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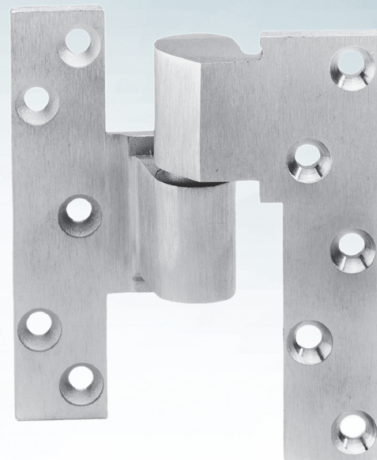
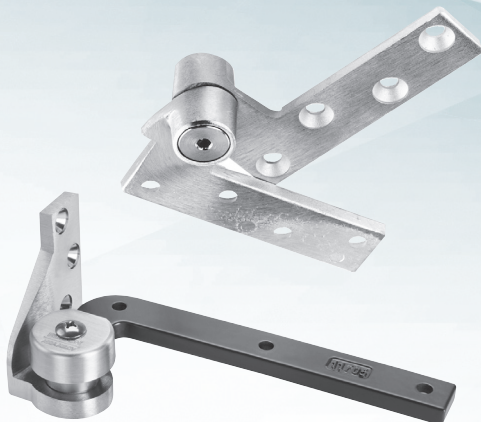


ASSA ABLOY

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# PIVOTS AND PIVOT SETS

ARCHITECTURAL SOLUTIONS  
FOR DURABLE AND EFFICIENT  
HANGING OF DOORS



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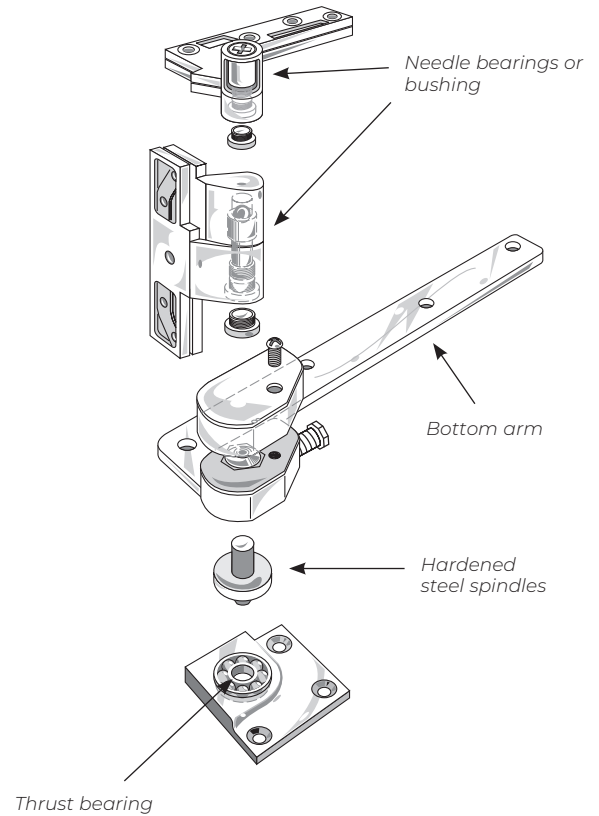
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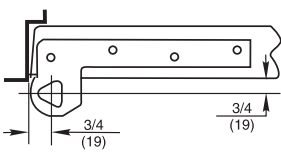
Pivot sets provide the best possible means of hanging a door. They are designed to work with the laws of physics to provide long-lasting performance and reliability.

- The weight of the door is supported at the bottom by the floor
  - Uses principles of gravity to its advantage
  - Door swings with less resistance
  - Heavier doors can be accommodated
- Reduced stress on frame
  - Fasteners are in shear, not tension
  - Eliminates door sag
  - Vertically adjustable
- Heavy-duty hardened steel spindles
  - Thrust bearing supports vertical load
  - Needle bearings and bushings for lateral force
  - Extra heavy-duty models also have an additional surface applied thrust bearing to handle heavier or high-traffic doors
- Offset pivots provide better weight distribution and can accommodate taller doors
- Intermediate pivots are used for alignment and to ensure proper installation of bottom pivot or floor closer
- Center hung pivots are used for aesthetics or if the pivot point is going to be moved nearer the lock edge of the door
- **PIVOTS DO NOT RETURN DOORS TO CENTER.** Pivots in this section are for door hanging means only. For door control see door closer catalog sections.



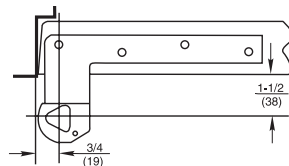
147 Pivot set and M19 Intermediate pivot shown (recommended)

## 1. OFFSET VS. CENTER HUNG APPLICATION



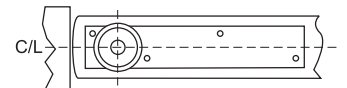
### 3/4" Offset

Pivot point located 3/4" from the heel edge of the door and 3/4" from face of door.



### 1-1/2" Offset

Pivot point located 3/4" from the heel edge of the door and 1-1/2" from face of door. Extended offsets should be used when there is cladding on the face of door or trim on the frame.



### Center Hung

Pivot point centered in thickness of door.

# HOW TO SELECT PRODUCT

## PIVOTS AND PIVOT SETS

### 2. SIZE OF DOOR (WIDTH, HEIGHT, THICKNESS)

*Estimated door weights pounds per square foot (PSF)*

	Door Thickness		
Door Material	1-3/4"	2-1/4"	3"
Hollow Metal	6.5	7	—
Solid Core Wood	7	9	11.5
Aluminum/Glass Storefront	3.5	4	—
Bullet Resistent	20	21	—
MDF	7	9	11.5
	Glass Thickness		
Tempered Glass	3/8"	1/2"	3/4"
	5	7	9.75
	Lead Thickness		
Lead Lining (add to door weight)	1/16"	1/8"	1/4"
	5	8	9.75
	Cladding Material		
3/4" Cladding (add to door weight)	Wood	Stone	Bronze
	3	10.5	28

*Example: 3'6" x 8' x 1/2" tempered glass door  
door: 28sq ft x 7lb./sq ft = 196lbs.*

*Example: 3' x 7' x 1-3/4" WD x 1/4" lead lining  
Door: 21sq ft x 7lb./sq ft = 147lbs.  
Lead lining: 9.75 = 204.75lbs.  
Total door weight: 351.75lbs.*

*For doors of other sizes, consult factory.*

### 3. CYCLES

Application	Daily Cycles	Yearly Cycles	Usage
Large department store entrance	5,000	1,500,000	High
Large office building entrance	4,000	1,200,000	
Theater entrance	1,000	365,000	
School entrance	1,250	225,000	
School restroom door	1,250	225,000	
Store or bank entrance	500	150,000	
Office building restroom door	400	118,000	
School corridor door	80	15,000	Average
Office building corridor door	75	22,000	
Store restroom door	60	18,000	
Residential entrance door	40	15,000	
Residential restroom door	25	9,000	Low
Residential hallway door	10	3,600	
Residential closet door	6	2,200	

### Door Thickness – Suffix 1-3/4", 2", 2-1/4", 2-1/2" or 3"

When ordering L series pivot for lead-lined doors, the thickness of the door must be given. The purpose of the L product is to have screws spaced so they straddle the lead in the center of the door. Also used when lead lining is under the skins of the door. Recommended for use on extra heavy or high traffic doors.

### ElectroLynx® Connectors – Suffix QC – Number of Wires

The plug-in connectors, with easy color coded wire system, eliminate matching wires. Must be used with ASSA ABLOY doors, frames and hardware. Available 4, 6, 8 or 12 wires for most products.

### Extended Spindle – Suffix extra length needed

Any special coverings or severe door undercuts will affect the spindle height. In these applications, an extended spindle may be required. Most standard spindle heights accommodate door undercuts up to 1/2". Extended spindles available in 1/2" increments up to 2" longer than standard. See template.

### Fire Rated – Prefix F

Pivots for fire rated doors (up to 3 hours) include a steel top pivot and must have additional steel intermediate pivots. For F519 pocket pivot, door assemblies must have been tested with pocket pivots.

### Handing

All offset pivots and pivot sets are handed. Suffix RH or LH.

### Less Top Pivot – Suffix LTP

For conditions requiring special top pivots or for arch top doors, the pivot set should be ordered less top pivot – LTP. For offset installations, an additional load bearing intermediate (side jamb) M190 pivot is required. All intermediate pivots for that opening should be M190's, not M19's.

### 1-1/2" Offset – Suffix 1-1/2

Offset is the distance from the face of the door to the pivot point. Extended offsets should not be used unless there is cladding on the face of the door or there is trim to clear on the frame. 1-1/2" offset arms and pivots are for doors with cladding or trim that project 3/4" from the face of the door. The greater the offset the less weight can be carried by the pivot.

### Special Layouts – Suffix SPLO#

Unique installations or specially engineered products are called special layouts. These numbers must be assigned by the technical support department and they must be called out specifically by their number when ordering.

### Twenty-minute label – Suffix - 20

This UL rating is for 20-minute assemblies. Product with this rating has an authorized label.

### Certifications

See individual sections for compliance with ANSI/BHMA A156.4 standards.

### Limited Warranty

Pivot sets are warranted for 2 years for defect. See Norton Rixson Price Book for specific details of the limited warranty.

### Specifications

All pivots and pivot sets shall be of one manufacturer. All heavy-duty pivots shall have a minimum of 2 bearings internal to the bottom pivot. One shall be a thrust bearing and the other a needle bearing. Separate bearing surfaces shall be in the top pivot. Lead-lined door units and high traffic pivots shall have additional thrust bearing. Fire rated pivot sets shall have steel top pivots. Fire rated doors require steel intermediate pivots.

# OFFSET HUNG

## PIVOTS AND PIVOT SETS

### MODEL 173

#### Description & Features

- Interior doors
- Weight 150 lbs.
- Door sizes up to 3'0" x 8'0" x 1-3/4" (914x2438x44mm)
- Handed
- 180 top pivot included
- 119 intermediate pivot recommended for all doors over 6'8" (2032mm) (sold separately)
- 3/4" (19mm) offset only (measured from centerline of pivot to face of door)
- Door edges must be beveled 1/8" in 2"
- Bottom pivot mounts directly to concrete floor
- 3/8" (10mm) vertical adjustment
- No spindle extensions available
- Door will swing 180°, trim permitting
- Uses same arm and cap as 117 pivot set
- Non-ferrous base metal
- Furnished with wood and metal screws
- Available in plated finishes

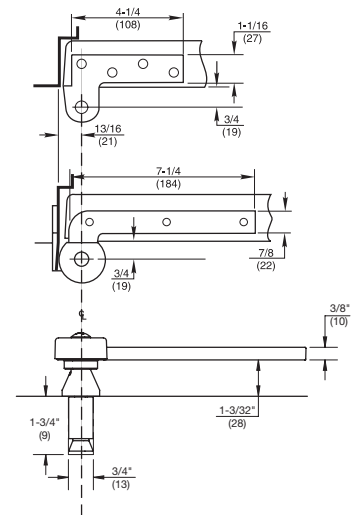
#### Optional Features

- Available for 1-1/2" (38mm) offset (door weight 100 lbs.) for doors with cladding or frame molding



#### Technical Information

(Frame stop required)



**MODEL 117-1/4**

**Description & Features**

- Interior doors
- Weight to 250 lbs.\*
- Door width up to 3'6" (1067mm)
- Handed
- 180 top pivot included
- 119 intermediate pivot recommended (sold separately)
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Door edges must be beveled 1/8" in 2"
- Bottom pivot mortised into side jamb
- Weight of door borne by floor
- Not available for fire-rated doors
- Non-ferrous base material
- Doors 60" (1524mm) to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) of door height warrants another intermediate pivot
- Furnished with wood and machine screws
- Available in plated finishes

**Optional Features**

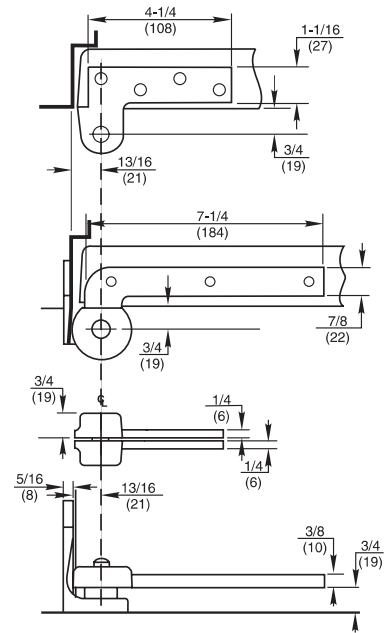
- Extended spindles available in 1/2" (13mm) increments up to 2" (51mm) longer than standard

\* Door size & weight guidelines are determined using the appropriate number of intermediate pivots



**Technical Information**

*(Frame stop required)*





# OFFSET HUNG PIVOTS AND PIVOT SETS

## MODEL 117

### Description & Features

- Interior doors
- Weight to 300 lbs.\*
- Door width up to 3'6" (1067mm)
- Handed
- 180 top pivot included
- 119 intermediate pivot recommended (sold separately)
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Door edges must be beveled 1/8" in 2
- Bottom pivot mortised into floor
- Non-ferrous base material
- Doors will swing 180°, trim permitting
- Doors up to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) of door height warrants another intermediate pivot
- Furnished with wood and machine screws
- Available finishes: plated (117, 117-20); plated or sprayed (F117)

### Optional Features

- Available for 1-1/2" (38mm) offset (door weight 150 lbs.) for doors with cladding or frame molding
- Extended spindles available in 1/2" (13mm) increments up to 2" (51mm) longer than standard

### Compliance

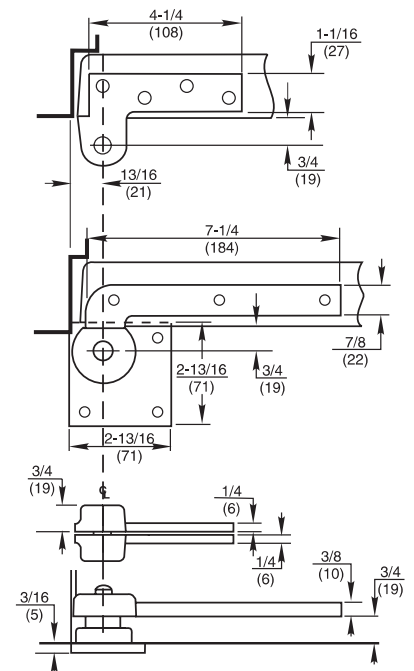
- Available for fire door assemblies up to three hours – specify F117. Intermediate pivot required by UL. Specify FM19 (sold separately).
- For 20-minute label suffix "-20" to the part number
- ANSI/BHMA A156.4, Grade 2
- ANSI C07162

\* Door size & weight guidelines are determined using the appropriate number of intermediate pivots



### Technical Information

(Frame stop required)

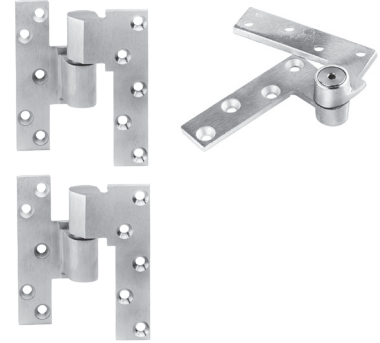


**MODEL 165**

**Description & Features**

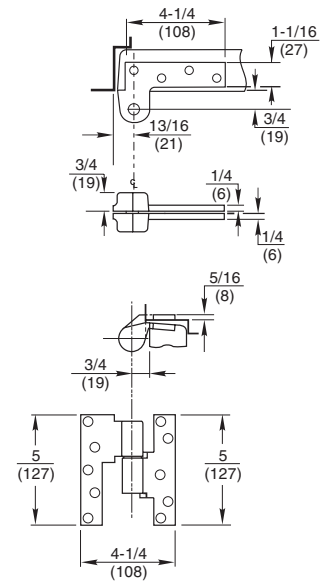
- Exterior or interior doors
- For doors without bottom pivots
- Weight to 300 lbs.\*
- Door width up to 3'6" (1067mm)
- Handed
- Set consists of one H180 top pivot and two each M190 intermediate pivots
- Not available for fire door assemblies
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Door edges must be beveled 1/8" in 2"
- Doors will swing 180°, trim permitting
- Non-ferrous base material
- Doors 60" (1524mm) to 90" (2286mm) in height have two intermediate pivots. Each additional 30" (762mm) of door height warrants another intermediate pivot
- Furnished with wood and machine screws
- Available in plated finishes

