SERVICE MANUAL



E SERIES

SERVICE MANUAL

BEST ACCESS SYSTEMS

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1 GETTING STARTED

INTRODUCTION

The *E Series Service Manual* contains essential information to help you maintain your E Series product. This manual includes information for 1E Series, 3E Series, and 5E Series 7-pin cylinder products only.

PRODUCT FAMILY DIAGRAM

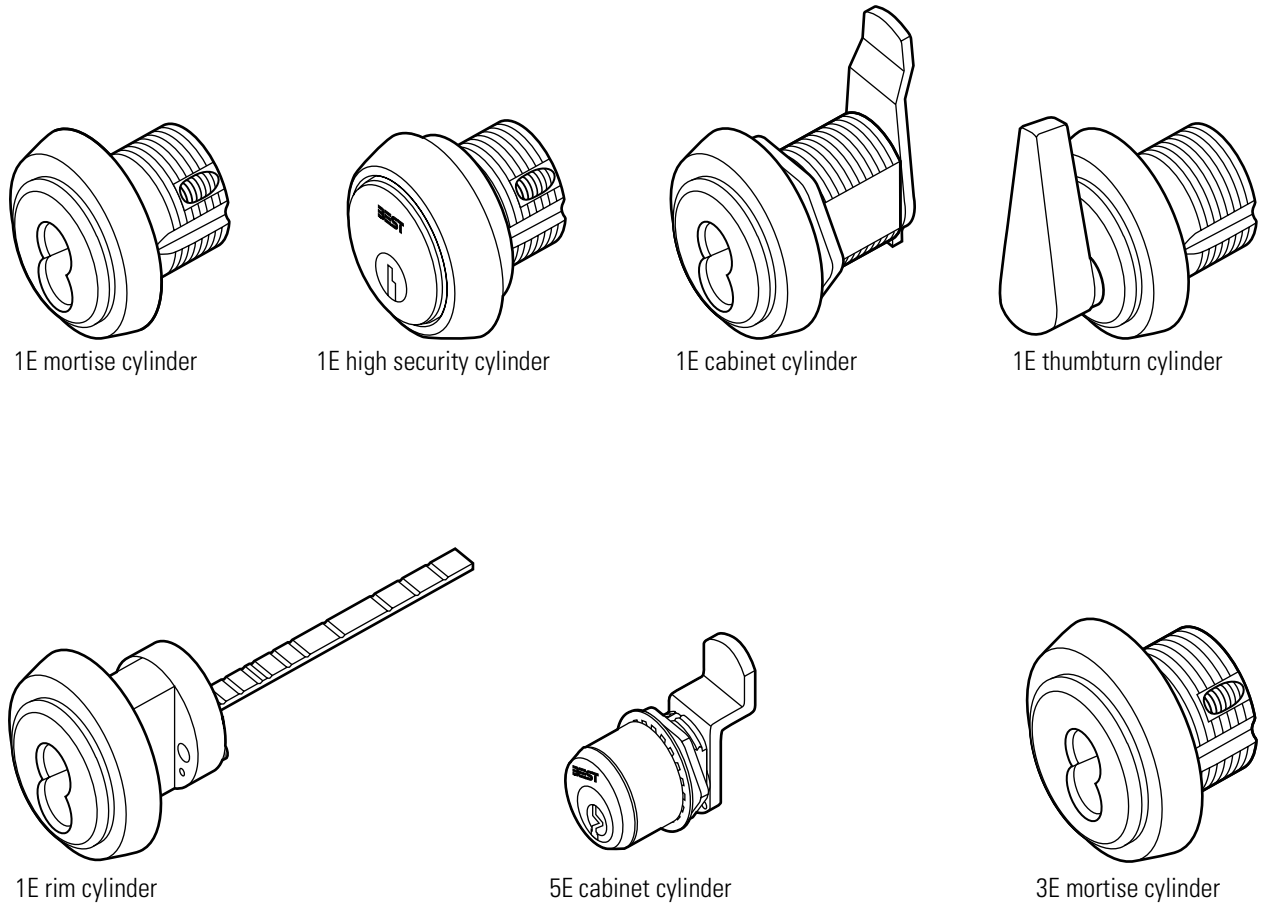


Figure 1.1 E Series product family diagram

CERTIFICATIONS AND STANDARDS

- The 1E7J4 high security cylinder is listed by Underwriter's Laboratories when used with 36H/37H mortise locks.
- The 1E74 mortise cylinder complies with ANSI/BHMA, Grade 2 standards when used with 30H Series mortise locks and the 1CD core.
- The 1E74 mortise cylinder complies with ANSI/BHMA, Grade 3 standards when used with the standard 1C core.

DOCUMENTATION PACKAGE

The following resources are available to help you with the installation, start-up, and maintenance of your BEST E Series product.

These documents can be ordered separately from the product:

Documentation Title	Doc. No.
BEST Installation Instructions for 1E Mortise Cylinders	T61781
BEST Installation Instructions for 1E Rim Cylinders	T61971
H Series Service Manual	T61964
Best Adaptation & Equivalent List (8th edition)	B120–1
Core and Key Service Manual	T35527

TECHNICAL SUPPORT

Support services

When you have a problem with an E Series product, your first resource for help is the *E Series Service Manual*. If you cannot find a satisfactory answer, contact your local BEST Representative.

Telephone and web technical support

A factory-trained Certified Product Specialist (CPS) is available in your area whenever you need help. Before you call, however, please make sure you are where the E Series product is, and that you are prepared to give the following information:

- what happened and what you were doing when the problem arose
- what you have done so far to solve the problem.

Best Access Systems Representatives provide telephone technical support for all E Series products. You may locate the representative nearest you by calling (317) 849-2250 Monday through Friday, between 7:00 a.m. and 4:00 p.m. eastern standard time; or visit the web site, www.BestAccess.com.

2 PARTS FOR 1E SERIES

The following pages contain exploded diagrams that show all field serviceable parts for common 1E Series mortise, rim, and cabinet cylinders. This chapter also contains diagrams of special application mortise cylinders, diagrams of trim and other miscellaneous parts, and diagrams of common cams.

EXPLODED DIAGRAMS AND PARTS LISTS
MORTISE CYLINDER

Item	Part no.	Qty.	Description
1	A06831	1	Spacer for 6-pin cores
2	A40095	2	Throw pin
3	A10390	1	Throw plug
4	A10391	1	Stamped head
5	C34075	1	7-pin cylinder
6	See page 2–10	1	Cylinder ring
7	See page 2–15	1	Cam† (C4 shown)
8	A34123	1	Set screw

† Specify cylinder length when ordering cams.
Cylinders 2 inches or longer require a thumbturn cam.
See *Appendix B* for available thumbturn cams.

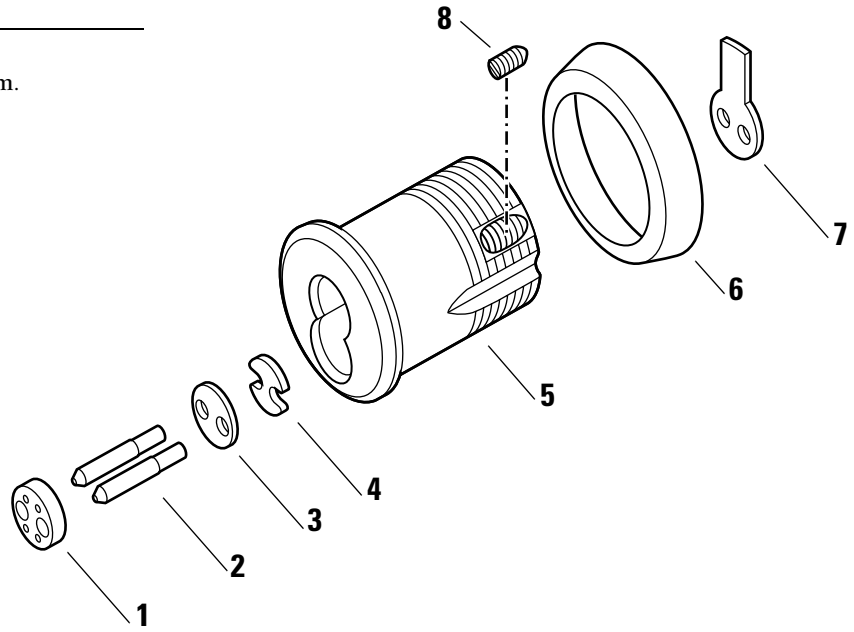


Figure 2.1 1E74 mortise cylinder exploded view

RIM CYLINDER

Item	Part no.	Qty.	Description
1	A06831	1	Spacer for 6-pin cores
2	C00121	1	7-pin cylinder
3	See page 2–10	1	Cylinder ring
4	A40110	1	Throw plug assembly
5	A40100	1	Spindle
6	B40109	1	Throw plug retainer
7	A14553	2	Retainer screw
8	C13910	1	Clamp plate
9	A08544	2	Mounting screw

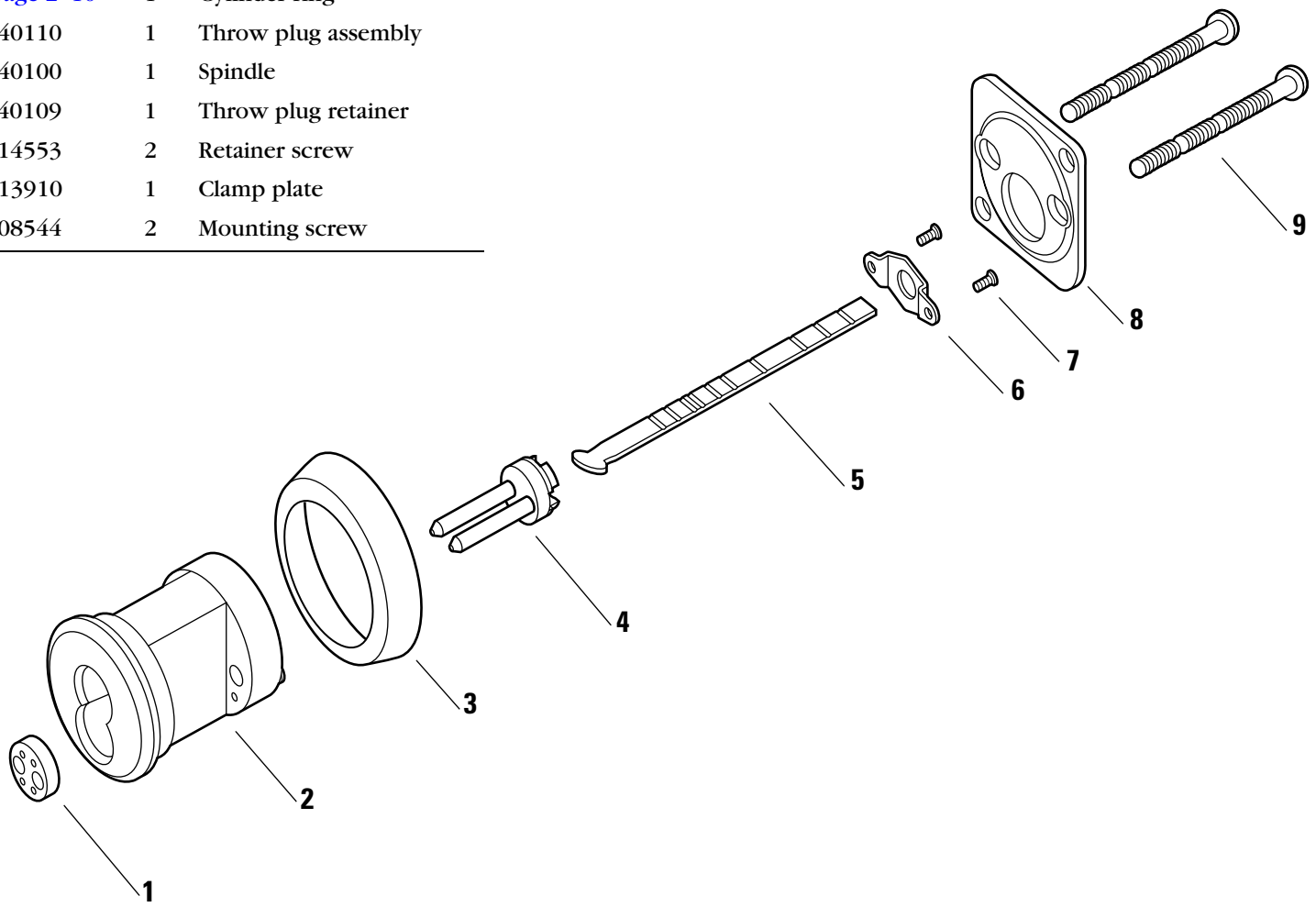


Figure 2.2 1E72 rim cylinder exploded view

THUMBTURN CYLINDER

Item	Part no.	Qty.	Description
1	B61572	1	ADA thumbturn
not shown	A24046	1	Non-ADA thumbturn
2	A03612	1	Spring plug
3	A18033	1	Spring
4	B04781	1	7-pin cylinder
5	See page 2–10	1	Cylinder ring
6	See page B–2	1	Cam (C413 shown)
7	A04838	2	Cam screw

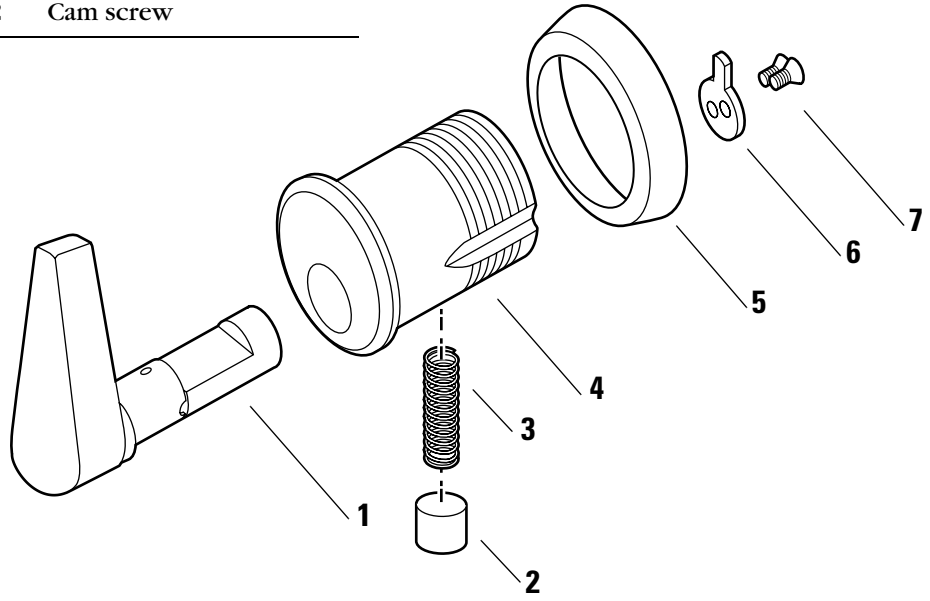


Figure 2.3 1E7A4 thumbturn cylinder exploded view

DIRECT MOTION CABINET CYLINDER

Item	Part no.	Qty.	Description
1	A06831	1	Spacer for 6-pin cores
2	A00539	2	Throw pin
3	A07544	1	Throw plug
4	B07547	1	7-pin cylinder
5	See page 2–10	1	Cylinder ring
6	A00836	1	Nut
7	A04460	1	Throw plug retainer
8	See page 2–20	1	Cam† (C228 shown)
9	A07542	2	Cam screw

† See page 5–16 for cam rotations.

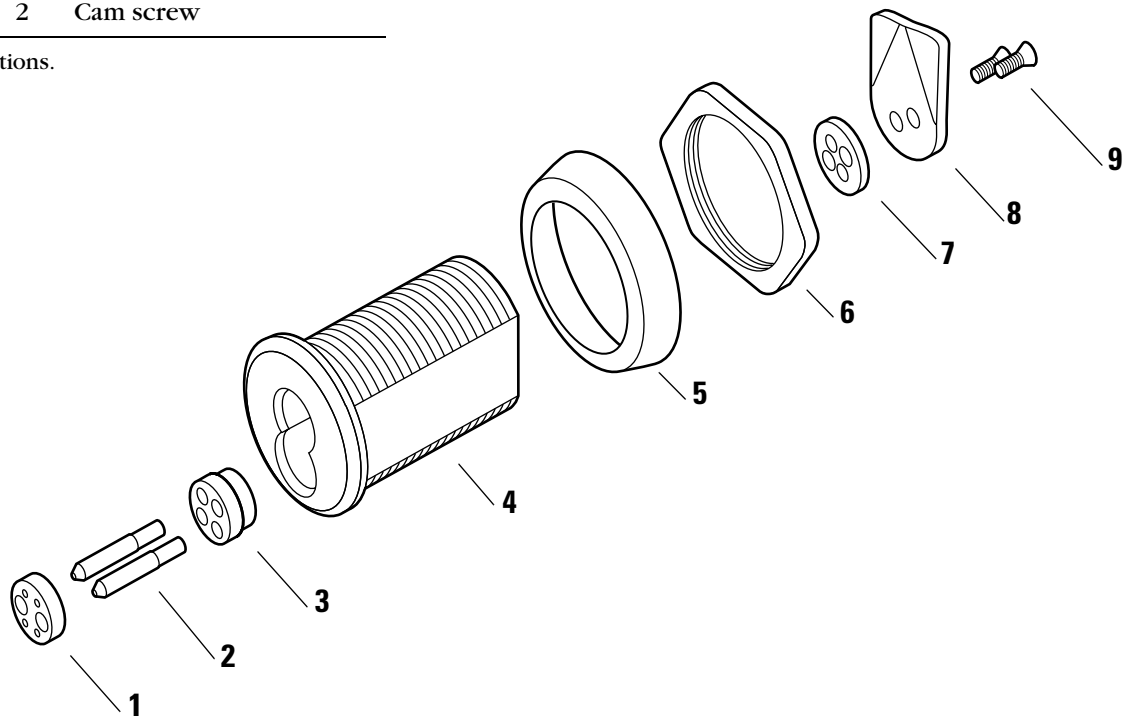


Figure 2.4 1E7D4 direct motion cabinet cylinder exploded view

LOST MOTION CABINET CYLINDER

Item	Part no.	Qty.	Description
1	A06831	1	Spacer for 6-pin cores
2	A07986	1	Throw member assembly
3	A07993	1	7-pin cylinder
4	See page 2–10	1	Cylinder ring
5	A00836	1	Nut
6	B40412	1	Cam stop pin
7	See page 2–20	1	Cam with drive pin† (C229 shown)
8	A07988	1	Cam driver
9	A07954	1	Washer
10	A07956	1	Cam screw

† See page 5–17 for cam rotations.

