

Exclusive Labor Cost Study

Rebuilding the Late Model Hemi Engine

CHRYSLER 5.7 L / 6.1 L

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ASSOCIATE PUBLISHER/ EDITOR DOUG KAUFMAN
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Although Chrysler didn't invent the hemispherical chamber, they were the first to build an engine with a hemi chamber for an American car back in 1951. Originally tagged the "Double Rocker Shaft V8," it soon became "the Hemi." It made a lot more power than the rest of the car engines that were available at that time, so some people say Chrysler started the "horsepower wars" with the Hemi.

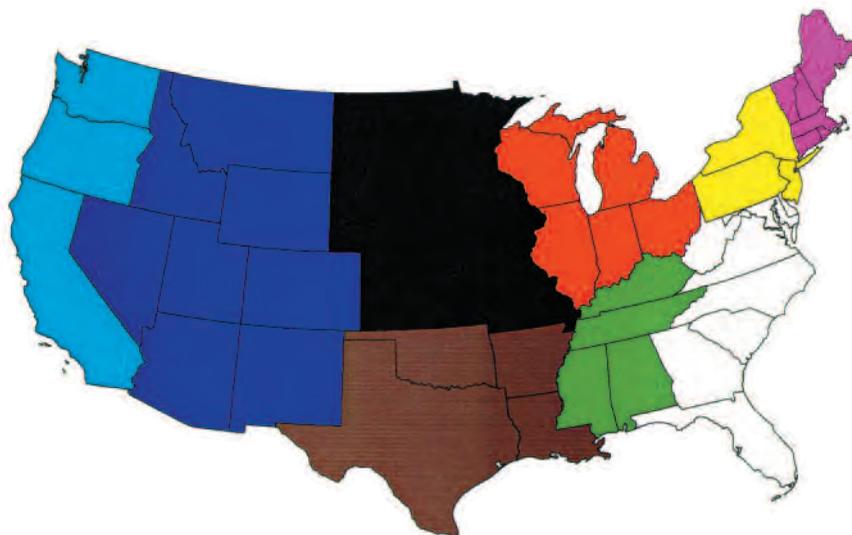
- With its good ports and bigger valves that opened away from the walls it had better volumetric efficiency.
- It had a low "surface-to-volume ratio" which gave it better thermal efficiency so it made more power.

So, with the best chamber, plenty of cubes, generous ports and better airflow, it was a winner – except that it was heavy (a 392 cid Chrysler weighed 737 pounds), more complicated and more expensive to build – so it eventually lost out to the big wedge motors like the 383, 400 and the 440 cid.

Chrysler has built three different families of Hemi motors since 1951. There were 12 different engines in the first generation that ranged from a 241 cid Dodge to the 392 cid Chrysler and spanned almost ten years from 1951 through 1958.

The only engine in the second generation was the legendary 426 that was built from 1964 thru 1971. It was originally intended to be used for racing at NHRA and NASCAR tracks, but it ended up on the street because NASCAR told Chrysler that they had to sell at least 500 cars with the "street Hemi" to make it legal for the Daytona 500 that year. It died in '71 because NASCAR had outlawed it on the track and the emissions police frowned on it for the street.

But in the late '90s, when Chrysler realized that it needed a new engine with more power and torque for the 2003 Ram pickups, the third generation Hemi was born. Since then, it's been used in SUVs, Jeeps and RWD cars, too. Some purists say it's not a real Hemi because it has squish areas on both sides of the chamber, but as *Engine Builder* technical (continued on page 30)



REGIONS

	NUMBER OF STATES IN EACH REGION
■ EAST NORTH CENTRAL	(5)
■ EAST SOUTH CENTRAL	(4)
■ MIDDLE ATLANTIC	(3)
■ MOUNTAIN	(8)
■ NEW ENGLAND	(6)
■ PACIFIC (Including Hawaii)	(4)
■ SOUTH ATLANTIC	(9)
■ WEST NORTH CENTRAL	(7)
■ WEST SOUTH CENTRAL	(4)



National Average, Median and Mode Labor Charges For Rebuilding The Hemi 5.7L/6.1L Engine

