INTERNATIONAL STANDARD ISO 3874

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Series 1 freight containers — Handling and securing

Conteneurs de la série 1 — Manutention et fixation

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3874 was drawn up by Technical Committee ISO/TC 104, *Freight containers,* and was circulated to the Member Bodies in July 1975.

It has been approved by the Member Bodies of the following countries :

Australia	Germany	Norway
Austria	Hungary	Poland
Belgium	India	Romania
Brazil	Iran	South Africa, Rep. of
Bulgaria	Ireland	Sweden
Canada	Israel	Switzerland
Cuba	Italy	Turkey
Czechoslovakia	Japan	United Kingdom
Denmark	Mexico	U.S.A.
Finland	Netherlands	U.S.S.R.
France	New Zealand	Yugoslavia

No Member Body expressed disapproval of the document.

Printed in Switzerland

Series 1 freight containers — Handling and securing

1 SCOPE AND FIELD OF APPLICATION

1.1 This International Standard is intended as a guide and describes recommended methods of handling and securing series 1 freight containers constructed in accordance with ISO publications.

1.2 The purpose of this International Standard is to define basic principles and procedures to enhance the safe operation of containers in all surface modes of transport.

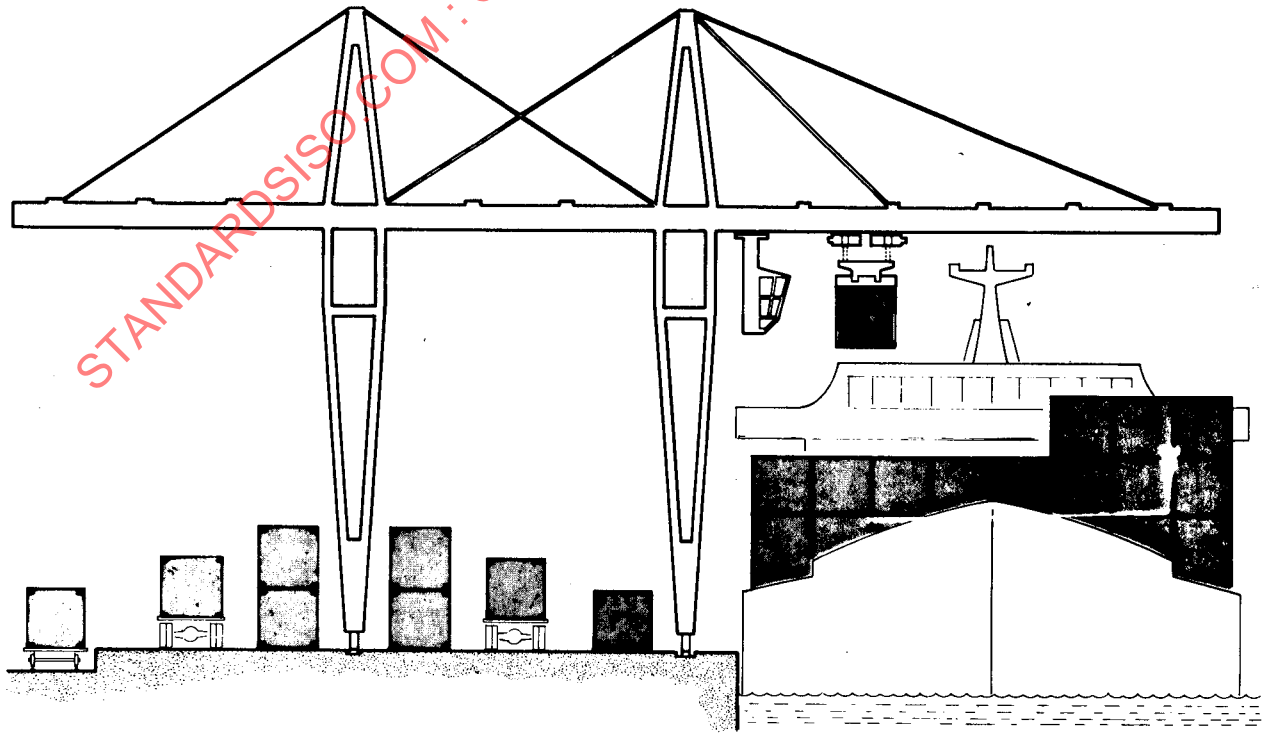

FIGURE 1 — **Example of loading/unloading containers**

2 GENERAL

2.1 In the clauses which follow it is assumed that :

2.1.1 The requirements of all relevant national and international regulations have been met.

2.1.2 The container and any equipment which may be used in its operation have been adequately maintained.

2.1.3 Doors, lids, closures, removable or foldable parts and any loose equipment, etc. are properly secured before any lifting, moving and stacking operation is undertaken.

2.1.4 All personnel engaged in handling and securing operations have received proper instructions, especially with regard to safety questions.

2.2 It is further assumed that the cargo within the container has been loaded, or packed and secured where necessary, in accordance with the recommended practices of the trade so that the cargo does not impose upon the container forces in excess of those for which it has been designed.

This last assumption implies in particular that :

2.2.1 The equipment used for packing and emptying the container only imposes loads which are not in excess of those for which the container was designed.

2.2.2 The total weight of all items loaded or packed into the container, including dunnage, securing equipment, etc., does not exceed the maximum permitted payload, i.e. the maximum permissible operating gross weight minus the tare weight.

