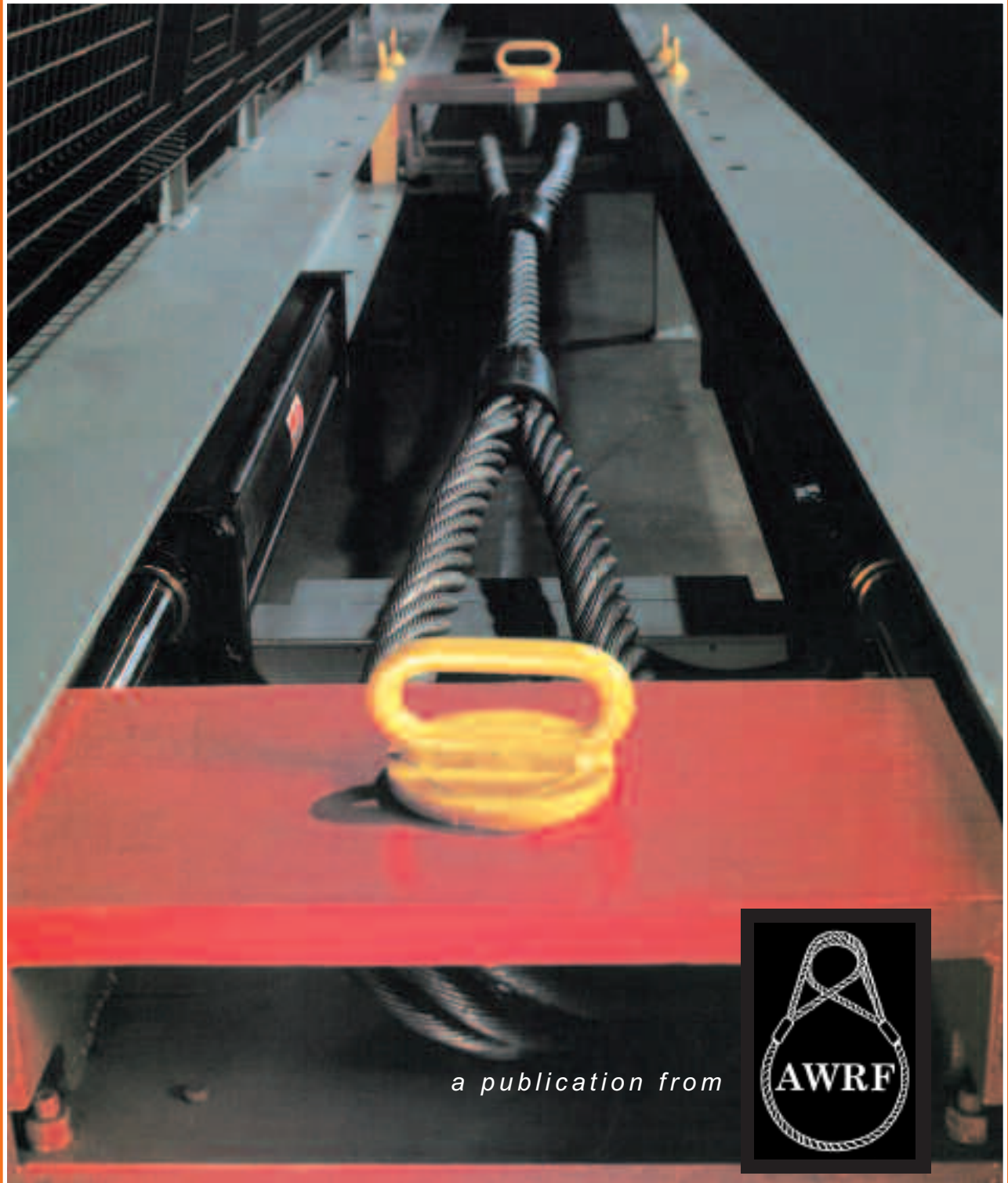


# Test Bed 1

## Safety Guide

Version I: September, 2007



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# **AWRF**

## **Associated Wire Rope Fabricators**

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### **Recommended Practice and Guideline**

