845B / 845B DHP
865B / 865B VHP / 865B AWD
885B / 885B DHP / 885B AWD
Grader

SERVICE MANUAL

Part number 84559573
English
October 2011

CASE CONSTRUCTION

SECTION INDEX

GENERAL

Section Title **Section Number**

CNH Latin America LTDA
2237, General David Sarnoff Avenue
Contagem - MG - Brazil

6-46520 ENG

Printed in Brazil
Issued July, 2011

Section 1001

STANDARD TORQUE ESPECIFICATIONS

CNH Latin America LTDA
2237, General David Sarnoff Avenue
Contagem - MG - Brazil

6-46530 ENG

Printed in Brazil
Issued July, 2011

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NOTE: CASE reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

TORQUE SPECIFICATIONS

Decimal

Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers dry, or when lubricated with engine oil. Not applicable if special graphities, Molydisulfide greases, or other extreme pressure lubricants are used.

GRADE 5 BOLTS, NUTS AND STUDS

Size (inch)	Pound-Inches	N.m
1/4	9 - 11	12 - 15
5/16	17 - 21	23 - 28
3/8	35 - 42	48 - 57
7/16	54 - 64	73 - 87
1/2	80 - 96	109 - 130
9/16	110 - 132	149 - 179
5/8	150 - 180	203 - 244
3/4	270 - 324	366 - 439
7/8	400 - 480	542 - 651
1.0	580 - 696	787 - 944
1-1/8	800 - 880	1085 - 1193
1-1/4	1120 - 1240	1519 - 1681
1-3/8	1460 - 1680	1980 - 2278
1-1/2	1940 - 2200	2631 - 2983

GRADE 8 BOLTS, NUTS AND STUDS

Size (inch)	Pound-Inches	N.m
1/4	12 - 15	16 - 20
5/16	24 - 29	33 - 39
3/8	45 - 54	61 - 73
7/16	70 - 84	95 - 114
1/2	110 - 132	149 - 179
9/16	160 - 192	217 - 260
5/8	220 - 264	298 - 358
3/4	380 - 456	515 - 618
7/8	600 - 720	814 - 976
1.0	900 - 1080	1220 - 1465
1-1/8	1280 - 1440	1736 - 1953
1-1/4	1820 - 2000	2468 - 2712
1-3/8	2380 - 2720	3227 - 3688
1-1/2	3160 - 3560	4285 - 4827

NOTE: *Use thick nuts with Grade 8 bolts.*

Métric

Use the following torques when specifications are not given. These values apply to fasteners with coarse threads as received from supplier, plated or unplated, or when lubricated with engine oil. These values do not apply if graphite or Molydisulfide grease or oil is used.

GRADE 8.8 BOLTS, NUTS AND STUDS

Size (inch)	Pound-Inches	N.m
M4	2 - 3	3 - 4
M5	5 - 6	6.5 - 8
M6	8 - 9	10.5 - 12
M8	19 - 23	26 - 31
M10	38 - 45	52 - 61
M12	66 - 79	90 - 107
M14	106 - 127	144 - 172
M16	160 - 200	217 - 271
M20	320 - 380	434 - 515
M24	500 - 600	675 - 815
M30	920 - 1100	1250 - 1500
M36	1600 - 1950	2175 - 2600

GRADE 10.9 BOLTS, NUTS AND STUDS

Size (inch)	Pound-Inches	N.m
M4	3 - 4	4 - 5
M5	7 - 8	9.5 - 11
M6	11 - 13	15 - 17.5
M8	27 - 32	37 - 43
M10	54 - 64	73 - 87
M12	93 - 112	125 - 152
M14	149 - 179	300 - 245
M16	230 - 280	310 - 380
M20	450 - 540	610 - 730
M24	780 - 940	1050 - 1275
M30	1470 - 1770	2000 - 2400
M36	2580 - 3090	3500 - 4200

GRADE 12.9 BOLTS, NUTS AND STUDS

Usually the torque values specified for grade 10.9 fasteners. can be used satisfactorily on grade 12.9 fasteners.

Steel Hydraulic Fittings

Tube OD Hose ID	Thread Size	Pound-Inches	N.m
37 DEGREE FLARE FITTING			
1/4" (6.4 mm)	7/16 - 20	6 - 12	8 - 16
5/16" (7.9 mm)	1/2 - 20	8 - 16	11 - 22
3/8" (9.5 mm)	9/16 - 18	10 - 20	14 - 34
1/2" (12.7 mm)	3/4 - 16	15 - 42	20 - 56
5/8" (15.9 mm)	7/8 - 14	25 - 58	34 - 78
3/4" (19.0 mm)	1-1/16 - 12	40 - 80	54 - 108
7/8" (22.2 mm)	1-3/16 - 12	60 - 100	81 - 135
1.0" (25.4 mm)	1-5/16 - 12	75 - 117	102 - 158
1-1/4" (31.8 mm)	1-5/8 - 12	125 - 165	169 - 223
1-1/2" (38.1 mm)	1-7/8 - 12	210 - 250	285 - 338

Tube OD Hose ID	Thread Size	Pound-Inches	N.m
STRAIGHT THREADS WITH O-RING			
1/4" (6.4 mm)	7/16 - 20	12 - 19	16 - 25
5/16" (7.9 mm)	1/2 - 20	16 - 25	22 - 34
3/8" (9.5 mm)	9/16 - 18	25 - 40	34 - 54
1/2" (12.7 mm)	3/4 - 16	42 - 67	57 - 90
5/8" (15.9 mm)	7/8 - 14	58 - 92	79 - 124
3/4" (19.0 mm)	1-1/16 - 12	80 - 128	108 - 174
7/8" (22.2 mm)	1-3/16 - 12	100 - 160	136 - 216
1.0" (25.4 mm)	1-5/16 - 12	117 - 187	159 - 253
1-1/4" (31.8 mm)	1-5/8 - 12	165 - 264	224 - 357
1-1/2" (38.1 mm)	1-7/8 - 12	250 - 400	339 - 542

SPLIT FLANGE MOUNTING BOLTS		
Size (inch)	**Pound-Inches**	**N.m**
5/16 - 18	15 - 20	20 - 27
3/8 - 16	20 - 25	27 - 34
7/16 - 14	35 - 45	47 - 61
1/2 - 13	55 - 65	74 - 88
5/8 - 11	140 - 150	190 - 203

Steel Hydraulic Fittings

Nom. SAE Dash Size	Tube OD INCH (mm)	Thread Size	Pound-Inches	N.m	Thread Size	Pound-Inches	N.m
O-RING FACE SEAL END					O-RING BOSS END FITTING OR LOCK NUT		
- 4	1/4 (6.4)	9/16-18	10 - 12	14 - 16	7/16-20	17 - 20	23 - 27
-6	3/8 (9.5)	11/16-16	18 - 20	24 - 27	9/16-18	25 - 30	34 - 41
-8	1/2 (12.7)	13/16-16	32 - 40	43 - 54	3/4-16	45 - 50	61 - 68
-10	5/8 (15.9)	1 - 14	46 - 56	62 - 75	7/8-14	60 - 65	81 - 88
-12	3/4 (19.0)	1-3/16-12	65 - 80	90 - 110	1-1/16-12	85 - 90	115 - 122
-14	7/8 (22.2)	1-3/16-12	65 - 80	90 - 110	1-3/16-12	95 - 100	129 - 136
-16	1.0 (25.4)	1-7/16-12	92 - 105	125 - 140	1-5/16-12	115 - 125	156 - 169
-20	1-1/4 (31.8)	1-11/ 16-12	125 - 140	170 - 190	1-5/8-12	150 - 160	203 - 217
-24	1-1/2 (38.1)	2-12	150 - 180	200 - 254	1-7/8-12	190 - 200	258 - 271

