

# Technical Service Bulletin

**NUMBER:** 03-05-00

**GROUP:** Axle & Propeller Shaft

**DATE:** July 21, 2000

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**SUBJECT:**

Quality Improvements To Address Front Axle Whine And 2,400 RPM Moan

**OVERVIEW:**

This bulletin involves the replacement of the front propshaft, axle yoke, and transfer case yoke. This bulletin also involves selectively erasing and reprogramming the Transmission Control Module or TCM (with calibration 99Ver9.0 or 00Ver9.0), and if necessary, reprogramming the Powertrain Control Module or PCM (with calibration 99Cal19A or 00Cal16A).

**MODELS:**

1999 – 2000 (WJ) Grand Cherokee

**NOTE: THIS BULLETIN APPLIES TO VEHICLES EQUIPPED WITH A 4.7L ENGINE AND EITHER A NV247 OR A NV242HD TRANSFER CASE.**

**SYMPTOM/CONDITION:**

The customer may experience powertrain related sound(s) which may be described as front axle whine or as 2,200 to 2,400 engine rpm moan. One or both sounds may be noticed at the same time or separately during different modes of driving.

The front axle whine-like sound may occur during any vehicle speed and during acceleration, coast, or float driving modes.

The moan-like sound will normally occur when the transmission is in top gear (overdrive) and the engine is running between speeds of 2,200 to 2,400 rpm. The moan-like sound will normally fade in and out (beat) while the throttle is held in a steady state or when the throttle is being depressed to accelerate the vehicle. The beat may increase in frequency as the engine speed increases. The moan-like sound will not occur if the transmission is shifted to a lower gear (overdrive button depressed) or if the throttle is released.

A revised front propeller shaft addresses the whine-like sound from the front axle area.

The revision to the TCM software adds a final gear ratio to the transmission. This new final gear ratio will cause a substantial reduction in the moan-like sound. Any remaining sound will occur at higher vehicle speeds.

**NOTE: TO MAINTAIN EMISSIONS COMPLIANCE, VEHICLES EQUIPPED WITH A FEDERAL EMISSION SYSTEM (SALES CODE NAA) MUST HAVE THE PCM REPROGRAMMED IF THE PCM CALIBRATION LEVEL IS EARLIER THAN 99CAL19A OR 00CAL16A. REPROGRAMMING IS NOT REQUIRED IF THE PCM SOFTWARE IS ALREADY AT ONE OF THESE LEVELS (OR LATER) OR IF THE VEHICLE HAS A CALIFORNIA EMISSION SYSTEM.**

**NOTE: WHENEVER A POWERTRAIN CONTROL MODULE OR A TRANSMISSION CONTROL MODULE IS REPLACED DUE TO FAILURE, THE SOFTWARE OF THE REPLACEMENT CONTROLLER MUST BE VERIFIED FOR THE LATEST REVISION LEVEL. USE THE FLASH PROCEDURE TO UPDATE REPLACED CONTROLLERS AS NECESSARY.**

***DIAGNOSIS:***

1. If one or both of the above symptoms has been experienced on the vehicle in question, then perform the Repair Procedure.
2. Refer to Technical Service Bulletin (TSB) 03-05-9 if additional axle diagnosis is required.

***PARTS REQUIRED:***

1	05019624AA	Yoke, front axle pinion (FBI 186 / Mdl 30)
1	05017755AA	Nut, pinion gear
2	J3240553	Strap, front pinion yoke to single cardan universal joint
4	J4006928	Bolt, front pinion yoke strap
1	05019514AA	Yoke, transfer case front (NV-247 or NV-242HD transfer case)
4	06034966	Bolt, transfer case yoke to double cardan universal joint
1	05019616AA	Propshaft, front (4.7L w/NV-247 or NV-242HD transfer case)
2(AR)	04669020	Label, Authorized Software Update
1	04275086	Label, Authorized Modification

