

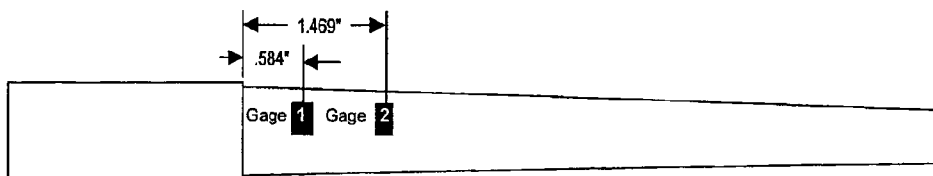
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# Remington Arms Company Inc.

Research & Development Technical Center  
315 West Ring Road  
Elizabethtown, KY 42701

## Test Summary (22 May 2003):

- Two guns received on May 9<sup>th</sup>, 2003. (.300 Win. Mag. caliber)
- Both guns had tangentially mounted strain gages installed on the exterior of the barrel in the chamber area. (2 gages applied/gun)
- 20 Proof rounds were fired per gun with headspace and chamber strain monitored on every shot.
- Headspace:
  - 1<sup>st</sup> gun increased .002" over the 20 rd. test (min.+.006 to min.+.008)
  - 2<sup>nd</sup> gun increased .001" over the 20 rd. test (min.+.007 to min.+.008)
- A strain level shift of 162 micro-in/in was observed on gun #1 while gun #2 increased by 260 micro-in/in from the beginning to end of the 20 rd. proof test. These levels are in line with what was seen with the M/710 .30-06 caliber and M/700 .30-06 caliber products. The strain leveled off at these levels, indicating that the slight shift may be instrumentation or thermal related.
- No increase in barrel diameter was observed during the test.
- Fired cases were consistent and showed no abnormal deformation.
- Bolts had to be tapped slightly with a hammer to extract/free the fired case from the chamber on every shot of proof ammo. Consistent marks on the cases indicate that small radial gouges in the chamber on both guns may be the reason for the hard bolt opening.



Chamber Strain Test with Heat Treated Barrels-- M/710 Magnum Bolt Action Rifle  
R & D Technical Center Project No. 241314; TLW1172

