

Keysight 85041A Transistor Test Fixture Kit

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Vent

HP 85041A TRANSISTOR TEST FIXTURE KIT

For use with the
HP 8510 Network Analyzer and
HP 85014A Active Device
Measurement Application Pac



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HP 85041A TRANSISTOR TEST FIXTURE KIT

For use with the
HP 8510 Network Analyzer and
HP 85014A Active Device Measurement Application Pac

This manual applies to Transistor Test Fixture Kits that have serial number prefix 2523A. Kits having other serial number prefixes may differ from the version documented in this manual.

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SAFETY CONSIDERATIONS

General

This product and related documentation must be reviewed for familiarization with safety markings and instructions before operation. This product has been designed and tested in accordance with international standards.

Safety Symbols

WARNING

The **WARNING** sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed could result in personal injury. Do not proceed beyond a **WARNING** sign until the indicated conditions are fully understood and met.

CAUTION

The **CAUTION** sign denotes a hazard. It calls attention to an operating procedure, practice or the like, which, if not correctly performed or adhered to could result in damage to or destruction of part or all of the product. Do not proceed beyond a **CAUTION** sign until the indicated conditions are fully understood and met.

Servicing

WARNING

Any servicing, adjustment, maintenance, or repair of this product must be performed only by qualified personnel.

During normal operation, dc bias voltage is supplied to the fixture by an external power supply through the Test Set. It is possible that the power supply used is capable of causing a shock hazard. Always disconnect bias voltage from the transistor test set prior to opening the transistor test lid to avoid any contact with dc bias voltages.

Be careful not to allow fingers, clothing, etc. to get in the way when the test fixture lid is being closed.

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HP 85041A Transistor Test Fixture Kit



Figure 1. HP 85041A Transistor Test Fixture Kit

INTRODUCTION

Introduction

The Hewlett-Packard 85041A Transistor Test Fixture Kit (Figure 1) is an accessory of the HP 8510 Network Analyzer system. It consists of a precision test fixture designed to make S-Parameter measurements of packaged bipolar and FET transistors. Fully error-corrected and de-embedded measurements are made using the HP 85014A Active Device Measurement Application Pac (required).

Transistors having either 70 mil (0.070-inch) or 100 mil (0.100-inch) case diameters may be measured, using either of these Test Sets:

S-Parameter Test Set	Transistor Meas. Frequency Range
HP 8514A	500 MHz to 18 GHz
HP 8515A	45 MHz to 18 GHz

How to Use This Manual

This manual explains how to assemble, use, and maintain the HP 85041A Transistor Test Fixture Kit. It **must** be used with the HP 85014A manual, which explains how to assemble the system, run the program, verify operation, and make measurements.

Read this HP 85041A manual **first** to:

1. Verify receipt of all Transistor Test Fixture (TTF) parts
2. Learn the proper way to assemble the TTF
3. Learn how to insert check devices and active devices
4. Learn how to replace parts and maintain your TTF

When applicable, a Manual Changes supplement is shipped along with the manual. In addition to change information, the Manual Changes supplement contains information for correcting errors in the manual. The supplement is keyed to the manual print date and part number. It is recommended that you periodically request the latest Manual Changes supplement. Complimentary copies are available on request through all HP offices.

HP 85041A Transistor Test Fixture Kit

Transistor Package Nominal Dimensions

Figure 2 illustrates the nominal dimensions of transistor packages that may be measured with the HP 85041A Transistor Test Fixture.

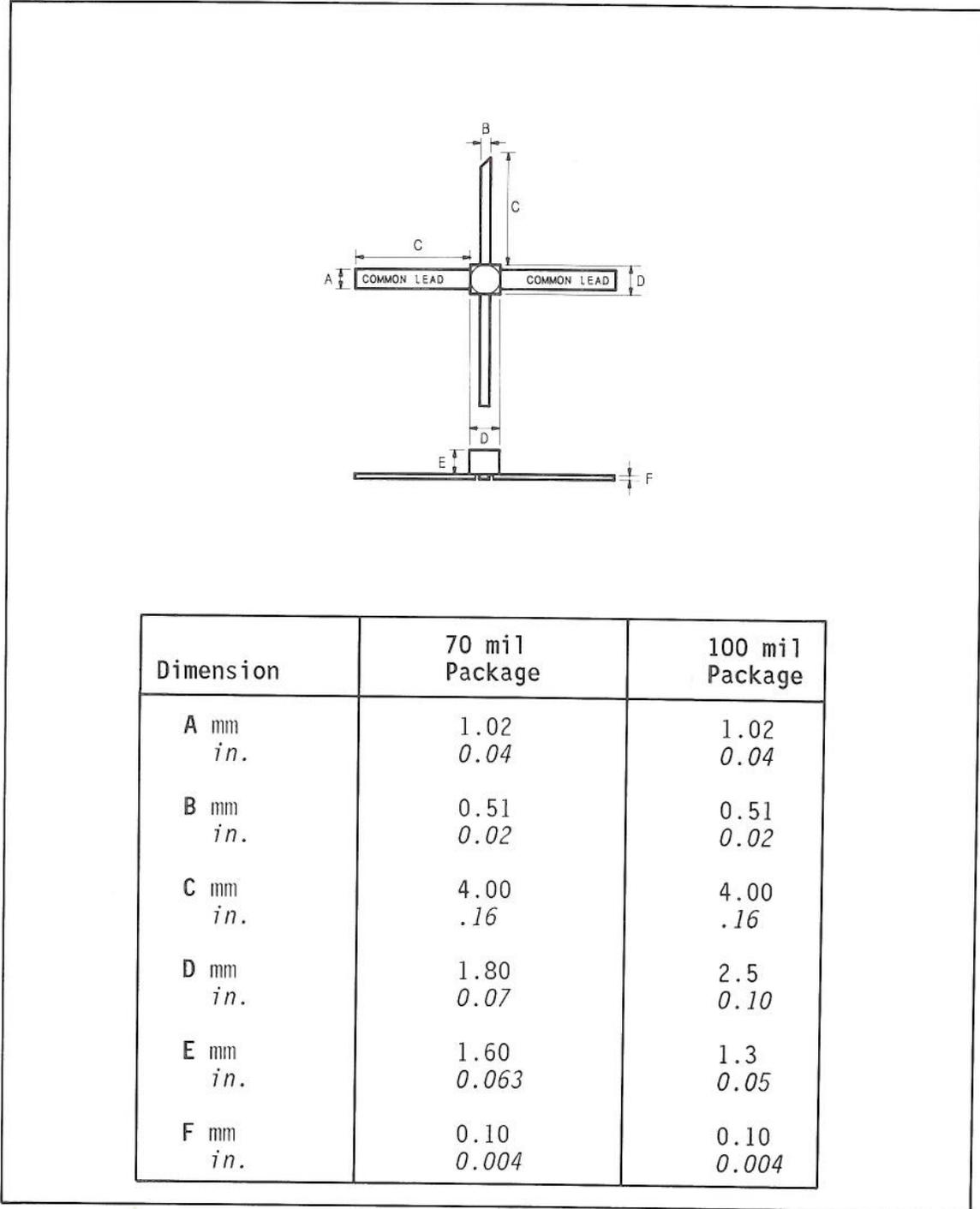


Figure 2. Transistor Package Nominal Dimensions

Intended Use of the Fixture

For error-corrected and de-embedded measurements, the HP 85041A Transistor Test Fixture Kit must be used with an HP 9000 Series 200 controller listed below, the HP 85014A Active Device Measurement Application Pac, and other components outlined in the HP 85014A Active Device Measurement Application Pac Manual.

Controllers:	HP 216	HP 217	HP 220
	HP 226	HP 236	HP 237

Two Model Program Software discs (3.5-inch and 5.25-inch) are located at the back of this manual, next to the binder rear cover. Each disc contains the same modeling information which mathematically characterizes the TTF. The two disc sizes match the requirements of the different disc drives used with the HP controllers available (listed above). How to use these discs is explained in the HP 85014A Active Device Measurement Application Pac Manual.

Parts Supplied

The first thing to do on receipt of the HP 85041A Transistor Test Fixture Kit is to verify that all parts of the kit have arrived intact. Refer to Figure 3 to do this.

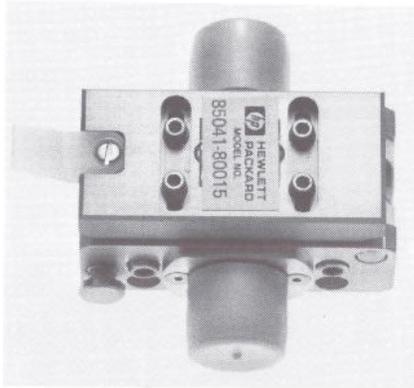
NOTE

Mechanically and electrically the 70 mil thru is identical to the 100 mil thru. Likewise, the 70 mil short is identical to the 100 mil short, even though each set has different HP part numbers. Each set is interchangeable.

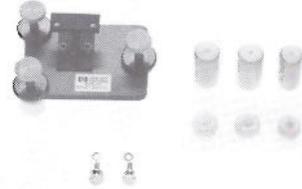
Care has been taken at the factory to assure that all parts of your kit were shipped to you in good working order. However, should your shipment be incomplete or damaged in transit, Hewlett-Packard will arrange for repair or replacement without waiting for a settlement from the transportation company.

If the storage case or devices appear to have been damaged or are incorrect in any way, set aside the HP 85041A Transistor Test Kit and all packaging materials and contact the nearest Hewlett-Packard Sales/Support Office listed inside the back cover of this manual.

