

121
DUAL AIR BRAKE SYSTEM
TEST & CHECK LIST

"FINDING TOMORROW'S FAILURE BEFORE IT OCCURS!"

The five tests outlined in this program have been designed to discover the presence of air leaks and/or sluggish performance in the Dual Air Brake Pneumatic System. The entire system, from the compressor through to the actuators at the spring brakes, can be easily diagnosed in a short period of time by performing these tests.

After completion, you will know whether or not the system is building pressure rapidly enough, if there is any leakage and if the emergency components are functioning properly.

In some cases, you may find that corrections will need to be made. Each test contains a corresponding check list that will give you a guide to the more common causes that prevented the vehicle from passing the test. Please note that these are static leakage tests only. They must not be interpreted as overruling the importance and necessity of functional, dynamic controllability tests and other tests required in assuring vehicle safety and performance.

Before You Begin Testing The Air Brake System, Perform The Following Checks:

1. Examine all tubing for signs of kinks or dents.
2. Examine all hoses for signs of wear, drying out or overheating.
3. Check suspension of all tubing. It should be supported and not vibrate.
4. Check suspension of all hoses. Position so that hose will not abrade or be subject to excessive heat.

We have designed this test and check list so that any vehicle can be quickly and easily checked. When the tests are completed and the necessary repairs are made, we suggest it be kept together with the vehicles permanent maintenance records.

Bendix

121 Dual Air Brake System
TEST & CHECK LIST

DATE:
TRUCK MILEAGE:
TRAILER: MILEAGE:
MECHANIC:

TEST 1 • GOVERNER CUT-OUT • LOW PRESSURE WARNING • PRESSURE BUILD-UP

VEHICLE PARKED, WHEELS CHOCKED	OK	NOT OK
1. Drain all reservoir to 0 PSI		
2. Start engine (run at fast idle) (Low pressure warning should be on. Note: on some vehicles with anti-lock, warning light will also come on momentarily when ignition is turned on.)	❑	❑
3. Low pressure warning (Dash warning light should go off at or above 60 PSI)	❑	❑
4. Build up time (Pressure should build from 85-100 PSI within 40 seconds)	❑	❑
5. Governor cut-out, Cuts out at correct pressure (Check manufacturers recommendations; usually between 100-130 PSI)	❑	❑
6. Governor cut-in, Reduce service air pressure to governor cut-in. The difference between cut-in and cut-out pressure must not exceed 25 PSI.	❑	❑

MAKE ALL NECESSARY REPAIRS BEFORE PROCEEDING TO TEST 2; SEE CHECKLIST 1 FOR COMMON CORRECTIONS.

Check List 1

If the low pressure warning light or buzzer doesn't come on:

1. Check wiring.
2. Check bulb.
3. Repair or replace the buzzer, bulb or low pressure warning switch(es).

If governor cut-out is higher or lower than specified by the vehicle manual:

1. Adjust the governor using a gauge of known accuracy.
2. Repair or replace governor as necessary after being sure compressor unloader mechanism is operating correctly.

If low pressure warning occurs below 60 PSI:

1. Check dash gauge with test gauge known to be accurate.
2. Repair or replace the faulty low pressure indicator.

If build up time exceeds 40 seconds or is considerably greater than the permanent record figure:

1. Examine the compressor air strainer and clean or replace.
2. Check for restricted inlet line if compressor does not have strainer, repair or replace as necessary.
3. Check compressor discharge port and line for excessive carbon. Clean or replace as necessary.
4. With system charged and governor compressor in unloaded mode, listen at the compressor inlet for leakage. If leakage can be heard apply a small amount of oil around unloader pistons. If no leakage is indicated, then leakage is through the compressor discharger valves.
5. Check the compressor drive for slippage.