22 May 2003

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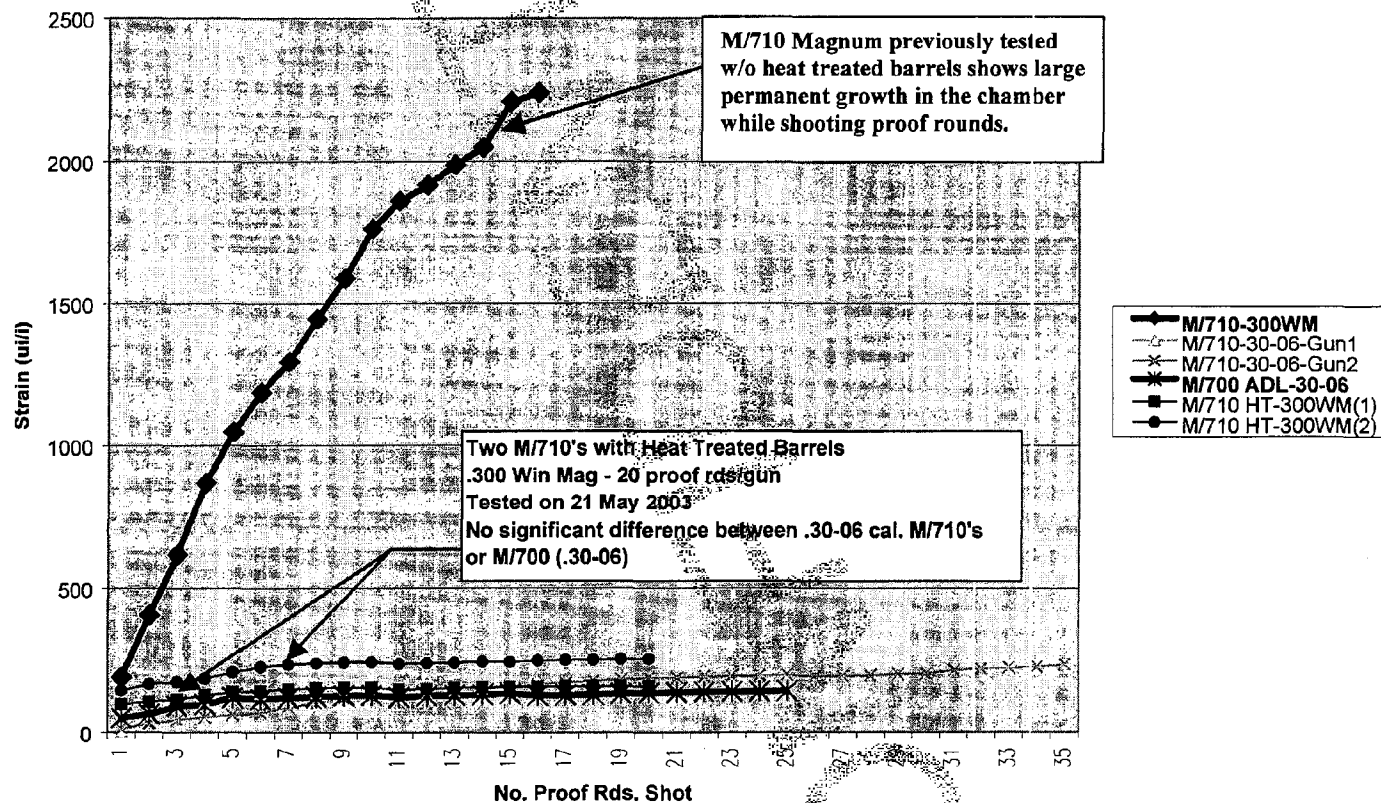
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**Remington Arms Company Inc.**  
 Research & Development Technical Center  
 315 West Ring Road  
 Elizabethtown, KY 42701

**Permanent Barrel Strain on OD of Chamber Shooting  
 Proof Rds.**



Chamber Strain Test with Heat Treated Barrels- M/710 Magnum Bolt Action Rifle  
 R & D Technical Center Project No. 241314- TLW1172

22 May 2003

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Confidential - Subject to Protective Order  
 Williams v. Remington

