NEW HOLLAND

ENGINE REPAIR MANUAL

667TA/EEG
667TA/EEC
667TA/EBF
667TA/EED
667TA/EBJ
667TA/EDJ

Issued 11-2006
Book/Form Number 87519804 NA

Printed in U.S.A. • Bur
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All data given in this publication is subject to production variations. Dimensions and weights are only approximate. Illustrations do not necessarily show products in standard condition. For exact information about any particular product, please consult your Dealer

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First Edition	11-2006	667TA/EEG 667TA/EEC 667TA/EBF 667TA/EED 667TA/EBJ 667TA/EDJ	87519804 NA

ENGINE REPAIR MANUAL

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CHAPTER 1

667TA
TIER III

DIAGNOSTICS

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CHAPTER 1
DIAGNOSTICS
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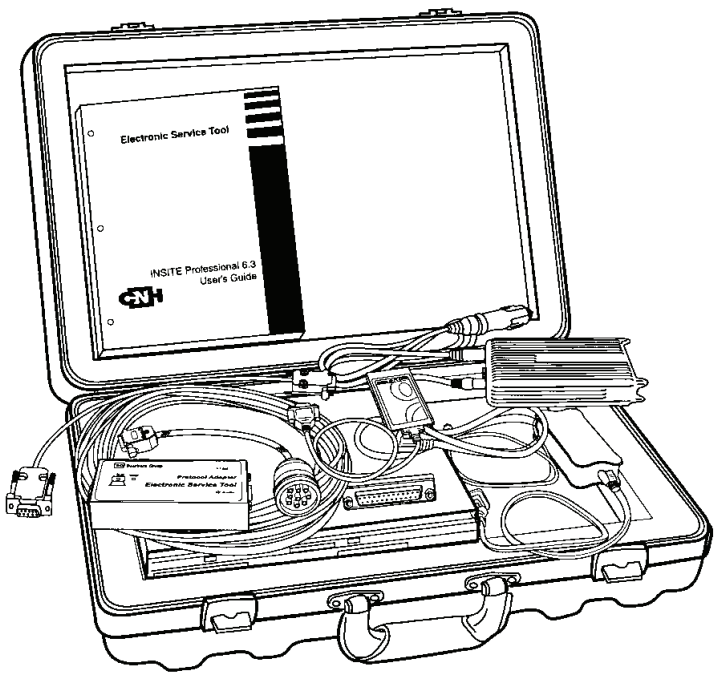
CNH- EST DIAGNOSTIC TOOL



BS06K009

Figure 1-1

The EST system allows diagnoses on machines by detecting the operating parameters of electronic control components (control units, sensors etc.) and check flow rates, pressures and temperatures. It is also capable of reading fault codes on the engine. To help with troubleshooting the engine failure mode.

TROUBLESHOOTING

ENGINE WON'T START

Batteries fully charged.	No →	Perform the checks described in the Electrical section of the Shop manual.
Yes ↓		
Connections to battery terminals are tight and clean.	No →	Inspect, clean, tighten or replace connections.
Yes ↓		
Starter motor working properly.	No →	Perform the checks described in the Electrical section of the Shop manual.
Yes ↓		
Pre-Post heating system working properly.	No →	Check using a multi meter replace or repair.
Yes ↓		
Fuel filters plugged.	Yes →	Replace.
No ↓		
The fuel system or injection pump shows signs of air in system.	Yes →	Check and repair air leaks.
No ↓		
The fuel system shows traces of water.	Yes →	Check and clean the fuel system including the fuel tank.
No ↓		
High pressure pump working properly.	No →	Check using Electronic Service Tool (EST) and repair or replace if necessary.
Yes ↓		
Injectors working properly.	No →	Check using Electronic Service Tool (EST). Check O-ring seal. Replace injectors if defective.
Yes ↓		
Compression good on all cylinders.	No →	Check each cylinder for proper compression, overhaul the engine or make repairs on defective parts (valves, piston rings, etc.).

ENGINE OVERHEATS

Coolant level correct.	No →	Check for leaks, repair leaks and refill to proper level.
Yes ↓		
Fan working properly.	No →	Replace.
Yes ↓		
Drive belts in serviceable.	No →	Replace.
Yes ↓		
Water Pump in working properly.	No →	Check for leaks, bad bearing, overhaul or replace.
Yes ↓		
Thermostat working properly.	No →	Replace.
Yes ↓		
Radiator plugged or leaking.	Yes →	Wash down, repair leaks and flush out radiator. If necessary replace radiator.
No ↓		
Oil in radiator fluid.	Yes →	Replace oil cooler.
No ↓		
Air to Air Cooler and hoses leaking.	Yes →	Clean or replace faulty parts.
No ↓		
Openings for coolant flow within the cylinder head and engine block plugged.	Yes →	Clean thoroughly.
No ↓		
Valve clearance correct.	No →	Check and adjust for correct valve clearance.
Yes ↓		
Cylinder head gasket in leaking.	Yes →	Replace.

ENGINE LACKS POWER AND RUNS ERRATICALLY

Air filter plugged.	No →	Clean the filter and replace if necessary.
Yes ↓		
Fuel filters in plugged.	No →	Replace.
Yes ↓		
Fuel system working properly.	No →	Check and make if necessary repair.
Yes ↓		
The fuel system shows impurities and or traces of water.	Yes →	Take off the hoses and injection pump, clean and dry thoroughly, then if necessary clean and dry the fuel tank.
No ↓		
Thermostat working properly.	No →	Replace.
Yes ↓		
High pressure pump working properly.	No →	Check using the Electronic Service Tool (EST) and repair or replace if necessary.
Yes ↓		
Injectors working properly.	No →	Check using the Electronic Service Tool (EST) and repair or replace if necessary.
Yes ↓		
High pressure fuel side leaking.	Yes →	Check for leaks around O-rings and gaskets.
No ↓		
Turbocharger working properly.	No →	Repair or replace the unit.
Yes ↓		
Correct valve clearance.	No →	Adjust the clearance to proper value.
Yes ↓		
Compression good on all cylinders.	No →	Check each cylinder for proper compression, overhaul the engine or make repairs on defective parts (valves, piston rings, etc.).