Section
2002

2002

ENGINE – TIER 3

845B DHP / 865B VHP / 885B DHP / 865B AWD / 885B AWD MODELS

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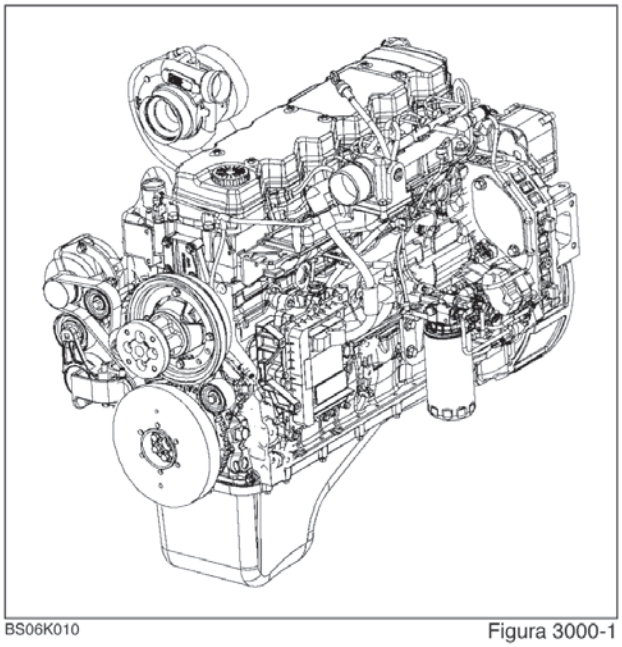
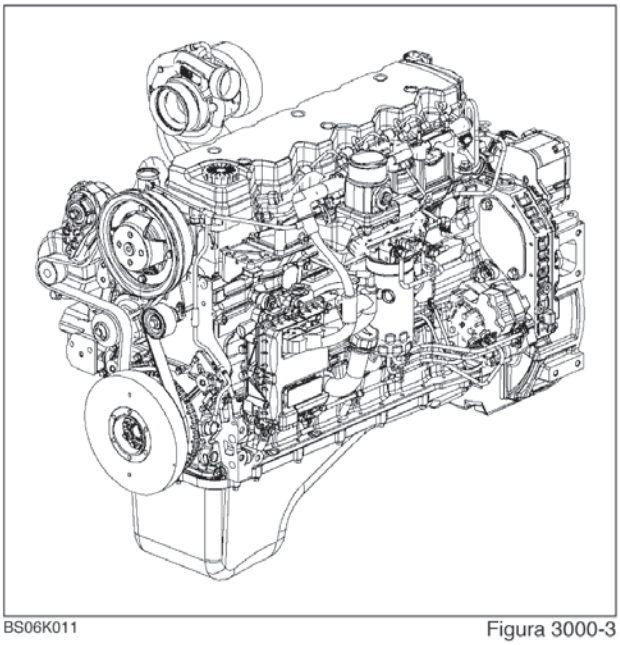
ENGINE



