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BRAKE SYSTEMS AND COMPONENTS

APPLICATION

This inspection applies to all vehicles.

PROCEDURE AND STANDARDS

Brake Components

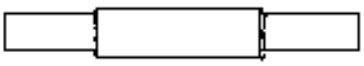
Check the condition, security and operation of brake rods, relays, levers, including slack adjusters, clevis joints, linkages, cables, flexible and rigid pipes.

Check the condition and security of brake drums, back plates and shoes, discs, callipers, pads including friction material.

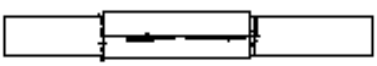
Note:

- A rod or lever reduced by more than one third of its original diameter is considered a failure.
- A pipe with its wall thickness reduced by more than one third of its original thickness is considered a major or dangerous deficiency depending upon severity.
- Cables, less than 10% of the wires fractured is not regarded as a reason for failure unless there is bunching, or likelihood of bunching, where the cable enters an outer cable, guide or sleeve (cables are usually made up of strands each containing a number of wires).
- A hose should be rejected for surface cracking or damage by chafing only if the reinforcement is visible.
- Repairs to metal air brake pipes by sleeving are acceptable, providing the repair appears to be good and sound. A pipe repaired in-situ by brazing is not considered acceptable. Repairs to hydraulic brake pipes are not acceptable. Compression joints of the type using separate ferrules are not considered suitable for joints on hydraulic pressure lines.

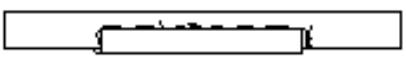
Pass



Fail



Fail



- Guidance on sleeved repairs of metal brake pipes (sleeving is not acceptable on plastic brake pipes).
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- The air pipe between the compressor and the reservoir is to be taken as a brake pipe.

- Slack adjusters; up to 9.5 mm radial movement at a radius of 150 mm is considered acceptable within the slack adjuster and between the slack adjuster and cam cross shaft. Slack adjusters must have a secure fastening to the cross shaft including a locking device

- Check that automatic slack adjusters are fitted to vehicles and trailers on which they are mandatory motor vehicles first used from 1 April 1995 and check presence, condition and security of control brackets for all vehicles fitted with lever type automatic slack adjusters.

- Check and compare travel of automatic slack adjusters across the same axle when service brakes are applied, and check that automatic slack adjuster levers return fully when brakes are released.

Disc Brakes

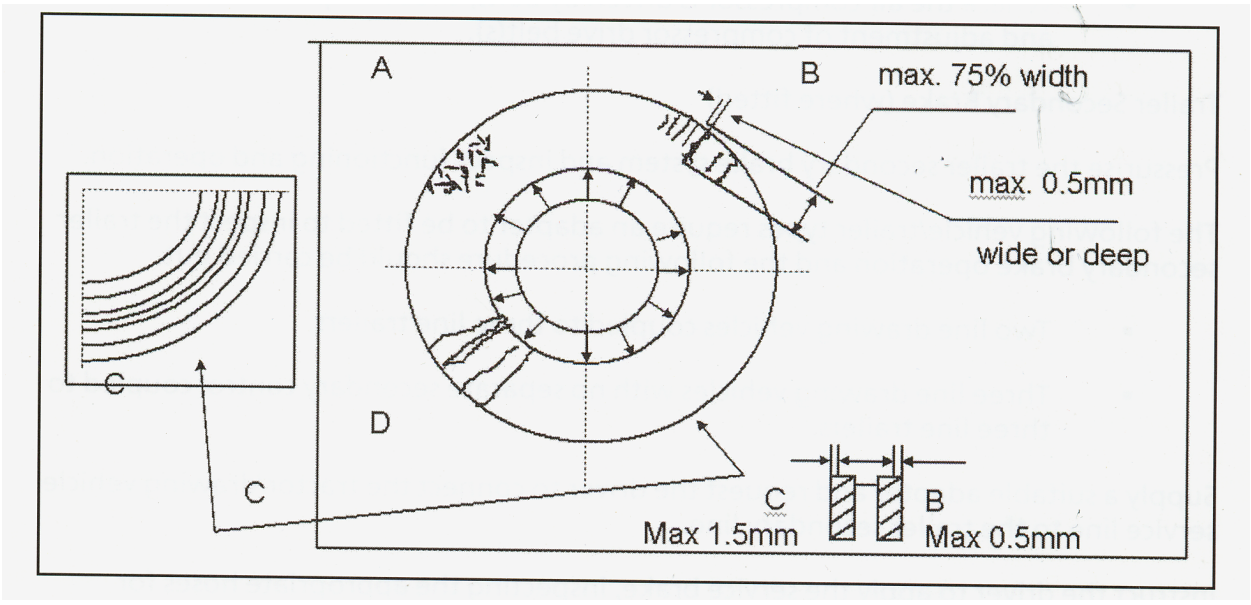
The diagram below shows the type of damage which is likely to be found on brake discs and gives guidance on how much damage is acceptable before failing the vehicle. This should be a visual assessment.

