



Tech Tips

Customer Care

Tech Tip No: MH122005A

Date: December 20, 2005

REV: Release

Subject: Instructions for replacing the fan motor for hydraulic fan drive system

Applies To: Mountain Master with Spartan hydraulic fan drive

For Internal use only: No

Vocation: Motor Home

Labor Time: 1.5 Hours

Purpose: Proper procedures for fan motor replacement

Please Read the Entire Tech Tip Before Proceeding With Any Work.

This document is prepared to assist in the replacement of the fan motor used in hydraulic fan drive systems on Spartan Chassis'. Appropriate trouble-shooting procedures should be followed to determine that replacement is necessary prior to replacing the motor (contact Spartan customer service for trouble-shooting procedures). Read these instructions completely prior to beginning work.

Problem Correction:

- 1) Referring to the attached drawings, remove the fan / fan hub assembly (drawing items # 7 and # 8) from the motor by removing the fan hub center bolt (drawing item # 11) from the center of the fan hub. **Do not disassemble the fan / fan hub assembly.** Loosen the set screw on the fan hub (drawing item # 12). Once the center bolt has been removed, slide the fan assembly off of the motor shaft. Take care to avoid dropping the fan assembly and / or damaging the radiator package.
- 2) Place a drain pan under the fan motor assembly and disconnect the two hoses from the fan motor (drawing item # 1). This area should be cleaned with a mild solvent prior to hose removal (brake parts cleaner works well) to ensure that no contamination is introduced into the system via the loose hose ends.

NOTE: Extreme care should be taken at all times to ensure that no contamination is introduced into the system.

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- 3) It is necessary to secure the fan motor adapter fittings (drawing items # 2 and 3) with a wrench while loosening the hose connections from the adapters. To avoid confusion, the hoses should be labeled or marked in some manner to ensure that the hoses are re-installed to correct side of the replacement motor. **CAUTION: Switching of the hoses will cause damage to the new motor.**
- 4) If present, disconnect the solenoid wire harness from the solenoid valve on the hydraulic motor.
- 5) Remove the two nuts (drawing item # 4) from the mounting bolts, making sure to not drop the fan motor. Remove the two mounting bolts (drawing item # 6) and fan motor (drawing item # 1) from the vehicle (take note of the mounting orientation of the fan motor in the mounting bracket to ensure that the replacement motor is mounted in the same orientation).
- 6) Remove the two adapter fittings (drawing items # 2 and # 3) from the fan motor. Inspect the o-rings and threads on the adapter fittings, and replace if damage is evident.
- 7) Remove the plastic plugs from the ports on the replacement motor. In the event that the failed motor is being returned for warranty consideration, manually drain any oil in the failed motor and insert these plastic plugs into the ports of the failed motor. Install the adapter fittings (drawing items # 2 and # 3) into the new fan motor. **NOTE:** The port sizes are different. Ensure that the correct fitting is installed into the correct port. Torque the fittings to the specification shown in the attached drawing.
- 8) Carefully slide the new fan motor into the fan mounting bracket, making sure that the motor pilot hub fits securely into the fan bracket. Verify that the fan motor is installed in the proper orientation by referring to the attached orientation drawing. Insert the two motor mounting bolts with lock washers (drawing items # 5 and # 6) through the mounting bracket and fan motor, as reflected in the drawing. Replace hex nuts (drawing items # 4) onto the mounting bolts and snug. Verify that the fan motor is seated securely in the mounting bracket, and torque the hex nuts to the specification reflected on the attached drawing.
- 9) Remove the plastic shaft protector from the fan motor shaft (if present), taking care that the shaft key is not lost. Align the keyway in the fan hub assembly with the key on the motor shaft, and slide the fan / fan hub assembly over the shaft on the fan motor, making sure that the key remains in place.

