



# PARTS PRO CLASSIC

## CLASSIC EDITION #20

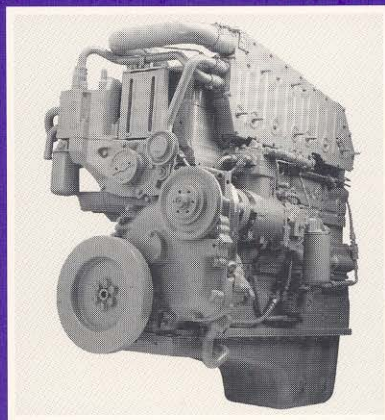
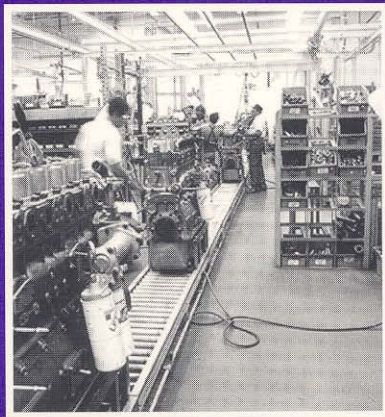
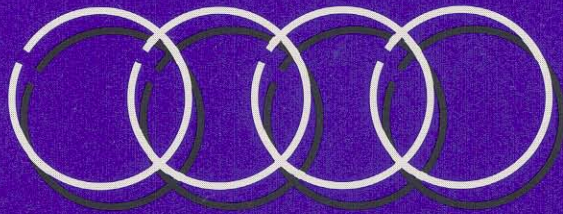
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# Cummins

## Parts Professional 20



**Invest in the best.**



## Parts Professional 20 Quiz

**Current Address**  Check here if this is a new address

Name \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_

**Old Address (if Applicable)**

Name \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_  
Distributor Code \_\_\_\_\_ Dealer Code \_\_\_\_\_

## Quiz

- |     |   |   |   |   |
|-----|---|---|---|---|
| 1.  | A | B |   |   |
| 2.  | A | B | C | D |
| 3.  | A | B |   |   |
| 4.  | A | B | C | D |
| 5.  | A | B | C | D |
| 6.  | A | B |   |   |
| 7.  | A | B | C | D |
| 8.  | A | B |   |   |
| 9.  | A | B | C | D |
| 10. | A | B | C | D |
| 11. | A | B | C | D |
| 12. | A | B |   |   |

## Parts Professional 20 Reply Card

Check here if this is a new address

Current Address

Old Address (if applicable)

Name \_\_\_\_\_ Name \_\_\_\_\_  
Street \_\_\_\_\_ Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_ Zip \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_ Zip \_\_\_\_\_  
Distributor Code \_\_\_\_\_ Dealer Code \_\_\_\_\_  
(if applicable) (if applicable)

Comments or Suggestions:

Dealer Name \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Hello! Enclosed in your package is the new Parts Professional binder. This binder will hold issues 20 - 40. If you do not have the old issues, you can order them through your local distributor. The Parts Professional binder containing issues 1 - 19 is bulletin number 3624186. If you need to order another new binder, the bulletin number is 3698522.

This issue of Parts Professional discusses engine performance enhancers. We will look at three different products that impact engine performance. The products are the pulse manifold, the ReCon® turbocharger, and the ReCon® engine.

Once you have read this issue, please take the quiz that is located in the back of the book. All you have to do is tear out the answer card in the front of the booklet and circle the correct answer. If you answer all fifteen questions correctly, you will win a Parts Professional pocket calculator. We need to receive the quizzes by August 30.

We are implementing another suggestion from a reader. Enclosed in your package, you will find two indexes. The first index is for the Parts Professional binder with issues 1 - 19. The second index is for the new Parts Professional binder. At the beginning of the year, I will send a new index that will outline the topics to be covered in the Parts Professionals for the year.

In Parts Professional 19, I mentioned that the reply card had changed; however, the old reply card was accidentally printed. This issue has the new reply card. If you have any suggestions on future topics to be covered or any other ideas, simply fill out the postage paid reply card.

If you have a TIP from the Professional or a Success Story, you can use the reply card to send me the information. Please remember that the TIPS and the Success Story must be compatible with Cummins standard practices and must relate to the sale of New or ReCon Genuine Cummins Parts. If you are the top winner in the TIPS or the Success Story, you will receive a Cummins Parts Professional jacket.

If you need additional booklets, please contact your local distributor. All past issues are available through your distributor, even though the incentives are no longer available.

I look forward to hearing from you!



Kathy Gastineau  
Advertising & Promotions Specialist

**Editor's Note:** Special thanks to Loretta Evans, Andrew Mariano, Mark Chapple, Richard Beach and Tim Jarvis for their contributions to Parts Professional 20.

