



Technical Service Bulletin

Technical Service Bulletin: TSB110265	Released Date: 15-Sep-2011
ISB Block Parts Compatibility	

ISB Block Parts Compatibility

Warranty Statement

The information in this document has no effect on present warranty coverage or repair practices, nor does it authorize TRP or Campaign actions.

Contents

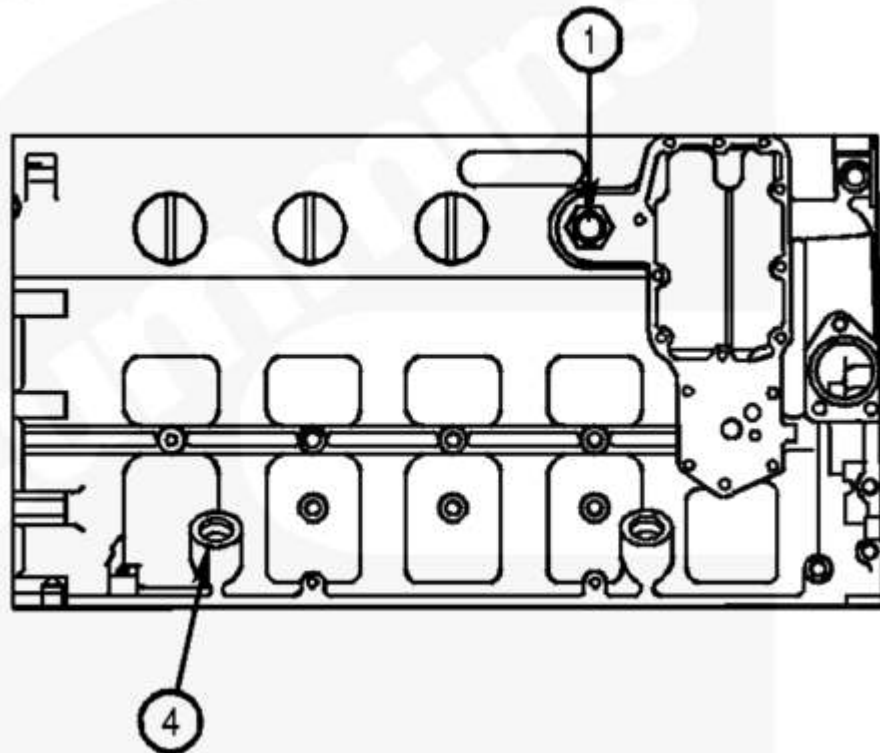
This document was originally released between 1994 and 2001. It has been added to QSOL for informational purposes.

This document provides comparison and compatibility information for the ISB and '94B engine parts.

A new block, with Straight Thread O-Ring Metric (STORM) fittings along the oil rifle, was developed for the ISB engine. Because of the fittings, this block is referred to as the STORM block.

Engine Block

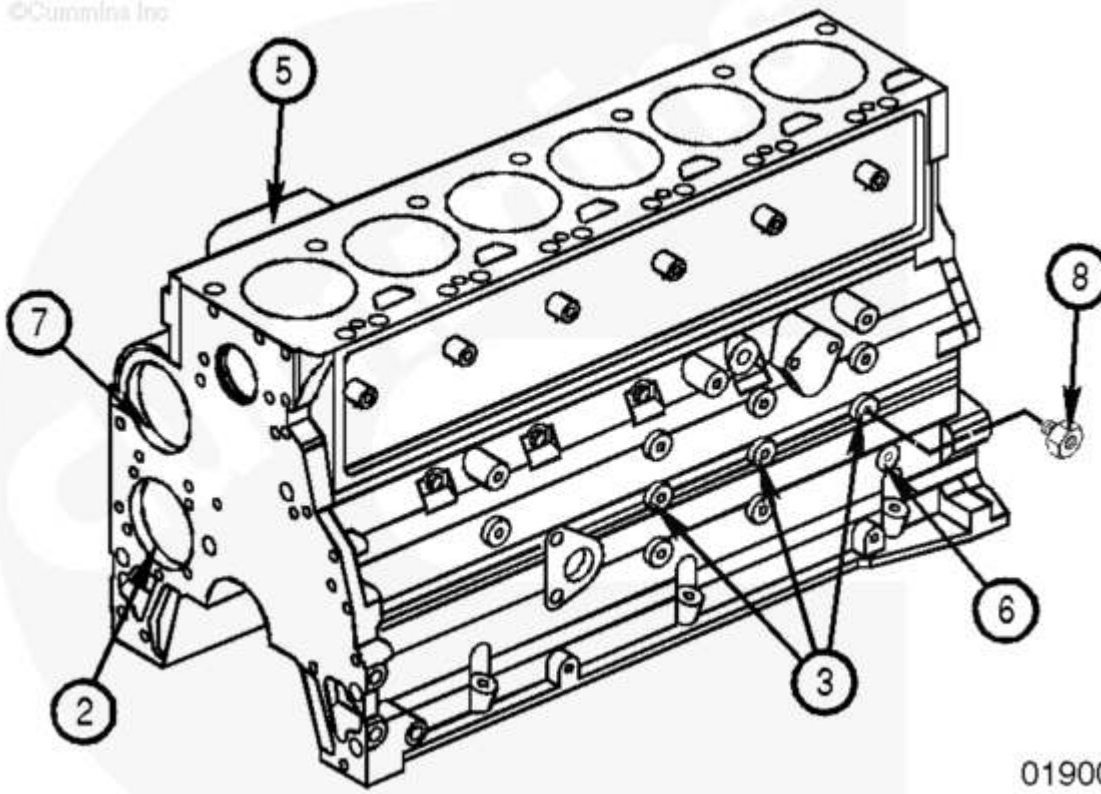
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STORM Block

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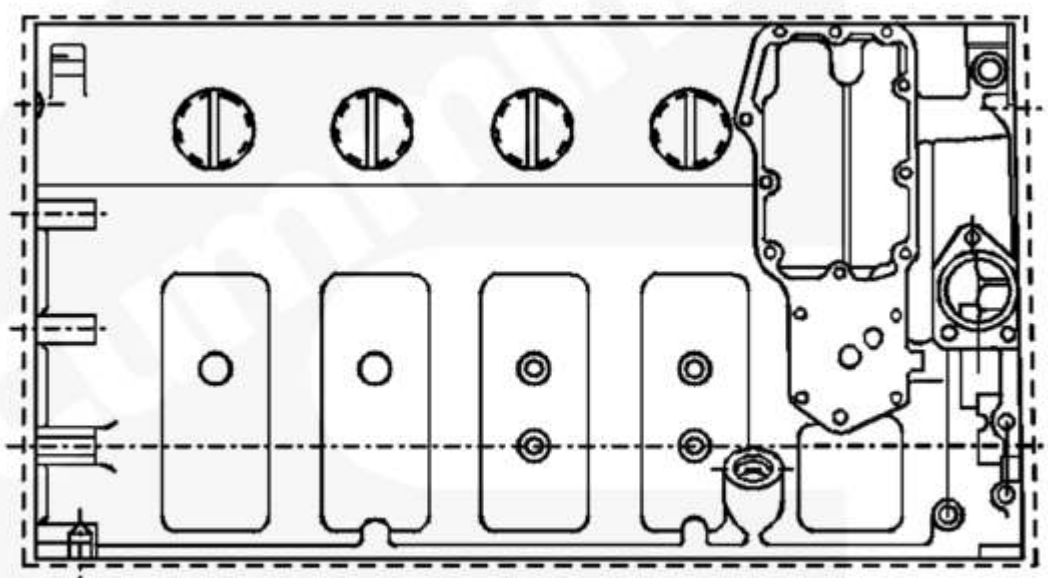
STORM Block

The STORM block is backward compatible with the pre-STORM block. Beginning May 1997, new '94B engines began using the STORM block.

The STORM block can be identified by the 3/4 NPT coolant heater plug (1) just rear of the oil cooler cavity. Features of the storm block include:

1. 3/4 NPT Coolant Heater Port
2. Larger Cam Bushing Bore on the STORM Block
3. STORM Oil Rifle Fittings (to reduce oil leaks)
4. Additional Rear Turbo Oil Drain Boss on the STORM Block
5. Engine Serial Number (ESN) Stamped on Block (Beginning First Quarter, 1998)
6. Engine Speed Sensor Bore
7. Water Pump Discharge Enlarged on the STORM Block
8. M10 to 1/8 NPT adapter, Part No. 3932302

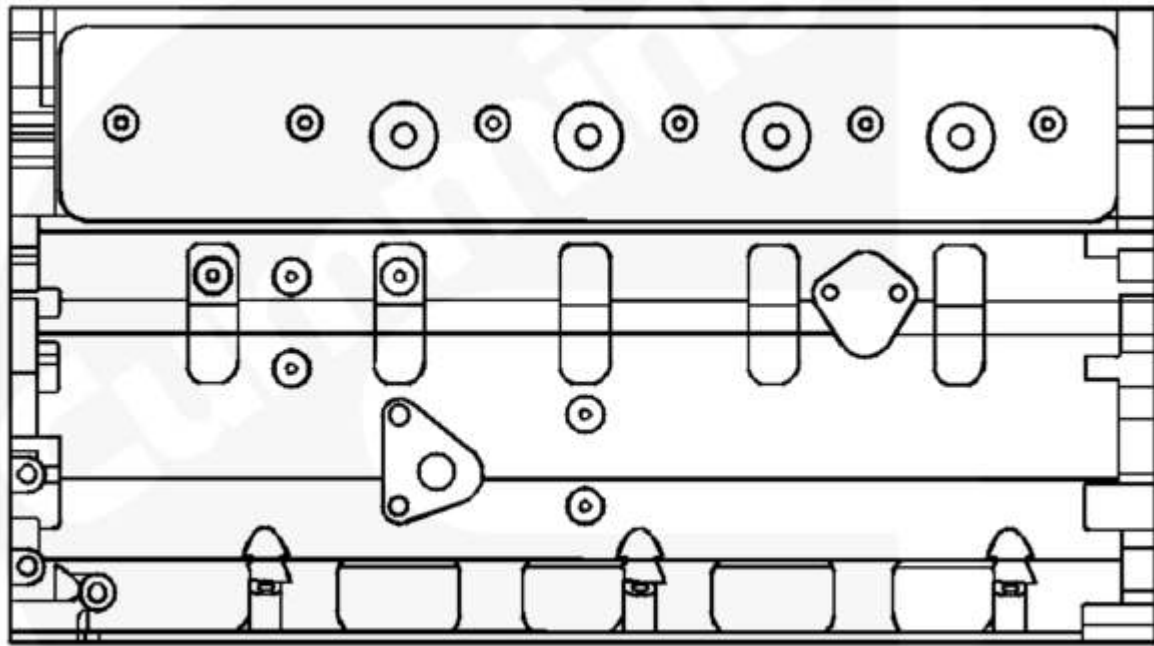
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Pre- STORM Block

