



U.S. Department
of Transportation
National Highway
Traffic Safety
Administration

DOT Auto Safety Hotline
Vehicle Owner's Questionnaire
To Report Vehicle Safety Defects
1-888-DASH-2-DOT
(1-888-327-4236)
INTERNET: www.nhtsa.dot.gov/hotline

FOR AGENCY USE ONLY 231

Date Received

Repository ☐

2000-10-25
22 OCT 2003

Reference No.
16041918

OWNER INFORMATION (Type or Print)

Name

Number

E-mail Address

Address

City

SPRINGFIELD

State

PA

Zip Code

Do you authorize NHTSA to provide a copy of this report to the manufacturer of your vehicle? ☐ YES ☒ NO

In the absence of an authorization, NHTSA WILL NOT provide your name or address to the vehicle manufacturer.

Signature of Owner

Date 11/11/03

VEHICLE INFORMATION

17 digit Vehicle Identification Number Located at bottom of windshield on driver's side

PLEASE FILL IN

1NP5XB7X7YN532116

Make

PETERBILT

Model

PETERBILT
379 convent.

Model Year

2000

Date Purchased

June 30, 2000

Dealer's Name and Telephone Number

HunterKeystone Peterbilt

610-285-2244

Engine:

No. Cylinders

6

Fuel Type:

Diesel

Original Owner

☐

Dealer's City

Lancaster, PA 17604

State

PA

Zip Code

17604

Transmission Type

Fuller
18 speed

☐ Antilock Brakes

☐ Cruise Control

Powertrain

Dana Spc DS462P
46000#

Vehicle Component Code

034410 SERVICE BRAKES, HYDRAULIC; FOUNDATION COMPONENTS

Multiple Failures: 11

FAILED COMPONENT(S)/PART(S) INFORMATION

Incident Date(s)

See replacement

Failure Mileage

Failure Speed

Invoices

Scam brake assy on Air Spring Chamber
bracket

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A TIRE FAILURE

Tire Make

NA

Tire Model (Name or Number)

Tire Size (Example P215/65R15)

DOT No. (Example: DOTM19ABC035)

☐ Original Equipment
☐ Prior Repair

Failure Location:

Tire Component Code

Tire Failure Type

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A CHILD SEAT FAILURE

Make: NA

Date Manufactured:

Model No./Name:

Seat Type:

Installation System:

Child Seat Component Code:

Failed Part:

APPLICABLE INCIDENT INFORMATION

(Please describe in detail the incident(s), failure(s), crash(es), and injury(ies).)

Crash

☐ Yes ☒ No

Fire

☐ Yes ☒ No

Number of Persons Injured

0

Number of Deaths

0

Reported to Police

N

Narrative Description of Incident(s), Crash(es), and Injury(ies).

Please describe (1) events leading up to the failure, (2) failure and its consequences, and (3) what was done to correct the failure; i.e., parts repaired or replaced (and if old part is available).

CONSUMER STATED BRAKING SYSTEM OPERATED POORLY. HAD VEHICLE INSPECTED, AND DISCOVERED THAT ALL FOUR REAR WHEELS BRAKE ASSEMBLY WAS CRACKED. ELEVEN FAILURES WERE REPORTED WITH DEALER WITHIN 22 MONTHS. *AK

See chart of locations, invoices, photographs of design defect.

Include, if available: Police/Fire Department Report, Photos, and Repair Invoice.

ATTACH ADDITIONAL SHEETS IF NECESSARY

The Privacy Act of 1974 (Public Law 93-579) This information is requested pursuant to authority vested in the National Highway Traffic Safety Act and subsequent amendments. You are under no obligation to respond to this questionnaire. Your response may be used to assist the NHTSA in determining whether a Manufacturer should take appropriate action to correct a safety defect. If the NHTSA proceeds with administrative enforcement or litigation against a manufacturer, your response, or a statistical summary thereof, may be used in support of the agency's action.

JOHN REED DAVIS REGISTERED PROFESSIONAL ENGINEER

815 W. Springfield Road
Springfield, Pennsylvania 19084

Phone / Fax: 610-544-1558

November 14, 2003

Mr. Alberto A. Jimenez, Chief
Office of Defects Investigation Enforcement
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

Dear Mr. Jimenez,

This letter and the attached enclosures augment the Vehicle Owner's Questionnaire from your office to bring attention to the serious problem of defective brake assemblies. Specifically these are the S cam Brake assemblies installed on the tri axle truck of my client; and common to other trucks with the same rear axle assemblies.

This writer was retained by Thomas J. Wardell, owner and sole driver of Wardell Trucking, a limited liability corporation, at 219 Paschall Mill Road in West Grove, PA 19390. The writer as a licensed professional engineer, serves as a consulting forensic engineer to address the engineering question in the following litigation:

Thomas Wardell doing business as Wardell Trucking Plaintiff vs Hunter Keystone, Peterbilt, and Peterbilt Motors Company et al. The caption is Civil Action-Law No. 2003-C303 in the Court of Common Pleas Lehigh County, PA and alleges a defective truck was sold to him..

Enclosure #1 – Peterbilt's Chassis Final Bill

The Wardell truck is identified as follows:

Mfr.:	Peterbilt Motors Company
Sold by:	Hunter Keystone Peterbilt In Lancaster, PA.
Date of Purchase:	June 30, 2000
Model year:	2000
Model:	Peterbilt 379 tri axle dump truck
Mileage @ 11/3/03	222401

Enclosure #2 – independent value appraisal

An independent appraiser's report is shown here to detail its characteristics, general condition and any damages.

Enclosure #3 – Load differences between a tractor and dump truck as it pertains to braking

Continued on page 2

Enclosure #4 – Chronology of brake failures on the Wardell truck from year 2000 thru 2002.

Enclosure #5 – Sketches of the S cam brake assemblies on the Wardell Peterbilt model truck
Taken from manufacturer's information.

Enclosure #6 – Photographs of a typical S cam Brake Assembly purchased from a truck salvage yard and taken from a Ford truck.

Enclosure #7 – Photographs of the typical area of the failures on the Wardell truck's rear axles.

Using the sample S cam brake assembly (see Enclosure #6 above) a polished cut away section was produced to show the weld between the cam tube and the air spring chamber bracket..

Conclusions:

The cause of the repeated failures over a 11 month period for a new truck was due to bending across that bracket supporting the air spring chamber. The polished cross section of the weld fillet between the tube and one side only of the bracket is adjacent to a gap caused by their loose fit. The bending in the bracket can be seen when braking was initiated while the truck was standing still. The repeated bending is causing cracking in the bracket adjacent to the weld in what is referred to as its heat effected zone, depicted by a ring of clay in the photographs in Enclosure 7. Adding a second fillet weld around the tube at the opposite side of the bracket plus closer fitting with the tube it is believed will eliminate the bending failure.

When the fourth failure (see Enclosure #4 above) occurred Wardell had a gusset welded between the tube and the bracket at the same time welding was placed over the cracks in the bracket. This repair enabled Wardell to demonstrate his theory of a gusset as well as avoiding towing the truck to the dealer for the replacement. This did demonstrate a counter to the bending action and was replaced by the dealer with the new assembly complete with a gusset. At present all S cam brake assemblies on Wardell's truck include the gusset supplied by the manufacturer. There is information that indicates that the 10th and 11th brake failures included the detaching of the factory supplied gusset.

Enclosure #8 – Photographs of the S cam brake with the gusset in place at this time.

The left side S cam brake assembly on the front rear axle can be seen with the addition of a bolt-on spacer intended to hold back the bracket from touching its adjacent U bolt hanger. At the time these were taken there was evident rubbing between the adjacent U bolt and the bracket at both S cam brake assemblies on the front rear axle.

Conclusions:

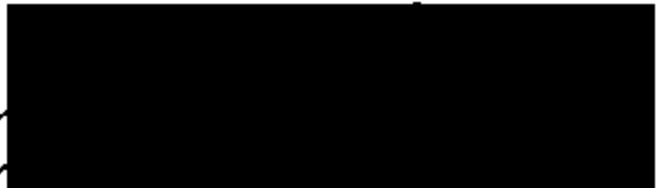
The bending of the air spring chamber can be countered with a redesign of that bracket that would extend the bracket to the outer housing of the rear axle for attachment there by machine screws into the housing. At present all S cam brake assemblies are cantilevered off their bolt on connection on the brake shield. My information indicates that cracking adjacent to the weld around the tube at that bracket configuration (see Enclosure #6 above) are common. Attaching the S cam tube at two places on the axle housing eliminates any bending at the welds. The design problem seems to be making room for this arrangement to clear or not touch the U bolt hangers with access to any repairs to other items in the near area.

Enclosure #9 – Six invoices showing replacement of nine assemblies over 22 months.

Notes:

1. The driver/owner Wardell sensed the brake failures while driving or detected the failure at the walk around inspection at the conclusion of his work day.
2. This writer has ridden with Wardell on one day when he made several pickups at a quarry/sand pit without being stalled there and then delivered these to his contract customer. These routes were over the highway traveled by conventional vehicles and were uneventful, smooth shifting of gears with and without load and without severe braking in highway traffic.
3. Wardell has no citations over a ten year driving period to August 2003 as recorded with the Penna. Department of Transportation, and has no restrictions on his Commercial Driver License (CDL) to expire in November 2006.
4. Wardell, has entered suit against Peterbilt Motors Company and their sales and service agency in Pennsylvania with the Request for Production of Documents to include drawings of the S cam Brake assembly (s) available for different rated rear axle assemblies from Dana Spicer Division of Eaton. Also requested are any and all failure investigation report (s) of these assemblies on the client's truck as well as similar reports on other trucks from this manufacturer. In October of 2003 the defendants were ordered by the court to produce Documents pertaining to the client's truck but seem to be resisting or have made no submittals to present.