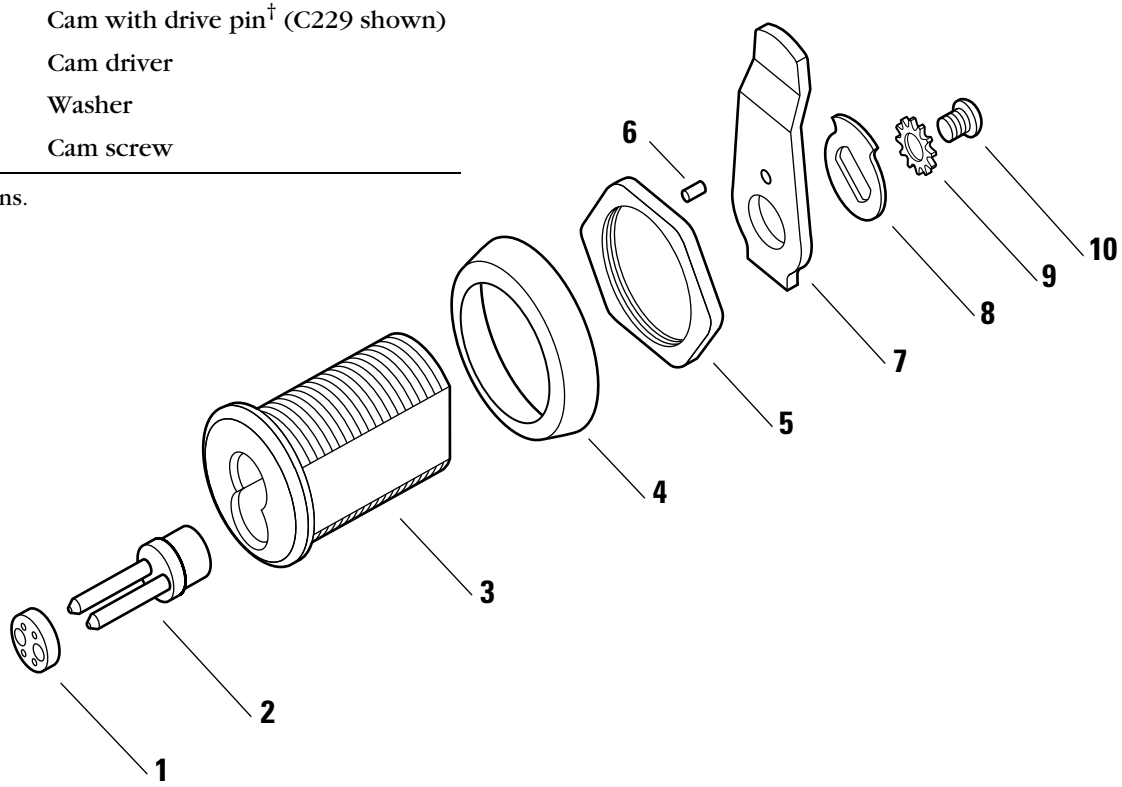


Figure 2.5 1E7E4 lost motion cabinet cylinder exploded view

SPECIAL MORTISE CYLINDER APPLICATIONS

Dust cover cylinder

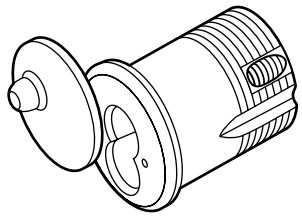


Figure 2.6 1E7B4 dust cover cylinder

Wrench-resistant cylinder

Note: See page 2–12 for wrench-resistant cylinder rings.

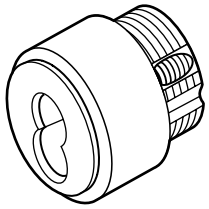


Figure 2.7 1E7C4 wrench-resistant cylinder

Lost motion cylinder

Note: Specify cylinder handing when ordering (for example, "RHI" = right hand, inside door).

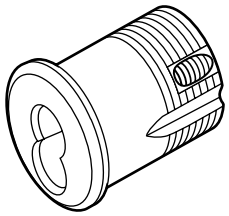


Figure 2.8 1E7F4 lost motion cylinder

Hotel shifting cam cylinder

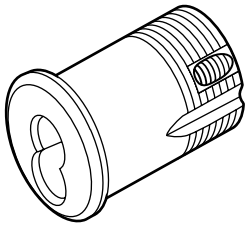


Figure 2.9 1E7G4 hotel cylinder

Non-UL high security cylinder

Note: To order the 1E7J4 high security cylinder listed by Underwriters Laboratories (UL), contact your BEST Representative.

Note: High security cylinders require long blade keys for operation.

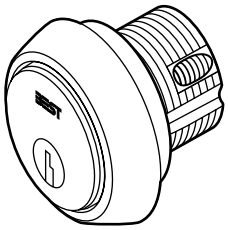


Figure 2.10 1E7K4 non-UL high security cylinder

Tapered-head cylinder

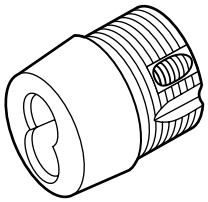


Figure 2.11 1E76 tapered-head cylinder

TRIM PARTS

Rim dummy trim

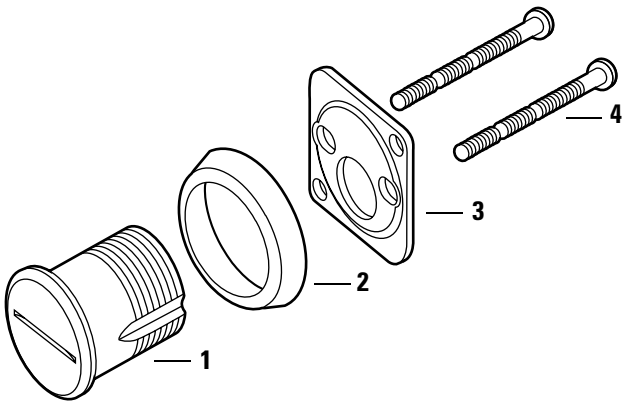


Figure 2.12 1E02 rim cylinder dummy trim

Rim dummy trim parts list

Item	Part no.	Qty.	Description
1	A05032	1	Dummy cylinder
2	See page 2-10	1	Cylinder ring
3	C13910	1	Clamp plate
4	A08544	2	Mounting screw

Mortise dummy trim

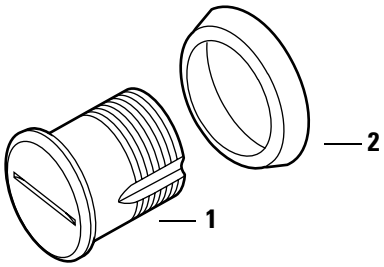


Figure 2.13 1E04 mortise cylinder dummy trim

Mortise dummy trim parts list

Item†	Part no.	Qty.	Description
1	A05032	1	Dummy cylinder
2	See page 2-10	1	Cylinder ring

† The C13910 clamp plate and two A08544 mounting screws for rim dummy trim applications are also included in the mortise dummy trim package.

Stamped cylinder rings

A cylinder ring is required if there is a gap between the cylinder head and the mounting surface when the cam is positioned for proper lock operation. Stamped cylinder rings may be stacked, if necessary, for some door applications.

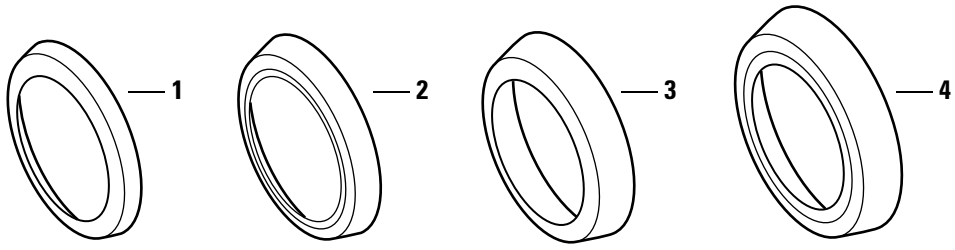


Figure 2.14 Standard cylinder rings

Stamped cylinder rings parts list

Item	Nomen-clature	Part no.	Length
1	1E-R2	A40102	1/8″
2	1E-R3	A40103	3/16″
3	1E-R4	A40104	1/4″
4	1E-R5	A40105	3/8″

Stamped cylinder ring packages

Nomen-clature	Rings included
RP†	1E-R3—3/16″ 1E-R5—3/8″
RP1	1E-R2—1/8″ 1E-R3—3/16″
RP2	1E-R2—1/8″ 1E-R4—1/4″
RP3‡	1E-R2—1/8″ 1E-R4—1/4″ 1E-R5—3/8″

† Supplied standard with 7-pin rim cylinders.
‡ Supplied standard with 7-pin mortise cylinders.

Straight cylinder rings

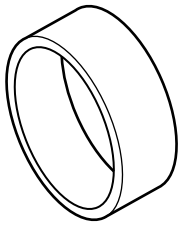


Figure 2.15 Straight cylinder ring (1E-R708 shown)

Straight cylinder ring part numbers

Nomen-clature	Part no.	Length
1E-R702	A06280	1/8″
1E-R703	A06281	3/16″
1E-R704	A06282	1/4″
1E-R705	A04370	5/16″
1E-R706	A06283	3/8″
1E-R707	A06284	7/16″
1E-R708	A06285	1/2″
1E-R709	A04369	9/16″
1E-R710	A06286	5/8″
1E-R711	A06288	11/32″
1E-R712	A06287	3/4″

Wrench-resistant cylinder rings

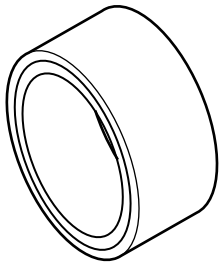


Figure 2.16 Wrench-resistant cylinder ring (1E-R808 shown)

Wrench-resistant cylinder ring part numbers

Nomen-clature	Part no.	Length
1E-R802	A05963	1/8″
1E-R803	A05958	3/16″
1E-R804	A05959	1/4″
1E-R805	A05960	5/16″
1E-R806	A05961	3/8″
1E-R807	A05962	7/16″
1E-R808	A05957	1/2″
1E-R809	A05964	9/16″
1E-R810	A05965	5/8″
1E-R811	A05966	11/16″
1E-R812	A05967	3/4″
1E-R814	A05969	13/16″
1E-R815	A05970	7/8″
1E-R816	A05971	15/16″

Mounting plates

The following mounting plates can be used with 1E7D4 and 1E7E4 cabinet cylinders.

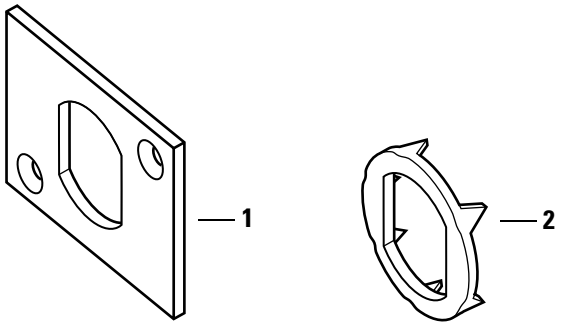


Figure 2.17 Mounting plates

Mounting plates part numbers

Item	Part no.	Description
1	A14543	Large mounting plate
2	A20361	Wood mounting plate

Tools The following tools are used to install and service 1E Series cylinders.

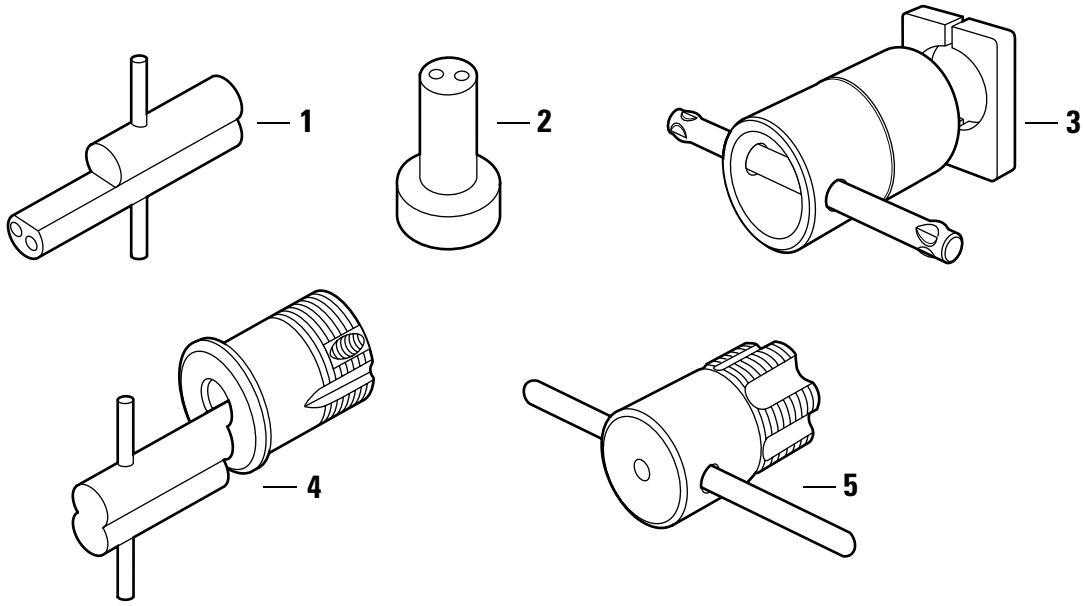


Figure 2.18 Tools

Tools parts list

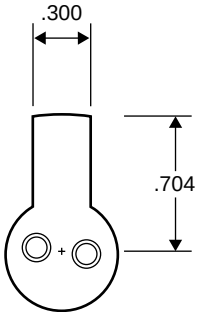
Item	Nomen–clature	Part no.	Description	Use
1	ED211	A09612	Mortise cylinder wrench	Tool for installing, removing, and testing cylinders
2	ED212	A19370	Mortise cylinder cam assembly tool	Tool for assembling cams to mortise cylinders
3	ED221	A06206	Mortise cylinder thread repair die	Tool for rethreading 1 5/32" cylinders
4	ED222	A06399	Cylinder cam testing tool	Tool for testing the functionality of cams when installed in a door
5	ED225	A01474	1E cylinder hole tap	Tool for rethreading case threads

CAM IDENTIFICATION

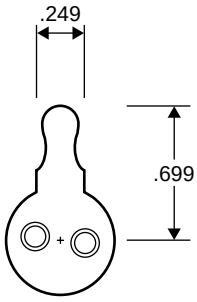
The following common cams are grouped by shape and then sorted by cam number, listing dimensions in inches for each. All cams are shown approximately their size. See *Appendix A Cams Table* for a table of E Series cams listed by part number.

Note: Specify "1E" when ordering cams separately (for example, "1E-C4").

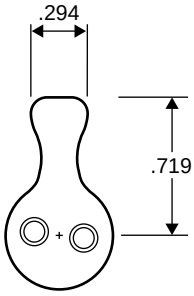
Straight cams



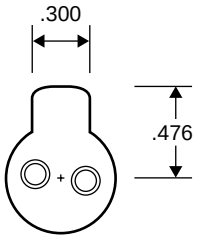
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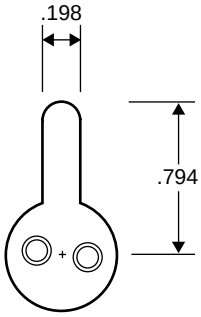
C101
A00117



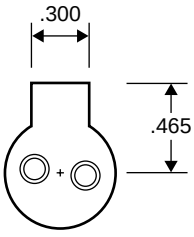
C103
A00533



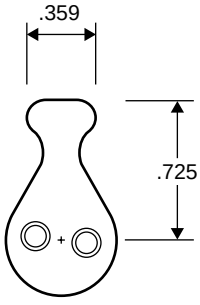
C110
A00683



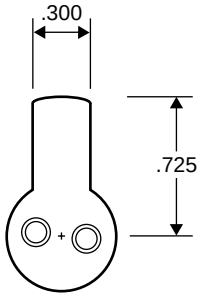
C115
A00967



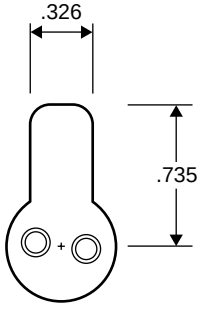
C121
A01172



C123
A01225

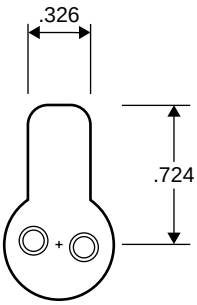


C127
A01247

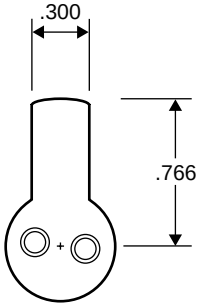


C128
A01248

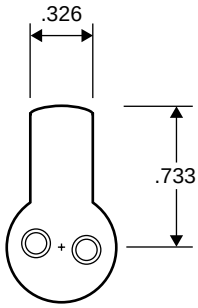
Straight cams cont'd.



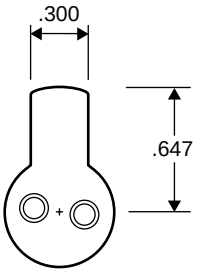
C129
A01249



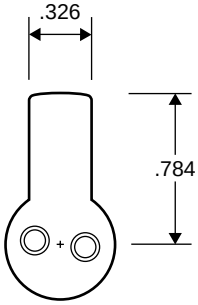
C130
A01400



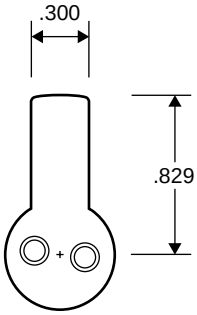
C131
A01401



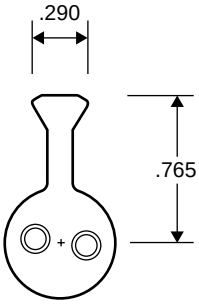
C134
A01414



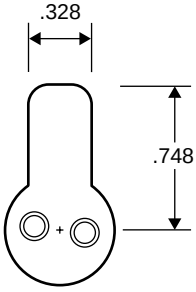
C136
A01416



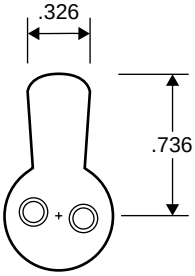
C137
A01417



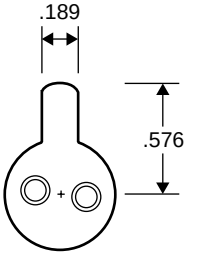
C143
A01487



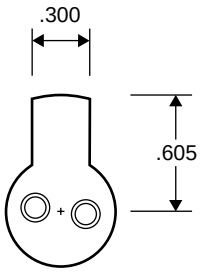
C152
A01799



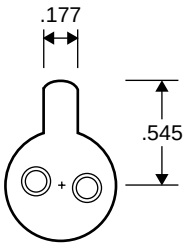
C162
A04387



C165
A04399

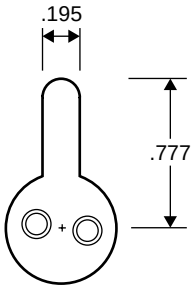


C169
A04445

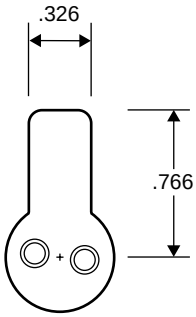


C171
A04492

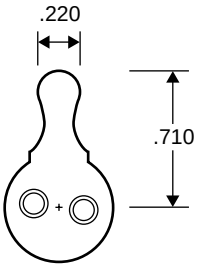
Straight cams cont'd.



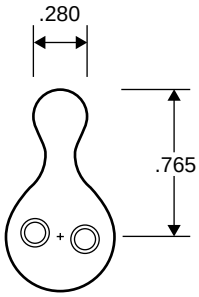
C173
B04796



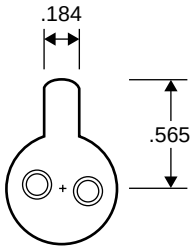
C177
A05397



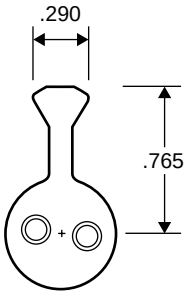
C178
A05466



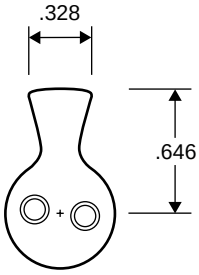
C179
B05467



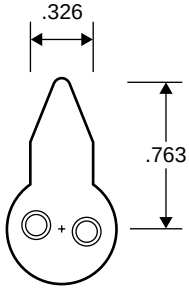
C181
A05979



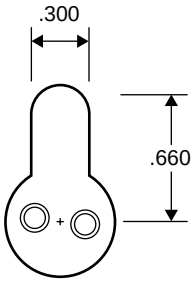
C182
A05989



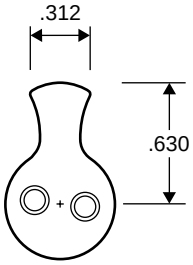
C185
A06060



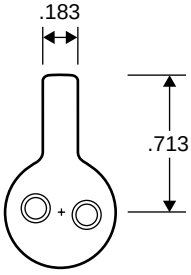
C186
A06190



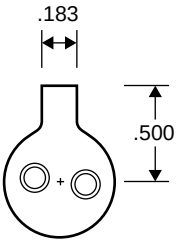
C191
A06419



C193
A07190

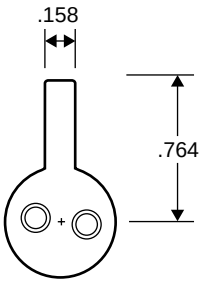


C208
A14520

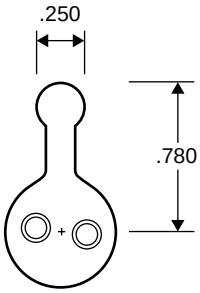


C209
A14521

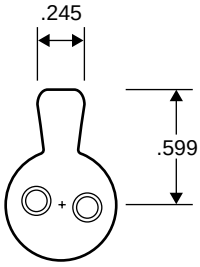
Straight cams cont'd.



