# Instruction Manual




## P6054 PROBE



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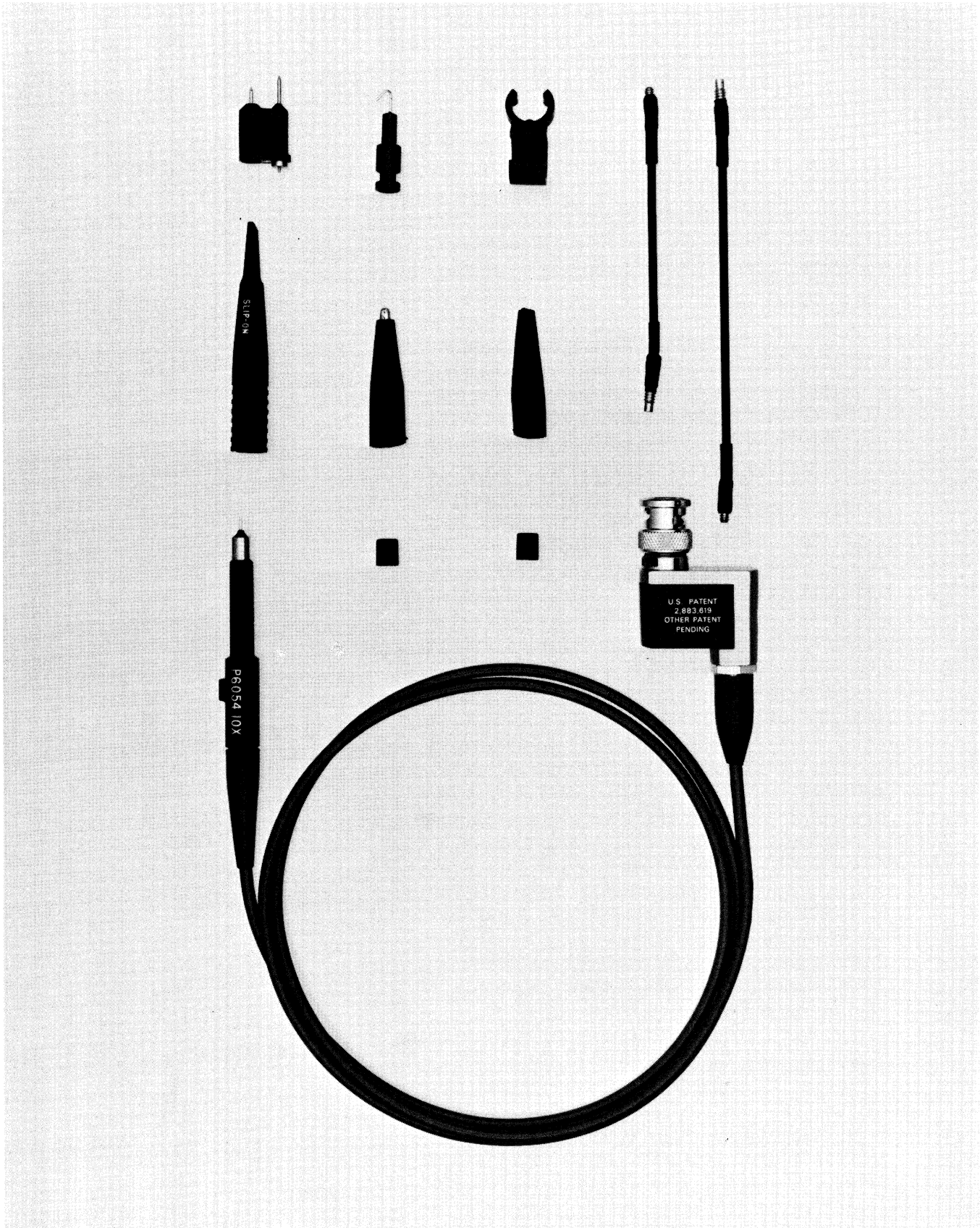



Fig. 1-1. P6054 Probe and standard accessories.

# SECTION 1
# SPECIFICATION

## Description

The P6054 Probe is a miniature, passive, fast-rise, 10X attenuation probe designed primarily for use with Tektronix oscilloscopes, such as 453, 453A, 454, 454A, and the 10A2A Plug-In Unit. The probe can be compensated for use with other oscilloscopes or plug-in units that have an input capacitance of 15 to 24 pF (paralleled by 1 MΩ).

The probe consists of a small-diameter probe body assembly (especially useful in compact circuitry), a 3.5-foot, 6-foot, or 9-foot cable, and a compensating box with a BNC connector.

The compensating box houses a compensation network that provides optimum transient response when the probe is used with wideband oscilloscopes. The probe can be low-frequency compensated to match the input of the associated instrument by adjusting the variable capacitor through the hole in the compensating box housing. Internal calibration adjustments provide high-frequency compensation. A snap-on cover gives access to the internal adjustments.

## ELECTRICAL CHARACTERISTICS

The following characteristics apply when the probe is calibrated at an ambient temperature between +20°C and +30°C, and operated within the limitations stated in this Specification section. The probe must be used with a calibrated oscilloscope amplifier system, and all equipment used in checking these characteristics must be calibrated and given sufficient warmup time to stabilize. Warmup time for each item is given in its own instruction manual.

Electrical characteristics which differ between the 3.5-foot, 6-foot, and 9-foot versions of the P6054 Probe are listed separately.

**TABLE 1-1**

**ELECTRICAL CHARACTERISTICS**

| Characteristic | Performance Requirement[1] | Supplemental Information |
|---|---|---|
| Attenuation | 10X ±3% | |
| Input Resistance | | 10 MΩ ±2%. See $X_p$, $R_p$ vs. Frequency curves in Section 2. |
| Input Capacitance | | |
| 3.5-foot Probe | | 9.5 pF ±0.5 pF |
| 6.0-foot Probe | | 12 pF ±0.5 pF |
| 9.0-foot Probe | | 13.5 pF ±0.5 pF |
| Compensation Range | 15 to 24 pF | Range must be adequate to match input capacitances of 15 pF to 24 pF **including their accuracy tolerances.** (14 to 25 pF.) |
| Step Response ($T_r$) (Probe alone) | | Measured with 25 Ω source impedance |
| 3.5′ and 6′ Probes | 0.7 ns | |
| 9′ Probe | 2.0 ns | |
| Maximum Input Voltage | | 500 V (DC + peak AC). Derated with frequency. See curves. |

[1] **A verification procedure is provided, for Performance Requirements, in Section 4 of this manual.**

TABLE 1-2

ENVIRONMENTAL CHARACTERISTICS

| Characteristic | Performance Requirement | Supplemental Information |
|---|---|---|
| Temperature | | |
| Non-Operating Range | −55°C to +75°C | |
| Operating Range | −15°C to +75°C | |
| Altitude | | |
| Non-Operating | To 50,000 feet | |
| Operating | To 15,000 feet | |
| Humidity | | |
| Storage and Operating | To 95% relative humidity | |
| Shock | | |
| Non-Operating | To 400 g's, 1/2 sine, 1/2 ms, 1 ms and 2 ms duration | |
| Transportation | Qualifies under National Safe Transit Committee Test Procedure 1A, Category 1 V (48 inch drop) | |

TABLE 1-3

PHYSICAL CHARACTERISTICS

| Characteristic | Description | Supplemental |
|---|---|---|
| Dimensions | | |
| Probe Body | Length: ≈3.7 inches<br>Maximum Outside Diameter: ≈0.4 inch | |
| Cable | Length: ≈3.5 feet, ≈6 feet, or ≈9 feet between strain relief bases | |
| Compensation Box | Length: ≈1.7 inches<br>Width: ≈0.6 inch<br>Height: ≈1.2 inches | (with connector) |
| Weight | | |
| Probe with 3.5 foot cable and Compensation Box | Net: ≈2 ounces<br>Shipping: ≈12 ounces | |
| Probe with 6.0 foot cable and Compensation Box | Net: ≈2.4 ounces<br>Shipping: ≈12 ounces | |
| Probe with 9.0 foot cable and Compensation Box | Net: ≈2.8 ounces<br>Shipping: ≈13 ounces | |

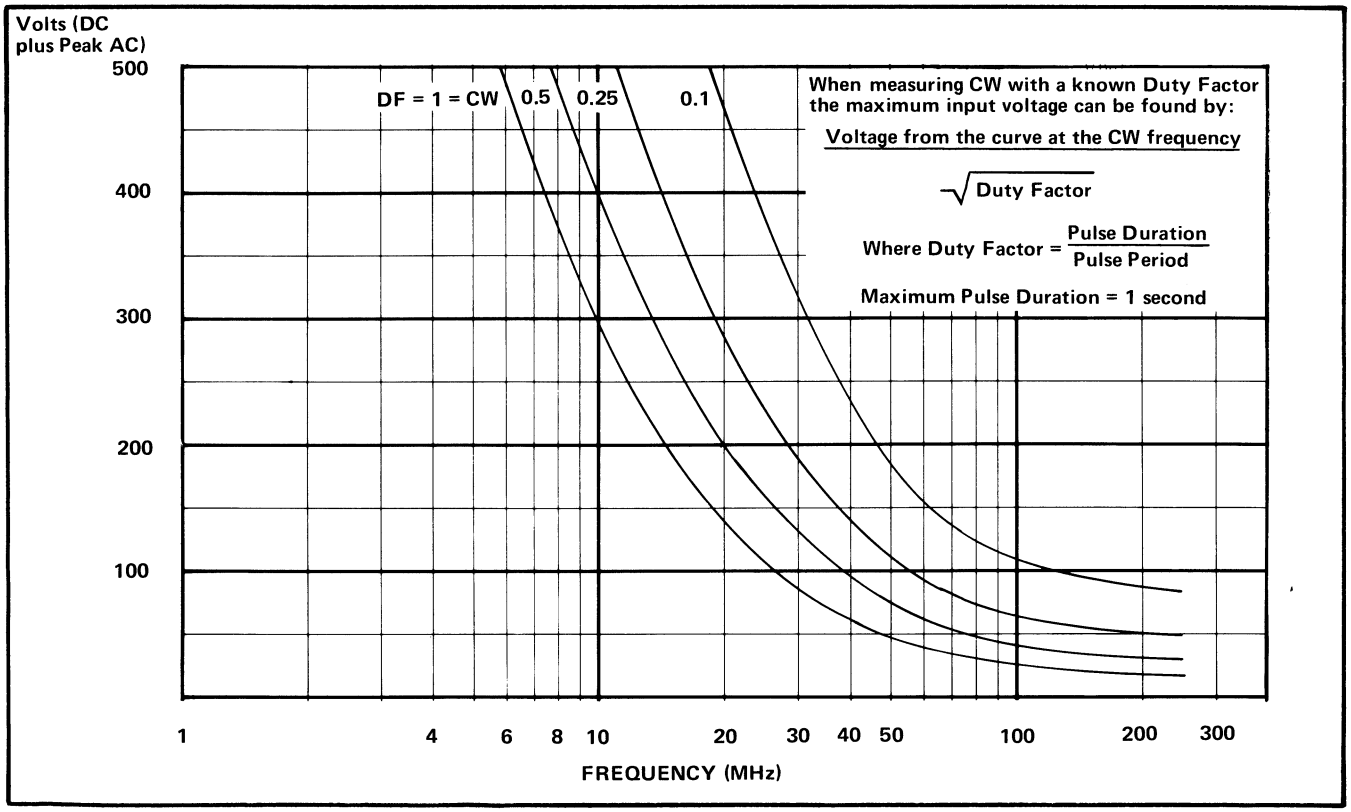



Fig. 1-2. P6054 Probe (3.5-foot cable) voltage derating with frequency curves at 25°C ambient temperature.

