LOG OF MEETING
DIRECTORATE FOR ENGINEERING SCIENCES

SUBJECT: Recreational Off-Highway Vehicles (ROVs) – OPEI B71.9 Public and Stakeholder Meeting

DATE OF MEETING: May 19, 2015

PLACE OF MEETING: Hilton Garden Inn, Atlanta Airport/Millennium Center, Atlanta, GA.

LOG ENTRY SOURCE: Caroleene Paul, ESME

COMMISSION ATTENDEES: See attached attendance list

NON-COMMISSION ATTENDEES: See attached attendance list

SUMMARY OF MEETING:

OPEI representatives summarized voluntary standard requirements that committee members have been discussing. The following topics were discussed:

- Scope – Remove the 50 mph maximum speed from scope/definition of multi-purpose off-highway utility vehicle (MOHUV).
- Occupant Protective Systems (OPS)
    - Add driver's side seat belt speed limiting system that limits vehicle speed to 15 mph if the driver's seat belt is not buckled.
    - Add performance requirement to occupant side retention devices requirement. Apply probe with 163 lbf. In outward direction.
- Static Lateral stability
    - Increase minimum tilt table angle for vehicle loaded with two occupants to 33 degrees.
    - Add hang tag requirement that displays vehicle tilt table angle at two-wheel lift.
    - Delete static K_{st} requirement.
- Dynamic Lateral Stability
    - Retain J-turn test at 20 mph and 180 degrees of steer angle.
    - Round robin test results show peak lateral acceleration at rollover (Ay) is not repeatable.
- Vehicle Handling
    - Constant steer angle test on 100 ft. diameter circle.
    - Average of yaw rate slope ratio (ratio of slope of yaw rate between 0.4 and 0.5 g and slope of yaw rate between 0.1 and 0.2 g) in both directions must be 3.5 or less.

CPSC staff asked OPEI members how they felt about the proposed requirements and generally everyone was in favor of the proposal.

Next Actions include:

- Member discussion of CPSC staff comment that ROVs not equipped with inertial locks performed poorly in rollover simulations.
- Exploration of critical speed at which ROVs exhibit divergent instability, and whether the proposed constant steer test takes into account the full range of each vehicle.
- Consideration of whether the tilt table angle test procedures should be an average of several measurements.
- Ensuring that supporting rationale for proposed requirements are based on increasing the safety of ROVs.
- Providing CPSC staff with a pre-canvass draft of the proposed standard for review and use in a future public meeting to discuss the ANSI/OPEI B71.9 voluntary standard.

OPEI presentation attached.

MEETING ATTENDANCE RECORD
OPEI B71.9 – May 19, 2015

COMMISSION ATTENDEES:

NAME	ORGANIZATION
Caroleene Paul	CPSC
Mark Kumagai	CPSC

NON-COMMISSION ATTENDEES:

NAME	ORGANIZATION
Greg Knott	OPEI
Carol Gardner	E-Z GO Textron
Mark Austrian	Kelly Drye/OPEI
Tom Yager	ROHVA
Brad Franklin	Yamaha Motor Corp.
Mike Wiegard	Eckert Seamans/Kawasaki
Tyler Furman	Kawasaki Motors
Eric Moore	Club Car
Jack Alden	Honda
Bob Loehr	John Deere
Keith Steenlage	John Deere
Jimmy Eavenson	MTD Products
Mark Holland	MTD Products
Paul Vitrano	Polaris Industries, Inc.
Damian Harty	Polaris Industries, Inc.
Louis Brady	Polaris Industries, Inc.

OPEI B71.9 Public & Stakeholder Meeting

Agenda

- Review Some Key B71.9-2012 Requirement – Scope, Occupant Protective Systems and Stability Requirements
- Discuss Items for Consideration as Part of B71.9-201X Revision
- Next Steps

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B71.9-2012 Requirements

- Scope
  - Multi-Purpose Off-Highway Utility Vehicles
  - 25 to 50 mph
  - 80” width
  - 4 or more wheels
  - Steering wheel
  - Non-straddle seat
  - Max 4000 lb GVRW
  - Min 350 lb cargo capacity

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B71.9-2012 Requirements

- Occupant Protective Systems
  - 3 pt Seat Belts w/ Visual Reminder
  - Side Restraint Device
- Dynamic Stability
  - 20mph, 180 degree J-Turn
    - No TWL. TWL defined as 2” or greater

