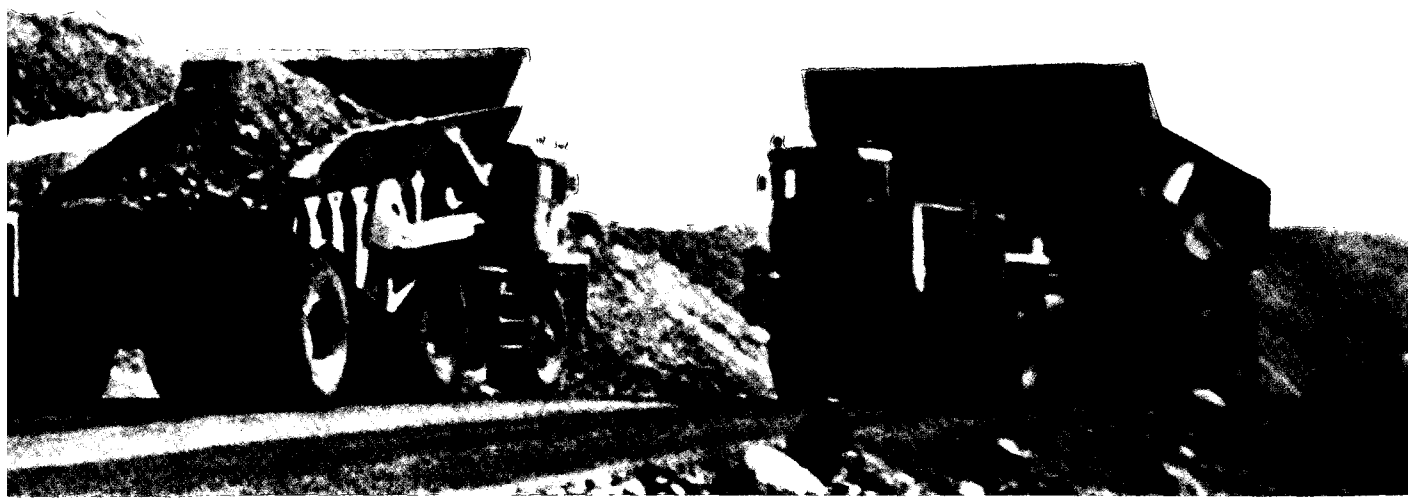
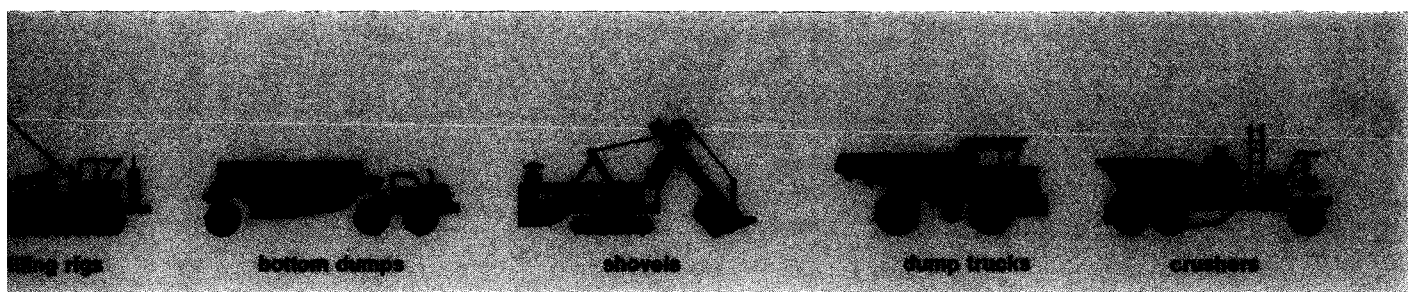
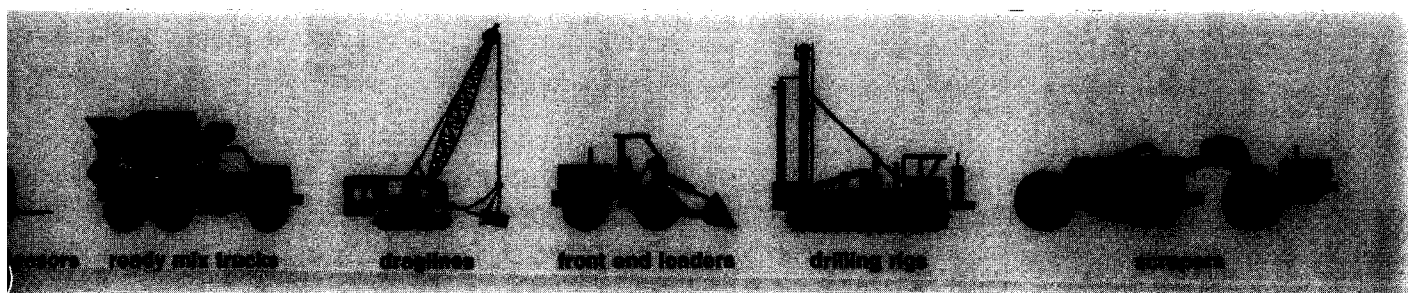
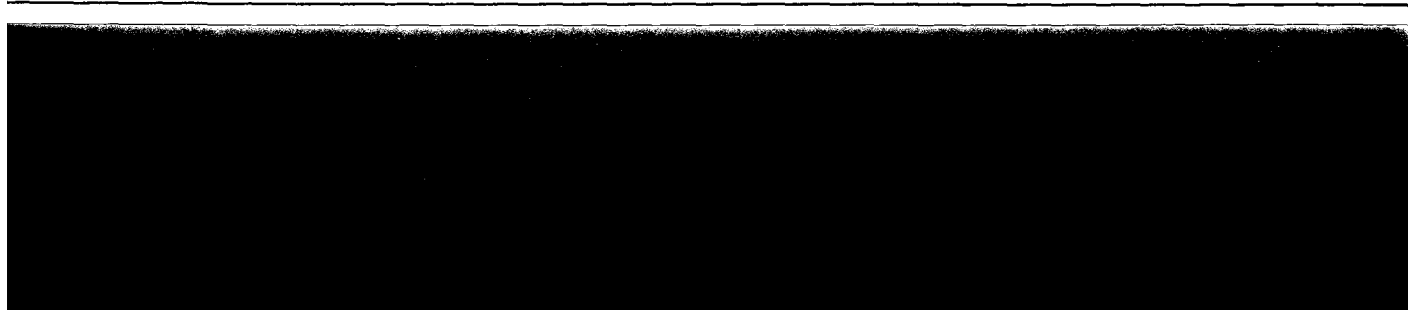
See your Cummins distributor or equipment dealer

When you are considering power for new equipment or repower for your present machines, see your Cummins distributor or equipment dealer. Whatever the job or the equipment, you will earn more profit by specifying Cummins *lowest total cost* diesels.



Cummins
engine
applications





**Cummins:
over 50 years
of power leadership**

Compact v engines: small and durable

Compact v diesels are the answer for mining applications requiring 140 to 320 horsepower in a compact, lightweight package. These 90° v oversquare diesels incorporate design features proven in Cummins famous in-line diesels.

The most vigorous testing program ever used on any diesel preceded the introduction of these remarkable engines. Their compact design makes them especially well suited for applications such as front end loaders, hydraulic backhoes, shovels, cranes, and compressors.

In-line 6's: proven power

Cummins six-cylinder in-line engines are the most proven and dependable diesels available today. These heavy-duty engines provide long life, low maintenance, and superior economy in a wide 160 to 420 horsepower range.

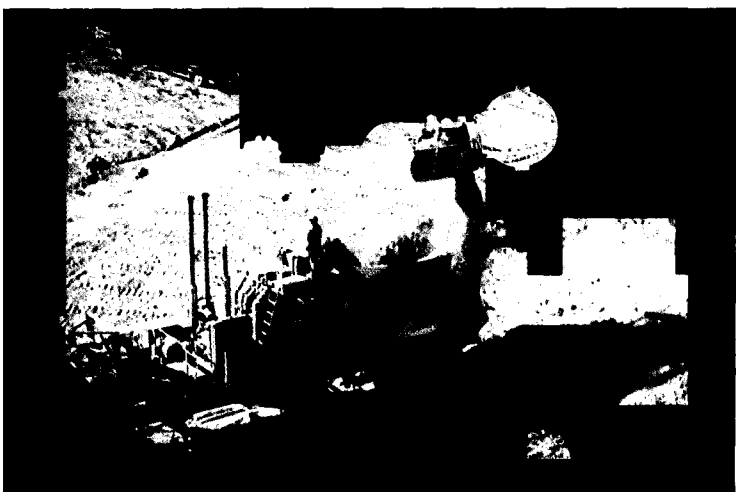
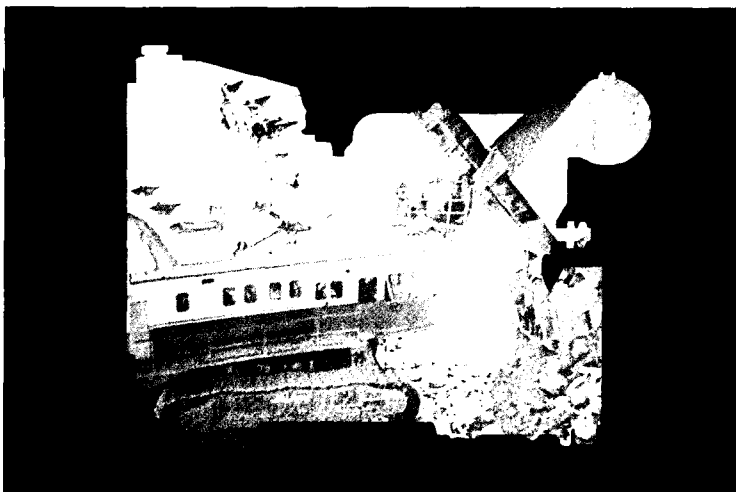
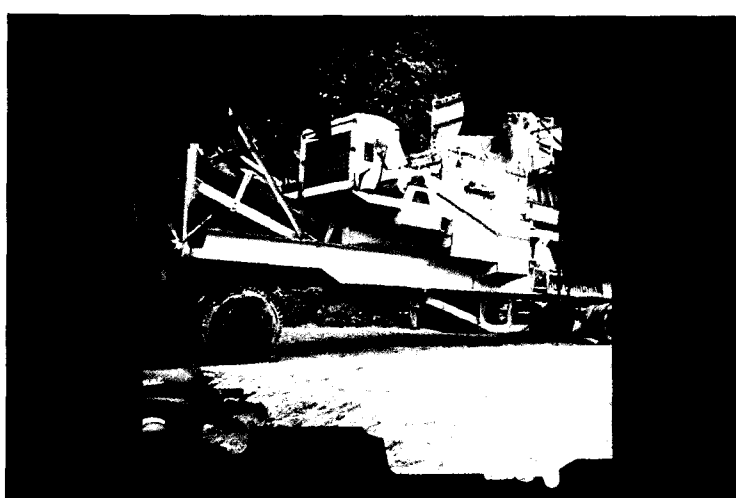
These "jack-of-all-trades" engines get the job done in all types of mining applications. And approximately 80% of the wearing parts are interchangeable within each engine series.

Rugged V12's: big-job power

Nothing can match the high performance of Cummins twelve-cylinder V engines—big power when you need it for the really big mining jobs. They combine this power with long life and *lowest total cost* to move more payload with bigger profits.

These V12's provide 500 to 800 horsepower in naturally aspirated and turbocharged models. Specify them for all your heavy-duty equipment applications to further reduce maintenance costs and parts inventories.





Automotive diesels: the industry standard

For nearly twenty years Cummins diesels have powered more heavy-duty on-highway trucks than all other engines combined. Miners have found them to be the best engine for haul use, too. They provide 140 to 370 horsepower and have been proven in *billions* of miles of service.

And with Custom Rated engines, you can tailor your horsepower to meet changing requirements.

Industrial engines: dependable stationary power

The proven ability of these engines to operate in adverse conditions makes them ideal for mining applications such as draglines, crushers, shovels, and pumps. They are available from 140 to 800 horsepower.

Industrial clutches, torque converters, and reduction gears are available for chain, belt, or direct coupling drive arrangements. Front power take-offs are available to provide convenient power for a wide number of uses.

Generator sets: prime and auxiliary power

Cummins generator sets provide critical electrical power at mines, pits, and quarries—wherever it is needed.

Specify standby sets for dependable protection from power failure. Prime power gen sets are the answer wherever normal utility power is not available or is not economical, especially for applications such as rock crushers.

Single unit systems supply 45 to 450 KW, and up to 3500 KW is available with Cummins automatic paralleling. Front power take-offs can be installed on Cummins generator sets to provide both electrical and mechanical power from one engine.

The Cummins package: power, parts, and service at the lowest total cost

Outstanding service availability

Cummins service organization is the largest in the world devoted to the maintenance and service of diesel engines. This organization includes over 2,000 sales and service locations in 94 countries and representation in every country in the free world.

Factory representatives are also located throughout the world, and service specialists can be dispatched wherever and whenever they are needed. This unmatched service availability keeps your equipment running.

Service around-the-clock

Call anytime night or day for excellent service in Cummins shops, at your service location, or on the job—wherever you want it.

Over 5,000 expert technicians with the most modern equipment are backed by a complete inventory of genuine Cummins parts. In the United States and Canada, ReCon™ reconditioned parts and sub-assemblies are available to save you time and money. Like-new parts at rebuilt prices reduce downtime to help provide the lowest total operating cost.

We come to you

Mobile service vans manned by Cummins service technicians are always ready to provide on-the-spot solutions to your maintenance and service problems.

Instant communications

All U.S. and Canadian Cummins distributors are interconnected with each other and with the factory through an automatic teletypewriter communication system. Instant communications means you can get a service specialist, a mobile service unit, critical parts, information—whatever you need—and get it fast. Fast service keeps you on the job where the profits are.

Service training

Cummins has the worldwide service training facilities and organization to train customer and Cummins service personnel. Training is available at Cummins factories, at distributor locations, or at your own location.

Courses are presented by professional service instructors using the latest training techniques, facilities, tools, and training aids. Many instructors are multi-lingual to provide technical training for foreign-speaking operations.

Mobile classrooms

Cummins also operates mobile classrooms on a full-time basis throughout North America. The self-contained units are fully equipped for training required at your job sites.

Built by Cummins—backed by Cummins

One of the most meaningful measures of quality is the warranty placed on the product. When you specify Cummins, you get a superior warranty because Cummins builds superior engines. And Cummins builds the vital parts of it—blocks, cranks, camshafts, valves, pistons, liners, air compressors, and turbochargers.

The Cummins distributors and dealers back this warranty with prompt service to help ensure that Cummins engines cost less to own and operate than other engines.





Cummins means Power

Cummins Engine Company, Inc.

Columbus, Indiana 47201

Cummins Industrial Diesel Engines

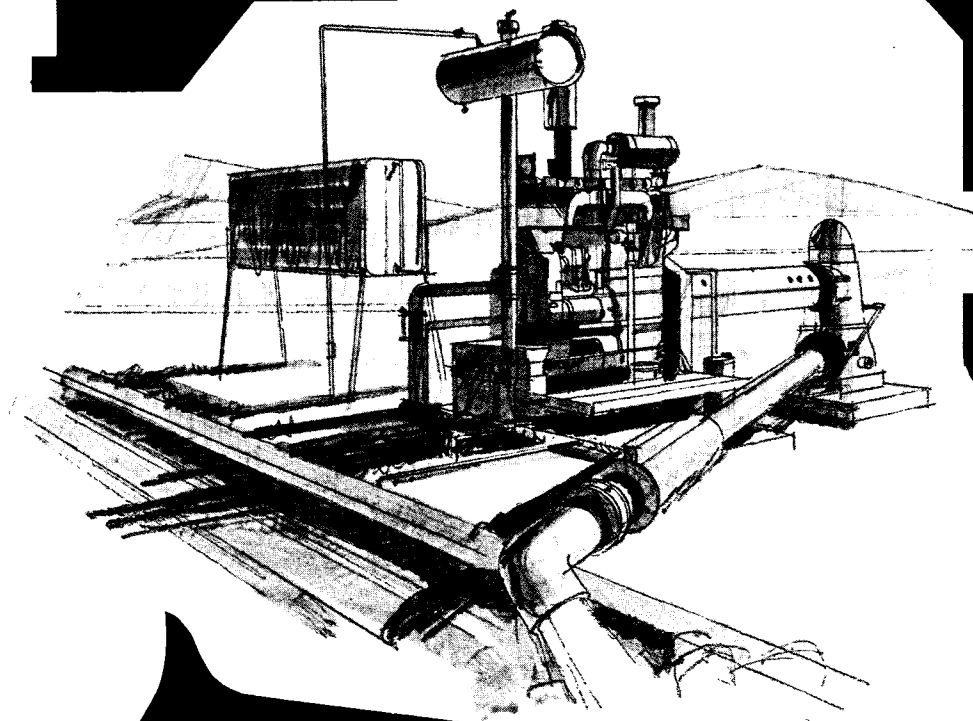
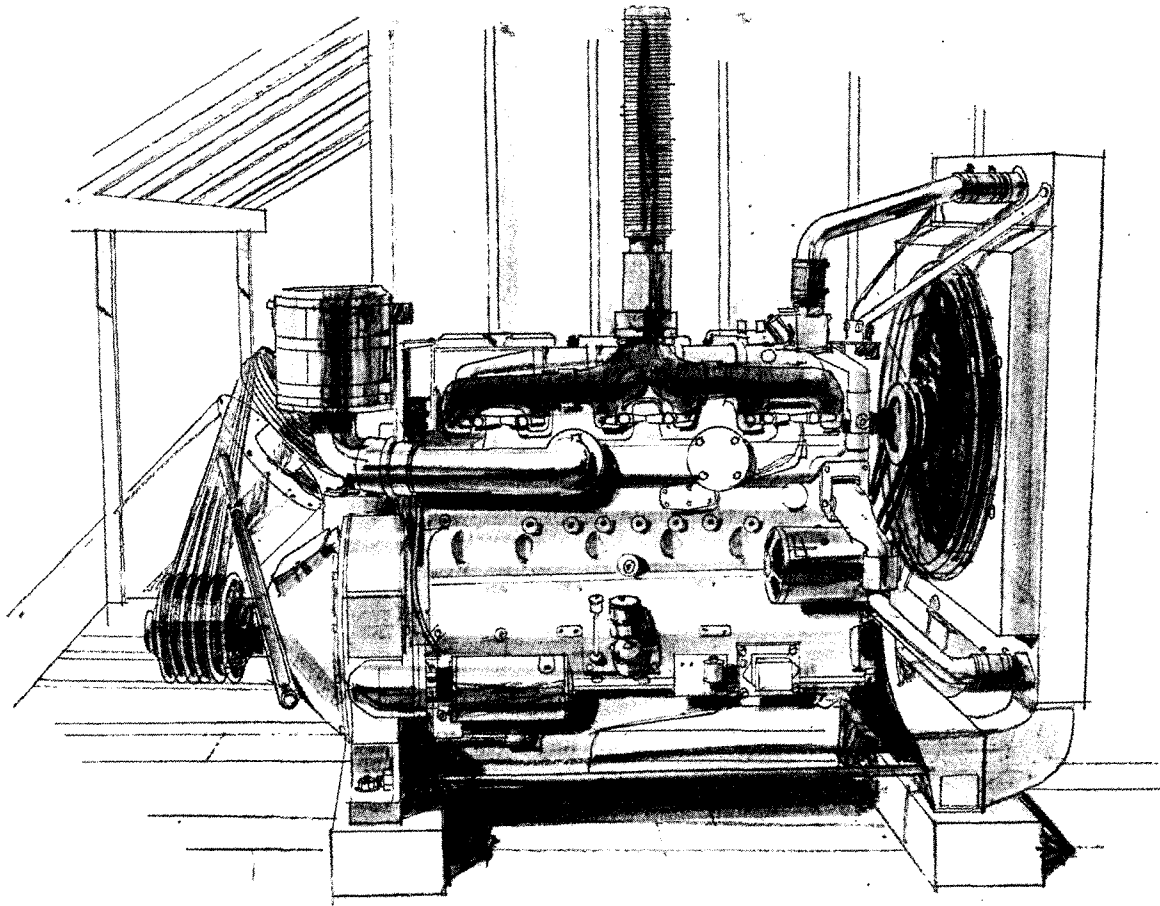


TABLE OF CONTENTS

Cummins Industrial Diesel Engines	1
Design Features	2
Engine Specifications	4
Optional Components	6
Principal Dimensions	8
Engines and Curves	10
Fire Pump Units	15
Cummins Worldwide Organization	16

CUMMINS INDUSTRIAL DIESEL ENGINES



Through millions of hours of operation, diesel engines have proven themselves more reliable, more durable and more economical to operate than gasoline engines of comparable power. Lacking the complex and delicate electrical ignition systems and carburetors, diesels are far less prone to breakdown or non-start caused by auxiliary components. Because they are built more rugged, they inherently provide longer operating life between overhauls and their economical fuel consumption makes them less expensive to operate.

Cummins, among the largest independent manufacturers of diesel engines in the world, has concentrated on the production of high quality diesels since 1919. Proof of this is evidenced by the Cummins Industrial Warranty which is an industry leader, backing the product for one full year or 3,600 hours of operation.

Supporting these fine diesels is a service organization recognized to be one of the most outstanding in the world, with over 1,500 primary sales and service outlets world wide. (See map at rear of book.) Wherever a Cummins Industrial Diesel is operated there is a service outlet within call, with trained technicians and adequate parts supply.

The following outlines some of the major features and uses of Cummins Industrial Diesels.



DESIGN FEATURES

Exclusive PT fuel system	Self compensating for wear and fuel viscosity. Maintains power on fuels ranging from heavy furnace oils to light jet type fuels without recalibration. The simple design, having less than half as many parts as other diesel fuel systems, is long lived and easy to maintain and repair. Assures minimum downtime.
Open type combustion chamber	Gives most efficient combustion . . . most power from each gallon of fuel. Thorough mixing of fuel and air in the combustion chamber combined with camshaft controlled injection insures smooth, complete burning of safe, economical diesel fuel.
Large intake and exhaust passages	Designed to offer minimum restriction to exhaust and air flow. Facilitate complete scavenging of heat and exhaust gases and complete filling of cylinder with fresh air for clean burning, top economy.
Overhead valves	Precision machined from high strength alloy steel. Intake valves are of silichrome steel. Exhaust valves are nitrogen steel for high temperature strength and faced with corrosion resistant material. High output models have two exhaust and two intake valves per cylinder.
Replaceable wet-type cylinder liners	Dissipate heat rapidly. Easily replaced without reboring block. Liners are alloy cast iron, honed and coated with a special material to give fast break-in and long life.
Large volume water passages	Give even flow of coolant around cylinder liners, valves and injectors to draw excess heat from combustion chamber. Centrifugal pump circulates large volumes of water.
Crankshaft	Precision machined from high strength steel forging. Bearing journals are induction hardened for long life. Main and connecting rod journals have material for several re-grinds.
Camshaft	Geared to crankshaft for positive control of all valve and injector movements. Forged alloy steel camshaft is induction hardened for long service life. Roller type cam followers give long, trouble free cam and follower life.
Connecting rods	Forged from high tensil strength alloy steel, I-beam section gives maximum strength. Piston pins are full-floating.
Pistons and Rings	Pistons are cam ground to assure perfect fit at operating temperatures. Top ring is chrome plated for long life. Oil control ring removes excess oil from cylinder wall, minimizing oil consumption.

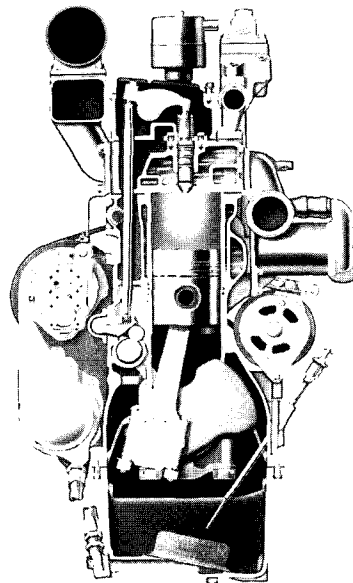


Internal fuel lines

Drilled passages in cylinder heads of most models eliminate external fuel lines and threaded connectors. Reduce possibility of leaks and damage from external sources.

Turbocharger

Cummins design and manufacture. Matched to output of applicable models. Utilize normally waste exhaust energy to increase output, reduce fuel consumption without increasing engine size. Permit altitude operation without deration.



PROVEN POWER

Cummins are the most used engines in such heavy-duty equipment as industrial switching locomotives, logging equipment and oil well cementing units. They also have proven their reliability, long life, and operating economy in power shovels, road building equipment, irrigation pump drives, rock crushers, dredgers, sawmills, large unloading pumps, municipal pumping service, sewage plants, and many other special applications.

WIDE RANGE AVAILABLE

Cummins power units match requirements of a wider range of equipment types than other engines. They cover a power range of 110 hp. to 800 hp. Standard units are equipped with radiator and fan but heat exchanger cooling is available for all sizes. Optional equipment includes clutches, torque convertors, hydraulic governors, safety controls, air starting, air cleaners for operation in heavy dust, and other equipment to meet specific application requirements. These power units are offered in equipment built by leading industrial machinery manufacturers and are available for re-powering present equipment through Cummins distributors.

ENGINE SPECIFICATIONS

The table below lists the basic Cummins line of industrial power units, showing maximum horsepower, recommended power setting for continuous duty, displacement, bore and stroke, number of cylinders, type aspiration and net weight.

Model	Maximum Horsepower @ RPM		Continuous Horsepower @ RPM		Displacement	
					Liters	Cubic Inc
J-401-P	110	2200	88	2200	6.6	401
J-401-P	130	2500	98	2200	6.6	401
C-464-P	160	2500	120	2200	7.6	464
CT-464-P	175	2500	122	2200	7.6	464
CS-464-P	180	2500	125	2200	7.6	464
N-495-P	130	2000	103	1900	8.1	495
H-672-P	160	1800	128	1800	11.0	672
H-743-P	175	1800	140	1800	12.2	743
H-743-P	190	2000	150	1900	12.2	743
N-743-P	220	2100	168	1900	12.2	743
NS-743-P	290	2100	194	1800	12.2	743
NS-743-P	320	2100	217	1800	12.2	743
N-855-P	250	2100	192	1900	14.0	855
NT-855-P	310	2100	210	1800	14.0	855
NT-855-P	335	2100	234	1800	14.0	855
NT-855-P	380	2300	262	2000	14.0	855
V-352-P	140	3300	108	3000	5.7	352
V-470-P	185	3300	140	3000	7.7	470
V-1710-P	500	2100	394	1900	28.0	1710
VT-1710-P	635	2100	435	1800	28.0	1710
VTA-1710-P	700	2100	480	1800	28.0	1710
VTA-1710-P	800	2100	550	1800	28.0	1710

All industrial power units have as standard equipment:

- A dry type, replaceable paper element air cleaner.
- Electric starting equipment, complete except batteries.
- Sucker type fan.
- Replaceable paper element lubricating oil and heavy duty replaceable paper element fuel oil filters.
- Flywheel and housing for industrial clutch.
- Mechanical variable speed governor with throttle control mounted on instrumental panel.
- Mounted instrument panel with meters and gauges.
- Heavy duty mounted radiator with fan shroud and guard.
- Pedestal type supports at front and rear (except 12 cylinder models which have base mounting).

Bore and Stroke		Cylinders	Aspiration	Net Weight	
mm	Inches			Kilograms	Pounds
39.7 x 127.0	4 $\frac{1}{8}$ x 5	6	Natural	906	1998
39.7 x 127.0	4 $\frac{1}{8}$ x 5	6	Natural	946	2085
12.7 x 127.0	4 $\frac{7}{16}$ x 5	6	Natural	946	2085
12.7 x 127.0	4 $\frac{7}{16}$ x 5	6	Turbocharged	964	2125
12.7 x 127.0	4 $\frac{7}{16}$ x 5	6	Supercharged	1415	3120
30.2 x 152.4	5 $\frac{1}{8}$ x 6	4	Natural	1082	2385
23.8 x 152.4	4 $\frac{3}{8}$ x 6	6	Natural	1400	3087
30.2 x 152.4	5 $\frac{1}{8}$ x 6	6	Natural	1400	3087
30.2 x 152.4	5 $\frac{1}{8}$ x 6	6	Natural	1407	3102
30.2 x 152.4	5 $\frac{1}{8}$ x 6	6	Natural	1430	3152
30.2 x 152.4	5 $\frac{1}{8}$ x 6	6	Supercharged	1623	3577
30.2 x 152.4	5 $\frac{1}{8}$ x 6	6	Supercharged	1623	3577
39.7 x 152.4	5 $\frac{1}{2}$ x 6	6	Natural	1497	3300
39.7 x 152.4	5 $\frac{1}{2}$ x 6	6	Turbocharged	1610	3550
39.7 x 152.4	5 $\frac{1}{2}$ x 6	6	Turbocharged	1610	3550
39.7 x 152.4	5 $\frac{1}{2}$ x 6	6	Turbocharged	1610	3550
17.5 x 88.9	4 $\frac{3}{8}$ x 3 $\frac{1}{2}$	6	Natural	696	1535
17.5 x 88.9	4 $\frac{3}{8}$ x 3 $\frac{1}{2}$	8	Natural	817	1800
39.7 x 152.4	5 $\frac{1}{2}$ x 6	12	Natural	3856	8500
39.7 x 152.4	5 $\frac{1}{2}$ x 6	12	Turbocharged	3901	8600
39.7 x 152.4	5 $\frac{1}{2}$ x 6	12	Turbocharged	3924	8650
39.7 x 152.4	5 $\frac{1}{2}$ x 6	12	Turbocharged	3992	8800

INDUSTRIAL ENGINE OPTIONAL EQUIPMENT

The following are some of the more popular options available on Cummins industrial power units:

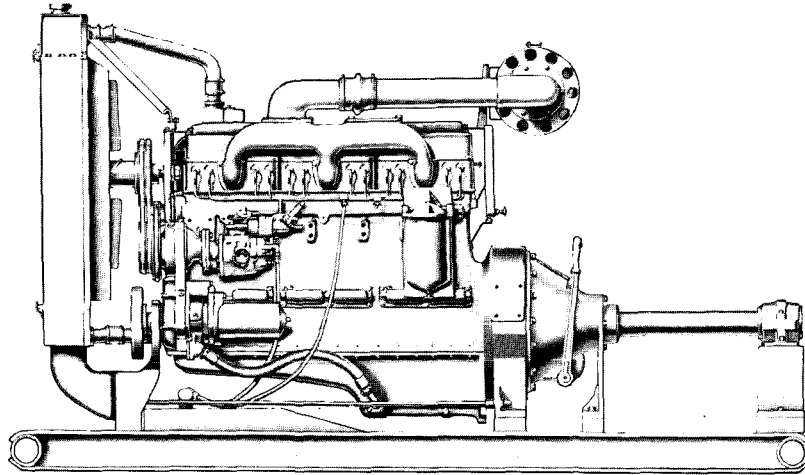
Air cleaners

Heavy duty composite dry type for severe dust conditions are available and recommended for all models, oil bath types are available for all except 352 and 470 series.

Bases and fuel tanks

Skid type bases are available for all models. Two types are available—either short with a mounting for clutch support or extended for outboard bearing. 1710 series engines are base mounted as standard.

Base mounted fuel tanks are available on some models—29 gallons capacity on 401 and 464 series; 25 gallons on 495 series; 44 or 82 gallons on 672, 743 and 855 series.



Compressor

A Cummins 12 CFM-100 psig air compressor can be flange mounted on all models.

Corrosion resistor

Supplied as standard on some models. A corrosion resistor is recommended for all models. It checks rust and corrosion, controls acidity and removes impurities from coolant.

Electrical equipment

Series 401 and 464 cu. in. displacement have 12 volt systems as standard. Series 352 cu. in. and 470 cu. in. displacement up have 24 volt systems as standard. 24 volt equipment is available in lieu of 12 volt and high output alternators are available on all models.

Fans

Blower type fans are available in lieu of standard sucker types on all models.

Filter

By-pass lubricating oil filter, standard on turbocharged models, is highly recommended. It decontaminates the oil without diluting the detergents. It extends the life of the lubricant and maintains cleanliness between change intervals.

Flywheels and housings

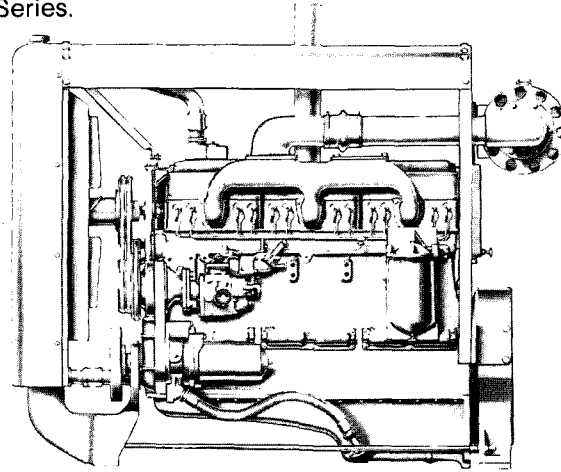
Various flywheels for adapting to different clutches, torque converters, etc., are available on all models as well as an alternate SAE flywheel housing size.

Governors

Mechanical variable speed governors, torque converter tailshaft speed control governors and hydraulic type governors for very close speed control are available.

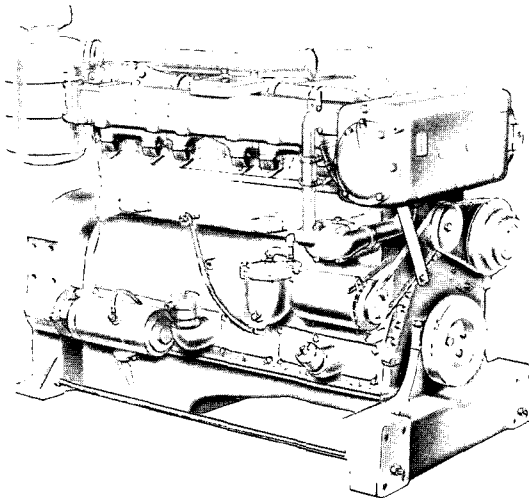
Enclosures

Back panel, hood and side panels are available on all in-line models and are recommended for all unsheltered applications. Also available on demand for 352 and 470 Series.



Heat exchanger

A tubular type heat exchanger unit and expansion tank plus a watercooled exhaust manifold are available for all models as an optional cooling system. A raw water pump is also available. A tubular type heat exchanger for cooling torque converter fluid is available for all models.



Power take-off

Complete power unit packages comprising engine plus industrial clutch or torque converter, with output shaft adapted for chain, belt or direct coupling drive can be readily supplied.

Safety controls

Engines which will operate unattended part or all of the time can be protected against low lubricating oil pressure and high water temperature both mechanically or electrically by systems that will shut down the engine, or sound an alarm (electrically). An electrical overspeed shutdown device is also available.

Starting

Air manifold preheater assembly type cold starting aid is available for all models. It is standard on 401 and 464 series, also on all super- and turbo-charged models. Alternatively, if preferred, ether starting aids (gelatin capsule or pressurized cylinder types) are available.

Compressed air motor starting is available on all models, in lieu of electric systems.

PRINCIPAL DIMENSIONS

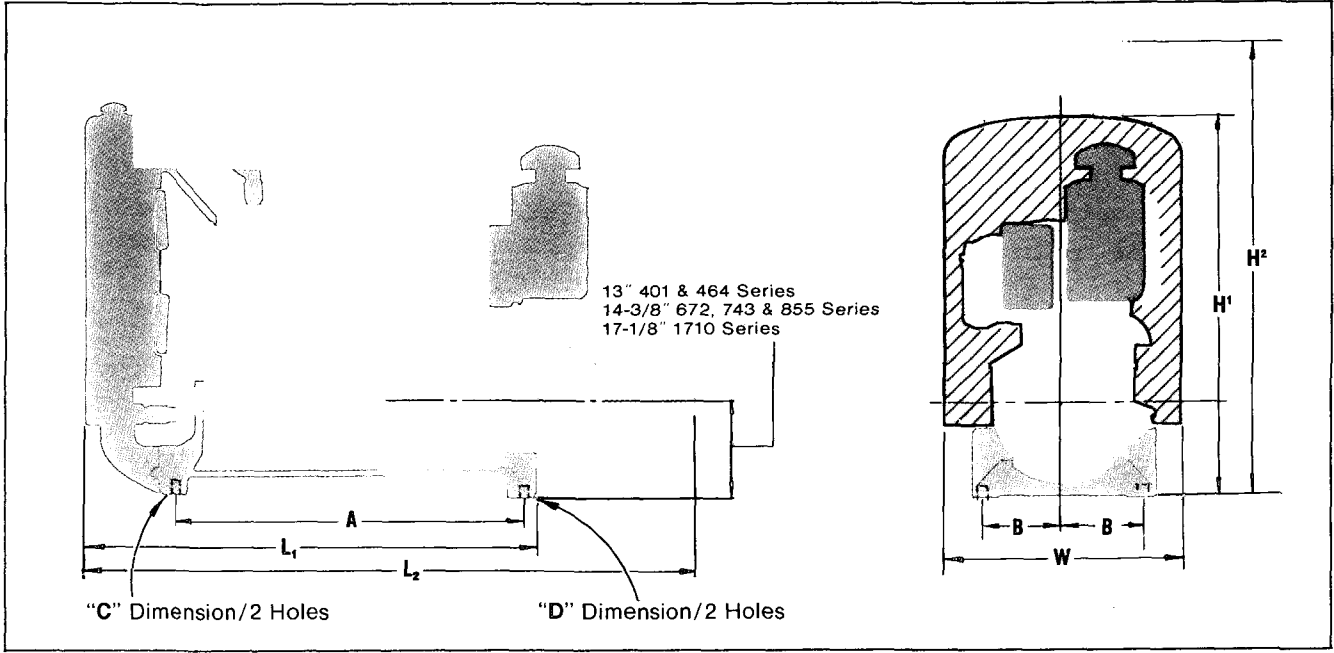
The chart below shows the principal dimensions of the basic engines in two common configurations.

The first group of columns, headed L_1 , W and H_1 shows the length (front of radiator to rear of flywheel housing), width (of radiator) and height (from floor to top of radiator) of the basic standard unit.

The second group of columns, headed L_2 , W and H_2 shows the length inclusive of the most popularly used clutch for each model, width as above, and height to top of exhaust stack—supplied when a hood is required.

The final group of columns, headed A, B, C and D locate the mounting holes longitudinally and laterally with respect to each other and the engine centerline, and also show the hole sizes.

MODEL	Max. HP	L_1		W		H_1		L_2	
		cm	In.	cm	In.	cm	In.	cm	In.
J-401-P	110	143.5	56½	83.8	33	129.9	51⅞	183.5	72¼
J-401-P	130	143.5	56½	83.8	33	129.9	51⅞	183.5	72¼
C-464-P	160	143.5	56½	83.8	33	129.9	51⅞	186.7	73½
CT-464-P	175	143.5	56½	83.8	33	129.9	51⅞	186.7	73½
CS-464-P	180	143.5	56½	83.8	33	129.9	51⅞	183.5	72¼
N-495-P	130	135.9	53½	97.5	38¾	135.6	53¾	280.1	71⅞
H-672-P	160	183.2	72⅞	94.3	37⅞	156.2	61½	244.2	96⅞
H-743-P	175	183.2	72⅞	94.3	37⅞	156.2	61½	244.2	96⅞
H-743-P	190	183.2	72⅞	94.3	37⅞	156.2	61½	244.2	96⅞
N-743-P	220	183.2	72⅞	94.3	37⅞	156.2	61½	244.2	96⅞
NS-743-P	290	183.2	72⅞	100.7	39¾	171.5	67½	249.2	98⅞
NS-743-P	320	183.2	72⅞	100.7	39¾	171.5	67½	249.2	98⅞
N-855-P	250	183.2	72⅞	100.7	39¾	156.2	61½	249.2	98⅞
NT-855-P	310	183.2	72⅞	100.7	39¾	171.5	67½	249.2	98⅞
NT-855-P	335	183.2	72⅞	100.7	39¾	171.5	67½	249.2	98⅞
NT-855-P	380	183.2	72⅞	100.7	39¾	171.5	67½	244.2	96⅞
V-352-P	140	112.1	44⅞	86.4	34	115.6	45½	Enclos	
V-470-P	185	125.7	49½	86.4	34	115.6	45½	Enclos	
V-1710-P	500	215.3	84¾	139.7	55	209.9	82¾	En	
VT-1710-P	635	215.3	84¾	139.7	55	209.9	82¾	En	
VTA-1710-P	700	215.3	84¾	139.7	55	209.9	82¾	En	
VTA-1710-P	800	215.3	84¾	139.7	55	209.9	82¾	E	



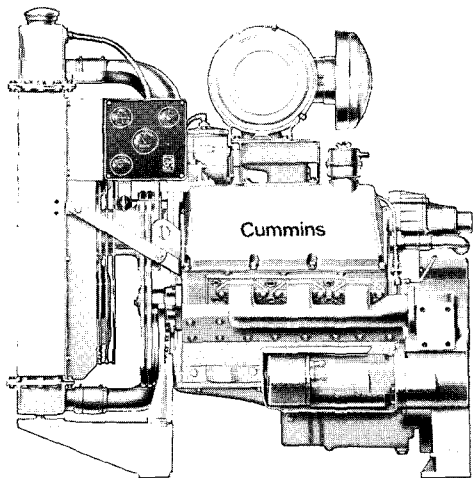
n.	H ₂		A		B		C		D	
	cm	In.	cm	In.	cm	In.	cm	In.	cm	In.
3	135.6	53 ³ / ₈	103.8	40 ⁷ / ₈	27.9	11	2.5	1	2.4	15 ¹ / ₁₆
3	135.6	53 ³ / ₈	103.8	40 ⁷ / ₈	27.9	11	2.5	1	2.4	15 ¹ / ₁₆
3	135.6	53 ³ / ₈	103.8	40 ⁷ / ₈	27.9	11	2.5	1	2.4	15 ¹ / ₁₆
3	135.6	53 ³ / ₈	103.8	40 ⁷ / ₈	27.9	11	2.5	1	2.4	15 ¹ / ₁₆
3 ³ / ₈	135.6	53 ³ / ₈	103.8	40 ⁷ / ₈	27.9	11	2.5	1	2.4	15 ¹ / ₁₆
3 ¹ / ₂	145.6	57 ³ / ₈	93.8	36 ¹ / ₁₆	25.4	10	1.7	11 ¹ / ₁₆	1.9	3 ¹ / ₄
7 ¹ / ₈	192.4	75 ³ / ₄	142.9	56 ¹ / ₄	30.5	12	2.5	1	2.4	15 ¹ / ₁₆
7 ¹ / ₈	192.4	75 ³ / ₄	142.9	56 ¹ / ₄	30.5	12	2.5	1	2.4	15 ¹ / ₁₆
7 ¹ / ₈	192.4	75 ³ / ₄	131.0	55 ¹ / ₃₂	30.5	12	2.5	1	2.4	15 ¹ / ₁₆
7 ¹ / ₈	183.5	72 ¹ / ₄	142.3	56 ¹ / ₃₂	30.5	12	2.5	1	2.4	15 ¹ / ₁₆
9 ⁵ / ₈	183.4	72 ⁷ / ₃₂	142.9	56 ¹ / ₄	30.5	12	2.4	15 ¹ / ₁₆	2.4	15 ¹ / ₁₆
9 ⁵ / ₈	183.4	72 ⁷ / ₃₂	142.9	56 ¹ / ₄	30.5	12	2.4	15 ¹ / ₁₆	2.4	15 ¹ / ₁₆
7 ¹ / ₈	183.5	72 ¹ / ₄	142.3	56 ¹ / ₃₂	30.5	12	2.5	1	2.4	15 ¹ / ₁₆
9 ⁵ / ₈	183.4	72 ⁷ / ₃₂	142.9	56 ¹ / ₄	30.5	12	2.4	15 ¹ / ₁₆	2.4	15 ¹ / ₁₆
9 ⁵ / ₈	183.4	72 ⁷ / ₃₂	142.9	56 ¹ / ₄	30.5	12	2.4	15 ¹ / ₁₆	2.4	15 ¹ / ₁₆
9 ⁵ / ₈	183.4	72 ⁷ / ₃₂	142.9	56 ¹ / ₄	30.5	12	2.4	15 ¹ / ₁₆	2.4	15 ¹ / ₁₆
n Demand					Dependent on Application					
n Demand					Dependent on Application					
ailable					Dependent on Application					
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**ENGINES
AND CURVES**

The following pages show a representative engine model of the various Cummins industrial engine series and curves for every model within each series.

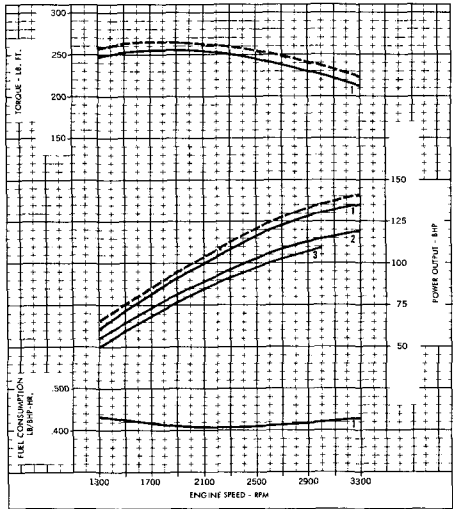
The dotted lines on the curves represent performance corrected to conditions of sea level and 60°F. air temperature. The solid lines marked by No. 1 show performance at S.A.E. standard conditions of 500 ft. altitude and 85°F. air temperature. The solid lines marked by No. 2 show recommended power setting for intermittent use. The solid lines marked by No. 3 show recommended rating for continuous duty.

352 SERIES

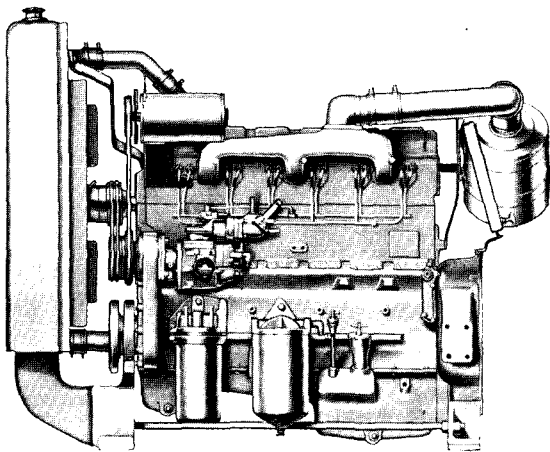


V-352-P

140 HP



401 SERIES

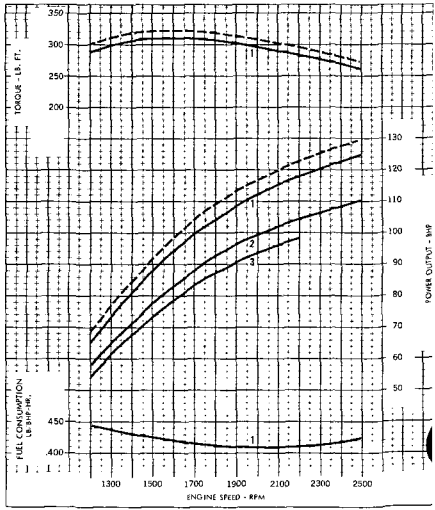
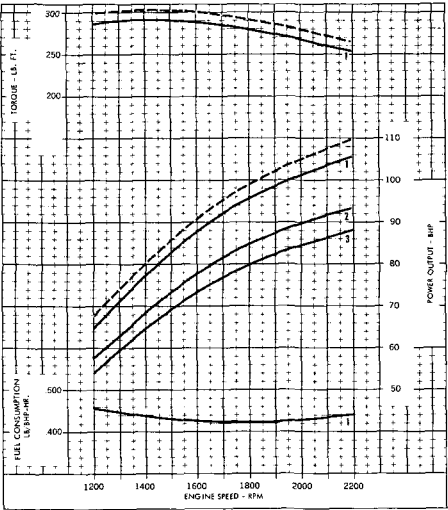


J-401-P

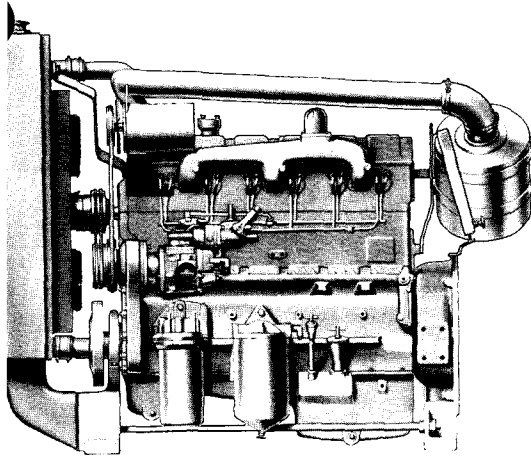
110 HP

J-401-P

130 H



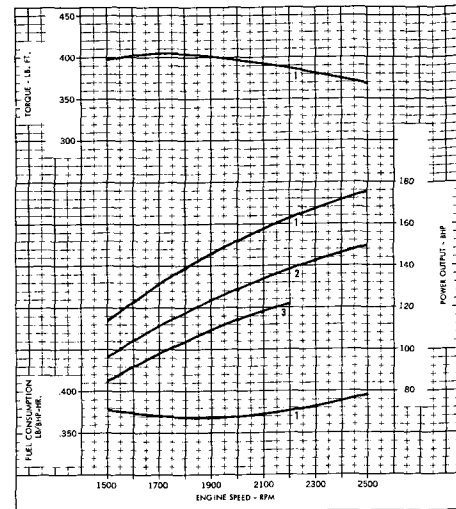
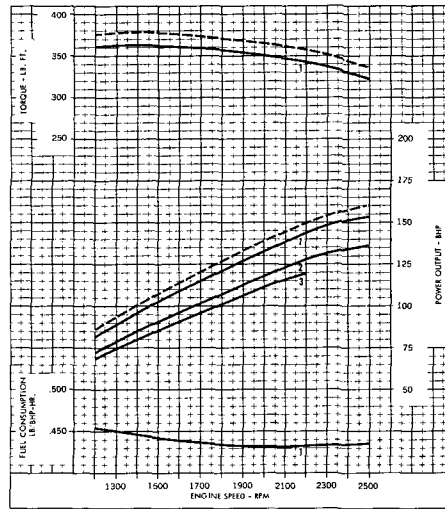
464 SERIES



C-464-P

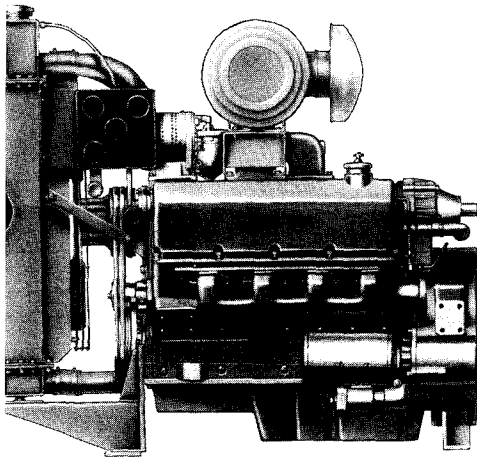
160 HP CT-464-P

175 HP



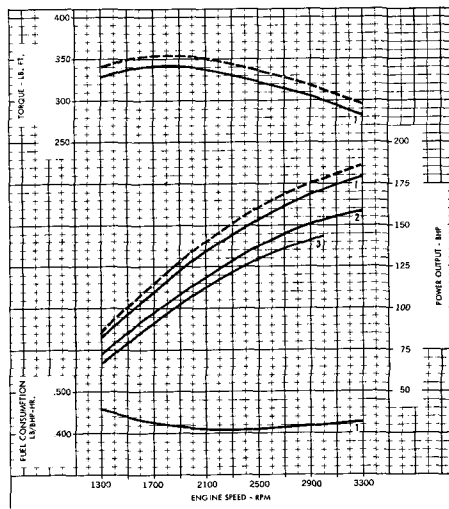
*Turbocharged

470 SERIES



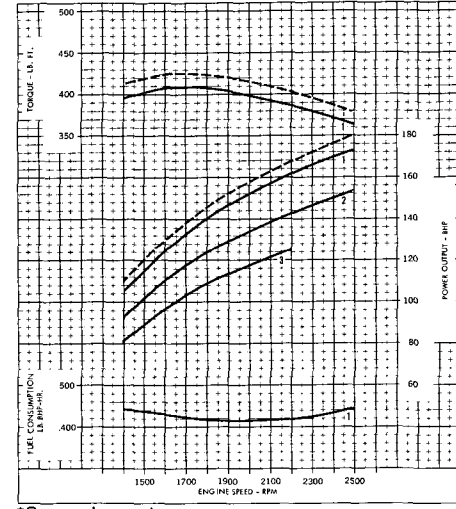
V-470-P

185 HP



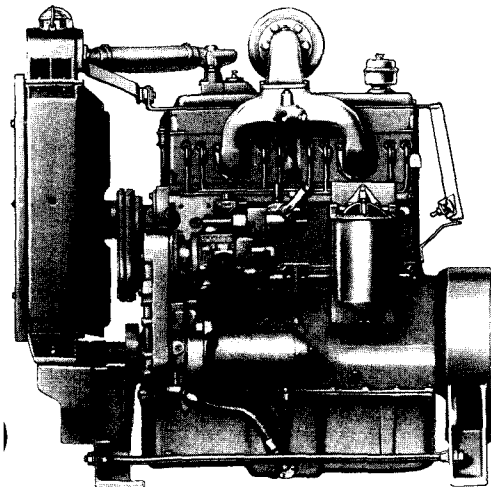
CS-464-P

180 HP



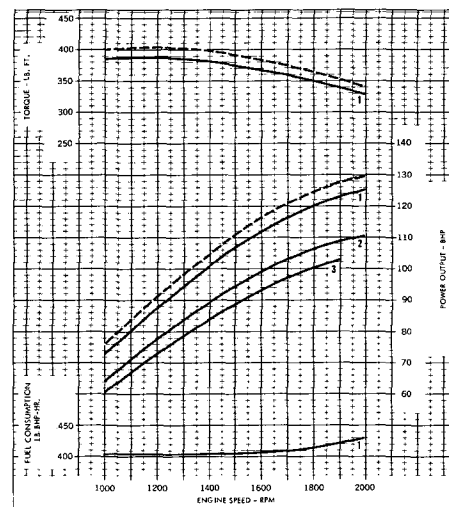
*Supercharged

495 SERIES

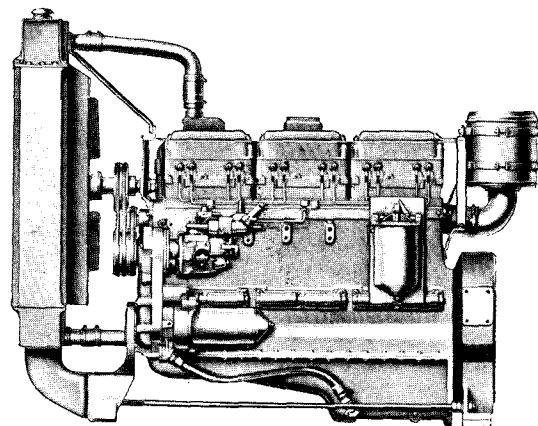


N-495-P

130 HP

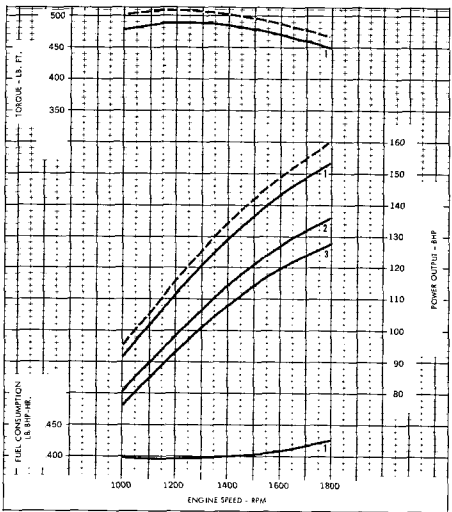


672 SERIES

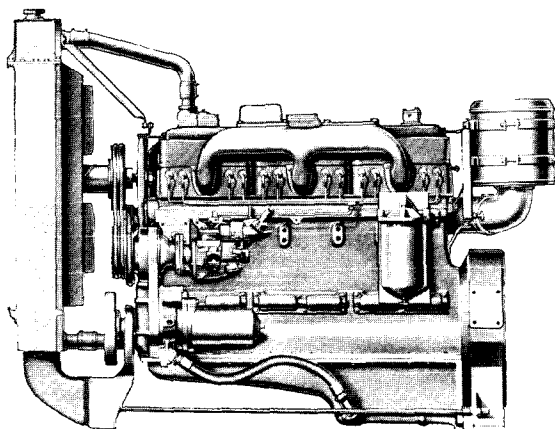


H-672-P

160 HP



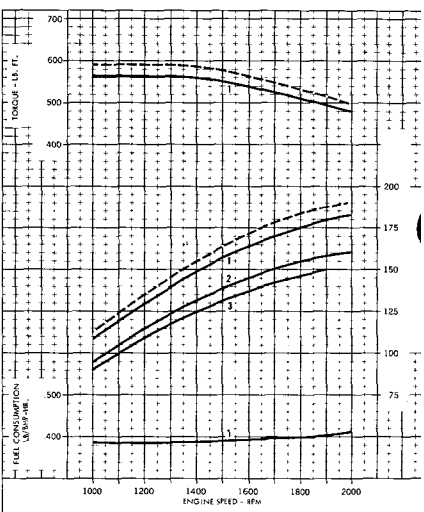
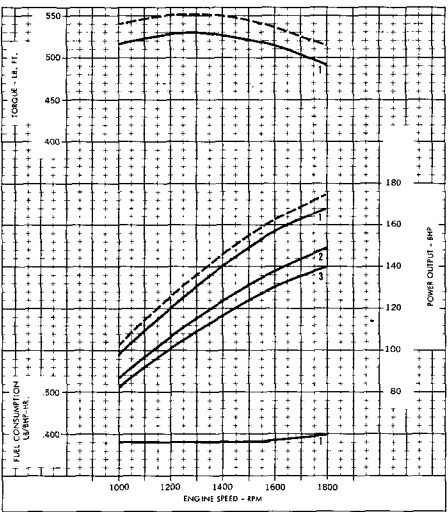
743 SERIES



H-743-P

175 HP H-743-P

190 HP



N-743-P

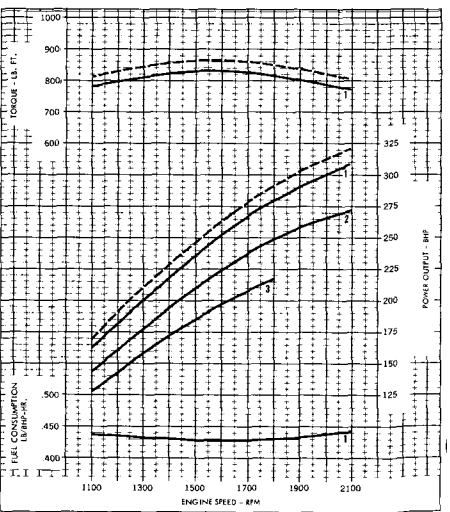
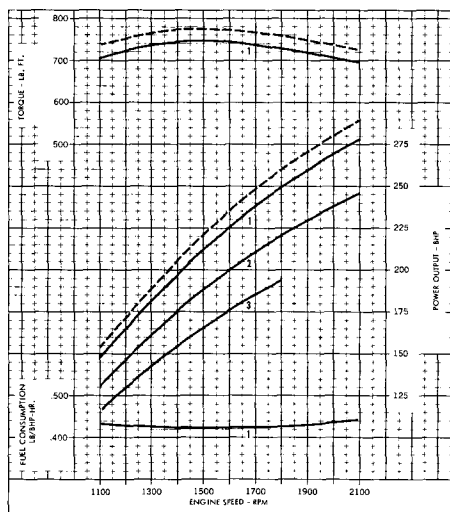
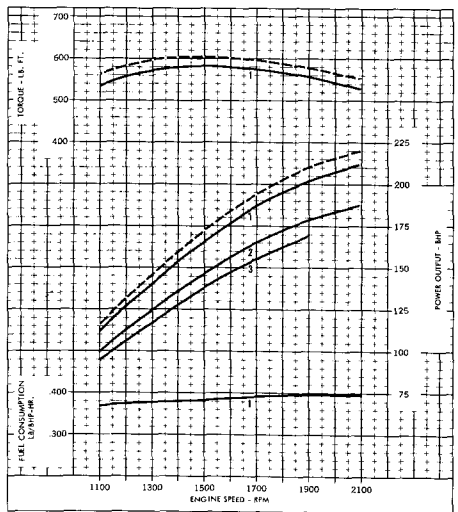
220 HP

NS-743-P

290 HP

NS-743-P

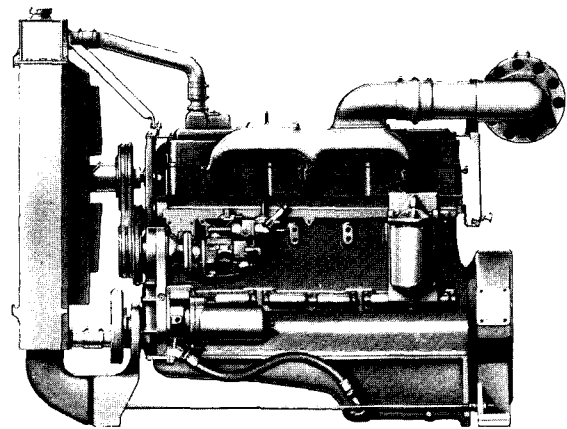
320 HP



*Supercharged

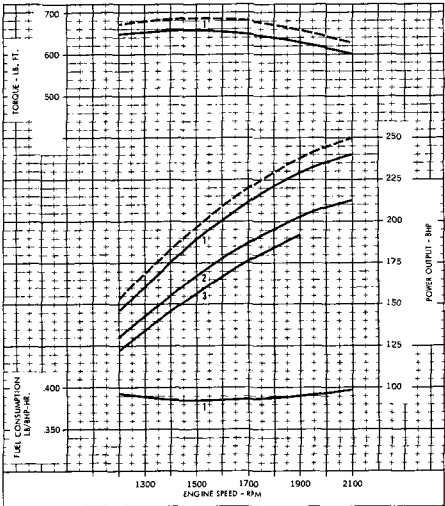
*Supercharged

855 SERIES



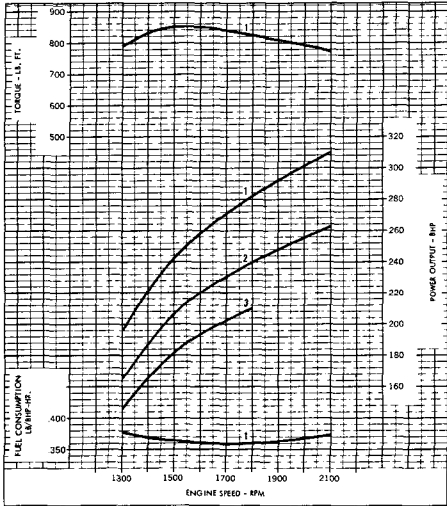
N-855-P

250 HP



NT-855-P

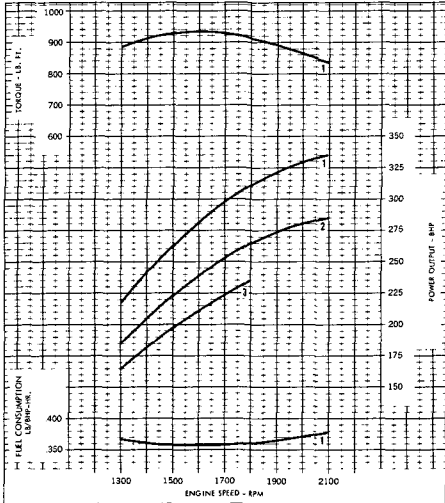
310 HP



*Turbocharged

NT-855-P

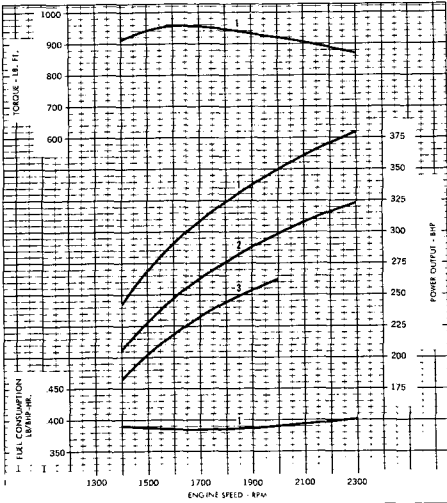
335 HP



*Turbocharged

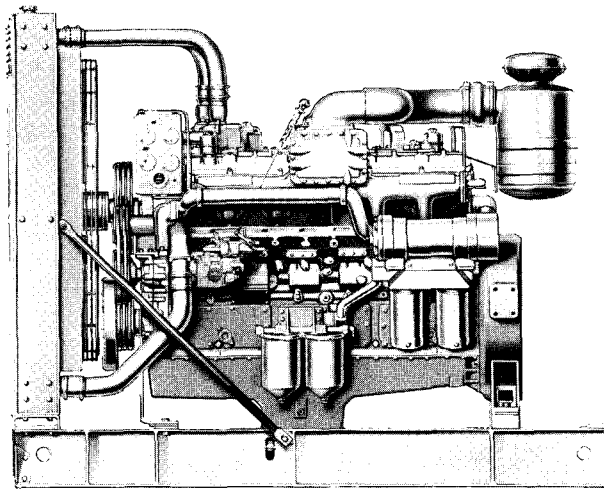
NT-855-P

380 HP

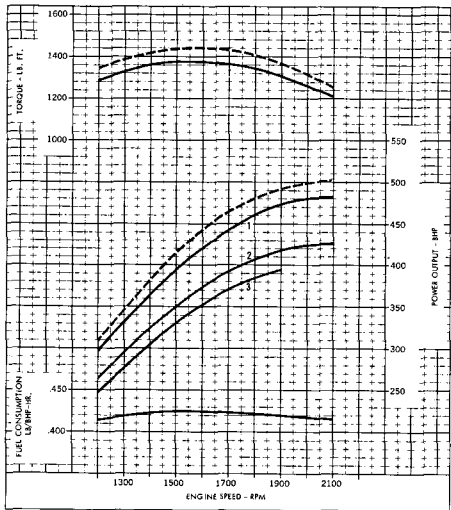


*Turbocharged

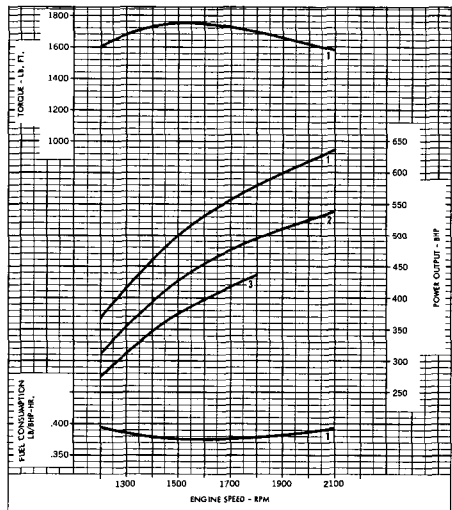
1710 SERIES



V-1710-P 500 HP

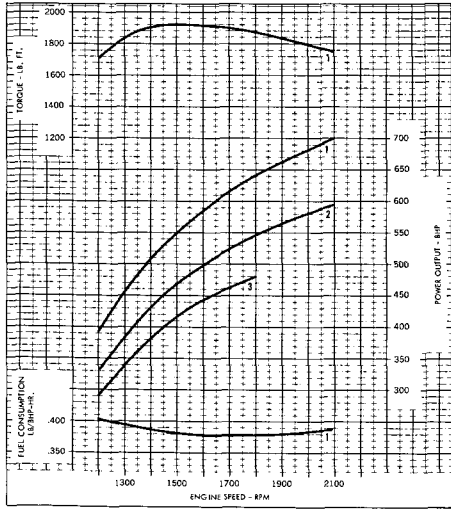


VT-1710-P 635 HP



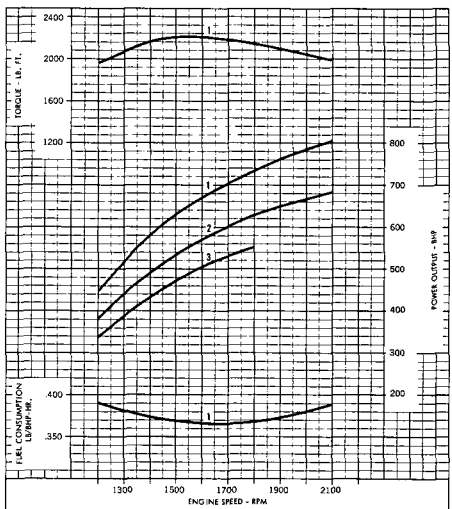
*Turbocharged

VTA-1710-P 700 HP



*Turbocharged

VTA-1710-P 800 HP

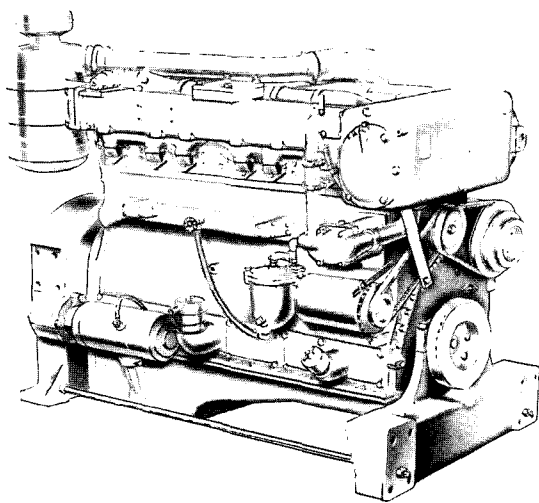


*Turbocharged

INDUSTRIAL FIRE PUMP UNITS

Through selected models Cummins offers a complete line of fire pump engines. These engines have been tested and approved by Underwriters' Laboratories and by Factory Mutual.