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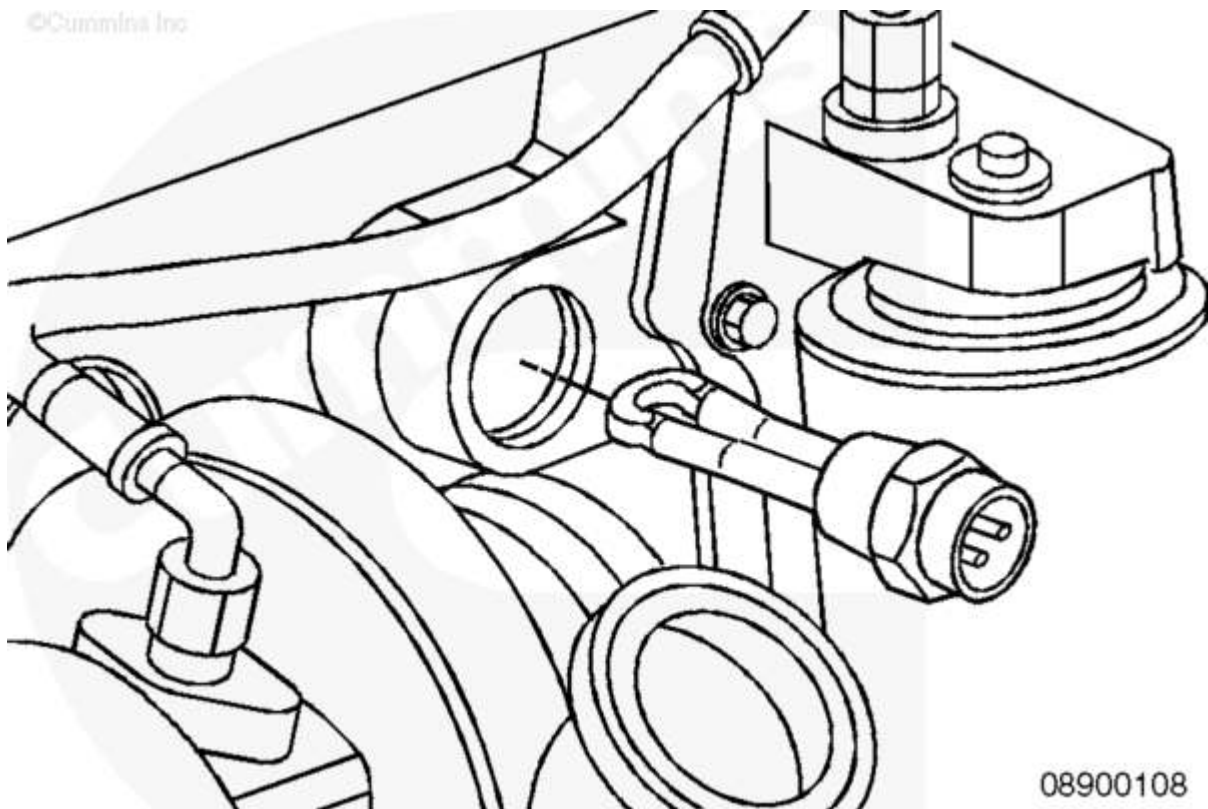


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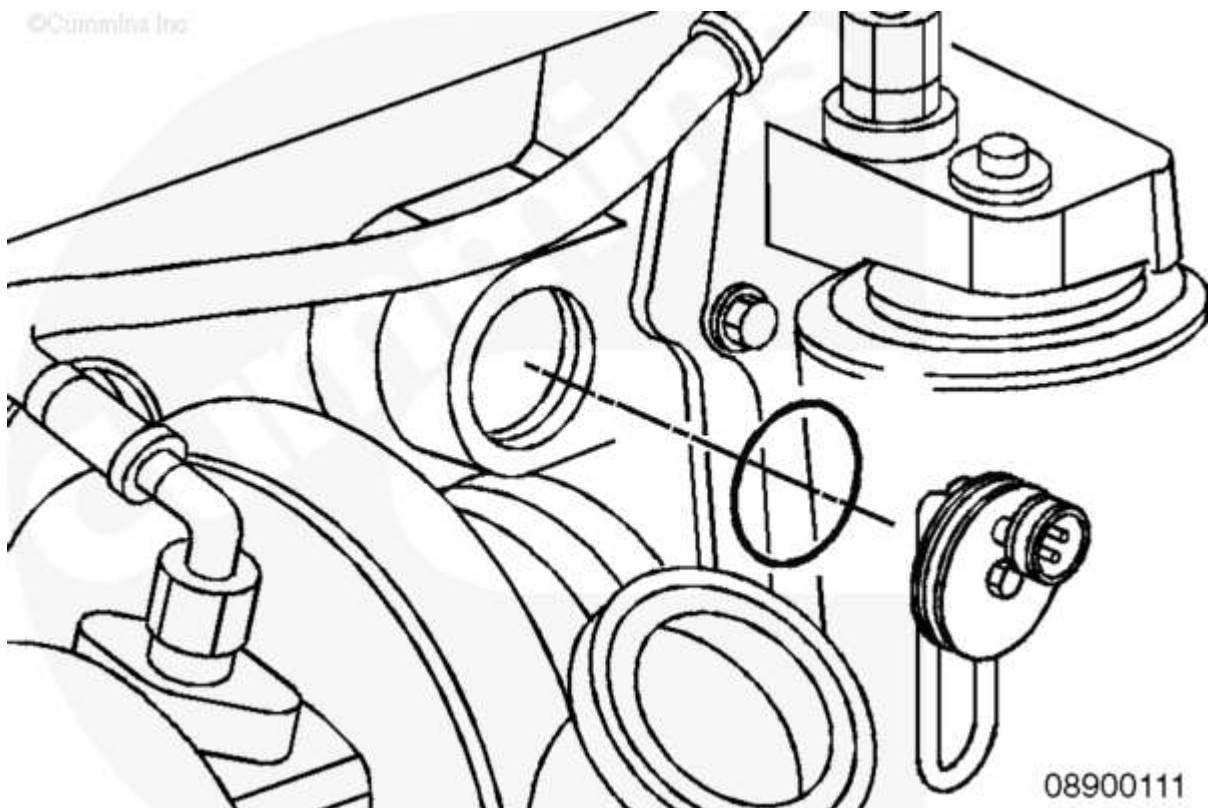
Pre- STORM Block

Note : The Pre- STORM block s only have one turbo oil drain location, no provision for a 3/4 NPT coolant heater, and fewer oil rifle ports.

Coolant Heater



STORM Block Coolant Heater Part No. 3940911



'94B Coolant Heater Part No. 3916127

The STORM block coolant heater, Part No. 3940911, installs in the 3/4 NPT fitting just rear of the oil cooler cavity.

The coolant heater for the '94B engine, Part No. 3916127, uses an o-ring and can also be used on a STORM block.

There is a water pump volute change on STORM block. Both the '94B and the ISB water pump are compatible with the STORM block.

The main bearing capscrews are M12 on a STORM block. The same main bearing cap, Part No. 3900967, is used on the STORM block as the pre-STORM block. The pre-STORM block uses M14x2.00x119 capscrews, Part No. 3904217. The STORM block uses M12x1.5x119 capscrews, Part No. 3927948.

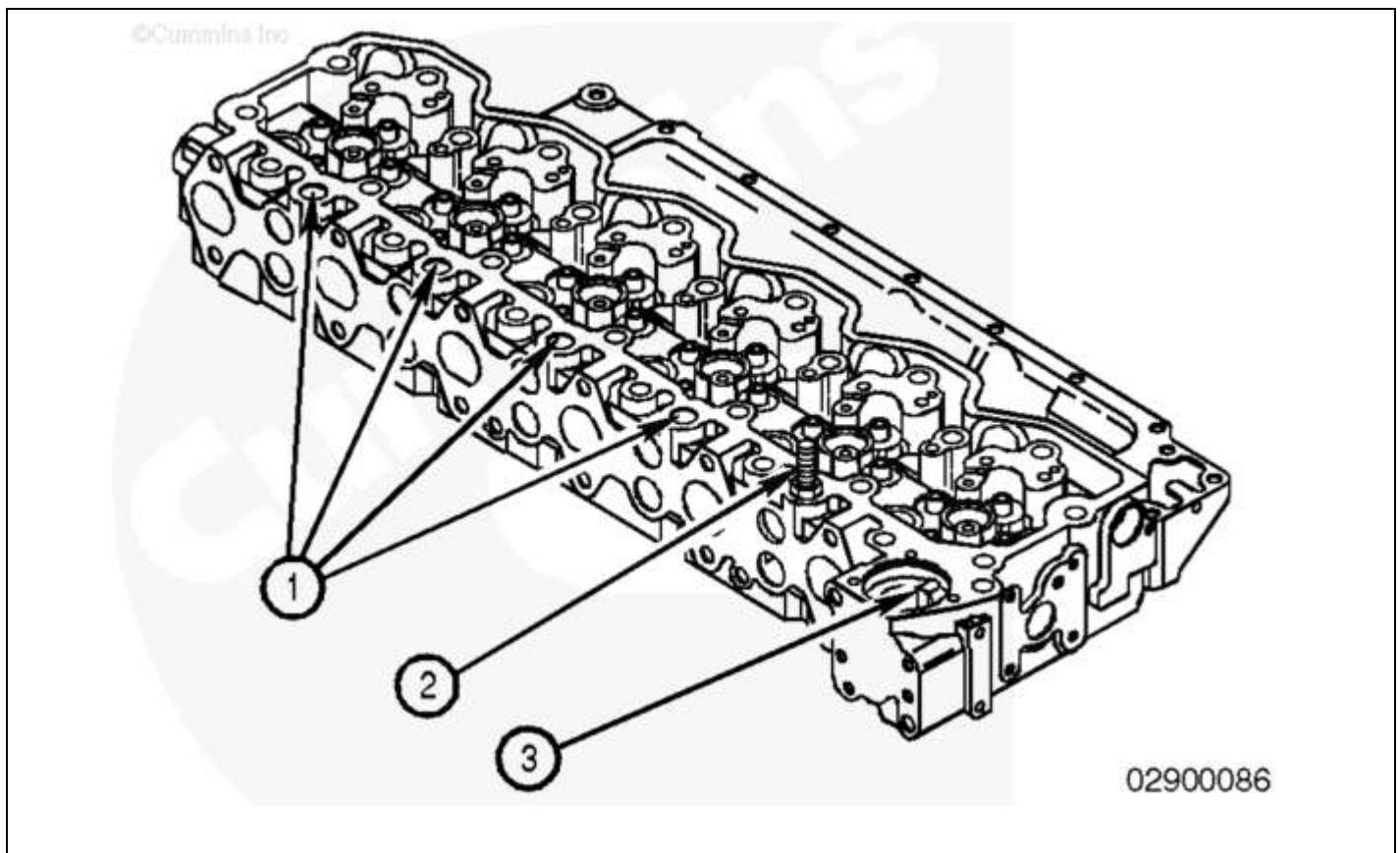
The STORM block has drillings for two oil passages.

1. Regulated oil returned from the oil pressure regulator to the oil pan (as in '94B engines).
2. Regulated oil returned from the oil pressure regulator to the oil pressure regulator to a drilling that returns to the oil pump inlet (as in ISB engines).

The oil cooler core, oil cooler filter head, and the filter head gasket **must** be chosen properly. Refer to the lube system components matrix in this service parts document.

The STORM block cam bushing outer diameter was increased from 57.38 mm [2.26 in] to 59.38 mm [2.34 in]. The pre-STORM block cam bushing is Part No. 3901306. The STORM block cam bushing is Part No. 3940059.

