



**Testimony before the International Trade Commission: Remanufactured Goods
Investigation No. 332-525
February 28, 2012**

What is remanufacturing and where does remanufacturing fit in?

Remanufacturing is more than rebuilding, it is a process of restoring the “core” product to a “like-new” condition. Remanufacturing is present in many industries including home appliances, furniture, medical, electronics, aviation, automotive and trucking.

Years ago, the term remanufacturing was used to describe a labor-intensive process that involved techniques similar to what would be expected in a service repair shop. Today, remanufacturing has evolved into a sophisticated process requiring skilled employees at all levels of knowledge and education. In the heavy duty industry for example, the development of “Metal On” remanufacturing and other technical recovery processes requires significant investments in specialized equipment and highly skilled employees.

The business, economic and job creation benefits of remanufacturing are strong. In addition, remanufacturing also provides environmental benefits. Remanufacturing is recognized as the ultimate form of recycling because it provides a “Closed Loop” process that renovates products which are at the end of their useful lives, thus minimizes the impact on the environment and landfills.

Why remanufacture?

There are many reasons why remanufacturing makes sense, but the two most important are the fact that the process makes environmental and business sense. From the environmental standpoint, the process is sustainable, represents a responsible corporate position and also minimizes resource and energy use. From the business side, remanufacturing makes sense because it reduces production costs, and the cost of ownership for customers with the potential to be profitable undertaking.

Environmental Benefits

The environmental benefits of the remanufacturing industry have been documented. The process has the potential to save up to 85 percent of the energy and material used to manufacture equivalent new parts. In addition, the process reduces CO2 emissions by 53%, saves 14 million tons of raw materials per year and generates 75% less landfill waste. These characteristics make the process sustainable and beneficial for the environment. As an example, in 2010, Detroit Diesel Remanufacturing processed over 25,000 tons of core material into finished goods.

In traditional recycling, products at the end of their life are sent back to the beginning of the manufacturing cycle. Energy is required to convert these discarded products into a useable form. For example, metals must be melted down in order to produce new castings. The castings then must be machined to achieve the dimensional requirements of the finished part. Remanufacturing avoids the

cost and energy required to convert the discarded metal into castings, and secondly, avoids most of the cost and energy to further refine them into a finished product. Remanufacturing is more than recycling, it is the recovery of the value in manufactured goods and restoring them to original condition. Remanufacturing reuses raw materials that would otherwise need to be mined from the earth.

Corporate and Customer Benefits

Remanufactured engines and parts average 20 to 30 percent below the cost of new engines and parts, and deliver a comparable level of quality backed by a factory warranty. The potential cost savings of producing remanufactured products over the cost of producing new is between 30 and 70 percent and represents a compelling low cost / high value proposition. It is estimated that the US remanufacturing industry currently employs over 500,000 employees.

Remanufactured products can be updated with the latest engineering improvements and upgrades through extensive recovery processes, tight standards and comprehensive testing. Parts are reused, recovered and restored to like-new condition and content of these products can include up to 80% remanufactured parts.

Hurdles

Consumer understanding and awareness

High quality remanufactured products are sometimes misunderstood domestically as well as internationally. In some countries a remanufactured product is considered a "used" product and is treated at the border and in the market as such.

No worldwide standards

As a worldwide standard does not exist, the understanding of remanufactured goods versus used or rebuilt products is not defined. This results in confusion within foreign markets as to how cores and products are managed.

Non-Tariff trade barriers

Certain countries restrict the importation of remanufactured goods and movement of cores in order to protect their domestic industries. These non-tariff trade barriers limit exports of remanufactured goods. As an example, Brazil, Colombia, Ecuador, Argentina and Peru restrict the free movement of remanufactured goods and cores. In order for Detroit Diesel to increase exports of remanufactured goods to these countries, these restrictions will need to be eased. In contrast, the movement of remanufactured goods and cores between the US and Australia is relatively efficient and a significant amount of products are exported into this region by Detroit Diesel.

Inconsistent use of remanufactured products

As a domestic example, government entities, including local municipalities as well as US government entities such as the armed forces, do not endorse the use of remanufactured goods to maintain equipment and vehicles.

