



1997-2004 C5 CORVETTE PERFORMANCE OIL COOLER KIT

PART NO. EC5-600

MADE IN USA



Important: Read these instructions in their entirety prior to installation.

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APPLICATIONS

- This complete oil cooler kit is designed for seamless installation on the following vehicles:
 - 1997-2004 Chevrolet Corvette (All Trims)

PARTS LIST

Qty	Part Number	Description
1	MHX-245C	45-Row 3-Pass Heat Exchanger for Corvettes
1	EGM-112-F1	Low Profile LS Oil Pan Adapter w/C5 Temp Probe
2	SFM-10	S-Union Adapter for MHX-245C and Oil Lines
2	OM-08-10	Adapter Fitting for Oil Pan Adapter
1	EC5-600-50	Line: 90° IN EGM-112, 60° Bottom MHX-245C
1	EC5-600-51	Line: 90° OUT EGM-112, 90° Top MHX-245C
1	EC5-600-60	MHX-245C Mounting Bracket Kit
1	EC5-600-61	Hose Bracket Kit











EC5-600-60 MOUNTING BRACKET KIT

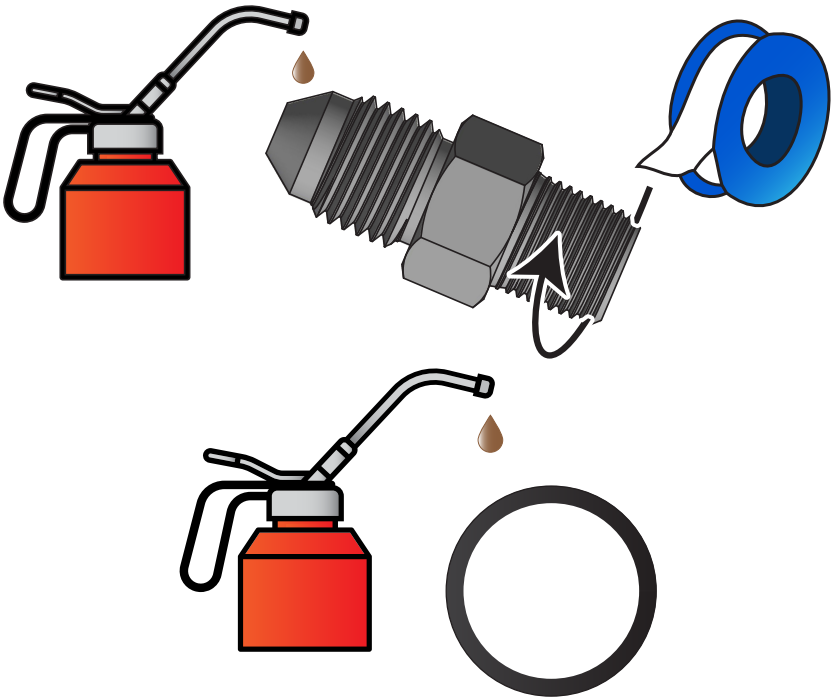
Qty	Part Number	Description
1	EC5-600-01	MHX-245C Passenger-Side Bracket
1	EC5-600-02	MHX-245C Driver-Side Bracket
4	HSC-1010	M8x1.25x16 Bracket Screws
2	HWA-1005	M8 Fender Washers
2	HSC-1100	Square U-Bolts for Brackets to Chassis
4	HWA-1001	U-Bolt Washers
4	HNT-1022	U-Bolt Nuts

EC5-600-61 HOSE BRACKET KIT

Qty	Part Number	Description
1	EC5-600-65	Hose Bracket for Front Subframe
2	CP-12-01	Hose Holder / Separator
2	HWA-1003	M6 Washer
1	HSC-1068	M6x1.00x35 Cap Screw
1	HWA-1005	M8 Fender Washer
1	HSC-1010	M8x1.25x16 Screw
1	HTD-1006	360° Rotating, High-Temp, Push-In Cable Tie
4	HTD-1003	High-Temp Cable Ties

