



PARTS PRO CLASSIC

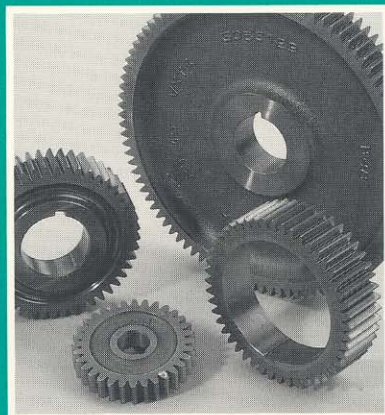
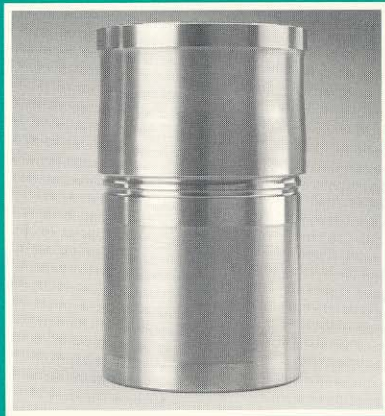
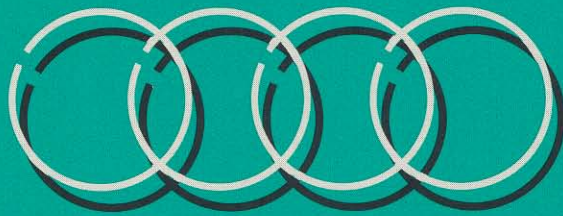
CLASSIC EDITION #19

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Cummins

Parts Professional 19



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Parts Professional 19 Reply Card

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Quiz

1. A B C D
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13. A B
14. A B C D
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▲ This issue's prize is a Cummins business card holder...and to win, all you have to do is score 100% on our quiz and return this form by May 15, 1994.

▼ Fill this card out and return it to be put on the Parts Professional mailing list and to receive future issues. Cards must be **completely** filled out in order to be processed.

Parts Professional Reply Card

Please put me on the Cummins Parts Professional mailing list:

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Hello and Happy New Year! Since we are now into the year 1994, this issue of the Parts Professional will discuss the product changes on the 1994 engines. Information on the 1994 engines was one of the most requested topics to cover, based on your response to the survey in Parts Professional 17.

After you have read this issue, remember to take the quiz in the back of the book. Simply fill out the postage-paid quiz card and return to us by May 15. If you answer the quiz correctly, you will win a Parts Professional Business Card Holder!

I want to thank all of you who took the time to answer the survey in Parts Professional 17. I appreciate all the suggestions made. In fact, one change has been made to this issue. I implemented the suggestion to perforate the Fact Sheet, so you can pull it out and store elsewhere.

Several comments were made regarding parts promotional literature and what is available. Every issue will have a list of available literature with prices. This information is located between the Fact Sheet and the Quiz.

The reply card also has been changed. When you have a TIP from the Professional or a Success Story, simply fill out the card and drop it in the mail. Please remember that the TIPS and the Success Stories 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, you will receive a Parts Professional jacket.

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

I look forward to reading your TIPS and success stories. If you have additional comments or suggestions, please use the reply card.

Kathy Gastineau
Advertising & Promotions Specialist

Editor's Note: Special thanks to Pat McClendon, Gene Fleetwood and Richard Beach for their contributions to Parts Professional 19.

Sales Success

Jeff Straw of Cummins Power has the winning success story for Parts Professional 19. He contributes his success to the training he acquired at the distributor Know How workshops and the Save A Bundle promotion that is currently running.

Recently, Jeff had traveled to several independent garages with his regional parts manager, Eddie Johnson. They were visiting the garages to gather information regarding parts usage of end users and independent garages.

After Jeff had attended Know How and had received the training along with the information on the Save A Bundle Promotion, he used this information to call on the independent garages. At first, the reaction was "will keep it in mind" concerning the Save A Bundle Promotion. To change the reaction from a thought to an action, Jeff decided to compile a Save A Bundle Chart. This chart lists the overhaul kits by CPL and also the camshaft type.

He distributed this chart to all the dealers and independent garages. The charts were mailed or delivered on a Monday. By Wednesday, he had sold three kits to dealers and three kits to independent garages. This chart really perked up the interest of Jeff's customers.

He finished his letter by stating that persistence will pay off. Any time you make it easier for the customer, they will be more likely to buy from you.

Congratulations Jeff for the excellent customer service. He will receive a Cummins Parts Professional Jacket for his successful effort.

Every issue will feature a success story, so be sure to send me your stories.

Editor's Note: If you would like a copy of the Save A Bundle CPL chart, contact your local distributor. It is bulletin 3385998 and may be ordered from Gannett.

