



BULLET PROOF DIESEL[®]
.COM

INSTALLATION MANUAL

**6.4L HALF KIT
2008-2010
F-SERIES**

NEAL TECHNOLOGIES INC.
UPDATED 10/11/2024

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Bullet Proof Diesel 6.4L Oil Cooler Half Kit

Neal Technologies Inc. is proud to offer the 6.4L Oil Cooler Half Kit. Much like the issues and pattern failures of the 6.0L Power Stroke engine, the 6.4L Power Stroke has proven to have many of the same issues.

One of these pattern failures is the plugging of the coolant portion of the engine oil cooler. The Original Equipment (OE) engine oil cooler is a stacked-plate, liquid-on-liquid assembly with alternating oil and coolant sections.

The purpose of the Bullet Proof Diesel 6.4L Oil Cooler Half Kit is to aid the OE oil cooler in performing its function. As the OE oil cooler becomes restricted, its ability to remove heat from the oil is diminished. Once the OE oil cooler has reached a tipping point, it can no longer remove the heat from the engine oil effectively.

The Bullet Proof Diesel 6.4L Half Kit offers a simple, easy-to-install solution for this condition, and operates in conjunction with the OE engine oil cooler. Hot engine oil is directed out from the engine to a high efficiency air-on-liquid oil cooler. This added oil cooling capacity returns the engine oil cooling system back to full functionality without having to perform the labor-intensive replacement of the OE oil cooler. Further, it offers the enthusiast or extreme heavy-duty users the ability to increase the oil cooling capacity of the 6.4L Power Stroke engine when used in conjunction with a properly functioning OE engine oil cooler.

Another benefit to the Bullet Proof Diesel 6.4L Half Kit is the addition of a large, heavy-duty spin-on oil filter. This spin-on oil filter replaces the existing OE oil filter. This solves several oil filtration issues that afflict the 6.4L Power Stroke. These oil filtration issues include:

1. Low engine oil pressure due to a missing or broken filter housing drain valve.
2. Engine oil continuously bypassing the oil filter due to a broken or missing oil filter bypass valve.
3. Engine oil continuously bypassing the oil filter caused by an incorrect oil filter element installation.

The air-on-liquid engine oil cooler has 2 additional ports that can be used for the addition of a bypass filtration system or other end user modifications.

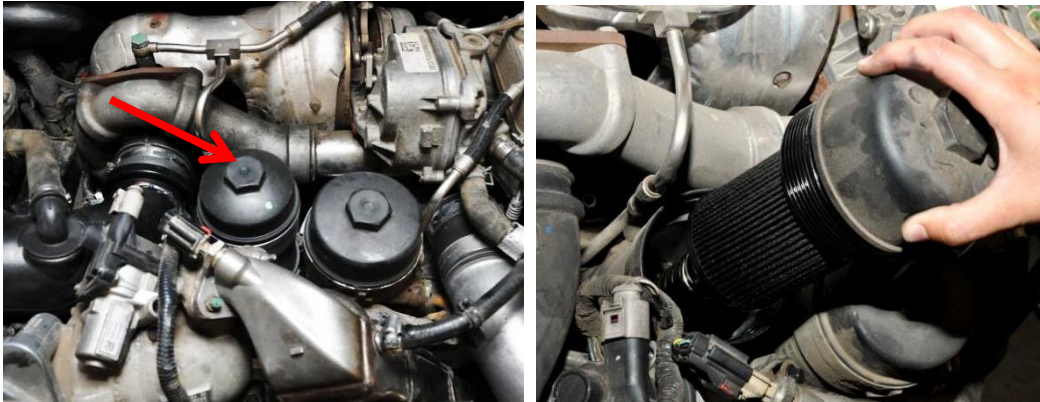
These are the parts included in your kit. Please locate and identify each part prior to starting the installation process. There are some drawings in the back of this manual that can aid you in identifying the proper pieces.

Part Number	Description	Quantity
90201007	6.4L Half Kit Adapter	1
6400076	Pressure Spring for Stock Replacement	1
6000070	O-Ring for Half Kit Adapter	1
6400077	O-Ring for Stock Oil Cooler Housing	1
6400075	#4 ORB Hex Head Plug	2
6000107	Oil Cooler	1
6502183	Oil Cooler Bracket	1
6502182	Bracket to Cooler	1
6502184	Hose Bracket	1
6502091	Oil Filter Bracket	1
6200121	Vibration-Damping Mount	1
6200120	3/8" Lock Nut	2
6200122	3/8" Washer	2
6200123	#8 Self Drilling Screw	6
6502039	Oil Filter Adapter	1
6000013	Oil Filter	1
90100050	46.5" Hose with 0° and 90° Fitting	1
90100051	51" Hose with 0° and 45° Fitting	1
90100052	54" Hose with two 0° Fittings	1
6200124	1 1/4" Loop Clamp	1
6200012	1/4" x 3/4" Bolt	2
6200015	1/4" Washer	4
6200011	1/4" Lock Nut	2
6400007	#12 0° JIC Fitting	3
6400012	#12 45° JIC Fitting	1
6400008	#12 90° JIC Fitting	2
6400038	#12 ORB Hex Head Plug	2
6200129	M8 x 60mm Bolt	2
6200125	M8 x 70mm Bolt	2
6200013	5/16" Lock Nut	5
6200016	5/16" Washer	12
6200076	5/16" x 3/4" Bolt	6
6200014	5/16" x 1 1/4" Bolt	1
6502185	#8 A/C to #8 AN Fitting	1
6400081	O-Ring, AC Adapter1	1
6400079	#8 AN to 90° Push Lock Fitting	1
6400125	52" Push Lock Hose 1/2" Diameter	1
6200126	Panel Mount Cable Tie	1
6200127	3/4" Loop Clamp	1
6200091	Viton Washer	1
6502188	Brass Piston Stock Replacement	1
6200090	Push on Retainer	1
6400082	Turbo Oil Feed Line O-ring	1
6502186	5/8" Crow Foot Wrench	1

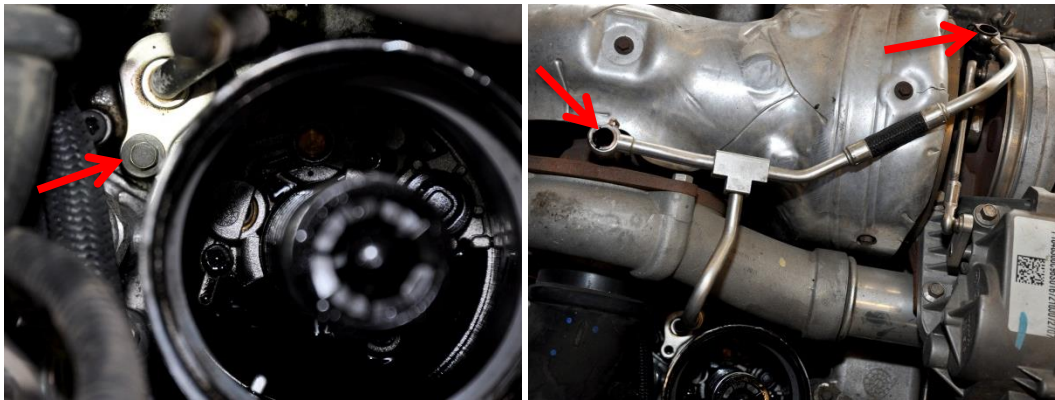
Installation Stage 1: Installing the 6.4L Half Kit Oil Cooler Adapter

NOTE: Removing the stock parts is best done when the engine is cool to avoid injury by hot engine oil.

