ENGINE Australia
The Diesel Parts Specialists

ENGINE SPECIFICATIONS

September 1999 ES-TOY09

General

Manufacturer	**TOYOTA**		
Model/Year	**H** (HJ45)	**1/1969 – 1980**	
L/(CID)	3,576cc DIESEL	**No. of Cylinders**	6
Bore & Stroke	88.0mm X 98.0mm		
Firing Order	1 – 4 – 2 – 6 – 3 – 5		
Compression Ratio	19.5 : 1	**Idle Speed**	625 – 675 rpm
Comp. Pressure @ RPM	3.0 MPa @ 320 rpm	2.0 MPa min.	< 200 kPa diff.
Oil Pressure	50 kPa min at idle	**Oil Capacity & Grade**	9.8 ltr dry CC-CD
Injection Timing	12° BTDC static -	Number 1 cylinder on	compression stroke

Block

Bore Diameter Standard	88.000 – 88.030 mm
Maximum Overbore	1.00 mm - dry liner block
Liner Flange Height & Fit	0.03 – 0.12 mm protrusion & 5,000 kg press load oiled
Crankshaft Housing Bore	74.000 – 74.020 mm
Camshaft Housing Bore	51.000 – 51.019 mm
Block Deck Height	0.15 mm warp limit

Pistons & Rings

Piston to Bore Clearance	0.18 – 0.20 mm @ 6 mm below the oil ring groove @ 20°C
Piston Protrusion	0.50 – 0.63 mm
Gudgeon Pin Diameter	27.000 – 27.012 mm
Gudgeon Pin Clearance	0.004 – 0.012 mm Limit: 0.05 mm
Ring Equipment	Top: 2.5 mm (½K), 2nd (& 3rd on 4 ring): 2.5 mm, Oil: 4.00 mm
Piston Ring End Gap	Top & 2nd: 0.25 – 0.45 mm, Oil: 0.20 – 0.40 mm
Ring to Groove Clearance	Top: 0.01 – 0.06 mm, 2nd: 0.05 – 0.09 mm, Oil: 0.03 – 0.07 mm

Connecting Rods

Big End Bore	58.000 – 58.020 mm
Pin End Bore	30.000 – 30.021 mm
Centre to Centre	
Big End Width	
Bush ID Finished	27.008 – 27.020 mm
Rod Side Clearance	0.08 – 0.16 mm Limit: 0.3 mm
Bend/Twist	0.05 mm/100mm bend 0.15 mm/100 mm twist

Camshaft

Journal Diameters	1: 47.16 mm 2: 46.96 mm 3: 46.76 mm 4: 46.56 mm
End Play	0.06 – 0.13 mm Limit: 0.3 mm
Oil Clearance	0.025 – 0.066 mm Limit: 0.1 mm
Minimum Lobe Height	**Inlet** 38.92 mm **Exhaust** 38.91 mm
Bend Limit	0.03 mm circle runout

Crankshaft

Main Journal Standard	69.980 – 70.000 mm			
Conrod Journal Standard	54.980 – 55.000 mm			
Harmonic Balancer Diam.				
Crank Gear Diameter				
Seal Diameter				
Thrust Thickness	2.930 – 2.980 mm			
Main Bearing Clearance	0.03 – 0.072 mm std. Limit: 0.1 mm			
Conrod Bearing Clearance	0.03 – 0.07 mm std. Limit: 0.1 mm			
Crankshaft End Play	0.04 – 0.24 mm Limit: 0.3 mm			
Journal Radius	**Main**		**Conrod**	