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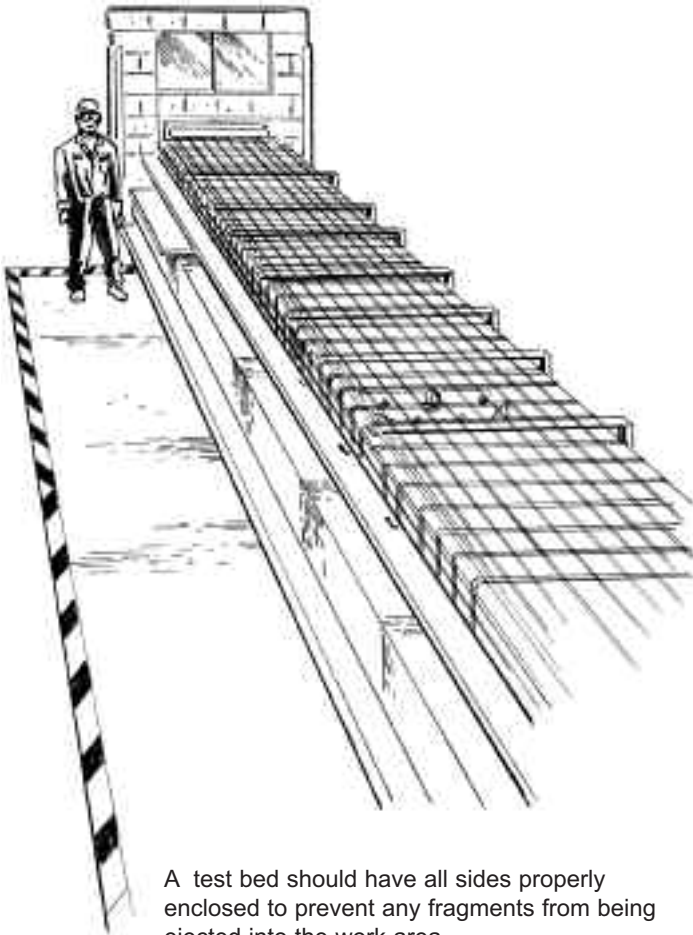
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**I**n any sling shop one of the most important jobs you can be asked to perform is the proper testing of sling and fixture assemblies. To accomplish this, you will be using a test bed which may be one of several types and sizes.



A test bed should have all sides properly enclosed to prevent any fragments from being ejected into the work area. The test bed should have safety guards or barriers in good working condition installed.

*But no matter what type or size of test bed you happen to be using, or how large or small the testing job, your basic goals will always be the same:*

To certify that an assembly meets the required proof load or breaking strength.

To perform a test that meets customer specifications.

To work safely around the test bed while it is in operation.

To make sure all safety rules and warnings are being followed.

**!** **WARNING:** Operators must be trained before operating test beds

**T**o help you work safely, AWRF has prepared this brief Test Bed Safety Guide. As you read through the following pages, please keep in mind that we cannot possibly cover every situation which you may come across when using a test bed in your shop. Should you ever question your safety or others around you at any time while operating or maintaining your test bed, you should always:

Stop operating the test bed

Talk to your supervisor or a more experienced test bed operator.

Refer to the test bed manufacturer's manual or contact the Manufacturer directly.

Refer to the test bed Warning Literature.

The point is: *NEVER TAKE CHANCES WITH YOUR SAFETY, YOUR CO WORKERS' SAFETY, VISITORS, OR THE SAFETY OF THOSE WHO DEPEND ON YOUR ASSEMBLIES AFTER THEY LEAVE THE SHOP !*

It is not the purpose of this guide to give step-by-step instructions for the proper testing sling and fitting assemblies. Before using any test bed or helping a test bed

operator, you should become completely familiar with the recommended steps for testing these specific assemblies.