Respectfully submitted,

A large black rectangular redaction box covering the signature area. A small, faint, curved line is visible to the left of the box.

cc: Honorable Curt Weldon, MC, 7th District Pennsylvania

ENCLOSURE # 1/2 PGS

3-05 11:12 HUNTER KEYSTONE PETERBILT

ID=

P.83

PETERBILT
VNMKR036-1

CHASSIS FINAL BILL
FOR VIN 1NP5XBTR7YN532116

PAGE 002
AS OF 12/28/99

UNIT TYPE 2

CODE	DESCRIPTION	PUB CD	PRICE	WEIGHT
BASE MODEL				
0003791	MODEL 379 CONVENTIONAL	P	106,255	13,655
N0004	FRAME APPROVED PER PROGRAM FOR DUMP			
N0005	TRUCK SERVICE WITH: 10 3/4" RAILS			
N0006	W/ FULL LINER, 248" WB, 57" OH, A			
N0007	PUSHER, AND A MAX GVWR OF 81K LBS			
N0047	OVERALL FRONT TREAD WIDTH IS 92.2"			
N0050	THE FRAME IS 1.5" HIGHER AT THE REAR			
N0051	AXLE THAN AT THE FRONT AXLE			
FRAME AND EQUIPMENT				
0514100	10-3/4" STL RAILS/STL XMBRS TO 354" (3/8" RAIL THICKNESS)	P	345	441
0601500	FULL STL INNER LINER	P	1,393	525
0633180	HUCK BOLT ALL ACCESSIBLE FRM COMPONENTS INCLUDING BOGIE & EOF XMBR IN TRUCK	P	166	0
0644020	EOF SQUARE W/XMBR	P	16-	0
0651090	OMIT REAR MUDFLAPS & HANGERS	P	77-	22-
0651110	PBILT FRONT WHEEL MUDFLAPS	P	0	0
FRONT AXLE AND EQUIPMENT				
1011480	DANA SPC EFA20F4 18-20,000 LB STD TRACK	P	3,964	487
1113720	TAPER LEAF SPRGS W/SHRS 18,000 LBS EFA20F4/PL941 AXLES	P	211-	90-
1232240	PWR STRG TRM TASS5 W/ASSIST PL941/EFA20F4/EFA24T5/EFA24T2 AXLES	P	0	0
1250350	PWR STRG RES ENG COMP MTD W/COOLER REQ'D W/RH ASSIST P/S	P	124-	24-
1353180	PHP10 ALUM HB/CAST DRMS/16.5X6 CAM BRKS PL941/EFA20F4 AXLES	P	101	15-
1361010	STD OIL SEALS	P	0	0
1390220	DANA SPC AUTO SLACK ADJUSTER	P	0	0
1390630	80 MM PAT SPRG SPACER BLOCKS	U	0	0
REAR AXLE AND EQUIPMENT				
1522400	DANA SPC DS462P 46,000 LB	P	3,130	481
1601720	MERITOR TRD800D PUSHER AXLE W/HEND	P	9,680	2,187
1607152	RLN-2 SUSPENSION 17,000 LBS 52" PUSHER AXLE SPACING	U	0	0
1608010	PUSHER AXLE(S) 17,000 LBS	U	0	0
1609990	PUSHER AXLE REQUIRES ENGR. REVIEW	U	0	0
1612930	PHP10 ALUM HB/CAST DRMS/16.5X7 CAM BRKS TANDEM AXLE / 46,000# MAX HUB RATING	P	175	60-
1614270	PHP10 IRON HB/CAST DRMS/16.5X7 CAM BRKS TAG/PUSHER AXLE	P	0	0
1632180	NGM TR-T 3036" PRG BRKS BOTH AXLE	P	240	33
1642110	DANA SPC AUTO SLACK ADJUSTER	P	0	0
1644050	IDM AXLE			
	DANA SPC AUTO SLACK ADJUSTER	P	0	0
	SGL T/P AXLE			

ENCLOSURE # 12

11:13 HUNTER KEYSTONE

P. 84

PETERBILT VHX036-1		CI FOR VIN 1NP5KATX7YN332116		PAGE 003 AS OF 12/28/99	
CODE	DESCRIPTION	PUD	CD	PRICE	WEIGHT
1652010	STD SEALS TDM AXLE	P		0	0
1654110	STD OIL SEALS	P		0	0
1672530	TAG/PUSHER TR(0)8000 AXLE KAYON FULL LOCK DIFF LOCK BOTH AXLES 46K-58K, D9461/4616/462/521/581	P		1,394	53
1682040	REAR BRK CAMSHAFT REINFORCEMENT W/ EXTENDED CAM TUBES - TANDEM AXLE	P		120	9
1682480	MERITOR WABCO 454M ABS W/ SRM	P		163	0
1684200	VALVE, D SERIES SYNTHETIC AXLE LUBRICANT ALL AXLE	P		0	0
N1613	MISMATCH OF HUBS DESIRED				
N1620	PUSHER TIRE TO GROUND CLEARANCE IS				
N1621	5.9" UNLOADED AND 2.8" LOADED				
N1622	PUSHER RIDE HEIGHT IS 11.1"				
1704110	RATIO 4.11 RR AXLE	P		0	0
1821860	PETERBILT AIR TRAC 46,000 LBS	P		2,675	485
1920410	1 LEVELING VALVE W/SGE NEEDLE GAUGE	P		69	2
1921060	MEND HLM-2 STD RIDE HEIGHT FOR T/P AXLES (8.0"-11.5")	U		0	0
2040803	ENGINE AND ENGINE EQUIPMENT				
N2012	C16 60002100 60001800 205001200	P		9,122	670
N2014	P01 31104...PULSES PER MILE				
N2016	P02 65...VEHICLE SPEED LIMIT				
N2018	P03 1537...ENGINE RPM @ VSL				
N2020	P04 12...TACHOMETER CALIBRATION				
N2022	P05 D...5 MPH DROOP				
N2024	P06 55...HIGH CRUISE SPEED LIMIT				
N2026	P07 30...LOW CRUISE SPEED LIMIT				
N2028	P08 1...RETARDER MODE				
N2030	P09 2...PTO MPH LIMIT				
N2032	P10 1400...PTO RPM LIMIT				
N2034	P11 50...PTO RAMP RATE				
N2036	P12 2120...LOW GEARS 1 RPM LIMIT				
N2038	P13 3...LOW GEARS 1 TURNOFF SPEED				
N2040	P14 2120...LOW GEARS 2 RPM LIMIT				
N2042	P15 5...LOW GEARS 2 TURNOFF SPEED				
N2044	P16 2120...RPM LIMIT IN HIGH GEAR				
N2046	P17 127...HIGH GEAR TURNON SPEED				
N2048	P18 2120...MAXIMUM ENGINE RPM				
N2050	P19 D...TOP ENGINE OVERRUN				
N2052	P20 700...LOW IDLE RPM				
N2054	P21 0...IDLE SHUTDOWN TIME				
N2056	P22 W...ENGINE PROTECTION MODE				
N2058	P23 4-PIN...LOW COOLANT LEVEL SENSOR				
N2060	S07 0.73...TRANS OVERDRIVE RATIO				
N2062	S08 4.11...REAR AXLE RATIO				
N2064	S09 473...TIRE REVOLUTIONS PER MILE				
2512310	S14 88...MAXIMUM GEARED SPEED				
2512640	DELCO 135 AMP ALT 33SI BRUSHLESS	P		273	11
	DELCO 12V STARTER 42MT TYPE 450	P		135	2
	W/OVERCRANK PROT.N14/SIG/ISX/ISX/S60/				



www.martinappraisal.com

Heavy Equipment Appraisal Consultants.
Serving NJ, DE, PA & MD.

Main office, Birdsboro PA.

11/3/03

Reference

Our File.
Vehicle.
Inspection Location.

2000 Peterbilt Tri Axle Dump
Cole Enterprises, West Grove PA.

At your request, we inspected the subject truck to perform a value appraisal only. We inspected the truck for appearance, condition, factory equipment and options. The following was noted and used to perform the evaluation.

Vin #	1NP5XBTX7YN532116
Year	2000
Make	Peterbilt
Model	379
Mileage	222,401
Hours	No meter
Engine	Caterpillar C-16 Arrangement # 184-2929
Engine HP	600
Engine Brake	Jacobs
GVWR	80,000lbs
Transmission	Eaton RTL020918B 18 speed
Front Axle	18,000lbs
Rear Axle(s)	46,000lbs
Lift Axle	17,000lbs
Frame	Double
Suspension	Pete Air Trac
Wheels	12 Aluminum
Tires Front	Bridgestone R295 315/80R22.5
Front tire tread	L/F 18/32" R/F 17/32"
Rear Tires	Dunlop SP481 11R24.5 matched virgin
Rear tire tread	LFO 15/32 LFI 13/32 LRO 12/32 LRI 9/32 RFO 16/32 RFI 13/32 RRO 12/32 RRI 7/32
Lift axle tires	315/80r22.5 L 11/32 R 11/32

Fuel Tank(s)	100 Gallon Aluminum diesel
	50 Gallon hydraulic
Dump Body	Raven Serial # 110041
Dump model	118A6060
Year	2000
Type	Alum construction with brushed finish
Length	18'
Width	96"
Side height	60"
Air gate	Yes
Tarp	Yes
Tarp type	Remote electric
Side boards	Yes
PTO	Muncie

Overall Appearance Good
 Damage noted None to cab and chassis
 Two seam openings in floor of body towards rear outside of floor.

