# INSTRUCTION MANUAL

# SUN

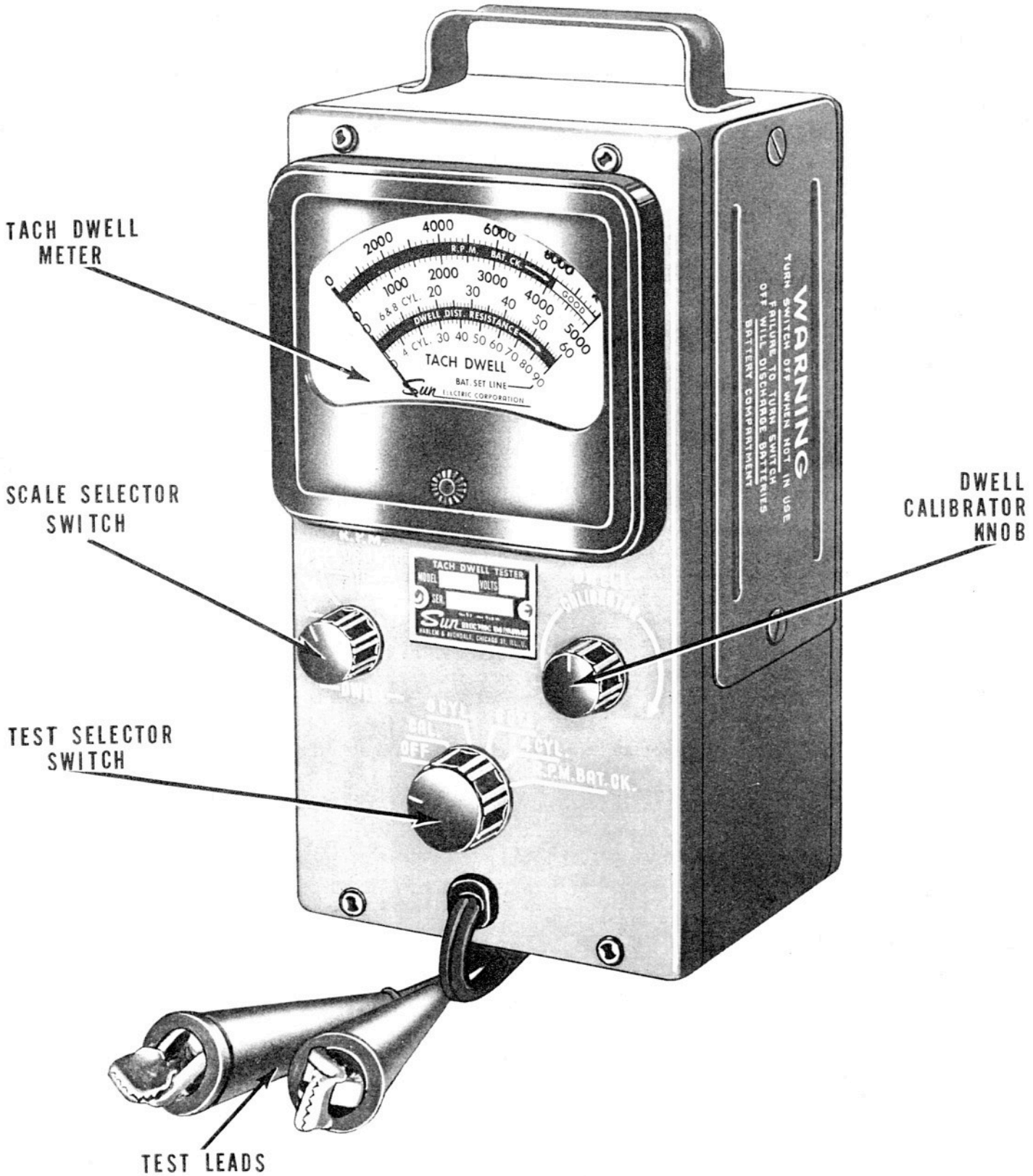
## TACH DWELL TESTER

### MODEL TDT-12


SUN ELECTRIC CORPORATION
HARLEM AND AVONDALE • CHICAGO, ILLINOIS 60631

# TACH DWELL TESTER

## MODEL TDT-12



## INTRODUCTION

The Sun Tach Dwell Tester Model TDT-12, is a self-contained unit consisting of a Dwell Tester and a Tachometer. The meter features two Dwell scale ranges; 0 to 60° for 6 and 8 cylinder dwell measurements, and 0 to 90° for 4 cylinder engines. Three Tachometer scales cover speed ranges of 0 to 1000, 0 to 5000, and 0 to 10,000 RPM.