# 300 WM Strains 710 Brl.

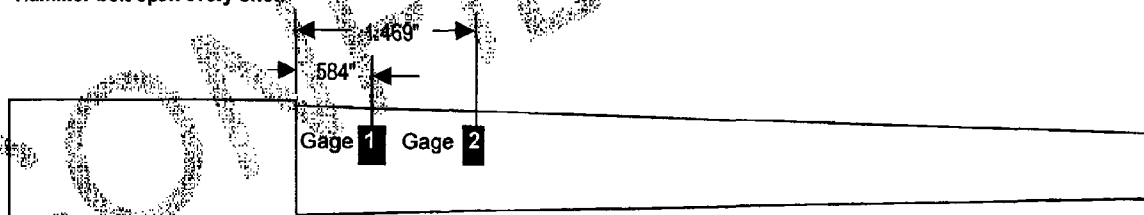
Tlr 1172	O'Scope		MultiMeter						Gun: 71116194		20-May-0
Shot:	Gage 1	Gage 2	Gage 1			Gage 2			Head	Scope:	Notes:
			Before	After	Change	Before	After	Change	Space		
Pre-Cal	1.12	1.05	.000	.000	.000	.000	.000	.000	.007	500mv/5ms 300mv	
Pre-Std	.060	.050	.000	.963	.963	.000	.962	.962	.007	500mv/500us 300mv	
1	3.100	2.890	.000	.147	.147	.000	.115	.115	.007	500mv/500us 300mv	
2	1.220	1.010	.146	.170	.024	.111	.144	.033	.007	500mv/500us 300mv	
3	1.160	.972	.169	.177	.008	.140	.158	.018	.007	500mv/500us 300mv	
4	1.200	1.020	.177	.188	.011	.153	.175	.022	.007	500mv/500us 300mv	
5	1.270	1.068	.187	.210	.023	.168	.194	.026	.008	500mv/500us 300mv	
6	1.300	1.100	.208	.228	.020	.189	.215	.026	.008	500mv/500us 300mv	
7	1.270	1.080	.227	.236	.009	.210	.226	.016	.008	500mv/500us 300mv	
8	1.280	1.080	.236	.240	.004	.221	.236	.015	.008	500mv/500us 300mv	
9	1.260	1.080	.241	.243	.002	.231	.242	.011	.008	500mv/500us 300mv	
10	1.230	1.080	.243	.244	.001	.236	.247	.011	.008	500mv/500us 300mv	Break 1:30 min.
11	1.210	.996	.232	.238	.006	.168	.188	.020	.008	500mv/500us 350mv	
12	1.18	1.00	.237	.240	.003	.185	.200	.015	.008	500mv/500us 350mv	
13	1.26	1.05	.239	.242	.003	.199	.212	.013	.008	500mv/500us 350mv	
14	1.27	1.07	.242	.245	.003	.206	.220	.014	.008	500mv/500us 350mv	
15	1.29	1.08	.244	.244	.000	.214	.220	.006	.008	500mv/500us 350mv	
16	1.28	1.08	.247	.249	.002	.220	.233	.013	.008	500mv/500us 350mv	
17	1.26	1.07	.249	.251	.002	.237	.242	.005	.008	500mv/500us 350mv	
18	1.26	1.08	.251	.252	.001	.236	.247	.011	.008	500mv/500us 350mv	
19	1.29	1.10	.252	.255	.003	.241	.253	.012	.008	500mv/500us 350mv	
20	1.22	1.05	.254	.255	.001	.249	.260	.011	.008	500mv/500us 350mv	
Post-Std	.320	.250	.249	.249	.000	.211	.211	.000	.008	500mv/500us 350mv	
Post-Cal	1.28	1.29	.249	1.213	.964	.211	1.171	.960	.008	500mv/500us 350mv	

> Ref: Tlr 896/904.xls for Test # 1 & 2

All in volts

1v = 1000ue

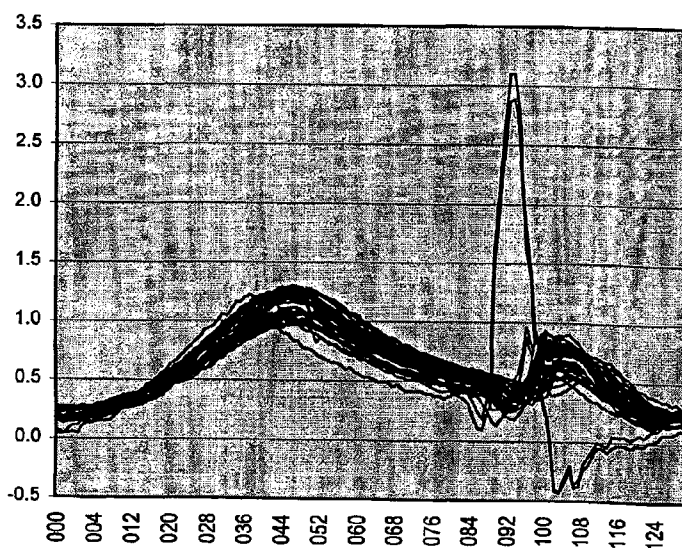
> Hammer bolt open every shot.



