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Title: PicoScope Test One Channel RCT

Applies To: All International / IC and Other Makes & Models

CHANGE LOG

Please refer to the change log text box below for recent changes to this article:

08/19/2022 - Initial Article Release

DESCRIPTION

This procedure was created to guide a technician through the procedure of how to evaluate the overall health and consistency of compression while cranking an engine.

SYMPTOM(s)

Engine concerns related to hard / no start, lack of power, misfire, excessive tailpipe emissions, smoke, low power, engine noise, rough idle, etc.

Use this test in place of a manual compression test

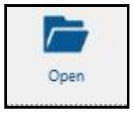
SPECIAL TOOL(s) / SOFTWARE

Tool Description	Tool Number	Comments	Instructions
PicoScope	1211210		
Breakout T	12355		

DIAGNOSTIC STEP(s)

1. Open PicoScope software.

2.Open folder and load **One Channel RCT.**



3. Connect the PicoScope as shown below.

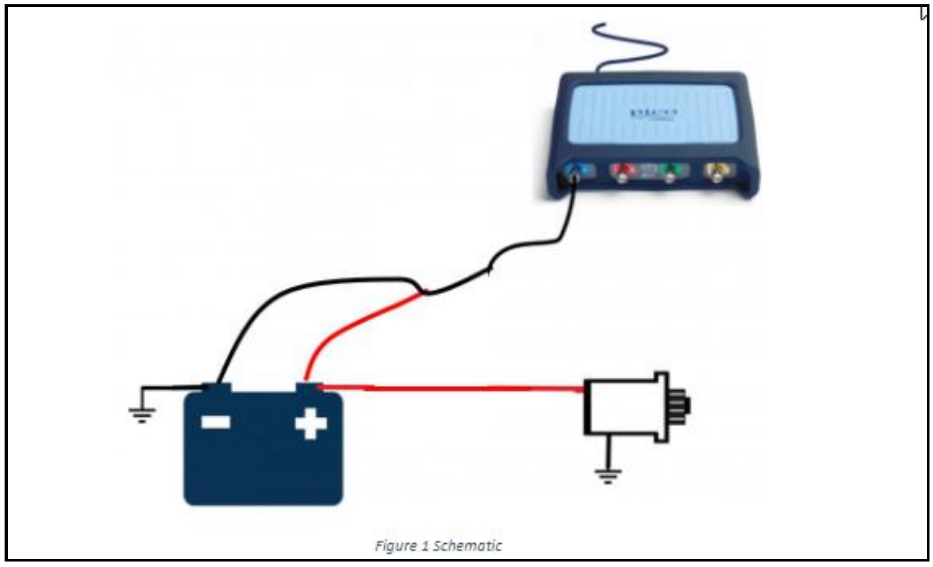


Figure 1 Schematic

4. **Prevent the engine from starting (cranks only) by disabling the fuel system / ignition system / ECM. Ensure the vehicle batteries are fully charged and the battery charger has been removed prior to proceeding.** Engine should be warm or hot for accruate results.

5. To begin operation move your cursor and tap on **RUNNING**.

6. Crank the engine for 5-10 seconds. ***Do not exceed 30 seconds of continuous cranking or starter damage may occur. Let the starter cool for 60 seconds between recordings.***

7. After cranking move your cursor and tap on **STOPPED.**

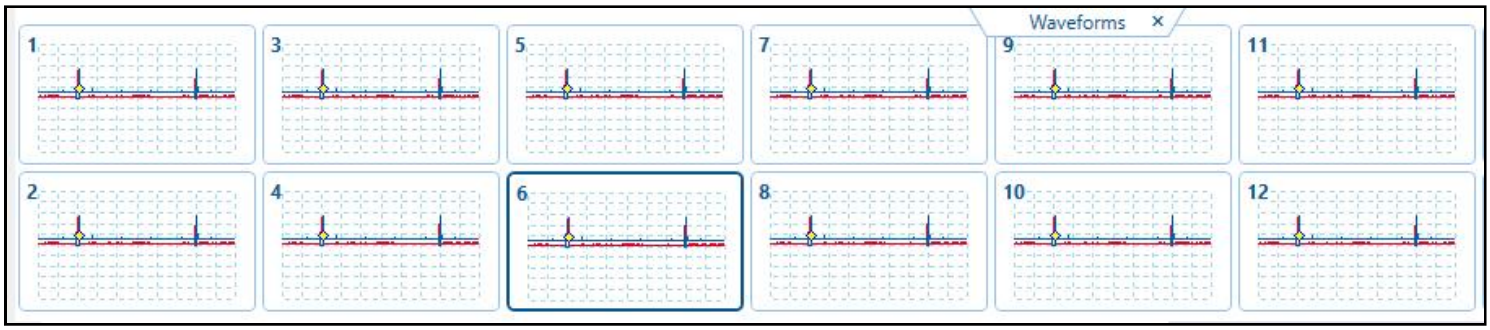
Note: If the concern hasn't been identified continue making recordings to compare results.

