

Chihuahua Operations

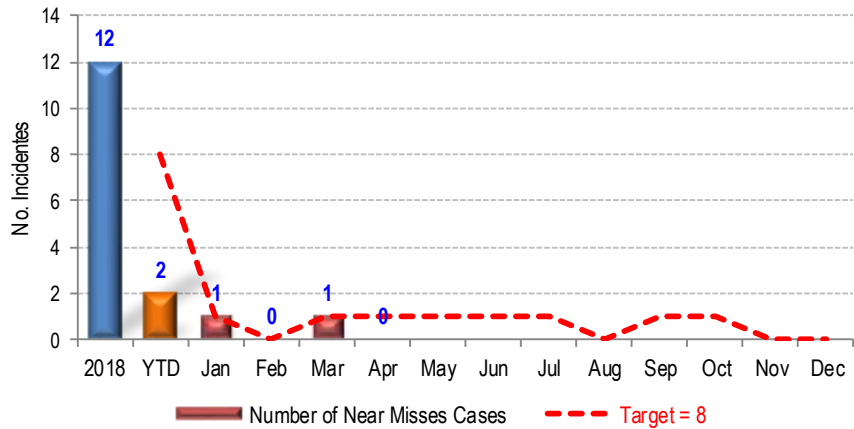


Performance Review

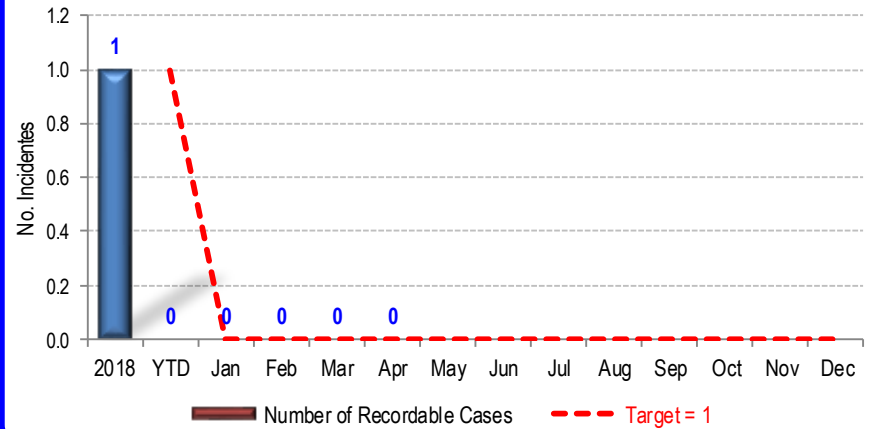


People

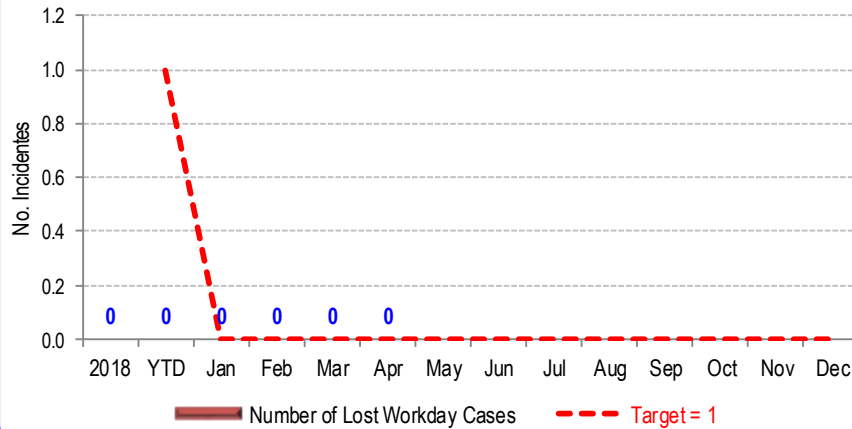
Number of Near Misses Cases



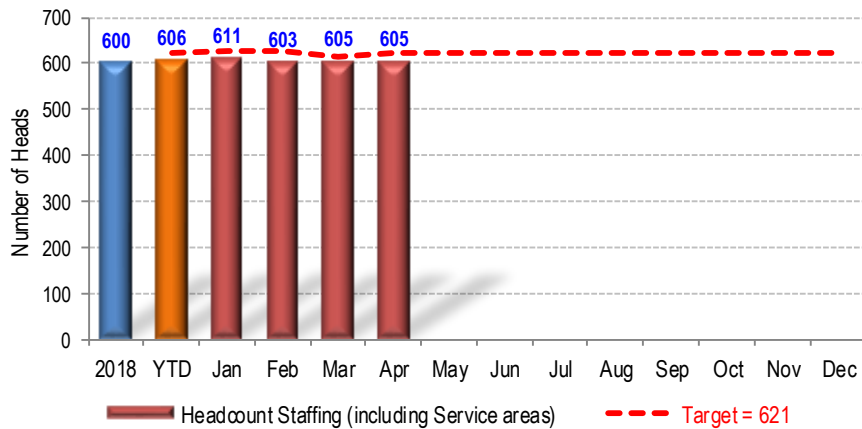
Number of Recordable Cases



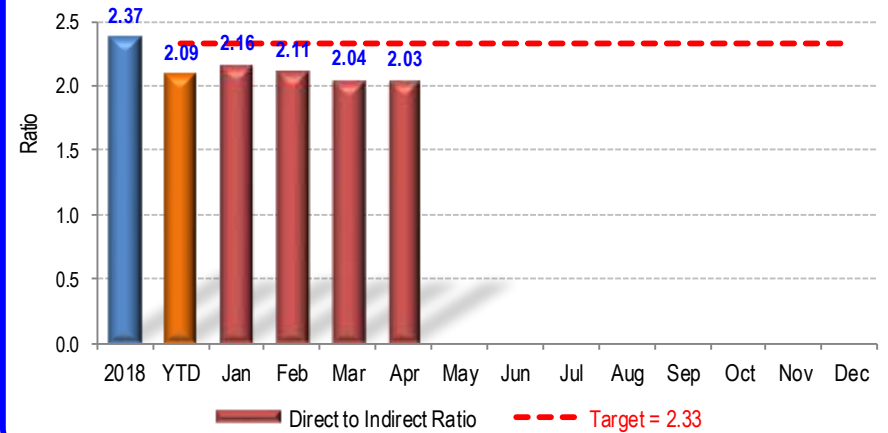
Number of Lost Work Day Cases



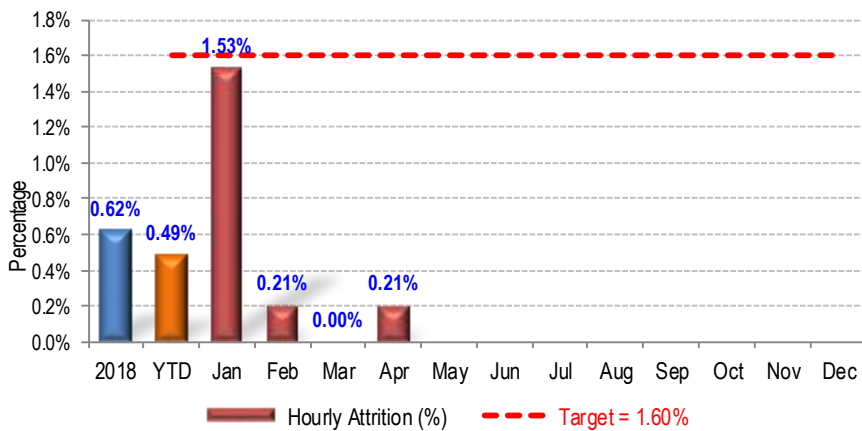
