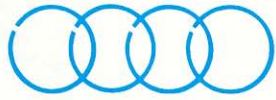




PARTS PRO CLASSIC

CLASSIC EDITION #6

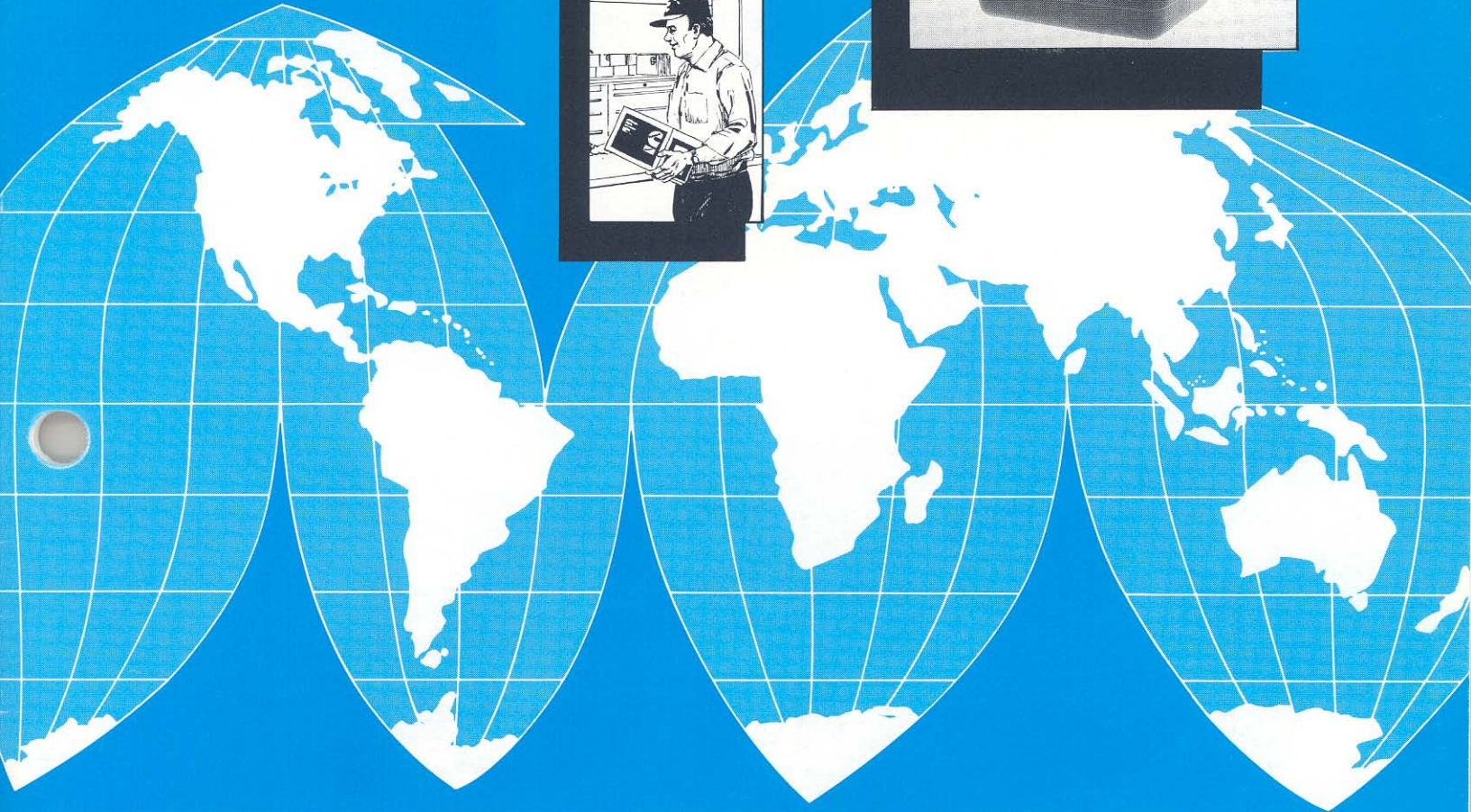
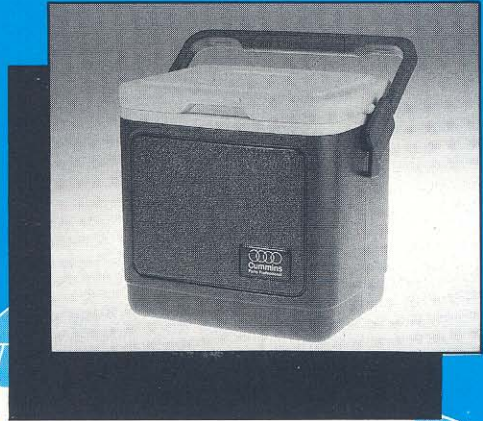
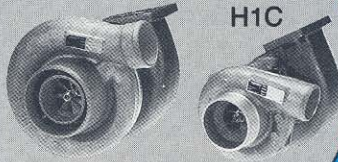
Parts Pro Classic is provided as a historical reference. Special offers, prizes and awards no longer apply to this edition. Current Parts Pro issues along with all Parts Pro Classics may be found at [click\) qsol.cummins.com](http://qsol.cummins.com).



Cummins
Parts Professional

H1E

H1C



**parts
professional**

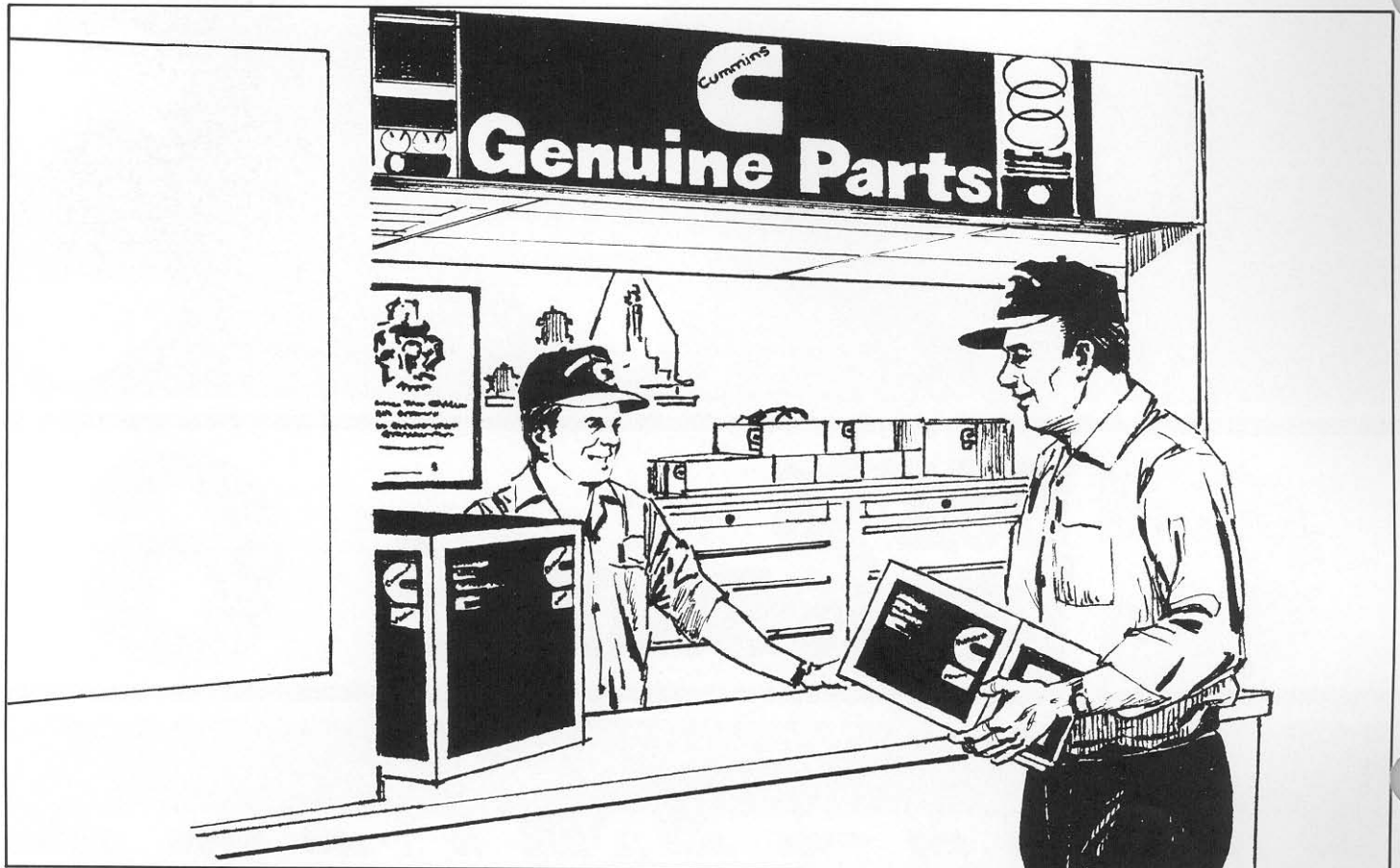
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INVEST IN THE BEST

NOTICE FROM THE EDITORS

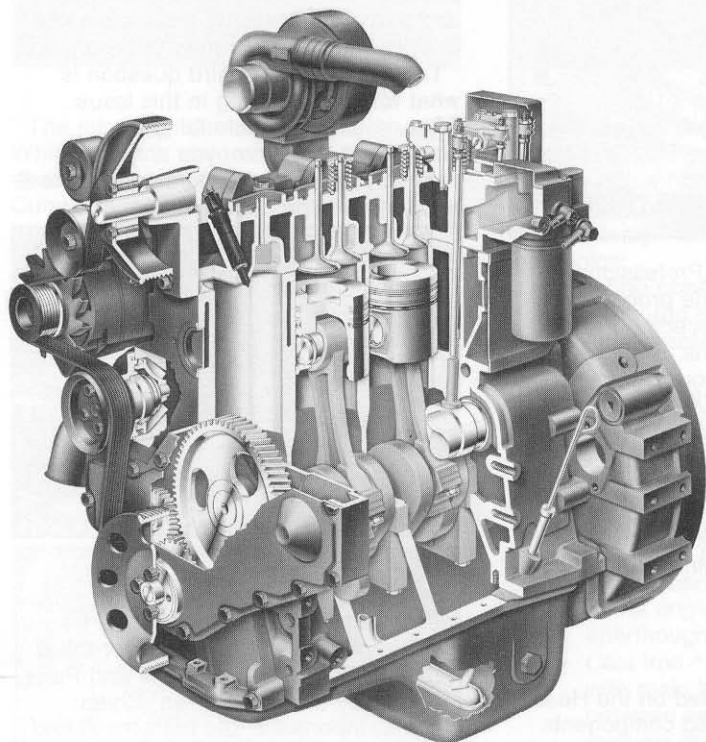
This booklet has been re-published only as a reference for engine and parts theory. Please be advised that part number and specifications information contained in this publication may be obsolete.

Please refer to the Superseding Parts List or other current references for correct Part Numbers.

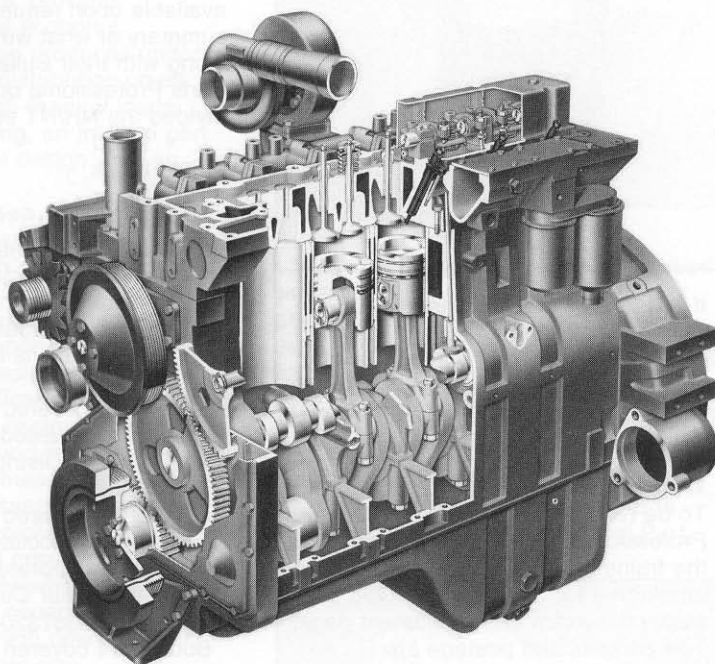


Cummins Parts Professional Tests - Product Familiarity is the Key to Selling Success

B Series



C Series



Cummins is taking their technical expertise from the heavy-duty market and applying it to lower-horsepower ranges.

This fact is obvious when we look at what Cummins has done in developing the medium-duty B and C Series engines. We've opened our doors to a tremendous market in the "under 250 horsepower bracket." This market offers great potential because there are so many different users. Just look at a cross section of the available market:

Automotive Repower

- Medium Duty Trucks (Class 2 through 6)

Industrial Equipment

- Forklifts
- Generator sets

Construction Equipment

- Back Hoe
- Front End Loaders
- Compactors

Agricultural Equipment

- Irrigation Pumps
- Tractors
- Combines

Marine Equipment

As you can imagine, with a potential market of this size there is ample reason to get into it. Plus, Cummins brings to it years of experience and engineering expertise. Who better to cover the medium-duty diesel engine market than the largest producer of heavy-duty diesel engines.

But what does all this mean to you, the Cummins Parts Professional? Well, it means a lot, starting with the potential parts sales. It also means that you'll have to put a little work into familiarizing yourself with the B and C series engines, their warranties, and the available service parts. That's where

this Parts Professional comes in; it's your key to familiarization. It's also a change from our earlier Parts Professional releases which dealt mainly with the Cummins NH/NT engine line. We'll bring out the facts on the B & C Series engines for you, plus we'll have the usual features on Parts News Update, New Products, Product Consolidations, Product Improvements, Parts Marketing, Allied Products and Fleetguard.