This tester is designed for testing distributor condition, engine speeds, engine governor setting, automatic transmission settings, etc., in the shop or when making road tests.

When making adjustments on automatic transmissions, follow the car manufacturer's instructions carefully. Instructions covering the use of the Tachometer for testing engine speeds are covered in this manual.

The Sun Tach Dwell Tester Model TDT-12, will operate on any 4, 6, or 8 cylinder engine equipped with either a conventional or transistor 6 volt, 12 volt, or 24 volt ignition system. When testing transistor systems refer to Sun Technical Bulletin part number 692-519 for correct lead connections.

## CALIBRATING THE TACH DWELL TESTER

### PROCEDURE

1. With Test Seclector switch in the OFF position, zero meter pointer. To zero meter pointer, turn adjustment button on face of meter case.

2. Turn Scale Selector switch to the DWELL position and Test Selector switch to the CAL. (calibrate) position. Adjust CALIBRATOR until meter reads on the BAT. SET LINE. (Test leads separated.)

   If meter cannot be adjusted to the BAT. SET LINE, it is an indication of a weak or dead battery in the tester. The battery is accessible when the Battery Compartment Cover is removed. See following Battery Replacement Section for proper battery replacement procedure.

3. Turn Scale Selector switch to the 1000 RPM position, and Test Selector switch to the RPM BAT. CK. (battery check) position. The meter should read in the white band marked GOOD. If the meter fails to read in the GOOD band, it is an indication of a weak or dead battery in the tester. The battery is accessible when the side Battery Compartment Cover is removed.

## BATTERY REPLACEMENT

1. Use a screwdriver to remove the screws holding the Battery Compartment Cover in place. This will allow the cover to be removed.

2. To replace the Dwell (round) battery, remove the clip holding it in place. Remove the battery from the tester. Locate a suitable replacement battery. (Note chart below for proper battery size.) Insert the new battery into the tester making sure the positive or insulated post is facing outward. Replace the clip allowing the contact button to touch the center of the battery insulated post.

   To replace the Tachometer (square) battery, first remove it from the tester. Unsnap the terminal connector from the top of the battery. Locate a suitable replacement battery. (Note chart below for proper battery size.) Connect the clip to the new battery snapping it securely in place. Insert the battery and lead into the tester. Replace the Battery Compartment Cover and install the two screws holding it in place.