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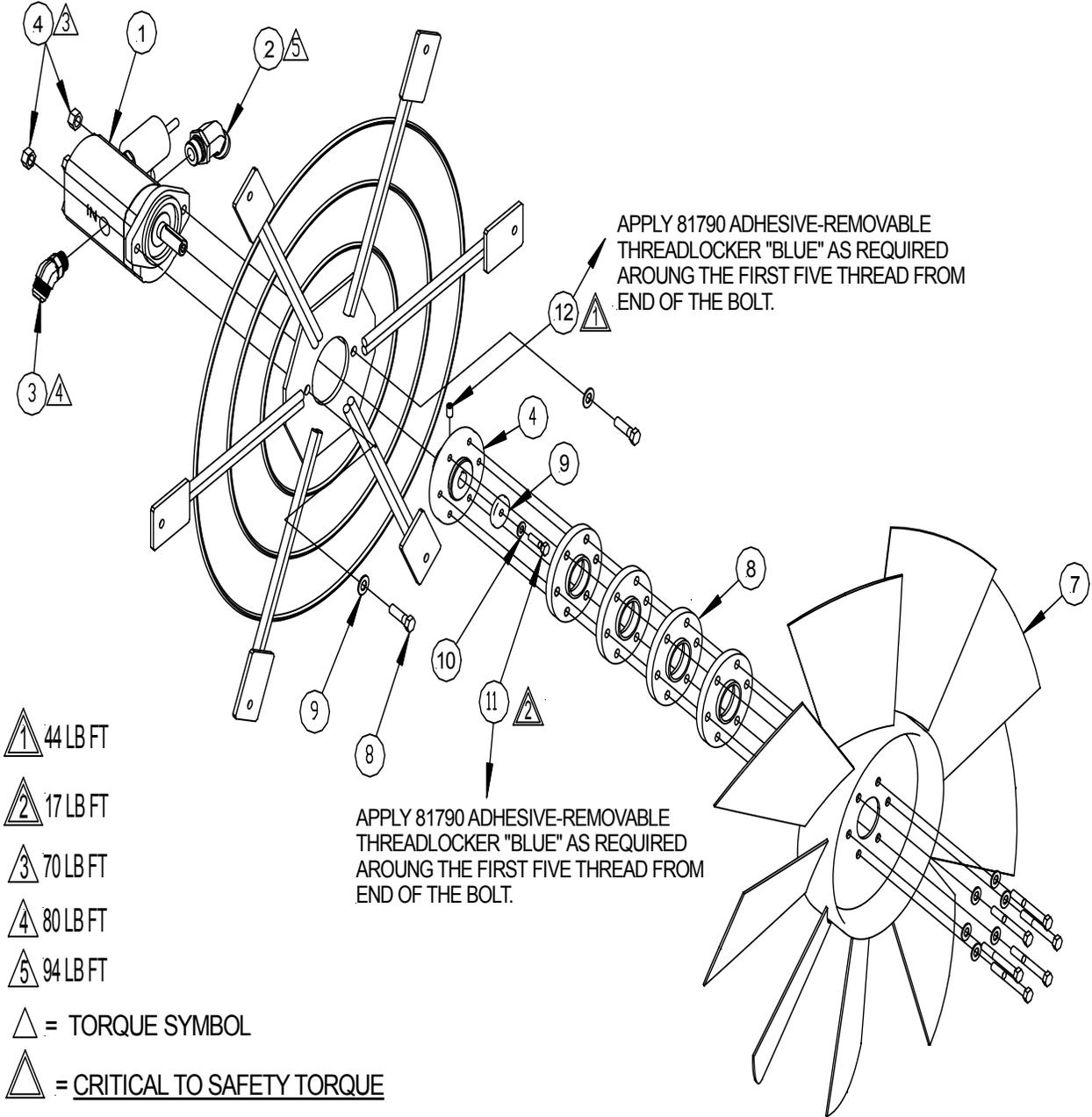
- 10) Replace the fan center bolt, washer and lock washer (drawing items # 9, # 10, and # 11) through the fan hub into the threaded hole in the end of the motor shaft (use 81790 blue removable threadlocker on the first five threads from the end of both the center hub bolt and the set screw). Torque the fan center bolt and the fan hub set screw to the specifications reflected on the attached drawing.
Note: Both of these are safety critical torque specifications!! Slowly rotate the fan by hand to ensure that no interference exists between the fan and shroud.
- 11) Re-attach the hoses to the appropriate motor adapter fittings. (Remember that accidental switching of the hoses **will** damage the new motor).
- 12) If present, re-attach the solenoid harness to the fan motor solenoid.
- 13) Check to verify that all fittings and fasteners are tight and secure. If the fan motor is being replaced for a failure other than leaking, or if the hydraulic filters have not been replaced at the proper change intervals (12 months / 12,000 miles) replace both the in-tank filter and external spin-on filter (if present), following Spartan's hydraulic filter replacement procedure.
- 14) Re-fill the hydraulic tank to the "cold full" point on the dip-stick and remove all tools and objects from the fan area. After verifying that all fittings and fasteners are secure, and that no interference exists between the fan and shroud, start the engine (keep hands and body parts clear of the fan area), and allow to idle. Verify that the fan is spinning, which may take several seconds, and that it is not contacting the shroud. During the first five minutes running at idle, check the oil level every 60 seconds, and re-fill as necessary. Once the oil level has stabilized (indicating that all air has been removed from the system) allow the engine to idle for an additional 5 minutes. At this point, gradually increase engine speed from idle to full throttle over a 10 – 15 second period. Allow to run at full throttle for 10 – 20 seconds, then return to idle and shut down the engine. Re-check the oil level, and re-fill as necessary.
- 15) Check to ensure that no leaks have occurred, and that all fittings and fasteners have remained tight.
- 16) If the fan motor was replaced under warranty, follow Spartan's procedure for returning the failed motor for warranty consideration.

