

Last Modified: 9-29-2009	5.6 F	From: 200501
Model Year: 2006	Model: Hiace	Doc ID: RM000001A9J000X
Title: SERVICE SPECIFICATIONS: 5L-E ENGINE MECHANICAL: SERVICE DATA (2006-2010 Hiace)		

SERVICE DATA

New drive belt deflection	Pressing force: 98N (10kgf, 22lbf)	
	For vane pump	7.5 to 9.5 mm (0.30 to 0.37 in.)
	For cooler compressor	11 to 15 mm (0.43 to 0.59 in.)
	For fan and generator	7.0 to 10 mm (0.28 to 0.39 in.)
Used drive belt deflection	Pressing force: 98N (10kgf, 22lbf)	
	For vane pump	9.0 to 13 mm (0.35 to 0.51 in.)
	For cooler compressor	15 to 20 mm (0.59 to 0.79 in.)
	For fan and generator	10 to 14 mm (0.39 to 0.55 in.)
New drive belt tension	For vane pump	441 to 539 N (45 to 55 kgf)
	For cooler compressor	372 to 608 N (38 to 62 kgf)
	For fan and generator	441 to 539 N (45 to 55 kgf)
Used drive belt tension	For vane pump	245 to 343 N (25 to 35 kgf)
	For cooler compressor	196 to 392 N (20 to 40 kgf)
	For fan and generator	196 to 343 N (20 to 35 kgf)
Idle speed	A/C OFF	720 to 820 rpm
	A/C ON	750 to 850 rpm
Maximum engine speed	-	4.850 to 4.950 rpm
Compression pressure	-	3,138 kPa (32.0 kgf/cm ² , 455 psi) or more
Minimum pressure	-	1,961kPa (20.0 kgf/cm ² , 284 psi)
Difference between each cylinder	-	490 kPa (5.0 kgf/cm ² , 71 psi) or less
Valve clearance at cold	Intake	0.20 to 0.30 mm (0.008 to 0.012 in.)
	Exhaust	0.40 to 0.50 mm (0.016 to 0.020 in.)
Cylinder head gasket		
Piston protrusion from cylinder block		0.68 to 0.97 mm (0.0268 to 0.0382 in.)
New installed cylinder head gasket thickness	Mark B	1.40 to 1.50 mm (0.0551 to 0.0591 in.)
	D	1.50 to 1.60 mm (0.0591 to 0.0630 in.)

	F	1.60 to 1.70 mm (0.0630 to 0.0669 in.)
Idler tension spring		
Free length		44.4 to 45.4 mm (1.748 to 1.787 in.)
Installed tension	at 52.1 mm (2.051 in.)	53 to 59 N (5.42 to 5.98 kgf, 11.9 to 13.2 lbf)
Cylinder head set bolt	Standard	11.80 to 12.00 mm (0.4646 to 0.4724 in.)
Outer diameter	Minimum	11.60 mm (0.4567 in.)
Cylinder head gasket		
New installed cylinder head gasket thickness	Mark B	1.40 to 1.50 mm (0.0551 to 0.0591 in.)
	D	1.50 to 1.60 mm (0.0591 to 0.0630 in.)
	F	1.60 to 1.70 mm (0.0630 to 0.0669 in.)
Valve clearance at cold	Intake	0.20 to 0.30 mm (0.008 to 0.012 in.)
	Exhaust	0.40 to 0.50 mm (0.016 to 0.020 in.)
Cylinder head		
Warpage	Maximum	0.20 mm (0.0079 in.)
Intake Valve		
Valve stem diameter		7.975 to 7.990 mm (0.3140 to 0.3146 in.)
Valve face angle		44.5°
Margin thickness	Standard	1.6 mm (0.063 in.)
	Minimum	1.1 mm (0.043 in.)
Overall length	Standard	104.10 to 104.50 mm (4.0984 to 4.1142 in.)
	Minimum	103.60 mm (4.0787 in.)
Exhaust Valve		
Valve stem diameter		7.960 to 7.975 mm (0.3143 to 0.3140 in.)
Valve face angle		44.5°
Margin thickness	Standard	1.7 mm (0.067 in.)
	Minimum	1.2 mm (0.047 in.)
Overall length	Standard	103.95 to 104.35 mm (4.0925 to 4.1083 in.)