Evaluation.

PA state law requires the use of the NADA and Blue Book Guides, however neither book has provisions for evaluation of this exact truck. Therefore the law suggests dealer's quotations based upon their opinion of retail sale value. The following dealers were called and all known facts about this truck were discussed to obtain their value opinion.

1. Vanderlys Truck Sales Ottsville PA. 610-847-5204 Tom Vanderly	Value	\$72,500.00
2. GL Sayre, Peterbilt Conshohocken PA 610-277-2000 Jim Sayre, Jr	Value	\$76,500.00
3. Hunter Keystone Peterbilt Lancaster PA 717-299-6630 Chris, Sales Manager	Value	\$76,500.00
4. Elliot Wilson Peterbilt Easton MD 410-822-0066 Joe, Sales Manager	Value	\$77,500.00
Average of dealers opinions	Average	\$75,750.00

At the time of this report we could not find any exact trucks available for sale.
 Attached to this report are photographs taken to document the truck at the time of inspection.

This concludes our evaluation of this truck.


 Jeremy Martin.
 PA Licensed Appraiser 134073

JEREMY MARTIN
License Number 134073

is licensed to engage in the business of insurance in the Commonwealth of Pennsylvania in the capacity stated below, subject to applicable laws and rules.

License Type: Motor Vehcl Phys Damg Apprais
Expiration Date: 06-30-2004



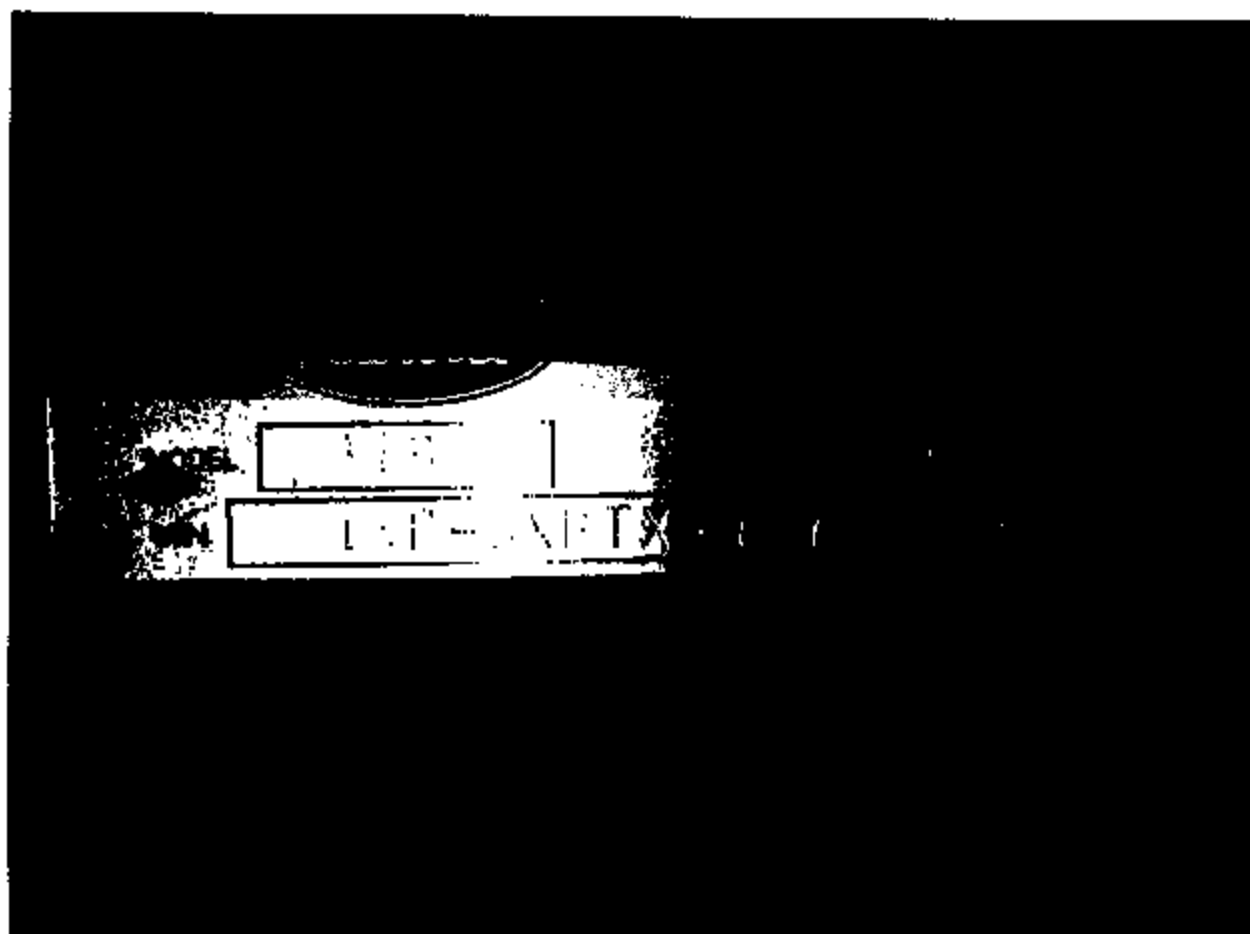
Lines of Authority:

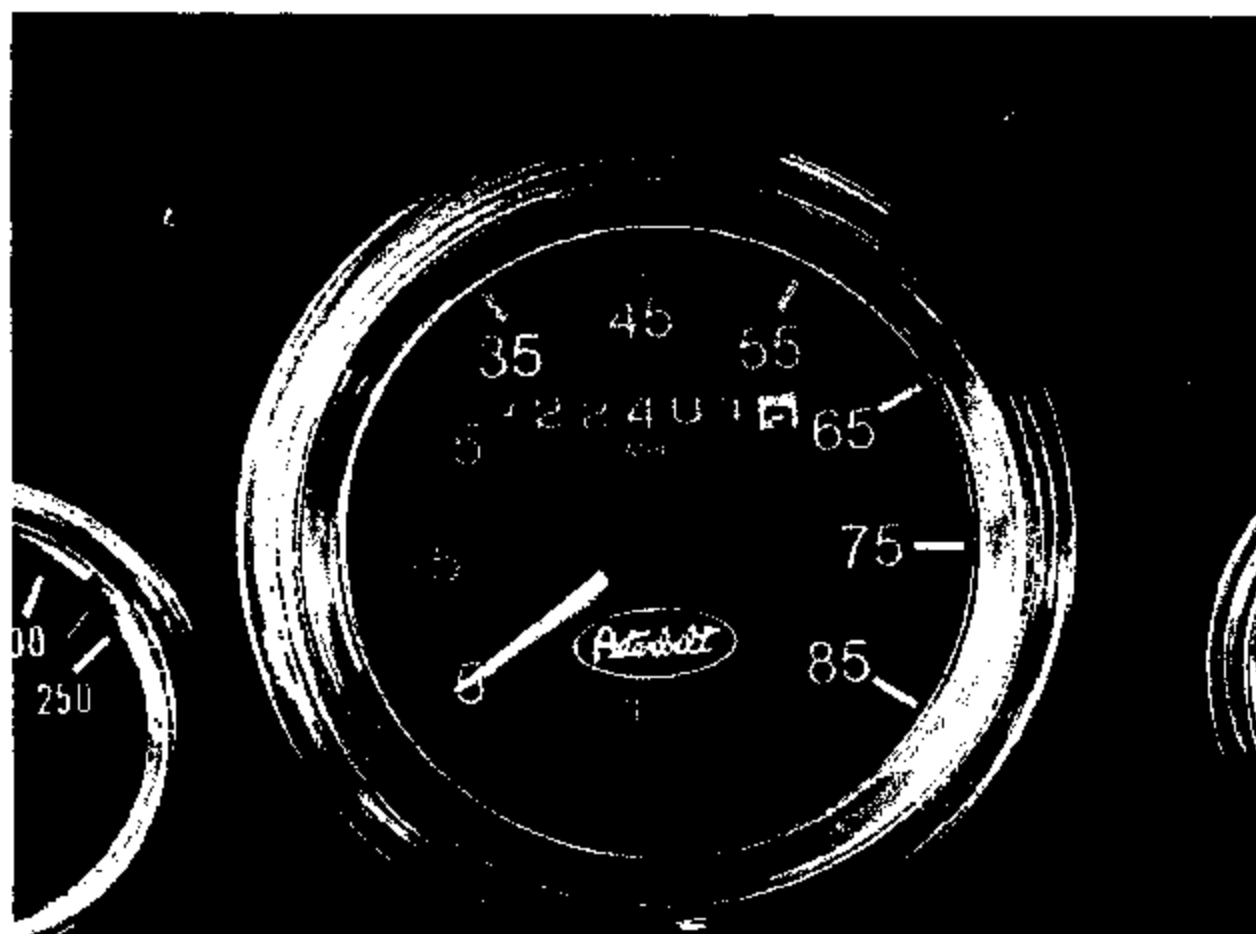
MARTIN, JEREMY
ONE SUPERIOR DRIVE
BIRDSBORO, PA 19508-2453

2003-05-14 08:01:18 2680-001

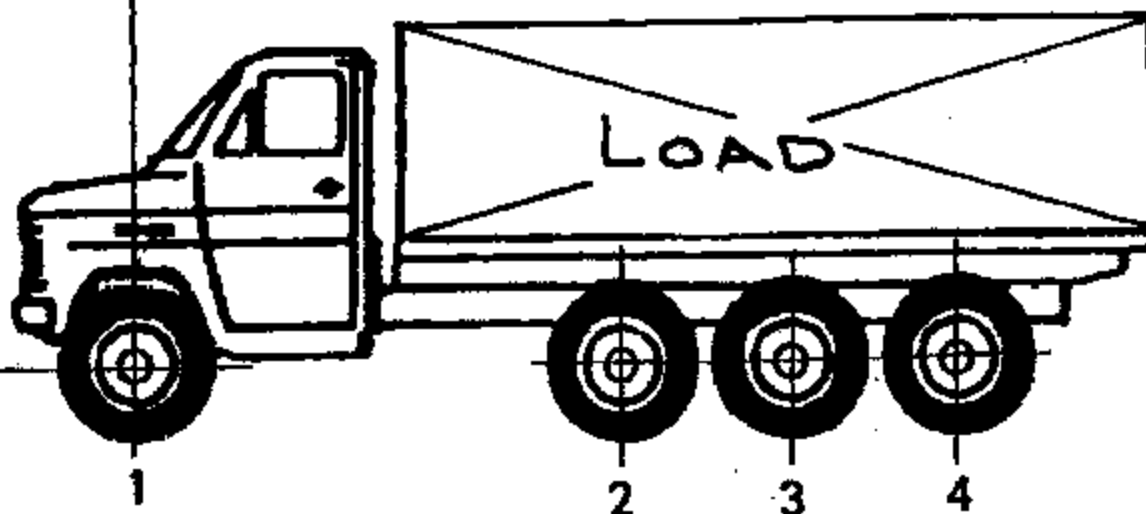
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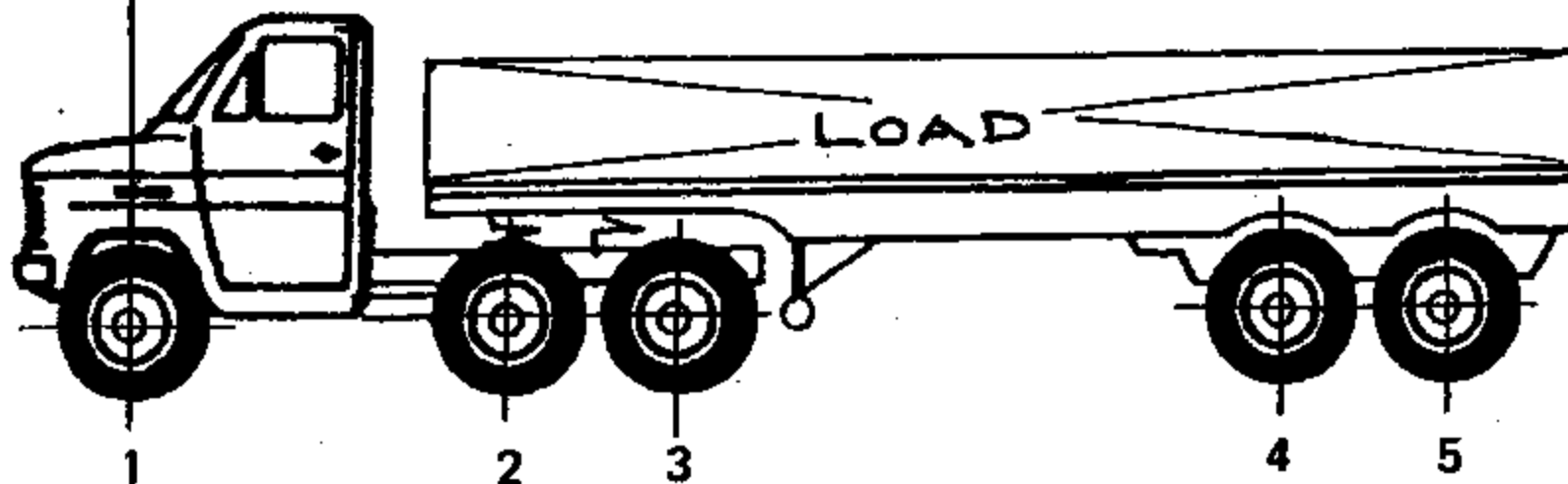








Note braking takes place at the wheels of the dual axles #3 and #4 as is the case for the Wardell Peterbilt 379 model with dump body.



Note braking with same load as the dump truck carries is now taking place over the dual axles #2 and #3 of the truck plus trailer's #4 and #5.

ENCLOSURE # 4

Revised 11/10/03

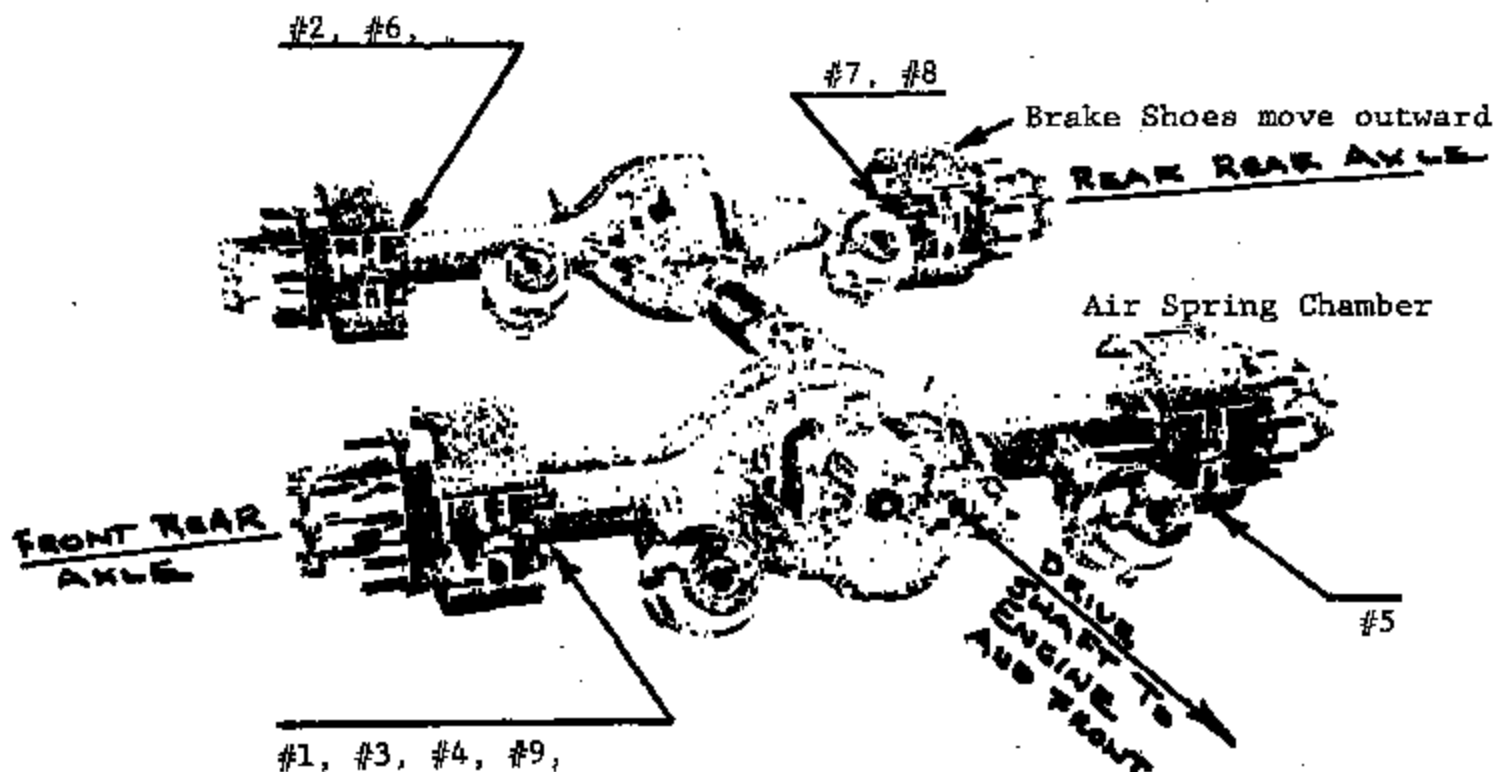
The first parts to fail were the S cam Brake Assemblies on the rear drive axles and are shown in the chart below:

No. Failure	Miles	Date	Location Axle	Exhibit/ Complaint	Notes
#1	27400	Nov/00	Right Front Rear	G-1	Failed slack adjust brkt
#2	37234	Nov/00	Right Rear Rear	G-3	Failed slack adjust brkt
#3	51413	Feb/01	Right Front Rear	G-4	Failed slack adjust brkt
#4	62380	May/01	Left Rear Rear	H-1	Failed slack adjust brkt - repair weld in place/add gusset by Wardell.
		June/01	Left Rear Rear	G-6	Replaced by dealer - with gusset at slack adjust brkt
#5	62380	June/01	Left Front Rear	G-6	Failed at slack adjust brkt replaced w/o gusset
#6	62380	June/01	Right Front Rear	G-6	Failed at slack adjust brk replaced w/o gusset
#7	62380	June/01	Right Rear Rear	G-6	Failed at slack adjust brkt replaced w/o gusset
#8	70613	Aug/02	Right Front Rear (by G.L. Sayre)		Failed at slack adjust brkt replaced with gusset
#9	70613	Aug/02	Right Rear Rear (by G. L. Sayre)		Failed at slack adjust brkt replaced w/o gusset
All rear axle S cam brake assemblies have the gusset at the slack adjust brkt @ 9/29/03 when this report was written..					

