

Installation Note

Extended Frequency Range (40 or 50 GHz to 67 GHz) Upgrade Kit

To Add Option 068

**Upgrade Kit Order Numbers: E8363BU/CU-068 and E8364BU/CU-068
For E8363B/C and E8364B/C PNA Series Microwave Network
Analyzers**



Agilent Kit Number: E8364-60106

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E8364-90023

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Safety Notes

The following safety notes are used throughout this document. Familiarize yourself with each of these notes and its meaning before performing any of the procedures in this document.

WARNING	Warning denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.
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CAUTION	Caution denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in damage to or destruction of the instrument. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.
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Description of the Upgrade

This upgrade kit is used to extend the frequency range of the E8363 B/C, or E8364B/C, Option 014 PNA microwave network analyzer from 40 GHz to 67 GHz, or 50 GHz to 67 GHz.

This upgrade applies to a PNA with only Option 014 or Option 014 and 080 in combination. No other optional hardware combinations can be upgraded with this upgrade kit. If options 016, 081, UNL, or H11 are already installed, special upgrade instructions are required. Stop here and contact Agilent for these instructions.

Getting Assistance from Agilent

Installing this upgrade kit requires special skills and experience. If you think you may not be qualified to do the work, or need advice, contact Agilent.

Contacting Agilent

Assistance with test and measurements needs and information on finding a local Agilent office are available on the Web at:

<http://www.agilent.com/find/assist>

If you do not have access to the Internet, please contact your Agilent field engineer.

NOTE In any correspondence or telephone conversation, refer to the Agilent product by its model number and full serial number. With this information, the Agilent representative can determine whether your product is still within its warranty period.

Getting Prepared

To successfully install this upgrade kit, you will need the following:

- A license key - refer to “[License Key Redemption](#)” below.
- A PDF copy or a paper copy of the PNA Service Guide - refer to “[Downloading the Online PNA Service Guide](#)” on page 5.
- An ESD-safe work area - refer to “[Protecting Your Workspace from Electrostatic Discharge](#)” on page 5.
- Correct tools - refer to “[Tools Required for the Installation](#)” on page 5.
- Enough time - refer to “[About Installing the Upgrade Kit](#)” on page 6.
- Test equipment for the post-upgrade adjustments. Refer to “[Test Equipment Required for Post-Upgrade Adjustments](#)” on page 11.

License Key Redemption

NOTE The enclosed Option Entitlement Certificate is a receipt, verifying that you have purchased a licensed option for the PNA of your choice. You must now use an Agilent Web page to request a license key for the instrument that will receive the option.

To enable the option product, you must request a license key from: <http://www.agilent.com/find/softwarelicense>. To complete the request, you will need to gather the following information:

- From the certificate
 - Order number
 - Certificate number
- From your instrument
 - Model number
 - Serial number
 - Host ID

The instrument information is available on the network analyzer – on the analyzer’s **Help** menu, click **About Network Analyzer**.

If you provide an email address, Agilent will promptly email your license key. Otherwise, you will receive your license key via postal mail.

Downloading the Online PNA Service Guide

To view the online Service Guide for your PNA model number, use the following steps:

1. Go to www.agilent.com
2. In the Search box, enter the model number of the analyzer (Ex: E8363B) and click **Search**.
3. Click [Technical Support > Manuals](#).
4. Click [Service Manual](#).
5. Click the service guide title to load the PDF file.
6. When the PDF of the Service Guide is displayed, scroll through the Contents section bookmarks to locate the information needed.

Protecting Your Workspace from Electrostatic Discharge

For information, click on the Chapter 1 PDF bookmark, “[Electrostatic Discharge Protection](#)” in the online Service Guide¹.

ESD Equipment Required for the Installation

Description	Agilent Part Number
ESD grounding wrist strap	9300-1367
5-ft grounding cord for wrist strap	9300-0980
2 x 4 ft conductive table mat and 15-ft grounding wire	9300-0797
ESD heel strap (for use with conductive floors)	9300-1308

Tools Required for the Installation

Description	Qty	Part Number
T-10 TORX driver - set to 9 in-lbs (1.02 N.m)	1	N/A
T-20 TORX driver - set to 21 in-lbs (2.38 N.m)	1	N/A
5/16-in (8 mm) nutsetter or open end torque wrench - set to 10 in-lbs (1.13 N.m)	1	N/A
5/16-in (8 mm) nutsetter or open end torque wrench - set to 21 in-lbs (2.38 N.m)	1	N/A
1-inch torque wrench - set to 72 in-lbs (8.15 N.m)	N/A	1-inch torque wrench (set to 72 in-lbs)

CAUTION Use a 5/16-in torque wrench set to 10 in-lbs on all cable connections except the front panel and some rear panel cable connectors. Torque these connections to 21 in-lb.

1. See “[Downloading the Online PNA Service Guide](#)” on page 5.

About Installing the Upgrade Kit

IMPORTANT Option 068 can only be installed on analyzers with Option 014, as listed below as “Products affected”. If your analyzer does not have Option 014 (as listed below), it will be necessary to install the option BEFORE installing this option (Option 068).

Products affected.	E8363B/C and E8364B/C with Option 014, Configurable Test Set
Installation to be performed by	Agilent service center or personnel qualified by Agilent
Estimated installation time	3 hours
Estimated adjustment time	1 hour
Estimated full instrument calibration time	4.5 hours

If you need assistance, refer to [“Contacting Agilent” on page 3](#).

Items Included in the Upgrade Kit

Check the contents of your kit against the following list. If any item is missing or damaged, contact Agilent Technologies. Refer to [“Contacting Agilent” on page 3](#).

Table 1 Contents of Option 068 Upgrade Kit (E8364-60106)

Ref. Desig.	Description	Qty	Part Number
	Installation note (this document)	1	E8364-90023
	Entitlement Certificate	1	5964-5145
	ROHS addendum	1	9320-6722
	Model number nameplate (for 67 GHz analyzer E8361A)	1	E8361-80001
	Model number nameplate (for 67 GHz analyzer E8361C)	1	E8361-80006
	Lower front panel overlay (Option 014)	1	E8361-80004
A12	Source 20	1	E8361-60002
A17	LOMA 12	1	5087-7247
A18	MA 24	1	5087-7248
A20	LODA	1	5087-7777
A22	Switch	1	5087-7238
A23	SOMA 70, port 1	2	5087-7249
A24	SOMA 70, port 2		
A25	Test port 1 coupler	2	5087-7225
A26	Test port 2 coupler		
A27	Channel A first converter (mixer)	4	5087-7258
A28	Channel R1 first converter (mixer)		
A29	Channel R2 first converter (mixer)		
A30	Channel B first converter (mixer)		
	Mixer bias board	1	E8361-63044
	SOMA 70 bracket	2	E8361-00002
	Machine screw M3.0 x 10 (for attaching A22 switch)	2	0515-0374
	Machine screw M3.0 x 6 (for attaching SOMA 70 brackets)	6	0515-0430
	Machine screw M3.0 x 25 (for attaching SOMA 70s to brackets)	4	0515-0667

Table 1 Contents of Option 068 Upgrade Kit (E8364-60106)

Ref. Desig.	Description	Qty	Part Number
	1.85 mm female bulkhead connector	12	5065-4673
	Nut, hex (for bulkhead connectors)	12	1250-3516
	Washer, lock (for bulkhead connectors)	12	1250-3310
	Ribbon cable, A23/A24 SOMA 70s to A16 test set motherboard	2	8121-1001
	Cable, stranded wire, A22 switch to A16 test set motherboard	1	8121-0990
	Cable tie (to secure cable W71)	2	1400-0249
	Cable tie mount (to secure cable W71)	2	1400-1551
W2	A21 SOMA 50 to A22 switch	1	E8361-20002
W3	A22 switch to A23 SOMA 70	1	E8361-20003
W4	A22 switch to A24 SOMA 70	1	E8361-20004
W20	A8 fractional-N synthesizer J106 to A17 LOMA 12 J2	1	E8361-20045
W21	A8 fractional-N synthesizer J101 to A17 LOMA 12 J3	1	E8361-20046
W38	A23 SOMA 70 to A16 test set motherboard	1	E8361-60124
W39	A24 SOMA 70 to A16 test set motherboard	1	E8361-60123
W60	Front-panel jumper	6	E8361-20023
W61	RF cable, A23 SOMA 70 to PORT 1 SOURCE OUT	1	E8361-20021
W62	RF cable, A24 SOMA 70 to PORT 2 SOURCE OUT	1	E8361-20022
W63	RF cable, PORT 1 CPLR THRU to A25 test port 1 coupler	1	E8361-20011
W64	RF cable, PORT 2 CPLR THRU to A26 test port 2 coupler	1	E8361-20012
W65	RF cable, A23 SOMA 70 to REFERENCE 1 SOURCE OUT	1	E8361-20015
W66	RF cable, A24 SOMA 70 to REFERENCE 2 SOURCE OUT	1	E8361-20016
W67	RF cable, A25 test port 1 coupler to PORT 1 CPLR ARM	1	E8361-20018
W68	RF cable, A26 test port 2 coupler to PORT 2 CPLR ARM	1	E8361-20018
W69	RF cable, PORT 1 RCVR A IN to A27 channel A mixer	1	E8361-20066
W70	RF cable, REFERENCE 1 RCVR R1 IN to A28 channel R1 mixer	1	E8361-20049
W71	RF cable, REFERENCE 2 RCVR R2 IN to A29 channel R2 mixer	1	E8361-20020
W72	RF cable, PORT 2 RCVR B IN to A30 channel B mixer	1	E8361-20048

Installation Procedure for the Upgrade Kit

The network analyzer must be in proper working condition prior to installing this option. Any necessary repairs must be made before proceeding with this installation.

WARNING This installation requires the removal of the analyzer's protective outer covers. The analyzer must be powered down and disconnected from the mains supply before performing this procedure.

Electrostatic Discharge Protection

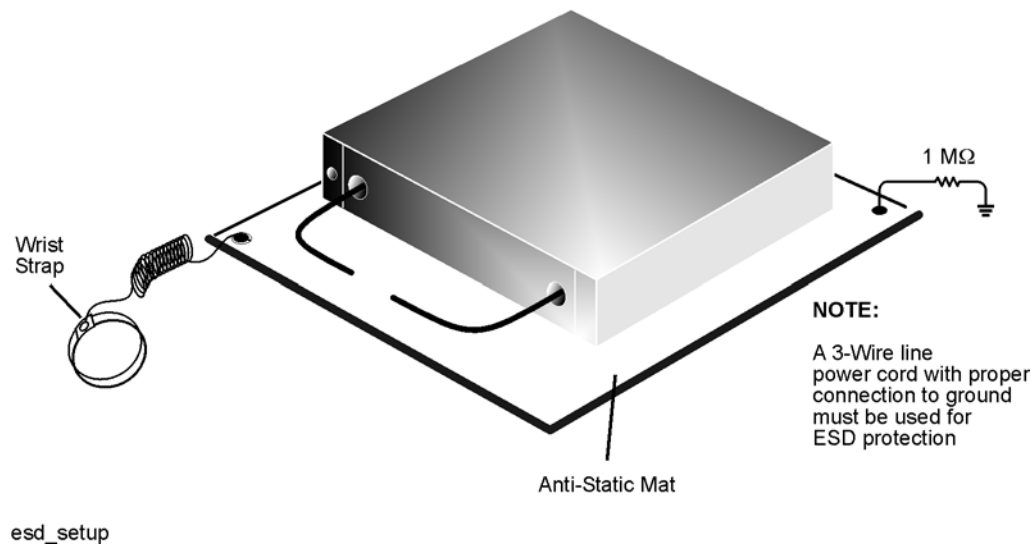
Protection against electrostatic discharge (ESD) is essential while removing or connecting cables or assemblies within the network analyzer.

Static electricity can build up on your body and can easily damage sensitive internal circuit elements when discharged. Static discharges too small to be felt can cause permanent damage. To prevent damage to the instrument:

- *always* wear a grounded wrist strap having a 1 M Ω resistor in series with it when handling components and assemblies.
- *always* use a grounded, conductive table mat while working on the instrument.
- *always* wear a heel strap when working in an area with a conductive floor. If you are uncertain about the conductivity of your floor, wear a heel strap.
- *always* ground yourself before you clean, inspect, or make a connection to a static-sensitive device or test port. You can, for example, grasp the grounded outer shell of the test port or cable connector briefly.

Figure 1 shows a typical ESD protection setup using a grounded mat and wrist strap. Refer to “Tools Required for the Installation” on page 5 for part numbers.

Figure 1 ESD Protection Setup



Overview of the Installation Procedure

Step 1. Obtain a Keyword and Verify the Information

Step 2. Remove the Outer and Inner Covers

Step 3. Replace the A12 Source 20

Step 4. Replace the Top Side to Bottom Side Cables

Step 5. Remove the Front Panel Assembly

Step 6. Raise the Receiver Deck

Step 7. Remove the Old Bottom Side Hardware and Cables

Step 8. Install the New Bottom Side Hardware and Cables

Step 9. Lower the Receiver Deck

Step 10. Replace the Front Panel Nameplate and Overlay

Step 11. Reinstall the Front Panel Assembly and Front Panel Jumpers

Step 12. Reinstall the Inner and Outer Covers

Step 13. Enter the New Model Number

Step 14. Perform Post-Upgrade Adjustments

Test Equipment Required for Post-Upgrade Adjustments

Description	Agilent Part Number
Power meter	E4418B/E4419B
Power sensor, Type-N (100 kHz–4.2 GHz)	8482A
Power sensor, 2.4 mm (4.2 GHz–50 GHz)	8487A
Power sensor, V-Band (50 GHz–67 GHz) ^a	V8486A
Adapter, WR-15 to 1.85 mm (m) ^a	V281B
Adapter, 1.85 mm (f) to 1.85 mm (f) ^b	85058-60114
Adapter, 3.5 mm (m) to 2.4 mm (f)	11901D
Adapter, 2.4 mm (f) to 2.4 mm (f) ^b	11900B
Adapter, Type-N (f) to 2.4 mm (f)	11903B
Adapter, SMA (m) to SMA (f), right angle	1250-1249
Test cable, 2.4 mm (f) to 2.4 mm (f) ^b or Test cable, 1.85 mm (f) to 1.85 mm (f) ^b	85133C N4697E
5/16-inch, open-end torque wrench (set to 10 in-lbs)	8710-1765
1/4-inch, open-end wrench, thin profile	8710-0510

- a. This sensor and adapter must be calibrated together by the Agilent factory. The data supplied are only valid as long as the sensor and adapter remain connected.
- b. The 1.85 mm connector has the same ruggedness and is compatible with the 2.4 mm connector. 1.85 mm and 2.4 mm connectors and adapters may be used interchangeably.

Step 1. Obtain a Keyword and Verify the Information

Follow the instructions on the Option Entitlement Certificate supplied to obtain a license key for installation of this upgrade. Refer to [“License Key Redemption” on page 4](#).

Verify that the model number, serial number, and option number information on the license key match those of the instrument on which this upgrade will be installed.

If the model number, serial number, or option number do not match those on your license key, you will not be able to install the option. If this is the case, contact Agilent for assistance before beginning the installation of this upgrade. Refer to [“Contacting Agilent” on page 3](#).

