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MOT inspection manual: motorcycles

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1. Brakes

Brake condition and operation (including brake lever and pedal, lining and pads, callipers and cylinders), brake performance and efficiency, and brake fluid rules and inspection for motorcycle MOT tests.

1.1. Condition and operation

1.1.1. Brake lever and pedal pivot in use

Defect	Category
(a) Lever or pedal pivot too tight	Major
(b) Lever or pedal pivot has excessive wear or free play	Major

1.1.2. Brake lever and pedal condition and travel

A motorcycle must only be failed for insufficient reserve travel if the brake lever is touching the handlebar or the brake pedal is fouling another part of the motorcycle. Motorcycles with servo-assisted braking systems should be checked with the engine running.

On some motorcycles it may be possible to pull the brake lever back until it touches the handlebar. In such cases the extent of reserve travel should be assessed during the brake test.

A brake pedal should be failed if its grooves or raised sections are worn smooth. However, a brake pedal should not be failed if the motorcycle has been manufactured with one that does not have grooves or is fitted with anti-slip material.

Where a brake pedal rubber is fitted, this is considered an anti-slip material. It's therefore not regarded as a defect if the design pattern is worn smooth.

Defect	Category
(a) Brake control has insufficient reserve travel	Major
(b) Brake control: (i) not releasing correctly (ii) not releasing correctly so that the functionality of brakes affected	 Minor Major
(c) Brake pedal anti-slip provision missing, loose or worn smooth	Major
(d) Brake control so positioned, bent or shortened that the brake cannot be readily applied	Major
(e) Brake control: (i) insecure (ii) so insecure that the brake cannot be readily applied	 Major Dangerous

1.1.3. Not in use

1.1.4. Not in use

1.1.5. Not in use

1.1.6. Not in use

1.1.7. Not in use

1.1.8. Not in use

1.1.9. Not in use

1.1.10. Brake master cylinder and servo

To check the operation of the brake servo:

1. Apply the brake control with the ignition off.
2. With the brake still applied, turn the ignition on.
3. The inspection is successful when you feel that the brake control increases brake pressure without any increase in effort.

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

Defect	Category
(a) Brake servo: (i) defective or ineffective (ii) inoperative	 Major Dangerous
(b) Master cylinder: (i) defective but brake still operating (ii) leaking	 Major Dangerous
(c) Master cylinder insecure	Major
(d) Brake fluid: (i) below minimum mark (ii) significantly below minimum mark (iii) not visible	 Minor Major Dangerous
(e) Master cylinder reservoir cap missing	Major

1.1.11. Rigid brake pipes

If the corroded metal brake pipes have surface dirt that needs to be removed before it’s possible to assess their condition, it’s permissible to lightly scrape the pipe with a specialist brake pipe corrosion tool or the corrosion assessment tool ‘spade end’. It must be done with care so that any protective coating does not get damaged.

Chafing, corrosion or damage to a rigid brake pipe so that its wall thickness is reduced by 1/3 (approximately 0.25mm for typical hydraulic brake pipe) justifies rejection, although it’s accepted that this is not easy to determine. The wall of a typical hydraulic brake pipe is around 0.75mm thick. If you are not sure whether the pipe is sufficiently deteriorated to justify rejection, you should give the benefit of the doubt.

Defect	Category
(a) Brake pipe is at imminent risk of failure or fracture	Dangerous
(b) Leaking brake pipe or connection	Dangerous
(c) Brake pipe excessively damaged or excessively corroded	Major
(d) Brake pipe: (i) inadequately clipped or supported (ii) likely to become detached or damaged	 Minor Major

1.1.12. Flexible brake hoses

A hose should only be considered excessively damaged or chafed if it’s severe enough to expose the reinforcement.

Defect	Category
(a) Brake hose damaged and likely to fail	Dangerous
(b) Flexible brake hose: (i) slightly damaged, chafed or twisted (ii) excessively damaged, deteriorated, chafed, twisted or stretched	 Minor Major
(c) Brake hoses or connections leaking	Dangerous
(d) Brake hose bulging under pressure	Major
(e) Brake hose porous	Major
(f) Brake hose ferrules: (i) excessively corroded (ii) excessively corroded and likely to fail	 Major Dangerous

1.1.13. Brake linings and pads

Defect	Category
(a) Brake lining or pad worn below 1.0mm	Dangerous
(b) Brake lining or pad contaminated with oil, grease etc.	Major
(c) Brake lining or pad missing or incorrectly mounted	Dangerous

1.1.14. Brake discs and drums

A brake disc or drum must be significantly worn before rejection is justified. Being worn below the manufacturer’s recommended limit is not a reason in itself.