We've also put together another Parts Professional Exam to quiz your knowledge of the B & C Series engines, and some of our other features in this issue. By the way, this is the sixth exam and, your chance to earn a Unisonic solar powered calculator by scoring 90% or better on Parts Professional Exams 5 and 6.



If this is your first experience with the Cummins Parts Professional, we would like to remind you that you can qualify for the Parts Professional solar powered calculator by following the instructions in the boxed area.

INSTRUCTIONS

To be recognized as a Cummins Parts Professional and to continue receiving the training booklets, complete the enrollment form on page 23, fold and staple the exam and enrollment page. The address and postage are preprinted on the fold-over envelope. Scoring an average of 90% or better on exams 5 and 6 will entitle you to an official "Cummins Parts Professional Calculator." Plus, you'll be keeping up with all the latest Cummins designs and with the most current Product Improvements, Standardizations and Service Products.

Participating in the Parts Professional program will help you learn more about Cummins products. You'll gain the competitive edge which, in turn will enhance your earning capabilities.

Parts Professional Chronology



If you're a new Parts Professional or just coming on board the program you'll be interested in the preceding Parts Professional publications. Back issues may be ordered from your Cummins Distributor however, Cummins will no longer grade exams 1-4. Answers are available upon request. This is a brief summary of what we've covered so far, along with their Bulletin Numbers. In Parts Professional booklet #1, we divided the NH/NT engine into groups:

- Head
- Block
- Ends
- Accessory

Booklet #1 concentrated on the Head Group and its associated components and gaskets. If you missed the first issue, it can be ordered, at no charge, from your Cummins Distributor, Bulletin No. 3387320-1R.

Booklet #2 covered the NH/NT Block Group. If you missed it, order it from your Cummins Distributor, Bulletin No. 3387320-2R.

Booklet #3 covered the NH/NT Accessories associated with the engine operation and Uprate. If you missed it, order it from your Cummins Distributor, Bulletin No. 3387320-3R.

Booklet #4 covered the Components and Programs offered by Cummins ReCon. Order it from your Cummins Distributor, Bulletin No. 3387320-4R.

Booklet #5 begins our current series of two exams for the calculator. It covers the National Overhaul Warranty (NOW) Plans. Order Bulletin No. 3387320-5R.

B & C Series Engines

To begin, let's ask three questions.

- Why is the largest manufacturer of heavy-duty diesels interested in medium-duty diesel engines?
- What do these engines mean to you, the Parts Professional?
- How do B & C Series engines differ from the heavy-duty models

that most of you are familiar with?

The answer to the first question is, to offer a complete product line. And, it allows us to use our existing sales, service and parts distribution networks.

The B and C Series engines provide the opportunity for additional parts sales. Knowing the products' service and parts requirements will enable you to offer sound advice to your customers.

The answer to the third question is what we'll be covering in this issue. After reading the material and completing the exam, you should be well on your way to understanding the B and C Series products.



Cummins manufactures its medium-duty line worldwide ... Production is started/planned for the B Series in Darlington, England and Pune, India; Izmir, Turkey; Shiyan, China; Jakarta, Indonesia; and both the B and C in Whitakers, North Carolina. The C Series is also manufactured in Sao Paulo, Brazil. The Whitakers facility is a joint venture between Cummins Engine Company and J.I. Case called CDC (Consolidated Diesel Company). These medium-duty engines range in horsepower from 52 to 250.

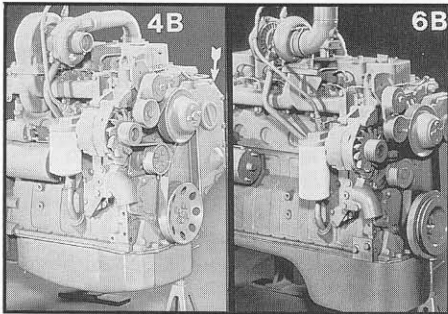
The B and C Series engines are designed to meet the growing worldwide demand for fuel efficient engines, and present new OEM (original equipment manufacturers) opportunities for Cummins. Other DOEM (Distributor Original Equipment Manufacturers) and repower opportunities are available to Cummins through its large distribution network.



The joint manufacturing facility in Whitakers is a state-of-the-art facility specifically designed to produce Cummins medium-duty diesel engines. With its 1.1 million square feet, the facility requires a minimum number of highly skilled workers to utilize its robotic manufacturing equipment. This plant has the capability of producing 150,000 engines per year.

Actual production start-up of the 4-cylinder B Series engine began on schedule, July 1, 1983.

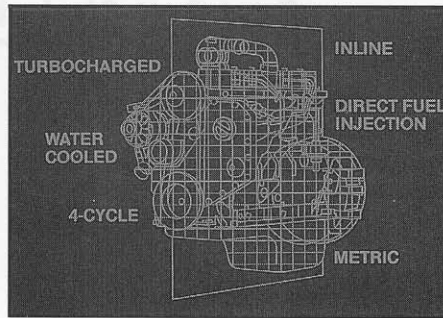
B & C Series Engine Description



Let's start with the B Series. When Cummins began planning a medium-duty product line, there were several design challenges to meet. These included:

- Design a new compact lightweight engine in the 50 to 200 horsepower range.
- Design an engine with superior fuel efficiency.
- Design an engine that is unsurpassed in strength, yet durable and uncomplicated.
- Design an engine with a minimum number of parts for higher reliability, easier service, and lower maintenance costs.

These challenges were met with the introduction of the B Series in 1983.



The B Series engine is a medium-duty diesel available in 4 and 6 cylinder models with a horsepower range from 52 to 210. The B Series engine has several design features which make it a top choice:

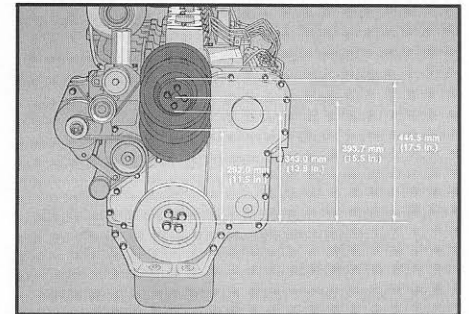
- **Inline configuration**, for fewer parts and easier servicing than comparable vee configuration engines.
- **Direct injection** as opposed to indirect injection used by many manufacturers; provides maximum fuel economy.
- **Liquid cooling** produces uniform temperature distribution on all parts with high thermal loads.
- **Turbocharging**, an integral part of the original design - not an afterthought.
- Cast iron "deep skirted" block with main bearing supports between each cylinder. The block features maximum strength and rigidity, low weight and excellent crankshaft support.
- A specially designed single-piece, **crossflow cylinder head** is used. This design allows for short length and maximum structural stiffness of the block/head assembly, for fewer head gasket problems.
- **Forged steel crankshaft**, with integral counterweights. The crankshaft is capable of transmitting high power output from a compact size.
- **Forged steel I-beam connecting rods** with angle split cap-to-rod interface and capscrew attachment providing maximum structural strength and ease of service.
- **Side mounted gear driven camshaft** providing low engine height and minimum maintenance.
- **Two valves per cylinder** with single valve springs resulting in fewer overall parts.
- **Metric design** allowing uniformity and acceptability throughout the world.

NOTE: The only deviation from metric specifications is the use of SAE standard pipe fittings and plugs. Thread and Torque specifications for optional accessory equipment will vary with the supplier. Bulletin No. 3810312 lists metric values along with their SAE equivalents for comparison.

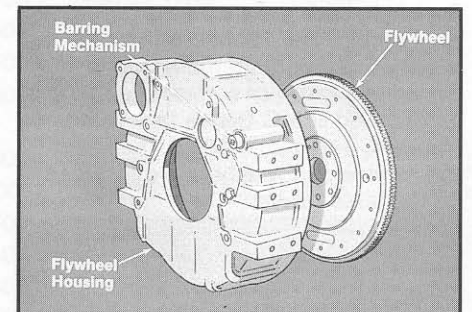
- **Parts standardization** between 4 and 6 cylinder models for ease of service and parts inventory (approximately 90% of the B Series family engine parts are common).

B & C Series Options

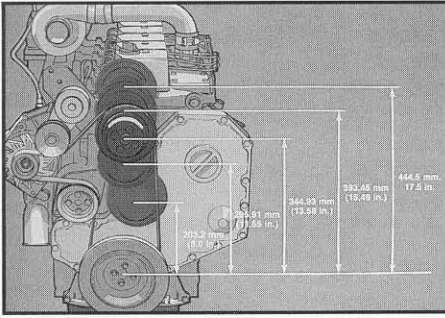
Obviously, application versatility is an essential requirement for both B and C Series engines. Optional equipment allows these engines to be adapted to a variety of applications for easy installations.



SAE #2 and #3 flywheel housings (both wet and dry) are available with arm or pad mounting arrangements. When used in conjunction with multiple options for flywheels, flexplates, torque converters and clutches, transmission mounting for both automotive and industrial markets will be satisfied. A barring mechanism is optional with the flywheel housings (both wet and dry) Part No. 3904682 or Service tool Part No. 3377321.



Dual Bolt Circle Medium Duty Fans

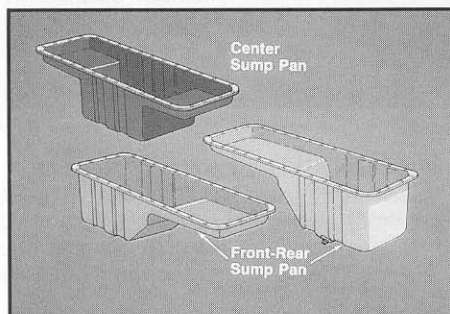


Multiple fan drive arrangements are available to satisfy a variety of application requirements for both the B and C series engines. B Series engines have five fan drive options with automatic belt tensioning. They are available with centers from 203.2mm to 444.5mm (8" to 17.5") above the crankshaft centerline, and with speed ratios of 1.1 to 1 or 1.35 to 1. C Series engines have four fan drive options with automatic belt tensioning. They are available with centers from 292mm to 444.5mm (11.5" to 17.5") above the crankshaft centerline and with speed ratios of 1.1 to 1 or 0.87 to 1. A crankshaft mounted fan drive option is also available for both the B and C Series engines.

Another important point to remember is that Cummins provides several fans to be used in conjunction with the different B and C Series engine applications.

The introduction of the C Series engine required the release of a new set of fans to match this engine's particular mounting arrangement. The C Series fan drive has (four) M10 mounting capscrews on a 60mm bolt circle for mounting the fan, while the B Series has (4) M8 capscrews on a 50mm bolt circle.

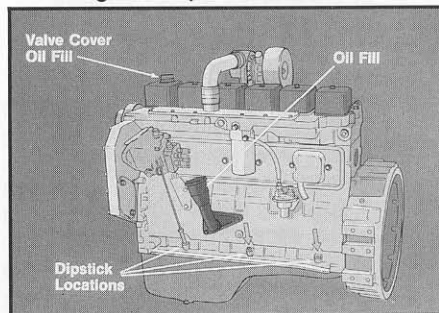
In order to achieve the highest degree of flexibility, the new fans for the C Series engines are made with a **dual-bolt-circle**. Therefore these fans may be used on both the B and C Series engines. For a complete listing of all released B & C Series fans reference PM2994, September 1986. The latest fan service part numbers are included on the table above:



Option No.	Part No.	Dia.(mm/in)	Air Flow
FN 9048	3911316	457/18	Blower
FN 9049	3911317	508/20	Blower
FN 9050	3911318	559/22	Blower
FN 9051	3911319	610/24	Sucker
FN 9052	3911320	610/24	Blower
FN 9053	3911321	660/26	Sucker
FN 9054	3911322	660/26	Blower
FN 9055	3911323	711/28	Sucker
FN 9056	3911324	711/28	Blower
FN 9057	3911325	762/30	Sucker
FN 9058	3911326	762/30	Blower
FN 9059	3911327	813/32	Sucker
FN 9060	3911328	813/32	Blower

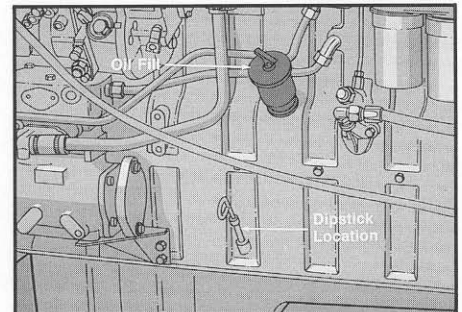
Two styles of oil pans are available for both the B and C Series engines. One pan can be used to provide either a front or rear sump, with the use of the corresponding internal lube suction tube. The other style oil pan provides a center sump arrangement. Several variations of the two specific styles are required for specific applications. Check your Option sales handbooks for specific Part No. Information.

Multiple options are available to allow for changes in dipstick locations.

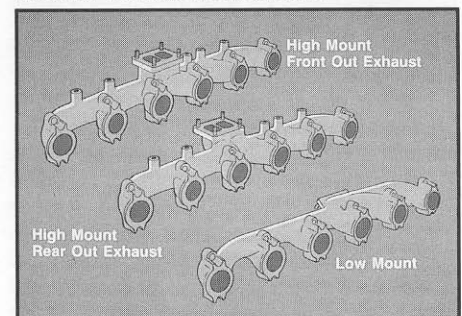


On the B Series engine the reversible oil pan is complimented by multiple fill and oil dipstick locations. The valve cover oil fill may be moved to the most convenient cylinder for service. A block-mounted side oil fill is also available; it will accept a 2 inch I.D. hose for remote fill locations.

Additionally, a new gear cover oil fill mounted option is now available to provide quick-fill capabilities at the front for both the B and C Series engines.

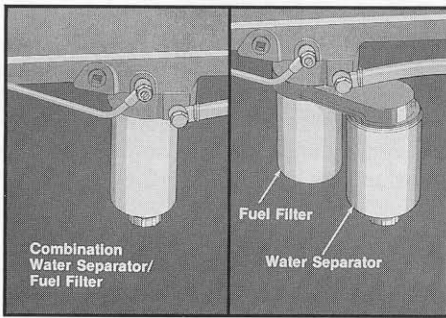


The C Series engine features a center-mounted dipstick location on both sides of the engine. This location provides oil level gaging for all pan options. All engines have an oil fill location in the valve cover. Like the B Series engine, a block-mounted oil fill is also available, accepting a 2 inch I.D. hose for remote fill locations.

