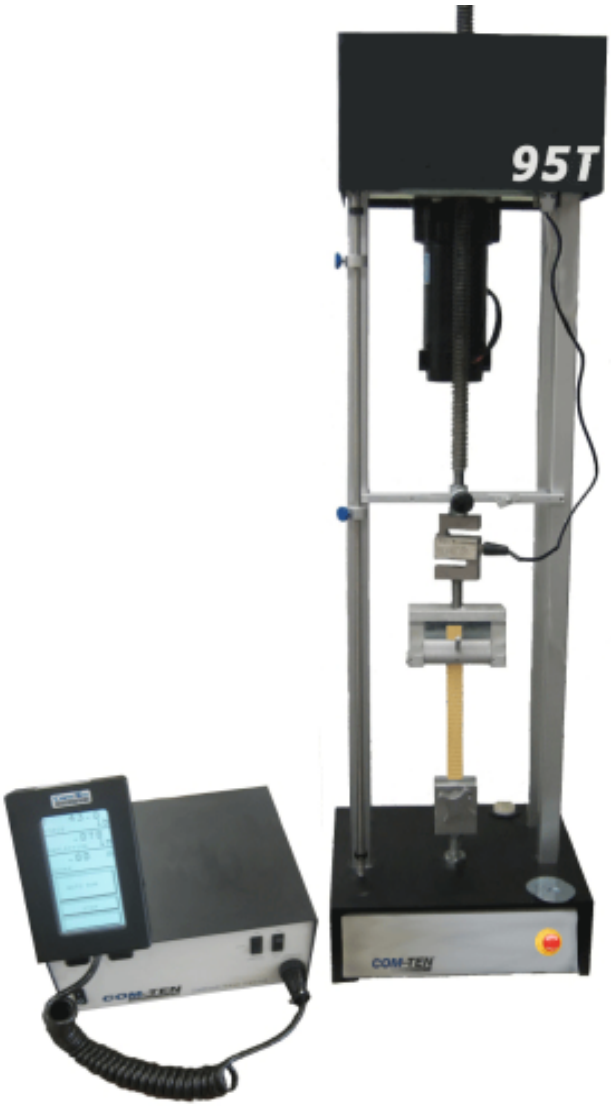
COM-TEN INDUSTRIES

Operating Guide

Automated tensile test stand w/ ComTouch Total Control System



User's Manual for:

Series 95 TS
Series 95 TM
Series 95 TL

COM-TEN INDUSTRIES

6405 49th Street North, Pinellas Park, FL 33781-5724 • Phone 727-520-1200 • FAX 727-520-0299

Operating Guide

Digital Documentation Test System w/ Variable Speed Test Stand and ComTouch Total Control

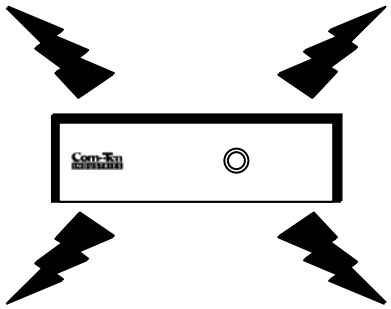
User's Manual for *Series 95T*

6405 49th Street North, Pinellas Park, FL 33781 • Phone 727-520-1200 • FAX 727-520-0299
E-mail: sales@com-ten.com • Web site: www.com-ten.com

TOM95T-RevD – September 2008 - **$25.00**

WARNING - IMPORTANT

STATIC ELECTRICITY & ELECTROSTATIC DISCHARGE



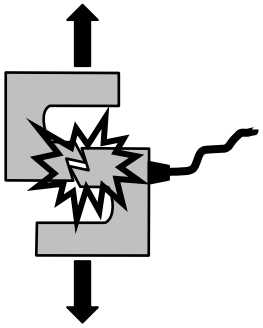
Electrostatic Discharge can severely damage this equipment. COMTEN INDUSTRIES does not warrant this equipment for damage caused by static electricity.

The lowest level of Electrostatic Discharge (ESD) felt by the fingertip is about 3500 Volts, with 7000 Volts being uncomfortable and over 10,000 Volts approaching painful. Pulling Integrated Circuits from a vinyl tray in a 40% relative humidity can generate 4000 Volts. Removing a Printed Circuit Board from a bubble pack can generate over 26,000 Volts at 10% relative humidity.

The most common application that has resulted in damage has been blow molders of plastic containers. These containers have high amounts of ESD when first removed from the mold. Relative humidity should be kept between 25 and 85% non-condensing. In severe applications such as blow molding an Anti-Static Mat should be used. All material to be tested should be touched to the properly grounded mat immediately prior to placing the material in the test stand. The operator must also touch the mat prior to touching the test equipment.

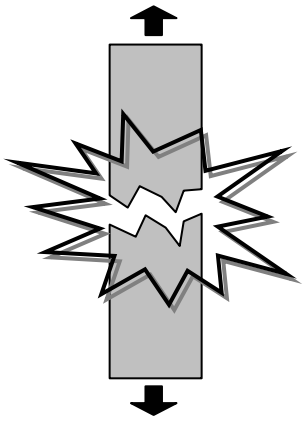
Repairing damage caused by ESD can cost upward of $500.00 as well as your downtime.

LOAD CELLS BREAKAGE



It is important that test readings do not exceed 90% of the capacity of the Load Cell. Operating the Load Cell above 90% of capacity may result in permanent damage to the Load Cell. When operating at speeds above two (2) inches per minute care should be taken not to exceed 75% of Load Cell Capacity. Should this occur, the over force protection system may not react quickly enough and you will break the S-Block Load Cell.

TESTING DANGERS



The purpose of the equipment manufactured by COM-TEN is destructive testing, and the inherent danger associated with such testing requires the equipment to be used only by experienced operators. Due to the nature and use of the equipment, Buyer's acceptance of the COM-TEN equipment constitutes Buyer's assumption of all risk and liability arising out of or resulting from the use of COM-TEN equipment.

COM-TEN WILL IN NO EVENT BE LIABLE FOR ANY INJURY OR INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF ITS EQUIPMENT.

TABLE OF CONTENTS

Chapter 1 - GENERAL INFORMATION

ORDER SPECIFICATIONS

SHIP TO NAME:

CUSTOMER NUMBER:

ORDER NUMBER:

SHIP DATE:

MANUAL PART #: TOM95F-REVB

TESTER SPECIFICATIONS:

TESTER MODEL NO.:

MAXIMUM FORCE:

TESTER SERIAL NO.:

SPEED RANGE: Inches / Min

POWER REQUIREMENT: 110 Volt - 50/60 Hz

TEST STAND FUSE: 4 AMP

MOTOR MODEL PART #:

POWER SCREW PART #:

DRIVE GEAR PART #:

POWER NUT PART #:

DRIVEN GEAR PART #:

OPTO CHOPPER PART #:

COMTOUCH SPECIFICATIONS:

ComTouch SERIAL NO:

PRINTER SPECIFICATIONS:

PRINTER MODEL NO.:
PRINTER SERIAL NO.:

LOAD CELL SPECIFICATIONS:

LOAD CELL MODEL:
LOAD CELL CAPACITY:
LOAD CELL SERIAL NO.:

LOAD CELL MODEL:
LOAD CELL CAPACITY:
LOAD CELL SERIAL NO.:

LOAD CELL MODEL:
LOAD CELL CAPACITY:
LOAD CELL SERIAL NO.:

LOAD CELL MODEL:
LOAD CELL CAPACITY:
LOAD CELL SERIAL NO.:

FIXTURES & ACCESSORIES:

TENSILE FIXTURE:
MAXIMUM CAPACITY:

COMPRESSION FIXTURE:
MAXIMUM CAPACITY:

TENSILE FIXTURE:
MAXIMUM CAPACITY:

COMPRESSION FIXTURE:
MAXIMUM CAPACITY:

TENSILE FIXTURE:
MAXIMUM CAPACITY:

COMPRESSION FIXTURE:
MAXIMUM CAPACITY:

OTHER ACCESSORIES:

SAFETY INSTRUCTIONS

1. **Read instructions** - The entire operating manual should be read before any attempt is made to set up or operate the Machine.

2. **Retain instructions** - The safety and operating instructions should be retained for future reference.

3. **Heed warnings** - Follow all warnings on the machine and in the operating manual.

4. **Follow instructions** - All operating and other instructions should be followed.

5. **Water and moisture** - The test stand should not be used near water or in high humidity (see specifications).

6. **Liquid and object entry** - Do not let liquids or objects enter into the Tester cabinet, the ComTouch cabinet, or the ComTouch handheld touchpad.

7. **Vibrations and dust** - Avoid locations subject to excessive dust and vibrations.

8. **Heat** - The machine should be situated away from heat sources such as radiators, appliances or machines that produce heat.

9. **Ventilation** - The machine should be situated so that its location does not interfere with its proper ventilation.

10. **Placement and leveling** - The test stand and ComTouch should be placed on a firm, stable and level surface. Leveling legs are provided on the test stand for fine adjustment.

11. **Power sources** - The machine should be connected to a power supply only of the type indicated on the machine. A surge protected power source is recommended.

12. **Removal of power cords** - When removing power cords from the wall always pull on the plug; never pull the cord.

13. **Power cord protection** - Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed on or against them.

14. **Grounding** - The tester/controller and ComTouch are provided with a ground connector in its power cord. Do not attempt to defeat this ground connection. Insure that all outlets used with the test stand and ComTouch are properly grounded.

15. **Static electricity** - In certain situations such as plastic bottle plants, static electricity can cause severe damage to the tester/controller and/or ComTouch. If static electricity is present, it will be necessary to use either a floor or table top grounded anti-static mat to prevent damage to the equipment.

16. **Lightning protection** - To prevent lightning damage during electrical storms, unplug the power cord of the test stand and ComTouch and/or use an uninterruptable power supply and surge protector.

17. **Electrical interference** - If the ComTouch hangs up or resets itself, the cause could be electrical interference from transformers, motors or other high voltage electrical equipment. If such interference is suspected, relocate the unit or provide a dedicated line from the main electrical service.

18. **Servicing** - When installing new parts, repairing or servicing the tester or the ComTouch, insure that they are not plugged in. Do not work on the unit with the power on. Replacement of some parts may require complete re-calibration.

19. **Operating precautions** - When in operation, wear protective eyewear and/or equip test stand with optional safety shield and keep hands away from fixtures.

20. **Maximum load capacity** - Do not exceed maximum load capacity indicated in the manual. Insure that all cables are connected between the tester/controller and the ComTouch. Also, set adjustable limit switch collars to limit the travel of the power screw and the fixture in both the up and down directions.

21. **Calibration** - For reliability of data, the Load Cell and ComTouch should be calibrated on a regular basis. Recommended frequency is twice per year when the tester is used often or if the results are critical. Once per year is the standard for normal use.

22. **Gear guard** - After servicing, insure that the gear-guard is in place to prevent possible injury to hands. Keep hands away from the gears when the unit is on.

WARRANTY AND LIMITATION OF LIABILITY

Subject to the provisions and conditions hereof, COM-TEN INDUSTRIES warrants to the buyer that, without charge, COM-TEN will repair or replace, at its option, all new equipment sold to Buyer when used and maintained in the course of normal operations and conditions, if Buyer finds defects in workmanship and materials during a period of one (1) year from the date of shipment.

A. The conditions hereof are:
   1. COM-TEN has been notified in writing by the Buyer of the defect prior to the termination of the warranty period.
   2. The goods are shipped to COM-TEN with prior approval.

CAUTION All warranty work is done at the factory. You will need to save the shipping container should your tester need to be returned to the factory. The use of an improper shipping container usually results in damage to the tester and additional charges.

   3. All shipping costs have been paid by the Buyer.
   4. The goods have been used and maintained under normal operating conditions.

B. Repair or replacement shall be the Buyer's sole and exclusive remedy in the event of COM-TEN's breach of this warranty.

C. This express warranty is in lieu of all other warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular intended purpose, with the exception of the implied warranty of title.

D. The purpose of the equipment manufactured by COM-TEN is destructive testing, and the inherent danger associated with such testing requires the equipment to be used only by experienced operators. Due to the nature and use of the equipment, Buyer's acceptance of the COM-TEN equipment constitutes Buyer's assumption of all risk and liability arising out of or resulting from the use of COM-TEN equipment.

E. In no event will COM-TEN be liable for damages, lost revenue, lost wages, lost savings or any other incidental or consequential damage arising from the purchase, use or inability to use said product, even if COM-TEN has been advised of the possibility of such damages.

COM-TEN WILL IN NO EVENT BE LIABLE FOR ANY INJURY OR INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF ITS EQUIPMENT.

Accuracy is guaranteed at time of shipment to be as advertised or quoted.

If products are damaged in shipment, notify shipping company and COM-TEN immediately.

Warranty void for damage due to accident, misuse or abuse.

All product names referenced herein are the trademarks of their respective companies.

TYPES OF TESTS

The 95T Series Tester utilizes an electronic Load Cell for measuring force. A Power Nut is driven by the Motor and Gears to apply a load on the test sample by moving the Power Screw. Force is applied to the sample via the Load Cell and the force and deflection data is transmitted electronically to the ComTouch Total Control unit.

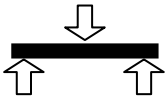
The 95T Series Tester has been designed to perform five types of tests by changing optional equipment; Tensile, Compression, Modulus of Rupture (MOR), Fatigue, and Hardness/Penetration.

TENSILE STRENGTH

The measurement of the amount of force exerted on an item by pulling on the ends of the item. A typical example would be to determine the breaking strength of fishing line.

COMPRESSION STRENGTH

The measurement of the amount of force exerted on an item pressed between two plates. A typical example would be to determine the load bearing strength of concrete block.



MODULUS OF RUPTURE (MOR)

The measurement of the amount of force exerted on an item with the item supported on two ends and the force applied in the center. A typical example would be to determine the strength of a ceramic bar.

FATIGUE

The repetitive application of a load in order to determine resistance to failure in relation to varying loads. A typical example would be the low cycle Fatigue testing of metal on a MOR fixture.

HARDNESS/PENETRATION

The determination of a material's surface hardness or resistance to penetration by other materials. A typical example would be the force required to puncture a plastic food bag.

TESTING TERMINOLOGY

YIELD STRENGTH
The amount of force that is required to stretch a material enough to cause permanent deformation.

ULTIMATE STRENGTH
The maximum amount of force measured before rupturing a material.

EXTENSION
The amount of stretching that a material undergoes with the application of a specified force.

FATIGUE LIFE
The number of fluctuating cycles that are required to cause a material to fail at a given load.

STRESS - STRAIN
This is a statement of the relationship between the load applied to a sample per unit area verses the amount of change that is produced in the sample's length in the direction of the force applied.

Chapter 2 - HANDLING YOUR TESTER

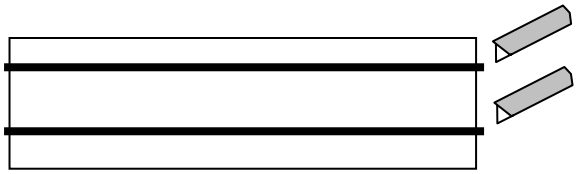
95T TEST SYSTEMS

REMOVING THE TESTER FROM THE CONTAINER

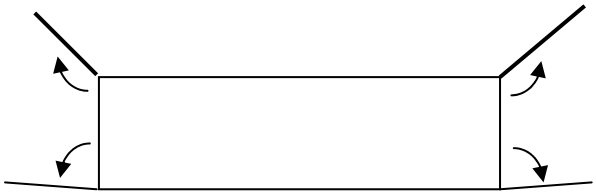
WARNING Wear Safety Glasses and gloves to prevent injury.

CAUTION All warranty work is done at the factory. **You will need to save the shipping container and all packaging materials should your tester need to be returned to the factory.** The use of an improper shipping container usually results in damage to the tester. Replacement shipping containers are upwards of $100!