RETEST TO CHECK OUT ALL ITEMS REPAIRED OR REPLACED

TEST 2 LEAKAGE (RESERVOIR AIR SUPPLY)

FULL PRESSURE, ENGINE STOPPED, PARKING BRAKES APPLIED	OK	NOT OK
1. Allow pressure to stabilize for at least 1 minute.		
2. Observe the dash gauge pressures for 2 minutes and note any pressure drop.		
A. Pressure Drop: Single Vehicle (A 4 PSI drop within 2 minutes is allowable for either service reservoir)	❑	❑
B. Pressure Drop: Tractor/Trailer (A 6 PSI drop within 2 minutes is allowable for either service reservoir)	❑	❑
C. Pressure Drop: Tractor/2 Trailers (An 8 PSI drop within 2 minutes is allowable for either service reservoir)	❑	❑

MAKE ALL NECESSARY REPAIRS BEFORE PROCEEDING TO TEST 3; SEE CHECK LIST 2 FOR COMMON CORRECTIONS.

Check List 2

IF THERE IS EXCESSIVE LEAKAGE IN THE SUPPLY SIDE OF THE PNEUMATIC SYSTEM, ONE OR MORE OF THE FOLLOWING DEVICES COULD BE CAUSING THE PROBLEM:

NOTE: (A leak detector or soap solution will aid in locating the faulty component)

1. Supply lines and fittings (tighten)
2. Low pressure indicator(s)
3. Relay valves (antilock modulators)
4. Relay valve (an option for spring brakes)
5. Dual brake valve
6. Trailer control valve
7. Park control valve
8. Tractor protection valve
9. Spring brake actuators
10. Safety valve in supply reservoir
11. Governor
12. Compressor discharge valves

***RETEST TO CHECK OUT ALL ITEMS REPAIRED OR REPLACED**

TEST 3 LEAKAGE (SERVICE AIR SUPPLY)

FULL PRESSURE, ENGINE STOPPED, PARKING BRAKES RELEASED	OK	NOT OK
1. Make and hold brake application (A block of wood can be used to hold the foot valve down during these tests)		
2. Allow pressure to stabilize for 1 minute; then begin timing for 2 minutes while watching the dash gauges for a pressure drop.		
A. Pressure Drop: Single Vehicle (A 6 PSI drop within 2 minutes is allowable for either service reservoir)		
B. Pressure Drop: Tractor/Trailer (An 8 PSI drop within 2 minutes is allowable for either service reservoir)	❑	❑
C. Pressure Drop: Tractor/2 Trailers (A 10 PSI drop within 2 minutes is allowable for either service reservoir)	❑	❑
3. Check brake chamber push rod travel (Refer to chart for allowable tolerances)	❑	❑

Brake Chamber Size	Maximum Stroke Before Readjustment
12	1-1/8”
16	1-3/4”
20	1-3/4”
24	1-3/4”
30	2”

4. Check the angle formed between the brake chamber push rod and slack adjuster arm. (It should be at least 90° in the fully applied position) ❑ ❑

MAKE ALL NECESSARY REPAIRS BEFORE PROCEEDING TO TEST 4; SEE CHECKLIST 3 FOR COMMON CORRECTIONS

Check List 3

If there is excessive leakage in the service side of the pneumatic system, one or more of the following devices could be causing the problem.

NOTE: A leak detector or soap solution will aid in locating the faulty component

1. Service lines and fittings (tighten)
2. Trailer control valve
3. Stoplight switch
4. Brake chamber diaphragms
5. Tractor protection valve
6. Relay valves (antilock modulators)
7. Service brake valve
8. Front axle ratio valve (optional)
9. Inverting relay spring brake control valve (optional) straight trucks and buses
10. Double check valve.

If the angle between the brake chamber push rod and slack adjuster arm is less than 90° then adjust slack adjuster arm to obtain desired setting.

If brake chamber push rod travel exceeds the allowable tolerance, then adjust adjuster arm to obtain desired setting.

***RETEST TO CHECK OUT ALL ITEMS REPAIRED OR REPLACED**

TEST 4 MANUAL EMERGENCY SYSTEM

	OK	NOT OK
FULL PRESSURE, ENGINE IDLING 600-900 RPM		
FOR STRAIGHT TRUCKS, BUSES AND BOBTAIL TRACTOR:		
1. Manually operate the park control valve and note that parking brakes apply and release promptly as control valve button is pulled out and pushed in.	❑	❑
FOR TRACTOR/TRAILER COMBINATIONS:		
1. Manually operate tractor protection control valve (trailer supply valve usually red octagonal button). Note that trailer brakes apply and release promptly as control button is pulled out and pushed in.	❑	❑
2. Manually operate system park control (usually yellow diamond button) and note all parking brakes (tractor and trailer) apply promptly.	❑	❑

