

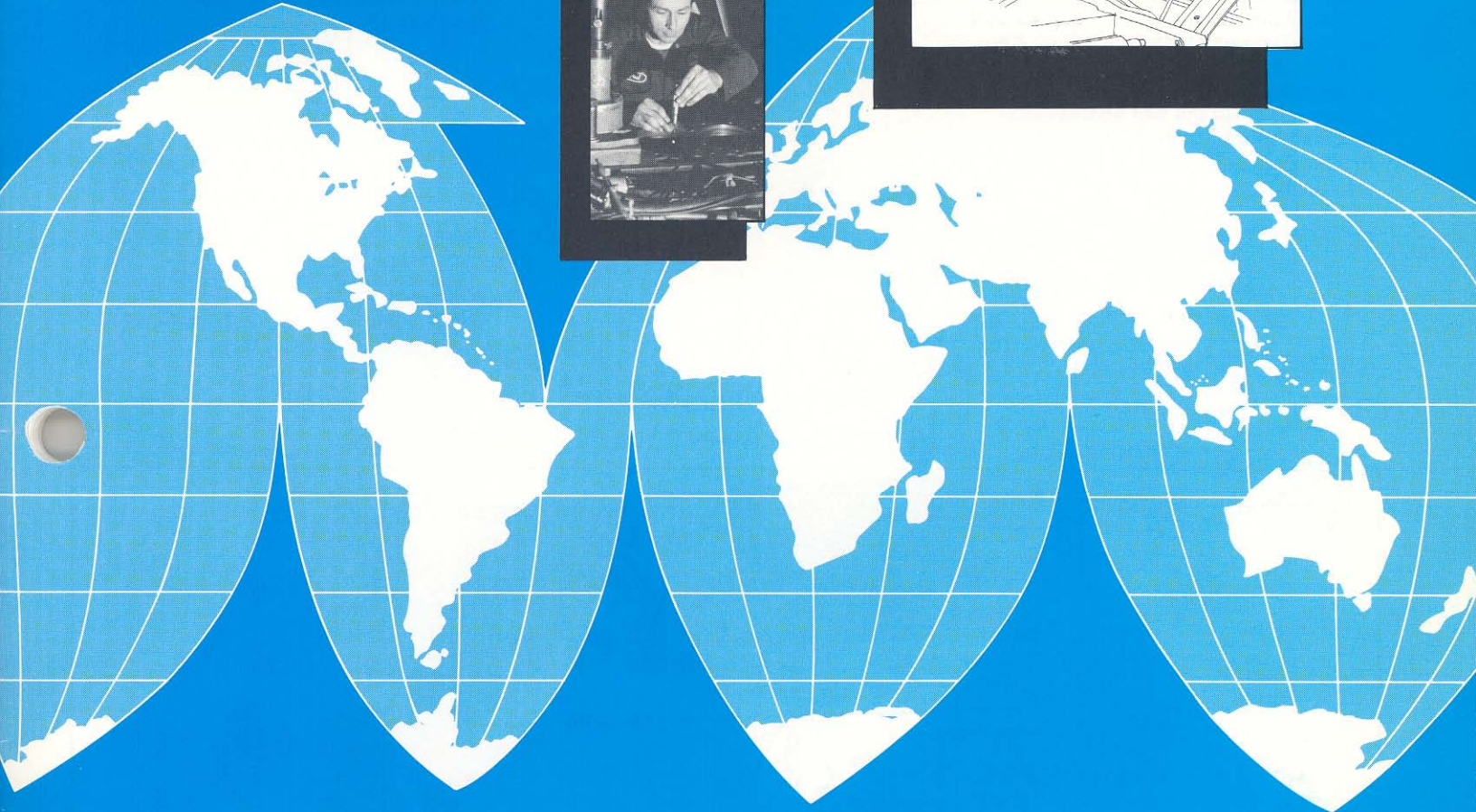


PARTS PRO CLASSIC

CLASSIC EDITION #5

Parts Pro Classic is provided as a historical reference.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



**parts
professional**



INVEST IN THE BEST

Letter From the Editor

As Parts Professionals, you know what a competitive world we live in. Many changes in the Parts Business are quickly becoming our opportunities. I trust that all of you are beginning to receive rewards as Parts Professionals. Those who mailed in Quiz No. 1 before the deadline, November 14, 1986, will receive a certificate with our thanks for your continued interest in Genuine Cummins Parts!

Again, I wish to thank the contributing editors of this booklet.

To continue receiving Part Professional booklets, you must stay current on the Parts Professional mail list. If you have an employment or address change, please complete the self addressed enrollment form. Remember, the Parts Professional is your key to Investing in the Best!

Regards,

Joan E. Mobley
Joan E. Mobley

Corrections to #4

Cummins ReCon Cylinder Head Warranty is 1 year/100,000 miles.

As of January 1, 1986, the 3008101 Cylinder Head does not have a conversion charge.

Your Ideas

Thanks to the "Parts Boys" in Maywood, California for submitting ideas for future issues.

Ed Gustason, Training Manager at Omaha suggested I include straight-talk regarding the ReCon Fuel Pump Calibration NOW Coverage. And, the sleeving requirement to obtain the advantage of the lower-press-fit liner. Ed, you're a true Cummins Professional.

The guys from the Charlotte Distributor and Dealers provided the field-test with great input too!



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



What's the key to dependability? Cummins Genuine Parts.

As a Parts Professional you know reliability comes from correctly installing **Cummins Genuine Parts**. It's part of your job to make sure your customers know it too! In the near future you'll get the chance to spread the good word about Cummins Parts to lots of new customers because of a new National Overhaul Warranty plan (NOW). This plan is designed to benefit you by pulling customers into your shops so you can implement the best Overhaul and Warranty deal that's available on the market today.

Currently the **Genuine Channel** of Cummins Authorized Distributors and Dealers pull-in approximately 20-25% of the service business. Independent repair shops, leasing companies and fleet shops get the rest. It is the goal of the NOW plan to "tie in" a genuine service and parts overhaul with the advantages of the Genuine Cummins Warranty.

This Parts Professional is the fifth in our continuing series. We've focused on Overhaul Parts and how they pertain to the guidelines which are outlined in the new National Overhaul Warranty plan. In this issue we'll discuss ways to identify Genuine Cummins Parts according to

the guidelines of the NOW plan and, most importantly, show you, the Parts Professional, how you fit into it.

In addition to overhauls and their associated parts, we've included the identification chart on Cummins ReCon, Parts News Update, New Products, Product Consolidations, Fleetguard and the current Parts Marketing program.

We've also put together another Parts Professional Exam to test your knowledge. We hope you enjoyed the first four issues of our series and we appreciate your continued participation. This issue begins another series. Complete

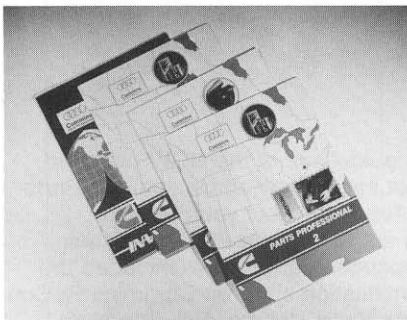
Exams 5 and 6 with an average quiz score of 90% or better and earn a Unisonic solar powered calculator. The pocket carrying case is embossed with the Parts Professional logo.



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

To be recognized as a Cummins Parts Professional and to keep your address current, complete the enrollment form on page 20, fold and staple the exam and enrollment page. The address and U.S. postage are preprinted on the fold over envelop. You'll be keeping up with all the latest Cummins designs, Product Improvements, Standardizations and Allied Products. Participating in the Parts Professional Series 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



In Parts Professional booklets 1-3 we divided the NH/NT engine into four basic groups:

- Head Group
- Block Group
- Ends Group
- Accessory Group

Parts Professional Booklets

Bulletin No.	Part Name	Description
3387320-1R	Parts Pro #1	Head Group
3387320-2R	Parts Pro #2	Block Group
3387320-3R	Parts Pro #3	Accessories
3387320-4R	Parts Pro #4	Cummins ReCon

Booklet 4 concentrated on the components, warranty and acceptance standards offered by Cummins ReCon. If you missed the back issues, your local Cummins Distributor can order booklets 1-4, at no charge from their Cummins Literature Distribution Services.

To begin we need to think about these two questions.

- Why overhaul?
- What is an overhaul?

Essentially, an overhaul is a renewal of engine performance through installation of new Cummins and ReCon Parts and the **Genuine** reconditioning of parts that are out of specification. An overhaul is generally performed because of specific engine symptoms or as a part of a set maintenance schedule. Reasons for overhauling include:

- Excessive oil consumption
- Excessive fuel consumption
- Low power
- Excessive blowby
- Major component wear or failure

Cummins National Overhaul Warranty (NOW)

The Cummins National Overhaul Warranty is a series of standardized **in-frame** overhauls for NH/NT automotive engines. The warranty is designed to increase Cummins parts and service business in the **Genuine Channel**. And, we can do it...**NOW!**

Let's take a look at what we can expect from the National Overhaul Warranty:

- Customers get a standardized repair package of **Genuine Cummins Parts and labor** backed by the latest training and technology, and overhaul pricing based on Cummins Standard Repair Times and a customer protection plan that leads the industry.
- Sales of Genuine Cummins Parts and shop labor are increased as the genuine channel increases its share of Cummins service market. Risks associated with shop comebacks are greatly reduced because we're sure that the engine is getting exactly what it needs.
- Cummins Engine Company provides its customers with the

very best in aftermarket support and sells more parts through participating Distributors and Dealers who actively promote this plan.

As you can see, **NOW** can mean a lot to you, the Parts Professional, in terms of:

- Increased Parts Sales
- Increased Service Business
- More Customers

NOW Concept



The National Overhaul Warranty offers Cummins engine owners the opportunity to purchase any of three standardized in-frame overhaul plans, available with options and a factory-backed warranty. Each overhaul plan is standardized and has been developed based on the concept of intelligently reusing **Genuine Parts** when they meet the reuse guidelines established by Cummins. The three overhaul plans include scheduled maintenance items, overhaul parts and uprate options.

A question you may be asking is; So where does this leave me, especially if they're reusing old parts? You, the Parts Professional, are going to be right in the thick of things primarily through the sale of associated parts, repair kits and Uprate options.

You'll be seeing more customers in your shops from the promotion of the NOW plan. Now, let's explore the customers benefits:

- Standardized overhaul plans with suggested pricing to take the guesswork out of an overhaul visit.
- Less downtime.
- Rebuilt with reliable Genuine Cummins Parts.
- Installation by Cummins trained technicians.
- Warranty factory sponsored and administered.
- National Warranty honored at 2800 locations.
- On-the-spot warranty decisions.
- Up to 2 Yrs./200,000 miles (321,870 km) or 7200 hrs. Coverage.

In addition to the customer's benefits, there are some obvious benefits to you as Distributors and Dealers. They include:

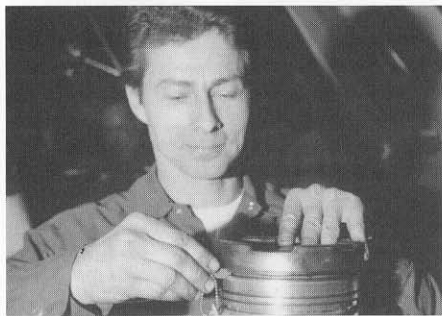
- Increased **parts** and labor sales.
- A marketable service program.
- Factory administered warranty.
- National advertising and promotion.
- Combats non-genuine service erosion.
- **Draws business** for associated sales.

Now that you've got a feel for the Overhaul Warranty plan, let's look closely at the guidelines.

Engine Rebuilding Options

Plan 1

Plan 1 is basically a re-ring job. It covers replacement of rings, rod bearings and gaskets, plus it provides for some performance alternatives. Plan 1 carries 1 year/100,000 mile warranty protection.



