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Over the past four decades, *Engine Builder* magazine has tracked this industry by surveying the same machine shop/custom engine rebuilder (CER) population. Because of the years of continuous data we've collected, we believe the information in this study is the most reliable data available for tracking trends in the production of engines, cylinder heads and crankshafts, as well as specific business data.

While it isn't always a rosy one, the picture that develops from our survey gives us a better understanding of the environment in which the engine builder, the parts supplier and machinery supplier operate. This industry has been through some tough times, to be sure. There have certainly been major casualties. It's very easy to look at the challenges and profess gloom and doom, but to be honest, the past two years – the heart of the recession that some say may ultimately be perceived

as tough as the Great Depression – have turned out to be pretty good in our industry.

In speaking with engine builders and their suppliers at trade shows, industry meetings, conferences and individual shop visits, things seem to be better for many engine builders, and especially their WD engine parts specialists, than they've seen in a long time. All things being equal, those shops that have survived the past two- to three-year economic tsunami in many cases are doing better today. Maybe they're not as profitable as they could or should be, but many appear to have work that needs done and engine parts suppliers continue to tell us that they are selling a wide variety of parts. And those parts sales, we suspect, have influenced other parts of the typical machine shop's business as well.

The data generated for this year's Machine Shop Market Profile was

collected through survey questionnaires sent to the machine shop/custom engine rebuilding membership of the Engine Builders Association (AERA). Four different questionnaires, consisting of four pages each, were developed to obtain the information contained in our profile.

We mailed questionnaires to the membership of the AERA and contacted a random sample of *Engine Builder* subscribers with an email survey containing key questions regarding production. In all, we heard from more than 230 locations that are performing machine work and building engines in the U.S. Analysis of the data was completed by Babcox Market Research.

The survey information reflects data for production year 2011. Part 1 of this two-part profile includes data on monthly production of engine blocks and cylinder heads, broken out by engine size as well as by gas and



# Engine Production Data

diesel configurations, crankshafts, core sourcing, shop equipment ownership and purchasing, and total production time spent in specific engine building areas.

Nationally, the numbers look like this: the average machine shop produced nearly 18 gas and diesel engines monthly last year, down from 22 per month in 2010. While that seems to be a significant decline (okay, it IS a significant decline – nearly 20 percent, according to our respondents) that number is still higher than anything we've seen in nearly a decade. Combined, that many engines per month still ranks up there with the years from the mid-'90s.

Increases were seen in two areas: six-cylinder gasoline engines (up 25 percent from 2010 – from 3.3 to 4.4 engines per month) and in eight-cylinder diesels (up from .46 engine per month to .65 engine, a 29 percent increase over the 2010 figure.). This makes sense when you think of it – the Cash for Clunkers program likely took many viable V8s out of the market last year and the return in popularity of the diesel pickup truck has been evident just by looking out your car window while driving.

Four-cylinder gas engines saw modest declines but eight-cylinder gas engines dropped significantly. Considering the huge jump that was reported in last year's Machine Shop Market Profile, this number may be a reflection of the engines that were rebuilt rather than replaced during the beginning of the recession. The number of unspecified "other" gas engines continued its upward climb, doubling from a yearly average of about 6 engines in 2010 to slightly more than 12 per year in 2011.

Overall, gas engine production decreased around 16 percent in 2011.

The diesel engine segment saw a

## AVERAGE NUMBER OF GAS/DIESEL ENGINES REBUILT PER MONTH IN 2011

	2011	2010	2009	2008
<b>GAS ENGINES</b>				
4 CYLINDER	3.7	4.0	2.9	3.1
6 CYLINDER	4.4	3.3	3.1	2.3
8 CYLINDER	5.6	10.1	6.1	4.9
OTHER	1.4	.52	.13	0.08
TOTAL	15.1	17.9	12.2	10.4
<b>DIESEL ENGINES</b>				
4 CYLINDER	.57	1.8	.68	.75
6 CYLINDER	.86	1.4	1.2	1.4
8 CYLINDER	.65	0.46	0.6	0.6
OTHER	0.040	0.5	0.06	0.4
TOTAL	2.5	4.1	2.5	2.8
<b>TOTAL NUMBER OF ENGINES</b>				
4 CYLINDER	4.3	5.8	3.6	3.9
6 CYLINDER	5.3	4.7	4.3	3.7
8 CYLINDER	6.3	10.6	6.7	5.0
OTHER	1.8	.19	.12	0.6
TOTAL	17.7	22.1	14.8	12.7

