INSTALLATION GUIDELINES–READ BEFORE STARTING!

FLOW-THROUGH PACKERS

HammerHead® point repair resin's working time / pot life and cure time is greatly affected by temperature and mass. Store in a dry place between 50-86° F. The ambient cure resin is formulated for pot life and cure times published. Starting temperature of the resin will greatly affect the working and cure time on your project. Warmer resins will have less working/cure times and cooler resins will have more working/cure times. Once the contents of the resin bag are mixed they must be applied to the fiberglass mat and installed within the working time listed on the resin cure chart provided. This is a tested and proven system, only use HAMMERHEAD components. Always wear proper PPE (Personal Protective Equipment).

STEP 1: INSPECTION AND CLEANING

Visually inspect the pipe section to be repaired using a CCTV camera. Inspect the area to identify any conditions that may prevent proper installation of the repair. Consult a HammerHead representative if necessary. Prior to installation of the repair, clean the pipe by removal of all debris, solids, roots, other deposits and sharp edges that could puncture the packer during installation. Visually inspect the pipe again to be sure it is ready to be repaired.

STEP 2: MEASURING

Insert the camera into the pipe and place the head of the camera at the center of the damaged area. Stop the camera and attach a piece of tape to the camera cable at the entry point into the pipe. In the next step this tape mark will be transferred to the push rods or air hose to indicate the distance to position the center of the Point Repair properly at the damaged area.

STEP 3: PREPARE PUSH RODS (FIGURE 1)

Connect the flex adapter to the packer. Assemble the necessary number of push rods to the flex adapter and tape all connections to ensure each connection is locked in place to prevent accidental disconnection within the pipe. Place the camera head at the center of the packer and transfer the measurement from the camera cable to the assembled push rods.

STEP 4: TEST EQUIPMENT

Place the packer inside a piece of plastic pipe of the same diameter as the pipe being repaired. Inflate the packer until repair reference lines are tight within the pipe and note the PSI used. This is the minimum PSI you will want to use for the point repair process (see caution note in Step 10). Note: this needs to be done for each repair as PSI needs will change over the life of the packer. Allow the packer to sit for five minutes fully inflated inside test pipe. Deflate the packer via the regulator relief valve. Check the push rods or air hose to verify that there are no restrictions to air flow. Consult your HammerHead representative with any equipment testing questions.

STEP 5: PERFORM TRIAL RUN

Pull the protective sleeve over the packer. Using the tape provided, secure the protective sleeve to the ends of the packer. Push the packer without a point repair to the point to be repaired. Verify that the packer can reach the area to receive the repair. DO NOT INFLATE! Pull the packer out of the pipe using pull cable.

STEP 6: LAYOUT MATERIALS (FIGURE 2-4)

- *Layout work surface and secure. This should only be performed on a flat surface.*
- *Layout fiberglass pieces.*
- *Layout resin bag(s).*
- *Make sure that all materials are easily accessible.*
- *If applicable, bridge zip ties to make long enough to go around loaded packer.*

STEP 7: PREPARE THE PACKER (FIGURE 5-6)

Replace the protective sleeve from the trial run with a new sleeve. DO NOT REUSE THE PROTECTIVE SLEEVE. Using the tape provided, secure the protective sleeve to the ends of the packer. Take care that the taped ends do not restrict inflation or water flow. Place 2 small slits on each end of the packer to provide a means for air to escape the protective sleeve during inflation of the packer.

STEP 8: RESIN MIX (FIGURE 7-9)

- *Double glove by putting two gloves on each hand.*
- *Resin bag activation:*
  - *Using Pin Style – Remove pin by separating the inner and outer pin.*
  - *Using Heat Seal (without pin) – Roll up one end of the bag until the inner seal divider in the middle opens.*
- *Mix by massaging the resin inside the bag thoroughly until the resin has consistent color. Approximately 1 minute.*

STEP 9: WET OUT (FIGURE 10-12)

Cut off a corner of the bag and pour half of the mixed resin on to the chop strand side of the fiberglass mat. Using the spreader provided, move the resin to allow for an even and plentiful saturation of the fiberglass mat. Flip the entire mat over to the biaxial side. Pour the remaining resin on the mat and spread out evenly. Remove excess resin by gently scraping it to the side. Fold the right side over as shown. Fold the left side over to provide a 1.00" overlap. If using 2 pieces of fiberglass, wet out both simultaneously.

