

EN

Original Instructions
Version 1
April 2024



SONIC BELT TENSION TESTER

24709



User Manual for: Sonic Belt Tension Tester

Stock No: 24709

Part No: ETBT

Read this manual in full before using this product and retain it for future use. Always use the latest version of the manual.

Please visit drapertools.com/manuals for the latest version.

2. Product Introduction

2.1 Intended Use

This product is designed for checking the tension of all types of drive belts including camshaft and auxiliary. The meter can measure the vibration by using the microphone to convert the tension level when installing or adjusting a new belt.

Features a flexible probe for restricted engine bays and includes 20 internal memory storage slots.

This product is suitable for use by enthusiasts and tradespersons alike. Any other application beyond the conditions established for use will be considered misuse. Draper Tools accepts no responsibility for improper use of this product.

2.2 Specification

Stock No.	24709
Part No.	ETBT
Frequency Range:	10- 600Hz
Battery:	2 x AAA 1.5V (not supplied)
Nett Weight:	242g
Tester Dimensions (L X W X H):	165 X 65 X 30mm
Probe Length:	115mm
Tester Probe Length:	42mm

Important: Read all the Health and Safety instructions before attempting to operate, maintain or repair this product. Failure to follow these instructions may result in injury or damage to the user, the product or the vehicle.



WARNING! Risk of explosion. Do not use the tester in an area where sparking may occur.

- **ALWAYS** follow the instructions and procedures listed in the vehicle's service manual before using this device.
- Keep the tester in good working order and condition.
- **DO NOT** operate the tester with a damaged probe or it has been dropped, get it checked by a qualified service representative.
- **DO NOT** use the tester for any other purpose than which it is designed for.
- Keep children and unauthorised person away from the work area.
- **DO NOT** use whilst under the influence of drugs, alcohol or intoxicating medication.
- Keep the work clean and tidy and ensure adequate lighting.
- **DO NOT** allow untrained persons to use the tester. This tester should only be used by qualified personnel.
- Handle the unit with care and if dropped or showing signs of damaged get it checked by a qualified service person.
- Wear suitable eye and face protection.
- **DO NOT** put water, solvents or other liquids on the tester.
- **DO NOT** leave in a dusty environment.
- Keep away from heat. **DO NOT** expose the tester to strong sunlight or other heat sources.
- **DO NOT** pull on the probe cord.
- To prevent electric shocks, **DO NOT** operate outdoors during thunderstorms.
- **DO NOT** bend the probe to sharp angles.
- **DO NOT** use this device if the tester or probe are damaged in any way or if there is evidence of battery leakage.

- The battery must be replaced with one with the same specification.
- When replacing the battery check that it is fitted in the correct +/- orientation.
- Remove the battery when storing the tester for extended periods.
- **DO NOT** store in a place of high temperature or humidity.

4. Symbols



Read the instruction manual



Warning!



Do not incinerate or throw onto fire



Wear face mask and safety glasses



Keep out of the reach of children



WEEE –
Waste Electrical & Electronic Equipment

Do not dispose of Waste Electrical & Electronic Equipment in with domestic rubbish

5. Identification

Carefully remove the product from the packaging and examine it for any signs of damage that may have occurred during shipment. If any part is damaged or missing, do not attempt to use the product.

Please contact the Draper Helpline; contact details can be found at the back of this manual.



- (1) Microphone
- (2) Removable test probe
- (3) Battery compartment
- (4) Protective case
- (5) LCD display screen
- (6) Error red light
- (7) Green indicator light
- (8) Power button
- (9) Measurement button
- (10) Belt width button
- (11) Belt mass button
- (12) Belt span button
- (13) Number Values 0 to 9 buttons
- (14) Frequency/tension (Hz) button
- (15) Select button
- (16) Storage case

Please visit drapertools.com for our full range of accessories and consumables.

5. Battery Installation

1. To fit or replace the battery, first remove the probe (2) and protective case (4). Fig.1 & Fig.2.

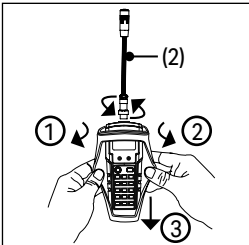


Fig. 1

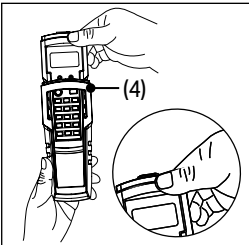


Fig. 2

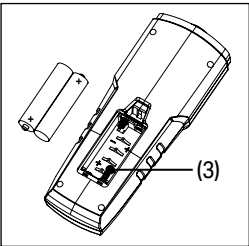


Fig. 3

2. Then unclip the battery compartment (3). Fig.3.

- 3. Fit 2 X AAA batterie into the compartment – ensuring that the battery is fitted in the correct +/- orientation.
- 4. Clip the cover back on and slide the tester back in the protective case.
- **Note:** Change the battery when the battery indicator (E) shows low power on the screen.

