

Using the Code Check eBook Navigational Tools

The book opens to the first page, containing the Key to using the book. The text on this page has instructions on the conventions that are used inside the book. It explains the “shorthand” used to reference specific tables and figures in the book, and also shows how codes with “exceptions” are noted.

A row of navigation buttons appears across the top of each screen. These buttons allow you to quickly find what you are looking for. The arrows at the left and right of the navigation bar take you back or forward one page. The “table of contents” button takes you to that page. Each line in the table of contents is a clickable link. On the next pages, follow through on your copy of the book to see how these links help navigate the book.



Code Check **Electrical** 8th Edition

Based on the 2017 NEC® – Including selected changes to the 2014 & 2017 NEC

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Code Check Electrical 8th Edition is a field guide to common code issues in residential electrical installations. It is based on the **2017 National Electrical Code (NEC)®**. Significant changes in the 2017 NEC and the 2014 NEC are highlighted throughout the text and summarized on **p.64**, so this book is current for areas using either the 2014 or 2017 NEC. Before beginning any electrical project, check with your local building department to determine the code edition used in your area. In addition to a model code, energy codes and utility rules may also apply to electrical installations. The smoke & carbon monoxide alarm rules here are from the 2015 edition of the International Residential Code, published by the International Code Council.

KEY TO USING CODE CHECK ELECTRICAL

Each line that begins with a checkbox is a rule in the 2017 NEC, and the specific code section is at the right end of the line. The following example is from **p.6**:

☐ Max 6 disconnects to shut off power at service _____ 230.71

This line summarizes the code rule found in section 230.71 requiring no more than 6 disconnects to shut off all power at the service.

A line might have more than one code rule, and the code sections are separated by an ampersand - the “&” symbol, as in this example from **p.19**:

☐ Min #6 Cu to bond IBT to service or GEC _____ 250.94A4&5

This line tells us that the intersystem bonding terminal must be bonded to the service or the grounding electrode conductor, and that the bond must be made in 250.94(A)(4) and in 250.94(A)(5). The Code Check uses abbreviations (see p.64) to save space. Also note that the actual code citation numbers after the initial code section, and we omit those parameters to save space.

Clicking on T1 would take you to Table 1

To find what “IBT” means, clicking the “abbreviations” button in the center of the navigation bar would take you the page with its definition.

References to figures and tables in this book are shown by bold colored letters and numbers, as in this example from **p.9**:

☐ Cover from top of cable or conduit to finish grade per **T1, F4** _____ 300.5A

This line tells us that the amount of cover required over underground conduits and cables is found in Table 1 and is illustrated in Figure 4.

Exceptions are noted by text lines that end in EXC, and the following line then shows the exception to the rule just cited, as in this example from **p.8**:

☐ Each building or structure req's GES **F3, F6** EXC _____ 250.32A
 • Building or structure w/ only 1 branch circuit & w/ EGC _____ 250.32AX

These lines tell us that each building or structure requires a grounding electrode system, with the exception of buildings supplied by a single branch circuit that contains an equipment grounding conductor.

Clicking on F4 would take you to Figure 4

1

When there are exceptions to a code rule, the line ends in “EXC” and the following line explains the exception.

After clicking on any of the linked items above, you can return to this page by clicking “back to previous page” on the navigation bar.

Using the Table of Contents as a starting point

Suppose you were wanting to quickly find whether AFCIs were required for a particular room. Clicking on the "table of contents" button will take you to this page. Scan through it to look for "AFCIs".

