INSTALLATION GUIDELINES - READ BEFORE STARTING!

PILLOW PACKERS 18 to 72 INCHES

HammerHead® Point Repair resin's working and cure times are greatly affected by temperature. Warmer temperatures result in less working and cure time. Store in a dry place between 50-86° F. The ambient cure resin is formulated for working and cure times published. For optimal control, resin components, fiberglass and packer equipment should be stored in a cool place prior to installation. Once the contents of the resin bag are mixed, they must be applied to the fiberglass mat and installed within the working time listed in the tables provided. This is a tested and proven system; only use HammerHead components. Always wear proper Personal Protective Equipment (PPE).

STEP 1: INSPECTION & CLEANING
Visually inspect pipe section to be repaired using CCTV camera to identify conditions that may prevent proper installation. Consult a HammerHead representative if necessary. Clean pipe by removing all debris, roots, solids, other deposits, and sharp edges that could puncture packer during installation. Visually inspect pipe again to be sure it is ready to be repaired.

STEP 2: MEASURE THE REPAIR
Insert camera or tape measure into pipe. Place camera or tape measure at center of damaged area. Record the measurement with a piece of tape on your camera push rod or by tape measure.

STEP 3: PREPARE AIR HOSE AND INSPECT PACKER (FIGURE 1)
Connect air source to regulator. Connect regulator to pillow packer with air hose. Transfer measurement from step 2 to air hose. Align this mark with pipe entrance during installation to ensure packer is centered in damaged area.

STEP 4: LAY OUT MATERIALS (FIGURES 2-4)
Lay out work surface and secure to ground or floor, ONLY on a flat surface. Lay out three resin pails (2 sealed and 1 open). Attach appropriately sized mixing blade to drill and place it for convenient access. Lay out fiberglass piece with woven side up. Make sure all materials are easily accessible.

STEP 5: PREPARE THE FIBERGLASS
Position fiberglass on left side of work surface. From edge A of fiberglass, measure down edge B toward center based on the boxed solution size:

a. 18": 16"
b. 24": 21"
c. 30"-36": 31"
d. 42"-48": 42"
e. 54"-60": 52"
f. 72": 62"

Mark this measurement. Repeat measurement & mark along edge D. Draw a line between marks on edges B and D. Use this line to position packer in step 10. Flip fiberglass over so the line is facing down and chop strand side is up.

STEP 6: PREPARE THE PACKER (FIGURES 5-6)
Lay packer on flat surface. Attach packer harness to both ends of packer. We recommend using a packer harness that extends beyond protective sleeve. It can be made from cable or roping secured to the pillow bracket. See image. Slide reinforced sleeve over packer, centering packer within it. Extend harnesses outside of sleeve material. Fold one end of protective sleeve in a Z shape to create fins, and cinch it about 1 inch from its edge. Wrap cinch with tape provided. Repeat the fold, cinch, and tape process at other end of protective sleeve. Carefully poke a hole in the protective sleeve near air coupling to allow it to connect to the air hose.

STEP 7: MIX RESIN (FIGURES 7-9)
Double glove by putting two gloves on each hand.

- **For sizes over 24":** Open the two sealed pails of resin. Pour contents of Component A pail into Component B pail and allow it to drain in for approximately 10 seconds. Some residual material will remain in Component A pail; this is accounted for in the proportioning. Using the drill with mixing blade, mix the material for one minute. Avoid adding air bubbles into the resin mix. Pour the contents of the Component B pail into the empty white pail labeled "Mixing and Pouring Pail." Mix the material again for 15-20 seconds.
- **For 18"-24":** Remove pin from bags by separating inner and outer pin. Pour resin into "Mixing and Pouring Pail" and mix thoroughly with a drill and paddle attachment until resin has a consistent light-caramel color. This should take about 1 minute.

STEP 8: WET OUT (FIGURES 10-12)
Pour about half of the mixed contents over the fiberglass mat (chopped strand side facing up) and work into the mat using spreaders. Flip the fiberglass mat over using the walkover technique. Use remaining resin to wet out this side and scrape off any excess.

STEP 9: LOAD AND POSITION THE PACKER (FIGURES 13-15)
Position the packer on the fiberglass mat so that the outside edge of the packer matches up with the line marked on the mat in STEP 5. Fold the long side of the fiberglass mat onto the packer and tuck the remainder underneath. Fold the opposite side of the fiberglass mat over the packer so that the seam is on top. If the packer will be pulled into place, secure the mat to the packer using zip ties (one at each end and one in the center). If the packer will be carried into place, no ties are needed. Fold the packer so that it can be carried using the work surface as a stretcher. Carry the loaded packer to the entry point. Pull or lift the packer into the predetermined location. All personnel must then exit the pipe. Use proper lifting techniques and team lift when handling the mat and packer. Improper lifting can cause muscle strain or back injury.