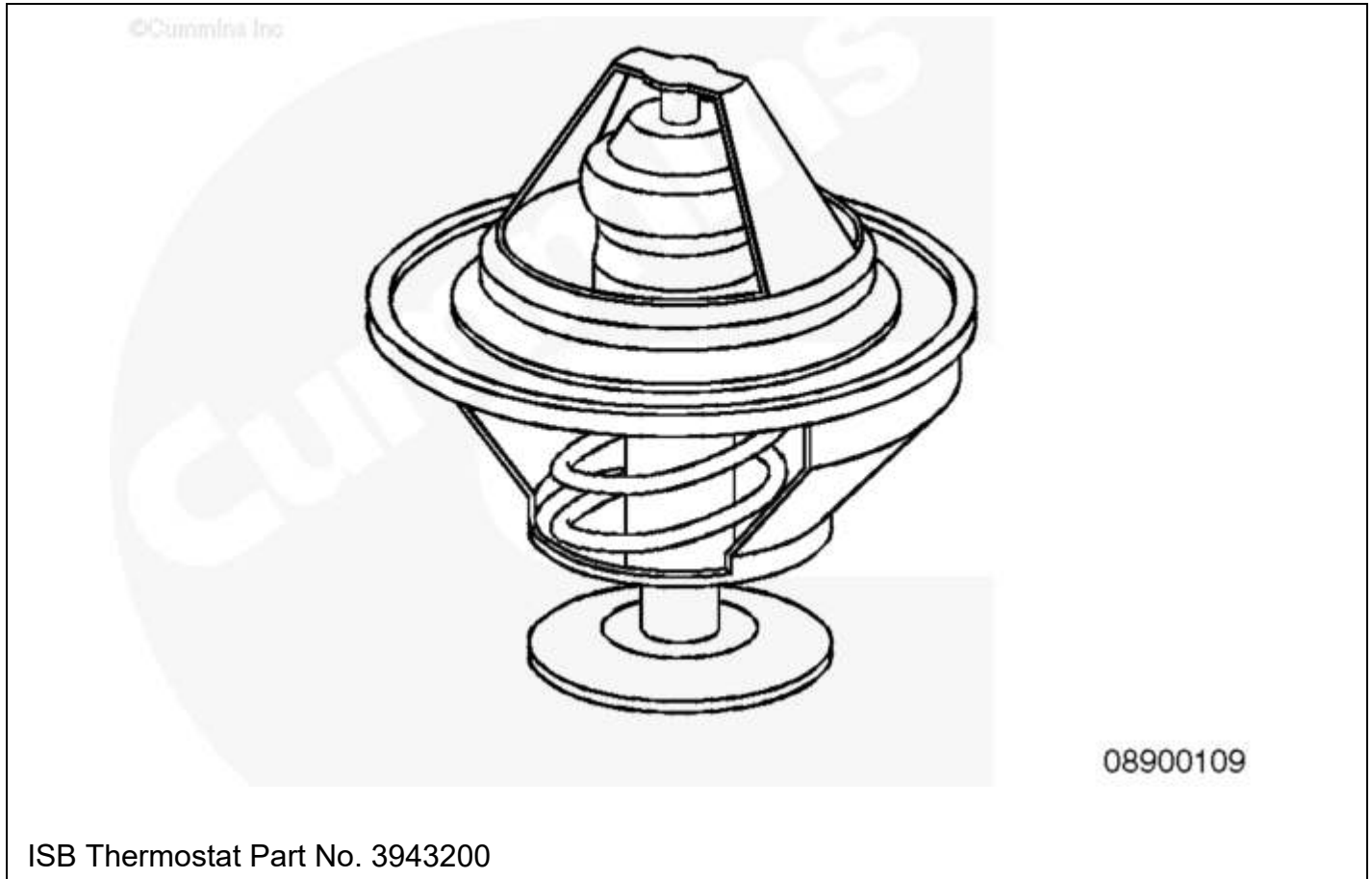
Cylinder Head



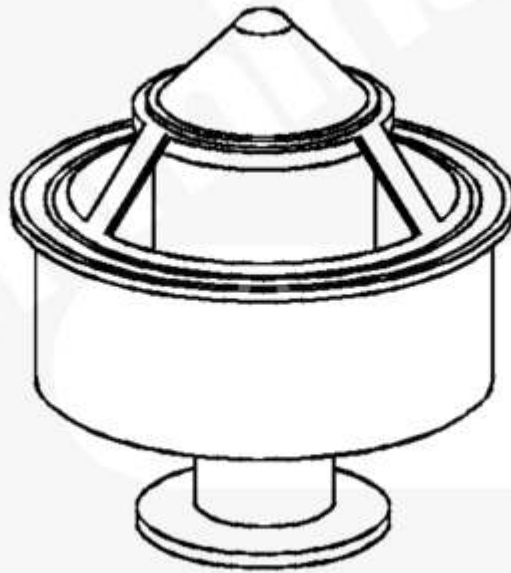
The ISB cylinder head is a 4-valve per cylinder head and is **not** interchangeable with the '94B engine.

The ISB cylinder head utilizes one capscrew size (M12x1.75–130), Part No. 3927063, instead of two different ones. Use capscrew stretch gauge, Part No. 3825140, to prevent using a the pre-ISB capscrew (M12x1.75–120) in place of the ISB cylinder head capscrew.

Thermostat



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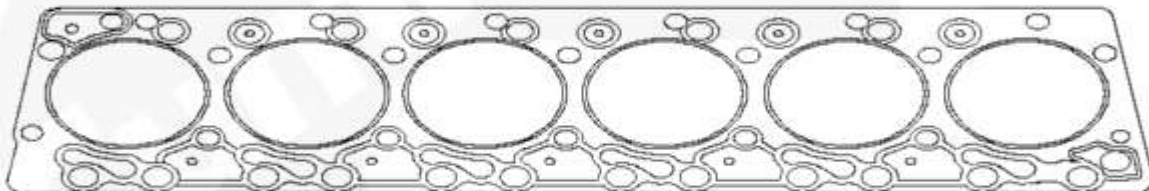
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'94B Thermostat Part No. 3928499

The larger, “Caged-Ball” thermostat that is used for ISB engines installs into the top of the cylinder head. Caged-ball design assists with venting entrapped air. The ISB and '94B thermostats are **not** interchangeable.

Cylinder Head Gasket

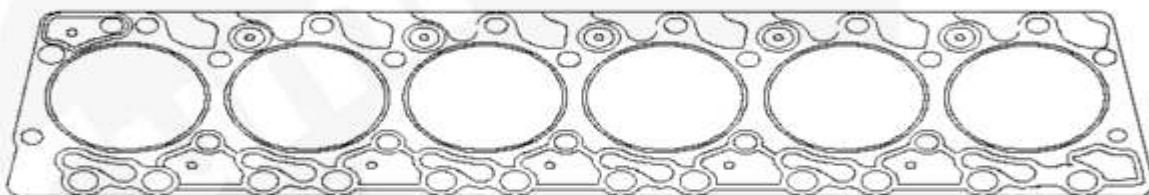
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ISB Cylinder Head Gasket Part No. 3804882

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'94B Cylinder Head Gasket Part No. 3283339

The ISB head gasket is **not** interchangeable with the '94B head gasket.

Performance Parts

PISTON

ISB pistons have a centered combustion bowl.

The '94B and ISB pistons are **not** interchangeable.

See the Control Parts List (CPL) for the proper piston part numbers.

CAMSHAFT

ISB camshafts are **not** interchangeable with '94B cams. See CPL for proper camshaft part numbers.

TURBO

ISB turbos are Holset® model HX35. See CPL for proper turbo part number.

TURBO MOUNTING GASKET

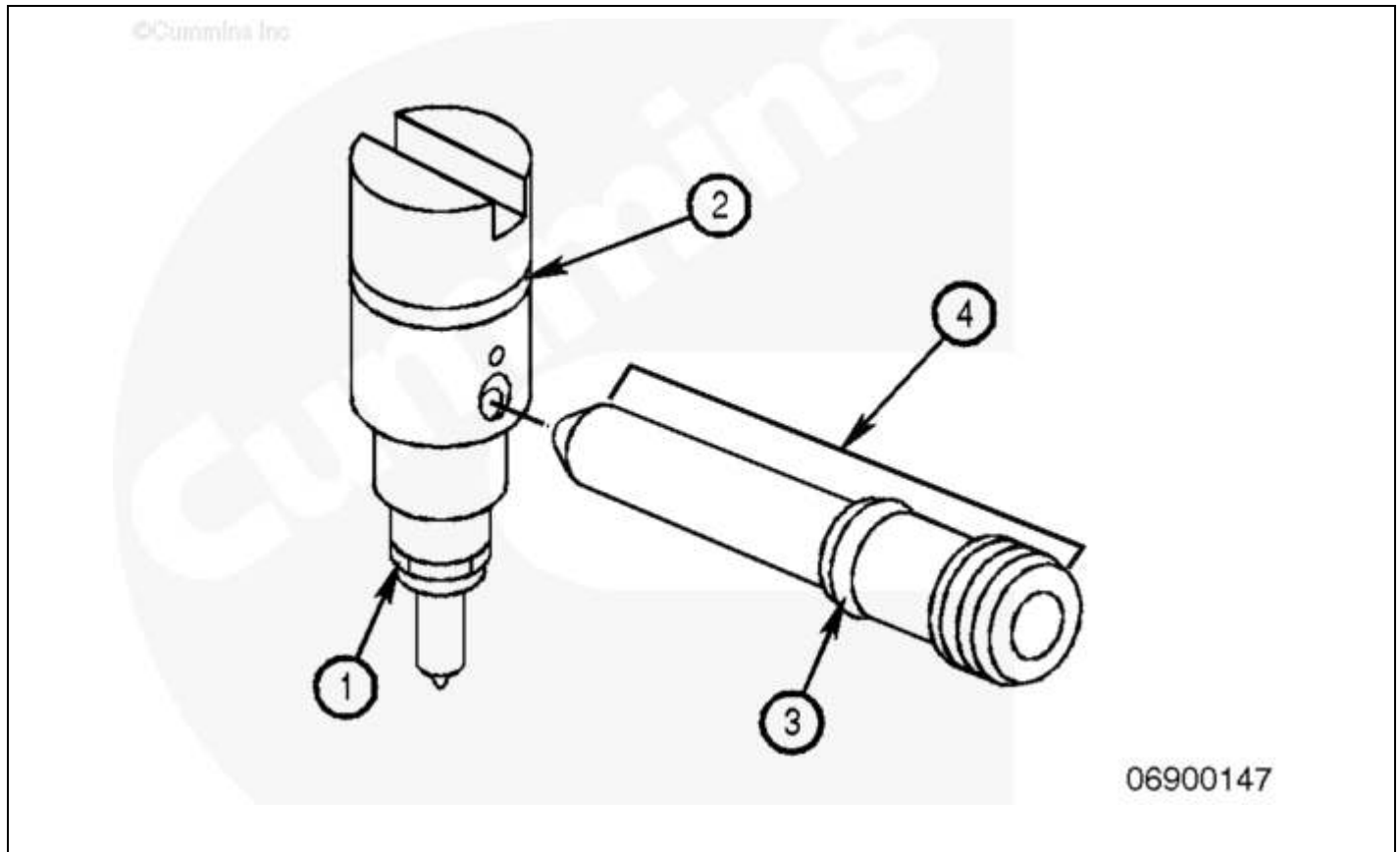
Both the ISB and '94B engines use Turbo Mounting Gasket, Part No. 3901356.

TURBO MOUNTING HARDWARE

Both the ISB and '94B engines use the same mounting hardware:

- Studs.....Part No. 3818823
- Flange Nuts.....Part No. 3818824

INJECTOR



Like the '94B, the ISB uses hole-type Bosch® injectors. The ISB injector nozzle holder has been redesigned for the new valve arrangement and combustion bowl. ISB and '94B injectors and injector nozzles are **not** interchangeable. See CPL for proper injector part number.

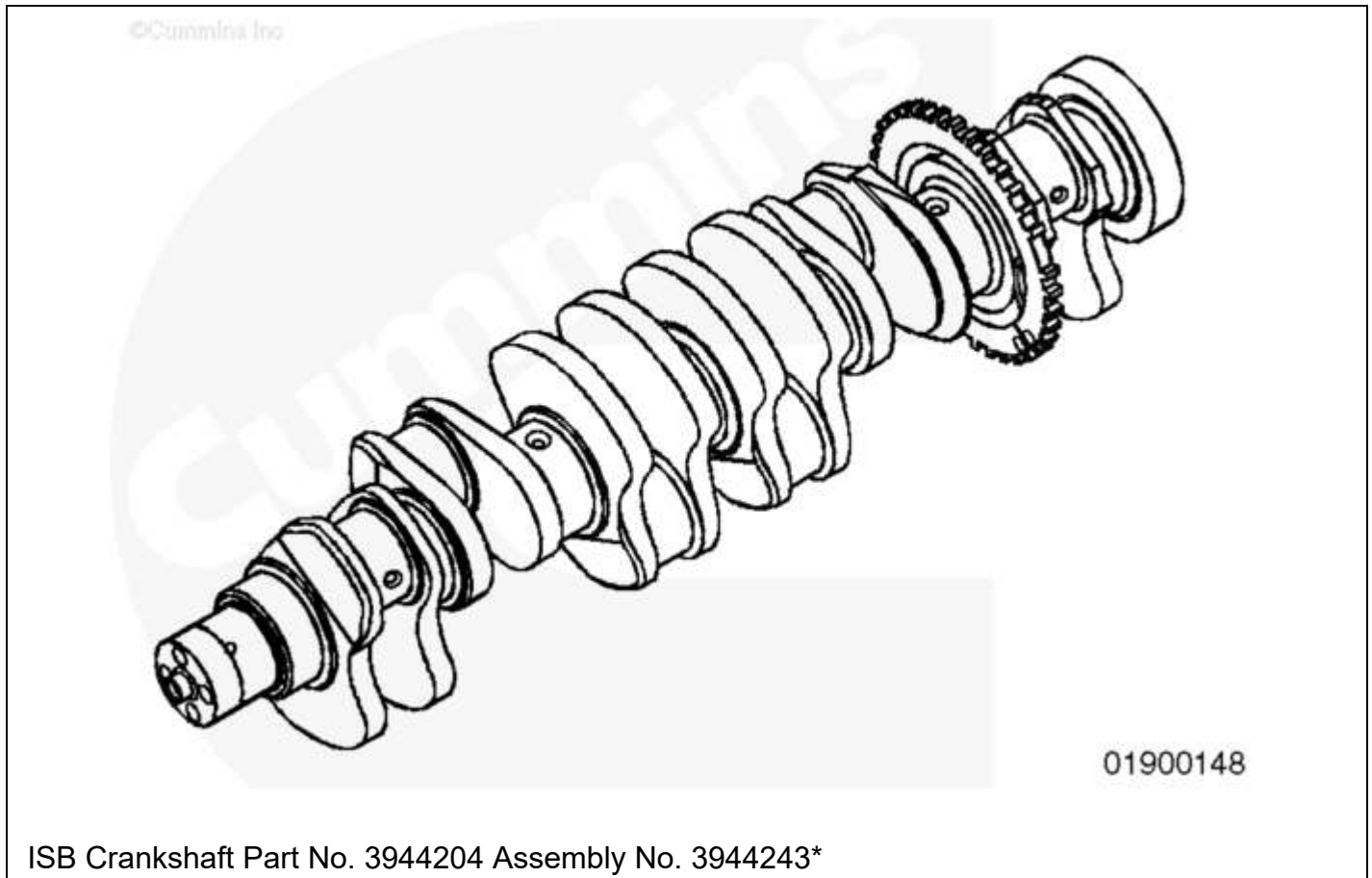
The ISB engine utilizes a fuel connector (4) to transfer fuel from individual high pressure fuel lines, to each injector. The thread on this connector is for use with connector puller.