A customer probably would use this particular plan for these general reasons:

- "Scheduled PM" Overhauls
- Preparation for trade for increased resale value.
- Usually related to first overhauls or conditions where many parts meet Cummins reuse guidelines.

As you can see, this isn't the type of plan you'd recommend for an engine with a million miles. This list includes the parts and service that go into a **Plan 1 Overhaul**, the underlined areas represent your sales opportunities.

- Premium Plus Piston Rings
- Clean and inspect pistons
- Clean and inspect liners and Replace Liner Seals
- Standard Rod Bearings
- Head Gasket Set
- Oil Pan Gasket
- Cummins Premium Blue Oil or equivalent 15W-40 (44 Qts.)
- Filters Oil, Coolant, Fuel and Air
- Antifreeze (Low Silicate, GM 6038 or equivalent)
- Steam Clean
- Compuchek, Dyno check or Road Test
- Cut Counterbore for shims
- Inspect Camshaft
- Clean and test cylinder heads
- Reseal Rocker Boxes
- Paint
- Check and/or replace Vibration Damper

Plan 2

Plan 2 is a traditional rebuild that calls for cylinder kits, rod and main bearings, exchange heads, gaskets, plus performance alternatives. It also includes a 1 year/100,000 mile warranty. The general reasons for plan 2 include:

- High oil consumption
- High blowby
- Customer prefers an inframe overhaul
- Situation where an overhaul requires heads, bearings and cylinder kits

A major rebuild opens the door for additional parts sales. Consider the fact that customers who opt for plan 2 or 3 offer you the perfect opportunity to sell Uprate items and associated parts. It's your job to help the customer consider all the options that Cummins has available to improve engine performance and reliability.

This listing includes the overhaul items that are available on Plan 2 and 3; however, the Plan 3 overhaul includes two extra items which we will describe later. The underlined items represent your parts sales opportunities.

- Premium Cylinder Kits
- Standard Rod Bearings
- Standard Main and Thrust Bearings
- Head Gasket

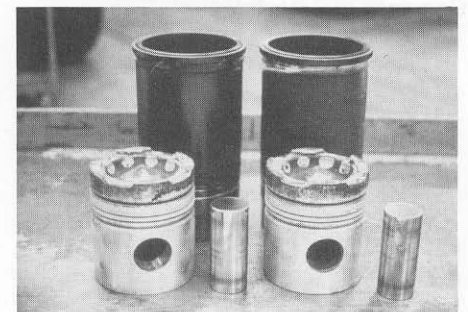
- Oil Pan Gasket
- Cummins Premium Blue Oil or equivalent 15W-40 (44qts.)
- Filters Oil, Coolant, Fuel and Air
- Antifreeze (Low silicate, GM 6038 or equivalent)
- Steam Clean
- Compuchek, Dyno Check or Road Test
- Cut Counterbores for shims
- ReCon Cylinder Heads
- Inspect Camshaft
- Reseal Rocker Boxes
- Check and/or replace Vibration Damper

Plan 3



A premium overhaul Plan 3 includes the installation of **Premium Plus Cylinder Kits and Compuchek fittings**. When a customer purchases Plan 3 all **New or ReCon** parts installed have an extended warranty of 2 yrs./200,000 miles (321,870 km) or 7,200 hours. As with all NOW plans, the customer has the option to Uprate to the latest technology for fuel economy and performance.

Parts Reuse



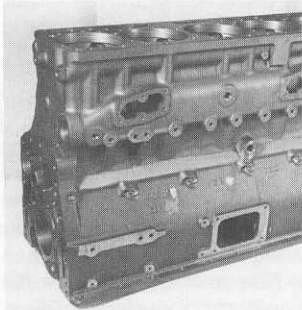
On the surface, reuse of old parts certainly isn't going to increase your parts sales. But, it's an overhaul option. Through the reuse of Genuine Cummins Parts, we can save customers money, and attract more business into our shops. By saving the customer money on the front-end, you could be opening

the purse strings for some performance alternatives and Uprates.

It is important to replace the maintenance items at the proper intervals. The authorized Cummins shop does the rebuild and you get the parts sales that go with it. This gets a line of communication going, especially with new customers, and opens the door for selling Cummins Repair Kits and ReCon Components.

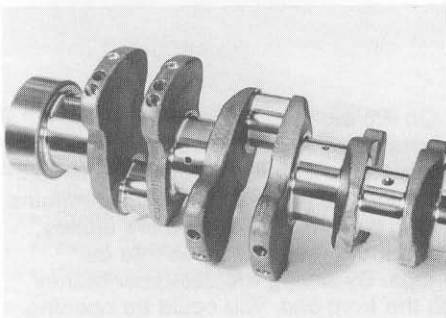
So, parts reuse is a good logical deal; however, it is very important to understand the concepts and practices that constitute reusing a particular part or component. Let's take a moment now to explore the reuse guidelines and look at the best ways to identify the Genuine Cummins product.

Visual Inspection and Reuse Guidelines



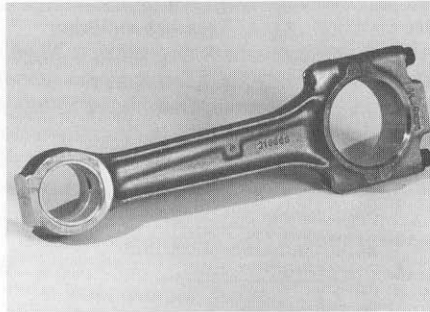
Cylinder Block - looking from the front, the part number is hand-stamped onto the side of the block just beneath the number 2 cylinder. On most NT blocks you'll also find the initials CEP stamped-in indicating the block was machined at the Columbus engine plant. Visually check the serial number; it will help you determine that the block is Genuine.

- Reuse if:
 - Block is not broken or damaged beyond repair.
 - Counterbore can be salvaged by current repair practice guidelines:
 - A. Use .020 inch shim
 - B. Use oversize liner
 - C. Sleeve the counterbore



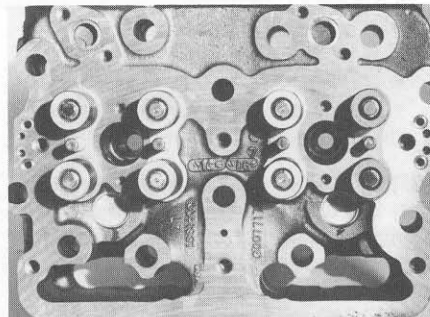
Crankshaft - Visually check the rod journals for authenticity

- Reuse if:
 - Crank journal is not cracked or broken.
 - Deep debris scratching is not evident.



Connecting Rod - Visually check for authenticity

- Reuse if:
 - There is no obvious piston pin bushing pitting.
 - There is no obvious bushing wear.

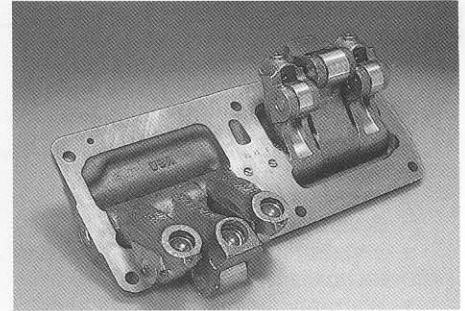


Cylinder Head - Visually check for authenticity and vacuum check according to procedures in Bulletin #3379076-05 NT Shop Manual, pg. 2-17

- Reuse if:
 - Leakage is within the established guidelines.

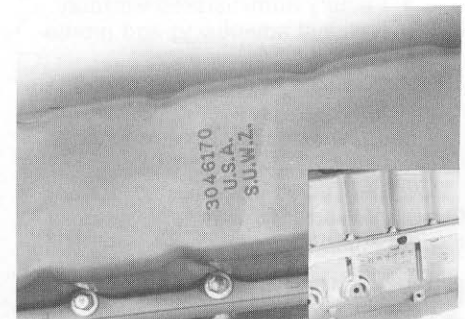
Upper Rocker Assemblies - Visually check for authenticity and replace the O-Rings

- Reuse if:
 - Broken or cracked parts are not evident.



Cam Follower Assembly - Visually check for authenticity

- Reuse if:
 - The roller to cam surface distress is acceptable according to the guidelines outlined in Bulletin #3379031-01R, Technical Overview of Camshaft Durability Page 12.



Aftercooler - Visually Check for authenticity

- Reuse if:
 - Water leaks or broken parts are not apparent.



Thrust Rod and Main Bearings - Visually check for authenticity and judge the main bearing condition by the rod bearing condition. Don't disturb the main bearings. See Bulletin No. 3810303.

- Reuse if:
 - Rod bearings do not show presence of debris.
 - Rod bearings do not show overlay distress due to lack of lubrication (overlay smearing).



Pistons - Visually inspect for the genuine trademark and make mechanical checks.

- Reuse if:

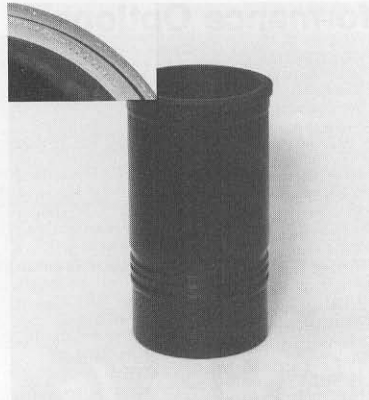
- Pistons can be reused if they meet the established reuse guidelines posted in:
 - Service/Parts Topic 83T1-10 - Piston Cleaning Recommendations.
 - Service/Parts Topic 83T1-13A - Piston Reuse Guidelines.
 - Service/Parts Topic 83T1-11 - Piston Dome Cracks (K Engine topic; however, the guidelines are same for the NT.)
- Pistons with pin bore cracks are not acceptable for reuse.



Push Tubes - Visually check and perform the drop test for oil fill.

- Reuse if:

- Ends are not cracked or loose.
- No cracks are observed.



Cylinder Liners - Visually check for authenticity and mechanically check

- Reuse if:

Liners meet the guidelines established in Service/Parts Topic 85T1-2 - Acceptable Bore Polish.



Camshaft and Bushing - Visually check for Genuine trademarks and

- Reuse if:

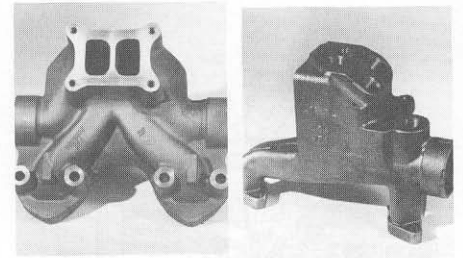
- Camshaft lobes meet visual checks found in Bulletin #3379031-01R, Technical Overview of Camshaft Durability.



Vibration Damper - Visually check and

- Reuse if:

- Vibration damper meets visual checks found in Bulletin No. 38102238-03, NT O. & M Manual, page 1-37; or in the NH/NT Shop Manual 3379076-05, pg.1-27.



Intake, Exhaust and Water Manifolds

- Visually check for correct Part Numbers

- Reuse if:

- They do not have any obvious cracks.



Fuel Pump - visually check for authenticity and

- Reuse if:

- Pump is properly calibrated
- No obvious damage

Parts Sales Targets



Even with the push to reuse parts, NOW provides you with new parts sales opportunities. Let's take a look at some specific target areas for increased parts sales.

General Rebuild Components



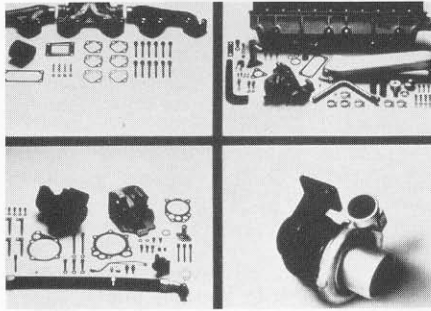
For an engine to qualify for the National Overhaul Warranty, Cummins requires that an engine contain the **correct CPL parts** and that **all engine parts are genuine**. A customer is ineligible to purchase the warranty plan if it is obvious that their engine does not match the specified guidelines. Here are some examples of components which are often not correct to the CPL.