Detroit Diesel Remanufacturing (DDR)

DDR is a global leader in the remanufacturing of products for on and off-highway power systems and is part of Daimler Trucks North America, the leading manufacturer of class 6-8 commercial trucks in the U.S. DDR has been in the remanufacturing business under the reliabilt® brand since 1966. These products are sold in the aftermarket through authorized dealers and distributors to customers across the US and around the world.

In the US, DDR employs 1,217 people at six facilities located in Ohio, Utah, Michigan, Kansas and Minnesota. From 2009 to 2011, DDR headcount has grown by 9% as business has grown during this period. This is evidence of the significant job creating power of the remanufacturing industry.

The plant locations and number of employees are listed below:

DDR East (Byesville, OH 43723)	528 Employees
DDR West (Tooele, UT 84074)	336 Employees
NAFSR (Kentwood, MI 49512)	134 Employees
DDR Central (Emporia, KS 66801)	107 Employees
DDR-DMR (Hibbing, MN 55746)	91 Employees
DDR - HQ (Detroit, MI 48239)	21 Employees

These facilities are ISO 9001:2008 certified which ensures remanufacturing operations and quality processes that are documented and controlled. DDR facilities are also certified to ISO14001:2004 Environmental Management System (EMS), with focus on compliance with federal, state, and local regulations.

Remanufactured Products

DDR remanufactures a wide range of products which are listed below in broad categories

Engines:

- Diesel – Heavy Duty, Medium Duty
- Diesel – Automotive and Light Truck
- Gasoline – Automotive and Light Truck

Components:

- Turbochargers – Diesel engines
- Fuel Systems
- Cylinder Heads
- Water Pumps
- Electronics – Engine Controllers

Transmissions:

- Automatic – Passenger cars and light trucks
- Manual – Medium duty trucks and buses

Axles:

- Heavy Duty and Light Truck

DDR Remanufacturing Process

Remanufactured Detroit Diesel products offer superior performance because the process not only restores damaged products, but it rejuvenates the product to its original blueprint specification while incorporating the current engineering upgrades.

As an example, the "Twin Wire Arc" process allows DDR to rebuild the head surface to meet original equipment specifications by "adding metal to metal". A robot ensures fine control of the distance from the spray gun to the surface and the speed at which the metal is applied. For environmental and safety reasons the process is done in an enclosed room with dedicated ventilation and dust collectors.

Recovery technology utilized in the remanufacturing process at DDR include the following:

Plasma Transferred Wire Arc

- Coats hard to reach areas to make them look like new

Submerged Arc Welding

- Automated welding process that rebuilds metal in thicker quantities
- Recovers non-wear areas that have incurred damage

Twin Wire Process

- Similar to the powder spray process but uses two wires as the base coating material instead of powder

Supersonic Spray

- Used to make cosmetic repairs to aluminum and cast iron



Brian A. Lewallen
Operations Director
Detroit Diesel Remanufacturing

Sources

*Lund, Robert & Hauser, William,
'The Remanufacturing Industry: Anatomy of a Giant'
Department of Manufacturing Engineering, Boston University, 2003*

*Sustainability: Challenges for the Manufacturing Enterprise.
John W. Sutherland, Ph.D. Professor and Head
Div. of Environmental and Ecological Engineering, Purdue University*

Rochester Institute of Technology (RIT), MERA, APRA

"The Sustainable Business - 2010" - www.efmd.org



DETROIT DIESEL
REMANUFACTURING

Brian A. Lewallen

Operations Director

Detroit Diesel Remanufacturing (DDR)

Daimler Trucks North America (DTNA)

What is remanufacturing (reman)?



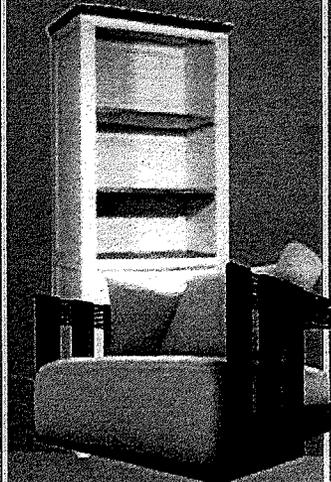
- **The reman mantra:** Why buy new when you can **REUSE** something that still has **VALUE**
- It's more than rebuilding, it's restoring the product to "like-new" condition

Remanufacturing is present in many industries:

