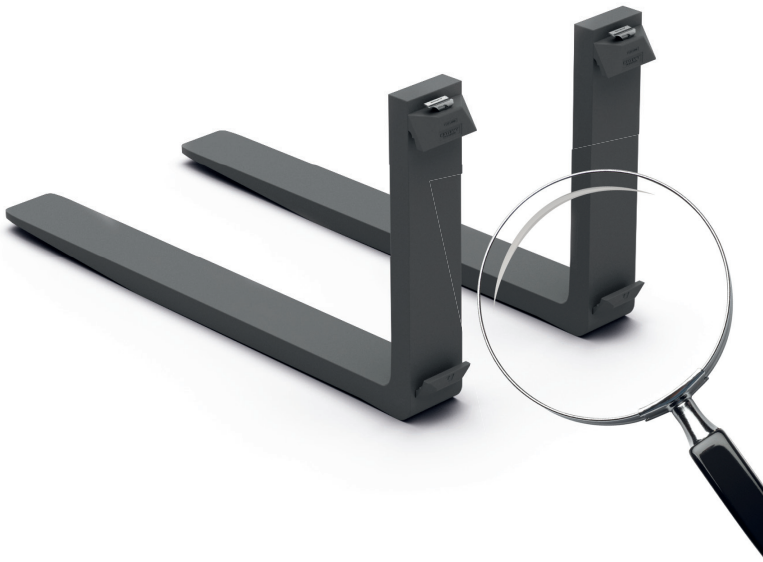
DOOSAN | PARTS

FORK SAFETY GUIDE

Inspection of forks

Forks are safety items. The value of daily transported goods runs into billions. Therefore, highest attention should be paid to a regular inspection of forks.

Note: The use of safe forks, which are in perfect condition, is not only your duty but also an advantage. Working safety means working at lower costs! Ensuring safety at all times prevents disturbance and and guarantees that your equipment is always at your disposal.



What has to be inspected?

Detailed information is provided by the following norm: **ISO 5057**. This international standard defines general instructions for inspecting and repairing forks.

Who inspects?

The yearly inspection shall be carried out carefully only by trained personnel. This service is mainly provided by acknowledged forklift service companies. Only the manufacturer of the fork arm or an expert of equal competence shall decide whether and how a fork may be repaired.

Inspection periods:

Tests should be carried out on a regular basis. The international standard ISO 5057 provides for inspection at least every 12 months. Depending on the application, e.g. multi-shift operation or hard working conditions, test intervals should be reduced accordingly. Furthermore, drivers or operators of lift-trucks are responsible for carrying out regular visible inspections.

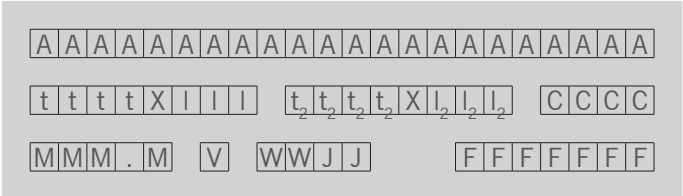
Who repairs?

Repairs shall only be carried out by the manufacturer or an acknowledged service company (ISO 5057). Each modification of a fork may lead to irreparable damages or even safety risks. Only small repairs (f.e. exchange of locking devices) can be carried out by yourself.

Using the VETTER / DOOSAN guidelines for fork inspection, you can easily and safely estimate the state of your forks!

What has to be inspected?

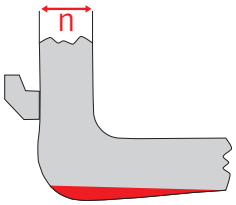
For an explicit definition of fork, please note down the stamping field!



A:	Article number	W:	Week of production
t:	Rated capacity / piece	J:	Year of production
l:	Load Center (LC)	C:	Material code
M:	Material	F:	Production order
V:	Manufacturer		

Please note: As soon as the stamping is no longer clearly readable, the fork needs to be taken out of service.

WEAR



Wear „n“ - 10 %
= Replace forks

Extract from ISO 5057: „If 10 % of the original fork thickness is worn, the fork has to be taken out of service.“ 10 % wear of the fork thickness already means a reduction of fork capacity by 20 %. Basis for wear measuring is the original nominal thickness (n) of the fork (f.ex. nominal thickness (n) =40 mm -> wear limit = 36 mm). Worn forks must not be welded.

