

**From:** Mike Dunlap [mdunlap@karco.com]  
**Sent:** Thursday, February 09, 2012 3:39 PM  
**To:** kchiu@karco.com  
**Subject:** FW: ZAP

Best regards,

Michael L. Dunlap  
Director of Operations  
KARCO Engineering, LLC.  
(760) 246-1672

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**From:** Stu.Seigel@dot.gov [mailto:Stu.Seigel@dot.gov]  
**Sent:** Thursday, February 09, 2012 2:41 PM  
**To:** mdunlap@karco.com  
**Subject:** RE: ZAP

Time to reach full brake application. Need to get on it real quick.

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**From:** Mike Dunlap [mailto:mdunlap@karco.com]  
**Sent:** Thursday, February 09, 2012 5:38 PM  
**To:** Seigel, Stu (NHTSA)  
**Subject:** RE: ZAP

Too slow of rate?

Best regards,

Michael L. Dunlap  
Director of Operations  
KARCO Engineering, LLC.  
(760) 246-1672

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**From:** Stu.Seigel@dot.gov [mailto:Stu.Seigel@dot.gov]  
**Sent:** Thursday, February 09, 2012 2:33 PM  
**To:** mhubbard@karco.com  
**Cc:** kchiu@karco.com; mdunlap@karco.com  
**Subject:** RE: ZAP

Do you have the time trace for these stops. Concerned with the rate of apply.

---

**From:** Matt Hubbard [mailto:mhubbard@karco.com]  
**Sent:** Thursday, February 09, 2012 4:19 PM

**To:** Seigel, Stu (NHTSA)  
**Cc:** kchiu@karco.com; 'Mike Dunlap'  
**Subject:** ZAP

Hi Stu,

Enclosed is two stops for Zap as requested.

Best Regards,

Matthew S. Hubbard  
Quality Assurance Manager  
KARCO Engineering, LLC.  
(760)246-1672

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No virus found in this message.

Checked by AVG - [www.avg.com](http://www.avg.com)

Version: 2012.0.1913 / Virus Database: 2112/4797 - Release Date: 02/08/12

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No virus found in this message.

Checked by AVG - [www.avg.com](http://www.avg.com)

Version: 2012.0.1913 / Virus Database: 2112/4797 - Release Date: 02/08/12

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No virus found in this message.

Checked by AVG - [www.avg.com](http://www.avg.com)

Version: 2012.0.1913 / Virus Database: 2112/4799 - Release Date: 02/09/12

**From:** Kelsey Chiu [kchiu@karco.com]  
**Sent:** Thursday, February 16, 2012 3:41 PM  
**To:** 'Rajakaruna Joe'  
**Cc:** 'Mike Dunlap'  
**Subject:** KARCO  
Joe,

Attached is the Data Sheet 5 information. The speed run data was 36.4 mph and 38.2 mph, making the maximum speed 37.3 mph.

The received weight is as follows:

Front	– 637 lb
Left Rear	– 618 lb
Right Rear	– 617 lb
Total	– 1872 lb

The as-tested weight is as follows:

Front	– 746 lb
Left Rear	– 696 lb
Right Rear	– 630 lb
Total	– 2072 lb

Best Regards,

Kelsey Chiu  
Engineering Department Supervisor  
KARCO Engineering, LLC.  
(760) 246-1672

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**From:** Rajakaruna Joe [jrajakaruna@zapworld.com]  
**Sent:** Tuesday, February 14, 2012 8:22 AM  
**To:** kchiu@karco.com  
**Subject:** Re: KARCO  
Hello Kelsey,

Can you send us the the official FMVSS 122 Data Form Sheet 3?

We're talking with Wilwood brake company to see why the testing they did is so different from the results of the KARCO testing.

best regards,  
Joe Rajakaruna

On Fri, Feb 3, 2012 at 4:57 PM, Kelsey Chiu <kchiu@karco.com> wrote:

Joe,

Below is the test data for the first effectiveness testing.

Test Run	Speed	Stopping Distance	Pedal Force
1	29.95	48.53	140
2	30.57	58.69	118
3	30.70	47.49	137
4	30.85	67.28	136
5	31.08	53.34	121
6	30.69	53.43	100
7	30.27	74.44	125
8	30.69	96.64	61
9	30.73	88.35	82
10	30.64	88.05	82
11	30.63	82.48	70
12	30.83	86.96	73

Because the test failed on the early portion of testing, we can offer the following. You can take the vehicle and make your modifications or repairs and then bring it back to start testing again. There will be a \$1000 re-starting fee that will basically cover the work that will need to be redone.

Please let me know how you want to proceed.

Best Regards,

Kelsey Chiu  
Engineering Department Supervisor  
KARCO Engineering, LLC.  
[\(760\) 246-1672](tel:7602461672)

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Version: 2012.0.1913 / Virus Database: 2112/4809 - Release Date: 02/14/12

**From:** Rajakaruna Joe [jrajakaruna@zapworld.com]  
**Sent:** Tuesday, February 28, 2012 2:59 PM  
**To:** kchiu@karco.com  
**Subject:** Re: KARCO  
Hello Kelsey,

Would you be available for a teleconference with Willwood brakes about the Xebra testing. We are trying to setup a meeting this week to find out the best option for the next step.

