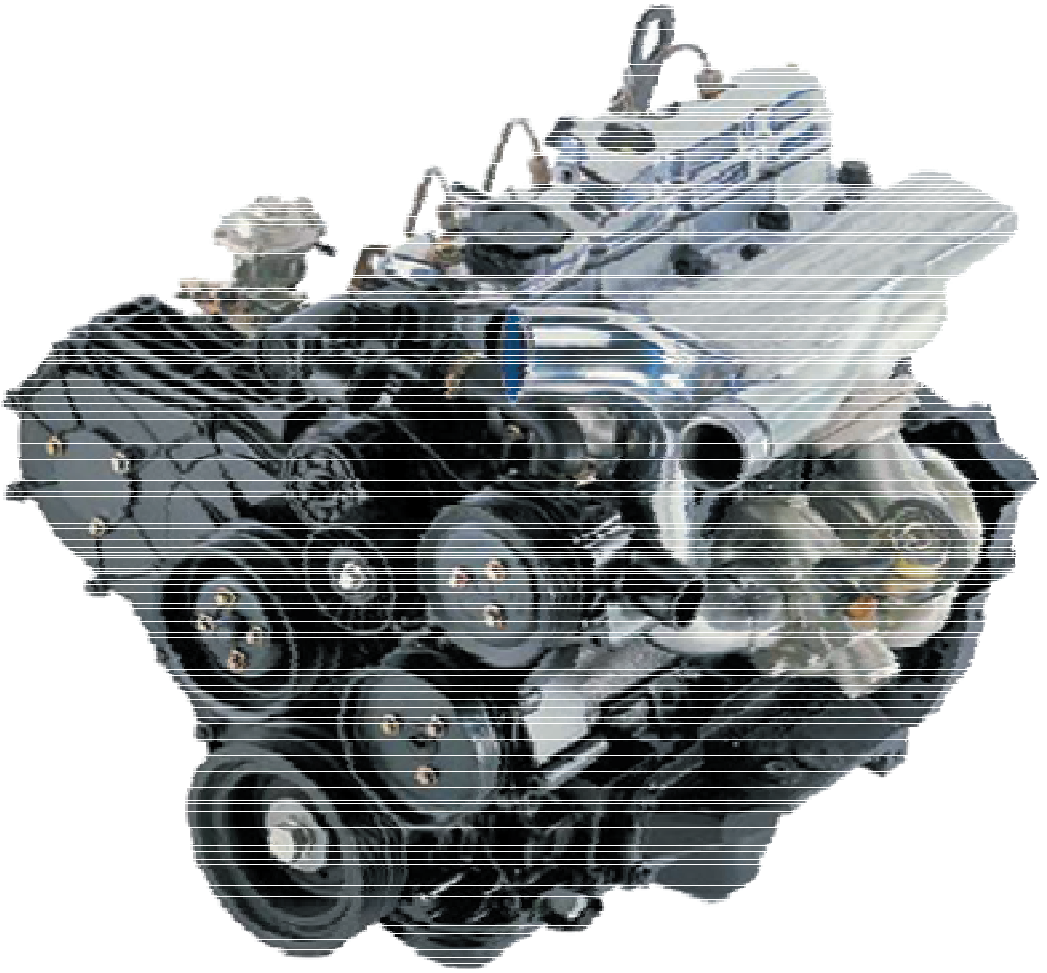
INTERNATIONAL®

Engines

SERVICE MANUAL



International HS 2.8L

➤ *PRESENTATION*

This Service Manual has technical specifications necessary to a correct maintenance and repairing of the International HS 2.8L engines.

As a strictly technical literature, it has been avoided the inclusion of theory concepts and basic definitions, due to this publication purpose.

It is important to learn how to correctly operate, to maintain and to repair these engines, as well to know the issues that may cancel warranty due to a bad operation, unauthorized adaptations, unoriginal parts use or any other procedures that affect it way any.

Following the instructions and specifications of this manual, the maintenance and repairing will be made in the most correct and safety way possible.

INTERNATIONAL ENGINES SOUTH AMERICA LTDA reserves the right of changing the content of this publication without warning, whenever innovations are necessary to be introduced in its products.

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SAFETY PRECAUTIONS

➤ *SAFETY PRECAUTIONS*

Warning: The texts emphasized with the symbol ⚠ means direct or indirect personal injuries risk.

Read carefully this manual and keep it always on hand to clarify any doubts.
Do not try to operate the equipment without knowing all controls and understanding the operation of the main systems.

Take all precautions of safety indicated next, because they are your protection during the work.

