

“Camera system defect detection / Detección de defectos mediante sistema de cámaras”

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25 / 26 de Octubre de 2022

Main Goal

Increase safety of trains and prevent service interruptions by cars using technology and try to avoid FRA /SCT violations in Operational Trains.

- Making mechanical inspections in remote way.
- Vision of 360° in all cars with high definition cameras.



2
KCSM - 4755

3
KCS - 307505

4
KCS - 315069

5
KCS - 17552

6
KCS - 287801



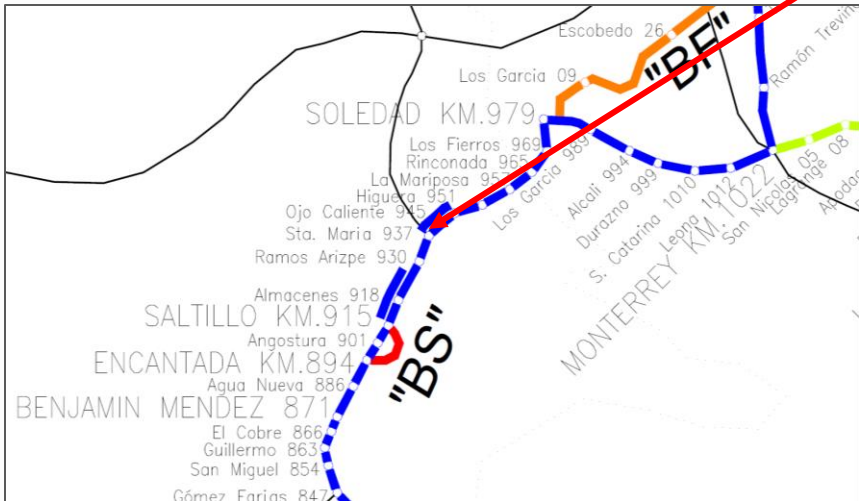
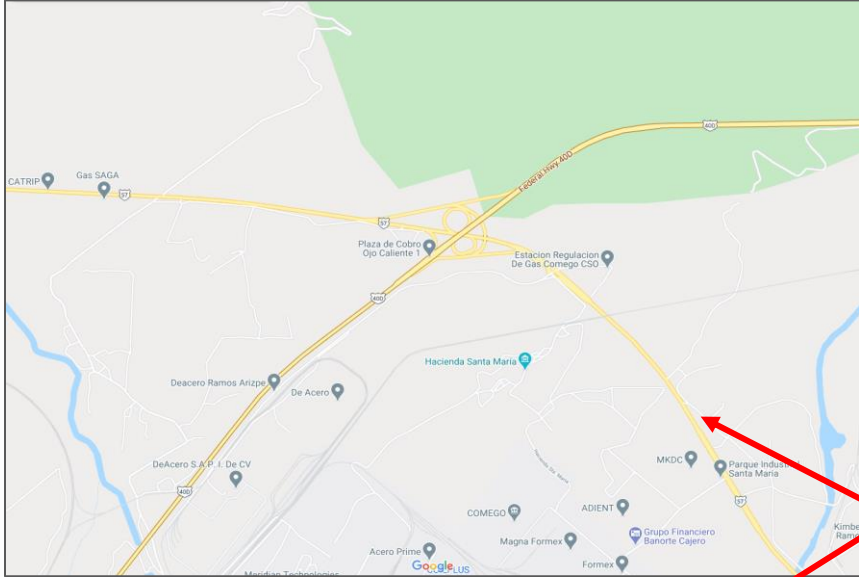
Targets

- Open Box doors and hatches.
- Marks and stencils according with AEI Tags.
- Missing pieces on cars.
- Hose height and disconnected hanger.
- Bent or broken ladders, handholds and sill steps.
- Non authorized people on cars.



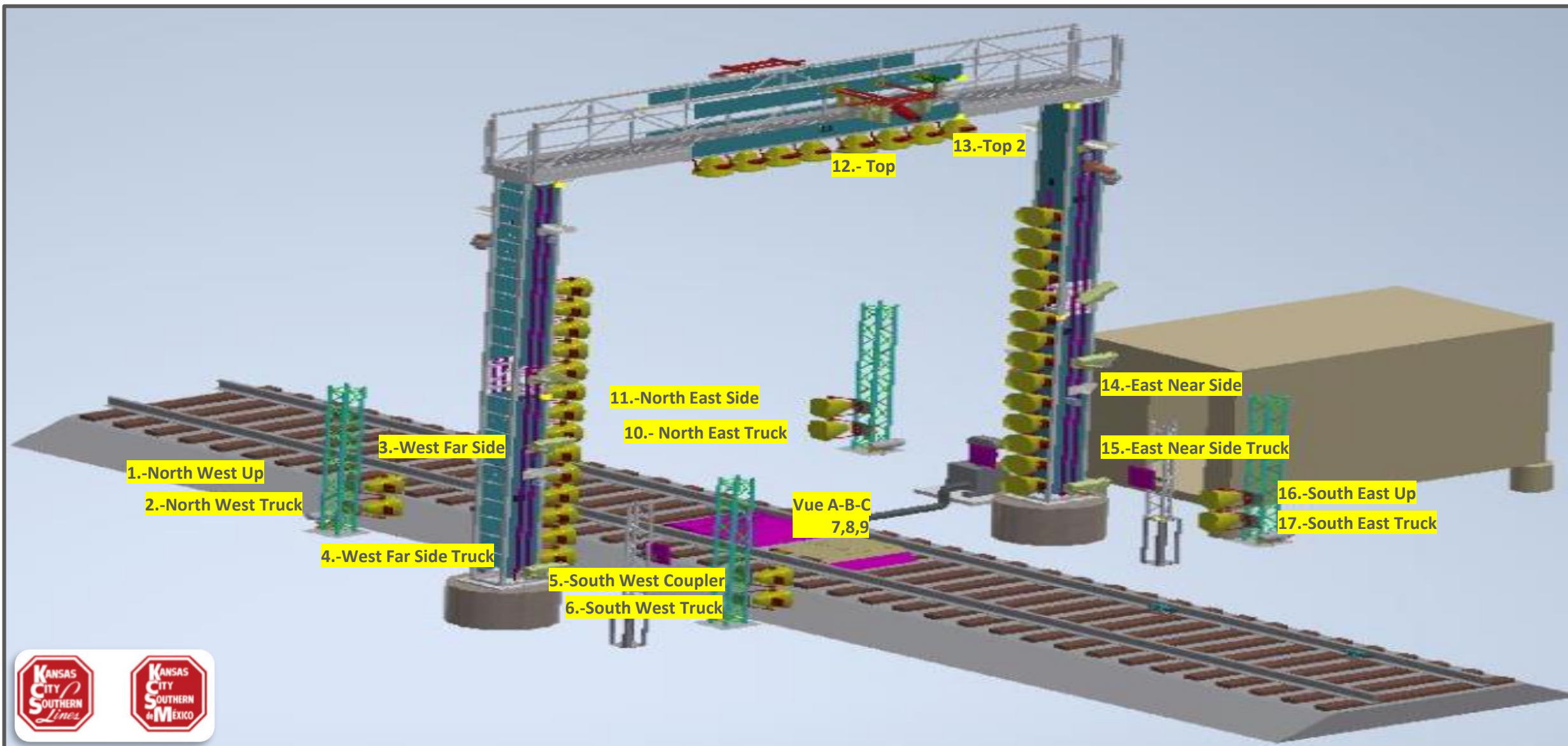
Location

Located at 22 KM of Saltillo Coahuila station, the portal is in Santa María station 937 line B PK 935.831



Inspection Portal

Duostech high definition Imaging utilizes megapixel line scan cameras to provide an average image resolution of 224 megapixels per railcar.



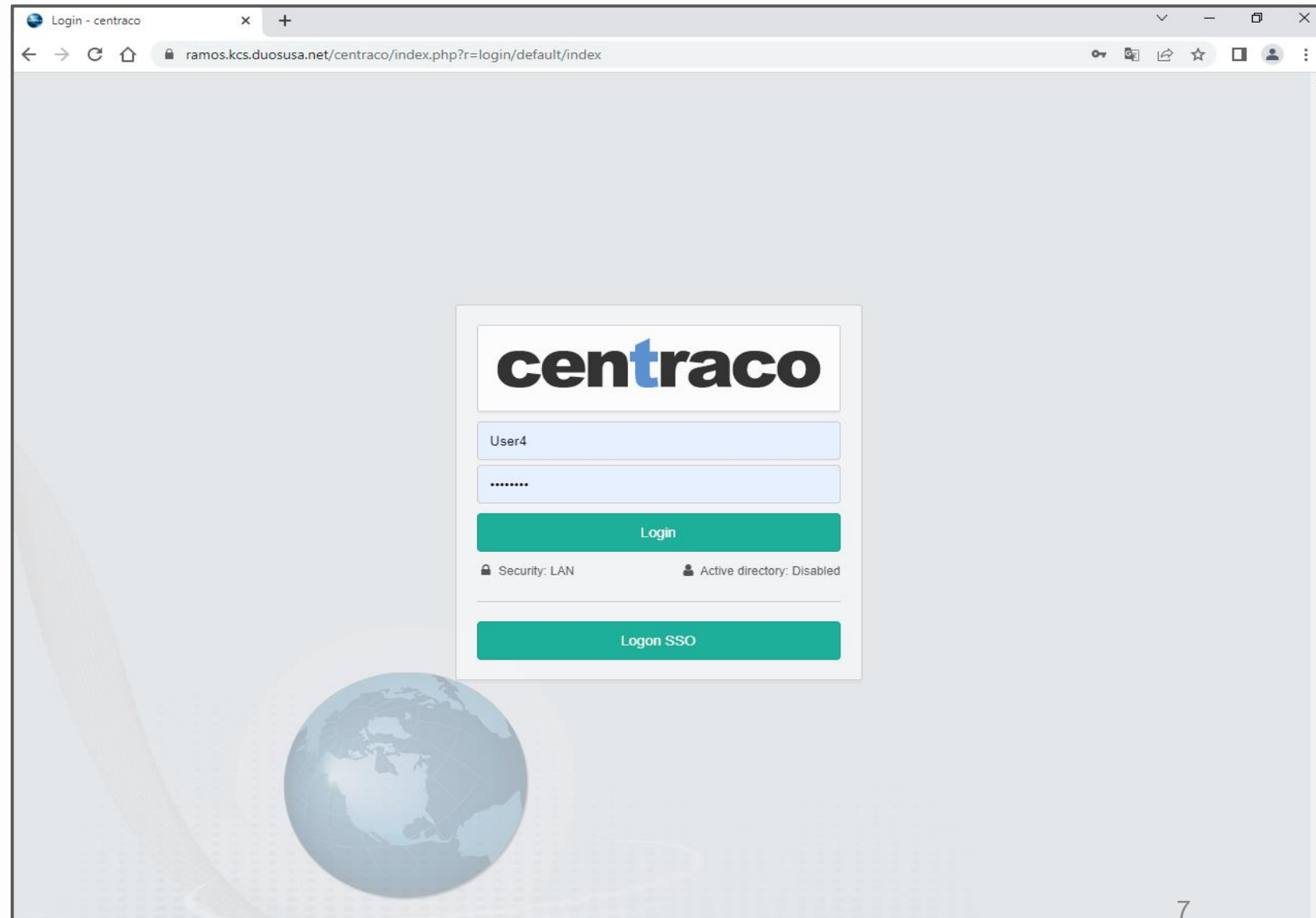
Office Inspection



Operating the System



- Entering Inspection Mode
- Setting Up Layout
- Using Inspection Mode
- Making a Detection



