

Mack SP Teleconference Call
Meeting Minutes
Thursday, December 6, 2012
10:30 am EST

Attendance

Bob Salgueiro, Infineum; Bob Campbell, Afton; Jim Rutherford, Oronite; Mark Cooper, Oronite; Jim Gutzwiller, Infineum; Zack Bishop, TEI; Jim Matasic, Lubrizol; Sean Moyer, TMC; Jeff Clark, TMC; Scott Richards, SwRI; Allison Rajakumar, Lubrizol; Mike Alessi, ExxonMobil; Jim Moritz, Intertek; Elisa Santos, Infineum; Greg Shank, Volvo

T-11 Issues

Mark Cooper summarized current test status: the panel has extended existing calibration periods; the test is running mild; multiple tests on RO 822 haven't hit 15 cSt viscosity increase; and we are running out of test parts. The combination of these issues dictate that the panel find a way forward for the test.

On parts supply, Zack Bishop stated there are about 500 builds worth of TU build hardware and 16 builds worth of TS hardware remaining.

In regards to reference oil, Jim Rutherford reviewed a presentation (**Attachment 1**) that he prepared for the panel. The Soot @15 cSt Viscosity Increase appears to be the only real problem with the data. Bob Campbell expressed the concern that the effects of injection timing may be contributing to the problem (**Attachment 2**, originally presented in 2006). Bob stated he saw three options: make this oil work; investigate modifying or tweaking this oil; get a new oil. Scott Richards suggested adding tighter restrictions on soot control as a possible fourth option. Greg mentioned a concern about the rate of soot generation affecting test severity.

After a great deal of discussion, the panel chose to pursue the following action:

- Requested that the TMC approach the oil supplier about the possibility of either changing/tweaking oil 822, or supplying a new oil (or new blend of this oil) **ACTION: TMC / Oil supplier**
 - If any of those options are pursued, the panel requests more than one demonstration test, from more than one lab; with a full test report's worth of information made available for all tests (including operational data)

T-12 Severity Issues with TUXO hardware

Jim Rutherford prepared and reviewed a presentation for the panel (**Attachment 3**). Jim Matasic also presented a bearing analysis (**Attachment 4**). Jim Matasic stated, that in general, nothing really stood out in the analysis as being different between the old and new bearings. Bob Campbell will send his low wear bearing to Jim Matasic for analysis. **ACTION: Bob Campbell.**

Scott Richards asked what connecting rods were used for the TUXO tests. The labs were asked to confirm/provide connecting rod information if it is available. **ACTION: Test Labs.**

Zack Bishop is still waiting on liner hardness data; he is hoping to have it next week. Bob Campbell asked if we should send used liners to the supplier to check hardness levels (hi/low wear liners). Zack agreed to have those liners analyzed if the labs send the liners to TEI. To expedite this issue, it was decided that the San Antonio labs will provide liners to Zack for over-nighting to the supplier. Hopefully, data would be available in time for a conference call next week. **ACTION: TEI / San Antonio Test Labs.**

Volvo was asked to investigate the possibility of obtaining a new batch of parts. **ACTION: Volvo.**

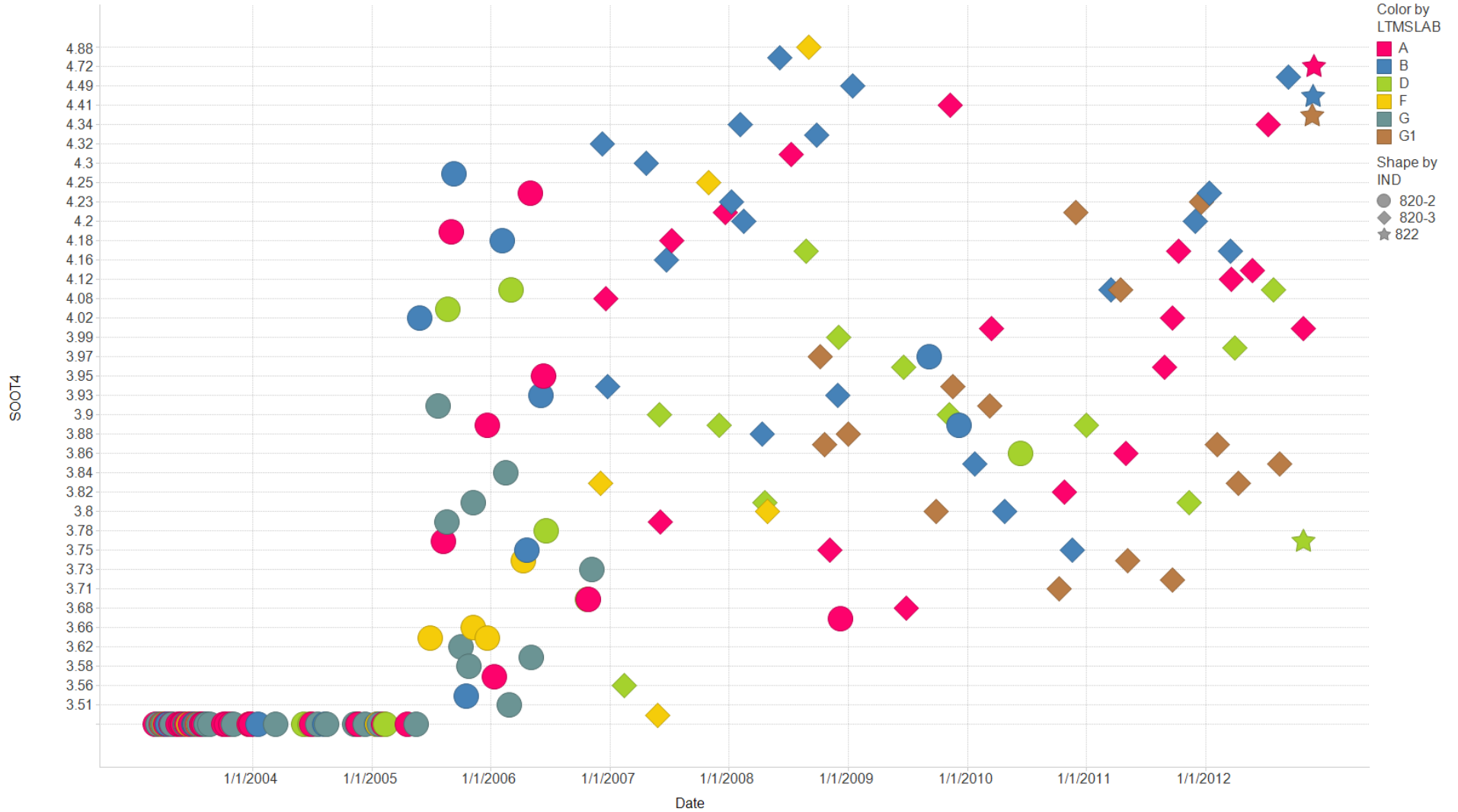
Zack Bishop was asked to supplement new parts information that is made available. **ACTION: TEI.**

The question was raised about possibly checking the liners for porosity, much like CAT does for the SCOTE cylinder liners. **No definite action assigned.**

Next Meeting: a conference call tentatively set for the afternoon of Thursday, December 13th at 3:00 EST.

The meeting adjourned at 12:35 pm.

