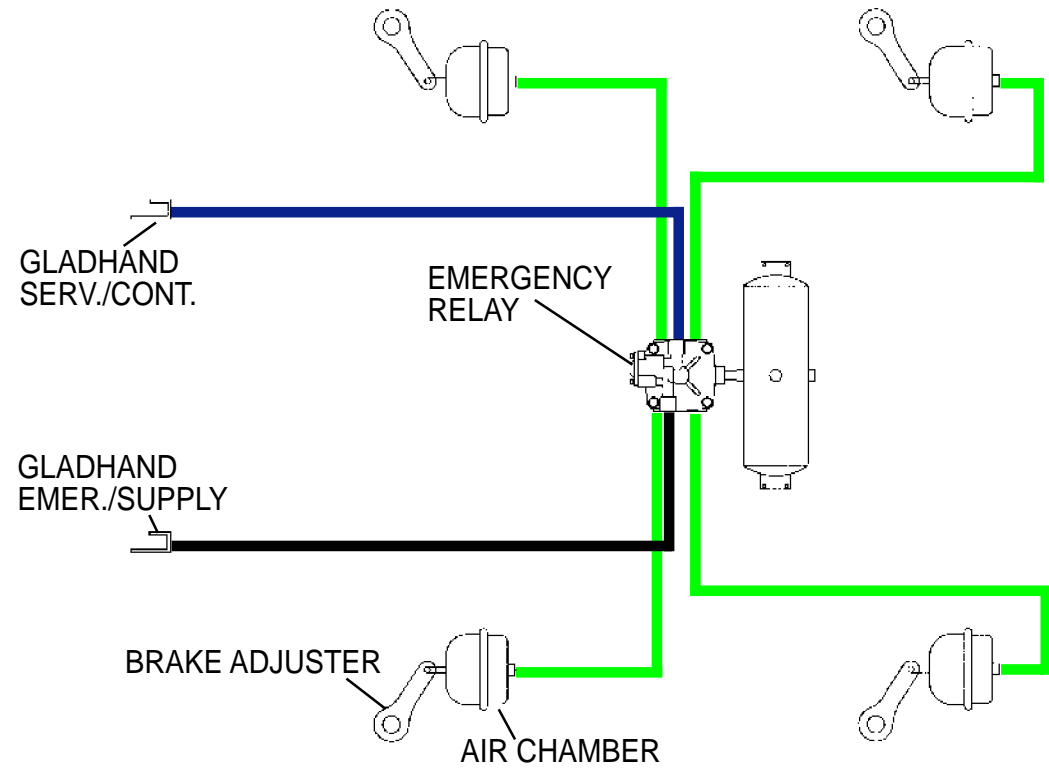
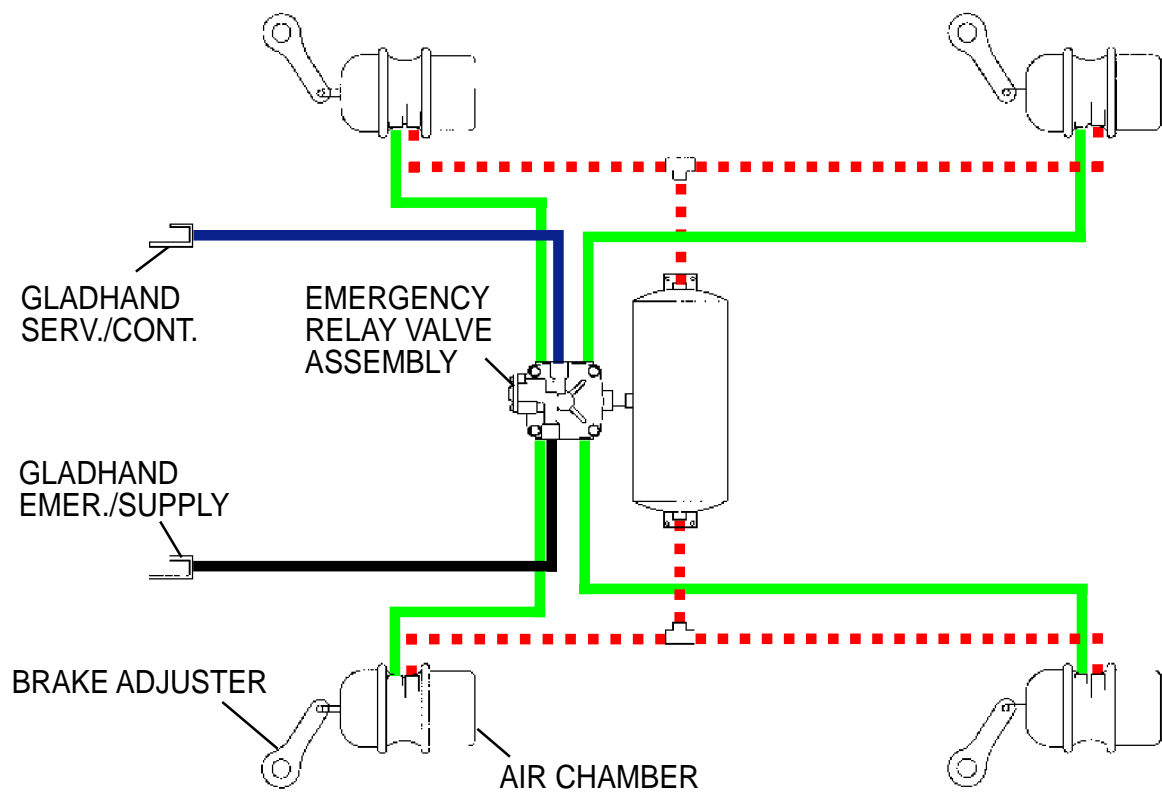