Injector and connector service parts:

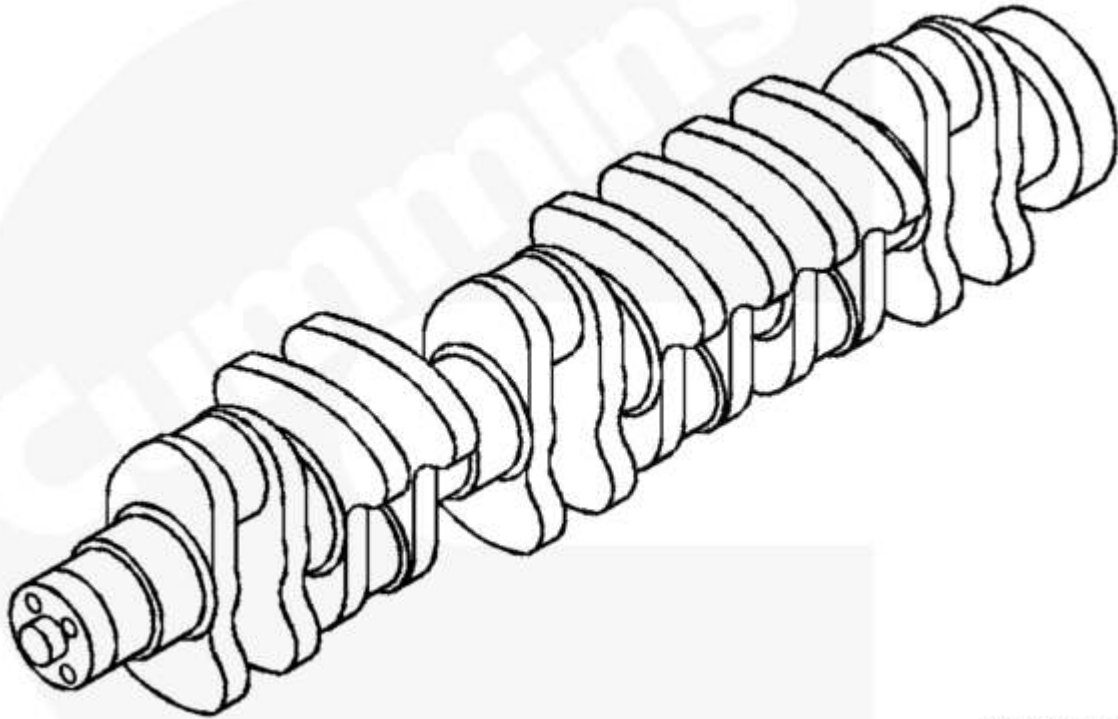
1. Sealing Washer (1.5 mm thickness for '98 ISB ratings).....Part No.
3906659
2. Injector O-Ring.....Part No.
3029820
3. Connector O-Ring.....Part No.
3882589

Note : ISB injector kits include the correct shim and o-ring.

Crankshaft



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'94B Crankshaft Part No. 3929037 Assembly No. 3908032*

The ISB crankshaft supersedes the '94B crankshaft. A speed indicator ring is fastened to the ISB crankshaft.

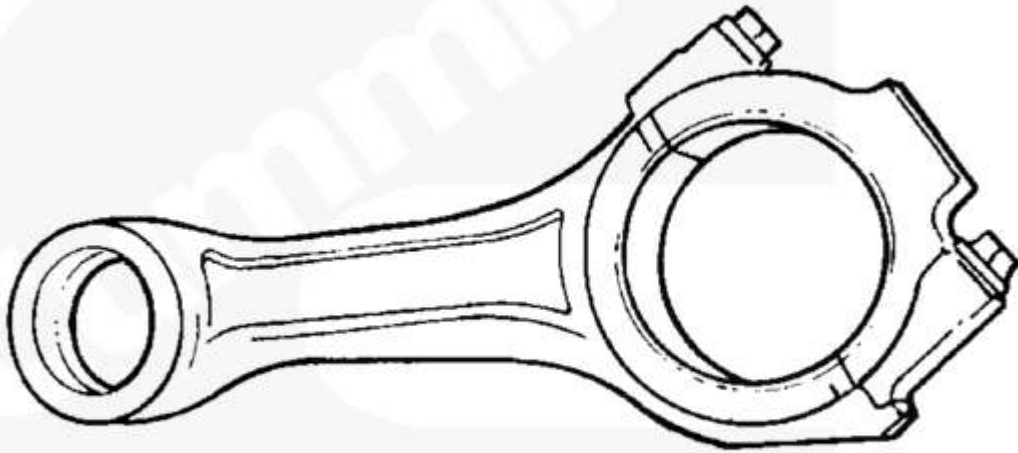
Use of the '94B crankshaft can be continued for '94B engines built with either the '94B or the STORM block .

If building an ISB engine, the 3944243* crankshaft is necessary.

* These assembly numbers include the crank gear, Part No. 3929027.

Connecting Rod

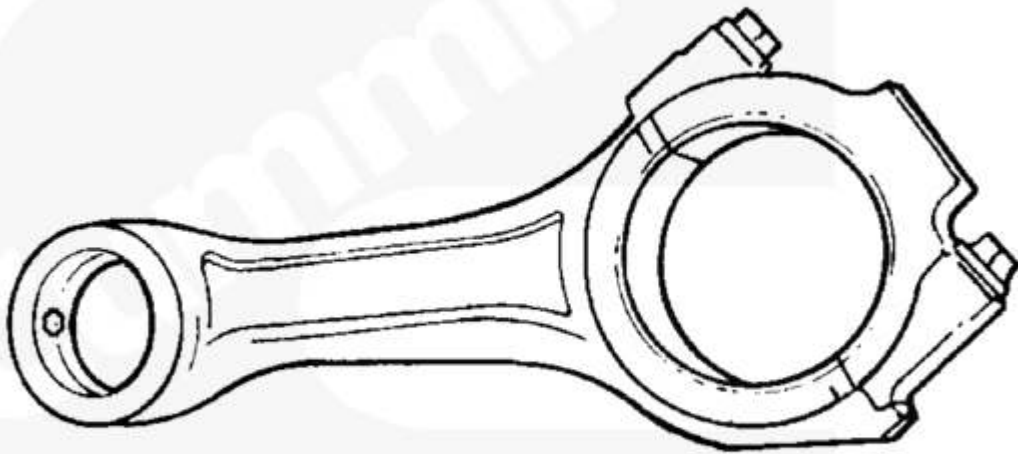
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ISB Connecting Rod Assembly No. 3942581

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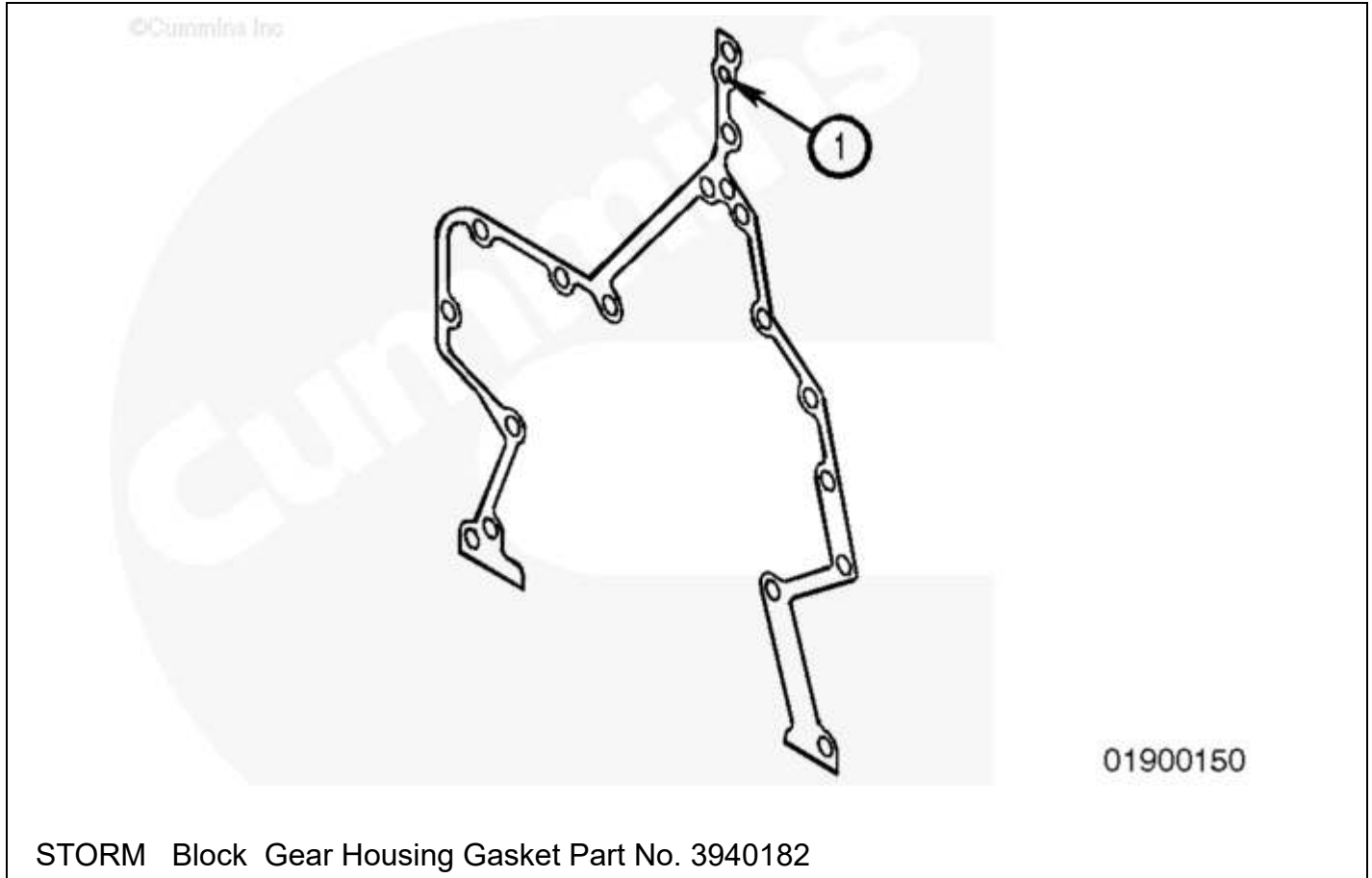
'94B Connecting Rod Assembly No. 3925232*