Entering Inspection Mode

Rail Inspection Portal - centraco

usa.net/centraco_beta/index.php?r=rip/default/index#2873

Saltillo 2020-08-26 12:09:48 Direction: South Car Count: 105 Avg Speed: 18.84 mph

West (Far) Side 48% Todo Vagones

#2 KCS - 4035

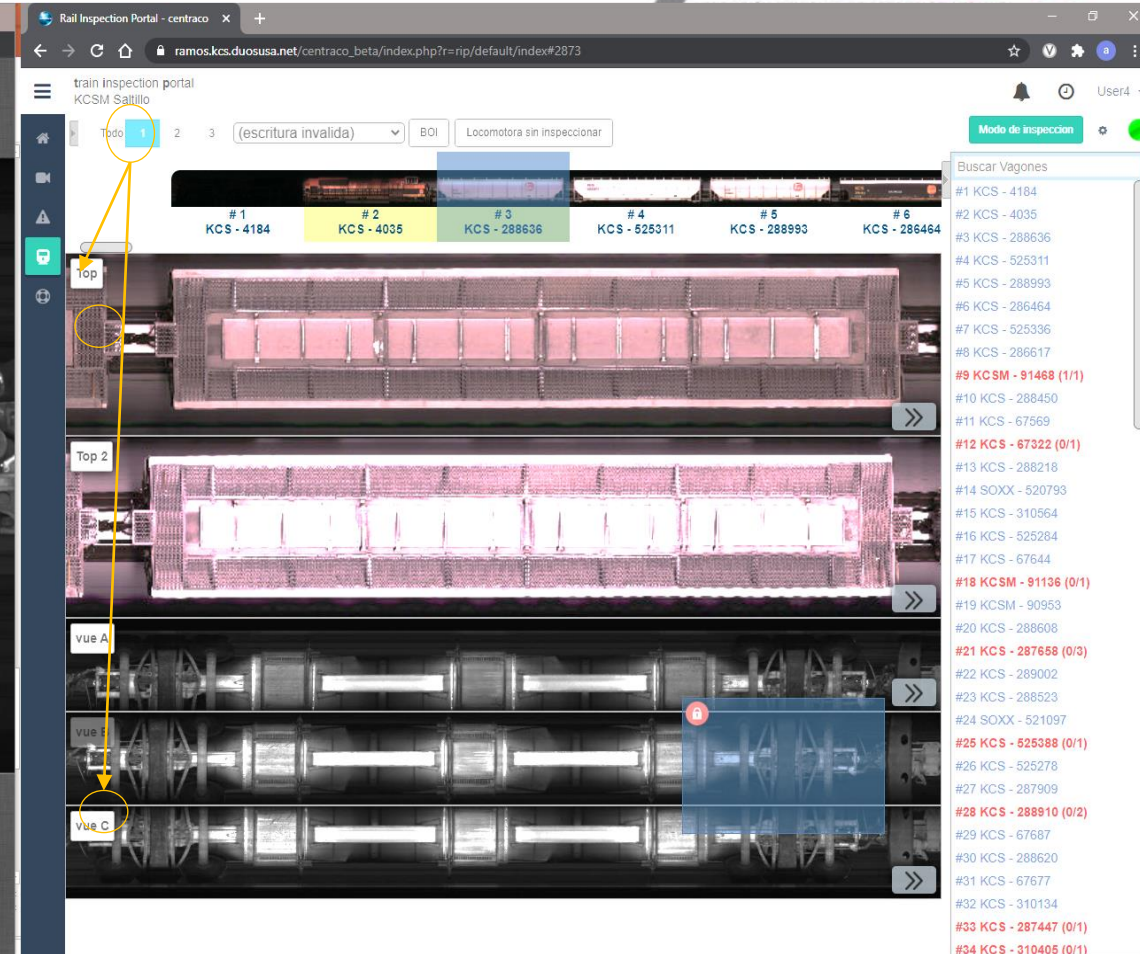
Modo de inspeccion

Buscar Vagones

- #1 KCS - 4184
- #2 KCS - 4035
- #3 KCS - 288636
- #4 KCS - 525311
- #5 KCS - 288993
- #6 KCS - 286464
- #7 KCS - 525336
- #8 KCS - 286617
- #9 KCSM - 91468 (1/1)**
- #10 KCS - 288450
- #11 KCS - 67569
- #12 KCS - 67322 (0/1)**
- #13 KCS - 288218
- #14 SOXX - 520793
- #15 KCS - 310564
- #16 KCS - 525284
- #17 KCS - 67644
- #18 KCSM - 91136 (0/1)**
- #19 KCSM - 90953
- #20 KCS - 288608
- #21 KCS - 287658 (0/3)**
- #22 KCS - 289002
- #23 KCS - 288523
- #24 SOXX - 521097
- #25 KCS - 525388 (0/1)**
- #26 KCS - 525278
- #27 KCS - 287909
- #28 KCS - 288910 (0/2)**
- #29 KCS - 67687
- #30 KCS - 288620
- #31 KCS - 67677
- #32 KCS - 310134
- #33 KCS - 287447 (0/1)**
- #34 KCS - 310405 (0/1)**

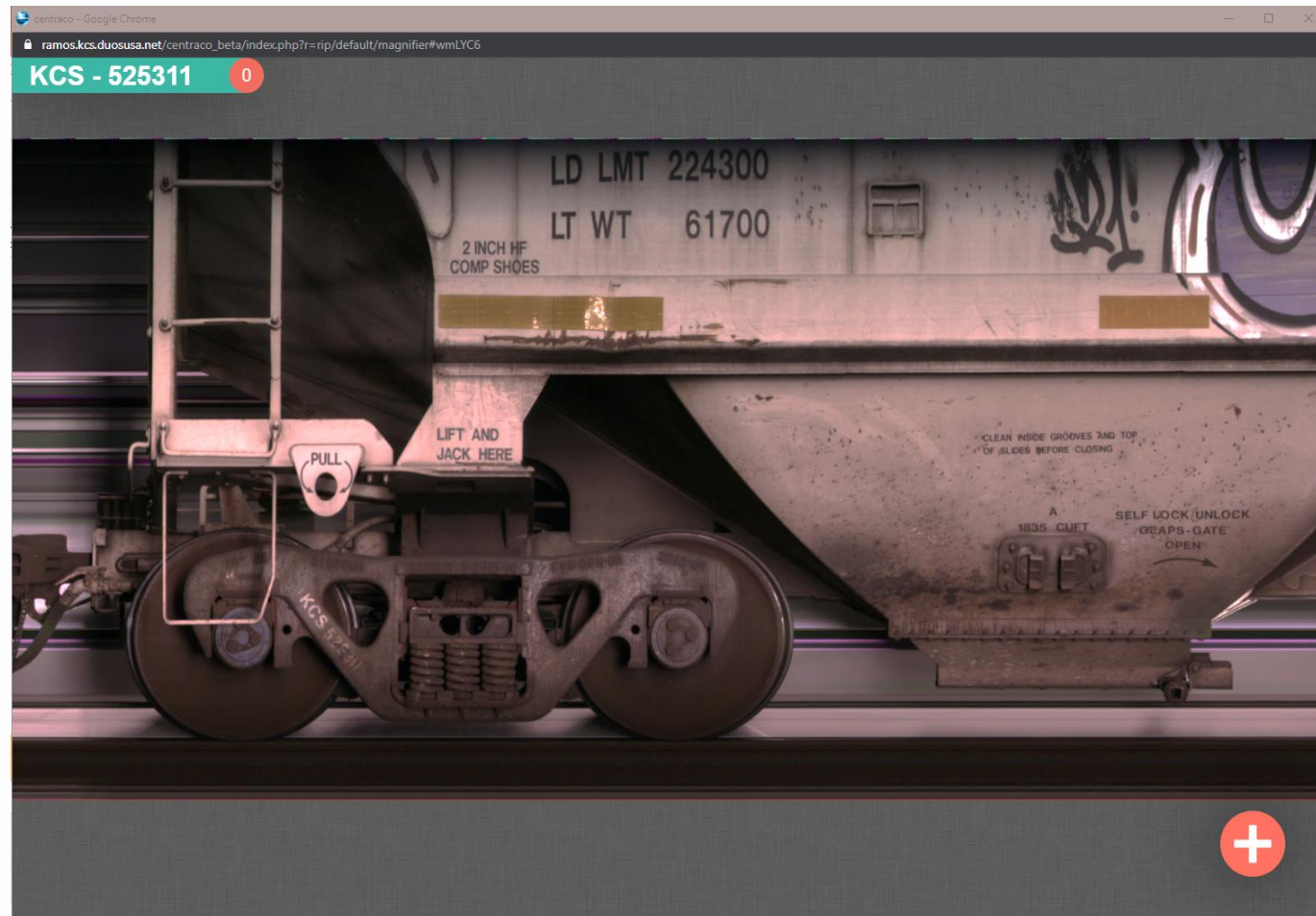
Select inspection mode

- Select a car (the car changes to yellow color when it is in inspection process)
- View #1 – Top and Bottom



View #2 – Side Car (Right and Left)

- Side Body Car
- Side Truck Car



#	Car ID	Status
#1	KCS - 4184	(escritura invalida)
#2	KCS - 4035	BOL
#3	KCS - 288636	Locomotora sin inspeccionar
#4	KCS - 525311	
#5	KCS - 288993	
#6	KCS - 286464	
#7	KCS - 525311	
#8	KCS - 286617	
#9	KCSM - 91468	(1/1)
#10	KCS - 288450	
#11	KCS - 67569	
#12	KCS - 67322	(0/1)
#13	KCS - 288218	
#14	SOXX - 520793	
#15	KCS - 310564	
#16	KCS - 525284	
#17	KCS - 67644	
#18	KCSM - 91136	(0/1)
#19	KCSM - 90953	
#20	KCS - 288608	
#21	KCS - 287658	(0/3)
#22	KCS - 289002	
#23	KCS - 288523	
#24	SOXX - 521097	
#25	KCS - 525388	(0/1)
#26	KCS - 525278	
#27	KCS - 287909	
#28	KCS - 288910	(0/2)
#29	KCS - 67687	
#30	KCS - 288620	
#31	KCS - 67677	
#32	KCS - 310134	
#33	KCS - 287447	(0/1)
#34	KCS - 310405	(0/1)



View #3 – Oblique- End car

- End A
- End B



Item	Descripción	Estado
# 87	KCS - 289193	
# 88	KCS - 289193	
# 89	KCS - 288917	
# 90	KCS - 288215	
# 91	SOXX - 521094	
# 92	KCS - 286821	
# 93	KCS - 288098	
# 94	KCS - 286710	
# 95	KCS - 525241	
# 96		
# 97		
# 98		
# 99		
# 100		



Open Boxcar Door

- Latch position not part of algorithm
- Laser profiles railcar sidewalls for missing or sliding doors on Side A and Side B

