

DIS 90 Ignition Adapter Instruction Sheet

Introducing the DIS 90

The DIS 90 is an optional accessory for use with the Fluke 98 Automotive ScopeMeter® Series II, Version 2.70 and higher, to measure parade on Distributorless Ignition Systems.

To check the version number press **F1** and **F5** simultaneously. Please contact your local representative for information about upgrading the version.

Unpacking

Check that the following items are included with the DIS 90 (see Figure 1):

- Ignition Adapter Unit with installed 9V battery
- Secondary Pickup Set with 4 black clamps
- Secondary Pickup Set with 4 red clamps

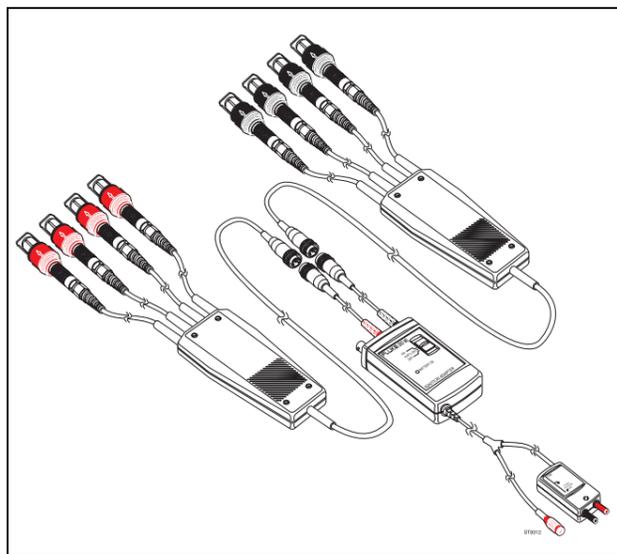


Figure 1. DIS 90 Package Contents

LIMITED WARRANTY & LIMITATION OF LIABILITY

This Fluke product will be free from defects in material and workmanship for one year from the date of purchase. This warranty does not cover fuses, disposable batteries or damage from accident, neglect, misuse or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Fluke's behalf. To obtain service during the warranty period, send your defective product to the nearest Fluke Authorized Service Center with a description of the problem.

THIS WARRANTY IS YOUR ONLY REMEDY. NO OTHER WARRANTIES, SUCH AS FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSED OR IMPLIED. FLUKE IS NOT LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY.

Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

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Safely using the DIS 90



Warning

Do the following to avoid electrical shock, fire, or personal injury:

- Turn the engine off before making any connections.
- Use the DIS 90 only on properly insulated ignition cables.
- Keep the Fluke 98 and the DIS 90 leads away from rotating parts and engine parts producing heat.
- Thoroughly fix all test leads before doing a road test.
- Read the safety section in the Fluke 98 Users Manual (from page VI).