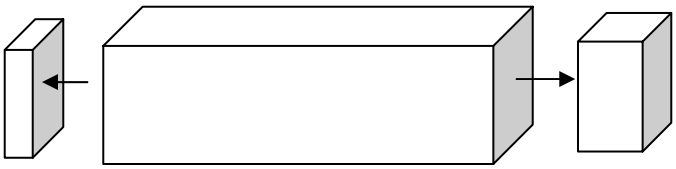
1. Lay the shipping carton containing your new Com-Ten test system on its side. Cut the 2 banding straps running the length of the carton. Also cut the packaging tape on both end of the carton. Do not cut the carton itself.



2. Open the flaps on both ends of the carton.

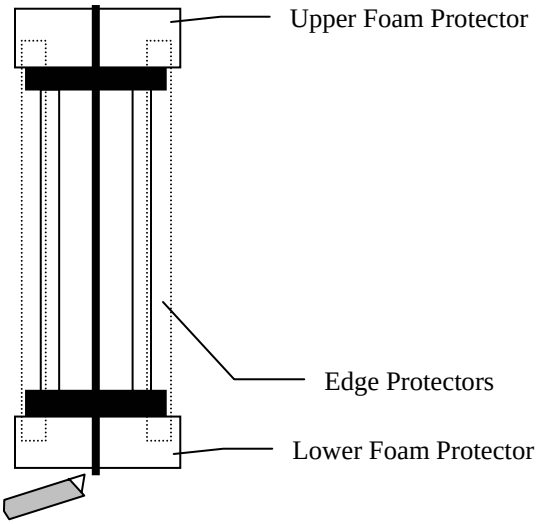


3. Any accessories or controllers you may have ordered will be packed in smaller boxes on either end of the shipping carton. Remove these smaller boxes first. It may be helpful to push from the opposite end to remove the smaller boxes.

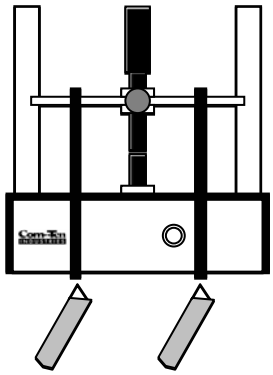


4. After any boxes are removed from inside the carton, remove the test stand by sliding it out from one end. Again, it may be helpful to push the test stand out from the opposite end.

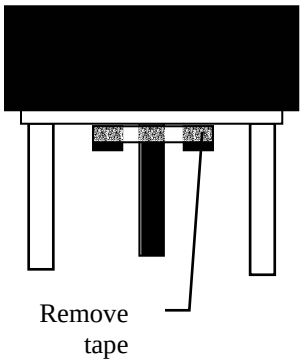
5. Set the test stand upright and cut the strap holding the foam protectors to the top and bottom of the test stand. Remove the 2 foam and 4 edge protectors and place inside the carton.



6. Cut the 2 straps holding the torque bar in place against the base of the tester.



7. Remove the tape holding the 2 thumb screws located near the top of the tester.



8. Carefully remove any accessories from the smaller boxes.
9. Place any smaller boxes inside the larger shipping carton.
10. SAVE ALL PACKAGING MATERIAL! If any piece of equipment, including the test stand, must be sent back to the factory for repair or calibration, use the original shipping carton to avoid any shipping damage. A new shipping carton can cost upwards of $100.
11. Contact the factory immediately if any part of your equipment has been damaged due to shipping.

SHIPPING INSTRUCTIONS FOR 95T

To minimize shipping damage, follow these instructions carefully.

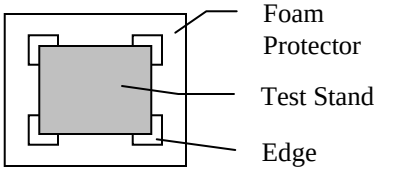
FOR DIAGRAM REFERENCE, SEE "REMOVING THE TESTER FROM THE CONTAINER" on page 11.

1. Remove all leveling feet, clamps and fixtures from Tester. Remove Load Cell from Power Screw.

2. Using the DIRECTION switch on the ComTouch, jog between the 'STOP' and the 'DOWN' position to run the Power Screw down against Base Mounting Stud of Tester (a wood block may be needed to fill the space on some models). Do not apply excessive force.

3. Install two nylon straps (or tie cord) around Base and Torque Bar to prevent movement during shipment.

4. Place the Tester on the lower protective foam support. These are marked "Top Front" and "Bottom Front". Install the four corner edge protectors (3" x 3" cardboard angle) vertically on each corner of the base and gear guard. Then place the upper protective foam support over the top of the Tester. These are a tight fit. See the diagram to the right.



5. Install one nylon or metal banding strap around the Tester and foam supports.

6. Slide Tester inside of shipping container.

7. Secure the ComTouch in the protective foam supports it was shipped with. Remove the handheld support bracket from the front of the ComTouch before packing and place separately in the shipping box. Place the handheld touchpad in the foam supports in front of the ComTouch. Pack the S-Block Load Cell and secure it along with the ComTouch in its original box.

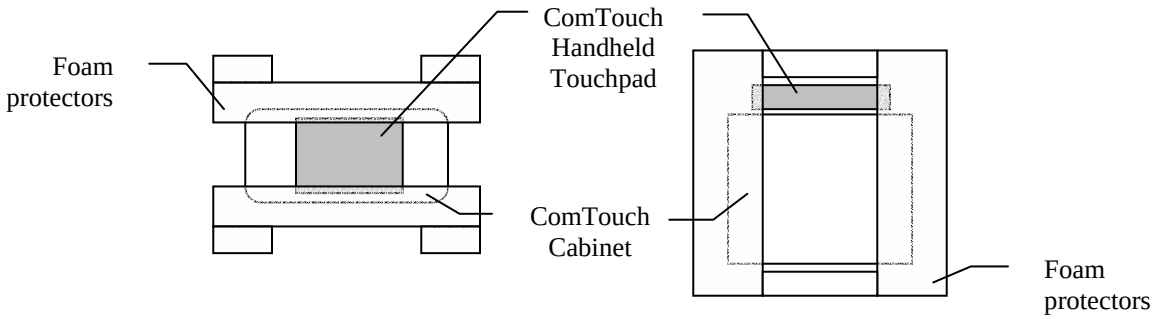


Figure 2.1 - PACKING THE COMTOUCH

8. Slide the box with the ComTouch in on top of the Tester through one end of the larger shipping container.

9. Place a note inside the container stating the problem, the contact name, and phone number of the contact person and a return shipping address.

10. Tape the flaps at either end. Install two nylon or metal bands vertically around length of the shipping container. Be sure to put cardboard edge protectors under the strapping where it contacts a corner.

11. Your Tester is now ready for shipment.

95T TEST SYSTEMS

REMOVING THE TESTER FROM THE CONTAINER

WARNING Wear Safety Glasses and gloves to prevent injury.

1. Cut and remove the nylon straps from the outside of the large container.
2. Remove the four screws from the front of the top flap and two from the left side flap. Raise the flap.
3. Remove the wood cross braces from the inside of the container. The braces are held in place by wood screws on the outside of the container.
4. Place the container carefully on its back.
5. Using a ½" socket wrench, remove the four 5/16-18 X 2-1/2 inch hex head cap screws, fender washers and lock washers mounted through the bottom of the container and into the base of the Tester.
6. Raise the container and the Tester so that the Tester is in an upright position with the Base down.
7. Carefully slide the Tester from the container.
8. Place the wood cross braces back inside the container.
9. Place the retainer cap screws and washers inside the container for future use.
10. Close the lid and re-install the two flap screws.

CAUTION All warranty work is done at the factory. You will need to save the shipping container should your tester need to be returned to the factory. The use of an improper shipping container usually results in damage to the tester.

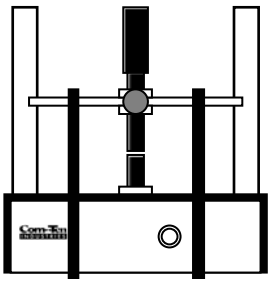
11. Store the container in a cool dry place for future shipment of Tester. Tester should ALWAYS be shipped in the container that the Tester arrived in from the factory.
12. Open the smaller carton and remove the ComTouch, Load Cell, and cables; place adjacent to the test stand

CAUTION Read the manual before proceeding. Damage to the Load Cell and other parts could result if proper procedures are not followed. Damage caused through abuse or misuse is not covered by the warranty.

SHIPPING INSTRUCTIONS FOR 95 FL

To minimize shipping damage, follow these instructions carefully.

1. Remove screws from shipping container lid flap.
2. Remove stored cross braces from inside of container.
3. Remove all clamps and fixtures from Tester.
4. Remove Load Cell from Power Screw.
5. Using the ComTouch DIRECTION switch, jog between the 'STOP' and the 'DOWN' position to run the Power Screw down against Base Mounting Stud of Tester (a wood block may be needed to fill the space on some models). Do not apply excessive force.
6. Install two nylon straps around Base and Torque Bar to prevent movement during shipment.



7. Remove leveling feet.
8. Place container in an upright position resting on its bottom (end with holes).
9. Slide Tester inside of shipping container.
10. With Tester in container, carefully tilt container over into a horizontal position with the flap up.
11. Using the lock washers and fender washers, install the four 5/16-18 X 2-1/2 inch cap screws with a ½" socket wrench through the holes in the bottom of the container and into the mounting holes in the base of the Tester.
12. Install the wood cross braces and install screws.
13. Place a note inside the container stating the problem, the contact name, and phone number of the contact person and a return shipping address.
14. If returning the Load Cell or fixtures, use foam or bubble pack to protect the equipment during shipment. Fix the equipment to the post of the test stand, DO NOT SHIP LOOSE IN THE CONTAINER.
15. Re-install the flap screws.
16. Place two banding straps around the length of the container. The straps should be running along the sides of the container, not front to back.
17. Place 4 banding straps around the width of the container.
18. Your Tester is now ready for shipment.

