

# Instruction Manual



## **P6133 10X Passive Probe for 2400 Series Oscilloscopes**

**070-5795-04**

### **Warning**

The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries prior to performing service.

**[www.tektronix.com](http://www.tektronix.com)**



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## WARRANTY

Tektronix warrants that the products that it manufactures and sells will be free from defects in materials and workmanship for a period of one (1) year from the date of purchase from an authorized Tektronix distributor. If any such product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product. Batteries are excluded from this warranty.

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, shipping charges prepaid, and with a copy of customer proof of purchase. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-Tektronix supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

**THIS WARRANTY IS GIVEN BY TEKTRONIX WITH RESPECT TO THE LISTED PRODUCTS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. TEKTRONIX AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TEKTRONIX' RESPONSIBILITY TO REPAIR OR REPLACE DEFECTIVE PRODUCTS IS THE SOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY. TEKTRONIX AND ITS VENDORS WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER TEKTRONIX OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.**

## Contacting Tektronix

|                       |  |
|-----------------------|--|
| Product support       | <p>For questions about using Tektronix measurement products, call toll free in North America:<br/>1-800-833-9200<br/>6:00 a.m. – 5:00 p.m. Pacific time</p> <p>Or contact us by e-mail:<br/>tm_app_supp@tek.com</p> <p>For product support outside of North America, contact your local Tektronix distributor or sales office.</p> |
| Service support       | <p>Tektronix offers extended warranty and calibration programs as options on many products. Contact your local Tektronix distributor or sales office.</p> <p>For a listing of worldwide service centers, visit our web site.</p>   |
| For other information | <p>In North America:<br/>1-800-833-9200<br/>An operator can direct your call.</p>  |
| To write us           | <p>Tektronix, Inc.<br/>P.O. Box 500<br/>Beaverton, OR 97077-1000<br/>USA</p>   |
| Web site              | <p><a href="http://www.tektronix.com">www.tektronix.com</a></p>  |

# General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

*Only qualified personnel should perform service procedures.*

## To Avoid Fire or Personal Injury

**Connect and Disconnect Properly.** Do not connect or disconnect probes or test leads while they are connected to a voltage source.

**Observe All Terminal Ratings.** To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

The common terminal is at ground potential. Do not connect the common terminal to elevated voltages.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

**Do Not Operate With Suspected Failures.** If you suspect there is damage to this product, have it inspected by qualified service personnel.

**Do Not Operate in Wet/Damp Conditions.**

**Do Not Operate in an Explosive Atmosphere.**

**Keep Product Surfaces Clean and Dry.**

## Symbols and Terms

**Terms in this Manual.** The following terms may appear in this manual:



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**WARNING.** *Warning statements identify conditions or practices that could result in injury or loss of life.*

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## Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* before performing any service procedures.

**Do Not Service Alone.** Do not perform internal service or adjustments to this product unless another person capable of rendering first aid and resuscitation is present.

# Operating Basics

The P6133 probe is a 150 MHz, 10X, 2 meter, passive voltage probe designed specifically for use with Tektronix 2400 Series oscilloscopes having bandwidths less than or equal to 150 MHz.

The P6133 standard probe comes with a 2 meter cable length (1.3 meter length is also available) and the Tektronix Subminiature probe tip/hybrid assembly, which is fully compatible with the Tektronix Subminiature family of accessories.

The P6133 Option 25 probe comes with the Compact Series probe tip/hybrid assembly and is available in 1.3 meter length only. The Compact size probe tip/hybrid assembly is slightly larger in diameter than the Subminiature, offering greater durability and ruggedness in those environments and applications where required. The Compact tip is not compatible with the Subminiature series and is supplied with its own accessories.

Optional accessories are available for both tip sizes. You can also convert the Subminiature and Compact probe tip/hybrid assemblies to the Tektronix Miniature series probe tip by using the subminiature/compact-to-miniature probe tip adapter (see the optional accessories sections for the individual probe types).



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**WARNING.** *To avoid electric shock when using the probe, do not touch the metallic portions of the probe head while connected to a voltage source.*

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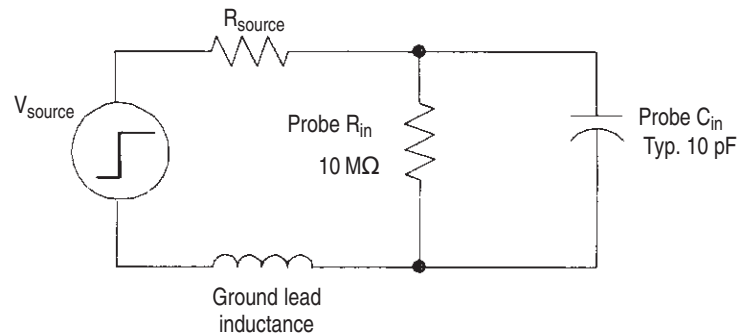
## Probe Compensation

Due to variations in oscilloscope input characteristics, probe low-frequency compensation should be checked and or adjusted if you move the probe from one oscilloscope input to another. Connect the probe tip to a 1 kHz square wave signal (such as the oscilloscope calibrator output) and use a nonconductive low-reactance alignment tool to adjust the probe compensation capacitor.

See page 9 for complete low-frequency and high-frequency compensation adjustment procedures.

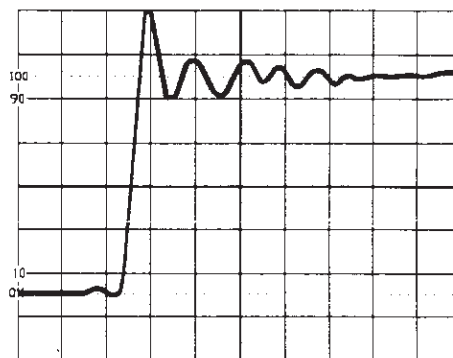
## Inductive Effects of Probe Grounding

Ground lead inductance can significantly reduce the performance of a probe. As shown in Figure 1, the ground lead inserts inductance into the signal path forming a series-resonant circuit with the probe input capacitance  $C_{in}$  and  $R_{source}$  as damping. This forms a resonant circuit with  $f_0 = 1 \div (2\pi \sqrt{LC})$ .



**Figure 1: Circuit model: test point and probe input**

A six-inch ground lead has approximately 150 nH of inductance, which produces an  $f_0$  of approximately 130 MHz within the frequency response of the instrument. This greatly degrades rise time, bandwidth, and transient accuracy as shown in Figure 2.



**Figure 2: Step response with six-inch ground lead**

For best results, ensure that ground lead inductance is at a minimum.