Service	Average	Median	Mode	95% CI range
Head Work				
Clean/disassemble/estimate valve job (both)	\$72.50	\$64.00	\$50.00	\$67.50-77.40
Clean & pressure test both cylinder heads	\$98.40	\$90.00	\$80.00	\$92.90-103.90
Dye penetrant inspect heads	\$87.10	\$70.00	\$50.00	\$78.80-95.50
Basic valve job both heads	\$197.20	\$180.00	\$150.00	\$187.10-207.30
3-angle valve job both heads	\$225.50	\$200.00	\$200.00	\$214.00-236.90
Install 1 valve guide	\$21.70	\$18.00	\$20.00	\$19.70-23.80
Install 8 guides	\$72.90	\$65.00	\$80.00	\$68.60-77.10
Install 16 guides	\$124.19	\$120.00	\$160.00	\$117.00-131.30
Machine and install 1 valve seat	\$29.40	\$25.00	\$25.00	\$27.30-31.50
Machine and install 4 valve seats	\$72.60	\$60.00	\$80.00	\$68.10-77.00
Machine and install 8 valve seats	\$122.90	\$120.00	\$80.00	\$115.40-130.30
Test valve springs (8)	\$25.90	\$20.00	\$20.00	\$22.60-29.30
Clean & surface cylinder head (1 head)	\$60.40	\$55.00	\$40.00	\$57.40-63.50
Weld crack repair in combustion cham. (each)	\$86.30	\$75.00	\$50.00	\$77.20-95.50
Crack repair using pin (ea.)	\$57.30	\$50.00	\$50.00	\$48.60-65.90
Install spark plug thread repair insert (each)	\$33.90	\$30.00	\$25.00	\$31.60-36.10
Other thread repair (each)	\$27.30	\$20.00	\$25.00	\$24.40-30.20
Complete valve job (1 head)	\$141.60	\$125.00	\$100.00	\$131.50-151.70
Dissassemble, clean/assemble rocker assem.	\$75.20	\$60.00	\$60.00	\$68.10-82.30
Block Work				
Clean cylinder block	\$70.60	\$65.00	\$50.00	\$64.90-76.40
Dissassemble, clean short block & estimate	\$138.90	\$125.00	\$150.00	\$130.40-147.30
Magnetic powder inspect block	\$54.90	\$50.00	\$50.00	\$50.00-59.80
Bore cylinders oversize and hone block	\$179.90	\$175.00	\$200.00	\$170.40-189.40
Install cylinder sleeve & bore (1 sleeve)	\$111.20	\$100.00	\$100.00	\$105.90-116.40
Resize big end of rods (per 8)	\$104.90	\$100.00	\$120.00	\$98.70-111.20
Clean and magnetic inspect rods (per 8)	\$53.70	\$44.50	\$40.00	\$48.40-59.00
Install rods on pistons (8)	\$66.20	\$60.00	\$80.00	\$60.70-71.70
Resurface block decks	\$128.90	\$120.00	\$150.00	\$122.20-135.50
Install core plugs (all)	\$28.90	\$25.00	\$20.00	\$26.90-30.80
Thread repair insert (each)	\$27.70	\$20.00	\$25.00	\$23.70-31.70
Align hone	\$161.10	\$150.00	\$125.00	\$151.90-170.30
Install cam bearings in block	\$48.20	\$40.00	\$40.00	\$44.30-52.00
Crankshaft Work				
Clean crank & check for cracks	\$47.20	\$45.00	\$50.00	\$44.40-50.10
Straighten crankshaft	\$52.80	\$45.00	\$50.00	\$46.10-59.50
Grind crankshaft	\$128.30	\$125.00	\$125.00	\$122.80-133.80
Polish crankshaft	\$49.00	\$42.00	\$50.00	\$44.10-53.80
Balance crankshaft	\$175.60	\$175.00	\$200.00	\$166.40-185.10
Miscellaneous Services				
Prep for dyno	\$180.40	\$150.00	\$200.00	\$152.50-208.20
Inspect cam, polish journals as needed	\$36.00	\$32.50	\$25.00	\$33.40-38.50
Assemble short block	\$309.70	\$295.00	\$300.00	\$290.10-329.30
Assemble long block	\$520.20	\$500.00	\$500.00	\$491.10-549.30
Clean all sheet metal/covers	\$58.00	\$50.00	\$50.00	\$53.50-62.50
Resurface flywheel	\$46.50	\$45.00	\$40.00	\$44.90-48.10
Rebuild oil pump	\$39.10	\$35.00	\$25.00	\$35.50-42.60

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of the engines (and from which much of this information has been drawn) it's close enough for most of us. It has a hemi-shaped chamber with the valves canted toward the middle of the cylinder, four rocker shafts with good valvetrain geometry and generous ports. And, it incorporates some modern technology including aluminum heads, dual spark plugs, roller lifters and a "multi-displacement system" (MDS) that deactivates four cylinders under light loads. It can pump out 345 hp and still get 21 mpg on the road.

Available in both 5.7L and the 6.1L configurations, it reintroduced the phrase "That thing got a Hemi?" into our culture.

When it comes to rebuilding this popular engine, it may be difficult for you to know where you stand on price. While you should never set your pricing directly based on what any of your competition does, it's always helpful to understand the ballpark in which you're playing.

To help, we present here our current labor costing study on rebuilding late model Hemi engines, with a look at national and regional average labor charges. The study covers various head, block and crankshaft service procedures as well as miscellaneous labor charges.

The individual charts begin below. In addition, the detailed chart on page 28 represents the national average, median and mode labor charges for all of the procedures cov-

ered in our survey.

The "average" for a specific labor charge is the result of adding all of the charges for that service from all respondents and then dividing that number by the total number of respondents. The "median" is the result of ranking all of the survey responses from highest to lowest and then finding the number that falls exactly in the middle. The "mode" is simply the most-often reported number from all survey respondents.

Additionally, our chart provides the "95% Confidence Interval (CI)" range. In real terms, if you were to ask all of the machine shops in the country what their labor rates were for each operation, it is 95 percent certain that the "true" average labor cost would fall within this range.

You may find your prices are either lower or higher than these averages. Don't worry – as we've tried to explain for years, we believe that knowing your costs is the only sure way to set your pricing. You may have updated equipment that allows you to be more productive than these charts indicate.

Conversely, you may find your costs are significantly higher than others in your same area. These discrepancies should not be seen as indicating that your costs are either too high or too low. But they will hopefully give you an incentive to look carefully at what you charge for services...and why.

"Some shops may include certain

operations in the process of doing others," says Bob Roberts, Market Research Manager for Babcox Research. "This may lead to a higher dollar amount charged. Additionally, some shops may have given us an 'each' price when we wanted 'all' or they may have included an 'all' when we asked 'price each.'"

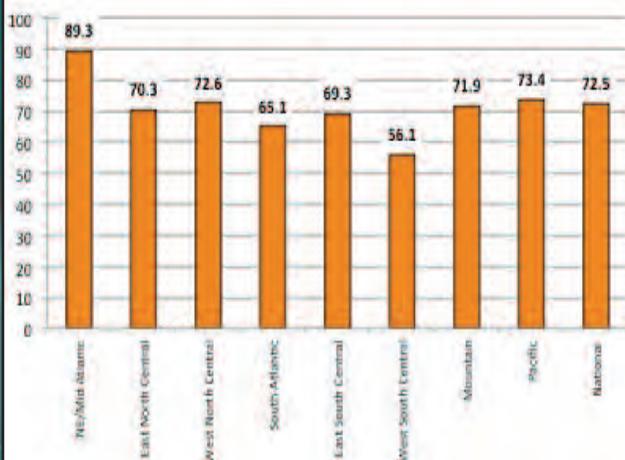
In a few cases, we did not provide a regional breakdown for certain services listed below. The information provided did not vary enough to give interesting regional breakdowns for a few categories, so only the national information is presented.

Roberts says while the overall results are statistically reliable, the way some respondents answered the question may have skewed certain numbers slightly.

