

POISON SPYDER

INSTALLATION INSTRUCTIONS

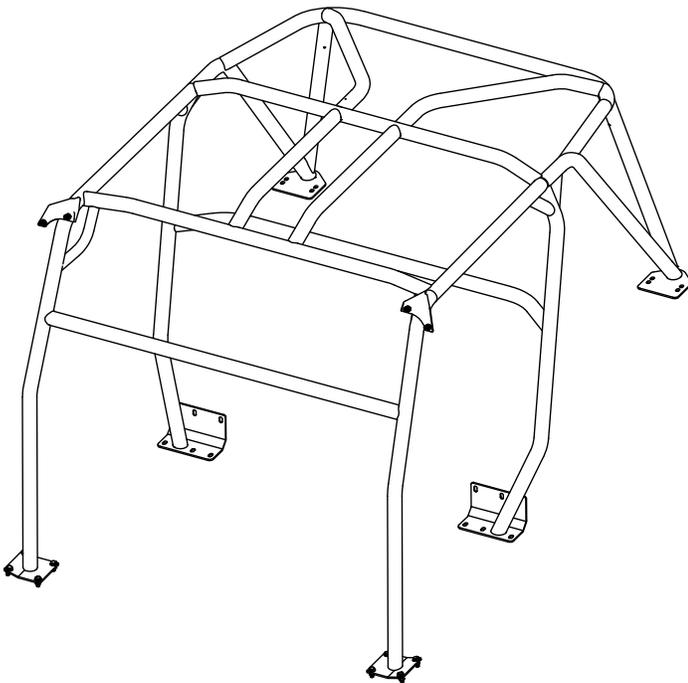
INST-13-19-020_A

YJ/CJ-7 Lazer-Fit™ Full Cage Kit

IMPORTANT: Thank you for purchasing this Poison Spyder product. Please read through this entire document before proceeding with installation. If you are not confident in your mechanical skills, please seek the help of a professional to perform the installation. Check your packages immediately upon arrival to ensure that everything listed is included, and to check for damage during shipping. If anything is missing or damaged, or if you need technical assistance with any aspect of this installation, call Poison Spyder at (951) 849-5911 as soon as possible. This document last updated April 2016.

APPLICATIONS

These installation instructions apply to the following Poison Spyder products:



