



**IPD Products for Caterpillar®  
C9 ENGINES**

**Your Local IPD Dealer**



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**The Standard for Quality, Innovation, Service and Support Since 1955**



# IPD...A SAFE AND SECURE INVESTMENT

Since 1955, IPD has lowered the cost of repairing engines without sacrificing quality, engine life or performance by providing cost effective quality products. Our product line covers a wide range of parts for diesel and gas engines.

IPD recognizes the importance of repairing engines with quality products. These products are a smart investment and a source of revenue for mechanics, and we use only quality materials. We use only quality materials and with over 55 years of manufacturing experience, our extensive QC process ensures that all products pass our high quality standards before being shipped to customers. Additionally, our comprehensive and clearly worded warranties give our customers peace of mind when purchasing IPD products. They know they are protected.

IPD is ISO9001:2008 certified by Lloyd's Register®, a respected worldwide organization for high standards of technical competence, impartiality and independence. Being ISO9001:2008 certified provides our customers the assurance of consistent compliance and processes. The extent to which IPD has developed its ISO process and made it a part of virtually every aspect of IPD is an uncommon practice in most companies in the automotive industry.

Read more about IPD quality and differentiation at [www.ipdparts.com](http://www.ipdparts.com). Thank you for the time to view this document. We appreciate the opportunity to prove to you what truly sets us apart from our competition.

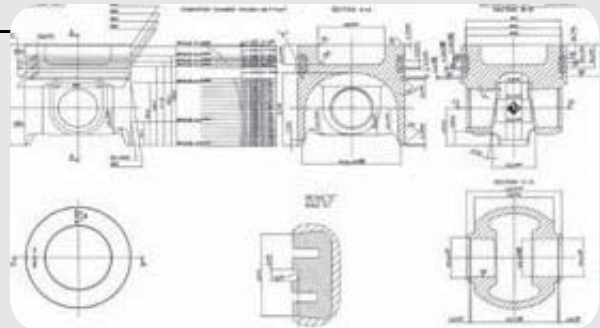


# SUPERIOR QUALITY CONTROL

IPD is known industry-wide for  quality parts and excellent service. Our goal is to create consistent and positive interactions with our distributors and their customers from start to finish  as well as offering reliable support after the sale. This starts by manufacturing IPD brand parts from high quality materials, ensuring that each part has the correct specification and tolerances  and has gone through a rigorous quality control process. Our attention to detail and quality truly makes IPD stand out from our competition. Listed below are just a few examples of how IPD ensures quality control  and takes the necessary steps to produce top of the line product .

## HOW OUR QC PROCESS WORKS

We produce our products from concept to execution. Our process begins with a drawing   ensures the verification of exact specifications and tolerances  as shown in a sample drawing of an inspection of a natural gas application piston.



Quality control of all IPD aluminum diesel and natural gas pistons includes ultrasonic bond and critical dimension checks through the use of CMM and hand measuring equipment.

Cylinder liner dimensional control includes dozens of critical specifications, including inside and outside dimensions, flange specifications  and o-ring groove size checks, which is accomplished through tools such as a CMM, height gauge, hardness testor  and surface analyzer.



Valve  guides, seats and springs are all critical items in heavy duty engines that require extra care. Our valve inspection program includes checking vital measurements such as valve angles  not to mention the critical metallurgies used today.

Shown here is our in-house tangential piston ring tension tester.



# SUPERIOR ENGINEERING INNOVATION

## IPDSTEEL™

Piston technology has evolved significantly to meet increased cylinder emissions requirements. IPD Steel™, through its advanced design and materials, specifications and designs are increasingly critical for proper engine life and performance. Since 2003, IPD has manufactured steel pistons in various sizes and provided product for thousands of engines in many vocations, applications and markets worldwide.

IPD began in the late 1990's working with world-class casting experts as well as independent metallurgy specialists to continue to evolve IPDSteel™ technology and apply it to various applications. After the concept and designs were run through a variety of casting experts including independent metallurgical evaluations, IPD subcontracted an independent company specialized in testing cylinder power components as well as utilizing extensive field testing to ensure exceptional IPDSteel™ technology.



How it works: Utilizing modern casting processes when controlled properly along with the correct metallurgy and heat treating, offers increased performance over previous designs and methods.

Our process begins with a base metallurgy which includes 4130 strength alloy steel to control the carbon content of the material. This steel when heated properly has high strength qualities and controls brittleness assuring our rigid quality standards are adhered to.

Our process continues with a high quality investment casting using the lost wax process. The process is tightly controlled throughout to assure a high integrity casting.

X-ray diagnosis was utilized in the development process to assure casting integrity and ongoing sampling of castings assures our rigid quality standards.

