



# Ford Diesel Fan # 278

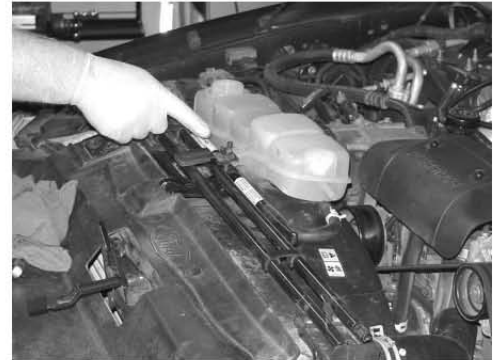
Fits 1998-2003 Ford Super Duty Trucks  
With 7.3L Diesel Engine (4WD Only)

## INSTALLATION INSTRUCTIONS



### REMOVE EXISTING FAN AND SHROUD ASSEMBLY

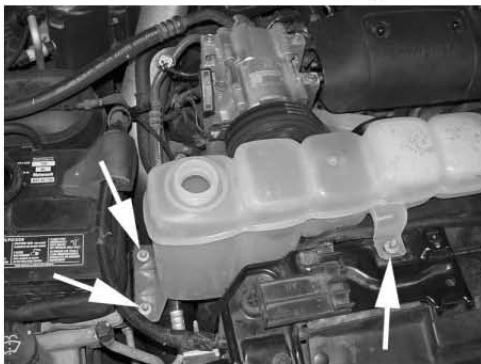
1. Disconnect battery negative cables
2. Remove the jack handle and lug wrench (*see detail 1*)
3. Remove the fill cap on the overflow bottle, then loosen the drain plug and allow coolant to drain into a clean bucket just until the overflow bottle is empty (*see detail 2*).
4. Remove the hose to the overflow bottle, the 3 bolts that attach the bottle, and the hose at the bottom (*see detail 3*). Remove the bottle and set it aside (this will be re-installed later).
5. Remove the 2 bolts securing the top of the factory fan shroud (*see detail 4*).
6. Remove the radiator inlet hose (hose at the top) from the radiator connection.
7. Loosen the large nut on the fan clutch by fitting a large wrench to the nut. Put a rag over the fan to keep from being cut. Hold the fan in place and pull the wrench in the direction of rotation. It may help to give the end of the wrench a sharp blow with a rubber mallet to break the nut free without the pulley slipping.
8. The fan and clutch assembly and the factory shroud must be removed together (*see detail 5*). Lift the fan and shroud out of the engine compartment. Have a friend hold the radiator hose out of the way. **Be careful not to damage the radiator fins!**



Detail 1



Detail 2



Detail 3



Detail 4



Detail 5

### INSTALLATION OF NEW FAN

#### KIT CONTENTS:

- |                   |                                  |                   |
|-------------------|----------------------------------|-------------------|
| 1 - 27812 bracket | 1 - Electric fan/shroud assembly | 1 - 27819 bracket |
| 1 - 27814 bracket | 1 - Connector Kit                | 1 - 28006 bracket |
| 1 - 27816 bracket | 1 - Variable Speed Control kit   | 1 - Wire bundle   |
| 1 - 27818 bracket | 1 - Mounting hardware kit        |                   |

1. Begin by mounting the bottom bracket (27818) to the bottom of the fan shroud with the 3 bolts and washers provided. Center the bracket on bottom of shroud as shown. **Do not tighten the bolts yet (*see detail 6*).**

## INSTALLATION (CONTINUED FROM PAGE 1)

2. Locate the temperature sensor kit bag. Insert the temp. sensor into the radiator fins near the radiator inlet. **Leave 1/4" or less protruding from the surface of the radiator for optimum performance (see-detail 7).** The wires will run out through the top corner of the fan shroud. Lay them toward the corner of the radiator out of the way for now.

3. While lowering the shroud down into the engine bay, have a friend under the truck making sure the tabs on the bottom brackets slide into the pockets on the radiator (see detail 8).

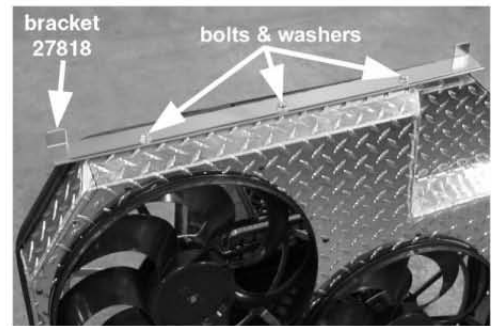
4. Attach the top brackets but **do not tighten yet (see detail 9)**. Bracket 27814 will bolt to the top driver's side of the shroud using the bolts and washers supplied. Bracket 27812 bolts to the driver's side of the truck and to bracket 27814 as shown. Attach bracket 27816 to the truck using the original mounting bolts. Attach bracket 28006 to the top of the shroud and bracket 27816 as shown (see detail 10).