	Minimum	103.45 mm (4.0728 in.)
Inner compression spring		
Deviation	Maximum	2.0 mm (0.079 in.)
Free length	Type A	46.20 mm (1.8189 in.)
	B	48.54 mm (1.9110 in.)
Installed tension	at 37.0 mm (1.4567 in.)	301 to 322 N (30.7 to 33.9 kgf, 67.7 to 74.7 lbf)
Intake valve guide bush		
Inside diameter		8.010 to 8.030 mm (0.3154 to 0.3161 in.)
Oil clearance	Standard	0.020 to 0.055 mm (0.0008 to 0.0022 in.)
	Maximum	0.08 mm (0.0031 in.)
Bush bore diameter	STD	13.004 to 13.025 mm (0.5120 to 0.5128 in.)
	O/S 0.05	13.054 to 13.075 mm (0.5139 to 0.5148 in.)
Protrusion height		10.8 to 11.2 mm (0.425 to 0.441 in.)
Exhaust valve guide bush		
Inside diameter		8.010 to 8.030 mm (0.3154 to 0.3161 in.)
Oil clearance	Standard	0.035 to 0.070 mm (0.0014 to 0.0028 in.)
	Maximum	0.10 mm (0.0039 in.)
Bush bore diameter	STD	13.004 to 13.025 mm (0.5120 to 0.5128 in.)
	O/S 0.05	13.054 to 13.075 mm (0.5139 to 0.5148 in.)
Protrusion height		10.8 to 11.2 mm (0.425 to 0.441 in.)
Intake valve seats		
Contacting width		1.5 to 1.9 mm (0.059 to 0.075 in.)
Exhaust valve seats		
Contacting width		1.8 to 2.2 mm (0.071 to 0.087 in.)
Valve lifter		
Lifter diameter		40.892 to 40.902 mm (1.6099 to 1.6103 in.)
Lifter bore diameter		40.960 to 40.980 mm (1.6126 to 1.6134 in.)

Oil clearance	Standard	0.058 to 0.088 mm (0.0023 to 0.0035 in.)
	Maximum	0.10 mm (0.0039 in.)
Camshaft		
Circle runout	Maximum	0.10 mm (0.0039 in.)
Cam lobe height	Standard	
	Intake	54.890 to 54.910 mm (2.1610 to 2.1618 in.)
	Exhaust	54.990 to 55.010 mm (2.1650 to 2.1657 in.)
	Minimum	
	Intake	54.39 mm (2.1413 in.)
	Exhaust	54.49 mm (2.1453 in.)
Journal diameter	STD No.1	34.969 to 34.985 mm (1.3767 to 1.3774 in.)
	Others	27.969 to 27.985 mm (1.1011 to 1.1018 in.)
	U/S 0.125 No.1	34.844 to 34.860 mm (1.3718 to 1.3724 in.)
	Others	27.844 to 27.860 mm (1.0962 to 1.0968 in.)
	U/S 0.250 No.1	34.719 to 34.735 mm (1.3669 to 1.3675 in.)
	Others	27.719 to 27.735 mm (1.0913 to 1.0919 in.)
Oil clearance	Standard	0.022 to 0.074 mm (0.0009 to 0.0029 in.)
	Maximum	0.10 mm (0.0039 in.)
Thrust clearance	Standard	0.080 to 0.280 mm (0.0031 to 0.0110 in.)
	Maximum	0.35 mm (0.0138 in.)
Combustion chamber		
Shim thickness		0.03 mm (0.0012 in.)
Protrusion		Minus 0.03 to Plus 0.03 mm (Minus 0.0012 to Plus 0.0012 in.)
Connecting rod		
Thrust clearance	Standard	0.080 to 0.300 mm (0.0031 to 0.0118 in.)

