The following is a proposal for limiting and constraining the design of future shocks and minimizing the possibility of creating excess complexity in shock design for use in QSAC sanctioned racing.

There have been a few conversations taking place expressing concerns for the potential for shock designs and complexity to increase at an alarming rate. The thought or theme is that the "next generation" or "next advancement" in our shocks would be a true multi-valve/ multi-stage/unequal damping rate design. This has a great potential to drive costs beyond the threshold we have reached to this point with the designs currently being offered. Included is a snapshot of dialogue on this topic that dates back to 2010; this is not new topic, but one that has been sitting in the background for some time. See the appendix at the end of this proposal.

In discussing what is currently offered for shocks, there has been dialogue and debate about whether we truly have a current offering that provides a markedly different compression versus rebound ratio. I proposed this question to one of our fluid dynamic engineers where I work. The engineer explained that fundamentally, based on what I shared with him of the current shocks on the market as of May 1st, 2018, that there would be very little difference in compression ratio versus rebound ratio without implementing a change in valve to the piston. The engineer explained that the shocks that are offered today are not truly 50/50 shocks (meaning equal compression and rebound values) simply due to the fact that the cross-sectional area below the piston is less than that above the piston due to the area taken by the shock shaft. I proposed a simple question to the engineer: is it possible to create a shock that is a 60/40 or something of greater contrast in compression ratio versus rebound ratio. The engineers response was "no, not without a piston where the valve is changed between compression and rebound".

Given these concerns along with the information provided by a fluid dynamics engineer, we are presenting a rule change to govern shock design. This proposal would limit the design of future shocks, while not obsoleting what is currently available to QSAC members.

General Shock/Damper Design Rules:

1. Material(s): Any material may be used in the construction of any part of the shock (shaft, seal, seal-retainer [cartridge], body, cap, piston, or volume compensation bladder).

2. The piston must be one, single piece in design. NOTE: this does not include an O-ring if the piston is guided by an O-ring inside the shock body.

2a. Pistons may be of any shape; they may have a different shape/contour on either side; they are not required to be symmetrical in design.

2b. Pistons may be blank (no holes), or have as many or as few holes as desired.

3. The piston must not move on the shaft with the exception of rotationally around the shaft. Example: a piston that is retained by an e-clip or snap-ring may allow the piston to rotate around the shaft.

4. No externally adjustments to damping are allowed. NOTE: this is intended that an operator would need to disassemble the shock to change the damping fluid to a different weight or make a change to a different piston.

5. No internal or external adjustable valve is allowed.

6. No internally adjustable damping change is allowed. NOTE: this is intended that there are no moving parts within the shock other than the shaft and the piston. E.G. no flappers or other items that will alter the compression or rebound damping rate of the shock.

7. No external reservoirs; all fluid or air must be contained within the main shock body or shock cap.

8. The use of internal springs is prohibited (E.G. a spring inside the shock body, either on the shaft side or the non-shaft side of the piston, to assist in compression or rebound).

9. Bleed holes in the cap are allowed.

9a. Volume compensating bladders are allowed in the cap.

