



PARTS PRO CLASSIC

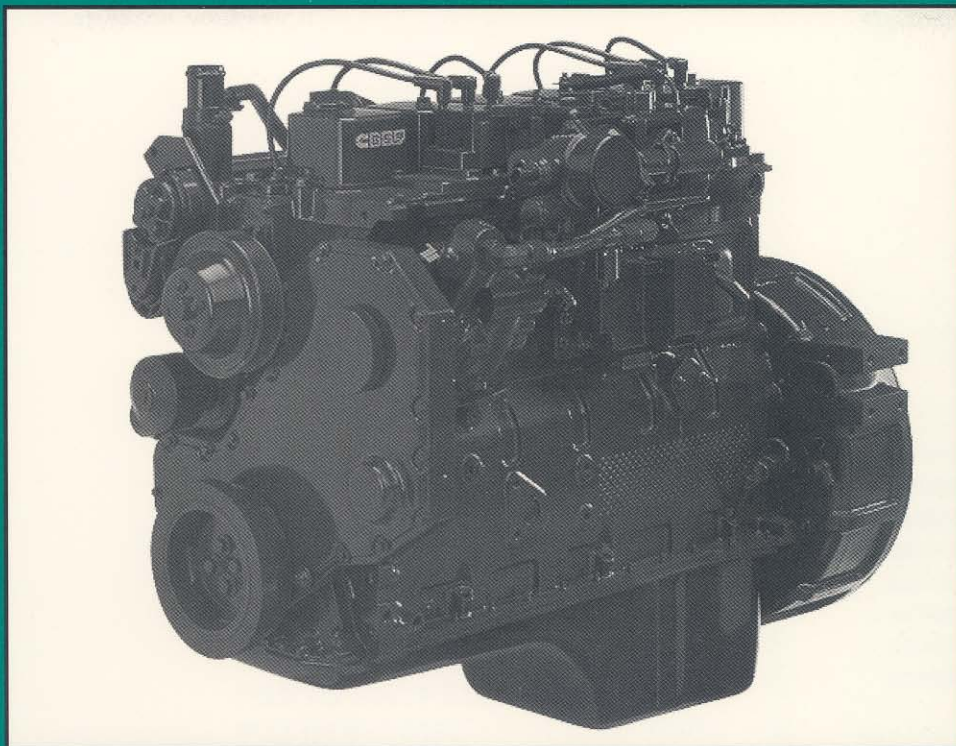
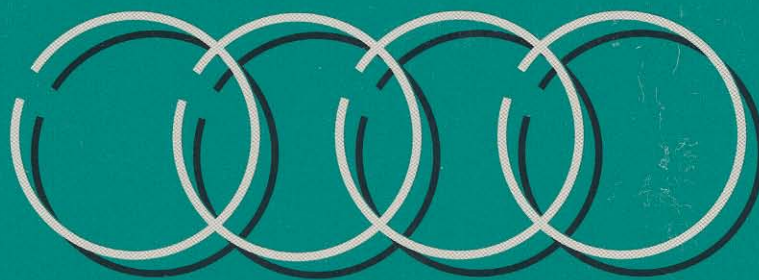
CLASSIC EDITION #22

Parts Pro Classic is provided as a historical reference.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 22**



INVEST IN THE BEST

Parts Professional 22 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 | C | D |
| 9. | A | B | | |
| 10. | A | B | | |
| 11. | A | B | C | D |
| 12. | A | B | | |

Parts Professional 22 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 _____

Welcome to Parts Professional 22! This issue will be on the natural gas engine.

After reading this issue, please take the quiz located in the back of the book. Tear out the answer card in the front of the book and circle the correct answers. If you score 100%, you will receive a Cummins acrylic desk clock.

Thank you to everyone who responded to the Parts Professional 21 survey. As you know, the Parts Professional program is a tool for you to use. I will not know the topics you want me to cover, unless I hear from you. Although this issue does not have a separate survey card, I still want to hear from you. Simply fill out the postage-paid reply card on the inside of the front cover.

Also, if you have a success story or a TIP from the Professional, please send the story or tip to me. You may use the reply card on the inside of the front cover. Please remember that all success stories and TIPS must be compatible with Cummins standard practices and must relate to a sale of Cummins or Cummins ReCon® Genuine Parts. The top winner for both the TIPS from the Professional and the Success Story will receive a Cummins Parts Professional Jacket.

I look forward to hearing from you!