***EQUIPMENT REQUIRED:***

1	6958	Yoke Holder
1	NPN	Dial Inch pound torque wrench
1	NPN	Dial Foot pound torque wrench
1	CH6000	Scan Tool (DRB III®)
1	CH7035	General Purpose Interface Bus Cable (GPIB)
1	CH7000/7001	J1962 Cable
1	MDS2	

**NOTE: THE MDS2 AND DRB III® ARE REQUIRED TO PERFORM PART OF THIS REPAIR. WHEN USING THE MDS2 AND THE DRB III®, THE SYSTEM MUST BE OPERATING AT CIS CD 2062 OR HIGHER.**

***REPAIR PROCEDURE:***

Front Propeller Shaft Replacement:

**NOTE: DO NOT EXECUTE THIS REPAIR PROCEDURE UNLESS THE CORRECT EQUIPMENT IS USED. PAY CLOSE ATTENTION TO REPAIR PROCEDURE.**

**NOTE: DO NOT USE AN IMPACT WRENCH TO TIGHTEN THE PINION OR TRANSFER CASE NUTS.**

1. Raise and support the vehicle on safety stands. Make sure the steering wheel is centered.
2. Shift the transmission and transfer case, if necessary, into the Neutral position.
3. Remove both front wheels and tires from their respective axle hub/bearing.
4. Remove both front brake calipers from their anchors. Support the brake calipers in a correct manner so that, the caliper will not interfere with the rotation of the axle shafts. Do not allow the brake hose to support the caliper weight.
5. Make a mark so that the brake rotor and hub can be installed back to their original position to each other.
6. Remove both brake rotors.

**NOTE: THE WHEEL/TIRE ASSEMBLY, BRAKE CALIPER, AND BRAKE ROTOR MUST BE REMOVED FROM BOTH SIDES OF THE FRONT AXLE BEFORE THE ORIGINAL TOTAL TORQUE TO ROTATE (TTR) MEASUREMENT IS TAKEN IN STEP 15.**

7. Remove the bolts holding the front CV joint of the front propeller shaft front to the front axle pinion companion flange.
8. Remove the bolts holding the rear CV joint of the front propeller shaft to the transfer case companion flange.
9. Remove the front propeller shaft.
10. Remove the nut used to secure the transfer case front companion flange to the transfer case front output shaft. Save the nut for assembly.
11. Remove the transfer case front companion flange from the transfer case front output shaft.
12. Install the new transfer case front yoke (pn 05019514AA) and its attaching nut onto the transfer case front output shaft.

**NOTE: NEVER USE AN IMPACT WRENCH TO TIGHTEN THE TRANSFER CASE NUT.**

13. Tighten the transfer case yoke nut to 122 – 176 Nm (90 – 130 ft. lbs.).
14. At the front axle, rotate the pinion gear a minimum of 10 turns.
15. Using a dial inch pound torque wrench attached to the front axle pinion nut, measure the Total Torque to Rotate (TTR) of the front axle. This specific TTR will be the measurement of the torque that is required to rotate the pinion and differential gears (with axle shafts in place). Record the TTR measurement for later use in steps 20, 21, and 22.

**NOTE: A MEASUREMENT OF THE FRONT AXLE TOTAL TORQUE TO ROTATE MUST BE TAKEN BEFORE THE ORIGINAL PINION NUT AND PINION YOKE IS REMOVED. THE ORIGINAL TTR MEASUREMENT MUST BE KNOWN TO PREVENT POSSIBLE PINION BEARING FAILURE DURING ASSEMBLY OF THE NEW PINION YOKE TO THE FRONT AXLE PINION.**

16. Remove the front axle pinion nut and companion flange.
17. Install the new front axle pinion yoke (pn 05019624AA) and attaching pinion nut (pn 05017755AA).

18. Tighten the pinion nut until there is zero bearing end-play.

**NOTE: NEVER USE AN IMPACT WRENCH TO TIGHTEN AN AXLE PINION NUT.**

19. Measure the current Total Torque to Rotate value with the same dial inch pound torque wrench used to obtain the original TTR measurement.
20. Slowly tighten the pinion nut in 6.8 Nm (5 ft. lbs.) increments until the original TTR value is obtained.