TIPS from the Professionals

I want to thank everyone for their

TIPS from the Professionals. Since I have received so many TIPS, I will only publish a few this issue. The rest will be featured in future issues.

Dan Gassaway of Adelanto, California gives us this TIP: "When selling an 88NT water pump, I always suggest what I call a 'companion kit.' This companion kit contains 1-109080 O/R, 1-3049221 O/R, 1-212161 O/R, 2-3050667 O/R, 2-S1098 and 2-S1003A Grommet." This way whether the customer is on the road or in the shop, he will have the extra pieces to ensure that the repair is a leak proof water pump job.

Another TIP comes from T. R. Riley of Scranton, Pennsylvania. He says that you should always stress to the customer the importance of the Genuine Cummins nationwide warranty. Often a customer is deciding between Cummins/Cummins ReCon and a local rebuild. When you discuss the nationwide warranty, it will help close a sale for you. This approach has helped close many sales for T. R. Riley.

Rick Holdaway of Blenheim, Ontario, Canada has an additional TIP for water pumps. He says that whenever he sells a New or ReCon water pump, he recommends the use of a New or ReCon idler. It does not matter what the condition is of the old one, because it will have as many miles as the water pump. He has had good results from his suggestion. Nine out of ten times, people will follow his advice.

The fourth TIP is from Morris Braaten of Essexville, Michigan. He discusses the importance of checking head casting numbers. Here is his tip: "When selling Big Cam IV heads, remember to check with the customer about the head casting numbers or the injector hold down screw." "Some CPLs allow different heads, which must be matched."

The winner of the TIPS from the Professional for Parts Professional 19 is Kim Gillespie of Port Arthur, Texas. The dealer where Kim works had recently invested in a microfilm printer. Kim's customer called and said that he was coming to pick up the oil cooler gaskets and seals for a V1710. Kim shot a picture on the microfilm and faxed it to him. He checked off the exact parts that he was looking for and faxed it back to Kim. They pulled the parts and had them ready for him by the time he arrived. Kim also mentions that this TIP works well with fuel tubing since the translation can often be misunderstood over the telephone.

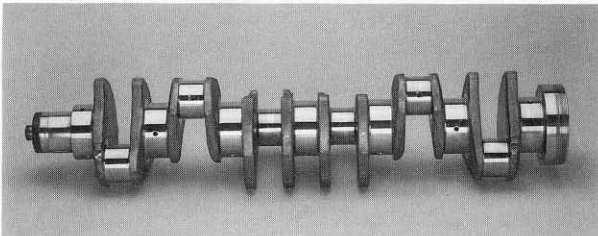
I want to thank Kim, Morris, Rick, T. R., and Dan for being this issue's winners of TIPS from the Professional. Because these five people were featured in this issue, they each will receive a Parts Professional cap and Parts Professional Patches. Kim also will receive the Cummins Parts Professional Jacket. Remember, all you have to do is send in your TIP. The guidelines are outlined in the letter from the editor.

M11

The M11 family was developed to provide more horsepower than the L10, but M11 would weigh less than the N14 engine. This new engine weighs only 100 pounds more than the L10; however, the M11 goes up to 370 horsepower while the L10 goes up to 330 horsepower. It is a light weight engine that will yield excellent productivity and fuel economy.

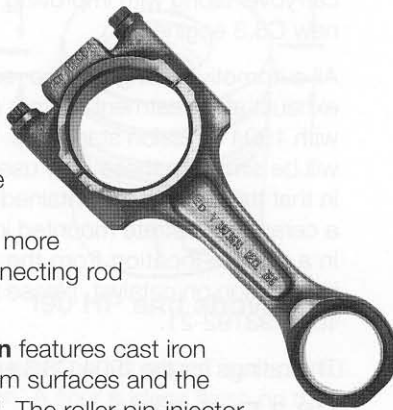
What are the differences in the parts for the M11 compared to the L10? One part that has changed is the block. The block has been strengthened thereby eliminating noise. The block features a wide skirt and is backward compatible to the L10 engine.

The **crankshaft** has partial counterweight machining for improved balance. A new crank pulley and damper design were developed for the M11 crankshaft.

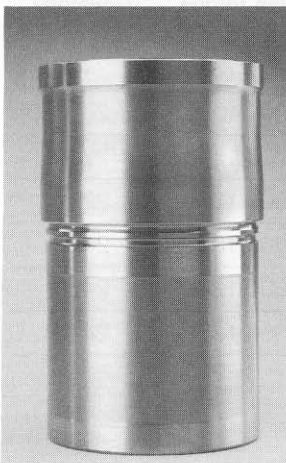


The **cylinder head** is made of a premium alloy cast iron material. An advanced swirl port technology was used for the M11 cylinder head. The benefits are durability, improved fuel economy, lower emissions, and lower lube oil soot.

