

EXHIBIT 6

Transmission Surge – Lurch - Lunge



2014-2019 Silverado/Sierra/; 2015-2020 Tahoe, Suburban, Escalade, Escalade ESV, Yukon, Yukon XL (No RPO restrictions);
2015-2018 Sierra LD, Silverado LD, Yukon, Yukon XL, 2015-2020 Escalade 2018-2020 Tahoe (8 speed trans only)
Global Vehicle Volume (build dates): 6,955,569 (2013-1-28 – 2020-1-14); 8 Speed trans RPO M5U/M5X: 730,617

Sev.#: 2 Det.#: 5 Occ.#: 4 IRN#: 40 GVS-CORE ID: N19-228256

Discovery: Submitted by external investigator due to a NHTSA informal request for “K2XX Transmission jerk/lunge forward and harsh shifting”.

DISCOVERY

Condition: The clutch(es) within the 8L90 transmission may experience the following:

PRIOR CASES

- Initial fill time(s) of the C3 and/or C4 clutch(es) may be delayed.
- C1 and/or C4 clutch(es) may be overfilled.

CONDITION

Effect of the Condition: The customer may notice a harsh shift that may be perceived as the following:

- “Hesitation” during first shift of the day ([1-2 upshift](#)) or garage maneuver ([shift from park to drive/reverse](#))
- “Lurch”, “Lunge” or “Jerk” during first shift of the day ([1-2 upshift](#)), coast down deceleration ([3-1 downshift](#)) or garage shift maneuver.

This may typically occur in the morning after the vehicle sits for a period of time. No DTC will be associated with this and there will be no prior warning.

Root Cause: The reduced capability of purging trapped air or overfilling clutch(es) may result in this delayed or premature engagement. This is possibly caused by HW (insufficient valve body features) and SW/cal issues (inadequate off-going pressure profiling & solenoid dither).

ROOT CAUSE

Relevant Field Data:

	Warranty (IPTV @ xx MIS)	RPTV (@ xx MIS)	Warranty	VOQ	TREAD	LEGAL	Total (Unique VIN)
As of Date	YYYY-MM-DD	2019-10-25	2019-10-25	2019-11-04	2019-11-04	2019-10-28	
Complaints- Lurch/Surge/Lunge/Leap/Jump/Hit from behind	***	See detailed charts 81.8 @ 62 - 2015 M5U 109.1 @ 47 - 2016 M5X	29,628	128	5,413	18	35,183
Safety Hazard	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Accidents	N/A	N/A	0	1	33	0*	34
Injuries	N/A	N/A	0	0	0	0*	0
Fatalities	N/A	N/A	0	0	0	0	0

*See additional notes for legal claim accident/injuries

Recommended Decision: CWNFA

Exhibit
PX 149

Transmission Surge – Lurch - Lunge

Current Status: Production improvements have already been implemented to improve shift quality:

- Significant Algorithm/calibration effort for shift control and TCC performance
- Hardware variation reduction and consistency enhancements
- First 1-2 upshift improvement on a key cycle
- Improved garage shifts fill consistency and adapts
- End of line / service fast learn development targeting green drive quality
- Shift sequencing and robustness
- Improved pressure control accuracy and consistency

IMPROVEMENTS

SERVICE
BULLETINS

Immediate Improvement /Containment: none

Responsibility / PRD: GM Engineering

PRD Champion: Chris Meagher – PRD assigned under N19-228272

Preliminary Quality Chain Impact:

Requirements (eg. STS / PPC / SOR / MR)	BEST PR.	Math Data / CAE	Feature / System FMEA	ICDm / ICDe	KCDS	DFMEA	DRBFM	PFMEA	PROCESS CONTROL PLAN / TOOL	DV / PV TEST (VCRI)	PPAP / PROCESS CAPABILITY	Other (List Below)
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Supplier: N/A

Population: Total 6,955,569 as of 1-16-2020 – no RPO restrictions

POPULATION

Country Of Sale	Produced	In Transit	Dealer Inventory - New	Dealer Inventory - Courtesy	Customer Driven	GM Inventory - Employee Leased Vehicles	Company Vehicles	Fleet	Retail
Grand Total	6,955,569	24,990	70,302	9,133	6,842,956		8,188	1,053,267	5,902,302

Total 730,617 as of 2-10-2020 with 8 speed transmission:

Country Of Sale	Produced	In Transit	Dealer Inventory - New	Dealer Inventory - Courtesy	Customer Driven	GM Inventory - Employee Leased Vehicles	Company Vehicles	Fleet	Retail
Grand Total	730,617	1,036	253	208	728,855		265	19,238	711,379

Potential Field Remedy: The 8 speed transmission shift quality has been improved over the years. There is no software/cal solution that is backward compatible due to hardware differences from year to year.

Estimated Cost: TBD

Reference Materials

NHTSA Inquiry – ODINO 11231409 (MY17 Sierra Surge/Lurch)

Examples of VOQ's

Subject ODINO 11231409, MY17 Sierra, Received 7/12/2019:

~THE TRUCK LURCHES FORWARD AS IF THE ACCELERATOR IS BEING DEPRESSED WHILE COMING TO A STOP OBVIOUSLY WHILE DEPRESSING THE BRAKE. THIS CAUSES DANGEROUS SITUATIONS EVERY DAY IN TRAFFIC. I HAVE NOT FOUND ANY SOLUTIONS TO THE PROBLEM ONLINE. REPROGRAMMING COMPUTER AND REPLACING OTHER SPEED CONTROL MODULES HAS NOT SOLVE THE PROBLEM FOR OTHER DRIVERS.

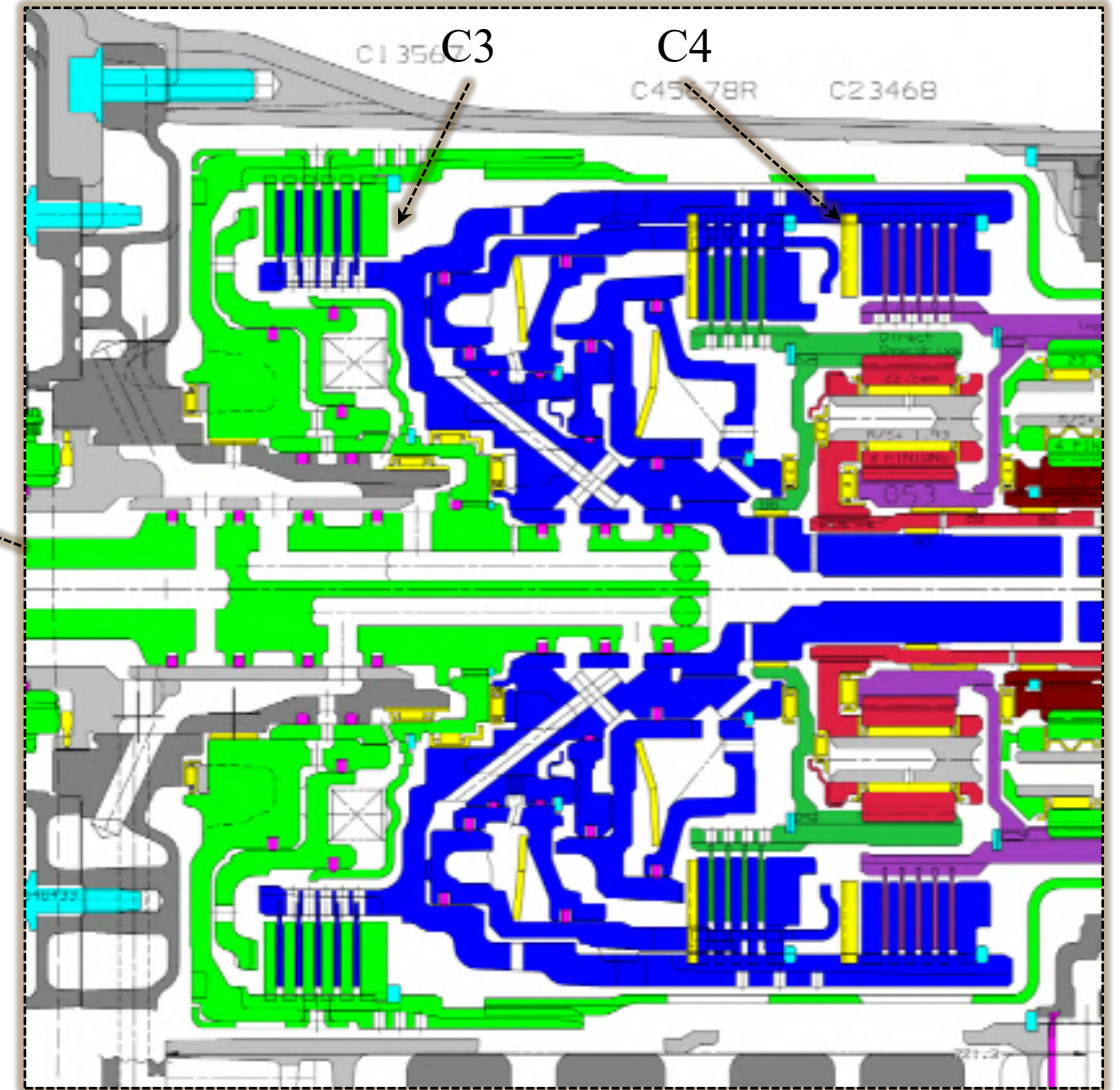
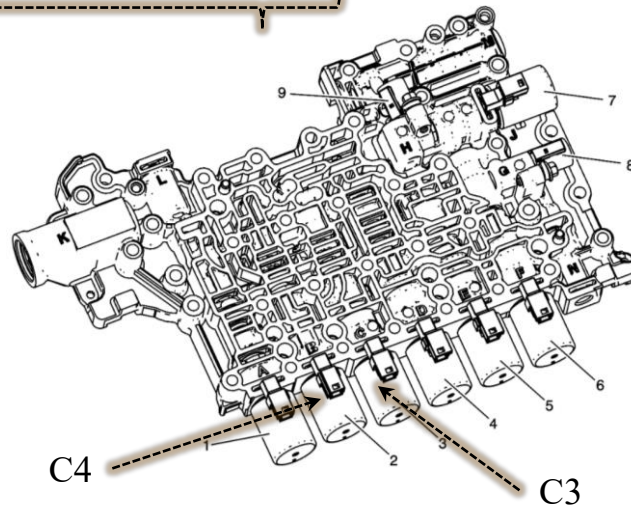
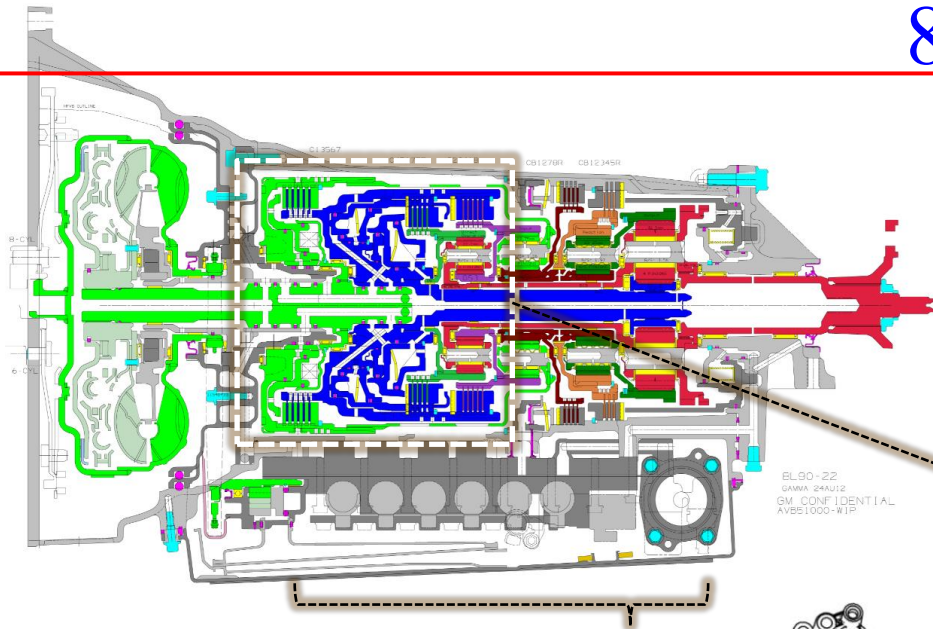
Potentially similar VOQs (also see embedded file for additional records):

~8 SPEED TRANSMISSION BUCKS, HESITATES, LURCHES FORWARD, CLUNKS, WHILE STARTUNG ACCELERATION OR COMING TO A STOP. I TRY TO KEEP A BIG GAP BETWEEN MY TRUCK AND CARS IN FRONT OF ME AT STOP SIGNS BECAUSE IT RANDOMLY LURCHES FORWARD AND I ALMOST HAVE BUMPED CARS IN FRONT OF ME. I HAVE HAD THE TRUCK INTO THE DEALER SO MANU TIMES TO FIX THE VIBRATION ISSUES AS WELL, THEY SAID 3 TIRES THAT CAME IN THE BRAND NEW TRUCK WERE DEFECTIVE SO I HAD TO REPLACE THEM ALL AND THE SHAKE IS STILL THERE, THE BALANCED, REBALANCED, ROAD FORCE BALANCE AND NOTHING WORKS. LAST TIME AT THE DEALER SAID IT IS PROBABLY THE TIRES, HE SAID DONT ROTATE THEM AGAIN AND WHEN THEY WEAR OUT HE WILL PUT ME IN A BETTER TIRE. I AM PAST MY WARRANTY SO THE DEALER SAYS ANY COSTS ARE MY RESPONSIBILITT, IF THE NHTSA COULD PLEASE STEP IN TO ASSIST US TO MAKE GM FIC THEAE VEHICLES WHICH ARE A SAFETY HAZARD.

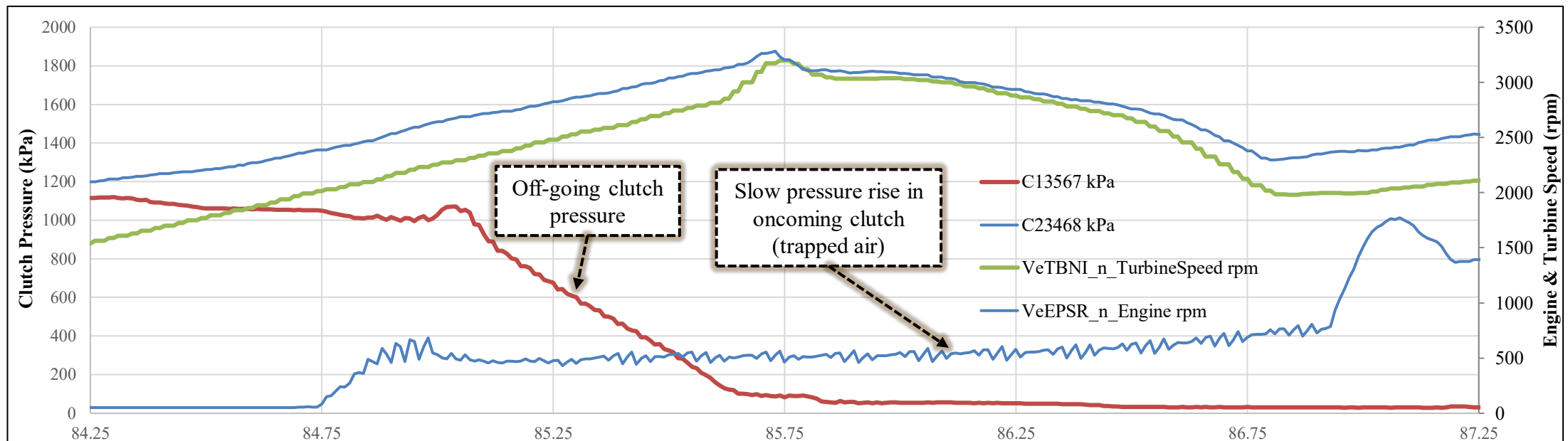
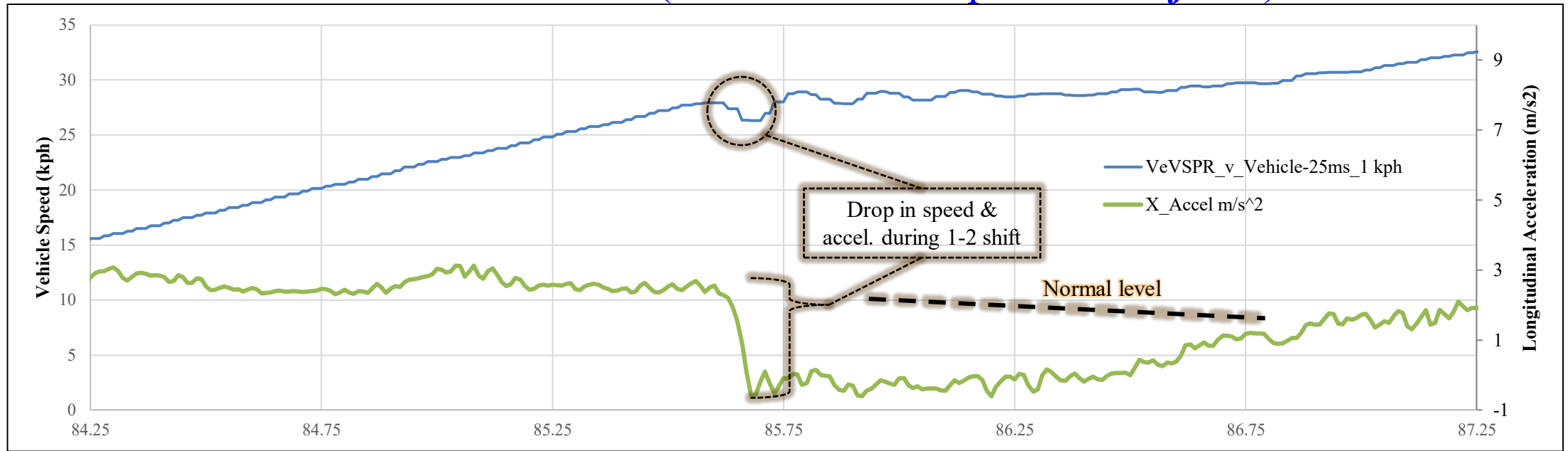
~TRUCK SHIFTS REALLY HARD AND IS UNPREDICTABLE. I ALMOST DROVE THROUGH MY GARAGE DOOR THE OTHER DAY SHIFTING TO DRIVE FROM REVERSE. TRUCK WILL LUNGE FORWARD OR DELAY IN SHIFTING. THERE HAVE BEEN A FEW TIMES I VE HAD TO SLAM ON THE BRAKES BEFORE I BACKED INTO SOMETHING. I HAVE BROUGHT IT IN 3-4 TIMES FOR THE ISSUE AND GMC WON T REMEDY THE PROBLEM.