**NOTE: MEASURE THE ROTATING TORQUE FREQUENTLY TO AVOID OVER CRUSHING THE COLLAPSIBLE SPACER.**

21. Increase the torque on the pinion nut in 6 – 8 Nm (5 ft. lbs.) increments until the TTR has increased by 0.22 – 0.56 Nm (2 – 5 in. lbs.) above the original TTR value.
22. Once the new TTR value (the original TTR + 2 to 5 in. lbs.) has been obtained, rotate the pinion gear a minimum of ten times. Verify that the pinion rotates smoothly. Verify that the new TTR value has not changed.
23. Note the paint mark on the transfer case yoke, front axle pinion yoke, and at each end of the propeller shaft. The paint marks must be aligned (positioned next to each other) to minimize propeller shaft runout and out-of-balance.
24. Install the front propeller shaft rear double cardan joint to the transfer case yoke. Make sure the paint marks are aligned with each other.
25. Tighten the four bolts (pn 06034966) connecting the transfer case yoke to the double cardan joint to 27 Nm (20 ft. lbs.).
26. Install the single cardan joint to the front axle pinion yoke. Make sure the paint marks are aligned with each other.
27. Install the two front axle yoke straps (pn J3240553) and four attaching bolts (pn J4006928).
28. Tighten the axle yoke strap bolts to 19 Nm (14 ft. lbs.).
29. Verify proper axle fluid level.
30. Install each front brake rotor to its original position/orientation on the hub. Make sure each rotor is aligned with the mark made previously.
31. Install the front brake calipers and wheels. Tighten the caliper slide pins to 29 – 41 Nm (21 – 30 ft. lbs.).
32. Tighten the front wheel lug nuts to 115 – 150 Nm (85 – 115 ft. lbs.).
33. If necessary, shift the transmission into the Park position and the transfer case into the 4 All-Time position (NV247) or either 4 Full-Time or 2 WD (NV242HD).
34. Lower the vehicle.

TCM and PCM Reprogramming:

**NOTE: PERFORM A QUICK LEARN OF THE TRANSMISSION ONCE THE TCM IS REPROGRAMMED.**

**NOTE: ONLY VEHICLES WITH A FEDERAL EMISSIONS SYSTEM AND PCM SOFTWARE THAT IS EARLIER THAN CALIBRATION 99CAL19A OR 00CAL16A REQUIRE REPROGRAMMING. VERIFY THE CURRENT CALIBRATION LEVEL OF THE PCM.**

1. Log onto the MDS2 system.
2. Connect the MDS2 and DRB III® to the vehicle and switch the ignition key to "ON".
3. Use the arrow keys and select #2 CONNECT TO MDS2 on the DRB III® MAIN MENU SCREEN.
4. Use the arrow keys and select #2 RUN MDS2 APPLICATION on the DRB III® MAIN MENU SCREEN.

**NOTE: ONCE MDS2, DRB III®, AND VEHICLE COMMUNICATION HAS BEEN ESTABLISHED, THE "CANNOT READ VIN FROM DRB III®" MESSAGE (ON THE MDS2) WILL BE REPLACED BY THE VEHICLE VIN. PRESS THE "OK" BUTTON ON THE MDS2 TO REQUEST A MDS2 SESSION FOR THE VEHICLE VIN INDICATED. PRESS THE "OK" BUTTON WHEN ASKED TO BEGIN SESSION.**

5. Select the FLASH tab on the MDS2.
6. Select READ PART NUMBERS FROM VEHICLE and click SHOW UPDATES on the MDS2. Press the "OK" button.