Total Plant Headcount



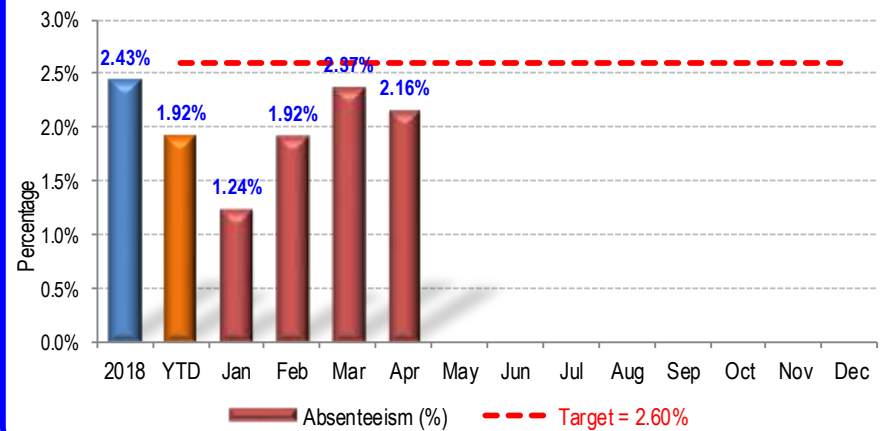
Direct to Indirect Ratio

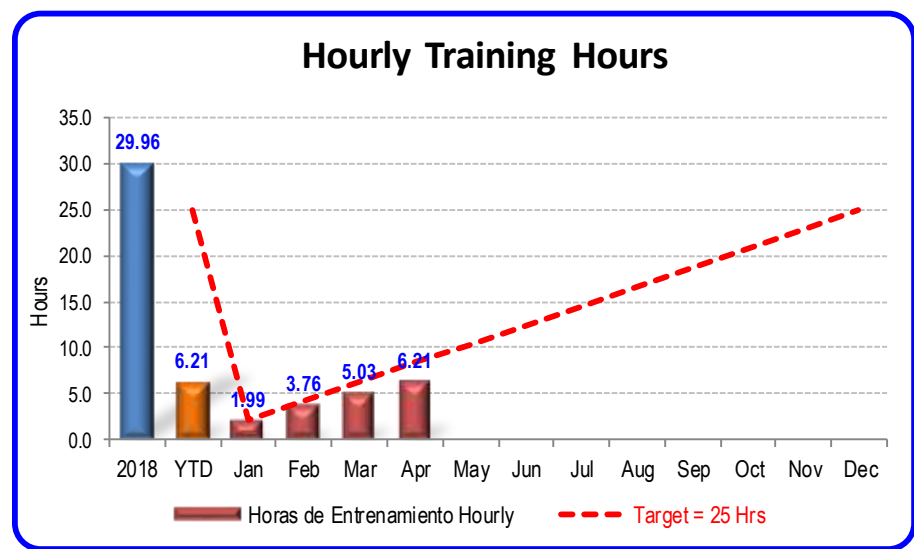
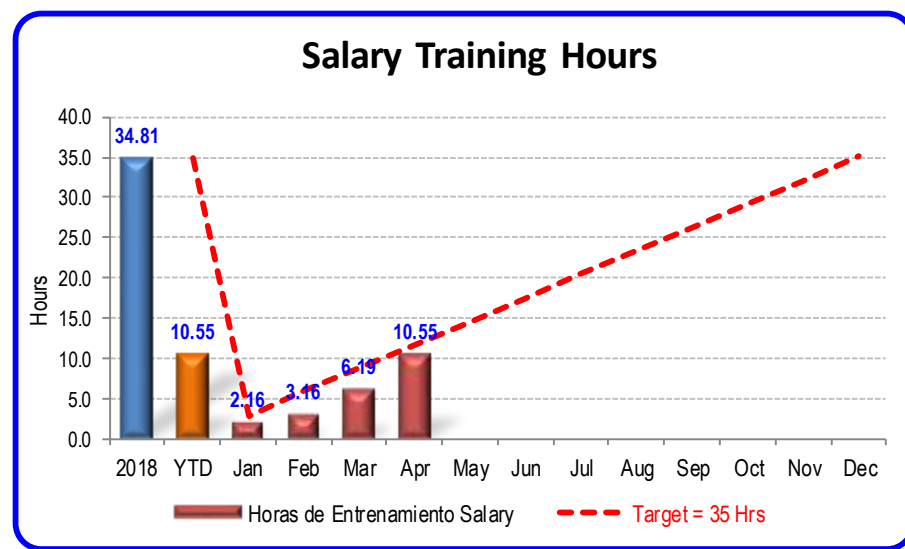
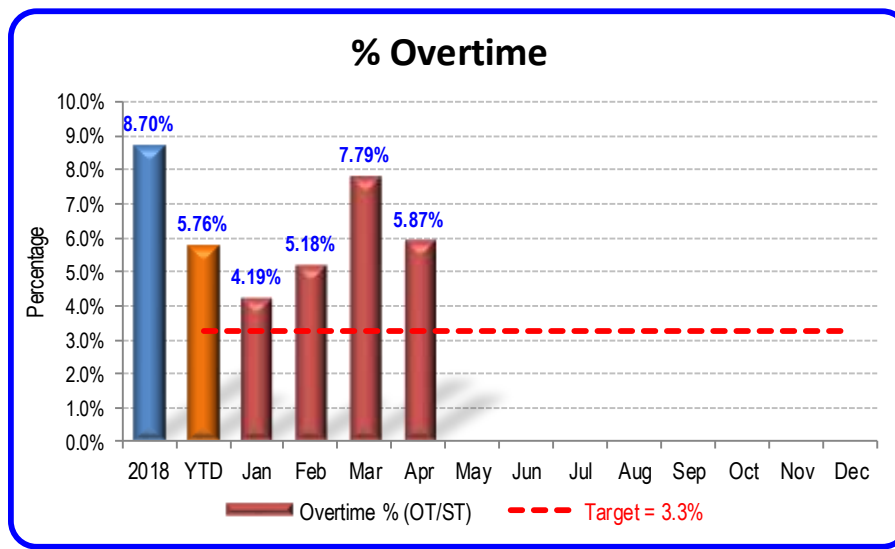


% Attrition



% Absenteeism



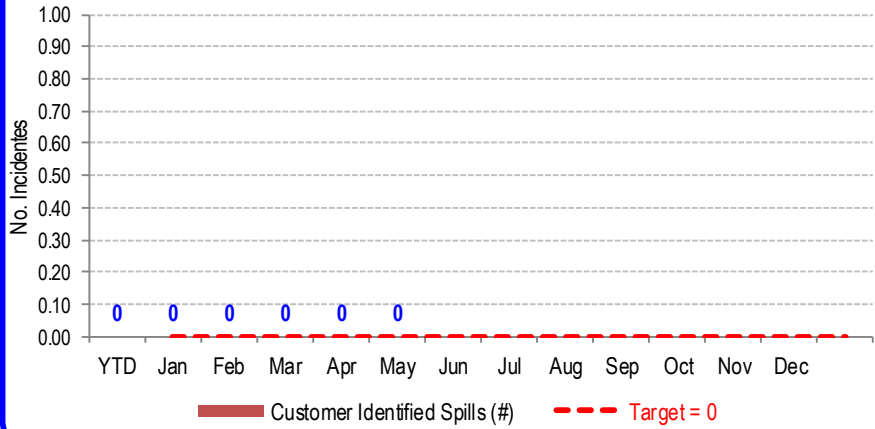




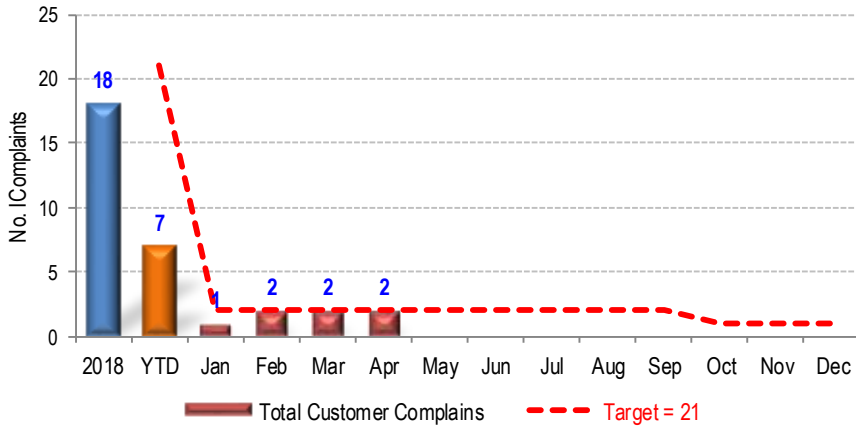
Customer Satisfaction (Quality and Delivery)