- Turbo
- Fuel Pump
- Injectors
- Pistons
- Water Pump

Non-genuine parts or progressive damage resulting from the failure or use of these parts is not covered by the New Parts Warranty. So do your customers a favor by selling them the correct parts for their engine's CPL. Labor can only be warranted through the use of **Genuine Parts**. Plus, with genuine Cummins Parts your customers can be assured of top quality, and they'll get these great advantages.

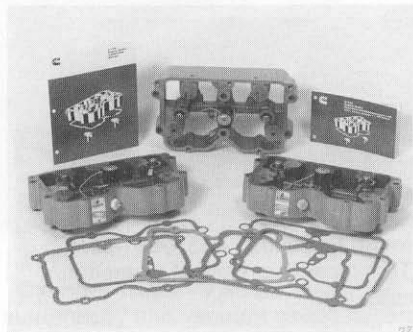
- Genuine Cummins parts are designed specifically for Cummins engines and their CPL's, so your customer can be assured of the best reliability and performance.
- Genuine Cummins ReCon components offer Quality and substantial cost savings.

Performance Options and Uprate Components



When a customer is in for a rebuild it's the perfect time to Uprate. The downtime is already dialed into the schedule, so what better time to get the increased performance and fuel economy that only an Uprate can provide. In addition to Uprate, there are several performance alternatives that can offer customers increased performance and reliability. Let's look at some of them here:

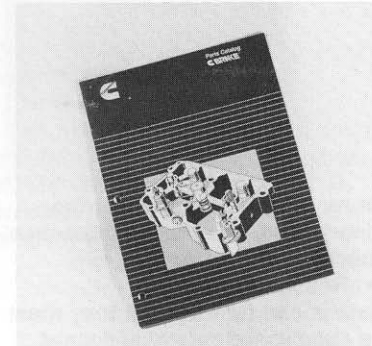
Engine Brakes



An engine brake can be a real benefit to any trucker because it saves a lot of wear and tear on the vehicle's braking system. Compression brakes actually retard the engine, meaning they negate the power stroke, by hydraulically holding the exhaust valves slightly open during the power stroke. The effect of these devices is to reduce vehicle speed during downhill operation and stop and go driving.

The C BRAKE provides the latest in compression brake technology and has been developed and tuned by Cummins engineers to provide the highest braking horsepower with improved reliability and durability over competitive engine brakes. Plus, the C BRAKE is backed by the Genuine Cummins Parts Warranty, 1 year/100,000 miles and, when applied as part of the NOW Plan 3, its warranty is increased to 2 years/200,000 miles.

The C BRAKE is specifically designed for Cummins NT engines and provides you with an excellent Uprate opportunity. The C BRAKE means added safety, resale value and longer vehicle brake life. The C BRAKE is offered as an option on Big Cam IV engines and can be retrofitted to most Big Cam I, II and III CPL's with ST-50, T-46, T-46B and HT3B Turbochargers. It's important to note, C BRAKES are currently designed for vehicles that use a 12 volt negative ground electrical system.



When applying a Cummins C BRAKE to an engine, you must match the CPL and the turbocharger to determine the correct adjusting screw kit. The C BRAKE is divided into 5 kits for service. Four of these, Engine Brake, Brake Mounting, Engine Control and Cab Control are top level kits and can be used on most NT engine applications. The fifth kit is the adjusting screw kit. Adjusting screw kits are applied by specific turbo model and CPL. A new revised C BRAKE catalog has been released Bulletin No. 3822028-01, it provides a complete application table to match the adjusting screw kit to an engine's CPL and turbocharger.

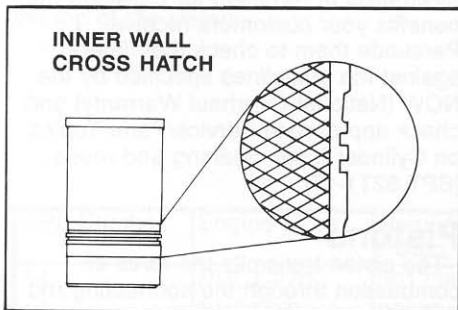
If you have trouble convincing customers that a C BRAKE is worth the money. Ask them about all the money they've got tied up in energy saving devices, such as, fan clutches, aerodynamic aids and radial tires. Owners are always trying to increase their trucks efficiency especially when it comes to fuel economy. But, as vehicle efficiency increases it becomes more difficult to slow it down on descending grades. This puts a lot of extra wear on the brakes. Installing a C BRAKE can lengthen vehicle brake life by as much as 100% in some applications. Essentially the component pays for itself.

Liners, Pistons and Rings

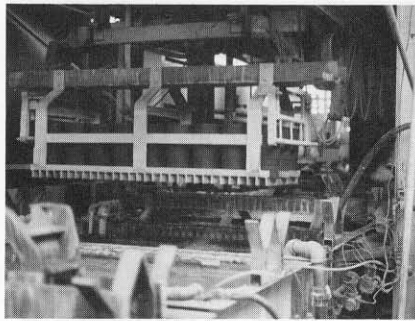
Cylinder liners



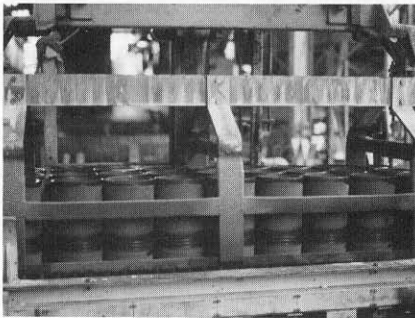
Cummins pioneered replaceable liners in 1928 and has been improving them ever since. In NH/NT engines, the even temperature around the liners is attributed to coolant flow, and the balance of coolant additives in the system. The ability of the Cummins liner to protect the block adds to the life of your engine. Cummins liners are centrifugally cast. This process helps to eliminate certain impurities in the metals. The benefit: a liner with a long-wearing surface and superior oil control.



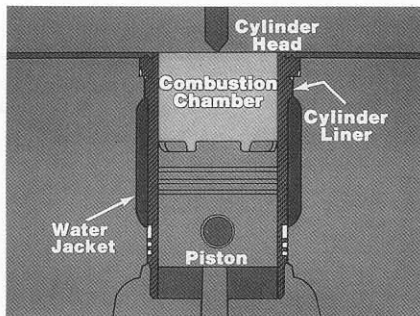
The inner wall of the NH/NT liner is cross-hatch honed for a precise finish that produces a network of recessed canals and island plateaus for proper oil control, fast break-in and maximum fuel economy.



Then Cummins NH/NT liners are lubrite etched to aid oil retention. This process creates "microscopic pores" that help to hold the proper amount of oil on the liner surface.



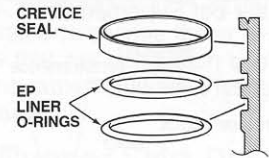
The lubrite feature helps prevent rust from forming and improves lubrication during break-in operation, thereby contributing to longer component life.



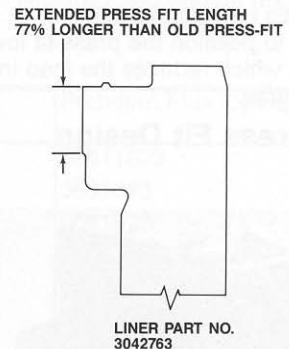
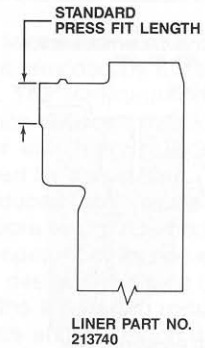
Cylinder liners act as the walls of the combustion chamber. Cylinder Liners used in Cummins NH/NT engines are referred to as wet liners, meaning that the coolant flows around the liner. The head gasket seals the area between the cylinder head and the liner. Two black o-rings and a crevice seal are used to keep the water and the oil from mixing.

The crevice seal withstands high coolant temperatures and prevents foreign particles from damaging the center o-ring. The center o-ring separates the water from the oil. The bottom

o-ring prevents the oil from contaminating the crevice seal and the center o-ring.



The top of the liner protrudes slightly above the block surface to assure proper gasket seal and uniform torque pressure. The liner flange fits into the block counterbore and assures a proper liner-to-block counterbore fit.

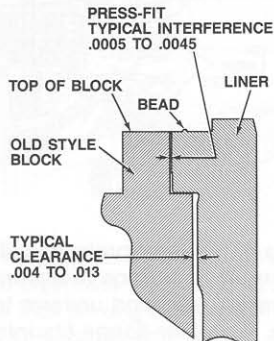


Liner flange dimensions are critical. If the fit is too loose, it may cause "counterbore fretting", coolant leakage and block wear. If it is too tight, the liner may become distorted and crack. This condition could also result in a cracked block at the liner counterbore. To prevent liner wear and fretting, Cummins introduced an Extended-Press-fit liner. This drawing compares the press-fit areas of the standard (old) and the extended press-fit liners.

Lower Press Fit Liners

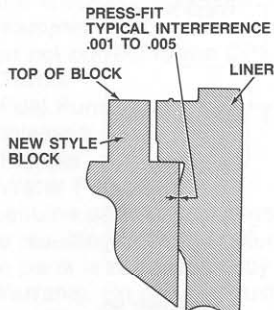
New Part No.	Part Name	Old Part No.	Model	Old Stock Disposition
3801826	Cylinder Liner Kit	**AR11317	NH/NT,V28	Use
3055099 (Lower press)	Cylinder Liner	**3042763 (Extended press)	NH/NT,V28&	Use

** Obsolete but Superseded



EXTENDED PRESS-FIT LINER

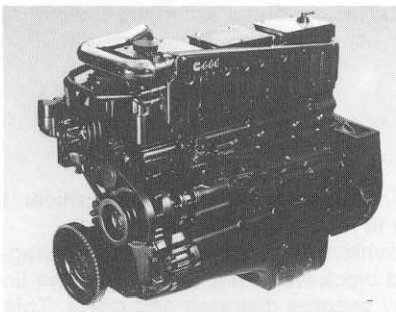
LINER PART NO. 3055099



LOWER PRESS-FIT LINER

To prevent block counterbore cracking, Cummins has redesigned the liner flange area to position the press-fit lower in the block which reduces the load in this critical area.

Lower Press Fit Design



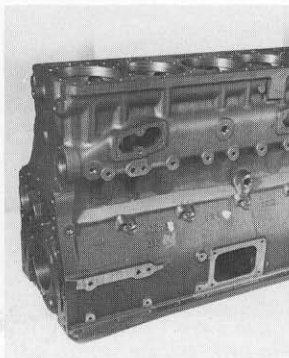
The lower-press-fit design was first introduced on the Cummins NTC-444 and will be used on New NT's as they are introduced. The lower press position reduces stress in the block and improves counterbore durability. The new lower-press-fit liner, Part No. 3055099 will work in your old block, in place of

Part No. 3042763; however, you will not receive the advantages offered by the lower-press-fit feature unless you machine and add a sleeve. (See Service/ Parts Topic 86T1-19).

Caution: Old stock Kit Part No. AR11317, Liner Part No. 3042763 cannot be substituted in blocks with the new block counterbore dimensions. Blocks with the new dimensions must use Liner Kit Part No. 3801826, Liner Part No. 3055099. Old liner stock cannot be used on the NTC-444 and the new improved Big Cam IV engines or older engines that have been rebuilt with a new-style 444 block. (See Service/Parts Topic 86T1-28)

For more details on Cylinder Liner consolidation refer to Service/Parts Topic 86T1-19 and 86T1-20A.