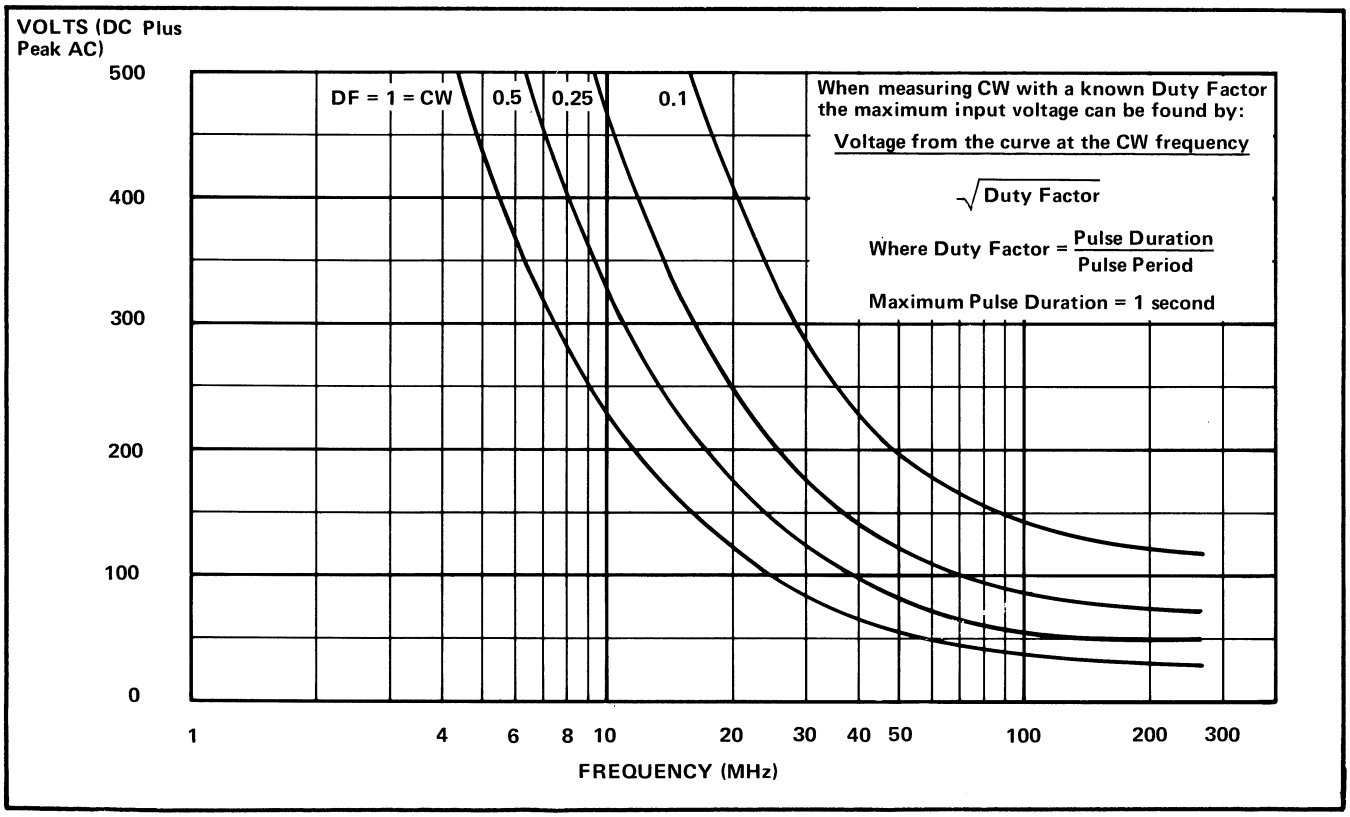



Fig. 1-3. P6054 Probe (6.0-foot cable) voltage derating with frequency curves at 25°C ambient temperature.

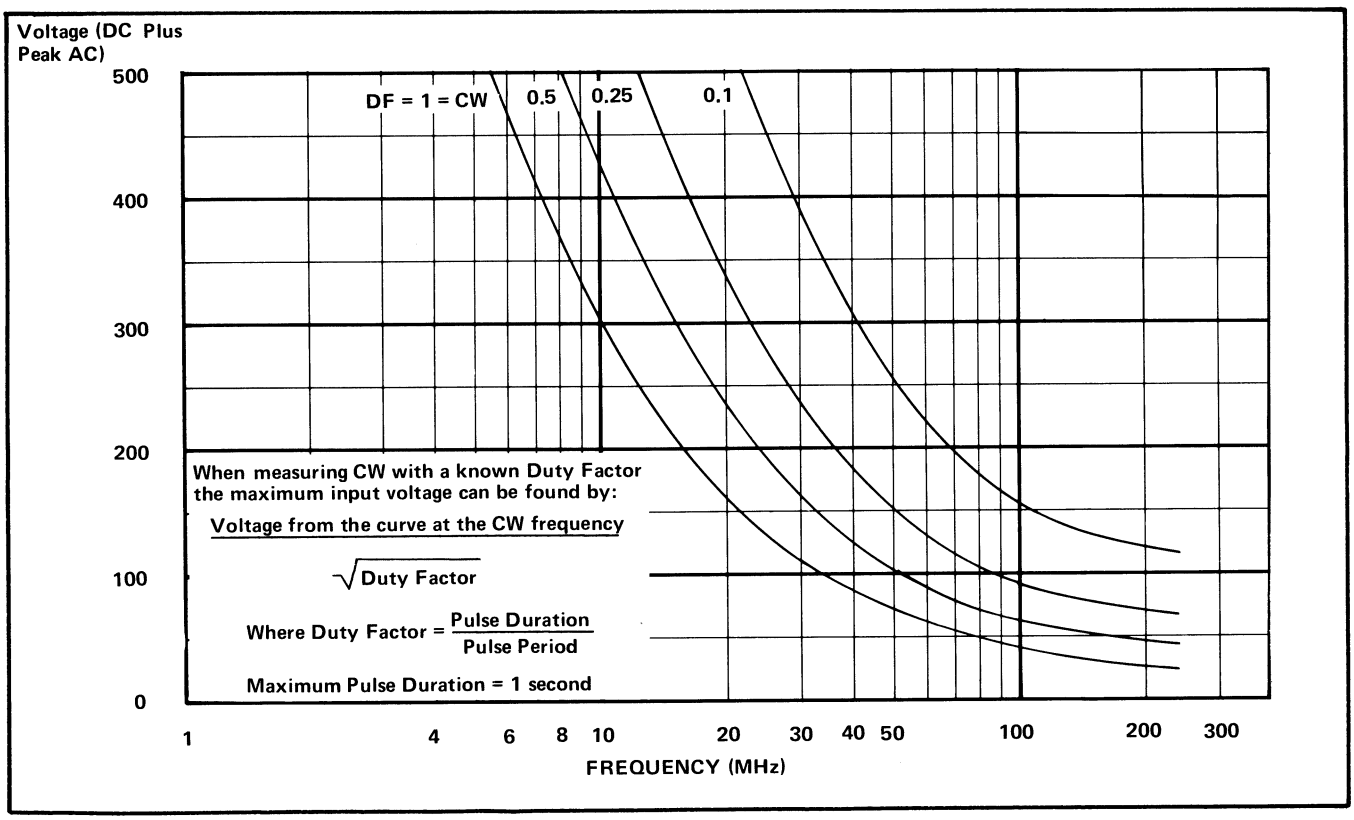



Fig. 1-4. P6054 Probe (9.0-foot cable) voltage derating with frequency curves at 25°C ambient temperature.

# SECTION 2
# OPERATING INSTRUCTION

## Introduction

The P6054 Probe is a miniature passive probe, designed primarily for Tektronix oscilloscopes, such as 453, 453A, 454, 454A, and the 10A2A Plug-In Unit. The probe is designed to monitor the signal source with minimum circuit loading while maintaining waveform fidelity.

## Probe Compensation

Due to slight variations in the input capacitance between oscilloscope input amplifiers (even of the same type), it is usually necessary to compensate the probe whenever it is transferred from one instrument to another or from one channel to another of dual (multi-trace) units. Improper compensation will produce waveshape distortion and amplitude measurement error of the display. See Fig. 2-1.

Low-frequency compensation is accomplished by touching the probe tip to a square wave source (typically 1 kHz from the oscilloscope Calibrator) and adjusting the observed waveform to have a flat top and square corners. Fig. 2-2 shows the effect of this adjustment. Location of the adjustment is shown in Fig. 2-3.

If the probe is to be used in observing or measuring sine-waves or pulses with frequency components above 3 or 4 MHz, high-frequency compensation must be checked and

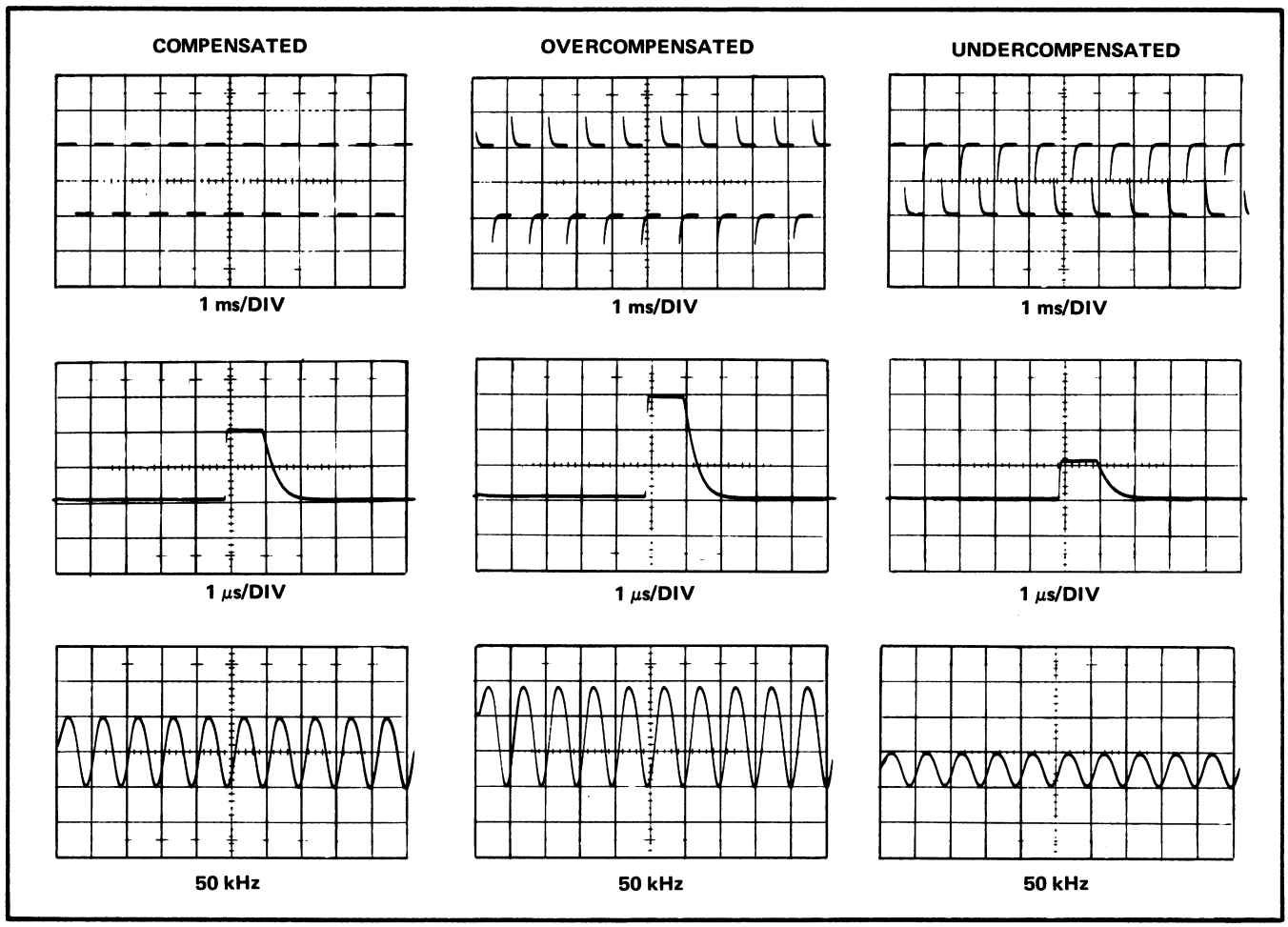



Fig. 2-1. Effects of probe low-frequency compensation on signal waveform.

