UDC 621.868.27

Ref. No. : ISO/R 1074-1969 (E)

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 1074

STABILITY OF COUNTERBALANCED LIFT TRUCKS

BASIC TESTS

1st EDITION

May 1969

For each individual country the only valid standard is the national standard of that country.

Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

BRIEF HISTORY

The ISO Recommendation R 1074, *Stability of counterbalanced lift trucks – Basic tests*, was drawn up by Technical Committee ISO/TC 110, *Industrial trucks*, the Secretariat of which is held by the Association Française de Normalisation (AFNOR).

Work on this question led to the adoption of a Draft ISO Recommendation.

In September 1967, this Draft ISO Recommendation (No. 1064) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	Ireland	Turkey
Belgium	Israel	U.A.R.
Bulgaria	Japan	United Kingdom
Czechoslovakia	Netherlands	U.S.A.
France	Poland	U.S.S.R.
Germany	South Africa, Rep. of	Yugoslavia
Greece	Sweden	
India	Switzerland	

No Member Body opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in May 1969, to accept it as an ISO RECOMMENDATION.

ISO Recommendation | R 1074 | May 1969

STABILITY OF COUNTERBALANCED LIFT TRUCKS

BASIC TESTS

1. SCOPE

This ISO Recommendation defines the basic tests for the verification of stability of counterbalanced lift trucks.

2. FIELD OF APPLICATION

This ISO Recommendation applies to counterbalanced fork lift trucks with tiltable or non-tiltable masts, up to and including 10 000 kg or 20 000 lb manufacturer's rated capacity.*

It also applies to lift trucks operating under the same conditions but having ancillary attachments other than forks.

It applies neither to trucks with retractable devices (mast or fork) nor to lift trucks when adapted for use as mobile cranes.

3. CONDITIONS OF VALIDITY

3.1 Normal operating conditions

The basic tests defined in this ISO Recommendation ensure that the type of lift truck under consideration has satisfactory minimum stability under standardized operating conditions defined as follows :

(*a*) operating on level surfaces;

(*b*) travelling with the load in the lowered position;

(*c*) stacking with the mast vertical.

3.2 Other conditions

When the operating conditions differ from those stated in clause 3.1 (as, for example, where the use of forward tilt is required when stacking full load at maximum lift height), and until the publication of the relevant ISO Recommendations**, it is necessary, to meet the test values agreed upon between the interested parties, to use either

(*a*) a truck with a higher rated capacity, or

(*b*) a truck having design modifications.

In both cases, the stability conditions should be equivalent to those obtained during the four tests described below for normal operating conditions.

3.3 Additional tests

If any tests other than the four tests described below are required, and until the publication of the relevant ISO Recommendations***, the details should be agreed upon between the interested parties.

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* See ISO Recommendation R . . ., *Counterbalanced fork lift trucks – Rated capacity* (at present Draft ISO Recommendation No. 1063).

** The tests for the verification of the stability of lift trucks when the operating conditions differ from the standardized conditions (see clause 3.1) are at present under consideration.

*** The additional tests which could be required are at present under consideration.

4. STABILITY TESTS FOR FORK TRUCKS

4.1 Specification of tests

The stability of fork trucks should be verified by four tests carried out by means of a platform which can tilt about a side.

The tests are carried out on an operational truck but without the operator.

A fork truck being tested for stability is placed on a platform which is initially horizontal, in the conditions specified in clause 4.2 and, successively, in each of the four positions described in section 6, Table of tests, which correspond respectively to the four tests.

In each of these tests the platform is tilted to the slope indicated in the Table.

The truck is considered stable if it passes all four tests without overturning.

In the case of test No. 4, it is permissible for one of the front wheels to lose contact with the platform and, in the case of three-wheeled trucks, for the outer extremity of the chassis to come into contact with the platform.

4.2 Conditions for carrying out the tests

4.2.1 *Position of the truck on the platform.* For tests No. 1 and 2 the truck should be placed on the platform in such a manner that the axes of its wheels are parallel to the axis of tilting XY of the platform (see Fig. 6).

For tests No. 3 and 4 the truck should be placed on the platform in a turning position, and in such a manner that the line MN is parallel to the axis of tilting of the platform. Moreover, the steering wheel nearer to this axis should be parallel with it (see Fig. 7, 8 and 9).