	Maximum	0.35 mm (0.0138 in.)
	Standard	
Oil clearance	STD	0.036 to 0.064 mm (0.0014 to 0.0025 in.)
	U/S 0.25, U/S 0.50	0.033 to 0.079 mm (0.0013 to 0.0031 in.)
	Maximum	0.10 mm (0.0039 in.)
	Standard	
Connecting rod bearing center wall thickness (Reference)	Mark 1	1.478 to 1.482 mm (0.0582 to 0.0583 in.)
	2	1.482 to 1.486 mm (0.0583 to 0.0585 in.)
	3	1.486 to 1.490 mm (0.0585 to 0.0587 in.)
	Standard	
Rod bent	Maximum per 100 mm (3.94 in.)	0.05 mm (0.0020 in.)
Rod twist	Maximum per 100 mm (3.94 in.)	0.15 mm (0.0059 in.)
Bush inside diameter		29.008 to 29.020 mm (1.1420 to 1.1425 in.)
Connecting rod bolt tension portion diameter	Standard	8.400 to 8.600 mm (0.3307 to 0.3386 in.)
	Minimum	8.20 mm (0.3228 in.)
Crankshaft		
Thrust clearance	Standard	0.040 to 0.250 mm (0.0016 to 0.0098 in.)
	Maximum	0.30 mm (0.0118 in.)
Thrust washer thickness	STD	2.430 to 2.480 mm (0.0957 to 0.0976 in.)
	O/S 0.125	2.493 to 2.543 mm (0.0981 to 0.1001 in.)
	O/S 0.250	2.555 to 2.605 mm (0.1006 to 0.1026 in.)
Main journal oil clearance	Standard	
	STD	0.034 to 0.065 mm (0.0013 to 0.0026 in.)
	U/S 0.25, 0.50	0.033 to 0.079 mm (0.0013 to 0.0031 in.)
	Maximum	0.10 mm (0.0039 in.)

	Standard	
Main bearing center wall thickness (Reference)	Mark 1	1.979 to 1.983 mm (0.0779 to 0.0781 in.)
	2	1.983 to 1.987 mm (0.0781 to 0.0782 in.)
	3	1.987 to 1.991 mm (0.0782 to 0.0784 in.)
Circle runout	Maximum	0.06 mm (0.0024 in.)
Main journal diameter	STD	61.985 to 62.000 mm (2.4403 to 0.4409 in.)
	U/S 0.25	61.745 to 61.755 mm (2.4309 to 2.4413 in.)
	U/S 0.50	61.495 to 61.505 mm (2.4211 to 2.4215 in.)
Crank pin diameter	STD	54.988 to 55.000 mm (2.1649 to 2.1654 in.)
	U/S 0.25	54.745 to 54.755 mm (2.1553 to 2.1557 in.)
	U/S 0.50	54.495 to 54.505 mm (2.1455 to 2.1459 in.)
Main journal taper and out-of round	Maximum	0.02 mm (0.0008 in.)
Crank pin taper and out-of round	Maximum	0.02 mm (0.0008 in.)
Cylinder block		
Warpage	Maximum	0.20 mm (0.0079 in.)
Cylinder bore diameter	Mark 1	99.500 to 99.510 mm (3.9173 to 3.9177 in.)
	2	99.510 to 99.520 mm (3.9177 to 3.9181 in.)
	3	99.520 to 99.530 mm (3.9181 to 3.9185 in.)
	Maximum	
	STD	99.73 mm (3.9264 in.)
	O/S 0.50	100.23 mm (3.9461 in.)
Piston		
Piston diameter	STD	
	Mark 1	99.450 to 99.460 mm (3.9153 to 3.9157 in.)
	2	99.460 to 99.470 mm (3.9157 to 3.9161 in.)

	3	99.470 to 99.480 mm (3.9161 to 3.9165 in.)
	O/S 0.50	99.950 to 99.980 mm (3.9350 to 3.9362 in.)
Oil clearance	Standard	0.040 to 0.060 mm (0.0016 to 0.0024 in.)
	Maximum	0.13 mm (0.0051 in.)
Piston protrusion from cylinder block		0.68 to 0.97 mm (0.0268 to 0.0382 in.)
Piston pin		
Diameter		29.000 to 29.012 mm (1.1417 to 1.1422 in.)
Piston pin oil clearance	Standard	0.004 to 0.012 mm (0.0002 to 0.0005 in.)
	Maximum	0.05 mm (0.0020 in.)
Piston ring set		
Piston ring groove clearance	Standard	
	No.1	0.057 to 0.101 mm (0.0022 to 0.0040 in.)
	No.2	0.060 to 0.100 mm (0.0024 to 0.0039 in.)
	Oil	0.030 to 0.070 mm (0.0012 to 0.0028 in.)
	Maximum	0.20 mm (0.0079 in.)
Piston ring end gap	Standard	
	No.1	0.350 to 0.590 mm (0.0138 to 0.0232 in.)
	No.2	0.470 to 0.720 mm (0.0185 to 0.0283 in.)
	Oil	0.200 to 0.520 mm (0.0079 to 0.0205 in.)
	Maximum	
	No.1	1.29 mm (0.0508 in.)
	No.2	1.42 mm (0.0559 in.)
	Oil	1.22 mm (0.0480 in.)