2.2.3 Cargo has been distributed over the length and width of the floor of the container as evenly as practicable in order that no part of the container is overstressed.

2.2.4 Special care has been taken (for example by the use of load-spreading dunnage) to distribute loads from cargo which could otherwise, under dynamic conditions, subject the floor to local pressures in excess of those for which it was designed.

2.2.5 The centre of gravity is sufficiently low and central to give safe and satisfactory handling and transportation characteristics, i.e. to avoid such problems as :

— excessive tilting and/or overstressing of container and handling equipment;

— unacceptable vehicle axle loading and lack of vehicle stability.

2.2.6 Cargo has been so stowed and/or so secured as to prevent damage which might otherwise result from dynamic conditions encountered in handling and transportation.

3 HANDLING

3.1 General

In every lifting operation care must be taken to ensure that the equipment is suitable for the load and is safely attached to the container.

In the case of a single point lift (see for example figure 8), special attention should be paid to the risk of the container tilting owing to eccentricity of cargo loading.

3.2 Lifting from top corner fittings

The top corner fittings are the recommended lifting points.

3.2.1 *Container sizes 1AA, 1A, 1BB, 1B, 1CC and 1C*

The lifting forces should always be applied vertically, engaging all four corner fittings. (See figures 2, 3 and 4.)

3.2.1.1 LIFTING BY MEANS OF A SPREADER WITH BUILT-IN TWISTLOCKS

The spreader may be suspended from a crane (see figure 2), straddle carrier or other suitable equipment.

The proper engagement and disengagement of the twistlocks should be checked, as far as possible. The operation of safety interlocks, when provided, should be verified visually or automatically.

Exterior gather devices should impinge on corner fittings only.

3.2.1.2 LIFTING FROM TOP CORNER FITTINGS BY MEANS OF A SPREADER EQUIPPED WITH HOOKS OR SHACKLES OR HAND-ENGAGED TWISTLOCKS

The proper engagement or attachment of such devices should be checked. (See examples in figures 3 and 4.)

An ordinary hook shall always be placed in an inward-to-outward direction. (See figure 3b.)

For a safety hook, placement in an outward-to-inward direction is acceptable, because of its special construction. (See figure 3c.)

Hand-engaged twistlocks shall be impossible to turn while containers are suspended from them. (See figure 3e.)