Chapter 3 - YOUR TEST SYSTEM

GENERAL TESTER TERMINOLOGY

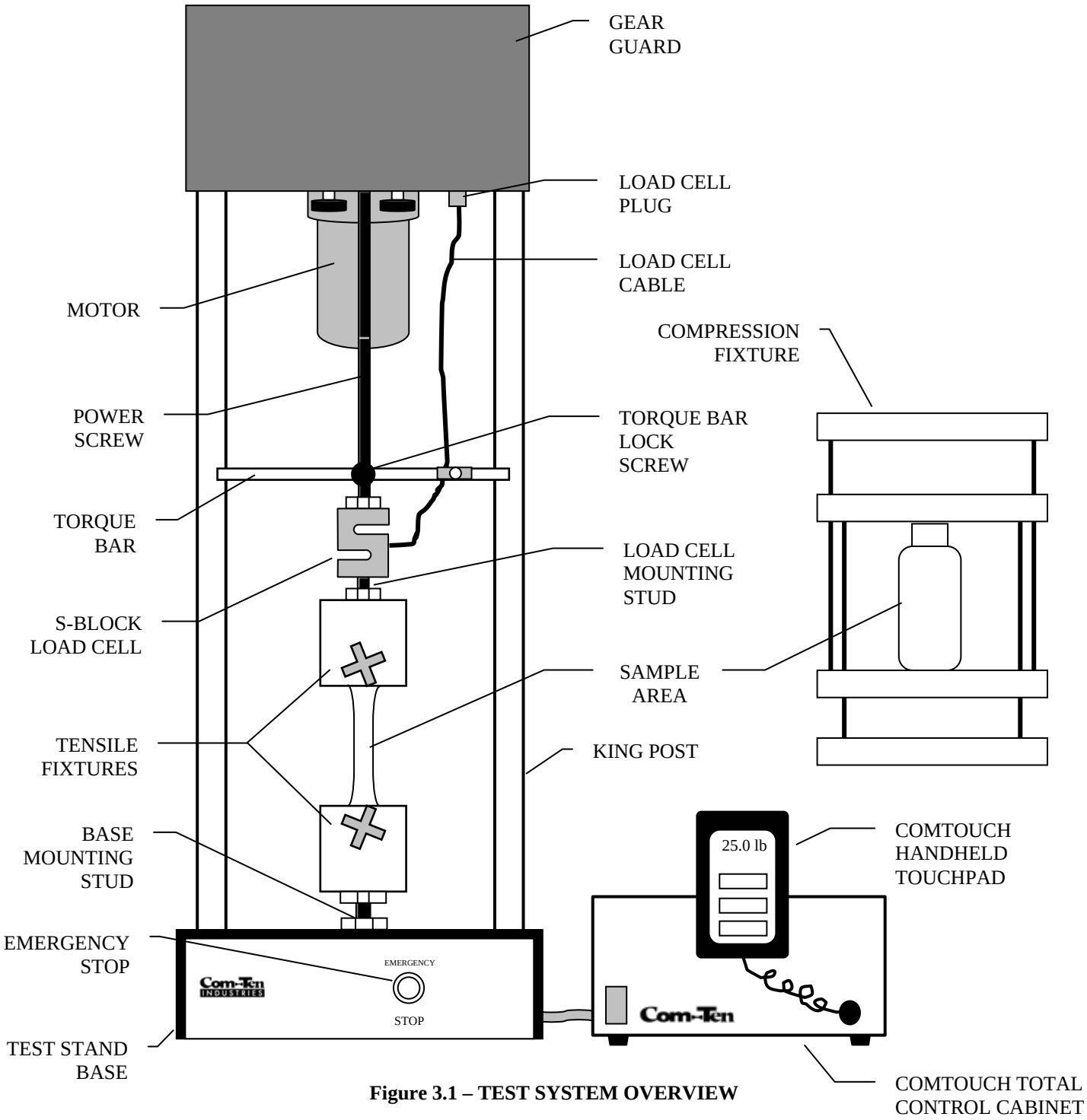


Figure 3.1 – TEST SYSTEM OVERVIEW

TEST STAND CONTROLLER

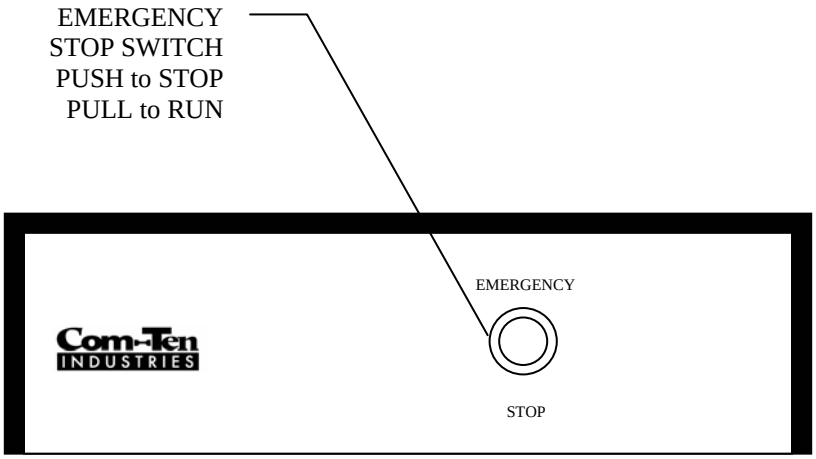


Figure 3.2 – TEST STAND BASE FRONT

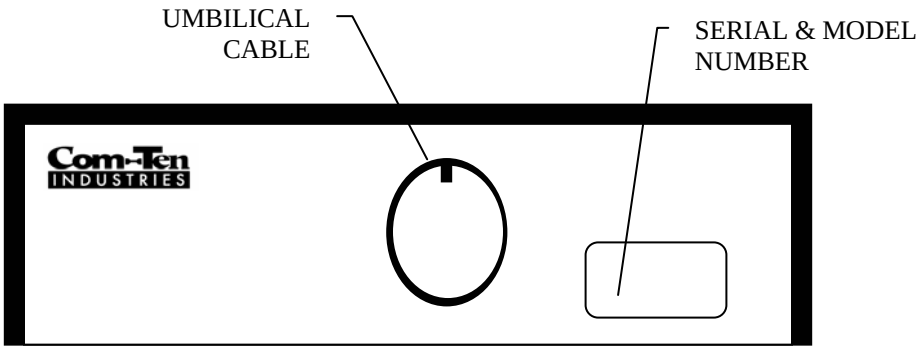


Figure 3.3 – TEST STAND BASE REAR

COMTOUCH TOTAL CONTROL

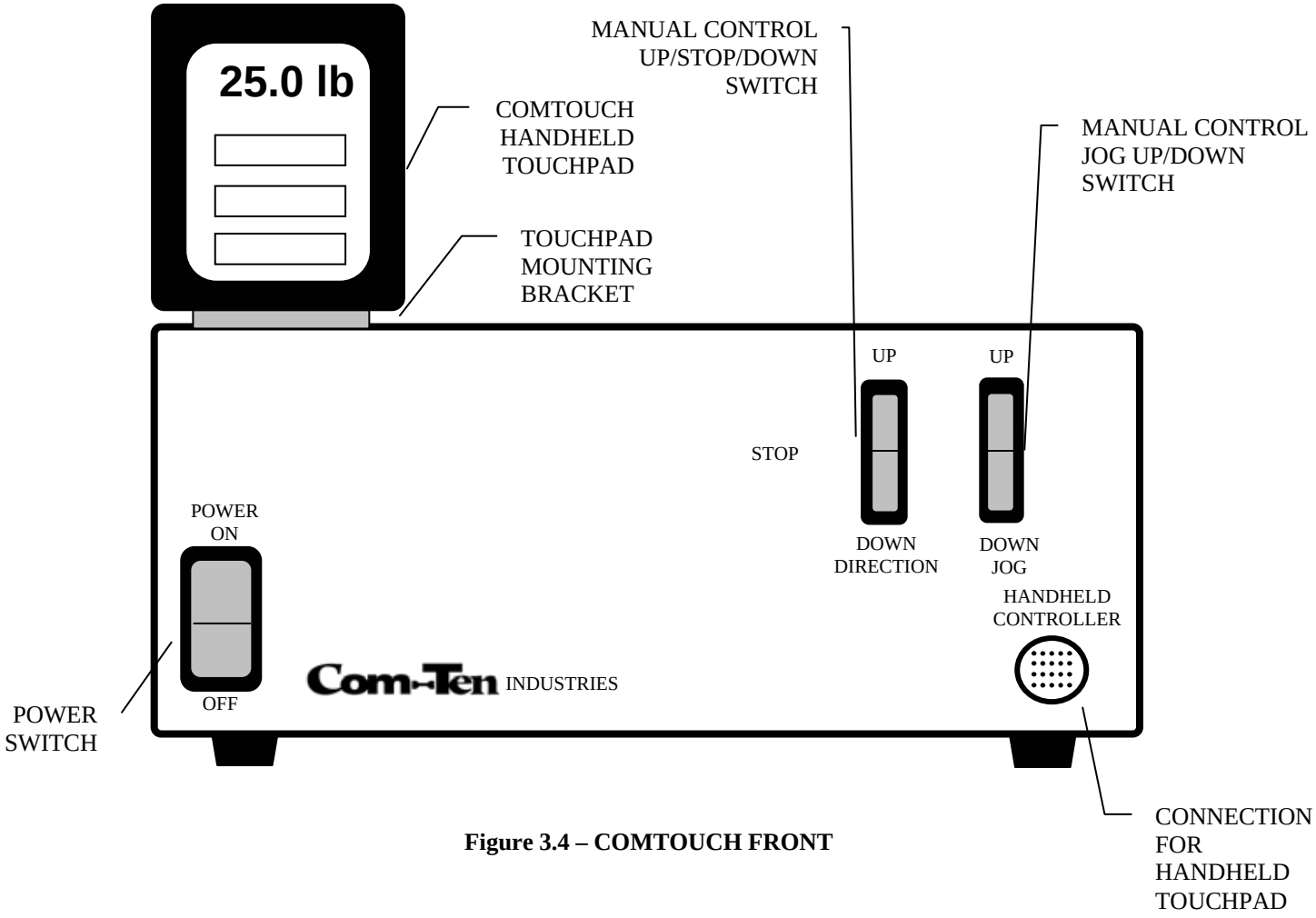


Figure 3.4 – COMTOUCH FRONT

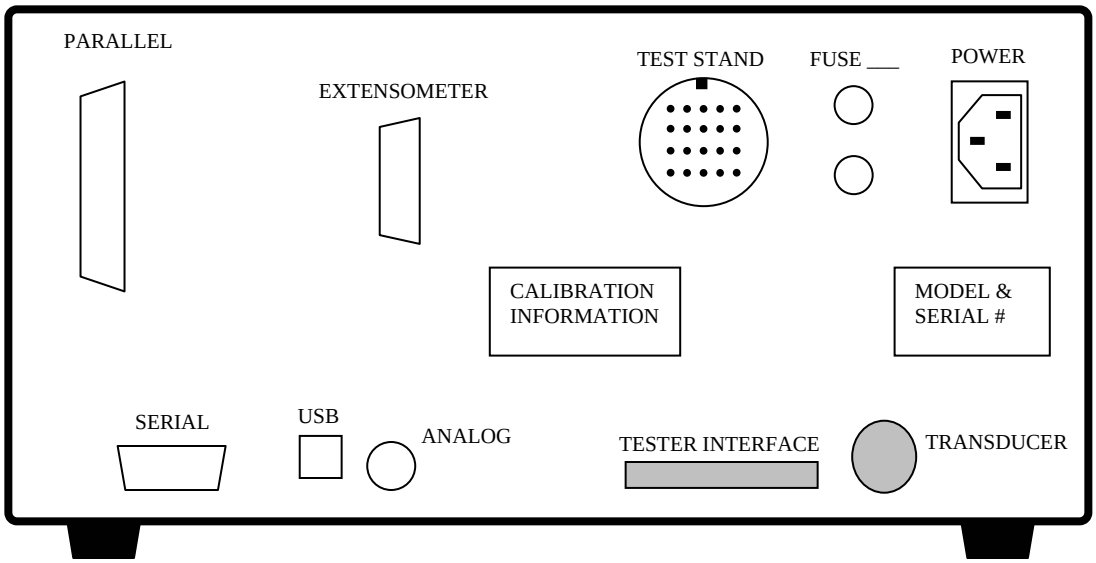


Figure 3.5 COMTOUCH REAR

DRIVE TRAIN

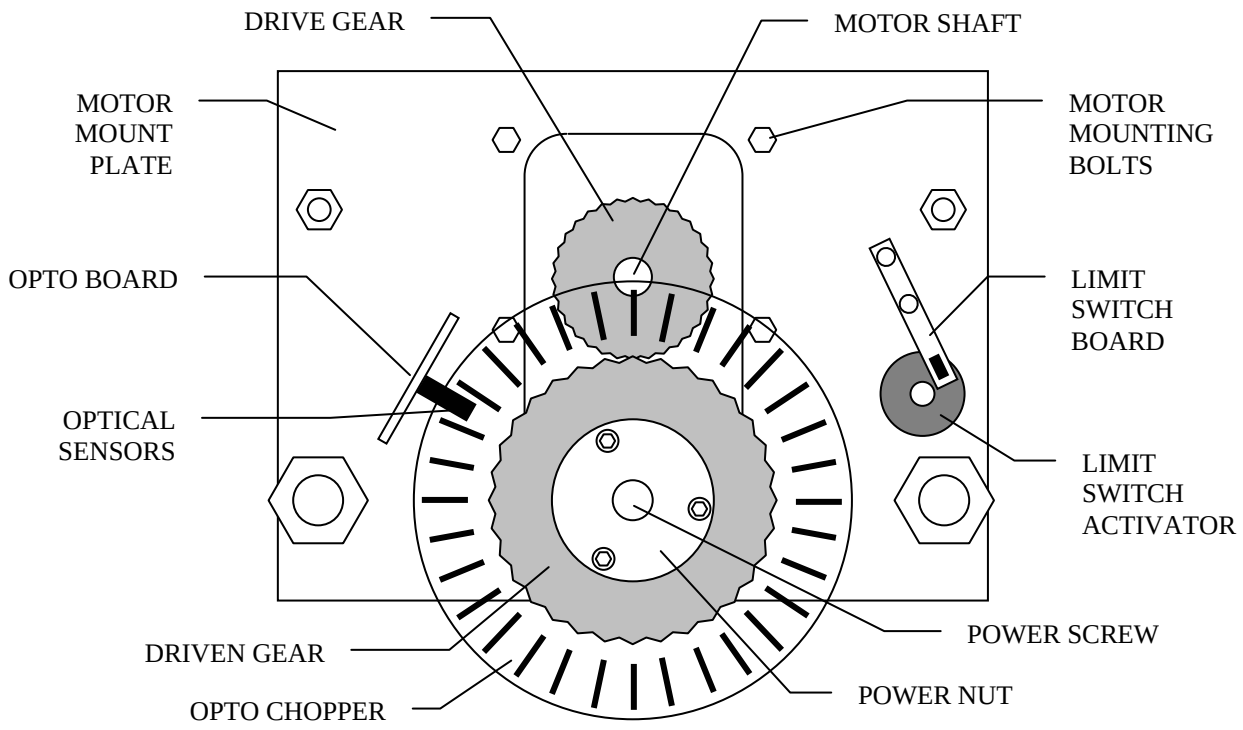


Figure 3.6 – DRIVE TRAIN (TOP VIEW)

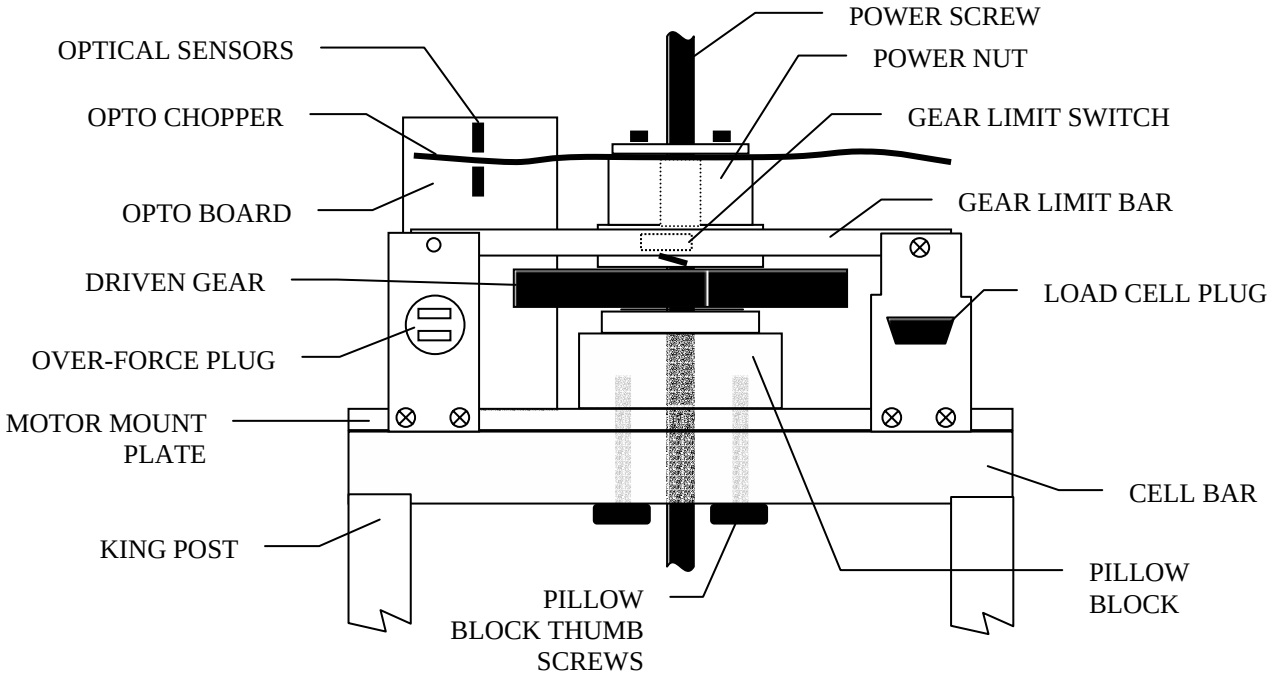


Figure 3.7 – DRIVE TRAIN (FRONT VIEW)

Chapter 4 - GETTING STARTED

LEVEL ADJUSTMENT

Properly mount your Tester for maximum accuracy and safety.

CAUTION Failure to level your Tester may affect accuracy of tests.

1. Determine desired location on work bench for Tester.

WARNING Allow enough overhead clearance for the Power Screw to extend through the top of the Tester an amount equal to the travel distance of the Tester. See SPECIFICATIONS on page 46 for the travel distance of your Tester.

2. Place Tester in a vertical position on selected location. For many testing applications it is advisable to bolt the tester to the work bench instead of using the leveling feet provided. Use the 5/16-18 threaded holes in the tester base for bolting to a work surface.

WARNING Wear Safety Glasses and gloves to prevent injury.

3. Cut and remove the two nylon straps located around the base and Torque Bar.
4. If using the leveling feet, screw the four leveling feet into the base of the Tester. Refer to Figure 4.1 –LEVELING FEET, below.

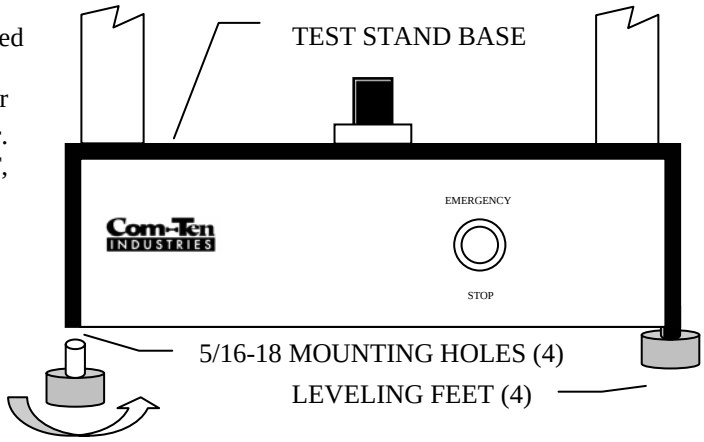


Figure 4.1 –LEVELING FEET

5. Observe the bubble in the Level located at right rear of the Tester Base. Refer to Figure 4.2 – LEVEL ADJUSTMENT, below.

6. If used, adjust the leveling feet to position the bubble in the center of the Level.

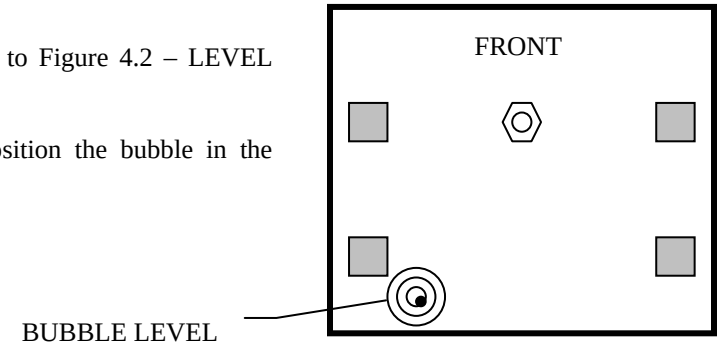


Figure 4.2 – LEVEL ADJUSTMENT

CONNECTING THE COMTOUCH

1. Place the ComTouch on the work bench or table next to the Test Stand. See Figure 3.1 – TEST SYSTEM OVERVIEW on page 16.