ENGINE EXHAUST SMOKE BLACK OR DARK GREY

Air filter plugged.	No →	Clean the filter and replace if necessary.
Yes ↓		
Electronic fuel system working properly.	No →	Check using the Electronic Service Tool (EST) and repair or replace if necessary.
Yes ↓		
Fresh clean diesel fuel in tank.	No →	Clean the tank and replace the fuel filter.
Yes ↓		
Compression good on all cylinders.	No →	Check each cylinder for proper compression, overhaul the engine or make repairs on defective parts (valves, piston rings, etc.).

ENGINE EXHAUST SMOKE GREY (VERGING ON WHITE)

Injectors working properly.	No →	Check using the Electronic Service Tool (EST) and repair or replace if necessary.
Yes ↓		
Coolant level correct.	No →	Possible flow of coolant into the combustion chamber; replace the cylinder head gasket or overhaul the engine.
Yes ↓		
Pre-Post heating system working properly.	No →	Check using a multi meter replace or repair.
Yes ↓		
Fresh clean diesel fuel in tank.	No →	Clean the tank and replace the fuel filter.

ENGINE EXHAUST SMOKE LIGHT BLUE

Excessive oil consumption.	Yes →	Check: oil vapor breather, cylinder compression. Leaks into or out of turbocharger. Leaks from valve guides. Overhaul cylinder head or engine if necessary.
No ↓		
Oil contaminated with diesel fuel.	Yes →	Check the high pressure fuel pump O-ring, injector O-ring for failure, or cylinder head porosity.

ENGINE KNOCKS IRREGULARLY

Knock detected in the crankshaft.	Yes →	Check the following items: Journal play and out-of -roundness, bolt torque for main journal caps and engine flywheel, oil pressure. Replace the defective parts or overhaul the engine.
↓ No		
Knock detected in the connecting rods.	Yes →	Check the following items: Rod journal end play and out-of -roundness, bolt torque for connecting rod caps, connecting rod torsion, straightness. Replace defective parts or overhaul the engine.
↓ No		
Knock detected in pistons.	Yes →	Check the following items: Play between the pistons and the cylinder liners, integrity of piston rings, play between the pins and the piston hubs. Replace the defective parts or overhaul the engine.
↓ No		
Knock detected in the cylinder head.	Yes →	Check the following items: Play between the rocker arms and the valves, injection pump timing, valve timing. Adjust to proper specification.
↓ No		
Knock detected in valve gear.	Yes →	Check and replace if necessary the gears. Inspect for broken springs, excessive play between the stems and guides, and the tappets and seats. Adjust the clearance.
↓ No		
Knock detected in injectors.	Yes →	Check using the Electronic Service Tool (EST) and repair or replace if necessary.
↓ No		
Knock detected in the engine flywheel.	Yes →	Replace loose screws and tighten all screws to the specified torque and angles.

ENGINE STOPS

Fuel tank filled.	No →	Refuel and drain if necessary.
Yes ↓		
Fuel filters plugged.	Yes →	Replace.
No ↓		
Fuel system in working properly.	No →	Check the circuit and make necessary adjustments or repairs.
Yes ↓		
Valve timing correct.	No →	Make necessary adjustments.

EXCESSIVE OR INSUFFICIENT OIL PRESSURE

Oil pressure control valve working properly.	No →	Check and replace if necessary.
Yes ↓		
Proper engine oil SAE viscosity.	No →	Replace engine oil with proper viscosity oil.
Yes ↓		
Oil pump delivering proper pressure.	No →	Check and replace if necessary.
Yes ↓		
Main bearings and connecting rod bearings in acceptable condition.	No →	Replace the bearings and reface if necessary the crankshaft.

EXCESSIVE FUEL CONSUMPTION

Fuel tank and lines leaking.	Yes →	Repair leaks (if any) and replace the worn parts.
No ↓		
After cooler leaking.	No →	Replace.
Yes ↓		
Electronic fuel injection system operating properly.	No →	Check using the Electronic Service Tool (EST) and repair or replace if necessary.

NOTES

CHAPTER 2

667TA
TIER III

667TA ENGINE OVERHAUL

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CHAPTER 2
667TA ENGINE OVERHAUL
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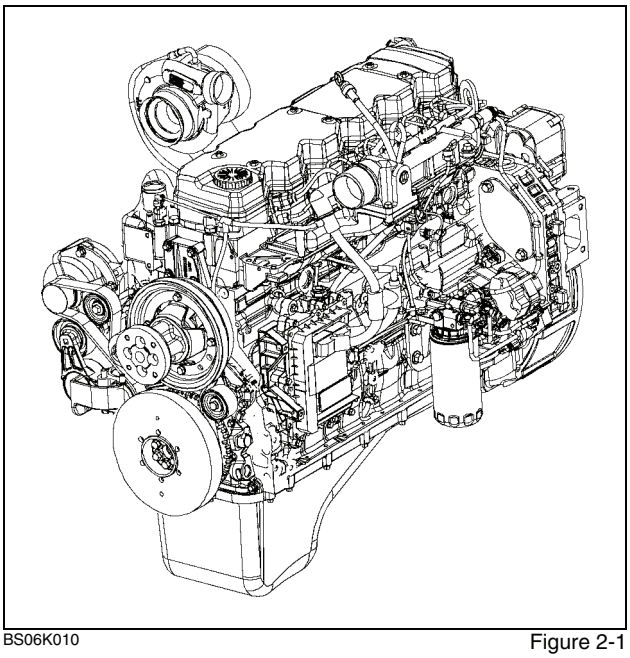
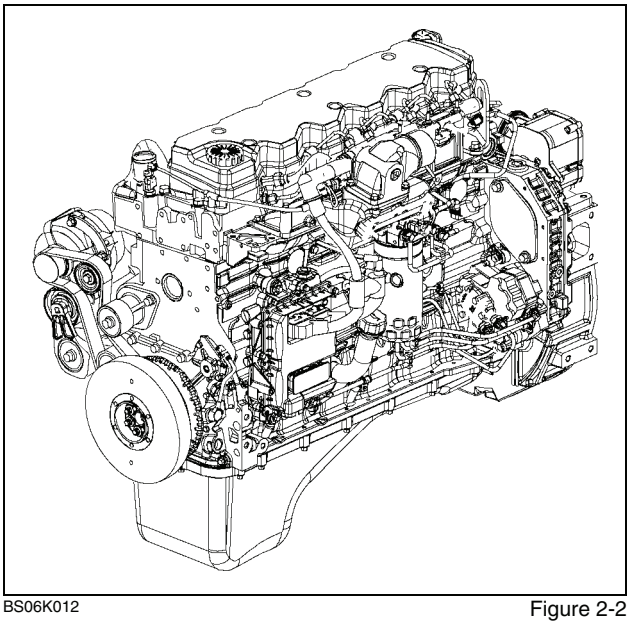
ENGINES



