

# 74WELD

## BRONCO STEERING RACK

### OWNER'S MANUAL

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## *VIDEOS AND EXTRA INFO*

74WELD  
OWNER'S  
MANUAL

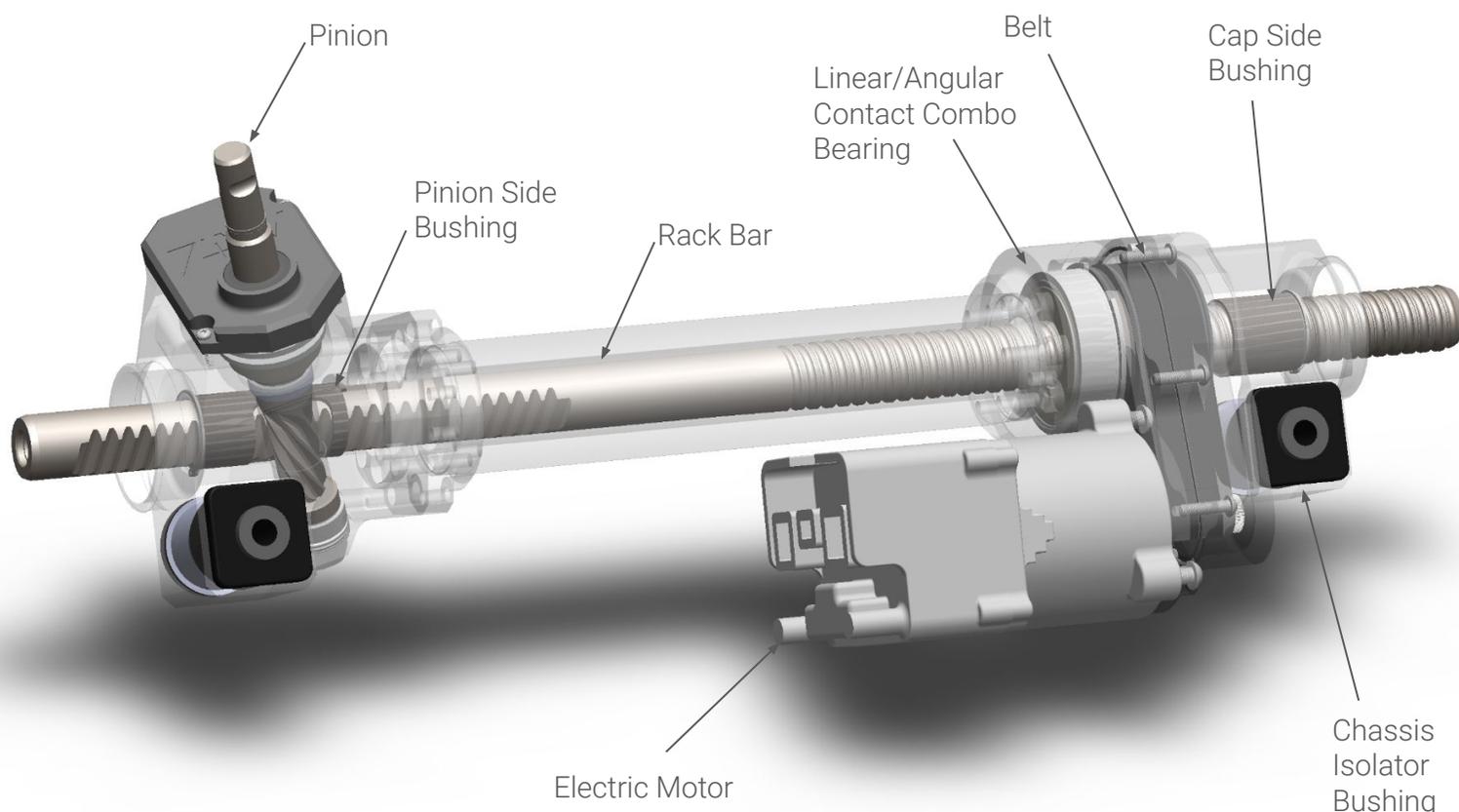


## STEERING RACK OVERVIEW

The factory 2021+ Ford Bronco steering gear assembly is a rack and pinion with electronic power assist. Its housing is made of cast aluminum and is prone to fracture during operation off road with large tires. The 74Weld billet aluminum housing is designed to accept the gears and electronics from your stock rack assembly and provide the following benefits.

- Improved Material
  - Higher strength, more ductile, 6061 Aluminum construction.
- Thicker Cross Sections
  - Two to three times thicker typical cross section in structural areas.
- Additional Rack Bar Support
  - Bronze bushings at each end stabilize the rack bar
  - Rack bar deflection is arrested at the bushings which protects internal components.
- Maintains all factory electronics to seamlessly integrate with your vehicle's systems.

Diagram below illustrates what your steering system will look like post-install.