8. Review recordings tap on **WAVEFORM** ***see examples below.***

9. Reconnect and reinstall items that were removed to disable the engine from starting.

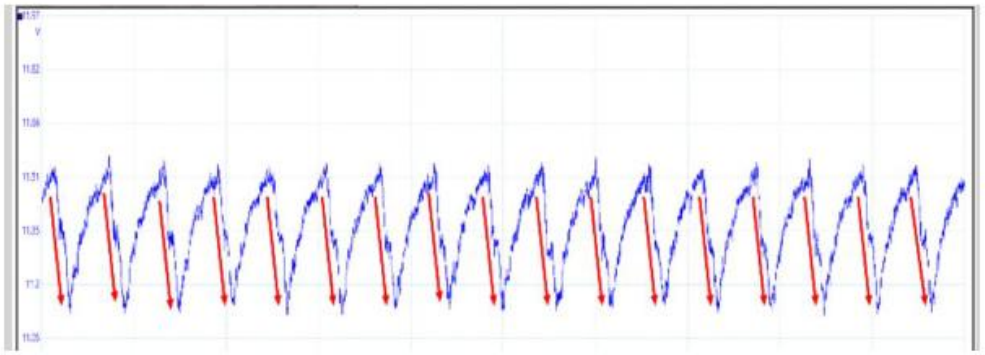
DATA ANALYSIS

Review each recording to help identify when a concern occurs by expanding out each graph and adjusting **time and division.**



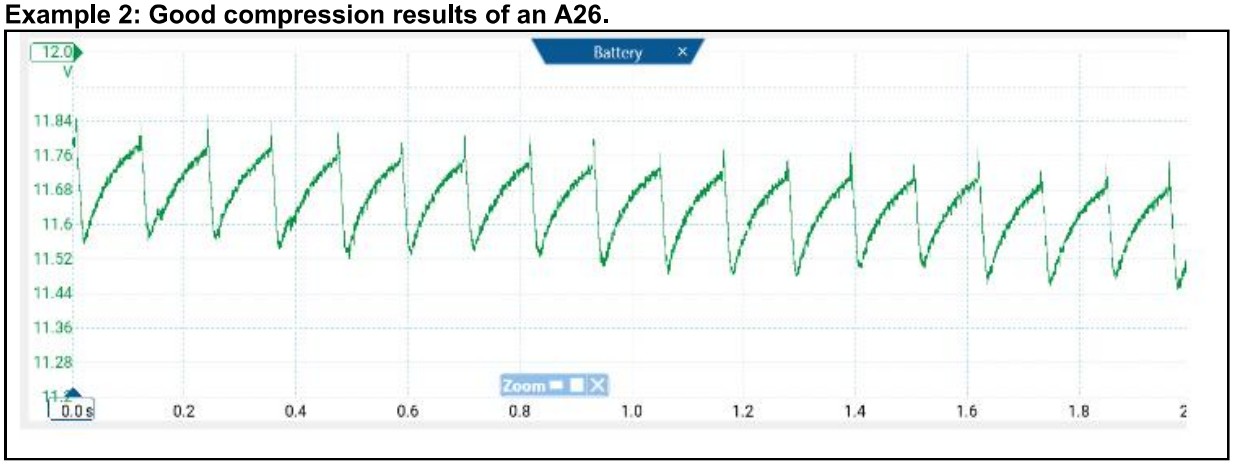
Note:The following examples 1 & 2 below is the engine starter motor drawing more voltage / amps from the battery during a compression stroke.

Example 1: Good healthy engine. Red voltage indicates voltage drop during each cylinder compression stroke.