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B71.9-2012 Requirements

- Tilt Table Angle
  - Lateral
    - Operator + Passenger – Min 30 degrees
    - GVWR – Min 24 degrees
  - Longitudinal
    - GVWR – Min 28 degrees
- Static Stability Coefficient (Kst)
  - Curb Weight Kst Min of 1.0

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Next Steps Discussion
B71.9-201X Revision

- Occupant Protective Systems
- Vehicle Handling
- Dynamic Stability
  - Tilt Table Angle
    - Ay vs TTA
    - Hang Tag
  - J-Turn
  - Static Stability Coefficient (Kst)

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Next Steps Discussion
B71.9-201X Revision

- Scope
- Other Considerations

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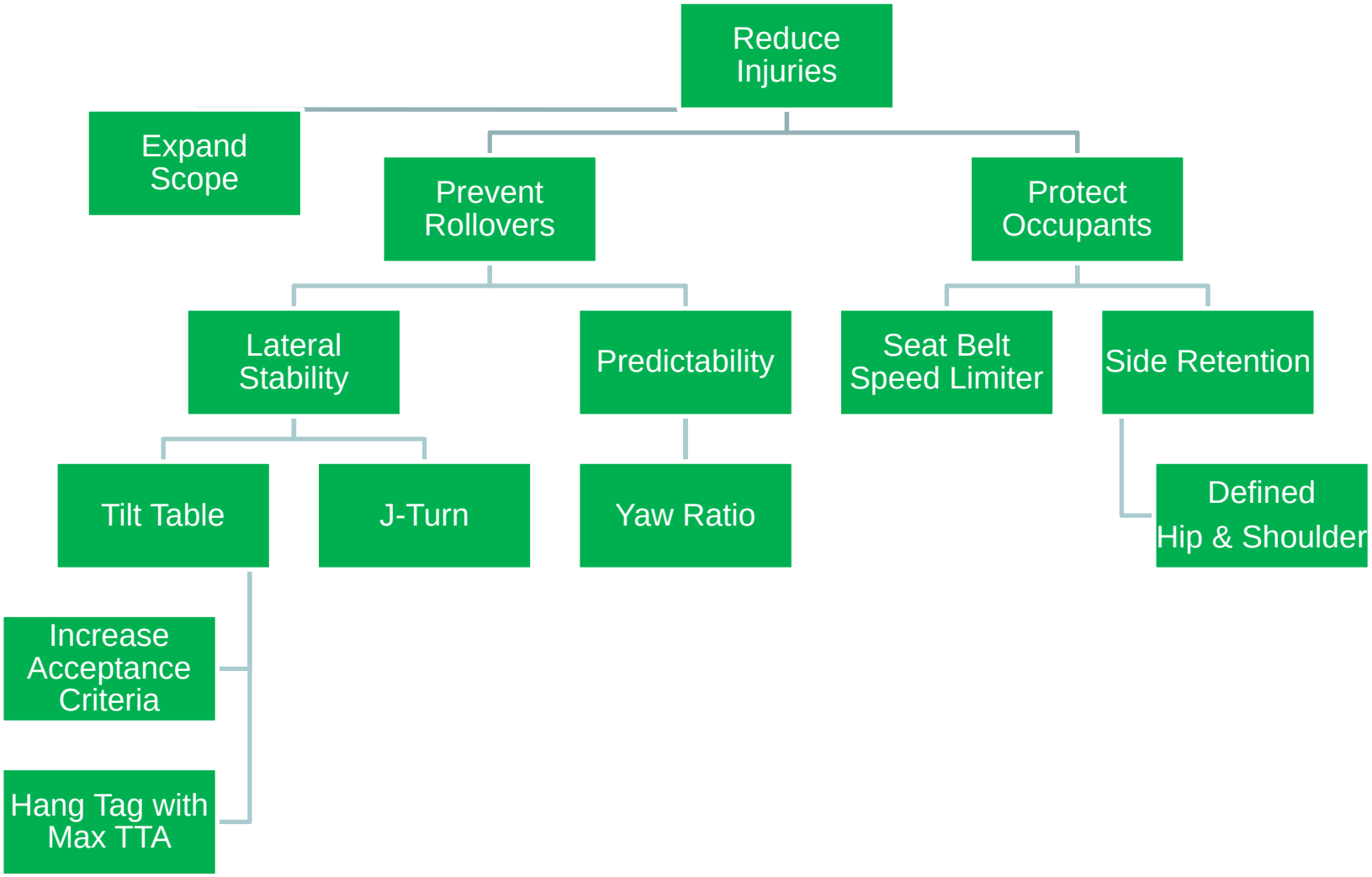