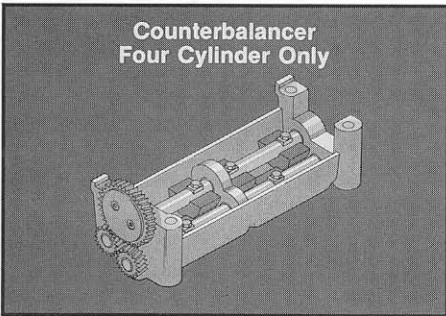


To allow for multiple turbocharger locations, different exhaust manifolds are available for both the B and C Series engines. These exhaust manifolds feature various configurations for the most effective placement of the turbocharger. These configurations allow for high or low mounting, and front or rear exhaust.

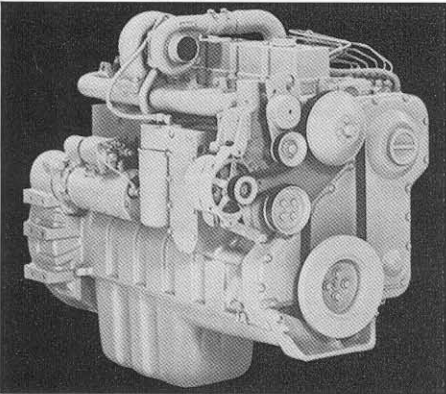
There are a couple of fuel filter options available for the B and C Series engine that must be mentioned. The first option provides superior fuel system protection against dirt and water contamination.



It is a combination fuel water separator/filter. It provides increased protection over a single filter. Also available is a dual filter head option that is plumbed in series. This is available for severe service applications. A single filter fuel-water separator or a filter without the fuel-water separator feature are also offered.



Four cylinder B Series engines have an optional counterbalancer available for smoother engine operation. This unit attaches to two main bearing caps and is driven by and timed to the crankshaft gear. A center sump pan is required when this counterbalancer is used. Currently the balancer is limited to 2200 RPM, and lower speed rated engines.



The C Series diesel engine has many of the same B Series design concepts for simplicity and compactness. There are some differences though such as different design connecting rods and higher capacity fuel injection pumps to name a few. For the most part though

the B and C Series engines are quite similar. The C Series engine is about the same height as an L10, but is approximately 7.5 inches shorter, 5 inches narrower and weighs 640 pounds less. The smaller size allows it to fit easily into the engine compartment of a variety of industrial and automotive applications.

	Length mm (in.)	Width mm (in.)	Height Above ϕ mm (in.)	Weight Kg (lb.)
L10	1308 (51.5)	805 (31.7)	709 (27.9)	875 (1,930)
C Series	1118 (44)	679 (26.7)	694 (27.3)	587 (1,291)

The C Series engine ranges from 120 to 250 horsepower for general industrial use, and 180 to 250 horsepower for automotive use.

Specifications For B and C Series Engines

The next two charts provide a listing of current available B and C horsepower ranges.

A very special point to consider is the commonality of engine parts within their specific families. Most parts are not interchangeable between families, but are common among the same family. This simplifies things for both Cummins and its Distributors and Dealers. For Cummins it reduces the number of required parts and eases production, warehousing and distribution. For our Distributors and Dealers, it reduces on-hand-inventory.

B Series Specifications

Industrial				
Model	CPL	Rated Hp	PeakTorque	Remarks
4B3.9	591	76 @ 2500	184 @ 1200	Construction
4B3.9	721	80 @ 2800	184 @ 1200	Construction
4B3.9	730	100 @ 2500	250 @ 1500	Construction
4BTA3.9	594	116 @ 2500	300 @ 1600	Construction
4BTA 3.9	595	120 @ 2800	290 @ 1700	Hi-Speed
6B5.9	714	115 @ 2500	270 @ 1200	Construction
6B5.9	791	120 @ 2800	280 @ 1200	Hi-Speed
6BT5.9	938	152 @ 2500	400 @ 1600	Construction
6BTA5.9	599	177 @ 2500	459 @ 1500	Construction
6BTA5.9	912	192 @ 2800	458 @ 1700	Hi-Speed
Automotive				
4BT3.9	767	105 @ 2500	267 @ 1700	EPA
4BT3.9	767	105 @ 2800	267 @ 1700	EPA
4BT3.9	727	105 @ 2500	290 @ 1700	CARB
4BTA3.9	595	120 @ 2500	290 @ 1700	EPA
6BT5.9	766	160 @ 2500	396 @ 1700	EPA
6BT5.9	766	160 @ 2800	396 @ 1700	EPA
6BT5.9	716	156 @ 2500	430 @ 1700	CARB
6BTA5.9	600	180 @ 2500	445 @ 1700	EPA
Marine				
4BT3.9	741	150 @ 2800	2890 @ 1700	High-Output
4BT3.9	741	130 @ 2500	3140 @ 1700	Med/Continuous
6BT5.9	742	210 @ 2600	467 @ 1700	High Output
6BT5.9	742	180 @ 2500	435 @ 1700	Med/Continuous

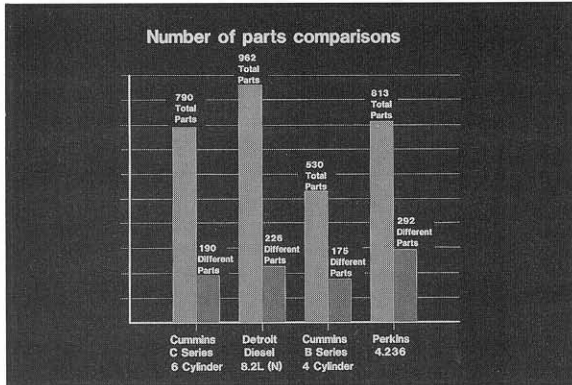
C Series Specifications

Model	CPL	Rated Hp	Peak Torque	Remarks
Industrial				
6C8.3	601	150 @ 2200	400 @ 1200	Construction
6CT8.3	602	210 @ 2200	567 @ 2200	Construction
6CT8.3	602	215 @ 2500	567 @ 1500	Construction
6CTA8.3	755	234 @ 2200	640 @ 1500	Construction
6CTA8.3	604	250 @ 2200	716 @ 1500	Construction
6CTA8.3	830	250 @ 2500	650 @ 1800	Hi-Speed
Automotive				
6CT8.3	603	210 @ 2200	605 @ 1500	EPA
6CT8.3	819	210 @ 2200	605 @ 1500	EPA '88
6CT8.3	890	250 @ 2100	728 @ 1500	EPA

Both the B and C Series engines are designed for simplicity and ease of maintenance. This graphic compares the number of parts used in B and C series engines to competitors and to heavy-duty engines. The number is substantially lower and further supports our claim of simplicity in design and service.

Fewer parts means a lot to your customers. It means less to go wrong, less to purchase, less to inventory, and faster maintenance and repairs.

No special tools are required to overhaul the B Series. The few special tools for the B Series are those needed to service the fuel system and the alternative repair tooling required to remachine the head and block deck surfaces. We've put together a listing of repair tools needed for the C Series and flagged those tools which are commonly used to service the B Series models.



B and C Series Overhaul Tools

Part No.	Description	B Series	C Series
*3382607	Rollover Stand Adapter Plate		✓
*3376975	Rollover Stand Adapter Plate	✓	
*3375193	Engine Rebuild Stand (Rollers)	✓	✓
*3375194	Engine Rebuild Stand (w/o rollers)	✓	✓
3376015	Cylinder Liner Puller		✓
3376639	Cylinder Liner Extension (Qty 2 Common L10)		✓
ST-1229	Cylinder Liner Driver		✓
3376944	Liner Holddown Clamps	✓	✓
3376220	Protrusion Gauge (liner/valve)		✓
*3822513	Tappet Removal Kit		✓
*3377371	Engine Barring Tool	✓	✓
*3904682	PDC Part No. Engine Barring Tool	✓	✓

*These tools are convenience items, They are not required for overhaul

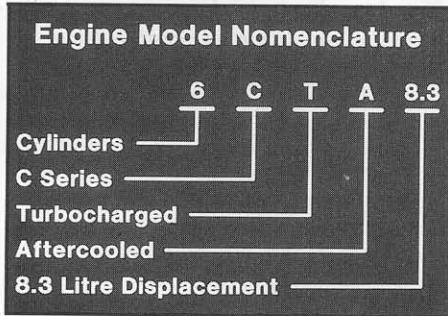
B and C Series Fuel System Repair Tools

Part No.	Description	B Series	C Series
3376946	Nozzle Tester	✓	✓
3376947	Nozzle Cleaning Kit	✓	✓
3376933	Seal Puller (VE pump shaft seal)	✓	
3376934	Gasket Extractor (VE pump sealing washer)	✓	
3376935	Control Shaft Wrench (VE pump shaft removal)	✓	
3376936	Protective Sleeve (VE pump front shaft)	✓	
3376937	Mounting Plate (VE and CAV bench repair)	✓	
3376929	8mm Protective Sleeve (CAV pump seal)	✓	
3376930	14.7mm Protective Sleeve (CAV pump seal)	✓	
3376931	21mm Protective Sleeve (CAV pump seal)	✓	
3822509	Injector Bore Brush	✓	

*In-chassis, can be fabricated see C Series Troubleshooting and Repair manual, 3810261

Engine and Parts Identification

Both the B and C Series engines share a simple, straightforward method of identification for both the engine model and for parts identification.



Engine identification and determination of model is easy. Check the data plate in the model name box; you'll find a series of numbers. The first digit of the model number tells the number of cylinders; the next character denotes the engine series (either B or C). the remaining letters signify aspiration (T = Turbocharged, A = Aftercooled) and the trailing numbers indicate displacement in liters. An example of this can be seen on this sample data plate.

Customer Parts Information

The Engine Data Plate located on the Gear Housing on fuel pump side of the engine and should be referenced when sourcing parts.

Manufactured in U.S.A. for Cummins Engine Company, Inc. 604 3005 Columbus, 47302-3005	Year: 2002 Model: 3.9 Series: B EC: 9591	Engine Serial No. 44005095
Model designation Letter G	Stroke: 254mm Bore: 508mm	Model Part No. 3903383
Warning: Users May Repair and Maintain as long as they follow the Cummins Co. Aftercooler System and Application	Firing Order: 1342	Rated HP: 76 at 2500 RPM
Rated Maximum Values For This Model And Application	Low Idle RPM: 750	Fuel Rate at rated HP: 52 gph (1970)
Date of Mfg: 4/27/83	E.C.S.	Model Name: 4B-3.9

Information contained on the Engine Data Plate is the Engine Model Name located in the lower right corner, the Engine Serial Number located in the upper right corner and the CPL (Control Parts List) number located in the upper center.

SEE THIS INFORMATION WHEN ORDERING PARTS.

NOTE: The Engine Data Plate for B and C Series engines is located on the gear housing on the fuel pump side of the engine and should be referenced when sourcing parts. Information contained on the Engine Data Plate includes, the Engine Model Name located in the lower right corner, the Engine Serial Number located in the upper right corner and the CPL (Control Parts List) number located in the upper center.

The B and C Series engines have a unique series of part numbers to identify them. The seven digit part number starts with 39. There are a limited number of parts released by worldwide plants that begin with a different prefix. For example, Sao Paulo, Brazil - 335xxxx and Darlington - 327xxxx. Take a look at the sample

page pulled from the C Series Parts Catalog. All the parts start with the number 39, with some exceptions. These exceptions are the limited number of parts used on the B and C Series that are common to the higher horsepower engines. These parts will retain their original part numbers.

3802122	Kit, Cylinder
3802130	Kit, Piston
3901922	Ring, Retaining
3802110	Set, Piston Ring
(3908749)	Piston
3901597	Piston, Pin
3802088	Kit, Liner
3907177	Seal, Ring
(3907792)	Liner, Cylinder

Kits and Sets are assigned 3802 series Cummins Part Numbers. The listing shown here includes the most up-to-date listing of B and C Series kits and sets. The beginning numbers 38 reference Kits and Sets just like the heavy-duty engines, and the 02 portion of the number identifies B and C Series. Some examples of this part numbering are shown in this listing of current Kits and Sets available for the C Series engine.