## ENGINE PRODUCTION INCREASES/DECREASES

RESPONSE	2011	2010	2009	2008
INCREASED	26.5%	29.3%	15.8%	9.6%
REMAINED THE SAME	70.6%	40.4%	47.4%	57.7%
DECREASED	2.9%	30.3%	36.8%	32.7%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
AVERAGE INCREASE	13.0%	4.5%	29.7%	12.5%
AVERAGE DECREASE	20.0%	14.0%	20.8%	22.3%

## REBUILT ENGINE SALES – DOMESTIC AND IMPORT

GAS	2011	2010	2009	2008
DOMESTIC	68.6%	69.6%	71.8%	73.2%
IMPORT	31.4%	30.4%	28.2%	26.8%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
DIESEL	2010	2010	2009	2008
DOMESTIC	86.2%	80.3%	88.8%	84.1%
IMPORT	13.8%	19.7%	11.2%	12.9%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

# Engine Production Data



## PERCENTAGE OF ENGINE REBUILDING FALLING INTO THE FOLLOWING CATEGORIES

	2011	2010	2009
AUTOMOTIVE GASOLINE	44.9%	38.7%	46.9%
PERFORMANCE	19.6%	22.5%	27.6%
INDUSTRIAL ENGINES	10.6%	4.7%	8.3%
MEDIUM-DUTY DIESEL	6.3%	5.5%	2.5%
AUTOMOTIVE DIESEL	6.3%	3.7%	3.7%
PERFORMANCE DIESEL	2.0%	1.6%	-
MARINE ENGINES	4.0%	3.8%	3.7%
MOTORCYCLE/MOWER/OTHER SMALL	3.2%	1.1%	2.8%
HEAVY-DUTY DIESEL	2.1%	11.9%	3.7%
OTHER TYPES	1.0%	5.0%	0.9%

## PERCENTAGE OF SHOPS THAT REBUILD THE FOLLOWING CATEGORIES

	2011	2010	2009
AUTOMOTIVE GASOLINE	93.1%	90.0%	95.7%
PERFORMANCE GAS	86.2%	80.0%	78.3%
INDUSTRIAL ENGINES	65.5%	53.3%	60.9%
AUTOMOTIVE DIESEL	62.1%	56.7%	60.9%
PERFORMANCE DIESEL	17.2%	23.3%	-
MARINE ENGINES	58.6%	60.0%	60.9%
MOTORCYCLE/MOWER/OTHER SMALL	37.9%	30.0%	47.8%
MEDIUM-DUTY DIESEL	44.8%	40.0%	52.2%
HEAVY-DUTY DIESEL	27.6%	46.7%	21.7%
OTHER TYPES	10.3%	16.7%	13.0%

## PERCENTAGE OF TOTAL REBUILT ENGINE SALES RETURNED AS WARRANTY

	2011	2010	2009	2008
Returned	3.0%	1.5%	1.8%	1.3%

## PERCENTAGE OF WARRANTY RETURNS WHICH ARE ACTUALLY CUSTOMER INSTALLATION OR DIAGNOSTIC PROBLEMS

	2011	2010	2009	2008
Customer Caused	79.9%	63.0%	70.4%	77.1%
Percent change	26.8%	-10.5%	-8.6%	7.1%

huge increase in the 2010 numbers – perhaps the anticipation of lower diesel fuel prices or much higher gasoline prices played a role. In 2011, however, respondents report numbers more closely in line with our 2007–2008–2009 results, regressing to its flat-to-down trend we had been seeing.

