INSTALLATION INSTRUCTIONS

Transmission / Differential Oil Cooler Pump

• ***Flow rate:*** 1-2 gal/min (3.8 - 7.6 liters/min) • ***Working pressure:*** 50 PSI (3.4 bar) maximum • ***Power:*** 12-volt DC
• ***Temperature range:*** 40-160° F continous; 265° F (max) intermittent • ***Prime:*** Self-priming up 8 ft (2.6 meters) vertical height

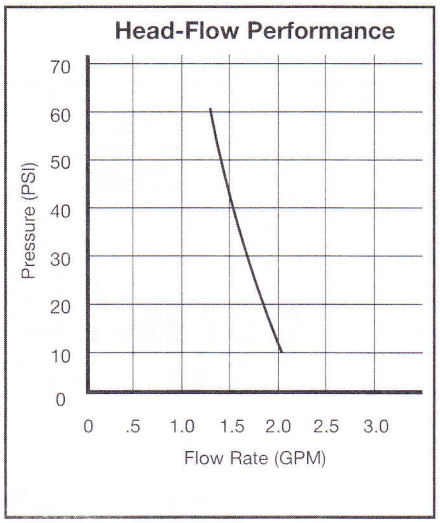
A. How It Works

The Tilton Differential Pump is a positive displacement type of pump, so its output is directly proportional to the motor speed. If a lighter load increases the motor speed by 25%, then the flow rate increases by 25%. The flow rate vs. pressure is shown in **Graph 1** with a maximum available pressure of 50 PSI. A fluid system will only flow as much as the smallest restriction will allow. Larger diameter lines and fittings allow more flow and place less load on the pump. This pump is self-priming and can be placed up to 8 ft above the source from which it draws. The typical application for the pump is in a differential or transmission cooling system. However, the pump can be used for other applications such as emptying fuel tanks. A 12-volt DC, 10-amp power supply is required. The current draw is 6.6 amps under a maximum load condition with a more typical current draw between 2 and 3 amps. This pump has a very light weight at 3.5 lbs and has a flow rate of 1-2 gallons per minute. There are two types of diaphragms available for the differential pumps; the BUNA type diaphragms are for standard coolants and the VITON diaphragms are for the more corrosive coolants.

B. Installation Notes

Important: Because every pump is tested with water at the factory, it is crucial that the pump is flushed with the fluid to be used before installing.

The Tilton Differential Pump is placed inline with the cooling system as shown in **Diagram 1**. Placing the pump on the outlet side of the cooler exposes it to lower temperatures significantly increasing the life and reliability of the pump. A 40-mesh (400 micron) strainer or filter placed inline before the inlet of the pump prevents foreign objects from damaging the pump. Heavy gear oil must be brought up to operating temperature before the pump is engaged. The cold fluid can be very thick and place an unusually large strain on the pump. Tilton recommends the use of an on/off switch so the pump can be turned off during warm-up periods. The pump includes an integral cooling fan to keep the pump cool during loaded conditions. If the pump is mounted in a vertical position, mount the pump with the motor above the pump inlet and outlet to prevent damage to the motor in the event of a fluid leak. The pump head can be rotated in 180-degree increments, allowing a variety of hose positions. Be careful not to damage the plastic pump housing by over tightening the fittings. If a check valve is placed inline with the pump, the check valve must have an opening pressure of no more than 2 PSI. The electrical hook-up is simple. Connect the pump to a 12-volt DC supply with a 10-amp fuse inline with the (red) positive lead. The black lead is the chassis ground.



Graph 1

C. Pump Removal

1. Drain any excess coolant out of the pump before continuing
2. Disconnect the electrical connections
3. Disconnect the inlet and outlet lines
4. Remove the pump from the vehicle

Mounting Hole Dimensions

- 2.25" vertical centers x 3.25" horizontal centers.
- Drill hole diameter: 3/16", 4 places.
- Use high quality #10 bolts with lock nuts

Plumbing

- For best results, use AN8 steel braided flexible hose. (1/4" or AN4 min)
- Use only 3/8" NPT fittings at the pump inlet and outlet.

Operation

- Allow the pump to prime with the discharge line open to prevent airlock.
- The pump will not be harmed if it is allowed to run dry. It is self-priming.

Electrical

- Use a minimum of 16AWG stranded wire for power connections.
- Use a 10-amp inline fuse on the 12-volt DC (red) power connection.

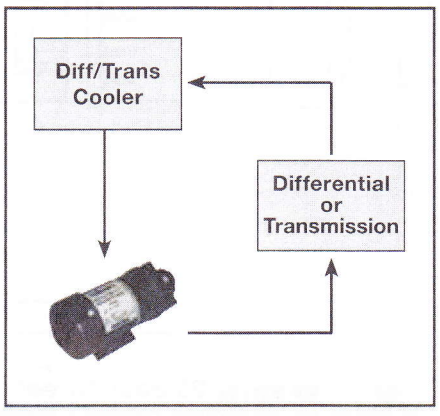


Diagram 1

D. Check Valve Assembly Replacement

*(Refer to **Diagram 2** for the Part Numbers)*

1. Mark a line at the joint between the pump head and the cam bearing housing and use this line when assembling.
2. Pay particular attention to the orientation of the pump head inlet and outlet lines and the check valve.
3. Loosen and remove the four upper Phillips head screws that retain the pump head assembly.
4. Remove the pump head assembly.
5. Carefully remove and set aside the old check valve body, which includes the old o-ring.
6. The Tilton Differential Pumps (P/Ns 40-524 & 40-525) use the o-ring that is supplied. The ring seal is not used.
7. Place the new o-ring into the new check valve body.
8. Insert the new check valve body with o-ring installed into the pump head.
9. Place the pump head onto the cam bearing housing.
10. Align the marks that were made on the body in step #1.
11. Insert and tighten the four Phillips head screws.
12. Temporarily supply 12-volt DC power to the pump and check operation of the pump before installing it into the vehicle.

Troubleshooting

Symptom	Possible Causes	Action to Take
Motor runs, no discharge	Restricted intake or discharge lines Air leak in intake line Punctured pump diaphragm Crack in pump housing Ensure correct power polarity	Restricted intake or discharge lines Check for leaks Disassemble and inspect Inspect for cracks Check fuse, power switch and polarity
Motor fails to turn on	Pump or equipment not wired correctly Defective motor Blown fuse or switch is off	Check fuse, power switch and polarity Check for motor rotation Check fuse and power
Low flow and pressure	Air leak in intake line Accumulated debris inside pump/plumbing Worn pump bearing Punctured pump diaphragm Defective motor Insufficient voltage to pump	Check for leaks Disassemble and inspect Disassemble and inspect Disassemble and inspect Check for motor rotation Measure supply voltage, must be > 12-volt DC
Pulsating flow-pumping cycle on/off	Restricted pump delivery Undersized line to intake of pump	Check discharge lines, fittings for blockage Use only 3/8" NPT fittings

Diagram 2