1. Remove the stock oil filter cap and oil filter.



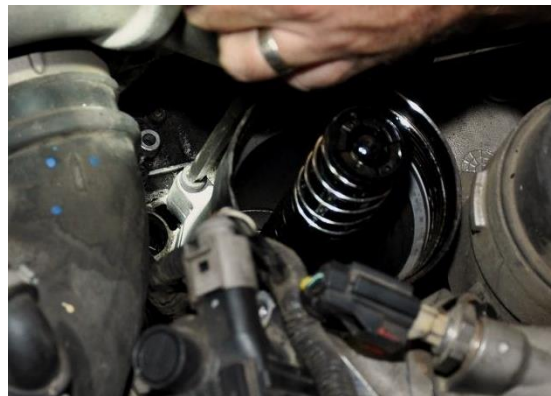
2. Remove the turbo oil feed line.



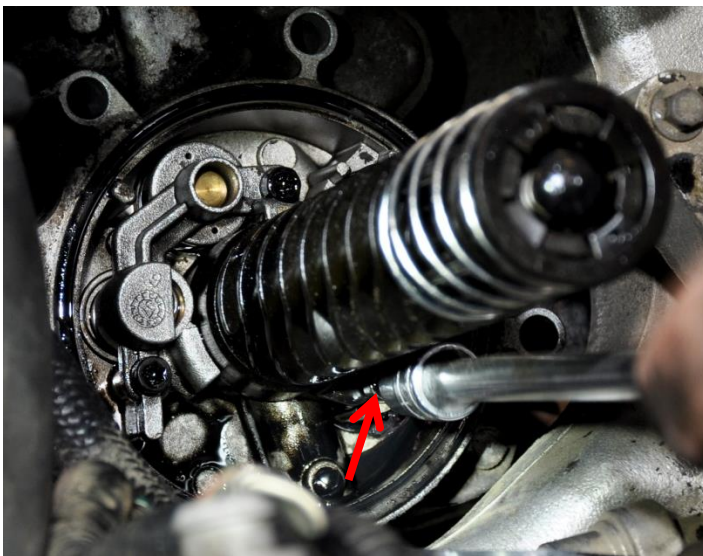
NOTE: Remove with caution, do not bend or kink the turbo oil feed line!

3. Remove the 4 Torx head bolts holding the oil filter housing down.

NOTE: SAVE THESE BOLTS – You will need them for step #15.

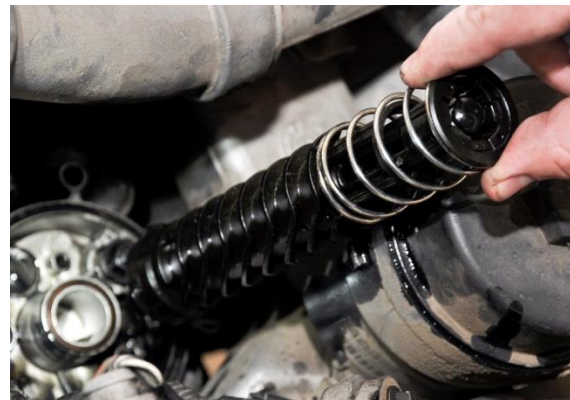


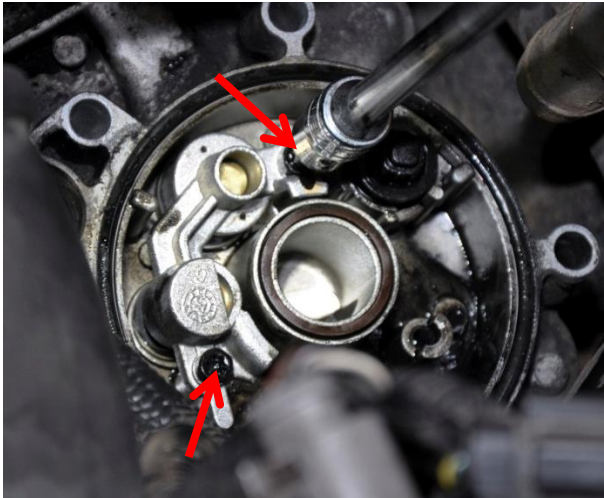
4. Remove the oil filter housing.



5. Remove the Torx head bolt holding down the oil filter support stand.

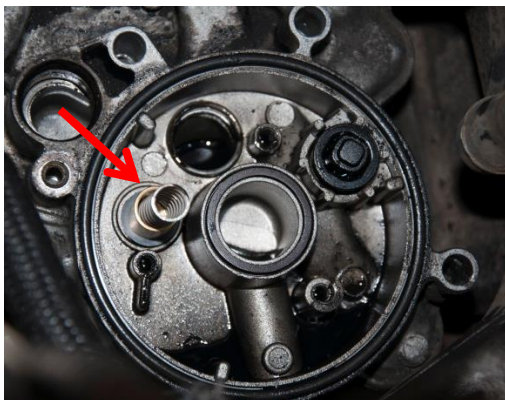
6. Twist the oil filter support stand to loosen, and then remove the stand from the housing.





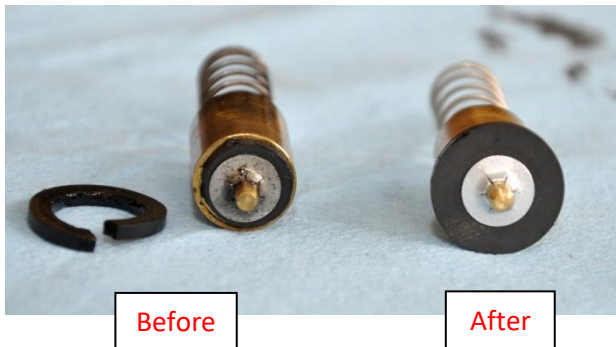
7. Remove the 2 Torx head bolts holding the stock bypass/anti-drain back assembly in place.