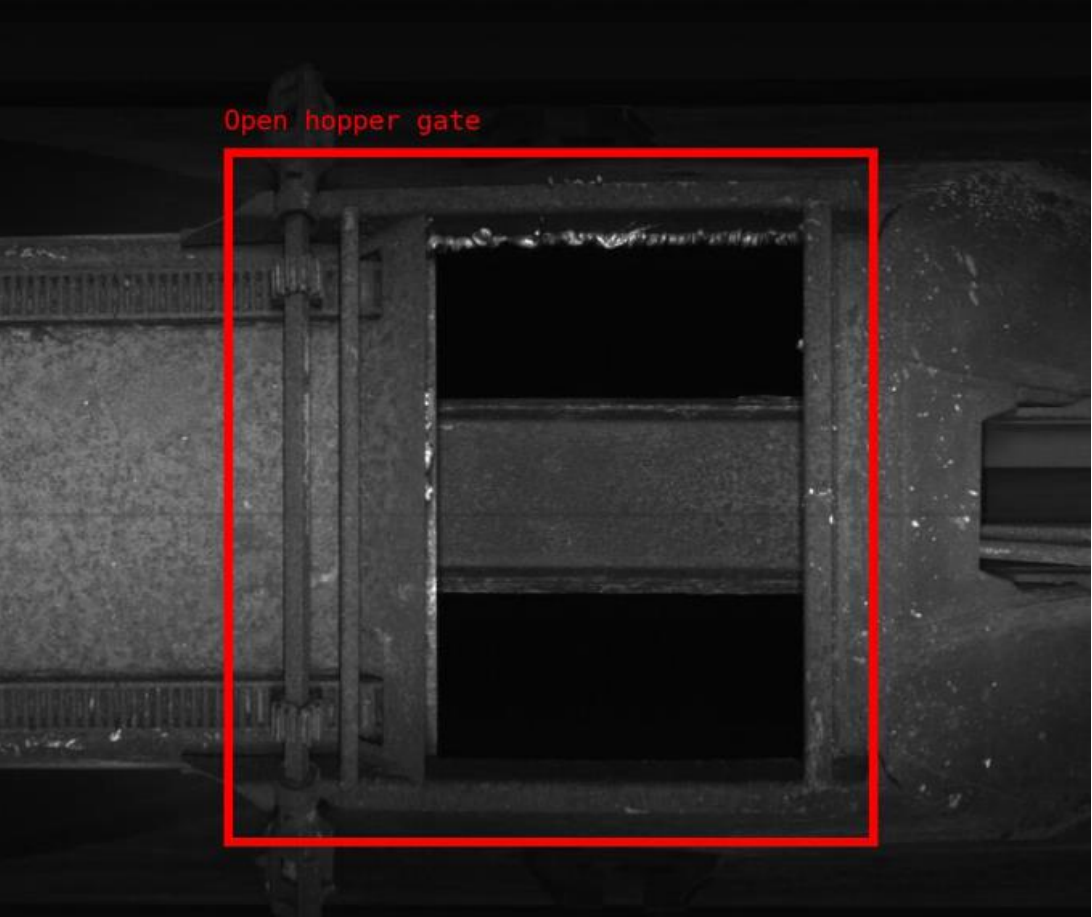


Algorithm Open/Missing Top Hatches

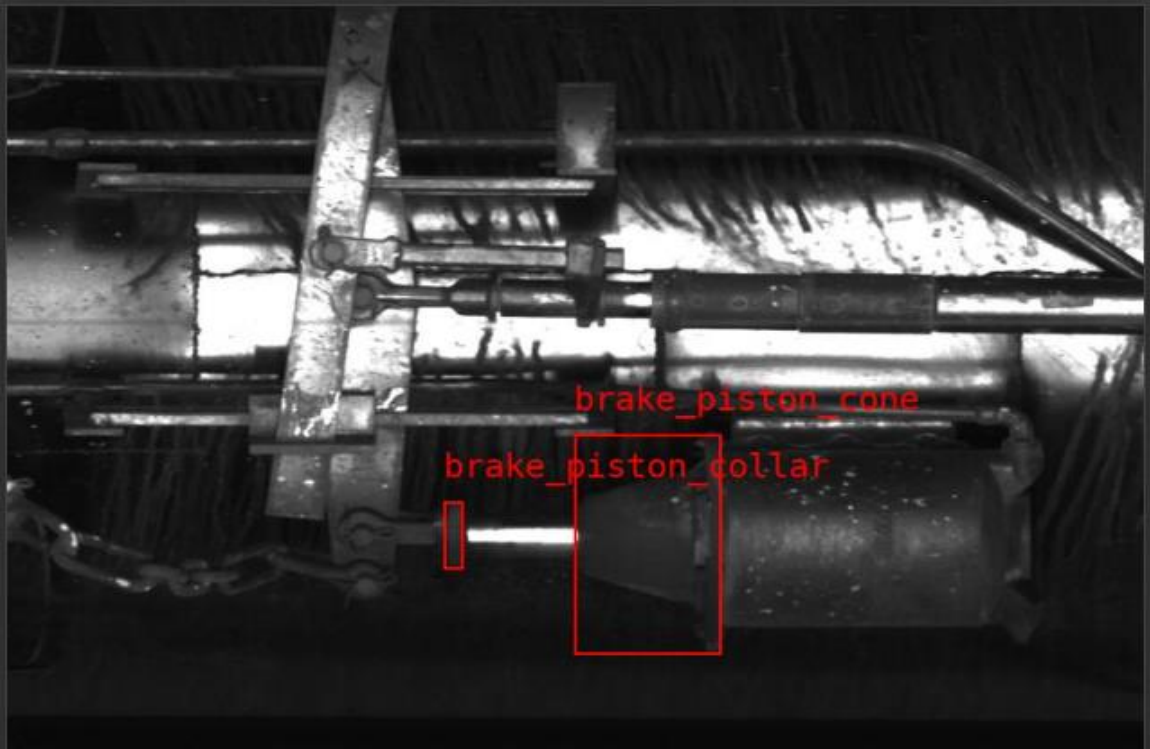
- Laser profiles monitor center-line hatches for open or missing hatch covers



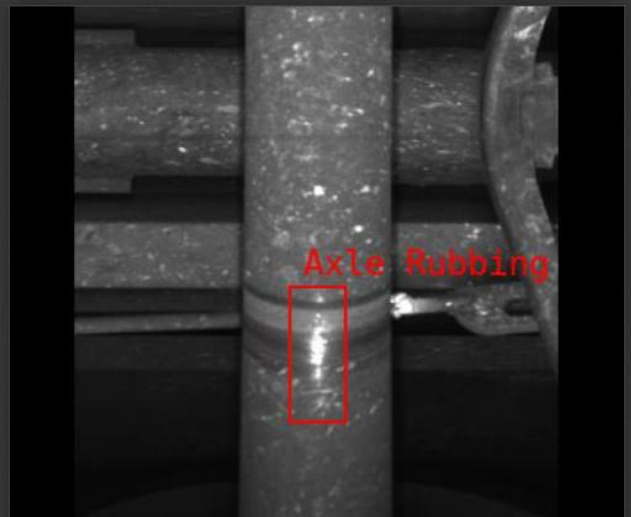
Algorithm Hopper Sliding Gate Open



Body piston cylinder engaged



Algorithm Axle Rubbing
(D0004)



Algorithm Knuckle Pin Missing
(D0029)



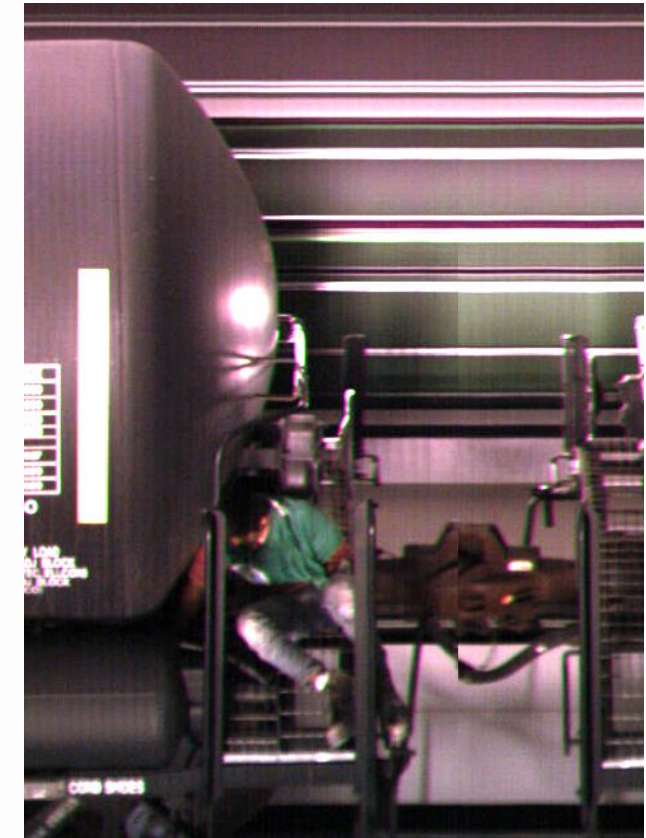
Algorithm Tank Car Missing
Cap (D0001)



Algorithm Retainer Valve Missing
(D0045)



Algorithm Illegal Riders (D0007)

