PD ISO/TS 15143-3:2016

BSI Standards Publication

Earth-moving machinery and mobile road construction machinery — Worksite data exchange

Part 3: Telematics data

bsi.

National foreword

This Published Document is the UK implementation of ISO/TS 15143-3:2016.

The UK participation in its preparation was entrusted by Technical Committee B/513, Construction equipment and plant and site safety, to Subcommittee B/513/1, Earth moving machinery (International).

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2017.
Published by BSI Standards Limited 2017

ISBN 978 0 580 93939 6
ICS 35.240.99; 53.100

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 April 2017.

Amendments/corrigenda issued since publication

Date	Text affected

PD ISO/TS 15143-3:2016

TECHNICAL SPECIFICATION

ISO/TS 15143-3

First edition
2016-12-01

Earth-moving machinery and mobile road construction machinery — Worksite data exchange —

Part 3: Telematics data

Engins de terrassement et machines mobiles de construction de routes — Échange de données sur le chantier —

Partie 3: Données télématiques

Reference number
ISO/TS 15143-3:2016(E)

© ISO 2016

COPYRIGHT PROTECTED DOCUMENT

© ISO 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword ..... **vii**
Introduction ..... **viii**
1 Scope **1**
2 Normative references **2**
3 Terms, definitions and abbreviated terms **2**
4 Data management and access control **4**
4.1 Minimum requesting period 4
4.2 Editing the data elements over time 5
4.3 Data element use case 5
4.4 Data element cross reference 5
4.5 Access authentication 5
5 Response formats **5**
6 XML Declaration links to definition segments **6**
7 Paging **6**
8 Discoverability **6**
8.1 General 6
8.2 Snapshot endpoint 6
8.2.1 Fleet snapshot 6
8.2.2 Single-element snapshot 7
8.3 Time series endpoint 8
8.3.1 General 8
8.4 Links 9
8.4.1 Reference attribute (rel) 9
8.4.2 Hypermedia reference URL (href) 9
9 Date and time formats **9**
10 Data fields summary **10**
11 Data field descriptions **12**
11.1 General 12
11.2 Machine header information 13
11.2.1 General 13
11.2.2 Telematics unit installation date 13
11.2.3 Equipment make 13
11.2.4 Equipment model 13
11.2.5 Equipment ID 13
11.2.6 Serial Number 13
11.2.7 OEM ISO Identifier (PIN or VIN) 13
11.3 Last known location 14
11.3.1 General 14
11.3.2 Date and time of location 14
11.3.3 Latitude of location 14
11.3.4 Longitude of location 14
11.3.5 Altitude of location 14
11.3.6 Unit of measure of altitude 14
11.3.7 Location Time Series Endpoint (Request) 14
11.3.8 Location Response Schema (Response) 15
11.4 Operating hours 15
11.4.1 General 15
11.4.2 Date and time of operating hours 15
11.4.3 Operating hours 15
11.4.4 Operating hours endpoint (Request) 15

© ISO 2016 – All rights reserved

11.4.5 Operating hours schema (Response) 16
11.5 Cumulative fuel used (preferred) 16
11.5.1 General 16
11.5.2 Date and time of cumulative fuel used 16
11.5.3 Unit of measure of fuel used to date 16
11.5.4 Amount of fuel used to date 16
11.5.5 Cumulative fuel used endpoint (Request) 17
11.5.6 Cumulative fuel used schema (Response) 17
11.6 Fuel used in the preceding 24 hours (alternative, not preferred) 17
11.6.1 General 17
11.6.2 Date and time of fuel use in the preceding 24 hours 17
11.6.3 Unit of measure of fuel used in the preceding 24 hours 18
11.6.4 Fuel used in the preceding 24 hours 18
11.6.5 Fuel used in the preceding 24 hours endpoint (Request) 18
11.6.6 Fuel used in the preceding 24 hours schema (response) 18
11.7 Cumulative distance travelled 18
11.7.1 General 18
11.7.2 Date and time of distance 19
11.7.3 Unit of measure of distance 19
11.7.4 Cumulative distance travelled 19
11.7.5 Cumulative distance travelled endpoint (Request) 19
11.7.6 Cumulative distance travelled schema (response) 19
11.8 Caution codes referencing number 20
11.8.1 General 20
11.8.2 Date and time of code 20
11.8.3 IEC/ISO Symbol Reference Number identifier 20
11.8.4 Code description 20
11.8.5 Caution codes referencing number endpoint (Request) 20
11.8.6 Caution codes referencing number schema (response) 20
11.9 Cumulative idle operating hours 21
11.9.1 General 21
11.9.2 Date and time of cumulative idle operating hours 21
11.9.3 Cumulative idle operating hours 21
11.9.4 Cumulative idle operating hours endpoint (Request) 21
11.9.5 Cumulative idle operating hours schema (response) 22
11.10 Fuel remaining ratio 22
11.10.1 General 22
11.10.2 Date and time of percent fuel remaining 22
11.10.3 Fuel Remaining Ratio 22
11.10.4 Unit of measure for fuel tank capacity 22
11.10.5 Fuel tank capacity 22
11.10.6 Fuel remaining ratio endpoint (Request) 23
11.10.7 Fuel remaining ratio schema (response) 23
11.11 Percent of DEF remaining 23
11.11.1 General 23
11.11.2 Date and time of percent DEF remaining 23
11.11.3 Percent of DEF remaining 23
11.11.4 Unit of measure for DEF tank capacity 24
11.11.5 DEF tank capacity 24
11.11.6 Percent DEF remaining endpoint (Request) 24
11.11.7 Percent DEF remaining schema (response) 24
11.12 Engine condition 24
11.12.1 General 24
11.12.2 Date and time of engine condition 25
11.12.3 Engine Number 25
11.12.4 Engine condition 25
11.12.5 Engine condition endpoint (Request) 25
11.12.6 Engine condition schema (response) 25