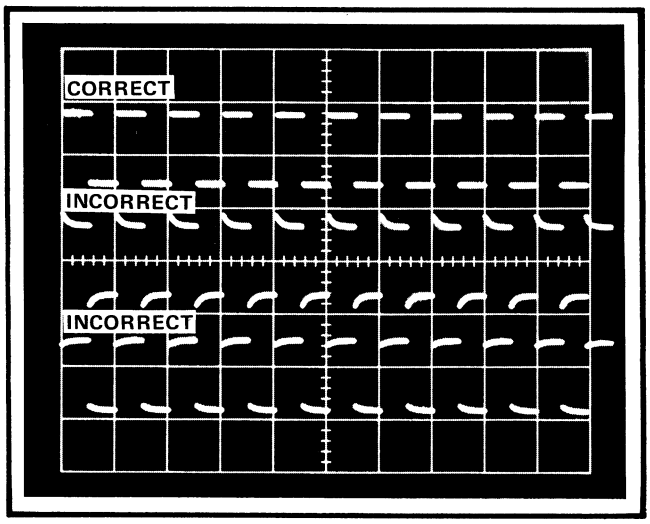



Fig. 2-2. Probe low-frequency compensation.

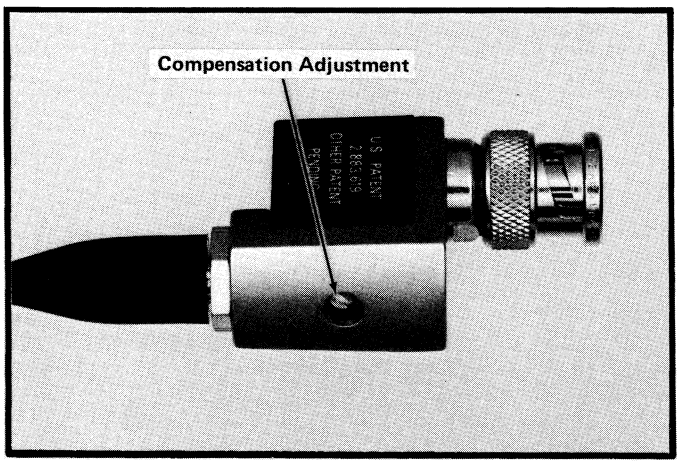



Fig. 2-3. Location of probe low-frequency compensation adjustment.

adjusted as necessary. Adjustment of high-frequency compensation is described in the Calibration Procedure in Section 4.

## Low-Frequency Compensation Procedure

Connect the probe to the Ch 1 or Ch 2 Input of the oscilloscope. Turn the oscilloscope power on and allow ample time for the instrument to warm up and stabilize.

1. Set the Volts/Div selector to 20 mV.

2. Set the Time/Div selector to 1 ms.

3. Connect the probe tip to the Calibrator output connector. Adjust the triggering controls for a triggered display. (A probe tip-to-BNC adapter, 013-0084-01, may be used to connect the probe to the Calibrator output connector.)

4. Adjust C8 (Fig. 2-3), through the access hole in the compensation box, for optimum pulse flat top. Fig. 2-2 illustrates correct and incorrect square wave response.

The probe is now ready to use for low- to mid-frequency measurements (below 3 to 4 MHz) with the instrument it has been compensated for. If frequencies above this are to be measured, the high-frequency compensation must be checked. See Calibration Procedure in Section 4. When the probe is changed to another instrument or input channel, it must again be checked for proper compensation.

## Voltage Rating and Derating Curves

The maximum allowable input voltage of the P6054 Probe is 500 V (DC + peak AC) at the low frequency end of its range. As the frequency increases to a point where the input capacitive reactance decreases significantly, the maximum allowable input voltage decreases. Figs. 1-2, 1-3, and 1-4 show the voltage derating curves for the P6054 Probe. In no case can the peak pulse voltage exceed the DC voltage limit.

## Circuit Loading

Although the input DC resistance of the P6054 Probe is 10 MΩ, it can load any high impedance circuit it is connected into, and distort the actual waveform present. To minimize this loading effect, select the lowest impedance points to check waveforms. At higher frequencies, the equivalent probe input impedance decreases because of the input capacitance of the probe. Therefore, the probe loading increases with frequency. Figs. 2-4, 2-5, and 2-6 show $R_p$ and $X_p$ curves as a function of frequency. These curves should be referred to when making measurements at higher frequencies.

## Ground Lead Length and Considerations

A passive probe such as the P6054 is a capacitance divider for high frequency components. An inductance formed by a long ground lead will form a series resonant circuit which will "ring" if driven by a signal containing significant frequency components at or above circuit resonance. (See Fig. 2-7.) These oscillations can appear on the oscilloscope display and distort the true waveform.

To check for ground lead inductance problems, change the ground return path and look for signal shape changes. If the ground lead must be long, loop the lead through a small ferrite core to introduce losses in the resonant circuit. The spring-loaded bayonet ground or a chassis-mounted connector and probe tip-to-connector adapter are the recommended methods to obtain a minimum-inductance ground path.

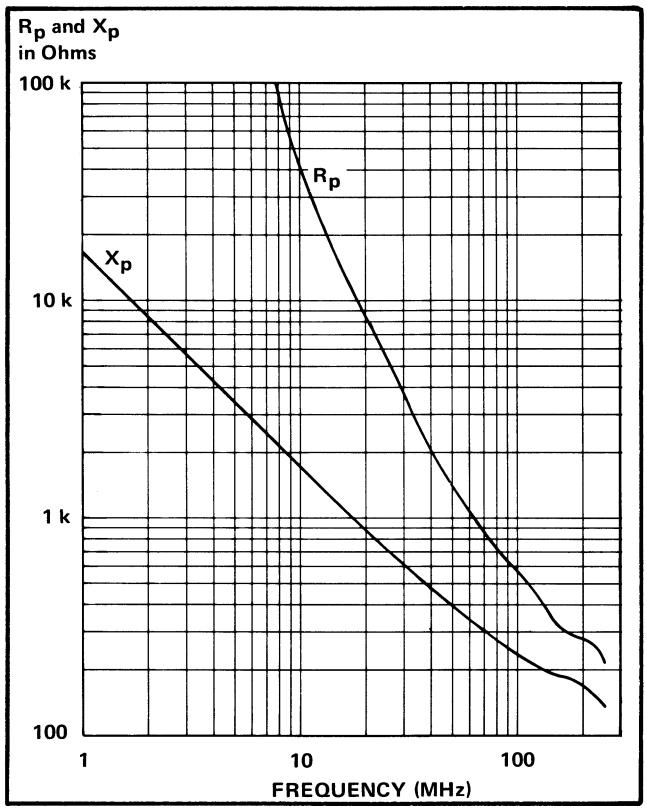



Fig. 2-4. P6054 Probe (3.5-foot cable), typical $X_p$, $R_p$ versus frequency curves at an ambient temperature of 25°C.

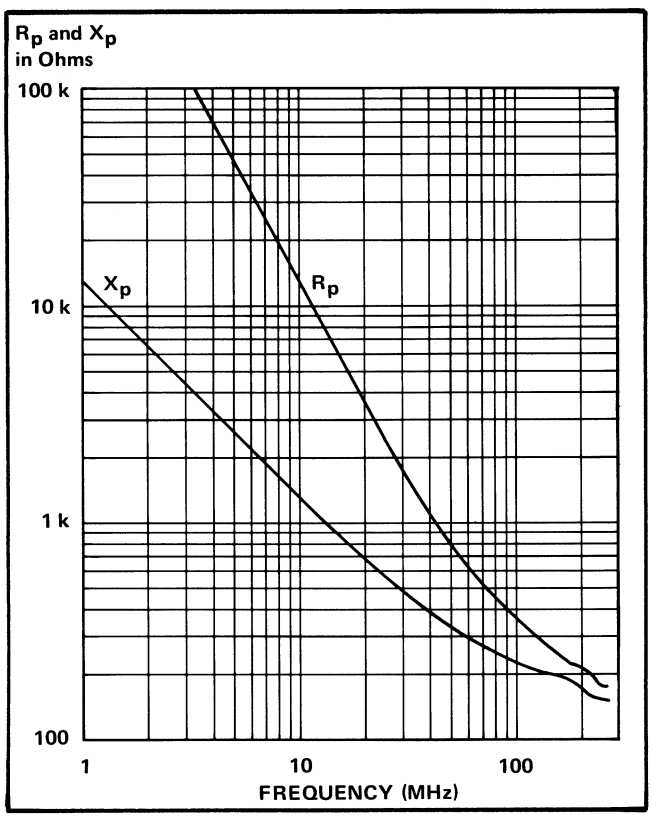



Fig. 2-5. P6054 Probe (6.0-foot cable), typical $X_p$, $R_p$ versus frequency curves at an ambient temperature of 25°C.

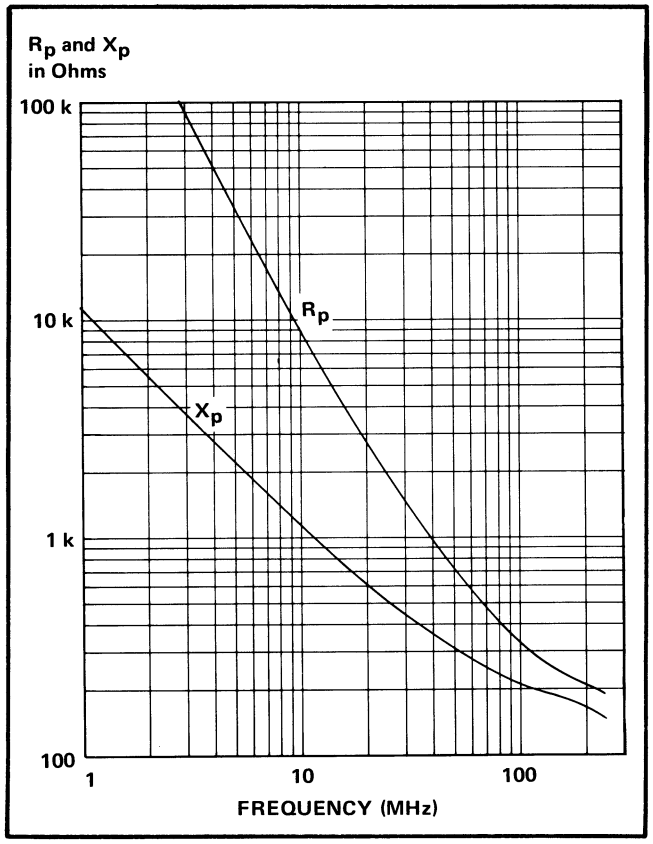



Fig. 2-6. P6054 Probe (9.0-foot cable), typical $X_p$, $R_p$ versus frequency curves at an ambient temperature of 25°C.

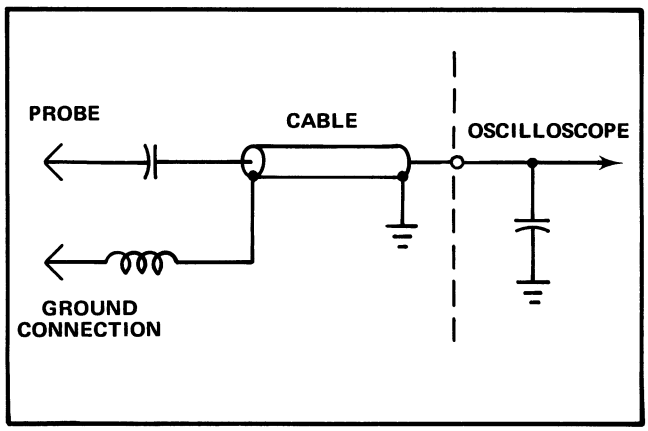



Fig. 2-7. Series-resonant circuit formed by excessive lead length in probe ground return.