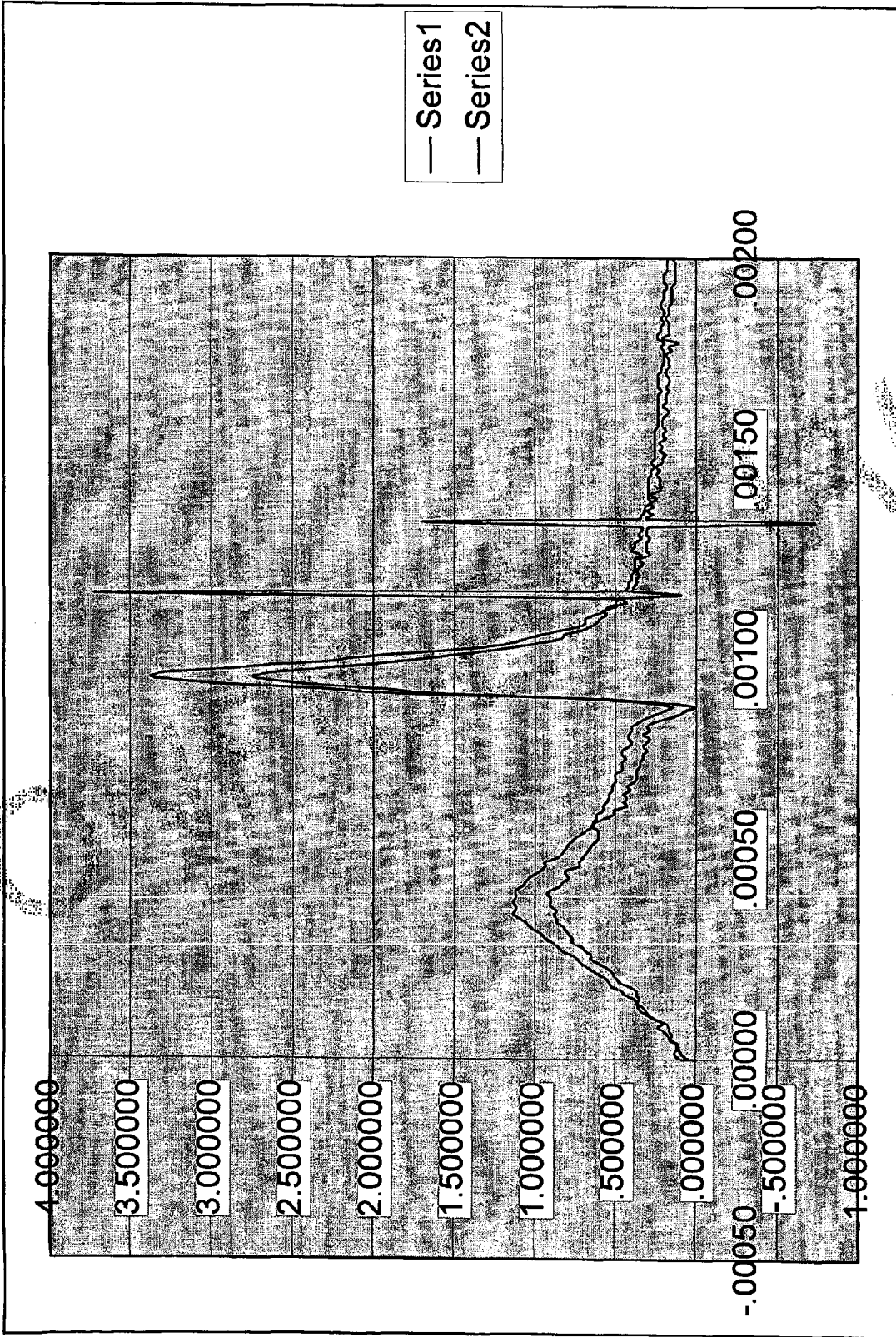
Measurement:	Pre:	Post:	
Gage 1 O.D. 94	1.223		Inches
Gage 2 O.D. 94	1.219		Inches
Headspace 94	.007 go	.008 go	Inches
Gage 1 94	120.2	120.3	ohms
Gage 2 94	120.2	120.1	ohms

Gage 1 Hoop			Gage 2 Hoop		
Max-Avg	Max	M-Meter Max	Max-Avg	Max	M-Meter Max
1.341	3.100	.255	1.148	2.890	.260
All in volts			1v = 1000ue		

> Includes spikes in shot one.