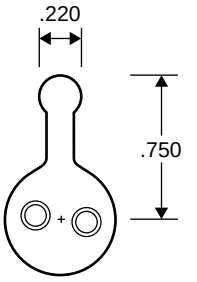
C210
A14472



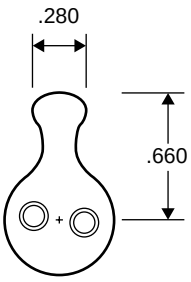
C211
A15981



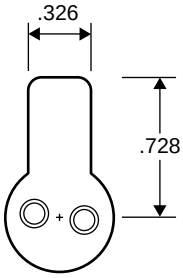
C223
A09229



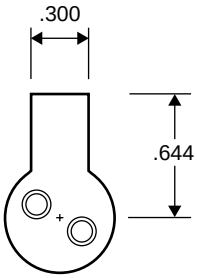
C231
A20931



C233
A09359

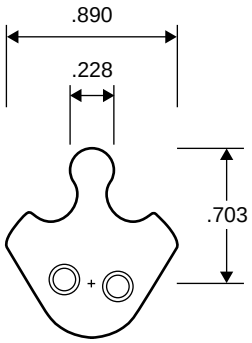


C234
A40088

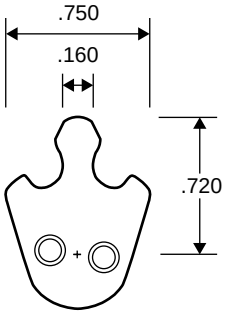


C239
A07212

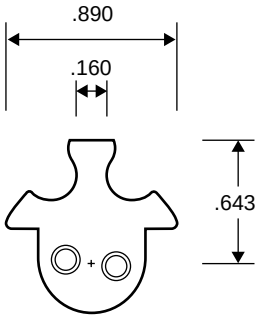
Cloverleaf cams



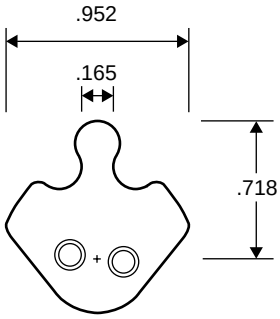
C118
A00995



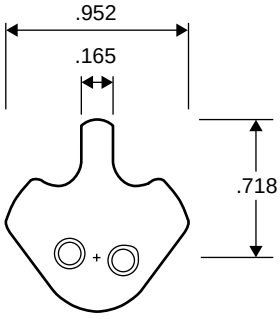
C161
A02770



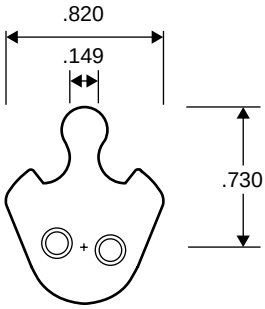
C204
A07880



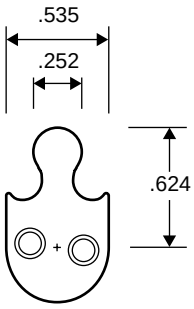
C222
A20877



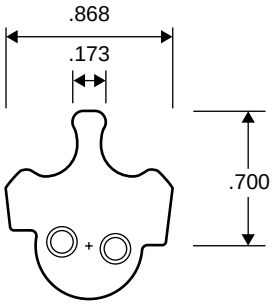
C256
A23770



C258
B34077

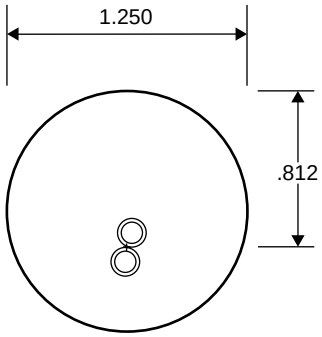


C265
B39256

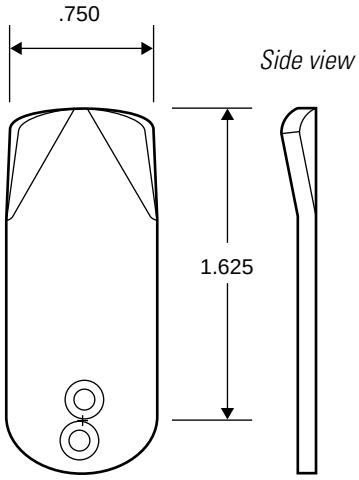


C281
B34562

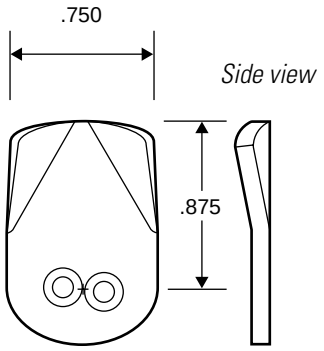
Cabinet cams



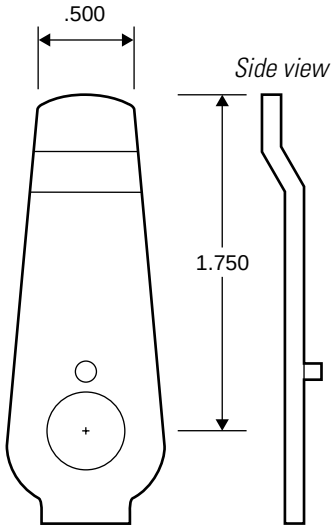
C224
A08095



C225
A20421



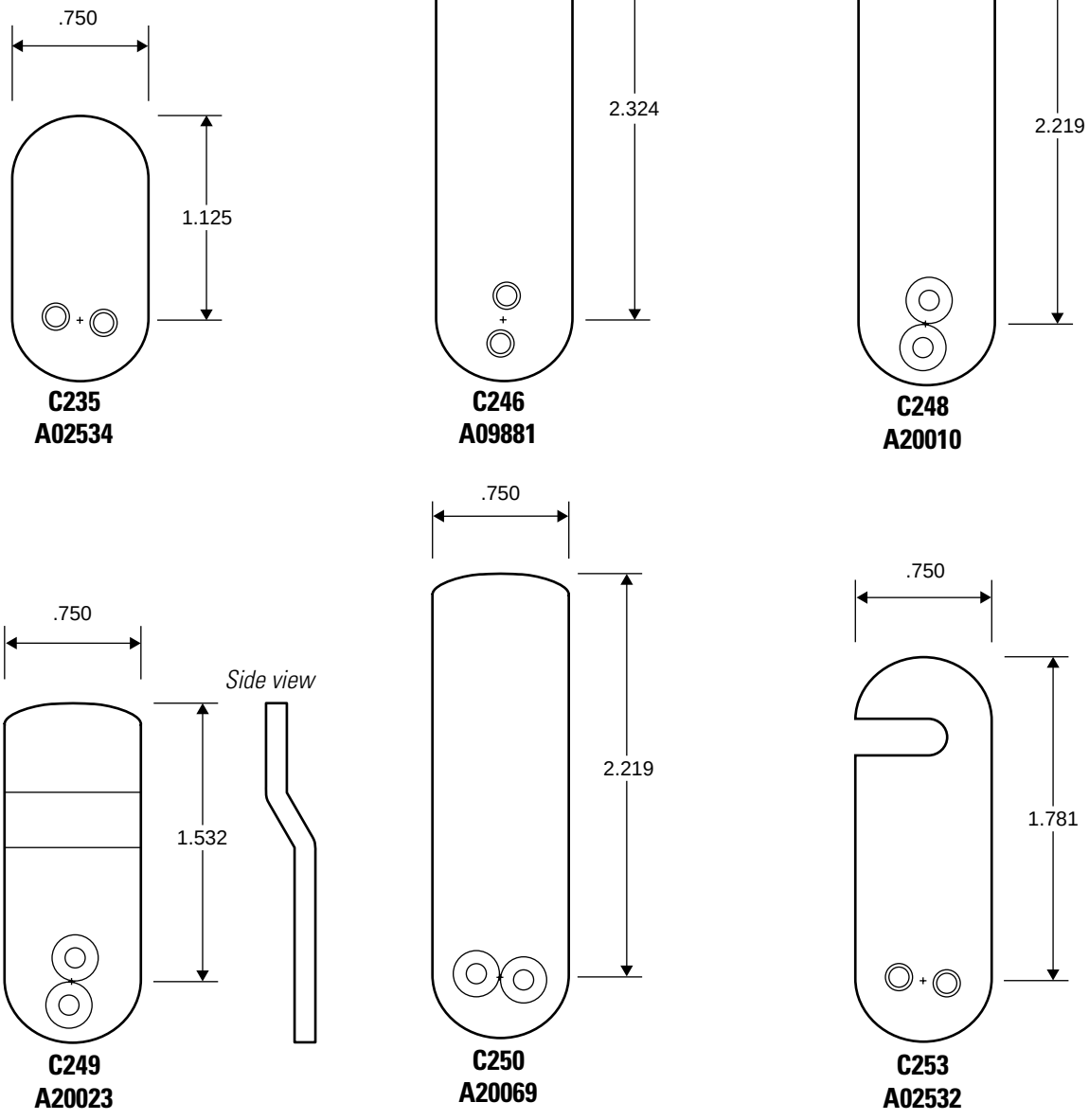
C228
A08778



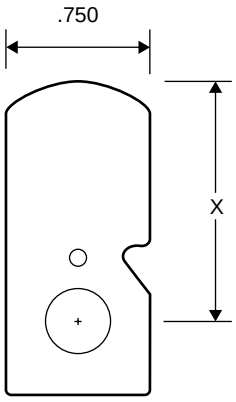
C229†
A07990

† Drive pin location shown.

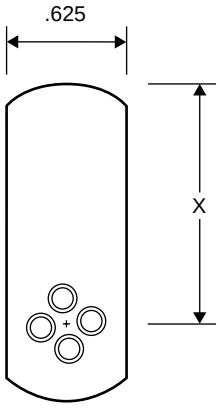
Cabinet cams cont'd.



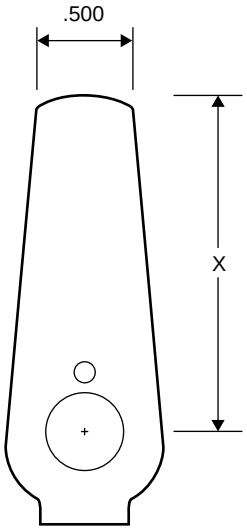
Cabinet cams cont'd.



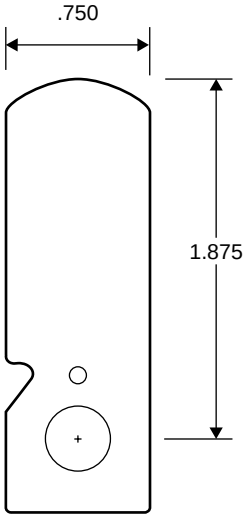
C500-C502†,‡



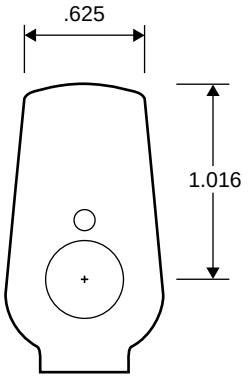
C503-C505†



C506-C508†,‡



A11468‡

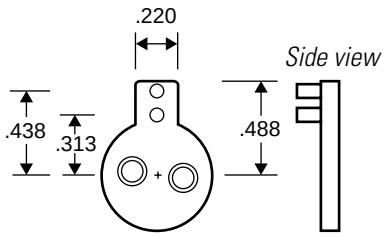


A04607‡

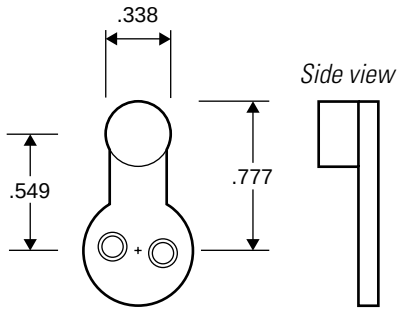
† Specify cam length "X" when ordering. See the table below. See page 5–16 for 1E Series cam rotations.
‡ Drive pin hole location shown.

Cam	Part No.	Length "X"
C500	A63060	1 1/8″
C501	A63061	1 1/2″
C502	A63062	2 1/4″
C503	A63063	1 1/8″
C504	A63064	1 1/2″
C505	A63065	2 1/4″
C506	A63066	1 1/8″
C507	A63067	1 1/2″
C508	A63068	2 1/4″

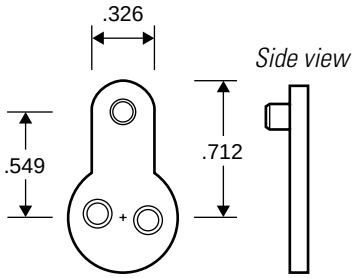
Roller cams



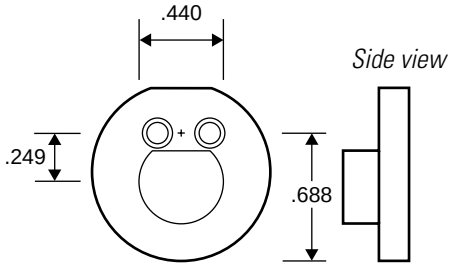
C124
A01231



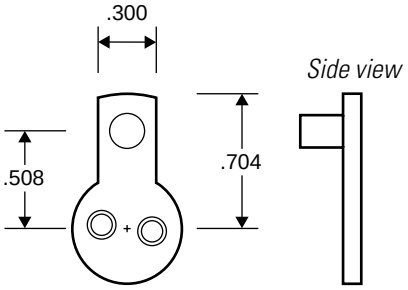
C142
A01475



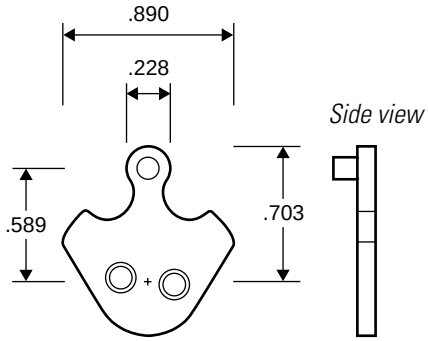
C148
A01707



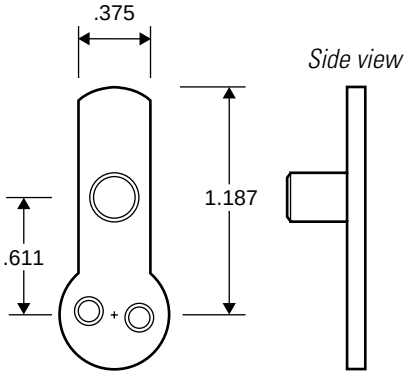
C221
A04284



C227
A20128

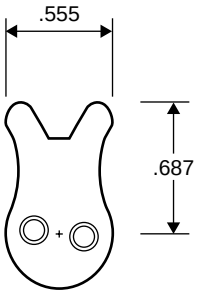


C254
A04737

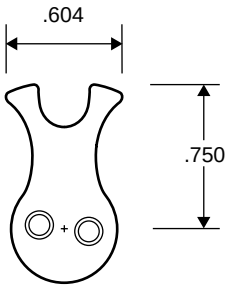


A04533

Two-point cams



C102
A00490



C114
A00921

3 PARTS FOR 3E SERIES

The following pages contain an exploded diagram showing all field serviceable parts for the 3E Series mortise cylinder, diagrams of trim and other miscellaneous parts, and diagrams of common cams.

MORTISE CYLINDER EXPLODED DIAGRAM AND PARTS LIST

Item	Part no.	Qty.	Description
1	A06831	1	Spacer for 6-pin cores
2	A40095	2	Throw pin
3	A10390	1	Throw plug
4	A10391	1	Stamped head
5	C40090	1	7-pin cylinder
6	See page 3-3	1	Cylinder ring
7	See page 3-4	1	Cam (C3 shown)
8	A34123	1	Set screw

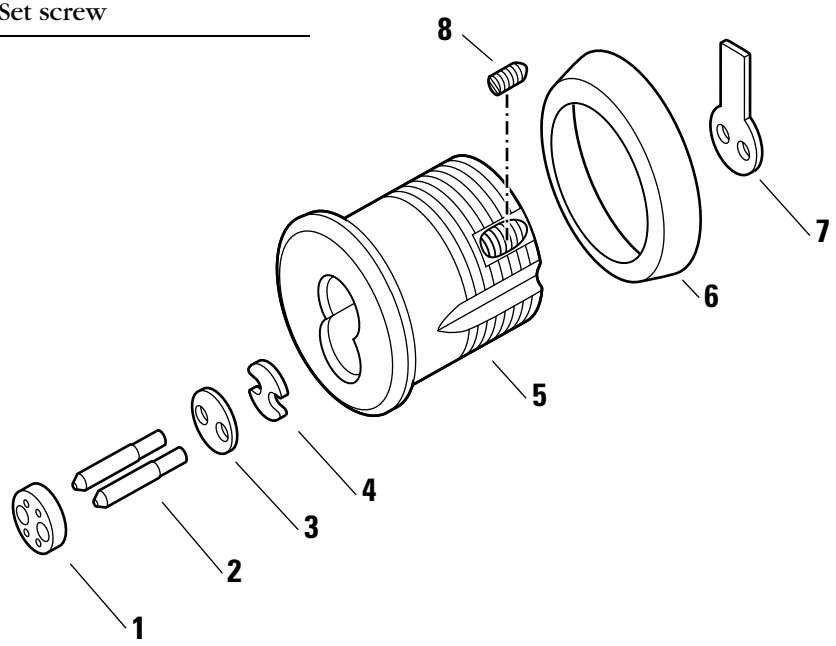


Figure 3.1 3E74 mortise cylinder exploded view

TRIM PARTS

Stamped cylinder rings

A cylinder ring is required if there is a gap between the cylinder head and the mounting surface when the cam is positioned for proper lock operation. Stamped cylinder rings may be stacked, if necessary, for some door applications.

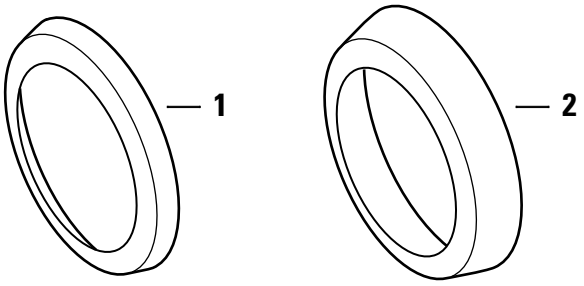


Figure 3.2 Cylinder rings

Cylinder rings parts list

Item	Nomen-clature	Part no.	Length
1	3E-R2	A40106	1/8″
2	3E-R4	A40107	1/4″
not shown	3E-R8	A09198	3/8″

Tools

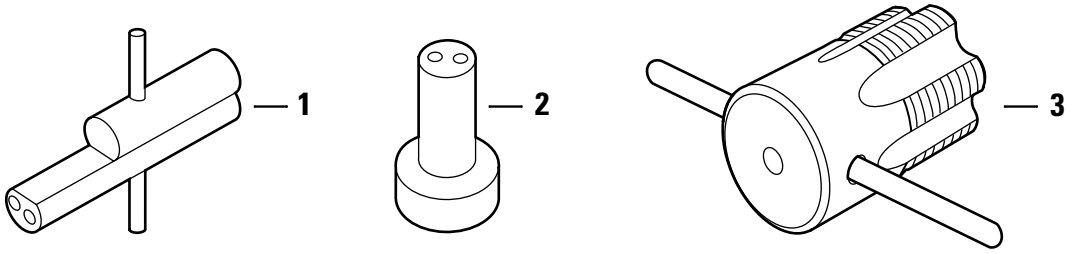


Figure 3.3 Tools

Tools parts list

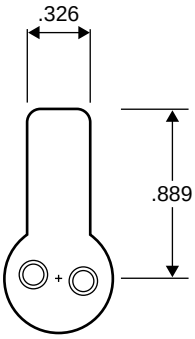
Item	Nomen–clature	Part no.	Description	Use
1	ED211	A09612	Mortise cylinder wrench	Tool for installing, removing, and testing cylinders
2	ED212	A19370	Mortise cylinder cam assembly tool	Tool for assembling cams to mortise cylinders
3	ED224	A07861	3E cylinder hole tap	Tool for rethreading case threads

CAM IDENTIFICATION

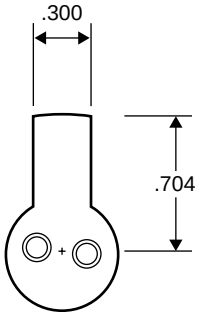
The following section shows common 3E cams and their dimensions in inches. Cams are shown approximately their size. See *Appendix A E Series Cams Table* for a list of E Series cams sorted by part number.

