Installation Instructions

818228

2021-2027

F150 Regular Cab Short Bed

Through The Bed Side Exit

2 or 4-Wheel Drive

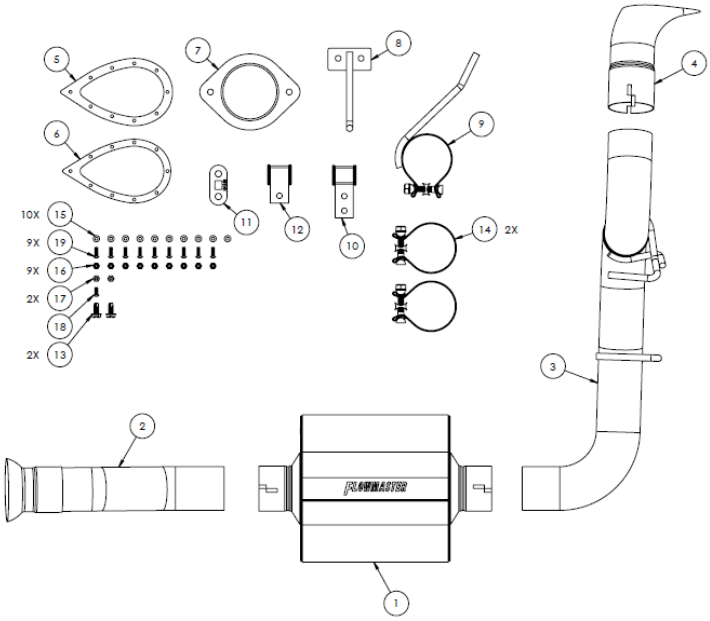
Installation requires moderate mechanical skill and cutting of the bed side for the tail Pipe to exit. If this job is beyond your abilities, seek the services of a qualified technician.

If you do not understand any part of these instructions, please call Flowmaster Technical Support at (866) 464-6553 for assistance.

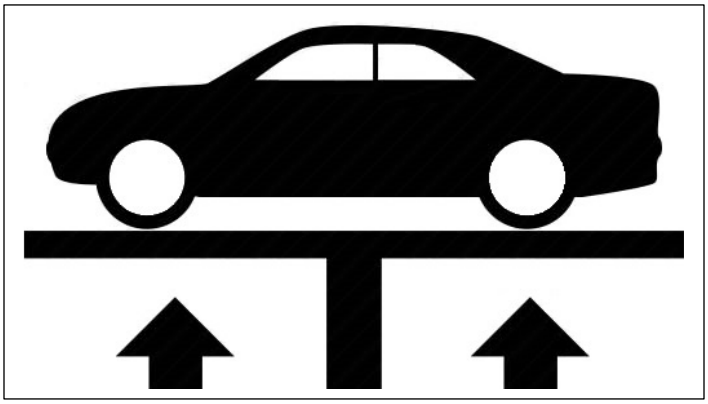
Apply penetrating oil generously to clamps, fasteners, pipes, and hanger rods for ease of disassembly.

REVIEW THE INSTRUCTIONS & VERIFY THE KIT CONTENTS

Take a moment to read and understand these instructions before installing your Flow FX exhaust kit.



Item	Part Number	Description	Qty
1	8530014-Z	Outlaw Muffler	1
2	27048S	Muffler Inlet Pipe	1
3	27047S	Muffler Outlet Pipe	1
4	27045H	304SS Outlet Pipe Extension	1
5	ST524	Large Trim Ring (Bottom)	1
6	ST525	Small Trim Ring (Top)	1
7	SF059	Inlet Pipe Flange	1
8	551HA	Frame Hanger Bracket	1
9	527HA	Front Clamp Hanger assembly	1
10	HA572	2 Hole Universal Hanger	1
11	HA168	Red Rubber Hanger	1
12	HA602	1 Hole Universal Hanger	1
13	HW225	5/16 -18 Self Threading Bolt	2
14	MC300BS	3.0 Band Clamp	2
15	HW340	10/32 Flat washer	10
16	HW134	10-32 Lock Nut	9
17	HW135	Non-Locking Nut	2
18	HW292	10/32 X 1/2 BHCS	2
19	HW293	10/32 X 5/8 BHCS	9



Vehicle Compatibility

Model Year: **2021- 2027**
Make: **Ford**
Model: **F150 Regular Cab Short Bed**
Engine: **5.0L**
***Will Only Fit Regular Cab Short Bed Trucks**

BEFORE STARTING:

Your vehicle must be raised a minimum of 18 inches. A floor hoist is ideal. If no hoist is available, we strongly urge the use of axle stands as a safety measure. **Please read and understand these instructions and disclaimer in their entirety before attempting installation.**

CAUTION! WORK ONLY ON A LEVEL SURFACE. USE JACKS /JACK STANDS OF SUFFICIENT CAPACITY TO LIFT AND SUPPORT YOUR VEHICLE. NEVER WORK UNDER A VEHICLE SUPPORTED BY A FLOOR OR BUMPER JACK.

INSTALL YOUR FLOWMASTER EXHAUST SYSTEM



Before installing clamps in the following steps, remove their nuts, apply anti-seize compound to the bolt threads, and re-install the nuts.

Important: This installation requires cutting of the bedside to allow the tail pipe to exit. Do not attempt this installation if you are not confident in your abilities or lack the correct tools to cleanly and safely perform the tasks necessary to cut the sheet metal bedside. This is an advanced installation and requires the correct tools, ability to follow the instructions and most importantly TAKE YOUR TIME and triple check your measurements. Once the hole is cut, there is no turning back.

Below is a recommended list of tools that will be required to accurately cut the hole outlined in these instructions. This is a recommendation only based on our experience and may not be the best combination of tools for you.

Recommended Tools List: Does Not include basic hand tools required to remove the OEM exhaust or install the exhaust kit.

1. **Painters tape 2" wide (Green Tape is ideal)**
2. **12" ruler or straight edge**
3. **12' tape measure**
4. **Pencil / Fine point sharpie**
5. **Scribe**
6. **Drill motor**
7. **Handheld cut off tool- Milwaukee 2522-20 or Harbor Freight Equivalent. Use 1/16" x 3"o.d abrasive cut off wheel.**
8. **3/16 drill bit- (Pilot point preferred)**
9. **17/64 drill bit- (Pilot point preferred)**
10. **3" hole saw & mandrel**
11. **¾" hole saw and mandrel**
12. **Snap (Automatic) center punch (using a center punch and hammer is not recommended)**
13. **¼" or 3/8" carbide De Burring bit (fine tooth only) "Do Not" use a large flute Aluminum bit.**
14. **Pneumatic die grinder or Electric dremel motor.**
15. **1" sanding drum and (2) 1" 80 Grit Sanding rolls**
16. **2" sanding drum and (2) 2" 80 Grit Sanding rolls**
17. **1/8" Allen wrench or T-handle**
18. **3/8" wrench**
19. **Etching primer and touchup paint**
20. **Blue thread locker**

******Warning:** The tools referenced are dangerous if not used as they are intended. Read and understand the manufacturer's instructions and warnings for safe operation of each tool. Always wear the proper safety and protective equipment to prevent Bodily injury. Only use tools rated for the job at hand.

