

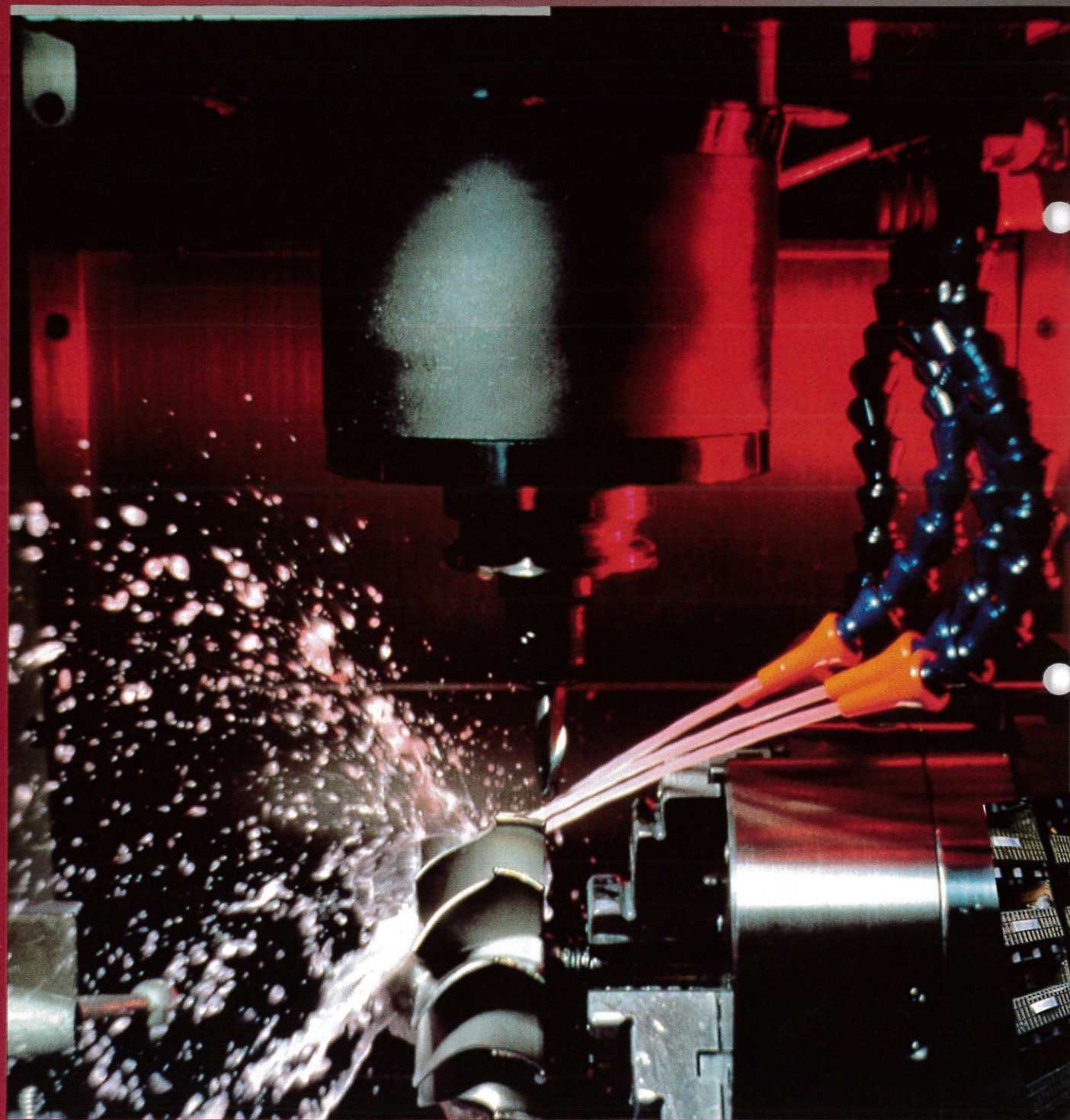
DETROIT DIESEL

Remanufactured Parts



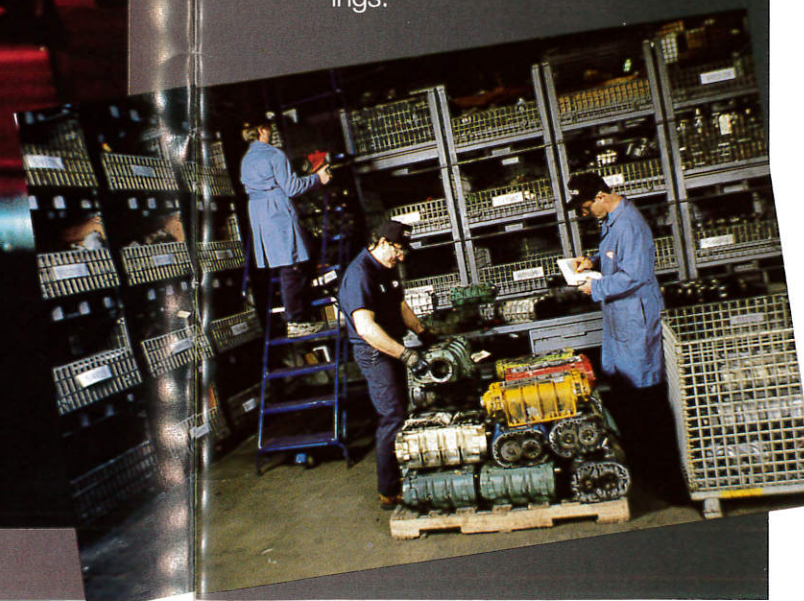
reliabilt





reliabilt® is Detroit Diesel Corporation's trademark for "factory" remanufactured products. The **reliabilt**® reman exchange program exists to help you maximize engine performance while minimizing operating costs. As a user of Detroit Diesel engines, you can take advantage of this program by simply bringing a used assembly to your local Detroit Diesel distributor or authorized dealer and exchange it for a **reliabilt**® assembly. The **reliabilt**® exchange program offers many distinct advantages over any other rebuild option:

- Our quick, visual core inspection makes it easy to determine core credit immediately, avoiding the threat of unpleasant charge-backs.
- Downtime is kept to a minimum since **reliabilt**® products are in stock, ready to install.
- When you purchase a **reliabilt**® product, you're assured of factory quality at substantial savings.

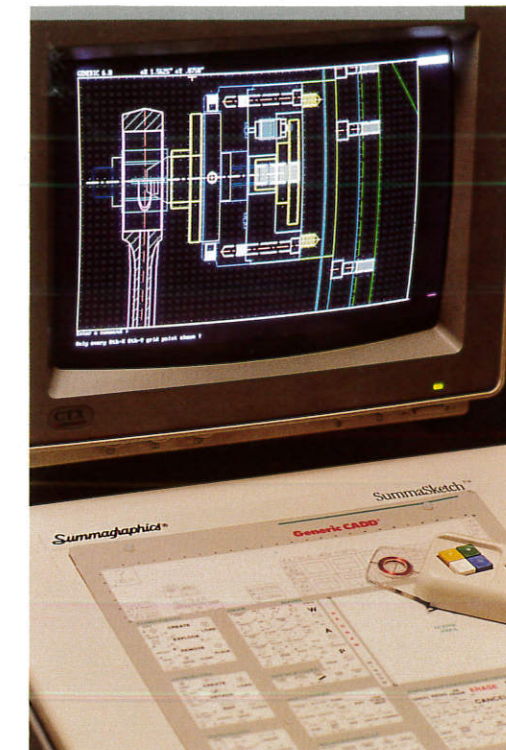


Detroit Diesel Remanufacturing Corporation, a subsidiary of Detroit Diesel, operates four facilities which remanufacture **reliabilt**® products for sale through the Detroit Diesel distributor and dealer network throughout the world.

Each **reliabilt**® center builds to the same specification using common process controls and equipment. The result is a consistent, high performance product.

Only **reliabilt**® products possess these unique features:

- Remanufactured to *current* Detroit Diesel **reliabilt**® specifications.
- Updated with the latest factory modifications for durability, reliability, fuel consumption, emissions and overall performance.
- Audited by Detroit Diesel for quality standard compliance
- Warranted for 12 months at any authorized Detroit Diesel in the world.



Factory Support

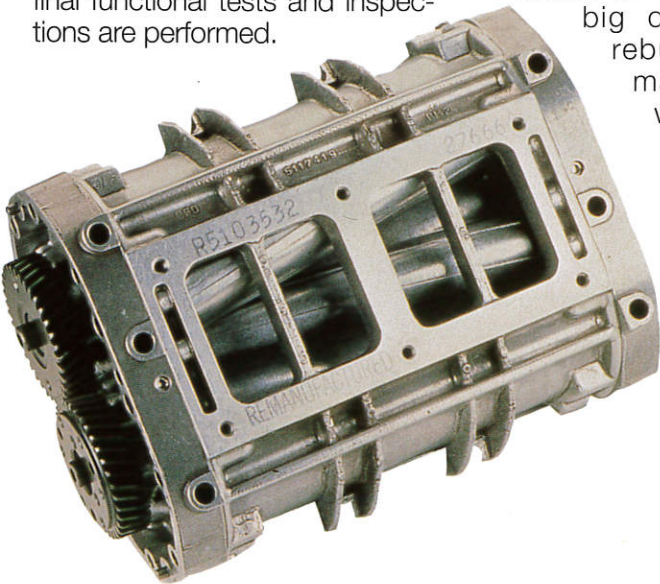
One thing that only the OEM can supply is true factory support for your specific performance issues. If you are experiencing performance problems, our staff will analyze the situation and recommend solutions. One of our primary goals is to help you accomplish your goals...not just sell parts. Only the original manufacturer has benefit of the latest design changes and technological innovations which may be used to enhance the overall performance of older engines.

reliabilt® Products **Offer the Best in** **Quality, Value and** **Performance**

While the words are often used interchangeably, there are many distinct differences in rebuilt, remanufactured and **reliabilt®** products.

The purpose of rebuilding is to restore the functionality of a component...that is, make it work again. Rebuilding generally involves identifying the failed item, replacing or fixing the failed item, and re-assembling the part. Since many of the constituent parts are not replaced or requalified, the end result is a product that has an unpredictable service life with uncertain performance.

In the case of remanufacturing, the part is completely disassembled. Each constituent part is cleaned, inspected, tested and requalified. Wear items are replaced with new parts and salvageable items are restored to specification. Updates and specification modifications are incorporated in the assembly. The component is reassembled and final functional tests and inspections are performed.



reliabilt® goes beyond the remanufacturing process to offer you optimum performance and more value for your money. While the **reliabilt®** process closely parallels the remanufacturing process, there are some distinctive differences in **reliabilt®** products.