Kathy Gastineau

Editor's Note: Special thanks to Pat McClendon for her contribution to Parts Professional 22.



Success Story

This success story is based on our MVP National Promotion that is running through June 30, 1995. Bob Sauer of Cummins Northeast in Albany, New York sent us this story. When deciding on how he could promote the MVP Promotion, Bob did a few calculations. He found that if an end user was to purchase Big Power Performance Cylinder Kits, 6 PX injectors, 3 standard ReCon cylinder heads, main & rod bearings, and a head set and pan gasket, the customer would spend more money than if the customer would have bought an Option 2 of the MVP Promotion. In addition, the customer would not have received the updated ReCon cylinder heads or the 6 connecting rods.

The Option 2 of the MVP Promotion includes six Big Power Performance cylinder kits, one bearing/gasket kit (with new Cealastic™ rubber molded-edge head gasket), six ReCon PX injectors, 3 ReCon Premium Gold cylinder heads, and six ReCon connecting rods. The six ReCon connecting rods are free.

Bob Sauer used this sales tactic of showing the price individually and as the Option 2 to sell to several different dealers. One dealer ordered this MVP Option 2 for a customer that wanted to put only top shelf parts in his Big Cam I engine. Another dealer ordered the Option 2 in order to put it on his shelf for a rebuild for CPL 838/840.

We want to thank Bob Sauer for his Success Story. Since he had the winning Success Story, he will receive a Cummins Parts Professional jacket. If you want to contribute a Success Story, simply fill out the postage-paid reply card in the front of the Parts Professional. Please remember that you must follow the guidelines outlined in the Letter from the Editor.

TIPS from the Professionals

The first tip is from Ronnie Harmon of Vinton, Virginia. His TIP pertains to the winter months. He writes that you should always suggest to your drivers that they carry a spare fuel filter during the winter months. A driver never knows when the fuel filter will gel up. By carrying the spare, he will save money and reduce downtime.

A second TIP comes from Glyn Newsham of Brantford, Ontario. He suggests that before installing a new water filter, test the coolant for proper chemical and additive levels. The proper guidelines outlined in the Operations & Maintenance Book should be followed.

The winning TIP is from Barry Dayton of Vidalia, Louisiana. He suggests that when you are selling a complete overhaul kit, explain to the customer how much the customer is saving by the complete kit instead of buying separate items. He has seen customers continue to buy genuine Cummins parts with the money saved off the complete kit.

Thanks to Glyn, Barry and Ronnie for their TIPS. All four people will receive a Parts Professional cap and Parts Professional badges for their TIPS. Barry also will receive a Cummins Parts Professional Jacket for his winning TIP.

If you would like to contribute a TIP, simply write out your TIP on the postage-paid card located in the front of your Parts Professional book. Remember to follow the guidelines outlined in the Letter from the Editor.

Cummins MVP Sale!
For MVPs like you.

2 year/250,000 mile Cummins warranty on new Performance MVP and the sale on the sale.

MVP Option 1: \$1,499
1 ReCon PX injector and Big Cam I, II and III main & rod bearings. 3 ReCon Premium Gold cylinder heads. 6 ReCon connecting rods.

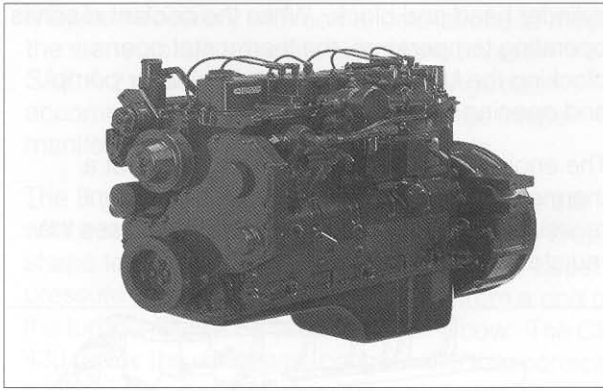
MVP Option 2: \$2,359
1 ReCon PX injector. 1 bearing/gasket kit. 3 ReCon Premium Gold cylinder heads. 6 ReCon connecting rods. 6 Big Power Performance cylinder kits. \$2.75 for STC.

MVP Option 3: As Low As \$7,125
Head set and pan gasket. 6 ReCon Premium Gold cylinder heads. 6 ReCon connecting rods.

SAVE \$250
CUMMINS

THE PARTS PEOPLE. THE BEST PARTS. THE BEST QUALITY. CUMMINS. MVP'S ARE ALL IN THE FAMILY.