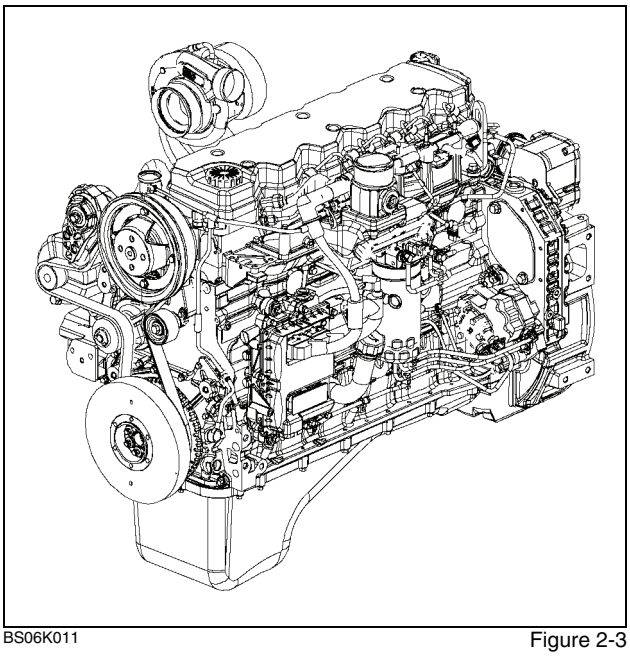
BS06K010 Figure 2-1

ENGINES: 667TA/EEG - 667TA/EEC



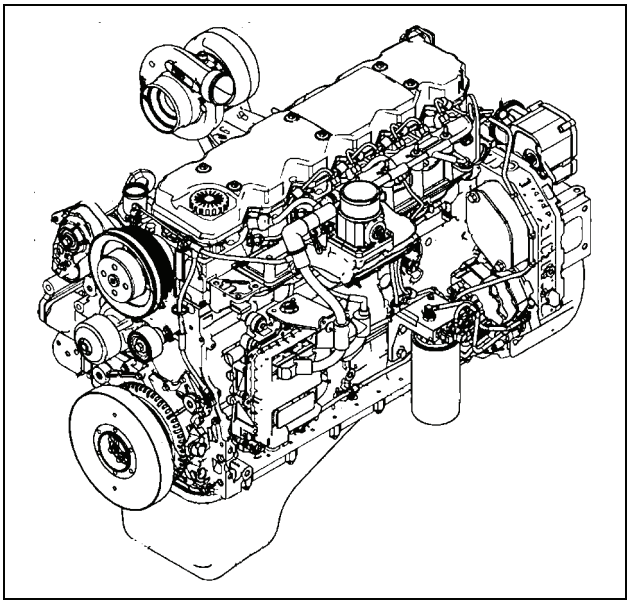
BS06K012 Figure 2-2

ENGINES 667TA/EED - 667TAEBD



BS06K011 Figure 2-3

ENGINES 667TA/EED - 667TAEBF



BS06K628 Figure 2-4

ENGINE 667TA/EDJ

CODING OF SOURCE ENGINES

ENGINE MODEL BREAKDOWN DISCRIPTION

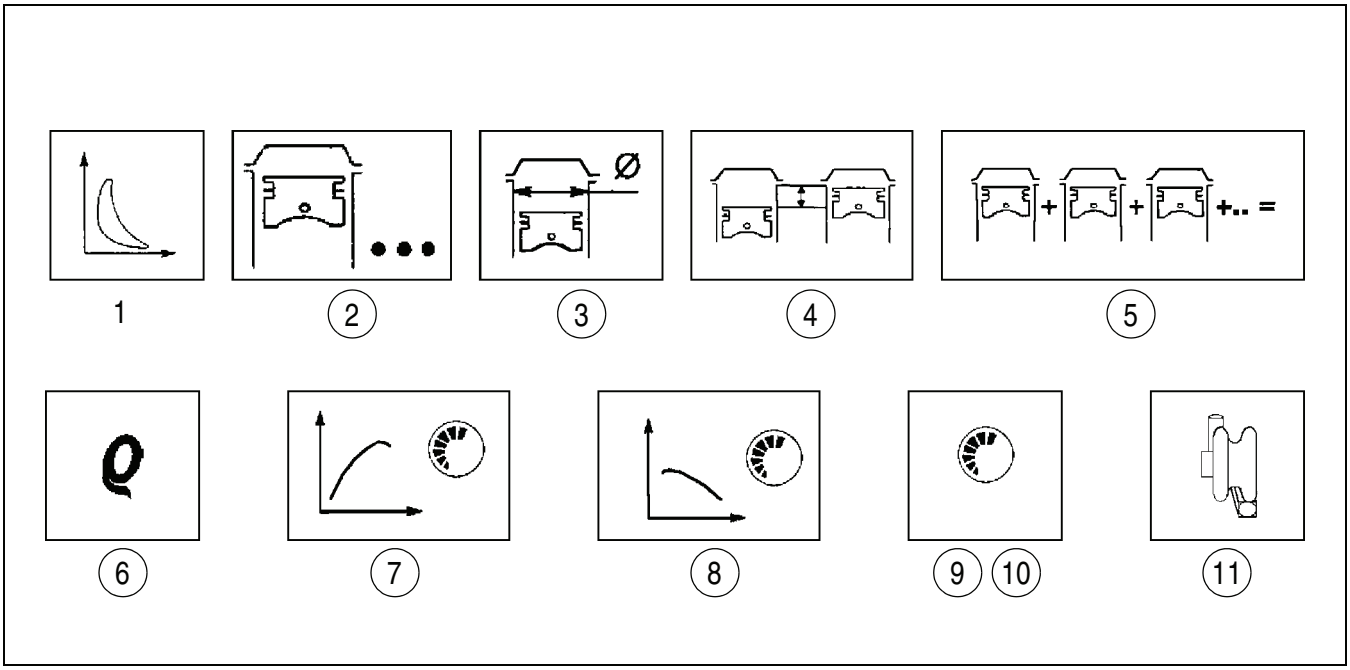
6	6	7	T	A	E	D	J
							Engine Calibration (Power) (D) J= 97 kW (130 H.P.) (E) G= 137 kW (183.7 H.P.) (E) D= 145 kW (194.4 H.P.) (E) C= 148 kW (198.5 H.P.) (B) F= 157 kW (210.5 H.P.) (B) D= 169kW (226.6 H.P.)
						Compression Ratio **B =** 16.5:1 > 130 kW (174 H.P.) **D =** 17.5:1 < 130 kW (174 H.P.) **E =** 17.5:1 > 130kW (174 H.P.)	
					E= Electronic Injection (Common Rail)		
				A= Intercooled			
			T= Turbocharged				
		67= Total Displacement in Liters/ Cubic Inches- 6.7 Liters (409 Cubic Inches)					
6= Number of Cylinders							

ENGINE PROPERTIES

A	667TA	667TA	667TA	667TA	667TA	667TA
B	EEG	EEC	EBF	EED	EBD	EDJ
C	6 CYLINDERS					
D	6728 cm^3 (410.6 c.i.)					
E	137 kW (183.7 h.p.) 2100 rpm	148 kW (198.5 h.p.) 2100 rpm	157kW (210.5 h.p.) 2000 rpm	145kW (194.4 h.p.) 2000 rpm	169 kW (226.6 h.p.) 2000 rpm	97 kW (130.1 h.p.) 2200 rpm
F	Electronic Direct Injection					
G	Common Rail					
H	T.A.A. (Turbo Charged, Air to Air Cooling)					

A. Type of engine
B. Engine model
C. Number of cylinders
D. Total displacement
E. Maximum power currently available
F. Type of Injection
G. Injection system
H. Air supply system