- No other remanufacturer has access to current Detroit Diesel specifications or insight into ongoing product modifications.
- No other remanufacturer has ongoing dialogue and direction from Detroit Diesel.
- No other remanufacturer has their products subjected to Detroit Diesel engineering quality audits to ensure compliance to Detroit Diesel specifications.
- When parts are replaced, we use only genuine Detroit Diesel replacement parts.
- When cores are received with non-genuine parts content, the non-genuine parts are scrapped and destroyed.

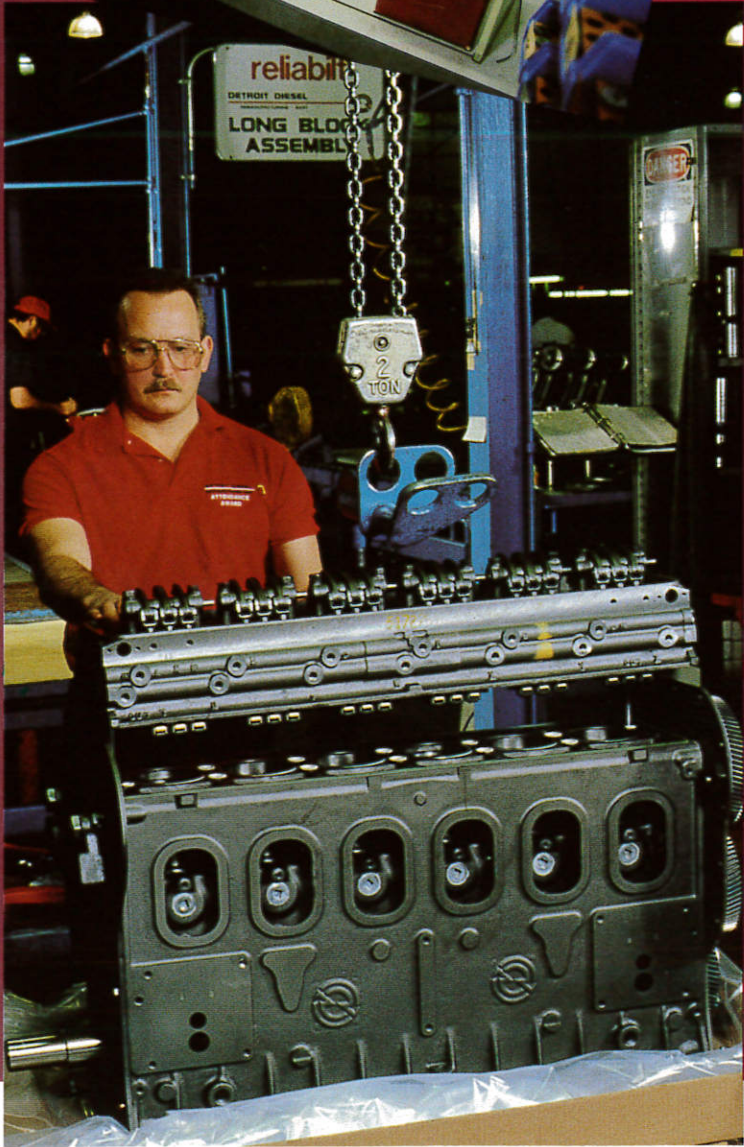
Our main goal in remanufacturing **reliabilt®** parts is to restore useful service life and latest performance levels for the product...a big difference from the rebuilder's objective of making a component work again.



The reliabilt® **Product Line**

The following **reliabilt®** products are available through authorized Detroit Diesel outlets:

- Air compressors (Series 60)
- Cam followers
- Connecting rods
- Cylinder heads
- Starters and alternators
- Electronic control modules
- Engines
- Fuel pumps
- Injectors
- Rocker arms
- Turbochargers
- Blowers
- Camshafts
- Crankshafts
- Cylinder kits (Series 60)
- End bearings
- Governors
- Long blocks
- Oil pumps
- Vibration dampers
- Water pumps
- Bull gears
- Oil cooler cores



Cylinder Heads

Cylinder heads are available in several configurations. *We will not sell a welded or plugged head.* Welding cannot be done properly on a consistent basis, and therefore, the performance of welded heads is unreliable. A cracked cylinder head is typically the result of an overheat, so there is an excellent possibility the head may be damaged in areas other than the visible crack. A welded head may have defects uncorrected by, or even caused by, the welding process. For example, restricted water passages or expansion slots filled with weld. Plugging is equally risky. The damaged area is only patched and no bonding of the metal takes place. Plugging will typically result in excessive installation stresses (known as stress risers) which lead to further head cracking.