C Series Kits and Sets

AUTOMOTIVE/INDUSTRIAL							
CPL	ENGINE MODEL	PISTON	COMP RATIO	PISTON KIT	CYLINDER KIT	INJECTOR	TURBO
601	6C 8.3	3908748	16.3	3802190	3802121	3802095	—
752	6C 8.3	3908748	16.3	3802190	3802121	3802095	—
805	6C 8.3	3908748	16.3	3802190	3802121	3802095	—
602	6CT 8.3	3908749	17.3	3802130	3802122	3802097	3802126
603	6CT 8.3	3908749	17.3	3802130	3802122	3802096	3802126
753	6CT 8.3	3908749	17.3	3802130	3802122	3802097	3802126
819	6CT 8.3	3908749	17.3	3802130	3802122	3802065	3802127
828	6CT 8.3	3908749	17.3	3802130	3802122	3802095	3802126
829	6CT 8.3	3908749	17.3	3802130	3802122	3802097	3802126
604	6CTA 8.3	3908750	16.5	3802150	3802123	3802098	3802126
605	6CTA 8.3	3908750	16.5	3802150	3802123	3802091	3802126
830	6CTA 8.3	3908750	16.5	3802150	3802123	3802098	3802129
848	6CTA 8.3	3908750	16.5	3802150	3802123	3802091	3802126
890	6CTA 8.3	3908750	16.5	3802150	3802123	3802091	3802126
893	6CTA 8.3	3908750	16.5	3802150	3802123	3802091	3802127

* = OVERSIZE PISTON KITS AND RING SETS
(0.50 & 1.00 MM) AVAILABLE

CYLINDER LINER KIT = 3802088 (6C SERIES ONLY)
CYLINDER BLOCK SALVAGE SLEEVE = 3904166
(B SERIES ONLY)

CRANKSHAFT = 3908032 (6B) 3904363 (6C)
CAMSHAFT = 3907824 (6B) 3911236 (6C)

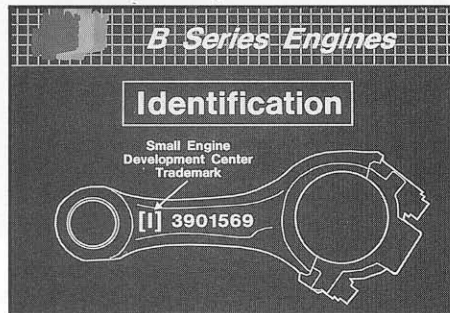
RING SETS NATURALLY ASPIRATED (6B)
STD 3802040
.5 O/S 3802042
1.0 O/S 3802044

CYLINDER HEAD = 3910276 (6B) 3913111 (6C)
WATER PUMP = 3802004 (6B) 3802081 (6C)
AFTERCOOLER = 3910282 (6BTA) 3907171 (6CTA)

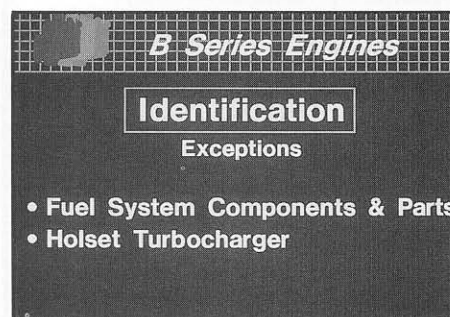
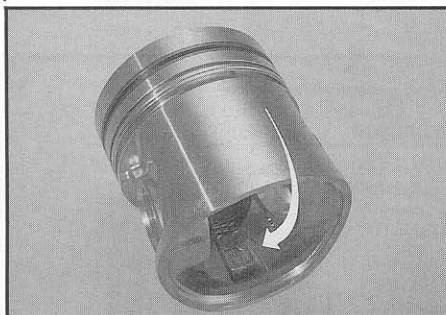
RING SETS TURBOCHARGED (6B)
STD 3802050
.5 O/S 3802052
1.0 O/S 3802054

RING SET = 3802110 (6C SERIES)

Also note in the listing of Kits and Sets available for the C Series engine that oversized service parts are numbered sequentially in increments corresponding to their oversize beginning with zero as standard. This can be seen specifically in the main bearing sets for which there are four oversizes available. The sequential numbering is true for all versions of the B and C Series engines.



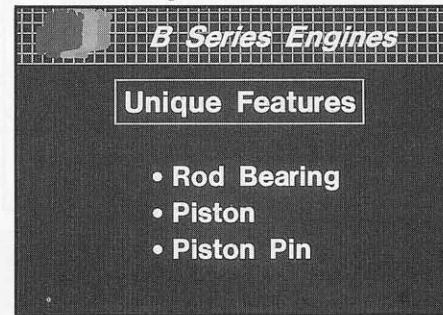
Another important point that you must be aware of is that major B and C series engine parts are identified with a trademark that indicates that the part is genuine. The "CDC" indicates that the part was released from the Cummins Engine Development Center. You'll find this marking on connecting rods, block, crankshaft, camshaft, pistons and cylinder heads. If the mark isn't present it probably means it's an aftermarket part.



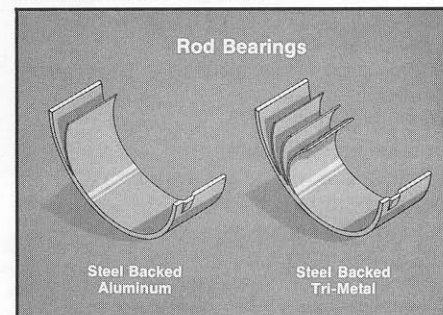
The fuel pump and injectors are sourced from outside suppliers so they will not have the "CDC" Trademark. However, Robert Bosch pumps are stamped at the factory with a 39 series

Cummins Part Number; and, the injector service kits are identified with a 38 series Cummins Part Number.

NOTE: Fuel systems are either Lucas CAV or Robert Bosch. They will be covered in detail later in this booklet. The turbocharger is a Cummins/Holset.

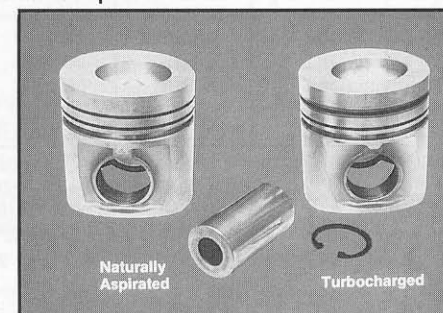


The rod bearing, piston and piston pin have unique characteristics that you should be familiar with.



There are two types of rod bearings used in the B Series engine. In production, naturally aspirated models use steel backed aluminum bearings. Turbocharged models use steel backed tri-metal bearings. For service only the premium steel backed tri-metal bearings are sold. Similarly on the C Series, only the premium style bearing is offered for service.

Many of the B Series pistons are used interchangeably between 4 and 6 cylinder applications. Check the engine CPL to assure that you are providing the correct piston.



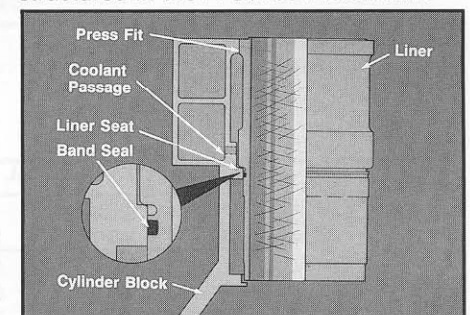
A similarity which the pistons have in all B and C series engines is that they use a free floating piston pin design

rather than a press fit. The reason for this is that lighter loads are carried by the piston and its pin. The use of a hollow pin allows some flex under load. The pin is normally re-used at overhaul and is not included in the Piston Kit.

Engine Rebuild

Both B and C Series engines have several common heavy-duty features that allow them to be overhauled several times during their service life. Cummins B and C Series engines are a **real value** due to their serviceability and long life.

On B Series engines the Cylinder Block can be bored oversize to .5mm or 1.0mm to accept oversized pistons without sleeving. The block can be further bored to an oversize that will accept sleeving, thus returning the bore to its standard size. An important point to note is that B Series engines use dry sleeves, not the wet type commonly found in heavy-duty Cummins engines. The dry liner insert is available, P/N 3904166. The chart on the following page shows B Series Piston Kits that are available for the various CPL's released. Note, the B Series chart gives the bare Piston Part Number for your information only and is not sold separately. Also, piston pins are not structured in the B Series Piston Kits.



C Series engines have only one diameter piston available. Replacement of C Series cylinders compares to Cummins heavy-duty products. If at overhaul time the pistons and liners exceed the recommended wear limits for reuse, replace with **new** Genuine Cummins Parts. The C series engine utilizes wet liners like those used in heavy-duty Cummins engines. These liners feature a mid-stop design that locates the liner in the block. A press fit between the liner and the block provides coolant sealing at the top of the liner. All liners are machined for installation of a band seal.

Cummins offers Piston and Cylinder Kits for the C Series engine. The Cylinder Kits are structured the same as those used in the heavy-duty market. However, the Piston Kits omit the piston

B Series Piston Kits

Piston P/N*	Piston Kit P/N	Bore Size	Short Blocks	CPL's
3903579	3802030	Std	4 Cyl. 3905378	592,646,697
3903656	3802032	.5mm	6 Cyl. 3905812	
3903655	3802034	1.0mm		
3903582	3802090	Std	4 Cyl. 3908025	593,598,692,728,729,766,767
3908035	3802092	.5mm	6 Cyl.3908027	
3908036	3802094	1.0mm		
3903803	3802020	Std		S/S 3802060
3903811	3802022	.5mm		S/S 3802062
3903814	3802024	1 .0mm		S/S 3802064
3906223	3802060	Std	4 Cyl.3905377	591,596,681,691,714,721,725,791,802,843,845,895
3908815	3802132	.5mm	6 Cyl. 3911255	
3908816	3802134	1.0mm		
3907156	3802100	Std	4 Cyl. 3908153	594,595,599,600,696,698,710,711,712,713,715,741,742,792,793,826
3907157	3802102	.5mm	6 Cyl. 3908151	
3907158	3802104	1.0mm		

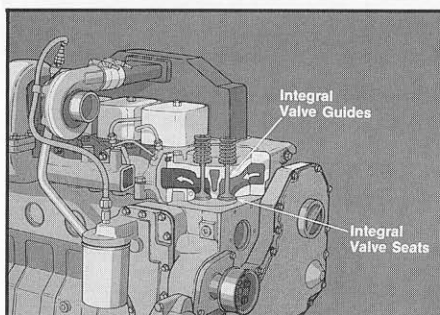
* Bare piston not sold.

pin. The replacement of this component is not generally required with just a piston replacement.

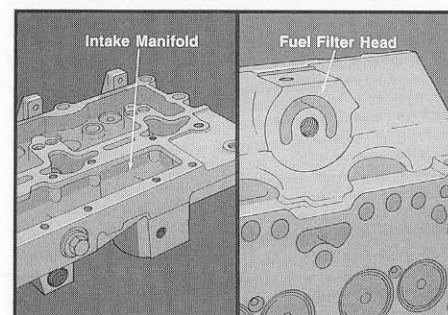
The generic content of each kit is as follows:

Piston Kit	QTY
Set, Piston Rings	1
Ring, Retaining	2
Piston, Engine	1
Cylinder Kit	QTY
Set, Piston Rings	1
Pin, Piston	1
Ring, Retaining	2
Seal, Rectangular Ring	1
Liner, Cylinder	1
Piston, Engine	1

The following chart shows the current summary of C Series piston and cylinder kits. Note that the piston part number is provided for information only, and is not sold separately.



As we mentioned earlier both the B and C Series cylinder heads are a one-piece, cross flow design with two valves per cylinder. The exhaust ports are very short and only lightly cooled, to preserve exhaust energy (for more efficient turbo operation if one is used).



Another important fact concerning the B and C Series cylinder head is that the intake manifold, thermostat housing and fuel filter head are integral with the cylinder head. This simplifies design, reduces the number of required parts minimizes cost and improves reliability.

C Series Piston and Cylinder Kits

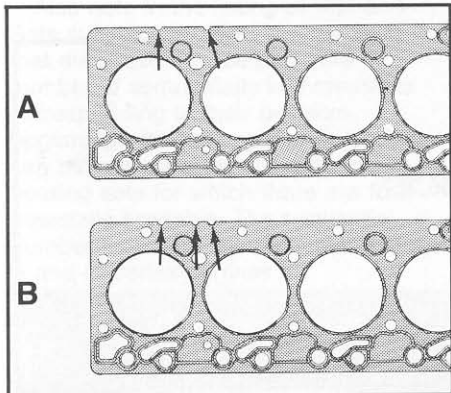
Piston P/N*	Piston Kit P/N	Cylinder Kit P/N	CPL's
3908748	3802120	3802121	601,752,805
3908749	3802130	3802122	602,603, 753
3908750	3802150	3802123	604,605,754,755,830,831,848,890

* Bare piston not sold.

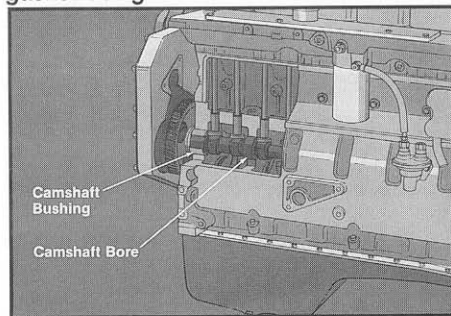
The cylinder head of the B Series features integrally cast valve guides and induction hardened valve seat surfaces. The head can be ground once, no more than 0.25mm (0.010 in). Replacement valve guides and seats are available for service.

C Series engines are equipped with replaceable valve guides and seats right from the start.

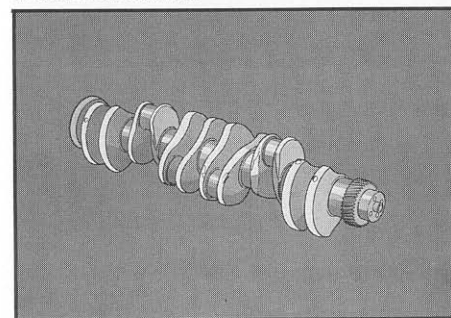
Oversize thickness head gaskets are available for the B and C Series engines for use when the block deck is machined. The use of these oversize gaskets assures that the proper compression ratios are maintained. It is very important that you provide the correct oversize gasket set for a block that has been decked.



Currently, loose-piece gaskets or gasket sets are available in standard, 0.15mm oversize thickness, A, identified by the two cutouts and 0.50mm oversize thickness, B, identified by the three cutouts. Note: On B Series engines if oversize pistons are used, don't look for an oversize head gasket. The service gasket design allows for oversize bores.



The B Series engine uses a single camshaft bushing in the front of the block to carry the side loading from the accessory drive. The remaining journals run directly on oil film in the cast iron bores of the cylinder block. Should the parent bore begin to wear, all the camshaft journals can be machined oversized and bushings installed to extend block life.

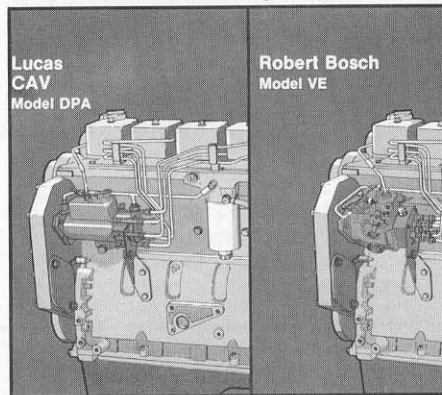


The crankshafts are forged steel. The rod and main journals are significantly larger than competitive engine crankshafts. The bearing journals can be reground in increments of .25, .50, .75 and 1 millimeter. In addition to oversize bearing shells, oversize thrust bearings are available for B Series

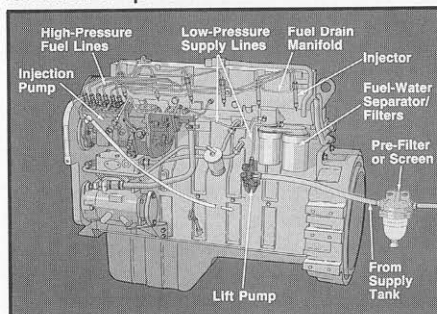
engines. These bearings are available in .50/.50mm and 1.0/1.0mm (thickness/diameter) sizes.

