

Press Automation, Inc.



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February 9, 2001

Randy Hoffman
Reese Products, Inc.
51671 State Road 19 North
Elkhart, In 46514

Subject: Hylatechnique Impact Damper Demo Report

Dear Randy:

I enjoyed working with you and the people at Reese regarding our testing of the Reverse-Load Dampers on your 400 ton Niagara. This letter will provide you with the results of the test.

As we discussed, most press builders will allow about 10% of the rated forward load in a reverse load situation. Some manufacturers will allow a little more, like maybe 15%. This means your 400 ton press should see a maximum of 40 tons or so of reverse load before the press begins to experience forces that can have a serious negative affect on the integrity of the frame, connections, bearings, as well as punches and die components. You are seeing a reverse load now of about 100 tons, which is about 42%. By placing the Hylatechnik Dampers in the press, we were able to reduce the reverse load to about 1 ½ tons! We were also able to show a substantial reduction in the noise around the press with the dampers in place. The benefits of this product will quickly pay for itself.

A. Without damper system:

<i>Trial</i>	<i>Working Tonnage (ton)</i>	<i>Reverse Load (ton / %)</i>
1	234	100 / 43%
2	233	101 / 44 %

B. With damper system:

<i>Trial</i>	<i>Working Tonnage (ton)</i>	<i>Reverse Load (ton / %)</i>
1	356	1.2 / .01%
2	359	1.3 / .01 %

of tooling
25% of press
tonnage.

Subject: Results of damper demo - press 172 - 1700 ton

Date: Fri, 28 Jul 2000 08:20:51 -0500

From: Dave A Owens@bobcat.com

To: Lee_Bahn@bobcat.com, Kim_Kolegraf@bobcat.com, Dennis_Nelson@bobcat.com,
Bis_Fab@bobcat.com, Al_Michels@bobcat.com, Dennis_Fuller@bobcat.com

CC: us@icfluid.com, Stevens@conceptmachine.com

Here are the results of the Hylatechnik dampers tried of the 1700 ton press.

With out shock dampers:

Forward	Reverse
571 tons	223 tons - 13%
588 tons	215 tons
584 tons	211 tons - 12%
583 tons	217 tons

With shock dampers

Forward	Reverse
769 tons	38 tons - 2%
775 tons	36 tons
797 tons	33 tons
823 tons	32 tons - 1%
823 tons	35 tons

* data was collected off of the Toledo tonnage monitor on the press. The dampers were used as shipped and no adjustments were made to alter the results.

There was a dramatic difference in vibration felt and "crack" heard with the dampers. With the dampers the press stroked almost as smooth as if the die was stroked empty.

I'll keep you posted,

Dave Owens

Demo results from Bobcat, Bismarck, ND
David Owens - Manufacturing Engineer

Assessment of Hylatechnik Vibration Dampers 1600 Ton Verson Stamping Press SKD Automotive Group

Prepared for:

SKD Automotive Group
40 Holtby Avenue
Brampton, Ontario
L6X 2M1

January 25, 2007

1 INTRODUCTION

HGC Engineering was retained by SKD Automotive Group to assess the effectiveness of Hylatechnik vibration dampers installed as a trial on a 1600 Ton Verson Press located at their 40 Holtby Avenue plant in Brampton.

Vibration measurements were conducted on January 23, 2007 on the press frame and on grade near the press, with and without four Hylatechnik SHYC-100-15 Blanking Stroke Dampers mounted on the bolster plate. These dampers are impacted by the ram and intended to reduce the effects of reverse loading when the die snaps through the part. The dampers have a capacity of 100 tons and a stroke of 15 mm, although it is anticipated that model SHYC-150-15 dampers having a somewhat higher capacity would be used for a permanent installation. At the time of the testing the press was producing Ford 944/5 Blades from material nominally 0.154" thick.

2 TEST INSTRUMENTATION

Vibration measurements were conducted using a Hewlett Packard model 3569A Real Time Frequency Analyzer (S/N 3442A00141), equipped with two accelerometers, one a sensitive PCB type J353 B52 (S/N 9403) to measure vibration on grade, and the other a less sensitive PCB type

J353 B04 (S/N 49422) to measure vibration on the frame of the press. The correct calibration of the vibration measurement systems were verified on site. All instrumentation was within its annual laboratory calibration period.

The accelerometers were mounted on one of the press frame legs at a height of 78" and on a steel rail imbedded in concrete 88" in front the press. Both accelerometers were mounted in the vertical direction using magnets.

The vibration was measured as acceleration. A Fast Fourier Transform spectrum of the root-mean-squared (RMS) acceleration, in units of decibels relative to the acceleration due to gravity (dB re 1g), was measured as a function of frequency in Hertz (Hz). In addition, the time signal of the acceleration in g was recorded to capture the impulse provided by the press.