Once the license key has been received and the information verified, you can proceed with the installation at step 2.

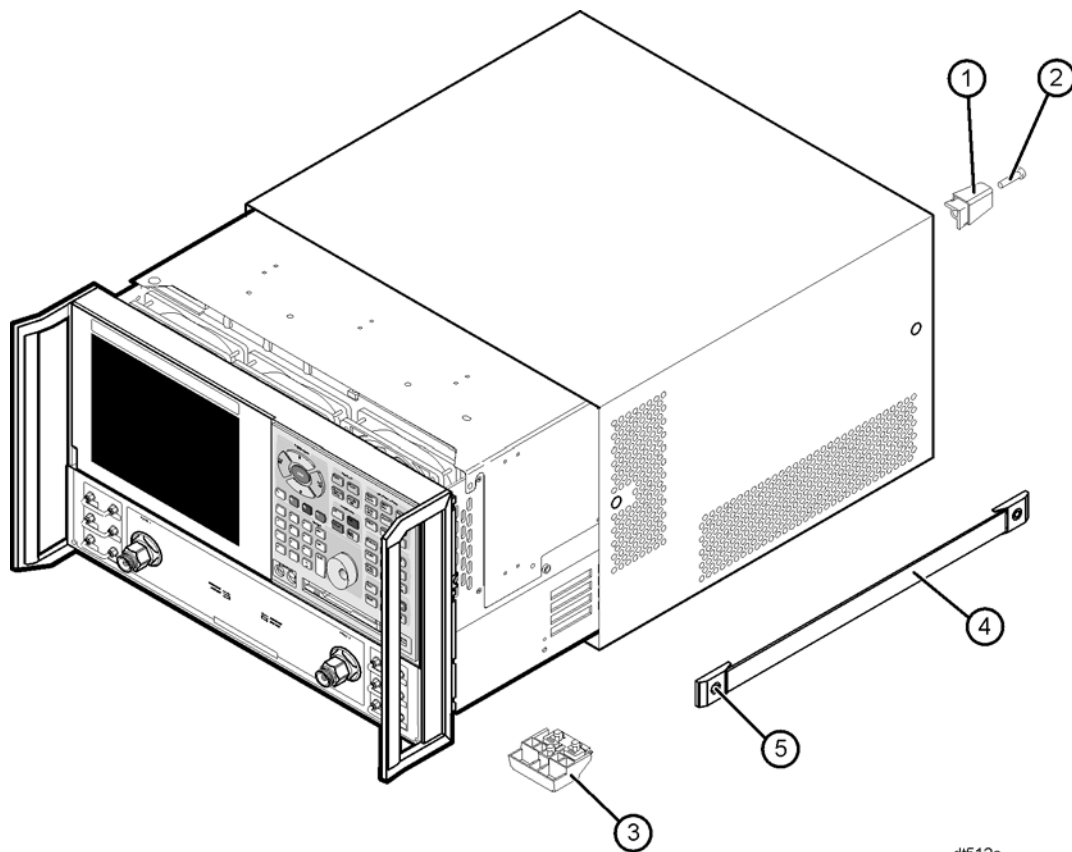
Step 2. Remove the Outer and Inner Covers

Remove the Outer Cover

CAUTION This procedure is best performed with the analyzer resting on its front handles in the vertical position. *Do not place the analyzer on its front panel without the handles.* This will damage the front panel assemblies.

1. Disconnect the power cord (if it has not already been disconnected).
2. Using a T-20 TORX driver, remove the strap handles (item ④) by loosening the screws (item ⑤) on both ends until the handle is free of the analyzer.
3. Using a T-20 TORX driver, remove the four rear panel feet (item ①) by removing the center screws (item ②).
4. Slide the four bottom feet (item ③) off the cover.
5. Slide the cover off of the frame.

Figure 2 Outer Cover Removal



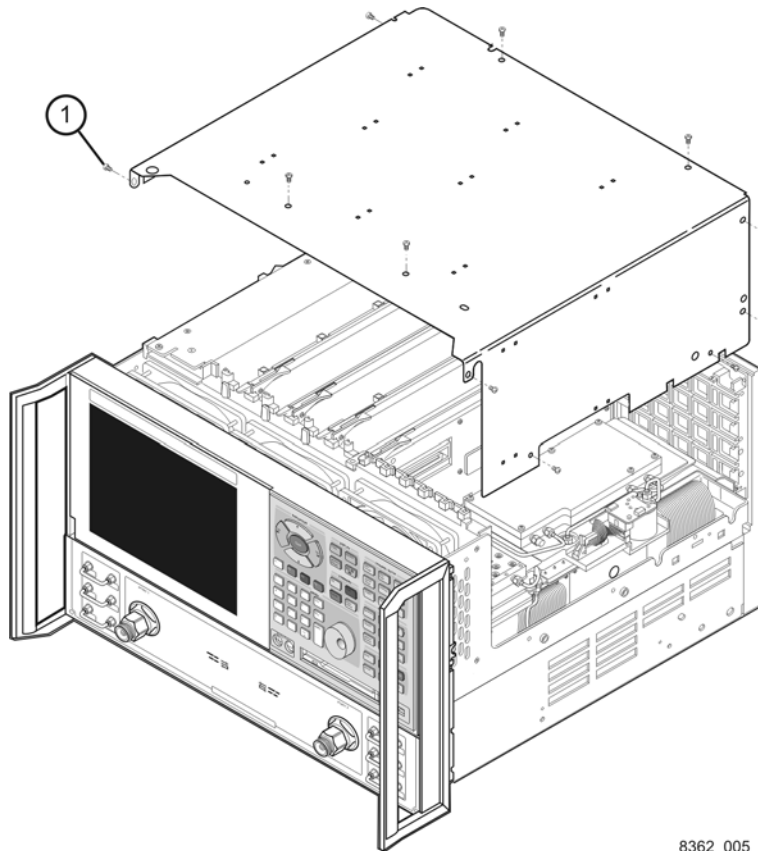
dt512a

NOTE The figure above shows the E8364B front panel and floppy disk drive. The E8363C and E8364C front panel have a slightly different appearance and does not include a floppy disk drive.

Remove the Inner Cover

1. Place the analyzer top-side up on a flat surface.
2. Using a T-10 TORX driver, remove the eleven screws (item ①).
3. Lift off the cover.

Figure 3 Inner Cover Removal



8362_005_01

NOTE The figure above shows the E8364B front panel and floppy disk drive. The E8363C and E8364C front panel have a slightly different appearance and does not include a floppy disk drive.

Step 3. Replace the A12 Source 20

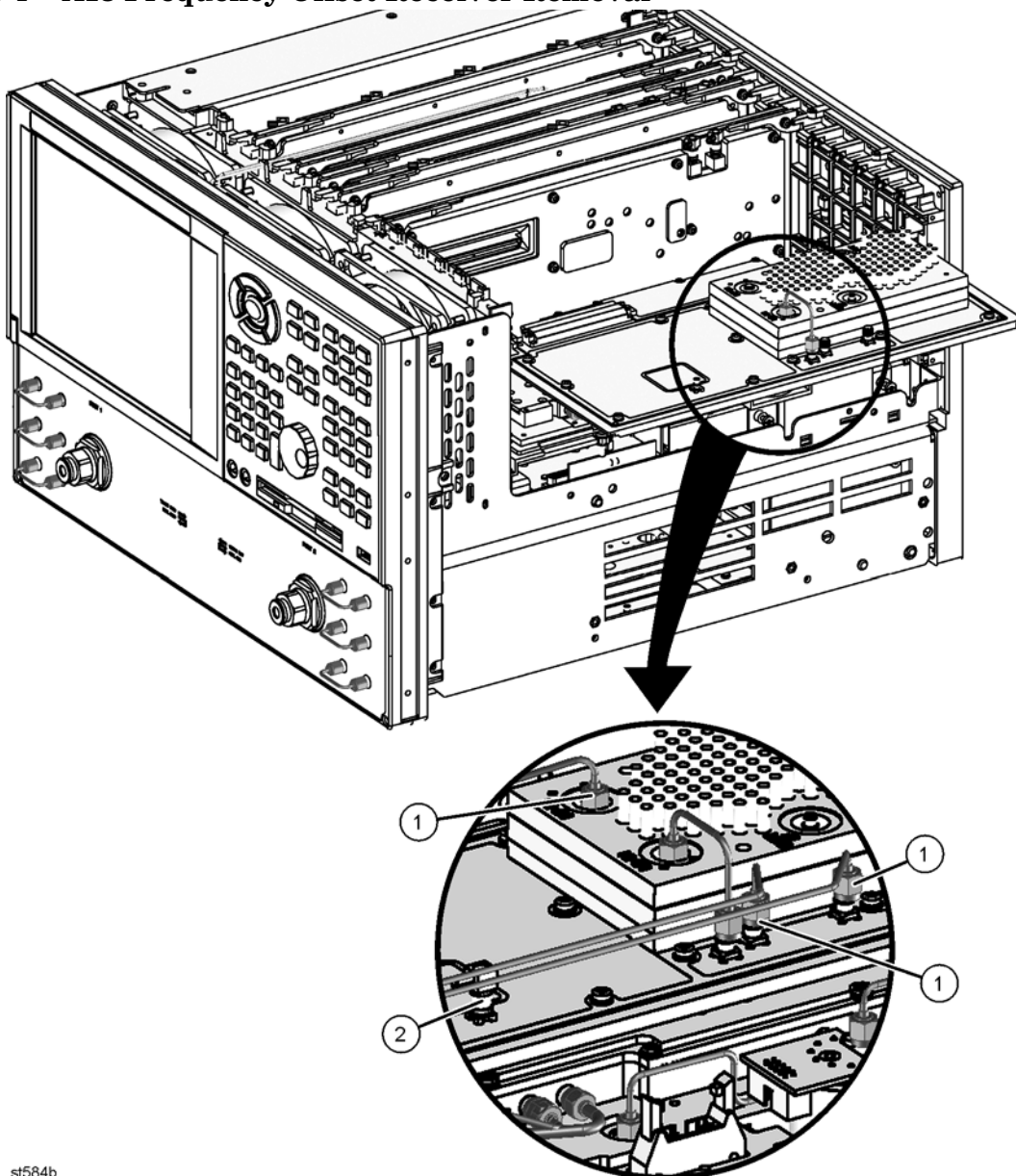
Remove the A13 Frequency Offset Receiver (Option 080 Only)

The A13 frequency offset receiver must be removed to allow access to the A12 source 20.

1. With a 5/16-inch wrench, disconnect semirigid cables (item ①) and then disconnect flexible cable (item ②) from the top of the A13 frequency offset receiver.
2. Disengage the A13 frequency offset receiver from the A11 connector and slide it out of the analyzer.

CAUTION Be careful not to damage the center pins of the semirigid cables. Some flexing of the cables is necessary to remove the assembly. Do not over-bend them.

Figure 4 A13 Frequency Offset Receiver Removal



st584b

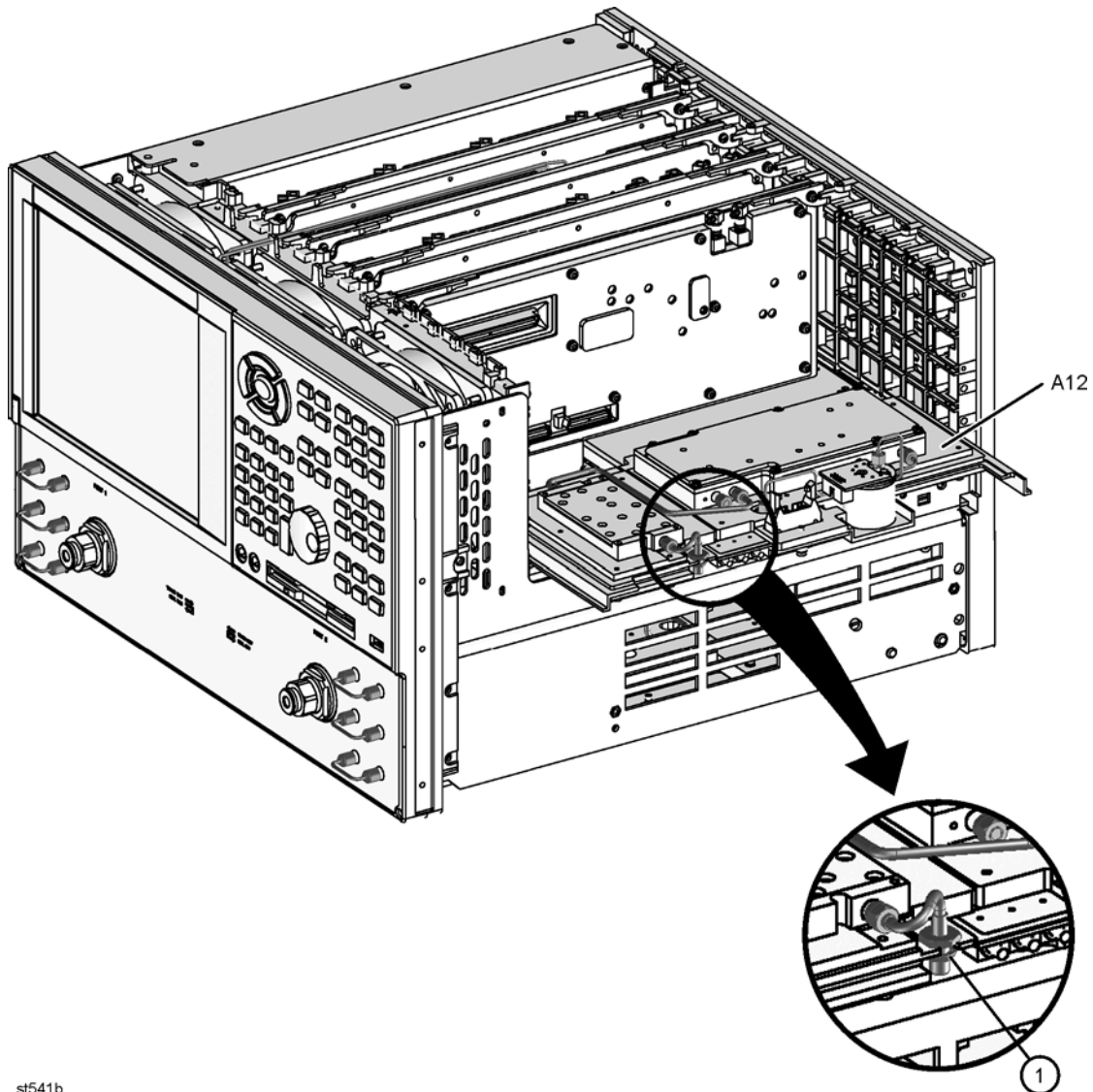
NOTE The previous figure and the figure below show the E8364B front panel and floppy disk drive. The E8363C and E8364C front panel have a slightly different appearance and does not include a floppy disk drive.

Remove the A12 Source 20

1. With a 5/16-inch wrench, disconnect semirigid cable (item ①).
2. Disengage the A12 source 20 from the A11 connector and slide it out of the analyzer while observing the **CAUTION** below.

CAUTION To avoid damaging the semirigid cable (item ①), pull down on the cable from the analyzer's bottom side to move it away while sliding out the A12 source 20. The cable has some spring to it – the RF pin could be damaged by the A12 source 20.