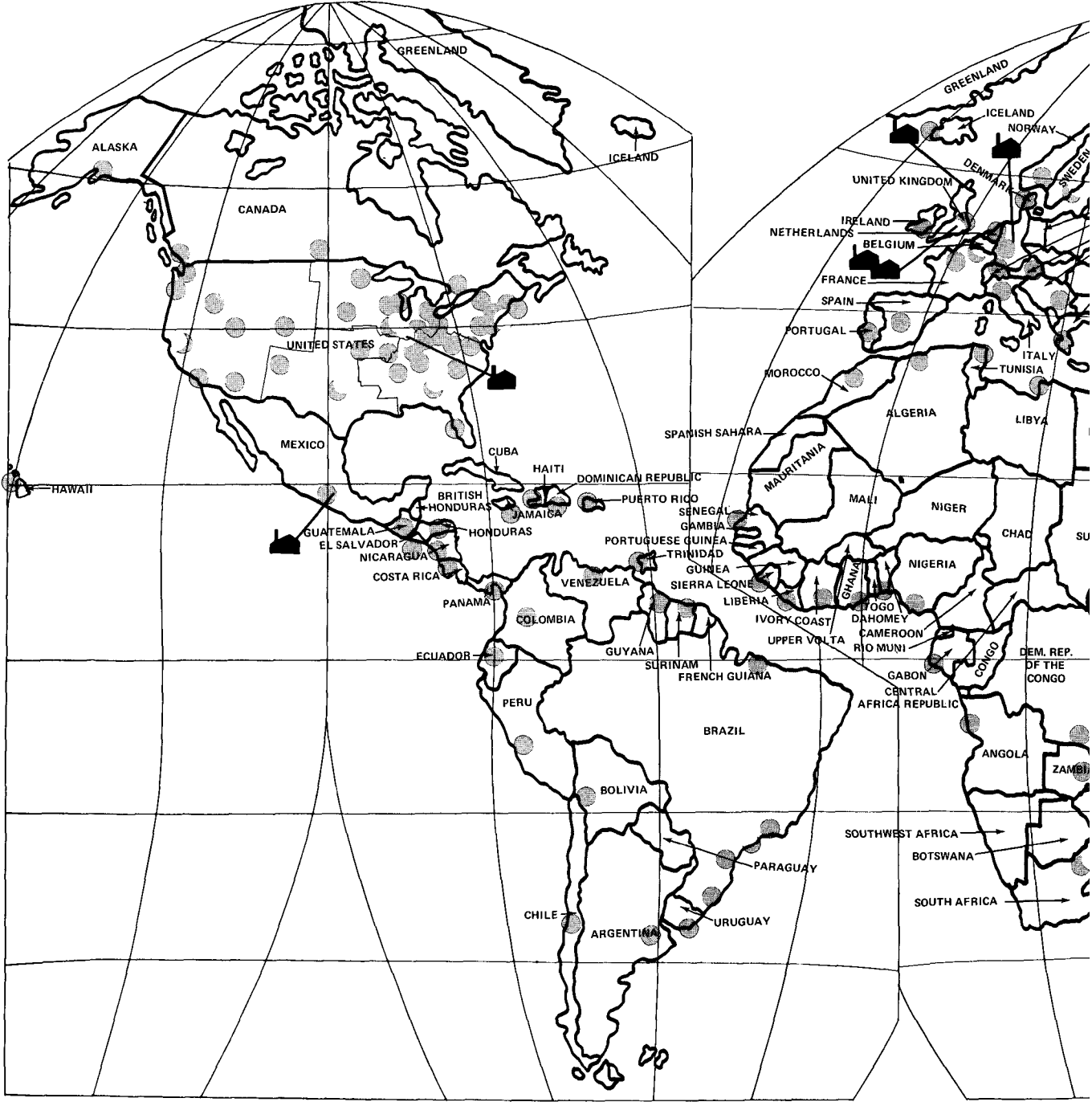
As illustrated below standard equipment includes a mounted tubular type heat exchanger for cooling, a water cooled exhaust manifold, an oil bath air cleaner, 24 volt electrics—including starting motor, 20 ampere generator, voltage regulator and starting switch—flywheel, drive flange and drive shaft, pedestal supports and mounted instrument panel with gauges.



The specific models and approved rating points are shown in the chart below.

Cummins Fire Pump Engine Models	Underwriters' Laboratories Ratings HP @ RPM	Factory Mutual Ratings HP @ RPM
H-6-IF	135 @ 1750	137 @ 1750 139 @ 1800
NH-220-IF	175 @ 1750	172 @ 1750 182 @ 1900 191 @ 2100
NHS-6-IF	225 @ 1750	220 @ 1750 234 @ 1900 252 @ 2100
NHRS-6-IF	225 @ 1750	246 @ 1750 260 @ 1900 278 @ 2100
NT-380-IF	285 @ 1750 303 @ 1900 325 @ 2100 340 @ 2300	274 @ 1750 304 @ 2000 330 @ 2300

**CUMMINS
WORLDWIDE
ORGANIZATION**





International Operations
West

Regions

Mexico
Caribbean
Central & Pacific
So. Latin America
Brazil
Europe & N. W. Africa
Mid Africa
South Africa

○ Distributor Headquarters

○ Regional Offices

■ Manufacturing Operations

Cummins means Diesel

Cummins Engine Company, Inc., Columbus, Indiana, U.S.A.

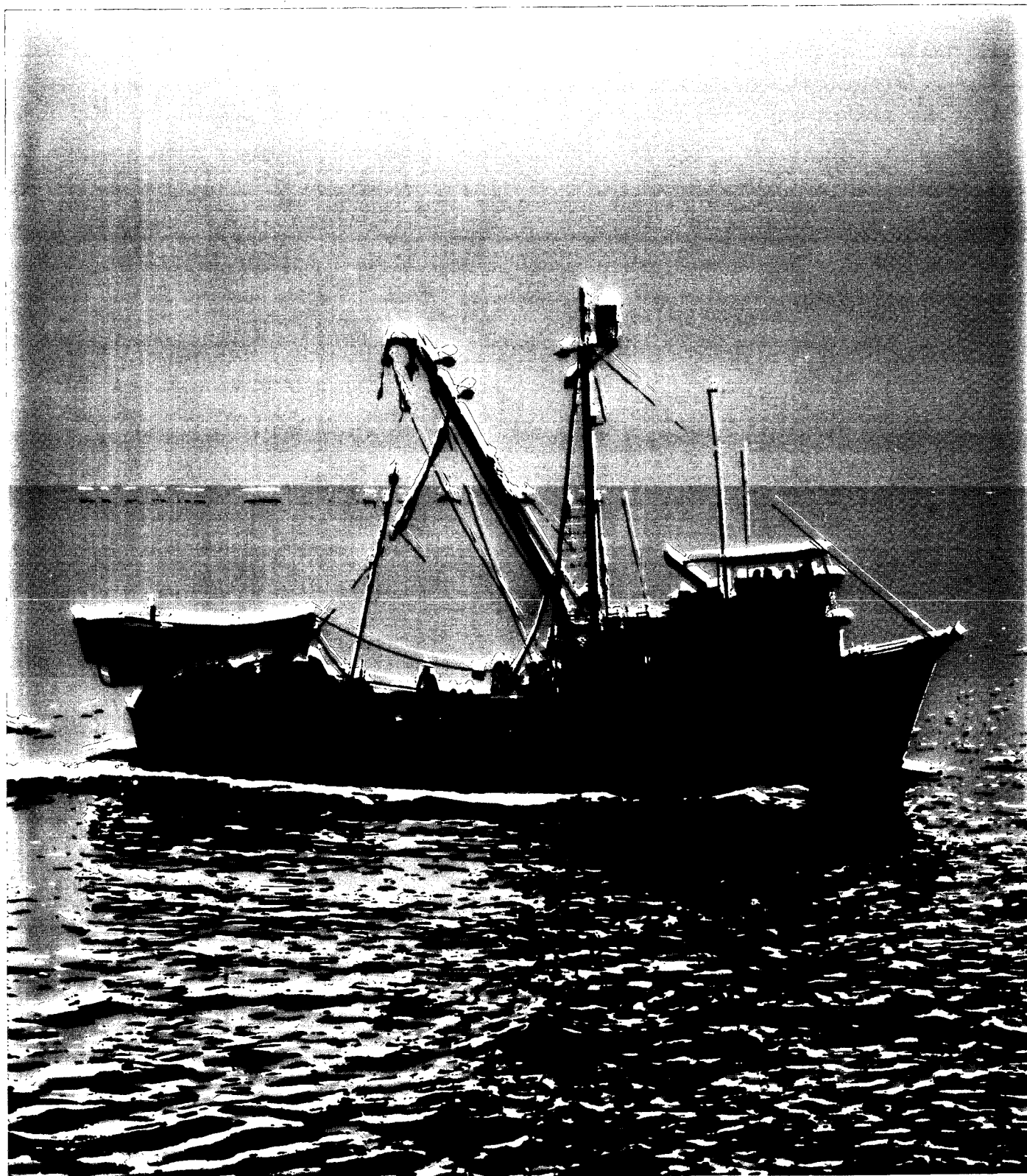
Cummins Americas, Inc., Columbus, Indiana, U.S.A.

Cummins Diesel Australia, Ringwood, Australia

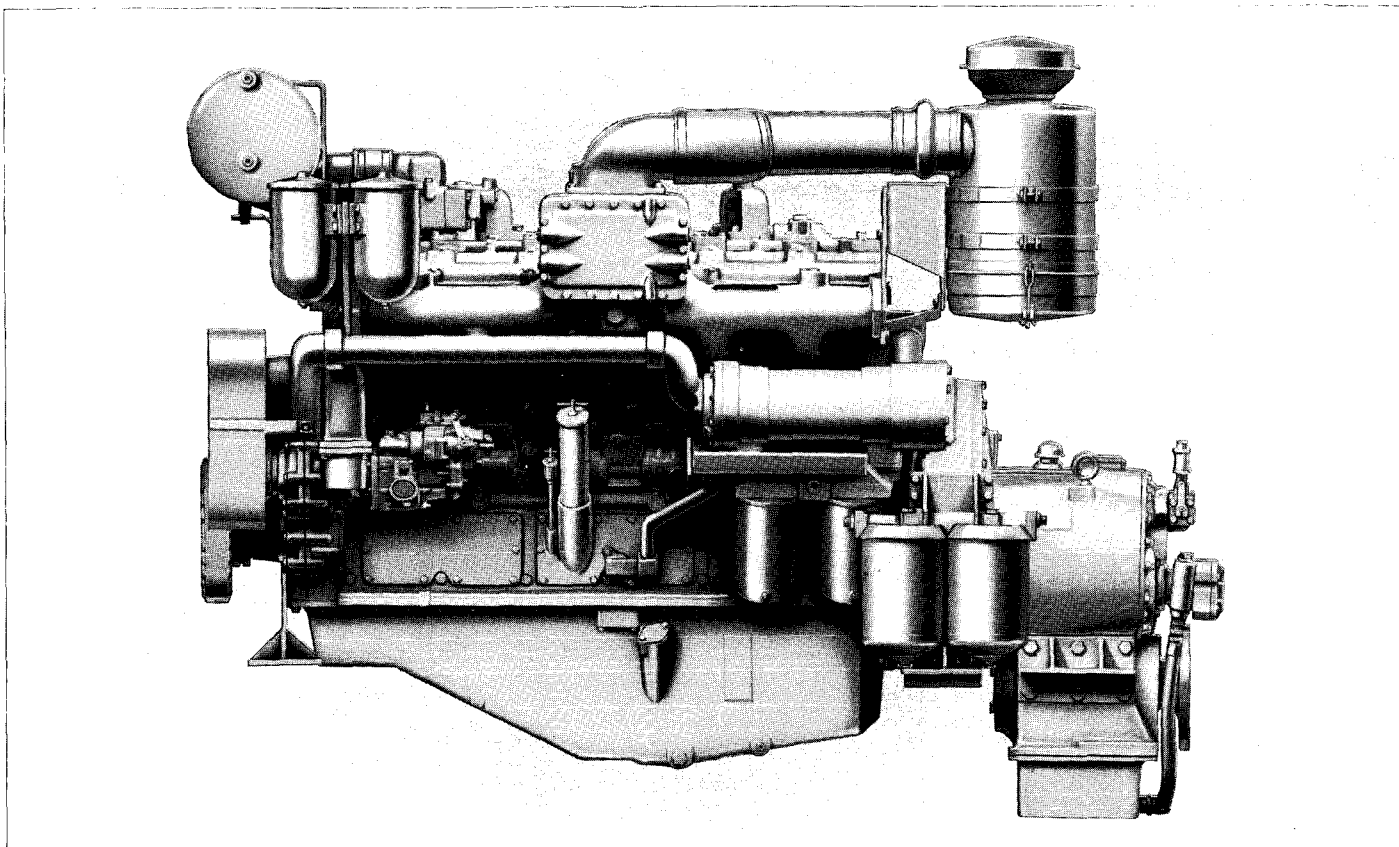
Cummins Diesel International Ltd.

Cummins Engine Company Ltd., London, England

**Cummins diesels
for workboats
and fishing boats**



Cummins marine diesels- more power at lower cost



Workboat and fishing boat owners who demand the highest dependability and lowest operating costs from marine diesels specify Cummins. Cummins powerful in-line and V marine diesels are designed to provide the longest possible life, maximum reliability, and lowest operating costs for all types of workboat and fishing boat applications.

Cummins has twelve rugged marine diesels from 128 to 550 continuous horsepower that are used extensively in tug boats, trawlers, towboats, seiners, pushers, gill netters, barges, ferry boats, shrimpers, fire boats, charter boats, patrol boats, and crew boats.

Cummins industrial-type engines from 110 to 800 HP, and generator sets from 50 to 450 KW are also available to power such marine service applications as lighting, communications, navigation, pumping, dredging, barge unloading, winches, bow thrusters, and accessory equipment.

Long Life

Cummins marine diesels are built to last. These rugged engines average thousands of hours before a major overhaul is necessary. There are numerous Cummins marine diesels still running after 30,000 or more hours. A Cummins model F engine has been in continuous operation for 40 years on the Doreen, a sturdy little fishing boat owned by Mr. H. Gates of Willoughby, N.S.W., Australia. Through the years a Cummins engine will repay its initial cost many times.

And when it does finally become necessary to rebuild, features such as replaceable cylinder liners and regrindable crankshafts permit repair of the engine so that many more years of highly productive life can be profitably realized. Also, Cummins design features make a minor overhaul possible without removing the engine from the boat.

Reliability

There are many design features

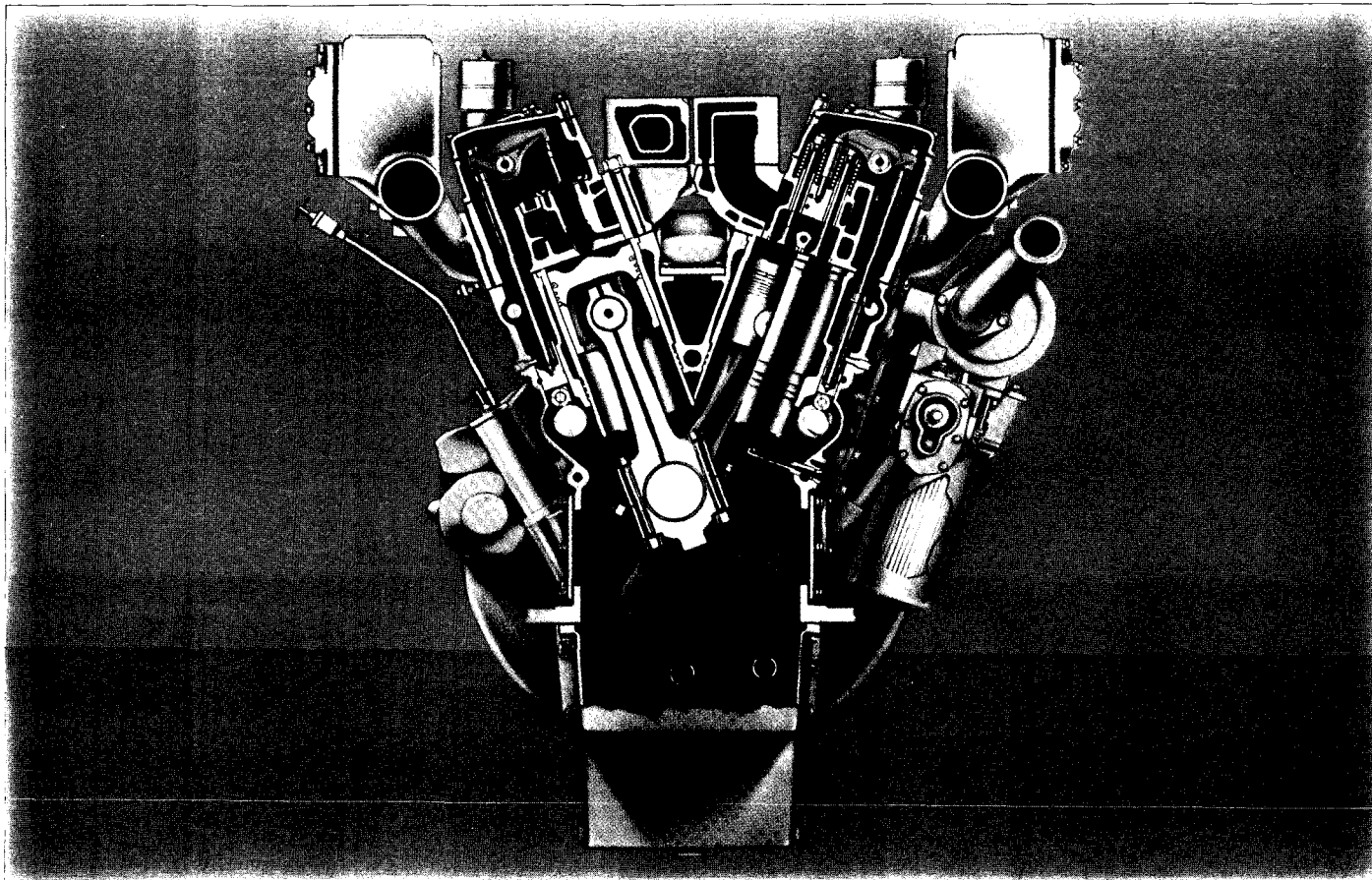
contributing to Cummins outstanding reliability. These design concepts have been proven under the most adverse operating conditions in worldwide marine applications ranging from intermittent light duty to 24 hour-a-day heavy duty operation. Among these proven features are rapid heat dissipation, high tensile strength components, efficient four cycle operation, internal lubricating oil lines, and Cummins patented PT Fuel System with internal fuel lines.

Economy

Cummins long life means more power per dollar invested. Proven reliability means that costly breakdowns and maintenance expenses will not take away profits.

Lower fuel costs can offer the greatest savings of all. Owners and captains report that Cummins diesels use considerably less fuel than they had anticipated. Higher horsepower per weight ratios offer additional savings.

Cummins tested and proven design features



Big Displacement

Big displacement design utilizes a large bore and allows use of bigger valves for improved breathing and better fuel economy. Big displacement reduces cylinder pressures and temperatures for long life.

PT Fuel System

The pressure-time fuel system is the simplest, most maintenance-free diesel fuel system available. Precise metering and complete atomizing of fuel assures better fuel economy than other diesel fuel systems. Internal fuel lines eliminate fuel leaks and decrease maintenance costs.

Dual Overhead Valves

Dual overhead intake and exhaust valves provide free breathing. Intake valves are silichrome steel and exhaust valves are

hard faced nitrogen steel for high temperature strength and long life. Exhaust valve seats are hardened inserts.

Replaceable Cylinder Liners

Replaceable wet-type cylinder liners transfer combustion heat to coolant rapidly. In-boat overhauls are practical because the block does not need reboring.

Regrindable Crankshaft

Crankshaft journals are induction hardened deep enough for several regrinds. They are precision machined from high tensile strength alloy steel.

Cam Ground Pistons

Cam ground pistons assure a perfect fit at operating temperatures. Cummins pistons are manufactured from light weight aluminum alloy.

Induction Hardened Valve Train

Induction hardened camshaft actuates valves and injectors through a hardened push rod and rocker lever arrangement. Roller-type cam followers provide long life with nearly friction-free action.

Four Cycle Design

All Cummins engines are four cycle offering the advantages of better fuel economy and lower maintenance costs.

Open Combustion Chamber

Open-type combustion chambers mix air and fuel thoroughly for smooth, complete, efficient burning of low cost diesel fuel.

Corrosion Resistor

Replaceable element checks rust and corrosion, controls acidity, and removes impurities from the coolant to reduce maintenance and increase engine life.

Cummins workboat/fishing boat propulsion diesels

Model	1 Light Duty BHP @ RPM	2 Medium Duty BHP @ RPM	3 Heavy Duty BHP @ RPM	Dis- place- ment litres (cu. in.)	Bore & Stroke mm. (in.)	No. of Cyls.	Marine Gear	Length cm. (in.)	Height cm. (in.)	Width cm. (in.)	Weight kg. (lbs.)
V-470-M	170 @ 3000	NA	128 @ 2500	7.7 (470)	117.5 x 88.9 (4 5/8 x 3 1/2)	8	Twin Disc 1.93:1	140.2 (55 3/16)	78.1 (30 3/4)	81.6 (32 1/8)	794 (1750)
V8-300-M	260 @ 2800	NA	220 @ 2600	12.8 (785)	139.7 x 104.7 (5 1/2 x 4 1/8)	8	Twin Disc 1.93:1	158.2 (62 9/32)	83.8 (33)	99.1 (39)	1140 (2515)
VT8-370-M	320 @ 2800	NA	270 @ 2600	12.8 (785)	139.7 x 104.7 (5 1/2 x 4 1/8)	8	Capitol 2.05:1	175.2 (69)	87.6 (34 1/2)	99.1 (39)	1259 (2775)
HR-175-M	NA	NA	140 @ 1800	12.2 (743)	130.2 x 152.4 (5 1/8 x 6)	6	Twin Disc 3.83:1	209.5 (82 15/32)	123.1 (48 15/32)	82.5 (32 1/2)	1551 (3420)
NH-250-M	210 @ 2100	200 @ 1800	190 @ 1800	14.0 (855)	139.7 x 152.4 (5 1/2 x 6)	6	Twin Disc 4.5:1	209.5 (82 15/32)	138.4 (54 1/2)	87.0 (34 1/4)	1583 (3490)
NT-335-M	285 @ 2100	265 @ 1800	235 @ 1800	14.0 (855)	139.7 x 152.4 (5 1/2 x 6)	6	Capitol 4.55:1	218.0 (85 27/32)	118.9 (46 27/32)	89.2 (35 1/8)	1803 (3975)
NT-380-M	320 @ 2300	300 @ 2000	253 @ 2000	14.0 (855)	139.7 x 152.4 (5 1/2 x 6)	6	Capitol 4.55:1	218.0 (85 27/32)	118.9 (46 27/32)	89.2 (35 1/8)	1803 (3975)
V12-500-M	425 @ 2100	400 @ 1800	370 @ 1800	28.0 (1710)	139.7 x 152.4 (5 1/2 x 6)	12	Twin Disc 4.13:1	240.6 (94 23/32)	178.2 (70 3/16)	124.9 (49 3/16)	3166 (6980)
VT12-635-M	540 @ 2100	490 @ 1800	435 @ 1800	28.0 (1710)	139.7 x 152.4 (5 1/2 x 6)	12	Twin Disc 4.08:1	278.8 (109 25/32)	167.0 (65 3/4)	129.3 (50 29/32)	3624 (7990)
VT12-700-M	595 @ 2100	545 @ 1800	480 @ 1800	28.0 (1710)	139.7 x 152.4 (5 1/2 x 6)	12	Twin Disc 4.08:1	278.8 (109 25/32)	167.0 (65 3/4)	129.3 (50 29/32)	3683 (8120)
VT12-800-M	680 @ 2100	620 @ 1800	550 @ 1800	28.0 (1710)	139.7 x 152.4 (5 1/2 x 6)	12	Twin Disc 4.08:1	278.8 (109 25/32)	167.0 (65 3/4)	129.3 (50 29/32)	3683 (8120)

NA = Not Applicable

1.
Light Duty rating is intended for intermittent application of full throttle not exceeding 8 hours total in any 24 hour period, such as crew boats and charter fishing boats.

2.
Medium Duty rating is intended for commercial fishing applications, with full throttle operation not exceeding 15 hours total in any 24 hour period, such as trawlers, seiners, and gill netters.

3.
Heavy Duty rating is intended for heavy duty, continuous full throttle operation 24 hours a day, such as tow boats, tugs, self-propelled barges, and freighters.

Marine gear listed is design standard — many other models and ratios are also available.

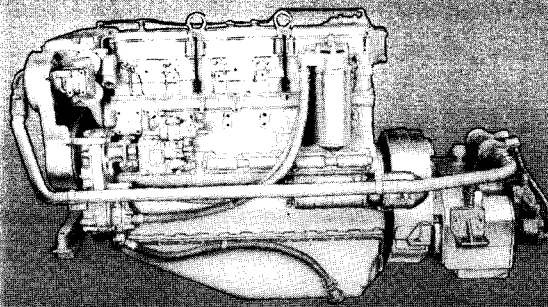
Dimensions and weights are based on engines equipped with heat exchanger,

raw water pump, reverse and reduction gear, electric starting motor and battery charging generator, and other standard accessories.

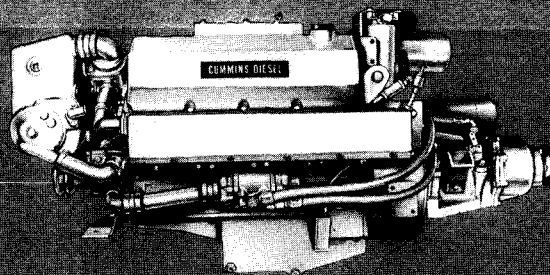
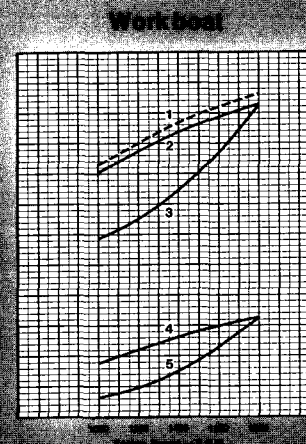
Propulsion power: model and performance

The following curves represent performance of the engine using No. 2 diesel fuel. All data is obtained at 29.4°C (85°F) ambient air temperature, and 746mm. (29.38 in.) Hg. barometric pressure.

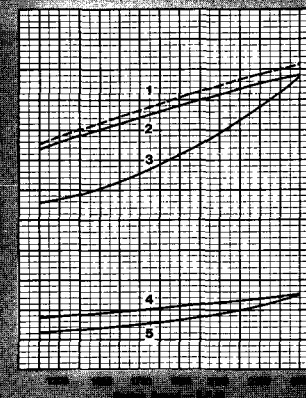
1. Gross brake horsepower.
2. Net horsepower with reverse reduction gear, generator and raw water pump.
3. Hypothetical propeller power curve (3.0 exponent).
4. Fuel consumption for net shaft horsepower.
5. Fuel consumption for hypothetical propeller.



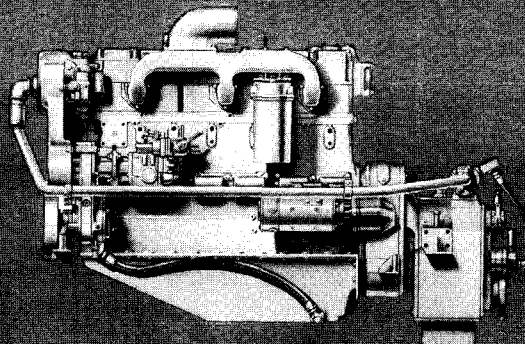
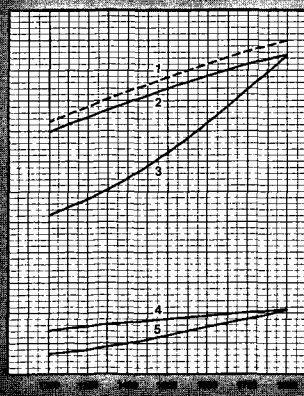
195-175-40



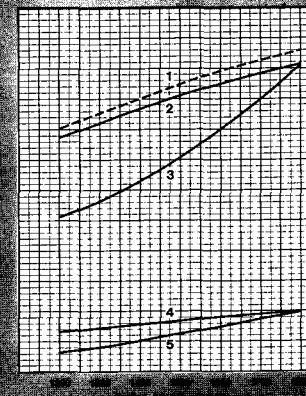
195-175-40



Fishing boat

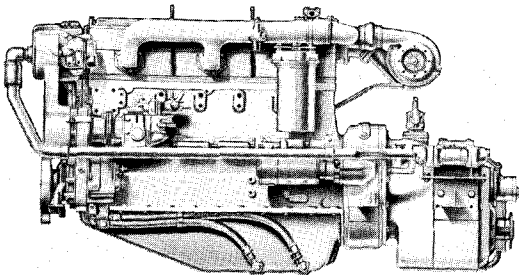
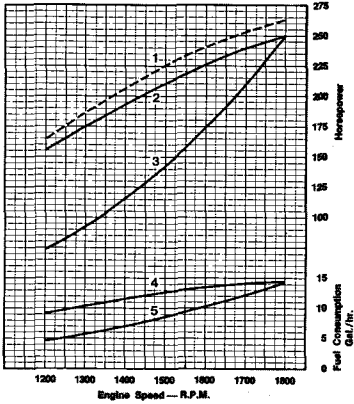


195-175-40



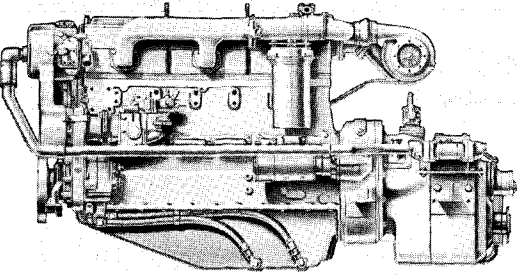
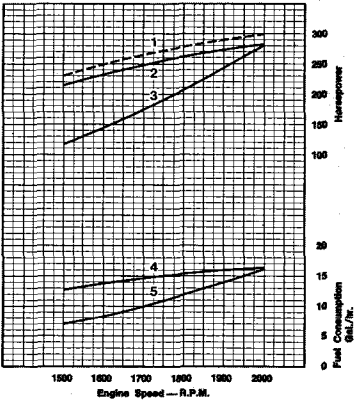
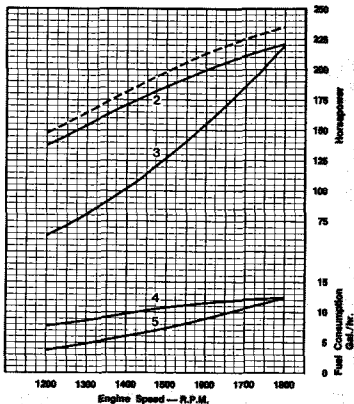
Model and performance

Fishing boat

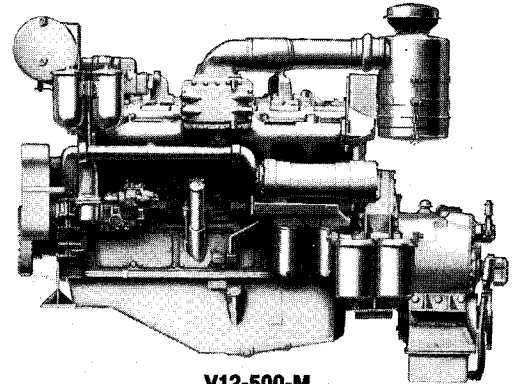
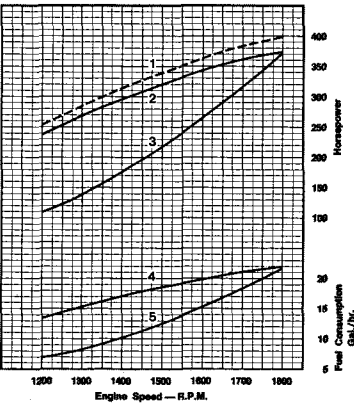
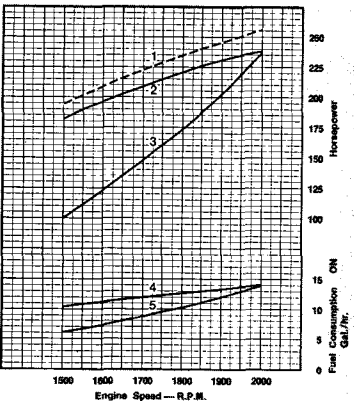


NT-335-M

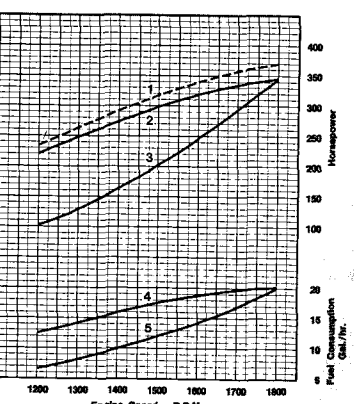
Work boat

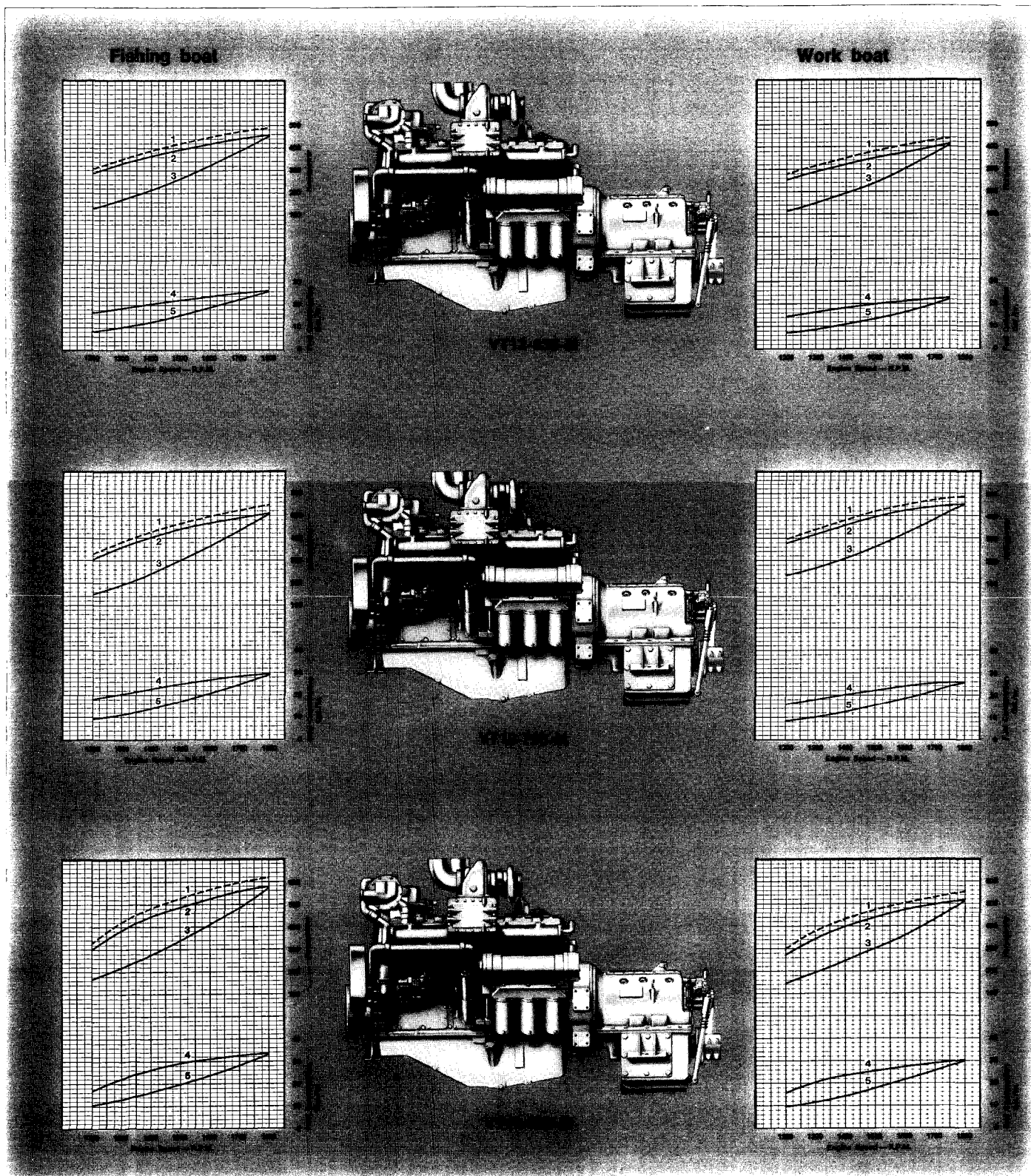


NT-380-M

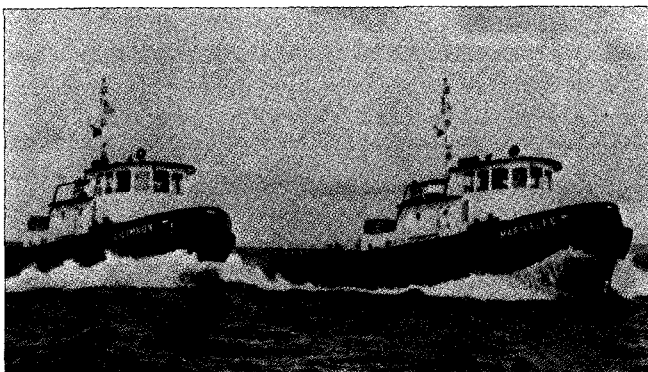


V12-500-M





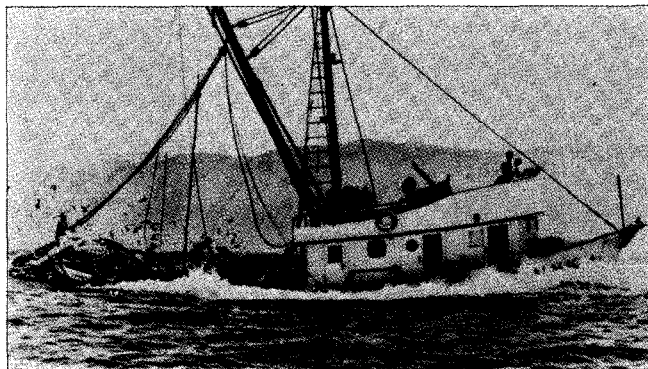
Cummins proven workboat/fishing boat performance



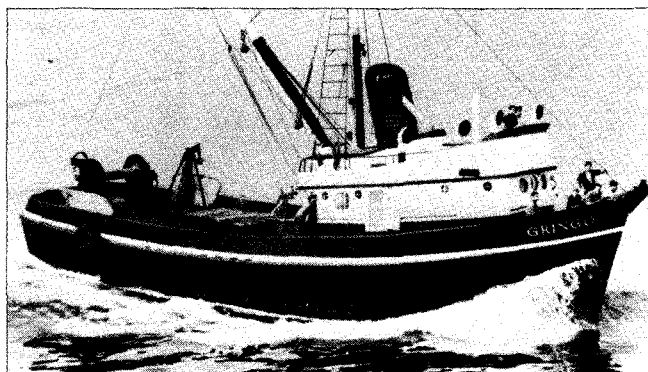
Assisting in Philippine harbor development programs, the twin tugs "Lilimbon" and "Mariveles" are each powered by a Cummins V12 marine diesel.



The 16.7m (55 ft.) fishing boat "Strandby" of Hartlepool, England, reports improved catches since its repower in 1967 with a Cummins H series marine engine.



Loaded to capacity, the 20m (66 ft.) anchovy seiner "Dalmacia" heads back to its Chilean port under dependable Cummins power. (Photo courtesy of MARCO).



Operating out of Chile, the Cummins powered seiner/trawler "Gringo" holds a production record for landing over 11,000 metric tons of hake in one year (Photo courtesy of MARCO).

Boat owners everywhere have proven Cummins reliability, long life and economy in the most demanding workboat and fishing boat applications. They have found that Cummins diesels deliver more propeller power than engines of comparable size and weight with lower operating costs.

Twin 20m (66 ft.) steel tugs, each powered by a Cummins V12 marine diesel have been working since 1967 in Philippine harbor development programs. Christened the "Lilimbon" and "Mariveles", the tugs are designed for towing barges and floating equipment such as dredges and pile drivers. Owned by the Bureau of Public Works, Republic of the Philippines the tugs have a beam of 5.7m (18 ft. 9 in.) a draft of 2m (7 ft.), and are capable of a 2500-nautical-mile cruising range.

The 16.7m (55 ft.) wooden fishing boat "Strandby", of Hartlepool, England, was repowered in 1967 with an H series Cummins marine diesel. Rated at 110 s.h.p. at 1600 RPM, this engine has proven to be thoroughly reliable. Since the repower the "Strandby" has been fishing regularly and has clocked over 4,000 hours on the engine. Only routine maintenance has been necessary. Mr. J. Stephenson, owner and Mr. S. Lyons, captain of the "Strandby", are very satisfied with their Cummins engine, and are more than pleased with the boat's improved catches since repowering.

The "Dalmacia", an anchovy trawler, and the "Gringo" a combination seiner/trawler, are both part of a very large Cummins powered fishing fleet operating out of southern Chile. Built by Marco Chilena Shipyard, in Iquique, Chile, these boats have been very successful. Mr. Darrell H. Jorgenson, Jr., Fleet Manager for Marco Chilena in the early 1960's recently commented: "The Marco Chilena fleet found the Cummins V12-500-M engine the most dependable and operationally economical engine in that horsepower range. In a two year period of operation we never had to pull a cylinder head nor any major component on a group of twelve engines."

Cummins is also well represented in the Chilean fleet by a number of NT-380-M diesels installed in 20m (66 ft.) fishing vessels, and a variety of U. S. built seiners repowered with Cummins diesels.

Cummins engines have also proven themselves in light-duty commercial applications as crew boats, ferry boats, fire boats and pilot cutters.

The United Kingdom's Trinity House Service now has three launches powered by twin Cummins V-470-M engines, with additional Cummins powered craft under construction. Trinity House offers a pilot service in all U. K. ports, providing high performance launches to transport pilots from shore to ship and ship to shore, even under extremely inclement weather conditions.

Many Cummins V8 diesels are now operating in fire boats in the Japanese port cities of Kobe, Osaka, Chiba, Sakai and Kawasaki. Cummins versatility in these applications is proven by the fact that Osaka's twin diesel powered 52 ton fire boat is of catamaran twin hull design. In other areas of the Far East, such as Thailand and Korea, Cummins marine diesels are becoming increasingly popular as shown by those countries' recent purchases of a number of Cummins powered custom patrol boats.

Three Cummins VT12-700-M diesel engines power the 46.3m (152 ft.) ferry boat "Viva Pena Francia IV" operating in the Philippines. Mr. Domingo Reyes, owner of the Viva Shipping Company, reports that repowering several of his boats with Cummins diesels has increased speeds considerably and that operation has been continuous and trouble-free.

An unusual, but very successful application of Cummins marine engines has been in hovercraft. A good example is the Cummins powered HM 2 hovercraft built by Hovermarine Ltd. This vessel is now in use by British Railways on their "Seaspeed" transport service between Portsmouth, England, and Ryde, Isle of Wight. The Hovercraft, an immersed sidewall type, is powered by three Cummins V engines. It has cut the normal 24 minute trip to 12 minutes, and carries 65 passengers at speeds of up to 35 knots.

Reports such as these show why boat owners around the world look to Cummins proven power for their workboats and fishing boats. Contact your Cummins distributor for complete details on installing Cummins diesels in your particular marine application.

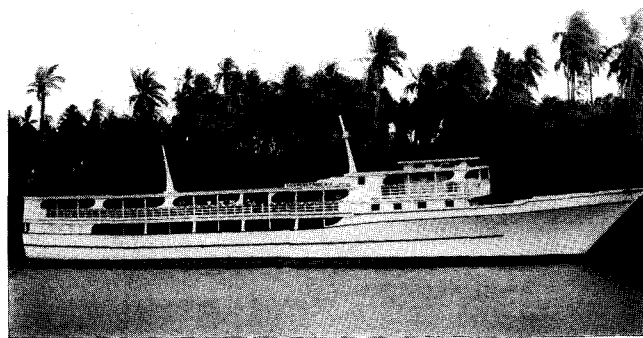
One of several V-470-M powered Trinity House pilot launches now in service in U. K. ports.



Powered by twin VT8-370-M Cummins diesels, this 17.5 m (57½ ft.) fire boat is at work at the Chiba Fire Station, Chiba, Japan.



The "Viva Pena Francia IV", a ferry boat operating in the Philippines, is powered by three Cummins VT12-700-M engines.



The HM 2, one of Hovermarine's immersed sidewall type hovercraft, uses three Cummins V series marine engines to transport passengers between Portsmouth, England and Ryde, Isle of Wight.



Cummins marine generator sets



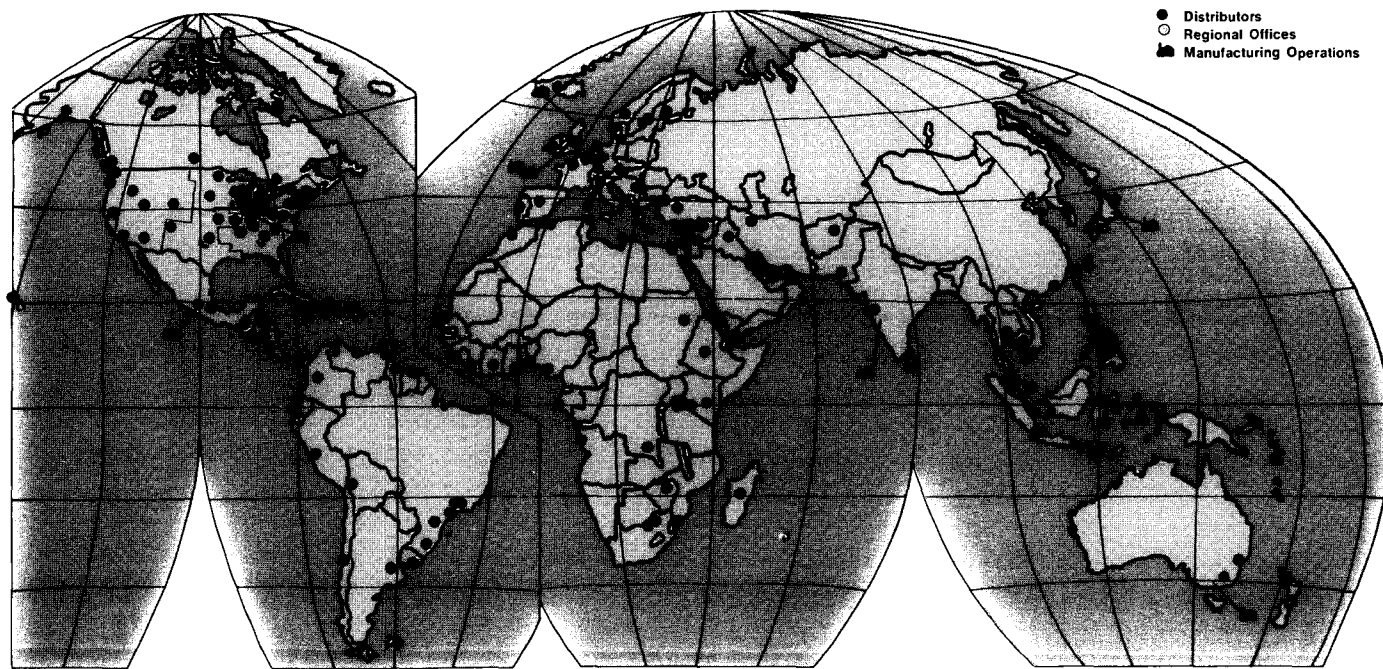
Model	PRIME POWER RATINGS (GC)		AUXILIARY POWER RATINGS (GS)	
	50 Hertz — 0.8 Power Factor KW @ RPM	60 Hertz — 0.8 Power Factor KW @ RPM	50 Hertz — 0.8 Power Factor KW @ RPM	60 Hertz — 0.8 Power Factor KW @ RPM
NH-4-GC/GS	45 @ 1500	50 @ 1800	50 @ 1500	60 @ 1800
NHC-4-GC/GS	50 @ 1500	60 @ 1800	60 @ 1500	75 @ 1800
HR-6-GC/GS	65 @ 1500	75 @ 1800	85 @ 1500	100 @ 1800
NH-220-GC/GS	85 @ 1500	100 @ 1800	100 @ 1500	125 @ 1800
NT-270-GC/GS	100 @ 1500	125 @ 1800	125 @ 1500	150 @ 1800
NT-310-GC/GS	125 @ 1500	150 @ 1800	150 @ 1500	175 @ 1800
NT-335-GC/GS	150 @ 1500	175 @ 1800	165 @ 1500	200 @ 1800
NT-400-GC/GS	170 @ 1500	200 @ 1800	190 @ 1500	230 @ 1800
V12-500-GC/GS	210 @ 1500	250 @ 1800	250 @ 1500	300 @ 1800
VT12-635-GC/GS	250 @ 1500	300 @ 1800	300 @ 1500	350 @ 1800
VT12-700-GC/GS	300 @ 1500	350 @ 1800	335 @ 1500	400 @ 1800
VT12-800-GC/GS	330 @ 1500	400 @ 1800	370 @ 1500	450 @ 1800

Cummins marine generator sets from 45 to 450 KW are available to provide dependable prime power and auxiliary power for ships services. These reliable units are designed for heat exchanger, keel, or radiator cooling.

Engines, generators, and accessory equipment are available to meet American Bureau of Shipping, Lloyd's, and other classification agency specifications. Other certification tests may be conducted at Cummins factory.

For additional information on generator sets to match specific requirements, contact your Cummins Distributor.

Cummins world wide operations



Over 300 Cummins distributors and their branches plus over 150 authorized Cummins Marine Dealers provide complete service and maintain parts inventories at all points of the compass.

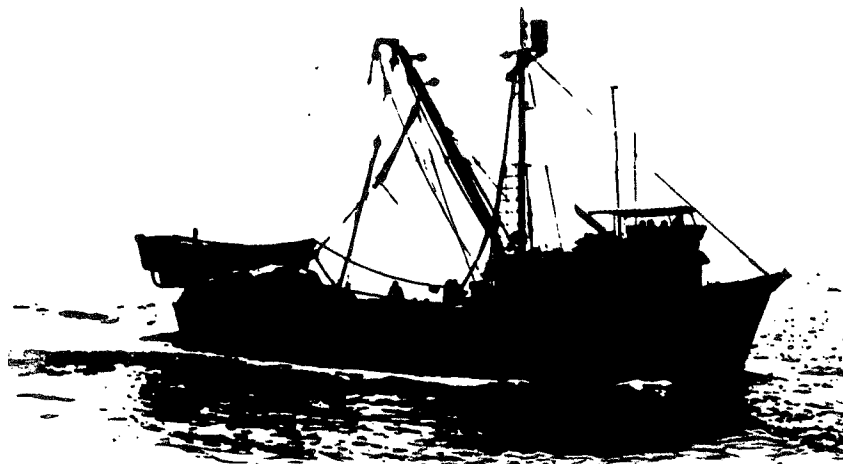
Wherever Cummins customers go, they will find competent, highly trained Cummins mechanics and complete inventories of Genuine Cummins Parts. This service availability minimizes downtime and eliminates fleet owners' need for expensive service tools and parts inventories.

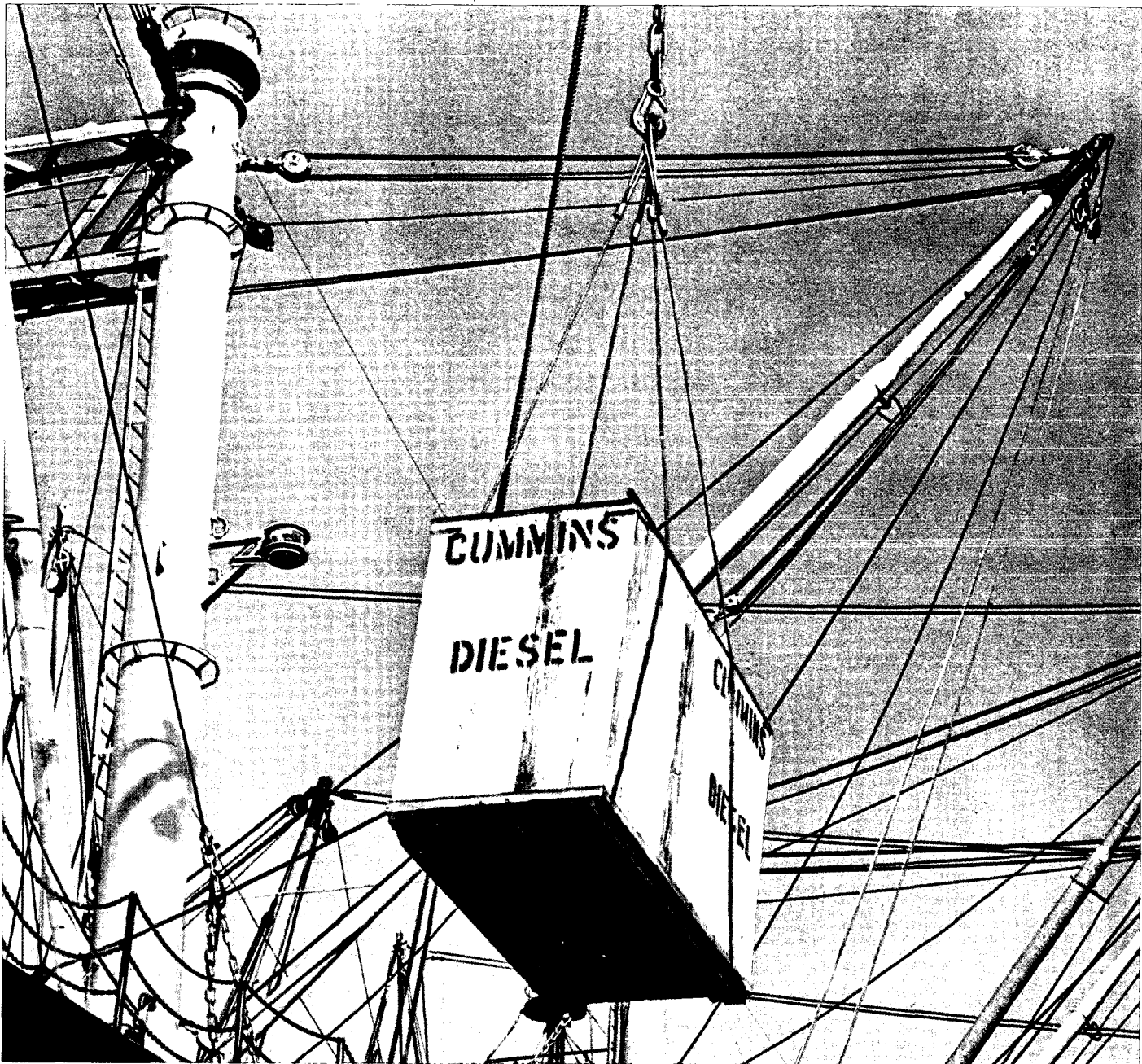
Many naval architects throughout the world base their designs on the use of Cummins power because of on-the-spot technical assistance from Cummins distributors.

Cummins is an international company in manufacturing as well as in service and distribution. In addition to five factories in the United States, manufacturing plants in Australia, the United Kingdom, India, Japan, and Mexico also produce Cummins engines and/or parts. All Cummins products are built to the same precise specifications and assure perfect fit and equal quality wherever they are purchased.

Cummins Marine Warranty

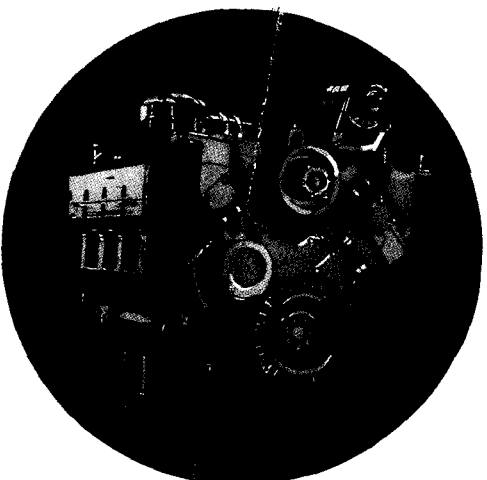
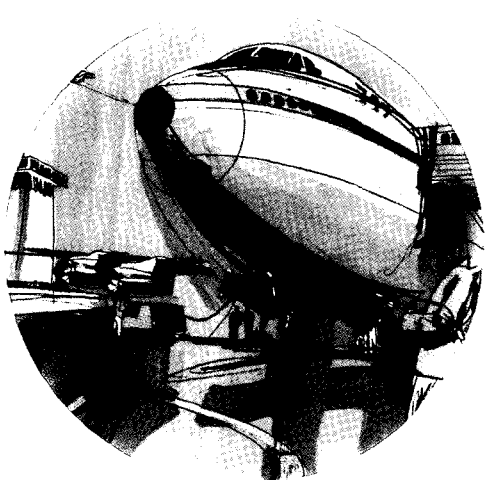
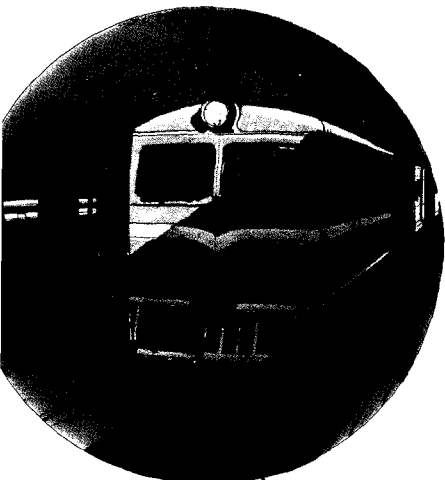
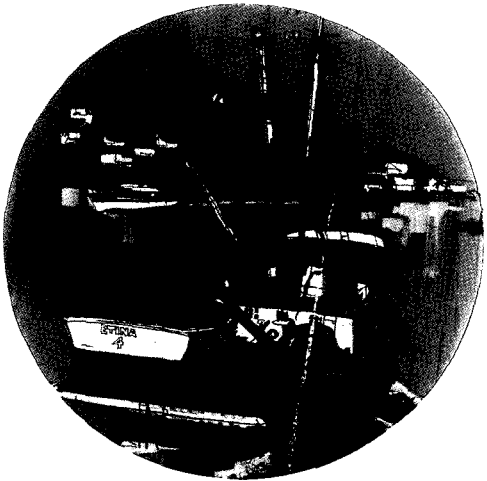
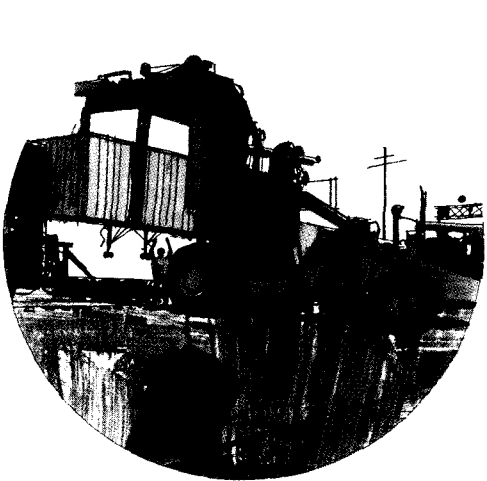
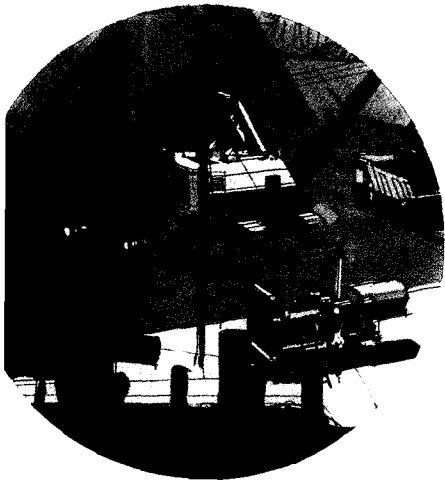
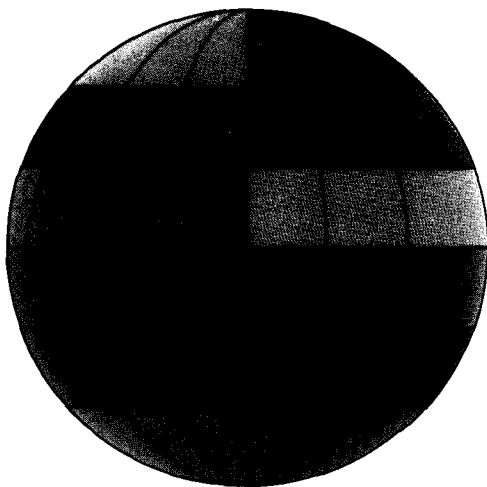
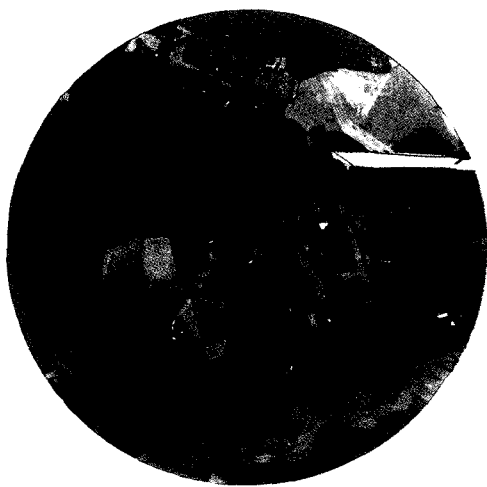
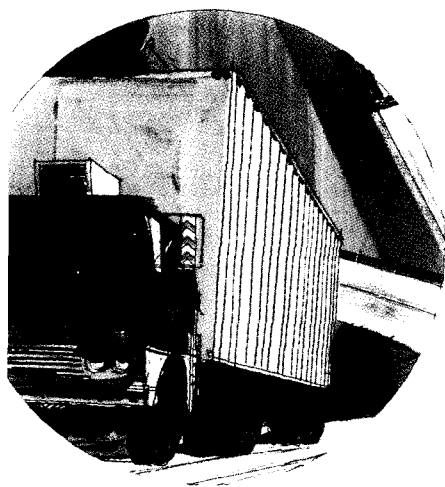
Cummins 3600 hour or two year warranty, the most liberal available, gives protection against defects in workmanship and materials. This warranty covers replacement of defective parts and certain labor costs. Cummins distributors can provide additional details.