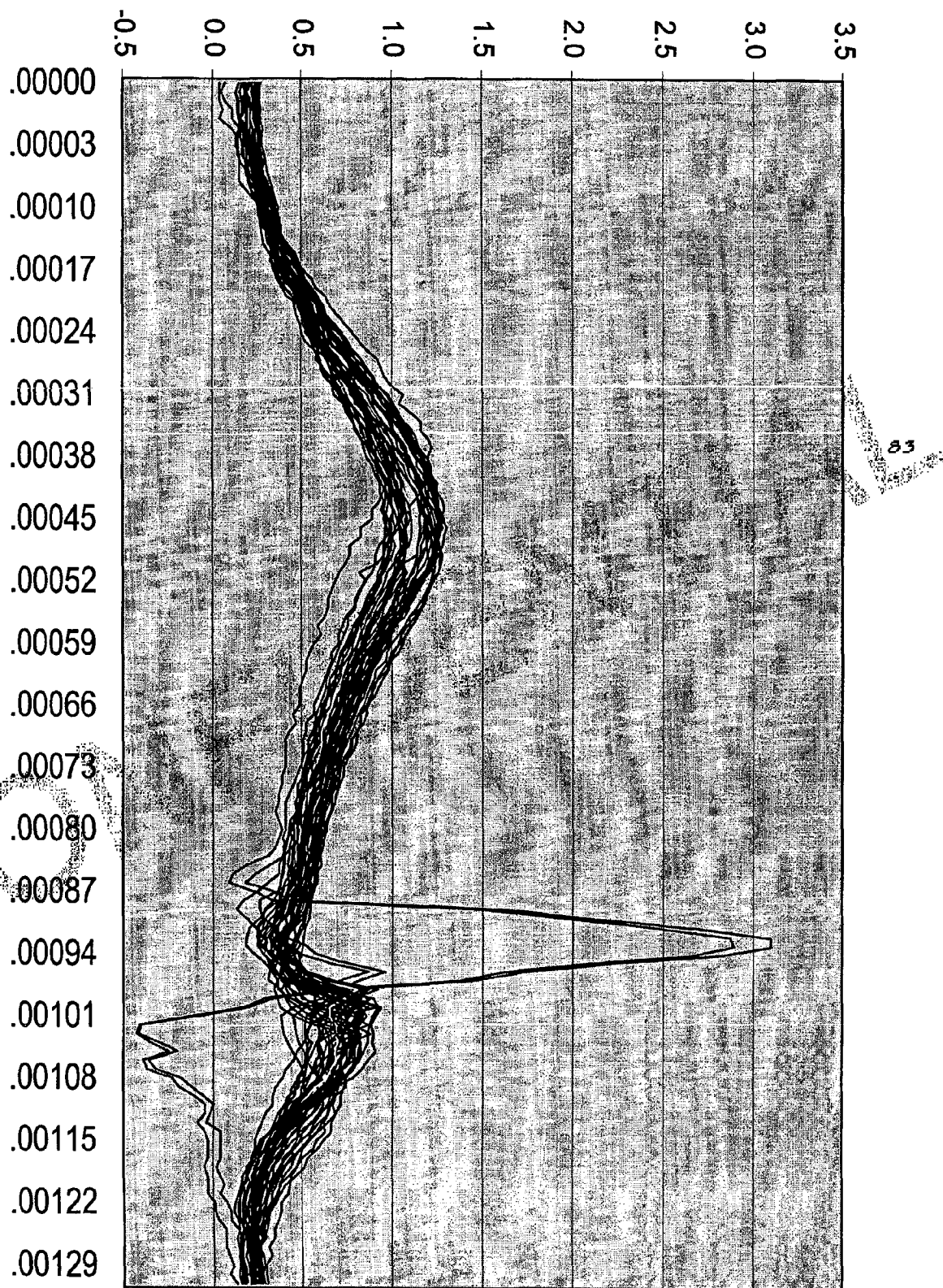


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ET28228



ET28229

**Franz, Scott**

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**From:** Reesor, Phillip K.  
**Sent:** Monday, May 19, 2003 1:44 PM  
**To:** Franz, Scott  
**Subject:** RE: Test Request

Scott, can you submit a request to Jim?

-----Original Message-----

**From:** Lonoke - R&D  
**Sent:** Monday, May 19, 2003 1:40 PM  
**To:** Franz, Scott; Reesor, Phillip K.  
**Cc:** Danner, Dale; Schluckebier, David; Dennison, Greg A.  
**Subject:** RE: Test Request

Let's go ahead get them all as they are a part of the Oehler printout anyway. I am NOT looking for O'scope detail/traces at this time, just what the Oehler prints out. If there are any questions, call me at 501.676.4121.

R/  
Greg

-----Original Message-----

**From:** Franz, Scott  
**Sent:** Monday, May 19, 2003 12:00 PM  
**To:** Lonoke - R&D; Reesor, Phillip K.  
**Cc:** Schluckebier, David; Danner, Dale  
**Subject:** RE: Test Request

Greg,  
You want all 400 P/V traces stored or just the anomalies and record P/V on the others??

-----Original Message-----

**From:** Lonoke - R&D  
**Sent:** Monday, May 19, 2003 12:27 PM  
**To:** Reesor, Phillip K.  
**Cc:** Schluckebier, David; Danner, Dale; Franz, Scott  
**Subject:** Test Request

Phillip:

I received 24 cases of PR12CLU Friday. I need to get 200 rds of each sample (Sample #3 and Sample #9M marked on the outside of the cases) shot for ambient P&V as soon as I can. Please shoot on the Oehler (old system is fine) as I would like to have a copy of the pressure traces it provides. Please call me at 270.769.7672 when you have the data. I am looking for off-sounds and low shots so please note these as they occur.

R/  
Greg