2. Connect the power cord to the ComTouch and plug it into a 110V, surge protected power source.

3. Connect the large umbilical cable between the ComTouch and the Test Stand**. The cable is keyed. The large key notch should be up. Align connector end key and push cable into connector. Rotate connector lock COLLAR 90 degrees clockwise to lock connection.** Refer to Figure 4.3 – COMTOUCH SETUP below.

4. Connect the round TRANSDUCER cable between the ComTouch and the Test Stand.

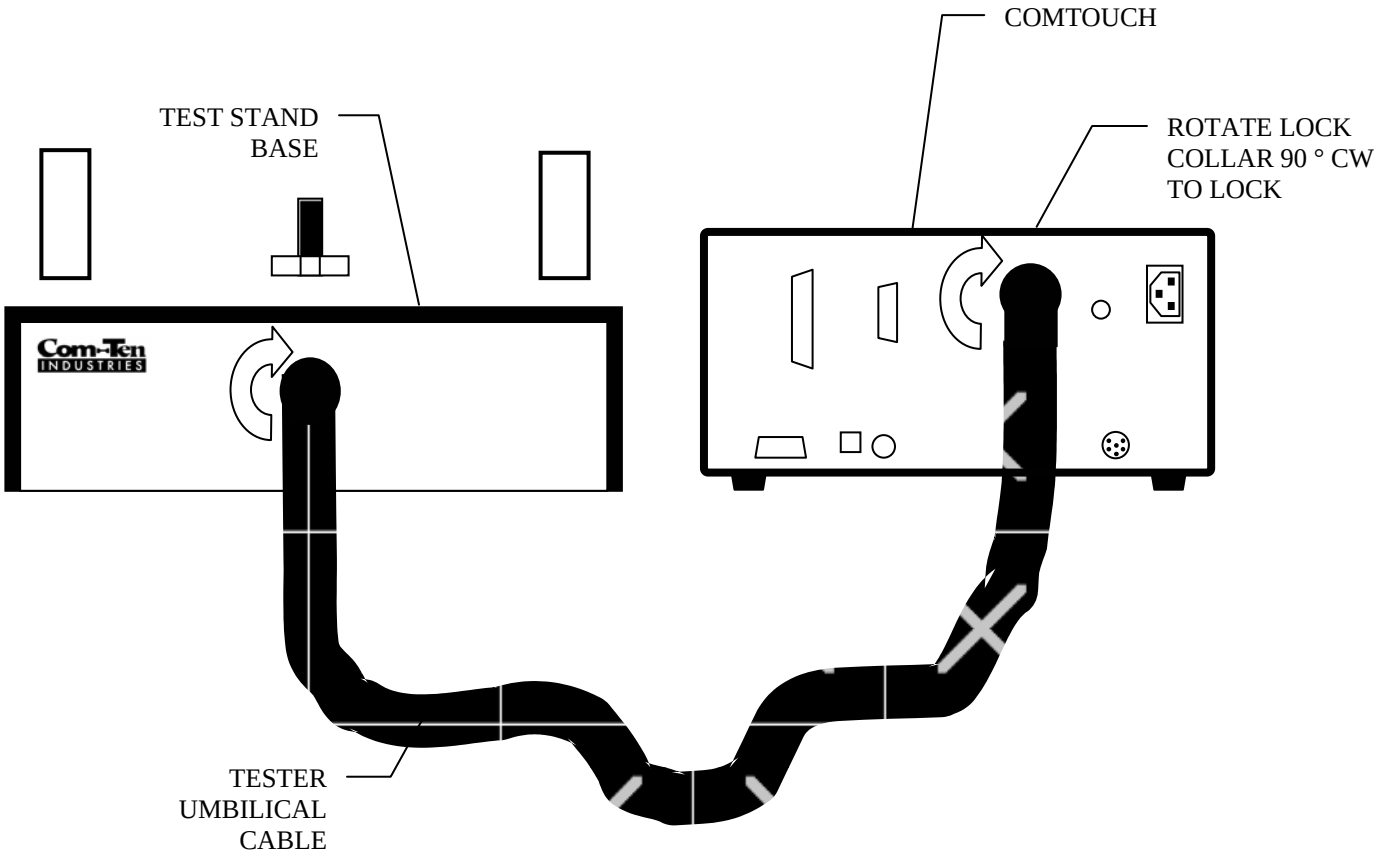


Figure 4.3 – COMTOUCH SETUP

LIMIT SWITCH ADJUSTMENT

COM-TEN 95T series Test Stands come standard with magnetic adjustable travel Limit Switches. These Limit Switches can be set to limit the up and down travel of the test stand. They can prevent damage to the machine by not allowing the compression cage to fully close or running the unit too far up. Limit Switches are also helpful in resetting the test stand to its original position after a test is completed.

1. Your Tester was shipped from the factory with the Limit Set Collars firmly tightened against the Torque Bar. Refer to Figure 4.4 – LIMIT SWITCH (SIDE VIEW) below. Loosen the Upper Limit Set Collar Thumb Screw and re-position towards the top of the Tester about 2 inches below the Red Stationary Collar; re-tighten the Thumb Screw. This will allow room to move the Test Stand and install the Load Cell.

2. After the Load Cell and fixtures or compression cage are installed, adjust the Lower Limit Set Collar to your starting sample length or height.

3. Set the Upper Limit Set Collar to a point above where the sample may fail. If using a compression cage, set the Upper Limit Set Collar at a point where the compression cage, or the fixtures in it, will never fully close.

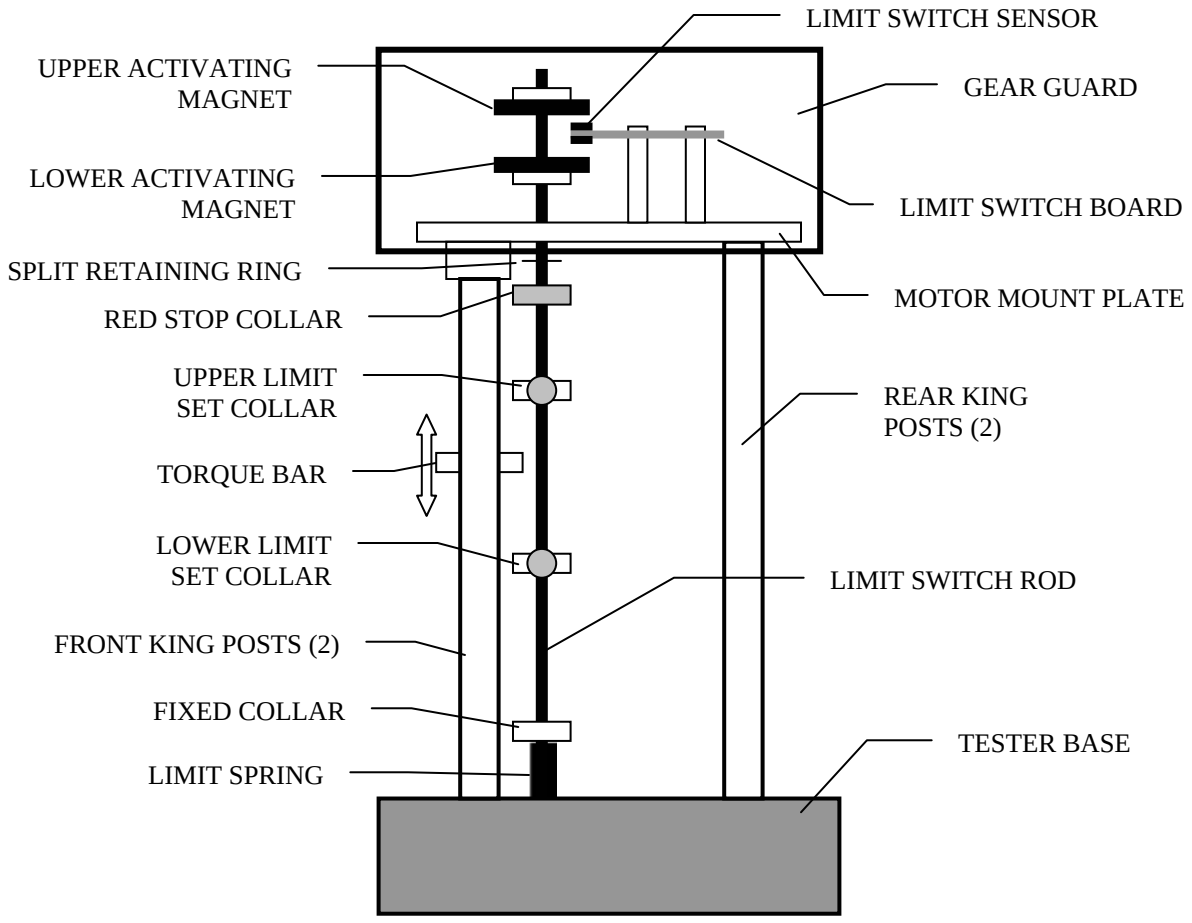


Figure 4.4 – LIMIT SWITCH (SIDE VIEW)

SELECTING THE PROPER LOAD CELL

Series **95T** Testers use COM-TEN TSB series S-Block Load Cells. These load cells ONLY work with the ComTouch Total Control system, and do not work with older Digital Monitor Controllers (DMC) units. These testers can have a rated frame capacity of either 2000 or 5000 pounds, depending on the model.

To prevent damage to the Load Cell and achieve the best accuracy, the anticipated force reading of normal testing should be within 40 - 60% of Load Cell capacity. In addition, ASTM recommends that electronic Load Cells are not used below 10% or above 90% of their rated capacity. System accuracy for the 95T Testers is +/- 0.5% full scale.

EXAMPLE: If anticipated forces are 200 pounds, select a 400 pound TSB0400 Load Cell. This Load Cell should not be used below 40 pounds or above 360 pounds. The system would be accurate to +/- 2 pounds.

If you are using our Tester in a Compression mode, refer to SELECTING A COMPRESSION CAGE on page 27. Compression Cages have specific minimum Load Cell requirements due to high tare weights.

Select the TSB Load Cell(s) for your application(s) from Table 4.1 – LOAD CELL SELECTION CHART below.

CAUTION It is important that test readings do not exceed 90% of the rated capacity of the Load Cell. Operating the Load Cell above 90% of capacity may result in permanent damage to the Load Cell. When operating at speeds above two (2) inches per minute, care should be taken not to exceed 75% of Load Cell Capacity. Should this occur, the over force protection system may not react quickly enough and you will damage or break the S-Block Load Cell.

Table 4.1 – LOAD CELL SELECTION CHART

CAPACITY LB (kg)	PART NUMBER	CAPACITY LB (kg)	PART NUMBER	CAPACITY LB (kg)	PART NUMBER
10 (4)	TSB0010	100 (45)	TSB0100	1000 (450)	TSB1000
20 (9)	TSB0020	200 (90)	TSB0200	2000 (900)	TSB2000
50 (22)	TSB0050	500 (225)	TSB0500	5000 (2250)	TSB5000

CAUTION Do not exceed the capacity of your test stand when ordering Load Cells.

OVER FORCE CONTROL

It is important that test readings do not exceed 90% of the capacity of the Load Cell. Regularly operating the load cell above this may result in permanent damage to the Load Cell. The OVER FORCE protection system will automatically stop the Motor at or near the upper end of the Load Cell range, less any consideration for tare weight. **Should the Test Stand be traveling in excess of two (2) inches per minute, the system may not react fast enough to prevent damage to the Load Cell.**

If the Tester stops as a result of reaching an over force condition, place the DIRECTION Switch in the STOP position. After Motor has stopped driving, place the DIRECTION Switch in the DOWN position, allowing the Tester to back out of the OVER FORCE condition. Moving the DIRECTION Switch directly from the UP position to DOWN position can cause an over current condition that will result in blowing a fuse.

INSTALLING THE LOAD CELL

CAUTION The Load Cell is a precision piece of equipment. Load Cells, especially smaller capacities, are very sensitive and can be damaged or ruined by dropping or mishandling them. To avoid damage during installation, follow these instructions carefully. Repeated removal could cause damage to the cable. To avoid this, Quick Disconnect fixtures are recommended. See page 31.

1. Check to make sure the power switch on both the Test Stand and ComTouch is in the OFF position.

2. Connect the Test Stand and ComTouch power cords to appropriate power source.

3. Make sure that the transducer and tester interface cables are connected between the Test Stand and ComTouch (See CONNECTING THE COMTOUCH, page 21).

4. Verify that the Test Stand and ComTouch power switch is in the OFF position. While holding the Load Cell in one hand, plug it into the top of the Test Stand (See Figure 3.7 – DRIVE TRAIN (FRONT VIEW) on page 19).

   NOTE: In order for the test stand to run up, the Load Cell must be plugged in and the ComTouch must be ON.

5. Turn the Test Stand and ComTouch power ON. Place the DIRECTION Switch to the UP position. When the Power Screw is separated from the base about eight (8) inches, move the DIRECTION switch to STOP. Turn OFF the Test Stand and the ComTouch and unplug the Load Cell.

CAUTION Watch for overhead clearance of wiring, lights and other objects.

6. As Load Cells are available in different sizes and the end of the Power Screw has one standard size (1/2-20 threaded stud), an adapter is sometimes used to make these parts mechanically compatible. Adapters are supplied from the factory attached to those Load Cells that require them. If your Load Cell *DOES NOT* have an adapter, go to **STEP A** below. If your Load Cell *DOES* have an adapter, go to **STEP B** on page 25. If your Load Cell is equipped with a Quick Disconnect Fixture, refer to QUICK DISCONNECT FIXTURES on page 31.

STEP A

1A. Manually screw Load Cell onto the Power Screw until one to two threads appear under the top of the S-Block Load Cell. Threading the S-Block Load Cell on too far can damage it. Hand tighten the jam nut against the top of the Load Cell.

2A. Refer to Figure 4.5 – LOAD CELL INSTALLATION (W/O ADAPTERS) below. Grasp the Load Cell with a wrench at Reference Point 'A' as shown in the drawing. Using a second wrench, tighten the jam nut against the top of the Load Cell while holding the Load Cell firmly with the wrench.

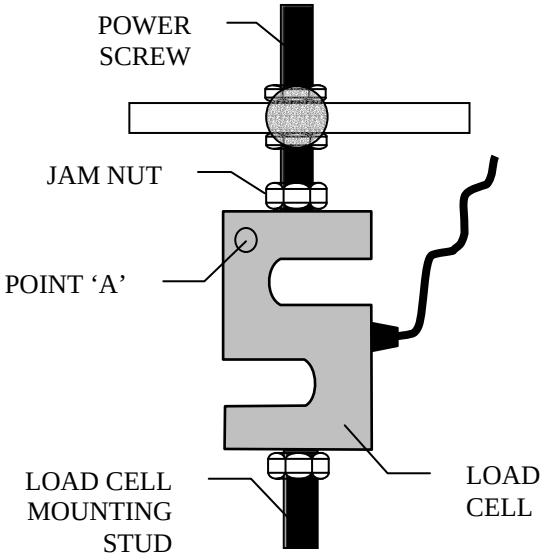


Figure 4.5 – LOAD CELL INSTALLATION (W/O ADAPTERS)

STEP B

The adapter is installed at the factory.

1B. Hand thread the adapter on to the Power Screw until the Power Screw bottoms out in the adapter. Do not over tighten. Hand tighten the jam nut against the top of the adapter.

2B. Refer to Figure 4.6 – LOAD CELL INSTALLATION (W/ ADAPTERS) below. Grasp the top adapter with a wrench. Using a second wrench, tighten the jam nut against the top of the adapter while holding the top adapter firmly with the wrench.