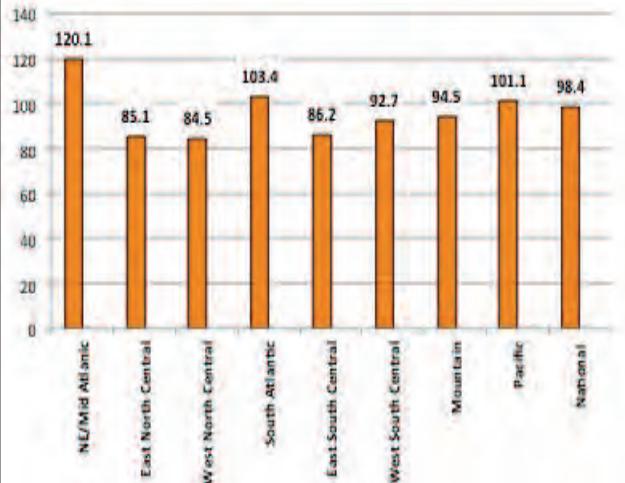
"Some shops reported to us that they perform some repairs on a 'time' basis. We did not use a dollar-per-hour value if they provided it. A few shops price all their repairs on a 'time' basis. This is most common with welding repairs. Some shops do not perform all the operations listed and this leads to a smaller number of observations and thus a less reliable average," Roberts says. However, he says "In all cases, the national average will be the most accurate figure."

You can read Doug Anderson's complete article on rebuilding the 5.7/6.1L Hemi on *Engine Builder's* website (www.enginebuildermag.com) by searching for "Anderson Rebuilding Hemi." ■

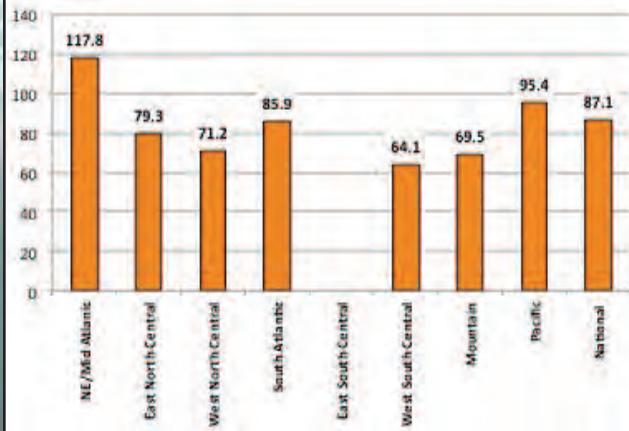
Clean/Disassemble/Estimate Valve Job (Both)



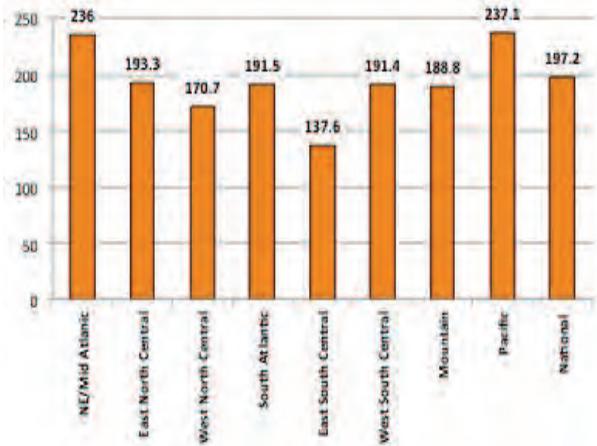
Clean and Pressure Test Cylinder Heads (Both)



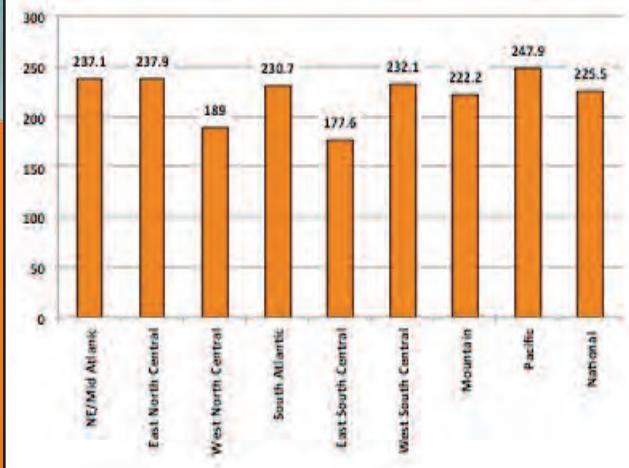
Dye Penetrant Inspect Heads



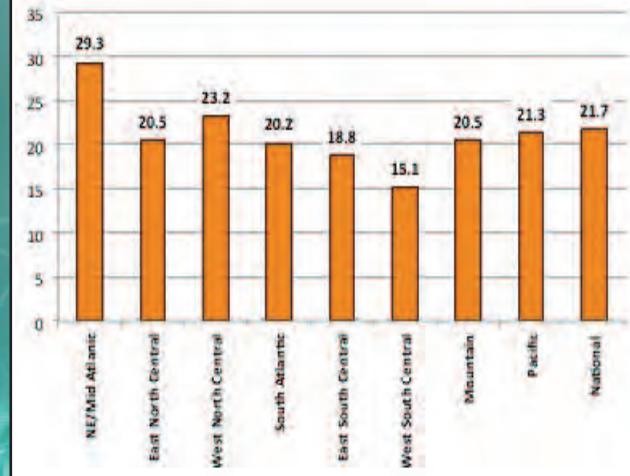
Basic Valve Job (Both)



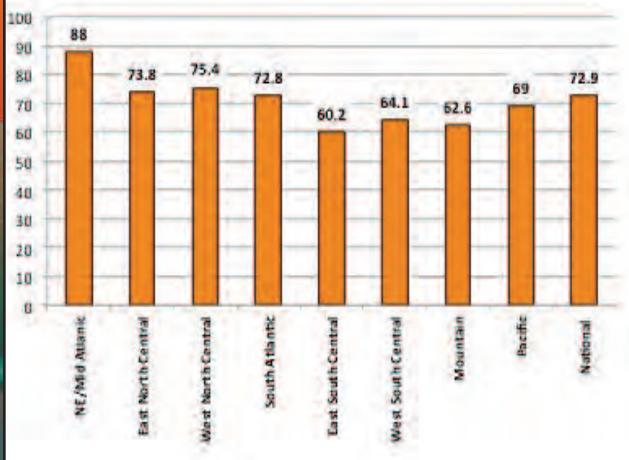
3-Angle Valve Job (Both)