Installation Continued

Cutting the bedside and installing the trim rings

- Apply painters' tape to the lower half of the Passenger (Right) bedside **Fig.1**
- Use the ruler to establish a horizontal reference line at the style line of the bed. **Fig.1**
- Hold the ruler flat against the body, just below and parallel with the style line. **Fig.1**
- Push the ruler up evenly into the style line, keeping inward pressure on the ruler until you feel it starts to find the natural stopping point. (The ruler will want to stop moving up into the curve of the style line) Perform this several times to get a good feel for the way it locates into curve of the body.
  Note: If the ruler rides up the radius of the style line easily, use more inward pressure on the ruler.
- Once the natural stopping point has been found, draw a reference line across the top of the ruler. **Fig.2 / 3**
- Measure from the horizontal reference line down 6 3/4, make a reference mark **(A)**. **Fig. 4**

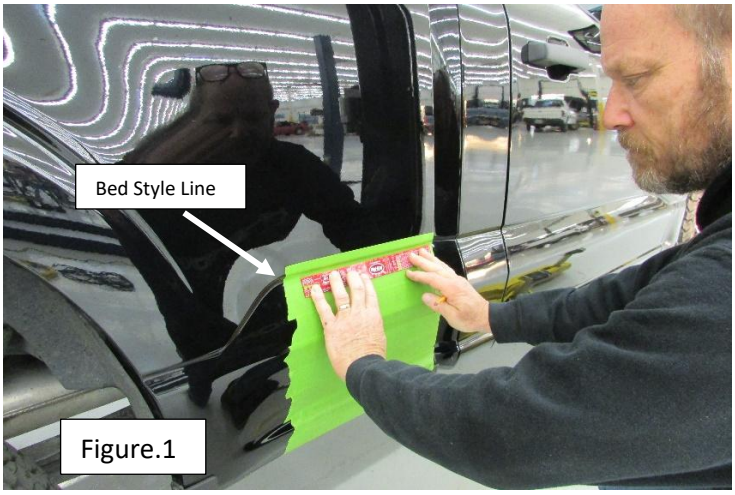


Figure.1


Figure.2

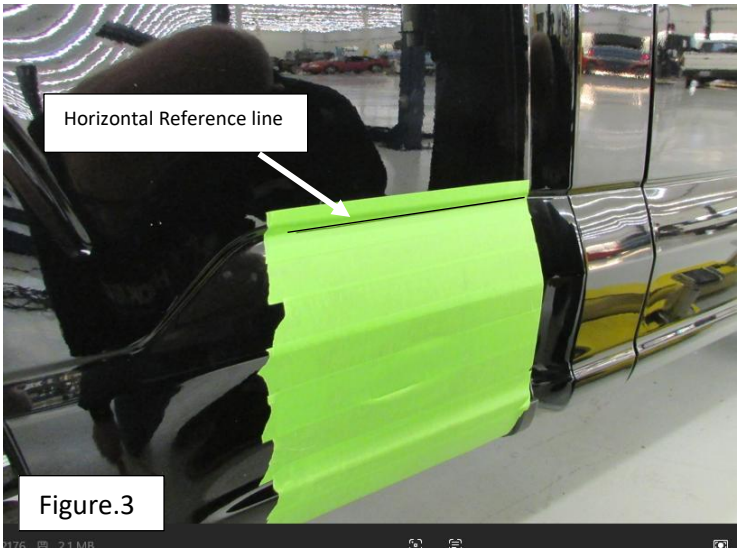


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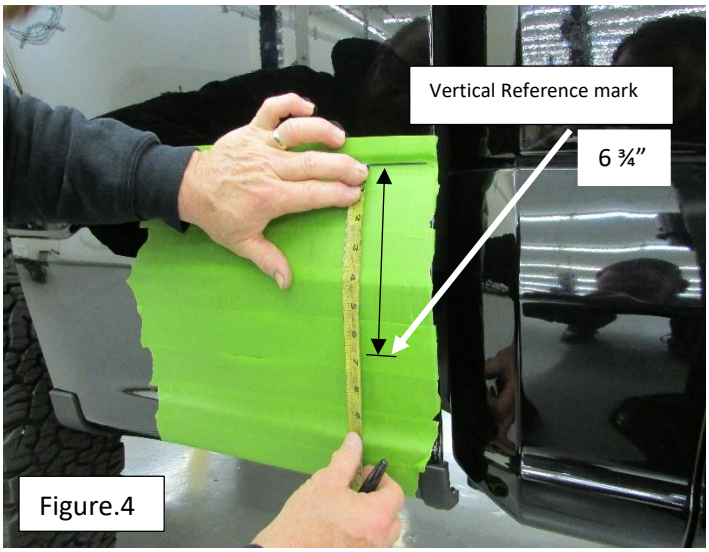


Figure.4

Installation Continued

Cutting the bedside and installing the trim rings

- Measure from the horizontal reference line down 6 3/4" make a second reference mark **(B)**. **Fig. 5**
- Draw a line from vertical reference mark (A) to vertical reference mark (B) at 6 3/4". This is now the centerline reference of the cutout. **Fig.5**
- Verify the placement of the Centerline**:** Measure from the underside of the bed edge to the centerline reference. This measurement should be 7 ½" on a clean undamaged bed side. **Fig.6**
- Measure (4 13/16") from the front edge of the bed rearward at the centerline. Make a reference mark. **Fig.7**