\* Door size & weight guidelines are determined using the appropriate number of intermediate pivots



**Technical Information**

(Frame stop required)



# OFFSET HUNG

## PIVOTS AND PIVOT SETS

### MODEL 195

#### Description & Features

- Exterior or interior doors
- Weight to 450 lbs.\*
- Door width up to 4'0" (1219mm)
- Handed
- 180 top pivot included
- 119 or M19 intermediate pivots are recommended (sold separately)
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Door edges must be beveled 1/8" in 2"
- Bottom pivot mortised into side jamb
- Pivot set can be vertically adjusted up to 3/16" (5mm) after installation without the use of shims
- Weight of door is borne by floor portion
- Doors will swing 180°, trim permitting
- Non-ferrous base material
- Doors 60" (1524mm) to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) of door height warrants another intermediate pivot
- Furnished with wood and machine screws
- Available in plated finishes

#### Optional Features

- Extended spindles available in 1/2" (13mm) increments up to 2" (51mm) longer than standard

#### Compliance

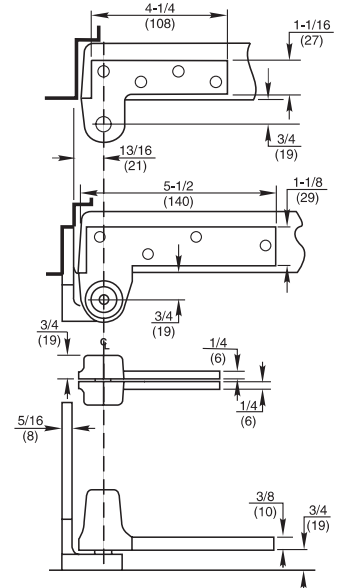
- Available for fire door assemblies up to three hours. Specify F195. Intermediate pivot required by UL. Specify FM19 (sold separately)
- ANSI/BHMA A156.4, Grade 2
- ANSI C07172

\* Door size & weight guidelines are determined using the appropriate number of intermediate pivots



#### Technical Information

(Frame stop required)



**MODEL 547**

**Description & Features**

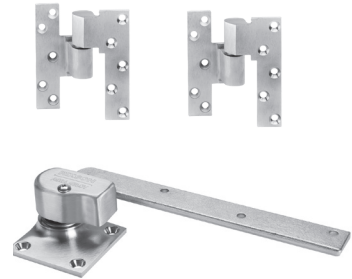
- Exterior or interior doors
- For arch top doors or overhead concealed closers
- Weight to 500 lbs.
- Door width up to 3'6" (1067mm)
- Handed
- Set consists of two each M190 intermediate pivots and bottom pivot
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Door edges must be beveled 1/8" in 2"
- Bottom pivot mounts directly to floor
- Doors will swing 180°, trim permitting
- Non-ferrous base material
- Doors 60" (1524) to 90" (2286mm) in height have two intermediate pivots. Each additional 30" (762mm) of door height warrants another intermediate pivot
- Furnished with wood and machine screws
- Available finishes: plated (547), plated or sprayed (F547)

**Optional Features**

- Extended spindles available in 1/2" (13mm) increments up to 2" (51mm) longer than standard

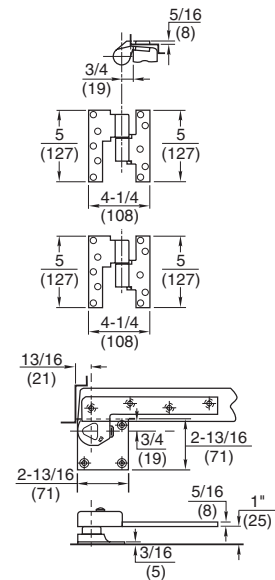
**Compliance**

- Available for fire door assemblies up to three hours. Specify F547. Intermediate pivots (FM190) included
- For 20-minute label suffix "-20" to the part number



**Technical Information**

*(Frame stop required)*



# OFFSET HUNG PIVOTS AND PIVOT SETS

## MODEL 147

### Description & Features

- Exterior or interior doors
- Weight to 600 lbs.\*
- Door width up to 4'0" (1219mm)
- Handed
- 180 top pivot included
- M19 intermediate pivot required (sold separately)
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Door edges must be beveled 1/8" in 2"
- Bottom pivot mounts directly to floor
- Doors will swing 180°, trim permitting
- Uses same arm and cap as 27 floor closer
- Non-ferrous base material
- Doors 60" (1524mm) to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) of door height warrants another intermediate pivot
- Furnished with wood and machine screws
- Available finishes: plated (147, 147-20); plated or sprayed (F147)

### Optional Features

- Available for 1-1/2" (38mm) offset (door weight 350 lbs.) for doors with cladding or frame molding
- Extended spindles available in 1/2" (13mm) increments up to 2" (51mm) longer than standard

### Compliance

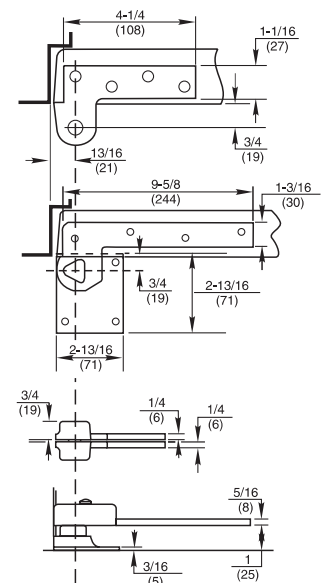
- Available for fire door assemblies up to three hours (ferrous material) – specify F147. Intermediate pivot required by UL. Specify FM19 (sold separately)
- For 20-minute label suffix "-20" to the part number
- ANSI/BHMA A156.4, Grade 2
- ANSI C07162/C07202
- Cal Fire 3725-0047:0108 (-20 min)

\* Door size & weight guidelines are determined using the appropriate number of intermediate pivots



### Technical Information

(Frame stop required)



## MODEL 117-1/2

### Description & Features

- Exterior or interior doors
- Weight to 650 lbs.\*
- Door width up to 4'0" (1219mm)
- Handed
- 180 top pivot included
- M19 intermediate pivot required (sold separately)
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Door edges must be beveled 1/8" in 2"
- Bottom pivot mortised into floor
- Doors will swing 180°, trim permitting
- Non-ferrous base material
- Doors 60" (1524mm) to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) of door height warrants another intermediate pivot
- Furnished with wood and machine screws
- Available finishes: plated (117-1/2, 117-1/2-20); plated or sprayed (F117-1/2)

### Optional Features

- Available for 1-1/2" (38mm) offset (door weight 350 lbs.) for doors with cladding or frame molding
- Extended spindles available in 1/2" (13mm) increments up to 2" (51mm) longer than standard

### Compliance

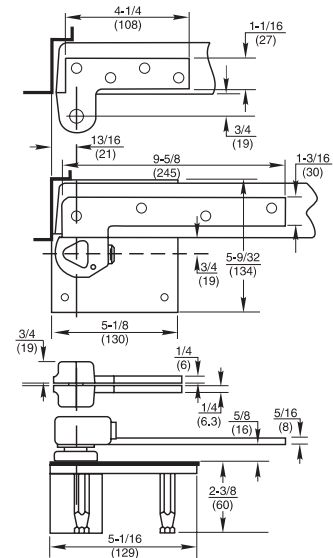
- Available for fire door assemblies up to three hours (ferrous material) – specify F117-1/2
- Intermediate pivot required by UL. Specify FM19 (sold separately)
- For 20-minute label suffix "-20" to the part number
- ANSI/BHMA A156.4, Grade 1
- ANSI C07121/C07161/C07201

\* Door size & weight guidelines are determined using the appropriate number of intermediate pivots



### Technical Information

(Frame stop required)



# OFFSET HUNG PIVOTS AND PIVOT SETS

## MODEL L147

### Description & Features

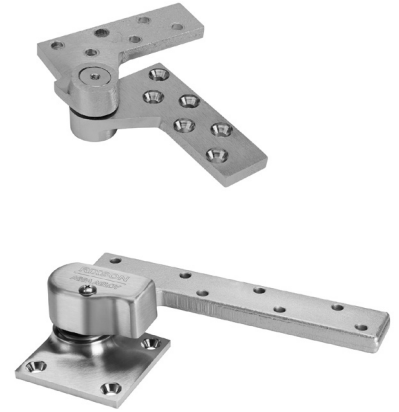
- Exterior or interior doors
- Lead-lined, heavy, high traffic doors
- Weight to 800 lbs.
- Door width up to 4'0" (1219mm)
- Handed
- L180 top pivot included
- ML19 intermediate pivot required (sold separately)
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Door edges must be beveled 1/8" in 2"
- Bottom pivot mounts directly to floor
- Doors with lead lining under the skin should also use this product.
- Screw holes in top pivot and bottom arm spaced to straddle lead lining in the middle of the door
- Doors will swing 180°, trim permitting
- Non-ferrous base material
- Doors 60" (1524mm) to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) of door height warrants another intermediate pivot
- Available to accommodate lead in door thicknesses 1-3/4" (44mm), 2" (51mm), 2-1/4" (57mm), 2-1/2" (64mm), or 3" (76mm) – specify when ordering
- Furnished with wood and machine screws
- Available finishes: plated (L147, L147-20); plated or sprayed (FL147)

### Optional Features

- Extended spindles available in 1/2" (13mm) increments up to 2" (51mm) longer than standard

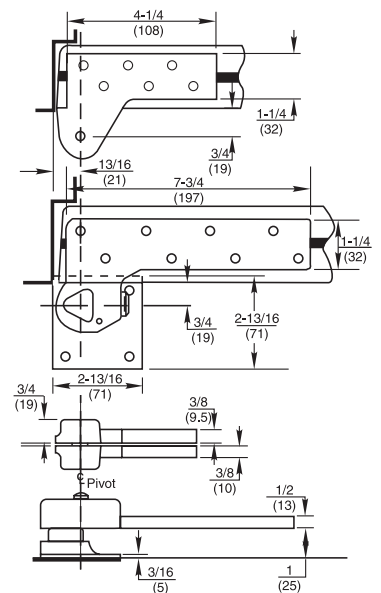
### Compliance

- Available for fire door assemblies up to three hours for 1-3/4" (44mm) doors only (ferrous material) – specify FL147. Intermediate pivot required by UL. Specify FML19 (sold separately)
- For 20-minute label suffix "-20" to the part number
- Cal Fire 3725-0047:0108 (-20 min)



### Technical Information

(Frame stop required)



1-3/4" door shown

**MODEL L117**

**Description & Features**

- Exterior or interior doors
- Lead-lined, heavy, high traffic doors
- Weight to 1,750 lbs.\*
- Door width up to 4'0" (1219mm)
- Handed
- L180 top pivot included
- ML19 intermediate pivot required (sold separately)
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Door edges must be beveled in 1/8" in 2"
- Bottom pivot mortised into floor
- Available to accommodate lead in door thicknesses 1-3/4" (44mm), 2" (51mm), 2-1/4" (57mm), 2-1/2" (64mm), or 3" (76mm) – specify when ordering
- Additional thrust bearing for greater load capacity
- Doors will swing 180°, trim permitting
- Non-ferrous base material for top pivot
- Doors 60" (1524mm) to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) of door height warrants another intermediate pivot
- Furnished with wood and machine screws
- Available finishes: plated (L117, L117-20); plated or sprayed (FL117)

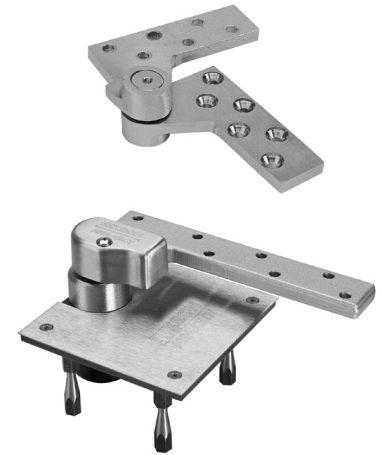
**Optional Features**

- Extended spindles available in 1/2" (13mm) increments up to 2" (51mm) longer than standard

**Compliance**

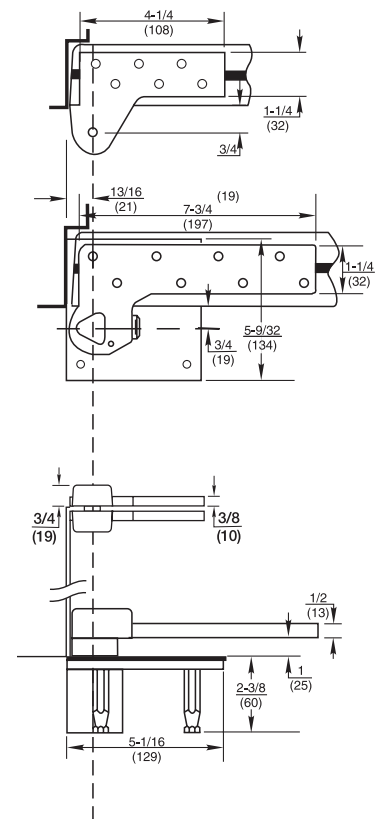
- Available for fire door assemblies up to three hours (ferrous material). Specify FL117. Intermediate pivot required by UL. Specify FML19 (sold separately).  
Note: UL listing for 1-3/4" thick doors only
- For 20-minute label suffix "-20" to the part number
- ANSI/BHMA A156.4, Grade 1
- ANSI C07111

\* Door size & weight guidelines are determined using the appropriate number of intermediate pivots



**Technical Information**

(Frame stop required)



Pivot for 1-3/4" door shown



# OFFSET HUNG TOP PIVOTS

## PIVOTS AND PIVOT SETS

### MODEL 180

#### Description & Features

- Full mortise
- Non-handed
- Standard top pivot for most offset pivot sets and floor closers
- Oil-impregnated sintered bronze bushing
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Non-ferrous base material
- Furnished with wood and machine screws
- Available finishes: plated (180, H180, 180-20, H180-20); plated or sprayed (F180, FH180)

#### Optional Features

- Available for 1-1/2" (38mm) offset
- For extra wide or high traffic prefix "H" – H pivots have heavy-duty needle bearings; available in 1-1/2" (38mm) offset
- Available with longer than standard pivot pins. Increments are 1/4" (6mm), 1/2" (13mm), 3/4" (19mm) only

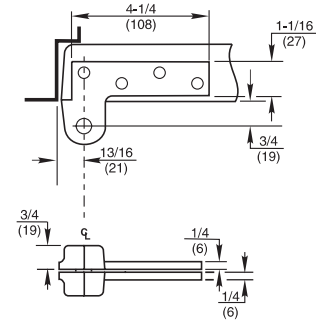
#### Compliance

- Available for fire door assemblies (ferrous material) – specify F180 or FH180
- For 20-minute label suffix "-20" to the part number
- Cal Fire 3725-0047:0108 (-20 min)



#### Technical Information

(Frame stop required)



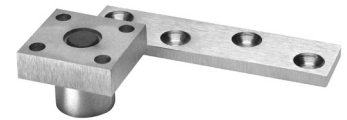
### MODEL 180 X 102

#### Description & Features

- Full mortise
- Handed
- Special top pivot for doors in deep reveals or unusual door details where one leaf is too long for the normal door or frame portion
- Oil-impregnated sintered bronze bushings
- Non-ferrous base metal
- May be inverted
- Furnished with wood and machine screws
- Available in plated finishes