MAKE ALL NECESSARY REPAIRS BEFORE PROCEEDING TO TEST 5; SEE CHECKLIST 4 FOR COMMON CORRECTIONS

Check List 4

If sluggish performance is noted in either test, check for:

1. Dented or kinked lines
2. Improperly installed hose fitting
3. A faulty relay emergency valve
4. A faulty modulator(s)

If the trailer brakes do not actuate and the trailer supply line remains charged, check the:

1. Tractor protection control
2. Trailer spring brake valve

***RETEST TO CHECK OUT ALL ITEMS REPAIRED OR REPLACED**

TEST 5 AUTOMATIC EMERGENCY SYSTEM

	OK	NOT OK
FULL PRESSURE, ENGINE STOPPED		
1. Drain front axle reservoir to 0 PSI. A. Rear axle reservoir should not lose pressure	❑	❑
B. On combination vehicles, the trailer air system should remain charged	❑	❑
C. Tractor and trailer brakes should not apply automatically	❑	❑
2. With no air pressure in the front axle reservoir make a brake application. A. Rear axle brakes should apply and release	❑	❑
B. On combination vehicles the trailer brakes should also apply and release	❑	❑
C. The stop lamps should light	❑	❑
3. Slowly drain rear axle reservoir pressure. A. Spring brake push pull valve should pop out between 35 & 45 PSI.	❑	❑
B. Tractor protection valve should close between 45 PSI and 20 PSI and trailer supply hose should be exhausted	❑	❑
C. Trailer brakes should apply after tractor protection closes	❑	❑
4. Close drain cocks, recharge system and drain rear axle reservoir to 0 PSi. A. Front axle reservoir should not lose pressure	❑	❑
B. On combination vehicles the trailer air system should remain charged	❑	❑
5. With no air pressure in the rear axle reservoir, make a brake application. A. Front axle brakes should apply and release	❑	❑
B. On combination vehicles the trailer brakes should also apply and release	❑	❑
C. If the vehicle is equipped with an inverting relay spring brake control valve, the rear axle brakes should also apply and release	❑	❑

Check List 5

If the vehicle fails to pass the tests outlined, then check the following components for leakage and proper operation:

1. Fittings
2. Kinked hose or tubing
3. Single check valves
4. Double check valves
5. Tractor protection valve
6. Tractor protection control valve
7. Parking control valve
8. Relay valves (antilock modulators)
9. Trailer spring brake control valve
10. Inverting relay spring brake control valve (optional) straight trucks and buses

***RETEST TO CHECK OUT ALL ITEMS REPAIRED OR REPLACED**

NEED PARTS?

DON'T SETTLE FOR LESS THAN GENUINE BENDIX REPLACEMENT PARTS, MAINTENANCE KITS OR A NEWLY REBUILT UNIT THAT'S BACKED BY A NEW UNIT WARRANTY.

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BENDIX PARTS DISTRIBUTOR OUTLET

USE THE FORM BELOW TO RECORD PARTS REPLACED AND WORK PERFORMED.

TYPE OR MODEL	DEVICE	PIECE NO.	REPAIRED	REPLACED
_____	COMPRESSOR	_____	❑	❑
_____	GOVERNOR	_____	❑	❑
_____	DUAL BRAKE VALVE	_____	❑	❑
_____	PARK CONTROL VALVE	_____	❑	❑
_____	TRACTOR PROTECTION VALVE	_____	❑	❑
_____	LOW PRESSURE INDICATOR	_____	❑	❑
_____	TRAILER SUPPLY VALVE	_____	❑	❑
_____	FRONT AXLE RATIO VALVE	_____	❑	❑
_____	DOUBLE CHECK VALVE	_____	❑	❑
_____	RESERVOIR CHECK VALVE	_____		
_____	STOP LIGHT SWITCH/		❑	❑
	DOUBLE CHECK VALVE	_____	❑	❑
_____	CHAMBER DIAPHRAGM	_____	❑	❑
_____	_____	_____	❑	❑
_____	_____	_____		

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