HP 85041A Transistor Test Fixture Kit

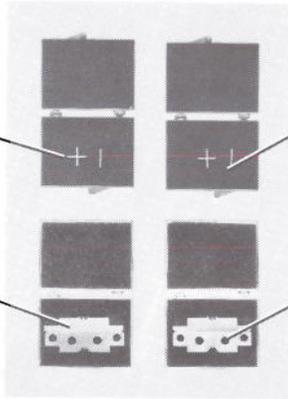


TRANSISTOR TEST FIXTURE
HP 85041-80015



STAND
HP 85041-80002
(Includes all feet and hardware)

70 MIL-INCH
CHECK DEVICES
HP 85041-80010



100 MIL-INCH
CHECK DEVICES
HP 85041-80012

70 MIL-INCH
TTF/INSERT
HP 85041-80009

100 MIL-INCH
TTF/INSERT
HP 85041-80011



TORQUE TOOL
HP 85041-80003

BOLT KIT
HP 85041-80013

LID TOOL
HP 85041-80005

TWEEZERS
HP 85041-80004

Figure 3. Parts Supplied (1 of 2)

HP 85041A Transistor Test Fixture Kit

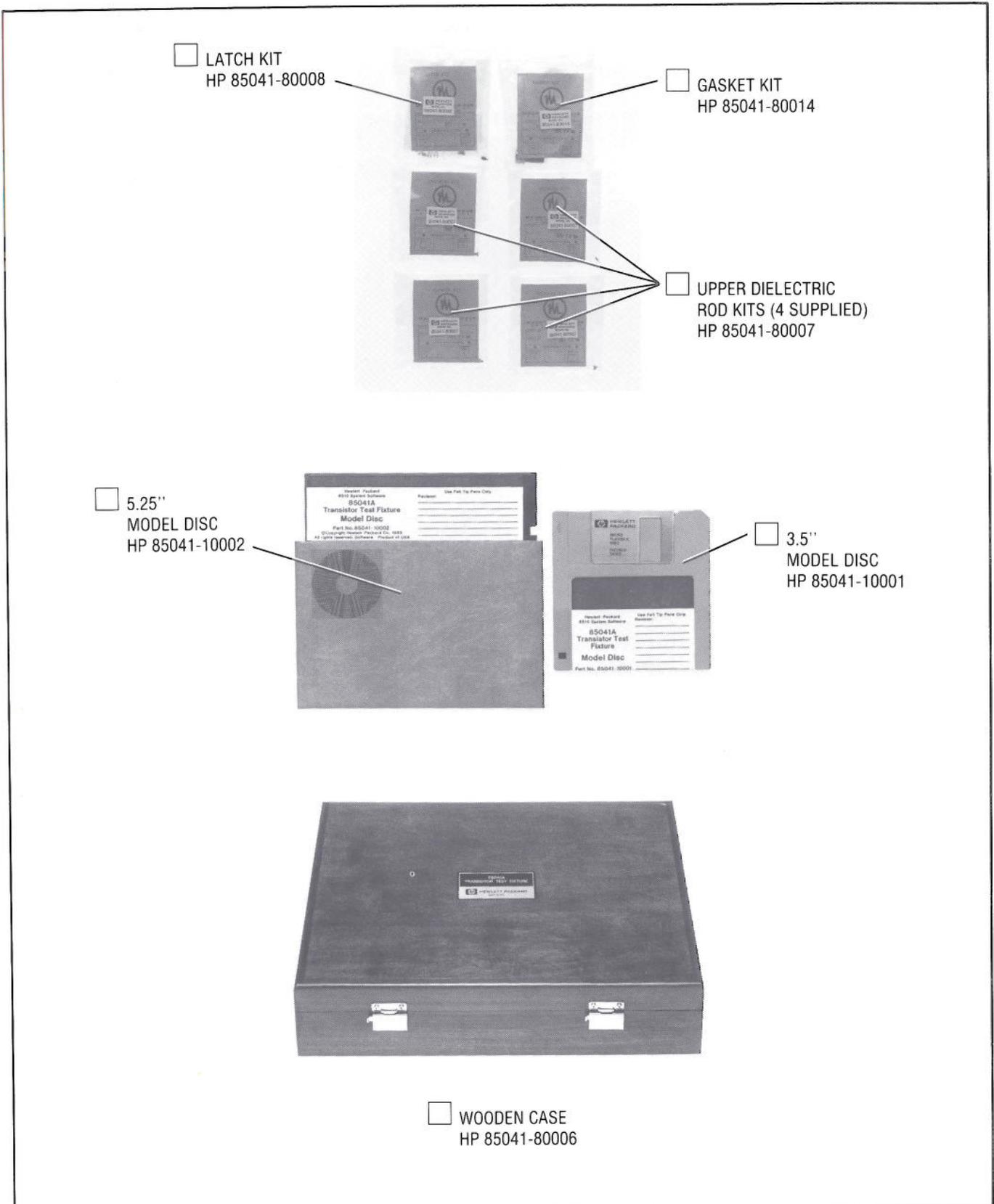


Figure 3. Parts Supplied (2 of 2)

Options

Each fixture is supplied with one complete copy of the HP 85041A Operating and Service Manual. Option 910 provides one additional manual. To obtain additional Operating and Service Manuals after receiving the initial fixture shipment, order HP part number 85041-90001. No other options are available for the HP 85041A.

Shipping Weight

Shipping weight of the HP 85041A is 3.2 kg (7 lbs.)

Operating Environment

Environments that contain excessive airborne contaminants, oils, salts, corrosives, vibration, and extremes in temperature or humidity can reduce useful life of the transistor test fixture.

Environmental limitations for the HP 85041A Transistor Test Fixture Kit are the same as those for the HP 8510 system. Refer to the HP 8510 Installation Manual for this information.

Handling

The transistor test fixture (TTF) itself is a delicate precision tool that will fail if abused. Take care in handling, using and storing the fixture to protect it from mechanical damage. This is especially true in making connections, to avoid damaging the connectors and the test fixture itself. When not in use, always keep the protective covers on the 7mm connectors to protect these connectors from damage. The 7mm connectors on the TTF are **not** replaceable parts.

Cleanliness of the TTF mating surfaces, connectors, check devices, and transistor inserts is very important. Assembly of the fixture with grit on these parts can result in permanent damage. Refer to **Cleaning the Fixture** and Figure 13 in this manual, which tells how to keep your TTF clean.

When it is not in use, always close the TTF lid to avoid accidental damage to the internal surfaces, and to reduce the buildup of dust and grime. When it is not connected to an S-Parameter Test Set, store the fixture in its foam-lined storage case for protection.

Storage and Shipment

The foam-lined storage case in which you receive the transistor test fixture is the best place to store the fixture and related components when you are not using them. Never store any of the test fixture

HP 85041A Transistor Test Fixture Kit

components loose in a desk drawer or allow the mating surfaces of the metal pieces to come in contact with any hard surface.

If you must reship the HP 85041A, and you have not retained the original packing materials, the same kinds of containers and materials used for the original shipment can be obtained through your nearest Hewlett-Packard sales/service offices.

In any correspondence, refer to the instrument by model number and its full serial number. The serial number is located on the top cover of the transistor test fixture.

The following general instructions should be followed when repackaging with commercially available materials:

Wrap the instrument in heavy paper or plastic, and place the wrapped instrument in a strong shipping container. A double-wall carton made of 350-pound test material is adequate.

Place enough shock-absorbing material (a three-inch to four-inch layer) around all sides of the instrument to provide a firm cushion and to prevent any movement of the instrument inside the container.

Seal the shipping container carefully and mark it FRAGILE to ensure careful handling.

Typical System Configuration

Figure 4 shows the transistor test fixture and all other system components needed to make a typical bipolar transistor measurement. It illustrates the closely-linked system/software concept of the transistor test fixture. For specific details about assembling the system, and required equipment, refer to the HP 85014A Active Device Measurement Application Pac Manual.

HP 85041A Transistor Test Fixture Kit

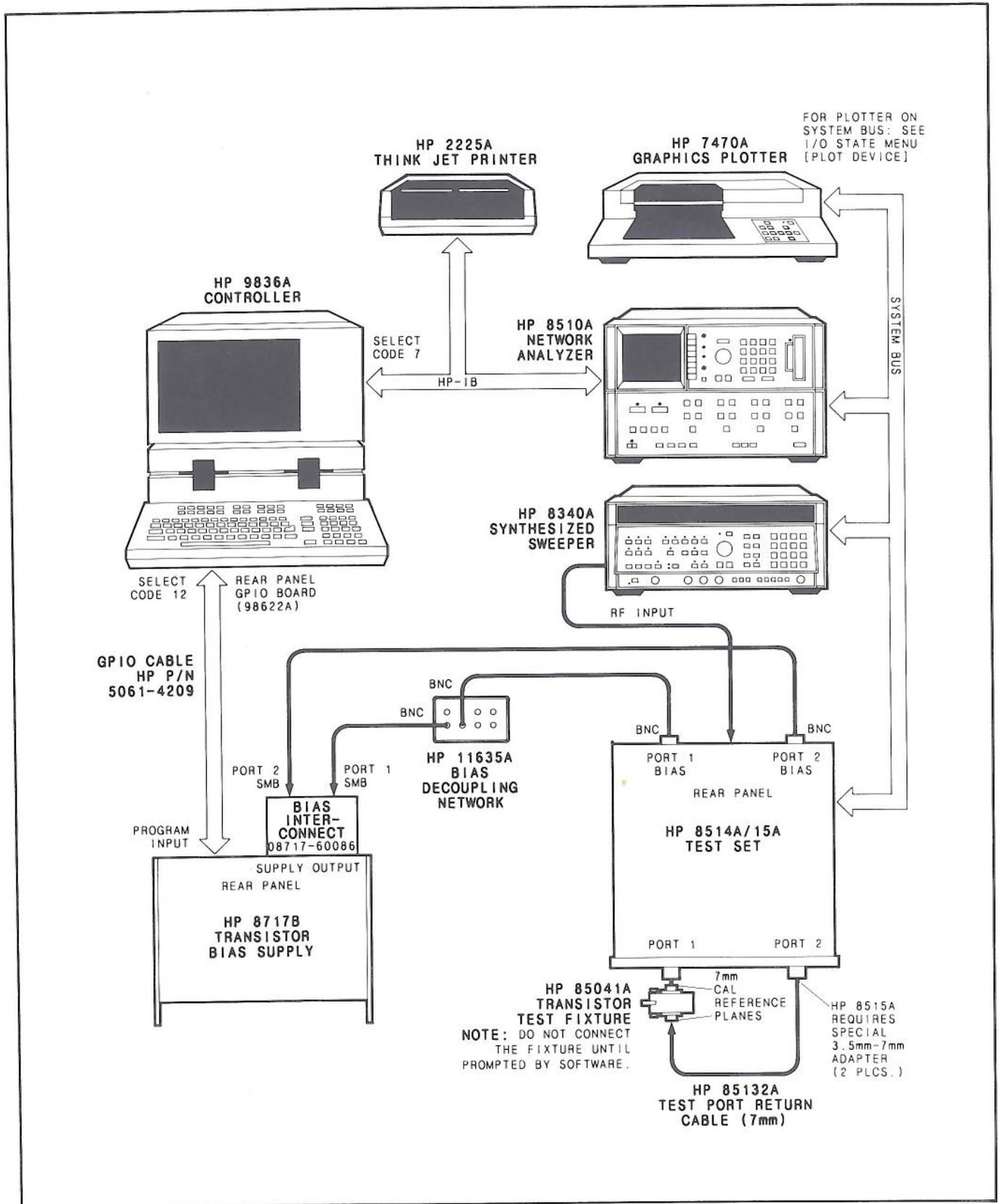


Figure 4. Typical HP 85041A System Configuration

ASSEMBLY PROCEDURES

Mechanical Assembly Procedure (Figure 5)

This procedure must be followed before any transistor measurements can be made. Use this procedure to first install or change transistor inserts. Transistor inserts are matching pieces of metal that support transistors as they are being measured. You may change inserts with the fixture installed on its stand. When installing a transistor insert, keep the hinged lid closed until you are told to open it in step 9.

1. Loosen the four captivated (by E-rings) cover screws using the lid tool, HP part number 85041-80005 (supplied) and remove the cover.
2. Loosen the two fixture screws using the torque tool, HP part number 85041-80003 (supplied). Carefully slip the TTF halves apart, and discard the two plastic shipping spacers (on the fixture screws).
3. Choose the transistor insert you wish to use, based on the size of active device to be measured (70 mil or 100 mil). The 70 mil insert is 0.119 inch wide, and the 100 mil insert is 0.150 inch wide.

Transistor inserts come in matched sets. A number is stamped on the horizontal surface on one end of each top and bottom insert (see Figure 5, Pictorial 3). Check your transistor inserts now and verify that the two numbers match. If they do not match, it is possible that your fixture will not pass electrical verification.