Fuel System

The B and C Series fuel system are quite different from those used on the Cummins heavy-duty product line. The B and C Series engine fuel systems rely on a fuel injection pump to generate injection pressure rather than the camshaft and fuel injectors that are used on Cummins heavy-duty products.

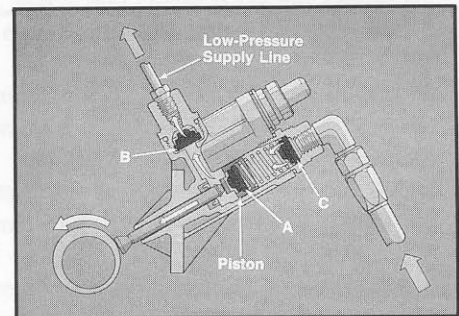


Let's take an overall look at the fuel system. The B Series uses a distributor style pump, whereas the C Series uses an inline type pump. Although these pumps differ in appearance, the general function is quite similar.

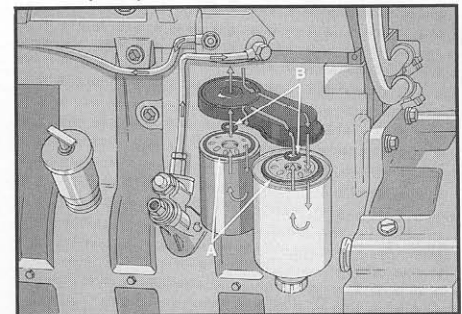


This is a C Series fuel system. It's quite similar to the B Series system. An easy way to understand this fuel system is to think of it as having two sides: "low pressure" where fuel pressure is below 20 psi and "high pressure" where fuel pressure can be several thousand psi. We'll look at both sides of the system and talk about the components. Let's start with the low pressure side of the system. We'll talk about each component as it relates to fuel flow, starting at the fuel supply tank and the pre-filter or screen. The system consists of:

Low Pressure



- **Lift Pump** - It's mechanically driven off a special lobe on the camshaft. The lobe pushes against the plunger in the lift pump to create a pumping action. Check valves control the direction of fuel flow. The seals should prevent fuel bleed-back during engine shutdown. The lift pump draws fuel from the fuel tank and supplies it through the fuel filters to the fuel injection pump. It assures that there is a positive flow of fuel from the supply tank through the filter head and on to the fuel injection pump.

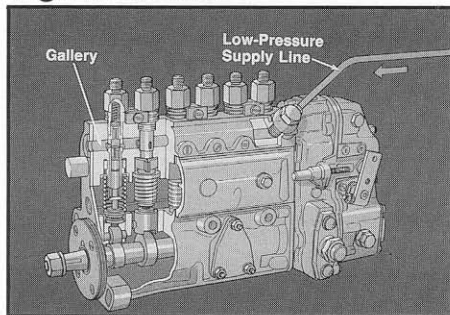


- **Fuel-Water Separator/ Filters** - Remove water and contaminants from the fuel. These filters contain very fine filtering elements to assure that only very clean fuel is supplied to the fuel injection pump. Contaminated fuel can quickly destroy this type of injection pump as clearances between operating components inside can be within millionths of an inch. The setup shown is a dual filter arrangement. The larger filter on the right is actually a fuel-water separator which should be drained at regular intervals and contains a filter element. The smaller filter provides additional protection against dirt or other contamination reaching the fuel injection pump. Note, square cut sealing rings are used to seal

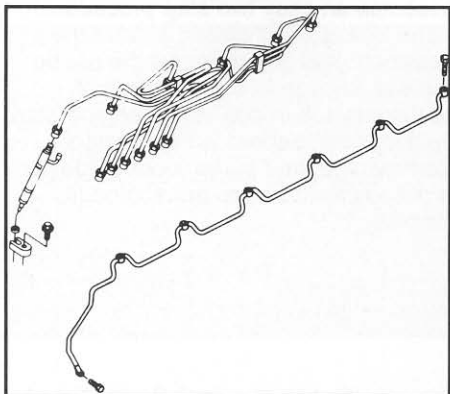
between mating surfaces. A large sealing ring (A) affixed to the fuel filter seals the outside diameter. A smaller sealing ring (B) seals the inside diameter around the threaded support. Remember, it's very important to use the correct filters and change them at the recommended interval. Don't substitute one of questionable quality; always use a Cummins recommended Fleetguard filter.

- Low Pressure Fuel Supply Lines - Carry the fuel between the components on the low pressure side of the fuel system. These connections must be tight and leak free to prevent poor performance and "no start" conditions.

High Pressure

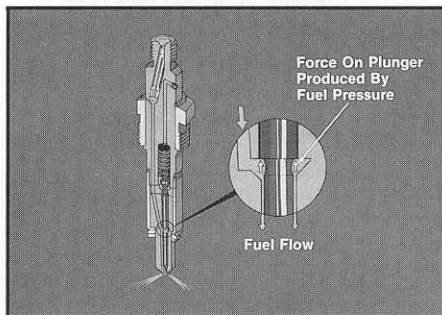


- Fuel Injection Pump - Creates and distributes a metered amount of high-pressure fuel to the injectors through the high pressure fuel lines. A special point to note is that the B Series engines use a distributor type fuel injection pump, while the C Series engines use an inline pump. Both CAV and Robert Bosch fuel injection pumps are used on the B Series. Robert Bosch is used on the C Series.

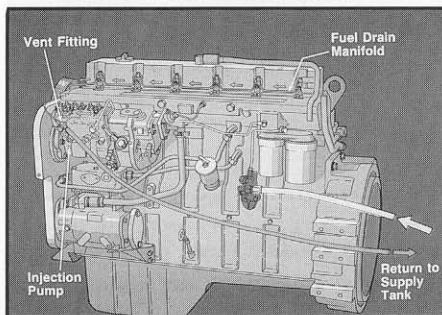


- High Pressure Fuel Lines - Metal fuel lines going from the fuel injection pump to the individual fuel injectors. Line length, inside

diameter and number of bends are extremely important to assure that the fuel pressure is transmitted to the fuel injector at precisely the right moment; otherwise timing will be adversely affected. As a result of this, high pressure fuel lines are CPL items. As a Parts Professional it's important for you to provide the correct replacement line to assure the proper fuel flow. Remember, each high pressure fuel line is different per CPL and has its own separate part number.

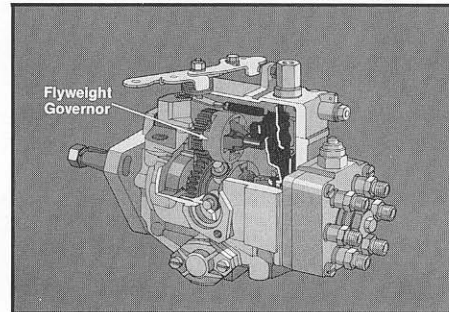


- Fuel Injector - During injection, the pressurized fuel from the fuel injection pump forces open the needle valve in the fuel injector against spring pressure. Once the valve is opened the high pressure fuel is forced out through spray holes in the nozzle into the combustion chamber where it meets the hot compressed air and begins to burn. Once the pressure drops off, the spring snaps the valve shut. In general, it takes approximately 25,000 kPa (3600 psi) to lift the needle valve off its seat. Opening pressure is critical to engine performance. Each specific injector has a precise opening range. The opening valve is written on the injector in "bars," just below the fuel drain boss on the nozzle holder.

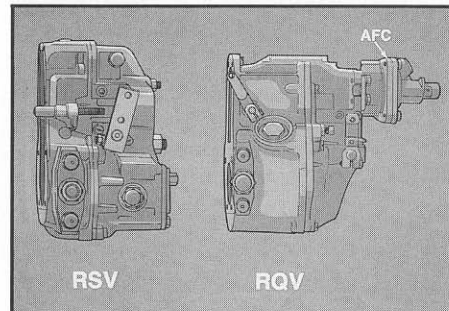


There is one other circuit that has to be mentioned; that is the fuel return

line. There is a small amount of fuel vented by the fuel injection pump and injectors that is not used to run the engine. This fuel is returned to the fuel supply tank. There should always be a steady flow of fuel through the fuel return line when the engine is running. The fuel injection pump depends on this fuel flow for lubrication and cooling.



Another point of interest is the governor used on these engines. In the B Series engine, both the Lucas CAV and the Bosch VE fuel pumps have integral governor assemblies. The governor is a mechanical flyweight type which prevents overspeeding of the engine by limiting fuel flow at excessive engine RPM.



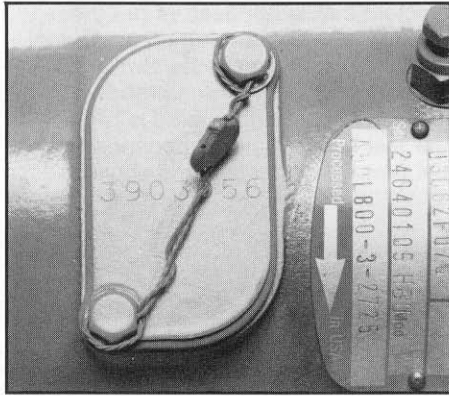
The C series engine has a separate governor unit which attaches to the back of the inline fuel injection pump.

Industrial engines use Robert Bosch RSV governors. Automotive engines use Model RQV governors for better lower speed regulation and ease of operation of the accelerator pedal. For emission control, the RQV governor is equipped with an air fuel control (A.F.C.) that is sensitive to turbocharger boost and adjusts fuel flow to the amount of turbocharger boost available. These governors are also mechanical flyweight type.

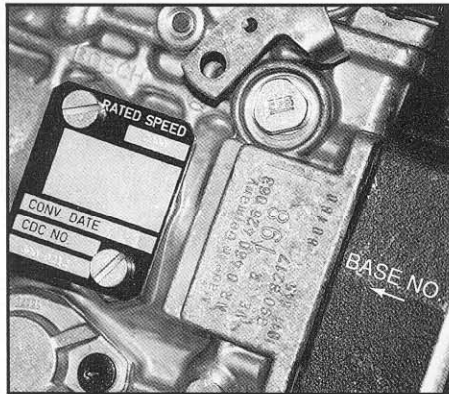
Now that you have an idea of how this fuel system works, we'll get into a few more details about the individual parts that you have to be aware of.

As we've already said the fuel injection pumps used on the B and C Series engines differ in design. On the B Series engines there are two different brands of distributor type fuel injection

pumps used: the Lucas CAV Model DPA and the Robert Bosch VE.

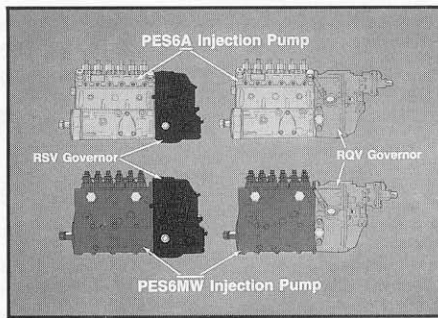


The Lucas CAV model DPA is a mechanically governed, rotary, distributor pump. The data plate provides important information about the configuration and specifications and includes the serial number. The arrow indicates the direction of pump rotation. Note: the CAV pump now has a Cummins Part No. on the side-cover plate.



The Robert Bosch model VE distributor pump is also mechanically governed. The pump data is stamped on the housing and provides important information about configuration and specifications for the pump and includes the Cummins base pump part number. Lower volume pumps are made from the base pumps. A nameplate is added to indicate the new Cummins Part Number for some variations.

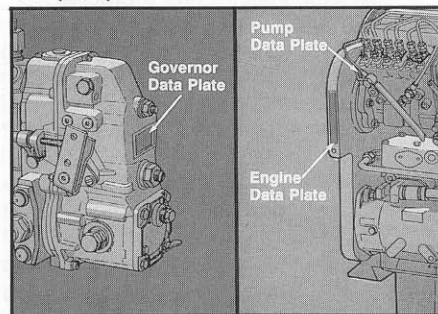
Naturally aspirated engines, marine units and generator sets along with some selected high output ratings utilize the Lucas CAV DPA pump. The Robert Bosch model VE pump is generally for all turbocharged applications except gen sets and selected high output applications.



As we said earlier, the C Series engine uses an inline fuel injection pump. The C Series actually uses two different models. Depending on the application and power rating, each C Series engine is equipped with one of four combinations of two injection pumps and two governors. The PES6A, commonly known as the "A" pump can use either the RSV governor or the RQV governor. The PES6MW, "MW" pump can also use both governors.

Pump Model	Engine Model
PES6A	6C8.3
	6CT8.3
	6CTA8.3 (Low Rating)
PES6MW	6CTA8.3 (High Rating)

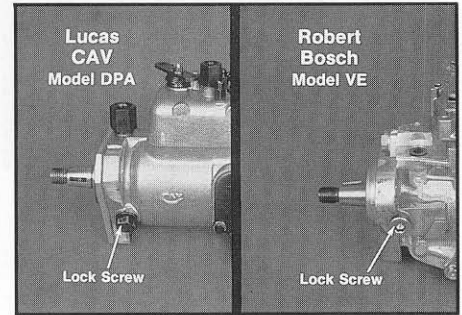
Engine models 6C8.3, 6CT8.3 and lower-power rated 6CTA8.3 use the "A" pump. Higher rated 6CTA8.3 engines use the "MW" pump. The operating principles of the pumps are the same. The camshaft and pumping elements of the "MW" pump are designed for more fuel delivery than that provided by the "A" pump.