BEFORE YOU BEGIN

-  **WARNING: NEVER work under a vehicle supported only by a jack.**
-  **WARNING: NEVER cap / plug the oil ports on the EGM-112 adapter.**
-  **WARNING: Capped / plugged oil ports block oil flow in the engine and may result in catastrophic engine damage.**
-  Use a union to loop the lines, or create a new line to join the ports if servicing or removing the oil cooler from the vehicle.
-  **WARNING: Only qualified mechanics should install this oil cooler kit.**
-  **WARNING: Improper installation may result in severe engine damage.**
-  Use aluminum tools to avoid damaging fittings.
-  Lubricate all fitting flares before final tightening of connection.
-  Wrap tapered pipe (NPT) threads with Teflon (PTFE) tape or apply thread sealant to seal the threads.
-  Lubricate O-rings prior to installation to prevent damage and ensure a leak-free seal.



REMOVING THE BUMPER COVER

1. Raise and support the vehicle using automotive-use-approved frame stands, lift, or ramps.
2. Open the hood of the vehicle.
3. Apply masking tape on the fenders to prevent scratching when removing the bumper cover.
4. Use a prying tool to release four pop-clips from the top of the bumper cover at the hood seam. Remove the clips completely and set aside until reinstallation.
5. Use a 7 mm tool to remove three screws in the front of each wheel well that attach to the bumper cover. Six total screws will be removed from the wheel wells.
 - a. Take the wheels off to make this easier, or turn them side-to-side.
6. Use a 7 mm tool to remove ten total screws from each front bumper closeout panel. There are five total screws to remove per side.
 - a. Close-out panel screws are circled in red on Figure 1.

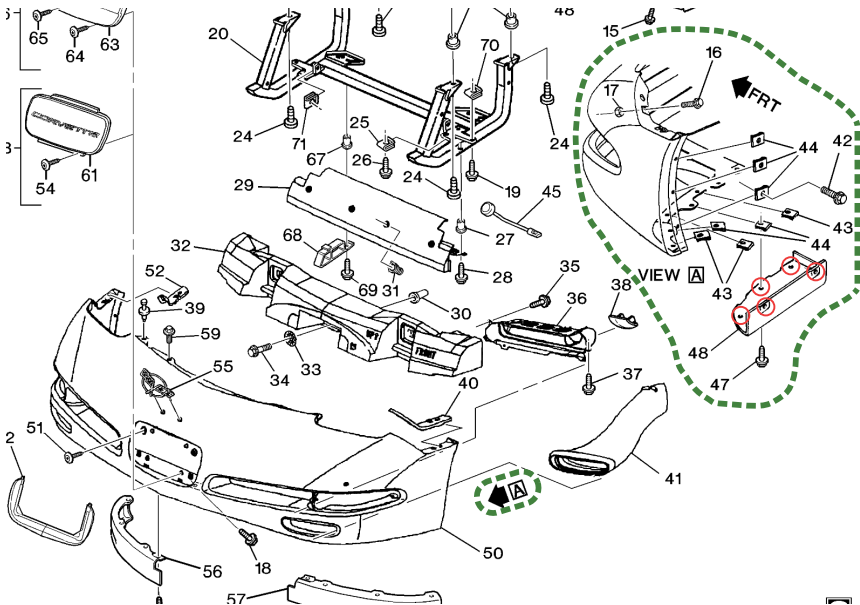


Figure 1 - Removing the Close-Out Panel Screws

7. Remove the close-out panels from each side of the vehicle.
8. Use a 10 mm tool to remove two screws (#28 in Figure 1) that secure the spoiler / deflector (#29 in Figure 1) to the radiator support. Set the spoiler / deflector aside until reinstallation.

9. Use a 7 mm tool to remove five screws from the underside of the bumper cover where it connects to the radiator shroud.
10. Use a 7 mm tool to remove two screws from the underside of the bumper cover that secure the thin bumper cover strips to the radiator support.
11. Reach through the voids left by removing the closeout panels on each side and use a 10 mm tool to remove four fender nuts securing the bumper cover to the fender.
12. If reachable, disconnect the large wiring harness on the passenger side that runs inside the front bumper cover now, otherwise wait for Step 13.
13. Release the bumper cover from the fender studs on each side of the vehicle.
14. Peel the top of the bumper cover off the vehicle and carefully remove the bumper cover from the front of the vehicle.
 - a. Disconnect the main wiring harness from the bumper cover if not done previously.
 - b. Ensure that the brake ducts release from the bumper cover.
15. Set bumper cover aside until reinstallation.
16. Remove the driver-side brake duct from the fender liner.
17. Use a screwdriver to release the smog pump ratcheting hose clamps.
18. Remove the hoses from the smog pump.
19. Use a 10 mm tool to loosen all three smog pump mounting screws and remove the smog pump.
20. Save the screws and temporarily hang the smog pump if reinstalling.