CAUTION

In the following procedure, hold the fixture with the dowel pins horizontal. Mechanical damage may occur if the lower insert is allowed to fall and hit against the TTF body during assembly.

Hold the TTF half with the dowel pins horizontal. Then, carefully slide the lower insert all the way onto the two large dowel pins.

4. Gently place the upper half of the insert on top of the smaller dowel pins. Hold it in place as you complete the next step.
5. Join the two halves together. Do not let the upper insert fall.
6. Insert the two fixture screws through the lower holes in the fixture body and tighten them evenly using the torque tool.

HP 85041A Transistor Test Fixture Kit

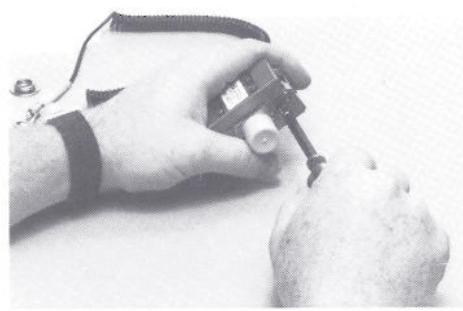
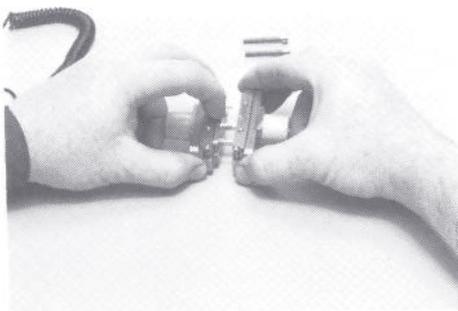
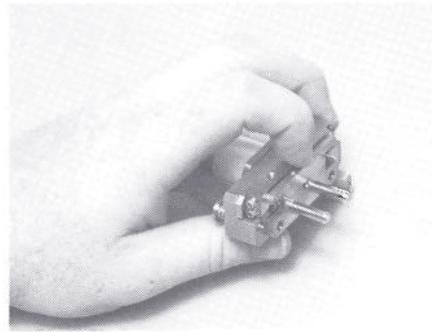
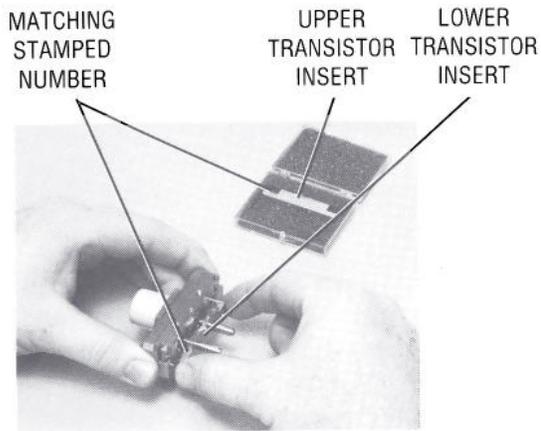
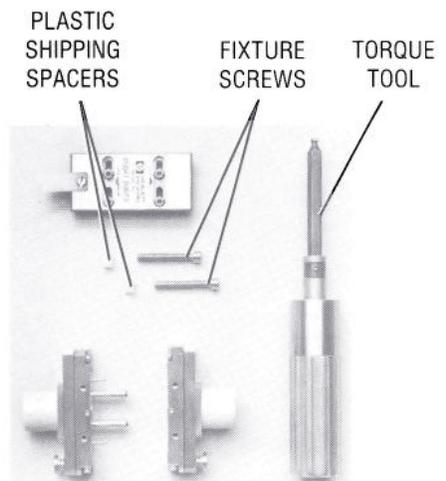
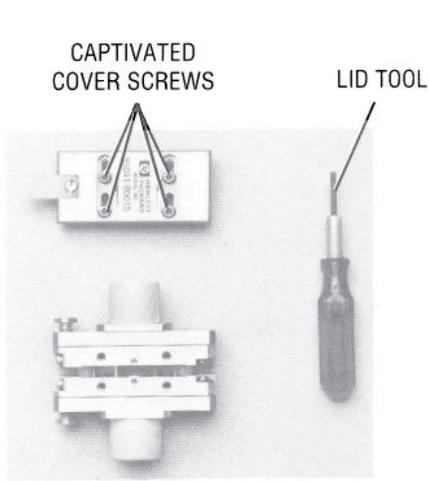


Figure 5. Mechanical Assembly Procedure (1 of 2)

Mechanical Assembly Procedure (continued)

7. Orient the cover with the plastic handle on the same end as the release buttons. Position the cover so that the two spring-loaded alignment pins protruding from the base of the top cover fit into the two holes in the top half of the insert.

CAUTION

Never install the cover unless a transistor insert is in place; damage to the hinged lid and cover may result.

8. Align the cover to be square with the fixture and push down on the cover to reduce the tension on the top four captured (by E-rings) screws as they are tightened.

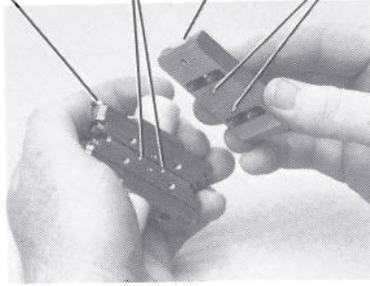
Push down on the lid screws gently until they are started in the holes. Heavy pressure should be avoided because the screws will scratch the top surface of the test fixture as you search for the holes. While holding the top down, tighten all four lid screws securely, using the lid tool.
9. Unlatch the lid by depressing the two latch buttons, while holding the cover handle so that the lid does not suddenly swing open.
10. Open the lid fully and check for excessive tightness, rubbing and binding of the lid as it is opened, and during its entire swing. If the lid binds, it is possible that the four cover screws were not tightened enough in step 8. Loosen the cover screws, remove the cover, and repeat steps 6 through 11. Make sure the fixture screws are inserted in the lower holes and not the top holes.
11. Close the lid by pressing on the cover (not on the plastic handle). Whenever the test fixture is mounted on its stand, always hold the bottom of the fixture for stability and to avoid stressing connectors when attached to a test set. You should be able to see and hear the two spring-loaded latches lock the lid into place.

RELEASE
BUTTON

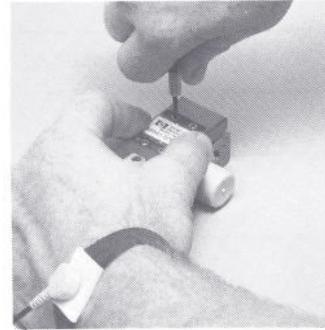
TRANSISTOR
INSERT
HOLES

PLASTIC
HANDLE

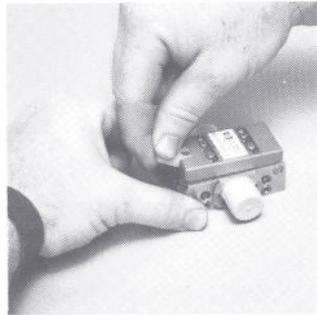
ALIGNMENT
PINS



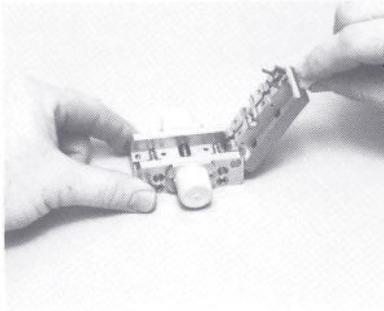
7



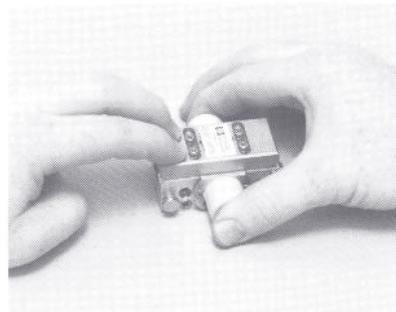
8



9



10



11

Figure 5. Mechanical Assembly Procedure (2 of 2)

HP 85041A Transistor Test Fixture Kit

Attaching the Fixture to the Stand (Figure 6)

1. There are three different sizes of feet that attach to the transistor test fixture stand. Their respective heights and use with common HP 8510 system configurations are shown below. Choose the length of feet that is best suited to your installation.

Foot	Foot Length	Use
A	1 1/2 inches	HP 8514A on bench
B	7/8 inch	HP 8514A in HP 85043A Rack or, HP 8515A on bench
C	1/4 inch	HP 8515A in HP 85043A Rack

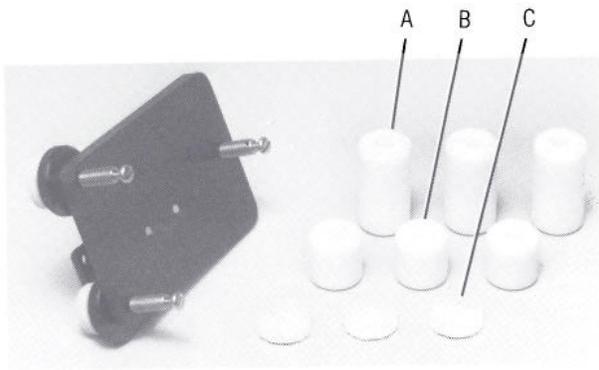
2. If feet are already installed, extend them by turning the knurled lock nuts fully counter-clockwise, and then turning the knurled adjustment nuts fully clockwise.
3. To install different sized feet, or to install feet for the first time, hold the knurled adjustment knob with one hand. Use a flat-bladed screwdriver to remove the foot screw (accessible through the bottom of the foot, if installed).

Install the new foot; the one-sized screw will attach all sized feet. When adjusting foot height, turn the knurled adjustment nut and not the foot; otherwise, the foot may loosen.

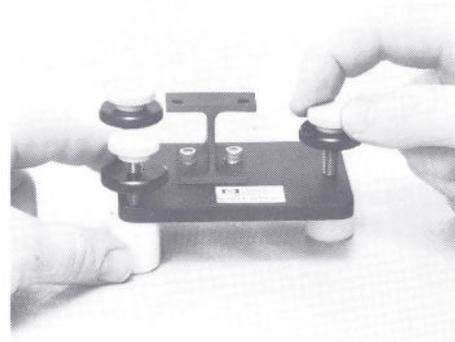
4. Hold the transistor test fixture and position the stand as shown. Locate the two sets of attaching thumbscrews and lockwashers. Put the lockwasher onto the thumbscrew and then insert it through one of the platform holes in the stand. Attach the fixture, using the correct fixture holes as shown. Attach the other thumbscrew similarly.

If you use the other fixture holes, it will be impossible to change transistor inserts once the fixture is connected to the S-Parameter Test Set. Also, the assembly may be easily toppled as the center of gravity will not be directly over the feet.

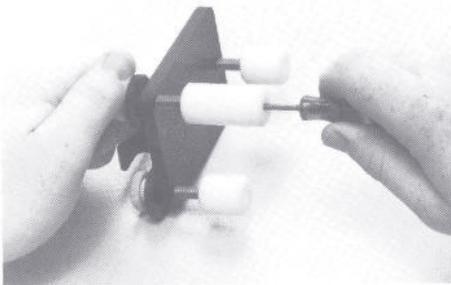
5. Compare the completed assembly with Figure 6, Pictorial 5. They should match.