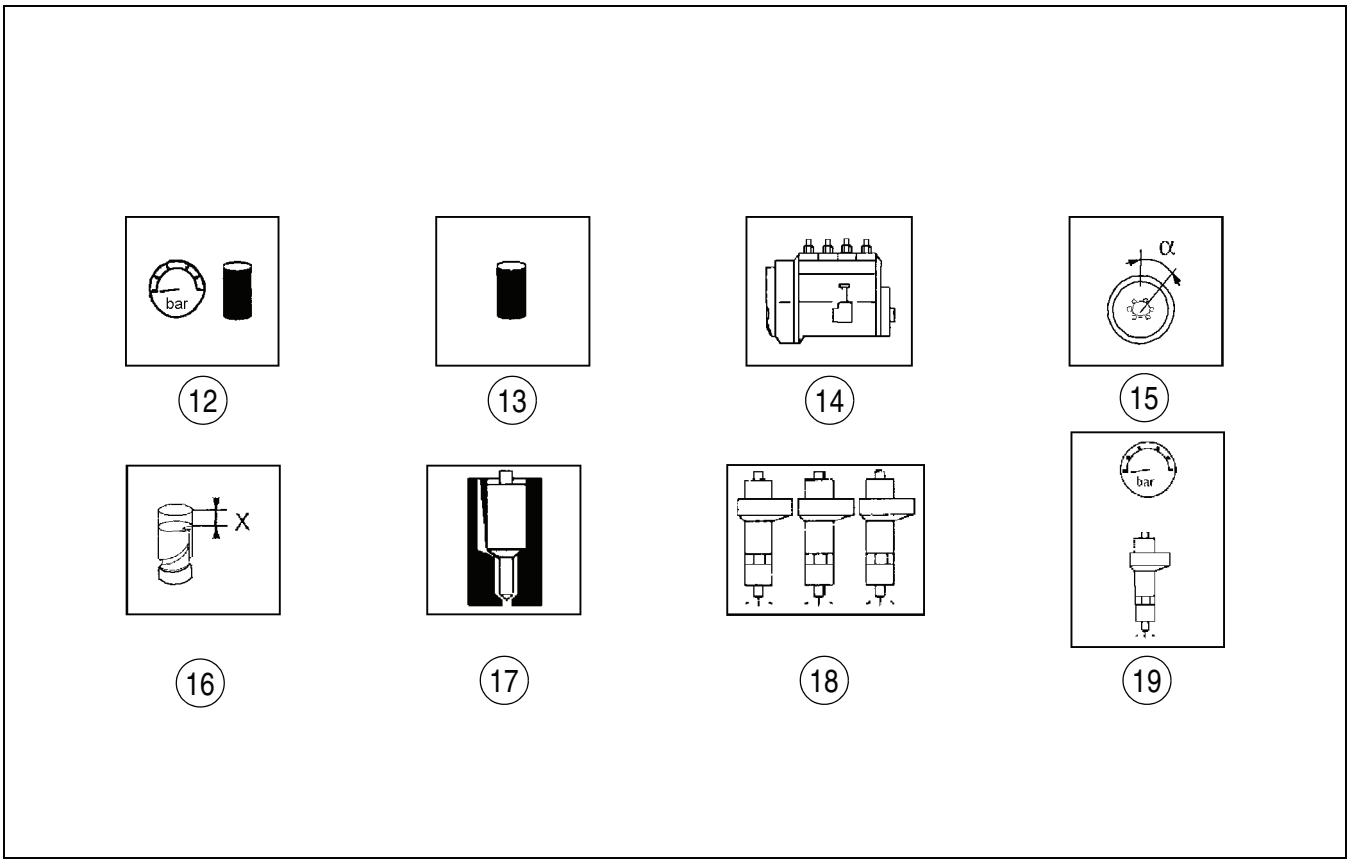
GENERAL ENGINE FEATURES



BS06K013

Figure 2-5

REF. NO.	ENGINE TYPE	667TA					
		EEG	EEC	EBF	EED	EBD	EDJ
1	Cycle	4- Stroke diesel engine					
	Air	T.A.A. (Turbo charged, Air to Air cooling)					
	Injection	Direct					
2	Number of cylinders	6 in-line					
3	Bore	104 mm (4.1 inches)					
4	Stroke	132 mm (5.2 inches)					
5	Total displacement	6728cm³ (410.6 cubic inches)					
6	Compression ratio						
7	Maximum power rating (net power at flywheel ISO 14396)	137 kW	148 kW	157 kW	145 kW	169 kW	97 kW
		2100 rpm	2100 rpm	2000 rpm	2000 rpm	2000 rpm	2200 rpm
		184 hp	198 hp	211 hp	194 hp	227 hp	130 hp
		2100 rpm	2100 rpm	2000 rpm	2000 rpm	2000 rpm	2200 rpm
8	Maximum Torque	710 Nm	810 Nm	952 Nm	860 NM	1002 Nm	607 Nm
		1400 rpm	1400 rpm	1400 rpm	1400 rpm	1400 rpm	1400 rpm
		524 pound feet	597 pound feet	702 pound feet	634 pound feet	739 pound feet	607 pound feet
		1400 rpm	1400 rpm	1400 rpm	1400 rpm	1400 rpm	1400 rpm
9	No-load idle	700 rpm					
10	No-load peak rpm						
11	Boosting (type of turbocharger)	With intercooler HOLSET HX35					