Figure 5 A12 Source 20 Removal



st541b

Install the New A12 Source 20

Refer to [Figure 5 on page 15](#).

1. Slide the new A12 source 20 into the analyzer while observing the **CAUTION** below. Be sure that the assembly is seated completely into the A11 connector.

CAUTION To avoid damage to the semirigid cable (item ①), pull down on the cable from the bottom side of the analyzer to move it away while sliding in the A12 source 20. The cable has some spring to it and the RF pin could be damaged by the A12 source 20.

2. Reconnect the semirigid cable and tighten with a 5/16-inch torque wrench.

Reinstall the A13 Frequency Offset Receiver (Option 080 Only)

Refer to [Figure 4 on page 14](#).

1. Slide the A13 frequency offset receiver into the analyzer while observing the **CAUTION** below. Be sure that the assembly is seated completely into the A11 connector.

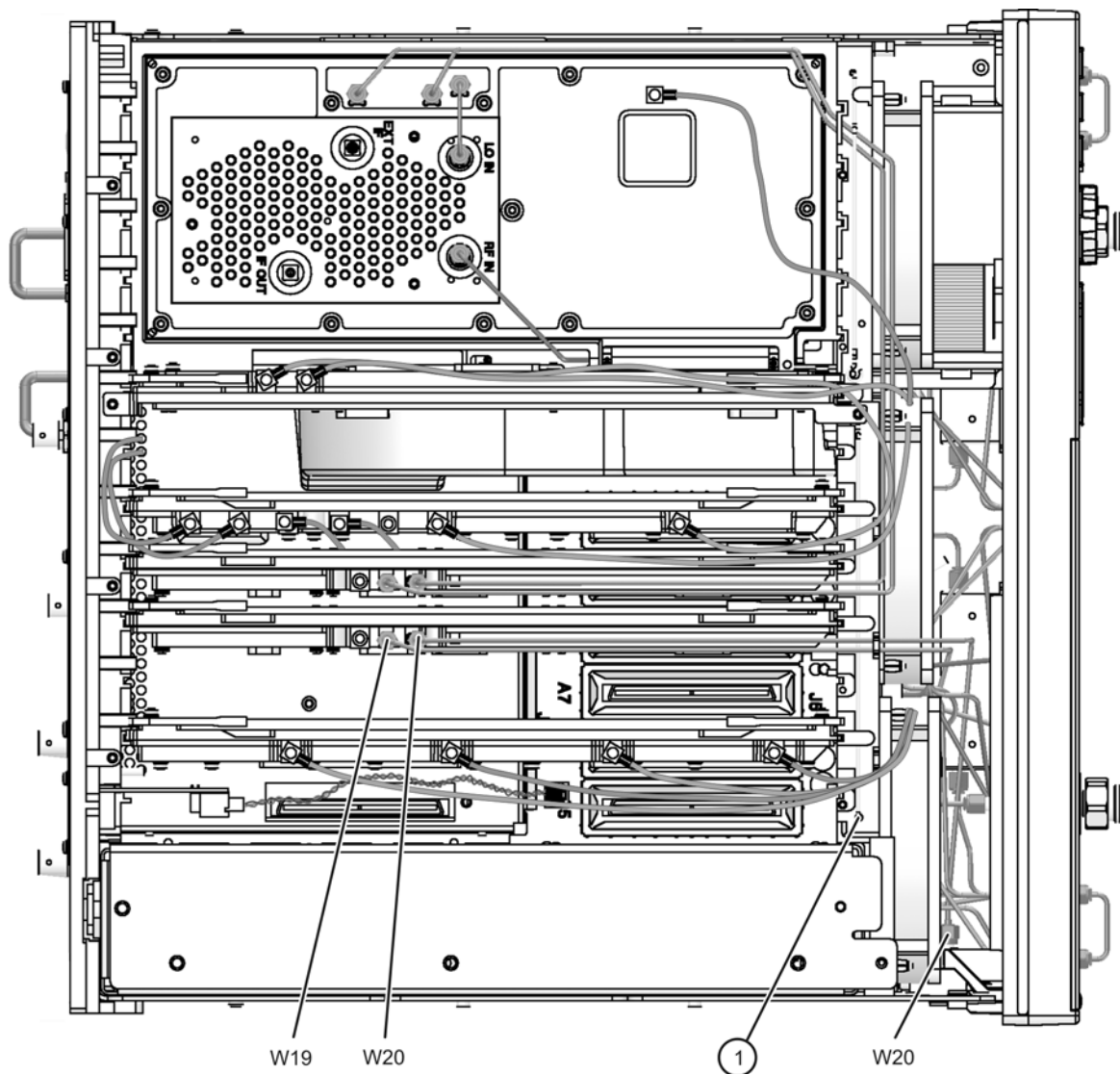
CAUTION Be careful not to damage the center pins of the semirigid cables. Some flexing of the cables is necessary to install the assembly. Do not over-bend them.

1. With a 5/16-inch wrench, reconnect semirigid cables (item ①) and then reconnect flexible cable (item ②) to the top of the A13 frequency offset receiver.

Step 4. Replace the Top Side to Bottom Side Cables

1. Place the analyzer on its side as shown.
2. Remove the cable hold-down wire (item ①).
3. Disconnect cables W19 and W20 at both ends; two top side connections and two bottom side connections.
4. Remove cables W19 and W20 from the analyzer.
5. Position the new cables provided into the analyzer. These cables are now designated as W20 and W21. Connect these cables to the top side connectors at A8J101 and A8J106 but do not connect the other ends to the A17 LOMA 10 as the LOMA 10 will be replaced.
6. Reinstall the cable hold-down wire (item ①).

Figure 6 Top Side to Bottom Side Cables Replacement



e8364_023_17

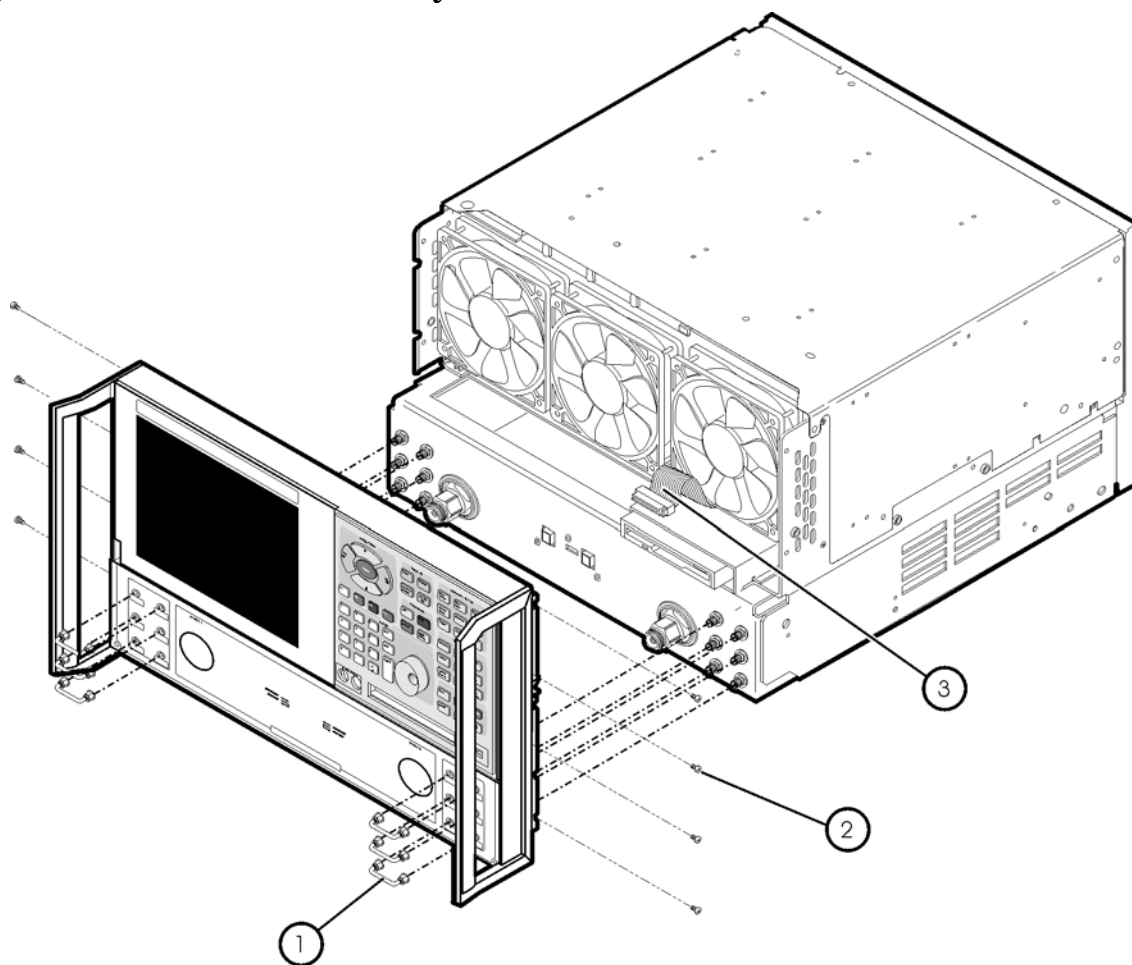
Step 5. Remove the Front Panel Assembly

1. Using a 5/16-inch wrench, remove the six front panel semirigid jumper cables (item ①).
2. Using a T-10 TORX driver, remove the eight screws (item ②) from the sides of the frame.

CAUTION Before removing the front panel from the analyzer, lift and support the front of the analyzer chassis.

3. Slide the front panel over the test port connectors.
4. Disconnect the front panel interface ribbon cable (item ③). The front panel is now free from the analyzer.

Figure 7 Front Panel Assembly Removal



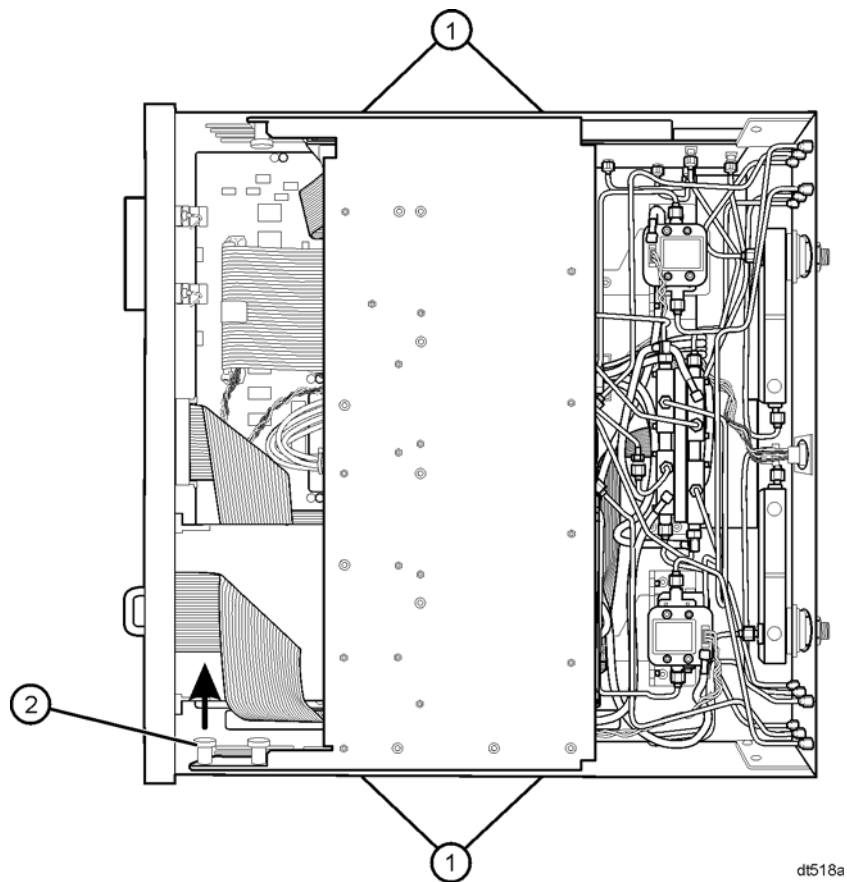
st536a

NOTE The figure above shows the E8364B front panel and floppy disk drive. The E8363C and E8364C front panel have a slightly different appearance and does not include a floppy disk drive.

Step 6. Raise the Receiver Deck

1. Place the analyzer bottom-side up on a flat surface.
2. Using a T-10 TORX driver, remove the four screws, (item ①), that secure the receiver deck.
3. Pull the latch pin (item ②) towards the opposite side of the analyzer to release the receiver deck.
4. Lift the receiver deck to partially raise it, then release the latch pin (item ②). Lift the receiver deck to its fully raised position and ensure that the latch pin latches in the raised position.

Figure 8 Receiver Deck Raising



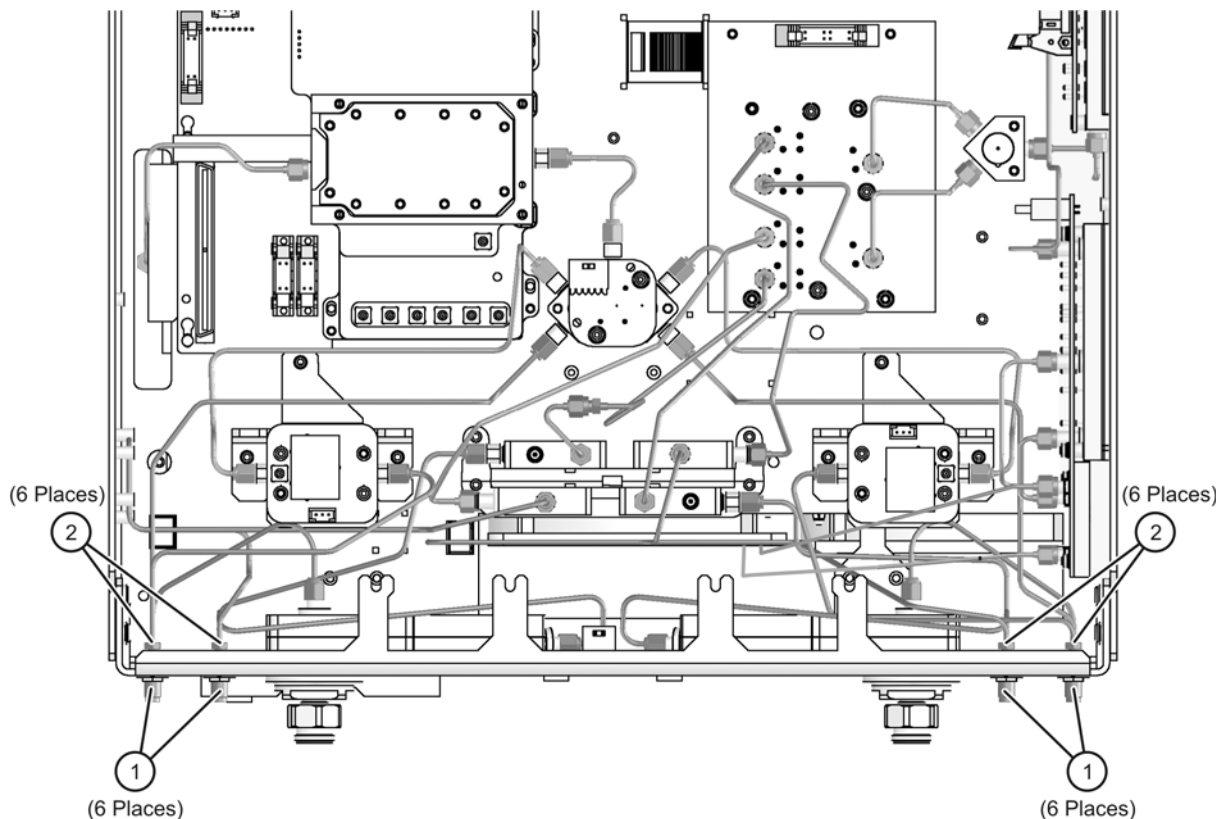
Step 7. Remove the Old Bottom Side Hardware and Cables

- Remove the Existing Configurable Test Set Cables
- Remove the A17 LOMA 10
- Remove the A18 MA 20
- Remove the A22 Switch/Splitter
- Remove the A23 and A24 Detectors
- Remove the A27, A28, A29, and A30 First Converters (Mixers)
- Remove the A25 and A26 Test Port Couplers
- Remove the A20 LODA (5087-7129)

Remove the Existing Configurable Test Set Cables

1. Using a 5/16-inch wrench, remove the hex nuts from all 12 front panel connectors (item ①). Remove the lock washers. Retain both the hex nuts and lock washers for installation of new connectors later.
2. Using a 5/16-inch wrench, remove each of the configurable test set cables (item ②) from the analyzer. Discard these cables, they will be replaced with new ones.