Point N is the centre of the tread of the front wheel nearer to the axis of tilting XY on the platform (see Fig. 7, 8 and 9).

Point M is defined as follows :

(*a*) for trucks having a steering axle : the projection on the platform of the intersection of the axis of the truck with the axis of this axle (see Fig. 7);

(*b*) for trucks steering by means of a single swivelling wheel : the centre of the tread of the steering wheel on the platform (see Fig. 8);

(*c*) for trucks steering by means of twin swivelling wheels : the centre of the tread of the steering wheel nearer to the axis of tilting XY on the platform (see Fig. 9).

4.2.2 *Test load.* The test load should be such that its action corresponds to that of a homogeneous cube the mass of which is equal to the maximum load Q and the dimensions of which are equal to twice the load centre distance D, the values of Q and D corresponding to the manufacturer's rated capacity of the truck* (see Fig. 1).

The centre of gravity G of the test load should be located in the longitudinal plane of symmetry AB of the truck (see Fig. 6, 7, 8 and 9).

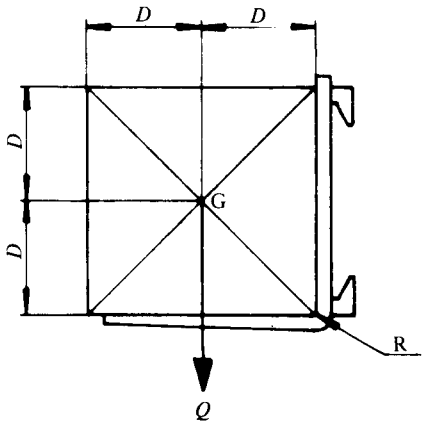

FIG. 1

* See ISO Recommendation R . . ., *Counterbalanced fork lift trucks – Rated capacity* (at present, Draft ISO Recommendation No. 1063).

4.2.3 *Immobilisation of the truck*. The truck should be immobilised only by the braking device and not by chocks between the wheels and the platform or other external devices. If the hand-brake of a truck is not sufficient, the foot-brake may be locked in its braking position.

The coefficient of friction of the platform surface may be increased if necessary by an appropriate friction-increasing material.

4.2.4 *Verification of the vertical position of the mast*. Before proceeding with test No. 1, the vertical position of the mast should be verified by means of a plumb-line.

The plumb-line hanging from R (inner corner of the fork, see Fig. 1) should indicate the same point in the horizontal plane for two lift heights of load : the height 0.30 m (12 in) and the maximum height.

Deviations should be corrected by varying the tilt of the mast within the limits imposed by the design of the truck.

NOTE. – This clause does not apply to trucks with non-tiltable mast.

4.2.5 *Safety devices*. Special precautions should be taken to prevent the overturning of the truck or the displacement of the test load during the course of the tests. If the device for preventing the total overturning of the truck consists of a lashing, this should not be tight and should be sufficiently supple to impose no appreciable restriction on the truck until the overturning movement commences.

For tests No. 1 and 3 (load at maximum lift height), the test load should be either

(*a*) placed on the fork and held at the upper edge by a safety sling which is supple and kept slackened, or

(*b*) suspended near the ground from an appropriate support placed on the fork in such a manner that the seat of the hook of the support is at the point where the centre of gravity G of the test load would be located if the test load were to be placed on the fork.

5. STABILITY TESTS FOR TRUCKS WITH OTHER ATTACHMENTS

Lift trucks furnished with attachments other than forks should be subjected to the same stability tests, except in cases where the attachment can bring the centre of gravity of the load out of the plane of symmetry AB of the truck.*

For the verification of the vertical position of the mast, a reference point R should be suitably chosen, near to the fixing point of the attachment.

The test load, however, should be the specified load at the specified distance indicated for the attachment when used on the truck being tested.

The lift height envisaged for tests No. 2 and 4 should be measured between the platform and the underside of the load or of the attachment. Only the smaller of these heights is to be taken into consideration.

* The stability tests are under further consideration for lift trucks furnished with attachments which can bring the centre of gravity of the load out of the plane of symmetry of the truck.