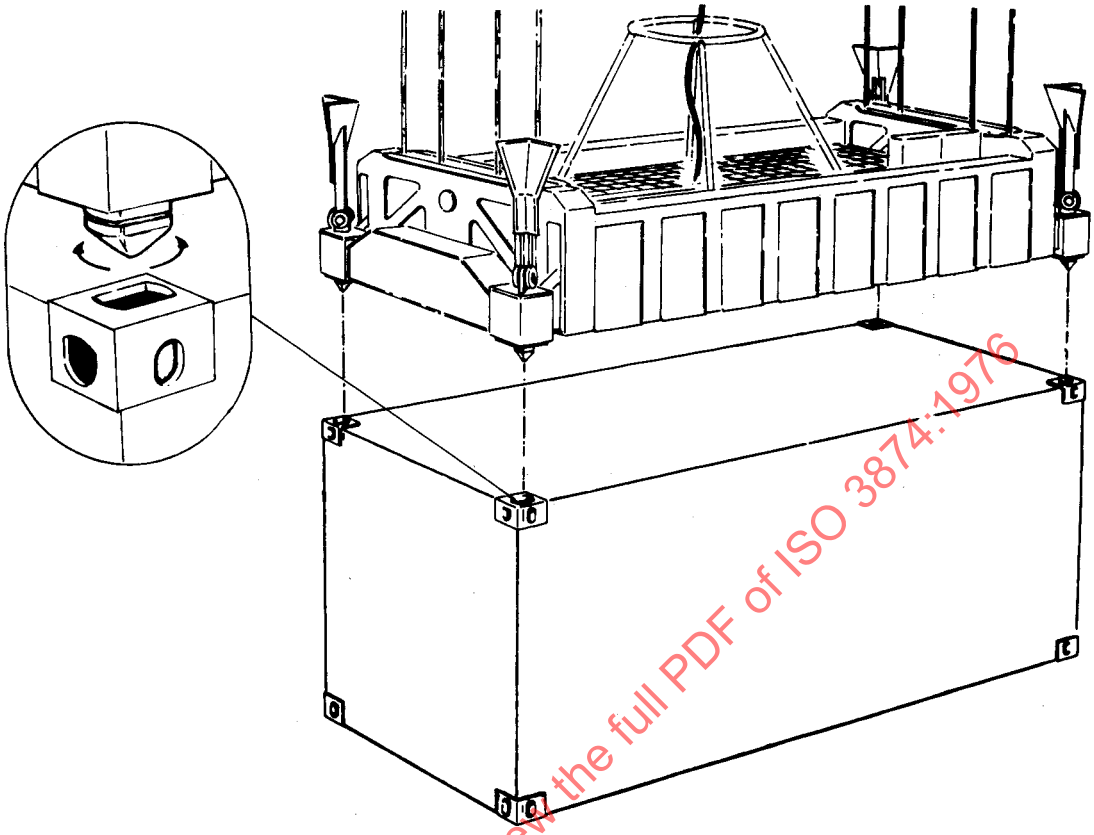

FIGURE 2 – **Example of lift by crane spreader with built-in twistlocks**

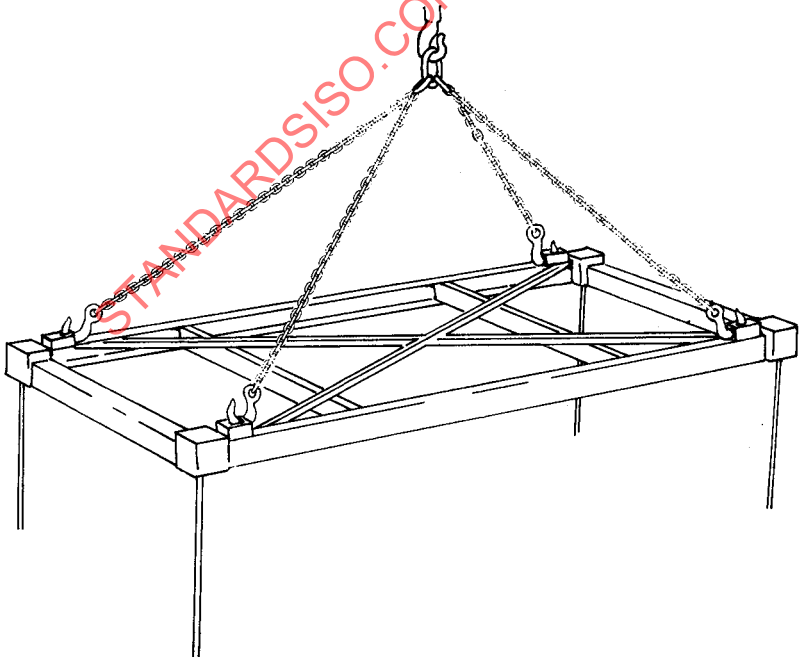

FIGURE 3a) – **Example of lifting containers by spreader equipped with hooks, shackles or hand-engaged twistlock attachment**