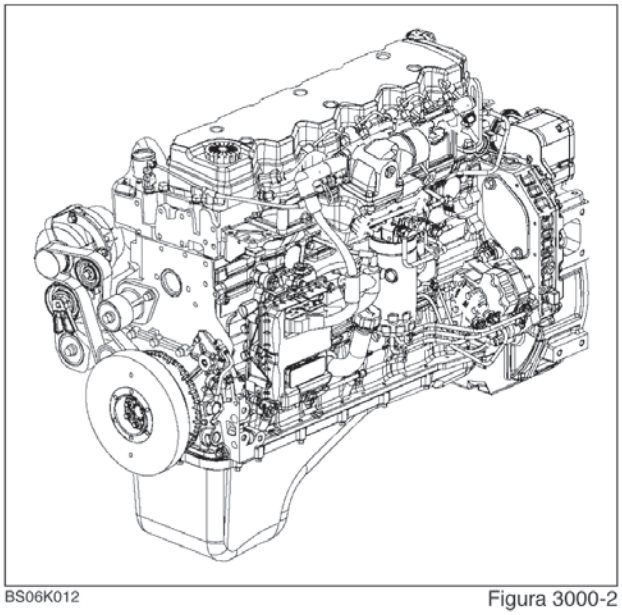
BS06K010 Figura 3000-1

667TA/EEG - 667TA/EEC



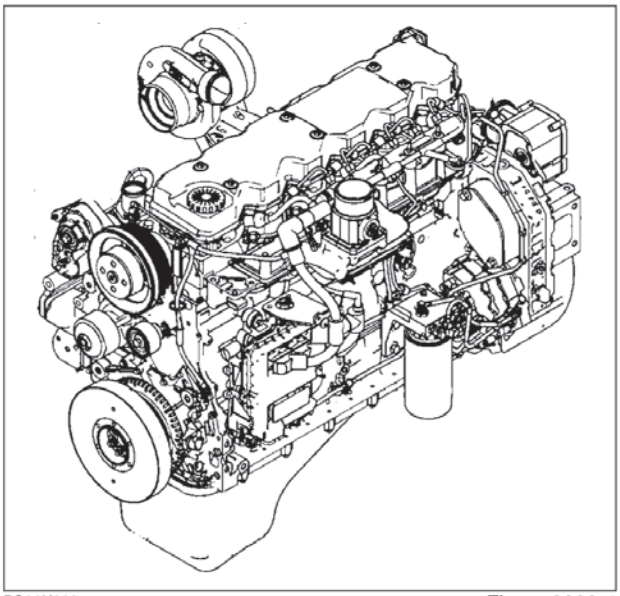
BS06K011 Figura 3000-3

667TA/EED - 667TAEBF



BS06K012 Figura 3000-2

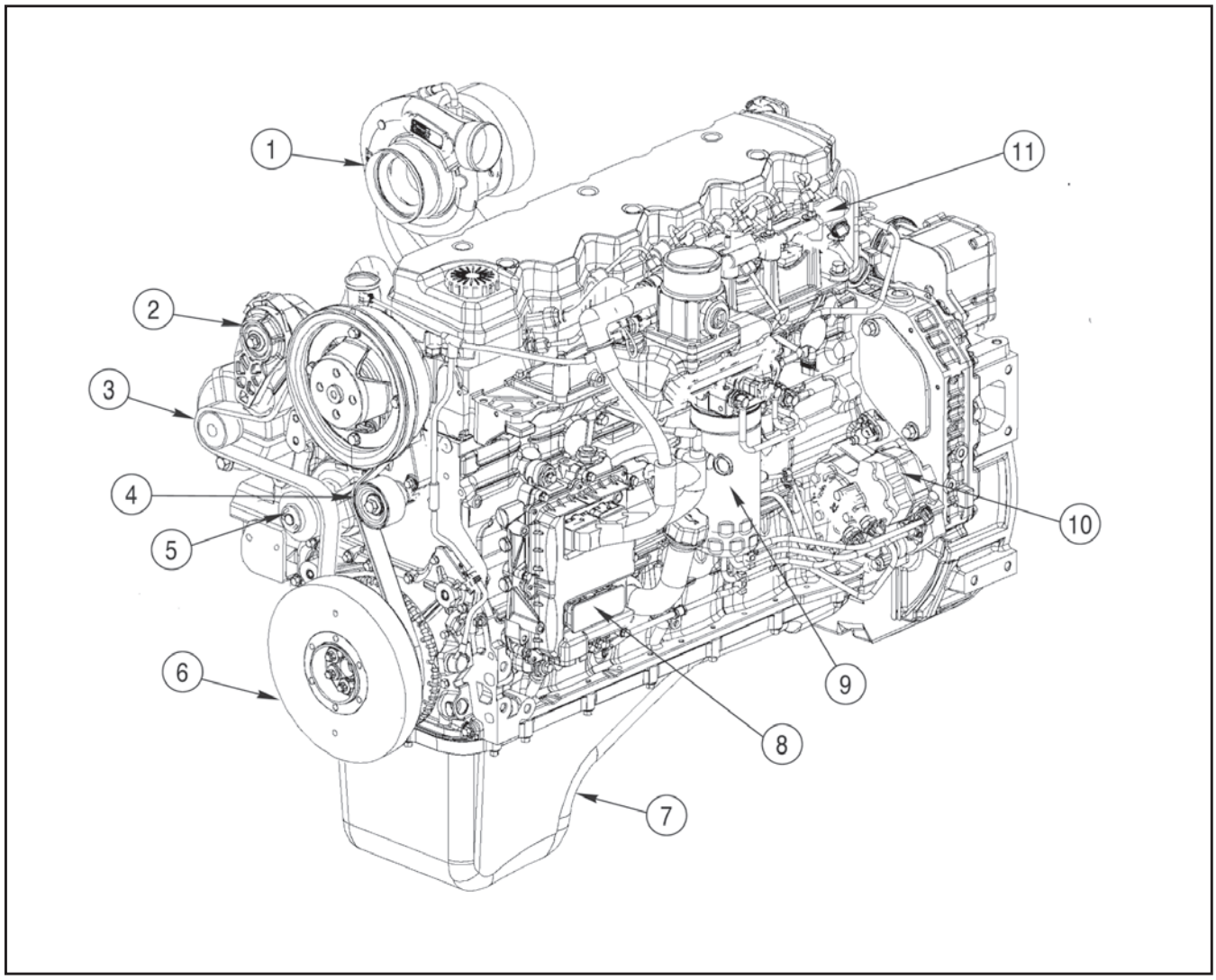
667TA/EED - 667TAEBD



BS06K628 Figura 3000-4

667TA/EDJ

667TA ENGINES



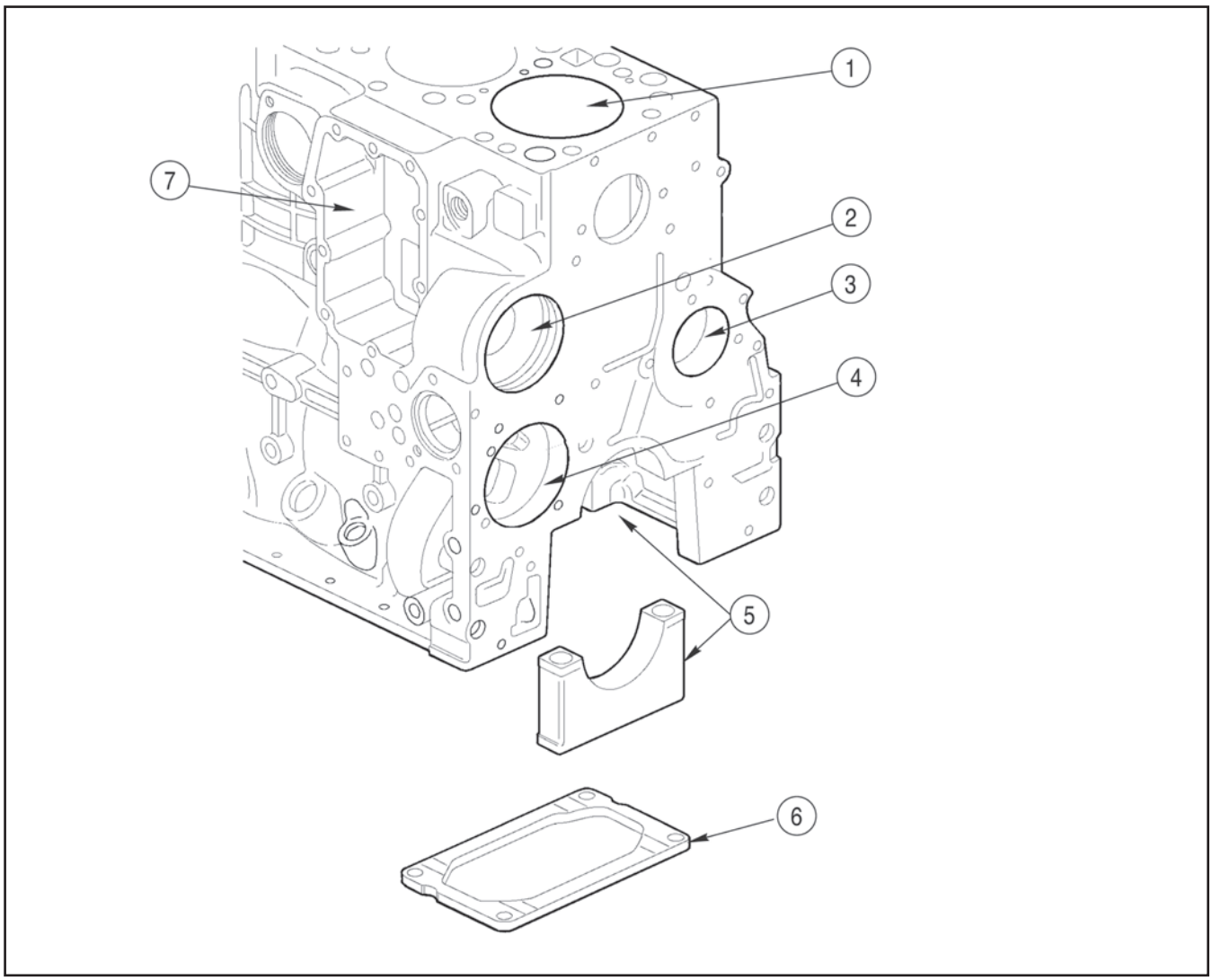
BS06K020

Figura 3000-12

1. TURBOCHARGER
2. AUTOMATIC TENSION BELT
3. ALTERNATOR
4. FIX GUIDE PULLEY
5. WATER PUMP
6. ENGINE FLYWHEEL COUNTERWEIGHT
7. OIL SUMP
8. ELECTRONIC CONTROL UNIT - E.C.U.
9. FUEL FILTER
10. HIGH PRESSURE PUMP
11. COMMON RAIL

DESCRIPTION OF ENGINE MAIN COMPONENTS

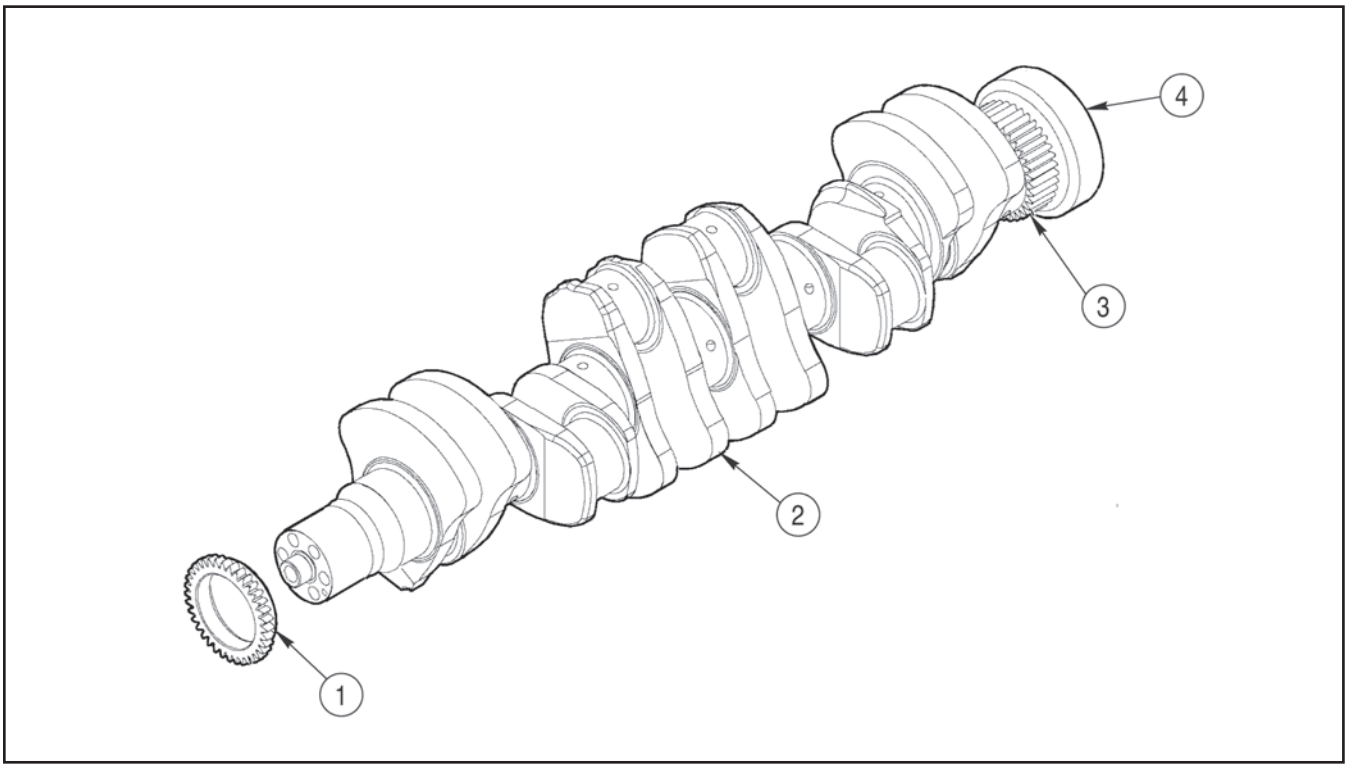
Engine Block



1. CYLINDER BORE
2. MOUNTING FOR WATER PUMP
3. MOUNTING FOR CAMSHAFT BEARING
4. MOUNTING FOR OIL PUMP
5. MAIN JOURNALS
6. STIFFENING PLATE
7. MOUNTING FOR WATER-OIL EXCHANGE HEATER

The cylinder block is a cast iron structure with cylinders bores (1), main journals (5) e moun-tings for camshaft bearing (3) and valves, water-oil exchanger heater (7), water pump (2) and oil pump (4). The block also has coolant and oil passages. The lubrication circuit provides oil for the moving parts. The stiffening plate (6) is applied in the engine block botton to increase the resistance to mechanical fatigue.