INSTALLING THE IMPROVED RACING KIT

1. Place a drain pan under the oil filter and remove the oil filter.
2. Use a 10 mm tool to remove the oil pan bypass cover located above the oil filter, then wipe the sealing surface clean.
3. Review the product manuals for EGM-112 and MHX-245C to prepare for installation.
4. Install the adapter fittings into EGM-112 and torque the fittings to 25 lb-ft (33 N-m).
5. Install EGM-112 onto the oil pan to replace the bypass cover removed in Step 2 of this section and torque the M6 screws to 110 lb-in (13 N-m).
 - a. Use a Prestaratchet tool or cut a 5 mm hex key on the short side to make a low-profile tool when headers restrict screw access.

6. Use a tape measure and Figure 2 to mark the center point for the adapter fitting through-hole in the plastic radiator shroud.

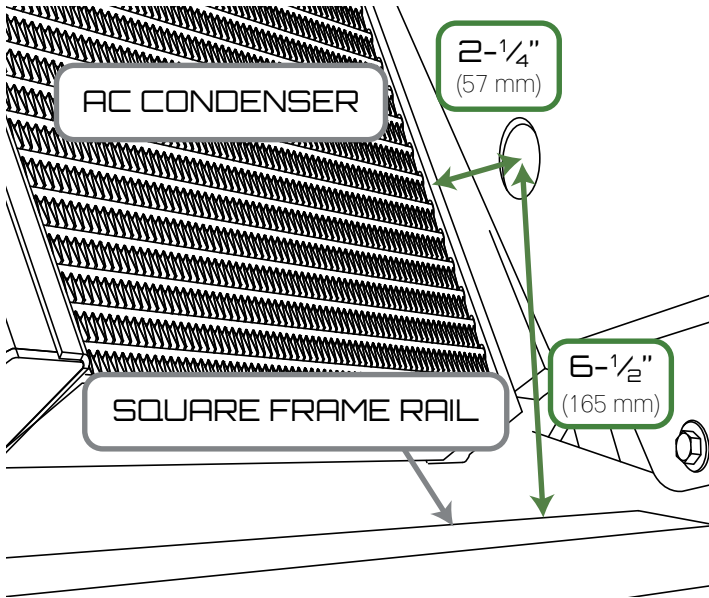


Figure 2 - Marking the Center-Point

7. Use a 1-1/4" (30 mm) hole saw to drill one through-hole for the top SFM-10 adapter fitting.
8. Install the top SFM-10 fitting onto MHX-245C as shown in Figure 3.