Overall, the number of diesel engines fell back to 2009 levels, losing the impressive 40 percent increase we reported last year. Yet, the damage was done at the four-cylinder and six-cylinder levels: both of these categories experienced declines unlike any we have seen in at least the past 5 years. As reported earlier, V8 diesels continue to show strong improvement. Respondents say diesel engines account for just about 3.5 engines per month.

The average national monthly gas and diesel engine production of 18 units translates to 216 engines produced annually. This is down from the 264 reported last year, yet is still much higher than the annual production of 178 engines produced during 2009 and the 152 engines produced during 2008 by the typical CER.

Projected onto a universe of 3,500 to 5,000 full-service machine shops, it's estimated that CERs accounted for between 756,000 to 1.08 million gas and diesel engines built during production year 2010. Last year the market range was 924,000 to 1.32 million units.

If you add in an estimated 450,000 engines remanufactured annually by the approximately 30 North American production engine remanufacturers (PERs), the combined total number of engines rebuilt in 2011 by CERs and PERs would be approximately 1.21 million to 1.53 million units. This compares to approximately 1.37 million to 1.77 million engines produced by PERs and CERs during production year 2009.

At an average retail cost of approximately \$2,600 per engine, we calculate





## Engine Production Data

### PERCENTAGE OF TOTAL REBUILDING BUSINESS IN GAS ENGINE PRODUCTION FOR FOLLOWING CATEGORIES

	2011	2010
SHORT BLOCKS	7.9%	10.3%
LONG BLOCKS	11.3%	22.6%
COMPLETE ENGINES	31.5%	23.6%
HEADS*	41.8%	33.8%
CRANKS	7.5%	9.8%

\*Not used on long blocks or complete engines

### PERCENTAGE OF TOTAL DIESEL ENGINE REBUILDING PRODUCTION IN FOLLOWING CATEGORIES

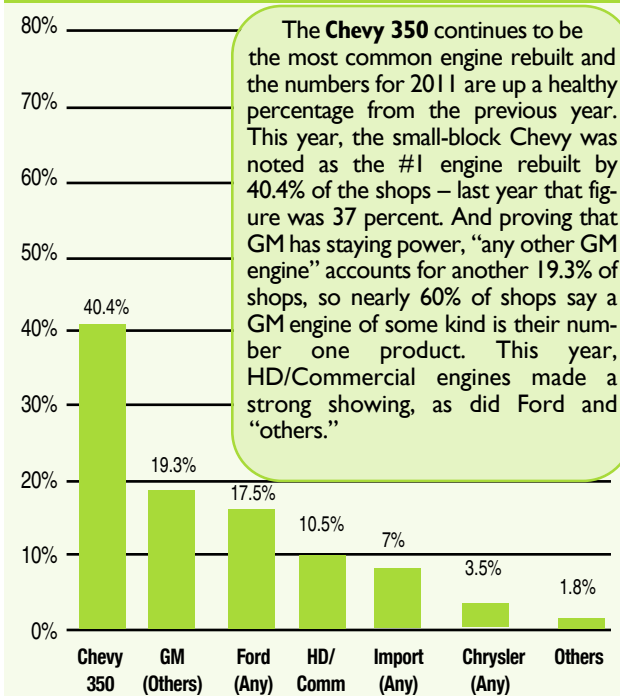
	2011	2010
SHORT BLOCKS	4.7%	8.4%
LONG BLOCKS	10.0%	24.0%
COMPLETE ENGINES	22.3%	13.7%
HEADS*	53.3%	43.5%
CRANKS	9.6%	10.4%

\*Not used on long blocks or complete engines

### PERCENTAGE OF ENGINE PRODUCTION (TOTAL) THAT IS PERFORMANCE-RELATED

	PERCENTAGE OF RESPONDENTS
One to 10%	33.0%
11% to 20%	21.6%
21% to 30%	11.4%
31% to 40%	5.7%
41% to 50%	6.8%
51% to 70%	6.8%
More than 70%	11.4%
None/no answer	3.4%

### PERCENTAGE RANKING AS #1 ENGINE REBUILT



that the total rebuilt/remanufactured engine market generated between \$3.15 billion and \$3.98 billion in rebuilt engine sales in 2011.