Figure 9 Existing Configurable Test Set Cables Removal



8364_023_01

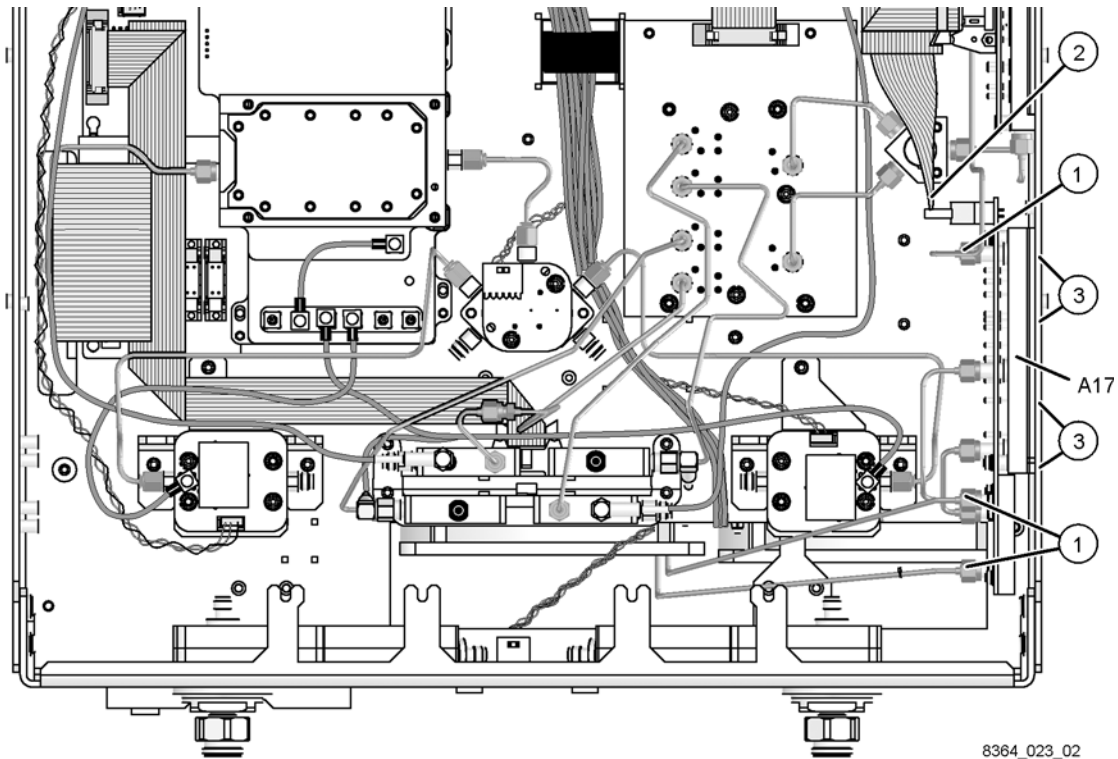
Remove the A17 LOMA 10

1. Using a 5/16-inch wrench, disconnect the three semirigid cables (item ①) from the A17 LOMA 10. Two of these cables should already be disconnected (from step 4).
2. Disconnect the ribbon cable (item ②) at the A17 LOMA 10.
3. Using a T-10 TORX driver, remove the four mounting screws (item ③) from the side of the analyzer. Retain the mounting screws for reinstallation later.

CAUTION Be careful not to damage the center pins of the semirigid cables. Some flexing of the cables is necessary to remove the assembly. Do not over-bend them.

4. Remove the A17 LOMA 10 from the analyzer. Observe the **CAUTION** above.

Figure 10 A17 LOMA 10 Removal



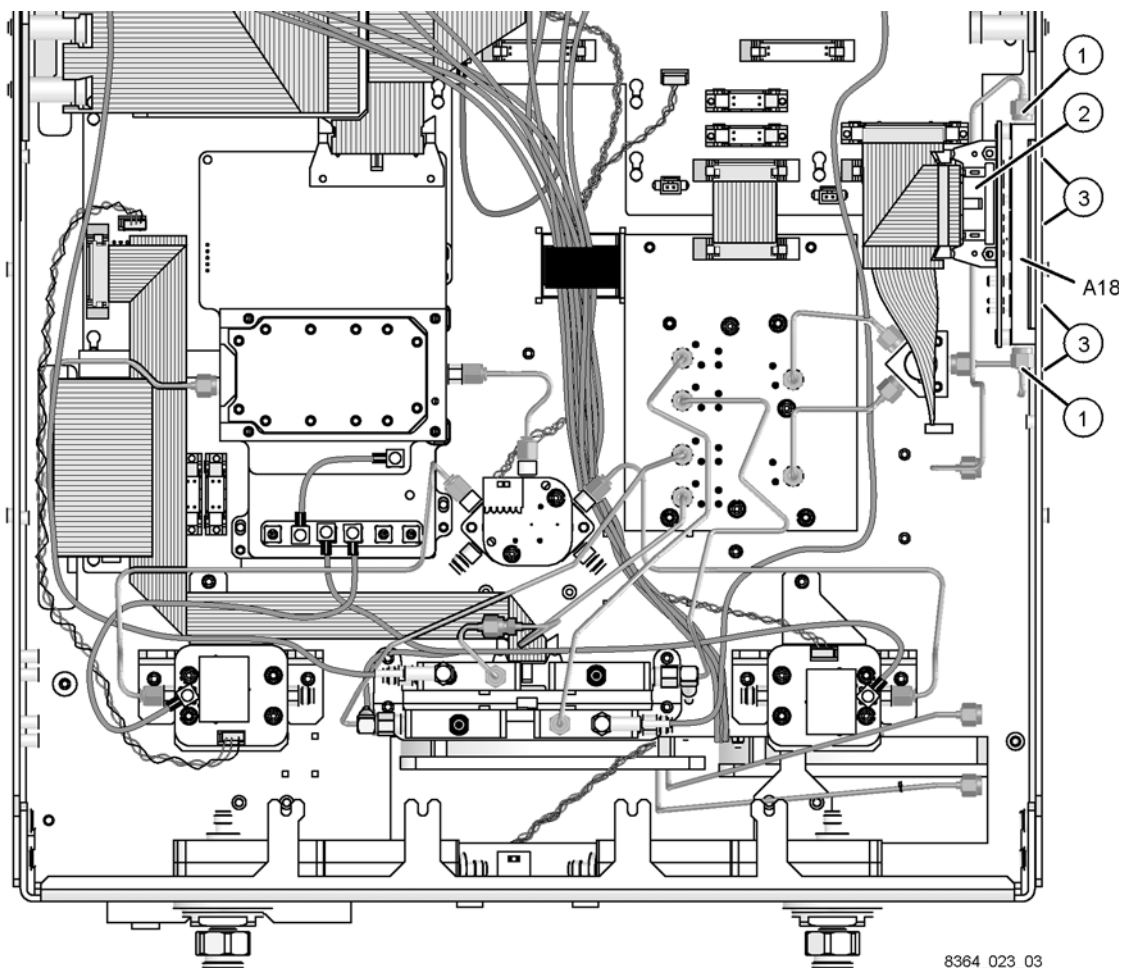
Remove the A18 MA 20

1. Using a 5/16-inch wrench, disconnect the two semirigid cables (item ①) from the A18 MA 20. Remove these cables completely to allow the A18 MA 20 to be removed from the analyzer. Retain these cables for reinstallation later.
2. Disconnect the ribbon cable (item ②) at the A18 MA 20.
3. Using a T-10 TORX driver, remove the four mounting screws (item ③) from the side of the analyzer. Retain the mounting screws for reinstallation later.

CAUTION Be careful not to damage the center pins of the semirigid cables. Some flexing of the cables is necessary to remove the assembly. Do not over-bend them.

4. Remove the A18 MA 20 from the analyzer. Observe the **CAUTION** above.

Figure 11 A18 MA 20 Removal



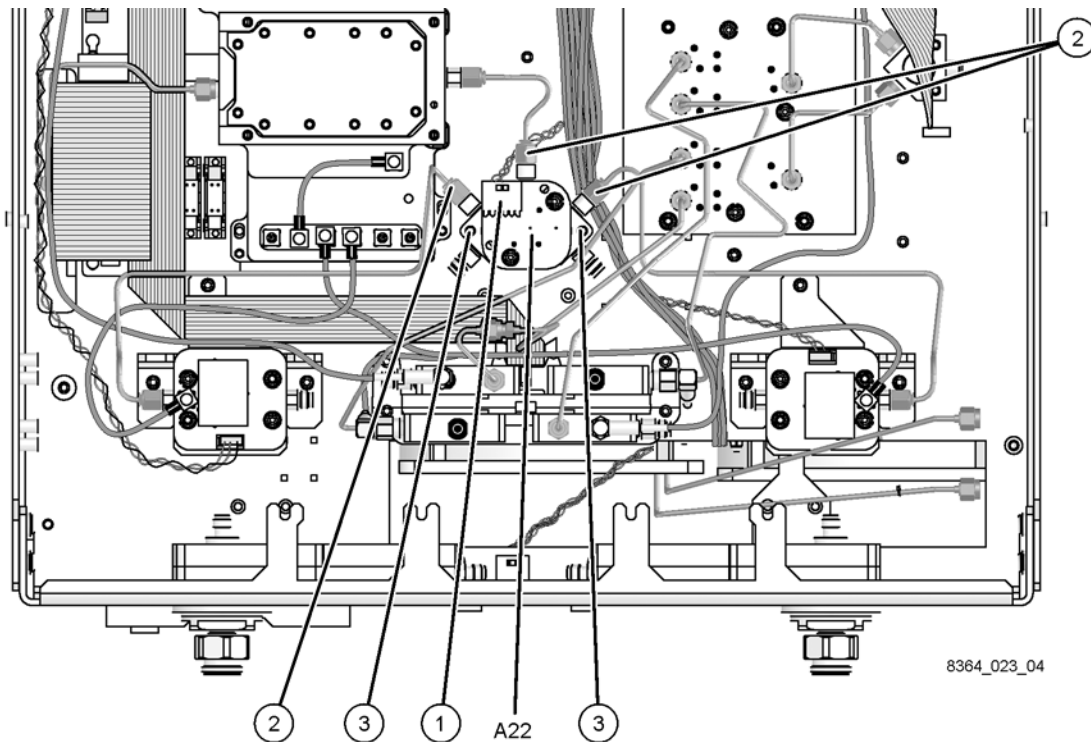
Remove the A22 Switch/Splitter

1. Disconnect the stranded switch control cable (item ①) from the A22 switch/splitter. Remove this cable completely from the analyzer and discard it. It will be replaced later.
2. Using a 5/16-inch wrench, remove the remaining three semirigid cables (item ②) from the A22 switch/splitter. Discard these cables, they will be replaced with new ones.
3. Using a T-10 TORX driver, remove the two mounting screws (item ③). Retain the mounting screws for reinstallation later.

CAUTION Be careful not to damage the center pins of the semirigid cables. Some flexing of the cables is necessary to remove the assembly. Do not over-bend them.

4. Remove the A22 switch/splitter from the analyzer. Observe the **CAUTION** above. Discard this switch/splitter, it will be replaced with a new one.

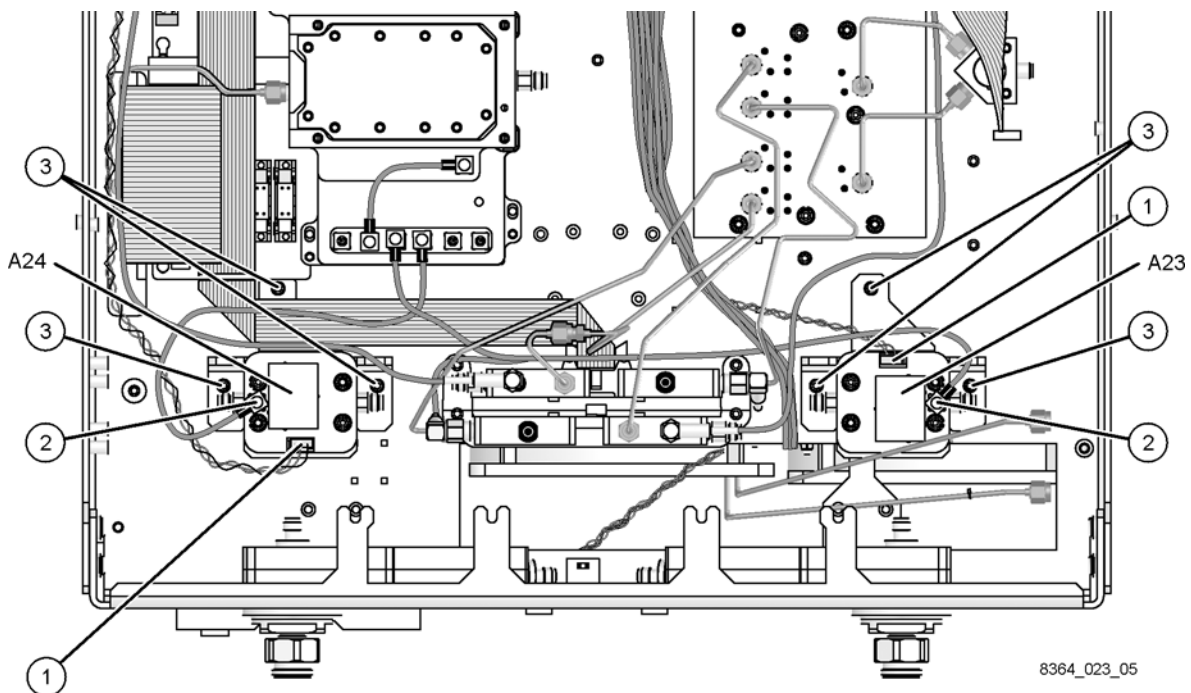
Figure 12 A22 Switch/Splitter Removal



Remove the A23 and A24 Detectors

1. Disconnect the stranded control cable (item ①) from each detector. Remove and discard this cable, it will not be used.
2. Remove the flexible cable (item ②) from each detector and discard them, they will not be used.
3. Using a T-10 TORX driver, remove the three mounting screws (item ③) from each bracket to which the detectors are attached.
4. Remove the brackets, with the detectors attached, from the analyzer and discard them, they will not be used.