STEP 10: LOAD THE PACKER (FIGURE 13-15)

Center the mat on the protected packer. Tightly roll the mat around the protected packer overlapping itself. Secure the mat to the protected packer using the nylon ties provided. Position one tie 1.00" from one end of the mat and another tie 1.00" from the other end of the mat. Position one tie in the middle of the mat. If using a 48" repair, position the 2 remaining ties in the middle of each remaining gap. DO NOT USE TWO TIES ON ANY SINGLE SPOT. Pull the nylon ties snug and cut off any tails. Reattach the packer to the pre-measured push rods and pull cable. Introduce the packer into the pipe and position it at the point to be repaired as marked on the push rods.

STEP 11: INFLATION OF THE PACKER

Using the air regulator, slowly inflate the packer to the predetermined psi. The nylon ties will release allowing the wetted mat to be pressed against the inner surface of the pipe at the point of the repair. Caution: Care must be taken during packer inflation, especially when the damage to the pipe is severe. Utilize the minimum inflation pressure of the packer determined during the testing step. This will minimize the possibility of damaging the host pipe or the packer. Contact your HammerHead representative to answer installation questions.

STEP 12: REMOVE THE PACKER

Leave the packer in place under maintained pressure allowing the Point Repair to cure for the predetermined time frame (utilize the resin cure chart or consult with your HammerHead representative). Deflate the packer and remove using the attached pull cable. Inspect the point of the repair with the CCTV camera.

VISUAL INSTRUCTIONS

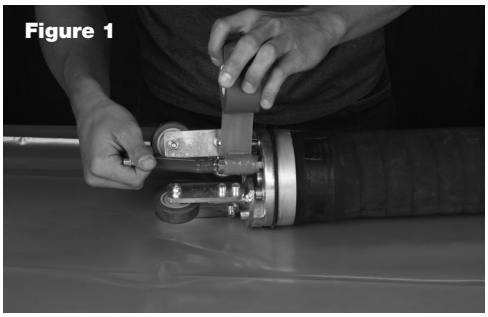
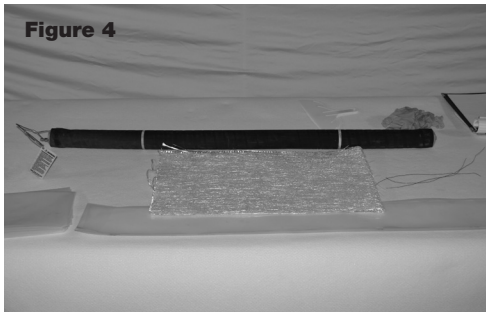


Figure 1


Figure 2


Figure 3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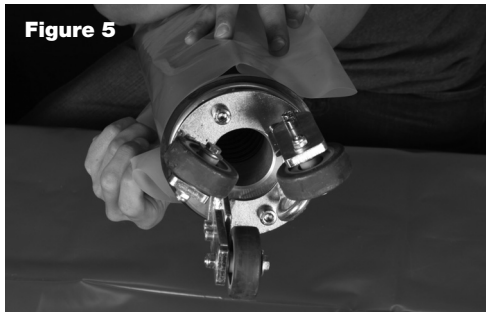
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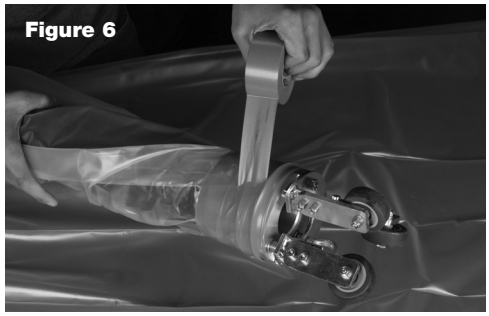
Figure 6


Figure 7


Figure 8

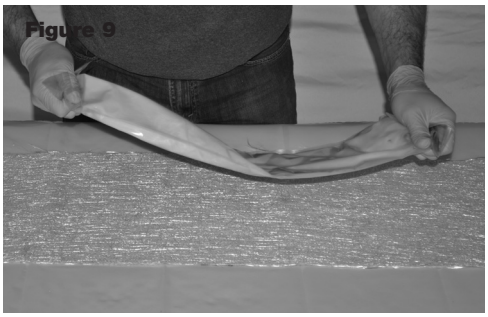
Figure 9

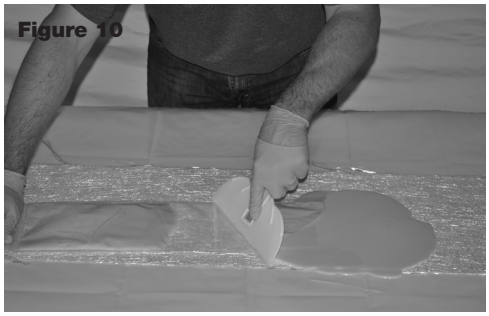
Figure 10


Figure 11

Note: Wet out both sides of matting.

