MSI

MSI-Forks

Forks Safety and Inspection Guide

in accordance with ISO 5057 & ANSI B56.1

A WORLD LEADER IN FORK-ARMS MANUFACTURING

MSI-Forks is a subsidiary of MS International plc. with headquarters in the United Kingdom and manufacturing sites in the UK, United States and Brazil.

Since 1964, MSI-Forks has been forging a wide range of high-quality forks utilizing the most advanced metallurgical processes in order to meet the markets demands.

An expanding list of original equipment manufacturers trusts their requirements to MSI-Forks.

MSI-Forks is committed to offer its customers:

- Top quality forks at a competitive cost;
- On time and flexible delivery;
- Full technical and warranty support.

Approved supplier of all main truck brands/OEMs.

Produces a complete range of quality forks for all kinds of trucks.

Wide selection **IN STOCK** ready to ship and minimize your downtime.

World leader manufacturer of forks with plants in the UK, USA and Brazil.

Making forks since 1964, vast product knowledge and experienced technical team.

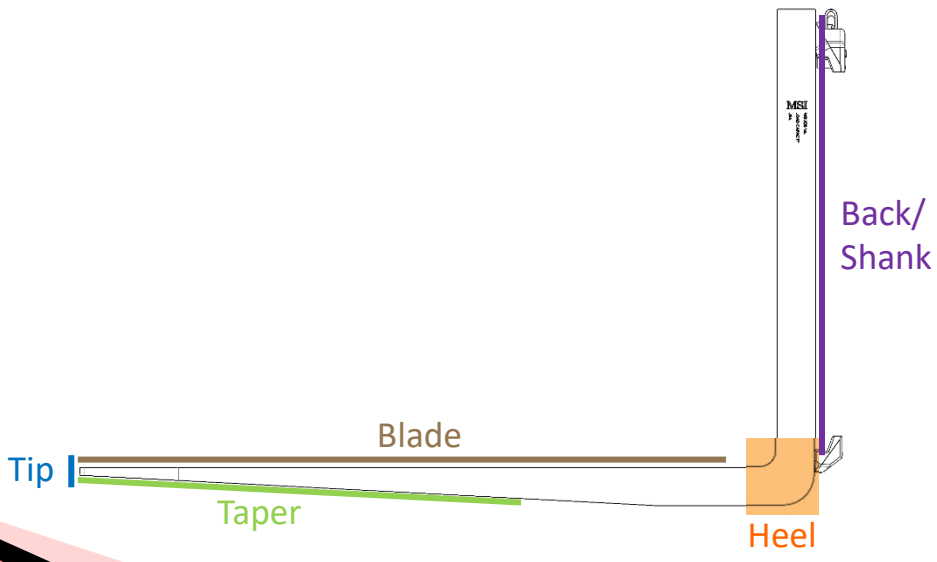
Introduction & Terminology


MSI
MSI-Forks
Fork Inspection
for lift trucks and construction machinery
Lift truck details:
(Make, model and/or capacity)
Internal control number/identification:
Fork-arm details:
(Width – Thickness – Lenght)
Suspension type:
According to ISO 5057, forks in service must be inspected at least once a year by a trained professional.
Inspection point
Example
Result
1. Wear
Original thickness (N) – 10% = replace
Measure the thickness on the back of the fork (N) and compare with the heel area.
2. Surface cracks
Surface crack = replace
- Check all welds
- Check heel area
3. Blade deformation / Tip alignment
- (d) < 3% of blade lenght = ok
- (d) > 3% of blade lenght = replace or re-set
If difference in tip heights > 3% = replace or re-set
4. Heel angle
- (d) = 560 - 570mm (A = 88.9 - 90.9°) = ok
- (d) = 571 - 580mm (A = 91 - 92.9°) = re-set
- (d) > 580mm (A>93°) = replace
5. Marking, lips, suspension & locking devices
- Damaged locking system = fix or replace
- Bent or deformed suspension = fix or replace
- Damaged tip = fix or replace
( ) ok
( ) not ok
Notes:
FINAL RESULT:
( ) Fork ok
( ) Fork not ok
( ) Replace
( ) Repair
Notes:
Inspected by:
Date:
Signature:

As a world leader in fork manufacturing, MSI-Forks recognizes the importance of workplace safety. And to promote it, you just received our Fork Inspection Guide, which will go over each step of the fork inspection procedure.

