

ADDITIONAL INFORMATION

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SPECIFICATIONS

Specifications, clearances and wear limits are listed below. It should be specifically noted that the clearances apply only when all new parts are used at the point where the various specifications apply. This also applies to references within the text of the manual. The column entitled "Limits" in this chart lists the amount of wear or increase of clearance which can be tolerated in used engine parts and still ensure satisfactory performance. It should be emphasized that the figures given as "Limits" must be qualified by the judgment of personnel responsible for installing new parts. These wear limits are, in general, listed only for the parts more frequently replaced in engine overhaul work.

Specifications, New Clearances, and Wear Limits

These limits also apply to oversize and undersize parts.

Refer to the following tables to obtain specifications, new clearances, and wear limits for the DD Platform Engines.

Component	Reference
Piston and Piston Rings	Listed in Table
Piston Pin	Listed in Table
Idler Gear Specifications	Listed in Table
Idler Gear Axial Play	Listed in Table
Intake Valves	Listed in Table
Exhaust Valves	Listed in Table

Table 0-1 Engine Component Reference Table

Engine Part (Standard Size, New)	DD13 Minimum	DD13 Maximum	DD15 Minimum	DD15 Maximum	Limits
Piston Diameter	131.92 mm	-	138.94 mm	-	-
Compression Rings	-	-	-	-	-
Gap Top Compression (fire ring)	0.45 mm (0.01772 in.)	0.55 mm (0.02165 in.)	0.60 mm	0.75 mm	-
Gap (No. 2 middle compression ring)	0.90 mm 0.035 (in.)	1.10 mm (0.043 in.)	0.70 mm (0.028 in.)	0.90 mm (0.035 in.)	-
Oil Control Rings	-	-	-	-	-
Gap	0.30 mm (0.01181 in.)	0.50 mm (0.01969 in.)	0.40 mm	0.60 mm	-

Table 0-2 Piston and Piston Rings

Engine Part (Standard Size, New)	DD13 Minimum	DD13 Maximum	DD15 Minimum	DD15 Maximum	Limits
Piston Pin Outside Diameter	58 mm (2.44 in.)	-	62 mm (2.44 in.)	-	-

Table 0-3 Piston Pin

Engine Part (Standard Size, New)	DD13 Minimum	DD13 Maximum	DD15 Minimum	DD15 Maximum	Limits
Piston Protrusion	-0.201 mm (-0.007913 in.)	0.2215 mm (0.00872 in.)	-0.213 mm (-0.009094 in.)	0.2075 mm (0.008169 in.)	-

Table 0-4 Piston Protrusion

Engine Part (Standard Size, New)	DD13 Minimum	DD13 Maximum	DD15 Minimum	DD15 Maximum
Backlash (crank gear idler 1)	0.039 mm	0.197 mm	0.039 mm	0.197 mm
Backlash (idler 1- idler 2)	0.042 mm	0.166 mm	0.042 mm	0.166 mm
Backlash (idler 2 - idler 3)	0.042 mm	0.166 mm	0.042 mm	0.166 mm
Backlash (idler3 - 5)	0.043 mm	0.165 mm	0.043 mm	0.165 mm
Backlash (idler 5 to cam gear)	0.051 mm	0.257 mm	0.051 mm	0.257 mm
Backlash (crank gear- oil pump gear)	0.032 mm	0.388 mm	0.032 mm	0.388 mm
Backlash (crank gear- idler 4)	N/A	N/A	0.039 mm (DD15 only)	0.197 mm (DD15 only)
Backlash (idler 4 - turbocompound gear)	N/A	N/A	0.037 mm (DD15 only)	0.143 mm (DD15 only)
Backlash (crank gear oil pump gear)	0.032 mm	0.388 mm	0.032 mm	0.388 mm
Backlash (idler 2- High Pressure Fuel Pump gear)	0.041 mm	0.167 mm	0.041 mm	0.167 mm