8. Remove the stock bypass/anti-drain back assembly.



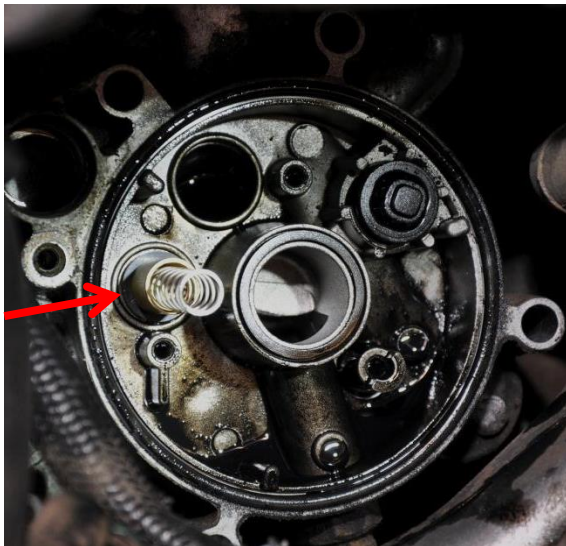
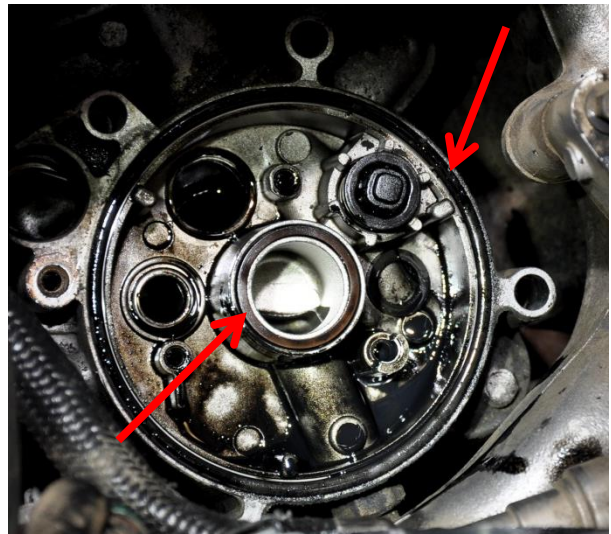
9. Once the bypass/anti-drain back assembly is removed, a spring and the bypass piston will be exposed. Remove both parts. Discard the spring.

10. Replace the spring with the new spring provided in the kit.



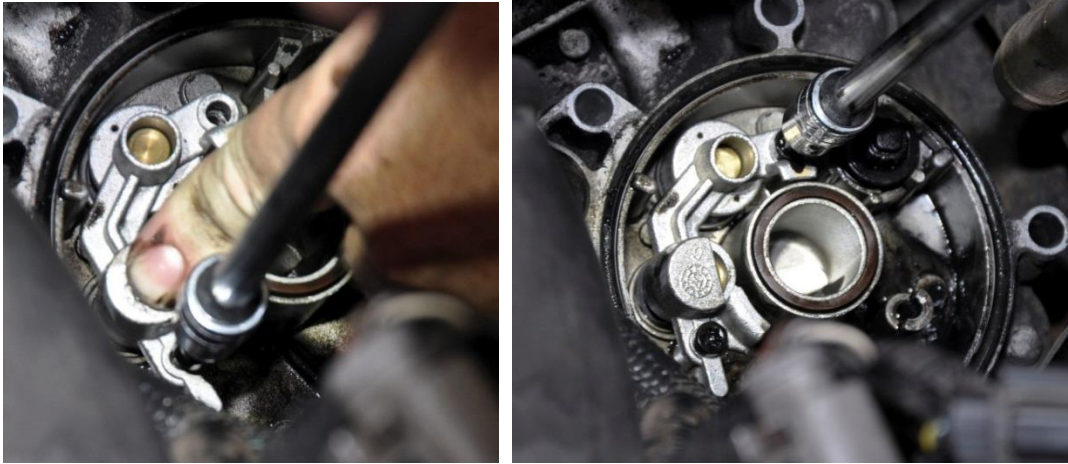
11. Examine the bypass piston; replace the rubber seal and retaining ring on the bypass piston with the new parts provided, if needed.

12. Remove both old O-rings from the housing, clean the O-ring grooves and replace with the provided new O-rings.



13. Place the bypass piston with the new provided spring back into the housing.

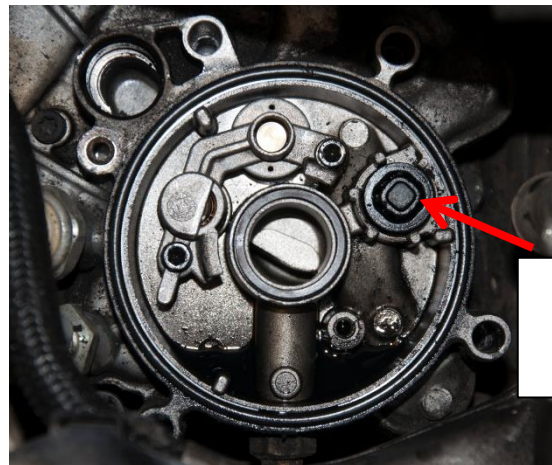
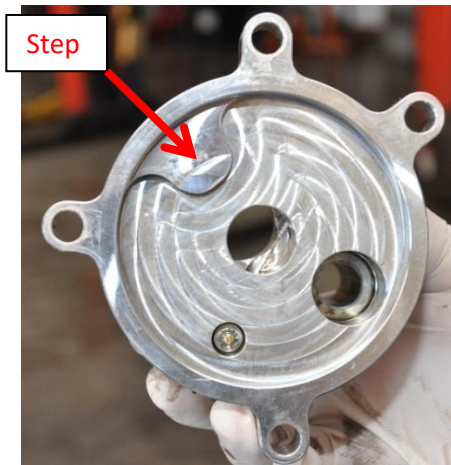
14. Install the bypass/anti-drain back assembly.



15. Install two #12 JIC 0° fittings into the Half Kit adapter.



WARNING: When installing the Half Kit adapter, make sure the step on the bottom of the adapter is placed on the filter housing drain. Once the adapter is resting on the housing **DO NOT SPIN OR TWIST IT.** If the filter housing drain is broken, oil will not flow properly through the oiling system **AND SEVERE ENGINE DAMAGE MAY RESULT.**



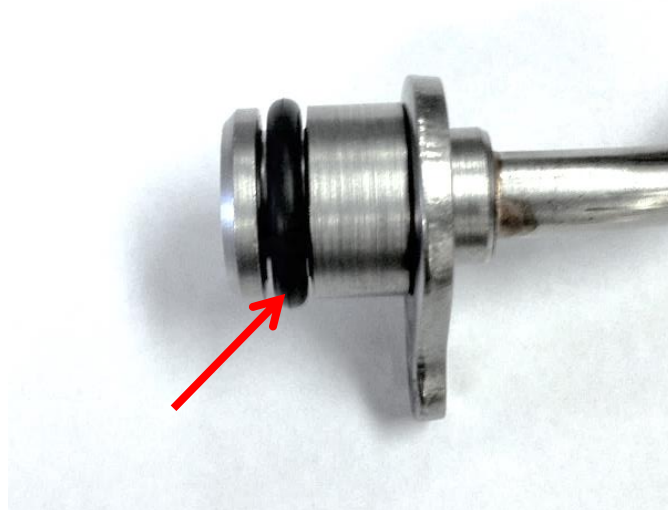
****IF you are installing a new OE Oil Cooler you MUST tap the holes in the new cooler with the OE bolts saved from Step 3.****

16. Install the Half Kit adapter where the stock oil filter housing was placed.

NOTE: There are two different size bolts for installing the adapter. The longer ones go towards the front of the vehicle (see picture).