A lower press fit liner is also available in oversize. It's sold only as an NT Liner Kit Part No.3801812; the Oversize Liner Part No. is 3054936. The block must be machined to the new oversize dimensions; see Service/Parts Topic 86T1-28, to allow the use of new oversize liner Part No. 3054936. **The new oversize Part No. 3054936 must not be used in a block machined for oversize Part No. 3046325 without machining to specified dimensions.**



Remember to take advantage of the lower press fit feature in an older-style block, it must be machined to a different specification in the liner counterbore area. If you do not machine your block you will not receive the advantage of the lower press fit feature. The lower press fit liner will work as a direct replacement for the older style liner without sleeving the block. However, installation **without** machining will cause the press fit to occur in the **upper** counterbore area. Cummins has **retained** the extended

press fit feature of liner Part No. 3042763 on the new lower press fit Part No. 3055099. The difference in these two liners is in the outside dimension below the liner flange. Remember, the interference fit has been changed in new NT blocks. This machining change improves the fit characteristics between the block and the liner.



The width of the bottom o-ring groove land of the new lower press fit liner was decreased so that the liner Part No. 3055099 is interchangeable for use in the V-28 engine model.

Cummins does not recommend rehonng liners. Rehoning can leave abrasives on the liner surface, which causes premature piston, piston ring and liner wear.

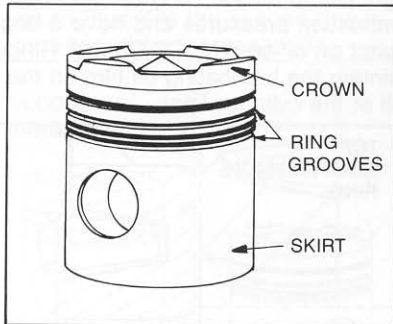
The risks of rehonng far outweigh the benefits your customers receive. Persuade them to check their liners against the guidelines specified by the NOW (National Overhaul Warranty) and check appropriate Service/Parts Topics on Cylinder Liner cleaning and reuse. (SPT 82T1-17)

Pistons

The piston transmits the force of combustion through the connecting rod to the crankshaft. In a four-stroke cycle diesel engine, the piston performs four important functions. During the intake stroke, the piston moves downward drawing fresh air into the cylinder. On the upward stroke, the piston compresses the air, heating it well above combustion temperatures. When fuel is sprayed into the hot compressed air, combustion occurs, and the resulting pressure forces the piston downward, causing the crankshaft to turn. During the exhaust stroke, the upward motion of the piston forces the burned gases through the exhaust port.

Most pistons are made of an aluminum alloy. Cummins castings are molded

from a high grade of alloy, approximately 20% stronger than those used in the casting of automobile pistons. This assures that Cummins pistons can be machined to exacting specifications to provide the best possible performance and reliability.



The top of the piston is called the crown. The bottom area is called the skirt. Between the crown and the skirt is the ring band, which consists of lands and grooves for the piston rings. NT pistons have a dome area in the center which causes the fuel to make a swirling pattern as it is sprayed into the combustion chamber. This helps the air and fuel to thoroughly mix, resulting in more efficient combustion. Valve relief pockets are machined into the top of the piston to prevent the valves from striking the top of the piston.

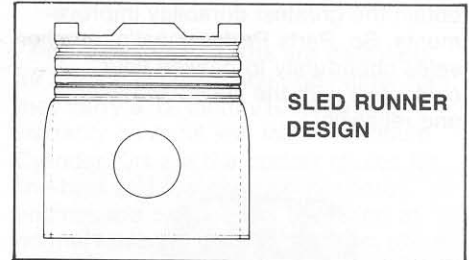


Due to tremendous pressures generated by diesel engines, the first and the second rings pound against their grooves. In order to resist wear caused by the constant pounding action, the first ring groove, and in some cases the second ring groove, has a Ni-Resist insert made of nickel alloy to resist heat erosion and wear. See Service/Parts Topic 86T 1-9A.

In recent years Cummins has made many technical changes to the piston. Our recent piston consolidation incorporates the use of a shallow valve pocket and a **sled-runner** skirt, for use on most NH/NT engines which use standard valve lift camshafts and piston cooling nozzles. **Four** barrel skirt design pistons are retained to service those NH/NT engines that are non-piston cooled.

See the table below for Pistons that are retained.

Sled Runner Skirt Design



Let's take a moment to review the benefits provided by the sled-runner design. The sled-runner design reduces clearance between the skirt and the cylinder wall, thereby reducing the noise produced by piston-slap. The design also reduces the likelihood of piston tilt in the bore to provide better ring seating during operation. Its non-cutback ring groove design increases the diameter above the top ring to reduce the dead air space above the top ring. The increased diameter improves combustion efficiency and engine response.

Pistons Retained

CPL Number	Engine Model	Required Piston	Piston Kit	Premium Cylinder Kit	Premium Plus Cylinder Kit
14	NHCT-270	3017349	3801058	3801872	38011873
16	NHCTCT	3017349	3801058	3801872	3801873
18	NT-855	3017349	3801058	3801872	3801873
24	NHTF-295	3017349	3801058	3801872	3801873
102	NT-280-IF	3017349	3801058	3801872	3801873
104	NT-855	3017349	3801058	3801872	3801873
117	NHCT-270	3017349	3801058	3801972	3801783
173	NT-855	3017349	3801058	3801872	3801873
271	NT-855	3048650	3801703	3801795	None
407	NTC-230	3017348	3801057	3801874	3801875
408	NTCC-230	3017348	3801057	3801874	3801875
437	NT-250	3048650	3801703	3801795	None
448	NTCC-230	3048650	3801703	3801795	None
488	NTC-230	3017348	3801057	3801874	3801875
497	NTC-240	3017348	3801057	3801874	3801875
498	NTC-240	3048650	3801703	3801795	None
547	NT-270	3017348	3801057	3801874	3801875
558	NTCC-240	3048650	3801703	3801795	None
647	NTC-320	3028706	3801229	None	None

*European NTC incorporates a high lift camshaft

All NH/NT Pistons have the top ring groove machined in a ni-resist insert to increase the piston's resistance to heat, erosion and wear, to increase ring groove durability. Some of the new pistons have **the two upper ring grooves machined in a Ni-Resist insert. This feature further increases piston durability in high load, low RPM operation. It is also recommended that when the "dual ni-resist" pistons are fitted into any early Big Cam III engines that they also be updated with Water Pump Assembly Part No. 3045944 and an HT3B turbocharger to obtain the greatest durability improvements. So, Parts Professional's, another sales opportunity to provide your customers with the latest technology and reliability.**



The Dual Ni-Resist pistons were first introduced to NH/NT's on fleet 300 engines which operate at high-loads and low-RPM's. Dual Ni-Resist pistons will be "featured in" most new model NT engines. The dual ni-resist feature is standard on the NTC-444 model.

The sled-runner skirt design has been adopted for most NH/NT engine models except the CPL's in the Pistons Retained table. The piston consolidation reduces the number of single Ni-Resist piston part numbers from 24 to 15. This design combines the features of Big Cam II, III and IV, and eliminates most low-usage, odd weight pistons. As a

Parts Professional you'll notice new part numbers for most NH/NT Pistons and Cylinder Kits. You are probably wondering why we had to change the kit part numbers since you were very familiar with most of the high volume numbers. The following will help:

- needed to maintain CPL/Certification order.
- new Cylinder Kits also contain the new lower press fit liner.

Remember a certain number of old piston and Kit numbers were retained to service certain CPL performance options and standard service practices.

Ring Sets

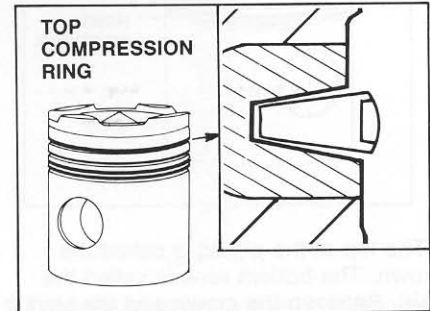


Ring Kit Part No. 3801049 is designed to withstand high load and low RPM operation. This ring set was first introduced on Big Cam III engines built after March 1, 1984. The first Cylinder Kits were packed with the 3801049 ring set in January 1984. A new ring set, 3801755, has been released for use on dual-Ni-Resist pistons. Its make-up is the same as the 3801049 except for the third ring, 3056429. The third ring was redesigned to maximize durability.

Ring Set Part Numbers **3801049** and **3801755** are Premium Plus rings for use in **high load, low RPM** applications. If your engine is equipped with a compression brake, it's necessary to install **Premium Plus** rings.

Ring Set Part Numbers 3801056 and 3014149 are excellent choices for those applications which avoid high load, low engine speed operation and are not equipped with a compression brake. Please see the Ring Set table for complete set information.

There are two basic types of piston rings: Compression Rings seal in the combustion pressures and have a large impact on oil control. Oil Control Rings maintain the lubricating oil film on the wall of the cylinder liner.



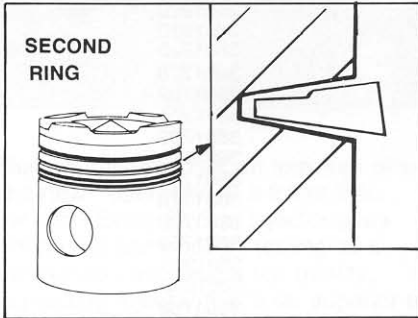
The first Compression Ring is keystone shaped so that it produces a self cleaning action on the power stroke to keep the ring free from carbon build up. The Top Ring is barrel faced and chrome plated for quick run-in and correct oil control. The top ring in set 3014149 is back-edge-loaded for optimum sealing in naturally aspirated and lightly loaded turbocharged models. In the other **three** ring sets, the top ring is front-edge-loaded for optimum sealing and durability.

Ring Sets

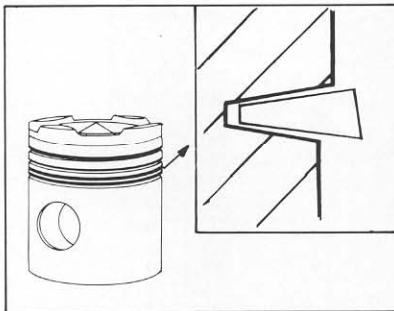
Ring Kit Part No.	1st Ring (top)	2nd Ring	3rd Ring	4th Ring	Comments
3014149	147670	3012332	214730	218732	Commonly used on naturally aspirated models.
3801056	3012331	3012332	214730	218732	Used on naturally aspirated and some turbocharged models.
3801049	218025	216983	214730	218732	Packed in Premium Plus Cylinder Kits with single Ni-Resist pistons.
3801755	218025	216983	*3056429	218732	Packed with NTC-444 Cylinder Kits with dual Ni-Resist pistons.

*Part No. 3801755 was initially released to include two second rings, Part No. 216983.

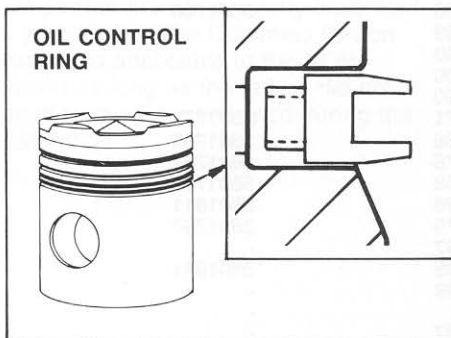
The second ring has a 2 degree modified keystone shape. This design applies a 2 degree angle to the cylinder wall on the downstroke to scrape excess oil from the liner wall. It's back-edge-loaded for better seating and oil control. The second ring is "stepped" or notched to further enhance its ability to control blow-by past the top ring. In the Premium Plus Kits the second ring is **chrome faced** for increased life.