ATTACHMENT 1

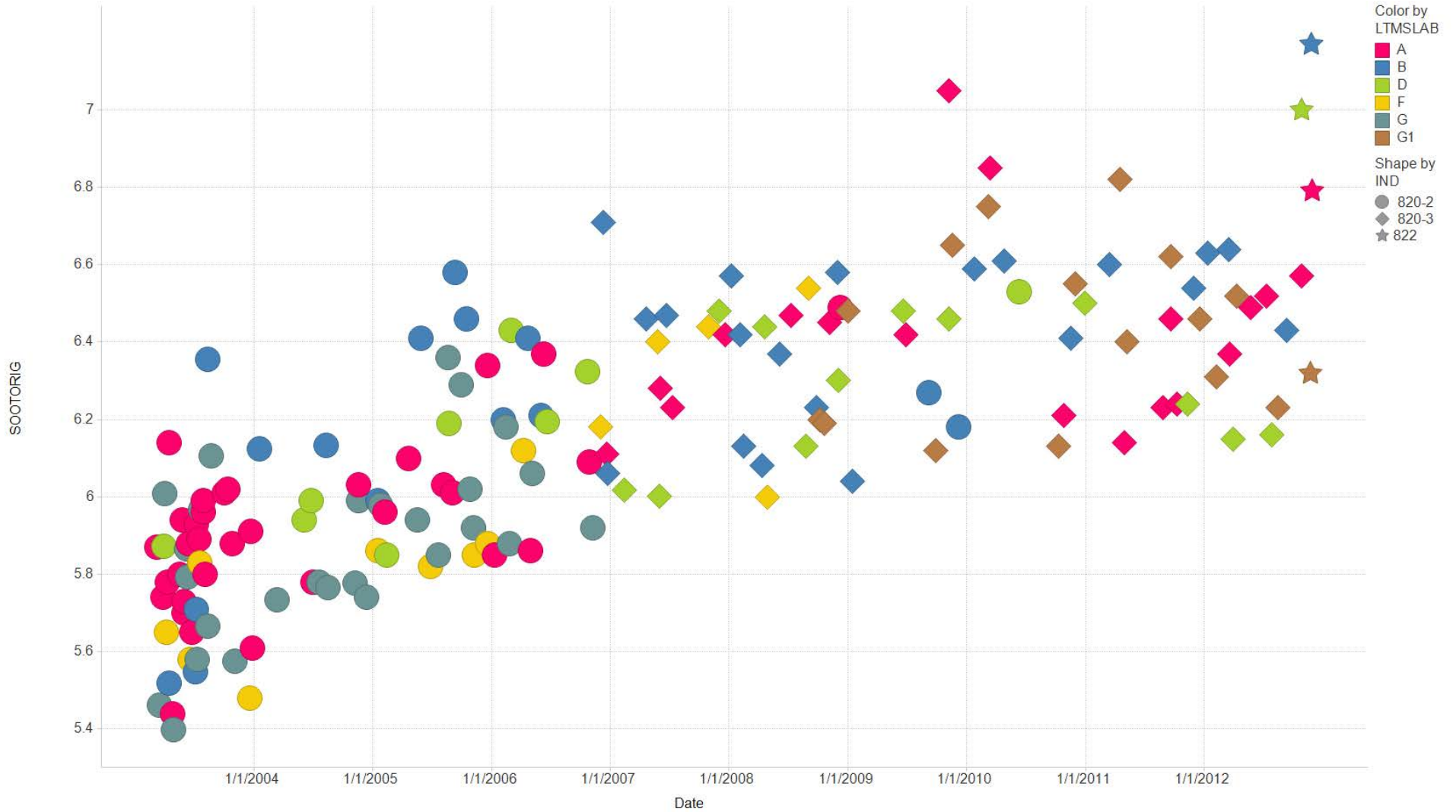


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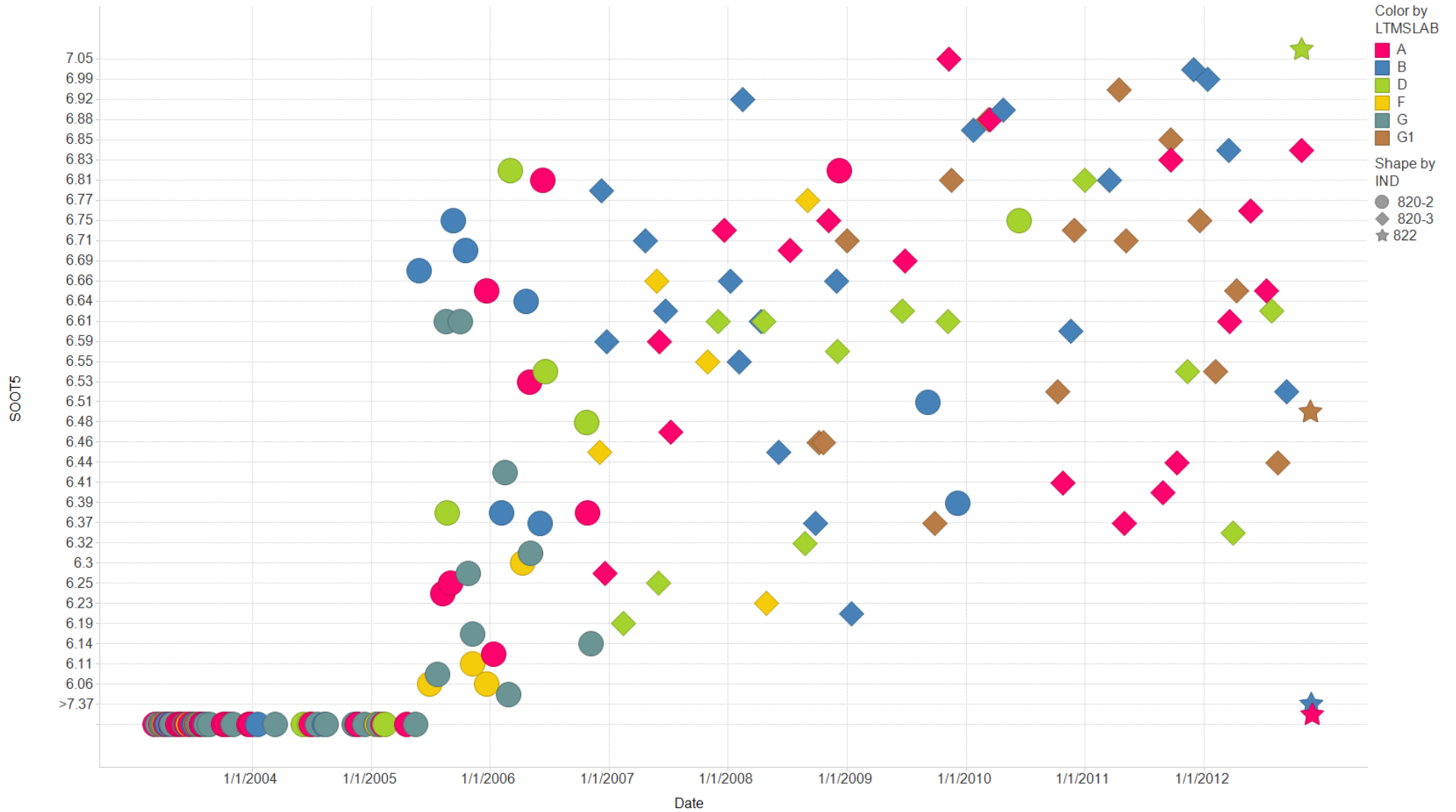


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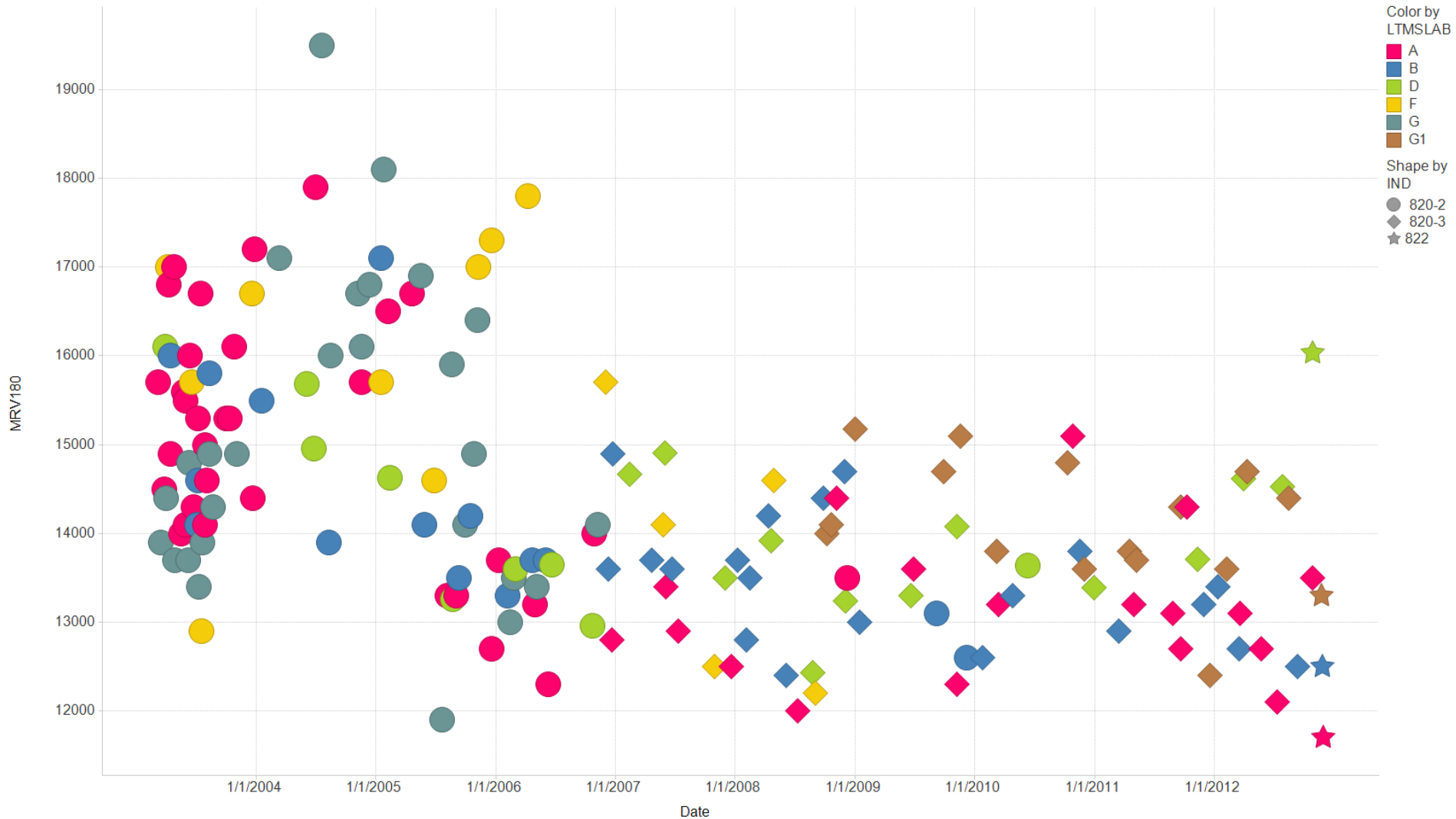