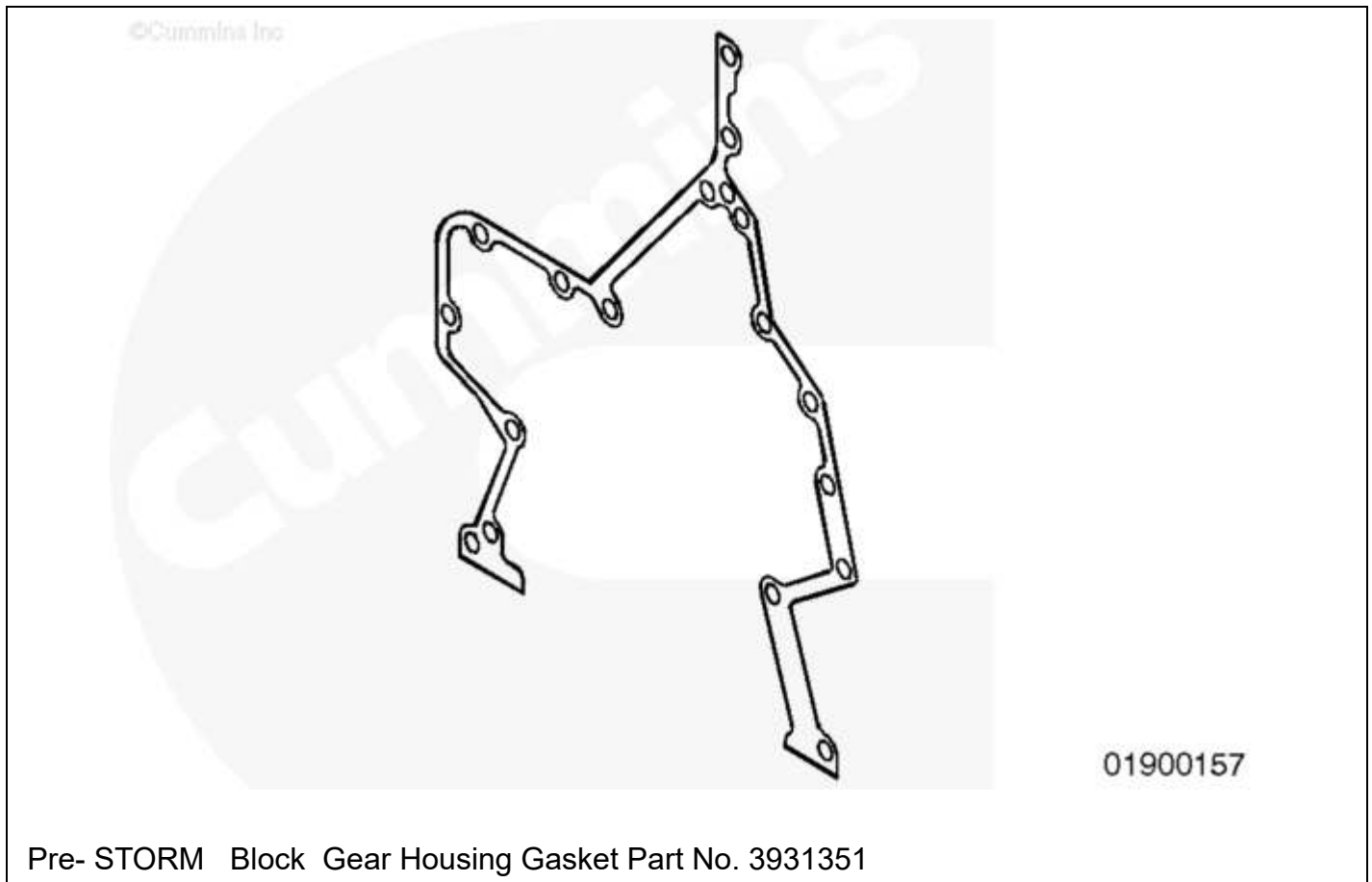
The ISB connecting rod has been redesigned for higher stress. The oil hole at the top of the rod has been removed and the connecting rod capscrews have been reduced from M14, Part No. 3900919, to M12, Part No. 3900919.

* The ISB connecting rod assembly supersedes the '94B assembly. When ordering connecting rods for a '94B engine, use available stock of Part No. 3925232.

Either rod can be used in place of the other in any combination. With the exception that the '94B rod, Part No. 3925232, is disallowed for engines rated higher than 2,500 rpm (eg. ISB Chrysler ratings).

Gear Housing Gasket





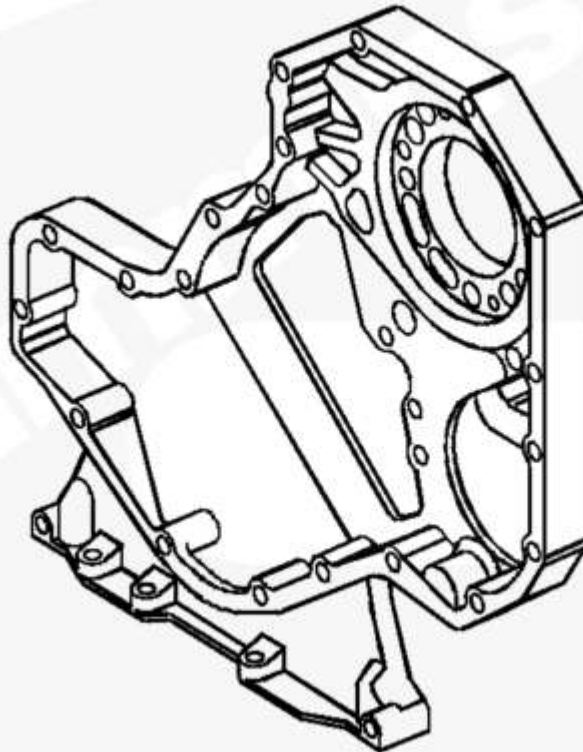
The STORM Block gear housing gasket is of an improved material and includes a seal ring (1) for the unused oil drilling in the front of the STORM block .

The STORM Block gasket will work in place of the '94B gasket on a '94B block .

The '94B gasket will fit on the STORM block , but should **not** be used for engines built with the STORM block .

Gear Housing

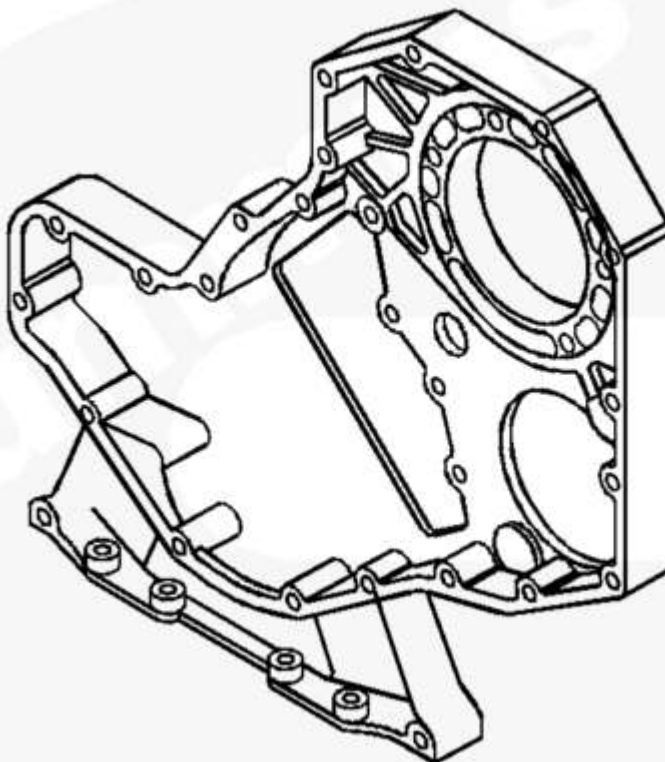
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ISB Gear Housing Part No. 3943379 Part No. 3943380 (Chrysler)

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'94B Gear Housing Part No. 3920519

The ISB and '94B gear housings are **not** interchangeable.

The ISB gear housing has been redesigned to accommodate the VP44 injection pump.

The ISB gear housing is wider to accommodate the VP44 injection pump.

Gear Cover Gasket

The '94B gasket, Part No. 3918673, will **not** fit the ISB gear housing.

The ISB engine does **not** use a gasket. A coating of three-bond, Part No. 3823494, is used as a gasket.

Gear Cover

The '94B gear cover, Part No. 3923898, is **not** compatible with the ISB gear cover, Part No. 3941759. The Chrysler ISB engine uses gear cover, Part No. 3941911.