~THERE ARE 2 CONSCERNS I HAVE THERE IS A VIBRATION SO BAD IT WILL SPILL A COFFEE IN THE CUP HOLDERS WHEN I AM ON THE HIGHWAY AT CRUISING SPEED AND PASSING SPEED UP TO 80 MPH AND MY SECOND ISSUE WILL HAPPEN DURING CITY DRIVING WHERE I WILL STEP ON THE GAS AND THE TRUCK LUNGES FORWARD MAKING ME HIT THE BRAKES SO I DON T HIT ANOTHER CAR I HAVE HAD MY TIRES BALANCED AND HAD THE TRUCK IN THE SHOP MULTIPLE TIMES AND GOT DIFFERENT TIRES TO TRY AND FIX THE VIBRATION AND NOTHING WORKED AND I VE THAD THE TRUCK AT THE DEALERSHIP FOR THE TRANSMISSION ISSUE BUT THEY SAID IT S NORMAL

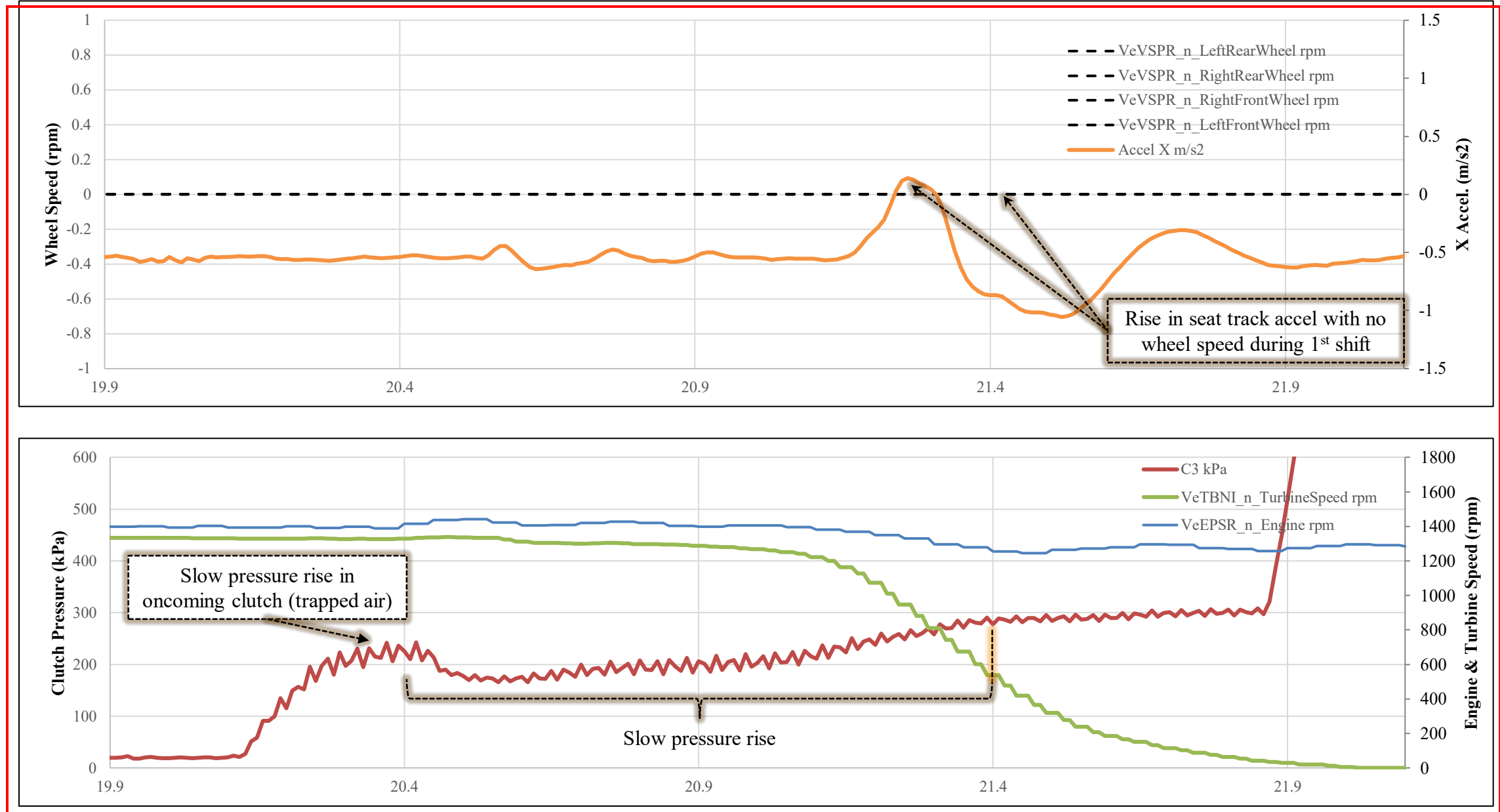
8L90 Cross Section



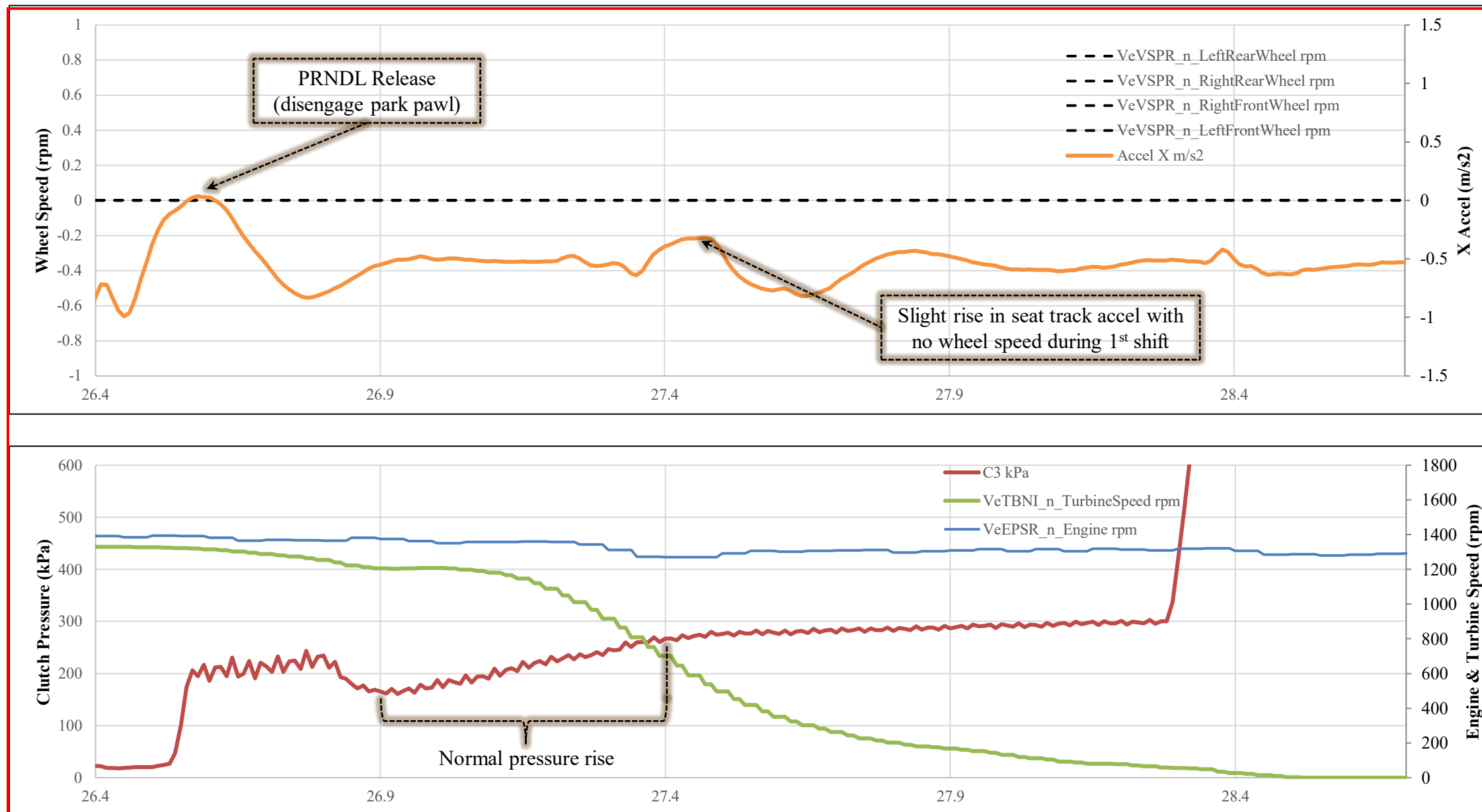
- In Park and Neutral, C1278R and C12345R are applied
- For the shift into Drive, C3 (C13567) is applied in addition to C1278R and C12345R
- For the shift into Reverse, C45678R is applied in addition to C1278R and C12345R
- For a 1-2 shift, C4 (C23468) is applied and C3 (C13567) comes off while C1278R and C12345R remain applied.



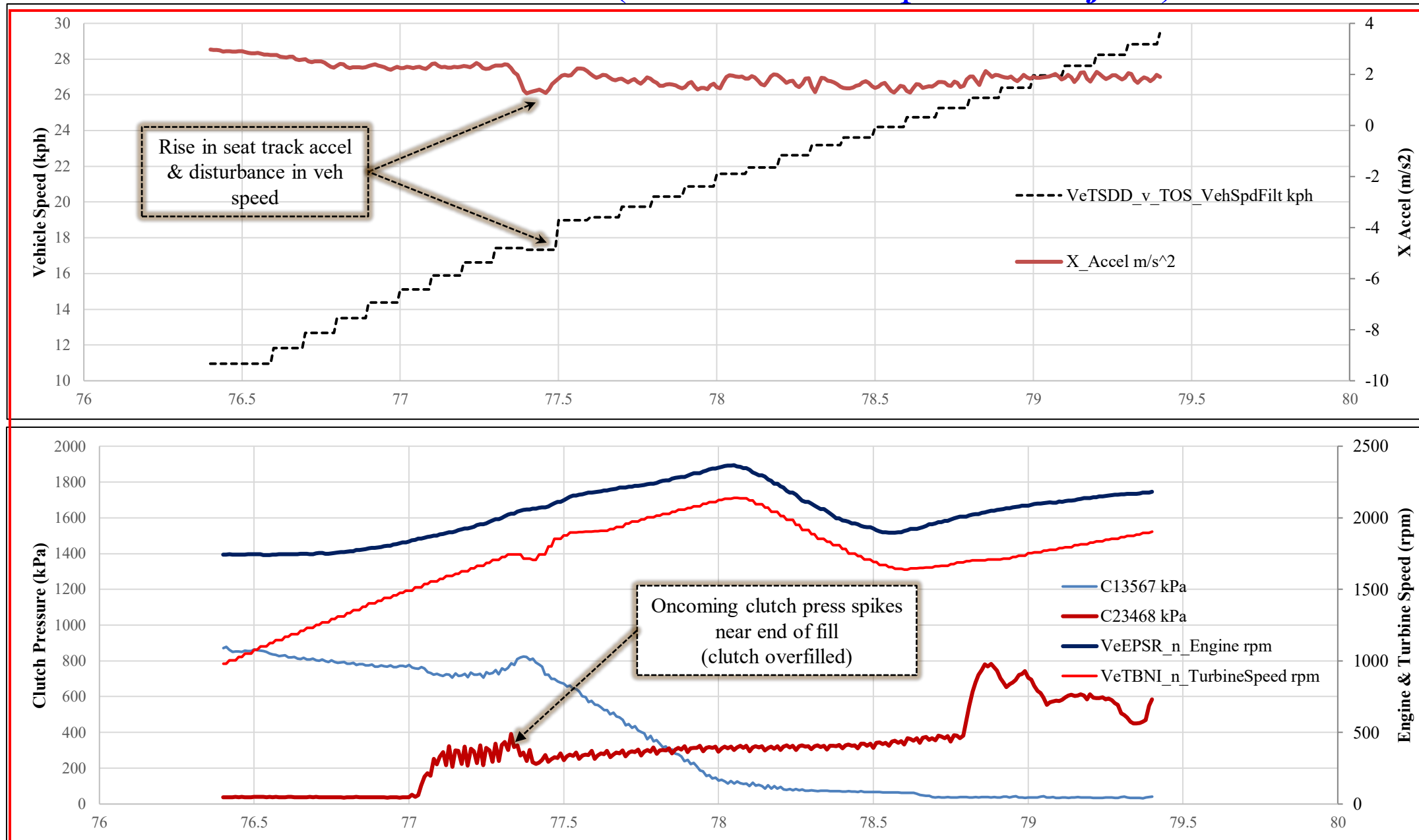
Effect of Condition (*Abnormal* 1st Shift to Drive; ~18% Brake Apply)

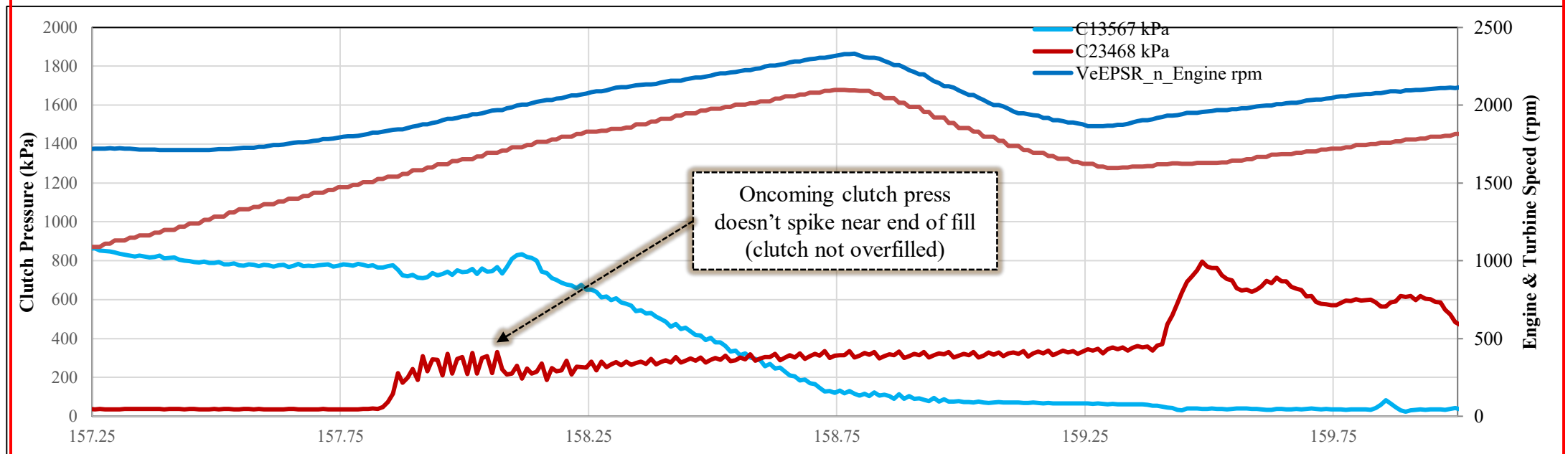
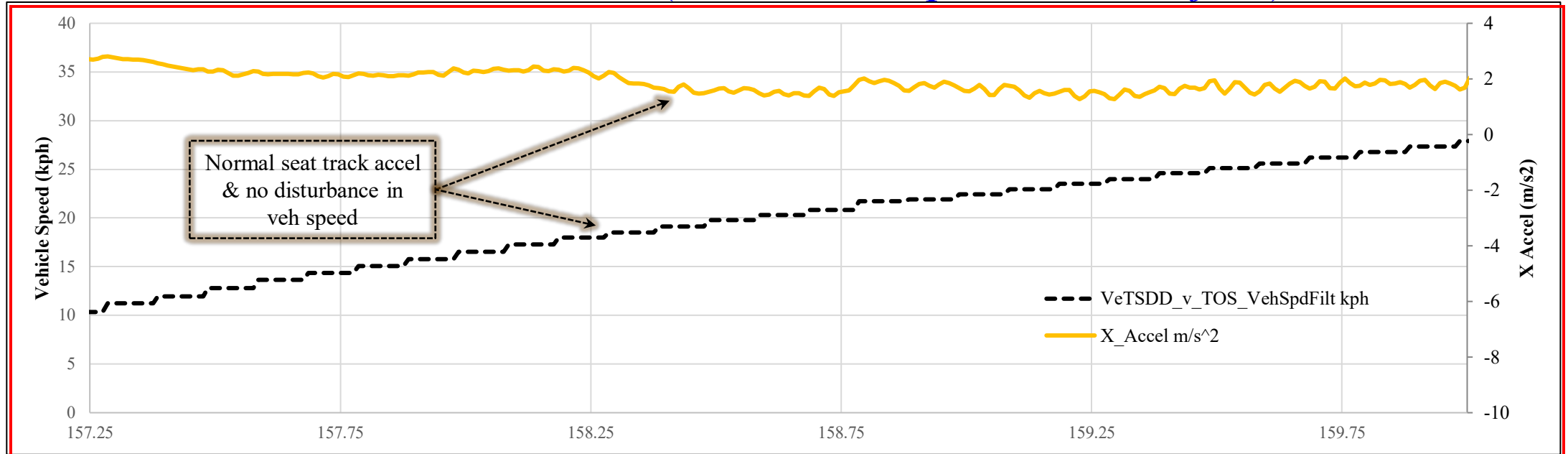


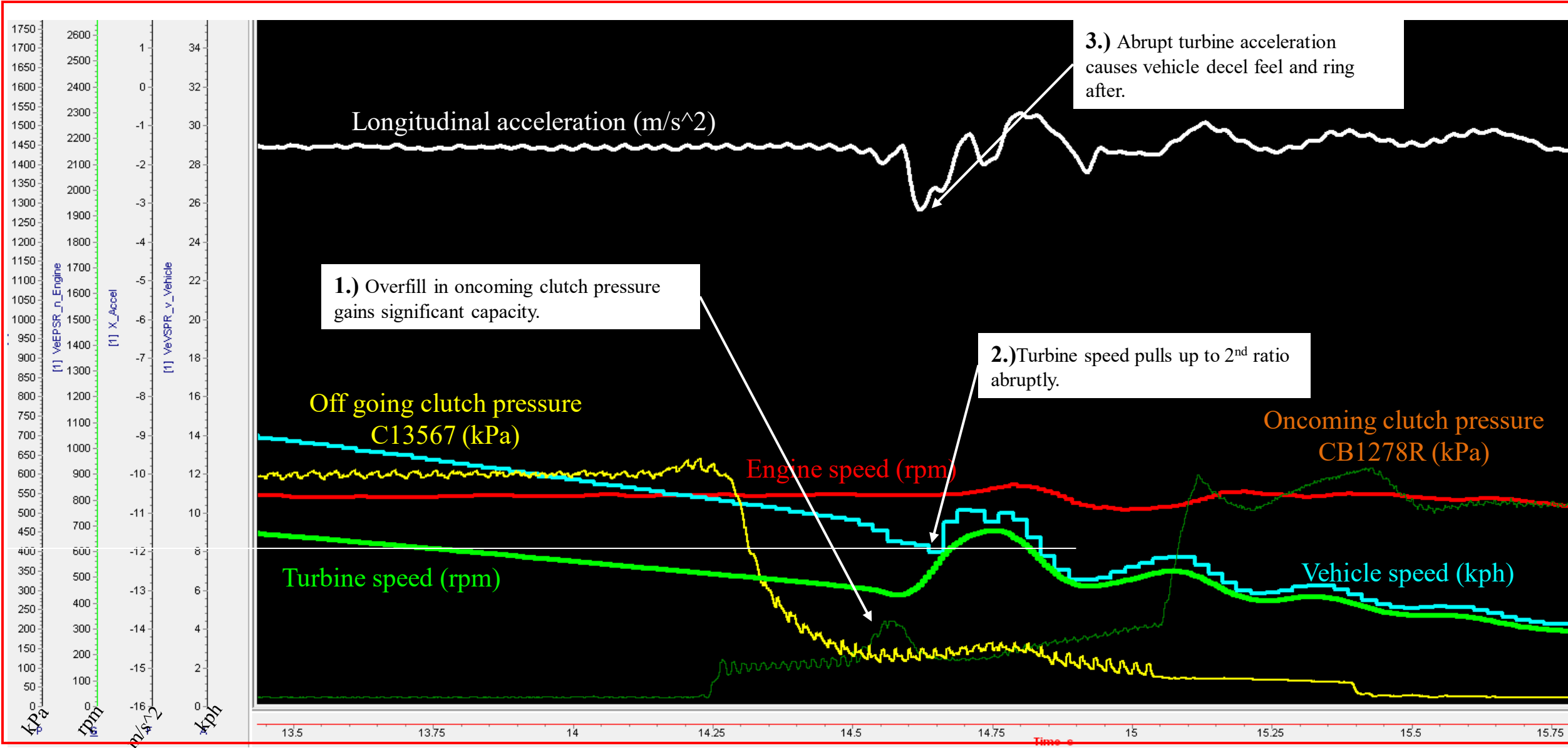
Effect of Condition (*Normal* 1st Shift to Drive; ~18% Brake Apply)

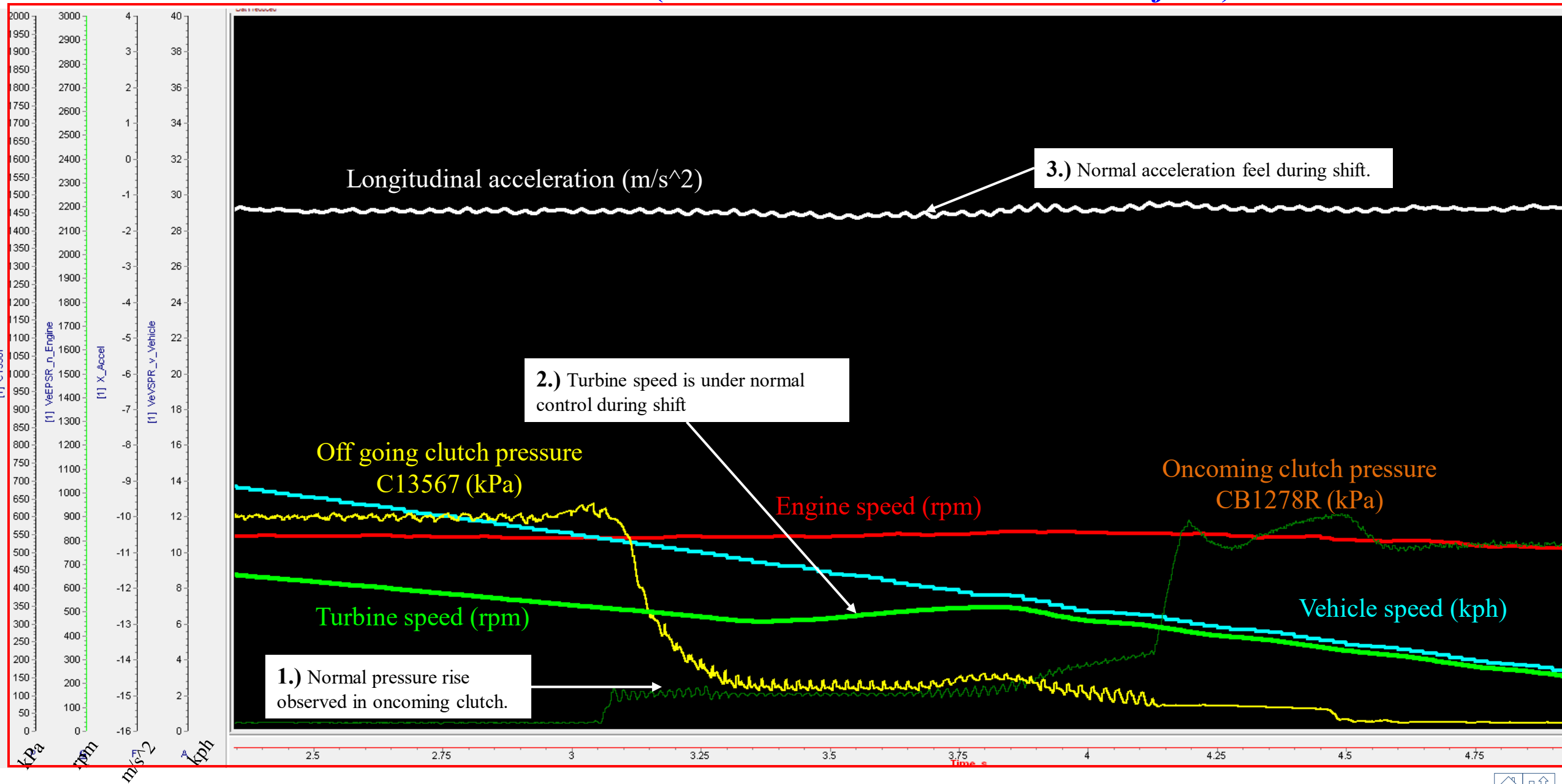


Effect of Condition (*Abnormal* 1-2 upshift *with jerk*)









Root Cause of 8 Speed Trans Issues

Contributor	Impact	Improvements
1) Non linear load curve for C1 and C4 return springs.	This is causing a delay in the clutches release and this is affecting shifting quality.	Change to a different geometry for C1 & C4 return spring Result in a higher load for any given deflection, a faster release of the C1 & C4 clutches, and improved shift quality
2) High seal compression (by design)	Seal wear was noted in the small diameter seal of C2 dam and C4 dam This Seals compression is causing an increase in drag (clutch engaged even after it has been released) which affects the shifting quality.	Decreasing compression to 2% MIN on D-rings, These changes will help in lowering drag and hence clutch exhaust and apply times as well as low mileage seal wear.
3) C4 Valve pressure orientation	This cause inconsistent clutch fill times, this means that there is not a good synchronization between the oncoming clutch and the off-going clutch, leading to poor shift quality.	Change orientation of cross drilled hole in valve so the axis is +/-20 degrees parallel to the flow notch edge
4) C4 Reg Valve Gain	Reduces the pressure gain on the clutch. Change from 1.4:1 to 1:1	Lower gain more tolerant of system variation – helped with 1-2 upshift issues – MY18
5) Not an optimal software and calibration strategy with hardware variation	Variation with nominal hardware was attributed to engine torque model variation during shift event.	Algorithm changes were made to use a torque converter calculated input torque which improved control repeatability with nominal hardware.