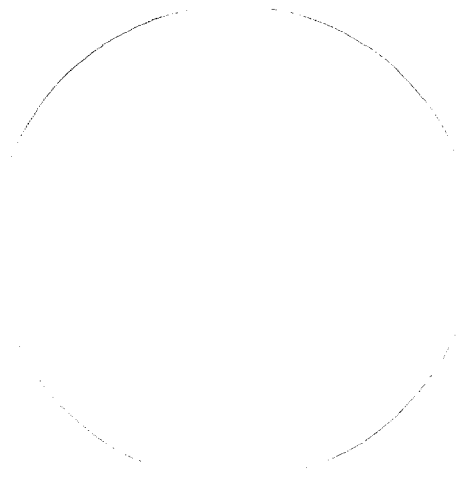
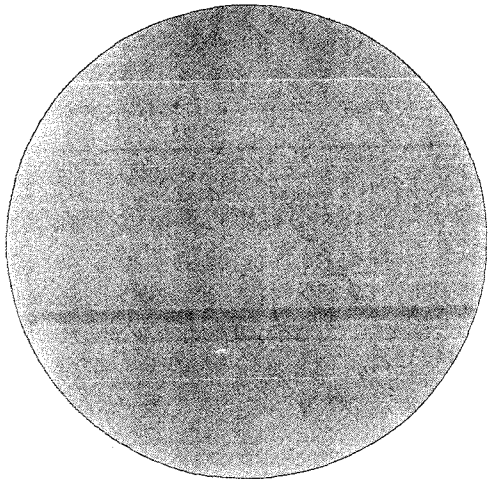
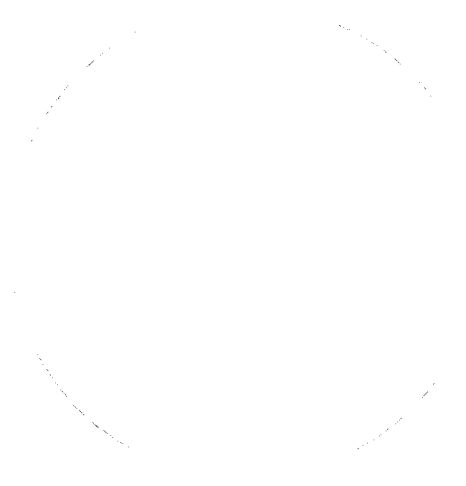
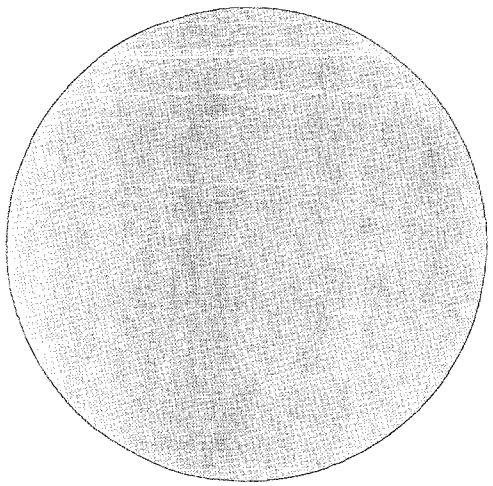
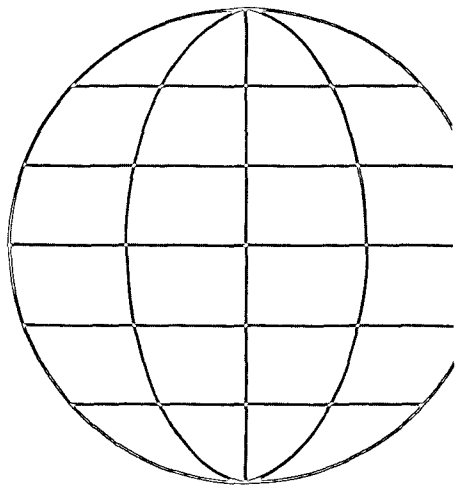
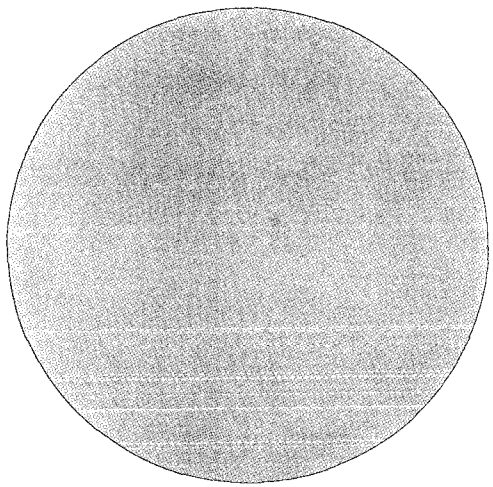




Cummins Engine Company, Inc., Columbus, Indiana, U.S.A. 47201
Cummins Americas, Inc., Columbus, Indiana, U.S.A. 47201
Cummins Diesel Australia, Ringwood, Australia
Cummins Diesel International Ltd.
Cummins Engine Company Ltd., London, England

CUMMINS DIESEL APPLICATIONS
APPLICATIONS DE MOTEURS DIESEL CUMMINS
ANDWENDUNGEN DER CUMMINS DIESEL MOTOREN
APLICACIONES DE LOS DIESEL CUMMINS





CUMMINS: THE FIRST CHOICE

Cummins is the first choice of diesel power selected by large numbers of equipment operators around the world. More than 400 manufacturers offer dependable Cummins diesel engines in over 1,700 equipment models. Covering a broad range of applications, Cummins powered equipment is available in nearly every country.

Wide acceptance has been achieved because Cummins delivers the reliability, economy, and top performance that you expect from the world's largest independent diesel engine manufacturer. Over fifty years of diesel research and engineering have made this possible. Cummins has pioneered the diesel from its early beginnings as a bulky, stationary engine, to a versatile, compact power source applicable to almost any type of equipment.

Cummins diesels are produced in seven manufacturing plants strategically located around the world. These facilities maintain the highest possible standards of quality, matched with modern, highly efficient production techniques. No matter where a Cummins diesel is produced, you can place solid confidence in its reliability, economy, and performance. You are assured that the same stringent standards of quality control apply to every Cummins engine produced.

Cummins supports its products with the finest sales and service work in the industry. Spanning the globe, this network is ready to serve its customers anywhere in the world with competent, reliable service. In addition, Cummins distributors maintain large parts inventories to ensure prompt parts delivery should you need them.

CUMMINS: LE PREMIER CHOIX.

Cummins est la puissance Diesel sur laquelle se porte le premier choix de masses de gens qui manoeuvrent des équipements dans le monde entier. Plus de 400 fabricants offrent dans plus de 1.700 modèles d'équipement, des modèles de moteurs Diesel qui méritent entière confiance. Couvrant une large gamme d'applications, l'équipement actionné par les moteurs Cummins est offert à la clientèle dans presque tous les pays.

Cummins s'est imposé dans un marché s'élargissant sans cesse parce qu'il fournit des moteurs diesel d'une fiabilité, d'une économie et d'un rendement supérieur tels qu'on ne peut s'attendre à trouver ces qualités au degré le plus élevé que dans les moteurs fabriqués par le fabricant indépendant, le plus grand du monde. Cummins a développé depuis ses débuts le diesel qui était alors un moteur fixe encombrant et en a fait une source de puissance, universelle, compacte, applicable à presque n'importe quel type d'équipement.

Les diesels Cummins sont fabriqués dans sept usines, érigées à des emplacements stratégiques, dans le monde entier. Ces usines fabriquent des moteurs de la qualité la plus élevée en appliquant des techniques modernes de production efficaces au plus haut degré. Peu importe l'endroit où un diesel Cummins est fabriqué. Vous pouvez toujours avoir la plus grande confiance dans ses qualités : fiabilité, économie et rendement. Vous serez assuré que chaque diesel fabriqué subit partout le même contrôle sévère de qualité.

Cummins "soutient" ses produits en mettant au service de l'industrie un réseau de vente et de service après vente minutieusement organisé. Ce réseau qui s'étend au monde entier est prêt à servir partout la clientèle qui se fie à lui pour obtenir le concours de spécialistes compétents, méritant entière confiance. Les distributeurs Cummins tiennent en outre en permanence des stocks considérables de pièces de rechange pour vous servir rapidement si vous avez besoin de telles pièces.

CUMMINS BEDEUTET ERSTE WAHL

Zahlreiche Industrieausrüstungen auf der ganzen Welt sind mit Cummins-Diesel-motoren erste Wahl. Mehr als 400 Herstellerfirmen wenden Cummins-Diesel-motoren in über 1700 Anlagentypen. Cummins-Motoren ausgerüstete Maschinen sind fast in jedem Land anzutreffen, da Cummins einen weiten Bereich der verschiedensten Bedarfsfälle deckt.

Die uneingeschränkte Vertrauen wurde erreicht, weil Cummins die Zuverlässigkeit, Wirtschaftlichkeit und höchste Leistung bietet, die man von dem größten unabhängigen Dieselmotorenhersteller der Welt erwartet. Dies ist das Ergebnis von mehr als fünfzigjähriger Forschungs- und Konstruktionserfahrung. Cummins hat hienarbeit geleistet in der Entwicklung des anfänglich sperrigen, beweglichen Dieselmotors zu einer vielseitigen und kompakten Triebquelle mit nahezu unbeschränkter Einsatzfähigkeit in allen gleichen Maschinen- und Anlagentypen.

Cummins-Dieselmotoren werden in sieben verschiedenen Produktionsstätten gebaut, die sich auf klug gewählte Standorte um die ganze Welt verteilen. Diese gewährleisten die Einhaltung höchster Qualitätsnormen bei gleichzeitigem Einsatz modernster Fertigungstechniken. Aus welchem Werk Ihr Cummins-Diesel auch kommen mag, stets können Sie uneingeschränktes Vertrauen in seine Zuverlässigkeit, Wirtschaftlichkeit und Leistungsfähigkeit haben. Sie können sich darauf verlassen, daß die gleichen strengen Prüfbedingungen überall und auf jeden Cummins-Motor angewendet werden.

Cummins bietet für seine Erzeugnisse die beste Kundendienstorganisation in der Branche. Dieses weltumspannende Netz ist in der Lage, dem Kunden in jedem Land stets fachmännische und zuverlässige Dienste zu leisten. Hinzu kommt, daß die Cummins-Vertriebshändler einen umfangreichen Ersatzteilbestand führen, damit im Bedarfsfall prompt beliefert werden können.

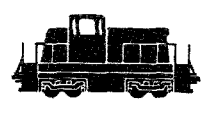
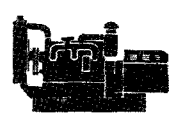
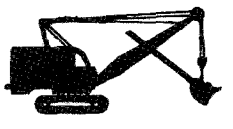
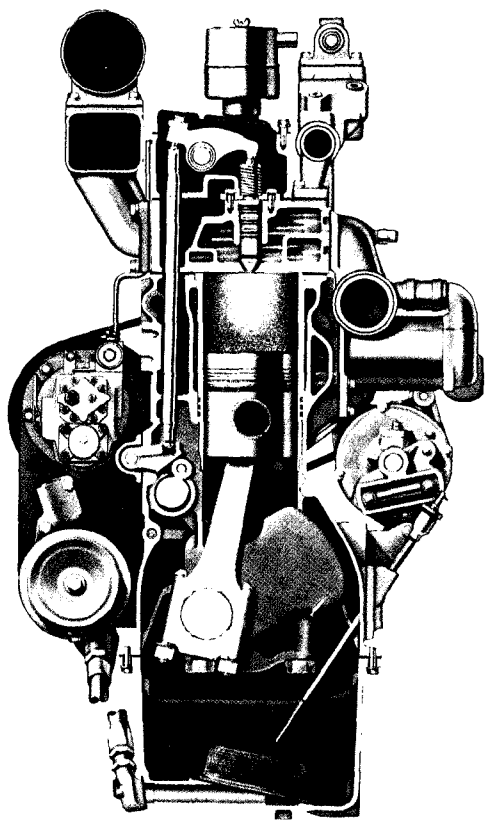
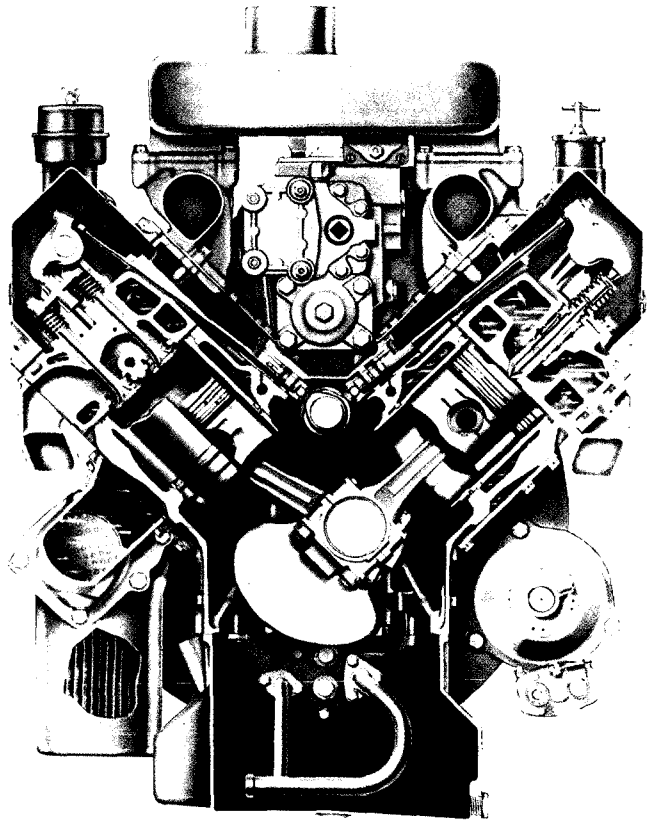
CUMMINS, LA PRIMERA ELECCION

Cummins es la primera elección de potencia diesel que hacen un gran número de operadores de equipo en todo el mundo. Más de 400 fabricantes ofrecen los confiables motores Cummins diesel en más de 1,700 modelos de equipo. El equipo con potencia Cummins, que abarca una amplia gama de aplicaciones, está disponible casi en todos los países.

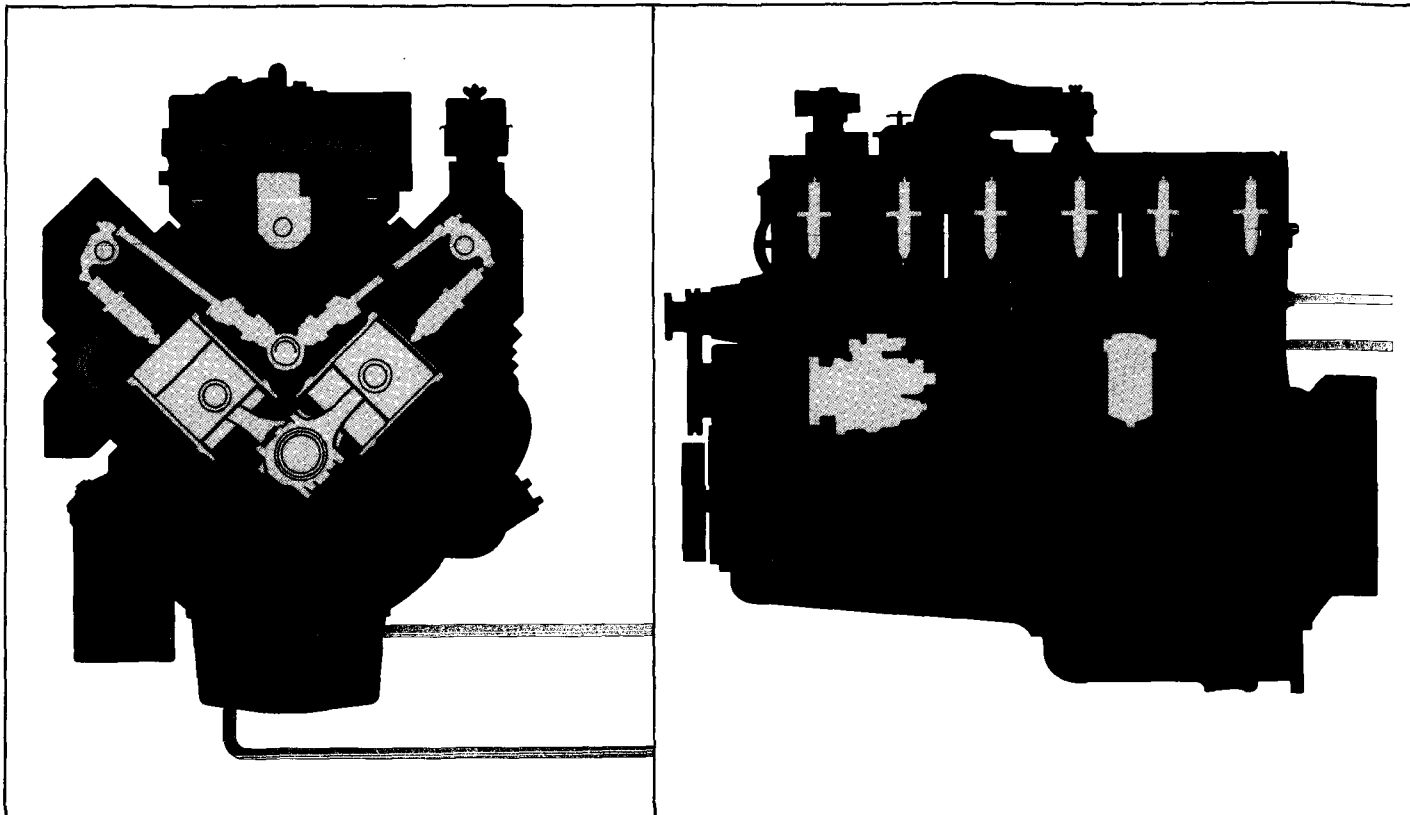
Esta gran aceptación se ha logrado porque Cummins le proporciona toda la confiabilidad, economía y máximo rendimiento que usted espera del fabricante independiente de motores diesel más grande del mundo. Más de cincuenta años de investigaciones y de ingeniería con diesel, han hecho esto posible. Cummins ha sido el precursor en diesel, desde sus comienzos como un voluminoso motor estacionario, hasta una planta motriz versátil, compacta, aplicable a casi cualquier tipo de equipo.

Los diesel Cummins se producen en siete plantas manufactureras ubicadas estratégicamente alrededor del mundo. Estas instalaciones mantienen las más elevadas normas de calidad, en combinación con técnicas de producción modernas y altamente eficientes. No importa dónde haya sido fabricado un diesel Cummins; usted puede confiar plenamente en su confiabilidad, economía y rendimiento. Usted tiene la seguridad de que en cada motor Cummins que se produce, se aplican las mismas estrictas normas de control de calidad.

Cummins respalda sus productos con la más destacada red de ventas y servicio en la industria. Esta red, que abarca todo el globo, está presta a servir a sus clientes en cualquier lugar del mundo dándoles atención competente y confiable. Además, los distribuidores Cummins mantienen amplios inventarios de piezas de repuesto para asegurar entrega rápida de ellas, si usted llegase a necesitarlas.



CUMMINS DESIGN FEATURES ... engine is better than its design. More than fifty years of experience in building diesel engines have enabled Cummins to develop design features unexcelled in dependability, efficiency, and economy. These features ensure superior engine performance in any application. - Internal fuel lines. - Large intake and exhaust passages. - Open type combustion chamber. - Cam ground pistons. - Fully counterweighted crankshaft. - Replaceable wet-type cylinder liners. - Dual overhead intake and exhaust valves. - Induction hardened valve train, camshaft and crankshaft journals. - High tensile strength connecting rods. - Large volume water passages. - Big displacement for lower internal pressures and longer engine life. - Cummins exclusive PT fuel system.	CARACTERISTIQUES DES MODELES CUMMINS Aucun moteur n'est meilleur que son modèle. Plus de 50 ans d'expérience dans la construction des diesels ont permis à Cummins de mettre au point des modèles dont la fiabilité, le rendement et l'économie n'ont jamais été surpassés. Aussi le rendement du moteur est supérieur à celui de ses concurrents dans n'importe quelle application. 1. Conduites intérieures de combustible. 2. Grandes ouvertures de passage à l'admission et à l'échappement. 3. Chambre de combustion de type ouvert. 4. Pistons rectifiés, légèrement ovalisés. 5. Vilebrequin parfaitement équilibré par des contre poids. 6. Chemises de cylindre, remplaçables, de type humide. 7. Soupapes jumelles d'admission et d'échappement en tête. 8. Jeu de soupapes, vilebrequin et tourillons de vilebrequin, trempés au four à induction. 9. Bielles motrices à résistance élevée à la traction. 10. Ouvertures de passage pour grands volumes d'eau. 11. Grande cylindrée, pressions intérieures plus faibles et durée plus longue du moteur en service. 12. Système d'alimentation en combustible "pression-temps" (exclusivité de la firme Cummins).
DIE BESONDERHEITEN DER CUMMINS-KONSTRUKTION ... Motor ist so gut wie die ihm zugrundeliegende Konstruktion. Auf der Grundlage einer mehr als fünfzigjährigen Erfahrung im Bau von Dieselmotoren hat Cummins eine Konstruktion entwickelt, die ihrer Zuverlässigkeit, Leistung und Wirtschaftlichkeit unübertroffen ist. Diese Konstruktionsmerkmale garantieren beste Motorenleistung in jedem Einsatz. • Innengeführte Kraftstoffleitungen. • Groß bemessene Ansaug- und Auspufföffnungen. • Offener Verbrennungsraum. • Leicht oval geschliffener Kolben. • Voll ausgewuchtete Kurbelwelle. • Auswechselbare, nasse Zylinderlaufbüchsen. • Obengesteuerte doppelte Einlaß- und Auslaßdoppelventile. • Ventile, Nockenwellen- Kurbelwellen und Kurbelwellenzapfen einsatzgehärtet. • Pleuelstangen hoher Zugfestigkeit. • Reichlich bemessene Wasserdurchflußöffnungen. • Großer Verdrängungsraum, daher niedrigere Innendrücke und längere Lebensdauer des Motors. • Dazu die exklusive Cummins PT Kraftstoffanlage.	CARACTERISTICAS DEL DISEÑO CUMMINS Ningún motor es mejor que su diseño. Más de cincuenta años de experiencia construyendo motores diesel le han permitido a Cummins desarrollar características de diseño insuperables en materia de confiabilidad, eficiencia y economía. Estas características aseguran un superior rendimiento del motor en cualquiera aplicación. 1. Tuberías internas para combustible. 2. Grandes conductos para admisión y escape. 3. Cámara de combustión de tipo abierto. 4. Pistones pulidos excéntricos. 5. Cigüeñal totalmente contrapesado. 6. Camisas de cilindros, tipo húmedo, reemplazables. 7. Dobles válvulas de admisión y escape, en la culata. 8. Mecanismo de válvulas, árbol de levas y muñones del cigüeñal, endurecidos por inducción. 9. Bielas de alta resistencia tensil. 10. Conductos para gran volumen de paso de agua. 11. Gran cilindrada para menores presiones internas y mayor duración del motor. 12. El exclusivo sistema de combustible Cummins PT.



CUMMINS PT FUEL SYSTEM: HOW IT WORKS

Pressure

Pressure of the fuel in the engine's operating range is controlled by the operator through a simple throttle. A mechanical fly-ball type governor regulates the pressure at idling speed, at governed speed and at all speeds when operating under full power conditions. The governor compensates for pump wear and for fuel viscosity.

Time

Mechanically actuated and timed by the engine's camshaft, the injector plunger regulates the amount of fuel entering the injector cup and then forces the fuel charge into the combustion chamber as an extremely fine spray at the predetermined piston position that gives maximum efficiency and power.

FONCTIONNEMENT DU SYSTEME PT CUMMINS D'ALIMENTATION EN COMBUSTIBLE

Pression

La pression du combustible dans la gamme des régimes de fonctionnement du moteur est réglée par l'opérateur par un simple étrangleur. Un régulateur mécanique du type à boules règle la pression à la vitesse à vide, à la vitesse réglée par le régulateur et à toutes les vitesses lorsque le moteur fonctionne à pleine puissance. Ce régulateur compense l'usure de la pompe et la viscosité du combustible.

Temps

Le plongeur de l'injecteur est actionné mécaniquement et réglé dans le temps par l'arbre à cames du moteur. Il règle la quantité de combustible, entrant dans le bol de l'injecteur et force ensuite la charge de combustible à entrer dans la chambre de combustion sous la forme d'un liquide, pulvérisé d'une manière extrêmement fine, cette introduction s'effectuant dans une position prédéterminée du piston, telle que la puissance et le rendement du moteur soient maximum.

DIE WIRKUNGSWEISE DER CUMMINS PT KRAFTSTOFFANLAGEN

Druck

Der Druck des Kraftstoffes wird im Rahmen des Arbeitsbereiches des Motors vom Fahrer mittels eines einfachen Gashebels geregelt. Die Einstellung des Druckes für Leerlaufdrehzahl, Regeldrehzahl sowie in allen Drehzahlbereichen unter Last erfolgt durch einen Fliehkraftregler. Dabei gleicht dieser Regler auch Schwankungen infolge Pumpenverschleiß und unterschiedlicher Kraftstoffviskosität aus.

Zeit

Der Tauchkolben des Injektors wird über die Motornockenwell mechanisch betätigt und gesteuert, wobei er die in die Injektkammer gelangende Kraftstoffmenge dosiert und anschließend diesen Kraftstoff als einen äußerst feinen Sprühnebel in den Verbrennungsraum drückt, und zwar genau bei einer ganz bestimmten Motorkolbenstellung, so daß ein Höchstmaß an Leistung und Wirkung zustandekommt.

SISTEMA DE COMBUSTIBLE CUMMINS PT: COMO FUNCIONA

Presión

La presión del combustible en la gama de funcionamiento del motor es controlada por el operador mediante un sencillo acelerador. Un gobernador mecánico, del tipo de contrapesos, regula la presión en marcha mínima, a velocidad gobernada y a todas las velocidades cuando se trabaja en condiciones de plena potencia. El gobernador compensa el desgaste de la bomba y la viscosidad del combustible.

Tiempo

El émbolo del inyector que es accionado y sincronizado mecánicamente por el árbol de levas del motor, regula la cantidad de combustible que entra a la copa del inyector y, luego, expulsa la carga de combustible hacia la cámara de combustión como una atomización sumamente fina, en la posición predeterminada del pistón que produzca máximas eficiencia y potencia.

CUMMINS PT FUEL SYSTEM

The Cummins PT fuel system is a well proven, efficient, and simple method of fuel metering and injection. Designed and built by Cummins for Cummins engines, it assures accurate fuel metering, high pressure injection yet low pressure fuel lines, and controlled injection timing.

Because the PT fuel system is made exclusively for Cummins engines, you can be assured of perfect coordination between fuel meter and engine. This results in low maintenance costs, ease of service, excellent fuel economy, and outstanding performance, even with low grade diesel fuels.

Number of excellent design features contribute to the success of Cummins PT fuel system:

The PT fuel pump does not require timing to the engine, thus saving complicated and frequent maintenance. Self-adjusting for wear, it can operate for extremely long periods of time without recalibration.

The PT fuel system governor is self-compensating for fuel viscosity. This means that equal line pressure can be maintained even with heavy, low grade diesel fuels. Recalibration is never necessary when changing from one fuel grade to another. Horsepower varies only slightly depending upon the heating value (BTU/lb.) of the fuel.

Although there are several types of PT injectors, they all have the same basic function and utilize a fixed size opening for simple, yet efficient operation. Being mechanically operated, they always measure the exact amount of fuel and inject it at precisely the right time for maximum fuel economy and smooth operation.

SYSTEME PT CUMMINS D'ALIMENTATION EN COMBUSTIBLE (PRESSION-TEMPS)

Le système PT Cummins d'alimentation en combustible (pression-temps) est efficace et a fait ses preuves. C'est un moyen bien simple d'injection et de mesurage de la consommation de combustible.

Puisque la système PT d'alimentation en combustible est fait exclusivement pour les diesels Cummins vous pouvez être sûr que ce système d'alimentation convient parfaitement à ces moteurs. Il en résulte des avantages importants : frais d'entretien très réduits, facilité de service, économies intéressantes dans la consommation de combustible et rendement supérieur même si l'on utilise des huiles combustibles diesel de qualité inférieure.

Le succès du système PT Cummins d'alimentation en combustible est dû aux excellentes caractéristiques de ce modèle de système d'alimentation.

1. La pompe du système PT d'alimentation en combustible n'a pas besoin d'être réglée sur le moteur. On s'économise ainsi un entretien compliqué et fréquent. A l'égard de l'usure elle est auto-ajustable et peut fonctionner pendant des périodes de temps extrêmement longues sans recalibrage du cylindre.
2. Le régulateur du système PT Cummins d'alimentation en combustible est autocompensateur de la viscosité du combustible liquide. Il est ainsi possible de maintenir dans les conduites une pression toujours égale même si l'on utilise des huiles combustibles diesel lourdes de qualité inférieure. Il ne faut jamais recalibrer le cylindre si l'on passe d'une qualité de combustible à une autre. La puissance varie alors légèrement, cette variation ne dépendant que du pouvoir calorifique (BTU/lb.) du combustible.
3. Bien qu'il y ait plusieurs types d'injecteurs PT, ils ont tous en principe la même fonction et ont une ouverture de dimension fixe pour fonctionner d'une manière simple et efficace. Manoeuvrés mécaniquement, ils mesurent toujours la quantité exacte de combustible nécessaire, et l'injectent précisément au moment qui convient pour que le moteur fonctionne en douceur et que l'économie réalisée dans la consommation du combustible soit maximale.

CUMMINS PT KRAFTSTOFFANLAGEN

In den Cummins PT Kraftstoffanlagen handelt es sich um eine ebenso bewährte wie zuverlässige und einfache Methode der Kraftstoffzumessung und -einspritzung. Von Cummins eigens für Cummins-Motoren konstruiert und gebaut, gewährleistet dieses System genaue Kraftstoffdosierung, hohen Einspritzdruck bei niedrigem Leitungsdruck und genau gesteuerten Einspritzzeitpunkt.

Da weil die PT Kraftstoffanlagen ausschließlich für Cummins-Dieselmotoren gebaut werden, können Sie sich auf hundertprozentige Abstimmung der Kraftstoffanlage auf den Motor verlassen. Das Ergebnis sind niedrigere Unterhaltungskosten sowie einfache Durchführung der Wartung, hervorragende Kraftstoffwirtschaftlichkeit und höchste Leistung selbst bei geringwertigen Dieselmotoren.

Der Erfolg der Cummins PT Kraftstoffanlagen erklärt sich aus einer Reihe technischer Besonderheiten:

Die PT Kraftstoffpumpe bedarf keiner Einstellung auf den Motor, erspart also komplizierte und häufige Wartung. Da sie sich außerdem selbsttätig auf Verschleiß einregelt, kann sie über sehr lange Zeit ohne Nachstellung betrieben werden.

Der Regler der PT Kraftstoffanlage gleicht Schwankungen in der Kraftstoffviskosität selbsttätig aus. Das bedeutet, daß der Druck in den Kraftstoffleitungen selbst bei schwerem, geringwertigem Dieselmotorkraftstoff konstant gehalten werden kann. Beim Wechseln von einer Kraftstoffqualität auf eine andere ist keinerlei Nachstellung erforderlich. Die PS-Leistung schwankt nur geringfügig je nach Heizwert (Kcal) des Kraftstoffes.

Obwohl es verschiedene PT Injektortypen gibt, sind sich diese in ihrem Prinzip gleich und weisen im Interesse einfacher und dennoch zuverlässiger Wirkungsweise eine unveränderliche Bohrung auf. Da sie mechanisch betätigt werden, dosieren sie stets die richtige Menge Kraftstoff und spritzen diese im richtigen Augenblick ein, so daß sparsamster Kraftstoffverbrauch und einwandfreier Motorenlauf gewährleistet sind.

EL SISTEMA DE COMBUSTIBLE CUMMINS PT

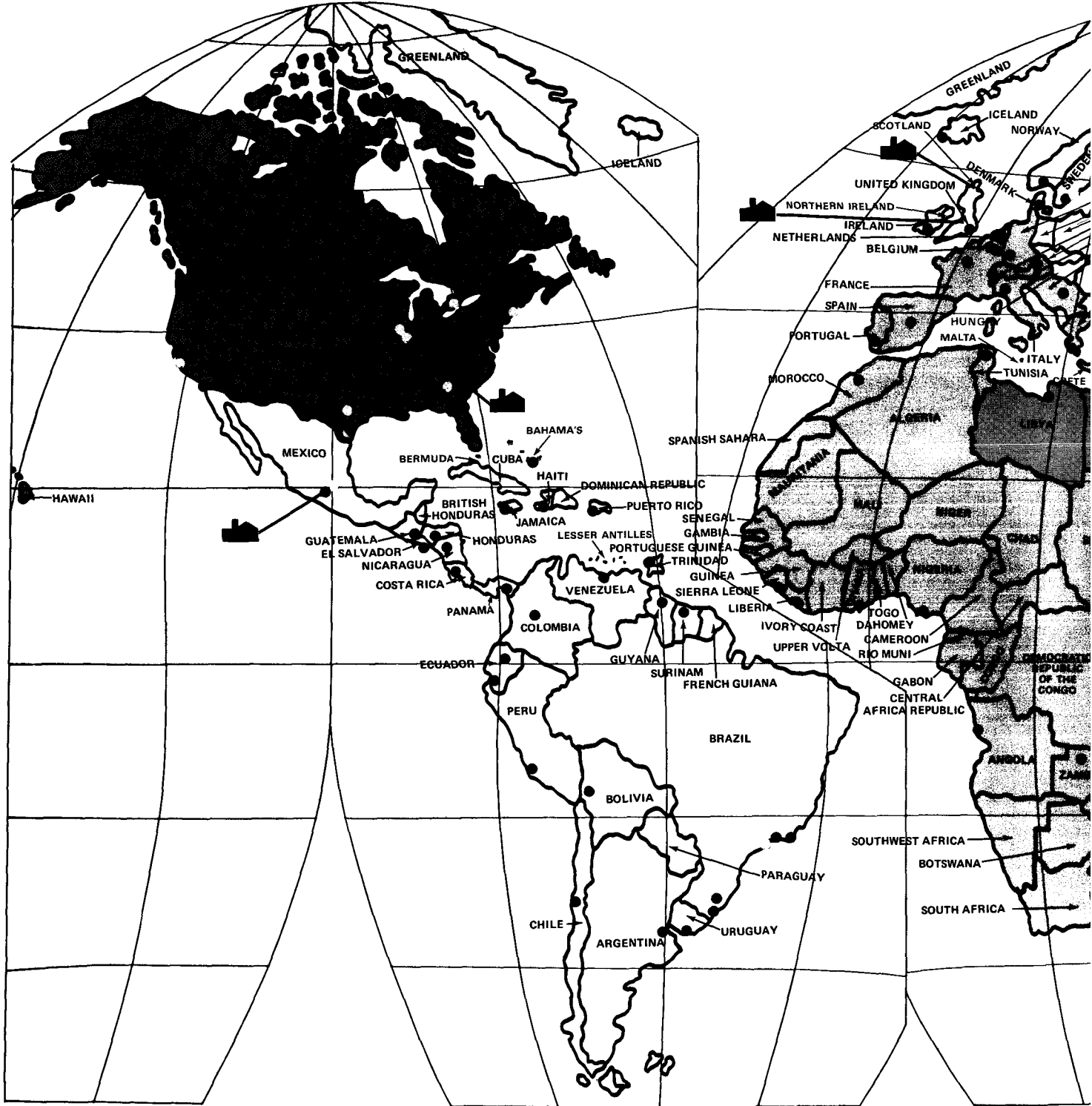
El sistema de combustible Cummins PT es un método bien comprobado, eficiente y sencillo, para la medición y la inyección del combustible. Diseñado y construido por Cummins para los motores Cummins, asegura una medición exacta del combustible y su inyección a alta presión, pero con tuberías para baja presión así como sincronización controlada para los inyectores.

Debido a que el sistema de combustible PT está hecho exclusivamente para los diesels Cummins, usted puede tener la seguridad de una perfecta coordinación entre el sistema de combustible y el motor. Esto da por resultado bajos costos de mantenimiento, facilidad de servicio, excelente economía de combustible y notable rendimiento, incluso con combustibles diesel de baja calidad.

Un buen número de excelentes características de diseño contribuyen al éxito del sistema de combustible Cummins PT:

1. La bomba PT no requiere sincronización con el motor, ahorrando así un mantenimiento frecuente y complicado. Se ajusta automáticamente de acuerdo con el desgaste, por lo que puede funcionar por periodos extremadamente largos sin recalibrarla.
2. El gobernador del sistema de combustible PT es de auto-compensación según la viscosidad del combustible. Esto significa que se puede mantener igual la presión en las tuberías incluso con combustibles diesel pesados y de baja calidad. Nunca se necesita la recalibración al cambiar de un grado de combustible a otro. El caballaje varía muy ligeramente, dependiendo del valor termal (Cal./kilo o BTU/libra) del combustible.
3. Aunque hay varios tipos de inyectores PT, todos tienen la misma función básica y utilizan un orificio de tamaño fijo para un funcionamiento sencillo aunque muy eficiente. Como son accionados mecánicamente, siempre miden la cantidad exacta de combustible y la inyectan precisamente en el momento adecuado para lograr máxima economía de combustible y funcionamiento suave.

CUMMINS WORLDWIDE OPERATIONS
 CUMMINS, UNE FIRME ETABLIE DANS LE MONDE ENTIER
 CUMMINS UBERALL IN DER WELT
 OPERACIONES MUNDIALES DE CUMMINS



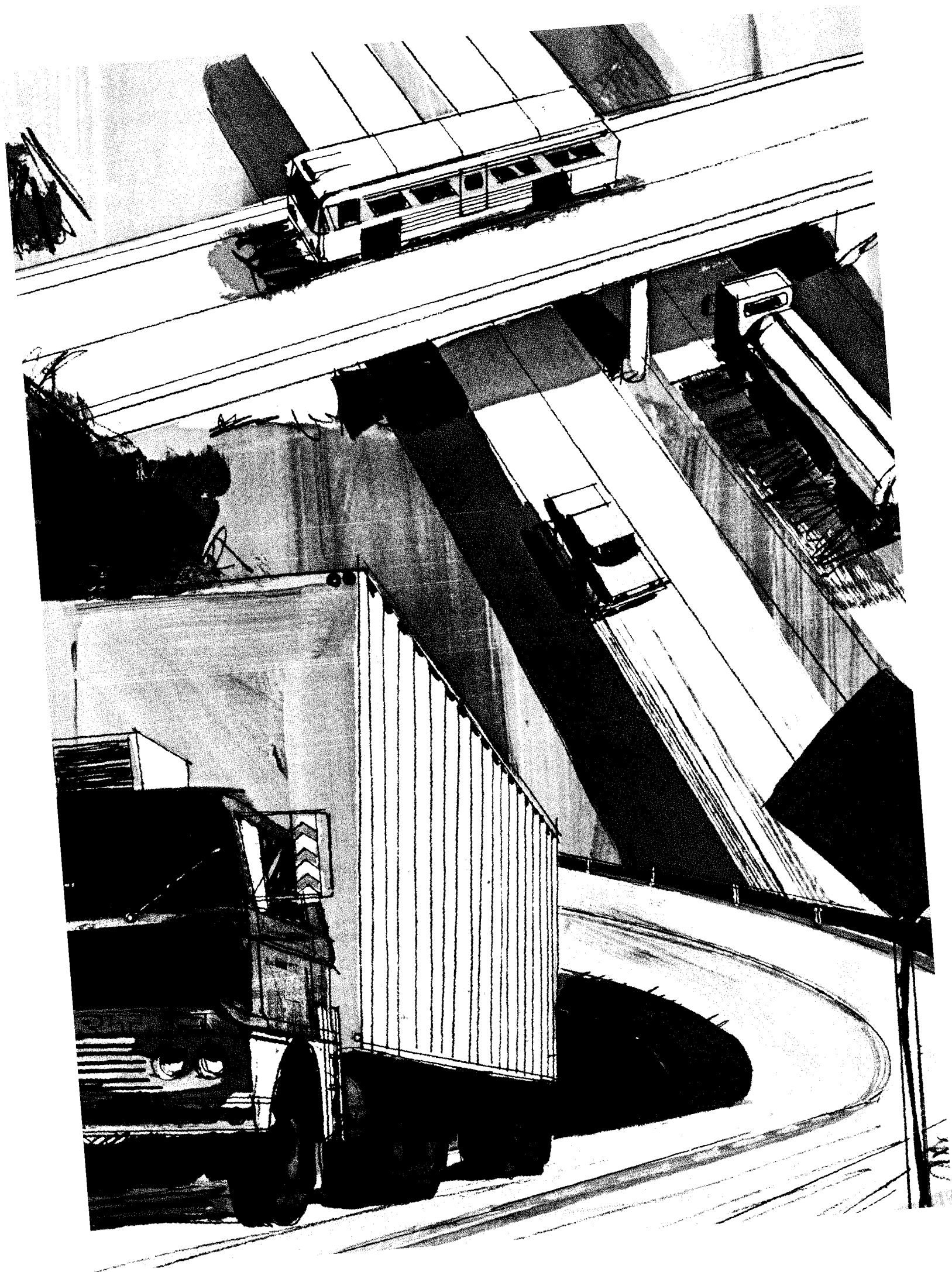
Cummins • Distributor Headquarters • Regional Offices and Manufacturing Facilities are strategically located around the world. In addition, International branches and dealers combined with U.S. and Canada outlets provide a total of over 2,000 support locations.

Cummins • quartiers généraux de distribution • Les offices régionaux et les usines sont repartis dans le monde à des emplacements stratégiques. En outre les succursales internationales et les établissements de distributeurs en liaison avec les Etats-Unis et le Canada fournissent un total de plus de 2000 points d'appui commerciaux.



Cummins • Großhändlerzentralen • Zweigniederlassungen und Produktionsbetriebe sind strategisch über die ganze Welt verteilt. Außerdem Werksvertretungen in den USA und Kanada zusammen mit Auslandsvertretungen und Händlern ergeben insgesamt mehr als 2000 Stützpunkte.

Cummins • Distribuidores • Oficinas Regionales y Plantas Manufactureras, están situadas estratégicamente en todo el mundo. Además, las sucursales y distribuidores de la División Internacional, combinados con los de Estados Unidos y Canadá, ofrecen un total de más de 2,000 lugares para obtener piezas y servicio.



CUMMINS AUTOMOTIVE ENGINES

Dependability, fuel economy, minimum maintenance and long engine life have made Cummins' automotive diesels a top choice of truck and bus manufacturers around the world. In the United States, for example, every major truck producer now offers Cummins power.

Cummins complete line of on-highway engines provide maximum flexibility for both high speed and stop-and-go driving. They match a wide variety of applications, from buses to short haul vans to intercity tractors.

In recent years, Cummins custom rated engines have become very popular as original equipment in heavy-duty trucks and in large intercity buses. The custom rating concept allows horsepower to be increased or decreased to match varying gross vehicle weights by simply changing a button in the PT fuel pump. Three in-line diesels and one V diesel are available with custom rating, and cover a range of 225 to 335 horsepower.

Cummins small v diesels, from 140 to 210 horsepower are as rugged as their larger, in-line counterparts. The small v's have been established worldwide as ideal diesel power for all types of medium duty trucks. Their reputation among bus fleet operators as outstanding power has made them a first choice of many of the world's bus manufacturers. These engines offer dependability to meet schedules plus excellent economy and performance in either city traffic or high speed expressway driving.

Cummins wide range of power means that manufacturers can offer several engine options to meet nearly every customer power demand.

MOTEURS CUMMINS POUR VEHICULES AUTOMOBILES

La fiabilité, l'économie réalisée dans la consommation de combustible, l'entretien réduit au minimum et la longue durée en service des diesels, placés sur les véhicules automobiles, ont fait que dans le monde entier les fabricants de camions et d'autobus se sont littéralement rués sur ces moteurs. Aux Etats-Unis par exemple tout fabricant un peu important de camions offre actuellement à sa clientèle, de la puissance Cummins.

La gamme Cummins complète de moteurs pour véhicules automobiles circulant sur les autoroutes est d'une souplesse maximale parce qu'elle permet la circulation à grande vitesse et celle à arrêts fréquents sur les routes. Elle peut s'utiliser dans une large variété d'applications : autobus, camionnettes et tracteurs interurbains.

Ces dernières années, les moteurs Cummins, construits suivant des spécifications particulières, sont devenus très populaires comme équipement original des camions du type "poids lourds" et des grands autobus interurbains. L'idée de construire des moteurs Cummins suivant des spécifications particulières permet d'augmenter la puissance en CV ou de la diminuer pour adapter celle-ci aux poids bruts variables des véhicules, en changeant tout simplement la position d'un bouton dans la pompe PT d'alimentation en combustible. Cette idée a été appliquée à 3 diesels en ligne et à un diesel en V dans lesquelles la puissance développée peut varier de 225 à 335 CV.

Les petits diesels Cummins en V de puissance variant entre 140 et 210 CV sont aussi robustes que leurs collègues plus grands, en ligne. Les petits moteurs en V se sont imposés dans le monde comme étant la source de puissance idéale pour tous les types de camions, effectuant un service intermédiaire entre le service léger et le service lourd. Leur réputation parmi les gérants de grands parcs d'autobus, chez qui ils sont très appréciés à cause de leur puissance, a fait que dans le monde entier le choix des fabricants d'autobus s'est porté sur eux en premier lieu. Ils offrent des avantages très importants : Fiabilité extrême dans le respect des horaires, économie importante de combustible et rendement élevé sur les véhicules automobiles, dans la circulation urbaine ou dans la circulation à grande vitesse sur autoroutes.

CUMMINS MOTOREN FÜR KRAFTFAHRZEUGE

Zuverlässigkeit, sparsamer Kraftstoffverbrauch, geringe Wartung und lange Lebensdauer, dies sind die Tatsachen, auf denen sich die Vorrangstellung des Cummins-Dieselmotors bei LKW- und Omnibusproduzenten auf der ganzen Welt gründet. In den USA zum Beispiel verwendet jedes große LKW-Werk nunmehr Cummins-Dieselmotoren.

Mit seiner reichen Auswahl an Motoren für den Straßenverkehr bietet Cummins höchste Anpassungsfähigkeit im schnellen Überlandverkehr wie auch im Anhalterverkehr. Für jeden Bedarfsfall, vom Bus bis zum Lieferrahverkehr und Städte-Sattelschlepperverkehr ist der entsprechende Motor greifbar.

In den letzten Jahren erfreuen sich die speziell nach individuellen Kundenanforderungen auszustellenden Cummins-Motoren immer größerer Beliebtheit als Erstausrüstung bei schweren LKW und in großen Schnellbussen. Das Prinzip der individuellen Abstufung ermöglicht es, die PS-Leistung je nach unterschiedlichen zGG-Grenzen zu erhöhen bzw. zu verringern, und zwar ganz einfach durch Auswechseln eines Knopfes in der PT Kraftstoffpumpe. Mit dieser Ausrüstung sind drei Diesel-Reihenmotortypen sowie ein Diesel V-Motor im Bereich von 225 bis 335 PS lieferbar.

Die kleinsten Cummins V-Motoren, von 140 bis 210 PS, stehen in Robustheit ihren größeren Reihen-Verwandten nicht nach. Die kleinen V-Diesels haben sich auf der ganzen Welt als der ideale Dieselmotor für alle Arten von LKW in mittelschwerem Einsatz bewährt. Ihr Ruf bei den Besitzern von Omnibusparks hat dazu geführt, daß sie von vielen Omnibusherstellern auf der ganzen Welt bevorzugt werden. Mit diesen zuverlässigen Motoren kann man Termin- und Fahrpläne einhalten, wobei sie gleichzeitig hervorragende Wirtschaftlichkeit bei höchster Leistung bieten, wie man sie im Stadtverkehr und Überland Schnellverkehr gleichermaßen schätzt.

Durch seine reich abgestufte Auswahl sorgt Cummins dafür, daß der Kfz.-Hersteller jeweils verschiedene Motortypen seinem Kunden zur Wahl anbieten kann, so daß praktisch jeder individuelle Bedarfsfall erfüllt wird.

MOTORES CUMMINS AUTOMOTRICES

Confiabilidad, economía de combustible, mínimo mantenimiento y una larga vida del motor, han hecho que los Cummins diesel automotrices sean los preferidos por los fabricantes de camiones y autobuses en todo el mundo. En Estados Unidos, por ejemplo, todos los productores importantes de camiones ya ofrecen potencia Cummins.

La completa línea Cummins de motores para uso en carretera, proporciona la máxima flexibilidad para manejo tanto a alta velocidad como entre el tránsito. Se adaptan a una amplia variedad de aplicaciones que van desde autobuses hasta camiones de caja para reparto y tractores para servicio interurbano.

En años recientes, los motores Cummins de potencia seleccionada, se han hecho muy populares como equipo original en camiones para trabajo pesado y en autobuses grandes para servicio en carretera. El concepto de la potencia seleccionada permite aumentar o disminuir el caballaje para adaptarlo a pesos vehiculares variables, simplemente cambiando un "botón" en la bomba de combustible PT. Están disponibles tres modelos en línea y un modelo en "V" con potencia seleccionada, en una gama de 225 a 335 caballos.

Los Cummins diesel en v, pequeños, de 140 hasta 210 caballos, son tan fuertes como sus equivalentes del tipo en línea y de mayor tamaño. Los motores en v pequeños, han establecido fama mundial como la potencia diesel ideal para todos los tipos de camiones para trabajo mediano. Su reputación entre los operadores de flotillas de autobuses como un extraordinario motor, los ha convertido en la primera elección de muchos de los fabricantes de autobuses en todas partes. Estos motores ofrecen confiabilidad para cumplir con los itinerarios así como excelentes economía y rendimiento ya sea entre el tránsito urbano o en el manejo a alta velocidad en las autopistas.

La amplia gama de potencia disponible con Cummins, significa que cada fabricante puede ofrecer varias opciones de motores para satisfacer prácticamente todas las necesidades de potencia de sus clientes.

AUTOMOTIVE ENGINE SPECIFICATIONS
SPECIFICATIONS DE DIESELS POUR VEHICULES AUTOMOBILES
CUMMINS MOTORDATEN FÜR KFZ
ESPECIFICACIONES PARA MOTORES AUTOMOTRICES

Engine	HP *S.A.E.	RPM	Displacement Cubic Inches (Litres)	Bore and Stroke Inches (mm)	Number of Cylinders	Aspiration	Net Weight Pounds (Kg.)
Moteur	CV	T/MN	Cylindrée Pouces Cubiques	Alésage et Course Pouces	Nombre de Cylindres	Aspiration	Poids Net Livres
Motor	PS	U/min.	Hubraum	Bohrung und Hub	Anzahl der Zylinder	Ansaugart	Nettogewicht
Motor	HP	RPM	Cilindrada Pulgadas Cúbicas	Diámetro y Carrera Pulgadas	Número de Cilindros	Aspiración	Peso Neto Libras
V6-140	140	3300	352 (5.7)	4-5/8 x 3-1/2 (117.5 x 88.9)	6	Natural	1175 (533)
V6-155	155	3300	378 (6.2)	4-5/8 x 3-3/4 (117.5 x 95.2)	6	Natural	1195 (542)
V8E-170	170	3300	470 (7.7)	4-5/8 x 3-1/2 (117.5 x 88.9)	8	Natural	1410 (640)
V8-185	185	3300	470 (7.7)	4-5/8 x 3-1/2 (117.5 x 88.9)	8	Natural	1410 (640)
V8-210	210	3300	504 (8.2)	4-5/8 x 3-3/4 (117.5 x 95.2)	8	Natural	1460 (662)
V6E-195	195	2500	588 (9.6)	5-1/2 x 4-1/8 (139.7 x 104.7)	6	Natural	1640 (775)
V6-200	200	2600	588 (9.6)	5-1/2 x 4-1/8 (139.7 x 104.7)	6	Natural	2080 (943)
V8E-235	235	2400	785 (12.8)	5-1/2 x 4-1/8 (139.7 x 104.7)	8	Natural	2080 (943)
V8-265	265	2600	785 (12.8)	5-1/2 x 4-1/8 (139.7 x 104.7)	8	Natural	2080 (943)
V-903	320	2600	903 (14.8)	5-1/2 x 4-3/4 (139.7 x 120.6)	8	Natural	2160 (980)
	300	2600	903 (14.8)	5-1/2 x 4-3/4 (139.7 x 120.6)	8	Natural	2160 (980)
	280	2600	903 (14.8)	5-1/2 x 4-3/4 (139.7 x 120.6)	8	Natural	2160 (980)
C-160**	160	2500	464 (7.6)	4-7/16 x 5 (112.7 x 127.0)	6	Natural	1600 (726)
CF-160**	160	2800	464 (7.6)	4-7/16 x 5 (112.7 x 127.0)	6	Natural	1600 (726)
C-180	180	2500	464 (7.6)	4-7/16 x 5 (112.7 x 127.0)	6	Supercharged	1660 (753)
C-190	190	2500	464 (7.6)	4-7/16 x 5 (112.7 x 127.0)	6	Turbocharged	1670 (757)
NH-200	200	2100	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	2415 (1096)
NH-220	220	2100	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	2415 (1096)
NHH-220	220	2100	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	2500 (1134)

*Horsepower at standard S.A.E. conditions of 500 ft. (152 m) altitude and 85°F (29.4°C) air intake temperature.

**Not available for on-highway use in U.S.A. and Canada.

*Puissance en CV aux conditions standardisées S.A.E., altitude 500 pieds (152 m) et température d'admission de l'air 85°F (29.4°C).

**Non disponible(s) pour utilisation sur les routes publiques aux Etats-Unis et au Canada.

*Horsepower gemäß SAE-Normbedingungen: 152 m Höhe ü.d.M. und 29.4° C Luftansaugtemperatur.

**Nicht erhältlich für Straßenverkehrsfahrzeuge in USA und Kanada.

*Caballaje en condiciones de norma S.A.E., de 500 pies (152 metros) de altura y con el aire de admisión a una temperatura de 85°F (29.4°C).

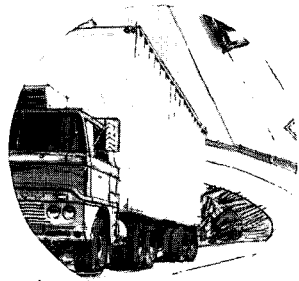
**No disponible para uso en carretera en U.S.A. y Canadá.

Engine	HP *S.A.E.	RPM	Displacement Cubic Inches (Litres)	Bore and Stroke Inches (mm)	Number of Cylinders	Aspiration	Net Weight Pounds (Kg.)
Moteur	CV	T/MN	Cylindrée Pouces Cubiques	Alésage et Course Pouces	Nombre de Cylindres	Aspiration	Poids Net Livres
Motor	PS	U/min.	Hubraum	Bohrung und Hub	Anzahl der Zylinder	Ansaugart	Nettoge- wicht
Motor	HP	RPM	Cilindrada Pulgadas Cúbicas	Diámetro y Carrera Pulgadas	Número de Cilindros	Aspiración	Peso Neto Libras
NHD-230	220	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Natural	2430 (1102)
NH-230	230	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Natural	2430 (1102)
NHCT-CT	240	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2510 (1139)
NHC-250	250	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Natural	2460 (1115)
	225	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Natural	2460 (1115)
NHHTO-6	262	2100	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Turbocharged	2605 (1182)
NHRTO-6	262	2100	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Turbocharged	2605 (1182)
NHCT-270	270	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2510 (1139)
	255	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2510 (1139)
	240	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2510 (1139)
NTC-335	335	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2680 (1216)
	320	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2680 (1216)
	300	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2680 (1216)
	280	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2680 (1216)
	260	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2680 (1216)
NT-350	350	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2750 (1247)
NT-380**	380	2300	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2710 (1230)

Fire Truck Models
Modèles de Camions des Services de Protection Contre les Incendies
Modelle für Feuerlöschfahrzeuge
Modelos para Camiones de Bomberos

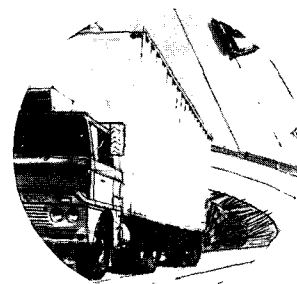
NHF-240	240	2300	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Natural	2430 (1102)
NHF-265	265	2300	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Natural	2460 (1115)
NHTF-295	295	2300	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2510 (1139)
NTF-365	365	2300	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2680 (1216)
VF-903	320	2600	903 (14.8)	5-1/2 x 4-3/4 (139.7 x 120.6)	8	Natural	2160 (980)

AUTOMOTIVE
VEHICULES AUTOMOBILES
KRAFTFAHRZEUGE
AUTOMOTRICES



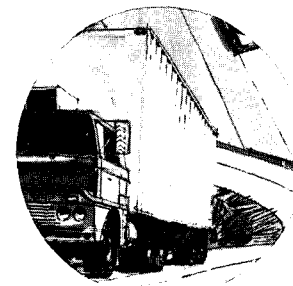
 Buses and Coaches Autobus et Cars Omnibusse und Reisebusse Autobuses Urbanos e Interurbanos				
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Australia	Ansair Pty. Ltd. Essendon, Victoria	Various	City/Tourist Bus	V8-185 V8-265
		Various	City/Tourist Bus	V6-200
Germany	Freighters Ltd. Adelaide, South Australia	Setra	Tourist Bus—Seating Capacity—72	V6-200
Mexico	Kaessbohrer Ulm	532	Front Engine Chassis	V6-140
		533	Front Engine Chassis	V8-185
		604	Rear Engine Chassis	V8-185
		319	Inter-City Coach—Seating Cap.—40	NTC-335
	Trailers de Monterrey Monterrey	13	Inter-City Coach—Seating Cap.—41	V8-265
		14	City Transit—Seating Capacity—40	V8E-235
		17	Inter-City Panoramic—Seat. Cap.—41	NTC-335
South Africa	Bus Bodies Pty. Ltd. Port Elizabeth	18	Inter-City Panoramic—Seat. Cap.—41	NTC-335
		Various	Various	NHH-220 NHHTO-6
United Kingdom	Transport Equipment Ltd. (Daimler) Coventry	Roadliner CR-36	City/Tourist Bus—Seat. Cap.—49	V6-200
			Inter-City bus—Seating Capacity—52	V6-200
United States	Bluebird Body Company Fort Valley, Georgia	All American various types	Various—Seating Capacity—50 to 64	NHH-220 V8E-170 V8-185 C-160 C-180
		CPB-42	Pusher chassis	C-160 C-180
		ADV185		V8-185
		AD672	Seating Capacity—79	NHH-220
		AD743	Seating Capacity—79	NHH-220
	Crown Coach Corporation Los Angeles, California	2-AD743	Seating Capacity—91	NHH-220
		FCB-900	Pusher Chassis	V8-185
		111CD-C1	Transit—Seating Capacity—35	V8E-170 V8-185
	Dodge-Chrysler Detroit, Michigan		Transit—Seating Capacity—50	V8E-235 V8-210
			Inter-City—Seating Capacity—50	V8-265
			Inter-City—Seating Capacity—35	V8-185
		743-D	Seating Capacity—79	C-190 NHH-220
		672	Seating Capacity—79	NHH-220
	The Flixible Company Loudenville, Ohio		Transit Coach	V8-185
	Gillig Brothers Haywood, California			
	Highway Products Company Kent, Ohio			
	International Harvester Co. Chicago, Illinois (Chassis)	1853-DFC (front engine)		C-160 CF-160 C-180
	Jay Madsen Equipment Co. Bath, New York			C-160 C-180 C-190

AUTOMOTIVE
VEHICULES AUTOMOBILES
KRAFTFAHRZEUGE
AUTOMOTRICES



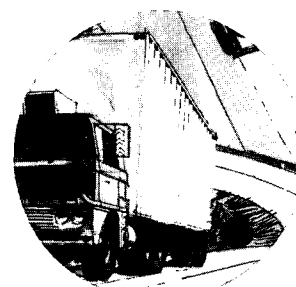
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Jay Madsen Equipment Co. Bath, New York (Continued)			NHH-220 NT-380 V8-185 V8-265
 On-Highway Trucks Camions en Circulation sur les Autoroutes Lastkraftfahrzeuge für Strassenverkehr Camiones para Carretera				
Australia	Atkinson Vehicles (A'Asia) Pty. Ltd. Clayton, Victoria	T3266C T2846C L2486C	Normal Control & C.O.E.	NH-220 NHC-250 NTC-335
	British Motor Corporation Zetland, N.S.W.	BMC FJ1071	C.O.E. Truck	V8-185
	British Standard Machinery Sydney, N.S.W.	FWD	C.O.E. & Normal Control	C-180 NH-220 NH-250
	Chrysler Australia Ltd. Tonsley Park	Dodge 760 DV Dodge D2 F-1160	Normal Control Truck C.O.E. Truck	V8-185 V8-185
	H. W. Crouch Pty. Ltd. Camperdown, N.S.W. (Diamond Reo)	C101640 C90640	C.O.E. & Normal Control	C-160, NHC-250, C-180, NHCT-270, V8-185
	E. R. F. Australia Villawood, N.S.W.	64 CU 220 66 CU 220 68 CU 250 BGT	C.O.E.	NH-220 NH-225 NT-335
	Fodens Ltd. Australia Sydney, N.S.W.	8C6-28 6AC6-32	C.O.E. Truck	NH-220 NH-250
	Ford Motor Company Pty. Ltd. Melbourne, Victoria	F 8000 D 1000	Normal Control Truck C.O.E. Truck	C-180 V8-185
	General Motors Holden Melbourne, Victoria	KM Series	C.O.E. Truck	V8-185
	IHC of Australia Pty. Ltd. Melbourne, Victoria	ACCO-1950 ACCOF-1950 ACCO-1950 Twin Steer	C.O.E. Truck C.O.E. Truck C.O.E. Truck	V8-185 V8-185 V8-185
		CD1840	Normal Control Truck	C-160 C-180 V8-185
		CO4070	C.O.E. Truck	NH-250 NHC-250 NTC-335 V-903
	Kenworth Motor Trucks P/L. Melbourne, Victoria	W 900 K 100 L 900	C.O.E. & Normal Control	NH-250 NHCT-270 NTC-335 NT-380
	Leyland Motor Corp. of Australia Melbourne, Victoria	Scammell Contractor	6 x 4 Heavy Duty Truck	NH-250 NTC-335
	Mack Trucks of Australia	Mack	Normal Control Truck	NTC-335

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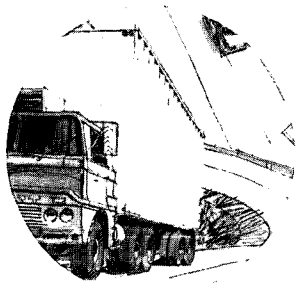
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Australia (Continued)	Theiss White Australia Brisbane	1550 TD 2364 D 4500 TD 7400 TD DC 7564	C.O.E. & Normal Control Various	NH-250 C-180 C-175 NHCT-270-CT NTC-335
Austria	O.A.F. Wein	Tornado	6 x 4 Tractor	NH-250
Canada	Canadian Kenworth Ltd. Burnaby, B. C. Hayes Manufacturing Co. Vancouver, B. C. International Harvester Co. Chatham, Ontario S. Madill Ltd. British Colombia Pacific Truck and Trailer Ltd. Sicard, Inc. Ste. Therese, Quebec White Truck Mfg. Ltd. Kelowna, B. C.			NHC-250 NHCT-270 NTC-335 NHC-250 NTC-335 NT-380 NH-220 NH-230 NHC-250 NTC-335 NT-380 NTC-335 C-160 C-180 C-190 NH-220 NHD-230 NHC-250 NHCT-270 NTC-335 NH-230 NHC-250 NHCT-270 NTC-335
France	Automobiles M. Berliet Vinessieux (Rhône)	TBO-M3 TBO-120	Tractor Tractor	NT-280 NT-280
Germany	Faun-Werke Nurnberg	L1212	Tractor	NT-335 NT-380
Mexico	Autocar Mexicana Diesel Nacional (DINA) Sahagun (DINA and Diamond T Trucks) Kenworth Mexicana S.A. de C.V. Remolques, S.A. (Atlas truck)	DC-102 531 631 661 761 W-921 W-922 W-923 K-521-M K-522-M K-523-M 250 235	Tractor Straight Truck Straight Truck Straight Truck Tractor Tractor Tractor	NTC-335 V6-140 V8-185 V8-185 NTC-335 NTC-335 NTC-335 NTC-335 NTC-335 NTC-335 NH-250 NTC-335

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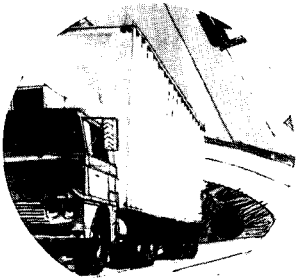
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Mexico (Continued)	Trailers de Monterrey, S.A. Monterrey (Ramirez truck)	R-18-A R-18-AT R-18-2D	Tractor Tractor Tractor	NH-220 NH-220 NTC-335
	Trailers Del Norte, S.A. (Pena Trucks)	R-250 R-335	Tractor Tractor	NH-250 NTC-335
	Victor Patron, S.A. (White trucks)	4964-WTD	Tractor	NTC-335
South Africa	Atkinson Vehicles South Africa		Various	NH-220 NH-250 NT-335
	Chrysler South Africa	K-800 K-900	Various	V6-140 V8-185
	E.R.F. South Africa (Pty.) Ltd.	66 CU 220 66 CU 250	Various Various	NH-220 NH-250
	Foden		Various	NH-220 NH-250
	Ford South Africa I.H.C.	D-1000	Various Various	V8-185 NH-220 NH-250 NT-335
United Kingdom	Rolway Enterprises (Ralph trucks)		Various	NH-250 NHCT-270
	Atkinson Vehicles Ltd. Preston, Lancs.	Various on-highway models	Tractor units and freight chassis from 16 to 100 tons G.T.W.	NHK 220 to NT-335
	E. R. F. Ltd. Sandbach, Cheshire.	Various on-highway models	Tractor units from 25 to 50 ton G.T.W., & special purpose chassis.	NHK 220 to NT-335
	Fodens Ltd. Sandbach, Cheshire.	Various on-highway models	Tractor, tipped, and special purpose chassis from 16 tons to 100 tons G.T.W.	NHK 220 to NT-335
	Ford Motor Co. Ltd.	D1000 Series	Tractor, tipper and freight chassis from 16 tons to 28 tons G.T.W.	V8-185 V8E-170
	Guy Motors Ltd.	Big J Series	30 and 32 ton G.T.W. Tractor Chassis	V8-185 V8E-170
	Scammell Lorries Ltd. Watford, Herts.	Constructor and Super Constructor Contractor	6 x 6 heavy duty tractor for special loads to 200 ton G.T.W. 6 x 4 heavy duty tractor for special loads up to 75 ton G.T.W.	NHK-200 NHK-220 NHK-220 NHK-250 NT-335 NT-380
United States	Autocar Division of White Motor Co. Exton, Pennsylvania	S 42, S 64 & A 62		NH-200 NH-230 NHD-230 NHCT-CT NHC-250 NHCT-270 NTC-335 V-903