A small end balance lug was eliminated on the **connecting rod**. The rod is backward compatible to the L10. In the rod cap there is a deep fillet that is not drilled. A more reliable and durable connecting rod is the end result.



The **valve/injector train** features cast iron rocker supports. The cam surfaces and the rollers are micro finished. The roller pin-injector follower is larger. Another design change is improved lubrication to the overhead. The benefits are durability and serviceability.



An improved surface finish is a characteristic of the **cylinder liner**. This cylinder liner is a patented design and features a tapered wall thickness at mid-stop. The benefits of the new cylinder liner are reduced bore distortion, lower oil consumption, increased durability, and reduced emissions.

The M11 **piston** has an articulated piston that has a forged steel crown and an aluminum skirt. Other traits of the piston include a re-entrant bowl and a raised top ring. The ring pack has been improved. Benefits of the piston/rings are increased reliability/durability, higher cylinder temperature capability, better oil control, reduced emissions, increased power/torque capability, and improved fuel economy.

Holset HX50 **turbo** is a design matched to the M11. It has a five inch turbine outlet. The operating tolerances are tighter and the thrust capability has been increased. Benefits of this turbo are improved efficiency, better fuel economy, and a more reliable/durable product.

The fuel system in the M11 is the **CELECT injectors**. It is a longer stroke injector with a 15 percent higher injection pressure. Improvements also were made in the injector design. Advantages are increased power and torque, improved fuel economy, ease of update to 370 horsepower, lower emissions and an increase in the reliability and durability of the fuel system.

Capacity in the oil pan is 9.5 gallons with the total **lube system** capacity being 10.8 gallons. The oil suction tube is block mounted. Some modifications were made to the flange design. All these features allow for a more durable product.

On the M11, the **oil cooler** has a two pass design similar to the N14. There are no hose connections. The oil cooler has a new water header plate and improved gasket technology. The new gasket is a rubber coated steel. The benefits of the oil cooler are durability, a leak free design, and improved fuel economy.

On the **air compressor**, new characteristics are the ring valve head design and plumbing changes that make it quicker. Benefits are improved efficiency, higher output, and lower tank noise.

The M11 Engine ratings are listed below:

M11 Ratings

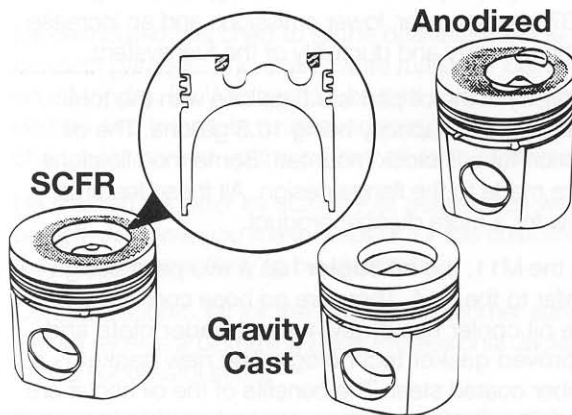
Engine Model	Maximum Horsepower	Peak Torque LB-FT @ RPM	Governed RPM
M11-370E	370 hp	1350@1200	1800/2000
M11-350E	350 hp	1350@1200	1800/2000
M11-330E	330 hp	1350@1200	1800/2000
M11-330E	330 hp	1250@1200	1800/2000
M11-310E	310 hp	1150@1200	1800/2000
M11-280E	280 hp	1050@1200	1800/2000
M11 ESP II	310/370 hp	1150/1350	1800
M11 ESP I	280/330 hp	1050/1250	1800

E designates CELECT

C8.3 Success

The C8.3 engine did not have as many changes as the N14 engine. The P7100 high pressure fuel pump was improved for enhanced atomization. Fuel atomization has been improved through the use of a new fuel injection pump with higher injection pressures and a new injector with improved spray patterns for optimized fuel penetration. New high pressure fuel lines have been designed to accommodate the changes to the P7100 fuel injection pump. The improvement to the **fuel pump** will lead to better fuel economy.

For the **piston**, the automotive rating of 250 BHP and above with high torque will be equipped with Squeeze Cast Fiber Reinforced (SCFR) pistons. The fiber reinforcement pistons increase the fatigue strength of the piston and improve durability. The industrial ratings and automotive ratings below 250 BHP with low torque rise will be equipped with gravity cast pistons. These gravity cast pistons have an anodized coating on the piston crown.



