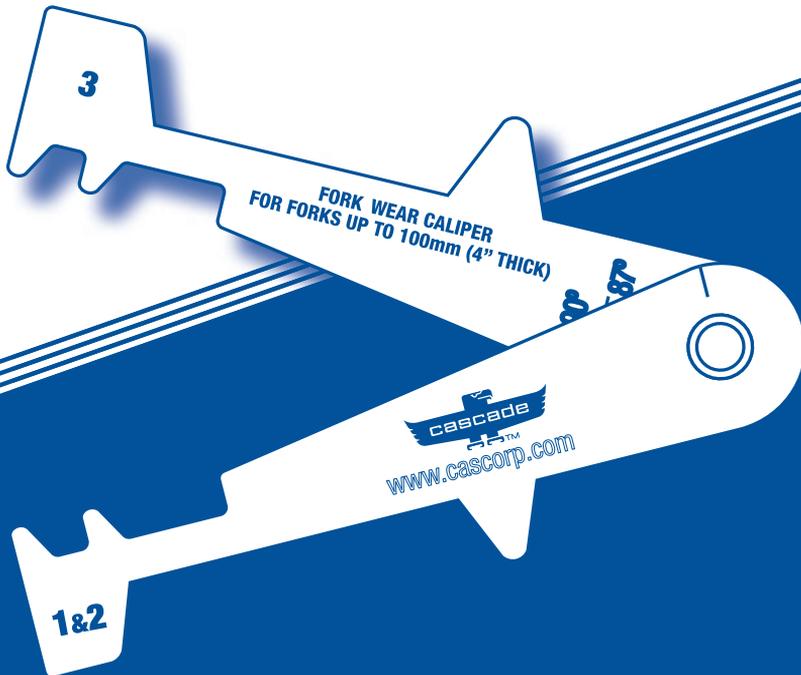




FORK SAFETY GUIDE

A fork inspection guide designed with safety in mind.



ISO 5057



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Form 6877613_EN_ISO 3000 C2 04/16



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Cascade Genuine Forks

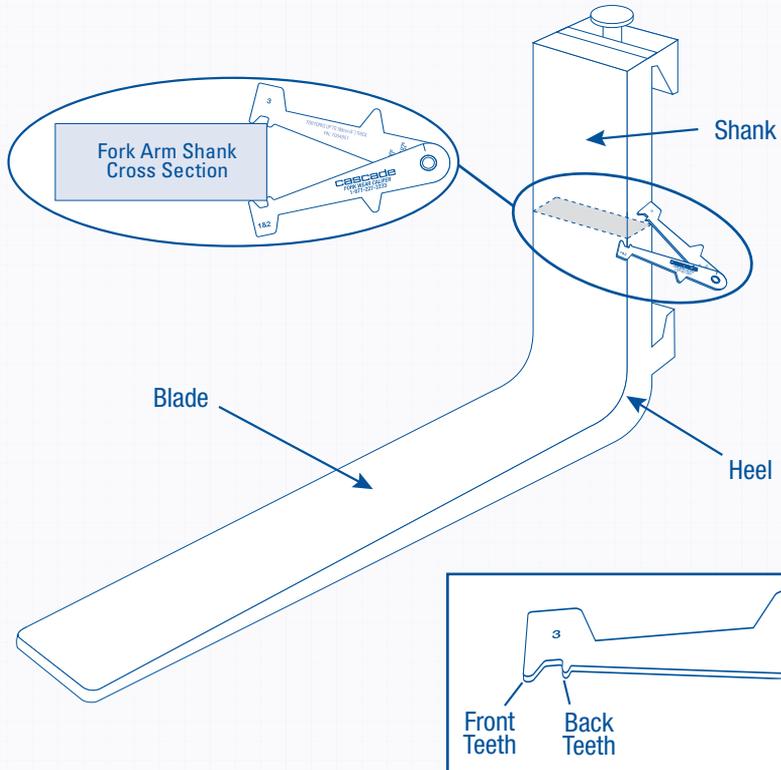
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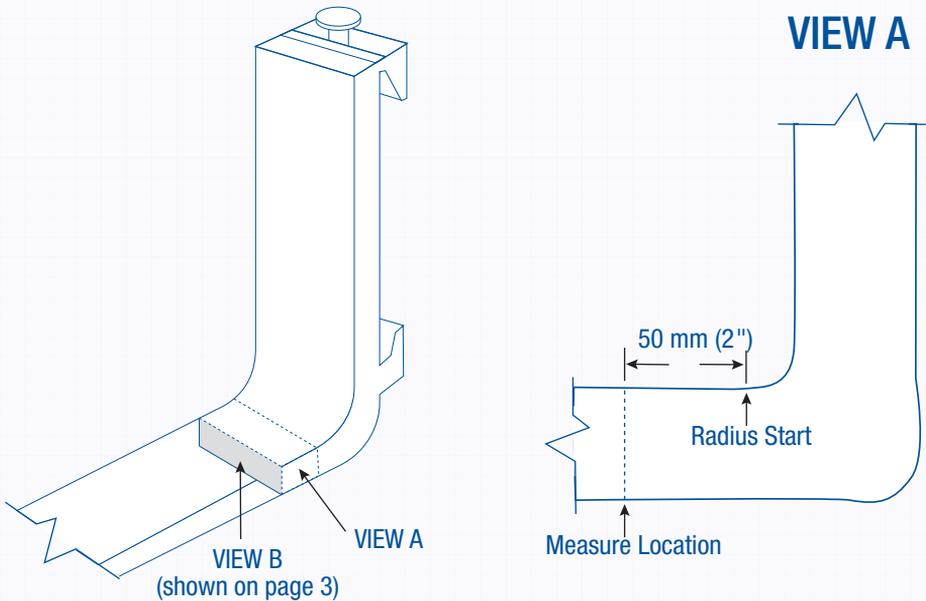
Setting The Fork Wear Caliper:

Set the front teeth of the jaws by measuring the thickness of the shank. Ensure that the caliper is held square across the shank for an accurate reading. The caliper is now set to measure the fork arm blade.



Fork Wear Caliper Placement:

Without changing the caliper setting, position the front teeth of the caliper over the fork arm blade. Ensure the measurement is taken 50 mm (2") in front of the start of the radius (View A).

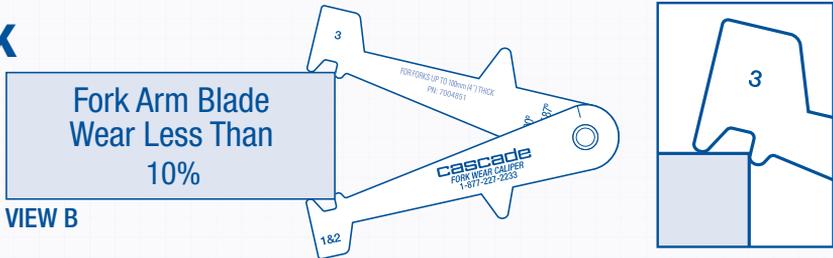


Note: The enclosed Cascade Fork Wear Caliper can be used on forks up to and including 100 mm (4") thick. They are **NOT TO BE USED ON FULL TAPER OR TWO-STAGE TAPERED FORKS** where the shank thickness is greater than that of the blade. In these cases, the blade thickness reduction must be obtained using alternative measuring methods, and you will need to know the original thickness of the fork blade. Contact fork manufacturer to determine if measurements meet design requirements.

When to Replace Forks:

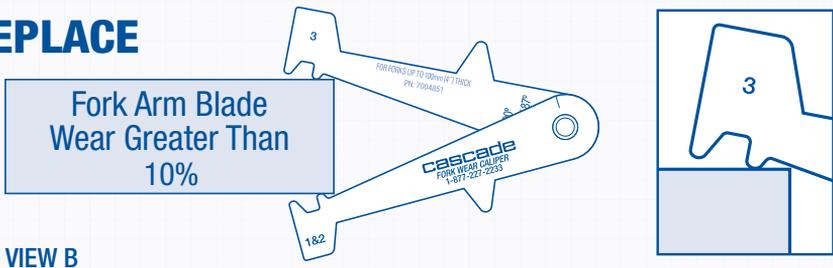
If any part of the caliper back teeth hit the fork blade, it has less than 10% wear and can remain in service. Refer to View B (as seen on page 2).