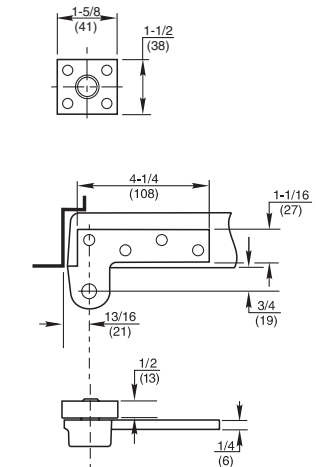
#### Optional Features

- Available for 1-1/2" (38mm) offset
- Available with longer than standard pivot pins. Increments are 1/4" (6mm), 1/2" (13mm), 3/4" (19mm) only



#### Technical Information

(Frame stop required)



# OFFSET HUNG TOP PIVOTS

## PIVOTS AND PIVOT SETS

### MODEL FA180

#### Description & Features

- Behavioral health design
- Full mortise
- Handed
- Standard top pivot for SEC27-180 floor closer packages
- Optional top pivot for institutional use or installations where flat surfaces are objectionable
- Ferrous base material
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Furnished with wood and machine Torx® screws
- Available in plated or sprayed finishes

#### Optional Features

- Available with longer than standard pivot pins. Increments are 1/4" (6mm), 1/2" (13mm), 3/4" (19mm) only

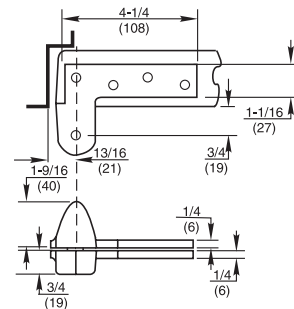
#### Compliance

- For fire door assemblies



#### Technical Information

(Frame stop required)



### MODEL L180

#### Description & Features

- Lead-lined, heavy, high traffic doors
- Full mortise
- Non-handed
- Standard top pivot for L147, L117 pivots and L27 floor closers
- Doors with lead lining under the skin should also use this product
- Screw holes spaced to straddle lead in the middle of the door
- Available to accommodate lead lined door thicknesses: 1-3/4" (44mm), 2" (51mm), 2-1/4" (57mm), 2-1/2" (64mm), or 3" (76mm) – specify when ordering
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Non-ferrous base material
- Furnished with wood and machine screws
- Available finishes: plated (L180, L180-20); plated or sprayed (FL180)

#### Optional Features

- Available with longer than standard pivot pins. Increments are 1/4" (6mm), 1/2" (13mm), 3/4" (19mm) only

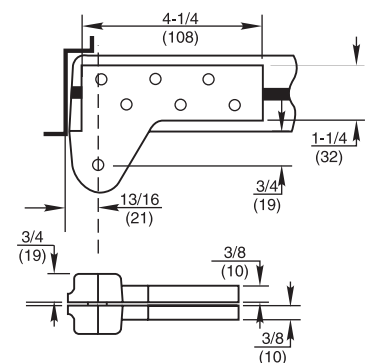
#### Compliance

- Available for fire door assemblies for 1-3/4" (19mm) doors only (ferrous material). Specify FL180
- For 20-minute label suffix "-20" to the part number
- Cal Fire 3725-0047:0108 (-20 min)



#### Technical Information

(Frame stop required)



1-3/4" door shown

# OFFSET HUNG TOP PIVOTS

## PIVOTS AND PIVOT SETS

### MODEL 280

#### Description & Features

- Half surface
- Handed
- Flush door and frame application only
- Optional top pivot where door portion cannot be mortised
- 1-3/4" (44mm) door only
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Contact factory if door is not flush
- Non-ferrous base material
- Furnished with wood and machine screws
- Available finishes: plated (280, 280-20); plated or sprayed (F280)

#### Optional Features

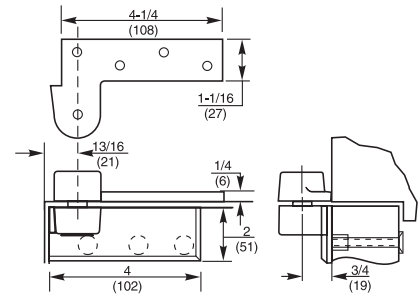
- Available with longer than standard pivot pins. Increments are 1/4" (6mm), 1/2" (13mm), 3/4" (19mm) only

#### Compliance

- Available for fire door assemblies (ferrous material) – specify F280
- For 20-minute label suffix “-20” to the part number
- Cal Fire 3725-0047:0108 (-20 min)



#### Technical Information



### MODEL 380

#### Description & Features

- Half mortise
- Handed
- Flush door and frame application only
- Optional top pivot where jamb portion cannot be mortised
- Designed for channel iron door frames with aluminum, hollow metal or wood doors
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Non-ferrous base material
- Furnished with wood and machine screws
- Available finishes: plated (380, 380-20); plated or sprayed (F380)

#### Optional Features

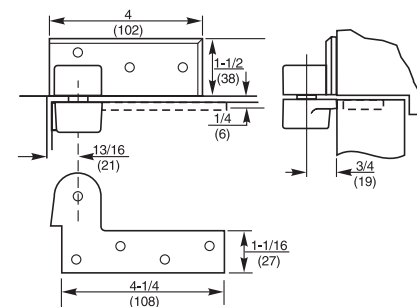
- Door portion from L180 pivot is available if lead-lined doors are used – specify L380 and door thickness
- Available with longer than standard pivot pins. Increments are 1/4" (6mm), 1/2" (13mm), 3/4" (19mm) only

#### Compliance

- Available for fire door assemblies (ferrous material) – specify F380
- For 20-minute label suffix “-20” to the part number
- Cal Fire 3725-0047:0108 (-20 min)



#### Technical Information



# OFFSET HUNG TOP PIVOTS

## PIVOTS AND PIVOT SETS

### MODEL 480

#### Description & Features

- Full surface
- Handed
- Flush door and frame application only
- Optional top pivot where door and jamb portion cannot be mortised
- Designed for channel iron door frames and any door where thru-bolting is advantageous
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- 1-3/4" (44mm) door only
- Non-ferrous base material
- Furnished with wood and machine screws
- Available finishes: plated (480, 480-20); plated or sprayed (F480)

#### Optional Features

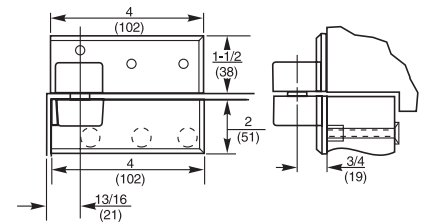
- Available with longer than standard pivot pins. Increments are 1/4" (6mm), 1/2" (13mm), 3/4" (19mm) only

#### Compliance

- Available for fire door assemblies (ferrous material) – specify F480
- For 20-minute label suffix "-20" to the part number
- Cal Fire 3725-0047:0108 (-20 min)



#### Technical Information



### MODEL 680

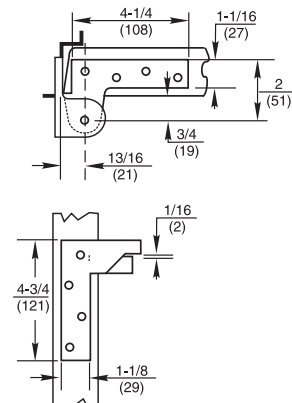
#### Description & Features

- Side jamb mounted
- Frame portion
- Handed
- Used where no frame exists above door, or where it is not possible to anchor pivot into header of frame
- Side jamb portion can be surface mounted or mortised
- Non-ferrous base material
- 3/4" (19mm) offset (measured from centerline of pivot to face of door)
- Door edges must be beveled in 1/8" in 2"
- Furnished with wood and machine screws
- Possible mountings:
  - Surface mount jamb; double mortise door
  - Mortise jamb, header and door
  - Mortise jamb and door
- Available in plated finishes



#### Technical Information

(Frame stop required)



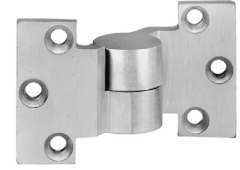
# INTERMEDIATE OR SIDE JAMB PIVOTS

## PIVOTS AND PIVOT SETS

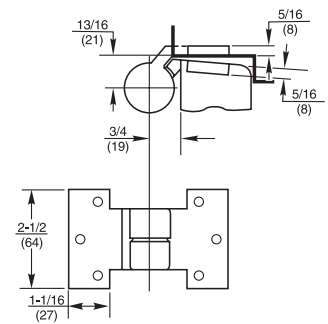
### MODEL 119

#### Description & Features

- Full mortise
- Handed
- Not load-bearing
- Maintains door alignment
- Available 3/4" (19mm) offset only
- Door edges must be beveled in 1/8" in 2"
- Used with 117, 117-1/4, 195 pivot sets and 127 and 427 floor closers
- Non-ferrous base material
- Doors 60" (1524mm) to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) of door height warrants another intermediate pivot
- Furnished with wood and machine screws
- Available in plated finishes



#### Technical Information



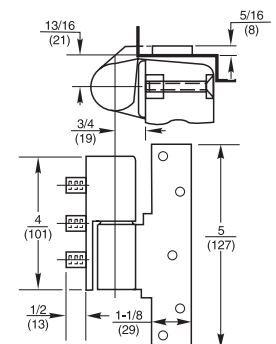
### MODEL 219

#### Description & Features

- Half surface
- Handed
- Flush door and frame applications only
- Optional intermediate pivot where door portion cannot be mortised
- Maintains door alignment
- 3/4" (19mm) offset only
- 1-3/4" (44mm) door only
- Door edges must be beveled in 1/8" in 2"
- Non-ferrous base material
- Doors up to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) warrants another intermediate pivot
- Furnished with wood and machine screws
- Available in plated finishes



#### Technical Information



#### Compliance

- For 20-minute label suffix "-20" to the part number
- Cal Fire 3725-0047:0108 (-20 min)

# INTERMEDIATE OR SIDE JAMB PIVOTS

## PIVOTS AND PIVOT SETS

### MODEL 319

#### Description & Features

- Half mortise
- Handed
- Flush door and frame applications only
- Optional intermediate pivot where jamb portion cannot be mortised
- Maintains door alignment
- 3/4" (19mm) offset only
- Door edges must be beveled in 1/8" in 2"
- Non-ferrous base material
- Doors up to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) warrants another intermediate pivot
- Furnished with wood and machine screws
- Available in plated finishes

#### Optional Features

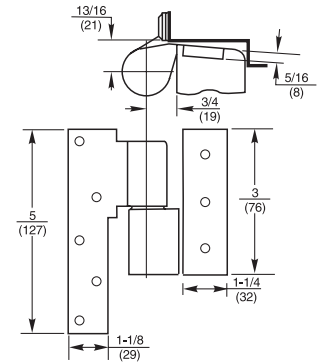
- Door portion from ML19 pivot is available if lead-lined door is used – specify L319 and door thickness

#### Compliance

- For 20-minute label suffix “-20” to the part number
- Cal Fire 3725-0047:0108 (-20 min)



#### Technical Information



### MODEL 419

#### Description & Features

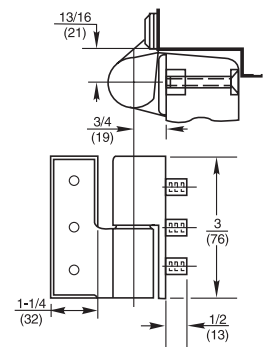
- Full surface
- Handed
- Flush door and frame applications only
- Optional intermediate pivot where door and jamb portion cannot be mortised
- Maintains door alignment
- 3/4" (19mm) offset only
- Non-ferrous base material
- 1-3/4" (44mm) door only
- Doors up to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) warrants another intermediate pivot
- Furnished with wood and machine screws
- Available in plated finishes

#### Compliance

- For 20-minute label suffix “-20” to the part number
- Cal Fire 3725-0047:0108 (-20 min)



#### Technical Information



# INTERMEDIATE OR SIDE JAMB PIVOTS

## PIVOTS AND PIVOT SETS

### MODEL FA19

#### Description & Features

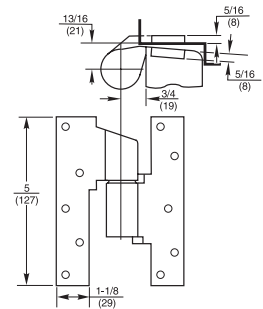
- Full mortise
- Behavioral health or high security applications
- Handed
- Optional intermediate pivot for institutional use or installations where flat surfaces are objectionable
- Maintains door alignment
- Aids in installing bottom pivots
- 3/4" (19mm) offset
- Door edges must be beveled in 1/8" in 2"
- Ferrous base material
- Doors 60" (1524mm) to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) warrants another intermediate pivot
- Furnished with wood and machine Torx® screws
- Available in plated or sprayed finishes

#### Compliance

- May be used with fire door assemblies



#### Technical Information



### MODEL M19

#### Description & Features

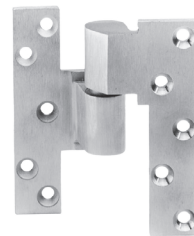
- Full mortise
- Handed
- Not load-bearing
- Maintains door alignment
- Aids in installing floor closers and bottom pivots
- 3/4" (19mm) offset
- Door edges must be beveled in 1/8" in 2"
- Non-ferrous base metal
- Doors 60" (1524mm) to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) warrants another intermediate pivot
- Furnished with wood and machine screws
- Available finishes: plated (M19, M19-20); plated or sprayed finishes (FM19)

#### Optional Features

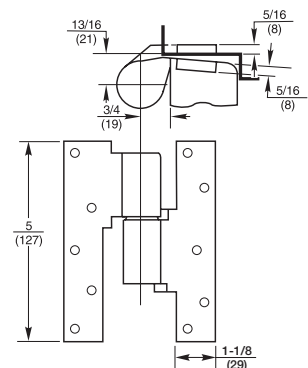
- Available for 1-1/2" (38mm) offset

#### Compliance

- Available for fire door assemblies (ferrous material) - specify FM19
- For 20-minute label suffix "-20" to the part number
- Cal Fire 3725-0047:0108 (-20 min)



#### Technical Information



# INTERMEDIATE OR SIDE JAMB PIVOTS

## PIVOTS AND PIVOT SETS

### MODEL M190

#### Description & Features

- Heavy-duty full mortise
- Handed
- Used when frame condition does not allow standard top pivot
- Lateral load-bearing
- Maintains door alignment
- Aids in installing floor closers and bottom pivots
- Heavy-duty needle bearing
- 3/4" (19mm) offset standard
- Door edges must be beveled in 1/8" in 2"
- Non-ferrous base metal
- Doors 60" (1524mm) to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) warrants another intermediate pivot
- Furnished with wood and machine screws
- Available finishes: plated (M190, M190-20); plated or sprayed (FM190)

#### Optional Features

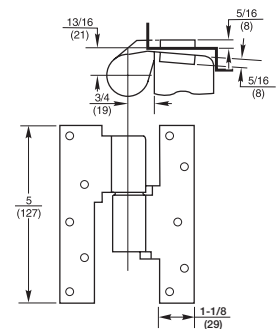
- Available for 1-1/2" (38mm) offset

#### Compliance

- Available for fire door assemblies (ferrous material) – specify FM190
- For 20-minute label suffix "-20" to part number
- Cal Fire 3725-0047:0108 (-20 min)