6. Now have a friend push up on the bottom of the shroud while gently pulling the top in toward the radiator core to seal it. **The top brackets should be supporting the weight of the shroud.** The rubber seal should be compressed about 50%.

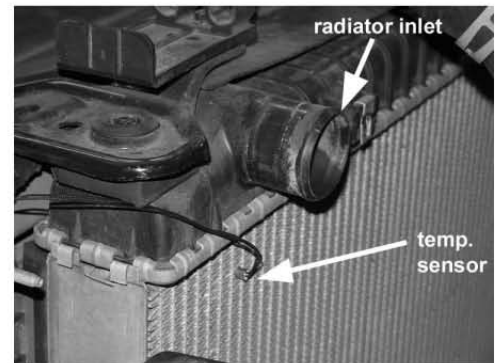
Tighten the bolts on the top brackets. Repeat this procedure for the bottom bracket - compress the rubber seal against the core, then tighten the bolts.



7. Install bracket 27819 to the bottom corner of the shroud. This bracket will shield the fan blade from the oil line. Use the bolts and washers supplied and install the bracket to the lower passenger side of the shroud as shown (see detail 11). Be sure the blades rotate freely before reconnecting batteries!



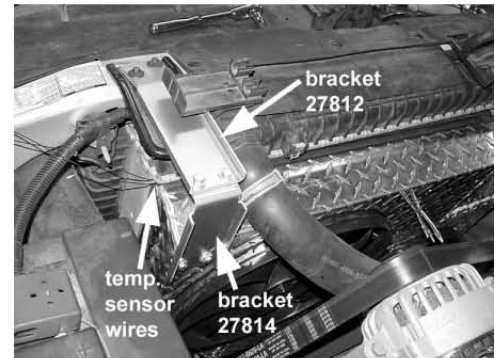
Detail 6



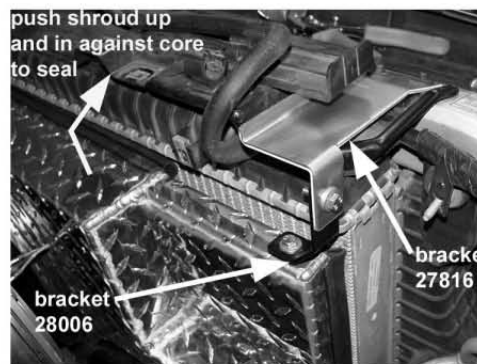
Detail 7



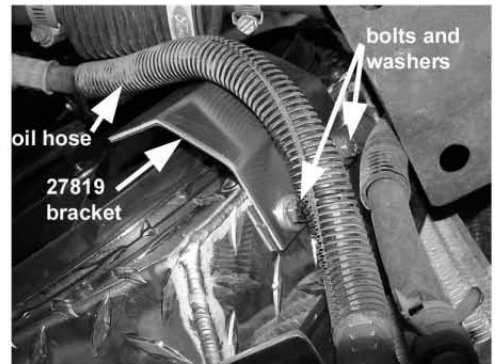
Detail 8



Detail 9



Detail 10



Detail 11

CONTINUE TO NEXT PAGE FOR WIRING INSTRUCTIONS

## WIRING THE VARIABLE SPEED CONTROL



**FOLLOW THESE INSTRUCTIONS CAREFULLY TO AVOID DAMAGING THE CONTROL UNIT, FAN MOTORS, AND YOUR VEHICLE! WHEN CRIMPING WIRES, ALWAYS USE A QUALITY CRIMPING TOOL (DO NOT USE PLIERS OR OTHER DEVICES).**

1. Find the *thick red* and thick *black* wire in the wiring bundle. Use yellow butt connectors to crimp the red wire to the short red wire on the Variable Speed Control (VSC), and the black wire to the short black wire on the VSC (*see wiring diagrams below*).

2. Determine the length needed to connect the red and black power leads to the battery terminals and trim appropriately. Crimp a large yellow ring connector to the end of the black wire and connect to the negative (-) battery terminal, but **do not** connect the red wire yet.