### Low-Inductance Ground Lead

The low-inductance ground lead provided with all Tektronix P6133 probes allows for a substantial reduction in ground-lead inductance, approximately 32 nH instead of 150 nH.

To install the low-inductance ground lead, refer to Figure 3 and perform the following steps:

1. Unscrew and remove the ribbed-tip shell and slide off the ground collar with ground lead.
2. Slip on the low-inductance ground lead collar (1) and reinstall the ribbed plastic tip cover.
3. Install the low-inductance lead (2) from the accessory pack.

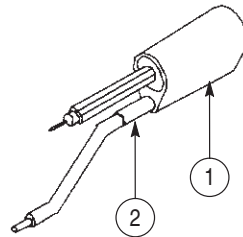


Figure 3: Low-inductance ground lead

## Grounding the Probe

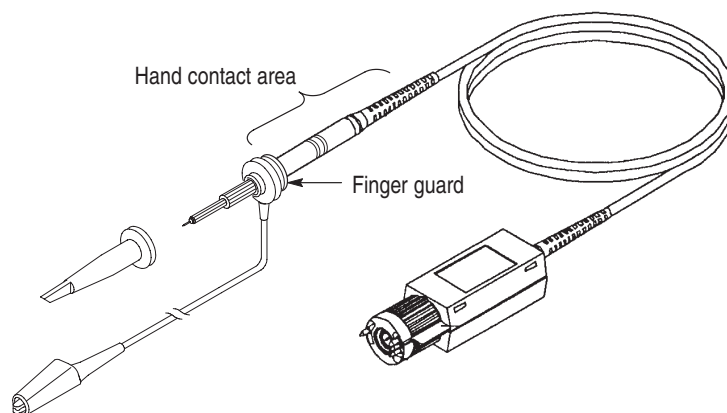
Connect the probe to the instrument and connect the ground lead to ground before making any measurement. Ensure that no part of the ground lead contacts voltage in the circuit under test. Except for the probe tip and BNC center conductor, all accessible metal (including the ground clip) is connected to the BNC shell.



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**WARNING.** To avoid electric shock when using the probe, keep your fingers behind the finger guard on the probe body. See Figure 4 below.

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**Figure 4: Probe finger guard and hand contact area**

# Specifications

The characteristics listed in Table 1 apply to P6133 probes installed on Tektronix 2400 Series oscilloscopes unless otherwise noted.

Specifications apply when the instrument warms up for a period of at least 10 minutes in an environment that does not exceed the limits described in Table 2 on page 6.

**Table 1: Electrical characteristics<sup>1</sup>**

| Characteristic                       | Description   |
|--------------------------------------|---|
| Attenuation <sup>2</sup>             | 10X: ±1% at DC  |
| Input resistance <sup>2,3</sup>      | 10 MΩ ±1% at DC   |
| Input capacitance <sup>3</sup>       |   |
| 1.3 m                                | 11.4 pF (Option 01)<br>10.8 pF (Option 25)  |
| 2 m                                  | 12.7 pF (Standard)  |
| Compensation range                   | 10 pF to 25 pF  |
| Signal delay                         | Delay difference between any two probes is less than 200 ps.  |
| Maximum system bandwidth (–3 dB)     |   |
| 1.3 m                                | 150 MHz   |
| 2 m                                  | 150 MHz   |
| Maximum Input Voltage <sup>4,5</sup> | 300 V RMS CAT I or 300 V DC CAT I<br>150 V RMS CAT II or 150 V DC CAT II<br>100 V RMS CAT III or 100 V DC CAT III<br>425 V peak, @50% DF, <1 sec PW<br>650 V peak, @20% DF, <1 sec PW<br>750 V peak, @10% DF, <50 μs PW<br>See Figure 7 for voltage derating curve. |

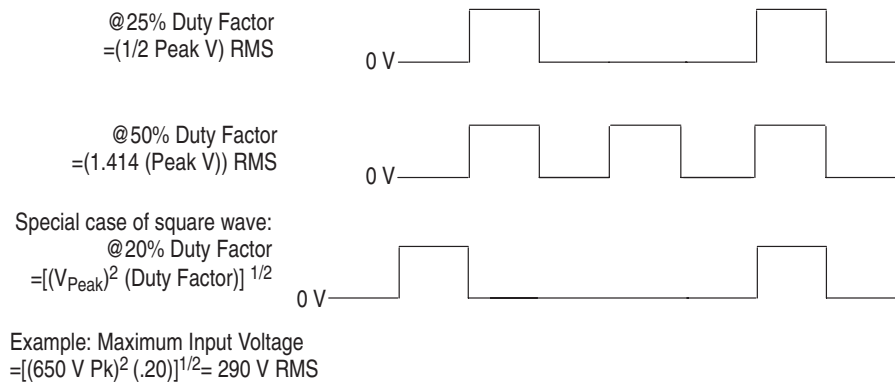
<sup>1</sup> Probe installed on Tektronix 150 MHz (or less) 2400 Series oscilloscope.

<sup>2</sup> System characteristic.

<sup>3</sup> Also see Figure 6.

<sup>4</sup> As defined in EN61010-1. See Certifications and compliances in Table 4

<sup>5</sup> RMS=Root Mean Square=rms=The square root of the average of the sum of the squares of the instantaneous voltage in one cycle =  $\sqrt{\sum (fx_i)^2/n}$  .  
300 VDC=300V RMS, 420 V Peak (sinewave)=300 V RMS See Figure 5.



**Figure 5: Maximum input voltage calculation example**

**Table 2: Environmental characteristics**

| Characteristic        | Description  |
|-----------------------|--|
| Temperature range     |  |
| Operating             | -15° C to 65° C (+5° F to 149° F)  |
| Nonoperating          | -62° C to 85° C (-80° F to 185° F)   |
| Humidity <sup>1</sup> | Five cycles (120 hr) at 95% to 97% relative humidity, per Tektronix standard 062-2847-00, Class 3. |
| Altitude              | < 2000 meters  |

<sup>1</sup> Tektronix standard 062-2847-00, class 3. Refer to MIL-E-16400F, paragraph 4.5.9 through 4.5.9.5.1, class 4.

**Table 3: Physical characteristics**

| Characteristic          | Description                                  |
|-------------------------|--|
| Net weight <sup>1</sup> | 1.3 m, 108 g (3.8 oz)<br>2 m, 129 g (4.8 oz) |
| Probe cable length      | 1.3 m (4.3 ft)<br>2 m (6.6 ft)               |

<sup>1</sup> Includes accessories.