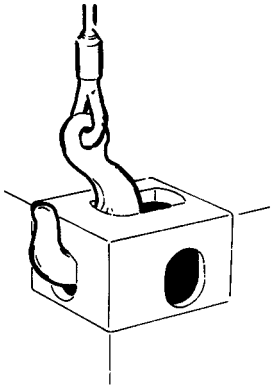

FIGURE 3b) – **Example of ordinary hook attachment**

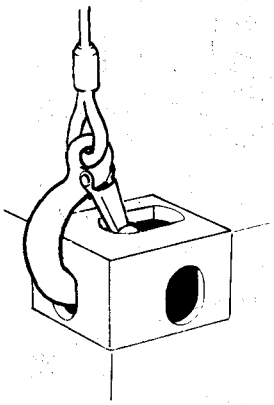

FIGURE 3c) — **Example of safety hook attachment**

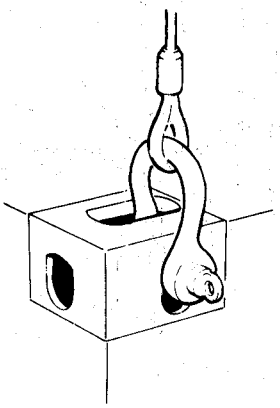

FIGURE 3d) — **Example of shackle attachment**

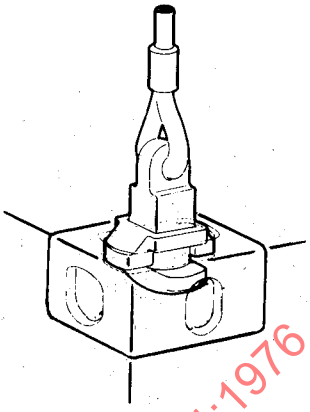

FIGURE 3e) — **Example of hand-engaged twistlock**

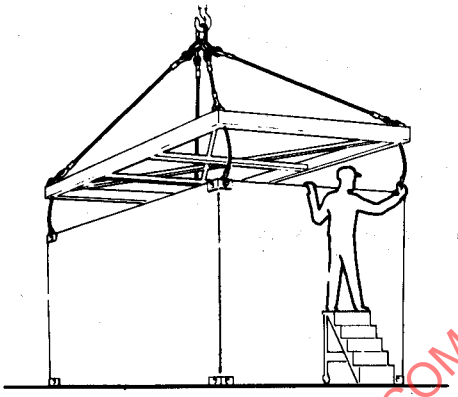

FIGURE 4a) — **Attaching lifting equipment**

