



# Service Bulletin

File In Section: 06 - Engine/Propulsion System

Bulletin No.: 04-06-01-032

Date: November, 2004



## INFORMATION

**Subject:** Information on Northstar® Engine Mechanical Repairs

**Models:** 1994-2002 Cadillac Eldorado  
1994-2004 Cadillac Seville  
1994-2005 Cadillac DeVille  
1996-2000 Cadillac Concours  
with 4.6L Northstar® Engine (VINs Y, 9 - RPOs LD8, L37)

Now that parts are available to correct customer concerns of oil consumption and cold start conditions on these engines, there has been some confusion on what parts are for which repairs. This bulletin has a section listing a guideline of parts required for typical engine repair. Also included is a discussion of thread repairs, when and how many Time Serts should be used during repairs. There is also a chart that shows the correct special tool numbers to use for which model years when installing Time type serts. And finally, the head bolt torque specifications when reassembling the engine are listed at the end of this bulletin.

**Important:** When performing Northstar® engine mechanical repairs that require removal of the oil pan, oil manifold or separation of the upper and lower crankcases, use the RTV sealant procedure in Bulletin 03-06-01-027 when reassembling. The RTV sealant has a better resistance to heat and will not shrink like the current gaskets material.

**Important:** Light vertical scratches that are not deep enough to catch a fingernail are acceptable. If any of the cylinder bores are scored, that is not acceptable and the engine will have to be replaced.

**Important:** When replacing pistons or rings, the crankcase halves do not need to be separated to complete the repair. It is advised at the time of the piston/ring repairs that the original crankcase seals be removed and sealed with RTV per Bulletin 03-06-01-027.

### **Bulletin 02-06-01-009C Oil Economy**

This bulletin addresses Northstar® oil economy only. The cleaning procedure in this bulletin should be done first and the oil economy evaluated. In most cases, cleaning the cylinders per Bulletin 02-06-01-009C will restore the function of the rings to wipe the oil down the bore. If the oil economy after cleaning is still not satisfactory, then the revised piston rings should be installed. For an oil consumption concern, it is not necessary to replace pistons. The original pistons can be cleaned. The critical part of the cleaning process is to remove all the carbon deposits from the piston ring grooves.

**Important:** The cylinder bore surface does not require any preparation when installing new rings. The repair would be ineffective if any honing is done to the bore surface.

Recognize that the oil consumption mileage figure of 2000 miles per quart (3200 km per 0.946 liters) in Bulletin 01-06-01-011A applies to a vehicle during the warranty period. As mileage accumulates on the engine, oil economy mileage will decrease due to normal wear in the engine.

**Bulletin 03-06-01-025 Cold Engine Knock**

This bulletin address cold start engine knock noise. Use of top engine cleaner, or the cleaning process for oil consumption is only a temporary fix for this condition on 2000 through 2003 vehicles. Unless the driving cycle is changed, the cold knock will return in a short time. The piston listed in this bulletin is the only recommended repair to eliminate a cold start knock from reoccurring.

**Important:** If only a single piston(s) is installed for another type concern, this part number can be used without any balance or performance concerns. P/N 89017413 is the only service piston and it is completely interchangeable with the original pistons. If the condition is for cold knock, all 8 pistons should be replaced.

**Important:** A small percentage of vehicles have exhibited a subtle ticking sound when the engine is at operating temperature. The noise is usually heard through the fender wells with the hood closed. This noise is a wrist pin noise and should be considered characteristic of this engine with these pistons. There is not any mechanical damage or wear from this noise, no further repairs should be attempted.

**Recommended Parts List**

When performing either oil consumption or cold engine noise repairs, the following is a list of commonly used parts. The recommendation in SI to replace the rod bearings was based on the assumption that the engine has over 100,000 miles (160,000 kilometers) when engine mechanical service is being performed. The rod bearing should be inspected for signs of wear and replaced, if necessary.

**Northstar® Oil Ring Replace, Commonly Used Parts**

Part	Description
Front cover gasket	Install New
Rear main seal	Install New
Head bolt	Install New
Rod Bolt	Install New
Flywheel bolts	Install New
Head Gasket set — Left	Install New
Head Gasket set — Right	Install New
Cam Seal	Install New
Water cross over gaskets	Install New
Housing	Install New
Oil Adaptor seal	Install New
DEX-COOL	Install New
Coolant line Connector	Install New

**Northstar® Oil Ring Replace, Commonly Used Parts (cont'd)**

Part	Description
Oil Manifold	Install New, The procedure requires outer perimeter bolts to be removed contributing to a potential leak when retightened.
Plastic Plugs (4)	Install New, These could be damaged since they are plastic. It's only splash oil behind these.
Cat Convert Gasket	Not needed. Reuse unless damaged
Rod Bearings	As needed, based on wear. Vehicles with less than 90,000 miles should not need replacement.
Front cover with seal	Not needed. Use due care and the front cover will not be damaged and can be reused.
Valve cover gaskets	Not needed. If the cover is removed carefully and the seal stays in the valve cover, you can reuse.
Valve seal	Not needed. These are very good valve seals and do not need to be replaced, especially if they are not disassembled.
Sealer	Record lot number from tube on repair order. If there are any issues with the sealer the lot can then be traced and analyzed.
Cam Lube	Not needed, Engine oil will suffice, not replacing the camshafts.
Main bolt	Not needed. Can be reused, these bolts are not stretched when installed.
Tube Seals (2)	Not needed. These are the seals on the underside of V/C these seals for the Ign. Module ground, protecting from splash oil and PCV sealing. These are reusable.
Spark Plug tube Seals (8)	Not needed. These are the seals on the underside of V/C these seals for the Spark plugs.
Pan Gasket	Should be using sealer 12378521 (in Canada 88901148) per Bulletin 03-06-01-027 instead of gasket. Record lot number on repair order.
Manifold Seals (8)	Not needed. Should be reusable in most cases.
Exhaust Gaskets (2)	Not needed. These are metal composite gaskets, they should be reused



### Head Bolt Thread Repairs

When disassembling the engine, all head bolt threads should be inspected as they are removed. If there is any section of the aluminum block thread on the bolt, that hole will need a Time Sert repair. Typically, all the cylinder head bolt holes do not need Time Serts. The recommendation is to do a thread repair on the damaged hole(s) and the adjacent holes. As the clamp load is relieved from one hole (threads pulling), the adjacent holes threads load will increase and may be damaged during reassembly.