The remainder of this guide is broken into three basic sections:

**1. General Safety Warnings:**

these are safety tips which may apply to both the operation and the maintenance of the test bed.

**2. Operational Safety:** this

section includes safety tips for the operation of your test bed.

**3. Inspection and Maintenance**

**Safety:** this section includes safety tips which may apply when you are inspecting and maintaining your test bed.

**!** *WARNING: This guide has been prepared after careful research by AWRF. We have tried to present the best available safety information for our members and their employees. However, we cannot be responsible for any misuse of this guide by unauthorized personnel. We cannot confirm that the opinions in this guide are identical to those held by other experts, consultants, practitioners, regulatory agencies, or safety authorities.*

## General Safety Warnings

**A** Test Bed in operation produces a tremendous amount of force. As an operator, you must always maintain a respect for this force and remind others in the shop of the safety procedures while your test bed is operating. To put this in perspective, a 200 ton test bed generates enough force to lift 500 average sized elephants, at once !

The slow operation of most test beds will enable you to work safely while you



Operator checking the proper seating of a test sample, guards are closing.

carefully observe and control the entire process. But as you position your work in the tester, you should never forget the large amount of force you are controlling! Always remember: to remain safe you must keep your mind focused on your work !

To give you complete access and an unobstructed view of the testing area, test beds have barrier guards that open. Experienced operators know that when installing pull test fixtures by hand or with a crane you must check for slip and trip hazards. It would be nearly impossible to do your job properly if the work area is cluttered or covered with oil.

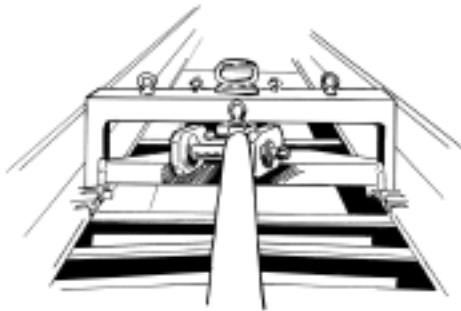
Once the proper fixtures are installed and the test sample is loaded the barrier guards must be closed before any testing is done.

You should always make certain that your test fixtures have the capacity to handle the force and correctly fit the product to be tested. It is recommended

**!** *The warning information and other instructions posted around your test bed are there for YOUR protection and safety. Make it a habit and follow them. The forces you are working with can cause serious injury or even death.*

to mark all fixtures and pins with their rated capacity.

The test sample and fixtures should always be in-line with the travel of the ram. Testing setups requiring different components than those specified on the setup sheet should always be approved by your supervisor.



Example of an off-center attached test sample

Never substitute fixtures that are not designed for your test bed or force.

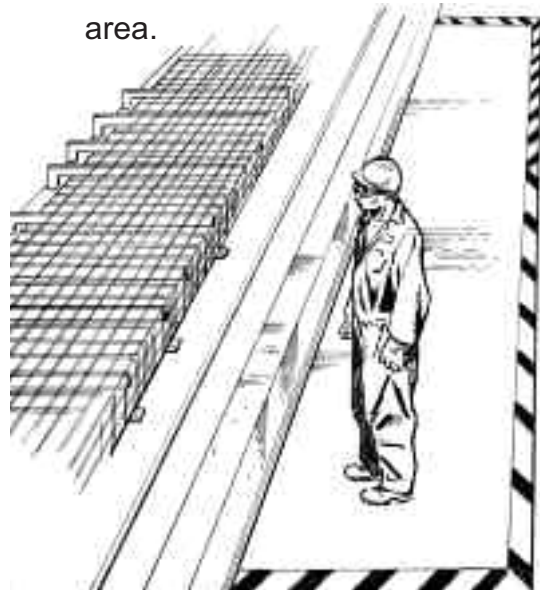
Always make sure the test sample is properly aligned, properly seated and without kinks or twists.

Never perform any type of pull test with the barrier guard open.

You should always make certain that you understand the operation of the tester controls and the specification of the test.