Welded and plugged heads are not worth the risk. A few dollars saved can be quickly eaten away with further downtime and excessive repair costs.

reliabilt® heads are offered in a number of different configurations. The product that is right for you will depend on your head casting and your engine application. The standard offering is the **reliabilt®** head assembly which requires that your core head casting be free of cracks.

reliabilt® Head Assembly

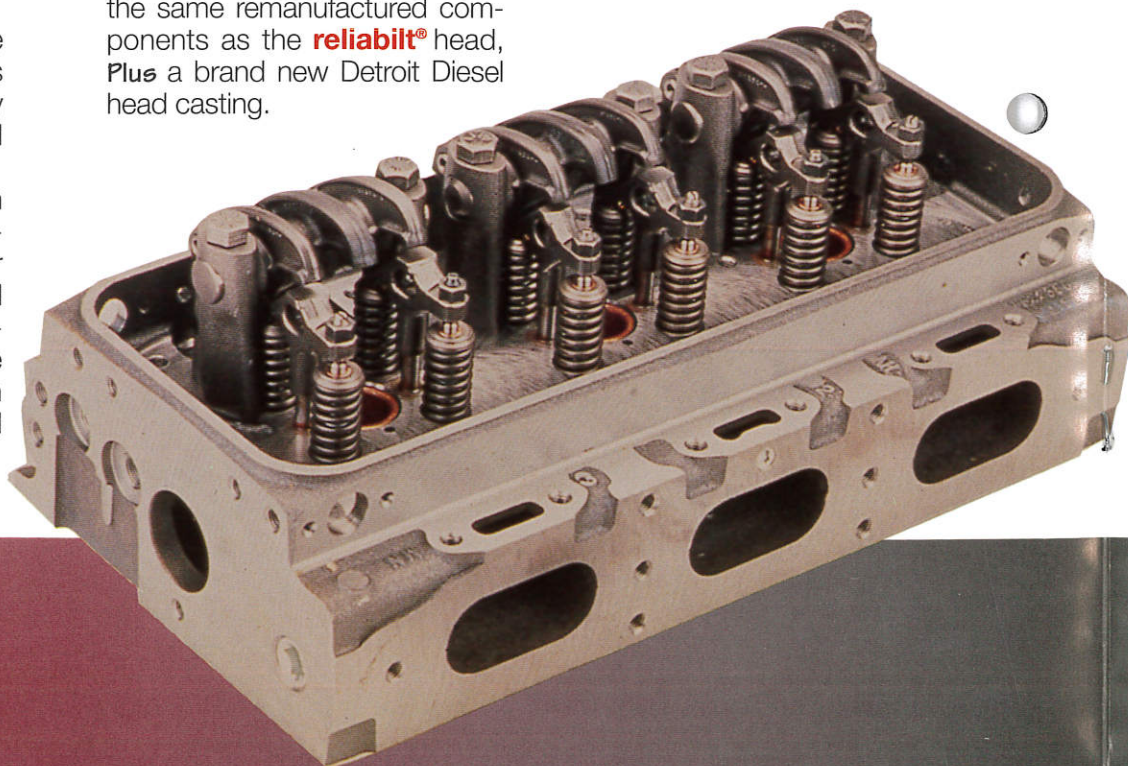
All **reliabilt®** cylinder heads start with a good casting which meets Detroit Diesel factory specs.

- The **reliabilt®** head is complete with valves, cam followers, valve seals and rocker arms.
- The casting is "experienced" but free of cracks and within Detroit Diesel specifications.
- All valves, springs, cam followers and rocker arms are requalified, remanufactured or replaced with new.

To avoid an unacceptable core charge, your head core must be free of cracks. If your head casting is cracked, the **reliabilt® Plus** head assembly is your best value.

reliabilt® Plus Head Assembly

- The **reliabilt® Plus** head features the same remanufactured components as the **reliabilt®** head, **Plus** a brand new Detroit Diesel head casting.