The geometry of the piston bowl and size has been improved to provide optimum conditions for combustion. The piston height has been increased to 0.8mm on all pistons. To create the best performance for white smoke control, all pistons will be graded into three sizes to optimize piston height for each cylinder.

A new **piston ring** has been introduced for all dual Ni-resist pistons to decrease cylinder blow-by and decrease lubricating oil consumption. The top piston ring has a positive twist feature that decreases oil consumption and blow-by. The new oil piston ring increases unit pressure against the cylinder liner to decrease lubricating oil consumption.

Changes were made to the C Series **cylinder block**. The upper liner bore in the cylinder block is machined 2.00 mm smaller in diameter. This modification will allow more material between adjacent cylinder bores. Casting modifications have been made to stiffen the upper liner area and to reduce engine noise. Internal and external ribs have been added to the oil pan flange, crankshaft centerline and the horizontal centerline of the main oil rifle. The additional material in the upper skirt area of the cylinder block provides more support under the cylinder liner "mid-stop."

The additional material also increases the strength of the cylinder block walls for an improved cylinder liner clamping load path.

The **turbocharger** is a new turbocharger for the 94 C Series Automotive engines. Except for the automotive engines with 210 and 225 BHP ratings, all 1994 C series Automotive engines will use a turbocharger with a wastegate. The 210 and 225 BHP ratings will use a non-wastegated version of the HX 40.

Changes were made to the wastegated turbocharger compressor casing assembly to make it simpler. The wastegate bracket is not fastened to the compressor casing, which improves the serviceability and the compressor orientation capability. These modifications will increase the available boost air at low speeds, increase transient performance, and improve white smoke clean up under cold conditions.

The **camshaft lobes** changes include an improved surface finish that will provide better wear characteristics. The lobes were widened and the edges of the lobes have been machined instead of rough casting. The profile of the exhaust lobe has been changed to improve the thickness of the lubricating oil film. All these changes will increase the durability and reliability of the engine.

A new **air compressor** will reduce the noise and oil carryover along with improving fuel economy for the new C8.3 engines.

All automotive ratings will be required to use an exhaust aftertreatment system (catalyst) to comply with 1994 emission standards. The catalytic converter will be similar to those now used on gasoline engines in that the catalyst is contained within a coating on a ceramic substrate mounted in the exhaust system in a remote location from the engine. For more information on catalyst, please refer to Service Parts Topic 93T92-21.

The ratings for the 1994 C8.3 engines are the following:

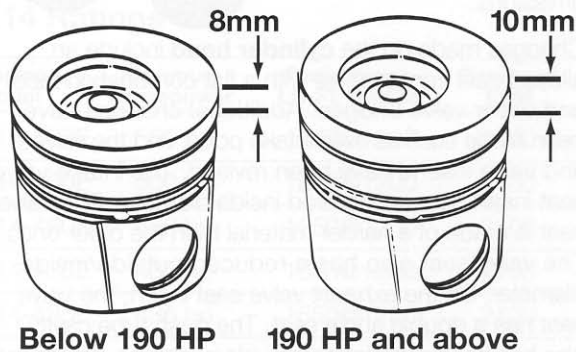
C8.3 Ratings

Engine Model	Maximum Horsepower	Peak Torque LB-FT @ RPM	Governed RPM
C8.3-300	300 hp	820@1300	2400
C8.3-275	275 hp	860@1300	2000
C8.3-275	275 hp	800@1300	2200
C8.3-250	250 hp	800@1300	2200
C8.3-250	250 hp	660@1300	2400
C8.3-225	225 hp	660@1300	2400
C8.3-210	210 hp	605@1300	2400

B5.9

The B5.9 engine also has a few changes. To improve low engine speed response and reduce emissions, the **Holset integral wastegate turbocharger** was released for the 1994 B Automotive engines. The wastegated turbocharger increases the available boost air at low speeds, increases transient performance and improves white smoke clean up under cold conditions. The wastegate bracket has been redesigned to improve reliability and durability. A large snap ring is used instead of a v-band clamp to connect the compressor housing to the bearing housing. The ends of the snap ring are upturned so that it can be easily removed with large pliers.

The **piston** and the **top ring** were redesigned to optimize compression sealing and reduce the oil consumption of the engine. The piston bowl geometry and size have been improved to provide optimum conditions for combustion. These changes create a more durable and reliable product. For automotive ratings below 190 BHP, the location of the top piston ring was moved closer to the top of the piston. This change reduces the dead volume and enhances the white smoke performance during cold start conditions. Automotive ratings of 190 BHP and above will continue to have the top ring location 10 mm down from the piston top.