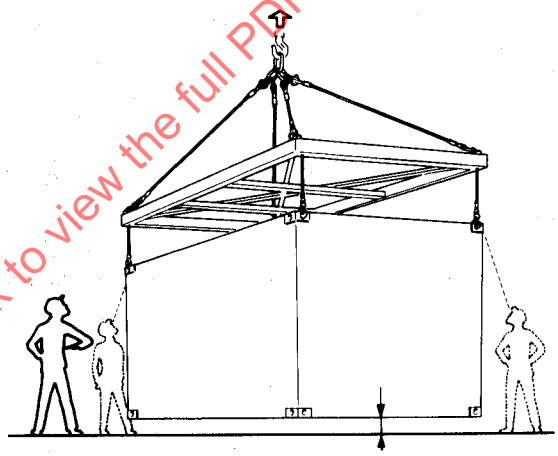

FIGURE 4b) — **Checking attachment when just clear of ground**

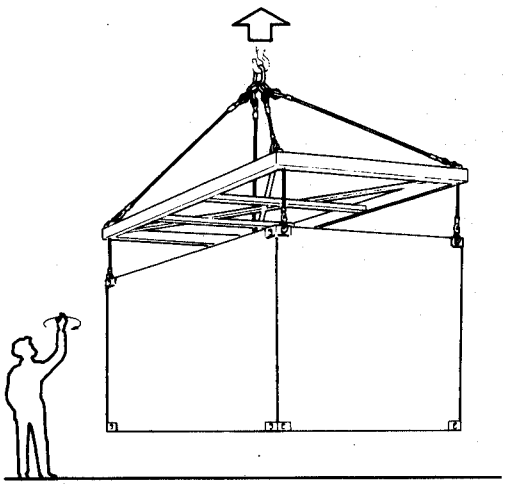

FIGURE 4c) — **Lifting**

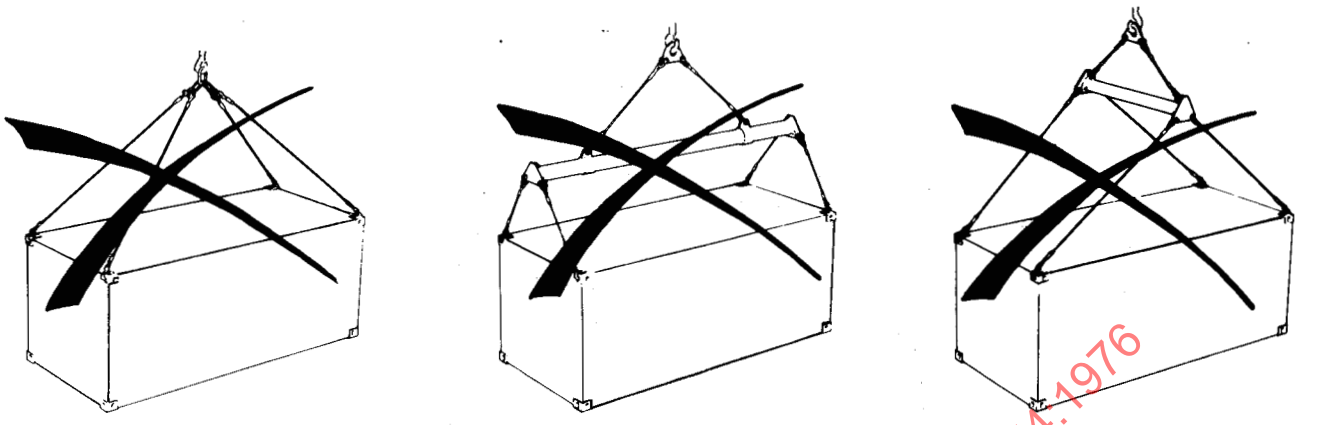

FIGURE 5 — **Examples of lifting methods which must not be used**

3.2.2 *Container sizes 1D, 1E and 1F*

Sub-clause 3.2.1 is applicable, but the lifting forces may also be applied at an angle not less than 60° to the horizontal (see figure 6).