HOME
APPLIANCES



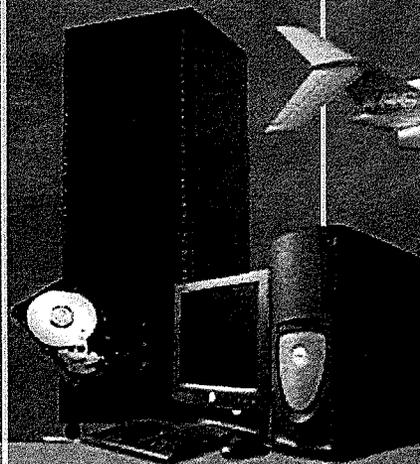
FURNITURE



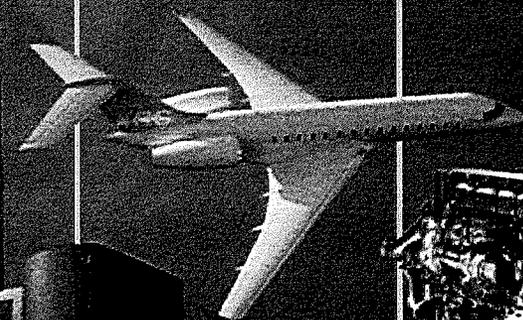
MEDICAL



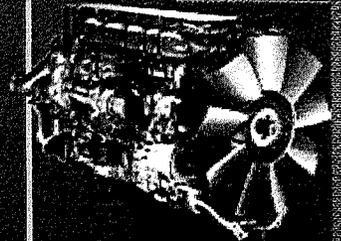
ELECTRONICS



AVIATION



AUTOMOTIVE-
TRUCKING



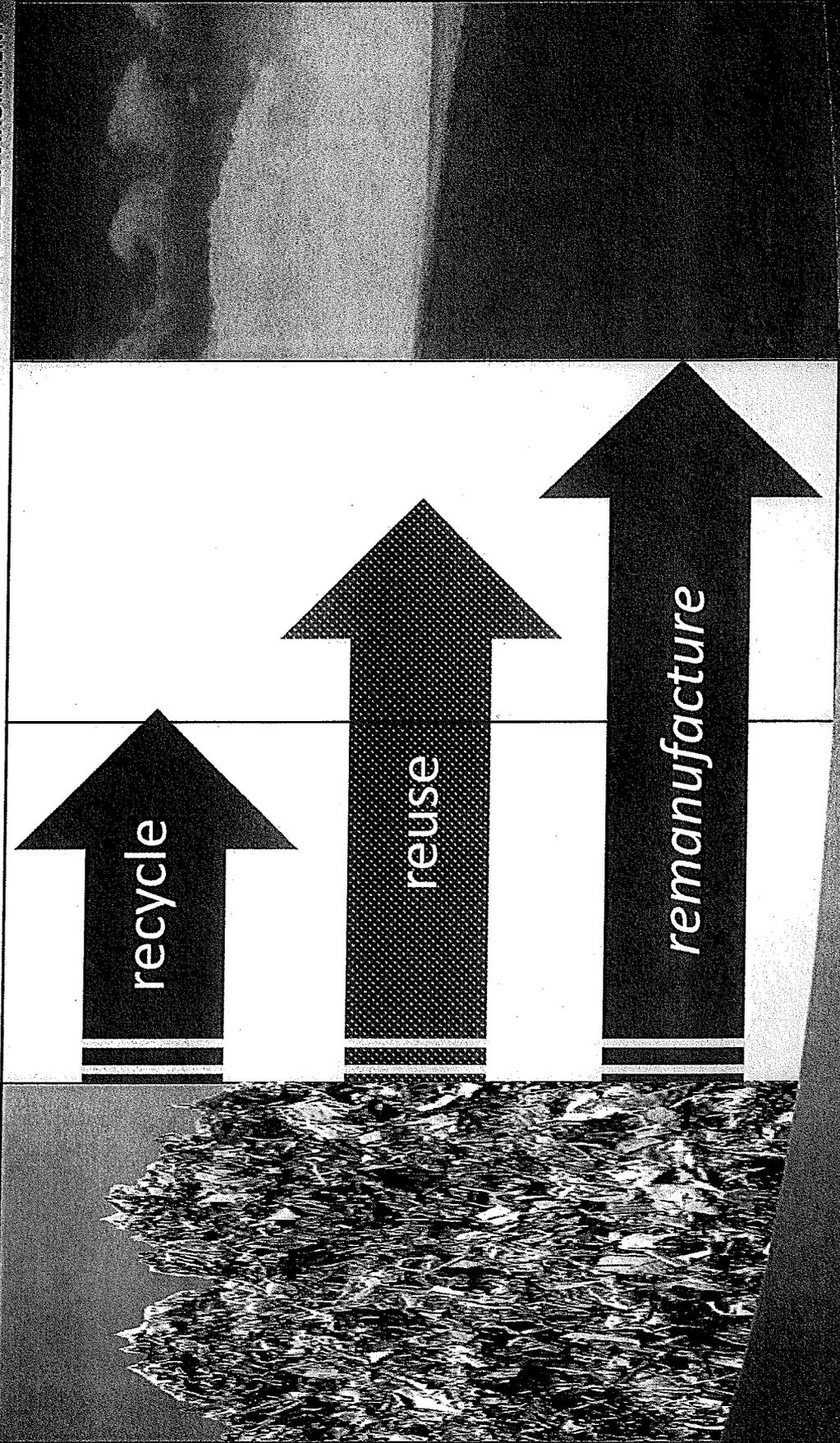
Where does remanufacturing fit in?