## Sales Success

The winning success story for Parts Professional 20 comes from Tim Tomei. Tim works at the parts counter at Cummins West in San Leandro, California. Here is his story:

"A customer came in looking for a liner kit. He had his CPL number, so I gave him the liner part number and price. I asked him what was wrong with his old liner. He told me his liner was pitted, and he had water in his oil. His problem led me to ask more questions:

Which liner was pitted?  
Are you going to check the other liners?  
Have you looked at your injectors, heads, etc.?

I let him know that if one liner was pitted, the other liners may also be pitted. He may have more of a problem than just one pitted liner. At this point, I mentioned the Save A Bundle Promotion and its value and long term advantages. He said he was taking off all the heads, but he was sure this was the problem.

I suggested that before I sold him the liner, he should go back and check out the other liners along with the injectors and the heads. I said that I would hold the one liner for him in case he only needed the one liner.

After a few hours, I received a call. Three liners were pitted and in bad shape, two liners were pitted moderately, and the last liner looked as if the pitting had just started. In any case, all six liners were pitted. He said he wasn't sure about his heads and his injectors. We talked more in depth about the Save A Bundle program. I did a cost comparison between the Save A Bundle program price and individual parts prices. In the individual parts, we did liner kits (not cylinder kits), heads, injectors, rod & main bearings, and gasket kits. The cost was higher than the Save A Bundle program. He bought the Save A Bundle Super Overhaul Kit because he realized the value he was getting.

While the focus was on the Save A Bundle kit, the customer's needs went beyond the kit. Liner pitting tells me that the customer has not maintained his coolant. So we went over the coolant maintenance, using the information in Service Parts Topics 92-8-9. I told him that without proper coolant maintenance, he would end up having the same problem. By reviewing the proper coolant maintenance information, I sold the Fleetguard Cooling System Cleaner Restore™, 3 cases of Compleat™ and a water filter.

While he was at the counter, I asked if he needed lube filters, and what kind of shape were his belts? He added the lube filters and belts to his order."

Tim concludes his success story by saying that not all of Save A Bundle sales end up this way, but his format remains the same:

- To look beyond the target sale
- Ask about their belts, filters, hoses, etc.
- Discuss the importance of coolant maintenance.

He says that sometimes they buy the additional items, and sometimes they pass on the items. Either way, he wins by looking beyond the target sale and getting to know the customer's total needs.

Tim is not selling the customer something he doesn't need. He is ready to help the customer while he is standing at the counter. This way, the customer will not have to go somewhere else to get an item he forgot to purchase while at his counter.

Congratulations Tim on excellent customer service! Since Tim has the winning success story, he will receive a Cummins Parts Professional jacket.

# TIPS

from the Professionals

In this Parts Professional, we have four more TIPS from the Professionals. The first TIP is from Patrick Walters. Patrick works at Peterbilt of NW Ohio in Findley, Ohio. His tip is when selling ReCon parts, it helps to show the core acceptance book to customers. This way they know what to expect as far as core acceptance is concerned. By showing them the book, you can avoid surprises and hot customers at core time.

The second TIP also covers ReCon core acceptance. This tip is from Mike Johnson of Cummins Intermountain in Salt Lake City. He says that you should train and orient your larger fleet customers in Cummins ReCon core acceptance. This way there are no surprises when issuing core credits.

Robert Kish of Cummins Ohio has the third TIP. He writes: if a customer wants to buy parts for an overhaul that he is doing himself (to save money), he tries to give him as much help as possible. He gives the customer the correct part numbers that are needed to do the job. This way he can shop for the best prices using Genuine Cummins Parts and not "will-fit." He feels that even if the customer goes to one of the dealers, they are still buying the part from Cummins Ohio. He believes the customer will remember who saved him money and will come back for future sales. He also suggests that you try to sell him a shop manual, and that you suggest uprates for his engine.

The TIP from the Professional winner for Parts Professional 20 is from Corbitt Doss of Duncan Truck Sales in Waco, Texas. He had an excellent idea for servicing the customer. He keeps a record of all his local owner/operators and small fleets' information. The information includes the truck serial numbers, engine serial numbers, and CPL numbers. Below the name and telephone numbers of bigger fleets (5 or more), he also keeps a record of unit numbers for quick reference. This record-keeping speeds up the parts process, and then the customer does not have to go home or go to the unit to get the number.