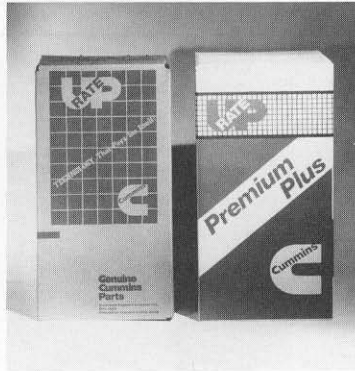
The third ring has a 2 degree modified keystone shape and is back-edge-loaded for better oil control. The main difference between the second and third ring is the third ring is **not** "stepped" or notched. The third ring is not chrome plated.



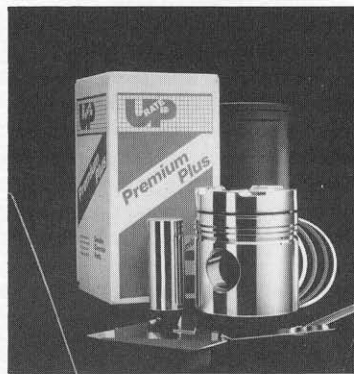
The fourth or the Oil Control Ring is chrome plated on both the front and the back and uses a serpentine expander. The serpentine expander maintains uniform ring pressure on the cylinder wall. The ring has large drain slots to prevent oil from collecting around the upper rings.



Cylinder Kits



Premium Plus



Premium Plus Cylinder Kits are designed for higher engine loads and lower rpm operation. Premium Plus Kits carry a 24 month/200,000 mile warranty on parts and labor. The Kit features the sled-runner design piston and the new lower-press-fit liner for improved reliability. It also features a top compression ring with an inlaid chrome face and more precise dimensions to improve sealing and resistance to wear. The top ring is made of a tougher base material to resist breakage. The second ring is chrome plated for reduced ring and groove wear.

Premium Plus Kits are offered as Uprate Kits and are the best choice for heavy-haulers running between 50 and 300 rpm above peak torque. Uprate Premium Plus Cylinder Kits offer Plus protection, technology, economy and durability. It is recommended that Premium Plus Kits be used on engines that are equipped with compression brakes.

Premium



Premium Cylinder Kits are designed for normal engine loads and higher rpm; they carry a 12 month/100,000 mile warranty on parts and labor. Premium Cylinder Kits are the perfect choice for line-haul and city operations where engines are consistently operating at normal loads and 300 to 400 rpm above peak torque. Premium Kits apply the latest technology to Big Cam I, II and III engine models.

The Premium Kits feature the sled-runner design piston and are packed with the new lower-press-fit liner for improved reliability. The ring pack is specifically designed for normal load/high rpm operation to achieve maximum performance and fuel economy. The top ring is keystone shaped barrel faced and chrome plated. The second ring has a 2 degree modified keystone shape and is "stepped" or notched to further enhance its ability to control blow-by past the top ring. The two major differences between the Premium and Premium Plus Ring Sets are, (1) the top Premium ring is chrome plated rather than inlaid and (2) the second ring is not chrome faced. The Premium Ring Set is not recommended for use on engines which are equipped with compression brakes.

The chart on the following page provides you with the appropriate Piston, Premium and Premium Plus Kits for the top 78 NH/NT, (855 cubic inch) CPL's. Please refer to the chart for the Cylinder Kits required for your overhaul.

CYLINDER KITS BY CPL

CPL	MODEL	PISTON	PREMIUM	PREMIUM PLUS	OVERSIZE
26	▲NH-250 SC	3048650	3801795	-	-
155	▲NTC-290-R SC	3051555	3801779	3801768	3801769
160	▲NTC-350 SC	3051555	3801779	3801768	3801769
187	▲NTC-290 SC	3051555	3801779	3801768	3801769
189	▲NTC-250 SC	3051553	3801764	3801765	3801920
204	▲NTCC-350 SC	3051555	3801779	3801768	3801769
205	▲NTA-400 BCI	3051557	3801781	3801782	-
217	▲NTC-290 SC	3051553	3801764	3801765	3801920
220	▲NTC-230 SC	3051553	3801764	3801765	3801920
222	▲NTC-250 BCI	3051553	3801764	3801765	3801920
233	▲NTC-290 BCI	3051553	3801764	3801765	3801920
249	▲NTCC-290	3051553	3801764	3801765	3801920
266	▲NTC-350 BCI	3051554	3801776	3801777	3801778
267	▲NTC-400 BCI	3051555	3801779	3801768	3801769
270	▲NTCC-230 SC	3051553	3801764	3801765	3801920
278	▲NTC-350 SC	3051555	3801779	3801768	3801769
294	▲NTCC-350 BCI	3051554	3801776	3801777	3801778
298	▲NTC-350 BCI	3051554	3801776	3801777	3801778
306	▲NTCC-290 BCI	3051554	3801776	3801777	3801778
308	▲NTCC-350 SC	3051555	3801779	3801768	3801769
310	▲NTCC-400 BCI	3051555	3801779	3801768	3801769
322	▲NTC-290 BCI	3051553	3801764	3801765	3801920
323	▲NTC-250 BCI	3051553	3801764	3801765	3801920
324	▲NTC-400 BCI	3051555	3801779	3801768	3801769
327	▲NTC-350 BCI	3051555	3801779	3801768	3801769
328	▲NTCC-350 SC	3051555	3801779	3801768	3801769
329	▲NTC-350 BCII	3051555	3801779	3801768	3801769
330	▲NTC-475 BCII	3031227	-	3801783	-
332	▲NTCC-290 SC	3051555	3801779	3801768	3801769
344	▲NTC-290 BCI	3051553	3801764	3801765	3801920
345	▲NTC-250 BCII	3051553	3801764	3801765	3801920
353	▲NTC-290 BCI	3051554	3801776	3801777	3801778
354	▲NTC-250 BCI	3051554	3801776	3801777	3801778
369	▲NTC-350 BCI	3051555	3801779	3801768	3801769
393	▲NTC-400 BCI	3051555	3801779	3801768	3801769
407	# NTC-230 SC	3017348	3801874	3801875	-
408	# NTCC-230 SC	3017348	3801874	3801875	-
414	▲NTC-300 BCI	3051554	3801776	3801777	3801778
433	▲NTC-300 BCII	3051554	3801776	3801777	3801778
448	▲NTC-230 SC	3048650	3801795	-	-
449	▲NTC-400 BCII	3051556	3801780	3801771	3801772
450	▲NTC-350 BCII	3051555	3801779	3801768	3801769
454	▲NTCC-400 BCII	3051555	3801779	3801768	3801769
455	▲NTCC-350 BCII	3051555	3801779	3801768	3801769
456	▲NTCC-300 BCII	3051554	3801776	3801777	3801778
457	▲NTCC-400 BCII	3051555	3801779	3801768	3801769
458	▲NTCC-350 BCII	3051555	3801779	3801768	3801769
459	▲NTCC-300 BCII	3051554	3801776	3801777	3801778
471	▲NTC-300 BCII	3042320	3801774	3801775	3801767
491	▲NTC-270 BCII	3051554	3801776	3801777	3801778
494	▲NHHTCC-290	3051554	3801776	3801777	3801778
497	▲NTC-240 SC	3017348	3801874	3801875	-
498	▲NTC-240 BCIII	3048650	3801795	-	-
506	▲FLT-270 BCII	3042320	3801774	3801775	3801767
529	▲NTC-300 BCIII	3042320	3801774	3801775	3801767
530	▲NTC-350 BCIII	3051555	3801779	3801768	3801769
531	▲NTC-400 BCIII	3051556	3801780	3801771	3801772
558	▲NTCC-240 BCIII	3048650	3801795	-	-
579	▲NTC-270 BCIII	3042320	3801774	3801775	3801767
581	▲FLT-270 BCIII	3042320	-	3801775	3801767
586	▲NTC-475 BCIII	3031227	-	3801783	-
606	▲FLT-300 BCIII	3051555	3801779	3801768	3801769
614	▲NTCC-400 BCIII	3037285	-	3801799	-
615	▲NTCC-350 BCIII	3037285	-	3801799	-
616	▲NTCC-300 BCIII	3034185	-	3801800	-
617	▲NTCC-240 BCIII	3034185	-	3801800	-
625	▲NTC-400 BCIII	3051556	3801780	3801771	3801772
632	▲NTC-350 BCIII	3051555	3801779	3801768	3801769
633	▲NTC-300 BCIII	3042320	3801774	3801775	3801767
634	▲FLT-300 BCIII	3051555	-	3801768	3801769
642	▲NTC-400 BCIV	3028685	-	3801796	3801811
674	▲NTC-300 BCIV	3042320	3801774	3801775	3801767
675	▲NTC-350 BCIV	3042318	-	3801797	-
676	▲NTC-400 BCIV	3028685	-	3801796	3801811
677	▲NHHTCC-300	3037285	-	3801799	-
709	▲NHC-250 SC	3048650	3801795	-	-
718	▲FLT-300 BCIII	*3045948	-	3801537	-
749	▲NTC-315 BCIV	3042319	-	3801798	-

▲ STAMP FF 106 ON ENGINE DATA PLATE WHEN USED IN THIS CPL

* DUAL NI-RESIST PISTON SEE SPT-86T1-9A

STAMP FF 77 WHEN USED IN THIS CPL

ReCon Exchange Injectors

Cummins ReCon Injectors



Long injector life and good fuel economy are not accidents!



Remanufactured ReCon injectors offer "like new" operation at a lower-than-new cost. Every ReCon injector goes through the same tough testing as a new injector, assuring a top quality, long-lasting injector that's far superior to other remanufactured injectors. ReCon injector exchange is style for style (ex. any top stop for applicable ReCon top stop).

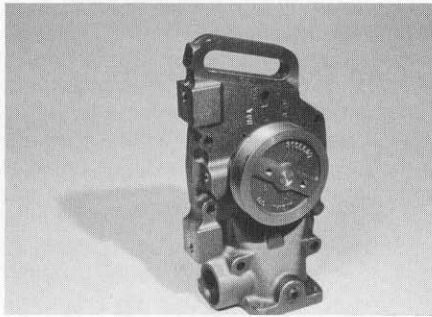
ReCon Exchange Fuel Pump



Sell your customers on a ReCon fuel pump, either to improve performance or to bring their engines back to the correct CPL. The fuel pumps offered by ReCon are top quality components which feature the great ReCon warranty of 1 year/100,000 miles.

The NOW plan does not cover fuel pumps that are not correctly calibrated in your shops. The Cummins ReCon warranty is applicable to the NOW rebuild as long as the failure did not result from work performed during the Calibration.

ReCon Exchange Water Pump



Cummins ReCon water pumps go the extra mile. Every ReCon pump is equipped with a high quality carbon on ceramic seal, specially designed with a top hardness grade of carbon to resist wear and maximize seal durability. In addition, every ReCon water pump goes through precise machining, assembly and testing procedures to assure a top quality, long lasting product, sure to be better than any other remanufactured pump.

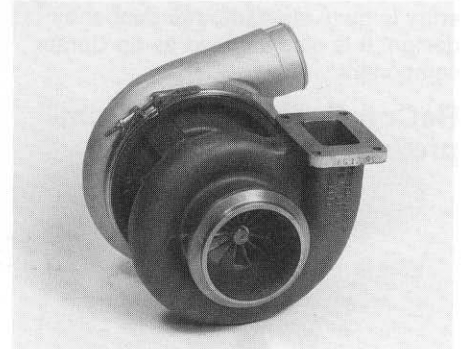
Cummins has standardized on a water pump for NH/NT engine models, Part No. 3045943. This pump can be applied to most Big Cam I, II, III and IV engine models except Big Cam III GMC applications, which require the use of Part No. 3022474.