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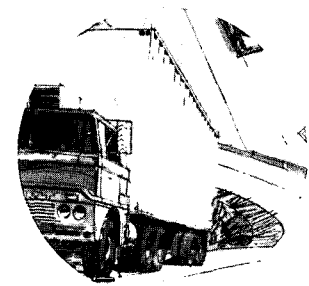
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Autocar Division of White Motor Co. Exton, Pennsylvania (Continued)	CK-64 Half cab		NH-200 NHD-230 NH-230 NHC-250
		DC 66, D 73, DC 87, DC 9966		NH-200 NHD-230 NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335 V-903
		DC 93, DC 103 & DC 10366		NH-200 NHD-230
		100 Series and 200 Series		C-160 CF-160 C-180
	Brockway Motor Trucks Cortland, N. Y.	300 Series and 400 Series		C-160 CF-160 V8E-170 C-180 V8-185 NHD-230 NH-230 NHCT-CT NHC-250 NHCT-270 V-903 NTC-335 NHC-250
				NHCT-270
				NH-220 NHD-230 NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335
				C-180 C-190
	Chevrolet Division of General Motors Detroit, Michigan	FN-90, HN-90, DN-90 & JN-90 FC-90, DC-90		C-160 CF-160 V8E-170 C-180 V8-185 C-190 V6-140
		C-9042D & DL and C-9064D & DL		C-180 C-190
	Diamond Reo Division of White Motor Co. Lansing, Michigan	C-9086		
		C-10142D, C-10144D, C-10164D, C-10166D, DC-10142 & DC-10144 C-6842D C-10186D		

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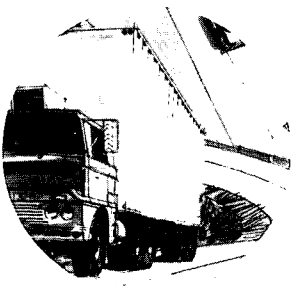
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Diamond Reo Division of White Motor Co. Lansing, Michigan (Continued)	C-11442D & DL and C-11464D & DL		NH-220 NHD-230 NH-230 NHCT-CT NHC-250 NHCT-270 V-903 NTC-335
		CF-5964D & CF-5942TD		C-160 CF-160 C-180 V8E-170 V8-185
		C-11486-D		NH-220 NHC-250 NH-230 V8-185
		CF-6842D & CF-5542		CF-160 C-180 C-190
		CF-8342D & DF-8364D		NH-220 NHD-230 NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335 NT-350
	Dodge Truck Operations Chrysler Corporation Detroit, Michigan	CO-5042D & DL, CO-5064 & DL, CO-7842D and CO-7864D		V8E-170 V8-185
		C-800, CT-800 & C-850		NH-230 NHC-250 V8E-170 V8-185
		CN-900 & CNT-900 L-700		NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335
	Ford Motor Company Dearborn, Michigan	LN-1000 & LNT-1000		C-180
		C-8000 CT-8000 LN & LNT-9000		NHD-230 NH-230 NHC-250 NHCT-270 NHCT-CT NTC-335

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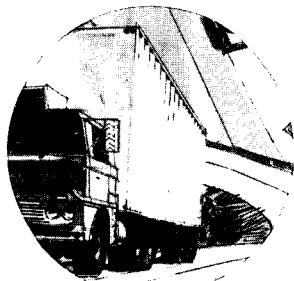
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Ford Motor Company Dearborn, Michigan (Continued)	W & WT		NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335 V-903
	Freightliner Corporation Portland, Oregon	WFHT		CF-160 C-180 V8-185 C-190 NH-200 NH-220 NHD-230 NH-230 NHC-250 NHCT-270
		WFT		NH-200 NHD-230 NH-230 NHCT-CT NHC-250 NHCT-270 V-903 NTC-335 NT-350
	FWD Corporation Clintonville, Wisconsin	B Series		CF-160 C-180 V8-185 C-190 NH-220 NH-230 NHCT-CT NHC-250 V8-265 NHCT-270 NTC-335
		LB Series		CF-160 C-180 V8-185 C-190 V8-265
		C Series		C-180 V8-185 C-190 V8-265
		COE Series		NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335

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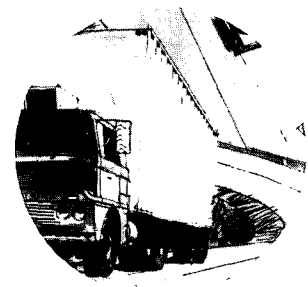
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	GMC Truck & Coach Division Pontiac, Michigan	NH-9500 & JN-9500		NHD-230 NH-230 NHC-250
		DC-9502 & FC-9502		NHCT-CT NHCT-270 NTC-335
		DN-9502 & FN-9502		NH-230 NHC-250
	Hendrickson Manufacturing Co. Lyons, Illinois	H Series		C-180 V8-185 C-190 NH-200 NH-220 NHD-230 NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335 V-903
		CO4070D		V6-200 NH-220 NH-230 NHCT-CT NHC-250 NHCT-270 V-903 NTC-335
	International Harvester Co. Chicago, Illinois	DC400 & D400		C-190 NH-220 NH-230 NHCT-CT NHC-250 NHCT-270 V-903 NTC-335
		DCO-200 & 205H Series		C-180 NH-200 NH-220 NH-230 NHC-250
		M Series		C-180 NH-200 NH-220 NHD-230 NH-230 NHC-250 NHCT-270

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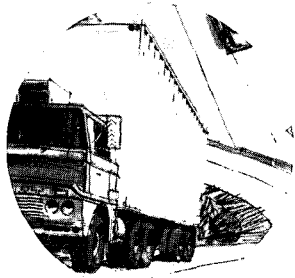
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	International Harvester Co. Chicago, Illinois (Continued)	2000 D		NH-200 NH-220 NH-230 NHC-250 NHCT-270
		210D & F230D		NH-200 NH-220 NHD-230 NH-230 NHC-250 NHCT-270 NTC-335
	Kenworth Motor Truck Company Seattle, Washington	W-923		C-180 C-190 NH-220 NH-230 NHC-250
		K121, K122, K123, K124, & K125		NH-220 NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335 NT-350
		C-800 S2		NH & NT Series
		W-900 S2		C-180 C-190 V8-210 V-903
		W-900 S12		NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335 NT-350
		W-921, W-922, W-923, W-924, & W-925		NH-220 NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335 NT-350

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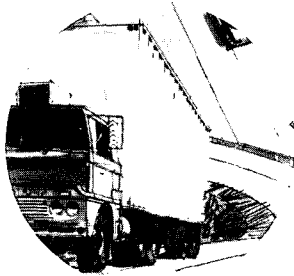
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Mack Trucks, Inc. Allentown, Pennsylvania	DM Series		V8-185 NH-220 NHD-230 NH-230 NHC-250 NTC-335 NT-350 V-903
		F Series		NH-220 NH-230 NHC-250 NTC-335 NT-350 V-903
		MB-477		V8E-170 V8-185
		R Series		V8-185 NH-220 NHD-230 NH-230 NHC-250 NTC-335 NT-350 V-903
	Mack Western Division of Mack Trucks, Inc. Hayward, California	FL-700 & RL-700		NH-220 NHD-230 NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335 NT-350
	Marmon Harrington Lebanon, Indiana	CHDT-BC & CHDT-BF		NHD-230 NH-230 NHC-250 NHCT-270 NTC-335
		HDT-BC & HDT-BF		NHD-230 NH-230 NHC-250 NHCT-270 NTC-335
	Oshkosh Motor Truck, Inc. Oshkosh, Wisconsin	D Series		V8-265
		F & C Series		V8E-170 C-180 C-190 V8-265

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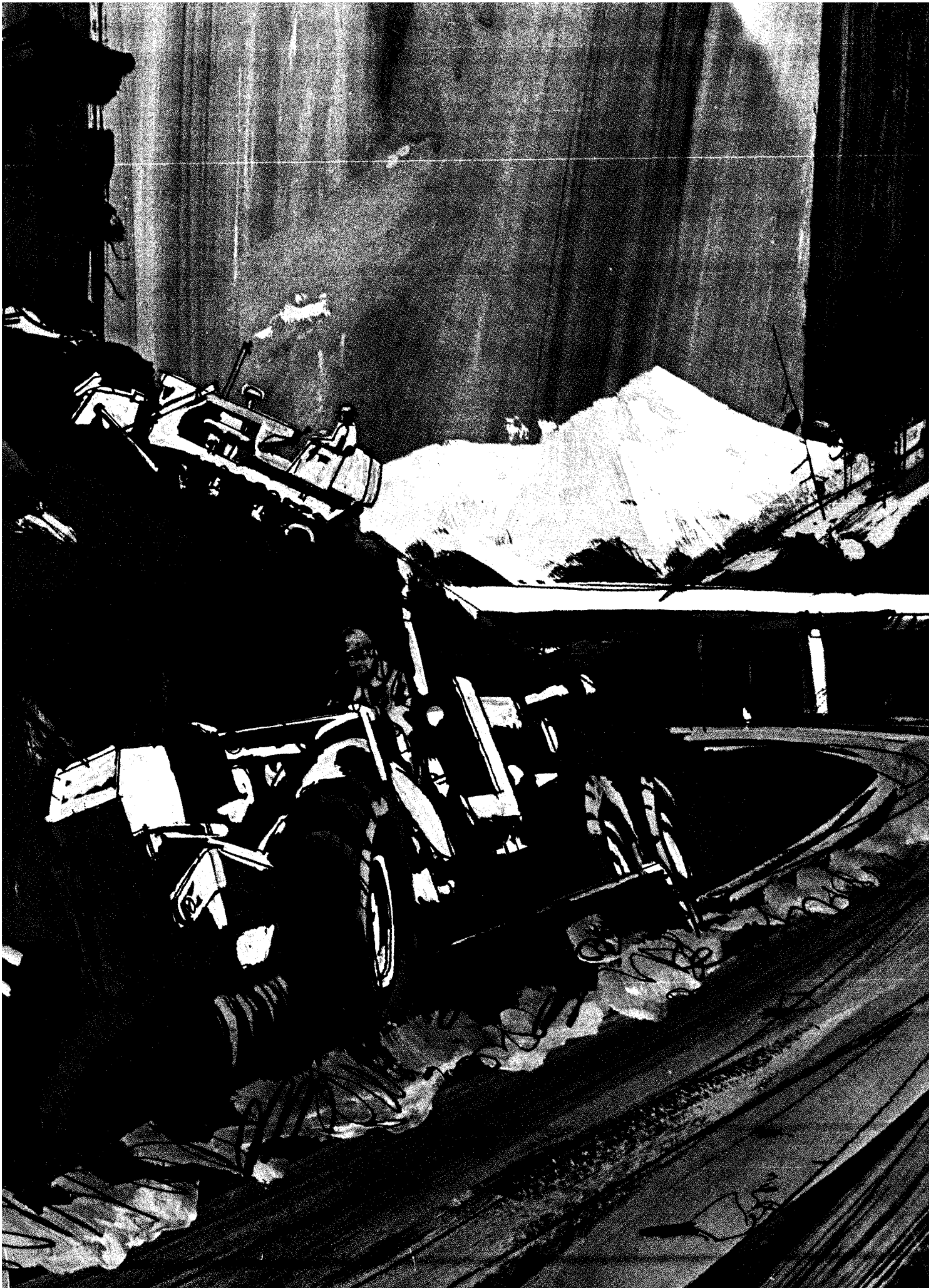


Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Peterbilt Motor Co. Newark, California	281 & 288	Ready Mix Truck	C-180 C-190 NH-220 NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335 NT-350
		282		NH-220 NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335 NT-350
		341 & 351		C-180 C-190 V8-210 NH-220 NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335 NT-350
		352, 381 & 383		NH-220 NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335 NT-350
	Rite-Way Fort Wayne, Indiana	6811		C-180 C-190
	Sicard, Inc. Watertown, N. Y.	A-270, A-6416 & A-6430		C-160 C-180 C-190
		KS-6430		NH-220 NHC-250 NHCT-270 NTC-335
	White Truck Division of White Motor Company Cleveland, Ohio	1500D & 1550TD Series		C-160 CF-160 C-180 C-190 V6-140 V8E-170 V8-185

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Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	White Truck Division of White Motor Company Cleveland, Ohio (Continued)	2300D Series		C-160 CF-160 V8E-170 C-180 V8-185 C-190
		1200D Series		V6-140
		4300 Series		C-160 CF-160 C-190 V8E-170 V8-185
		4500 Series		NH-200 NH-220 NHD-230 NH-230 NHCT-CT NHC-250 V-903 NTC-335 NHCT-270
		4600 Series		NH-220 NHD-230 NH-230 NHCT-CT NHC-250 NHCT-270 NTC-335
		9300		C-160 CF-160 V8E-170 V8-185
		9500		NH-200 NHD-230 NH-230 NHCT-CT NHC-250 NHCT-270 V-903 NTC-335
		7400		NHD-230 NH-230 NHCT-CT NHC-250 V-903 NHCT-270 NTC-335



CUMMINS CONSTRUCTION AND MINING ENGINES

Whether digging a ditch or moving a mountain, Cummins delivers the rugged, economical and reliable power that construction and mining equipment customers demand in meeting deadlines and maximizing profits.

A wide range of power is available in a minimum number of basic engine models. Standardizing on Cummins in all types of construction and mining equipment results in many customer benefits, including high parts interchangeability, lower parts inventory cost, lower maintenance and repair costs, less equipment downtime, uniform engine installation, higher mechanic efficiency, and increased profits.

Cummins big displacement and conservative ratings give plenty of power when it is needed, without putting undue internal stress on the engine. This, of course, increases engine life while decreasing maintenance and downtime.

Cummins engineers have developed excellent, well designed components that protect internal parts against the elements and thus insure long, trouble-free operation. Full flow lubricating oil filters, coolant corrosion resistors, heavy duty fuel filters, positive seal oil filler caps and dipsticks, composite dry-type air cleaners, and molded air connections are standard on all Cummins construction and mining engines.

MATERIELS CUMMINS DE CONSTRUCTION ET DE MINE

Que ce soit pour creuser un fossé ou déplacer une montagne, Cummins fournit dans la quantité voulue et d'une manière économique la puissance sur laquelle les clients, désireux d'acheter du matériel de construction et de mine doivent pouvoir compter pour satisfaire leurs besoins et réaliser le maximum de profits.

Une large gamme de puissances est disponible dans un minimum de modèles-types de moteurs. La standardisation des moteurs Cummins dans tous les types de matériels de construction et de mine offre au client de nombreux avantages comprenant les suivants : interchangeabilité élevée des pièces, coût plus bas du stock de pièces, entretien et coût des réparations, plus réduits, moins d'inactivité dans l'équipement en service, installation uniforme des moteurs, rendement mécanique plus élevé et augmentation des profits.

La grande cylindrée des diesels Cummins et l'estimation prudente des caractéristiques de ces moteurs permettent de garantir la fourniture de la puissance nécessaire sans soumettre le matériel de ceux-ci à des contraintes excessives. La durée du moteur en service augmente tandis que les frais d'entretien et le temps d'inactivité de celui-ci diminuent.

Les ingénieurs de Cummins ont mis au point des organes excellents, bien étudiés, protégeant les pièces intérieures contre les éléments et permettant de faire fonctionner le moteur longtemps, sans dérangements. Les filtres à huile lubrifiante à plein débit, les résistances de mesure de la corrosion par le liquide de refroidissement, les filtres à huile combustible, fortement chargés, les chapeaux de remplissage à joint d'étanchéité positif, les jauges, les filtres à air composés de type sec et les raccords moulés des tuyaux d'air sont standardisés sur tous les matériels de construction et de mine Cummins.

CUMMINS MOTOREN FÜR BAU- UND BERGBAUMASCHINEN

Ob es sich darum handelt, einen Graben auszuheben oder einen Berg zu bewegen, Cummins bietet jene robusten und zuverlässigen Motoren, welche der Kunde im Baumaschinen- und Bergbaumaschinen-Sektor verlangt, damit er Termine einhalten und höchsten Nutzen erzielen kann.

Bei einer geringen Anzahl von Motorgrundmodellen bietet Cummins hier dennoch eine reiche Auswahl. Wenn der Kunde sich einheitlich für Cummins Bau- bzw. Bergbaumaschinen entscheidet, so bringt ihm dies vierlei Vorteile, unter anderem weitgehende Austauschbarkeit von Teilen, niedrigere Kosten in der Ersatzteilerhaltung, niedrigere Unterhaltungs- und Reparaturkosten, geringere Ausfallzeiten, einheitliche Motorenausrüstung, höhere Maschinenrentabilität und höheren Gewinn.

Mit ihrem großen Hubraum und soliden PS-Leistungen liefern Cummins-Motoren äußerste Kraft, wenn diese benötigt wird, ohne dabei das Innere des Motors übermäßig zu beanspruchen. Dies trägt natürlich zu längerer Lebensdauer des Motors bei und gleichzeitig verringert Wartung und Ausfallzeit.

Cummins-Ingenieure haben ausgezeichnete, gut durchkonstruierte Anlagen entwickelt, welche die Innenteile gegen die Elemente schützen und damit langen, störungsfreien Betrieb gewährleisten. Vollstrom-Schmierfilter, Rostschutzeinbauten im Kühlsystem, Hochleistungs-Kraftstofffilter, selbstdichtende Ölverschlußkappe und Ölmeßstäbe, mehrstufige Trockenluftreiniger sowie Luftanschlußstücke aus Plastikformteilen gehören zur Normalausrüstung sämtlicher Cummins Bau- und Bergbaumaschinen.

MOTORES CUMMINS PARA CONSTRUCCION Y MINERIA

No importa que se trate de excavar una zanja o de mover una montaña, porque Cummins entrega la potencia fuerte, económica y confiable que los compradores de equipo para construcción y minería exigen para cumplir con las fechas de entrega y obtener máximas ganancias.

Está disponible una amplia gama de potencias dentro de un número mínimo de modelos de motores básicos. El uso normalizado de Cummins en todos los tipos de equipo para construcción y minería da por resultado muchos beneficios para el cliente, incluyendo gran intercambiabilidad de piezas, menor costo de inventario de piezas, costos de reparación y mantenimiento más bajos, menores pérdidas de tiempo del equipo, instalación uniforme de los motores, mayor eficiencia mecánica y ganancias aumentadas.

La gran cilindrada y las especificaciones conservadoras de Cummins brindan abundancia de potencia cuando se necesita, sin aplicar esfuerzos internos anormales al motor. Esto, por supuesto, aumenta la vida del motor a la vez que reduce el mantenimiento y el tiempo perdido en reparaciones.

Los ingenieros de Cummins han desarrollado excelentes y bien diseñados componentes que protegen a las partes internas contra los elementos y, con ello, aseguran una operación larga y libre de problemas. Los filtros para lubricante de flujo pleno, los anticorrosivos para el sistema de enfriamiento, filtros de combustible para trabajo pesado, tapones y varillas de nivel de aceite de sellado positivo, filtros de aire del tipo doble y conexiones moldeadas para aire, todos, son equipo de norma (standard) en todos los motores Cummins para construcción y minería.

CONSTRUCTION AND MINING ENGINE SPECIFICATIONS
SPECIFICATIONS DES MATERIELS DE CONSTRUCTION ET DE MINE
MOTORDATEN FÜR BAU- UND BERGBAUMASCHINEN
ESPECIFICACIONES DE MOTORES PARA CONSTRUCCION Y MINERIA

Engine	HP *S.A.E.	RPM	Displacement Cubic Inches (Litres)	Bore and Stroke Inches (mm)	Number of Cylinders	Aspiration	Net Weight Pounds (Kg.)
Moteur	CV	T/MN	Cylindrée Pouces Cubiques	Alésage et Course Pouces	Nombre de Cylindres	Aspiration	Poids Net Livres
Motor	PS	U/min.	Hubraum	Bohrung und Hub	Anzahl der Zylinder	Ansaugart	Nettogewicht
Motor	HP	RPM	Cilindrada Pulgadas Cúbicas	Diámetro y Carrera Pulgadas	Número de Cilindros	Aspiración	Peso Neto Libras
V-352-C	140	3300	352 (5.7)	4-5/8 x 3-1/2 (117.5 x 88.9)	6	Natural	1175 (533)
V-378-C	155	3300	378 (6.2)	4-5/8 x 3/4 (117.5 x 95.2)	6	Natural	1195 (542)
V-470-C	185	3300	470 (7.7)	4-5/8 x 3-1/2 (117.5 x 88.9)	8	Natural	1410 (640)
V-504-C	210	3300	504 (8.2)	4-5/8 x 3-3/4 (117.5 x 95.2)	8	Natural	1460 (662)
V-588-C	200	2600	588 (9.6)	5-1/2 x 4-1/8 (139.7 x 104.7)	6	Natural	1790 (812)
V-785-C	220	2300	785 (12.8)	5-1/2 x 4-1/8 (139.7 x 104.7)	8	Natural	2180 (989)
V-785-C	265	2600	785 (12.8)	5-1/2 x 4-1/8 (139.7 x 104.7)	8	Natural	2180 (989)
C-464-C	160	2500	464 (7.6)	4-1/8 x 5 (112.7 x 127.0)	6	Natural	1580 (717)
CT-464-C	175	2500	464 (7.6)	4-1/8 x 5 (112.7 x 127.0)	6	Turbocharged	1720 (780)
CS-464-C	196	2600	464 (7.6)	4-1/8 x 5 (112.7 x 127.0)	6	Supercharged	1650 (748)
H-743-C	175	1800	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	2435 (1104)
H-743-C	190	2000	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	2435 (1104)
N-743-C	220	2100	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	2470 (1120)
NS-743-C	320	2100	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Supercharged	2470 (1120)
N-855-C	250	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Natural	2590 (1174)
NT-855-C	310	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2750 (1247)
NT-855-C	335	2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2750 (1247)
NTA-855-C	380	2300	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2750 (1247)
V-1710-C	500	2100	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Natural	5280 (2395)
VT-1710-C	635	2100	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	5780 (2622)
VTA-1710-C	700	2100	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	5780 (2622)
VTA-1710-C	800	2100	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	5780 (2622)

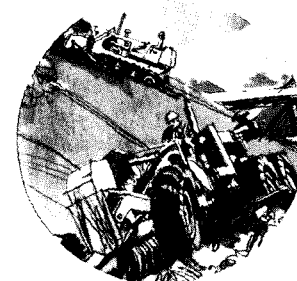
*Horsepower at standard S.A.E. conditions of 500 ft. (152 m) altitude and 85°F (29.4°C) air intake temperature.

*Puissance en CV aux conditions standardisées S.A.E. altitude 500 pieds (152 m) et température d'admission de l'air 85°F (29.4°C).

*Horsepower gemäß SAE-Normbedingungen: 152 m ü.d.M. und 29.4° C Luftansaugtemperatur.

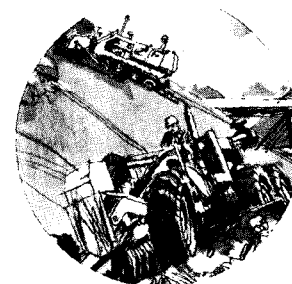
*Caballaje en condiciones de norma S.A.E. de 500 pies (152 metros) de altura y con el aire de admisión a una temperatura de 85°F (29.4°C).

CONSTRUCTION & MINING
CONSTRUCTION ET MINES
BAUMASCHINEN UND BERGBAUMASCHINEN
CONSTRUCCION Y MINERIA



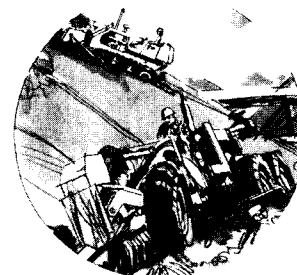
 Air Compressors Compresseurs d'air Kompressoren Compresores de Aire				
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Australia	Armstrong Holland Pty. Ltd. Sydney. N.S.W.	Jaeger	365 c.f.m. 600 c.f.m.	C-464-C160 N-743-B220
	Atlas Copco Australia Pty. Ltd. Sydney. N.S.W.	Atlas Copco	365 c.f.m. 600 c.f.m.	N-495-C130 N-743-B220
	Broom & Wade (Aust.) Pty. Ltd. Melbourne, Victoria	WR-600	600 c.f.m.	N-743-B220
	Consolidated Pneumatic Melbourne, Victoria.	CPTRO-2	365 c.f.m.	C-464-B160
	Gardner Denver Australia P/L. Sydney. N.S.W.	SP-600	600 c.f.m.	N-855-C250
	Holman Bros. (Aust.) Pty. Ltd. Melbourne, Victoria.		370 c.f.m. 600 c.f.m.	HU-170 N-743-B220
	Ingersoll Rand (Aust.) Pty. Ltd. Melbourne, Victoria.	DR 365 DR 600	365 c.f.m. 600 c.f.m.	N-495-B130 N-743-B220
	Joy Manufacturing Co. Pty. Ltd. Sydney. Victoria.	Joy	600 c.f.m.	N-743-B220
	Worthington Australia Sydney. N.W.W.	Worthington	600 c.f.m.	N-855-C250
India	Consolidated Pneumatic Tool Co. (I) Ltd. Mulund, Bombay	CPT 600-RO-2 CPT 365-RO-2	600 c.f.m. 365 c.f.m.	NH-220-BI NHC-4-BI
	Kirloskar Pneumatic Company Ltd. Poona	Kirloskar- Broomwade WR-600	600 c.f.m.	NH-220-BI
Japan	Hokuetsu Kogyo Co., Ltd. Tokyo	AMR-370 AMR-600	370 c.f.m. 600 c.f.m.	N-495-C N-743-C
	Kobe Steel Ltd. Kobe	KSP-600	600 c.f.m.	N-743-C
	Mitsui Seiki Kogyo Co. Ltd. Tokyo	RV-105 RV-170 RS-170	370 c.f.m. 600 c.f.m. 600 c.f.m.	N-495-C N-743-C N-743-C
Mexico	Gardner-Denver de Mexico	SP-600	600 c.f.m. portable	N-855-C
	Worthington de Mexico, S.A.	600	600 c.f.m. portable	N-855-C
South Africa	Atlas Copco Benoni, Transvaal	PR-365 PR-600	365 c.f.m. 600 c.f.m.	N-495-C N-743-C
	Broom & Wade Isando, Transvaal	WR 380 WR 600	380 c.f.m. 600 c.f.m.	H-672-C N-743-C
	C.P.T.	600 RO2	600 c.f.m.	N-743-C
	Holman Bros. Germiston, Transvaal	RO 370 RO 600	370 c.f.m. 600 c.f.m.	H-672-C N-743-C
	Ingersoll Rand Alrode, Transvaal	DR-365 DR-600	365 c.f.m. 600 c.f.m.	N-495-C N-743-C
	Atlas Copco Ltd. Hemel Hempstead, Herts.	PR 600	600 c.f.m.	V-504-C NH-220-BI
United Kingdom	Broom & Wade Ltd. High Wycombe, Bucks.	WR 380 WR 600	380 c.f.m. 600 c.f.m.	HU-170-BI NH-220-BI

CONSTRUCTION & MINING
CONSTRUCTION ET MINES
BAUMASCHINEN UND BERGBAUMASCHINEN
CONSTRUCCION Y MINERIA



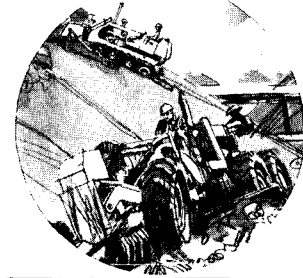
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United Kingdom (Continued)	Consolidated Pneumatic Tool Co. Ltd., London	600 RO 2	600 c.f.m.	NH-220-BI
	Holman Bros. Ltd. Camborne, Cornwall	900	900 c.f.m.	NTA-380-BI V-378-C
	Ingersoll-Rand Ltd. Manchester	Rotair RO 60 DR 365 DR 600	600 c.f.m. 365 c.f.m. 600 c.f.m.	NH-220-BI NHC-4-BI NH-220-BI
	Joy Manufacturing Co. (UK) Ltd. Renfrewshire, Scotland	RP 600 WM 102 Series	600 c.f.m.	NH-220-BI NH-220 to NT-380-BI
	Petters (Air Pumps) Ltd. Staines, Middx.	ARMD 600	600 c.f.m.	NH-220-BI
	United States			
	Atlas Copco Hackensack, New Jersey	PR-365 PR-600	365 c.f.m. 600 c.f.m.	N-495-C N-743-C
	Grimmer-Schmidt Corporation El Paso, Texas	190 275 380 750	190 c.f.m. 275 c.f.m. 380 c.f.m. 750 c.f.m.	V-352-C V-588-C V-785-C V-785-C (2)
	Worthington Corporation Construction Equipment Div. Holyoke, Massachusetts	365 600 750 1500	365 c.f.m. 600 c.f.m. 750 c.f.m. 1500 c.f.m.	C-464-C N-855-C V-903-C VT-1710-C
 Augers/Drills Hohlbohr- und Vollbohrmaschinen Tarières Barrenas/Taladros				
Australia	English Electric Diesel of Aust. Melbourne, Victoria.	Bucyrus-Erie	Drill	VT-1710-C
France	Benoto Paris	E.D.F.	Earth drill	N-743-P
Japan	Kato Works Co., Ltd. Tokyo	50 THC	Earth drill	N-743-C
United States	Bucyrus-Erie South Milwaukee, Wisconsin	30-R 40-R	Blast hole drill (rotary) Blast hole drill (rotary)	N-743-P NS-743-P NT-855-P
		45-R 60-R	Blast hole drill (rotary) Blast hole drill (rotary)	NTA-855-P VT-1710-P
		McCarthy 1020-30D	22,900 lb. coal auger	H-672-P
		McCarthy 1524-36	47,000 lb. coal auger	H-672-P J-401-P
	Salem Tool Company Salem, Ohio	McCarthy 1530-42	50,000 lb. coal auger	NS-743-P J-401-P
		Special Version of 1530-42	Coal auger	NS-743-P J-401-P
		1630-48	78,800 lb. coal auger	NTA-855-P N-495-P
		1836-48	120,000 lb. coal auger	VT-1710-P N-495-P
		MUL-T	Coal auger	NTA-855-P N-495-P

CONSTRUCTION & MINING
 CONSTRUCTION ET MINES
 BAUMASCHINEN UND BERGBAUMASCHINEN
 CONSTRUCCION Y MINERIA



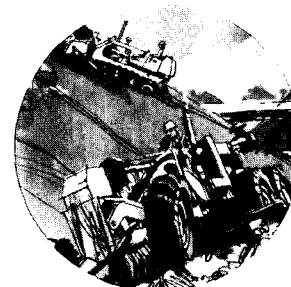
 Backhoes Rétrocaveuses Tieflöffelbagger Retroexcavadoras				
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Australia	English Electric Diesels of Aust. Melbourne, Victoria.	RB 20H	Hydrahoe	V-352-C
Germany	Atlas-Weyhausen Delmenhorst	1602	¾ cu. yd. hydraulic	V-352-C
Japan	Kato Works Co., Ltd. Tokyo	HD-75D	1 cu. yd. hydraulic backhoe/shovel	C-464-C160
United Kingdom	Hymac Peter Hamilton Ltd. London	HM880	1 cu. yd. hydraulic backhoe	V8-185-BI
		HM1080	1¼ cu. yd. hydraulic backhoe	V6-200
United States	Ruston Bucyrus	HM1280		N-743-C
		20H	¾ cu. yd. hydraulic backhoe	V6-140-IP
		Hopto 550	¾ yd. hydraulic	J-401-C
	Badger Division of Warner & Swasey Winona, Minnesota	20-H	¾ yd. hydraulic	V-352-C V-470-C
		30-H	1¼ yd. hydraulic	V-588-C V-785-C
		35C	¾ yd. hoe or 1 yd. shovel (crawler)	V-352-C
	Drott Manufacturing Company Wausau, Wisconsin	40C	Hydraulic	V-352-C
		40R Cruz-air	Hydraulic (rubber tired)	V-352-C
		50C	1¼ yd.	V-470-C
	Gradall New Philadelphia, Ohio	G-660	¾ yd. hydraulic	V-470-C
		G-800	1 yd. hydraulic	N-495-C
		G-1000	1¼ yd. hydraulic	N-495-C
	Hein Werner Corporation Waukesha, Wisconsin	C-14	1½ yd. hydraulic	V-470-C
		C-12-HD (crawler)	¾ yd. hydraulic	V-352-C
	Hydraulic Machinery Milwaukee, Wisconsin	Hy-Hoe 690/695	⅞ yd. crawler	V-352-P
		790	⅞ yd. truck backhoe	V-352-P
	Insley Manufacturing Company Indianapolis, Indiana	HC-560	¾ yd. backhoe/crane/shovel	V-352-C
		HC-875	⅞ yd. backhoe/crane/shovel	V-470-C
	Koehring Division Milwaukee, Wisconsin	366	¾ yd. hydraulic	C-464-C
		466	1 yd. hydraulic	CT-464-C
	P & H (Harnischfeger)	550	1½ yd. crawler cable hoe	H-743-P(TC)
	Schild Bantam Division Waverly, Ohio	C-450-A	¾ yd. hydraulic	V-352-C
		725-Telescoop	¾ yd. hydraulic	V-352-C
	Thew Lorain Lorain, Ohio	L-48H	1½ yd. hydraulic	N-743-P
	Unit Crane and Shovel Milwaukee, Wisconsin	271	1 yd. shovel/backhoe/ dragline/crane	N-495-C
		1020A Combination	¾ yd. shovel/backhoe/ dragline/crane	J-401-C

CONSTRUCTION & MINING
 CONSTRUCTION ET MINES
 BAUMASCHINEN UND BERGBAUMASCHINEN
 CONSTRUCCION Y MINERIA



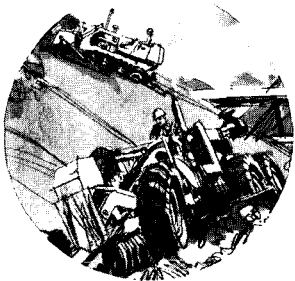
 Bottom Dumps Remorques, Déversant la Charge par le fond Bodenentlader Descargadores Inferiores				
Country Pays Land Pais	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Australia	Wabco Australia Pty. Ltd. Sydney. N.S.W.	120 BD 100 BD	120 ton 100 ton	VTA-1710-C700 VT-1710-C635
United States	Euclid, Inc. Cleveland, Ohio	B100/110	100/110 ton bottom dump/coal hauler	VT-1710-C
	KW Dart Kansas City, Missouri	D-4651	Coal hauler	VTA-1710-C
	Wabco Peoria, Illinois	75A	120 ton	VTA-1710-C
 Bucket Wheel Excavators/Trenchers Excavateurs à Roues à Godets/Excavatrices Eimerbagger/Grabenpflüge Excavadoras de Cangilones/Zanjadoras				
Germany	Demag-Lauchhammer GmbH Dusseldorf		Bucket wheel excavator	Various Gensets
United Kingdom	Mavor & Couson Ltd. Glasgow		Bucket wheel excavator	V8-185-CI NH-220-CI NH-250-CI
United States	Parsons Division Newton, Iowa	335	Trencher	N-743-B V-470-C
 Compactors Matériel de Compactage Bodenverdichter Compactadoras				
Canada	Pakall Manufacturing Calgary, Alberta	KB-4		V-470-C
United States	Bros Division, AH & D Minneapolis, Minnesota	SP-10,000	Rubber tired compactor/roller	C-464-C
	Clark (Michigan) Benton Harbor, Michigan	180 III	Tractor compactor 37,500 lbs.	CT-464-C
		280 III	Tractor compactor 59,500 lbs.	NT-855-C
	FWD-Wagner Portland, Oregon	SP-17 WC-17 WC-24 SF 430	San. fill compactor	NT-855-C NT-855-C NTA-855-C V-470-C
			San. fill compactor	
 Crane Carriers Trucks de Grue Krantransporter Camiones para Grúas				
Australia	Commonwealth Engineering P/L. Sydney. N.S.W.	Shield Bantam 450	Carrier	V8-185
	Harnischfeger Australia Melbourne, Victoria.	645 TC 780 TC	Carrier Carrier	NH-220 NHRS-6
	Pacific Ace Equipment Co. Sydney. N.S.W.	FWD TM250	Carrier	C-180
	Steelweld Melbourne, Victoria.	SW16 SW20 SW25 SW300T	Carrier	C-160 V8-185

CONSTRUCTION & MINING
 CONSTRUCTION ET MINES
 BAUMASCHINEN UND BERGBAUMASCHINEN
 CONSTRUCCION Y MINERIA



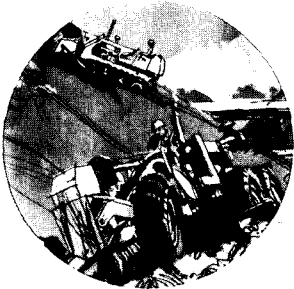
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Canada	American Hoist & Derrick	395 4450 5460 5520 7450 7520 9520	30 ton 45 ton 55 ton 65 ton 80 ton 110 ton 200 ton	C-190 C-190 NH-230 NH-230 NH-250 NTC-335 V12-525
Japan	Kobe Steel Ltd. (P & H) Kobe	9125 8100		NS-743-B320 NS-743-B320
South Africa	Copelyn Construction Denver, Transvaal	Various		N-743-C N-855-C
United Kingdom	Fodens Ltd. Sandbach, Cheshire		Low-line 8-wheel low bed, long wheel base crane carrier chassis	NHK-220
United States	Baldwin-Lima-Hamilton Corp. Lima, Ohio	250, 350 & 450 Series 500 & 600 Series 500 Special		C-180 NHF-240 NHC-250
	Beall Pipe and Tank Manufacturing Co.	B253084 B354084 B455066 B455084 B455086 B6284 B75801X4 B8010084	25-30 ton 35-40 ton 45-50 ton 45-50 ton 45-50 ton 62 ton 75-80 ton 80-100 ton	N-743-B220 N-743-B220 N-855-B250 N-743-B220 N-855-B250 NT-855-B335 N-743-B220 N-855-B250 NT-855-B335 N-743-B220 N-855-B250 NT-855-B335
	Crane Carrier Corporation Tulsa, Oklahoma	700 Series 800 Series 900 Series 1000 Series		C-180 C-190 C-180 C-190 NH-200 NHD-230 NH-230 NHC-250 NH-200 NHD-230 NH-230 NHC-250 NHCT-270 NTC-335 NH-220 NHC-250 NHCT-270 NTC-335

CONSTRUCTION & MINING
CONSTRUCTION ET MINES
BAUMASCHINEN UND BERGBAUMASCHINEN
CONSTRUCCION Y MINERIA



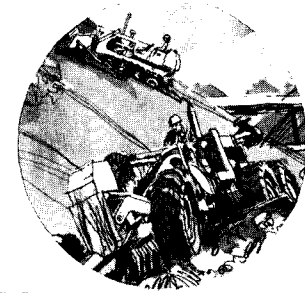
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Crane Carrier Corporation Tulsa, Oklahoma (Continued)	1200, 1500 and 2000 Series		NH-220 NHC-250 NHCT-270 NTC-335
		DHT		NH-230 NHC-250 NHCT-270 V-903 NTC-335
				V8E-170 V8-210 NHF-240
	Duplex, Division of Warner & Swasey Lansing, Michigan	Gradall 660 Gradall 800 Gradall 1000	6 x 4 and 6 x 6 carrier 6 x 4 and 6 x 6 carrier 8 x 4 carrier	
	FWD Corporation Clintonville, Wisconsin		Crane carriers	C-180 C-190 NH-220 NH-230 NHC-250
			Grove carriers	C-180 C-190 NH-230 NHC-250
	Pierce-Pacific Manufacturing Company Portland, Oregon	253064, 253066, 253084	25-30 ton	N-743-B220
		354084, 354086	35-40 ton	N-743-B220 N-855-B250
		455084	45-50 ton	N-743-B220 N-855-B250 NT-855-B250
		556084	55-60 ton	N-743-B220 N-855-B250 NT-855-B335
		657084	65-70 ton	N-743-B220 N-855-B250 NT-855-B335
		758084	75-80 ton	N-743-B220 N-855-B250 NT-855-B335
		8010084	80-100 ton	N-743-B220 N-855-B250 NT-855-B335
	Thew Lorain Lorain, Ohio	32-M	6x4 20 ton	C160
		MC-320	6x4 20 ton	C-160
		MC-325	6x4, 8x4 20 ton	C-160
		MC-30H	8x4 30 ton	C-190
		MC-330	8x4 30 ton	C-190
		MC-540A	8x4, 6x4 40 ton	NHC-250
		MC-545A	8x4, 6x4 45 ton	NHC-250
		MC-550A	8x4 50 ton	NHC-250
		MC-670	8x4 65 ton	NHC-250
		MC-790	8x4 75 ton	NHCT-270
		MC-9115	8x4 115 ton	NHCT-270

CONSTRUCTION & MINING
 CONSTRUCTION ET MINES
 BAUMASCHINEN UND BERGBAUMASCHINEN
 CONSTRUCCION Y MINERIA



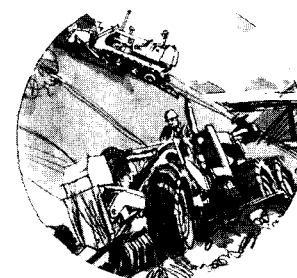
 Cranes Kräne Grues Grúas				
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Australia	B.L.H. Australia Melbourne, Victoria.	Austin Western Lima 450-T	Hydraulic crane Truck crane	V-470-C N-495-P (upper) C-180 (carrier)
		Lima 700-T	Truck crane	H-672-P (upper) NH-230 (carrier)
		Lima 900-T	Truck crane	H-743-P (upper) NH-230 (carrier)
	Coles Cranes Sydney, N.S.W.	Various	Truck crane	V8-185 (carrier) C-180
	Commonwealth Engineering P/L. Sydney, N.S.W.	Shield Bantam	Truck crane	V-352 (upper)
	English Electric Diesels of Aust. Melbourne, Victoria.	Various	Truck crane	NT-855-P
	Harnischfeger Australia Melbourne, Victoria.	650-TC	50 ton, truck crane	H-743-C (upper)
		670-TC	70 ton, truck crane	NH-220 (carrier)
		T-650	65 ton, truck crane	H-743-C (upper)
		780-TC	80 ton, truck crane	NHRS-6-B (carrier)
India	Pacific Ace Equipment Co. Sydney, N.S.W.	T-250	Hydraulic crane	C-190
		Grove TM-250/175	Hydraulic crane	V-352-C (upper) C-180 (carrier)
		S-W 16 S-W 20 S-W 25 S-W 300T	Truck crane	J-401-B C-160 V8-185
	Steelweld, Melbourne, Victoria.	Hind Marion 93-M	2½ cu. yd. crane/dragline/ clamshell	NHRS-6-IP
		Hind Marion 101-M	3 cu. yd. crane/dragline/ clamshell	NHRS-6-IP
		Harnischfeger TATA P & H 655B	1½ cu. yd. crane/dragline/ clamshell-attachment avail.	NH-220-IP
	Tata Engineering & Locomotive Company Limited Jamshedpur	Harnischfeger TATA P & H 955A	2½ cu. yd. crane/dragline/ clamshell-attachment avail.	NHRS-6-IP
		Harnischfeger TATA P & H 315	¾ cu. yd. crane/dragline/ clamshell	NHC-4-CI
	Hitachi Ltd. Tokyo	50 M/T 60 M/T U-106 U-112 U-116	Wrecking crane Wrecking crane Crawler crane Crawler crane Crawler crane	NHC-4-IPTC HRS-6-IP N-495-C N-743-C NT-743-C
		Ishikawajima-Koehring Co., Ltd. Tokyo (Koehring)	305LC 605LC 1000LW	N-495-C N-743-C N-743-C
Japan	Ishikawajima-Koehring Co., Ltd. Tokyo (Thew-Lorain)	MC-775 MC-790	Truck crane Truck crane	N-743-P N-743-P

CONSTRUCTION & MINING
 CONSTRUCTION ET MINES
 BAUMASCHINEN UND BERGBAUMASCHINEN
 CONSTRUCCION Y MINERIA



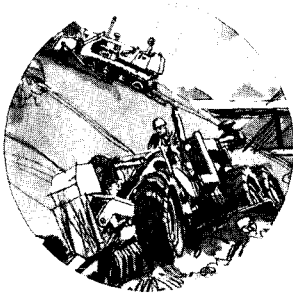
County Pays Land Pais	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Japan (Continued)	Kobe Steel Ltd. Kobe (P&H)	335S	Crawler crane	N-495-C
		655 BLC	Crawler crane	N-743-C
		855 BLC	Crawler crane	N-743-C
		955 A	Truck crane (upper works)	NS-743-P
		9125	Truck crane (upper works)	V-785-P
		8100		N-743-P
	Sumitomo Heavy Machinery Co. Ltd. Nagoya (Link-Belt)	LS78RS	Crawler crane	N-495-C
		LS78LWJ	Crawler crane	N-495-C
United Kingdom	Hymac Peter Hamilton Ltd. London	LS408LWJ	Crawler crane	N-743-P
		HM1050		V8-185
	Ruston Bucyrus	71 RB		NT-855-P335
		61 RB		NT-855-P335
	Steels Engineering Products Ltd. Sunderland	38 RB		NT-855-P335
			50 ton	NT-280
United States	American Hoist & Derrick St. Paul, Minnesota	Coles Gargantua		
		200 Series	18 ton, ¾ yd. crawler crane/excavator	N-495-P
		300 Series	23½ ton, 1 yd. ³ crawler crane/excavator	N-495-P
		400 Series	35 ton, 1¼ yd. ³ crawler crane/excavator	N-495-P C-464-P
		500 Series	50 ton, 1½ yd. ³ crawler crane/excavator	CS-464
		700 Series	110 ton, 2½ yd. ³ crawler crane/excavator	N-743 N-743-P
		900 Series	200 ton 5 yd. ³ crawler crane/excavator	NT-855
		200 Series	25 ton truck crane	C-180 N-495
		300 Series	30 ton truck crane	N-495
		400 Series	40 ton truck crane	C-190 N-495 C-464
		500 Series	65 ton truck crane	NH-220 CS-464
		700 Series	110 ton truck crane	NH-220 NHS-6 N-743
	Austin Western Division Aurora, Illinois	900 Series	200 ton truck crane	V12-500
		610	10 ton hydraulic crane	V-470
		615	15 ton hydraulic crane	V-470
		630	30 ton hydraulic crane	V-470
	Baldwin-Lima-Hamilton Lima, Ohio	25 & 250 - TS	15, 20, 25 ton, ¾ yd. shovel/crane	N-495-P
		350	35 ton	N-495-P (TC) N-495-P
		450	45 ton	N-495-P N-495-P (TC)

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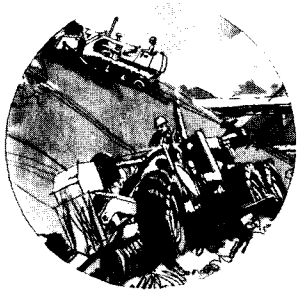
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Baldwin-Lima-Hamilton Lima, Ohio (Continued)	550	55 ton	H-743-P
		700-T	70 ton	H-743-P (TC)
		Type 34	20 ton, ¾ yd. shovel/crane	N-495-P
		Type 44	25 ton, 1 yd. shovel/crane	N-495-P
				C-464-P (TC)
		Type 45C	25 ton, 1 yd. shovel/crane	H-672-P
		Type 65	45 ton, 1½ yd. shovel/crane	H-672-P
		Type 1200	80 ton, 3 yd. shovel/crane	NS-743-P
		Type 1850	112 ton, 5½ yd. shovel/crane	V-1710-P
		Type 1250		NT-855-P
		Type 2400	110 ton, 8 yd. shovel/crane	VT-1710-P
	Bucyrus-Erie South Milwaukee, Wisconsin	22-B	Shovel/crane	J-401-C
		25-B	Shovel/crane	J-401-C
		30-B	Shovel/crane	H-743-P
		38-B	Shovel/crane	N-855-P
		61-B	Shovel/crane	NT-855-P
		71-B	Shovel/crane	NT-855-P
		88-B	Shovel/crane	V-1710-P
				VT-1710-P
		110-T	110 ton crane	H-743-P (upper)
				NH-220 (carrier)
				NH-230 (carrier)
	Galion Iron Works & Mfg. Galion, Ohio	35-C	20 ton hydraulic crane	C-464-C
		45-C	25 ton hydraulic crane	C-464-C
		55-C	45 ton hydraulic crane	CT-464-C
		65-C	70 ton hydraulic crane	N-743-C
		150	15 ton rough terrain crane	V-352-C
	Grove Manufacturing Shadygrove, Pennsylvania	RT-48	Hydraulic crane	V-352-C
		RT-58	Hydraulic crane	V-352-C (HT)
		RT-59	Rough terrain crane	V-470-C
		RT-60	Rough terrain crane	V-470-C
		TM-150 & TM-180	Hydraulic crane	V-352-C (HT)
				CS-464-C
		TM-250	Hydraulic crane	CS-464-B
	Hein Werner Corporation Waukesha, Wisconsin	TM-400	Hydraulic crane	V-470-C
		TM-550	Hydraulic crane	N-743-C
				CS-464-B
		T-12-HD	Truck crane	V-352-C
	Insley Manufacturing Company Indianapolis, Indiana	WBA	45 ton, 1½ yd. crawler/ crane/excavator	H-743-P
		305	17½ ton crawler crane	H-495-B
		405	26 ton, crawler crane	H-743-B
		440	40 ton, truck crane	CT-464-C
		450	50 ton, crawler crane	H-743-B
	Koehring Division Milwaukee, Wisconsin	665	65 ton, truck crane	CT-464-C
		HC-98A	35 ton, truck crane	N-495-P (upper)
				NH-220 (carrier)
	Link Belt Speeder Cedar Rapids, Iowa	UC-98A	35 ton, yard crane	N-495-P (upper)
		LS-98LC	35 ton, crawler crane	N-495-P (upper)
		HC-108B	45 ton, truck crane	N-495-P (upper)
		UC-108B	45 ton, yard crane	N-495-P (upper)
		LS-108B	45 ton, crawler crane	N-495-P (upper)

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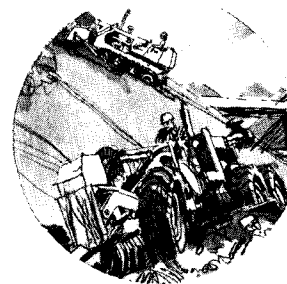
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Link Belt Speeder Cedar Rapids, Iowa (Continued)	HC-138	50 ton, truck crane	H-743-C (upper) V8-265 (carrier)
		HC-218	82 ton, truck crane	N-743-C (upper) NHCT-270 (carrier) NHTF-295 (carrier)
		LS-518	140 ton, crawler crane	NS-743-C
	Manitowoc Manitowoc, Wisconsin	2300-W	35 ton, 1½ yd. crane/shovel	H-743-B
		2900-T	60 ton, truck crane	H-743-B NH-220
		2900-WC	65 ton, 2½ yd. crane/shovel	HS-743-B
		3000-W	65 ton, 2½ yd. crane/shovel	H-743-B
		3600	65 ton, 2½ yd. crane/shovel	H-743-B
		3900	100 ton, 3½ yd. crane/shovel	NS-743-B
		3000-W	65 ton, 2½ yd. (Vicon) crane/shovel	NS-743-B
		3600	65 ton, 3½ yd. (Vicon) crane/shovel	NTA-855-B
		3900-T	120 ton, truck crane (Vicon)	HS-743-B NS-743-B
		3900-T	120 ton, truck crane (Vicon)	NS-743-B NT-855-B NT-855-B NTA-855-B NH-220
	Northwest Engineering Co. Chicago, Illinois	4600	200 ton, 6 yd. (Vicon) crane/shovel	N-855-B V-1710-B
		390	17½ ton, winch & hoist	HS-743-B NTA-855-B
		25-T	Truck crane	J-401-P130
		41-T	Truck crane	H-743-P-160
		6-D	Shovel/crane dragline	V-588-P200
	Pettibone-Rome Division Rome, New York	180-D	Shovel/crane dragline	V-1710-500
		60-T	Truck crane	V-588-P200
		15	7½ ton, hydraulic crane	J-401-B
		20	10 ton, hydraulic crane	V-352/378
		70	35 ton, hydraulic crane	V-504-C
	P & H (Harnischfeger) Milwaukee, Wisconsin	315	17 ton, crawler crane	J-401-C
		320	20 ton, crawler crane	J-401-C
		525	25 ton, crawler crane	H-743-P
		535	35 ton, crawler crane	H-743-P (TC)
		550	50 ton, crawler crane	H-743-P
		660	40 ton, crawler crane	N-743-C
		955A	82 ton, crawler crane	NS-743-P
		255-BTC	25 ton, truck crane	C-160 (carrier) C-175 (carrier)
		430-TC	30 ton, truck crane	J-401-C (upper) C-464-C (upper) C-160 (carrier) C-175 (carrier) NH-220 (carrier)
		435-TC	35 ton, truck crane	J-401-C (upper) C-464-C (upper) HRF-6 (carrier) NH-220 (carrier)

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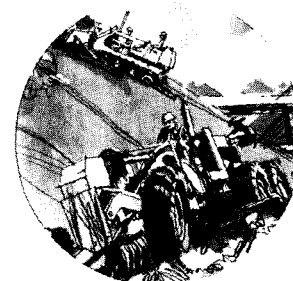
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	P & H (Harnischfeger) Milwaukee, Wisconsin (Continued)	650-TC	50 ton, truck crane	H-743-C (upper)
		670-TC	70 ton, truck crane	H-743-C (upper)
		T-650	65 ton, truck crane	NH-220 (carrier)
				NH-250 (carrier)
			NHF-240 (carrier)	
		780-TC	80 ton, truck crane	H-743-C (upper)
				NHRS-6-B (carrier)
		9125-TC	125 ton, truck crane	V-785-C (upper)
				NHRS-6-B (carrier)
		6250-TC	250 ton, truck crane	NT-855-P (upper)
				V-1710-B (carrier)
		HT-8425	25 ton, truck crane	V-352-C
	Sargent Engineering Division Fort Dodge, Iowa			
	Schild Bantam Division Waverly, Ohio	450	17½ ton, hydraulic crane	V-352-C
	Silent Hoist Brooklyn, New York	FAZ-60	30 ton, mobile crane	C-464-B
	Thew Lorain Lorain, Ohio	L-54 (K5)	30 ton, 1½ yd. crawler crane/shovel	C-464-P (TC)
		MC-320	20 ton, truck crane	J-401-P (upper)
		MC30H	30 ton, truck crane (hydraulic)	C-464-C
		MC-540A	40 ton, truck crane	C-464-P (TC)
	MC-545B	45 ton, truck crane	C-464-P (TC)	
	MC-550-A	50 ton, truck crane	C-464-P (TC)	
	MC-670	70 ton, truck crane	CT-464-P (TC)	
	MC-790	90 ton, truck crane	N-743-P (TC)	
	MC-9115	115 ton, truck crane	N-743-P (TC)	
	Unit Crane & Shovel Milwaukee, Wisconsin	271	1 yd. shovel/backhoe/ dragline crane	N-495-C
		1020A	¾ yd. shovel/backhoe/ dragline crane	J-401-C
 Crawler Tractors Tausendfüßler Tracteurs à Chenilles Tractores de Orugas				
Japan	Komatsu Manufacturing Co. Ltd. Tokyo	D60A D60P D-55 D-60 D-75 D-80 D-85 D-120 D-125		N-743-C N-743-C N-495-C N-743-C N-743-C N-743-C N-743-C NT-743-C NT-743-C
United States	Allis-Chalmers Springfield, Illinois	HD-41	95,000 lbs.	VT-1710-C

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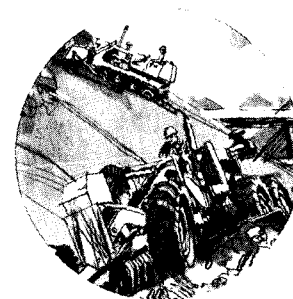
 Crushers Brecher Concasseurs Trituradoras				
Country Pays Land Pais	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Japan	Daido Nakayama Osaka	MK 6052	Stone crusher	N-743-P (TC)
United Kingdom	Frederick Parker Ltd. Leicester	1109 C Ranger 1107 A 1107	Portable jaw crusher Portable jaw crusher Portable jaw crusher	N-743-P220 NS-743-P290 N-743-P220
	Goodwin Barsby & Co. Ltd. Leicester	Goliath 36 x 24	Portable jaw crusher	N-855-P250
United States	Pioneer Engineering Company Minneapolis, Minnesota	Various	Various	As required
	Smith Engineering Works Division of Barber Greene	Various	Various	As required
 Dozers Bulldozer Bulldozers Empujadoras				
Australia	Clark Equipment Australia (Dist.) Pty. Ltd.			V-785-C CT-464-C
India	Bharat Earth Movers Ltd. Bangalore	Komatsu D-50	Crawler tractor/dozer	NHC-4-CI
		Komatsu D80A-8	Crawler tractor/dozer	NH-220-CI
Japan	Komatsu Manufacturing Co. Tokyo	Komatsu-D120A-12	Crawler tractor/dozer	NH-220-CI
		Komatsu-D120-18	Crawler tractor/dozer	NRTO-6-CI
United Kingdom	Clark Equipment Ltd. Camberley, Surrey	D60-A D60-P D-125-A-18 D-55-S D-80-A D-85-A D-120-A D-125-A D-120	Angle dozer Swamp dozer Remote controlled Angle dozer Angle dozer Angle dozer Angle dozer Remote controlled— amphibious	N-743-C N-743-C NT-743-C N-495-C N-743-C N-743-C NRTO-6-CI NRTO-6-CI NT-743-C
		SRX	Scrapedozer	N-743-C
United States	Eimco Corporation Salt Lake City, Utah	180 TD 280 TD 180 III 280 III 280 Articulated 380 Articulated 103-C 123-C 106-C D-90-C D-120-C D-500	Wheeled dozers Wheeled dozers Tractor dozer 35,400 lbs. (axle wt.) Tractor dozer 52,500 lbs. (axle wt.) Tractor dozer 55,100 lbs. (axle wt.) Tractor dozer 94,800 lbs. 45,600 lb. crawler-dozer 2½ cu. yd. crawler-dozer 73,000 lb. crawler-dozer 44,000 lb. 68,000 lb. 145,000 lb.	CT-464-C175 NT-855-C310 C-464-C NT-855-C NT-855-C V-1710-C C-464-C C-464-C V-785-C V-588-C NT-855-C VT-1710-C

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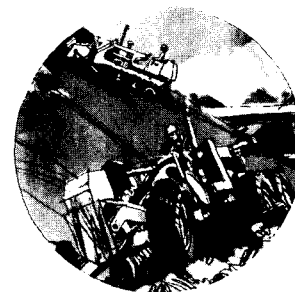
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Multi-Wheel Tractor Company Longmont, Colorado	70	Eight wheeled scraper tractor/pusher; replaces dozer in scraper-pusher operations.	NT-855-C335 (2)
	Wabco Peoria, Illinois	D-55S-2 D-60A-3 D-75S-2 D85A-12 D125A-18	1.8 yd. dozer/front end loader 29,060 lb. dozer 2.6 yd. dozer/front end loader 43,220 lb. 108,000 lb.	N-495-C N-743-C N-743-C N-743-C NT-743-C
 Graders Planierraupen Niveleuses Niveladoras				
Australia	A. E. Goodwin Ltd. Ipswich, Queensland.	110 135 160	Grader Grader Grader Grader	J-401-C100 H-743-C135 H-743-C160 H-743-C190
	British Standard Machinery Co. Ltd. Sydney. N.S.W.	Galion T-500 Galion T-600 Galion 118B Galion 160B	Grader Grader Grader Grader	C-464-C CT-464-C H-743-C135 H-743-C160
	Steelweld Melb. Victoria	130-S 130-P	Manual transmission Automatic transmission	C-464-C J-401-C
	Wabco Australia Sydney. N.S.W.	440 H 777 888	Medium grader Heavy grader Heavy grader	H-743-C135 H-743-C160 N-855-C250
Brazil	Huber Warco do Brasil, S.A. Sao Paulo	10D 11D	Motor grader Motor grader	NHC-4 C-464-C H-743-C
India	Bharat Earth Movers Ltd. Bangalore	Wabco Adams 440	Motor grader	NHC-4-CI
Japan	Kawasaki Heavy Ind. Co., Ltd. Kobe	D1300 37	Huber-Warco grader	V-352-C
	Komatsu Manufacturing Co. Tokyo, Japan	D GD 37		N-743-C
Mexico	Industria del Hierro, S.A. (Huber)	D-1300 D-1700		V-352-C V-470-C
South Africa	Galion (Pty.) Ltd. Waderville, Transvaal	160B 160L T500A T600B	29,000 lbs. 31,000 lbs. 27,550 lbs. 33,000 lbs.	H-743-C160 H-743-C160 C-464-C160 CT-464-C175
	Wabco Alrode, Transvaal	440H 660B		H-672-C135 H-743-C160
United States	Austin Western Division Aurora, Illinois	Pacer & Super 100 Pacer & Super 200 Pacer & Super 300 Pacer & Super 400 Pacer & Super 500	20,000 lb. 23,000 lb. 25,000 lb. 29,000 lb. 30,000 lb.	J-401-C J-401-C C-464-C CS-464-C C-464-C V-785-C

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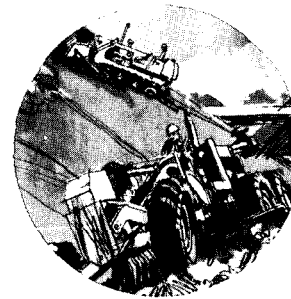
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins	
United States (Continued)	Galion Iron Works & Mfg. Galion, Ohio	104	23,000 lb.	J-401-C	
		104H	23,500 lb.	J-401-C	
		118	24,500 lb.	H-743-C	
		118 Special	24,500 lb.	H-743-C	
		160 B	26,000 lb.	H-743-C	
		160 L	28,100 lb.	H-743-C	
		T-500	24,400 lb.	C-464-C	
		T-500 Special	24,400 lb.	CT-464-C	
		T-600	29,200 lb.	CT-464-C	
		Hein Werner Corporation Waukesha, Wisconsin	Rotograder	8 ft. blade	V-352-C
	Huber Corporation Marion, Ohio		D-1100		V-352-C
			D-1300		V-352-C
			D-1400		H-672-C
		D-1700		H-743-C	
	Wabco Indianapolis, Indiana	440	23,450 lb.	N-495-C	
		440-H	25,500 lb.	H-743-C	
		666-B	28,100 lb.	H-743-C	
		660-B	27,700 lb.	H-743-C	
		777	32,300 lb.	H-743-C	
		777B-PF	32,450 lb.	N-743-C	
		888	41,245 lb.	N-855-C	
		 Loaders Chargeuses Mécaniques Lademaschinen Cargadores			
Australia	Clark Equipment Aust. Sydney. N.S.W.	275 111A	4½ cu. yd.	NT-335-CI	
		175 111A	3½ cu. yd.	NT-280-CI	
		125 111A	2½ cu. yd.	V8R-220-CI	
				NH-220-CI	
				CT-464-C	
		75A	Articulated 7500 lb. operating load		
		125A	Articulated 12,000 lb. operating load	V8-785-C	
		275A	Articulated 20,000 lb. operating load	NT-855-C	
		475A	Articulated 36,000 lb. operating load	VT-1710-C	
	Conquip Co., Sydney. N.S.W.	Thew-Lorain	2 yd.	J-401-C	
	International Harvester Co. of Aust. Melbourne, Victoria.	H-65C Hough	2½ yd.	C-464-C	
		H-80A Hough	3 yd.	CS-195	
		H-90E Hough	3 yd.	V-785-C	
		H-100C Hough	5 yd.	NT-855-C	
		H-120C Hough	5 yd.	NT-855-C	
	Sandovers Ltd. Perth. W.A.	H-400B Hough	10 yd.	VT-1710-C	
		D-600 KW-Dart	22.5 ton	VTA-1710-C	
Wabco Australia Sydney. N.S.W.	204-A Trojan	2¼ yd.	J-401-C		
	2000 Trojan	2½ yd.	V-470-C		
	3000 Trojan	3½ yd.	V-785-C		
	4000 Trojan	4½ yd.	V-785-C		
	6000 Trojan	5½ yd.	NT-855-C		
	8000 Trojan	8 yd.	V-1710-C		
India	Bharat Earth Movers Ltd. Bangalore	Tigar T-120-S	Wheeled tractor/front end loader	NHC-4-IP	