The **camshaft** material has been changed from chilled iron to chilled ductile iron. A finer surface finish on the camshaft lobes has been introduced to provide greater wear characteristics. The lobes have been widened and the edges of the lobes have been machined instead of a rough casting. The profile of the exhaust lobe has been changed to improve the thickness of the lubricating oil film. The bolt on gear design has been eliminated.

The inside diameter of the **connecting rod bushing** has been reduced to give a tighter fit to the piston pin in order to control dead volume in the combustion chamber. The diameter of the piston pin did not change.

The P7100 higher pressure **fuel pump** has been redesigned to increase injection pressures. The delivery valves have been changed to improve combustion and meet emissions' requirements. Fuel atomization has been improved through the use of higher injection pressures and by improved spray patterns from newly designed fuel injector nozzles.

Fleetguard is offering an advanced micro-glass LF3552 filter that will improve filtration up to 400 percent over full flow cellulose filters. This filter will make a more durable and reliable engine.

All automotive ratings will be required to use a catalyst (exhaust aftertreatment system) to comply with 1994 emission standards. The catalytic converter will be similar to those now used on gasoline engines. The catalyst is contained within a coating on a ceramic substrate mounted in the exhaust system in a remote location from the engine. Additional information is available in Service Parts Topic 93T92-21a.

Listed below are the ratings for the B5.9 engine:

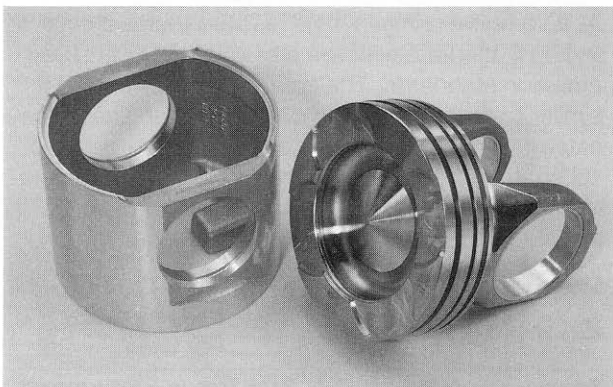
B5.9 Ratings

Engine Model	Maximum Horsepower	Peak Torque LB-FT @ RPM	Governed RPM
B5.9-230	230	605@1600	2500
B5.9-210	210	520@1600	2500
B5.9-210	210	485@1600	2500
B5.9-190	190	475@1600	2500
B5.9-175	175	420@1600	2500
B5.9-160	160	400@1600	2500

N14 Engines

The changes made to the N14 engine have made a top-notch engine even better. For the parts professionals, the question is what changes have been made to the parts and why?

One of the major changes was the **piston**. The 1994 N14 engine will have an articulated piston. An articulated piston has a forged steel crown and an aluminum skirt. The steel crown provides durability at higher temperatures and at peak cylinder pressure. Cummins optimized the piston geometry for reduced liner cavitation. The ring location on the piston is raised and the bowl is a re-entrant bowl. The benefit to the customer includes improved fuel economy, a more reliable and durable product, better oil control, increased power/torque capability, and reduced emissions.

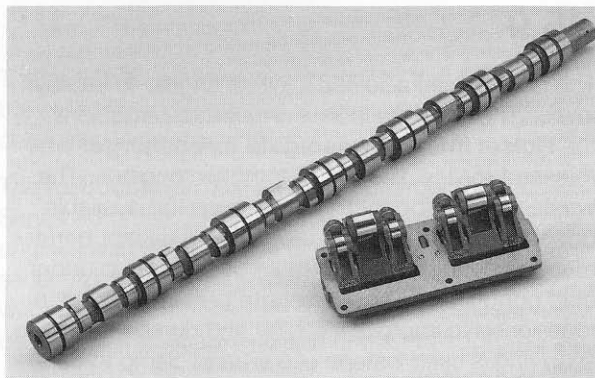


Performance changes were made to the **injectors**. One adjustment is an increase in the injector pressure because of a strong sac nozzle and the solenoid valve seat. The 1994 injectors will also have a longer stroke. The longer stroke is due to the external bias spring and the return spring. Spray hole quality has improved.

Reliability and durability changes made to the 1994 engine injectors were with the bias spring, the timing plunger, the return spring and the solenoid valve. A change in the timing plunger surface finish will improve cleanliness. The solenoid valve has a longer nut that will improve torque.

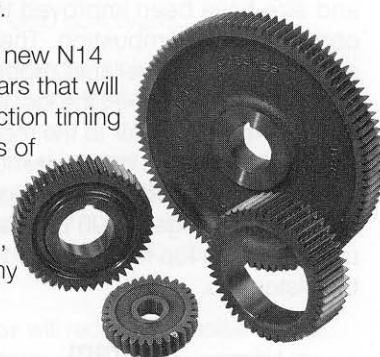
The **injector rocker level** also has some changes. A larger angled adjusting screw will reduce wear. The optimized ball and socket geometry will provide durability with increased injection pressure.