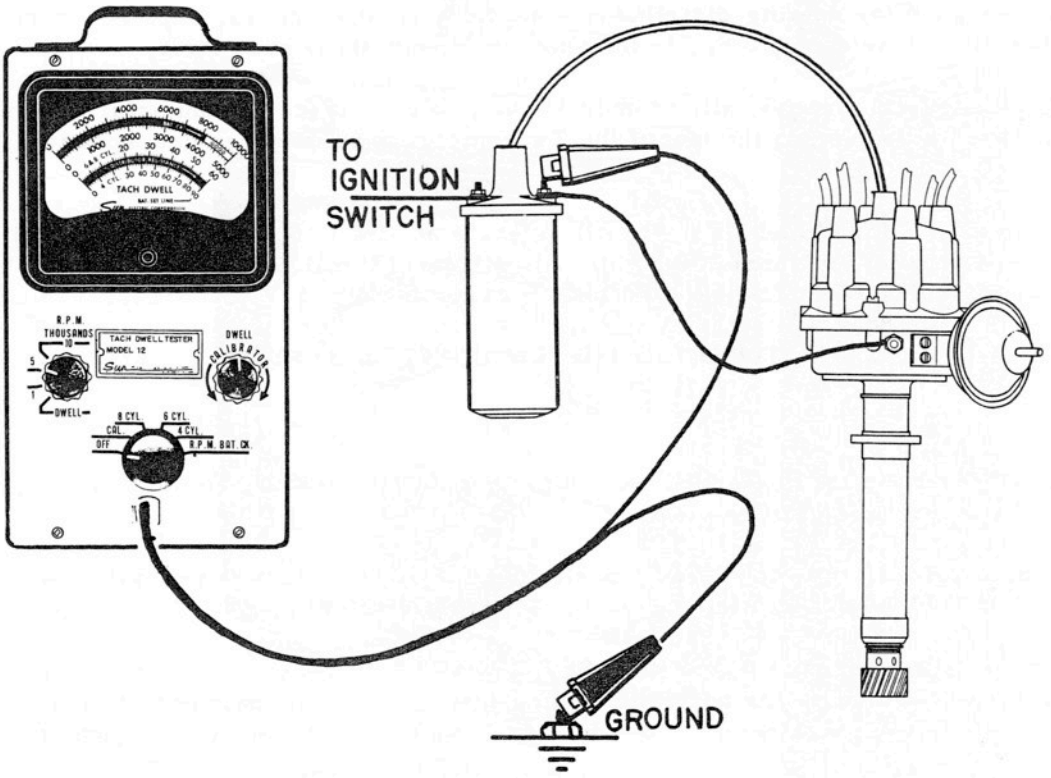
## BATTERY SIZES

| | Dwell | Tach |
|---|---|---|
| Eveready | D | 266 |
| Burgess | #2 | M6 |
| Mallory | M13F | M1605 |

## DISTRIBUTOR RESISTANCE TEST

This test indicates the resistance of the ignition primary circuit from the distributor terminal of the coil through the distributor primary circuit to ground.

Excessive resistance in this portion of the ignition system will reduce the maximum coil output.




PROCEDURE

1. Calibrate the Tach Dwell Tester with the Scale Selector switch in the DWELL position and Test Selector switch in CAL. (calibrate) position.

2. Connect test leads as shown.

3. Turn the vehicle's ignition switch on.

4. Observe meter reading.

   If the meter reads Zero, crank the engine a fraction of a revolution at a time to close the breaker points and repeat step 4.

   If the meter reads within the Black Bar at the right end of the scale, the distributor primary circuit resistance is within allowable limit.

   If the meter does not read within the Black Bar at the right end of the scale, excessive resistance is present in the distributor primary circuit and should be eliminated.