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Next Steps

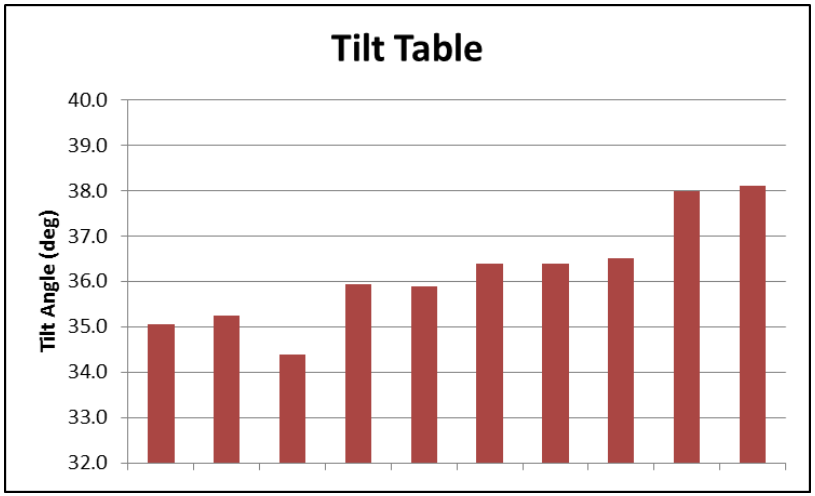
The End

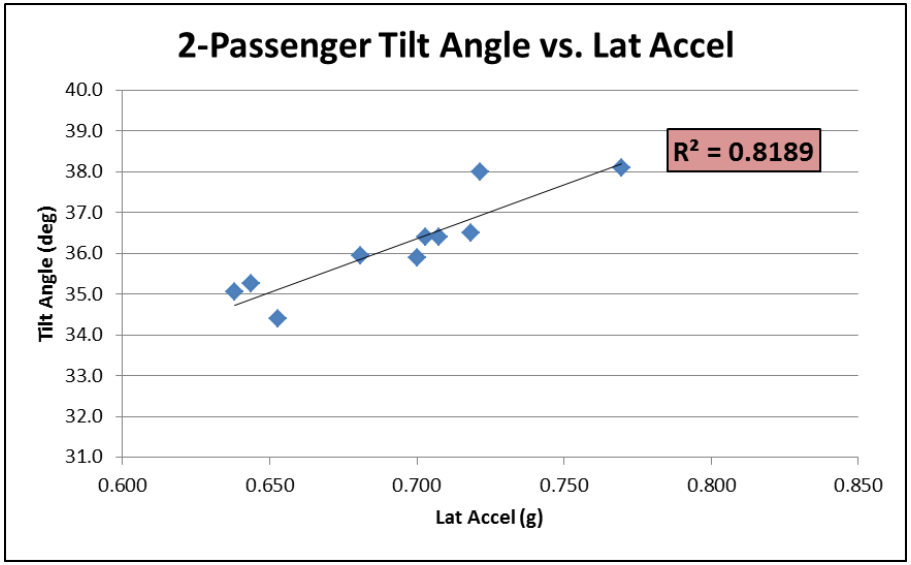
Comparative Metrics: J-Turn and Tilt Table Correlation