The inductance that appears on the ground side may also apply to the probe tip if short lengths of wire are connected to extend the tip. Therefore, try to touch the probe tip directly to the signal source for all waveform measurements.[1]

## Compensation Box Cover Removal

The compensation box cover is a snap-fit type. See Fig. 3-1 for directions on removal.

[1] Measurement Concept Booklet; Probe Measurements, Tektronix Part No. 062-1120-00, is a recommended treatise on probe use and measurement evaluation.

# SECTION 3
# MAINTENANCE

## General

The P6054 Probe is an extremely rugged device, but is susceptible to damage if treated carelessly. Avoid kinking or straining the cable or subjecting the probe to excessive environmental conditions. When not in use, probes should be stored in drawers or supported by the plastic probe hangers supplied with the probe.

If the probe is damaged, replacement parts are available through your local Tektronix Field Office or representative. The mechanical and electrical parts lists at the back of this manual provide the Tektronix part numbers for the components, and instructions on how to order replacement parts.

Substitution of **non-standard** parts is **not** advisable if the original performance is to be restored. Even shortening the cable by more than a few percent will have a noticeable effect on the probe's transient response. The resistive center conductor has been specifically selected to damp and eliminate the reflections that would exist in an undetermined system. If this resistive element is reduced, the reflections will not be properly damped and may cause noticeable signal distortions.

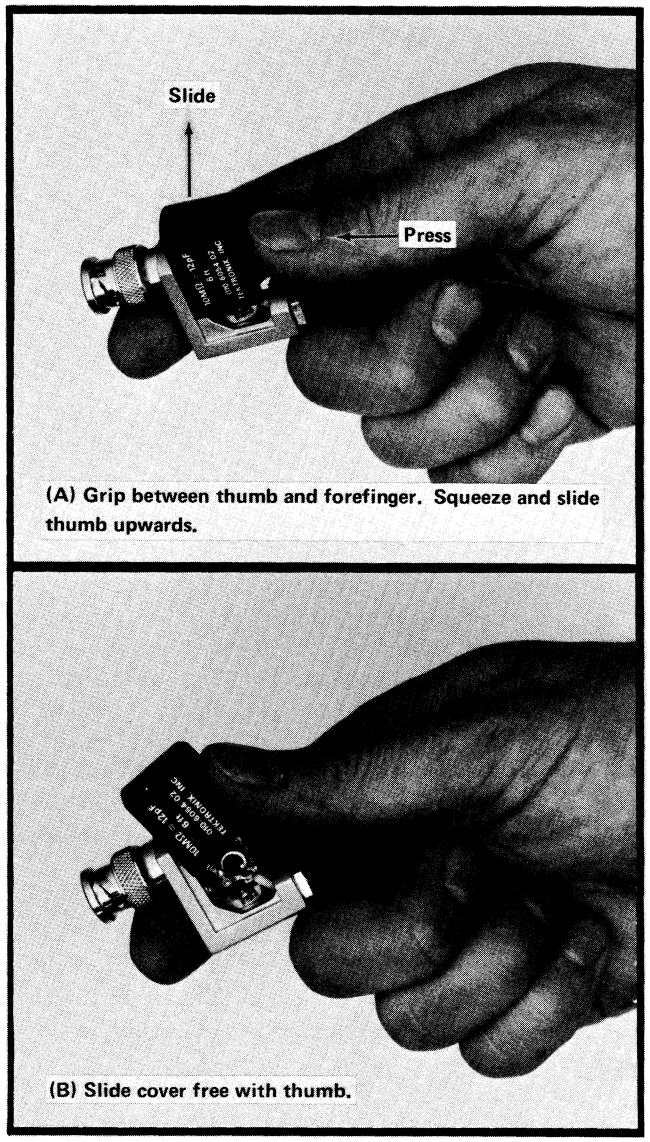
Refer to Figs. 3-2 and 3-3 for location of the adjustments on the circuit board.

## Connector Replacement

1. Remove the snap-fit cover on the compensation box. See Fig. 3-1 for instructions.

2. Unsolder the center conductor of the connector from the circuit board. Tilt the board back away from the connector while applying heat to the conductor to achieve separation.

3. Loosen the 7/16-inch nut (part of the connector), unscrew, and remove the connector.




(A) Grip between thumb and forefinger. Squeeze and slide thumb upwards.

(B) Slide cover free with thumb.

Fig. 3-1. Removal of cover on compensation box.

4. Install the new connector, performing steps 1 through 3 (above) in reverse order. Keep board tilted back away from the connector until the 7/16-inch nut is tightened.

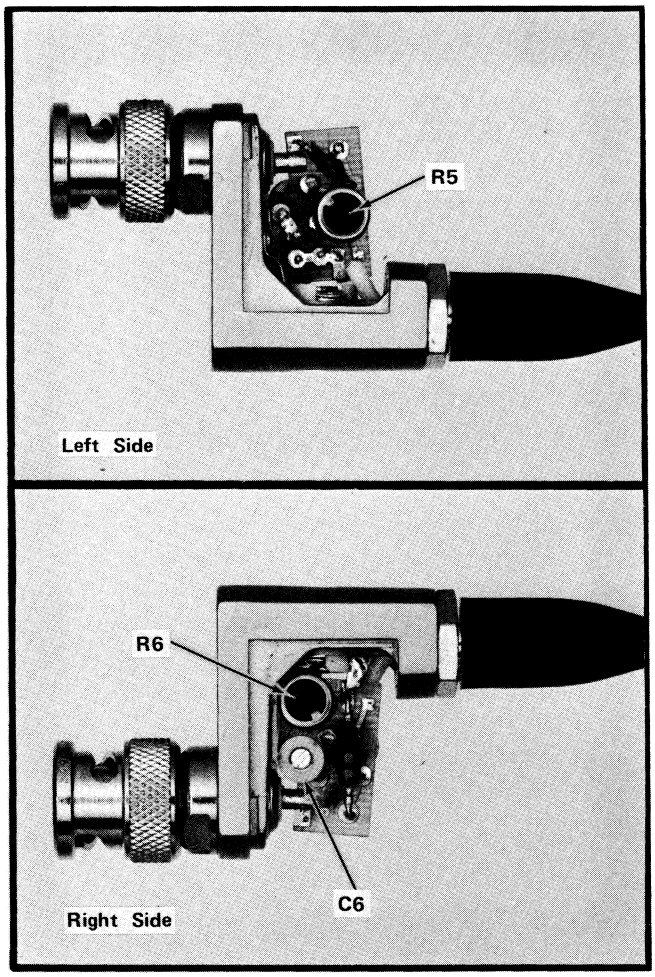



Fig. 3-2. P6054 Probe (3.5-foot cable); location of adjustments on circuit board in compensation box.

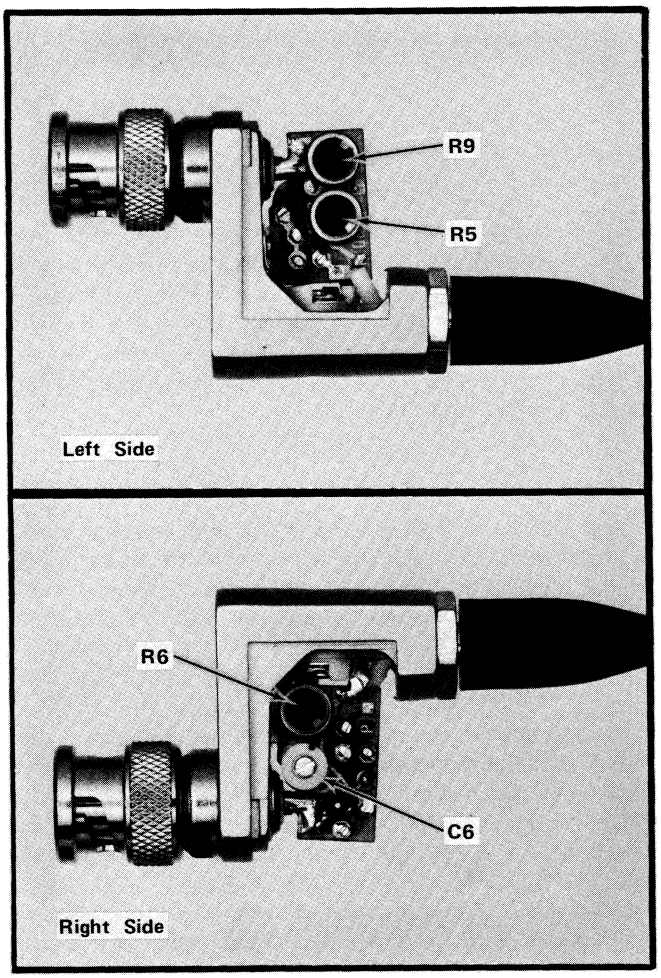



Fig. 3-3. P6054 Probe (6.0- and 9.0-foot cables); location of adjustments on circuit board in compensation box.

## Cable Replacement

1. Remove the snap-fit cover on the compensation box. (See Fig. 3-1.)

2. Unsolder the cable center conductor from the circuit board.

3. Remove the 7/16-inch cable bushing from the compensation box.

4. Unscrew the probe body from the cable.

5. Unsolder the cable center conductor from the resistor/capacitor lead (located in the probe head).

6. Pull the resistor/capacitor assembly from the holder.

7. Insert the resistor/capacitor assembly into the holder of the new probe cable and re-assemble the probe, reversing the procedure given in steps 1 through 6 above.

# SECTION 4
# PERFORMANCE CHECK/CALIBRATION

## Introduction

The following procedure may be used to check performance of the P6054 as tabulated in Section 1, or it will serve as a calibration procedure. By performing the complete procedure, the probe is checked and restored to its original performance standards. The recommended equipment listed is required for both the Performance Check and Calibration procedure. Equipment setup pictures, control settings, and most waveform photographs apply to both procedures.

Limits, tolerances, and waveforms provided in the calibration steps are furnished as guides to calibrating the probe. They are not intended as instrument specifications.

Low-frequency compensation of the probe is required whenever the probe is changed from one instrument to another. If optimum performance is desired, the high-frequency compensation must be checked and adjusted as necessary when changing the probe to another instrument or input channel.

## Equipment and Test Fixtures Required

The following list of equipment or its equivalent is required to perform a performance check or calibration. Some of the recommended equipment specifications may exceed requirements; however, substitute equipment must meet or exceed these minimum specifications.

Special Tektronix calibration fixtures are used to facilitate the procedure. These fixtures are available from Tektronix, Inc. and may be ordered through your local Tektronix Field Office or representative.

1. Test oscilloscope with 150 MHz or greater bandwidth. The Tektronix Type 454A Oscilloscope is used in this procedure.

2. Constant Amplitude Signal Generator, output signal selectable up to 1.0 V P-P into 50 Ω at 3 MHz and from 100 MHz to 200 MHz; Tektronix Calibration Fixture 067-0532-01.

3. Pulse Generator, output amplitude range of 0 to 5 V into 50 Ω, pulse risetime 0.25 ns; Tektronix Type 109 Pulse Generator.

4. 60-nanosecond Transmission Line; Tektronix Type 113 Delay Cable.

5. (Two) Cables, 5 ns, 50-Ω coaxial Type RG213 with GR connectors; Tektronix Part No. 017-0502-00.

6. Termination Adapter, 50 Ω Probe tip-to-GR; Tektronix Part No. 017-0088-00.

7. Attenuator, 10X, 50 Ω with GR connectors; Tektronix Part No. 017-0078-00.

8. Termination, 50 Ω thru-line, GR-to-BNC male; Tektronix Part No. 017-0083-00.

9. (Optional). Adapter, probe tip-to-BNC male; Tektronix Part No. 013-0084-01.