8 Speed: Root cause - Non linear load curve for C1 and C4 return springs clutches

Transmission Hardware:

Current 3-1 coast-down and 1-2 shift variation can be perceptible to the customer.

Change to a different geometry for **C1 return spring** will result in a higher load for any given deflection, a faster release of the C1 clutch, and improved shift quality.

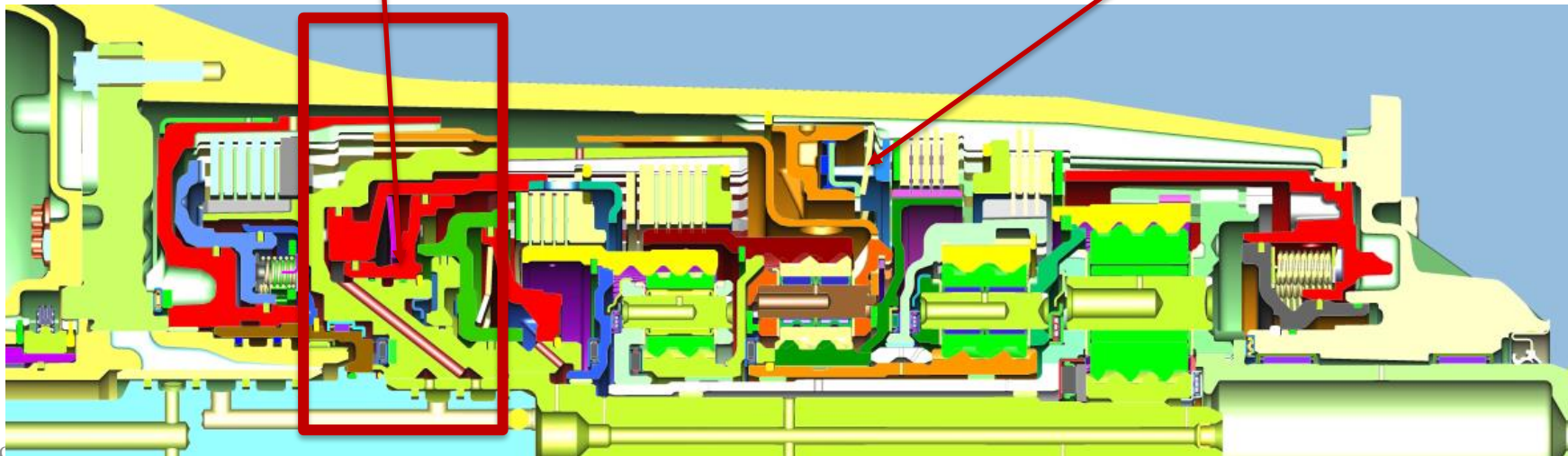
- Thickness will increase from 1.91 mm to 2.03 mm,
- Free height will increase from (7.05) mm to (8.64) mm,
- Slot height will decrease from (4.6(mm to (4.42) mm,
- And slot diameter will increase from 183 to 187.96.

Change to a different geometry for **C4 return spring** will result in a higher load for any given deflection, a faster release of the C4 clutch, and improved shift quality.

- Free height will increase from 5.18 mm to 5.46 mm.
- Slot ID will increase from Ø133.35 mm to Ø138.43mm
- Thickness increases from 1.72 to 1.91 mm..

8L90- C4 updating spring thickness and curve.

8L90- C1 updating spring thickness and curve.



8 Speed: Root Cause - High seals compression

Transmission Hardware:

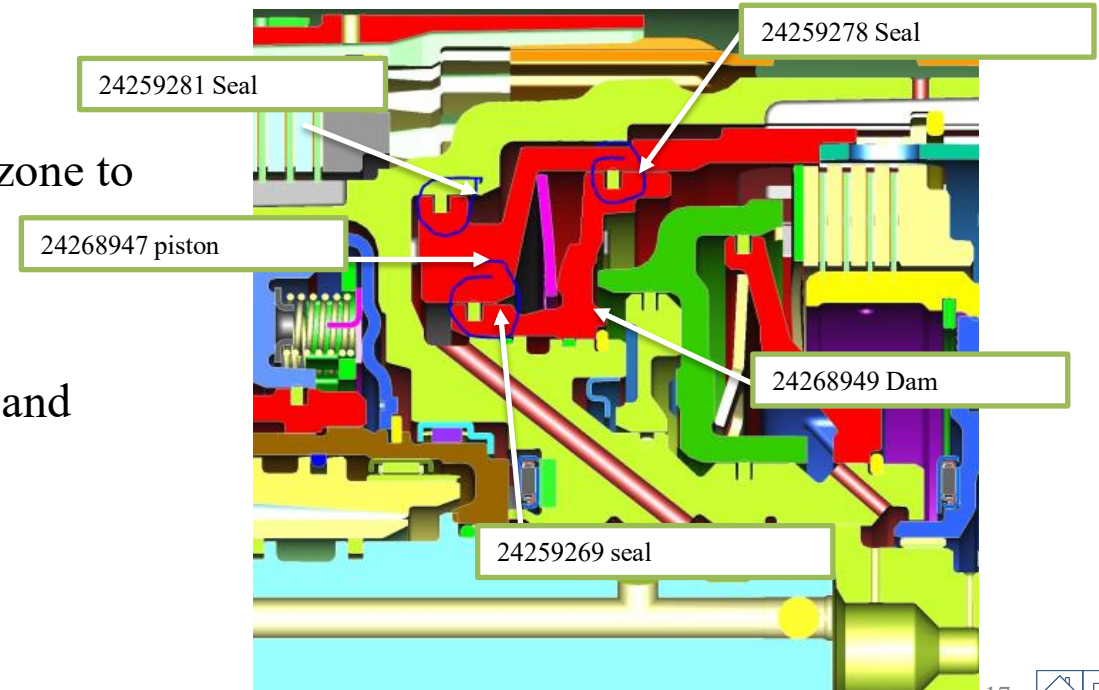
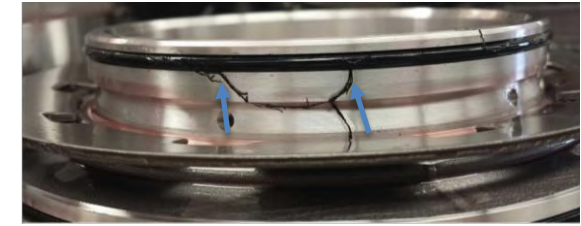
Seal wear was noted in the small diameter seal of C2 dam and C4 dam.

Is causing an increase in drag which affects the clutch apply and exhaust times.

Decreasing compression to 2% MIN on D-rings by reducing:

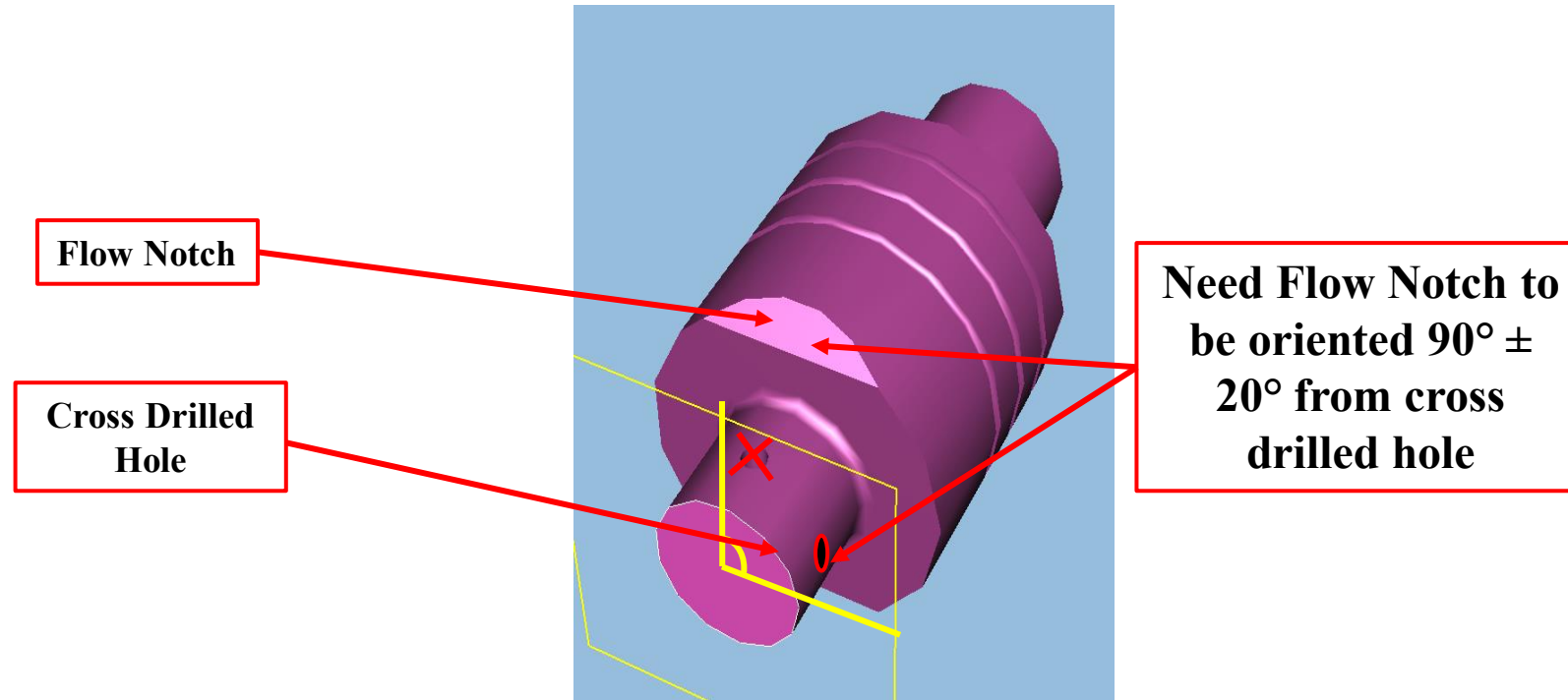
1. O.D of the D-ring,
2. Adjusting the cross-section dimensions of D-ring to reduce rolling tendency
3. Refining the surface finish spec. of piston's seal functional zone to obtain a 0.8Max Ra.

These changes will help in lowering drag and hence clutch exhaust and apply times as well as low mileage seal wear.



8 Speed: Root Cause - C4 Valve pressure orientation

- Valve design causes inconsistent clutch fill times leading to poor shift quality
- Problem occurs when orientation of cross drilled hole lines up with flow notches.
- Change orientation of cross drilled hole in valve so the axis is ± 20 degrees parallel to the flow notch edge



8 Speed: Root cause - Not an optimal software/calibration strategy with hardware variation

Transmission Software:

Issue:

3-1 Downshift Control. A DFSS project was completed to help determine 3-1 downshift variation seen in CTF/Compass complaints, which are normally double bobble coming to stop.

Root Cause:

A large contributor to variation with nominal hardware was attributed to engine torque model variation during shift event in addition to insufficient calibration handles for step-in control.

The Controls/Calibration team also identified hardware changes targeted for 18MY to significantly reduce hardware variation that impacts 3-1 downshift quality.

Corrective action:

Algorithm changes were made to use a torque converter calculated input torque which improved control repeatability with nominal hardware. Additional content was added to improve step-in feel.

GM Technical Contact References

		<u>Global Subsystem Leadership Team (GSSLT):</u>	N/A
<u>Emerging Issue Engineer:</u>	Nancy McIntyre	<u>Systems Management Team (SMT) Director:</u>	Jerry Beemer John Dietz, Sarah Cohen
<u>Lead Investigator:</u>	Christa Zilincik	<u>Executive Chief Engineer (ECE):</u>	Jim Danahy
<u>Supporting Investigator:</u>	Eva Demeter	<u>Supplier Quality Director:</u>	Tony Marsala
<u>Global Function Leader (GFL):</u>	Chris Meagher, Wayne McConnell	<u>Supplier Quality Engineer:</u>	N/A
<u>Bill of Material Family Owner (BFO):</u>	N/A	<u>Chief Engineer</u>	Martin Hayes
<u>Design Responsible Engineer (DRE):</u>	Olu Adabonyan, John Martyka, John Boughner	<u>Additional Contact:</u>	Tanja Kryzaniwskyj Nabeel Peracha
<u>Assembly Plant Quality Manager:</u>	Lori Darks-Arlington Stephen Joness– FTW Juan Jose Vargas Silva-Silao	<u>Additional Meeting Invitee:</u>	Mark Gordon, Bill Goodrich, James Springer, Brian Combs, Martin Hefter, Gary Cygan, Alexandria Marikis Cameron Oskoian
<u>SMT Service Engineer:</u>	John Durbin	<u>BOM Leader</u>	Jerry Beemer John Dietz

Chronology

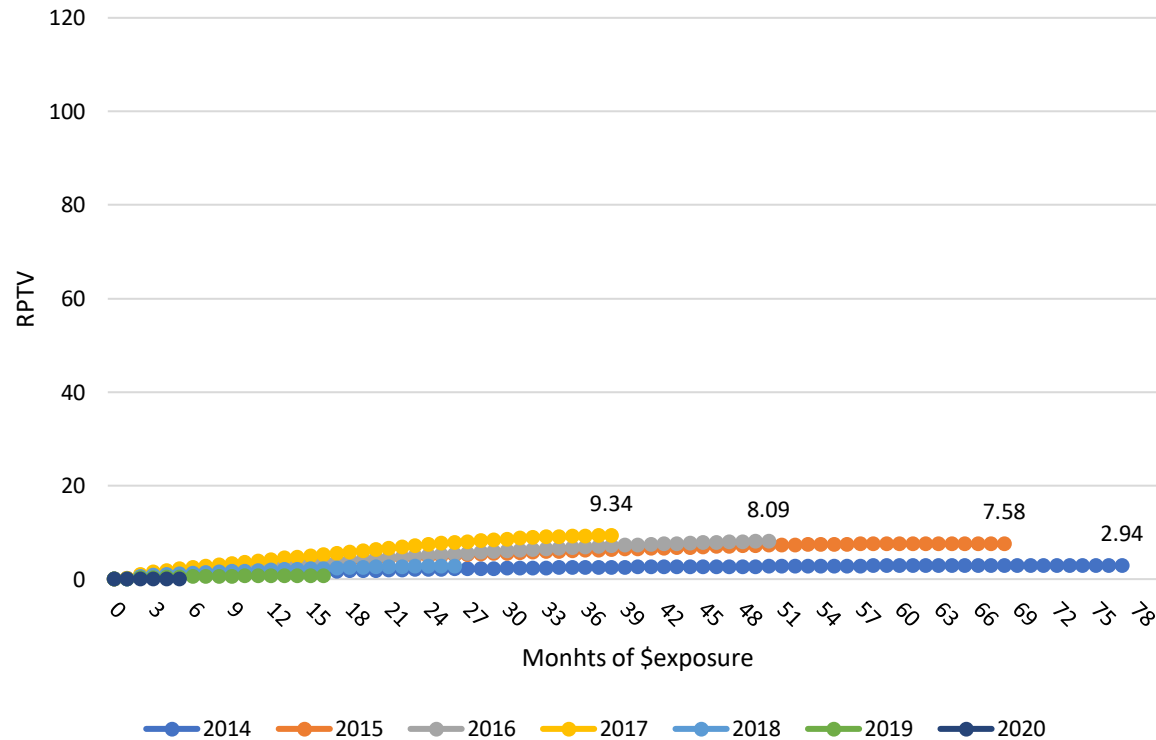
Date	Event
2019-10-15	Submitted by external investigator. NHTSA brought 1 VOQ to GM’s attention – VOQ ID - 11231409
2019-10-16	Record processed through streamline (offline approval by executive) by SFE.
2019-10-16	Streamline PIR Direction: This issue was reviewed via email and received direct approval to move to Open Investigation by VP Global Vehicle Safety
2019-12-03	After reviewing data acquired from a vehicle experiencing a garage shift without wheel speed, severity was change to 2.
2020-02-17	OIR Review