Note: Specify "3E" when ordering cams separately (for example, "3E-C3").

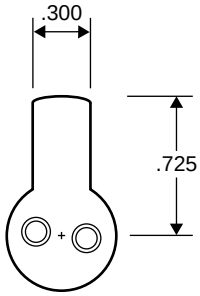
Straight cams



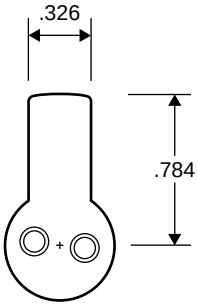
C3
A40092



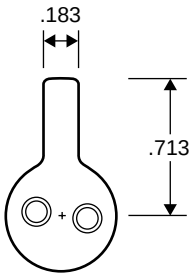
C4
A40091



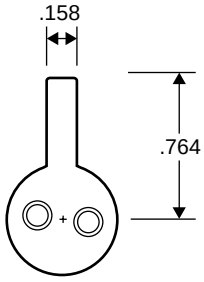
C127
A01247



C136
A01416

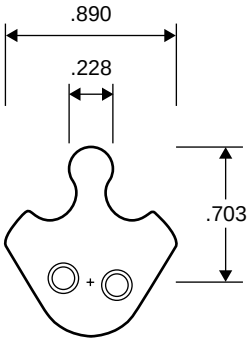


C208
A14520

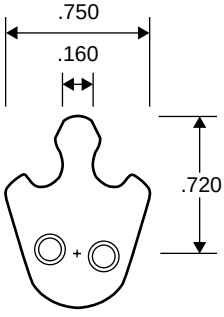


C210
A14472

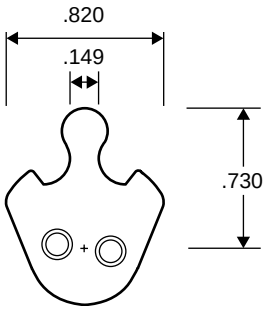
Cloverleaf cams



C118
A00995

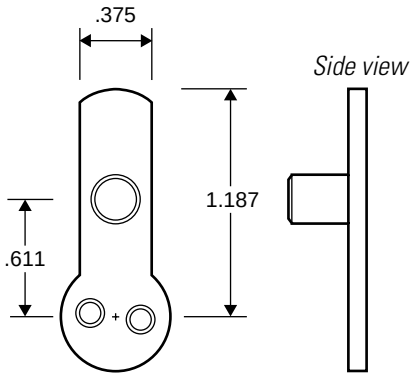


C161
A02770



C258
B34077

Roller cams



A04533

4 PARTS FOR 5E SERIES

The following pages contain exploded diagrams showing all field serviceable parts for the 5E Series cylinders, diagrams of trim and other miscellaneous parts, and drawings of common cams.

EXPLODED DIAGRAM AND PARTS LIST
LOST MOTION CABINET CYLINDER

Item	Part no.	Qty.	Description
1	C10861	1	7-pin cylinder and plug assembly†
2	A12350	2	Groove pin
3	B10852	1	Slide cap for 7-pin cylinders
4	See page 4–5	1	Cylinder ring
5	A21068	1	Lock washer
6	A08049	1	Nut
7	A21150	1	Throw plug
8	See page 4–7	1	Cam‡ (C4A shown)
9	A21099	1	Drive pin
10	A21151	1	Cam driver
11	A14045	2	Washer
12	A04845	2	Screw

† Specify keyway when ordering.
‡ See page 5–18 for cam rotations.

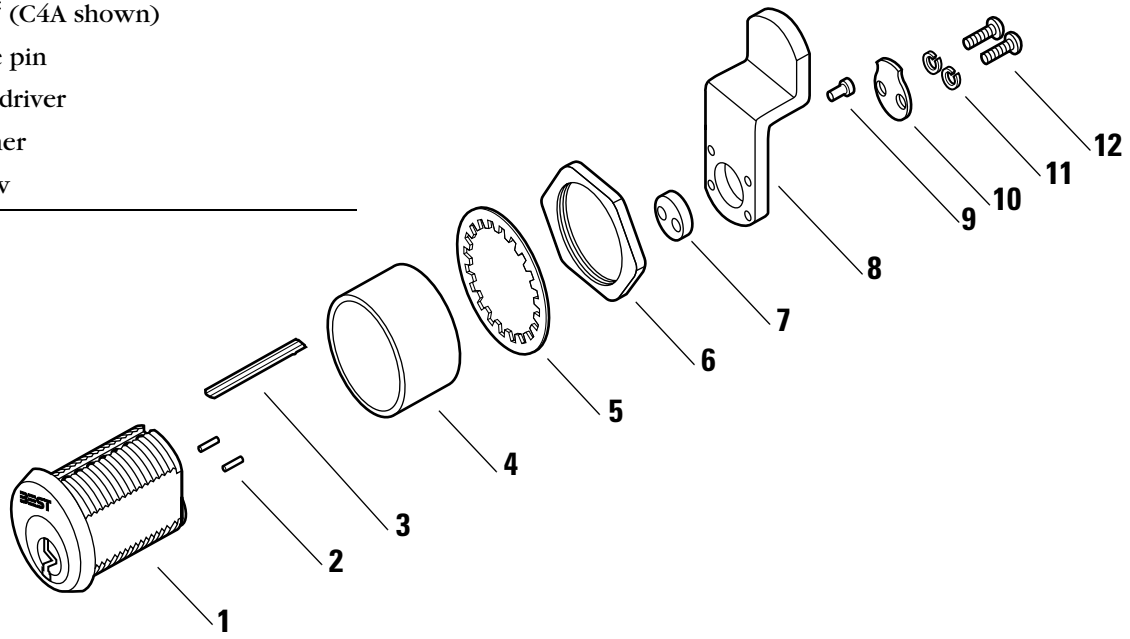


Figure 4.1 5E7 lost motion cabinet cylinder exploded view

LIMITED MOTION CABINET CYLINDER

Item	Part no.	Qty.	Description
1	C10861	1	7-pin cylinder and plug assembly†
2	A12350	2	Groove pin
3	B10852	1	Slide cap for 7-pin cylinders
4	See page 4–5	1	Cylinder ring
5	A21068	1	Lock washer
6	A08049	1	Nut
7a	A21302	1	Stop plate (for 180° rotation) *OR*
7b	A14065	1	Stop plate (for 90° rotation)
8	See page 4–7	1	Cam‡ (C1 shown)
9	A14045	2	Washer
10	A04845	2	Screw

† Specify keyway when ordering.
‡ See page 5–22 for cam rotations.

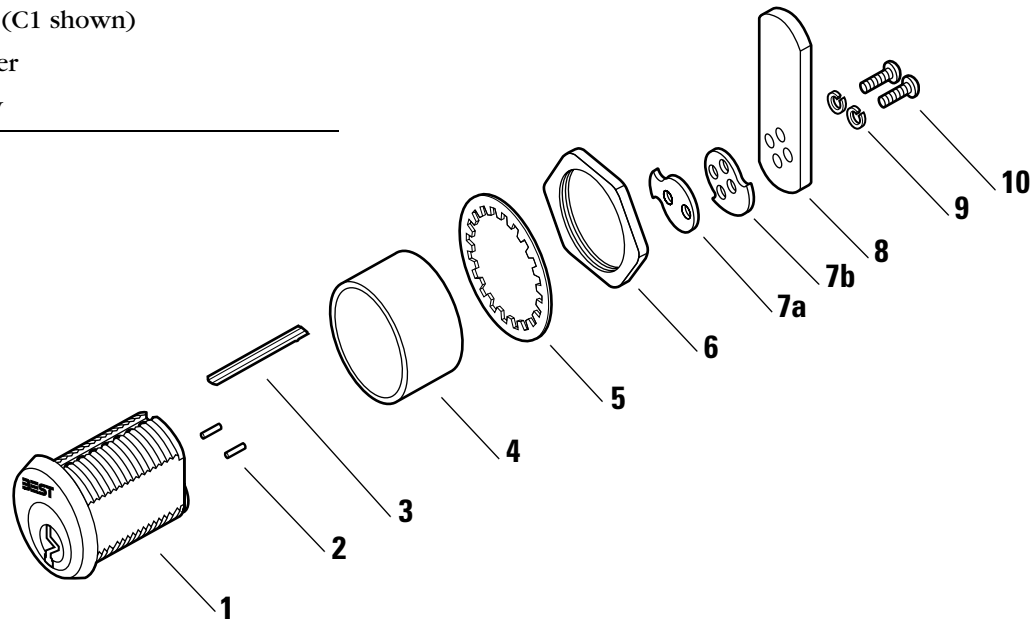


Figure 4.2 5E7 limited motion cabinet cylinder exploded view

TRIM PARTS

Cylinder rings

Determining the ring length for 5E7 cylinders

A cylinder ring is required if there is a gap between the cylinder head and the mounting surface when the cam is positioned for proper lock operation. To determine what length cylinder ring is needed, see Figure 4.3 and perform the following steps:

1. Measure in inches the thickness of the mounting surface. See length "A" in Figure 4.3.
2. Measure in inches the desired distance from the cam to the inside of the mounting surface. See length "B" in Figure 4.3.
3. Add together the measurement for "A" from Step 1 and the measurement for "B" from Step 2.

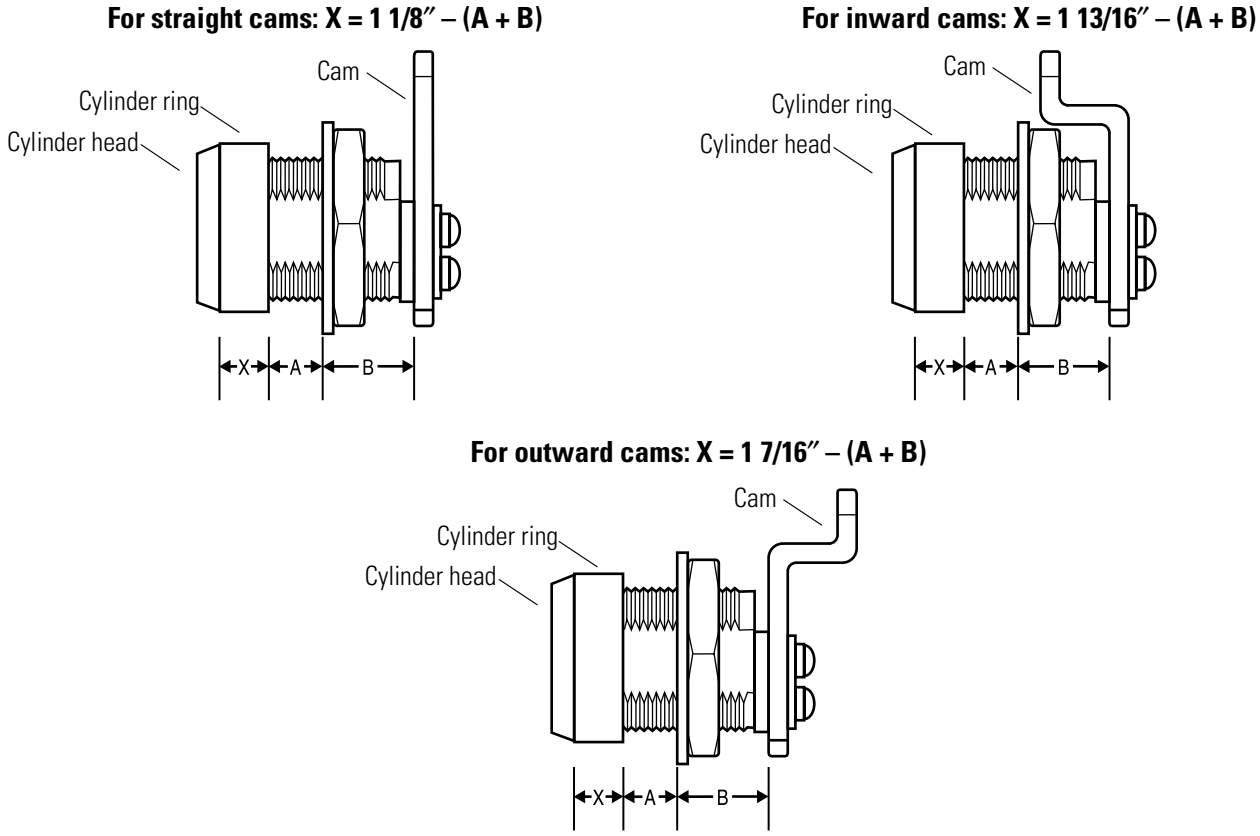


Figure 4.3 Determining the cylinder ring length

4. *For straight cams*, subtract the total in Step 3 from 1 1/8″. The difference is the length of the cylinder ring needed. See straight cam length "X" in Figure 4.3.

   For inward mounted cams, subtract the total in Step 3 from 1 13/16″. The difference is the length of the cylinder ring needed. See inward cam length "X" in Figure 4.3.

For outward mounted cams, subtract the total in Step 3 from 1 7/16″. The difference is the length of the cylinder ring needed. See inward cam length "X" in Figure 4.3.

See the parts table below for available cylinder ring lengths.

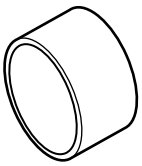


Figure 4.4 Cylinder ring (R708 shown)

Cylinder ring part numbers

Nomen-clature	Part no.	Length
5E-R701	A10253	1/16″
5E-R702	A10250	1/8″
5E-R703	A10260	3/16″
5E-R704	A10257	1/4″
5E-R705	A10265	5/16″
5E-R706	A10263	3/8″
5E-R707	A10266	7/16″
5E-R708	A10258	1/2″
5E-R709	A10269	9/16″
5E-R710	A10256	5/8″
5E-R711	A10268	11/16″
5E-R712	A10267	3/4″

Mounting plates

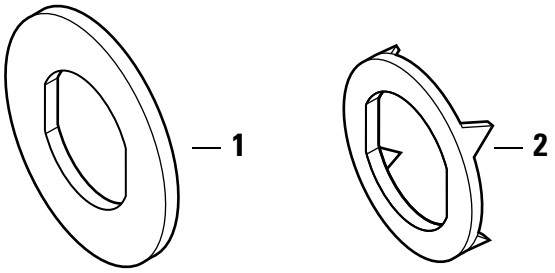


Figure 4.5 Mounting plates

Mounting plates part numbers

Item	Part no.	Qty.	Description
1	A14533	1	Round mounting plate
2	A14534	1	Wood mounting plate

Tools

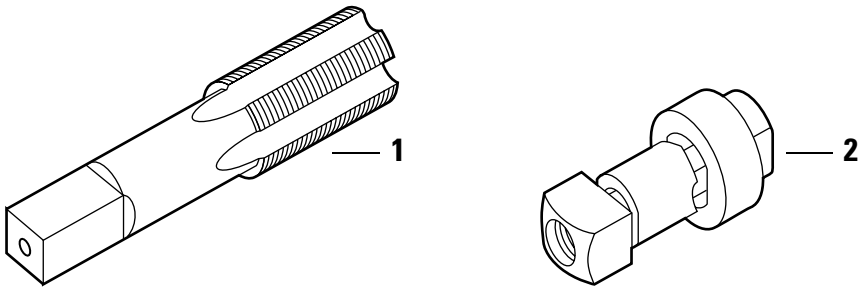


Figure 4.6 Tools

Tools parts list

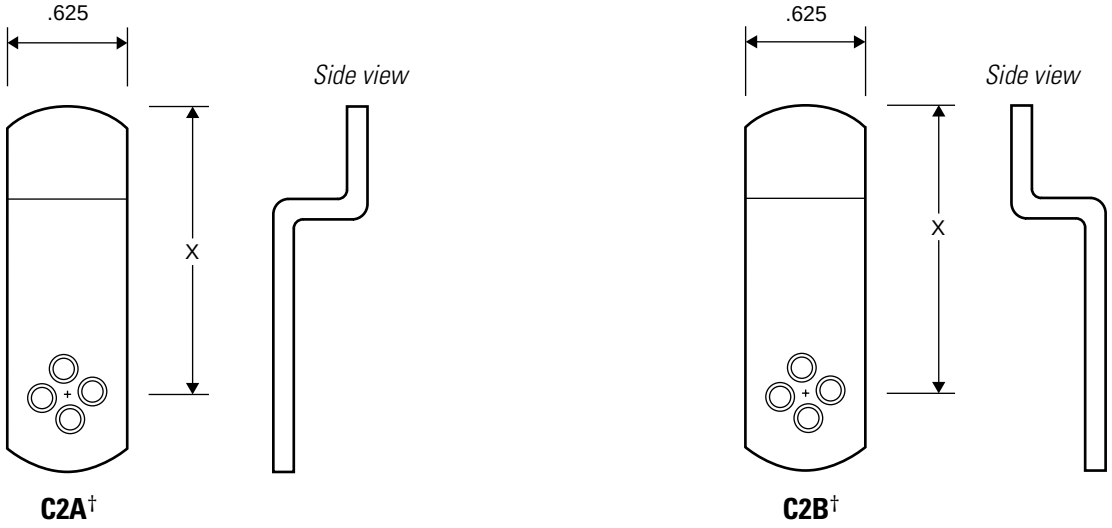
Item	Nomen-clature	Part no.	Qty.	Description	Use
1	5ED253	A14053	1	5E cylinder hole tap	Tool for rethreading case threads
2	5ED254	BT-21071	1	SE-5E 3/4″ metal punch die	Tool for punching cabinet holes for cylinder installation

CAM IDENTIFICATION

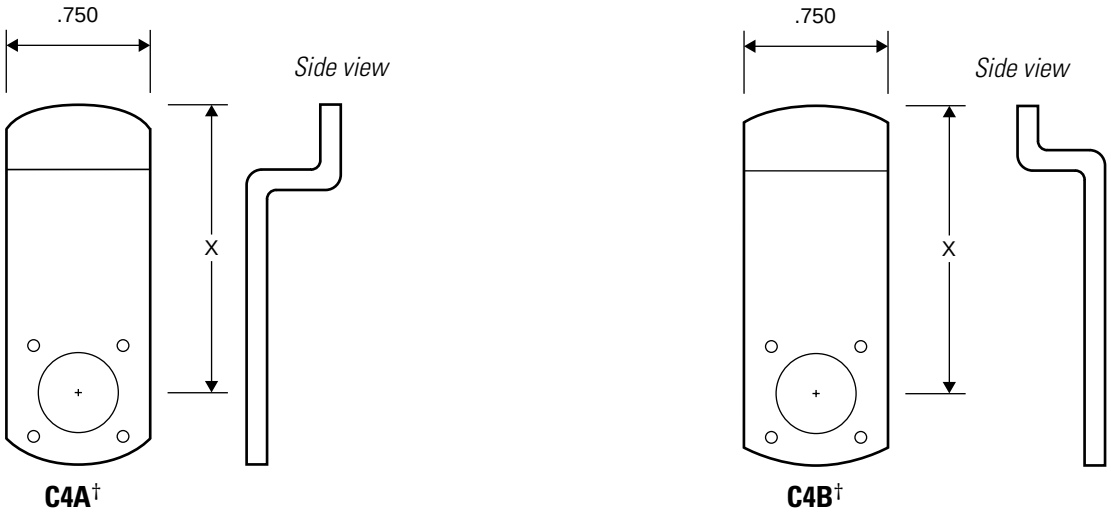
The following section shows common 5E cams and their dimensions in inches. See *Appendix A Cams Table* for a list of E Series cams sorted by part number.