## PERFORMANCE CHECK AND CALIBRATION

The following abridged procedure may be used as a performance check or calibration procedure guide by the experienced calibrator, or it may be used as a record. (Tektronix, Inc. authorizes reproduction of the abridged procedure by any user of the equipment.) The step numbers and titles are identical to those used in the complete procedure. When the instrument meets the requirements in the Performance Check steps, the P6054 Probe will meet all Electrical Characteristics listed under Performance Requirement in Section 1.

1. Check/Adjust Probe Low-Frequency Compensation

Probe Compensation range is ≤14 pF to ≥25 pF. (Adjustable to match 15 pF to 24 pF inputs.)

2. Check Attenuation

Attenuation is 10X ±3%.

3. Check/Adjust High-Frequency Compensation

Waveform distortion is ⩽+3%, −3%, or 3% P-P.

4. Check Step Response Risetime

Probe risetime is: ⩽0.7 ns (3.5- and 6.0-foot cables); ⩽2.0 ns (9.0-foot cable).

## Preliminary Procedure

a. Install the P6054 Probe on the Ch 1 Input of the test oscilloscope.

b. Preset the front-panel controls as follows:

**Test Oscilloscope (Channel 1)**

| | |
|---|---|
| Coupling | DC |
| Volts/Div | 20 mV |
| Variable | Cal |
| Bandwidth | Full |
| Mode | Ch 1 |
| Trigger | Norm |
| Position | Centered |

**Test Oscilloscope (Time Base)**

| | |
|---|---|
| Horiz Display | A |
| Mag | Off |
| A Time/Div | 1 ms |
| A Variable | Cal |
| A Sweep Mode | Auto Trig |
| A Sweep Length | Full |
| A Triggering | |
| Level | 'O' (centered) |
| HF Stab | Centered |
| Slope | + |
| Coupling | AC |
| Source | Int |
| Position | Centered |

c. Turn the test oscilloscope power on and allow enough warmup time for the instrument to stabilize.

## 1. Check/Adjust Probe Low-Frequency Compensation ◐

Requirement—Probe compensation range: ⩽14 pF to ⩾25 pF. (Probe must adjust to match 15 pF to 24 pF inputs including their accuracy tolerances.)

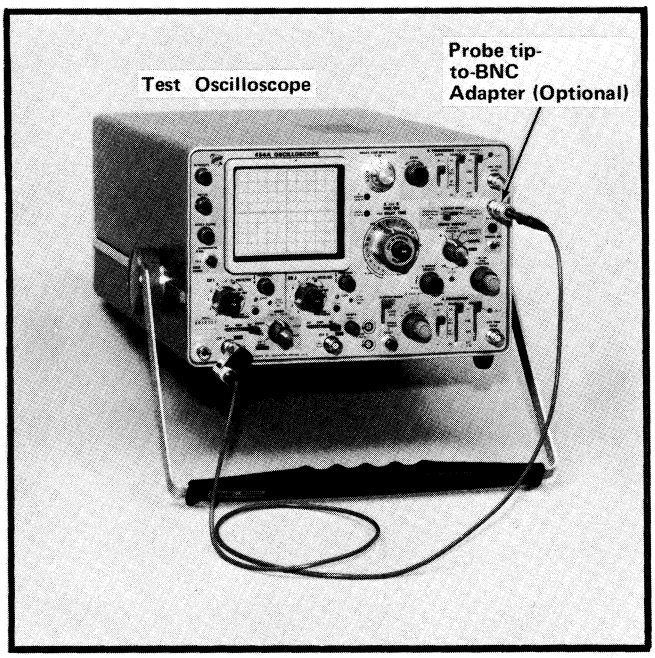



**Fig. 4-1. Equipment setup for steps 1 and 2.**

a. Equipment setup is shown in Fig. 4-1.

b. Connect the P6054 Probe tip to the 1 V Cal output connector. A probe tip-to-BNC male adapter (013-0084-01) may be used to eliminate the need for holding the probe in position. Adjust the Triggering Level control for a triggered display.

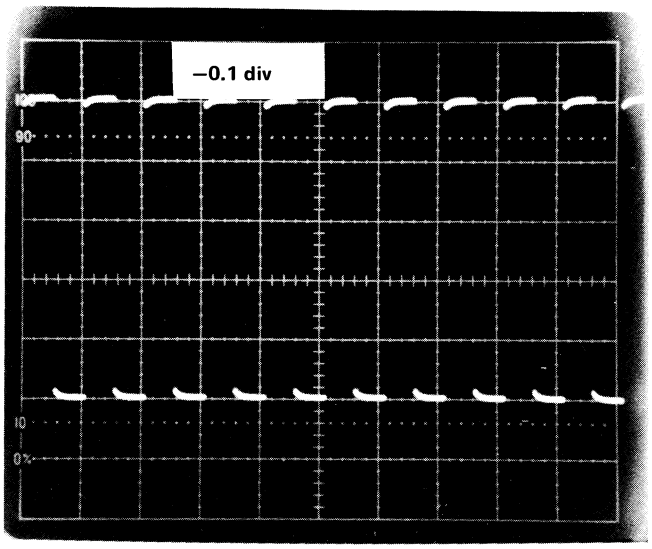
c. CHECK—The compensation range (14 pF or less to 25 pF or more) of the P6054 Probe as follows:

1. Adjust the compensation (C8, see Fig. 2-3) for maximum rolloff or undershoot of the pulse front corner.

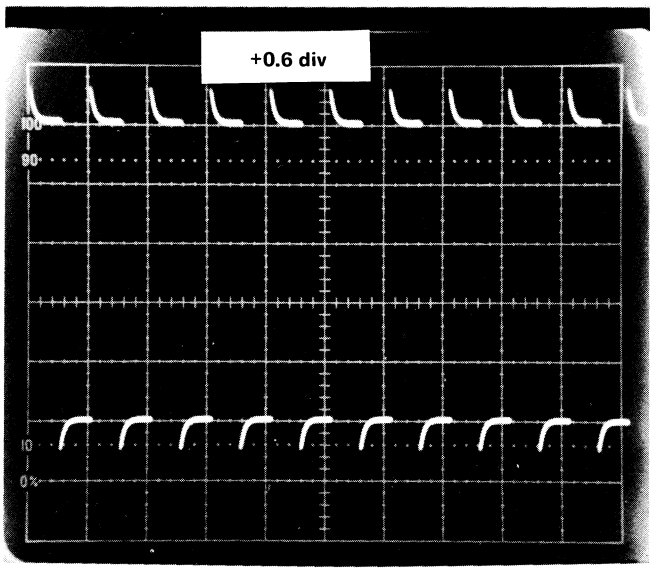
2. Check—Rolloff or undershoot must equal or exceed 2% of the 5 division square wave, or −0.1 division. See Fig. 4-2. This verifies that the probe compensation adjustment will compensate to a vertical amplifier input capacitance of 15 pF, ±0.5 pF.

3. Adjust the compensation for maximum overshoot of the pulse front corner.

4. Check—Overshoot must equal or exceed 12% of the 5 division square wave, or +0.6 division. See Fig. 4-2. This verifies that the probe will compensate to a vertical amplifier input capacitance of 24 pF, ±1.0 pF.




(A) Range required to compensate to 14 pF input capacitance.




(B) Range required to compensate to 25 pF input capacitance.

Fig. 4-2. Measurement of probe low-frequency compensation range.

d. Recompensate the probe to the test oscilloscope input capacitance.

## 2. Check 10X Attenuation

Requirement—10X ±3% attenuation.

a. Equipment setup is shown in Fig. 4-1.

b. Turn the Triggering Level control fully clockwise. The display should be two reference lines 5 divisions apart.

c. CHECK—Display amplitude must equal 5 (±0.15) major divisions. This tolerance does not include any error present in the test oscilloscope Calibrator or input attenuator.

## 3. Check/Adjust High-Frequency Compensation ◐

Requirement—Waveform distortion (aberrations) should not exceed +3%, −3%, or 3% P-P.

a. Equipment setup is shown in Fig. 4-3(A).

b. Connect the 50 Ω Output of the Type 109 Pulse Generator through a GR 10X attenuator, a 5 ns, 50 Ω cable, and a 50 Ω termination with GR-to-BNC male connectors to the Ch 1 Input of the test oscilloscope.

c. Set the Type 109 Voltage Range switch to 5.0 and the Pulse Polarity to +.

d. Set the Time/Div on the test oscilloscope to 0.05 μs/div and adjust the Triggering Level control for a triggered display.

If the test oscilloscope used is a 454A, set the Volts/Div to 10 mV. For the 453, 453A, and 454, set the Volts/Div to 20 mV.

e. Adjust the Amplitude control on the Type 109 for a pulse amplitude of 5 divisions.

f. Note the pulse shape and aberrations.

g. Remove the 10X attenuator, the 50 Ω cable, and the termination from the Type 109 and the test oscilloscope. Connect the P6054 Probe to the test oscilloscope Ch 1 Input.

h. Connect the probe tip to the 50 Ω Output of the Type 109, using a probe tip-to-GR termination adapter, 017-0088-00. See Fig. 4-3(B) for this setup.

i. CHECK—High-frequency response, by comparing the probe/oscilloscope pulse response against the response obtained in step f. Aberrations from the reference response should not exceed +3%, −3%, or 3% P-P of the pulse amplitude (or 0.15 div).

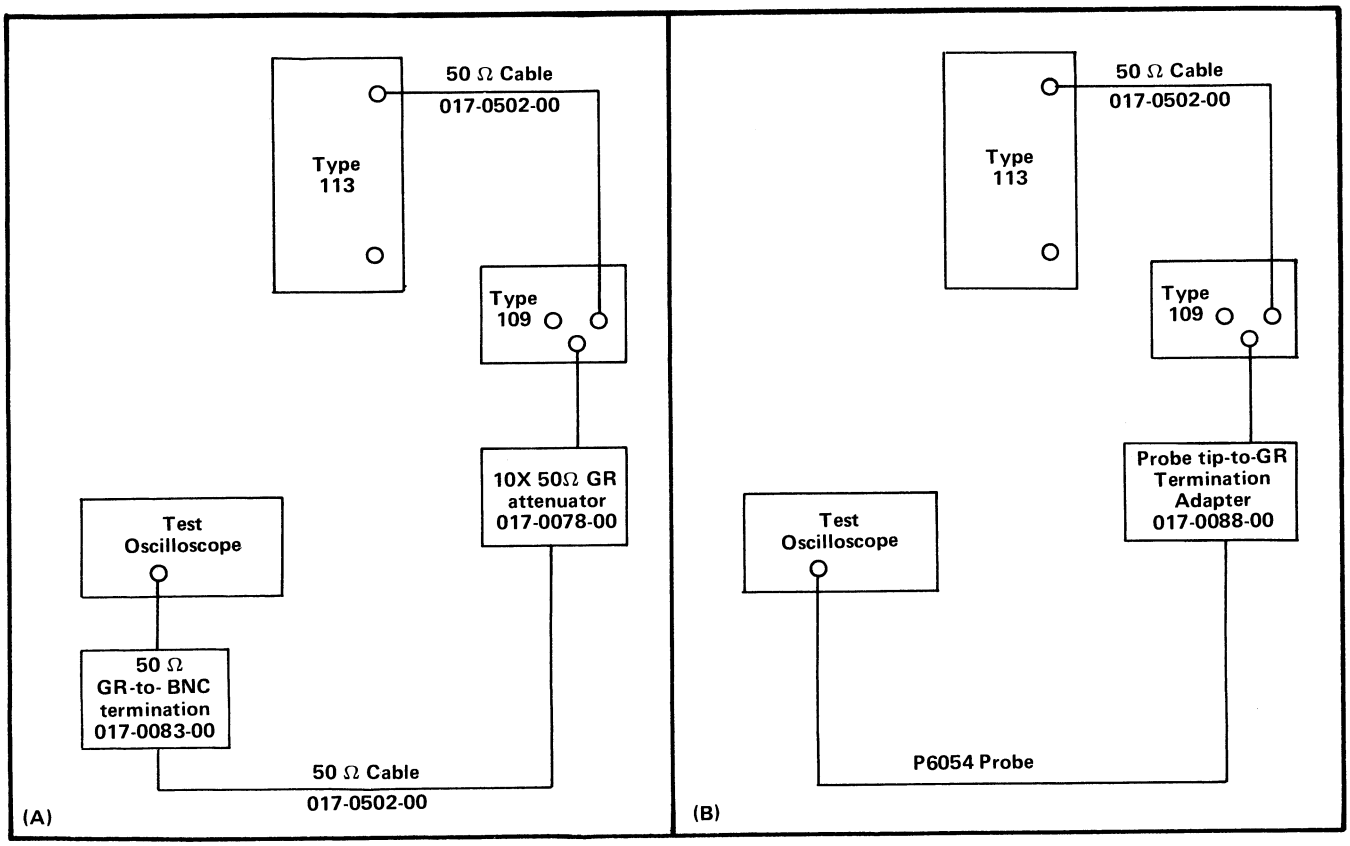



**Fig. 4-3. Equipment setup for step 3.**

j. If aberrations are excessive, proceed as follows:

3.5-Foot Cable

1) Remove the compensation box cover. (See Fig. 3-1 for directions).