Customer Satisfaction

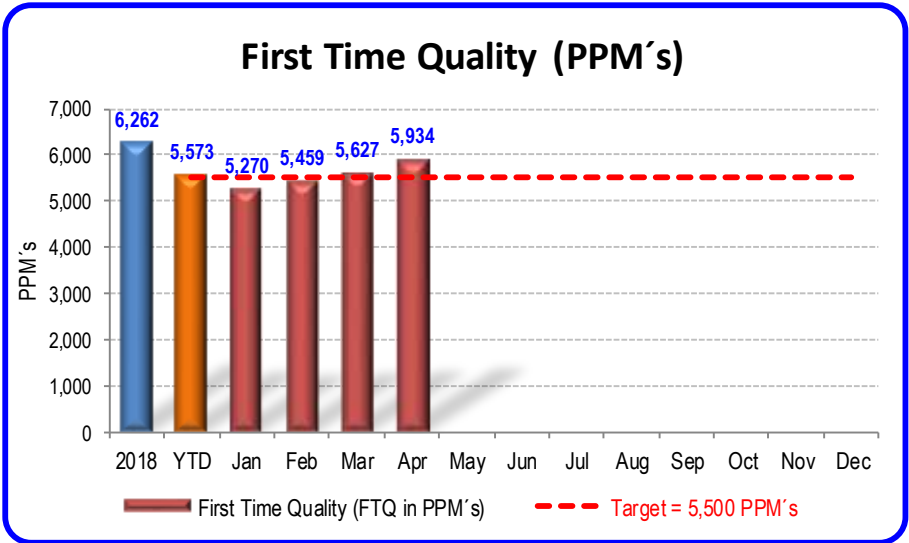
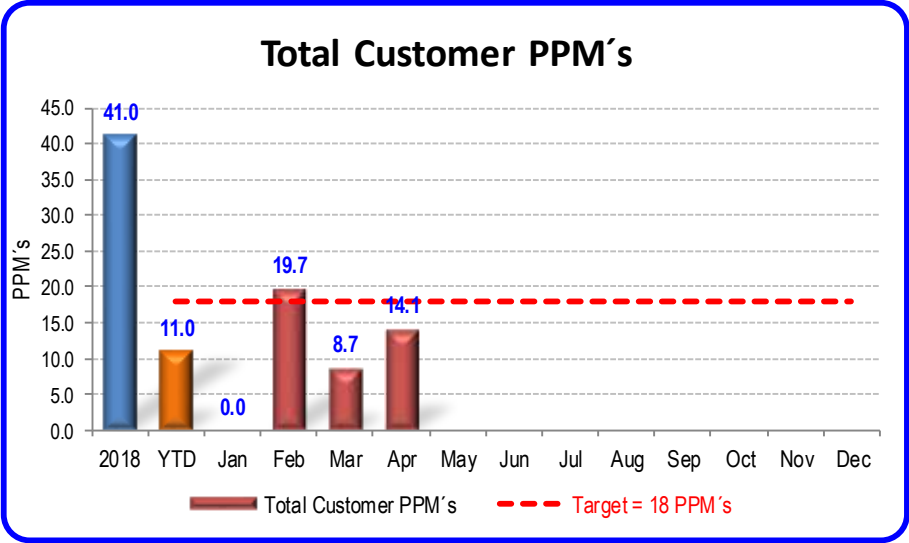
Customer Identified Spills



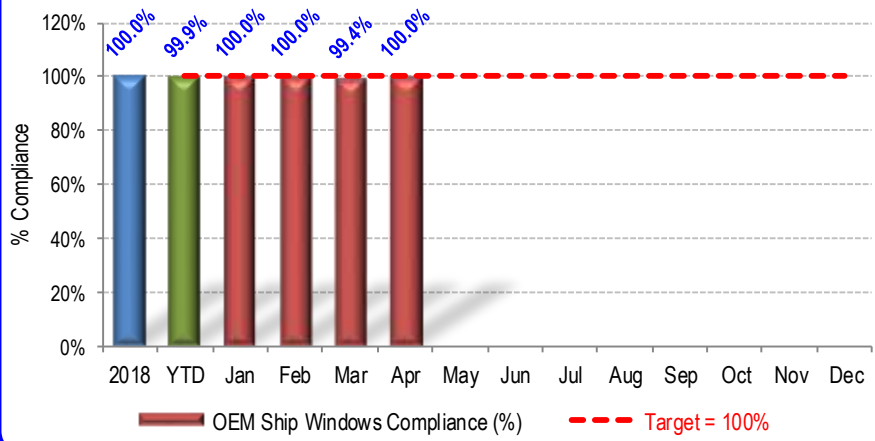
Total Customer Complaints



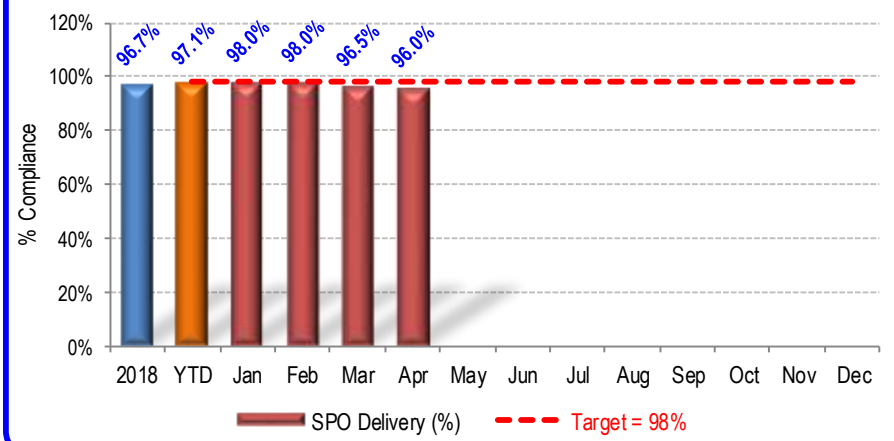
Customer Satisfaction



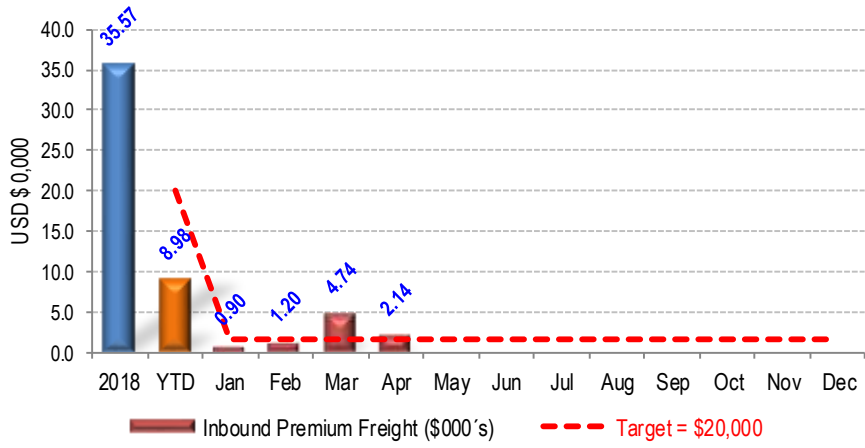
Ship Windows Compliance (OEM)



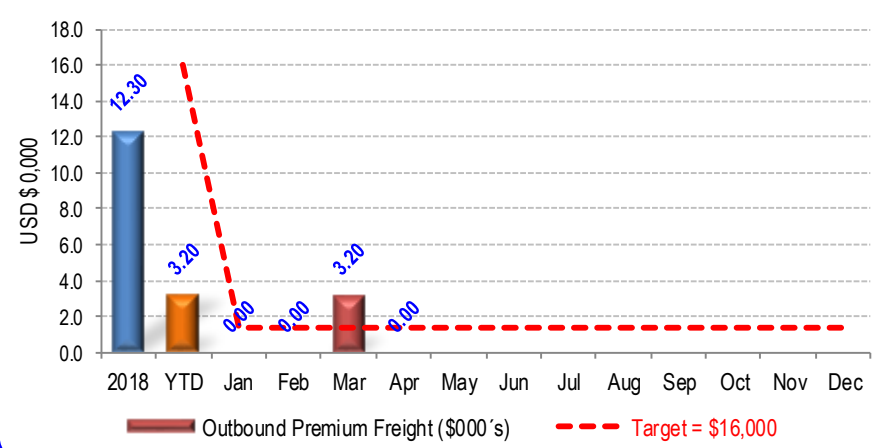
Ship Windows Compliance (Service)



Inbound Premium Freight (\$000's)



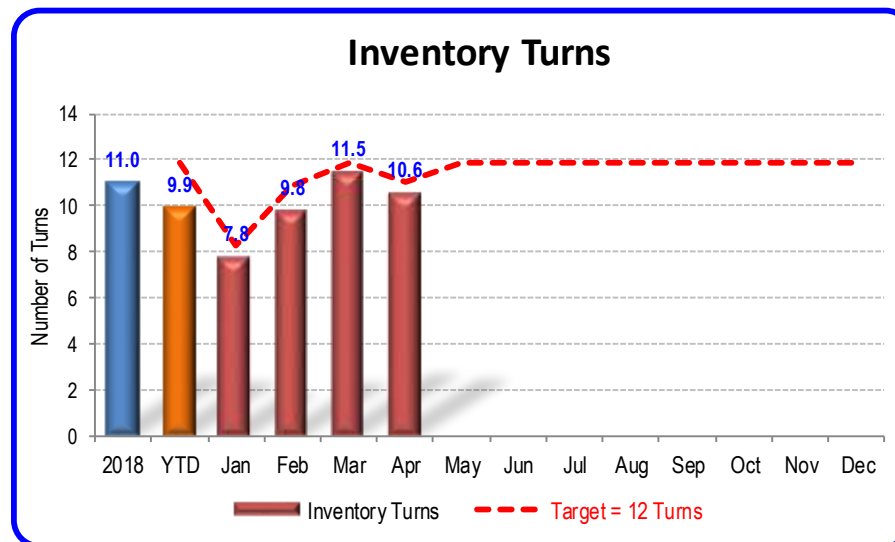
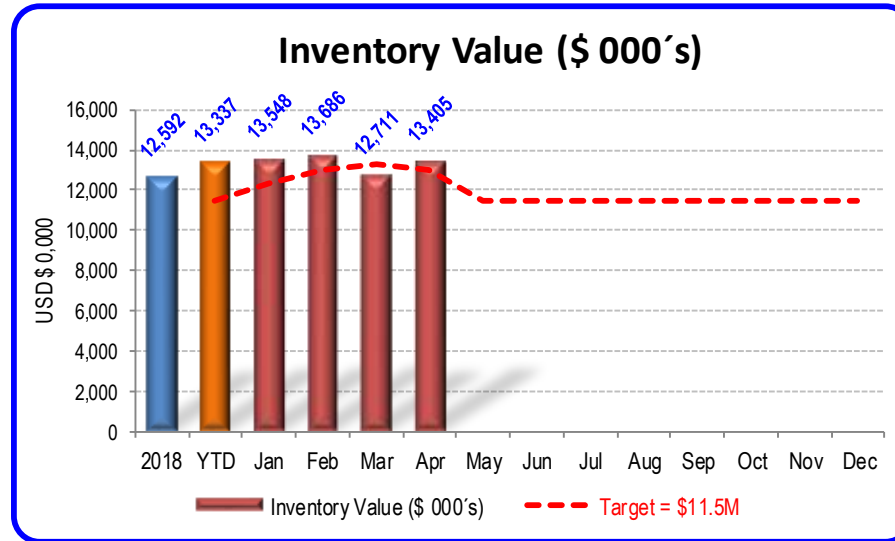
Outbound Premium Freight (\$000's)