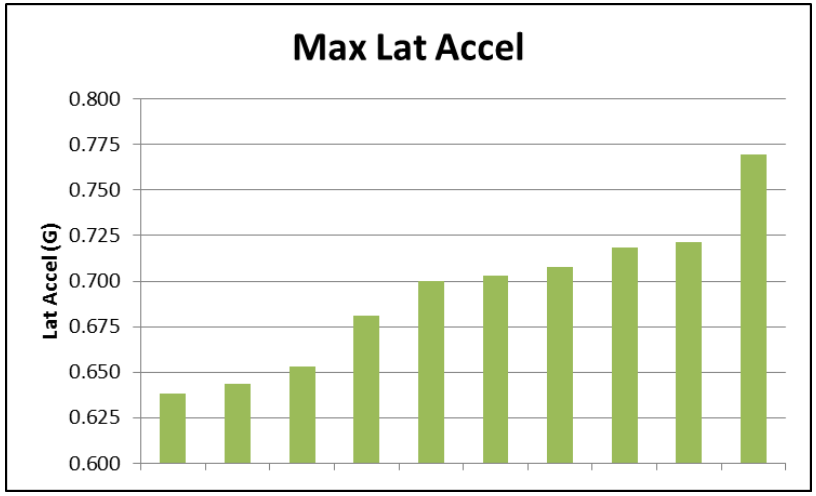
Correlation: J-Turn Ay and 2-Pass TTA

Off Road Vehicle Division

Vehicle Number	J-Turn (Peak Lat Accel)			Tilt Table (2-Passenger)		
	LH Turn (G)	RH Turn (G)	Average Max Lat Accel (G)	LH Tilt Angle (Deg)	RH Tilt Angle (deg)	Average Tilt Angle (deg)
1	0.648	0.628	0.638	35.1	35.0	35.1
2	0.662	0.626	0.644	35.4	35.1	35.3
3	0.704	0.602	0.653	34.7	34.0	34.4
4	0.711	0.651	0.681	36.6	35.3	36.0
5	0.716	0.684	0.700	36.4	35.3	35.9
6	0.723	0.683	0.703	35.9	36.9	36.4
7	0.726	0.689	0.708	36.2	36.6	36.4
8	0.774	0.663	0.719	36.5	36.5	36.5
9	0.703	0.740	0.721	38.4	37.6	38.0
10	0.816	0.723	0.770	37.6	38.6	38.1





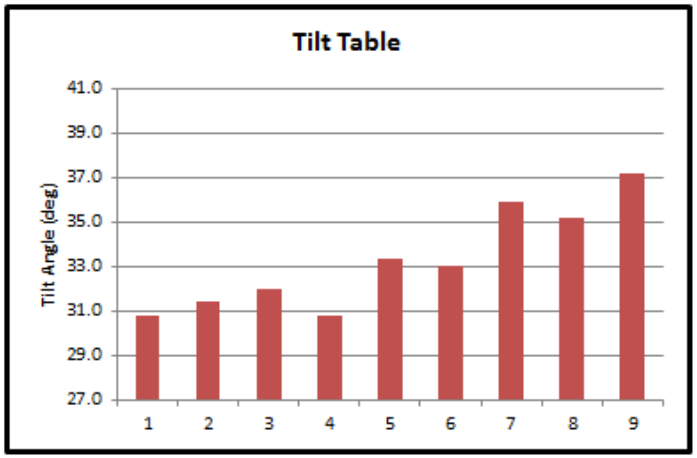


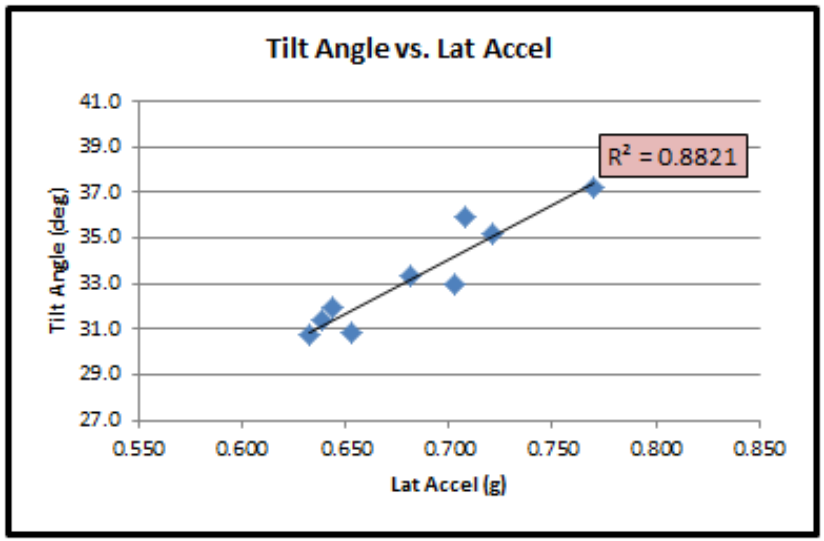
TTA Hang Tag Would Provide Comparable Comparison of Vehicles