OK



If the back teeth of the caliper pass freely over the fork blade, the fork arm shall be taken out of service. This represents over 10% wear and 20% reduction in strength.

REPLACE



ISO 5.6.1 Fork Arm Blade and Shank - The fork arm blade and shank shall be thoroughly checked for wear, special attention being paid to the vicinity of the heel. If the thickness of the blade or shank is reduced to 90% of the original thickness, or to the minimum thickness specified by the fork arm or truck manufacturer, the fork arm shall be withdrawn from service.

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Fork Arm Mountings:

Use the end of the caliper designated for your fork class (Class 1, 2 or 3). With the caliper positioned approximately 19mm (3/4") in from the side of the hook, slide the caliper into the hook pocket. If the hook lip contacts the back of the caliper (Diagram B), the fork shall be removed from service.

Diagram A (Class 3 Fork)

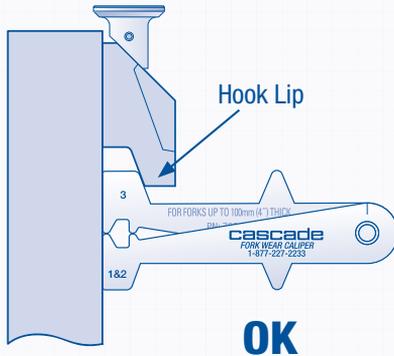
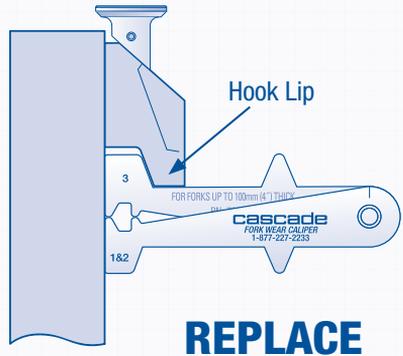


Diagram B (Class 3 Fork)



ISO 5.6.2 Fork Arm Mountings - The support face of the top hook and the retaining faces of both hooks shall be checked for wear, crushing, and other local deformations. If these are apparent to such an extent that the clearance between the fork arm and the fork carrier becomes excessive, the fork arm shall be withdrawn from service. For other types of mounting, similar checks shall be carried out.

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Shaft/Pin Type Forks:

The Fork Wear Caliper can also be used as inside calipers for measuring the bore or bushing on shaft/pin type forks.

Insert the reversed caliper inside the bore or bushing (see Diagram 1), opening the teeth until both sides of the teeth come in contact with the inside wall of the bore. Pull the caliper out and measure the distance from tip to tip (see Diagram 2). Contact fork manufacturer to determine if measurement meets design requirements.

Diagram 1

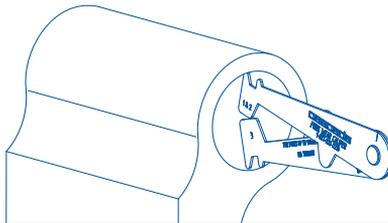
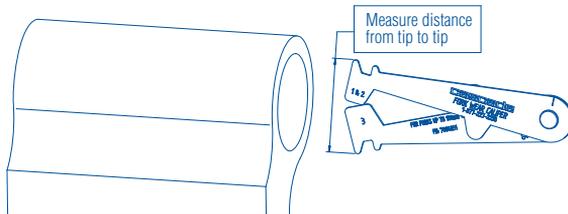
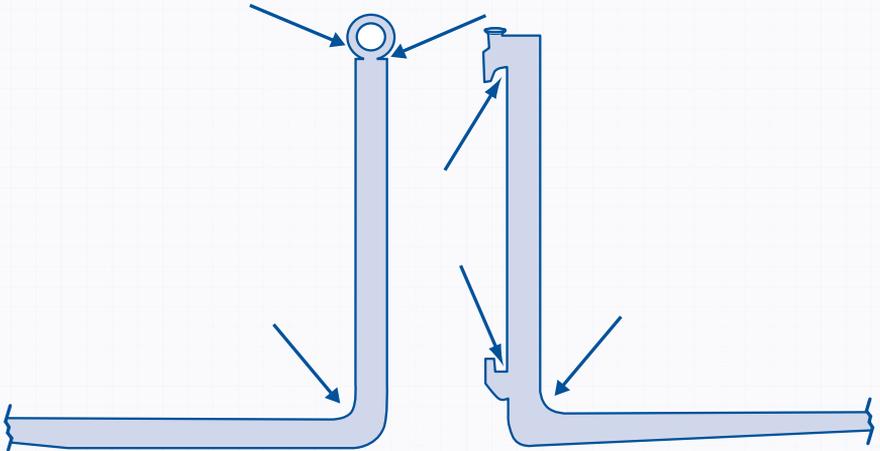