13-19-020 YJ/CJ-7 Lazer-Fit™ Full Cage Kit

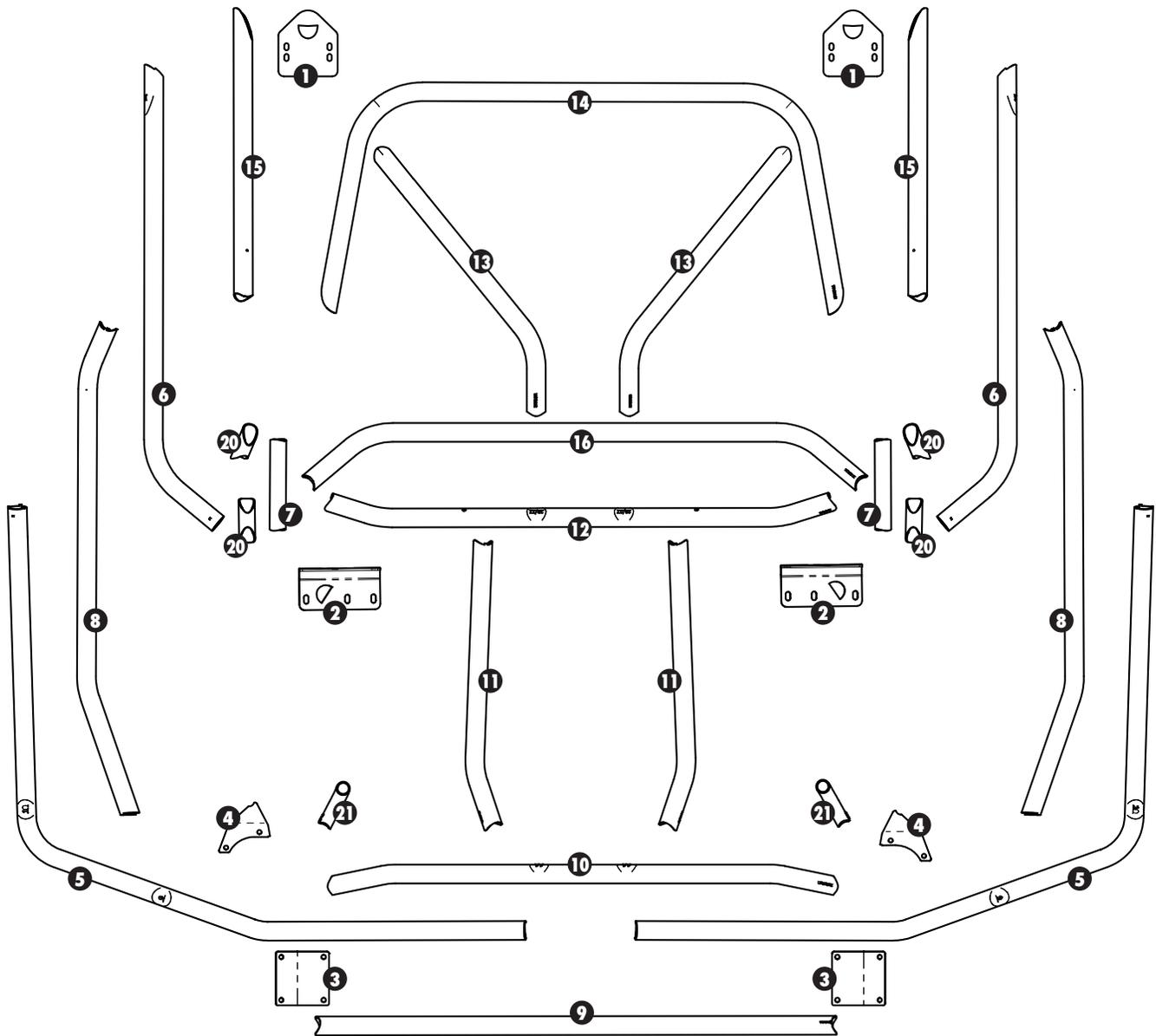
PARTS LIST

Please check your packages immediately upon arrival to ensure that everything listed is included, and to check for damage during shipping. If anything is missing or damaged, call Poison Spyder at (951) 849-5911 as soon as possible. The ID numbers for each item correspond to the diagram on the following page.

- (2) C-Pillar Mount Plate L&R ①
PN: 13-19-020-01 & 13-19-020-01R
- (2) B-Pillar Mount Plate L&R ②
PN: 13-19-0202-02 & 13-19-020-02M
- (2) A-Pillar Mount Plate L&R ③
PN: 13-19-020-03
- (2) Windshield Mount Plate L&R ④
PN: 13-19-020-04 & 13-19-020-04M
- (2) A-Pillar Tube L&R ⑤
PN: 13-19-020-T5 & 13-19-020-T5R
- (2) Rear Down-Bar Tube L&R ⑥
PN: 13-19-020-T6 & 13-19-020-T6R
- (2) Tube Sleeve ⑦
- (2) B-Pillar Tube L&R ⑧
PN: 13-19-020-T8 & 13-19-020-T8R
- (1) Dash Bar Tube ⑨
PN: 13-19-020-T9
- (1) A-Crossbar Tube ⑩
PN: 14-18-010-T10
- (2) Forward Center Stringer Tube ⑪
PN: 15-19-010-T11
- (1) B-Crossbar Tube ⑫
PN: 15-19-020-T12
- (2) Rear Center Stringer Tube L&R ⑬
PN: 15-19-020-T13 & 15-19-020-T13R
- (1) C-Crossbar Hoop Tube ⑭
PN: 15-19-010-T14
- (2) C-Pillar Tube L&R ⑮
PN: 13-19-020-T15 & 13-19-020-T15R
- (1) Seat Harness Bar ⑯
PN: 15-19-010-T16
- (4) 90° Tube Gusset ⑰
PN: 15-19-010-T20
- (2) Entry Grab Handle L&R ⑱
PN: 14-19-020-T1 & 14-19-020-T1
- (1) YJ/CJ-7 Lazer-Fit Full Cage Hardware Kit
PN: HWKIT-13-19-020 includes:
 - (8) 3/8-16 X 1 Gr8 Hex Head Cap Screw
 - (8) 3/8-16 Gr8 Nylon Insert Lock Nut
 - (16) 3/8" Hardened Flat Washer
 - (4) 5/16-18 X 3/4 SS Flat Head Cap Screw
 - (4) 5/16-18 Nut-Sert