6. Probe Installation



Fig. 4

- 1. Connect the probe (2) to the top of the tester, then rotate the collar clockwise until secure. Fig. 4

7. Calibration

7.1 User Calibration

- 1. Press the 'POWER' button (8) until the screen turns on.
- 2. Then press the 'HZ' button (14) to enter the frequency measure.
- 3. Press the 'MEASURE' button (9) to enter the test mode and check the calibration source (e.g. tuning fork or tone generator).
- 4. Then press the number '7 & 9' buttons at the same time and 'CAL' will appear on the screen.
 - For example, if using 256Hz tuning fork to calibrate, enter value 256.0Hz and then press 'MEASURE' button to save the calibration.
 - **Note:** The calibration frequency must be between 100 – 600Hz.
 - 'U' will appear on the screen when the user calibration is selected.

7.2 Restore Factory Calibration

- 1. Follow step 1 to 4 in section 7.1 Manual Calibration.
- 2. Then press the 'SELECT' button (15) to restore the factory calibration.

7.3 Switch between User & Factory Calibration

- 1. Follow step 1 to 4 in section 7.1 Manual Calibration.
- 2. Then press the 'SELECT' button (15) to restore the factory calibration or press 'HZ' button (14) for user calibration.
- Ensure the tester is calibrated before operating as per Section 7 Calibration.

8. Operation

EN

- 3. Press the 'POWER' button (8) until the screen turns on.
- 4. The following data will be displayed on the screen. Fig.5

- A. Mas: belt mass
- B. Wid: belt width
- C. Spa : tangent line span
- D. No: storage number
- E. Battery level

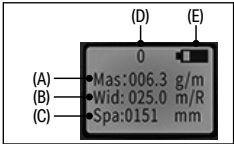


Fig. 5

- 5. Enter the belt information using the relevant buttons (10), (11) and (12). Note: The specific belt Information can be obtained from the belt or vehicle manufacturer's instruction manuals.

ERROR: A red light (6) will show on the panel below the screen if the calculated tension value is higher than the vale displayed on the screen.

- 6. Press the 'SELECT' button (15) to enter each measurement.

Date Information			
Input Data	Formula	Press button	Value
Belt Mass	Mas = XXX.X g/m	'Mass' (11)	000.1g to 999.9g
Width Synchronous Belt	Wid = XXX.X mm/R	'Width' (10)	000.1 to 999.9mm 20mm = 020.0
Width V-Belt	Enter number of strands or ribs	'Width' (10)	Number Single = 001.0
Span Length	Spa = XXXmm	'Span' (12)	000.1 – 999.9mm

- 7. The meter will automatically turn off if no activity after 5 minutes.

8.1 Span Length Measurement (spa = XXXXmm)

- 1. The span length is the tangent length of the contact points between adjacent pulley gears. The distance can be measured directly by measuring from the contact point on one pulley to the contact point on the second. For more accurate results the span length can be calculated using the formula below.

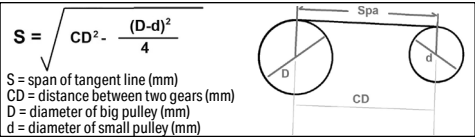


Fig. 6

8.2 Frequency Measurement

Measurement	Formula	Press button	Value
Frequency/Tension	F = XXX.X Hz	'Hz' (14)	10 to 600Hz

9. Taking a Measurement

- Place the probe microphone (1) within 10mm of the belt and press the **'MEASURE'** button (9).
- Tap the belt to make it vibrate, ensuring the probe does not touch the belt.
- 'Testing'** will be displayed on the screen (5).
- Once a reading has been taken **'Calculating'** will appear on the screen.
 - If the measurement is within the specified range the tester will buzz and the green light (7) will come on.
 - If the measured frequency or calculated tension is over the specified range the red light (6) will come on an 'Error' will appear on the screen.
- For best results always take 3 measurements.