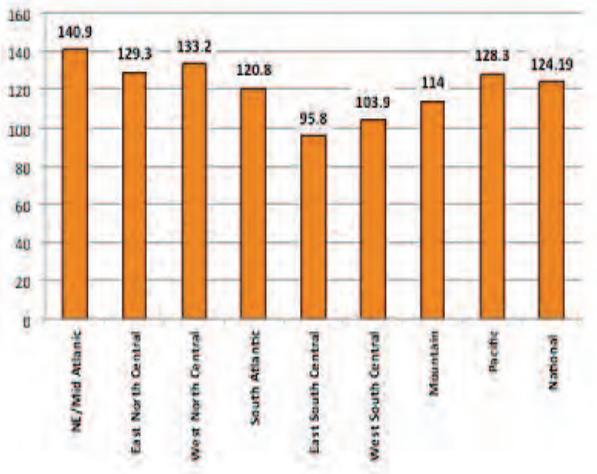
Install 1 Valve Guide



Install 8 Valve Guides

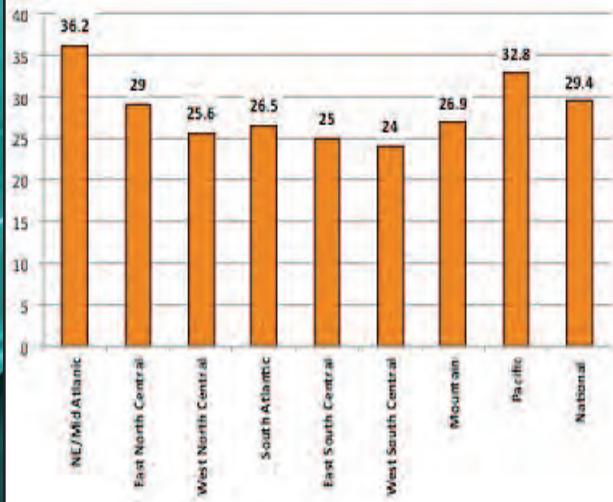


Install 16 Valve Guides

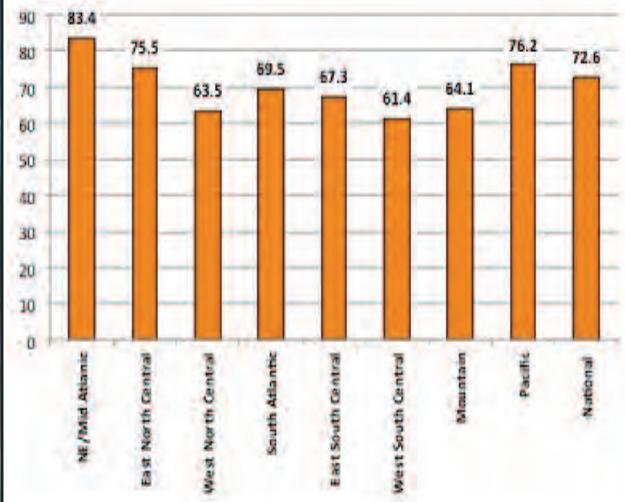




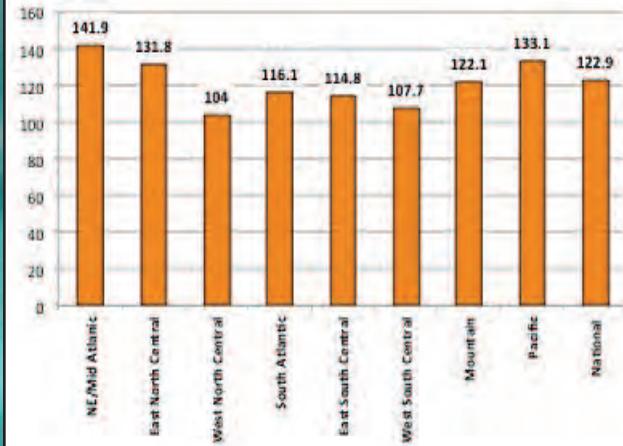
Machine & install 1 Valve Seat



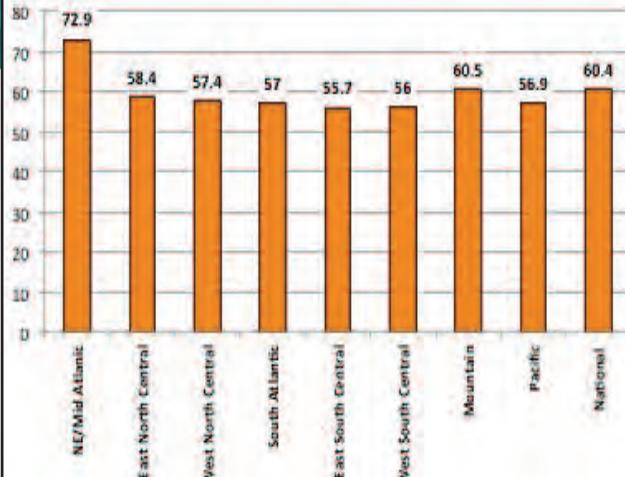
Machine & Install 4 Valve Seats



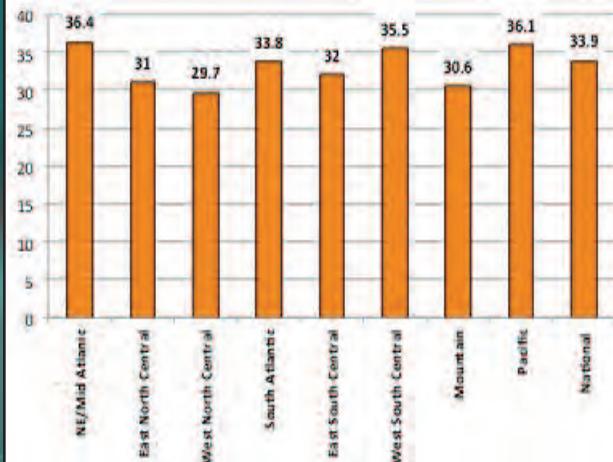
Machine & Install 8 Valve Seats



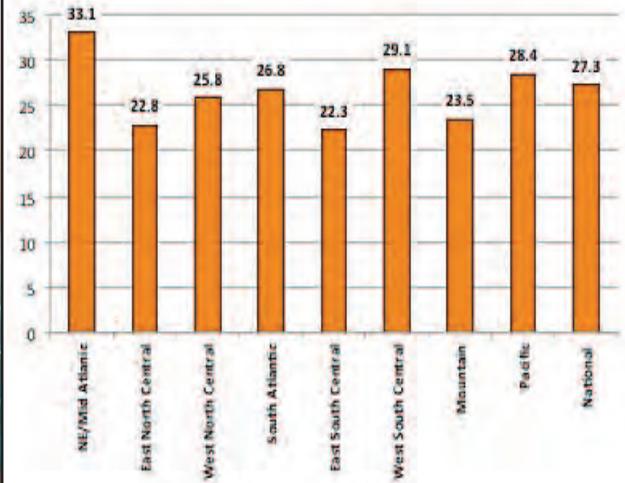
Clean & Surface Cylinder Head (Each)