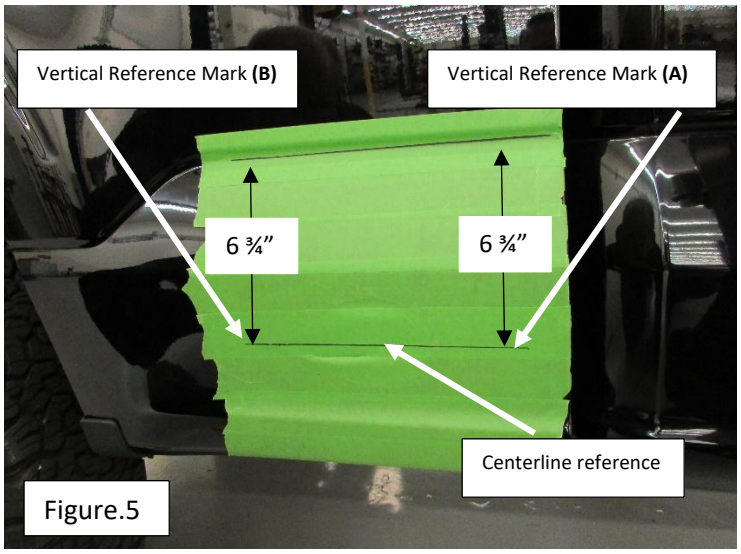


Figure.5

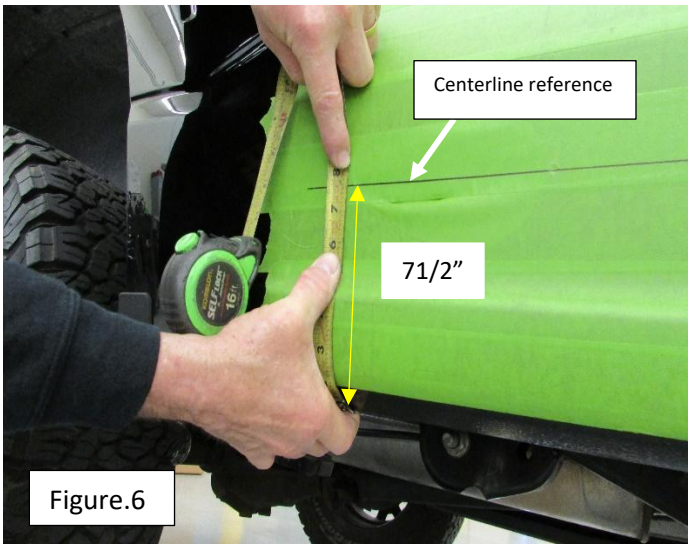


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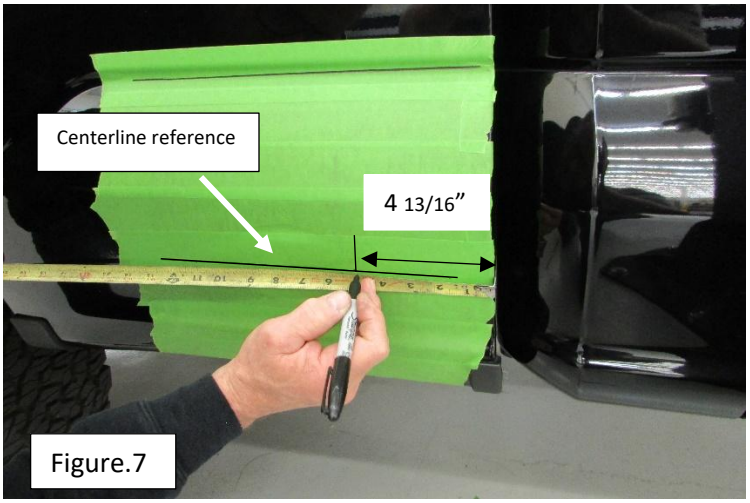