Summary of Prior Relevant or Related SFI Investigations

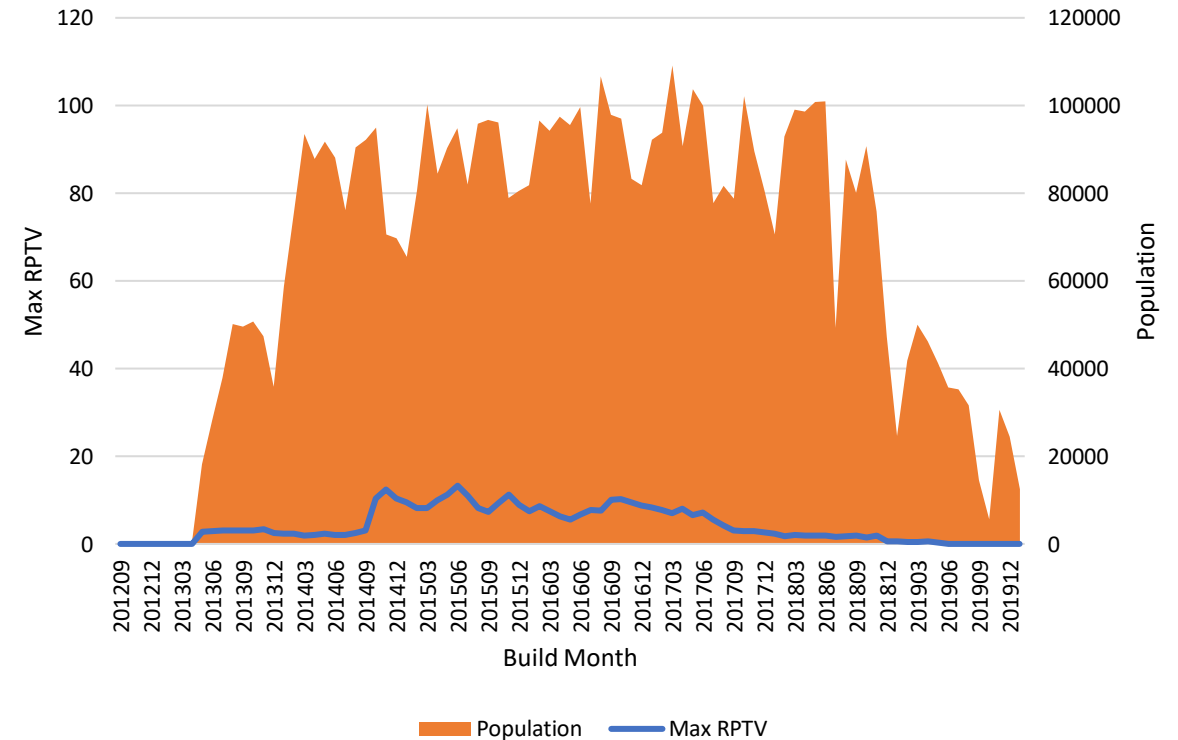
GVS-Core #	Final SFI Phase	Decision Logic / Status	Warranty	Accidents/Injuries Fatalities/Fires	Notes
N19-228272	SFADA 1/16/2020	CWNFA Not a safety issue. Potential customer annoyance from rough shift/lurch feeling.	RPTV 18.73@16MIS 2227 Claims As of 12/17/2019	0 accidents, injuries, fatalities, fires	Transmission and condition similar in scope: 2019 Chevrolet Silverado & GMC Sierra LD (T1XX) - Alleged Lunge/Lurch/Hesitation Upon Shifting (8L90 Transmission)
N17-212697	SFADA 3/8/2018	CWNFA Not a safety issue. Low rate of occurrence. Production improvements have already been implemented to improve shift quality Condition is a change in deceleration rate, where the vehicle acceleration never goes positive, due to this the condition was not deemed to be a safety issue.	RPTV 2.3 @ 26MIS 247 Claims As of 2/9/2018	As of 2/9/2018: 1 accidents, 0 injuries, 0 fatalities, 0 fires.	Vehicle MMY, Transmission and Condition SAME in scope: 2016-2017 Chevrolet Silverado & GMC Sierra w/ L83 (5.3L Engine) and M5U (8-speed auto Transmission) – Investigation of similar condition: Surge, Lurch, Lunge
N18-216213	SFADA 8/9/2018	CWNFA 2 accidents. 0 injuries, fatalities or fires. Extremely low rate of issues in the field.	RPTV .08 @18MIS 13 Claims As of 7/27/2018	As of 7/27/2018: 2 accidents. 0 injuries, fatalities or fires.	Vehicle and Condition Similar in scope: 2017-18 K2xx HD Duramax Diesel Investigation of a surge, jerk, jolt or what could be perceived as an unintended acceleration
N17-210818	SFADA 8/16/2018	SUB Very low rate of occurrence. Customers could experience a brief (~1.5 s) surge in acceleration during deceleration or idle in case of investigation N17-208930 due to a combustion mode transition	RPTV 1.3@6MIS 20 Claims As of 7/2017	1 accident, 0 injuries	Vehicle and Condition Similar in scope: 2017 M.Y. Chevrolet Silverado-HD & GMC Sierra-HD w/ L5P (6.6L Duramax). Investigation condition: unintended acceleration from engine surging while intending to decelerate
N17-208930	SFADA 7/20/2017	CWNFA Low rate of occurrence. This is not a safety concern. Coordinate this decision with N17-210818	RPTV 0.9@5MIS 10 Gart Claims As of 6/2017	1 accident, 0 injuries.	Vehicle and Condition Similar in scope: 2017 M.Y. Chevrolet Silverado-HD & GMC Sierra-HD w/ L5P (6.6L Duramax) Investigation condition: Unintended acceleration from engine surging at low speed and near idle

Pertinent Warranty Data / Verbatim as of 2019-10-25

228256 - 2014 to 2020 K2XX
Filtered Warranty & TREAD with US Population



228256 - 2014 to 2020 K2XX
Filtered Warranty & TREAD with US Population



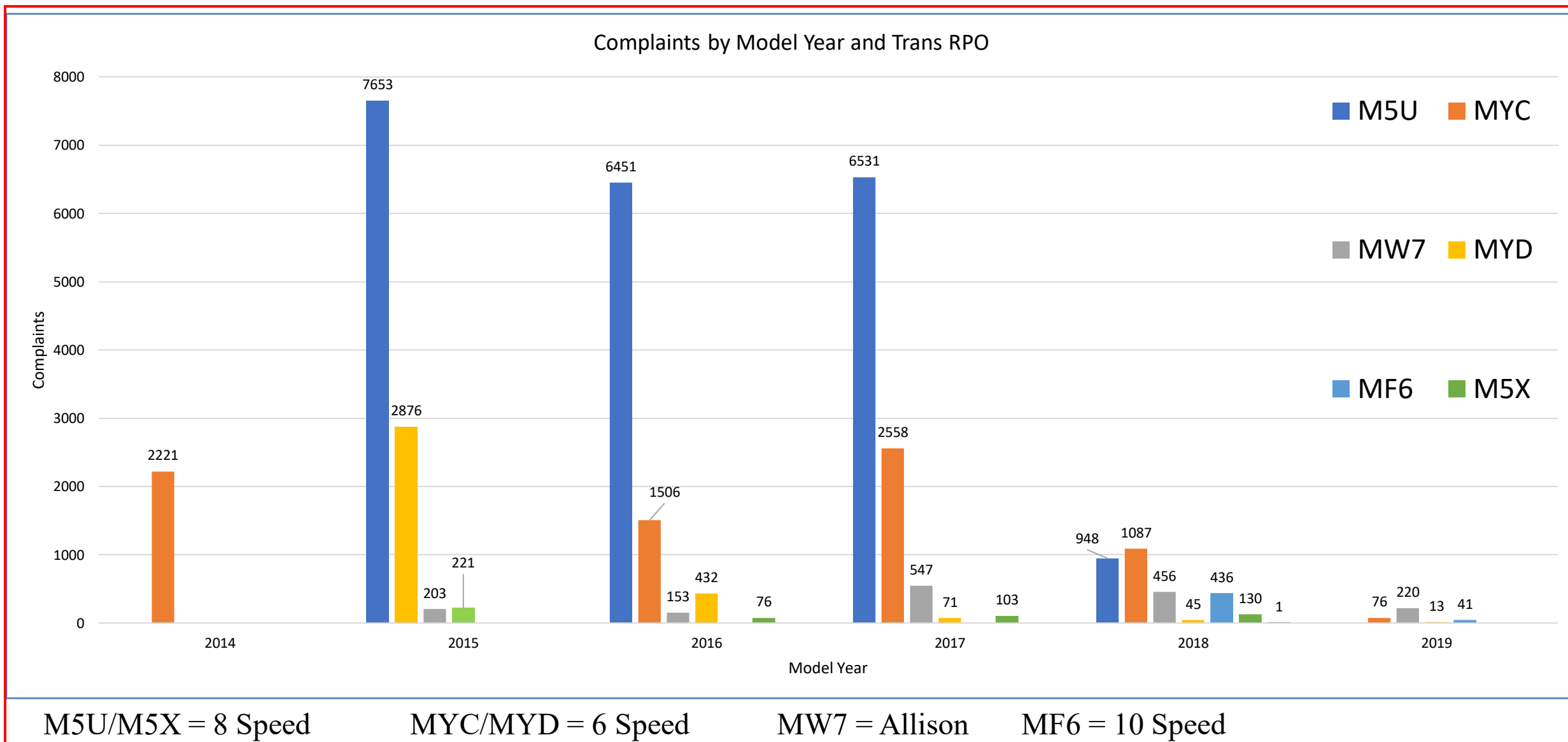
Filter In – like terms

- lunge, jump, surge, lurch, jerk, hit from behind

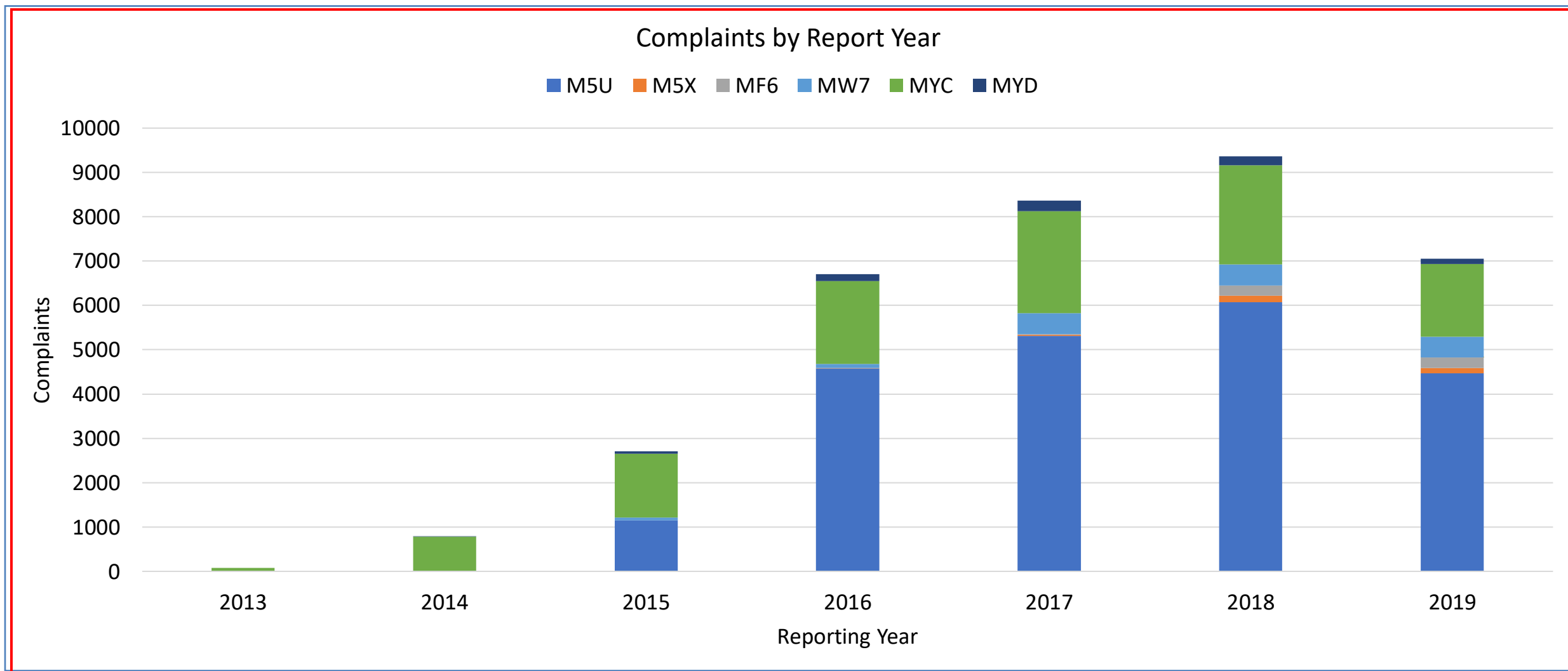
Filter Out – like terms

- rough, kicks, hard shift, harsh shift

Pertinent Field Data / Verbatim as of 2019-10-25



Pertinent Field Data / Verbatim as of 2019-10-25



M5U/M5X = 8 Speed

MYC/MYD = 6 Speed

MW7 = Allison

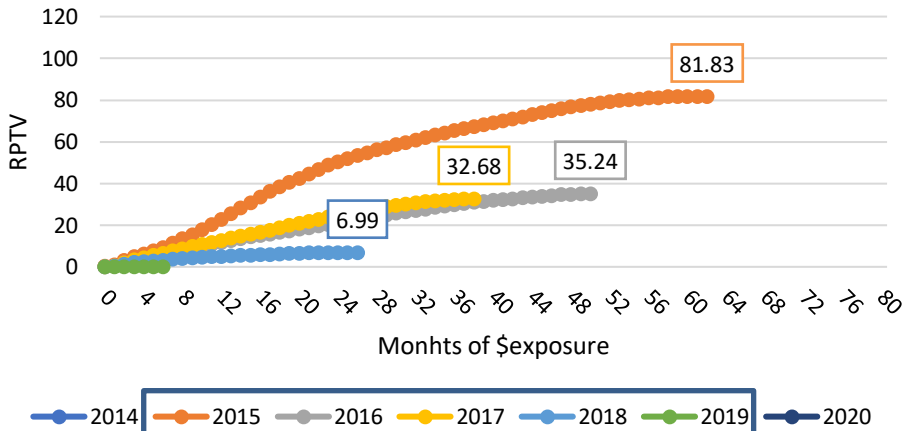
MF6 = 10 Speed

Pertinent Warranty Data / Verbatim as of 2019-10-25

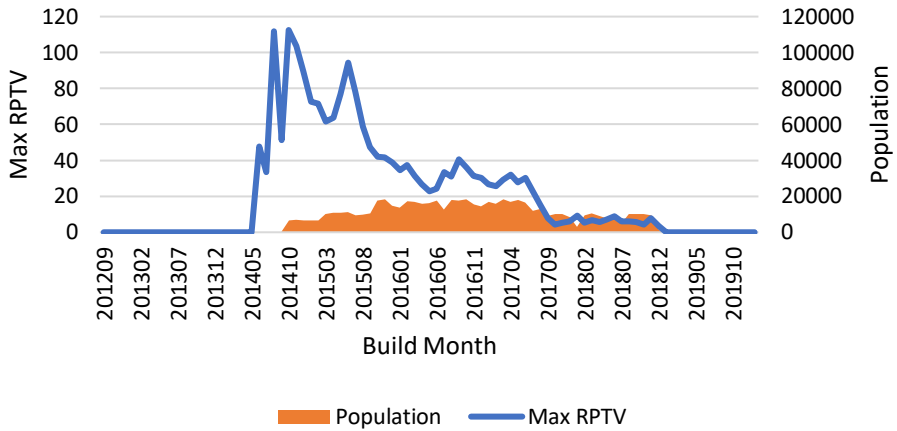
8 Speed Transmission

Keywords: lunge, jump, surge, lurch, jerk, hit from behind

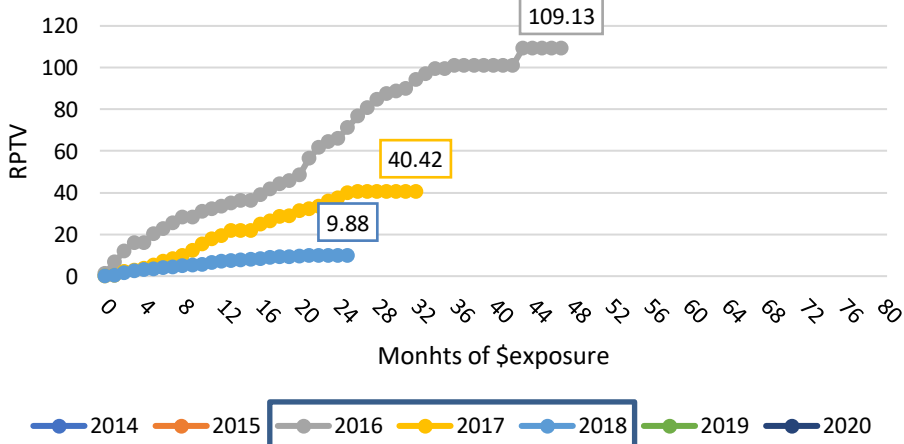
228256 - 2014 to 2020 K2XX - **M5U** Transmission
Filtered Warranty & TREAD with US Population



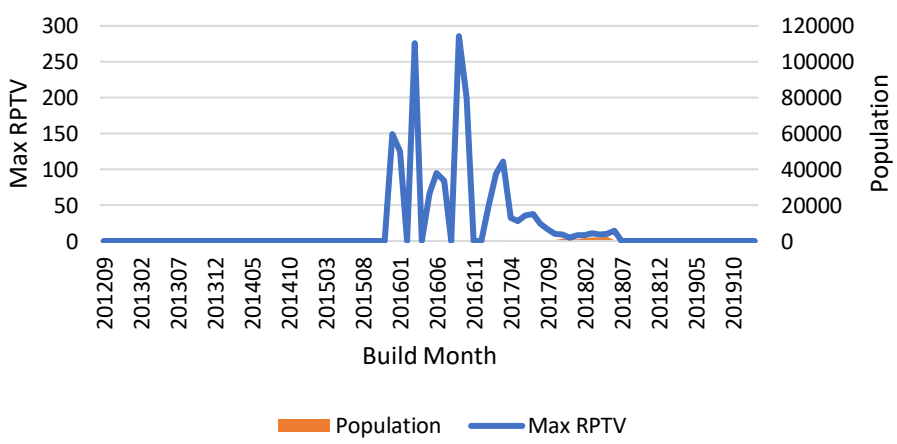
228256 - 2014 to 2020 K2XX - **M5U** Transmission
Filtered Warranty & TREAD with US Population



228256 - 2014 to 2020 K2XX - **M5X** Transmission
Filtered Warranty & TREAD with US Population



228256 - 2014 to 2020 K2XX - **M5X** Transmission
Filtered Warranty & TREAD with US Population

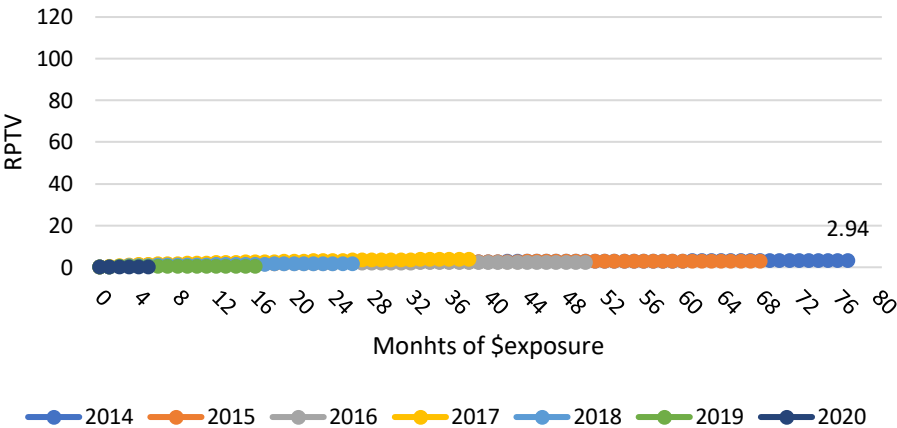


Pertinent Warranty Data / Verbatim as of 2019-10-25

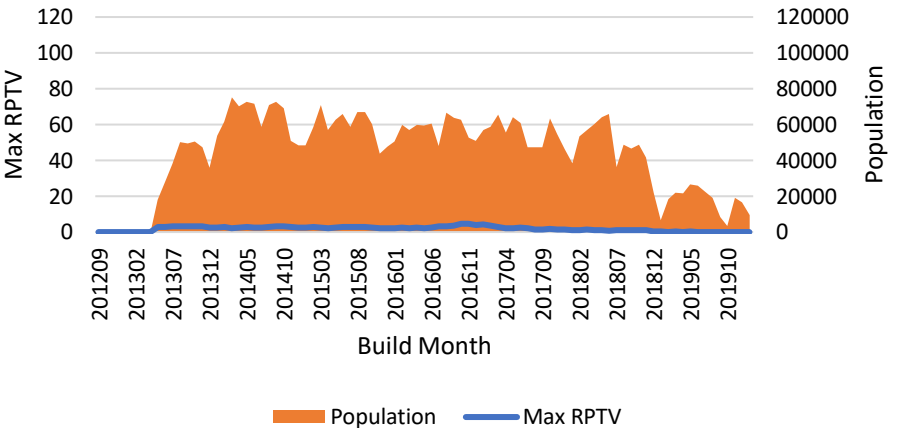
6 Speed Transmission

Keywords: lunge, jump, surge, lurch, jerk, hit from behind

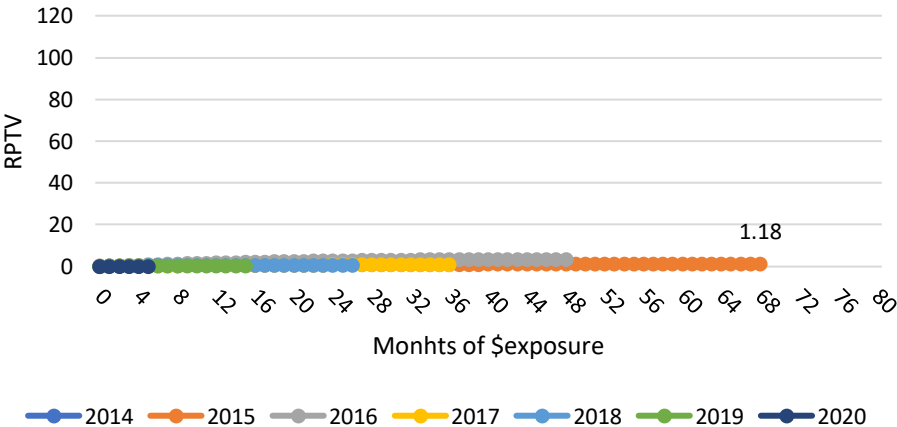
228256 - 2014 to 2020 K2XX - **MYC** Transmission
Filtered Warranty & TREAD with US Population