Defect	Category

Defect	Category
(a) Brake disc or drum: (i) significantly and obviously worn (ii) insecure, fractured or otherwise likely to fail	 Major Dangerous
(b) Contaminated with oil, grease etc.	Major
(c) Missing	Dangerous
(d) Brake drum back plate insecure	Major

1.1.15. Brake cables, rods, levers and linkages

A component such as a brake rod should be considered to be excessively worn or corroded if its diameter is reduced by more than a third.

Defect	Category
(a) Cable damaged or knotted	Major
(b) Component excessively worn or corroded	Major
(c) Cable, rod or joint insecure	Major
(d) Cable guide defective affecting operation	Major
(e) Restriction in free movement of the braking system	Major
(f) Abnormal movement of levers indicating maladjustment or excessive wear	Major

1.1.16. Brake callipers and cylinders

Defect	Category
(a) Brake calliper or cylinder cracked or damaged and: (i) braking performance not affected (ii) braking performance affected	 Major Dangerous
(b) Brake calliper or cylinder leaking and: (i) braking performance not affected (ii) braking performance affected	 Major Dangerous

Defect	Category
(c) Brake calliper or cylinder insecure or inadequately mounted and: (i) braking performance not affected (ii) braking performance affected	 Major Dangerous
(d) Brake calliper or cylinder: (i) excessively corroded (ii) excessively corroded and likely to crack	 Major Dangerous
(e) Brake calliper or cylinder has: (i) excessive travel of operating system indicating need for adjustment (ii) no reserve travel and braking performance affected	 Major Dangerous

1.1.17. Not in use

1.1.18. Not in use

1.1.19. Not in use

1.1.20. Not in use

1.1.21. Complete braking system

Defect	Category
(a) Not in use	
(b) Not in use	
(c) Any braking system component insecure or inadequately mounted	Major
(d) Braking system component modification: (i) unsafe (ii) adversely affecting braking performance	 Major Dangerous

1.2. Brake performance and efficiency

1.2.1. Brake performance

You must ensure that the motorcycle is in such a condition that the test can be carried out safely.

If the primary brake tester is not suitable to test the motorcycles braking system, a full or partial decelerometer test may be appropriate. If the testing station does not have an approved decelerometer they should decline to test.

Sidecar wheels do not need to be fitted with a brake, but if one is fitted it must be tested.

Not all defects will apply depending on the equipment used.

Using a roller brake tester

Ensure that the motorcycle's braking system is suitable for a roller brake tester. If the motorcycle or the system is unsuitable, it should be tested with a decelerometer.

Motorcycles with 2 front and/or rear wheels may need each braked wheel to be tested independently if they cannot both fit in the roller brake tester.

1. Sit on the motorcycle and locate the front wheel in the rollers of the brake tester, ensuring that the motorcycle is lined up in the straight ahead position and settled in the rollers.
2. Make sure that the roller brake tester is set to rotate in the correct direction so that the motorcycle wheel will rotate forward.
3. Start the rollers and allow the front wheel to stabilise. With the rear wheel brake fully applied (unless it's a linked system), gradually apply the front brake until maximum effort is achieved or the wheel locks and slips on the rollers.
4. Record the reading at which the maximum braking effort is achieved and release the brake.
5. Restart the rollers if necessary and gradually increase the front brake effort to about half the maximum reading and observe the way it builds up. Hold steady and check for fluctuations. Release the brake and observe the way in which the braking effort reduces.
6. In the case of linked systems, repeat the steps 1 to 5 for each control operating the front wheel brake. However, some linked systems are designed to only work above 10km/h and will not work in a roller brake tester.
7. Repeat the procedure for the rear wheel brake and any sidecar brake fitted.

Using a plate brake tester

1. Drive the motorcycle onto the plate tester at a steady speed of around 4mph. As soon as the front wheel is on the plate's high friction braking surface, gradually apply the front brake until maximum effort is achieved or the wheel locks and skids.
2. Note the way in which the brake effort increases and the maximum value achieved.
3. Repeat the procedure for the rear wheel brake and any sidecar brake fitted.

If a motorcycle fails any aspect of the plate brake test, you should repeat the check to confirm the result.

Using a decelerometer

If the motorcycle cannot be tested on a roller brake tester, you should carry out a decelerometer test.

You should make sure that the motorcycle is in a safe condition to conduct a decelerometer test. If you think it is not safe you should refuse to complete the test.

Before carrying out a decelerometer test on the public highway, you must ensure you have a suitable motorcycle licence and are familiar with the controls.

For motorcycles with special controls, such as for disabled use, you can let the vehicle presenter conduct the decelerometer test if he/she wishes under the observation of the tester.