3. Find a convenient place to mount the circuit breaker between the VSC and the positive (+) battery terminal and use the two screws provided to mount it. Cut the red wire at the point where you mounted the breaker. Find the red boot for the circuit breaker and lay it on the breaker as shown in **Detail 12**. Crimp a small ring connector to the ends of the wires and connect them to the circuit breaker. **NOTE: BE SURE TO CONNECT THE END COMING FROM THE BATTERY POSITIVE (+) TERMINAL TO THE "BAT" TERMINAL ON THE CIRCUIT BREAKER (COPPER-COLORED).** Now press the top of the boot over the breaker terminals to protect from arcing.

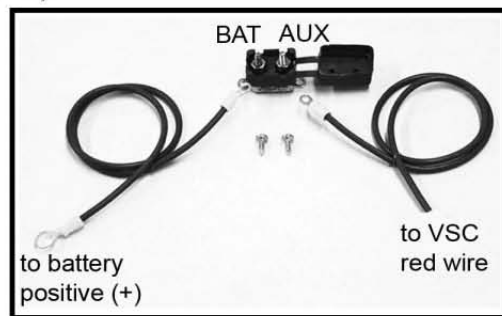
4. Crimp a large ring connector to the positive (+) battery end of the power lead and connect it to the battery.

5. Locate Power Distribution box (fuse box). Find a circuit that is "hot" when the key is in the "ON" position. **NOTE: DO NOT use the DRL or brake/taillight fuse!** Attach the included fuse tap to fuse. Attach a pink female connector to the *thin* red wire included and connect to the fuse tap. Trim the wire so that it will reach the VSC. Attach pink female connector to the other end of the wire and connect to **terminal #9** on VSC.

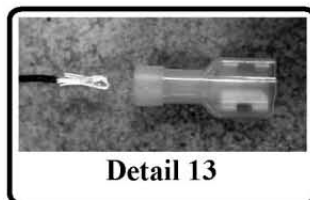
6. Locate the wires going to the A/C clutch. Determine which wire is ground and which is the positive trigger wire. Tap into the positive trigger wire using the supplied thin green wire and the piggyback connector. Determine length needed to reach VSC and trim to length. Attach a pink female connector and connect this wire to **terminal #8**. Terminal #7 on VSC will be left open.

7. Find the two small wires coming from the temp. sensor you installed earlier. Determine length of wire needed to reach VSC. **IMPORTANT:** Strip the insulation back about 1" and fold the wire onto itself to effectively double the thickness of the wire before connecting the pink female connectors (*see detail 13*). Then attach these wires to **terminals #10 & 11**. Both wires need to be connected but it doesn't matter which wire goes to each terminal.

8. If manual switches (Flex-a-lite #31148) have been purchased, attach them as follows: To override engine temperature to turn fans off, connect the switch to **terminal #5** on VSC to send a negative (-) signal. To override engine temperature to turn fans on, connect the switch to **terminal #6** on the VSC so that a negative (-) signal is sent.