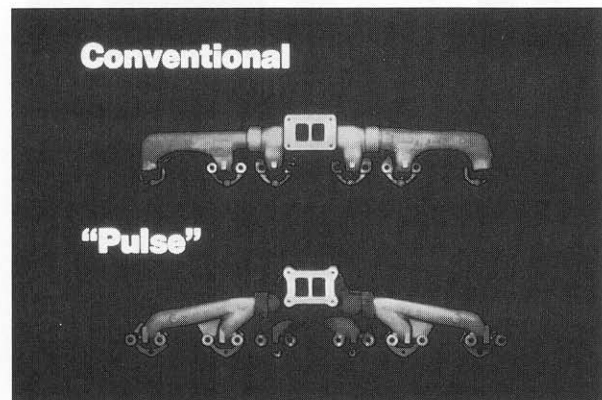
We want to thank Mike, Patrick, Robert, and Corbitt for their TIPS. Each person will receive a Cummins Parts Professional cap and Cummins Parts Professional patches for their contribution to the TIPS from the Professional. Since Corbitt had the winning TIP, he also receives the Cummins Parts Professional jacket.

If you have a TIP, please send it to me. The rules for the program are listed in the letter from the editor.

## CUMMINS PULSE EXHAUST MANIFOLDS

The performance of the engine is very important. Parts Professionals often look at what parts can they change in order to improve or enhance their engine. What about performance improvement through changing the engine exhaust manifold? It is certainly not a new idea, instead it's an idea that has been around Cummins for well over a decade. This good "bolt on" idea has proven itself for many years, that is installing a pulse manifold on an engine where a pulse manifold does not already exist. This manifold change, from a standard type manifold to a "pulse" design manifold, coupled with the correct turbo design, can result in a low cost improvement in the engine performance.

How does the pulse manifold work? First, we need to look at the basic function of an engine exhaust manifold for a six cylinder turbocharged engine. As an engine "breathes," it requires that the flow of air be routed first through a filtration system to clean the air before it enters the individual cylinders of the engine.



After passing through the engine cylinders and the combustion cycle, the flow of air exits each of the engine exhaust ports, and goes directly into the exhaust manifold. The engine exhaust manifold then acts as a collector of the engine exhaust gases that have exited the multiple engine exhaust ports and channels or directs those gases into the turbo. The turbo harnesses the energy and uses that energy to enhance engine efficiency.

During the cycle or the air flow process, the engine will at various times experience what is commonly called "pumping losses." Engine "pumping losses" include the energy required to draw air in or the energy required to expel out the exhaust gases. In the case of the exhaust manifold, the design of the manifold's shape and the internal passageway size can have an impact on an engine's pumping losses.



The basic standard non pulse manifold collects the engine's exhaust "beats" or "pulses" into a common chamber or two chambers, allowing the engine exhaust pulses to work on, or in some cases, against each other, before they ever have time to get the short distance to the turbocharger. In addition to the exhaust pulses working against each other, under certain conditions, these exhaust gases will act as a pressure pulse on a cylinder that is attempting to expel its gases. When this happens, the engine will have to "pump" or work to get the exhaust out against that pressure. It makes sense to use available engine horsepower to transmit power to the drivetrain, instead of wasting it in the effort to pump out or expel engine exhaust gases.

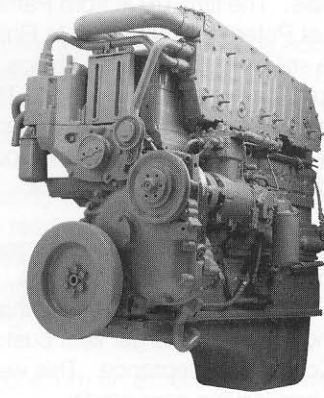
The pulse manifold, by design, incorporates a combination of carefully engineered and complex gaseous flow angles to harness and optimize the individual exhaust or pulses that occur each time an exhaust valve opens on each of the engine's cylinders. The pulse manifold then directs or channels each of the exhaust pulses from the engine into the turbocharger's specially designed divided turbine housing. **Note:** Single entry turbine housings will also work fine with the pulse manifold, but not at the same level of efficiency. Inside the turbine housing, the pulses that have been carefully channeled through the manifold, travel through each side of the separated turbine housing chambers where they act on the turbine wheel with a form of alternating pattern of pulses. This system of optimizing the exhaust pulse and reducing the turbulent exhaust gas interaction, net a reduction in the engine pumping losses and result in more usable horsepower to the drivetrain.

Brake Specific Fuel Consumption (BSFC), peak torque and horsepower output, turbocharger boost and engine exhaust temperature are engine measurements that are used to calculate the benefit of changing parts for the purpose of increasing engine performance. In the case of the pulse manifold that has been specifically designed for a given engine, and then matched with the proper turbocharger, one can realize a lower BSFC number (lower BSFC = reduced fuel consumption), higher peak torque and horsepower output, with a better turbocharger boost output, and an improved exhaust temperature. This results in a carefully engineered bolt on performance enhancement.

