Installation Manual v1.0:
Force Cool Kit
Dodge with NV4500/NV4500HD/NV5600 Manual Transmissions

Please read all instructions before installation.

Figure 1 - Force Cool Kit

Note: Use Teflon sealing tape or equivalent on all pipe threads to ensure a good seal.

ATS strongly recommends soldering all electrical connections to ensure good, long lasting electrical connections.

Before drilling, double check clearance behind mounting surfaces so as not to damage other vehicle systems.

The thermostat switch provided will activate the system at 185°F and it will run until transmission temperatures drop below 165°F.
Instructions:

1. Please make sure no parts are missing from ATS Force Cool Kit. A complete corresponding list of parts can be found on page 9.

2. Park vehicle on level ground and apply parking brake.

3. Disconnect negative (-) battery terminal(s) and secure leads away from battery(s).

4. Remove bottom PTO bolts to drain transmission fluid. Use drain pain or appropriate container to catch fluid.

5. Remove both PTO covers by removing the 6 bolts holding each cover in place.

6. Scrape and clean the PTO mounting surfaces on the transmission and the factory covers. Make sure to remove all transmission fluid from sealing surfaces as it can interfere with RTV sealant adhesion.

7. Prior to installing the PTO coolers, find a suitable position on the frame to mount the pump. Locate the pump below the transmission so gravity will feed the pump inlet.

Figure 2 - PTO Cover and Drain Bolt
8. Place the threaded cooler on the same side of the transmission as the pump will be mounted. Make sure drain plug is oriented on the bottom of the cooler.

9. Install 45° adapter hand-tight into bottom of cooler and determine orientation such that it will point toward pump.

10. Remove cooler and 45° adapter fitting.

11. Install 90° 3/8" NPT to 1/2" barbed fitting hand-tight into top of cooler.

12. Install 45° adapter in the orientation determined in step 8. Install straight 3/8" NPT to 1/2" barbed fitting into female port of 45° adapter.

13. Install the temperature sending unit probe into 3/8" NPT port next to the 1/4" NPT drain plug.

Note: Some applications may not require the 45° adapter. It is only necessary when other fittings will not point pickup hose in the correct direction.

14. Place RTV sealant (Permatex) on both sides of the cooler, making sure to apply sealant around each eyelet. After applying the sealant, ATS recommends letting the sealant set or firm for 10 to 15 minutes before installation.

Figure 3 - Assemble PTO Cooler
15. Place cover on opposite side of cooler as will be mounted to the transmission. Slide a 3/8”-16 x 4” bolt into each hole with a lock washer in between bolt head and cover. The cooler is now ready for installation.

16. With the entire unit carefully in hand, so that the bolts do not slide out, start all six bolts and hand tighten, then torque each bolt to approximately 20 ft-lbs in a criss-cross pattern.

17. Repeat steps 14 thru 16 for the opposite side.

18. Install 90° 3/8" NPT to 1/2" male hose barb or straight 3/8" NPT to 1/2" male hose barb fittings in each port on the pump. If the pump is to be mounted sideways, use the 90° fittings oriented such that the pump inlet fitting points toward the transmission and the other fitting points toward the oil cooler. If the pump is to be mounted vertically, use the straight fittings.

19. Mount the pump in the pre-planned position from step 7 using the supplied self tapping screws and 1/4” washers.

20. Install the -8 fittings on the cooler ports.

21. Mount the fan/cooler in a suitable location (using the supplied self tapping screws) under the truck such that the cooling fan can flow air effectively.
22. Route a section of 1/2" hose from the lower barbed fitting on the PTO cooler to the inlet of the pump. Flow direction of the pump is indicated by an arrow located on the top of the pump.

23. Route a section of 1/2" hose from the outlet of the pump to one of the barbed fittings installed on the cooler.

24. Route a section of 1/2" hose from the remaining fitting on the fan/cooler assembly to the return port on the PTO cooler. **DO NOT CONNECT HOSE TO TOP PORT ON PTO COOLER.**

25. Refill transmission with Mopar Manual Transmission Lubricant (p/n 4874464) or equivalent fluid. Refer to owner’s manual or call your local dealer if you are not sure which type to use.

26. Typically, once the oil has reached the factory fill plug (after installing the factory plug) add an additional 1/2 to 1 quart of lubricant thru the top of the PTO cooler. This can be done by removing the return fitting that was installed hand-tight in step 11.