Install Spark Plug Thread Repair Insert (Each)



Other Thread Repair (Each)



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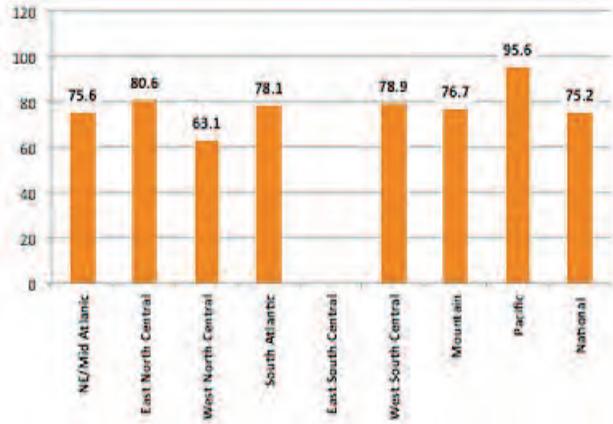
Second- and Third-Place Finalists will be named and awarded as well!



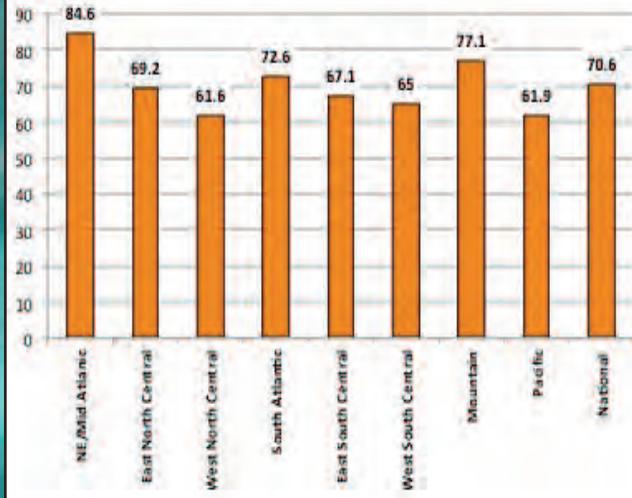
Complete Valve Job (Each Head)



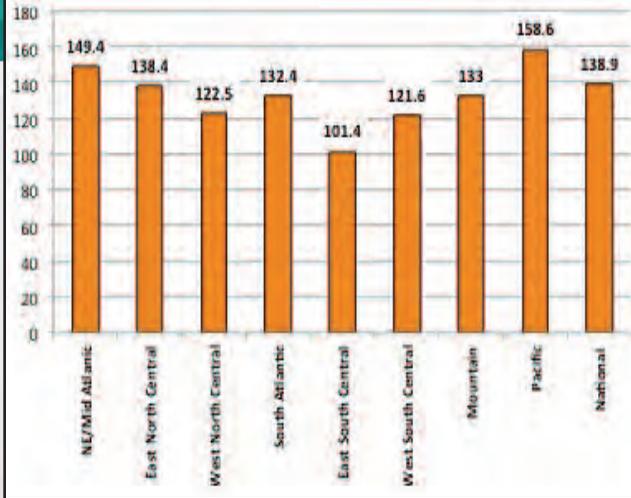
Disassemble, Clean/Assemble Rocker Assembly



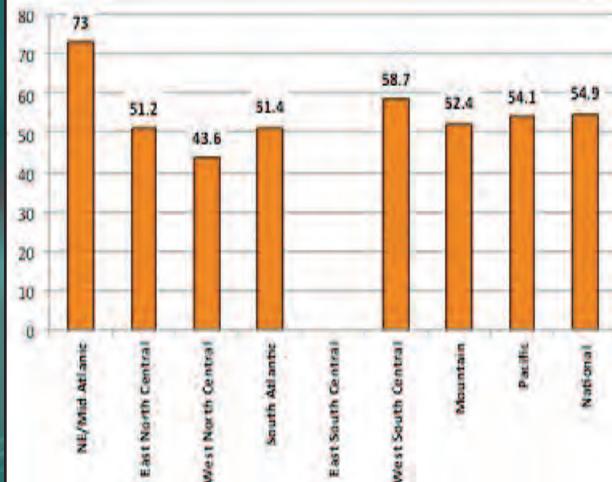
Clean Cylinder Block



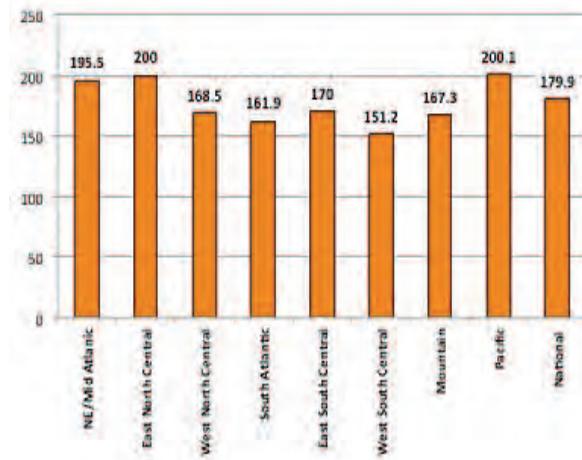
Disassemble, Clean Short Block & Estimate