For additional reference, please review Cummins Service Topics 83T11.1, 83T11.4, 93T11.2 & 93T10.1.

## CUMMINS RECON<sup>®</sup> ENGINES

ReCon engines provide an excellent way for customers to gain improvements in performance and fuel economy. Before looking at examples of improvements in performance, one should first look at why a customer would consider a ReCon engine.



When should you present a ReCon engine to your customer?

1. A ReCon engine when should be considered when equipment duty cycle dictates the need for a complete engine out-of-frame overhaul to ensure maximum reliability, durability, and performance.
2. When an engine may need extensive block repair or a replacement is required. When a crankshaft or camshaft replacement is required.
3. When the benefits of upgrading to a higher horsepower or later engine technology are needed. The customer will receive improved productivity and lower operating costs.
4. When revenue loss from equipment downtime needs to be minimized.
5. When a customer is looking for a good resale value.
6. If a customer is considering glider applications.
7. When nationwide warranty protection is important to your customer.

Since ReCon is a division of Cummins, ReCon is able to incorporate the latest product improvements made by Cummins to ensure that the customers receive like-new performance, horsepower, and fuel economy. Unlike some competitors, ReCon does not just assemble a collection of parts to reach a certain horsepower, and hope that the engine will perform properly. When an engine is assembled by collecting odd parts, the engine performance, fuel economy and durability may be compromised.

ReCon remanufactures all the engines to the latest Cummins CPLs to ensure customers receive top performance. ReCon uses only Holset turbochargers on all the big cam engines forward, as well as the latest pulse exhaust manifolds.

Customers often are looking for ways to upgrade their engine. Upgrade programs provide options for customers to achieve top performance. With the ReCon program, customers can upgrade for higher horsepower within any engine family at NO CHARGE. For example, a customer can trade a Big Cam III 300 for a Big Cam III 400 at no upgrade charge.

Customers can also upgrade to later Cummins technology for improved performance and fuel economy. One example is that a customer can upgrade from a Big Cam I to a Big Cam III technology. In a typical application, the improved fuel economy can actually payback the upgrade charge in about eight months. During these eight months, the customer receives the benefits of BC III technology. After the eight months, the fuel savings generated by the later Cummins technology goes right to the customer's bottom line.

Schedule E Fuel Economy Improvements with Cummins ReCon® Engine Upgrades (in percentages)	Old Models					
	NTC290 BCI @ 2100	NTC350 BCI @ 2100	NTC400 BCI @ 2100	NTC300 BCI @ 2100	NTC350 BCI @ 2100	NTC400 BCI @ 2100
ReCon® Models						
NTC300 BCIII @ 2100	8.0			2.8		
NTC300F BCIII @ 1800	10.0			4.9		
NTC350 BCIII @ 2100	5.9	4.7		Equal	1.4	
NTC350F BCIII @ 1800	8.5	7.4		3.3	4.0	
NTC400 BCIII @ 2100	6.1	4.9	3.5	0.7	1.5	1.3

ReCon offers technology upgrades for every engine family including N Series, L10, B and C Series. Complete details on ReCon engine upgrades can be found in the Cummins ReCon Engine Handbook which is bulletin 3605497B.


NH/NT, VT903 Conversion Matrix									
Model Ordered	Core Returned								
	NFFC NPC	NFFC PC	FFC NPC	FFC PC	BCI	L10/BCII	BCIII	BCIV	V903
NFFC NPC	N/C								
NFFC PC	\$	N/C							
FFC NPC	\$	\$	N/C						
FFC PC	\$	\$	\$	N/C					
BCI	\$	\$	\$	\$	N/C				
BCIII	\$	\$	\$	\$	\$	\$	N/C		
BCIV	\$	\$	\$	\$	\$	\$	\$	N/C	
VT903	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	\$

N/C - No Charge; N/A - Not Applicable; \$ - See your distributor for pricing.


## CUMMINS RECON® TURBOCHARGERS

As Parts Professionals are aware, Cummins ReCon turbochargers are remanufactured, not rebuilt. Unlike the competition, the ReCon remanufacturing process has evolved over a 25 year period and has required millions of dollars in equipment investment and thousands of hours of employee training. ReCon manufacturing processes are highly mechanized and include fail-safe features (eliminate the mistake factor). Turbochargers follow the same manufacturing process every time to ensure that the customer will get the same reliable product with each purchase.