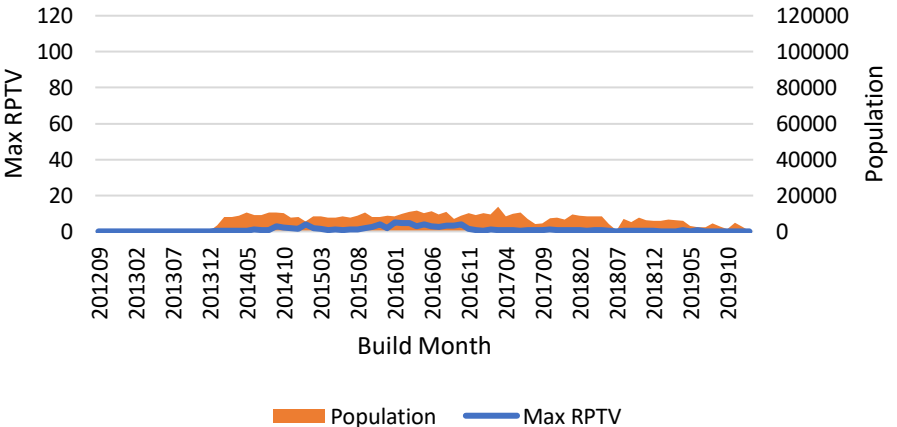
228256 - 2014 to 2020 K2XX - MYC Transmission
Filtered Warranty & TREAD with US Population



228256 - 2014 to 2020 K2XX - **MYD** Transmission
Filtered Warranty & TREAD with US Population



228256 - 2014 to 2020 K2XX - MYD Transmission
Filtered Warranty & TREAD with US Population

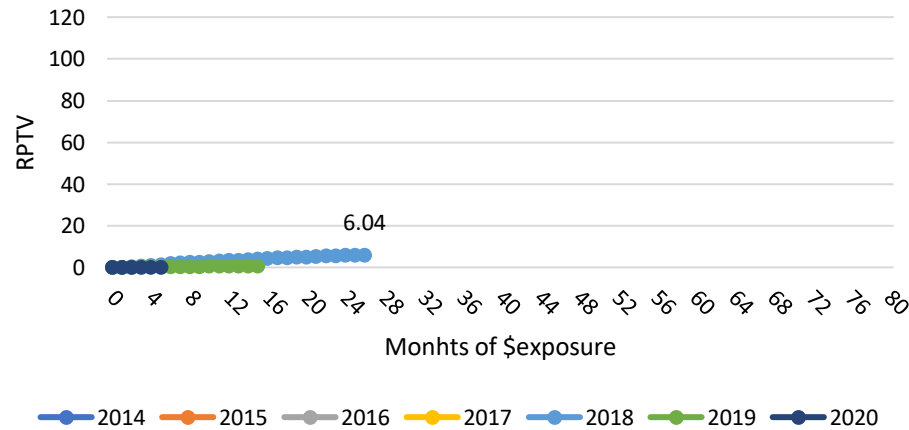


Pertinent Warranty Data / Verbatim as of 2019-10-25

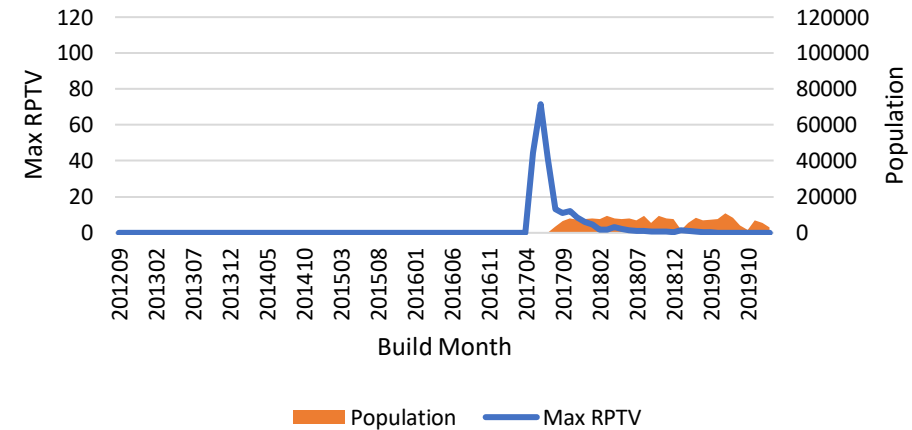
10 Speed and Allison Transmissions

Keywords: lunge, jump, surge, lurch, jerk, hit from behind

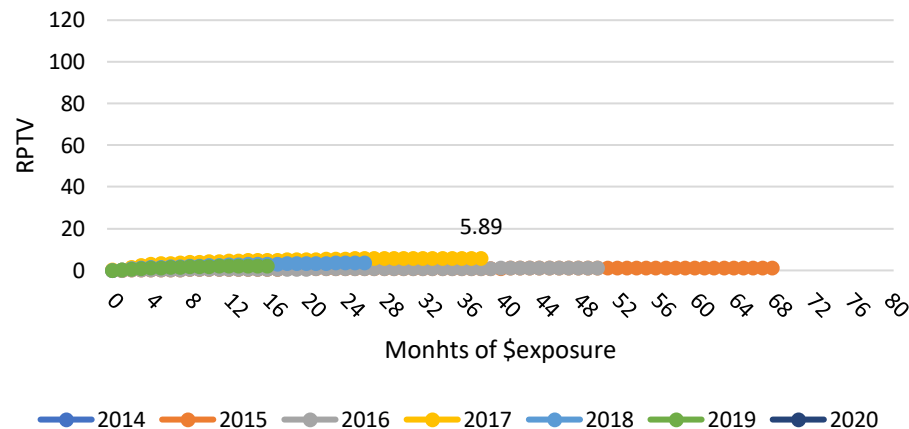
228256 - 2014 to 2020 K2XX - **MF6** Transmission
Filtered Warranty & TREAD with US Population



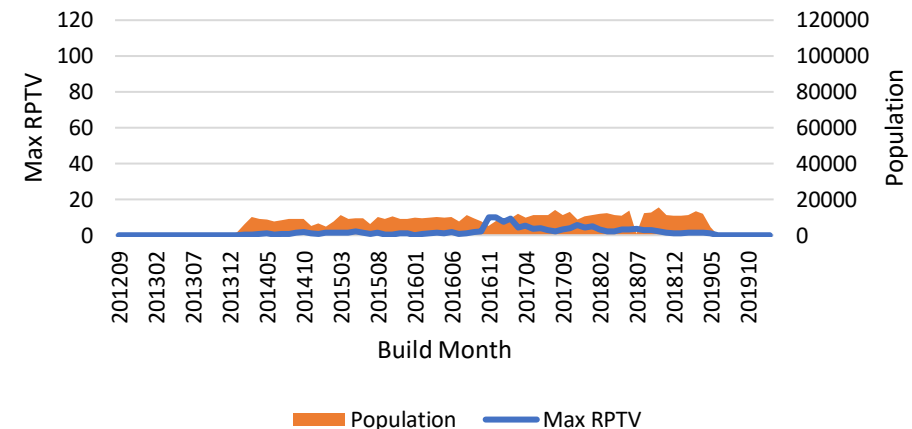
228256 - 2014 to 2020 K2XX - MF6 Transmission
Filtered Warranty & TREAD with US Population



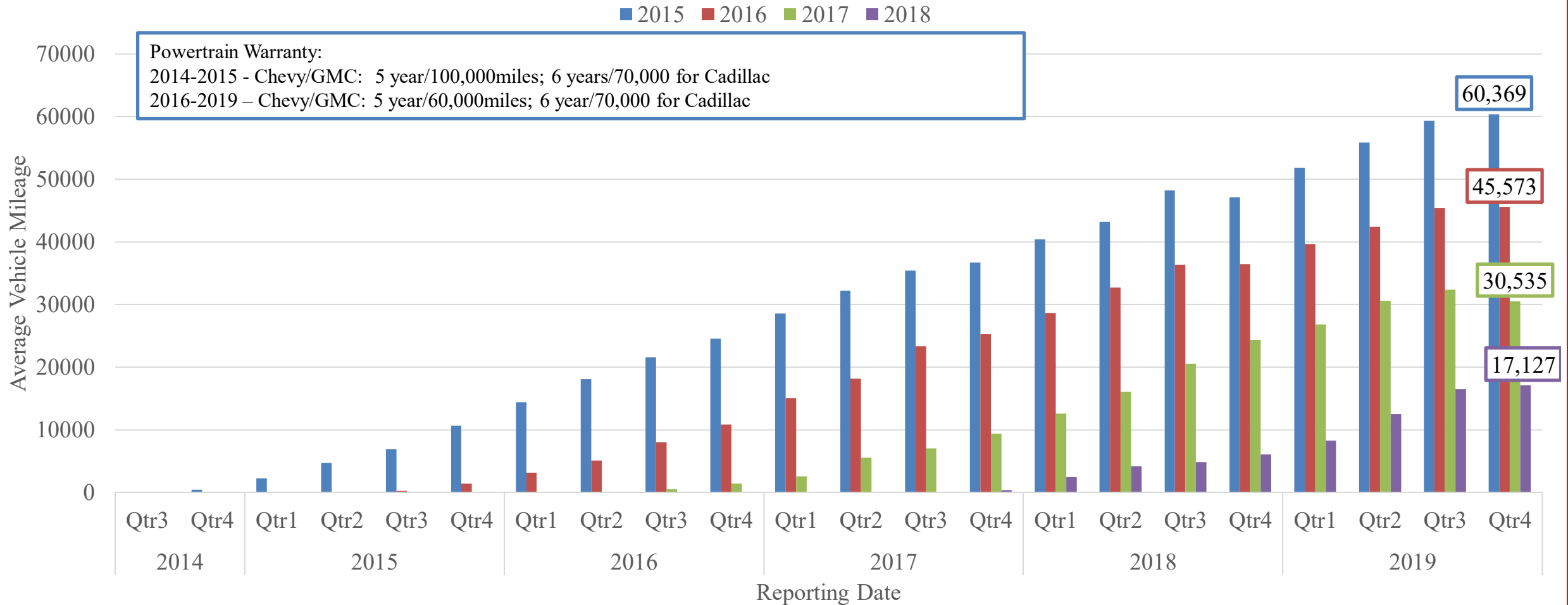
228256 - 2014 to 2020 K2XX - **MW7** Transmission
Filtered Warranty & TREAD with US Population



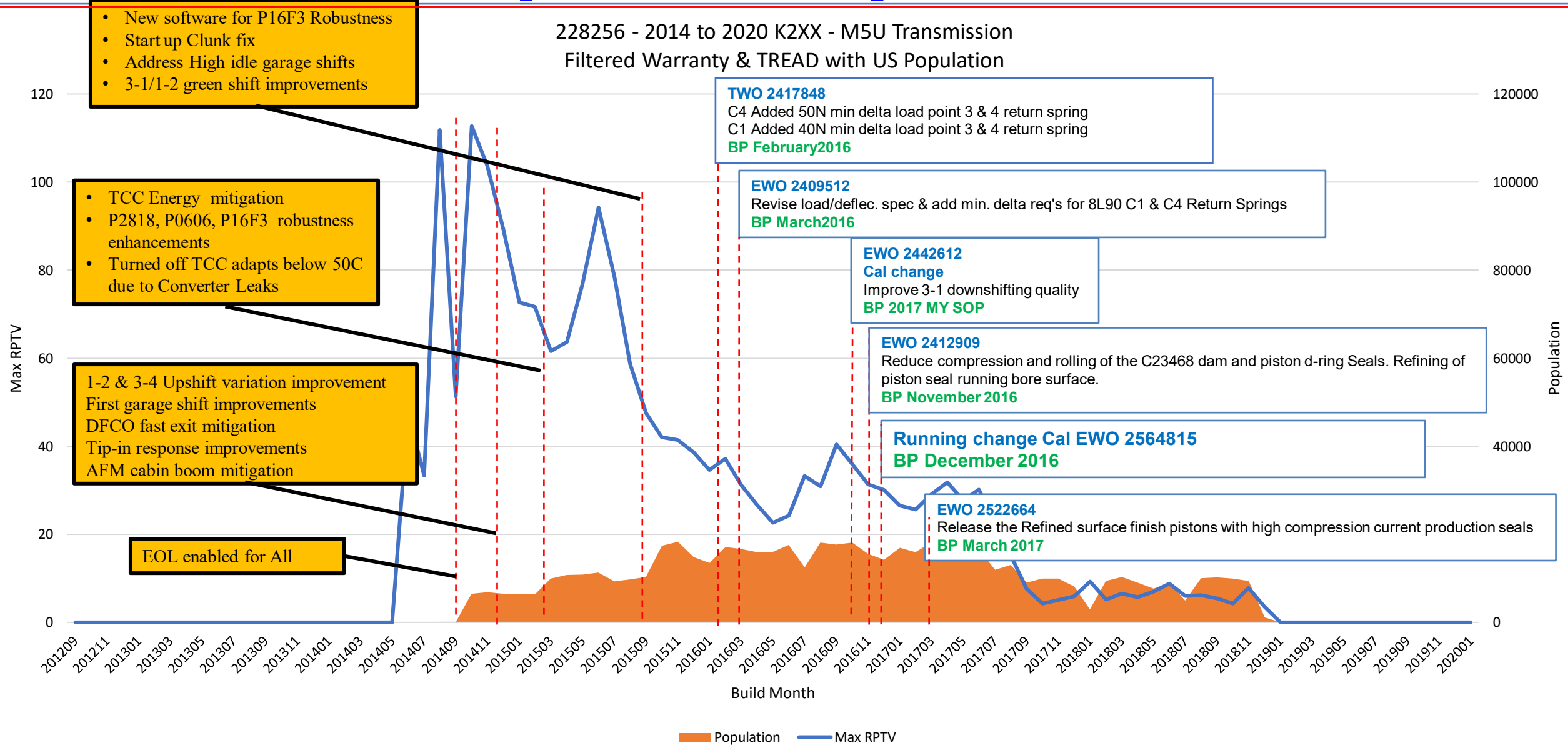
228256 - 2014 to 2020 K2XX - MW7 Transmission
Filtered Warranty & TREAD with US Population



Average Vehicle Mileage at Time of Repair
8 speed Trans-M5U/M5X - Overall Average = 23,520 Miles

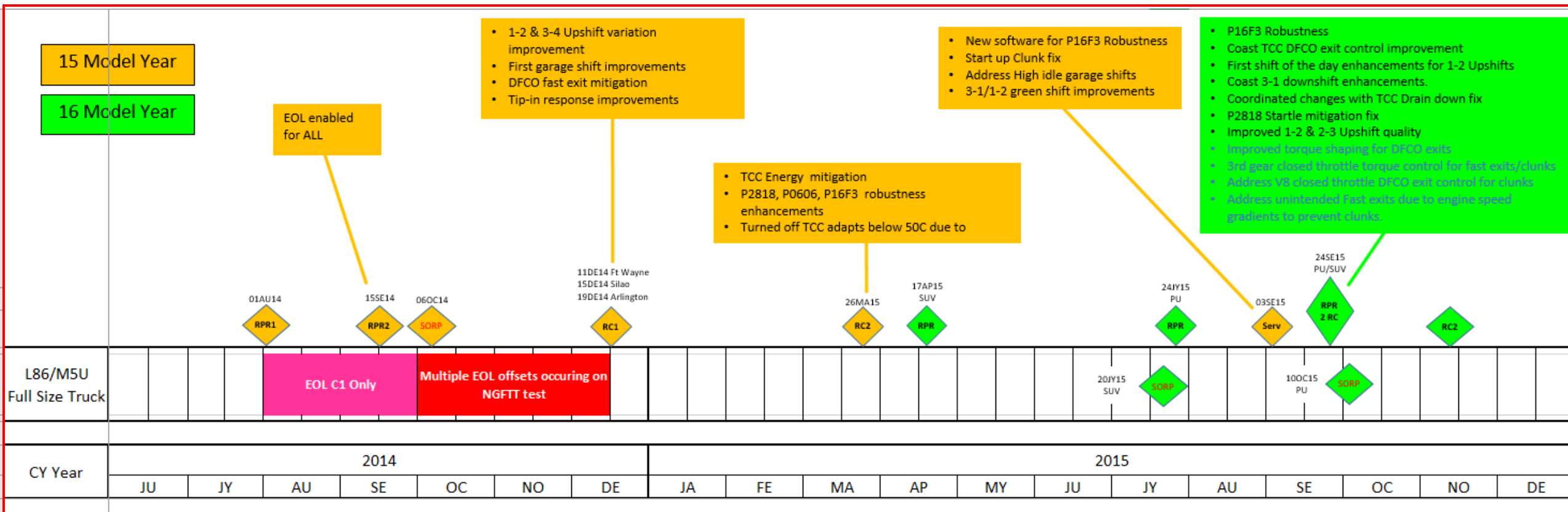


8 Speed Product Improvements



8 Speed Shift Quality Improvements

2015-2016MY



8 Speed Shift Quality Improvements

2017 MY

• Inclusive of Default Valve changes for SUV

17 Model Year

• TUT SW/Cal's (P0747)
• Default Valve changes
• PU Commonize clutch control with SUV

Option B Oil

Calendar Year	2016																2017															
	AP		MY		JU		JY		AU		SE		OC		NO		DE		JA		FE		MA		AP		MY		JN		JY	
FST L86	20AP16 PU	RPR			20JN16 SUV	RPR	SORP		11JY16 PU			SORP		12SE16 SUV				RC	16DE16													
FST L83 PU	20AP16 PU	RPR					SORP		11JY16 PU									RC	16DE16													
FST L8B PU	20AP16 PU	RPR			20JN16 PU	RPR2	SORP		11JY16 PU									RC	16DE16													

24OC16

8 Speed Shift Quality Improvements

2018 MY

18 Model Year																
Calendar Year	2017										2018					
	AP	MY	JU	JY	AU	SE	OC	NO	DE	JA	FE	MA	AP	MY	JN	JY
FST L86	RPR	07AP17		10JY17												
FST L83 PU	RPR	07AP17		10JY17												
FST L8B PU		07MY17		10JY17												

• Gearbox Torque Limit software fix

• Project "HAY" introduction for 4WD ONLY (10/2/17)

Hardware Modifications

- C4 Reg Valve (1:1)
- C4 Return Spring
- C1 Return Spring
- Option B Oil
- C3 Stator Groove
- C4 Piston seal compression
- C4 piston polish
- C3 Return Spring
- Reg Valve (flats to orifice)

Software Modifications

- Garage Shift Adapts
- FVA/CP Learn mods
- Downshift control mods
- Upshift control mods
- TCC Control mods
- First Shift 1-2 SAP mods

Calibration Modifications

- Overall Upshift/Power downshift improvements
- Improved accuracy and speed of adapt learns
- Characterized C4/C1 return springs
- TCC Control enhancements
- Instituted new LFGH to reduce busyness

8 Speed Key Product Improvements

TWO 2417848 BP February 2016 C4 and C1 Return Spring Delta load change

EWO 2409512 BP March 2016 Revise load/deflec. spec & add min. delta req's for 8L90 C1 & C4 Return Springs.

EWO 2412909 BP November 2016 Reduce compression and rolling of the C23468 dam and piston d-ring Seals. Refining of piston seal running bore surface

EWO 2442612 BP 2017 MY SOP Cal change Improve 3-1 downshifting quality

EWO 2522664 BP March 2017 Release the Refined surface finish pistons with high compression current production seals

2018MY SOP Changes

EWO 2414636 New return spring for C4 (increased preload and consistent positive slope)

EWO 2424345 New return spring for C1 (increased preload and consistent positive slope)

New C4 Regulator valve (reduce gain)

EWO 2693891, 2693836 C4 Regulator valve orifice orientation (improve variation)

EWO 2693836-Cross drilled hole in regulator valve C4 only

EWO 2728838-The Gearbox Torque Limiting feature is not functioning for 18MY

Address the software anomaly for all 18MY 8-Speed legacy application

EWO 2605185-8RWD Channel Plate Spacer Plate Change for Thermistor Performance

Mapping temperatures from cold to hot and improves shifts

EWO 2424570- Release a new 8L90 C13567 "C3" return spring pack for improved shift quality.