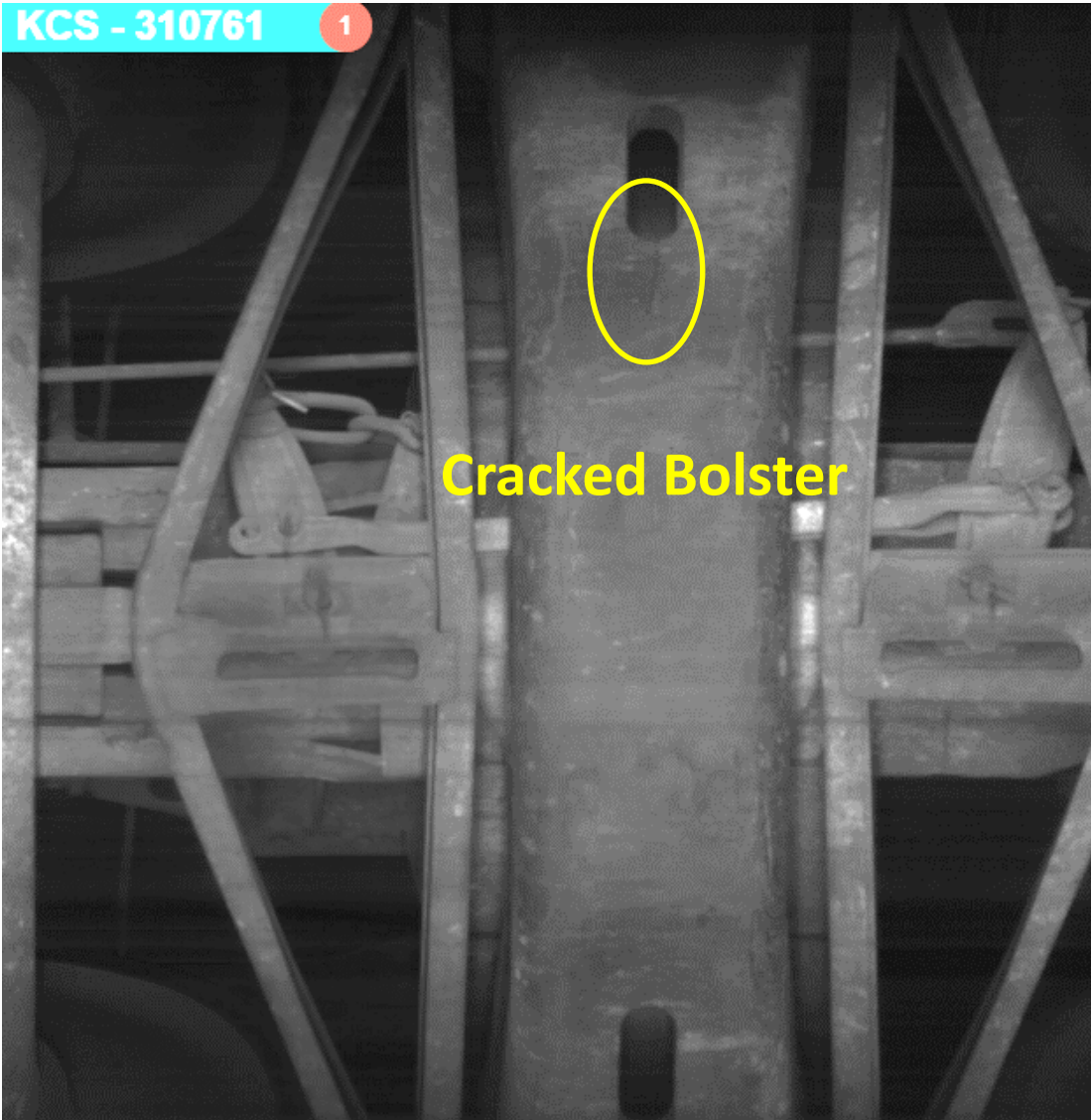


Operation Detection KCSM



KCS - 310761

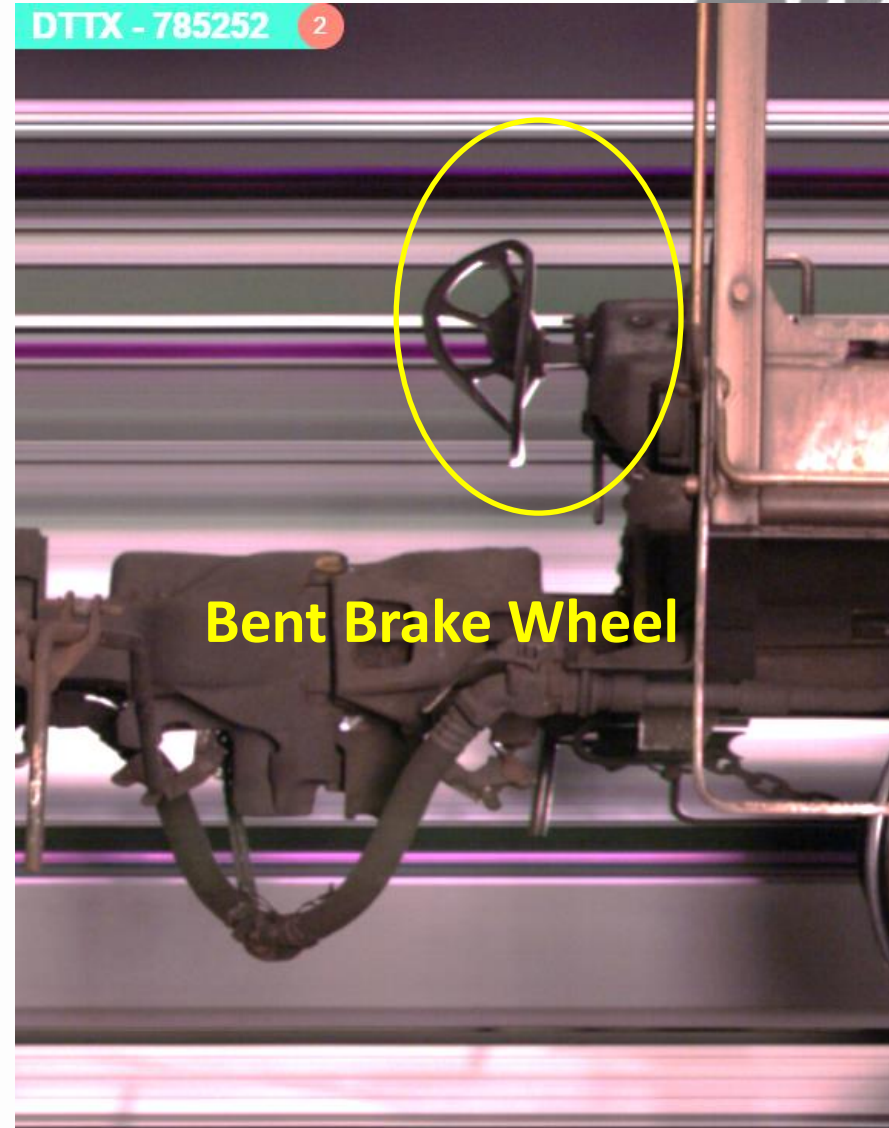
1



Cracked Bolster

DTTX - 785252

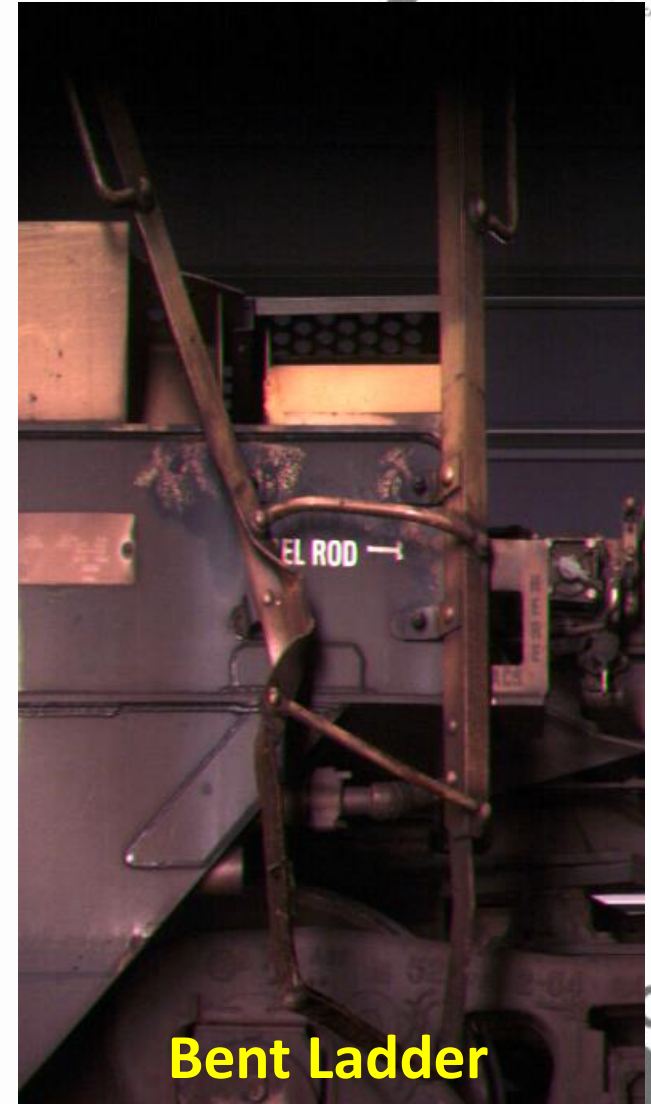
2



Bent Brake Wheel

OPORAIL
2022

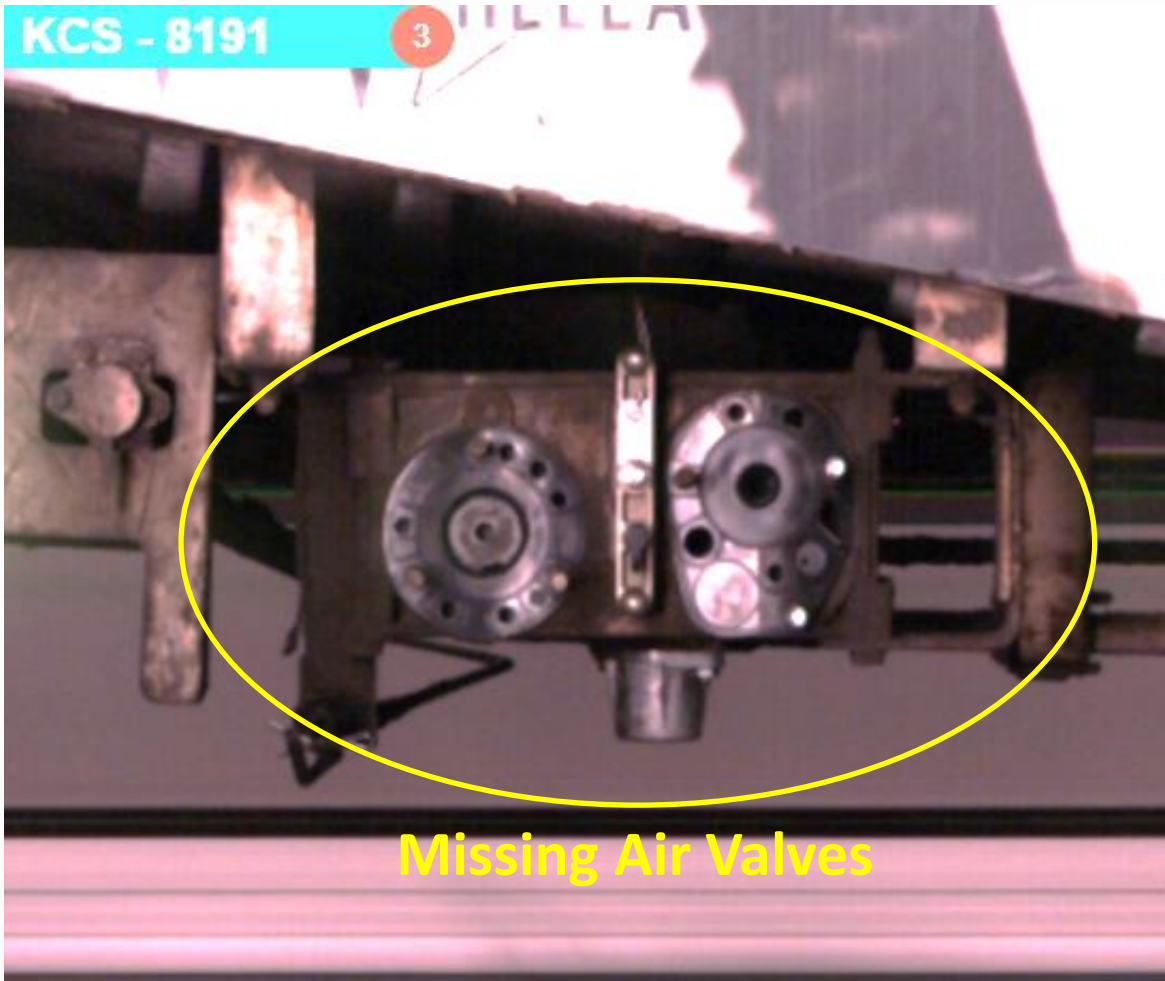