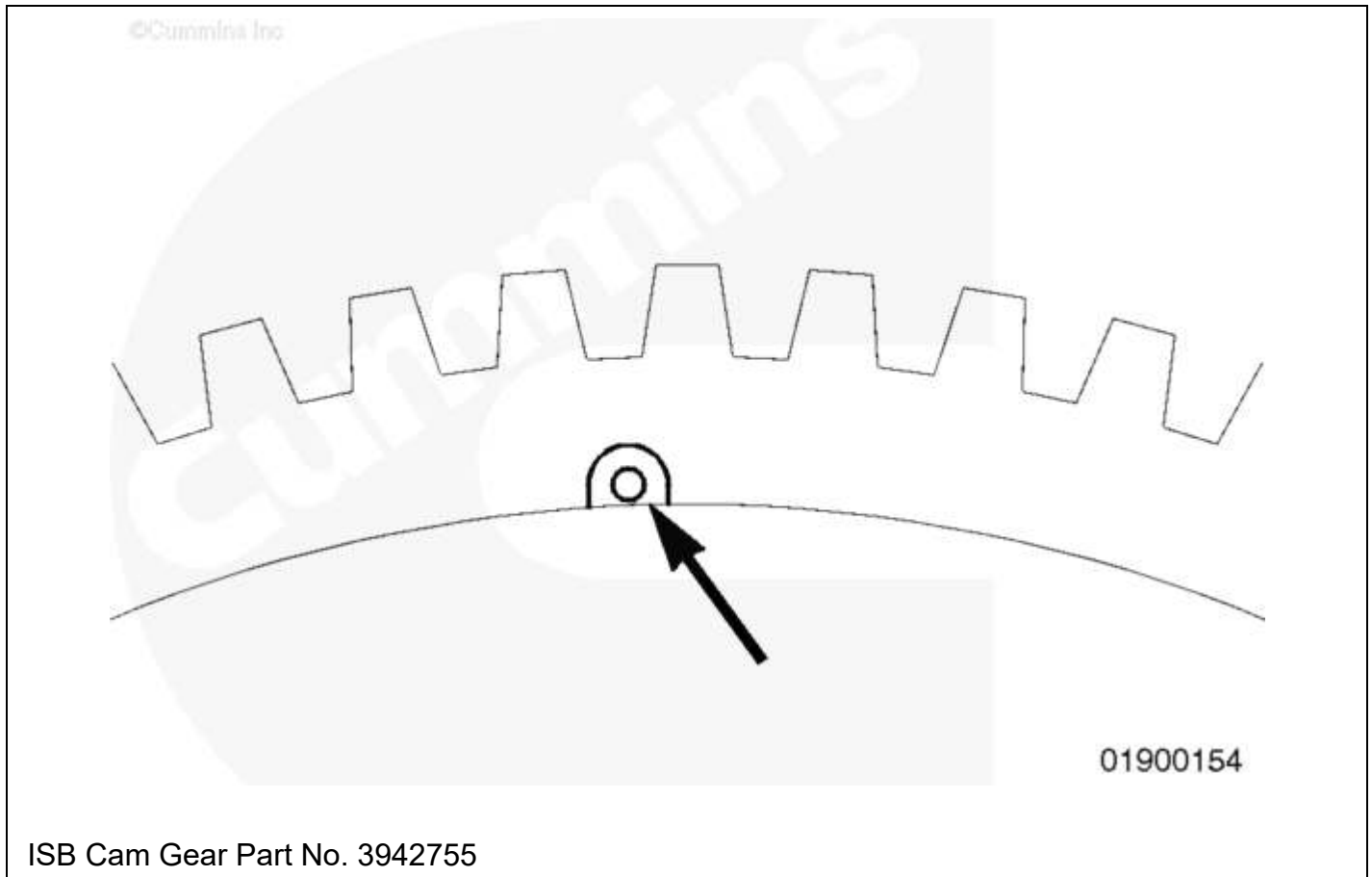
Front Gear Train

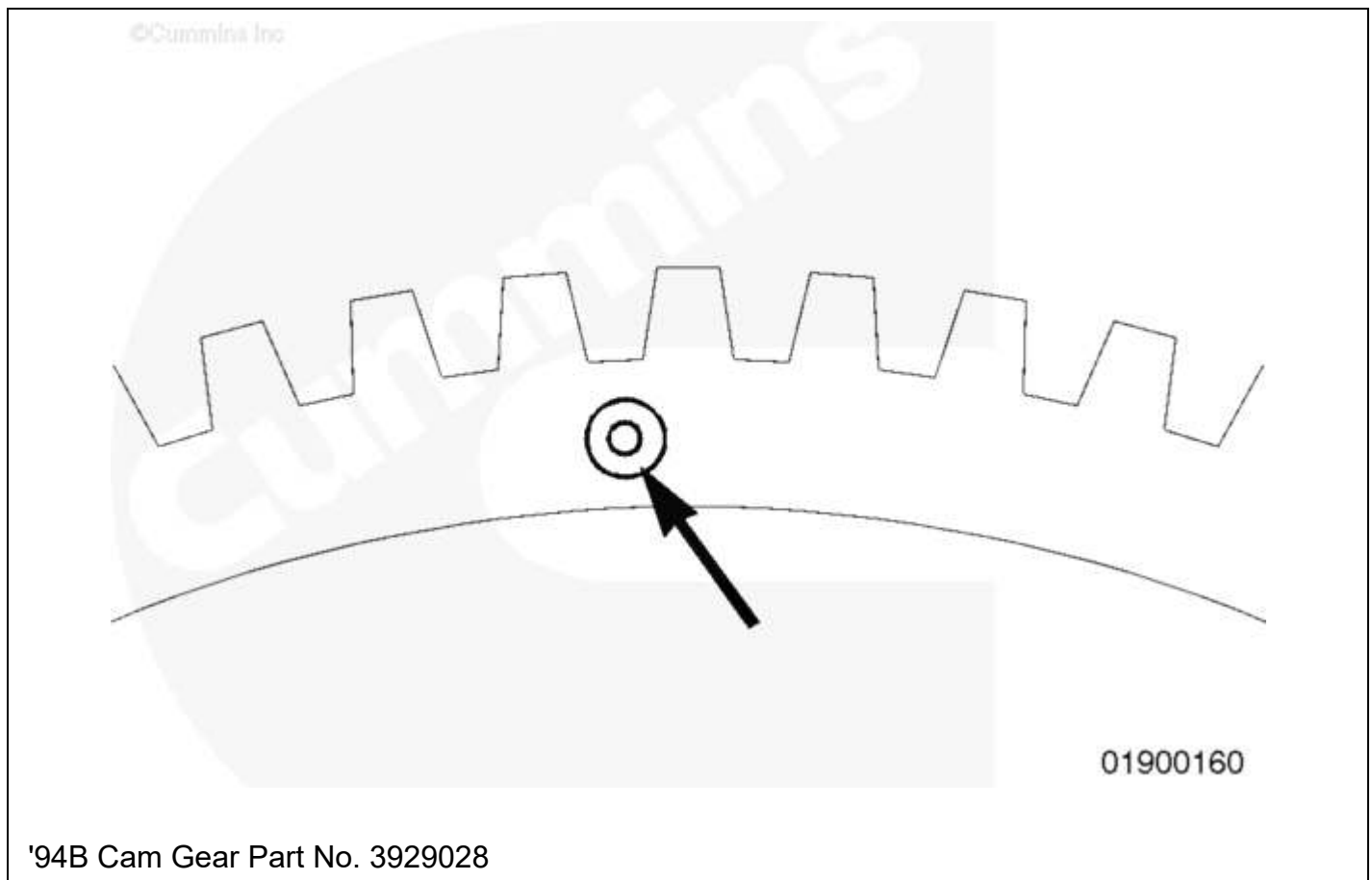
Fuel Pump Gear

New for ISB (Journal Change and keyway to match VP44).

The ISB fuel pump gear, Part No. 3941541, is **not** interchangeable with the '94B gear, Part No. 3929031.

Cam Gear





'94B Cam Gear Part No. 3929028

The ISB cam gear and the '94B cam gear are **not** interchangeable.

The ISB cam gear is machined for the engine position sensor. The '94B gear is machined for the TDC timing pin.

The ISB cam gear, Part No. 3942755, has a position sensor ring for use of cam gear sensing engine position that is in place for performing cylinder diagnostics.

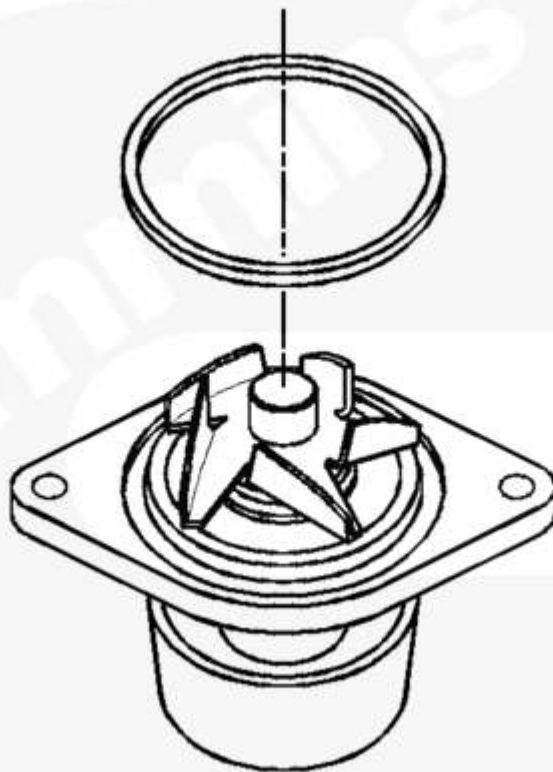
The '94B cam gear, Part No. 3929028, has a timing pin hole.

Crank Gear

For both the ISB and '94B engines, use crank gear, Part No. 3929027.

Water Pump and Seal Ring

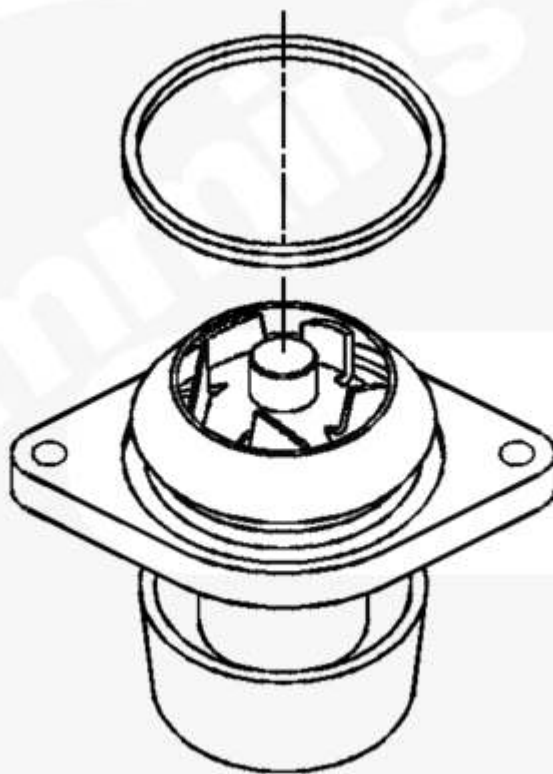
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ISB Water Pump and Seal Ring Seal Ring Part No. 3913481 Kit No. 3802923

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'94B Water Pump and Seal Ring Seal Ring Part No. 3906698 Kit No. 3802970

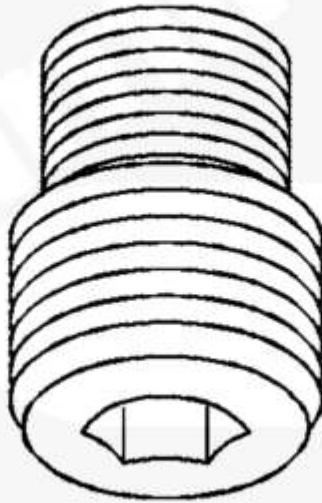
Either water pump will fit into either the '94B or the STORM block .

Use the '94B water pump and seal ring if building a '94B engine.

Use the ISB water pump and seal ring if building an ISB engine.

Fuel Filter Adapter

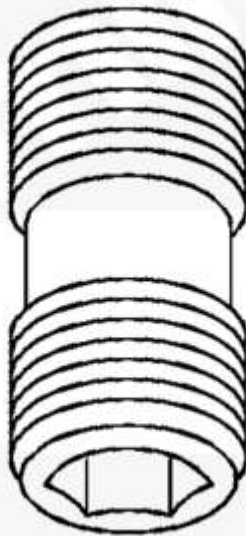
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ISB Fuel Filter Adapter Part No. 3942435

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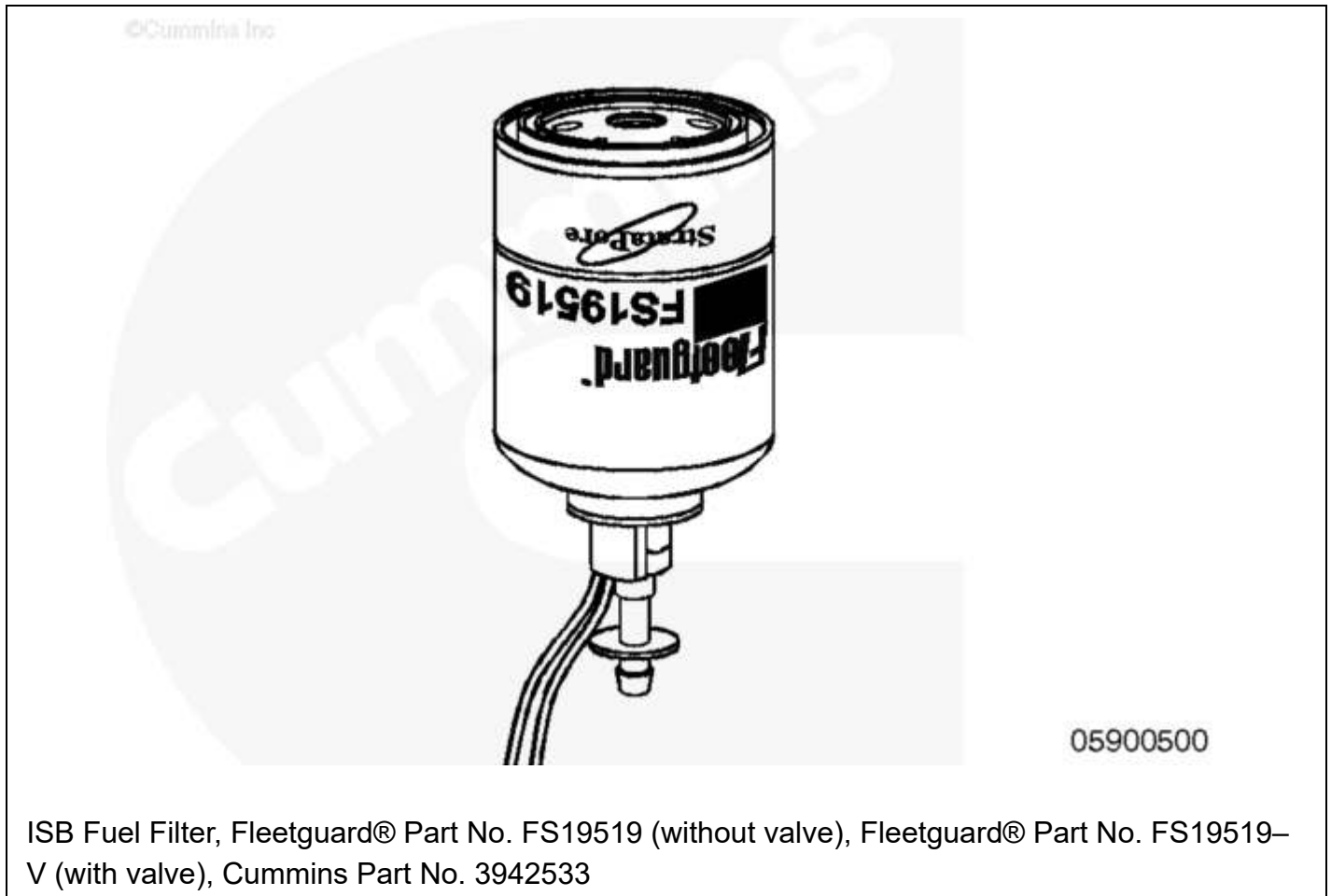