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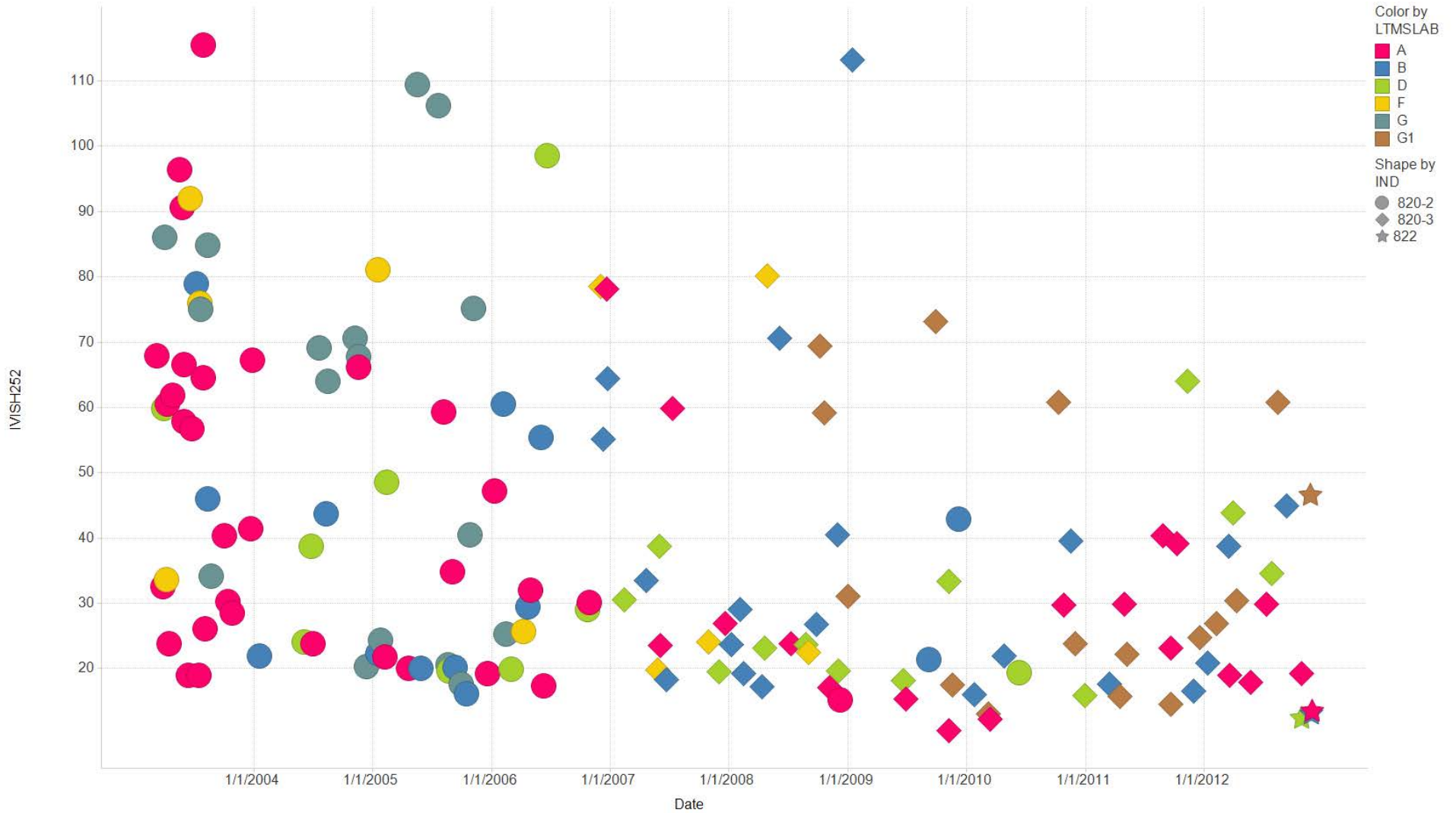


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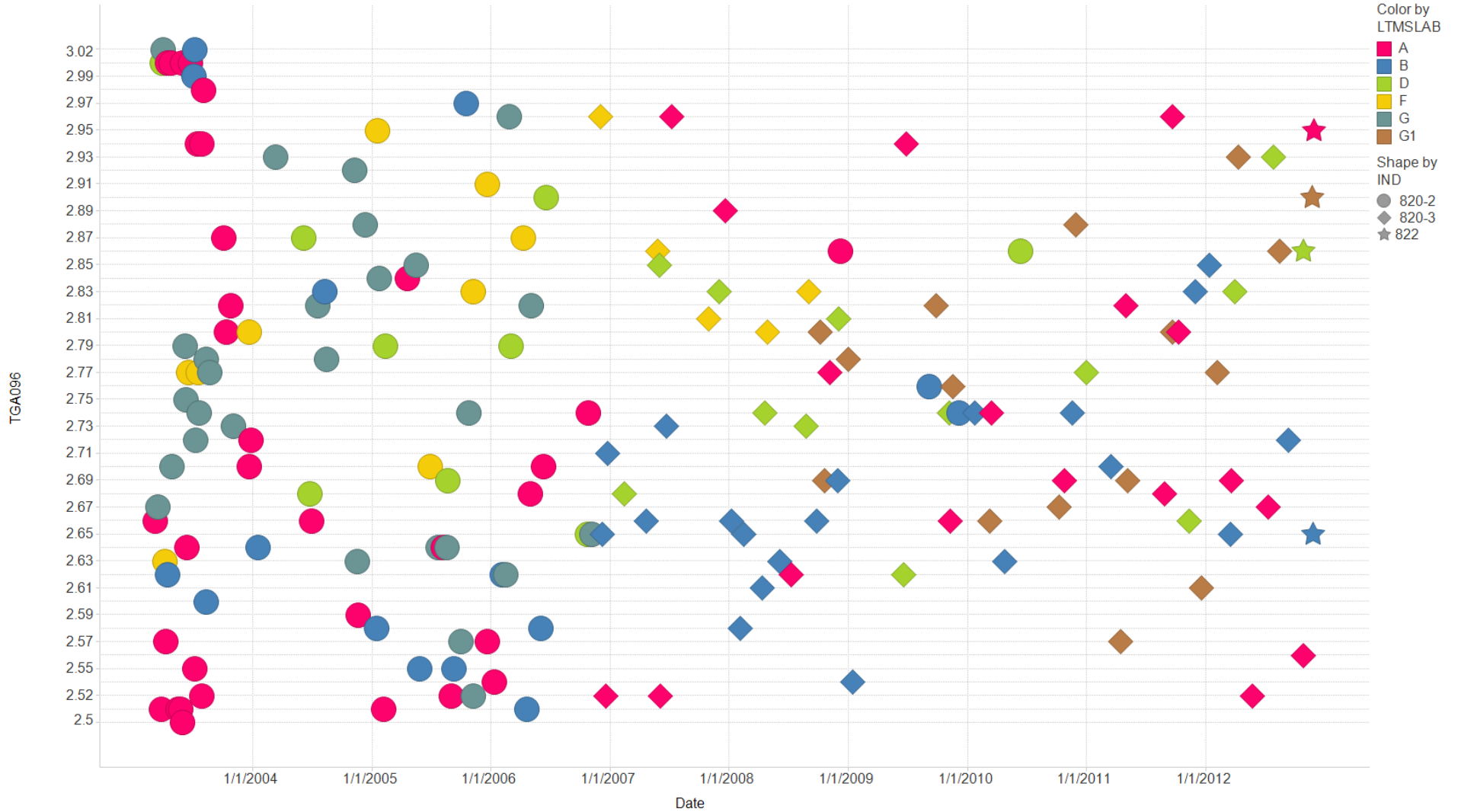