- Do not change the original features of the engine.
- Do not smoke while filling fuel tank.
- Clean immediately all and any spilled fluid. Put the material used on cleaning in a safe position and discard according the Local Legislation.
- Do not fill, while engine is running, unless it is absolutely necessary.
- Never clean, lubricate or adjust an engine in operation.
- Do not adjust anything, if you do not know how to do it correctly.
- Do not operate the engine in closed rooms, because the exhaust gases are extremely “prejudicial” to the health.
- Do not allow people or animals to stay close to the engine, vehicle or equipment while in operation.
- Do not allow people with loose clothes or long and loose hair to stay close to the mobile parts.
- Stay away from the rotary parts. Remember that helices, for example, cannot be well seen while the engine is running.
- Do not remove radiator cap if the engine is still hot, because cooling water, under pressure, is extremely dangerous, and may spill and cause serious injuries.
- Do not use salty water or any other substance that can cause corrosion in the cooling system.
- Avoid sparks or fire near batteries, especially while they are charging, because they can cause explosions. The solution of the batteries could boil and its contact with the skin and eyes is dangerous.
- Disconnect battery terminals before doing any repair in the electric system.
- Seek medical assistance if diesel fuel, under high pressure, penetrates the skin.

ENVIRONMENT

➤ *ENVIRONMENT*

ENVIRONMENTAL POLICY

INTERNATIONAL ENGINES SOUTH AMERICA LTDA is committed with the continuous search of the environment preservation in Diesel engines production for the worldwide market, through an efficient administration of its resources, processes and products.

GUIDELINES:

To attend the legislation, applicable environmental rules and other requirements that the Company has joined.

To develop products and procedures to reduce environmental impacts and to avoid pollution.

To apply an efficient administration system that promotes the continuous improvement to reach environmental objectives and targets.

To promote, in the Company, the sense of individual responsibility in relation with the environment.

To involve its suppliers and service suppliers in the development of habits which cooperate in the preservation of the environment.

ENVIRONMENT

The environment preservation is a basic point in the managerial philosophy of **INTERNATIONAL ENGINES SOUTH AMERICA LTDA.**

It has been approved a program of actuation that includes activities as natural resources conservation, elimination and residues recycling, water protection, noise reduction and acoustic isolation, air purity conservation and contaminants residues elimination.

All these subjects constitute the mark of a wide environment protection program, which is considered since the beginning of a new product project.

The International HS 2.8L engine was released in the market and accomplishes without problems all these requirements.

The systematical accomplishment of this philosophy can be appreciated especially in the main aspects, like disassembly easiness, less number of materials, usage of plastics of easy recycling.

It means, equally, that materials harmful to the environment are not used, like amianthus, cadmium and hydro-carbide fluor-chlorined.

In the same field, gases and acoustics emissions reduction are considered, as well as the improvement of the active and passive safety.

This environment protection program is not limited only to the production process, because it is extended to the complete cycle of useful life of the engine, considering also its wear after a long operation period.

We have assumed a commitment with the planet we live in. A commitment that we take very seriously.

ENVIRONMENTAL POLLUTION CONTROL

INTERNATIONAL ENGINES SOUTH AMERICA LTDA, through its Environmental Administration System, has improved more and more its engines contributing to pollution reduction (Program of Air Pollution Control for Auto-Motorized Vehicles - PROCONVE) and attending, in this way, to the resolutions of CONAMA (National Council of the Environment).

Warning: The engine adjustment values specified in this manual, must be strictly observed, because, besides to offer a better performance to the vehicle, also reduce noises and harmful gases emissions to the atmosphere.

Warning: Any change in the fuel injection or air intake system, or even the exhaust system, may affect directly the homologated values.

DESTINATION OF THE USED COMPONENTS OF THE ENGINE

INTERNATIONAL ENGINES SOUTH AMERICA LTDA is applying in its engines, more and more, materials of easy recycling, making easy this way, in the end of the component life, its sale or re-fusion.

Plastic and Metallic Components / Packing

This type of component must be sent to a Scrap Trade where the parts will be sold and re-melted.

Lubricant Oil

This fluid has a high polluting potential and it cannot be discarded, never, in the sewer. Send it to companies that make the re-process (re-refine).

TECHNICAL FEATURES

➤ *TECHNICAL FEATURES*

ENGINE TYPE	INTERNATIONAL HS 2.8L	
PL number	8B60	8B61
Turbocharger	Variable Nozzle (VNT)	With Wastegate
Number and Cylinder Arrangement	4 in line	
Cylinder Nominal Bore	93.0 mm	
Stroke	102.50 mm	
Cycle	Diesel, 4 stroke	
Compression Relation	19.5 : 1	
Total Displacement	2,8 Liters	
Combustion System	Direct Injection	
Rotation Sense (front view)	Clockwise	
Firing Order	1 - 3 - 4 - 2	
Opening Beginning	86 - 90 ºC	
Operation Temperature	86 -102 ºC	
Lubricant oil Pressure (at Maximum Specified Speed With the Engine at Normal Operation Temperature)	3.5 bar	
Maximum Speed Unload	4640 rpm	
Idle Speed	800 rpm ± 20	
Static Injection Beginning at TDC	0º	
Engine Cooling	Liquid	
Power (NBR5454)	135 hp (99 kW) at 3800 rpm	133 hp (97 kW) at 3800 rpm
Torque (NBR5454)	38.2 kgfm (375 Nm) at 1400 rpm	36.2 kgfm (355 Nm) at 1600 rpm
Weight (basic unit)	208 kg	205 kg