Diagram 2



Surface Cracks:

Pay special attention to the fork heel and all welds which attach mounting components to the fork blank. Forks with surface cracks shall not be returned to service.

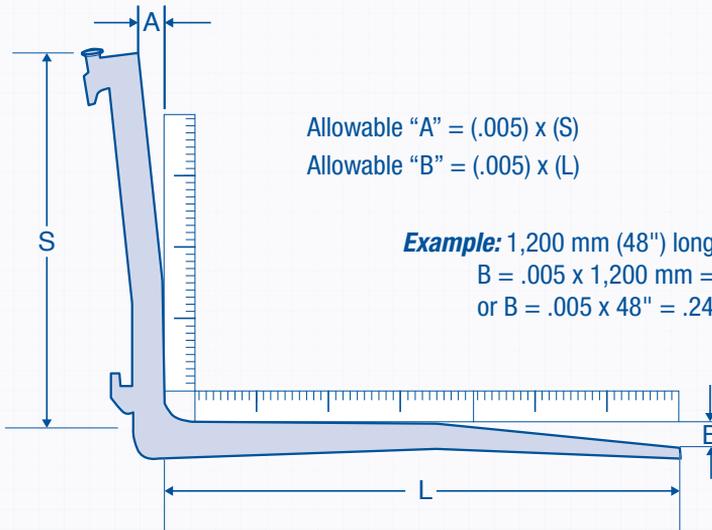


ISO 5.2 Surface Cracks - The fork arm shall be thoroughly examined visually for cracks and, if considered necessary, subjected to a non-destructive crack detection process. Special attention shall be paid to the heel and the top and bottom hooks including their attachment to the shank. The fork arm shall be withdrawn from service if surface cracks are detected.

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Straightness of Blade and Shank:

Fork shall be removed from service if the deviation from straightness exceeds allowable "A" and "B" values.



