



EC DIRECTIVE 2002/78

SUMMARY SHEET

REPLACEMENT BRAKE LININGS

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Summary Sheet

Replacement Brake Linings

ENFORCEMENT DATE.

The UK position for mandatory application is 31 March 2001.

SUMMARY OF REQUIREMENTS

New approvals for M1 category vehicles (other category vehicles may require alternative procedures). New approvals can be done in one of two ways, either: -

- i. Part dynamometer and part vehicle based test
- ii. Vehicle based test.

(i) Part Dynamometer Testing

A suitable dynamometer capable of the following; continuous recording of rotational speed, brake torque, pressure in the brake line, number of rotations after brake application, braking time and brake rotor temperature.

The test is split into two parts, firstly a cold performance equivalence test. This compares the cold performance of the replacement parts with that of the original equipment. This requires a minimum of 6 brake applications at spaced intervals of line pressure up to a fully developed deceleration of 6ms^2 . To comply with the requirements of R90 the replacement part must be within $\pm 15\%$ of the upper 2/3 of the original equipment result.

Secondly, speed sensitivity test is required, this is carried out on the replacement part only, and comprises of three brake applications at three different speeds. (The pressure required to carry out these stops is derived from the cold performance graph). The average deceleration of the results from each group is then plotted against the corresponding speed.

To comply with this test, the mean fully developed deceleration's recorded for the higher speeds shall lie within $\pm 15\%$ of that recorded for the lowest speed.

(i) Part Vehicle Test

For the vehicle based tests the vehicle must be fitted with instrumentation capable of the followings -

Measuring stopping distance

Measuring or deriving mean fully developed deceleration

Measuring pedal effort or line pressure

Where required a means of measuring handbrake force

Measuring start speed

Measuring disc/drum temperature

The remaining part of the test will be carried out on the vehicle

This will comprise of a number of type “O” stops in the laden and unladen condition. When testing the secondary brake system the axle being fitted with the replacement parts will need to be isolated and tested separately (if a vehicle is fitted with a diagonal split system this test may be omitted).

Parking braking system. (Only applicable if the brake for which the lining approval is sought is used for parking). Requirement; static downhill test at 18 per cent gradient, vehicle in the laden condition.

The final vehicle test is a fade test, which is carried out in the laden condition.

(ii) VEHICLE BASED TESTING

For the vehicle based tests the vehicle must be fitted with instrumentation capable of the followings -

Measuring stopping distance

Measuring or deriving mean fully developed deceleration

Measuring pedal effort or line pressure

Where required a means of measuring handbrake force

Measuring start speed

Measuring disc/drum temperatures

Cold performance. This compares the cold performance of the replacement parts with that of the original equipment. This comprises a **minimum** of 6 brake applications at spaced intervals of pedal effort or line pressure up to a fully developed deceleration of 6ms^{-2} (or wheel lock/maximum allowable pedal effort or line pressure). To comply with the requirements of R90 the replacement part must be within +/-15% of the upper 2/3 of the original equipment result.

Secondly a speed sensitivity test is required, this is carried out on the replacement part only, and comprises of three brake applications at three different speeds. (The pressure required to carry out these stops is derived from the cold performance graph) The average deceleration of the results from each group is then plotted against the corresponding speed.

To comply with this test, the mean fully developed deceleration's recorded for the higher speeds shall lie within +/- 15% of that recorded for the lowest speed.

The remaining part of the test carried out on the vehicle will comprise of a number of type “O” stops in the laden and unladen condition. When testing the secondary brake system the axle being fitted with the replacement parts will need to be isolated and tested separately (if a vehicle is fitted with a diagonal split system then this part of the test may be omitted).

Parking braking system (Only applicable if the brakes for which the lining approval is sought are used for parking). Test requirement; downhill test at 18 per cent gradient, vehicle in the laden condition.

The final vehicle test is a fade test, which is carried out in the laden condition.



Additional requirements

For both M and N category vehicles there is a requirement for physical data; shear strength according to ISO 6312 (1981), Compressibility according to ISO 6310 (1981) and friction characteristics. The Regulation also requires packaging and fitting instructions to be complied with.

The above information is intended only as an initial guide and should not take the place of in-depth discussions with relevant engineers.

Contact Details

In the UK, contact Dave Picker VCA Midlands Centre (go to <http://www.vca.gov.uk/contact.asp> for further details).