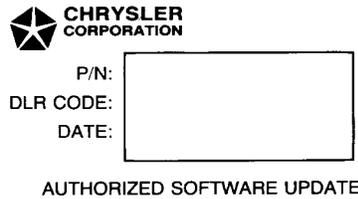
**NOTE: IN ABOVE STEPS #5 AND/OR #6, A MESSAGE MAY APPEAR THAT INDICATES NO UPDATES ARE AVAILABLE. IF THIS OCCURS, MAKE SURE YOUR DIAGNOSTIC EQUIPMENT IS OPERATING AT THE LATEST SOFTWARE LEVEL AS LISTED EARLIER IN THIS BULLETIN. IF THE LATEST SOFTWARE IS INSTALLED, AND NO UPDATES ARE AVAILABLE, ANOTHER VEHICLE CONDITION EXISTS THAT WILL REQUIRE FURTHER INVESTIGATION.**

7. Select the new software part number with the light pen and click UPDATE CONTROLLER SOFTWARE.
8. The MDS2 and DRB III® will prompt for any operator action needed during the remainder of the reprogramming process.

**NOTE: DUE TO THE PCM AND THE TCM REPROGRAMMING PROCEDURE, A DTC MAY BE SET IN OTHER MODULES (PCM, TCM, BCM, MIC, SKIM) WITHIN THE VEHICLE IF SO EQUIPPED. SOME DTC'S MAY CAUSE THE MIL TO ILLUMINATE. ALL DTC'S RELATE TO A LOSS OF COMMUNICATIONS WITH THE MODULE THAT IS BEING REPROGRAMMED. CHECK ALL MODULES, RECORD THE FAULTS, AND ERASE THESE FAULTS PRIOR TO RETURNING THE VEHICLE TO THE CUSTOMER. ERASE ANY FAULTS IN THE PCM ONLY AFTER ALL OTHER MODULES HAVE HAD THEIR FAULTS ERASED.**

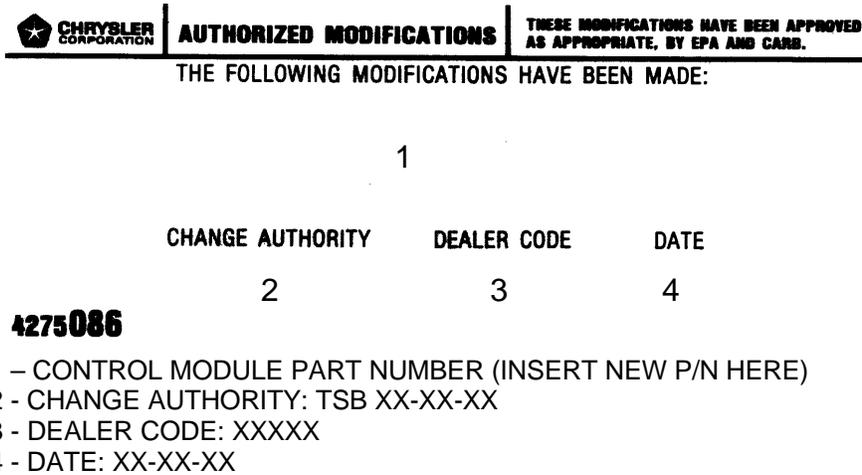
**NOTE: THE FOLLOWING STEPS ARE REQUIRED BY LAW.**

- 9. Type the necessary information on the “Authorized Software Update Label” p/n 04669020 (Figure 1). Attach a label to the TCM (EATX), and if reprogramming was required, attach a label to the PCM (JTEC). Cover both labels with the clear plastic overlay.



**FIGURE 1**

- 10. Type the necessary information on the “Authorized Modification Label” p/n 04275086 and attach the label near the VECI label (Figure 2).



**FIGURE 2**

**POLICY:** Reimbursable within the provisions of the warranty.

**TIME ALLOWANCE:**

Labor Operation No:

16-30-03-90 (Replace front propeller shaft) .....	1.3 Hrs.
08-19-50-99 (Reprogram TCM) .....	0.5 Hrs.
08-19-44-94 (Reprogram PCM – Federal Emissions Only) .....	0.5 Hrs.

**FAILURE CODE:** P8 – New Part  
 FM – Flash Module