Operation Detection KCSM



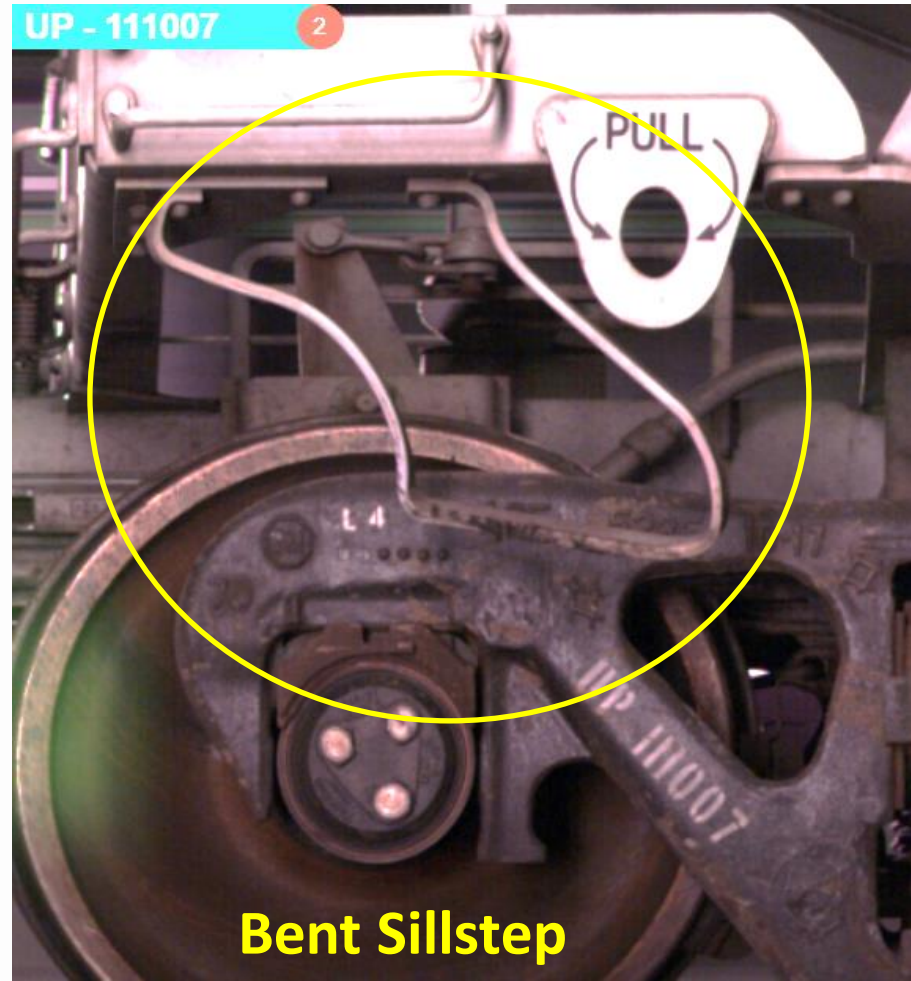
Operation Detection KCSM



Operation Detection KCSM

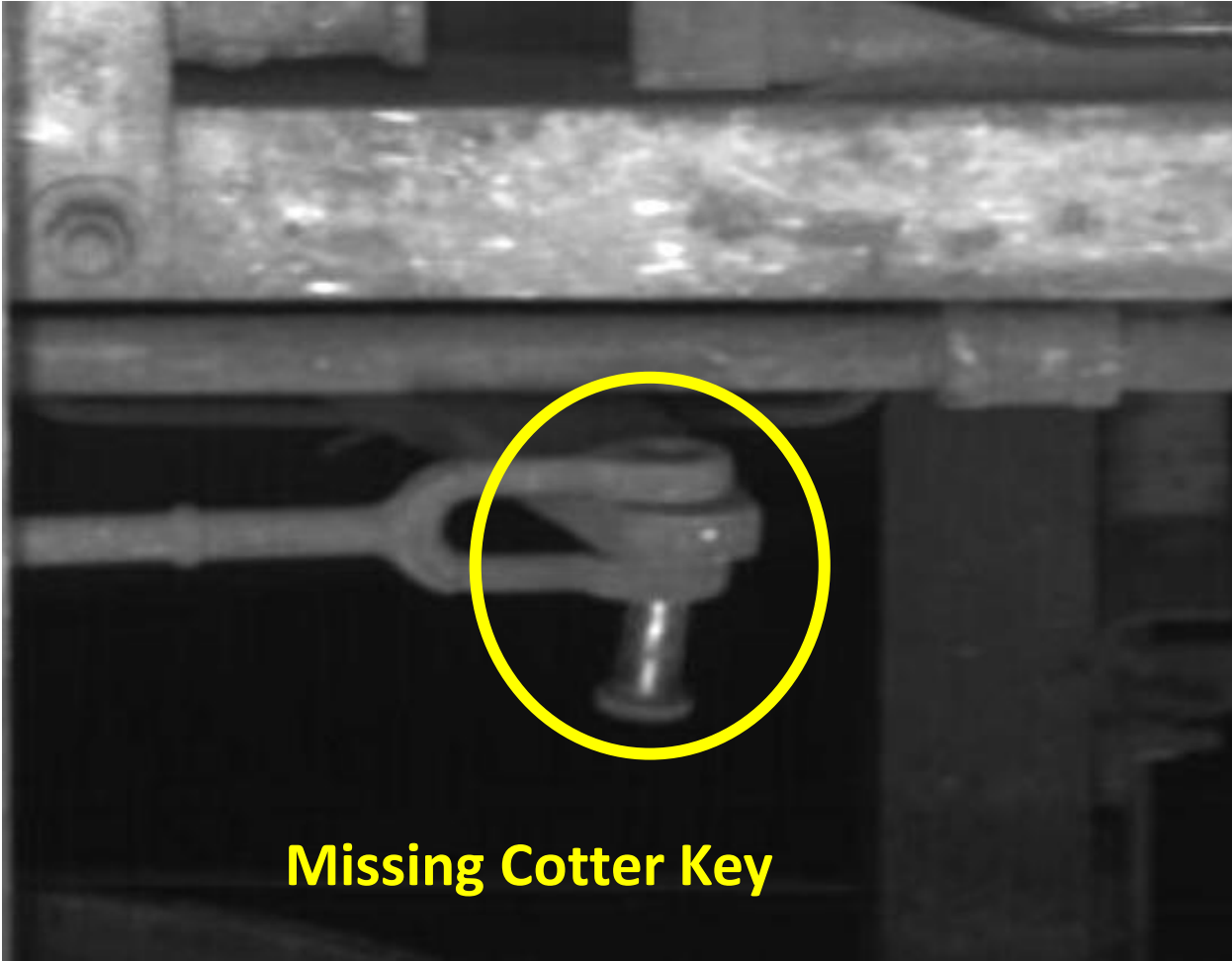


Missing Air Valves

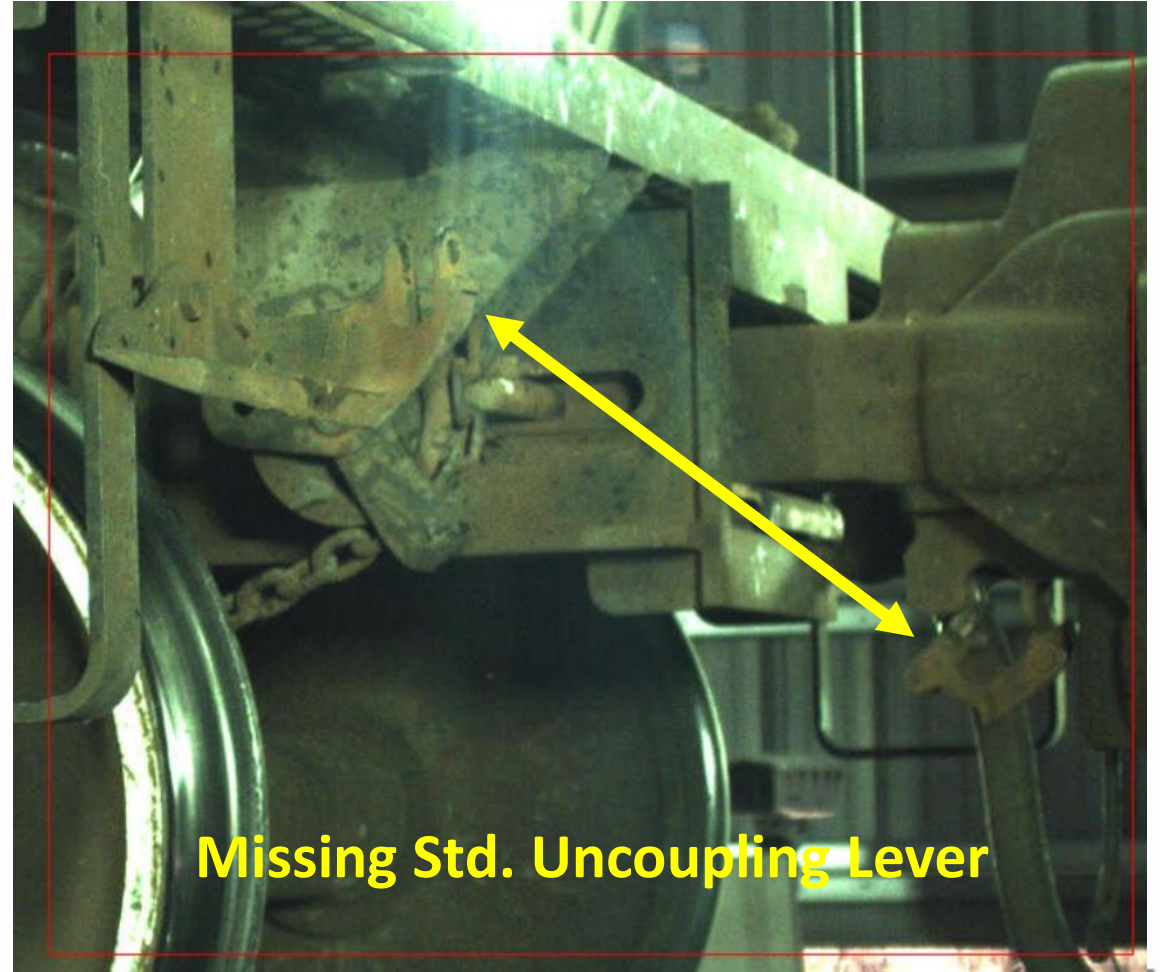


Bent Sillstep

