NEF is the highest expression of engine versatility and efficiency made available by IVECO to the customers. They are highly innovative engines, designed to comply today with future exhaust gas and noise emission regulations. NEF is a range of 3, 4, 6 cylinder Diesel engines that can be customized in a wide variety of ways, with traditional injection systems complemented by a common rail fuel supply system with total electronic control.
Designed with innovative techniques and manufactured with cutting edge work and assembly processes, the engines of the NEF range are the result of more than 100 years of engine-making tradition and of the constant effort that IVECO, a worldwide leader in power train systems, invests into research, to find improved and more advanced technologies.
The implementation of new criteria with greater definition of the control parameters, that determine the combustion process and injection control, results in new balance between high performance and fuel economy.

The use of waste-gate controlled turbines allows for the highest torque levels in a wide range of rpm settings, while assuring an effective delivery of high power. Modern production processes are employed for the engine and its components, the controlled combustion inside the cylinders with near perfect filtration and cooling treatment, has resulted in extremely low lubrication oil consumption.
EXTRAORDINARY VERSATILITY

A WIDE SELECTION OF CONFIGURATIONS PROVIDES THE POSSIBILITY TO TAILOR THE ENGINEERING SOLUTION TO THE CUSTOMER’S REQUIREMENTS

The 3, 4, and 6 cylinder NEF engines are available in many design solutions such as two-and four-valve cylinders, natural or supercharged induction, and structural engine blocks for load-bearing purposes. The range of engines equipped with electronic control allows for customization power matching since the engine’s performance can be adapted to each specific usage profile. Interfacing on the CAN data Bus, the Central Unit exchanges data with other electronic Units connected to the application and complementing the different system requirements to manage the engine in unique fashion; the impressive availability of structural and application options enhances versatility.

- Traditional or structural engine blocks
- Lubrication oil sumps of suitable shape and size
- Oil and fuel filters variable by number, type and position
- SAE 1 – SAE 2 – SAE 3 flywheel housing
- Coupling flywheels for different type of driveline
- Intake and exhaust manifolds adapted in shape and position
- Cooling fans tailored by type and position
- Front and rear power takeoffs up to 240 Nm
- Shafts and balancing masses
- Hydraulic oil pumps as required
- Single and twin cylinder air compressor
- A/C compressor for air and liquid
- Suitable heat exchangers
- Starting aid systems
- 12 or 24V service and monitoring electrical systems
A perfect combustion process enables not only the reduction of hydrocarbon and nitrogen oxide emissions, but also reduces fuel burning, thereby assisting in curtailing the greenhouse effect. The reduction of noise emissions, provided by a rigid structure, has been improved with the adoption of rubber gaskets on cover and sump. Further enhancements are due to the pilot injection which, by facilitating a progressive and complete combustion, softens the typical Diesel engine knock. With a noise level of 91 dBA, 95 dBA with mechanical pump, (at rated power) they are in absolute terms the quietest in their respective category of use. They comply with all major certification standards today in terms of gaseous emissions, EPA-CARB, directive CE, with no consumption penalties, and the engineering solutions adopted have allowed for a considerable reduction in operating costs, thanks to extended operating times between maintenance.
The excellent performance of NEF engines originates in the new-design intake and exhaust ducts where the gas exchange phases and intake air turbulence are optimized and the potential of the new injection systems is fully utilized. A perfect diffusion of the spray thus sets the stage for a progressive and complete combustion of the injected fuel, thereby providing for the high thermodynamic efficiency that enables to deliver the best performance in terms of torque and power, as well as fuel economy. The wide range of engines equipped with rotary or in-line pump injection system is further broadened by those fitted with the Common Rail system with total electronic control.
**TECHNOLOGICAL EXCELLENCE**

**Marine**

- **POWER**
- **TORQUE**

- **Industrial - Agriculture**

- **POWER**
- **TORQUE**

**Power Generation**

- **STAND-BY**
- **PRIME**

* Maximum performance in accordance with the specific Directives ISO 3046/1-DIN 6271- BS 5514-SAE J 1349 Test Conditions

**Maximum performance in accordance with ISO 8528**
TOTAL ELECTRONIC CONTROL

COMMON RAIL, NEW FRONTIER FOR INJECTION SYSTEMS, WITH 1500 BAR PRESSURES ACHIEVES OPTIMUM FUEL ATOMISATION FOR THE BEST POSSIBLE COMBUSTION UNDER ANY OPERATING CONDITION.

