# INTERNATIONAL STANDARD

# ISO
# 11783-2

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2002-04-15
**AMENDMENT 1**
2006-04-01

# Tractors and machinery for agriculture and forestry — Serial control and communications data network —

## Part 2:
## Physical layer

AMENDMENT 1

*Tracteurs et matériels agricoles et forestiers — Réseaux de commande et de communication de données en série —*

*Partie 2: Couche physique*

*AMENDEMENT 1*

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77cc5b71485b/iso-11783-2-2002-amd-1-2006

# 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

Amendment 1 to ISO 11783-2:2002 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 19, *Agricultural electronics*.

ISO 11783 consists of the following parts, under the general title *Tractors and machinery for agriculture and forestry — Serial control and communications data network*:

— *Part 1: General standard for mobile data communication*

— *Part 2: Physical layer*

— *Part 3: Data link layer*

— *Part 4: Network layer*

— *Part 5: Network management*

— *Part 6: Virtual terminal*

— *Part 7: Implement messages application layer*

— *Part 8: Power train messages*

— *Part 9: Tractor ECU*

— *Part 10: Task controller and management information system data interchange*

— *Part 11: Mobile data element dictionary*

— *Part 13: File Server*

The following part is under preparation:

— *Part 12: Diagnostics*

# Introduction

Parts 1 to 13 of ISO 11783 specify a communications system for agricultural equipment based on the CAN 2.0 B protocol. SAE J 1939 documents, on which parts of ISO 11783 are based, were developed jointly for use in truck and bus applications and for construction and agricultural applications. Joint documents were completed to allow electronic units that meet the truck and bus SAE J 1939 specifications to be used by agricultural and forestry equipment with minimal changes. This part of ISO 11783 is harmonized with SAE J 1939/81. General information on ISO 11783 is to be found in ISO 11783-1.

The purpose of ISO 11783 is to provide an open, interconnected system for on-board electronic systems. It is intended to enable electronic control units (ECUs) to communicate with each other, providing a standardized system.

The International Organization for Standardization (ISO) draws attention to the fact that it is claimed that compliance with this part of ISO 11783 may involve the use of a patent concerning the controller area network (CAN) protocol referred to throughout the document.

ISO takes no position concerning the evidence, validity and scope of this patent.

The holder of this patent right has assured ISO that he is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with ISO. Information may be obtained from:

> Robert Bosch GmbH
> Wernerstrasse 51
> Postfach 30 02 20
> D-70442 Stuttgart-Feuerbach
> Germany

Attention is drawn to the possibility that some of the elements of this part of ISO 11783 may be the subject of patent rights other than those identified above. ISO shall not be held responsible for identifying any or all such patent rights.

# Tractors and machinery for agriculture and forestry — Serial control and communications data network —

## Part 2:
## Physical layer

## AMENDMENT 1

*Page 47, Annex B*

Add the following entirely new clause to Annex B, at the conclusion of subclause B.10.4.

### B.11   Optional in-cab connector

#### B.11.1 General

There may be an optional connector (referred to as LBS by some manufacturers) in the cab. This can be used to connect existing components or other ECUs mounted in a tractor or implement cab to the ISO 11783 bus. This is called the *optional in-cab connector*. The CAN_H, CAN_L and power connections are transferred through this connector as in the (LBS) connector.

#### B.11.2 Optional in-cab connector receptacle dimensions

The in-cab connector receptacle shall have dimensions according to Figure B.10.

#### B.11.3 Optional in-cab connector pin allocations

The nine connector pins shall have the following allocations.

    Pin 1:    Connected to ECU_PWR

    Pin 2:    CAN_L input

    Pin 3:    CAN_L output

    Pin 4:    CAN_H input

    Pin 5:    CAN_H output

    Pin 6:    TBC_PWR

    Pin 7:    ECU_PWR

    Pin 8:    TBC_GND

    Pin 9:    ECU_GND

The loading limits on TBC_PWR and TBC_GND shall be in accordance with 5.2.3.

Dimensions in millimetres



The in-cab connector receptacle specifications are met by AMP type 206705-1 or 206705-2 [1].