While fewer rebuilders said they saw a production increase in 2011, many fewer saw their production numbers decline. Instead, the bulk of our respondents (more than 79 percent, as a matter of fact) said production numbers stayed the same. Of those who did report an increase, it was, on average, 13 percent. Considering how strong the 2010 numbers were, keeping pace in 2011 is a testimony to the resilience of this industry.

Sales of rebuilt engines in 2011 trended in different ways. Import gas engines increased 1 percentage point at the expense of domestic gas engines, while the diesel market saw domestic engines hand the imports a 5.9 percentage point decline.

As you can see in the chart on page 26, the Chevy small-block 350 continues to be the number one engine built. Other engine platforms continue their assault against the King, but a GM engine of some kind is listed number one by nearly 60 percent of our respondents. New this year, 10.5 percent of respondents tell us that heavy duty and commercial engines are their Number 1.

It's interesting to look at the percentage of engine production that is performance-related. Obviously, the definition of “performance” is somewhat arbitrary, but according to our survey, 96.6 percent of shops do performance work. Last year, that number was 88.4 percent. There are more shops saying performance makes up less than 20 percent of their mix, but far fewer shops saying they do none.

Each year we ask survey respondents to tell us about their engine building business by breaking down their operation into five specific machining processes – production of short blocks, long blocks, complete engines, cylinder heads (not used on long blocks or complete engines) and crankshafts (also not used in long blocks or complete engines). When we asked for the percentage of business in gasoline engines they did in each, we found declines in the percentage of

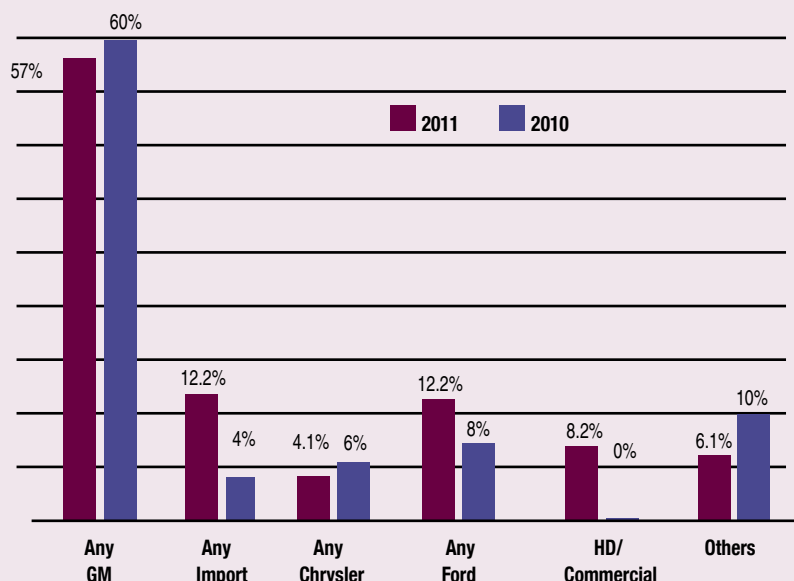


# Cylinder Head Production Data

## AVERAGE NUMBER OF GAS/DIESEL CYLINDER HEADS REBUILT PER MONTH IN 2011

	2011	2010	2009
<b>GAS CYLINDER HEADS</b>			
4 CYLINDER	17.1	16.7	13.4
6 CYLINDER	11.5	8.6	8.0
8 CYLINDER	12.7	14.9	12.4
OTHER	.26	.78	.15
TOTAL	43.9	41.3	36.4
<b>DIESEL CYLINDER HEADS</b>			
4 CYLINDER	2.1	3.9	2.2
6 CYLINDER	2.9	5.8	2.9
8 CYLINDER	2.5	2.5	2.1
OTHER	0.6	0.6	0.3
TOTAL	8.1	12.8	7.5
<b>TOTAL NUMBER OF CYLINDER HEADS</b>			
4 CYLINDER	19.2	20.6	15.6
6 CYLINDER	14.4	14.4	10.9
8 CYLINDER	15.2	18.4	17.0
OTHER	3.2	1.4	0.45
TOTAL	52.0	54.8	43.9

## PERCENT NAMING AS NUMBER ONE CYLINDER HEAD REBUILT



## PERCENT OF CYLINDER HEAD REBUILDING THAT IS ALUMINUM

Average 2011 42.2%

Average 2010 55.5%

## PERCENT OF CYLINDER HEAD REBUILDING THAT IS DIESEL

Average 2010 30.4%

Average 2011 15.5%

production of short blocks, long blocks and crankshafts.