HEAVY-DUTY ON THE BODY



The B5.9-195G engine was created in response to the needs generated by the government's emissions and energy strategies for ultra-low emissions and alternative fueled products. The Cummins B5.9-195G engine is the first factory delivered natural gas engine developed for BLCA and medium-duty automotive markets by a full line engine supplier. The initial target markets will be the school bus, small transit and specific medium duty truck applications.

The Cummins B5.9-195G engine is a natural gas fueled derivative of the B5.9 six cylinder diesel. It is a spark ignited, lean burn engine which utilizes a water-cooled Holset turbocharger and clean-air cooler.

Before changes in the engine can be addressed, Parts Professionals need to know what the term lean burn means. Fuel must be mixed with oxygen in the proper proportion in order to burn. If the fuel is mixed with too much (too lean) or too little (too rich) air, it will not combust. The lean-burn concept increases the ratio of air to fuel for optimum ignition, combustion and power by adding more fuel. Lean burn technology provides cooler combustion temperatures for reduced levels of nitrous oxides and increased durability. The cooler combustion temperatures reduce the thermal stress on the pistons, valves and valve seats. The lean burn technology raises the engine thermal efficiency to approximately 37% compared to a typical spark-ignited engine having a thermal efficiency of approximately 32%. It also improves the fuel economy.

What changes are made to the engine components due to the use of natural gas as a fuel? A major change is with the **fuel system**. A different fuel delivery system has been developed by Cummins for the B5.9G. Fuel delivery is monitored electronically by the CM 420. There are eight sensors from which the CM 420 receives its critical information. The eight sensors are gas mass flow sensor, turbocharger boost pressure, throttle position sensor, manifold absolute pressure, intake manifold temperature sensor, engine position sensor, temperature cooler sensor, and exhaust gas oxygen sensor.

Cummins supplied components include the CM 420, a secondary regulator, a gas filter, an air/fuel mixer, the fuel control valve, a fuel shutoff valve, and the eight sensors. The secondary fuel regulator, fuel shutoff valve, and the gas mass sensor are mounted to the rear face of the gear housing and are connected to the air/fuel mixer by means of a flexible hose. The gas mass flow sensor is located just after the fuel shutoff valve. A current input signal into this sensor results in an output that verifies the amount of gas flowing to the engine.

The remote mounted **fuel filter** should be installed on the engine. Natural gas may have oil contaminants that will plug the screens and cause turbulence in gas flows. The filter element removes debris and contaminants from the fuel.

The low pressure regulator is located in the same housing as the fuel filter. The low pressure regulator reduces the pressure of the natural gas.

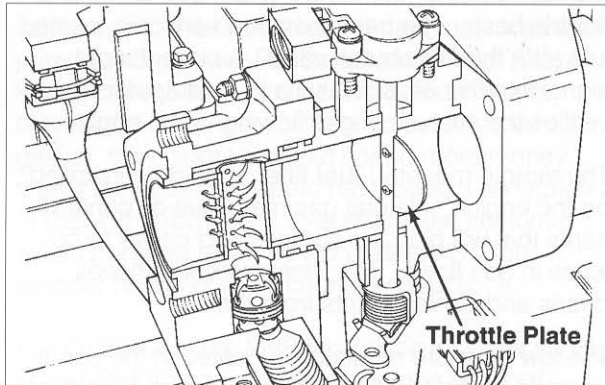
The **fuel control valve** controls the quality of gas introduced into the air flow. When this normally closed valve receives a signal from the CM 420, the solenoid on the end of the valve pushes the seal off its seat and allows gas to flow into the mixer. By adjusting the size of the opening around the seat, the fuel control valve regulates the gas flow.

The CM 420 also controls the **fuel shutoff valve** and the **idle bypass solenoid**. The fuel shutoff valve is activated when there is a coolant overheat condition, a high intake manifold temperature condition, an overspeed condition, or a turbo overboost condition. In these situations, the engine is protected from unnecessary damage. The idle bypass solenoid is activated when the CM 402 senses an idle droop that causes the engine to drop below 800 RPM. An example is if the freon compressor, the air compressor or the clutched fan engages, an idle droop will occur. The CM 420 will react by opening the idle bypass solenoid to allow more air and fuel to the engine. The idle bypass can accommodate up to 100 lb. ft of added torque to the engine.