27. Reinstall return fitting and attach 1/2" hose.

28. Mount relay under hood near battery using a supplied self tapping screw or a factory bolt.

29. Connect the **YELLOW** wire from the relay to a key-on +12V power source. The supplied Add-a-Circuit fuse holder can be helpful.

30. Using supplied butt connector and heat shrink tubing; join the **BLACK** wire from the relay to the terminal on the thermostat using the supplied ring terminal.

31. Using a supplied butt connector and heat shrink tubing; join the **RED** wire from the relay to the **RED** wire on the pump.

32. Ground the **BLACK** wire from the pump using the supplied ring terminal and self tapping screw.

33. Using the supplied butt connector and heat shrink tubing, join the **BLUE** wire from the relay to the **BLUE** wire on the fan.

34. Ground the **BLACK** wire on the fan using the supplied ring terminal and self tapping screw.
35. Connect the **RED** wire with **30A** fuse to the positive battery terminal.

36. Reconnect negative (-) battery terminal(s).

37. Once wiring is complete, final inspection should be made to ensure clearances and proper sealing of all portions of the Force Cool Kit. An easy way to do this is to ground the terminal on the thermostat (with the key in the ON position. This will bypass the thermostat switch and engage the pump and fan. This may take a minute to fully circulate fluid throughout the Force Cool System. If the pump will not prime, remove the pump from where it is mounted and place it as far below the transmission as possible. This will help purge air from the inlet side of the pump.

With the system on, check for leaks around fittings. If the system does not leak, remove the wire used to ground the thermostat switch and the system will be ready for use.

If the system does leak, reseal leaking fitting/surface and recheck.
Force Cool Wiring Diagram

- BLACK: FROM PTO
- RED: TO PTO
- BLUE: BATTERY TERMINALS
- BLACK: KEY-ON 12V POWER SOURCE
- YELLOW: FROM PTO 45°

Force Cool Fluid Flow Diagram

- FROM PTO 45°
- TO PTO RETURN
Have Any Questions?

Thank you for purchasing the ATS Force Cool Kit. Please check our website at http://www.atsdiesel.com for technical support and other performance products such as the 5-Star™ torque converter, ATS High Performance Valve Body and ATS High Performance Transmission along with our full line of power enhancers. Please call or e-mail our Technical Service Department, 8:00am to 5:30pm Mountain Standard Time, Monday through Friday.

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We strive to make our instructions as clear and complete as possible. To achieve this, our instructions are under constant construction. We encourage you to visit our Technical Support Website (http://www.atsdiesel.com/ATSWebsite/Technical.asp) to check for the most up-to-date manuals and diagrams as well as other information. If you have any suggestions as to how we can improve this installation manual, let us know at mailto:Suggestions@ATSDiesel.com.
Bill of Materials

1. High Output Transfer Pump 8030-813-239
2. PTO Coolers
   • (1) Blank PTO Cooler 2fc300a
   • (1) Tapped PTO Cooler 2fc300b
3. PTO Hardware Kit
   • (12) 3/8”-16 x 4” Hex Head Cap Screw 2fc300s
   • (12) 3/8” Lock Washer 2fc300w
4. Wiring/Mounting Kit
   • (4) 16-14 Non-Insulated Butt Connector 95353
   • (3) 16-14 Ring Terminal 25262
   • (4) 3/16” Heat Shrink (1” Pieces) HSR316
   • (4) Self Tapping Screw (long) 85241D
   • (4) Self Tapping Screw (medium) 2539D
   • (4) Self Tapping Screw (short) 84927D
   • (4) 1/4” x 3/4” Flat Washer 58819 (not pictured)
5. Brass Fittings
   • (3) 90º 3/8” NPT to 1/2” Male Hose Barb Fitting 53525K21
   • (2) 45º 3/8” NPT to 3/8” NPTF Fitting 50785K83
   • (3) Straight 3/8” NPT to 1/2” Male Hose Barb Fitting (2 shown) 5346K23
   • (2) Straight JIC-8 to 1/2” Barbed Fittings 30682-8-8B
6. (1) Oil Cooler 15800
7. (1) Thermostat Switch BCI-75029
8. (1) Wiring Harness 2164-310-011
   • (1) Wiring Harness 2164-310-011
   • (1) ATM Mini Add-a-Circuit 58332
   • (1) ATM 15A Fuse ATM15
9. (15’) 1/2” PushLok Hose 821FR-8

Not Pictured:

10. Instruction Folder
    • (1) Purple ATS Folder
    • (2) ATS Stickers
    • (1) Instruction Manual 2164-310-910-INST