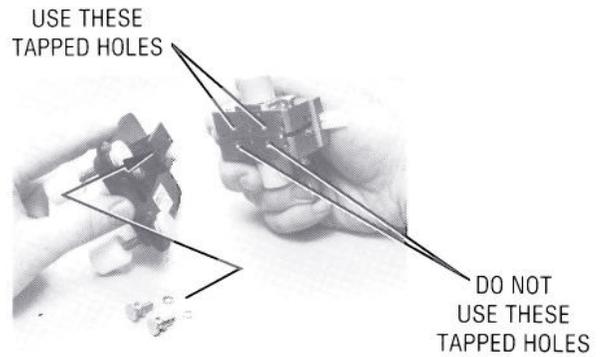
1



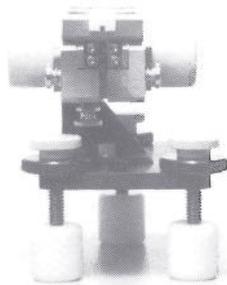
2



3



4



5

Figure 6. Attaching the Fixture to the Stand

HP 85041A Transistor Test Fixture Kit

Attaching the Fixture to the Test Set (Figure 7)

First, gage the test set port connectors to make sure they are within limits. Then, gage the transistor test fixture connectors by referring to the **7mm Connector Gaging Procedure** in the **SERVICE PROCEDURES** section of this manual.

Second, make sure all connectors are clean. Refer to the **CLEANING PROCEDURE** section of this manual.

The torque wrench used in the following procedure (HP part number 1250-1874) is supplied in the HP 85050A 7mm Calibration Kit.

1. Wear an anti-static wrist strap. Fully retract all test fixture feet by turning each knurled adjustment knob fully counter-clockwise.

Hold the fixture so that the top cover handle is facing you. Remove the protective cover from the 7mm connector on the **left** of the fixture. Attach the 7mm connector of the fixture to Port 1 of the HP S-Parameter Test Set, using your fingers. Prevent the fixture from turning by holding it as you tighten the connection with the torque wrench. Keep the other protective cover on the connector until told to remove it in step 3.

When using an HP 8515A S-Parameter Test Set, first connect the HP 85130A 3.5mm-to-7mm adapters to Ports 1 and 2 of the test set.

The transistor test fixture feet should **not** be touching the work surface at this time. Remove the other 7mm connector protective cover from the fixture. Save both protective covers.

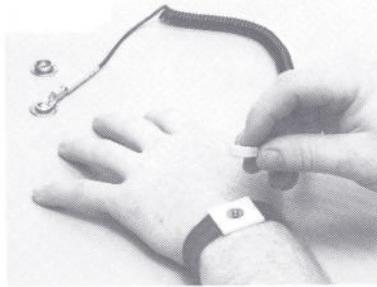
2. Turn each knurled adjustment knob clockwise until the fixture is *snug* against the work surface, without binding the connector.

CAUTION

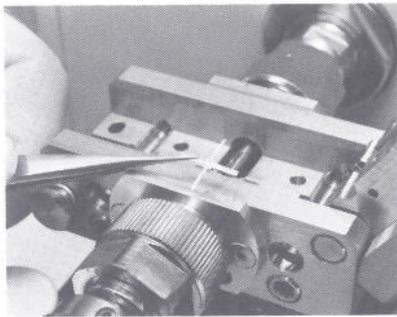
Do not over-extend the feet. If they are over-extended, the Test Set Port 1/fixture 7mm connectors will bind, and possibly be damaged.

Turn the knurled lock nuts clockwise until they contact the base of the stand and lock the feet into place.

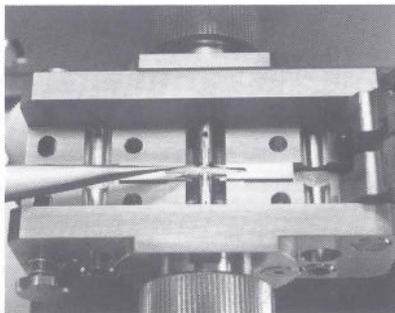
3. Remove the protective cover from the connector of the TTF. Attach one end of the HP 85132A 7mm test port return cable to the fixture and the other end to Port 2 of the test set. Hold the transistor test fixture from turning when connecting the port extension cable to the fixture. Again, use care.



1



2



3

Figure 8. Electrostatic Discharge Procedure

Inserting Check Devices (Figure 9)

Included with the HP 85041A transistor test fixture (TTF) are two sets of check devices (one 70 mil set and one 100 mil set). Each set contains one short and one thru device. The check short is used during the verification procedure in the HP 85014A Manual.

Mechanically and electrically the 70 mil thru is identical to the 100 mil thru. Likewise, the 70 mil short is identical to the 100 mil short, even though each set has different HP part numbers. Each set is interchangeable.

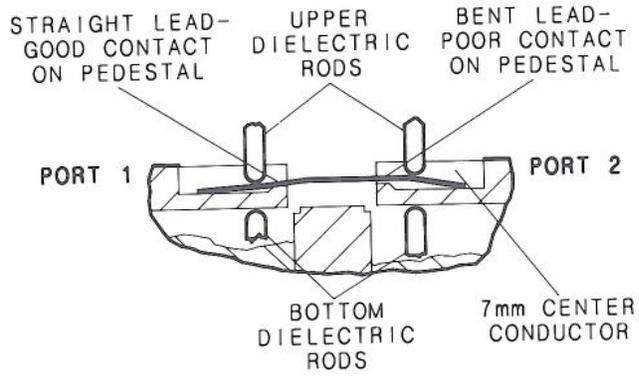
Refer to Figure 9 and the matching steps below for inserting check devices into the TTF.

1. Clean and straighten the leads of the check device to be tested. Figure 9, Pictorial 1 shows a check short device in the fixture with a straight lead connected to Port 1, and a bent lead connected to Port 2. The bent lead is making poor contact. The proper contact points are raised pedestals near the edges of the 7mm center conductors.
2. Wear an anti-static wrist strap. Use the tweezers to pick up the check device. Gently touch the tweezers to the outside grounded case of the TTF to discharge any residual static.
3. Orient the check device as shown and gently drop it into the fixture.

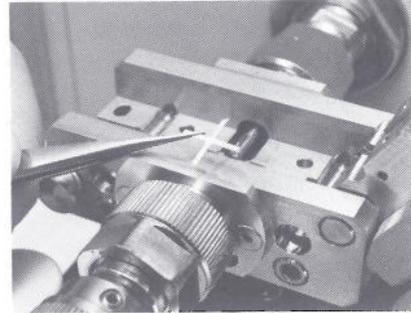
The angle-cut lead on the check short should always point toward Port 1 of the test set. This is because the common leads are wider than the angle-cut lead. The check short "centers" itself in the fixture because its lead widths are close to the maximum allowed dimensions.

The check thru device should be positioned symmetrically in the fixture, midway between the Port 1 and Port 2 ends and centered in the slotted center conductor.

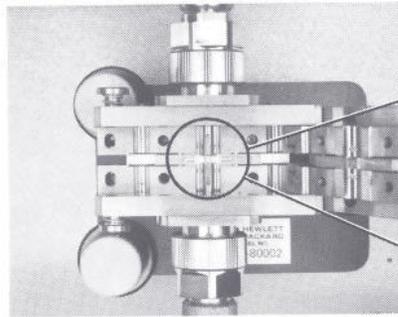
4. When closing the fixture lid, always support the bottom of the fixture body as shown. Undue stress and damage to the 7mm connectors of the test set/transistor fixture connection may result if support is not given, and the stand feet are not fully extended.



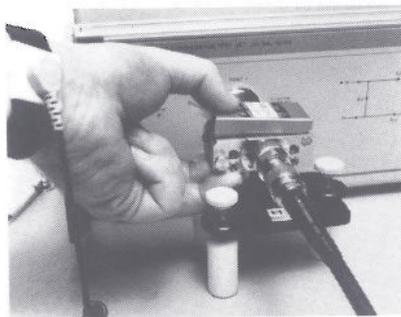
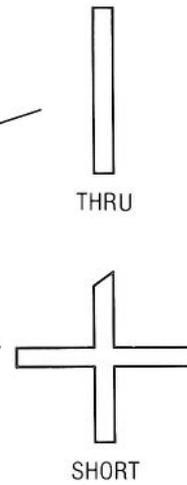
1



2



3



4

Figure 9. Inserting Check Devices

Inserting Active Devices (Figure 10)

Any active device inserted into the transistor test fixture (TTF) must be oriented correctly. Remember the following points:

- * For common emitter bipolar devices, the **base** lead always points toward (connects to) Port 1 of the Test Set.
- * For common source FET devices, the **gate** lead always points toward (connects to) Port 1 of the Test Set.
- * With either device, the transistor body always faces downward.

The angle-cut lead on your active device might not denote the base or gate. To determine lead identity, consult the data sheet of the active device you intend to use.

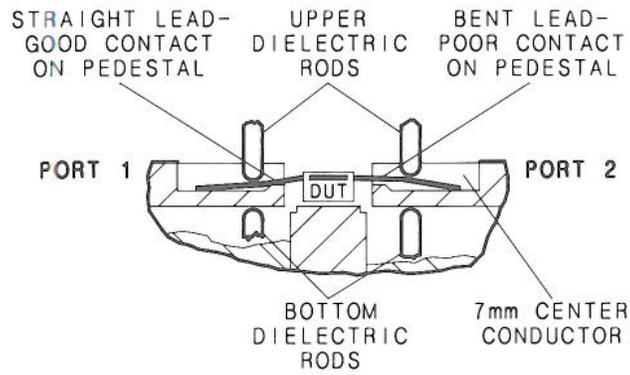
Refer to Figure 10 and the matching steps below for inserting active devices into the TTF.

1. Active devices must be clean and the leads must be straight. Shown is a check short device in the fixture with a straight Port 1 lead, and a bent Port 2 lead. The bent lead is making poor contact. The proper contact points are raised pedestals near the edges of the 7mm center conductors, as shown.
2. Wear an anti-static wrist strap. Use the tweezers to pick up the active device by the common lead, with the body facing **down**. Gently touch the tweezers to the outside grounded case of the TTF to discharge any residual static.
3. Refer to Figure 10, Pictorial 3.

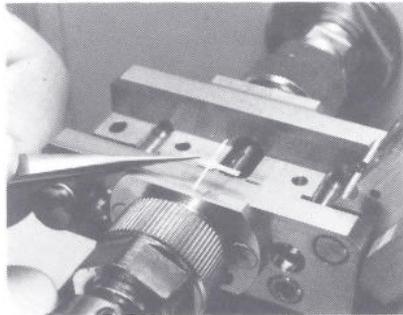
CAUTION

The transistor body must be pointing down when you insert it into the fixture. Otherwise, the device and TTF may be damaged.

This procedure continues on the next page.



