

Introduction

Read, understand and follow all instructions in this manual before operating the TC².

The Dillon Tension/Compression Cycle Tester (TC²) is a single column ballscrew-driven test frame with a load rating of up to 550 lb (2500N). Complemented by a Dillon loadcell or force gauge, together with special fixtures and accessories it constitutes a key component in force measurement systems suitable for accurately and reproducibly testing a wide range of products.

There is only one standard model of the TC². The dimensions, speed range and capacity have been carefully optimized to cover the test procedures and specimen sizes most often needed by quality departments within many sectors of manufacturing industry.

Thank you for choosing the Dillon TC². With correct use it will give many years of reliable service.

Installing the TC²

Unpacking the TC²

If any damage is discovered do not go any further with installation and do not connect the unit to a power supply under any circumstances.

The power supply for the test frame must have a third-wire earth ground. Connecting the test frame to an outlet without an earth ground is extremely dangerous and could lead to a risk of electrocution.

Upon receiving the unit please check for obvious physical damage to the packaging material and the instrument itself. If any damage is evident, or if any of the items listed below are missing, please notify your Dillon distributor immediately.

- This User's Manual
- Dovetail bracket (fitted to the crosshead)
- Appropriate power cable
- Allen key for crosshead dovetail and safety stop
- Four rubber feet with integral attachment screws, and hex key if necessary

We strongly recommend you keep all packaging for future shipping requirements. Screw on (hand tighten only) the four rubber feet to the TC².

Be sure you have adequate equipment available to safely lift the test frame from the packaging. Trying to lift heavy items without adequate assistance or the correct equipment may lead to accidental personal injury.

Once removed from the packaging, place the test frame on a stable work surface. Inspect the machine for any signs of obvious transit damage.

Check that the inlet voltage corresponds to your electrical installation — either 220 VAC or 110 VAC. The machine has a label close to the power connector which advises which voltage it is set for. If the machine does not correspond to your supply, inform your local distributor.

After all the above points have been checked and confirmed to be correct you may connect the machine to the power outlet only with the supplied power cord. When power is applied the power indicator will illuminate. This shows power is reaching the machine and is ready for use.

Operating the TC²

Speed Setting

The TC² has variable speed control in both upward and downward directions. Speeds can be independently set and controlled by the speed control knobs on the front panel, shown in Figure 1. The white pointer on the speed control knobs gives an indication of the speed setting. Some test standards place particular requirements upon speed accuracy/reproducibility, which may exceed the normal performance of the TC². Under such circumstances calibration of each individual test stand may be appropriate.

Start-up Procedure

Pressing the red 'Emergency Stop' button will, at any time, stop the crosshead moving. Note that the green power bar light fades over a period of about one second.

Follow these steps to prepare your TC² for use:

1. Set the limit switches (see Figure 1) by turning each red plastic thumbscrew counterclockwise and moving them approximately two inches either side of the moving crosshead and retighten. Do not confuse these limit switches with the (preset) safety stop. See Figure 1.
2. Be sure your TC² is connected to an appropriate power supply.
3. Turn on the power switch shown in Figure 2. If the power bar does not illuminate, turn the red emergency stop button in a clockwise direction.

Manual Operation

Follow these steps to manually operate the TC²:

1. Set the **MODE** rocker switch to **Manual Control** (center position).
2. Set each speed control knob to a mid-range position (with pointer close to 12 o'clock).
3. Hold the **START/STOP** toggle switch in either the **Up** or **Down** position...
4. Release the **START/STOP** switch to stop the crosshead movement.

A red LED will illuminate showing that the crosshead is moving and indicating the direction of travel.

The crosshead will not move in a given direction if it is against a limit switch stop.