Note: Specify "5E" when ordering cams separately (for example, "5E-C2A").

Note: For 5E cam rotations, see page 5–18.

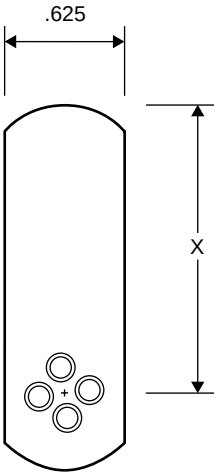


C2A† **C2B**†

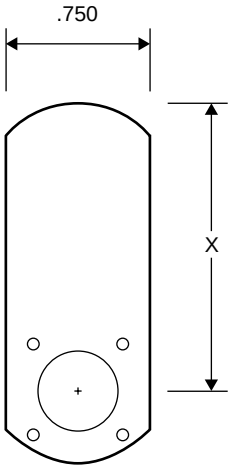


C4A† **C4B**†

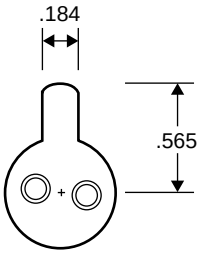
† Specify cam length when ordering. See the BEST Catalog for available cam lengths.



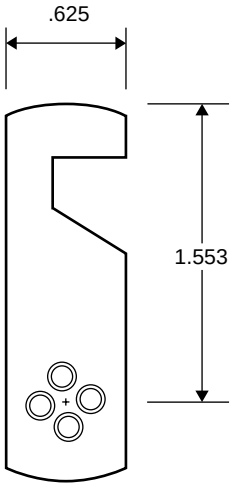
C1†



C3†



A21198



A26344

† Specify cam length "X" when ordering. See the BEST Catalog for available cam lengths.

5 SERVICE AND MAINTENANCE

This chapter contains instructions for replacing components, servicing and maintaining components, and troubleshooting common problems for the 1E Series, 3E Series, and 5E Series cylinders.

To	See page
Replace mortise cylinders	5-2
Replace rings	5-7
Replace riveted cams	5-8
Replace rim cylinders	5-10
Replace spindles	5-12
Replace cabinet cylinders	5-13
View 1E Series cam rotations	5-16
View 5E Series cam rotations	5-18
Troubleshoot problems	5-25

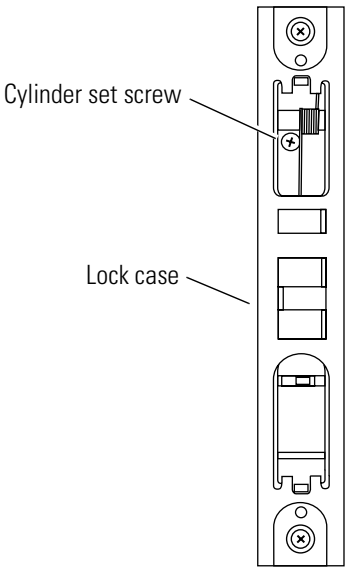
REPLACING PARTS

Replacing the standard mortise cylinder

For information about servicing your BEST mortise lock case, see the *H Series Service Manual* [T61964].

To remove the mortise cylinder:

1. Unscrew the two faceplate screws and remove the faceplate from the lock case.
2. Insert the control key into the core and rotate the key 15 degrees to the right. Remove the core.
3. Loosen the cylinder set screw, found on the inside of the lock case. See Figure 5.1.



View from the edge of the door

Figure 5.1 Location of the cylinder set screw

4. Using a narrow-bladed screwdriver, insert the blade into the figure-8 opening and back the small set screw into the cylinder until the tip of the screw is below the threads of the cylinder.

5. Insert the mortise cylinder wrench into the cylinder unscrew the cylinder from the lock mortise case.
   See Figure 5.2.

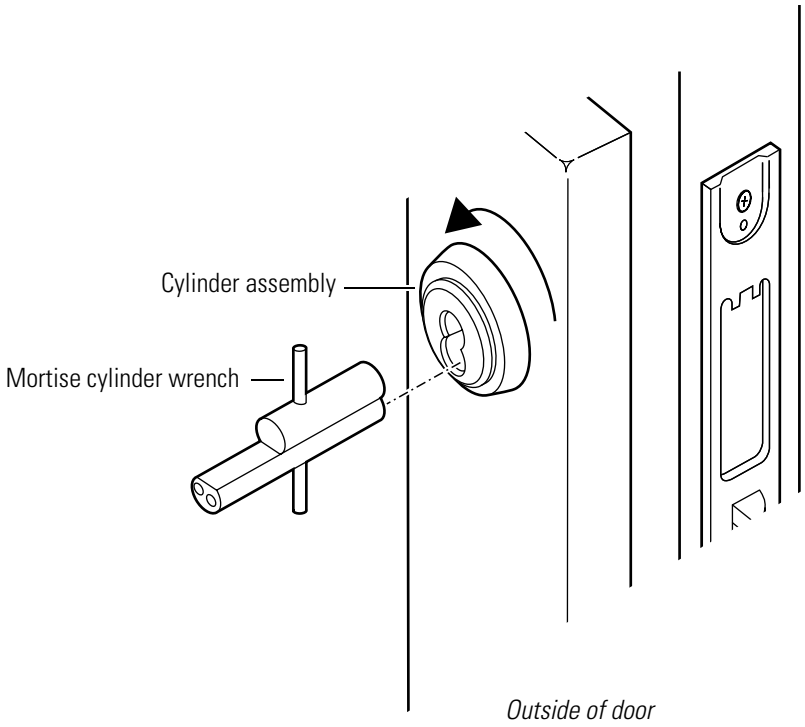


Figure 5.2 Removing the mortise cylinder

6. Slide the cylinder assembly out of the door.
7. If the lock is double-keyed, repeat steps 2 through 6 for the other cylinder.

To reinstall the mortise cylinder:

1. *If installing a new cylinder*:
   a. From the outside of the cylinder, thread the slotted head of the set screw into the cylinder. See Figure 5.3.
   b. Using a narrow-blade screwdriver, insert the blade into the cylinder's figure-8 opening and back the set screw into the cylinder until the tip of the set screw is below the threads of the cylinder.

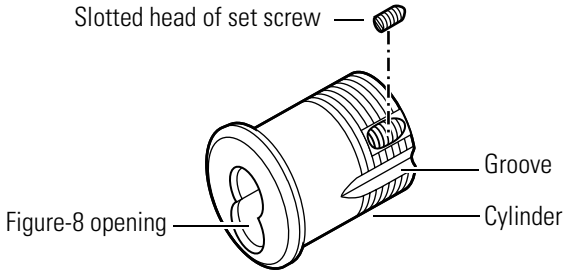


Figure 5.3 Threading the set screw

2. Place the cylinder ring, if used, on the cylinder.
3. From the back end of the cylinder, rotate the cam to the 12 o'clock position. See Figure 5.4.

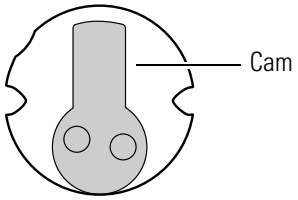


Figure 5.4 Back view of cam in 12 o'clock position

4. With the mortise cylinder wrench inserted into the figure-8 opening, insert the cylinder assembly into the cylinder hole on the outside of the door. See Figure 5.5.

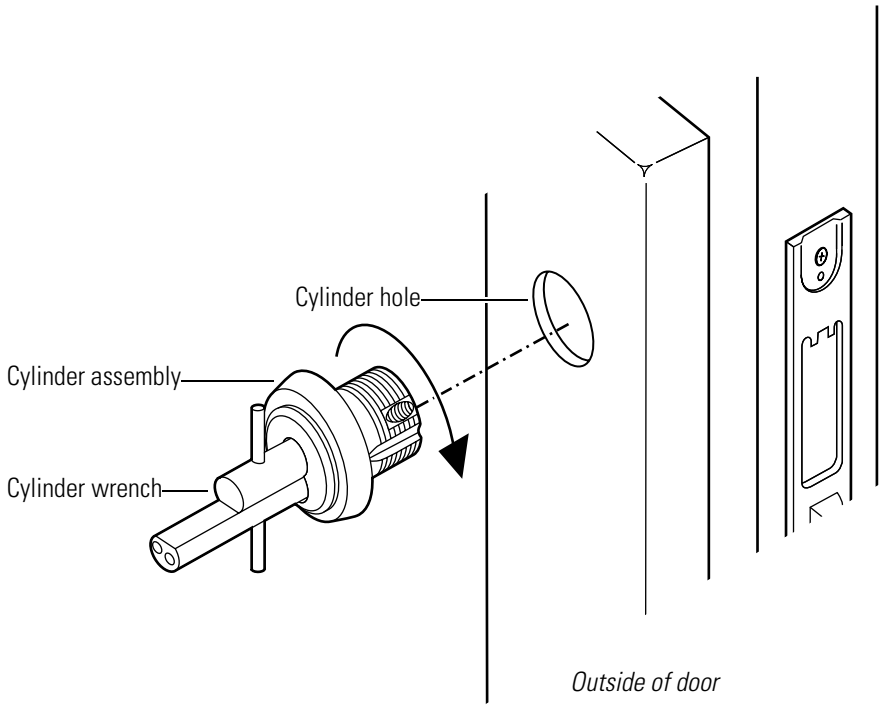


Figure 5.5 Reinstalling the mortise cylinder

5. *For standard cylinders*, screw the cylinder into the lock case until the cylinder ring is flush against the door.

   For concealed cylinders, screw the cylinder into the lock case until the groove around the cylinder head is even with the door surface.

   For high security cylinders, screw the cylinder into the lock case until the cylinder head touches the inside rim of the cylinder ring.

Caution

Be careful not to cross-thread the cylinder during the rotation process to avoid jamming the cylinder in the door.

Do not screw the cylinder in too tightly. Doing so may cause you or someone else to be locked out.

6. Using a narrow-blade screwdriver, insert the blade into the figure-8 opening and tighten the small set screw (installed in the cylinder) into the lock case.

7. Tighten the cylinder set screw, found on the inside of the lock case, into the cylinder groove (see Figure 5.3 for the location of the cylinder groove). See Figure 5.6.

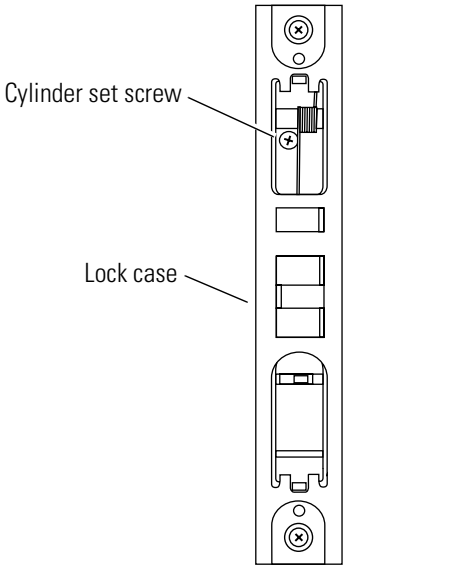


Figure 5.6 Location of the cylinder set screw (view from the edge of the door)

8. Insert the control key and core into the cylinder. Rotate the control key 15 degrees counterclockwise and then remove the key.
9. If the lock is double-keyed, repeat steps 1 through 8 for the other cylinder.
10. Position the faceplate on the lock case and reinstall the two faceplate screws.
11. Lock and unlock the door to be sure the cylinder is properly installed.

Replacing the cylinder ring

To remove the cylinder ring:

1. *For mortise cylinders*, remove the faceplate from the lock case and the cylinder assembly from the door (page 5–2).

   For rim cylinders, remove the cylinder assembly from the door (page 5–10).

   For cabinet cylinders, remove the cylinder assembly from the cabinet door (page 5–13).

2. Slide the cylinder ring off of the cylinder assembly. See Figure 5.7.

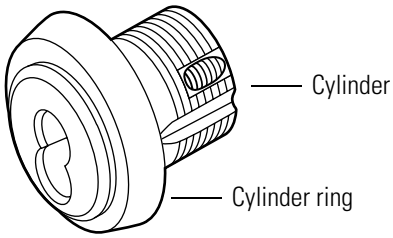


Figure 5.7 Removing the cylinder ring (mortise cylinder shown)

To reinstall the cylinder ring:

1. Select a cylinder ring that will position the cylinder assembly to the correct length in the door.
2. Slide the cylinder ring onto the cylinder assembly. See Figure 5.8.

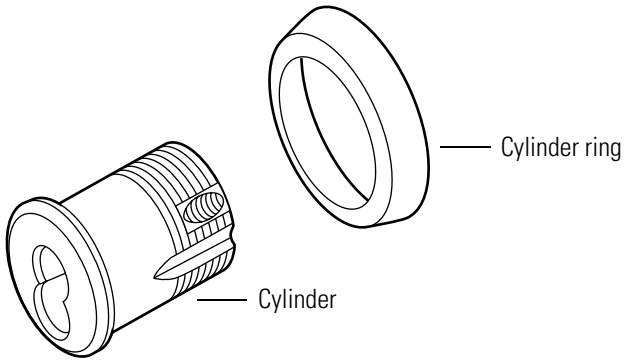


Figure 5.8 Reinstalling the cylinder ring (mortise cylinder shown)

3. *For mortise cylinders*, reinstall the cylinder assembly in the door and the faceplate on the lock case (page 5–4).

   For rim cylinders, reinstall the cylinder assembly in the door (page 5–10).

   For cabinet cylinders, reinstall the cylinder assembly in the cabinet door (page 5–14).

Replacing riveted cams

Before beginning this process, get the following parts:

- two new throw pins
- one new throw plug
- one new stamped head.

Note: For ordering information, see the parts tables starting on page 2–2 or refer to the BEST Catalog.

To the remove the cam:

1. Remove the lock case faceplate, core, and cylinder from the door (page 5–2).
2. Remove the cylinder ring from the cylinder (page 5–7).
3. Place the cylinder face down on a flat cloth-covered surface to avoid scratching the front of the cylinder.
4. Position a standard 3/32″ punch at the center point of one of the two throw pins. See Figure 5.9.

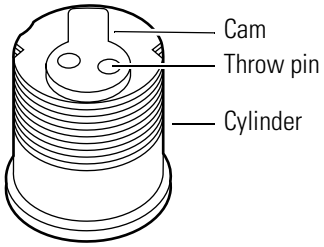


Figure 5.9 Removing the cam

5. Using a ballpeen hammer, hit the punch two or three times to drive the throw pin out of the cam.
6. Repeat steps 4 and 5 to remove the remaining throw pin. Discard the throw pins.
7. Remove the cam.
8. Discard the stamped head and throw plug.

To reinstall the cam:

1. *If installing a new cam*, use the cylinder cam testing tool (page 2–14) to make sure the cam will function properly when installed in the door.
2. Refer to Figure 5.10 and assemble the following parts onto the cam assembly tool:
   - two throw pins
   - throw plug
   - stamped head
   - cylinder.

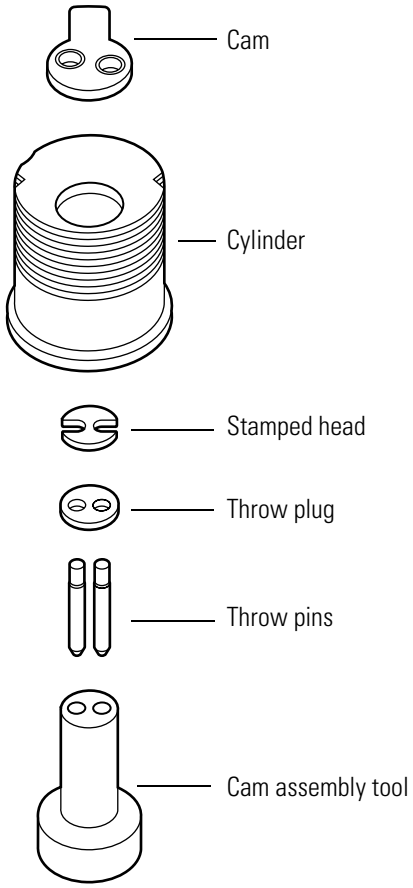


Figure 5.10 Reinstalling the cam

3. Position the cam on the back of the cylinder so that the throw pins go through the two cam holes.
4. Using a ballpeen hammer, hit around the edges of the two throw pins until the ends of the throw pins are level with the surface of the cam.

5. Remove the cam assembly tool.

   Note: If the tool cannot be removed from the cylinder, hold the cylinder in one hand (with the cam in the palm of your hand) and strike the bottom of the cam assembly tool with the ballpeen hammer to loosen the cylinder.

6. Turn the cam clockwise and counterclockwise to make sure it is installed properly.
7. Reinstall the cylinder ring, if present onto the cylinder (page 5–7).
8. Reinstall the cylinder, the core, and the lock case faceplate on the door (page 5–4).

Replacing the rim cylinder

To remove the rim cylinder:

1. Remove the necessary trim components to expose the front and back of the rim cylinder. Contact your BEST Representative for more information.
2. On the inside of the door, remove the two mounting screws and the clamp plate. See Figure 5.11.

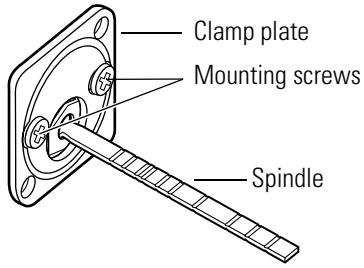


Figure 5.11 Removing the rim cylinder

3. Note the orientation of the spindle and slide the cylinder assembly out from the outside of the door.
4. Insert the control key into the core and rotate the key 15 degrees to the right. Remove the core.

To reinstall the rim cylinder:

1. Make sure that the cylinder ring, if present, is positioned on the cylinder, as shown in Figure 5.12.
2. Orient the cylinder assembly so that the throw pins are on the bottom of the figure-8 opening.
3. Make sure that the spindle is oriented in the position that you noted above.

   Note: Depending on the application, spindles may be installed vertically and horizontally.

4. From the outside of the door, insert the rim cylinder assembly into the cylinder hole.

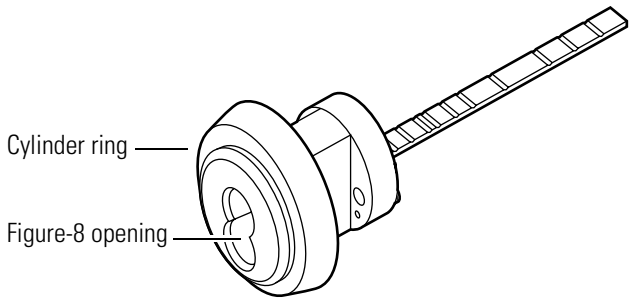


Figure 5.12 Figure-8 opening

5. *If installing a new cylinder:*
   a. Break off the new spindle to match the length of the old spindle.
   b. Break off the new mounting screws to match the length of the old mounting screws.
6. On the inside of the door, orient the cylinder and clamp plate as shown in Figure 5.13.