 © ISO 2016 – All rights reserved

11.13 Digital input state 25
11.13.1 General 25
11.13.2 Date and time of digital input set response 26
11.13.3 Digital input number 26
11.13.4 1Digital input state 26
11.13.5 Digital input state endpoint (Request) 26
11.13.6 Digital input state schema (response) 26
11.14 Cumulative power takeoff hours 27
11.14.1 General 27
11.14.2 Date and time of cumulative power takeoff 27
11.14.3 Cumulative power takeoff hours 27
11.14.4 Cumulative power takeoff hours endpoint (Request) 27
11.14.5 Cumulative power takeoff hours schema (response) 27
11.15 Average daily engine load factor 28
11.15.1 General 28
11.15.2 Date and time of average load factor 28
11.15.3 Average load factor for preceding 24 hour period 28
11.15.4 Average daily engine load factor endpoint (Request) 28
11.15.5 Average daily engine load factor schema (response) 28
11.16 Peak daily speed 29
11.16.1 General 29
11.16.2 Date and time of peak travel speed 29
11.16.3 Units of measure for speed 29
11.16.4 Peak speed for the preceding 24 h 29
11.16.5 Peak daily speed endpoint (Request) 29
11.16.6 Peak daily speed schema (response) 29
11.17 Cumulative load count 30
11.17.1 General 30
11.17.2 Date and time of load count 30
11.17.3 Cumulative load count 30
11.17.4 Cumulative load count endpoint (Request) 30
11.17.5 Cumulative load count schema (response) 30
11.18 Cumulative payload total 31
11.18.1 General 31
11.18.2 Date and time of cumulative payload 31
11.18.3 Unit of measure for payload 31
11.18.4 Cumulative payload 31
11.18.5 Cumulative payload total endpoint (Request) 31
11.18.6 Cumulative payload total schema (response) 31
11.19 Cumulative non-productive regeneration hours 32
11.19.1 General 32
11.19.2 Date and time for cumulative non-productive regeneration hours 32
11.19.3 Cumulative non-productive regeneration hours 32
11.19.4 Cumulative hours in non-productive regeneration endpoint (Request) 32
11.19.5 Cumulative hours in non-productive regeneration schema (response) 33
11.20 Cumulative idle non-operating hours 33
11.20.1 General 33
11.20.2 Date and time of cumulative idle nonoperating hours 33
11.20.3 Cumulative idle non-operating hours 33
11.20.4 Cumulative idle non-operating hours endpoint (Request) 33
11.20.5 Cumulative idle non-operating hours schema (response) 34
11.21 Data field descriptions for codes unique to each system 34
11.21.1 General 34
11.21.2 Diagnostic Trouble Code identifier 34
11.21.3 Date and time of code 35
11.21.4 Code severity 35
11.21.5 Code description 35
11.21.6 Unit of measure for ambient air temperature 35

© ISO 2016 – All rights reserved

11.21.7 Ambient air temperature at time when code was triggered 35
11.21.8 Description of code source 35
11.21.9 Data field descriptions for codes unique to each system endpoint (Request) 36
11.21.10 Data field descriptions for codes unique to each system schema (response) 36

12 Data schemas **36**
12.1 Common schema 36
12.2 Time series schema 36

13 Syntax errors **36**

Annex A (informative) **Relationship between this document and ISO 15143-2** **38**

Annex B (informative) **Data support and collection** **54**

Annex C (informative) **Common schema** **55**

Annex D (informative) **Time series schema** **59**

Bibliography **60**

© ISO 2016 – All rights reserved

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 3, *Machine characteristics, electrical and electronic systems, operation and maintenance*.

This part of ISO 15143 is intended to be used in conjunction with ISO 15143-1 and ISO 15143-2.

A list of all parts in the ISO 15143 series can be found on the ISO website.

© ISO 2016 – All rights reserved

Introduction

This document is a data schema having the purpose of providing data directly from the equipment manufacturer or provider to the equipment owner in a standardized format for the use and convenience of equipment owners with mixed fleets of equipment.