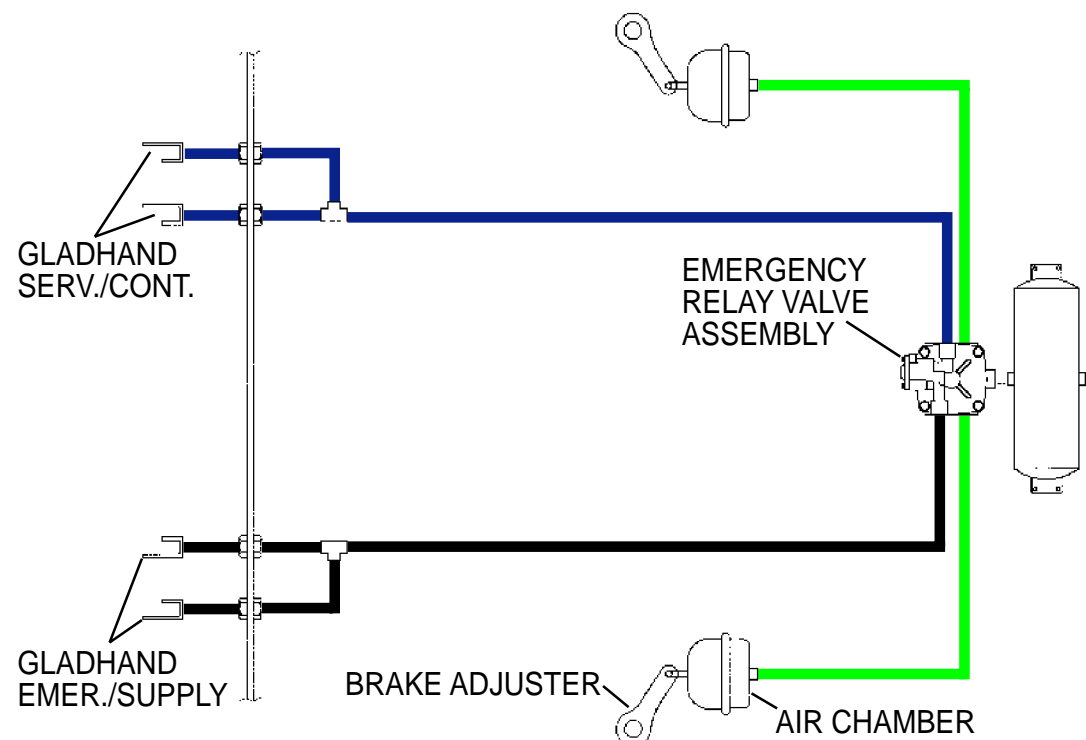
SYSTEM "A"
PRE-121 RELAY/EMERGENCY VALVE SYSTEM