Be sure to keep in mind the safety of others. Make sure the barrier guards are closed while the test bed is in operation.

Always operate the test bed from within a designated work area. While the test bed is in operation other personnel must stay outside of the designated work area.



The guards are fully closed and only authorized personnel are within the designated work area.

**NOTE:** If you are uncertain about the proper use of the fixtures or maximum tonnages WLL (Working Load Limit) your fixtures are designed for in your shop, talk to your supervisor, review your fixtures in the Manufacturer's test bed manual, or contact the test bed Manufacturer.

## Operational Safety

**N**o one should operate a test bed without proper training and authorization by his/her employer. Operating a test bed safely and properly actually begins before the test starts; some preparation steps you should take include:

Always make certain you are familiar with the manufacturer's instruction manual before operating the machine. If you are in doubt about anything, ask your supervisor.

Make sure the test bed is calibrated to the latest revision of either ASTM E4 or ISO 7500-1.



Observing a pull test from this position may result in serious injury or death !

Always have the guard fully closed before testing !

Never enter the test bed while the ram is moving.

Never enter the test bed while the guard is still moving.

Proper PPE (Protective Personal Equipment) could help you avoid a serious accident.

Always wear approved safety gear as per your company's policy while operating a test bed.



Observe the test from a safe position



Typical array of PPE

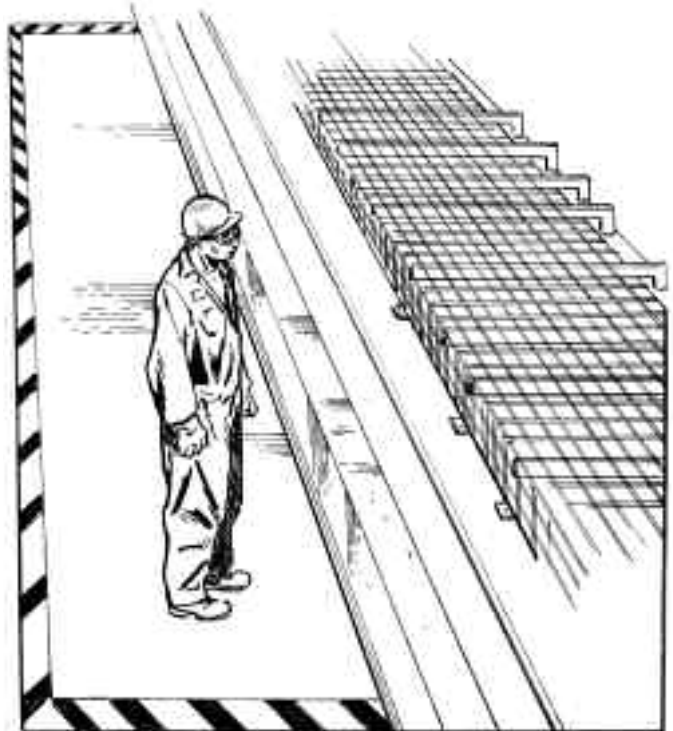


## The Test Bed Work Zone

There must be a clearly marked work zone around your test bed. This marked zone is to keep unauthorized and untrained people clear of an operating test bed. These boundaries must be maintained so they can easily be seen. As the operator it is your responsibility to:

Know the exact boundaries of the work zone. This zone's limits must clearly be marked and maintained. The work zone in your shop is described at this booklet's end.

Remember, boundaries can be marked by a wall, a fence or painted on the floor, which has been posted in writing. You must know the work zone for each test bed in your shop.



Clealy marked work zone around your test bed

Before you begin testing make sure only trained, authorized personnel are inside the work zone.