Crankshaft



BS06K022 Figura 3000-14

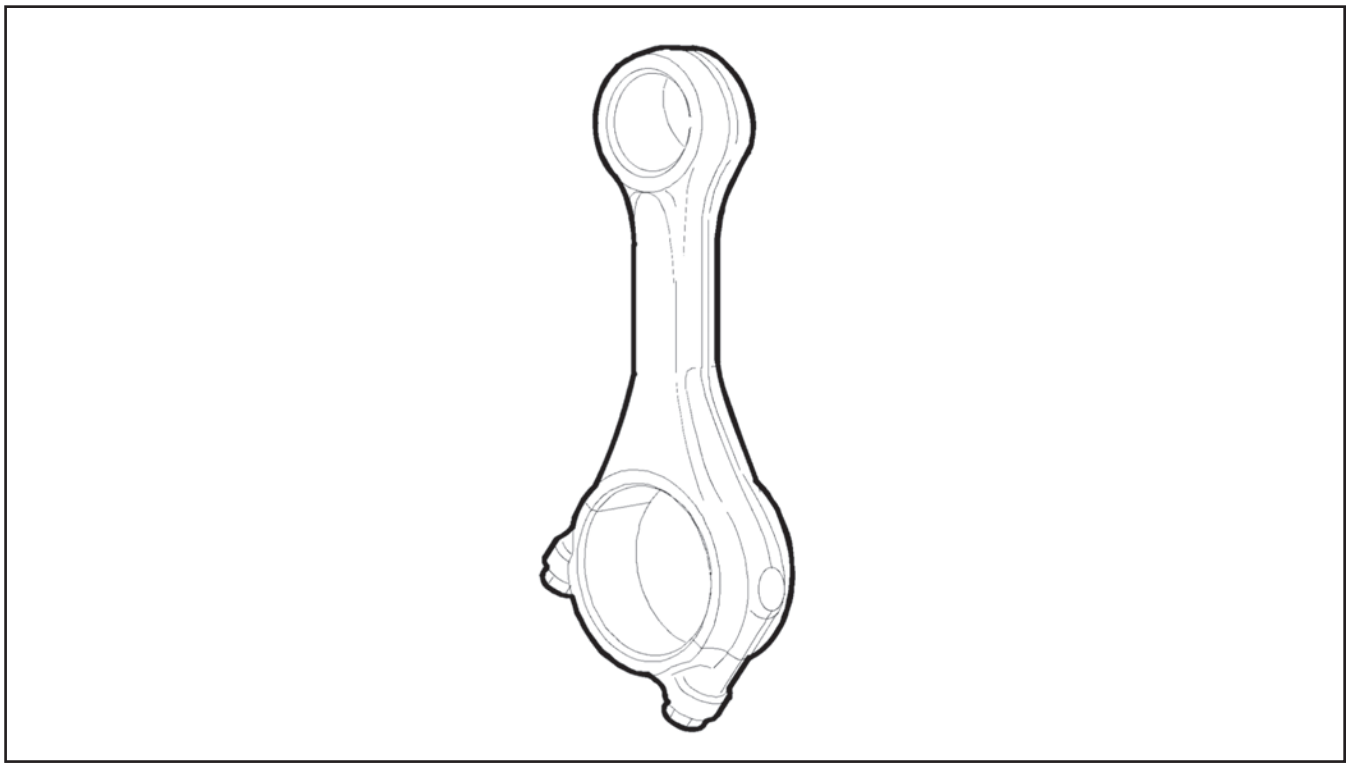
1. OIL PUMP GEAR
2. CRANKSHAFT
3. TIMING GEAR
4. MOUNTING FOR ENGINE FLYWHEEL

The crankshaft is steel made and rests in seven journals tempered by induction.
There is a series of drilled passages for the lubricating oil.
The follow items are pressed in front: oil pump gear (1), position sensor sprocket, counterweight, and the auxiliary devices pulley.
The follow items are pressed in rear: timing gear (3), and the mounting for engine flywheel (4).
The main journals bearings are steel made and coated by a anti-friction alloy. One of them is equipped with shoulders to limit the cranckshaft axial clearance.
The timing gear (3) and the engine flywheel mounting (4) are forced positioned in the cranckshaft rear and can not be replaced.

CRANCKSHAFT OIL SEALS

The front and rear seals are box type with radial sealing. To remove them use the special tools 380000665 e 380000663. For installation se special tools 380000666 e 380000664.

Connecting Rod



BS06K023

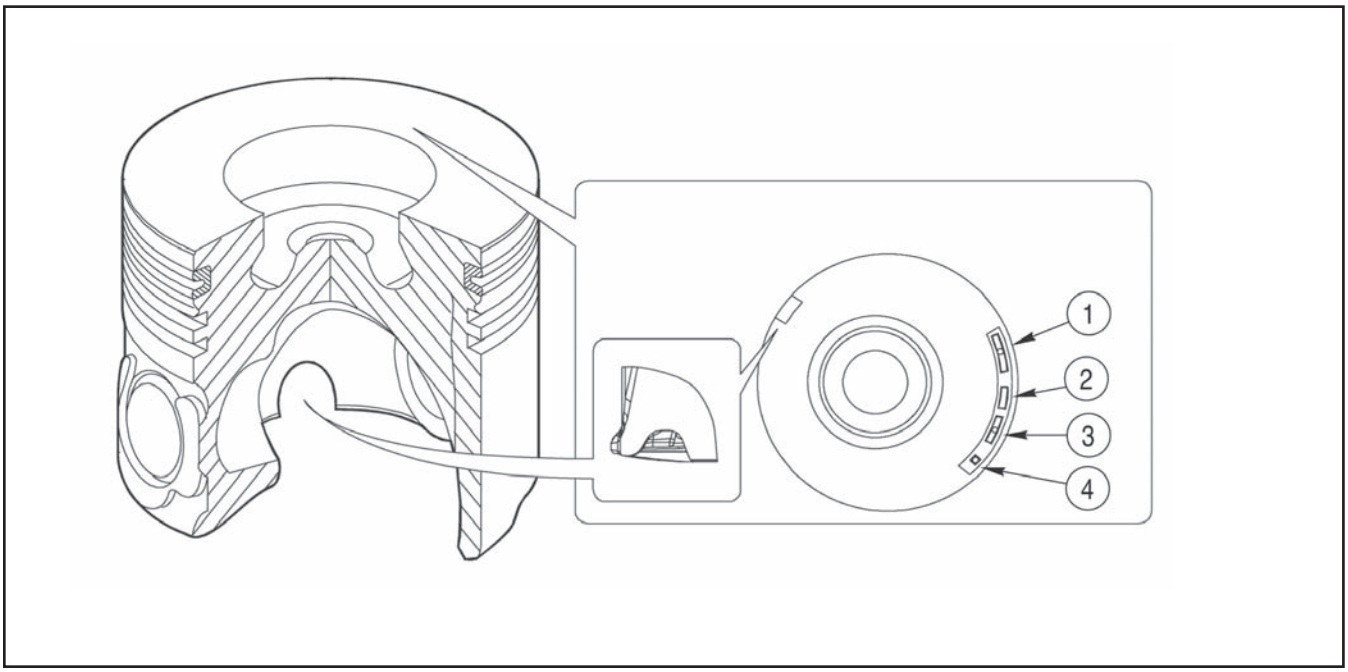
Figura 3000-15

Connecting rods are forged steel. The big ends are made with an oblique angle. Caps and rods are separeted by a fracture splitting method that produces a strong and unique fit cap.
The connecting rod big end bearings are coated by anti-friction alloy.