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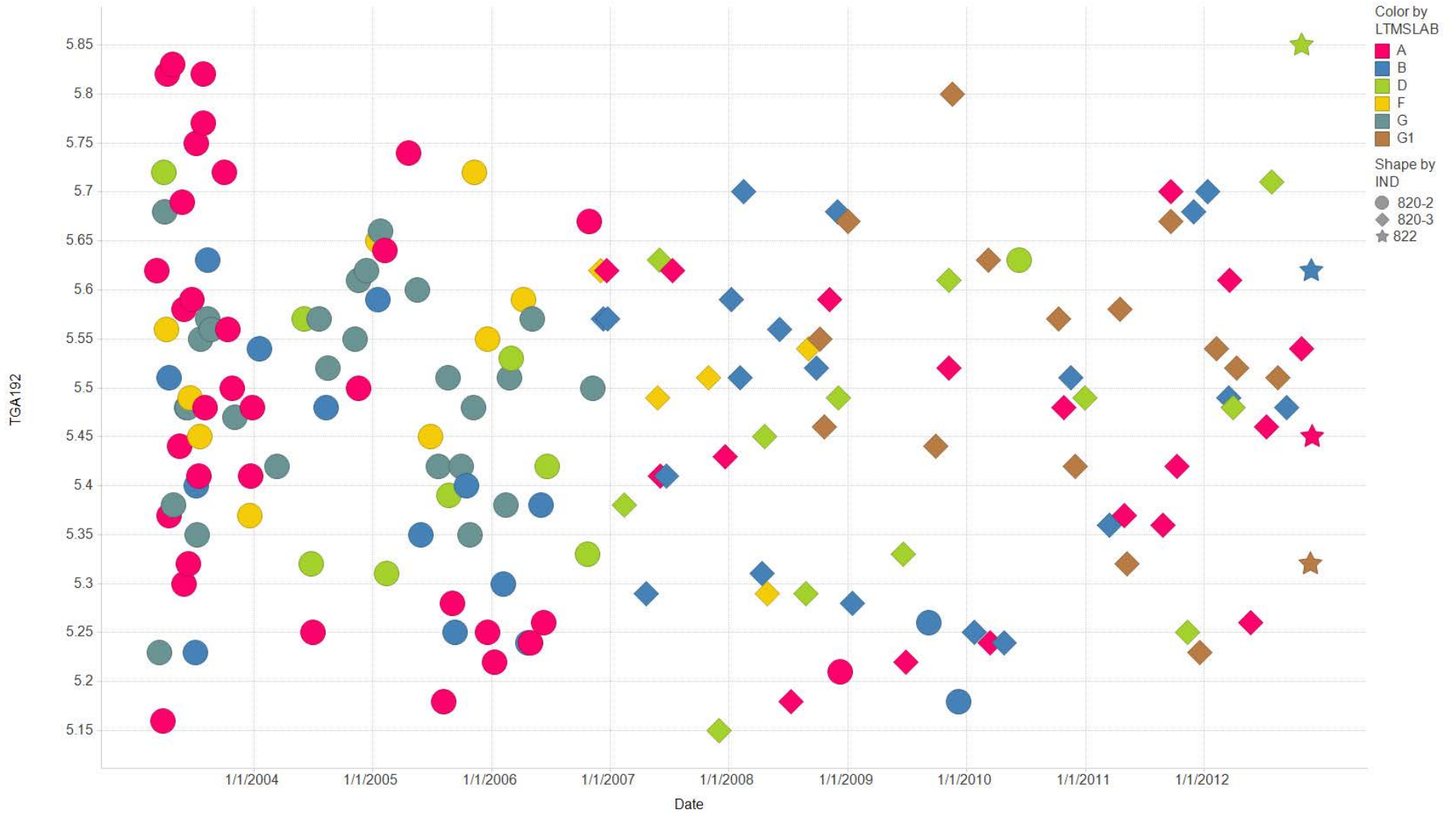


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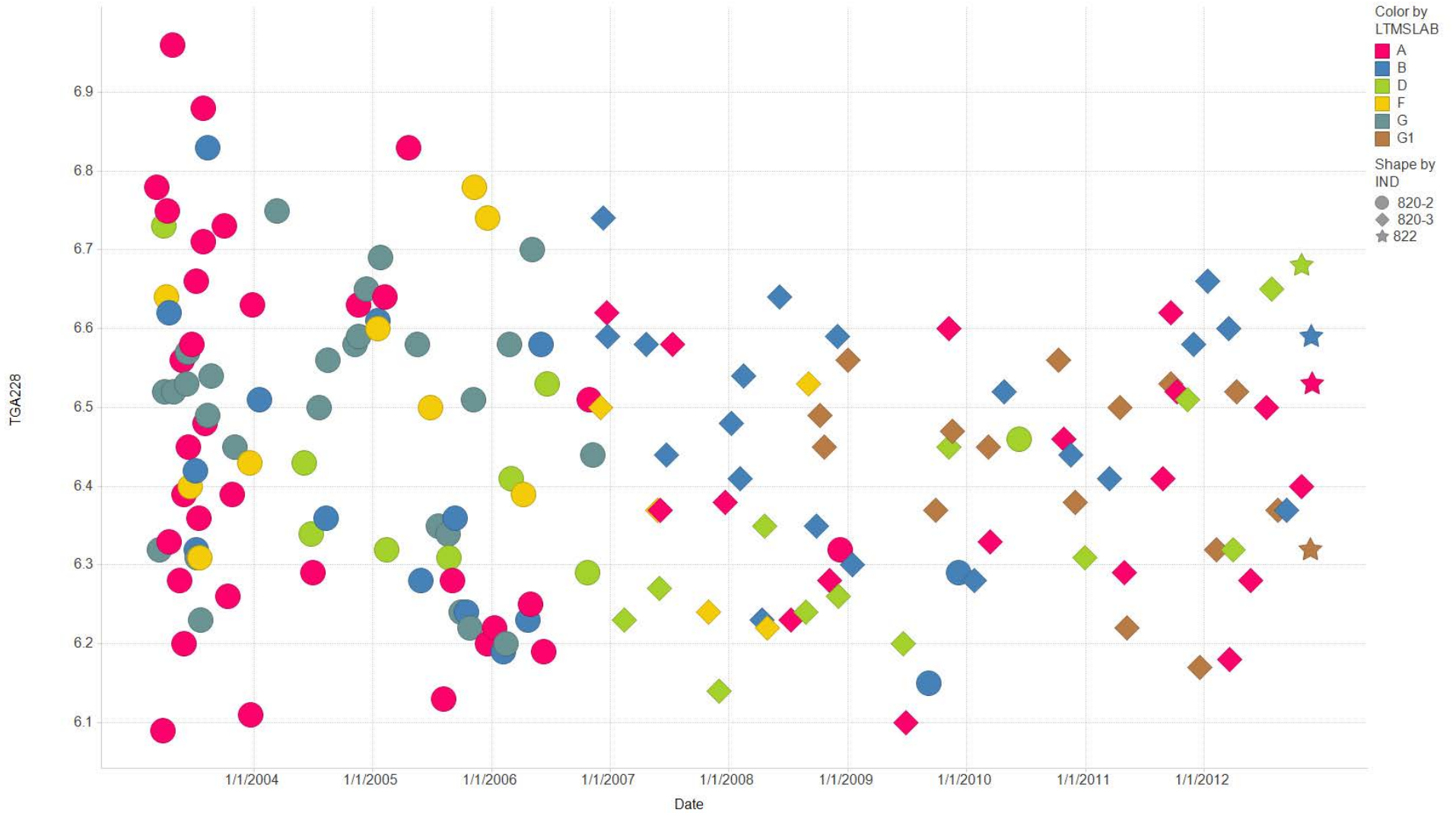


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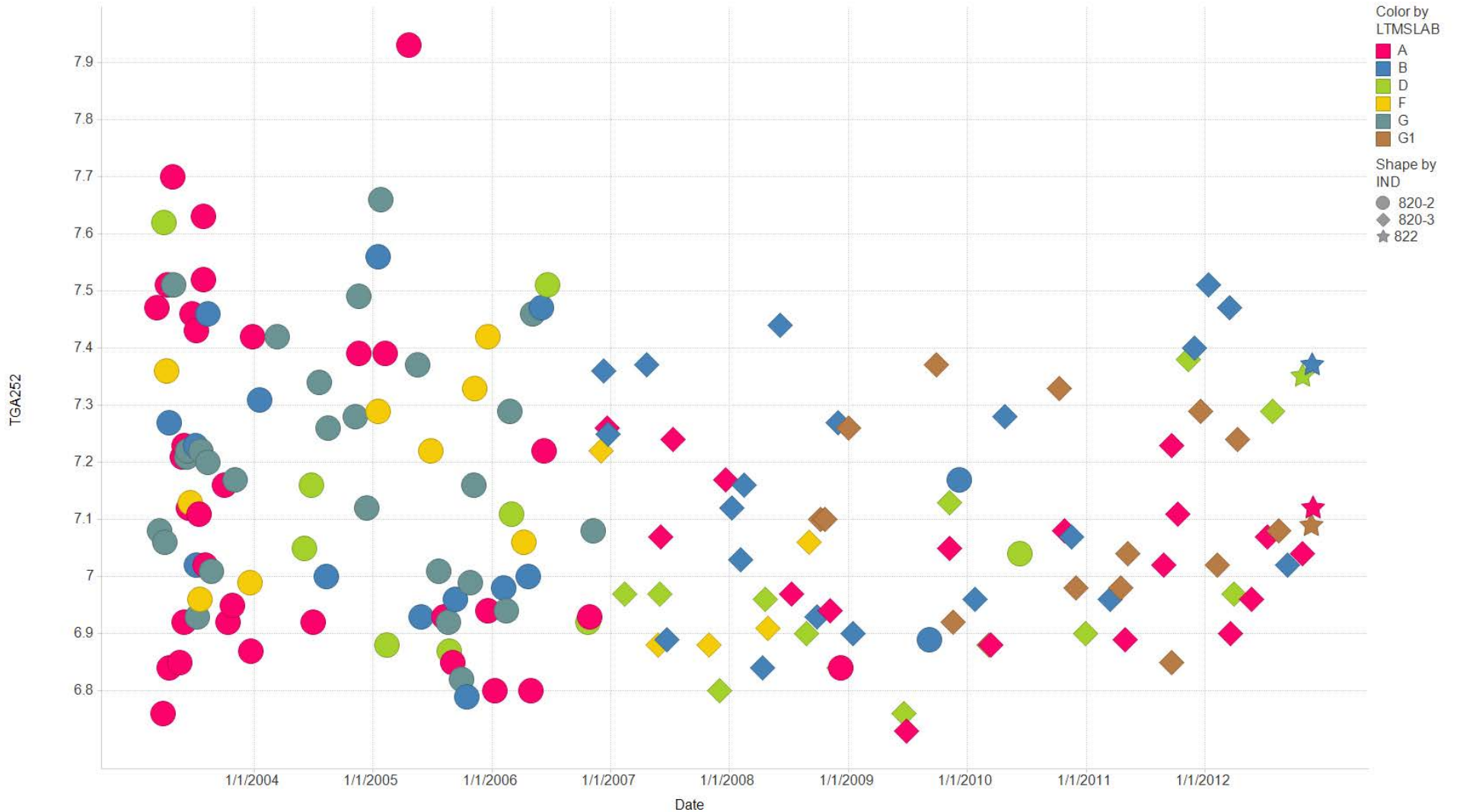