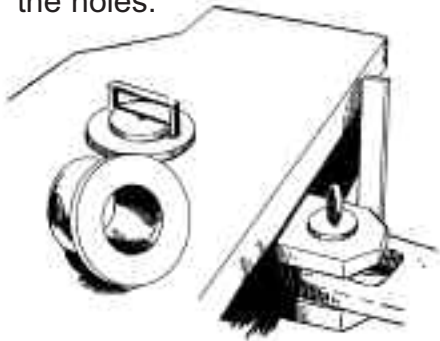
If an unauthorized employee enters the zone while you are testing, stop testing and warn them to stay away. However, do not allow them to take your attention away from the job you are doing.

Operator's Initials

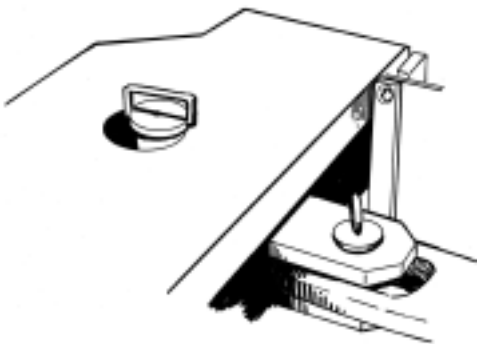
## Checking the attachment pins or grips

The parts subject to the greatest forces during a test are usually the pins in the moveable crosshead and the pins or grips used to attach the test sample. For this reason only trained and qualified personnel should be allowed to check these prior to operating the test bed. Some things to check include:

Crosshead pins: make sure these pins are fully seated into the holes.



Properly seated pin and pin size for the test



Never use an incorrect pin attachment for the test

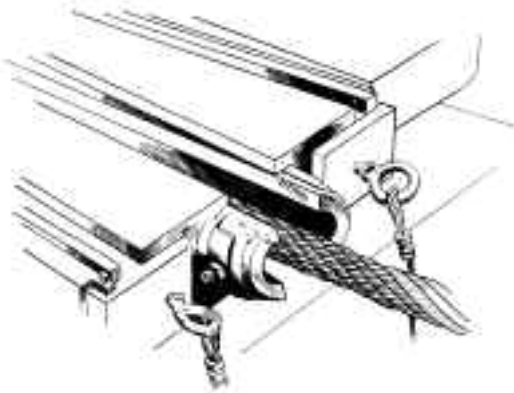
Make sure properly mated pins and fixtures are used for the test.

Grips: if using a wire rope or chain grip make sure the proper size liner or wedge is used for the product under test. Make sure the grips are fully assembled or closed and that the wedges are fully forward ready for a pull.

Grip liners and adapters: Make sure you are using a matched set of liners or adapters in the grip. Never mix a liner set or adapter halves. Always make sure the wedge area of the grip is clean and free of foreign matter, that may keep the wedges from pulling tight.

**! WARNING:** *Mismatched liner and adapter sets can apply extreme forces causing a safety hazard, including serious injury or death !*

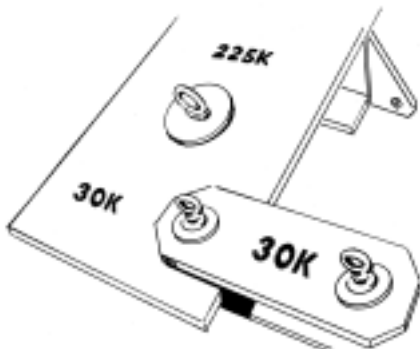
Always make sure the pins and attachment points are in good condition and clearly marked. Any pins that are bent or damaged should not be used.