Complete engines and cylinder heads became a bigger part of the typical shop's production. In 2010, these two categories accounted for more than half of the typical shop's gas engine production. Cylinder head work remains the single biggest part of the typical rebuilding business.

For diesel engine builders, it's exactly the same story. Declines are seen in short blocks, long blocks and crankshaft production numbers, while complete engines and cylinder heads account for 75 percent of total diesel engine rebuilding production numbers.

Cylinder head production numbers showed some declines, although gas head production increased about 6 percent, going from 41 units monthly in 2010 to 44 units produced each month last year. The numbers were up in most cases, although modestly in many: four-cylinder head production saw an increase of 2 percent; six-cylinder production increased 34 percent while eight-cylinder head rebuilding actually fell over 2010. "Other" gas cylinder heads saw a huge percentage increase as well as a unit increase, going from .78 cylinder heads per month in 2010 to 2.6 cylinder heads per month in 2011.

Diesel heads rebuilt monthly saw reversal in fortunes from last year. Total diesel cylinder head production fell from 12.8 units rebuilt monthly in 2010 to 8.1 units in 2011, an overall



# Cylinder Head Production Data

## CYLINDER HEAD PRODUCTION INCREASES/DECREASES

RESPONSE	2011	2010	2009	2008
INCREASED	42.9%	39.3%	32.5%	33.3%
REMAINED THE SAME	51.4%	38.2%	50.0%	38.9%
DECREASED	5.7%	29.6%	17.5%	27.8%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
AVERAGE INCREASE	20.0%	8.3%	18.4%	11.9%
AVERAGE DECREASE	12.5%	25.0%	25.7%	21.2%

## CRACK REPAIR ON CYLINDER HEADS

REPAIR ALTERNATIVE	Diesel Heads	Aluminum
DO REPAIRS OURSELVES	33%	42%
SEND OUT FOR REPAIR	67%	58%

## PERCENTAGE OF CYLINDER HEAD CRACKS WELDED VERSUS PINNED

REPAIR ALTERNATIVE	Diesel Heads	Aluminum
WELD CRACK	24.6%	70.7%
PIN CRACK	75.4%	29.3%

## PERCENTAGE OF CYLINDER HEADS REPAIRED VERSUS SCRAPPED

	Diesel Heads	Aluminum
REPAIR CYLINDER HEAD	74.4%	70.7%
SCRAP CYLINDER HEAD	25.6%	14.9%

## PERCENTAGE OF TOTAL CYLINDER HEAD PRODUCTION THAT IS PERFORMANCE RELATED

	PERCENTAGE OF RESPONDENTS - 2011 : 2012	
One to 10%	35.2%	42.4%
11% to 20%	19.3%	8.2%
21% to 30%	12.5%	5.9%
31% to 40%	10.2%	8.2%
41% to 50%	18.2	7.1%
51% to 70%	4.5%	7.1%
More than 70%	8.0%	15.3%
None/no answer	0%	5.9%

37 percent decrease. Four-cylinder diesel head production and six-cylinder diesel head production both lagged, while eight-cylinder and “other diesel cylinder heads” production maintained their 2010 production numbers.

On a national basis, combined gas and diesel cylinder head production decreased about 5 percent, falling from a total of 55 units rebuilt monthly in 2010 to 52 units rebuilt monthly in 2011.