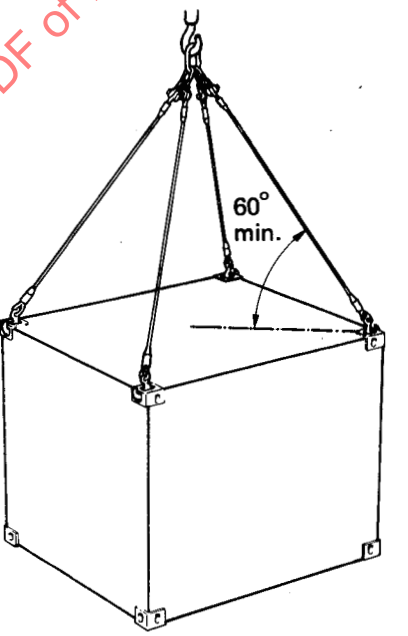

FIGURE 6 — **Example of lifting containers 1D 1E and 1F**

3.3 Lifting from bottom corner fittings

3.3.1 When lifting containers by the bottom corner fittings, the lifting devices should bear on the four bottom corner fittings only and should not make any other contact with the container (see figure 7).

3.3.2 Attachment devices should be so used that the lifting forces are exerted not more than 38 mm (1 1/2 in) away from the face of the corner fitting (see detail in figure 7).

3.3.3 Before lifting from bottom corner fittings, check to ensure the correct engagement of sling terminal fittings with corner fittings.

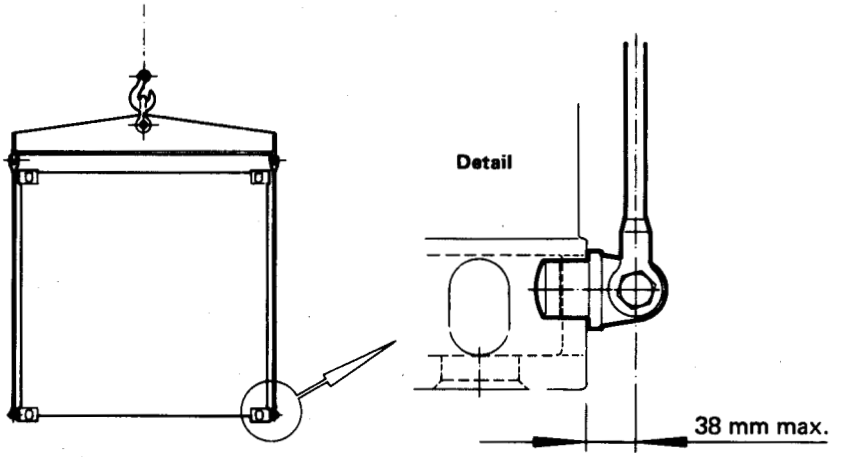

FIGURE 7 — **The lifting devices should make contact with the bottom corner fittings only**