$$\text{Allowable "A"} = (.005) \times (S)$$

$$\text{Allowable "B"} = (.005) \times (L)$$

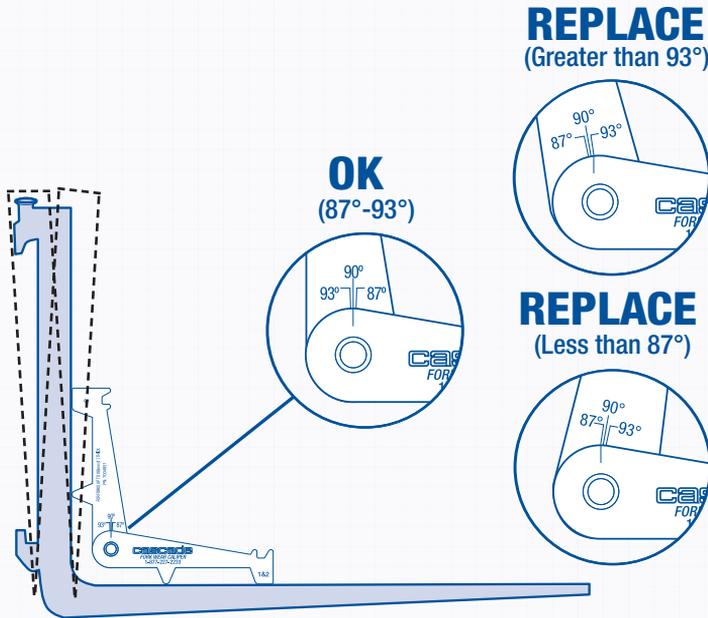
Example: 1,200 mm (48") long blade

$$B = .005 \times 1,200 \text{ mm} = 6.0 \text{ mm}$$

$$\text{or } B = .005 \times 48" = .24"$$

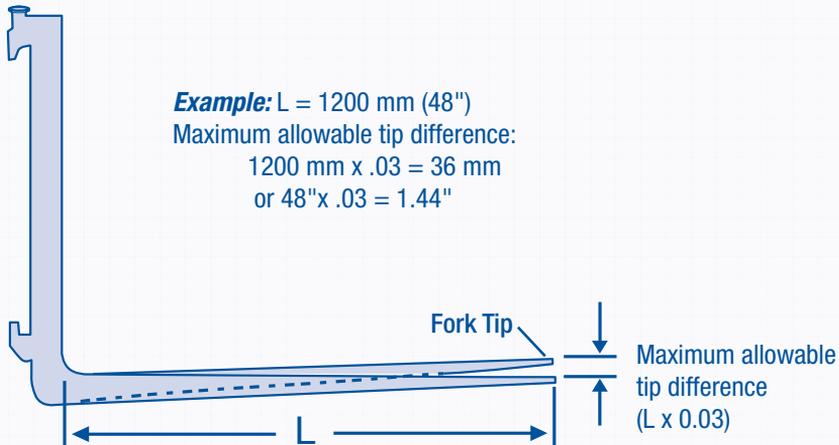
Fork Angle:

If the blade to shank angle exceeds allowable values of 3° , the fork shall be removed from service.



Difference in Height of Fork Tips:

When the difference in height of the tips of a pair of forks on the same carriage exceeds 3% of the forks blade length (L), then the forks shall be removed from service.



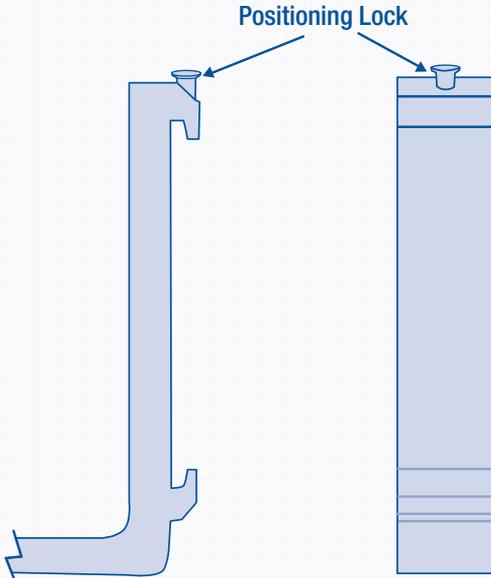
ISO 5.3 Difference in Height of Fork Tips - A set of fork arms shall be checked for any difference in height when mounted on the fork carrier. If the difference in tip heights exceeds 3% of the blade length or that recommended by the truck manufacturer, the set of fork arms shall be withdrawn from service. The set of fork arms shall not be returned to service until they have been re-set as necessary and tested in accordance with ISO 6.2.

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Positioning Lock:

Check the positioning lock and other fork retention devices to ensure they are in place and in correct working order. If the Positioning Lock is missing or non-operational, the fork shall be removed from service.