17. Replace the O-ring on the bottom of the turbo feed line.



18. Reinstall the turbo oil feed line.

Installation Stage 2

1. Remove the bumper.
2. Remove the Charge Air Cooler (CAC), also known as the intercooler.

NOTE: Make sure to detach the fuel cooler from the CAC.



3. Remove the driver's side headlight and driver's side front fender liner.

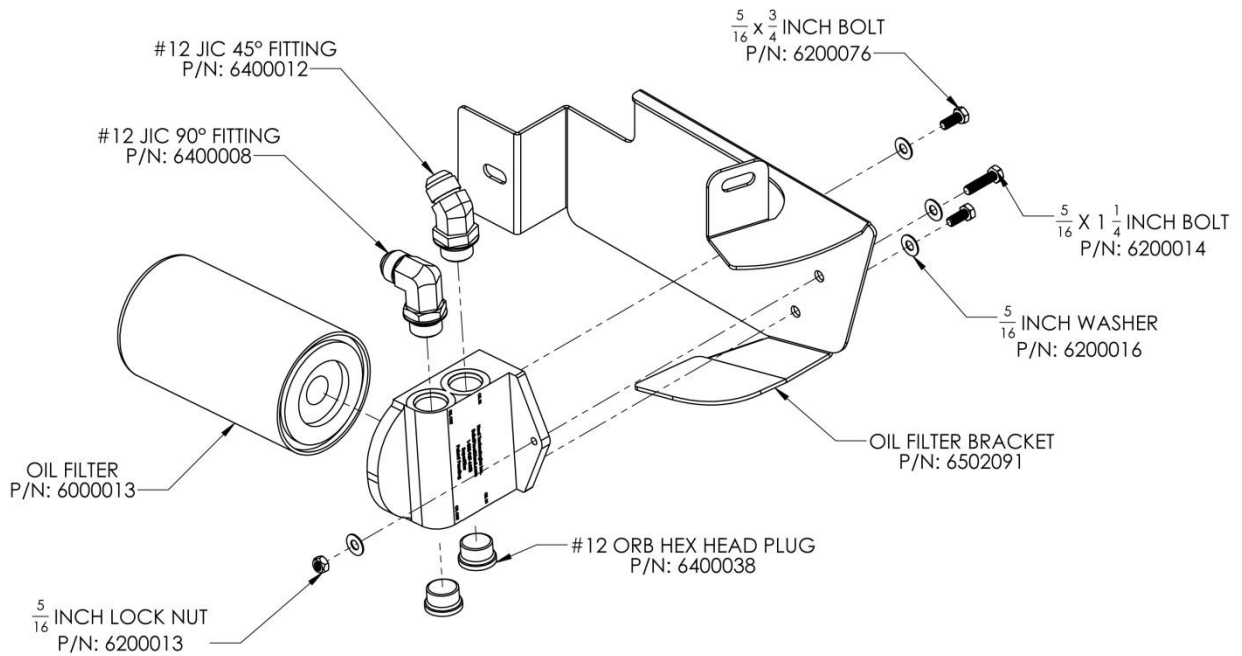


4. Remove the transmission cooler line.

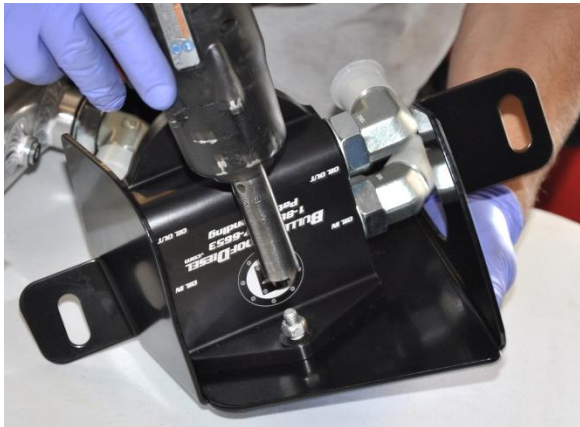


NOTE: The spring clamp from the stock transmission cooler line will be reused, remove from the stock line and set aside.

Installation Stage 3: Assembling and Installing the Oil Filter Bracket and Adapter



1. Install the #12 JIC 90° fitting, #12 JIC 45° fitting, and two #12 JIC plugs as shown:



2. Attach the oil filter adapter to the oil filter bracket.

3. Install the oil filter on the oil filter adapter.

TECH TIP: Fill the oil filter full of oil before installing it on the adapter to help prime the oil system.



4. Take the existing retaining clip nut off of the frame and turn it around as shown:

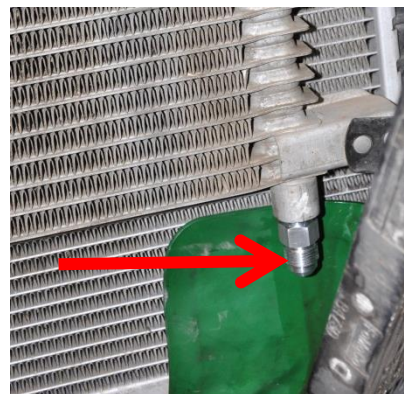


5. Mount the oil filter bracket on the truck using the stock hardware.



Installation Stage 4: Replacing the Transmission Cooler Line

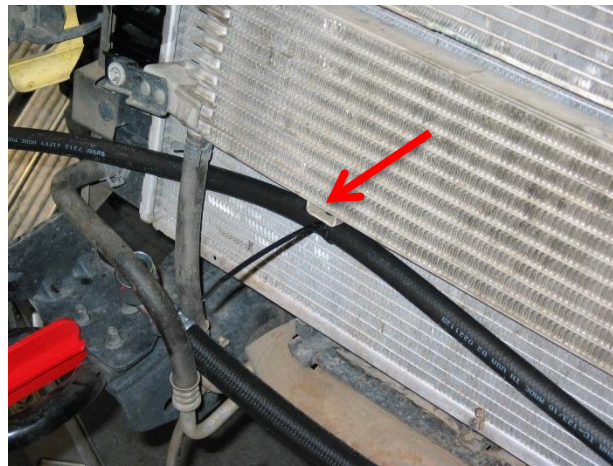
1. Install the provided transmission cooler adapter fitting. Lubricate the inside of the hose with transmission fluid to aid the installation of the fitting.



Connect the ½" inch push lock hose to the #8 AN to 90° push lock fitting and install below the transmission cooler.

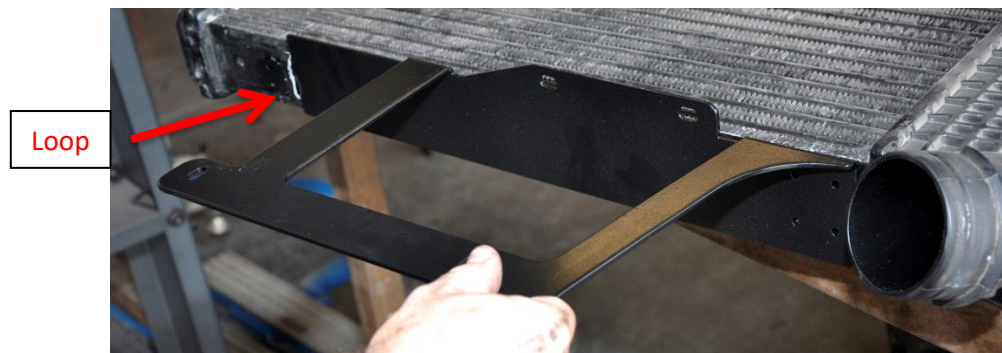


2. Route the hose along the bottom of the transmission cooler and behind the hose connected to the opposite side of the cooler. Secure the hose with the cable tie provided.