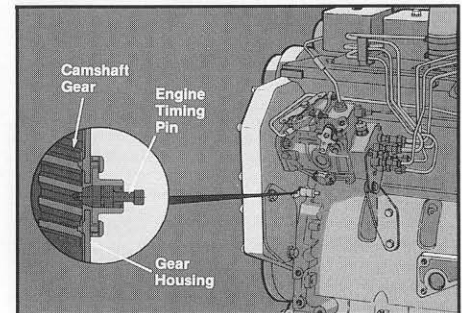
On the C Series engine the Cummins Part Number for the pump and governor is imprinted on the governor housing data plate. The pump data plate provides important information about the configuration and specifications for the pump, including the serial number.

Always use the pump specified for the CPL, engine horsepower rating and fuel pump solenoid voltage requirements.

Injection pump timing is a very important procedure to assure good performance, prevent excessive smoke and to meet emission regulations.

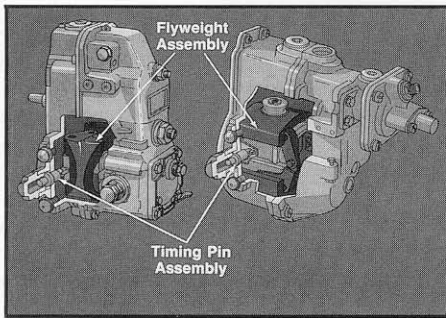


On the B Series engines a unique concept has been designed into the fuel system to simplify fuel pump timing. Both pumps have a provision for locking the pump shaft at a position corresponding to top-dead-center, (TDC) compression stroke, for cylinder No. 1.



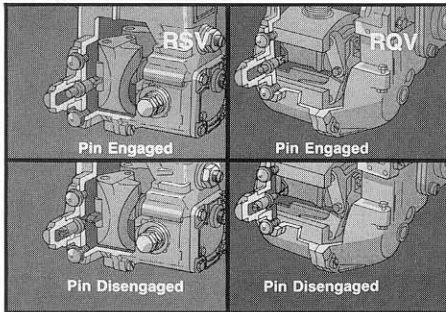
An engine timing pin inserts into a hole in the camshaft gear to locate TDC on the compression stroke, for cylinder number 1. After establishing TDC with the pin and locking the pumpshaft, removal and installation of the pump with correct pump-to-engine timing becomes an easy two step procedure.

The timing pin is plastic so that the camshaft gear will shear off the pin tip without damage to the gear train if mistakenly left in position at engine start up. However, serious pump damage may result if the "pump locking" device is not released before the engine is started.



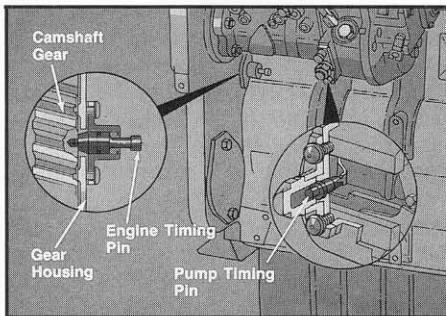
The C Series engine also utilizes the same pump timing pins, but they are located differently than on the B Series pumps. Both types of governors, the RSV and RQV, have a pump timing feature to allow the pump shaft to be oriented in a position corresponding to top-dead-center for the compression stroke of cylinder No. 1.

Indexing the flyweight assembly to the shaft during assembly establishes pump timing.



The timing feature positions the pumpshaft during pump installation. A tang on the carrier assembly locates the pump shaft for correct timing to the engine. A pin behind the access nut is fitted over the tang.

After pump installation, the pin is removed and installed in the reverse position for storage behind the access nut.



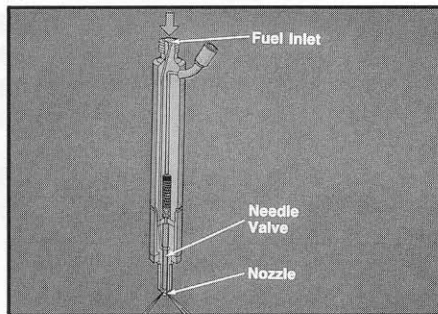
As with the B Series to assure pump-to-engine timing, a second pin is used to lock the camshaft at the No. 1 top-dead-center, compression stroke position. With both pins positioned, fuel injection pump timing is assured. Always

be sure that you follow procedures in the shop manual when installing and timing the fuel injection pump.

Actual pump service involving pump calibration and major disassembly is not performed at the dealer or distributor level. Exchange fuel pumps are available from Cummins ReCon. Service parts are available to perform certain external repairs and adjustments that do not require the use of a fuel pump test stand. These include:

- Replacing Solenoids
- Replacing Control Levers
- Adjusting Idle Speed
- Replacing Governor Springs and Attaching Hardware (B Series CAV)
- Replacing Miscellaneous External Gaskets, O Rings, and Seals (except main shaft seal on Lucas CAV)

NOTE During any fuel injection pump service, cleanliness is of the utmost importance. Make sure that your customers know this, because just a small amount of dirt or contamination entering the fuel injection pump can ruin it.



B Series engines primarily use Robert Bosch, 17mm closed nozzle, hole type injectors. Selected high output rating B Series engines use a similar Lucas CAV nozzle. The injector consists of the:

- Nozzle holder
- Spring
- Shims
- Needle Valve
- Nozzle

Service parts are available from Cummins to repair or rebuild the injector. Cummins ReCon also offers rebuilt B Series injectors. The same prerequisites of a very clean work surface that applied to the injection pump also applies to injectors because of their close tolerances.

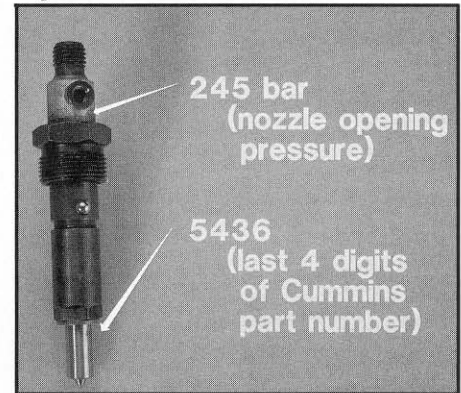
There are three choices available for injector service either replacement or rebuild. First, Cummins ReCon is offering exchange injector assemblies to minimize downtime. Cummins encourages distributors and dealers to use this easy replacement process with a reliable ReCon product. Second, some

distributors or dealers may want to repair these injectors in their own shop. All that is required is an injector pressure (POP) tester and the correct service parts. Complete rebuild and test procedures are included in the B Series Overhaul Manual.

A final alternative for repair/replacement is through the fuel systems supplier authorized dealer network.

C Series engines primarily use Robert Bosch 17mm closed nozzle, hole type injectors. General operation is identical to the B Series. New and ReCon exchange assemblies are available for service.

Injector Identification



Robert Bosch injectors are identified with the last **four** digits of the Cummins Part No. stamped on the nozzle and the opening pressure which is stamped on the nozzle holder assembly in bar. These two identifiers can be cross-referenced to the assembly number required for each CPL. At the back of this booklet you will find cross-reference charts for B Series, Robert Bosch and Lucas CAV injectors.

Turbochargers



Turbocharged versions of the B and C Series engines utilize the H1C and H1E respectively. Turbos are designed by Cummins and manufactured by Holset, a subsidiary of Cummins.

Turbocharger Kits

Service Kit***	Base Turbo	Turbo Model	Eng. Fam.	Superseded Turbo Part Numbers	Overhaul Kit	Rotor Assembly ✓	CPL
3802107	3522068	H1C	B	3522069 3904415 3904414	3802007	3523325	593*, 767*
3802108	3525103	H1C	B	3521366 3905144 3904527 3910830 3904528	3802007	3523321	598, 728, 729, 766
3802109	3522903	H1C	B	3905036		3545529	710, 711
3802111	3523244	H1C	B	3523245 3905042	3802067	3525526	712, 713 741, 826
3802113	3522900	H1C	B	3520030 3906602 3523518 3906603 3523519 3908293 3524311 3908294 3524312 3909317 3903666 3909969 3903667	3802007	3523323	592, 594, 595*, 640, 690, 696, 730, 763, 793
3802115	3522778	H1C	B	3522777 3907029 3907026 3907752 3907027 3910431 3907028	3802007	3523318	597, 599, 692, 697, 698, 715, 716, 729, 792, 804, 807
3802116	3523294	H1C	B	3523223 3907750 3907638 3908098 3907639	3802007	3523755	600
3802117	3523741	H1C	B	3523742 3907857	3802007	3523325	593** 767**
3802118	3524424	H1C	B	3524427 3908233	3802067	3523755	742
3802119	3523743	H1C	B	3523744 3908460	3802007	3523323	595**
3802124	3524121	H1C	B	3524122 3908589 3908587	3802007	3523323	727*, 762*
3802125	3524125	H1C	B	3524126 3908591	3802007	3523323	727** 762**
3802126	3524034	H1E	C	3524035 3909309 3909308 3910877	3802089	3545527	602, 603, 604, 605, 753, 754, 755, 828, 829, 831, 848, 890
3802127	3525488	H1E	C	3525487 3911825 3911824 3911826	3802089	3545528	819, 893

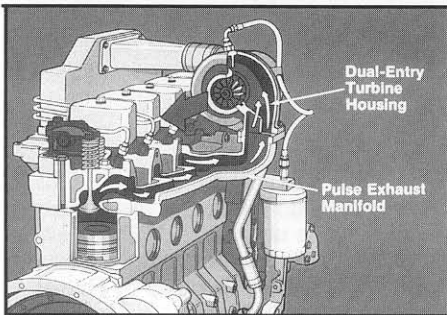
* 76mm (3") Compressor inlet O.D.

** 60mm (2 3/8") Compressor inlet O.D.

*** Appropriate mounting gaskets supplied in kit

✓ Rotor Assemblies service the base turbo and may not fit previously superseded turbos

It is used in conjunction with a pulse exhaust manifold with a divided entry passage.



The divided entry passage feature improves engine efficiency by more

effectively directing the exhaust gases into the turbo housing and against the turbine wheel.

At overhaul time, these turbos can be exchanged for a ReCon unit or may be serviced with an overhaul kit and rotor assembly available from Cummins. Make sure that, when you provide a ReCon turbo, overhaul kit or rotor assembly, that it is the correct one for the engine's CPL.

All requirements for B and C Series turbos are serviced by one of the 14 turbocharger kits outlined in the chart above.

Also included on the chart are the rotor assemblies required for the base Turbocharger. The rotor assemblies

consist of the Wheel and Shaft, Oil Slinger, Thrust Collar, Compressor Wheel and locknut; i.e., all of the rotating members of the Turbocharger Assembly. These assemblies are precision balanced and proper rebuild procedures must be followed.

A final note, current CPL's have been listed with the appropriate Turbocharger Service Kit for convenience. As the CPL is stamped on the engine data plate, this is a quick reference to determine the proper service turbocharger.

B & C SERIES PARTS WARRANTY

Cummins Engine Company warrants all new B and C Series engine parts anywhere in the world through authorized service locations.

New Cummins replacement parts are warranted to be free from defects in material and/or workmanship under normal use and service. This coverage extends six months from the date of first installation.

The warranty is similar to that of Cummins larger engines except that the owner is responsible for travel and other incidental expenses for mechanics to the repair site. Cummins is not responsible for incidental or consequential damages. Also, except for fuel pumps, Cummins does not warrant parts supplied by Cummins which bear the name of another company. These parts are warranted by their manufacturers and not by Cummins. This category of parts includes, but is not limited to:

- Hydraulic pumps
- Alternators
- Starters
- Fans
- Air Conditioning Compressors
- Clutches
- Transmissions
- Torque Converters
- Marine Gears
- Air Cleaners
- Non Cummins Air Compressors
- Non Cummins Engine Compression Brakes
- Non Cummins Steering Pumps

The parts used in repairs may be new Cummins, Cummins approved rebuilt parts, or repaired parts. Cummins is not responsible for failures resulting from the use of parts not approved by Cummins.



For full details on the B and C Series parts warranties refer to Bulletin No. 3381292. This is the latest and most up-to-date warranty.

It is important to note that the Cummins Dealer, as an agent of

Cummins Engine Company, must exercise the warranty responsibility to use "only new Genuine Cummins or Cummins approved rebuilt parts, engines and assemblies in making the repair" as stated in the Cummins Warranty Certificate. The Cummins distributor should insure, therefore, that parts used on the Cummins B and C Series engines for warranty are indeed sourced through the Cummins network. The warranty claim itself must flow through the Cummins Distributor to the factory. This practice also applies to Warranty on "New Parts".

Becoming a B and C Series Engine Dealer - Guidelines

If your dealership is not handling B and C Series engines you could be missing out on some real sales opportunities. Here's a listing of the minimum qualifications you need to become a B and C Series engine dealer. These qualifications apply to any establishment regardless of other Cummins affiliations.

