

Trailer Systems Troubleshooting Guide

HOW TO USE THIS CHART

The purpose of the chart is to help you solve a specific problem in the pneumatic portion of a trailer air brake system with the assumption the foundation brake components and tractor pneumatics are in good repair.

Identify which system is malfunction. (Refer to how to check your system).

Identify your system from the schematics shown.

Identify the problem and select the solution recommended for that system.

CAUTION: WHEELS MUST BE BLOCKED.

CAUTION: SPRING BRAKE INSPECTION AND DISASSEMBLY MUST BE IN ACCORD WITH THE MANUFACTURER'S.

HOW TO CHECK YOUR SYSTEM

The most important factor in trailer troubleshooting is to determine if the malfunction is in the vehicle's "parking brake system" or the "service brake system". If the problem is "Neither air system is working", the fault may be mechanical.

All "Pre-121" or new "121" trailers have a "parking/emergency system" and a normally used "service brake system". The parking system works from the emergency (supply) line. The service system works from the service (control) line.

You can determine if the parking/emergency brakes operate by changing and then disconnecting the tractor emergency (supply) line.

The service brakes will operate with apply and release air in the service (control) line by the tractor hand control or foot control valve.

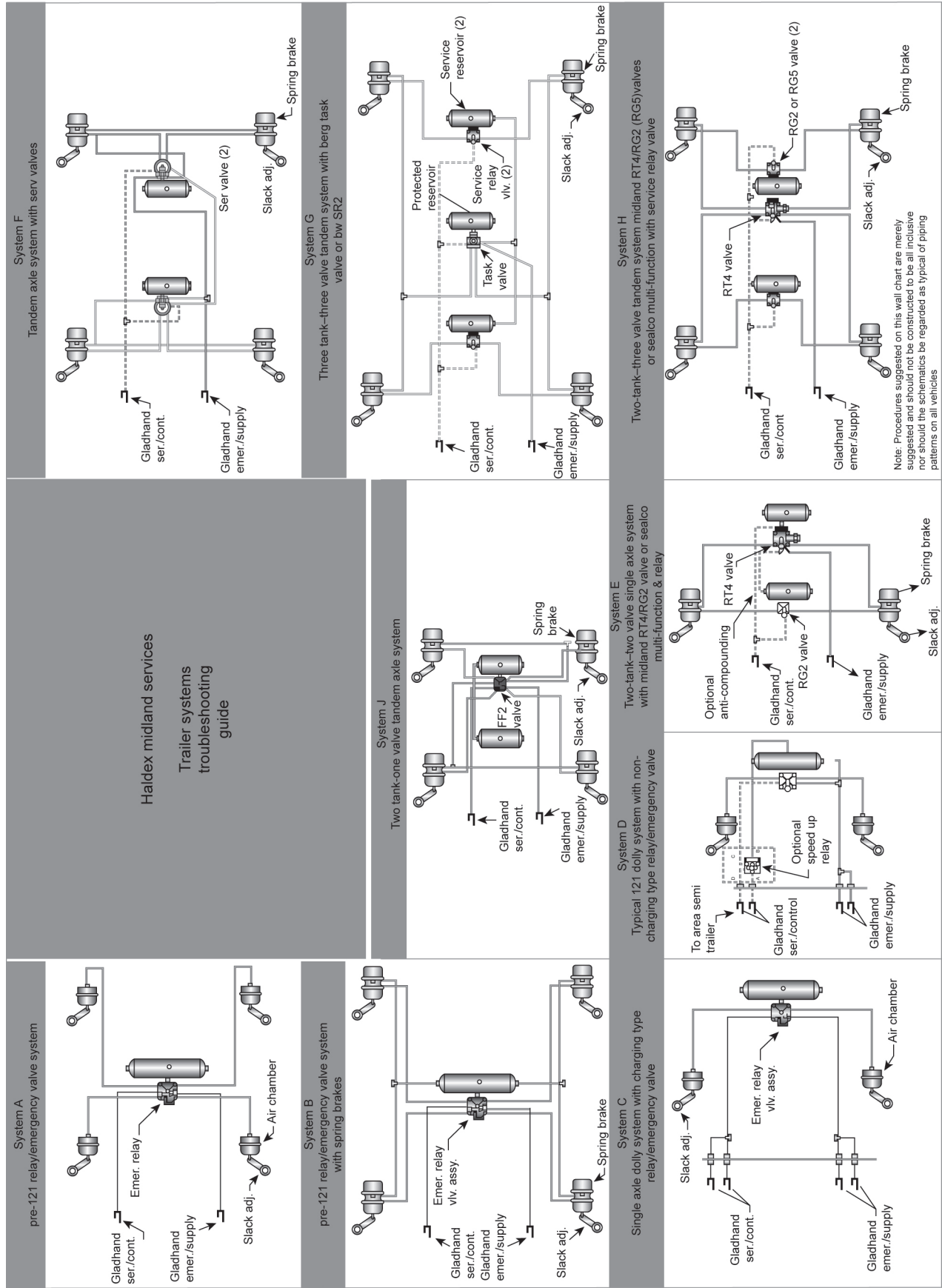
HOW TO IDENTIFY YOUR SYSTEM

All types of trailer air brake systems can be identified for troubleshooting purposes by starting from the brake chamber or spring brake assembly. This procedure will work for older "Pre-121" equipped trailers regardless of how many tanks and valves, or types of valves that you see.

If your trailer is equipped with chambers only—you are dealing with a system "A" for a trailer and systems "C" and "D" for a converter dolly. A "four-wheel" trailer may have chambers on the steerable axle—identify axle as a dolly system "C" or "D". If the vehicle is equipped with spring brakes you must determine which hose is the "parking/emergency" and which is the "service".

Follow the service hose from the service portion of the spring brake assembly. The hose will be connected to the service relay valve and it responsible for the application and release of the service brake only.

Follow the parking/emergency hose from the spring brake assembly and you will end up at the spring brake control valve. After you have identified your system, go directly to the Problem and Solution Section on the reverse side to remedy your situation.



Haldex midland services
Trailer systems troubleshooting guide

Note: Procedures suggested on this wall chart are merely suggested and should not be construed to be all inclusive nor should the schematics be regarded as typical of piping patterns on all vehicles