SYSTEM "B"
PRE-121 RELAY/EMERGENCY VALVE SYSTEM WITH SPRING BRAKES



SYSTEM "C"
SINGLE AXLE DOLLY SYSTEM WITH CHARGING TYPE RELAY/EMERGENCY VALVE



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 malfunctioning. (Refer to how to check your system). 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 MANUFACTURERS PROCEDURE.

HOW TO CHECK YOUR SYSTEM

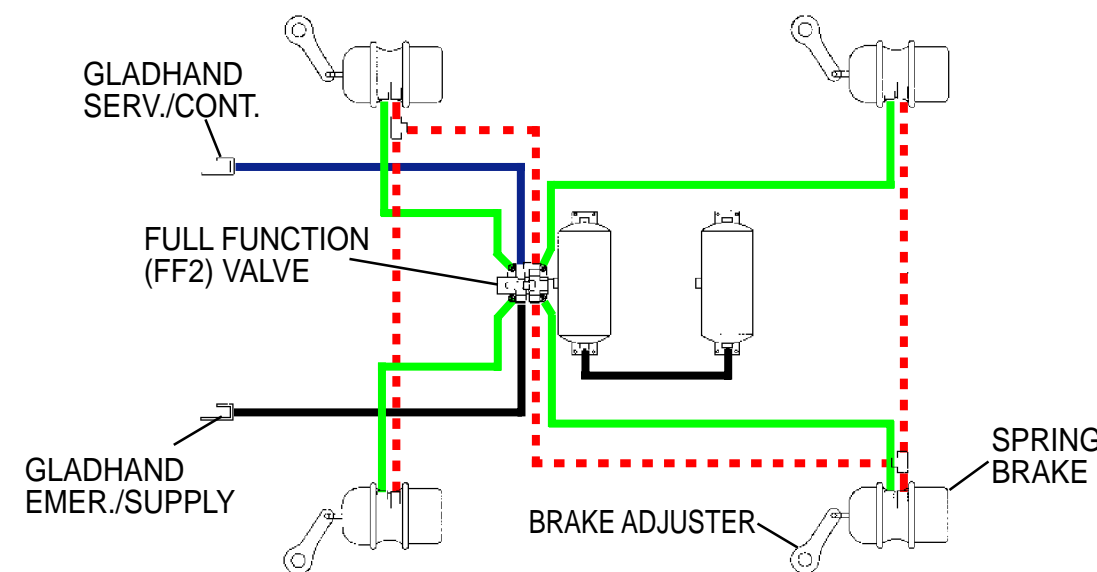
The most important factor in trailer troubleshooting is to determine if the malfunction is in the vehicle's "parking brake system" or the "service brake system". If the problem is "Neither air system is working", the fault may be mechanical. All "Pre-121" or new "121" trailers have a "parking/emergency 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 charging 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