### 74Weld Steering Rack Assembly



## **PRIOR TO INSTALLATION**

**Prior to installation read this installation manual in its entirety.**

**WARNING: Improper installation of this product can result in vehicle codes which may render some functionalities of the vehicle inoperable. The presence of codes may also affect your ability to register the vehicle, depending on jurisdiction.**

**WARNING: Improper use or installation of this product can cause mechanical failures that may result in serious injury or death.**

**WARNING: Only perform this installation if you are a qualified mechanic with adequate equipment**

**WARNING: Wear safety glasses and personal protective equipment as-required to prevent injury**

## MATERIALS OVERVIEW

### TOOLS

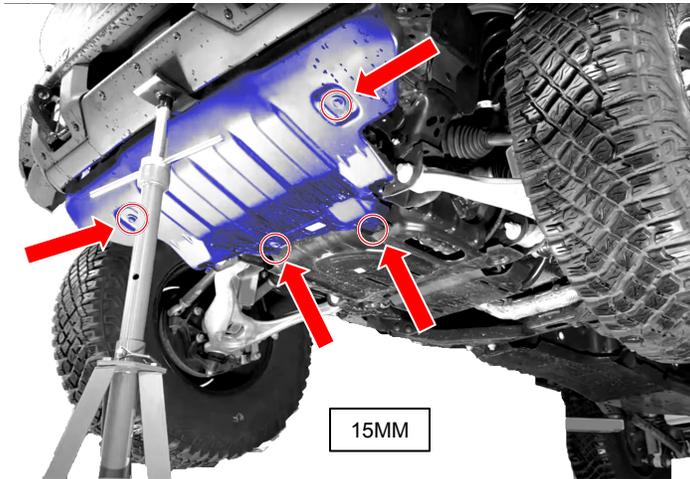
The following tools will be required for rack installation to the vehicle

- Safety glasses
- Basic mechanic's tools
- Metric wrench set up to 21mm
- Metric socket set up to 21mm
- 28mm open ended wrench
- Pliers
- 44mm crowfoot (Hoss 3.0 Tie Rods)
- 40mm crowfoot (Hoss 2.0 Tie Rods)
- Pickle fork or ball joint separator (if changing tie rods)
- Torque wrench
- Loctite 242 (Blue)
- Loctite 271 (Red)

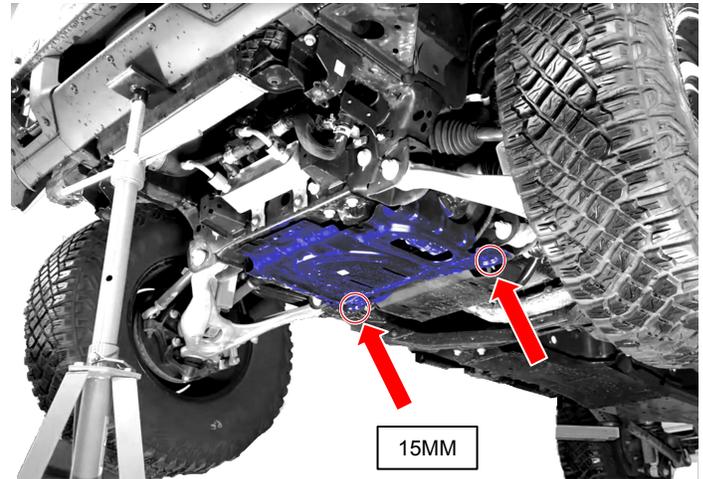
The following tools will be required to swap internals from a factory rack to a 74Weld housing

- 6 point torx driver set
- 6 point torx socket set
- 5 point security torx set
- Pinion plug removal tool (can be purchased from 74Weld, PN: 74W-SR-TOOL1)
- Micrometer (Ranged for 1.228" & 1.288" nominals) or rack bar gages
- Arbor press
- Grease
- Snap ring pliers
- 1 inch socket
- Paint pen
- Pry bar
- Loctite 242 (Blue)
- Loctite 271 (Red)