Operation Detection KCSM

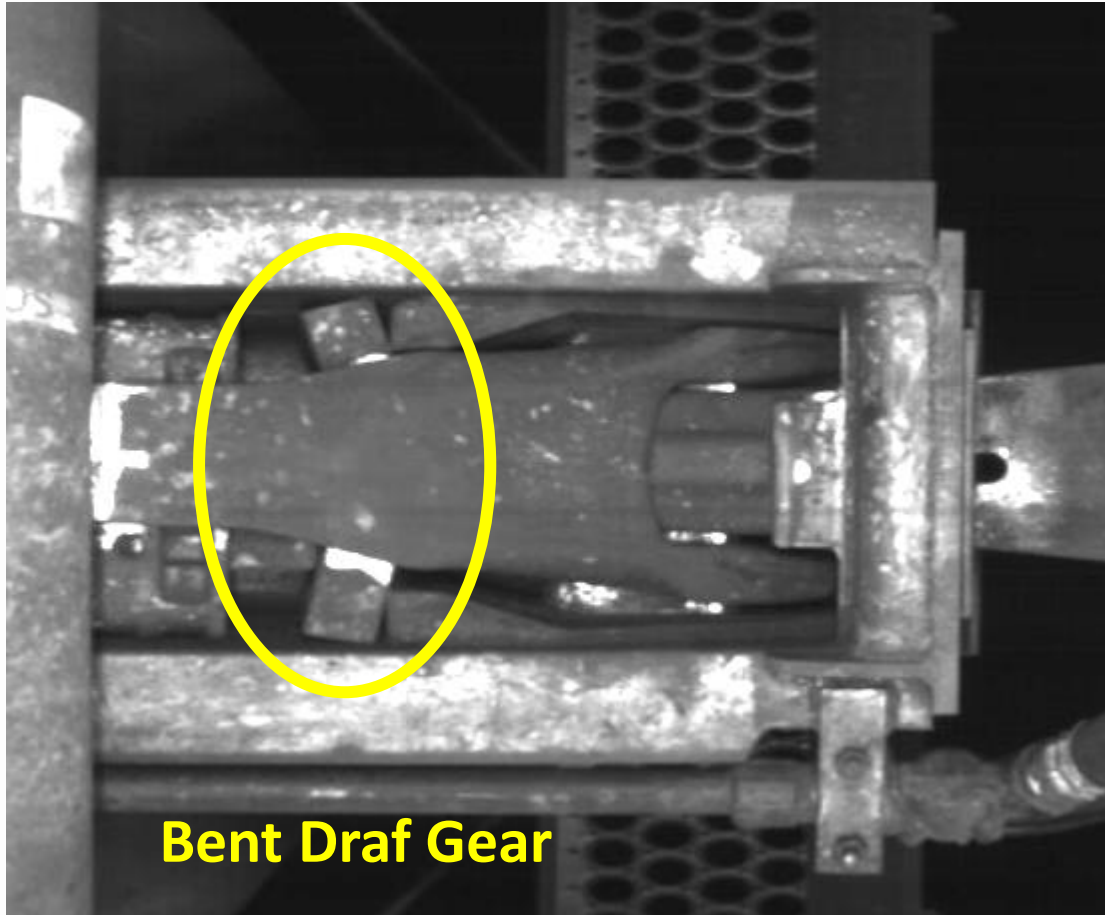


Missing Cotter Key

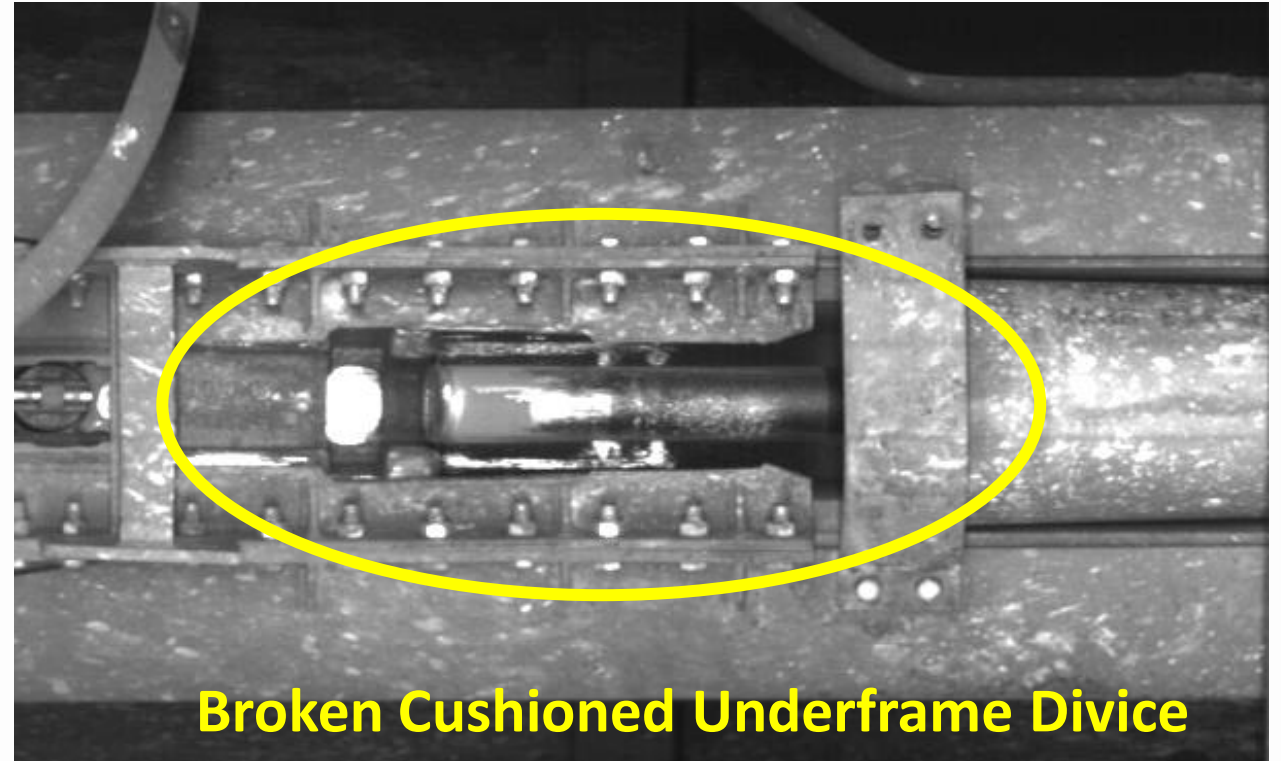


Missing Std. Uncoupling Lever

Operation Detection KCSM

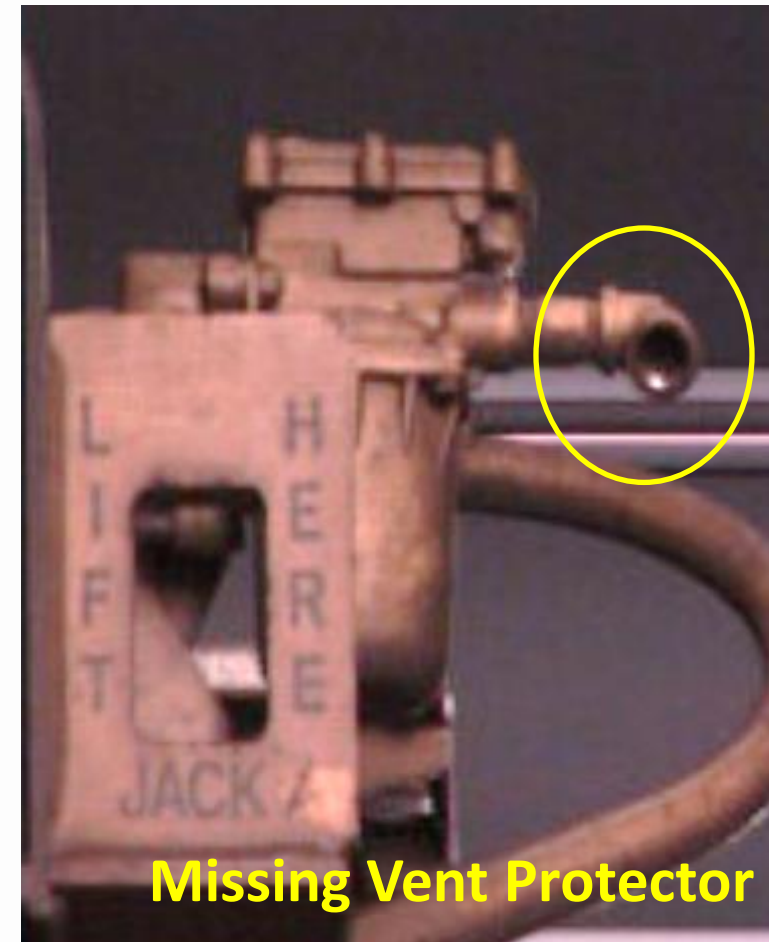
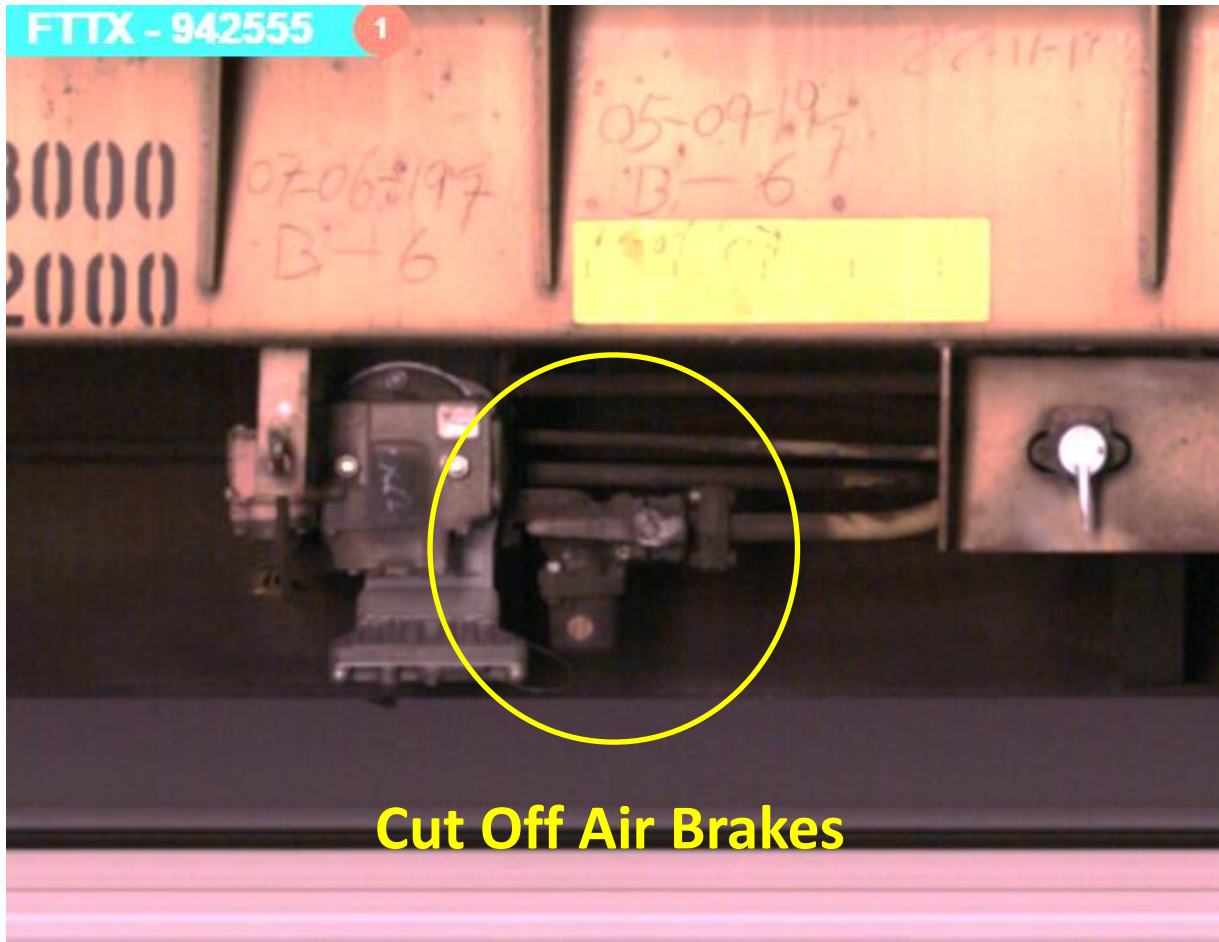