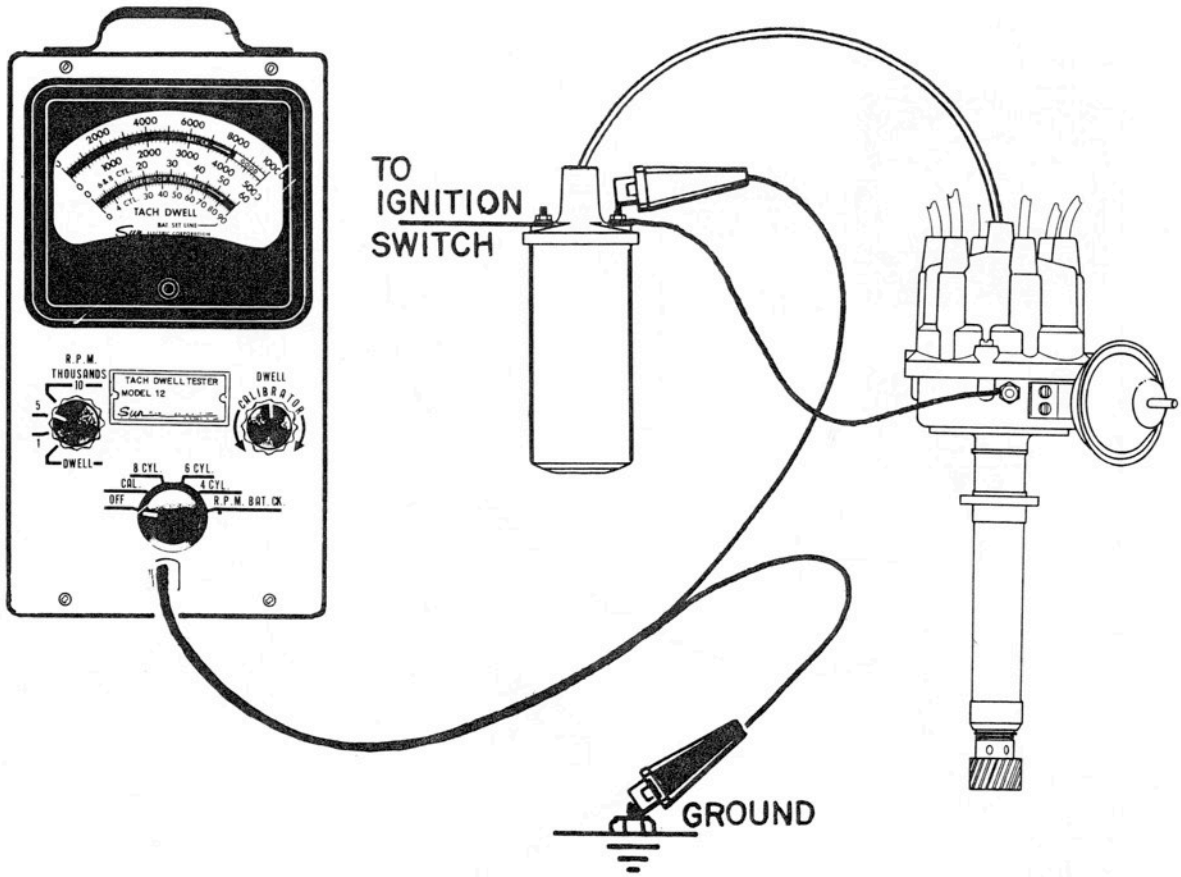
   To locate the cause of high resistance, move either test lead in the direction of the other until a definite change in the meter reading is noticed. The portion of the circuit, which when eliminated causes a definite change in the reading, contains the point of high resistance.

Do not recalibrate meter after a reading within the Black Bar is obtained. Meter circuitry automatically compensates for permissible resistance.

## ENGINE RPM TESTS

The engine must idle within the manufacturer's specifications to prevent complaints of stalling, or complaints of creeping, or hard shifting on vehicles equipped with automatic transmissions.

The Tachometer can also be used for testing engine governor settings, transmission or overdrive shift points and other engine speed tests.




### PROCEDURE

1. With Tach Dwell Tester properly calibrated, connect test leads as shown.

2. Turn the Test Selector switch to the CYL. (cylinder) position corresponding to the number of cylinders in the engine.

#### ENGINE IDLE RPM

3. Set Scale Selector switch to 1000 RPM position.

4. With engine at normal operating temperature momentarily open throttle and release to make sure the idle speed screw is against stop.