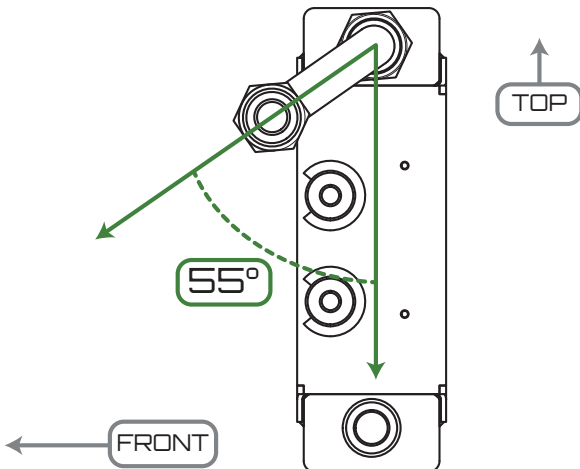


Figure 3 - Installation Angle for SFM-10 Adapter Fitting

9. Torque the adapter fitting to 25 lb-ft (33 N-m).

10. Fasten EC5-600-01 to MHX-245C using two HWA-1005 and HSC-1010 from the EC5-600-60 Hardware Kit as shown in Figure 4.

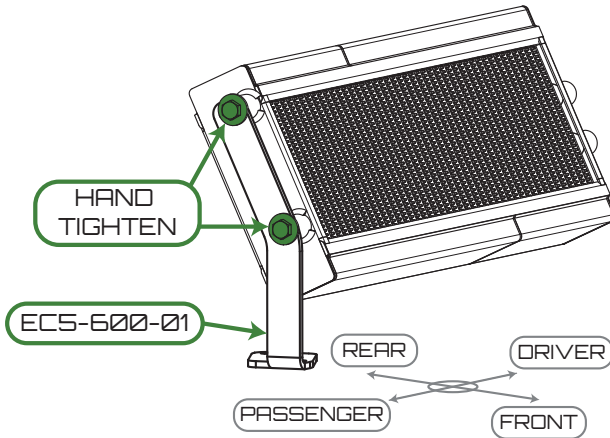


Figure 4 - Loosely Assembling the Passenger Bracket

11. Loosely attach EC5-600-02 using one HSC-1010 and HWA-1005 as shown in Figure 5.

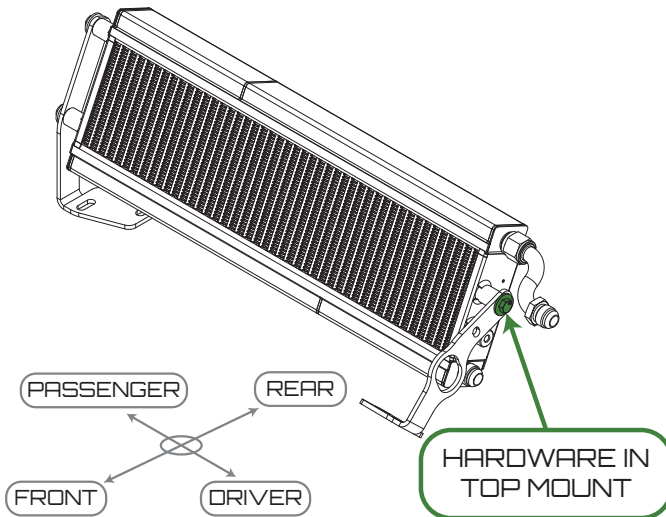


Figure 5 - Loosely Assembling the Driver Bracket

12. Insert MHX-245C with brackets into the radiator shroud. Guide the SFM-10 adapter fitting through the hole drilled in the radiator shroud.
13. Rest the brackets on the square frame rail once the fitting is through the shroud and loosely install the U-bolts and hardware onto the frame and passenger bracket.

14. Insert the remaining HWA-1005 and HSC-1010 hardware into the lower hole on the driver bracket and hand-tighten.
15. Loosely install the remaining U-bolt and hardware for the driver bracket.
16. Connect the remaining SFM-10 adapter fitting to MHX-245C by passing the nut through the hole in the driver bracket.
17. Position the male end of the fitting as shown in Figure 6.

