In paragraph 5.7.4.3 of EN1493 latest edition, load rectangles have been changed basing on the new concept of NORMATIVE VEHICLE which gives better answer to circulating vehicles now on-the-road.

The application of these load rectangles is very clear when referring to 5.7.4.2 – wheel support vehicle lift – but it’s not so clear while referring to lifts with arms.

For those types in effect it seems not to be valid the new concept of normative vehicle but ONLY those of MINIMUM DISTANCE of 1000 mm in the wheel track direction (partial).

If we do not limit the 5.7.4.3 wording to drive designers and notified bodies to the new normative vehicle load rectangle, they can risk to design or check the lift for load conditions worser than those really representative for the new normative vehicle load rectangle and circulating vehicles now on-the-road.

Moreover, the distance of pick-up points in the wheel BASE direction could be so reduced to destabilize the supported vehicle: if you remember in the old norms a minimum distance between front and rear pick-up points was indicated as normative.

This effect is sensible especially for 2 post lifts with rotated columns with arms which could be driven on the same side in order to improve arms positioning under the vehicle.

The attached example is referred to a RAV lift, but similar situation can be easily found also on other manufacturer lift’s range and types.

Applying the norm “as is” today, long arms must be positioned to the maximum extension and with pick-up points at 1000 mm in the wheel track direction. But the short arm could be ALSO positioned in the worst position of 736 mm in the direction of the wheel base instead of 1400 mm as required from the normative vehicle dimension reported in 5.7.4.3. The load rectangle is then 1000 x 736 mm instead of 1000 x 1400 mm.

The gravity center of the rectangle is heavily increased mm from 625 to 891mm(see pict.1B and 1A).

To avoid this interpretation (in our opinion not desired while writing the standard, but surely possible for the actual wording) we should point out that the reference also for lifts with arms is always the normative vehicle load rectangle.

On the other hand, the same meaning of normative vehicle leaves out of consideration the lift: a vehicle remains such for all the lifts that are used to lift it. So for all the lifts (chassis supporting or wheel supporting lifts) the reference must be the same .

Our suggestion could be to modify or to add as “errata corrige” at the end of par. 5.7.4.3 – sub a) and 5.7.4.3 – sub b) the following (in red)

***5.7.4.2.a) Rated load < 3,5 t***

***………..***

***On vehicle lifts with carrying arms the rated load shall be distributed on the four corners of a rectangle with the dimension 1000x1400 / 1700x1400mm with the maximum load at the maximum length of the longest arm.***

Instead of:

***5.7.4.2.b) Rated load > 3,5 t***

***………..***

***On vehicle lifts with carrying arms the rated load shall be distributed on the four corners of a rectangle with the dimension 1000x 1800 / 1700x1800mm with the maximum load at the maximum length of the longest arm and the short arm in the position which gives the worst condition***

Instead of:

In the case the lift’s layout does not allow short arms to be positioned in the pick-up points identified from load rectangle, short arm pick-up points must be aligned to those of long arms in the wheel track direction and the distance in the wheel base must be adapted to be AS FAR AS POSSIBLE BUT NOT LESS THAN the wheel base distance identified from load rectangle.

In other words dimension of load rectangles must be considered as “MINIMAL”, so, just in case lift’s geometry cannot reach normative vehicle pick-up points, the load rectangle must be extended in length in wheel base direction up to the pick-up point achievable from the arm (see pict. 1C from A to A”)

If you share above said meaning and is not possible to modify wording for said complex formal passages, we think that we can overcome the obstacle with an official note from TC98WG3 which clarify the “right” meaning, in order to avoid misunderstandings during type homologation phases from notified bodies which could apply the norm “as is “ now written.

Thanking in advance for the cooperation, we look forward to hear your kind reply.