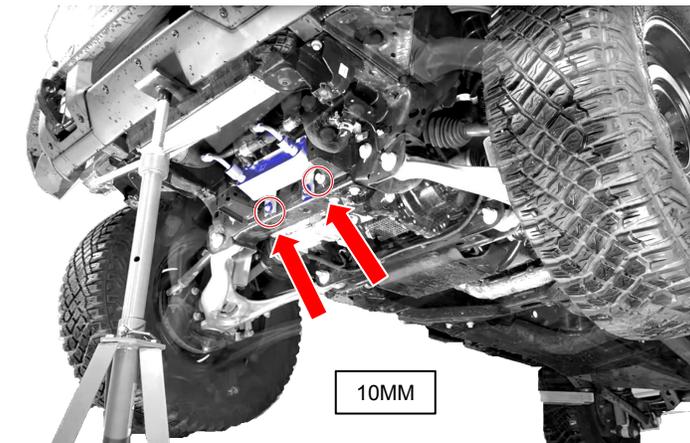
## FACTORY RACK REMOVAL



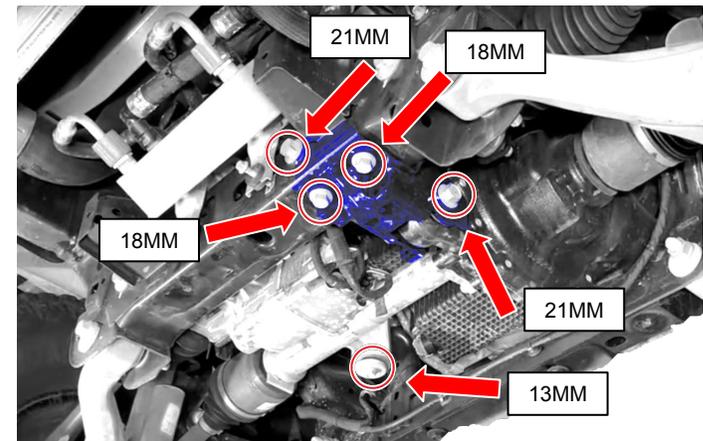
1. Lift the vehicle and support the chassis as-required. Remove the four bolts shown to detach the front portion of the front skid plate.



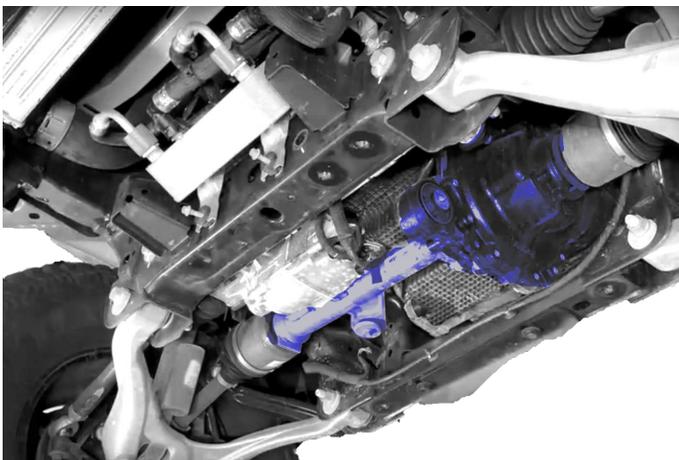
2. Unfasten the two bolts shown to detach the rear portion of the front skid plate.



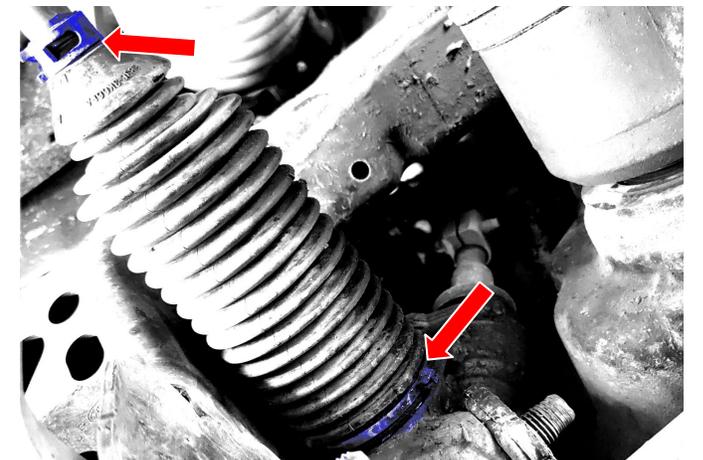
3. Loosen the two bolts shown to be able to maneuver cooler out of the way in future steps.



4. Unfasten the four bolts shown to detach the front, driver, differential mounting bracket. Unfasten passenger side of diff tube.

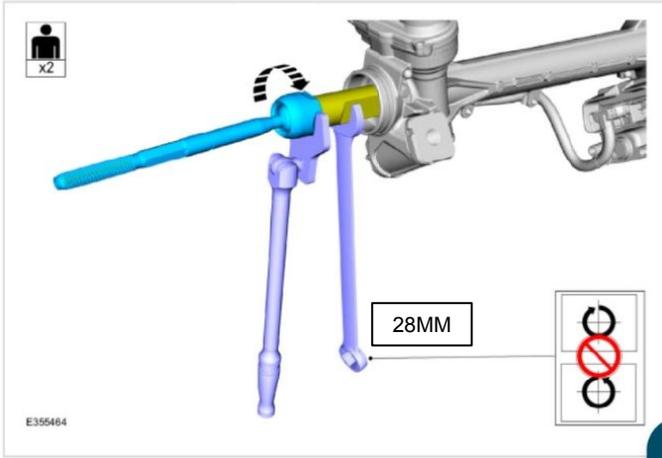


5. Lower differential and support with jack or jack stand.



6. Use pliers to remove boot clamps, both sides. The tie rod side is a reusable pinch clamp. The Rack side clamp can be destroyed and discarded. Separate boots from rack housing.