Make sure the selected wedges match the rope size



Do not use damaged pins or attachments



Properly marked and rated test attachments

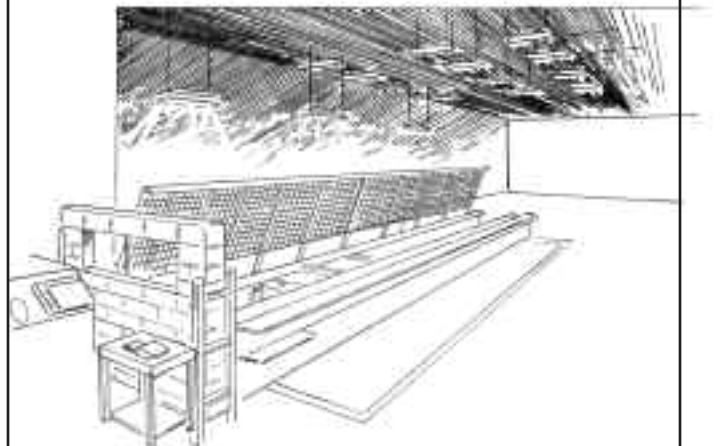
**! WARNING:** *Damaged or worn attachment pins can fail and cause serious injury or death !*

### Keeping a clear view of your work

It is always a good idea to keep an unobstructed view from a safe distance of the item under test. Some important points to be aware of:

The product under test will be moving during the test, allow yourself room to move.

Maintain adequate lighting in the test area.



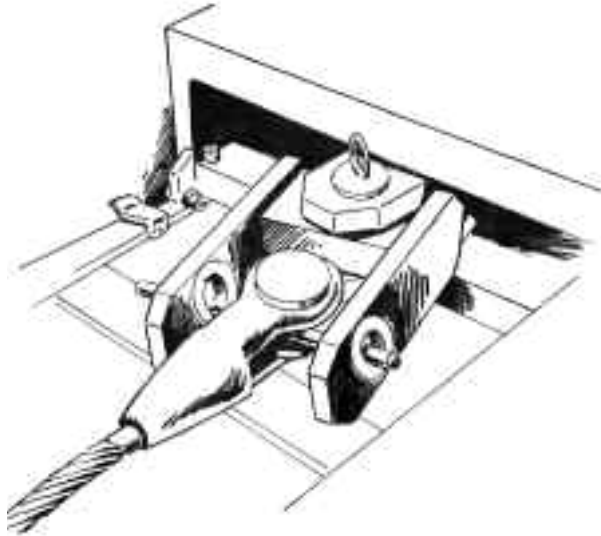
Maintain adequate lighting in the test area

**! WARNING:** *Ejected material can cause serious injury or death !*

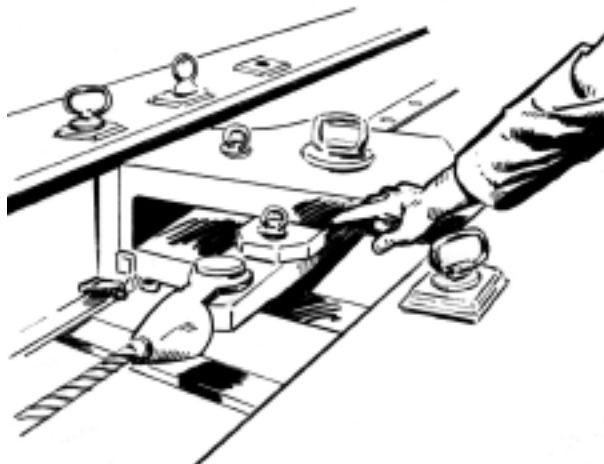
Operator's Initials

### Setting up a Test Sample

When applicable and available read and follow industry recommended testing guidelines for the product you are testing.



Example of an improperly attached test sample



Use only properly sized and capacity matched test attachments

### Preparing the test bed:

Make sure that the machine is in good working order.

Make sure you know the tension force required for the test.

**! WARNING:** *Only trained and authorized personnel should operate the test bed.*

Make sure if using a grip that the proper size liners/adapters are used.

Make sure the test product is securely attached into the machine

Make sure the guard is closed before testing begins.

### During a test:

Always keep in mind that the item being tested can break unexpectedly

Always keep in mind that the test bed has moving parts that can form pinch points during operation.

Always keep in mind you are testing with high loads that can produce dangerous recoils if breakage occurs.

When necessary observe the test through the guard from a safe position.

Do not get too close to the test sample and ALWAYS wear safety glasses.

Stop testing if the test sample unexpectedly starts to slip or break.