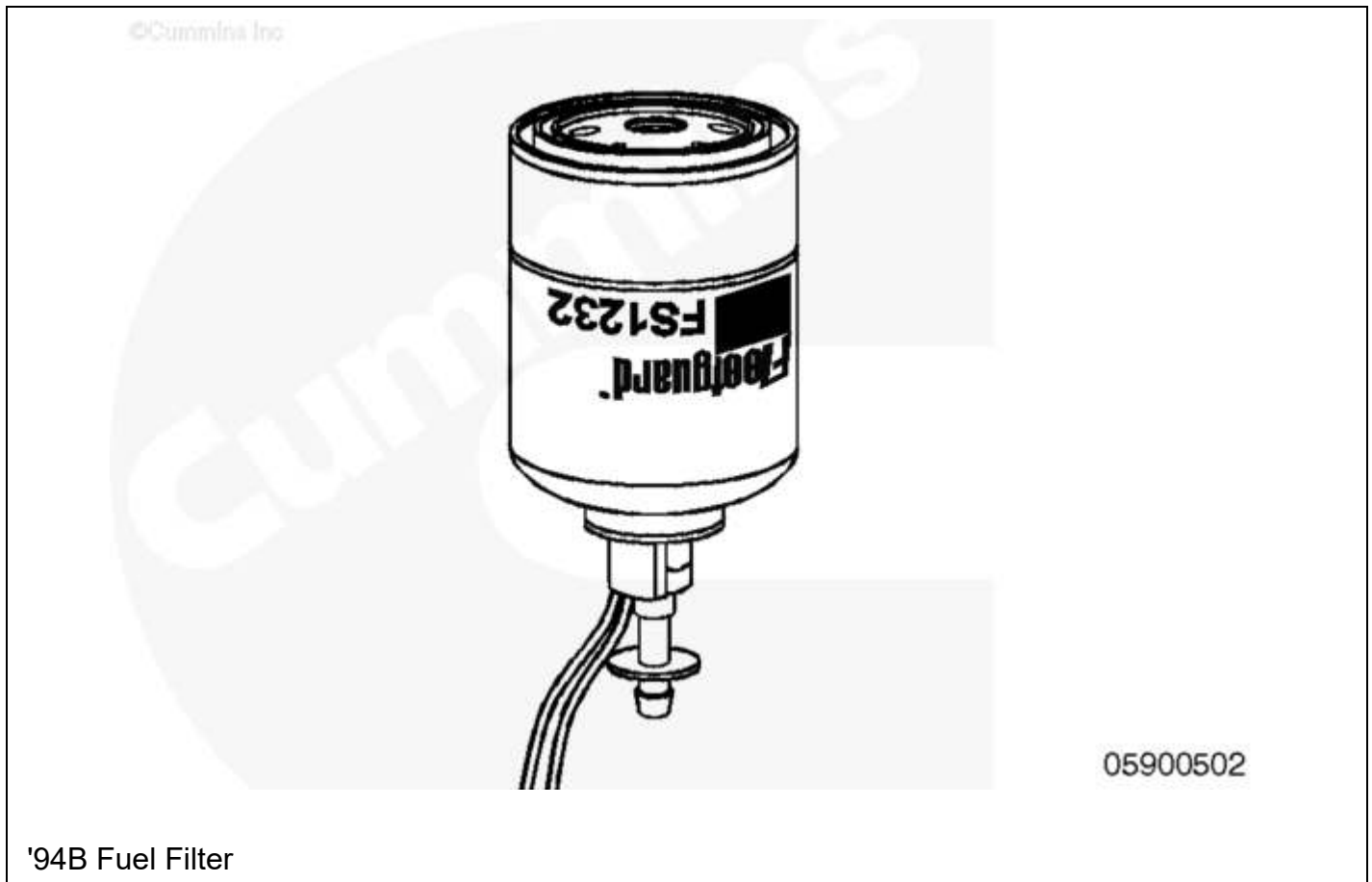
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'94B Fuel Filter Adapter Part No. 3925954

Part No. 3941589 is an ISB spin-on filter adapter with additional length to accommodate a spin-on compatible fuel heater.

Fuel Filter





The ISB fuel filter, Part No. 3942533, will **not** fit on a '94B engine.

The ISB utilizes a spin-on fuel filter with a more efficient Stratapore™ element.

Oil Filter

Part No. 3932217 (Fleetguard® Part No. LF3349) is the standard '94B oil filter.

Part No. 3942365 (Fleetguard® Part No. LF3729) is the ISB lube filter with Stratapore™ element which helps permit the longer oil drain interval of the ISB engine.

Chrysler engines will continue to use the standard oil filter, Part No. 3932217.

Exhaust Manifold

Changes in the exhaust manifold result in the following compatibility:

The ISB one-piece and two-piece exhaust manifolds are **not** compatible with the '94B exhaust manifold.

Both the ISB and '94B engines use exhaust manifold capscrews, Part No. 3901448. The ISB engine uses the capscrews in conjunction with mounting spacers, Part No. 3088579.

The ISB exhaust manifold gaskets, Part No. 3943132, differ from the '94B gasket, Part No. 3927154.

Intake Manifold

Both the ISB and the '94B use air intake connection gasket, Part No. 3924990.

The ISB intake manifold cover, Part No. 3941437, differs from the '94B intake manifold cover, Part No. 3920551. The bolt patterns are the same, but the location of the air inlet location has changed.

The ISB intake manifold cover gasket, Part No. 3931347, has additional sealing surface compared to the '94B intake manifold cover, Part No. 3931347.

Oil Seals

Both the ISB and '94B engine use:

- Front oil seal kit.....Part No. 3804899
- Rear cover gasket.....Part No. 3928493
- Rear oil seal carrier.....Part No. 3921043
- Rear oil seal kit.....Part No. 3909410
- Rectangular ring seal.....Part No. 3912473

Accessory Drive

Both the ISB and '94B engines use accessory drive gasket, Part No. 3008400.

Both the ISB and '94B engines use accessory drive gear, Part No. 3928861, and drive the same Holset® air compressors.

Oil Pan

Both the ISB and the '94B engines utilize the same oil pans in conjunction with oil pan gasket, Part No. 3931346.

Push Tubes

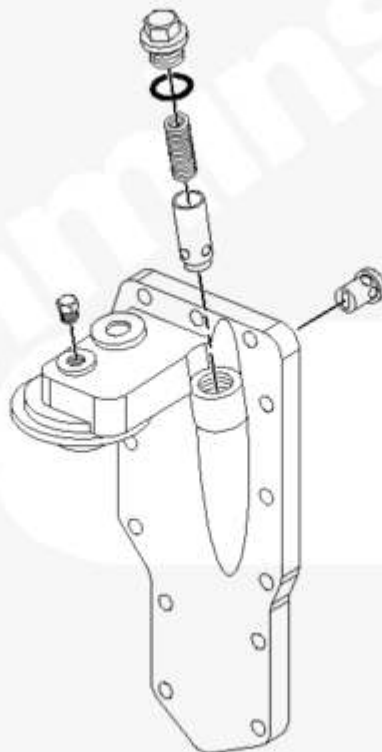
ISB and '94B push tubes are **not** interchangeable.

Tappets

ISB and '94B tappets are **not** interchangeable.

Oil Cooler Cover

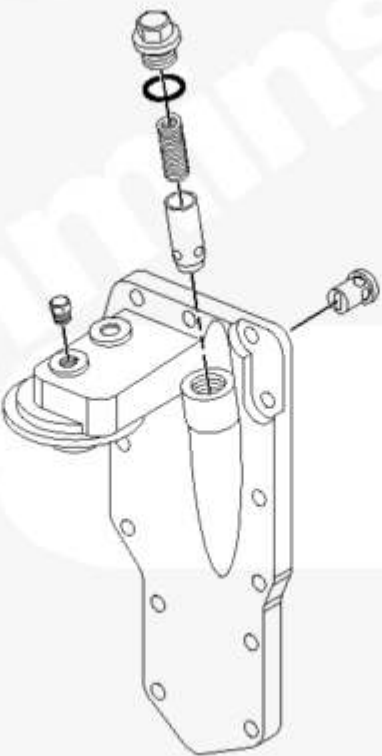
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Dump-to-Pump Cooler Cover Part No. 3942366

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Dump-to-Sump Cooler Cover Part No. 3923332

The ISB oil filter head has been redesigned to direct pressure regulated oil to the block drilling that returns to the lube pump inlet.

Use the '94B (dump-to-sump) filter head only with the '94B cooler core and cooler cover gasket, Part No. 3929792.

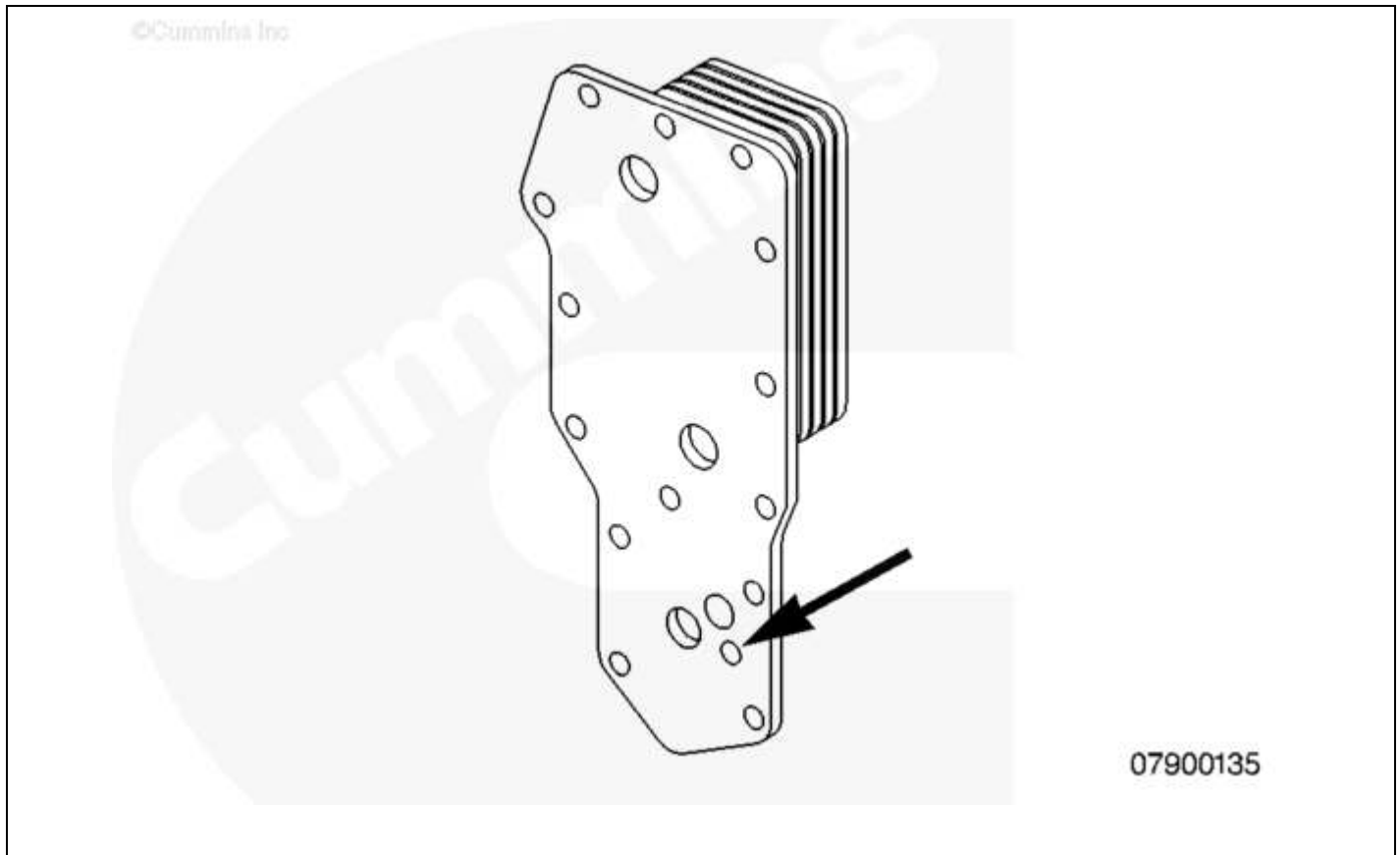
Use the ISB filter head only with the ISB cooler core and gaskets with a STORM engine block and ISB lube pump. Use of this dump-to-pump style cooler cover requires the use of cooler cover gasket, Part No. 3942915.