**Davidson, Harold E.**

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**From:** Barry Heathcotte  
**Sent:** Saturday, May 17, 2003 2:43 PM  
**To:** Davidson, Harold E.  
**Subject:** Re: inspection dimension symbol

Harold,

No there is no such standardized symbol, so you are free to use anything you want to use. Of course, you would not want to use anything that could be confused with another standardized symbol. To my knowledge, there is no symbol being considered that would conflict with your pill-shaped symbol. There is discussion about using an elongated circle in certain circumstances, but that would look different from the pill.

I am checking with one of my colleagues on the committee to see if I have missed something and a shape conflicting with your pill might be in the offing, but I don't think so.

Barry

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At 09:30 AM 5/15/2003 -0400, you wrote:

Barry,

I participated in your GD&T class at the Remington Arms Company's Elizabethtown, KY facility. My question involves the use of inspection dimension symbols. Solidworks, our CAD package, uses a pill-shape or elongated oval to surround inspection dimensions. I haven't been able to locate a standardized symbol in the ANSI literature I have available. Does a standard symbol exist?

Any comments would be appreciated.

Harold Davidson  
Senior Research Engineer  
**Remington Arms Company, Inc.**  
Research & Development Technology Center  
Telephone: (270) 769-7639 - (0) for Operator  
email: harold.davidson@remington.com  
FAX: (270) 737-9576

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This email has been scanned for viruses by McAfee Webshield and is clean.

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5/19/2003

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