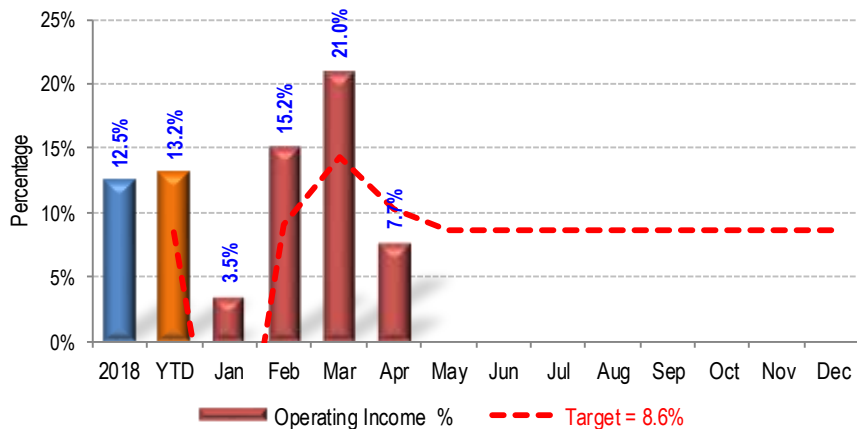
Make the Parts (Cost)

Inventory Cost

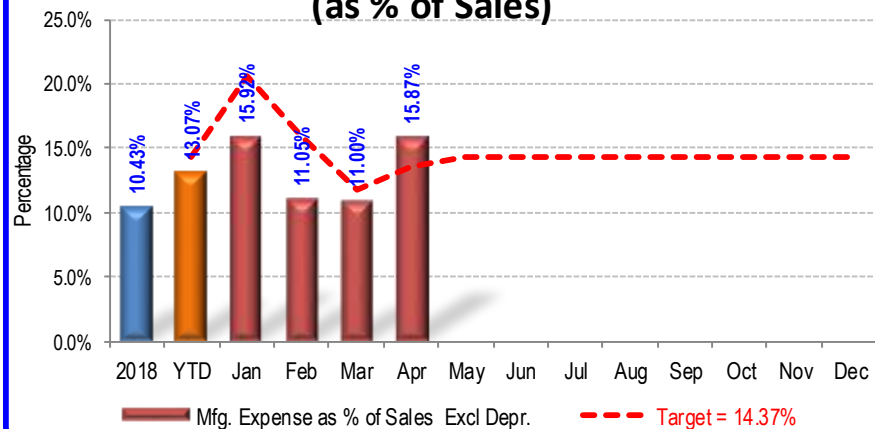


Operations Performance

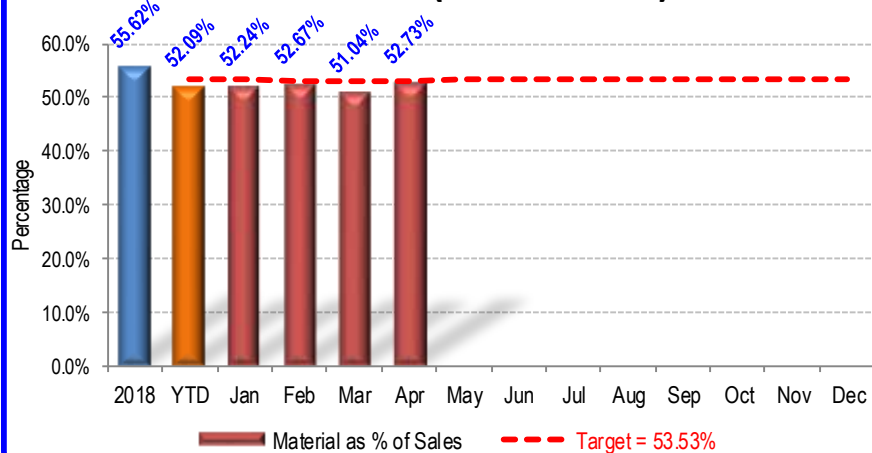
Operation Income (as % of Sales)



Manufacturing Expenses (as % of Sales)



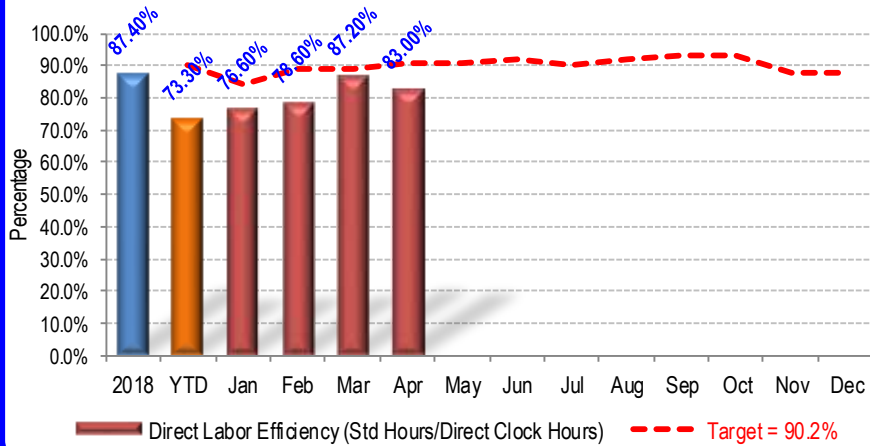
Material Cost (as % of Sales)