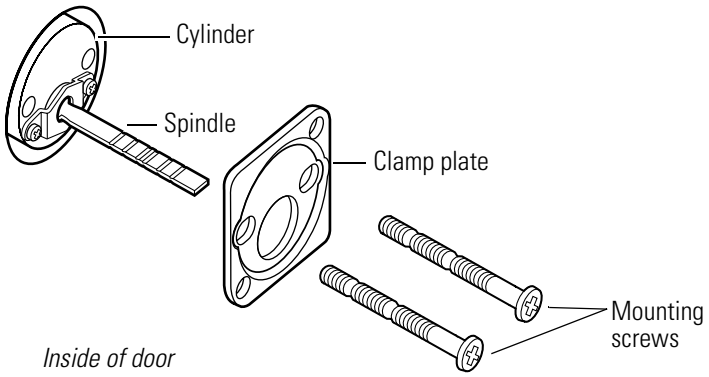


Figure 5.13 Reinstalling the rim cylinder

7. Secure the clamp plate to the cylinder with the mounting screws.
8. Insert the control key and core into the cylinder. Rotate the control key 15 degrees counterclockwise and then remove the key.
9. Reinstall the necessary trim components. Contact your BEST Representative for more information.
10. Lock and unlock the door to be sure the cylinder is installed properly.

Replacing the spindle

To remove the spindle:

1. Remove the cylinder from the door (page 5–10).
2. Note the orientation of the spindle (horizontal or vertical).
3. Using a narrow-blade screwdriver, unscrew the two retainer screws and remove the throw member retainer and spindle. See Figure 5.14.

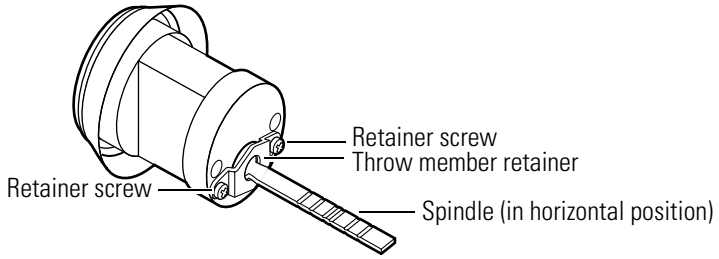


Figure 5.14 Removing the spindle

To reinstall the spindle:

1. Break off the new spindle to match the length of the old spindle.
2. Using the same orientation as the old spindle (horizontal or vertical), align the spindle so that it fits into the throw plug. See Figure 5.15.

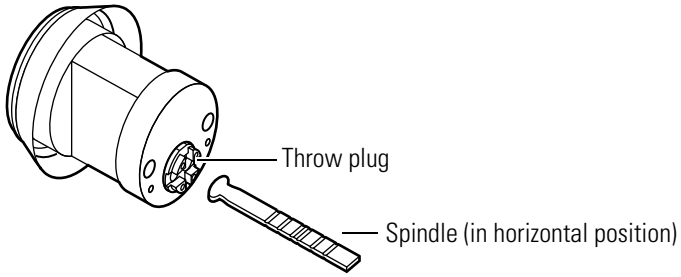


Figure 5.15 Reinstalling the spindle

3. While holding the spindle in place, use a narrow-blade screwdriver to secure the throw member retainer to the back of the cylinder with the two retainer screws. See Figure 5.16.

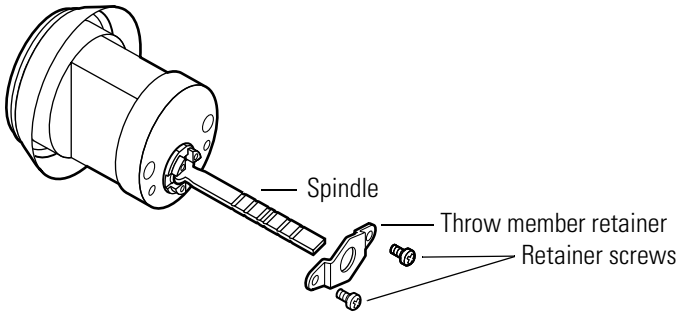


Figure 5.16 Securing the spindle

4. Reinstall the cylinder in the door (see page 5–10).

Replacing cabinet cylinders

To remove the cabinet cylinder:

1. Using an operating key, open the cabinet to expose the back of the cylinder assembly.
2. Using a narrow-blade screwdriver, unscrew the two cam screws located on the back of the cylinder assembly. See Figure 5.17.

   Note: The 1E7E4 cylinder has only one cam screw.

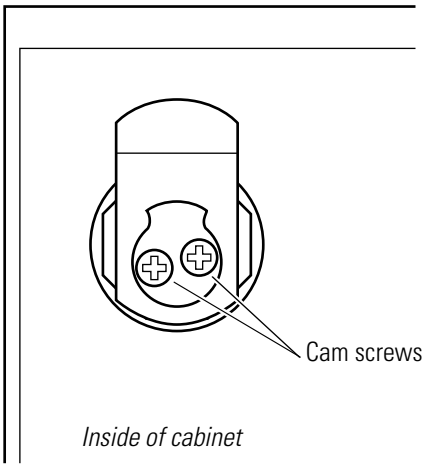


Figure 5.17 Location of cam screws (5E Series cylinder assembly shown)

3. *For the 1E7D4 cylinder*, remove the following parts (see page 2–5 for part numbers and drawings):
   - cam
   - throw plug retainer.

   For the 1E7E4 cylinder, remove the following parts (see page 2–6 for part numbers and drawings):
   - washer
   - cam driver
   - cam with drive pin.

   For 5E Series cylinders, remove the following parts, if present (see page 4–2 and page 4–3 for part numbers and drawings):
   - two washers
   - cam driver
   - stop plate
   - cam
   - plug throw.
4. Unscrew the nut and remove it from the cylinder.
5. Remove the lock washer, if present.
6. Slide the cylinder assembly out from the front of the cabinet door.

To reinstall the cabinet cylinder:

1. Make sure that the cylinder ring is positioned on the cylinder.
2. Insert the cylinder into the front of the cabinet door.
3. While holding the front of the cylinder in place, attach the lock washer, if present, to the back end of the cylinder assembly so that it is flush with the cabinet door.
4. Thread the nut onto the cylinder and tighten it to secure the cylinder in the cabinet door.
5. *For the 1E7D4 cylinder*, reinstall the following parts (see page 2–5 for part numbers and drawings):
   - throw plug retainer
   - cam in the locked position (see page 5–16 for 1E7D4 cam rotations).

   For the 1E7E4 cylinder, reinstall the following parts (see page 2–6 for part numbers and drawings):
   - cam in the locked position (see page 5–17 for 1E7E4 cam rotations).
   - cam driver
   - washer.

   For 5E cylinders, reinstall the following parts, if present (see page 4–2 and page 4–3 for part numbers and drawings):
   - plug throw
   - cam in the locked position (see page 5–18 for 5E cam rotations).
   - cam driver
   - stop plate
   - two washers.

6. Secure the two cam screws to the back of the cylinder assembly. See Figure 5.18.

   Note: 1E7E4 cylinders have only one cam screw.

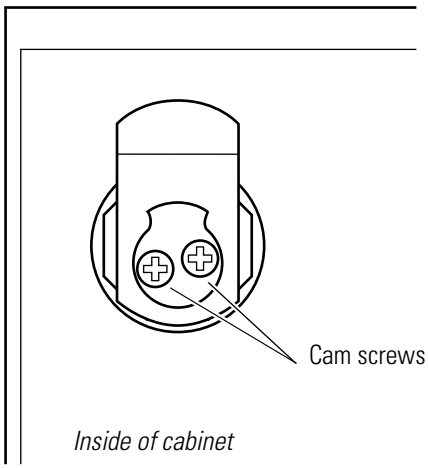


Figure 5.18 Reinstalling the cabinet cylinder (5E Series cylinder assembly shown)

7. Lock and unlock the cabinet to make sure the cylinder is installed properly.

CAM ROTATIONS FOR 1E SERIES CYLINDERS

Direct motion cabinet cylinders

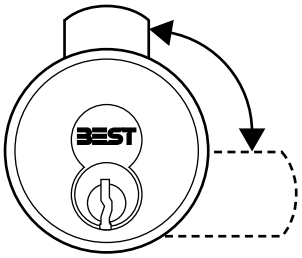
This section shows the cam rotation options for 1E7D4 direct motion cabinet cylinders.

Note: The following cam rotations only apply to cylinders with cores installed in the orientation shown.

For direct motion cylinders, the key and cam rotation is direct and both rotate 360°. The key can be removed in the locked position only. The figures below indicate the direction of the cam rotation and the locked position.

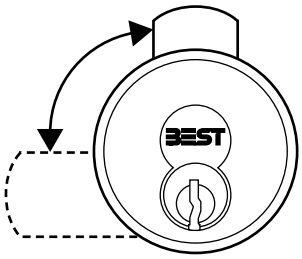
Note: See page 2–20 for common cabinet cams.

1E7D4 LH 12



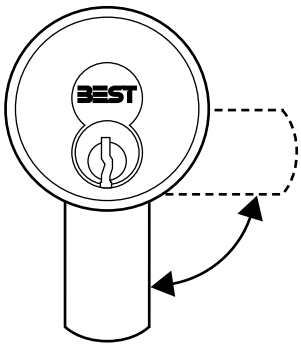
- For upward locking applications
- Cam locks in the 12 o'clock position

1E7D4 RH 12



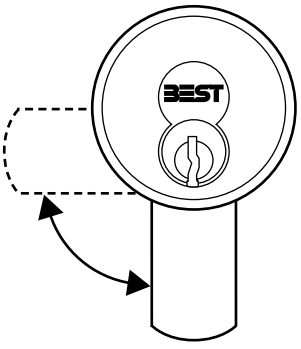
- For upward locking applications
- Cam locks in the 12 o'clock position

1E7D4 LH 6



- For downward locking applications
- Cam locks in the 6 o'clock position

1E7D4 RH 6



- For downward locking applications
- Cam locks in the 6 o'clock position

Lost motion cabinet cylinders

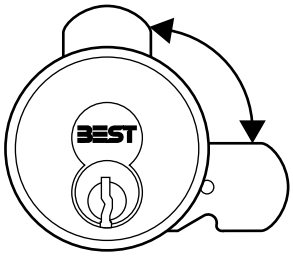
This section shows the cam rotation options for 1E7E4 lost motion cabinet cylinders.

Note: The following cam rotations only apply to cylinders with cores installed in the orientation shown.

For lost motion cylinders, the cam rotates 90° and the key rotates 360°. The key can be removed with the cam in the locked or unlocked position. The figures below indicate the direction and range of cam rotation, as well as the locked positions.

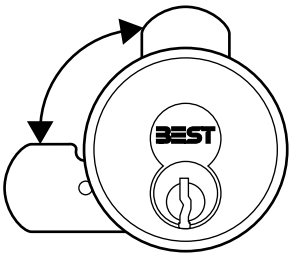
Note: See page 2–20 for common cabinet cam options.

1E7E4 LH 12 or 3



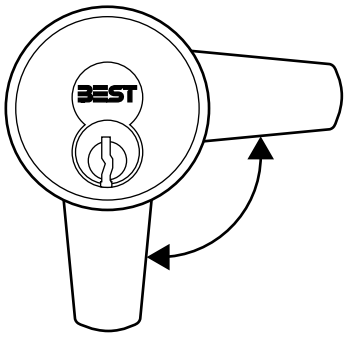
- For upward locking applications
- Cam locks in the 12 o'clock or 3 o'clock position

1E7E4 RH 12 or 9



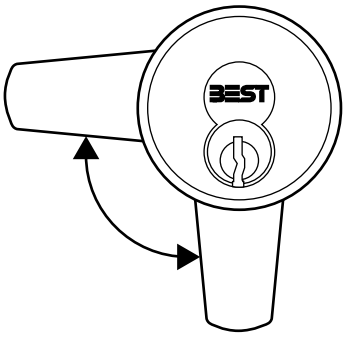
- For upward locking applications
- Cam locks in the 12 o'clock or 9 o'clock position

1E7E4 LH 3 or 6



- For downward locking applications
- Cam locks in the 3 o'clock or 6 o'clock position

1E7E4 RH 6 or 9



- For downward locking applications
- Cam locks in the 6 o'clock or 9 o'clock position

CAM ROTATIONS FOR 5E SERIES CYLINDERS

The following section contains cam rotation options for 5E Series 7-pin cylinders. 5E Series cylinders are categorized by cam motion type. The table below shows the cam motion types described in this section.

Type	Motion	Height of groove pins are:	Cam rotation	Key rotation	Key can be removed when cam is in:
B	Limited	Above the throw plug. See Figure 5.19.	90° or 180°	90° or 180°	Locked position
C	Lost	Level with the throw plug. See Figure 5.20.	90°	360°	Locked or unlocked position

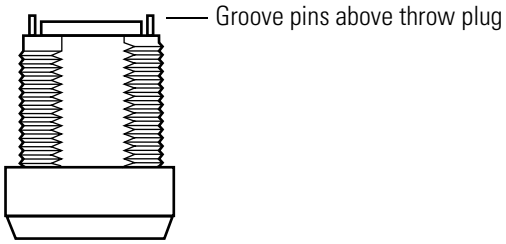


Figure 5.19 Groove pins installed for limited motion rotations

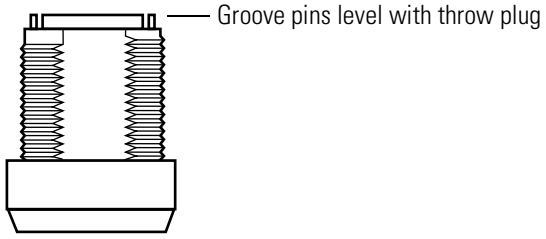
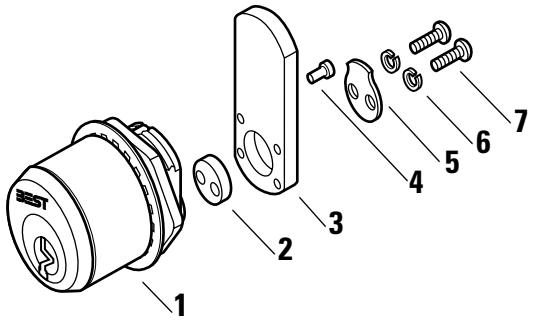


Figure 5.20 Groove pins installed for lost motion rotations

LOST MOTION C3 CAM ROTATION

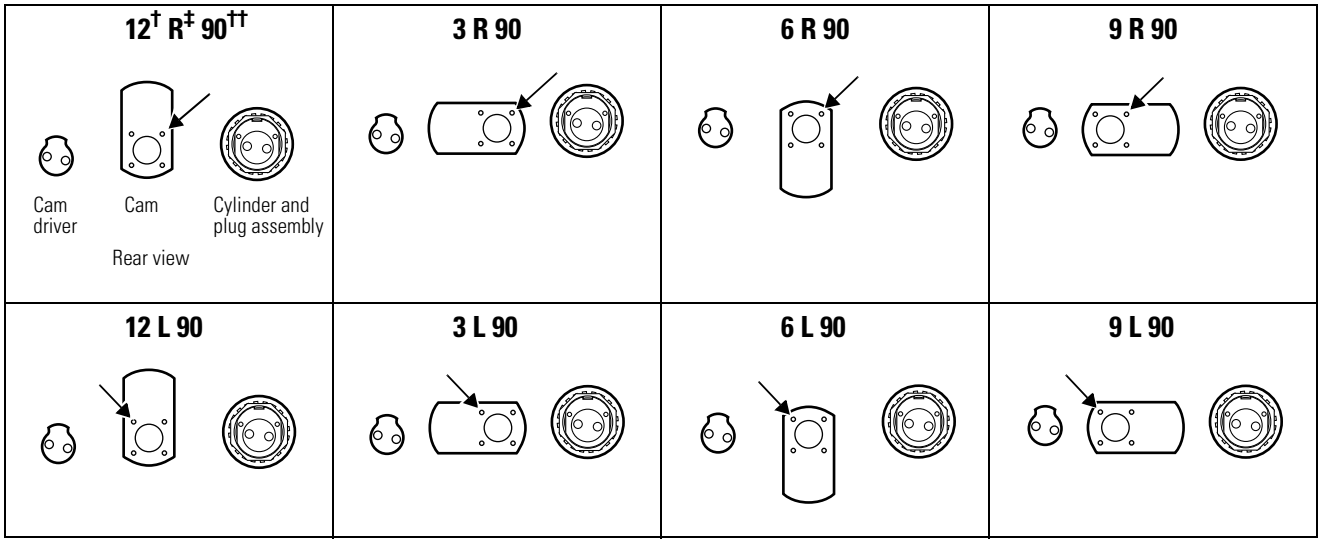


Item	Part No.	Qty.	Description
1	C10861	1	Cylinder and plug assembly†
2	A21150	1	Throw plug
3	A21124	1	Cam
4	A21099	1	Drive pin
5	A21151	1	Cam driver
6	A14045	2	Washer
7	A04845	2	Screw

† Shown with cylinder ring, washer, and nut.

Figure 5.21 5E Series lost motion C3 cam rotation

The C3 cam is a straight cam mounted for lost motion operation. The diagrams below show rotation assemblies for the C3 cam. The arrow in each diagram indicates where the drive pin should be inserted into the cam. When assembling the cylinder, orient the cam driver and cam in the position shown.

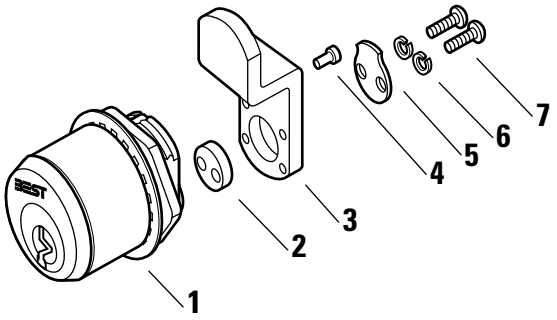


† Indicates the locked cam mounting position as seen from the front of the cylinder (for example, 12 = 12 o'clock position).

‡ Indicates the direction of cam rotation as seen from the front of the cylinder (L = left, R = right).

†† Indicates the degree of cam rotation (90 = 90°, 180 = 180°).

LOST MOTION C4A CAM ROTATION

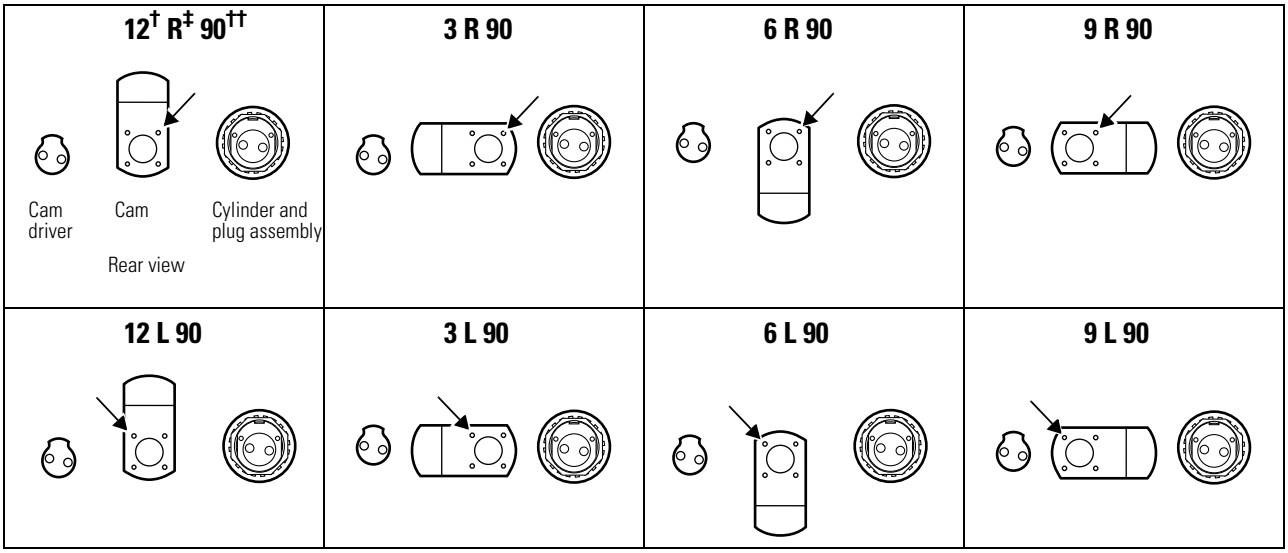


Item	Part No.	Qty.	Description
1	C10861	1	Cylinder and plug assembly†
2	A21150	1	Plug throw
3	A13909	1	Cam
4	A21099	1	Drive pin
5	A21151	1	Cam driver
6	A14045	2	Washer
7	A04845	2	Screw

† Shown with cylinder ring, washer, and nut.