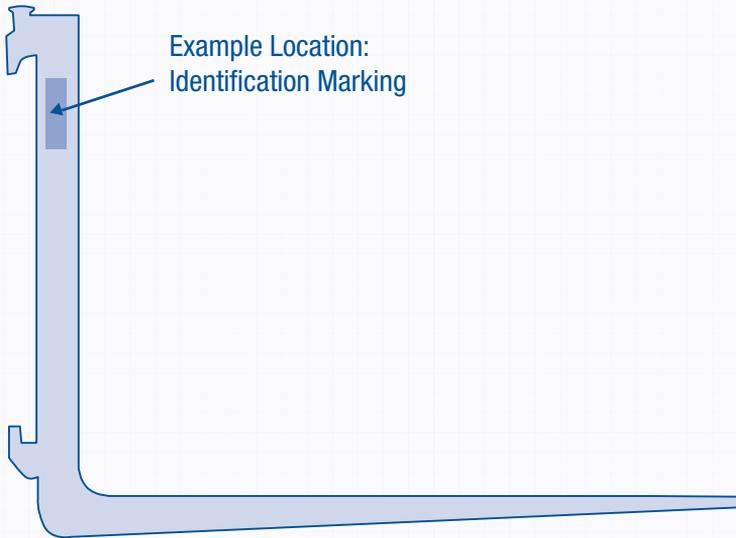


ISO 5.4 Positioning Lock - It shall be confirmed that the positioning lock, where originally provided, is in good repair and correct working order. If any fault is found, the fork arm shall be withdrawn from service until satisfactory repairs have been effected.

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Legibility of Marking:

If the fork identification marking is not clearly legible, it shall be removed from service.



ISO 5.5 Legibility of Marking - If the fork arm marking in accordance with ISO 2330 is not clearly legible, the fork arm shall be removed from service.

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Using Your Forks Correctly:

Forks last a long time if treated properly, however it can be difficult to see when they are worn or damaged. Utilizing the material provided in this Fork Safety Guide, along with the following points, can help minimize issues associated with fork wear.

- Fork arms in service shall be inspected at intervals of not more than 12 months and whenever any defect or permanent deformation is detected. Severe applications may require more frequent inspections.
- The inspection of a fork arm shall be carried out carefully by trained personnel with the aim of detecting any damage, failure, deformation, etc., which may impair safe use.
- Any fork arm which shows such a defect shall be withdrawn from service.
- All positioning locks must be in place at all times. Forks must be properly seated on the carriage and the positioning locks fully engaged in the slot before use.
- Make sure loads are seated securely against the rear fork shank and load backrest.
- Make sure the fork capacity meets or exceeds lift truck capacity and load center rating as identified on lift truck capacity/nameplate.
- Determine fork wear cycle and establish a fork replacement schedule for your operation.
- Always contact fork manufacturer to obtain written approval PRIOR to making any fork modifications and/or repairs.
- Though drum clamps and portable booms can be supported on forks, be aware of what is contained in the drum or the boom hook.
- If a collision with a building beam, wall or other object occurs (even if the forks show no discernible damage), thoroughly inspect the forks for any slight bends or damage which may impact safety.
- Always destroy worn or damaged forks so they are not mistakenly re-used.

What Not to Do:

Forks that are mistreated or neglected can become a detriment to a safe working environment. The following are some recommendations of what to avoid so forks are not damaged in the course of daily work.

- **DO NOT** perform any modifications or alterations to a powered industrial truck that may affect the capacity, stability or safe operation of the truck without the prior written approval of the original truck manufacturer or its successor thereof.
- **DO NOT** overload forks by picking up a load too far out on the forks.
- **DO NOT** pick up loads heavier than the lift truck rating.
- **DO NOT** pick up off-balanced loads far from the side of the lift truck.
- **DO NOT** overload the fork beyond its rated capacity.
- **DO NOT** change forks from one lift truck to another without knowing capacities of each truck and fork.
- **DO NOT** use a fork in an application for which it is not designed.
- **DO NOT** add a fork extension longer than 150% of the supporting fork's length.
- **DO NOT** allow maintenance shops to bend forks back into shape.
- **DO NOT** weld on forks as welding destroys a fork's heat treat properties and diminishes the fork strength.
- **DO NOT** drill holes in forks or grind on forks.
- **DO NOT** lift or carry any loads using one fork.
- **DO NOT** apply sideways pressure to forks, commonly called "side loading", as they are designed for vertical loading only.
- **DO NOT** install unapproved attachments or devices which may add stress to the forks.
- **DO NOT** use forks to open rail car doors.
- **DO NOT** use forks to break loads out/away from other loads.
- **DO NOT** insert the fork tips under other lift trucks to lift them during maintenance operations.
- **DO NOT** apply heat to any part of fork for any reason.
- **DO NOT** overlook fork hooks during your periodic fork inspection.