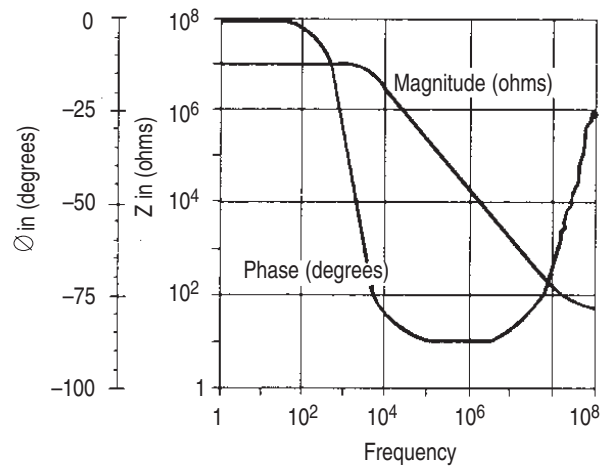


Figure 6: Typical P6133 input impedance

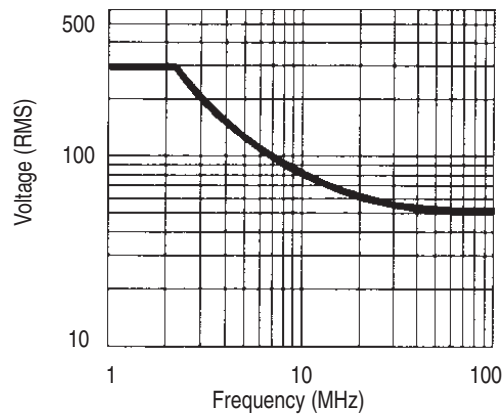


Figure 7: Typical P6133 voltage derating

**Table 4: Certifications and compliances**

|                                     |   |           |  |         |  |        |   |       |   |
|-------------------------------------|---|-----------|--|---------|--|--------|---|-------|---|
| <p>EC Declaration of Conformity</p> | <p>Compliance was demonstrated to the following specification as listed in the Official Journal of the European Communities:</p> <p>Low Voltage Directive 73/23/EEC as amended by 93/68/EEC:</p> <p>EN 61010-1/A2                      Safety requirements for electrical equipment for measurement, control, and laboratory use</p> <p>EN 61010-2-031:1994              Particular requirements for hand-held probe assemblies for electrical measurement and test</p> |           |  |         |  |        |   |       |   |
| <p>Overvoltage Category</p>         | <table border="0"> <tr> <td>Category:</td> <td>Examples of Products in this Category:</td> </tr> <tr> <td>CAT III</td> <td>Distribution-level mains, fixed installation</td> </tr> <tr> <td>CAT II</td> <td>Local-level mains, appliances, portable equipment</td> </tr> <tr> <td>CAT I</td> <td>Signal levels in special equipment or parts of equipment, telecommunications, electronics</td> </tr> </table>  | Category: | Examples of Products in this Category: | CAT III | Distribution-level mains, fixed installation | CAT II | Local-level mains, appliances, portable equipment | CAT I | Signal levels in special equipment or parts of equipment, telecommunications, electronics |
| Category:                           | Examples of Products in this Category:  |           |  |         |  |        |   |       |   |
| CAT III                             | Distribution-level mains, fixed installation  |           |  |         |  |        |   |       |   |
| CAT II                              | Local-level mains, appliances, portable equipment   |           |  |         |  |        |   |       |   |
| CAT I                               | Signal levels in special equipment or parts of equipment, telecommunications, electronics   |           |  |         |  |        |   |       |   |
| <p>Pollution Degree 2</p>           | <p>Do not operate in environments where conductive pollutants may be present.</p>   |           |  |         |  |        |   |       |   |
| <p>Safety</p>                       | <p>UL3111-1, First Edition &amp; IEC61010-2-031, First Edition<br/>         CSA C22.2 No. 1010.1-92 &amp; CAN/CSA C22.2 No. 1010.2.031-94<br/>         EN61010-1/A2<br/>         EN61010-2-031<br/>         Pollution Degree 2</p>  |           |  |         |  |        |   |       |   |

# Service Information



**WARNING.** The following instructions are for use by qualified service personnel only. To avoid electrical shock, do not disassemble or maintain the probe while it is connected to a signal source other than those specified in this procedure.

## Adjustment Procedure

This section contains procedures to adjust the P6133 probe low-frequency and high-frequency compensation. Always perform the low-frequency compensation adjustment before proceeding to the high-frequency compensation adjustment.

Table 5 lists the recommended test equipment needed to perform the adjustment procedures.

**Table 5: Test equipment**

| Description                   | Minimum requirements   | Example product   |
|-------------------------------|--|---|
| Oscilloscope                  | Input Resistance: $1\text{ M}\Omega \pm 0.5\%$<br>Input Capacitance: 10 pF to 25 pF<br>Bandwidth (-3dB): 150 MHz                     | Tektronix 2445B   |
| Calibration generator         | Pulse Rise Time: $\leq 1\text{ ns}$<br>Amplitude: 0.5 V into $50\ \Omega$<br>Rep Rate: 100 kHz                                       | Wavetek 9100 Universal Calibration System with Oscilloscope Calibration Module (Option 250)<br><br>Fluke 5500A Multi-product Calibrator with Oscilloscope Calibration Option 5500A-SC |
| Leveled sine wave generator   | Amplitude adjustable to at least $1\text{ V}_{p-p}$ into $50\ \Omega$ . Frequency range must exceed 150 MHz, fixed 50 kHz reference. |   |
| Precision coaxial cable       | $50\ \Omega$ BNC   | Tektronix 012-0482-XX   |
| 10X attenuator                | $50\ \Omega$ BNC   | Tektronix 011-0059-XX   |
| Adapters                      | For Subminiature tip use:<br><br>Subminiature-to-BNC, $50\ \Omega$ terminated Adapter, BNC-to-probe                                  | Tektronix 001-0049-XX<br>Tektronix 013-0195-XX  |
|                               | For Compact tip use:<br><br>$50\ \Omega$ terminated, Compact-to-BNC BNC-female-to-BNC-female   | Tektronix 013-0227-XX<br>Tektronix 013-0028-XX  |
| Low-reactance adjustment tool | Insulated, low-reactance type  | Tektronix 003-1433-XX   |

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**NOTE.** *To ensure accurate measurements, warm up all test equipment according to the manufacturer's recommendations before making any adjustments.*

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### **Low-Frequency Compensation**

To adjust the probe low-frequency compensation do the following:

1. Connect the P6133 probe to the oscilloscope CH 1 input.
2. Set the oscilloscope controls for 100 mV (includes probe 10X attenuation), 1 ms, and DC coupling.
3. Use the hook tip to connect the probe to the oscilloscope calibrator output.
4. Set the triggering and amplitude controls for a stable display of approximately five square wave cycles and an amplitude of four divisions at center screen.
5. Use the low-reactance nonconductive adjustment tool to adjust LF COMP (low-frequency compensation) for the squarest waveform front corner edge. Refer to Figures 8 and 9 for further details.
6. Disconnect the test setup.