According to ISO 5057, forks must be inspected at least once a year by a trained professional.

As a start, let's become familiar with the basic fork structure:



Safety Facts & Questions

"According to OSHA, 70% of all forklifts accidents in the USA could be avoided with proper safety training."

Serious accidents and equipment downtime can be prevented with **proper fork sizing, inspection and operator training.**

Forks are one of the most demanded items on a forklift and companies **are usually not aware of their forks condition or quality.**

"Forklifts accidents that result in serious injury total 34,900 annually, with 85 deaths. Minor injuries related to forklifts reach 61,800 each year."

Common Questions

- Are your forks **regularly inspected** in compliance to **industry standards ISO 5057 or ANSI B56.1**?
- Did you know that forks with **10% wear must be replaced,** and they are unsafe to use?
- Are your **operators properly trained** to understand critical concepts of load center and capacity?
- Are you monitoring fork replacements to **prevent cyclic operational issues** or accidents?
- Are you using the correct forks **for your application**, capacity and blade length?

Because these are very common questions, we put together this inspection guide for you.

Operation & Safety Best Practices

Easy to avoid issues

The points below will significantly reduce the life of your forks:

↓ Making unauthorized repairs or modification to the forks.
↓ Handling loads above the fork's capacity.
↓ Using only one fork to handle loads.
↓ Applying side pressure/force on the forks.
↓ Dragging the forks on the ground.
↓ Using the forks as a lever or crowbar to separate loads.
↓ Using the forks to push or pull dragging loads.
↓ Adding fork extensions longer than 150% of the fork original blade length.

Easily start by training your forklift operators to avoid these "unsafe" operational practices.

Inspection Frequency

Forks in service should be inspected according to ISO 5057 and ANSI B56.1, the fork inspection intervals should not be more than 12 months.

MSI recommends the frequency as follows:

✓ For operations with 1 shift (up to 8 hours per day) = at least every 12 months.
✓ For operations with 2 shifts (up to 16 hours per day) = at least every 6 months.
✓ For operations with 3 shifts (up to 24 hours per day) = at least every 3 months.

The frequency you inspect your forks should be increased in case of repetitive damage or severe working conditions.

Step-by-step Fork Inspection

Here is a quick summary of what you should be looking for in each step.

1. **Wear:** the material wear on the heel area of the forks cannot exceed 10% of the original section of the fork. Capacity of the fork is drastically reduced due to material wear.

2. **Surface cracks:** attention to all welds and internal heel area. Forks should be replaced if surface cracks are detected.

3. **Blade deflection or Tip height:** the difference of tip heights cannot exceed 3% of the blade length.

4. **Heel angle opening:** the internal angle of the fork heel cannot exceed 93°.

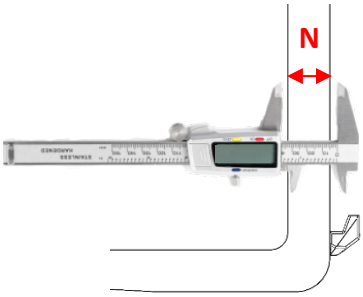
5. **Marking legibility and Suspension devices:** fork identification according to ISO 2330 should be easily legible. In case of missing or unclear marking the fork should be removed from service. Check if forks are securely locked to the equipment carriage. In case of extra clearance or damaged attachments, the forks should be repaired.

We will go over each step in the next pages.

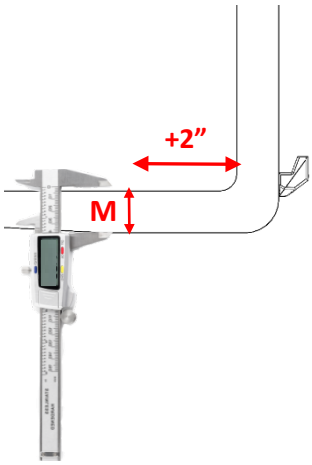
1. Checking for Wear

The first step is to check for wear by comparing the thickness between the heel area and the back of the fork:

A. Measure the thickness on the back (N).



B. Measure the thickness on the blade (M). Make sure the measurement is taken at least 2” (50mm) from the heel.



A 10% wear represents a 20% loss of capacity.