Magnetic Powder Inspect Block



Bore Cylinders Oversize and Hone Block



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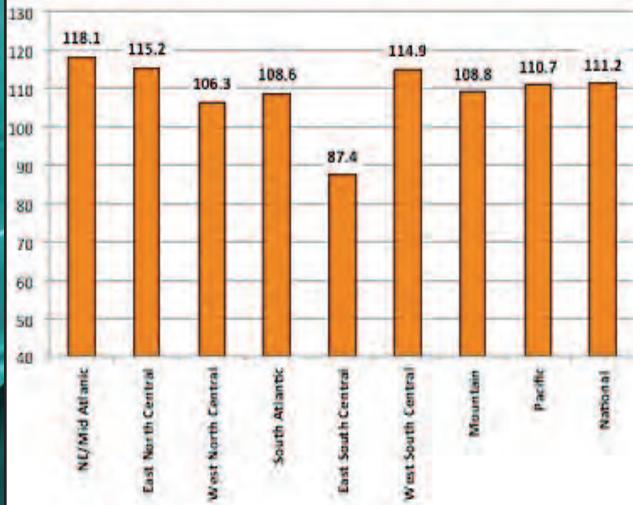


* Call for details

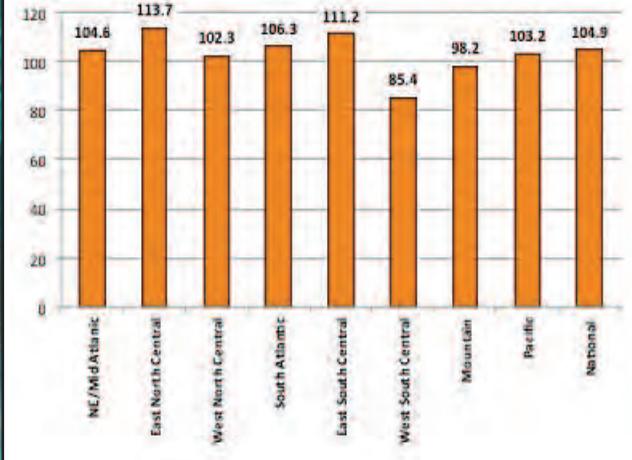
...and over 80 more!



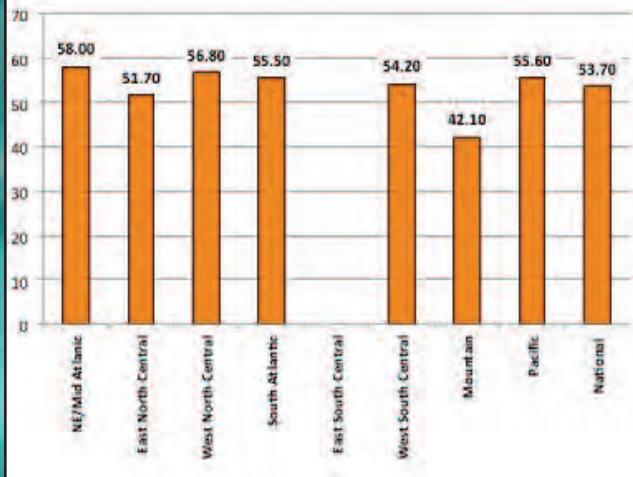
Install Cylinder Sleeve and Bore



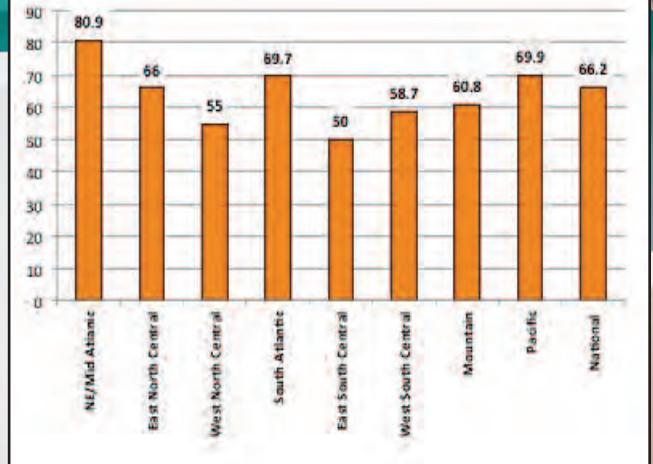
Resize Big End of Connecting Rods (8)



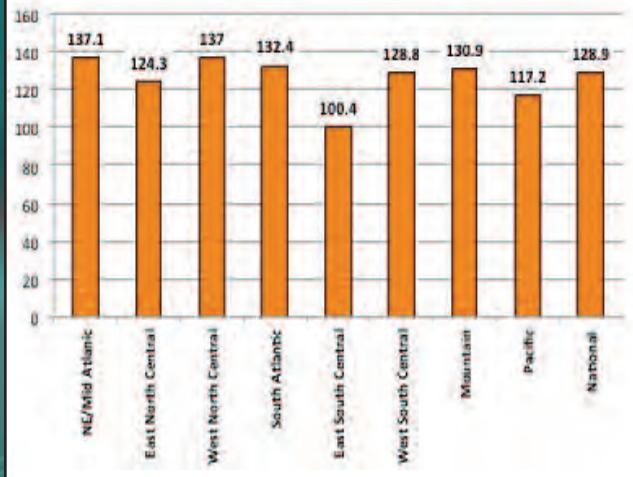
Clean and Magnetic Particle Inspect Rods (8)



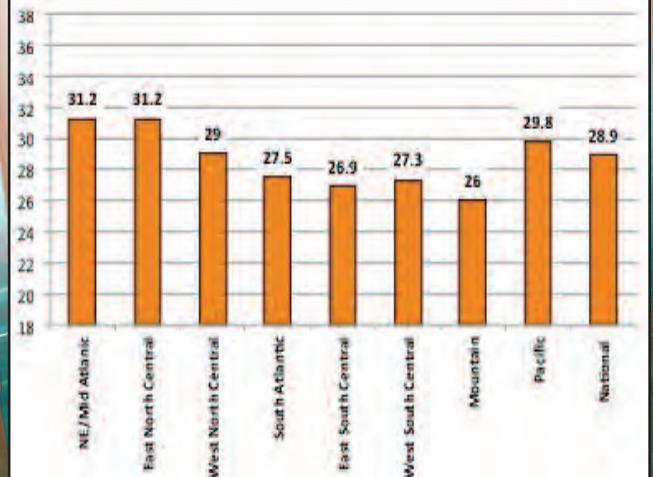
Install Rods on Pistons (8)