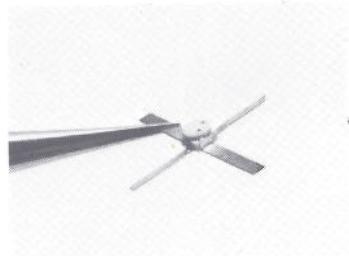
1



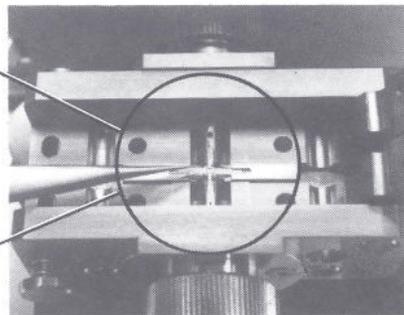
2



RIGHT



WRONG

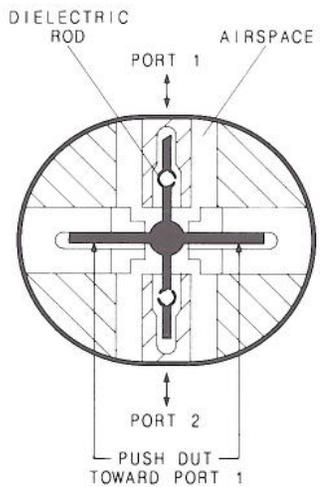


3

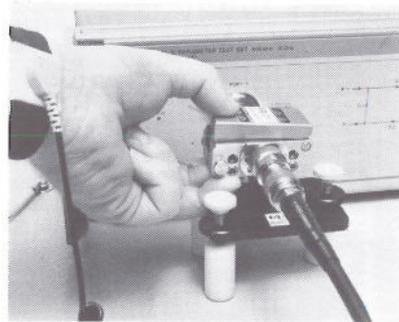
Figure 10. Inserting Active Devices (1 of 2)

Inserting Active Devices (continued)

4. Push the active device toward Port 1 after it has been installed. The common lead edges should touch the insert walls closest to Port 1, as shown. This is necessary for repeatable measurements.
5. Provide support when closing the lid to minimize undue stress on the 7mm connectors of the TTF and the S-Parameter Test Set.



4



5

Figure 10. Inserting Active Devices (2 of 2)

Operation Verification

Verification of the transistor test fixture (TTF) consists of using the verification process as outlined in the HP 85014A Manual. The check short is measured and compared against given limits to determine if verification has passed. **The verification procedure is not explained here, but is explained in detail in the HP 85014A Active Device Measurement Application Pac Manual.**

There is no verification without the HP 85014A Active Device Measurement Application Pac, as it is an integral and required part of using the HP 85041A Transistor Test Fixture Kit.

Figures 11 and 12 show S11/S22 magnitude and phase de-embedded responses of the check short after performing the HP 85014A verification process. Verification limits are also given.

The result of a properly verified TTF using the HP 85014A program is:

- The HP 8510 system errors are removed by the 7mm calibration.
- The HP 85041 TTF/insert errors are removed by de-embedding.
- The TTF characteristics are normalized by a second de-embedding to verify TTF limits for proper operation.

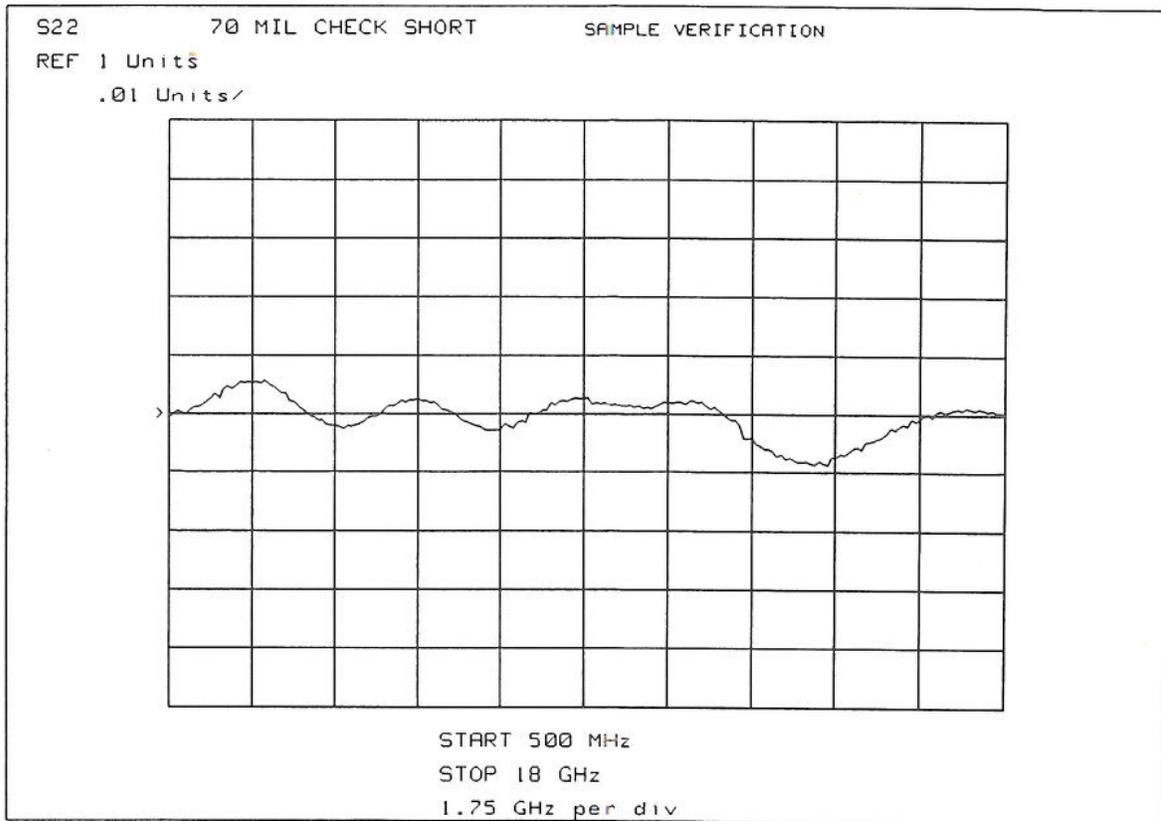


Figure 11. Check Short S11/S22 Lin Mag Response

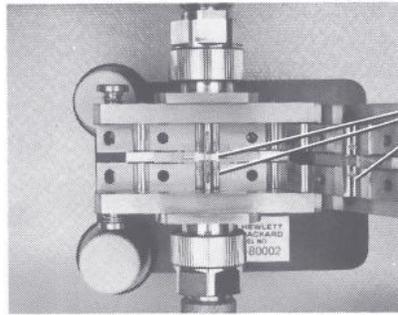
Check Short S11/S22 Lin Mag Verification Limit = 1 ± 0.025 dB

HP 85041A Transistor Test Fixture Kit



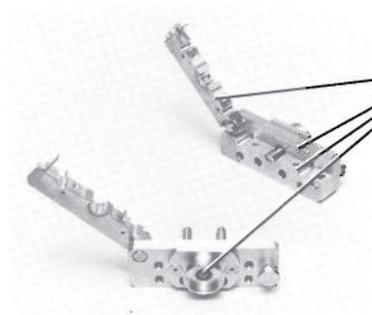
SUPPLIED WITH
HP 8510 SYSTEM

1



CLEAN

2



CLEAN

3

Figure 13. Cleaning the Fixture (1 of 2)

Cleaning the Fixture (continued)

Figure 13 (2 of 2) shows the proper method of cleaning 7mm connectors, as well as hard-to-reach places in the fixture.

First, use low pressure compressed air to blow out residual particles. If this is unsatisfactory, the next best cleaning method is to use a cotton swab and trichlorotrifluoroethane.

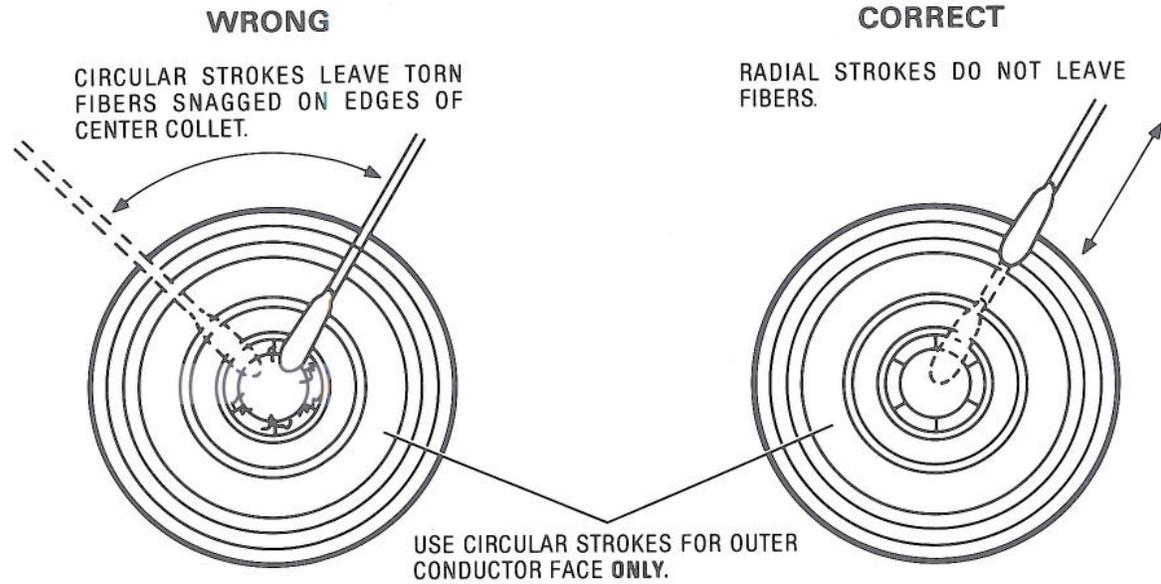
Plastic foam swabs are recommended for accessible, flat surfaces, but are too large to clean 7mm connectors. Remove the rubber band and foam from the tip of the swab to uncover the cotton tip. The swab may then be small enough to clean hard-to-reach places.

For cleaning hard-to-reach places, use a toothpick and a foam swab or lint-free cloth as shown.

CAUTION

Never use any metal object for cleaning purposes, to prevent scratching delicate parts and mating surfaces.

HP 85041A Transistor Test Fixture Kit



NOTE

TRY TO CLEAN THE CONNECTOR WITH COMPRESSED AIR BEFORE RESORTING TO SWABS.



WRAP THIN FOAM OR A LINT-FREE CLOTH AROUND A SLENDER WOODEN ROD (SUCH AS A TOOTHPICK) FOR CLEANING AREAS THAT ARE TOO SMALL FOR THE SWABS.

Figure 13. Cleaning the Fixture (2 of 2)

SERVICE PROCEDURES

7mm Connector Gaging Procedure (Figure 14)

The following gaging procedure is used to check collet protrusion and center conductor depth (setback).

1. Obtain the following items, or their equivalents:

Description	HP Part Number
HP 85050A 7mm Calibration Kit Manual	85050-90001
7mm Connector Gage Kit (gage and calibration block shown)	1250-1875
7mm Center Contact Extractor	5060-0236
Tweezers (supplied)	85041-80004

Familiarize yourself with the recommended method of using and calibrating the gage and of extracting collets, as explained in the HP 85050A 7mm Calibration Kit Manual.

