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2017 Ford Transit-250 Service and Repair Manual

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No	GO to F2

F2 CHECK FOR OBVIOUS SIGNS OF MECHANICAL DAMAGE

- Ignition OFF.
- Visually inspect the powertrain components and all possible causes listed for obvious signs of mechanical damage.

Is any mechanical damage present?

Yes	REPAIR as necessary.

No	GO to F3

F3 CHECK THE ENGINE OIL LEVEL

- Check the engine oil level.

Is the engine oil level OK?

Yes	GO to F4

No	FILL the engine oil to specification.

F4 CHECK THE ENGINE OIL FOR CONTAMINATION

- Check the engine oil for contamination.

Is the engine oil free of contamination?

Yes	GO to F5

No	IDENTIFY the source of the contamination and REPAIR as necessary.

- Check the coolant pump for excessive end play. Inspect the coolant pump for imbalance with the drive belt off.

Is any concern with the coolant pump present?

Yes	REPAIR as necessary.
No	GO to F9

F9 CHECK FOR A VACUUM LEAK

NOTE

A smoke machine may be used to identify the location of a vacuum leak.

- Inspect the vacuum hoses for leaks and check the engine for a vacuum leak.

Is a vacuum leak present?

Yes	REPAIR as necessary.
No	GO to F10

F10 CHECK THE AIR INTAKE SYSTEM

NOTE

The turbocharger bypass valve closes approximately 30 seconds after cold start up creating a pop noise. This is a normal operating condition.

NOTE

A hissing noise on vehicles with a plastic intake manifold may occur during idle or high idle that is apparent with the hood open. This is a normal operating condition.

- Inspect the air intake system.
- Check the air intake ducts, air cleaner and throttle body for leaks and correct fit.

- Inspect the fuel injection system. REFER to the Diagnosis and Testing procedures in the 303-04 and 310-01 section for the engine being diagnosed. Refer to the appropriate section in Group 303for the procedure.

Is any concern discovered with the fuel injection system?

Yes	REPAIR as necessary.

No	GO to F13

F13 CHECK THE STARTER MOTOR

- Inspect the starter motor for damage and correct installation. REFER to the Diagnosis and Testing procedure in the 303-06 section for the engine being diagnosed. Refer to the appropriate section in Group 303for the procedure.

Is any concern discovered with the starter motor?

Yes	REPAIR as necessary.

No	GO to F14

F14 CHECK THE POWERTRAIN MOUNTS

- Inspect the powertrain mounts for damage.

Is any concern discovered with the powertrain mounts?

Yes	PERFORM the Powertrain/Drivetrain Mount Neutralizing procedure. REFER to: Powertrain/Drivetrain Mount Neutralizing (303-00 Engine System - General Information, General Procedures). . If the concern still exists, REPAIR or INSTALL new powertrain mounts as necessary.

No	GO to F15

F15 CHECK THE EXHAUST SYSTEM

F18 IDENTIFY THE LOCATION OF THE ENGINE NOISE

- Using EngineEAR/ChassisEAR, stethoscope and accelerometers along with the VCMM (Vehicle Communication and Measurement Module) , locate the engine noise.
  REFER to: Engine Noise Identification and Location(303-00 Engine System - General Information, General Procedures).

Is the noise coming from the engine?

Yes	If the noise is coming from the rear of the engine GO to F19 If the noise is coming from the front of the engine, GO to F20 If the noise is coming from the upper end of the engine, GO to F21 If the noise is coming from the lower end of the engine, GO to F24

No	The condition is not present at this time.

F19 CHECK THE FLEXPLATE OR FLYWHEEL AND CLUTCH

- If equipped, remove the torque converter nut/bolt access plug. If equipped, remove the inspection cover. If needed, remove the starter motor. Check if the torque converter nuts or bolts are loose. Visually inspect the flexplate or flywheel and clutch for damage. Using an assistant, rotate the crankshaft pulley by hand while inspecting the flexplate or flywheel and clutch and listening for unusual noises coming from between the engine and transmission. Check to be sure the flexplate or flywheel do not feel loose on the crankshaft. Restrict the movement of the flexplate or flywheel while an assistant turns the crankshaft by hand if needed to help identify a possible source of the noise.

Is damage found to the flexplate, flywheel or clutch, are the torque converter, flexplate or flywheel fasteners loose or does the noise seem to be coming from between the engine and transmission?

Yes	REMOVE the transmission. INSPECT the flexplate or flywheel and clutch for damage. INSTALL a new flexplate or flywheel and clutch as needed.

No	GO to F24

F20 CHECK THE TIMING DRIVE COMPONENTS

- Remove the engine front cover. Inspect the timing components for excessive wear or damage. Inspect the engine front cover for contact marks from the timing chain or belt. Inspect the VCT (variable camshaft timing) unit(s) for damage or excessive wear.

- Remove the cylinder head(s). Remove the valves from the cylinder heads and inspect the valves and valve guides for excessive wear or damage.
  REFER to: Valve Stem Diameter(303-00 Engine System - General Information, General Procedures).
  REFER to: Valve Guide Inner Diameter(303-00 Engine System - General Information, General Procedures).
  Compare the measurement to the valve stem-to-guide clearance specification in 303-01 specifications for the engine being diagnosed. Refer to the appropriate section in Group 303for the procedure.

Are the valve clearances within specifications?

