PRODEMAND

YMMS: 1993 Ford Ranger Base
Engine: 4.0L Eng
VIN:

Oct 28, 2020
License:
Odometer:

COMPRESSION RATIO SPECIFICATIONS - 6-CYLINDER

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Application	Compression Ratio
4.9L	8.8:1

COMPRESSION RATIO SPECIFICATIONS - V6

COMPRESSION RATIO SPECIFICATIONS - V6

Application	Compression Ratio
4.0L	9.0:1
3.0L	9.3:1

ENGINE SPECIFICATIONS

GENERAL SPECIFICATIONS

Application	Specification
Displacement	241 Cu. In. (4.0L)
Bore	3.94" (100 mm)
Stroke	3.31" (84 mm)
Compression Ratio	9.0:1
Fuel System	PFI

CYLINDER BLOCK SPECIFICATIONS

CYLINDER BLOCK

Application	In. (mm)
Cylinder Bore	
Standard Diameter	3.9527-3.9543 (100.398-100.439)
Maximum Taper	.010 (.25)
Maximum Out-Of-Round	
Standard	.0015 (.038)
Service Limit	.005 (.13)
Maximum Deck Warpage	(1)

(1)	.003" (.08mm) within a 6" (152 mm) area or .006" (.15 mm) overall.

VALVES & VALVE SPRINGS SPECIFICATIONS

VALVES & VALVE SPRINGS

Application	In. (mm)
Face Angle	44°
Head Diameter	
Intake	1.71 (43.5)
Exhaust	1.36 (34.5)
Stem Diameter	
Intake	.3159-.3167 (8.024-8.044)
Exhaust	.3149-.3156 (8.998-8.016)
Valve Margin	.031 (.79)
Valve Springs	
Free Length	1.91 (48.5)
Installed Height	1.58-1.61 (40.1-40.9)
Out-Of-Square	.078 (1.98)
Pressure Lbs. @ In. (Kg @ mm)	
Closed	60-68 @ 1.59 (27-31 @ 37.8)
Open	138-149 @ 1.22 (63-68 @ 31.0)

CYLINDER HEAD SPECIFICATIONS

CYLINDER HEAD

Application	In. (mm)
Maximum Warpage (1)	.003 (.08)
Valve Seats	
Seat Angle	45°
Seat Width	.060-.079 (1.52-2.00)
Maximum Seat Runout	.0015 (.038)
Valve Guides	
Valve Guide Bore I.D.	.3174-.3184 (8.062-8.087)
Stem-To-Guide Clearance	
Intake	.0008-.0025 (.020-.064)
Exhaust	.0018-.0035 (.046-.089)

(1)	Specification listed is within 6" (152 mm). Overall warpage is .006" (.15 mm). **DO NOT** machine more than .010" (.25 mm) from original gasket surface.

CAMSHAFT SPECIFICATIONS

CAMSHAFT

Application	In. (mm)
Camshaft Bearing I.D.	
No. 1	1.954-1.955 (49.64-49.66)
No. 2	1.939-1.940 (49.26-49.28)
No. 3	1.919-1.920 (48.75-48.77)
No. 4	1.924-1.925 (48.88-48.90)
End Play	
Standard	.025-.064 (.065-.165)
Service Limit	.009 (.23)
Journal Runout	.005 (.13)
Lobe Lift Wear Limit	.005 (.13)
Oil Clearance	
Standard	.0010-.0026 (.025-.066)
Service Limit	.006 (.15)
Valve Lift	.4024 (10.220)

VALVE LIFTERS SPECIFICATIONS

VALVE LIFTERS

Application	In. (mm)
Lifter Diameter	.8742-.8755 (22.205-22.238)
Oil Clearance	
Standard	.0005-.0022 (.013-.056)
Service Limit	.005 (.13)

CRANKSHAFT MAIN & CONNECTING ROD BEARINGS SPECIFICATIONS

CRANKSHAFT MAIN & CONNECTING ROD BEARINGS

Application	In. (mm)
Crankshaft End Play	
Standard	.0020-.0125 (.05-.32)
Service Limit	.0125 (.32)

Main Bearings	
Journal Diameter	2.2433-2.2441 (56.980-57.000)
Journal Out-Of-Round	.0006 (.015)
Journal Taper Per 1 INCH (25.4 mm)	.0006 (.015)
Journal Runout (Max.)	.002 (.05)
Oil Clearance	
Desired	.0008-.0015 (.020-.038)
Allowable	.0005-.0019 (.013-.048)
Connecting Rod Bearings	
Journal Diameter	2.1252-2.1260 (53.980-54.000)
Journal Out-Of-Round	.0006 (.015)
Journal Taper Per 1 INCH (25.4 mm)	.0006 (.015)
Oil Clearance	
Desired	.0005-.0022 (.013-.056)
Allowable	.0003-.0024 (.008-.061)