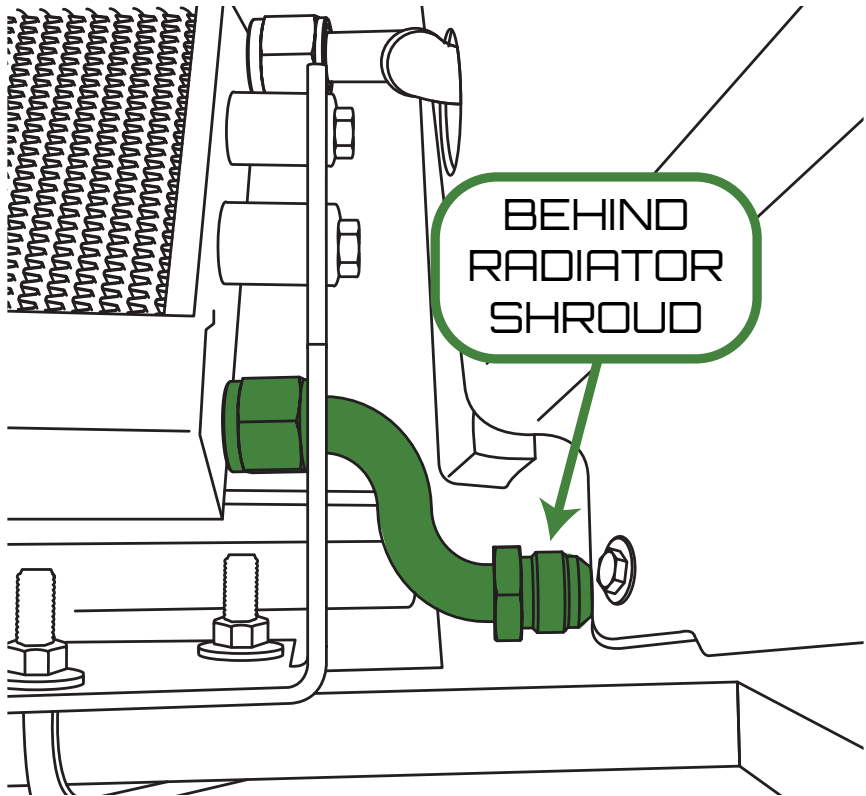



Figure 6 - Positioning the Lower Adapter Fitting

18. Torque the fitting nut to 25 lb-ft (33 N-m). Ensure that the fitting position does not change during torquing.
19. Ensure the oil cooler is centered and that there is enough clearance for the brackets and fittings on each side.
-  Position the oil cooler so that it's parallel to, and about $\frac{1}{8}$ " (3 mm) away from the AC condenser.
20. Use a $\frac{9}{16}$ " tool to tighten all nuts for each bracket while maintaining proper alignment. **DO NOT OVER TIGHTEN.**

21. Locate the oil cooler lines supplied with the kit and spray some soapy water onto the silicone hose shielding.
22. Route the lines past the driver side engine mount:
 - a. The two 90° hose ends with silicone hose shielding will connect to EGM-112.
 - b. The line with two 90° hose ends goes above the wire harness that runs alongside the engine and oil pan.
 - c. The line with one 90° hose end goes below the wire harness that runs alongside the engine and oil pan.
23. Continue to work the lines toward the front of the vehicle, taking care to go over the wiring harness that runs across the front sub-frame where the steering rack is located.
 - a. Spray the silicone hose shielding with soapy water if the hoses become stuck.
24. Connect the hose ends to EGM-112:
 - a. Connect the line routed above the wiring harness to the rear (IN) port of the EGM-112.
 - b. Connect the second line to the angled (OUT) port on EGM-112.
 - c. Use a 1-inch crowfoot tool to torque both nuts to 25 lb-ft (33 N-m).
25. Unpack EC5-600-61 and loosely assemble the hardware as shown in Figure 7.

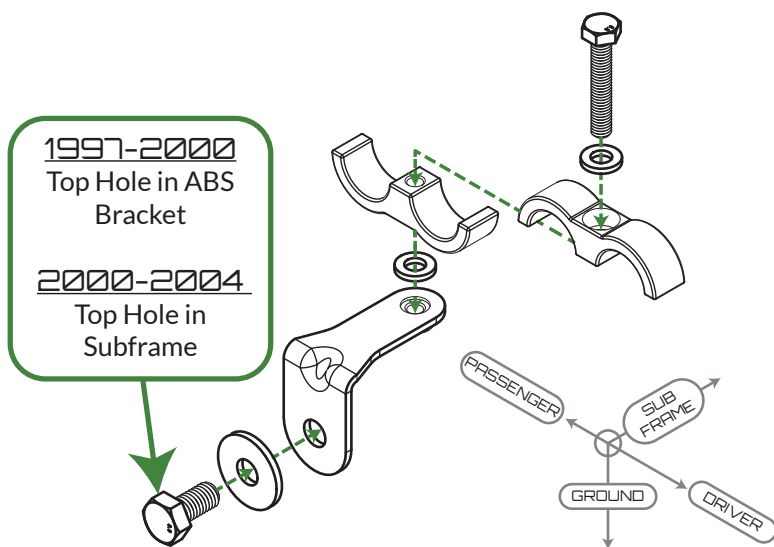


Figure 7 - Hardware Arrangement for Subframe Hose Clamp

26. 1997-2000 cars should install the L-bracket following these steps:
- Remove the top screw from the passenger side of the ABS bracket.
 - Fasten the L-bracket to the ABS bracket using the same screw and hole like shown in Figure 8.
 - Fasten the hose clamp to the L-bracket using the M6 screw in the kit.