Figure.7

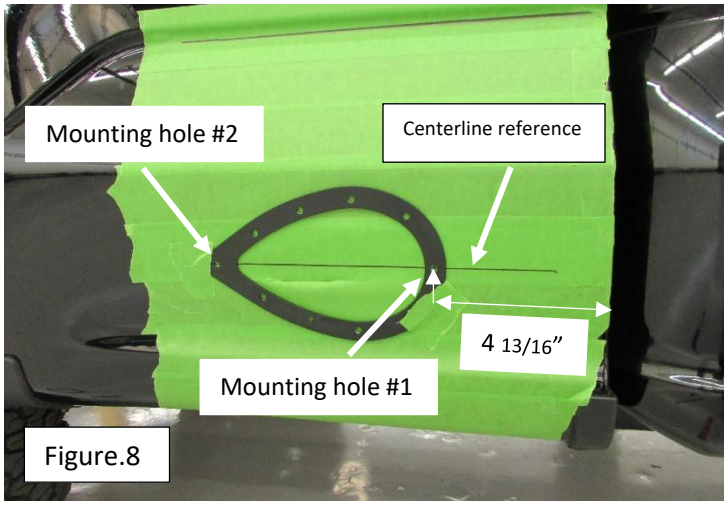


Figure.8

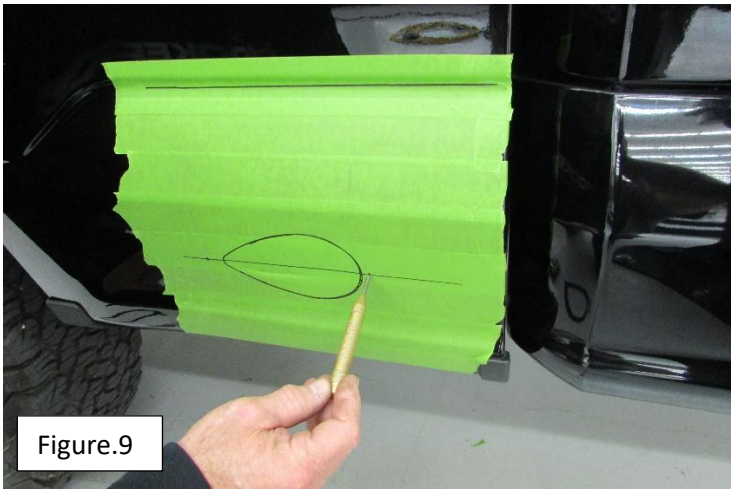
Placement of the trim rings

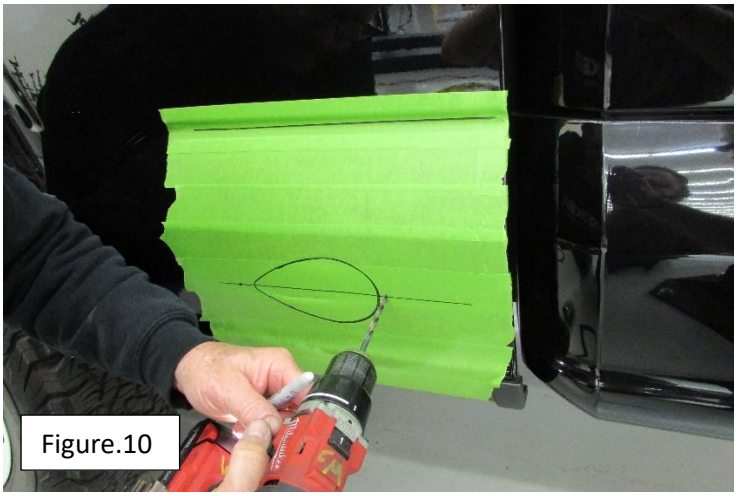
- Align the Large Trim Ring with mounting hole #1 aligned on center to the intersection of the centerline and the mark made at 413/16" from the bed edge.
- Align mounting hole #2 with the centerline directly through the center of the hole and tape the trim ring in place. Mark the center of mounting hole #2
- Stand Back and visually evaluate the position of the trim ring on the bedside. The trim ring should lay flat against the sheet metal and look centered and level with the body lines.
- Triple check all measurements and make any corrections NOW before any holes are made.

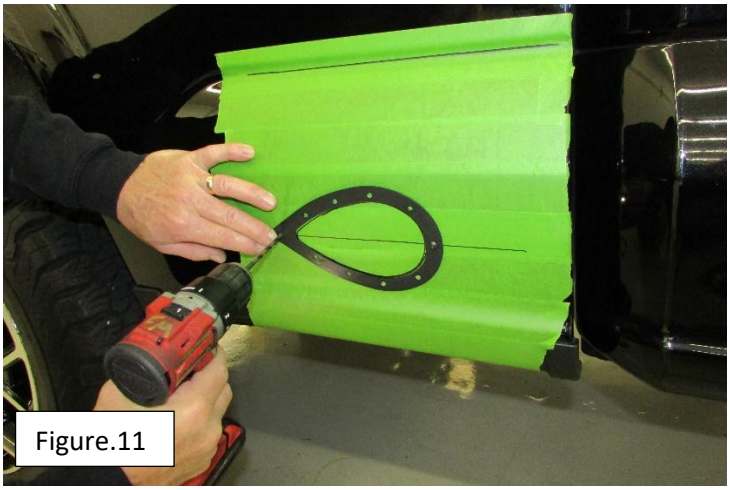
Installation Continued

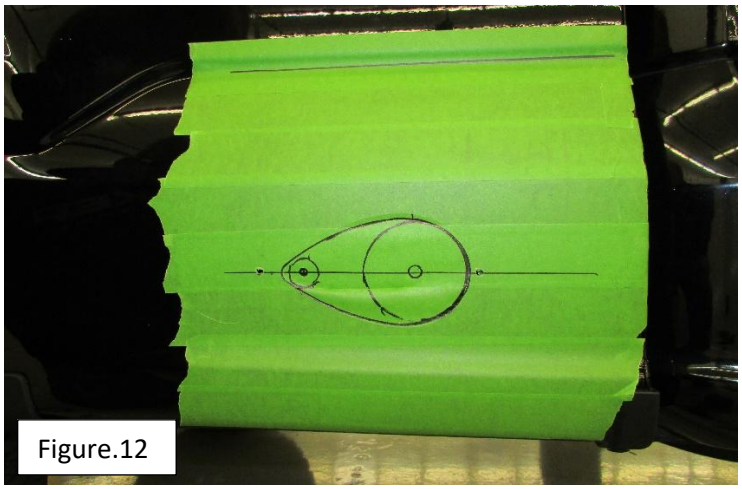
Cutting the bedside and installing the trim rings

- Trace the inside edge of the trim ring with a fine point sharpie. **Fig.9**
- Remove the trim Ring.
- Center punch mounting hole location #1 from figure.7/8, using the spring loaded (Automatic) centerpunch. **Fig.9**
- Use a 3/16 Drill bit (pilot bit preferred) and drill the Mounting hole #1. **Fig. 10**
- Install the large trim ring with a provided 10-32 button head screw and the non-locking 10-32 nut into mounting hole #1. Tighten the nut just enough to hold the trim ring in place.
- Align mounting hole #2 with the mark made on the centerline and tighten the mounting screw.
- Verify the trim ring is located correctly and drill mounting hole #2 using the trim ring as a guide. **Fig.11** Remove the trim ring.
- Outline the body of the hole saws inside the trim ring tracing as shown in **Fig. 12**
  Note: Be sure and leave a small space (1/8”) between the outline of the hole saw and the trim ring tracing to allow for Hole Saw drift during the drilling process. More material can always be removed later. You can’t put it back!!


Figure.9


Figure.10


Figure.11


Figure.12

Installation Continued

Cutting the bedside and installing the trim rings

- Use the ruler and connect the hole saw circles as shown in **Fig.13**
- Centerpunch the dead center of the hole saw locations. This will help locate the guide drill bit of the hole saw mandrel.
- Predrill the location of the hole saw guide bit with no hole saw installed on the mandrel. **Fig .13**

Important: NEVER ATTEMPT TO USE A HOLE SAW WITH NO GUIDE DRILL!!!

- Drill each hole as shown in **Fig.14 Take your time and go slow!!**
- Using the handheld rotary cut off tool with an abrasive blade, carefully cut along the lines connecting the circles to remove the center of the cut out. **Fig.15/16 Body Saws or Jig saws are not recommended for this Job!!**