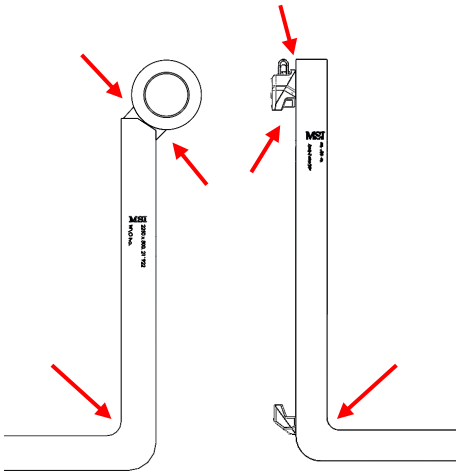
Replace forks if the blade thickness (M) is less than 10% of the back thickness (N). *Example: N = 2” and M = 1.8”,* ***replace****!*

2. Checking Surface Cracks

Next, check for surface crack, specially on welds and heel area. Forks that have surface cracks should be replaced.

Traditional crack detection tests:

- Contrast spray
- Magnetic particles
- Ultra-sound



The above tests should only be carried out after a visual and dimensional inspection of the forks is completed and a crack indication is suspected. Technical crack tests should be performed only by a trained professional. MPI (magnetic particles inspection) is the preferred method of ISO 2330 and ANSI B56.11.4.

Based on ISO 5057 and ANSI B56.1, at **no** circumstance surface cracks can be repaired by welding.

3. Checking Blade Deformation/Tip Alignment

There are a variety of usages that can cause blade deformation/bend and tip alignment issues.

We will check the tip alignment and blade deformation next. Using a ruler or a level, measure the difference of the fork tips height (d), which cannot exceed 3% of the blade length.

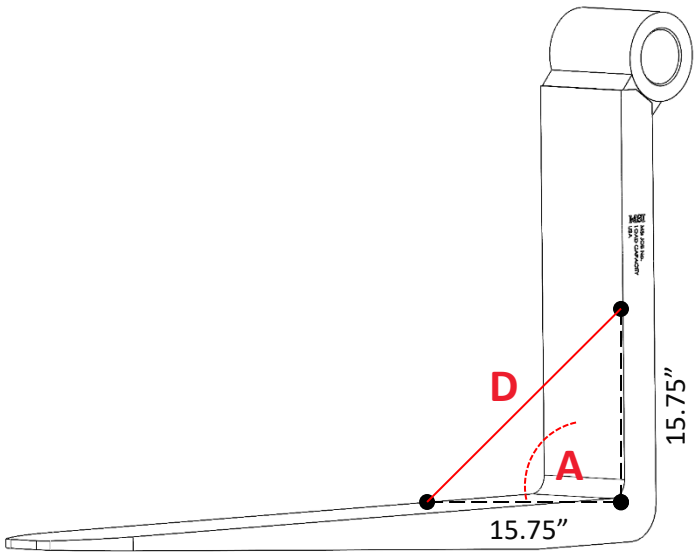
Normal: d < 3% of blade length
Replace: d > 3% of blade length

Example: blade = 48", replace if tip height difference is 1.44" or greater.

4. Checking Heel Angle

The heel angle can also be damaged during usage. If the angle exceeds a deformation of 3°, forks should be replaced.

The heel angle (A) should be between (88.9°- 90.9°). If A is 93° or above, replace forks.



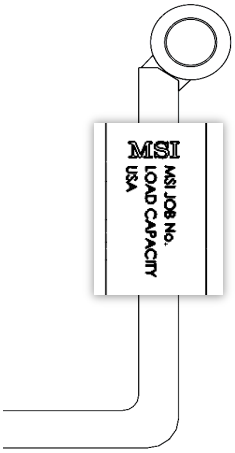
Normal: D = 22.00”- 22.43” (A = 88.9° - 90.9°)
Repair: D = 22.43”- 22.82” (A = 91° - 92.9°)
Replace: D > 22.82” (A = 93°)

You can also use an “angle finder tool” or a protractor to measure the angle of your forks.