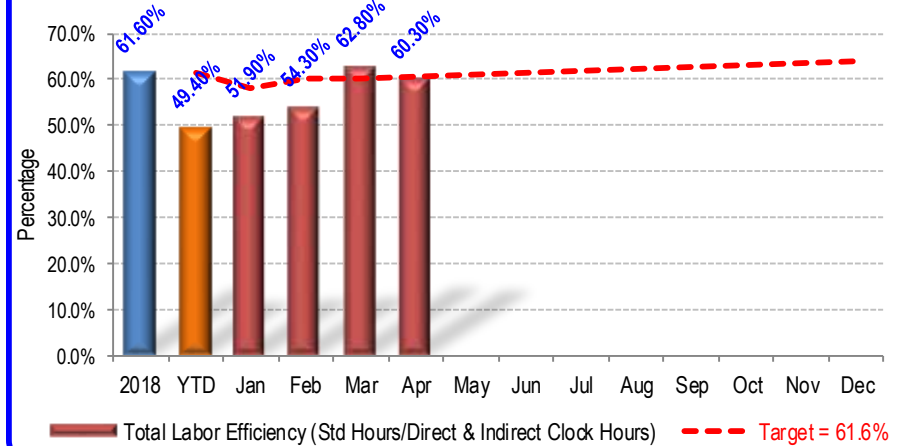
Operations Performance



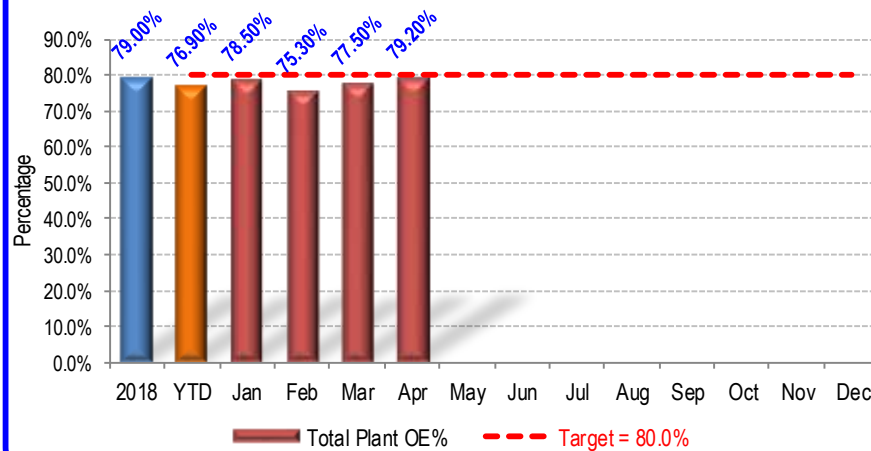
Direct Labor Efficiency



Total Labor Efficiency



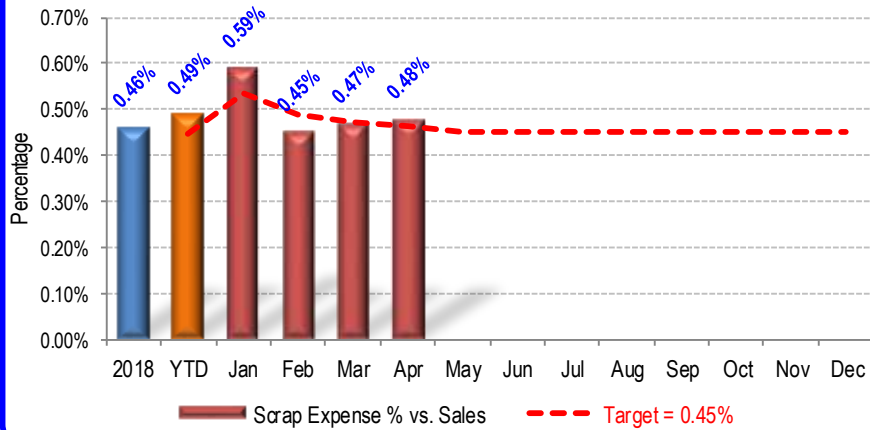
Total Plant % OE



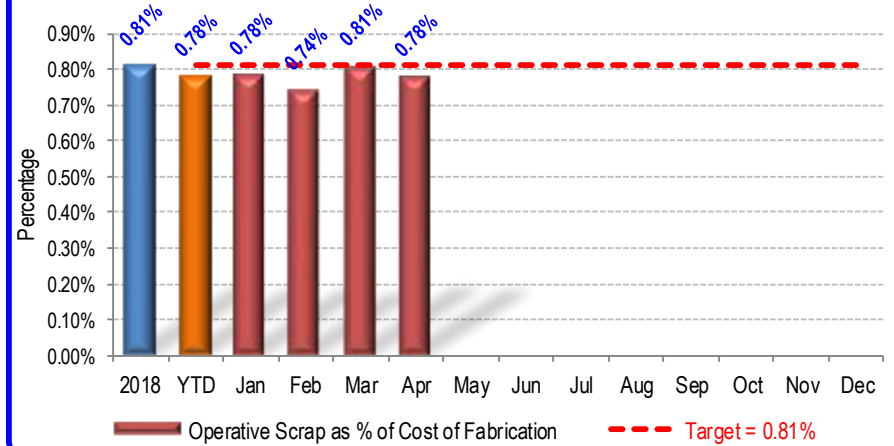
Maintenance Performance



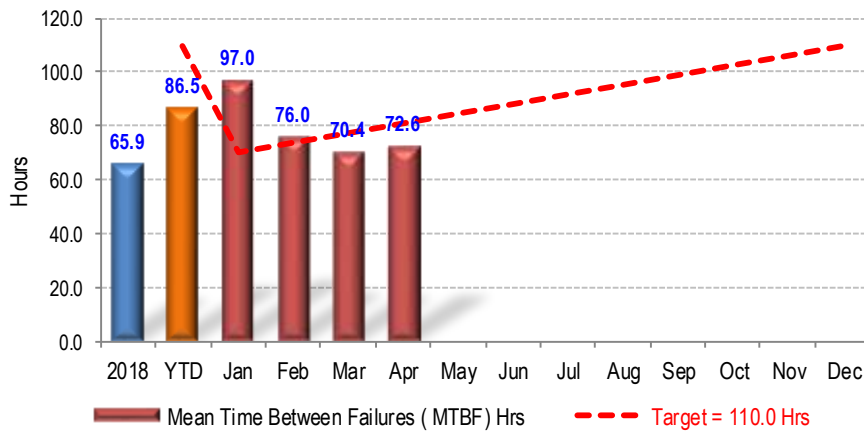
Total Scrap Expenses (as % of Sales)



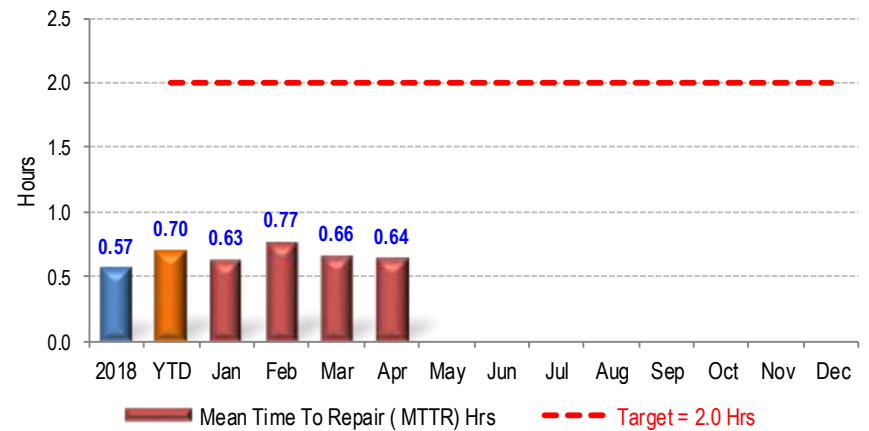
Operative Scrap Expenses (as % of COF)



Mean Time Between Failures (MTBF)



Mean Time To Repair (MTTR)





MCIP / ECIP

MCIP Status as of 4/29/2019



Direct Material Cost Savings by Plant

Plant	Complete	Forecast	C+F	Non Fcst	MCIP Goal	% to Goal
Cheb	(\$87,913)	(\$279,606)	(\$367,519)		\$260,531	-141%
Chihuahua	\$259,822	\$402,400	\$662,222	\$6,529	\$2,373,652	28%
Fangshan	\$430,593	\$161,573	\$592,166		\$436,525	136%
Greenfield	\$81,428	\$64,262	\$145,690	\$61,388	\$227,589	91%
Krosno	\$226,679	\$174,181	\$400,860	(\$78,962)	\$1,765,057	18%
Luton	(\$80,984)	\$949,686	\$868,702	(\$146,422)	\$1,404,141	51%
Shanghai	\$0	\$197,535	\$197,535		\$4,585	4308%
Total	\$829,625	\$1,670,031	\$2,499,656	(\$157,467)	\$6,472,080	36%

Direct Material Cost Savings by Product Team

Product Team	Complete	Forecast	C+F	Non Fcst	MCIP Goal	% to Goal
Brakes	\$0	\$261,199	\$261,199			0%
Controlled Brakes	\$0	\$257,495	\$257,495			0%
Foundation Brakes	\$0	\$3,704	\$3,704			0%
Suspension	\$829,625	\$1,408,832	\$2,238,457	(\$223,498)	\$6,472,080	31%
Controlled Suspension	\$604,719	\$691,652	\$1,296,371	(\$374,538)	\$4,126,014	22%
Mounts	(\$72,518)	\$329,250	\$256,732	\$70,297	\$248,851	131%
Passive Suspension	\$297,424	\$387,930	\$685,354	\$80,743	\$2,097,215	37%
Total	\$829,625	\$1,670,031	\$2,499,656	(\$223,498)	\$6,472,080	35%