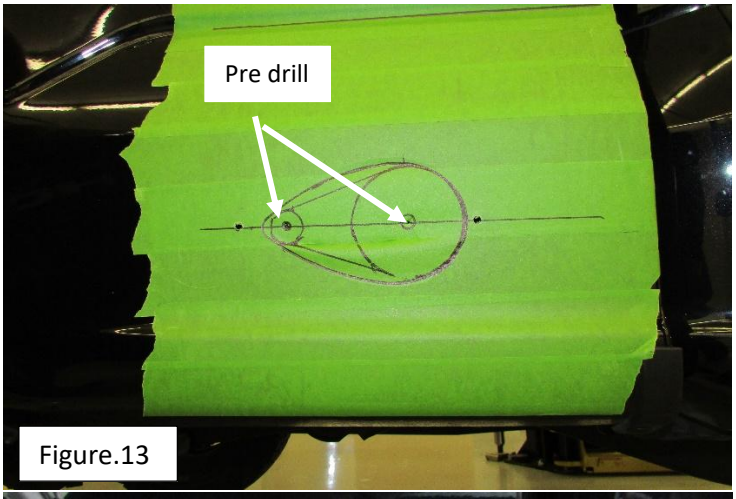


Figure.13

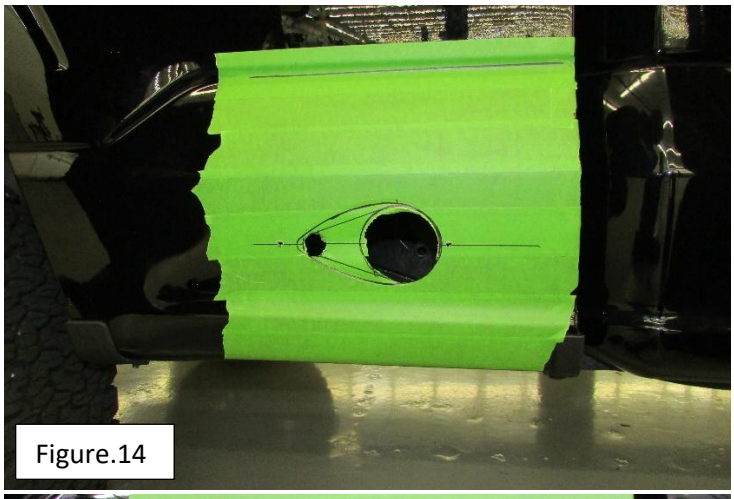
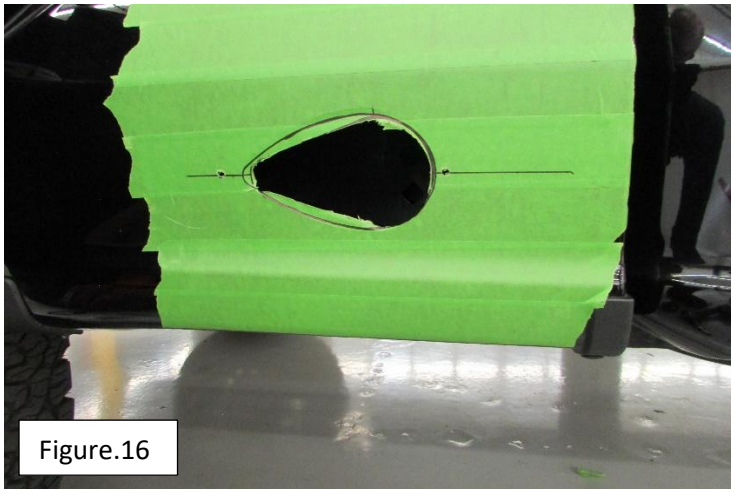

Figure.14


Figure.15


Figure.16

Installation Continued

Cutting the bedside and installing the trim rings

Note: More of the excess material inside the tracing can be trimmed with the cutoff wheel if desired but it is recommended that a Dremel or Die Grinder and round nosed carbide burr be used to avoid removing too much material.

- Remove the tape from around the cut-out area before the finish work is performed
- Install the large trim ring using mounting bolts #1 #2.
- Use the scribe tool to make a witness mark around the **INSIDE** of the trim ring in the same way the sharpie was used to trace the inside profile. This will leave a permanent line in the paint that that can easily be followed as a reference when trimming excess material from the hole. Leaving the tape installed during this process can provide a false indicator of where the edge is. **Fig.17**
- **Remove the trim Ring.**
- Begin slowly removing the excess material from the hole using the Die grinder or Dremel. Remove all excess material up to the scribe line. Be careful to not to remove the scribe line at this point. **Fig.18**
- After the excess material is removed, Final shaping can begin with the sanding drums. Slowly remove small amounts of material using long sweeping motions and light pressure to avoid creating low spots. Remove material until the scribe line just disappears. **Fig.19**
- Use the smaller 1" drum for the small end of the cut out were the 2" drum will not reach. **Fig.20**
- Install the **Large** trim ring periodically as a reference as you are performing the final details and making adjustments. *** Do not use the trim ring as a guide or the powder coating will be removed.**


Figure.17

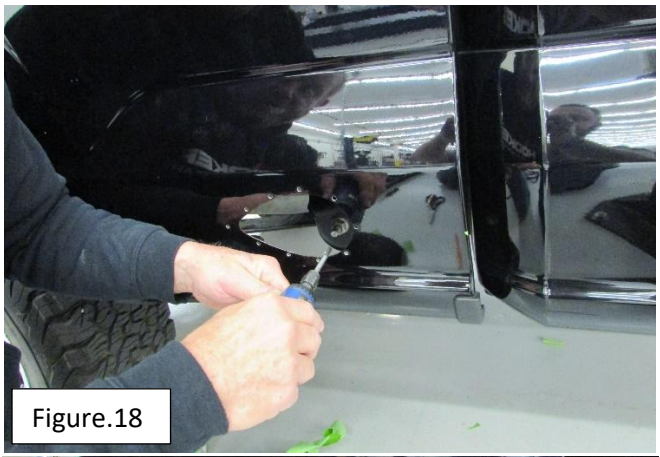

Figure.18


Figure.19


Figure.20

Installation Continued

Cutting the bedside and installing the trim rings

- Install the large trim ring using the mounting bolts #1 and #2. Lightly tighten the bolts. **Fig.21**
- Using the 3/16" drill bit, drill the remaining (8) mounting holes using the trim ring as a guide. Drill slowly and with light pressure for best results. **Fig.21**
- After the holes are drilled remove the trim ring and de-burr the inside and outside of the hole with a 3/8" drill bit or deburring tool. **Spin the drill bit by hand – do not use a drill motor**
- Treat the inside edge and all the bolt holes with a Self-etching primer and vehicle colored touch up paint. This will prevent the exposed aluminum metal from corroding. **Do not skip this step!!!**
- Install the trim rings using the provided 10-32 button head cap screws.
- Install the small Trim ring on top of the large trim ring, align the bolt holes, Install the short ½" screw into mounting hole #1 and a longer 5/8" screw into mounting hole #2.
- Install the trim rings on to the bedside.
- Install a flat washer on to each screw from the back of the bed.
- Apply Blue Lock tight to the threads of the screw in mounting hole #1
- Install the non-locking nut on to the screw in mounting hole #1 and a Nylock nut on to the screw in mounting hole #2. **Fig.22**
- Install the remaining screws, washers and Nylock nuts in the remaining 8 mounting holes. **Fig.22**
- Tighten evenly from the center out and avoid overtightening the screws. A good snug condition is all that is necessary with the lock nuts. This will prevent deforming the trim rings at the screw holes. **Fig.22**