- Sell B and C Series engine parts to the general public.
- Facility with a "clean" work area equipped to perform maintenance troubleshooting and repairs, plus engine removal and installation. A commitment to fast, quality service is mandatory.
- Maintain an adequate inventory of Cummins B and C Series engine parts and rebuilt components to support service and OTC (over-the-counter) demands.
- Perform B and C Series engine or component repair or rebuild service and sell these services to the general public.
- Service capabilities are able to meet Cummins B and C Series maintenance requirements, or facility repairs B and C Series engines or components to Cummins B and C Series service specifications.
- Perform B and C Series engine warranty as agreed between the Dealer, Cummins Distributor and approved by Cummins.
- Performs B and C Series Parts Warranty.
- Maintain up-to-date Parts and Service information - i.e., B and C Series microfiche, Parts Catalogs and Master Repair Manual.
- The minimum level of service offered must include:

- Complete B and C Series Maintenance
- Engine Replacement
- Minor repairs, including replacement of the following components (The list above reflects the minimum type of repair that Cummins expects a B and C Series dealer to perform). There may be some other tasks relating to options and accessories that may also be performed:

- Crankshaft
- Crankshaft Seals
- Water Pump
- Thermostat
- Lift Pump
- High Pressure Fuel Lines
- Low Pressure Fuel Lines
- Injection Pump
- Injectors
- Fuel Shutdown Valve
- Air Crossover Tube and Hose
- Turbocharger
- Exhaust Manifold
- Oil Cooler Element
- Oil Pan
- Tappet Cover
- Starter Motor
- Alternator
- Rocker Lever/Push Tubes
- Belt Tensioner
- Air Compressor
- Timing Pin
- Crankshaft Pulley/Damper
- Essential dealer personnel must have the following Cummins sponsored training:

Service Manager

- Engine Familiarization
- Fuel System Familiarization
- Turbocharger Familiarization
- Operations Training
- Parts and Warranty Training

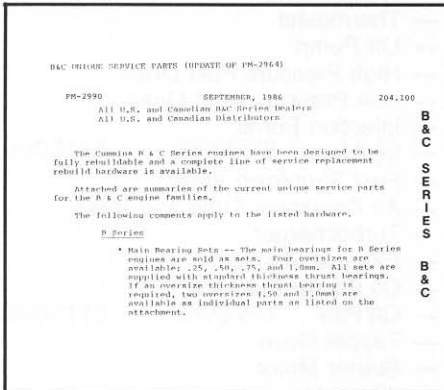
Mechanic(s)

- Operations Training
- Troubleshooting and Minor Repair
- Engine Familiarization
- Fuel System Familiarization
- Parts Familiarization

As you can see, it isn't all that difficult to become a Cummins B and C Series Engine Dealer. If your dealer already is one - great. If it isn't, maybe it's about time to become one.

B and C Series Literature

There is a wide variety of service, sales, and informational literature available for the B and C Series engines. As a Parts Professional it's important for you to know how to identify B and C Series Parts Marketing Bulletins. As a dealer, to receive B and C Parts Marketing Bulletins, you must be an authorized B and C Series dealer. These bulletins are evident by the B & C Series logos that run down the right side of the page.



Other information available include several training programs, parts catalogs and brochures. The following chart lists these publications and their bulletin numbers.

What's New For Parts Publications



Since the last issue of Parts Professional, Parts Publications has released 10 new and/or revised Parts Catalogs. The people at the factory are working hard to keep you up-to-date with the most current and accurate information. The following table gives a listing of the latest catalogs.

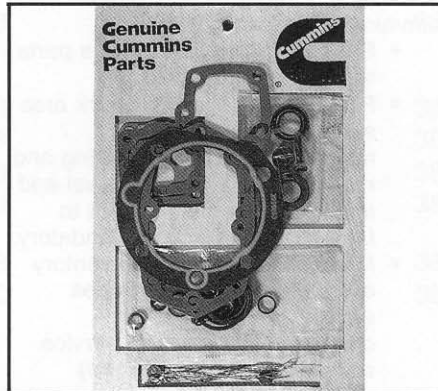
Parts Publications continues to update the Master Parts Book; the latest revisions include the KT38 and KT50 sections.

Parts Publications

Application	Bulletin Number
REVISIONS	
NTC/NTCC 444 Automotive	3822103-01
LTA10 Automotive Conventional Aftercooling	3379630-02
KTA 50M Series Marine	3379595-01
VTA 903T FMC for BFV	3379702-01
NEW	
New Big Cam IV Step Timing Control Automotive	3822114-00
New Big Cam IV Fixed Timing Automotive	3822113-00
LTA10 Optimized Aftercooling Automotive	3822120-00
KTTA 38 Series G Drive	3822115-00
CUSTOMIZED	
6CT8.3 Paccar Mid-Ranger Model 13-210	3822117-00

Product Consolidation

Fuel Pump Gasket Sets



Cummins fuel pump gasket sets have been completely re-engineered to improve their contents and packaging. The consolidation reduced the number of gasket sets from 10 to 5. The following table provides a listing of the products offered.

Fuel Pump Gasket Sets

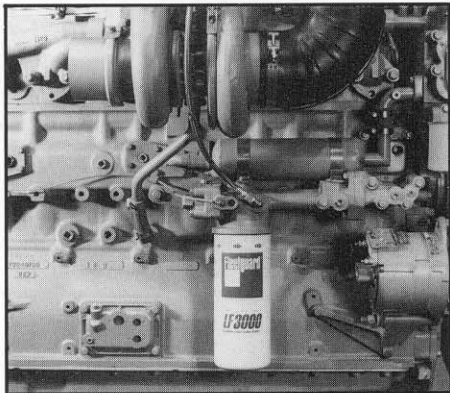
Part Number	Application
BM 68356	PT Type G-Automotive Standard Governor
BM 98776	Seal Kit-MVS Governor (use with BM 68356)
3010240	PT Type G, Automotive Pump Pressure Regulated
3010242	PT Type G, Automotive Pump with AFC/AFC-VS
3801003	PT Type H Pump with AFC/AFC-VS

Fuel pump gasket sets that had very little or no sales activity were eliminated from the service product line.

Customer input indicated that the gaskets and seals were sometimes damaged during the manufacturing or shipping process. A Parts Engineering investigation found the gear pump gasket (red in color) was wrinkled, torn or ripped. The package has been redesigned to eliminate damage.

The consolidation carefully scrutinizes which sets should be retained for service. With the help of fuel pump production personnel, the contents of the service sets have been reworked to provide the correct seals and gaskets. If you find an unsatisfactory number of items in the set you purchase please contact your Cummins Parts Order Representatives.

Fleetguard



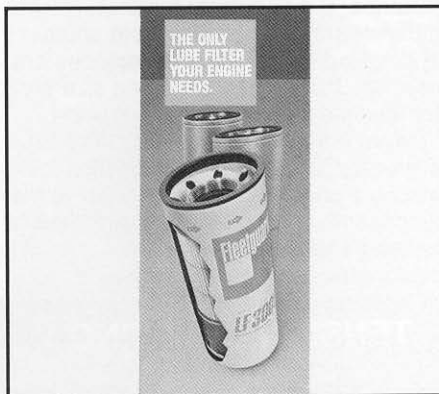
Fleetguard has introduced a revolutionary Lube Filter. The LF3000 filter is the standard option on BCIV engines, and is designed to do the job of both the **full flow** and **bypass filters** in one spin-on element. It's the same size as the LF670 full flow. Retrofit kits are available from Fleetguard to convert Cummins Big Cam engines, Detroit Diesels and Caterpillars. The conversion process requires less than an hour.

The LF3000 is constructed in sections. The full flow section is constructed with a MicroGlass media which provides dramatic filtration performance. The bypass section features a stacked-disc filtering media currently used in the Cummins spin-on LF777. Due to the superb filtering capabilities, the LF3000 filters more and smaller particles. As a matter-of-fact, testing has proven the "3000" is 115% more efficient at filtering particles the size of 3 to 7 microns than the current two-filter system.

LF3000 increases engine reliability because... it filters smaller micron size particles, thereby protecting bearings and other major engine components from wear. The MicroGlass media has a lower resistance to flow thereby allowing cold oil to be filtered more quickly at start up and during cold ambient temperatures. The LF3000 has a one piece seam, making it virtually leakproof. In addition, its larger thread size and "L" shape gasket allow hand-tight installation without leaking. And, removal torque is much lower.

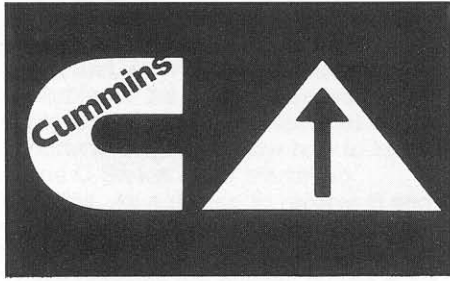
The LF3000 is a Fleetguard filter system that beats the performance of any OEM filter system now on the market in terms of removal of particles. The only filter system that would outperform the LF3000 would be a full flow, constructed of 100% MicroGlass, in combination with a separate by pass filter, an application which is far more

costly. The Fleetguard LF3000 costs about the same as the present two-filter system.



The LF3000 ... the only Lube Filter your engine will ever need. An information training brochure may be obtained by contacting your nearest Cummins Distributor or Fleetguard outlet, or you may write P.O. Box 162409, Irving, Texas 75016.

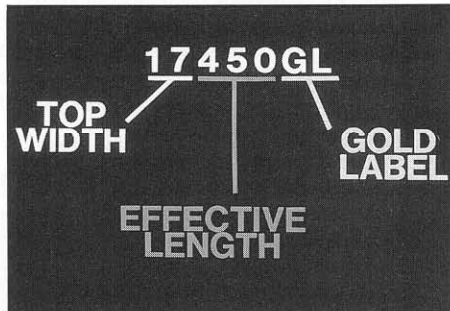
Cummins Dayco Belts



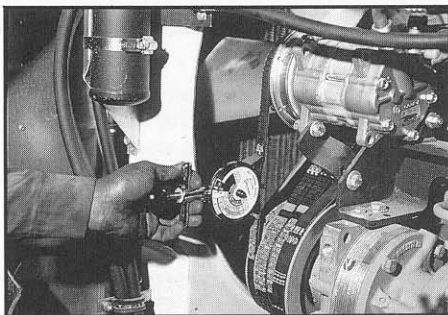
Belt Matching

When it comes to selling matched belts for multiple-belt drives, "close enough" won't do! Multiple belt drives (two or more V-belts) require a **matched set** to guarantee reliability.

"What's the difference?" you may ask. Well, there's not a whole lot of difference, but it's that "little bit" that's critical. V-belts are manufactured to dimensional tolerances established by the Society of Automotive Engineers (SAE). This assures that all belts manufactured to a specific size will have the same top width and effective length (within S.A.E. parameters) and, therefore will fit on a specific drive application.



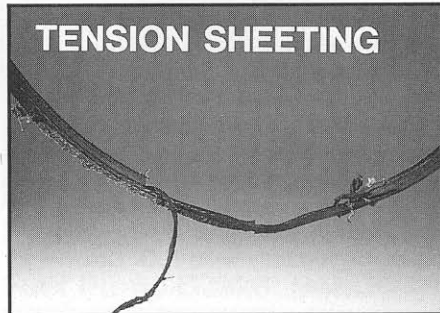
Single belt drives have a relatively wide range of adjustment that allows for correct tensioning during installation. A small difference from belt to belt (within S.A.E. specs) poses no tensioning problem.



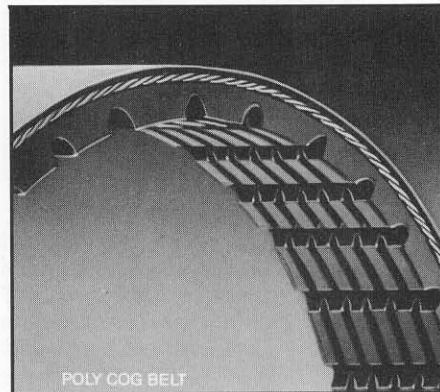
With multiple belt drives, belt tolerance is much more critical, because, there is

virtually **no** allowance for tension variations from belt to belt. All belts are tensioned together, equally. So in this instance, S.A.E. tolerances that differentiate one belt size from another are not sufficient. Closer tolerances are needed. Just buying the same size belts for multiple belt drives will not work!

Dayco matches belts during the final inspection process. The inspection machine checks tolerances down to the thousandth of an inch. Belts matched to the same tolerances are then designated as **matched sets**.



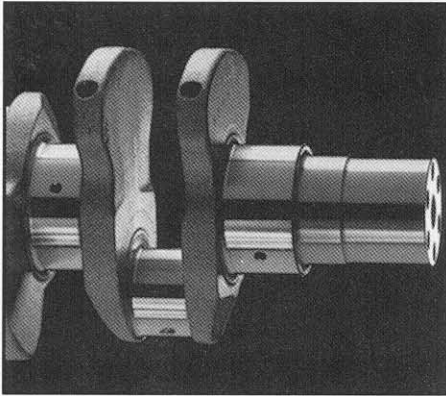
If matched belts are not used on multiple drive applications, each belt will not carry its proportional share of the load, and early belt failure will result. Belt life can be cut in half or, in extreme cases, failure is almost immediate if matched belts are not used.



As a Cummins Parts Professional, you owe it to your customers to sell them the right belt for the right application...So when it comes to **belt matching**, provide your customers with the right belts for their application!

Parts Marketing

Cummins Crankshafts



Cummins is now offering Genuine Crankshafts at a great low price!

Cummins Crankshafts give you these important advantages:

- Forged manganese steel for superior reliability
- Induction-hardened fillet and bearing surfaces for long life

Plus, Service crankshafts are identical to new.

Cummins offers **new Crankshafts**:

- that are competitively priced to sell against new, low-priced off-shore and domestic cranks. And, it eliminates the Cummins ReCon "CX" bad core Crank option.

Prices have been reduced on several Cummins NT, L10 and V903 crankshafts. The thrust of this reduction is meant to keep customers in the **Genuine channel**, providing you with increased sales opportunities.

Cummins Crankshafts ... the best for less!

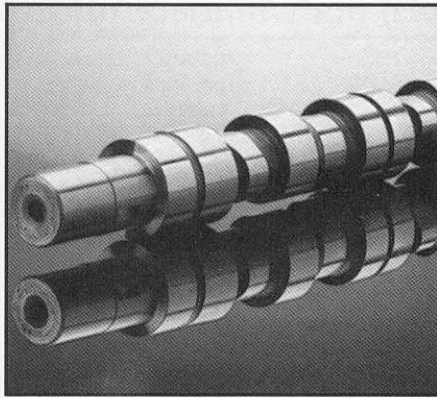
Help your customer's protect their Cummins investment with:

Nationwide

- Warranty 1 yr/100,000 miles/ 3,600hours
- Extended Coverage 3 yrs/ 300,000 miles/ 10,800 hours
- Technical Service Network
- Technical Support

Cummins Camshafts

New service camshafts from Cummins offer you the best for less! Prices on Cummins NT Small Cam and Big Cam Camshafts are now reduced by as much as 20%.