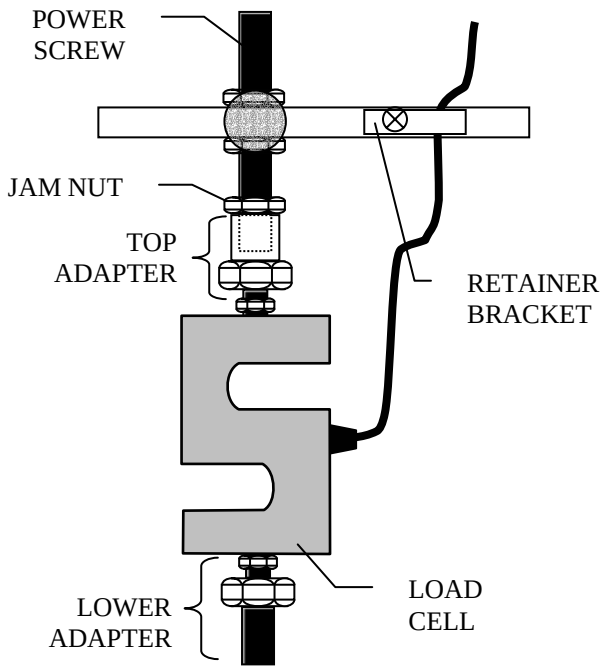


Figure 4.6 – LOAD CELL INSTALLATION (W/ ADAPTERS)

7. Loosen the screw in the Cord Retainer Bracket on the Torque Bar. Place the Load Cell Cord in the Cord Retainer Bracket and re-tighten the screw. Refer to Figure 4.6 – LOAD CELL INSTALLATION (W/ ADAPTERS) above.

8. Connect the Load Cell Plug (DB-9) into the receptacle on top of the Test Stand. Tighten the screws on the load cell connector.

9. Install clamps or cage as required. Refer to TENSILE FIXTURE INSTALLATION on page 26, or COMPRESSION CAGE INSTALLATION on page 27.

10. With the ComTouch ON, set DIRECTION switch to the DOWN position, bringing the upper fixture close to the lower fixture so as to facilitate the installation of the test sample into the fixtures.

SELECTING A TENSILE FIXTURE

Gripping the sample is one the most critical aspects of testing. The sample must be held firm enough to not allow slippage but gripping too hard may produce undesirable results such as breakage at the clamp. There are dozens of standard models of tensile clamps and fixtures available from COM-TEN INDUSTRIES that will fit most applications. If your needs are not covered by the selections listed in your catalog (located in the rear of this manual), please call your Dealer or the factory. COM-TEN INDUSTRIES can economically build custom clamps and fixtures to your needs and specifications.

Clamps are designed for tensile strength testing and are generally installed in matched pairs; however, using dissimilar clamps is an acceptable practice. If you frequently use more than one type of Clamp or Load Cell, you can save time by using Quick Disconnects with your clamps. See the section titled QUICK DISCONNECT FIXTURES on page 31. Refer to your catalog or call your Dealer or the factory for more information.

The tare weight of the fixtures should not exceed 10% of the Load Cell rated capacity. The tare weight for various fixtures can be found in the catalog located in the rear of the manual.

TENSILE FIXTURE INSTALLATION

1. Refer to Figure 4.7 – CLAMP INSTALLATION below. Turn the Test Stand and ComTouch ON. Set the Direction Switch to UP.

2. Raise the Power Screw high enough to allow clearance while installing clamps then return the Direction Switch to STOP. Turn the Power switch to the OFF position.

3. Thread the Face Nut (1/2"-20 by 7/16" thick) onto Load Cell Stud far enough to allow the clamp to be threaded onto the Power Screw.

4. Thread the top clamp onto the Load Cell Stud at least ½". Orient the clamp for operator convenience.

5. Tighten the Face Nut against the clamp. While holding onto the clamp, tighten the nut with an end wrench.

6. Thread a Face Nut onto the Base Mounting Stud.

7. Thread the lower clamp onto the Base Mounting Stud at least ½". Align it with the upper clamp.

8. Tighten the Face Nut against the lower clamp. While holding onto the lower clamp, use an end wrench to tighten the nut up against the clamp.

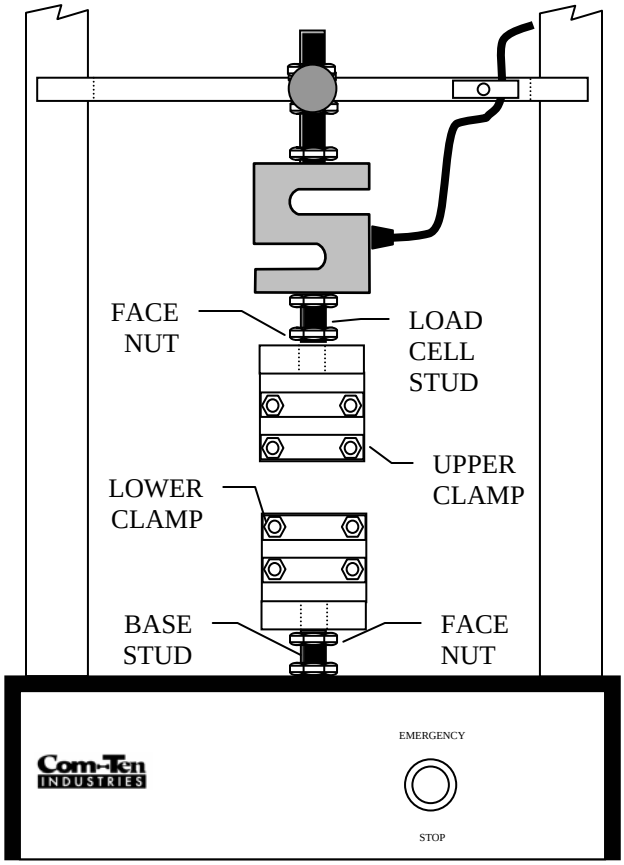


Figure 4.7 – CLAMP INSTALLATION

NOTE: See the individual instructions provided with the fixture on how to load the sample into the Clamp.

SELECTING A COMPRESSION CAGE

A compression cage is an optional piece of equipment that allows a COM-TEN Tester to perform Compression Strength and Modulus of Rupture (MOR) tests. Compression Cages are available in many capacities, widths, and heights. There are dozens of standard models of Compression Cages available from **COM-TEN INDUSTRIES** that will fit most applications. If your needs are not covered by the selections listed in your catalog (located in the rear of this manual), please call your Dealer or the factory. **COM-TEN INDUSTRIES** can economically build custom Compression Cages to fit your needs and specifications.

Select the proper compression cage for your application. Cages should be rated higher than the highest rated compression load anticipated. The proper Load Cell should also be used. Since some Compression Cages have significant tare values, this tare value should not exceed 10% of the Load Cell capacity. The tare weight for various cages and fixtures can be found in the catalog located in the rear of the manual.

EXAMPLE: Maximum anticipated compression load is 1300 pounds. Tester must be rated at 2000 or 4000 pounds. Select a Compression Cage rated at 2000 pounds.

Verify the rating of your Tester before ordering equipment. Do NOT exceed rating of your Tester. Cages MUST be used with Platens, 'F' Blocks or MOR fixtures. Be sure to order with your cage.

COMPRESSION CAGE INSTALLATION

Compression Cages allow the use of your Tester in a Compression mode. Side-Saddle type cages allow for testing items larger than capable with the Standard cage. Cages **MUST** be used with Platens, 'F' Blocks or MOR fixtures, or custom fixtures.

1. Place the DIRECTION Switch to the UP position to raise the Power Screw high enough for the Cage to be placed between the base and the Load Cell Stud plus about three inches. Return the DIRECTION Switch to STOP. Turn the Power Switch to OFF position.

2. Set the Compression Cage beside the Tester in a vertical position with Cage weight rating facing operator. The letters "RF" should appear on the right side of the Compression Bar and Tie Down Bar. Refer to Figure 4.8 – CAGE INSTALLATION below.

3. Locate the clearance hole in the Tie Down Bar on the Compression Cage. This will be the hole in the bottom bar.

4. Lift the Compression Cage and place on the Tester with the Cage Tie Down Bar resting on the Tester Base. The Base Mounting Stud should pass through the clearance hole in the Tie Down Bar.

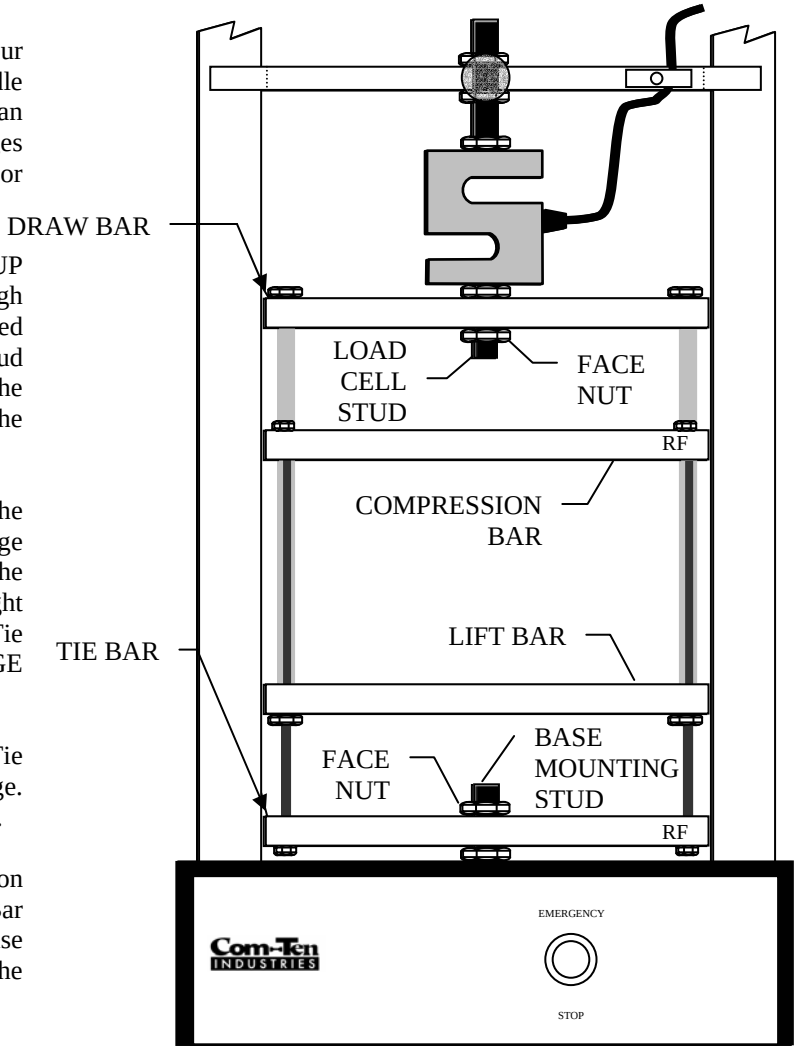


Figure 4.8 – CAGE INSTALLATION

5. Standard Compression Cages will fit in between the King Posts of the Tester. Side Saddle type cages will go diagonal from behind the left King Post to in front of the right King Post. For cage orientation, refer to Figure 4.9 - CAGE REFERENCE below.

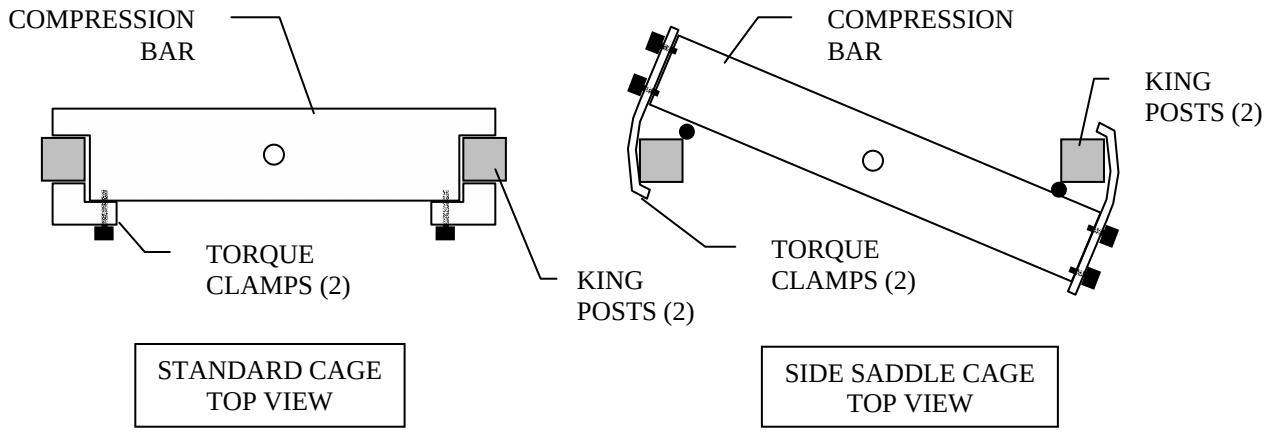


Figure 4.9 - CAGE REFERENCE

6. Thread a Face Nut onto the Base Mounting Stud and tighten with an end wrench.

7. On Standard Cages, install Torque Clamps on the Compression Bar to fix the cage to the King Posts. On Side Saddle type cages, install the Torque Clamp on the Compression Bar to wrap around the King Posts.

8. Carefully raise the top Draw Bar over the Load Cell Stud through clearance hole in the cage Draw Bar.

9. While holding the Draw Bar in place, install a Face Nut on the Load Cell Stud. If the Load Cell Stud is extremely long, a second Face Nut may be threaded onto the stud first then the Draw Bar slid onto the stud. Adjust the upper nut so that the end of Load Cell Stud is flush with exposed end of lower nut.

10. While holding the Face Nut above the Draw Bar with a wrench, tighten the Face Nut below the bar against the cage Draw Bar. Tighten securely.

CAUTION Never run the Compression Cage, or the fixtures in the cage, completely closed! This will generate extreme forces and will severely damage or ruin the Load Cell. Always run the tester at a slow speed whenever possible when using it with a Compression Cage.

PLATENS AND 'F' BLOCK INSTALLATION

Platens are used for compression testing of large items; 'F' blocks are for smaller items. These items are installed in Compression Cages and are designed to prevent damage to your cage. Installation is similar for either item.

The tare weight of the Compression Cage and Compression Fixtures should not exceed 10% of the Load Cell capacity. The tare weight for various cages and fixtures can be found in the catalog located in the rear of the manual.

1. With the Cage mounted on the Tester, raise the Draw Bar by moving the DIRECTION Switch to UP to allow working room for your hands. Return the switch to STOP and turn the Power Switch to the OFF position.

S

tarting with the lower Platen/block, place the plate on top of the Lift Bar. Align the Fixture Mounting Stud with the Lift Bar clearance hole. Place Platen/block clearance hole over the Stud. Refer to

2. Figure 4.10 below.

3. Install a Fixture Mounting Nut from the under side of the Lift Bar and onto the Fixture Mounting Stud. Tighten securely.

4. Similarly, hold the top plate against the bottom of the Compression Bar with the Mounting Stud passing through the clearance hole. Install a Fixture Mounting Nut from the topside of the Compression Bar and on to the Fixture Mounting Stud. Tighten securely.