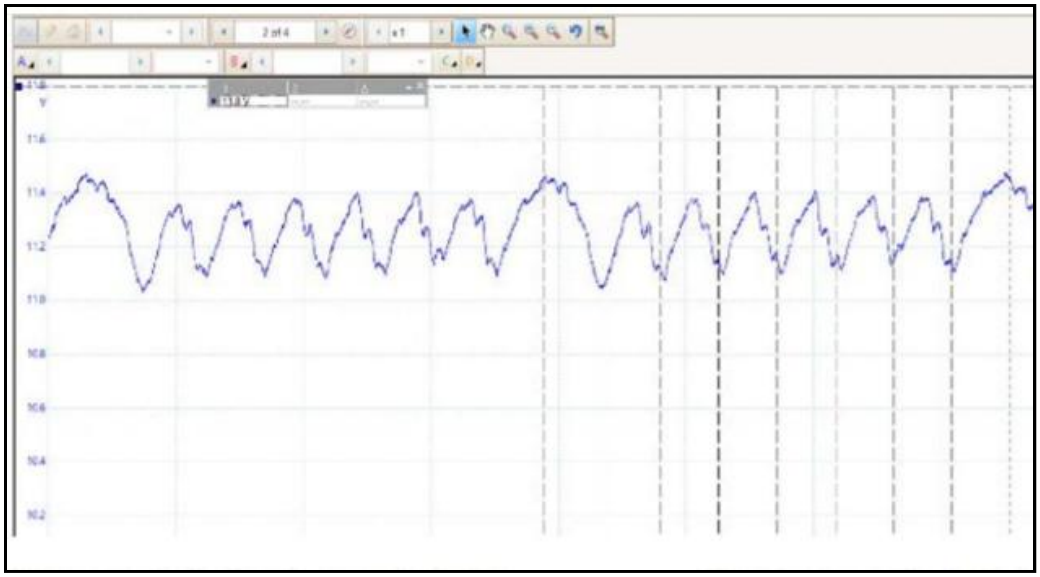


Good compression above. Red arrow indicates voltage drop during each cylinder's compression

Example 2: Good compression results of an A26.



Example: The graphic below depicts an example of an eight-cylinder engine with a cylinder that has no compression in one cylinder.



Note: One of the dips is missing and its repeats every eight dips. This is a clear indication there is an concern with this engine.

Example: This graphic below is a four-cylinder engine with a 40 psi loss in one cylinder.

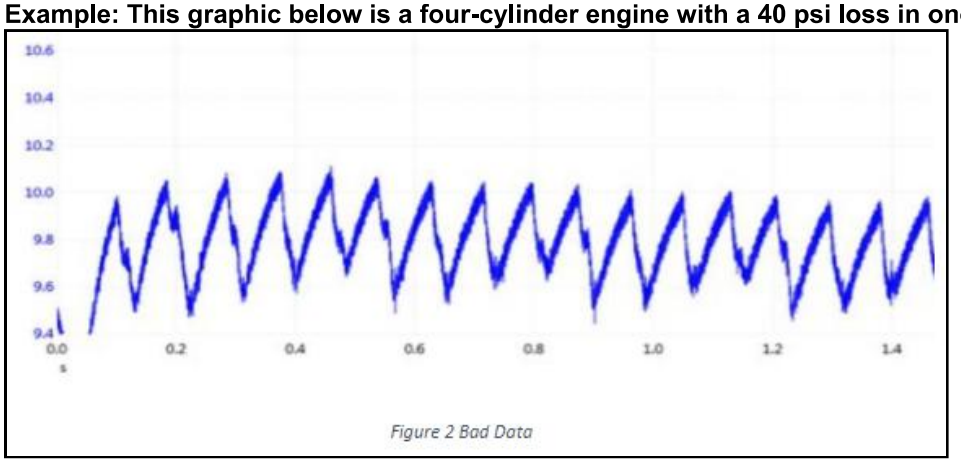


Figure 2 Bad Data

SHOP TALK

While cranking the engine and graphing battery voltage, a technician can understand the overall health of an engine without installation of a compression gauge. As an engine wears over-time starter draw will decrease due to less drag with a piston moving up and down within a cylinder. Studying each waveform will give a technician a better understanding of an engine with one weak cylinder or a completely worn engine. Any repetitive low peak in the waveform indicates a cylinder with low compression and provides justification for further investigation.

WARRANTY INFORMATION

Warranty Claim Coding:

Refer to the Warranty Coding Manual for Group and Noun Codes

Standard Repair Time(s):

Refer to the SRT Manual for Repair Times

OTHER RESOURCES

Master Service Information Site

Helpful: 1

Not Helpful: 0

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