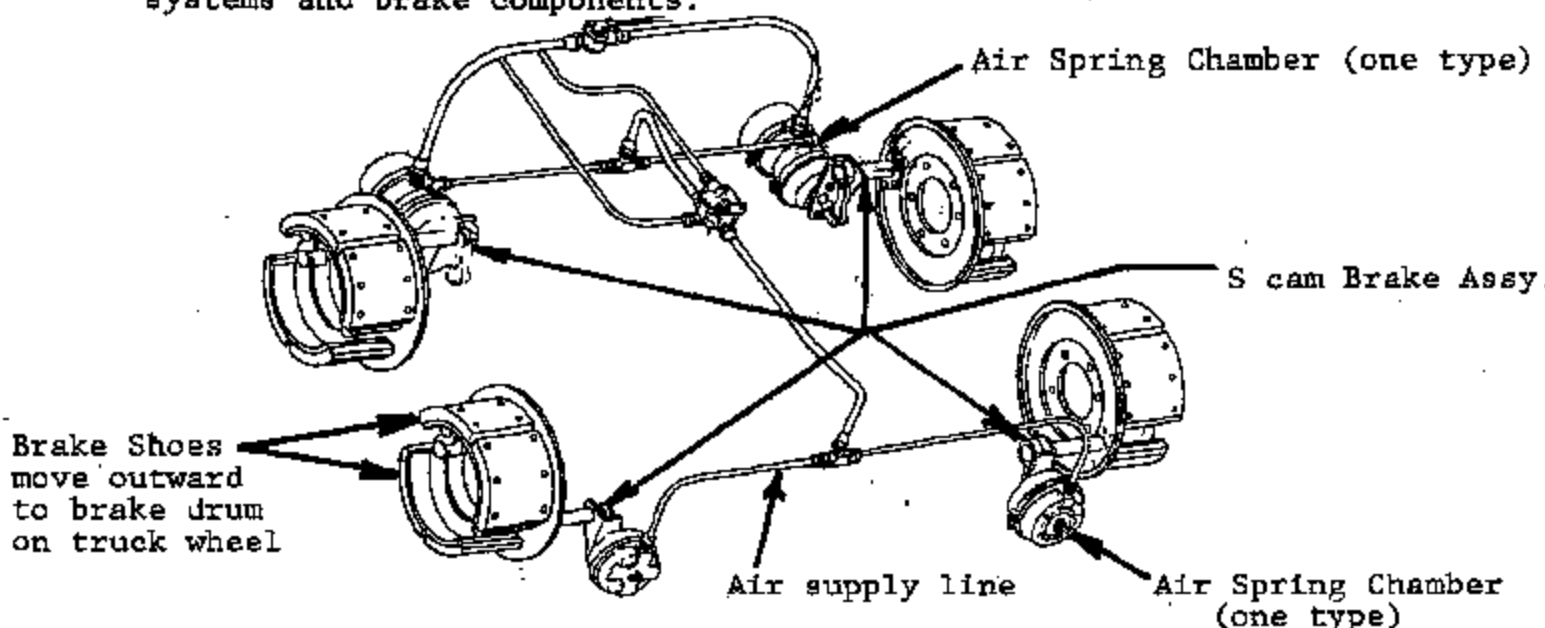
The failures above were observed by T. Wardell and M. Cole, State Inspector/truck repair shop owner in West Grove, PA. By making a weld repair in place and adding a stiffener-gusset Wardell was able to drive safely to Hunter Peterbilt in Lancaster instead of being towed there. This is # 4 failure above repaired in May 2001 and then replaced new with gusset by the dealer (invoiced June/01).

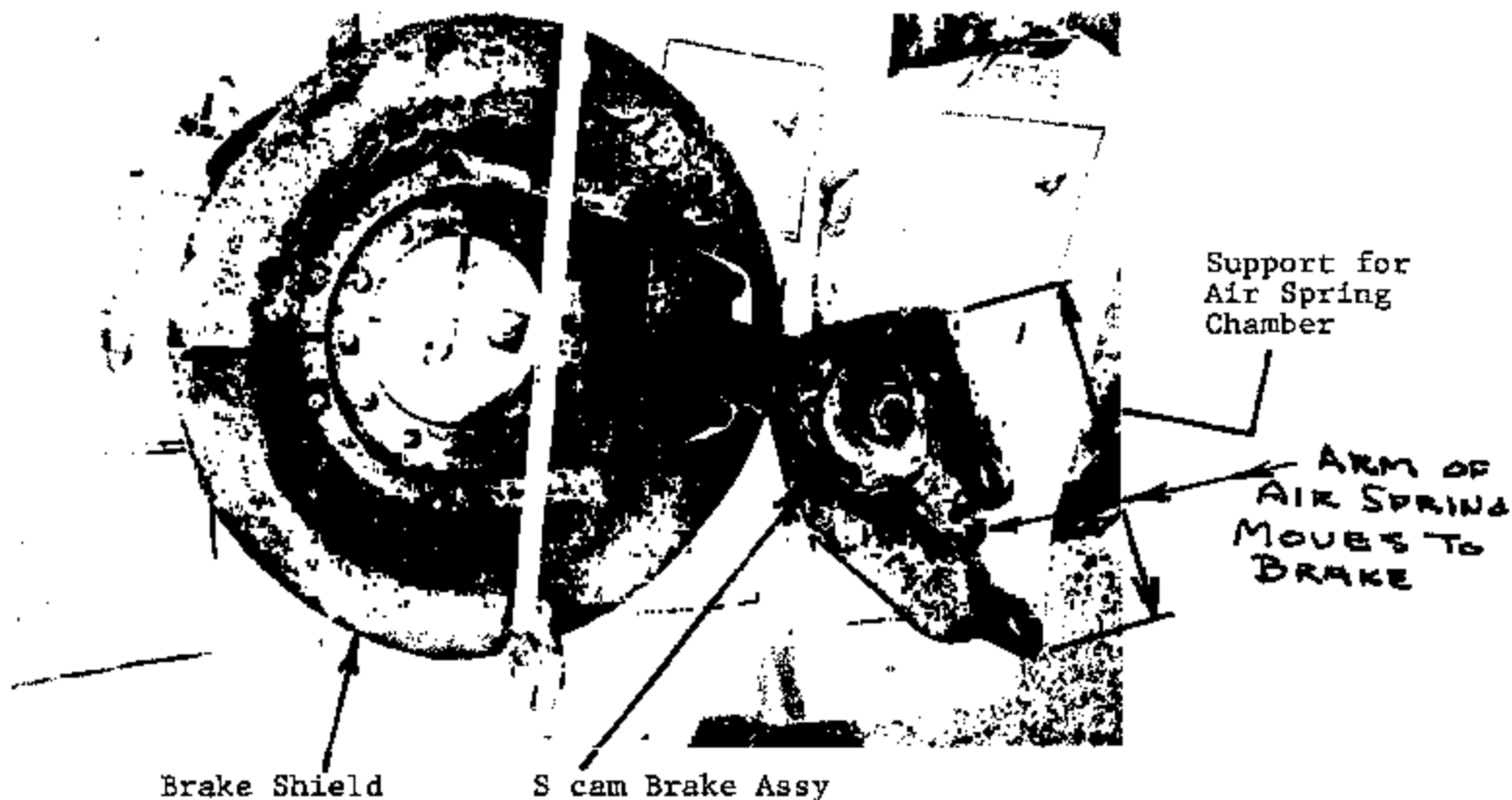
ENCLOSURE # 5

The drawing below is an excerpt from Peterbilt sales literature. Shown there are the locations of the S cam Brake failures on the Wardell truck.



The drawing below was taken out of the sales catalog of Wagner Electric Corp., an original equipment manufacturer of brake systems and brake components.