Cummins ReCon Turbochargers



Convince your customers to exchange or Uprate their present turbo. Cummins ReCon provides your customers with a durable, dependable product and provides many options through its core acceptance programs. ReCon accepts T-50, VT-50, ST-50 and T-46 models on a non-style for style basis. You can assure your customers that Cummins ReCon turbo's are precisely matched to Cummins engines both in engineering specifications and CPL, so it will fit right in with the National Overhaul Warranty

Guidelines. You'll be saving your customers bucks, too, on the front end with the great ReCon price and over the long haul too, because as you know, even a slight turbo mismatch can result in hundreds of dollars lost in wasted fuel each year.



If you've got the chance, really push Uprate to the HT3B. The HT3B turbocharger was designed to improve the responsiveness and durability of the Big Cam III engine. The HT3B has full floating shaft bearings for minimum shaft drag. A smaller, low-inertia compressor wheel, combined with low-drag bearings, provides outstanding acceleration. The HT3B lets the engine respond more quickly when the throttle is opened.

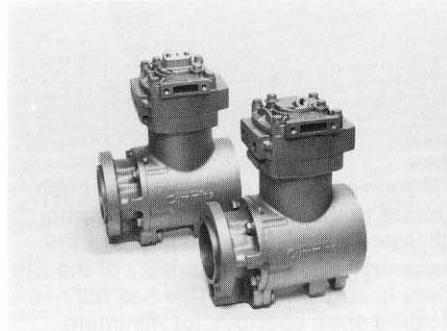


The HT3B **dual entry** was introduced on Big Cam III production engines produced after March 20, 1984. Previously built Small Cam and Big Cam I and II engines may be uprated with the dual entry design, which offers a fuel economy improvement of up to 2.5% over earlier designs. The dual entry offers better engine performance and lower exhaust temperatures at lower engine speeds. Also, there is improved exhaust pulse separation from the front to the rear of the engine. Fuel pump recalibration is not required to gain the improved acceleration and fuel economy. A certification field fix number must be stamped on the engine data plate; see SPT 85T 10-4 for more information. Jacobs Brake equipped

engines will require a new "TT" Auto Lash screw when the dual entry is applied as an Uprate component.

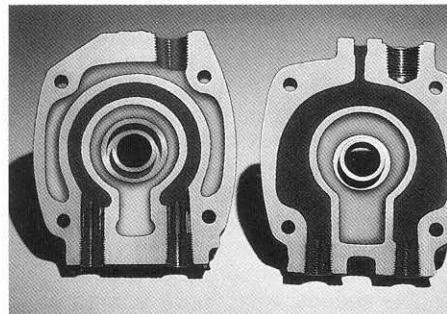
Cummins further refined its HT3B technology and introduced a single entry HT3B turbo on Big Cam IV production engines for 350 horsepower and below. Aside from the turbine casing, the single entry is quite similar to the dual entry design. It is also certified as an Uprate component.

ReCon Exchange Air Compressors



Cummins ReCon supplies the ReCon Universal Air Compressor (Part No. 3024365RX). This one part number replaces over 40 standard models found on Cummins engines. In addition, ReCon offers the Cummins Super Single design. With its reliable and proved design and 52% fewer parts, the Super Single (Part No. 3049186RX) is a masterpiece of cooling technology.

You can also Uprate your current 13.2 CFM style with a Cummins Super Single Air Compressor head and valve assembly Kit. The Uprate kit provides an improved head which incorporates a separately cast water passage, eliminating the gasketed joint between the air and water passages.

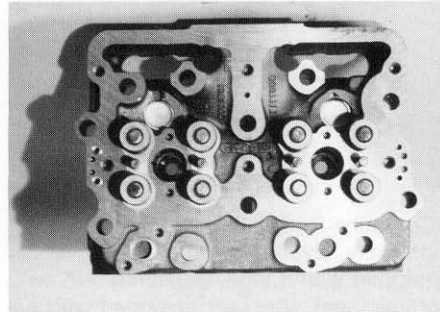


New

This water passage cools the hot compressed air which reduces carbon formation in the head and discharge line, thereby extending air compressor life. The new press fit valve assembly with twice the discharge port area

increases compressor efficiency. Better efficiency means further reduced air temperature and less power is required to drive the compressor. The reduced power consumption increases fuel savings by .5%.

ReCon Cylinder Heads

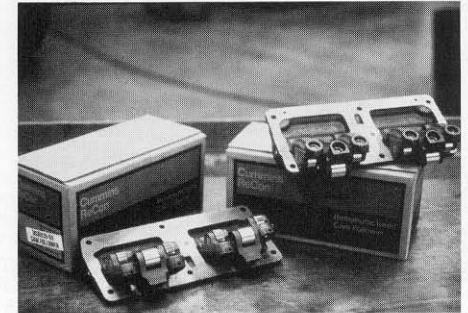


ReCon cylinder heads give your customers trade-in value. ReCon is the alternative to the welded head. A totally remanufactured dependable cylinder head from Cummins ReCon is the genuine alternative to rebuilding. ReCon heads provide like-new performance at a competitive cost. Plus, each ReCon head goes through a precise remanufacturing process to assure accurate tolerances, quality castings, tight sealing valves and cleanly cut threads. In addition ReCon heads are equipped with 100% new Cummins Parts in the following areas:

- Valve Guides
- Injector sleeves
- Spring guides
- Spring retainers and collets

Plus, upgrades from Small Cam to Big Cam and from naturally aspirated to turbocharged are performed at no additional cost. In addition, if your customer has damaged heads, they can be exchanged under ReCon's Cracked Head (CX) program, which allows for cracked casting, dropped valve, broken bolt holes or fuel passages, and other damage which render the head unusable. Also, your core could be taken in at no additional cracked-head (cx) charge and when visually and mechanically inspected, a core could be found unacceptable for normal (good) rebuildable exchange stock. In such an instance, the receiving location will receive a core charge instead of the normal or good core credit.

ReCon Cam Followers and Crown Rollers



Top quality remanufactured camfollowers and crown rollers are available to help complete a successful rebuild. Low internal engine friction is a major key to good mileage, cool running, and long engine life. ReCon's cam followers and crown rollers provide very low friction operation and are specially designed to closely match the Cummins camshaft profiles and metallurgy, assuring precise, long lasting operation. Switching to new or ReCon Cam followers is especially important if the camshaft is replaced. In this situation it's a good idea to let new components wear together, rather than putting a new surface against one that has previously "worn in" against another surface.

New Cummins Camshaft and Cam Bushings

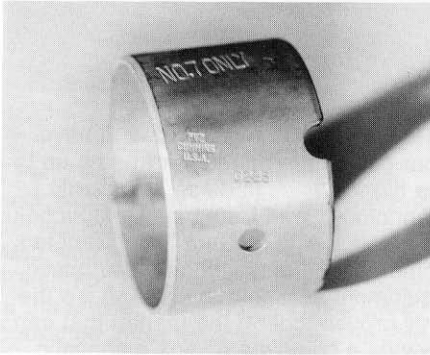


If there's any question about the camshaft, there's only one answer: replace it with a new Genuine Cummins or Uprate to the Flangeless design. The Flangeless Camshaft is designed to reduce fretting between the camshaft and the cam gear. When combined with "crowned" Camfollower rollers, stress is greatly reduced. The crown roller design provides even loading on the camshaft lobes and reduces contact stress on the roller edges. These improvements have increased camshaft life over three times in the lab and field tests. The flangeless

camshaft can provide the same benefits in the life of your customer's Big Cam engine. A field fix number must be stamped on the engines data plate when an Uprate Cam is installed.

A 3 year/300,000 mile (482,805 km) 10,800 hour new parts warranty applies to a Camshaft Uprate as long as the crowned rollers are used.

Camshaft Bushings



If new cam bushings are required for an overhaul and your customer isn't Uprating, keep in mind that there are two types of camshaft bushings current for service on Big Cam engine models. The wide oil groove, or thin-walled bushing, Part No. 3007689, is for all seven journals and applies to specific camshafts produced prior to 1981. The other is Kit, Part No. 3801106; it has a wider oil groove and is known as a thick-walled bushing.

This bushing was introduced in 1981 on some Big Cam II models. See the illustration for the differences in bushing part numbers. And, reference Parts Professional #2 or SPT 81T 1-20 for Specific Journal Positions.

Actually, the major difference between the two types of bushings is in the width of the oil groove. Another difference in the thick-walled, narrow-grooved bushing kit, Part No. 3801106, is that the position of the locating notches in bushings 1-6 were moved to match the oil drillings in the camshaft journal, and bushing 3 and 5 are longer than the old style Part No. 3007689. The thick and thin walled bushings are not interchangeable. It is necessary to replace worn bushings with the same Part No. bushings that were removed, unless your customer is Uprating to a new camshaft.

Main Bearings

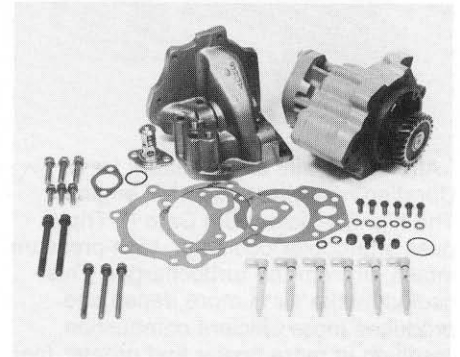


If a customer needs new main bearings, or decides that it's probably a good idea to install new ones as long as the engine is down, sell Genuine Cummins Main Bearings. Cummins bearings are manufactured to exacting specifications. They are specifically designed and engineered for complete compatibility to ensure reliability. Cummins offers bearings in standard, .010, .020, .030 and .040 inch sizes. Main Bearings are sold in sets that include the lockplates and thrust bearings. Cummins recommends that the thrust bearings be replaced whenever the mains are replaced.

Aftercooler and Oil Cooler

A performance option listed with the NOW guidelines is to clean and reseal both the aftercooler and oil cooler. Well, here's another opportunity. Instead of cleaning and regasketing, how about an Uprate?

DFC Lube System

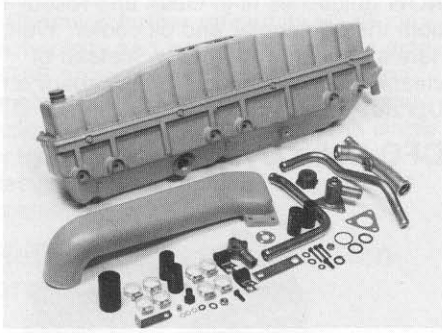


You can recommend an Uprate to the DFC (Demand Flow Cooling) Lubrication System. It's standard on Big Cam II and III engines but can be applied to earlier NT engines. The DFC system has three distinguishing design features:

- reduces main rifle press
- maintains a more constant oil flow
- maintains a more constant oil temperature

These features are accomplished by two independent circuits, a thermostatically controlled bypass valve in the oil cooler housing and a lower flow capacity pump. The DFC system reduces oil flow and cooling to "demand", thus reducing the power required to turn the pump by 4 horsepower at rated speed and load condition. The DFC system improves durability, provides more power at the flywheel and produces up to 2.5% better fuel economy.

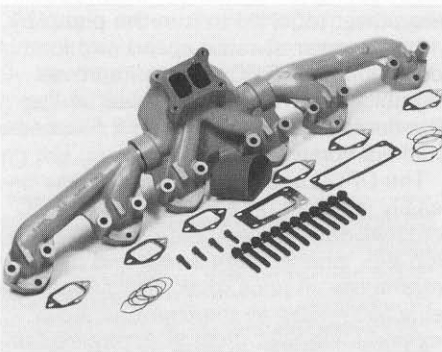
The DFC Lube System Kit can be easily installed on any Small Cam FFC or Big Cam I engine. Two DFC Plumbing Kits, one for front sump and one for rear sump oil pans, make Uprating simple . . . and all the changes are external. No CPL change is required. If the engine is equipped with a Jacobs Brake, the brakes must be upfitted with a new Jacobs master piston return spring and new inner control valve spring.