# SUPERIOR PERFORMANCE

## VALVE TRAIN

At IPD, our valve train products offer customers a safe and cost effective alternative. Our valve train product is developed from materials specifically designed for heavy-duty applications and not from automotive grade materials—a common aftermarket industry practice. IPD puts quality first, which gives our customers the assurance that they are not exposing their equipment to risk that could potentially decrease cylinder head life expectancy. Our valve guides maintain uniformed dimensions, knurling and tight tolerances to achieve maximum valve cooling and oil control, as well as valve springs made from the highest quality steel, correct tensions and shot-penned for strength and long service life.



## IPD GASKET MATERIALS AND TECHNOLOGY



The quality of our materials at IPD defines our gasket program. Many aftermarket gasket manufacturers compromise the quality of their gaskets by using materials not intended to work under the extreme conditions that most diesel and natural gas engines are subject to. These lighter duty materials lead to reduced sealing capability or in more extreme cases, lower engine performance and engine life.

IPD uses the latest materials and verifies through a rigorous QC process that each part number receives the correct material specification for the application. Critical tests and measurements are applied to all of our gasket materials to assure that there are no performance issues. These include:

### Creep Relaxation

This indicates the ability of a material to retain its original bolt torque specification after exposure to stress.

### Crush Resistance Density

Crushing or extrusion can occur when compressive forces exceed the point where the gasket materials pore volume is zero, resulting in leakage.

### Tensile Strength

This is a measurement of the materials resistance to blow out when used in high pressure or high torque applications.

# SUPERIOR SOLUTIONS

## IPD GASKET PROGRAM

We realize that demands can differ between markets or applications, so we offer two distinct gasket systems:

### Modular "Original Style" Multiple Sets

These sets are based on the same multiple groups that you might be accustomed to from the OEM. They are specific to an engine arrangement, or a close grouping of arrangements, and serial numbers. Many times when ordering the Modular Original Style multiple sets, you must order multiple part numbers (possibly up to 8 or 9 or more) to rebuild your engine, they are items commonly replaced or needed to reinstall a component. IPD offers a unique and custom solution to alleviate these issues.

### IPDStyle 123™ Consolidated Sets



For years, IPD customers complained of the difficulty of ordering, shipping, and inventorying original style multiple sets. In the late 1980's, IPD developed and customized our special sets to:

- Reduce IPD distributor's and rebuilder's inventory by consolidating a wider range of serial and arrangements than was possible with the original style multiple sets.
- Reduce the time to order and stock many different multiple style sets in order to cover a wider range of equipment and engines.
- Packaging IPDStyle 123™ with individual groupings based on the engine component, or the location of the gaskets on the engines, in easy to identify bags.
- Marking all gaskets and O-rings clearly with the part numbers for easy identification, reducing engine technician's time to find the proper part.
- IPDStyle 123™ sets are designed from the ground up with help from our customers that rebuild these engines. Do not confuse these with other companies that simply put all the multiple sets into one box, and call it consolidated, which lack critical items or duplicating pieces.









# IPD C9 PRODUCT LINE

IPD provides cost effective quality without risk to engine life or performance. Listed below are a few product highlights of the IPD C9 series product line.

## IPDSteel™ Pistons

IPDSteel™ articulated two piece piston crowns for C9 engines are manufactured with a Patented heat treated steel casting for high strength, durability, heat and wear resistance, and dimensionally stability under conditions of high heat and pressure. The finished design provides excellent overall thermal transfer between the piston crown and cooling system of the engine for exceptional performance.

## Main and Rod Bearings

IPD main and rod bearings for “extreme” C9 engine applications feature a bi-metal design with a copper/lead alloy and steel for strength, durability, and performance. In addition to fatigue strength, this design provides resistance against wear, seizure, corrosion, and cavitation, and also imparts excellent conformability and embedability.

## Gaskets and Gasket Kits

IPD uses premium materials designed for heavy duty industrial engine applications. Rocker cover base seals are made of molded rubber with metal inserts. And, for selected applications, composite type oil pan seals come with integrated metal inserts.

## Piston Pin

IPD piston pins are manufactured from a hardened chromium, molybdenum, and nickel alloy steel to produce excellent tensile strength and wear resistance.

## Cylinder Liners

IPD cylinder liners are induction hardened for improved wear resistance and strength.

## Valve Train Components (available August 2011)

For C9 engines, the intake valve heads are made of a chrome-nickel alloy, which provide excellent high temperature strength, hardness and corrosion resistance. This high quality, heat-treated material includes Stellite™ facing, a corrosion and wear resistant cobalt-chromium alloy. The intake valve stems are made of a high chromium alloy that provides excellent corrosion resistance, and resistance to stress corrosion cracking. The exhaust valves are made of a special high performance nickel-chromium “super alloy” that is designed for very high temperature strength (in the 1,600°F range), while providing excellent corrosion resistance. The exhaust valve stems feature chromium, molybdenum, & manganese low-alloy type steel designed for torsional and fatigue strength, and durability.



IPD brand quality products distributed by:



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