New spring pack assy. will have dimples added to the FILLER

EWO 2391896- 8RWD Controls 2018-C23468 Gain to 1:1 and Del VFS Accum Pstn & Spring – Changes to valves, valve body machining and valve body casting



Service Bulletins

Service Bulletins:

16-NA-019 for 2016 vehicles equipped with 8L45 or 8L90 transmission- **Released 08/19/2016** - Transmission Service Fast Learn - Correcting Low Mileage **Harsh** Shifts, Slips, or Flares

16-NA-361 for 2015-2020 vehicles equipped with 8L45 or 8L90 transmission: Information on Transmission **Harsh 1-2** Shift Upon First Start Up/Shift of the Day Under Light Throttle – **Released 11/18/2016**

16-NA-411 for 2015 to 2016 vehicles equipped with the L86 engine and the 8L90 transmission. **Released 1/20/2017**-Harsh 1-2, **Harsh 3-1** Decel Downshift, Harsh Downshifts Under Heavy Throttle, AFM Transition and Step In Clunk During Downshift

16-NA-412 for 2015 to 2016 vehicles equipped with the L83 engine and the 8L90 transmission. -**Released 03/16/2017** - TCM Reprogramming and Transmission Service Fast Learn - **Harsh 3-1** Decel Downshift

16-NA-404 for 2017 vehicles - **Released 04/7/2017** - Transmission Control Module Reprogramming - **Harsh** Shift, Delayed Shift, Erratic Shifting, Hesitation

16-NA-364 for 2015 -2017 vehicles equipped with 8L45 or 8L90 transmission– **Released 6/29/2017** - Delayed Engagement After Sitting With Engine Off - Clutch Slow to Fill. Delayed engagement followed by a **harsh** engagement

18-NA-355 2015-2018 vehicles equipped with 8L45 or 8L90 transmission **Released 1/17/19**- Shake and/or Shudder During Light Throttle Acceleration Between 25 and 80 MPH (40 and 128 KM/H) at Steady Speed - (Jul 29, 2019) - This condition may be due to Torque Converter Clutch (TCC) Shudder. - **Correction to change HP trans fluid**



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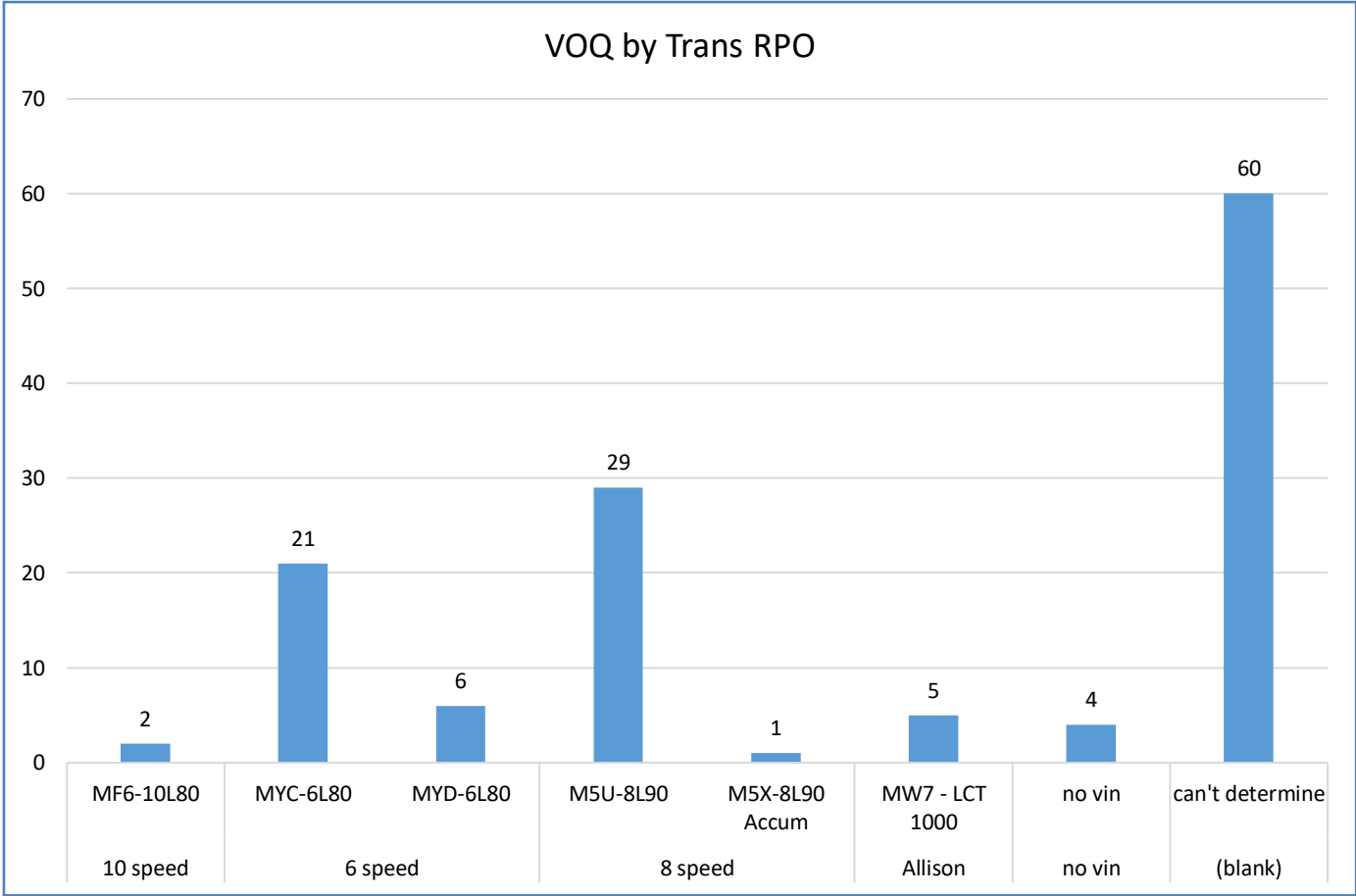
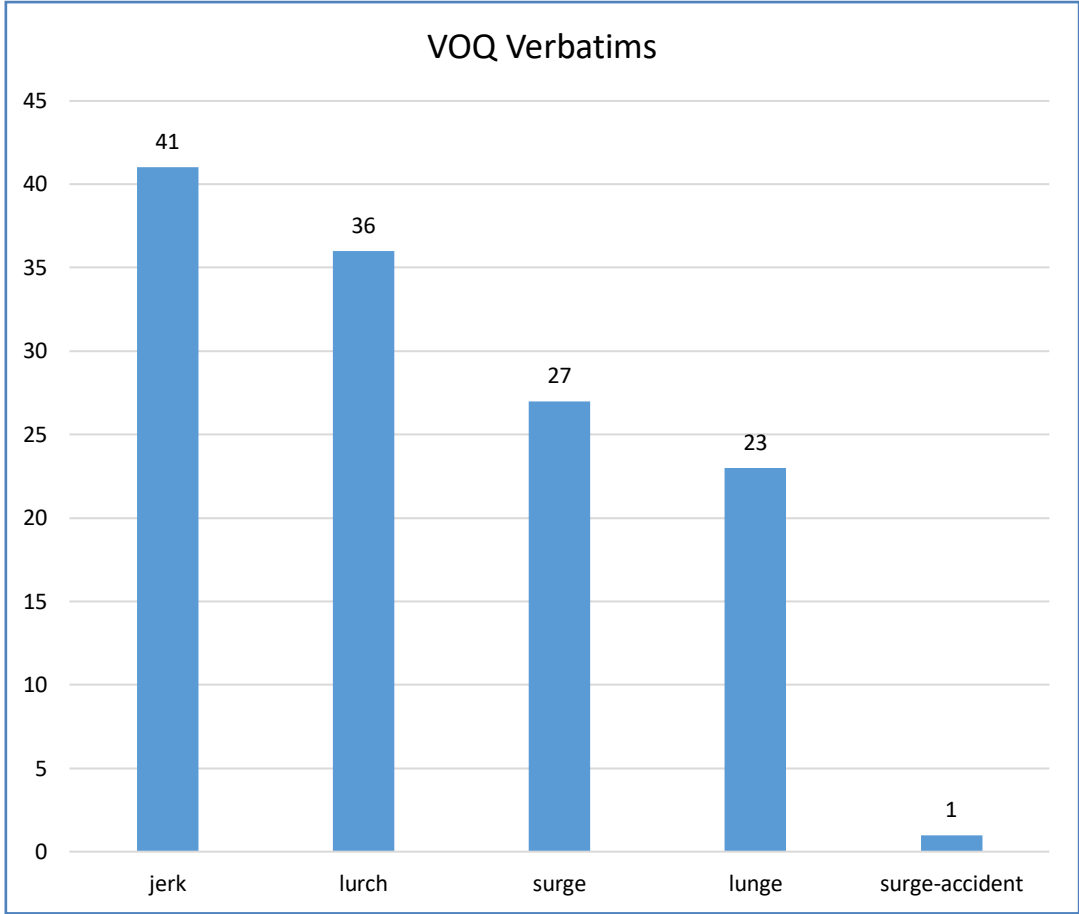
Pertinent VOQ Verbatim as of 2019-11-4

				lunge, lurch, surge, serge, lerch, surging, lunging, Vibrat, shutter,, jerk, harsh, rough, Down shift, downshift, up shift, upshift, lock up, locking up, locks up, kick, throttle, 16-na-361 Accel, acel, cold start, trans, drivetrain, drive, not work, nt work, n't work, inop, fail, shift, slip, hard, 1st, 2nd, 1-2, 1 - 2, accident, crash, hit, injur, hurt, die, fatal
Partial VIN	Reporting Model	Model Year	Incident Date	Complaint Text
3GTU2PEJ4HG254520	SIERRA LD CREW DENALI	2017	7/9/2019	8 SPEED TRANS MISSION IS DANGEROUS. UNDER LIGHT THROTTLE , THE VEHICLE WILL MAKE A LOUD POPPING NOISE AND LURCH FORWARD. LIKE STOPPING AT A STOP LIGHT, DRIVING THROUGH A DRIVE -THRU. MY TRUCK WILL SHAKE VIOLENTLY.. DEALER SAYS ITS THE TRANS MISSION. WHEN I TRY TO ENTER MY GARAGE THE TRUCK WILL SORT OF JUMP FORWARD. DEALER SAYS ITS TORQUE CONVERTER SUTTER. TRANS MISSION HAS BEEN WORKED ON 3 TIME. IT SEEMS TO GET WORSE. DEALERS SAYS THE 8 SPEED TRANS MISSION HAS MANY ISSUES BUT GM DOES NOT HAVE A FIX. THESE 8 SPEED TRANS MISSIONS WILL END UP KILLING FOLK.. THIS STUFF HAPPENS ON A DAILY BASIS
3GCUKTEJ5HG	SILVERADO LD CREW	2017	4/9/2019	TRUCK TRANS MISSION WAS GOOD UNTIL ABOUT 2,000 MILES. TRUCK HAS DELAYS WHEN PUTTING IN GEAR AFTER IT SITS OVERNIGHT. TRUCK HAS HARSH LOW SPEED DOWNSHIFT S. PROBLEMS ARE REAL BAD WHEN VEHICLE IS COLD. WHEN YOU COME TO A COMPLETE STOP AND LET OFF THE BRAKE THE TRUCK WILL SOMETIMES LUNGE FORWARD. TOOK TRUCK BACK TO THE DEALER WHERE I BOUGHT IT AND THEY SAID NOTHING WAS WRONG SO I MADE AN APPOINTMENT FOR A WEEK LATER WITH ANOTHER DEALERSHIP. THEY DID A "TIMING" TEST AND FELT THE DELAY AND DID 16NA364 UPDATE. IT SEEMED TO HELP FOR A COUPLE OF DAYS AND PROBLEM RETURNED. BOTH DEALERSHIPS ARE AWARE OF THE PROBLEM BUT GM IS NOT PROVIDING A FIX. I NOW WARM THE TRUCK UP A FEW MINUTES BEFORE DRIVING TO HELP WITH DELAYED GEAR ENGAGEMENT. HARSH DOWNSHIFT S CONTINUE WITH THE LUNGING AND SLOW RESPONSE AT TIMES WHEN APPLYING GAS PETAL. YOU HAVE TO BE VERY CAREFUL WHEN DRIVING THIS TRUCK BECAUSE OF THE TRANS MISSION PROBLEMS. THERE ARE MANY COMPLAINTS FOR THIS NOT TO BE A MAJOR PROBLEM. THIS VEHICLE STICKER PRICE WAS \$64,000 DOLLARS. I WISH I HAD MY OLD TRUCK BACK BECAUSE IT WAS RELIABLE AND NOT POTENTIALLY DANGEROUS TO DRIVE . GENERAL MOTORS NEED FIX THIS PROBLEM OR AT LEAST GIVE AN FREE EXTENDED WARRANTY. THE DEALERS WILL FIX THE TRANS MISSION IF GM WILL TELL THEM HOW.
1GKS2HKJ1GR	YUKON XL DENALI	2016	4/2/2019	MY 2016 YUKON DENALI XL LURCH ES FORWARD WHILE DRIVING ACTING LIKE IT IS HAVING ISSUES SHIFT ING GEARS. I HAVE ALSO HAD AN ISSUE TWICE NOW WHERE WHEN I SHIFT FROM PARK TO REVERSE IN MY DRIVEWAY MY VEHICLE GOES FORWARD INSTEAD.
3GTU2NEJ3HG353835	SIERRA LD CREW	2017	3/15/2019	"HAVE TAKEN MY 2017 GMC SIERRA INTO THE DEALERSHIP TWICE FOR TRANS MISSION ISSUES, THE LAST TIME WAS A MONTH AGO. BOTH TIMES I WAS TOLD THAT THERE WASN T ANYTHING WRONG BUT THAT THE TRANS MISSION SOFTWARE WAS RE-FLASHED AND THAT THE TRANS MISSION WOULD HAVE TO RE-LEARN MY DRIVING HABITS . MY TRUCK IS STILL HAVING PROBLEMS. WHILE UPSHIFT ING FROM 1ST TO 2ND GEAR, THE TRANS MISSION SOMETIMES HESITATES BEFORE IT ENGAGES AND THEN CAUSES THE TRUCK TO LUNGE FORWARD WITH A HUGE SLAM. WHILE DOWNSHIFT ING FROM 2ND TO 1ST GEAR, THE TRANS MISSION WILL MAKE A VERY NOTICEABLE CLUNK . I M ABOUT TO TAKE IT BACK A 3RD TIME. THIS IS EXTREMELY FRUSTRATING MY BOUGHT MY TRUCK LESS THAN 2 YEARS AGO AND IT ONLY HAS 25,000 MILES."
3GTU2NEJ4JG508253	SIERRA LD CREW	2018	2/1/2019	EXTREMELY HARD SHIFT ING ON LOWER GEARS. WHEN SLOWING WHEN IT GOES FROM 2ND TO 1ST IT FEELS LIKE I GOT REAR-ENDED. NOT ALL THE TIME BUT ONCE A DAY AT LEAST. IT ALSO SHUDDERS WHEN SLOWLY ACCEL ERATING IN TRAFFIC, SOMETIMES THE RPM GOES WAY HIGH AND IT LURCH ES FORWARD WHEN IT UPSHIFT S.

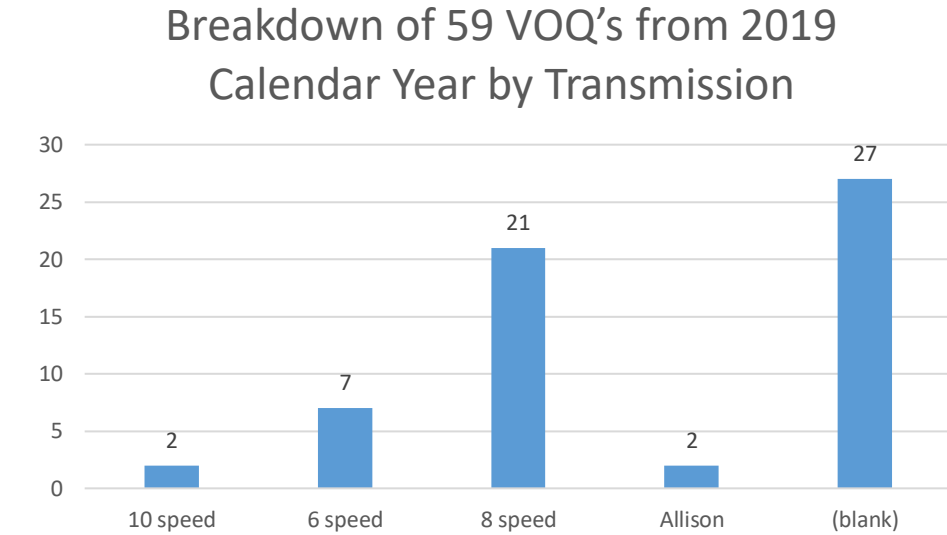
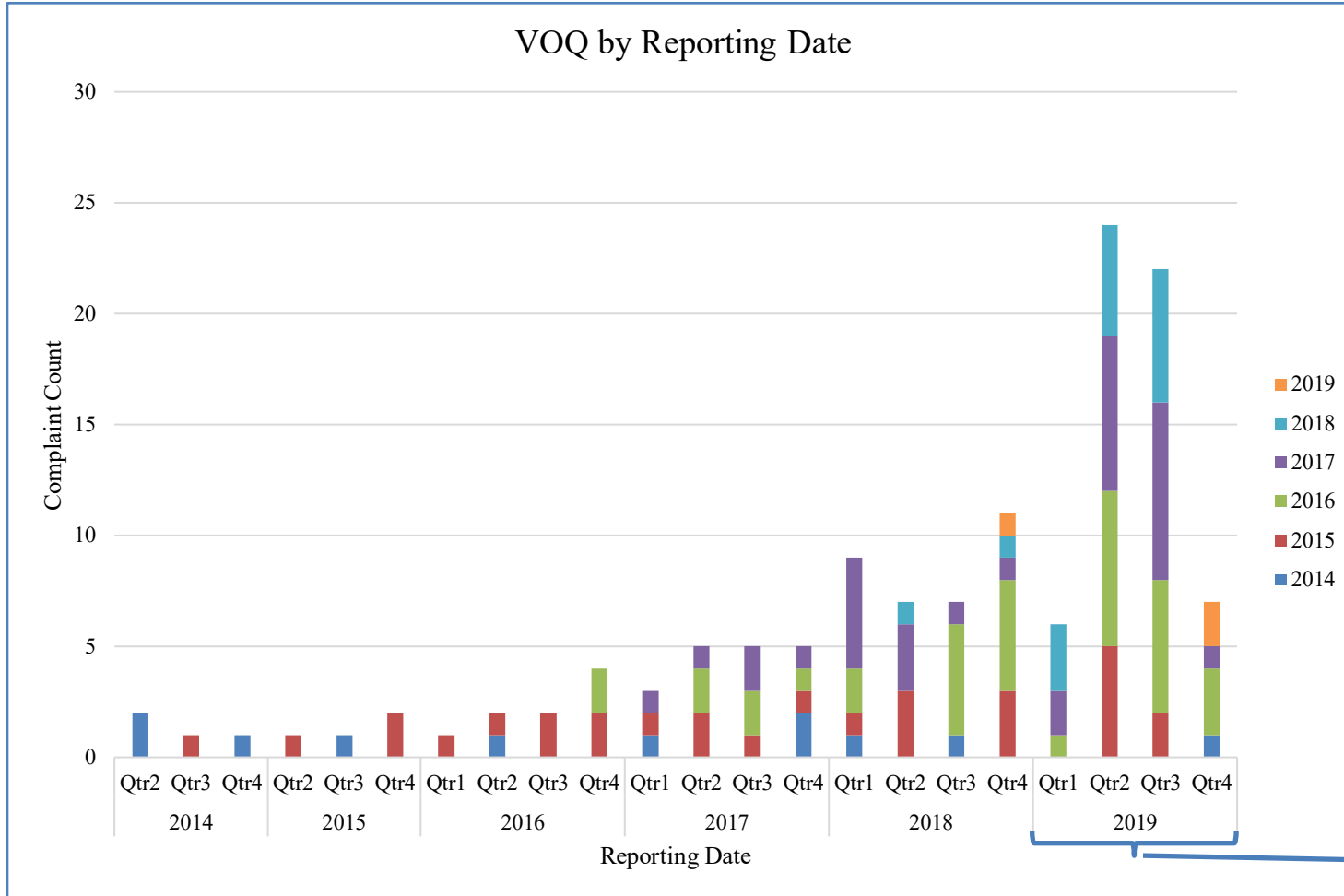


Pertinent **Accident** VOO Verbatim as of 2019-11-4

				lunge, lurch, surge, serge, lerch, surging, lunging, Vibrat, shutter,, jerk, harsh, rough, Down shift, downshift, up shift, upshift, lock up, locking up, locks up, kick, throttle, 16-na-361 Accel, acel, cold start, trans, drivetrain, drive, not work, nt work, n't work, inop, fail, shift, slip, hard, 1st, 2nd, 1-2, 1 - 2, accident, crash, hit, injur, hurt, die, fatal
Partial VIN	Reporting Model	Model Year	Incident Date	Complaint Text
1GNSKJKC4FR	SUBURBAN	2015	9/9/2015	WHILE BRAKING AT A LOW SPEEDS (20-25 MPH) MY TRUCK SURGE D FORWARD. THIS SUDDEN ACCEL ERATION IN SPEED HAS CAUSED TWO (2) ACCIDENT S.