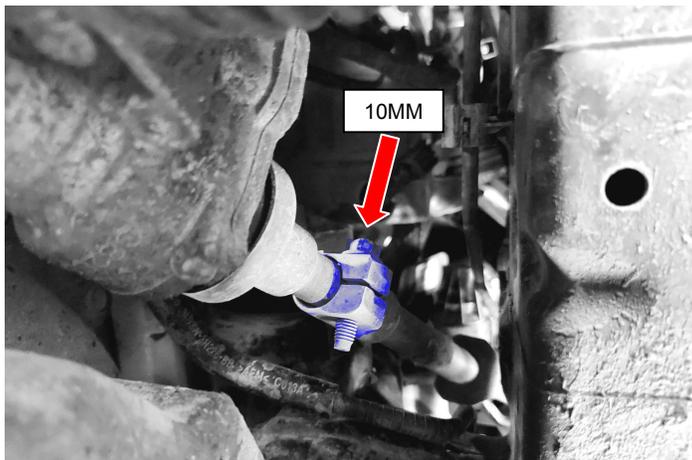
## FACTORY RACK REMOVAL (CONTINUED)



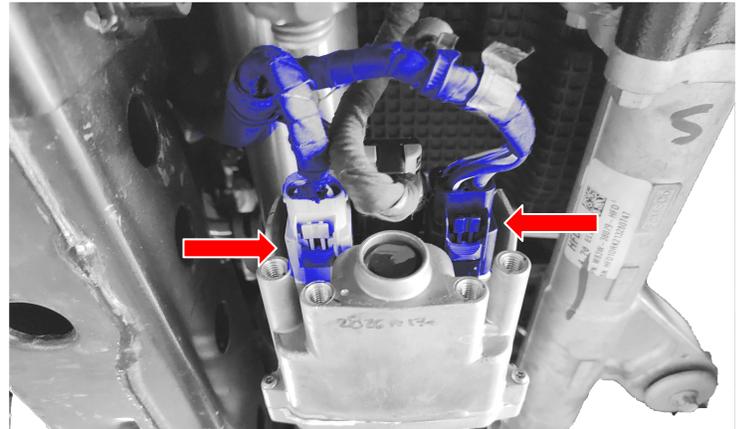
7. Remove tie rods from rack bar. Use a 28mm wrench as shown to support rack during tie rod removal to protect gear set.



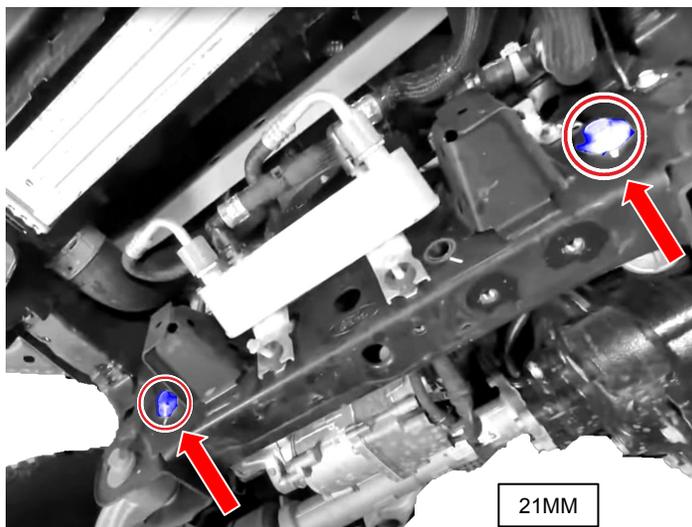
8. Center rack position by straightening the steering wheel. **LOOP THE SEAT BELT THROUGH THE STEERING WHEEL TO PREVENT ROTATION IN FOLLOWING STEPS**



9. Remove screw from collar attaching steering shaft to pinion. Slide steering shaft up and off of pinion.



10. There are three connectors on the rack motor. Disconnect the two that lead to the chassis. The third (middle) can be left connected.



11. Remove the two bolts holding the rack to the chassis.

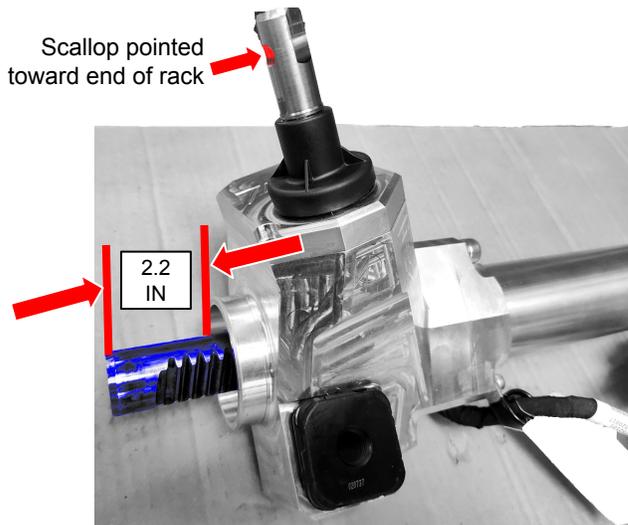


12. Remove rack by pushing it toward the passenger side of the vehicle. Rotate the rack fore and aft as required for the pinion to clear the differential and engine.