Figure.21

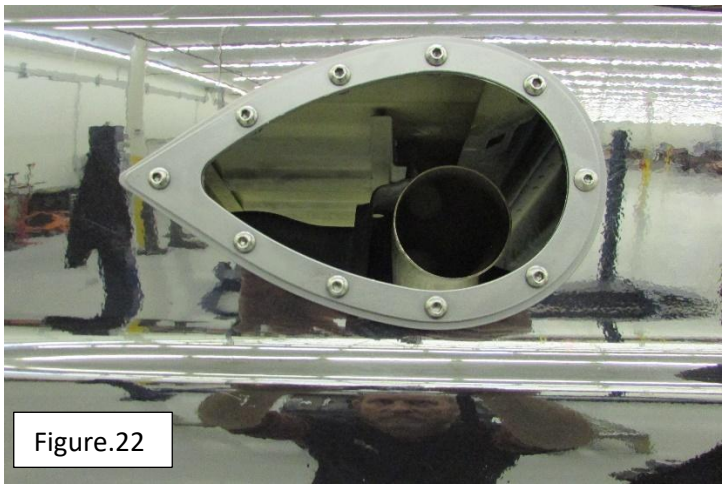


Figure.22

Installation Continued

Removing the factory exhaust

1. Loosen the 15mm nut at the band clamp on the muffler inlet pipe. Spray the connection with penetrating oil. **Fig.23**
2. Support the muffler and tail pipe.
3. Remove the bolts from the (X3) exhaust hanger brackets (1), (2),(3). **Fig. 23**
   Caution: The muffler and tail pipe assembly are one large, welded assembly and will require two people to remove from the vehicle. Cutting the tail pipe at the muffler outlet will make it possible to remove the assembly more easily.
4. Remove the (2x) bolts from the flange at the resonator and remove the resonator assembly. **Fig.23**

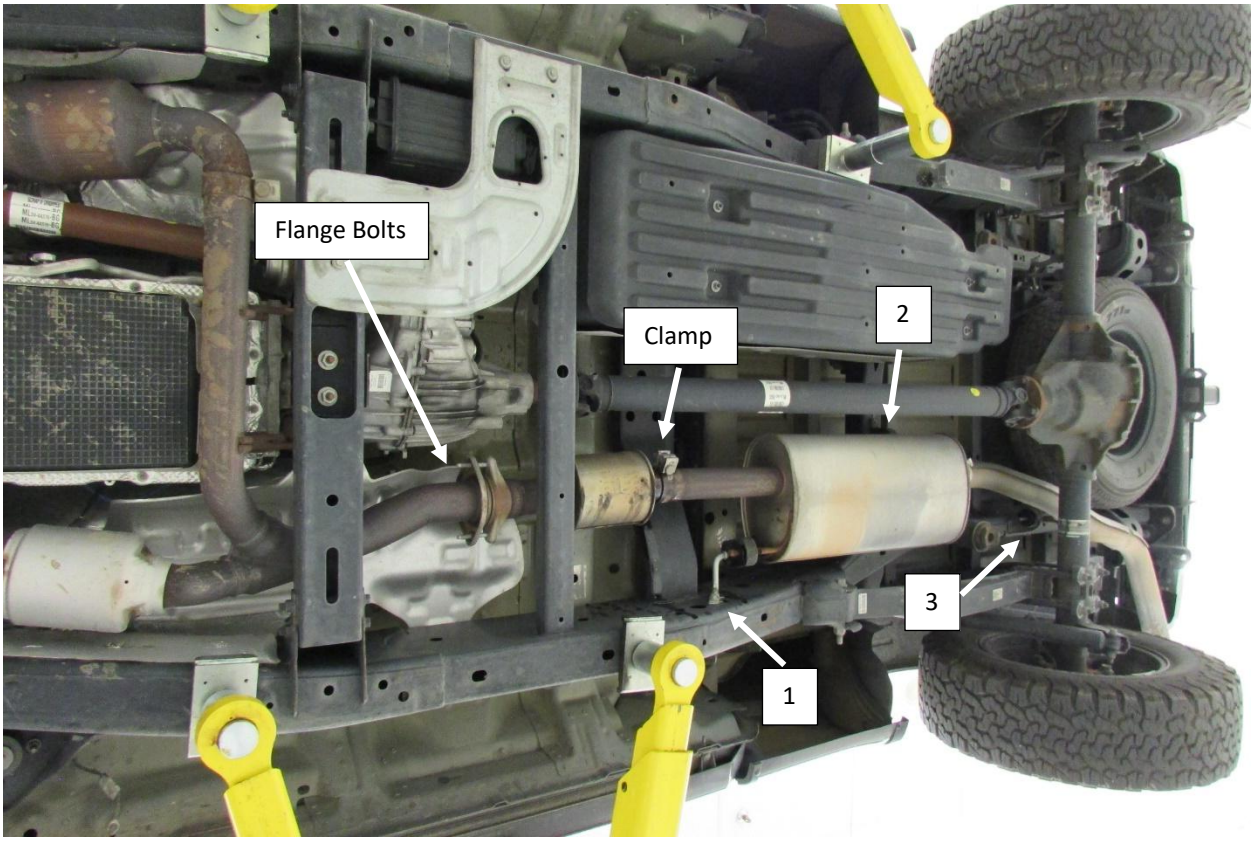


Figure.23

Installing the Flowmaster Exhaust

1. Install the supplied flange on to the inlet pipe with the machined side toward the ball flare. **Fig.24**
2. Install the supplied inlet pipe on to the factory down pipe, use the factory bolts that were removed from the resonator. Install the inlet pipe straight and level allowing ¾" space between the pipe and crossmember. **Fig.24**
3. Remove the (x2) OEM muffler hanger (1) clip nuts from the frame at the location shown. **Fig 23/24**
4. Transfer the clip nuts to the forward location on the frame. Install the supplied frame hanger with the OEM bolts removed from the factory muffler hanger (1). Rotate the hanger clockwise toward the top of the frame and tighten the bolts. **Fig.24**