Figure 8 - Installing the Sub-frame Hose Holder (Early Models)

27. 2000-2004 cars should use the provided M8 screw to fasten the L-bracket to the unused hole in the front subframe, as shown in Figure 9.
28. Use the provided M6 screw to install the hose clamp onto the L-bracket as shown in Figure 7 and Figure 9.



Figure 9 - Installing the Sub-frame Hose Holder (Late Models)

29. Use a 13 mm tool to torque the sub-frame screw to 25 lb-ft (33 N-m)
30. Use a 10 mm tool to torque the hose clamp screw to 110 lb-in (13 N-m).
- 💡 Use channel lock pliers to align the hose clamp while tightening.
31. Route each line under the sway bar and through the power steering line, like shown in Figure 9.
32. Connect the oil lines to MHX-245C:
 - a. Cut and remove the perforated zip tie holding the smog pump hose to the radiator support bar to clear a path for the hose that will route through here.
 - b. Route the 90° hose end between the smog pump hose and radiator support bar, then connect it to the top adapter fitting on MHX-245C.
 - c. Route the 60° hose end around the radiator support bar and over the smog pump to connect it to the bottom adapter fitting on MHX-245C as shown in Figure 10.

- d. Torque the all connections to 25 lb-ft (33 N-m) using a 1-inch crowfoot tool.

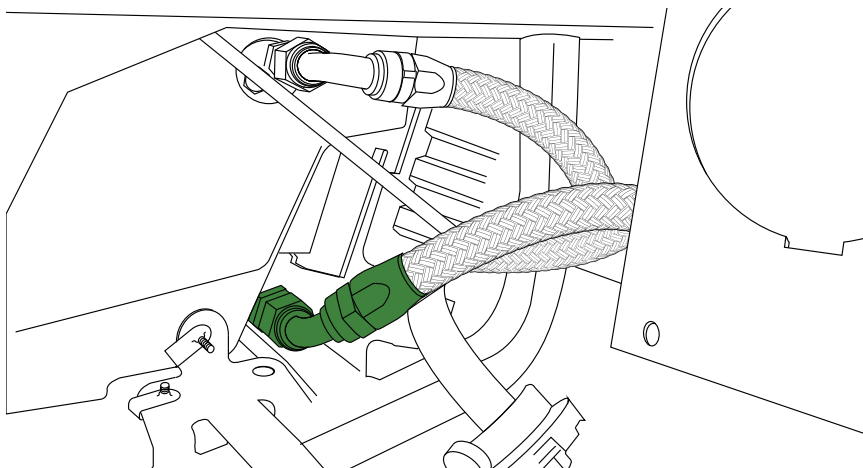


Figure 10 - Routing & Connecting the 60° Hose-End

33. Remove the wire harness clip from the radiator fan and replace it with HTD-1006. This is the **orange** zip tie shown in Figure 10.