2019 Indirect ECIP Status as of 4/29/2019

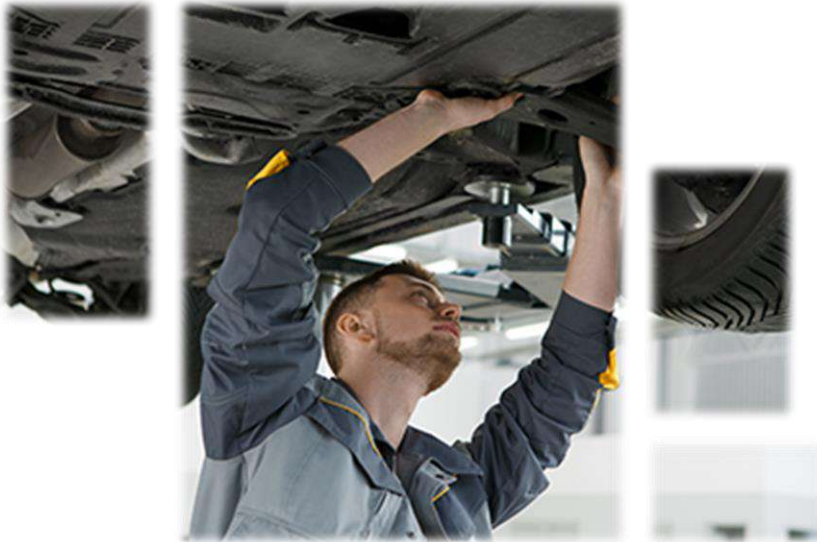


	Complete	Forecast	C+F	Non Ecst
Asia	\$0	(\$2,479)	(\$2,479)	
Fangshan	\$0	\$0	\$0	
Shanghai	\$0	(\$2,479)	(\$2,479)	
Europe	(\$668,483)	\$0	(\$668,483)	\$39,476
Cheb	\$0	\$0	\$0	
Krakow Tech Center	\$0	\$0	\$0	
Krosno	(\$682,207)	\$0	(\$682,207)	
Luton	\$13,724	\$0	\$13,724	\$39,476
Paris Tech Center	\$0	\$0	\$0	
North America	\$45,212	\$0	\$45,212	
Chihuahua	\$45,212	\$0	\$45,212	
Dayton Tech Center	\$0	\$0	\$0	
Global	\$0	\$0	\$0	
Total	(\$623,271)	(\$2,479)	(\$625,750)	\$39,476





Warranty



BWIGroup Suspension Systems QRD Review

David M. Hudson – Warranty Responsible Engineer

Antonio Borunda – Plant Warranty Responsible Engineer

Ryder Combs – Interim Warranty Engineer

Presented 5/28/2019 GART Data through 4/30/2019



- Top Issues: 1- XTS Rear, 2- K2XX Front, 3- XTS Front
- Warranty Findings
 - 2017 XTS Rear (W2313) – Returned for Leakage – Wiper Seal Dislodged, Twisted o-ring
 - 2017 XTS Rear (W2314A & B) – Returned for Leakage – Wiper Seal Dislodged
 - 2017 XTS Rear (W2315) – Returned for Noise – Wiper Seal Dislodged, Dust Shield Rubbing
 - 2017 XTS Rear (W2316) – Returned for Noise – Wiper Seal Dislodged, Dust Shield Rubbing, Wire Damaged
 - 2017 XTS Rear (W2317) – Returned for Leakage – Wiper Seal Dislodged
 - 2017 XTS Rear (W2318) – Returned for Leakage – Wiper Seal Dislodged, Twisted o-ring
 - 2017 XTS Rear (W2319A & B) – Returned for Noise – Wiper Seal Dislodged, Dust Shield Rubbing
 - 2017 XTS Rear (W2320) – Returned for Leakage – Rough Rod Surface
 - 2017 XTS Rear (W2321) – Returned for Noise – Dust Shield Rubbing
 - 2017 XTS Rear (W2322) – Returned for Leakage – Wiper Seal Dislodged
 - 2017 XTS Rear (W2323) – Returned for Leakage – Wiper Seal Dislodged
 - 2017 XTS Rear (W2324) – Returned for SSL – Wire Damaged
 - 2017 XTS Rear (W2325) – Returned for Noise – Wiper Seal Dislodged, Wire Damaged
 - 2017 XTS Rear (W2326) – Returned for Noise – Wiper Seal Dislodged, Dust Shield Rubbing

➤ Warranty Findings (continued)

- 2017 XTS Rear (W2327A & B) – Returned for Leakage – Wiper Seal Dislodged, Scratches on Rod
- 2019 31XX Rear (W2328) – Returned for Leakage – Flaking Chrome Damaged Seal
- 2016 O1SL Front (W2329) – Returned for Leakage – Protrusion from Rod Guide Damaged Rod
- 2017 A1XC Front (W2330A & B) – Returned for Leakage – Scratched Rod Damaged Seal
- 2013 XTS Rear (W2331A & B) – Returned for SSL – Damaged Wire
- 2020 A1XC Front (W2332A & B) – Returned for Leakage – Scratched Rod Damaged Seal

➤ Back-up Slides

- Remaining IPTV Slides

Top Suspension Issues & Vehicle Volumes

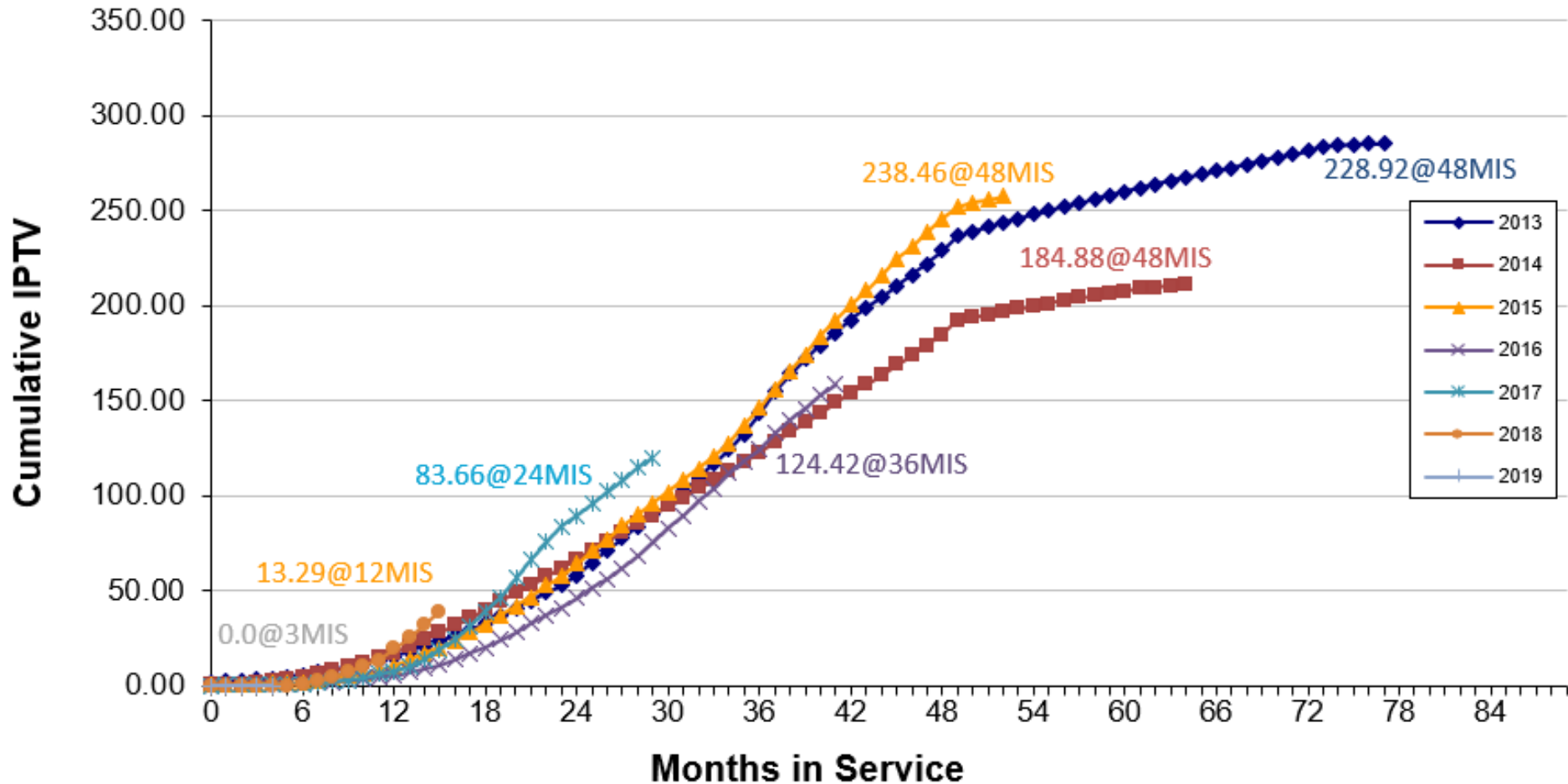


Controlled MR	2015 MY	2016 MY	2017 MY	2018 MY	2019 MY
XTS	14,351	22,017	18,331	1,380	1,396
ATS	1,926	971	717	898	187
ATS – V series	NA	2,588	768	0	65
CTS	3,987	3,098	711	2,492	1,936
CTS – V series	NA	2,128	1,643	1,335	1,241
Camaro (A1XC)	NA	8,838	14,923	14,409	5,373
Corvette (Y1XX)	16,088	23,875	22,341	6,398	14,606
Chevy SS	3,176	2,196	4,008	0	0
K2XX SUV	201,530	191,103	170,926	163,844	97,253
K2XX Truck	26,966	19,534	36,656	40,152	0
CT6 (O1SL)	NA	5,696	6,412	6,035	2,948
Total	268,024	282,044	277,436	236,943	125,005
Passive					
31XXN	105,669	219,953	149,805	206,669	167,520
CT6 (O1SL)	NA	9,800	15,785	19,794	11,066
Total	105,669	229,753	165,590	226,463	178,586