Clicking anywhere on the line that says AFCIs takes you to page 25



CODE CHECK ELECTRICAL TABLE OF CONTENTS

<input type="checkbox"/> INTRODUCTION & REFERENCE DOCUMENTS _____	1	<input type="checkbox"/> KITCHENS _____	33
<input type="checkbox"/> KEY TO USING THIS BOOK _____	1	<input type="checkbox"/> BOXES _____	34-36
<input type="checkbox"/> ABBREVIATIONS _____	2	<input type="checkbox"/> LIGHTING _____	37-38
<input type="checkbox"/> GLOSSARY _____	3	<input type="checkbox"/> SWITCHES _____	39
<input type="checkbox"/> OVERHEAD SERVICE DROP CLEARANCES _____	5	<input type="checkbox"/> APPLIANCES _____	40-42
<input type="checkbox"/> SERVICE ENTRANCE CONDUCTORS _____	6	<input type="checkbox"/> WIRE AMPACITY _____	43-44
<input type="checkbox"/> SERVICE PANELS _____	6-7	<input type="checkbox"/> CABLE SYSTEMS _____	45-48
<input type="checkbox"/> WORKING SPACE _____	7	<input type="checkbox"/> VOLTAGE DROP _____	49
<input type="checkbox"/> SEPARATE BUILDINGS _____	8	<input type="checkbox"/> RACEWAYS _____	50-54
<input type="checkbox"/> UNDERGROUND WIRING _____	9	<input type="checkbox"/> KNOB & TUBE (K&T) / FUSES _____	55
<input type="checkbox"/> TEMPORARY WIRING _____	10	<input type="checkbox"/> REPLACEMENT RECEPTACLES & LUMINAIRES _____	56
<input type="checkbox"/> SERVICE & FEEDER LOAD CALCULATIONS _____	11-14	<input type="checkbox"/> ELECTRIC VEHICLE CHARGING _____	56
<input type="checkbox"/> GROUNDING ELECTRODES _____	15-16	<input type="checkbox"/> OLD NM CABLE _____	56
<input type="checkbox"/> GROUNDING ELECTRODE CONDUCTORS (GECS) _____	16-17	<input type="checkbox"/> ALUMINUM WIRE _____	57
<input type="checkbox"/> BONDING _____	18-19	<input type="checkbox"/> PHOTOVOLTAICS _____	58-60
<input type="checkbox"/> EQUIPMENT GROUNDING CONDUCTORS (EGCS) _____	19-20	<input type="checkbox"/> SWIMMING POOL _____	61-62
<input type="checkbox"/> PANELBOARDS & CABINETS _____	20-24	<input type="checkbox"/> FOUNTAINS _____	63
<input type="checkbox"/> ARC-FAULT CIRCUIT INTERRUPTERS (AFCIS) _____	25-26	<input type="checkbox"/> HOT TUB/SPA _____	63
<input type="checkbox"/> GROUND-FAULT CIRCUIT INTERRUPTERS (GFCIS) _____	27-28	<input type="checkbox"/> SIGNIFICANT CHANGES IN THE 2014 & 2017 NEC _____	64-66
<input type="checkbox"/> BRANCH CIRCUITS & OUTLETS _____	29-32		

The "table of contents" button is available on every page and is the easiest way to search for most items.

Another method is a "word search" using <Control + F> on a PC, or <Command + F> on a MAC, and then typing in the word you are searching for. This method will find all instances of the word, so you may need to click on "next" a few times to scroll through all the occurrences of the word.

Another button that is often useful is the glossary. Here you find common terms used throughout the book.

The table of contents or a word search for "AFCIs" takes you to the page that lists areas where AFCI protection is required. The first code citation is a different color with a superscript number after it, meaning there was a recent code change, in this case code change #23. Clicking on the citation takes you to the Code Changes page that has more detail on this change.



ARC-FAULT CIRCUIT INTERRUPTERS (AFCIs)

AFCIs provide fire protection by tripping when an arcing fault is detected. AFCI breakers and GFCI breakers look similar **F21,24**, and you must read the label to determine if a breaker is an AFCI or a GFCI. Dual function breakers that provide both AFCI & GFCI protection are also available **F21**. Outlet branch-circuit type (OBC) AFCIs are also available, including ones that are also GFCIs, and the codes have changed substantially to recognize these new methods.

The number of areas requiring AFCI protection expands in each code cycle. The time to plan for the AFCIs is during the rough wiring, so that separate cables are provided for the circuits requiring AFCI protection. Not all brands and models of AFCI are compatible with multiwire circuits.

Beginning January 1, 2008, all AFCIs were req'd to meet the UL standard for "combination" types rather than the older "branch/feeder" type. Combination AFCIs provide a broader range of protection than branch/feeder types. OBC AFCIs provide the same range of protection as combination types, and when installed at the first outlet box on a circuit protected by an older "branch/feeder" AFCI, that circuit then complies with the 2014 and 2017 NEC.