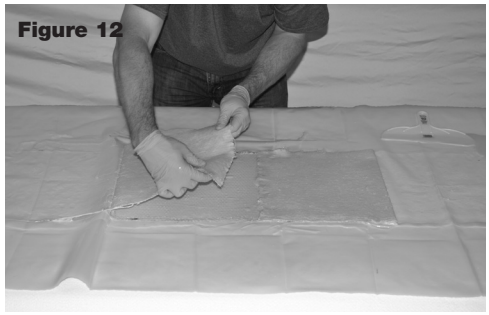
Figure 12


Figure 13


Figure 14


Figure 15

POINT REPAIR SYSTEMS BY HAMMERHEAD® TRENCHLESS

STEP BY STEP CHECKLIST

- [ ] Inspect and clean host pipe
- [ ] Determine diameter and length of patch needed
- [ ] Measure distance to repair area
- [ ] Prepare packer and push rods
- [ ] Test equipment Packer Inflation Min. PSI: _____
- [ ] Perform a trial run
- [ ] Layout materials and setup work area
- [ ] Prepare packer
- [ ] Thoroughly mix resin Time: _____
- [ ] Wet out fiberglass matting
- [ ] Load the packer
- [ ] Push or pull the packer into position
- [ ] Inflate the packer Time: _____ PSI:_____
- [ ] Deflate and remove the packer Time: _____

POINT REPAIR SYSTEMS BY HAMMERHEAD® TRENCHLESS

REORDER INFORMATION

POINT REPAIR

Description	Part #
3.00 x 24.00", Point Repair, Summer	PR-S3
3.00 x 24.00", Point Repair, Winter	PR-W3
4.00 x 24.00", Point Repair, Summer	PR-S4
4.00 x 24.00", Point Repair, Winter	PR-W4
6.00 x 24.00", Point Repair, Summer	PR-S6
6.00 x 24.00", Point Repair, Winter	PR-W6
8.00 x 24.00", Point Repair, Summer	PR-S8
8.00 x 24.00", Point Repair, Winter	PR-W8
10.00 x 24.00", Point Repair, Summer	PR-S10
10.00 x 24.00", Point Repair, Winter	PR-W10
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
3.00 x 48.00", Point Repair, Summer	PR-S3X48
3.00 x 48.00", Point Repair, Winter	PR-W3X48
4.00 x 48.00", Point Repair, Summer	PR-S4X48
4.00 x 48.00", Point Repair, Winter	PR-W4X48
6.00 x 48.00", Point Repair, Summer	PR-S6X48
6.00 x 48.00", Point Repair, Winter	PR-W6X48
8.00 x 48.00", Point Repair, Summer	PR-S8X48
8.00 x 48.00", Point Repair, Winter	PR-W8X48
10.00 x 48.00", Point Repair, Summer	PR-S10X48
10.00 x 48.00", Point Repair, Winter	PR-W10X48
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, Summer	PR-S18X48
18.00 x 48.00", Point Repair, Winter	PR-W18X48
24.00 x 48.00", Point Repair, Summer	PR-S24X48
24.00 x 48.00", Point Repair, Winter	PR-W24X48
30.00 x 48.00", Point Repair, Summer	PR-S30X48
36.00 x 48.00", Point Repair, Summer	PR-S36X48
42.00 x 48.00", Point Repair, Summer	PR-S42x48
48.00 x 48.00", Point Repair, Summer	PR-S48x48

ELBOW POINT REPAIR, (3.00–8.00" x 24.00")

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

REORDER YOUR SUPPLIES ONLINE AT
WWW.HAMMERHEADSHOP.COM

HANDLING AND CURE TIMES

IMPORTANT!

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

SUMMER RESIN

Ambient Temperature	Pot Life * (Minutes)	Cure** (Minutes)
50° F (10° C)	35–50	280
68° F (20° C)	25–38	130
86° F (30° C)	20–25	118

WINTER RESIN

Ambient Temperature	Pot Life * (Minutes)	Cure** (Minutes)
50° F (10° C)	22–25	120
68° F (20° C)	12–15	90
86° F (30° C)	5–8	50

**Pot life: Approximate time available after resin has been mixed to complete installation before resin starts to set.*

***Cure time: Time for resin to cure after resin has been mixed.*

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