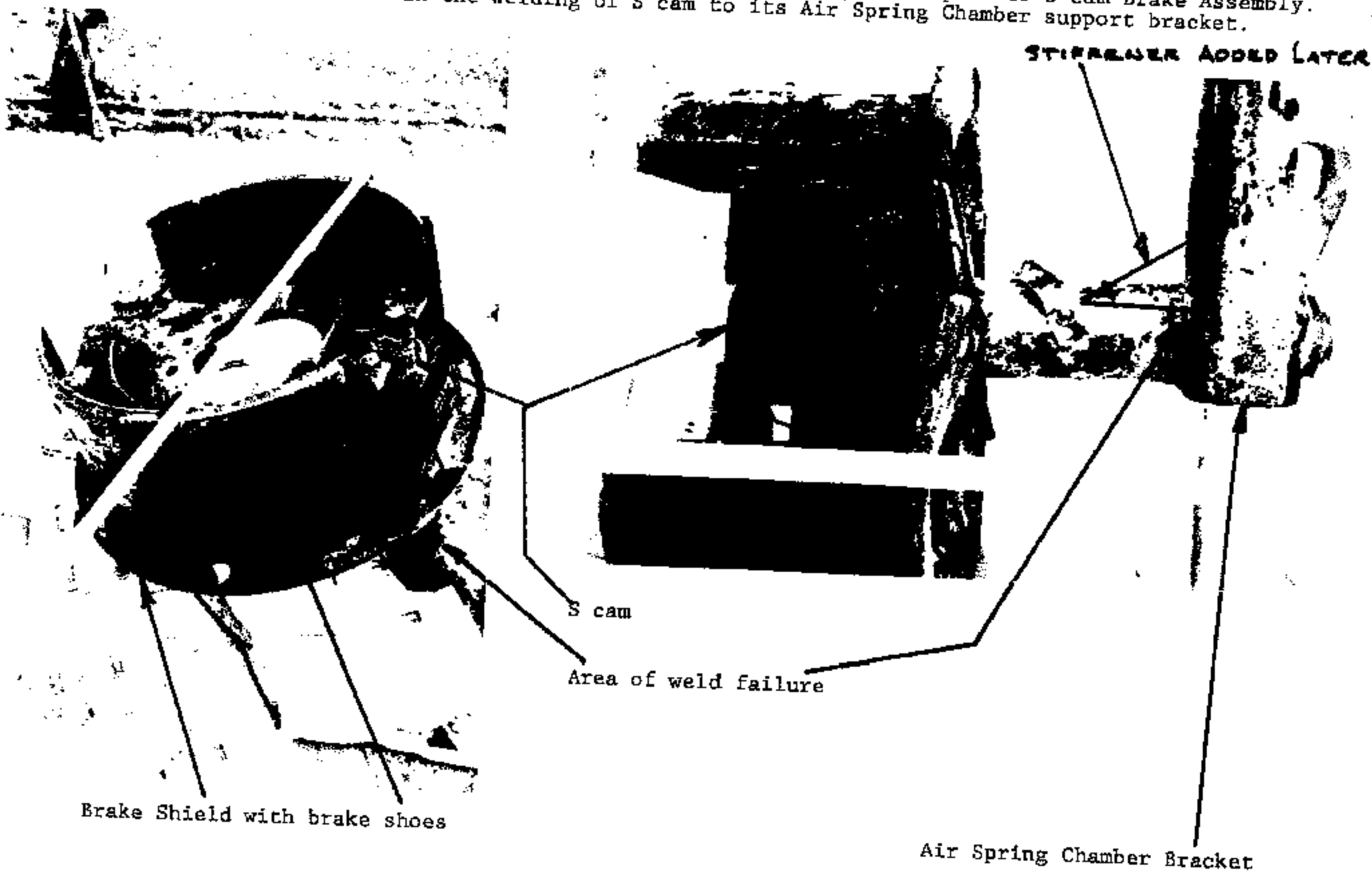


These pictures make up a view of the attachment of the S cam Brake Assembly to the Brake Shield/Rear Axle which is stationary. Below the failure area occurs in the welding at the Chamber support.

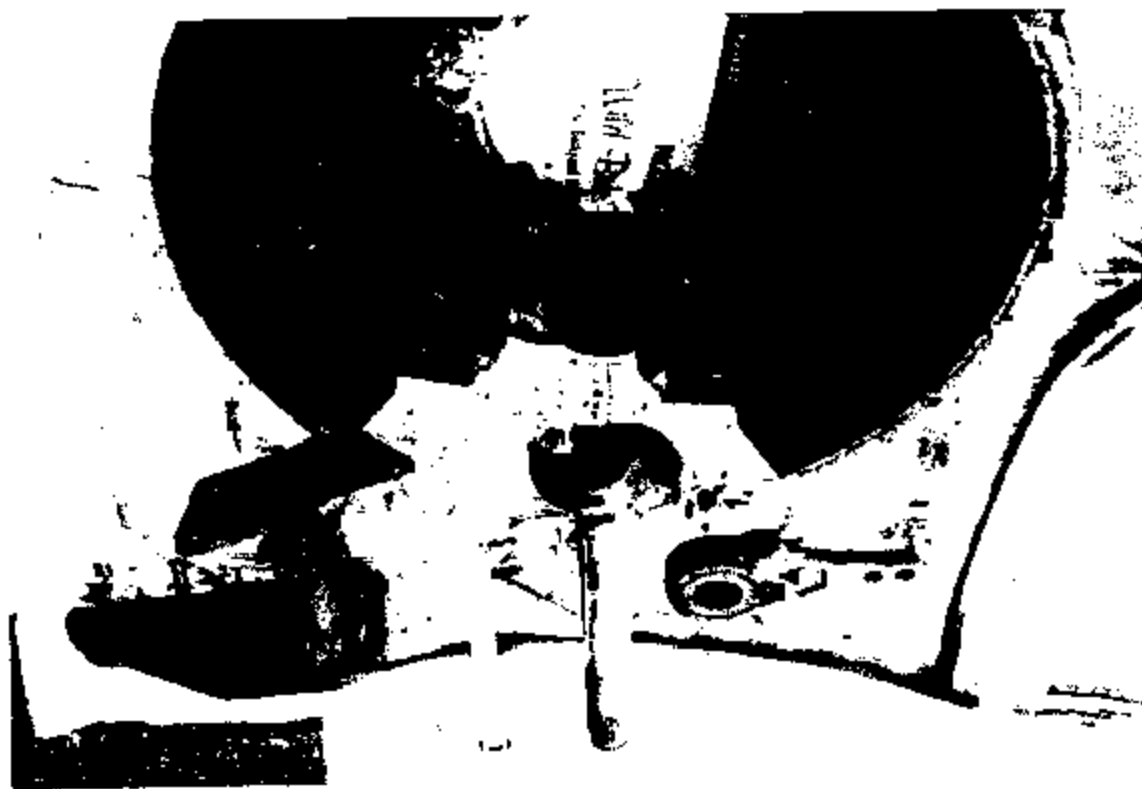
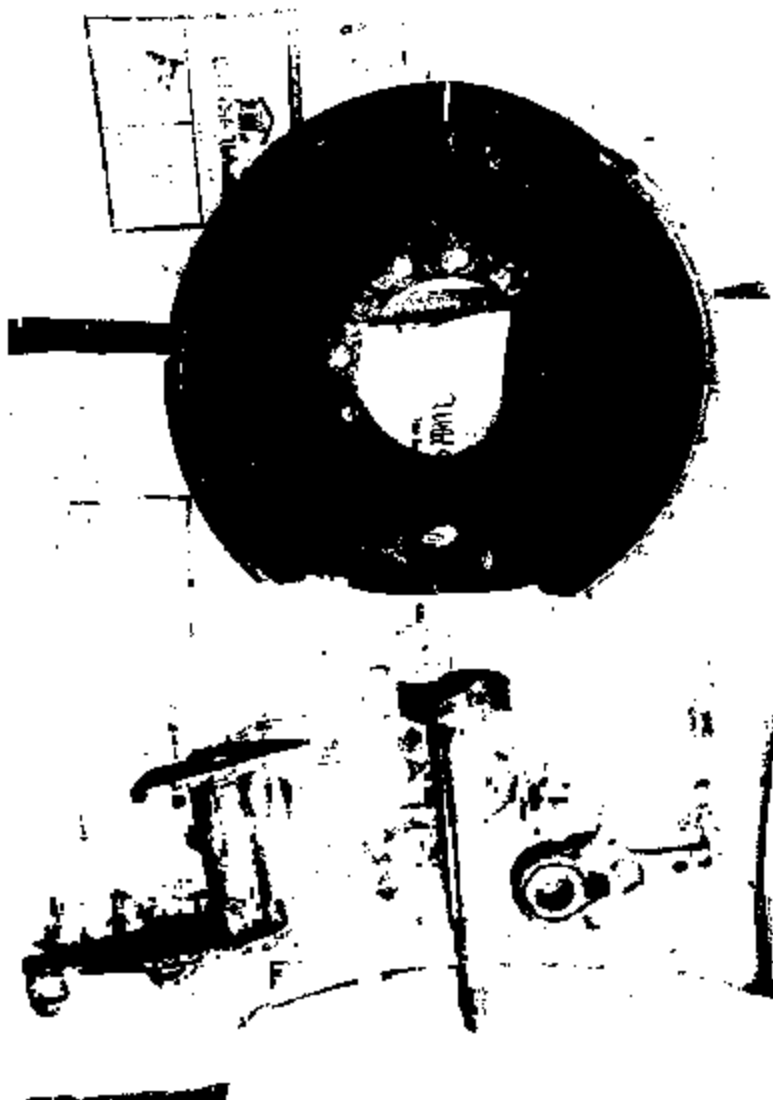
Weld of tube to bracket fails (not shown)



These pictures make up a view of the Brake Shield/Brake Shoes coupled to S cam Brake Assembly.
Also shown is the area in the welding of S cam to its Air Spring Chamber support bracket.



These pictures make up a view of the brake shield, which is attached to the rear axle housing (not shown here). The viewer is looking into area of the rear axle that comes through the brake shield with brake shoes attached. The shoes are opened and closes against the truck wheel's drum (not shown) by the S cam with its shaft.