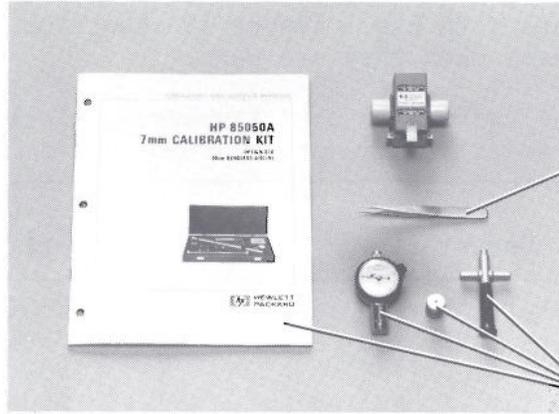
2. Complete this step with the collet installed. Do not use the gage with the aligning pin attached. Calibrate the connector gage and verify that the collet protrusion of each transistor test fixture (TTF) connector is within the limits shown on Figure 14, Pictorial 2. If it is not within limits, repeat this step. If it meets adjustment limits or not, complete step 3.
3. Use the center collet extractor tool to remove the collets from each 7mm connector on the TTF. Do not use the gage with the aligning pin attached. Measure the setback of each connector in turn, using a calibrated connector gage and the limits shown on Figure 14, Pictorial 3. If it is not within limits, repeat this step.

Steps 2 and 3 pass: Re-install the collets in the 7mm connectors using the tweezers. Check proper collet springiness; the collet must recess when pressed, then spring back when released.

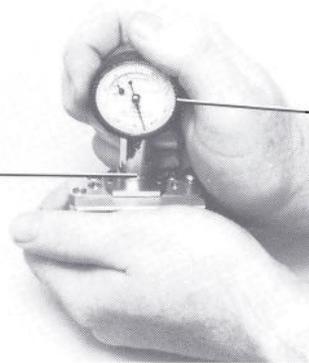
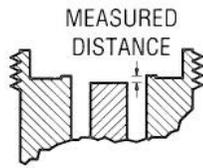
Step 2 fails, and step 3 passes: It is likely that the collet is no longer useable, and/or the center conductor collet hole needs cleaning. Clean the center conductor, replace the collet (with a new one if necessary), and re-gage by repeating steps 2 and 3.

Step 2 passes, but step 3 fails,
 or *Steps 2 and 3 fail:* The fixture body requires factory repair.

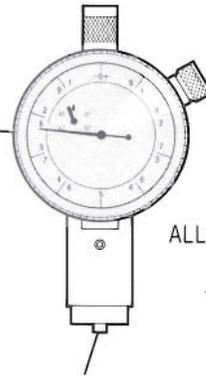
HP 85041A Transistor Test Fixture Kit



1

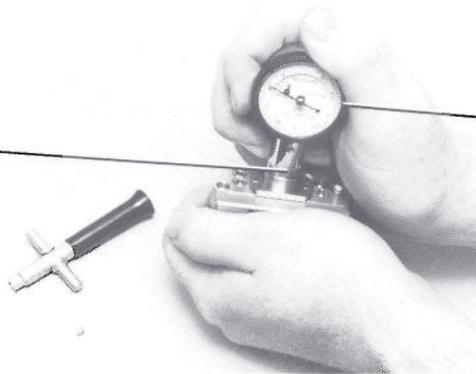
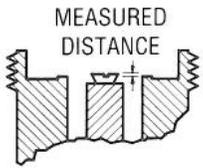


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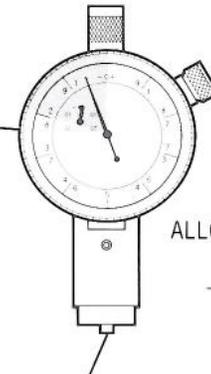


ALLOWABLE RANGE
+0.002 TO
+0.010 INCH

DO NOT USE
ALIGNING PIN



3



ALLOWABLE RANGE
0.0000 TO
-0.002 INCH

DO NOT USE
ALIGNING PIN

Figure 14. 7mm Connector Gaging Procedure

RF Gasket Replacement Procedure (Figure 15)

The RF gaskets used in the transistor test fixture (TTF) are made of a material that wears with use. Figure 15 shows the proper method of replacing RF gaskets when they are worn.

1. Obtain the following items, or their equivalents:

Description	HP Part Number
RF Gasket Kit (supplied)	85041-80014
Tweezers (supplied)	85041-80004
Lid Tool (supplied)	85041-80005
Torque Tool (supplied)	85041-80003
Toothpicks (not supplied)	none

2. RF gaskets are used four places in the TTF as shown. The two gaskets closest to the outer edge of the fixture should wear the most, due to friction caused by opening and closing the lid. If only these are replaced, you need not disassemble the fixture. Replacement of the other gaskets require fixture disassembly. Refer to the **Mechanical Assembly Procedure**, and Figure 5 for this procedure. Check each gasket periodically for wear and replace as needed.
3. Remove the RF gasket by inserting the tip of a toothpick under one end of the gasket and pry it out using an upward motion. Thoroughly clean the area, using the cleaning techniques described in **Cleaning the Fixture**, and Figure 13.
4. Grasp one end of a new gasket with the tweezers. Starting at one end of the gasket slot, position the gasket with the tweezers while you press it in place with your thumb.

HP 85041A Transistor Test Fixture Kit

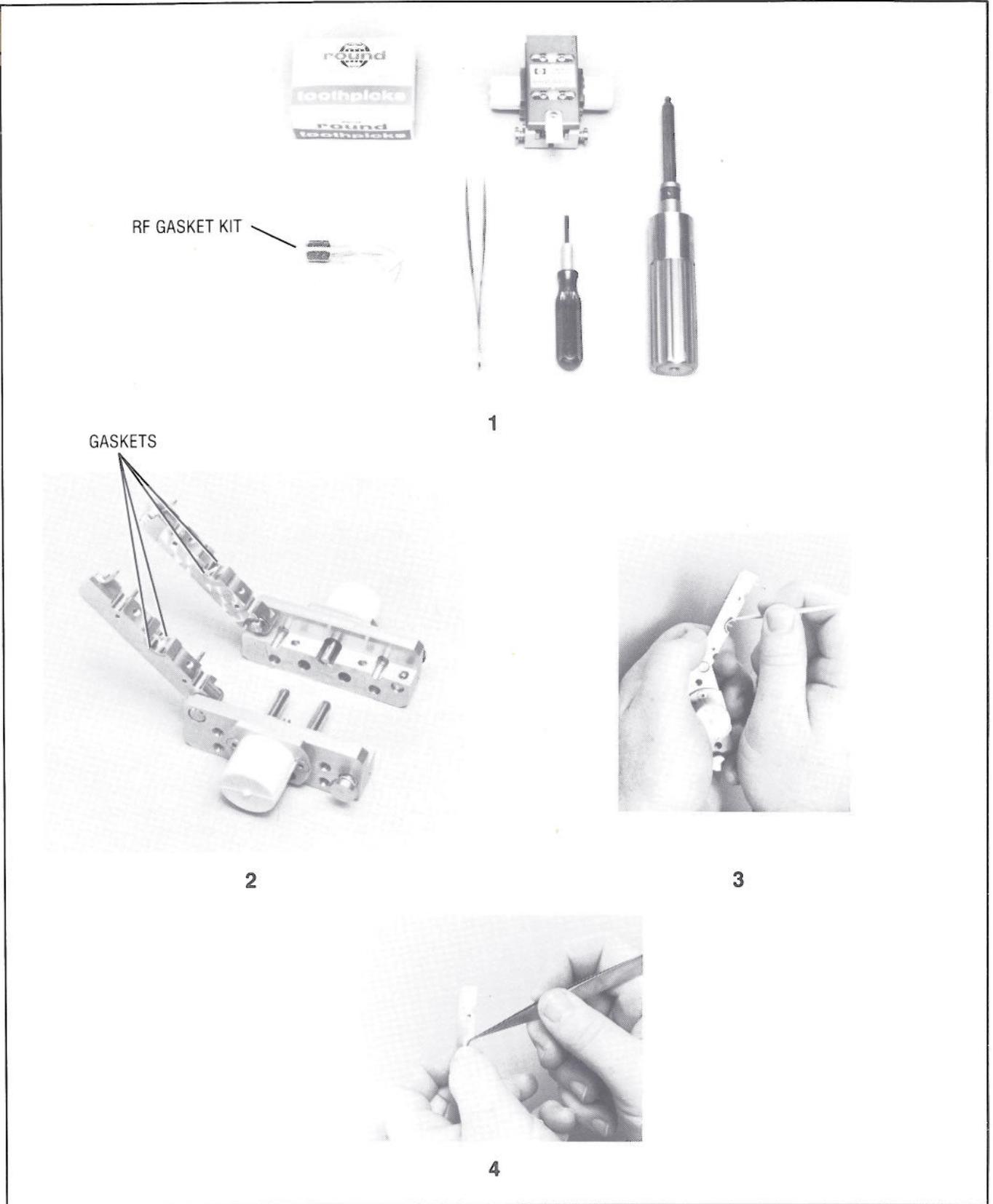


Figure 15. RF Gasket Replacement Procedure

Upper Dielectric Rod Replacement Procedure (Figure 16)

1. Obtain the following items, or their equivalents:

Description	HP Part Number
Dielectric Rod Kit (supplied)	85041-80007
.035 in. Allen Wrench (not supplied)	8710-1075
Lid Tool (supplied)	85041-80005
Torque Tool (supplied)	85041-80003
Tweezers (supplied)	85041-80004
Toothpicks (not supplied)	none
Locktite Adhesive #222	none

2. Figure 16, Pictorial 2 shows the positions of the upper dielectric rod and of the center conductor slot when the lid is about to be closed. With the lid shut, the upper dielectric rod is centered in the 7mm center conductor slot. But, it is not lined up symmetrically to go into the transistor slot just before the lid latches, as shown. This is normal. It is this way because the lid closes in an arc, and not straight down.

CAUTION

Dielectric rods are very delicate and brittle; nearly any amount of side pressure will break one. Be very careful when using the fixture and replacing rods.

3. Disassemble the transistor test fixture by removing the lid, body screws, and transistor inserts, and separate both fixture halves. Open the fixture by pressing the spring latch. Use a 0.035 inch Allen wrench to loosen the set screw as shown; remove the set screw and the spring.
4. Remove the dielectric rod by gently pushing it out with a toothpick.

Upper Dielectric Rod Replacement Procedure (continued)

5. Open a new replacement upper dielectric rod kit and use the tweezers to grasp the new rod by the short end. Carefully put the new rod into the hole with the long end down. Then, use the tweezers to put the spring into the hole.
6. Put a small drop of Loctite adhesive on the threads of the set screw near the Allen head end. Thread the set screw into its hole using a 0.035 inch Allen wrench. Turn the screw one turn after the top of the screw is even with the cover top surface.

CAUTION

Use only "Loctite grade 222 mild strength small screw thread locker." Other adhesive grades or types may make adjustment impossible, or wick down the threads and adhere to the dielectric rod.