### **High-Frequency Compensation**

To adjust the probe high-frequency compensation do the following:

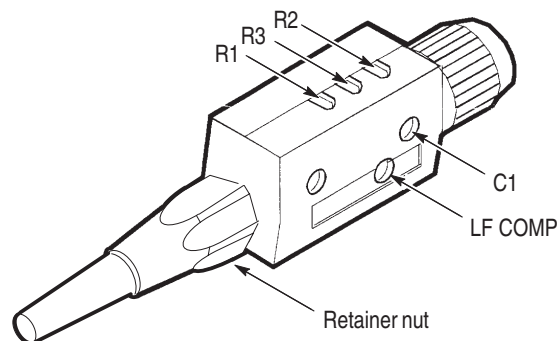
1. Connect the positive fast-rise output of the calibration generator through the BNC cable and 10X attenuator to the oscilloscope CH 1 input.
2. Set the oscilloscope controls for 10 mV, 20 ns, and 50  $\Omega$  coupling.
3. Adjust the pulse amplitude to produce a 5 division display on the oscilloscope.
4. Set the triggering controls for a stable display and center the waveform on-screen.
5. Note the system aberrations for comparison in step 9.
6. Remove the BNC cable and 10X attenuator connecting the oscilloscope to calibration generator. Connect the P6133 probe to the oscilloscope CH 1 input.
7. Connect the probe tip through the probe-tip-to-BNC 50  $\Omega$  adapter and the female BNC-to-BNC adapter (or the 50  $\Omega$  terminator and the probe-tip adapter) to the positive fast-rise output of the calibration generator.
8. Set the oscilloscope coupling to the 1 M $\Omega$  DC position.



9. Note the high-frequency aberrations in the first 30 ns (in addition to the system aberrations noted in step 5).
10. If the probe aberrations are greater than  $\pm 4\%$ , 6% peak to peak, proceed to step 11 below. If the probe aberrations are typical ( $\leq \pm 4\%$ , 6% peak to peak), proceed to step 17.
11. Disconnect the probe from the signal source and the oscilloscope.
12. Unscrew the compensation box retainer nut about two complete turns and lift the cover out and up. Retighten the retainer nut.
13. Reconnect the probe to the signal source and oscilloscope.

See Figure 8 for the location of all adjustments to follow and Figure 9 for identification of the waveform area affected by each adjustment. The high-frequency adjustments affect probe bandwidth. A small overshoot on the leading edge of the pulse may be necessary to meet the bandwidth specification.

14. Adjust R1 for the best overall flat response.
15. Adjust R2 for the best corner response.
16. Disconnect the probe from the signal source and reinstall the compensation box cover by performing step 12 above in reverse order.
17. Disconnect the test setup.

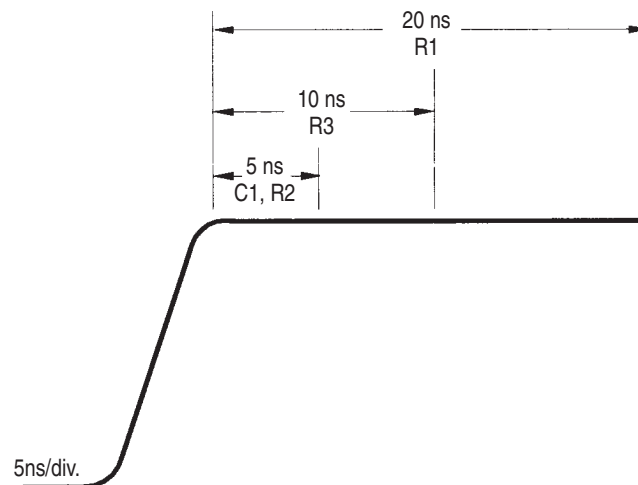


**Figure 8: High-frequency adjustments locations**

**Bandwidth Check**

To adjust the probe bandwidth do the following:

1. Connect the P6133 probe output to the oscilloscope CH 1 input.
2. Connect the probe tip through the 50  $\Omega$  adapters and BNC cable to the output of the leveled sine wave generator (as described in the *High-Frequency Compensation* procedure on page 10).
3. Set the oscilloscope controls for 100 mV (includes 10X attenuator), 1 ms, and 1M $\Omega$  DC coupling.
4. Set the leveled sine wave generator frequency to 50 kHz.
5. Adjust the generator output amplitude to produce a 6-division display on the oscilloscope and center the waveform on screen.
6. Set the generator frequency range to the high-frequency position.
7. Slowly increase the setting of the variable frequency control until the display amplitude decreases to 4.2 divisions ( $-3$  dB).
8. Check the sine wave generator frequency readout. The frequency must be greater than or equal to the specified P6133 probe system bandwidth. See page 5.
9. If the reading is less than the required value, repeat the *High-Frequency Compensation* adjustments beginning on page 10.



**Figure 9: High-frequency adjustment effects on waveform areas**

## Maintenance

Use the following procedures to clean and maintain the P6133 probe.

**Cleaning** To remove accumulated dirt from the probe exterior, use a soft cloth dampened with a nonresidue cleaner, preferably isopropyl alcohol. In particular, avoid solvents such as benzene, toluene, xylene, or acetone.

**Probe Module Replacement** Modular construction has been used to simplify repair. The probe tip assembly, compensation box, and cable are available as separate units through your local Tektronix field office or representative. Individual components within the compensation box are not replaceable. See page 15 for a list of replaceable parts.

The probe tip assembly unscrews from the probe head/cable assembly. To disconnect the cable from the compensation box, do the following:

1. Unscrew the compensation box retainer nut about two complete turns.
2. Pull out the cable until it separates from the compensation box.
3. To reconnect the cable to the compensation box, implement the above procedure in reverse.