Another product change is with the **injector push tubes**. The outside diameter features a larger diameter than the old push tubes. A larger diameter was needed for increase injection pressure. The optimized ball and socket geometry will reduce the wear to the injector push tubes.



On the 1994 engines, the **camshaft** has a revised micro finished injector lobe. This lobe will increase the lift and increase the injector pressure. On the cam follower, the roller pin has a larger diameter and the roller has a super-finish. Both the larger diameter and the super finish will make the cam follower more durable.

The **geartrain** on the new N14 engines has spear gears that will reduce noise and injection timing variability. The benefits of the changes to the geartrain will be a more durable product, improved fuel economy and a reduction in emissions.



Changes made on the **cylinder head** include an alloyed cast iron material with a flat combustion face and wider valve bridges. Additional changes have been made such as swirl intake ports, and the valves and valve inserts have been revised. The intake valve seat insert has a contoured inside diameter. The valve seat is made of a harder material than the older ones. The valve seat also has a reduced outside/inside diameter. On the exhaust valve seat insert, the valve seat has a double angle seat. The push tube cavity also has been modified to provide pushtube clearance. All these changes allow for improved fuel economy, increased durability, reduced lube oil soot, and lower emissions.

On the **turbocharger**, the compressor cover has been redesigned. The compressor wheel was reduced and the turbine casing was made larger. The benefit to these modifications is improved performance and a more durable product.

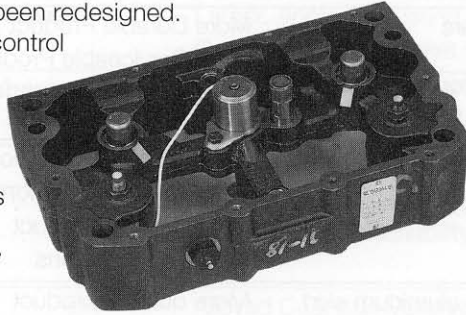
Technical Talk

The **lube oil cooler** features reduced lube system restriction passages. The oil temperature operating range has been revised; a new oil thermostat will improve fuel economy.

A change made to the **accessory drive** is an increase in the shaft diameter that will allow for an increase in the accessory drive capability. The sealing arrangement has been revised thus improving the durability and reliability of the accessory drive.

The **C-Brake** features a ceramic pad on the master piston. The pressure relief valve and the master piston leaf spring have been redesigned.

The redesigned control valve spring has a height of .175 that will improve bore durability. All these changes will increase the C-Brake reliability and durability.



On the **air compressor**, the plumbing changes and the ring valve head design will improve efficiency. This will result in a higher output with a lower tank noise.

Listed below are the ratings for the 1994 N14 Engine:

N14 Ratings

Engine Model	Maximum Horsepower	Peak Torque LB-FT @ RPM	Governed RPM
N14-500E	500 hp	1750@1200	2100
N14-500E	500 hp	1650@1200	2100
N14-460E	460 hp	1650@1200	2100
N14-435E	435 hp	1650@1200	2100
N14-435E	435 hp	1550@1200	2100
N14-435E	435 hp	1450@1200	2100
N14-435E	435 hp	1450@1200	1800/2100
N14-410E	410 hp	1450@1200	1800/2100
N14-370E	370 hp	1450@1200	1800/2100
N14-350E	350 hp	1400@1200	1800/2100
N14-330E	330 hp	1350@1200	1800/2100
N14-310E	310 hp	1250@1200	1800
N14 ESP III	400/460 hp	1450/1650	1800
N14 ESP II	350/390 hp	1350/1500	1800
N14 ESP I	310/390 hp	1250/1450	1800

E designates CELECT make the cam follower more durable.

Several people have been asking questions regarding the problem with low sulfur fuel. For your information, we have included the official Cummins statement on this problem.

"With the recent introduction of low sulfur - low aromatic diesel fuel, fuel leaks have been reported by a number of customers. These leaks have occurred on some older Cummins engines equipped with the PT fuel system, generally with more than 300,000 miles. The leak on the engines is occurring between the throttle shaft O-ring and throttle shaft. This is the only problem that we are aware of that occurs with some of the new low sulfur-low aromatic fuels on Cummins engines.

The throttle shaft O-ring is made of nitrile, which is a proven performer. The nitrile O-ring is designed to 'swell' in the presence of diesel fuel and provides an excellent seal with the throttle shaft. The low sulfur-low aromatic fuel can cause a different rate of O-ring swell than previous fuels, and this can result in an aged O-ring not sealing properly with the throttle shaft on some engines and a leak can occur.