TOOLS NEEDED

- Mechanic's tool set
- Ratchet straps
- Dead-blow hammer
- Fine-tip felt marker or transfer punch set
- Drill motor with 1/8, 3/8, 5/16 & 17/32 drill bits.
- Brake cleaner & shop rags
- Welder and proper welding equipment



- Protective welding blankets

INSTALLATION NOTES

Installation of the Full Cage Kit can take up to 8 hours. This kit requires welding, which should be done by a certified welder. You will need a friend or two to assist with the installation.

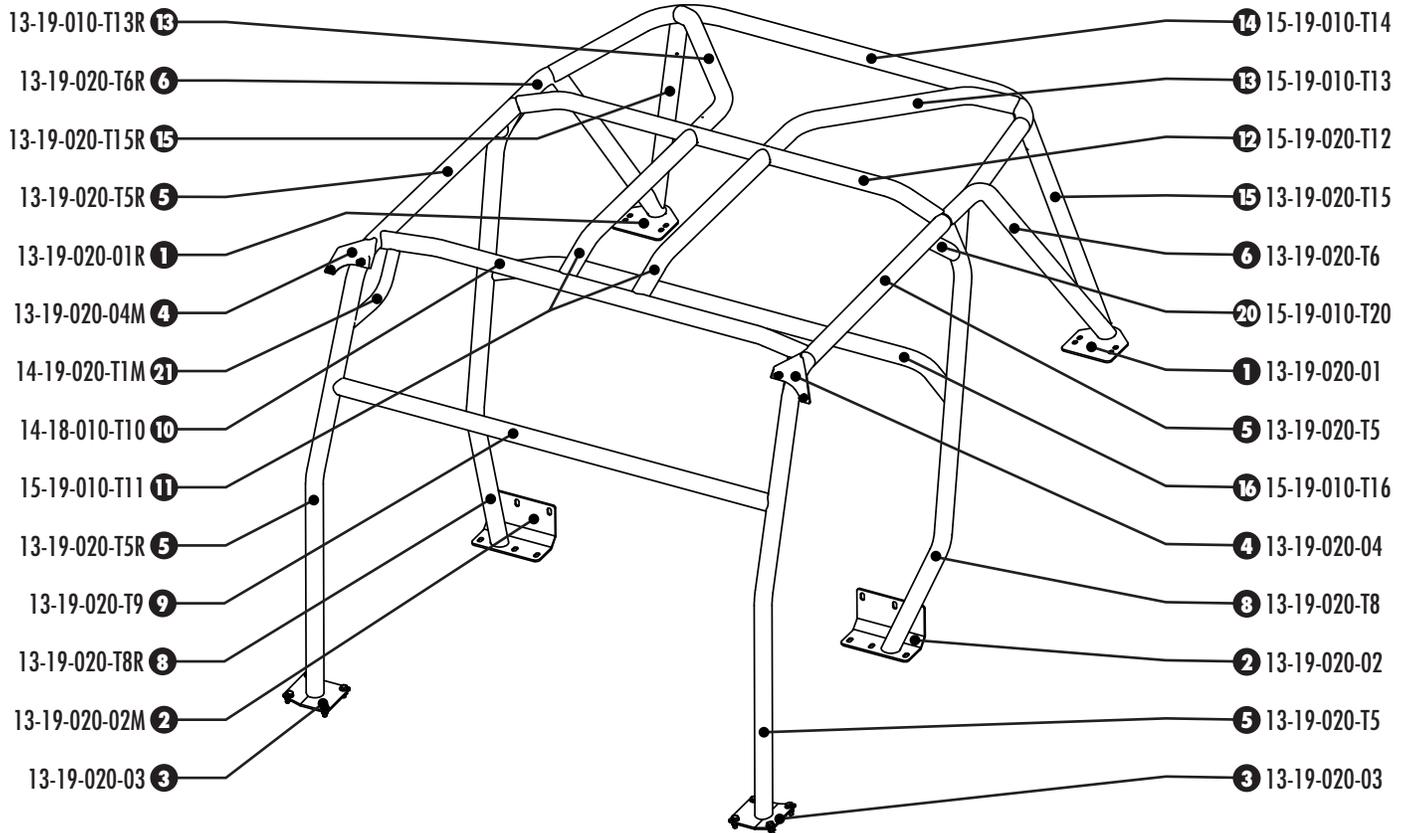
IMPORTANT: It is imperative that the top, doors, seats, plus any other components that are going to be reinstalled after the cage install be test-fitted BEFORE final welding of the cage! Poison Spyder Customs is not liable for fitment issues due to negligent install.