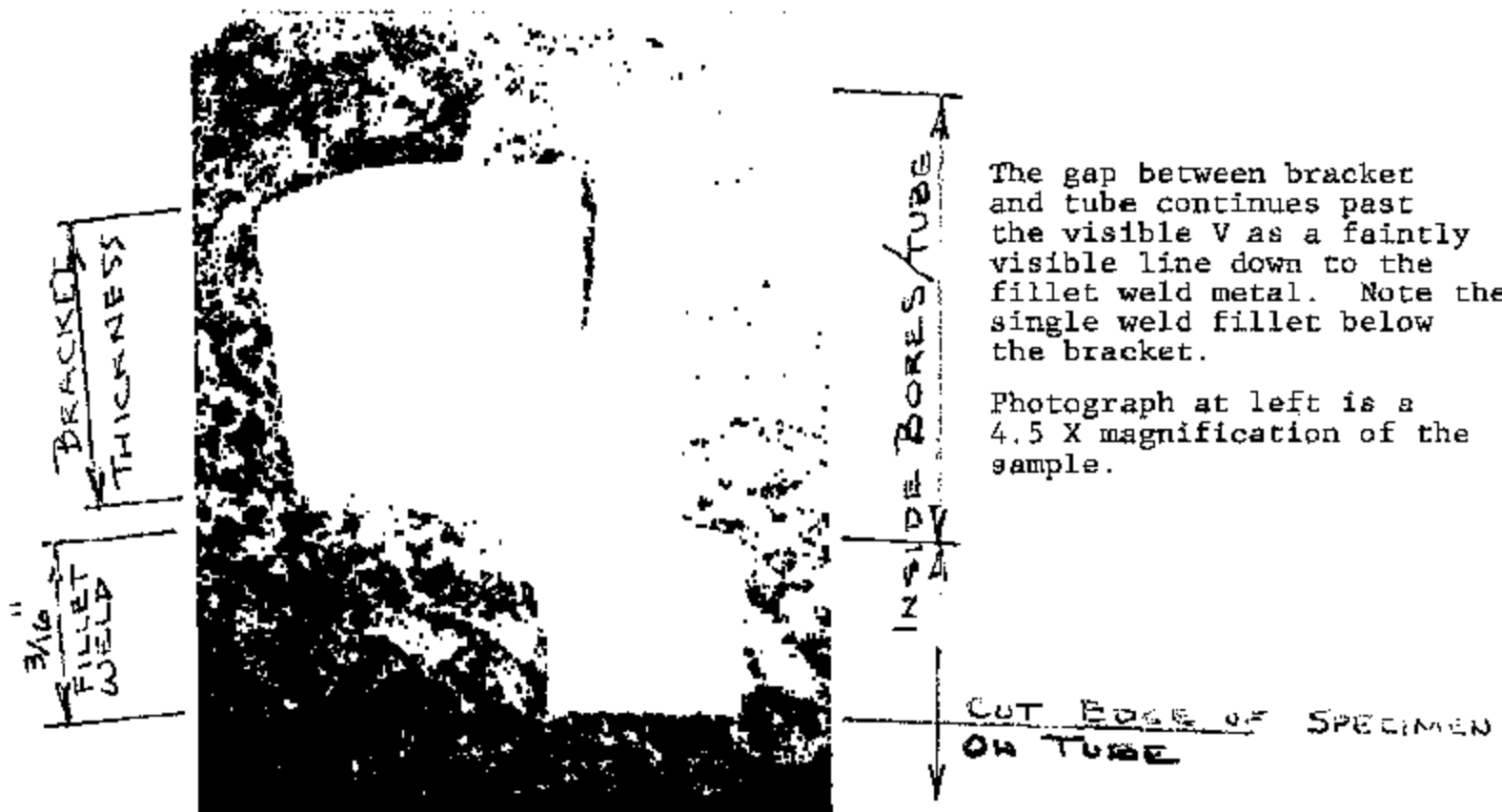




The left side pictures show that side of the bracket where a weld fillet ties it to the tube. The yellow clay bead locates the area just off the weld metal where cracking occurs.

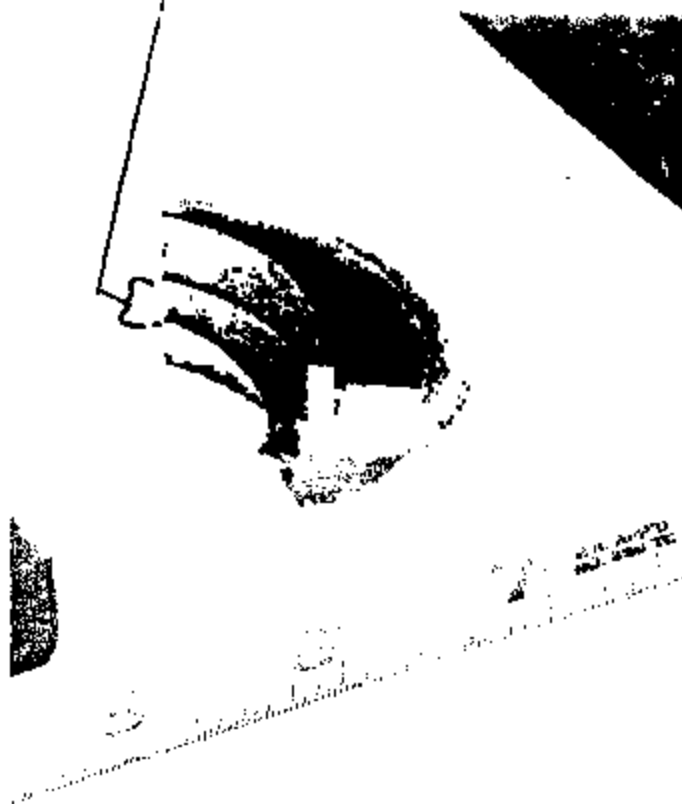
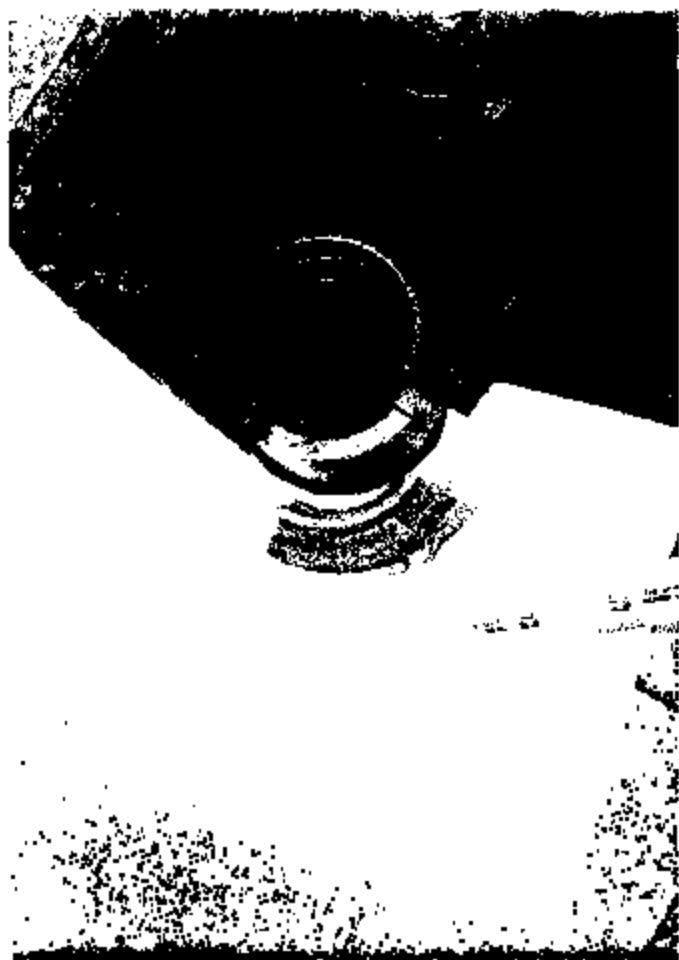
The right side pictures show the area of a cut away specimen that will be examined to show area of the weld and its tie into the tube metal and the bracket metal.