The **mixer** is located in the intake air system between the charge air cooler and the throttle plate assembly. This component is used to introduce natural gas into the intake air flow. The natural gas flows to a series of holes located around the inside diameter and in the center air foil of the air passage. From these passages, gas flows into the air stream, mixing the gas with the inlet air. The air/fuel mixture is then delivered to the throttle assembly.

The **throttle plate assembly** consists of a body, throttle plate, shaft, and lever. The position of the plate controls the amount of air and fuel mixture delivered to the engine. A mechanical throttle pedal linkage controls the throttle plate position. The throttle breakover level is used to protect the linkage

from over travel and to provide lineage adjustment to ensure full travel. Using the throttle plate position sensor, the CM 420 determines when the throttle is on or off idle. This sensor signal also is used when sudden changes in the throttle require rapid changes in the fuel flow.



From the throttle plate, the air/fuel mixture flows into the intake manifold. As the piston moves down on the intake stroke, the cylinder fills with the air/fuel mixture. As the piston starts into the compression stroke, the intake valves close, trapping the air/fuel mixture in the cylinder. Although the compression process raises the temperature of the mixture, it remains below the auto/ignition threshold and no ignition will occur. The mixture is compressed into the piston bowl, and is ready for ignition. As the B gas engine operates, its speed and power are controlled by the opening of the throttle plate and the quantity of mixture that enters the cylinders.

The **pistons** used in the B natural gas engine have a deep recessed bowl combustion chamber providing a 10.5 to 1 compression ratio. The piston utilizes a single ni-resist insert for improved durability in the upper piston ring groove. The top ring is a standard rectangular ring with a square cut design.

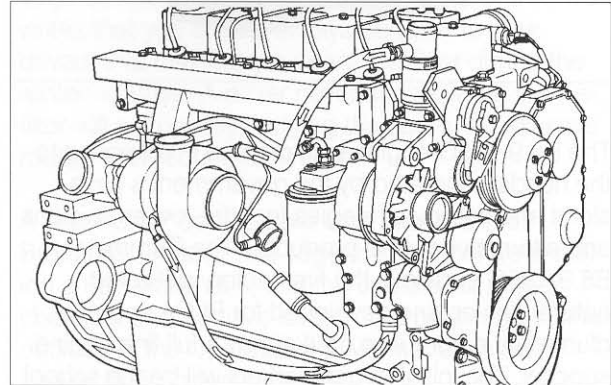
Another change is with the **cooling system**. The B natural gas engine requires the same size radiator and charge air cooler as a B5.9-230 HP diesel. The radiator and charge air cooler will dissipate the added heat that the natural gas engine will produce. Most OEM locations for ports, venting, and connections are the same as used on the B5.9 diesel. Some changes have been made to the water inlet and outlet connections.

Within the cooling system, the coolant flow is circulated by the integrally mounted water pump. By directing the coolant to the oil cooler immediately after the water pump, the cooler is provided with the lowest temperature coolant possible.

When the engine is below operating temperature, the **thermostat** is closed which allows the coolant to bypass the radiator and flow back to the water pump inlet through the internal drillings in the

cylinder head and block. When the coolant reaches operating temperature, the thermostat opens, blocking the bypass passage to the water pump and opening the outlet to the radiator.

The engine must never be operated without a thermostat. Without a thermostat, the coolant recirculates through the engine and bypasses the radiator, causing the engine to overheat.



Since the natural gas engine will have a higher average exhaust gas temperature than a diesel engine, the turbocharger will be subject to higher operating temperatures. To withstand the higher exhaust temperatures, provisions for additional cooling must be provided for the turbocharger.

A **water cooled bearing housing** will provide the additional cooling needed. Supplemental cooling of the turbocharger is provided by coolant flow through the bearing housing. Coolant lines are connected to the bearing housing from the outlet after the thermostat and to the water pump inlet. The reduced pressure at the water pump inlet draws coolant from the thermostat housing and through the turbocharger bearing housing. This coolant flow through the housing assists the oil flow in cooling the turbocharger. The life of the turbocharger bearings is increased because of the water cooling feature.

The primary benefit of a water cooled bearing housing is after engine shutdown. With a natural gas engine, the temperature of the exhaust at idle is comparable to that of a diesel engine during a hot shutdown. This would cause the turbocharger to experience a hot shutdown every time the engine is turned off. However, after shutdown, the coolant in the bearing housing absorbs heat from the housing. As the water temperature in the housing increases, the hot water flows up through the line connected to the thermostat outlet reversing the direction of the flow when the engine is operating. The coolant flow in the bearing housing helps dissipate the heat and limit these thermal stresses after engine shutdown.