INSTALL PROCEDURE

NOTE: In most cases, the laser-cut notches and laser-etched assembly marks will eliminate all guesswork. Regardless, carefully inspect each part and its placement prior to tacking

and finish-welding. Also, each step should be extrapolated for both sides, where needed.

- 1. Park vehicle on a level** surface and set the emergency brake. You will want to wear eye protection beyond this point.
- 2. Remove any existing hard top,** soft top and associated bracketry, front seats, roll bar or cage, and spreader bars if present. Save any bolts that mounted the OE roll bar to the floor, as these may be re-used during the install of the new Poison Spyder cage. Place welding blankets or some sort of protective covering over the Jeep's dash and interior to protect it from weld splatter.
- 3. If your Jeep uses knobs** with large handles to bolt the windshield in place, you will need to remove these and replace them with a standard bolt in order to install the cage as close to the dash/windshield as possible.



4. **Clean ALL bare metal pieces** provided in the kit, using a clean rag and brake cleaner. This will ensure an easier, cleaner installation and better welds later in the installation.
5. **Position the C-Pillar Mount Plates 1** into their approximate locations. Use the OE hardware to bolt the C-Pillar Mount Plates into place, but leave the bolts loose so that slight adjustment may be made to the plates' position.



6. **Position the B-Pillar Mount Plates 2** into their approximate locations. Use the OE hardware to bolt the B-Pillar Mount Plates into place, but leave the bolts loose so that slight adjustment may be made to the plates' position.
7. **Position the A-Pillar Mount Plates 3** into their approximate locations. You will have to drill holes for the A-Pillar Mount Plates, but wait until later steps to do this. For now just leave them set into their approximate location

in the driver and passenger footwell, below the dash and near the door jamb.

8. **(YJ Only) Attach the Windshield Mount Plates 4** to the upper corners of the windshield using the OE hardware from the stock header bar. (Skip this step for CJ-7, which will be addressed in a later step for CJ's)



9. **Insert a Tube Sleeve 7** into the short end of a Rear Down Bar Tube 6, then slip the correct A-Pillar Tube 5 on to the other side of the Tube Sleeve. Be sure that 5 and 6 are each from the same side (Left or Right). It may be necessary to sand or bevel the outside edges at the ends of the Tube Sleeve and the inside edges at the ends of 5 and 6 as it is a tight slip-fit between the Tube Sleeve and the two outer tubes. Make sure that the Tube Sleeve extends past the round hole that is cut a few inches from the ends of each outer tube. These holes are for rosette welds that will be added later.



Make sure the two outer tubes (5 and 6) meet snugly against each other. There are tangs on the tube ends to provide the correct amount of stand-off for the weld that will be applied in later steps.

- 10. Install the 5-6-7 assembly into the Jeep**, with the A-Pillar Tube 5 sitting on the previously-installed A-Pillar Mount Plate 3 and the opposite end of the Rear Down Bar 6 sitting on the previously-installed C-Pillar Mount Plate 1. The specially cut ends of the Rear Down Bars will index into pre-cut holes of the C-Pillar Mount Plates. There are no indexing holes or marks on the A-Pillar Mount Plates, as these are to be adjusted as-needed. For now, leave them loosely aligned.