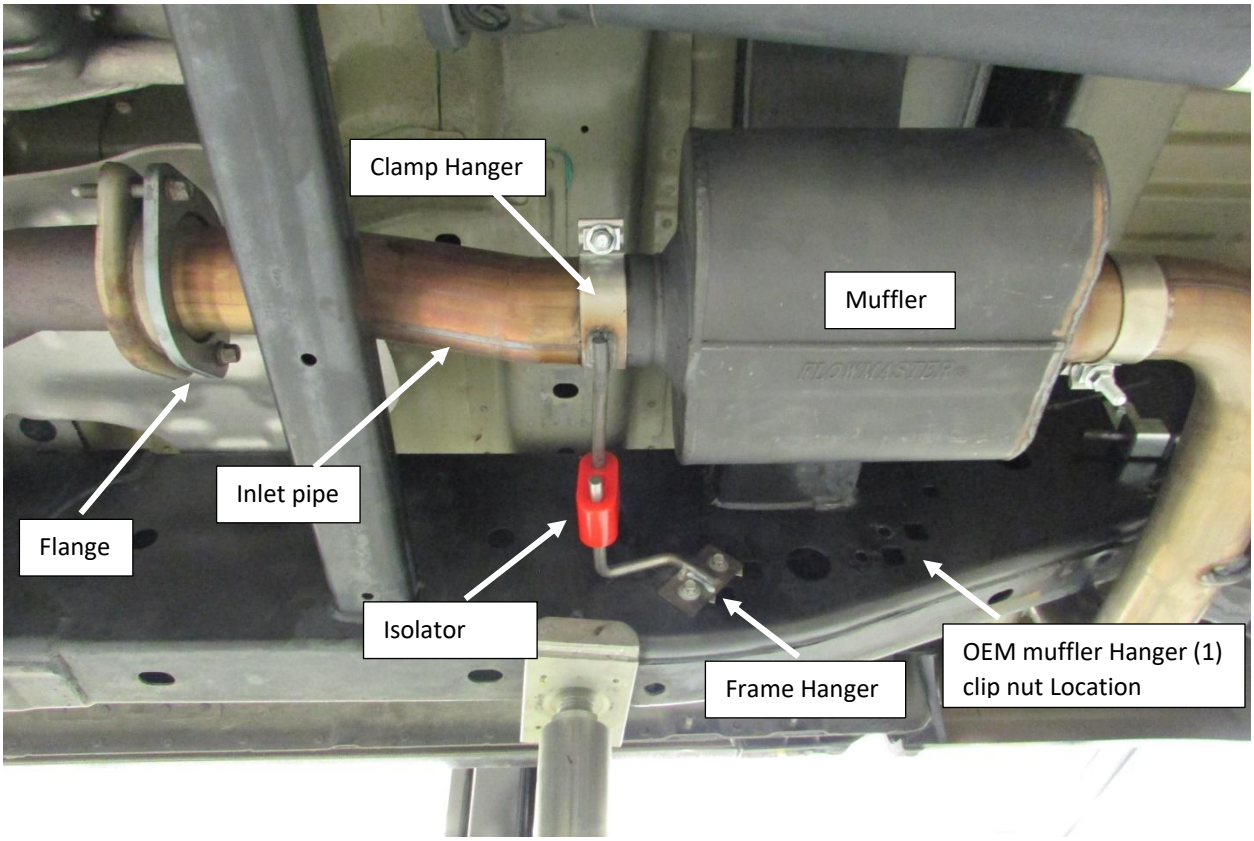


Figure.24

5. Install the rubber isolator on to the frame hanger rod. **Fig.24**
6. Install the Clamp hanger on to the inlet pipe with the rod on the bottom.
7. Install the hanger rod into the rubber isolator bottom hole. **Fig.24**
8. Install the Outlaw muffler on to the inlet pipe with the Logo facing the ground. **Fig.24**
9. Position the Clamp hanger on to the muffler inlet as shown. Tighten the clamp to allow for adjustment. **Fig.24**
10. Adjust the muffler to be parallel to the frame and level. Support the muffler.
11. Tighten the bolts at the inlet pipe flange then tighten the clamp hanger nut on the muffler inlet to approximately 35ft/lbs. Do not overtighten.

Installation Continued

Installing the Flowmaster Exhaust

12. Remove the OEM Rear muffler hanger clip nut from the frame. **Fig.23**
13. Install the clip nut into the lower location on the outside of the frame rail shown in figure.25
14. Preinstall the supplied rubber hanger assemblies on to the tail pipe as shown in figure.26

    Note: Use liberal amounts of spray lube on the hangers before installation.

    Do not use grease on the hanger rod or rubber hanger assemblies.