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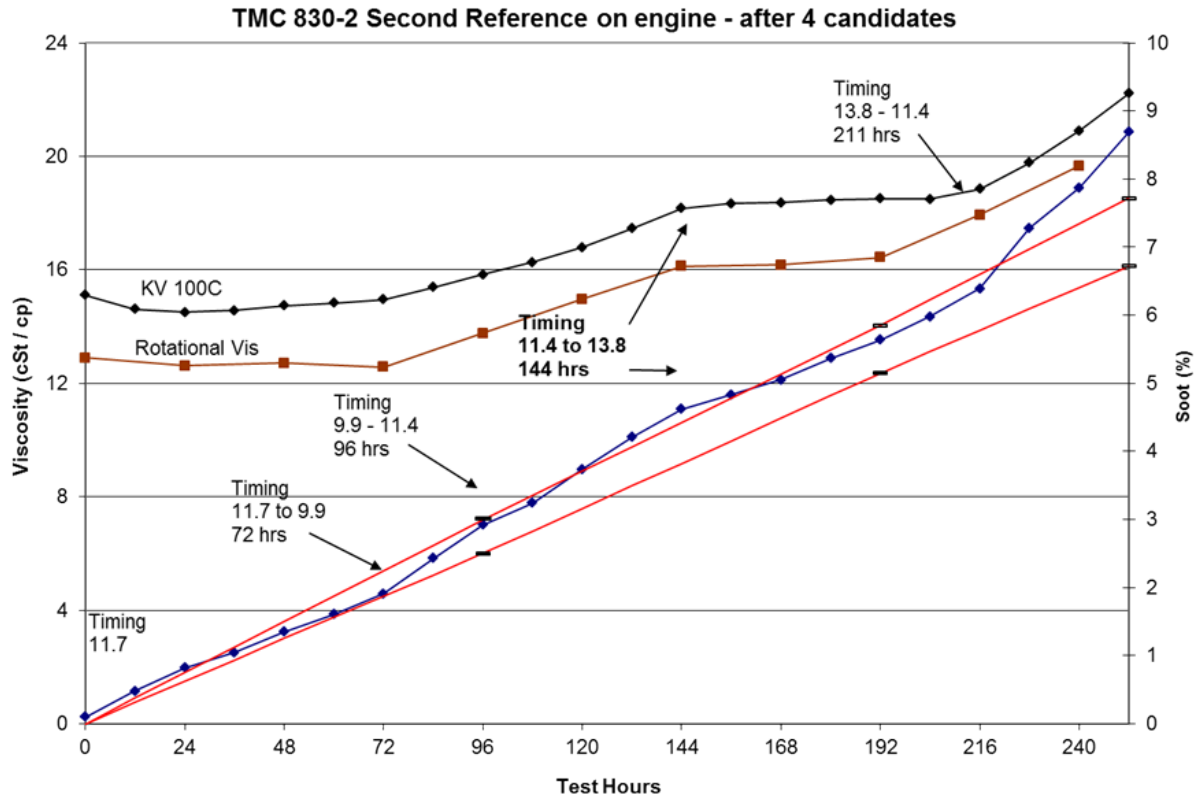
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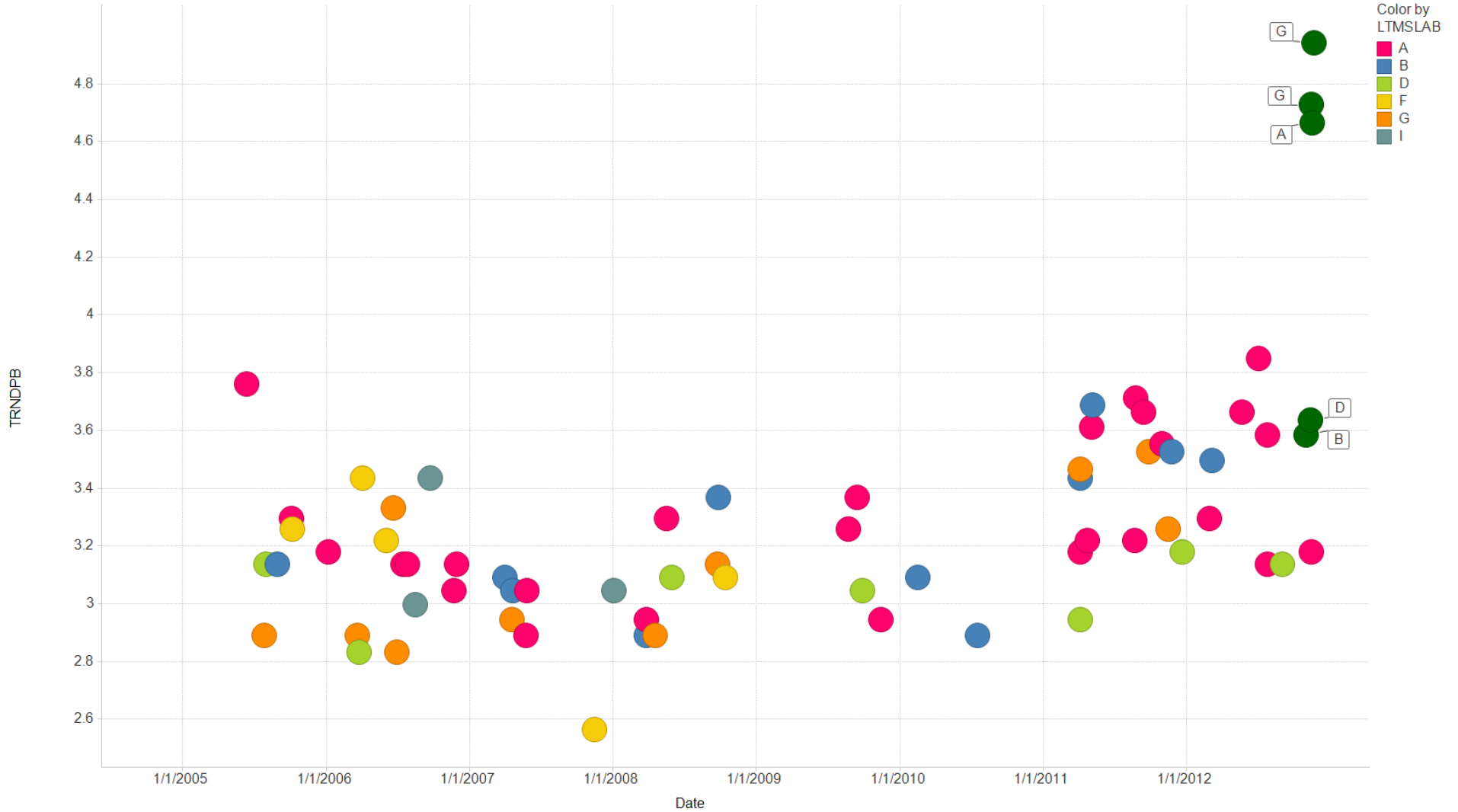