STEP 10: INFLATE PACKER
Using air regulator, inflate packer. When using pillow packers, proper training is important to identify how much pressure to use. Offsets or bends may require increased pressure. Visual inspection is important to verify there is no annular space left after inflation. Caution: Take care during inflation, especially when damage to the pipe is severe. Contact your HammerHead rep to answer installation questions.

STEP 11: DEFLATE PACKER
Leave packer in place under maintained pressure, allowing point repair to cure for the predetermined time frame (use resin cure table or consult with your HammerHead representative to determine this time frame). Deflate packer and remove using proper lifting techniques. Inspect the point of repair with CCTV camera to confirm that repair is successful.

VISUAL INSTRUCTIONS


FIG. 1


FIG. 2


FIG. 3

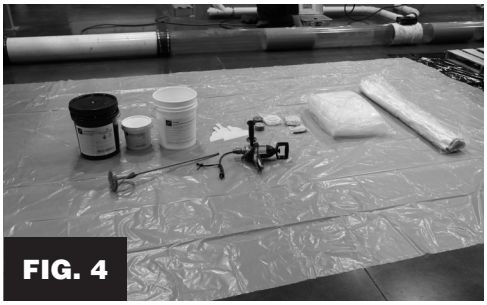
FIG. 4


FIG. 5


FIG. 6


FIG. 7


FIG. 8


FIG. 9


FIG. 10


FIG. 11


FIG. 12


FIG. 13

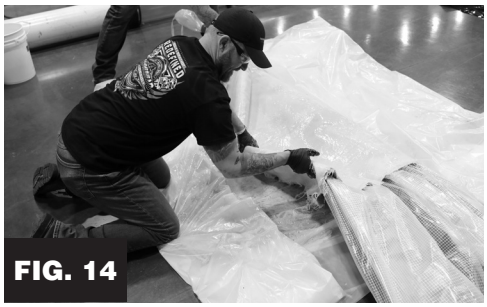
FIG. 14


FIG. 15

POINT REPAIR SYSTEMS BY HAMMERHEAD® TRENCHLESS

STEP BY STEP CHECKLIST

Use the following checklist each time you install a point repair to ensure that you never miss a step.

- ☐ Inspect and clean the host pipe.
- ☐ Measure the distance to the center of the repair.
- ☐ Prepare the air regulator and push rods.
- ☐ Test the equipment and determine inflation minimum. PSI: _____
- ☐ Lay out materials and set up the work area.
- ☐ Prepare the fiberglass mat.
- ☐ Prepare the packer.
- ☐ Thoroughly mix resin. Time: _____
- ☐ Wet out the fiberglass matting.
- ☐ Load the packer.
- ☐ Move the packer into position.
- ☐ Inflate the packer. Time: _____ PSI: _____
- ☐ Deflate and remove the packer. Time: _____

WORKING AND CURE TIMES

Working and cure time are greatly affected by temperature. Warmer temperatures result in less working and cure time. Colder temperatures provide more working time and require longer cure time. Always read, understand and comply with hazard warnings described in Safety Data Sheet(s) before use.

SUMMER

Ambient Temperature [1]	Working Time [2] (Minutes)	Cure [3] (Minutes)
50° F (10° C)	40	275
59° F (15° C)	35	200
68° F (20° C)	30	150
86° F (30° C)	20	100

WINTER

Ambient Temperature [1]	Working Time [2] (Minutes)	Cure [3] (Minutes)
50° F (10° C)	35	150
59° F (15° C)	30	120
68° F (20° C)	25	90
86° F (30° C)	15	60

WINTER EXPRESS [4]

Ambient Temperature [1]	Working Time [2] (Minutes)	Cure [3] (Minutes)
50° F (10° C)	15	50
59° F (15° C)	10	40
68° F (20° C)	5	35
86° F (30° C)	Not Recommended	

[1] Ambient temperature: Temperature of work area where resin system is mixed, used to saturate the fabric and assembled onto the packer. [2] Working time from the start of mixing resin to the time of the repair being positioned at the defect and expanded within the pipe. [3] Cure time: Time from the start of mixing resin to the time of substantial completion of cure of the point repair whereby the packer may be deflated and removed; based on pipe temperature of 65°F (18°C) [4] Limited sizes available. Contact HammerHead representative before installing.