DETROIT DIESEL



DISPOSAL

SUSTAINABLE ENVIRONMENT



Why remanufacture?



DETROIT DIESEL

MAKES ENVIRONMENTAL SENSE

- Sustainable
- Responsible Corporate Citizenship
- Minimize Resource Use

MAKES BUSINESS SENSE

- Reduced Costs
- Lower Cost of Ownership
- Profitable Business

Do the right thing because it's the right thing to do!

Environmental Benefits



DETROIT DIESEL

Uses Up to 85% Less Energy

53% CO2 Reduction

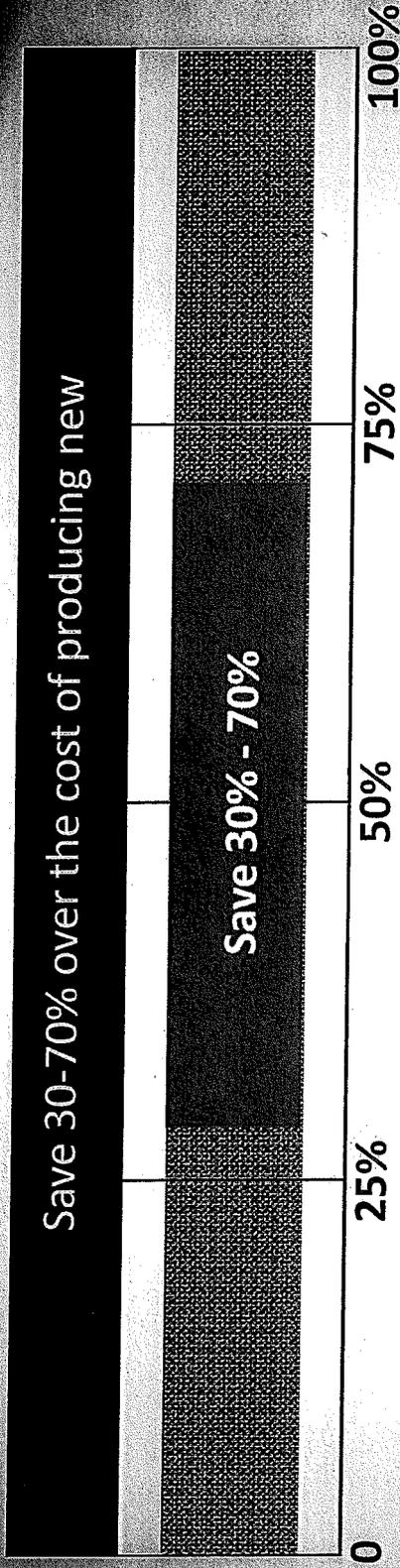
Saves 14 Million Tons of Raw Material per Year