Yes	GO to F28

No	INSTALL new cylinder head(s) and valves.

F24 CHECK THE BALANCE SHAFTS FOR DAMAGE OR EXCESSIVE WEAR

- If equipped, remove the balance shaft assembly. Inspect the balance shaft assembly for excessive wear or damage. Check the bearing surfaces for excessive wear or damage.

Is damage or excessive wear found on the balance shaft assembly or the bearings?

Yes	If debris from the balance shaft or bearings appear to have entered the engine oil, GO to F25 INSTALL a new balance shaft assembly.

No	GO to F25

F25 CHECK THE ENGINE OIL PUMP

- Remove the engine oil pump. Check the engine oil pump for damage or excessive wear. Check for cracks on the housing. Check for scoring or excessive clearance on the gearotor or internal moving parts.

Is the engine oil pump damaged?

Yes	If debris from the balance shaft or bearings appear to have entered the engine oil, GO to F26 INSTALL a new engine oil pump.

F28 CHECK THE PISTON TO CYLINDER WALL CLEARANCE

- Remove the engine. Remove the piston and connecting rod assemblies from the engine. Inspect the pistons, piston rings and cylinder walls for signs of piston slap. Inspect the pistons.
  REFER to: Piston Inspection(303-00 Engine System - General Information, General Procedures).
  Check the piston ring end gap. REFER to: Piston Ring End Gap(303-00 Engine System - General Information, General Procedures).
  Measure the cylinder bore taper. REFER to: Cylinder Bore Taper(303-00 Engine System - General Information, General Procedures).
  . Measure the piston diameter. REFER to: Piston Diameter(303-00 Engine System - General Information, General Procedures).
  Calculate the piston-to-cylinder bore clearance and compare the specification to the specification procedure in the 303-01 section for the engine being diagnosed. Refer to the appropriate section in Group 303for the procedure.

Is the piston-to-cylinder wall clearance within specification?

Yes	INSTALL new piston rings. Hone the cylinder walls.

No	INSTALL a new short block.

Low or high engine oil pressure	GO to Pinpoint Test E

Symptom Chart - NVH (noise, vibration and harshness)

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: Diagnostic Methods

(100-00 General Information, Description and Operation).

Condition	Actions
Upper engine noise	GO to Pinpoint Test F
Lower engine noise	GO to Pinpoint Test F
Front of engine noise	GO to Pinpoint Test F
Rear of engine noise	GO to Pinpoint Test F

Pinpoint Tests

PINPOINT TEST A : EXCESSIVE ENGINE OIL CONSUMPTION

Possible Sources

- Gasket
- Seal
- Blocked or restricted turbocharger oil drain pipe
- Damaged or collapsed air intake hoses and tubes
- Turbocharger oil seals
- Inoperative PCV (positive crankcase ventilation) system
- Incorrect engine oil
- Worn valve stem seal
- Worn valve stem or valve guide
- Sticking piston ring
- Worn piston ring groove
- Damaged oil control ring
- Worn piston or cylinder

A1 CHECK FOR ACCEPTABLE ENGINE OIL CONSUMPTION

- Carry out the engine oil consumption test

- Check the vehicle service history and make sure the correct engine oil used is documented.

Is the correct engine oil used based on the vehicle service history?

Yes	GO to A5
No	CHANGE the engine oil and filter using the correct engine oil specification. Refer to the Specifications procedure in the 303-01 section for the engine being diagnosed. Refer to the appropriate section in Group 303for the procedure.

A5 CHECK THE AIR INTAKE SYSTEM

- Inspect the air intake system and make sure all of the hoses and tubes are securely connected and free of damage.

Is the air intake system free of damage and all of the connections correctly secure?

Yes	GO to A6
No	REPAIR as necessary.

A6 CHECK THE PCV (POSITIVE CRANKCASE VENTILATION) SYSTEM

- Inspect the PCV (positive crankcase ventilation) system and make sure all of the hoses and tubes are securely connected, free of damage and the PCV (positive crankcase ventilation) valve operates correctly.

Is the PCV (positive crankcase ventilation) system free of damage, all of the connections correctly secure and the PCV (positive crankcase ventilation) valve operating correctly?

Yes	GO to A7
No	REPAIR as necessary.

A7 CHECK FOR ENGINE OIL IN THE COOLING SYSTEM

REFER to: Spark Plug Inspection(303-00 Engine System - General Information, General Procedures).
Using a bore scope, inspect the pistons for oil deposits.

Do the spark plugs or pistons have oil deposits or show signs that the engine is burning oil?

Yes	GO to A11

No	The source of the concern is not the engine. Check for other possible sources for oil consumption. Re-check for acceptable oil consmumption. Check the PCV (positive crankcase ventilation) system and turbochargers.

A11 CHECK THE CYLINDER HEAD GASKET, CYLINDER HEAD AND ENGINE BLOCK DECK SURFACES

- Remove the cylinder head(s). Inspect the cylinder head gasket, cylinder head and cylinder block for damage.
  REFER to: Cylinder Block Distortion(303-00 Engine System - General Information, General Procedures).
  and REFER to: Cylinder Head Distortion(303-00 Engine System - General Information, General Procedures).

Is the cylinder block and cylinder head(s) free of damage?

Yes	GO to A12

No	REPAIR as necessary.

A12 CHECK THE VALVE STEM SEALS