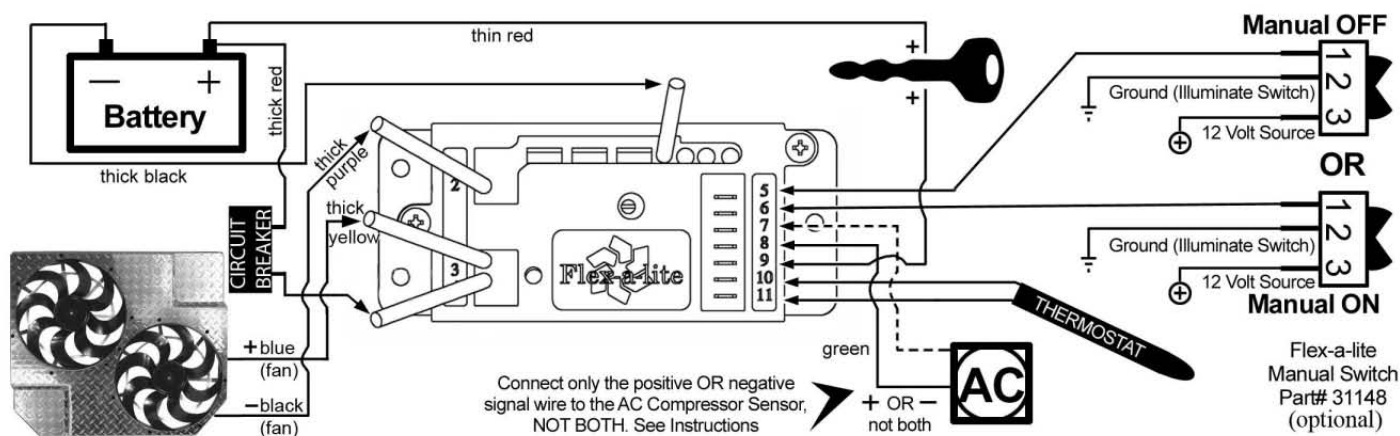


**Detail 12**



**Detail 13**

## WIRING DIAGRAM

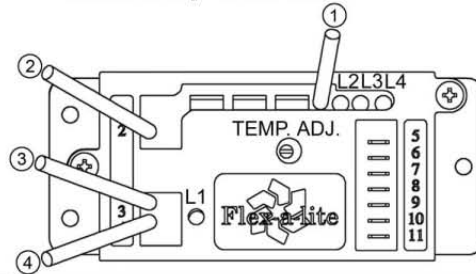


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## WIRING CONNECTIONS

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| #1 Battery Negative*              | #8 A/C Compressor Positive Signal |
| #2 Negative to Fan*               | #9 Ignition Positive Signal*      |
| #3 Positive to Fan*               | #10 Temp Sensor Wire*             |
| #4 Battery Positive*              | #11 Temp Sensor Wire*             |
| #5 Negative Override Signal OFF   | L1 Fan Output Indicator           |
| #6 Negative Override Signal ON    | L2 Override Condition Indicator   |
| #7 A/C Compressor Negative Signal | L3 A/C Signal Indicator           |
|                                   | L4 Ignition Signal Indicator      |

\* mandatory connections

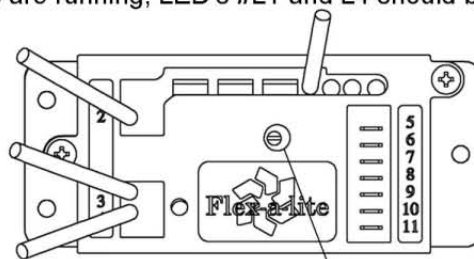


### The Variable Speed Control has new features.

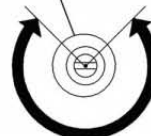
At the set temperature, the fans will come on at 60%; this reduces the load on your charging system. If the temperature rises, the fan speed will increase. If your set temperature is 195°F, then between 195° and 205° the fan speed will increase from 60% to 100%. So after a 10-degree rise from the set point, the fans will be running at 100%.

### Initial Start-up and Adjustment Procedure

1. Turn ignition on. After 6 seconds, LED #L4 should light up. If not, check to make sure that there is 12 Volts at terminal #9 on VSC. The delay is to allow starter to start the vehicle without the fans drawing any power.
2. With your engine running, engage the A/C. The fans should come on and cycle with the A/C clutch. LED's #L1, L3 and L4 should be lit when fans are running. If they do not turn on, verify that the A/C clutch is engaged and make sure you have a positive signal when the clutch is engaged at terminal #8 on the VSC. Shut off A/C and let engine continue to idle, or drive the vehicle a short distance to bring the engine to operating temperature (monitor the vehicle's temperature gauge).
3. Verify that operating temperature has been reached by feeling the upper radiator hose. Hot water should be flowing through hose into the radiator. If the fans have not cycled on yet, slowly adjust the screw on the VSC until the fans cycle on. Turning the screw further in this direction will keep the engine at a lower temperature, and turning in the opposite direction will keep the engine at a higher temperature. **NOTE: THE TOTAL MOVEMENT OF THE ADJUSTMENT SCREW IS ABOUT 3/4 OF A TURN. TURNING THE SCREW BEYOND THE LIMITS WILL DAMAGE THE UNIT!** Once desired temperature is set, let the engine continue to idle and make sure the fans will cycle to maintain desired temperature. When fans are running, LED's #L1 and L4 should be lit.



**NOTE:** Maximum rotation of adjusting screw is 3/4 turn!



#### **The Flex-a-lite Limited Warranty**

Flex-a-lite Consolidated, 7213-45th St. Ct. E., Fife, WA 98424, Telephone No. 253-922-2700, warrants to the original purchasing user, that all Flex-a-lite products to be free of defects in material and workmanship for a period of 365 days (**1 year**) from date of purchase. Flex-a-lite products failing within 365 days (**1 year**) from date of purchase may be returned to the factory through the point of purchase, transportation charges prepaid. If, on inspection, cause of failure is determined to be defective material or workmanship and not by misuse, accidental or improper installation, Flex-a-lite will replace the fan free of charge, transportation prepaid. **Flex-a-lite will not be liable for incidental, progressive or consequential damages.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights and you may have other rights, which vary from state to state. The Flex-a-lite warranty is in compliance with the Magnuson-Moss Warranty Act of 1975.