They are marked two ways:

- Body-cap: have a number that indicates match and cylinder which they are assembled.
- Rod shank: marked with a letter indicating weight class.

Piston



BS06K024 Figura 3000-16

A coroa na cabeça do pistão apresenta uma câmara de combustão de alta turbulência. A parte inferior da coroa na cabeça do pistão é arrefecida pelo óleo do motor distribuído por um bico pulverizador instalado no bloco do motor.

Existem três canaletas para anéis do pistão com diferentes funções e diferente geometria:

The piston crown features a high turbulence combustion chamber. The piston crown is cooled from underneath by a spray nozzle installed in the cranckcase.

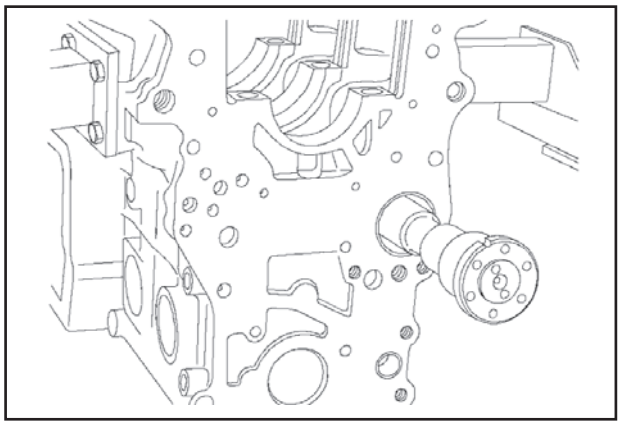
There is three groves for piston rings with different functions and different geometry:

- 1st pinston ring with trapezoidal section (keystone) and coated by chome ceramic.
- 2ndt piston ring with torsional conical rectangular section.
- 3rd piston ring with double oil scraper and inner spring.

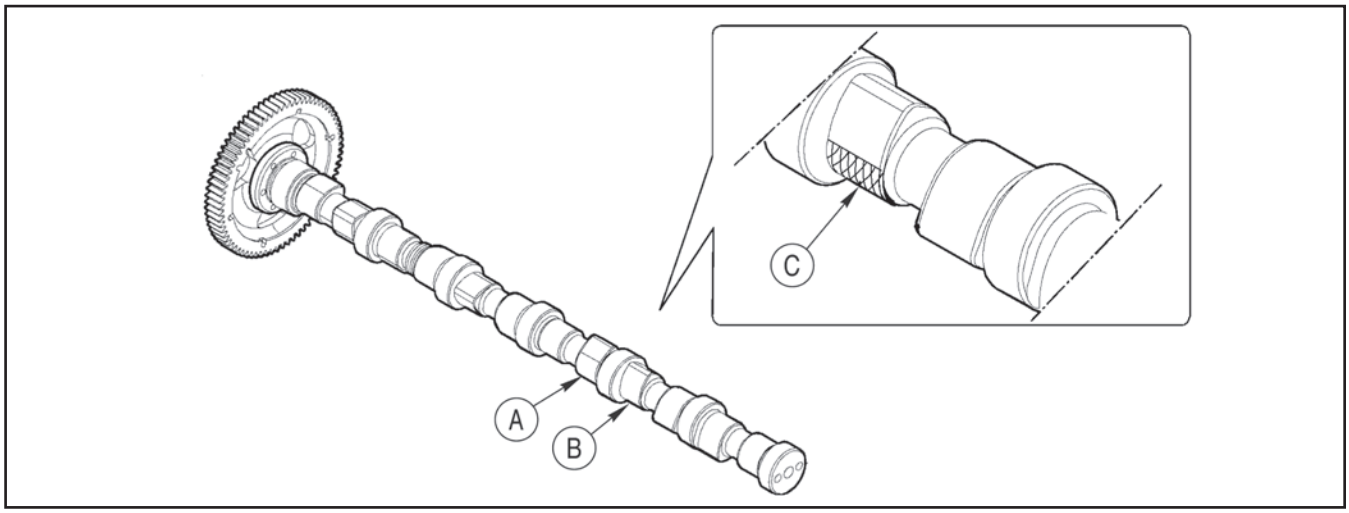
In the piston crown are marked the reference data:

1. Number of spare part and number of design modification.
2. Mark (looking from the frontal engine block) indicating the direction of assembly of the piston in the cylinder
3. Date of manufacture.
4. Mark indicating the first test of the recess insert.

Camshaft



BS06K025 Figura 3000-17



BS06K026 Figura 3000-18

A. INTAKE VALVE LOBE
B. EXHAUST VALVE LOBE
C. LOBE EGR

Camshaft is supported by seven journals in the engine block.
The front and rear journals seats are equipped with steel bushings coated with anti-friction material forced positioned.
There is two lobes for each cylinder

A. Intake lobe
B. Exhaust lobe

Camshaft is directly controlled by rear gears moved by the crankshaft.

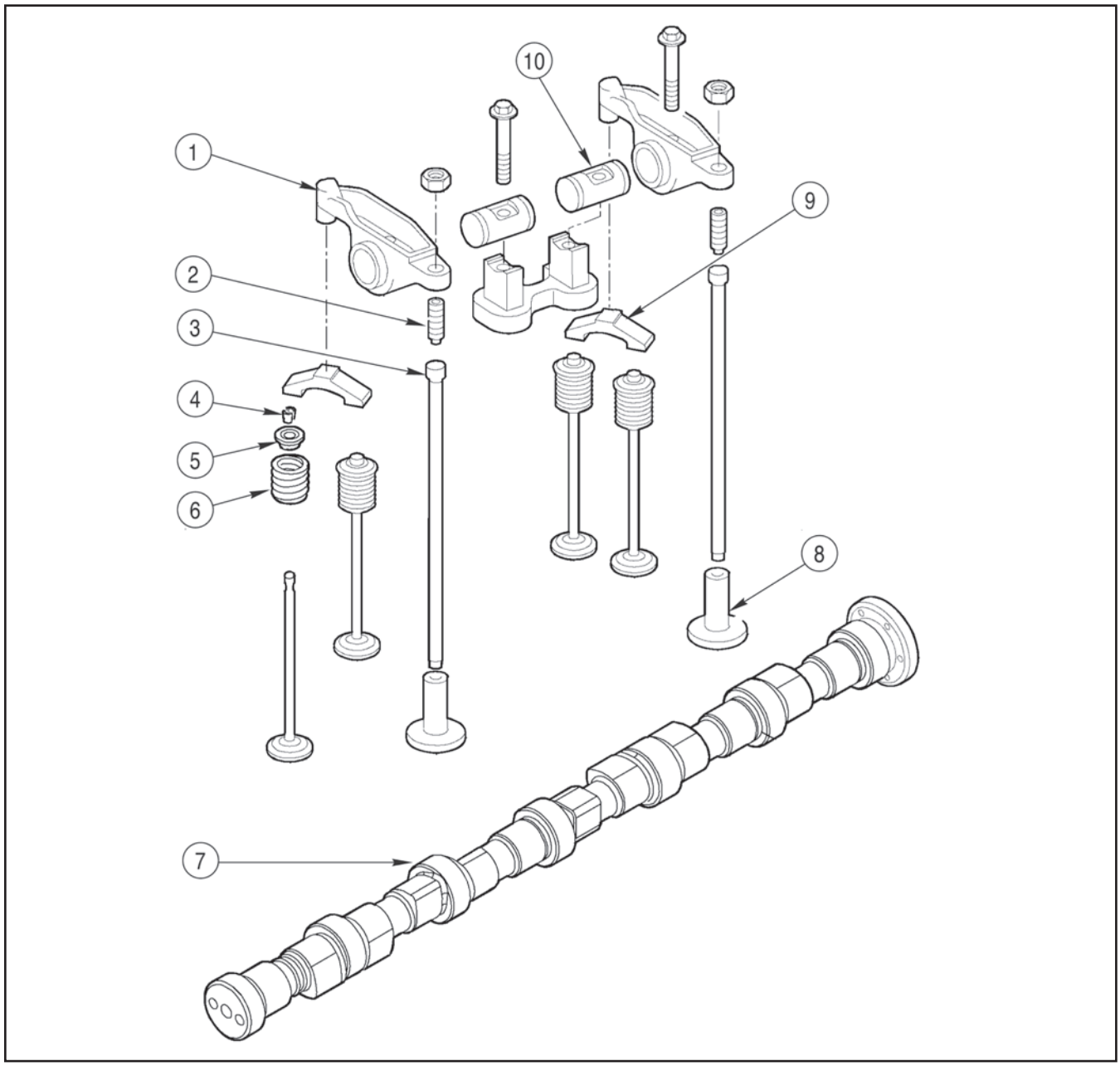
Exhaust Gas Recirculation - EGR

The exhaust gas can return partially to the cylinder and reduce the maximum temperature res-ponsible caused by the nitrogen oxide (NOx) generation.