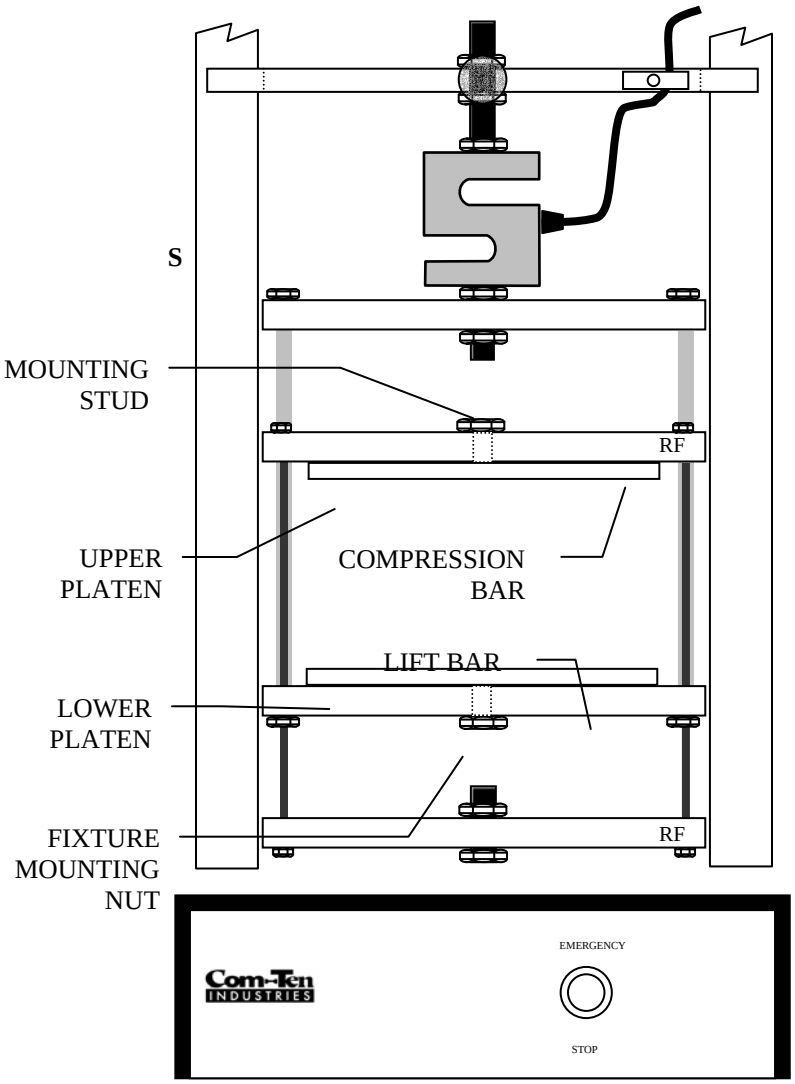


Figure 4.10 - MOUNTING PLATENS & 'F' BLOCKS

MODULUS OF RUPTURE INSTALLATION

MOR (Modulus of Rupture) fixtures are designed to determine the Flexural or Bend strength of an item and are designed to be mounted to a Compression Cage. This is also known as a 3-point bend test.

1. With the Compression Cage mounted in the Tester, raise the Draw Bar by moving the DIRECTION Switch to UP to allow working room for your hands. Return the switch to STOP and turn the Power Switch to the OFF position.

2. Starting with the lower MOR fixture, place it on top of and perpendicular to the Lift Bar, aligning the center hole in the fixture with the mounting hole in the Lift Bar. Refer to Figure 4.11 - MOUNTING LOWER MOR FIXTURE below.

3. Install the Fixture Mounting Nut up through the underside of the Lift Bar. Mount the lower MOR fixture to the Fixture Mounting Nut with the 5/16-18 bolt provided.

4. Place the Lower Anvil Fixtures in the proper holes to achive the desired span.

5. Hold the upper MOR fixture against the bottom of, and parallel to, the Compression Bar with the Mounting Stud passing through the center hole. Install the Fixture Mounting Nut from the topside of the Compression Bar and onto the fixture stud. Refer to Figure 4.12 – MOR FIXTURE REFERENCE below.

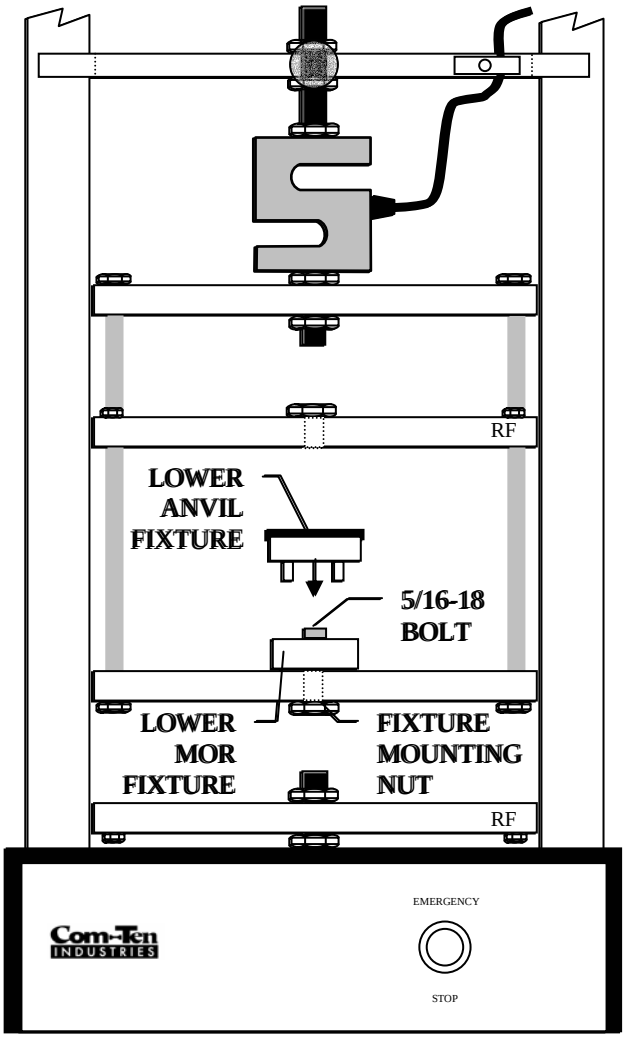


Figure 4.11 - MOUNTING LOWER MOR FIXTURE

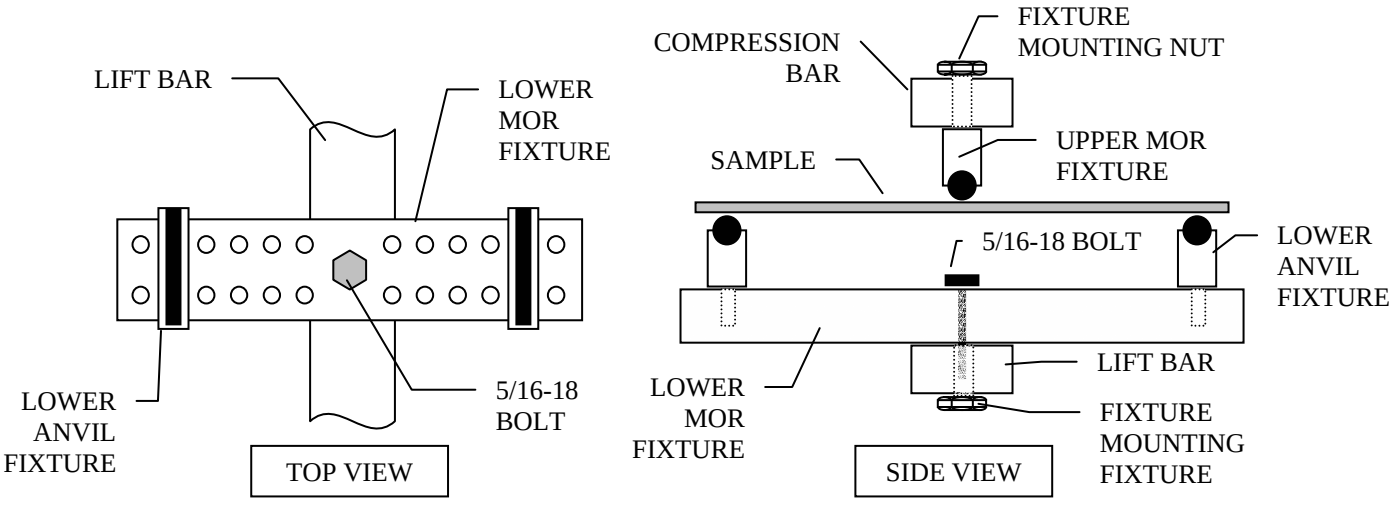


Figure 4.12 – MOR FIXTURE REFERENCE

QUICK DISCONNECT FIXTURES

In many applications it is necessary to have more than one Load Cell and/or more than one clamp or cage. COM-TEN offers Quick Disconnect Fixtures for the quick and easy replacement of Load Cells, clamps, and cages. These fixtures eliminate the need of wrenches and may prevent damage to Load Cells caused by frequent handling. The Swivel Quick Disconnect offers the additional feature of providing self-alignment of the top fixture for better test results. Note that using these fixtures reduces available travel and may necessitate a taller test stand.

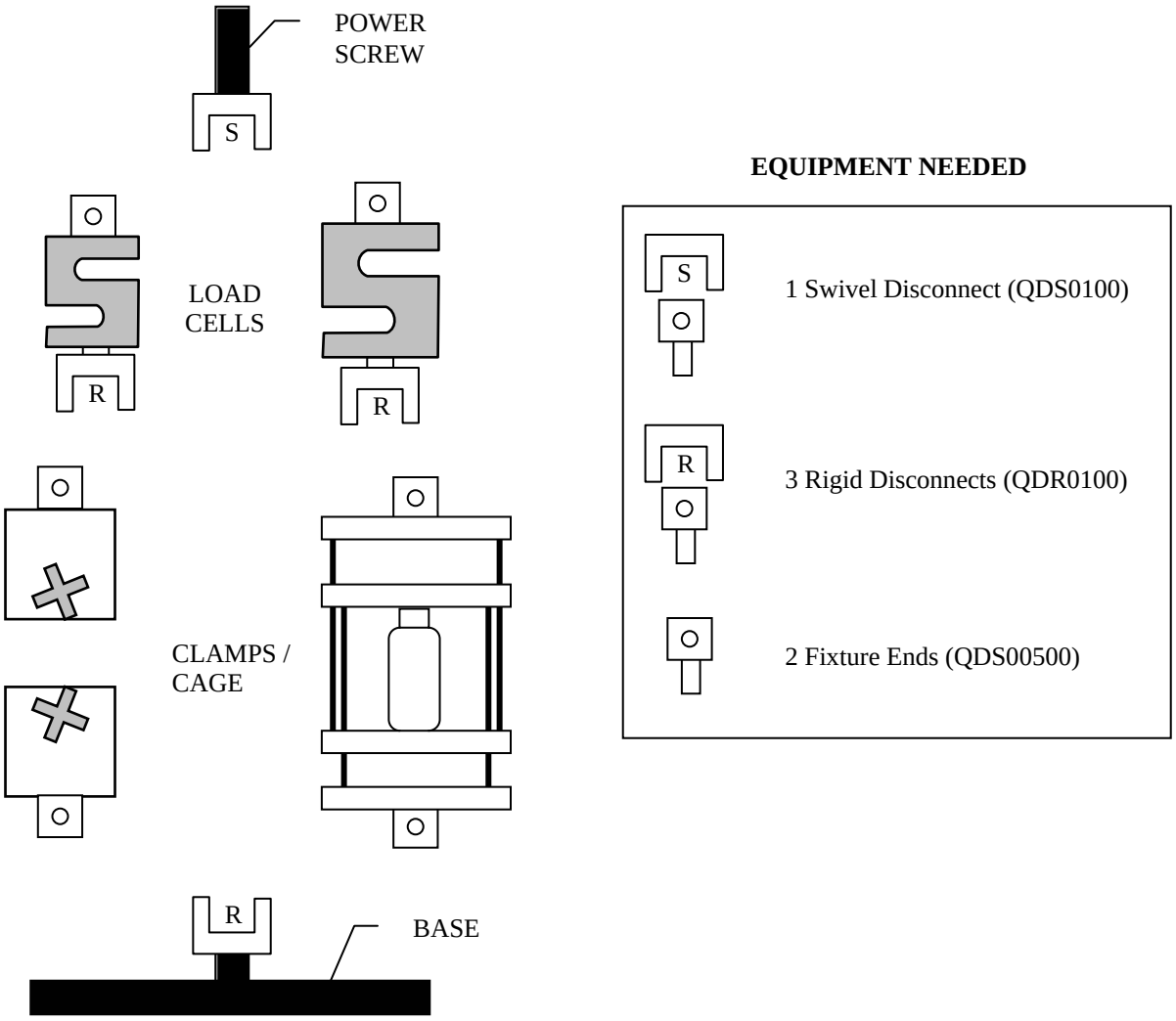


Figure 4.13 – QUICK DISCONNECT CONFIGURATION

Figure 4.13 above shows a typical configuration using multiple Load Cells and multiple fixtures. Any variation of Load Cells and fixtures can be accommodated using the correct fixtures. Contact COM-TEN for additional information about your specific needs.

Chapter 5 - TESTER CONTROLS

TEST STAND CONTROLS

The controls on the front panel of the controller are used to operate the test stand. The functions of these controls are listed below. Refer to Figure 3.2 – TEST STAND BASE FRONT on page 17. EMERGENCY STOP
Any time the EMERGENCY STOP switch is pressed the machine will stop immediately. Before restart, the EMERGENCY STOP switch must pulled out to the normal operation position. The automated test sequence must be restarted.

Chapter 6 - COMTOUCH CONTROLS

CAUTION The ComTouch *MUST* be turned ON at least twenty minutes prior to performing tests to assure accuracy of tests. This warm up period is necessary to allow the electronics to stabilize.

TESTER MANUAL CONTROLS

The tester can be run manually with the two manual control switches no front of the ComTouch.

UP/STOP/DOWN SWITCH

This switch is set to STOP for automatic operation. All manual switches will be ignored during automatic operation. To run the tester up at the ComTouch set speed set the switch to up. The tester will run up until the upper limit travel limit stop is reached.
To run the tester down set this switch to down. The tester will run down at the preset speed or maximum speed until the lower travel limit stop is reached. Speed is selected in the ComTouch return setup screen 3 of 5.
Place this switch in stop for automatic operation.

JOG SWITCH

The JOG SWITCH allows tester movement in small increments. Press and hold the JOG SWITCH either in UP or DOWN direction to move the tester approximately 0.005 inches per step. This is a timed operation. Actual distance traveled will depend on speed setting

STARTUP SCREEN

Upon power up of the ComTouch, the Startup Screen will be displayed. The size of the load cell connected will be displayed in the upper portion of the screen. If a security option is set, this is where the user will enter their PIN

number (maximum 8 digits). For your convenience security is not set on your new system. The START UP screen will display momentarily then pass on to the normal run display

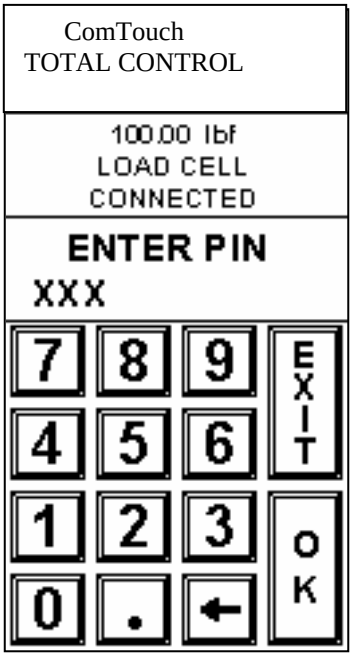


Figure 6.1 - STARTUP SCREEN

DISPLAY AREA

The display area of the ComTouch is split into three areas: the Force Display, Deflection Display, and the Speed Display.