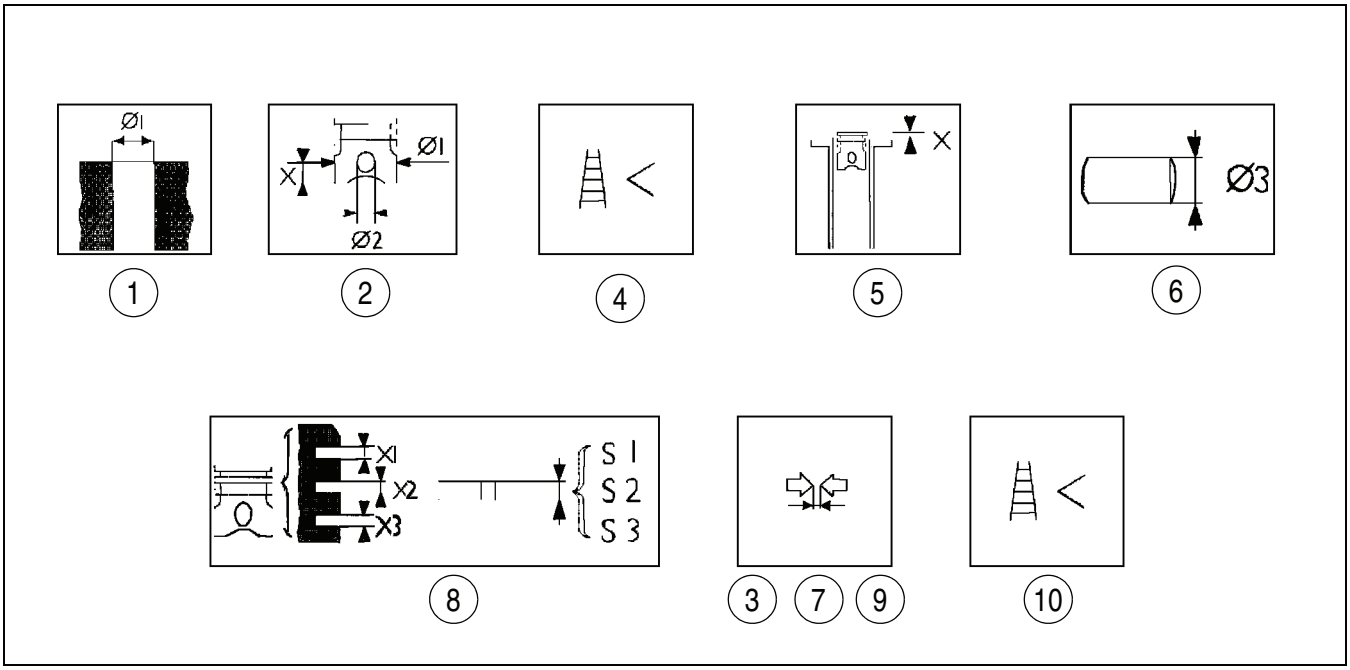


BS06K014

Figure 2-6

REF. NO.	ENGINE TYPE	667TA					
		EEG	EEC	EBF	EED	EBD	EDJ
12	Lubrication.	Forced by means of gear pump. Oil psi control valve.					
	Oil pressure with hot engine: at idle rpm.	1.2 bar (17.4 psi)					
	Oil pressure with hot engine: at peak rpm.	3.8 bar (55.1 psi)					
13	Cooling.	Fluid					
	Water pump drive.	Belt					
	Thermostat start of opening temperature.	79 to 83° C (174 to 181° F)					83 to98° C (181 to 208° F)
14	Oil capacity 1st filling.	No Information Available		No Information Available			
	Oil capacity engine sump.	No Information Available		No Information Available			
	Oil capacity engine sump + filter.	17 litres (18 qt.)		19 litres (20 qt.)			
15	Feeding Bosch-type injection	High pressure Common Rail					
16	Pump setting	No Information Available					
17	Start of delivery	No Information Available					
18	Type of injector	CRIN 1		CRIN 2			CRIN 2
19	Injection sequence	1 -5 -3 -6 -2 -4					
20	Injection pressure	--		250 - 1600 bar	250 -1400 bar	250 -1600 bar	--
		--		3626 - 23206 psi	3626 - 20305 psi	3626 - 23206 psi	--

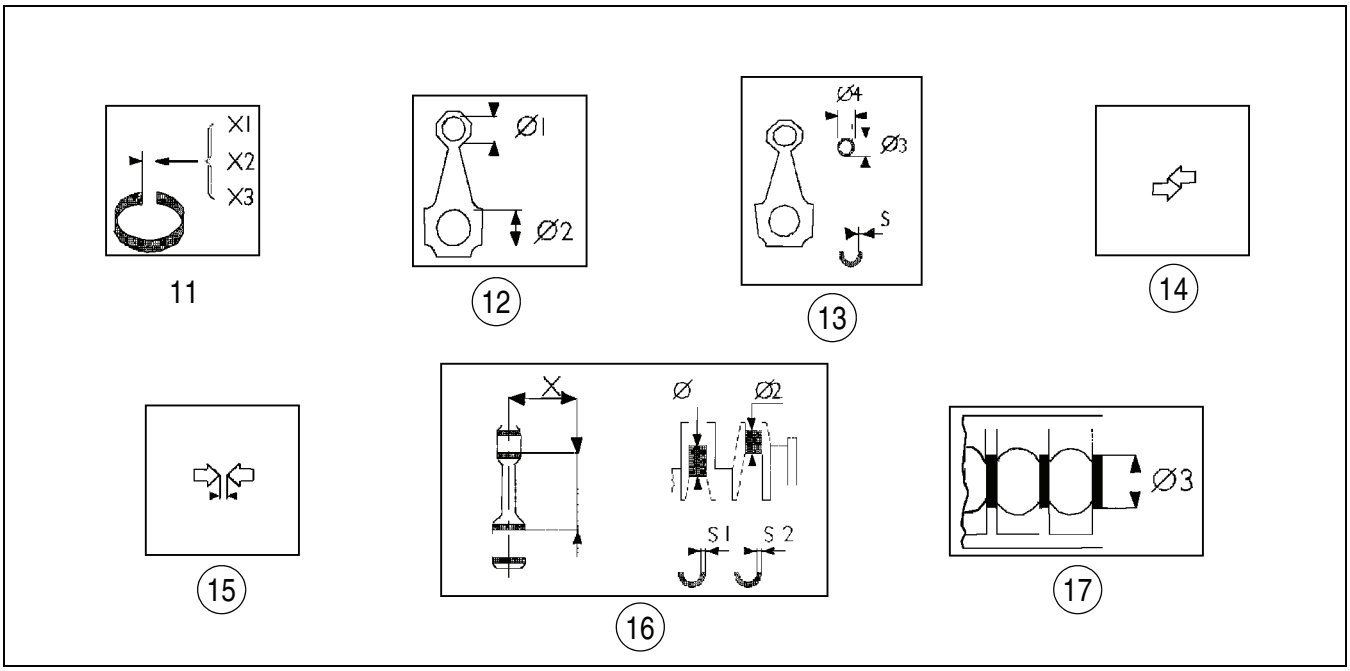
CRANK GEAR COMPONENTS AND CYLINDER ASSEMBLY