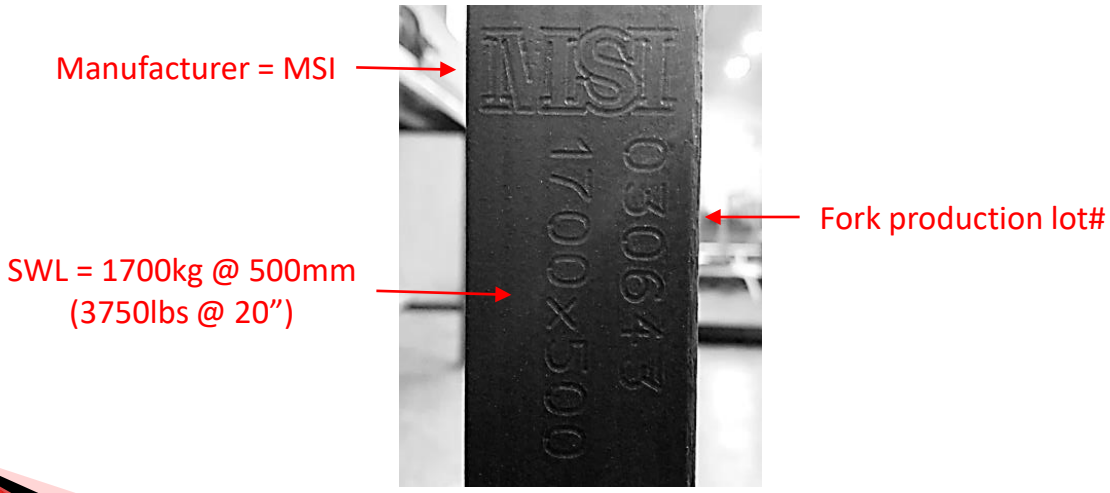
5a. Checking Marking Legibility

The last step on the inspection procedure consists of 2 separate parts:
5a. Checking marking legibility;
5b. Checking the suspension and locking devices.

According to ISO 2330, fork identification should be easily legible. In case of missing or unclear marking, the fork should be removed from service. The marking must contain the fork SWL (safe working load) and manufacturer.



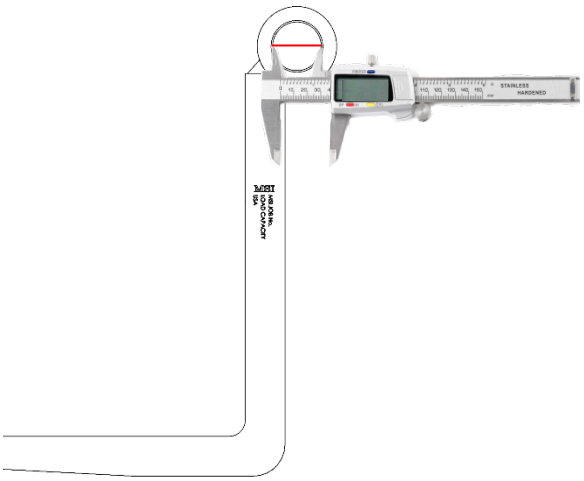
This is how MSI-Forks' marking looks like on the side of the fork:



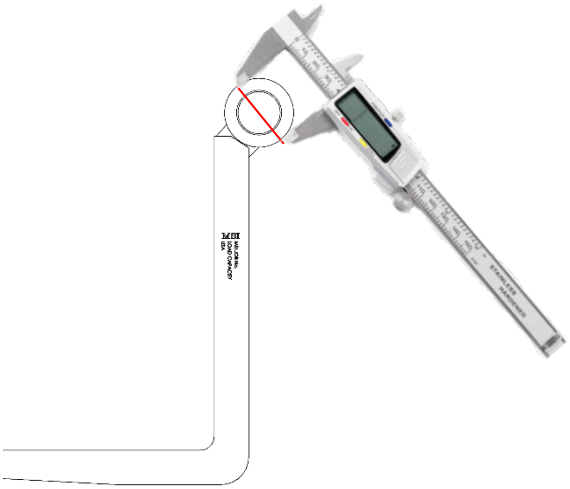
5b. Checking Suspension & Locking devices