It defines a set of web services that provide information about fleets of mobile equipment and their associated telematics data. The information about a fleet is provided as a resource, typically on the Internet, at a known Uniform Resource Location (URL). Any number of fleets can be represented, each with its own URL.

Clients can access these resources by sending HTTPS GET requests to the server at the given location. The server responds with an equipment information document whose vocabulary is defined in this document.

ISO/TC 127/SC 3 wishes to acknowledge the Association of Equipment Manufacturers and the Association of Equipment Management Professionals for their contributions to prior work on this subject.

The goal of this document is to provide direct access by end users to their specific fleet data, and not to enable third parties for data aggregation across end users or other purposes. The use of this document enables each end user or assigned third-party application developer to develop applications for purposes deemed appropriate by the end user.

© ISO 2016 – All rights reserved

Earth-moving machinery and mobile road construction machinery — Worksite data exchange —

Part 3: Telematics data

1 Scope

This document specifies the communication schema designed to provide mobile machinery status data from a telematics provider's server to third-party client applications via the Internet. The data are collected from a mobile machine using telematics data-logging equipment and stored on a telematics provider's server. This document describes the communications records used to request data from the server and the responses from the server containing specified data elements to be used in the analysis of machine performance and health.

It is applicable to mobile earth-moving machinery as defined in ISO 6165 and mobile road construction machinery as defined in ISO 22242 equipped with location and time instrumentation.

It is not applicable to the on-board data collection, on-board communication protocol (e.g. CANbus) or wireless transmission of the mobile machinery data to the telematics provider's server *after* the data have been collected at the data logger. See Figure 1.

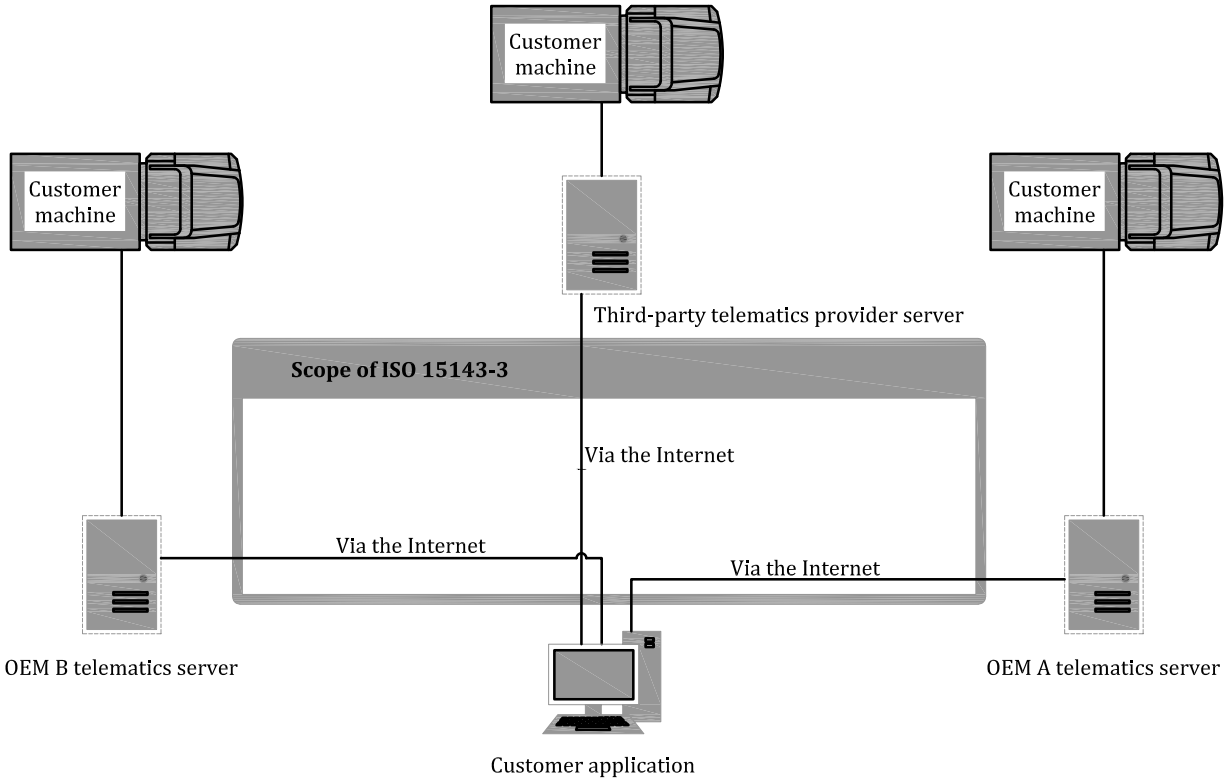

Figure 1 — Topography of conceptual mixed fleet telematics system within the scope of this document

© ISO 2016 – All rights reserved