#### Technical Information



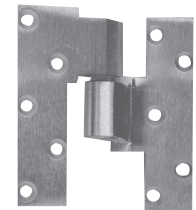
### MODEL ML19

#### Description & Features

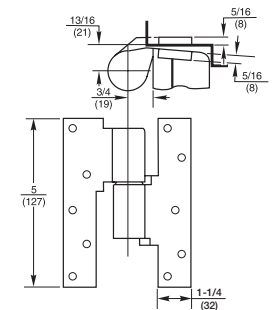
- Full mortise
- Lead-lined, heavy or high traffic doors
- Handed
- Load-bearing
- Screw holes spaced to straddle lead lining in center of door. Also use on extra heavy or high traffic door
- Maintains door alignment
- Aids in installing closers and pivots
- Door edges must be beveled in 1/8" in 2"
- Available to accommodate door thicknesses 1-3/4" (44mm), 2" (51mm), 2-1/4" (57mm), 2-1/2" (64mm), or 3" (76mm) – specify thickness when ordering
- Non-ferrous base material
- Doors 60" (1524mm) to 90" (2286mm) in height should use one intermediate pivot. Each additional 30" (762mm) warrants another intermediate pivot
- Furnished with wood and machine screws
- Available finishes: plated (ML19, ML19-20); plated or sprayed (FML19)

#### Compliance

- Available for fire door assemblies – 1-3/4" (44mm) door only – specify FML19
- For 20-minute label suffix "-20" to the part number
- Cal Fire 3725-0047:0108 (-20 min)



#### Technical Information





# ELECTRIFIED INTERMEDIATE OR SIDE JAMB PIVOTS

## PIVOTS AND PIVOT SETS

### MODEL E-M19

#### Description & Features

- Offset hung
- Electric pivot for power transfer
- Handed
- Not load-bearing
- Door and jamb portion are factory assembled and cannot be separated
- Always use M19 intermediate pivot to install door
- Specify four, six, eight or twelve wires
- ElectroLynx® option available, suffix "QC#" (number of wires)
- 24-gauge wire is rated at 2 amps for low voltage, Class II wiring applications
- 3/4" (19mm) offset
- Door edges must be beveled in 1/8" in 2"
- Furnished with wood and machine screws
- Available in plated finishes

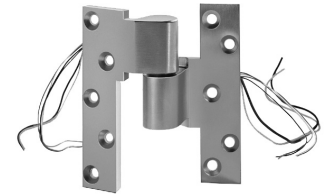
#### Optional Features

- Available 1-1/2" offset

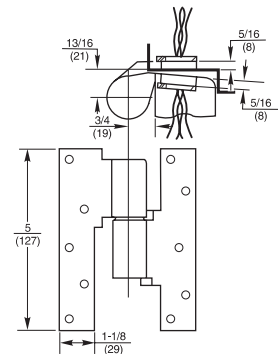
#### Compliance

- Available for fire door assemblies (ferrous material) – specify E-FM19
- For 20-minute label, suffix "-20" to the part number

*Whenever power transfer pivots are used, the leaves must not be separated*



#### Technical Information

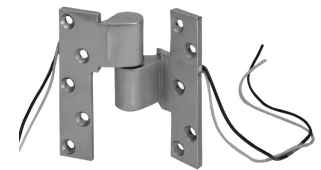


### MODEL E-M19U

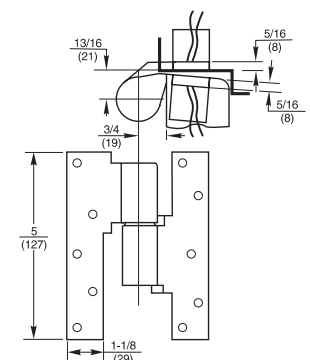
#### Description & Features

- Offset hung
- Electric pivot for power transfer
- Handed
- For electrified panic devices with large inrush current
- Not load-bearing
- Door and jamb portion are factory assembled and cannot be separated
- Two each 18 gauge wires. Each wire is rated at 2 amps continuously. UL listed for 24-volt, Class I wiring
- ElectroLynx® option not available
- Junction boxes are supplied with pivots
- Not available in ferrous material
- 3/4" (19mm) offset
- Always use M19 intermediate pivot to install door
- Door edges must be beveled in 1/8" in 2"
- Furnished with wood and machine screws
- Available in plated finishes

*Whenever power transfer pivots are used, the leaves must not be separated*



#### Technical Information



## MODEL E-ML19

### Description & Features

- Offset hung
- Lead lined or extra heavy doors
- Electric pivot for power transfer
- Handed
- Not load-bearing
- Door and jamb portion are factory assembled and cannot be separated
- Specify four, six, eight or twelve wires
- ElectroLynx® option available, suffix "QC#" (number of wires)
- 24-gauge wire is rated at 2 amps for low voltage, Class II wiring applications
- 3/4" (19mm) offset
- Available 1-3/4" (44mm) doors only
- Always use ML19 intermediate pivot to install door
- Door edges must be beveled in 1/8" in 2"
- Furnished with wood and machine screws
- Available in plated finishes

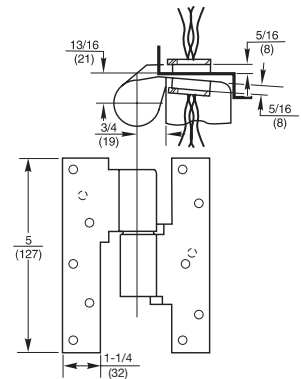
### Compliance

- Available for fire door assemblies (ferrous base material) specify E-FML19
- For 20-minute label, suffix "-20" to the part number

*Whenever power transfer pivots are used, the leaves must not be separated*



### Technical Information



# STANDARD AND ELECTRIFIED POCKET PIVOTS

PIVOTS AND PIVOT SETS

**NORTON  
RIXSON**

**ASSA ABLOY**

## MODEL F519

### Description & Features

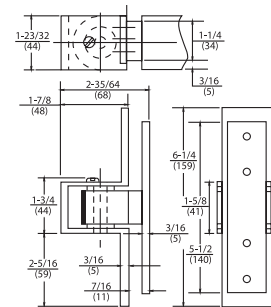
- Pocket door pivot
- Non-handed
- Full mortise, non-handed pivot for pocket door applications
- Heavy-duty steel pivot with ball bearings
- Allows doors to swing 90°
- Minimum three pocket pivots per door
- Doors over 90" (2286mm) in height require four pocket pivots. Every additional 30" (762mm) of door height warrants another pocket pivot
- Furnished with wood and machine screws
- Available in plated or sprayed finishes

### Compliance

- UL listed for all labeled pocket fire-door assemblies up to and including 3 hours
- Fire-rated door assemblies must have been tested with pocket pivots
- ANSI/BHMA A156.4, Grade 2



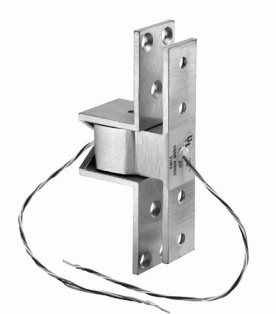
### Technical Information



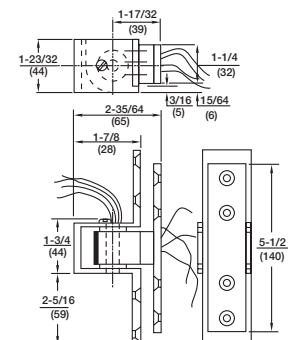
## MODEL E-F519

### Description & Features

- Pocket door pivot
- Electric pivot for power transfer
- Non-handed
- Full mortise, non-handed pivot for pocket door applications
- Door and jamb portions are factory assembled and cannot be separated
- Always use as middle pivot
- Available with four wires only
- ElectroLynx® option available, suffix "QC4"
- 24-gauge wire is rated at 2 amps for low voltage, Class II wiring applications
- Heavy-duty steel pivot with ball bearings
- Allows doors to swing 90°
- Minimum three pocket pivots per door
- Doors over 90" (2286mm) in height require four pocket pivots. Every additional 30" (762mm) of door height warrants another pocket pivot
- Furnished with wood and machine screws
- Available in plated finishes



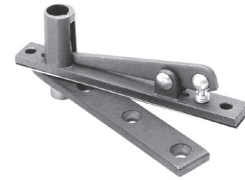
### Technical Information



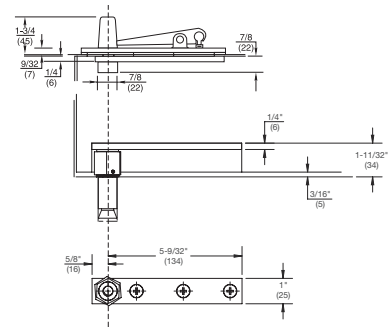
**MODEL 176**

**Description & Features**

- Interior doors
- Weight up to 150 lbs.
- Door sizes up to 3'0" x 8'0" (914x2438mm)
- Door thickness 1-3/8" to 1-3/4" (34-44mm)
- Non handed
- 320 top pivot included
- Bottom pivot mounts directly into concrete floor
- Pivot point centered in thickness of the door
- Door must have radius on pivot edge
- Not allowed for use on labeled doors and frames
- 3/8" (10mm) vertical adjustment
- No spindle extensions available
- Furnished with wood and machine screws
- Available in plated finishes



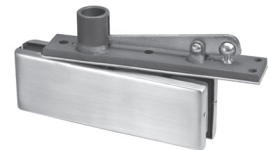
**Technical Information**



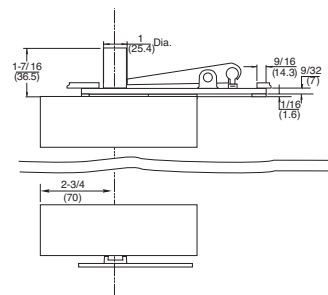
**MODEL 178**

**Description & Features**

- Interior doors
- Weight to 175 lbs.
- Door sizes up to 3'0" x 8'0" (914 x 2438mm)
- Non handed
- Used on full glass doors
- Doors do not return to center
- Accommodates glass thicknesses 3/8"-1/2" (10-13mm)
- Includes special floor portion, top and bottom patch fittings and walking beam top pivot
- Available in plated finishes



**Technical Information**



Center hung pivots are door hanging means only. To close doors see closer sections of the catalogs.

# CENTER HUNG PIVOTS AND PIVOT SETS

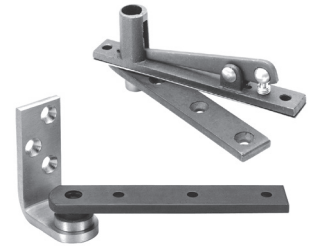
## MODEL 127-3/4

### Description & Features

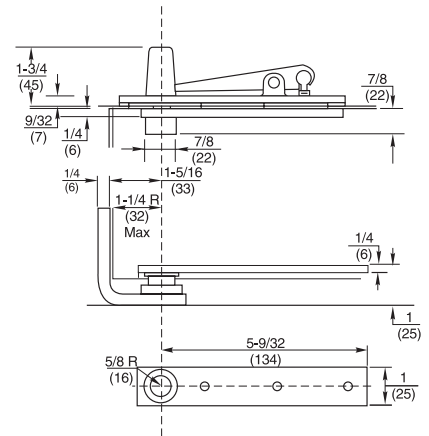
- Interior doors
- Weight to 200 lbs.
- Door sizes up to 3'6" x 8'6" (1067 x 2591mm)
- Non-handed
- 320 top pivot included
- Bottom pivot mortised into side jamb
- Weight of door borne by floor
- Pivot point centered in thickness of door
- Door must have radius on pivot edge
- Not allowed for use on labeled doors and frames
- Pivot point remains constant at 1-1/4" (32mm) from the edge of the door
- Furnished with wood and machine screws
- Available in plated finishes

### Optional Features

- Available with extended spindles in 1/2" (13mm) increments up to 2" (51mm) longer than standard



### Technical Information



## MODEL 128-3/4

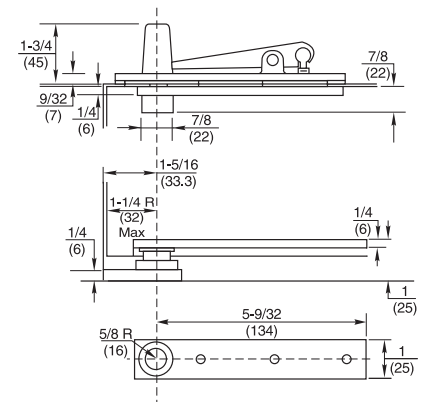
### Description & Features

Identical to the 127-3/4 except

- Weight to 250 lbs.
- Bottom pivot mounts directly to floor



### Technical Information



Center hung pivots are door hanging means only. To close doors, see floor closer sections of the catalogs.

## MODEL 270

### Description & Features

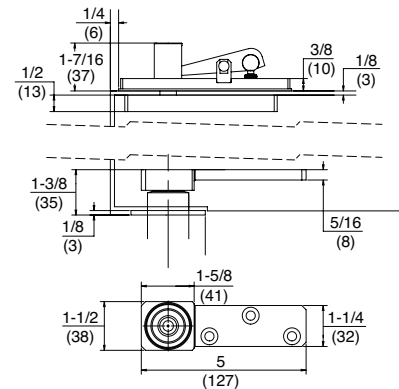
- Exterior or interior doors
- Weight to 300 lbs.
- Door sizes up to 3'8" x 8'6"\* (1118 x 2591mm)
- Non-handed
- Top pivot included
- Bottom pivot mounts directly to floor
- Pivot point centered in thickness of door
- Door must have radius on pivot edge
- Pivot set features sealed bearings for protection against weather and debris
- Not allowed for use on labeled doors and frames
- Furnished with wood and machine screws
- Available in plated finishes

### Compliance

- ANSI/BHMA A156.4, Grade 1
- ANSI C07031



### Technical Information



## MODEL 370

### Description & Features

- Exterior or interior doors
- Weight to 500 lbs.
- Door sizes up to 3'8" x 8'6"\* (1118 x 2591mm)
- Non-handed
- 340 top pivot included
- Bottom pivot mounts directly to floor
- Pivot point centered in thickness of door
- Door must have radius on pivot edge
- Pivot set features sealed bearings for protection against weather and debris
- Not allowed for use on labeled doors and frames
- Furnished with wood and machine screws
- Available in plated finishes

### Optional Features

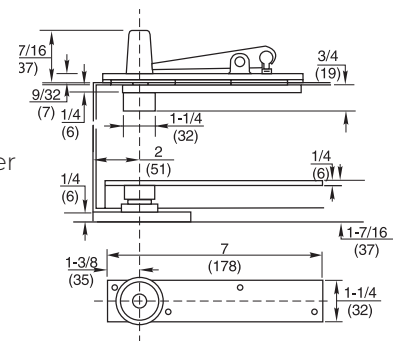
- Available with extended spindles in 1/2" (13mm) increments up to 2" (51mm) longer than standard

### Compliance

- ANSI/BHMA A156.4, Grade 2
- ANSI C07032



### Technical Information



Center hung pivots are door hanging means only. To close doors, see floor closer sections of the catalogs.

