BELT TENSION TESTER

This Belt Tension Tester is small in size, light in weight, easy to carry. Although complex and advanced, it is convenient to use and operate. Its ruggedness will allow many years of use if proper operating techniques are followed. Please read the following instructions carefully and always keep this manual within easy reach.

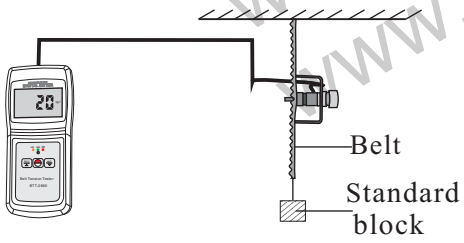
1. Introduction

This Belt Tension Tester used the exclusive Micro-computer LSI circuit and crystal time base to offer high accuracy measurement. It can be used to measure and adjust the tension of timing and auxiliary belts fitted to motor vehicles and other machines. Tension can be displayed in a variety of standard and manufacturers' units. Tension limits can be set into the instrument, either manually or automatically. During belt tension measurement and adjustment, the belt tension is displayed. A visual and audible indication of whether the tension is within or outside the set limits is also given. This avoids the user having to read the display whilst adjusting the belt.

The selected tension limits, measurement units and calibration parameters are stored in The memory of the tester, and will be remembered even when the instrument is switched off and the batteries removed.

Can communicate with PC computer for statistics and printing by the optional cable and software for RS232C interface.

Note: Tension checking should always be carried out in accordance with the vehicle manufacturers' instructions.



W=W0+W1

Here W0 is the weight of standard block, and W1 is the weight of the belt

9.1 Clamp the measuring head correctly onto the belt. Reading shows on the display.

9.2 When the reading almost stable, Depress 'POWER' key and not release it till 'CAL' appears on the Display. It is about 4 seconds from starting depressing the 'POWER' key. Here CAL means calibration. A value will be on the display after releasing the 'POWER' key. That value can be changed to the standard weight W shown in fig. 2 by depressing the '▲' and '▼' keys to increase or decrease. To save and quit, just press the 'power' key for a while.

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2. Principle of operation

The measuring head is placed on the belt and the clamp is tightened using the clamping knob. This deflects the belt through a known angle defined by the anvil and the fixed pillars. A load cell attached to the clamp measures the force required to deflect the belt, which is proportional to the tension in the belt. The output voltage from the load cell is digitized and scaled to give the correct tension reading on the instrument display.

3. Specifications

Display: 4 digits, 10 mm LCD
With colored coded LED indication of Low, Ok and Hi

Measurement range :
0 - 750 Newtons
0 - 120 Pounds
0 - 77 Kilograms
0-114 Seems

Belt width : Up to 36 mm
Overload alarm: 750 Newtons
Maximum load: 850 Newtons
Resolution: ± 1 Newtons or 1 least significant digit of other units
Accuracy: ± 5% of full-scale
PC interface: RS232C interface
Audible warning: Piezoelectric sounder

NOTE:

In order to guarantee the calibration accuracy, It is requested that the weight of standard should be over 25kg. The tester itself will refuse to do calibration by showing the symbol 'Err1' on the display if the weight of standard block is under 25kg.

10. Power off

If no key is pressed for approximately 10 minutes, the instrument will switch itself off to save the battery. The unit can also be switched off at any time by holding down the '0' key until the display disappears 'OFF'.

11. Low battery indication

(1) when the battery voltage less than approx. 5v, The battery symbol will appear on the Display.
(2) Slide the Battery Cover away from the instrument and remove batteries.
(3) Install 4x1.5v AAA batteries correct ly into the case.
(4) If the instrument is not to be used for any extended period remove batteries.

8. How to Get the best results

8.1 The belt tension between the measuring points will vary as the engine is rotated due to differing internal loads on the crankshaft, camshaft etc. For this reason, it is recommended that at least four measurements are taken with the crankshaft turned to four different positions.

8.2 Do not forget to remove the measuring head before rotating the crankshaft. Always zero the instrument every ten minutes if the instrument is being used for a long time.