Installation Stage 5: Assembling and Installing the Oil Cooler

1. Install the oil cooler bracket on the CAC. The edge of the bracket should be parallel to the front of the CAC.



NOTE: Place the tab in the loop on the side of the CAC.

2. Secure the bracket to the CAC using the #8 self-drilling screws.



NOTE: Do not over-tighten. Stripping the screws will cause the bracket to be loose.
NOTE: Only use the hardware provided! Use of longer hardware may damage the CAC.

3. Install the #12 JIC 90°, #12 JIC 0°, and both #4 JIC plugs into the oil cooler.



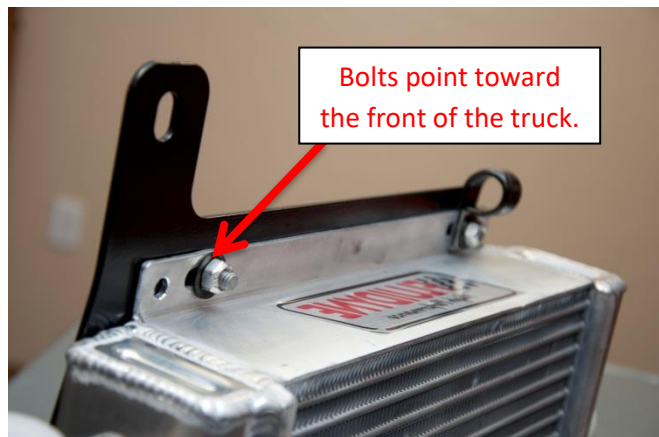
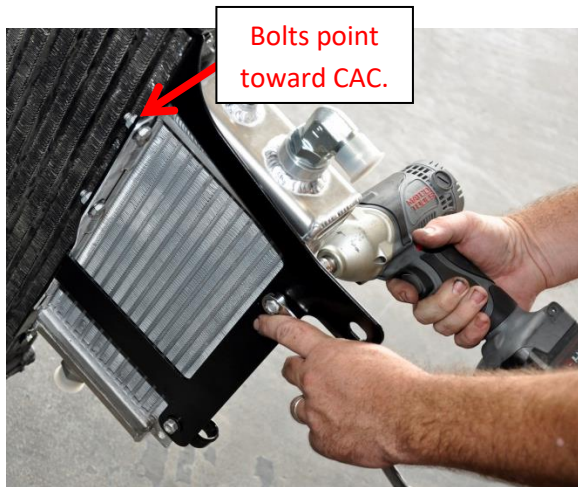
4. Place the oil cooler onto the oil cooler bracket.





5. Loosely install the ¼ inch loop clamp in the correct hole, as shown. Leave the loop clamp loose to slip the hose through later.

6. Secure the other 3 mounting holes with the provided 5/16 inch hardware.



7. Remove the bolt on the core support as shown:



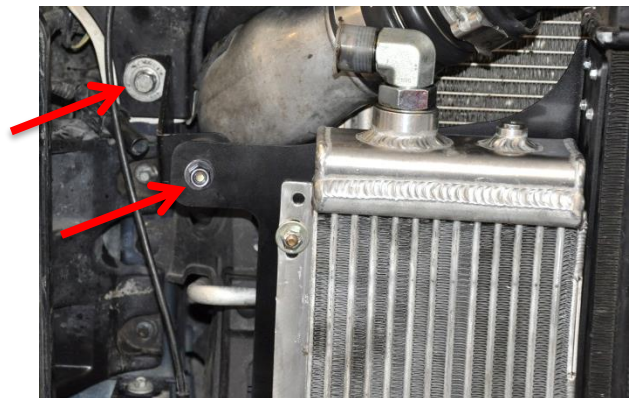


8. Install the support bracket, vibration-damping mount, and hardware to the oil cooler bracket.

TECH TIP: To aid in the priming of the oil system you may wish to delay the tightening of the 90° JIC fitting until after Hose #1 and Hose #2 are installed. Once Hose #1 and Hose #2 are installed, it will be easy to fill the oil cooler with oil if you unscrew the 90° JIC fitting, fill the cooler through the fitting hole, reinstall the fitting, and finish the CAC installation.

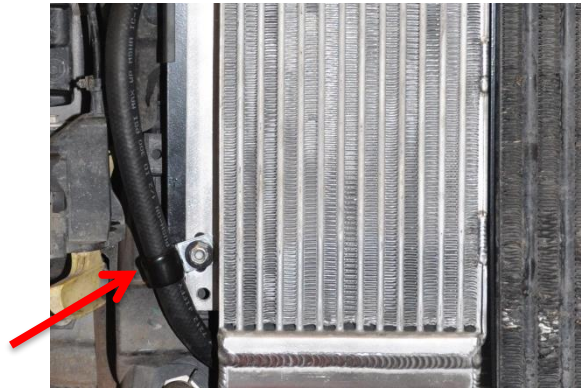
9. Re-install the CAC and the fuel cooler.

10. Secure the support bracket to the cooler bracket and tighten both.



11. Reconnect the CAC pipe to the CAC. Make sure the clamp is rotated so it does not hit the hood.

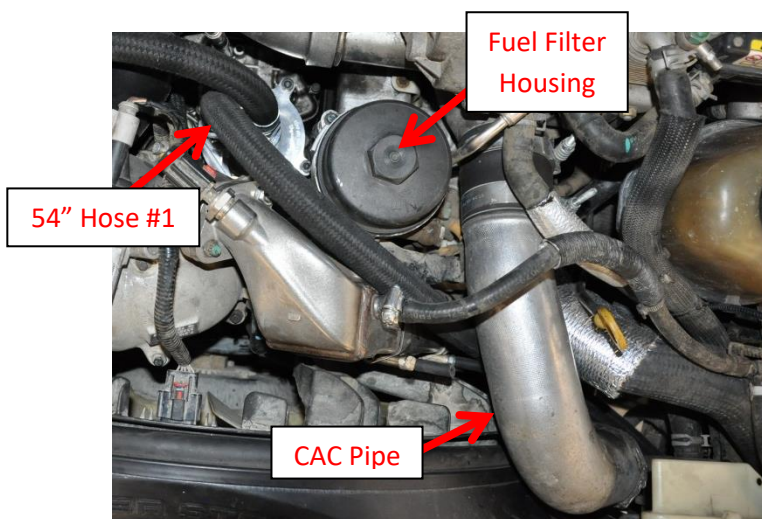
- Using the provided loop clamp secure the transmission line to the cooler bracket.



- Connect the new transmission cooler line to the correct port on the radiator using the stock spring clamp. Trim the hose to fit if necessary.