On YJ's, the upper corner of the A-Pillar Tube should fit snugly into the previously-installed Windshield Mount Plates 4. If needed, some adjustment may be made at the opposite end, with the slotted bolt holes that hold the C-Pillar Mount Plates to the Jeep's rear wheel well. If the fasteners are loosened, the entire assembly may be adjusted forward or backward until fitment is just right. After placing the tube assembly on one side, have a friend hold it in place (or use a small tack-weld at the Windshield Mount Plate to hold it in place) while positioning the corresponding assembly on the opposite side of the Jeep. (YJ Owners may skip the following sequence of nut-sert installation steps)



- 11. CJ ONLY: On CJ's, place the Windshield Mount Plate 4 into place in the upper corner of the Windshield Frame.** There are no pre-existing holes on the CJ's so you will have to mark and drill new holes in the windshield frame. With the help of a friend, adjust the 5-6-7 tube assembly forward until it fits into the laser-cut edges of the Windshield Mount Plate. Use a fine-tip felt marker or transfer punch to mark drill holes at the center of each of the two bolt holes in the Windshield Mount Plate. Do this for both sides, then set the Windshield Mount Plate 4 and 5-6-7 tube assemblies aside.

- 12. CJ ONLY: As mentioned, on CJ's a pair of 5/16-18 nut-sert will need to be installed for each of the Windshield Mount Plates.** Begin by center-punching or auto-punching the hole locations marked in the previous step, then drilling a 1/8" pilot hole at each of the hole locations. Then step up to a 3/8" drill, then finish by drilling each hole out to 17/32" It is best to drill in steps as directed, in order to keep the hole from wandering from its starting point.

NOTE: It is HIGHLY RECOMMENDED to invest in a professional nut-sert installation tool, such as the one sold by Poison Spyder (p/n: 70-TS-325-RN) or elsewhere.



The professional tool will make the installation of nut-serts MUCH easier than using the free tool included in this kit, and it will come in handy with future product installations as well. If using a professional nut-sert installation tool, follow the directions that came with the tool and skip the next three steps of these instructions. The simple "tool" included with this product is admittedly frustrating to use, however it will work for those with patience who would like to save the cost of the professional tool. If using the simple tool included with this product, continue through the following steps.

- 13. CJ ONLY: The provided nut-sert install tool consists of a bolt, two washers and a coupler (long) nut.** Assemble these items as shown (bolt—washer—coupler nut—

washer—nut-sert). Insert the nut-sert end of the assembly into the hole you drilled.



NOTE: Photo is of a different product installation but the principle is the same)

- 14. CJ ONLY: Use an open end wrench to hold the coupler nut stationary while turning the head of the bolt clockwise with a ratchet (or small impact wrench) and socket. As you turn the ratchet, the bolt will draw the far end of the nut-sert toward the inside of the sheet metal, gripping it with the knurled outside edge of the nut-sert as it deforms. Continue to turn the ratchet until the nut-sert is fully seated. DO NOT OVER-TIGHTEN as you can damage the nut-sert, or cause it to lose its grip.**



NOTE: Photo is of a different product installation but the principle is the same)

- 15. CJ ONLY: Once the nut-sert has seated correctly, loosen the bolt then remove it and the rest of the tool from the nut-sert. Install a new nut-sert onto the tool, oriented the same as the last, and set it aside until your next nut-sert installation. Inspect the nut-sert to make sure it is properly seated and that the surrounding sheet metal isn't excessively deformed. Note that some deformation of the sheet metal is normal, and that it will be covered by the part after installation.**



NOTE: Photo is of a different product installation but the principle is the same)

If you "spin" a nut-sert: That is, if it loses its grip due to over-tightening or improper installation, the quickest, easiest fix is to use a MIG welder to place a small tack weld at the edge of the nut-sert flange. Before applying the tack weld, sand or grind the paint from a very small area of the sheet metal where the tack weld will be. Then insert a screw into the nut-sert to protect the threads from weld splatter. Only apply a very small tack or two, as you do not want to heat up and deform the nut-sert or the sheet metal. Then grind the tack(s) smooth and apply touch-up paint to prevent rust.