A. Interlinked cracks or surface crazing is acceptable

B. Cracks running towards hub centre up to max 75% of the width of the friction surface, and a maximum of 1.5mm wide or deep is acceptable

C. Unevenness in the disc surface less than 1.5mm is acceptable

D. Cracks running from edge to centre is not acceptable



Brake drum fracture is not acceptable

Reservoirs (The term reservoir includes accumulators and other types of vacuum & pressure vessels).

- Check for condition, security and leaks.

- Brake Actuators, Hydraulic Master & Wheel Cylinders, Valves and Servos.

- Check for operation, condition, security and leaks.

Damp patches around valves or adjacent components are not a Reason for Failure. Only where there is evidence of heavy discharge of oil from the valve at the time of test should there be a failure.

Note:
To check the condition of brake pipes, valves, hydraulic master & wheel cylinders it will be necessary to ask the other examiner to pressurise the braking systems. There is no requirement for a specific check on the operation of all valves, however where it is obvious that a valve is malfunctioning during any stage of the test, this is a Reason for Failure.

When assessing the significance of leaks, it should be remembered that certain pneumatic components are subject to leakage to some degree.

Vented master cylinders as fitted in particular to some Bedford vehicles may be subject to some dampness around the vent, due to fluid in the bores of the cylinder used to lubricate the piston seals, this should not be treated as a defect.

Hydraulic brake fluid and fluid level checks are confined to transparent reservoirs or where an indicator is fitted. Reservoir caps should not be removed.

Load Sensing Valves: Vehicles first used before 1 April 1983 should not be failed where a load-sensing valve has been removed.

There are many types of load sensing valves fitted to vehicles, employing different methods of operation. Care must therefore be exercised when deciding if a valve is defective or not.

Certain vehicles with anti-lock braking systems or which otherwise comply with the requirements of the Brake Directive do not require load sensing valves.

Missing or illegible Load Sensing Valve (LSV) plate only applies to the following;

Bus first used on or after 29th October 2011

Quick Release Valves/Spring Brake Systems;

Buses in excess of 3500 KGs GVW used on or after 1 May 1997, must have an automatic means of wear adjustment on the service brake system.

Air Compressor Drive

- Where belts drive the air compressor, check for presence, condition and adjustment of compressor drive belt(s).

Note: Hydraulic fluid reservoir level checks are confined to transparent reservoirs or where an indicator is fitted. Reservoir caps should not be removed.

REASONS FOR FAILURE

		Deficiency Category
Brake Components		
1.	A brake rod, clevis joint, linkage, relay, lever, slack adjuster or cable:	
a.	Seriously weakened by excessive wear, corrosion or damage or reduced in diameter by more than the prescribed limit.	MAJOR
b.	With abnormal movement indicating incorrect adjustment or excessive radial free play.	MAJOR
c.	With an ineffective, insecure or missing locking device.	MAJOR
d.	A brake cable knotted, or with more wires broken than permitted by the specified standard.	MAJOR
e.	A brake cable knotted, or with more wires broken than permitted by the specified standard which obviously affects the braking performance.	DANGEROUS
f.	Cable guide is defective	MAJOR
g.	Automatic slack adjuster component incorrectly installed, missing, disconnected, insecure, distorted, fractured or inoperative.	MAJOR
h.	Brake system not fitted with a means of Automatic wear adjustment where required.	MAJOR
i.	A brake fitted with an automatic slack adjuster exceeding two-thirds of the travel of the brake actuator, or obviously having a different travel from another brake on the same axle, or not returning fully when brakes are released.	MAJOR