On the **turbocharger**, a low mount turbocharger with rear-out exhaust will be offered with the natural gas B series engine. Because of the rear-out exhaust, it

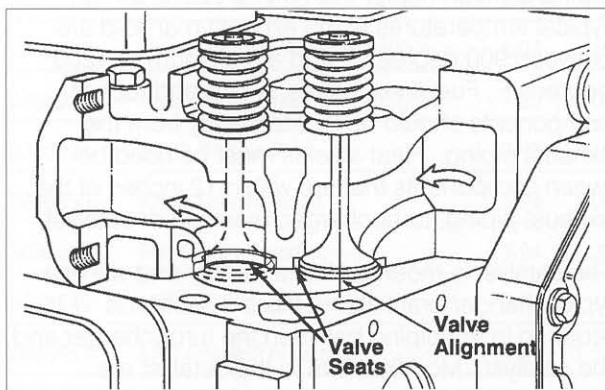
may be necessary with some installations to move the starter to the opposite side of the engine. SAE # 2 and SAE # 3 flywheel housings that accommodate a starter mounting on the intake manifold side of the engine are available.

The B gas engine has been designed to operate with a specific boost pressure. To produce a proper shape to the torque curve, the turbocharger boost pressure is monitored by the CM 420 from a port on the turbocharger compressor outlet elbow. The CM 420 drives the wastegate control valve that controls the boost pressure by regulating air flow in the boost pressure signal line to the wastegate actuator.

By utilizing a wastegated turbocharger, the engine is provided with improved low speed torque without overboosting at high speeds. The wastegate controls the engine power output by opening a valve to bypass the turbine wheel with some exhaust gas flow. This limits the turbine speed and the maximum boost pressure.

The exhaust gases flow from the combustion chamber, through the exhaust manifold and into the turbine section of the turbocharger. The flow of exhaust gases in the turbine housing causes the turbine wheel and shaft to turn at a high speed. Because the compressor wheel is attached to the turbine wheel through a common shaft, the compressor wheel also turns. This draws intake air into the turbocharger and compresses it, providing an increased air supply to the engine.

Air is drawn into the turbocharger inlet, compressed and delivered to the charge air cooler. From the cooler, the intake air is directed to the air inlet connection. Although different connection configurations are available for the B gas engine, the function of this connection remains the same. From the inlet connection, the air is directed to the mixer where the intake air is combined with the natural gas. The amount of air/fuel mixture permitted into the cylinder is controlled by the throttle plate.

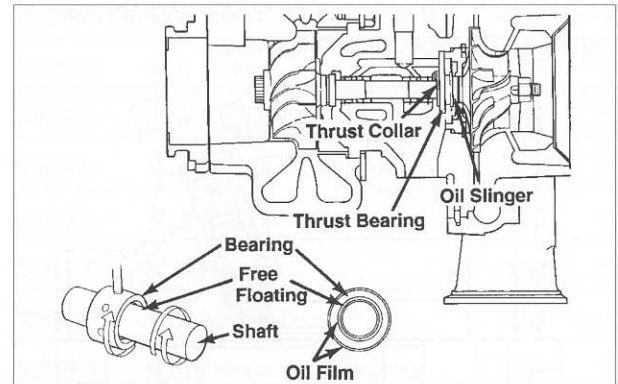


There are also some differences with the **cylinder head**. The cylinder head is a one-piece, cross-flow design, with two valves per cylinder and an integral intake manifold. The same intake and exhaust valve

train is used for the natural gas B engine as the B5.9 diesel. The difference is in the seat angle. A different seat angle has been established for the valves to reduce friction, and an alloy hardened seat has been added to reduce wear. The B natural gas cylinder head has valve seat inserts. The valves and valve seats are made of a very hard material to resist the high exhaust temperatures that occur in a natural gas engine. The cylinder head has been modified so that the spark plugs can be inserted directly into the head. The spark plug is located in the cylinder head in approximately the same location as the B diesel engine's injector.

The Holset SS296QE **air compressor** is used for the natural gas engines. The compressor air supply for the Holset units is turbocharged. The engine is delivered to the customer with the compressed air supply plumbed from the air intake elbow attached to the mixer to the supply port on the compressor. The compressed air supply must not be replumbed so that it mixes with fuel before entering the compressor.