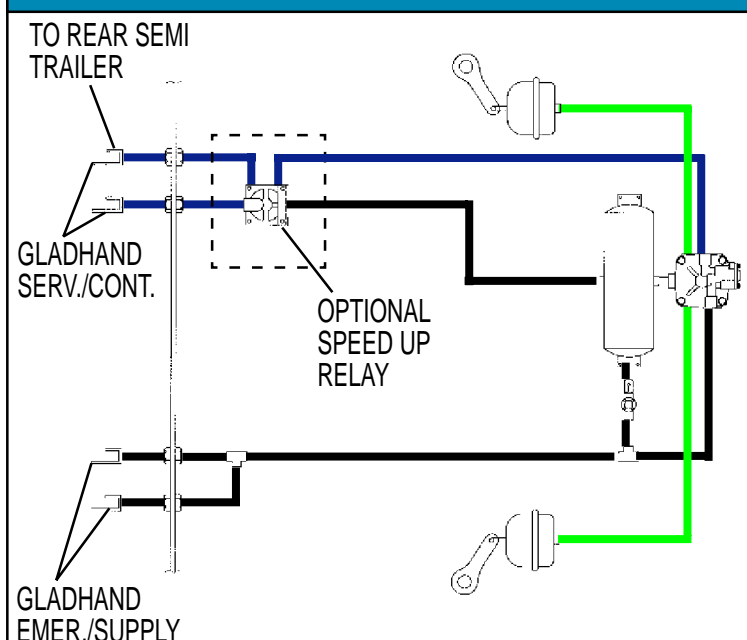
All types of trailer air brake systems can be identified for troubleshooting purposes by starting from the brake chamber or spring brake assembly. This procedure will work for older "Pre-121" equipped trailers regardless of how many tanks and valves, or types of valves that you see. If your trailer is equipped with chambers only – you are dealing with 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 is 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 Sections on the reverse side to remedy your situation.

— EMER./SUPPLY — SER./CONT. — SER./DEL. - - - - PARK/EMER. DEL.