8.3 Do not forget that the zeroing must be done with the measuring head removed from the belt, and the clamp fully unscrewed.

9. Calibration procedure

For most of belt tension testers, calibration should only be carried out by a service centre equipped with the appropriate calibration equipment. But for our model, it is very easy for distributors or even users to calibrate it in a very simply condition. Here below is a simple way of calibration for reference.

tester is in a setting mode. That value can be changed to the required setting by depressing the '▲' and '▼' keys to increase or decrease. To save and quit, just press the 'power' key for a while. If an error info Err4 shows on the display about 1 second, that indicates AL1>AL2 and requires resetting.

NOTES:

a) To make the setting quicker, if a key is held down, the count will speed up after about 4 seconds.

b) The first time the instrument is used, the default high and low limits are 250 and 200 Newtons respectively.

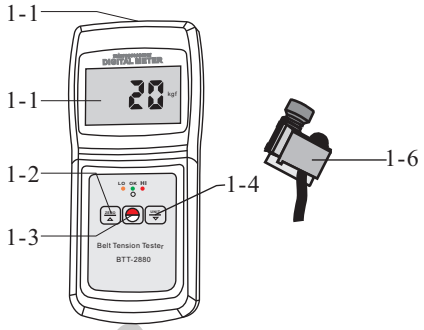
c) The maximum value to which the high limit can be set is the maximum value that the unit will display in the currently selected units (see Specifications).

d) The maximum value to which the low limit can be set is the high limit. The low limit cannot be set higher than the high limit.

e) If the measurement unit is changed, the previously stored limit is erased and replaced with the maximum value for the selected unit.

Power supply: 4 x 1.5V AAA size batteries
Battery life Approximately 100 hours continuous operation
Dimensions: 135x62x33mm or 5.3x2.4x1.3 inch
Weight: 335g (not including batteries)
Standard accessories included :
Measuring head.....1 pc
Carrying case .....1 pc.
Operation manual..... .1 pc.
Optional accessory: Cable and software for RS232C and USB

4. Descriptions



1-1 Display
1-2 Zero/Up key
1-3 Power key
1-4 Unit/Down key
1-5 Socket for Measuring head
1-6 Measuring head

7.5 Turn the tensioning knob clockwise until the flat side of the belt contacts the anvil, and the knob is finger-tight. Do not over tighten.

7.6 To ensure that the tension applied to the belt is correctly distributed, turn the crankshaft until the engine is in the position that would be appropriate for valve timing checking/belt replacement. This is normally TDC on the compression replaced with the maximum value for the selected unit. stroke for No.1 or No.4 cylinder.

If at any time whilst tightening the clamp, the LED is off illuminate, the beeper sounds continuously and the message 'INF1' appears on the display, stop tightening the clamp immediately. Or the measure head will be damaged. If this happens, the user has to buy a measuring head to replace the broken one and recalibrate the tester before using it or the instrument must be returned to the manufacturer for head replacement.

7.7 To change the measurement unit, just depress the 'UNIT' key.

as a multifunctional key which acts as 'SET' key and 'ENTER' key.

The 'ZERO' key switches the instrument from measuring mode to zero mode. It also functions as a 'DOWN' key to decrement a value in a set mode.

The 'UNIT' key switches different units. It also functions as a 'UP' key to increment a value in a set mode.

In measuring mode, the color coded LED and the beeper indicate if the measured tension is below, within, or above the pre-set limits.

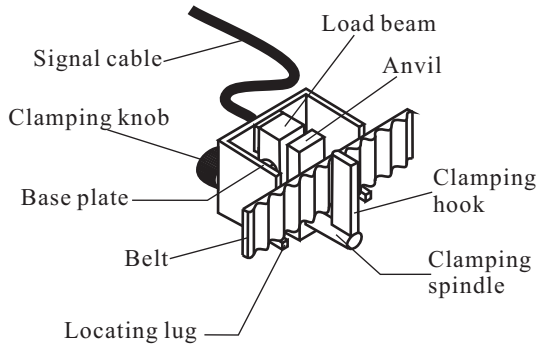
If the measured tension is low, the LED's color changes to that of 'LO' and the beeper will emit a single beep after each measurement. If the tension is OK, the LED's color changes to that of 'OK' and the beeper will not sound. If the tension is high, the LED's color changes to that of 'HI' and the beeper will emit a 3-beep sound after each measurement.