2) Adjust R5 and R6 for the best overall flat response. Fig. 3-2 shows component locations.

3) Adjust C6 for the best corner response (without ringing).

4) Repeat parts 2 and 3 as necessary for best waveform.

5) Recheck the waveform with the compensation box cover installed. Perform adjustments as necessary to obtain the correct waveform after the cover is installed. See Fig. 4-4.

6.0- and 9.0-Foot Cables

1) Remove the compensation box cover. (See Fig. 3-1.)

2) Adjust R5, R6, and R9 for best overall flat response. (See Fig. 3-3 for component locations.)

3) Adjust C6 for the best corner response (without ringing).

4) Repeat parts 2 and 3 as necessary for best waveform.

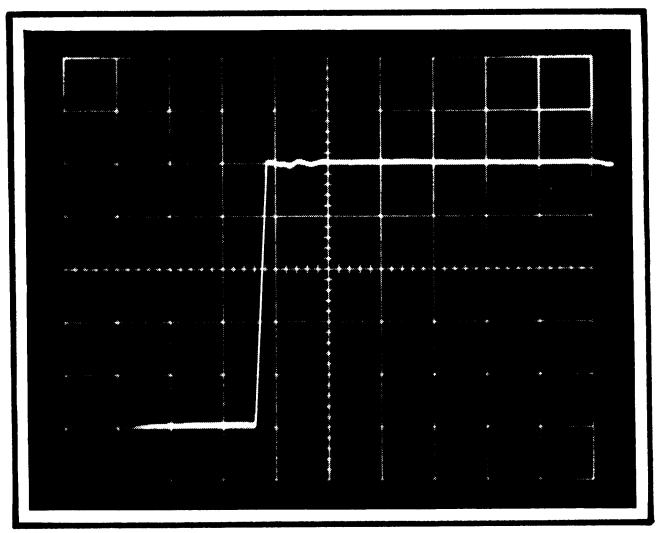


**Fig. 4-4. Probe response to a fast-rise pulse input signal (risetime ≤0.25 ns). Note that aberrations are ≤3% (0.15 div).**

5) Recheck the waveform with the compensation box cover installed. Perform adjustments as necessary to obtain the correct waveform after the cover is installed. See Fig. 4-4.

## 4. Check Step Response Risetime

Requirement—Risetime ($T_r$): ≤0.7 ns (3.5- and 6.0-foot cables);
($T_r$): ≤2.0 ns (9.0-foot cable).

*NOTE*

*Fast-rise characteristics of the P6054 Probe make direct measurement of the risetime difficult to resolve. Therefore, we calculate risetime from bandwidth measurements. ($T_r$ = 0.35/BW). Risetime of the probe is more rapid than that of the test oscilloscope, but may be calculated from the formula:*

$$T_r(probe) = \sqrt{T_r(system)^2 - T_r(scope)^2}$$

a. Equipment setup is shown in Fig. 4-5.

b. Apply a 3.0 MHz signal from the Constant Amplitude Signal Generator through a GR 10X attenuator and a 50 Ω termination with GR-to-BNC male connectors to the Ch 1 Input of the test oscilloscope.

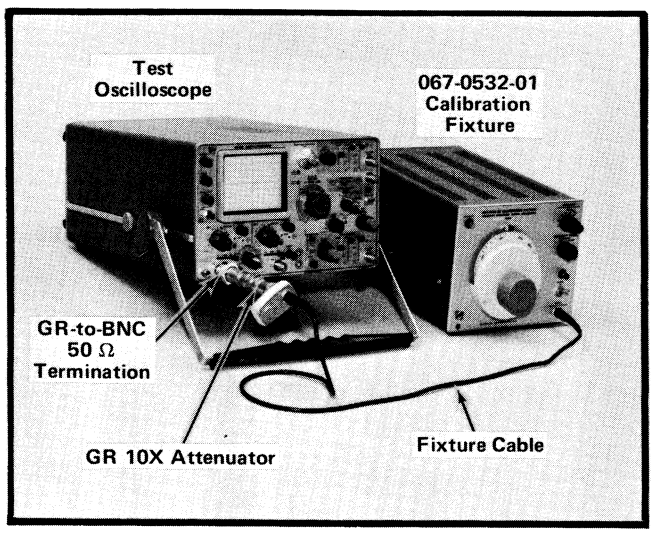



**Fig. 4-5. Equipment setup for step 4.**

c. Set the Time/Div on the test oscilloscope to 10 μs and the Volts/Div to 10 mV (set the 453, 453A, and 454 to 20 mV).

d. Set the Amplitude range control on the Constant Amplitude Signal Generator to 0.5 volt and the Variable control for a reference display amplitude of 5 divisions.

e. Set the Frequency Range selector on the Constant Amplitude Signal Generator to 65-500 MHz. Then rotate the frequency dial upwards from 65 MHz until the display amplitude drops to 3.5 divisions. This level is 70% of the reference amplitude, or −3 dB. Record the frequency reading.

f. Remove the 50 Ω termination and the GR 10X attenuator from the oscilloscope and from the output connector of the Constant Amplitude Signal Generator. Connect the P6054 Probe to the Ch 1 Input on the test oscilloscope. Then connect the probe tip to the output connector of the Constant Amplitude Signal Generator, using a probe tip-to-GR termination adapter, 017-0088-00.

g. Reset the Constant Amplitude Signal Generator for a display amplitude of 5 divisions at 3.0 MHz. Then, increase the frequency until the display amplitude drops to 3.5 divisions. Record the frequency reading.

h. Calculate risetimes from parts e and g. Risetime = 0.35/BW.

Example:

System bandwidth = 170 MHz, risetime = 2.06 ns

Scope bandwidth = 180 MHz, risetime = 1.95 ns

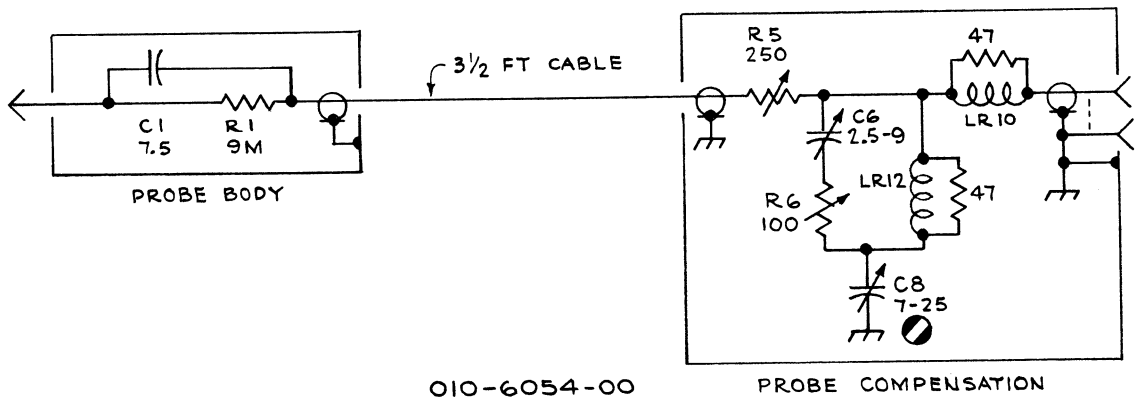
Risetime (probe) $= \sqrt{T_r(system)^2 - T_r(scope)^2}$

$= \sqrt{2.06^2 - 1.95^2}$

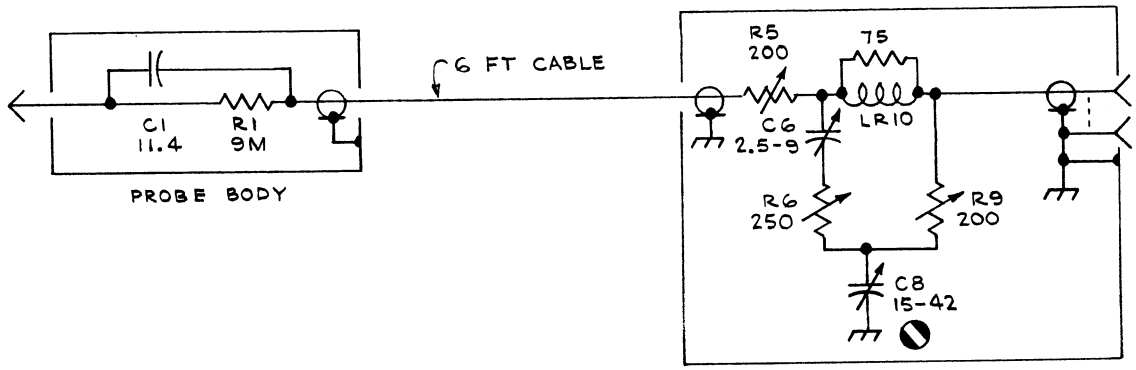
$= \sqrt{4.24 - 3.80}$

$= \sqrt{0.44} = 0.66$ ns

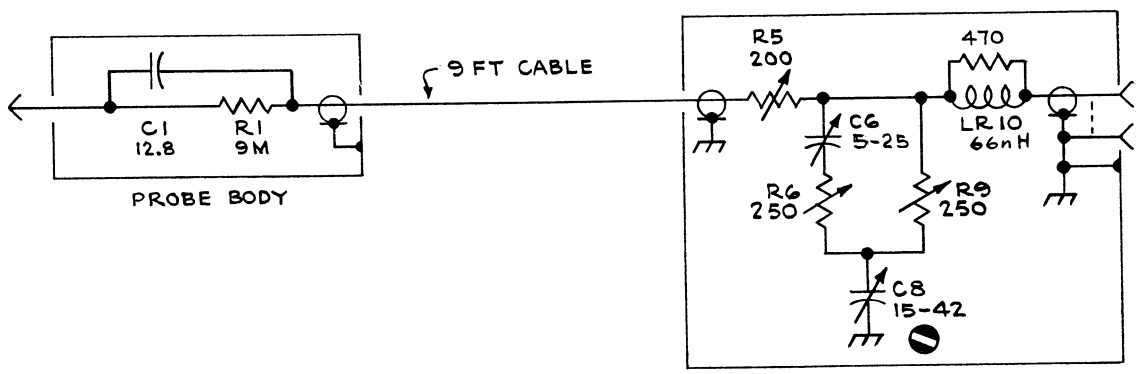
This completes the performance check and/or calibration for the P6054 Probe. If the probe has met or exceeded all checks, it will meet all electrical specification requirements listed under Performance Requirements in Section 1.




