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**Methods for the calibration of vibration  
and shock pick-ups**

**Part 12:**  
Testing of transverse shock sensitivity

*Méthodes pour l'étalonnage de capteurs de vibrations et de chocs —  
Partie 12: Essai de sensibilité aux chocs transversaux*



- *Part 9: Secondary vibration calibration by comparison of phase angles*
- *Part 10: Primary calibration by high-impact shocks*
- *Part 11: Testing of transverse vibration sensitivity*
- *Part 12: Testing of transverse shock sensitivity*
- *Part 13: Testing of base strain sensitivity*
- *Part 14: Resonance frequency testing of undamped accelerometers on a steel block*
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- *Part 17: Testing of fixed temperature sensitivity*
- *Part 18: Testing of transient temperature sensitivity*
- *Part 19: Testing of magnetic field sensitivity*
- *Part 20: Primary vibration calibration by the reciprocity method*

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# Methods for the calibration of vibration and shock pick-ups —

## Part 12: Testing of transverse shock sensitivity

### 1 Scope

ISO 5347 comprises a series of documents dealing with methods for the calibration of vibration and shock pick-ups.

This part of ISO 5347 lays down detailed specifications for the instrumentation and procedure to be used for transverse shock sensitivity testing. It applies to rectilinear accelerometers of the strain gauge, piezoresistive and piezoelectric type.

This part of ISO 5347 is applicable for a time range from 0,01 ms to 10 ms and a dynamic range from 100 m/s<sup>2</sup> to 10<sup>5</sup> m/s<sup>2</sup>.

The limits of uncertainty applicable are  $\pm 20\%$  of reading.

### 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 5347. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 5347 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5347-0:1987, *Methods for the calibration of vibration and shock pick-ups — Part 0: Basic concepts*.

ISO 5347-2:1993, *Methods for the calibration of vibration and shock pick-ups — Part 2: Primary shock calibration by light cutting*.

### 3 Apparatus

**3.1 Equipment capable of maintaining room temperature** at  $23\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ .

**3.2 Shock calibration equipment**, complying with the equipment requirements specified for the comparison calibration method for shock (see ISO 5347-0).

The shock machine shall have a fixture for transverse shocks on the pick-up. It shall be possible to mount the accelerometer at different angles about its sensing axis.

### 4 Preferred pulse durations and accelerations

The following shock pulse durations, in milliseconds, shall be chosen:

— 0,01; 0,02; 0,05; 1; 2; 5; 10.

The following accelerations, in metres per second squared, shall be used:

— 100; 200; 500;

— 1 000; 2 000; 5 000;

— 10 000; 20 000; 50 000; 100 000.

### 5 Method

#### 5.1 Test procedure

Shock-test the pick-up at the same shock pulse times and accelerations as during calibration (see

ISO 5347-2) to determine its sensitivity. Determine the direction and magnitude of the maximum and minimum values for transverse sensitivity at different angles by shock-testing perpendicularly to the main axis of the pick-up.

The values obtained shall be reported as the maximum and minimum values for shock transverse sensitivity. The angles corresponding to maximum and minimum values shall be reported.

## 5.2 Expression of results

Calculate the transverse sensitivity,  $S_{\text{trans}}$ , expressed as a percentage, using the following formula:

$$S_{\text{trans}} = \frac{A_{\text{trans}}}{A} \times 100$$

where

$A_{\text{trans}}$  is the transverse response amplitude;

$A$  is the shock pulse amplitude in the test direction.

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Price based on 2 pages

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