Observe and operate the test bed from a designated control area.

**!** **WARNING:** *The operator should stay focused on visible and audible indications of the test.*

**!** **WARNING:** *Improper use of a test bed can result in serious injury or death !*

Never put your hands into the machine while in operation.

Reduce shop distractions, such as other loud machine noise while operating the test bed.

Loud music may muffle audible warnings emitted by the test.

Never operate the test bed while under the influence of drugs, alcohol, or any other limiting physical conditions.



Loud music, alcohol, drugs, missing safety equipment and ignoring your employers safety policy may lead to injury or death !

**!** **WARNING:** *Take these Warnings seriously !*

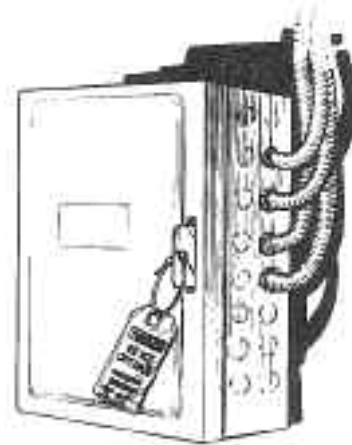
# *Inspection and Maintenance Safety*

A safe testing operation depends on the routine and careful inspection of your test bed and its parts. If signs of wear are found, you should take immediate steps to ensure that the test bed continues to run smoothly and operates properly.

To safely inspect or maintain your test bed you should always follow any lockout/tagout procedures your shop uses to prevent accidental and possibly dangerous unexpected start-up. These procedures must disable not only the electrical but also the hydraulic systems.

*Note: the variety of test beds and their supporting systems makes it impossible to provide specific lockout steps for your particular operation. Refer to the original manufacturer's operational and maintenance manual for specific requirements.*

**!** **WARNING:** *If you have doubts, ask your supervisor for instructions or for a written Lockout/Tagout procedure for your shop as required by OSHA or other responsible regulatory or safety agencies.*



Once you have disabled your test bed, some inspection and maintenance steps to perform often include:

Make sure all bolts and nuts are in place and tightened to the proper torque.

Inspect all the pins and attachments points, pin location holes etc. for excessive wear or bending. Replace any damaged components.

Inspect your grip, liners, and adapters for excessive wear or damage. Replace any worn components.

Inspect all hydraulic cylinder seals for excessive leakage. Replace as required.

Make sure the test bed is generally clean and free from dirt and foreign matter.

Inspect the operator control station, switches and controls for proper operation. Repair or replace as required.



Regular inspections maintains safe operating of your test bed

## Maintaining the Hydraulic System

The forces used to tension test the specimens are generated by hydraulic pressure. Maintaining and inspecting this vital system on a regular basis can help assure that you will be operating your test bed to the manufacturer's specifications. Some safety points here include:

Never increase the hydraulic pressure above the preset level by the Manufacturer.

**!** **WARNING:** *Adjusting the pressure above the manufacturer's recommended pressures could cause serious injury or death !*

Under normal conditions you should change the hydraulic fluid after 250 hours of operation or every two years, whichever comes first.

Hydraulic filters should be replaced every time the reservoir is opened, drained, or cleaned.

# Conclusion

This guide is only intended to give the most basic safety considerations which apply to a wide variety of test beds performing normal operations.

*IT SHOULD NOT BE USED IN PLACE OF ANY SAFETY GUIDES, WARNING DECALS, OR OTHER SAFETY MATERIALS WHICH MAY HAVE BEEN SUPPLIED BY YOUR TEST BED MANUFACTURER!*

Should you have any further safety questions or special applications which might call for additional safety measures, please contact:

Your employer or shop supervisor.

The manufacturer of the test bed, fittings, or attachments you are using.

## In our shop.

The boundaries of the test bed work zone(s) are clearly marked in our shop by (check one or more):

Lines on the floor

Walls

Fences

Non-skid material

Other (specify):

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As a test bed operator in our shop, you should be aware that:

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