75% Less Landfill Waste

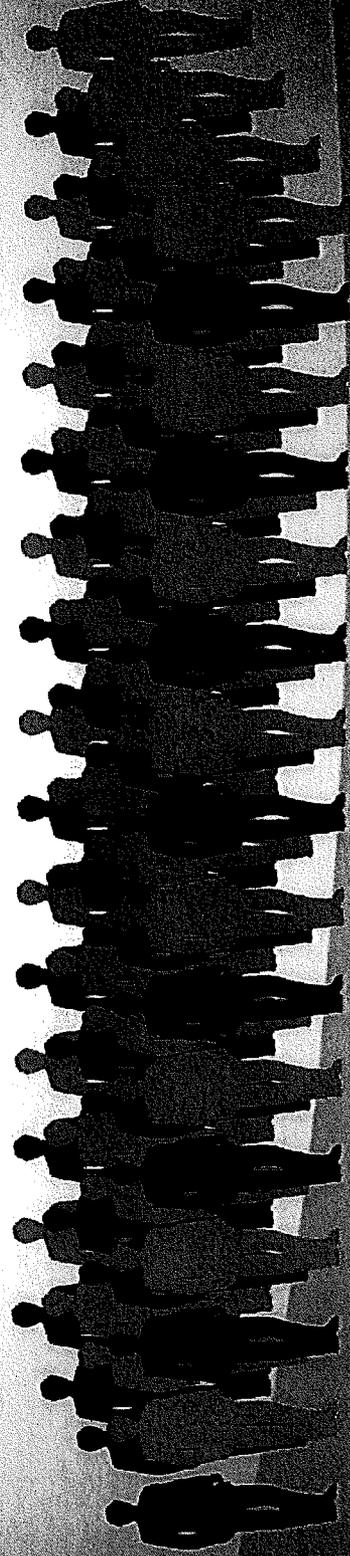
Corporate Benefits



DETROIT DIESEL



- Offers a compelling low cost/high value product
- Profitable business
- U.S. industry employs over 500k workers

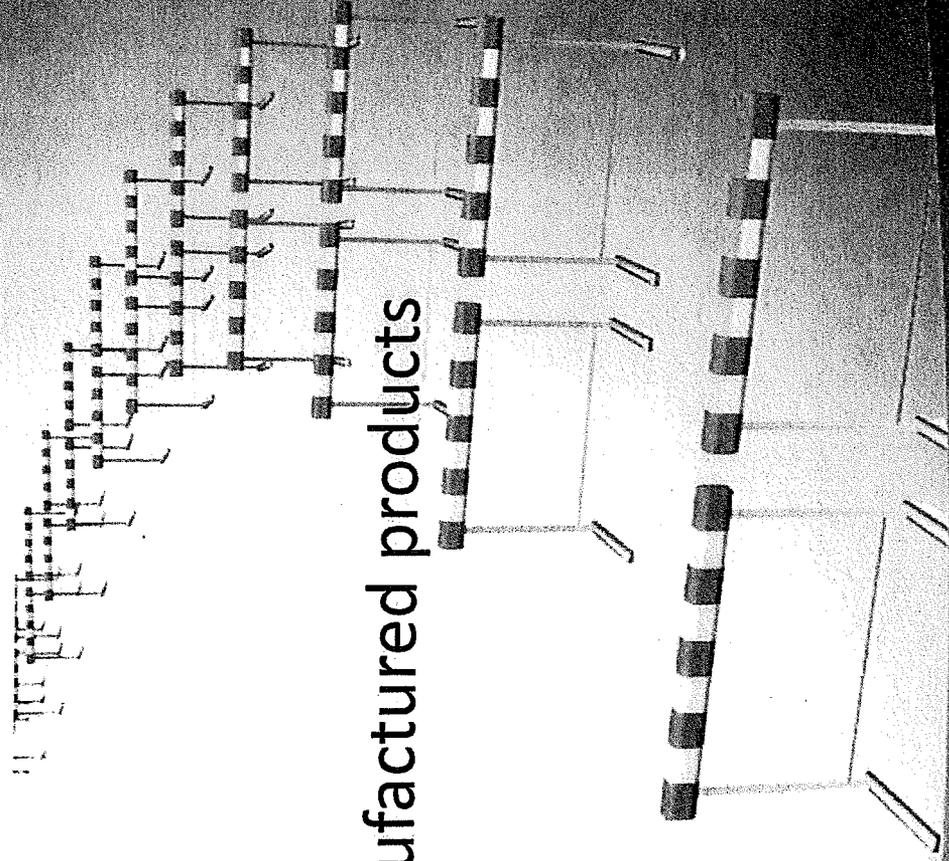


Hurdles



DETROIT DIESEL

- Consumer understanding
- No worldwide standards
- Non-Tariff trade barriers
- Inconsistent use of remanufactured products