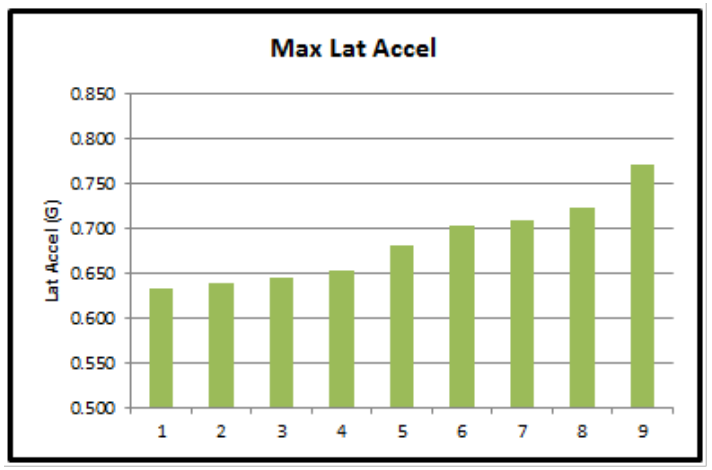
Correlation: J-Turn Ay and GVW TTA

Off Road Vehicle Division

Vehicle Number	J-Turn (Peak Lat Accel)			Tilt Table (GVW)		
	LH Turn (G)	RH Turn (G)	Average Max Lat Accel (G)	LH Tilt Angle (Deg)	RH Tilt Angle (Deg)	Average Tilt Angle (Deg)
1	0.678	0.588	0.633	30.7	30.8	30.8
2	0.648	0.628	0.638	31.6	31.2	31.4
3	0.662	0.626	0.644	32.0	31.9	32.0
4	0.704	0.602	0.653	31.1	30.5	30.8
5	0.711	0.651	0.681	33.7	32.9	33.3
6	0.723	0.683	0.703	32.5	33.5	33.0
7	0.726	0.689	0.708	36.0	35.8	35.9
8	0.703	0.740	0.721	35.6	34.7	35.2
9	0.816	0.723	0.770	37.4	37.0	37.2