\*For doors taller than 8'6" use top pivot 345 in lieu of 340

# CENTER HUNG

## PIVOTS AND PIVOT SETS

### MODEL 375

#### Description & Features

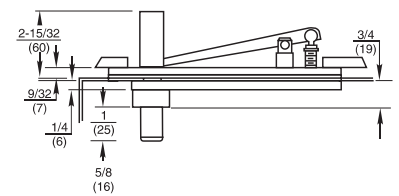
- Exterior or interior doors
- Weight to 500 lbs.
- Door width: up to 3'8" (1118mm)
- Door height: above 8'6" (2591mm)
- Non-handed
- 345 top pivot included
- Bottom pivot mounts directly to floor
- Pivot point centered in thickness of door
- Door must have radius on pivot edge
- Pivot set features sealed bearings for protection against weather and debris
- Not allowed for use on labeled doors and frames
- Furnished with wood and machine screws
- Available in plated finishes

#### Optional Features

- Available with extended spindles in 1/2" (13mm) increments up to 2" (51mm) longer than standard



#### Technical Information



For bottom portion see 370 above

### MODEL 117-3/4

#### Description & Features

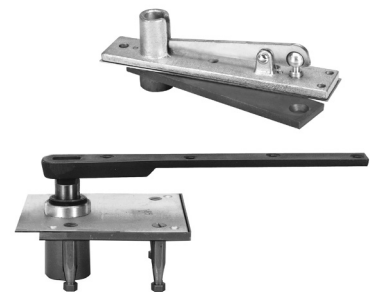
- Exterior or interior doors
- Weight to 600 lbs.
- Door sizes up to 4'0"x 8'6"\* (1219 x 2591mm)
- Non-handed
- 340 top pivot included
- Bottom pivot is mortised into floor
- Pivot point centered in thickness of door
- Door must have radius on pivot edge
- Heavy-duty bearings
- Pivot set features sealed bearings for protection against weather and debris
- Not allowed for use on labeled doors and frames
- Furnished with wood and machine screws
- Available in plated finishes

#### Optional Features

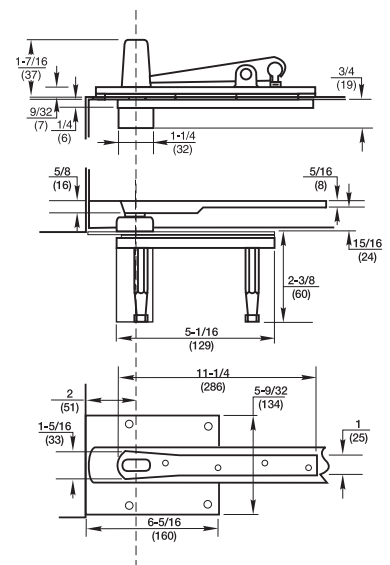
- Available with extended spindles in 1/2" (13mm) increments up to 2" (51mm) longer than standard

Center hung pivots are door hanging means only. To close doors, see floor closer sections of the catalogs.

\*For doors taller than 8'6" use top pivot 345 in lieu of 340



#### Technical Information



# CENTER HUNG PIVOTS AND PIVOT SETS

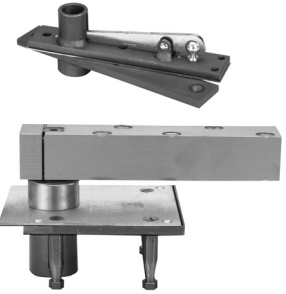
## MODEL H117-3/4

### Description & Features

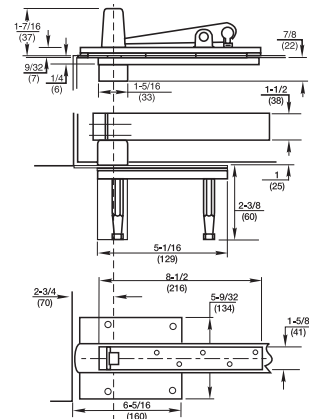
- Exterior or interior doors
- Weight to 1,000 lbs.
- Door Sizes up to 4'0" x 8'6" (1219 x 2591mm)
- Non-handed
- H340 top pivot included
- Bottom pivot is mortised into floor
- End load arm for minimum 2" (51mm) thick doors
- Pivot point centered in thickness of door
- Additional surface applied thrust bearing
- Door must have radius on pivot edge
- Pivot point remains constant at 2-3/4" (70mm) from the edge of the door
- Pivot set features sealed bearings for protection against weather and debris
- Not allowed for use on labeled doors and frames
- Furnished with wood and machine screws
- Available in plated finishes

### Optional Features

- Available with extended spindles in 1/2" (13mm) increments up to 2" (51mm) longer than standard



### Technical Information



## MODEL H117-3/4 X 587 ARM

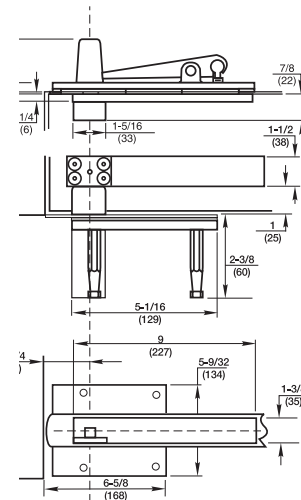
### Description & Features

Identical to the H117-3/4 except:

- Special side load arm for 1-3/4" (44mm) thick doors or for moving pivot point toward lock edge of door



### Technical Information



Center hung pivots are door hanging means only. To close doors, see floor closer sections of the catalogs.

\*For doors taller than 8'6" use top pivot H345 in lieu of H340



# CENTER HUNG TOP PIVOTS

## PIVOTS AND PIVOT SETS

### MODEL 320

#### Description & Features

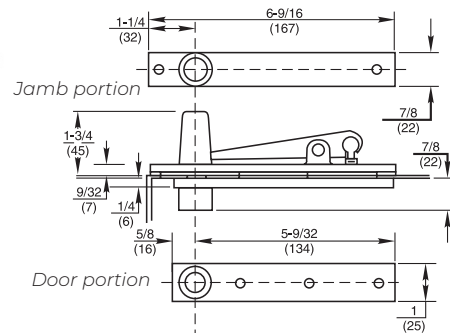
- Fully concealed
- Non-handed
- Standard top pivot for models 127-3/4, 128-3/4, and 176 pivot sets
- Walking beam-type pivot – 1/2" (13mm) diameter pivot pin with 3/4" (19mm) engagement
- Oil-impregnated sintered bronze bushing
- Completely concealed when door is closed
- Furnished with wood and machine screws
- Available in plated finishes

#### Optional Features

- Available with longer than standard pivot pins. Increments are 1/4" (6mm), 1/2" (13mm), 3/4" (19mm) only



#### Technical Information



### MODEL 340

#### Description & Features

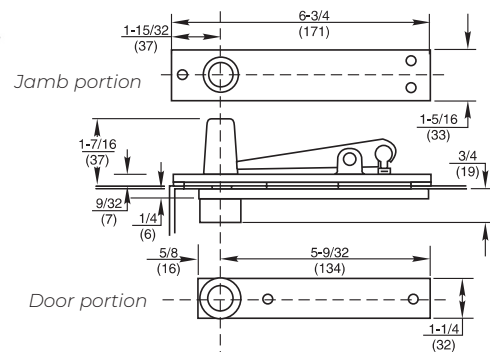
- Fully concealed
- Non-handed
- Standard top pivot for Models 370 and 117-3/4 pivot sets. Also used for 28, 30, 40 and 50 Series floor closers
- Walking beam-type pivot – 1/2" (13mm) diameter pivot pin with 3/4" (19mm) engagement
- Oil-impregnated sintered bronze bushing
- Completely concealed when door is closed
- Furnished with wood and machine screws
- Available in plated finishes

#### Optional Features

- Available with longer than standard pivot pins. Increments are 1/4" (6mm), 1/2" (13mm), 3/4" (19mm) only



#### Technical Information



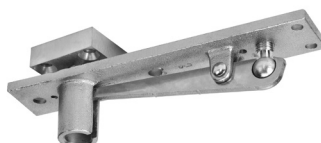
### MODEL 340 X 102

#### Description & Features

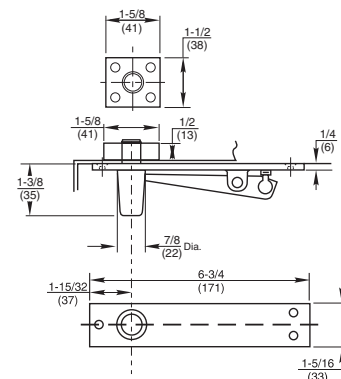
- Fully concealed
- Non-handed
- Optional top pivot for doors or frames that have conflicts with other hardware
- Can be inverted. The walking beam portion would be installed the header of the frame
- No finish plate supplied
- If inverted, finish plate should be ordered and priced separately
- Oil-impregnated sintered bronze bushing
- Completely concealed when door is closed
- Furnished with wood and machine screws
- For lighter weight doors use 320 x 102
- Available in plated finishes

#### Optional Features

- Available with longer than standard pivot pins. Increments are 1/4" (6mm) up to 3/4" (19mm)



#### Technical Information



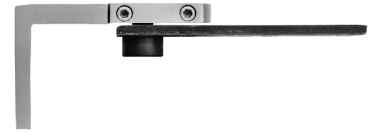
# CENTER HUNG TOP PIVOTS

## PIVOTS AND PIVOT SETS

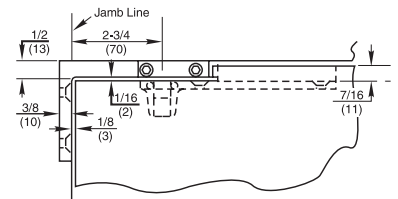
### MODEL 340 X AP3

#### Description & Features

- Surface mounted
- Handed doors up to 3'6" (1067mm) wide
- Used where no frame exists above door, or where it is not possible to anchor pivot into header of frame
- Center hung applications only
- Furnished with 340 door portion
- Part is handed to keep installation plate to inside of room or building
- Furnished with wood and machine screws
- Available in plated finishes



#### Technical Information



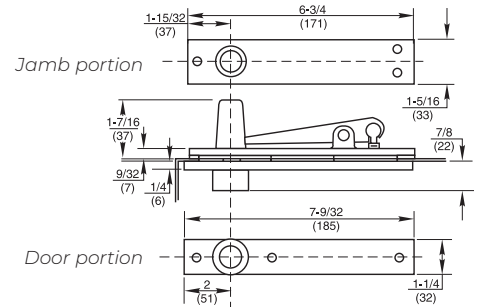
### MODEL H340

#### Description & Features

- Fully concealed
- Heavy-duty
- Non-handed
- Standard top pivot for model H117-3/4 pivot set. Also used for H28 and H40 Series floor closers
- Can be used with any floor closer or pivot set with pivot point 2-3/4" (70mm), or greater, from edge of the door
- Walking beam-type pivot – 11/16" (17mm) diameter pivot pin with 3/4" (19mm) engagement
- Heavy-duty needle bearing
- Completely concealed when door is closed
- Furnished with wood and machine screws
- Available in plated finishes



#### Technical Information



#### Optional Features

- Available with longer than standard pivot pins. Increments are 1/4" (6mm), 1/2" (13mm), 3/4" (19mm) only

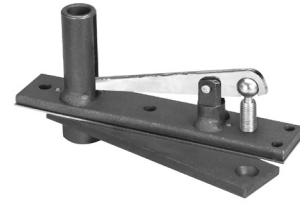
# CENTER HUNG TOP PIVOTS

## PIVOTS AND PIVOT SETS

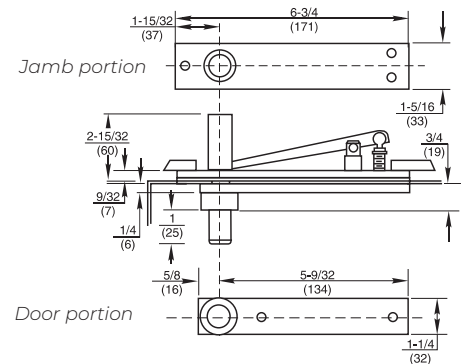
### MODEL 345

#### Description & Features

- Fully concealed
- Center hung
- Non-handed
- Earthquake tolerant
- Optional top pivot for taller doors
- Ideal for locations where there is a fear of dramatic building settling or for doors over 8'6" (2491mm) in height
- Long pivot pin engages in top of door 1-3/4" (44mm)
- Can be used with any center hung bottom pivot or floor closer whose pivot point is 2" (50mm), or greater, from the edge of the door.
- Walking beam-type pivot -1/2" (13mm) diameter pivot pin
- Oil-impregnated sintered bronze bushing
- Completely concealed when door is closed
- Furnished with wood and machine screws
- Available in plated finishes



#### Technical Information



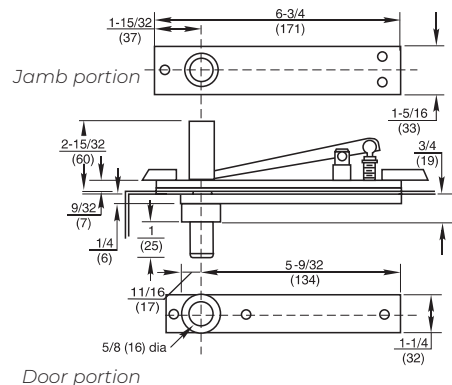
### MODEL H345

#### Description & Features

- Fully concealed
- Center hung
- Non-handed
- Earthquake tolerant
- Taller doors
- Ideal for locations where there is a fear of dramatic building settling or for doors over 8'6" (2591mm) in height
- Long pivot pin engages in top of door 1-3/4"(44mm)
- Can be used with any center hung bottom pivot or floor closer whose pivot point is 2-3/4" (70mm), or greater, from the edge of the door. Order pivot set or floor closer LTP (less top pivot) with H345 on separate line item
- Walking beam-type pivot - 11/16" (17mm) diameter pivot pin
- Heavy-duty needle bearing
- Completely concealed when door is closed
- Furnished with wood and machine screws
- Available in plated finishes



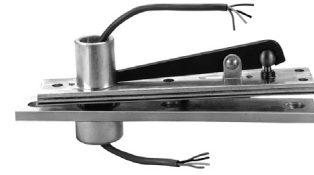
#### Technical Information



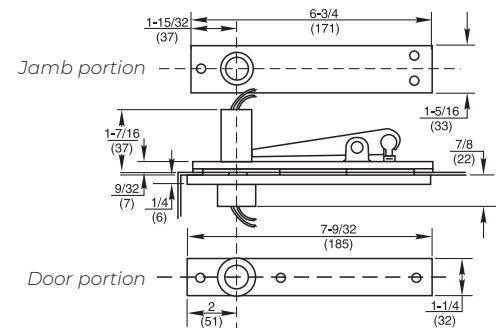
### MODEL E-H340

#### Description & Features

- Center hung
- Top pivot for power transfer
- Non-handed
- Walking beam type pivot – 11/16" (17mm) diameter pivot pin with 3/4" (19mm) engagement
- Can be used with any center hung bottom pivot or floor closer. Order the pivot set LTP (less top pivot) with E-H340 as a separate line.
- Heavy-duty needle bearing
- Specify two, four, six, eight or twelve wires
- Two-wire is available in 18 gauge and is not available ElectroLynx®
- Four, six, eight and twelve wires are 24 gauge and available in ElectroLynx®. Suffix QC x number of wires.
- Completely concealed when door is closed
- Furnished with wood and machine screws
- Available in plated finishes



#### Technical Information



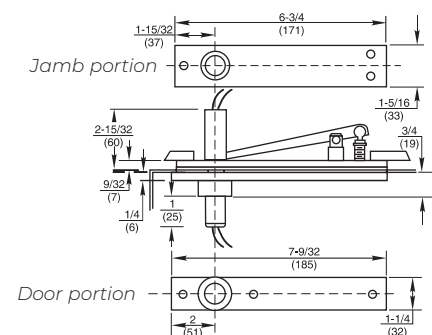
### MODEL E-H345

#### Description & Features

- Fully concealed
- Center hung
- Top pivot for power transfer
- Non-handed
- Earthquake tolerant
- Taller doors
- Walking beam-type pivot – 11/16" (17mm) diameter pivot pin
- Longer pivot pin throw engages in top of door 1-3/4" (44mm). Ideal for locations where there is a fear of dramatic building settling
- Can be used with any center hung bottom pivot or floor closer whose pivot point is 2-3/4" (70mm), or greater, from the edge of the door. Order the pivot set LTP (less top pivot) with E-H345 as a separate line
- Used with heavy-duty pivots & floor closers
- Heavy-duty needle bearing
- For doors over 8'6" in height
- Specify two, four, six, eight or twelve wires
- Two-wire is available in 18 gauge and is not available with ElectroLynx®
- Four, six, eight and twelve wires are 24 gauge and available in ElectroLynx®. Suffix QC# (number of wires)
- Furnished with wood and machine screws
- Available in plated finishes