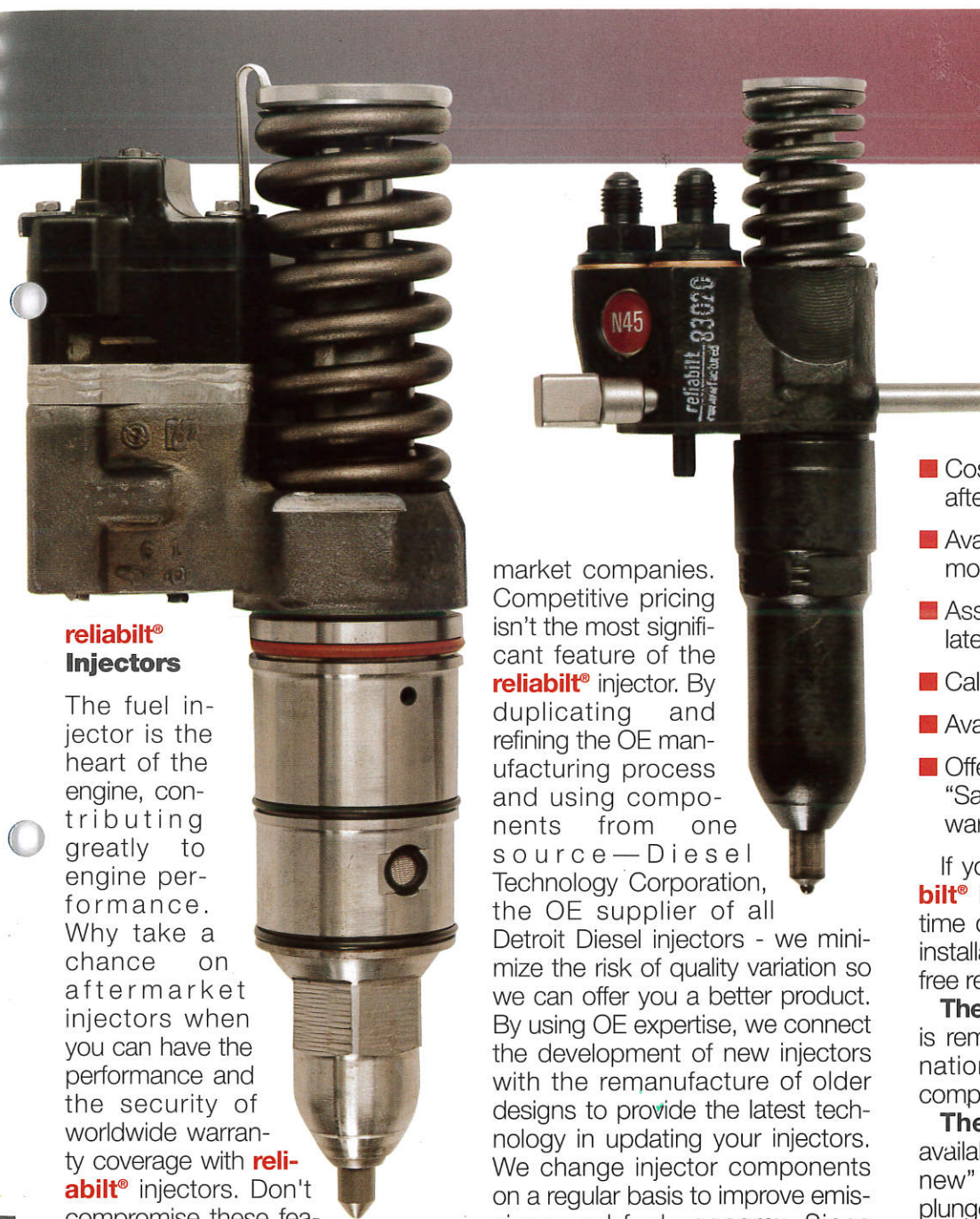


With the **reliabilt® Plus** head assembly, any condition head core is acceptable providing there are no missing parts.

Other cylinder head options include a **reliabilt® Plus** valve and spring head, a **reliabilt®** Bus and Coach head with cross drilled rocker shafts and wide rib rocker arms, and a **reliabilt® Plus** Premium Series Marine head.

While the **reliabilt®** Premium Series Marine head was created for the demanding duty cycle of a marine engine, it is available for all applications. The Premium Series head includes:

- New casting**
- New springs**
- New valve seals**
- New style injector rocker arms**
- New cross drilled rocker shafts**
- New valves**



reliabilt® Injectors

The fuel injector is the heart of the engine, contributing greatly to engine performance. Why take a chance on aftermarket injectors when you can have the performance and the security of worldwide warranty coverage with **reliabilt®** injectors. Don't compromise these features to save a couple of dollars. If you haven't tried **reliabilt®** injectors lately, give us a shot...you'll be glad you did.

By dealing with large volumes (60,000 injectors per month), we gain process efficiency to be cost competitive with any of the after-

market companies. Competitive pricing isn't the most significant feature of the **reliabilt®** injector. By duplicating and refining the OE manufacturing process and using components from one source—Detroit Diesel Technology Corporation, the OE supplier of all Detroit Diesel injectors - we minimize the risk of quality variation so we can offer you a better product. By using OE expertise, we connect the development of new injectors with the remanufacture of older designs to provide the latest technology in updating your injectors. We change injector components on a regular basis to improve emissions and fuel economy. Since duty cycles and performance demands vary by application, we offer fuel injectors to meet every requirement.

All reliabilt® injectors are:

- Built with 100% genuine replacement parts

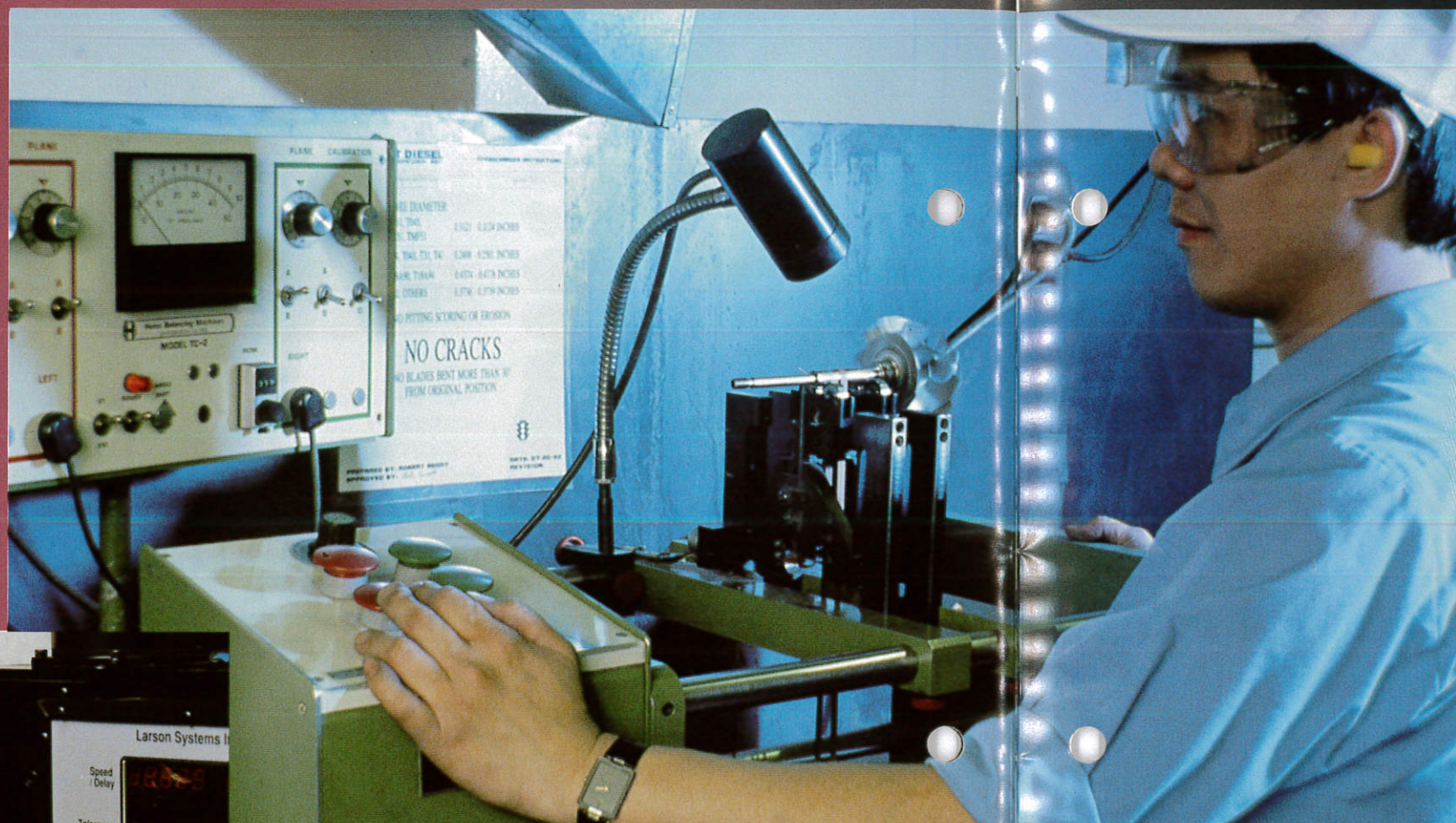
- Cost competitive with any of the aftermarket companies
- Available with the latest design modifications
- Assembled and tested to the latest factory specifications
- Calibrated at full rack and at idle
- Available in matched sets
- Offered with our exclusive "Satisfaction Guaranteed" warranty

If you are unhappy with a **reliabilt®** injector performance at any time during the first year following installation, return the injector for a free replacement.

The standard reliabilt® injector is remanufactured using a combination of experienced and new components.

The reliabilt® Plus injector is available with either a "guaranteed new" spray tip or new spray tip, plunger and matched bushing.

The reliabilt® Plus Premium Series Marine Injector includes a new spray tip, plunger and bushing, check valve, valve spring and seat and plunger spring. All premium Series injectors are output matched.



reliabilt® Water Pumps

Most water pumps are available with two different seal options...the conventional carbon seal and the unitized seal.

The carbon seal pump core will be accepted when upgrading to the unitized seal pump.

The older style Gitts pump is automatically upgraded to newer standards.

Water pumps are supplied with appropriate mounting gaskets and seals (except Series 149).

reliabilt® Turbochargers

All turbochargers are completely remanufactured to exacting OE specifications.

Both the turbine and compressor wheels are balanced separately and together. Radial and axial endplay are checked to ensure compliance to critical tolerances.

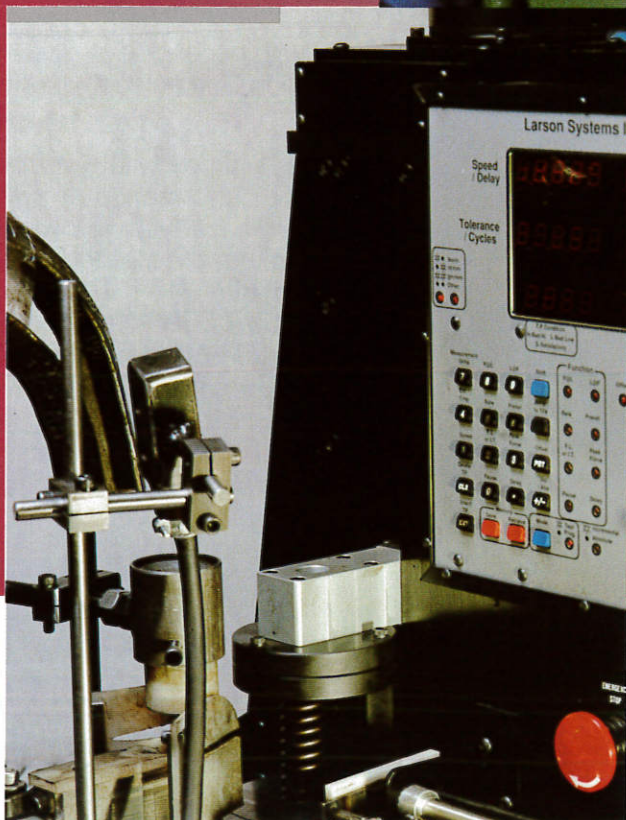
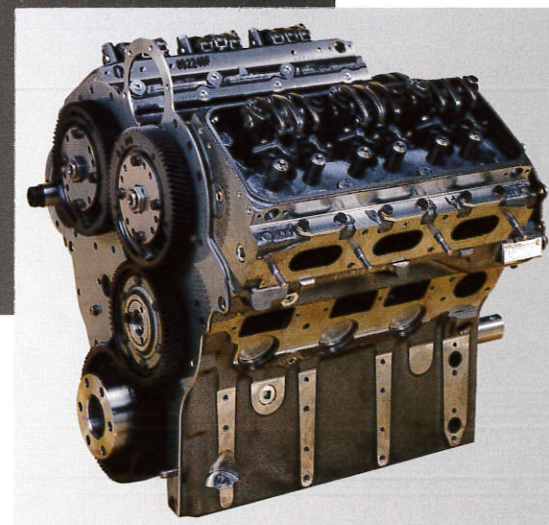
Conversion programs are available for customers who wish to upgrade to a different turbocharger type.