The ECR reduces the combustion temperature, decreasing the oxigen concentration in the combustion chamber, creating a efficient system to control the NOx emissions. The EGR lobe is not equipped with any electronic control, and the system is always enabled. Its configuration do not requires aditional elements such as retaining valve, pipes or heat dissipation.

There is an aditional lobe (C). When a cylinder is intaking, this lobe allow a brief opening of the exhaust valve. The recirculation occurs in that cylinder due the great exhaust pressure compared to the intake gases.

Valve Control

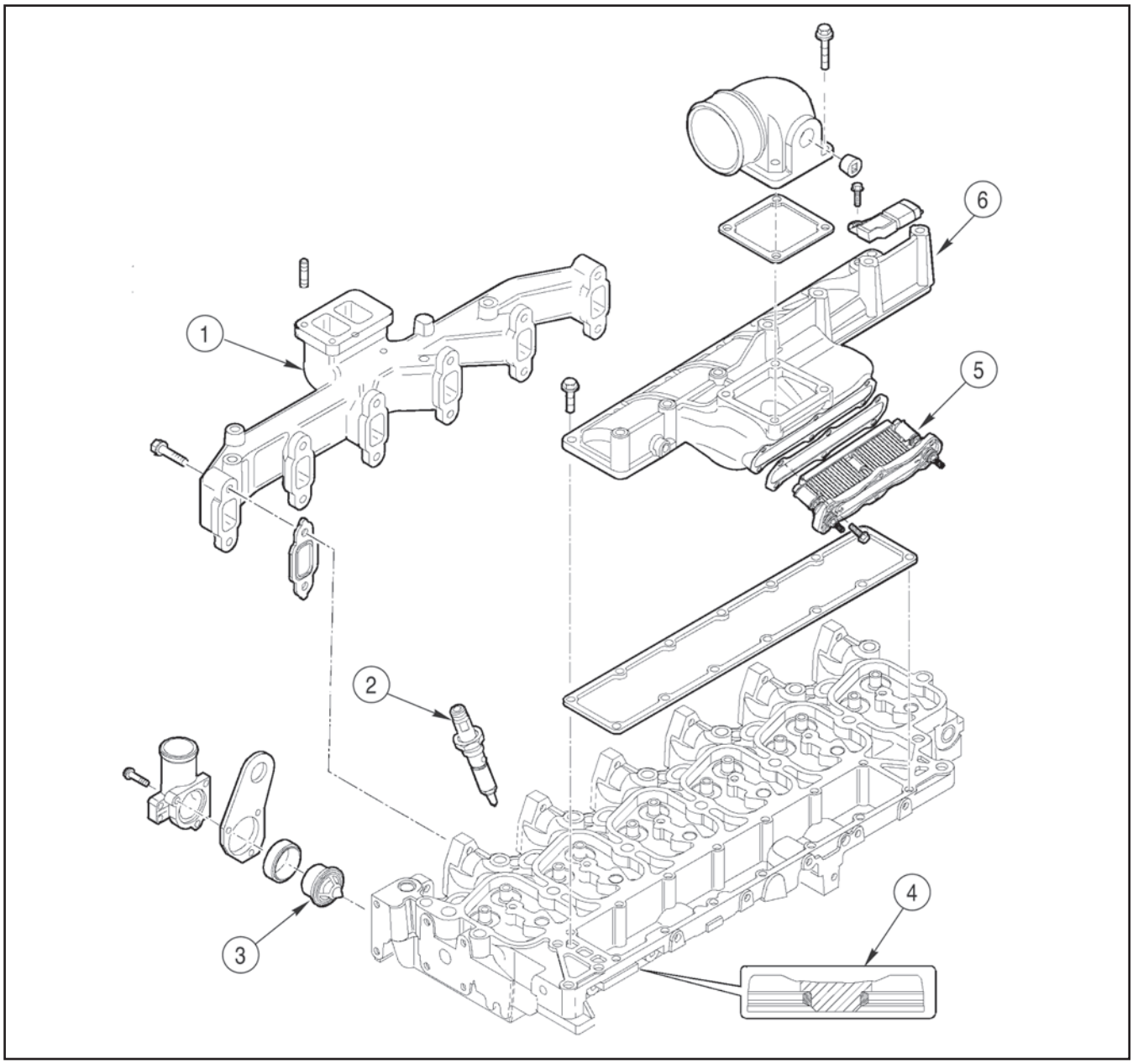


BS06K027

Figura 3000-19

1. ROCKER
2. VALVE CLEARANCE ADJUSTING SCREW
3. PUSHROD
4. VALVE CONE
5. VALVE SEAT
6. SPRING
7. CAMSHAFT
8. TAPPET
9. BRIDGE
10. ROCKER AXLE