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Attachment 2



ATTACHMENT 3

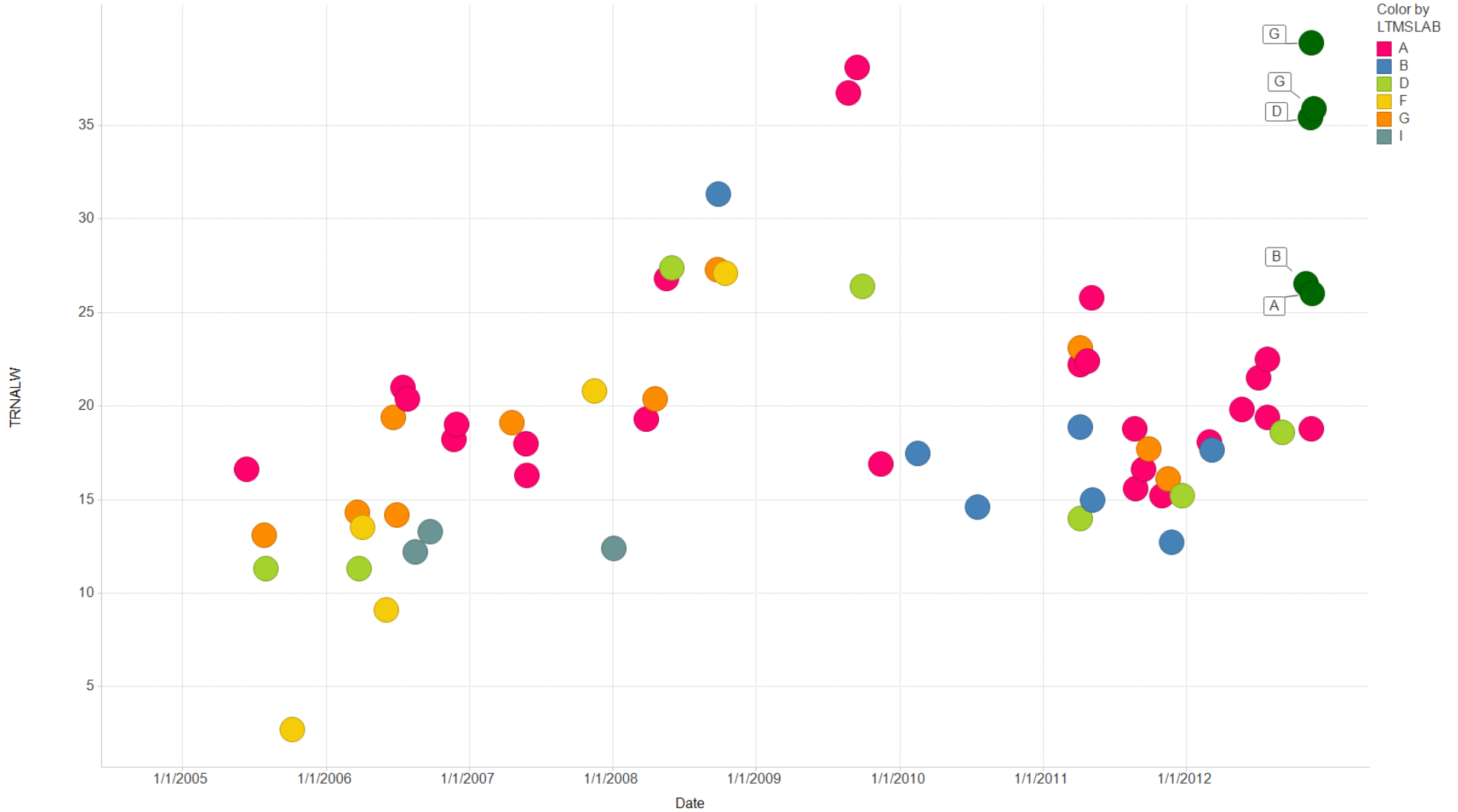


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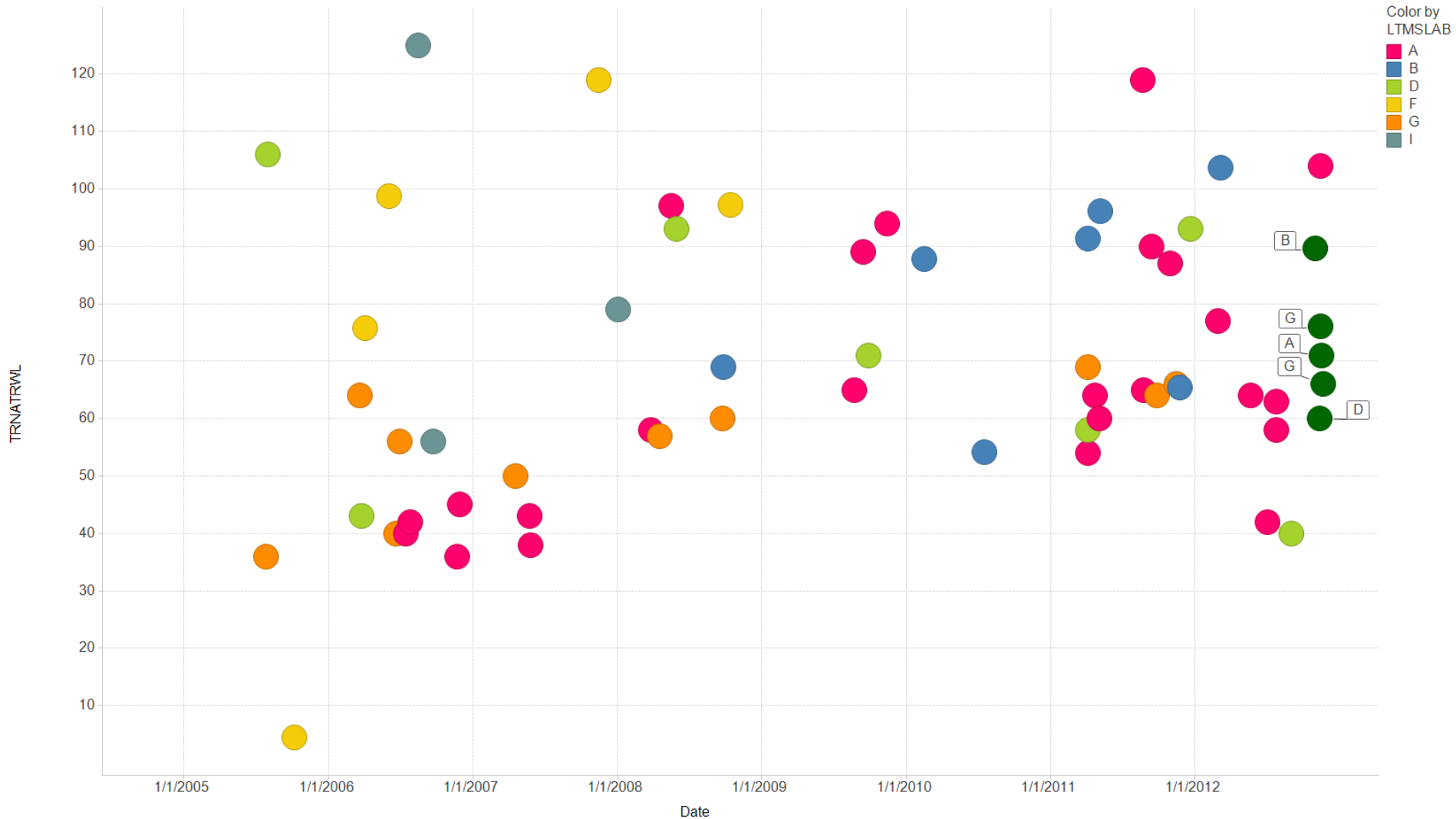