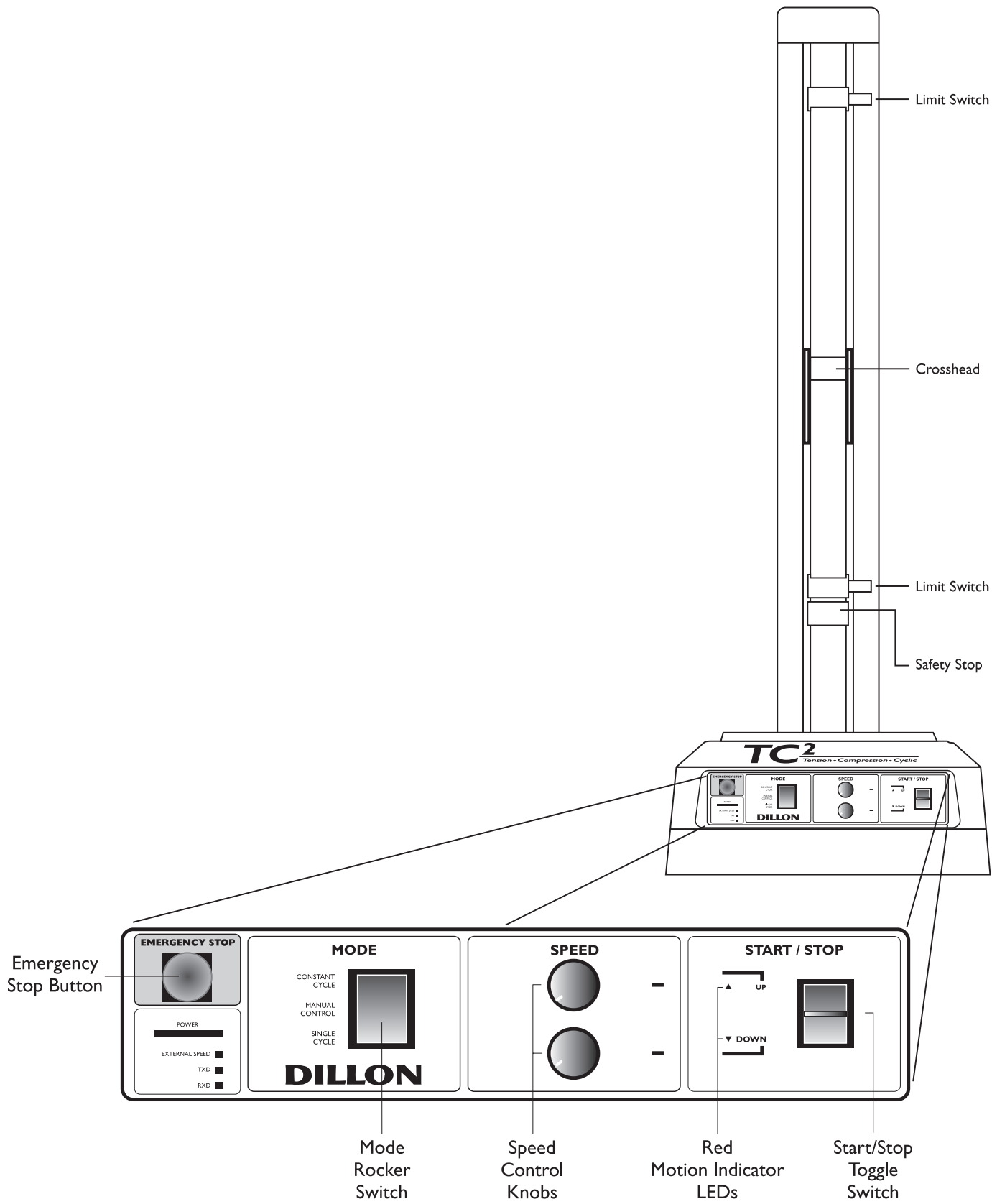


Figure 1
TC² Control panel

Single Cycle Operation

1. Set the **MODE** switch to **Single Cycle**.
2. Move the **START/STOP** switch to the **Up** or **Down** position, and then release...

The crosshead will move and the LED indicating direction of travel will illuminate. When a limit switch position is reached, the crosshead will begin to travel in the opposite direction. When the position of the other limit switch is reached, the motor will stop and the crosshead will come to rest.

During the cycle, setting the **MODE** switch to **Manual Control**, or selecting either the **Up** or **Down** position will stop the crosshead movement.

Constant Cycle Operation

1. Set the **MODE** switch to **Constant Cycle**
- 2.. Move the **Start/Stop** switch to the **Up** or **Down** position, and then release...

The crosshead will move and the LED indicating direction of travel will illuminate. The crosshead will cycle continuously between the limit switch positions. During the cycle, setting the **MODE** switch to **Manual Control**, or selecting either the **Up** or **Down** position will stop the crosshead movement.

Force Gauges, Loadcells and Your Fixturing

Attaching an AFG

You will need to attach a force measuring device to your TC². This will usually be a Dillon Advanced Force Gauge, a remote Advanced Force/Torque Indicator, or a smart loadcell. The AFG/AFTI can control the TC² direction via an optional interface cable (PN 49756-1043). See the AFG/AFTI User's manual for instructions on setup.

Follow these steps to attach an AFG to the test frame:

1. Attach an AFG by screwing a dovetail extension bracket to the back of the AFG and slide it (with the loadcell stud pointing downwards) onto the moving crosshead dovetail
2. Tighten with the hex key provided.