The percentage of cylinder head rebuilding that is aluminum fell in 2011. In 2008, 56.3 percent of repaired cylinder heads were aluminum; the 2009 results showed that 58.1 percent of cylinder heads rebuilt were aluminum; our 2010 respondents reported that 55.5 percent of cylinder heads are aluminum. In 2011, that number is 42.2 percent. We attribute much of this not to lack of aluminum cylinder head expertise but to an increase in the availability of quality aftermarket cylinder heads, both of the aluminum and cast iron variety.

As with complete engines, General Motors continues to dominate in the cylinder head rebuilding market, according to our survey respondents. Even though the share fell somewhat, GM is still the dominant player. When asked what the number one cylinder head rebuilt in their shop was, 57.1 percent named a GM product, down from 60 percent in 2010.

However, other brands are making their presence felt as well. Ford and import heads share second place with 12.2 percent of shops naming either as their top product. Ford had a slightly higher number than last year’s survey; the total Import number was higher than last year’s Toyota and Honda numbers combined.

Heavy-duty/commercial heads climbed into fourth place, with 8.2 percent of respondents naming these heads



# Crankshaft Production Data

number one. This is the first time the HD/commercial categories have done so well, outshining even the “other” category.

Chrysler fell in popularity, according to 2011 survey respondents. Mopar was ranked Number 1 by 4.1

percent of rebuilders, down from 6 percent last year.

Just as with complete engines, performance cylinder head work continues to be an important component of the typical shop’s work. When we asked what percentage of total cylin-

der head production is performance related, in 2010, nearly 6 percent of respondents said none. This year, 100 percent of respondents said they do some amount of performance cylinder head work.

Respondents tell us that the percentage of cylinder head rebuilding that is diesel is 15.5 percent. This is a sizeable drop from our report last year of 30.4 percent; but again, we attribute much of this decline to the growing availability of aftermarket diesel cylinder heads.

Despite our industry’s traditional ability to get the most out of its components, we learned that fewer cylinder heads are being repaired. We found that nearly 26 percent of diesel heads and nearly 30 percent of aluminum heads are being scrapped, both numbers significantly higher than last year. But when they are repaired, rebuilders continue to leave the work to the experts. Our survey results indicate that 42 percent of respondents say they do aluminum cylinder head crack repairs themselves and 33 percent do their own diesel head repair.

Apparently, the mystery of aluminum welding is less frightening because an increasing number of respondents say they weld cracked aluminum cylinder heads. Welding is used nearly 83 percent of the time, up from 77 percent last year. For diesel heads, welding is performed 25 percent of the time. Pinning remains the most-often used method for repairing cast iron cylinder heads, and has opened up a huge lead over welding.

The national average number of gas and diesel crankshafts reground monthly by the typical CER fell somewhat, from 27.5 units in 2010 to 21 percent in 2011. Slight decreases were seen across the board, except in the case of eight cylinder cranks.

Diesel crank production decreased

## AVERAGE NUMBER OF GAS AND DIESEL CRANKSHAFTS GROUND PER MONTH IN 2011

	2011	2010	2009	2008
<b>GAS CRANKSHAFTS</b>				
4 CYLINDER	6.0	6.5	5.6	5.9
6 CYLINDER	4.7	5.6	4.0	4.2
8 CYLINDER	9.0	8.7	6.7	7.2
OTHER	.036	0.25	0.26	0.09
TOTAL	20.1	21.05	16.6	17.4
<b>DIESEL CRANKSHAFTS</b>				
4 CYLINDER	1.3	2.7	1.0	0.7
6 CYLINDER	1.7	2.9	1.2	1.1
8 CYLINDER	1.4	0.4	0.7	0.6
OTHER	0.4	0.4	.17	0.08
TOTAL	4.8	6.4	3.1	2.5

## TOTAL AVERAGE NUMBER OF GAS AND DIESEL CRANKSHAFTS GROUND PER MONTH

	2011	2010	2009	2008
<b>TOTAL NUMBER OF CRANKSHAFTS</b>				
4 CYLINDER	7.3	9.2	6.6	6.6
6 CYLINDER	6.4	8.5	5.2	5.3
8 CYLINDER	10.4	9.1	7.4	7.8
OTHER	.76	.65	.43	.17
TOTAL	24.9	27.5	19.6	19.9