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ISO 5057:1993 (E)

Industrial Trucks - Inspection and repair of fork arms in service on fork-lift trucks:

4 Inspection Intervals

Fork arms in service shall be inspected in accordance with Clause 5 at intervals of not more than 12 months and whenever any defect or permanent deformation is detected. Severe applications may require more frequent inspections.

5 Inspection

5.1 General

The inspection of a fork arm shall be carried out carefully by trained personnel with the aim of detecting any damage, failure, deformation, etc., which may impair safe use. Any fork arm which shows such a defect shall be withdrawn from service, and not be returned to service unless it has been satisfactorily repaired and tested in accordance with 6.2, if applicable.

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ISO 5057:1993 (E)

Industrial Trucks - Inspection and repair of fork arms in service
on fork-lift trucks (cont'd):

5.2 Surface Cracks

The fork arm shall be thoroughly examined visually for cracks and, if considered necessary, subjected to a non-destructive crack detection process. Special attention shall be paid to the heel and the top and bottom hooks including their attachment to the shank. The fork arm shall be withdrawn from service if surface cracks are detected.

5.3 Difference in Height of Fork Tips

A set of fork arms shall be checked for any difference in height when mounted on the fork carrier. If the difference in tip heights exceeds 3% of the blade length or that recommended by the truck manufacturer, the set of fork arms shall be withdrawn from service.

The set of fork arms shall not be returned to service until they have been re-set as necessary (see 6.1) and tested in accordance with 6.2.

5.4 Positioning Lock

It shall be confirmed that the positioning lock, where originally provided, is in good repair and correct working order. If any fault is found, the fork arm shall be withdrawn from service until satisfactory repairs have been effected.

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Industrial Trucks - Inspection and repair of fork arms in service on fork-lift trucks (cont'd):

5.5 Legibility of Marking

If the fork arm marking in accordance with ISO 2330 is not clearly legible, the fork arm shall be removed from service.

5.6 Wear

5.6.1 Fork Arm Blade and Shank

The fork arm blade and shank shall be thoroughly checked for wear, special attention being paid to the vicinity of the heel.

If the thickness of the blade or shank is reduced to 90% of the original thickness, or to the minimum thickness specified by the fork arm or truck manufacturer, the fork arm shall be withdrawn from service.

5.6.2 Form Arm Mountings

The support face of the top hook and the retaining faces of both hooks shall be checked for wear, crushing and other local deformations. If these defects are apparent to such an extent that the clearance between the fork arm and the fork carrier becomes excessive, the fork arm shall be withdrawn from service. For other types of mounting, similar checks shall be carried out.

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Industrial Trucks - Inspection and repair of fork arms in service
on fork-lift trucks (cont'd):

6 Repair and Testing

6.1 Repair

Only the manufacturer of the fork arm or an expert of equal competence shall decide if a fork arm may be repaired for return to service. The repairs shall only be carried out in accordance with the recommendations of the fork arm manufacturer.

It is not recommended that surface cracks or wear be repaired by welding.

When repairs necessitating re-setting are required, the fork arm shall subsequently be subjected to an appropriate heat treatment, as necessary.

6.2 Yield Test:

A fork arm that has undergone repairs other than repair or replacement of the positioning lock and/or the marking shall only be returned to service after being submitted to, and passing, the yield test described in ISO 2330, except that the test load shall be in accordance with table 1.

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Industrial Trucks - Inspection and repair of fork arms in service
on fork-lift trucks (cont'd):

Table 1 - Test Load for Yield Test (values in kilograms)

Fork Arm Specified Capacity, m	Test Load F_t
$m \leq 5,000$	2.5 m
$m \geq 5,000$	2.1 m

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Cascade's Commitment to Workplace Safety

As the global leader in lift truck attachments, forks, accessories and material handling solutions, Cascade recognizes the importance of workplace safety. As a part of our philosophy to promote safety, we have developed this Fork Safety Guide (which includes one Fork Wear Caliper) as a means to promote consistent periodic inspection of forks as part of a comprehensive workplace safety program. Please utilize the information outlined in this guide to ensure components comply with the law and are safe for use.

For additional Fork Safety Guides, Fork Wear Calipers or to inquire about Cascade's extensive line of replacement forks, contact your local Cascade representative or visit www.cascorp.com.

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