Aftercooler kits are available for Uprating non-aftercooled NT engines. The highly efficient Big Cam III Triple pass aftercooler cools hot, high-pressure intake air from the turbocharger. This cooled intake air is more dense and produces more efficient combustion, resulting in more power and greater fuel efficiency. Cooler intake air also lowers peak combustion and exhaust temperatures for improved engine life and durability.

Keep in mind, the addition of aftercooling to a non-aftercooled NT engine requires the aftercooler assembly, an aftercooler mounting kit and an air compressor. The mounting kits make this Uprate job simple. Also, an aftercooler kit can only be added as part of a Full Engine Uprate and requires a new CPL number.

Pulse Exhaust Manifold



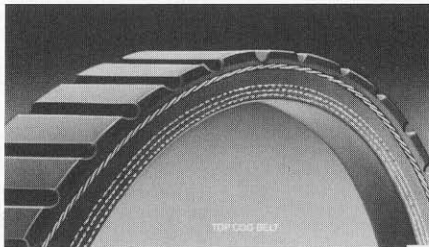
While we're on the subject of Uprating, let's talk about the Pulse Exhaust Manifold. If your customer is in for any rebuild, option 1, 2 or 3, and the engine isn't equipped with a pulse manifold, then communicate the features and benefits.

The pulse manifold is one of the major features of Big Cam II and III engines. The manifold is an excellent option for Small Cam and Big Cam I engines. The pulse manifold design provides a more direct path for exhaust gases to flow from the combustion chamber to the

turbocharger. This produces up to 1.5% increase in fuel economy, quicker turbocharger response and overall improved engine performance.

The pulse manifold kit makes uprating simple and convenient. All the changes are external, so the installation is easy and does not require a CPL change. To identify the Uprate a certification field fix number must be stamped on the engine's data plate. Field Fix number information is located in the CPL Manual (Control Parts List) Bulletin No. 3379133-14.

Belts and Hoses



Anytime an engine is in for service, let alone a rebuild, is a great time to sell belts and hoses. And remember, you're selling the best -- Cummins/Dayco. Cummins/Dayco belts and hoses set the industry standard for durability.

Failure of a hose or belt is something that could ruin a new rebuild, so don't let your customers chance it. Sell them a set of new belts and hoses.

The belts and hoses covered by the NOW plan include the following

- Belts - covers Cummins and Cummins/Dayco water pump and fan hub part numbers. No other belts qualify for the coverage.
- Hoses - any Cummins Part number hose which is specified for use on NH/NT models.

Compuchek



Rebuild time is a great time to have your customers bring their engine up to the highest level in diesel diagnostic technology...with Cummins Compuchek.

Compuchek is the most sophisticated, computerized diesel engine diagnostic equipment available today. And it's the only proven tool on the market that can provide a complete engine diagnostic evaluation. The ability to hook into the compuchek diagnostic equipment requires special fittings to be installed at different points on the engine where pressures, temperatures, flows, and other important information can be monitored.

Being able to hook into the Compuchek system is well worth the money because it takes the guesswork out of diagnostics. Conventional diagnostic methods are heavily dependent on the skill level of the technician. Diagnostic information is often difficult to interpret and may lead to misdiagnosis. With Compuchek though, engine evaluation is precise and consistent, and pinpoints required engine repairs, if any, without engine disassembly.

A Plan 3 Overhaul includes the installation of Compuchek fittings if needed. The price of the first Compuchek test is included in the base Overhaul price. Cummins will pay for one Compuchek test after 100,000 miles of operation or 1 year.

What's New For Parts Publications



Parts Publications has released six new and or revised parts catalogs since the last issue of Parts Professional. Also, you'll find updates to Cylinder Kits, Piston Kits and Liners in the "F" section of the Master Parts Book. These were published in September, 1986. The Parts Catalog table provides a complete listing.

Part No.	Description	Part No.	Description
12-01	12-01	12-01	12-01
12-02	12-02	12-02	12-02
12-03	12-03	12-03	12-03
12-04	12-04	12-04	12-04
12-05	12-05	12-05	12-05
12-06	12-06	12-06	12-06
12-07	12-07	12-07	12-07
12-08	12-08	12-08	12-08
12-09	12-09	12-09	12-09
12-10	12-10	12-10	12-10
12-11	12-11	12-11	12-11
12-12	12-12	12-12	12-12
12-13	12-13	12-13	12-13
12-14	12-14	12-14	12-14
12-15	12-15	12-15	12-15
12-16	12-16	12-16	12-16
12-17	12-17	12-17	12-17
12-18	12-18	12-18	12-18
12-19	12-19	12-19	12-19
12-20	12-20	12-20	12-20

Allied Products Ultra Duty and Torque Starter Batteries



A Cummins Battery Power Training kit has been assembled. The kit has been shipped to each Cummins Distributor location to the attention of the Parts Manager. The battery training kit provides an overview of the Cummins Battery Line. It gives features, benefits, product specifications and warranty. The program is intended to help equip, source, stock and sell the correct battery and or system for specific applications.

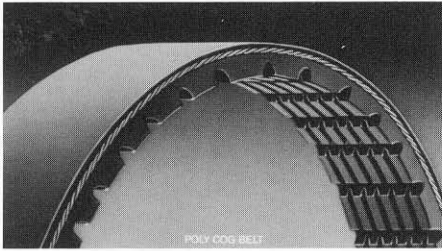
Cummins Battery Power

Description	Bulletin No.
Cummins Battery power Training	3385424-R
Video	3385424-V
Charging and Testing (slide show only)	
Slides	3385423-S
Audio Tape	3385423-T
Cummins Battery Power Spec Sheet	3385422
Cummins/Ultra Duty Wall Chart	3385438
Cummins Torque Starter Wall Chart	3385439
Ultra Duty Battery Replacement Data Book	BCI 1986

Parts Catalogs

Application	Bulletin No.
Revision	
C BRAKE	3822028-01
NTC-475 Series Big Cam II and III Automotive Application	3379660-01
KTTA-50 Series Construction	3379581-02
KTTA-50 Series Construction	3822112-00
New	
KTTA-38 Construction	3822102-00
NTTA-855 Series Agriculture, Const. Industrial/Power Customized	3822109-00
NHHTC-300/350 MVT Big Cam Ontario Bus Industries	3822111-00

Belts



Poly Cog

The Cummins tradition has been to be first with new technology that will make a trucker's life easier. It is with pride in this tradition that Cummins introduces the exclusive new Cummins/Dayco **Gold Label Poly Cog Belt** with up to **double** the life and improved performance over ordinary poly rib belts.

The new Poly Cog has the same multiple-rib construction as the poly rib, with the addition of transverse grooves across the belts, giving the grooves a "cogged" appearance. These transverse grooves give Poly Cog a number of unique advantages:

- Up to **DOUBLE** the life of ordinary poly rib belts. This is a very conservative estimate.
- Improved flexibility. The grooves lessen flexural stresses, making it easier for the belt to bend around pulleys, or make backward arcs around tensioners or idlers.
- Reduced operating temperature. Less inner stress means less heat build-up within the belt. Cooler running temperatures have a direct effect on extended belt life.
- Torque capacity equal to or greater than ordinary poly rib belts. The grooved surface enables the Poly Cog to conform more exactly to the curved surface of the pulley.
- Early reports from the field indicate a reduced sensitivity to splash-induced slip.

It's not often that a technological innovation comes along that more than doubles the life of a part. Poly Cog delivers this performance, and it's exclusive with the **Cummins/Dayco Gold Label** line of heavy duty belts and hose.

Next time a customer needs a poly rib, sell him Poly Cog, and take the opportunity to sell Cummins as the innovator in heavy duty technology!

Product Consolidation Small Vee Cranks

Service Crankshafts for all Small Vee engines are now available without the crank gear. This change in the product offering is a result of customer input from our South American distributors. This change makes the sale of Cummins parts more competitive.

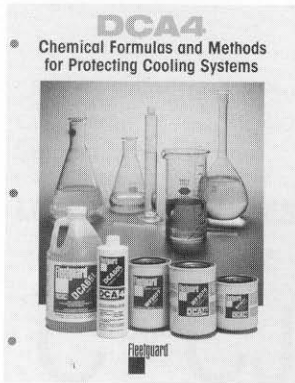
As we mentioned in Parts Professional #1, Cummins consolidated its crankshaft offering to sell the crank without the gear in 1985 (see SPT 85T 1-3). This consolidation eliminated the often unnecessary expense of buying a new gear which allows the customer to receive the most value from the original genuine part. Cummins ReCon also offers a crankshaft sold without the gear.

Care should always be used when preparing to reuse a gear. Always follow the recommended procedures or you could damage the gear preparing it for reinstallation.

Note: Some engine crankshafts for specific Small Vee engines are being discontinued due to little or no service demands, (i.e. V6-140 Phase 4).

Fleetguard

DCA4 Advanced Cooling System Protection



DCA4 is now the standard supplemental coolant additive formula for all Cummins engines. Tested and proven DCA4 is the corrosion protection that your engine cooling system needs to lessen the likelihood of "silica gel" formation, a gritty jelly-like material that coats the coolant's passageways. Gel formation is caused when the cooling system is either overconcentrated or overcharged with antifreeze or supplemental coolant additives, or a combination of both. The overconcentration causes the silicates, which are held in suspension, to drop-out or chemically change into a sticky substance that can literally plug coolant passages. DCA4 has a lower silicate content, which makes it only half as likely to "drop-out", thus making it very compatible with the low-silicate antifreezes recommended by Cummins.

Cooling System Treatment Methods DCA4

System Capacity Gallons	Filter	or	Liquid DCA 60L
5-7	WF2070	or	1/2 pint
8-10	WF2070	or	1/2 pint
11-20	WF2071	or	1 pint
21-30	WF2072	or	1 1/2 pints

Note: Mack-applied filters are WF-2015 and WF-2022 both contain DCA4.

Silica Gel forms when too many silicates are put into solution. Silica gel build-up can plug heat exchanger passages and block warm air blowing from the truck's cab heater. Sometimes build-up causes engine overheating and at worst, total system blockage.

Cummins Recommends

Four methods to avoid silica gel:

1. Use a specially formulated low-silicate heavy-duty antifreeze which corresponds to GM 6038 formula.
2. Antifreeze concentration should not exceed 65% to 35% water.
3. Do not overconcentrate supplemental coolant additives. Stick with the

supplier's recommended replenishment guidelines.

4. Use DCA4. DCA4's lower Borate/Nitrite/formula is compatible with today's cooling systems. Today's systems require supplemental coolant additives with fewer silicates. Most of the formulas on the market are higher in silicates than DCA4; this includes the original formula DCA.

The high silicate formulas are designed for use in passenger cars with aluminum blocks. Since DCA4 is an excellent protector of aluminum, this formula is ideal for the trucker who wants to protect cars, mid-range diesels and heavy-duty diesels.

Tips for Truckers

DCA4 and DCA are compatible. In fact, DCA4 is compatible with most supplemental additive formulas on the market. Before you begin using DCA4, it's best to drain the system and clean it, with "RESTORE", a Heavy-Duty cooling system cleaner from Fleetguard, technically formulated to clean and restore the cooling system. If you don't have time to drain, you can simply start to use the new formula. Cummins recommends cleaning and changing the coolant every two years, and suggests checking the coolant level every 10,000 miles (16,000 km).

A pre-mix of low silicate antifreeze, water and proper amounts of DCA4 will correctly protect an engine's cooling system.