# Replaceable Parts

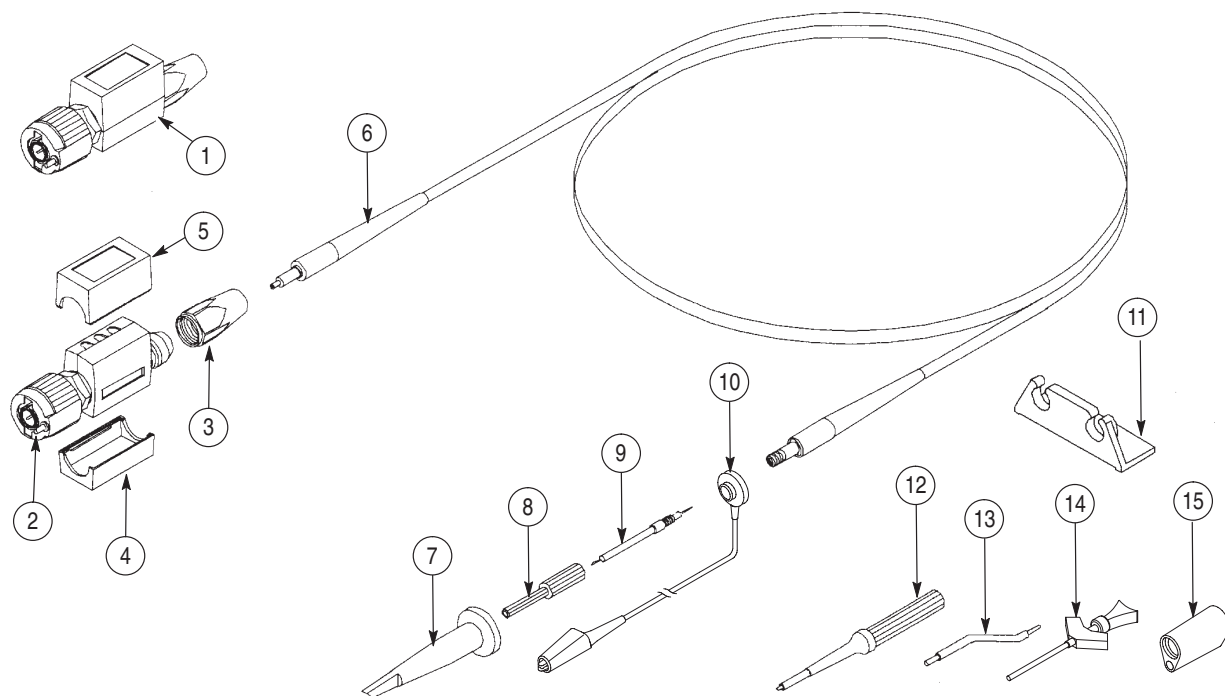


Figure 10: P6133 probe with Option 01 and standard accessories

## Replaceable parts: P6133 probe with Option 01 and standard accessories

| Fig. & index number | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name & description                   | Mfr. code | Mfr. part number |
|---------------------|-----------------------|----------------------|----------------------|-----|--------------------------------------|-----------|------------------|
| <b>P6133 PROBE</b>  |                       |                      |                      |     |                                      |           |                  |
| 10-1                | 206-0350-00           |                      |                      | 1   | COMP BOX ASSY:2M                     | 80009     | 206-0350-00      |
| -2                  | 131-3219-00           |                      |                      | 1   | CONN,RF PLUG:BNC,MALE                | 24931     | 28P266-3         |
| -3                  | 200-3018-00           |                      |                      | 1   | COVER,CABLE NIP:COMP BOX             | 0J260     | ORDER BY DESC    |
| -4                  | 200-3017-00           |                      |                      | 1   | COVER,COMP BOX:BOTTOM,ABS SLATE GRAY | TK2565    | 200-3017-00      |
| -5                  | 200-3016-00           |                      |                      | 1   | COVER,COMP BOX:TOP,ABS DOVE GRAY     | TK2565    | 200-3016-00      |
| -6                  | 174-0971-00           |                      |                      | 1   | CABLE ASSY,RF:39 OHM COAX,2.0M       | TK2469    | 174-0971-00      |
| -7                  | 013-0208-02           |                      |                      | 1   | TIP,PROBE:SUBMINIATURE SIZE          | TK2565    | 013-0208-02      |
| -8                  | 204-0925-01           |                      |                      | 1   | BODY SHL,PROBE                       | TK2565    | 204-0925-01      |
| -9                  | 206-0265-12           |                      |                      | 1   | TIP,PROBE:10X,12.5PF,CLEAR YELLOW    | 80009     | 206-0265-12      |
| -10                 | 196-3305-00           |                      |                      | 1   | LEAD,ELECTRICAL:22 AWG,6.0 L,W/CLIP  | 060D9     | 196-3305-00      |
| -11                 | 352-0351-00           |                      |                      | 1   | HOLDER,PROBE:BLACK ABS P6000 SERIES  | 7X318     | 1127             |

Replaceable parts: P6133 probe with Option 01 and standard accessories (cont.)

| Fig. & index number                            | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name & description                     | Mfr. code | Mfr. part number |
|--|-----------------------|----------------------|----------------------|-----|--|-----------|------------------|
| <b>P6133 PROBE OPTION 01</b>                   |                       |                      |                      |     |  |           |                  |
| 10 -1  | 206-0349-00           |                      |                      | 1   | COMP BOX ASSY:1.3M                     | 80009     | 206-0349-00      |
| -2   | 131-3219-00           |                      |                      | 1   | CONN,RF PLUG:BNC,MALE                  | 24931     | 28P266-3         |
| -3   | 200-3018-00           |                      |                      | 1   | COVER,CABLE NIP:COMP BOX               | 0J260     | ORDER BY DESC    |
| -4   | 200-3017-00           |                      |                      | 1   | COVER,COMP BOX:BOTTOM,ABS SLATE GRAY   | TK2565    | 200-3017-00      |
| -5   | 200-3016-00           |                      |                      | 1   | COVER,COMP BOX:TOP,ABS DOVE GRAY       | TK2565    | 200-3016-00      |
| -6   | 174-0973-00           | 8805                 |                      | 1   | CABLE ASSY,RF:39 OHM COAX,1.3M         | TK2469    | 174-0973-00      |
| -7   | 013-0208-02           |                      |                      | 1   | TIP,PROBE:SUBMINIATURE SIZE            | TK2565    | 013-0208-02      |
| -8   | 204-0925-01           |                      |                      | 1   | BODY SHL,PROBE:P6130                   | TK2565    | 204-0925-01      |
| -9   | 206-0265-13           |                      |                      | 1   | TIP,PROBE:10X,11.3PF,CLEAR/CLEAR       | 80009     | 206-0265-13      |
| <b>P6133 PROBE OPT 01 STANDARD ACCESSORIES</b> |                       |                      |                      |     |  |           |                  |
| 10 -10   | 196-3305-00           |                      |                      | 1   | LEAD,ELECTRICAL:22 AWG,6.0 L,W/CLIP    | 060D9     | 196-3305-00      |
| -11  | 352-0351-00           |                      |                      | 1   | HOLDER,PROBE:BLACK ABS P6000 SERIES    | 7X318     | 1127             |
| -12  | 003-1433-02           |                      |                      | 1   | SCREWDRIVER:ADJUSTMENT TOOL,PLASTIC    | 80009     | 003-1433-02      |
| -13  | 195-4240-00           |                      |                      | 1   | LEAD,ELECTRICAL:0.025 DIA,COPPER,2.3 L | TK2469    | 195-4240-00      |
| -14  | 206-0364-00           | 9005                 |                      | 1   | TIP,PROBE:MICROCKT TEST,0.05 CTR       | 80009     | 206-0364-00      |
| -15  | 343-1003-01           |                      |                      | 1   | COLLAR,GND                             | TK2565    | 343-1003-01      |
|  | 070-5795-04           |                      |                      | 1   | SHEET,TECHNICAL:INSTR,P6133            | 80009     | 070-5795-04      |