3 MEASUREMENT RESULTS AND DISCUSSION

The measurements of the time signal and frequency spectrum of acceleration were measured on the frame of the press and on the floor in front of the press, first without the dampers in place and then with the dampers in place. Without the dampers, the press was achieving a tonnage of about 1050, whereas the settings were changed slightly and the press was achieving a tonnage of 1200 when the dampers were in place. The measurements were recorded by setting the instrumentation to trigger on a peak impulse. Three or four records were taken in each case to ensure that the results were consistent from part to part. A shim was added to increase the stroke of the dampers when the dampers were in operation; this improved the performance somewhat and those are the results presented here.

Figure 1 shows the time signals of acceleration on the frame before and after the dampers were in operation. The peak acceleration drops from 1 g to about 0.8 g, but it is also clear from the decay of the signal that the vibration is damping out quicker. The amplitude during the initial impact of the die with the part remains the same, but the impulse created by the snap through at about 0.15 seconds after impact is markedly less. Figure 2 shows the time signals measured on the frame before and after the dampers were operational. In this case the improvement is more noticeable with the peak acceleration dropping from 0.15 g to 0.08 g after the dampers were installed.

Figures 3 and 4 illustrate the RMS acceleration spectrum, measured on the frame and floor, before and after the dampers were in operation. At the lowest dominant frequency, 23 Hz, reductions of 5 decibels (a 40% reduction) resulted in both instances. During the vibration measurements previously conducted by HGC Engineering along the south property line, a peak frequency of approximately 23 Hz was also measured.

4 CONCLUSIONS

Overall, the above results show that the Hylatechnik SHYC-100-15 Blanking Stroke Dampers installed as a trial in the 1600 Ton Verson Press provided an improvement in the vibration levels occurring on the press frame and transmitted to the surrounding ground. In both instances the dampers reduced the vibration levels by approximately 40%.

We trust that this is sufficient for your present needs. Please do not hesitate to call if there are any questions or concerns.

Respectfully submitted,
Howe Gastmeier Chapnik Limited



Brian Howe, MEng, MBA, PEng

Figure 1. Summary of Acceleration Response Measured on Frame of 1600 Ton Verson Press Before and After the Installation of Dampers, SKD Automotive Group, January 23, 2007.

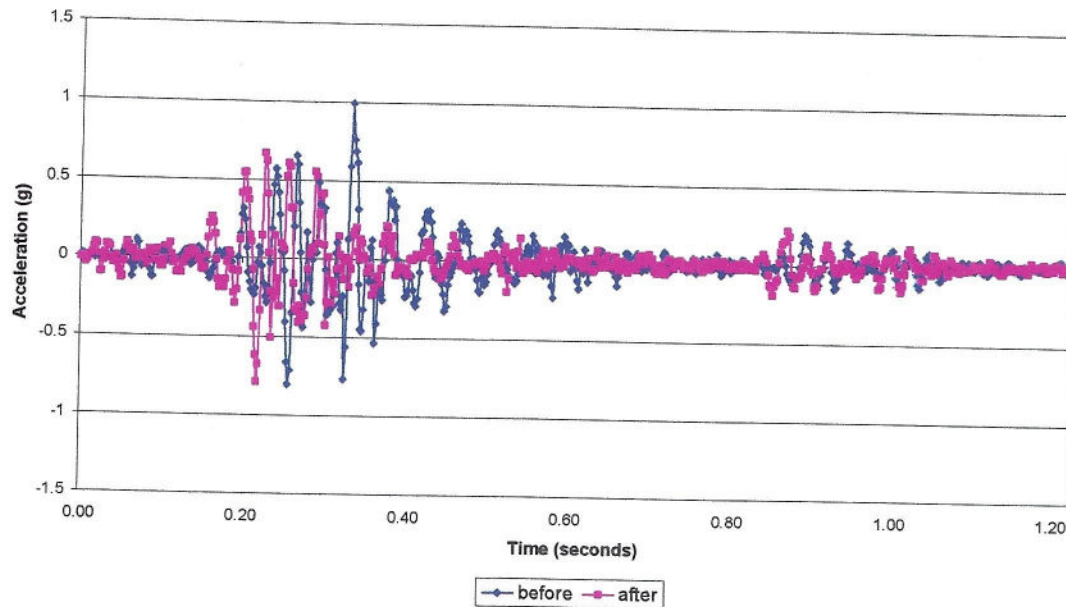


Figure 2. Summary of Acceleration Response Measured on the Floor in Front of 1600 Ton Verson Press Before and After the Installation of Dampers, SKD Automotive Group, January 23, 2007.