Figure 13 A23 and A24 Detectors Removal



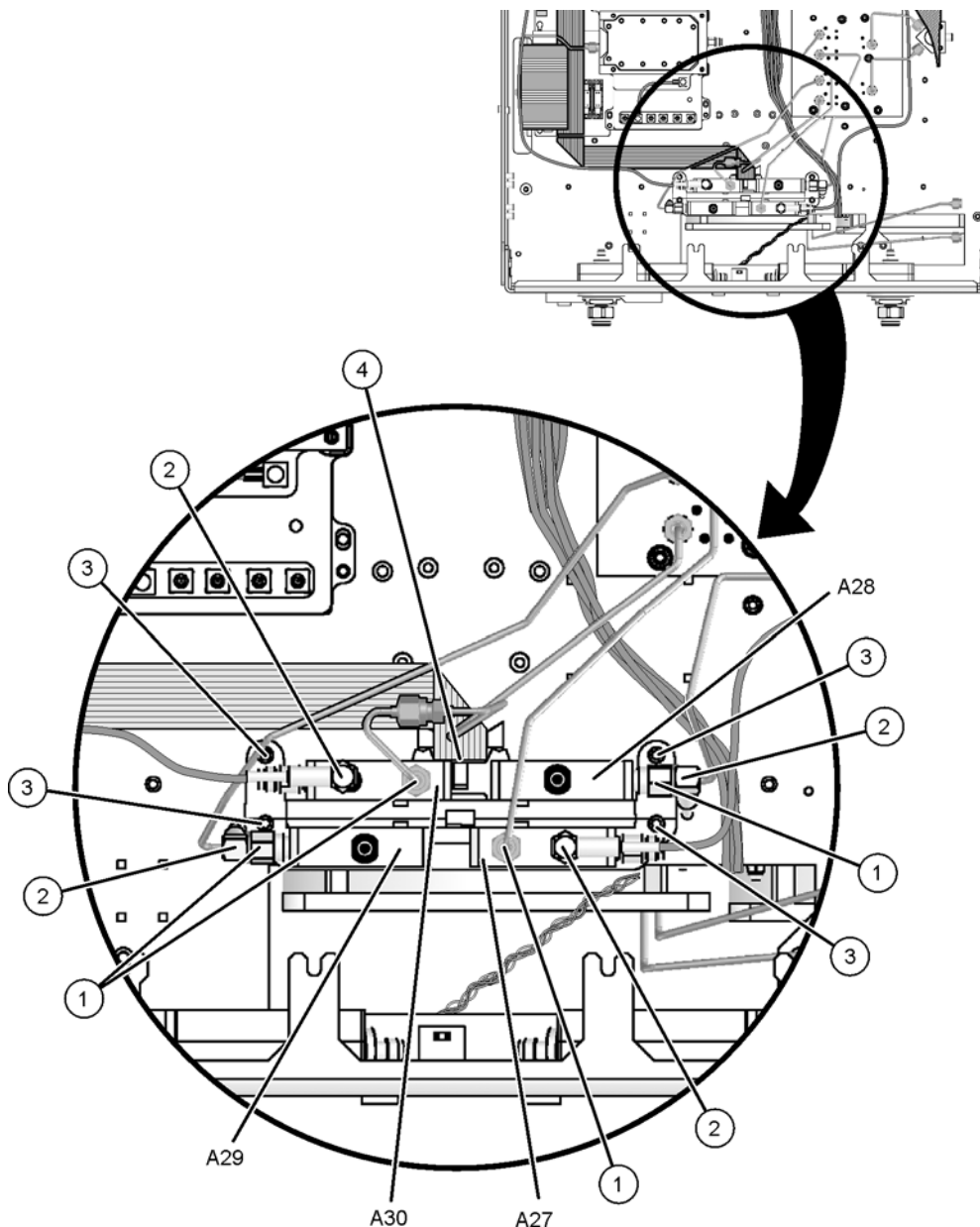
Remove the A27, A28, A29, and A30 First Converters (Mixers)

1. Using a 5/16-inch wrench, disconnect the four remaining semirigid cables (item ①) from the mixers and the four flexible cables (item ②).
2. Using a T-10 TORX driver, remove the four mounting screws (item ③). Retain the mounting screws for reinstallation later.

CAUTION Be careful not to damage the center pins of the semirigid cables. Some flexing of the cables is necessary to remove the assembly. Do not over-bend them.

3. Remove the mixer bracket with all four mixers attached and disconnect the ribbon cable (item ④). Observe the **CAUTION** above. Set this item aside for modification later.

Figure 14 A27, A28, A29, and A30 First Converters Removal



8364_023_06

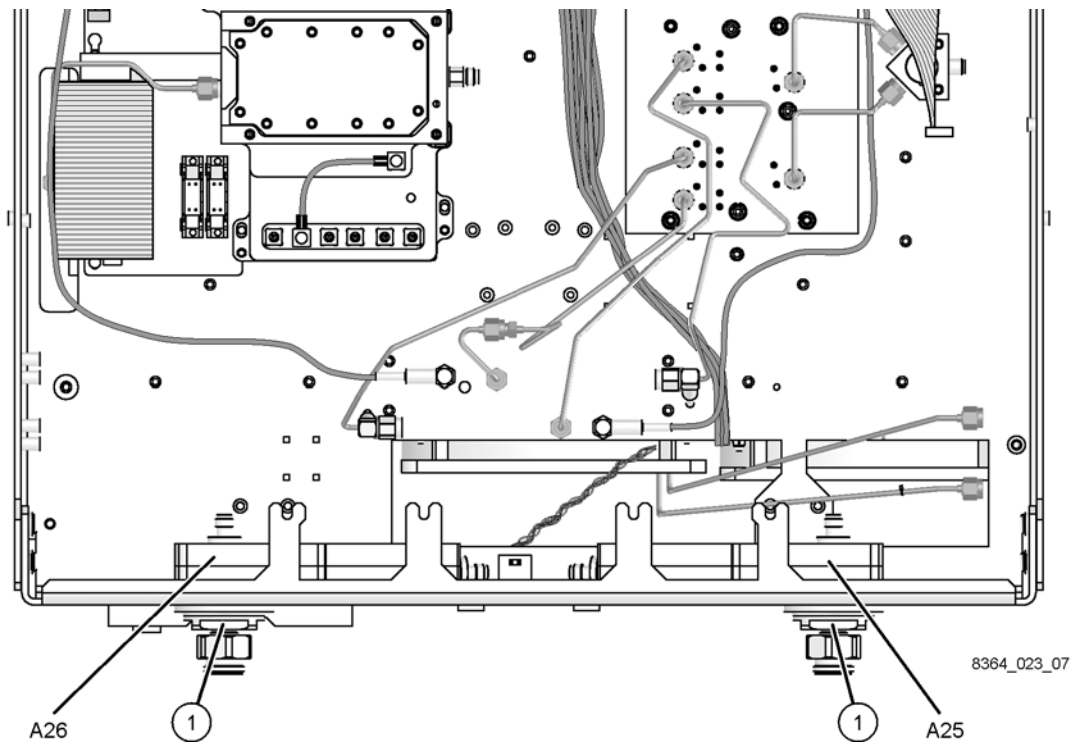
Remove the A25 and A26 Test Port Couplers

1. Using a 1-inch wrench, remove the test port coupler nuts (item ②) from the front panel. Retain the test port coupler nuts for reinstallation later.

CAUTION Be careful not to damage the center pins of the semirigid cables. Some flexing of the cables is necessary to remove the assembly. Do not over-bend them.

2. Remove the A25 and A26 test port couplers from the analyzer. Observe the **CAUTION** above.

Figure 15 A25 and A26 Test Port Couplers Removal



Remove the A20 LODA (5087-7129)

For instructions, click the Chapter 7 PDF bookmark "Removing and Replacing the A20 LODA" in the online Service Guide¹.

1. See ["Downloading the Online PNA Service Guide" on page 5](#).

Step 8. Install the New Bottom Side Hardware and Cables

- Install the New A17 LOMA 12
- Install the New A18 MA 24
- Install the New A20 LODA (5087-7777)
- Install the New A25 and A26 Test Port Couplers
- Install the New A23 and A24 SOMA 70s
- Install the New A22 Switch
- Install the New A27, A28, A29, and A30 First Converters (Mixers)
- Install the Remaining New Cables

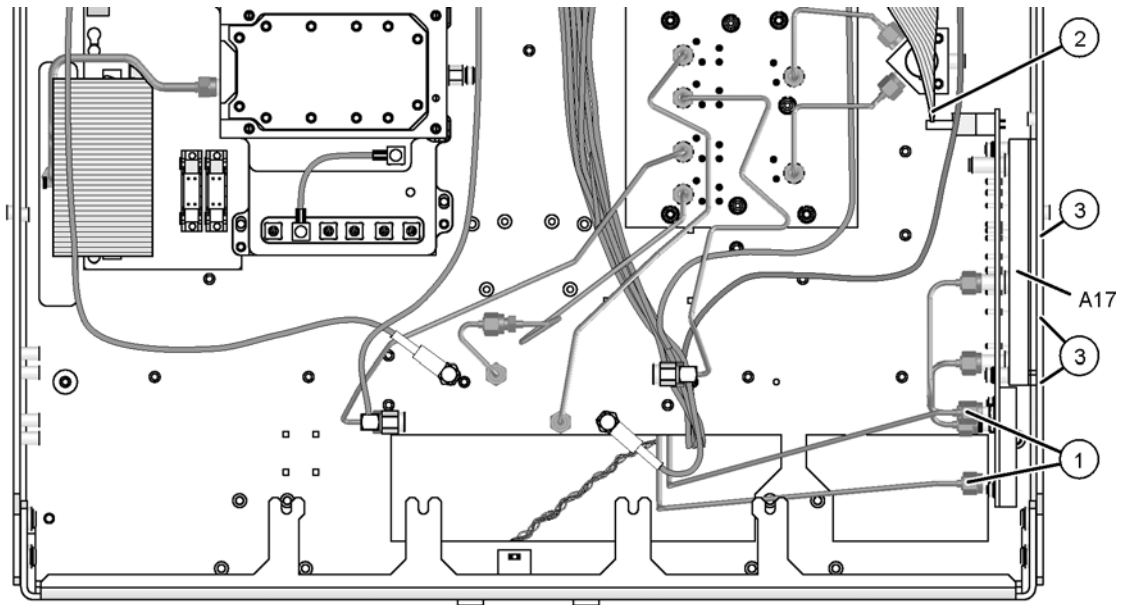
Install the New A17 LOMA 12

1. Position the new A17 LOMA 12 in the analyzer as shown. Observe the **CAUTION** below.

CAUTION Be careful not to damage the center pins of the semirigid cables. Some flexing of the cables is necessary when installing the assembly. Do not over-bend them.

2. Using a T-10 TORX driver, install three of the four mounting screws (item ③), previously removed from the old A17 LOMA 10, through the side of the analyzer as shown. One of the screws removed previously is not reused.
3. Using a 5/16-inch torque wrench (set to 10-inch lbs), reconnect the two semirigid cables (item ①) to the A17 LOMA 12. Observe the **CAUTION** above.
4. Reconnect the ribbon cable (item ②) to the A17 LOMA 12.

Figure 16 A17 LOMA 12 Installation



8364_023_08

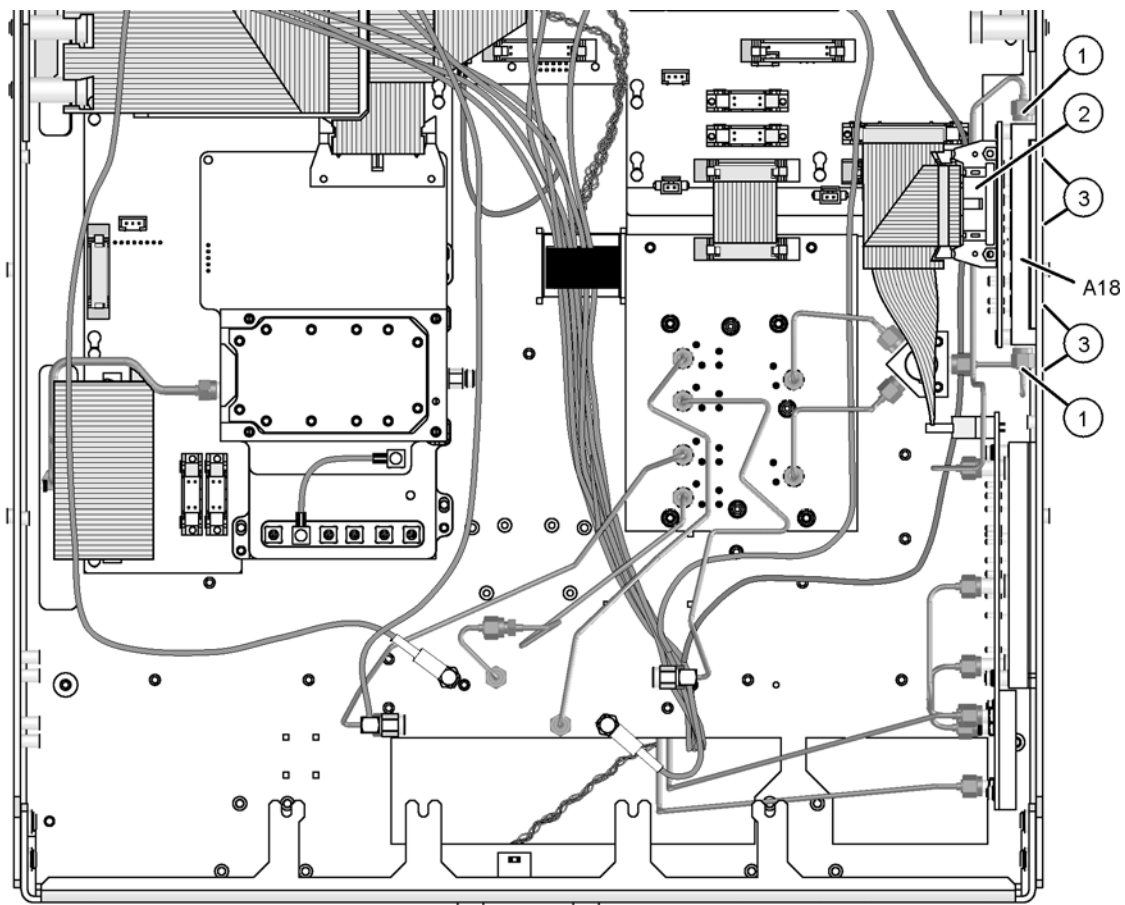
Install the New A18 MA 24

1. Position the new A18 MA 24 in the analyzer as shown. Observe the **CAUTION** below.

CAUTION Be careful not to damage the center pins of the semirigid cables. Some flexing of the cables is necessary when installing the assembly. Do not over-bend them.