Figure 5.22 5E Series lost motion 4A cam rotation

The 4A cam is an offset cam (inward mount) for lost motion operation. The diagrams below show rotation assemblies for the 4A cam. The arrow in each diagram indicates where the drive pin should be inserted into the cam. When assembling the cylinder, orient the cam driver and cam in the position shown.

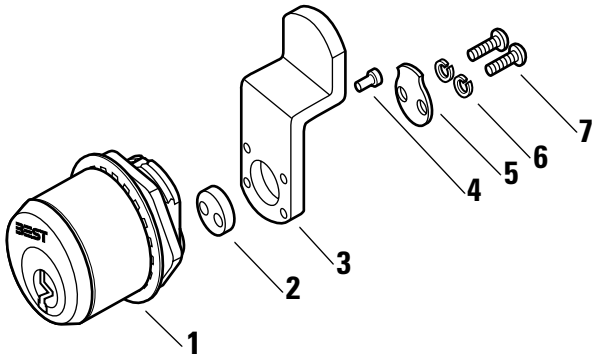


† Indicates the locked cam mounting position as seen from the front of the cylinder (for example, 12 = 12 o'clock position).

‡ Indicates the direction of cam rotation as seen from the front of the cylinder (L = left, R = right).

†† Indicates the degree of cam rotation (90 = 90°, 180 = 180°).

LOST MOTION C4B CAM ROTATION

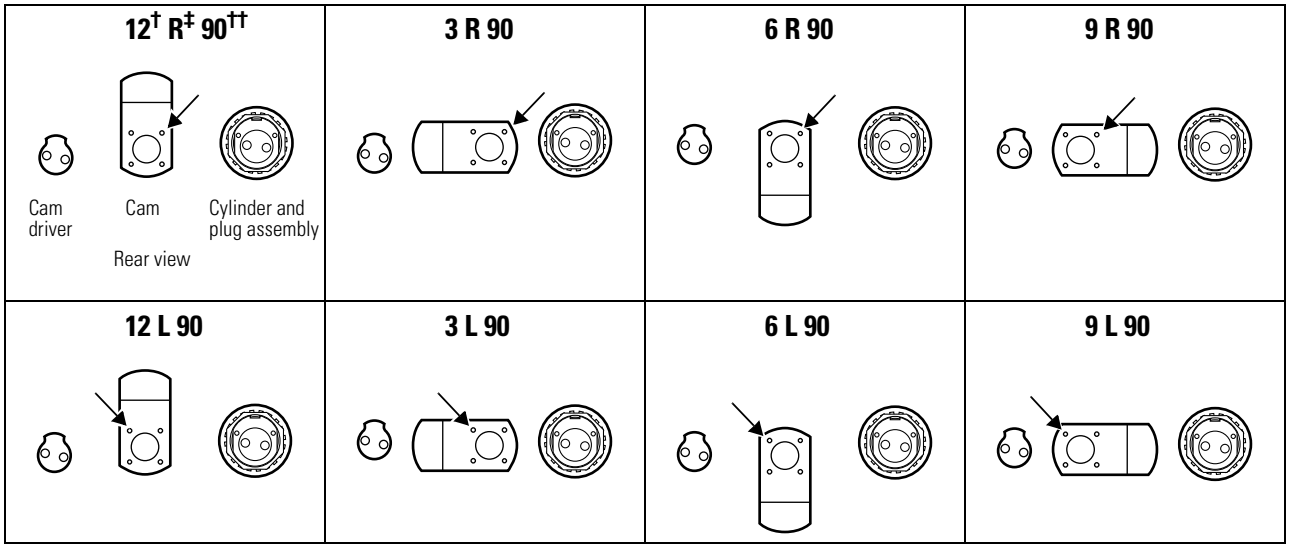


Item	Part No.	Qty.	Description
1	C10861	1	Cylinder and plug assembly†
2	A21150	1	Plug throw
3	A21125	1	Cam
4	A21099	1	Drive pin
5	A21151	1	Cam driver
6	A14045	2	#4 lock washer
7	A04845	2	Screw

† Shown with cylinder ring, washer, and nut.

Figure 5.23 5E Series lost motion 4B cam rotation

The 4B cam is an offset cam (outward mount) for lost motion operation. The diagrams below show rotation assemblies for the 4B cam. The arrow in each diagram indicates where the drive pin should be inserted into the cam. When assembling the cylinder, orient the cam driver and cam in the position shown.

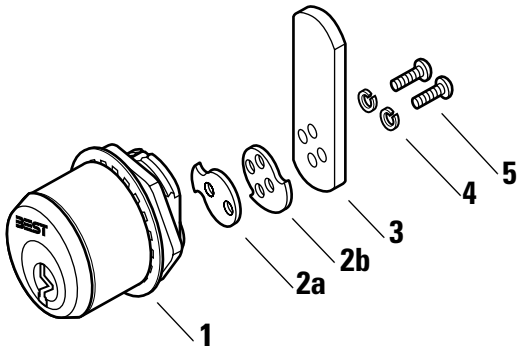


† Indicates the locked cam mounting position as seen from the front of the cylinder (for example, 12 = 12 o'clock position).

‡ Indicates the direction of cam rotation as seen from the front of the cylinder (L = left, R = right).

†† Indicates the degree of cam rotation (90 = 90°, 180 = 180°).

LIMITED MOTION C1 CAM ROTATION

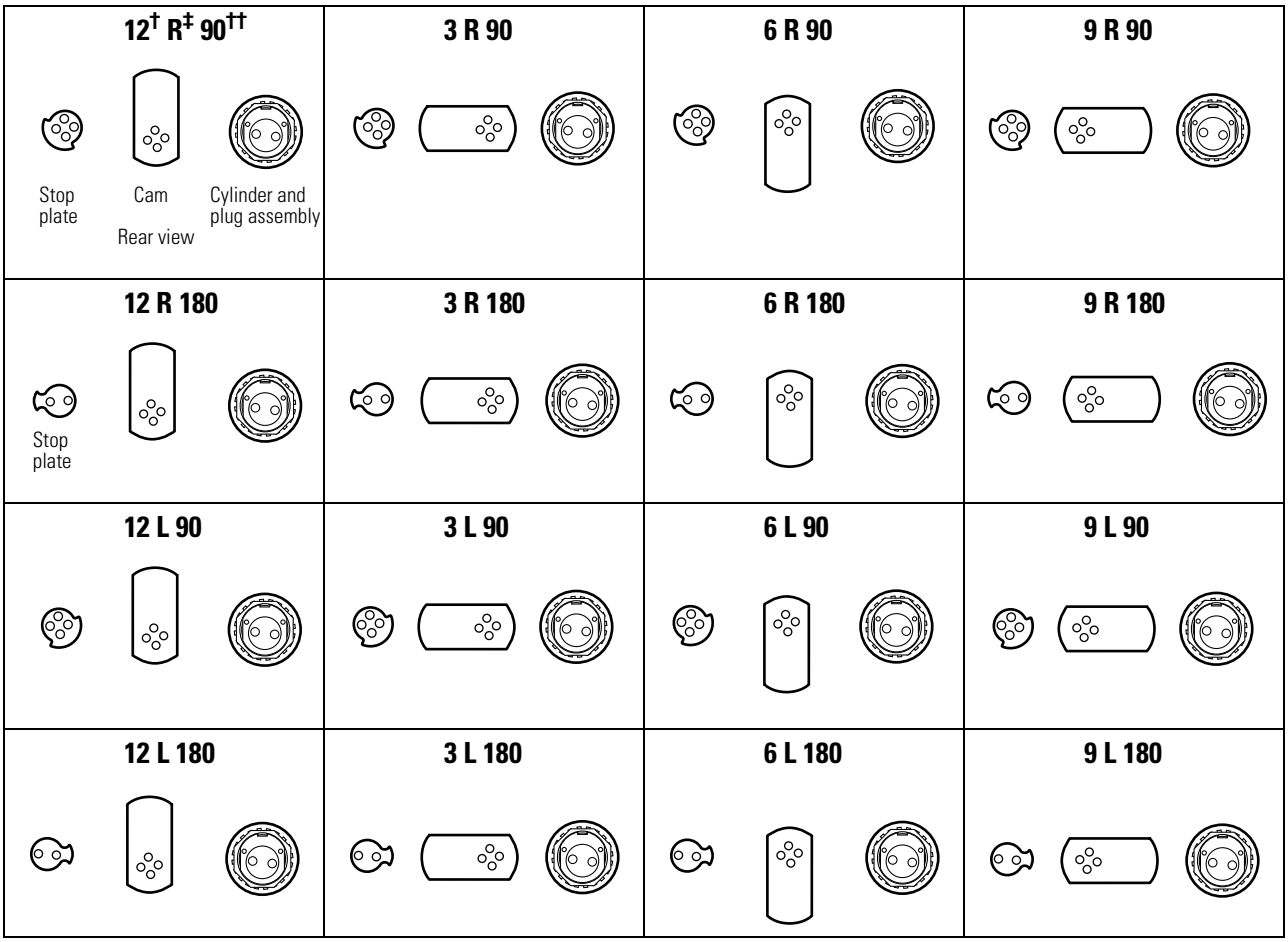


Item	Part No.	Qty.	Description
1	C10861	1	Cylinder and plug assembly†
2a	A21302	1	180° rotation stop plate
2b	A14065	1	90° rotation stop plate
3	A10281	1	Cam
4	A09930	2	Washer
5	A09929	2	Screw

† Shown with cylinder ring, washer, and nut.

Figure 5.24 5E Series limited motion C1 cam rotation

The C1 cam is a straight cam mounted for fixed motion operation. The diagrams below show rotation assemblies for the C1 cam. Use the diagrams below to determine the orientation of the stop plate and cam.

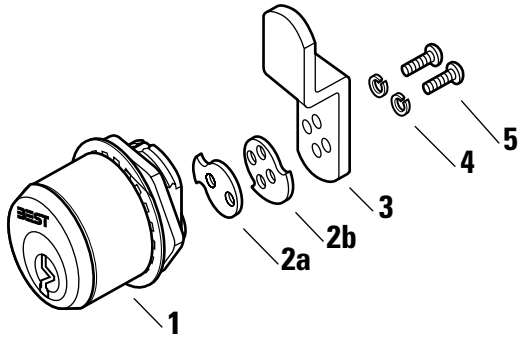


† Indicates the locked cam mounting position as seen from the front of the cylinder (for example, 12 = 12 o'clock position).

‡ Indicates the direction of cam rotation as seen from the front of the cylinder (L = left, R = right).

†† Indicates the degree of cam rotation (90 = 90°, 180 = 180°).

LIMITED MOTION C2A CAM ROTATION

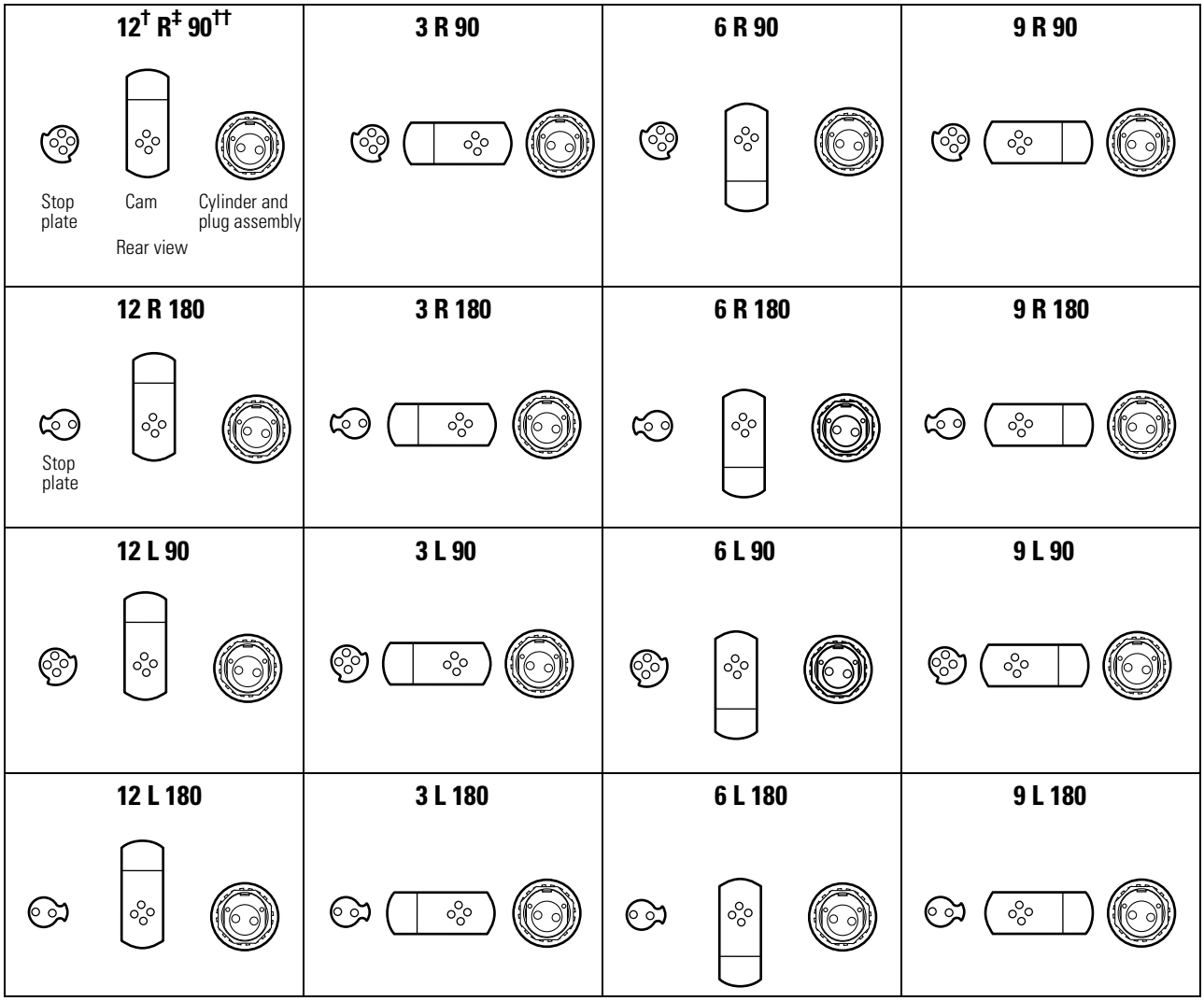


Item	Part No.	Qty.	Description
1	C10861	1	Cylinder and plug assembly†
2a	A21302	1	180° rotation stop plate
2b	A14065	1	90° rotation stop plate
3	A14050	1	Cam
4	A09930	2	Washer
5	A09929	2	Screw

† Shown with cylinder ring, washer, and nut.

Figure 5.25 5E Series limited motion C2A cam rotation

The C2A cam is an offset cam (inward mount) for fixed motion operation. The diagrams below show rotation assemblies for the 2A cam. Use the diagrams below to determine the orientation of the stop plate and cam.

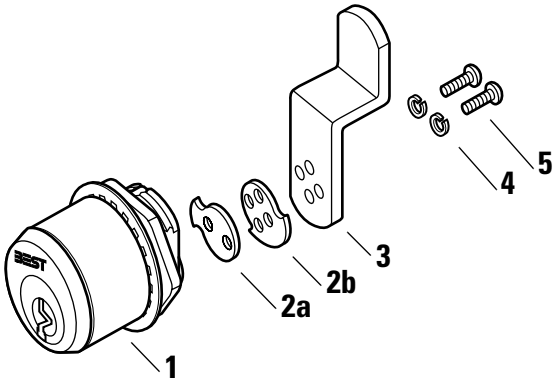


† Indicates the locked cam mounting position as seen from the front of the cylinder (for example, 12 = 12 o'clock position).

‡ Indicates the direction of cam rotation as seen from the front of the cylinder (L = left, R = right).

†† Indicates the degree of cam rotation (90 = 90°, 180 = 180°).

LIMITED MOTION C2B CAM ROTATION

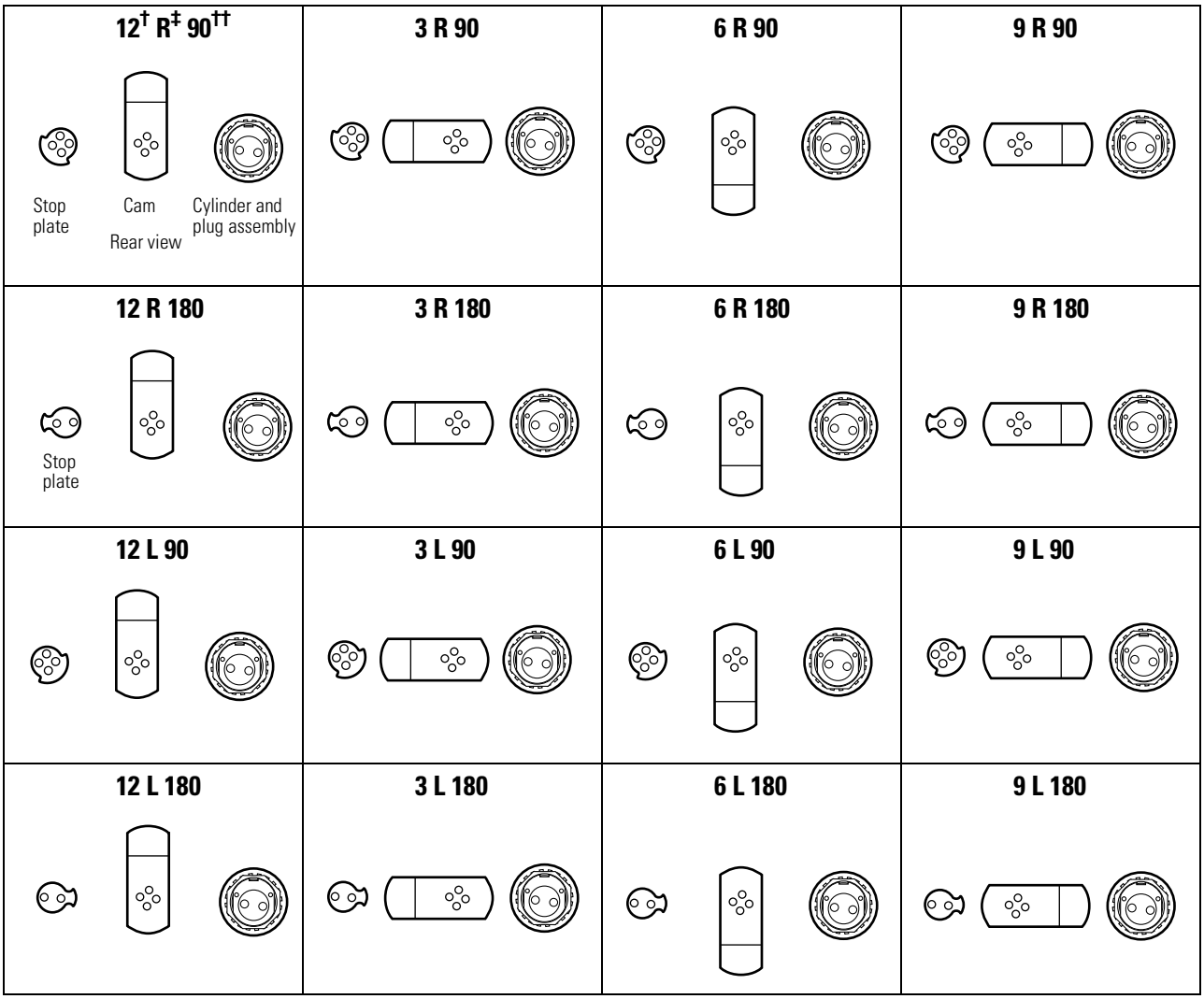


Item	Part No.	Qty.	Description
1	C10861	1	Cylinder and plug assembly†
2a	A21302	1	180° rotation stop plate
2b	A14065	1	90° rotation stop plate
3	A14051	1	Cam
4	A09930	2	Washer
5	A09929	2	Screw

† Shown with cylinder ring, washer, and nut.