## CRANKSHAFT PRODUCTION INCREASES/DECREASES

RESPONSE	2011	2010	2009	2008
INCREASED	16.1%	14.8%	9.1%	12.5%
REMAINED THE SAME	74.2%	55.6%	69.7%	62.5%
DECREASED	9.7%	29.6%	21.2%	25.0%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
AVERAGE INCREASE	17.5%	7.3%	12.7%	10.6%
AVERAGE DECREASE	8.3%	36.7%	14.3%	22.0%





## Shop Equipment Data

### SHOP EQUIPMENT PROFILE

TYPE OF EQUIPMENT	% OF SHOPS WHO OWN	AVG. NO. OWNED	AVG. AGE	% LIKELY TO PURCHASE	% PURCHASED LAST YR.
Aqueous Cleaning	49%	2.0	11.3	5.0%	0.0%
Ultrasonic Cleaning	17%	1.1	4.8	0.0%	0.0%
Solvent Cleaning	80%	1.4	14.8	0.0%	0.0%
Aluminum Head Welding	51%	1.2	12.3	0.0%	0.0%
Blasting Equipment	80%	1.4	17.7	0.0%	0.0%
CNC Machining Center	17%	1.3	11.2	0.0%	0.0%
Crack Detection	90%	1.6	16.1	0.0%	0.0%
Crankshaft Grinder	54%	1.2	20.7	0.0%	2.0%
Crankshaft Polisher	66%	1.3	14.7	0.0%	0.0%
Crankshaft Straightener	41%	1.1	20.6	0.0%	0.0%
Crankshaft Welder	12%	1.0	20.2	0.0%	0.0%
Cylinder Boring Bar	85%	1.6	18.1	0.0%	0.0%
Cylinder Honing Machine	90%	1.1	14.9	0.0%	2.0%
Dynamometer	22%	1.2	10.6	0.0%	0.0%
Electrical Testers	20%	2.5	11.0	0.0%	0.0%
Engine Balancing	46%	1.1	12.1	0.0%	2.0%
Flywheel Grinder	73%	1.1	17.4	0.0%	0.0%
Head/Block Resurfacer	85%	1.4	15.3	0.0%	0.0%
Heat Cleaning	44%	1.1	15.8	0.0%	0.0%
Lathe	73%	1.5	21.0	0.0%	0.0%
Line Boring (Blocks)	51%	1.3	14.2	0.0%	0.0%
Line Boring (OHC Heads)	22%	1.2	15.0	0.0%	0.0%
Micropolishing Equipment	24%	1.1	11.8	0.0%	0.0%
Pin-Fitting & Rod Reconditioning	80%	1.3	19.8	0.0%	0.0%
Pressure Testing	88%	1.3	15.2	0.0%	0.0%
Spray Washers	88%	1.3	13.5	0.0%	0.0%
Valve Guide and Seat Machine	93%	1.3	17.9	2.0%	0.0%
Valve Refacer	98%	1.4	16.1	2.0%	0.0%
Valve Seat Grinder/Cutter	90%	1.2	17.2	0.0%	0.0%

**AVERAGE AGE OF ALL EQUIPMENT IS 15.2 YEARS IN 2011**

### PRESENT VALUE (DEPRECIATION INCLUDED) OF YOUR MACHINE SHOP EQUIPMENT

YEAR	AVERAGE	PERCENT CHANGE
2011	\$248,905	11.6%
2010	\$223,000	24.6%
2009	\$179,066	22%
2008	\$146,650	-7.3%
2007	\$158,135	-11.9%

in 2011 relative to 2010, falling from 6.4 to 4.8 total units per month. Gasoline crankshaft regrinding fell less, percentage-wise, going from just over 21 total units produced monthly during 2010 to just over 20 total units produced in 2011.

These declines are, as we've seen in other segments, partially attributable to the availability of quality aftermarket components.

Good news for equipment manufacturers – the profits reported over the past few years have, apparently, been turned into equipment purchases. 2011 Survey respondents say 44.2 percent of their purchases were of new equipment and 55.8 percent of equipment was used. In 2010 the numbers were 43.5 percent new and 56.5 percent used.