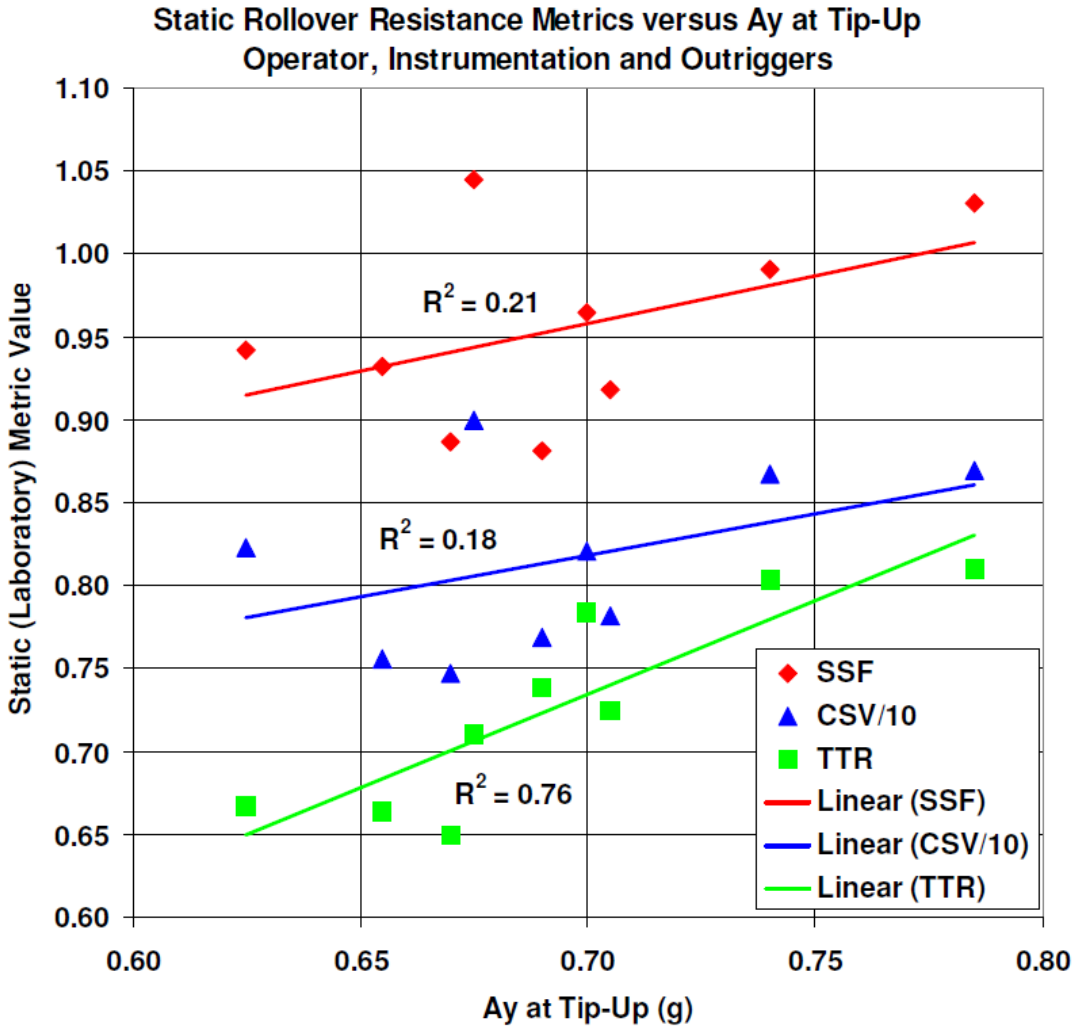




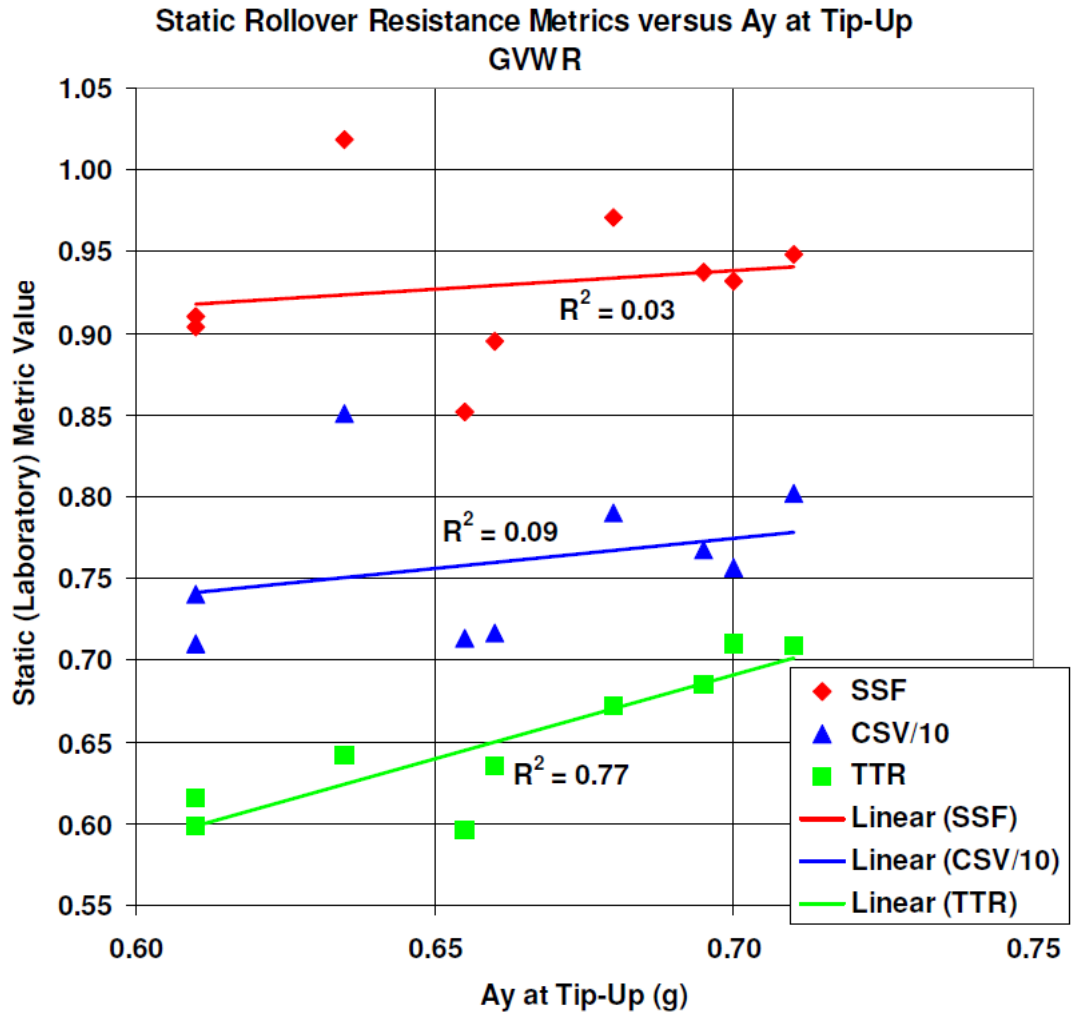
Return

TTA Hang Tag Would Provide Comparable Comparison of Vehicles

SEA Ay vs TTA @ 2-Pass

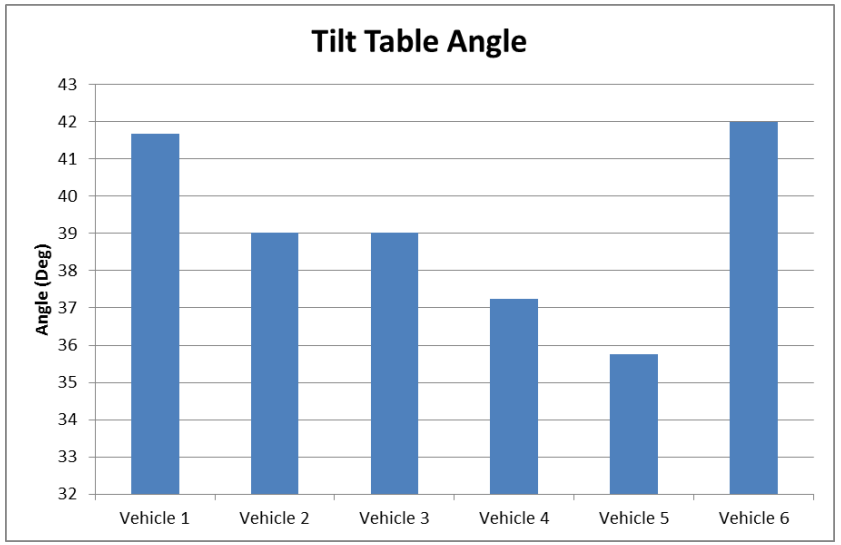


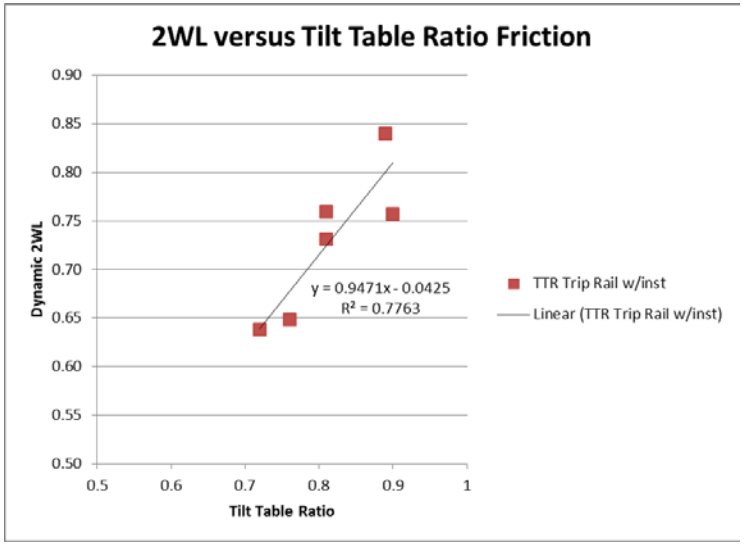
SEA Ay vs TTA @ GVW