Installation Stage 6: Oil Hose Routing

- Take the 54" Hose #1 from the OIL OUT port on the half kit adapter and route it in front of the fuel filter housing, then under the CAC pipe on the driver's side. Continue routing out through the headlight compartment and connect the hose to the #12 JIC 45° fitting on the oil filter adapter.

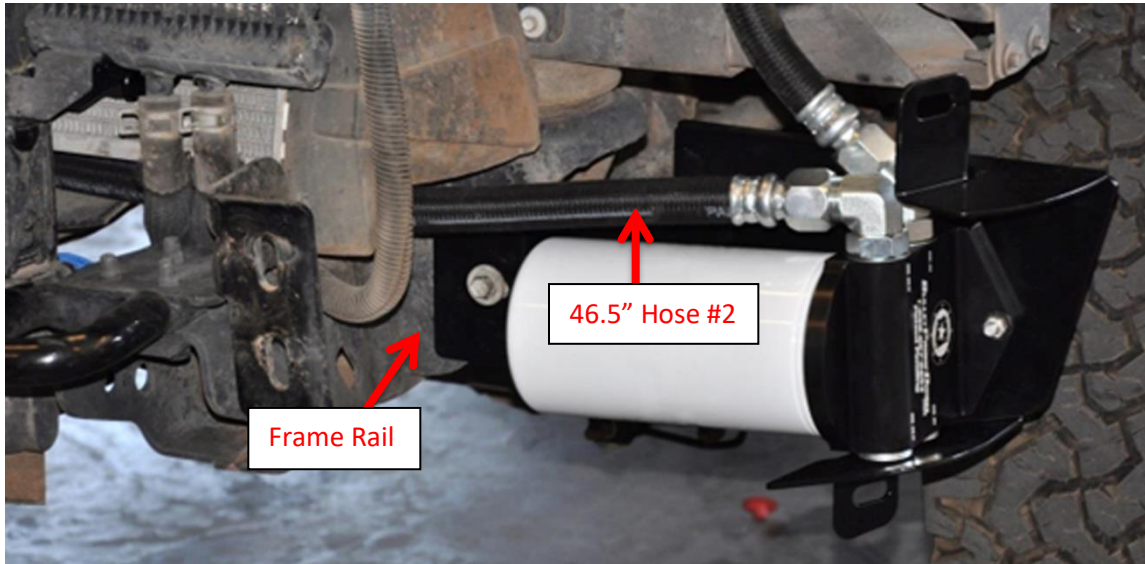
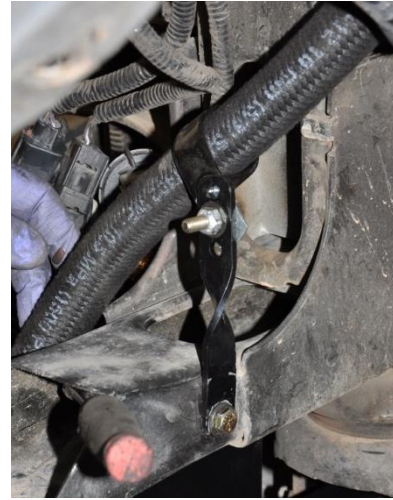


2. Install the hose clamp and adjustment strap to the core support.

NOTE: Choose the appropriate hole to keep the hose from rubbing on the headlight and core support. Also, make sure the hose is clear of any sharp or abrasive edges.

D

3. Route the 46.5" hose #2 under the radiator and over the frame rail to the #12 JIC 90° fitting on the oil filter adapter, as shown below.



Tech Tips for Weatherizing Your Oil Lines and Fittings



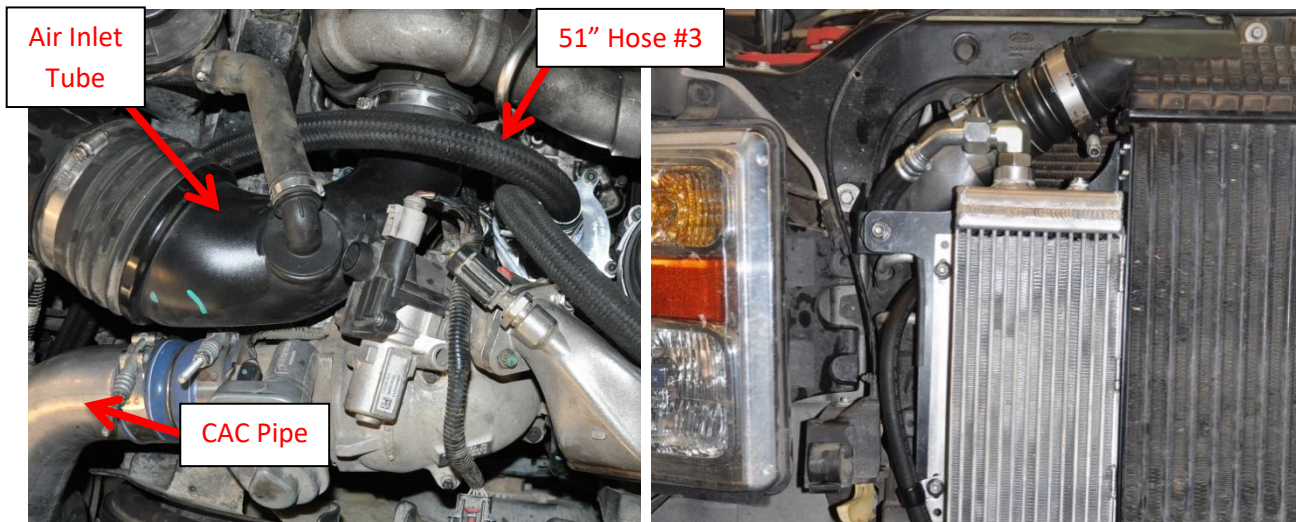
Some of our customers live in areas/climates where salt or chemicals are used for deicing the roads in the winter months. These substances can cause premature deterioration of the fittings and hoses.

Instead of replacing these parts as they wear from the attack of chemicals, a simple rubberized undercoating (pictured) can help ensure that your fittings are protected against the elements, so you can enjoy your Bullet Proof Diesel products for years to come.

4. Connect the 90° fitting on the 46.5" hose from the oil filter adapter to the bottom of the oil cooler.



5. Take the 51" Hose #3 from the OIL IN port on the half kit adapter; route it over the air inlet tube, where it connects to the turbo, then under the air inlet tube, where it connects to the air filter box. Continue routing under the CAC pipe on the passenger side out to the front of the truck where the CAC pipe connects to the CAC. Attach the 45° hose end to the #12 JIC 90° fitting on the oil cooler.