## 74WELD RACK INSTALLATION

IF YOU ARE ASSEMBLING YOUR 74WELD HOUSING (GUT SWAP), HEAD TO THE "INTERNALSWAP" SECTION LATER IN THIS MANUAL BEFORE PROCEEDING WITH RACK INSTALLATION PROCEDURE BELOW.

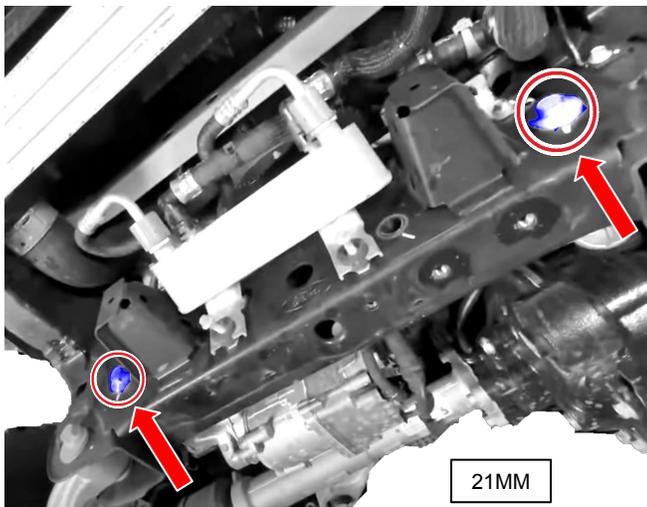
IF YOU HAVE A FULLY ASSEMBLED RACK READY TO GO, PROCEED WITH INSTALLATION PROCEDURE BELOW.



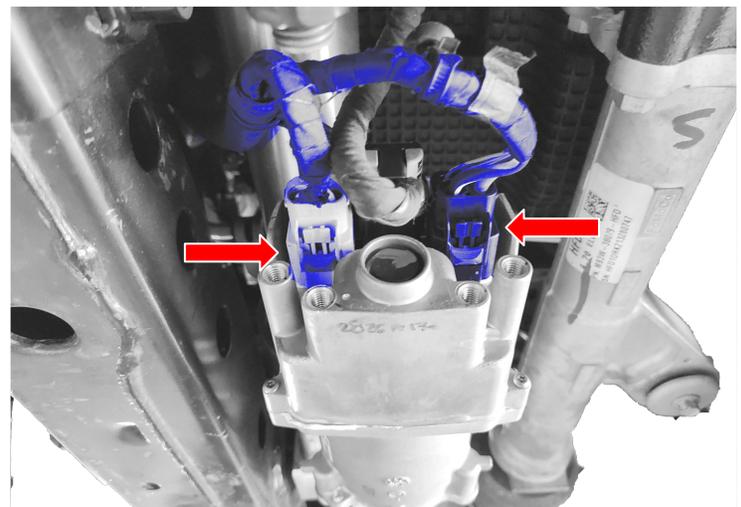
13. Turn pinion such that the scalloped side of the pinion shaft is pointed toward the end of the rack. There should be about 2.2 inches of shaft extending from the housing.



14. Place new rack into chassis from the passenger side. Tilt fore and aft as-required to get pinion shaft to clear differential and engine.

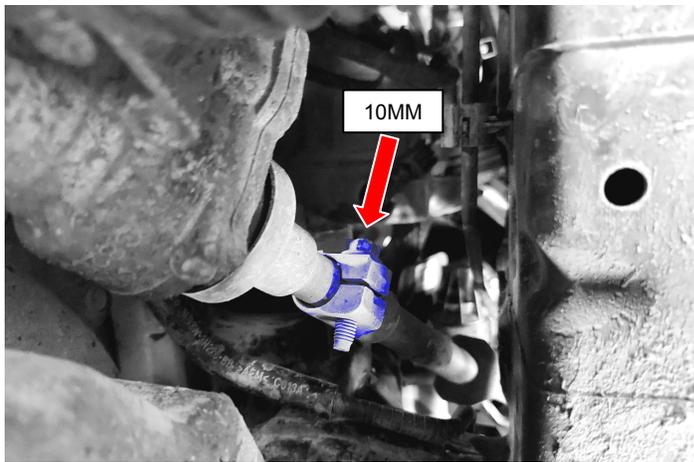


15. Apply threadlocker to rack chassis bolts. Pass bolts through frame and thread into rack bushings. Torque to 185 ft-lbs.