Blanks due to no full vin available to determine trans RPO



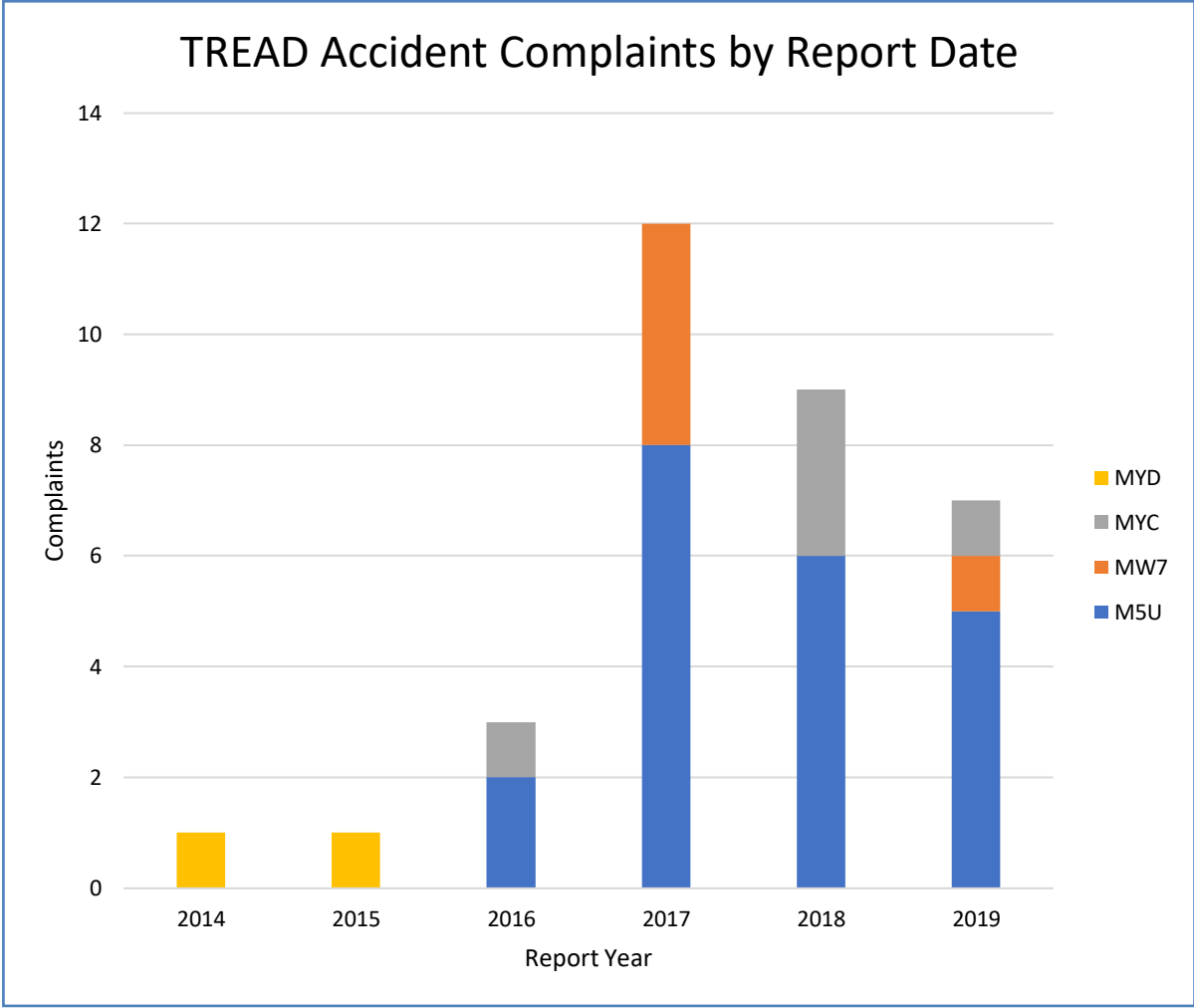
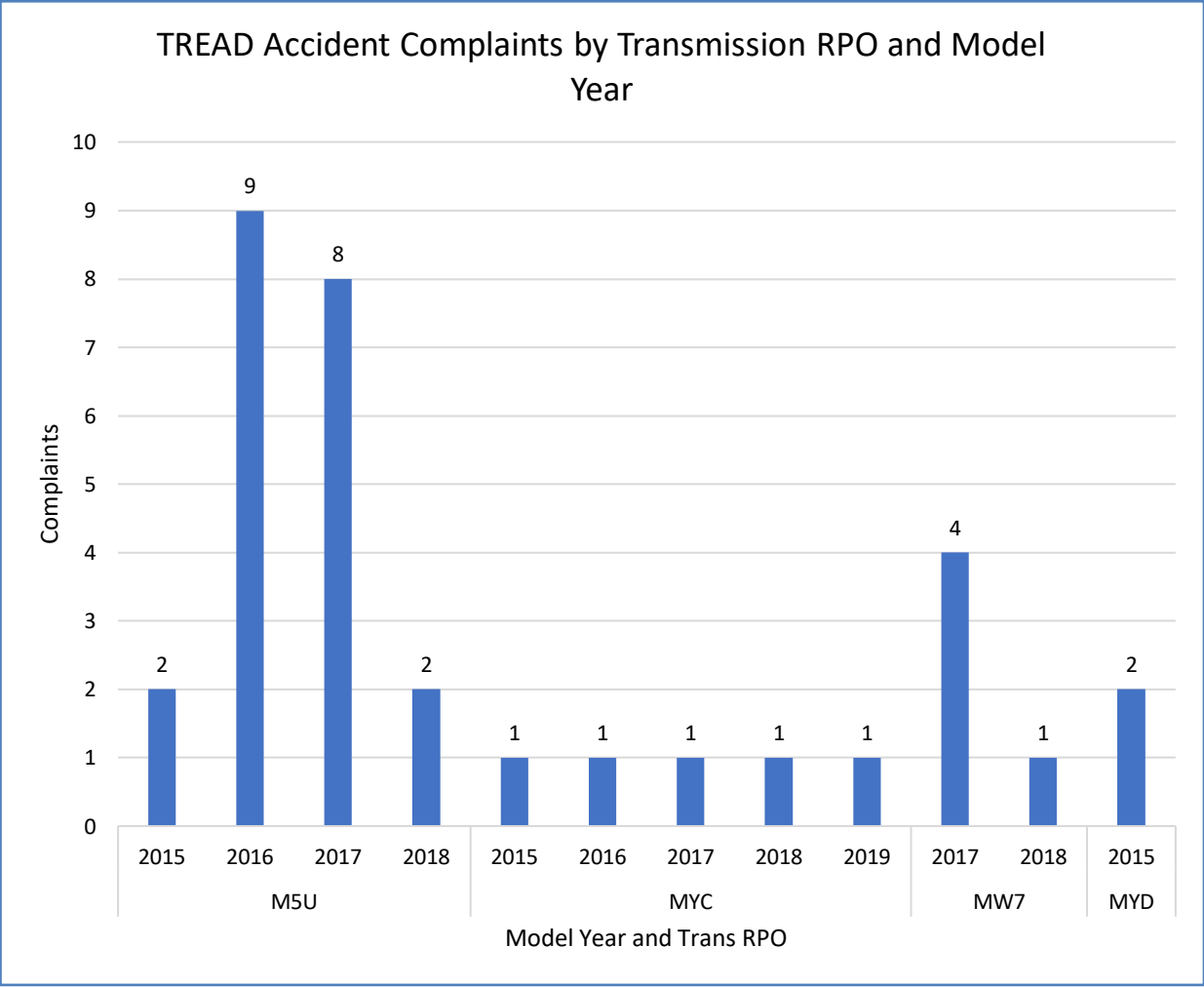
Blanks due to no full vin available to determine trans RPO

Pertinent TREAD Verbatim as of 2019-11-04

Model	Model Year	VIN	Combined Verbatim
SIERRA HD CREW DENALI	2015	1GT120E80FF638865	Other automatic trans mission troubles you will be stopped at a stop sign traffic signal, doesnt matter and the trans mission will a surge kind of thing.. It doesnt make it lurch forward but it does a heavy rotate thing q:When first noticed - Within the first month q:Distance drive n when noticed - 1000 q:Trouble occurs at all temperatures q:How often trouble occurs - Most of the time q:How long running before problem - It occurs all the time/does not matter q:Occur when accel /decel - All the time q:Taken vehicle for repair - No q:Conditions when you experience problem - All driving conditions q:Bothersome rating - 3 a moderate frustration q:Aftermarket parts related - No
SIERRA HD CREW DENALI	2015	1GT120E85FF536347	A/t unusual trans noise - While starting/ accel . From a stop if you make a somewhat sudden stop, it seems like the converter is unloading and it will actually feel like you have been rear ended. The truck will lunge forward a bit and if you werent holding the brake it feels like it would throw you into the car in front of you. My son actually asked me the other day if we were rear ended when it happened. I have had 4 duramax diesel trucks and this is the first one that has ever had this issue. Q:When first noticed - Within the first week after delivery q:Distance drive n when noticed - 200 q:Trouble occurs at 33 - 49 degrees q:How often trouble occurs - Occasionally q:How long running before problem - It occurs all the time/does not matter q:Noise type 1 - Other q:Taken vehicle for repair - No q:How loud is the noise - Loud/distracting q:Bothersome rating - 5 so bothersome that I might consider a different make/model in the future q:Aftermarket parts related - No
SIERRA LD EXT DENALI	2015	1GTV2UEC0FZ331594	Auto trans shift while driving - Shift ing is rough /not smooth when I park the truck and turn off the engine then take my foot off the brake the truck lunges forward. Q:When first noticed - More than 2 months after delivery q:Distance drive n when noticed - 10000 q:Trouble occurs at all temperatures q:How often trouble occurs - Most of the time q:How long running before problem - 15 minutes to 1 hour q:Occur when accel /decel - When decelerating q:Taken vehicle for repair - No q:Conditions when you experience problem - Parking q:Bothersome rating - 2
SIERRA LD EXT DENALI	2015	1GTV2UEC4FZ242658	Engine hesitates/surges/run rough - 1st startup of the day q:When first noticed - Within the first month q:Distance drive n when noticed - 1000 q:Trouble occurs at 33 - 49 degrees q:Trouble occurs at 50 - 69 degrees q:Trouble occurs at 70 - 79 degrees q:Trouble occurs at 80 - 89 degrees q:How often trouble occurs - Occasionally q:How long running before problem - Just started q:Taken vehicle for repair - No q:Bothersome rating - 3 a moderate frustration q:Aftermarket parts related - No q:Fuel in tank - Gasoline
SIERRA LD EXT	2015	1GTV2VEC1FZ231431	Caller s full name: Chris harley tech 1___ number of times in for the same concern? 1___ number of days down? N___ does the vehicle have any aftermarket modifications? Y___ is the vehicle currently at the dealer? Y___ is the vehicle customer owned? Y___ has the concern been duplicated? Y___ is the concern intermittent (y/n) (complete below section if y) if no, provide dealer with bulletin 01-00-89-010I note - If you are confident that a known pi or bulletin can resolve the concern, provide the dealer technician with the pi or bulletin number along with bulletin (01-00-89-010), should you're recommendation not resolve the concern. N___ has data been captured during concern? Customer concern: Lunges into gear when shift ing from rev to drive n___ have any si document been utilized (capture doc id)? Caller states (results of previous repair attempts, si docs, dtcs, verified? Etc.): Dealer states the vehicle has a hard engagement in drive from reverse. Dealer states he is looking for diagnoses information. Advised caller (your suggestions, info source, etc.) recommend dealer to do a line pressure test. Recommend dealer to drop pan to inspect for debris. Recommend dealer to if no debris is found inspect valve body for sticking or scored valves. Recommend dealer to if good replace trans mission control module and retest.



Pertinent TREAD Accidents as of 2019-11-04

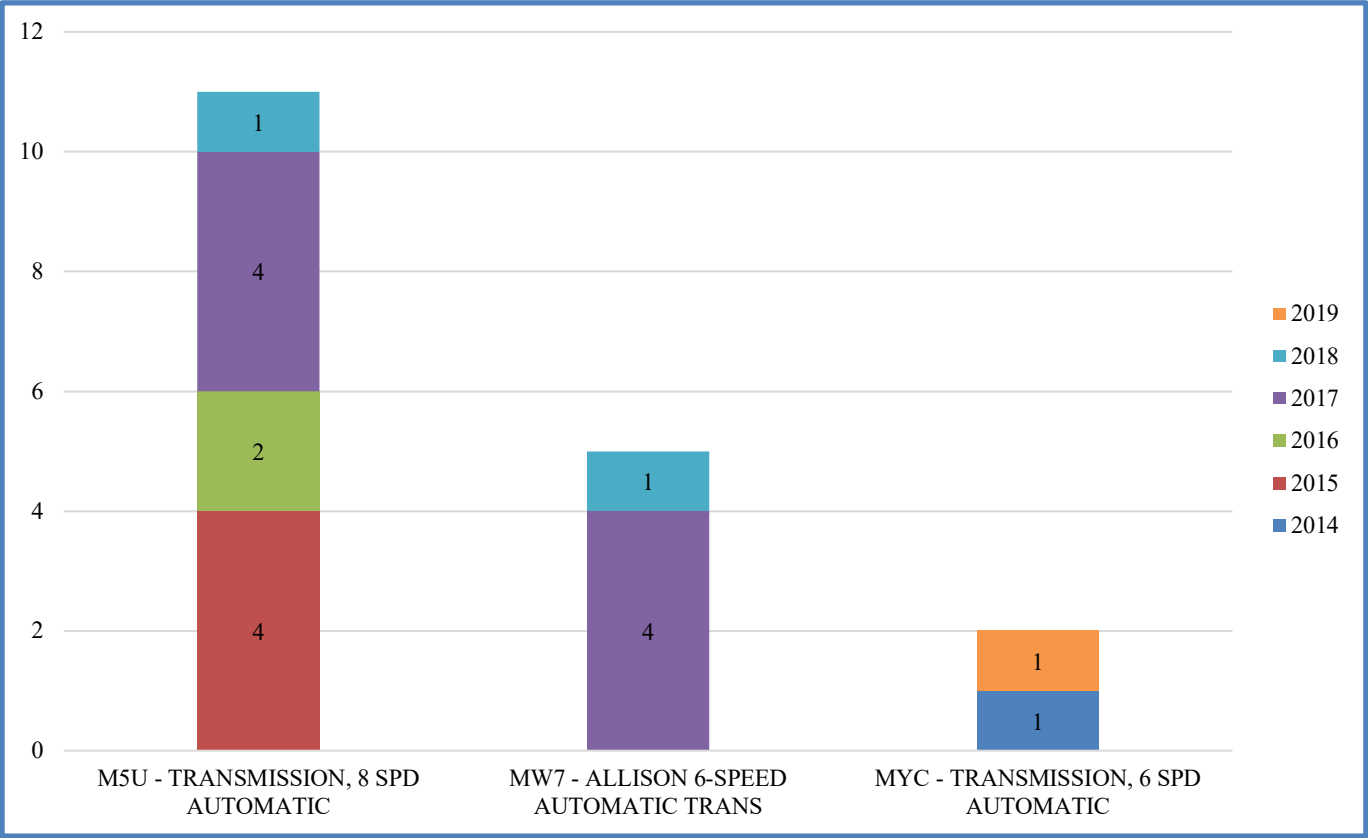


Pertinent TREAD Accident Verbatim as of 2019-11-04

Odometer	Open Date	Model Year	Model	Trans RPO	Final VIN	Vehicle Build Date	Combined Verbatim
2813	9/16/2016	2016	SILVERADO 1500	M5U	3GCPCTEC1GG132328	11/6/2015	9/16/2016 accident location (city, state & street/intersection): Unknown brief description of the situation and the customer's allegation (i.E. Did the driver or passenger airbag deploy): Brief description of damage to property, other than vehicle (i.E: Mailbox, garage door, etc.): Defect caused vehicle to lunge forward and hit vehicle in front of him causing damage to both vehicles bumper was insurance claim filed?: No has the vehicle been repaired?: No is the vehicle in the owner's possession and where is it currently located?: Yes at his residence did anyone seek professional medical attention? (if yes, escalate to esis & follow process): No best time to call customer? Any time
17000	5/31/2018	2016	SILVERADO 1500	M5U	3GCUKTEC XGG200521	1/18/2016	Closing case as satisfied- 1. Customer alleges that the vehicle jerks forward when trans mission gears are shifted . 2. Customer says he put the vehicle in reverse and it lurched backwards and crashed into his garage door . 3. Case has been escalated to esis due to property damage-The customer is satisfied with the escalation. Tony/pac/wmi
21000	4/6/2017	2016	ESCALADE	M5U	1GYS4DKJ6GR216476	11/12/2015	Vehicle lurched into a wall unexpectedly causing her to hit a wall. Accident location 3rd level parking structure at 2411 w sahara ave, las vegas, nv 89102 date of the incident: 03/23/2017 involved dealer cadillac of west las vegas current mileage: 21000 year, make, model: 2016 cadillac escalade vin:
3915	5/18/2017	2017	SIERRA HD	MW7	1GT42YFY1HF141550	1/26/2017	Type of concern: Customer states that his vehicle lunged forward when he would go to shift into a different gear (from drive to reverse, etc.). He states that when he was moving the vehicle he drove forward and when he put it in reverse, the vehicle lunged forward, hitting his neighbor's mailbox causing some damage to his vehicle. He was able to pick up the mailbox and put it back up. The customer states that the dealership advised him that there is a service bulletin out describing what his vehicle is doing. The dealership did the software update on the vehicle to fix the problem. Cus...
17000	8/3/2018	2017	SILVERADO 1500	MYC	3GCUKRE CXHG140969	8/13/2016	While backing up the vehicle lurched backward and hit his trailer. Customer was calling to get his money back from gm and did not want to discuss his allegation. He is going to file paperwork with the attorney general. Closing pac file pending. Elaine locke/pac/wmi
19871	12/2/2015	2015	SILVERADO 2500HD	MYD	1GC1CUE G1FF188395	8/8/2014	Date of the incident:11/14/15 brief description of the situation and the customer's allegation: Unwanted acceleration and very high rpm when driver entered the vehicle and put into gear, caused the vehicle to lurch and hit a cement pylon . Front bumper damage occurred. Was insurance claim filed? No has the vehicle been repaired? No is the vehicle in the owner's possession and where is it located? Simpson chevrolet of garden grove bac # 273945. Did anyone seek professional medical attention? No. Best time to call customer? Any marion/ca cec advisor/ atx//ext. # 5921259



Pertinent Legal Claims – Surge/Lurch – As of 2019-10-28



Row Labels	2014	2015	2016	2017	2018	2019	Grand Total
M5U - TRANSMISSION, 8 SPD AUTOMATIC		4	2	4	1		11
MW7 - ALLISON 6-SPEED AUTOMATIC TRANS				4	1		5
MYC - TRANSMISSION, 6 SPD AUTOMATIC	1					1	2
Grand Total	1	4	2	8	2	1	18

Pertinent Legal Claims – Surge/Lurch – As of 2019-10-28

VIN	ALL Narrative on Matter String
1GCRCREC3EZ272504	10/02/2014 - Incident - CLAIMANT WAS AT A LIGHT AND HIS FOOT WAS ON THE BRAKE. ALL OF A SUDDEN, IT FELT LIKE HE WAS REAR-ENDED BUT THERE WAS NO REAR-END COLLISION. Injury description: issues with back and unable to sleep more than 3 hours.
3GCUKSEJ6FG340671	09/22/2016 - Incident - AS CLAIMANT WAS DRIVING, SUBJECT VEHICLE LURCHED FORWARD AND SHE WAS INJURED. Injury Description: neck pain, shoulder and arm pain - whiplash
1GKS2JKJ7FR589149	01/04/2017 - Incident - PER CLAIMANT TO PAR HE WAS TURNING WHEN THE VEHICLE JERKED AND HE HIT A CITY LIGHT POLE Injury description: hit her head on drivers side window. Knee nit something and shoulder is sore
1GKS1CKJ2FR721913	05/16/2017 - Incident - PER PAR, CLAIMANT WAS DRIVING AND EXPERIENCED A TRANSMISSION MALFUNCTION, VEHICLE GEAR SHIFTS ARE ROUGH WHICH CAUSED A ROUGH RIDE. Injury descritpion: engine surges and is causing her neck and back pain
1GT12UEY2HF130696	05/16/2017 - Incident - PER PAR, CLAIMANT WAS DRIVING AND ATTEMPTED TO SLOW SUBJECT VEHICLE AND VEHICLE UNEXPECTEDLY ACCELERATED , SUBJECT VEHICLE COLLIDED WITH OTHER VEHICLE. Injury description: neck and back pain
1GC2KVEYXHZ218209	10/18/2017 - Incident - CLAIMANT ALLEGES THEY REPORTED PROBLEMS WITH ENGINE PULSING. STATES WAS TOLD BY DEALER SERVICE BULLETIN DID NOT PERTAIN TO HIS VEHICLE. DAY AFTER OIL CHANGE ENGINE SURGED IN TRAFFIC AND CLAIMANT REAR ENDED A SMALL TRAILER WHILE COMING FROM A STOPPED POSITION.
1GC1KVEY9HF115523	12/19/2017 - Incident - CLAIMANT WAS DRIVING AND VEHICLE SEEMED TO SURGE AND HE LOST CONTROL WENT OFF THE ROAD AND UP AN EMBANKMENT BEFORE EVENTUALLY ROLLING OVER. Injury description: bruises on neck
3GTU2PEJ2HG447765	01/29/2018 - Incident - VEHICLE LUNGED BECAUSE THE TRANSMISSION SLIPS AND DOES NOT DOWN SHIFT PROPERLY. Injury description: alleged neck injury
3GCUKTECXGG200521	06/06/2018 - Incident - PER STATEMENTS BY CLAIMANT, HE PLACED THE VEHICLE IN REVERSE AND IT SURGED BACKWARDS STRIKING HIS GARAGE DOOR.
1GC4K0EY3HF214757	07/10/2018 - Incident - PER 1241, CLAIMANT REPORTED WHILE BACKING UP THE VEHICLE SURGED AND JUMPED TO 300 RPM'S CAUSING HIM TO HIT A TREE
3GTU2NEJ0HG365621	08/13/2018 - Incident - PER 1241 - DRIVER STATES THE VEHICLE JERKS FORWARD AND BACKWARDS WHEN HE COMES TO A STOP. Injury description: back pain
1GYS4MKJ7FR516252	11/15/2018 - Incident - PER 1241: CUSTOMER WAS DRIVING ON THE JACKIE ROBINSON PARKWAY AND THE VEHICLE JERKED VERY HARD. Injury description: neck pain
1GKS2HKJ7GR387275	02/22/2019 - Incident - CLAIMANT REPORTS THAT WHILE HUSBAND WAS DRIVING THE VEHICLE AND SUDDENLY THE VEHICLE ACCELERATED CAUSING SUBJECT VEHICLE TO STRIKE SOMEONE'S PERSONAL PROPERTY.
3GCUKTEC5JG172828	05/29/2019 - Incident - CLAIMANT ALLEGES TO PAR, HE WAS DRIVING IN TRAFFIC WHEN HIS TRANSMISSION JUMPED GEARS AND HE HIT THE VEHICLE IN FRONT OF HIM
1GT42YFY3JF250307	06/11/2019 - Incident - PER THE INSURANCE ADJUSTER, CLAIMANT WAS DRIVING THE VEHICLE IN REVERSE WHILE PUSHING SNOW, AND UNWANTED ACCELERATION OCCURRED CAUSING CLAIMANT TO HIT A LIGHT POLE.
1GYS4CKJ8HR262029	08/14/2019 - Incident - PER CLAIMANT WHILE PARALLEL PARKING IN REVERSE THE VEHICLE HIT A PARK CAR
3GTU2PEJ6HG476556	09/03/2019 - Incident - CLAIMANT ALLEGES TO PAR, HE WAS IN A DRIVE-THROUGH WITH HIS FOOT ON THE BRAKE AND VEHICLE IDLING, THE VEHICLE THEN LUNGED FORWARD HITTING THE VEHICLE IN FRONT OF HIM
2GCVKMEC6K1157338	10/08/2019 - ESIS Tread Notes - ESIS TREAD NOTE - CLAIMANT ADMINISTRATOR NEVER SPOKE WITH CLAIMANT. 09/30/2019 - Incident - 1241: SUBJECT VEHICLE WAS COMING TO A STOP ON A SIDE STREET, WHEN THE VEHICLE LUNGED AND HIT SOMETHING.