BS06K015

Figure 2-7

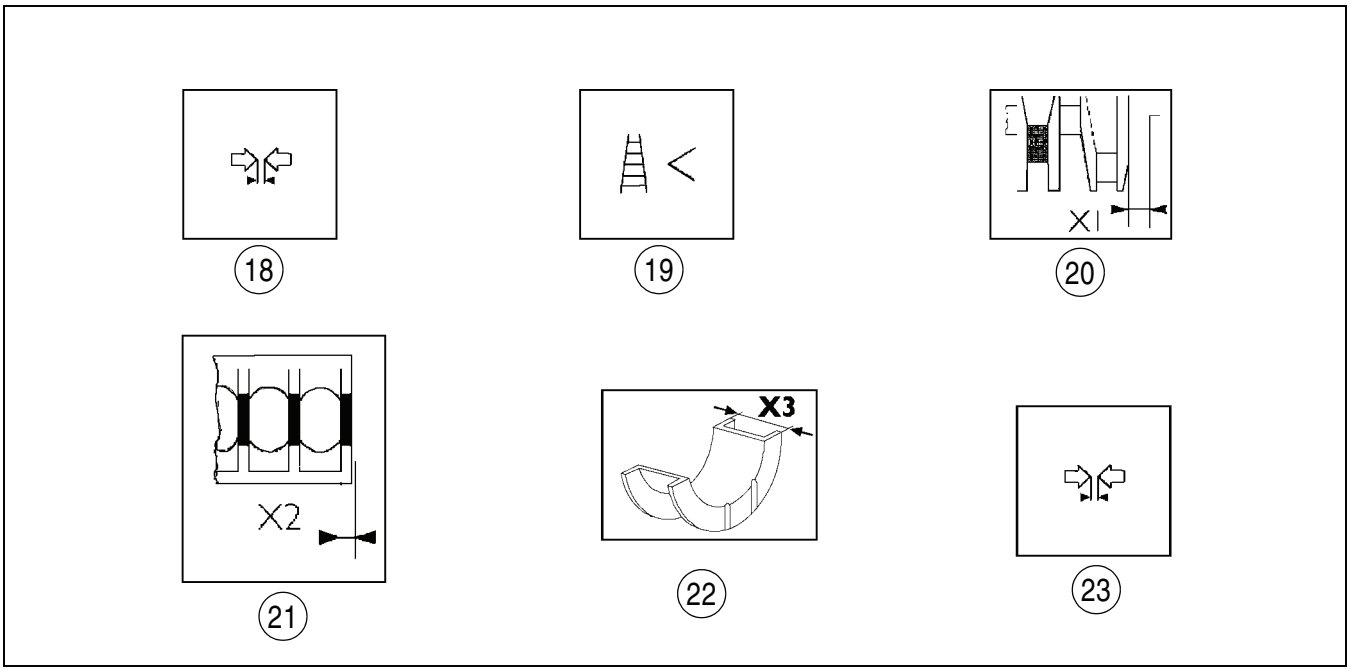
REF. NO.	ENGINE TYPE	667TA					
		EEG	EEC	EBF	EED	EBD	EDJ
1	Cylinder liners.	104.000 to 104.024 mm. (4.0945 to 4.0954 in.)					
2	Pistons:	Supplied as spares					
	Measurement dimension.	X = 49.5 mm. (1.948813 in.)					
	Outer diameter.	Ø1= 103.759 to 103.777 mm. (4.0850 to 4.0857 in.)					
	Pin seat.	Ø2= 38.010 to 38.016 mm. (1.4965 to 1.4967 in.)					
3	Piston - cylinder liners.	0.235 to 0.273 mm. (0.0093 to 0.0107 in.)					
4	Piston diameter.	Ø= 0.4 mm. (0.0157 in.)					
5	Protrusion of pistons from crankcase.	No Information Available					
6	Piston pin.	Ø3= 37.994 to 38.000 mm. (1.4958 to 1.4961 in.)					
7	Piston pin-Pin seat.	0.01 to 0.022 mm. (0.0004 to 0.0009 in.)					
8	Piston ring grooves (measured on Ø of 101 mm 3.976366 in.)	X1= 2.705 to 2.735 mm. (0.1065 to 0.1077 in.)					
		X2= 2.420 to 2.440 mm. (0.0953 to 0.0961 in.)					
		X3= 4.03 to 4.05 mm. (0.1587 to 0.1594 in.)					
	Piston rings (measured 1.5 mm 0.05905494 in. away from external Ø).	S1= 2.560 to 2.605 mm. (0.1008 to 0.1026 in.)					
		S2= 2.350 to 2.380 mm. (0.0925 to 0.0937 in.)					
		S3= 3.977 to 3.990 mm. (0.1566 to 0.1571 in.)					
9	Piston rings - Slots.	1= 0.100 to 0.175 mm. (0.0039 to 0.0069 in.)					
		2= 0.04 to 0.09 mm. (0.0016 to 0.0035 in.)					
		3= 0.04 to 0.083 mm. (0.0016 to 0.0033 in.)					
10	Piston rings.	0.4mm. (0.0157 in.)					



BS06K016

Figure 2-8

REF. NO.	ENGINE TYPE	667TA					
		EEG	EEC	EBF	EED	EBD	EDJ
11	Piston ring gaps in cylinder liner.	X1= 0.30 to 0.40 mm. (0.0118 to 0.0157 in.)					
		X2= 0.60 to 0.80 mm. (0.0236 to 0.0315 in.)					
		X3= 0.30 to 0.55 mm. (0.0118 to 0.0217 in.)					
12	Connecting rod small-end bearing seat.	Ø1= 40.987 to 41.553 mm. (1.6137 to 1.6147 in.)					
	Connecting rod bearing seat.	Ø2= 72.987 to 73.013 mm. (2.8735 to 2.8745 in.)					
13	Connecting rod small-end bearing diameter.						
	Outer	Ø4= 41.279 to 41.553 mm. (1.6252 to 1.6359 in.)					
	Inner	Ø3= 38.019 to 38.033 mm. (1.4968 to 1.4974 in.)					
14	Connecting rod small-end bearing seat.	0.266 to 0.566 mm. (0.0105 to 0.0223 in.)					
15	Piston pin - bearing.	0.019 to 0.039 mm. (0.0007 to 0.0015 in.)					
16	Measurement dimension.	No Information Available					
	Maximum error on connecting rod axis parallelism.	No Information Available					
	Journals	Ø1= 82.990 to 83.010 mm. (3.2673 to 3.2681 in.)					
	Crank pins	Ø2= 68.987 to 69.013 mm. (2.7160 to 2.7170 in.)					
	Main half bearings (supplied as spares).	S1= 2.456 to 2.464 mm. (0.0967 to 0.0970 in.)					
	Connecting rod half bearings.	S2= 1.955 to 1.968 mm. (0.0770 to 0.0775 in.)					
17	Main bearing- journals						
	Numbers 1, 7	Ø3 87.982 to 88.008 mm. (3.4638 to 3.4649 in.)					
	Numbers 2, 3, 4, 5, 6	Ø3= 87.977 to 88.013 mm. (3.4637 to 3.4651 in.)					