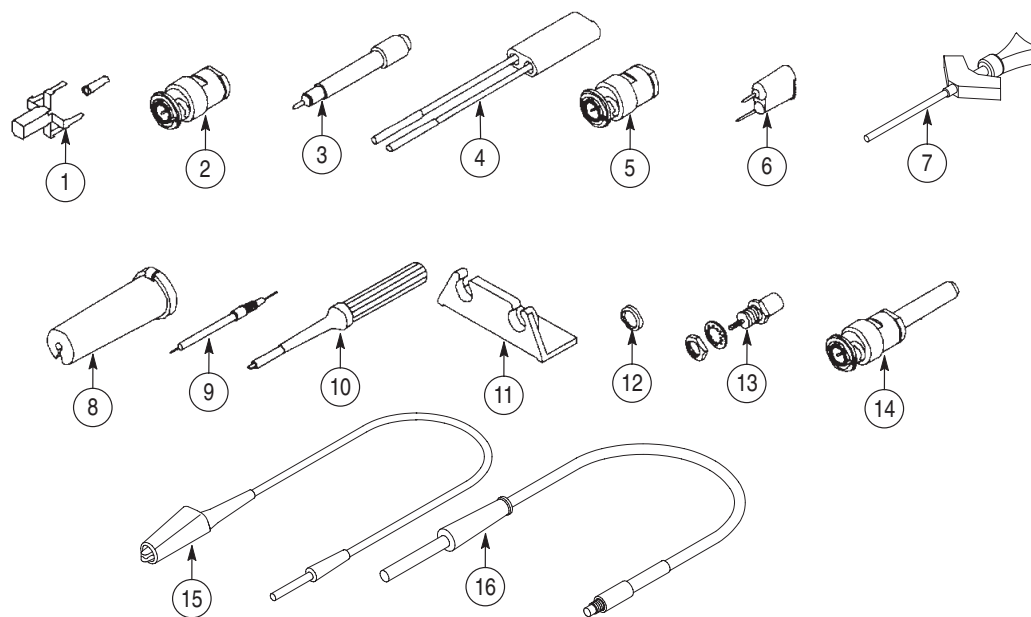


Figure 11: P6133 probe Option 01 optional accessories

Replaceable parts: P6133 probe Option 01 optional accessories

| Fig. & index number   | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name & description  | Mfr. code | Mfr. part number |
|---|-----------------------|----------------------|----------------------|-----|---|-----------|------------------|
| <b>P6133 PROBE OPT 01 OPTIONAL ACCESSORIES</b>  |                       |                      |                      |     |   |           |                  |
| 11-1  | 131-5030-00           | 8926                 |                      | 1   | CONNECTOR,PROBE:PKG OF 25,SUBMINIATURE                            | 80009     | 131-5030-00      |
| -2  | 013-0195-00           |                      |                      | 1   | ADAPTER,CONN:BNC TO PROBE   | 24931     | 28P264-1         |
| -3  | 013-0202-03           | 8727                 |                      | 1   | ADAPTER,PROBE:SUBMINIATURE/COMPACT TO MINIATURE PROBE TIP ADAPTER | TK2565    | 013-0202-03      |
| -4  | 015-0325-01           |                      |                      | 1   | ADAPTER,PROBE:PROBE TO CONNECTOR PINS                             | TK2565    | 015-0325-01      |
| -5  | 013-0084-04           |                      |                      | 1   | ADAPTER,CONN:BNC TO PROBE   | 80009     | 013-0084-04      |
| NOTE: USE ITEMS 6 THRU 9 WITH SUBMINIATURE/COMPACT TO MINIATURE PROBE TIP ADAPTER (ITEM 3). |                       |                      |                      |     |   |           |                  |
| -6  | 013-0085-00           |                      |                      | 1   | TIP,PROBE:GROUNDING   | 80009     | 013-0085-00      |
| -7  | 206-0364-00           |                      |                      | 1   | TIP,PROBE:MICROCKT TEST,0.05 CTR                                  | 80009     | 206-0364-00      |
| -8  | 352-0670-00           |                      |                      | 1   | HOLDER,PROBE:ATTENUATOR TIPS (3)                                  | TK2565    | 352-0670-00      |
| -9  | 206-0268-00           |                      |                      | 1   | TIP ASSY,PROBE:1X,SUBMINIATURE                                    | 80009     | 206-0268-00      |
| -10   | 003-1433-02           | 8845                 |                      | 1   | SCREWDRIVER:ADJUSTMENT TOOL,PLASTIC                               | 80009     | 003-1433-02      |
| -11   | 352-0351-00           | 8924                 |                      | 1   | HOLDER,PROBE:BLACK ABS P6000 SERIES                               | 7X318     | 1127             |