Check for proper springiness and travel of the dielectric rod by pressing upward on the rod with your finger. Again, be careful! Side pressure or excessive upward force will break the new rod that was just installed. The rod should travel a minimum of 0.020 inch into the spring and easily return to normal position when released.

Incorrect measurements of a transistor or check device may be caused by incorrect spring pressure on the rod. The only pressure required is that which provides contact of the device lead at the center conductor pedestal.

Correct installation may be verified using the HP 85014A Active Device Measurement Application Pac.

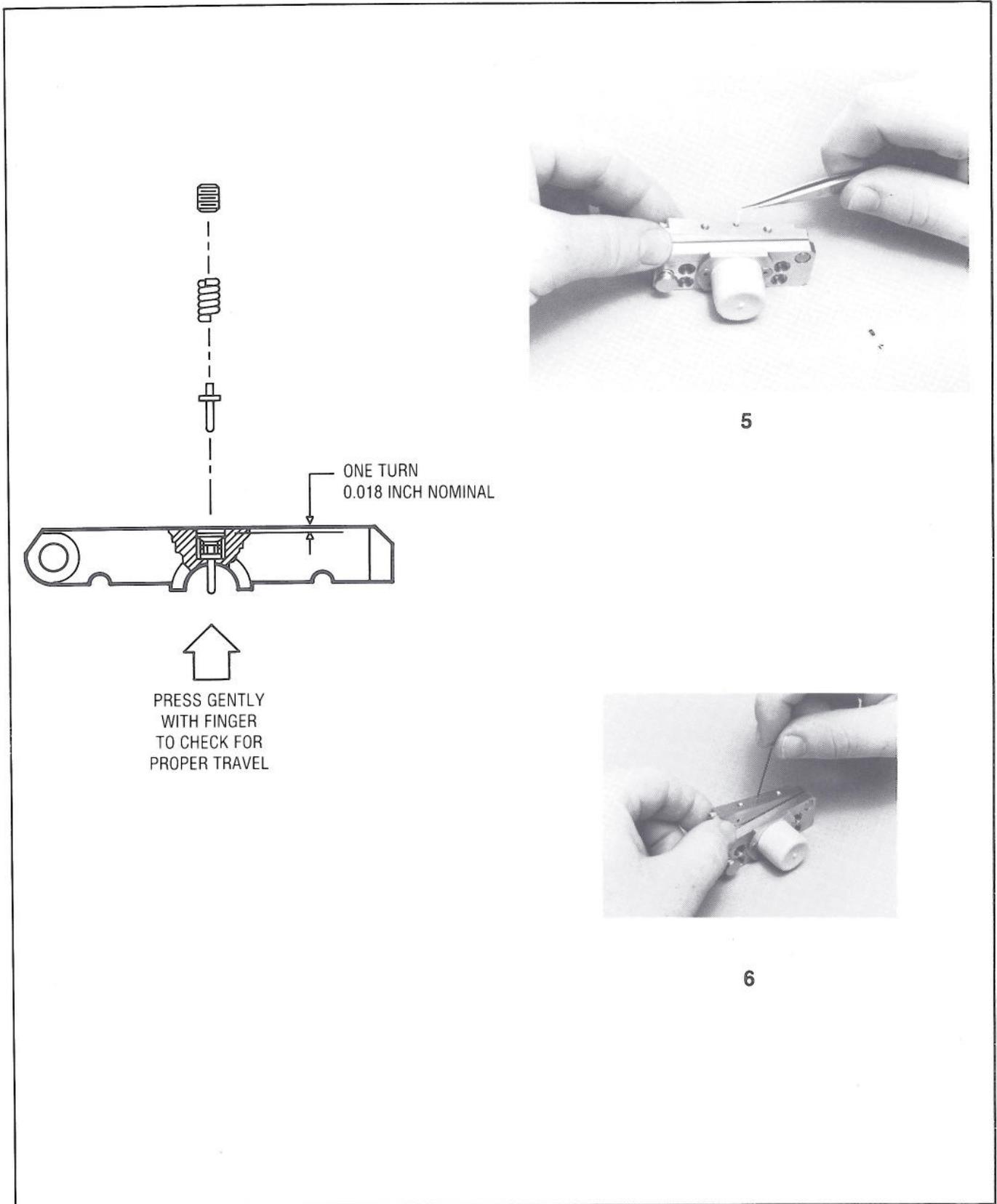


Figure 16. Upper Dielectric Rod Replacement Procedure (2 of 2)

7mm Connector Concentricity Adjustment Procedure (Figure 17)

1. Concentricity of the 7mm connector is adjusted by turning the lower dielectric rod set screw.

CAUTION

Do not adjust the lower dielectric rod set screw unless absolutely necessary. To do so without the proper equipment to realign the center conductor will adversely affect future electrical measurements of your transistor test fixture.

Figure 17, Pictorial 1 shows the lower dielectric rod assembly. This assembly consists of one rod and one set screw. The set screw is adjustable with a 0.035 inch Allen wrench (not supplied).

Unlike the upper rod assemblies, there are no springs supporting the lower rods. No lower rod replacement kits are supplied with your HP 85041A Transistor Test Fixture Kit. Refer to Table 1 at the back of this manual for the HP part number of the Lower Dielectric Rod Kit.

2. Figure 17, Pictorial 2 shows the concentricity adjustment limits of the 7mm connector center conductors. The recommended method of measuring center pin concentricity is by visual means, such as with an optical comparator. This method is best because physical contact with mating surfaces and dielectric rods is minimized.

With the lid closed, optically measure the A and B distances. The difference between these measurements should not be greater than 0.003 inch. The center conductor lateral position is fixed.

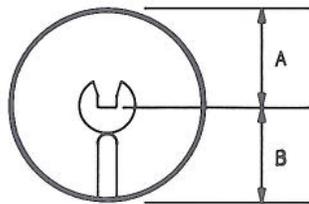
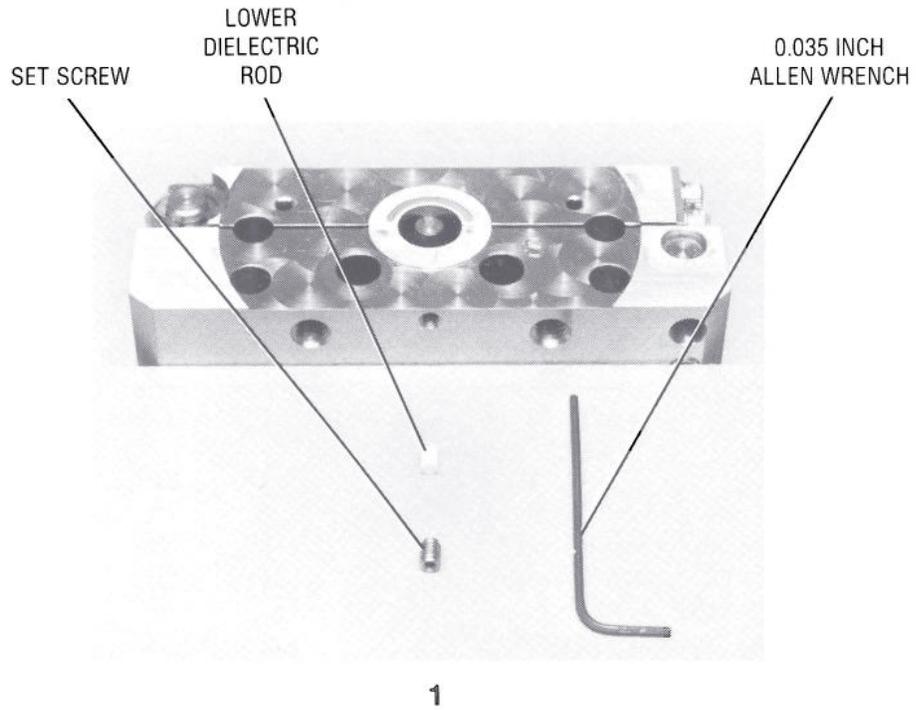
If adjustment limits are not met, remove the lower rod set screw with a 0.035 inch Allen wrench. Put a small drop of Loctite adhesive on the threads of the set screw near the Allen head end and put the set screw into its hole. Adjust connector concentricity by using the optical comparator while turning the lower set screw.

CAUTION

Use only "Loctite grade 222 mild strength small screw thread locker." Other adhesive grades or types may make adjustment impossible, or wick down the threads and adhere to the dielectric rod.

Verify proper adjustment by following the electrical verification procedure in the HP 85041A Measurement Application Pac Manual.

HP 85041A Transistor Test Fixture Kit



PERFECT CIRCULARITY IS ASSUMED
TIR = 0.006 INCH MAX
OR,
 $|A - B| \leq 0.003$ INCH

2

Figure 17. 7mm Connector Concentricity Adjustment Procedure

Latch Replacement Procedure (Figure 18)

All latch parts are very reliable and should rarely need replacement. Often, a simple adjustment or some lubricant is all that is required for smooth operation. However, should any part be damaged or wear out, a complete spare latch kit is provided in every HP 85041A Transistor Test Fixture Kit.

- 1 Obtain the following items, or their equivalents:

Description	HP Part Number
Tube of light grease (stem grease shown - not supplied)	6040-0024
Latch Kit (supplied)	85041-80008
5/64 inch Allen Wrench (not supplied)	none
1/16 inch Allen Wrench (not supplied)	none
Toothpicks (not supplied)	none

- 2 Figure 18, Pictorial 2 shows how the latch is installed. The latch kit includes two new latches, but does not include the two lock washers and Allen head screws. You must re-use existing hardware.

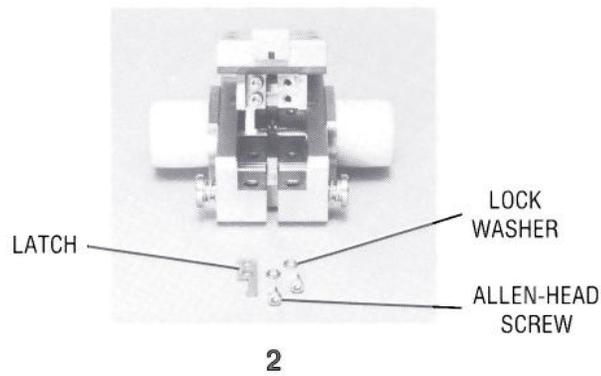
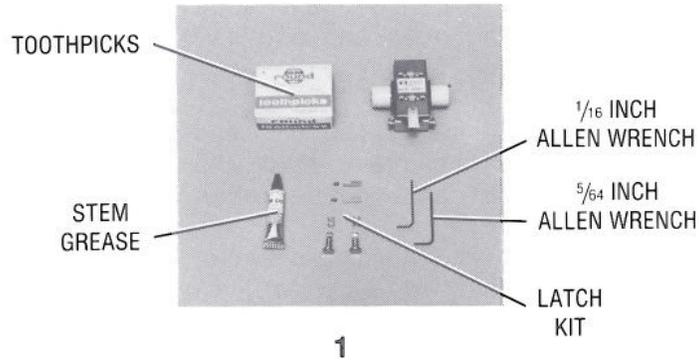
Remove the old latch by loosening the Allen head screws with a 5/64 inch Allen wrench. Note latch orientation. Save the lockwashers and screws. Install the new latch by reversing the procedure used to remove the old latch. Use moderate force when tightening, but do not strip the threads. The latches may need adjustment later.