2. Brake pipes and flexible hoses:

a.	Misplaced and fouled or chafed by moving parts, with no obvious damage evident.	MINOR
b.	Misplaced and fouled or chafed by moving parts with obvious signs of damage.	MAJOR
c.	Chaffed, cracked and no reinforcement cords exposed, corroded, stretched or twisted.	MINOR
d.	Excessively chafed, cracked with reinforcement cords exposed and damaged, excessively corroded, deteriorated,	MAJOR
e.	Excessively chafed, cracked with reinforcement cords exposed, excessively corroded, deteriorated, leaking, bulging, kinked, stretched or twisted and damage evident.	DANGEROUS
f.	Leaking, bulging, kinked, stretched or twisted and in such a condition that risk of failure is imminent.	MAJOR
g.	Inadequately clipped or otherwise inadequately supported.	MAJOR
h.	Inadequately repaired or with unsuitable joint fittings.	MAJOR
i.	Non-metallic pipe(s) exposed to excessive heat.	MAJOR
j.	Leaking air from a pipe or connection.	MAJOR
k.	Leaking hydraulic fluid from a pipe or connection.	DANGEROUS

3. Brake drums, back plates & shoes, discs, callipers, pads including friction material with:

a.	A brake disc or drum excessively worn or cracked	MAJOR
b.	A brake back plate, disc or drum in such a condition that it is seriously weakened or insecure.	DANGEROUS
c.	A brake back plate or calliper securing bolt loose or missing.	MAJOR
d.	A brake lining or pad less than 1.5mm thick at any point.	MAJOR
e.	A brake lining or pad, missing, incorrectly fitted,	DANGEROUS

	insecure or with the lining no longer visible.	
f.	Restricted movement of a brake component.	MAJOR
g.	A brake drum, disc, lining or pad contaminated by oil or grease.	MAJOR
h.	A brake drum, disc, lining or pad contaminated by oil or grease with the brake performance obviously affected.	DANGEROUS

4. Reservoirs:

a.	Lightly corroded	MINOR
b.	Insecure, excessively corroded, or leaking.	MAJOR
c.	With damage or dents that do not reduce the capacity.	MINOR
d.	With damage or dents that obviously reduce the capacity.	MAJOR
e.	With a securing strap fractured, cracked, excessively corroded or chafing on the reservoir or other mounting.	MAJOR
f.	Missing where it is known to be a standard fitting.	MAJOR

5. Air actuators, hydraulic master & wheel cylinders, valves & servos:

a.	Defective in operation.	MAJOR
b.	Defective in operation and brake performance affected.	DANGEROUS
c.	Insecure but still operational.	MAJOR
d.	Insecure and brake performance affected.	DANGEROUS
e.	Leaking air or fluid, fractured, cracked, excessively damaged or corroded.	MAJOR
f.	Leaking air or fluid, fractured, cracked, excessively damaged or corroded and brake performance is affected.	DANGEROUS
g.	With a locking device missing or insecure.	MAJOR
h.	With insufficient or excessive travel of operating	MAJOR

	mechanism indicating a need for adjustment.	
i.	With insufficient or excessive travel of operating mechanism indicating a need for adjustment and brake performance is affected.	DANGEROUS
j.	With a cap missing from a hydraulic master cylinder.	MINOR
k.	Fluid below minimum level or level warning device defective/activated.	MINOR
l.	Fluid significantly below minimum level.	MAJOR
m.	No brake fluid visible.	DANGEROUS
n.	Brake fluid contaminated	MAJOR
o.	With a valve with excessive discharge of oil.	MINOR
p.	A load sensing valve removed or disconnected when it is known to be a standard fitment.	DANGEROUS
q.	A load sensing valve obviously seized or restricted in its free movement, linkage or brackets cracked, defective or out of adjustment (ABS functioning).	MAJOR
r.	A load sensing valve obviously seized or restricted in its free movement, linkage or brackets cracked, defective or out of adjustment. (No ABS function).	DANGEROUS
s.	Hydraulic brake actuator dust cover damaged or deteriorated but not to the extent that it would no longer prevent the ingress of dirt etc.	MINOR
t.	Hydraulic brake actuator dust cover missing, insecure, excessively damaged or severely deteriorated to the extent that it would no longer prevent the ingress of dirt etc.	MAJOR

6. A load sensing data plate is missing or illegible. MINOR

7. Air Compressor Drive:

a.	A drive belt missing, badly deteriorated and/ or so loose that it is likely to slip.	MAJOR
b.	A compressor drive pulley loose, cracked or missing.	MAJOR

8.

a.	Unsafe modification to any part of the braking system.	MAJOR
b.	Unsafe modification to any part of the braking system and braking performance is affected.	DANGEROUS