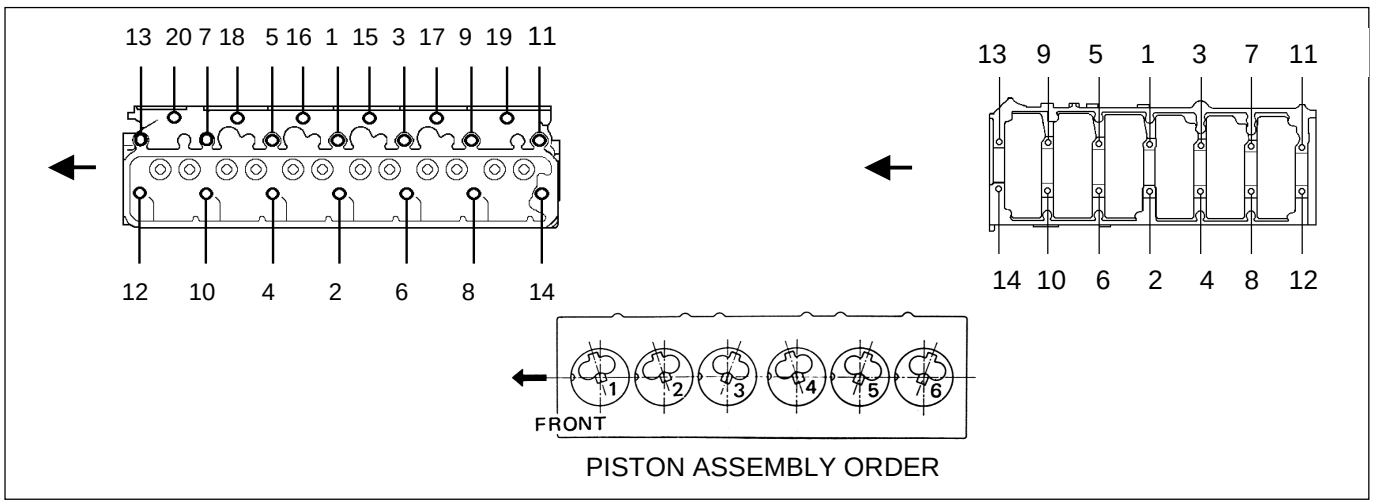
Cylinder Head

Tappet Clearance	**Inlet**	0.20 mm HOT	**Exhaust**	0.36 mm HOT
Head Height	**New**		**Limit**	
Warp Limit		0.2 mm		
Valve Seat Angle	**Inlet**	45°	**Exhaust**	45°
Valve Seat Width	**Inlet**	1.3 – 1.6 mm	**Exhaust**	1.3 – 1.6 mm
Valve Head Margin	**Inlet**	0.9 mm min	**Exhaust**	1.0 mm min
Valve Face Angle	**Inlet**	45.5°	**Exhaust**	45.5°
Valve Length	**Inlet**	120.6 mm	**Exhaust**	120.4 mm
Valve Stem Diameter	**Inlet**	8.97 – 8.99 mm	**Exhaust**	8.95 – 8.97 mm
Valve Guide Height	**Inlet**	16.2 – 16.8 mm	**Exhaust**	16.2 – 16.8 mm
Valve Guide Clear. Std.	**Inlet**	0.02 – 0.06 mm	**Exhaust**	0.04 – 0.08 mm
Valve Guide Clear. Limit	**Inlet**	0.10 mm	**Exhaust**	0.12 mm
Valve Spring Pressure	**Inner**	21.7 kg	**Outer**	21.7 kg
Valve Spring Free Length	**Inner**	45.1 mm	**Outer**	45.1 mm
Valve Spring Install. Height	**Inner**	40.0 mm	**Outer**	40.0 mm
Precom. Chamber Protrus.		0.00 – 0.10 mm		

Torque Specifications

Main Bolts	9.8 – 11.2 kgf.m OILED			
Conrod Bolts	6.5 – 7.5 kgf.m OILED			
Head Bolts	12.8 – 14.2 kgf.m OILED			
Rocker Arm Bolts	1.5 – 2.2 kgf.m			
Manifold Bolts	**Inlet**	1.5 – 2.2 kgf.m	**Exhaust**	1.5 – 2.2 kgf.m
Flywheel Bolts	11.5 – 12.5 kgf.m OILED			
Harmonic Balancer	16.0 – 20.0 kgf.m OILED			

Torque Sequences



PISTON ASSEMBLY ORDER