### Durability

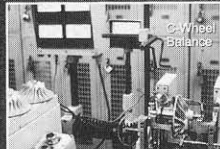


T-Wheel Balance

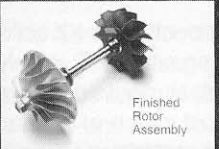


Rotor Assembly Balance


- 100% Balanced
- T-Wheel
- C-Wheel
- Rotor Assembly



C-Wheel Balance



Finished Rotor Assembly



Cummins ReCon provides the 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. Furthermore, customers can be assured that Cummins ReCon turbos are precisely matched to Cummins engines both in engineering specifications and CPL, so it will fit right in the National Overhaul Warranty Guidelines. The customer will be saving money through ReCon's low prices and through the exact match of turbo to engine. As parts professionals know, even a slight mismatch can result in hundreds of dollars lost in wasted fuel each year.

If a customer is looking for an uprate, the parts professional should push the HT3B turbocharger. The HT3B turbocharger was designed to improve the responsiveness and durability of the Big Cam III engine. Now the HT3B is an ideal UPRATE option for most Small Cam, Big Cam I, Big Cam II, some earlier Big Cam III, and Big Cam IV engines.

The HT3B has full floating shaft bearings for minimum shaft drag. A smaller low-inertia compressor wheel, combined with lowdrag bearings, provides outstanding acceleration. The HT3B lets the engine respond faster when the throttle is opened. Tests indicate the HT3B improves engine transient up to 95 percent.

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 percent over earlier designs. The dual entry casing provides much higher air flow at lower engine speeds than previous designs. The higher air flow reduces combustion and exhaust temperatures which mean engine parts will run cooler. When parts run cooler, the parts will last longer. 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 accelerations and fuel economy. [Note: A certification field fix number must be stamped on the engine data plate; see SPT 85T 10-4 for more information.]

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

The HT3B Turbocharger Kit contains the turbocharger and mounting gaskets. Turbocharger plumbing kit (P/N 3801486) is required to adapt the new HT3B turbocharger oil inlet and drain to the standard oil plumbing. The HT3B also requires use of the longer mounting studs.

ReCon turbochargers are remanufactured to Cummins specifications for top performance and fuel economy. No other manufacturer or remanufacturer has full access to genuine Cummins and Holset technology. ReCon offers the right turbocharger for the right application. For example, ReCon offers over 100 turbochargers for different applications. With the ReCon product, you get the right turbocharger for your application and not just one that bolts on.

## Durability



- ReCon offers more than 100 different turbos for Cummins engines
- The right turbo for the application

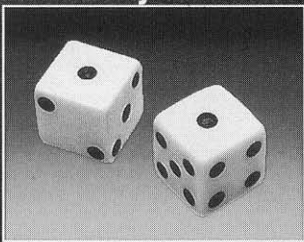


ReCon offers eight turbochargers compared to two and four turbochargers offered by the competition for the BHT3B turbocharger.


ReCon offers all fourteen of the different models of HT3B turbochargers. The competition offers less, but implies that the turbochargers offered will cover all of the Cummins engine applications. ReCon spends hundreds of hours of engineering time each year

making sure that if there is an opportunity for part number consolidation, ReCon will take advantage of it. ReCon has been unable to find a way to reduce the requirement of fourteen turbochargers to eight without impacting engine performance. Having the wrong turbocharger for the wrong application will rob the customer of fuel driveability and power. A mismatched turbo can also result in excessive smoke.

## Reliability



- 8 turbos vs 14 sounds good to minimize inventory
- But your customers only have a 57% chance of getting the right turbo



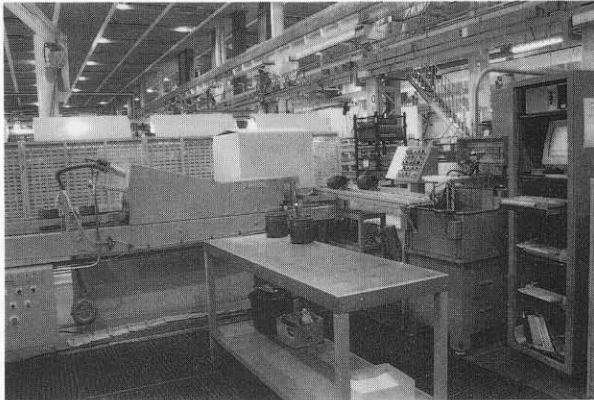
ReCon has Full Core Acceptance on turbochargers. This means that regardless of the condition of the core, ReCon will give you full core credit. As long as the core is in "off engine" condition, there is no billback or partial credit. The ReCon "Upgrade/Conversion Programs" discussed above helps customers upgrade their engines to the latest turbocharger technology. In the case of a T-style upgrade, the Holset replacement costs less (including the upgrade charge) than the T-style replacement. ReCon wants the parts professionals to encourage their customers to use the newer technology...the better the products perform, the more profitable our customers become. What do the "will-fitters" offer to improve their customer's engine performance?