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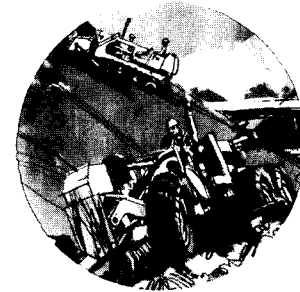
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins	
Japan	Kawasaki Heavy Ind. Co., Ltd. Kobe	KLD7 Scoopmobile	2 cu. yd. (rubber tired)	C-464-C	
		KLD8 Scoopmobile	3 cu. yd. (rubber tired)	N-743-C	
	Komatsu International Mfg. (Hough) Tokyo	JH-65C	2½ cu. yd. (rubber tired)	C-464-C	
	Komatsu Manufacturing Co. Ltd. Tokyo	D 55 S	Crawler type	N-495-P	
		D 60 S	Crawler type	N-743-C	
D 75 S		Crawler type	N-743-C		
	Toyo Umpanki Co. Ltd. (Clark Michigan) Osaka	75 IIIA	2 cu. yd. (rubber tired)	CT-464-C	
		175 IIIA	4½ cu. yd. (rubber tired)	NT-855-C	
		275 IIIA	6½ cu. yd. (rubber tired)	NT-855-C	
Mexico	Astilleros de Verzcruz, S.A. (Lorain)	ML-200		V-470-C	
	PRIMSA (Clark)	65 AM 85III	1½ cu. yd. 2 cu. yd.	V-352-C V-470-C	
United Kingdom	Bray Construction Company Ltd. Feltham, Middx.	566 572	2½ cu. yd. 3 cu. yd.	V-504-C N-743-C220	
		Clark Equipment Ltd. Camberley, Surrey (Michigan)	275 IIIA	4½ cu. yd.	NT-855-C335
	175 IIIA		3½ cu. yd.	NT-855-C280	
	125 IIIA		2¾ cu. yd.	V-785-C220	
	United States	Muir Hill Gloucester	125 III	2¾ cu. yd.	N-743-C220
A12000			3/3½ cu. yd.	N-743-C220	
Yale & Towne Wenesfield, Staffs.		2000 3000 4000	2½ cu. yd. 3 cu. yd. 4 cu. yd.	V-504-C N-743-C220 NT-855-C310	
		Clark (Michigan) Benton Harbor, Michigan	75A	Articulated—75,000 lb. operating load	CT-464-C
			125A	Articulated—12,000 lb. operating load	V8-785-C
275A	Articulated—20,000 lb. operating load		NT-855-C		
475A	Articulated—36,000 lb. operating load		VT-1710-C		
	Hough Division Libertyville, Illinois	H-60B	1½ yd.	V-352-C	
		H-65C	2½ yd.	C-464-C	
		H-80A	3 yd.	CS-195	
		H-90E	3 yd.	V-785-C	
		H-100C	5 yd.	NT-855-C	
		H-120C	5 yd.	NT-855-C	
		H-400B	10 yd.	VT-1710-C	
	Joy Manufacturing Claremont, New Hampshire	TL-52	4.8 cu. yd. transloader	C-464-B	
		TS-55-3	5.5 cu. yd. transloader	C-464-B	
		TL-60	6 cu. yd. transloader	C-464-B	
		TL-110	12.5 cu. yd. transloader	N-855-B	
	KW Dart Kansas City, Missouri	D-600	22.5 ton	VTA-1710-C	
	NP Nelson, Inc. Clifton, New Jersey	150 200 250 400	1½ yd. 2 yd. 2½ yd. 4 yd.	V-352-C J-401-C C-464-C N-743-C	
Pettibone Michigan Corporation Baraga, Michigan		Super 40 Super 50	40,000 lb. 50,000 lb.	NS-743-C NT-855-C	

CONSTRUCTION & MINING
CONSTRUCTION ET MINES
BAUMASCHINEN UND BERGBAUMASCHINEN
CONSTRUCCION Y MINERIA



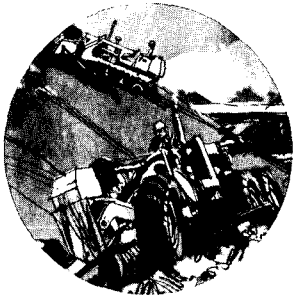
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins	
United States (Continued)	Pettibone Mulliken Division	245-A	2 yd. tractor shovel	J-401-C	
		345-AD	3/3¼ yd. tractor shovel	C-464-C	
		445	3¾ yd. tractor shovel	N-743-C	
		550	5 yd. tractor shovel	N-743-C	
	Scoopmobile, Inc. Division of Wabco Portland, Oregon	150	5,500 lb.	J-401-C	
		7	7,500 lb.	C-464-C	
		7A	9,000 lb.	C-464-C	
		300	10,500 lb.	CS-464-C	
		350	12,500 lb.	N-743-C	
		400	14,500 lb.	N-855-C	
		500	20,000 lb.	NT-855-C	
		1200	37,000 lb.	V-1710-C	
		M1	9,000 lb. loader (miner)	J-401-C	
		8B	12,500 lb. loader (miner)	N-672-C	
		450M	14,500 lb.	N-855-C	
		800	30,000 lb.	V-1710-C	
		Thew Lorain Lorain, Ohio	ML-200	2 yd.	J-401-C
			ML-225	2½ yd.	J-401-C
	ML-250		2½ yd.	C-464-C	
	ML-275		2¾ yd.	C-464-C	
	300		3 yd. articulated	CS-464-C	
	400		3½/4½ yd. articulated	N-855-C	
	Trojan Division Eaton Yale & Towne Batavia, New York	500A	5½/6½ yd. articulated	NT-855-C	
		204-A	2¼ yd.	J-401-C	
		2000	2½ yd.	V-470-C	
		3000	3½ yd.	V-785-C	
		4000	4½ yd.	V-785-C	
		6000	5½ yd.	NT-855-C	
	Wabco Peoria, Illinois	8000	8 yd.	V-1710-C	
		D-55S-2	¾ yd. dozer/front end loader	N-495-C	
		D-75S-2	2.6 yd. dozer/front end loader	N-743-C	
Off-Highway Trucks Camions tous Terrains Geländegängige LKW Camiones para Fuera de Carretera					
Australia	Kockum Australia Pty. Ltd. Wabco Australia Pty. Ltd.	KL440	35 ton rear dump	NT-855-C380	
		Haulpak 35	Rear dump 35 ton	NT-855-C380	
		Haulpak 50	Rear dump 50 ton	V-1710-C500	
		Haulpak 65	Rear dump 65 ton	VT-1710-C635	
Belgium	LeTorneau-Westinghouse Gembloux	LW35	Rear dump 75 ton	VTA-1710-C700	
			35 ton	NTA-380-CI	
France	Automobiles M. Berliet Venissieux (Rhône)	T-22	24 ton	NH-250-CI	
		T-30		NHRS-6-CI	
		T-45	33 ton	NT-335-CI	
		T-60	50 ton	V12-525-CI	
Germany	Kockums Munchen	KL-440	66 ton	VT-1710-C	
			33 ton	NTA-380-CI	
Italy	Roberto Perlini Verona	T20	22 ton	NH-220-CI	
India	Bharat Earth Movers Ltd. Bangalore	S30	33 ton	NTA-335-CI	
		T40	44 ton	NTA-380-CI	
		WABCO	Dumper	NT-380	
		Haulpak 35			
	Hindustan Motors Limited P O Uttarpura, West Bengal	TEREX	Dumper	NHRS-6-BI	

CONSTRUCTION & MINING
CONSTRUCTION ET MINES
BAUMASCHINEN UND BERGBAUMASCHINEN
CONSTRUCCION Y MINERIA



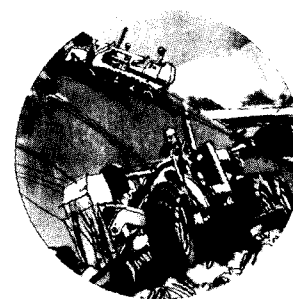
County Pays Land Pais	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Japan	Hitachi, Ltd. Tokyo	DM15D DH321	16½ ton 35 ton	N-743-C NTA-855-C
	Komatsu Manufacturing Co. Tokyo	HD-150 HD-180 HD-300 HS-70	16½ ton 20 ton 38½ ton Slag dump	NH-220-C NTO-6 NTA-855-C NH-220-B
	Nippon Sharyo Seizo Kaisha, KK Nagoya	SD 230 SD 250 TR 401 S	Slag dump Slag dump	NH-220 NH-220 NRTO-6
	Wabco Alrode, Transvaal	30 35 50 65	30 ton dump truck 35 ton dump truck 50 ton dump truck 65 ton dump truck	NT-855-C335 NT-855-C380 VT-1710-C VT-1710-C
Sweden	AB Kockum-Landsverk Lands Krona	KL-440	35 ton dump truck	NTA-380-C
United Kingdom	Aveling Barford Ltd. Grantham, Lincs.	SN 35	35 ton	V12-525-C
	Clark Equipment Company Camberley, Surrey		65 ton	VT12-635-C
	Fodens Ltd. Sandbach, Cheshire	4 DC 6/24 6 DC 6/35 6 DC 6/39	12 cu. yd.—4 wheel 14 cu. yd.—6 wheel 13 cu. yd.—6 wheel	NHK-200 NHK-220 NHK-250 or NT-280
	G. M. Scotland Ltd. Lanarkshire (Scotland)	B 10 FTD-BISH R 17 R 25 R 355 R 35 R 45	12 cu. yd. 17 ton 25 ton 35 ton 35 ton 45 ton	N-743-C220 N-743-C220 NT-855-C-335 NTA-855-C380 NTA-855-C380 V1710-500
	Heathfield Engineering Ltd. Newton Abbot, Devon	DF 20 DE 50	14 ton 25 ton	V6-140 NT-855-C280
	Scammell Lorries Watford, Herts.	Contractor	6 x 4 Heavy duty tractor for special loads up to 75 ton G.T.W.	NHK-220 NHK-250 NTK-335 NTK-380
	Cline Truck Manufacturing Company Kansas City, Missouri		Custom built machinery— off-highway trucks (small rear dumps)	N-855-B250
	Euclid, Inc. Cleveland, Ohio	R-22 R-35 R-50 RX	22 ton rear dump truck 35 ton rear dump truck 50 ton rear dump truck 85/105 ton rear dump truck	N-855-C NTA-855-C VT-1710-C VTA-1710-C
United States	IHC Melrose Park, Illinois	PH-100 PH-180	30 ton rear dump 50 ton rear dump	NTA-855-C VT-1710-C
	KW Dart Kansas City, Missouri	D-2330 D-2440 D-2541 D-2551 D-2561 D-2661 D-2771 DE-2771 D-4655	35 ton rear dump 40 ton rear dump 50 ton rear dump 65 ton rear dump 75 ton rear dump 85 ton rear dump 110 ton rear dump 110 ton rear dump 120 ton rear dump earth mover	NTA-855-C V-1710-C V-1710-C VTA-1710-C VTA-1710-C VTA-1710-C VTA-1710-C VTA-1710-C VTA-1710-C
		D-6651	110 ton rear dump Tractor-trailer	VTA-1710-C

CONSTRUCTION & MINING
CONSTRUCTION ET MINES
BAUMASCHINEN UND BERGBAUMASCHINEN
CONSTRUCCION Y MINERIA



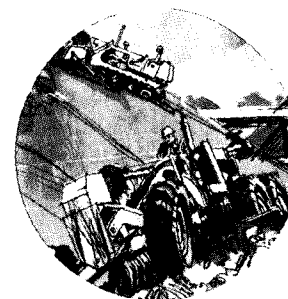
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Mack Manufacturing Co. Allentown, Pennsylvania	M-15X	15 ton end dump	N-743-C
		M-20X	20 ton end dump	N-743-C
		M-25X	35 ton end dump	NT-855-C
		M-30X	30 ton end dump	NT-855-C
				NTA-855-C
		M-32SX	32 ton end dump	NT-855-C
				NTA-855-C
		M-45SX	45 ton end dump	V1710-C
		M-50SX	50 ton end dump	V-1710-C
		M-65SX	65 ton end dump	VT-1710-C
	M-70SX	70 ton end dump	VT-1710-C	
	Parsons Division Newton, Iowa	60	8½ ton rear dump	V-352-C
		18-60	18 ton rear dump	N-743-C
	Unit Rig & Equipment Co. Tulsa, Oklahoma	M-85	85 ton rear dump	VTA-1710-C700
		M-100	100 ton rear dump	VTA-1710-C 700/800
WABCO Peoria, Illinois	35	35 ton rear dump	NT-855-C	
			NTA-855-C	
	50	50 ton rear dump	V-1710-C	
			VT-1710-C	
	65B	65 ton rear dump	VT-1710-C	
	75B	75 ton rear dump	VTA-1710-C	
	M-30X	30 ton end dump	NT-855-C	
		NTA-855-C		
	M-32SX	32 ton end dump	NT-855-C	
		NTA-855-C		
	M-45SX	45 ton end dump	V-1710-C	
 Pavers/Mixers Mélangeurs Mécaniques Mischer Mezcladoras				
United States	Bros Division, A H & D Minneapolis, Minnesota	LSPRM	Roto-Mixer	NS-743 -C
		SSPRM-7	Roto-Mixer	NT-855 -C
	Rex Chainbelt Inc., Construction Machinery Group Milwaukee, Wisconsin	Pulvimixer HDS, HDTW, HDT, HDTM	Self-propelled soil stabilizer with optional liquid systems	C-464-P -C
		Deepmixer	Self-propelled soil stabilizer with optional liquid systems	CS-464-B180
				NT-855-B335
 Rollers Rouleaux Walzen Aplanadoras				
United States	Bros Division, A H & D Minneapolis, Minnesota	SP-255 SP 10,000	33,500 lb. sheeps foot roller 30 ton pneumatic tire roller/compactor	CT-464 C-464-C
	RayGo Inc. Minneapolis, Minnesota	Super 600	Self-propelled vibrating roller	V-470-C

CONSTRUCTION & MINING
CONSTRUCTION ET MINES
BAUMASCHINEN UND BERGBAUMASCHINEN
CONSTRUCCION Y MINERIA



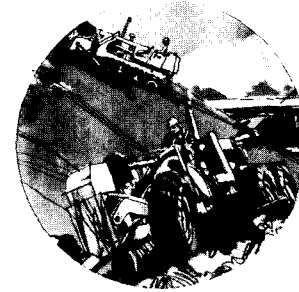
 Scrapers Scrapers (Racleurs) Löffelräumer Escrepas				
Country Pays Land Pais	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Australia	Clark Equipment Australia Sydney, N.S.W.	210 210 H 410	Hancock scraper 20 yd. Hancock scraper 23 yd. Hancock scraper 40 yd.	NT-855-C NT-855-C VT-1710-C
India	Bharat Earth Movers Ltd. Bangalore	WABCO LWC Tournapull	Scraper	NHRS-6-CI
United Kingdom	G. M. Scotland Ltd. Lanarkshire, Scotland	TS.24	24 cu. yd. scraper	NT-855-C310 (2)
United States	Clark (Michigan) Benton Harbor, Michigan	210 210 H 410	20 cu. yd. Michigan scraper 23 cu. yd. Hancock scraper 40 cu. yd. Michigan scraper	NT-855-C NT-855-C VT-1710-C
	Multi-Wheel Tractor Company Longmont, Colorado	70	Eight wheeled scraper tractor/pusher replaces dozer in scraper-pusher operations.	NT-855-C335 (2)
 Shovels/Excavators Pelles/Excavateurs Löffelbagger Palas/Excavadoras				
Australia	A.N.I. Perkins Pty. Ltd., Sydney, N.S.W. B.L.H. Australia, Melbourne, Victoria	111M Marion 191M Marion	4½ yd. 12 yd.	V-1710-C VTA-1710-C (3)
		Type 45C Type 65	1 yd., 25 ton shovel/crane 1½ yd., 45 ton shovel/crane	H-672-P H-672-P H-743-P (TC)
		Type 1200 Type 1850 Type 1250 Type 2400 25 & 250 TS	3 yd., 80 ton shovel/crane 5½ yd., 112 ton shovel/crane 8 yd., 110 ton shovel/crane ¾ yd., 15, 20, 25 ton shovel/crane	NS-743-P V-1710-P NT-855-P VT-1710-P N-495-P
		Type 34	¾ yd., 20 ton shovel/crane	N-495-P
		20H 71RB	¾ yd. 3½ yd.	V-352-P NT-855-P
	English Electric Diesel of Aust., Melbourne, Victoria. Kockum Australia Pty. Ltd., Melbourne, Victoria.	KL-270	3½ yd.	NTA-855-C
	Brazil	Industrias Villares, S.A. Sao Paulo (P & H Licensee)	955 955A	NS-743-P320 NS-743-P290
	Canada	Dominion Engineering Works Limited	550 600 480	2½ cu. yd. 3 cu. yd. 1¾ cu. yd.
	Finland	Locomo-OY Tampere	43 E	2 cu. yd.
France	Ateliers et Forges de la Loire L'Horme (Marion Licensee) Nordest	101 M 111 M	3 cu. yd. 4 cu. yd.	NHRS-6-I-TC V-1710-P
		P-90 P-95	2½ cu. yd. 3 cu. yd.	N-855-P NHRS-6-IP-TC
Germany	Rheinstahl Union A.G. Dortmund (P & H Licensee)	955-A	2½ cu. yd.	NHRS-6-IP
Holland	Stertil Kootstertille (Insley Subsidiary)	H-560-B	1 cu. yd.	V-352-C

CONSTRUCTION & MINING
CONSTRUCTION ET MINES
BAUMASCHINEN UND BERGBAUMASCHINEN
CONSTRUCCION Y MINERIA

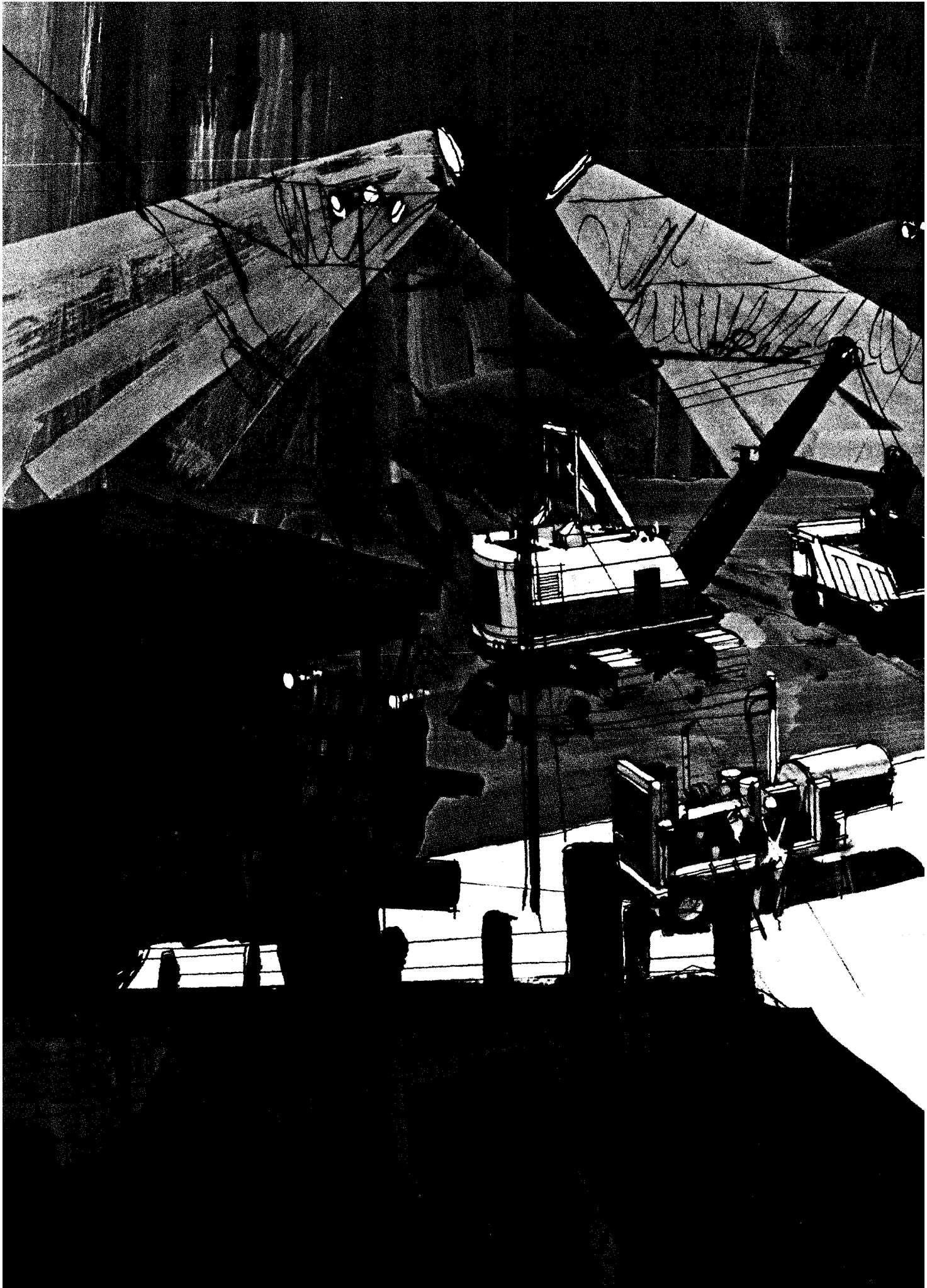


County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
India	Hindustan Motors Limited P O Uttarpara	Hind Marion 93-M	2½ cu. yd. crane/dragline/clamshell	NHRS-6-IP
		Hind Marion' 101-M	3 cu. yd. crane/dragline/clamshell	NHRS-6-IP
		Harnischfeger TATA P & H 655B	1½ cu. yd. crane/dragline/ clamshell-attachment avail.	NH-220-IP
		Harnischfeger TATA P & H 955A	2½ cu. yd. crane/dragline/ clamshell-attachment avail.	NHRS-6-IP
		Harnischfeger TATA P & H 315	¾ cu. yd. crane/dragline/ clamshell	NHC-4-CI
Japan	Ishikawajima Koehring (Koehring) Tokyo	305	Crawler shovel	N-495-C
		605-2A	Crawler shovel	N-743-C
		1000	Crawler shovel	NTO-6-CI
		1000	Crawler shovel	NS-743-C
		655B	Crawler shovel	N-743-P-TC
	Kobe Steel Ltd. (P & H) Kobe	955A	Crawler shovel	NHRS-6-IP-TC
		1400	Crawler shovel	VTA-1710-C
		22B	Crawler shovel	N-495-C
		D-55-S	Tractor shovel	NHC-4-CI
		D-60-S	Tractor shovel	N-743-C
	Komatsu Bucyrus K.K. (Bucyrus-Erie) Tokyo	D-75-S	Tractor shovel	N-743-C
		LS-78J	Crawler shovel	N-495-P
		LS-408	Crawler shovel	NHS-6-IP-TC
		Sumitomo Machinery (Linkbelt) Nagoya		
United Kingdom	Babcock & Wilcox Balmuir, Glasgow (Marion Licensee)	101MB	3 cu. yd.	NS-743-C320
		111M	4½ cu. yd. shovel	V12-1710-525
		183M	9 cu. yd. dragline	VT12-1710-825 or NT-855-C380
		NCK Rapier Ltd. Ipswich	1½ cu. yd. shovel	N-743-P220
		3 cu. yd. shovel		NT-855-P335 (TC)
	Ruston Bucyrus Ltd. Lincoln	71 RB	3½ cu. yd. shovel	NT-855-P335
		61 RB		NT-855-P335
		38 RB		NT-855-P335
		American Hoist & Derrick St. Paul, Minnesota		
		200 series	¾ cu. yd. 18 ton crawler crane/excavator	N-495-P
United States		300 series	1 cu. yd. 23½ ton crawler crane/excavator	N-495-P
		400 series	1¼ cu. yd. 35 ton crawler crane/excavator	N-495-P C-464-P
		500 series	1½ cu. yd. 50 ton crawler crane/excavator	CS-464-P
		700 series	2½ cu. yd. 110 ton crawler crane/excavator	N-743-P
		900 series	5 cu. yd. 200 ton crawler crane/excavator	NT-855-P
	Baldwin-Lima-Hamilton Lima, Ohio	Type 44	1 yd., 25 ton shovel/crane	N-495-P C-464-C (TC)
		Type 45C	1 yd., 25 ton shovel/crane	H-672-P
		Type 65	1½ yd., 45 ton shovel/crane	H-672-P H-743-P (TC)

CONSTRUCTION & MINING
 CONSTRUCTION ET MINES
 BAUMASCHINEN UND BERGBAUMASCHINEN
 CONSTRUCCION Y MINERIA



County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Baldwin-Lima-Hamilton Lima, Ohio (Continued)	Type 1200	3 yd., 80 ton shovel/crane	NS-743-P
		Type 1850	5½ yd., 112 ton shovel/crane	V-1710-P
		Type 1250		NT-855-P
		Type 2400	8 yd., 110 ton shovel/crane	VT-1710-P
		25 & 250 TS	¾ yd., 15, 20, 25 ton shovel/crane	N-495-P
	Bucyrus-Erie South Milwaukee, Wisconsin	Type 34	¾ yd., 20 ton shovel/crane	N-495-P
		22 B	¾ yd. shovel/crane	J-401-C
		25 B	1 yd. shovel/crane	J-401-C
		30 B	1¼ yd. shovel/crane	H-743-P
		38 B	2 yd. shovel/crane	N-855-P
		61 B	3¾ yd. shovel/crane	NT-855-P
		71 B	4¾ yd. shovel/crane	NT-855-P
		88 B	5½ yd. shovel/crane	V-1710-P
	Eimco Corporation Salt Lake City, Utah	115	1½ cu. yd. crawler excavator	N-495-C
	Insley Manufacturing Company Indianapolis, Indiana	WBA	1½ yd., 45 ton crawler crane/excavator	H-743-P
		HC-560	5/8 yd. backhoe/crane/shovel	V-352-C
	Manitowoc Manitowoc, Wisconsin	HC-875	7/8 yd. backhoe/crane/shovel	V-352-C
		2300-W	1½ yd., 35 ton shovel/crane	H-743-B
		2900-WC	2½ yd., 65 ton shovel/crane	HS-743-B
		3000-W	2½ yd., 65 ton shovel/crane	H-743-B
		3600	2½ yd., 65 ton shovel/crane	H-743-B
		3900	3½ yd., 100 ton shovel/crane	NS-743-B
		3000-W	2½ yd., 65 ton (Vicon) shovel/crane	NS-743-B
		3600	3½ yd., 65 ton (Vicon) shovel/crane	NTA-855-B
		4600	6 yd., 200 ton (Vicon) shovel/crane	N-855-B V-1710-B NTA-855-B
	Marion Power Shovel Marion, Ohio	93 M	2½ yd.	NS-743-P
		101 M	3 yd.	NS-743-P
		111 M	4½ yd.	V-1710-P
		151 M	8 yd.	VTA-1710-P
		183 M	8-10 yd.	VT-1710-P NS-743-P
	Northwest Engineering Chicago, Illinois	191 M	12 yd.	VTA-1710-P
		6-D	1½ yd., 40 ton shovel/crane	V-588-P 200
	P & H (Harnischfeger) Milwaukee, Wisconsin	180-D	4½ yd., 100 ton shovel/crane	V-1710-P 500
		1055-B	4 yd. crawler shovel	V-1710-P
		1400-DE	4½ yd. crawler shovel	VTA-1710-P
	Thew Lorain Lorain, Ohio	1500-DE	5 yd. crawler shovel	VTA-1710-P
		L54 (KS)	1½ yd., 30 ton shovel/crane	C-464-C(TC)
	Unit Crane & Shovel Milwaukee, Wisconsin	271	1 yd. shovel/backhoe/dragline/crane	N-495-C
		1020A	¾ yd. shovel/backhoe/dragline/crane	J-401-C
 Miscellaneous Divers Verschiedenes Misceláneos				
United States	American Pipe and Construction Company Los Angeles, California	Pipemobile	Special heavy pipe transporter	VTA-1710-C (2)



CUMMINS GENERATOR SETS

Cummins generator sets deliver dependable power in both primary and auxiliary applications. The matched performance of Cummins engines with Cummins generators provides the user with outstanding performance, reliability and long life.

Cummins prime power generator sets combine rugged design, conservative rating and economical operation to provide low cost utility power wherever it is needed.

Because of their compact design, Cummins generator sets are ideal for applications where mobility is required, such as on construction sites. This same design makes stationary installations in a small space possible, such as in shipboard applications.

Reliability and fast start up are key features of Cummins auxiliary power systems. Should an electrical power failure occur, Cummins generator sets can restore power in seconds. Conservative ratings allow these generator sets to be used continuously at full rating whether the power failure lasts 30 minutes or 30 days.

Cummins has recently introduced a complete line of brushless generator sets. These brushless systems represent another significant step forward in generator set design and technology. Additionally, in large kilowatt power applications, Cummins new Automatic Paralleling System provides high multiple unit reliability while dramatically cutting costs.

GROUPES ELECTROGENES CUMMINS

Les groupes électrogènes Cummins fournissent à la fois dans les applications primaires et secondaires une puissance à laquelle on peut se fier. Le rendement de diesels Cummins accouplés à des générateurs Cummins est excellent. L'utilisateur peut se fier à de tels groupes de machines qui, en service, durent longtemps.

Les groupes électrogènes Cummins sont d'un modèle robuste, d'une puissance prudemment calculée et d'un fonctionnement économique. Ils fournissent une puissance utile d'un prix peu élevé, partout où celle-ci doit satisfaire un besoin.

Les groupes électrogènes Cummins, du fait qu'ils sont d'un modèle compact conviennent d'une manière idéale dans toutes les applications où la mobilité s'impose, par exemple sur les chantiers de construction. Le même modèle peut servir dans des installations fixes à placer dans un espace le plus réduit possible, comme c'est le cas dans les applications aux constructions navales.

La fiabilité et le démarrage rapide sont les caractéristiques principales des groupes Cummins de fourniture d'énergie électrique auxiliaire. S'il se produit une panne d'électricité, les groupes Cummins rétablissent en quelques secondes la fourniture d'énergie électrique. Ces groupes électrogènes, d'une puissance, estimée avec prudence, peuvent être utilisés d'une manière continue à plein régime, que la panne de courant dure 30 minutes ou 30 jours.

Cummins a récemment introduit sur le marché une gamme complète de groupes électrogènes sans balais, qui représente un autre progrès important dans l'étude et la technique de fabrication des groupes électrogènes. Dans les applications, nécessitant de grandes énergies en kW, le nouveau système Cummins de mise en parallèle automatique offre à l'utilisateur une fiabilité élevée dans la mise en parallèle d'unités multiples tout en réduisant d'une manière drastique les frais d'exploitation.

CUMMINS STROMERZEUGUNGSAGGREGATE

Cummins Generatoren sind zuverlässige Energiequellen, und zwar sowohl als Hauptversorgungsaggregate als auch als Notstromaggregate. Beim Cummins-Generator sind Motor und Stromerzeuger genau aufeinander abgestimmt, was dem Kunden höchste Leistung, Zuverlässigkeit und lange Lebensdauer gewährleistet.

Cummins-Hauptstromaggregate vereinen robuste Konstruktion mit starker Kraftreserve und wirtschaftlichem Betrieb, so daß eine preisgünstige Energieversorgung in jedem Bedarfsfall zur Verfügung steht.

Dank ihrer kompakten Bauweise eignen sich Cummins-Generatoren besonders in solchen Fällen, wo es auf die Beweglichkeit ankommt, wie zum Beispiel auf Baustellen. Andererseits ist diese Bauweise auch bei stationärem Einbau, wie z.B. in Schiffen, vorteilhaft, da der Raumbedarf nur gering ist.

Bei den Cummins-Notstromaggregaten sind schnelle Anfahrleistungen besonders zu erwähnen. Bei Stromausfall stellen Cummins-Notstromaggregate die Energieversorgung innerhalb von Sekunden wieder her. Reichlich ausgelegte Leistungsreserve ermöglicht es, diese Generatoren im Dauerbetrieb auf Vollast laufen zu lassen, ganz gleich, ob der Stromausfall 30 Minuten oder 30-Tage dauert.

Cummins hat vor Kurzem eine komplette Serie bürstenloser Stromaggregate herausgebracht, die einen weiteren wichtigen Schritt nach vorn in Generatorbau und -technik darstellen. Hinzu kommen für besonders schwere Einsatzfälle die neuen automatischen Parallelschaltanlagen (Automatic Paralleling System), bei welchen die Zuverlässigkeit mehrerer Einheiten mit beträchtlich verringerten Kosten vereinigt sind.

EQUIPOS GENERADORES CUMMINS

Los equipos generadores Cummins producen potencia confiable en aplicaciones tanto primarias como auxiliares. El rendimiento equilibrado de los motores Cummins con los generadores Cummins le proporciona al usuario notable rendimiento, confiabilidad y larga vida.

Los equipos generadores primarios Cummins combinan un diseño fuerte, potencia conservadora y operación económica, a fin de proporcionar energía para servicios públicos, a bajo costo, en cualquier sitio en que se necesite.

Debido a su diseño compacto, los equipos generadores Cummins son ideales para aplicaciones en donde se requiere movilidad, por ejemplo en sitios de construcción. Este mismo diseño hace posibles instalaciones estacionarias en un espacio reducido, tales como las de embarcaciones.

La confiabilidad y el arranque rápido son características clave de los generadores Cummins auxiliares. Si llega a ocurrir una falla de la energía eléctrica, los equipos generadores Cummins pueden restablecer la corriente en cuestión de segundos. Su conservadora potencia les permite a estos equipos generadores ser utilizados continuamente a pleno régimen, sin que importe que la interrupción de la corriente dure 30 minutos o 30 días.

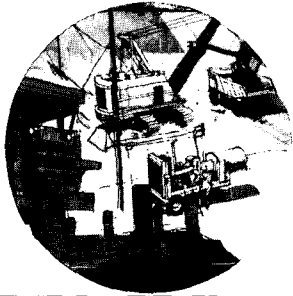
Cummins ha introducido recientemente una línea completa de equipos generadores sin escobillas. Estos sistemas sin escobillas representan otro importante paso hacia adelante en diseño y tecnología de equipos generadores. Adicionalmente, en las aplicaciones para alta potencia en kilowatts, el nuevo Sistema de Paralelización Automática de Cummins, ofrece la gran confiabilidad de unidades múltiples, a la vez que reduce impresionantemente los costos.

GENERATOR SET SPECIFICATIONS
SPECIFICATIONS DES GROUPES ELECTROGENES
DATEN FUR CUMMINS-STROMERZEUGUNGSAGGREGATE
ESPECIFICACIONES DE EQUIPOS GENERADORES CUMMINS

Power Ratings Puissances Nominales Elektrische Daten Potencias	Prime Power Ratings (GC) Puissances Nominales des Générateurs Principaux (GC) Hauptstromaggregate (GC) Potencia como Unidad para Impulsión (GC)		Auxiliary Power Ratings (GS) Puissances Nominales des Générateurs Auxiliares (GS) Notstromaggregate (GS) Potencia como Unidad Auxiliar (GS)	
Gen. Set Model	50 Hertz 0.8 Power Factor KW @ RPM	60 Hertz 0.8 Power Factor KW @ RPM	50 Hertz 0.8 Power Factor KW @ RPM	60 Hertz 0.8 Power Factor RPM @ RPM
Modèle de Groupe Electrogène	50 Hz. 0,8 Facteur de Puissance KW à T/ MN	60 Hz. 0,8 Facteur de Puissance KW à T/ MN	50 Hz. 0,8 Facteur de Puissance KW à T/ MN	60 Hz. 0,8 Facteur de Puissance KW à T/ MN
Generator-Modell	50 Hz. cos. phi=0,8 kW bei U/ min	60 Hz. cos. phi=0,8 kW bei U/ min	50 Hz. cos. phi=0,8 kW bei U/ min	60 Hz. cos. phi=0,8 kW bei U/ min
Modelo del Equipo Generador	50 Hertzios (Ciclos) Factor de Potencia: 0.8 KW a RPM	60 Hertzios (Ciclos) Factor de Potencia: 0.8 KW a RPM	50 Hertzios (Ciclos) Factor de Potencia: 0.8 KW a RPM	60 Hertzios (Ciclos) Factor de Potencia: 0.8 KW a RPM
NH-4-GC/GS	45 1500	50 1800	50 1500	60 1800
NHC-4-GC/GS	50 1500	60 1800	60 1500	75 1800
HR-6-GC/GS	65 1500	75 1800	85 1500	100 1800
NH-220-GC/GS	85 1500	100 1800	100 1500	125 1800
NT-270-GC/GS	100 1500	125 1800	125 1500	150 1800
NT-310-GC/GS	125 1500	150 1800	150 1500	175 1800
NT-335-GC/GS	150 1500	175 1800	165 1500	200 1800
NT-400-GC/GS	170 1500	200 1800	190 1500	230 1800
V12-500-GC/GS	210 1500	250 1800	250 1500	300 1800
VT12-635-GC/GS	250 1500	300 1800	300 1500	350 1800
VT12-700-GC/GS	300 1500	350 1800	335 1500	400 1800
VT12-800-GC/GS	330 1500	400 1800	370 1500	450 1800

Engine	Displacement Cubic Inches (Litres)	Bore and Stroke Inches (mm)	Number of Cylinders	Aspiration	Net Weight Static Pounds (Kg.)	
Moteur	Cylindrée Pouces Cubiques	Alésage et Course Pouces	Nombre de Cylindres	Aspiration	Poids Statique Livres	Net Sans Balais Pounds (Kg.)
Motor	Hubraum	Bohrung und Hub	Anzahl der Zylinder	Ansaugart	Nettogewicht Statisch	Bürstenlos Livres
Motor	Cilindrada Pulgadas Cúbicas	Diámetro y Carrera Pulgadas	Número de Cilindros	Aspiración	Neto Peso Estáticos Libras	Sin Escobillas Libras
NH-4	495 (8.1)	5-1/8 x 6 (130.2 x 152.4)	4	Natural	3280 (1488)	3375 (1531)
NHC-4	495 (8.1)	5-1/8 x 6 (130.2 x 152.4)	4	Natural	3340 (1515)	3400 (1542)
HR-6	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3880 (1760)	3805 (1726)
NH-220	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	4180 (1897)	4175 (1894)
NT-270	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	4860 (2205)	4610 (2092)
NT-310	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	5040 (2287)	5010 (2273)
NT-335	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	5190 (2355)	5190 (2355)
NT-400	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	5310 (2409)	6510 (2954)
V12-500	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Natural	9790 (4442)	11040 (5009)
VT12-635	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	10640 (4828)	11140 (5054)
VT12-700	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	10840 (4918)	11240 (5100)
VT12-800	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	11240 (5100)	11490 (5213)

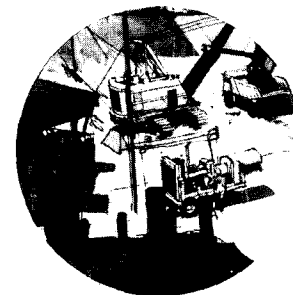
GENERATOR SETS
GROUPES ELECTROGENES
STROMERZEUGUNGSAGGREGATE
EQUIPOS GENERADORES



 Gen Sets* Generatoren* Groupes électrogènes* Equipos Generadores*				
Country Pays Land Pais	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Australia	Davey and Co. Pty. Ltd. Melbourne, Victoria.	Various	50-300 KW	
	Dunlite Electrical Co. Adelaide, S.A.	Various	50-300 KW	C,NH Series
	McColl Electric Works Pty. Melbourne, Victoria	Various	50-300 KW	NT, V12 Series
	Northern Electrics Pty. Ltd. Brisbane, Queensland.	Various	50-300 KW	
Finland	OY Stromberg AB Helsinki		200 KVA 50 cycle stand-by 100 KVA stand-by 230 KVA (marine applications)	NT-380-IP NH-220-IP NT-380-M
Japan	Taiyo Electric Co. Tokyo		100 KW 125 KW	N-743-P NRTO-6-IP
	Tokyo Electric Co. Tokyo		100 KW 125 KW	N-743-P NRTO-6-IP
	Toyo Electric Manufacturing Co.		125 KW 400 KW	NRTO-6-IP VTA-1710-P
Mexico	Selmec		50-440 KW, standby and continuous	N-495-P to VTA-1710
South Africa	E. C. C. Johannesburg		Various	NT-885 to VT-1710
	Hawker-Siddley-Brush Johannesburg		Various	H-672-P to VT-1710
	Steel Metals Johannesburg		Various	N-743 to VT-1710
United Kingdom	Auto Diesels Ltd. Uxbridge, Middx.		30KW-300KW	N-743-P220 to VT-1710-700
	Dale Electric (Yorks) Ltd. Filey, Yorks		30KW-300KW	V-504 to VT-1710-700
	Dawson-Keith Ltd. Sutton, Surrey		Various types and ratings	Various
	Elequip Ltd. Wigston, Leics.		Various types and ratings	Various
	Grahame Puttick Ltd. Ash, Kent		30 KW to 300 KW	N-743-P220 to VT-1710-700
	Hampson Industries Ltd. West Bromwich		Various types and ratings	Various
	Int. Diesel Electric Co. Kettering, Northants		Various types and ratings	Various
	Petbow Ltd. Sandwich, Kent		Various types and ratings	Various
	Stone Chance Ltd. Crawley, Sussex		Various types and ratings	Various
	Workman Reed Ltd. Bristol		Various types and ratings	Various

*See page 50 for specifications on Cummins' complete line of Generator Sets.
 *Voir page 50 pour spécifications sur la gamme Cummins complète de groupes électrogènes.
 *komplette Daten für Cummins-Stromerzeugungsaggregate siehe Seite 50.
 *Ver página 50 para las especificaciones de la línea completa de Equipos Generadores Cummins.

GENERATOR SETS
GROUPES ELECTROGENES
STROMERZEUGUNGSAGGREGATE
EQUIPOS GENERADORES



County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States	Katolight Corporation Mankato, Minnesota	D40FZ6	Brushless gen. set 40KW(GC)—45KW(GS)	N-495-P130
		D50FZ6	Brushless gen. set 50KW(GC)—55KW(GS)	H-743-P175
		D60FZ6	Brushless gen. set 60KW(GC)—75KW(GS)	H-743-P175
		D60FZ4	Brushless gen. set 60KW(GC)—75KW(GS)	N-495-P130
		D75FZ4	Brushless gen. set 75KW(GC)—85KW(GS)	H-743-P175
		D100FZ6	Brushless gen. set 100KW(GC)—115KW(GS)	NS-743-P320
		D100FZ4	Brushless gen. set 100KW(GC)—115KW(GS)	N-743-P195
		D125FZ4	Brushless gen. set 125KW(GC)—140KW(GS)	N-855-P250
		D150FZ4	Brushless gen. set 150KW(GC)—170KW(GS)	NT-855-P310
		D175FZ4	Brushless gen. set 175KW(GC)—190KW(GS)	NT-855-P335
		D200FZ4	Brushless gen. set 200KW(GC)—220KW(GS)	NT-855-P400
		D300FZ4	Brushless gen. set 300KW(GC)—330KW(GS)	VT-1710-P600
	Kohler Company Kohler, Wisconsin	70RO, 70CO	70KW(GC)—60KW(GS)	N-495-B130
		85RO, 85CO	85KW(GC)—75KW(GS)	H-743-B160
		110RO, 110CO	110KW(GC)—110KW(GS)	H-743-B190
		175RO, 175CO	175KW(GC)—150KW(GS)	NS-743-B320
		230RO, 230CO	230KW(GC)—200KW(GS)	NT-855-B380
	Onan Minneapolis, Minnesota	DFJ	70KW	N-495-P
		DFB	85KW	H-672-P
		DFC	115KW	H-743-P
		DFH	125KW	N-743-P
		DFD	140KW	HS-743-P
		DFQ	150KW	NT-855-P
		DFE	175KW	NS-743-P
		DFK	175/200KW	NTA-855-P
		DFP	200KW	NT-855-P
		DFM	230KW	NTA-855-P
		FT	250KW	GV-1710-P
		DET	300KW	V-1710-P
		DFU	350KW	VT-1710-P
		DEV	400KW	VTA-1710-P
		DFW	450KW	VTA-1710-P

*See page 50 for specifications on Cummins' complete line of Generator Sets.
 *Voir page 50 pour spécifications sur la gamme Cummins complète de groupes électrogènes.
 *komplette Daten für Cummins-Stromerzeugungsaggregate siehe Seite 50.
 *Ver página 50 para las especificaciones de la línea completa de Equipos Generadores Cummins.



CUMMINS INDUSTRIAL ENGINES

Low fuel consumption, low maintenance costs, long life between overhauls, light weight, and portability are important features designed into Cummins industrial engines. Adaptable to equipment of various synchronous operating speeds, these engines are excellent power for applications such as centrifugal pumps and electric generators. They have also proven themselves in other applications such as conveyor drives, industrial cranes, all types of pumping operations, and a variety of industrial materials handling equipment.

All Cummins industrial engines are available with mountings and integral cooling systems. Radiators are standard, but heat exchangers are also available. In addition, a variety of optional accessory items are offered to meet the requirements of most types of industrial equipment and climatic conditions.

- The Cummins industrial engine line includes five fire pump models. Naturally, these engines must offer the most reliable service available for the critical periods in which they must operate.
- Cummins offers five natural gas engines for industrial applications.
- The same basic components used in Cummins heavy duty diesels are used in these high efficiency, high compression engines. In areas where the proper type of gas is available, natural gas models provide an excellent power source for air conditioning, refrigeration, water works, sewage systems, gas transmission lines, air compressor drives, and other industrial uses.

As indicated in the following list, numerous types of industrial and materials handling equipment are powered by Cummins construction engines. Specifications for these engines are shown on page 26.

DIESELS INDUSTRIELS CUMMINS

Faible consommation de combustible, coût réduit d'entretien, longue durée en service entre les révisions, légèreté dans le poids et dans le transport voilà les avantages importants que vous offre Cummins dans ses moteurs industriels. Ces moteurs qui s'accouplent facilement à des récepteurs à vitesse; de fonctionnement, synchrones, variées, développent une puissance fort appréciée dans des applications telles que la commande de pompes centrifuges et de générateurs électriques. Ils ont également fait leurs preuves dans d'autres applications telles que les commandes à courroie, grues industrielles, pompes de tous types et engins de manutention de matériaux industriels extrêmement variés.

Les moteurs industriels Cummins sont livrés avec toutes pièces d'assemblage et systèmes de refroidissement intégral. Les radiateurs sont standardisés et Cummins peut fournir les échangeurs de chaleur. Cummins offre encore une grande variété d'accessoires facultatifs pour satisfaire les besoins de nombreux types d'équipements industriels et de conditions climatiques diverses.

La gamme des moteurs industriels Cummins comprend 5 modèles de pompes pour lutter contre le feu. Il va sans dire que ces moteurs doivent pouvoir fournir un service sur lequel on doit pouvoir absolument compter dans les périodes critiques pendant lesquelles ils doivent fonctionner.

Cummins offre cinq moteurs à gaz naturel pour certaines applications industrielles. Les éléments de base qui font partie des diesels Cummins, affectés à un service lourd, sont utilisés dans ces moteurs à gaz, à haut rendement et à taux de compression élevé. Dans les régions où l'on peut trouver le type de gaz qui convient, les modèles de moteurs, fonctionnant au gaz naturel, représentent une excellente source de puissance dans les applications suivantes : conditionnement d'air, réfrigération, usines élévatoires des sociétés de distribution d'eau, systèmes d'égouts, lignes de transport de gaz, commandes de compresseurs d'air et autres usages industriels.

Comme le montre la liste suivante, de nombreux types d'engins industriels et de matériels industriels de manutention de matériaux sont actionnés par des moteurs Cummins. Vous trouverez à la page 26 les spécifications qui concernent ces moteurs.

CUMMINS-INDUSTRIEMOTOREN

Niedriger Kraftstoffverbrauch, niedrige Wartungskosten, Inspektionen bzw. Überholungen nur in langen Abständen erforderlich, leichtes Gewicht und Transportierbarkeit, dies sind hervorragende Merkmale, die den Cummins-Industriemotoren zu eigen sind. Sie sind anpassungsfähig an verschiedenen Synchronbetriebsdrehzahlen und eignen sich daher vorzüglich zum Antrieb von Zentrifugalpumpen und Stromerzeugern. Auch in anderen Einsatzfällen haben sie sich bestens bewährt, z.B. zum Antrieb von Fördermitteln, Industriekränen, allen Arten von Pumpen und verschiedenen industriellen Transportausrüstungen.

Sämtliche Cummins-Motoren werden komplett mit Armaturen und eingebauter Kühlanlage geliefert. Als Normalausrüstung werden Kühler geliefert, doch sind auch Wärmeaustauscher lieferbar. Außerdem steht eine Reihe von Zubehörausrüstungen auf Wunsch zur Verfügung, so daß den meisten industriellen Bedarfsfällen und Klimabedingungen Rechnung getragen werden kann.

- Das Programm an Cummins-Industriemotoren enthält fünf verschiedene Feuerlöschpumpenmodelle. Es liegt auf der Hand, daß es gerade hier auf höchste Zuverlässigkeit im Ernstfall ankommt.

Cummins baut außerdem fünf verschieden e Erdgasmotoren für industrielle Einsatzfälle. In diesen leistungsstarken hochverdichteten Motoren werden die gleichen Grundbauteile verwendet wie in den schweren Cummins-Dieselmotoren. In Gebieten, in welchen die entsprechende Gasqualität vorhanden ist, stellen die Erdgasmotoren ein hervorragendes Antriebsmittel für Klimaanlage, Kühlanlagen, Wasserwerke, Kanalisationsanlagen, Gasförderanlagen, Kompressoraggregate und andere Industriezwecke dar.

Wie aus der nachstehenden Liste hervorgeht, werden eine grosse Zahl von Industrie- und Transportanlagen mit Cummins-Motoren angetrieben. Die Daten dieser Motoren finden sich auf Seite 26.

MOTORES INDUSTRIALES CUMMINS

Bajo consumo de combustible, bajos costos de mantenimiento, larga duración entre reparaciones mayores, ligereza de peso y facilidad de transportarlo, son importantes características de diseño de los motores industriales Cummins. Adaptables a equipo de diversas velocidades sincrónicas de operación, estos motores constituyen una excelente fuente de potencia para aplicaciones tales como bombas centrífugas y generadores eléctricos. También han sido bien comprobados en otras aplicaciones, tales como transportadores, grúas industriales, todos los tipos de operaciones de bombeo y una gran variedad de equipos para manejo de materiales industriales.

Todos los motores industriales Cummins están disponibles con soportes y sistemas integrales para enfriamiento. Los radiadores son equipo de norma; pero, también están disponibles cambiadores de calor. En adición, se ofrece una gran variedad de accesorios para satisfacer los requisitos de la mayoría de los tipos de equipo industrial y de condiciones climatológicas.

La línea de motores industriales Cummins incluye cinco modelos para bombas contra incendio. Naturalmente, estos motores deben ofrecer el servicio más confiable de que se disponga para los periodos críticos en que deben funcionar.

Cummins ofrece cinco motores de gas natural para aplicaciones industriales. Los mismos componentes básicos utilizados en los diesel Cummins para trabajo pesado, se utilizan en estos motores de alta eficiencia y alta compresión. En los lugares en donde hay disponible el tipo apropiado de gas, los modelos para gas natural constituyen una excelente fuente de potencia para aire acondicionado, refrigeración, suministro de aguas, sistemas de alcantarillado, gasoductos, impulsión para compresores de aire y otros usos industriales.

Como se indica en la lista siguiente, numerosos tipos de equipo industrial y para manejo de materiales son impulsados por motores Cummins para construcción. Las especificaciones de estos motores aparecen en la página 26.

INDUSTRIAL ENGINE SPECIFICATIONS
SPECIFICATIONS DES MOTEURS INDUSTRIELS
DATEN FÜR CUMMINS-INDUSTRIEMOTOREN
ESPECIFICACIONES DE MOTORES INDUSTRIALES CUMMINS

Engine	Maximum HP @ RPM *S.A.E.		Continuous HP @ RPM *S.A.E.		Displacement Cubic Inches (Litres)	Bore and Stroke Inches (mm)	Number of Cylinders	Aspiration	Net Weight Pounds (Kg.)
Moteur	Maximum CV à T/MN		Continu CV à T/MN		Cylindrée Pouces Cubiques	Alésage et Course Pouces	Nombre de Cylindres	Aspiration	Poids Net Livres
Motor	PS-Spitzenleistung bei U/min.		PS-Dauerleistung bei U/min.		Hubraum	Bohrung und Hub	Anzahl der Zylinder	Ansaugart	Nettogewicht
Motor	Máximos HP a RPM		Continuous HP a RPM		Cilindrada Pulgadas Cubicas	Diámetro y Carrera Pulgadas	Número de Cilindros	Aspiración	Peso Neto Libras
V-352-P	140	3300	108	3300	352 (5.7)	4-5/8 x 3-1/2 (117.5 x 88.9)	6	Natural	1550 (702)
V-470-P	185	3300	140	3000	470 (7.7)	4-5/8 x 3-1/2 (117.5 x 88.9)	8	Natural	1800 (815)
J-401-P	110	2200	88	2200	401 (6.6)	4-1/8 x 5 (139.7 x 127.0)	6	Natural	1998 (906)
J-401-P	130	2500	98	2200	401 (6.6)	4-1/8 x 5 (139.7 x 127.0)	6	Natural	2080 (942)
C-464-P	160	2500	120	2200	464 (7.6)	4-7/16 x 5 (112.7 x 127.0)	6	Natural	2090 (947)
CT-464-P	175	2500	122	2200	464 (7.6)	4-7/16 x 5 (112.7 x 127.0)	6	Turbocharged	2120 (960)
CS-464-P	180	2500	125	2200	464 (7.6)	4-7/16 x 5 (112.7 x 127.0)	6	Supercharged	2120 (960)
N-495-P	130	2000	103	1900	495 (8.1)	5-1/8 x 6 (130.2 x 152.4)	4	Natural	2390 (1082)
H-672-P	160	1800	128	1800	672 (11.0)	4-7/8 x 6 (123.8 x 152.4)	6	Natural	3087 (1400)
H-743-P	175	1800	140	1800	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3100 (1404)
H-743-P	190	2000	150	1900	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3100 (1404)
N-743-P	220	2100	168	1900	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3150 (1427)
NS-743-P	290	2100	194	1800	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Supercharged	3550 (1608)
NS-743-P	320	2100	217	1800	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Supercharged	3600 (1630)
N-855-P	250	2100	192	1900	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Natural	3250 (1472)
NT-855-P	310	2100	210	1800	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	3550 (1608)
NT-855-P	335	2100	234	1800	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	3550 (1608)
NT-855-P	380	2300	262	2000	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	3600 (1630)
V-1710-P	500	2100	394	1900	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Natural	7970 (3610)
VT-1710-P	635	2100	435	1800	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	8060 (3650)
VTA-1710-P	700	2100	480	1800	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	8500 (3850)
VTA-1710-P	800	2100	550	1800	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	8500 (3850)

Fire Pump Models
Modèles de Pompes pour Lutter Contre le Feu

Feuerlöschpumpenmodelle
Modelos para Bombas Contra Incendio

Engine	Underwriters Laboratories Ratings		Factory Mutual Ratings		Displacement Cubic Inches (Litres)	Bore and Stroke Inches (mm)	Number of Cylinders	Aspiration	Net Weight Pounds (Kg.)
	HP @ RPM	*S.A.E.	HP @ RPM	*S.A.E.					
	CV à T/MN		CV à T/MN						
	PS bei U/min		PS bei U/min						
Motor	HP a RPM		HP a RPM		Cilindrada Pulgadas Cúbicas	Diámetro y Carrera Pulgadas	Número de Cilindros	Aspiración	Peso Neto Libras
H-6-IF	135	1750	137	1750	672 (11.0)	4-7/8 x 6 (123.8 x 152.4)	6	Natural	2500 (1134)
	139	1800	139	1800	672 (11.0)	4-7/8 x 6 (123.8 x 152.4)	6	Natural	2500 (1134)
NH-220-IF	175	1750	172	1750	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	2800 (1270)
			182	1900	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	2800 (1270)
			191	2100	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	2800 (1270)
NHS-6-IF	225	1750	220	1750	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3150 (1429)
			234	1900	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3150 (1429)
			252	2100	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3150 (1429)
NHRS-6-IF	250	1750	246	1750	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3150 (1429)
			260	1900	743 (12.2)	5-1/8 x 6 (130.2 x 152.5)	6	Natural	3150 (1429)
			278	2100	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3150 (1429)
NT-380-IF	285	1750	274	1750	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	3200 (1452)
	303	1900	304	2000	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	3200 (1452)
	325	2100	330	2300	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	3200 (1452)
	340	2300			855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	3200 (1452)

*Horsepower at standard S.A.E. conditions of 500 ft. (152 m) altitude and 85°F (29.4°C) air intake temperature.

*Horsepower gemäß SAE-Normbedingungen: 152 m ü.d.M. und 29,4° C Luftansaugtemperatur.

*Puissance en CV aux conditions standardisées S.A.E. altitude 500 pieds (152 m) et température d'admission de l'air 85°F (29,4°C).

*Caballaje en condiciones de norma S.A.E., de 500 pies (152 metros) de altura y con el aire de admisión a una temperatura de 85°F (29,4°C).

INDUSTRIAL ENGINE SPECIFICATIONS
SPECIFICATIONS DES MOTEURS INDUSTRIELS
DATEN FÜR CUMMINS-INDUSTRIEMOTOREN
ESPECIFICACIONES DE MOTORES INDUSTRIALES CUMMINS

Natural Gas Models **Erdgasmodelle**
Modèle Industriel au Gaz **Modelos para Gas Natural**

Engine	Continuous HP @ RPM *S.A.E.		Displacement Cubic Inches (Litres)	Bore and Stroke Inches (mm)	Number of Cylinders	Aspiration	Net Weight Pounds (Kg.)
Moteur	Continu CV à T/MN		Cylindrée Pouces Cubiques Hubraum	Alésage et Course Pouces	Nombre de Cylindres	Aspiration	Poids Net Livres
Motor	PS-Dauerleistung bei U/min.		Hubraum	Bohrung und Hub	Anzahl der Zylinder	Ansaugart	Nettogewicht
Motor	Continuous HP a RPM		Cilindrada Pulgadas Cúbicas	Diámetro y Carrera Pulgadas	Número de Cilindros	Aspiración	Peso Neto Libras
GNHC-4-IP	118	1800	495 (8.1)	5-1/8 x 6 (130.2 x 152.4)	4	Natural	2385 (1082)
	98	1500	495 (8.1)	5-1/8 x 6 (130.2 x 152.4)	4	Natural	2385 (1082)
	78	1200	495 (8.1)	5-1/8 x 6 (130.2 x 152.4)	4	Natural	2385 (1082)
GNH-220-IP	177	1800	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3152 (1430)
	148	1500	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3152 (1430)
	118	1200	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3152 (1430)
GNH-250-IP	204	1800	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Natural	3300 (1497)
	170	1500	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Natural	3300 (1497)
	136	1200	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Natural	3300 (1497)
GV12-450-IP	354	1800	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Natural	8500 (3856)
	296	1500	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Natural	8500 (3856)
	236	1200	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Natural	8500 (3856)
GV12-525-IP	408	1800	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Natural	8500 (3856)
	340	1500	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Natural	8500 (3856)
	272	1200	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Natural	8500 (3856)

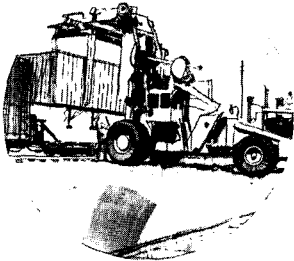
*Horsepower at standard S.A.E. conditions of 500 ft. (152 m) altitude and 85°F (29.4°C) air intake temperature.

*Puissance en CV aux conditions S.A.E. altitude 500 pieds (152 m) et température d'admission de l'air 85°F (29.4°C).

*Horsepower gemäß SAE-Normbedingungen: 152 m ü.d.M. und 29,4° C Luftansaugtemperatur.

*Caballaje en condiciones de norma S.A.E., de 500 pies (152 metros) de altura y con el aire de admisión a una temperatura de 85°F (29.4°C).