#### Technical Information



# PARTS DRAWINGS

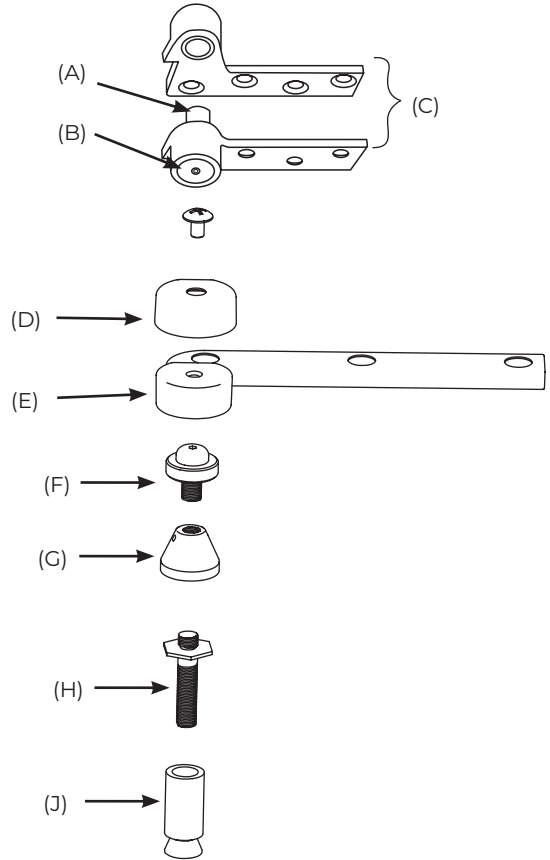
## PIVOTS AND PIVOT SETS

### MODEL 173 PIVOT SET

- |                                      |   |
|--------------------------------------|---|
| (A) Pivot pin assembly<br>181770-ASY | <b>Screw Kits</b><br>180<br>107014 - * machine (2 req.)<br>107114 - * wood (2 req.) |
| (B) Hex cap<br>181778-*              |   |
| (C) 180 top pivot                    | Bottom arm<br>107044 (machine)<br>107144 (wood)                                     |
| (D) Arm cap and screw<br>12029-AS    |   |
| (E) 3/4" offset arm LH<br>11706L*AS  |   |
| (E) 3/4" offset arm RH<br>11705R*AS  |   |
| (F) Spindle stud<br>173003           |   |
| (G) Spindle collar<br>173001         |   |
| (H) Mounting bolt<br>173002          |   |
| (J) Floor anchor<br>173010           |   |

#### 173 x 1-1/2" Offset

- |                                       |
|---------------------------------------|
| (E) 1-1/2" offset arm LH<br>11706L15* |
| (E) 1-1/2" offset arm RH<br>11705R15* |

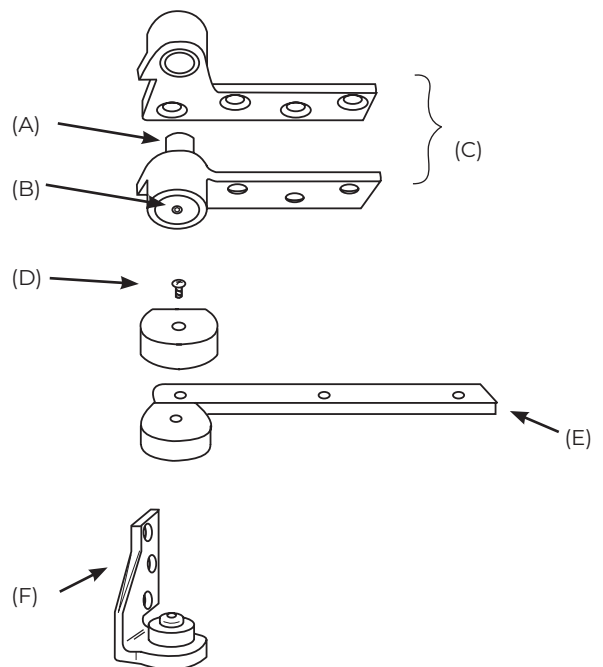


### MODEL 117-1/4 PIVOT SET

Right Hand Shown

#### 3/4" Offset Only

- |  |   |
|--|---|
| (A) Pivot pin assembly<br>181770-ASY   | <b>Screw Kits</b><br>180<br>107014 - * machine (2 req.)<br>107114 - * wood (2 req.) |
| (B) Hex cap<br>181778-*                |   |
| (C) 180 top pivot                      | 117-1/4<br>117127 - *   |
| (D) Arm cap and screw<br>12029-AS      |   |
| (E) Arm LH<br>11706LAS                 |   |
| (E) Arm RH<br>11705RAS                 |   |
| (F) Floor portion assy RH<br>17406R*AS |   |
| (F) Floor portion assy LH<br>17406L*AS |   |



\*specify finish

**MODEL 117, F117 PIVOT SET**

Right Hand Shown

**3/4" and 1-1/2" Offset**

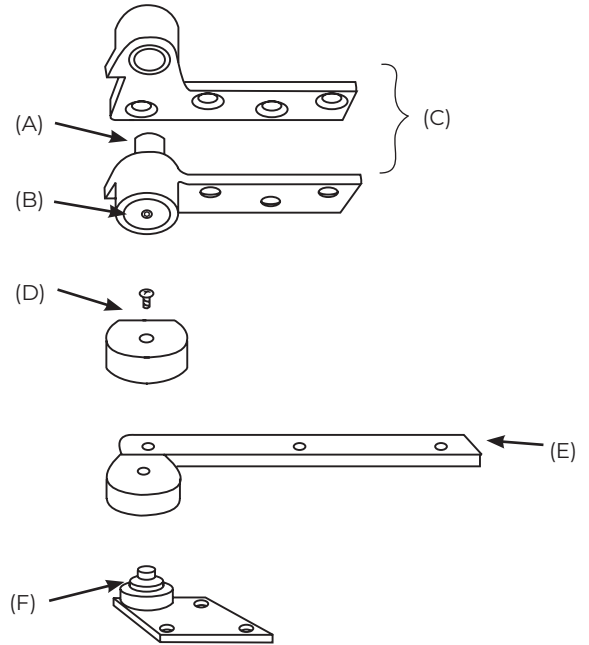
- (A) Pivot pin assembly  
181770-ASY
- (B) Hex cap  
181778-\*
- (C) 3/4" offset top pivot assembly  
180 (standard)  
F180 (Fire rated)  
180-20 (20 minutes)
- (D) Arm cap and screw  
12029-AS
- (E) 3/4" offset arm LH  
11706LAS
- (E) 3/4" offset arm RH  
11705RAS
- (F) 117 floor portion assy  
17526-AS  
  
F117 floor portion assy  
17559-AS

**117 x 1-1/2 OS**

- (E) 1-1/2" offset arm LH  
11706L15\*
- (E) 1-1/2" offset arm RH  
11705R15\*

**Screw Kits**

- 180  
107014 - \* machine (2 req.)  
107114 - \* wood (2 req.)
- Bottom pivot  
117127 -\*



**MODEL 195 PIVOT SET**

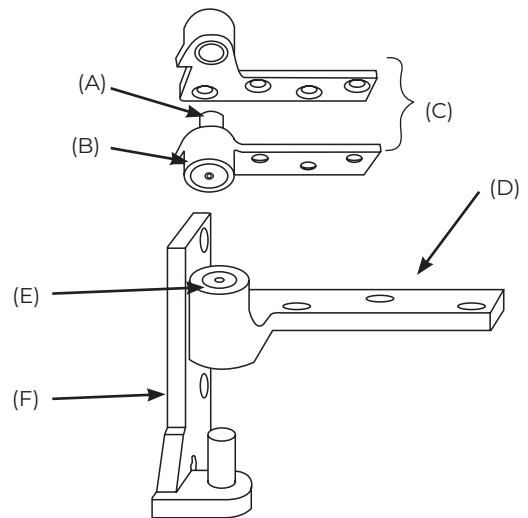
Right Hand Shown

**3/4" Offset**

- (A) Pivot pin assembly  
181770-ASY
- (B) Hex cap  
181778-\*
- (C) 3/4" offset top pivot assembly  
180 (standard)  
F180 (fire rated)
- (D) Door portion assy RH  
19503-AS
- (D) Door portion assy LH  
19504-AS
- (E) Cap  
19511-\*
- (F) Jamb portion assy RH  
(includes stud)  
19501-AS
- (F) Jamb portion assy LH  
(includes stud)  
19502-AS

**Screw Kits**

- 180  
107014 - \* Machine (2 req.)  
107114 - \* Wood (2 req.)
- 195  
107014 - \* Machine (2 req.)  
107114 - \* Wood (2 req.)



# PARTS DRAWINGS

## PIVOTS AND PIVOT SETS

### MODEL 547/F547 PIVOT SET

Right Hand Shown

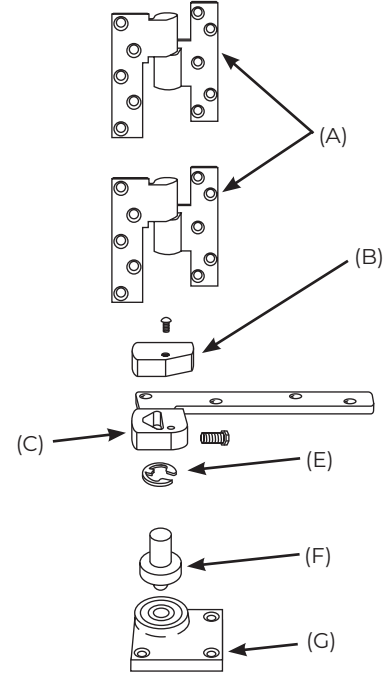
**3/4" Offset Only**

- (A) M190 intermediate pivot (for fire-rated doors order FM190)
- (B) Arm cap & screw  
012142R\*AS (RH, BRS)  
012142L\*AS (LH, BRS)  
012144R\*AS (RH, SS)  
012144L\*AS (LH, SS)
- (C) Arm x locking screw  
275177 RH  
275176 LH
- (D) Arm x locking screw pkg (5 per)  
88905-PKG
- (E) Arm shim kit (2 per)  
107071
- (F) Spindle stud  
14714
- (G) 147 floor portion x bearing  
14721-\*AS

#### Screw Kits

Bottom pivot  
107062\*

\*specify finish



**MODEL 147, F147 PIVOT SET**

Right Hand Shown

**3/4" and 1-1/2" Offset**

- (A) Pivot pin assembly  
181770-ASY
- (B) Hex cap  
181778-\*
- (C) 3/4" offset top pivot assembly  
180 (standard)  
F180 (fire rated)  
180-20 (20 minutes)
- (D) Arm cap & screw  
012142R\*AS (RH, BRS)  
012142L\*AS (LH, BRS)  
012144R\*AS (RH, SS)  
012144L\*AS (LH, SS)
- (E) Arm x locking screw  
3/4" Offset  
275177 RH  
3/4" Offset  
275176 LH
- (F) Arm lock screw pkg (5 per)  
88905-PKG
- (G) Arm shims (2 per)  
107071
- (H) Spindle stud  
14714
- (I) 147/F147 floor portion x bearing  
14721-\*AS

**147 & F147 1-1/2 OS**

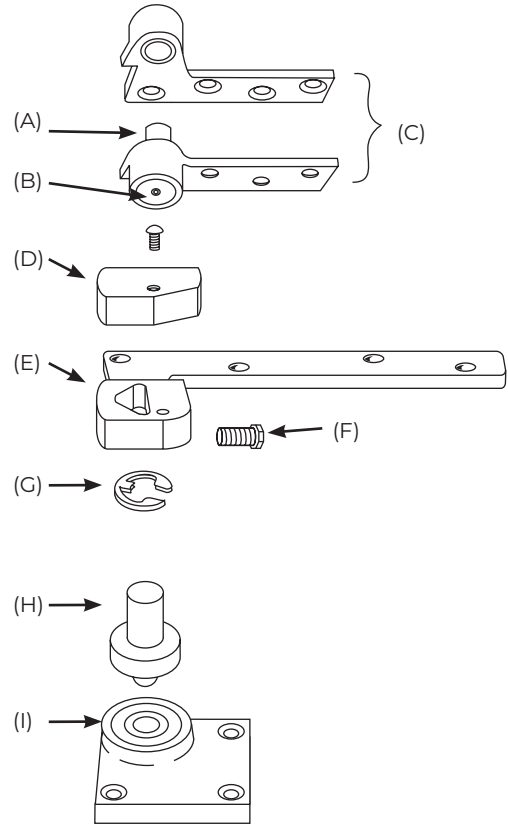
- (E) Arm x locking screw 1-1/2" offset  
275167-\*

**Screw Kits**

- 180/F180
- 107014-\* machine (2 req)
- 107114-\* wood (2 req)

- Arm
- 107044 machine
- 107144 wood
- 147/F147 bottom pivot
- 107062-\* (includes 107071)

\*specify finish





# PARTS DRAWINGS

## PIVOTS AND PIVOT SETS

### MODEL 117-1/2, F117-1/2 PIVOT SET

Right Hand Shown

#### 3/4" and 1-1/2" Offset

- (A) Pivot pin assembly  
181770-ASY
- (B) Hex cap  
181778-\*
- (C) 3/4" offset top pivot assembly  
180 (standard)  
F180 (fire rated)  
180-20 (20 minutes)
- (D) Arm cap & screw  
012142R\*AS (RH, BRS)  
012142L\*AS (LH, BRS)  
012144R\*AS (RH, SS)  
012144L\*AS (LH, SS)
- (E) Arm x locking screw  
3/4" offset  
275177 RH  
3/4" offset  
275176 LH
- (F) Arm lock screw pkg (5 per)  
88905-PKG
- (G) Arm shim kit (5 per)  
275065-PKG
- (H) Spindle shoulder collar  
16301\*
- (I) Floor plate x screws  
1174050-\*
- (J) 117-1/2 & F117-1/2 Floor Portion Assembly  
X01176350

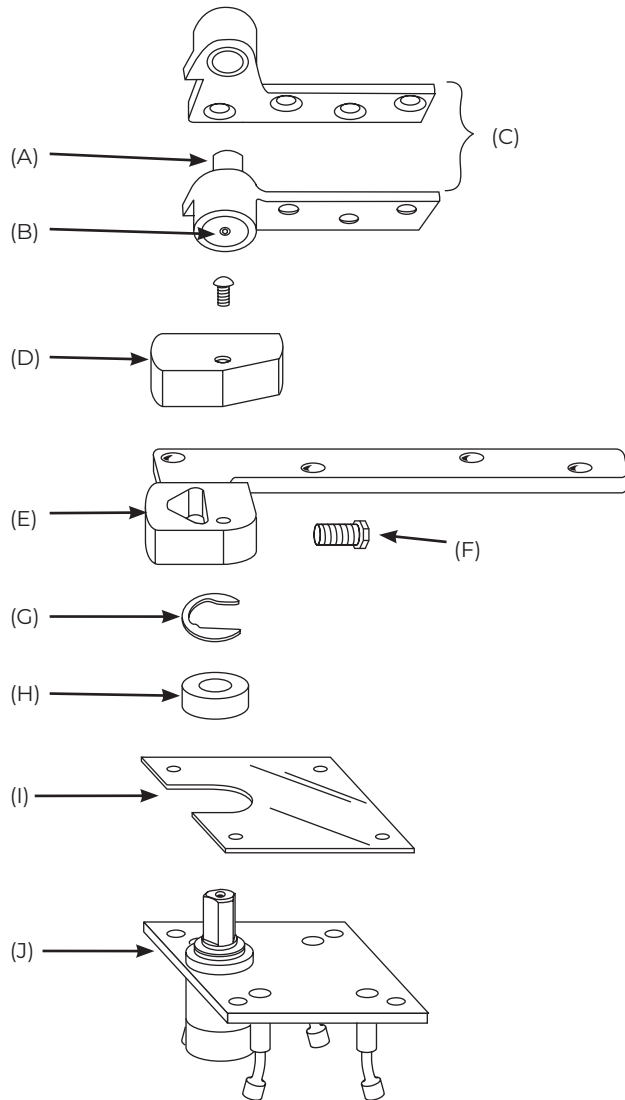
1-1/2" offset arm  
275167-\*

#### Screw Kits

- 180/F180
- 107014-\* machine (2 req)
- 107114-\* wood (2 req)