ReCon turbochargers offer the highest value for Cummins customers. ReCon may not always be the lowest priced alternative, but the costs of a "will-fit" product could be much more than the sales price. The cost associated with decreased fuel economy due to a poor performing or mismatched turbo can be much higher than the premium required for the ReCon product. Not only fuel costs, but the warranty costs, durability, and downtime are at risk when a customer goes non-genuine. Non-genuine isn't worth the risk. When one compares the product quality, warranty, service support, product offering, and availability with anyone else in the business, no one else even comes close. ReCon has remained the industry leader for 25 years, and ReCon will be here for the customer needs. Will the "will-fitter" be there for the customers down the road?

## Technical Talk

Parts Professional 20 Technical Talk is a little different. In this issue, Tim Jarvis, product manager for High Horsepower Engines, discusses his visit to the Daventry U.K. K/KV piston plant.

Tim went to Daventry to view the new process of piston ultrasonic inspection. Effective on 11/8/93, 100 percent of all K/KV (Production and Service) Pistons were processed through the DAV Ultrasonic Equipment.

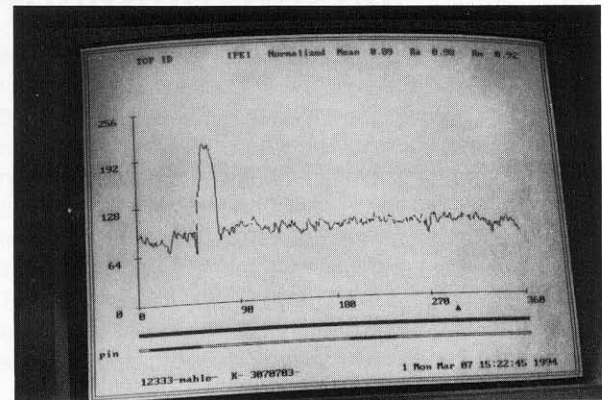


The Ultrasonic equipment is a state of the art inspection tool that was designed by Cummins manufacturing specialists. The machine features six ultrasonic probes and is integrated with a PLC (Program Logic Controller) for automation purposes.



The machine compares each piston to a master sample and projects a separate ultrasonic signal from each piston location. Each piston is immersed in fluid to allow the signal to surround the piston surface. The acceptance/rejection is based on the signal seen by the PLC. Any failure data is stored and reported to Mahle on the monthly review process. The current capacity of the equipment is 400 pieces per day.

After the pistons have been inspected, each piston is etched with the D.I. stamping under the skirt. The stamping assures that the piston has been Daventry Inspected. This stamping also guarantees that the piston is genuine Cummins.



The process has been defined as the best debond screening tool in the World. The equipment feature less than a one percent error. The equipment rejects up to fifteen percent of the pistons that were checked by the Mahle (supplier) equipment. Sample pistons are then saw cut to reveal bond strength fractures.

Since identifying the fifteen percent rejection of the pistons supplied by Mahle, Cummins has been able to work with Mahle to refine their manufacturing process. The U.S. machine was able to detect bond integrity weaknesses in a location on the piston that was used to hold the piece during the sealing process. The lack of sealant in this location caused potential debond failures.

A second machine is being designed to be placed in the Indianapolis Parts Distribution Center. This second machine will serve the needs of the CIC and Service.

There is also work being done for continuous improvements. New inspection equipment is being developed to improve the current state-of-the-art machine. Software enhancements will be made to allow for greater data collection and operator ease of use.