-Joe Rajakaruna

On Thu, Feb 16, 2012 at 3:41 PM, Kelsey Chiu <[kchiu@karco.com](mailto:kchiu@karco.com)> wrote:

Joe,

Attached is the Data Sheet 5 information. The speed run data was 36.4 mph and 38.2 mph, making the maximum speed 37.3 mph.

The received weight is as follows:

Front	– 637 lb
Left Rear	– 618 lb
Right Rear	– 617 lb
Total	– 1872 lb

The as-tested weight is as follows:

Front	– 746 lb
Left Rear	– 696 lb
Right Rear	– 630 lb
Total	– 2072 lb

Best Regards,

Kelsey Chiu  
Engineering Department Supervisor  
KARCO Engineering, LLC.  
[\(760\) 246-1672](tel:(760)246-1672)

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No virus found in this message.

Checked by AVG - [www.avg.com](http://www.avg.com)

Version: 2012.0.1913 / Virus Database: 2114/4837 - Release Date: 02/28/12

From: Kelsey Chiu [kchiu@karco.com]  
Sent: Monday, February 06, 2012 8:05 AM  
To: 'Rajakaruna Joe'  
Cc: 'Mike Dunlap'  
Subject: RE: KARCO

Joe,

The first effectiveness stopping distance is 54 feet. It could stop in this distance. 43 feet is the stopping distance for the second effectiveness, which is after the burnish process.

Best Regards,

Kelsey Chiu  
Engineering Department Supervisor  
KARCO Engineering, LLC.  
(760) 246-1672

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Original Message-----

From: Rajakaruna Joe [mailto:jrajakaruna@zapworld.com]  
Sent: Friday, February 03, 2012 5:20 PM  
To: kchiu@karco.com  
Cc: Mike Dunlap  
Subject: Re: KARCO

Hello Kelsey,

I had thought from our telephone discussion ther vehicle could stop in 43 ft but with high foot pressure. But the resulst show no such stops even with high foot pressure?

-Joe Rajakaruna

On 2/3/12, Kelsey Chiu <kchiu@karco.com> wrote:

> Joe,  
>  
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>  
> Below is the test data for the first effectiveness testing.  
>  
>  
>  
> Test Run  
>  
> Speed

>  
> Stopping Distance  
>  
> Pedal Force  
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>  
> 1  
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> 29.95  
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> 48.53  
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> 140  
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> 2  
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> 30.57  
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> 73  
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> Because the test failed on the early portion of testing, we can offer  
> the following. You can take the vehicle and make your modifications or  
> repairs and then bring it back to start testing again. There will be a  
> \$1000 re-starting fee that will basically cover the work that will  
> need to be redone.

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>  
> Please let me know how you want to proceed.

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> Best Regards,

>  
>  
> Kelsey Chiu  
> Engineering Department Supervisor  
> KARCO Engineering, LLC.  
> (760) 246-1672

>  
>  
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No virus found in this message.  
Checked by AVG - www.avg.com  
Version: 2012.0.1913 / Virus Database: 2112/4784 - Release Date: 02/03/12

**From:** Mike Dunlap [mdunlap@karco.com]  
**Sent:** Thursday, February 09, 2012 2:38 PM  
**To:** Stu.Seigel@dot.gov; mhubbard@karco.com  
**Cc:** kchiu@karco.com  
**Subject:** RE: ZAP  
I'll get them from Matt.

Best regards,

Michael L. Dunlap  
Director of Operations  
KARCO Engineering, LLC.  
(760) 246-1672

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**From:** Stu.Seigel@dot.gov [mailto:Stu.Seigel@dot.gov]  
**Sent:** Thursday, February 09, 2012 2:33 PM  
**To:** mhubbard@karco.com  
**Cc:** kchiu@karco.com; mdunlap@karco.com  
**Subject:** RE: ZAP

Do you have the time trace for these stops. Concerned with the rate of apply.

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**From:** Matt Hubbard [mailto:mhubbard@karco.com]  
**Sent:** Thursday, February 09, 2012 4:19 PM  
**To:** Seigel, Stu (NHTSA)  
**Cc:** kchiu@karco.com; 'Mike Dunlap'  
**Subject:** ZAP

Hi Stu,

Enclosed is two stops for Zap as requested.

Best Regards,

Matthew S. Hubbard  
Quality Assurance Manager  
KARCO Engineering, LLC.  
(760)246-1672

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Version: 2012.0.1913 / Virus Database: 2112/4797 - Release Date: 02/08/12

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Checked by AVG - [www.avg.com](http://www.avg.com)

Version: 2012.0.1913 / Virus Database: 2112/4799 - Release Date: 02/09/12