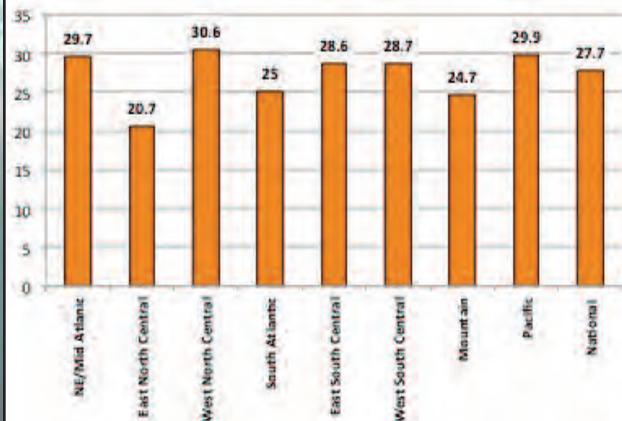
Resurface Block Decks



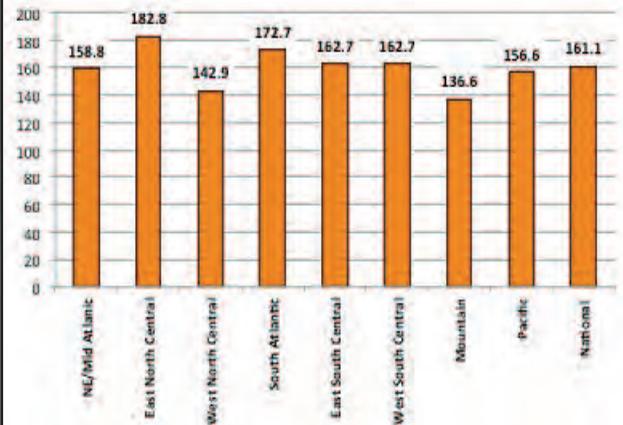
Install Core Plugs (All)



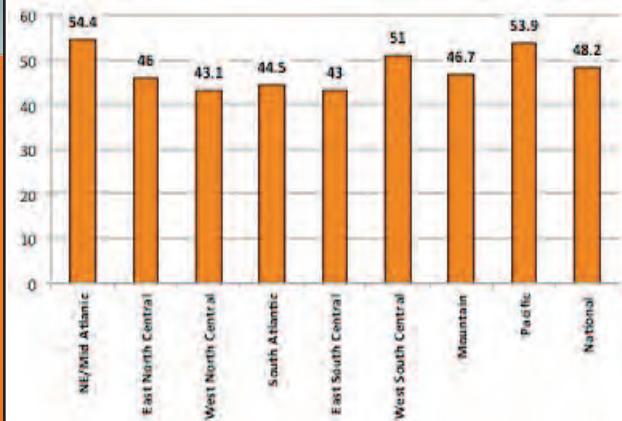
Thread Repair Insert (Each)