Oil Filter Head Gasket

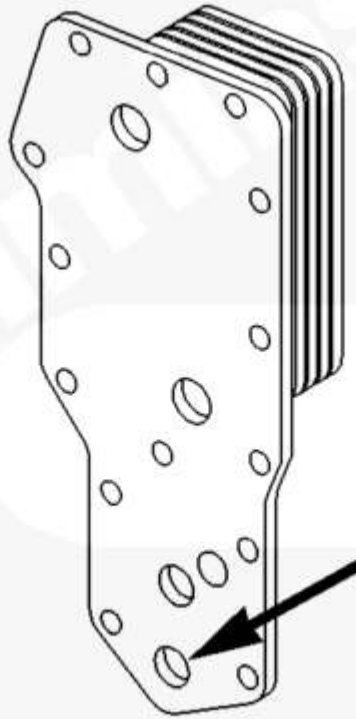
A new gasket, Part No. 3942915, is for use with dump-to-pump style lube cooler cover, Part No. 3942366 **only**; this gasket can be identified by the “window” opening near the pressure regulator valve in the filter head. Use of this gasket with the '94B dump-to-sump style cooler covers can result in low oil pressure due to the additional “window”. This “window” eliminates gasket cavitation in the area of pressure regulated oil return on dump-to-pump systems, but will cause pressure loss if used in a dump-to-sump system.

Gasket, Part No. 3929792, **must** be used on **all** dump-to-sump lubrication systems.

Oil Cooler Core

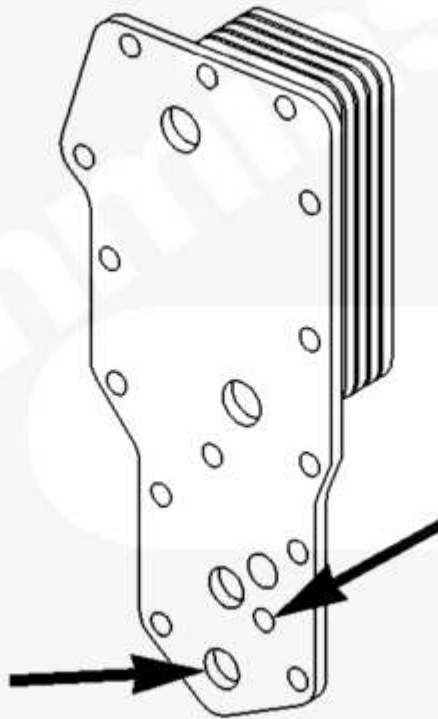


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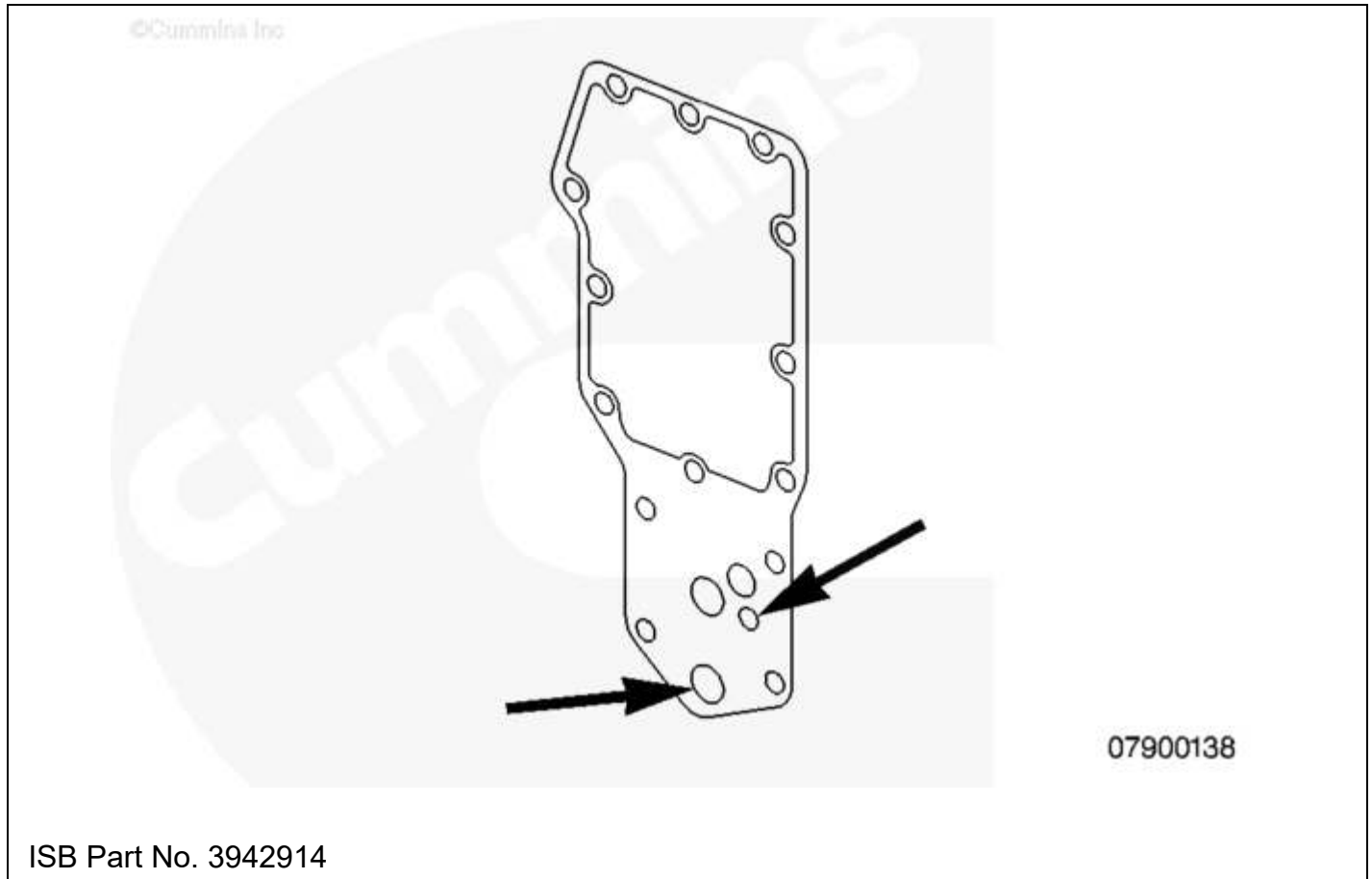
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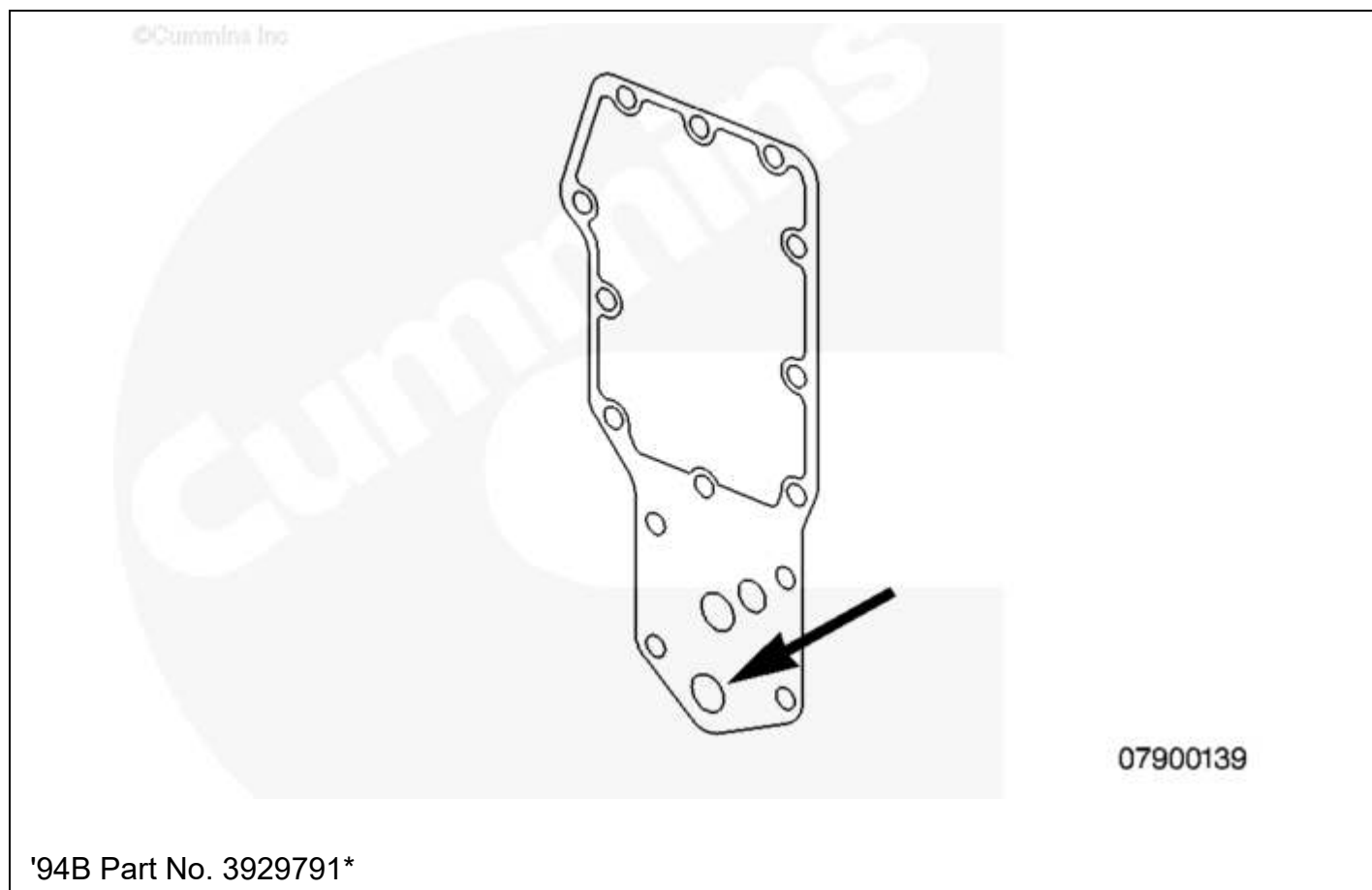
Three distinctly different cooler cores may be encountered in service.

- Coolers with four passage drillings have drillings at both the dump-to-sump and dump-to-pump locations. These are **not** to be reused on ISB block s.

- Coolers with three passage drillings designed for dump-to-sump lubricating systems may be used in a STORM or PRE- storm block **if** the engine is a pre-ISB engine with a dump-to-sump oil system.
- Coolers with three passage drillings designed for dump-to-pump lubricating systems may **only** be used on STORM block with a dump-to-pump oil system.

Oil Cooler Core Gasket





The new oil cooler core gasket, Part No. 3942914, replaces **all** previous B Series cooler core gaskets.

New gasket, Part No. 3942914, **must** be used on any engine that is built using the STORM block engine.

* The ISB gasket, Part No. 3942914, supersedes the '94B gasket, Part No. 3929791.

LUBE System Component Comparisons for STORM Block / Non- STORM Block Comparisons						
	LubeSystem:	Return to Pan		Return to Pan	Return to Pump	Return to Pump
	Block Used:	Pre- STORM		STORM	STORM	STORM
	Engine:	Pre-ISB		Pre-ISB	Pre-ISB	ISB
Oil Cooler Cover Gasket		3942914		3942914	3942914	3942914
Oil Cooler Core		3 PassageDrillings (Dump-to-Sump)	4 PassageDrillings(Dump-to-Sump)	3 PassageDrillings(Dump-to-Sump)	3 PassageDrillings(Dump-to-Pump)	3 PassageDrillings(Dump-to-Pump)

LUBE System Component Comparisons for STORM Block / Non- STORM Block Comparisons						
	LubeSystem:	Return to Pan		Return to Pan	Return to Pump	Return to Pump
	Block Used:	Pre- STORM		STORM	STORM	STORM
	Engine:	Pre-ISB		Pre-ISB	Pre-ISB	ISB
		3921558	3903375	3921558	3942010	3942010
		3921557	3904320	3921557		
		3928907	3918292	3928907		
		3928908	3911940	3928908		
			3918293			
Oil Cooler Cover Gasket		3929792		3929792	3942915	3942915
Cooler Cover		These Cooler Covers are designed for Dump-to-Sump Lubricating Systems			This new cooler cover is designed for Dump-to-Pump Lube Systems	
		3915243		3915243	3942366	3942366
		3918295		3918295		
		3918954		3918954		
		3923332		3923332		
		3909352		3909352		
		3915243		3915243		
		3918295		3918295		
		3918954		3918954		
		3909352		3909352		
		3918288		3918288		
		3918328		3918328		
		3924338		3924338		
		3909351		3909351		
		3915245		3915245		
Lube Pump		3926203		3926203	3941742	3941742

Last Modified: 15-Sep-2011