5. Adjust idle speed screw until engine idles at speed specified by manufacturer.

#### OTHER ENGINE SPEED TESTS

3. Set Scale Selector switch to:
   1000 RPM for tests under 1000 RPM. (Each scale division equals 20 RPM.

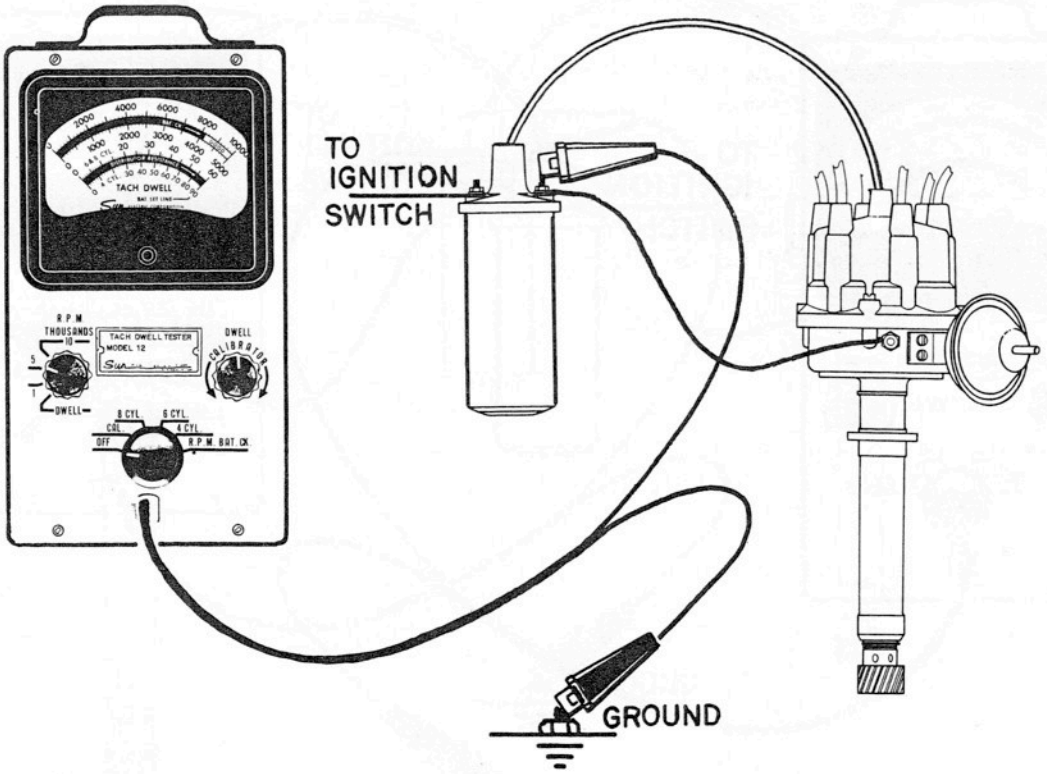
   5000 RPM for tests over 1000 RPM. (Each scale division equals 100 RPM.)

   10,000 RPM for tests over 5000 RPM. (Each scale division equals 200 RPM.

4. With engine at normal operating temperature, make tests carefully following the vehicle manufacturer's instructions.

## DISTRIBUTOR POINT DWELL AND DWELL VARIATION TEST

The "degrees of dwell" of the distributor breaker points are the degrees of cam rotation through which the breaker points must remain closed. This is also commonly referred to as "dwell angle" or "cam angle." Correct distributor point dwell is essential, both from the standpoint of good ignition performance and long point life.




PROCEDURE

DISTRIBUTOR POINT DWELL TEST

1. With the Tach Dwell Tester properly calibrated and connected as shown, turn the Test Selector switch to the CYL. (cylinder) position corresponding to the number of cylinders in the engine.

2. Turn the Scale Selector switch to the DWELL position.

3. Operate the engine at idle speed and note the dwell reading. Compare with manufacturer's specifications.

DWELL VARIATION TEST

4. Turn the Scale Selector switch to the 5000 RPM position.

5. Increase engine speed to 1500 RPM and turn Scale Selector switch to the DWELL position and observe Dwell Meter reading.

   Dwell should not change more than 3° on most vehicles. Refer to specifications before condemning distributor.