**Key**

1 panel

2 3/4-20 UNEF-2A

3 AMP part no.

4 peripheral seal

**Figure B.10 — In-cab receptacle dimensional requirements**

1) AMP is the trade name of a product supplied by Tyco International. This information is given for the convenience of users of this part of ISO 11783 and does not constitute an endorsement by ISO of this product.

### B.11.4 Optional in-cab connector plug dimensions

The connector plug for the in-cab connector shall have dimensions according to Figure B.11, so as to mate with the in-cab connector receptacle.

Dimensions in millimetres
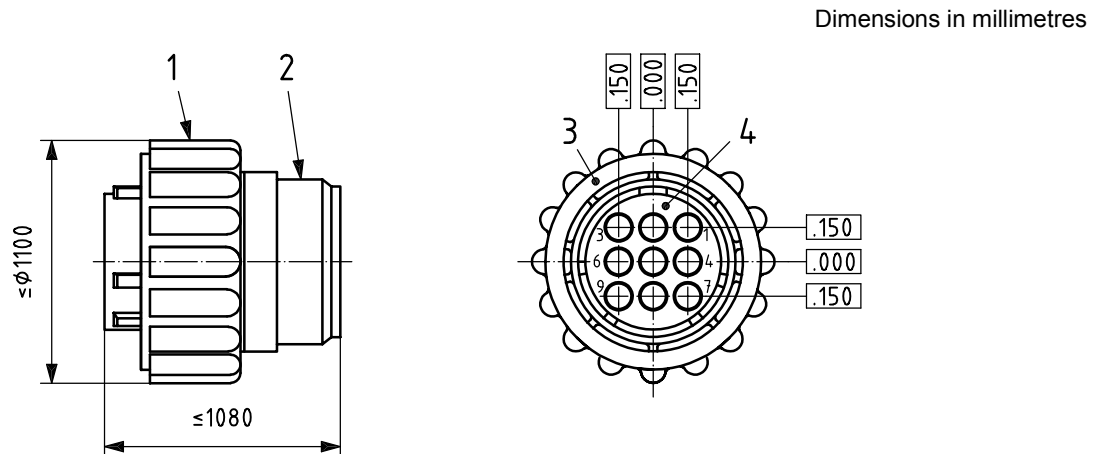


The optional in-cab connector plug specifications are met by AMP 206708 1 [2].

**Key**

1   polyester, black
2   glass filled nylon, 6/6 black
3   AMP part no.
4   mating face

**Figure B.11 — In-cab plug dimensional requirements**

### B.11.5 Optional in-cab connector cable connections

The connection of the in-cab connector to ISO controllers or display terminals is as shown in Figure B.12. A shorting plug is not required to connect CAN_L input to CAN_L output and CAN_H input to CAN_H output when no controller or terminal is connected to the in-cab connector. When not powered, a relay circuit is used to maintain the CAN_H and CAN_L connections.

The following three connection configurations are possible, as shown in Figure B.12.

a)   A loop through the in-cab connector to extend the bus. The relay is powered by a connection to the ECU_PWR terminal to open the bus on the "tractor side". Stub bus connections are provided for connection of multiple ECUs.

b)   When the ECU connection from the in-cab connector is more than 1 m, the ECU is connected by a stub connection to the bus that is looped through the in-cab connector. The TBC_PWR and TBC_GND connections are not returned through the in-cab connector but are left open circuit at the connector. The relay is powered by a connection to the ECU_PWR terminal to open the bus on the "tractor side" of the connector.

c)   When the ECU connection to the bus is less than 1 m, the ECU is connected directly to the bus and not looped through.

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2)   AMP is the trade name of a product supplied by Tyco International. This information is given for the convenience of users of this part of ISO 11783 and does not constitute an endorsement by ISO of this product.