INDUSTRIAL AND MATERIALS HANDLING
MANUTENTION INDUSTRIELLE ET MANUTENTION DE MATERIAUX
INDUSTRIE- UND TRANSPORTANLAGEN
INDUSTRIALES Y MANEJO DE MATERIALES



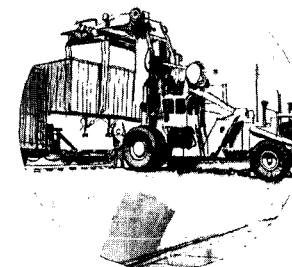
 Carriers Transporteurs Transporter Transportadores				
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Canada	Flextrack-Nodwell Calgary, Alberta	FN-110	Tracked carrier—used for carrying materials into rough or swampy terrain	V-352-C
	Bombardier Snowmobile Balcourg, Quebec	Muskeg Terrainmaster	4 x 4 Transporter	V-352-C
United Kingdom	Stacatruc Ltd. Birmingham	S12	Van carrier	V8-185-B
United States	Clark (Industrial Truck Division) Battle Creek, Michigan	Series 95 Series 100 Series 120 & 121 Series 510 Series 512	40,000 lb. straddle carrier 50,000 lb. straddle carrier 60,000 lb. straddle carrier 50,000 lb. van carrier 75,000 lb. van carrier	C-464-C C-464-C C-464-C C-464-C C-464-C
	Hyster Portland, Oregon	M-500A M-600	50,000 lb. straddle carrier 60,000 lb. straddle carrier	V-470-C V-470-C
 Cranes Grues Kräne Grúas				
United States	Drott Manufacturing Company Wausau, Wisconsin	200RF2 250 RF2	20,000 lb. lift, 25,000 lb. carry industrial crane 25,000 lb. lift, 25,000 lb. carry industrial crane	V-352-C V-352-C
	Link Belt Speeder Cedar Rapids, Iowa	UC-108B UC-98A	45 ton yard crane 35 ton yard crane	N-495-P (upper) NH-220 (carrier) N-495-P (upper) NH-220 (carrier)
 Fork Lifts Elevateurs à fourche Gabelstapler Camiones Montacargas				
United States	Baker-York, Inc. West Memphis, Arkansas	150 180 200 225	15,000 lb. 18,000 lb. 20,000 lb. 22,500 lb.	V-352-C V-352-C V-352-C V-352-C
	FWD-Wagner Portland, Oregon	P-70	Piggy Packer	N-743-C
	Silent Hoist Brooklyn, New York	FK-15 FK-30	15 ton forklift truck 30 ton forklift truck	V-352-C C-464-B
	Taylor Machine Works Louisville, Mississippi	Y-16WO Y-16BW4 Y-20BWD Y-20W50 WPY-200C WPY-200 Y-26WO Y-30WO Y-30WOM Y-36WO Y-36WO5 Y-45WOM Y-52WO	16,000 lb. 16,000 lb. 20,000 lb. 20,000 lb. 20,000 lb. 20,000 lb. 26,000 lb. 30,000 lb. 30,000 lb. 36,000 lb. 36,000 lb. 45,000 lb. 52,000 lb.	J-401-C J-401-C J-401-C J-401-C J-401-C C-464-C J-401-C G-453-C C-464-C C-464-C C-464-C C-464-C C-464-C V-470-C C-464-C

INDUSTRIAL AND MATERIALS HANDLING

MANUTENTION INDUSTRIELLE ET MANUTENTION DE MATERIAUX

INDUSTRIE- UND TRANSPORTANLAGEN

INDUSTRIALES Y MANEJO DE MATERIALES



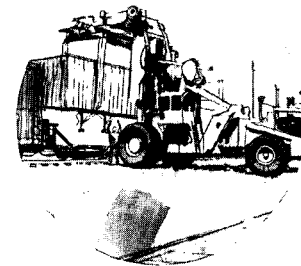
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Unit Rig & Equipment Company Tulsa, Oklahoma	L-120	120,000 lb. capacity	VT-1710-C700
 Hoists & Winches Engins de Levage et Treuils Aufzüge und Winden Elevadores y Cabrestantes				
United Kingdom	James Cuthbertson Ltd. Bigger		150 ton hydrostatic winch	NH-220-IP
United States	Manitowoc Manitowoc, Wisconsin	390	35,000 lbs. winch & hoist	HS-743-B NTA-855-B
 Pumps Pompes Pumpen Bombas				
Australia	F.N. Bethune Pty. Ltd., Melbourne, Victoria.	Various	Pumps	Various
	F.M.C. Pty. Ltd., Melbourne, Victoria.	Various	Pumps	Various
	George Moss Pty. Ltd., Perth. W.A.	Various	Pumps	C, H, NH, NT,
	Harland Engineering P/L., Melbourne, Victoria.	Various	Pumps	V12 Series
	Ornel Pumps Sydney. N.S.W.	Various	Pumps	Various
	Thompson Ltd., Castlemaine, Victoria.	Various	Pumps	Various
	Wormald Bros (Aust.) Pty. Ltd., Melbourne, Victoria.	Various	Pumps	Various
	Canada Fairbanks Morse, Inc. Division of Colt Industries Kingston, Ontario	5823F	8 inch ind. fire pump 1500 GPM/58 PSI	H-6-IF
		5823F	6 inch ind. fire pump 1500 GPM/90 PSI	H-6-IF
		5824F	6 inch ind. fire pump 1500 GPM/100 PSI	H-6-IF NH-220-IF
		5824F	6 inch ind. fire pump 1500 GPM/105 PSI	NH-220-IF
		5824F	6 inch ind. fire pump 1500 GPM/125 PSI	NH-220-IF NHS-6-IF
		5824F	6 inch ind. fire pump 1500 GPM/140 PSI	NHS-6-IF NHRS-6-IF
		5824F	8 inch ind. fire pump 2000 GPM/100 PSI	NHS-6-IF NH-220-IF
		5824F	8 inch ind. fire pump 2000 GPM/125 PSI	NHS-6-IF NHRS-6-IF NT-380-IF
		5824F	8 inch ind. fire pump 2500 GPM/100 PSI	NHS-6-IF NHRS-6-IF NT-380-IF
		5824F	8 inch ind. fire pump 2500 GPM/125 PSI	NT-380-IF

INDUSTRIAL AND MATERIALS HANDLING

MANUTENTION INDUSTRIELLE ET MANUTENTION DE MATERIAUX

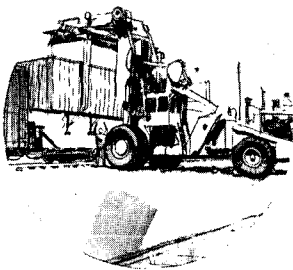
INDUSTRIE- UND TRANSPORTANLAGEN

INDUSTRIALES Y MANEJO DE MATERIALES



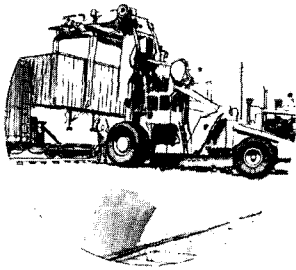
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
India	Kirloskar Brothers Limited P O Kirloskarwadi Dist: Sangli	Kirloskar	Industrial fire/ irrigation pumps	NH-220-IP
		Kirloskar	Industrial fire/ irrigation pumps	NHC-4-IP
South Africa	J. H. Vivien Ltd. Johannesburg		Various	N-743 VT-1710
United Kingdom	Drysdale Pumps Ltd. Yorker, Glasgow	Various	Diesel pumping sets for industrial and fire pump duty.	V-352-P140 to V-1710-P700
	Harland Engineering Ltd. Alloa, Clackmannanshire	Various	Diesel pumping sets for industrial and fire pump duty.	V-352-P140 to V-1710-P700
	Lee Howl Tipton, Staffs.	Various	Diesel pumping sets for industrial and fire pump duty.	V-352-P140 to V-1710-P700
	Sigmund Pulsometer Pumps Ltd. Sunderland and Reading	Various	Diesel pumping sets for industrial and fire pump duty.	V-352-P140 to V-1710-P700
	Worthington Simpson Ltd. Newark, Notts.	Various	Diesel pumping sets for industrial and fire pump duty.	V-352-P140 to V-1710-P700
United States	Allis-Chalmers Manufacturing Co. Milwaukee, Wisconsin		A line of custom order industrial fire pumps.	Various
	Patterson Pump Division Patterson Industries, Inc. Erie, Pennsylvania	DMD	4 x 3 industrial fire pump	H-6-IF
		MI	8 x 6 industrial fire pump	H-6-IF
		MABS	8 x 6 industrial fire pump	H-6-IF
		M	10 x 8 industrial fire pump	H-6-IF
				NH-220-IF NHS-6-IF NHRS-6-IF NT-380-IF
	Peerless Pump Company Division of FMC Los Angeles, California	4TUF5	500 GPM industrial fire pump	H-6-IF
		5TUF7	750 GPM industrial fire pump	H-6-IF NH-220-IF
		4ABF10 4AF12C 5AF10	750 GPM industrial fire pump 750 GPM industrial fire pump 1000 GPM industrial fire pump	V-470-P V-470-P H-6-IF

INDUSTRIAL AND MATERIALS HANDLING
MANUTENTION INDUSTRIELLE ET MANUTENTION DE MATERIAUX
INDUSTRIE- UND TRANSPORTANLAGEN
INDUSTRIALES Y MANEJO DE MATERIALES

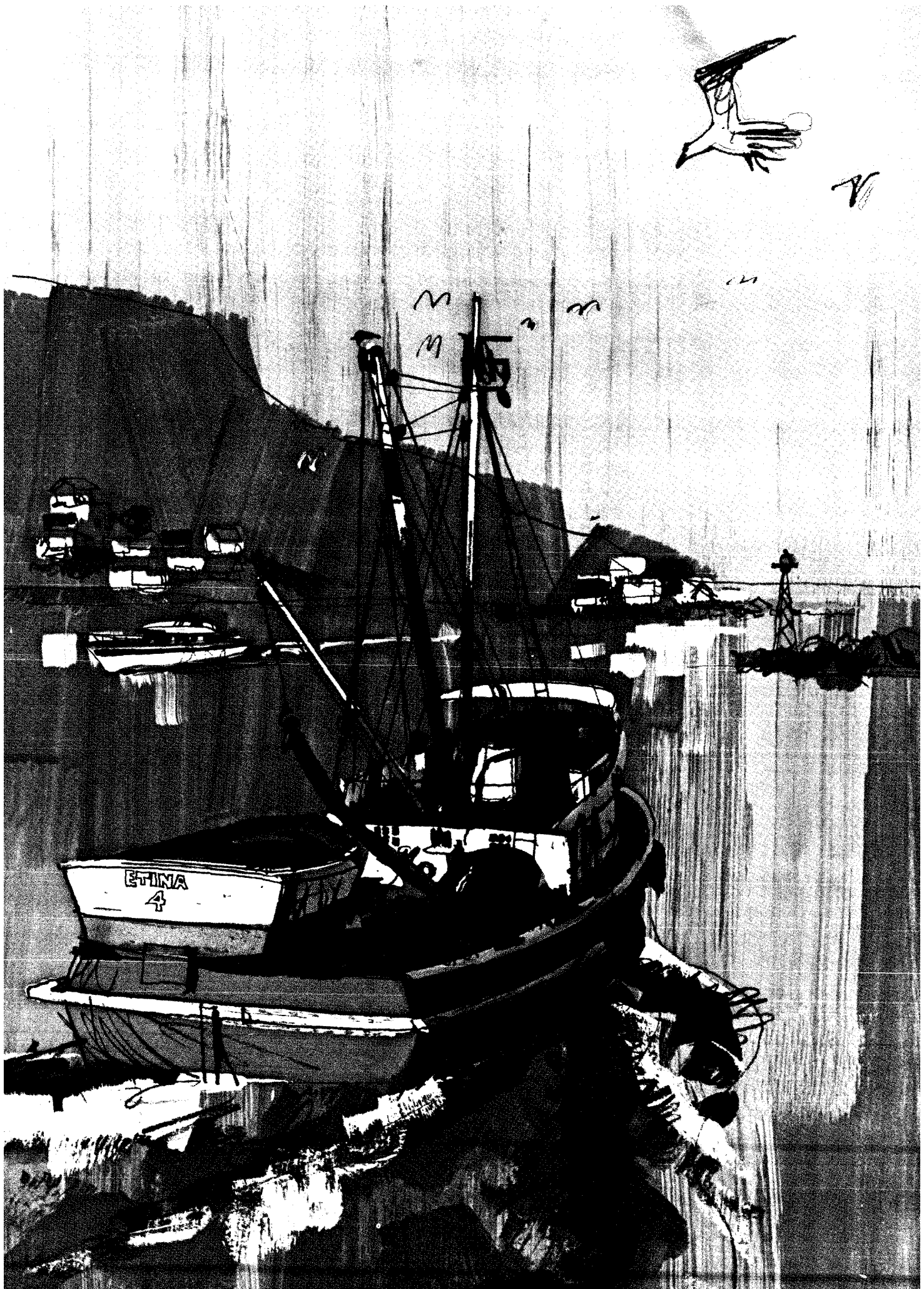


County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Peerless Pump Company Division of FMC Los Angeles, California (Continued)	6TUF10	1000 GPM industrial fire pump	H-6-IF NH-220-IF NHS-6-IF NHRS-6-IF
		5ABF10½ 6AF16	1000 GPM industrial fire pump 1500 GPM industrial fire pump	V-470-P NH-220-IF H-6-IF NHS-6-IF NHRS-6-IF
		8TUF15 8AF20B 8AF25B	1500 GPM industrial fire pump 2000 GPM industrial fire pump 2000 GPM industrial fire pump	NT-380-IF NH-220-IF NHS-6-IF NHRS-6-IF NT-380-IF
		8AF20B	2500 GPM industrial fire pump	NHS-6-IF NHRS-6-IF
	Worthington Corporation Holyoke, Massachusetts	8AF25B Various	2500 GPM industrial fire pump Industrial fire pumps	NT-380-IF H-6-IF NHS-6-IF NHRS-6-IF NH-220-IF NT-380-IF
 Miscellaneous Divers Verschiedenes Misceláneos				
United Kingdom	Sheppards Eng. Ltd. Glamorgan	PSC-376	Mobile scrap car and metal bailing machine	C-464-P
	Lancer Machinery Ltd. Leighton Buzzard, Beds.	3500 Series	40 ton side loaders	NT-380
United States	Bucyrus-Erie South Milwaukee, Wisconsin	10-R	Well drill (rotary)	N-743-P
		28-L	Well drill (spudder)	J-401-C C-464-P
		35-L	Well drill (spudder)	H-743-P
	FWD-Wagner Portland, Oregon	SW-28 Steel worker	28,000 lb. capacity steel handler	J-401-C
		SW-45 Steel worker	45,000 lb. capacity steel handler	CT-464-C
		SW-66 Steel worker	66,000 lb. capacity steel handler	N-743-C
		SW-96 Steel worker	96,000 lb. capacity steel handler	NT-855-C

INDUSTRIAL AND MATERIALS HANDLING
MANUTENTION INDUSTRIELLE ET MANUTENTION DE MATERIAUX
INDUSTRIE- UND TRANSPORTANLAGEN
INDUSTRIALES Y MANEJO DE MATERIALES



County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	FWD-Wagner Portland, Oregon (Continued)	WI-14	Industrial tractor	N-743-C
		WI-17	Industrial tractor	N-855-C
				NT-855-C
	Ibex Motor Truck Corporation Salt Lake City, Utah	WI-24	Industrial tractor	NT-855-C
				NTA-855-C
		2423	Yard hustler	V6-140
	Morgan Manufacturing Company Black Mountain, N. C.	FDR-30-C	Mechanical conveyor (75KW)	HR-6-GC (75KW)
		FDR-40-C	Mechanical conveyor (75KW)	HR-6-GC (75KW)
		FDR-85	Mechanical conveyor (75KW)	HR-6-GC (75KW)
	Ottawa Steel Products Grand Haven, Michigan Pengo/Hydra-Pull	Commando	Yard hustler	V8-185
		Thirty		
		TRCP-60	6,000 lb. cable puller-tensioner	V-470-P
		TRBW-60PT-72	6,000 lb. cable puller-tensioner	V-470-P
	R. G. LeTourneau Longview, Texas Silent Hoist Brooklyn, New York	TRBW-100PT-72	10,000 lb. cable puller-tensioner	V-470-P
		SP-70	70,000 lb. side porter	NS-743
		SP-90	90,000 lb. side porter	NTA-855
		FS-7½	7½ ton side loader	V-352-C



CUMMINS MARINE ENGINES

Cummins marine diesels provide a wide range of power for work boats, fishing boats, and pleasure boats. Their reliability, long life, and economy has been proven even in the most demanding of these applications. In addition, Cummins delivers more propeller horsepower than most engines of comparable size and weight.

The clean lines and compact dimensions of Cummins marine diesels allow installations that are smooth and simple. External components are kept to a minimum to avoid unnecessary fitting alterations.

Cummins eight cylinder V models feature a compact, stylized design that eliminates the machinery appearance of ordinary engines. Their compact size and low profile reduce the amount of space required for the engine compartment. As a result, more power can be installed in a smaller engine room to permit better utilization of available space.

- A wide selection of in-line and V models complete the Cummins marine line. Internal fuel lines are featured on 5½" bore in-line engines and all V engines. Every Cummins marine diesel has internal lubricating oil lines which obsolete the hoses and tubing normally required on other diesels.

- All models are heat exchanger cooled, have electric starting equipment, water cooled manifolds, intake air cleaners, oil filters, and fuel filters as standard equipment. Various air silencers, electrical systems, power take-offs, and marine gear ratios are available optionally.

The list of boat manufacturers on the following pages is only a partial representation of Cummins worldwide acceptance in marine applications. Naval architects and boat builders around the world prefer Cummins power, and specify Cummins in numerous custom built boats each year.

DIESELS MARINS CUMMINS

Les diesels marins Cummins actionnent les "work boats," bateaux de pêche et bateaux de plaisance qui trouvent en eux la large gamme de puissances, répondant à leurs besoins. Dans les plus exigeantes de ces applications, ils ont fait leurs preuves en offrant les avantages suivants : grande fiabilité, longue durée en service, consommation minimum de combustible. Cummins fournit en outre plus de puissance à l'hélice que la plupart des engins de dimensions et de poids comparables.

Les modèles Cummins à 8 cylindres en V caractérisent un modèle compact, stylisé, éliminant l'aspect un peu trop mécanique des moteurs ordinaires. Leurs dimensions compactes et leur profil surbaissé réduisent l'espace nécessaire pour les loger dans la salle des machines. Il en résulte qu'on peut installer plus de puissance dans une salle de machines de dimensions plus réduites et ainsi mieux utiliser l'espace disponible.

Un large choix de modèles de moteurs en ligne et en V complète la gamme des diesels marins Cummins. Des conduites intérieures de combustible liquide sont prévues sur les moteurs en ligne de 5½" (139,7 mm) alésage et sur tous les moteurs en V. Chaque diesel marin Cummins a des conduites intérieures d'huile lubrifiante qui démontrent les tuyaux flexibles et les tuyauteries, normalement requises sur d'autres diesels.

Tous les modèles sont refroidis par des échangeurs de chaleur. Ils ont des démarreurs électriques, des collecteurs refroidis à l'eau, des filtres d'air d'admission, des filtres à huile et des filtres à huile combustible comme équipement standardisé. La livraison de silencieux variés d'aspiration, de dispositifs électriques, de prises de force et de rapports de transmission d'engrenages de moteurs marins est facultative.

La liste des constructeurs de bateaux, figurant dans les pages suivantes ne mentionne qu'une partie de la clientèle qui a adopté le diesel Cummins dans les applications de la marine. Les architectes, spécialisés dans les constructions navales et les constructeurs de navires, établis dans le monde entier, préfèrent la puissance Cummins et spécifient Cummins dans les nombreux navires qu'ils construisent chaque année suivant des spécifications particulières.

CUMMINS-SCHIFFSMOTOREN

Cummins-Schiffsdiesels dienen zum Antrieb einer ganzen Reihe von technischen Wasserfahrzeugen, Fischereifahrzeugen sowie Vergnügungsbooten. Ihre Zuverlässigkeit, lange Lebensdauer und Wirtschaftlichkeit sind selbst unter den rauhsten Bedingungen erprobt und bewährt. Außerdem bieten Cummins-Motoren mehr Schiffsschrauben-PS als die meisten Motoren vergleichbarer Größe bzw. Gewichts.

Die klare Linienführung und kompakte Bauweise von Cummins-Schiffsdiesels ermöglichen elegant-raffinierte Einbauanordnung. Außenliegende Bauteile sind auf ein Mindestmaß beschränkt, um unnötige Montage- bzw. Umbauarbeiten zu vermeiden.

Der Cummins V-8 erinnert in seiner kompakten, formschönen Ausführung nur noch wenig an das schwerfällige Ungetüm des herkömmlichen Motors. Dank dieser kompakten und schlanken Bauweise ist der Raumbedarf gering, das heißt, man kann auf verhältnismäßig kleinem Raum größere Motorkraft unterbringen und damit den vorhandenen Platz besser ausnutzen.

- Das Cummins-Schiffsmotorenprogramm wird schließlich mit einer reichen Auswahl an Reihen- und V-Motoren ergänzt. Alle Reihen- und V-Motoren mit 139,7 mm Bohrung zeichnen sich durch in den Zylinderblock gebohrte Kraftstoffleitungen aus. Außerdem verlaufen bei sämtlichen Cummins-Schiffsdieselmotoren die Schmierölleitungen im Motorblock, so daß die normalerweise bei anderen Dieseln erforderlichen Schlauch- und Rohrleitungen wegfallen.

Alle Modelle werden mittels Wärmeaustauscher gekühlt, sind mit elektrischem Anlasser, wassergekühltem Krümmer, Ansaugluftreiniger, Ölfilter und Kraftstofffilter als Normalausführung ausgestattet. Als Sonderausrüstung auf Wunsch stehen verschiedene Schalldämpfer, elektrische Anlagen, Nebenantriebe und verschiedene Übersetzungsverhältnisse zur Verfügung.

Die auf den folgenden Seiten verzeichneten Schiffsbaufirmen sind nur ein Auszug aus dem Kreis der internationalen Verbraucher von Schiffsmotoren auf der ganzen Welt, bei denen Cummins erste Wahl genießt. Schiffsbauer und Bootsbauer überall auf der Welt bevorzugen Cummins-Motoren und schreiben diese Jahr für Jahr in zahlreichen Sonderanfertigungen für Ihre Bootskunden vor.

MOTORES CUMMINS MARINOS

Los motores Cummins diesel marinos ofrecen una amplia gama de potencia para botes de trabajo, barcos pesqueros y embarcaciones de placer. Su confiabilidad, larga vida y economía han sido comprobadas incluso en las más exigentes de estas aplicaciones. Además, Cummins produce más caballos en el árbol de la hélice que la mayoría de los motores de tamaño y peso comparables.

Las líneas sin salientes y las dimensiones compactas de los Cummins diesel marinos permiten instalaciones rápidas y sencillas. Los componentes externos se mantienen al mínimo para evitar alteraciones innecesarias.

Los modelos Cummins V8 se caracterizan por un diseño compacto y estilizado que elimina el aspecto de "maquinaria" de los motores ordinarios. Su tamaño compacto y su perfil bajo reducen la cantidad de espacio necesario para el compartimiento de máquinas. Como resultado, se puede instalar más potencia en un cuarto de máquinas más chico, para permitir mejor utilización del espacio disponible.

Una vasta selección de modelos en línea y en V completan la línea marina Cummins. La tuberías internas para combustible se emplean en todos los motores en línea de 139,7 mm (5½") de diámetro y en todos los motores en V. Todos los motores Cummins marinos tienen tuberías internas para el lubricante que hacen anticuadas a las mangueras y tuberías requeridas normalmente en otros diesel.

Todos los modelos son enfriados por cambiador de calor, tienen equipo eléctrico para arranque, múltiples de escape enfriados por agua, filtros para la admisión de aire, filtros de aceite y filtros de combustible como equipo de norma. Opcionalmente, están disponibles diversos silenciadores de admisión, sistemas eléctricos, tomas de fuerza y transmisiones marinas.

La lista de constructores de embarcaciones en las páginas siguientes es apenas una representación parcial de la aceptación mundial de Cummins en aplicaciones marinas. Los arquitectos navales y los constructores de embarcaciones en el mundo entero prefieren potencia Cummins y especifican Cummins en numerosos botes de construcción sobre pedido todos los años.

MARINE ENGINE SPECIFICATIONS
SPECIFICATIONS DE MOTEURS MARINS
SCHIFFSMOTORENDATEN
ESPECIFICACIONES DE MOTORES MARINOS CUMMINS

Engine	1. Pleasure Boat Ratings		Workboat and Fishing Boat Ratings				4. Heavy Duty	
	HP *	@ RPM	2. Light Duty	3. Medium Duty	HP *	@ RPM	HP *	@ RPM
	1. Bateaux de Plaisance		Workboats et Bateaux de Pêche Puissances				4. Service Lourd	
	CV *	à T/MN	2. Service Modéré	3. Service Léger	CV *	à T/MN	CV *	à T/MN
Motor	1. PS bei Vergnügungsbooten		PS bei Technischen- und Fischerei-Fahrzeugen				4. f. Schweren Einsatz	
Motor	PS *	bei U/min	2. f. Leichten Einsatz	3. f. Mittelschw. Einsatz	PS *	bei U/min	PS *	bei U/min
Motor	1. Especificación para Botes de Placer		Especificaciones para Bacos de Trabajo y Barcos Pesqueros				4. Trabajo Pesado	
Motor	HP *	@ RPM	2. Trabajo Liviano	3. Trabajo Mediano	HP *	@ RPM	HP *	@ RPM
V-470-M	185 (170)	3300	170 (156)	3000	**	**	128 (117)	2500
V8-300-M	300 (275)	3000	260 (239)	2800	**	**	202 (220)	2600
VT8-370-M	370 (340)	3000	320 (294)	2800	**	**	270 (248)	2600
HR-175-M	175 (161)	1800	**	**	**	**	140 (128)	1800
NH-220-M	220 (202)	2100	**	**	**	**	165 (151)	1800
NH-250-M	250 (229)	2100	210 (193)	1800	200 (184)	1800	190 (174)	1800
NHRS-320-M	320 (294)	2100	**	**	**	**	218 (200)	1800
NT-335-M	335 (307)	2100	285 (262)	2100	265 (243)	1800	235 (216)	1800
NT-380-M	380 (349)	2300	320 (294)	2100	300 (275)	2000	253 (232)	2000
V12-500-M	500 (459)	2100	425 (390)	2100	400 (367)	1800	370 (340)	1800
VT12-635-M	635 (583)	2100	540 (496)	2100	490 (450)	1800	435 (397)	1800
VT12-700-M	700 (642)	2100	595 (546)	2100	545 (500)	1800	480 (441)	1800
VT12-800-M	800 (734)	2100	680 (624)	2100	620 (569)	1800	550 (505)	1800

1. Pleasure boat rating is intended for those applications where full throttle operation does not exceed fifteen minutes of duration, and does not occur more than once every hour, such as privately owned pleasure craft.

2. Light Duty rating is intended for intermittent application of full throttle not exceeding 8 hours total in any 24 hour period, such as crew boats and charter fishing boats.

3. Medium Duty rating is intended for commercial fishing applications, with full throttle operation not exceeding 15 hours total in any 24 hour period, such as trawlers, seiners, and gill netters.

4. Heavy duty rating is intended for heavy duty continuous full throttle operation 24 hours a day, such as tow boats, tugs, self-propelled barges, and freighters.

**Not applicable for these engine models.

*Horsepower at 85°F (29.4°C) ambient air temperature, and 29.38 inches (746mm) Hg. barometric pressure.

1. Sont ici visées les applications dans lesquelles le fonctionnement du moteur à étrangleur entièrement ouvert ne dépasse pas 15 minutes et dans lesquelles le bateau de plaisance ne fonctionne pas plus d'une heure à ce régime, comme c'est le cas d'un bateau de plaisance qui serait la propriété d'un particulier.

2. Est ici visée une application intermittente du fonctionnement à étrangleur entièrement ouvert, ne dépassant pas huit heures au total au cours d'une période quelconque de 24 heures, comme c'est le cas des bateaux à équipage et des bateaux de pêche d'affrètement.

3. Sont ici visées les applications de la pêche commerciale, dans lesquelles le fonctionnement à étrangleur entièrement ouvert ne dépasse pas 15 heures au total au cours d'une période quelconque de 24 heures, comme c'est le cas des chalutiers, senneurs et bateaux de pêche au filet maillant.

4. Est ici visée une application en service lourd continu dans laquelle le diesel fonctionne à étrangleur entièrement ouvert, 24 heures par jour, comme c'est le cas des bateaux toueurs, des remorqueurs, des chalands auto-propulsés et des cargos.

**Non applicable à ces modèles de moteurs.

*Obtenues dans les conditions suivantes: 85°F (29.4°C) température de l'air ambiant 29.38 pouces Hg. (746mm Hg.) pression barométrique.

Displacement Cubic Inches (Litres)	Bore and Stroke Inches (mm)	Number of Cylinders	Aspiration	Net Weight Pounds (Kg.)
Cylindrée Pouces Cubiques	Alésage et Course Pouces	Nombre de Cylindres	Aspiration	Poids Net Livres
Hubraum	Bohrung und Hub	Anzahl der Zylinder	Ansaugart	Nettogewicht
Cilindrada Pulgadas Cúbicas	Diámetro y Carrera Pulgadas	Número de Cilindros	Aspiración	Peso Neto Libras
470 (7.7)	4-5/8 x 3-1/2 (117.5 x 88.9)	8	Natural	1750 (704)
785 (12.8)	5-1/2 x 4-1/8 (139.7 x 104.7)	8	Natural	2515 (1140)
785 (12.8)	5-1/2 x 4-1/8 (139.7 x 104.7)	8	Turbocharged	2775 (1259)
743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3420 (1551)
743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3490 (1583)
855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Natural	3490 (1583)
743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	3765 (1708)
855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	3975 (1803)
855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	3975 (1803)
1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Natural	6980 (3166)
1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	7990 (3624)
1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	8120 (3683)
1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	8120 (3683)

1. Für solche Vergnügungsboote, wo Vollgasbetrieb nicht länger als jeweils 15 Min. andauert und nicht öfter als einmal pro Stunde vorkommt, wie z.B. bei privaten Vergnügungsbooten.

2. Als leichter Einsatz gilt abwechselnder Vollgasbetrieb bis zu höchstens 8 Stunden Gesamtdauer pro 24 Stunden, wie z.B. bei Personen- und Fischereicharter-fahrzeugen.

3. Als mittelschwerer Einsatz gilt gewerblich betriebene Fischerei mit Vollgasbetrieb bis zu höchstens 15 Stunden, wie z.B. Trawler, Schleppnetz- sowie Tiefnetzbetrieb.

4. Unter schwerem Einsatz ist Dauerbetrieb unter Vollgas 25 Stunden pro Tag zu verstehen, wie z.B. Schleppfahrzeuge, Motorkähne und Frachtschiffe.

**kommt für diese Motorenmodell nicht infrage.

*PS Leistung under 29.4°C lufttemperature und 746mm Hg. barometrischer druck.

1. La especificación para Botes de Placer se destina para aquellas aplicaciones en que la operación con todo el acelerador abierto no excede de 15 minutos de duración y no ocurre más de una vez cada hora, tal como en los botes de placer de propiedad privada.

2. La especificación para Trabajo Liviano está destinada para aplicaciones intermitentes de máxima aceleración que no exceden de un total de 8 horas en cualquier periodo de 24 horas, tales como botes de servicio de bacos y embarcaciones pesqueras para alquiler.

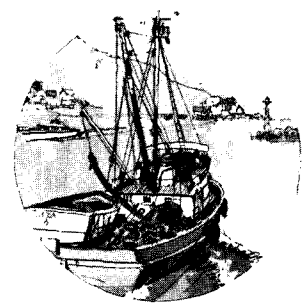
3. La especificación para Trabajo Mediano está destinada para aplicaciones pesqueras comerciales, en donde la operación con máxima aceleración no excede de un total de 15 horas en cualquier periodo de 24 horas, tales como en rastreadores, barredores y arrastradores.

4. La especificación para Trabajo Pesado está destinada para operación continua en trabajo pesado, con máxima aceleración las 24 horas del día, en aplicaciones tales como remolcadores, barcasas de motor y barcos de carga.

**No se aplica para estos modelos de motor.

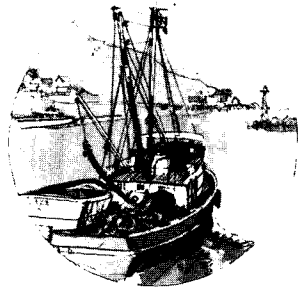
*Con el aire de admisión a 85°F (29.4°C) y 29.38" (746mm) Hg. de presión barométrica.

MARINE
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MARINOS



 Pleasure Boats Bateaux de Plaisance Vergnügungsboote Botes de Placer				
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Australia	Bertram Yachts Aust. Melbourne, Victoria	Cruiser	34' twin screw	VT6-280-M
	Ferrex Development Mackay, Queensland	Cruiser	45' twin screw	V6-215-M
	Milkraft Pty. Ltd. Brisbane, Queensland	Cruiser	Various	H, NH, V6 and V8 series
	Savage Cruisers Melbourne, Victoria	Cruiser	34' twin screw 26' single screw	V-470-M V-470-M
Canada	Asher Marina Ltd. N. Vancouver, B.C.		Pleasure boats	V-470-M V8-300-M VT8-370-M
	Canoe Cove Marine Ltd. Sidney, B.C.		Pleasure boats	V-470-M V8-300-M VT8-370-M
	Enno's Custom Boats, Ltd. N. Vancouver, B.C.		Pleasure boats	V8-300-M
	Fibo Boat Works Vancouver, B.C.	Various	Various	V8-300-M
	Grenfell Yachts Vancouver, B.C.		Pleasure boats	V8-300-M VT8-370-M
	McKay-Cormack Ltd. Victoria, B.C.	Various	Various	V6-215-M
	McQueen's Boat Works Vancouver, B.C.		Pleasure boats	V-470-M V8-300-M
	J. Nicholson Boat Works Victoria, B.C.		Pleasure boats	V8-300-M
	Shepherd Boats Ltd. Niagara-on-the-Lake, Ontario		46' cruiser 50' cruiser	V8-300-M VT8-370-M
	William Garden Shipyard Victoria, B.C.		Pleasure boats	NT-335-M V-470-M V8-300-M VT8-370-M
Japan	Fuji Marine Co. Ltd.	Seven Star	52' pleasure boat	Twin VT8-370-M
	Sumidagawa Shipyard Co., Ltd. Tokyo		55' catamaran	Twin VT8-370-M
	Toa Yachts, Ltd. Yokosuka	Whistle Wing	72' ketch	VT3-270-M
	Toei Marine Boat Co., Ltd. Yokosuka		52' pleasure boat	Twin VT8-370-M
United States	Alglas Corporation Division of Pacemaker Corp. Egg Harbor, New Jersey	31' Cruiser 33' Cruiser 38' Sedan 43' Motor Yacht 48' Motor Yacht	Various cruiser, sport fish, sedan and double cabin models.	V-470-M V-470-M V-470-M V8-300-M VT8-370-M

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MARINOS



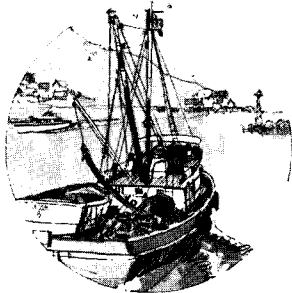
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Bertram Yacht Corp. Miami, Florida		31' fiberglass 38' fiberglass 38' fiberglass	V-470-M VT8-370-M V8-300-M
	Burger Boat Company Manitowoc, Wisconsin Century		57' steel	VT8-370-M
			45' wood 45' wood	VT8-370-M V8-300-M
	Chris Craft Corp. Pompano Beach, Florida		38' fiberglass 47' fiberglass 57' wood 50' wood 55' wood 52' wood 57' wood 45' wood 47' fiberglass 40' wood	V-370-M V8-300-M VT8-370-M V8-300-M V8-300-M V8-300-M VT8-370-M V8-300-M V8-300-M V8-300-M
	Colonial Cruisers, Inc. Millville, New Jersey		38' wood 53' wood	V-470-M VT8-370-M
	Davis Custom Boats Marshallberg, N. C.	Various	Various	V8-300-M VT8-370-M
	Devils Lake Marina Lincoln City, Oregon		Various pleasure boats and buoytenders	Various
	Egg Harbor Boat Company Division of Pacemaker Corp. Egg Harbor, N. J.		Various cruiser, sport fish, sedan and double cabin models.	V-470-M V8-300-M
	Feadship		52' steel	V8-300-M
	Galleon Industries		42' houseboat	V-470-M
	Grafton Boat Grafton, Ill.		Various commercial and pleasure boats	V-470-M V8-300-M HR-175-M NH-250-M NT-335-M V12-500-M
	Hatteras Yacht Company High Point, N. C.	30C 34C 48C 41C	30' 34' 48' 41'	V-470-M V-470-M VT8-370-M V8-300-M or VT8-370-M
		44TC 45C 53TC	44' 45' 53'	V8-300-M VT8-370-M VT8-370-M
	Hi Tide Boat Works Williston, N. C.	Various	Various	V8-300-M VT8-370-M
	Huckins Yacht Corp. Jacksonville, Florida		50' wood	VT8-370-M

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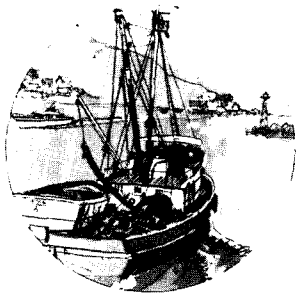
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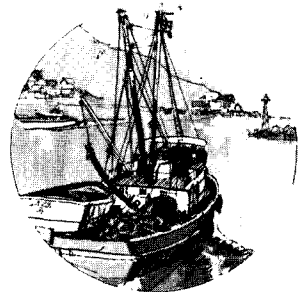
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Inland Seas Boat Company Sandusky, Ohio		Various pleasure boats	V-470-M V8-300-M VT6-280-M
	Jansen Machine & Boatworks South Beach, Oregon		Various commercial & fishing vessels	Various
	Lemay Boat Works Davis, N. C.	Various	Various	V8-300-M VT8-370-M
	Luhrs Sea Skiffs, Inc. Morgan, New Jersey		32' fiberglass	V-470-M
	The Mathews Company Port Clinton, Ohio		45' cruiser	V8-300-M or VT8-370-M
			53' cruiser	VT8-370-M
	Norseman Shipbuilding, Inc. Miami, Florida		59' wood	VT8-370-M
	Owens Yacht Division Brunswick Corporation Baltimore, Maryland	31' Cruiser 33' Cruiser 35' Cruiser 40' Cruiser 44' Cruiser 47' Cruiser	Various cruiser, sedan, sport fish, sedan, and double cabin models.	V-470-M V-470-M V-470-M V8-300-M V8-300-M VT8-370-M
	Pacemaker Corporation Egg Harbor, N. J.	32' Cruiser 34' Cruiser 42' Motor Yacht 47' Motor Yacht 55' Motor Yacht 60' Motor Yacht 65' Motor Yacht	Various cruiser, convertible sedan, sport fish, double cabin, and sedan fishing models.	V-470-M V-470-M V-470-M V8-300-M VT8-370-M VT8-370-M VT8-370-M
	Roamer Yacht Division Chris Craft Corp. Holland, Michigan		46' aluminum 56' aluminum 48' aluminum	V8-300-M VT8-370-M V8-300-M
	Rose Brothers Boat Works Harkers Island, N. C.	Various	Various	V8-300 VT8-370
	Rybovich and Sons Boatworks, Inc. West Palm Beach, Florida		47' wood 54' wood	V8-300-M VT8-370-M
	Striker Boats, Inc. Ft. Lauderdale, Florida		36' aluminum	V-470-M
	Tollycraft Kelso, Washington	Royal 50	50' pleasure craft	V8-300
	Trojan Boat Company Lancaster, Pa.		42' motor yacht	V-470-M
	John Trumpy & Sons Annapolis, Md.		58' motor yacht	VT8-370-M
	Tucker Marine Cincinnati, Ohio	Various boats	Various	V-470-M VT8-370-M
	Uniflite		36' fiberglass 42' fiberglass	V-470-M V8-300-M
	M. W. Willis & Sons Marshallberg, N. C.	Various	Various	V8-300-M VT8-370-M

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MARINOS



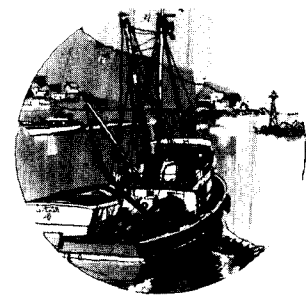
 Workboats and Fishing Boats Workboats et Bateaux de Pêche Technische- und Fischereifahrzeuge Barcos de Trabajo y Pesqueros				
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Brazil	Marco do Brasil S.A. Sao Paulo		72' fishing boat	V12-500-M
Canada	Allied Shipbuilders Ltd. N. Vancouver, B.C., Canada		Workboats	NH-250-M NT-335-M V12-500-M VT12-700-M
	Bel-Aire Shipyards N. Vancouver, B.C.		Various workboats	NH-250 VT12-700-M
	Benson Bros. Shipbuilding Ltd. Vancouver, B.C.	Various	Various	NH-250-M VT-380-M V8-300-M
Chile	Marco Chilena Shipyards Iquique	Various	Various fishing vessels	NT-380-M V12-500-M (others as required)
Denmark	Hadsond Shipyard Hadsond		Fishing boat	VT-12-M
	Ove Christensen Hirtshals		Fishing boat	VT-380-M
	Vienoe Hirtshals		Fishing boat	NT-380-M VT-12
Japan	Azuma Shipbuilding Co. Ltd. Yokosuka	Truat Pramong I	65' patrol boat	Twin VT8-370-M
	Ishihara Dockyard Co. Ltd. Kobe	Kusunoki	Fire boat	Twin VT8-370-M
	Kita Shipyard Co. Kobe	No. 83 & 84 (custom nos.)	49' patrol boat	Twin VT8-370-M
	Nagasaki Shipyard Ltd. Nagasaki	Kashi Asakaze	39' patrol boat 39' patrol boat	V8-300-M VT8-370-M
	Okamoto Boat Yard Yokohama	Hamakaze	42' launch	V6-215-M
	Sumidagawa Shipyard Co., Ltd. Tokyo	Tokiwa Maru Hagoromo	52' fire boat 57' fire boat	Twin VT8-370-M Twin VT8-370-M
	Toei Marine Boat Co., Ltd. Yokosuka	No. 46, 48, & 50 No. 96	67' patrol boat 49' patrol boat	Twin VT12-825-M Twin VT8-370-M

MARINE
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SCHIFFSMOTOREN
MARINOS



County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Japan (Continued)	Usuki Iron Works, Ltd. Kyushu Yokohama Yacht Yokohama	Oceanic 2	500 T oil tanker (pump)	VT12-700-M
		Ashigara	49' quarantine boat	V8-300-M
		Mufeed	86' crash, fire and rescue boat (fire pump)	V8-300-M
United States	Barbour Metal Boat St. Louis, Mo.		Various workboats	HR-175-M NH-250-M NT-335-M V12-500-M V12-700-M
			Various commercial fishing vessels	NH-250-M NT-335-M
			Trawlers	V12-500-M
	Bayside Machine & Boatworks South Beach, Oregon	Various	Various workboats	Various
	Bellamy Boat Works Holden Beach, N. C.		Various pleasure boats and buoytenders	Various
	Cape Girardeau Boat & Dry Dock Cape Girardeau, Mo.		Various workboats and bow thrusters	Various
	Devils Lake Marina Lincoln City, Oregon		Various Commercial and Pleasure Boats	V-470-M V8-300-M HR-175-M NH-250-M NT-335-M V12-500-M
	Fraser Shipyards Inc. Superior, Wisconsin		Various Workboats	HR-175-M NH-250-M NT-335-M V12-500-M VT12-700-M
	Grafton Boat Grafton, Illinois		Various Commercial and Pleasure Boats	Various
	Humboldt Boat St. Louis, Missouri		Trawlers	V12-500-M NT-335-M
	Jansen Machine and Boatworks Troutdale, Oregon		Various fishing vessels	As required.
	Lewis Bros. Boat Works Hampstead, N. C.		Various Workboats	Various
	Marine Construction and Design Company Seattle, Washington			
	Maxon Construction Co. Tell City, Indiana			

MARINE
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MARINOS



County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	New Bern Shipyard New Bern, N. C.		Various Workboats	Various
	St. Louis Ship St. Louis, Mo.		Various Workboats	HR-175-M NH-250-M NT-335-M V12-500-M V12-700-M
	Varham Boat Works Holden Beach, N. C.		Trawlers	V12-500-M
	Walker Boat Yard Paducah, Kentucky		Various Workboats	Various
	Yaquina Boat Works Toledo, Oregon		Various	NH-250-M NT-335-M
 Miscellaneous Divers Verschiedenes Misceláneos				
Finland	Hollming OY Ruama		Aquamaster Drives	NTA-380-M
United States	American Shipbuilding Lorain, Ohio		Bow thrusters	VT12-800-M
	Fraser Shipyards Inc. Superior, Wisconsin		Bow thrusters	Various
	G & W Welding Cleveland, Ohio		Bow thrusters	Various



CUMMINS RAILWAY ENGINES

Through thousands of hours of operation and over thousands of miles of track, Cummins engines have proven to be rugged, dependable railway power. Used in applications ranging from mountain railcars to underground mining locomotives, these diesels have the stamina and working power to be first choice of many railway equipment manufacturers around the world.

Cummins locomotive and railcar engines are built specifically for those applications, whether they be diesel hydraulic or diesel electric. Their high horsepower per weight ratio offers a distinct advantage over many diesels. Since they are of compact, heavy duty design, yet are comparatively light weight, they are ideally suited for operation in many countries which have lightweight rails and require low axle loads.

Cummins locomotive diesels are designed to withstand the shocks and sudden impact of yard switching and shunting operations. They continue to operate at peak efficiency even under constant heavy loads. This means that many years of service can be expected from every Cummins railway engine.

Cummins combines the latest in horizontal engine design with the proven performance of the famous NH engine series to provide one of the finest railcar engine lines in the world. These horizontal engines naturally have minimal height dimensions to accommodate the often exacting tolerances required in railcar engine installations. They offer the rugged durability that is built into every Cummins engine.

Cummins offers a variety of flywheel options to fit many types of torque converters and traction generators. Other options, such as various torque converter oil coolers, oil pans, fans and fan mountings, air compressors, governors and air cleaners provide a perfect engine match to the application.

Cummins diesels are standard power on many other related types of railway equipment, such as track layers, locomotive cranes, and snow plows.

DIESELS CUMMINS EN SERVICE SUR LES CHEMINS DE FER

Les diesels Cummins en service sur les chemins de fer ont fonctionné des milliers d'heures et parcouru sur les lignes des milliers de milles. Ils ont ainsi prouvé qu'ils étaient robustes et qu'ils méritaient l'entière confiance des compagnies de chemins de fer. Utilisés dans les applications variées, allant des autorails de montagne aux locomotives en service souterrain dans les mines, ils ont l'endurance et la puissance de travail qu'il faut pour que de nombreux constructeurs d'équipement de chemins de fer, établis dans le monde entier, tournent vers eux leurs regards pour fixer définitivement leur choix.

Les diesels Cummins de locomotives sont étudiés pour résister aux chocs et en particulier aux chocs brusques, se produisant dans les gares au cours des manœuvres de triage, au franchissement des aiguillages. Ils continuent à fonctionner à leur rendement de pointe même à charge constante en service dur. On peut donc s'attendre à ce que le moteur Cummins de chemin de fer reste de longues années en service.

Cummins combine le dernier cri de la technique dans le modèle de diesel horizontal avec le rendement prouvé de la fameuse série des moteurs NH pour fournir une des plus fines gammes de diesels d'autorails qui existe au monde. Ces diesels horizontaux ont naturellement les dimensions minimales en hauteur pour pouvoir respecter les tolérances souvent exigeantes, requises dans les installations des diesels d'autorail. Ils offrent la même robustesse et la même endurance que celles incorporées à chaque diesel Cummins.

Cummins offre un choix très varié de volants, s'adaptant à de nombreux types de convertisseurs de couple et de générateurs de traction. D'autres articles facultatifs tels que divers refroidisseurs d'huile pour convertisseur de couple, bacs à huile, ventilateurs et pièces d'assemblage de ventilateurs, compresseurs d'air, régulateurs et filtres à air peuvent être fournis au client pour que le diesel puisse fonctionner parfaitement dans le cas de l'application envisagée.

Les diesels Cummins sont des sources de puissance standardisées sur de nombreux autres types de matériel de chemin de fer tels que des machines de pose de voies ferrées, grues à flèche tournante sur voie normale et chasse-neige.

CUMMINS-MOTOREN FÜR SCHIENENFAHRZEUGE

Cummins-Motoren haben sich über Tausende von Betriebsstunden und Tausende von Schienenkilometern als robuste, zuverlässige Antriebsmotoren für die Eisenbahnen bewährt. Ob im Einsatz bei Bergbahnen oder als Loks im Untertagebau, diese Dieselmotoren besitzen eine solche Dauerbelastbarkeit und Leistungsstärke, daß sie inzwischen von vielen Firmen des Eisenbahnbaus auf der ganzen Welt bevorzugt werden.

Cummins-Diesel für Loks sind so konstruiert, daß sie dem Aufprall und ruckartigen Belastungen im Rangierbetrieb gewachsen sind. Sie arbeiten mit voller Leistungsspitze selbst bei andauernder Höchstbelastung. Daher können Sie beruhigt von einem Cummins-Schienenendiesel viele Jahre zuverlässiger Dienste erwarten.

Bei Cummins vereinigen sich die modernen Formen der liegenden Bauweise mit der bewährten Leistung der berühmten NH-Motorenserie zu einem der besten Schienenbusmotoren der Welt. Diese liegenden Motoren weisen eine nur geringe Höhe auf, weshalb sie ideal zum Einbau in Schienenbusse geeignet sind, wo oft schwierige Raumprobleme zu lösen sind. Dabei sind ihnen natürlich jene Robustheit und Dauerhaftigkeit zu eigen, die in allen Cummins-Motoren zu finden ist.

Cummins besitzt eine reiche Auswahl von besonderen Schwungradausführungen zur Anpassung an die verschiedensten Typen von Drehmomentwandlern und Zuggeneratoren. Hinzu kommen weitere Sondermöglichkeiten auf Wunsch, wie z.B. verschiedene Ölkühler für Drehmomentwandler, Ölwannen, Lüfter und Lüfterarmaturen, Luftverdichter, Regler (zur mechanischen Drehzahlregelung, Abtriebswellenregelung, hydraulische Einrichtungen, usw.), sowie Luftreiniger, so daß in jedem Falle der Motor genau auf seinen Einsatz zugeschnitten werden kann.

Auch in vielen anderen Schienenfahrzeugen, wie z.B. Schienenleger, Lok-Kräne und Schneepflüge, gehören Cummins-Motoren zur Standardausrüstung.

MOTORES FERROVIARIOS CUMMINS

En miles de horas de operación y a lo largo de miles de kilómetros de vías, los motores Cummins han demostrado ser una fuerza motriz resistente y confiable para uso ferroviario. Utilizados en aplicaciones que van desde automotrices (autovías) de montaña hasta locomotoras para galerías de minas, estos motores tienen la resistencia y la potencia de trabajo para ser la primera elección de muchos fabricantes de equipo ferroviario en todo el mundo.

Los Cummins diesel para locomotoras están destinados a soportar los choques y los impactos repentinos de las operaciones de patio y de maniobras. Siguen operando a su más alta eficiencia incluso bajo cargas pesadas constantes. Esto significa que se pueden esperar muchos años de servicio del motor Cummins ferroviario.

Cummins combina lo más reciente en diseño de motores horizontales con el comprobado rendimiento de la famosa serie de motores NH para ofrecer una de las líneas de motores para automotrices (autovías) mejores en el mundo. Estos motores horizontales, naturalmente, tienen dimensiones mínimas en su altura para adaptarse a las tolerancias, frecuentemente muy precisas, requeridas en las instalaciones en autovías. Ofrecen la misma resistente durabilidad que se encuentra en cada motor Cummins.

Cummins ofrece una gran variedad de volantes opcionales para acoplarlos con muchos tipos de convertidores de torsión y generadores para tracción. Otras opciones, tales como diversos enfriadores para convertidores de torsión, depósitos de aceite, ventiladores y montajes de ventilador, compresores de aire, gobernadores (mecánicos de velocidad variable, para eje de salida de convertidor de torsión, hidráulicos, etc.) y filtros de aire proporcionan la combinación perfecta del motor con la aplicación.

Los motores Cummins diesel son equipo de fábrica en muchos otros tipos relacionados de equipo ferroviario, tales como tendedores de carriles, grúas y quitanieves.

RAILWAY ENGINE SPECIFICATIONS
SPECIFICATIONS DES DIESELS CHEMIN DE FER
MOTORDATEN FÜR SCHIENENFAHRZEUGE
ESPECIFICACIONES PARA MOTORES FERROVIARIOS

Locomotive Engines
Diesel de Locomotives

LOK-Motoren
Motores para Locomotoras

Engine	1. Intermittent Traction Rating U.I.C. and BS. 2953: 1958 HP @ RPM	2. Continuous Traction Rating U.I.C.— BS. 2953: 1958 HP @ RPM	Displacement Inches (Litres)	Bore and Stroke Inches (mm)	Number of Cylinders	Aspiration	Net Weight Pounds (Kg.)
Moteur	1. Puissance en Traction Intermittente U.I.C. et BS. 2953: 1958 CV à T/MN	2. Puissance en Traction Continue U.I.C.— BS. 2953: 1958 CV à T/MN	Cylindrée Pouces	Alésage et Course Pouces	Nombre de Cylindres	Aspiration	Poids Net Livres
Motor	1. PS-Leistung für Rangierbetrieb U.I.C. und BS. 2953: 1958 PS bei U/min		Hubraum	Bohrung und Hub	Anzahl der Zylinder	Ansaugart	Nettogewicht
Motor	1. Especificación para Tracción Intermitente U.I.C. y BS. 2953: 1958 HP a RPM	2. Especificación para Tracción Continua U.I.C.— BS. 2953: 1958 HP a RPM	Cilindrada Pulgadas Cúbicas	Diámetro y Carrera Pulgadas	Número de Cilindros	Aspiración	Peso Neto Libras
H-743-L	175 1800	157 1800	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Natural	2435 (1105)
N-855-L	238 2100	205- 215 1900- 2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Natural	2590 (1175)
NT-855-L1	285 2100	246- 260 1900- 2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2625 (1191)
NS-743-L	290 2100	245- 260 1900- 2100	743 (12.2)	5-1/8 x 6 (130.2 x 152.4)	6	Supercharged	2750 (1247)
NT-855-L2	335 2100	285- 300 1900- 2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2625 (1191)
NTA-855-L	370 2100	318- 335 1900- 2100	855 (14.0)	5-1/2 x 6 (139.7 x 152.4)	6	Turbocharged	2750 (1247)
V-1710-L	475 2100	410- 430 1900- 2100	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Natural	5280 (2399)
VT-1710-L	650 2100	560- 590 1900- 2100	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	5780 (2621)
VTA-1710-L	750 2100	640- 680 1900- 2100	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	5780 (2621)
VTA-1710-L (Electric)	750 2100	640- 680 1900- 2100	1710 (28.0)	5-1/2 x 6 (139.7 x 152.4)	12	Turbocharged	7425 (3368)

1. Suggested for yard switching and shunting and industrial locomotives.
2. Suggested for branch and mainline service.
3. Suggested for suburban or intermittent road service.
4. Suggested for mainline road service.

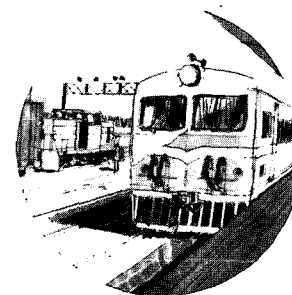
1. Modèle recommandé pour les locomotives industrielles, de gares de triage et de manœuvre.
2. Modèle recommandé pour les grandes lignes et les lignes locales.
3. Modèle recommandé pour les services routiers de courte distance.
4. Modèle recommandé pour les services routiers de longue distance.

Schienenbusmotoren
Motores para Automotrices (Autovías)

1. Empfohlen für Rangier- und Werksverkehrslokomotiven.
2. Empfohlen für Nahverkehrs- und Fernverkehrslokomotiven.
3. Empfohlen für Nahverkehrstrassen-transport.
4. Empfohlen für Fernverkehrstrassen-transport.

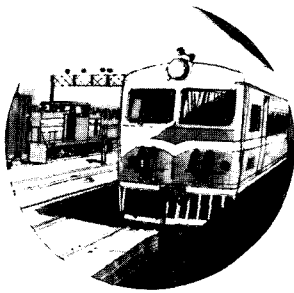
1. Recomendados para locomotoras de maniobras e industriales.
2. Recomendados para servicio de vias principales y ramales.
3. Recomendados para servicio intermitente o suburbano por carretera.
4. Recomendados para transporte por carretera a largas distancias.

RAILWAY EQUIPMENT
MATERIEL DE CHEMIN DE FER
SCHIENENFAHRZEUGE
EQUIPO FERROVIARIO



 Locomotives Lokomotiven Locomotives Locomotoras				
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Australia	Baldwin & Sons Pty. Ltd., Sydney. N.S.W.	Various	Underground locomotive	NHH-220
	Commonwealth Engineering (NSW) P/L. Sydney. N.S.W.	Various	Diesel hydraulic	VT-1710-L
	A. Goninan & Company Newcastle. N.S.W.	Various	Diesel electric (G.E.)	H, NH, NT, V12 Series
	Tulloch Ltd. Sydney. N.S.W.	T Class	Diesel electric (brush)	VTA-1710-L
	Walkers Ltd. Maryborough, Queensland	Various	Diesel hydraulic	H, NH, NT, V12 Series
Belgium	Ateliers Belges Reunis St. Pierre		Diesel hydraulic	NH-220-BI NT-855-LI
	Cockerill-Ougree Liege		Diesel hydraulic	NT-855-LI
Brazil	General Electric do Brasil Campinas, Sao Paulo		Shunting locomotive	NT-855-LI
Canada	Fairbanks Morse Ltd. Kingston, Ontario		Diesel hydraulic	As required
Finland	Locomo OY Tampere	C-600	Diesel hydraulic shunting locomotive	VTA-1710-L
Germany	Orenstein-Koppel Dortmund		Diesel hydraulic	H-743-L to VTA-1710-L
India	Dynacraft Machines Co. (P) Ltd. (Kirloskar Pneumatic) Poona	DYNACRAFT	Shunting locomotive	NHRS-6-IP
Japan	Hitachi Ltd. Tokyo	HR-22B HR-40BB HR-20B	Diesel hydraulic Diesel hydraulic Diesel hydraulic Diesel hydraulic Diesel hydraulic Diesel electric Diesel hydraulic Diesel hydraulic	NH-220-BI NH-220-BI (2) NH-220-BI NS-743-L NT-855-L1 NS-743-L VTA-1710-L NTA-855-L
	Kawasaki Heavy Ind. Co., Ltd. Kobe			NS-743-L
	Kisha Seizo Kaisha Osaka		Diesel hydraulic	VT-1710-L
	Kyosan Kogyo Co., Ltd. Sendai		Diesel hydraulic	NH-220-BI
	Nippon Sharyo Seizo, KK Nagoya		Diesel hydraulic Diesel hydraulic Diesel hydraulic Diesel hydraulic	NH-220-BI NH-220-BI NTA-855-L VT-1710-L

RAILWAY EQUIPMENT
MATERIEL DE CHEMIN DE FER
SCHIENENFAHRZEUGE
EQUIPO FERROVIARIO



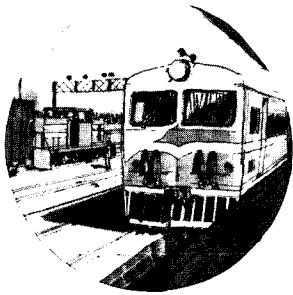
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
South Africa	C.H. Funkey & Co. (Pty.) Ltd. Alrode, Alberton		Diesel electric	N-855-L to VT-1710-L
	General Electric Co. (Pty.) Ltd. Johannesburg		Diesel electric	As required
	Hunslet Taylor Malvern, Johannesburg		Diesel electric	N-855-L to VT-1710-L
	SA General Electric Benoni, Transvaal		Diesel electric	N-855-L NT-855-L
	Union Carriage & Wagon (Pty.) Ltd. Nigel, Transvaal		Diesel electric	N-855-L to VT-1710-L
Sweden	ASJ Falun	Bo Bo	Shunting locomotive	V-1710-L
	Kalmar Verkstads AB Oskarshamm		Various diesel electric	NT-380 VT-12
Switzerland	SLM-Sulzer Winterthur		Diesel electric	VTA-1710-L
United Kingdom	Andrew Barclay Co., Ltd. Kilmarnock	Various	Diesel hydraulic shunting locomotives	N-855-L to VT-1710-L
	Brush Electrical Eng. Co. Ltd. Loughborough	Various	Diesel electric shunting locomotives	NT-855-L2 to VTA-1710-L
	Drewry Baguley Ltd. London	Various	Diesel electric shunting locomotives	NT-855-L to NTA-855-L
	English Electric Lancashire	Various	Diesel hydraulic/diesel electric locomotives	N-855-L to VT-1710-L
	Hunslet Eng. Co. Ltd. Leeds		Diesel hydraulic shunting locomotives	N-855-L to VT-1710-L
United States	General Electric Erie, Pennsylvania	Various	25 ton industrial locomotive 35 ton industrial locomotive 45 ton industrial locomotive 65/80 ton industrial locomotive 100 ton industrial locomotive 120 ton industrial locomotive	H-743-L NS-743-L H-743-L (2) NT-855-L1 (2) NT-855-L2 (2) NTA-855-L
	Plymouth Locomotive Works Division of Fate-Root-Heath Plymouth, Ohio	Various	8-15 ton locomotives 15-30 ton locomotives 30-45 ton locomotives 80-120 ton locomotives	H-743-L NS-743-L NT-855-L1 V-1710-L (2)

RAILWAY EQUIPMENT

MATERIEL DE CHEMIN DE FER

SCHIENENFAHRZEUGE

EQUIPO FERROVIARIO



 Locomotive Cranes Grue à Flèche Tournante sur Voie Normale Lok-Kräne Grúas				
Country Pays Land Pais	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Japan	Hitachi Ltd. Tokyo	50 M/T 60 M/T 100 M/T	Locomotive crane Locomotive crane Locomotive crane	NHC-4-IP HRS-6-IP NHS-6-IP
United Kingdom	Cowans Sheldon Ltd. Carlisle		Custom built railway breakdown cranes winch gear	NHC-4 to NT-380
United States	American Hoist & Derrick St. Paul, Minnesota	825/830 DE 840/850 DE 5030/7030 DE W-150 W-250	25/30 ton railway crane 40/50 ton railway crane 30/40 ton railway crane 150 ton railway wrecker 250 ton railway wrecker	H-743-P HS-743-P H-743-P NT-855-P NT-855-P
 Railcars Autorails Schienenbusse Automotrices (Autovías)				
Australia	Commonwealth Engineering P/L., Sydney. N.S.W.	Various	Diesel hydraulic	NHH-220 to NHHRTO-6
	Tulloch Ltd., Sydney. N.S.W.	Various	Diesel hydraulic	NTA-855-R
Germany	Ferrostaal Dortmund		Diesel mechanized, hydraulic	NHH-220 to NHHRTO-6
India	Integral Coach Factory (Kirloskar Pneumatic Co.) Poona, India	DYNACRAFT	Meter gauge rail cars	NHHRTO-6-BI
Japan	Hitachi Ltd. Tokyo		Diesel hydraulic	NHH-220-BI (2) NHHRTO-6-BI NTA-855-R
	Kisha Seizo Kaisha Osaka		Diesel hydraulic	NHH-220-BI (2)
	Nippon Rolling Stock Nagoya		Diesel hydraulic/ Diesel electric	VTA-1710-L (2), NHHTO-6-BI, NHHRTO-6-BI
	Tokyo Car Mfg. Co. Yokohama		Diesel hydraulic	NHHRTO-6-BI NHH-220-BI (2)
Switzerland	SLM-Sulzer Winterthur		Diesel electric	NHH-220

RAILWAY EQUIPMENT

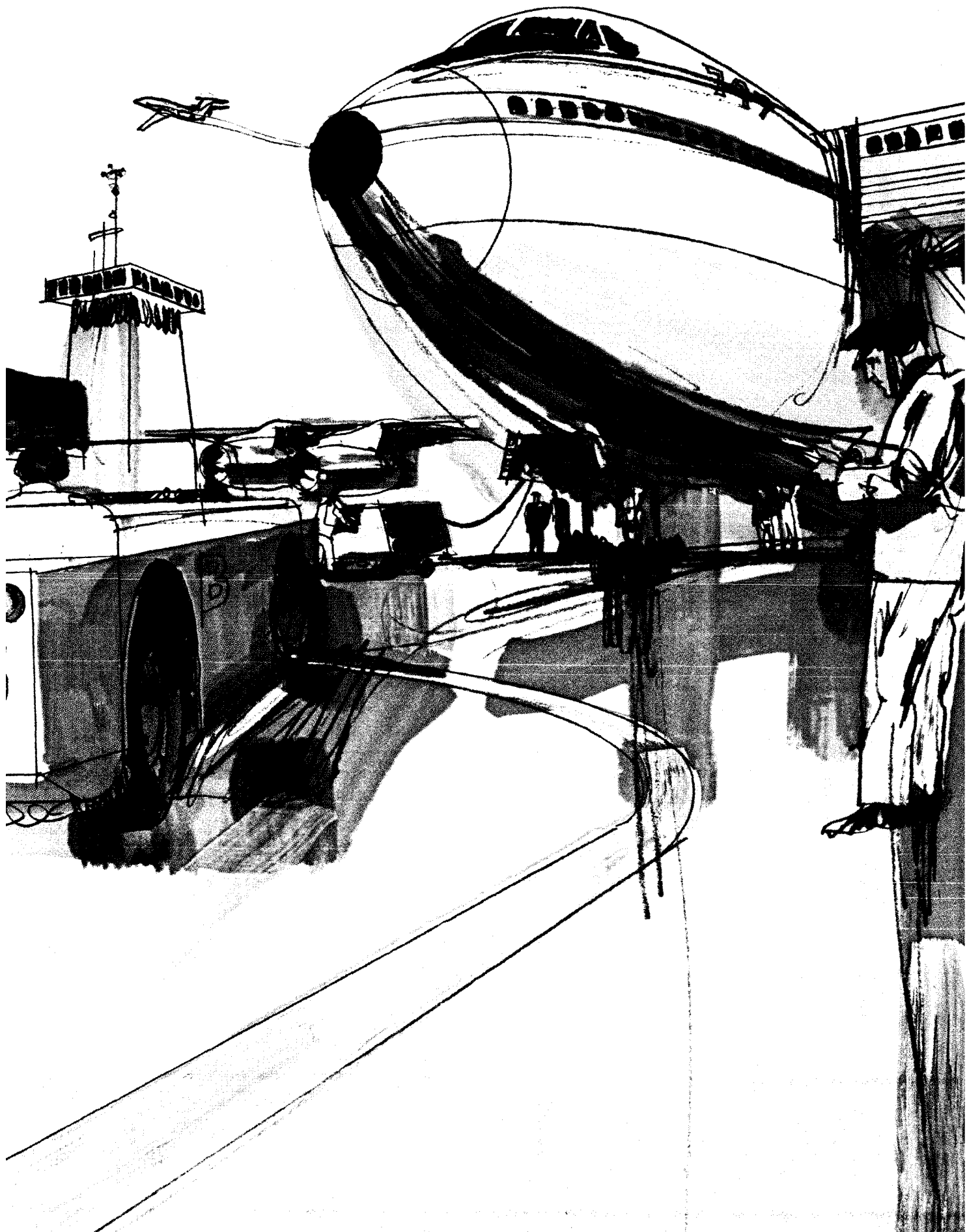
MATERIEL DE CHEMIN DE FER

SCHIENENFAHRZEUGE

EQUIPO FERROVIARIO



 Track Layers Machines de Pose de Voies Ferrées Schienenleger Tendedores de Vías				
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States	Railway Service & Supply Co. Division of Ayshire Collieries Indianapolis, Indiana	Universal track machine	Track layer	V-785-C
	Whiting Corporation Harvey, Illinois	5-TM 7-TM	Trackmobile Trackmobile	V-352 J-401-B
 Miscellaneous Divers Verschiedenes Misceláneos				
Canada	Bert Pyke Limited Oshawa, Ontario		Railroad snow plow Railroad switch broom	CT-464-P C-464-P



CUMMINS ENGINES FOR SPECIAL EQUIPMENT

Equipment manufacturers around the world appreciate the versatility of Cummins diesel engines. No matter what type of equipment, its engine requirements fall within the broad Cummins horsepower range, there is a Cummins diesel ready to deliver reliable, economical power.

A wide variety of engine options is offered so that the engine and the equipment will operate as one efficient unit. These options include various flywheels and flywheel housings, air, oil and fuel filters, governors, instrument panels, heat exchangers, oil pans for different angularities, power takeoffs, etc.

Cummins diesels are designed to keep operating at peak efficiency even under conditions of inclement weather, extreme dust, or constant, heavy work loads. These are conditions in which only the most durable and dependable engines can survive. Cummins engines meet and surpass these demands every day in applications spanning the globe.

In specialized equipment such as that used by the oil and logging industries, Cummins has become synonymous with reliability. Manufacturers who standardize on Cummins can assure their customers of dependable engines designed to build profits with minimum downtime and maintenance, and maximum economy and performance.

DIESELS CUMMINS POUR MATERIELS SPECIAUX

Dans le monde entier, les fabricants de matériel apprécient le caractère universel des diesels Cummins. Quel que soit le type de matériel, si les exigences du diesel à placer sur celui-ci tombent dans la large gamme des puissances Cummins, le client trouvera toujours un diesel Cummins qui lui conviendra et sera prêt à fournir une puissance sur laquelle il peut compter et qui sera en même temps économique.

Cummins lui offrira une large variété de diesels susceptibles de le satisfaire, de sorte que le diesel et le matériel, actionné par celui-ci, fonctionneront comme un groupe efficient. Les options, laissées au choix du client, porteront également sur d'autres articles tels que les suivants : volants divers, carters de volants, filtres à air, à huile et à huile combustible, régulateurs, panneaux d'instruments, échangeurs de chaleur, bac à huile pour différentes angularités, prises de force etc...

Les diesels Cummins sont étudiés de manière à toujours fonctionner au rendement maximum même par temps inclement, en atmosphère extrêmement poussiéreuse ou à charge constante, en service dur. Ce sont là précisément les conditions, dans lesquelles seuls les diesels, pouvant se prévaloir d'une longue durée en service et d'une fiabilité parfaite, peuvent survivre. Les diesels Cummins font face à ces exigences et les dépassent même tous les jours dans des applications à l'échelle du monde.

Dans l'équipement spécialisé tel que celui utilisé dans l'industrie du pétrole et dans celle du bois, Cummins est devenu synonyme de fiabilité parfaite.

Les constructeurs qui standardisent sur Cummins peuvent assurer leur clientèle qu'ils leur fournissent des diesels auxquels elle peut hardiment se fier et qui sont étudiés pour réaliser des profits, assis sur les avantages suivants : temps d'inactivité minimum, entretien minimum, économie et rendement maxima.

CUMMINS-MOTOREN FÜR SPEZIALAUSRÜSTUNGEN

Überall auf der Welt wird der Cummins-Motor von Anlagenherstellern wegen seiner Vielseitigkeit geschätzt. Ganz gleich um welche Anlage oder Ausrüstung es sich handelt, wenn der Kraftbedarf im Rahmen der umfangreichen Cummins-Serien liegt, dann hat Cummins auch den Dieselmotor zur Hand, um in dem betreffenden Bedarfsfall einen zuverlässigen, wirtschaftlichen Antrieb zu liefern.

Dazu steht eine Auswahl von Sonderausführungen auf Wunsch zur Verfügung, so daß Anlage und Motor in jedem Fall eine leistungsstarke Einheit darstellen. Zu diesen Sonderwünschen gehören verschiedene Schwungräder und Schwungradkasten, Luft-, Öl- und Kraftstofffilter, Regler, Armaturentafeln, Wärmeaustauscher, Ölwanne für verschiedene Einbaulagen, Nebenantriebe usw.

Cummins-Dieselmotoren sind in der Lage, ihre Leistungsspitze selbst unter ungünstigsten Wetterverhältnissen, starkem Staubanfall bzw. unter ständiger Vollbelastung zu halten. In solchen Einsatzbedingungen können nur die zähesten und zuverlässigsten Motoren überleben. Cummins-Motoren erfüllen und übertreffen diese Anforderungen Tag für Tag im Einsatz rund um die Welt.

Bei Spezialausrüstungen, wie sie z.B. in der Erdöl- und Holzindustrie verwendet werden, ist Cummins zum Begriff für Zuverlässigkeit geworden. Der Anlagenhersteller, welcher sich ganz auf Cummins einstellt, kann seinen Kunden garantieren, daß er zuverlässige Motoren in die Hand bekommt, die ihm Gewinn bringen, und zwar bei einem Minimum an Ausfallzeiten und Wartung und einem Höchstmaß an Wirtschaftlichkeit und Leistung.

MOTORES CUMMINS PARA EQUIPO ESPECIAL

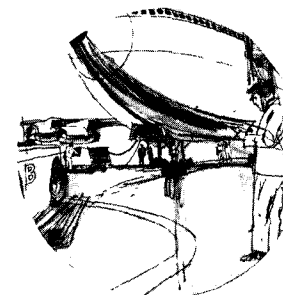
Los fabricantes de equipo en el mundo entero aprecian la versatilidad de los motores Cummins diesel. No importa cual sea el tipo del equipo; si sus requerimientos están dentro de la amplia gama de cabalajes de Cummins, hay un Cummins diesel listo para ofrecer potencia confiable y económica.