Pertinent Legal Claims – Surge/Lurch – As of 2019-10-28

Notes:

18 NISM with allegations of Surge/Lurch/Lunge due to transmission issues.

12 NISMS allege accidents – from the available info these accidents were all deemed as inconclusive, not enough info to deem conclusive, some PTR's note potential driver error and unlikely that these transmission issues will result in a lack of torque control and should have no impact on the ability of the brakes to stop the vehicle.

10 allegations of injuries –The information available at this time does not support claimant allegations of a transmission issue which caused an injury. Allegations consist of whiplash, back and neck pain. A few PTR's mention that a BioMedical expert would need to access if the alleged level of acceleration, equivalent to a hard brake apply, could cause injury.

911386 (Class Action Complaint)

- Vehicles equipped with **8L90** or 8L45 **manufactured between 2015 and 2018**.
 - Includes **2015-2019 Chevrolet Silverado**; the 2017-2019 Chevrolet Colorado; the 2015-2019 Chevrolet Corvette; the 2016-2019 Chevrolet Camaro; the **2015-2019 Cadillac Escalade and Escalade ESV**; the 2016-2019 Cadillac ATS, ATS-V, CTS, CT6, and CTS-V; the **2015-2019 GMC Sierra, Yukon, and Yukon XL, and Yukon Denali XL**; and the 2017-2019 GMC Canyon
- “.....Transmission Defect that endangers the drivers and passengers of the vehicles that use them. Drivers attempting to **accelerate or decelerate their cars encounter a hesitation**, followed by a significant shake, shudder, jerk, clunk, or "hard shift" when the automatic transmission changes the vehicles' gears.”
- “Drivers have reported that the shift is sometimes so violent, they feel as though they have been hit by another vehicle. Many drivers have reported that, **when they try to accelerate into traffic, their vehicles hesitate and then abruptly jerk into gear**, creating a traffic safety hazard. Other drivers have reported that the transmission shifts gears so hard that it slams the car forward, leading drivers to believe they have been rear-ended. At least one consumer has complained that the transmission shifted from "reverse" to "drive" so harshly that he almost drove through his garage door.”

#16-NA-361: Information on Transmission Harsh 1-2 Shift Upon First Start Up/Shift of the Day Under Light Throttle - (Oct 8, 2019)

Subject: Information on Transmission Harsh 1-2 Shift Upon First Start Up/Shift of the Day Under Light Throttle



Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		from	to	from	to		
Cadillac	ATS	2016	2019				Automatic 8L45 (M5N) 8L90 (M5X, MQE)
	CTS Models						
	CT6	2016	2020				
	CT4	2020	2020				
	Escalade Models	2015	2017				Automatic 8L90 (M5U, MQE)
Chevrolet	Camaro	2016	2020				Automatic 8L45 (M5T) 8L90 (M5U, M5X, MQE)
	Colorado (VIN S, T)	2017	2020				
	Corvette	2015	2019				
	Express	2017	2020				
	Silverado	2015	2018				
	Silverado LD	2019	2019				
	Silverado 1500 (New Model)	2019	2020				

Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		from	to	from	to		
GMC	Canyon	2017	2020				Automatic 8L45 (M5T) 8L90 (M5U, M5X, MQE)
	Savana		2020				
	Sierra	2015	2018				
	Sierra Limited	2019	2019				
	Sierra 1500 (New Model)	2019	2020				Automatic 8L90 (M5U, MQE)
	Yukon	2015	2017				

Involved Region or Country	North America and N.A. Export Regions
Condition	Some customers may comment that the transmission exhibits a harsh 1-2 shift on the first shift of the day, typically under light throttle.
Cause	This condition is due to the initial clutch fill time of the 2-3-4-6-8 (C4) clutch.
Information	Some customers may experience a flare condition on the first 1-2 shift of the day or after the vehicle has been parked for several hours. The condition may have developed after the replacement of a complete transmission assembly or the replacement of the stator support to correct a delayed engagement condition. This is most likely to occur under light throttle conditions. Subsequent 1-2 shifts have acceptable shift feel. Replacing transmission components will not correct the condition.
Correction	Important: Replacing transmission components or complete assemblies will not improve the condition. The first 1-2 shift of the day may be harsh. The customers' vehicle should be compared to a like vehicle under the same driving conditions. Do Not replace any parts for this condition. Note: This condition will not impact the designed performance or reliability of the vehicle.



How to Adapt Your Transmission

- Enter GDS 2 Diagnosis and navigate to: Transmission Service Fast Learn
- When the Service Fast Learn is complete, perform a test drive and note any soft or harsh shifts. To improve these complaint shifts further, locate the clutches that need to be learned in the following table below, and perform the required learning procedure for each clutch listed in the chart.

	Learn These Clutches	
To Correct The Shift Feel	Applying Clutch	Releasing Clutch
3-1	C1	C4
2-1	C3	C4

Note: If the harsh shift is noted when the vehicle is coming to a stop and shifting into 1st gear, this downshift is most likely a 3-1 shift.

To Learn C1 (For 6-7 or 3-1 Shift)

- 1. Pressure Learns:
 - Shift the transmission into 6th gear with the PRNDM in the M position. Obtain an engine speed between 1000 and 1600 engine rpm. Maintain this condition for a total of about 5 miles (8 km). Cruise control may be used and has been found to result in faster learning of the clutch values.
- 2. Volume Learns:
 - Complete 15 light throttle 6-7 upshifts at approximately 15% throttle to further learn C1.

To Learn C4 (For 1-2, 5-6, or 7-8 Shift)

- 1. Pressure Learns:
 - Shift the transmission into 7th gear with the PRNDM in the M position. Obtain an engine speed between 1000 and 1750 rpm. Maintain this condition for a total of about 5 miles (8 km). Cruise control may be used and has been found to result in faster learning of the clutch values.
- Important: Application Specific Express & Savana Vans Pressure Learns:**
- 2. Volume Learns:
 - Complete 15 light throttle 1-2 upshifts at approximately 15% throttle to further learn C4.

Document ID: 4366757

#16-NA-019: Information on Transmission Adaptive Functions and Correcting Low Mileage Harsh Shifts, Slips, or Flares - (Aug 19, 2016)

Subject: Information on Transmission Adaptive Functions and Correcting Low Mileage Harsh Shifts, Slips, or Flares



Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		from	to	from	to		
Buick Cadillac Chevrolet GMC	All GM Passenger Cars and Trucks	2016	2017			All	Equipped with 8L90 and 8L45 Automatic Transmission (RPOs M5U, M5T, M5N, M5X)

Involved Region or Country	North America and N.A. Export Regions
Condition	Some customers may comment on low mileage vehicles with an automatic transmissions that the shifting may feel too firm (harsh), slips, or flares. Customers should be advised that the transmission makes use of an adaptive function that will help to refine the shift feel while driving and improve shift quality.

Important: Using Tis2Web please check the ECM/TCM Software/Calibrations against what's currently in the vehicle and if the description of the update is relevant to the customer concern please perform the update prior to proceeding with the learns below. By completing the software/calibration update, the clutch adapts will clear and thus a Service Fast Learn followed by Adaptive

Document ID: 4641373

#16-NA-404: Harsh Shift, Delayed Shift, unwanted Downshift, Transmission Stuck in One Gear, Erratic Shifting, Hesitation or Have a Malfunction Indicator Lamp (MIL) Illuminated - DTC P0747, P0777, P0797, P2715 or P2724 May Be Set Current or History in Transmission Control Module - (Apr 7, 2017)

Subject: Harsh Shift, Delayed Shift, Unwanted Downshift, Transmission Stuck in One Gear, Erratic Shifting, Hesitation or Have a Malfunction Indicator Lamp (MIL) Illuminated - DTC P0747, P0777, P0797, P2715 or P2724 May Be Set Current or History in Transmission Control Module



Involved Region or Country	North America and N.A. Export Regions
Condition	<p>Some customers may comment that one or more of the following conditions:</p> <ul style="list-style-type: none"> • Harsh shift • Delayed shift • Unwanted downshift • Transmission stuck in one gear • Erratic shifting • Hesitation between shifts • MIL illuminated <p>The technician may find one or more of the following DTCs set:</p> <ul style="list-style-type: none"> • P0747 • P0777 • P0797 • P2715 • P2724
Cause	This condition may be caused by a calibration anomaly in the Transmission Control Module (TCM).
Correction	If you encounter a vehicle with the above concern, reprogram the Transmission Control Module (TCM) with the latest software available on TIS2WEB.

Document ID: 4660350

#16-NA-412: Harsh 1-2, Harsh 3-1 Decel Downshift, Harsh Downshifts Under Heavy Throttle - (Mar 16, 2017)

Subject: Harsh 1-2, Harsh 3-1 Decel Downshift, Harsh Downshifts Under Heavy Throttle



Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		from	to	from	to		
Chevrolet	Silverado	2016	2016			L83	8L90
GMC	Sierra Yukon Models	2016	2016			L83	8L90

Involved Region or Country	North America and N.A. Export Regions
Additional Options (RPO)	Equipped with 8L90 Automatic Transmission and 5.3L Engine (RPO L83)
Condition	<p>Some customers may comment on one or more of the following conditions regarding the 8L90 Automatic Transmission in their vehicle.</p> <ul style="list-style-type: none"> • Harsh 1-2 upshift (except for the first 1-2 upshift of the day) • Harsh 3-1 downshift when de-accelerating to a stop • Harsh downshift under heavy throttle apply

Correction

New TCM software has been developed to improve the conditions described above.



Bulletin 16-NA-364

Document ID: 4618991

#16-NA-364: Delayed Engagement After Sitting With Engine Off - Clutch Slow to Fill - (Jun 29, 2017)

Subject: Delayed Engagement After Sitting With Engine Off - Clutch Slow to Fill



Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		from	to	from	to		
Cadillac	Escalade	2015	2017				8L90 (MSU, MSX)
	ATS	2016	2017				8L45, 8L90 (MSN, MST, MSU)
	CTS	2016	2017				8L45, 8L90 (MSN, MST, MSU)
	CT6	2016	2017				8L45, 8L90 (MSN, MSX)
Chevrolet	Camaro	2016	2017				8L45, 8L90 (MST, MSU)
	Corvette	2015	2017				8L90 (MSU)
	Colorado	2017	2017				8L45 (MST)

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https://gsi.ext.gm.com/gsi/showDoc.do?name=Delayed+Engagement+After+Sitting+With+Engine+Off+-+Clutch+Slow+to+Fill&bulletinNr=16-NA-364&from=ns&releaseDate=2017-06-29&docSyskey=4... 1/5

Involved Region or Country	North America and N.A. Export Regions
Condition	<p>Some customers may comment on a condition of delayed engagement when the transmission is shifted from Park to Reverse or Park to Drive after the vehicle has been sitting with the engine off. This condition may typically occur after several hours or more commonly overnight.</p> <p>Customers may describe this condition as:</p> <ul style="list-style-type: none">• Vehicle delaying into gear.• Not wanting to move.• Feeling like the transmission is slipping.• Delayed engagement followed by a harsh engagement. <p>Operation will be normal for the subsequent engagements throughout the day and the condition will not occur until the vehicle sits again with the engine off for several hours or</p> <p>© 2020 General Motors. All rights reserved.</p>

2/11/2020

Document ID: 4618991

Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		from	to	from	to		
	Silverado	2015	2017				8L90 (MSU, MSX)
	Suburban	2017	2017				8L90 (MSU, MSX)
	Tahoe	2017	2017				8L90 (MSU, MSX)
GMC	Canyon	2017	2017				8L45 (MST)
	Sierra	2015	2017				8L90 (MSU, MSX)
	Yukon	2015	2017				8L90 (MSU, MSX)



Population as of 2020-1-16 – No RPO Restrictions

Country Of Sale	Produced	In Transit	Dealer Inventory - New	Dealer Inventory - Courtesy	Customer Driven	GM Inventory - Employee Leased Vehicles	Company Vehicles	Fleet	Retail
ARUBA - Total	46	10			36				46
AUSTRIA - Total	20				20				20
AZERBAIJAN - Total	7				7				7
BAHAMAS - Total	75	13			62				75
BAHRAIN - Total	4,148	97	70		3,981			378	3,770
BELARUS - Total	2	1			1				2
BELGIUM - Total	41				41				41
CAMBODIA - Total	5	4			1				5
CANADA - Total	640,656	1,766	3,604		635,059		227	126,262	514,394
CAYMAN ISLANDS - Total	208	9			199			6	202
CHILE - Total	5,221	36	154		5,031				5,221
COLOMBIA - Total	222	9	35		178				222
COSTA RICA - Total	271	30	5		236				271
CURACAO - Total	37	4			33				37
CZECHOSLOVAKIA - Total	39				39				39
DENMARK - Total	1				1				1
DOMINICAN REPUBLIC - Total	2,277	312	4		1,961				2,277
ECUADOR - Total	374	56	89		229				374
EL SALVADOR - Total	141	33			108				141
FINLAND - Total	41	17			24				41
FRANCE - Total	39				39				39
FRENCH POLYNESIA - Total	4	4							4
GERMANY - Total	567				567				567
GUATEMALA - Total	530	108			422			7	523
HAITI - Total	60	6			54				60
HONDURAS - Total	284	24	6		254				284
IRQ - Total	5,032	26	256		4,721		29	2,440	2,592
ISRAEL - Total	4,667				4,667				4,667
ITALY - Total	28				28				28
JAPAN - Total	498		37		461				498
JORDAN - Total	799	141	148		510			97	702
KAZAKHSTAN - Total	195	38			157				195
KOREA, REPUBLIC OF - Total	799	36	132		630		1		799
KUWAIT - Total	38,503	570	1,332		36,599		2	5,976	32,527
LEBANON - Total	1,575	32	83		1,460			267	1,308
MEXICO - Total	105,687	1,386	325		103,848		128	35,974	69,713
MYANMAR - Total	13		1		12				13
NETH. ANTILLES - Total	6	1			5				6
NETHERLANDS - Total	193				193			97	96
NEW CALEDONIA - Total	37				37				37
NICARAGUA - Total	33		1		32				33
OMAN - Total	7,076	115	210		6,751			788	6,288
PANAMA - Total	451	67			384				451
PERU - Total	339	32	117		190				339
PHILIPPINES - Total	187	5	26		156				187
POLAND - Total	25	8	17						25
QATAR - Total	14,040	63	249		13,728			1,447	12,593
RUSSIAN FEDERATION - Total	7,048	596	9	50	6,393				7,048
SAUDI ARABIA - Total	133,637	3,041	3,043		127,551		2	23,592	110,045
SURINAME - Total	3	1			2				3
SWEDEN - Total	128				128				128
SWITZERLAND - Total	217				217				217
THAILAND - Total	14	6	8						14
TURKEY - Total	33		33					13	20
TURKS & CAICOS ISLANDS - Total	5	4			1				5
U. A. E. - Total	28,829	317	832		27,619		61	2,266	26,563
UNITED KINGDOM - Total	16				16				16
UNITED STATES - Total	5,949,791	15,948	59,476	9,083	5,857,546		7,738	853,645	5,096,146
Unknown - Total	321	15			306			12	309
Unknown GMNA - Total	2	2							2
YEMEN - Total	12				12				12
Grand Total	6,955,569	24,990	70,302	9,133	6,842,956		8,188	1,053,267	5,902,302

8 Speed Transmission Population as of 2020-02-10

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Country Of Sale	Produced	In Transit	Dealer Inventory - New	Dealer Inventory - Courtesy	Customer Driven	GM Inventory - Employee Leased Vehicles	Company Vehicles	Fleet	Retail
ARUBA - Total	1				1				1
AZERBAIJAN - Total	7				7				7
BAHRAIN - Total	212				212				196
BELARUS - Total	2	1			1				2
BELGIUM - Total	23				23				23
CANADA - Total	76,000	21	22		75,953				72,448
CAYMAN ISLANDS - Total	14				14				14
CHILE - Total	2,051		28		2,023				2,051
COSTA RICA - Total	36	4	3		29				36
CZECHOSLOVAKIA - Total	12				12				12
DENMARK - Total	1				1				1
DOMINICAN REPUBLIC - Total	30	3			27				30
FINLAND - Total	43	21			22				43
FRANCE - Total	7				7				7
GERMANY - Total	289				289				289
HONDURAS - Total	5				5				5
IRAQ - Total	8				1				8
ITALY - Total	9				9				9
JAPAN - Total	292	30	34		228				292
JORDAN - Total	92				92			20	72
KAZAKHSTAN - Total	217	57			160				217
KOREA, REPUBLIC OF - Total	135		2		133				135
KUWAIT - Total	855				855			90	765
LEBANON - Total	184				184			13	171
MEXICO - Total	11,095	105	4		10,978		8	79	11,016
NETHERLANDS - Total	29				29			10	19
NEW CALEDONIA - Total	37				37				37
OMAN - Total	762				762			65	697
PANAMA - Total	42	1			41				42
QATAR - Total	1,665				1,665			187	1,478
RUSSIAN FEDERATION - Total	2,919	685	8	53	2,173				2,919
SAUDI ARABIA - Total	3,992				3,992			466	3,526
SWEDEN - Total	84				84				84
SWITZERLAND - Total	141				141				141
U. A. E. - Total	5,532		1		5,521		10	313	5,219
UNITED KINGDOM - Total	6				6				6
UNITED STATES - Total	623,482	108	151	155	622,832		236	14,427	609,055
Unknown - Total	306				306				306
Grand Total	730,617	1,036	253	208	728,855		265	19,238	711,379

8 Speed Usage – M5U/M5X

2015-2018 Sierra LD, Silverado
LD, Yukon/Yukon XL

2015-2020 Escalade

2018-2020 Tahoe



Product Investigation Overview

GVS-CORE Number: N18-228256

OIR Date: 2020-02-17

SFADA Date: 2020-02-20

Responsibility / PRD: GM Engineering

PRD Champion: Chris Meagher

Preliminary Quality Chain Impact:

Requirements (eg. STS / PPC / SOR / MR)	BEST PR.	Math Data / CAE	Feature / System FMEA	ICDm / ICDe	KCDS	DFMEA	DRBFM	PFMEA	PROCESS CONTROL PLAN / TOOL	DV / PV TEST (VCRI)	PPAP / PROCESS CAPABILITY	Other (List Below)
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Supplier(s):

Investigated Component Name: Transmission Hardware/Calibrations

Investigated Component Description: Transmission Hardware/Calibrations

Investigated Component Part Number:

Name of supplier (Indicate Tier level)

Supplier Address

Supplier Address

Supplier Contact Name (if available)

Supplier Phone #

Country of Manufacturing/Assembly