Fausto Manganelli

Edo Orlandini

Attachments:

***1) 2 post lift with rotated columns and possibility to position short and long arm on same side.***

***Pict. 1A***

Capacity < 3,5 t, load distribution 2:3 / 3:2, reference load rectangle 1000 x 1400 mm.

Calculation as proposed norm modify.

Load condition are considered correct as “right” meaning.

***Pict. 1B***

Capacity < 3,5 t, load distribution 2:3 / 3:2, load rectangle 1000 x 736 mm coming from FIXING WIDTH of wheel track to 1000 mm ONLY.

Calculation as standard “as is” now.

Load condition are largerly worser than “right” meaning and with vehicle stability danger on arms.

***Fig 1C***

Capacity < 3,5 t, load distribution 2:3 / 3:2, reference load rectangle 1700 x 1400 mm.

Dimension 1400 is intended as “minimum”, so, just in case arms do not reach point A we must consider the extension of load rectangle up to point A’ being a new load rectangle 1700 x 1848 mm.

Load condition correct but “less worser” with respect to pict. 1A, so the reference to rectangle 1700 x 1400 could be omitted.

***Pict. 1D***

Capacity < 3,5 t with load rectangle 1700x1123 coming from FIXING WIDTH of wheel base to 1700 mm ONLY.

The pick-up point of short arm is located in position A” of Pict. 1C.

Load condition are largerly worser than “right” meaning and with vehicle stability danger on arms.

***2) 2 post lift with standard columns (face-to-face) whose arms have max swiveling angle able to reach a direction nearly parallel to the transverse lift axle (typical solution for 2 post lift high capacity).***

***Pict. 2A***

Capacity < 3,5 t, load distribution 2:3 / 3:2, reference load rectangle 1000 x 1400mm.

Calculation as proposed norm modify.

Load condition are considered correct as “right” meaning.

***Pict. 2B***

Capacity < 3,5 t, load distribution 2:3 / 3:2, with load rectangle 1000 x 1309 coming from FIXING WIDTH of wheel base to 1000 mm ONLY.

Calculation as ACTUAL standard wording.

Load condition are very similar to those of Pict.2A (as confirmation that problem mentioned is sensible especially for 2 post lift with rotated columns, not for face to face lifts), only slightly worse.

***Pict. 2C***

Capacity < 3,5 t, load distribution 2:3 / 3:2, with load rectangle 1700 x 1400.

Distance 1400 mm is intended as MINIMAL distance so just in case short arms cannot reach point A we must consider extension of load rectangle up to point A’, bringing dimension to 1700 x 1709 mm.

Load condition are correct but “less worser” to those of Pict.2A, so the reference to rectangle 1700 x 1400 could be omitted.

***Pict. 2D***

Capacity < 3,5 t, load distribution 2:3 / 3:2, with load rectangle 1700 x 1400, in the worst possible load condition, but with long arms not completely extended.

It correspond to what is really done during lift’s loading phase with a vehicle.

Load condition are correct but “less worser” to those of Pict.2A, so the reference to rectangle 1700 x 1400 could be omitted.

***Pict. 2E***

Capacity > 3,5 t, load distribution 1:3 / 3:1, with load rectangle 1000 x 1800 mm.

Reference calculus with SOLE WIDTH 1000 mm can be slightly worser of calculus made considering load rectangle, but not significantly.

With a load rectangle of 1800 mm could be possible that short arms do not reach the right position: but this case is quite rare because lifts with capacity > 3,5 t usually have very long arms because of possibility to lift light and medium commercial vehicles such as vans and light trucks.

***Pict. 2F***

Capacity > 3,5 t, load distribution 1:3 / 3:1, with load rectangle 1700 x 1800 mm.

This load condition could be significant with respect to those of Pict. 2E because of bigger overhang (867 mm against 679 mm)

It depends solely from column’s construction and design.

This situation could drive designer to consider both load rectangles 1000 x 1800 mm and 1400 x 1700: this is the reason why we should keep both rectangle in the “errata corrige”