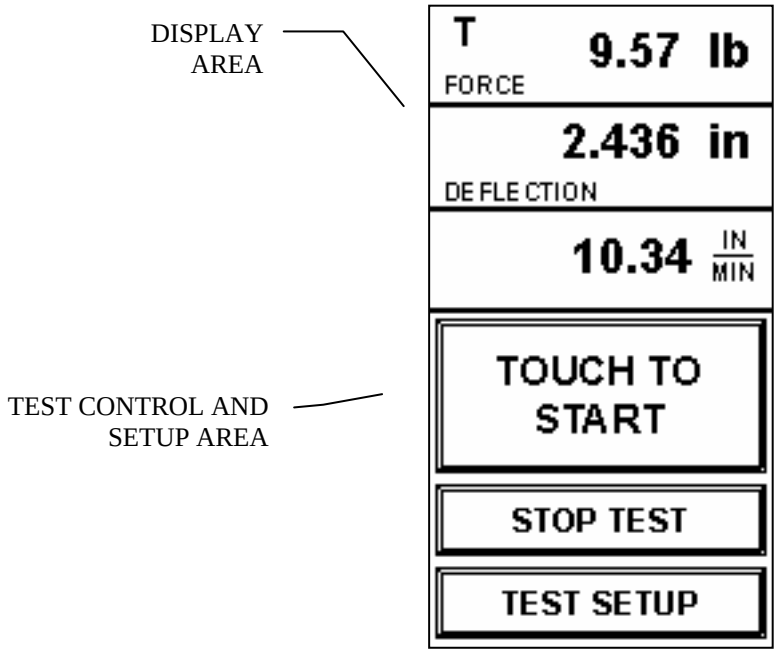


Figure 6.2 – COMTOUCH MAIN DISPLAY SCREEN

FORCE DISPLAY

This section will display the force readout during a test. It will also indicate the force units or error messages. On the left side of this display, whether the load cell is being used in tensile or compression will be indicated by a "t" or a "c".

DEFLECTION DISPLAY

Upon startup of the ComTouch, the load cell size will be displayed here. The deflection or extension will be displayed during or after a test in this area.

SPEED SET AND DISPLAY

To set the speed of the test stand, touch the SPEED area of this screen. This will allow the user to set the speed of the test stand for either manual operation through the control switches or the test speed.

Pressing this area will bring the user to the speed set screen. The current set speed will be displayed. To enter a new speed, press the DOWN ARROW then type in the speed you wish to set the test stand at. Pressing the UP ARROW will set the test stand to the maximum speed of the tester.

During a test the speed will show in this area in units according to the deflection units selected.

TEST SETUP

Pressing the TEST SETUP screen accesses the many user settable options available in the ComTouch Total Control system. These are displayed in a menu format. Pressing MORE OPTIONS takes the user to the next menu of options, and RETURN takes the user to the previous menu shown. To get back to the main display screen, press RETURN until it is shown on the display.

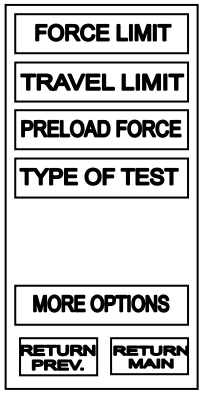


Figure 6.3 - TEST SETUP MENU 1

On the first menu screen, setup options for FORCE LIMIT, TRAVEL LIMIT, PRELOAD FORCE, TYPE OF TEST, and SAMPLE LOCATION are offered.

FORCE LIMIT

To set a stopping point of the test based on a force limit, choose this option. If both a force limit and deflection/extension limit are set, the test will stop at whichever is reached first. Enter the numerical value of the force you desire the test to terminate at. This is will in the force units that the ComTouch is currently set in. Press OK to accept the entry entered.

TRAVEL LIMIT

To set a stopping point of the test based on the travel of the test stand, choose this option. After TRAVEL LIMIT is pressed, the user may be able to select between DEFLECTION or EXTENSION. If no extensometer is connected to the tester, then only DEFLECTION will be offered. Select this to enter to the numerical entry screen.

If both a force limit and deflection/extension limit are set, the test will stop at whichever is reached first. Enter the numerical value of the deflection distance you desire the test to terminate at. This is will in the deflection units that the ComTouch is currently set in. Press OK to accept the entry entered.

PRELOAD FORCE

If PRETENSION is selected, the tester will start, apply this force to the sample, then stop and tare again before starting the test. This is commonly used in the textile industry.

To set preload action SET PRELOAD FORCE button and enter a numerical value of the force desired. Press OK to accept this value. The preload force must be greater than the start force.

TYPE OF TEST

When testing with the 95T system, three options are offered on this screen, TENSILE, FATIGUE/CYCLE and TOPLOAD.
For most standard testing, TENSILE will be chosen and highlighted(light letters on dark background). This will allow the user to perform standard tensile testing. It is important to remember that to perform compression testing with the 95T test system, a compression cage is needed. Refer to SELECTING A COMPRESSION CAGE, page 27.
If TOP LOAD is selected, the tester will reset the deflection to zero once the start force is reached. Start force is commonly set to a very low value and used to detect the top of a compression sample such as in bottle testing. TOP LOAD can be selected after selecting TENSILE. TOP LOAD can be run at preset or high speed. Touching TOP

LOAD cycles through all choices.

FATIGUE/CYCLE mode will run numerous tests continuously. If this is selected, choose MORE OPTIONS on the screen to set up the cycling mode. Cycling can be terminated by the LIMIT SWITCH or PEAK FAIL. A CYCLE COUNT can also be set, or the tester can be set to CONTINUOUS CYCLE.
RESULT DISPLAY can be changed from FORCE @ PEAK to FORCE @ LIMIT. Normal testing is done with the force display at the end of test set to peak. Special or spring testing may better be served with the end of test display set to limit. Setting the display to limit will display the force and deflection at the end of a TOP LOAD or PRETENSION test at the deflection limit set.

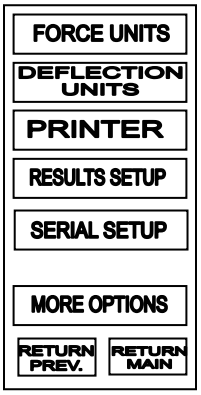


Figure 6.4 - TEST SETUP MENU 2

On the 2nd test setup menu screen are options for FORCE UNITS, DEFLECTION UNITS, PRINTER SETUP, RESULTS SETUP, and SERIAL SETUP.

FORCE UNITS

Force can be displayed in POUNDS, KILOGRAMS, NEWTONS, GRAMS, and OUNCES. The units the ComTouch is currently set in will be highlighted. Simply press a new selection to change the units. The grams and ounce options may not be available on some larger load cell sizes. Changing the force units will affect all screens where a force is entered.

DEFLECTION UNITS

Deflection/extension can be displayed in INCHES, MILLIMETERS, and CENTIMETERS. This selection affects both deflection and extension. The units the ComTouch is currently set in will be highlighted. Simply press a new selection to change the units. Changing the deflection units will affect all screens where a deflection or travel is entered.

PRINTER SETUP

The ComTouch can print test reports directly to a report printer, without the need of a computer. The following options are available:

REPORT ON/OFF

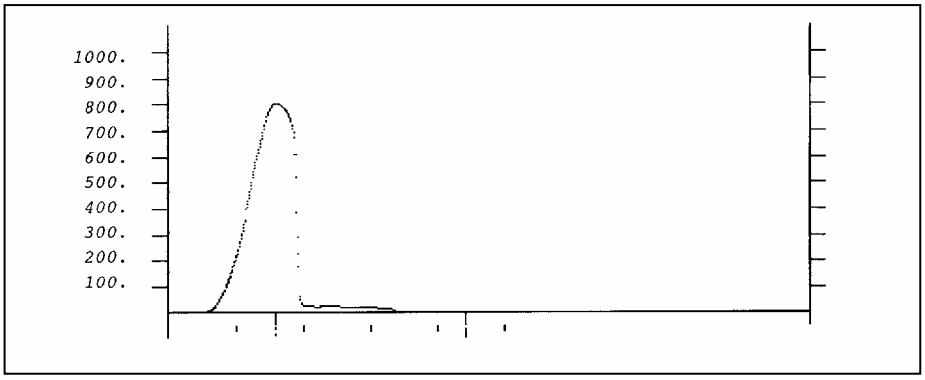
AUTO PRINT: Prints the test report automatically after the completion of every test
ON DEMAND: Brings up a prompt where the user can select to print the report after a test.
PRINTING OFF: Turns all report printing off.
PRINT COLOR: If using a InkJet printer, the user can use only a certain color for the report to print in.

REPORT TYPE

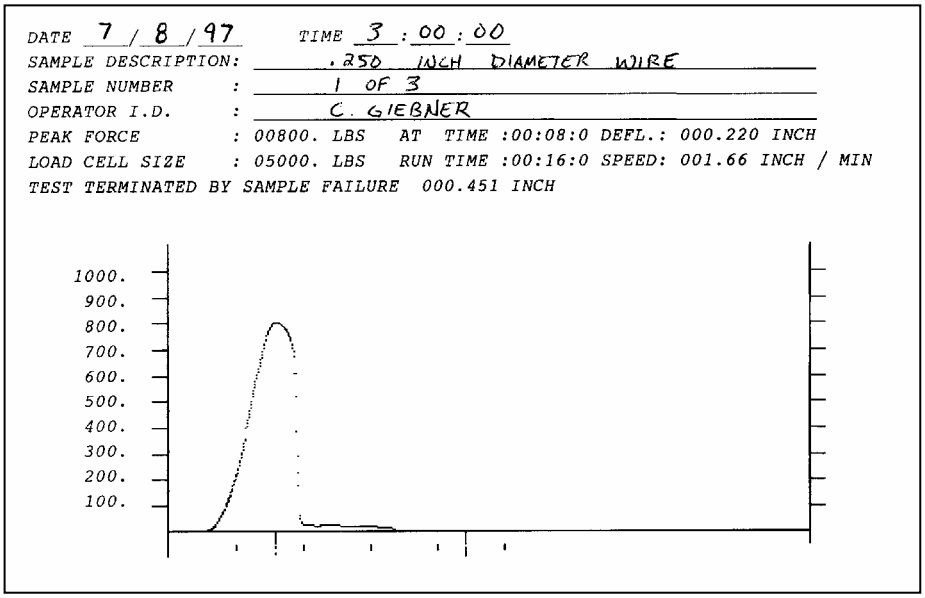
TEXT ONLY: Prints a text only version of the test report including peak force, deflection, speed, etc.

```
SAMPLE NUMBER #0001

PEAK FORCE          : 0017.5 KGS        AT  TIME  :00:09:1        DEFL. :  0009.42 MM

LOAD CELL SIZE      : 01818. KGS        RUN  TIME  :00:10:5       SPEED:  0061.7 MM / MIN

TEST TERMINATED BY SAMPLE FAILURE       0010.82 MM
```

GRAPH ONLY: Prints only a force vs. time graph of the test.



TEXT AND GRAPH: Prints both a graph with text data of the test.



TEST PRINTER: Will test the connection of the printer by printing a short test.

RESULTS SETUP

Both force and deflection can be set to display at either the PEAK or the BREAK at the conclusion of a test. There are two sets of choices:

DISPLAY END FORCE AT?

PEAK: The maximum force recorded during the test is displayed

BREAK: The force at which the sample broke is displayed. This is based on the FAIL %, discussed below.

DISPLAY END DEFLECTION AT?

PEAK: Displays the deflection at the point where the Peak Force occurred.

BREAK: Displays the deflection at the point where the Break Force occured.

SERIAL SETUP

Depending on the rate of your serial connection, a selectable baud rate (communication speed) is offered. Either 19200 or 38400 can be chosen. The system default is 19200.

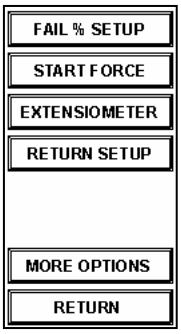


Figure 6.5 - TEST SETUP MENU 3

On the 3rd test setup menu screen are options for FAIL % SETUP, START FORCE, EXTENSOMETER, AND RETURN SETUP.

FAIL % SETUP

This is the point at which the system terminates the test, sometimes called the Break Point. This is based on a percent of the peak force (i.e. the system will terminate once the force drops to this percent of the highest force recorded). Enter the percentage as a numerical value on the keypad and press OK to enter.

Example: If the FAIL % is set at 80%, and a test ran up to a peak of 200 pounds before the sample began to fail, the test would terminate once the force dropped to 160 lbs (or 80% of 200 pounds).

For materials that fail suddenly (ceramics, certain metals, hard plastics, etc.) the FAIL % may be set to a relatively high value (~75-90%). However if testing a material that has a large amount of deflection and force reduction after the peak (soft plastics), this may be set to a lower value. For some material, this setting may also be set depending on what kind of information is desired. If testing a textile or piece of multi-strand wire or cloth, the force will increase to a certain point then individual fibers or wires will start to break one-by-one until the force slowly backs down close to zero. If the user is looking for just the peak force and wants the test to stop after the first filament or wire snaps, the FAIL % should be set to a higher value. However, if the user wants the test to run until all filaments or wires have broken, the FAIL % should be set to a very low number.

START FORCE

This is the point at which the system will begin to look for the FAIL %. This reading is a force reading in whatever units the ComTouch is set at. This is useful for test such as peel or adhesive tests where the force may bounce around at the beginning of the test then increase later. If the test is ending prematurely at the beginning of the test, the START FORCE may need to be increased in order to eliminate a “false peak” at the beginning.

EXTENSOMETER

An extensometer is a device that attaches directly to the sample to record the actual stretch or compression of the sample itself. This eliminates any extraneous deflection that may take place in the test stand, load cell, fixtures, or other areas of the sample. This device will produce much more accurate elongation and modulus values, especially for high force/low elongation materials. An extensometer can be attached to the ComTouch Total Control system as an option. This requires the extensometer device itself as well as an additional acquisition board inside the ComTouch. If your ComTouch is equipped with an extensometer, set this option to YES. For more information about extensometer options, contact your sales engineer at Com-Ten Industries.

RETURN SETUP

The ComTouch is normally set to return to the lower limit switch immediately after the test terminates. This return feature can be disabled if the selection is set to NO. If set to YES, the crosshead will return after the test completes. This return feature can also be delayed. To delay the return, select PAUSE TIME and enter a time, in seconds, that the system will pause before returning the crosshead to the lower limit switch.

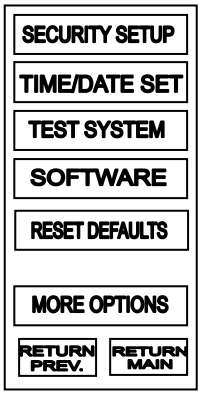


Figure 6.6 - TEST SETUP MENU 4

On the 4th test setup menu, the user can select SECURITY SETUP, TIME/DATE SETUP, TEST STAND, SOFTWARE, and RESET DEFAULTS.

SECURITY SETUP

Three levels of security can be setup; OPERATOR, SUPERVISOR, and ADMINISTRATION. To set a password for a level of security, press the level to set. You will be asked to enter and re-enter a password. This can be a 1-8 digit password and the user will be asked to enter their password upon power up of the ComTouch.

- Operator setting allows the operator to start and stop the test only. Test setup is not allowed.
- Supervisor setting allows access to all functions **except** changing security pins.
- Administrator setting allows access to all settings and parameters including security pins.

TIME/DATE SETUP

The user can set the time, date, and day of the week. These settings are saved in the ComTouch via a battery backup inside the unit. Simply press the section of the screen that contains the information you wish to change and use the keypad to enter a new value.

TEST SYSTEM

The user can not select the test stand that the ComTouch is connected to. The ComTouch Total Control system can be connected to Com-Ten's 95T series test stands or 700 series test stands. This control will be properly set for your system.

RESET DEFAULTS

All the options on all test setup menu screens can be set back to the factory default settings. This WILL erase all previous settings and change them to the factory defaults.

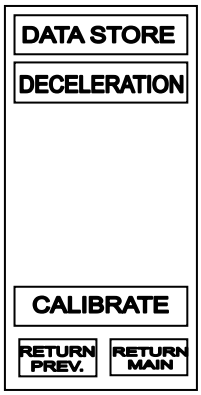


Figure 6.7 – TEST SETUP MENU 5

On the 5th test setup menu, the user can select DATA STORE, DECELERATION and CALIBRATE.