Top Issues

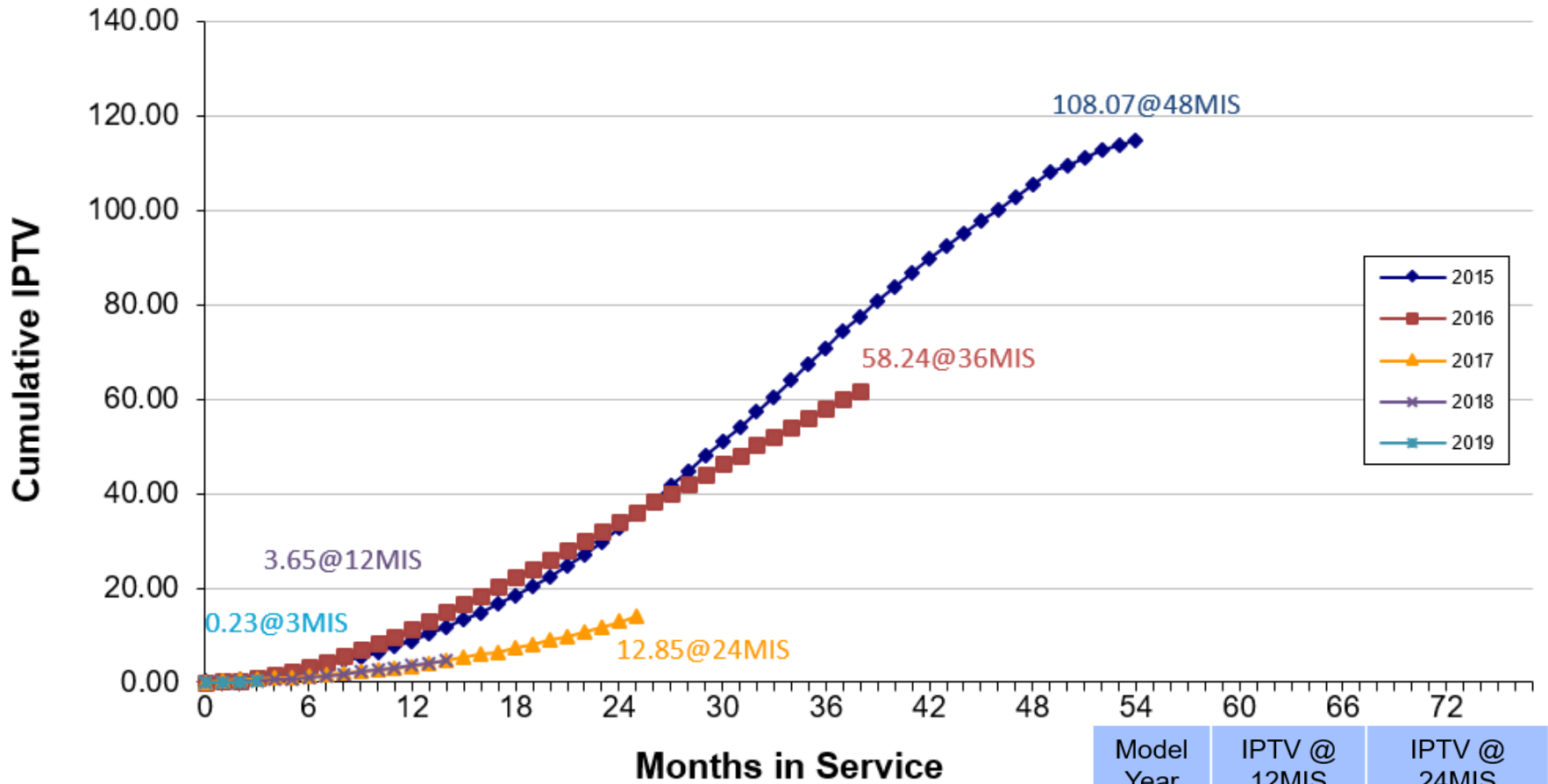
1. XTS Rear
2. K2XX Front
3. XTS Front

#1 - XTS (P1LL) Rear Damper Fan Chart



2015 MY	2016 MY	2017 MY	2018 MY	2019 MY
14,351	22,017	18,331	1,380	1,396

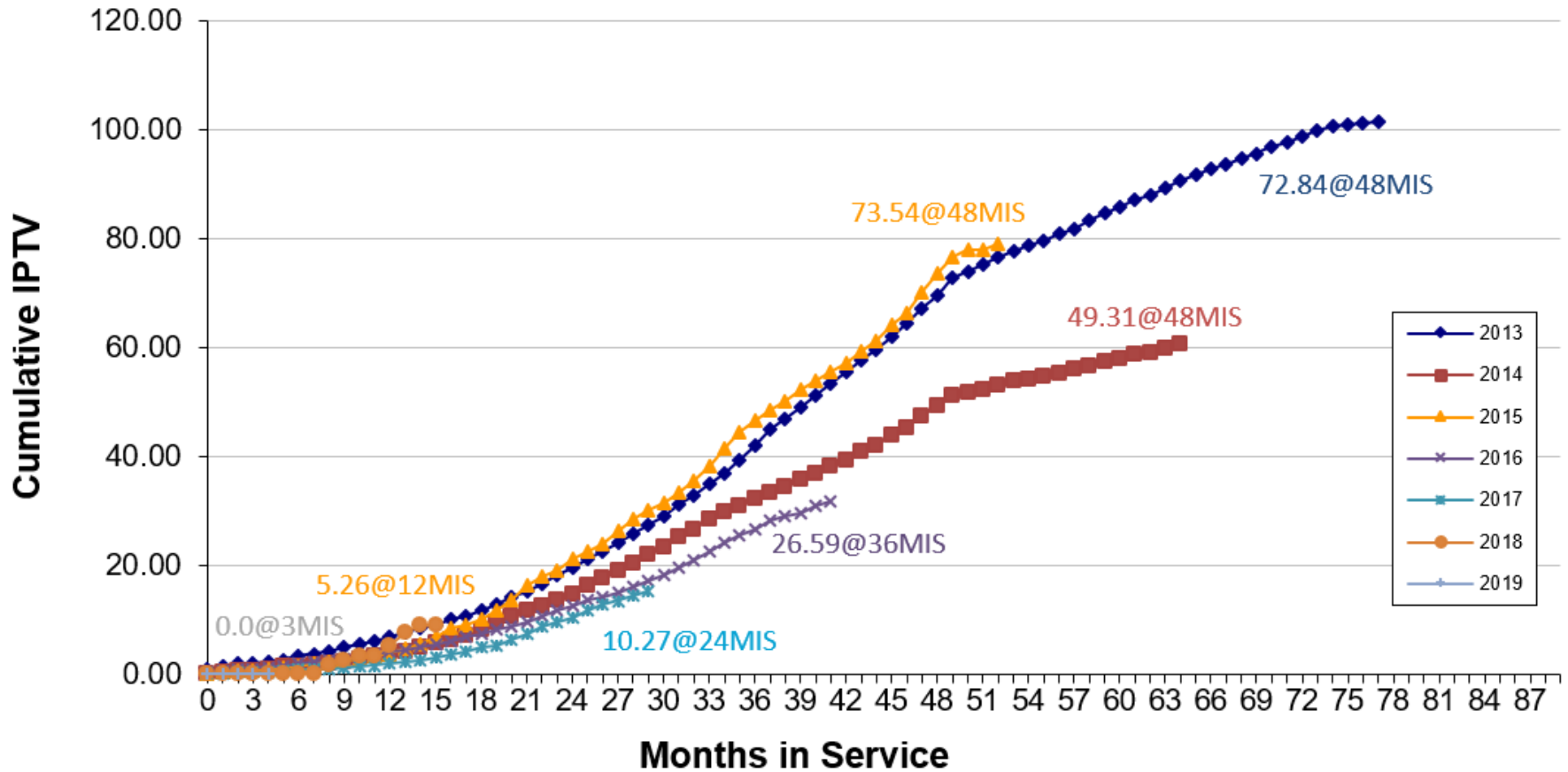
#2 - K2XX SUV TWDC Front Coil-over Damper Fan Chart



Model Year	IPTV @ 12MIS	IPTV @ 24MIS
2015	8.78	32.59
2016	11.50	33.95
2017	3.48	12.85
2018	3.15	--