Bent Draft Gear

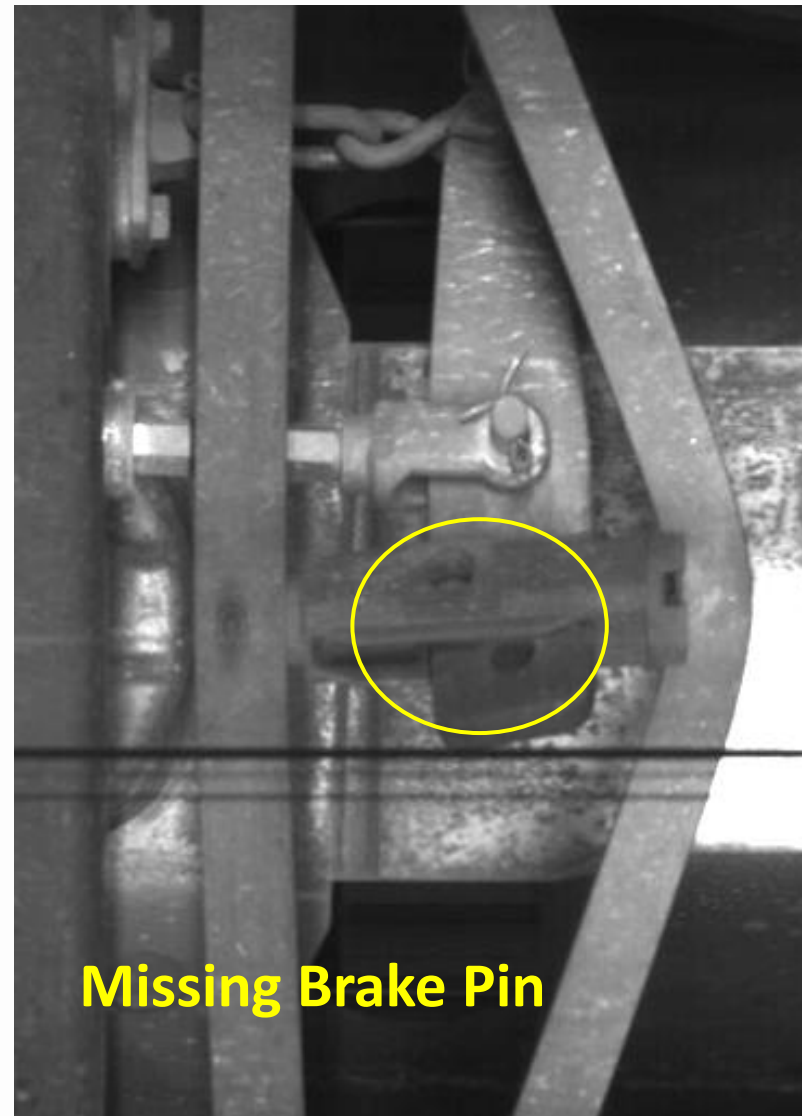
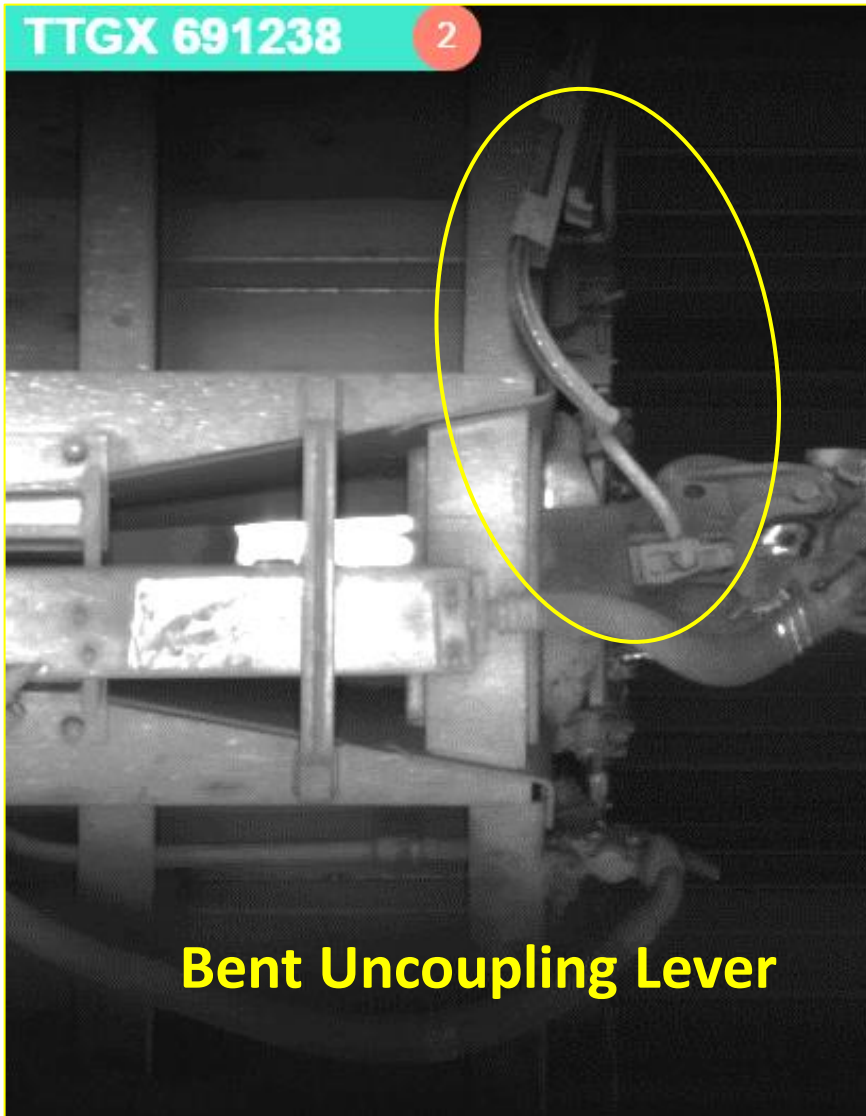


Broken Cushioned Underframe Device

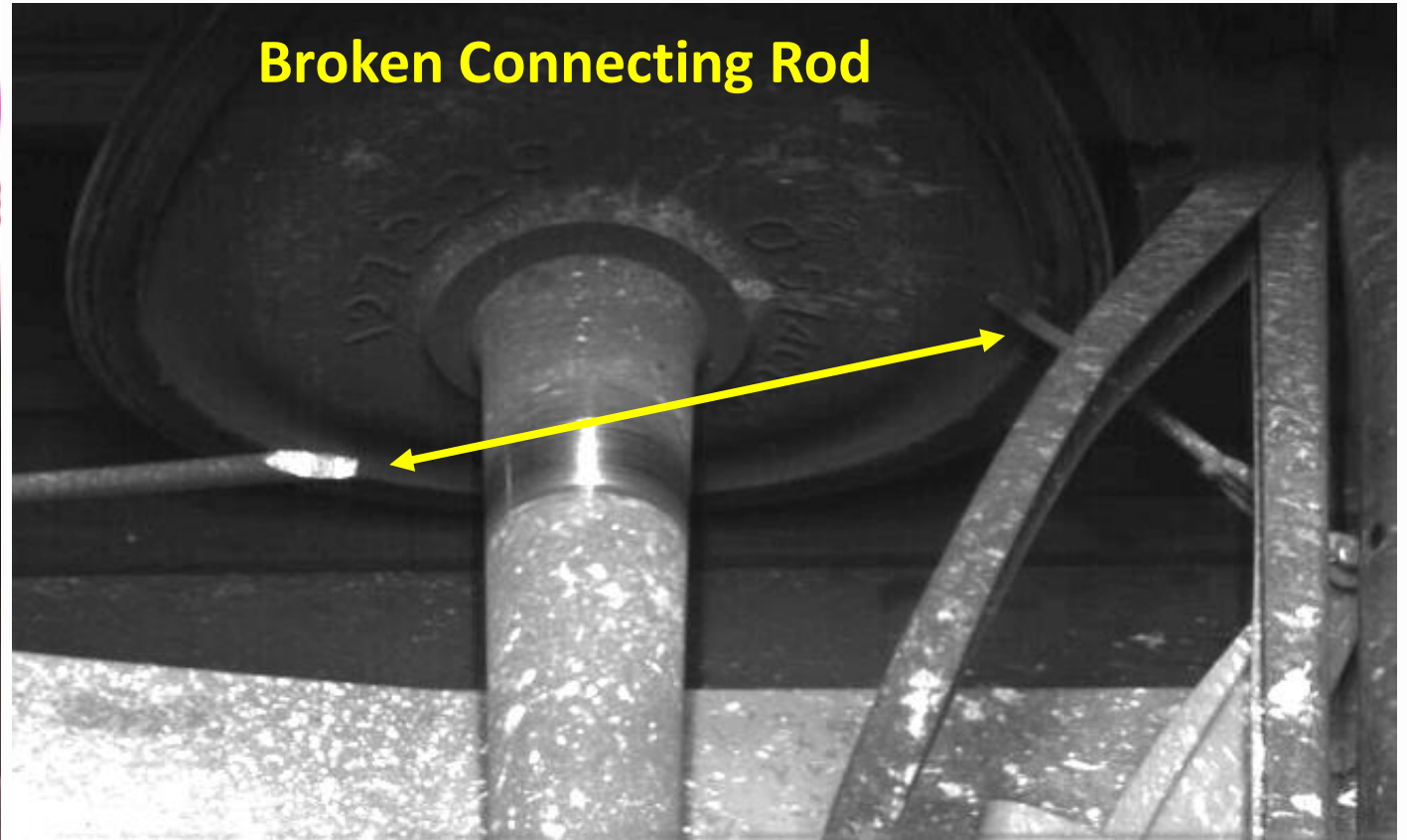
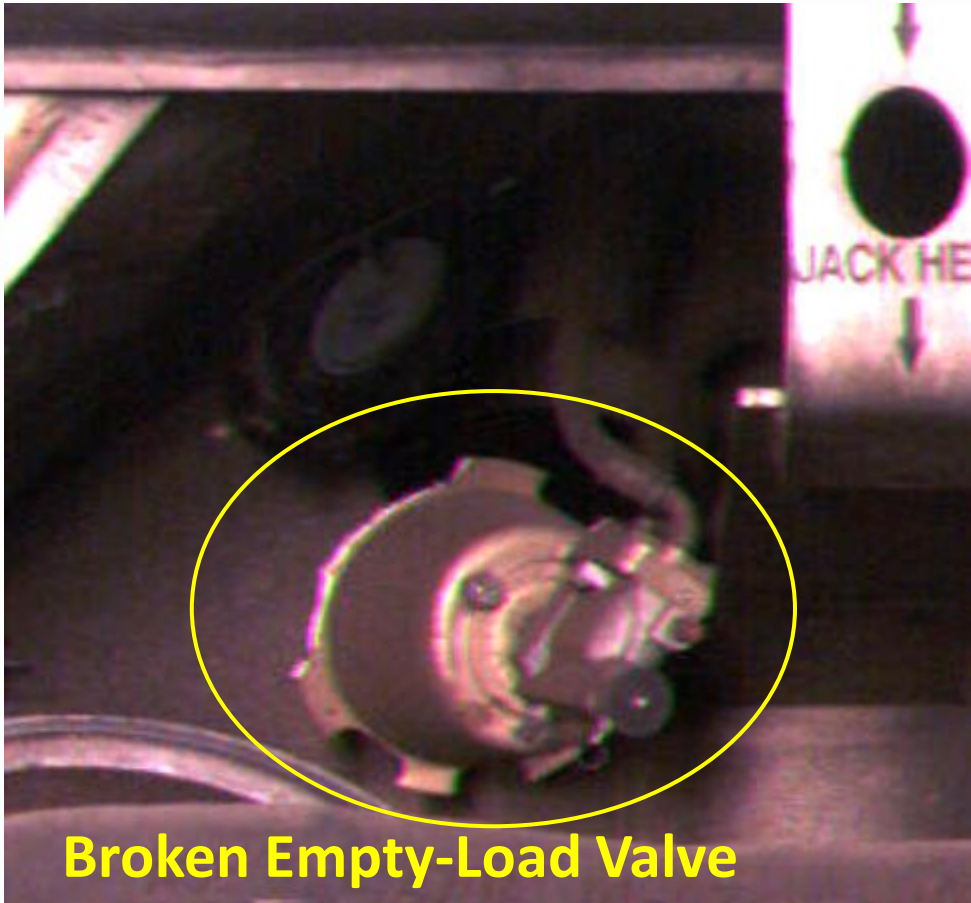
Operation Detection KCSM