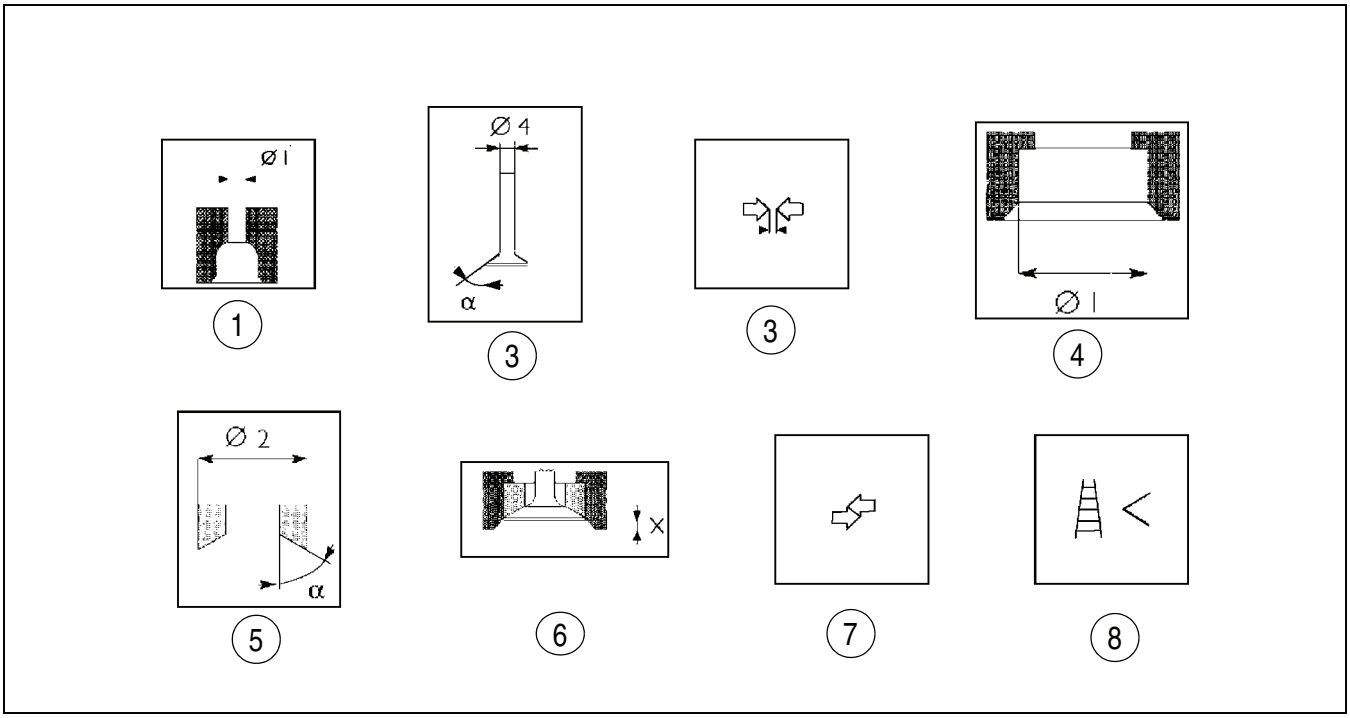


BS06K017

Figure 2-9

REF. NO.	ENGINE TYPE	667TA					
		EEG	EEC	EBF	EED	EBD	EDJ
18	Half bearing- journals.						
	Numbers 1, 7	0.044 to 0.106 mm. (0.0017 to 0.0042 in.)					
	Numbers 2, 3, 4, 5, 6	0.041 to 0.103 mm. (0.0016 to 0.0041 in.)					
	Half bearing - crank pins.	0.039 to 0.111 mm. (0.0015 to 0.0044 in.)					
19	Main half bearings	+0.250 mm. (0.0098 in.)					
	Connecting rod half bearings.	+0.500 mm. (0.0197 in.)					
20	Main journal of thrust bearing.	X1= 37.475 to 37.545 mm. (1.4754 to 1.4781 in.)					
21	Main bearing housing of thrust bearing.	X2= 25.980 to 26.480 mm. (1.0228 to 1.0425 in.)					
22	Shoulder half ring.	X3= 37.280 to 37.380 mm. (1.4677 to 1.4716 in.)					
23	Crankshaft shoulder.	0.095 to 0.265 mm. (0.0037 to 0.0104 in.)					

VALVE GEAR - CYLINDER ASSEMBLY



BS06K018

Figure 2-10

REF. NO.	ENGINE TYPE	667TA					
		EEG	EEC	EBF	EED	EBD	EDJ
1	Valve guide seats on cylinder head.	Ø1= 7.042 to 7.062 mm. (0.2772 to 0.2780 in.)					
2	Valves - Intake.	Ø4= 6.970 to 6.999 mm. (0.2744 to 0.2756 in.)					
		angle= 60° ± 0.25°					
	Valves - Exhaust.	Ø4= 6.970 to 6.999 mm. (0.2744 to 0.2756 in.)					
		angle= 45° ± 0.25°					
3	Valve stem and respective guide.	0.043 to 0.092 mm. (0.0017 to 0.0036 in.)					
4	seat on head for valve seat. - Intake.	34.837 to 34.863 mm. (1.3715 to 1.3725 in.)					
	seat on head for valve seat. - Exhaust.	34.837 to 34.863 mm. (1.3715 to 1.3726 in.)					
5	Valve seat outer diameter; angle of valve seats on cylinder head.						
	Intake.	Ø2= 34.917 to 34.931 mm. (1.3747 to 1.3752 in.)					
		angle= 60°					
	Exhaust.	Ø2= 34.917 to 34.931 mm. (1.374681 to 1.375232 in)					
		angle= 45°					
6	Recessing. Intake valve	0.590 to 1.110 mm. (0.0232 to 0.0437 in.)					
	Recessing. Exhaust valve	0.960 to 1.480 mm. (0.0378 to 0.0583 in.)					
7	Between valve seat and head- Intake	0.054 to 0.094 mm. (0.0021 to 0.0037 in.)					
	Between valve seat and head- Exhaust	0.054 to 0.094 mm. (0.0021 to 0.0037 in.)					
8	Valve seats	No Information Available					