The correction for this problem is to replace the old O-ring with a new O-ring (same part, same material). The new O-ring will swell adequately in the presence of the low sulfur - low aromatic fuel, and will provide an excellent seal. This is approximately a three-hour repair. Experience to date has indicated that this solves the problem.

Not all low sulfur fuels will cause a leak, because the amount and type of aromatics vary from one refiner to the next. For example, low sulfur fuel has been used in the LA Basin on Cummins engines for a number of years without any problems. It should also be noted that other engine fuel system manufacturers and fuel delivery system manufacturers have reported problems and that the engine manufacturers and the trucking industry have made the fuel producers well aware of these issues."

Fact Sheet

M11 Engines

Part	Change Made	Benefit
Block	Strengthened the Block	Eliminates Noise
Crankshaft	Partial counterweight machining.	Improved Balance
Cylinder Heads	Premium alloy cast iron material Advanced Swirl Port Technology	More Durable Product Improved Fuel Economy Lower Emissions Lower lube oil soot
Connecting Rod	Eliminated small end balance lug Deep Fillet in Rod Cap - Not Drilled	More Durable Product
Valve/Injector Train	Cam Surfaces & Rollers are Microfinished Larger roller pin-injector follower Improved Lubrication to Overhead	More Durable Product More Serviceable Product
Cylinder Liner	Improved surface finish Tapered wall thickness at mid-stop	Reduced bore distortion Lower oil consumption More durable product Reduced emissions
Articulated Piston	Forged steel crown & aluminum skirt Re-entrant bowl Raised top ring Improved ring pack	More durable product Higher cylinder temp. capability Better oil control Improved fuel economy
Turbo	5 inch turbine outlet Operating tolerances are tighter Increased thrust capability	Improved efficiency Improved fuel economy More durable product
Select Injectors	Longer stroke injector 15 percent higher injection pressure Injector design was improved	Improved efficiency Improved fuel economy More reliable product
Lube System	Modifications to flange design	More durable product
Oil Cooler	New water header plate Improved gasket technology	Improved fuel economy Leak free design
Air Compressor	Change in ring valve head design Plumbing changes	Improved efficiency Higher output Lower tank noise

B5.9 Engines

Parts	Changes Made	Benefits
Turbocharger	Improved Wastegated Turbocharger Redesigned Wastegated Bracket	Improve Responsiveness of Engine Increase Durability/Reliability
Piston	Piston and Top Ring Redesigned to Optimize Compression Sealing Piston Bowl Geometry Optimum Conditions for Combustion	Reduced Oil Consumption Increase Reliability/Durability Improved to Provide
Camshaft	Finer Surface Finish on Camshaft Lobes Chilled Ductile Iron Material	Provide Greater Wear Characteristics Increase Durability/Reliability
Connecting Rod Bushing	Reduced Inside Diameter	Control Dead Volume in Combustion Chamber
Fuel Pump	Redesigned Fuel Pump Delivery Valves Changed	Increase Injection Pressures Improve Combustion
Fleetguard Filter	Advanced Filter which will Improve Filtration	More Reliable/Durable Product

N14 Engines

Part	Change Made	Benefit
Articulated Piston	Forged Steel Crown	Improved Fuel Economy
	Aluminum Skirt	Better Oil Control
	Optimized Piston Geometry	Increased Power/Torque Capability
	Ring Location Raised	Reduced Emissions
	Re-entrant Bowl	More Durable Product
Injectors	Strong Sac Nozzle & Solenoid Valve Seat Longer Stroke due to External Bias Spring & Return Spring	Improved Spray Hole Quality
Injector Rocker Level	Larger, Angled Adjusting Screw Optimized Ball & Socket Geometry	Reduced Wear More Durable Product
Injector Push Tubes	Larger Outside Diameter Optimized Ball & Socket Geometry	Reduced Wear
Camshaft	Revised Micro Finished Injector Lobe	Increase Injector Pressure
Geartrain	Spear Gears Will Reduce Noise and Injection Timing Variability	More Durable Product Improved Fuel Economy Reduced Emissions
Cylinder Head	Alloyed Cast Iron Material with a Flat Combustion Face & Wider Valve Bridges Valve Seat has a Reduced Inside/Outside Diameter Valve Seat Made of a Harder Material On the Exhaust Valve Seat Insert, the Valve Seat has a Double Angle Seat	Improved Fuel Economy More Durable Product Reduced Lube Soot Reduced Emissions
Turbocharger	Redesigned Compressor Cover Compressor Wheel Reduced Larger Turbine Casing	Improved Performance More Durable Product
Lube Oil Cooler	Reduced Lube System Restriction Passage Revised Oil Temperature Operating Range	Improved Fuel Economy
Accessory Drive	Increase in Shaft Diameter Revised Sealing Arrangement	Increase in Acc. Drive Capability More Durable Product
C-Brake	Redesigned Pressure Relief Valve and Master Piston Leaf Spring Redesigned Control Valve Spring	More Durable Product
Air Compressor	Plumbing Changes Ring Valve Head Design Changes	Improved Efficiency Higher Output/Lower tank noise