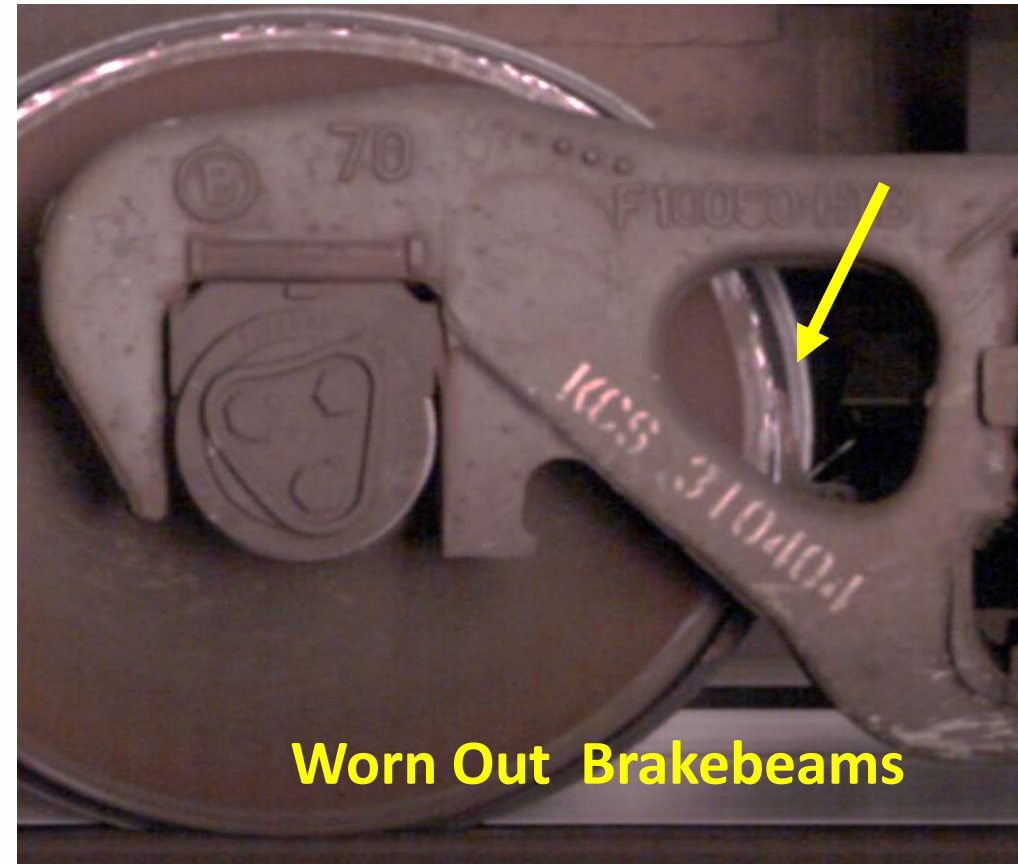
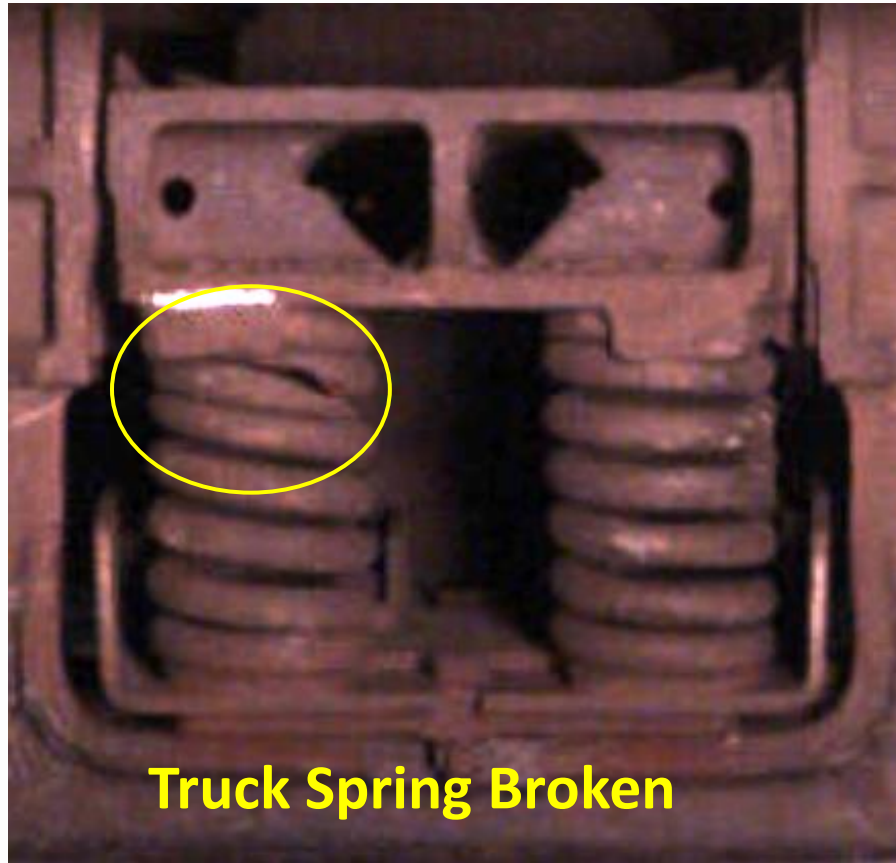
Operation Detection KCSM



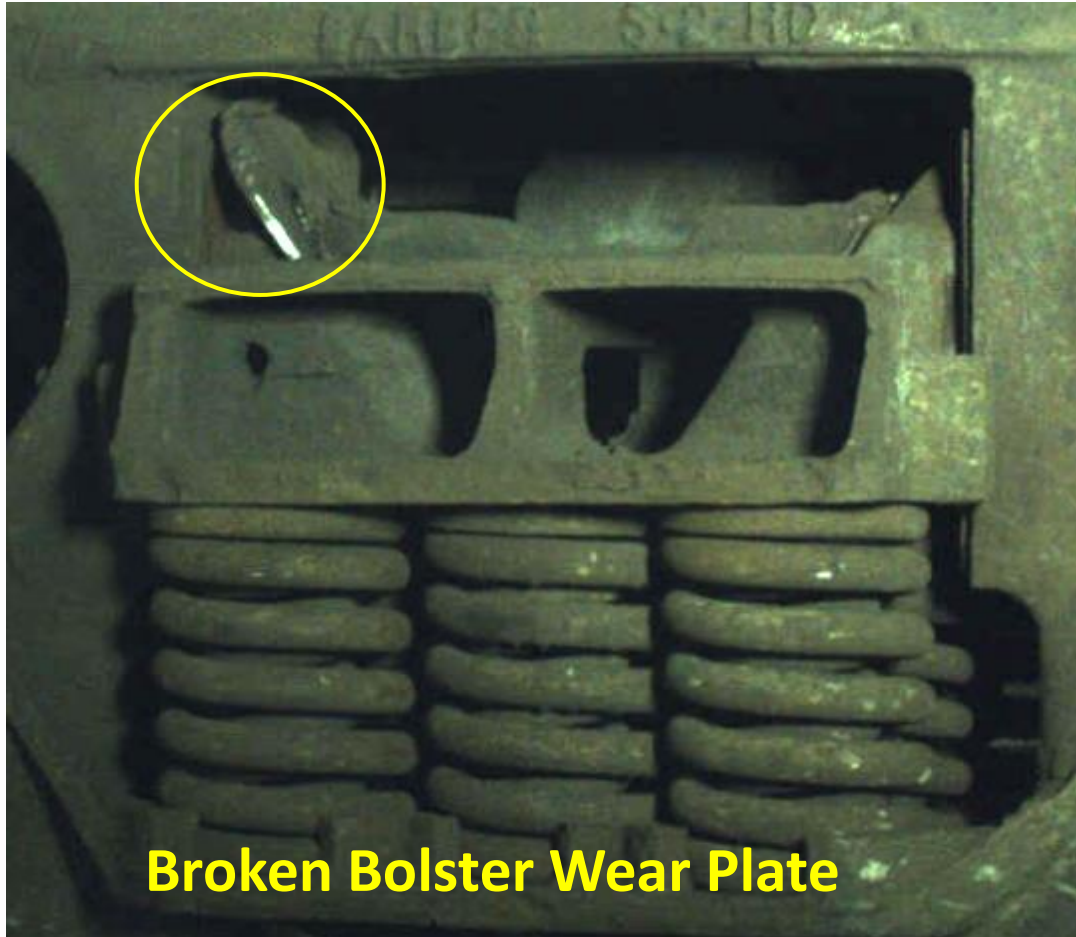
Operation Detection KCSM



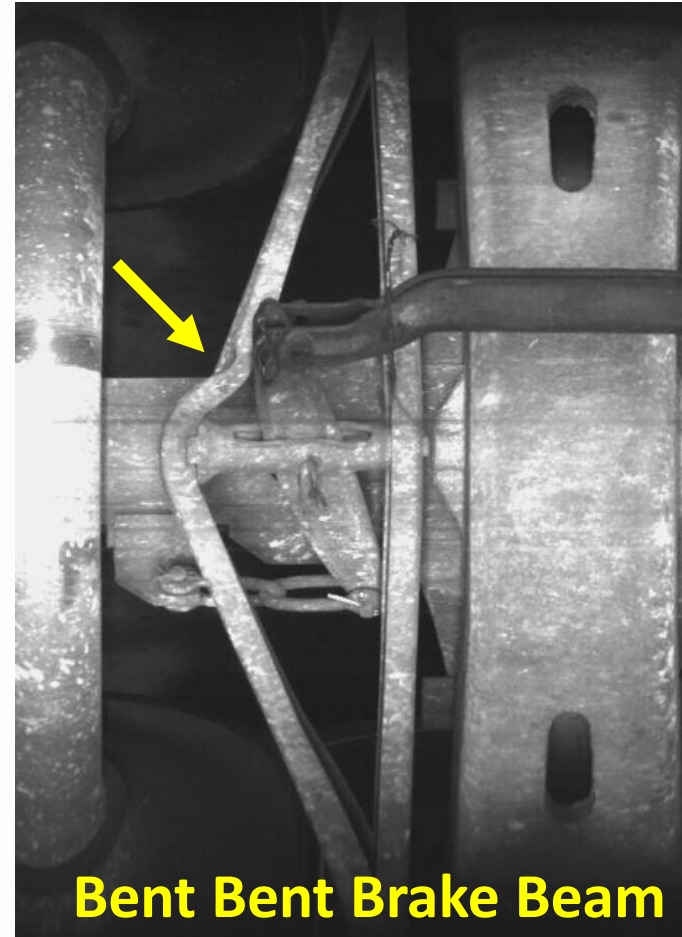
Operation Detection KCSM



Operation Detection KCSM



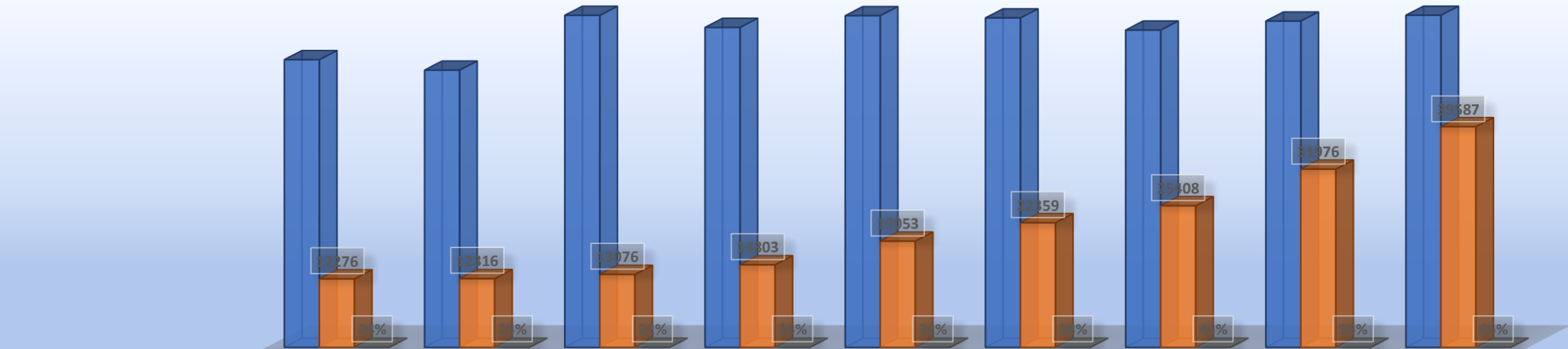
Broken Bolster Wear Plate



Bent Bent Brake Beam

Car inspection statistics by month 2022

CARS INSPECTED



	January	February	March	April	May	June	July	August	September
■ Cars detected by RMI Portal.	51620	49746	59578	57409	59513	59112	56926	58548	59593
■ Cars Inspected.	12276	12316	13076	14803	19053	22359	25408	31976	39587
■ Cars Inspected %.	24%	25%	22%	26%	32%	38%	45%	55%	66%

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