Installation Stage 7: Finishing Install

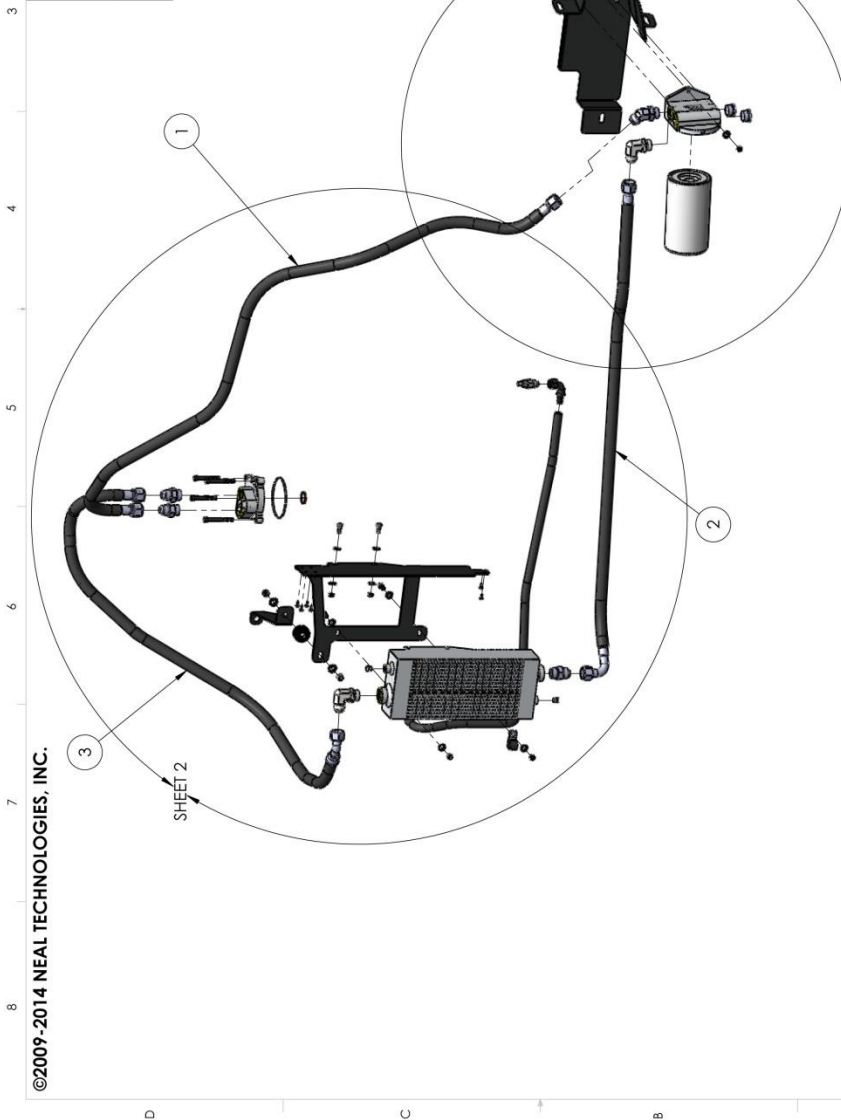
1. Re-install the bumper.
2. Secure the oil filter adapter bracket to the bumper.



3. Re-install the head light.
4. Inspect the hose routing and verify that it does not rub.
5. Inspect the oil filter clearance and verify that it is clear of contact.
6. Re-install the fender liner.
7. Slowly close the hood and make sure the oil cooler and oil lines clear the grill support. Adjust as needed.

Thank you for purchasing and installing the Bullet Proof Diesel 6.4L Half Kit. If you have any questions or comments please contact us at 1-888-967-6653.

Item	Part Number	Description	Quantity
1	90100052	HOSE FROM OIL OUT TO FILTER	1
2	90100050	HOSE FROM FITLER TO COOLER	1
3	90100051	HOSE FROM COOLER TO OIL IN	1



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4249 E. PALM STREET, MESA, AZ 85213

6.4L Half Kit

DATE: 08/24/12

NAME: FERRELL

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
FRACTIONS: 1/32
DECIMALS: TWO PLACE DECIMAL ± 0.03
THREE PLACE DECIMAL ± 0.010
MFG APPR.