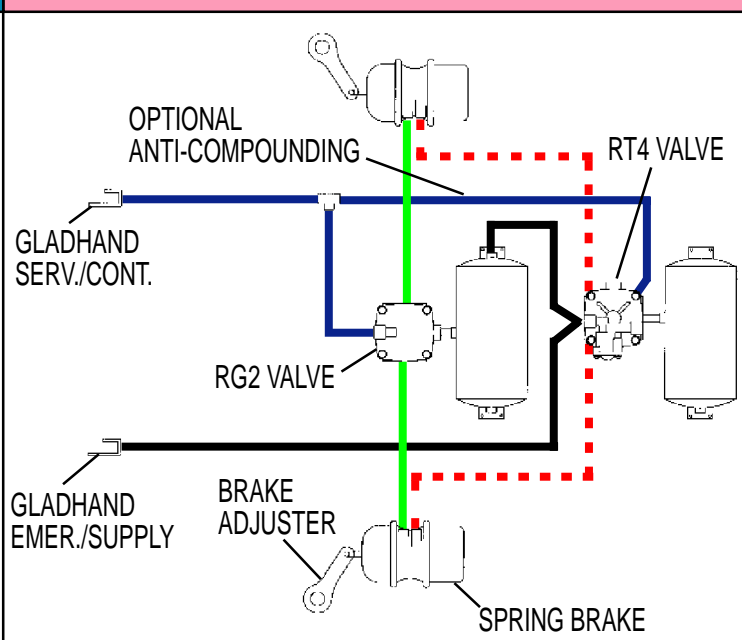
SYSTEM "J"
TWO TANK - ONE VALVE TANDEM AXLE SYSTEM



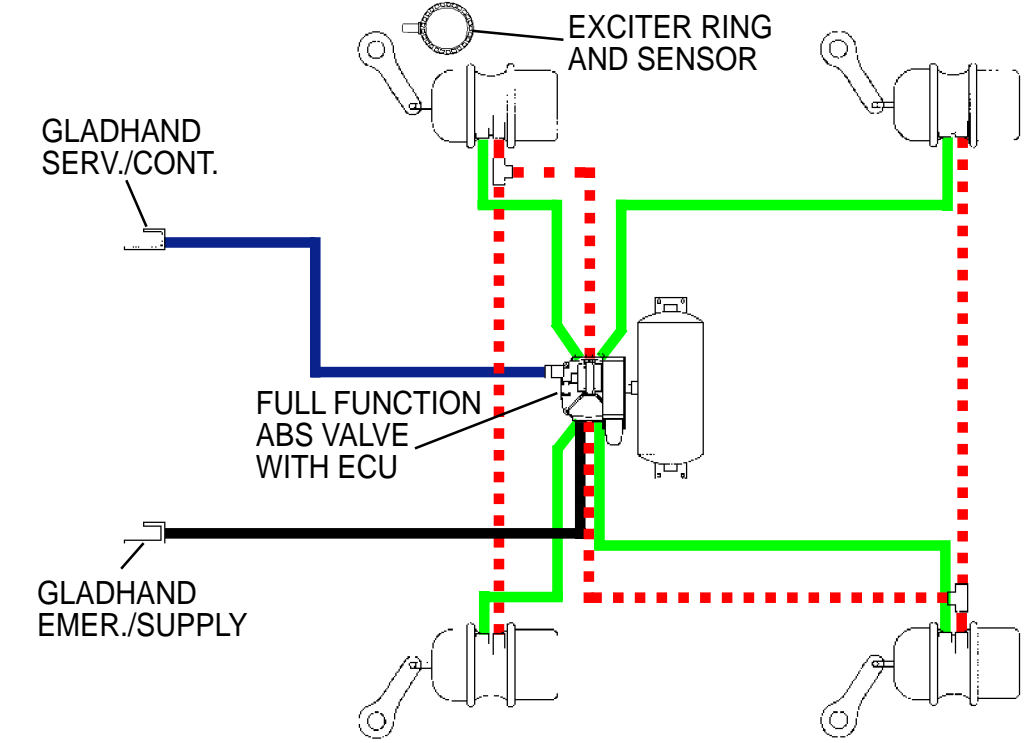
SYSTEM "D"
TYPICAL 121 DOLLY SYSTEM WITH NON-CHARGING TYPE RELAY/EMERGENCY VALVE