Total DDR Employees: 1,366



DETROIT DIESEL

Daimler Trucks North America
(Portland, OR 97217)

DDR-DMR (Hibbing, MN 55746)
91 Employees

NAFSR (Kentwood, MI 49512)
134 Employees

Detroit Diesel Remanufacturing
HQ (Detroit, MI 48239)
21 Employees

DDR East (Byesville, OH 43723)
528 Employees

DDR West (Tooele, UT 84074)
336 Employees

DDR Central (Emporia, KS 66801)
107 Employees

DDR Mexicana (Toluca, Mexico)
149 Employees

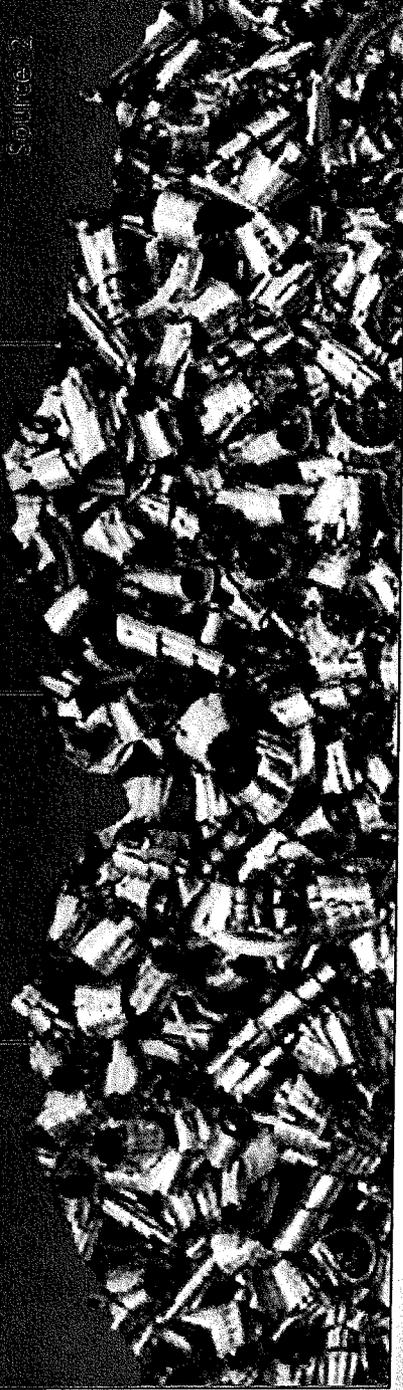
9% headcount increase '09 to '11

Remanufacturing at DDR



In 2010 DDR processed over 25K tons
of core material into finished goods

Source 2



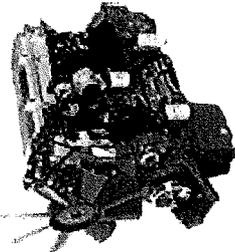
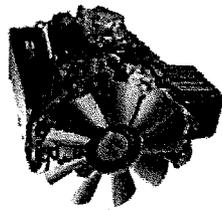
- Sustainable 40 years before it was cool to be “green”