- 16. CJ ONLY: Install the Windshield Mount Plates ④** using the newly-installed nut-serts at the top corners of the windshield frame, and the supplied 5/16-18 X 3/4 SS Flat Head Cap Screws
- 17. CJ ONLY: Re-install the ⑤-⑥-⑦ assemblies (both sides) into the Jeep as described in step 10.**

YJ OWNERS RESUME HERE

- 18. Install the B-Pillar Tubes ⑧** on each side. At the top they will index into holes laser-cut into the joint of the ⑤-⑥-⑦ tube assembly. At the bottom they will index into half-moon holes laser-cut into the previously-installed B-Pillar Mount Plates ②. A soft dead-blow hammer may be helpful to tap them into place.



On YJ's it may be necessary to remove a wiring loom cover on the driver's side.



19. Tack the B-Pillar Tubes into place at the top where they join the 5-6-7 tube assemblies.



When properly aligned, small tabs that have been laser-cut into the ends of the B-Crossbar will slip into corresponding slots that have been laser-cut into the adjoining tubes. A soft dead-blow hammer may be useful to gently nudge the tubes into place. Apply a ratchet strap from one A-Pillar Tube to the other, adjacent to the B-Crossbar, to temporarily hold the assembly together.



20. Tack the opposite ends of the Rear Down Bar Tubes 6 to their corresponding C-Pillar Mount Plates 1.



22. Set the A-Crossbar Tube 11 in place, spanning between the two A-Pillar Tubes 5, toward the front, near the windshield.



21. Place the B-Crossbar 12 between the two 5-6-7 tube assemblies, joining at the 5-6-8 tube junction at either end. Note that the B-Crossbar has two pairs of tab slots laser cut into the side of the tube, centered about half-way down its length. These tab slots will be oriented toward the FRONT of the Jeep when the B-Crossbar is set into place.



Note that the side of the A-Crossbar Tube has been laser etched with a circular guide mark for proper placement of the A-Crossbar.



The slight bends at each end of the A-Crossbar should be oriented so that the center section of the Crossbar is bowed rearward, away from the windshield.

23. Install the two Forward Center Stringer Tubes 11 between the A-Crossbar and the B-Crossbar



Note that the rearward end of each Forward Stringer has laser cut tabs that fit into slots in the side of the B-Crossbar. The forward end is located using laser-etched marks in the side of the A-Crossbar.



24. Once the Forward Stringers and A-Crossbar are positioned correctly, tack-weld them together and to the A-Pillar Tubes, and to the B-Crossbar.



25. Position the C-Crossbar Hoop Tube 14. The laser-cut ends are notched to fit to each Rear Down Bar, using the laser-etched alignment marks. Have a friend hold the rearward end of the C-Crossbar while you check that both ends are correctly aligned onto the cage's Rear Down Bars.



Once the C-Crossbar is correctly positioned, with a helper continuing to support the rearward side of the tube, tack it into place. The helper must continue to support the C-Crossbar through the following step.

26. Position the C-Pillar Tubes 15, one at a time, into place between the C-Crossbar and the Rear Down Bar. There are alignment marks etched into each of these tubes to properly locate them.



Have the helper continue to support the C-Crossbar until both C-Pillars have been tacked into place. Tack-weld the C-Pillar Tubes at both ends, to the C-Crossbar Hoop Tube and to the C-Pillar Foot Plates.



27. Position the Rear Center Stringer Tubes 13, one at a time, into place between the B-Crossbar and the rear corners of the C-Crossbar.



There are alignment marks etched into each of these tubes to properly locate and align them.



Once the Rear Center Stringer Tubes are correctly positioned, tack them in place to the B-Crossbar Tube and C-Crossbar Hoop Tube.

28. Place the Dash Bar Tube 9 between the two A-Pillar Tubes 5 just above the dash of the Jeep, using the circular tube alignment marks etched into the A-Pillar Tubes.