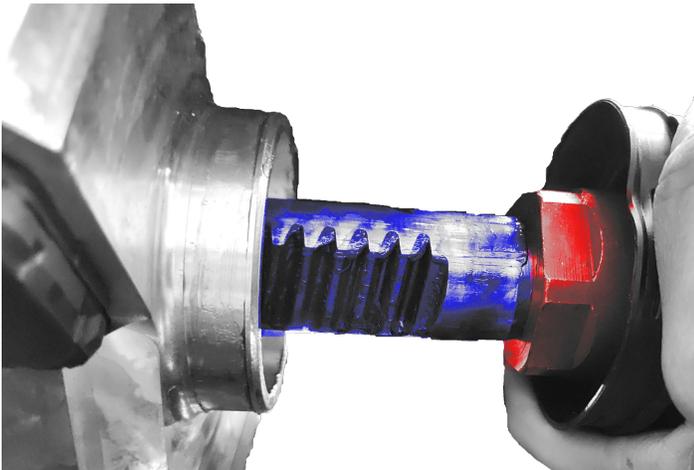


16. Plug the two chassis connectors into the rack motor.

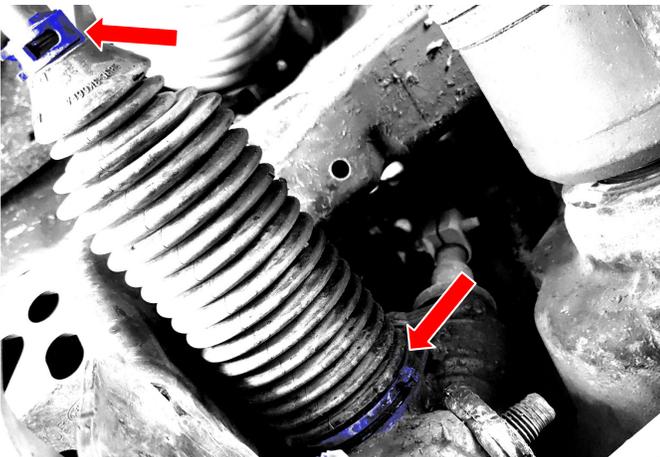
## 74WELD RACK INSTALLATION (CONTINUED)



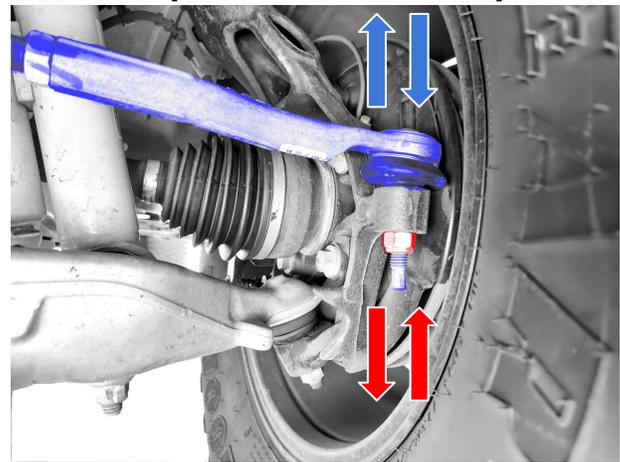
17. Reconnect pinion shaft to steering shaft. Apply blue loctite to collar screw prior to tightening.



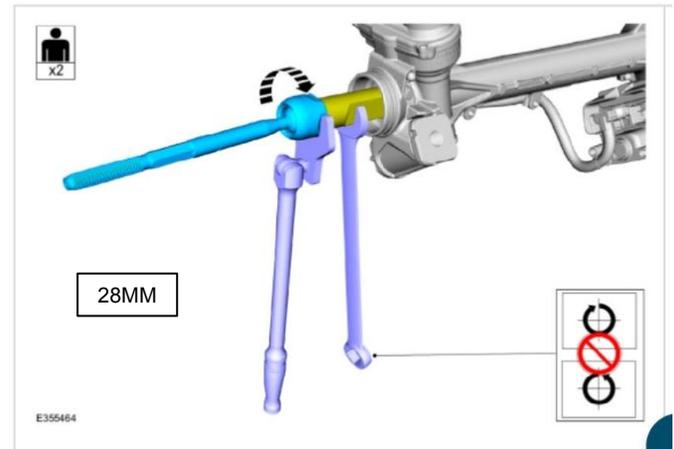
19. Place hose clamps (provided) and boot pinch clamps (reused) onto tie rod, apply threadlocker to tie rod end threads and thread rack-side tie rod end into rack bar.



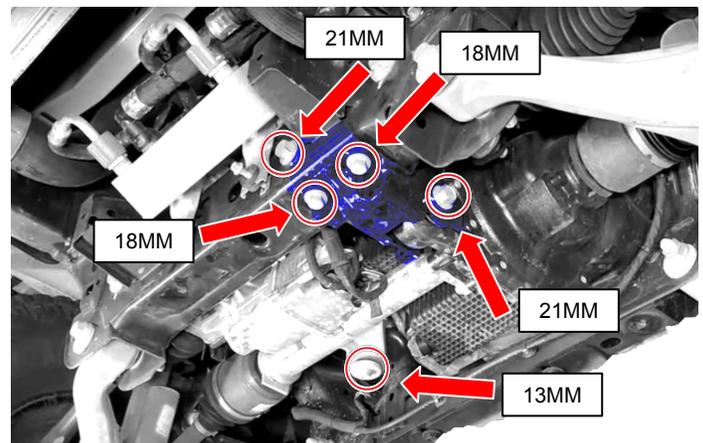
21. Tighten hose clamps to seal boots to rack housing. Re-attach pinch clamps to seal boots to tie rods.



18. If you are installing new tie rods, remove existing tie rods from uprights at this time and install new tie rods on to uprights. Use a pickle fork or ball joint separator as required to unseat tie rod taper from upright.

