

- **ENGINE—7.3L DIESEL—ENGINE KNOCK OR “CACKLE”—1999-2000 SUPER DUTY F-SERIES AND 2000 EXCURSIONS WITH ENGINE SERIAL NUMBERS 661894 THROUGH 1311240—ALL 1998-2000 E-SERIES WITH ENGINE SERIAL NUMBERS 661974 THROUGH 1311240**
- **NOISE—“CACKLE” OR ENGINE KNOCK—7.3L DIESEL—1999-2000 SUPER DUTY F-SERIES AND 2000 EXCURSIONS WITH ENGINE SERIAL NUMBERS 661894 THROUGH 1311240—ALL 1998-2000 E-SERIES WITH ENGINE SERIAL NUMBERS 661974 THROUGH 1311240**

**Article No.  
03-21-39**

**FORD:** 1998-2000 E SERIES  
1999-2000 SUPER DUTY F SERIES  
2000 EXCURSION

This article is being published to combine TSB **00-22-1** and **01-14-6** as part of a consolidated 7.3L diagnostic aid booklet.

### **ISSUE**

Some vehicles equipped with a 7.3L Powerstroke diesel engine with engine serial number 661894 through 1311240, may exhibit a noise above the normal sound of the diesel combustion. This noise may sound like a rod knock, but it is intermittent and increases in intensity as the engine warms up to operating temperature. This “cackle” noise may be caused by pressure variation within the fuel rail and in virtually all instances is attributed to cylinder #8 (driver side rear). The “cackle” noise does not cause damage the engine, or impact the engine’s performance or economy.

Engines after serial number 1311240 were built with a long lead injector in cylinder #8 and correct calibration from the factory. It is possible for engines with the long lead injector, from the factory or installed in service, to exhibit a “lifter noise” (the long lead injector can be identified by the “LL” stamp on top of the solenoid.) This noise is typically most noticeable when the vehicle is parked next to a brick or concrete wall, such as at a fast food drive through. This noise is a normal characteristic of the long lead injector and is not a reason to replace the injector.

### **ACTION**

Refer to the following Service Procedure for diagnostics, injector replacement, and Powertrain Control Module (PCM) reprogramming procedure.

### **SERVICE PROCEDURE**

The “cackle” noise will typically be found early in an engine’s life due to low fuel pressure and/or the relationship of injectors and engine firing order, or fuel pressure below specification. If a mature engine develops the “cackle” noise, low fuel pressure is the likely cause. Before making a repair attempt, the following tests should be performed:

1. Verify that the noise occurs with a hot engine, not cold.
2. Verify that the vehicle has been driven long enough to purge the air out of the high-pressure oil system and the fuel system since the last injector/high pressure oil system repair. Air trapped in the system could induce the “cackle” noise.
3. If the fuel pressure is less than 379 kPa (55 psi) in either head, repair it first and re-evaluate the “cackle” concern.

**NOTE:** The information in Technical Service Bulletins is intended for use by trained, professional technicians with the knowledge, tools, and equipment to do the job properly and safely. It informs these technicians of conditions that may occur on some vehicles, or provides information that could assist in proper vehicle service. The procedures should not be performed by “do-it-yourselfers”. Do not assume that a condition described affects your car or truck. Contact a Ford, Lincoln, or Mercury dealership to determine whether the Bulletin applies to your vehicle.

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4. Repair any other engine driveability concerns prior to attempting a repair for "cackle".  
Example: low fuel pressure concerns may be causing low power and "cackle". Repairing the low fuel pressure may correct both concerns. Also, an engine miss may be an indicator of valve train concerns.
5. Verify that there is no air entering the fuel system. Air entering the fuel system will affect injector timing, causing unusual noise/performance.
6. The Injector Performance Analyzer can be used to determine if the "cackle" is coming from cylinder #8. Cancel that cylinder to determine whether the noise still exists. "Cackle" cannot be identified using the Cylinder Contribution Test.

If the noise is only present when engine is hot, and:

- a. no performance concern exists
- b. fuel pressure is above the minimum specification of 379 kPa (55 psi)
- c. there is no air present in the fuel/oil system
- d. a long lead injector is currently not installed

then the engine is a candidate for a special Injector, F81Z-9E527-EARM (engine s/n 661894 - 896811) or XC3Z-9E527-AARM (engine s/n 896812 - end of 7.3L production).