Powering the DIS 90

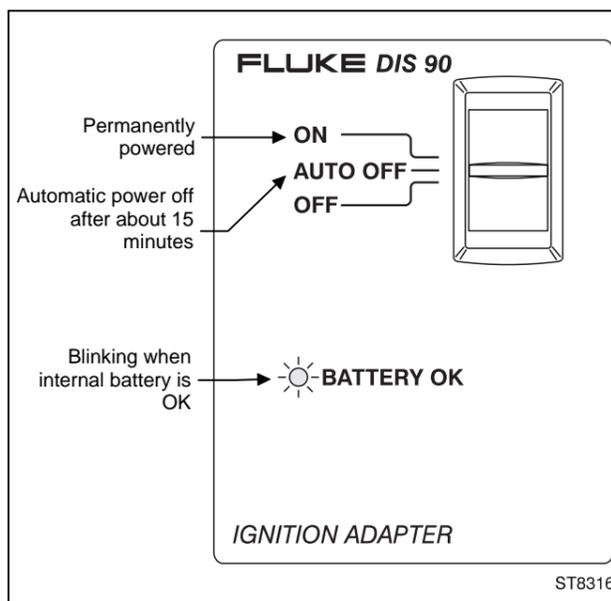


Figure 2. Powering the DIS 90

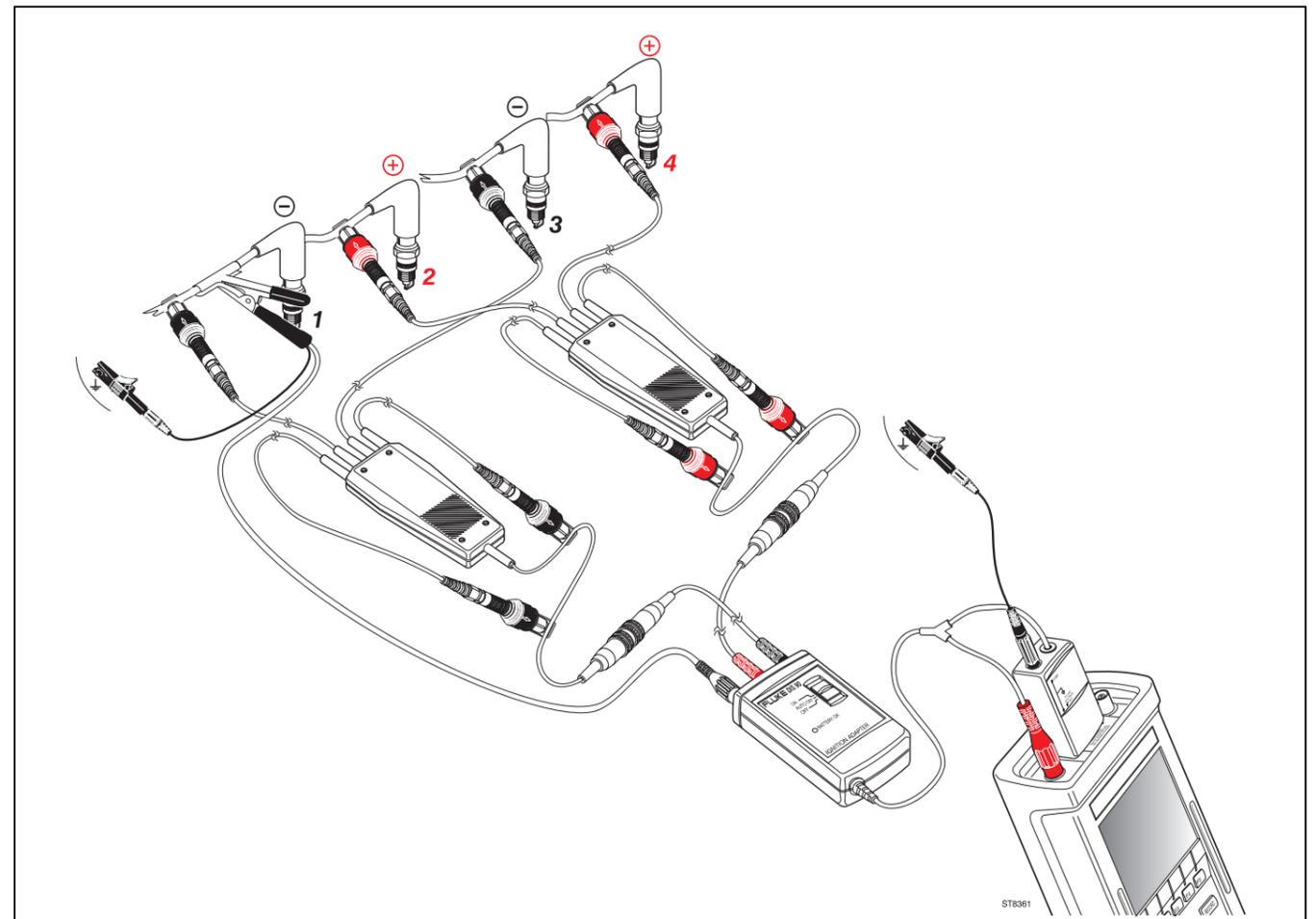


Figure 3. Measurement setup with the DIS 90 for a 4-cylinder dual-spark ignition coil system.

