

Item	Specification
Theoretical valve lift (intake) @ 0 lash	0.3937 in (10 mm)
Theoretical valve lift (exhaust) @ 0 lash	0.3543 in (9 mm)
Lobe lift - intake	0.2067 in (5.25 mm)
Lobe lift - exhaust	0.1870 in (4.75 mm)
Camshaft journal bore inside diameter â€” 1st journal	0.0011 â€” 0.0028 in (.027 â€” .072 mm)
Camshaft journal bore inside diameter â€” intermediate journals	0.0011 â€” 0.0028 in (.027 â€” .072 mm)
Camshaft bearing outside diameter â€” 1st journal	1.3764 â€” 1.3772 in (34.96 â€” 34.98 mm)
Camshaft bearing outside diameter â€” intermediate journals	1.1263 â€” 1.1273 in (28.607 â€” 28.633 mm)
End play	0.0010 â€” 0.0059 in (.025 â€” .15 mm)

Cylinder Block

Item	Specification
Cylinder bore diameter	3.362 â€” 3.363 in (85.4 â€” 85.42 mm)
Cylinder bore roundness	0.0004 in (.01 mm)
Cylinder bore taper	0.0005 in (.013 mm)
Block main bore roundness	0.0003 in (.007 mm)
Main bearing bore inside diameter	2.850 â€” 2.851 in (72.402 â€” 72.422 mm)
Head gasket surface flatness	Flat within 0.150 mm (0.005 in) overall 0.050 mm (0.001 in) per 150 mm (5.905 in) x 150 mm (5.905 in) 0.025 mm (0.0009 in) per 25 mm (0.98 in) x 25 mm (0.98 in)

Crankshaft

Item	Specification
Main bearing journal diameter	2.6568 â€” 2.6576 in (67.483 â€” 67.503 mm)
Main bearing journal-to-main bearing clearance	0.0020 â€” 0.0024 in (.05 â€” .062 mm)
Connecting rod journal diameter	2.2037 â€” 2.2044 in (55.973 â€” 55.993 mm)
Crankshaft end play	0.0020 â€” 0.0115 in (.051 â€” .291 mm)

Piston and Connecting Rod

Item	Specification
Piston diameter - single grade	3.3601 â€” 3.3606 in (85.346 â€” 85.36 mm)
Piston-to-cylinder bore clearance	0.0016 â€” 0.0028 in (.04 â€” .072 mm)
Piston ring end gap - compression (top, gauge diameter)	0.0091 â€” 0.0130 in (.23 â€” .33 mm)
Piston ring end gap - compression (bottom, gauge diameter)	0.0157 â€” 0.0236 in (.4 â€” .6 mm)

Item	Specification
Piston ring end gap " oil ring (steel rail, gauge diameter)	0.0079 "0.0197 in (.2 " .5 mm)
Piston ring groove width - compression (top)	0.0484 "0.0492 in (1.23 "1.25 mm)
Piston ring groove width " compression (bottom)	0.0402 "0.0409 in (1.02 "1.04 mm)
Piston ring groove width - oil ring	0.0799 "0.0807 in (2.03 "2.05 mm)
Piston ring width - upper compression ring	0.0461 "0.0469 in (1.17 "1.19 mm)
Piston ring width - lower compression ring	0.0382 "0.0390 in (.97 " .99 mm)
Piston ring-to-groove clearance (upper and lower compression rings)	0.0016 "0.0031 in (.04 " .08 mm)
Piston pin bore diameter	0.8663 "0.8665 in (22.004 "22.009 mm)
Piston pin diameter	0.8660 "0.8661 in (21.997 "22 mm)
Piston pin length	2.0177 "2.0295 in (51.25 "51.55 mm)
Piston pin-to-piston fit	0.0002 "0.0005 in (.004 " .012 mm)
Piston-to-connecting rod clearance	0.1181 in (3 mm)
Connecting rod-to-pin clearance - standard	0.0007 "0.0012 in (.017 " .03 mm)
Connecting rod pin bore diameter	0.8668 "0.8668 in (22.017 "22.017 mm)
Connecting rod length (center-to-center)	5.6677 "5.6709 in (143.96 "144.04 mm)
Connecting rod maximum allowed bend	0.0008 in (.02 mm)
Connecting rod maximum allowed twist	0.0016 in (.04 mm)
Connecting rod bearing bore diameter	2.3397 "2.3402 in (59.428 "59.442 mm)
Connecting rod bearing-to-crankshaft clearance	0.0017 "0.0035 in (.042 " .088 mm)
Connecting rod side clearance (assembled to crank) - standard	0.0049 "0.0148 in (.125 " .375 mm)
Connecting rod side clearance (assembled to crank) - service limit	0.0049 "0.0148 in (.125 " .375 mm)

Description and Operation

Engine - Overview

Overview

The 3.0L Gasoline Turbocharged Direct Injection (GTDI) (4V) is a V-6 engine with the following features:

- Interference design engine
- Dual overhead camshafts
- Four valves per cylinder
- Gasoline Turbocharged Direct Injection (GTDI)
- Composite intake manifold
- Aluminum cylinder heads
- Compacted graphite iron cylinder block
- Twin independent variable cam timing (Ti-VCT)
- An electronic ignition system with 6 ignition coils
- Continuous variable displacement oil pump

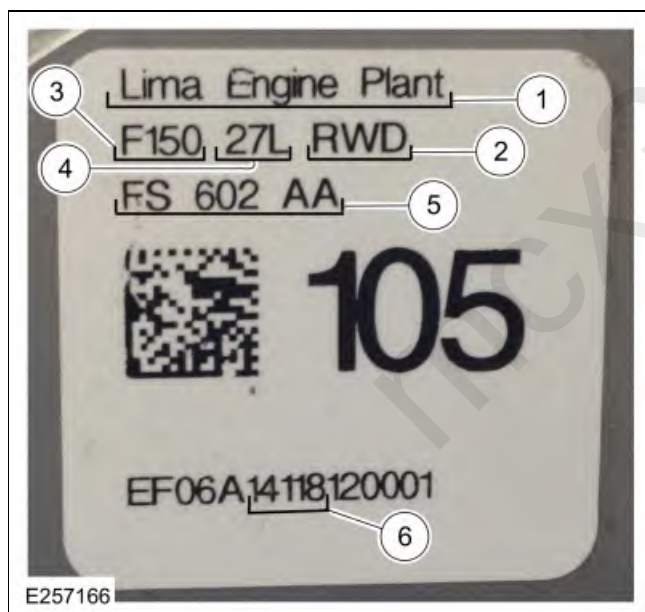
Engine Identification

For quick identification, refer to the safety certification decal.

The decal is located on the LH front door lock face panel.

Engine Code Information Label

The engine code information label, located on the rear of the vacuum pump and on the LH valve cover, contains the following:



Item	Description
1	Engine plant
2	Drive type
3	Vehicle line
4	Engine displacement
5	Engine part number
6	Engine build date YYDDD (DDD=Julian Date [001-365])

Engine Cylinder Identification