2. Using a T-10 TORX driver, install the four mounting screws (item ③), previously removed from the old A18 MA 20, through the side of the analyzer.
3. Using a 5/16-inch torque wrench (set to 10-inch lbs), reconnect the two semirigid cables (item ①) to the A18 MA 24. Observe the **CAUTION** above.
4. Reconnect the ribbon cable (item ②) to the A18 MA 24.

Figure 17 A18 MA 24 Installation



8364_023_09

Install the New A20 LODA (5087-7777)

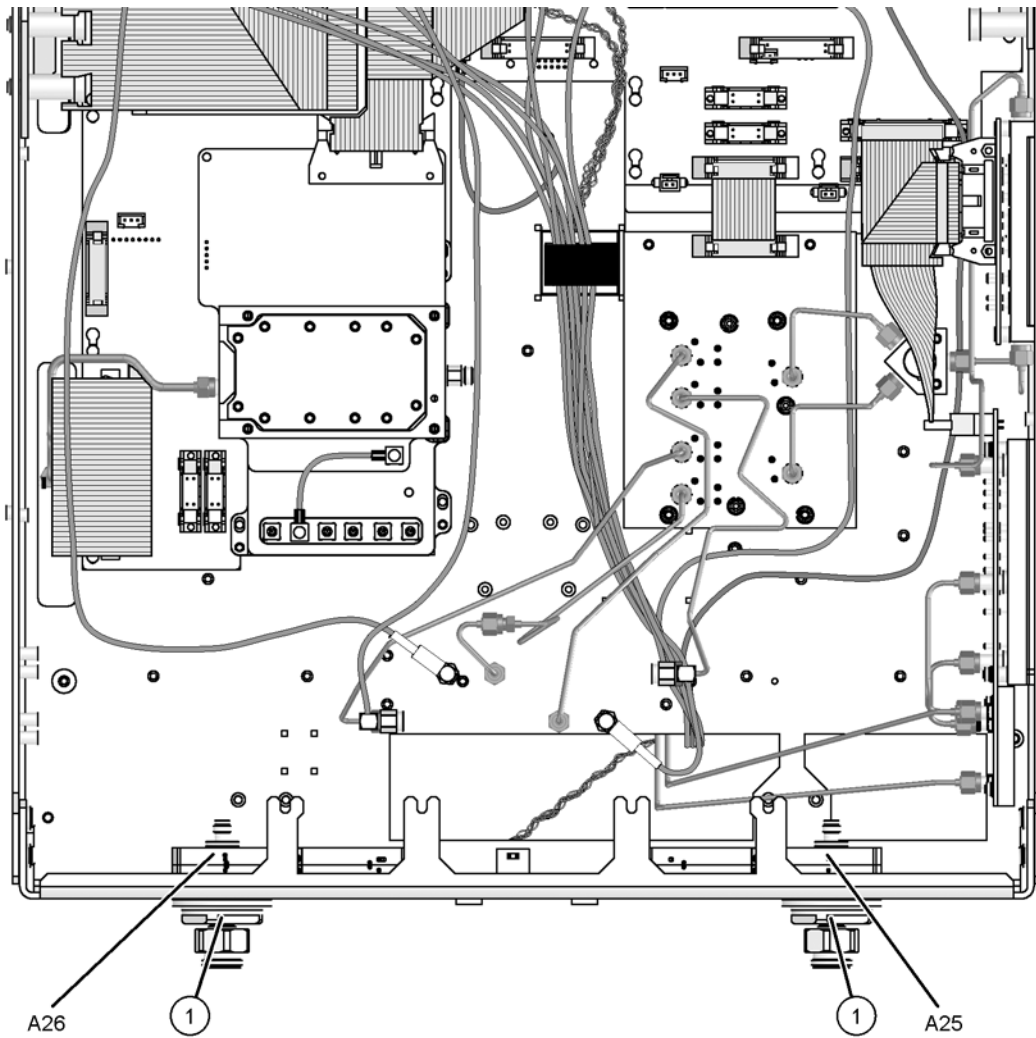
For instructions, click the Chapter 7 PDF bookmark "Removing and Replacing the A20 LODA" in the online Service Guide¹.

1. See ["Downloading the Online PNA Service Guide" on page 5](#).

Install the New A25 and A26 Test Port Couplers

1. Position the A25 and A26 test port couplers in the analyzer as shown.
2. Install the test port coupler nuts (item ①) and, using a 1-inch torque wrench, tighten them to 72 in-lbs.
3. The cables will be installed later.

Figure 18 A25 and A26 Test Port Couplers Installation

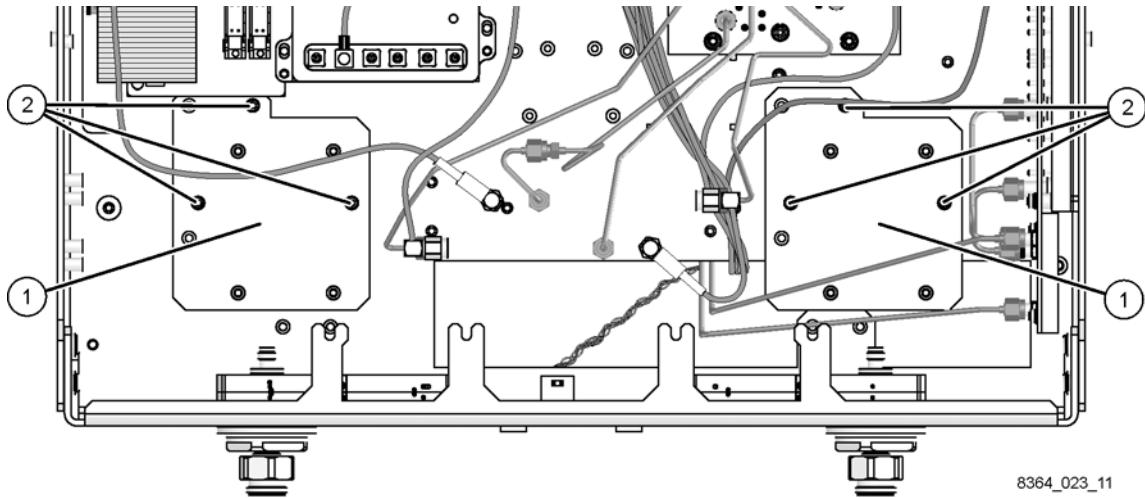


8364_023_10

Install the New A23 and A24 SOMA 70s

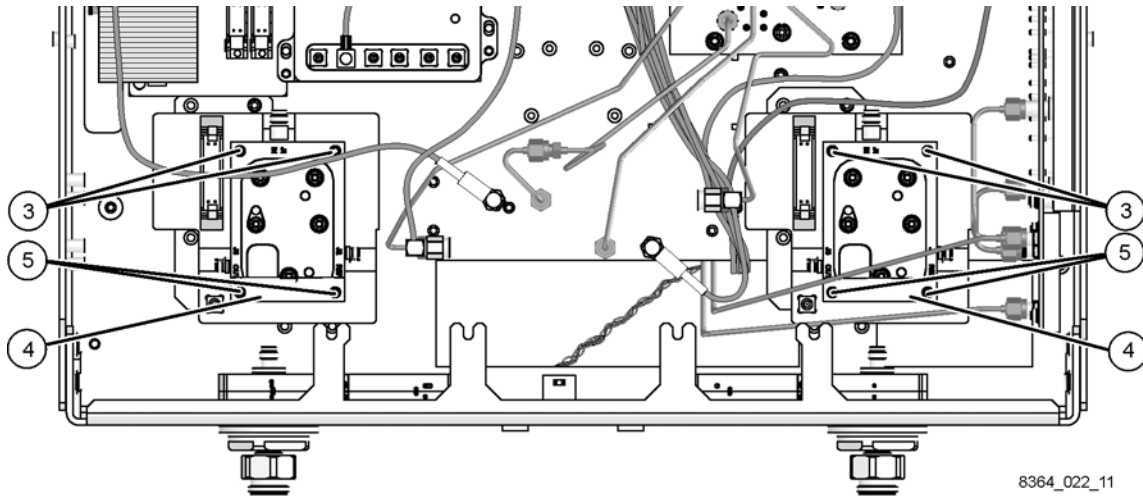
1. Place the SOMA 70 mounting brackets (item ①) in the analyzer as shown.
2. Using a T-10 TORX driver, install three mounting screws (item ②) in each bracket.

Figure 19 SOMA 70 Brackets Installation



3. Position the A23 and A24 SOMA 70s on the brackets as shown.
4. Using a T-10 TORX driver, install two mounting screws (item ③) in each SOMA 70.
5. The cables will be installed later.

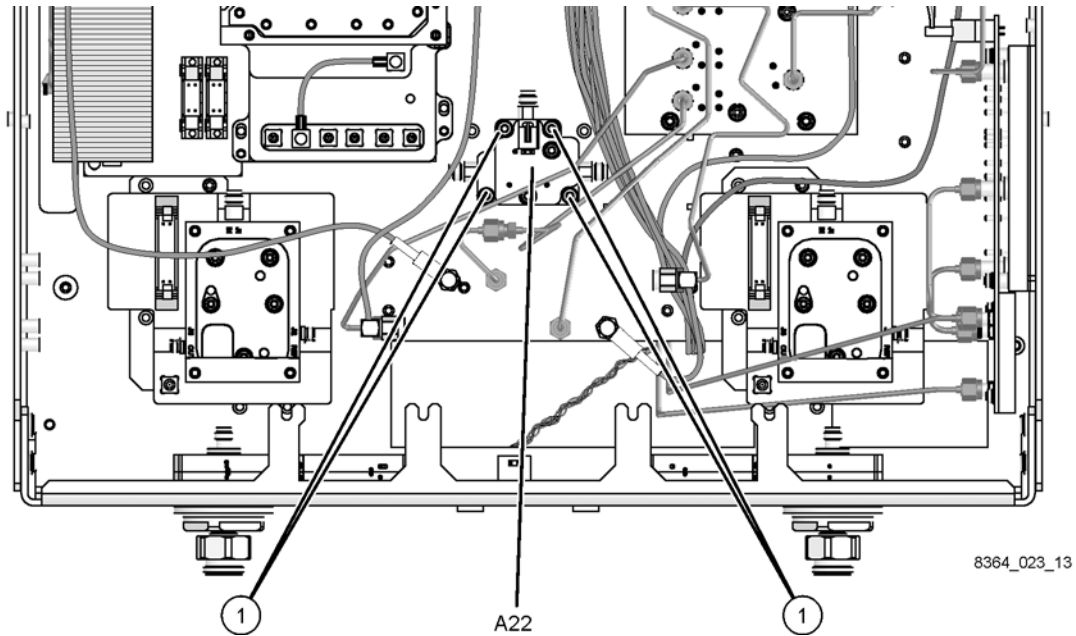
Figure 20 A23 and A24 SOMA 70s Installation



Install the New A22 Switch

1. Position the A22 switch in the analyzer as shown.
2. Using a T-10 TORX driver, install the four mounting screws (item ①). Two screws were retained from removal of the A22 switch/splitter and an additional two are provided.
3. The cables will be installed later.

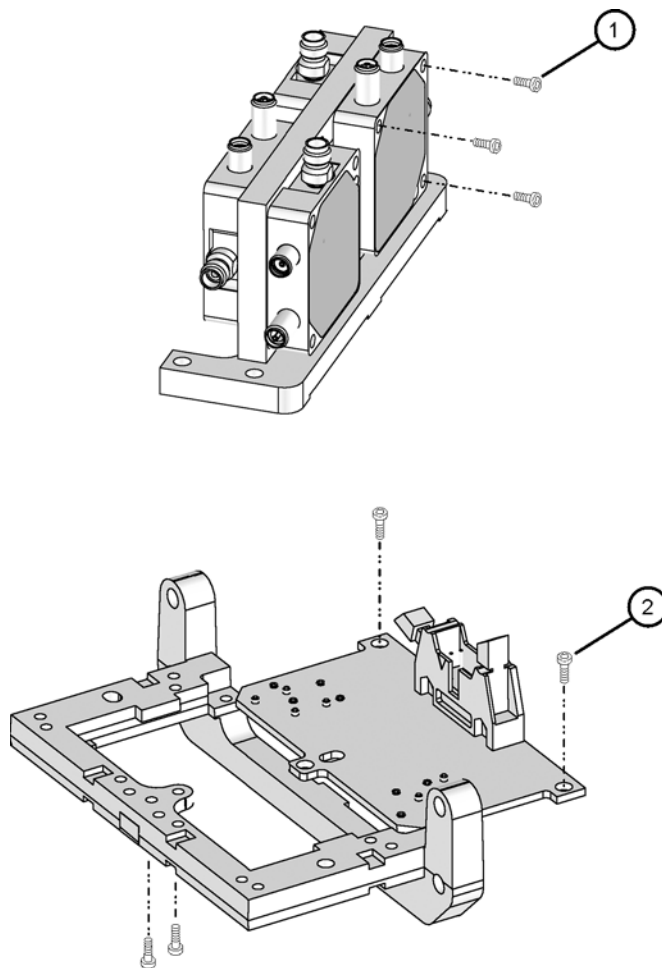
Figure 21 A22 Switch Installation



Install the New A27, A28, A29, and A30 First Converters (Mixers)

1. Remove all four mixers from the previously removed mixer bracket by removing three screws (item ①) from each mixer. Retain the screws.
2. Remove the mixer bias board by removing the four attachment screws (item ②). Retain the screws.
3. Install the new mixer bias board onto the bracket by *loosely* installing the attachment screws (item ②) from the old mixer bias board. Do not tighten the screws at this time.
4. Using a T-10 TORX driver, install the four new mixers onto the bracket using the screws (item ①) from the previously removed mixers. Be sure to orient the mixers as shown, and be sure that the DC feed-through pins align properly with the mixer bias board.
5. Using a T-10 TORX driver, tighten the mixer bias board attachment screws (item ②).
6. The mixer bracket with new mixers attached is now ready to be installed in the analyzer.