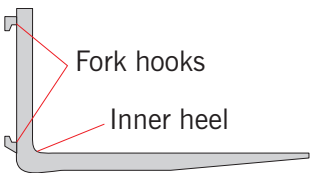
Attention: If fork blade thickness differs to fork back thickness, please observe wear limit Smin (stamped in this case). Using the **Fork**Wear**Measuring**Card, you can easily decide whether a fork needs to be replaced or not.

1. Determine nominal thickness „N“ of fork using scale (for example at the shank of the fork).

2. Put opening allocated to the nominal thickness „N“ (for example N 45 for 45 mm nominal (thickness) at the area of the greatest wear (often in the heel area).

3. If the opening fits over the fork, the fork has to be replaced (regardless the manufacturer). In this case the wear is already higher then 10% of nominal thickness.

CRACKS

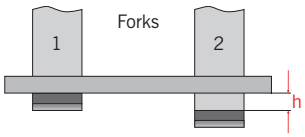


Critical areas:
- Inner heel section
- Welding seems

Testing methods:
- Magnetic particle inspection
- Penetrant flaw detection

What has to be inspected?

HEIGHT DIFFERENCE OF FORKS

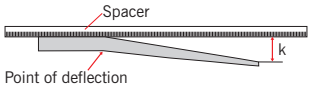


L = blade length in mm

Height difference of fork tips should not exceed 1.5 % of the length of fork blade (L).

Acceptable: h max = L[mm] / 66
Level fork: h max = L[mm] / 66 to L[mm] / 33
Replace fork: h > L[mm] / 33

PERMANENT DEFLECTION



Point of deflection
L = Blade length in mm

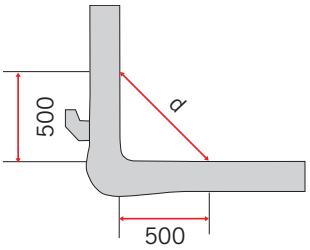
Acceptable: k max = L[mm] / 66
Level fork: k max = L[mm] / 66 to L[mm] / 33
Replace fork: k > L[mm] / 33

Reference measures for height difference / permanent deflection

Blade length (mm)	Acceptable (mm)	Level fork* from... (mm)	Replace fork (mm)
800	<12	12 to 24	> 24
900	< 14	14 to 27	> 27
1,000	< 15	15 to 30	> 30
1,100	< 17	17 to 33	> 33
1,200	< 18	18 to 36	> 36
1,300	< 20	20 to 39	> 39
1,400	< 21	21 to 42	> 42
1,500	< 23	23 to 45	> 45
1,600	< 24	24 to 48	> 48
1,700	< 26	26 to 52	> 52
1,800	< 27	27 to 55	> 55
1,900	< 29	29 to 58	> 58
2,000	< 30	30 to 61	> 61
2,100	< 32	32 to 64	> 64
2,200	< 33	33 to 67	> 67
2,300	< 35	35 to 70	> 70
2,400	< 36	36 to 73	> 73

What has to be inspected?

ANGULARITY



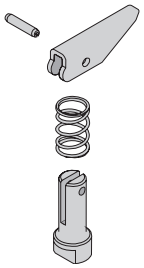
Forks are delivered with an angle of 90°. They are designed with a safety factor 3. i.e. a one-time triple nominal load does not lead to a permanent deflection. However, constant over-load and misuse may cause permanent deformation

1.Mark the horizontal and vertical distance at 500 mm (see sketch).
2.Take the diagonal measure d:

Perfect 90°:	d = 707 mm
Acceptable:	d = 695 - 713 mm
Level fork:	d = 714 - 730 mm
Replace fork:	d > 730 mm

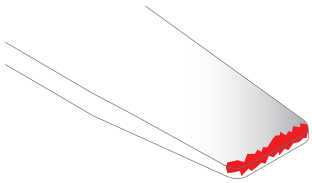
Attention: For special applications, forks are delivered with another angle.
Please check before inspection. Levelling of forks shall only be carried out by acknowledged forklift service companies.

PERMANENT DEFLECTION



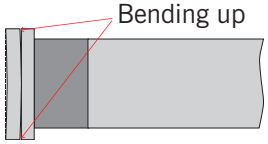
Locking devices prevent unintentional slipping off the fork carrier.
It is not allowed to use forks with defective locking devices.

DAMAGE / WEAR OF TIP



As soon as the fork tip is worn, the fork needs to be shortened or replaced.

LATERAL BENDING OF HOOKS



Lateral forces and long-term use may cause lateral bending of fork hook.
In this case, fork hooks or forks need to be replaced.