Cylinder Head of Engines – 667TA/EBF – 667TA/EBD – 667TA/EED

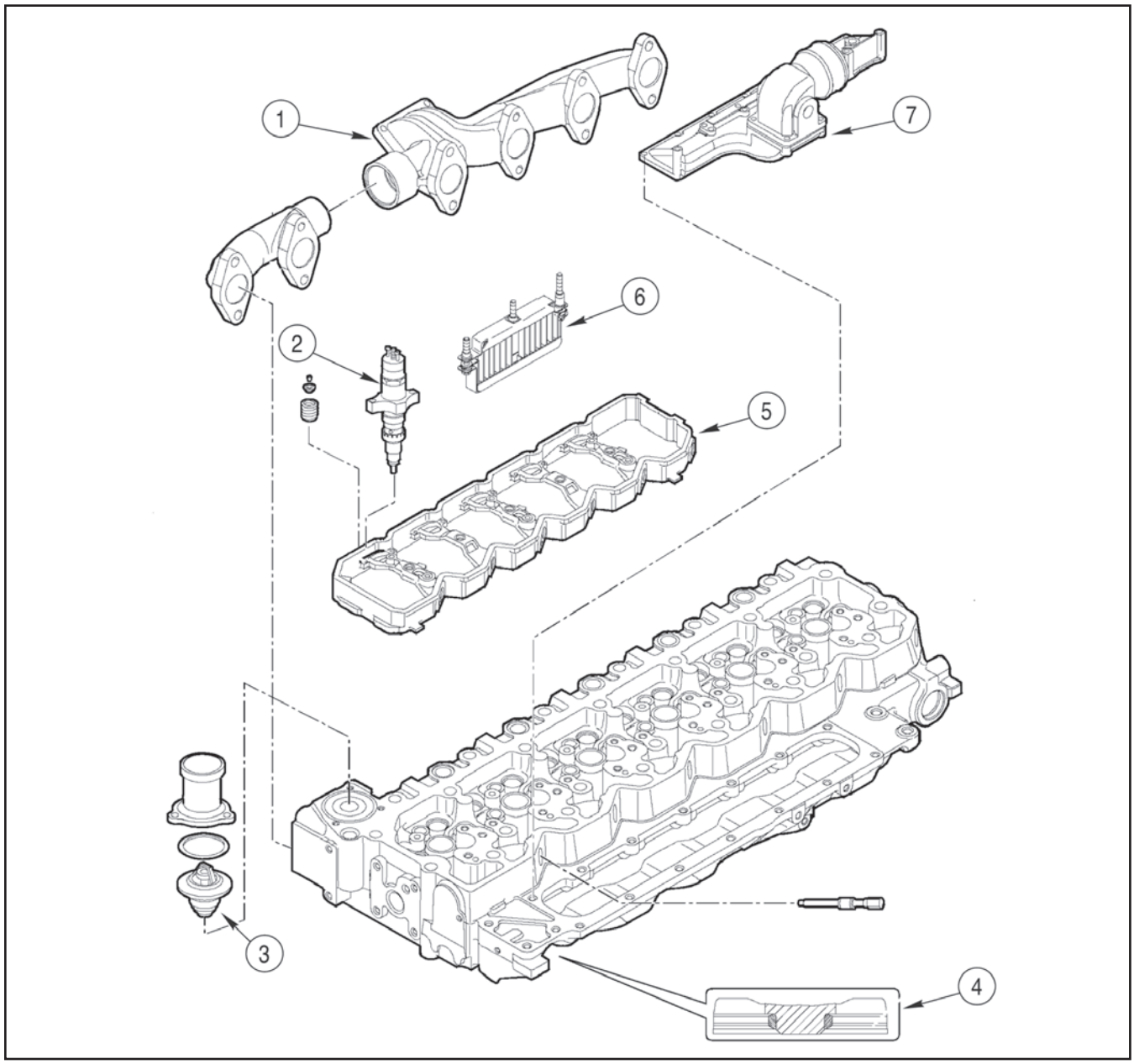


1. EXHAUST MANIFOLD
2. INJECTOR
3. THERMOSTAT
4. VALVE SEAT
5. INTAKE AIR HEATER
6. INTAKE MANIFOLD

The cast iron cylinder head is machined to allow mounting the following parts:
- Valve seats (4).
- Injectors (2).
- Thermostat (3).

It is designed also to accommodate the following components:
- Exhaust manifold (1).
- Intake manifold (6) with intake air heater mounting (5).

Cylinder Head of Engines – 667TA/EEG – 667TA/EEC

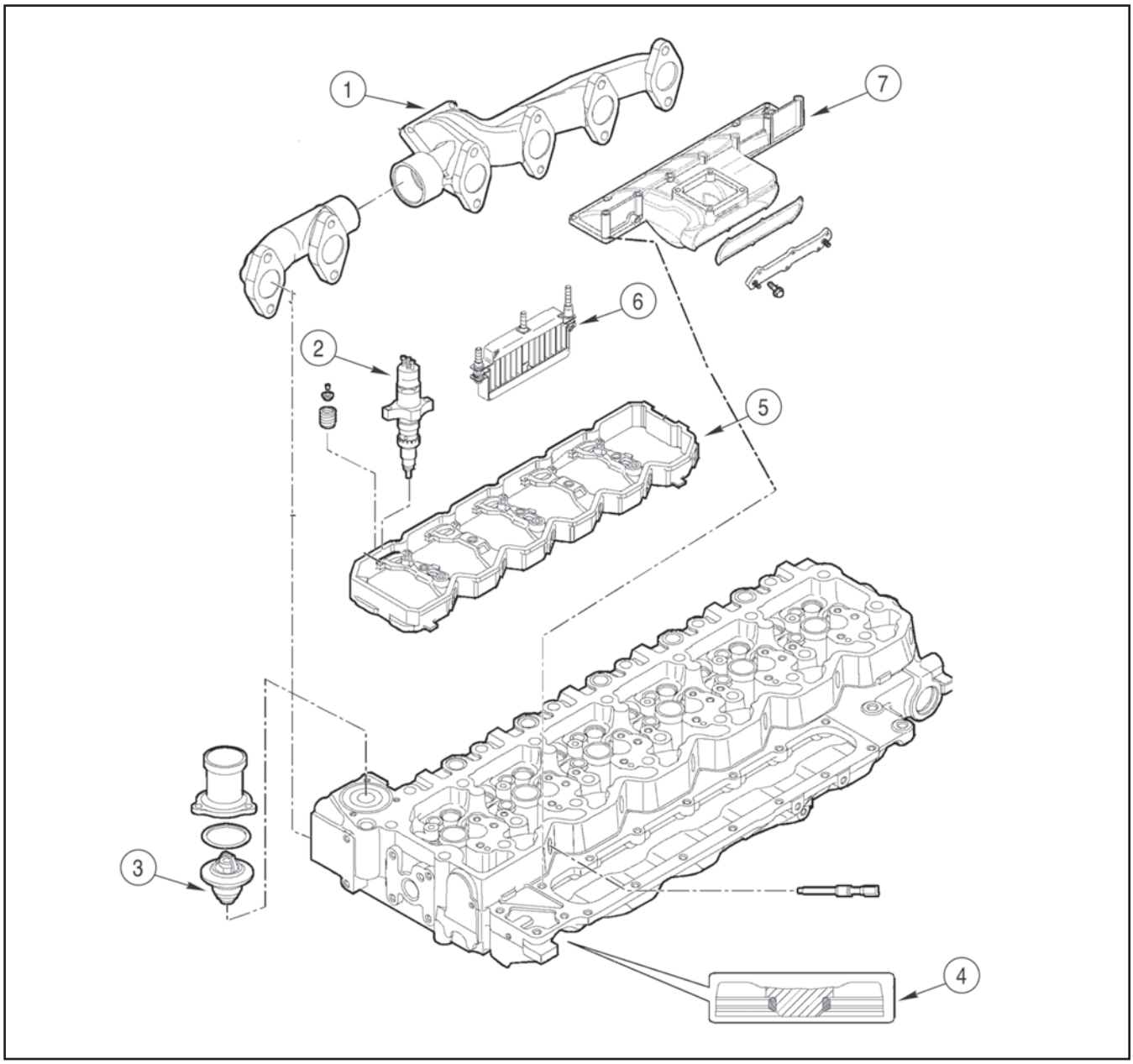


1. EXHAUST MANIFOLD
2. INJECTOR
3. THERMOSTAT
4. VALVE SEAT
5. INJECTORS ELECTRICAL CABLE SUPPORT
6. INTAKE AIR HEATER
7. INTAKE MANIFOLD

The cast iron cylinder head is machined to allow mounting the following parts:
- Valve seats (4)
- Injectors (2)
- Thermostat (3)

It is designed also to accommodate the following components:
- Exhaust manifold (1)
- Intake manifold (7) with intake air heater mounting (6)

Cylinder Head of Engines – 667TA/EDJ



1. EXHAUST MANIFOLD
2. INJECTOR
3. THERMOSTAT
4. VALVE SEAT
5. INJECTORS WITH ELECTRICAL CABLE SUPPORT
6. INTAKE AIR HEATER
7. INTAKE MANIFOLD

The cast iron cylinder head is machined to allow mounting the following parts:
- Valve seats (4)
- Injectors (2)
- Thermostat (3)

It is designed also to accommodate the following components:
- Exhaust manifold (1)
- Intake manifold (7) with intake air heater mounting (6)

Valves and Valves Seats

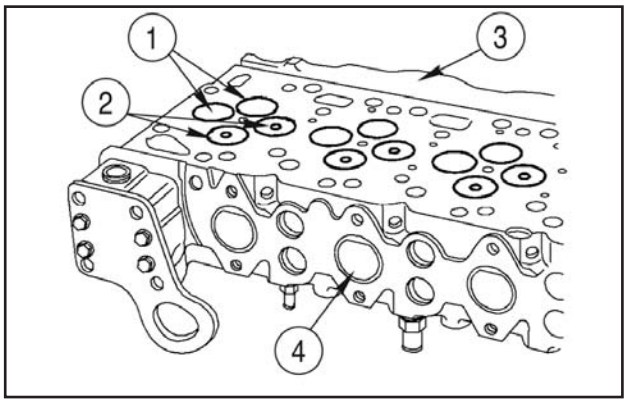
The valve seats has the following angles:

Exhaust valve - 45°

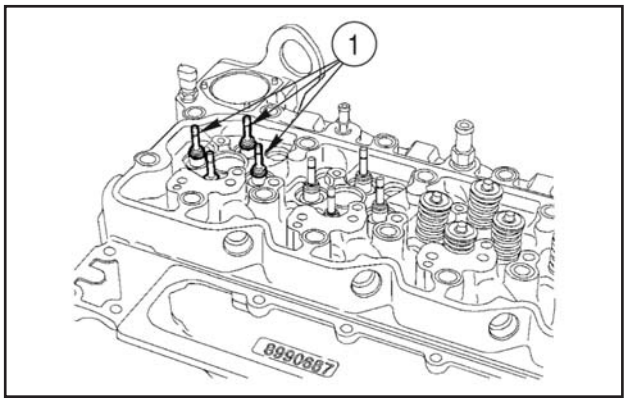
Intake valve - 60°

NOTE: The exhaust valves (2) has a identification cavity in its center.