Table 0-5 Idler Gear Specifications

Engine Part (Standard Size, New)	DD13 Minimum	DD13 Maximum	DD15 Minimum	DD15 Maximum	Limits
Idler 1 axial play	0.100 mm (0.003937 in.)	0.330 mm (0.01299 in.)	0.100 mm (0.003937 in.)	0.330 mm (0.01299 in.)	–
Idler 2 axial play	0.100 mm (0.003937 in.)	0.180 mm (0.007087 in.)	0.100 mm (0.003937 in.)	0.180 mm (0.007087 in.)	–
Idler 3 axial play	0.100 mm (0.003937 in.)	0.180 mm (0.007087 in.)	0.100 mm (0.003937 in.)	0.180 mm (0.007087 in.)	–
Idler 4 axial play	N/A	N/A	DD15 only 0.100 mm (0.003937 in.)	DD15 only 0.330 mm (0.01299 in.)	–
Idler 5 axial play	0.100 mm (0.003937 in.)	0.180 mm (0.007087 in.)	0.100 mm (0.003937 in.)	0.180 mm (0.007087 in.)	–

Table 0-6 Idler Gear Axial Play

Engine Part (Standard Size, New)	Minimum	Maximum	Limits
Stem Diameter	9.46 mm (0.3724 in.)	–	–
Valve Height	240.0 mm (9.449 in.)	–	–

Table 0-7 Intake Valves

Engine Part (Standard Size, New)	Minimum	Maximum	Limits
Stem Diameter	9.442 mm (0.3717 in.)	–	–
Valve Height	246.5 mm (9.70 in.)	–	–

Table 0-8 Exhaust Valves

Engine Part (Standard Size, New)	DD13 Minimum	DD13 Maximum	DD15 Minimum	DD15 Maximum	Limits
Block Bore: Diameter	159 mm (6.259 in.)	159,15 mm (6.27 in.)	164.4 mm (6.47 in.)	167 mm 6.57 in.	–

Table 0-9 Cylinder Block

Engine Part (Standard Size, New)	DD13 Minimum	DD13 Maximum	DD15 Minimum	DD15 Maximum	Limits
Outside Diameter Top of Liner)	–	158.98 mm (6.25 in.)	–	166.98 mm (6.57 in.)	–
Outside Diameter Bottom of Liner)	141.95 mm (5.588 in.)	142.95 mm (— 5.590 in.)	—	149.04 mm (6.00 in.)	–

Table 0-10 Cylinder Liner

Engine Part (Standard Size, New)	
Fire Deck Flatness	0.02 mm over 150 mm distance and a maximum 0.05 mm (0.0007874 in over 5.906 in. and a maximum 0.001969 in.)

Table 0-11 Cylinder Head

Bolt Length	DD13 Maximum	DD15 Maximum
Cylinder Head Bolt	194 mm (7.638 in.)	194 mm (7.638 in.)
Main Cap Bolt	175.5 mm (6.909 in.)	200.5 mm (7.894 in.)
Bearing Cap to Rod Bolt Cap Bolt	79 mm (3.11 in.)	82.3 mm (3.240 in.)
Flywheel to Crankshaft Bolt	88 mm (3.465 in.)	88 mm (3.465 in.)
Rocker Shaft Bolts	80.3 mm (3.161 in.)	80.3 mm (3.161 in.)
Damper Bolts	29.3 mm (1.153 in.)	29.3 mm (1.153 in.)
#1 Idler Gear	84.0 mm (3.307 in.)	84.0 mm (3.307 in.)
#2 Idler Gear	55.5 mm (2.185 in.)	55.5 mm (2.185 in.)
#3 Idler Gear	60.5 mm (2.381 in.)	60.5 mm (2.381 in.)
#4 Idler Gear	N/A	84.0 mm (3.307 in.)
#5 Idler Gear	45.5 mm (1.791 in.)	45.5 mm (1.791 in.)
Turbocharger Mount Bolts	40.0 mm (1.574 in.)	40.0 mm (1.574 in.)
Exhaust Bolts (3 Piece Manifold Bolts)	80.5 mm (9.0 mm Spacer) 3.169 in. (0.354 in. Spacer)	80.5 mm (9.0 mm Spacer) 3.169 in. (0.354 in. Spacer)
Exhaust Bolts (5 Piece Manifold Bolts)	DD13	DD15
Center Bolts	N/A	80.5 mm (9.0 mm Spacer) (3.169 in.) (0.354 in. Spacer)
Outer Bolts	N/A	60.5 mm (5.0 mm Spacer) (2.381 in) (0.196 in. Spacer)

Maximum bolt shaft length to be measured during repair. If the bolts are out of specification they must be replaced.

Table 0-12 Maximum Bolt Length