Remanufactured Products

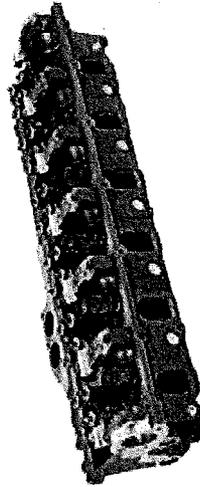


DETROIT DIESEL

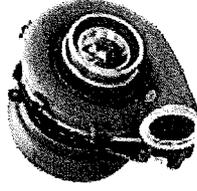
Heavy-Duty Diesel



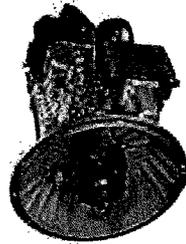
Engine Components



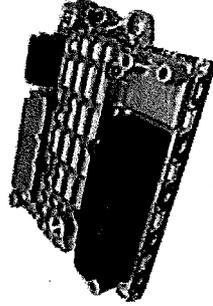
Fuel / Air Systems



Transmissions



Electronics

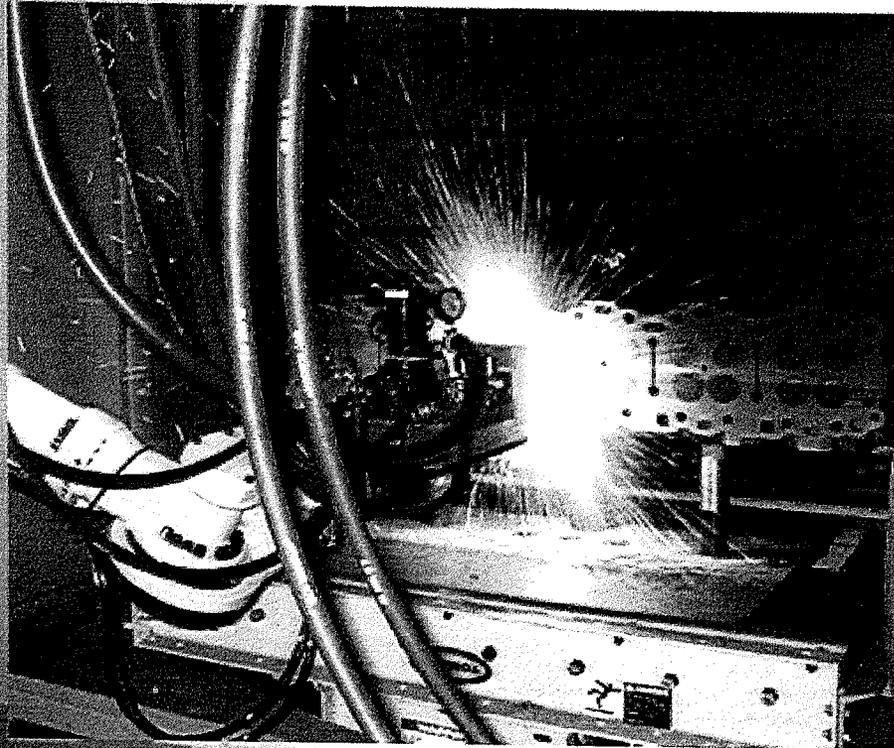


Remanufacturing Process



Not only restores damaged products, but rejuvenates the product to its original blueprint specification while incorporating the current engineering upgrades

BUILD UP / TRANSFORMATION



- The Twin Wire Arc process allows us to rebuild the head surface to meet original equipment specifications
- A robot ensures fine control of the distance from the spray gun to the surface and the speed at which the metal is applied
- For environmental and safety reasons, process is done in an enclosed room with dedicated ventilation and dust collectors

State-of-the-Art Recovery Technologies



Environmentally-Friendly Cleaning

- Diesel Particulate Filter cleaning
- Ultrasonic cleaning

Plasma Transferred Wire Arc

- Coats hard to reach areas to make them look like new

Submerged Arc Welding

- Automated welding process that rebuilds metal in thicker quantities
- Recovers non-wear areas that have incurred damage

Twin Wire Process

- Similar to the powder spray process but uses two wires as the base coating material instead of powder

Supersonic Spray

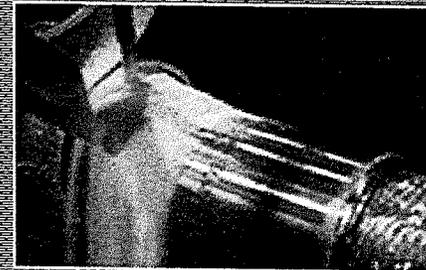
- Used to make cosmetic repairs to aluminum and cast iron



DPF Cleaning



PTWA



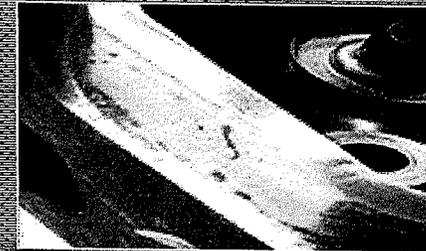
Submerged Arc



Twin Wire Process



Supersonic Spray (aluminum)