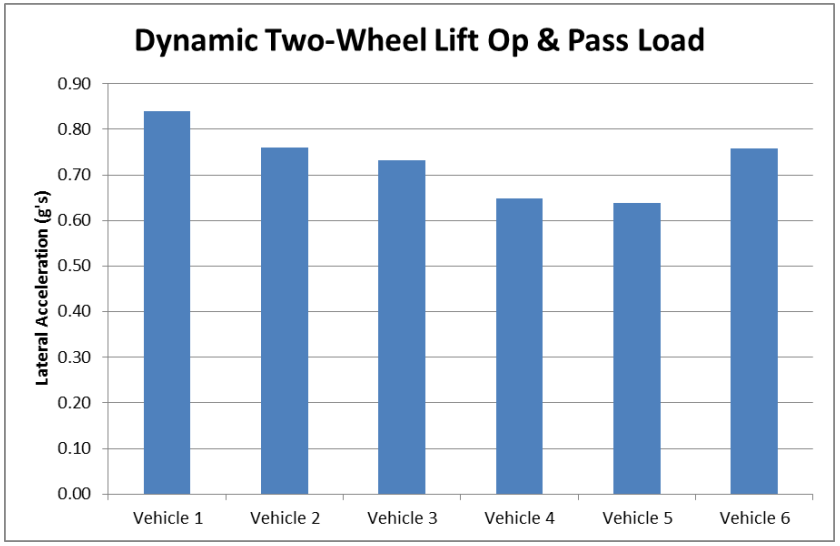


OPEI Member J Turn Ay and 2 Pass TTA Data

Vehicle	Dynamic Two Wheel Lift (g)	TTA Trip Rail w/inst (deg)
Vehicle 1	0.84	41.7
Vehicle 2	0.76	39.0
Vehicle 3	0.73	39.0
Vehicle 4	0.65	37.2
Vehicle 5	0.64	35.8
Vehicle 6	0.76	42.0