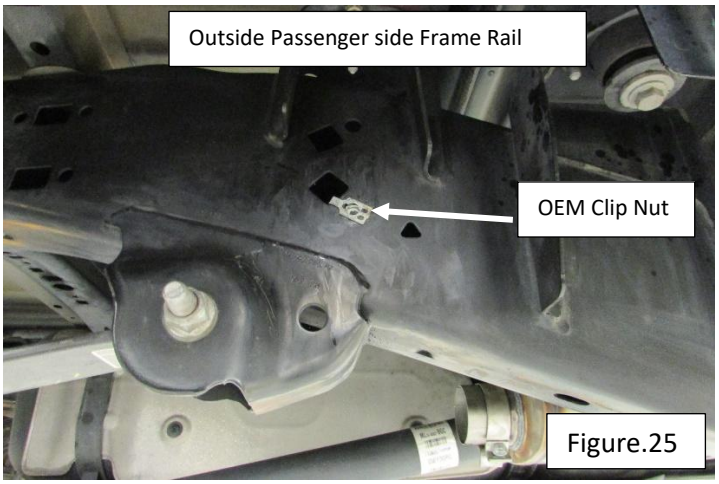


Figure.25

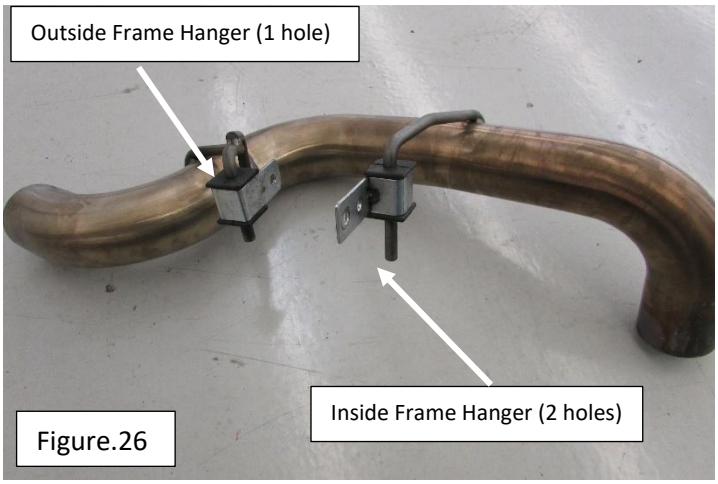


Figure.26

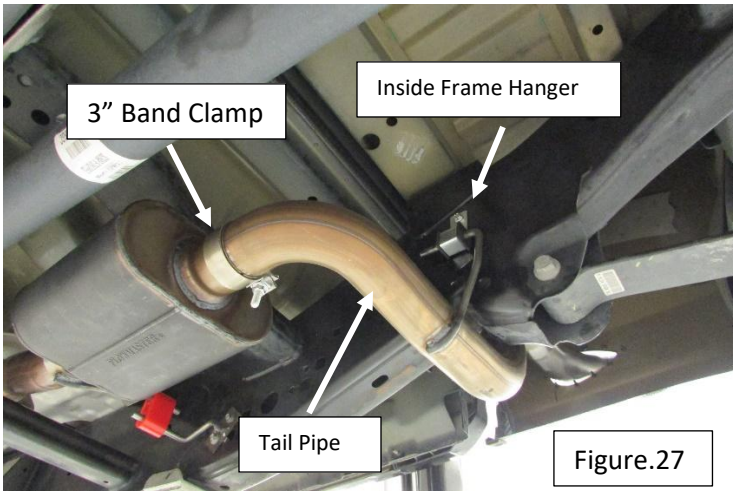


Figure.27

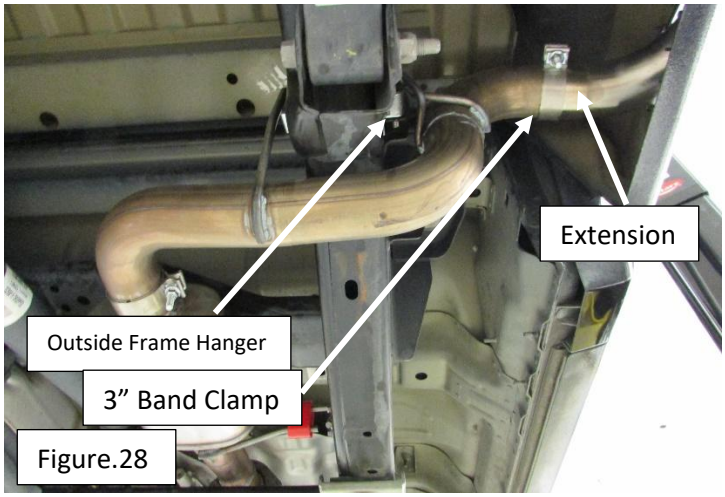


Figure.28

15. Install a supplied 3” band clamp on to the muffler outlet. **Fig.27**
16. Slide the tail pipe hangers over the frame rail just in front of the leaf spring bracket. **Fig.27/28**
17. Install the tail pipe into the muffler outlet. **Fig.27**
18. Align the tailpipe outside frame anger with the clip nut and install the OEM bolt. Tighten to allow for adjustment. **Fig.28**
19. Install a 3” band clamp on to the tail pipe outlet. **Fig.28**
20. Install the tear drop tail pipe extension on to the tail pipe from the outside of the bed and through the trim rings. **Fig.28**
21. Tighten the clamp to allow for adjustment. **Fig.28**

Installation Continued

Installing the Flowmaster Exhaust

22. Adjust the tailpipe until the tear drop extension is aligned within the trim rings.

Alignment is adjustable on all axes

- **Tail Pipe Front to back –** Adjust the tail pipe in and out of the muffler for large adjustments.
  Adjust the outside frame hanger on the bolt for small adjustments

- **Tail Pipe Up and Down –** Adjust the muffler height in the chassis up and down for large adjustments
  Rotate the tail pipe inside the muffler and pivot on the outside hanger rod for large adjustments.
  Adjust the outside hanger up and down on the bolt for small adjustments.
- **Tail Pipe Extension Rotation -** Turn the teardrop extension clockwise or counterclockwise as needed.
- **Tail pipe extension In/Out -** Slide the teardrop extension in/out on the tail pipe for desired stick out of the trim rings.

Note: One adjustment may affect another, multiple adjustments may be needed to achieve the desired alignment.

Installing the (2x) 5/16 mounting bolts for the inside frame hanger assembly.

23. Confirm tail pipe alignment is at the desired location.
24. Centerpunch the center of each mounting hole of the inside hanger bracket. **Fig.29**
25. Use a 17/64 drill bit and pre-drill each bolt hole.
26. Install the (x2) supplied 5/16 self-threading bolts **Fig.29** - **Do Not use an impact driver to install the bolts.**

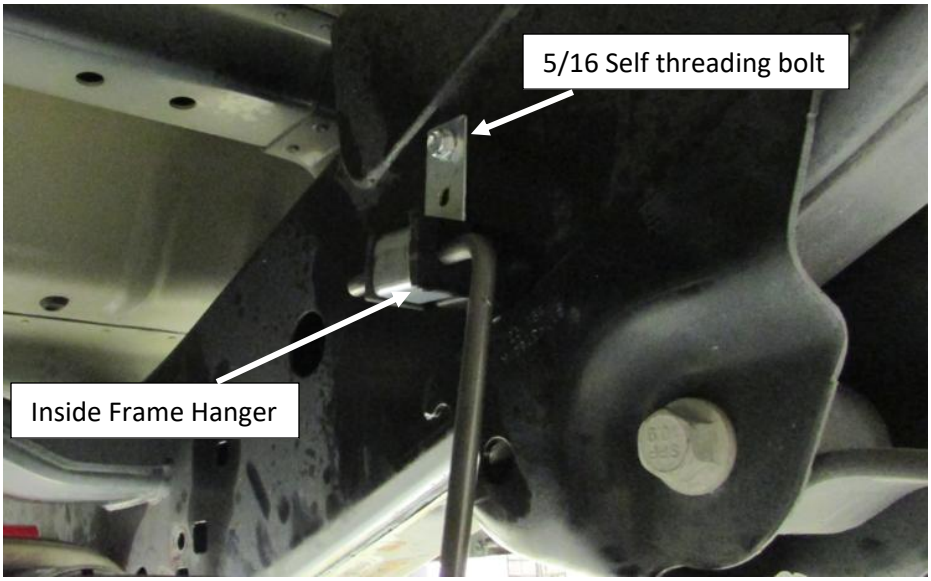


Figure.29

Installation Continued

27. Tighten all clamps and hardware starting at the front and working towards the rear of the system.
    Important: Do not overtighten the Band clamp nuts. Torque the nuts to 35/40 ft lbs. once the clamps are at maximum range they will not hold clamping load and require replacement.

28. Make final adjustments to the tailpipe before the system has had its final tightening.
29. Tail pipe adjustments will likely be needed after the first 30 miles of driving to correct for heat cycle movement in the system.



Enjoy your Flowmaster Exhaust