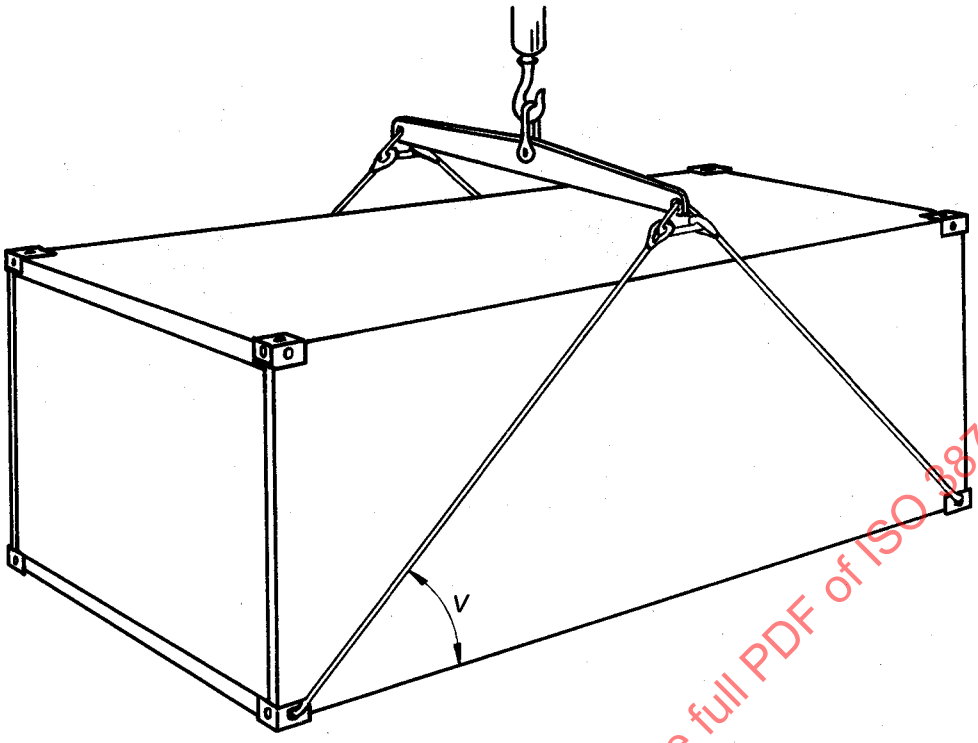

FIGURE 8 – **Example of lifting container from bottom corner fittings**

3.3.4 The lifting angle *V*, shown in figure 8, should not be less than the minimum values shown in the following table.

Container size	1AA and 1A	1BB and 1B	1CC and 1C	1D, 1E and 1F
V min.	30°	37°	45°	60°

3.4 Other methods of handling by corner fittings

Handling of containers by the corner fittings by methods other than those mentioned in 3.2 and 3.3, for example using corner fittings of one side or one end of the container, should be done only after careful evaluation of the container design.

3.5 Handling by means of standardized optional features

3.5.1 *Fork lift pockets*

For container sizes 1CC, 1C and smaller, but excluding tank containers, lifting and handling may be done by means of forks inserted into fork lift pockets which are specifically designed for this practice in accordance with International Standards (see figure 9). Ideally, forks should extend over the whole width of the container but in no circumstances should they extend over less than 1 825 mm (71 7/8 in) into these pockets.

Containers with or without fork lift pockets must not, under any circumstances, be directly lifted by forks under the base of the containers (see figure 10).

3.5.2 *Grappler lift points*

Handling may be done by means of grappler arms being engaged at the base of containers only at those points which are specifically designed for this practice in accordance with International Standards (see figure 11).

3.6 Methods of handling not envisaged above

Handling of containers by methods other than those mentioned in 3.2, 3.3, 3.4 and 3.5 should be done only after careful evaluation of the container design.

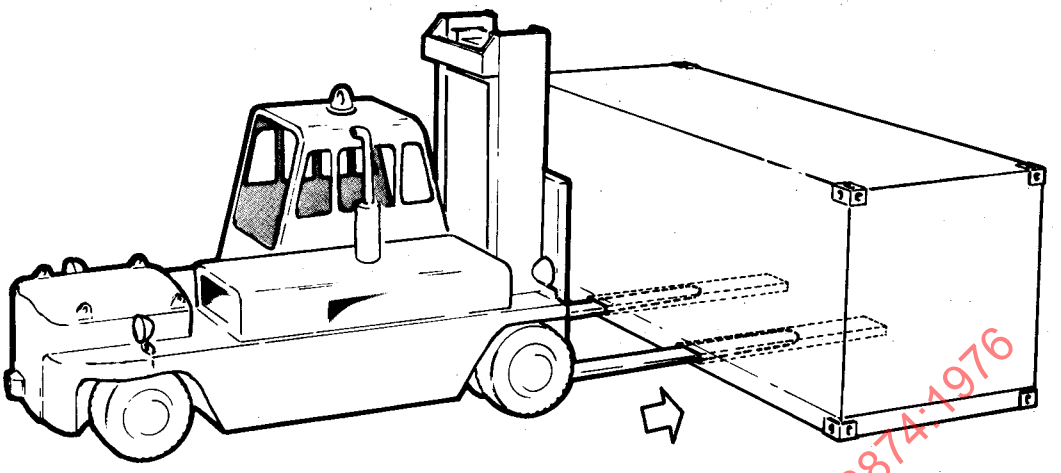

FIGURE 9 — **Example of correct method of handling (with forks being inserted into or retracted from fork lift pockets)**