reliabilt® Long Blocks

Long blocks are available for all engine types except Series 149. The **reliabilt®** long block includes the following items:

- Cylinder block
- Gear train
- Cylinder kits
- Rear end plate
- Crankshaft (.020 max)
- Camshaft(s)
- Front cam weights
- Oil pump drive gear (53 Series only)
- Cylinder heads with operating mechanism

Best of all, the **reliabilt®** long block is offered with a no-hassle core acceptance program. If there is no visible damage and the long block is assembled, the core is acceptable. If the core does have visual damage, there is a reasonable flat fee to get the engine running again.





reliabilt® Crankshafts

The **reliabilt®** crankshaft is unlike any other reground crankshaft available today. There are many distinctive features that position the **reliabilt®** crankshaft program above all others.

reliabilt® crankshafts are available standard through .020 under-size. The price you pay is predicated on the size ordered, not the size of the core returned.

reliabilt® cranks are sold as kits, complete with rod bearings, main bearings and thrust washers.

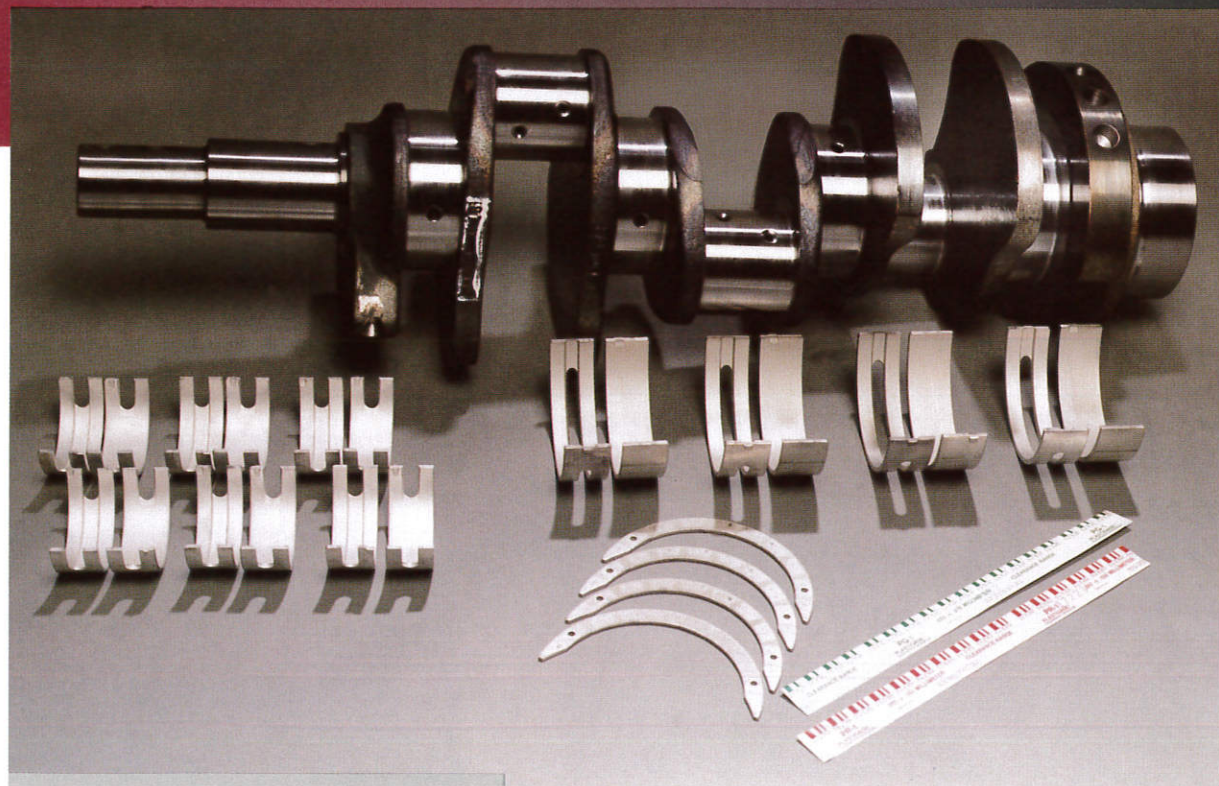
All **reliabilt®** crankshaft rear seal areas are brought back to standard, eliminating the need for wear sleeves and oversize seals.

reliabilt® cranks have an innovative core acceptance policy which allows the core to be qualified with a visual inspection — no measuring, no magnafluxing.

All **reliabilt®** crankshafts are subjected to a rigorous battery of tests

on our coordinate measuring machine (CMM). In addition to measuring journal size and taper, the CMM validates fillet radii, parallelism, stroke and timing.