Figure 5.26 5E Series limited motion C2B cam rotation

The C2B cam is an offset cam (outward mount) for fixed motion operation. The diagrams below show rotation assemblies for the 2B cam. Use the diagrams below to determine the orientation of the stop plate and cam.



† Indicates the locked cam mounting position as seen from the front of the cylinder (for example, 12 = 12 o'clock position).

‡ Indicates the direction of cam rotation as seen from the front of the cylinder (L = left, R = right).

†† Indicates the degree of cam rotation (90 = 90°, 180 = 180°).

TROUBLESHOOTING

The table summarizes the possible causes for certain cylinder problems. The causes of failure are listed in the order of likelihood. (The most like cause is first, and so forth.)

For problems with the core and key, such as difficulty removing or inserting the key or difficulty turning the key, see the *Core and Key Service Manual* [T35527].

For problems with the BEST mortise lock case, see the *H Series Service Manual* [T61964].

You notice...	Possible causes include...	You should...
Cannot remove the core from the cylinder.	Set screw is installed with the slotted head toward the outside of the cylinder, securing the core in the cylinder.	Remove the mortise case faceplate (pg. 5-2). Using a narrow-bladed screwdriver, loosen the set screw so that the core can be removed from the cylinder. **Note:** To use the set screw to secure the cylinder to the mortise case, reverse the position of the set screw in the cylinder (pg. 5-4).
Cannot insert the core into the cylinder.	a. Set screw is installed too far down in the cylinder.	a. Remove the mortise case faceplate (pg. 5-2) and use a screwdriver to adjust the position of the set screw (pg. 5-4).
	b. Throw pins are not horizontally aligned.	b. Adjust the two throw pins so they are aligned with the two core holes.
	c. A 7-pin core is being inserted into a 7-pin cylinder that has a 6-pin spacer installed.	c. Remove the spacer from the cylinder.
Cannot turn key easily in the core.	a. Cam is riveted too tightly onto the cylinder.	a. Place the cylinder on the cam assembly tool and strike the cam once or twice with a ballpeen hammer to loosen it. Repeat if necessary.
	b. Cylinder ring is too deep or too shallow for the cylinder being used.	b. Replace the old ring with a ring of appropriate size.
	c. Wrong cam is being used for the lock application.	c. Replace the old cam with the cam appropriate for the lock application.

A E SERIES CAMS TABLE

The following table lists E Series cams according to their part numbers.

Note: Cylinders 2 inches or longer require a thumbturn cam.

E SERIES CAMS

Part no.	Cam	Series	Description
A00117	C101	1E	Straight
A00490	C102	1E	Two-point
A00533	C103	1E	Straight
A00683	C110	1E	Straight
A00921	C114	1E	Two-point
A00967	C115	1E	Straight
A00995	C118	1E, 3E	Cloverleaf
A01172	C121	1E	Straight
A01225	C123	1E	Straight
A01231	C124	1E	Straight
A01247	C127	1E, 3E	Straight
A01248	C128	1E	Straight
A01249	C129	1E	Straight
A01400	C130	1E	Straight
A01401	C131	1E	Straight
A01414	C134	1E	Straight
A01416	C136	1E, 3E	Straight
A01417	C137	1E	Straight
A01449	C140	1E	Thumbturn
A01475	C142	1E	Roller
A01487	C143	1E	Straight
A01707	C148	1E	Straight
A01799	C152	1E	Straight
A02532	C253	1E	Cabinet
A02534	C235	1E	Cabinet
A02770	C161	1E, 3E	Cloverleaf
A04284	C221	1E	Roller
A04387	C162	1E	Straight
A04399	C165	1E	Straight
A04445	C169	1E	Straight

Part no.	Cam	Series	Description
A04492	C171	1E	Straight
A04533	NA	1E, 3E	Roller
A04607	NA	1E	Cabinet
A04737	C254	1E	Cloverleaf
A05397	C177	1E	Straight
A05466	C178	1E	Straight
A05979	C181	1E	Straight
A05989	C182	1E	Straight
A06060	C185	1E	Straight
A06190	C186	1E	Straight
A06246	C187	1E	Straight
A06419	C191	1E	Straight
A06421	C238	1E	Cabinet
A07190	C193	1E	Straight
A07212	C239	1E	Straight
A07221	C240	1E	Roller
A07543	C199	1E	Cabinet
A07605	C200	1E	Straight
A07747	C203	1E	Straight
A07880	C204	1E	Cloverleaf
A07990	C229	1E	Cabinet
A08095	C224	1E	Cabinet
A08778	C228	1E	Cabinet
A08854	NA	1E	Cabinet
A09225	C241	1E	Cabinet
A09229	C223	1E	Straight
A09230	C243	1E	Cloverleaf
A09359	C233	1E	Straight
A09419	C245	5E	Cabinet
A09881	C246	1E	Cabinet
A10281	NA	5E	Cabinet
A10500	C401	1E	Thumbturn

Part no.	Cam	Series	Description
A10501	C402	1E	Thumbturn
A10502	C403	1E	Thumbturn
A10503	C404	1E	Thumbturn
A10504	C405	1E	Thumbturn
A10505	C406	1E	Thumbturn
A10506	C407	1E	Thumbturn
A10507	C408	1E	Thumbturn
A10508	C409	1E	Thumbturn
A10509	C410	1E	Thumbturn
A10510	C411	1E	Thumbturn
A10511	C412	1E	Thumbturn
A10512	C413	1E	Thumbturn
A10513	C414	1E	Thumbturn
A10514	C415	1E	Thumbturn
A10515	C416	1E	Thumbturn
A10516	C417	1E	Thumbturn
A10517	C418	1E	Thumbturn
A10518	C419	1E	Thumbturn
A10519	C420	1E	Thumbturn
A10520	C421	1E	Thumbturn
A10521	C422	1E	Thumbturn
A10522	C423	1E	Thumbturn
A10523	C424	1E	Thumbturn
A10524	C425	1E	Thumbturn
A10525	C426	1E	Thumbturn
A10526	C427	1E	Thumbturn
A10527	C428	1E	Thumbturn
A10528	C429	1E	Thumbturn
A10529	C430	1E	Thumbturn
A10530	C431	1E	Thumbturn
A10531	C432	1E	Thumbturn
A10532	C433	1E	Thumbturn

Part no.	Cam	Series	Description
A10533	C434	1E	Thumbturn
A10534	C435	1E	Thumbturn
A10535	C436	1E	Thumbturn
A10536	C437	1E	Thumbturn
A10537	C438	1E	Thumbturn
A10538	C439	1E	Thumbturn
A10539	C440	1E	Thumbturn
A10540	C441	1E	Thumbturn
A10541	C442	1E	Thumbturn
A10542	C443	1E	Thumbturn
A10543	C444	1E	Thumbturn
A10544	C445	1E	Thumbturn
A10545	C446	1E	Thumbturn
A10546	C447	1E	Thumbturn
A10547	C448	1E	Thumbturn
A10548	C449	1E	Thumbturn
A10549	C450	1E	Thumbturn
A13909	C4A	5E	Cabinet
A14050	C2A	5E	Cabinet
A14051	C2B	5E	Cabinet
A14154	NA	1E	Cabinet
A14333	C220	1E	Straight
A14472	C210	1E, 3E	Straight
A14520	C208	1E, 3E	Straight
A14521	C209	1E	Straight
A15981	C211	1E	Straight
A17744	C226	1E	Straight
A19851	C247	1E	Straight
A20010	C248	1E	Cabinet
A20023	C249	1E	Cabinet
A20069	C250	1E	Cabinet
A20128	C227	1E	Roller

Part no.	Cam	Series	Description
A20332	C251	1E	Roller
A20421	C225	1E	Cabinet
A20474	C252	1E	Straight
A20877	C222	1E	Cloverleaf
A20931	C231	1E	Straight
A20942	C242	1E	Straight
A21124	C3	5E	Cabinet
A21125	4B	5E	Cabinet
A21198	NA	5E	Cabinet
A23770	C256	1E	Cloverleaf
A26344	NA	5E	Cabinet
A40088	C234	1E	Straight
A40091	C4	1E, 3E	Straight
A40092	C3	3E	Straight
A63060	C500	1E	Cabinet
A63061	C501	1E	Cabinet
A63062	C502	1E	Cabinet
A63063	C503	1E	Cabinet
A63064	C504	1E	Cabinet
A63065	C505	1E	Cabinet
A63066	C506	1E	Cabinet
A63067	C507	1E	Cabinet
A63068	C508	1E	Cabinet
A63069	C509	1E	Cabinet
B04796	C173	1E	Straight
B05467	C179	1E	Straight
B34077	C258	1E	Cloverleaf
B34562	C281	1E	Cloverleaf
B39256	C265	1E	Cloverleaf

B

THUMBTURN CAM CONVERSION TABLE

The following pages list standard cams with part numbers and their equivalent counter-sunk thumbturn cams with part numbers.

Note: Cylinders 2 inches or longer require a thumbturn cam.

THUMBTURN CAM CONVERSION TABLE

The following table lists standard cams with part numbers and their equivalent counter-sunk thumbturn cams with part numbers. Figure 2.1 shows a standard cam and its equivalent thumbturn cam.

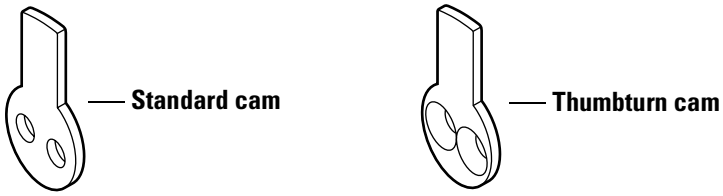


Figure 2.1 C4 standard cam and equivalent C140 thumbturn cam

Standard		Thumbturn	
Cam	**Part no.**	**Cam**	**Part no.**
C4	A40091	C140	A01449
C101	A00117	C425	A10524
C103	A00533	C447	A10546
C115	A00967	C444	A10543
C118	A00995	C401	A10500
C121	A01172	C402	A10501
C123	A01225	C443	A10542
C127	A01247	C403	A10502
C128	A01248	C404	A10503
C129	A01249	C405	A10504
C134	A01414	C406	A10505
C136	A01416	C432	A10531
C137	A01417	C442	A10541
C142	A01513	C426	A10525
C143	A01487	C407	A10506
C151	A01798	C434	A10533
C161	A02770	C408	A10507
C162	A04387	C409	A10508
C164	A04398	C430	A10529
C165	A04399	C424	A10523
C169	A04445	C410	A10509

Standard		Thumbturn	
Cam	**Part no.**	**Cam**	**Part no.**
C171	A04492	C423	A10522
C173	B04796	C411	A10510
C178	A05466	C433	A10532
C179	B05467	C412	A10511
C181	A05979	C413	A10512
C186	A06190	C414	A10513
C191	A06419	C428	A10527
C193	A07190	C429	A10528
C200	A07605	C436	A10535
C201	A07698	C445	A10544
C203	A07747	C441	A10540
C208	A14520	C417	A10516
C209	A14521	C418	A10517
C210	A14472	C416	A10515
C211	A15981	C419	A10518
C222	A17744	C420	A10519
C226	A17744	C422	A10521
C231	A20931	C421	A10520
C241	A09229	C415	A10514
C244	A20511	C446	A10545
C258	B34077	C427	A10526
C265	B39256	C431	A10530
C273	A24039	C437	A10536
C277	A34312	C439	A10538
C278	A34313	C438	A10537
C279	A20701	C440	A10539
C281	B34562	C448	A10547
NA	A09404	C435	A10534
NA	A20010	C449	A10548
NA	A23770	C450	A10549

C GLOSSARY

Cam Part of the cylinder that rotates to actuate the deadbolt or latchbolt as the key is turned. The cam may also act as the bolt in a utility cam lock.

Cam assembly tool Tool used for assembling the cam to the mortise cylinder.

Clamp plate Metal plate on the inside of a door used to secure a rim lock cylinder to the door by means of clamp screws. The spindle of the cylinder extends through a hole in the clamp plate.

Core Interchangeable figure-8 device that can be installed in a lock or door and operated by a key.

Cylinder Subassembly of a lock containing a plug with keyway and a body with tumbled mechanism. Cylinders may have either a cam (See *Mortise cylinder*) or a spindle (see *Rim cylinder*) as the actuator.

Cylinder die Tool for rethreading a 1 5/32″ diameter cylinder.

Cylinder lock Lock in which the locking mechanism is controlled by a cylinder. A double-cylinder lock has a cylinder on both the inside and outside of the door.

Cylinder ring Metal ring, surrounding the exposed portion of a lock cylinder, which protects the cylinder from being wrenched, turned, pried, cut, or pulled with attack tools. The cylinder ring also adapts the cylinder to the door thickness.

Cylinder tap Tool for rethreading lock case threads.

Cylinder wrench Tool for installing, removing, and testing cylinders.

Dummy cylinder Nonfunctional cylinder without an operating mechanism used for appearance only. Dummy cylinders are available for mortise and rim locks.

Faceplate Part of the mortise lock that serves as a facing or covering over the front of the lock.

Hand-of-door Opening direction of the door. A right-hand door (RH) is called "right-hand" because it is opened with the right hand. A right-hand door is hinged on the right and swings inward when viewed from the outside. A left-handed door (LH) is hinged on the left and swings inward when viewed from the outside. If a door swings outward, it is referred to as a right hand reverse bevel door (RHRB) or a left-hand reverse bevel door (LHRB).

Latchbolt Beveled, spring-actuated, bolt which may or may not include a deadlocking feature. The latchbolt must be actuated by a key, knob, or turn knob.

Lock Device that secures openings and entrances such as doors, gates, cabinets, and so forth. Locks include mechanical, electromechanical, and electronic security devices.

Mortise Rectangular cavity cut into the edge of a door. Mortise also can mean the act of making such a cavity.

Mortise cylinder Threaded lock cylinder that screws directly into the lock case; usually includes a key-driven rotating cam, attached to the back of the cylinder, which drives the locking mechanism. The cylinder houses the BEST interchangeable core.

Mortise lock Lock that fits into a mortise. Other locks fit into bored holes or mount to a surface.

Rim cylinder Lock cylinder that is secured to a door with a clamp plate and clamp screws. The rim cylinder's spindle actuates the bolt or latch. The cylinder houses the BEST interchangeable core.

Shifting cam Spring-loaded cam that shifts back to actuate another mechanism.

Spindle Unit on a rim cylinder lock, which actuates the bolt or latch when the key is turned.

Throw member Connecting piece between core and lock mechanism that transfers key motion to the locking device.

Thumbturn Part that someone grips between the thumb and forefinger, and turns to project or retract a bolt.

D

INSTALLATION INSTRUCTIONS

The following pages contain *Installation Instructions for 1E Mortise Cylinders* and *Installation Instructions for 1E Rim Cylinders.*

Installation Instructions for 1E Mortise Cylinders

Use these instructions to install a BEST 1E mortise cylinder in either a BEST mortise lock or another manufacturer's mortise lock.

Caution: **Other lock manufacturers may make changes to their product that affect the operation or compatibility of the BEST cylinder. When this occurs, they are not obligated to notify us.**

If you are using a BEST cylinder in another manufacturer's lock and find that it does not operate properly, please contact your local BEST representative.

1 Install cylinder set screw

1 From the outside of the cylinder, thread the set screw, slotted head first, as shown in Figure 1.

2 With a narrow screwdriver, insert the blade through the figure-8 hole and back the set screw in until the tip of the screw is below the threads of the cylinder.

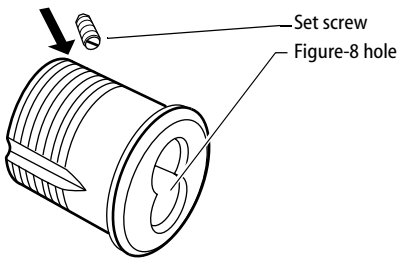


Figure 1 Threading the set screw into the cylinder

2 Install cylinder

1 Loosen the cylinder clamp screw in the front edge of the mortise lock and remove the old cylinder. See Figure 2.

2 Note the length "L" of the old cylinder. See Figure 3. If the BEST cylinder is longer, select a cylinder ring that will provide the correct length.

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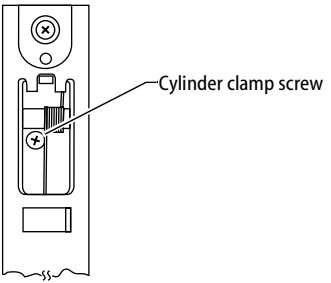


Figure 2 Loosening the cylinder clamp screw

3 Turn the cam to the 12 o'clock position as shown in Figure 3.

4 With a BEST cylinder wrench, screw the cylinder into the mortise case so that the figure-8 hole stops in the 12 o'clock position and the set screw is to the right.

Caution: **Do not screw the cylinder in too tightly. Doing so may cause you or someone else to be locked out.**

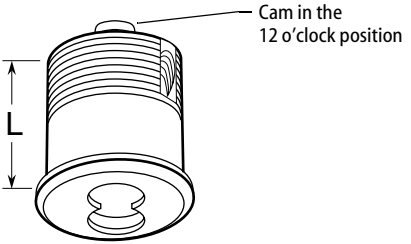


Figure 3 Turning the cam to the 12 o'clock position

5 Tighten the set screw into the mortise case. This prevents a thief from removing the cylinder and figure-8 core.

6 Tighten the cylinder clamp screw as shown in Figure 2.

3 Install core

1 Put the control key into the core and turn the key 15 degrees clockwise.

2 Adjust the throw pins if needed, then put the core into the cylinder with the control key.

3 Turn the key 15 degrees counterclockwise and remove the key.

Installation Instructions for 1E Rim Cylinders

Use these instructions to install a BEST 1E rim cylinder in rim lock applications.

Only if you are replacing a cylinder:

1 Remove the lock case (examples of lock cases include rim locks and panic devices) from the inside of the door and remove the cylinder.
2 Measure and make note of the length of the old ring, spindle, and screws. See Figure 1.

1 Prepare cylinder

Perform the following steps by either: (a) comparing the new BEST rings, spindle, and screws to the existing ring, spindle, and screws, or (b) trying and measuring the new BEST cylinder in the door with the lock case.

1 Select the cylinder ring that will position the cylinder to the correct length.
2 Break off the spindle at the point that will position it to the correct length.
3 Break off the screws so that the clamp plate and cylinder will tighten onto the door.

2 Install cylinder

1 Insert the BEST cylinder from the outside of the door and secure it in place with the clamp plate. See Figure 1.

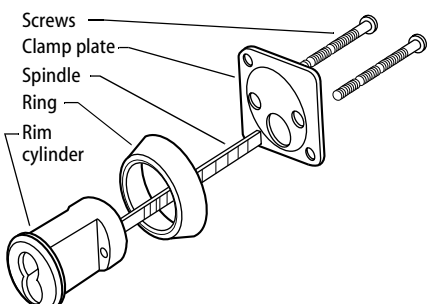


Figure 1 Securing the rim cylinder

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— Over

Note: *Make sure that the cylinder stays in the upright, centered position and that the spindle stays in the spindle hole in the lock case.*

2 Reinstall the lock case.

3 Check the installation by inserting the key and turning. The key will operate the bolt freely if the cylinder and case are in proper alignment.

3 Install core

1 Put the control key into the core and turn the key 15 degrees clockwise. See Figure 2.

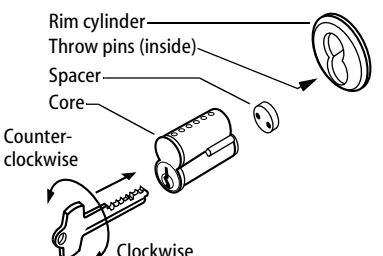


Figure 2 Installing the spacer (six-pin cores only) and core

2 When installing a six-pin core, slide the spacer onto the throw pins.

3 Adjust the throw pins if needed, then put the core into the cylinder with the control key.

4 Turn the key 15 degrees counterclockwise and remove the key.

E

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