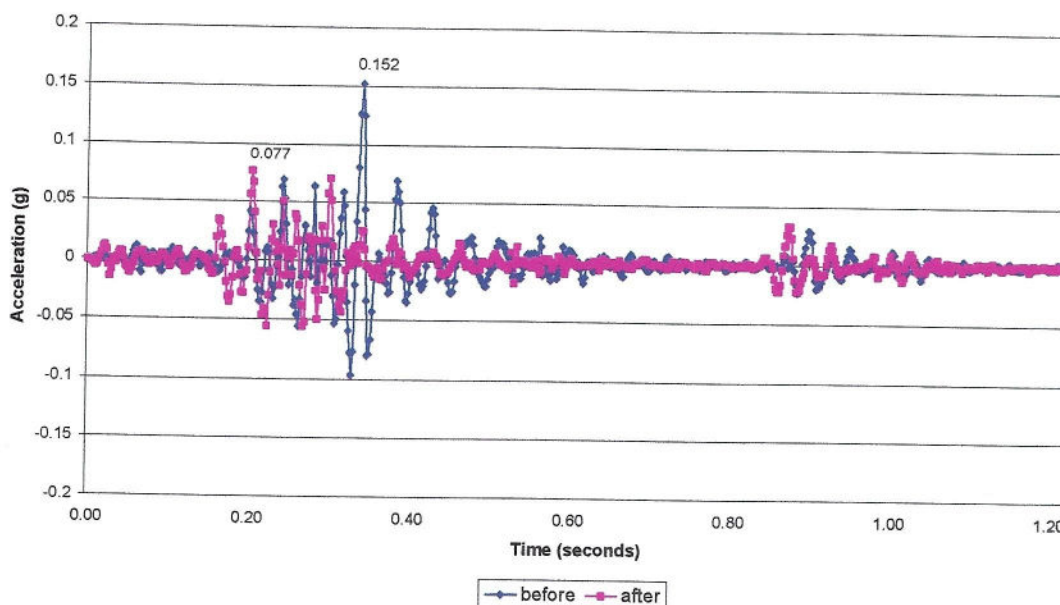


Figure 3. Frequency Spectrum of Acceleration Response Measured on Frame of 1600 Ton Verson Press Before and After the Installation of Dampers, SKD Automotive Group, January 23, 2007.

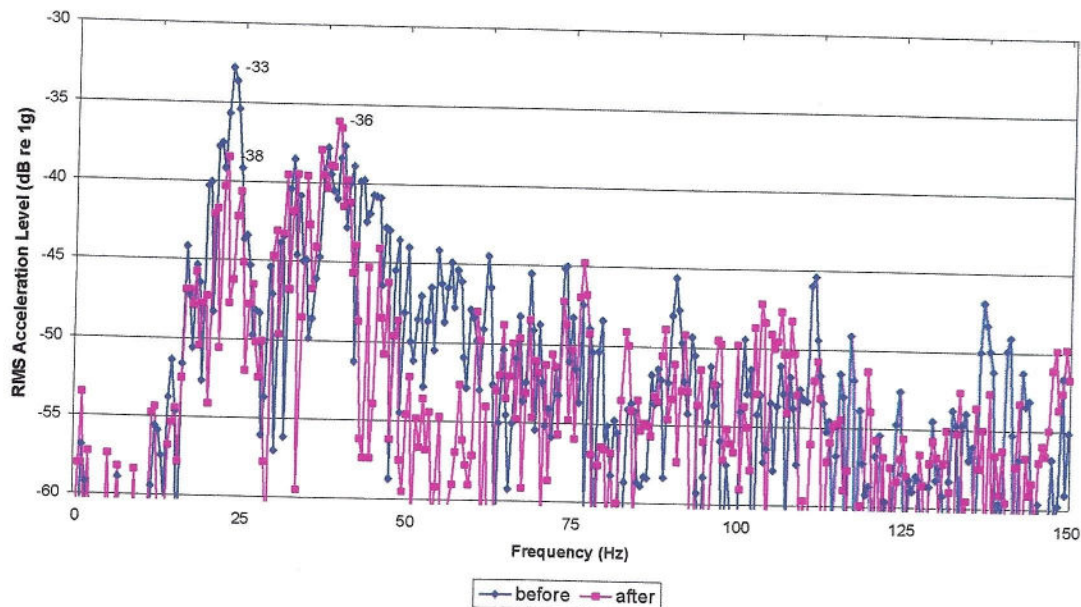


Figure 4. Frequency Spectrum of Acceleration Response Measured on Floor in Front of 1600 Ton Verson Press Before and After the Installation of Dampers, SKD Automotive Group, January 23, 2007.