1. Intake valve
2. Exhaust valve
3. Intake side
4. 4. Exhaust side

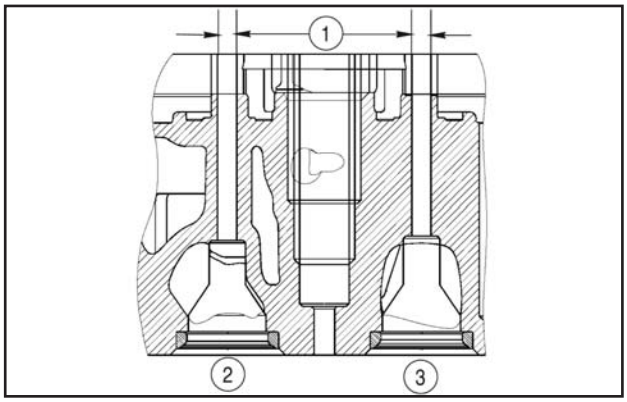


Oil seals (1) installed in the valves steams.



The cylinder head do not has guides inserts. The guides are machined directly in cylinder head.

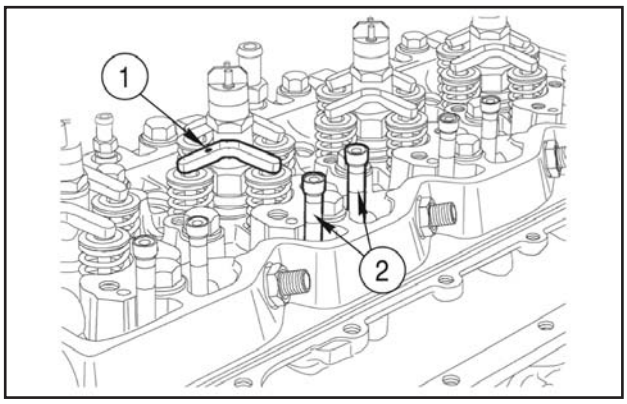
1. 7.042 A 7.062mm (0.277 A 0.278 IN)
2. Intake valves
3. Exhaust valves



Valves Bridge

NOTE: During the cylinder head installation, the rocker bridge direction must be positioned with the marks (1) turned to the exhaust ma-nifold.

1. Bridge
2. Pushrods



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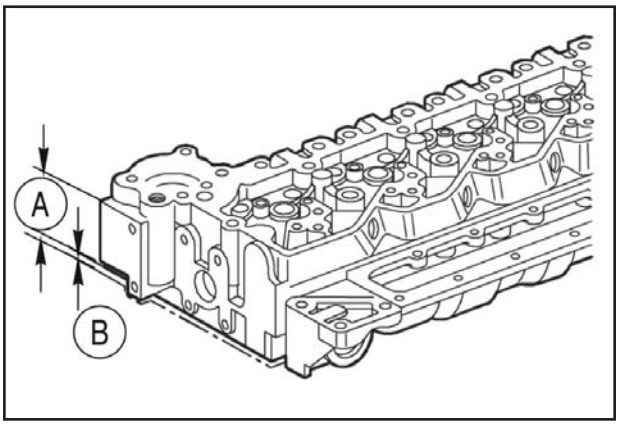
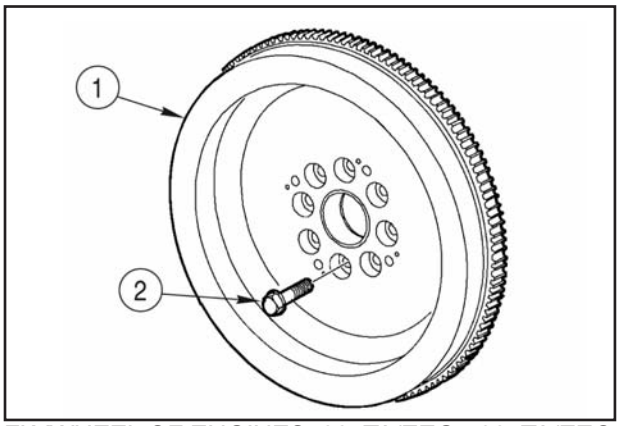
Cylinder Head Machining

The cylinder head nominal thickness (A) is 105 ± 0.25mm (4.134 ± 0.0098 in) and the maximum material remotion (B) MUST BE less than 0.13mm (0.0051 in).

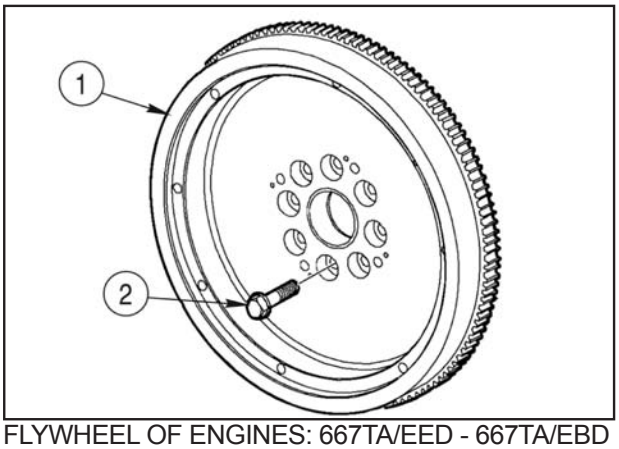


Engine Flywheel

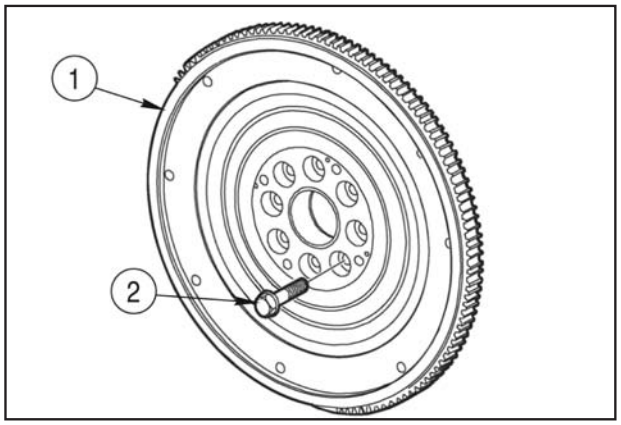
The engine flywheel (1) is not synchronized to the crankshaft and do not have any marks, slots or reference holes for sensors or sychronism. The fixation screws holes equidistance (2) allows the installation in any position.



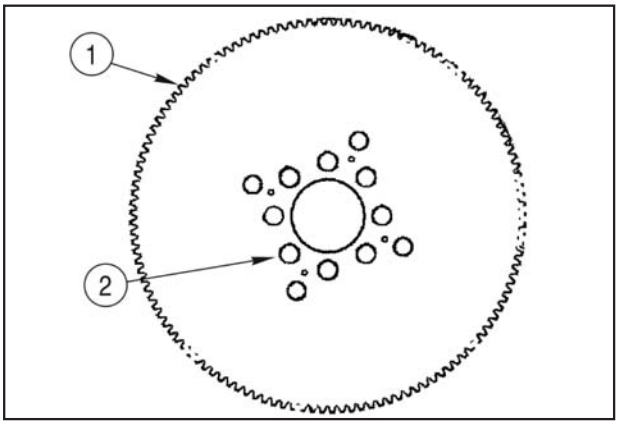
FLYWHEEL OF ENGINES: 667TA/EEG - 667TA/EEC



FLYWHEEL OF ENGINES: 667TA/EED - 667TA/EBD



FLYWHEEL OF ENGINES: 667TA/EBF - 667TAEED



FLYWHEEL OF ENGINES: 667TA/EDJ