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व्यापक परिचालन में मसौदा

प्रलेख प्रेषण सूचना

Ref	Date
टीईडी 22/ टी- 81	20 06 2018

परिवहन ट्रैक्टर, ट्रैलर और औद्योगिक ट्रक विषय समिति, टीईडी 22

क) परिवहन इंजीनियरिंग विभाग परिषद |पंडविप| के सभी सदस्यों को

ख) परिवहन ट्रैक्टर, ट्रैलर और औद्योगिक ट्रक विषय समिति, टीईडी 22 के सभी सदस्यों को

ग) अन्य सभी रूचि रखने वाले निकाय

महोदय/ महोदया,

निम्नलिखित प्रलेख संलग्न हैं:

प्रलेख संख्या	विषय
TED 22 (11511) W	फार्क - लिफ्ट ट्रक - फार्क आर्म - तकनीकी विशेषताएँ एवं परीक्षण (आईएस 6876 का दूसरा पुनरीक्षण )

कृपया उपरोक्त मानक मसौदे का अवलोकन कर अपनी सम्मतियां यह बताते हुए भेजें, कि यदि अंततः यह मानक राष्ट्रीय मानक के रूप में स्वीकृत हो जाए, तो इस पर अमल करने में आपके व्यवसाय अथवा कारोबार में क्या कठिनाइयां आ सकती हैं ।

सम्मति की अन्तिम तिथि : 19 08 2018

सम्मति यदि कोई हो तो नीचे दिए गए प्रारूप में लिख कर, उपरिलिखित पते पर अधोहस्ताक्षरी को भेजें ।यदि कोई सम्मति प्राप्त नहीं होती हैं अथवा सम्मति में केवल भाषा संबंधी त्रुटि हुई तो उपरोक्त प्रलेख को यथावत अंतिम रूप दिया जायेगा । यदि कोई सम्मति तकनीकी प्रकृति की हुई तो विषय समिति के अध्यक्ष के परामर्श से अथवा उनकी इच्छा पर आगे की कार्यवाही के लिए विषय समिति को भेजे जाने के बाद प्रलेख को अंतिम रूप दे दिया जाएगा ।

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धन्यवाद

भवदीय

( आर आर सिंह )

वैज्ञानिक ई एवं प्रमुख  
परिवहन इंजीनियरिंग विभाग

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**DRAFT IN WIDE CIRCULATION**

**DOCUMENT DESPATCH ADVICE**

Ref	Date
<b>TED 22/ T-81</b>	<b>20 06 2018</b>

**Automotive Electrical Equipment and Instruments Sectional Committee, TED 22**

- 1) All Members of Transport Engineering Division Council, TEDC
- 2) All Members of Transport tractors, Trailers and Industrial Trucks Sectional Committee, TED 22
- 3) All Others Interested.

Dear Sir/ Madam,

Please find enclosed the following draft standard:

Document No.	Title
TED 22 (11511) W	Fork-lift trucks — Fork arms — Technical Characteristics and Testing ( <i>Second Revision of IS 6876</i> )

Kindly examine this draft standard and forward your views stating any difficulty which you are likely to experience in your business or profession, if this is finally adopted as National Standard. Last date for comments : **19 08 2018**

Comments, if any, may please be made in the format given below and mailed to the undersigned at the above address.

In case no comments are received or comments received are of editorial nature, you will kindly permit us to presume your approval for the above document as finalized. However, in case of comments of technical in nature are received then it may be finalized either in consultation with the Chairman, Sectional Committee or referred to the sectional committee for further necessary action if so desired by the Chairman, Sectional Committee.

The document is also hosted on BIS website [www.bis.org.in](http://www.bis.org.in)

Thanking you,

Yours faithfully,

Encl: As above

(R R Singh)  
Scientist 'E' & Head  
Transport Engineering Department



**For Comments Only**

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***Draft Indian Standard***  
**Fork-lift trucks — Fork arms — Technical Characteristics and Testing**  
*(Second Revision of IS 6876)*  
ICS 53.060

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Last date for receipt of  
comments is 19.08.2018

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**FOREWORD**

This draft Indian Standard ( Second Revision ) shall be adopted by the Bureau of Indian Standards on the recommendation of the Transport Tractors, Trailers and Industrial Trucks Sectional Committee and approval of the Transport Engineering Division Council.