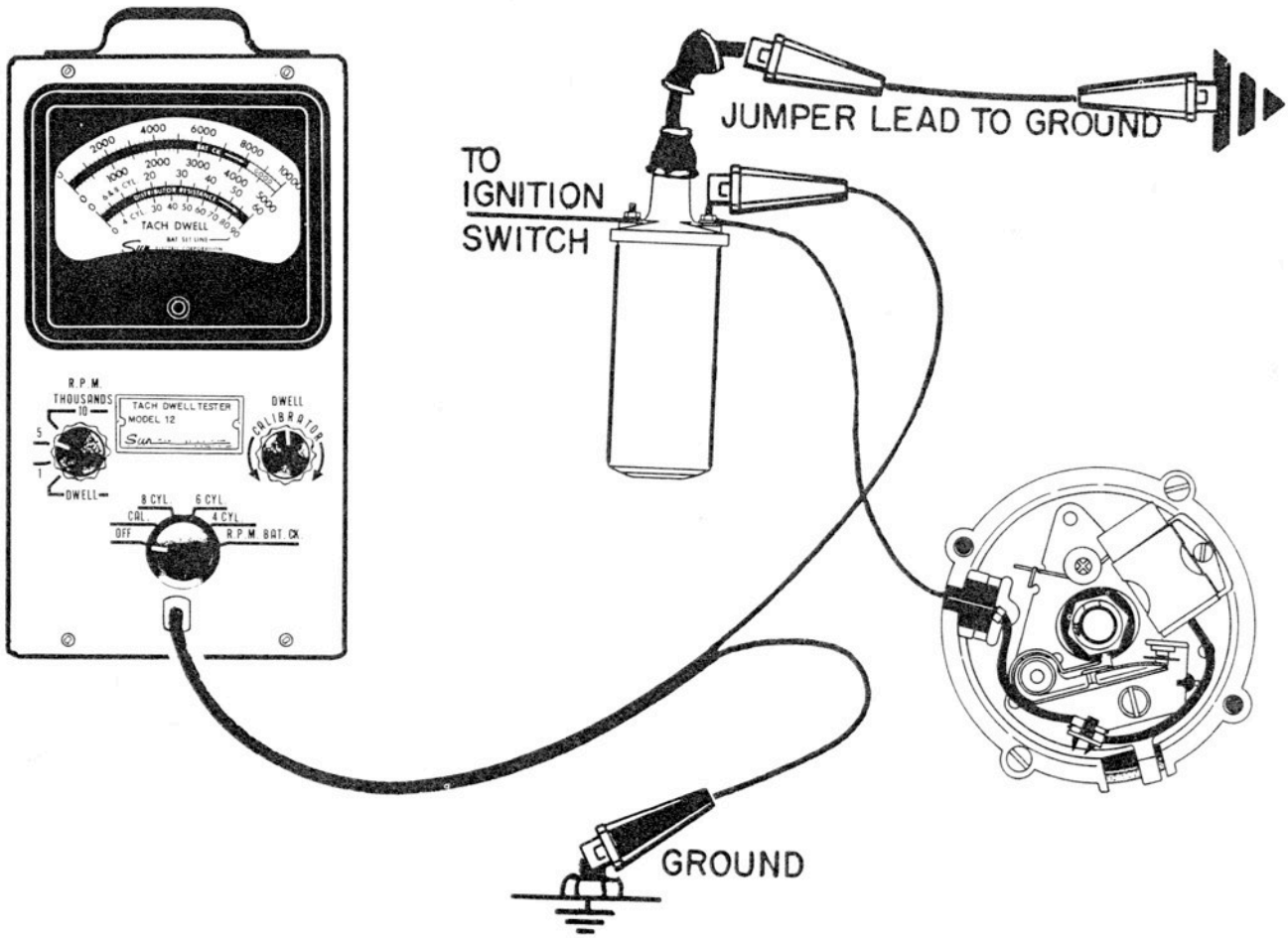
IMPORTANT

Dwell and gap of the points must both be within their specified tolerance at the same time. If this cannot be accomplished, it is probable that the wrong points are installed or the cam lobes are badly worn.

## DISTRIBUTOR DWELL ADJUSTMENT
## (ON CAR)

Distributor point dwell can be adjusted with engine running or during cranking on cars with Delco distributors having the sliding door in the distributor cap.

On all cars, point dwell can be adjusted with distributor cap and rotor removed and coil secondary wire grounded.




PROCEDURE

1. With distributor cap and rotor removed, connect tester as illustrated.

2. Crank engine with starter. Adjust points while engine is cranking to specified dwell. (Recheck dwell when engine is running.)

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## WARRANTY

"The Manufacturer, Sun Electric Corporation, warrants each piece of equipment manufactured by it to be free from defects in material and workmanship under normal use, its obligation under this warranty being limited to replacing or repairing any part or parts which shall have been returned to the Manufacturer at its factory or any branch, transportation charges prepaid, within one year after purchase and delivery of such equipment to the original purchaser and which the Manufacturer's examination shall disclose to its satisfaction to have been thus defective. This warranty shall not apply to equipment which shall have been repaired or altered by others than the Manufacturer in a manner which in the judgment of the Manufacturer has adversely affected its operation. The Manufacturer reserves the right to make changes at any time in the design and price of its equipment. This warranty is in lieu of all other warranties, expressed or implied, and the Manufacturer neither assumes, nor authorizes any other person to assume for it, any other liability in connection with the sale of its products."

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