# PARTS PROMOTIONAL LIST

PART NO	DESCRIPTION	ISSUE DATE	PRICE
3381213	New Engine Parts Warranty	6/94	.10
3381292	A, B, C, New Parts Warranty	8/93	.10
3385550	NOW Engine Sticker	9/88	.10
3385556	444 Pulse Exhaust Manifold	3/90	.10
3385584	C Brake Cross Ref. Guide	4/91	.10
3385589	Water Pump Poster	---	.10
3385591	Water Pump Mail Brochure	---	.10
3385709	PT Pacer Mailer	---	.10
3385742	L10 Bolt Sizer	---	.10
3385756	Camshaft Feature/Benefits Flyer	2/90	.10
3385755	Crankshaft Feature/Benefit Flyer	2/90	.10
3385758	Inj. Cups Feature/Benefit Flyer	2/90	.10
3385836	How To Talk To CECO 800-Dies	10/90	.10
3385838	Associated Parts Guide Booklet	11/90	.10
3385852	Parts Overhaul Kit Co-op Ad	1/91	.10
3385877	Cylinder Kit Competitive Brochure	7/91	.10
3385878	NT/L10 Cylinder Kit Cross Ref.	6/92	.25
3385899	NOW Certificate	10/93	.10
3385914	Prem. Cylinder Ad Slick 85line	6/92	.10
3385915	Prem. Cylinder Ad Slick 120line	6/92	.10
3385917	Cummins Care Aftermarket Flyer	8/92	.10
3385932	NOW Poster	11/92	1.00
3385933	NOW #10 Flyer	11/92	.10
3385934	NOW Ad Slick 85line	2/93	.10
3385935	NOW Ad Slick 120line	2/93	.10
3385936	NOW Folder	11/92	.25
3385937	NOW Window Decal	4/93	2.00
3385950	CEPC Flyer	3/93	.10
3385958	Cummins Care Poster	3/93	1.00
3385959	Genuine Overhaul Poster	3/93	1.00
3386577	Cummins Care Shopping Bag	---	.25
3386741	NOW Cost Estimate Worksheet	10/89	.10
3386848	NOW Pre-Overhaul Checklist Manual	4/94	1.00
3386857	NOW Pre-Overhaul Checklist	10/89	.10
3386858	NOW Component Inspection Check.	10/89	.10
3386866	NOW Program Manual	10/93	1.00
3387320-01	Parts Professional #1	---	1.00
3387320-02	Parts Professional #2	---	1.00
3387320-03	Parts Professional #3	---	1.00
3387320-04	Parts Professional #4	---	1.00
3387320-05	Parts Professional #5	---	1.00
3387320-06	Parts Professional #6	---	1.00
3387320-07	Parts Professional #7	---	1.00
3387320-0	Parts Professional #8	---	1.00
3387320-09	Parts Professional #9	---	1.00
3387320-10	Parts Professional #10	---	1.00
3387320-11	Parts Professional #11	---	1.00
3387320-12	Parts Professional #12	---	1.00
3387320-13	Parts Professional #13	---	1.00
3387320-14	Parts Professional #14	---	1.00
3385815	Parts Professional #15	---	1.00
3385816	Parts Professional #16	---	1.00
3385817	Parts Professional #17	8/93	1.00
3385818	Parts Professional #18	11/93	1.00
3385819	Parts Professional #19	2/94	1.00
3385820	Parts Professional #20	6/94	1.00

PART NO	DESCRIPTION	ISSUE DATE	PRICE
3624186	Parts Professional Binder w/ Issues 1-19	—	5.00
3698522	Parts Professional Binder w/ Issues 20 -	—	3.00
3624349	Maintenance Requirements—Lam.	11/93	.10
3624360	Maintenance Requirements Flyer	2/92	.10
3822013	New/ReCon Kits & Sets Booklet	6/92	1.00
3385888	Premium Blue Flyer	2/92	.10
3385889	Premium Blue Ad Slick 85line	4/92	.10
3385890	Premium Blue Ad Slick 120line	4/92	.10
3385891	Premium Blue Availability Direc.	4/93	.15
3385892	Premium Blue Data Sheet	7/92	.10
3385893	Premium Blue 2000 Data Sheet	7/92	.10
3385894	Premium Blue/P. Blue 2000 Folder	7/92	.50
3385897	Premium Blue Value Wheel	7/92	.50
3385918	Premium Blue/P. Blue 2000 Poster	7/92	1.00
3385920	Premium Blue A-OK Analysis Flyer	2/93	.10
3385938	Premium Blue 2000 Ad Slick 85line	10/92	.10
3385939	Premium Blue 2000 Ad Slick 120line	10/92	.10
3385941	Premium Blue Customer Kits	9/92	2.00
3385960	Premium Blue 2000 Ad Insert	3/93	.15
3385985	Premium Blue 2000 #10 Mailer	—	.10
3385973	Cummins Care Ad Slick 85line	6/93	.10
3385974	Cummins Care Ad Slick 120line	6/93	.10
3385979	Parts Management Dev. Program	7/93	125.00
3385994	1-800 Diesels Flier	9/93	.10
3385999	NOW Premium Plan Certificate	10/93	.10
3698510	Fan Clutch Brochure	3/94	.25