Problem

System letter and solution number

	A	B	C	D	E	F	G	H	J
Air leak at									
• Service brake chamber	1-2-3-4	--	1-2-3-4	1-2-3-4	--	--	--	--	--
• Spring brake with service brakes released and park brake applied	--	11-36-37	--	--	--	11-36-37	--	--	--
• Spring brake with service brakes released and spring brake released	--	6-11-36 or 37	--	--	6-11-36 or 37	6-11-36 or 37	6-11-36 or 37	6-11-36 or 37	6-11-36 or 37
• Spring brake with service brakes applied and spring brake released	--	6-25-36	--	--	6-25-36	6-25-36	6-25-36	6-25-36	6-25-36
• Emergency relay valve with service brake applied or released	42	33-36-37 or 37	42	51	--	--	--	--	--
• Emergency relay valve with emergency brake applied	42	42	42	51	--	--	--	--	--
• Service relay valve with service brake released and spring brake applied	--	--	--	--	38	--	38	38	53
• Service relay valve with service brake released and spring brake released	--	--	--	--	33-38	--	33-38	33-38	33-53
• Service relay valve with service brake applied and spring brake released	--	--	--	--	38	--	38	38	53
• Spring brake control valve with spring brake applied or released	--	--	--	--	40	--	39	40	53
• Trailer service gladhand on disconnect (with trailer supply pressurized)	42	42	42	51	24-40	43	24-39	24-40	24-53
• Trailer emergency gladhand on disconnect	42	42	42	51 or 52	--	43	32	--	--
• Trailer system leakage exceeds 2 p.s.i., per min. with service brakes applied	30	30	30	30	30	30	30	30	30
• SERV valve with service brake released and park brake applied	--	--	--	--	--	43	--	--	--
• SERV valve with service brake released and park brake released	--	--	--	--	--	33-43	--	--	--
• SERV valve with service brake applied and park brake released	--	--	--	--	--	43	--	--	--
System or component failure									
• Trailer brakes slow and sluggish	3-4-22- 44-45-46- 47	3-4-22- 44-45-46- 47	3-4-22- 44-45-46- 47	3-4-22- 44-45-46- 47	3-4-22- 44-45-46- 47	3-4-22- 44-45-46- 47	3-4-22- 44-45-46- 47	3-4-22- 44-45-46- 47	3-4-22- 44-45-46- 47
• Trailer brakes drag	3-4-13- 22-23-42	3-4-22- 23-27	3-4-22- 23-42	3-4-22- 23-51	3-4-13- 22-23-27- 37	3-4-13- 22-23-27- 37	3-4-13- 22-23-27- 37	3-4-13- 22-23-27- 37	3-4-13- 22-23-27- 37
• Trailer brakes won't apply (service)	3-4-14- 6-18-19	3-4-14- 6-18-19	3-4-14- 6-18-19	3-4-14- 14-18-19	3-4-14- 15-16-19	3-4-14- 15-16-19	3-4-14- 15-16-19	3-4-14- 15-16-19	3-4-14- 15-16-19
• Trailer emergency application too slow	22-28	22-28	22-28	22-28	22-28	22-28	22-28	22-28	22-28
• Park/Emer brakes won't release	7-17-18- 19-22-42	7-11-17- 18-19-22 42	7-17-18- 19-22-42	7-17-18- 19-22-51	7-11-17- 19-22 40	7-11-17- 19-22 43	7-11-17- 19-22 39 or 40	7-11-17- 19-22 40	7-11-17- 17-19-22 53
• Park/Emer brakes won't hold	3-4-19	3-4-36 or 37	19-32	19-32	3-4-36 or 37	3-4-36 or 37	3-4-36 or 37	3-4-36 or 37	3-4-36 or 37
• Park/Emer brakes won't apply	4-12-19- 42	4-12-19- 36 or 37 42	4-12-19- 42	4-12-19- 51	4-10-12- 36 or 37 40	4-10-19- 36 or 37 43	4-10-12- 36 or 37 39	4-10-12- 36 or 37 40	4-10-12- 36 or 37 53
• Air reservoir leaks or loose mounting	35	35	35	35	35	35	35	35	35
Brake balance									
• Semi-trailer "RUNS-UP" on tractor	4-22-45- 46-47-49	4-22-45- 46-47-49	4-22-46- 47-49	4-22-46- 47-49	4-22-45- 46-47-49	4-22-45- 46-47-49	4-22-45- 46-47-49	4-22-45- 46-47-49	4-22-45- 46-47-49
• Uneven brakes	3-4-22- 31-49	3-4-22- 31-49	3-4-22- 31-49	3-4-22- 31-49	3-4-22- 31-49	3-4-22- 31-49	3-4-22- 31-49	3-4-22- 31-49	3-4-22- 31-49
• Trailer brake lining wear excessive	45-50	27-44-50	44-50	44	27-44-50	27-44-50	27-44-50	27-44-50	27-44-50
• Trailer brake lining wear insufficient when compared to tractor	4-16-45- 46-47-49	4-16-45- 46-47-49	4-17-45- 46-47-49	4-16-45- 46-47-49	4-16-45- 46-47-49	4-16-45- 46-47-49	4-16-45- 46-47-49	4-16-45- 46-47-49	4-16-45- 46-47-49
• Trailer brakes slow to apply	4-19-22- 46-47	4-19-22- 46-47	4-19-22- 46-47	4-19-22- 46-47	4-19-22- 46-47	4-19-22- 46-47	4-19-22- 46-47	4-19-22- 46-47	4-19-22- 46-47
• Trailer brakes slow to release	8-22-42- 47-48	8-22-42- 47-46	8-22-42- 47-48	8-22-47- 48-51	8-22-38- 47-48	8-22-43- 47-48	8-22-38- 47-48	8-22-38- 47-48	8-22-38- 47-48
• Damaged foundation components due to brake compounding	--	29	--	24	24	--	24	24	24

ANOTHER PRODUCT FROM:

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Solution

1. Check service chamber at clamp housing push rod for damage.
2. Check service chamber diaphragm for rupture.
3. Check slack adjuster and chamber/spring brake push rod alignment for interference.
4. Assure slack adjuster and chamber/spring brake push rod angle 90° applied with proper adjustment.
5. Check all lines, valves, reservoirs, actuators for leakage.
6. Check spring brake for damage or loose clamp.
7. Assure jumper hoses are not crossed.
8. Assure functional return spring in service chamber or spring brake.
9. Assure air chamber size and slack adjuster arm length to original spec.
10. Assure spring brake control port has exhausted.
11. Check for ruptured spring brake diaphragm (furthest from slack adjuster).
12. Supply/emergency line must be at atmosphere.
13. Assure emergency line exceeds 100 psi pressure: check and maintain governor at max cut-in.
14. Assure air delivery to service gladhand.
15. Assure air delivery to service relay valve control port.
16. Assure air delivery to air chamber or spring brake.
17. Assure air delivery to emergency gladhand exceeds 100 psi.
18. Assure air delivery to emergency relay valve emergency port.
19. Assure air delivery to all reservoirs at system working pressure.
20. Assure air delivery to spring brake control valve control port.
21. Assure air delivery to control port on spring brake (port furthest from slack adjuster).
22. Assure open lines — no kinks, bends, closed shut-off cocks, restriction, excessive elbows.
23. Check for trapped service air pressure at trailer service/delivery hoses. If air pressure is noted, check for full release of all application valves (tractor/truck/trailer).
24. Trailer brakes which have a spring brake control valve can be compounded by the tractor air brake system. The compounding occurs when service air pressure is trapped in the trailer service line by the tractor protection valve when the supply line is released to atmosphere. Compounding is prevented by connecting the trailer service line to the appropriate port of the trailer spring brake control valve through a tee. Early spring brake control valve are equipped with a shuttle valve between the supply and service connections at the cover. The RT-4 has a one way check valve which prevents supply pressure from entering the service line: but will allow service pressure to vent at trailer supply coupling. System A,B,C,D and F will not compound the trailer brake system if connected as show on this chart.
25. Check for ruptured service brake diaphragm in spring brake (clamp nearest slack adjuster) after attention to damage or loose clamps.
26. Proceed same as for service-relay valve.
27. Assure spring brake is fully released with supply air at system pressure above 100 PSI on emergency side of spring brake.
28. Excessive volume imposed in supply/emergency line — ie: air pintle air chamber.
29. On a pre-121 exempt trailer utilizing an emergency relay valve, the spring brake emergency port should be plumbed directly to the tank.
30. Observe and determine which specific device, fitting or hose is leaking and replace.
31. Assure a leak free system by applying service brake and inspecting.
32. Note that some trailers may have the emergency/supply line piped to a single check valve at both tanks — one could be leaking.
33. Check for failure in spring brake center seal.
 - A. Block wheels and release park brake.
 - B. Check for air pressure leakage at service port of each spring brake until the leaking assembly is located. Replace leaking unit.
 - C. If no spring brake leakage is found see #41.
34. Confirm and replace with Type 30 diaphragm, N20130F; air chamber Type 30, KN36300.
35. Confirm and replace/use rubber grommets with integral brackets.
36. Confirm and replace with appropriate spring brake assembly: Type 30/30, 15431 or Type 24/30, 15425. Diaphragm Type 24/30 piggy back 15427.
37. Confirm and replace with Type 30/30 piggy back 15435, or Type 24/30 piggy back 15427
38. Confirm and replace with service relay valve. KN28550 (1/2 supply) or KN28551 (3/8 supply).
39. Confirm and replace with task spring brake control valve 12360.
40. Confirm and replace with RT4 spring brake control valve KN26000 (replaces Sealco ratio valves).
41. Assure adequate trailer brake function
42. Confirm and replace with emergency relay valve, A71890 (1/4 Del.) or A99036 (3/8 Del.).
43. Confirm and replace with FFV (Full Function Valve) System.
44. Assure adequate tractor brake function.
45. Assure adequate pressure and timing balance relative to tractor/trailer application.
46. Consider addition of "FAB Valve" to accelerate trailer timing.
47. Consider used of "jumper hose analyzer" and duplex gauge to pin-point brake imbalance.
48. Assure full mechanical release — foundation brake.
49. Assure "push-out" pressure or initial slack adjuster motion at 3 to 7 psi — at all brakes.
50. Proceed per problem "trailer brakes drag."
51. Confirm and replace with emergency relay valve (non-charging), A71891 or A71892.
52. Confirm and replace with pressure protection valve with one-way check, A80570 (50 psi) or A80571 (75 psi).
53. Confirm and replace with full function valve (FFV) KN28600 (3/4 Resv) or KN28601 (1/2 Resv).

Note: For further technical assistance contact your midland distributor, District manager, a task team member or call 800-643-2374 and ask for application specialist.