Users can change the alarm limits AL1 or AL2 when required. Please refer part 7.9.

6. Precautions

To secure accurate results it is essential that the operating procedure is followed carefully.

6.1 The instrument must only be used with the measuring head with which it has been calibrated. The measuring head could not



MEASURING HEAD for
BELT TENSION GAUGE

5. Controls and indicators

The main unit has a LCD (liquid crystal display), one color coded indicator LED, a beeper, and a keypad with 3 keys. The display is used for setting up the instrument and displaying the measured tension. To avoid the user having to read the display whilst adjusting the belt, the beeper give an audible and the color coded LED gives visual indication of whether the tension is within or outside the preset limits.

All 3 keys on the keypad have dual functions:

The 'power' key switches on the instrument. During operation of the instrument, it functions

be exchanged or replaced in any cases even if they are used for same model of a same manufacturer.

6.2 If the instrument is used with a different measuring head, it must be re-calibrated before using.

6.3 To avoid potential irreparable damage, never clamp the measuring head onto a belt unless the head is plugged in and the instrument is switched on.

6.4 The instrument warns of a head overload condition, but is unable to if the head is unplugged or the instrument is switched off.

6.5 Never clamp the measuring head onto an inflexible object such as a metal or wooden bar.

6.6 Never drop the instrument or subject it to sharp impacts.

6.7 Never allow the instrument or measuring head to hang by the connecting cable.

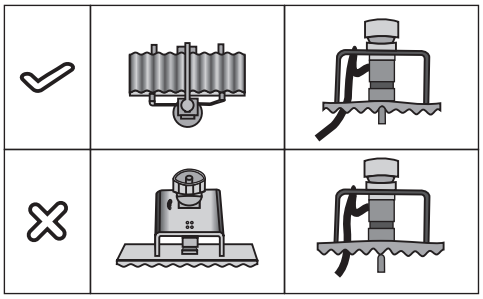
7. Operations

7.1 Before using the instrument for the first time, remove the battery compartment cover, and fit 4 AAA size 1.5V alkaline batteries. Pay attention to the polarity as indicated in the compartment.

7.2 Plug the DIN connector of the measuring head into the DIN socket of the main unit.

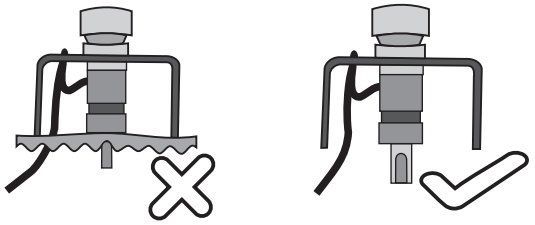
7.3 Power on the instrument by pressing the 'POWER' key. And the tester is in a measuring state. The present state is indicated by the reading on the display, beep sound and LED's color.

7.4 Slide the clamping hook of the measuring head over the belt at the measurement position indicated by the vehicle manufacturer, so that the edge of the belt touches the two locating lugs. If no position is indicated, position the measuring head in the centre of the longest free section of the belt. Ensure that the clamping hook rests in the 'trough' between the belt teeth. See fig. below.



7.8 Zero calibration

It is easy to zero the tester out in the measuring state by depressing the 'ZERO' key if the reading is not '0.0' when the measuring head removed from the belt, and the clamp fully unscrewed. See the figure below.



Note: At this point the measuring head should not be clamped onto the belt, nor have any load applied to it. Ensure that the clamping knob is fully unscrewed.

7.9 How to set the low limit or the high limit

Depress 'POWER' key and not release it till 'AL1' or 'AL2 ' appears on the Display. It is about 7 or 9 seconds from starting depressing the 'POWER' key. Here AL1 is the low limit and AL2 is the high limit.

The preset value is recalled on the display after releasing the 'POWER' key while the