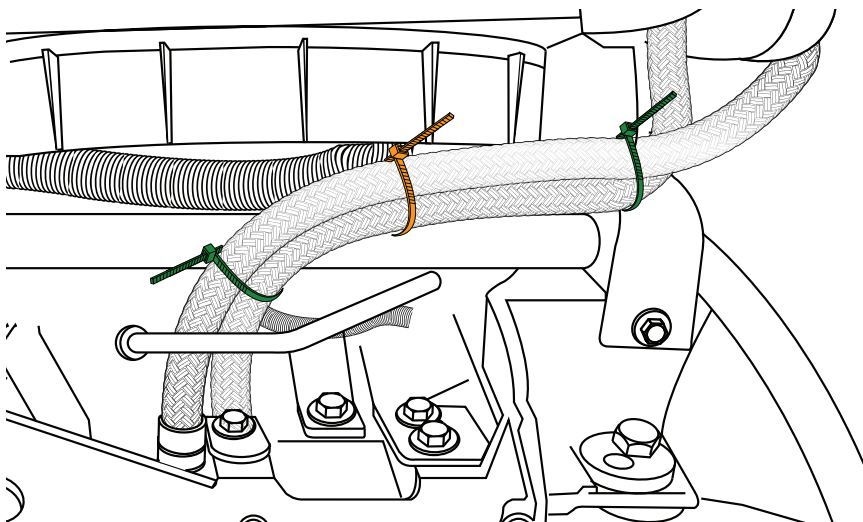







Figure 11 - Replacing the Fan Shroud Wire Clip with Push-In Cable-Tie

34. Ensure that the wiring harness is above the two hoses and then cinch the cable tie to the fan shroud.
35. Use two HTD-1004 cable ties to affix the corrugated hose protector to the hose that passes between the smog pump hose and radiator support.

36. Use the remaining HTD-1004 to tie the hoses together in the locations shown in **green** on Figure 10.

PREPARING FOR STARTING

1. Fill a new oil filter with oil and install the oil filter onto the oil pan.
-  Lubricate the oil filter seal with engine oil prior to installation to prevent damage and to ensure a reliable seal.
-  **WARNING: DO NOT overtighten the oil filter.**
2. Verify all hydraulic connections are coupled and properly torqued.
3. Check the engine oil level and add oil if necessary.
4. Prime the system to fill the engine, lines and heat exchanger with fluid before starting:
 - a. Remove the fuel injector fuses.
 -  Consult the vehicle's factory service manual for the fuse locations.
 - b. Crank the engine over for five seconds to build oil pressure, repeating this cycle three to five times.
 - c. Replace the fuel injector fuses removed previously.
 -  Fluid prelubers, such as one made by Melling or Motive, are the preferred method for engine oil priming.
5. Start the vehicle and inspect for oil leaks.
6. Turn-off the vehicle.
7. Inspect the engine oil level.
-  Add oil when necessary.

REINSTALLING THE BUMPER COVER

1. Use a 10 mm tool and three prior-saved screws to remount the smog pump onto the radiator support, when reusing the smog pump.
2. Slide the plastic hose clamps back onto the smog pump hoses, reconnect the hoses to the correct smog pump ports and tighten the hose clamps.
3. Reinstall the driver's side brake duct into the fender liner.
4. Use two people to reinsert the brake ducts into the bumper cover, reconnect the main wiring harness and place the bumper cover back onto the car.
5. Use a 10 mm tool to reinstall all four fender washers that secure the bumper cover to the fenders.

- 💡 There are two fender nuts per side.
- 6. Use a 7 mm tool to reinstall two screws into the bumper cover strips that secure to the radiator support.
- 7. Use a 7 mm tool to reinstall five screws that secure the bottom of the bumper cover to the radiator shroud.
- 8. Trim the front spoiler / deflector according to Figure 12.
- 💡 Trimming the spoiler / deflector as shown clears the oil cooler brackets and maintains the fold away function.

TRIM EACH SIDE
1/2" (13mm)

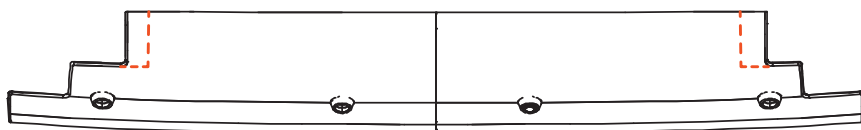


Figure 12 - Trimming the Spoiler / Deflector

- 9. Use a 10 mm tool to reinstall the modified spoiler / deflector onto the radiator support.
- 💡 The U-bolts may needed loosened to re-center the brackets when reinstalling the trimmed spoiler / deflector
- 10. Use a 7 mm tool to reinstall the close out panels on the driver and passenger sides.
- 11. Use a 7 mm tool to reinstall the wheel well screws.
- 12. Put the wheels back on the vehicle, if applicable.
- 13. Reinsert all four plastic push-in fasteners at the top of the bumper cover.
- 14. Remove any masking tape that was applied.
- 15. Close the hood of the vehicle and safely lower the vehicle back onto the ground.
- 16. Take a test drive to verify function and performance.
- 17. Check for loosened fittings and leaks after 50 miles of driving.

🚩 Installation is now complete. Thank you for purchasing an Improved Racing product!