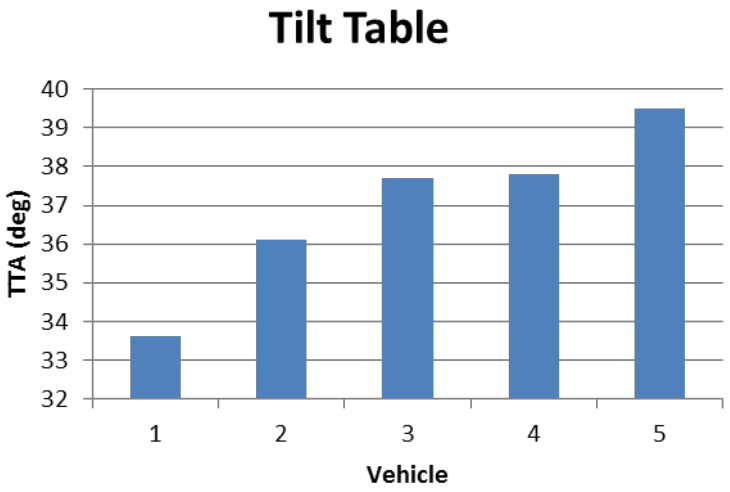


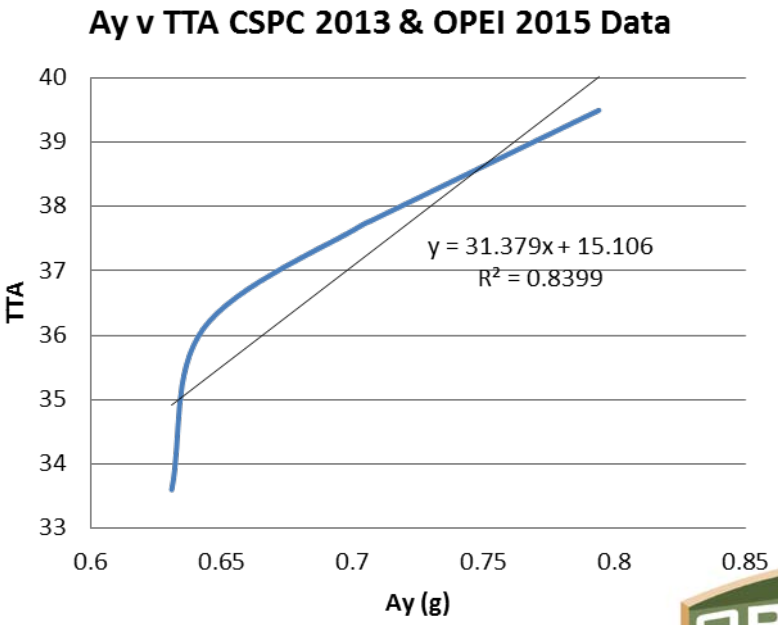


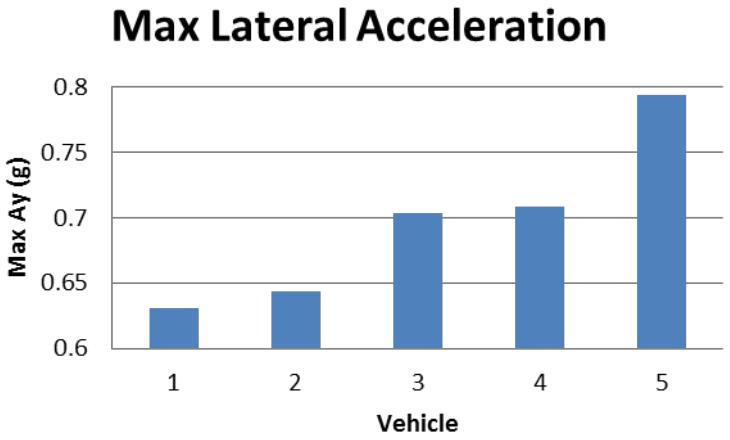


OPEI J Turn Ay and 2-Pass TTA Data

SEA/CPSC 2013, OPEI 2015			
	Vehicle	Peak Ay	TTA Op+Pass
1	CPSC D - 2013	0.631	33.6
2	CPSC J - 2013	0.643	36.1
3	CPSC E - 2013	0.703	37.7
4	OPEI V2 - 2015	0.708	37.8
5	OPEI V1 - 2015	0.794	39.5
Average of all OPEI 2015 Tests			
Avg of all OPEI 2015 + SEA/CPSC 2013			







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