Se ofrece una gran variedad de opciones para los motores, a fin de que el motor y el equipo operen como una sola y eficiente unidad. Estas opciones incluyen diversos volantes y cubiertas de volante, filtros de aire, aceite y combustible, gobernadores, tableros de instrumentos, cambiadores de calor, depósitos de aceite para diferentes angularidades, tomas de fuerza, etc.

Los diesel Cummins están diseñados para seguir funcionando a su máxima eficiencia incluso en condiciones de tiempo inclemente, mucho polvo o cargas de trabajo pesadas y constantes. Estas son condiciones en las cuales solamente pueden sobrevivir los motores más duraderos y confiables. Los motores Cummins satisfacen y exceden de esas demandas todos los días, en aplicaciones que circundan el orbe.

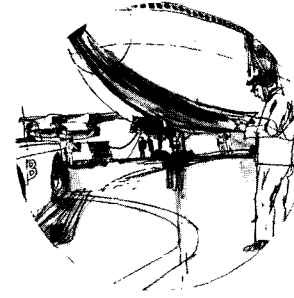
En equipo especializado tal como el que utilizan las industrias petrolera y de la madera, Cummins se ha convertido en sinónimo de confiabilidad. Los fabricantes que usan Cummins como equipo de norma, pueden asegurar a sus clientes que tendrán motores confiables, diseñados para producirles ganancias con un mínimo de tiempo para reparaciones y mantenimiento, con economía y rendimiento máximos.

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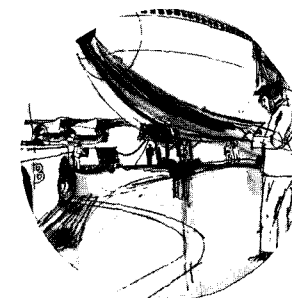
 Agricultural Equipment Ausrüstungen für die Landwirtschaft Equipement Agricole Equipo Agrícola				
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
Australia	Horwood Bagshow Ltd.	Vac-U-ator	Grain loader	JN
	Oliver Australasia Pty. Ltd.			C-160
Canada	Versatile Manufacturing Winnipeg, Manitoba	M-118 M-145	118 HP farm tractor 145 HP farm tractor	V-352-B V-470-B
United States	D-K Manufacturing Batavia, Illinois	167 168	Vac-U-Ator grain loader Vac-U-Ator grain loader	J-401-P C-464-P
	FWD-Wagner Portland, Oregon	WA-9	Agricultural tractor	C-464-C CT-464-C
		WA-14 WA-17	21,990 DP Ag. tractor 22,844 DP Ag. tractor	N-855-C NT-855-C
	John Deere Moline, Illinois	WA-14 WA-17	Agricultural tractor Agricultural tractor	N-855 NT-855
	Myers-Sherman Company Streator, Illinois	Super Sucker	Grain unloader, conveyor	C-464-P V-470-P V-352-P
	Speed Sprayer Plant John Bean Division FMC Corporation Orlando, Florida	757-CP	100 GPM, 150 PSI speed sprayer	V-470-P185
 Aircraft Ground Support Bodeneinrichtungen im Luftverkehr Appui Terre—Avion Equipo de Tierra para Aviones				
Australia	Ausair		Ground power unit	CS-464-C
Belgium	Arpic Engineering Antwerp	Air Starter	Jet starter	NS-743-C
France	Ets. M. Guinault & Cie. Houilles (S&D)	Air Starter	Jet starter Ground power unit— trailer mtd.	V-785-C C-464-C
United Kingdom	Atlas Copco Ltd. Hemel Hempstead, Herts.	Air Partner	Jet starter	NHRS-6-BI
	Auto Diesel Ltd. Uxbridge, Middx.	Air Starter	Jet starter	NT-335-BI, VT12-600 NT-380
	F. L. Douglas (Equipment) Ltd. Cheltenham, Gls.	Tugmaster series	Aircraft tow tractor	NH-220 to VT12-700
	Hampson Industries Ltd. West Bromwich	Air master	Jet starter	NT-335
	Hunslet Engineering	ATT YY	Aircraft tow tractor	VT-1710-635
	Mercury	MD300	Aircraft tow tractor	V8-185
	Transport Equipment (Thornycroft) Ltd. Basing	Nubian Major	Aircraft fire tender— 20 ton GVW	V8-300

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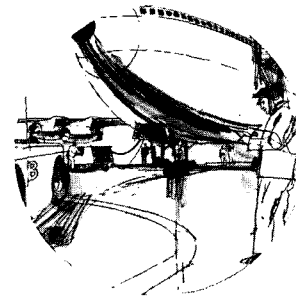
County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States	Accessory Controls & Equipment Windsor, Connecticut		70 ton, truck mounted aircraft air conditioning unit	V-588-B
	Air-A-Plane Norfolk, Virginia		Mobile aircraft air conditioning unit	V-588-B
	American Snowblast Denver, Colorado	B-16-A	Airport broom	NT-855-P CF-160
	Autocar Division of White Motor Company Exton, Pennsylvania	60 DF & 80 DF	Aircraft refueler	C-160 CF-160 C-180
	Greer Hydraulics, Inc. Los Angeles, California	500 Series	Hydraulic test stand	V-352-C
	Hobart Troy, Ohio		Ground power unit— self-propelled (60 KVA)	V-352-B C-464-B
			Ground power unit— self-propelled (75 KVA)	C-464-B
			Ground power unit— self-propelled (90 KVA)	CT-464-B
			Ground power unit— self-propelled (125-140 KVA)	NT-855-B
			Ground power unit— self-propelled (140-160 KVA)	NT-855-B
			Ground power unit— self-propelled (160-180 KVA)	NT-855-B
			Ground power unit— truck mounted (90 KVA)	CT-464-B
			Ground power unit—truck mounted (125 to 140 KVA)	NT-855-B
			Ground power unit—truck mounted (140-160 KVA)	NT-855-B
			Ground power unit—truck mounted (160-180 KVA)	NT-855-B
			Ground power unit—trailer mounted (60 KVA)	C-464-B
			Ground power unit—trailer mounted (75 KVA)	C-464-B
			Ground power unit—trailer mounted (90 KVA)	CT-464-B
			Ground power unit—tractor mounted (60 KVA)	C-464-B
			Ground power unit—tractor mounted (75 KVA)	C-464-B
			Ground power unit—tractor mounted (90 KVA)	CT-464-B
	C. G. Hokanson Co. Division of Lear Siegler Santa Ana, California	HH-1000	Aircraft heater	V-470-C

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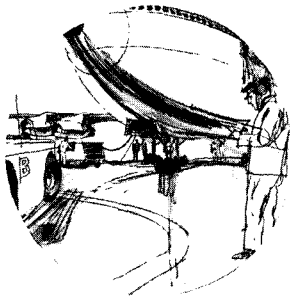
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Inet Power Division of Teledyne	Various	Various types of ground support equipment. All equipment built to order.	V-785-P (most commonly used)
	Ingersoll-Rand New York, New York	200 DH-165 747, DC-10, L-1011	Jet starter Jet starter	NT-855-B VT-1710-B
	KW Dart Kansas City, Missouri		5000 & 8000 gal. airport refueler	C-160
	Pierce-Pacific Manufacturing Company Portland, Oregon	T-1000	Aircraft tow tractor	NT-855-B380
	Unit Rig & Equipment Co. Tulsa, Oklahoma	T-150	Aircraft tow tractor	VT-1710-C
 Gas Turbine Starters Anlasser für Gasturbinen Démarrateurs de Turbines à Gaz Arrancadores para Turbinas de Gas				
Germany	AEG (G.E. Licensee) Essen	158A	Gas turbine starter	V8-300-BI
Italy	Fiat Grande Motori SPA Torino (Westinghouse Licensee)	T.G16	16,000 KW Gas turbine starter	V-1710-P
	Nuovo Pignone SPA Firenze (G.E. Licensee)		Gas turbine starters	V8-300-IP
Japan	Hitachi, Ltd. Tokyo	158A7426-1 158A7131 & 158A7132-1	Gas turbine starter	V8-300-BI VT8-430-BI
United Kingdom	John Brown Clydebank, Scotland		Gas turbine starting units	V8-300 VT12-525
United States	General Electric Schenectady, New York		Gas turbine starter Gas turbine starter	VT8-430 V8-300
 Logging Equipment Holzschlagausrüstungen Matériel Forestier Equipo para Movimiento de Troncos				
Canada	Clark Equipment Co. of Canada Ltd. St. Thomas, Ontario	666	Skidder	V-352-C
	Sicard Ltd. of Canada Ste. Therese, Quebec	FS	Feller skidder	V-352-C
		VIT	Feller-Buncher	V-352-C
	Tye Machinery Company Limited Vancouver, B. C.	G.80	5 Drum skidder	V-1710-C
		G.89	8 Drum skidder	V-1710-C
		G.45	4 Drum yarder	NS-743-C
		G.41	4 Drum yarder	NS-743-C
		G.41	5 Drum yarder	NS-743-C
		G.69	4 Drum yarder	N-743-C
		G.69	5 Drum yarder	NT-855-C
		G.120	3 Drum yarder	NT-855-C
		G.120	5 Drum yarder	NT-855-C

SPECIAL EQUIPMENT
EQUIPEMENT SPECIAL
SPEZIALAUSRUSTUNGEN
EQUIPO ESPECIAL



County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States	Clark (Michigan) Benton Harbor, Michigan	666 668	14,900 lb. tree skidder Tree skidder	V-352 V-504-C
	FWD-Wagner Portland, Oregon	L-24 L-40 L-60 L-90 L-120	24,000 lb. log stacker 40,000 lb. log stacker 60,000 lb. log stacker 90,000 lb. log stacker 120,000 lb. log stacker	J-401-C CT-464-C N-743-C NT-855-C NTA-855-C
	Garrett Manufacturing Enumclaw, Washington	666 668	14,900 lb. tree skidder Tree skidder V-352	V-470-C V-378-C V-352-C
	Hein Werner Corporation Waukesha, Wisconsin		8 ton log loader 4-wheel drive	V-352-C
	Hydraulic Machinery Milwaukee, Wisconsin	LT-650 Hy-loader	21,000 lbs. log loader	V-352
	KW Dart Kansas City, Missouri	KW-80	80,000 lbs. log stacker	NT-855-C
	Link Belt Speeder Cedar Rapids, Iowa	LS-98	Special logger	H-743-C
	R. G. LeTourneau Longview, Texas	F-802 F-804	80,000 lb. log stacker	NT-855-C
	Schild Bantam Division Waverly, Ohio	515	Logger	V-352-C
	Scoopmobile, Inc. Division of Wabco Portland, Oregon	WL-4-30	30,000 lb. Loggermobile	N-743-C
	Skagit Corporation Sedro-Woolley, Washington	SJ-5RN SJ-7R GT-5 PT-4Y 555 777	Mobile logger Mobile logger Guylineless tower Mobile yarder Mobile loader Mobile loader	N-743-C N-743-C N-743-C N-743-C N-743-C N-743-C
	Washington Iron Works Seattle, Washington	98 157	Yarder Yarder	V-588-C N-743-C NT-855-C NS-743-C
		158 207	Yarder Yarder	NT-855-C NS-743-C NT-855-C NTA-855-C
		208	Yarder	NT-855-C NTA-855-C

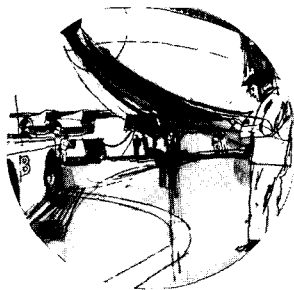
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EQUIPO ESPECIAL



 Oil Field Equipment Equipement de Champs Pétrolifères Ausrüstungen für die Erdölindustrie Equipo para Campos Petroleros				
Country Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States	Cline Truck Manufacturing Company Kansas City, Missouri		Custom built drilling rig units	N-855-B250
	Concrete Equipment Company Milwaukee, Wisconsin	Pumpit	Concrete pump	V-470-P
	Conequip Division, Universal Fluid Dynamics Company Alpena, Michigan	Dynaplayer	Concrete pump (truck mounted)	V-470-P185
		Dynaplayer	Concrete pump (trailer mounted)	V-470-P185
	KW Dart Kansas City, Missouri	Dune Buggy	110,000 lb. oil derrick hoist and transporter	VTA-1710-C
	Robbins Machinery Company Birmingham, Alabama	RR-10	45,000 PSI vertical drill rig	N-855-B250
		RRT-10	50,000 PSI vertical drill rig	N-855-B250
			60,000 PSI vertical drill rig	N-855-B250
			70,000 PSI vertical drill rig	N-855-B310
		RRTS	Horizontal drill rig	NS-743-P290
	RR-H	Horizontal drill rig	V-1710-P500	
	Special			
	Whitman Manufacturing Company Pacoima, California	P80-D	Concrete pump	V-352-C

 Snow Removal Equipment Equipement d'enlèvement de la Neige Schneeräumer Equipo Limpianieves				
Canada	Bert Pyke Limited Oshawa, Ontario		Railroad snow plow	CT-464-IP
	Richardson Road Machinery Co., Ltd. Saskatoon, Saskatchewan	RV4L	Snowblower	J-401-P130 C-464-P160 N-743-P220
	Sicard Ste. Therese, Quebec	BK Junior	20 ton/min snowblower 20 ton/min snowblower	V-588-C N-743-B
United States	American Coleman Littleton, Colorado		Truck carriers used to power American Snowblast snow removal machines.	CF-160 NH-230
	American Snowblast Denver, Colorado	R-1200L	Snowblower	CT-464-P
		R-1200	Snowblower	CT-464-P
		R-2200	Snowblower	NT-855-B
		R-4500L	Snowblower	N-855-B NT-855-B (2)

SPECIAL EQUIPMENT
EQUIPEMENT SPECIAL
SPEZIALAUSRUSTUNGEN
EQUIPO ESPECIAL



County Pays Land País	Manufacturer Fabricant Hersteller Fabricante	Model Modèle Modell Modelo	Description Description Bezeichnung Descripción	Cummins Engine Moteur Cummins Cummins Motor Motor Cummins
United States (Continued)	Klauer Manufacturing Company Dubuque, Iowa Sicard Industries Watertown, New York	TU-3 MTR LTR-90 BJD BK BU-43 BL BX2-DS	Snowblower Snowblower Snowblower 18 ton/min snowblower 20 ton/min snowblower 20 ton/min snowblower 35 ton/min snowblower 50 ton/min snowblower	NT-855-P380 NT-855-P335 N-855-P250 N-855-P250 N-743-B V-588-B N-855-C NT-855-C VTA-1710-B
 Sweepers Balayeuses Kehrmaschinen Barredoras				
Canada	Bert Pyke Limited Oshawa, Ontario		Railroad switch broom	C-464-P
United States	Elgin Sweeper Company Elgin, Illinois D. P. Way Milwaukee, Wisconsin	Pelican White Wing 375 White Wing 475	2½ cu. yd. street sweeper 3½ cu. yd. street sweeper Street sweeper Self-propelled industrial vacuum cleaner	V-352-C V-352-C V-352-C V-352-C
 Miscellaneous Divers Verschiedenes Misceláneos				
Canada	Bombardier Snowmobile Balcourg, Quebec	Muskeg Terrainmaster	4 x 4 Transporter	V-352-C
United States	Ward Commons Manufacturing Co. Scio, Oregon	M1, M2 XL	Swamp Buggy Swamp Buggy	V-352-C V-470-C

INDEX BY APPLICATION

AUTOMOTIVE

Cummins Automotive Engines.....	9
Cummins Automotive Engine Specifications.....	10-11
On-Highway Equipment Manufacturers.....	12-23

CONSTRUCTION AND MINING

Cummins Construction and Mining Engines.....	25
Cummins Construction and Mining Engine Specifications.....	26
Construction Equipment Manufacturers.....	27-47

GENERATOR SETS

Cummins Generator Sets.....	49
Cummins Generator Set Specifications.....	50-51
Generator Set Manufacturers.....	52-53

INDUSTRIAL AND MATERIALS HANDLING

Cummins Industrial Engines.....	55
Cummins Industrial Engine Specifications.....	56-58
Industrial Equipment Manufacturers.....	59-63

MARINE

Cummins Marine Engines.....	65
Cummins Marine Engine Specifications.....	66-67
Marine Equipment Manufacturers.....	68-73

RAILWAY

Cummins Railway Engines.....	75
Cummins Locomotive and Railcar Engine Specifications.....	76-77
Railway Equipment Manufacturers.....	78-81

SPECIAL EQUIPMENT

Cummins Engines for Special Equipment.....	83
Special Equipment Manufacturers.....	84-89

INDEX DES CAS D'APPLICATION

INDUSTRIE DE L'AUTOMOBILE

Diesels Cummins de véhicules automobiles.....	10
Spécifications de diesels Cummins de véhicules automobiles.....	10
Fabrication de matériel en circulation sur les autoroutes.....	12-

CONSTRUCTION ET MINES

Diesels Cummins pour la construction et les mines.....	
Spécifications des diesels Cummins pour la construction et les mines.....	
Fabricants de matériels pour la construction.....	27-

GROUPE ELECTROGENES

Groupe électrogènes Cummins.....	
Spécifications de groupes électrogènes Cummins.....	50-
Constructeurs de groupes électrogènes.....	52-

MANUTENTION INDUSTRIELLE ET MANUTENTION DE MATERIAUX

Diesels industriels Cummins.....	
Spécifications de diesels industriels Cummins.....	56-
Fabricants de matériel pour l'industrie.....	59-

MARINE

Diesel marins Cummins.....	65
Spécifications de diesels marins Cummins.....	66-
Fabricants d'équipements pour la marine.....	68-

CHEMINS DE FER

Diesels Cummins en service sur les chemins de fer.....	
Spécifications des diesels Cummins, montés sur les locomotives et les autorails.....	76-
Fabricants de matériels de chemins de fer.....	78-

EQUIPEMENT SPECIAL

Diesels Cummins pour équipement spécial.....	83
Fabricants d'équipements spéciaux.....	84-89

VERZEICHNISS DER ANWENDUNGSZWECKE

KRAFTFAHRZEUGE

Cummins-Motoren für Kraftfahrzeuge.....	9
Cummins-Motordaten für Kraftfahrzeuge.....	10-11
Hersteller von Strassenfahrzeugen.....	12-23

BAU- UND BERGBAUMASCHINEN

Cummins-Motoren für Bau- und Bergbaumaschinen.....	25
Cummins-Motordaten für Bau- und Bergbaumaschinen.....	26
Hersteller von Baumaschinen.....	27-47

STROMERZEUGUNGSAGGREGATE

Cummins Stromerzeugungsaggregate.....	49
Daten für Cummins-Stromerzeugungsaggregate.....	50-51
Hersteller von Stromerzeugungsaggregate.....	52-53

INDUSTRIE- UND TRANSPORTANLAGEN

Cummins-Industriemotoren.....	55
Daten für Cummins-Industriemotoren.....	56-58
Hersteller von Industrieausrüstungen.....	59-63

SCHIFFSMOTOREN

Cummins-Schiffsmotoren.....	65
Daten für Cummins-Schiffsmotoren.....	66-67
Hersteller von Wasserfahrzeugen und -ausrüstungen.....	68-73

EISENBAHN

Cummins-Motoren für Schienenfahrzeuge.....	75
Daten für Cummins-Lokomotiv- und Schienenbusmotoren.....	76-77
Hersteller von Schienenfahrzeugen und -ausrüstungen.....	78-81

SPEZIALAUSRÜSTUNGEN

Cummins-Motoren für Spezialausrüstungen.....	83
Hersteller von Spezialausrüstungen.....	84-89

INDICE POR APLICACION

AUTOMOTRICES

Motores Cummins Automotrices.....	
Especificaciones de Motores Cummins Automotrices.....	10-1
Fabricantes de Equipo Para Uso en Carretera.....	12-2

CONSTRUCCION Y MINERIA

Motores Cummins para Construcción y Minería.....	2
Especificaciones de Motores Cummins para Construcción y Minería.....	2
Fabricantes de Equipo para Construcción.....	27-4

EQUIPOS GENERADORES

Equipos Generadores Cummins.....	4
Especificaciones de Equipos Generadores Cummins.....	50-5
Fabricantes de Equipos Generadores.....	52-5

INDUSTRIALES Y MANEJO DE MATERIALES

Motores Industriales Cummins.....	5
Especificaciones de Motores Industriales Cummins.....	56-5
Fabricantes de Equipo Industrial.....	59-6

MARINOS

Motores Marinos Cummins.....	6
Especificaciones de Motores Marinos Cummins.....	66-6
Fabricantes de Equipo Marino.....	68-7

FERROVIARIOS

Motores Ferroviarios Cummins.....	7
Especificaciones de Motores Cummins para Locomotoras y Autovías.....	76-7
Fabricantes de Equipo Ferroviario.....	78-8

EQUIPO ESPECIAL

Motores Cummins para Equipo Especial.....	83
Fabricantes de Equipo Especial.....	84-89

INDEX BY MANUFACTURER
INDEX DE MANUFACTURIER
ERZEUGER INHALTSVERZEICHNIS
INDICE POR FABRICANTE

A	Page No.
AB Kockum-Landsverk.....	43
Accessory Controls & Equipment.....	85
AEG.....	86
Air-A-Plane.....	85
Alglas Corporation.....	68
Allied Shipbuilders Ltd.....	71
Allis-Chalmers Manufacturing Co.....	37-61
American Coleman.....	88
American Hoist & Derrick.....	31-34-46-80
American Pipe and Construction Co.....	47
American Ship Building.....	73
American Snowblast.....	85-88
Andrew Barclay Co., Ltd.....	79
A.N.I. Perkins Pty. Ltd.....	45
Ansair Pty. Ltd.....	12
Armstrong Holland Pty. Ltd.....	27
Arpic Engineering.....	84
Asher Marina Ltd.....	68
ASJ.....	79
Astilleros de Veracruz, S.A. (Lorain).....	41
Ateliers Belges Reunis.....	78
Ateliers et Forges de la Loire L'Horme.....	45
Atkinson Vehicles (A'Asia) Pty. Ltd.....	13
Atkinson Vehicles Ltd.....	15
Atkinson Vehicles South Africa.....	15
Atlas Copco.....	27-28
Atlas Copco Australia Pty. Ltd.....	27
Atlas Copco Ltd.....	27-84
Atlas-Weyhausen.....	29
Ausair.....	84
Austin Western Division.....	34-39
Auto Diesels Ltd.....	52
Auto Diesel Ltd.....	84
Autocar Division of White Motor Co.....	15-85
Autocar Mexicana.....	14
Automobiles M. Berliet.....	14-42
Aveling Barford Ltd.....	43
Azuma Shipbuilding Co. Ltd.....	71
B	
Babcock & Wilcox (Marion).....	46
Badger Division of Warner & Swasey.....	29
Baker-York, Inc.....	59
Baldwin-Lima-Hamilton Corp.....	31-34-46
Baldwin & Sons Pty. Ltd.....	78
Barbour Metal Boat.....	72
Bayside Machine & Boatworks.....	72
Beall Pipe and Tank Manufacturing Co.....	31
Bel-Aire Shipyards.....	71
Bellamy Boat Works.....	72
Benoto.....	28
Benson Bros. Shipbuilding Ltd.....	71
Bert Pyke Limited.....	81-88-89
Bertram Yachts Aust.....	68
Bertram Yacht Company.....	69
F. N. Bethune Pty. Ltd.....	60
Bharat Earth Movers Ltd.....	38-39-40-42-45
B-L-H Australia Pty. Ltd.....	33-45
Bluebird Body Company.....	12
Bombardier Snowmobile.....	59
Bray Construction Company Ltd.....	41
British Motors Corporation.....	13
British Standard Machinery Co., Ltd.....	59-89
Brockway Motor Trucks.....	16
Broom & Wade (Australia) Pty. Ltd.....	27
Broom & Wade Ltd.....	27
Bros Division, AH&D.....	30-44
John Brown.....	86
Brush Electrical Eng. Co. Ltd.....	79
Bucyrus-Erie.....	28-29-35-47-62
Burger Boat Company.....	69
Bus Bodies Pty. Ltd.....	12

C	
Canadian Kenworth Ltd.....	14
Canoe Cove Marine Ltd.....	68
Cape Girardeau Boat & Dry Dock.....	72
Century.....	69
Chevrolet (Division of General Motors).....	16
Chris Craft.....	69
Chrysler Australia Ltd.....	13
Chrysler South Africa.....	15
Clark Equipment Australia Pty. Ltd.....	38-40-45
Clark Equipment Co. of Canada Ltd.....	86
Clark Equipment Ltd.....	38-41-43
Clark (Industrial Truck Division).....	59
Clark (Michigan).....	30-38-45-87
Cline Truck Manufacturing Company.....	43-88
Cockerill-Ougree.....	78
Colonial Cruisers, Inc.....	69
Coles Cranes.....	33
Commonwealth Engineering Pty., Ltd.....	30-33-78-80
Concrete Equipment Company.....	88
Conequip Division, Universal Fluid Dynamics Company.....	88
Conquip. Co. Pty. Ltd.....	40
Consolidated Pneumatic.....	27
Consolidated Pneumatic Tool Co. (I) Ltd.....	27
Consolidated Pneumatic Tool Co. Ltd.....	28
Copelyn Construction.....	31
Cowans Sheldon Ltd.....	80
C.P.T.....	27
Crane Carrier Corporation.....	31
H. W. Crouch Pty. Ltd. (Diamond Reo).....	13
Crown Coach Corporation.....	12
James Cuthbertson Ltd.....	60

D	
Daido Nakayama.....	38
Dale Electric (Yorks)Ltd.....	52
Davey and Co. Pty. Ltd.....	52
Davis Custom Boats.....	69
Dawson-Keith Ltd.....	52
John Deere.....	84
Demag-Lauchhammer GmbH.....	30
Devils Lake Marina.....	69-72
Diamond Reo Division of White Motor Co.....	12-16
Diesel Nacional (DINA).....	12-14
D-K Manufacturing.....	84
Dodge-Chrysler.....	12
Dodge Truck Operations—Chrysler Corporation.....	17
Dominion Engineering Works Ltd.....	45
F. L. Douglas (Equipment) Ltd.....	84
Drewry Baguley Ltd.....	79
Drott Manufacturing Company.....	29-59
Drysdale Pumps Ltd.....	61
Dunlite Electrical Co.....	52
Duplex, Division of Warner & Swasey.....	32
Dynacraft Machines Co. (P) Ltd.....	78

E	
E. C. C.....	52
Egg Harbor Boat Company.....	69
Eimco Corporation.....	38-47
Elequip Ltd.....	52
Elgin Sweeper Company.....	89
English Electric.....	79
English Electric Diesel of Aust.....	28-29-32-45
Enno's Custom Boats, Ltd.....	68
E.R.F. Australia.....	13
E.R.F. Ltd.....	15
E.R.F. South Africa (Pty.) Ltd.....	15
Euclid, Inc.....	30-43

F	Page No.
Fairbanks Morse, Inc. (Division of Colt Industries).....	60
Fairbanks Morse Ltd.....	78
Faun-Werke.....	14
Feadship.....	69
Ferrex Development.....	68
Ferrostaal.....	80
Fiat Grande Motori SPA.....	86
Fibo Boat Works.....	68
Flextrack-Nodwell.....	59
The Fixible Company.....	12
F.M.C. Pty. Ltd.....	60
Foden.....	15
Fodens Ltd.....	15-31-43
Fodens Ltd. Australia.....	13
Ford Motor Company.....	17
Ford Motor Company Ltd.....	15
Ford Motor Company Pty. Ltd.....	13
Ford South Africa.....	15
Fraser Shipyards, Inc.....	72-73
Frederick Parker Ltd.....	38
Freighters Ltd.....	12
Freightliner Corporation.....	18
Fuji Marine Co. Ltd.....	68
C. H. Funkey & Co. (Pty. Ltd.).....	79
FWD Corporation.....	18-32
FWD-Wagner.....	30-59-62-84-87

G

G & W Welding.....	73
Galion Iron Works & Mfg.....	35-40
Galion (Pty.) Ltd.....	39
Galleon Industries.....	69
Gardner Denver Australia Pty. Ltd.....	27
Gardner-Denver de Mexico.....	27
Garrett Manufacturing.....	87
General Electric.....	79-86
General Electric Co. (Pty.) Ltd.....	79
General Electric do Brasil.....	78
General Motors Holden.....	13
A. Geninan & Company.....	78
George Moss Pty. Ltd.....	60
Gillig Brothers.....	12
G. M. Scotland Ltd.....	43-45
GMC Truck & Coach Division.....	19
Goodwin Barsby & Co. Ltd.....	38
A. E. Goodwin Ltd.....	39
Gradall.....	29
Grafton Boat.....	69-72
Grahame Puttick Ltd.....	52
Greer Hydraulics, Inc.....	85
Grenfell Yachts.....	68
Grimmer-Schmidt Corporation.....	28
Grove Manufacturing.....	35
Ets. M. Guinault & Cie.....	84
Guy Motors Ltd.....	15

H

Hadsond Shipyard.....	71
Hampson Industries Ltd.....	52-84
Harland Engineering Ltd.....	61
Harland Engineering Pty. Ltd.....	60
Harnischfeger Australia.....	30-32-33
Hatteras Yacht Company.....	69
Hawker-Siddley-Brush.....	52
Hayes Manufacturing Company.....	14
Heathfield Engineering Ltd.....	43
Hein Werner Corporation.....	29-35-40-87
Henderickson Manufacturing Co.....	19
Highway Products Company.....	12
Hindustan Motors Limited.....	33-43-46
Hitachi, Ltd.....	33-43-78-80-86
Hi Tide Boat Works.....	69
Hobart.....	85

C. G. Hokanson Co. (Division of Lear Siegler).....	8
Hokuetsu Kogyo Co., Ltd.....	2
Holming OY.....	7
Holman Bros.....	2
Holman Bros. (Australia) Pty. Ltd.....	2
Holman Bros. Ltd.....	2
Horwood Bagshow Ltd.....	8
Hough Division.....	38-4
Huber Corporation.....	4
Huber Warco do Brasil, S.A.....	3
Huckins Yacht Corp.....	6
Humboldt Boat.....	7
Hunslet Engineering.....	8
Hunslet Eng. Co. Ltd.....	7
Hunslet Taylor.....	7
Hydraulic Machinery.....	29-8
Hy-Mac (Peter Hamilton Ltd.).....	29-3
Hyster.....	5

I

Ibex Motor Truck Corporation.....	6
I.H.C.....	4
IHC of Australia Pty. Ltd.....	1
Industria del Hierro, S.A. (Huber).....	3
Industrias Villares, S.A.....	4
Inet Power (Division of Teledyne).....	8
Ingersoll Rand.....	27-8
Ingersoll Rand (Australia) Pty. Ltd.....	2
Ingersoll Rand Ltd.....	2
Inland Seas Boat Company.....	7
Insley Manufacturing Company.....	29-35-4
Int. Diesel Electric Co.....	5
Integral Coach Factory (Kirloskar Pneumatic Co.).....	8
International Harvester Co.....	12-14-1
International Harvester Co. of Aust.....	4
Ishihara Dockyard Co. Ltd.....	7
Ishikawajima-Koehring Co., Ltd.....	33-4

J

Jansen Machine & Boatworks.....	70-72
Jay Madsen Equipment Co.....	12
Joy Manufacturing.....	41
Joy Manufacturing Co., Pty. Ltd.....	27
Joy Manufacturing Co. (UK) Ltd.....	28

K

Kaessbohrer.....	12
Kalmar Verkstads AB.....	78
Kato Works Co., Ltd.....	28-29
Katolight Corporation.....	50
Kawasaki Heavy Ind. Co., Ltd.....	39-41-78
Kenworth Logging Trucks.....	87
Kenworth Mexicana S.A. de C.V.....	14
Kenworth Motor Truck Company (Division of Pacific Car & Foundry).....	20
Kenworth Motor Trucks Pty. Ltd.....	13
Kirloskar Brothers Limited.....	61
Kirloskar Pneumatic Company Ltd.....	27
Kisha Seizo Kaisha.....	78-80
Kita Shipyard Co.....	71
Klauer Manufacturing Company.....	89
Kobe Steel Ltd.....	27
Kobe Steel Ltd. (P&H).....	31-34-46
Kockum Australia Pty. Ltd.....	42-45
Kockums Munchen.....	42
Koehring Division.....	29-35
Kohler Company.....	53
Kokuetsu Kogyo Co., Ltd.....	27
Komatsu Bucyrus K.K.....	46
Komatsu International Mfg. (Hough).....	41
Komatsu Manufacturing Company Ltd.....	37-38-39-41-43-46
KW Dart.....	30-41-43-86-87-88
Kyosan Kogyo Co., Ltd.....	78

	Page No.
ancer Machinery Ltd.....	62
ee Howl.....	61
emay Boat Works.....	70
eTouneau-Westinghouse.....	42
ewis Bros. Boat Works.....	72
eyland Motor Corp. of Australia.....	13
ink Belt Speeder.....	35-59-87
ocomo-OY.....	45-78
uhrs Sea Skiffs, Inc.....	70
v	
Mack Manufacturing Co.....	44
Mack Trucks, Inc.....	21
Mack Trucks of Australia.....	13
Mack Western Division of Mack Trucks, Inc.....	21
Madill Ltd.....	14
Manitowoc.....	36-47-60
Marco Chilena Shipyards.....	71
Marco do Brasil S.A.....	71
Marine Construction and Design Co.....	72
Marion Power Shovel.....	47
Marmon Harrington.....	21
he Mathews Company.....	70
Mavor & Couson Ltd.....	30
Maxon Construction Co.....	72
McColl Electric Works Pty. Ltd.....	52
McKay-Cormack Ltd.....	68
McQueen's Boat Works.....	68
Mercury.....	84
Milkraft Pty. Ltd.....	68
Mitsui Seiki Kogyo Co. Ltd.....	27
Morgan Manufacturing Company.....	63
Muir Hill.....	41
Multi-Wheel Tractor Company.....	39-45
Myers-Sherman Company.....	84
v	
Nagasaki Shipyard Ltd.....	71
NCK Rapier Ltd.....	46
New Bern Shipyard.....	73
I. Nicholson Boat Works.....	68
Nippon Rolling Stock.....	80
Nippon Sharyo Seizo Kaisha, KK.....	43
Nippon Sharyo-Seizo KK.....	38-79
Nordest.....	45
Norseman Shipbuilding, Inc.....	70
Northern Electrics Pty., Ltd.....	52
Northwest Engineering Co.....	36-47
NP Nelson, Inc.....	41
Nuovo Pignone SPA.....	86
O	
O.A.F.....	14
Okamoto Boat Yard.....	71
Oliver Australasia Pty. Ltd.....	84
Onan.....	53
Orenstein-Koppel.....	78
Ornel Pumps.....	60
Oshkosh Motor Truck, Inc.....	21
Ottawa Steel Products.....	63
Ove Christensen.....	71
Owens Yacht.....	70
P	
P & H (Harnischfeger).....	29-36-47
Pacemaker Corp.....	70
Pacific Ace Equipment Co.....	30-33
Pacific Truck and Trailer Ltd.....	14
Pakall Manufacturing.....	30
Parsons Division.....	30-44
Patterson Pump Division (Patterson Industries, Inc.).....	61

Peerless Pump Company (Division of FMC).....	61
Pengo/Hydrau-Pull.....	63
Roberto Perlini.....	42
Petbow Ltd.....	52
Peterbilt Motor Co.....	22
Petters (Air Pumps) Ltd.....	28
Pettibone Michigan Corporation.....	41
Pettibone (Mulliken Division).....	42
Pettibone—Rome Division.....	36
Pierce-Pacific Manufacturing Company.....	32-86
Pioneer Engineering Company.....	38
Plymouth Locomotive Works (Division of Fate-Root-Heath).....	79
PRIMSA (Clark).....	41
R	
Railway Service & Supply Co. (Division of Ayshire Collieries).....	81
RayGo Inc.....	44
Remolques, S.A. (Atlas truck).....	14
Rex Chainbelt Inc.....	44
R. G. LeTourneau.....	63-87
Rhein Stahl Union.....	45
Richardson Road Machinery Co., Ltd.....	88
Rite-Way.....	22
Roamer Yacht Division (Chris Craft).....	70
Robbins Machinery Company.....	88
Rolway Enterprises (Ralph trucks).....	15
Rose Brothers Boat Works.....	70
Ruston Bucyrus Ltd.....	29-34-46
Rybovich & Sons Boatworks, Inc.....	70
S	
SA General Electric.....	79
Salem Tool Company.....	28
Sandovers Ltd.....	40
Sargent Engineering Division.....	37
Savage Cruisers.....	68
Scammell Lorries Ltd.....	15-43
Schild Bantam Division.....	29-37-87
Scoopmobile, Inc. (Division of Wabco).....	42-87
Selmec.....	52
Shepherd Boats Ltd.....	68
Sheppards Eng. Ltd.....	62
Sicard, Inc.....	14-22-89
Sicard Ltd. of Canada.....	86-88
Sigmund Pulsometer Pumps Ltd.....	61
Silent Hoist.....	37-63
Skagit Corporation.....	59-87
SLM-Sulzer.....	79-80
Smith Engineering Works (Division of Barber Greene).....	38
Speed Sprayer Plant (John Bean Division).....	84
St. Louis Ship.....	73
Stacatruc Ltd.....	59
Steel Metals.....	52
Steels Engineering Products Ltd.....	34
Steelweld Pty. Ltd.....	30-33
Stertil.....	39-45
Stone Chance Ltd.....	53
Striker Boats, Inc.....	70
Stromberg OY.....	52
Sumidagawa Shipyard Co., Ltd.....	68-71
Sumitomo Heavy Machinery Co. (Link Belt).....	34-46
T	
Taiyo Electric Co.....	52
Tata Engineering & Locomotive.....	33-46
Taylor Machine Works.....	59
Theiss White Australia.....	14
Thew Lorain.....	29-32-37-42-47
Thompson Ltd.....	60
Toa Yachts, Ltd.....	68
Toe Marine Boat Co., Ltd.....	68
Tokyo Car Mfg. Co.....	80
Tokyo Electric Co.....	52
Tollycraft.....	70
Toyo Electric Manufacturing Co.....	52
Toyo Umpanki Co., Ltd.....	41

	Page No.
Trailers de Monterrey, S.A.....	12-15
Trailers Del Norte, S.A.....	15
Transport Equipment Ltd. (Daimler).....	12
Transport Equipment (Thornycroft) Ltd.....	84
Trojan Boat Co.....	70
Trojan Division (Eaton Yale & Towne).....	42
John Trumpy & Sons.....	70
Tucker Marine.....	70
Tulloch Ltd.....	78-80
Tyee Machinery Company Limited.....	86
U	
Uniflite.....	70
Union Carriage & Wagon (Pty.) Ltd.....	79
Unit Crane and Shovel.....	29-36-47
Unit Rig & Equipment Co.....	44-60-86
Usuki Iron Works, Ltd.....	72
V	
Varham Boat Works.....	73
Versatile Manufacturing.....	84
Victor Patron, S.A. (White trucks).....	15
Vienoe.....	71
J. H. Vivien Ltd.....	61

W	
Wabco.....	30-39-40-42-43-44
Wabco Australia Pty. Ltd.....	30-39-40
Walker Boat Yard.....	73
Walkers Ltd.....	78
Ward Commons Manufacturing Company.....	89
Washington Iron Works.....	87
D. P. Way.....	89
White Truck Division of White Motor Company.....	22
White Truck Mfg. Ltd.....	14
Whiting Corporation.....	81
Whitman Manufacturing Company.....	88
William Garden Shipyard.....	68
M. W. Willis & Sons.....	70
Workman Reed Ltd.....	53
Wormald Bros. (Australia) Pty. Ltd.....	60
Worthington Australia.....	27
Worthington Corporation.....	28-62
Worthington de Mexico, S.A.....	27
Worthington Simpson Ltd.....	61
XYZ	
Yale & Towne.....	41
Yaquina Boat Works.....	72
Yokohama Yacht.....	72



NOTES



NOTES



1

2

3



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D

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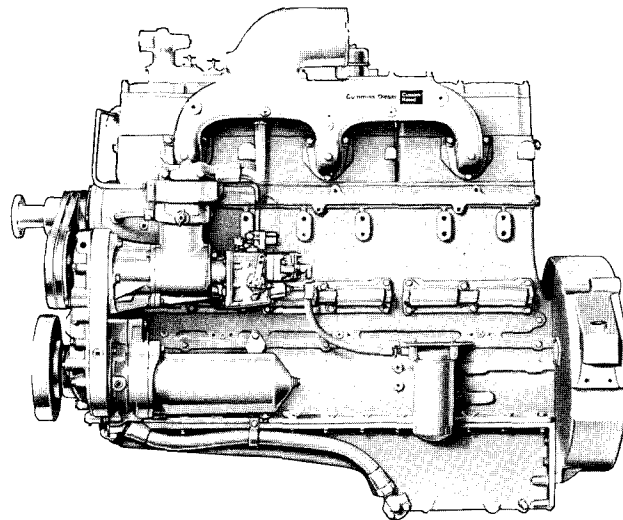
11



12



Cummins Diesel Custom Rated NHC-250



Specifications

Horsepower	250
Governed RPM	2100
Number of Cylinders	6
Bore and Stroke	5 1/2" x 6"
Piston Displacement—cu. in.	855
Compression Ratio	15.5
Operating Cycles	4
Crankcase Oil Capacity—gals.	5
Engine Coolant Capacity—gals.	5
Net Weight with Standard Accessories (lbs.)	2460
Lbs. Per Horsepower	9.8

Custom Rated NHC-250: Three horsepower ratings of 250 hp @ 2100 rpm, 225 hp @ 2100 rpm, and 225 hp @ 1950 rpm are available to meet specific load and road conditions. Change your power rating by a simple button change in the PT fuel pump. 1950 rpm setting also requires a governor adjustment.



225 H.P. @
1950 R.P.M.



225 H.P. @
2100 R.P.M.



250 H.P. @
2100 R.P.M.

Design Features

Bearings: Precision type, steel backed inserts. 7 main bearings, 4 1/2" diameter. Connecting Rod — 3 1/8" diameter.

Camshaft: Single camshaft controls all valve and injector movement. Induction hardened alloy steel with gear drive.

Camshaft Followers: Roller type for long cam and follower life.

Connecting Rods: Drop forged, 12" center to center length. Rifle drilled for pressure lubrication of piston pin. Taper piston pin end reduces unit pressures.

Crankshaft: High tensile strength steel forging. Bearing journals are induction hardened. Fully counterweighted.

Cylinder Block: Alloy cast iron with removable, wet liners.

Cylinder Heads: Each head serves two cylinders. Drilled fuel supply and return lines. Corrosion resistant inserts on exhaust valve seats.

Fuel System: Cummins PT self adjusting system with integral flyball type governor. Camshaft actuated injectors.

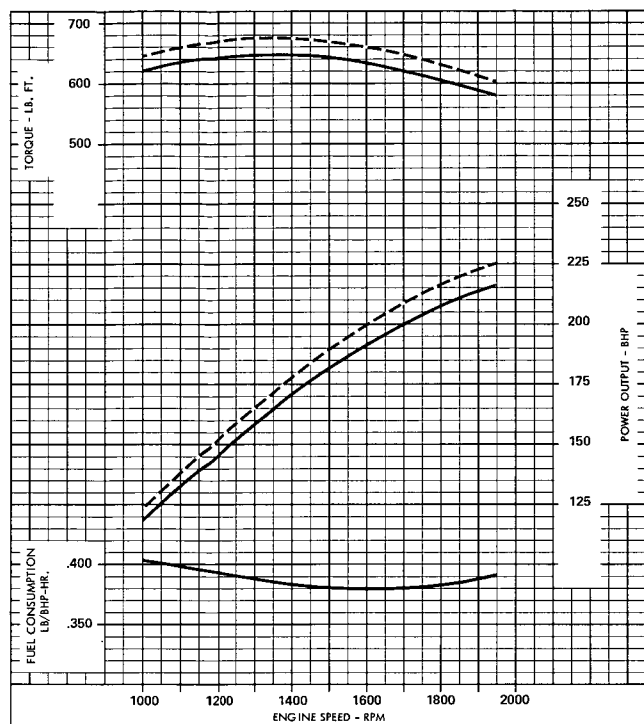
Gear Train: Heavy duty, located at front of cylinder block.

Lubrication: Force feed to all bearings, gear type pump. All lubrication lines are drilled passages, except pan to pump suction line.

Pistons: Aluminum, cam ground, with three compression and one oil ring.

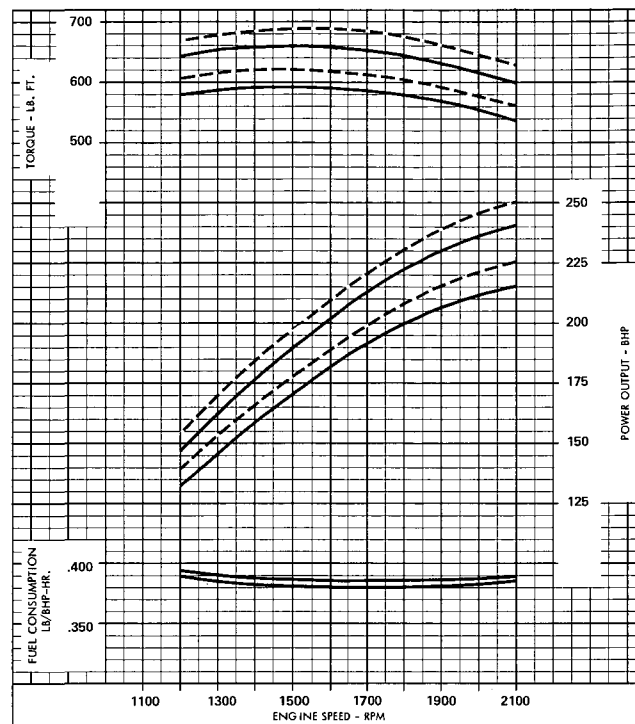
Piston Pins: 2" diameter, full floating.

Valves: Dual intake and exhaust each cylinder. Each valve 1 7/8" diameter. Heat and corrosion resistant face on exhaust valve.



Big Displacement Design Features

- 1 **Internal Fuel Lines:** Drilled passages in cylinder heads eliminate threaded fuel line connectors and external lines.
- 2 **Large Intake and Exhaust Passages:** Minimize restriction of air and exhaust flow. Allows maximum air charge for clean burning, top economy.
- 3 **Overhead Valves:** Precision machined from high strength alloy steel. Intake valves are of silichrome steel. Exhaust valves of big displacement models are nitrogen steel for high temperature strength and faced with corrosion resistant material.
- 4 **Open Type Combustion Chamber:** Gives most efficient combustion . . . most power from each gallon of fuel.
- 5 **Replaceable Wet-type Cylinder Liners:** Dissipate heat faster. Liners are easily replaced without reboring block.
- 6 **Conventional Push Rod and Rocker Lever Arrangement:** Activates valves and injectors from a single camshaft. Roller type camshaft followers are used for long life.
- 7 **Cam-ground Pistons:** Assure perfect fit at operating temperatures.
- 8 **Alloy Cast Iron Cylinder Block:** Follows proven design and material specification to achieve maximum durability.
- 9 **Large Volume Water Passages:** Give even flow of coolant around cylinder liners, valves, and injectors to draw excess heat from combustion chamber. Centrifugal pump circulates large volumes of water.
- 10 **Connecting Rods:** Forged from high tensile strength alloy steel. I-beam section gives maximum strength. Large diameter piston pins are full-floating. Tapered piston pin end used for superior load distribution and maximum crown material on piston.
- 11 **Counterweighted Crankshafts:** Precision machined from high tensile strength steel forgings. Bearing journals are induction hardened for long life.



Performance

Custom Rated. To match your application, the NHC-250 is available at 250 hp @ 2100 rpm, 225 @ 2100 rpm and 225 hp @ 1950 rpm as indicated on the curves above. Horsepower, torque and fuel consumption shown on solid lines represents performance at S.A.E. standard conditions of 500 feet altitude (29.38 inches mercury) and 85°F. intake air temperature. Dotted lines indicate performance corrected to conditions of sea level altitude (29.92 inches mercury) and 60°F intake air temperature.

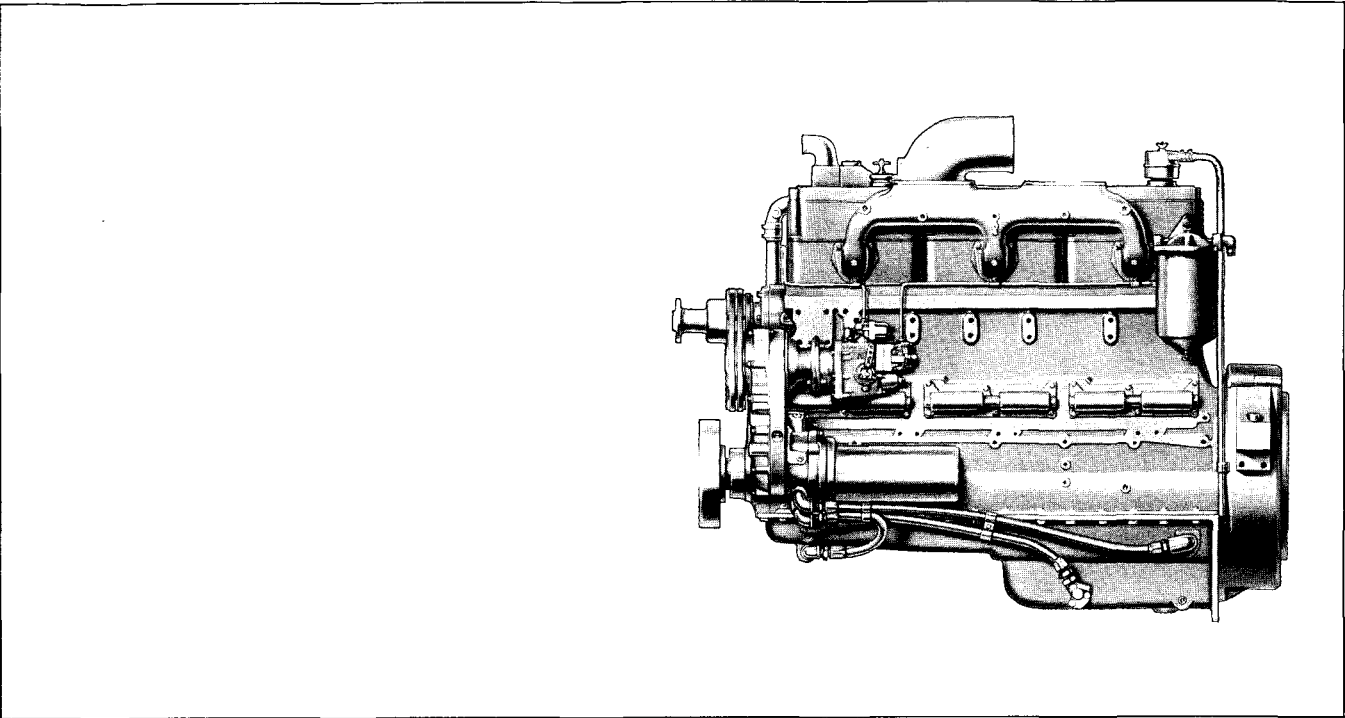
Curves represent performance of the engine with fuel system, water pump, lubricating oil pump, and air cleaner. Battery charging alternator, compressor, fan, and optional equipment are not included in these ratings. Equivalent results can be obtained with fuels ranging from heavy furnace oils to light jet and military type fuels.

NHC-250 engines purchased at one rating can be changed to another rating by a simple button change in the PT fuel pump. Changes to and from the 1950 rpm setting also require a governor adjustment.

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Cummins Engine Company Ltd., London, England

Cummins Diesel

N-855-C

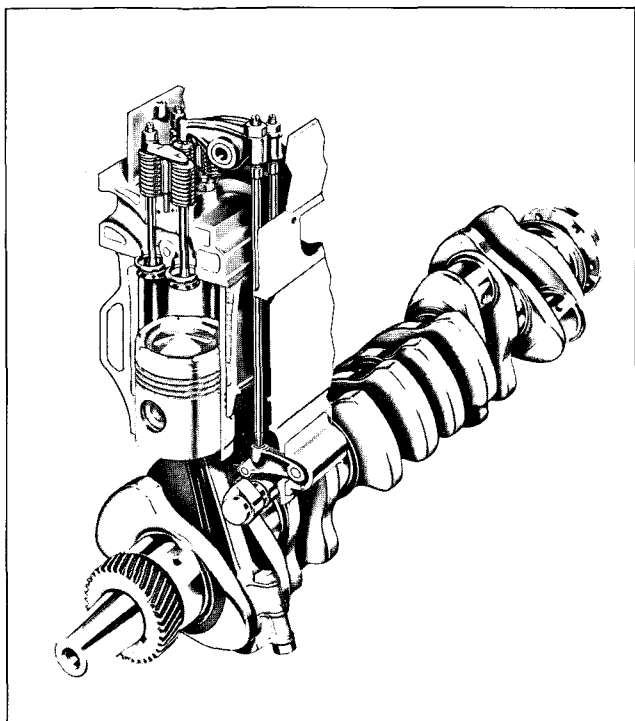


Specifications

Horsepower	250
Governed RPM	2100
Number of Cylinders	6
Bore and Stroke	5½" x 6"
Piston Displacement—cu. in.	855
Operating Cycles	4
Crankcase Oil Capacity—gals.	6
Engine Coolant Capacity—gals.	5
Net Weight with Standard Accessories (lbs.)	2590

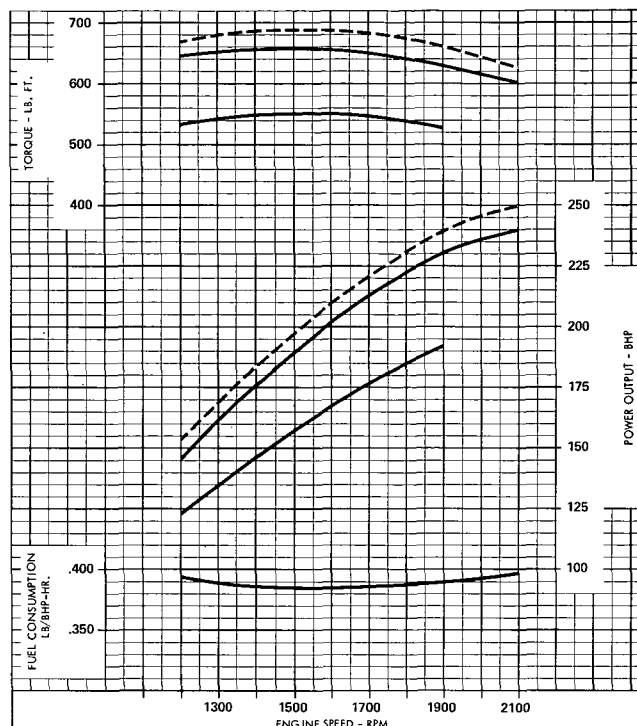
Design Features

- Bearings:** Precision type, steel backed inserts. 7 main bearings, 4½" diameter. Connecting Rod — 3⅞" diameter.
- Breather, Crankcase:** Dry type element.
- Camshaft:** Single camshaft controls all valve and injector movement. Induction hardened alloy steel with gear drive.
- Camshaft Followers:** Roller type for long cam and follower life.
- Connecting Rods:** Drop forged, 12" center to center length. Rifle drilled for pressure lubrication of piston pin. Taper piston pin end reduces unit pressures.
- Cooler, Lubricating Oil:** Tubular type, jacket water cooled.
- Crankshaft:** High tensile strength steel forging. Bearing journals are induction hardened. Fully counterweighted.
- Cylinder Block:** Alloy cast iron with removable, wet liners.
- Cylinder Heads:** Each head serves two cylinders. Drilled fuel supply and return lines. Corrosion resistant inserts on exhaust valve seats.
- Damper, Vibration:** Viscous type.
- Fuel System:** Cummins PT wear-compensating system with integral flyball type governor. Camshaft actuated injectors.
- Gear Train:** Heavy duty, located at front of cylinder block.
- Lubrication:** Force feed to all bearings, gear type pump. All lubrication lines are drilled passages, except pan to pump suction line.
- Pistons:** Aluminum, cam ground, with three compression and one oil ring.
- Piston Pins:** 2" diameter, full floating.
- Thermostat:** Single unit, modulating by-pass type.
- Valves:** Dual intake and exhaust each cylinder. Each valve 1⅞" diameter. Heat and corrosion resistant face on exhaust valve.



Big Displacement Design Features

- 1 **Internal Fuel Lines:** Drilled passages in cylinder heads eliminate threaded fuel line connectors and external lines.
- 2 **Large Intake and Exhaust Passages:** Minimize restriction of air and exhaust flow. Allows maximum air charge for clean burning, top economy.
- 3 **Overhead Valves:** Precision machined from high strength alloy steel. Intake valves are of silichrome steel. Exhaust valves of big displacement models are nitrogen steel for high temperature strength and faced with corrosion resistant material.
- 4 **Open Type Combustion Chamber:** Gives most efficient combustion . . . most power from each gallon of fuel.
- 5 **Replaceable Wet-type Cylinder Liners:** Dissipate heat faster. Liners are easily replaced without reboring block.
- 6 **Conventional Push Rod and Rocker Lever Arrangement:** Activates valves and injectors from a single camshaft. Roller type camshaft followers are used for long life.
- 7 **Cam-ground Pistons:** Assure perfect fit at operating temperatures.
- 8 **Alloy Cast Iron Cylinder Block:** Follows proven design and material specification to achieve maximum durability.
- 9 **Large Volume Water Passages:** Give even flow of coolant around cylinder liners, valves, and injectors to draw excess heat from combustion chamber. Centrifugal pump circulates large volumes of water.
- 10 **Connecting Rods:** Forged from high tensile strength alloy steel. I-beam section gives maximum strength. Large diameter piston pins are full-floating. Tapered piston pin end used for superior load distribution and maximum piston crown material.
- 11 **Counterweighted Crankshafts:** Precision machined from high tensile strength steel forgings. Bearing journals are induction hardened for long life.



Performance

Horsepower, torque and fuel consumption shown on upper solid curves above represent maximum performance under S.A.E. standard conditions of 500 feet altitude (29.38 inches mercury) and 85° F. intake air temperature. Dotted lines indicate performance corrected to conditions of sea level altitude (29.92 inches mercury) and 60° F. intake air temperature, for comparison with engines so rated. Curves represent performance of the engine with fuel system, water pump, lubricating oil pump and air cleaner. Battery charging alternator, compressor, fan and optional equipment are not included in these ratings. Curves represent performance on No. 2 diesel or furnace oil.

Since the amount of air in the cylinder available for combustion decreases at the rate of approximately 3% per 1000 feet increase in altitude and approximately 1% per 10° F. increase in air temperature, the fuel rate of engines permanently operated above standard conditions should be adjusted to maintain nearly the same air-fuel ratio as exists at standard test conditions.

Lower solid curves above represent a suggested rating for continuous duty operation where uninterrupted service at full throttle is required for extended periods of time.

Cummins Engine Company, Inc., Columbus, Indiana 47201
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Accessory Load

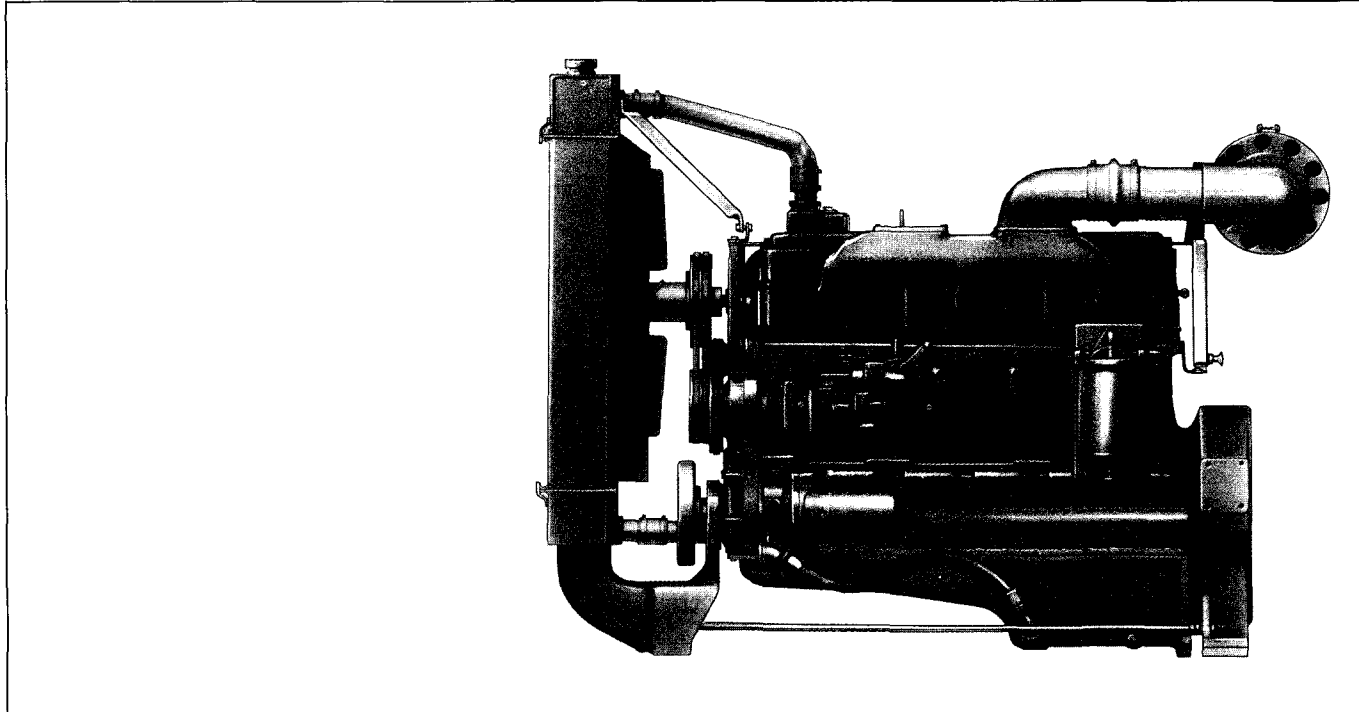
Compressor, Air: (10.6 cfm, 100 psig)	
HP absorbed @ 2100 RPM	4.5
Fan: (ratio 1:1)	
HP @ 2100 RPM	11.0
HP @ 1800 RPM	6.9
HP @ 1500 RPM	4.0
HP @ 1200 RPM	2.0
Generator:	
HP	2.0
Pump, Raw Water:	
HP @ 2100 RPM	2.0

Engineering Data

Air for Combustion:	
CFM @ 2100 RPM	472
Engine Coolant Flow:	
GPM @ 2100 RPM	73
Exhaust Temperature:	
Maximum Rating (°F)	1200
Fan Delivery: (free flow with radiator)	
CFM @ 2100 RPM	14100
CFM @ 1800 RPM	12100
CFM @ 1500 RPM	10100
CFM @ 1200 RPM	8100
Heat Rejection to Coolant:	
With Dry Manifold (btu/bhp/hr)	2000
With Wet Manifold (btu/bhp/hr)	2600
Maximum Allowable Back Pressure:	
At Exhaust Flange (in Hg)	1.5
Maximum Raw Water Pressure:	
Into Heat Exchanger (psig)	25

Tables above use engine RPM

Cummins Diesel N-855-P

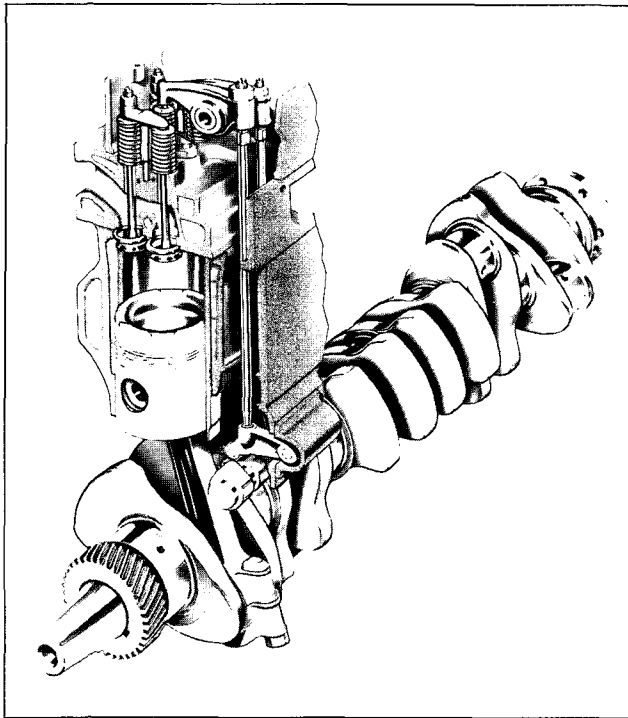


Specifications

Horsepower	250
Governed RPM	2100
Number of Cylinders	6
Bore and Stroke	5½" x 6"
Piston Displacement—cu. in.	855
Operating Cycles	4
Crankcase Oil Capacity—gals.	7
Coolant Capacity—gals.	19
Net Weight with Standard Accessories (lbs.)	3250

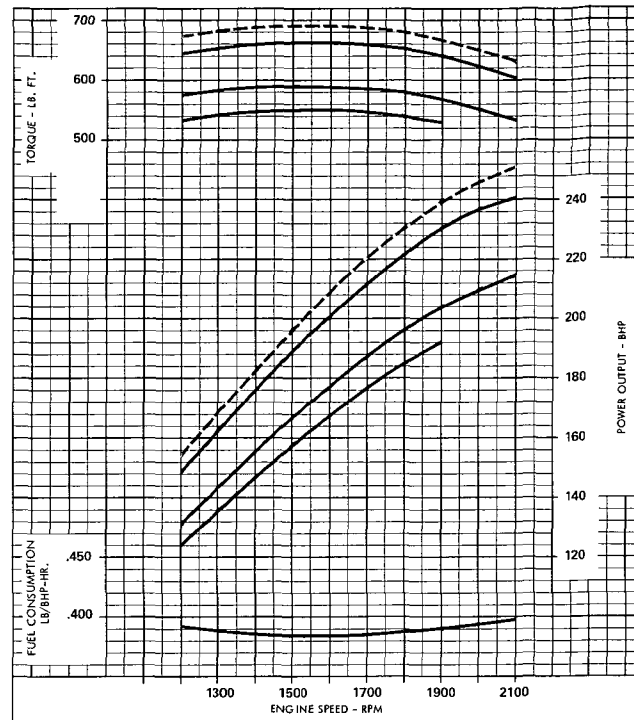
Design Features

- Bearings:** Precision type, steel backed inserts. 7 main bearings, 4½" diameter. Connecting Rod — 3⅞" diameter.
- Camshaft:** Single camshaft controls all valve and injector movement. Induction hardened alloy steel with gear drive.
- Camshaft Followers:** Roller type for long cam and follower life.
- Connecting Rods:** Drop forged, 12" center to center length. Rifle drilled for pressure lubrication of piston pin. Taper piston pin end reduces unit pressures.
- Crankshaft:** High tensile strength steel forging. Bearing journals are induction hardened. Fully counterweighted.
- Cylinder Block:** Alloy cast iron with removable, wet liners.
- Cylinder Head:** Each head serves two cylinders. Drilled fuel supply and return lines. Corrosion resistant inserts on exhaust valve seats.
- Fuel System:** Cummins PT wear-compensating system with integral, flyball type, mechanical variable speed governor. Camshaft actuated injectors.
- Gear Train:** Heavy duty, located at front of cylinder block.
- Lubrication:** Force feed to all bearings, gear type pump. All lubrication lines are drilled passages, except pan to pump suction line.
- Pistons:** Aluminum, cam ground, with three compression and one oil ring.
- Piston Pins:** 2" diameter, full floating.
- Thermostat:** Single unit, modulating by-pass type.
- Valves:** Dual intake and exhaust each cylinder. Each valve 1⅞" diameter. Heat and corrosion resistant face on exhaust valve.