SYSTEM "E"
TWO TANK - TWO VALVE SINGLE AXLE SYSTEM WITH MIDLAND RT4/RG2 VALVE OR SEALCO MULTI-FUNCTION & RELAY

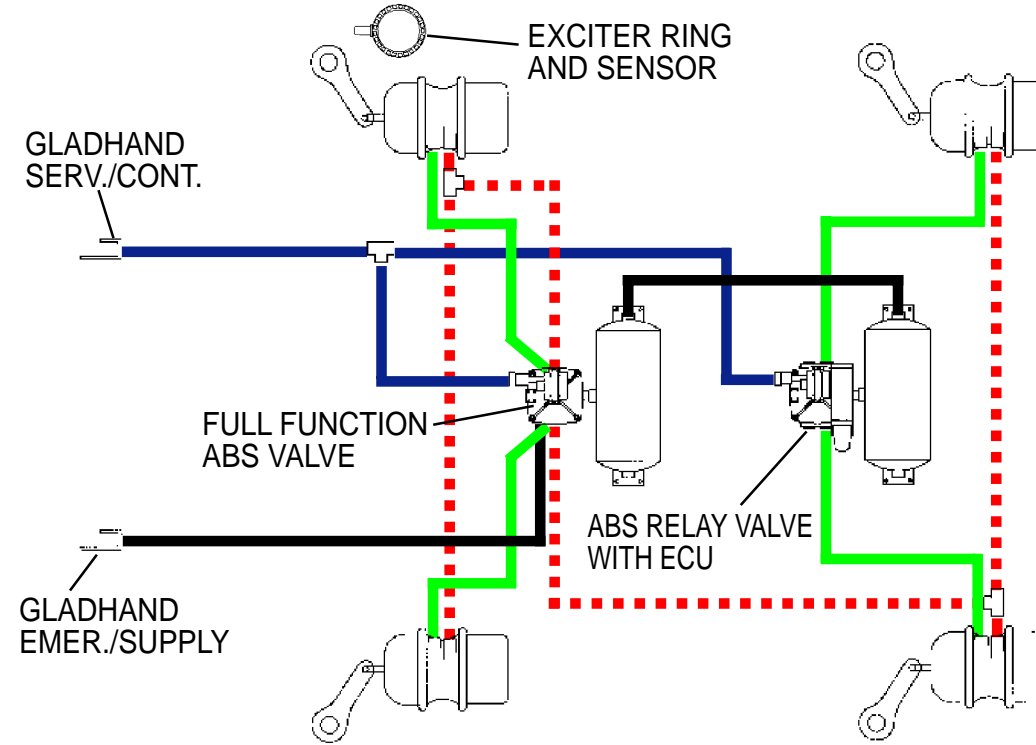


SYSTEM "F"
MOD-I FULL FUNCTION ABS 2S/1M



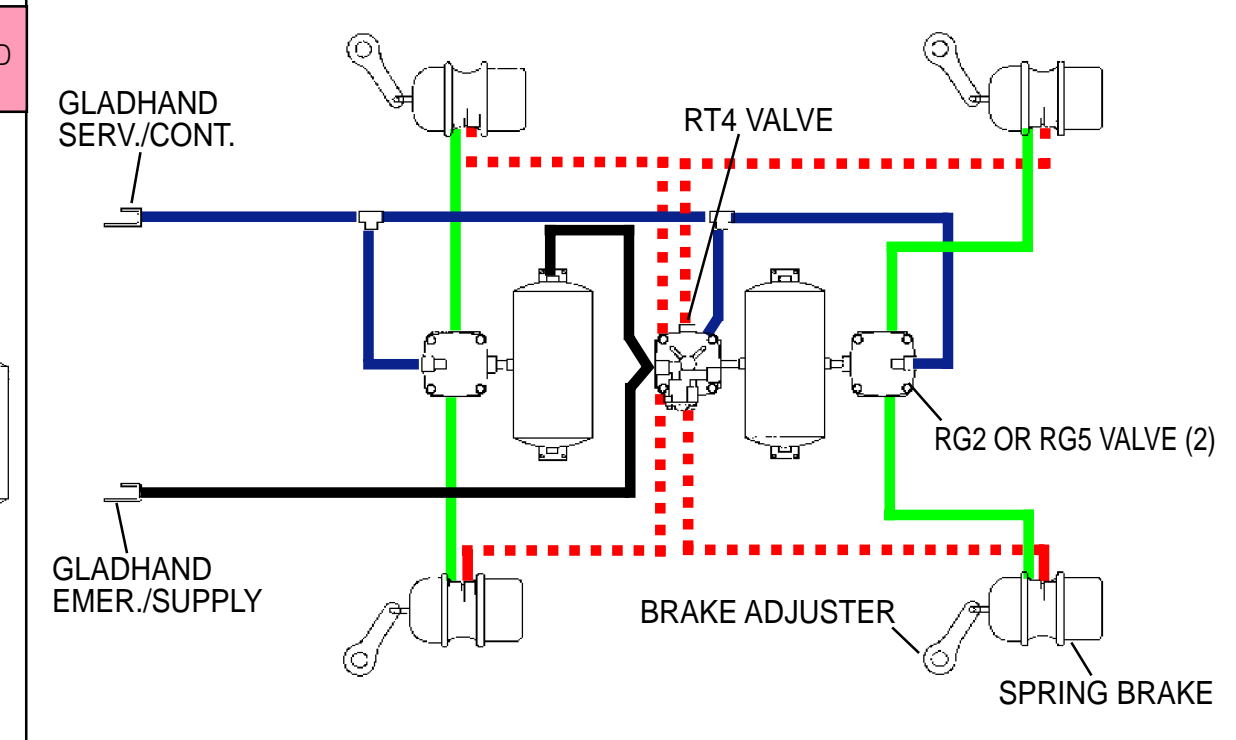
For ABS Troubleshooting, See ABS Diagnostic Troubleshooting Guide (L20293).