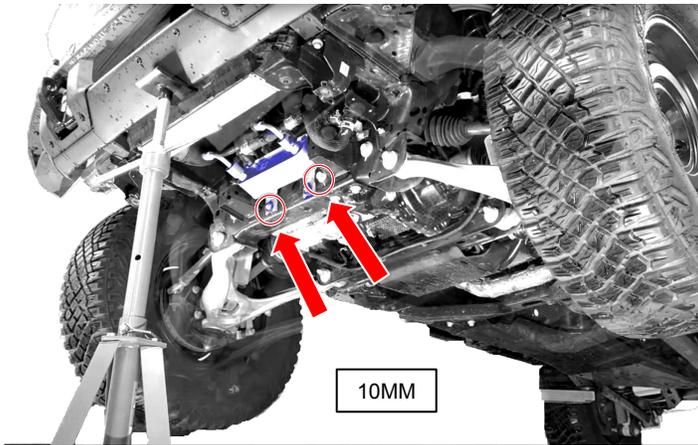


20. Torque tie rods to 89 ft-lbs. Use a 28mm wrench on the flats of the rack bar gear teeth to support bar during torque operation and protect gear set.

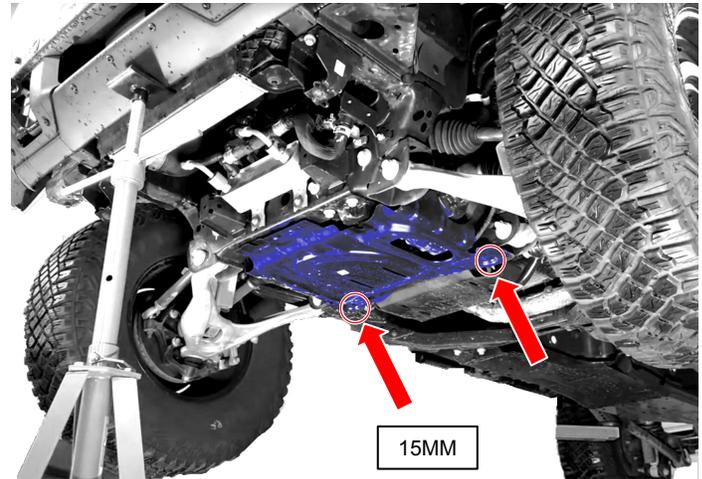


22. Reinstall differential mounting bracket and torque all hardware, including passenger side of diff tube.

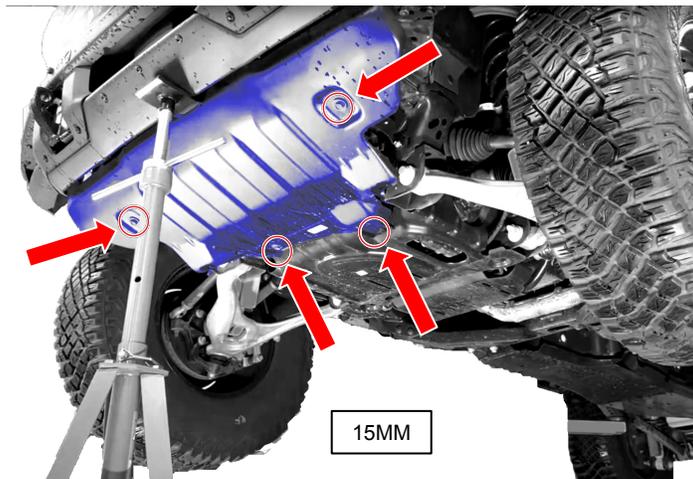
## 74WELD RACK INSTALLATION (CONTINUED)



23. Re-fasten cooler to frame



24. Reinstall rear skid plate

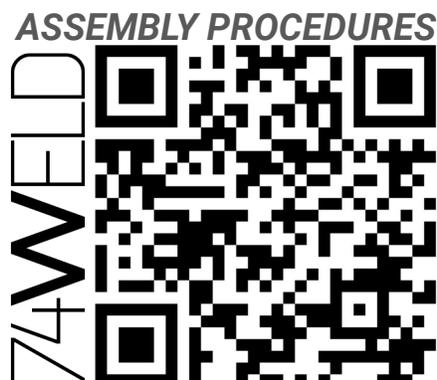


25. Reinstall front skid plate

After installation is complete, align steering to manufacturer's specifications

## SWAPPING INTERNALS - READ THIS SHEET

Prior to disassembling your factory rack, head to our website to download detailed assembly instructions and watch our video on the full internal swap procedure.