2015 MY	2016 MY	2017 MY	2018 MY	2019 MY
201,530	191,103	170,926	163,844	97,253

#3 - XTS (P1LL) Front Strut Fan Chart



2015 MY	2016 MY	2017 MY	2018 MY	2019 MY
14,351	22,017	18,331	1,380	1,396



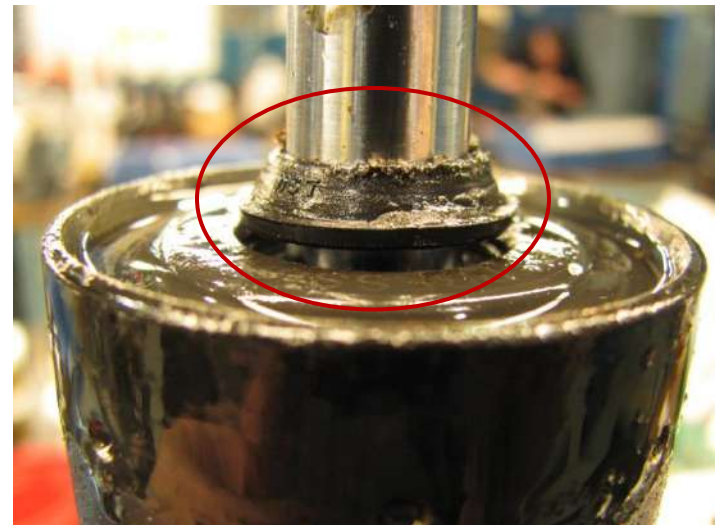
Return Information:

- Damper build date: 8/17/2016
- Model: 2017 XTS Rear
- VIN: 2G61M5S34H9112575
- Mileage: 43,186
- State: CA
- Cause: Leakage

Initial Findings:

- Leakage on cover assembly
- Wiper seal dislodged from cover assembly

NG






CUU War Feb
2017



Test Findings:

- Resistance: 1.23 - **OK**
 - Spec: 1.28 ± 0.2 Ohms
- Preload: 213 - **NG**
 - Spec: 432 ± 40 N
- Stickout: 83 - **NG**
 - Spec: 33.0 ± 3.0 mm
- Piston rod surface finish measurement:
 - Spec: .04 Ra Max
 - Measured: .0175 to .0481 Ra **NG**

Teardown:

- Deep scratches and comets on rod **NG**
- Twisted O-Ring **NG**
- Rust in bearing

Conclusion:

- Twisted O-Ring allowed for gas and fluid leakage to occur.
- Dislodged wiper seal allowed for contamination on the rod, scratching it when stroking.

Corrective Action:

- Gen 2.5 Rod guide assembly put into production 1/12/2018
- Twisted O-ring, Addressed in Q1-2017 with addition of conical installation fixture. No reoccurrence.



Return Information:

- Damper build date:
 - W2314A: 1/10/2017
 - W2314B: 1/12/2017
- Model: 2017 XTS Rear
- VIN: 2G61M5S35H9162210
- Mileage: 46,839
- State: WI
- Cause: Leakage

Initial Findings:

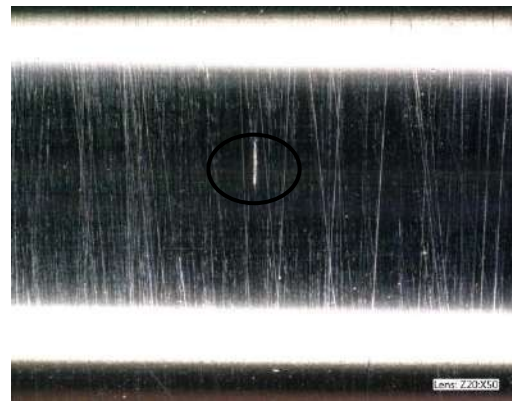
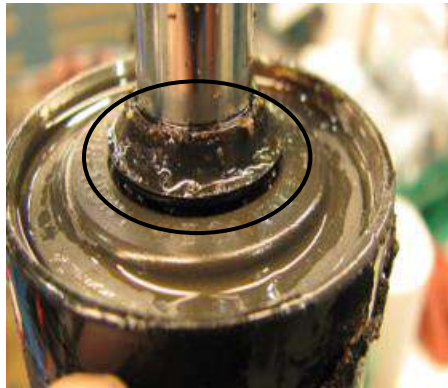
- Leakage noted on dampers (clear fluid not MR fluid)
 - Wiper seal dislodged from cover assembly
- NG**



W2314A wiper seal
NG



W2314B wiper seal
NG



Test Findings:

- Resistance: 1.26 - **OK**
 - Spec: 1.28 ± 0.2 Ohms
- Preload: 272 - **NG**
 - Spec: 432 ± 40 N
- Stickout: 53 - **NG**
 - Spec: 33.0 ± 3.0 mm
- Piston rod surface finish measurement: **NG**
 - Spec: 0.040 Ra Max
 - Measured: .0227 to .0444 Ra **NG**

Teardown:

- Scratches and some comets on rod **NG**
- Rust accumulation on bearing and damaged primary seal
- Rod surface finish does not meet spec **NG**

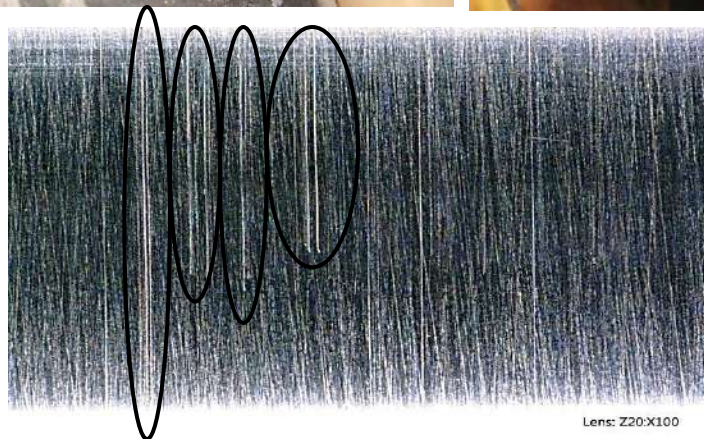
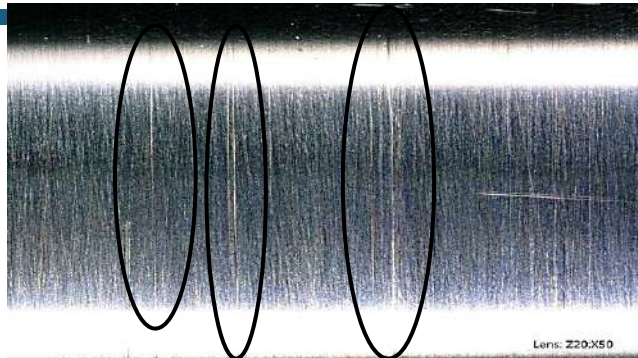
Conclusion:

- Dislodged wiper seal allowed for contamination to come in contact with the rod, scratching and damaging the rod. The damaged rod compromised the seal and allowed fluid and gas leakage

Corrective Action:

- Gen 2.5 Rod guide assembly put into production 1/12/2018
- Implemented 100 grit rough grind wheel, and improved machining parameters 3/23/2018





Test Findings:

- Resistance: 1.26 - **OK**
 - Spec: 1.28 ± 0.2 Ohms
- Preload: 249 - **NG**
 - Spec: 432 ± 40 N
- Stickout: 62 - **NG**
 - Spec: 33.0 ± 3.0 mm
- Piston rod surface finish measurement: **NG**
 - Spec: 0.040 Ra Max
 - Measured: .0214 to .0537 Ra **NG**

Teardown:

- Deep scratches **NG**
- Rust accumulation on bearing
- Rod surface finish does not meet spec **NG**

Conclusion:

- Dislodged wiper seal allowed for contamination to come in contact with the rod, scratching and damaging the rod. The damaged rod compromised the seal and allowed fluid and gas leakage

Corrective Action:

- Gen 2.5 Rod guide assembly put into production 1/12/2018
- Implemented 100 grit rough grind wheel, and improved machining parameters 3/23/2018



Return Information:

- Damper build date: 1/8/2018
- Model: 2017 XTS Rear
- VIN: 2G61U5S36H9167464
- Mileage: 74,475
- State: TX
- Cause: Noise

Initial Findings:

- Wiper seal dislodged from cover assembly
NG
- Wear on reservoir tube from dust shield
NG





Test Findings:

- Resistance: 1.26 ohms - **OK**
 - Spec: 1.28 ± 0.2 Ohms
- Preload: 376 - **NG**
 - Spec: 432 ± 40 N
- Stickout: 29 - **OK**
 - Spec: 33.0 ± 3.0 mm
- Piston rod surface finish measurement: **NG**
 - Spec: .04 Ra Max
 - Measured: .0288 to .0495 **NG**

Teardown:

- Deep scratches, “watermarks,” and comets on rod **NG**
- Some accumulated rust on bearing due to wiper seal allowing contamination into the bearing **NG**

Conclusion:

- Wear on outside of reservoir tube indicates dust shield wearing on reservoir tube causing noise
- **Corrective Action:**
- Gen 2.5 Rod guide assembly put into production 1/12/2018
- Implemented 100 grit rough grind wheel, and improved machining parameters 3/23/2018
- **Dust shield rubbing corrective action TBD**



Cápsula de Seguridad



Información General



Por tu asistencia!
Siguiente Equipo
a presentar:
RH