SYSTEM "G"
MOD-II ABS 4S/2M



For ABS Troubleshooting, See ABS Diagnostic Troubleshooting Guide (L20293).

SYSTEM "H"
TWO TANK - THREE VALVE TANDEM SYSTEM MIDLAND RT4/RG2 (RG5) VALVES OR SEALCO MULTI-FUNCTION WITH SERVICE RELAY VALVE



PROBLEM

SYSTEM LETTER AND SOLUTION NUMBER

SOLUTION

	A	B	C	D	E	F	G	H	J		
AIR LEAK AT											
• Service Brake Chamber	1-2-34	-	1-2-34	1-2-34	-	-	-	-	-	1. Check service chamber at clamp housing, push rod for damage.	27. Assure spring brake is fully released with supply air at system pressure above 100 psi on emergency side of spring brake.
• Spring Brake with Service Brakes Released & Park Brake Applied	-	11-36-37	-	-	-	-	-	-	-	2. Check service chamber diaphragm for rupture.	28. Excessive volume imposed in supply/emergency lines – ie: air pintle air chamber.
• Spring Brake with Service Brakes Released & Park 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	3. Check brake adjuster and chamber/spring brake push rod alignment for interference.	29. On a pre-121 exempt trailer utilizing an emergency relay valve, the spring brake emergency port should be plumbed directly to the tank.
• Spring Brake with Service Brakes Applied & Spring Brake Released	-	6-25-36	-	-	6-25-36	6-25-36	6-25-36	6-25-36	6-25-36	4. Assure brake adjuster and chamber/spring brake push rod angle 90° applied with proper adjustment.	30. Observe and determine which specific device, fitting or hose is leaking and replace.
• Emergency Relay Valve with Service Brake Applied or Released	42	33-36-37 or 42	42	51	-	-	-	-	-	5. Check all lines, valves, reservoirs, actuators for leakage.	31. Assure a leak free system by applying service brake and inspecting.
• Emergency Relay Valve with Emergency Brake Applied	42	42	42	51	-	-	-	-	-	6. Check spring brake for damage or loose clamp.	32. Note that some trailers may have the emergency/supply line piped to a single check valve at both tanks – one could be leaking.
• Service Relay Valve with Service Brake Released & Spring Brake Applied	-	-	-	-	38	54	54	38	53	7. Assure jumper hoses are not crossed.	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.
• Service Relay Valve with Service Brake Released & Spring Brake Released	-	-	-	-	33-38	33-54	33-54	33-38	33-53	8. Assure functional return spring in service chamber or spring brake.	34. Confirm and replace with Type 30 diaphragm, air chamber Type 30.
• Service Relay Valve with Service Brake Applied & Spring Brake Released	-	-	-	-	38	54	54	38	53	9. Assure air chamber size and brake adjuster arm length to original spec.	35. Confirm and replace/use rubber grommets with integral brackets.
• Spring Brake Control Valve with Spring Brake Applied or Released	-	-	-	-	40	54	54	40	53	10. Assure spring brake control port has exhausted.	36. Confirm and replace with appropriate spring brake assembly; Type 30/30 or Type 24/30. Diaphragm Type 24/30 PiggyBack.
• Trailer Service Gladhand on Disconnect (with Trailer Supply Pressurized)	42	42	42	51	24-40	54	54	24-40	53	11. Check for ruptured spring brake diaphragm (furthest from brake adjuster).	37. Confirm and replace with Type 30/30 PiggyBack or Type 24/30 PiggyBack.
• Trailer Emergency Gladhand on Disconnect	42	42	42	51 or 52	-	-	-	-	-	12. Supply/emergency line must be at atmosphere.	38. Confirm and replace with service relay valve 1/2 supply or 3/8 supply.
• Trailer System Leakage Exceeds 2 p.s.i., per min. with Service Brakes Applied	30	30	30	30	30	30	30	30	30	13. Assure emergency line exceeds 100 psi pressure; check and maintain governor at max cut-in.	39. Confirm and replace with task spring brake control valve.
• SERV Valve with Service Brake Released & Park Brake Applied	-	-	-	-	-	-	-	-	-	14. Assure air delivery to service gladhand.	40. Confirm and replace with RT-4 spring brake control valve (replaces Sealco ratio valves).