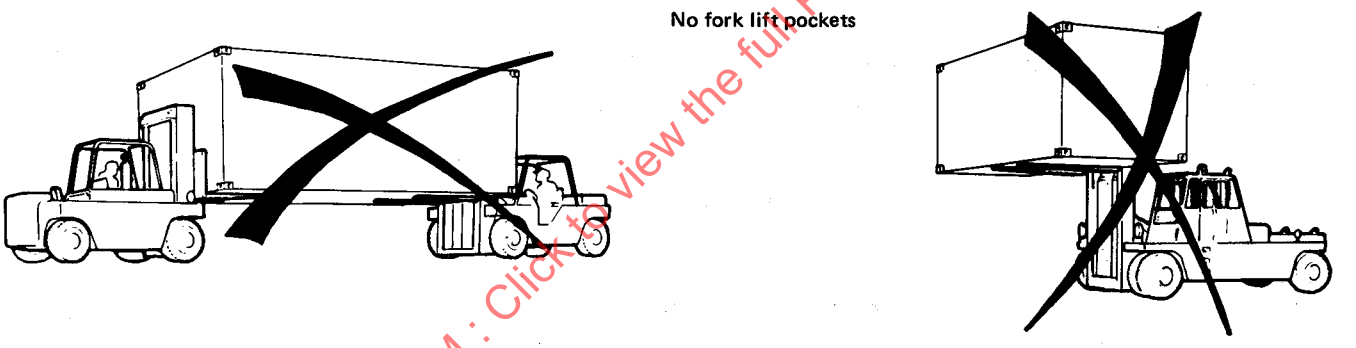

FIGURE 10 — **Example of methods of handling which must not be used**

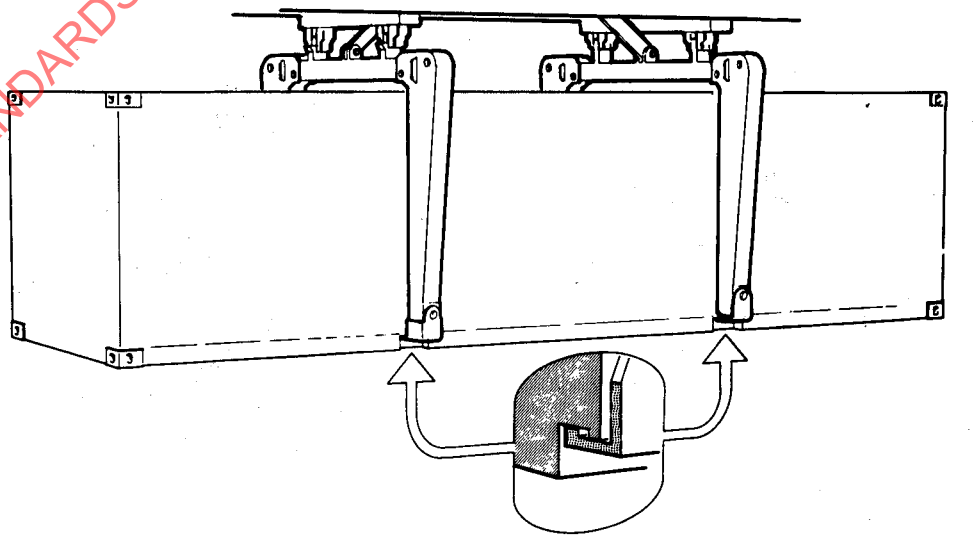

FIGURE 11 — **Example of correct method of handling**