This Standard was prepared as a guide for testing the suitability of fork to be used in forklift trucks and the principal dimensions were prepared to promote interchangeability and was published in 1983.

First revision of the standard was undertaken in 2003 to bring it in line with ISO 2330 : 2002 ‘Fork-Lift trucks — Fork arms — Technical characteristics and testing’, issued by International Organization for Standardization. In the first revision certain tests were added such as yield test, impact test, fatigue test and surface crack detection. Marking clause was also elaborated. This revision is being taken up to incorporate the references of latest standards for various tests and requirements and introduction of new alloy materials.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2005 ‘Rules for rounding off numerical values ( revised)’. The number of significant places retained in the rounded off value should be the same as that of specified value in this standard.

*Draft Indian Standard*  
**Fork-lift trucks — Fork arms — Technical Characteristics and Testing**  
*(Second Revision of IS 6876)*

## 1 SCOPE

**1.1** This Indian Standard specifies manufacturing, testing and marking requirements for solid-section fork arms, or quantity production and with all types of mounting. These include, but are not limited to, hook, shaft or pin, bolt-on and roller type fork arms.

**1.2** By agreement between the fork arm manufacturer and the purchaser, these requirements may also be applied to fork arms not intended for quantity manufacture.

## 2 REFERENCES

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.

<i>IS/ISO No.</i>	<i>Title</i>
IS 1757 (Part 1) : 2014 Part 1 ISO 148-1 : 2009	Metallic Materials — Charpy Pendulum Impact Test Test Method
ISO 683-1 : 2016	Heat-treatable steels, alloy steels and free-cutting steels — Part 1 : Non-alloy steels for quenching and tempering.
IS 7525 : 2017 ISO 2328:2011	Fork-lift trucks — Hook-on type fork arms and fork arm carriages — Mounting dimensions
IS 7570 : 1975 ISO 2331:1974	Glossary of terms relating to fork arms and attachments of fork lift trucks

## 3 TERMS AND DEFINITIONS

For the purposes of this Indian Standard, the terms and definitions given in ISO 7570 and the following shall apply.

**3.1 Prototype fork arm** — Fork arm intended for quantity production where any combination of the blade, shank cross-section, material specification, hook or fork heel design is new to production

## 4 MANUFACTURE

The fork arms shall be manufactured from material of solid cross-section.

## 5 TESTING

**5.1** A prototype fork arm shall be subjected to, and meet the requirements of, the yield test as given in **6** and the impact test in **7**. Prototype fork arms each having a specified capacity not greater than 4 000 kg and a load centre not greater than 4 000 kg  $\times$  600 mm shall be subjected to, and meet the requirements of, the fatigue test in **8**.

**5.2** The tests given in **6** and **7** may, by agreement between the fork arm manufacturer and the purchaser, be repeated periodically for quantity production fork arms.

## 6 YIELD TEST

### 6.1 Test load

**6.1.1** *Fork arms each of specified capacity up to and including 5 500 kg*

The test load  $F_T$  shall correspond to three times the specified capacity  $C$  of the fork arm.

**6.1.2** *Fork arms each of specified capacity greater than 5 500 kg*

The test load  $F_T$  shall correspond to the specified capacity  $C$ , expressed in kilograms, of the fork arm multiplied by the safety factor  $R$ , where  $R$  is given as follows:

$$R = 3 - 0.08(Q - 10)$$

Where

$$R \geq 2.5$$

$$Q = \frac{2C}{1000}$$

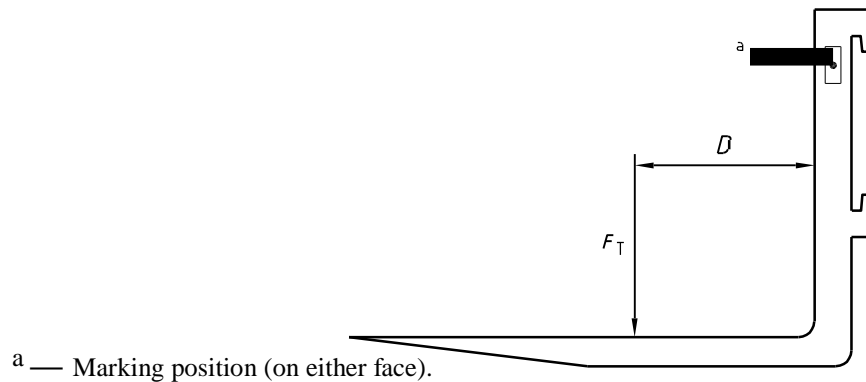
### 6.2

#### Procedure

**6.2.1** Restrain the fork arm in a manner identical to that used on the fork-lift truck. Fit the fork arm with a means of measuring any permanent deformation.