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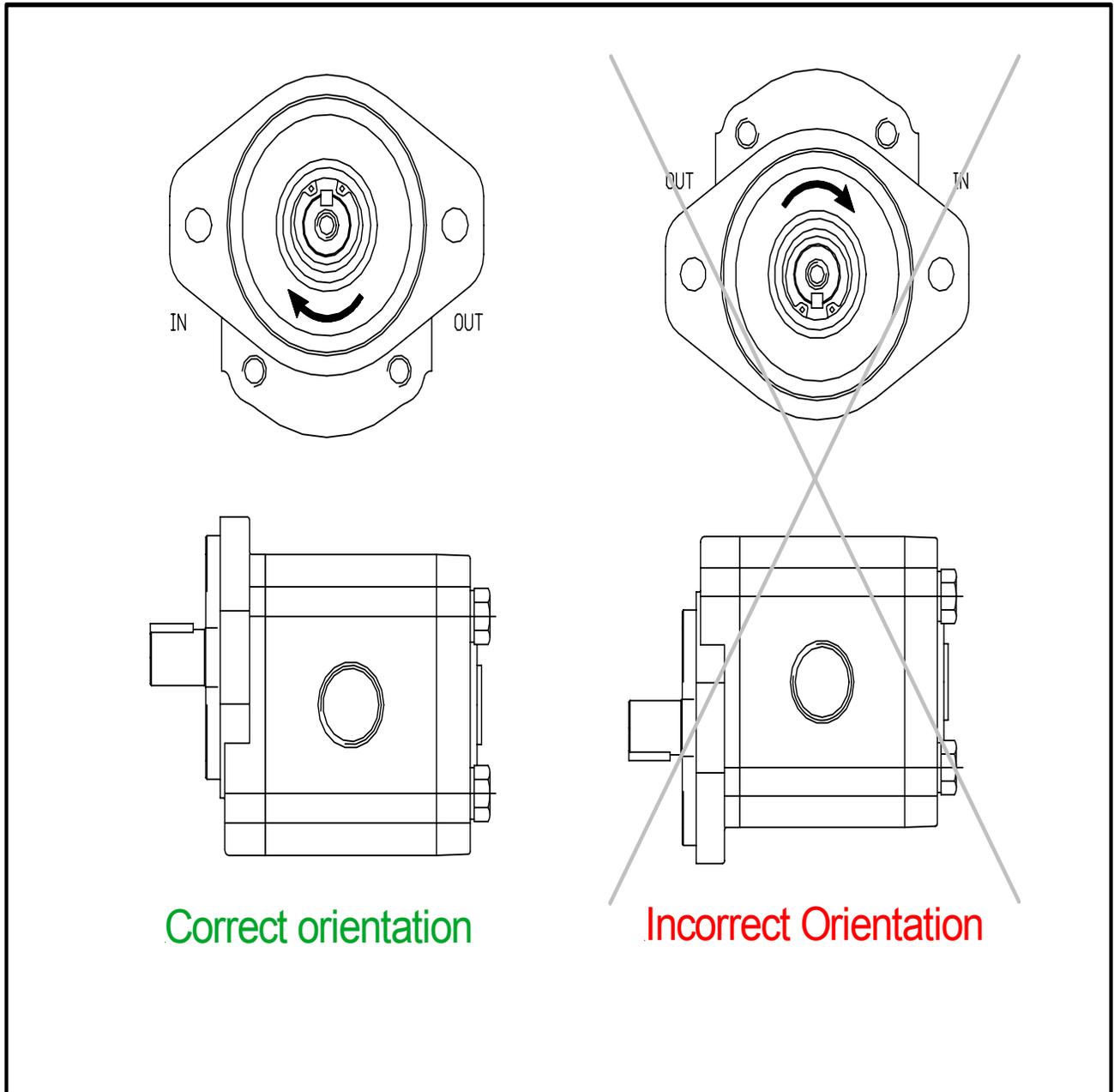


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