**Replaceable parts: P6133 probe Option 01 optional accessories (cont.)**

| <b>Fig. &amp; index number</b> | <b>Tektronix part number</b> | <b>Serial no. effective</b> | <b>Serial no. discont'd</b> | <b>Qty</b> | <b>Name &amp; description</b>                        | <b>Mfr. code</b> | <b>Mfr. part number</b> |
|--------------------------------|------------------------------|-----------------------------|-----------------------------|------------|--|------------------|-------------------------|
| 11 -12                         | 016-0633-00                  |                             |                             | 1          | MARKER SET,CA:2 EA VARIOUS COLORS                    | 80009            | 016-0633-00             |
| -13                            | 013-0240-00                  | 8822                        |                             | 1          | ADAPTER,TIP:SUBMINIATURE TIP TO CHASSIS MOUNT        | 24931            | 33JR186-2               |
| -14                            | 013-0253-00                  | 9307                        |                             | 1          | ADAPTER,CONN:BNC TO PROBE TIP,MALE                   | 24931            | 28P-302-1               |
| -15                            | 196-3286-00                  |                             |                             | 1          | LEAD,ELECTRICAL:26 AWG,10.222 L,0-N W/ALLIGATOR CLIP | TK2469           | 196-3286-00             |
| -16                            | 196-3302-00                  | 9005                        |                             | 1          | LEAD,ELECTRICAL:23 AWG,6.0 L                         | TK2469           | 196-3302-00             |
|                                | 016-0708-00                  |                             |                             | 1          | POUCH,ACCESSORY:6.25 X 9.25                          | 05006            | 501494                  |



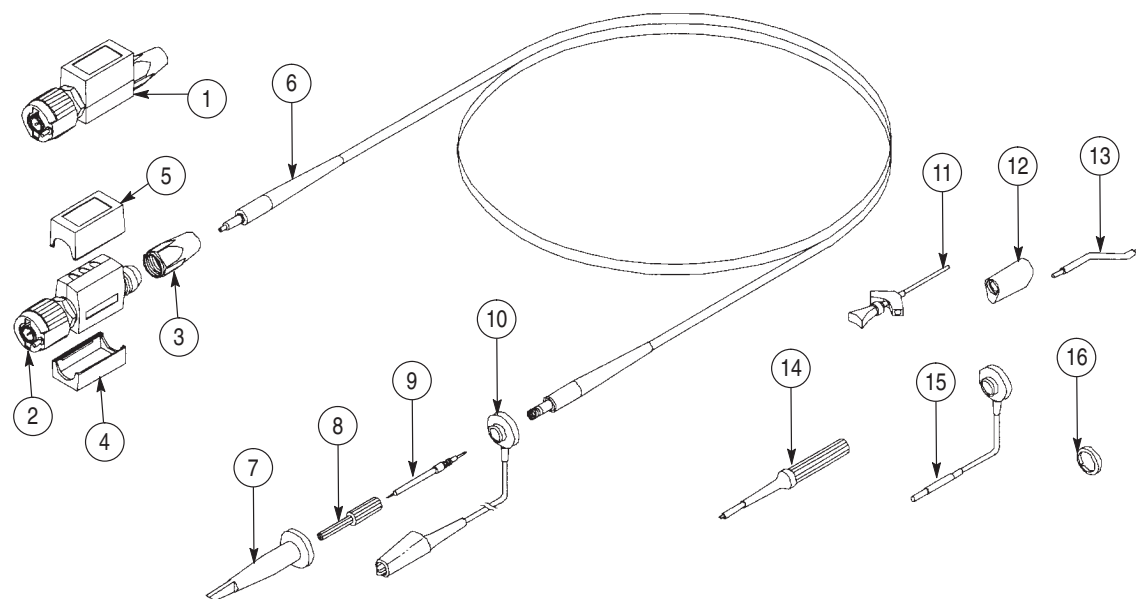


Figure 12: P6133 probe Option 25 with standard accessories (compact tip)

Replaceable parts: P6133 probe Option 25 and standard accessories

| Fig. & index number                               | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name & description                                     | Mfr. code | Mfr. part number |
|---|-----------------------|----------------------|----------------------|-----|--|-----------|------------------|
| <b>P6133 PROBE OPTION 25</b>                      |                       |                      |                      |     |  |           |                  |
| 12-1  | 206-0349-00           |                      |                      | 1   | COMP BOX ASSY:1.3M                                     | 80009     | 206-0349-00      |
| -2  | 131-3219-00           |                      |                      | 1   | CONN,RF PLUG:BNC,MALE                                  | 24931     | 28P266-3         |
| -3  | 200-3018-00           |                      |                      | 1   | COVER,CABLE NIP:COMP BOX                               | 0J260     | ORDER BY DESC    |
| -4  | 200-3017-00           |                      |                      | 1   | COVER,COMP BOX:BOTTOM,ABS SLATE GRAY                   | TK2565    | 200-3017-00      |
| -5  | 200-3016-00           |                      |                      | 1   | COVER,COMP BOX:TOP,ABS DOVE GRAY                       | TK2565    | 200-3016-00      |
| -6  | 174-0973-00           |                      |                      | 1   | CABLE ASSY,RF:39 OHM COAX,1.3M                         | TK2469    | 174-0973-00      |
| -7  | 013-0107-07           | 9140                 |                      | 1   | TIP,PROBE:MINIATURE/COMPACT SIZE                       | TK2565    | 013-0107-07      |
| -8  | 204-1049-00           |                      |                      | 1   | BODY SHELL:TIP COVER                                   | TK2565    | 204-1049-00      |
| -9  | 206-0393-00           |                      |                      | 1   | PROBE TIP ASSY:10X,11.0PF,9M OHM,GRAY TIP,NATURAL TAIL | 80009     | 206-0393-00      |
| -10   | 196-3305-00           |                      |                      | 1   | LEAD,ELECTRICAL:22 AWG,6.0 L,W/CLIP                    | TK2469    | 196-3305-00      |
| <b>P6133 PROBE OPTION 25 STANDARD ACCESSORIES</b> |                       |                      |                      |     |  |           |                  |
| -11   | 206-0364-00           |                      |                      | 1   | TIP,PROBE:MICROCKT TEST,0.05 CTR                       | 80009     | 206-0364-00      |
| -12   | 343-1003-01           |                      |                      | 1   | COLLAR,GND:P6130                                       | TK2565    | 343-1003-01      |
| -13   | 195-4240-00           |                      |                      | 1   | LEAD,ELECTRICAL:0.025 DIA,COPPER,2.3 L                 | TK2469    | 195-4240-00      |

**Replaceable parts: P6133 probe Option 25 and standard accessories (cont.)**

| <b>Fig. &amp; index number</b> | <b>Tektronix part number</b> | <b>Serial no. effective</b> | <b>Serial no. discont'd</b> | <b>Qty</b> | <b>Name &amp; description</b>         | <b>Mfr. code</b> | <b>Mfr. part number</b> |
|--------------------------------|------------------------------|-----------------------------|-----------------------------|------------|---------------------------------------|------------------|-------------------------|
| 12 -14                         | 003-1433-02                  |                             |                             | 1          | SCREWDRIVER:ADJUSTMENT TOOL,PLASTIC   | TK2565           | 003-1433-02             |
| -15                            | 196-3113-02                  |                             |                             | 1          | LEAD,ELECTRICAL:STRD,22 AWG,6.0 L,8-N | TK2469           | 196-3113-02             |
| -16                            | 016-0633-00                  |                             |                             | 1          | MARKER SET,CA:2 EA VARIOUS COLORS     | 80009            | 016-0633-00             |
|                                | 070-5795-04                  |                             |                             | 1          | SHEET,TECHNICAL:INSTR,P6133 PROBE,DP  | 80009            | 070-5795-04             |