**6.2.2** Apply the appropriate yield test load twice at the distance  $D$  from the front face of the fork arm shank (see Figure 1), gradually and without shock; maintain it for 30 s each time. For fork arms each of specified capacity below 5 500 kg and a load centre of 5 500 kg  $\times$  600 mm,  $D$  shall be taken as the appropriate rated load centre distance as specified in Table 1 of IS 7525. For fork

arms each of specified capacity of 5 500 kg and above and a load centre of  $5\,500 \text{ kg} \times 600 \text{ mm}$ ,  $D$  shall be specified by the truck manufacturer.



<sup>a</sup> — Marking position (on either face).

FIG. 1 MARKING POSITION AND TEST LOADS APPLICATION POSITION

### 6.3 Requirement

Datum readings shall be taken on the top surface of the fork blade tip after the first test and again after the second test. Comparison between these two readings shall indicate no permanent deflection.

## 7 IMPACT TEST

### 7.1 Sampling

**7.1.1** Specimens longitudinal to the grain shall be taken in relation to the fork arm section in accordance with the location of test pieces in bars and wire rods specified in ISO 683-1. These shall preferably be taken from an area between the top and bottom hooks, but it is also permissible to take specimens from a specially provided extension of the fork shank above the top hook or from a separate piece of semi-finished material of adequate size (i.e. length at least twice the width), which has the same cross-section, has been taken from the same material batch and has received the same heat treatment as the fork arm itself.

### 7.2 Procedure

Carry out the impact tests in accordance with IS 1757 (Part 1) using standardized V-notched samples, at a temperature of  $-20^{\circ}\text{C}$ .

### 7.3 Requirement

The samples shall achieve an impact value of at least 27 J at  $-20^{\circ}\text{C}$ .

## 8 FATIGUE TEST

## 8.1 Test load magnitude, frequency and duration

**8.1.1** The dynamic test load shall be of constant amplitude and have a peak magnitude of 1,25 times the specified capacity  $C$ . The minimum value for the dynamic test load shall not exceed 0.1 times the specified capacity  $C$ .

**8.1.2** The test load frequency shall be 10 Hz maximum. The frequency shall be reduced if the temperature of the fork arm exceeds 50°C or if resonance symptoms occur.

**8.1.3** The duration of the test shall be not less than  $10^6$  test load cycles.

## 8.2 Procedure

Restrain the fork arm in a manner identical to that used on the fork-lift truck. Apply the dynamic test load at the distance from the front face of the fork arm shank where  $D$  is as specified in 6.2 (see Fig.1).

## 8.3 Requirement

There shall be no cracks or permanent deformation in the fork arm on completion of the test. The crack detection procedure shall be as specified in 9.

## 9 SURFACE CRACK DETECTION

The fork arm manufacturer shall thoroughly visually examine every fork arm in quantity production (or following a fatigue test) for cracks, and subject them to a non-destructive crack detection process with special attention being given to the heel and any welds and heat-affected zones at the top and bottom hooks, including their attachment to the shank. The fork arm shall be withdrawn, if indications of cracking are detected.

NOTE—It is recommended that the non-destructive crack detection process be carried out by the magnetic particle inspection method.

## 10 MARKING

**10.1** At the position indicated in Fig. 1 (on either face), each fork arm shall be marked permanently with the following:

- a) Specified fork arm capacity  $C$ , in kg;
- b) Specified load centre distance  $D$ , in mm;
- c) Fork arm manufacturer's identification;
- d) Week or month and year of manufacture or agreed serial number.

**10.2** The truck manufacturer's identification and part number may be shown ,if requested.



### **10.3 BIS Certification Marking**

The fork arms of the fork lift trucks may also be marked with the Standard Mark.

The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.