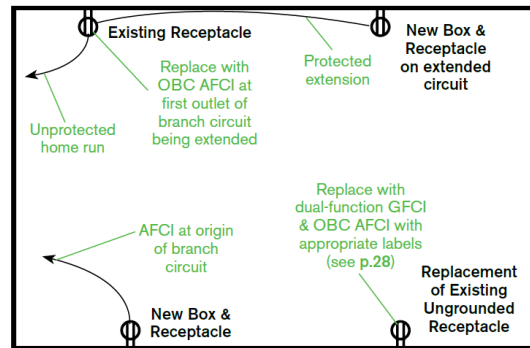
Areas Requiring AFCI Protection

- ☐ Req'd for all 120V 15A & 20A branch circuits supplying outlets or devices in family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, kitchens, laundry areas & similar rooms EXC **210.12A²³**
 - May be omitted on individual circuit to a fire alarm circuit in RMC, IMC, EMT, or steel-armored AC or MC cable w/ metal junction boxes that is part of central-station system in accordance w/ NEC Article 760 _ 210.12AX
- ☐ Req'd for all 120V 15A & 20A branch circuits supplying outlets & devices in dormitory unit bedrooms, living rooms, hallways, closets, bathrooms, & similar rooms **210.12B²⁴**

17 NEC

FIG. 20

AFCIs - Replacements & Extensions



Code change #23 explains that kitchens and laundry areas were added to the list of places requiring AFCI protection, and that the change occurred in the 2014 code.



TABLE 23		SIGNIFICANT CHANGES IN THE 2014 & 2017 NEC					
#	Page	NEC Year	Description	#	Page	NEC Year	Description
1	5	17	Metal support structures req bonding to grounded neutral.	15	19	17	Section renamed to clarify that IBT is for communications systems, not for items such as gas piping.
2	6	14	Couplings prohibited between weatherhead & last support.	16	19	17	IBT not req'd if communications systems not present.
3	6 & 44	14	Table 310.15B7 replaced with 83% rule.	17	21	14	Tagging & identification of neutrals expanded to all multiple circuits, not just multiwire circuits, moved to article 200
4	6	17	Barriers are req'd over live terminals in service equipment except those w/ multiple main breakers, as allowed by the rule permitting 2 - 6 disconnects.	18	21	17	Terminal torque AMI has always been part of L&L, & it now also has its own code section.
5	8	17	Feeder height above low slope roof 8 ft. 6 in. (8 ft. in 2014)	19	21	17	Power monitoring devices such as CTs OK if listed & not over-filling space inside panel.
6	8	17	All conduits supplying separate buildings must be sealed, not just underground conduits.	20	21	14	Separate wire-bending space sections for top/bottom, sides, & back wall, w/ new limitation on back wall space.
7	8	17	EV charger circuit allowed in addition to other feeders or branch circuits to separate building.	21	23	17	Compact AI added to table for "L" bends
8	10 & 47	17	SE cables allowed underground for temp wiring.	22	24	14	Other means of identification of multiwire circuit neutrals allowed, moved to article 200
9	10	17	MC cable splices w/out a box req a duplex fitting or similar means to maintain electrical continuity of the cable sheath.	23	25	14	AFCIs req'd for kitchens & laundry areas (which could be in a garage or basement) & for devices (such as switch in bedroom controlling exterior light).
10	10	14	Temporary power branch circuit & feeder cords & cables not allowed on floor or ground except extension cords.	24	25	14 & 17	2014 added dormitories, 2017 added devices & bathrooms.
11	10	17	GFCI cordsets can only supplement, not replace, the req for GFCI protection of temporary receptacles. GFCI cordsets can be the protection for permanent receptacles.	25	26	14	Branch/feeder AFCIs allowed if first outlet is OBC AFCI.
12	10	17	Other temp receptacles req GFCI, special purpose GFCI (UL 943C class C or D) or assured EGC program.	26	26	14	Exemption from AFCI upgrade if length of wire < 6 ft.
13	16	17	Connection of metal frame to Ufer can be hold-down bolts.	27	26	17	Replacement receptacles in 2-wire systems w/ no EGC or practical means to add one can be non-AFCI if AFCIs not available for panel, replacement is GFCI, no new wire, & dual-function AFCI/GFCI receptacles not available.
14	16	14 & 17	Recognition that Ufer can be extended above foundation for connection point; 2017 also req's location of connection to have protection against corrosion.				