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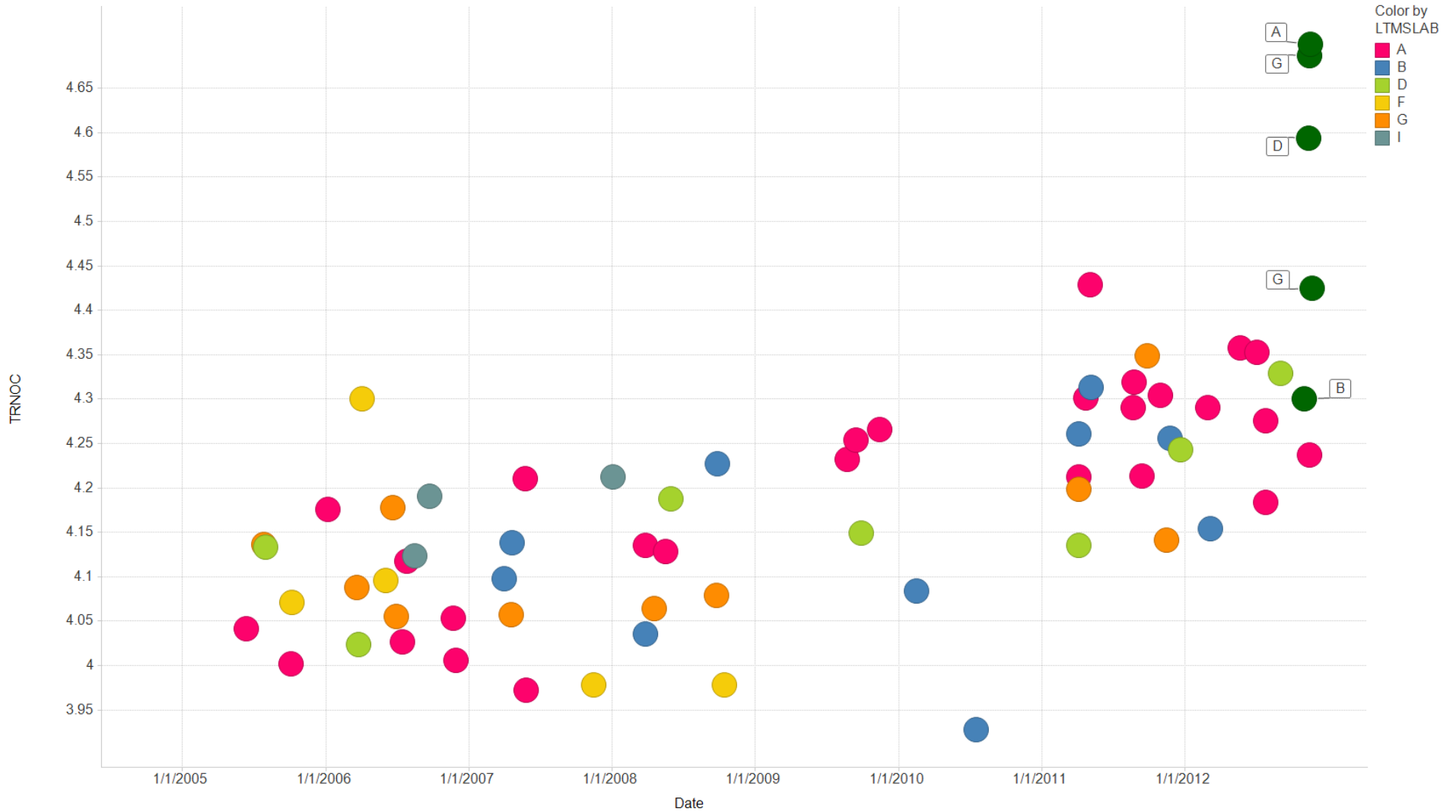
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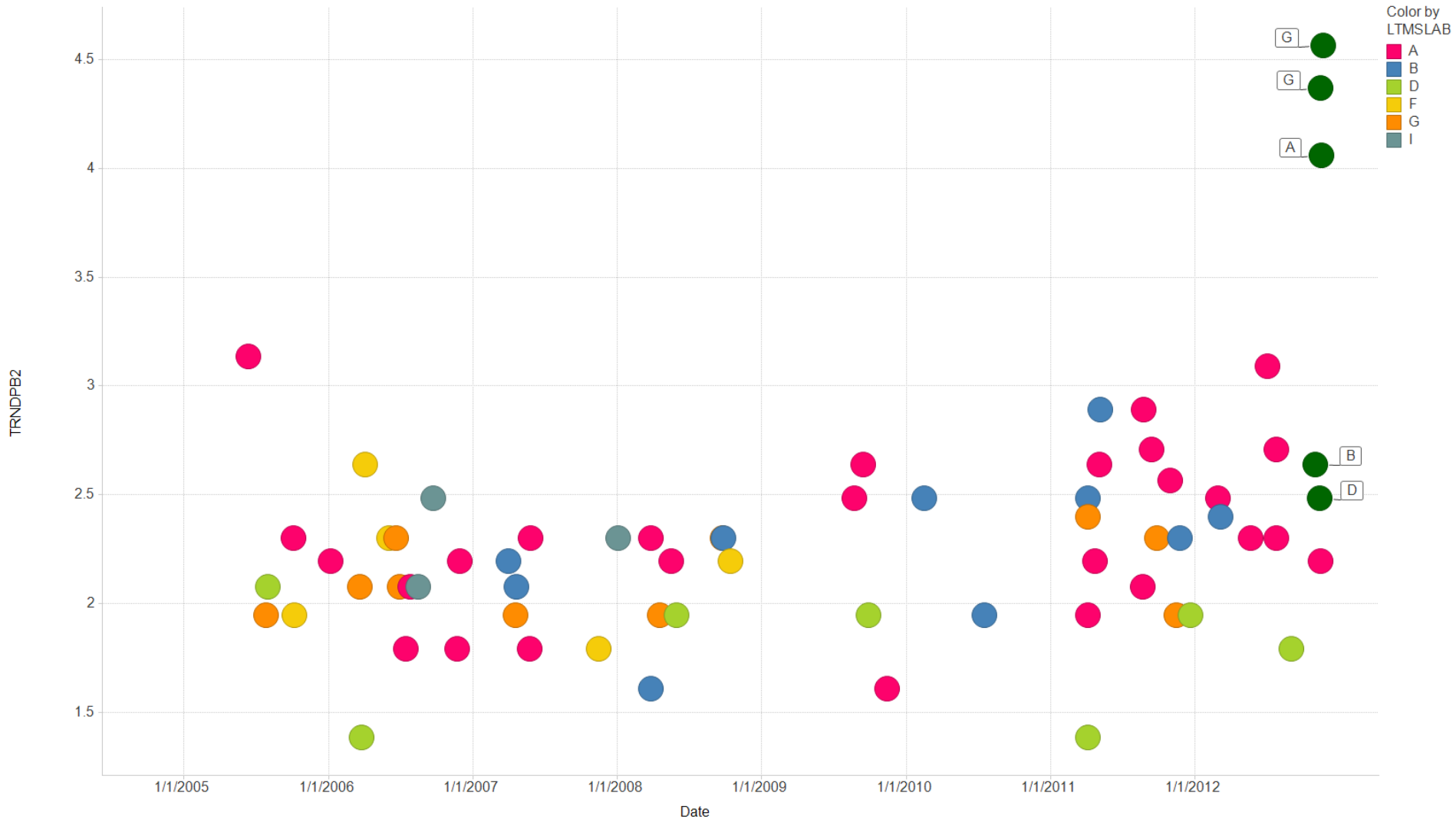


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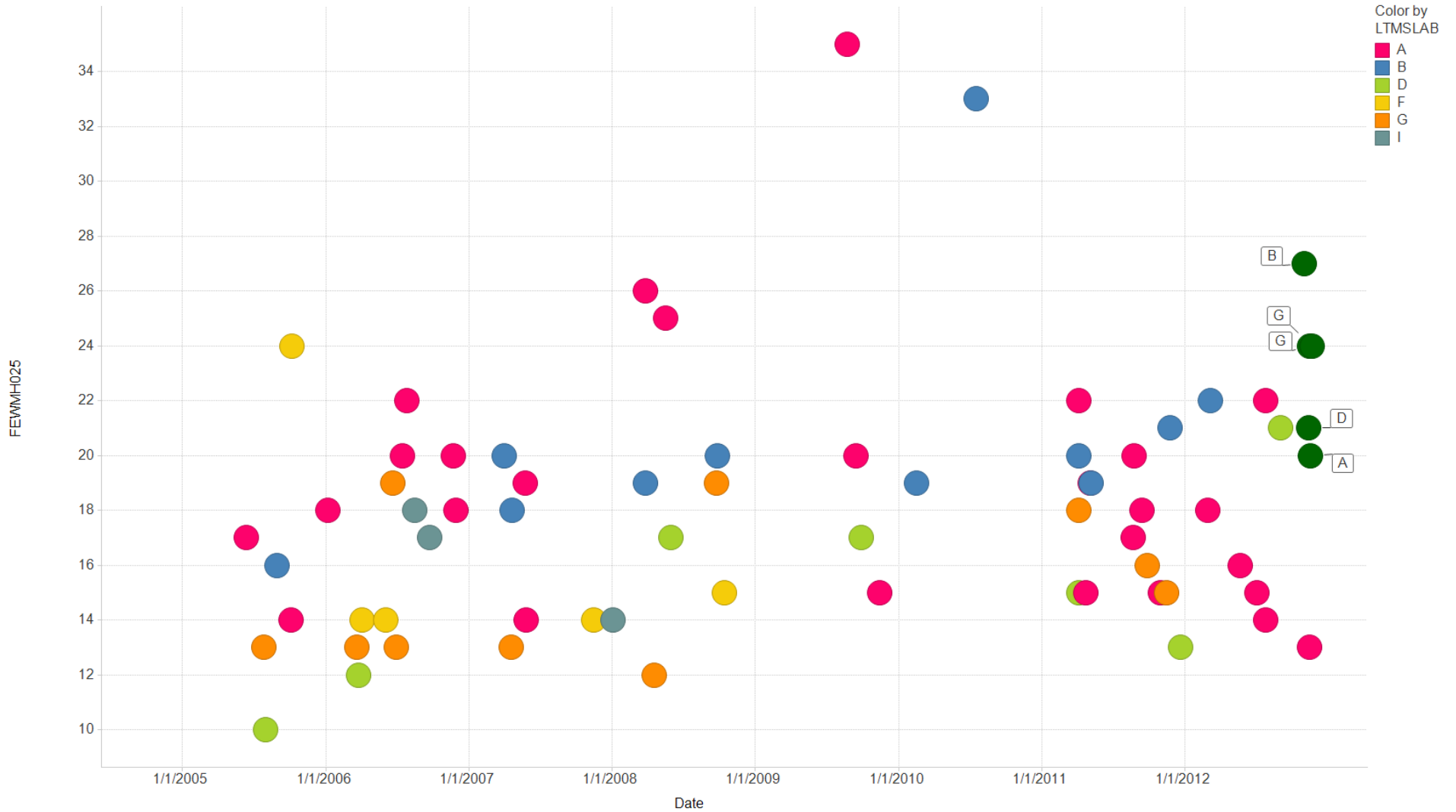