The lubricating oil flow begins as the gerotor lubrication pump draws oil from the pan through the internal suction tube. Oil is then delivered to the oil cooler cover through an internal drilling. In the oil cooler element, the oil is cooled by engine coolant passing around the plates of element.



From the cooler, the oil continues to the oil filter. The filtered oil then flows up the center of the filter. At this point, the flow is divided with some of the oil directed to the turbocharger. To withstand the high rotating speeds, bearings are located in the center bearing housing to support the shaft assembly. These free-floating, two piece journal bearings function with a lubricating oil film between the bearing and the shaft and between the bearing and the housing.

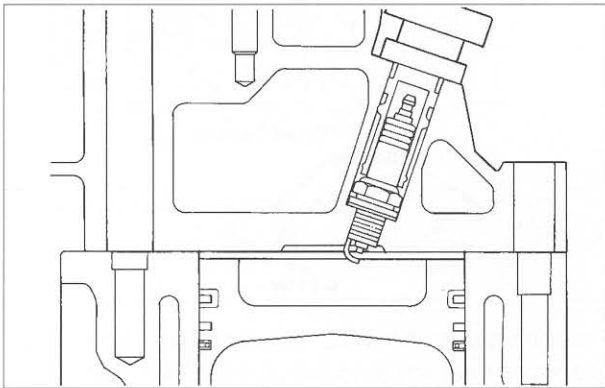
From the oil filter, the remainder of the oil flows through the cooler cover to the main oil rifle. The engine oil flow is the primary method of providing cooling for the turbocharger while the engine is operating.

The natural gas B engine requires oil that is formulated for natural gas fueled engines. For a list of the recommended oils for use in the natural gas B engine, refer to the Operations & Maintenance Manual (3666112).

Another difference with the natural gas B engine is the camshaft gear. The **camshaft gear** has seven cast protrusions on the back side. These protrusions are used by the engine position sensor to determine cycle event timing and engine speed. Six of the protrusions are equally spaced and the one extra protrusion indicates the top dead center position for cylinder number one.

The engine is also equipped with a **charge air cooler** to provide for improved engine performance and fuel economy. By reducing the intake air temperature, the charge air cooler also reduces emission levels.

Below the CM 420, an **Altronic Distributorless Ignition System** is mounted on the engine. It provides a signal to the two coil packs mounted at the front and the rear of the intake manifold. The primary windings of the coils are powered on/off by the Ignition Control Module. The current in the primary windings create a magnetic field in the coil. As the current is shut off, the magnetic field collapses and a high voltage is induced in the secondary windings. In turn, the coil delivers approximately 8,000 volts to the spark plugs at idle and approximately 14,000 volts at peak torque.



A **spark plug wire** connects each coil to a spark plug. The spark plug wire is a one piece assembly consisting of a resistor wire with terminal connections on both ends. The spark plug is located in the cylinder head. The plug electrode extends below the head surface into the piston bowl.

As the piston reaches the correct spark advance position, the ignition coil delivers a high voltage to the spark plug electrode, igniting the air/fuel mixture. The flame travels through the combustion chamber burning the mixture. The heat energy produced by combustion applies force to the piston resulting in the power stroke.

The condition of the spark plug is critical to the engine performance. The new B gas engine spark plug was designed to handle extreme conditions of lean-burn combustion. These spark plugs have been specifically designed for the natural gas B engine; therefore, the spark plugs are not the standard automotive spark plugs.

The Altronic system operates with a supply voltage of 12 volts. It can withstand ambient temperature extremes from -40 degrees F. to 250 degrees F. The CM 420 controls engine timing by monitoring the engine position sensor that reads seven magnetic pickup points on the camshaft gear. Each of the six cylinders is identified by an individual pickup point for firing, the seventh one indicates to the control module that another engine revolution has begun. The CM 420 drives the Distributorless Ignition System to provide the appropriate spark depending on engine demand. Engine timing adjustments are not necessary unless the magnetic pickup housing or gear cover is removed.

The OEM is provided with a **wiring harness** that has three leads. One lead provides power to the CM 420. Another lead provides power to the Altronic Distributorless Ignition System. The third lead is a ground. All three leads are 16 gauge wire with GXL insulation. Power to the CM 420 and the Altronic Distributorless Ignition System must be controlled by the key switch.