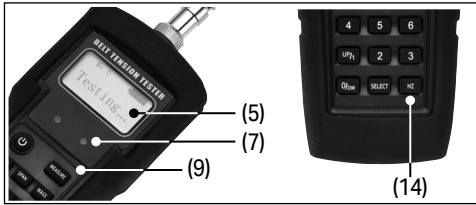


Fig. 7

- To view the frequency or tension reading press the **'HZ'** button (14)

Measurement Errors (Red Light and Error on screen)

- If the error message appears check the inputted mass, width and span length are correct.
- Repeat the measurement 3 times, if the measurements are close together then the measurement is correct.
- If the tension of the belt is low the belt may vibrate too easily, causing a measurement error.
- If the belt is too loose the frequency signal may be unclear and a tension value may not be obtained. Tighten the belt and retest.

Transverse Vibrations Formula

- The tester is designed to capture the vibration of the belt and transfer the calculation as frequency. Entering the mass, width and span length the relationship between frequency and tension can be determined by the following formula:

$$\text{Formula } T = 4 \times M \times W \times S^2 \times F^2 \times 10^{-9}$$

T = Tension of span length (N)

W = Width (mm) or number or ribs/strands

S = Span length (mm)

F = Frequency (Hz)

Belt Mass Table		
Belt Type		Belt Mass
Synchronous		g/m
HiTD	5M (9mm)	36.9
	8M (20mm)	128.2
	14M (40mm)	428.9
STPD	S8M (20mm)	110.9
	S14M (40mm)	462
Wrapped V, Wedge & Banded	Single Belt g/m	Banded Belt g/m
Z (40mm)	51	N/A
A (75mm)	115	150
B (105mm)	193	260
C (175mm)	320	417
D (305mm)	669	870
SPZ (56mm)	76	N/A
SPA (71mm)	134	155
SPB (107mm)	223	272
Wrapped V, V-Ribbed, Wedge	Single Belt g/m	V-Ribbed Belt g/m
SPC (200mm)	354	394
3V (61mm)	76	99
5V (171mm)	223	272
8V (315mm)	504	654
SPZ-XP (56mm)	79	N/A
SPA-XP (71mm)	122	N/A
SPB-XP (107mm)	202	N/A
SPC-XP (200mm)	350	N/A
3V-XP (200mm)	79	N/A
5V-XP (171mm)	202	N/A
ZX (40mm)	51	N/A
AX (75mm)	115	153
BX (85mm)	193	225
CX (175mm)	320	398
XPZ (56mm)	76	N/A
XPA (71mm)	134	156
XPB (107mm)	223	279
XPC (200mm)	354	548
3VX (55mm)	76	102
5VX (110mm)	223	252

Minimum Span Length

- When measuring a synchronous belt, the span length needs to be more than 20 times the tooth pitch length.
- When measuring a V-belt, the span length needs to be 30 times the top width.

Minimum Belt Tension

- When setting the belt ensure it is set to the correct tension for the belt type. Low belt tension will cause incorrect measurements.

New Belt Installation

- For newly fitted belts, turn and rotate the pulley by hand several times before measuring.

Windy Environments

- Noise from windy environments may affect the sensor, avoid using in windy environments.

Non-Standard Belt Measurements

- The tester has been designed for standard belts, measurements of non-standard belts may be incorrect. For non-standard belts the frequency and tension will need to be manually calibrated.

11. Data Storage and Retrieval

- The tester can store 20 sets of data.
- To retrieve the stored data press and hold down the **'SELECT'** button (15) – the data records stored will be displayed in the top left hand of the screen.
- To store or change the data press the **'WIDTH'** (10), **'MASS'** (11) and **'SPAN'** (12) buttons and add the measurements to be saved. The data will automatically be saved when the tester is switched off.

12. Maintenance, Storage and Disposal

- After use, wipe clean the tester and store in the case supplied.
- Remove the battery if the tester is to be stored for a prolonged period of time.

- Store in a cool, dry, childproof area.

At the end of its working life, dispose of the product responsibly and in line with local regulations. Recycle where possible.

- **DO NOT** dispose of this product with domestic waste; most local authorities provide appropriate recycling facilities.
- **DO NOT** burn or mutilate batteries; this may release toxic or corrosive substances.



13. Warranty

24months

Visit [drapertools.com/warranty](https://www.drapertools.com/warranty) for full details.

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