**THE MOST IMPORTANT PART OF THIS PROCEDURE IS FOUND AT MINUTE 5:25 OF THE INSTALLATION VIDEO AND SHEET 5 OF THE ASSEMBLY DRAWINGS. FAILURE TO MARK PINION GEARS AND RE-INSTALL THEM IN THE SAME ORIENTATION THAT THEY CAME OUT WILL RESULT IN YOUR VEHICLE DISPLAYING ERROR CODES AND LIMITING FUNCTIONALITY.**



The following two sheets will detail inspection items to perform during factory rack disassembly and 74Weld rack assembly. The disassembly inspection is an important step to ensure that your rack core is adequate and in good condition to be reused within a billet housing. Failure to properly inspect your rack core can result in the use of damaged or subpar components which can reduced lifespan or failure of your rack. Failure to perform assembly inspections can also result in reduced lifespan or failure of your rack assembly. If you discover damaged components and cannot find a replacement, give us a call and we may be able to assist you. 619-286-6656

**YOUR RACK WILL BE DELIVERED AS-SHOWN ON SHEET 4 OF THE ASSEMBLY DRAWING. DO NOT TAMPER WITH THE TORQ SEALED FASTENERS ON THE TUBE ASSEMBLY. REMOVING THESE FASTENERS CAN AFFECT YOUR RACK'S CONCENTRICITY AND VOID YOUR WARRANTY.**

Specialty installation tools and inspection gages can be purchased from 74Weld.

- Pinion cap removal tool
- $\frac{3}{8}$ " drive pinion head rotation tool
- Rack bar inspection gages

## FACTORY RACK INSPECTION

### PERFORM THESE INSPECTION ITEMS DURING DISASSEMBLY

INSPECTION ITEM	PASS	FAIL	INSPECTOR
Housing Visual Inspection. Inspect for cracks, breaks, bends, missing pieces etc. Special attention to cap and pinion preloader	Housing is <u>not</u> cracked or broken	Housing is cracked or broken	INSPECTED BY:  DATE:
Prior to disassembly, turn pinion 360 degrees each direction to check for sticking points	Pinion turns smoothly and freely. No sticking points observed	Pinion <u>does not</u> turn smoothly and freely. Sticking points observed	INSPECTED BY:  DATE:
During disassembly, inspect cleanliness inside of rack. Look for metal shavings, debris, and water intrusion	<u>No</u> metal shavings, debris or water intrusion observed	metal shavings, debris or water intrusion observed	INSPECTED BY:  DATE:
Check diameter of rack bar, pinion side. Use gauge or micrometer	Gauge slides over entirety of toothed section of rack bar <u>OR</u> 3 measurements of 1.228" or less taken along length	Gauge does not slide over rack bar <u>OR</u> any measurement over 1.228" taken from tooth section	INSPECTED BY:  DATE:
Check gauge of rack bar, ball screw side. Use gauge or micrometer	Gauge slides over entirety of screw section of rack bar <u>OR</u> 3 measurements of 1.288" or less taken along length	Gauge does not slide over rack bar <u>OR</u> any measurement over 1.288" taken from screw section	INSPECTED BY:  DATE:
Inspect linear bearing. Turn two revolutions each direction	Bearing turns smoothly, freely and no sticking points observed	Bearing <u>does not</u> turn smoothly, freely and/or sticking points observed	INSPECTED BY:  DATE:
Inspect pinion ball bearing. Turn two revolutions each direction	Bearing turns smoothly, freely and no sticking points observed	Bearing <u>does not</u> turn smoothly, freely and/or sticking points observed	INSPECTED BY:  DATE:
Inspect pinion needle bearing. Place pinion inside of needle bearing and turn two revolutions each direction	Bearing turns smoothly, freely and no sticking points observed	Bearing <u>does not</u> turn smoothly, freely and/or sticking points observed	INSPECTED BY:  DATE:
Visual inspection of hardware. Check for stripping, bending or thread damage	No damage to hardware observed	Damage to hardware observed	INSPECTED BY:  DATE:
Inspect pulley for wear and tear	No damage to pulley observed	Damage to pulley observed	INSPECTED BY:  DATE:

## 74WELD ASSEMBLY INSPECTION

### PERFORM THESE INSPECTION ITEMS DURING ASSEMBLY

INSPECTION ITEM	PASS	FAIL	INSPECTOR
Ensure ball bearing and needle bearing are packed with grease	YES	NO	INSPECTED BY:  DATE:
Ensure rack and pinion gear teeth are packed with grease	YES	NO	INSPECTED BY:  DATE:
Ensure bushings are packed with grease	YES	NO	INSPECTED BY:  DATE:
Marks were made during disassembly to match pinion gears. Verify that marks line up during re-assembly	Marks line up	Marks do not line up	INSPECTED BY:  DATE:
Verify rack bar to end of housing measurement matches measurement taken during disassembly	Measurement matches	Measurement does not match	INSPECTED BY:  DATE:
Once rack is assembled, turn pinion two revolutions each direction. Pinion to turn freely and smoothly with no sticking points	Smooth action of pinion with no sticking points	Sticking points observed	INSPECTED BY:  DATE:

*Thank you for purchasing from 74Weld. Should you require support, please contact us at the following number.*

*74Weld Support: 1-619-286-6656*

*Your purchase and product has been logged with a job number that was provided to you on a sheet with your shipment. Please have this job number ready so that our team can locate the specifics of your product and best assist you.*

*We appreciate your business and look forward to seeing you on the trail*