Injection control by the Electronic Central Unit allows for the greatest flexibility in fuel supply management, driving fuel delivery according to the requirements of the engine’s mission profile. In addition to providing for independent fuel injection management in each cylinder, the electronic control also monitors the operating conditions and checks the engine’s efficiency, offering total safety, even when conditions are extremely demanding.
SYSTEM PERFORMANCE
- Computation of injection quantity and advance
- Combustion verification
- Management of starting aid systems
- Isochronous control over engine rpm setting
- Optimized acceleration transient management
- Balancing torque delivery among the cylinders

- Injection compensation with engine and fuel temperature variations
- Tailoring operation to different environmental conditions
- Limiting engine torque and maximum rpm
- Managing the PTO rpm and the torque increase mode
- Recording operating events: hours, consumption, utilization factors
- Communication with other electronic units connected to the application on “CAN” network
- Self-diagnosis of critical operating factors
- Alarm indication in preventive, present, critical mode
- Communication with programming and diagnosing tools
NEF is the result of the experience accumulated with millions of engines manufactured and placed in service worldwide, in the most demanding applications, and its design takes into account this vast experience, avoiding any compromise that could detract, even to a minimal extent, from its best behavior. **NEF was conceived and developed as a robust design.** Design solutions inherited from heavy-duty engines and the absolute precision of the work processes assure **the highest possible operating reliability and long life.**
The 3, 4, and 6 cylinder NEF engines are available in many design solutions such as two-and four-valve cylinders, natural or supercharged induction, and structural engine blocks for load-bearing purposes. The range of engines equipped with electronic control allows for customization power matching, since the engine’s performance can be adapted to each specific usage profile. Interfacing on the CAN data Bus, the Central Unit exchanges data with other electronic Units connected to the application and complementing the different system requirements to manage the engine in unique fashion; the impressive availability of structural and application options enhances versatility.

- Traditional or structural engine blocks
- Lubrication oil sumps of suitable shape and size
- Oil and fuel filters variable by number, type and position
- SAE 1 –... for air and liquid
- Suitable heat exchangers
- Starting aid systems
- 12 or 24 V service and monitoring electrical systems
Availability of more than 20 different structural options. Traditional or total electronic control injection systems. Configuration designed to provide optimal access to every part of the engine and to reduce maintenance time. Limited number of components: 40% fewer than engines with equal performance levels. “Electronic” forecast of ordinary and extraordinary maintenance. Check of valve-rocker arm play after 4,000 hours. Replacement of lubrication oil and filters after an operating time up to 1,000 hours.

- Rear control of the timing system
- Extra strong engine block with provisions for overhaul
- Optimized cooling circuit for perfect temperature stabilization
- Lubrication oil sump coupled to the engine block with rubberized gasket
- Oversized dimensioned drive gear train
- Drive shaft made of induction hardened steel or cast iron
- New design connecting rods characterized by the perfect geometry of their end cap assembly
- Aluminum — nickel pistons for better heat dissipation and smaller moving masses
- Front — end configurable with many accessories
<table>
<thead>
<tr>
<th>ENGINE CYLINDERS AND ARRANGEMENT</th>
<th>3 cylinders inline</th>
<th>4 cylinders inline</th>
<th>6 cylinders inline</th>
</tr>
</thead>
<tbody>
<tr>
<td>displacement cm³</td>
<td>3364</td>
<td>3920</td>
<td>5880</td>
</tr>
<tr>
<td>bore mm</td>
<td>104</td>
<td>102</td>
<td>102</td>
</tr>
<tr>
<td>stroke mm</td>
<td>132</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>valves/cylinder n°</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>air feeding</td>
<td>NA - TC</td>
<td>TC - TAA</td>
<td>TAA - NA - TC</td>
</tr>
<tr>
<td>injection system</td>
<td>MEC</td>
<td>MEC - EL</td>
<td>MEC - EL</td>
</tr>
<tr>
<td>cylinder block</td>
<td>S</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>dimensions L mm</td>
<td>650 - 760</td>
<td>770 - 880</td>
<td>1010 - 1120</td>
</tr>
<tr>
<td>H mm</td>
<td>585 - 700</td>
<td>585 - 700</td>
<td>585 - 700</td>
</tr>
<tr>
<td>W mm</td>
<td>800 - 920</td>
<td>800 - 920</td>
<td>800 - 920</td>
</tr>
<tr>
<td>weight Kg</td>
<td>300</td>
<td>310</td>
<td>440</td>
</tr>
</tbody>
</table>

NA: naturally aspirated — TC: turbocharged — TAA: turbocharged after cooled
MEC: mechanical injection pump — EL: with electronic control
S = structural – N = not structural  * dry weight for basic configuration engine
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