# CHAPTER P8

## OTHER REQUIRED COMPONENTS FOR SUSPENDED SYSTEMS

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MEMBER

KINETICS™ Seismic Design Manual

Dublin, Ohio, USA • Mississauga, Ontario, Canada
KHRC-A ADJUSTABLE STIFFENER KIT

DRAWING # S-90.500-1A

RELEASE DATE: 12/19/03

KHRC-A INNER CLAMP
HALF BY KINETICS.

KHRC-A OUTER CLAMP
HALF BY KINETICS.

HOLE #1
HOLE #2

HOLE #1
HOLE #2

L 1 X 1 X 0.13
L 1.5 X 1.5 X 0.25

THUMB SCREW
BY KINETICS
IN HOLE #1
FOR L 1 X 1 AND
L 1.5 X 1.5 ANGLES.

THUMB SCREW
BY KINETICS
IN HOLE #1
FOR L 2 X 2 ANGLES.

KHRC-A ADJUSTABLE STIFFENER KIT

DRAWING # S-90.500-1A

RELEASE DATE: 12/19/03

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HALF BY KINETICS.

KHRC-A OUTER CLAMP
HALF BY KINETICS.

HOLE #1
HOLE #2

HOLE #1
HOLE #2

L 2 X 2 X 0.25

L 2 X 2 X 0.25

L 1 X 1 X 0.13
L 1.5 X 1.5 X 0.25

THUMB SCREW
BY KINETICS
IN HOLE #1
FOR L 2 X 2 ANGLES.

THUMB SCREW
BY KINETICS
IN HOLE #1
FOR L 1 X 1 AND
L 1.5 X 1.5 ANGLES.

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HOLE #1
HOLE #2

HOLE #1
HOLE #2

L 2 X 2 X 0.25

L 2 X 2 X 0.25

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KHRC-A OUTER CLAMP
HALF BY KINETICS.

HOLE #1
HOLE #2

HOLE #1
HOLE #2

L 2 X 2 X 0.25

L 2 X 2 X 0.25

L 1 X 1 X 0.13
L 1.5 X 1.5 X 0.25

THUMB SCREW
BY KINETICS
IN HOLE #1
FOR L 2 X 2 ANGLES.

THUMB SCREW
BY KINETICS
IN HOLE #1
FOR L 1 X 1 AND
L 1.5 X 1.5 ANGLES.

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KHRC-A OUTER CLAMP
HALF BY KINETICS.

HOLE #1
HOLE #2

HOLE #1
HOLE #2

L 2 X 2 X 0.25

L 2 X 2 X 0.25

L 1 X 1 X 0.13
L 1.5 X 1.5 X 0.25

THUMB SCREW
BY KINETICS
IN HOLE #1
FOR L 2 X 2 ANGLES.

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IN HOLE #1
FOR L 1 X 1 AND
L 1.5 X 1.5 ANGLES.

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HALF BY KINETICS.

KHRC-A OUTER CLAMP
HALF BY KINETICS.

HOLE #1
HOLE #2

HOLE #1
HOLE #2

L 2 X 2 X 0.25

L 2 X 2 X 0.25

L 1 X 1 X 0.13
L 1.5 X 1.5 X 0.25

THUMB SCREW
BY KINETICS
IN HOLE #1
FOR L 2 X 2 ANGLES.

THUMB SCREW
BY KINETICS
IN HOLE #1
FOR L 1 X 1 AND
L 1.5 X 1.5 ANGLES.

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STIFFENER ANGLE BY OTHERS. SIZE RECOMMENDED ON TABLE 4b OF KINETICS "SITE SPECIFIC FORCE CLASS TABLES".

KHRC-A ADJUSTABLE ANGLE STIFFENER KIT BY KINETICS.

COUPLING & ANCHOR BY OTHERS.

THREADED HANGER ROD BY OTHERS.

KSWC CABLE RESTRAINT KIT SHOWN BY KINETICS.

KCHB CLEVIS HANGER BRACE KIT SHOWN BY KINETICS.

IMPORTANT NOTES:
1.) THE VALUES OF L2 AND (L1+L3) MUST NOT EXCEED THE MAXIMUM UNSTIFFENED HANGER ROD LENGTH FROM TABLE 4b OF KINETICS "SITE SPECIFIC FORCE CLASS TABLES".
2.) A MINIMUM OF TWO (2) KHRC-A'S ARE REQUIRED PER HANGER ROD INSTALLATION.
KHRC-A ADJUSTABLE STIFFENER KIT

STIFFENER ANGLE BY OTHERS. SIZE RECOMMENDED ON TABLE 4b OF KINETICS "SITE SPECIFIC FORCE CLASS TABLES".