Attaching a Smart Loadcell

To attach a smart loadcell screw it into a tension block module, then proceed as for an AFG.

If you have purchased special fixturing, attach this to the gauge/loadcell and/or your TC².

Precautions

Loadcells and force gauges are delicate pieces of equipment and can easily be damaged irreparably. One way of doing this would be to drive the crosshead downward until the loadcell (or loadcell stud on an AFG) hits something solid.

This is a risk when a user is not yet familiar with operating a new test stand. Consequently the safety stop has been preset to significantly limit downward travel of the crosshead.

Now that the test system is assembled, use the hex key provided to reset the safety stop to the bottom of its intended travel range, allowing a gap of at least 3/8" between the fixed and mobile fixtures. Adjust the limit switches according to your sample dimensions and testing requirements.

Be sure to align the anvil fixture location in line with the force gauge you are using. Large and small capacity gauges have different thread locations. The force must be applied in line for tests to be accurate and to avoid gauge damage. Loosen the screws holding the anvil and position the fixture before tightening the screws.

Communication with External Devices

There are two external control ports at the rear of the TC². See Figure 2.

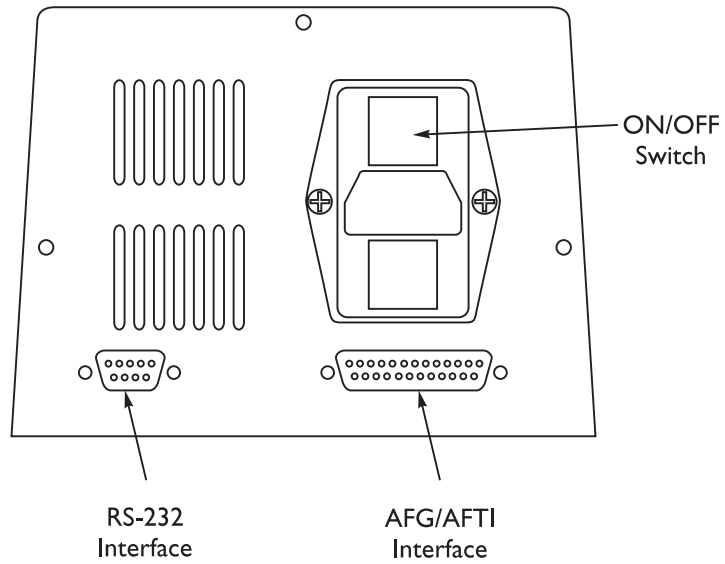


Figure 2
Control interfaces

The AFG/AFTI Interface, shown above, enables the TC² to respond, via the appropriate Dillon cable, to signals from a Dillon AFG/AFTI. Please refer to your *AFG User's Manual* for further details. Communication between the TC² and other external devices (e.g. a PC) is possible via the RS-232 interface and an appropriate cable. For further information (on programming/protocol) contact your Dillon distributor.

Specifications

Load capacity:	550lb (250kg, 2500N)
Power consumption:	150 watts (maximum)
Weight (stand only):	59.6lb (27kg)
CROSSHEAD MOTION	
Travel range:	19.7in (500mm)
Maximum daylight:	24.4in (620mm)
Max headroom (as in photograph):	20.08in (510mm)
Anvil plate:	6.3in (160mm) x 3.94in (100mm) Female threads 10/32" UNF, 5/16" UNC
Speed range:	0.5 - 19.7in/min (12.5 - 500mm/min)
Speed accuracy:	±5% of indicated speed
Up and down settings:	Yes
Speed indicated on stand:	Yes
Direction of travel indicated on stand:	Yes
Limit switch repeatability:	<0.004in (0.1mm)
Overrun at top speed:	<0.08in (2mm)
Operating modes:	Manual, cyclic and single cycle
Reverse on alarm point:	Yes, with AFG/AFTI and cable (PN49756-1043)
Reverse on sample break:	Yes, with AFG/AFTI and cable (PN49756-1043)

STANDARD LOAD MEASUREMENT OPTIONS

Force gauge & dovetail bracket

Smart loadcell, tension block module & AFTI

SPECIAL OPTIONS (details available on request)

Increased crosshead travel:	Yes
Increased crosshead depth:	Yes, (load capacity is reduced)
Machine guard:	Yes
Horizontal operation:	Yes
Simple logging/ plotting PC software:	DataPlot (see M/501201)
Full computer control:	PCM (see M/512071)

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UNITED STATES

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CANADA

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la Class A prescrites dans le Reglement sur le brouillage radioelectrique que edicte par le ministere des Communications du Canada.



CAUTION

Risk of electrical shock. Do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

Weigh-Tronix reserves the right to change specifications at any time.