There have been some comments about Time Serts pulling out of the block in a short time after a repair was done. The manufacture of the insert also makes a larger size insert. This larger size insert cannot be used for warranty repairs. Due to the increased O.D. of this sert, it's possible that when installing this larger sert that it will break out in the water jacket causing a coolant leak.

The most likely reason that a Time Sert pulls out after installation is that the incorrect J tools were used for the model year application. If the incorrect tool is used, installation of the sert could be either too deep in the hole or not deep enough. The table below lists which tool should be used for which model years.

### Model Year:

1994–1999

### TimeSert kit:

J 42385–500

Component Bolt Hole	Head	Main
Plate	301	306
Bushing	501	508
Alignment pin	502	509
Short bolt	503	510
Long bolt	—	—
Drill	504	511
Inboard stop collar	N/A	—
Tap	505	512
Driver/installer	506	513
Insert	507	514
Thread size	M11 x 1.5 x 30mm	M10 x 1.5 x 22 mm
Outboard hole depth	75 mm	32 mm
Counter bore depth	35 mm	4 mm
Thread length	35 mm	26.5 mm
Bottom	5 mm	1.5 mm
Inboard hole depth	75 mm	32 mm
Counter bore depth	35 mm	4 mm
Thread length	35 mm	26.5 mm
Bottom	5 mm	1.5 mm
Cylinder head boss height - outboard	76.0 mm	—
Cylinder head boss height - inboard	76.0 mm	—
Bolt Part Number	1647217	3542310
Bolt Length (under washer)	139.9 mm	125.8 mm
Thread length	44.5 mm	23.3 mm

**Model Year:**

2000–2003

**TimeSert kit:**

J 42385–2000

Component Bolt Hole	Head	Head	Main
Plate	301	301	306
Bushing	302	2022	307
Alignment pin	303	303	308
Short bolt	503	503	510
Long bolt	604	604	—
Drill	2006	2006	511
Inboard stop collar	2017	2017	—
Tap	2007	2007	512
Driver/installer	2008	2008	513
Insert	507	507	514
Thread size	M11 x 1.5 x 30 mm	M11 x 1.5 x 30 mm	M10 x 1.5 x 22 mm
Outboard hole depth	96.5 mm	89.5 mm	32 mm
Counter bore depth	51.5 mm	45.5 mm	4 mm
Thread length	38 mm	38 mm	26.5 mm
Bottom	7 mm	6 mm	1.5 mm
Inboard hole depth	80 mm	73 mm	32 mm
Counter bore depth	35 mm	29 mm	4 mm
Thread length	38 mm	38 mm	26.5 mm
Bottom	7 mm	6 mm	1.5 mm
Cylinder head boss height - outboard	76.0 mm	76.0 mm	—
Cylinder head boss height - inboard	92.5 mm	92.5 mm	—
Bolt Part Number	12557775	12557775	3542310
Bolt Length (under washer)	157.2 mm	157.2 mm	125.8 mm
Thread length	45.3 mm	45.3 mm	23.3 mm

**Important:** Late in MY2002, cylinder head bolt holes in block were revised. Thread start height was raised by 7 mm, block bolt hole depth was reduced by 7 mm.

**Model Year:**

2004–2005

**TimeSert kit:**

J 42385–2030 Head

J 42385–2000 Main

Component Bolt Hole	Head	Main
Plate	301	306
Bushing	302	307
Alignment pin	303	308
Short bolt	2035	510
Long bolt	2036	—
Drill	2031	511
Inboard stop collar	2034	—
Tap	2032	512
Driver/installer	2033	513
Insert	108	514
Thread size	M11 x 2.0 x 30 mm	M10 x 1.5 x 22 mm
Outboard hole depth	89.5 mm	32 mm
Counter bore depth	45.5 mm	4 mm
Thread length	38 mm	26.5 mm
Bottom	6 mm	1.5 mm
Inboard hole depth	73 mm	32 mm
Counter bore depth	29 mm	4 mm
Thread length	38 mm	26.5 mm
Bottom	6 mm	1.5 mm
Cylinder head boss height - outboard	76.0 mm	—
Cylinder head boss height - inboard	92.5 mm	—
Bolt Part Number	11589058	3542310
Bolt Length (under washer)	157.2 mm	125.8 mm
Thread length	64.8 mm	23.3 mm

**Torque Specifications:****1993–1999 Head Bolt Torque**

- First Pass 40 N·m (30 lb ft)
- Second Pass -- 70 Degrees
- Third Pass -- 60 Degrees
- Fourth Pass -- 60 Degrees (190 Degrees total)

**2000–2003 Head Bolt Torque:**

- First Pass 40 N·m (30 lb ft)
- Second Pass -- 70 Degrees
- Third Pass -- 60 Degrees
- Fourth Pass -- 45 Degrees (175 Degrees total)

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