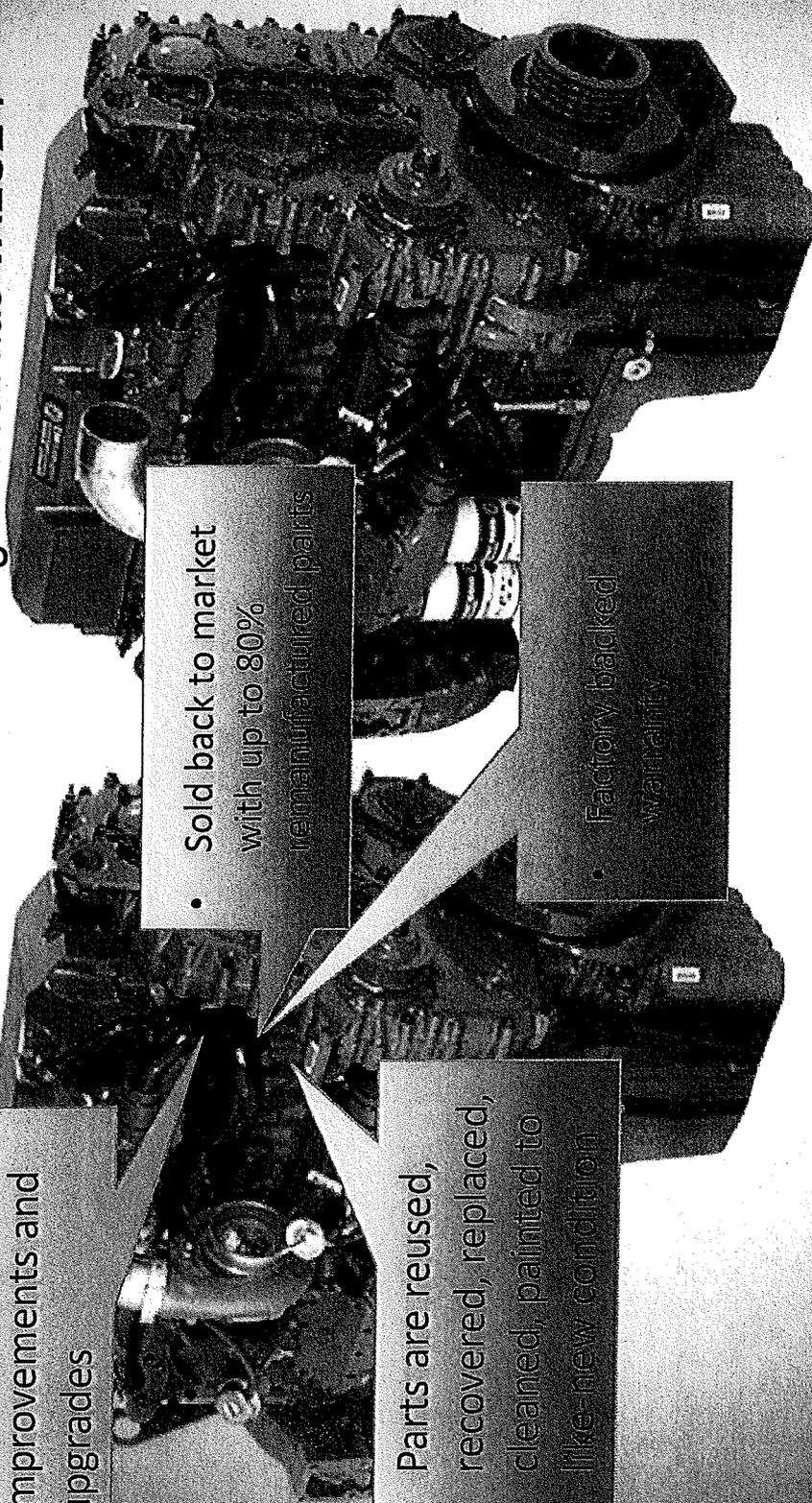
Supersonic Spray (cast iron)

Series 60 REMAN VS NEW



DETROIT DIESEL

- Updated with the latest engineering improvements and upgrades
- Why buy new when you can REUSE something that still has VALUE !



• Sold back to market with up to 80% remanufactured parts

• Factory backed warranty

• Parts are reused, recovered, replaced, cleaned, painted to like-new condition

Reman

New

Sources



Lund, Robert & Hauser, William,
'The Remanufacturing Industry: Anatomy of a Giant'
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