Arm  
107044-\* machine  
107144-\* wood

Floor Plate  
107004-\*



\*specify finish

**MODEL L147, FL147 PIVOT SET**

Right Hand Shown

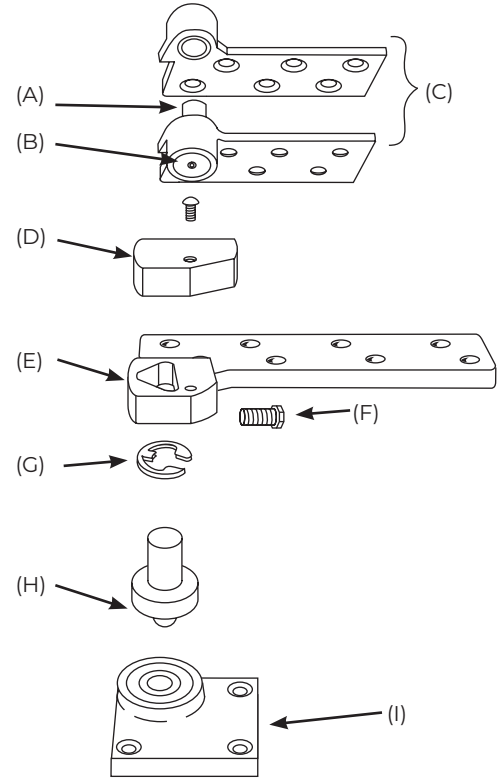
**3/4" Offset Only**

- (A) Pivot pin assembly  
181770-ASY
- (B) Hex cap  
181778-\*
- (C) 3/4" offset top pivot assembly  
L180 (standard)  
FL180 (Fire Rated)  
L180-20 (20 minutes)
- (D) Arm cap & screw  
012142R\*AS (RH, BRS)  
012142L\*AS (LH, BRS)  
012144R\*AS (RH, SS)  
012144L\*AS (LH, SS)
- (E) Arm x locking screw  
1-3/4" door  
18550-Asy RH  
18650-Asy LH
- (E) Arm x locking screw  
2" door  
18551-Asy RH  
18651-Asy LH
- (E) Arm x locking screw  
2-1/4" door  
18552-Asy RH  
18652-Asy LH
- (E) Arm x locking screw  
2-1/2" door  
18553-Asy RH  
18653-Asy LH
- (E) Arm x locking screw  
3" door  
18554-Asy RH  
18654-Asy LH
- (F) Arm lock screw pkg (5 per)  
88905-PKG
- (G) Arm shims (2 per)  
107071
- (H) Spindle stud  
14714
- (I) L147 floor portion x bearing  
14721-\*AS

**Screw Kits**

- 180/F180
- 107016-\* machine (2 req)
- 107116-\* wood (2 req)
- Arm
- 107048-\* machine (2 req)
- 107144-\* wood (2 req)
- L147/F147 bottom pivot
- 107062-\* (includes 107071)

*Special Note: FL147 is available for 1-3/4" doors only*



\*specify finish

# PARTS DRAWINGS

## PIVOTS AND PIVOT SETS

### MODEL L117, FL117 PIVOT SET

Right Hand Shown

#### 3/4" Offset Only

- (A) Pivot pin assembly  
181770-ASY
- (B) Hex cap  
181778-\*
- (C) 3/4" offset top pivot assembly  
L180 (standard)  
FL180 (rrire rated)  
L180-20 (20 minutes)
- (D) Arm cap & screw  
012142R\*AS (RH, BRS)  
012142L\*AS (LH, BRS)  
012144R\*AS (RH, SS)  
012144L\*AS (LH, SS)
- (E) Arm x locking screw  
1-3/4" door  
18550-ASY RH  
18650-ASY LH
- (E) Arm x locking screw  
2" door  
18551-ASY RH  
18651-ASY LH
- (E) Arm x locking screw  
2-1/4" door  
18552-ASY RH  
18652-ASY LH
- (E) Arm x locking screw  
2-1/2" door  
18553-ASY RH  
18653-ASY LH
- (E) Arm x locking screw  
3" door  
18554-ASY RH  
18654-ASY LH
- (F) Arm lock screw pkg (5 per)  
88905-PKG
- (G) Arm shim kit (5 per)  
275065-PKG
- (H) Spindle shoulder collar  
259500-\*
- (I) Heavy-duty thrust-bearing  
41204-PKG
- (J) Floor plate x screws  
1174050-\*
- (K) Floor portion assembly  
(includes 41204-PKG)  
X01176351

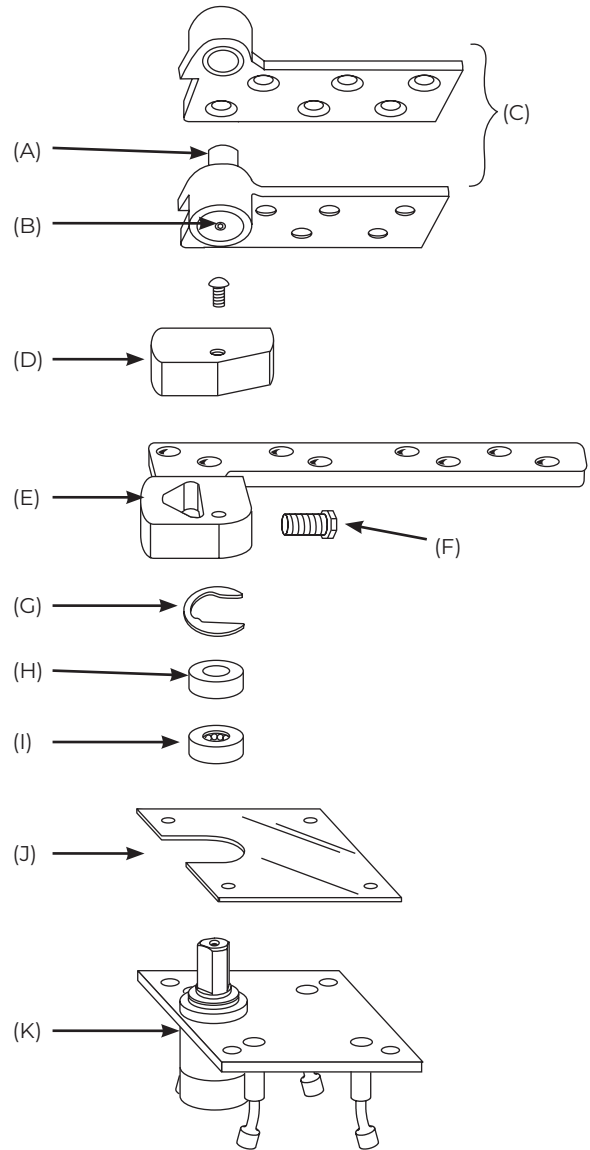
#### Screw Kits

L180/FL180  
107016-\* machine (2 req)  
107116-\* wood (2 req)

Arm  
107048-\* machine  
107114-\* wood

Floor Plate  
107004-\* machine (2 req)

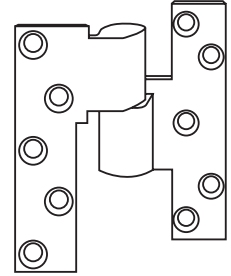
*Special note: FL117 is available for  
1-3/4" doors only*



\*specify finish

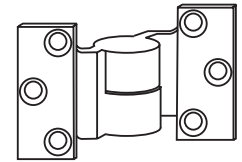
**M19, M190, ML19, FA19, 219, 319, FM19, FM190,  
ALL ELECTRIFIED M19 INTERMEDIATE PIVOTS**

Model	Description
107015-*	Metal screws for one leaf
107115-*	Wood screws for one leaf
181778-*	Hex cap
<b>219, 319 and 419 Also Use:</b>	
107059-*	Includes screws and backplate
	Torx® available - suffix "T"



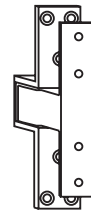
**MODEL 119 INTERMEDIATE PIVOT**

Model	Description
107014-*	Metal screws for one leaf
107114-*	Wood screws for one leaf
	Torx® available - suffix "T"



**MODEL F519 POCKET PIVOT**

Model	Description
619005-*	Screw kit
	Torx® available



\*specify finish

# PARTS DRAWINGS

## PIVOTS AND PIVOT SETS

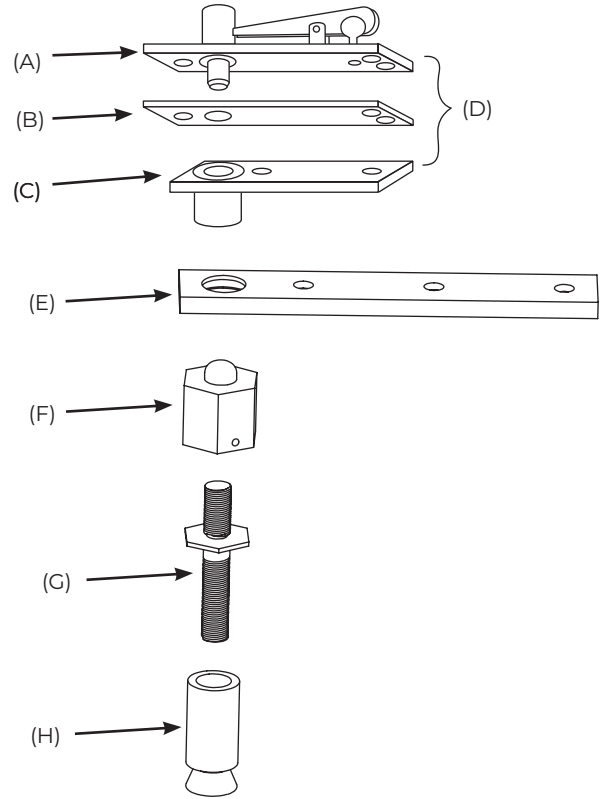
### MODEL 176 PIVOT SETS

- (A) Top pivot jamb portion  
640-ASY
- (B) Top pivot plate x screws  
12724-\*PK (SS)  
12720-\*PK (BRS)
- (C) Top pivot door portion  
12716
- (E) Bottom arm  
12704
- (F) Adj bearing spindle  
176001
- (G) Mounting bolt  
176002
- (H) Cement anchor  
173010

**Screw Kits**

320  
107340 machine & wood

Arm  
173176 machine & wood

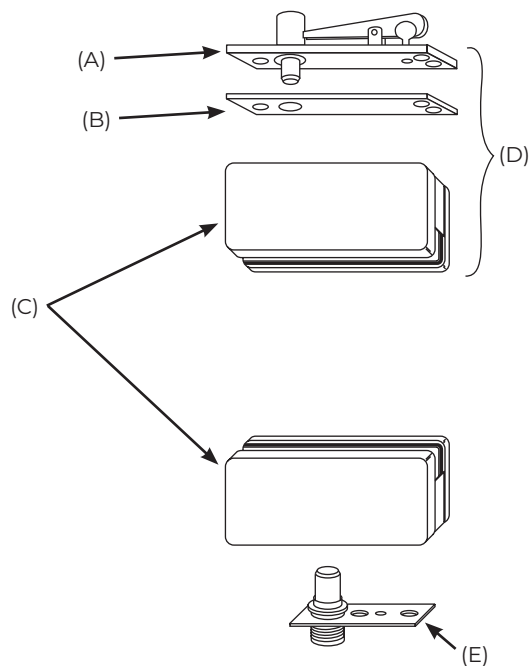


### MODEL 178 PIVOT SETS

- (A) Top jamb portion  
42801
- (B) Finish plate  
012202-\*PK (BRS)  
012204-\*PK (SS)
- (C) Patch fitting  
7495-\*
- (D) Top patch  
7494-\* PK
- (E) Bottom pivot floor portion  
74104

**Screw Kit**

Top pivot  
107329



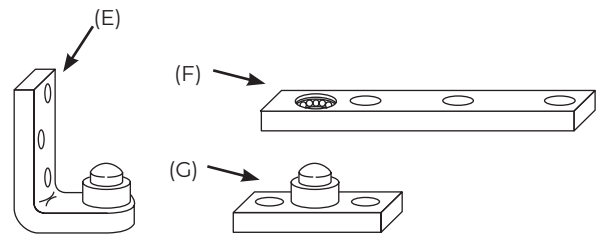
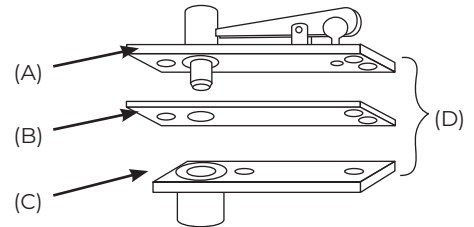
*\*specify finish*

**MODEL 127-3/4 & 128-3/4 PIVOT SETS**

- (A) Top pivot jamb portion  
640-ASY
- (B) Top pivot plate x screws  
12724-\*PK (SS)  
12720-\*PK (BRS)
- (C) Top pivot door portion  
12716
- (D) 320 top pivot
- (E) Jamb portion & stud  
assembly (127-3/4 only)  
12711-\*
- (F) Arm & bearing assembly  
12714
- (G) Floor pivot & stud  
assembly (128-3/4 only)  
71521-\*AS

**Screw Kits**

320  
107340 machine & wood  
127-3/4, 128-3/4  
117127-\*



*\*specify finish*

# PARTS DRAWINGS

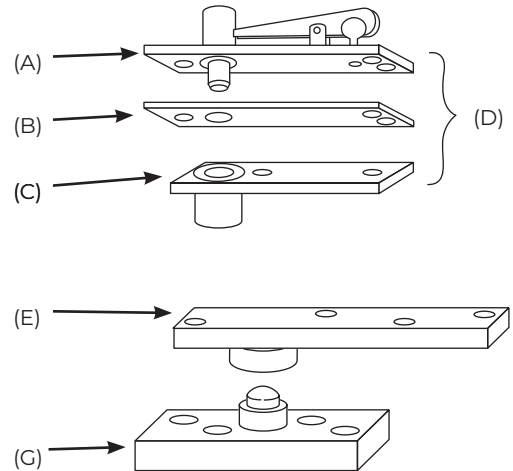
## PIVOTS AND PIVOT SETS

### MODEL 370 PIVOT SET

- (A) Top pivot jamb portion  
3065
- (B) Finish plate x screws  
012202-\*PK (BRS)  
012204-\*PK (SS)
- (C) Top pivot door portion  
30243
- (D) 340 top pivot
- (E) Arm  
22131
- (G) Floor portion and stud  
22121-\*

#### Screw Kits

- 340
- 107329 machine & wood
- 370 floor portion
- 107370-\*



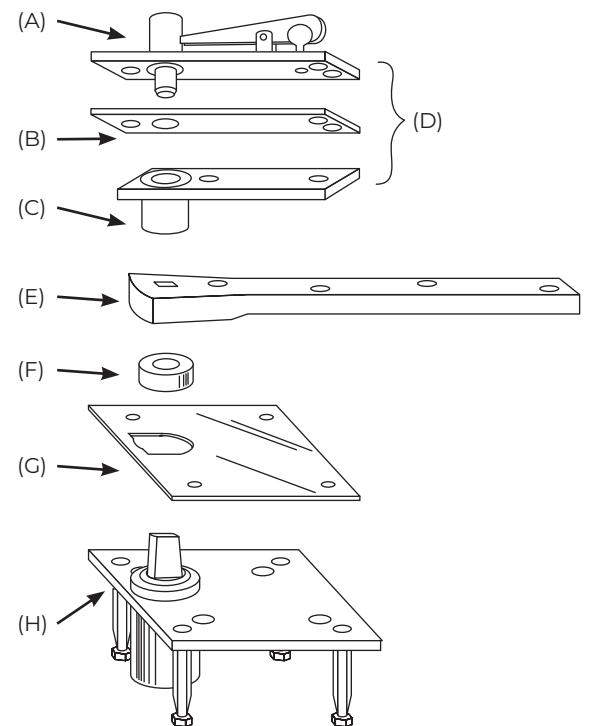
### MODEL 117-3/4 PIVOT SET

- (A) Top pivot jamb portion  
3065
- (B) Top pivot finish plate  
012202-\*PK (BRS)  
012204-\*PK (SS)
- (C) Top pivot door portion  
30243
- (D) 340 top pivot
- (E) Arm  
185.75
- (F) Spindle collar  
16301\*
- (G) Floor plate x screws  
1174020-\*
- (H) Floor portion assembly  
X01176320