COMMENTS:
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5M

MATERIAL: _____

FINISH: _____

USED ON: _____

APPLICATION: _____

DO NOT SCALE DRAWING

NEAL TECHNOLOGIES, INC.
4249 E. PALM STREET, MESA, AZ 85213

TITLE: **6.4L Half Kit**

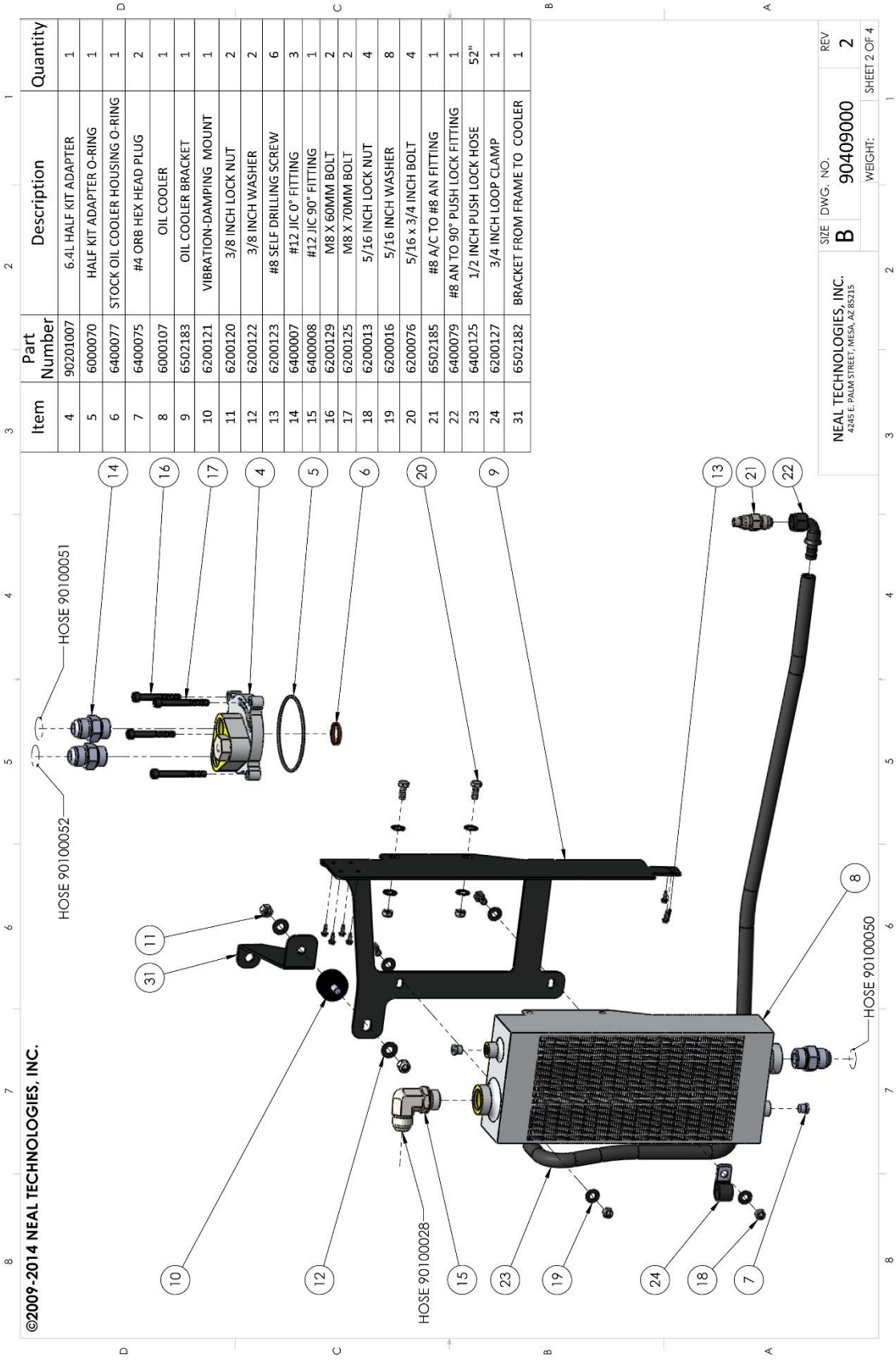
SIZE: **B**

DWG. NO.: **90409000**

REV: **2**

WEIGHT: _____

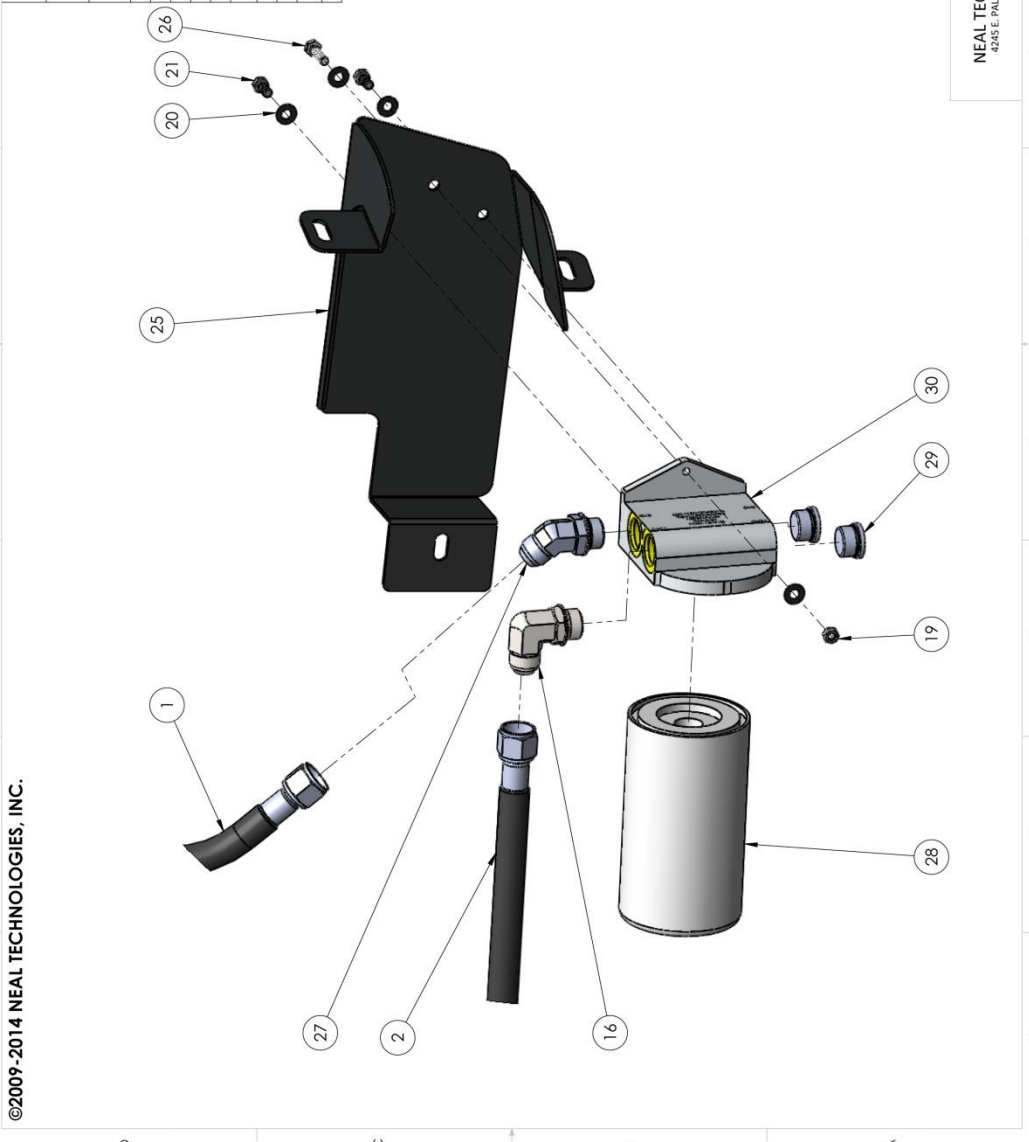
SHEET 1 OF 4



Item	Part Number	Description	Quantity
4	90201007	6.4L HALF KIT ADAPTER	1
5	6000070	HALF KIT ADAPTER O-RING	1
6	6400077	STOCK OIL COOLER HOUSING O-RING	1
7	6400075	#4 ORB HEX HEAD PLUG	2
8	6000107	OIL COOLER	1
9	6502183	OIL COOLER BRACKET	1
10	6200121	VIBRATION-DAMPING MOUNT	1
11	6200120	3/8 INCH LOCK NUT	2
12	6200122	3/8 INCH WASHER	2
13	6200123	#8 SELF DRILLING SCREW	6
14	6400007	#12 JIC 0° FITTING	3
15	6400008	#12 JIC 90° FITTING	1
16	6200129	M8 X 60MM BOLT	2
17	6200125	M8 X 70MM BOLT	2
18	6200013	5/16 INCH LOCK NUT	4
19	6200016	5/16 INCH WASHER	8
20	6200076	5/16 x 3/4 INCH BOLT	4
21	6502185	#8 A/C TO #8 AN FITTING	1
22	6400079	#8 AN TO 90° PUSH LOCK FITTING	1
23	6400125	1/2 INCH PUSH LOCK HOSE	52"
24	6200127	3/4 INCH LOOP CLAMP	1
31	6502182	BRACKET FROM FRAME TO COOLER	1

NEAL TECHNOLOGIES, INC. 4245 E. PALM STREET, MESA, AZ 85215	SIZE DWG. NO. B	REV 2
	WEIGHT:	SHEET 2 OF 4

Item	Part Number	Description	Quantity
1	90100052	HOSE FROM OIL OUT TO FILTER	1
2	90100050	HOSE FROM FILTER TO COOLER	1
16	6400008	#12 JIC 90° FITTING	1
19	6200013	5/16" LOCK NUT	1
20	6200016	5/16" WASHER	4
21	6200076	5/16" x 3/4" BOLT	2
25	6502091	OIL FILTER BRACKET	1
26	6200014	5/16" x 1.25" BOLT	1
27	6400012	#12 JIC 45° FITTING	1
28	6000013	OIL FILTER	1
29	6400038	#12 ORB HEX HEAD PLUG	2
30	6502039	OIL FILTER ADAPTER	1



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SIZE	DWG. NO.	REV
B	90409000	2
NEAL TECHNOLOGIES, INC. 4205 E. PALM STREET, MESA, AZ 85215		WEIGHT:
		SHEET 3 OF 4