• SERV Valve with Service Brake Released & Park Brake Released	-	-	-	-	-	-	-	-	-	15. Assure air delivery to service relay valve control port.	41. Assure adequate trailer brake function.
• SERV Valve with Service Brake Applied & Park Brake Released	-	-	-	-	-	-	-	-	-	16. Assure air delivery to air chamber or spring brake.	42. Confirm and replace with emergency relay valve, 1/4 Delivery or 3/8 Delivery.
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	17. Assure air delivery to emergency gladhand exceeds 100 psi.	43. Confirm and replace with FFV (Full Function Valve) System.
• 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	18. Assure air delivery to emergency relay valve emergency port.	44. Assure adequate tractor brake function.
• Trailer Brakes Won't Apply (Service)	3-4-14-16-18-19	3-4-14-16-18-19	3-4-14-16-18-19	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	19. Assure air delivery to all reservoirs at system working pressure.	45. Assure adequate pressure and timing balance relative to tractor/trailer application.
• Trailer Emergency Application Too Slow	22-28	22-28	22-28	22-28	22-28	22-28	22-28	22-28	22-28	20. Assure air delivery to spring brake control valve control port.	46. Consider addition of "FAB Valve" to accelerate trailer timing.
• Park/Emergency 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	7-11-13-17-19-22-54	7-11-13-17-19-22-54	7-11-17-19-22-40	7-11-13-17-19-22-53	21. Assure air delivery to control port on spring brake (port furthest from brake adjuster).	47. Consider use of "jumper hose analyzer" and duplex gauge to pin-point brake imbalance.
• Park/Emergency 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	22. Assure open lines – no kinks, bends, closed shut-off cocks, restrictions, excessive elbows.	48. Assure full mechanical release – foundation brake.
• Park/Emergency 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	4-10-12-36 or 37-54	4-10-12-36 or 37-54	4-10-12-36 or 37-40	4-10-12-36 or 37-53	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).	49. Assure "push-out" pressure or initial brake adjuster motion at 3 to 7 psi – at all brakes.
• Air Reservoir Leaks or Loose Mounting	35	35	35	35	35	35	35	35	35	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 valves 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 lines; but will allow service pressure to vent at trailer supply coupling. Systems A, B, C, D will not compound the trailer brake system if connected as shown on this chart.	50. Proceed per problem "trailer brakes drag."
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	25. Check for ruptured service brake diaphragm in spring brake (clamp nearest brake adjuster) after attention to damage or loose clamps.	51. Confirm and replace with emergency relay valve (non-charging).
• 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	26. Proceed same as for service relay valve.	52. Confirm and replace with pressure protection valve with one-way check, 50 psi or 75 psi.
• 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		53. Confirm and replace with full function valve (FFV). FFV has built-in anti-compounding feature.
• 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		54. Confirm and replace with spring brake priority or service brake priority (FFABS) ABS full function valve.
• 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	8-22-42-47-48	8-22-42-47-48	8-22-47-48-51	8-22-38-47-48	8-22-38-47-48	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	54	54	24	53		

NOTE: FOR FURTHER TECHNICAL ASSISTANCE CONTACT YOUR HALDEX SERVICES DISTRIBUTOR, DISTRICT MANAGER, A TECHNICAL SERVICE REPRESENTATIVE OR CALL (800) 643-2374 AND ASK FOR A TECHNICAL ADVISOR.