KHRC-A ADJUSTABLE ANGLE STIFFENER KIT BY KINETICS.

ISOLATION BY KINETICS

L1

L2

L3

0.38 MAX.

0.25 MAX.

VERTICAL LIMIT STOP @ ALL RESTRAINT LOCATIONS.

THREADED HANGER ROD BY OTHERS.

KSWC CABLE RESTRAINT KIT SHOWN BY KINETICS.

KCHB CLEVIS HANGER BRACE KIT SHOWN BY KINETICS.

IMPORTANT NOTES:
1.) THE VALUES OF L2 AND (L1+L3) MUST NOT EXCEED THE MAXIMUM UNSTIFFENED HANGER ROD LENGTH FROM TABLE 4b OF KINETICS "SITE SPECIFIC FORCE CLASS TABLES".

2.) A MINIMUM OF TWO (2) KHRC-A'S ARE REQUIRED PER HANGER ROD INSTALLATION.

CLEVIS HANGER BY OTHERS.
**KCHB CLEVIS HANGER BRACE**

**DRAWING #** S-90.600-1A  
**RELEASE DATE:** 12/19/03

**KCHB BRACE ANGLE STRAP**

**EACH KIT CONTAINS (2).**

**KCHB BRACE ANGLE**

**EACH KIT CONTAINS (1).**

**PER MODEL DESCRIPTION IN TABLE AT THE RIGHT.**

### PIPE SIZE:

<table>
<thead>
<tr>
<th>ØDmax (in.)</th>
<th>ØDmin (in.)</th>
<th>L (in.)</th>
<th>A (in.)</th>
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<tr>
<td>1-1/2&quot;</td>
<td>0.50</td>
<td>1.88</td>
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<tr>
<td>2&quot;</td>
<td>0.50</td>
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<td>0.25</td>
</tr>
<tr>
<td>2-1/2&quot;</td>
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<td>2.88</td>
<td>0.25</td>
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<tr>
<td>3&quot;</td>
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<td>3.50</td>
<td>0.25</td>
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<td>3-1/2&quot;</td>
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<td>4.00</td>
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<tr>
<td>4&quot;</td>
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<td>4.50</td>
<td>0.25</td>
</tr>
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<td>5.56</td>
<td>0.50</td>
</tr>
<tr>
<td>6&quot;</td>
<td>0.75</td>
<td>6.63</td>
<td>0.75</td>
</tr>
<tr>
<td>7&quot;</td>
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<td>8.63</td>
<td>0.75</td>
</tr>
<tr>
<td>8&quot;</td>
<td>0.75</td>
<td>10.75</td>
<td>0.75</td>
</tr>
<tr>
<td>9&quot;</td>
<td>0.75</td>
<td>12.75</td>
<td>0.75</td>
</tr>
<tr>
<td>10&quot;</td>
<td>0.75</td>
<td>14.00</td>
<td>0.88</td>
</tr>
<tr>
<td>11&quot;</td>
<td>0.75</td>
<td>16.00</td>
<td>0.88</td>
</tr>
<tr>
<td>12&quot;</td>
<td>0.75</td>
<td>18.00</td>
<td>0.88</td>
</tr>
<tr>
<td>13&quot;</td>
<td>0.75</td>
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<tr>
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<td>0.75</td>
<td>28.00</td>
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<tr>
<td>18&quot;</td>
<td>0.75</td>
<td>30.00</td>
<td>0.88</td>
</tr>
</tbody>
</table>

### KCHB MODEL DESCRIPTION:

- **KCHB-01:** 1-1/2" PIPE SIZE
- **KCHB-02:** 2" PIPE SIZE
- **KCHB-03:** 2-1/2" PIPE SIZE
- **KCHB-04:** 3" PIPE SIZE
- **KCHB-05:** 3-1/2" PIPE SIZE
- **KCHB-06:** 4" PIPE SIZE
- **KCHB-07:** 5" PIPE SIZE
- **KCHB-08:** 6" PIPE SIZE
- **KCHB-09:** 7" PIPE SIZE
- **KCHB-10:** 8" PIPE SIZE
- **KCHB-11:** 9" PIPE SIZE
- **KCHB-12:** 10" PIPE SIZE
- **KCHB-13:** 11" PIPE SIZE
- **KCHB-14:** 12" PIPE SIZE
- **KCHB-15:** 13" PIPE SIZE
- **KCHB-16:** 14" PIPE SIZE
- **KCHB-17:** 15" PIPE SIZE

**L ØD ØDmin ØDmax**

- ØDmin (in.): 0.38 0.69 0.88
- ØDmax (in.): 0.75 1.25 1.50

**KINETICS™ Seismic Design Manual**

MEMBER

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KCHB CLEVIS HANGER BRACE
DRAWING # S-90.600-1B

KSWC CABLE RESTRAINT KIT BY KINETICS

5/8-11 UNC HANGER ROD SHOWN BY OTHERS.