- 3 Figure 18, Pictorial 3 shows the assembly detail of the remainder of the latch. The latch kit includes all latch parts shown except the bottom set screws (these tighten against the dog-point set screws), so when disassembling the latch, save these set screws.

Disassemble the latch by removing the bottom latch set screws and the dog-point set screws with a 1/16 inch Allen wrench (not supplied). Pull the latch pins and springs out of the fixture body. The latch pins fit tightly in the body and are lubricated to allow smooth operation. You may need to use pliers and moderate force to remove them from the holes.

The two latch pins are **not** identical. Each pin has a latch slot and a (travel) stop slot machined into it and must be oriented as shown, when re-assembled. Do not re-assemble yet, this procedure continues on the next page.

HP 85041A Transistor Test Fixture Kit



**NOTE ORIENTATION
OF LATCH SLOT
AND STOP SLOT**

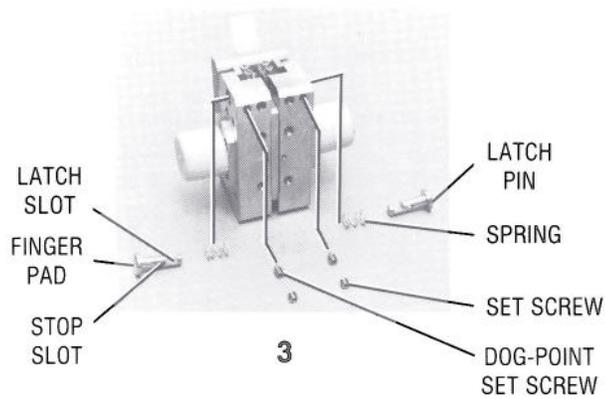


Figure 18. Latch Replacement Procedure (1 of 2)

Latch Replacement Procedure (continued)

- 4 Place the new spring over the latch pin. The spring fits very tightly on the latch pin body, and a pair of needle-nose pliers may help. Push the spring onto the pin as far as you can, until it makes contact with the finger pad.

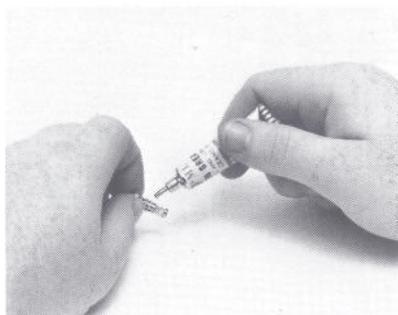
Lightly lubricate the new latch pin and spring. Do not allow grease **anywhere** else on the fixture. It might be helpful to use a toothpick to dab lubricant on the latch pin.

- 5 Place the fixture in the position shown in Figure 18, Pictorial 5. While holding the lid open as shown, insert the right-hand side latch pin. The latch slot should be facing up (toward latch), and the stop slot should be facing toward you (toward bottom of fixture). If the stop slot faces away from you with the latch slot up, you have the left (wrong) latch.

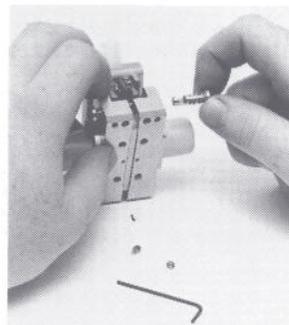
Press the latch in while you insert the dog-point set screw into the bottom screw hole, using the 1/16 inch Allen wrench. Do not tighten this set screw. It should stop the pin from coming out of the fixture, but not interfere with normal pin travel. Make sure the pin moves easily throughout its usual range. Repeat the procedure for the left latch pin. Do not insert the bottom set screw at this time.

- 6 Hold the fixture as shown and note the action of the latch pins as you are closing the lid. Just before lid closure, the latch pins move **into** the fixture body.
- 7 When the lid closes, the latch pins should spring **outward**, and you should hear a "click". Open and close the lid a few times and make sure it "feels" right. If the fixture does not latch properly, refer to the next step. If it does, insert the bottom set screws; each should fit snugly against the head of the dog-point set screw.
- 8 Close the lid. Loosen the Allen head latch screws as shown with a 5/64 inch Allen wrench, and then re-tighten them again.

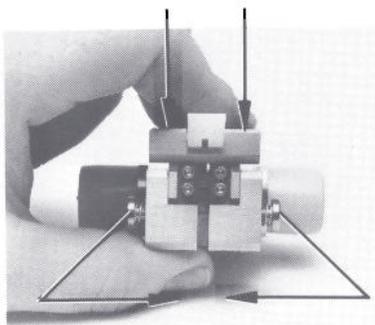
If the latch still does not work properly, remove the bottom latch pin set screws and make sure the dog-point set screws are not binding the latch pins. The points must fit **loosely** in the latch pin stop slot. Also, try loosening the latch and pulling it downward as you tighten the latch screws.



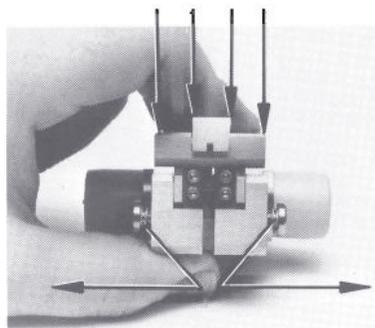
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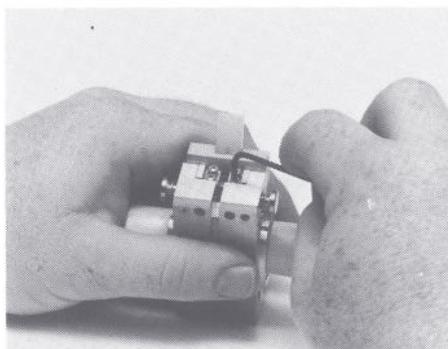
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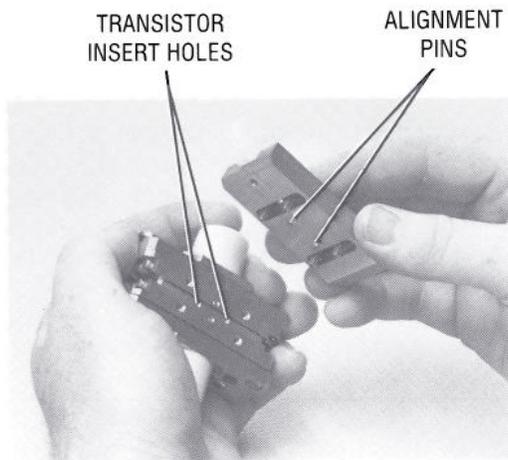
8

Figure 18. Latch Replacement Procedure (2 of 2)

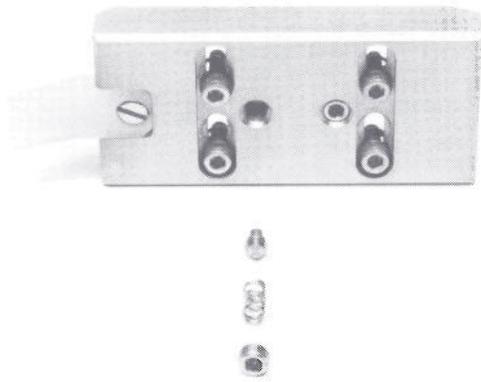
HP 85041A Transistor Test Fixture Kit

Top Cover Alignment Pins Adjustment Procedure (Figure 19)

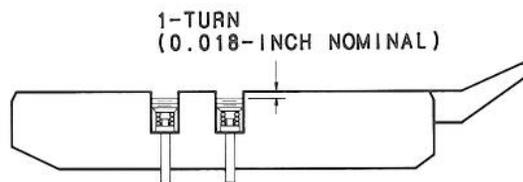
- 1 The purpose of the top cover alignment pins is to provide even pressure against the transistor insert to hold it in place when the cover is secure. Figure 19, Pictorial 1 illustrates this idea by showing placement of the spring-loaded alignment pins and the mating holes in the top of a transistor insert.
- 2 Components of one of the alignment pin assemblies are shown. The alignment pin assemblies are constructed of very reliable components, and no replacement kit is provided in the HP 85041A Transistor Test Fixture Kit. Replacement HP part numbers are not available. Contact your nearest HP sales/service Office and explain this if you ever need these parts; special arrangements may be made to accomodate your needs.
- 3 Thread the set screw into the hole by using the lid tool (supplied). Turn the screw 1/8 turn after the top of the screw is even with the cover top surface.



1



2



3

Figure 19. Top Cover Alignment Pins Adjustment Procedure

HP 85041A Transistor Test Fixture Kit

REPLACEABLE PARTS

Replaceable Parts

Table 1 lists the individual HP part numbers for all of the components in the HP 85041A Transistor Test Fixture Kit. To order an HP part, list the description, HP part number with check digit (CD), and quantity desired. Send your order to the nearest Hewlett-Packard Sales/Support Office listed inside the back cover of this manual.

Table 1. HP 85041A Replaceable Parts List (1 of 2)

Item	Qty	Description	HP Part Number	CD
1	1	Transistor Test Fixture	85041-80015	8
2	1	Operating and Service Manual	85041-90001	3
3	1	Operating and Service Manual (Microfiche)	85041-90002	4
4	1	Model Program Software Disc (3-1/2 in.)	85041-10001	5
5	1	Model Program Software Disc (5-1/4 in.)	85041-10002	6
6	1	Test Fixture Storage Case (includes foam)	85041-80006	7
7	1	Stand - includes: 2 thumbscrews 2 lockwashers 3 sets of 3 feet.	85041-80002	3
8	1	Torque Tool	85041-80003	4
9	1	Tweezers	85041-80004	5
10	1	Lid Tool	85041-80005	6
*11	1	Upper Dielectric Rod Kit includes: 1 dielectric rod 1 set screw 1 spring	85041-80007	8

* These items included with the HP 85041A Transistor Test Fixture Kit as spare replacement parts.

HP 85041A Transistor Test Fixture Kit

Table 1. HP 85041A Replaceable Parts List (2 of 2)

Item	Qty	Description	HP Part Number	CD
12	1	Lower Dielectric Rod Kit - includes: 1 dielectric rod 1 set screw	85041-80034	1
*13	1	Latch Kit - includes: 2 shaft locks 2 set screws 2 metal guides 2 springs	85041-80008	9
14	1	70 mil transistor insert (2 pieces)	85041-80009	0
15	1	70 mil check devices (2 pieces)	85041-80010	3
16	1	100 mil transistor insert (2 pieces)	85041-80011	4
17	1	100 mil check devices (2 pieces)	85041-80012	5
*18	1	Transistor Fixture Bolt Kit (2 pieces)	85041-80013	6
*19	1	Transistor Fixture Gasket Kit (8 pieces)	85041-80014	7
20	1	6 Slot Collets for 7mm Connector	85050-20001	7
21	1	Transistor Fixture Handle	85041-80033	0
<p>* These items included with the HP 85041A Transistor Test Fixture Kit as spare replacement parts.</p>				

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