C8.3 Engines

Parts	Changes Made	Benefits
Fuel Pump	New Fuel Injection Pump Injector with Improved Spray Patterns	Improved Fuel Atomization Optimized Fuel Penetration
Piston	Squeeze Cast Fiber Reinforced Piston Positive Twist Feature on Top Piston Ring	Increase Durability/Reliability Decrease Cylinder Blow-by
Turbocharger	Simpler Compressor Casing Assembly	Improve Serviceability
Camshaft Lobes	Improved Surface Finish Changed Profile of Exhaust Lobe Lobes were Widened	Provide Better Wear Characteristic Improve Thickness of Lubricating Oil Film Increase Durability/Reliability

Parts Promotional List

Part #	Description	Issue Date	Price
3381213	New Engine Parts Warranty	4/87	.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
3385754	Inj. Comp. Feature/ Benefit Flyer	2/90	.10
3385755	Crankshaft Feature/ Benefit Flyer	2/90	.10
3385757	Turbo Feature/Benefit Flyer	2/90	.10
3385758	Inj. Cups Feature/ Benefit Flyer	2/90	.10
3385836	How To Talk To CECO 800-Diesel	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	9/89	.10

Part #	Description	Issue Date	Price
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
3387320-08	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	02/94	1.00
3624186	Parts Professional Binder w/ Issues 1-16	---	5.00
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

Part #	Description	Issue Date	Price
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

Part #	Description	Issue Date	Price
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
3385995	Save a Bundle Flier	9/93	.10
3385996	Save a Bundle Poster	9/93	1.00
3385999	NOW Premium Plan Certificate	10/93	.10
3698510	Fan Clutch Brochure	3/94	.25

Translated Materials

FRENCH

3385970	French Premium/ P. Blue 2000	3/93	.25
3385971	French Premium Blue 2000 Value	3/93	.25
3385972	French Premium Blue 2000 Data	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

SPANISH

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 Brochure	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
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

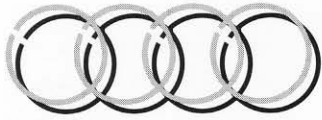
Quiz 19 Promotional List

Do you know the changes on the 1994 engines? Test your knowledge by answering these questions. Fill out the postage-paid card in the front of the issue and return the card to us by May 15.

- Benefit of the articulated piston in the N14 engine include:
 - Improved fuel economy.
 - Better oil control.
 - Increased power/torque capability.
 - All of the above.
- The injector push tubes on the 1994 N14 engine have a smaller outside diameter than the old push tubes.
 - True
 - False
- Changes made on the cylinder head include an alloyed cast iron material with a flat combustion face and wider valve bridges.
 - True
 - False
- The redesigned control valve spring of the C-Brake on the 1994 N14 engine has a height of _____ which will improve bore durability.
 - .05
 - .15
 - .175
 - .2
- The M11 series goes up to _____ horsepower.
 - 330
 - 500
 - 400
 - 370
- The cam surfaces and the rollers are micro finished.
 - True
 - False
- What Holset turbo was designed for the M11?
 - HX05
 - PX50
 - HX50
 - HX00
- On the M11, the oil cooler has a two pass design that is completely different from the N14.
 - True
 - False
- Modifications to the 1994 C8.3 turbochargers will
 - increase available boost air at low speed.
 - increase transient performance.
 - improve white smoke clean up in winter.
 - All of the above.
- The high pressure fuel pump used in the 1994 C8.3 engine is a _____ fuel pump.
 - T7100
 - P7100
 - L7100
 - None of the above.
- The squeeze cast fiber reinforced piston design in the C8.3 engine will increase the reliability and durability of the engine.
 - True
 - False
- Product changes to the C8.3 engine include the
 - piston.
 - turbocharger.
 - Both a and b.
 - No changes were made.
- The B5.9 piston and top ring were redesigned to optimize compression sealing and reduce oil consumption.
 - True
 - False
- Fleetguard is offering an advanced micro glass filter which will improve filtration up to _____ percent over full flow cellulose filters.
 - 100
 - 200
 - 300
 - 400
- Changes were made on the B5.9 fuel pump.
 - True
 - False

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