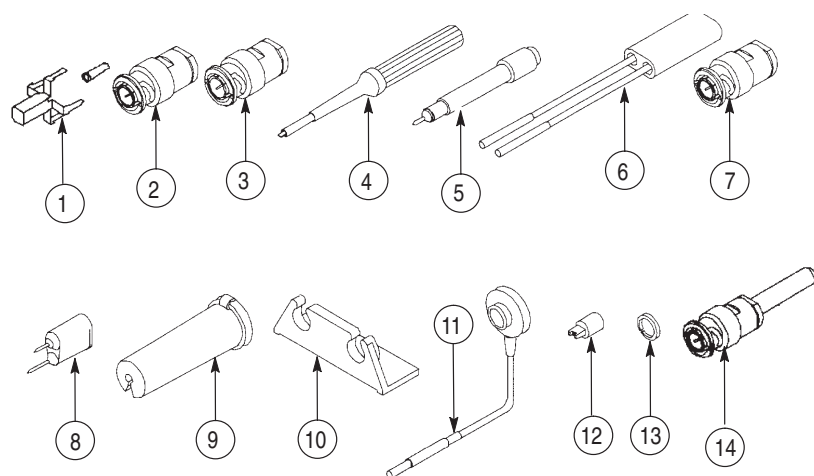


Figure 13: P6133 probe Option 25 optional accessories (compact tip)

Replaceable parts: P6133 probe Option 25 optional accessories

| Fig. & index number   | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name & description   | Mfr. code | Mfr. part number |
|---|-----------------------|----------------------|----------------------|-----|--|-----------|------------------|
| <b>P6133 PROBE OPTION 25 OPTIONAL ACCESSORIES</b>   |                       |                      |                      |     |  |           |                  |
| 13-1  | 131-5031-00           | 8926                 |                      | 1   | CONNECTOR,PROBE:PKG OF 25,COMPACT                            | 8009      | 131-5031-00      |
| -2  | 013-0226-00           |                      |                      | 1   | CONNECTOR,BNC:BNC TO PROBE TIP ADAPTER                       | 24931     | 28P264-2         |
| -3  | 013-0227-00           |                      |                      | 1   | CONNECTOR,BNC:50 OHM,BNC TO P TIP ADAPT                      | 24931     | 28P312-1         |
| -4  | 003-1433-02           |                      |                      | 1   | SCREWDRIVER:ADJUSTMENT TOOL,PLASTIC                          | 80009     | 003-1433-02      |
| -5  | 013-0202-03           |                      |                      | 1   | ADAPTER,PROBE:SUBMINI/COMPACT TO MINIATURE PROBE TIP ADAPTER | TK2565    | 013-0202-03      |
| NOTE: USE ITEMS 6 THRU 9 WITH SUBMINIATURE/COMPACT TO MINIATURE PROBE TIP ADAPTER (ITEM 5). |                       |                      |                      |     |  |           |                  |
| -6  | 015-0325-01           |                      |                      | 1   | ADAPTER,PROBE:PROBE TO CONNECTOR PINS                        | TK2565    | 015-0325-01      |
| -7  | 013-0084-04           |                      |                      | 1   | ADAPTER,CONN:BNC TO PROBE                                    | 80009     | 013-0084-04      |
| -8  | 013-0085-00           |                      |                      | 1   | TIP,PROBE:GROUNDING  | 80009     | 013-0085-00      |
| -9  | 352-0670-00           |                      |                      | 1   | HOLDER,PROBE:ATTENUATOR TIPS (3)                             | TK2565    | 352-0670-00      |
| -10   | 352-0351-00           |                      |                      | 1   | HOLDER,PROBE:BLACK ABS P6000 SERIES                          | 7X318     | 1127             |
| -11   | 196-3113-03           |                      |                      | 1   | LEAD,ELECTRICAL:STRD,22 AWG,3.0 L,8-N                        | TK2469    | 196-3113-03      |
| -12   | 015-0201-07           |                      |                      | 1   | TIP,PROBE:IC TEST,PKG OF 10                                  | 80009     | 015-0201-07      |
|   | 015-0201-08           |                      |                      | 1   | TIP,PROBE:IC TEST,PKG OF 100                                 | 80009     | 015-0201-08      |
| -13   | 016-0633-00           |                      |                      | 1   | MARKER SET,CA:2 EA VARIOUS COLORS                            | 80009     | 016-0633-00      |
| -14   | 013-0254-00           | 9307                 |                      | 1   | ADAPTER,CONN:BNC TO PROBE TIP,MALE                           | 24931     | 28P-302-2        |

**Manufacturers cross index**

| <b>Mfr. code</b> | <b>Manufacturer</b>            | <b>Address</b>   | <b>City, state, zip code</b> |
|------------------|--------------------------------|--|------------------------------|
| 05006            | 20TH CENTURY BOK               | 3628 CRENSHAW BOULEVARD<br>ATTN: CUSTOM DEPARTMENT                 | LOS ANGELES, CA 90016        |
| 0J260            | COMTEK MANUFACTURING OF OREGON | P O BOX 4200<br>M/S 16-207   | BEAVERTON, OR 970764200      |
| 24931            | BERG ELECTRONICS INC           | BERG ELECTRONICS RF/COAXIAL DIV<br>2100 EARLYWOOD DR<br>PO BOX 547 | FRANKLIN, IN 46131           |
| 7X318            | KASO PLASTICS INC              | 11013 A NE 39TH  | VANCOUVER, WA 98662          |
| 80009            | TEKTRONIX INC                  | 14150 SW KARL BRAUN DR<br>PO BOX 500                               | BEAVERTON, OR 97077-0001     |
| TK2469           | UNITREK CORPORATION            | 3000 LEWIS & CLARK HWY<br>SUITE 2                                  | VANCOUVER, WA 98661          |
| TK2548           | XEROX CORPORATION              | 14181 SW MILLIKAN WAY  | BEAVERTON, OR 97005          |
| TK2565           | VISION PLASTICS INC            | 26000 SW PARKWAY CENTER DRIVE                                      | WILSONVILLE, OR 97070        |