Cummins replacement camshafts:

- incorporate current Cummins engineering design improvements
- are built with the latest technical manufacturing techniques
- are 100% inspected to give you premium quality

Cummins offers **new camshafts**

- that are competitively priced

Plus, many Cummins Distributors will be offering a ReCon (RX) option when you present a used product that meets specific core acceptance standards. Please note: this option will be phased in at participating Cummins Distributors. Check with your branch to see if the option applies.

The following table includes available Parts Marketing Literature.

Component Marketing

Bulletin No.	Description
3385434	Camshaft Brochure
3385433	Crankshaft Brochure
3385432	Crank and Cam Poster

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BLANK

B Series Injector Identification (Robert Bosch)

Cummins Injector Assy.	Superseding Assy. No.	Nozzle No.*	Bosch Type No.	Opening Pressure (Bar)	CPL 4 Cyl.	CPL 6 Cyl.	Notes
3904197	3909476	3313	P-74	245	594,730,696	729,938,949,943,950	
3903383	3909475	3110	P-67	220	591,895,646,681	596,715,711	
3902969	3909454	1507	P-70	245	592,710		
3902980	3909464	2420	P-66	245		599,698,834,728	
3905438	3909509	5436	P-84	245	593	598	
3905454	3909522	7782	P-104	245	762, 727	804,716, 761, 766	
3907173	3909532	3313	P-74	220	721	713,714,697	
3908175	3909533	8446	P-114	245	595,767	600,912	
3910623	3912782	3110	P-67	180	725		
3911340		3110	P-67	220	763,843	845,960	Edge Filter
3911185		1186	P-157	180	793,826,937	792,791	
3912468		2492	P-170	245	856,857		

* Last four digist of Cummins Part Number

B Series Injector Identification (CAV Lucas)

Cummins Assy./No.	CAV Assy. No	CAV Nozzle No.	CPL 4 Cyl.	CPL 6 Cyl.
3905752	676-0403	6801055	690,689	692,691
3908238	676-0402	JBG-801060		742
3910325	676-0401	JBG-801059	741	
3912478	676-0408	6801075		940

4B SERIES

AUTOMOTIVE/INDUSTRIAL

CPL	ENGINE MODEL	PISTON	COMP RATIO	PISTON KIT	INJECTOR	TURBO
591	4B 3.9	3906223	17.3	3802060*	3802009	—
721	4B 3.9	3906223	17.3	3802060*	3802037	—
725	4B 3.9	3906223	17.3	3802060*	3802063	—
592	4BT 3.9	3903579	17.2	3802030*	3802008	3802113
593	4BT 3.9	3903582	18.5	3802090	3802036	3802107 A 3802117 B
646	4BT 3.9	3903579	17.2	3802030*	3802009	3802109
690	4BT 3.9	3907163	17.5	3802160*	3802049	3802113
696	4BT 3.9	3907156	16.5	3802100*	3802035	3802113
710	4BT 3.9	3907156	16.5	3802100*	3802008	3802109
711	4BT 3.9	3907156	16.5	3802100*	3802009	3802109
727	4BT 3.9	3907163	17.5	3802160*	3802038	3802124 A 3802125 B
730	4BT 3.9	3907163	17.5	3802160*	3802035	3802113
741	4BT 3.9	3907156	16.5	3802100*	3802059	3802111
762	4BT 3.9	3907163	17.5	3802160*	3802038	3802124 A 3802125 B
767	4BT 3.9	3903582	18.5	3802090*	3802048	3802107 A 3802117 B
793	4BT 3.9	3907156	16.5	3802100*	3802061	3802113
826	4BT 3.9	3907156	16.5	3802100*	3802061	3802111
594	4BTA 3.9	3907156	16.5	3802100*	3802035	3802113
595	4BTA 3.9	3907156	16.5	3802100*	3802048	3802113 A 3802119 B

* = OVERSIZE PISTON KITS AND RING SETS
(0.50 & 1.00 MM) AVAILABLE

A = COMPRESSOR INLET DIAMETER — 76MM (3.00") O.D.
B = COMPRESSOR INLET DIAMETER — 60MM (2.275") O.D.

CRANKSHAFT = 3908031

CAMSHAFT = 3907823

RING SETS NATURALLY ASPIRATED

STD 3802040

.5 O/S 3802042

1.0 O/S 3802044

RING SETS TURBOCHARGED

STD 3802050

.5 O/S 3802052

1.0 O/S 3802054

CYLINDER HEAD = 3910275

WATER PUMP = 3802004

AFTERCOOLER = 3910281

6B SERIES

AUTOMOTIVE/INDUSTRIAL

CPL	ENGINE MODEL	PISTON	COMP RATIO	PISTON KIT	CYLINDER KIT	INJECTOR	TURBO
596	6B 5.9	3906223	17.3	3802060*	—	3802009	—
691	6B 5.9	3906223	17.3	3802060*	—	3802049	—
714	6B 5.9	3906223	17.3	3802060*	—	3802037	—
597	6BT 5.9	3907163	17.5	3802160*	—	3802035	3802115
598	6BT 5.9	3903582	18.5	3802090*	—	3802036	3802108
698	6BT 5.9	3907156	16.5	3802100*	—	3802039	3802115
712	6BT 5.9	3907156	16.5	3802100*	—	3802035	3802111
713	6BT 5.9	3907156	16.5	3802100*	—	3802037	3802111
716	6BT 5.9	3907163	17.5	3802160*	—	3802038	3802115
729	6BT 5.9	3907163	17.5	3802160*	—	3802035	3802115
742	6BT 5.9	3907156	16.5	3802100*	—	3802058	3802118
761	6BT 5.9	3907163	17.5	3802160*	—	3802038	3802115
766	6BT 5.9	3903582	18.5	3802090*	—	3802038	3802108
792	6BT 5.9	3907156	16.5	3802100*	—	3802061	3802115
599	6BTA 5.9	3907156	16.5	3802100*	—	3802039	3802115
600	6BTA 5.9	3907156	16.5	3802100*	—	3802048	3802115
715	6BTA 5.9	3907156	16.5	3802100*	—	3802009	3802115
601	6C 8.3	3908748	16.3	3802190	3802121	3802095	—

* = OVERSIZE PISTON KITS AND RING SETS
(0.50 & 1.00 MM) AVAILABLE

CYLINDER LINER KIT = 3802088 (6C SERIES ONLY)

CYLINDER BLOCK SALVAGE SLEEVE = 3904166

(B SERIES ONLY)

CRANKSHAFT = 3908032 (6B) 3904363 (6C)

CAMSHAFT = 3907824 (6B) 3911236 (6C)

RING SETS NATURALLY ASPIRATED (6B)

STD 3802040

.5 O/S 3802042

1.0 O/S 3802044

RING SETS TURBOCHARGED (6B)

STD 3802050

.5 O/S 3802052

1.0 O/S 3802054

RING SET = 3802110 (6C SERIES)

CYLINDER HEAD = 3910276 (6B) 3913111 (6C)

WATER PUMP = 3802004 (6B) 3802081 (6C)

AFTERCOOLER = 3910282 (6BTA) 3907171 (6CTA)

Part Professional Test #6

1. B Series engines can be bored oversize to accept _____.
 - A. () oversize water separators
 - B. () oversize pistons
 - C. () oversize injectors
 - D. () oversize fuel lines
2. Currently C Series engines have only one diameter piston available for service.
 - A. () True
 - B. () False
3. Cummins includes piston pins in B and C Series Piston Kits.
 - A. () True
 - B. () False
4. The B Series 0.50mm oversize thickness head gasket is easily identified by _____ notches.
 - A. () 10
 - B. () 3
 - C. () 4
 - D. () 2
5. When oversize pistons are used in B Series engines it _____.
 - A. () does not require the use of oversize diameter head gasket
 - B. () requires the use of oversize diameter head gasket
 - C. () requires surface deck shims
 - D. () requires the installation of new fuel lines
6. B Series engines use distributor type fuel injection pumps produced by Robert Bosch or Lucas CAV.
 - A. () True
 - B. () False
7. There should always be a steady flow of fuel through the fuel return line to keep the _____.
 - A. () high pressure fuel lines warm
 - B. () engine from overspeeding
 - C. () injectors cooled and lubricated
 - D. () lube pump operational
8. B Series fuel pump data plates provide important information concerning _____.
 - A. () specifications
 - B. () configuration
 - C. () direction of pump rotation
 - D. () all of the above
9. Currently, B Series engines have a horsepower range from 52-210.
 - A. () True
 - B. () False
10. SAE #2 and #3 flywheel housings are available with arm or pad mounting arrangements.
 - A. () True
 - B. () False
11. The B Series uses _____ camshaft bushings in the front of the block to carry side-loading.
 - A. () 4
 - B. () 2
 - C. () 1
 - D. () 3
12. The engine data plate for B and C Series engines is located on the _____.
 - A. () fuel pump housing
 - B. () fuel pump side of the engine
 - C. () flywheel housing
 - D. () bottom oil pan rail
13. Cummins heavy-duty crankshafts provide you with these important advantages _____.
 - A. () nationwide warranty of 1 yr/100,000 miles/3600 hours
 - B. () extended coverage 3yrs/300,000 miles/10,800 hours
 - C. () Induction hardend fillet and bearing surfaces for long life
 - D. () all of the above
14. Multiple belt drives, two or more V-Belts require _____ to guarantee reliability.
 - A. () three belts in a sequence
 - B. () a matched set
 - C. () the same amount of ribs
 - D. () a glazed surface
15. The fuel pump gasket set consolidation reduced the number of gaskets sets from _____.
 - A. () 18 to 1
 - B. () 6 to 4
 - C. () 10 to 5
 - D. () 12 to 10

16. If belts are not matched on multiple drive applications, each belt will _____.
- A. not carry its proportional share of the load
 - B. early belt failure will most certainly occur
 - C. both A and B
 - D. none of the above
17. Turbocharged versions of the B Series engines use the _____.
- A. H1D
 - B. H1C
 - C. H1E
 - D. T46B
18. B and C Series engines primarily use Robert Bosch, 17mm closed nozzle, hole type injectors.
- A. True
 - B. False
19. These fuel pump repairs do not require the use of a fuel pump stand.
- A. replacing solenoids
 - B. replacing control levers
 - C. adjusting idle speed
 - D. all of the above
20. All turbocharger requirements for B and C Series engines are serviced by one of _____ turbocharger kits.
- A. 4
 - B. 14
 - C. 10
 - D. 8
21. As a dealer, to receive B and C Parts Marketing Bulletins or newsletters you must be an authorized B and C Series dealer.
- A. True
 - B. False
22. New B and C Series genuine replacement parts are warranted to be free from defects in material and/or workmanship for _____, from the date of installation.
- A. two years
 - B. ninety days
 - C. six months
 - D. three years
23. Robert Bosch stamps the original Cummins Part Number on the housing.
- A. True
 - B. False
24. The B Series engines uses a specially designed _____.
- A. dual-piece, crossflow cylinder head
 - B. four-sided, crossflow cylinder head
 - C. Single-piece, crossflow cylinder head
 - D. two-piece, crossflow cylinder head
25. The incentive for Parts Professional No. 7 and 8 is a 10 pack "Igloo" cooler.
- A. True
 - B. False
26. The C Series engine features a center-mounted dipstick location on both sides of the engine.
- A. True:
 - B. False
27. The B and C Series engines have a unique set of Part Numbers to identify them. The seven digit part number starts with _____.
- A. 14
 - B. 39
 - C. 12
 - D. 36
28. When selling a fuel pump for B and C Series engines always use the one specified for the _____.
- A. CPL and engine horsepower rating
 - B. fuel pump solenoid voltage requirements
 - C. both A and B
 - D. none of the above
29. C Series engine models 6C, 6CT and lower-rated 6CTA use the _____ pump.
- A. "X"
 - B. "B"
 - C. "A"
 - D. "F"
30. Many of the B Series pistons are interchangeable between the 4 and 6 cylinder applications.
- A. True
 - B. False

Reference

Brochures	Bulletin No.
B & C Series design Features	3382565
Small Engine Warranty Manual	3381224
B Series Engine Industrial Brochure	3382706
C Series Engine Industrial and Marine Warranty	3382855
C Series Engine Industrial	3382858
B & C Series North American Marketing Sales	3381219
B Series Automotive Brochure	3382749
Manuals	
Troubleshooting and Repair C Series	3810261
Troubleshooting and Repair B Series	3810207
Shop Manual B Series	3810206
Shop Manual C Series	3810275
C Series Specification	3810312
Operation and Maintenance B	3810205
Alternative Repair B	3810234
Operation and Maintenance C	3810248
B and C Series Parts Warranty Certificate	3381292

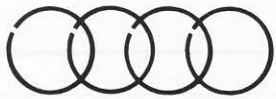
Service Parts Topics

Number	Description	Engine Model
86T1-15	Identification of 4 Cylinder equipped with balancer	B Series
86T1-16	Redesigned Gear and Timing Pin housing	B Series
86T1-18	4-Cylinder Engine Balancer Idler Gear and Retainer	B Series
86T13-1	Alternator Mounting Procedure	B Series
86T13-2	Delco B Series Starters	B Series
86T5-11	Delivery Valve Modification for Bosch VE Injection Pump	B Series
86T8-5	Cooling System Alternator Modification for Repower	B Series
86T8-14	Heater Plumbing	B Series
87T2-1	Cylinder Head Torque Value	B Series
87T2-2	Cylinder Head Reuse Guidelines	B Series
87T8-1	Marine Expansion Tank for Heat Exchange	B Series

Parts Marketing Newsletters

Number	Description	Date
PM-2986	B & C Dealer Information Requirements	9-86
PM-3004	B & C Turbocharger Kits	1-87
PM-2892	Intro to B & C Parts Marketing Bulletins	7-83
PM-2992	B Series Marine Upper Gasket Sets	9-86
PM-2990	B & C Unique Service Parts	9-86
PM-2989	B Series Piston Kits	9-86
PM-2962	C Series Piston and Cylinder Kits	9-86
PM-2896	B & C Series Part Numbers	8-83

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