Exhaust from the turbocharger is routed through an optional **catalytic converter** and muffler before being released in the atmosphere. Vehicles equipped with a catalyst will require 409 stainless steel exhaust pipe between the turbocharger and the catalyst. The diesel catalyst can be located up to 155 inches downstream from the engine turbocharger. This flexibility in location will have more of an impact on the B5.9G catalyst performance because it must significantly reduce unburned hydrocarbons.

The radiated heat from the catalyst and exhaust piping is much higher than with diesel engines. Typical temperatures at the exhaust manifold are between 900 degrees F and a maximum of 1200 degrees F. Fuel lines, hoses, wiring and rubber components should be located away from the exhaust piping. Heat shields must be used between components that are within 12 inches of the exhaust piping, turbocharger, manifold or catalyst.

The catalyst is mounted like a muffler and will use typical hanger brackets. A flexible section is required in the piping between the turbocharger and the catalyst. Modifications to the catalyst are prohibited as they affect serviceability and durability of the catalyst.

Parts Promotional List

Part #	Description	Issue	
		Date	Price
3381213	New Engine Parts Warranty	6/94	.10
3381292	A, B, C, New Parts Warranty	8/93	.10
3385556	444 Pulse Exhaust Manifold	3/90	.10
3385584	C Brake Cross Ref. Guide	4/91	.10
3385589	Water Pump Poster	—	.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
3385914	Prem. Cylinder Ad Slick 85line	6/92	.10
3385917	Cummins Care Aftermarket Flyer	8/92	.10
3385958	Cummins Care Poster	3/93	1.00
3385959	Genuine Overhaul Poster	3/93	1.00
3385950	CEPC Flyer	3/93	.10
3386577	Cummins Care Shopping Bag	—	.25
3624349	Maintenance Requirements—Lam.	11/93	.10
3624360	Maintenance Requirements Flyer	2/92	.10
3822013	New/ReCon Kits & Sets Booklet	6/92	1.00
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
3698550	Know How Notepad	9/94	1.00
3698510	Fan Clutch Brochure	3/94	.25
3698549	MVP Ad Slick (US version)	9/94	.10
3698551	MVP Poster (US version)	9/94	1.00
3698552	MVP Dealer Letter (US version)	9/94	.10
3698553	MVP Counter Card (Canadian version)	9/94	.50
3698555	MVP Ad Slick (Canadian version)	9/94	.10

Part #	Description	Issue	
		Date	Price
3698556	MVP Direct Mail (Canadian version)	9/94	.25
3698557	MVP Poster (Canadian version)	9/94	1.00
3698558	MVP Dealer Letter (Canadian version)	9/94	.10
3698554	MVP Coupon Pad (Canadian version)	9/94	.10
3698571	MVP Counter Card (US version)	9/94	.50
3698572	MVP Counter Card Pad (US version)	9/94	.10
3698573	MVP Direct Mail (US version)	9/94	.25
3698545	Marine Spares Kit Flier	11/94	.25
3698633	Marine Spares Kit Incentive Ltr.	11/94	.10
3698634	Marine Spares Kit Incentive Form	11/94	.10
3698625	Cealastic Gasket Brochure	12/94	.25
3698642	Cealastic Gasket Ad Slick 85line	12/94	.10
3698643	Cealastic Gasket Ad Slick 120line	12/94	.10
3698589	Fuel Pump Counter Mat	12/94	1.00
3698590	Fuel Systems Parts Catalog	12/94	3.50
3385899	NOW Certificate	10/93	.10
3385550	NOW Engine Sticker	9/88	.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
3385999	NOW Premium Plan Certificate	10/93	.10
3386741	NOW Cost Estimate Worksheet	10/89	.10
3386848	NOW Pre-Overhaul Checklist	2/94	1.50
3386857	NOW Pre-Overhaul Checklist	10/89	.10
3386858	NOW Component Inspection Check.	10/89	.10
3386866	NOW Program Manual	10/93	1.50
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

Part #	Description	Issue Date	Price
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
3698700	Parts Professional #21	12/94	1.00
3698701	Parts Professional #22	3/95	1.00
3624186	Parts Professional Binder w/ Issues 1-19	—	5.00
3698522	Parts Professional Binder w/ Issues 20	—	3.00
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
3385896	Premium Blue 2000 Brochure	6/94	.10
3698514	Premium Blue 2000 Oil Change	2/94	.25
3698579	Premium Plus Fuel Additive Flier	10/94	.25