CONNECTING RODS SPECIFICATIONS

CONNECTING RODS

Application	In. (mm)
Bore Diameter	
Pin Bore	.9432-.9439 (23.957-23.975)
Crankpin Bore	2.2370-2.2378 (56.820-56.840)
Center-To-Center Length	5.1386-5.1413 (130.520-130.589)
Maximum Bend (1)	.002 (.05)
Maximum Twist (1)	.006 (.15)
Side Play	
Standard	.0002-.0025 (.005-.063)
Service Limit	.014 (.36)
(1) Specification listed is measured at the ends of an 8" (203 mm) bar, 4" (102 mm) on each side of rod center line.	

PISTONS PINS & RINGS SPECIFICATIONS

PISTONS PINS & RINGS

Application	In. (mm)
Piston	
Clearance	.0008-.0019 (.020-.048)

Diameter (1)	3.9524-3.9531 (100.390-100.409)
Pin Bore Diameter	.9450-.9452 (24.003-24.008)
Pins	
Diameter	
Red Pin	.9446-.9448 (23.993-23.998)
Blue Pin	.9448-.9449 (23.998-24.000)
Length	2.84-2.87 (72.1-72.9)
Piston Fit	.0003-.0006 (.008-.015)
Rod Fit	Press Fit
Rings	
No. 1 & 2	
End Gap	.015-.023 (.38-.58)
Side Clearance	.0020.0033 (.051-.084)
No. 3 (Oil)	
End Gap (Steel Rail)	.015-.055 (.38-1.40)
Side Clearance	Snug Fit

(1) Measure at piston pin bore, 90 degrees to pin.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Bellhousing-To-Engine Bolt	28-38 (38-51)
Camshaft Sprocket Bolt	44-50 (60-68)
Connecting Rod Nut	18-24 (25-32)
Crankshaft Damper-To-Crankshaft Bolt	
Step 1	30-37 (40-50)
Step 2	Additional 80-90°
Cylinder Head Bolt (1)	
Step 1	44 (60)
Step 2	59 (80)
Step 3	Additional 80-85°
Engine Mount-To-Crossmember Nut	71-94 (96-127)
Engine Mount-To-Engine Bolt	40-60 (54-81)
Exhaust Manifold Bolt	18 (25)
Fan Clutch (2)	30-100 (40-135)
Flexplate-To-Converter Bolt	

	Step 1	9-11 (12-15)
	Step 2	50-55 (68-74)
Flywheel-To-Crankshaft Bolt		
	Step 1	9-11 (12-15)
	Step 2	50-55 (68-74)
Front Cover Bolt		13-15 (17-21)
Lower Intake Manifold Bolts/Nuts (3)		
	Step 1	(4)
	Step 2	6-11 (8-15)
	Step 3	11-15 (15-21)
	Step 4	15-18 (21-25)
Main Bearing Cap Bolt		66-77 (90-104)
Oil Level Sensor		13-20 (17-27)
Oil Pump Retaining Bolt		13-15 (17-21)
Rear Mount-To-Crossmember Nut		65-87 (88-118)
Rear Mount-To-Transmission Bolt		60-80 (81-109)
Rocker Arm Assembly Bolt (5)		24 + 90° (32 + 90°)
Starter Bolt		15-20 (20-27)
Transmission Crossmember Bolt		65-87 (88-118)
Upper Intake Manifold Bolt		15-18 (20-25)
		INCH Lbs. (N.m)
Camshaft Thrust Plate Bolt		80-115 (9-13)
Oil Pan Bolt/Nut		62-89 (7-10)
Valve Cover Bolt		54-71 (6-8)

(1)	Using NEW head bolts, tighten in sequence. See Figure. Cylinder head must be tightened in sequence with intake manifold. See CYLINDER HEAD under REMOVAL & INSTALLATION.
(2)	Left hand thread.
(3)	Tighten in sequence. See Figure.
(4)	Tighten to 35-71 INCH lbs. (4-8 N.m).
(5)	Tighten bolts evenly, 2 turns at a time.

Crankcase Capacity

Crankcase capacity is 5 qts. (4.75L) with oil filter.

ENGINE OIL CAPACITIES

CRANKCASE CAPACITIES

Application	(1) Qts. (L)

Except 3.0L & 7.3L	[2] 5.0 (4.70)
3.0L	4.5 (4.25)
7.3L	10.0 (9.50)

[1]	Add 1/2 qt. if equipped with oil cooler.
[2]	On Pickup, 6 quarts (5.6L).