10. Fundamentally, the shock should be of one of the following designs:

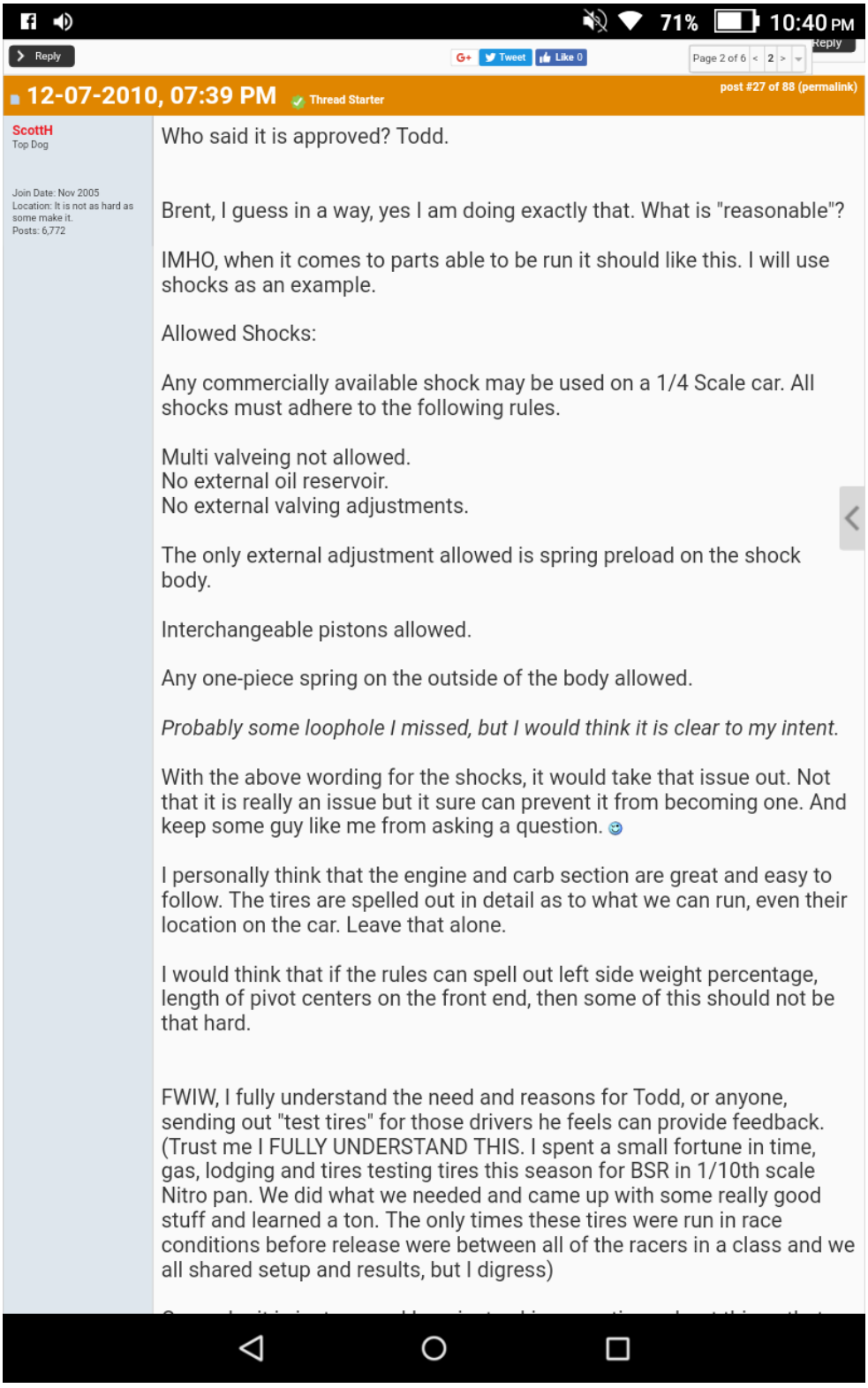
10a. Pass-through type pistons (Bullseye Invader Shocks, WCM DRX Shocks)

10b. Blow-by type pistons (Original WCM Shocks, Dynashox)

10c. Center-flow type pistons (JR Quarterscale)

10d. A combination of any of the first three (HADA Shocks, E.G. a blow-by piston that includes pass-through holes)

Appendix:



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12-07-2010, 07:39 PM Thread Starter post #27 of 88 (permalink)

ScottH
Top Dog

Join Date: Nov 2005
Location: It is not as hard as some make it.
Posts: 6,772

Who said it is approved? Todd.

Brent, I guess in a way, yes I am doing exactly that. What is "reasonable"?

IMHO, when it comes to parts able to be run it should like this. I will use shocks as an example.

Allowed Shocks:

Any commercially available shock may be used on a 1/4 Scale car. All shocks must adhere to the following rules.

Multi valveing not allowed.
No external oil reservoir.
No external valving adjustments.

The only external adjustment allowed is spring preload on the shock body.

Interchangeable pistons allowed.

Any one-piece spring on the outside of the body allowed.

Probably some loophole I missed, but I would think it is clear to my intent.

With the above wording for the shocks, it would take that issue out. Not that it is really an issue but it sure can prevent it from becoming one. And keep some guy like me from asking a question.

I personally think that the engine and carb section are great and easy to follow. The tires are spelled out in detail as to what we can run, even their location on the car. Leave that alone.

I would think that if the rules can spell out left side weight percentage, length of pivot centers on the front end, then some of this should not be that hard.

FWIW, I fully understand the need and reasons for Todd, or anyone, sending out "test tires" for those drivers he feels can provide feedback. (Trust me I FULLY UNDERSTAND THIS. I spent a small fortune in time, gas, lodging and tires testing tires this season for BSR in 1/10th scale Nitro pan. We did what we needed and came up with some really good stuff and learned a ton. The only times these tires were run in race conditions before release were between all of the racers in a class and we all shared setup and results, but I digress)