#### Screw Kits

- 340
- 107329 machine & wood
- Arm
- 107064
- Floor plate
- 107004-\* machine & wood

\*specify finish



**MODEL H117-3/4 PIVOT SET**

- (A) Top pivot jamb portion  
308548
- (B) Top pivot finish plate  
012202-\*PK (BRS)  
012204-\*PK (SS)
- (C) Top pivot door portion  
30141
- (D) 340 top pivot
- (E) Standard end load arm package  
262022
- (F) Spindle shoulder collar  
259500-\*
- (G) Heavy-duty thrust bearing  
41204-PKG
- (H) 587 side load arm package  
262587
- (I) Floor plate x screws  
1174020-\*
- (J) Floor portion assembly X01176322  
includes 41204-PKG

**Screw Kits**

H340  
107329 machine & wood

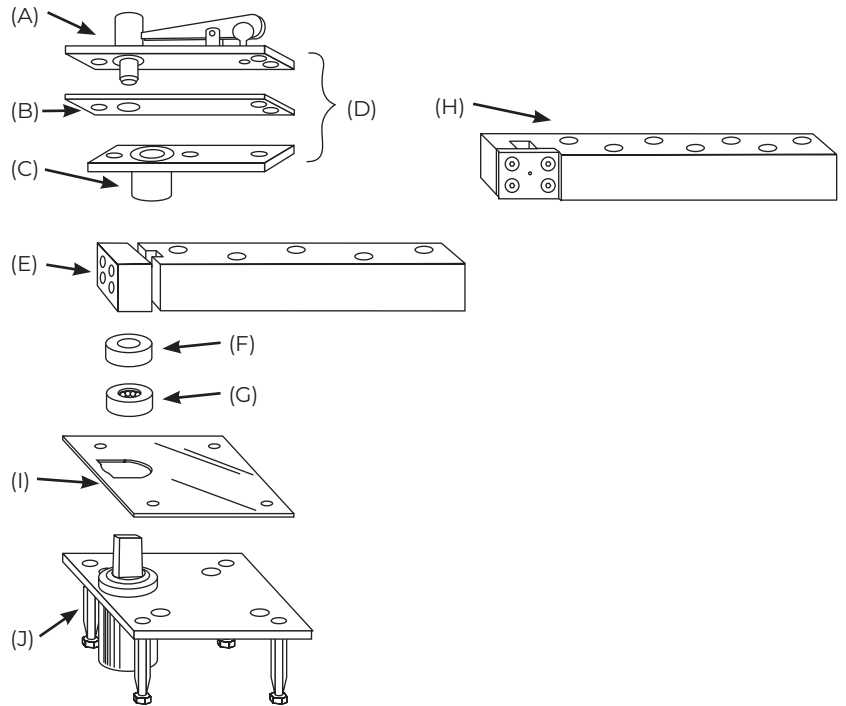
Arm  
107045 machine  
107145 wood

587 arm  
107077 machine  
107177 wood

Floor plate  
107004-\*

Arm shim  
107060

*\*specify finish*





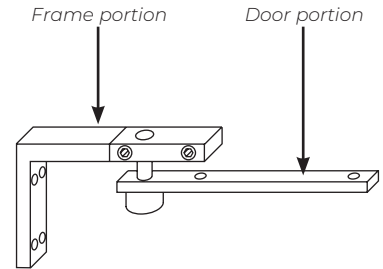
# PARTS DRAWINGS

## PIVOTS AND PIVOT SETS

### ANGLE PIVOT-3

Model	Description
107047*	AP3 screw kit
30243	Door portion
30814**	Frame portion (handed)

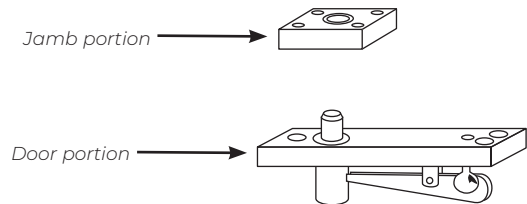
Torx® not available.



### TOP PIVOT 340 X 102 OR 320 X 102

Model	Description
10210-*AS	Jamb portion
3065	Door portion
640-ASY	Door portion (320 x 102)
107012*	Jamb portion screw kit
107329	Door portion screw kit

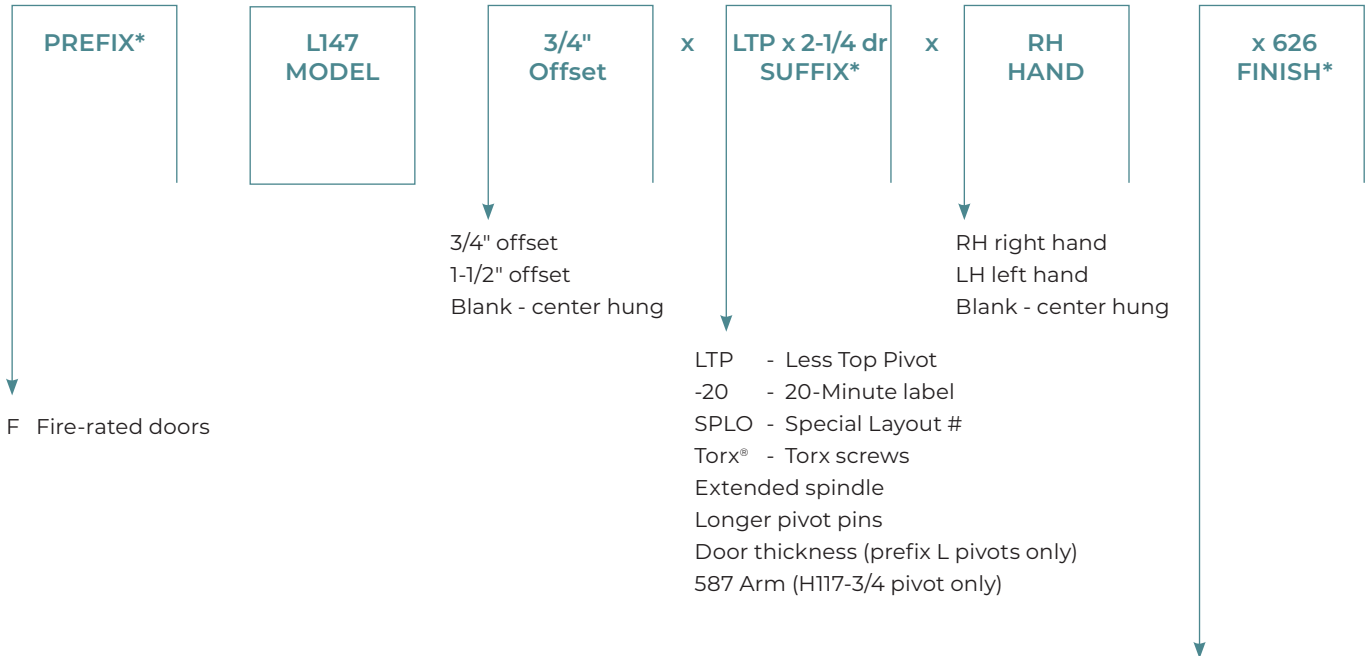
Torx® not available.



\*specify finish

# HOW TO ORDER

## PIVOTS AND PIVOT SETS



\* All options (prefixes & suffixes) and finishes may not be available on each pivot/pivot set. Refer to the individual product pages for more details.

ANSI/BHMA (US)	Description
605 (US3)	Bright brass, clear coated
606 (US4)	Satin brass, clear coated
611 (US9)	Bright bronze, clear coated
612 (US10)	Satin bronze, clear coated
613 (US10B)	Antique bronze
613E (US10BE)	Dark oxidized satin bronze - equiv.
618 (US14)	Bright nickel plated, clear coated
619 (US15)	Satin nickel plated, clear coated
622 (US19)	Flat black coated
625 (US26)	Bright chrome plated over nickel
626 (US26D)	Satin chrome plated over nickel
689 (US28)	Aluminum, painted
690 (US20)	Dark bronze, painted
691 (US10)	Light bronze, painted
693	Black, painted
696 (US4)	Gold, painted
BSP	Black suede powder coat
WSP	White suede powder coat

# PRODUCT COMPARISON CHARTS

## PIVOTS AND PIVOT SETS

### OFFSET HUNG PIVOT SETS

	173	117-1/4	117	165	195	547	147	117-1/2	L147	L117
Application	Standard	Standard	Standard	For doors without bottom pivots	Standard	Arch top doors or overhead concealed closers	Standard	Standard	Lead lined, heavy or high traffic doors	Lead lined, heavy or high traffic doors
3/4" offset standard	•	•	•	•	•	•	•	•	•	•
1-1/2" offset optional <sup>1</sup>	•		•				•	•		
Handed	•	•	•	•	•	•	•	•	•	•
Exterior door				•	•	•	•	•	•	•
Interior door	•	•	•	•	•	•	•	•	•	•
Door weight	150 lbs.	250 lbs.	300 lbs.	300 lbs.	450 lbs.	500 lbs.	600 lbs.	650 lbs.	800 lbs.	1750 lbs.
Maximum door swing <sup>2</sup>	180°	180°	180°	180°	180°	180°	180°	180°	180°	180°
Maximum Door width	36"	42"	42"	42"	48"	42"	48"	48"	48"	48"
1-3/4" Standard door thickness	•	•	•	•	•	•	•	•	•	•
Optional door thicknesses available <sup>3</sup>									•	•
Standard top pivot (included)	180	180	180	H180	180	N/A	180	180	L180	L180
Intermediate pivot (sold separately)	119	119	119	(2) M190's included	119 or M19	(2) M190's included	M19	M19	ML19	ML19
Bottom pivot mounting	Mounts directly to concrete floor	Mortised into side jamb	Mortised into floor	N/A	Mortised into side jamb	Mounts directly to floor	Mounts directly to floor	Mortised into floor	Mounts directly to floor	Mortised into floor
Extended spindles available <sup>4</sup>		•	•		•	•	•	•	•	•
Optional Features			F, -20		F	F, -20	F, -20	F, -20	F, -20	F, -20
Furnished with wood and machine screws		•	•	•	•	•	•	•	•	•

1 Door weight is less when 1-1/2" offset is ordered

2 Trim permitting

3 Can accommodate the following door thicknesses: 2", 2-1/4", 2-1/2" or 3". Specify when ordering

4 1/2" increments up to 2"

Options	Designation
Fire rated	F
20 minute label	-20

# PRODUCT COMPARISON CHARTS

## PIVOTS AND PIVOT SETS

### INTERMEDIATE PIVOTS

	119	219	319	419	FA19	M19	M190	ML19
<b>Application</b>	Standard	Flush door and frame applications	Flush door and frame applications	Flush door and frame applications	Behavioral health or high security	Standard	Use when frame conditions do not allow standard top pivot	Lead-lined, heavy or high traffic
<b>3/4" offset standard</b>	.	.	.	.	.	.	.	.
<b>1-1/2" offset optional</b>						.	.	
<b>Handed</b>	.	.	.	.	.	.	.	.
<b>Standard door thickness</b>	1-3/4"	1-3/4" only	1-3/4"	1-3/4" only	1-3/4"	1-3/4"	1-3/4"	1-3/4"
<b>Optional door thicknesses available<sup>1</sup></b>								.
<b>Mounting</b>	Full mortise	Half surface	Half mortise	Full surface	Full mortise	Full mortise	Heavy-duty Full mortise	Full mortise
<b>Maintains door alignment</b>	.	.	.	.	.	.	.	.
<b>Load bearing</b>							Lateral load bearing	.
<b>Heavy-duty needle bearing</b>							.	
<b>Optional Features</b>		-20	-20	-20	F is standard	F, -20	F, -20	F, -20
<b>Furnished with wood and machine screws</b>	.	.	.	.	.	.	.	.

<sup>1</sup> Can accommodate the following door thicknesses: 2", 2-1/4", 2-1/2" or 3". Specify when ordering.

Options	Designation
Fire rated	F
20 minute label	-20

# PRODUCT COMPARISON CHARTS

## PIVOTS AND PIVOT SETS

### ELECTRIFIED INTERMEDIATE PIVOTS

	E-M19 <sup>1,3</sup>	E-M19U <sup>2</sup>	E-ML19 <sup>1,4</sup>
<b>Application</b>	Electric pivot for power transfer	Electric pivot for power transfer and for electrified panic devices with large inrush current	Electric pivot for power transfer
<b>3/4" offset standard</b>	•	•	•
<b>1-1/2" offset optional</b>	•		
<b>Handed</b>	•	•	•
<b>Standard door thickness</b>	1-3/4"	1-3/4"	1-3/4" only
<b>Available wires</b>	4, 6, 8 or 12 (24 gauge)	2 (18 gauge)	4, 6, 8 or 12 (24 gauge)
<b>Non-load bearing</b>	•	•	•
<b>Options</b>	F, -20, QC		F, -20, QC
<b>Furnished with wood and machine screws</b>	•	•	•

Note: Door and jamb portion are factory assembled and cannot be separated

- 1 24-gauge wire is rated at 2 amps for low voltage, Class II wiring applications
- 2 18-gauge wire is rated at 2 amps continuously. UL listed for 24-volt, Class I wiring
- 3 Always use M19 intermediate pivot to install door
- 4 Always use ML19 intermediate pivot to install door

Options	Designation
Fire rated	F
20 minute label	-20
ElectroLynx®	QC

# PRODUCT COMPARISON CHARTS

## PIVOTS AND PIVOT SETS

### CENTER HUNG PIVOT SETS

	176	178	127-3/4	128-3/4	270	370	375	117-3/4	H117-3/4	H117-3/4 x 587 Arm
<b>Application</b>	Standard	Full glass doors	Standard	Standard	Standard	Standard	Standard	Standard	Heavy-Duty	Heavy-Duty
<b>Non-Handed</b>	•	•	•	•	•	•	•	•	•	•
<b>Exterior door</b>					•	•	•	•	•	•
<b>Interior door</b>	•	•	•	•	•	•	•	•	•	•
<b>Door weight</b>	150 lbs.	175 lbs.	200 lbs.	250 lbs.	300 lbs.	500 lbs.	500 lbs.	600 lbs.	1000 lbs.	1000 lbs.
<b>Maximum Door width</b>	36"	36"	42"	42"	44"	44"	44"	48"	48"	48"
<b>Standard door thickness</b>	1-3/8" to 1-3/4"	3/8" - 1/2" glass	1-3/4"	1-3/4"	1-3/4"	1-3/4"	1-3/4"	1-3/4"	2"	1-3/4"
<b>Standard top pivot (included)</b>	320	N/A	320	320	Unique to 270	340	345	340	H340	H340
<b>Bottom pivot mounting</b>	Mounts directly into concrete floor	Mounts directly to floor	Mortised into side jamb	Mounts directly to floor	Mounts directly to floor	Mounts directly to floor	Mounts directly to floor	Mortised into floor	Mortised into floor	Mortised into floor
<b>Extended spindles available<sup>1</sup></b>			•	•		•	•	•	•	•
<b>Furnished with wood and machine screws</b>	•		•	•	•	•	•	•	•	

<sup>1</sup>1-1/2" increments up to 2"

PIVOTS AND PIVOT SETS

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