Figure 22 Mixers Bracket Assembly



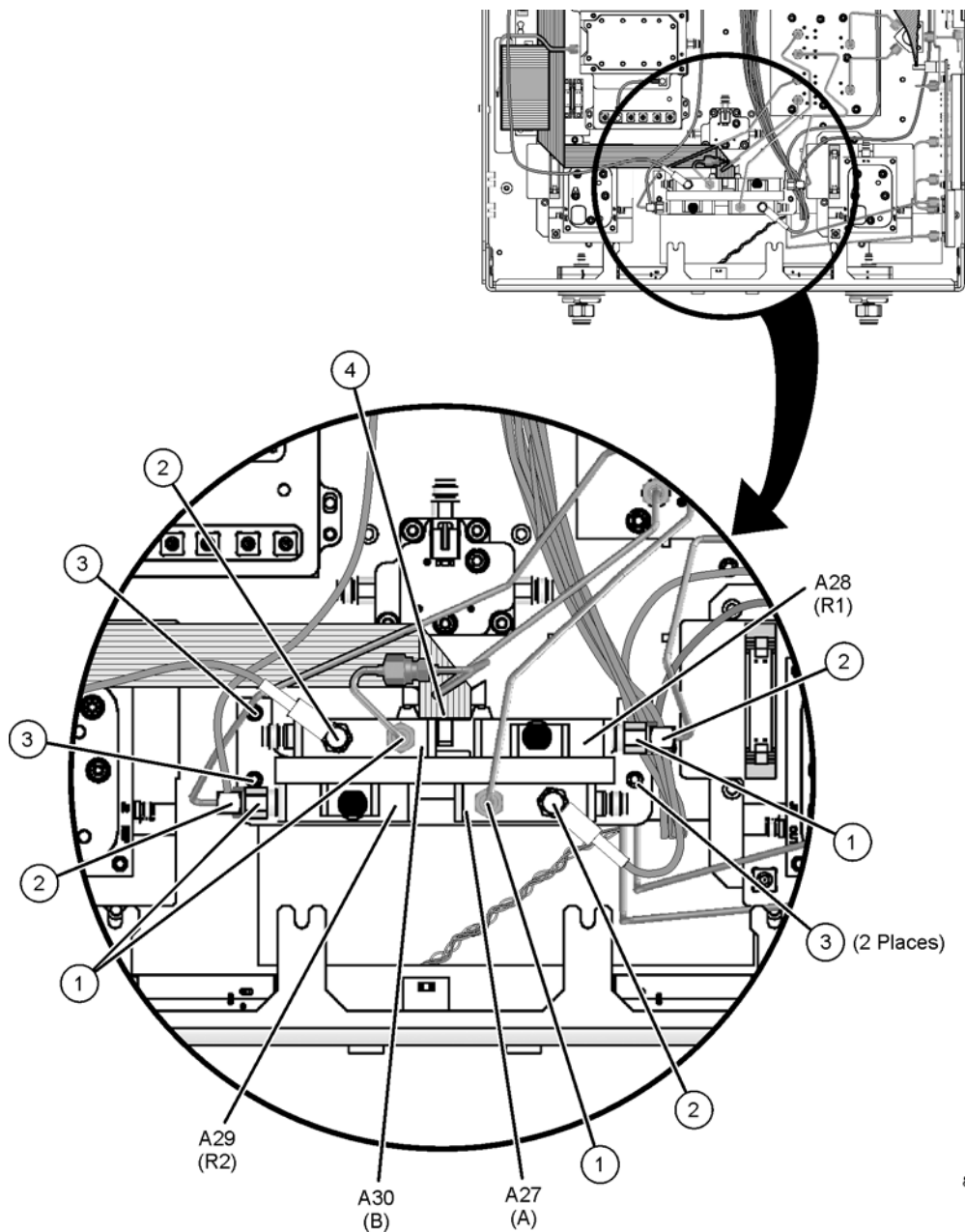
8364_022_13

7. Connect the ribbon cable (item ④) and place the mixer bracket, with all four mixers attached, into the analyzer. Observe the **CAUTION** below.

CAUTION Be careful not to damage the center pins of the semirigid cables. Some flexing of the cables is necessary when installing the assembly. Do not over-bend them.

8. Using a T-10 TORX driver, install the four mounting screws (item ③).
9. Using a 5/16-inch torque wrench (set to 10-inch lbs), reconnect the four semirigid cables (item ①) and the four flexible cables (item ②) shown. Observe the **CAUTION** above. The remaining cables will be installed later.

Figure 23 A27, A28, A29, and A30 Mixers Installation



8364_023_14

Install the New Configurable Test Set Cables

CAUTION Be very careful with these cables with 1.85 mm connectors. They are extremely delicate and can be easily damaged.

Install 12 bulkhead connectors on the front panel as shown in [Figure 24](#).

- Make sure that the hexagonal collar of the connector is on the inside of the front panel and that it is properly aligned with the recess in the panel.
- Place a washer and a hex nut on each bulkhead connector as shown.
- Using a 5/16-inch torque wrench, tighten the hex nuts to 21 in-lbs.

Using a 5/16-inch torque wrench (set to 10-inch lbs), install the following new cables **in the order listed**. These new parts are listed in [Table 1 on page 7](#).

- W71 REFERENCE 2 RCVR R2 IN to A29 channel R2 mixer

Before installing the remaining cables, install the two cable tie mounts in the locations shown by adhering them to the test set deck directly below cable W71 as shown. Secure cable W71 to each cable tie mount with a cable tie as shown.

- W70 REFERENCE 1 RCVR R1 IN to A28 channel R1 mixer
- W68 A26 test port 2 coupler to PORT 2 CPLR ARM
- W72 PORT 2 RCVR B IN to A30 channel B mixer
- W62 A24 SOMA 70 to PORT 2 SOURCE OUT
- W64 PORT 2 CPLR THRU to A26 test port 2 coupler
- W66 A24 SOMA 70 to REFERENCE 2 SOURCE OUT
- W67 A25 test port 1 coupler to PORT 1 CPLR ARM
- W69 PORT 1 RCVR A IN to A27 channel A mixer
- W61A23 SOMA 70 to PORT 1 SOURCE OUT
- W63 PORT 1 CPLR THRU to A25 test port 1 coupler
- W65 A23 SOMA 70 to REFERENCE 1 SOURCE OUT

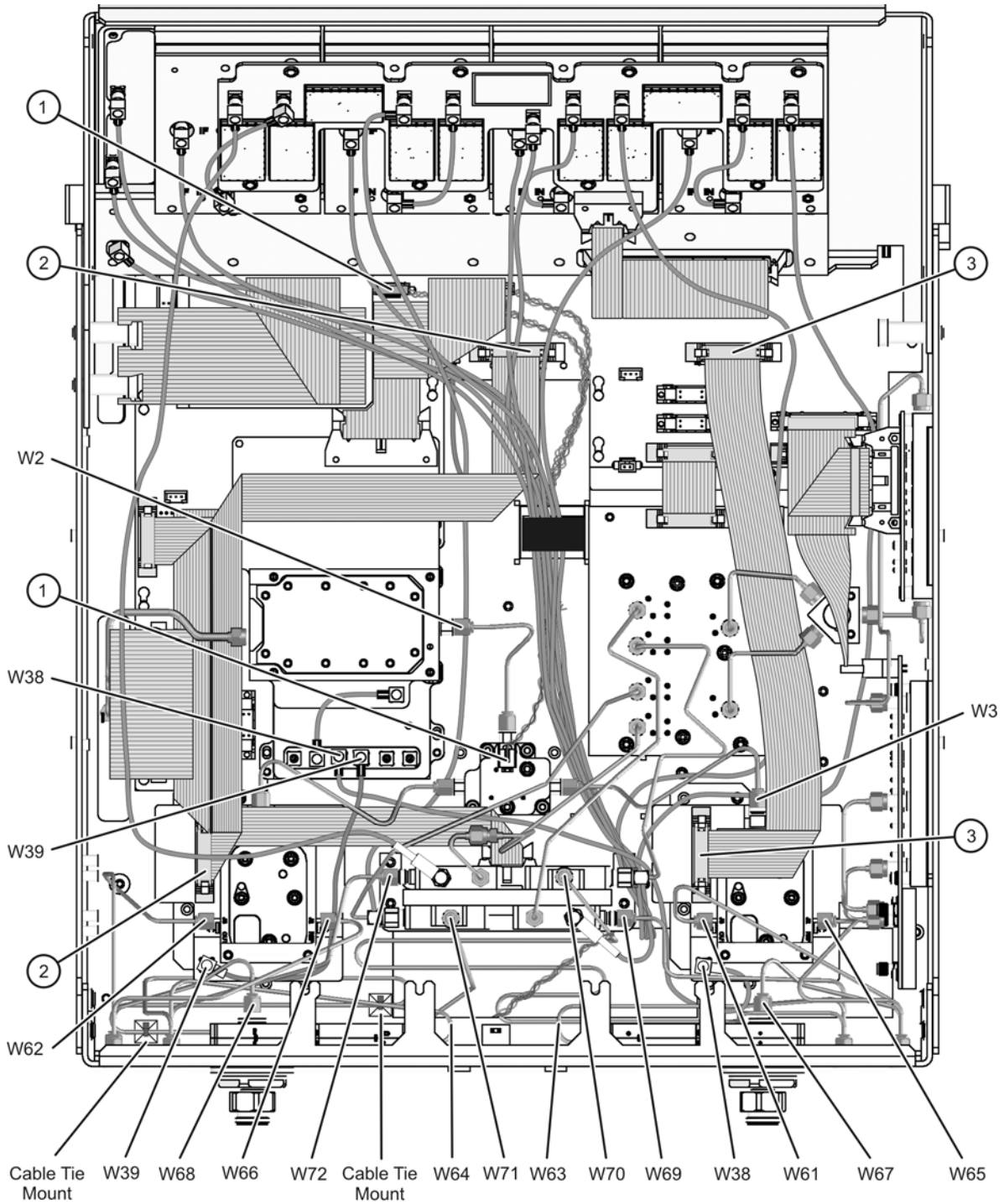
Install the Remaining New Cables

Using a 5/16-inch torque wrench (set to 10-inch lbs), install the following new cables **in the order listed**. These new parts are listed in [Table 1 on page 7](#).

- W2 A21 SOMA 50 to A22 switch
- W3 A22 switch to A23 SOMA 70
- W4 A22 switch to A24 SOMA 70
- W38 A23 SOMA 70 to A16 test set motherboard J204 (R1)
- W39 A24 SOMA 70 to A16 test set motherboard J205 (R2)
- ① Wrapped wire cable; A22 switch to A16 test set motherboard J500. Route this cable under the cable clamp as shown.
- ② Ribbon cable; A24 SOMA 70 to A16 test set motherboard J40 (SOMA70_2). Shape and route this cable as shown.

- ③ Ribbon cable; A23 SOMA 70 to A16 test set motherboard J50 (SOMA70_1). Shape and route this cable as shown.

Figure 24 New Cables Installation

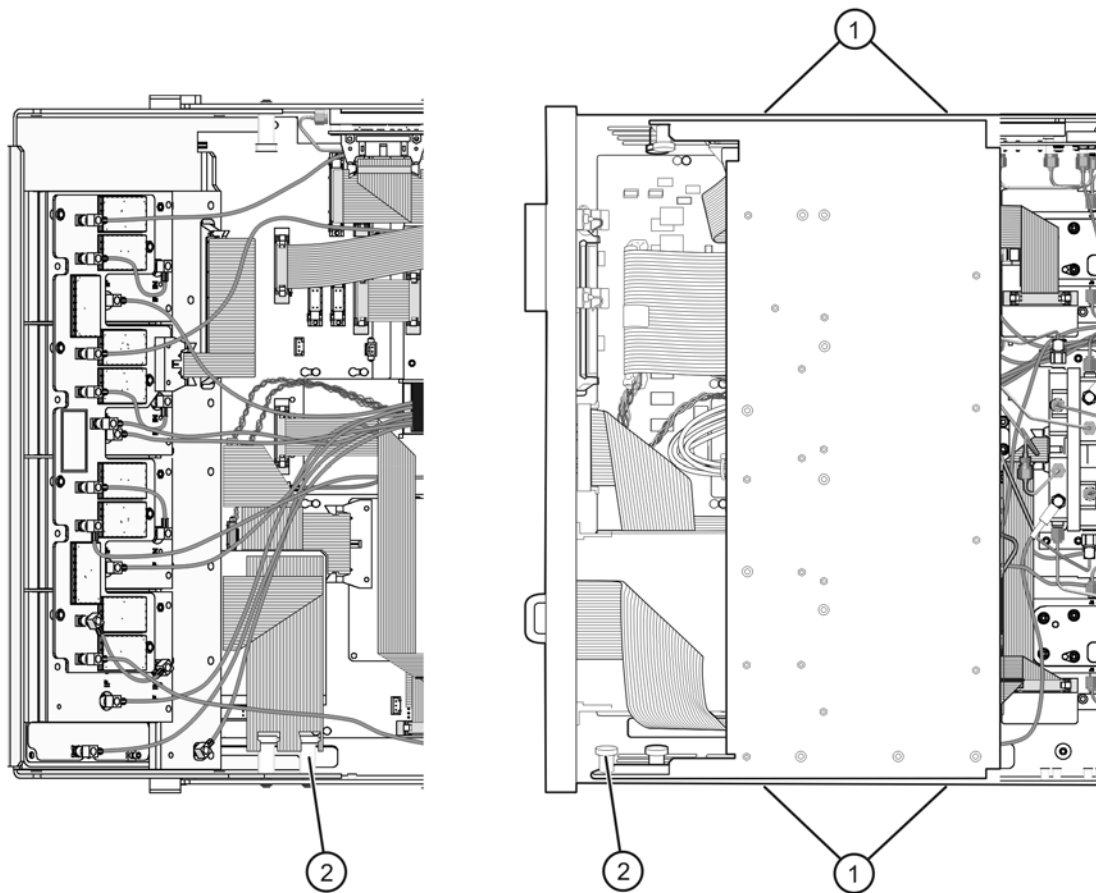


8364_023_15

Step 9. Lower the Receiver Deck

1. Pull the latch pin (item ②) towards the opposite side of the analyzer to release the receiver deck.
2. Lift the receiver deck to partially lower it, then release the latch pin (item ②). Lower the receiver deck to its fully lowered position and ensure that the latch pin latches in the lowered position.
3. Using a T-10 TORX driver, reinstall the four screws, (item ①), to secure the receiver deck.

Figure 25 Receiver Deck Lowering



8364_022_16

Step 10. Replace the Front Panel Nameplate and Overlay

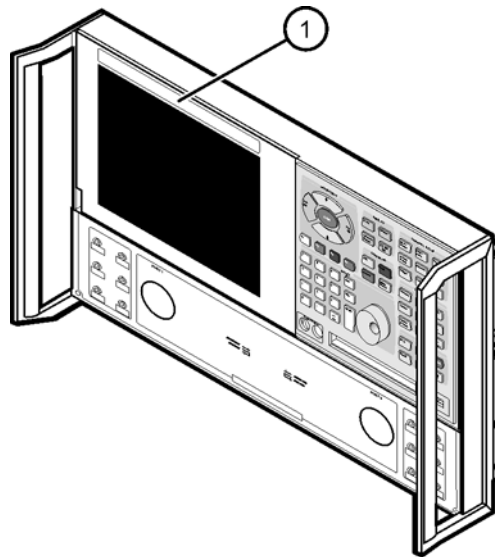
Remove the Old Nameplate

1. Using a sharp object such as a knife blade, lift one end of the old nameplate (item ①). Be careful not to scratch the painted surface.
2. Using your fingers, pull the nameplate completely off of the front panel and discard it.
3. If any adhesive remains on the front panel surface, it can be removed by rubbing it with your finger. Do not use a sharp object to remove this adhesive. If necessary, the surface can be cleaned with isopropyl alcohol.

Install the New Nameplate

1. There are two nameplates provided, make sure you select the proper one for your analyzer: an E8363B and E8364B upgrade to an E8361A; an E8363C and E8364C upgrade to an E8361C.
2. Remove the protective backing from the new nameplate to expose the adhesive. Avoid touching the adhesive with your fingers as this may affect its ability to adhere to the front panel surface.
3. *Loosely* align the new nameplate over the recess in the front panel and apply lightly.
4. Once the nameplate is properly aligned, press it firmly onto the surface to secure it.