Note that if your Jeep is not equipped with the factory dash pad, you may be able to lower the Dash Bar to obstruct less of the windshield. If you do this, make sure to take proper measurements to ensure placement and squareness of the Dash Bar. Once positioned, tack the Dash Bar Tube into place.

29. Fine-tune the position of the A-Pillar Mount Plates 3 (recall that these were placed approximately into position in one of the earliest steps, but not bolted down at that time). With the cage assembly properly positioned and tacked into place, the A-Pillar Mount Plates may now be positioned. Ideally they would be placed with the A-Pillar Tubes 5 landing directly in the center of the plate. However there is room to adjust them slightly in any direction, if needed. Make sure they are positioned far enough away from the outer wall of the Jeep's tub that they will clear the sheet metal lip at the door opening when removing and re-installing the cage. Also try to ensure that the two plates are symmetrical--i.e. that they are aligned with each other for proper appearance. Once the plates are properly positioned, tack-weld them to the A-Pillar Tubes.

30. Use a fine-tip felt marker or transfer punch to mark the four bolt hole locations for each A-Pillar Mount Plate, so that holes may be drilled through the floor boards in a later step.

31. Install the 90° Tube Gussets 20 at the junction of the B-Pillar, B-Crossbar, A-Pillar and Rear Down Bar.



32. (Optional) Install the Seatbelt Bar 16 to the rearward side of the B-Pillars. Use the laser-etched

assembly marks as guides to properly locate the tube junctions. If using custom seats and belts, you may adjust the height of the Seat Belt Bar (ignoring the laser etched assembly guides) to properly locate it for your specific setup. It may be necessary to temporarily set the seats back into place to determine the optimal height. Tack the Seatbelt Bar into place.



33. At this point, all of the main cage pieces are in place and tacked together. Before starting the finish welding process, go around the Jeep and make sure the hardware on each of the mount plates that bolt to the Jeep's tub (except for the A-Pillar Mount Plates) are tightened, including:

- Windshield Mount Plates
- B-Pillar Mount Plates
- C-Pillar Mount Plates

Check that each of the junctions where cage components meet are still correctly positioned, tubes line up with the correct etched markings or notches are correctly engaged into their slots on the adjoining pieces.

34. Fully test-fit all equipment that is located within, near or around the cage or any portion of the cage. This includes soft tops, doors, seats, etc. Test each component for both fit and operation. It is **EXTREMELY IMPORTANT** that you verify proper fitment of all components at this time. If any tube placement needs to be adjusted, it is a simple matter of grinding the small tack welds to make any adjustments. Making these adjustments will be impossible once the cage is fully welded.

35. Where the A-Pillar Tube and Rear Down Bar meet at the top of the B-Pillar, note that there are small tangs in the ends of the tubes to provide separation of the tubes for a proper weld. These separation tangs may be cut out in preparation for final welding. Do so with a thin cut-off wheel.



36. Finish-weld every joint on the cage. Work from side to side, welding the same joint on both sides of the cage in sequence (rather than welding all on one side of the cage, then all on the other). Be sure to do the rosette welds that hold the sleeve in place inside the A-Pillar Tube and Rear Down Bar. Weld as much as you can with the cage still bolted into the Jeep, to prevent twisting or warping of the cage.



37. Remove the cage from the Jeep only to finish those welds you can not reach with it installed. Remember that welding tends to bend metal slightly, so keeping everything bolted down for as much of the welding process as possible will ensure that the cage does not distort during welding.



38. While the cage is out of the Jeep, drill the four (4) mounting holes through the floor beneath each A-Pillar Mount Plate, at the hole locations that were marked in a previous step.



- 39. Add any optional items to** the cage, such as gussets, grab handles, seat Belt bungs, etc.
- 40. Paint or powder-coat the cage.** If painting yourself, thoroughly clean the cage to remove any residues, then start with a quality self-etching primer, followed by the color paint of your choice.
- 41. Re-install the cage into the** Jeep and tighten all hardware.

Congratulations, you have completed the installation of your Poison Spyder Full Cage Kit!