Part #	Description	Issue Date	Price
3698530	Cummins Extarder Brake Brochure	6/94	.25
3698531	Cummins Extarder Brake Flyer	6/94	.25
3698532	Cummins Extarder Brake Poster	6/94	1.00
3698533	Cummins Extarder Brake B Parts Manual	6/94	1.00
3698534	Cummins Extarder Brake C Parts Manual	6/94	1.00
3698535	Cummins Extarder Brake B Install. Manual	6/94	.50
3698536	Cummins Extarder Brake C Install. Manual	6/94	.50
3698537	Cummins Extarder Brake Air Supply Manual	6/94	.50
3698538	Cummins Extarder Brake Direct Mail	6/94	.25
3698540	Cummins Extarder Brake Counter Card	6/94	.50
3698542	Cummins Extarder Brake Ad Slick	6/94	.10
3698632	Cummins Extarder Warranty	2/95	.10

Translated Materials

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
3698513	French NOW Certificate	2/94	.10
3698592	French NOW Manual	10/94	1.50
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
3698548	Spanish Overhaul Flipchart Sections	8/94	5.00
3698593	Spanish Premium Blue Brochure	10/94	.25
3698635	Spanish Literature Kit	12/94	5.00
3698591	Spanish Fuel Systems Part Catalog	12/94	3.50
338733401	French Parts Professional # 1	—	1.00
338733402	French Parts Professional # 2	—	1.00

Part #	Description	Issue	
		Date	Price
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

Part #	Description	Issue	
		Date	Price
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	7/94	1.00
3385861	Spanish Parts Professional # 19	8/94	1.00
3385862	Spanish Parts Professional #20	9/94	1.00
3698636	Spanish Parts Professional Binder	1-20/94	5.00

Note: To order literature, contact your local distributor.
Distributors may order this literature through IMS.

Parts Professional Quiz 22

To win this issue's prize, all you have to do is answer the following 12 questions correct. The quizzes must be received by June 30, 1995.

- The Cummins B5.9-195G engine is a natural gas fueled derivative of the B5.9 six cylinder diesel engine.
 - True
 - False
- The _____ is(are) mounted to the rear face of the gear housing on the Cummins B5.9G engine.
 - secondary fuel regulator
 - fuel shutoff valve
 - gas mass sensor
 - all of the above
- The remote mounted fuel filter should be installed on the engine.
 - True
 - False
- The throttle plate assembly consists of a _____
 - body and throttle plate
 - shaft and lever
 - Both a and b
 - None of the above
- The pistons used in the B natural gas engine have a deep recessed bowl combustion chamber providing a _____ compression ratio.
 - 10.5 to 1
 - 10 to 1
 - 11 to 1
 - 12 to 1
- On the B5.9G cooling system, most OEM locations for ports, venting, and connections are the same as used on the B5.9 diesel
 - True
 - False
- A _____ turbocharger with rear-out exhaust will be offered with the natural gas B Series engine.
 - high mount
 - remote mount
 - low mount
 - None of the above
- The camshaft gear on the B natural gas engine has _____ cast protrusions on the back side.
 - seven
 - eight
 - five
 - six
- The B natural gas engine requires oil that is formulated for natural gas fueled engines.
 - True
 - False
- By utilizing a wastegated turbocharger, the engine is provided with improved low speed torque without overboosting at high speeds.
 - True
 - False
- What are some features of the B5.9G cylinder head?
 - Is a one-piece, cross-flow design with 2 valves per cylinder
 - Has an integral intake manifold
 - Both a and b
 - None of the above.
- The lean-burn concept increases the ratio of air to fuel for optimum ignition, combustion, and power by adding more fuel.
 - True
 - False

Parts Professional Quiz 22

NOTES

To view the results print, all you have to do is answer

5. The carburetor carburetor B engine gas engine

must be replaced by June 30, 1995

1. The carburetor B engine is a natural gas engine

2. The carburetor B engine is a natural gas engine

10. The carburetor B engine is a natural gas engine

11. The carburetor B engine is a natural gas engine

12. The carburetor B engine is a natural gas engine

13. The carburetor B engine is a natural gas engine

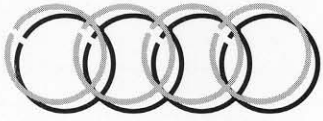
14. The carburetor B engine is a natural gas engine

15. The carburetor B engine is a natural gas engine

16. The carburetor B engine is a natural gas engine

17. The carburetor B engine is a natural gas engine

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Bulletin 3698701
Printed in U.S.A. 4/95
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