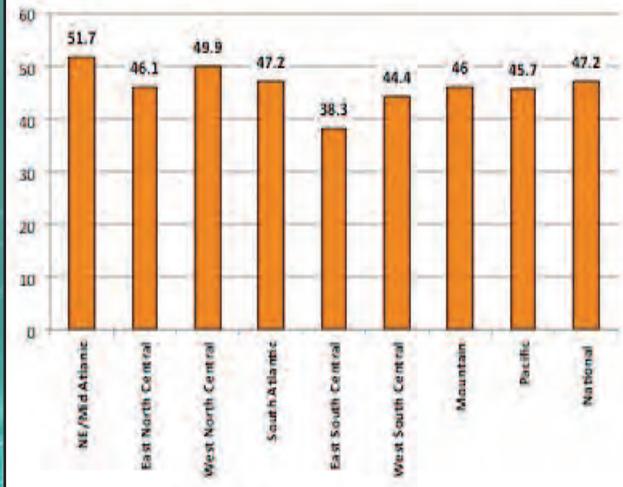
Align Hone



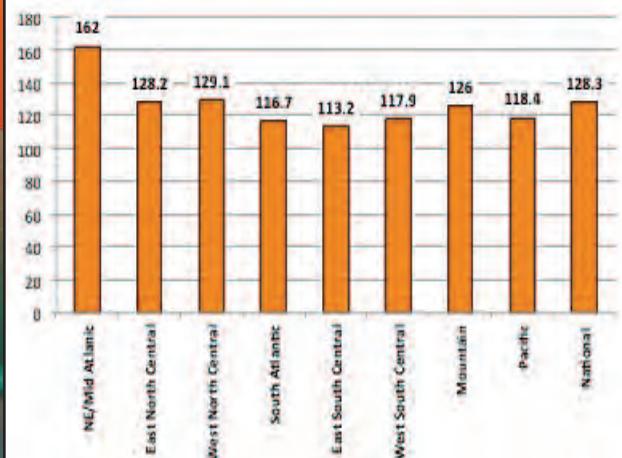
Install Cam Bearings In Block



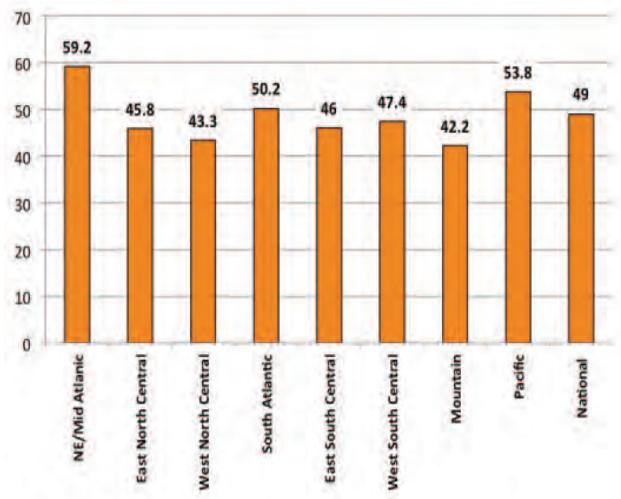
Clean Crank & Check For Cracks



Grind Crankshaft

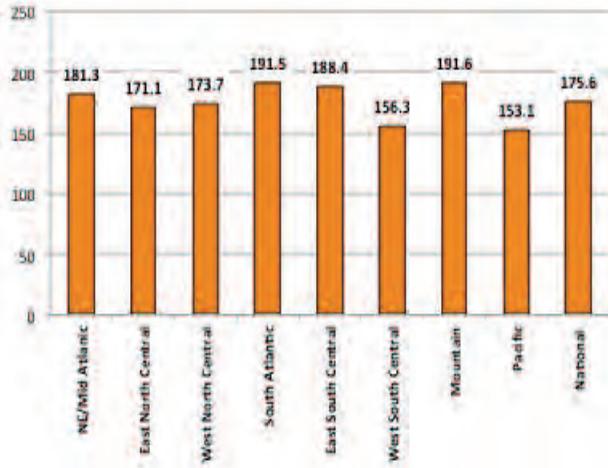


Polish Crankshaft

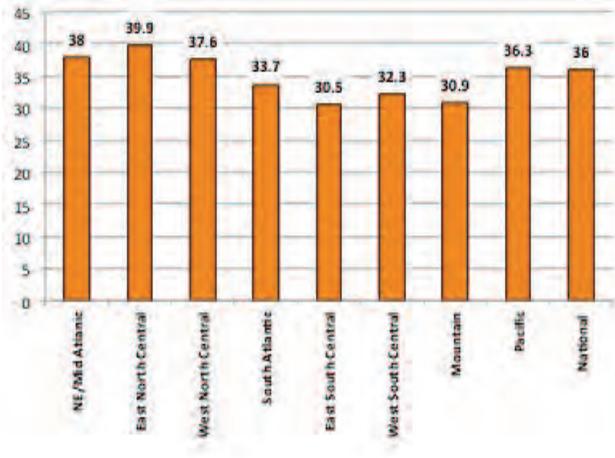




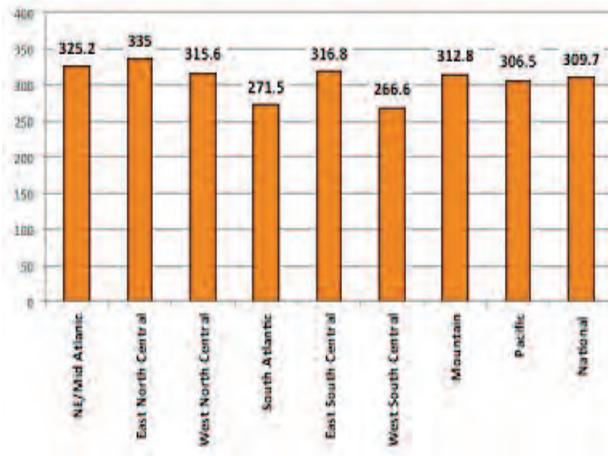
Balance Crankshaft



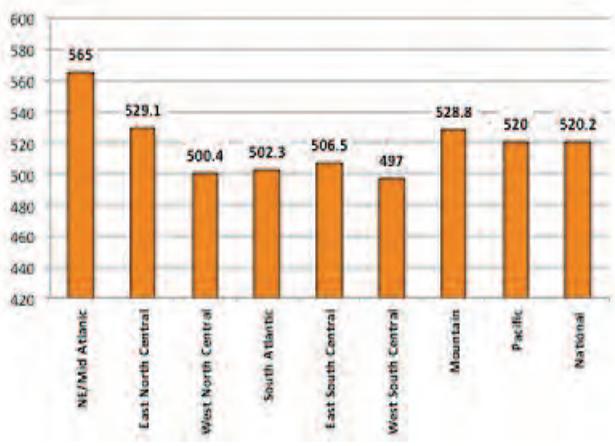
Inspect Cam, Polish Journals As Needed



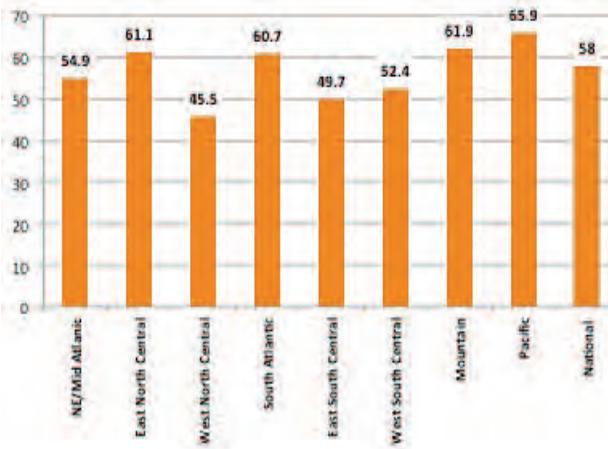
Assemble Short Block



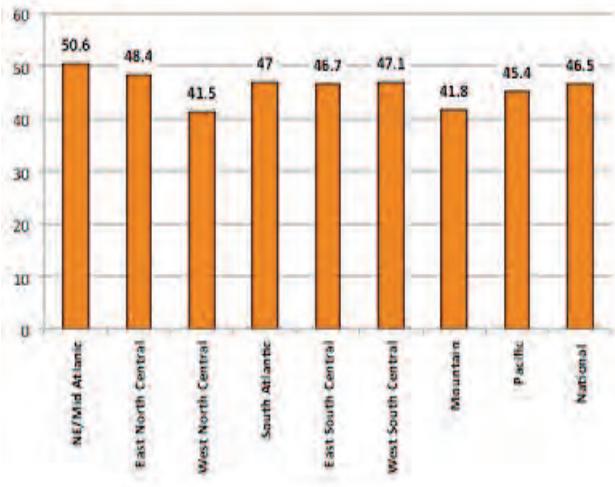
Assemble Long Block



Clean All Sheet Metal/Covers



Resurface Flywheel



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