# TRANSLATED MATERIALS

PART NO	DESCRIPTION	ISSUE DATE	PRICE
3385970	French Premium/P. Blue 2000	3/93	.25
3385971	French Prem. Blue 2000 Value	3/93	.25
3385972	French Prem. Blue 2000 Data	3/93	.10
3150474	Spanish Turbocharger Flyer	3/93	.10
3150475	Spanish Camshaft Flyer	3/93	.10
3150476	Spanish Gasket Flyer	3/93	.10
3150477	Spanish Crankshaft Flyer	3/93	.10
3150478	Spanish Valves Flyer	3/93	.10
3150479	Spanish Injector Cups Flyer	3/93	.10
3150480	Spanish Injector Components	3/93	.10
3385882	Spanish Cylinder Kit Competitive Bro	3/93	.10
3385957	Spanish Aftermarket Flyer	3/93	.10
3385975	Spanish Cummins Care Poster	3/93	.10
3385976	Spanish Genuine Overhaul Poster	3/93	.10
338733401	French Parts Professional # 1	---	1.00
338733402	French Parts Professional # 2	---	1.00
338733403	French Parts Professional # 3	---	1.00
338733404	French Parts Professional # 4	---	1.00
338733405	French Parts Professional # 5	---	1.00
338733406	French Parts Professional # 6	---	1.00
338733407	French Parts Professional # 7	---	1.00
338733408	French Parts Professional # 8	---	1.00
338733409	French Parts Professional # 9	---	1.00
338733410	French Parts Professional # 10	---	1.00
338733411	French Parts Professional # 11	---	1.00
3385875	French Parts Professional # 12	---	1.00
3385876	French Parts Professional # 13	---	1.00
3385867	French Parts Professional #17	2/94	1.00
3387335-01	Spanish Parts Professional # 1	---	1.00
3387335-02	Spanish Parts Professional # 2	---	1.00
3387335-03	Spanish Parts Professional # 3	---	1.00
3387335-04	Spanish Parts Professional # 4	---	1.00
3387335-05	Spanish Parts Professional # 5	---	1.00
3387335-06	Spanish Parts Professional # 6	---	1.00
3387335-07	Spanish Parts Professional # 7	---	1.00
3387335-08	Spanish Parts Professional # 8	---	1.00
3387335-09	Spanish Parts Professional # 9	---	1.00
3387335-10	Spanish Parts Professional # 10	---	1.00
3387335-11	Spanish Parts Professional # 11	---	1.00
3385854	Spanish Parts Professional # 12	---	1.00
3385855	Spanish Parts Professional # 13	---	1.00
3385856	Spanish Parts Professional # 14	---	1.00
3385857	Spanish Parts Professional # 15	---	1.00
3385858	Spanish Parts Professional #16	---	1.00
3385859	Spanish Parts Professional #17	6/94	1.00
3385860	Spanish Parts Professional #18	6/94	1.00

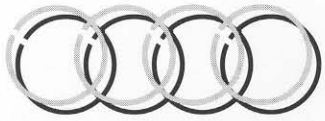
## Parts Professional Quiz 20

It's time to test your knowledge as a Cummins parts professional. Answer all 12 questions on the quiz correctly and you will win a Parts Professional solar calculator.

- Changing from a standard type manifold to a pulse manifold can result in a low cost engine performance improvement.
  - True
  - False
- The system of optimizing the exhaust pulses and reducing turbulent exhaust gas interaction will
  - net a reduction in engine pumping losses.
  - result in a more usable horsepower to the drivetrain.
  - both a and b
  - none of the above
- In the case of pulse exhaust manifold, the design of the manifold's shape and internal passageway size can have an impact on an engine's pumping losses.
  - True
  - False
- For pulse manifolds, what (is) are (an) engine measurement(s) that (is) are used to calculate the benefit of changing parts for the purpose of increasing engine performance.
  - BSFC (Brake Specific Fuel Consumption)
  - Peak torque & horsepower output
  - Turbocharger boost & engine exhaust temp.
  - All of the above
- When should a ReCon engine be considered?
  - to minimize revenue loss from downtime
  - customers want to uprate to a higher horsepower.
  - neither a nor b
  - both a and b
- ReCon engine upgrade programs also provide options for customers to achieve top performance.
  - False
  - True
- With upgrading with a ReCon engine, the improved fuel economy can actually payback the upgrade charge in about \_\_\_ months.
  - 24
  - 18
  - 8
  - 10
- ReCon offer technology upgrades for engine families including N, L10, B and C.
  - True
  - False
- The ReCon turbo remanufacturing process has evolved over a \_\_\_\_\_ year period.
  - 10
  - 15
  - 25
  - 20
- ReCon accepts \_\_\_\_\_ turbocharger models on a non-style for style basis.
  - T-50
  - VT-50
  - ST-50 and T-46
  - All of the above
- The HT3B turbo was designed to improve the
  - durability of the Big Cam III engine
  - responsiveness of the Big Cam III engine.
  - both a and b
  - neither a nor b
- Cummins also introduced a single entry HT3B turbo on Big Cam IV production engines for 350 horsepower and below.
  - True
  - False



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