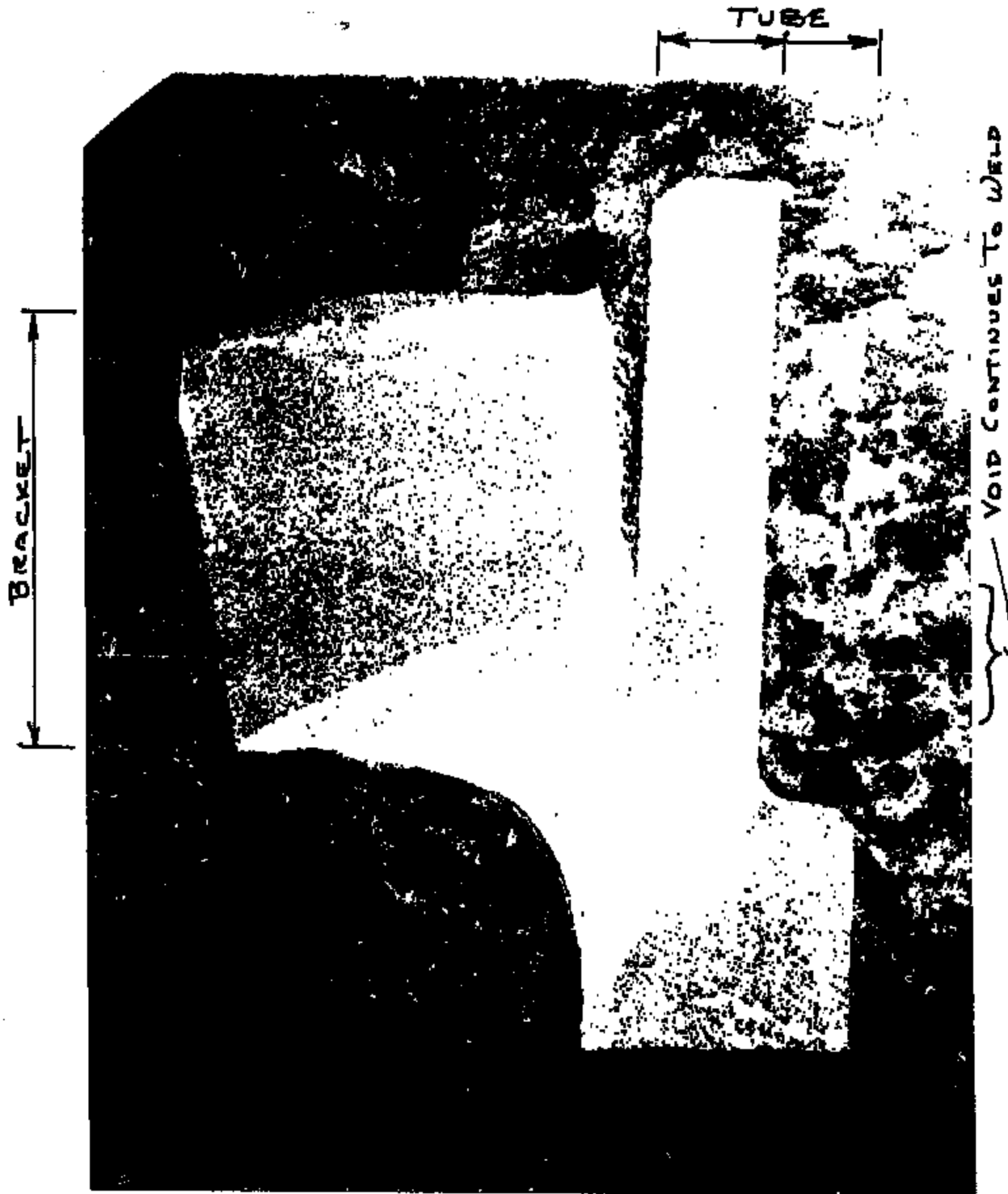




Above picture is the metallographic sample at 4.5 X magnification across the saw cut, after mounting, polishing and etching.

replaceable seal removed for above.





Cross section magnified 8.5 X approx. Original picture and sample prepared by Lehigh Laboratories.

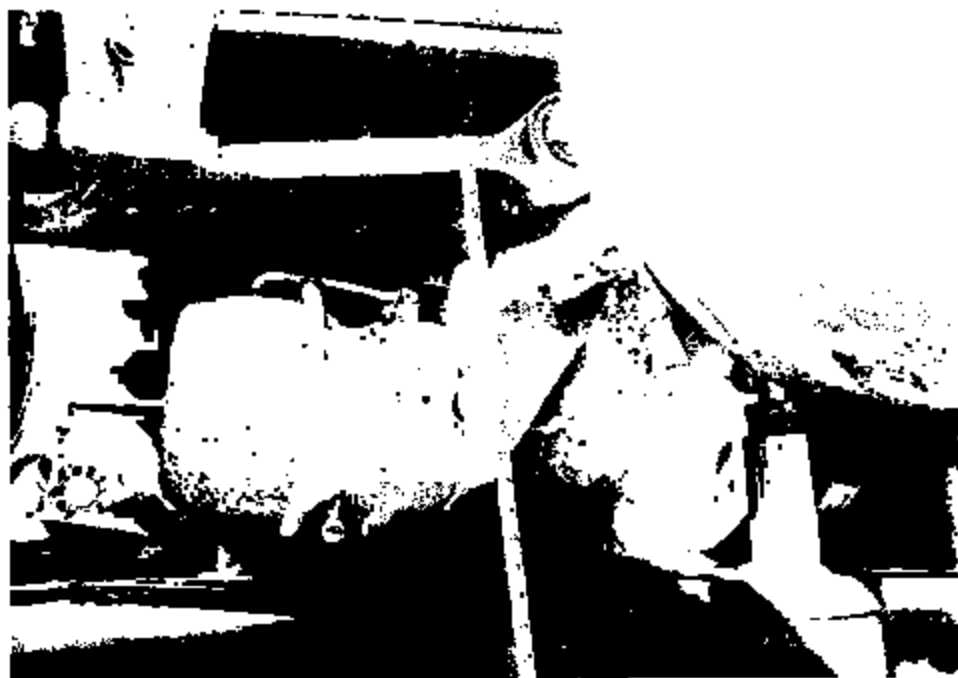


Bracket — Hanger U bolt (axle to frame)

These pictures make up a view of the S cam brake assembly at the left of the front rear axle as the viewer looks rearward. Note that the bracket on the brake shield at the right is wider than the equivalent bracket of the sample S cam brake assembly.

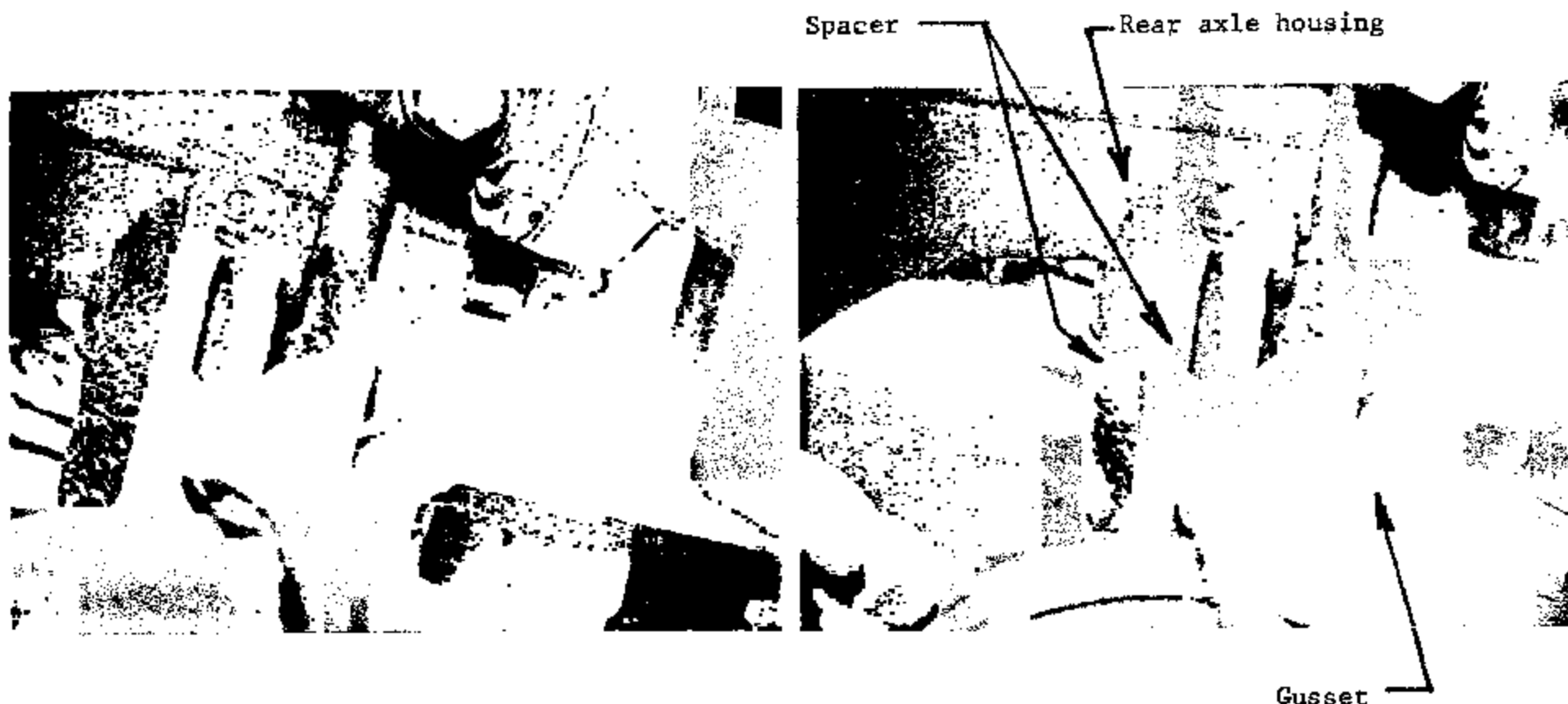
The bracket is touching the U bolt leaving marks although a spacer is in place to hold the S cam brake assembly some distance away from the axle housing.





Gusset

The pictures above are additional views of the air spring bracket at the U bolt, one of four each side of the axle, which hangs the rear axle beneath the frame. Also in one view is the gusset welded at the S cam tube and the bracket that is now furnished by the manufacturer (see failure #4 in Enclosure #4).



These pictures make up a view of a spacer mounted on the S cam brake to prevent any bending of the S cam tube that might touch or impact on the U bolt in the near vicinity. Because there is visible marking between the U bolt and the bracket and because the S cam brake assembly had to be pulled clear by considerable force by the State Inspector, Cole in his shop, there is reason to believe that this spacer was a quick fix that was ineffective.

In Conclusions above in the cover letter an alternate design to contend with the forces imposed suggests that the air spring chamber be revised to provide a second fixed mount of the S cam brake assembly. This pair of fixed mounts or attachments would be on the rear axle housing which is structurally sufficient with its mass that supports the axles to left and right wheels via a gear train with bearings and seal plus the brake shields.

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