010-6054-00 PROBE COMPENSATION




010-6054-02 PROBE COMPENSATION




010-6054-04 PROBE COMPENSATION

# ELECTRICAL PARTS LIST

## P6054 (3.5 foot cable)

Values are fixed unless marked Variable.

| Ckt. No. | Tektronix Part No. | Serial/Model No. Eff | Disc | Description | | | |
|---|---|---|---|---|---|---|---|
| | | | | **Capacitors** | | | |
| Tolerance ±20% unless otherwise indicated. | | | | | | | |
| C1 | 281-0722-00 | | | 7.5 pF | Cer | 500 V | +0.1 pF |
| C6 | 281-0122-00 | | | 2.5-9 pF, Var | Cer | 100 V | |
| C8 | 281-0175-00 | | | 7-25 pF, Var | Cer | 350 V | |
| | | | | **Inductors** | | | |
| LR10 | *108-0627-00 | | | 56 nH (wound on a 47 Ω, 1/8 W, 5% resistor) | | | |
| LR12 | *108-0628-00 | | | 290 nH (wound on a 43 Ω, 1/4 W, 5% resistor) | | | |
| | | | | **Resistors** | | | |
| Resistors are fixed, composition, ±10% unless otherwise indicated. | | | | | | | |
| R1 | 325-0021-00 | | | 9 MΩ | 1/4 W | Prec | 1% |
| R5 | 311-0978-01 | | | 250 Ω, Var | | | |
| R6 | 311-0622-01 | | | 100 Ω, Var | | | |

## P6054 (6 foot cable)

Values are fixed unless marked Variable.

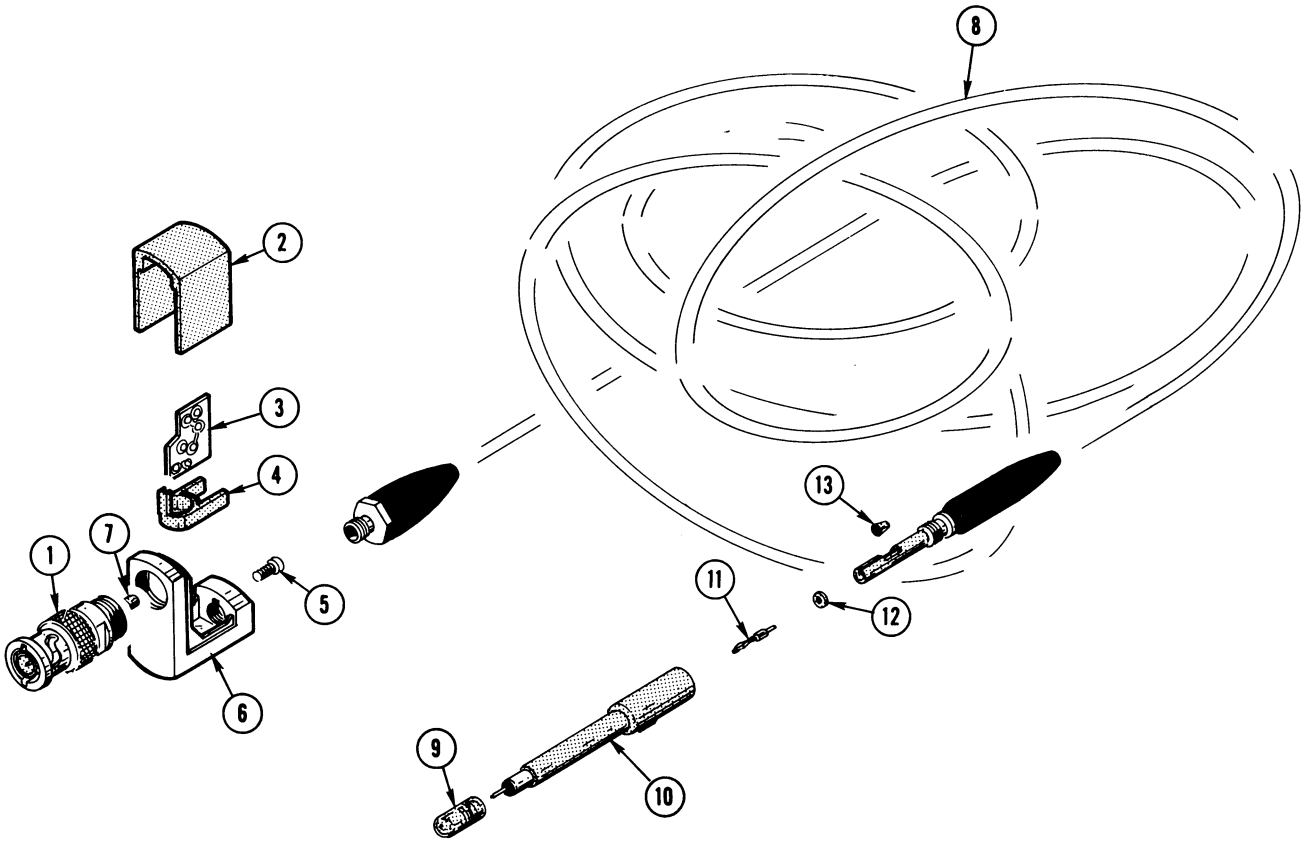
| Ckt. No. | Tektronix Part No. | Serial/Model No. Eff | Disc | Description | | |
|---|---|---|---|---|---|---|
| | | | **Capacitors** | | | |
| Tolerance ±20% unless otherwise indicated. | | | | | | |
| C1 | 281-0672-00 | | 11.4 pF | Cer | 500 V | 1% |
| C6 | 281-0122-00 | | 2.5-9 pF, Var | Cer | 100 V | |
| C8 | 281-0171-00 | | 15-42 pF, Var | Cer | 200 V | |
| | | | **Inductors** | | | |
| LR10 | 108-0602-00 | | 60 nH (wound on a 75 Ω, 1/8 W, 5% resistor) | | | |
| | | | **Resistors** | | | |
| Resistors are fixed, composition, ±10% unless otherwise indicated. | | | | | | |
| R1 | 325-0021-00 | | 9 MΩ | 1/4 W | Prec | 1% |
| R5 | 311-0605-01 | | 200 Ω, Var | | | |
| R6 | 311-0978-01 | | 250 Ω, Var | | | |
| R9 | 311-0605-01 | | 200 Ω, Var | | | |

## P6054 (9 foot cable)

Values are fixed unless marked Variable.

| Ckt. No. | Tektronix Part No. | Serial/Model No. Eff | Disc | Description | | | |
|---|---|---|---|---|---|---|---|
| | | | | **Capacitors** | | | |
| Tolerance ±20% unless otherwise indicated. | | | | | | | |
| C1 | 281-0727-00 | | | 12.8 pF | Cer | 500 V | 1% |
| C6 | 281-0123-00 | | | 5-25 pF, Var | Cer | 100 V | |
| C8 | 281-0171-00 | | | 15-42 pF, Var | Cer | 200 V | |
| | | | | **Inductor** | | | |
| LR10 | *108-0677-00 | | | 66 nH (wound on a 470 Ω, 1/8 W, 5% resistor) | | | |
| | | | | **Resistors** | | | |
| Resistors are fixed, composition, ±10% unless otherwise indicated. | | | | | | | |
| R1 | 325-0021-00 | | | 9 MΩ | 1/4 W | Prec | 1% |
| R5 | 311-0605-01 | | | 200 Ω, Var | | | |
| R6 | 311-0978-01 | | | 250 Ω, Var | | | |
| R9 | 311-0978-01 | | | 250 Ω, Var | | | |

## 3.5-Foot Probe Assembly

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| Fig. & Index No. | Tektronix Part No. | Serial/Model No. Eff | Disc | Qty | 1 2 3 4 5 | Description |
|---|---|---|---|---|---|---|
| | 010-6054-00 | | | 1 | | PROBE, P6054, 3.5 foot |
| | - - - - - - - - | | | - | | probe includes: |
| 1 | 131-0602-00 | | | 1 | | CONNECTOR, receptacle, electrical, female, BNC |
| 2 | 200-1158-02 | | | 1 | | COVER, compensating box |
| 3 | 670-0984-00 | | | 1 | | CIRCUIT BOARD ASSEMBLY—P6054 |
| | - - - - - - - - - - | | | - | | circuit board assembly includes: |
| | 381-1804-00 | | | 1 | | CIRCUIT BOARD |
| 4 | 354-0396-00 | | | 1 | | RING, capacitor mounting |
| 5 | 213-0121-00 | | | 1 | | SCREW, 0-80 X 0.093 inch, RHS |
| 6 | 426-0690-01 | | | 1 | | FRAME, compensating box |
| 7 | 103-0133-00 | | | 1 | | ADAPTER, connector, BNC to circuit board |
| 8 | 175-1173-00 | | | 1 | | CABLE ASSEMBLY, special purpose, electrical |
| 9 | 200-0372-00 | | | 1 | | CAP, end, plastic |
| 10 | 204-0447-00 | | | 1 | | BODY ASSEMBLY, probe |
| 11 | 214-0592-00 | | | 1 | | CONTACT, wire form |
| 12 | 210-1004-00 | | | 1 | | WASHER, guide, plastic |
| 13 | 210-0698-00 | | | 1 | | EYELET, 0.047 inch OD |

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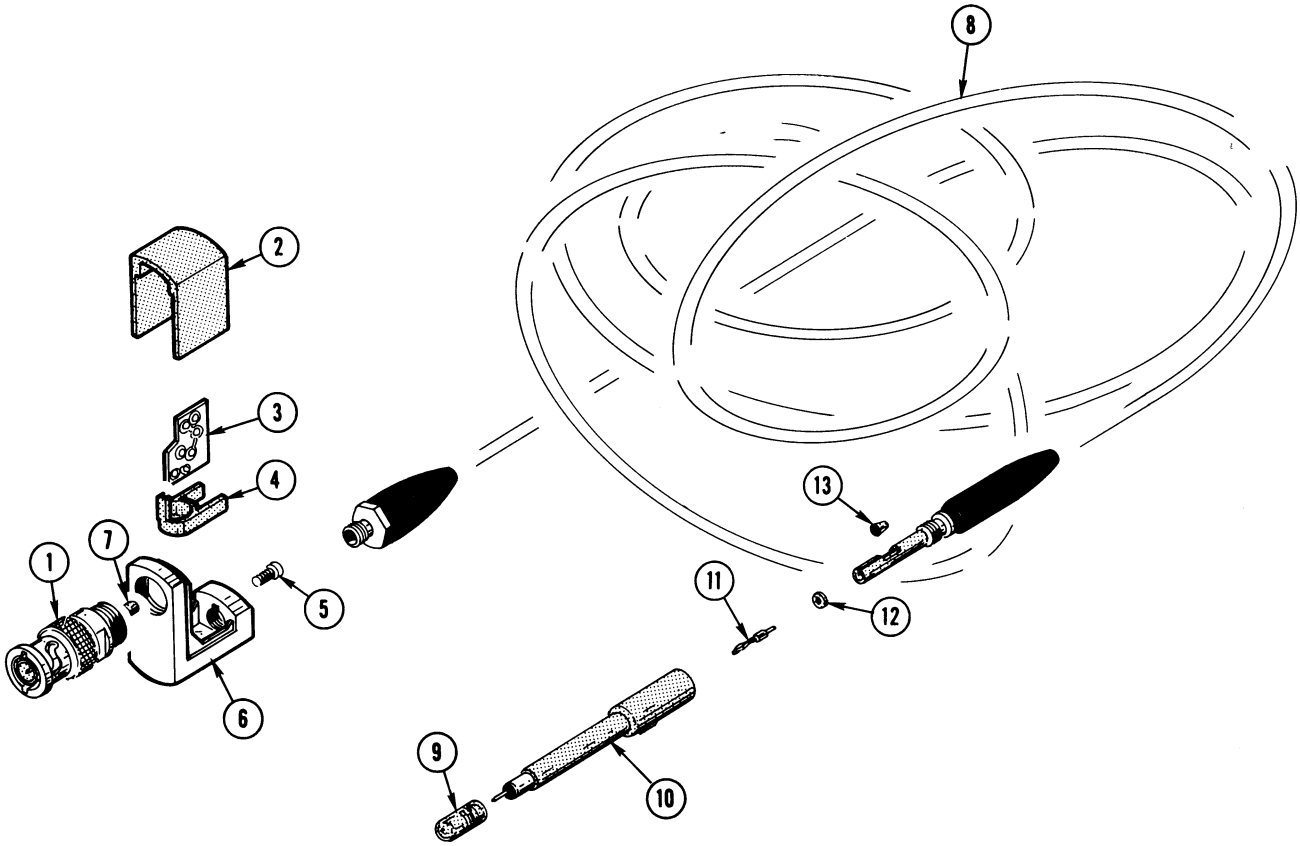
## 6-Foot Probe Assembly