Decelerometer testing is potentially hazardous. It's important that the used road meets all of the following criteria:

- is reasonably flat and level
- has a good surface
- is suitable for brake tests in the present weather conditions
- has very little traffic

To conduct the decelerometer test:

1. Set up the decelerometer on the motorcycle in accordance with the equipment manufacturer's instructions.
2. Ride the motorcycle on a level road at a steady speed of around 20mph (32km/h).
3. Gradually apply one brake control and come to a controlled stop. You should try to achieve only the required percentage to pass, rather than the best possible result.
4. While the motorcycle is decelerating, pay attention to the progression of application and any grabbing of the brake.
5. Record the brake efficiency from that brake control.
6. Repeat the test applying only the other brake control.

Using a floor tester (spring balance)

1. Hold the motorcycle upright in a straight-ahead position. Attach the cable from the spring balance to the front of the motorcycle using a strap around the front forks or the headstock
2. Sit on the motorcycle and apply one brake control while the assistant operates the spring balance system.
3. Record the effort required to move the motorcycle and rider forward.
4. Repeat the test applying only the other brake control.

Using a gradient tester

1. Set the platform to 30%.
2. Sit on the motorcycle with it facing 'downhill'.
3. Apply each brake in turn and confirm that the motorcycle can be held stationary without exerting any other retarding force.
4. If the motorcycle cannot be held stationary by either control, repeat the process with the platform set to a 25% gradient.
5. If the motorcycle cannot be held stationary by only one control, repeat the process for the other control only with the platform set to a 25% gradient.

Defect	Category
(a) On a motorcycle with two front or rear wheels, there is: (i) inadequate braking effort at a wheel (ii) no recorded brake effort at a wheel	 Major Dangerous
(b) Not in use	
(c) A brake on any wheel grabbing severely	Major
(d) Abnormal lag in brake operation on a wheel	Major
(e) Excessive fluctuation in brake effort through each wheel revolution	Major
(f) Significant brake effort recorded with no brake applied indicating a binding brake	Major
(g) Brake performance unable to be tested	Major

1.2.2. Brake efficiency

Most motorcycles have 2 brake controls, one operating the front wheel brake and the other the rear wheel brake. One control must achieve an efficiency of at least 30% and the other control 25%.

If a wheel locks on the operation of a brake control during a roller brake test, the efficiency requirement of 30% is considered to have been met for that control. The efficiency requirement does not apply to a braked wheel on a sidecar.

If a linked or dual braking system is operated by one control, the retarding force used in the efficiency calculation is the total from all wheels operated by that control only. However, some linked systems are designed to only work above 10km/h so cannot be tested during a roller, plate or floor test. In these cases, if the motorcycle fails the brake efficiency test, a decelerometer test must be carried out.

On motorcycles with 2 front and/or rear wheels, each braked wheel will need to be tested independently if they cannot both fit in the roller brake tester. In these cases the efficiency calculation is the total from both wheels when operated by that control only.

The retardation force of a sidecar brake should not be included unless it is operated by one of the motorcycle brake controls.

Calculating brake efficiency

For the majority of motorcycles, the MOT testing service will calculate brake efficiencies automatically. However, if MTS is not working, add the brake efforts from each wheel operated by the control under test and carry out the following calculation:

$$\text{efficiency \%} = \frac{\text{total retarding force for one system}}{\text{weight of machine plus rider (tester)}} \times 100$$

If the required brake efficiency is only just met, but the tester knows that a higher performance figure is normally obtained for the motorcycle type, the motorcycle presenter should be informed.

Brake test results

Brake efforts achieved during a test should be entered on the MOT testing service as follows.

Roller brake tests:

1. Enter the combined weight of the motorcycle and the rider (tester).
2. Enter the brake effort from each control and whether ‘lock-up’ occurs. The MOT testing service will automatically calculate the brake efficiency.
3. Enter any other braking defects manually.

Plate brake tests:

1. Enter the combined weight of the motorcycle and the rider (tester).
2. Enter the brake effort from each control. The MOT testing service will automatically calculate the brake efficiency.
3. Enter any other braking defects manually.

Decelerometer tests:

1. Enter the efficiencies recorded by the meter. The MOT testing service will automatically pass or fail the brake efficiency test.
2. Enter any other braking defects manually.

Floor tests:

1. Enter the brake effort from each control. The MOT testing service will automatically calculate the brake efficiency.
2. Enter any other braking defects manually.

Gradient tests:

1. Enter the result of the brake test.

If the MOT testing service is unavailable, refer to the latest edition of the MOT testing guide.

Defect	Category

Defect	Category
(a) Brake efficiency: (i) below minimum requirement (ii) less than 27.5% overall	 Major Dangerous

1.3. Not in use

1.4. Not in use

1.5. Not in use

1.6. Not in use

1.7. Not in use

1.8. Brake fluid

The hydraulic brake fluid check is confined to transparent reservoirs. Reservoir caps should not be removed.

Defect	Category
(a) Brake fluid contaminated	Major