The average amount spent on shop equipment in 2010 was \$18,400, a huge bump over a 2009 figure of \$10,566. This year's respondents reported a decline of 39 percent in equipment dollars – the average amount spent in 2011 was \$11,274.

What we see is a very interesting cyclical pattern. Over the past seven years the year following an increase shows a corresponding decline...but the rebound the next year is often dramatic. Our expectation for 2012 equipment purchases should be exceptional – and from what we've already heard from some suppliers our prediction is likely right on target.

Shops indicate that the present value of their equipment (including depreciation) is nearly \$249,000. This number is nearly a 12 percent increase over 2010's amount and continues a climb that started in 2009.

Shops indicated that the average age of their equipment is around 15.2 years old, slightly younger than



# Shop Equipment Data



## PERCENT OF TOTAL PRODUCTION TIME SPENT IN THE FOLLOWING AREAS

CATEGORY	2010	2010	2009	2008	2007
DISASSEMBLY/CLEANING	16.7%	16.7%	17.1%	13.2%	12.3%
BLOCK RESURFACING	5.5%	5.5%	6.9%	8.4%	7.4%
CYLINDER BORING	12.4%	12.4%	11.0%	12.0%	11.8%
CYLINDER HEAD RESURFACING	15.6%	15.6%	15.4%	17.7%	14.9%
VALVE GUIDE AND SEAT WORK	14.0%	14.0%	12.6%	15.4%	13.8%
CYLINDER HEAD CRACK REPAIR	2.0%	2.0%	2.6%	2.3%	2.2%
CONNECTING ROD RECON	4.7%	4.7%	5.8%	5.5%	7.9%
VALVE RECONDITIONING	10.6%	10.6%	10.8%	10.0%	10.5%
FLYWHEEL GRINDING	4.2%	4.2%	3.9%	5.3%	4.4%
CLUTCH RESURFACING	0.3%	0.3%	0.3%	0.4%	0.2%
CRANK GRINDING/POLISHING	4.8%	4.8%	5.1%	4.7%	8.4%
CRANKSHAFT WELDING	0.7%	0.7%	1.2%	0.2%	0.7%
OTHER	8.5%	8.5%	7.3%	4.7%	5.5%

the average age the year previous – reflecting the addition of newer, more efficient equipment to offset the older machines.

Purchases last year were made in crankshaft grinders, cylinder honing machines and engine balancing equipment. Our survey results show that several types of equipment are likely to be on the forward-thinking shop's wish list in 2012.

Potential sales may be seen in the area of aqueous cleaning equipment (on the list of 5 percent of respondents), valve seat and guide machines and valve refacing equipment (each in the sights of 2 percent of shops). Of course, as equipment ages, other types of machines may be necessary.

In most cases, shop owners say they're spending less time performing many of the necessary tasks to doing a complete engine build than last year. In many cases, more efficient equipment can be thanked.

Shops say that disassembly and cleaning, block resurfacing, cylinder boring, cylinder head resurfacing, valve guide and seat work, cylinder head crack repair, valve reconditioning and flywheel grinding all take them a little less time these days, while connecting rod reconditioning, clutch resurfacing, crank grinding and polishing and "other" services take a slightly greater portion of the typical day. Crankshaft welding is a push over the past two years of data.

A complete downloadable version of this report can be found online at [www.enginebuildermag.com](http://www.enginebuildermag.com). Part 2 of the Machine Shop Market Profile – which includes additional information on financial data, employee information and customer base analysis of the typical CER/machine shop compared to the national average – will be presented in July. **EB**

## AVERAGE AMOUNT SPENT ON MACHINE SHOP EQUIPMENT IN 2011

Year	Amount Spent	Percent Change*
2011	\$11,274	-38.7%
2010	\$18,400	78%
2009	\$10,566	-22.8%
2008	\$13,684	18.5%
2007	\$11,548	-36.8%

\*From previous year

## PERCENT OF EQUIPMENT PURCHASED THAT IS NEW AND USED

