AS 2775—2004
ISO 5348:1998

Australian Standard™

Mechanical vibration and shock—Mechanical mounting of accelerometers

STANDARDS AUSTRALIA

This Australian Standard was prepared by Committee AV-008, Vibration and Shock Instrumentation and Measurement. It was approved on behalf of the Council of Standards Australia on 24 October 2003 and published on 27 January 2004.

The following are represented on Committee AV-008:

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Mechanical vibration and shock—Mechanical mounting of accelerometers

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PREFACE

This Standard was prepared by the Standards Australia Committee AV-008, Vibration and Shock Instrumentation and Measurement to supersede AS 2775—1985, which has been technically revised.

The objective of this Standard is to provide designers, manufacturers, operators and maintainers of machines and structures with recommendations for the mounting of accelerometers for the assessment of vibration.

This Standard is identical with and has been reproduced from ISO 5348-3:1998, *Mechanical vibration and shock—Mechanical mounting of accelerometers.*

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(b) In the source text, ‘this International Standard’ should read ‘this Australian Standard’.

(c) A full point should be substituted for a comma when referring to a decimal marker.

There are no Australian Standards identical with the normative references listed in Clause 2.

CONTENTS

INTRODUCTION

The method most commonly used for determining the vibratory motion, v_S, of a structure or body S is that using an electromechanical transducer T.

Vibration-monitoring transducers fall into two broad classes: contacting and non-contacting transducers. Non-contacting structural response transducers are placed in close proximity to the structure and include such generic types as eddy-current probes and optical proximity probes. Contacting transducers are placed in mechanical contact with the structural system and include such generic types as piezoelectric and piezoresistive accelerometers and seismic velocity transducers. This International Standard is concerned with the contacting type of accelerometers which currently are in wide use. The concern with using such transducers is that the mechanical coupling between the accelerometer and the test structure may significantly alter the response of the accelerometer, the structure, or both. This International Standard attempts to isolate parameters of concern in the selection of a method to mount the accelerometer onto the structure.

This International Standard deals with accelerometers which are connected to the surface of the structure in motion by means of a mechanical mounting F (see figure 1).

The information supplied by such a transducer is the electric signal, u, generated by the action of its own motion, v_T. The information desired is the vibratory motion, v_S, at a specified location on the structure S.

The electric signal, u, generated by the transducer deviates from what it would have been, if that particular accelerometer effectively measured the vibratory motion, v_S, of the structure, owing to non-ideal transfer of motion from S to the sensitive elements of the accelerometer T.

Deviations may also occur owing to misalignment of the sensitive axis of the transducer, base bending, temperature transients, mounting torque and cable whip.

The mechanical mounting will change the useful frequency range for a given accuracy with regard to amplitude as well as phase response (see 5.4.5).

AUSTRALIAN STANDARD

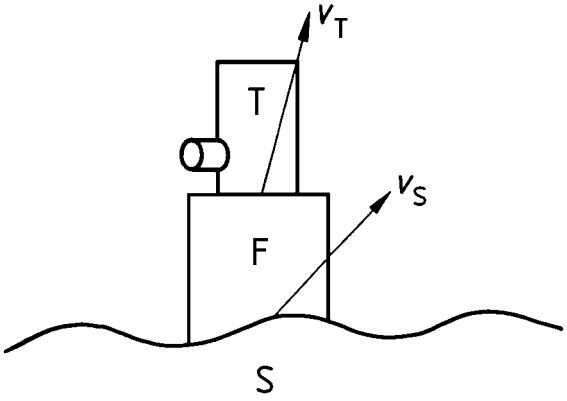
Mechanical vibration and shock—Mechanical mounting of accelerometers

1 Scope

This International Standard describes the mounting characteristics of accelerometers to be specified by the manufacturer and makes recommendations to the user for mounting accelerometers.

Application of this International Standard is limited to the mounting of accelerometers which are mounted on the surface of the structure in motion, as illustrated in the simplified diagram shown in figure 1.

It is not applicable to other types of transducers, such as relative motion pick-ups.



Key

S is the structure;
F is a means of mounting;
T is an accelerometer;
v_S is vibratory motion of the structure;
v_T is vibratory motion of the accelerometer.

Figure 1 — Accelerometer mounting

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard 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 2041:1990, *Vibration and shock — Vocabulary.*

ISO 2954:1975, *Mechanical vibration of rotating and reciprocating machinery — Requirements for instruments for measuring vibration severity.*