Figure 26 Model Number Nameplate Replacement



8364_023_16

NOTE

The figure above shows the E8364B front panel and floppy disk drive. The E8363C and E8364C front panel have a slightly different appearance and does not include a floppy disk drive.

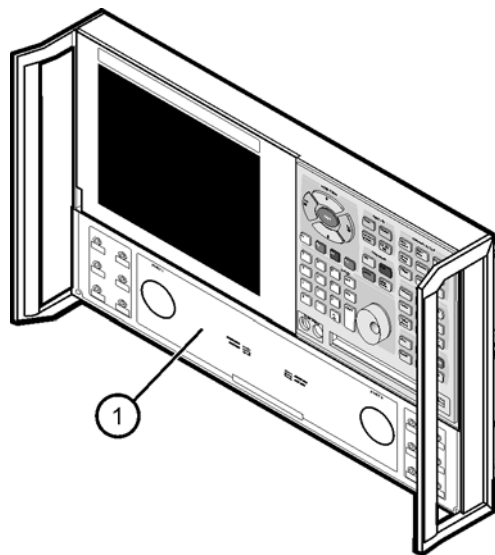
Remove the Old Overlay

1. From the back side of the front panel, use a blunt object in one of the cutouts in the lower frame to push the overlay (item ①) and separate it from the front panel.
2. From the front side of the front panel, pull the overlay completely off and discard it.
3. If any adhesive remains on the front panel surface, it can be removed by rubbing it with your finger. Do not use a sharp object to remove this adhesive. If necessary, the surface can be cleaned with isopropyl alcohol.

Install the New Overlay

1. Remove the protective backing from the new front panel overlay to expose the adhesive.
2. Starting from either the left or right side, *loosely* place the overlay in the recess on the lower front panel, ensuring that it fits tightly against the recess edges.
3. Once the overlay is properly aligned, press it firmly onto the surface to secure it.

Figure 27 Front Panel Overlay Replacement



dt510a

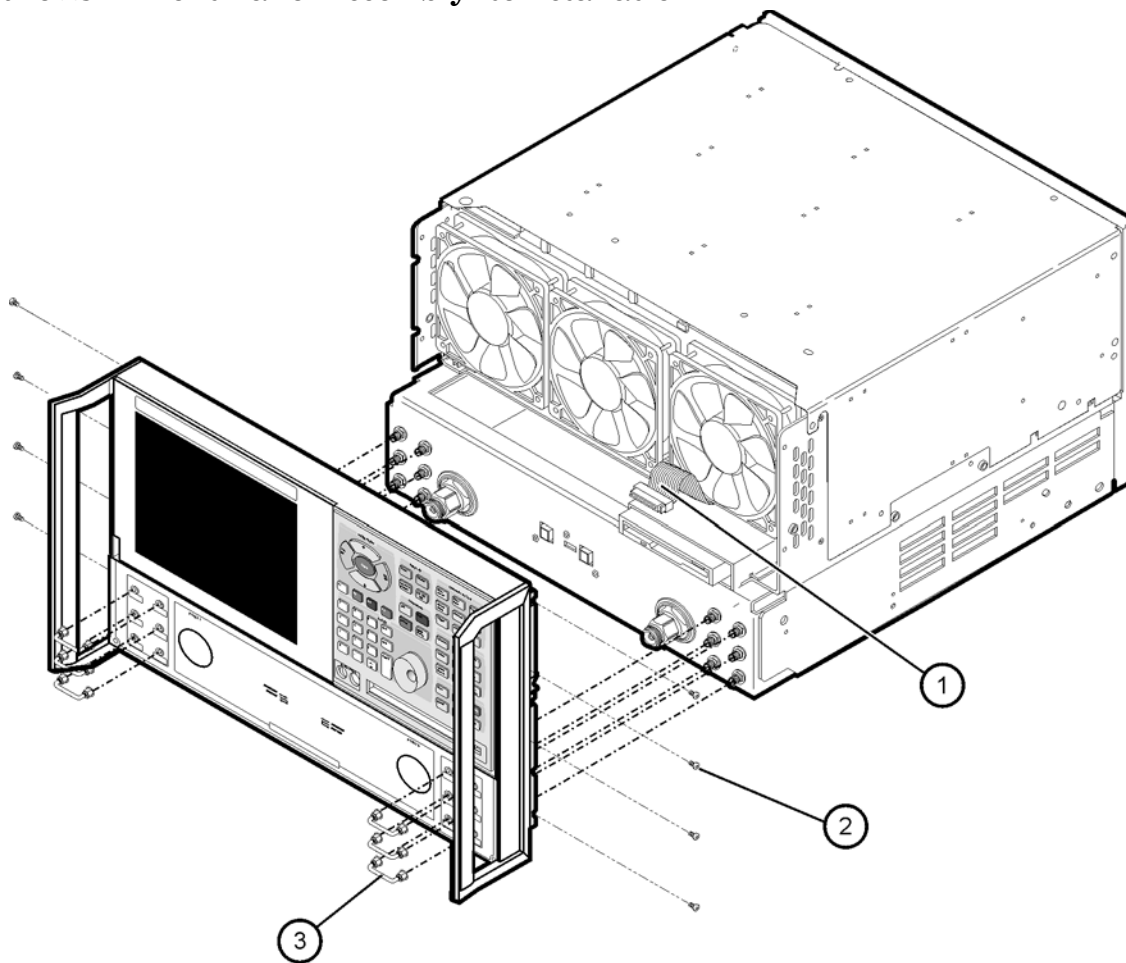
NOTE The figure above shows the E8364B front panel and floppy disk drive. The E8363C and E8364C front panel have a slightly different appearance and does not include a floppy disk drive.

Step 11. Reinstall the Front Panel Assembly and Front Panel Jumpers

CAUTION Before installing the front panel assembly onto the analyzer, lift and support the front of the analyzer chassis.

1. Reconnect the ribbon cable (item ①) to the A3 front panel interface board.
2. Slide the front panel over the test port connectors being careful to align the power switch and floppy disk drive to their corresponding front panel cutouts. Ensure that the ribbon cable (item ①) is located below the fan to prevent it from being damaged by the fan blades.
3. Using a T-10 TORX driver, install the eight screws (item ②) in the sides of the frame.
4. Install the six semirigid jumpers, W60, (item ③) on the front panel, and, using a 5/16-inch torque wrench, tighten the connector nuts to 10-in lbs.

Figure 28 Front Panel Assembly Reinstallation



dt511a

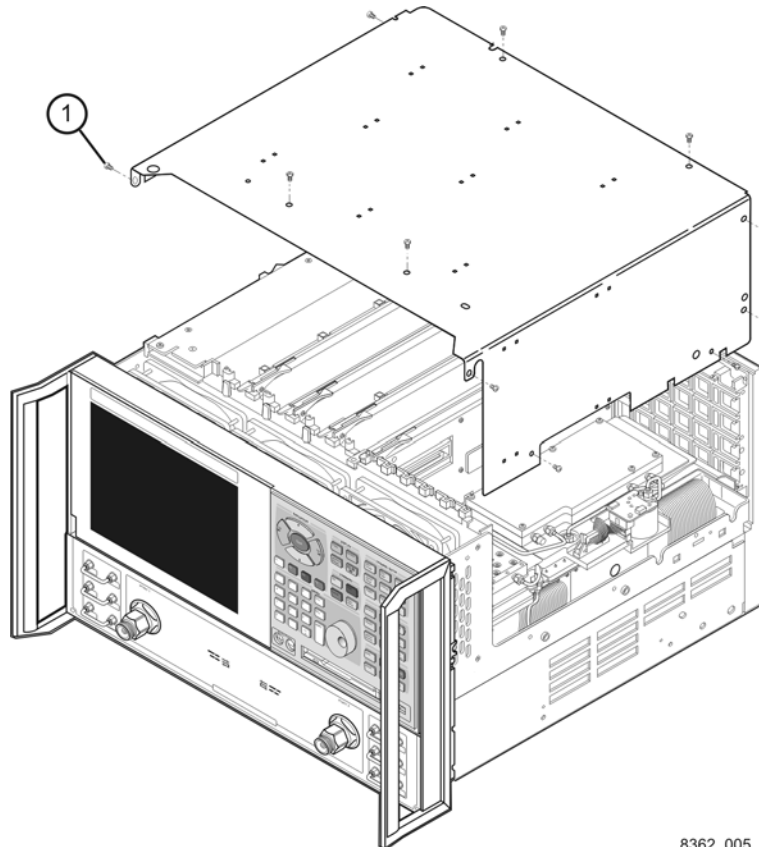
NOTE The figure above shows the E8364B front panel and floppy disk drive. The E8363C and E8364C front panel have a slightly different appearance and does not include a floppy disk drive.

Step 12. Reinstall the Inner and Outer Covers

Reinstall the Inner Cover

1. Place the analyzer top-side up on a flat surface.
2. Place the cover in position on the analyzer.
3. Using a T-10 TORX driver, install the eleven screws (item ①).

Figure 29 Inner Cover Reinstallation



8362_005_01

NOTE

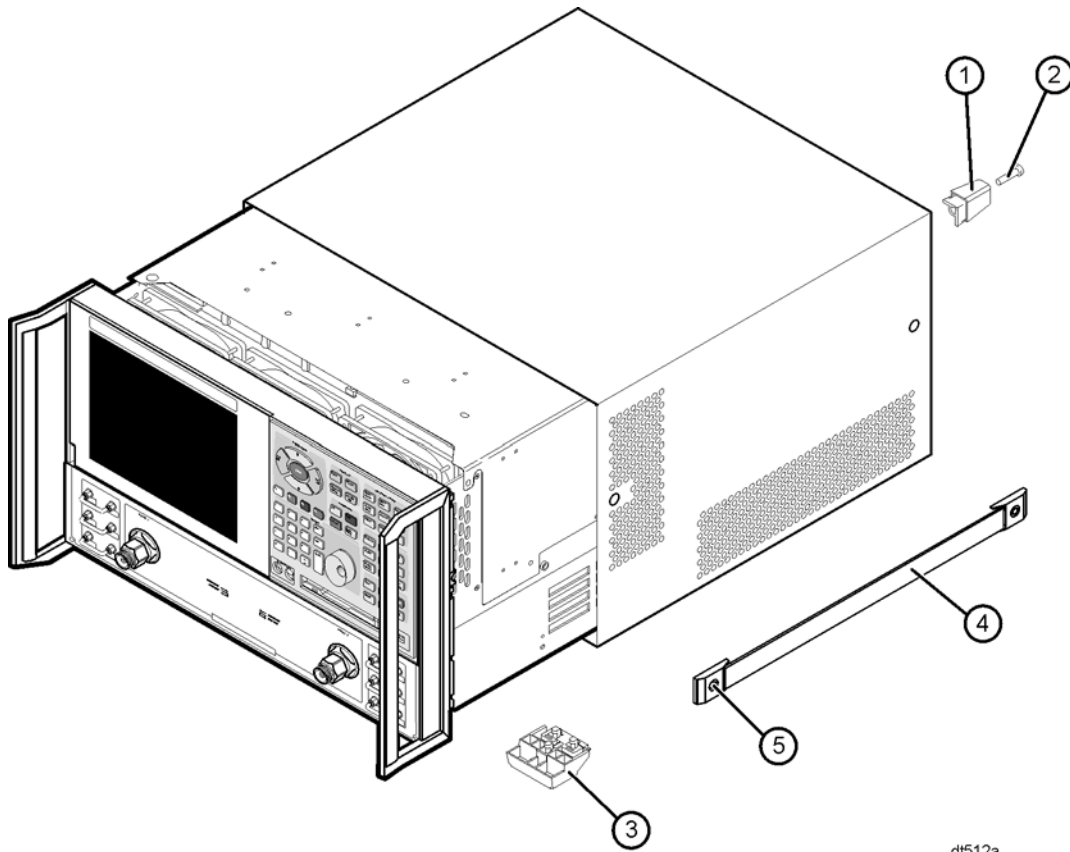
The figure above shows the E8364B front panel and floppy disk drive. The E8363C and E8364C front panel have a slightly different appearance and does not include a floppy disk drive.

Reinstall the Outer Cover

CAUTION This procedure is best performed with the analyzer resting on its front handles in the vertical position. *Do not place the analyzer on its front panel without the handles.* This will damage the front panel assemblies.

1. Slide the cover onto the frame.
2. Using a T-20 TORX driver, install the four rear panel feet (item ①) by installing the center screws (item ②).
3. Slide the four bottom feet (item ③) onto the cover.
4. Using a T-20 TORX driver, install the strap handles (item ④) by tightening the screws (item ⑤) on both ends.

Figure 30 Outer Cover Reinstallation



dt512a

NOTE The figure above shows the E8364B front panel and floppy disk drive. The E8363C and E8364C front panel have a slightly different appearance and does not include a floppy disk drive.

Step 13. Enter the New Model Number

Procedure Requirements

- The analyzer must be powered up and operating to perform this procedure.
- The Network Analyzer program must be running.
- A keyboard and a mouse must be connected to the analyzer for this procedure.

Enter the New Model Number

1. On the analyzer's **System** menu, point to **Service**, then click **Option Enable**.
2. Click **Repair**.
3. Check **Model shown is incorrect!**, then click **Begin Repair**.
4. In the **Model Change** box, select the new model number, **E8361A** or **E8361C** (the E8363B and E8364B upgrade to an E8361A; the E8363C and E8364C upgrade to an E8361C).
5. Using the keyboard, enter the keyword obtained in [“Step 1. Obtain a Keyword and Verify the Information”](#) in the box provided. Enter this keyword *exactly* as provided.
6. Click **Enter Model**.
7. Verify that the new model number displayed is correct, then click YES. BE CAREFUL. Once you click YES the entry cannot be changed without first obtaining another keyword from Agilent.

If it is not correct, click **NO** and repeat the repair.
8. When the installation is complete, click **Exit**.

Verify that the New Model Number is Shown Correctly

1. On the analyzer's **Help** menu, click **About Network Analyzer**.
2. Verify that the new model number, E8361A or E8361C, is shown correctly in the display.
3. Click OK.
4. On the analyzer front panel, press **Preset**. Verify that the full frequency range of the analyzer is correct. The analyzer should preset to a frequency range of 10 MHz to 67 GHz.

Step 14. Perform Post-Upgrade Adjustments

The following adjustments must be made due to the hardware changes made to the analyzer. **Perform these adjustments in the order listed.**

- 3.8 GHz PMYO frequency
- LO power
- offset LO
- source calibration
- phase lock IF gain
- receiver calibration

These adjustments are described in the PNA service guide and in the PNA on-line HELP. A list of equipment required to perform these adjustments can be found at [“Test Equipment Required for Post-Upgrade Adjustments” on page 11.](#)

Performance Tests and System Verification

The analyzer should now operate and phase lock over its entire frequency range.

If you experience difficulty with the basic functioning of the analyzer, contact Agilent. Refer to [“Contacting Agilent” on page 3.](#)

Although the analyzer functions, its performance relative to its specifications has not been verified for the additional frequency range enabled by this upgrade.

It is recommended that a full instrument calibration be performed using the PNA performance test software.

If the testing of the analyzer’s full range of specifications is not required, a system verification can be performed.

Refer to the analyzer’s service guide for information on performance tests and system verification.