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| Fig. & Index No. | Tektronix Part No. | Serial/Model No. Eff | Serial/Model No. Disc | Qty | 1 2 3 4 5 | Description |
|---|---|---|---|---|---|---|
| | 010-6054-02 | | | 1 | | PROBE, P6054, 6 foot |
| | - - - - - - - - - - | | | - | | probe includes: |
| 1 | 131-0602-00 | | | 1 | | CONNECTOR, receptacle, electrical, female, BNC |
| 2 | 200-1158-01 | | | 1 | | COVER, compensating box |
| 3 | 670-0983-00 | | | 1 | | CIRCUIT BOARD ASSEMBLY—P6054 |
| | - - - - - - - - - - | | | - | | circuit board assembly includes: |
| | 388-1803-00 | | | | | CIRCUIT BOARD |
| 4 | 354-0396-00 | | | 1 | | RING, capacitor mounting |
| 5 | 213-0121-00 | | | 1 | | SCREW, 0-80 X 0.093 inch, RHS |
| 6 | 426-0690-01 | | | 1 | | FRAME, compensating box |
| 7 | 103-0133-00 | | | 1 | | ADAPTER, connector, BNC to circuit board |
| 8 | 175-1174-00 | | | 1 | | CABLE ASSEMBLY, special purpose, electrical |
| 9 | 200-0372-00 | | | 1 | | CAP, end plastic |
| 10 | 204-0447-00 | | | 1 | | BODY ASSEMBLY, probe |
| 11 | 214-0592-00 | | | 1 | | CONTACT, wire form |
| 12 | 210-1004-00 | | | 1 | | WASHER, guide, plastic |
| 13 | 210-0698-00 | | | 1 | | EYELET, 0.047 inch OD |



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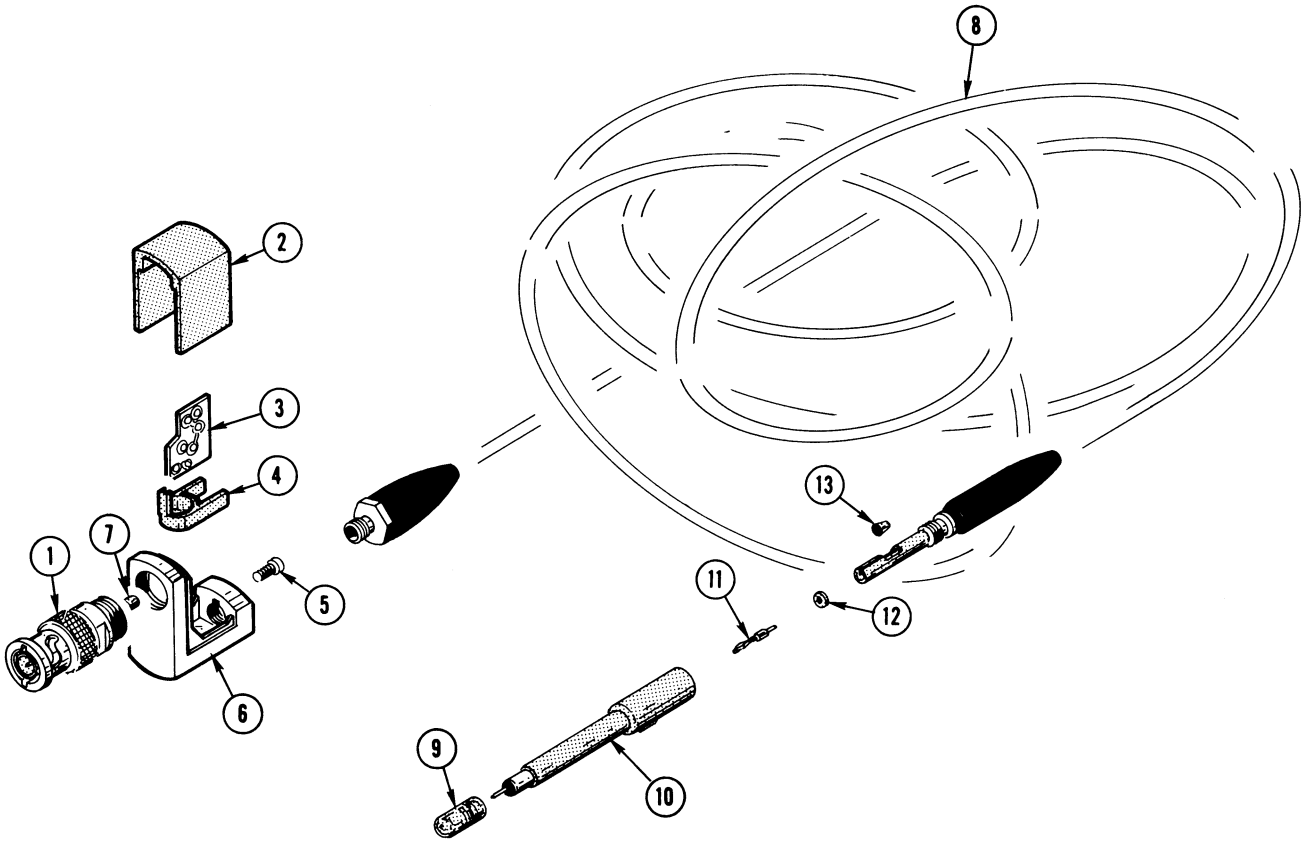
## 9-Foot Probe Assembly

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| Fig. & Index No. | Tektronix Part No. | Serial/Model No. Eff | Disc | Qty | 1 2 3 4 5 | Description |
|---|---|---|---|---|---|---|
| | 010-6054-04 | | | 1 | | PROBE, P6054, 9 foot |
| | - - - - - - - - - - | | | - | | probe includes: |
| 1 | 131-0602-00 | | | 1 | | CONNECTOR, receptacle, electrical, female, BNC |
| 2 | 200-1158-03 | | | 1 | | COVER, compensating box |
| 3 | 670-0996-00 | | | 1 | | CIRCUIT BOARD ASSEMBLY—P6054 |
| | - - - - - - - - - - | | | - | | circuit board assembly includes: |
| | 388-1842-00 | | | 1 | | CIRCUIT BOARD |
| 4 | 354-0396-00 | | | 1 | | RING, capacitor mounting |
| 5 | 213-0121-00 | | | 1 | | SCREW, 0-80 X 0.093 inch, RHS |
| 6 | 426-0690-01 | | | 1 | | FRAME, compensating box |
| 7 | 103-0133-00 | | | 1 | | ADAPTER, connector, BNC to circuit board |
| 8 | 175-1205-00 | | | 1 | | CABLE ASSEMBLY, special purpose, electrical |
| 9 | 200-0372-00 | | | 1 | | CAP, end, plastic |
| 10 | 204-0447-00 | | | 1 | | BODY ASSEMBLY, probe |
| 11 | 214-0592-00 | | | 1 | | CONTACT, wire form |
| 12 | 210-1004-00 | | | 1 | | WASHER, guide, plastic |
| 13 | 210-0698-00 | | | 1 | | EYELET, 0.047 inch OD |

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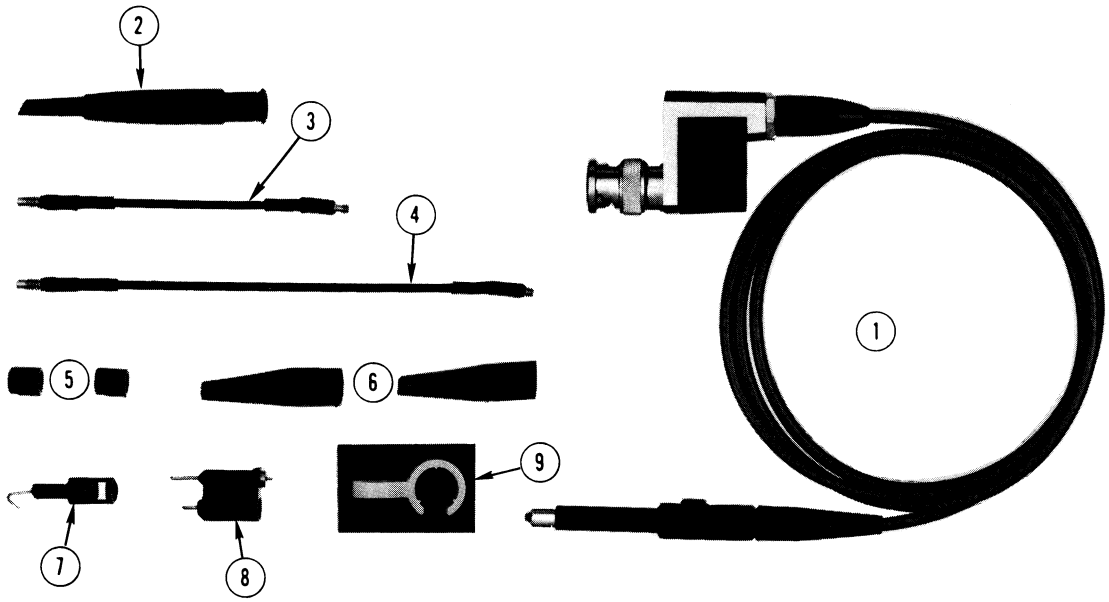


| Fig. & Index No. | Tektronix Part No. | Serial/Model No. Eff | Disc | Qty 1 2 3 4 5 | Description |
|---|---|---|---|---|---|
| | | | | | **PROBE PACKAGE** |
| 1-1 | 010-6054-01 | | | 1 | PROBE PACKAGE, P6054, 3.5 foot |
| thru | 010-6054-03 | | | 1 | PROBE PACKAGE, P6054, 6 foot |
| 1-9 | 010-6054-05 | | | 1 | PROBE PACKAGE, P6054, 9 foot |
| | ---------- | | | - | package includes: |
| | | | | | **PROBE ONLY** |
| 1-1 | 010-6054-00 | | | 1 | PROBE, P6054, 3.5 foot |
| | 010-6054-02 | | | 1 | PROBE, P6054, 6 foot |
| | 010-6054-04 | | | 1 | PROBE, P6054, 9 foot |
| | | | | | **STANDARD ACCESSORIES** |
| -2 | 013-0107-00 | | | 1 | TIP, probe retractable hook |
| -3 | 175-0848-00 | | | 1 | LEAD, electrical, 3 inches long |
| -4 | 175-0848-01 | | | 1 | LEAD, electrical, 5 inches long |
| -5 | 166-0404-01 | | | 2 | TUBE, insulating, plastic |
| -6 | 344-0046-00 | | | 2 | CLIP, probe |
| -7 | 206-0114-00 | | | 1 | TIP, probe |
| -8 | 013-0085-00 | | | 1 | ADAPTER, bayonet, ground |
| -9 | 352-0234-00 | | | 1 | HOLDER, probe |
| | 070-1110-00 | | | 1 | MANUAL, instruction (not shown) |