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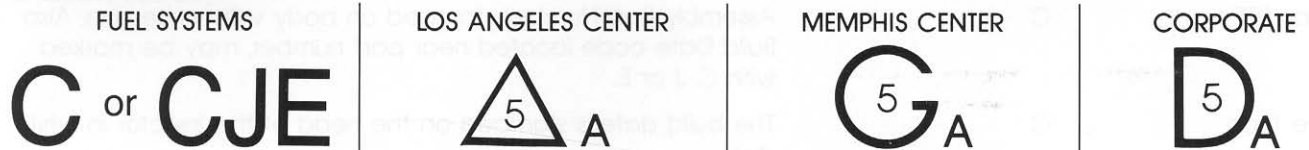
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Parts Professional Accreditation Exam Instructions

CUMMINS RECON PRODUCT IDENTIFICATION (ALL ENGINE SERIES)

Cummins ReCon products are marked to identify the date of remanufacture and the location which performed the components reconditioning. The following description of identification codes will assist you in identifying any Cummins ReCon product.

LOCATION CODES:



The number in the location mark (Δ = Los Angeles, \odot = Memphis) identifies the year and the letter identifies the month the product was rebuilt).

MONTH CODES:

January	A	April	D	July	H	October	L
February	B	May	E	August	J	November	N
March	C	June	G	September	K	December	P

PRODUCT	MANUFACTURING PLANT	MARKING LOCATION
Cam Follower	M	On inside surface near the top center capscrew hole
Connecting Rod	LA	On both ends of the machined balance lugs
Cylinder Head	M	On the exhaust side between the exhaust ports.
<ul style="list-style-type: none"> NH/NT Engine V-903, Small Vee V/VT-1710 Engine K-Engine L-10 		On the exhaust side between the exhaust ports.
		On the ledge at the end of the head next to the exhaust port.
		On ledge end of cylinder head.
		Top surface near exhaust port.
		Top surface near part number/casting number.
Engine	LA	On engine data tag mounted on accessory drive flange. 27 degrees.
Fuel Pump Assembly	C	Relevant marking information is all on the fuel pump tag:
The serial number is interpreted as follows:		
Chicago	C 31085 22	Build Number
	Date of Build	
	NTC 290	Engine Model
	C 3108522	Fuel Pump Serial Number
	3253-F	Fuel Pump Code Number
Fuel Pump Housing	C	On top of the housing on the machined surface exchange block – under AFC housing or bottom cast surface.

PRODUCT	MANUFACTURING PLANT	MARKING LOCATION
Gear Pump	C	On the flat surface adjoining the fuel pump housing
Governor Weight Carrier	C	Inside the carrier bracket visible between or under the weights.
Injector: PTD	C	Assembly Part Number stamped on body with white dye. Also Build Date code located near part number, may be marked with C, J or E.
Flange Type	C	The build date is stamped on the head of the injector in white dye.
Aftercooler	LA	On the top of the tube support block nearest the water inlet connections.
Upper Rocker Assembly	M	Near one of the center capscrew holes
Vibration Damper (rubber)	M	In the center hub area
Vibration Damper (viscous)	M	In the center hub area
Shutdown Valve	C	Top of housing adjacent to the fuel outlet
Tappet	C/E	On the flat on the outside diameter of the body, may be marked with either C or E.
Cylinder Blocks	LA	ID stamped on engine S/N Boss left rear side of block
Pulse Manifold	D	On center section near turbo mount pad.
L-IO Rocker Levers	D/C	Flat surface on side of body
Water Pump		
• FFC	M	On the flat cast surface below the fan bracket mounting hole.
• Non-FFC		On the cast ribs or on the machined clamping ring.
• V-903, Small Vee		On the front cast surface of the housing.
• V/VT-1710, C, J		On the outside of the bearing bore area.
Water Pump Idler	M	On front side of pulley.
Air Compressor	D/LA	On the boss at the bottom of the crankcase or component data tag affixed to housing.

Oil Cooled	
AR #	Serial #
12600	<input type="text"/>
Model VT50	<input type="text"/>
Cummins ReCon	<input type="text"/>

Date Stamp on tag or near tag on Compressor Housing

Cummins ReCon Co.	
MODEL NO.	VT50
SERIAL NO.	<input type="text"/>
ASSY. NO.	<input type="text"/>
MADE IN	USA

← Date Stamp

Parts Professional Accreditation Exam Instructions

1. Complete the examination, make sure to check only one answer PER question in the () provided.
2. Please be sure to fill in your Name, State and SS/INS No. at the top of the quiz form. This will assure proper credit and save grading time.
3. If you are enrolling for the first or you have had a change of address or employment fill in the mail list information in the boxes below. Keep yourself current on the mail list.
4. Score an average of 90% or better on exams 5 and 6 and earn a Cummins Parts Professional Calculator.

For factory use only.

Dist. Code		Dealer Code		OEM	
Your Name					
Social Security/ Ins. Number		Title			
Home Address					
City					
State/Province/Country		Zip/PC			
Employed By					
Address					
City					
State/Province/Country		Zip/PC			
Cummins Headquarter Distributor					
Address					
City					
State/Province/Country		Zip/PC			

Parts Professional Booklets

() Please send me the first series of four booklets. I understand that these are for extra reading only. Quiz 1-4 will no longer be graded.

Check who you are employed by:

- () Cummins Engine Company
- () Cummins Engine Distributor
- () Authorized Cummins Dealer
- () Authorized Cummins Service Center
- () OEM (specify) _____
- () Other (specify) _____

Turn Page, Begin Test

Detach here, fold and seal to mail.

Parts Professional Test #5

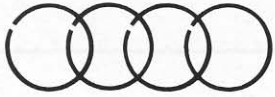
1. The National Overhaul Warranty (NOW) offers _____ standardized warranty plans.
 - A. () 6
 - B. () 4
 - C. () 3
 - D. () 10
2. To you, a parts professional, the NOW plan can mean:
 - A. () increased parts sales
 - B. () increased service business
 - C. () more customers
 - D. () all of the above
3. The NOW plan hinges on:
 - A. () the intelligent reuse of parts
 - B. () a standardized overhaul plan
 - C. () both A and B
 - D. () a B and C Series engine
4. A NOW Plan 3 rebuild includes the installation of:
 - A. () Premium Cylinder Kits and new rocker boxes
 - B. () Premium Plus Cylinder Kits and new rings
 - C. () Premium Cylinder Kits and new Cummins Cylinder Heads
 - D. () Premium Plus Cylinder Kits and Compuchek fittings
5. When new Cummins or ReCon parts are installed as part of a Plan 3 Overhaul, their warranty is:
 - A. () 1 year/100,000 miles
 - B. () 2 years/200,000 miles (321,870 km) or 7,200 hours
 - C. () 2 years, unlimited mileage
 - D. () optional
6. Premium Plus ring sets are designed to withstand high load low RPM operation.
 - A. () true
 - B. () false
7. Cummins main bearings are marked with the Genuine Cummins trademark.
 - A. () true
 - B. () false
8. A customer's engine is ineligible for the National Overhaul Warranty plans if it is obvious that the engine:
 - A. () contains non-genuine parts
 - B. () is not correct to the specified CPL
 - C. () does not have the correct components
 - D. () all of the above
9. When applying Cummins C BRAKE Kits to an engine, you must match the _____ to obtain the correct adjusting screw kits.
 - A. () turbocharger only
 - B. () aerodynamic aids and service brakes
 - C. () CPL and the turbocharger
 - D. () cylinder kits and crossheads
10. Cummins NH/NT liners are referred to as:
 - A. () dry liners
 - B. () wet liners
 - C. () island plateaus
 - D. () counterbore liners
11. To prevent liner wear and fretting, Cummins designed the _____.
 - A. () standard counterbore liner
 - B. () extended press fit liner
 - C. () protruding liner
 - D. () lower press fit liner
12. The new lower-press-fit liner will work as a direct replacement in an older-style block.
 - A. () true
 - B. () false
13. To take advantage of the lower-press-fit feature in an older-style block it is necessary:
 - A. () to purchase a new counterbore
 - B. () to use a standard oversize liner
 - C. () to machine and add a sleeve in the block counterbore area
 - D. () to install a dual oversize liner
14. The lower press fit position between the new style block and the lower press fit liner, part no. 3055099, is designed to _____.
 - A. () reduce block stress
 - B. () improve durability
 - C. () both A and B
 - D. () to decrease the fit
15. The lower-press-fit liner is interchangeable for use in the V-28.
 - A. () true
 - B. () false
16. The lubrite process _____.
 - A. () helps prevent rust from forming
 - B. () improves break-in lubrication
 - C. () contributes to longer component life
 - D. () all of the above
17. The NH/NT Piston Consolidation retains _____ barrel-skirt design pistons to service non-piston-cooled engines.
 - A. () 4
 - B. () 0
 - C. () 2
 - D. () None of the above
18. The sled-runner design piston skirt _____.
 - A. () reduces clearance between the liner skirt and the cylinder walls.
 - B. () reduces the likelihood of piston tilt.
 - C. () reduces the noise produced by piston slap
 - D. () all of the above
19. The Super Single Air Compressor _____.
 - A. () has 52% fewer parts
 - B. () has an improved discharge port area
 - C. () produces cooler air temperatures
 - D. () all of the above
20. Why overhaul an engine:
 - A. () better resale value
 - B. () excessive blowby/oil consumption
 - C. () major component wear
 - D. () all of the above

21. DCA4 is not meant for use in automotive or midrange diesel engines because it will attack and severely corrode aluminum.
- A. () true
B. () false
22. To make Small Vee engine service crankshafts more competitive, they are now available:
- A. () with four specific crankshaft gears
B. () without crankshaft gears
C. () with a selection of crankshaft gears
D. () with belts
23. Under which NOW rebuild plan are installation of Compuchek fittings included as part of the package?
- A. () Plan 1
B. () Plan 2
C. () Plan 3
D. () none of the above
24. Uprating with a Pulse Manifold Kit requires:
- A. () a CPL change
B. () that a field fix number be stamped on engine data plate
C. () finding new CPL number in CPL Manual
D. () A & C
25. The DFC (Demand Flow Cooling) lube system was made standard on BCII engines and can be applied to earlier NT engines
- A. () true
B. () false
26. Main Bearing Sets do not include the lockplates.
- A. () true
B. () false
27. An aftercooler Uprate on a non-aftercooled NT engine requires
- A. () a Full engine Uprate and a new CPL number
B. () Aftercooler Mounting Kit
C. () Air Compressor
D. () all of the above
28. A field fix number must be stamped on the engine data plate when an Uprate Camshaft is installed.
- A. () true
B. () false
29. Premium Plus Cylinder Kits are designed for _____ .
- A. () normal engine loads and higher rpm
B. () Crosshead performance
C. () improving the performance of a V-28
D. () higher engine loads and lower rpm
30. Cummins ReCon Cylinder Head Warranty is 1 year/100,000 miles.
- A. () true
B. () false

Reference

Bulletin Number	Description	Engine Series
86T1-9	Optional Use of Dual Ni-Resist	NH/NT
86T1-9A	Optional Use of Dual Ni-Resist	NH/NT
86T1-11	New "EP" Liner O-Ring Seals	NH/NT
86T1-19	New NH/NT Cylinder Liners	NH/NT & V28
86T0-2	Big Cam IV NTC 444 release	NH/NT
86T1-20A	NH/NT Piston Standardization	NH/NT
86T1-28	New Big Cam Cylinder Block	NH/NT
86T2-2	New Cylinder Head Gasket	NH/NT
84T1-5	Piston reuse guidelines	ALL
85T1-12	Acceptable Bore Polish Liner Reuse	ALL
85T1-18	Camshaft Improvement	NH
3379133-14	CPL Manual	
3822028-01	C BRAKE Catalog (revision 10-86) ReCon Core Acceptance Handbooks	

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