### NOTE

**IF THE NUMBER EIGHT INJECTOR HAS BEEN REPLACED PREVIOUSLY FOR A CACKLE NOISE CONCERN WITH PART NUMBER NOTED ABOVE, DO NOT REPLACE IT AGAIN. THE LONG LEAD INJECTOR CAN EXHIBIT A TICKING "LIFTER" NOISE AT NORMAL OPERATING TEMPERATURES. THIS IS CONSIDERED A NORMAL CONDITION AND DOES NOT REQUIRE SERVICE.**

### NOTE

**THE ENGINE SERIAL NUMBER CAN BE FOUND ON THE LOWER LEFT SIDE OF THE ENGINE BLOCK REARWARD OF THE OIL FILTER.**

### NOTE

**THE NEW LONG-LEAD INJECTOR FOR "CACKLE" NOISE IS USED ONLY IN CYLINDER #8. DO NOT USE IN ANY OTHER CYLINDER DUE TO FUTURE CYLINDER CONTRIBUTION TEST DIAGNOSTICS BEING AT RISK. THE INJECTOR IS RECOGNIZABLE BY AN "LL" STAMPED ON THE SOLENOID WHERE THE UVC (INJECTOR HARNESS) CONNECTS.**

Replace the #8 injector by referring to the replacement procedure in the appropriate vehicle Workshop Manual. In addition to replacing the injector, the PCM MUST be reprogrammed to prevent the #8 injector from flagging a false Cylinder Contribution Test code during future diagnostic tests. After the repair, realize that some small amount of "cackle" may remain.

### NOTE


**VEHICLES BUILT WITH ENGINE AFTER S/N 1311240 HAVE CORRECT CALIBRATIONS FROM THE FACTORY.**

<b>PCM CALIBRATION INFORMATION</b>					
<b>Application</b>	<b>Old Part Number (-12A650-)</b>	<b>Old Tear Tag</b>	<b>New Part Number (-12A650-)</b>	<b>New Tear Tag</b>	<b>NGS/WDS Qualifier</b>
F-250/350 M/T Federal Service Fix 1999.5	XU2F-UA	QEK0	XU2Z-UB	QEK1	WDS Release B26.4 or Later
F-250/350, F-450/550 M/T Federal Service 1999.5	XU2F-PA	ZHL0	XU2Z-PB	ZHL1	WDS Release B25.4 or Later
F-450/550/560 M/T 50S Service Fix 1999.5	XU2F-XA	VRP0	XU2Z-XB	VRP1	WDS Release B25.4 or Later
F-450/550/560 M/T 50S Service Fix 1999.5	XU2F-VA	BAW0	XU2F-VB	BAW1	WDS Release B25.4 or Later
F-250/350 M/T California Service Fix 1999.5	XU2F-YA	GLI0	XU2Z-YB	GLI1	WDS Release B25.4 or Later
F-250/350 M/T California Service Fix 1999.5	XU2F-SA	SBJ0	XU2Z-SB	SBJ1	WDS Release B25.4 or Later
F-250/350 A/T Federal Service Fix 1999.5	XU2F-ZA	YEV0, YEV1, YEV2	XU2Z-ZD	YEV3	WDS Release B25.4 or Later
F-250/350, F-450/550 A/T Federal Service 1999.5	XU2F-RA	MRT0, MRT1, MRT2	XU2Z-RD	MRT3	WDS Release B25.4 or Later
F-450/550/560 A/T 50S Service Fix 1999.5	XU2F-ABA	RXM0, RXM1, RXM2	XU2Z-ABD	RXM3	WDS Release B25.4 or Later
F-450/550/560 A/T 50S Service Fix 1999.5	XU2F-AAA	LVS0, LVS1, LVS2	XU2Z-AAD	LVS3	WDS Release B25.4 or Later
F-250/350 A/T California Service Fix 1999.5	XU2F-ACA	XWF0, XWF1, XWF2	XU2Z-ACD	XWF3	WDS Release B25.4 or Later
F-250/350 A/T California Service Fix 1999.5	XU2F-TA	HQN0, HQN1, HQN2	XU2Z-TD	HQN3	WDS Release B25.4 or Later
E-350/450 A/T Federal Service Fix 1999.5	XU2F-ADA	UYQ0	XU2Z-ADB	UYQ1	WDS Release B25.4 or Later
E-350/450 A/T California Service Fix 1999.5	XU2F-AEA	JUK0	XU2Z-AEB	JUK1	WDS Release B25.4 or Later
E-350/450 A/T California Service Fix 2000	XC2F-AND	CHK3, CHK4	XC2Z-ANF	CHK5	WDS Release B25.4 or Later
E-350 A/T California Service Fix 2000	XC2F-BBA	MYA0	XC2Z-BBB	MYA1	WDS Release B25.4 or Later
F-250/350 M/T California Service Fix 2000	XC3F-CF	ATA3	XC3Z-CG	ATA4	WDS Release B25.4 or Later
F-250/350 M/T California Service Fix 2000	XC3F-DF	FHP3	XU7Z-DA	FHP4	WDS Release B25.4 or Later
Excursion A/T 50S Service Fix 2000	YC3F-ARF	ZYS5	YU7Z-BA	ZYS6	WDS Release B25.4 or Later
Excursion A/T 50S R/C 2000	YC3F-AVA	AXD0	YU7Z-AA	AXD1	WDS Release B25.4 or Later
F-250/350 M/T Federal R/C 2000	XC3F-AF	DAC3	XC3Z-AG	XPC4	WDS Release B25.4 or Later
F-450/550 M/T California R/C 2000	XC3F-KF	VXY3	XC3Z-KG	VXY4	WDS Release B25.4 or Later