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- 9 **Large Volume Water Passages:** Give even flow of coolant around cylinder liners, valves, and injectors to draw excess heat from combustion chamber. Centrifugal pump circulates large volumes of water.
- 10 **Connecting Rods:** Forged from high tensile strength alloy steel. I-beam section gives maximum strength. Large diameter piston pins are full-floating. Tapered piston pin end used for superior load distribution and maximum crown material on piston.
- 11 **Counterweighted Crankshafts:** Precision machined from high tensile strength steel forgings. Bearing journals are induction hardened for long life.



Performance

Horsepower, torque and fuel consumption shown on solid lines represents performance at 500 feet altitude and 85°F. intake air temperature. Dotted lines indicate performance corrected to conditions of sea level altitude (29.92 inches mercury) and 60°F. intake air temperature. Curves represent performance of the engine with fuel system, water pump, lubricating oil pump, and air cleaner. Battery charging generator, compressor, fan, and optional equipment are not included in these ratings.

Curves represent performance on No. 2 diesel or furnace oil. Equivalent results can be obtained with fuels ranging from heavy furnace oils to light jet and military type fuels without recalibration. Engines permanently stationed at high altitudes should be derated 3% for each 1000 feet increase in altitude above 500 feet and 1% for each 10°F. increase in temperature above 85°F. to maintain rated air to fuel ratios.

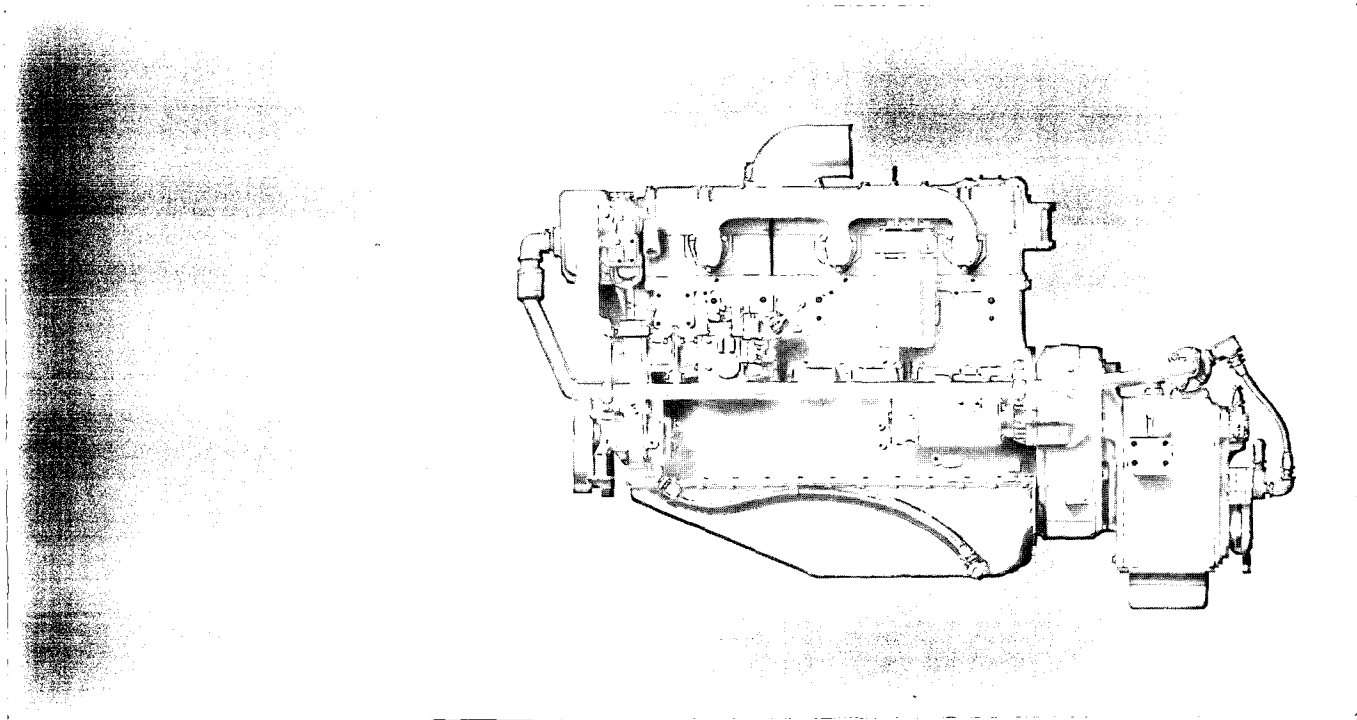
Curve No. 2 is a suggested rating for intermittent application in which periods of operation at full load are followed by equal periods at partial load, idle, or shut-down. For altitude performance, curve No. 2 should be derated 3% for each 1000 feet above 5000 feet.

Curve No. 3 is a suggested rating for continuous duty service in which full power is required for long periods of time without equal intervals of operation at reduced loads or shut down. For altitude performance, curve No. 3 should be derated 3% for each 1000 feet above 7000 feet.

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Cummins Marine Diesel

NH-250-M

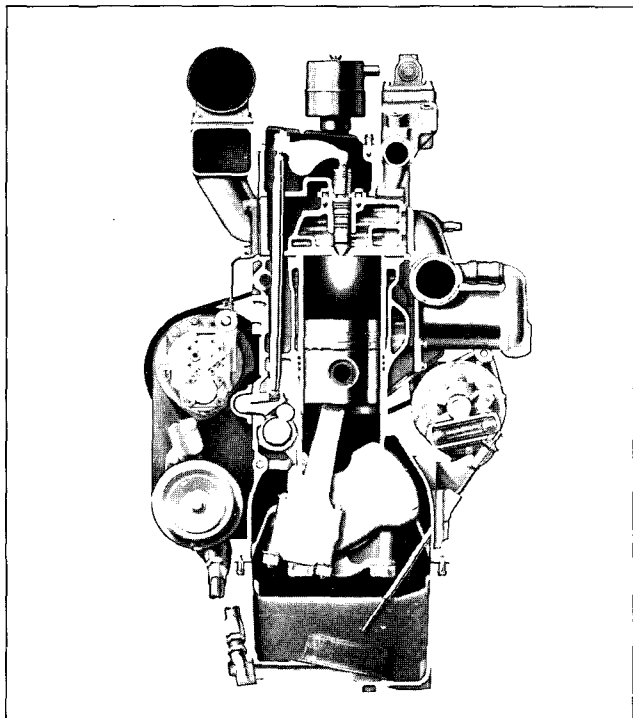


Specifications

Horsepower	250
Governed RPM	2100
Number of Cylinders	6
Bore and Stroke—in.	5½ x 6
Piston Displacement—cu. in.	855
Operating Cycles	4
Crankcase Oil Capacity—gals.	7
Coolant Capacity—gals.	9
Net Weight with Standard Accessories (lbs.)	3490

Design Features

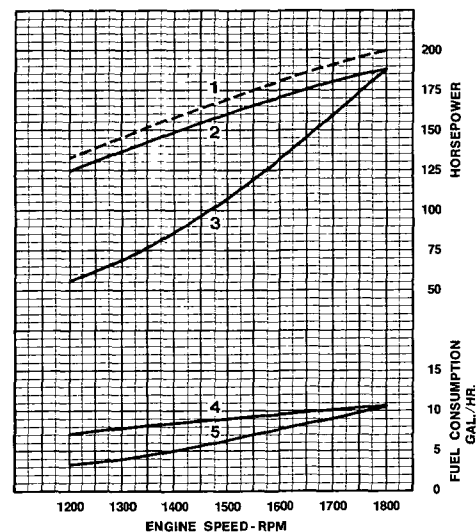
- Bearings:** Precision type, steel backed inserts. 7 main bearings, 4½" diameter. Connecting Rod — 3⅞" diameter.
- Camshaft:** Single camshaft controls all valve and injector movement. Induction hardened alloy steel with gear drive.
- Camshaft Followers:** Roller type for long cam and follower life.
- Connecting Rods:** Drop forged, 12" center to center length. Rifle drilled for pressure lubrication of piston pin. Taper piston pin end reduces unit pressures.
- Cooler, Lubricating Oil:** Tubular type, jacket water cooled.
- Crankshaft:** High tensile strength steel forging. Bearing journals are induction hardened. Fully counterweighted.
- Cylinder Block:** Alloy cast iron with removable, wet liners.
- Cylinder Heads:** Each head serves two cylinders. Drilled fuel supply and return lines. Corrosion resistant inserts on exhaust valve seats.
- Damper, Vibration:** Viscous type.
- Fuel System:** Cummins PT wear-compensating system with integral, flyball type, mechanical variable speed governor. Camshaft actuated injectors.
- Gear Train:** Heavy duty, located at front of cylinder block.
- Lubrication:** Force feed to all bearings, gear type pump.
- Pistons:** Aluminum, cam ground, with three compression and one oil ring.
- Piston Pins:** 2" diameter, full floating.
- Thermostat:** Single unit, modulating by-pass type.
- Valves:** Dual intake and exhaust each cylinder. Each valve 1⅞" diameter. Heat and corrosion resistant face on exhaust valve.



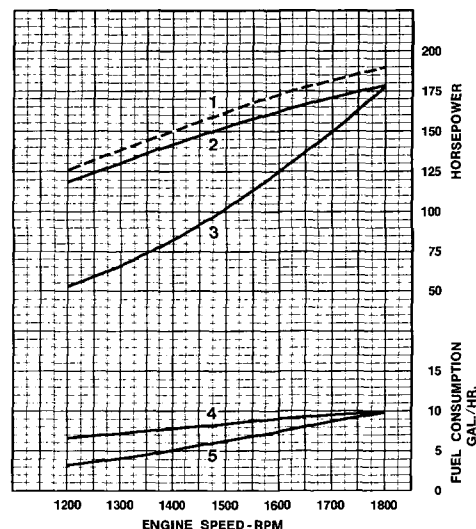
Big Displacement Design Features

- 1 **Internal Fuel Lines:** Drilled passages in cylinder heads eliminate threaded fuel line connectors and external lines.
- 2 **Large Intake and Exhaust Passages:** Minimize restriction of air and exhaust flow. Allows maximum air charge for clean burning, top economy.
- 3 **Overhead Valves:** Precision machined from high strength alloy steel. Intake valves are of silichrome steel. Exhaust valves of big displacement models are nitrogen steel for high temperature strength and faced with corrosion resistant material.
- 4 **Open Type Combustion Chamber:** Gives most efficient combustion . . . most power from each gallon of fuel.
- 5 **Replaceable Wet-type Cylinder Liners:** Dissipate heat faster. Liners are easily replaced without reboring block.
- 6 **Conventional Push Rod and Rocker Lever Arrangement:** Activates valves and injectors from a single camshaft. Roller type camshaft followers are used for long life.
- 7 **Cam-ground Pistons:** Assure perfect fit at operating temperatures.
- 8 **Alloy Cast Iron Cylinder Block:** Follows proven design and material specification to achieve maximum durability.
- 9 **Large Volume Water Passages:** Give even flow of coolant around cylinder liners, valves, and injectors to draw excess heat from combustion chamber. Centrifugal pump circulates large volumes of water.
- 10 **Connecting Rods:** Forged from high tensile strength alloy steel. I-beam section gives maximum strength. Large diameter piston pins are full-floating. Tapered piston pin end used for superior load distribution and maximum piston crown material.
- 11 **Fully Counterweighted Crankshafts:** Precision machined from high tensile strength steel forgings. Bearing journals are induction hardened for long life.

Fishboat Performance



Workboat Performance



1. Gross brake horsepower.
2. Net horsepower with reverse reduction gear, alternator and raw water pump.
3. Hypothetical propeller power curve (3.0 exponent).
4. Fuel consumption for net shaft horsepower.
5. Fuel consumption for hypothetical propeller.

Curves based on 500 ft. altitude (29.38 in. Hg.) and 85°F. intake air temperature.

Fuel consumption curves based on fuel weight of 7.0 lbs./U.S. gallon.

Medium Duty Commercial (Fishboat) rating is intended for commercial fishing applications, with full throttle operation not exceeding 15 hours total in any 24 hour period, such as trawlers, seiners, and gill netters.

Heavy Duty Commercial (Workboat) rating is intended for heavy duty, continuous full throttle operation 24 hours a day, such as tow boats, tugs, self-propelled barges, and freighters.

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Cummins Engine Company Ltd., London, England

Cleaner, Air: 12" diameter, oil bath type, not mounted.

Corrosion Resistor: Mounted, replaceable Fleetguard element, checks rust and corrosion, controls acidity, and removes impurities from coolant.

Dipstick, Oil: Starboard side when viewing engine from drive end.

Electrical Equipment: 32 volt, 45 ampere, negative ground a.c. system. Includes starting motor, alternator, regulator, field relay, and starting switch.

Exchanger, Heat: Tubular type, mounted.

Filters: Fleetguard. Lubricating oil, full flow replaceable paper element type, mounted. Fuel, heavy duty, replaceable-type, paper element, not mounted.

Flywheel: For reverse and reduction gear.

Gear, Marine: Twin Disc MG-509, 4.50:1 reverse and reduction gear with unbored propeller shaft companion flange.

Governor: Mechanical variable speed type.

Housing, Flywheel: S.A.E. No. 1 with marine mounting pads.

Manifold, Air Intake: With 5½" inlet connection.

Manifold, Exhaust: Water cooled. Outlet straight up on to the rear.

Pan, Oil: Aluminum, rear sump type, 7 U. S. gallon capacity.

Pump, Coolant: Belt driven, centrifugal type, 100 gpm @ 2100 rpm.

Pump, Raw Water: 63 gpm @ 2100 rpm.

Shield, Belt: Cast aluminum.

Support, Engine: Marine type, front and rear.

Optional Equipment

Electrical Equipment: 24 volt, 20 ampere d.c. system; 32 volt, 60 ampere a.c. system.

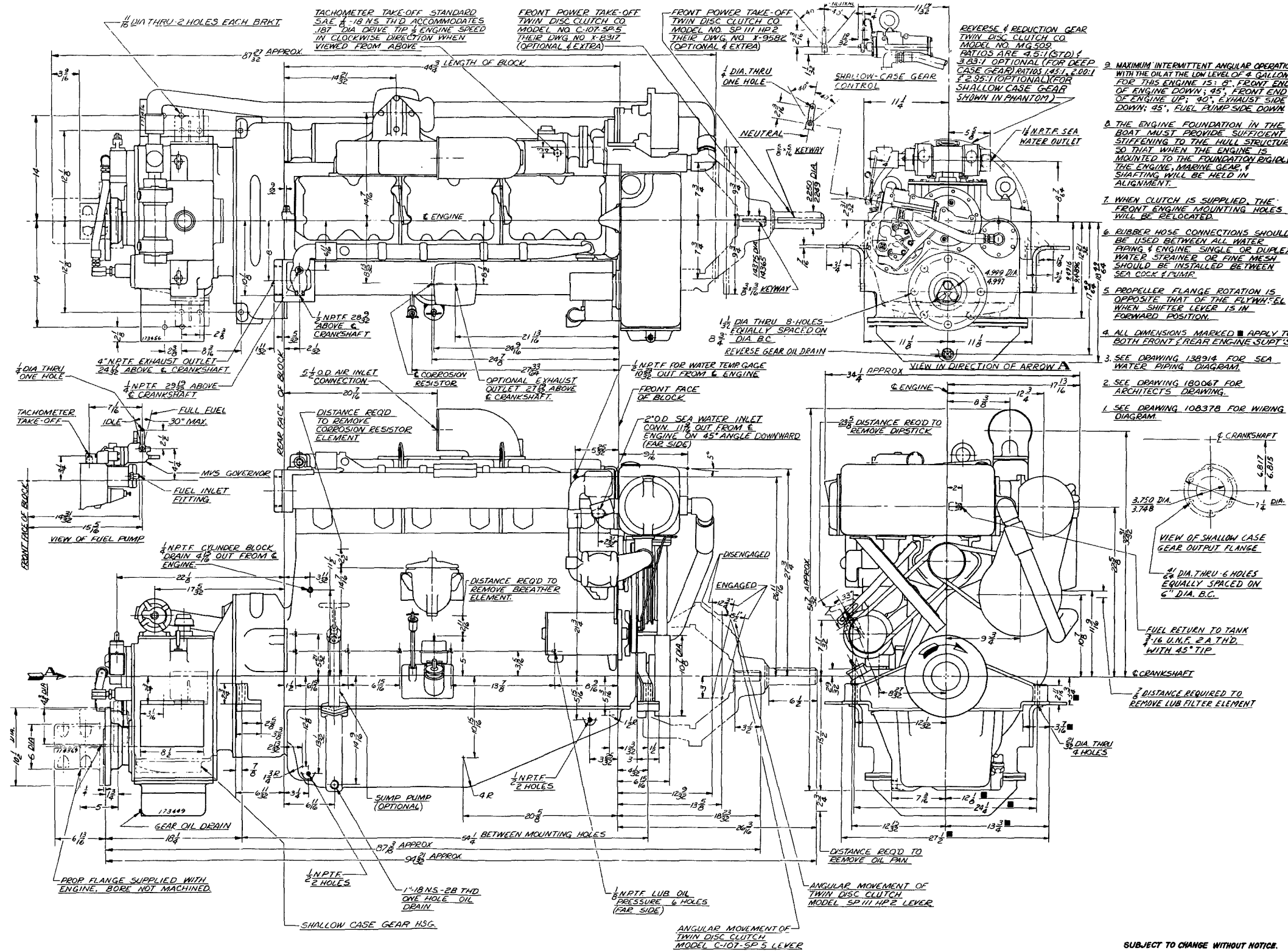
Filter: Lubricating oil by-pass type.

Gear, Marine: Capitol HYC-EC-6900, 2.95:1 ratio; Capitol HYC-EC-7700, 3.88:1 or 4.55:1 ratio; Twin Disc MG-509, 1.45:1, 2.00:1, 2.95:1, or 3.83:1 ratio.

Keel Cooling Arrangement

Power Take Off: Front mounted. Twin Disc clutch model C-107SP5 for up to 35 h.p.; Twin Disc clutch model SP-111 for up to 95 h.p.

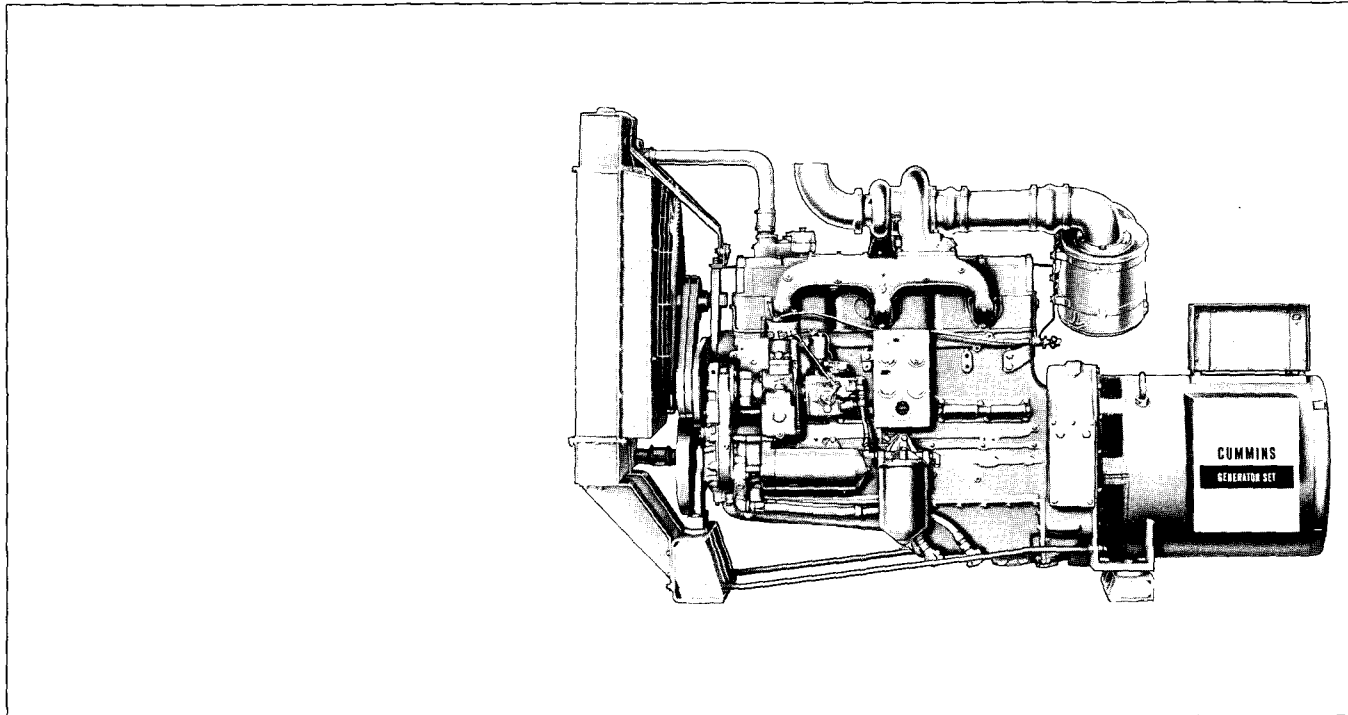
Switches, Alarm: Low oil pressure and high water temperature.



SUBJECT TO CHANGE WITHOUT NOTICE

Cummins Generator Set

NT-310-GC



Specifications

	60 Hertz	50 Hertz
Rated Output*		
KW @ 0.8 PF	150	125
KVA	188	157
Governed RPM at rated frequency	1800	1500
Operating Cycles	4	
Number of Cylinders	6	
Bore and Stroke — in.	5½ x 6	
— mm.	140 x 152	
Piston Displacement — cu. in.	855	
— liters	14.02	
Net Weight — static generator — lbs.	5040	
— kg.	2287	
— brushless generator — lbs.	5010	
— kg.	2273	

*Applicable to the combined operating conditions up to 5000 feet above sea level and ambient temperature up to 100°F, in utility-type, prime power systems with normal load factors. In this application, it may be operated continuously, 24 hours per day, with no deration.

The generator set includes reserve capacity for conditions above the standard rating, including 10% for an aggregate of two hours in any 24 hours of operation. Additional capacity, yielding gains in performance and economic return is available to meet specific applications. Submit detailed information for factory approval.

Standard Equipment

Base Mounting: Fabricated steel cross member type.

Cleaner, Air: Dry type, mounted.

Corrosion Resistor: Mounted, replaceable element, checks rust and corrosion, controls acidity, and removes impurities from coolant.

Coupling: Positive alignment, laterally flexible, laminated steel disc, easily accessible.

Electrical Equipment — Engine: 24 volt starting motor, 24 volt 20 ampere battery charging generator, voltage regulator.

Fan: Axial blower type complete with wire guard.

Filters: Lubricating oil, full flow paper element type, mounted. Fuel, heavy duty replaceable paper element type, mounted.

Governor: Woodward hydraulic, 3% speed droop, with idle speed setting. External vernier control for engine speed adjustment.

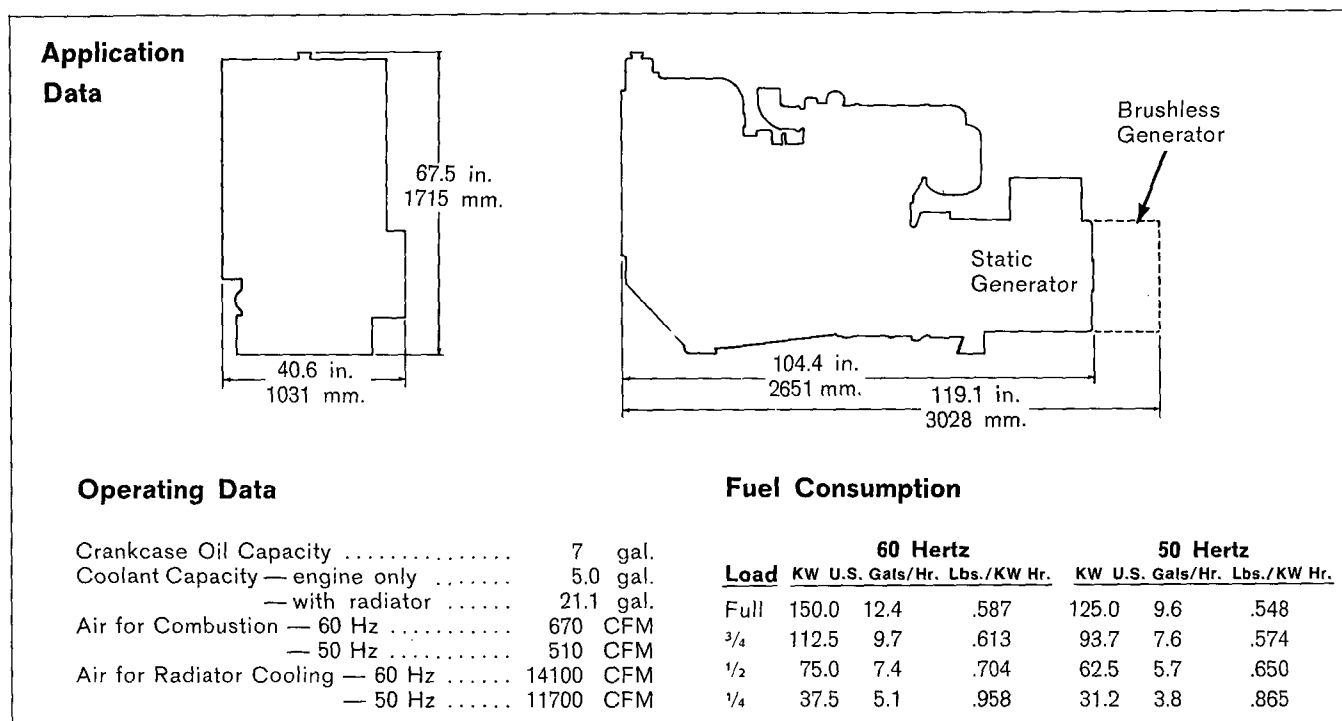
Lifting Brackets: Adequate eye brackets provided.

Panel, Instrument: Includes ammeter, lubricating oil pressure and temperature gauges, cooling water temperature gauge, hourmeter.

Pump, Coolant: Centrifugal type.

Radiator: Heavy duty type for 100°F. ambient temperature at specified rating.

Vibration Isolators: Rubber type between unit and cross-member.



Design Features, Engine

Bearings: Precision type, steel backed inserts. 7 main bearings, 4 1/2" diameter. Connecting Rod — 3 1/8" diameter.

Camshaft: Single camshaft controls all valve and injector movement. Induction hardened alloy steel with gear drive.

Cooler, Lubricating Oil: Tubular type, jacket water cooled.

Crankshaft: High tensile strength steel forging. Bearing journals are induction hardened. Fully counterweighted.

Cylinder Block: Alloy cast iron with removable, wet liners.

Cylinder Heads: Each head serves two cylinders. Drilled fuel supply and return lines. Corrosion resistant inserts on intake and exhaust valve seats.

Damper, Vibration: Compressed rubber type.

Fuel System: Cummins PT self adjusting system. Camshaft actuated injectors, flyball mechanical governor provides overspeed protection independent of main engine governor.

Lubrication: Force feed to all bearings, gear type pump. All lubrication lines are drilled passages, except pan to pump suction line.

Pistons: Aluminum, cam ground, with three compression and one oil ring.

Turbocharger: Cummins T-50.

Valves: Dual intake and exhaust each cylinder. Each valve 1 7/8" diameter. Heat and corrosion resistant face on exhaust valve.

Design Features, Generator

Construction: Built to recommended standard of N.E.M.A. MG2-1967, Section 22, revised January 1968 and B.S. 2613:1957 Revised March 1964.

Bearing: Single row ball, double shielded, greasable.

Cooling: Ventilating fan part of drive assembly.

Damper Windings: Continuous amortisseur windings for parallel operation.

Exciter: Offered in either solid state static exciter design or brushless rotating exciter design.

Insulation: Class F.

Main Frame: Cast iron construction.

Rotor: Dynamically balanced 4 pole to tolerate up to 25% overspeeding.

Stator: 6 coil, 12 lead permits multiplicity of 3 phase Y or Δ and single phase connections.

Temperature Rise: 70°C. or less at 40°C. ambient temperature, by thermometer.

Voltage Regulator: Transistor amplifier and silicon controlled rectifier type ±1% regulation maintained from no load to full load. Modular construction. Voltage range adjustable 15%.

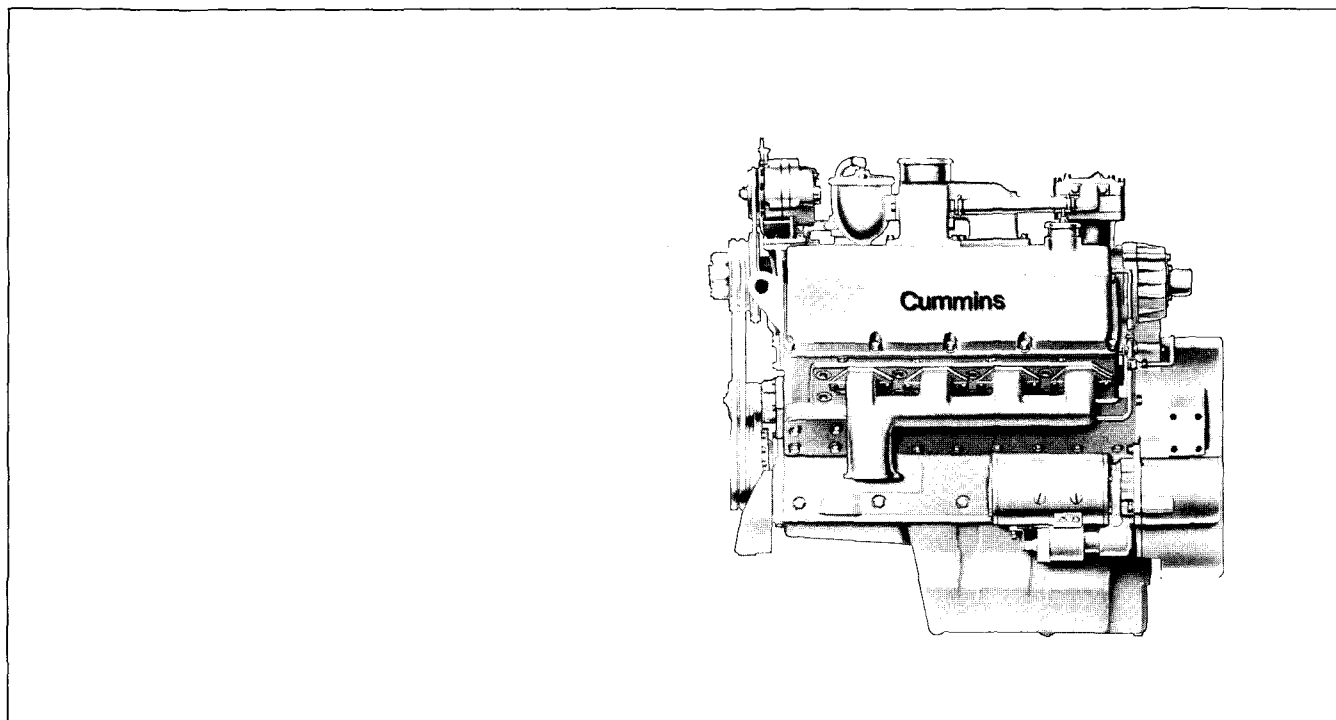
Voltages Available:

	3Y	4Y	3Δ
60 Hz	208 to 240	120/208 to 138/240	120 to 138
	416 to 480	240/416 to 277/480	240 to 270
50 Hz	173 to 208	100/173 to 120/208	100 to 120
	346 to 416	200/346 to 240/416	200 to 240

Cummins Engine Company, Inc.
Columbus, Indiana, U. S. A. 47201

Cummins Diesel

v8-210



Specifications

Horsepower	210
Governed RPM	3300
Number of Cylinders	8
Bore and Stroke—in.	4 ⁵ / ₈ x 3 ³ / ₄
Piston Displacement—cu. in.	504
Compression Ratio	17.0
Operating Cycles	4
Total Engine Oil Capacity—gals.	7
Coolant Capacity—gals.	3 ¹ / ₂
Net Weight with Standard Accessories (lbs.) .	1460
Lbs. Per Horsepower	6.95

Design Features

Bearings: Precision type, steel backed inserts.

Breather, Crankcase: Dry type element.

Camshaft: Single camshaft controls all valve and injector movement. Induction hardened alloy steel with gear drive.

Camshaft Followers: Roller type for long cam and follower life.

Connecting Rods: Drop forged, 6.020" center to center length. Taper piston pin end reduces unit pressures.

Cooler, Lubricating Oil: Tubular type, jacket water cooled.

Crankshaft: High tensile strength steel forging. Bearing journals are induction hardened. Fully counterweighted.

Cylinder Block: Alloy cast iron with removable, wet liners. Cross bolt support to main bearing cap.

Cylinder Heads: Two, one each bank. All fuel lines are drilled passages. Individual intake and exhaust porting for each cylinder.

Damper, Vibration: Compressed rubber type.

Fuel System: Cummins PT self adjusting system with integral flyball type governor. Camshaft actuated injectors.

Gear Train: Heavy duty, located rear of cylinder block.

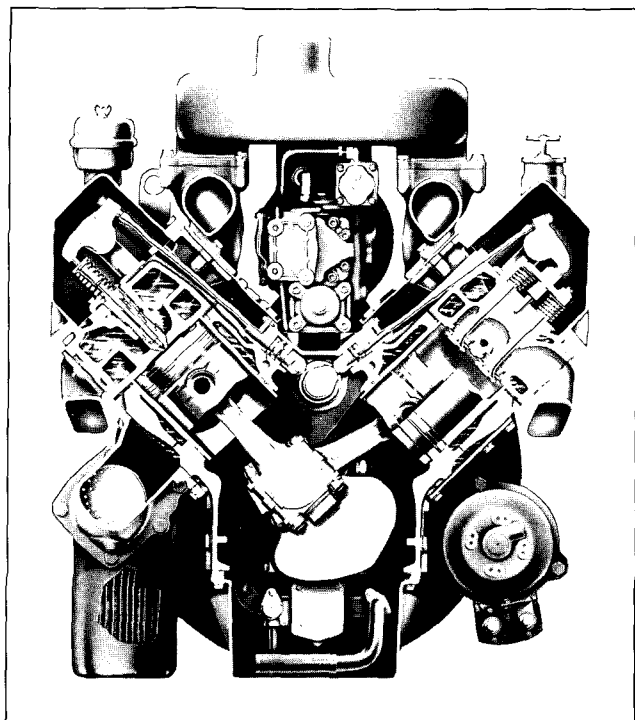
Lubrication: Force feed to all bearings. Gear type pump.

Pistons: Aluminum, cam ground, with two compression and one oil ring.

Piston Pins: 1³/₈" diameter, full floating.

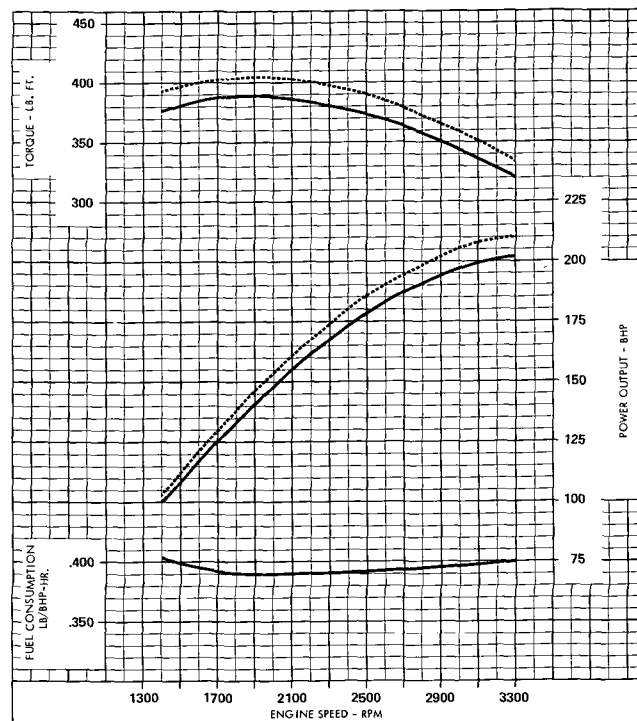
Thermostat: Single unit, modulating by-pass type.

Valves: Dual intake and exhaust each cylinder. Each valve 1³/₈" diameter.



Big Displacement Design Features

- 1 **Internal Fuel Lines:** Drilled passages in cylinder heads eliminate threaded fuel line connectors and external lines.
- 2 **Large Intake and Exhaust Passages:** Minimize restriction of air and exhaust flow. Allows maximum air charge for clean burning, top economy.
- 3 **Overhead Valves:** Precision machined from high strength steel. Intake and exhaust valves are of stainless steel for high temperature strength and corrosion resistance.
- 4 **Open Type Combustion Chamber:** Gives most efficient combustion . . . most power from each gallon of fuel.
- 5 **Replaceable Wet-type Cylinder Liners:** Dissipate heat faster. Liners are easily replaced without reboring block.
- 6 **Conventional Push Rod and Rocker Lever Arrangement:** Activates valves and injectors from a single camshaft. Roller type camshaft followers are used for long life.
- 7 **Cam-ground Pistons:** Assure perfect fit at operating temperatures.
- 8 **Alloy Cast Iron Cylinder Block:** Follows proven design and material specification to achieve maximum durability.
- 9 **Large Volume Water Passages:** Give even flow of coolant around cylinder liners, valves, and injectors to draw excess heat from combustion chamber. Centrifugal pump circulates large volumes of water.
- 10 **Connecting Rods:** Forged from high tensile strength alloy steel. I-beam section gives maximum strength. Large diameter piston pins are full-floating. Tapered piston pin end used for superior load distribution and maximum piston crown material.
- 11 **Counterweighted Crankshafts:** Precision machined from high tensile strength steel forgings. Bearing journals are induction hardened for long life.



Performance

Horsepower, torque and fuel consumption shown on solid lines represents performance at S.A.E. standard conditions of 500 feet altitude (29.38 inches mercury) and 85° F. intake air temperature. Dotted lines indicate performance corrected to conditions of sea level altitude (29.92 inches mercury) and 60° F. intake air temperature. Curves represent performance of the engine with fuel system, water pump, lubricating oil pump, and air cleaner. Battery charging alternator, compressor, fan, and optional equipment are not included in these ratings.

Curves represent performance on No. 2 diesel or furnace oil. Equivalent results can be obtained with fuels ranging from heavy furnace oils to light jet and military type fuels.

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Cummins Diesel International Ltd.

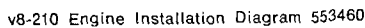
Cummins Engine Company Ltd., London, England

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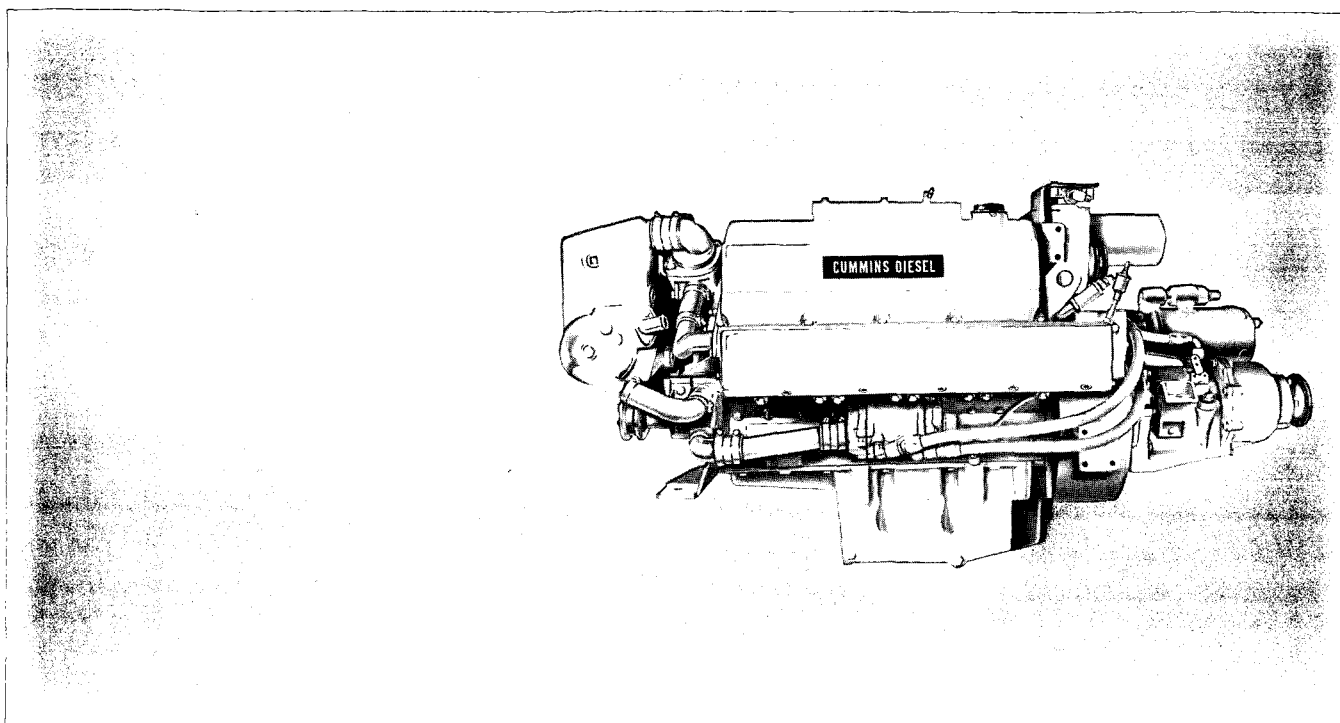
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Cummins Marine Diesel

V-504-M



Specifications

Horsepower*	210
Governed RPM	3300
Number of Cylinders	8
Bore and Stroke—in.	4 ⁵ / ₈ x 3 ³ / ₄
Piston Displacement—cu. in.	504
Operating Cycles	4
Crankcase Oil Capacity—gals.	4 ³ / ₄
Coolant Capacity—gals.	8.4
Net Weight with Standard Accessories (lbs)	1700

Design Features

Bearings: Precision type, steel backed inserts.

Breather, Crankcase: Dry type element.

Camshaft: Single camshaft controls all valve and injector movement. Induction hardened alloy steel with gear drive.

Camshaft Followers: Roller type for long cam and follower life.

Connecting Rods: Drop forged, 6.020" center to center length. Taper piston pin end reduces unit pressures.

Cooler, Lubricating Oil: Tubular type, jacket water cooled.

Crankshaft: High tensile strength steel forging. Bearing journals are induction hardened. Fully counterweighted.

Cylinder Block: Alloy cast iron with removable, wet liners. Cross bolt support to main bearing cap.

Cylinder Heads: Two, one each bank. All fuel lines are drilled passages. Individual intake and exhaust porting for each cylinder.

Damper, Vibration: Compressed rubber type.

Fuel System: Cummins PT™ self adjusting system with integral flyball type governor. Camshaft actuated injectors.

Gear Train: Heavy duty, located rear of cylinder block.

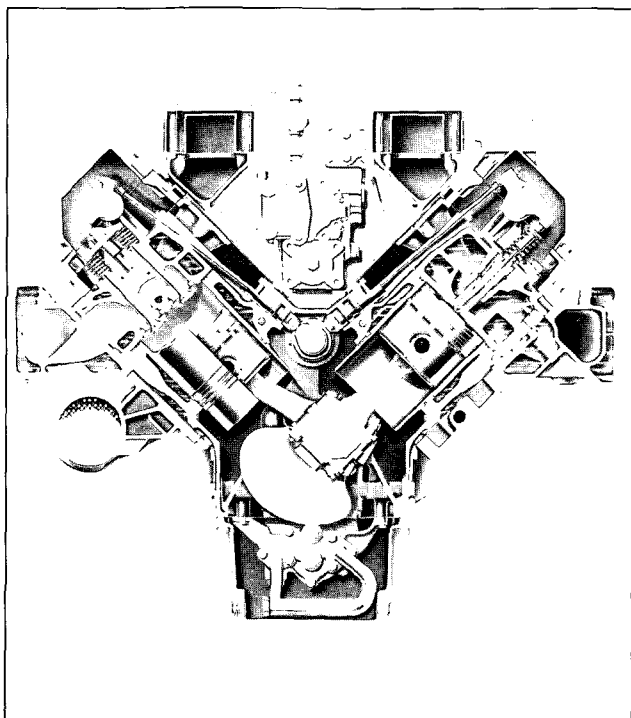
Lubrication: Force feed to all bearings. Gear type pump.

Pistons: Aluminum, cam ground, with two compression and one oil ring.

Piston Pins: 1³/₈" diameter, full floating.

Thermostat: Dual, modulating by-pass type.

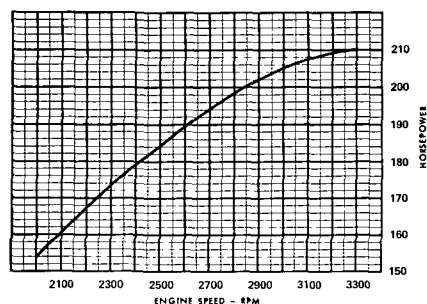
Valves: Dual intake and exhaust each cylinder. Each valve 1⁵/₈" diameter.



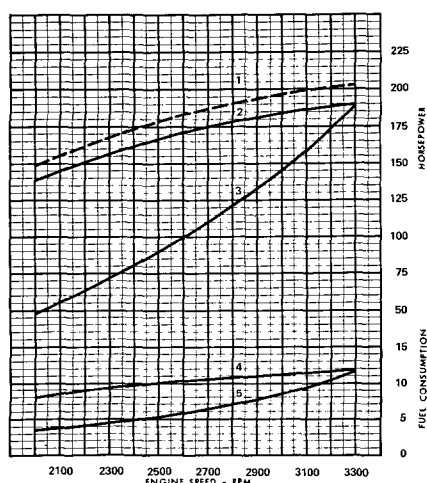
Big Displacement Design Features

- 1 **Internal Fuel Lines:** Drilled passages in cylinder heads eliminate threaded fuel line connectors and external lines.
- 2 **Large Intake and Exhaust Passages:** Minimize restriction of air and exhaust flow. Allows maximum air charge for clean burning, top economy.
- 3 **Overhead Valves:** Precision machined from high strength steel. Intake and exhaust valves are of stainless steel for high temperature strength and corrosion resistance.
- 4 **Open Type Combustion Chamber:** Gives most efficient combustion . . . most power from each gallon of fuel.
- 5 **Replaceable Wet-type Cylinder Liners:** Dissipate heat faster. Liners are easily replaced without reboring block.
- 6 **Conventional Push Rod and Rocker Lever Arrangement:** Activates valves and injectors from a single camshaft. Roller type camshaft followers are used for long life.
- 7 **Cam-ground Pistons:** Assure perfect fit at operating temperatures.
- 8 **Alloy Cast Iron Cylinder Block:** Follows proven design and material specification to achieve maximum durability.
- 9 **Large Volume Water Passages:** Give even flow of coolant around cylinder liners, valves, and injectors to draw excess heat from combustion chamber. Centrifugal pump circulates large volumes of water.
- 10 **Connecting Rods:** Forged from high tensile strength alloy steel. I-beam section gives maximum strength. Large diameter piston pins are full-floating. Tapered piston pin end used for superior load distribution and maximum piston crown material.
- 11 **Counterweighted Crankshafts:** Precision machined from high tensile strength steel forgings. Bearing journals are induction hardened for long life.

Sea Level Rating*



Pleasure Boat Performance



These performance curves represent the performance available for the specified ratings at 500 feet altitude (29.00 in Hg dry barometer — 736mm Hg) and 85°F. (29°C) intake air temperature (S.A.E. J816A test conditions).

1. Gross Brake Horsepower.
2. Net horsepower with reverse reduction gear, alternator and raw water pump.
3. Hypothetical propeller power curve (2.7 exponent).
4. Fuel consumption for net shaft horsepower.
5. Fuel consumption for hypothetical propeller.

The Pleasure Boat rating is intended for those applications where full throttle operation does not exceed fifteen minutes duration in any one hour, such as privately owned pleasure craft.

***NOTE:** The sea level horsepower rating stated in the specifications has been derived by adjusting the rated horsepower by about 4% to indicate approximate performance at sea level and 60°F. air intake temperature.

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 Cummins Diesel International Ltd.
 Cummins Engine Company Ltd., London, England

Corrosion Resistor: Mounted, Fleetguard replaceable element, checks rust and corrosion, controls acidity, and removes impurities from coolant.

Dipstick, Oil: Port side when viewing engine from drive end.

Electrical Equipment: 12 volt, 55 ampere a.c. system. Includes starting motor, alternator, regulator, magnetic switch and starting switch.

Exchanger, Heat: Tubular type, mounted.

Filters: Fleetguard. Lubricating oil full flow paper element type, mounted. Fuel, paper element replaceable type, mounted.

Flywheel: For reverse and reduction gear.

Gear, Marine: Borg Warner 72C, or Paragon, P-400 all Standard Ratios.

Governor: Mechanical variable speed type.

Housing, Flywheel: S.A.E. No. 3.

Intake Air: Silenced

Manifold, Exhaust: Two, fresh water cooled.

Pan, Oil: Aluminum, rear sump type, 4¾ U.S. gallon capacity.

Propeller Rotation: Right Hand

Pump, Coolant: Belt driven, centrifugal type, 62 gpm @ 3300 rpm.

Pump, Raw Water: Belt driven rubber impeller type, 30 gpm @ 3300 rpm.

Support, Engine: Marine type, front and rear.

Optional Equipment

Dipstick, Oil: Starboard side when viewing engine from drive end.

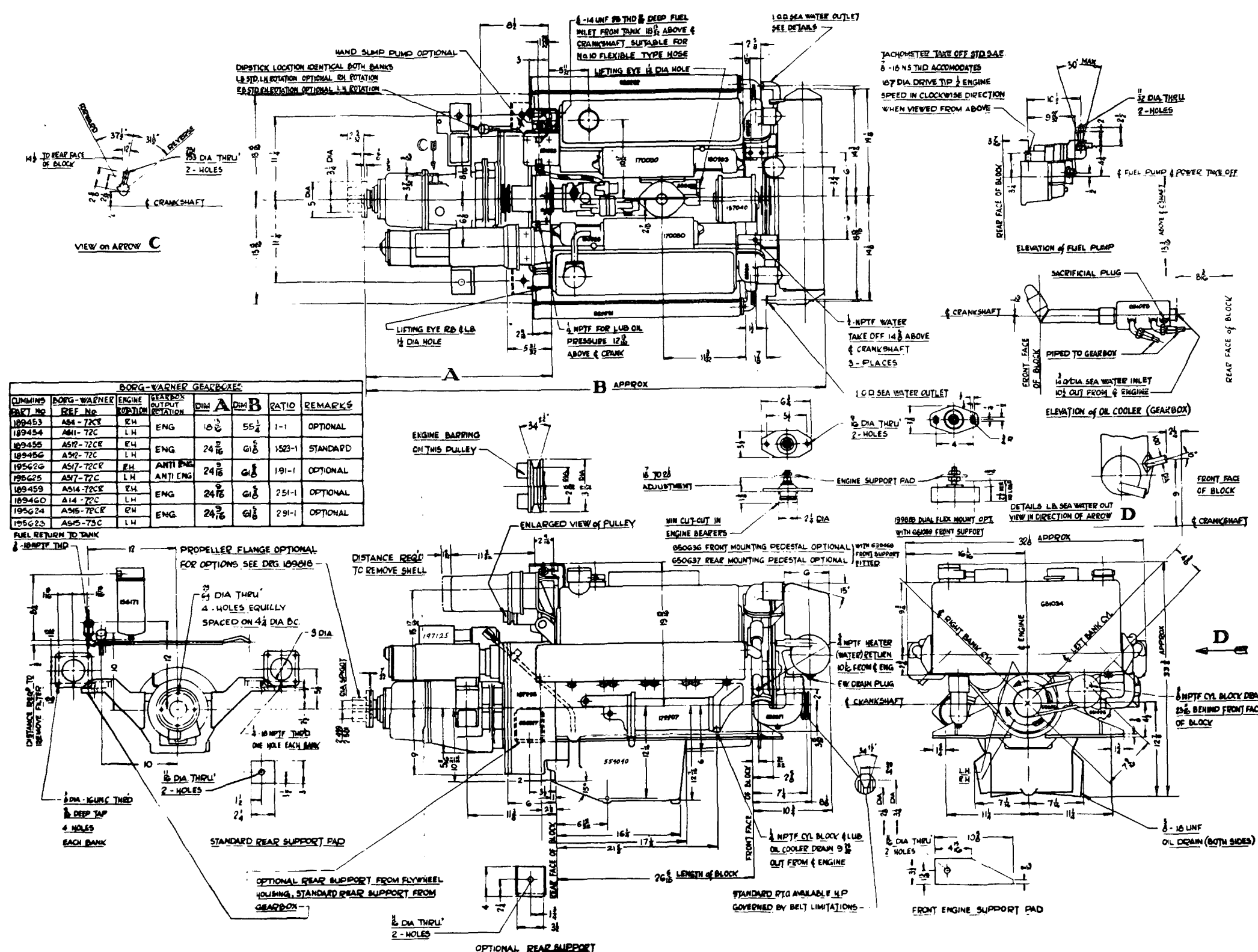
Electrical Equipment: 24 volt, 45 ampere a.c. system; 32 volt, 45 ampere a.c. system.

Gear, Marine: Twin Disc available in ratios of 2.91:1, 2.42:1, 1.93:1, and 1.47:1.

Propeller Rotation: Left hand.

Switches, Alarm: Low oil pressure and high water temperature.

Vibration Isolators: Rubber type.





1
2



3
4





1
2



3
4



Cummins Engine Company, Inc.
Supplier Quality Evaluation Survey
Finished Parts Supplier

Supplier: _____

Address: _____

The Above Supplier is Certified to Supply

to Cummins Engine Company, Inc. in accordance with the accompanying
Quality Evaluation Survey.

Supplier Official

Cummins Supplier Quality Assurance

Date _____

Summary Statement: _____



1

2



3

4



Engineering Design and Change Control

	Yes	No
A. <u>Design Control</u>		
Does your company have a reliability department		
Is reliability data used in developing new designs		
Is quality history fed back to engineering for improvements in current or future designs		
Does q.a. review new designs		
Does your company have a sample or prototype department		
Does q.a. review sample prototypes		
Is this information used in developing shop inspection instructions		
Are customer specifications interpreted into shop specifications		
Do drawings and specifications accompany purchase orders to suppliers		
Are these reviewed by q.a.		
Are characteristics classified on the engineering documents as to importance		
Does q.a. review new drawings with the intent of designing gaging fixtures		
B. <u>Change Control</u>		
Does your company have an effective system for documenting engineering changes		
Do Quality Control and Production Departments receive written notification of changes and effective dates		
Does the engineering change document specify disposition of inventory and in process stock		
Are "marked-up" drawings used		
Who authorized changes and brief description of the procedure used		
Are obsolete drawings destroyed		



1

2



3

4



Quality Control Organization

Responsible Quality Control official and title _____

Other responsibilities _____

The quality department reports to:

Name _____ Position _____

Other functions reporting at the same level are _____

Does the quality department have: Yes No

Written quality policy and procedures manual _____

Written inspection instructions _____

A quality engineering department _____

Person or persons who perform vendor surveys _____

A quality audit function _____

A quality cost program _____

A reliability department _____

To whom does the inspection department report _____

Who is responsible for analyzing customer complaints and goods returned
for defective quality _____

Does the quality department use statistical tools (control charts,
sampling plans, etc.) _____

Is Government source inspection available to your plant _____

Resident _____ Itinerant _____ No _____



2

1



2

2



Incoming Material Control

	<u>Yes</u>	<u>No</u>
Do you have an incoming inspection department	_____	_____
(If yes, list personnel) Inspectors _____		
Supervisory _____ Q. Engineers _____		
Is there a system for keeping shop drawings up-to-date	_____	_____
Are written inspection instructions available	_____	_____
Is gaging equipment calibrated periodically	_____	_____
Is gaging equipment correlated with suppliers' equipment	_____	_____
Are suppliers' test records used for acceptance	_____	_____
Are commercial test records used for acceptance	_____	_____
Is material identified to physical and chemical test reports	_____	_____
Are records kept to show acceptance and rejection of incoming material	_____	_____
Does your company have a vendor rating system	_____	_____
Is it made available to the purchasing department	_____	_____
Is the supplier notified of nonconforming material	_____	_____
Does your company have an approved supplier list	_____	_____
Does your company survey supplier facilities	_____	_____
Does the incoming inspection department have adequate storage space to hold material until it is inspected	_____	_____
Is nonconforming material identified as such	_____	_____
Is nonconforming material held in a specific area until disposition can be made	_____	_____
Who is responsible for making disposition of nonconforming material _____		
If sampling inspection is used, what is derivation of sampling plan _____		
Are written corrective action statements required from suppliers	_____	_____



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Is classification of characteristics used

What A.Q.L.'s are assigned to each classification:

Critical _____ Major _____ Minor _____ Incidental _____

Do you have a formal system for verifying chemical and
physical properties of purchased material

Comments: _____



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In Process Control

	<u>Yes</u>	<u>No</u>
Does your company use sampling inspection	_____	_____
If sampling is used, what is the derivation of the sampling plan:		
Mil Std. 105-D _____ Other _____		
Do you classify characteristics	_____	_____
What A.Q.L.'s are assigned to each classification of characteristics:		
Critical _____ Major _____ Minor _____ Incidental _____		
Are your machine operators trained and instructed to inspect the characteristics they process	_____	_____
Are inspection instructions available	_____	_____
Is there a system for reviewing and updating inspection instructions	_____	_____
Are inspection records kept on file	_____	_____
Are materials in process properly identified and segregated to indicate status and/or routing (Attach copies of tags used)	_____	_____
Do you use control charts for $\bar{X}$, R, P, C	_____	_____
Check which: $\bar{X}$ _____ R _____ P _____ C _____		
What authority does inspection have when defective parts are found		

Is defective material segregated from acceptable material until disposition is made	_____	_____
Are first production parts inspected before a job can be run	_____	_____
Is corrective action taken to prevent the recurrence of defective material documented	_____	_____
What procedure is used to determine disposition of nonconforming material		



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Finished Parts Control

	<u>Yes</u>	<u>No</u>
Does your company have a final inspection function	_____	_____
(If yes, list personnel) Inspectors _____		
Supervisory _____ Q. Engineers _____		
To whom does the final inspection department report	_____	_____
Are shop drawings and specifications available to inspection	_____	_____
Is there a system for keeping the documents up-to-date	_____	_____
Are written inspection instructions available	_____	_____
Is there a system for reviewing and updating inspection instructions	_____	_____
Are inspection records kept on file	_____	_____
Is inspection equipment calibrated periodically	_____	_____
Is all material identified (route tags, etc.)	_____	_____
Is defective material identified as such	_____	_____
Is defective material segregated from good material until disposition is made	_____	_____
Is reworked material submitted for reinspection	_____	_____
If sampling is used, what is the derivation of the sampling plan: Mil. Std. 105-D _____ Other _____		
Do you classify characteristics	_____	_____
What A.Q.L.'s are assigned to each classification of characteristics: Critical _____ Major _____ Minor _____ Incidental _____		
Are documented corrective action statements required from departments responsible for defective material	_____	_____
What procedure is used to determine disposition of nonconforming material	_____	_____

How are parts which have passed final inspection identified	_____	_____



Final Assembly Control

Yes No

Does your company test or inspect final assemblies

Is sampling inspection used

Briefly describe the final test or inspection process

What happens to assemblies which fail final test and how are they
identified

How are assemblies which pass final test identified



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Testing, Inspection and Gaging Equipment

	<u>Yes</u>	<u>No</u>
Does your company have a gage control function	_____	_____
(If yes, list personnel) Number _____		
Does your company have written instructions for operating inspection and test instruments	_____	_____
Are all inspection instruments calibrated at periodic intervals	_____	_____
Are records of calibration kept on file	_____	_____
Is there a system to recall inspection instruments when they are due for calibration	_____	_____
Are the inspection instruments used by production calibrated	_____	_____
If so, are these instruments calibrated periodically	_____	_____
Do employees personally own inspection instruments which they use to inspect the product	_____	_____
If so, are these instruments calibrated at periodic intervals	_____	_____
Are defective inspection instruments removed from use until they can be repaired or recalibrated	_____	_____
Are shop masters calibrated at periodic intervals to secondary standards traceable to NBS	_____	_____
Are production instruments such as pressure gages or temperature indicators checked at periodic intervals	_____	_____
Is an environmental controlled gage lab available	_____	_____
Are written records of calibration kept	_____	_____
Are adequate storage and handling facilities available	_____	_____



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General

	<u>Yes</u>	<u>No</u>
Is plant cleanliness adequate	_____	_____
Are stored materials checked for preservation	_____	_____
Are packaged goods checked for proper packaging	_____	_____
Does your company have a quality audit system for :		
Product conformance	_____	_____
System conformance	_____	_____
Does your company use:		
Process capability studies	_____	_____
Reliability (life) analysis	_____	_____



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Cummins warranty

100,000 miles
3,600 hours, one year

This warranty applies to highway, construction and industrial Cummins engines marketed by Cummins for use in any country of the free world except the United States, Canada and the United Kingdom. The responsibility of Cummins under this warranty is limited to repairing or, at its option, replacing, subject to the provisions set forth below, any part that, upon examination, is disclosed to the satisfaction of Cummins to have been defective and that is returned, with all transportation, duty, brokerage, surcharges and clearing fees prepaid, to the Cummins factory designated by Cummins, or to a Distributor or Dealer authorized by Cummins to perform warranty repairs.

Cummins engines are warranted to be free from defects in workmanship and material, under normal use and service, for one year or 100,000 miles or 3,600

hours of operation, whichever shall occur first, from the date of delivery to the first purchaser, but subject to the following conditions:

Until the engine shall have achieved 50,000 miles or 1,800 hours or six months of operation, whichever shall occur first, from the date of delivery to the first purchaser, Cummins will bear reasonable labor costs required to repair or replace any part found by it to be defective as stated above, provided the repairs or replacements are made by Cummins at its designated factory, or by an authorized Distributor or Dealer at the place of business of such Distributor or Dealer. Thereafter, and for the remainder of this warranty, Cummins, at its sole option, may pay a portion of such labor costs. This warranty does not include engine removal and reinstallation expense.

This warranty does not apply to (i) any engine that shall have been subject to overspeeding, misuse, negligence, or accident, (ii) any engine that shall have been repaired or altered by anyone who is not an authorized Cummins Distributor or Dealer in such a way that, in the judgement of Cummins, its performance

and reliability are adversely affected, (iii) any part of an engine improperly applied or installed, (iv) failures in any way resulting from use of parts not manufactured or approved by Cummins, or (v) normal maintenance services including, but not limited to, engine tune-up and the repair or replacement of filters and belts.

Cummins shall not be liable for loss of time to the user while the engine or other equipment is out of commission.

Starters, generators, transmissions, clutches, radiators, and other accessory items not manufactured by Cummins are warranted by their respective manufacturers, and are not warranted by Cummins.

Note: There are no warranties, express or implied, including warranties of merchantability or fitness for a particular purpose, by Cummins or any Distributor or Dealer, regarding Cummins engines except the warranty against defects in material and workmanship specified herein. No person is authorized to bind Cummins for any such other warranty.



Cummins warranty

3,600 hours, two years

This warranty applies to Cummins marine engines marketed by Cummins for use in any country of the free world except the United States and Canada. The responsibility of Cummins under this warranty is limited to repairing or, at its option, replacing, subject to the provisions set forth below, any part that, upon examination, is disclosed to the satisfaction of Cummins to have been defective and that is returned, with all transportation, duty, brokerage, surcharges and clearing fees prepaid, to the Cummins factory designated by Cummins, or to a Distributor or Dealer authorized by Cummins to perform warranty repairs.

Cummins engines are warranted to be free from defects in workmanship and material, under normal use and service, for two years or 3,600 hours of operation, whichever shall occur first, from the date of delivery to the first purchaser,

but subject to the following conditions:

Until the engine shall have achieved 1,800 hours or two years of operation, whichever shall occur first, from the date of delivery to the first purchaser, Cummins will bear reasonable labor costs required to repair or replace any part found by it to be defective as stated above, provided the repairs or replacements are made by Cummins at its designated factory, or by an authorized Distributor or Dealer at the place of business of such Distributor or Dealer. Thereafter, and for the remainder of this warranty, Cummins, at its sole option, may pay a portion of such labor costs. This warranty does not include engine removal and reinstallation expense.

This warranty does not apply to (i) any engine that shall have been subject to overspeeding, misuse, negligence, or accident, (ii) any engine that shall have been repaired or altered by anyone who is not an authorized Cummins Distributor or Dealer in such a way that, in the judgement of Cummins, its performance and reliability are adversely affected, (iii) any part of an engine improperly applied or installed, (iv) failures in any way resulting from use of parts not manufactured or approved by Cummins,

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