5" SCHED. 40 PIPE SHOWN.

STEP 1:
POSITION CLEVIS HANGER BOLT; WRAP CLEVIS ANGLE & BOLT AROUND ANGLE THROUGH SLOT. PULL TIGHT AND BEND AS SHOWN ABOVE.

STEP 2:
WRAP EXCESS ANGLE BRACE STRAP AROUND ANGLE & BOLT AS SHOWN ABOVE.

KCHB CABLE ANGLE STRAP (2) PER Kit BY KINETICS.

KCHB CABLE ANGLE STRAP (1) PER Kit BY KINETICS.

KCHB CLEVIS HANGER BRACE KIT BY KINETICS.

KCHB CABLE ANGLE KIT BY KINETICS.

KSWC CABLE RESTRAINT KIT BY KINETICS.

KCHB CABLE ANGLE KIT BY KINETICS.

KCHB CLEVIS HANGER BRACE KIT BY KINETICS.

KSWC CABLE RESTRAINT KIT BY KINETICS.

KCHB CABLE ANGLE KIT BY KINETICS.

KSWC CABLE RESTRAINT KIT BY KINETICS.

KCHB CABLE ANGLE KIT BY KINETICS.

KSWC CABLE RESTRAINT KIT BY KINETICS.

KCHB CABLE ANGLE KIT BY KINETICS.
Kinetics KSBC Seismically Rated Beam Clamp

There is frequently a desire to attach seismic restraints to roof or floor support I-beams. Equally often the ability to add holes to these beams for bolts or to weld tabs to them is not possible or practical. In these conditions, Beam Clamps can often be used as long as they are of the proper type, are properly sized and are properly installed.

Before proceeding in the selection of a beam clamp, first determine that the beams to which the restraint is to be attached are oriented properly. All connections must be positive and not rely on friction to carry the seismic load. This means that the direction of the cable and/or strut used to resist the forces must be at right angles to the beam. If the cable or strut is oriented in line with the beam axis, a beam clamp cannot be used and a weld-on tab or bolted connection is required.

If, based on the above, it is possible to use a beam clamp, an appropriate type and size must be selected. Most commercially available Beam Clamps are not appropriate for the attachment of restraints as they are designed to support vertical loads and not transfer horizontal ones. Unless rated for horizontal loads by the manufacturer, “conventional” beam clamps should not be used. As a minimum, appropriate beam clamps must meet the following set of requirements:

1) Beam clamps must engage both sides of a beam such that, even if the attachment bolt is not fully tightened, there is no possibility that the clamp can be pulled off of the beam.
2) Both the clamp bracket itself and the arm that engages the opposite side of the beam must be adequate to transfer the full horizontal load that is required for the application.
3) The hardware used to attach the restraint or strut bracket to the beam clamp must also be adequate to transfer the full horizontal load that is required for the application.
4) All components used must be rated using factors consistent with code requirements and appropriate for seismic design.

The Kinetics Noise Control KSBC Beam Clamp is designed to address the horizontal loads expected from seismic events. The two (2) sizes available use 3/8” and 1/2” attachment hardware and are equivalent to full bolted connections for hardware of the same size. (Thus if documentation requires that a 3/8” bolt be used, a 3/8” beam clamp is equally acceptable.)

Note that, as with any seismic connection to structural elements, the ability of the structural element to resist the design seismic load is known only by the structural engineer of record. As these forces can be significant and because beams used to support structures are typically designed around the vertical or gravity loads, there may be structural issues that must be addressed when connecting to and applying large horizontal forces to these members. Always, before connecting restraints to beams or...
other structural elements, ensure that the capacity of the elements to resist these loads is adequate. Kinetics Noise Control is not in a position to accept any responsibility for problems that develop from restraints being attached to inadequate structural elements.

Typical KSBC shown with KSUA attachment clip
(Can also be used with KSCA clip)
KSBC Beam Clamp

APPROX. 3 1/4" TALL

3/16" X 2" LONG RED HEX BOLT

1/2" FLAT WASHER

1/2" ALL THREAD

KSUA-2 SEE DRAWING SS0379A FOR 1/2" ROD

KSUA-2

SEE DRAWING SS0379A

MINIMUM CLAMPING WIDTH = 3" MAXIMUM CLAMPING WIDTH = 9"

KINETICS SEISMIC BEAM CLAMP ASSEMBLY DOES NOT INCLUDE THESE BRACKETS. SHOWN FOR OPTIONAL ASSEMBLY ONLY.

APPROX. 2" TALL