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PCM CALIBRATION INFORMATION					
Application	Old Part Number (-12A650-)	Old Tear Tag	New Part Number (-12A650-)	New Tear Tag	NGS/WDS Qualifier
F-250/350 A/T California R/C 2000	XC3F-EBD	NVK3, NVK4	XU7Z-AB	NVK5	WDS Release B25.4 or Later
F-250/350 A/T California R/C 2000	XC3F-PF	CNH4	XU7Z-BA	CNH5	WDS Release B25.4 or Later
F-250/350 M/T California R/C 2000	XC3F-DCA	HMR0	XC3Z-DCB	HMR1	WDS Release B25.4 or Later
F-450/550 A/T CFFV R/C 2000	YC3F-BCA	YLE0	YU7Z-CA	YLE1	WDS Release B25.4 or Later
F-250/350 A/T California R/C 2000	XC3F-DDA	UKN0	XU7F-CA	UKN1	WDS Release B25.4 or Later
E-350/450 A/T Federal R/C 2000	XC2F-APD	SZT3, SZT4	XC2Z-APF	SZT5	WDS Release B25.4 or Later
E-350/450 A/T Federal R/C 2000	XC2F-BAA	RCU0	XC2Z-BAB	RCU1	WDS Release B25.4 or Later
E-350/450 A/T California R/C 2000	XC2F-AZB	FHM1	XC2Z-AZC	FHM2	WDS Release B25.4 or Later
E-350 A/T California R/C 2000	YC2F-ATB	SBR1	YC2Z-ATC	SBR2	WDS Release B25.4 or Later
F-250/350 M/T Federal Warm Weather 1999	F81F-JE	BDT4	F81Z-JF	BDT5	WDS Release B27.8 or Later
F-250/350 M/T Federal Cold Weather 1999	F81F-AF	AWA4	F81Z-AG	AWA5	WDS Release B27.8 or Later
F-450/550/560 M/T 50S Warm Weather 1999	F81F-LE	DYK4	F81Z-LF	DYK5	WDS Release B27.8 or Later
F-450/550/560 M/T 50S Cold Weather 1999	F81F-KE	CLB4	F81Z-KF	CLB5	WDS Release B27.8 or Later
F-250/350 M/T California Warm Weath 1999	F81F-ME	ETR4	F81Z-MF	ETR5	WDS Release B27.8 or Later
F-250/350 M/T California Cold Weath 1999	F81F-CF	ZDR4	F81Z-CG	ZDR5	WDS Release B27.8 or Later
F-250/350 A/T Federal Warm Weather 1999	F81F-NG	FUT6, FUT7	F81Z-NJ	FUT8	WDS Release B27.8 or Later
F-250/350 A/T Federal Cold Weather 1999	F81F-BH	XLE6, XLE7	F81Z-BK	XLE8	WDS Release B27.8 or Later
F-450/550/560 A/T 50S Warm Weather 1999	F81F-RG	HPA6, HPA7	F81Z-RJ	HPA8	WDS Release B27.8 or Later
E350/E450 A/T Federal 1998-1999	F8UF-AFG	MLU6	F8UZ-AFH	MLU7	WDS Release B27.8 or Later
E350/E450 A/T California 1998-1999	F8UF-AGG	PTH6	F8UZ-AGH	PTH7	WDS Release B27.8 or Later

Obtain an Authorized Modifications Decal (FPS 8262 - obtainable through DOES II, 25/pkg) and list the date, dealer number, and summary of modifications performed. Select a prominent place adjacent to the Vehicle Emission Control Information Decal suitable for installing the Authorized Modifications Decal. Clean the area, install the decal, and cover it with a clear plastic decal shield.

 <b>AUTHORIZED MODIFICATIONS</b>	
<b>THE FOLLOWING MODIFICATIONS HAVE BEEN MADE:</b>	
<i>Replaced or Reprogrammed Powertrain Control Module (PCM) per TSB 03-21-39.</i>	
<b>THESE MODIFICATIONS HAVE BEEN APPROVED, AS APPROPRIATE, BY EPA AND CARB.</b>	
<b>DEALER NUMBER:</b>	<b>DATE:</b>
<b>CHANGE AUTHORITY:</b>	
FPS 8262 9/78    FORD MOTOR COMPANY    PRINTED IN U.S.A.	

PART NUMBER	PART NAME
F81Z-9E527-EARM	#8 injector (s/n 661894 - 896811)
XC3Z-9E527-AARM	#8 Injector (s/n 896812 - end of 7.3L production)

**OTHER APPLICABLE ARTICLES:** NONE  
**SUPERSEDES:** 00-22-1, 01-14-6  
**WARRANTY STATUS:** INFORMATION ONLY