If the controller or display provides a loop through of the bus, it shall have an internal circuit equivalent to the external connections shown for the configuration described in b).
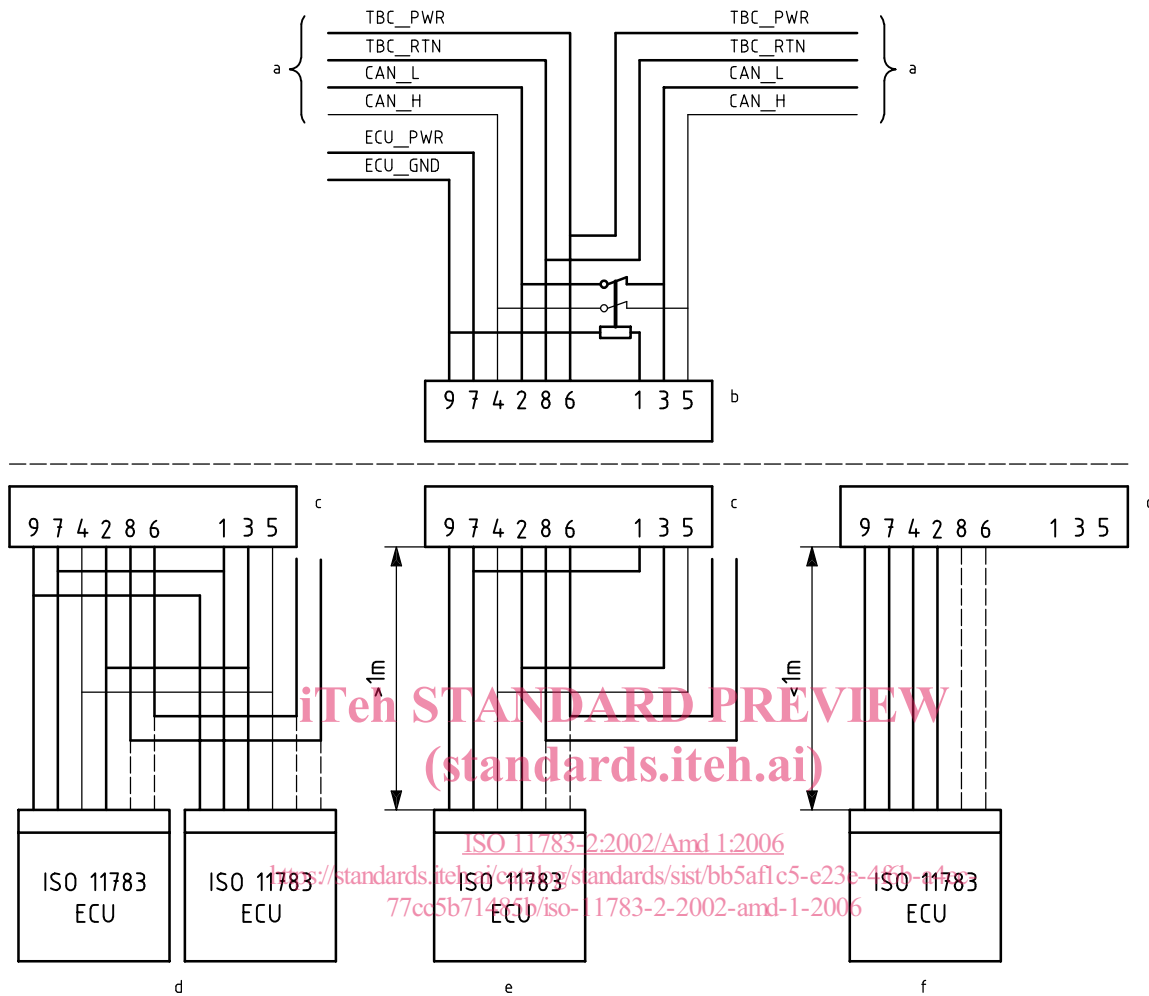


**Key**

a    ISO 11783 bus

b    In-cab connector (male)

c    In-cab connector (female)

d    Bus extension through in-cab connector for connecting multiple ECUs

e    Long bus extension through in-cab connector for connecting an ECU

f    Short bus extension (stub) through in-cab connector for connecting an ECU

NOTE      The TBC_PWR and TBC_RTN are routed together with the CAN_L and CAN_H as twisted quad cable for EMC purposes but only once connected to connector "c".

**Figure B.12 — In-cab connector cable connections**

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