Connecting the DIS 90 for measurement

Figure 3 shows a connection example for a 4-cylinder DIS engine. General connection procedure:

1. Connect the DIS 90 Adapter to the Fluke 98 Automotive ScopeMeter as shown in Figure 3. Use a ground lead to connect the COM input on the small connection unit to ground e.g. battery ground.
2. Connect the round cable plug of the **red secondary pickup set** to the Ignition Adapter box on the input with the **red grommet** (connection to the input with the black grommet will not fit because of different plug pinning!).
3. Connect the round cable plug of the **black secondary pickup set** to the Ignition Adapter box on the input with the **black grommet**. (Connection to the input with the red grommet will not fit because of different plug pinning!).
4. Connect the **black** secondary pickup clamps to the spark leads with **negative** polarity and the **red** secondary pickup clamps to the spark leads with **positive** polarity. You can check the polarities as follows (only possible with engine running):
 - a. Use a black or red secondary pickup and clamp it to a spark lead.
 - b. If the Fluke 98 displays an upward spark voltage, this pickup is connected to the correct polarity. If a downward spark voltage is displayed, the pickup is connected to the wrong polarity. Then use a pickup with the other color for this cylinder. Bear in mind that the spark voltage may be low or not visible due to a defect. Refer to the section "Indication of wrong polarity connections" on the back of this sheet.
 - c. Use the next black or red secondary pickup and repeat steps a and b until all pickups are connected.
6. Clamp the remaining pickups on the connecting cable to the Ignition Adapter unit. See the example for four cylinders in Figure 3 and for six cylinders in Figure 4. For safety reasons

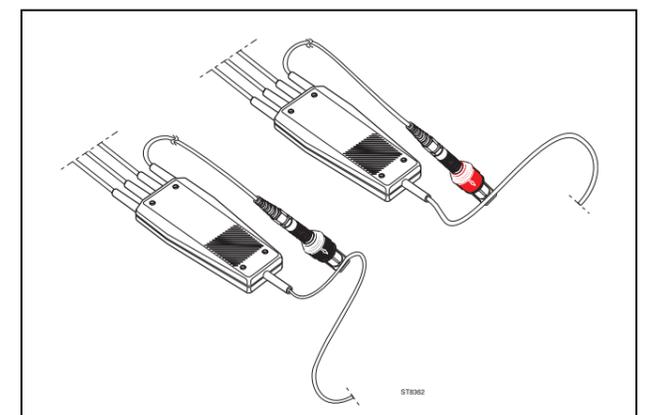


Figure 4. Connection of the unused pickups (example for six cylinders)

and to get a reliable measurement result, these unused pickups must not be left unconnected.

7. Clamp the Capacitive Secondary Pickup (CAP 90 or PM9096/001) on a spark lead with negative polarity (**black** pickup connected). Clamp it as close as possible to the spark plug (see figure 4). This cylinder is then displayed as first cylinder in the parade picture.



Automotive Application Example

The following is an application example of how to measure a DIS system (with dual-spark ignition coils) for a 4-cylinder engine. See Figure 3.

Test Tool Key Sequence

- ①
- ②
- ③
- ④
- ⑤ Connect the DIS 90, the Capacitive Secondary Pickup, and the ground leads as displayed on the Fluke 98 and depicted in the example of Figure 3.
- ⑥ Starts the secondary parade measurement.

Start the engine and observe the measurement result. See an example display in Figure 5.

Measurement Result

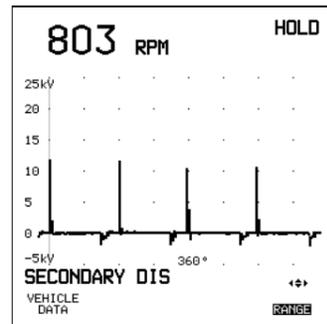


Figure 5. Typical Result Screen

Indication of wrong polarity connections

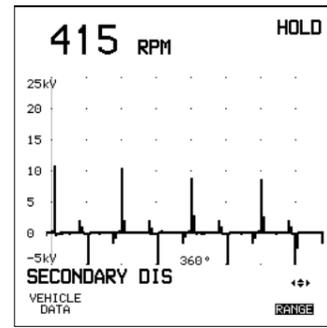


Figure 6. One red (positive) and one black (negative) secondary pickup swapped (4-cylinder system).