The fillet radius must be maintained to precise blueprint specification. A slight variance could create a stress riser at the journal edge and lead to catastrophic engine failure. Crankshaft parallelism, stroke and timing contribute to power, emission compliance and fuel economy. Failure to validate critical crankshaft dimensions after reground may create a phantom performance problem that could be chased at considerable expense.



reliabilt® Engine Assemblies

reliabilt® engines are completely remanufactured, dynamometer tested, painted and ready for installation. The **reliabilt®** engine program features our liberal, no-hassle core acceptance program. If your engine core passes a visual inspection, the core is acceptable and you will not be billed for internal damage. If the core fails, a reasonable unacceptable core charge is all you pay to cover damage.

The **reliabilt®** engine warranty coverage can't be beat. The standard warranty is one year / 100,000 miles honored at any authorized Detroit Diesel outlet in the world. An 800 number for 24 hour emergency service is affixed to every **reliabilt®** engine. This number will put you in touch with the closest authorized service outlet, 24 hours a day.

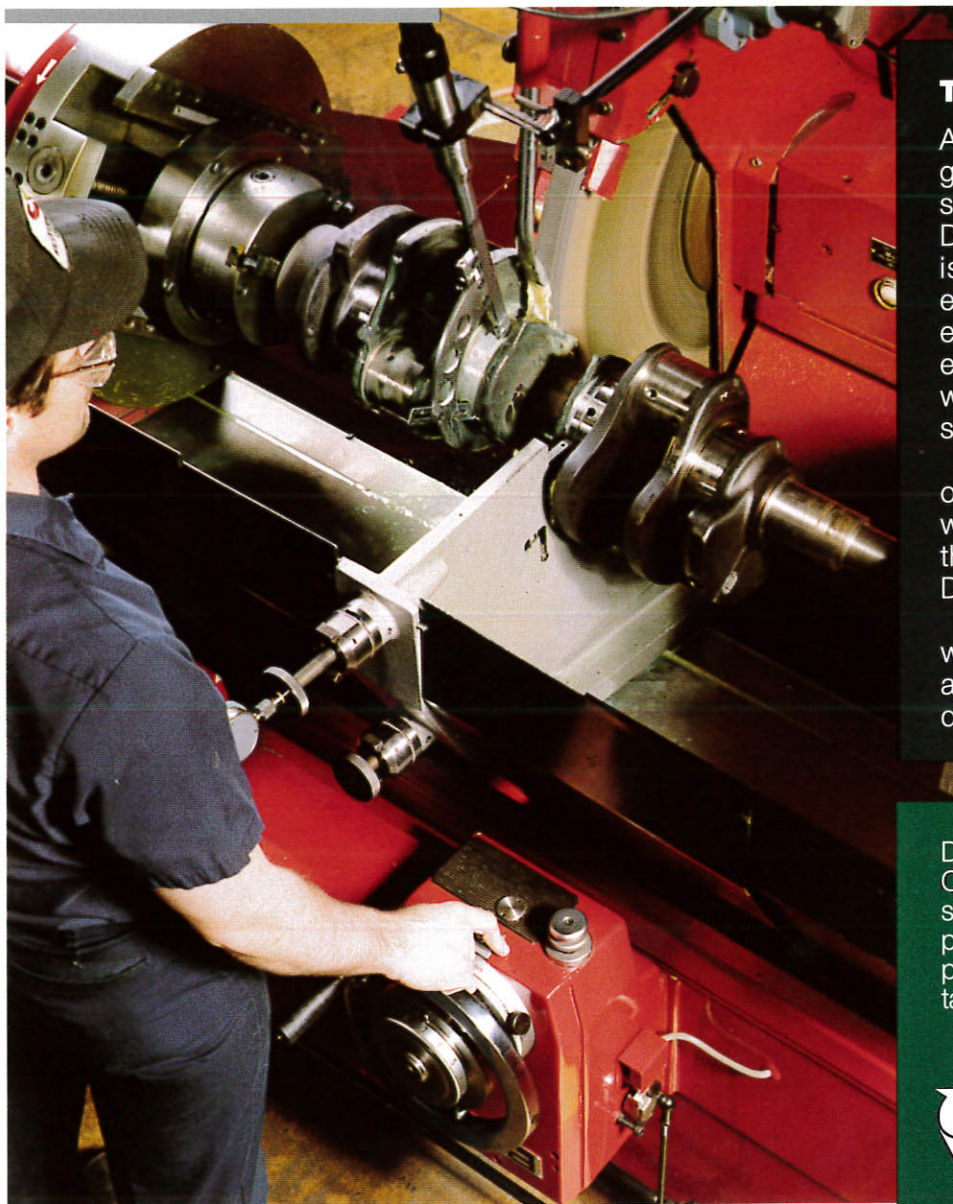
Extended warranty programs are also available. Several options ranging from two years to five years are available for most engine applications.

reliabilt®



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The **reliabilt**® Warranty

A product warranty is only as good as the company who stands behind it. Our goal at Detroit Diesel Remanufacturing is to build a product that exceeds your performance expectations. In the unlikely event you need to exercise your warranty, you'll receive the best support in the industry.

All **reliabilt**® products carry a one year, unlimited miles/hours warranty, honored throughout the world at authorized Detroit Diesel outlets.

A full description of the warranty is available through an authorized Detroit Diesel distributor.

Detroit Diesel Remanufacturing Corporation is an environmentally sensitive company, employing production methods and cleaning processes which are environmentally friendly. We fully comply with all



environmental operating criteria. Recycle your Detroit Diesel parts through any authorized Detroit Diesel outlet.

DETROIT DIESEL
CORPORATION



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