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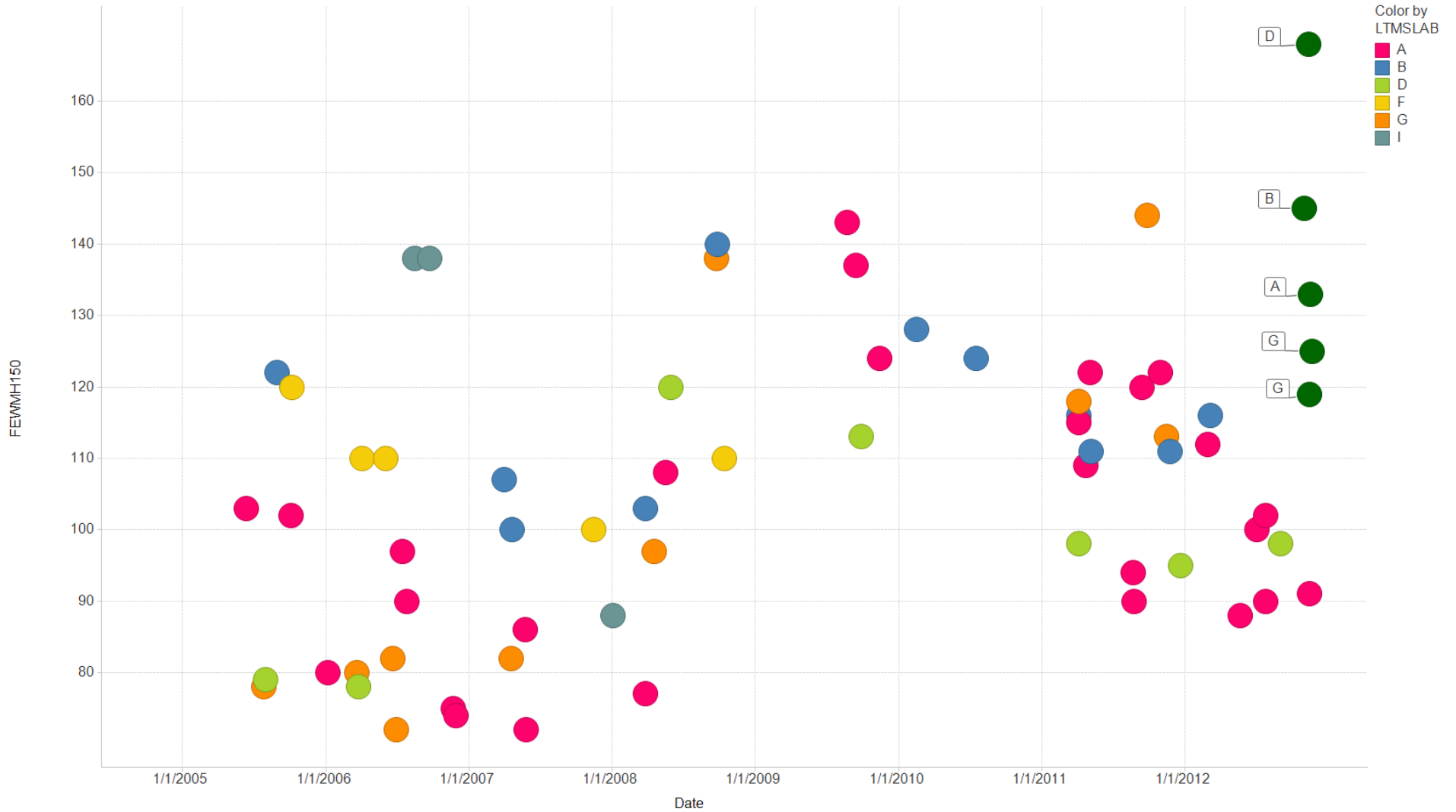


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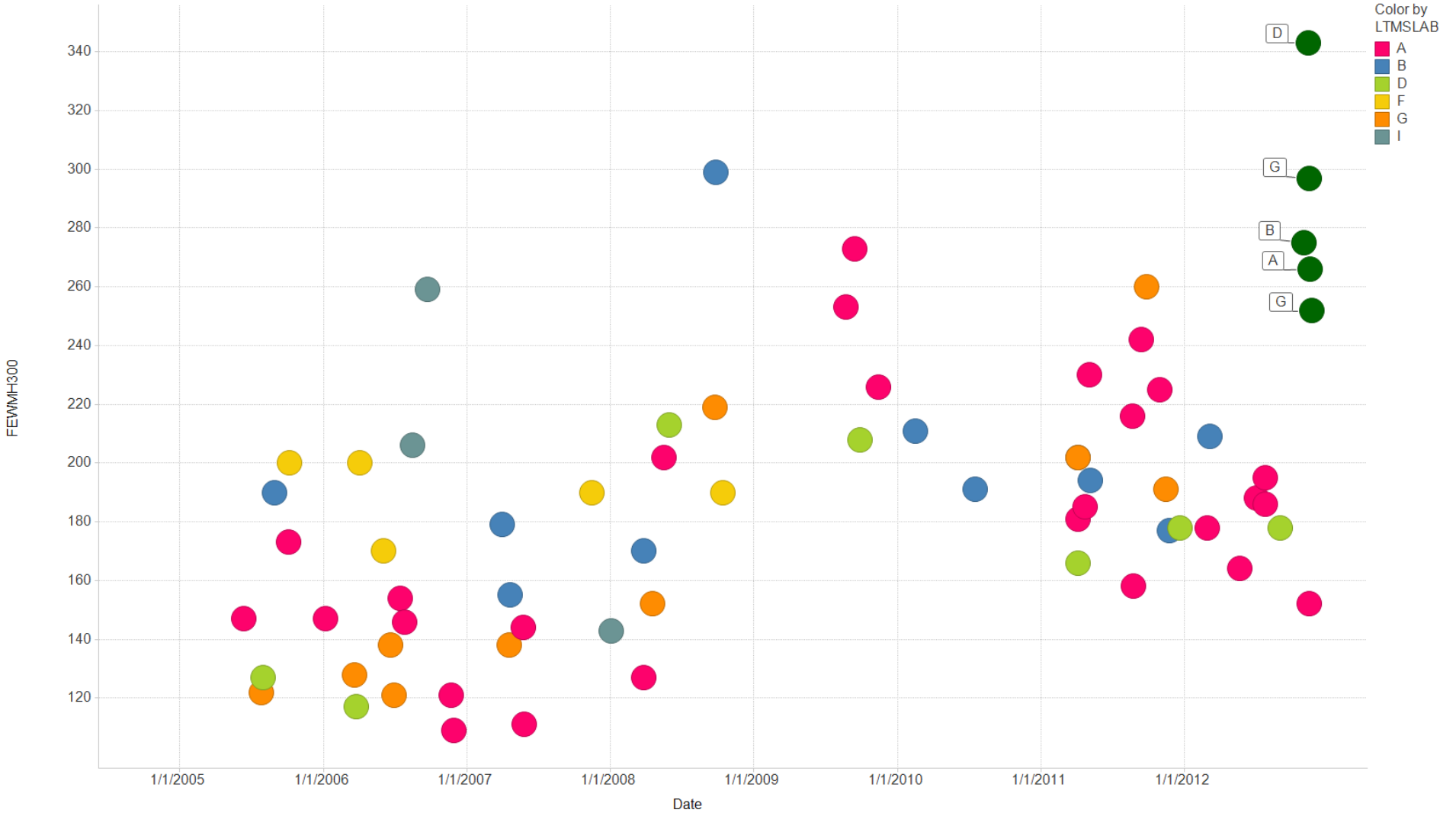


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Attachment 4

Mack T-12

U. Rod Bearings

Cross Sections

CYL# >	TRNSJQVPB EOT 3/6/12 Batch "W" Low Pb		TRN OS7QDB EOT 10/31/12 Batch "X" Low Pb	
	1	2	3	4
Sn	10.6	8.4	6.5	16.3
Cu	25.3	26.2	21	26.4
Pb	64.2	65.4	72.4	57.3

CYL#>	IAR Bearings Batch "X" High Pb					
	1	2	3	4	5	6
Sn	14	14	14.7	14.4	15.1	14.1
Cu	25.7	24.3	24.8	26.7	23.8	22.5
Pb	60.3	61.7	60.4	59	61.1	63.3

External Surface

A non-contact area at the shell end. EDS through the flash Sn layer.

TRNSJQVPB EOT 3/6/12 Batch "W" Low Pb

CYL# >	1	2	3	4	5	6
Sn	34	12.7	6.5*	40	30	39.3
Cu	3.9	2.8	1.1	3.2	2.7	2.6
Pb	62	64.5	64.5	57	68	58.2

TRN OS7QDB EOT 10/31/12 Batch "X" Low Pb

CYL# >	1	2	3	4	5	6
Sn	10	9.7	8.5	10.2	10.2	8.5
Cu	3.6	3.4	21	3.2	3.6	2.8
Pb	86	87	71	87	86.3	88.8

* There was wear at the shell end.

** EDS on a second area to verify Sn content

External Surface

IAR Bearings (contact area) Batch "X" High PB

CYL# >	1	2	3	4	5	6
Sn	23.2	14.9	17.5	18.7	17.2	20.8
Cu	8.1	5.4	3.5	5.8	8.2	4.4
Pb	68.8	79.7	79.1	75.6	74.6	74.7

External Surface

IAR Bearing (non-contact area) Batch "X" High Pb

CYL# >	1	2	3	4	5	6
Sn	11.5	7.5	22.2	9.8	10.7	22.3
Cu	5.2	2.1	7.9	2.8	3.6	7.3
Pb	83.3	90.4	70	87.4	85.7	70.4