If you connect a pickup to a cable with the wrong polarity, the ignition pulses of the related cylinder are displayed upside down and the RPM display is not correct. In the example of Figure 6, where two out of four pickups are wrongly connected, the RPM display is half the real value.

Service and Maintenance

Storing the DIS 90

If you are storing the DIS 90 for an extended period of time, the battery should be removed and stored separately. To remove the battery, see Figure 7.

Replacing the 9V Battery

Warning

To avoid electrical shock, disconnect the DIS 90 from the ignition cables before replacing the battery.

Note:

This instrument contains an alkaline battery. Do not dispose of this battery with other solid waste. Used batteries should be disposed of by a qualified recycler or hazardous materials handler. Contact your authorized FLUKE Service Center for recycling information.

Replace the 9V battery when the 'BATTERY OK' LED on the IGNITION ADAPTER unit remains off when the power is switched on.

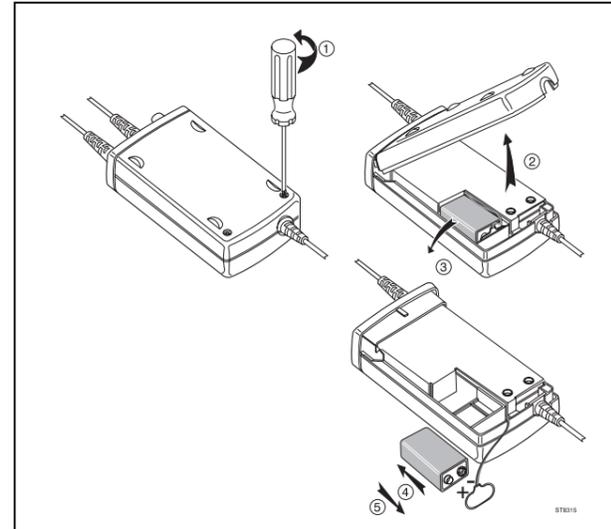


Figure 7. Replacing the Battery

Service Centers

To locate an authorized service center, visit us on the World Wide Web:

<http://www.fluke.com>

or call Fluke using any of the phone numbers listed below:

+1-800-443-5853 in U.S.A. and Canada

+31-402-678-200 in Europe

+1-425-356-5500 from other countries

Specifications

FLUKE guarantees the properties expressed in numerical values with the stated tolerance. Specified non-tolerance numerical values indicate those that could be nominally expected from the mean of a range of identical differential voltage probes.

GENERAL	
DIS 90 application	Parade measurement on Distributorless Ignition Systems with the Fluke 98 Automotive ScopeMeter Series II, Version 2.70 and higher (see the note at the bottom)
Maximum number of cylinders	8 4 positive ignition voltages (red pickup clamps) and 4 negative (black pickup clamps)
TRIGGER INPUT	
Trigger input device to be used	Secondary Pickup CAP90-2 or PM9096/101 (Europe only).
TRIGGER OUTPUT	
Connection to the Fluke 98	Dual banana plug (on small box). Black plug to COM input, red plug to TRIGGER input on the Fluke 98.
SIGNAL OUTPUT	
Connection to the Fluke 98	Red BNC connector (safe model). Connected to INPUT A on the Fluke 98.
RPM range:	
4-cylinder engine	600 to 8000 RPM
6-cylinder engine	600 to 6000 RPM
8-cylinder engine	600 to 4500 RPM
CABLE LENGTHS	
Secondary Pickup cable (from clamp to splitter box)	0.85 m
From splitter box to adapter box (connected)	2 m
From adapter box to Fluke 98 (connected)	0.5 m
IGNITION ADAPTER	
Box dimensions (length x width x height)	90 x 25 x 40 mm
BATTERY	
Battery requirement	Type 6 LR 61, 9V Alkaline NEDA 1064, IEC6F22.
Battery life	100 hours
ENVIRONMENTAL	
Temperature operating	0 to +50 °C
Temperature non-operating	-40 to +70 °C

Note: Press and simultaneously to read the version number. Please contact your local representative for information about upgrading the version.