DATA STORE

The user selects or deselects the DATA STORE option. Selecting the DATA STORE option allows the ComTouch to store or save data during the test. If you are using a printer for data display, select data store. Otherwise turn it off. C-TAP software will automatically disable data store.

DECELERATION

For 95T series testers the user may chose to run set speed or slow speed to deflection or force limit. If you wish the most accurate cross-arm positioning select RUN SLOW SPEED TO STOP. This will slow the motor speed to the slowest possible as the deflection or force limit is approached. This feature is presently under development.

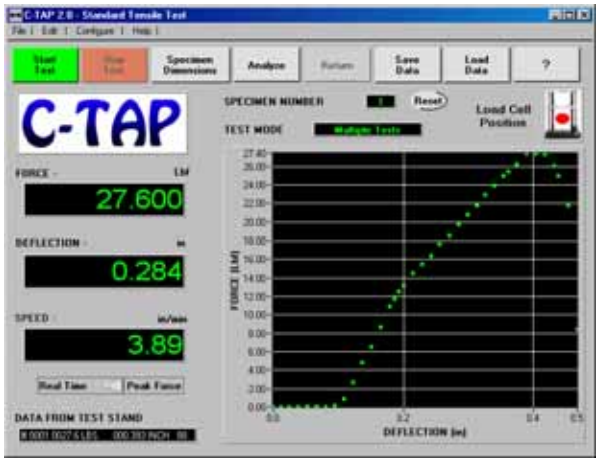
CALIBRATION

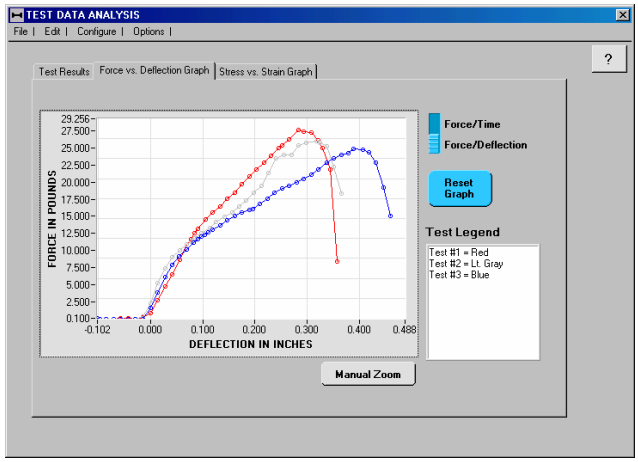
Calibration is used by the equipment manufacturer for test purposes only. Selecting calibration will allow the force display to display ADC counts instead of force. Calibration is password protected.

C-TAP SOFTWARE

Com-Ten's C-TAP software package can control the ComTouch and test stand, display real time graphing and data, and produce detailed test reports and plots, all from a personal computer. If the ComTouch is controlled by the C-TAP software, this setting must be set to YES. If no software is connected, select NO.

For more information on Com-Ten Industries C-TAP software, contact a sales engineer at 800-552-5546.





C-TAP FEATURES

- Choose from over 20 built-in formulas and report items to be displayed on the results screen
- Save and load test data on the fly as well as export data to ASCII files to import into Excel® or other spreadsheets
- Custom report generator wizard steps you through setting up printable reports complete with titles and data
- Results displayed in simple spreadsheet format with the ability to include or exclude tests from sample lot
- Extensive graphing capability, including multiple test plotting with overlaid tests indicated in various colors
- Security feature allows manager to lock various test parameters so they cannot be changed during testing
- Error log reports, extensive help menus, and an online manual make troubleshooting quick and easy
- Test notes entry keeps annotations on each test performed and attaches these to the test report
- Easy-to-read main display panel has all data clearly labeled
- Ability to create custom test methods for specific applications
- Real-time test control, data display, and graphing through the PC
- Fully compatible with Com-Ten's Digital Monitor Controller or the new
- ComTouch Total Control system
- All communication via RS-232 serial port, no expensive boards needed
- Reports can include tensile/compression stress, strength, percent elongation, modulus of elasticity, modulus of rupture, speed, and more!
- Hold time feature provides the ability to hold sample for period of time
- Extensive unit conversion windows allow user to mix and match units
- Test one sample or multiple samples to keep track of averages and trends
- Pre-programmed ASTM, ISO, DIN, or other complex custom test procedures are available as optional modules

NORMAL TESTING PROCEDURES

The instructions below are general guidelines for normal testing. These may be dependant on what parameters are set in the test setup menus.

NOTE If you are using the C-TAP software to control the test system, please refer to the software operating manual for more detailed information about running a test.

WARNING ***ALWAYS*** wear Safety Glasses when operating Tester.

TENSILE STRENGTH TESTING

1. Install the fixture or clamps in the tester. Refer to TENSILE FIXTURE INSTALLATION on page 26. Also follow the instructions for operation for the specific fixtures being used.

2. Set the tester speed to the desired setting using the speed control potentiometer on the controller. Refer to **Erreur ! Source du renvoi introuvable. Erreur ! Signet non défini.**. Also set the limit switch collars to desired positions. See LIMIT SWITCH ADJUSTMENT on page 22.

3. Turn the test stand and ComTouch power to ON.

4. Install one end of sample in the top clamp. Install the other end in the bottom clamp. If attempting to measure sample deflection, apply light force to the test sample by using the JOG switch. Stop when sample becomes taut.

5. Make sure the DIRECTION switch on the test stand is set to STOP.

WARNING This is a destructive test and may require extreme force. The danger associated with such testing **REQUIRES** the use of Safety Glasses and Safety Shield (if equipped) while performing tests.

6. Press the TOUCH TO START key on the handheld touchpad to start the test. The speed, force and deflection will be displayed on the ComTouch during the test.

7. After the test is completed, the tester will may automatically return to prepare for next sample. The Torque Bar will stop when it reaches Lower Limit Set Collar. Adjust Lower Limit Switch Collar if necessary.

8. Press the EMERGENCY STOP button any time to quickly stop the test. You may lose any force and deflection readings you have acquired. The STOP key on the ComTouch will also terminate the test if necessary.

9. Adjust Upper Limit Set Collar, if needed.

10. Read and record the Deflection and Force from the ComTouch display.

CAUTION It is important that test readings do not exceed 90% of the capacity of the Load Cell. Regularly operating the Load Cell above this will result in permanent damage. When operating at speeds above two (2) inches per minute, care should be taken not to exceed 75% of Load Cell capacity.

11. Open clamps and remove remains of test sample. Repeat these steps for continued testing.

COMPRESSION TESTING

1. Install the compression cage and compression fixtures in the tester. Refer to COMPRESSION CAGE INSTALLATION on page 27, PLATENS AND 'F' BLOCK INSTALLATION on page 29, and MODULUS OF RUPTURE INSTALLATION on page 30. Also follow the instructions for operation for the specific fixtures being used.

2. Set the tester speed to the desired setting using the speed control potentiometer on the controller. Refer to **Erreur ! Source du renvoi introuvable. Erreur ! Signet non défini.**. Also set the limit switch collars to desired positions. See LIMIT SWITCH ADJUSTMENT on page 22.

WARNING The compression cage should never fully close. This will apply extreme force to the Load Cell and may cause permanent damage. Set the Over Travel Limit Switch so that the Lift Bar or fixture will never come in contact with the Compression Bar or fixture.

3. Turn the test stand and ComTouch power to ON.

4. Place the sample to be tested on the lower Platen, 'F' Block, or MOR fixture.

5. Place DIRECTION Switch to the UP position to close the Compression Cage until the sample NEARS the upper fixture. If attempting to measure sample deflection, use the JOG switch to apply light pressure to the test sample. This is NOT necessary if a TOPLOAD FORCE was set in the PRELOAD FORCE menu.

6. Make sure the DIRECTION switch on the test stand is set to STOP.

WARNING This is a destructive test and may require extreme force. The danger associated with such testing **REQUIRES** the use of Safety Glasses and Safety Shield (if equipped) while performing tests.

7. Press the TOUCH TO START key on the handheld touchpad to start the test. The speed, force and deflection will be displayed on the ComTouch during the test.

8. After the test is completed, the tester will may automatically return to prepare for next sample. The Torque Bar will stop when it reaches Lower Limit Set Collar. Adjust Lower Limit Switch Collar if necessary.

9. Press the EMERGENCY STOP button any time to quickly stop the test. You may lose any force and deflection readings you have acquired. The STOP key on the ComTouch will also terminate the test if necessary.

10. Adjust Upper Limit Set Collar, if needed.

11. Read and record the Deflection and Force from the ComTouch display.

CAUTION It is important that test readings do not exceed 90% of the capacity of the Load Cell. Regularly operating the Load Cell above this will result in permanent damage. When operating at speeds above two (2) inches per minute, care should be taken not to exceed 75% of Load Cell capacity.

12. Remove remains of test sample. Repeat these steps for continued testing.

Chapter 7 - CARING FOR YOUR TESTER

ROUTINE MAINTENANCE

1. Clean Power Screw; apply a light coat of general-purpose grease at least once a month. Clean and lubricate more often in an extremely dusty environment.

2. Once every six months lift the Gear Limit Switch Bar then lift the Power Screw and Driven Gear from the Pillow Block. Apply a small dab of light lubricating grease on the bearing over which the Gear and Power Nut rotate. Refer to Figure 7.1 – GREASING THE PILLOW BLOCK below.

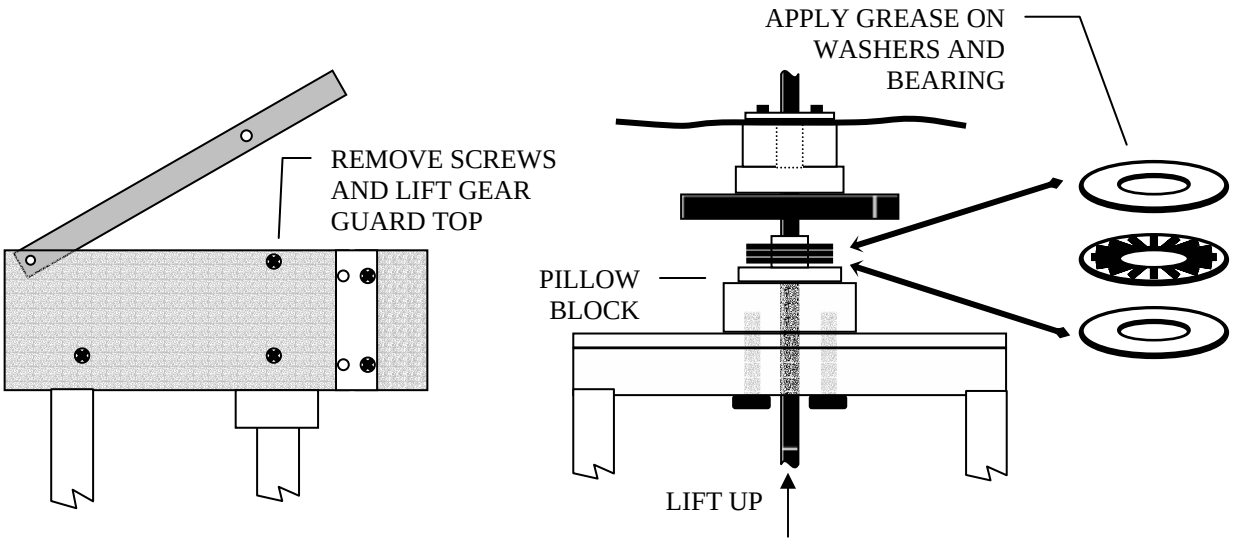


Figure 7.1 – GREASING THE PILLOW BLOCK

CAUTION DO NOT OPERATE THE TESTER WITHOUT BOTH THE WASHERS AND BEARING IN PLACE.

TEST STAND TROUBLE SHOOTING

The Tester and ComTouch are extremely reliable pieces of equipment designed to provide for many years of trouble free service. Like any piece of equipment, however, individual components can fail over time. The following procedures are presented to assist the technically competent to trouble shoot some of these potential problems.

PROBLEM	PROBABLE CAUSE	SOLUTION
A. ComTouch display back light is off and unit does not run.	1. The fuse is blown. 2. Loose or disconnected power supply. 3. Defective switches, wiring, etc.	1. Replace with proper fuse. 2. Check plugs and power connections. 3. Have a qualified electrician service or return to factory or dealer.
B. ComTouch display back light is on but unit does not run up or down.	1. Speed control setting at zero. 2. Over Travel Limit Switch	1. Turn control clockwise. 2. Check for relays to activate by moving the Limit Switch Rod up and down with the Direction Switch first set to the 'Down' position then repeating with it in the 'Up' position.
i. When checking machine under Solution B-2 above, the machine operates.	3. Over Travel Limit Switch is out of adjustment.	3. Contact the factory.
ii. When checking machine under Solution B-2 above, the relays can be heard activating but the machine does not run.	4. SCR board or motor may be bad.	4. Have a qualified electrician service or return to factory or dealer.
iii. When checking machine under Solution B-2 above, nothing is heard and the machine does not run.	5. The cause can be a bad Limit Switch, Up/Down Switch, relay, transistor or a broken or loose wire or connection. 6. Emergency stop switch depressed.	5. Have a qualified electrician service or return to factory or dealer. 6. Pull emergency stop switch out to normal operating position.
C. The stand runs down but not up.	1. ComTouch to Test Stand umbilical cable or other connection or wiring is loose, broken, or incorrectly installed. 2. The Platen Switch circuit is open (if so equipped).	1. Check all connections then have a qualified electrician service or return to factory or dealer. 2. Turn switch off then try to run machine up. If it runs up there is an open in the circuit.

Chapter 8 - SPECIFICATIONS

FORCE MEASUREMENT

CAPACITY:	See ORDER SPECIFICATIONS on page 6.
LOAD CELL:	Interchangeable TSB S-Block Load Cell
DISPLAY:	Digital (lb, kg, N, g, oz)
ACCURACY:	+/- 0.5% full scale
SAMPLE RATE:	100 samples / second
OVERFORCE:	Yes – standard 150% of rated Load Cell capacity

DEFLECTION READOUT

DISPLAY:	Digital (in, cm, mm)
ACCURACY:	+/- .008 inch

SPEED CONTROL

DISPLAY:	Digital (in/min, cm/min, mm/min)
ACCURACY:	+/- 2.0%
SPEED RANGE:	See ORDER SPECIFICATIONS on page 6.

DRIVE SPECIFICATIONS

DRIVE CONTROL:	DC variable speed motor with dynamic brake
TEST STAND CONTROL:	Automated with the ComTouch Total Control or C-TAP software
POSITION JOG:	0.001-inch crosshead jog function

DATA OUTPUT: Standard analog and serial port or optional software or report printer

TRAVEL LIMITS: Standard adjustable upper and lower magnetic limit switches

POWER REQUIREMENTS: 110 volt, 50-60 Hz (220 V, 50-60 Hz optional with transformer)

SAMPLE AREA (in inches)

SERIES	95 FS	95 FM	95 FL
Travel	20	30	40
Width	8	8	8

TEST STAND DIMENSIONS (in inches)

SERIES	95 FS	95 FM	95 FL
Width	12	12	12
Depth	11	11	11
Overhead clearance	62	82	94

ENVIRONMENTAL REQUIREMENTS:

	OPERATING	STORAGE
AIR TEMPERATURE:	10 to 35 Degrees Celsius	-25 to 70 Degrees Celsius
RELATIVE HUMIDITY:	20 to 85% Non-condensing	5 to 90% Non-condensing

All dimensions and weights are approximate and are without accessories included.
All specifications are subject to change without notice.