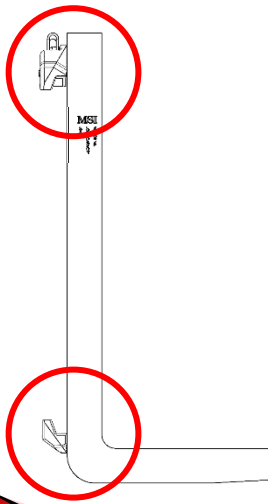
For shaft/pin mounted forks, you can use a caliper to measure both outside and inside diameters of the tube. Check if tube shows signs of “oval” deformation, if so, forks should be repaired or replaced.

A. Measuring the inside diameter.



B. Measuring the outside diameter.





For hook mounted forks, check if:

- Hooks show signs of side bend deformation or extra opening clearance.
- Pay attention to bottom hooks, they usually show signs of bad usage before top hook fails.
- Check pin kit (top lever) and make sure forks are securely locked to the carriage.

In case of extra clearance or damaged attachments, the forks should be repaired or replaced.

Fork Inspection

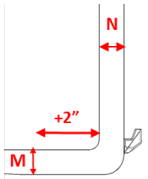
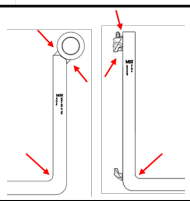
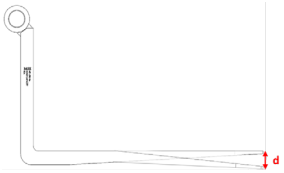
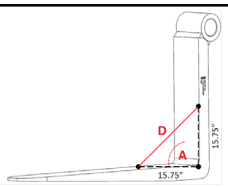
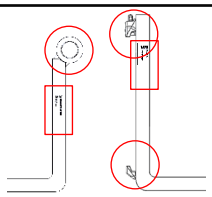
According to ISO 5057 / ANSI B56.1, forks in service must be inspected at least once a year by a trained professional.

Lift truck details:
Make, model and/or capacity

_____

Fork-arm details:
Width-thickness-length

_____

Inspection Point	Example	Result
1. Wear Original thickness (N) - 10% = replace Measure the thickness on the back of the fork (N) and compare with the heel area (M)		( ) OK ( ) not OK
2. Surface Cracks Surface crack = replace • check all welds • check heel area		( ) OK ( ) not OK
3. Blade deformation/tip alignment • (d) < 3% of blade length = ok • (d) > 3% of blade length = replace If difference in tip heights > 3% = replace		( ) OK ( ) not OK
4. Heel angle • (d) = 22.00"-22.43"(A= 88.9-90.0°) = ok • (d) = 22.43"-22.82"(A=91.0-92.9°) = repair • (d) > 22.82" (93°) = replace		( ) OK ( ) not OK
5. Marking, tips, suspension & locking devices • Damaged locking system = fix /replace • Bent or deformed attachments = replace • Damaged tip = replace		( ) OK ( ) not OK
Final result:	( ) Fork OK ( ) Fork not OK	( ) Replace ( ) Repair

Inspected by: _____

Date: _____ **Signature:** _____

Repair & Replace your forks

In case your forks need to be replaced, read below:

- Defective forks should be promptly replaced or repaired to maintain the maximum safety and performance of your machinery.
- Fork repairs can only be performed by the fork manufacturer or a certified company.
- Always request the fork manufacturer authorization before carrying any modification or repair.
  - Any modification performed without authorization will cancel the fork warranty.
- Be sure to replace the pair of forks, not a single piece.

Contact MSI for your repair and replace needs and questions.

(803) 980-6800

sales@msi-forks.com

Notes

MSI™

MSI-Forks

Sales & Technical Support:
sales@msi-forks.com
Phone: (803) 980-6800
Fax: (803) 980-6805

Address:
1298 Galleria Blvd
Rock Hill, SC - 29730

For more technical and safety information visit:
www.msiforksinc.com

Made in USA