REORDER INFORMATION

24-INCH REPAIRS

DESCRIPTION	PART #
3.00 x 24.00", Point Repair, Summer	PR-S3
3.00 x 24.00", Point Repair, Winter	PR-W3
3.00 x 24.00", Point Repair, Winter Express	PR-F3
4.00 x 24.00", Point Repair, Summer	PR-S4
4.00 x 24.00", Point Repair, Winter	PR-W4
4.00 x 24.00", Point Repair, Winter Express	PR-F4
6.00 x 24.00", Point Repair, Summer	PR-S6
6.00 x 24.00", Point Repair, Winter	PR-W6
6.00 x 24.00", Point Repair, Winter Express	PR-F6
8.00 x 24.00", Point Repair, Summer	PR-S8
8.00 x 24.00", Point Repair, Winter	PR-W8
8.00 x 24.00", Point Repair, Winter Express	PR-F8
10.00 x 24.00", Point Repair, Summer	PR-S10
10.00 x 24.00", Point Repair, Winter	PR-W10
10.00 x 24.00", Point Repair, Winter Express	PR-F10
12.00 x 24.00", Point Repair, Summer	PR-S12
12.00 x 24.00", Point Repair, Winter	PR-W12
15.00 x 24.00", Point Repair, Summer	PR-S15
15.00 x 24.00", Point Repair, Winter	PR-W15
18.00 x 24.00", Point Repair, Summer	PR-S18
18.00 x 24.00", Point Repair, Winter	PR-W18
24.00 x 24.00", Point Repair, Summer	PR-S24
24.00 x 24.00", Point Repair, Winter	PR-W24

48-INCH REPAIRS

DESCRIPTION	PART #
3.00 x 48.00", Point Repair, Summer	PR-S3X48
3.00 x 48.00", Point Repair, Winter	PR-W3X48
3.00 x 48.00", Point Repair, Winter Express	PR-F3X48
4.00 x 48.00", Point Repair, Summer	PR-S4X48
4.00 x 48.00", Point Repair, Winter	PR-W4X48
4.00 x 48.00", Point Repair, Winter Express	PR-F4X48
6.00 x 48.00", Point Repair, Summer	PR-S6X48
6.00 x 48.00", Point Repair, Winter	PR-W6X48
6.00 x 48.00", Point Repair, Winter Express	PR-F6X48
8.00 x 48.00", Point Repair, Summer	PR-S8X48
8.00 x 48.00", Point Repair, Winter	PR-W8X48
8.00 x 48.00", Point Repair, Winter Express	PR-F8X48
10.00 x 48.00", Point Repair, Summer	PR-S10X48
10.00 x 48.00", Point Repair, Winter	PR-W10X48
10.00 x 48.00", Point Repair, Winter Express	PR-F10X48
12.00 x 48.00", Point Repair, Summer	PR-S12X48
12.00 x 48.00", Point Repair, Winter	PR-W12X48
15.00 x 48.00", Point Repair, Summer	PR-S15X48
15.00 x 48.00", Point Repair, Winter	PR-W15X48
18.00 x 48.00", Point Repair, EZ, Summer	PR-S18X48EZ
18.00 x 48.00", Point Repair, EZ, Winter	PR-W18X48EZ
24.00 x 48.00", Point Repair, EZ, Summer	PR-S24X48EZ
24.00 x 48.00", Point Repair, EZ, Winter	PR-W24X48EZ

48-INCH REPAIRS CONTINUED

DESCRIPTION	PART #
30.00-36.00 x 48.00", Point Repair, EZ, Summer	PR-S30-36X48EZ
30.00-36.00 x 48.00", Point Repair, EZ, Winter	PR-W30-36X48EZ
42.00-48.00 x 48.00", Point Repair, EZ, Summer	PR-S42-48x48EZ
42.00-48.00 x 48.00", Point Repair, EZ, Winter	PR-W42-48x48EZ
54.00-60.00 x 48.00", Point Repair, EZ, Summer	PR-S54-60x48EZ
54.00-60.00 x 48.00", Point Repair, EZ, Winter	PR-W54-60x48EZ
72.00 x 48.00", Point Repair, EZ, Summer	PR-S72x48EZ
72.00 x 48.00", Point Repair, EZ, Winter	PR-W72x48EZ

ELBOW REPAIRS

3.00 x 24.00", Elbow Point Repair, Summer	PR-ELS3
3.00 x 24.00", Elbow Point Repair, Winter	PR-ELW3
3.00 x 24.00", Elbow Point Repair, Winter Express	PR-ELF3
4.00 x 24.00", Elbow Point Repair, Summer	PR-ELS4
4.00 x 24.00", Elbow Point Repair, Winter	PR-ELW4
4.00 x 24.00", Elbow Point Repair, Winter Express	PR-ELF4
6.00 x 24.00", Elbow Point Repair, Summer	PR-ELS6
6.00 x 24.00", Elbow Point Repair, Winter	PR-ELW6
6.00 x 24.00", Elbow Point Repair, Winter Express	PR-ELF6
8.00 x 24.00", Elbow Point Repair, Summer	PR-ELS8
8.00 x 24.00", Elbow Point Repair, Winter	PR-ELW8
8.00 x 24.00", Elbow Point Repair, Winter Express	PR-ELF8

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