

Explore the Engineering Edge

**IHI** GROUP

 **SHIBAURA**

# DIESEL ENGINE TECHNOLOGY.

TRADITIONAL VALUES – LEADING EDGE SOLUTIONS

 **Important information**

Improper use of any product may cause serious or fatal injury. Read carefully the operating and safety instructions in your owner's manual before use.

 **SHIBAURA**  
IHI Shibaura Machinery Corporation

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URL : [www.ihi-shibaura.com/english](http://www.ihi-shibaura.com/english)

INT-EN-EN-1406-AC-10

# CORPORATE PROFILE.

## IHI Corporation

The IHI Group legacy began in 1853 with the founding of the Ishikawajima Shipyard. This shipbuilding history was soon expanded as the IHI Group employed its mechanical engineering expertise in a wide variety of fields through the development of machinery for use on land and subsequently in aerospace applications.



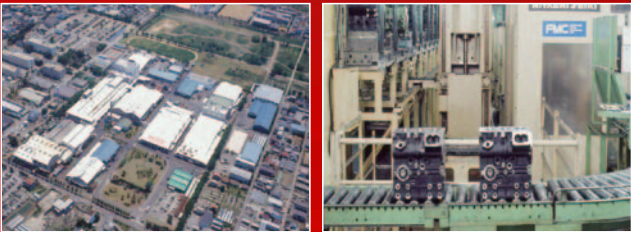
## IHI Shibaura Machinery Corporation

IHI Shibaura Machinery Corporation is a subsidiary of IHI Corporation and was established in 1950 as a joint venture between Ishikawajima Shipyard and Shibaura Engineering Works, Ltd. This venture was established with the intention of providing Japan and the rest of the world with the most comprehensive engineered products in a wide variety of fields. IHI Shibaura Machinery Corporation is a leader in the design, engineering and manufacturing of Diesel Engines, Compact Tractors and Tractor Components, Golf & Turf Care Products, Fire-Fighting Pumps and Ozone Disinfection equipment for environmental control systems.



## Japanese Quality

From our main factory in Matsumoto City in Nagano, Japan, we bring the world the most durable and reliable products on the market, all representing our core values of sincerity, diligence and innovation. Our products are all built to the highest standards and focused on our customers' needs. We satisfy the needs of every professional looking for diesel engines that tackle the tough work with ease while always delivering reliability and value.



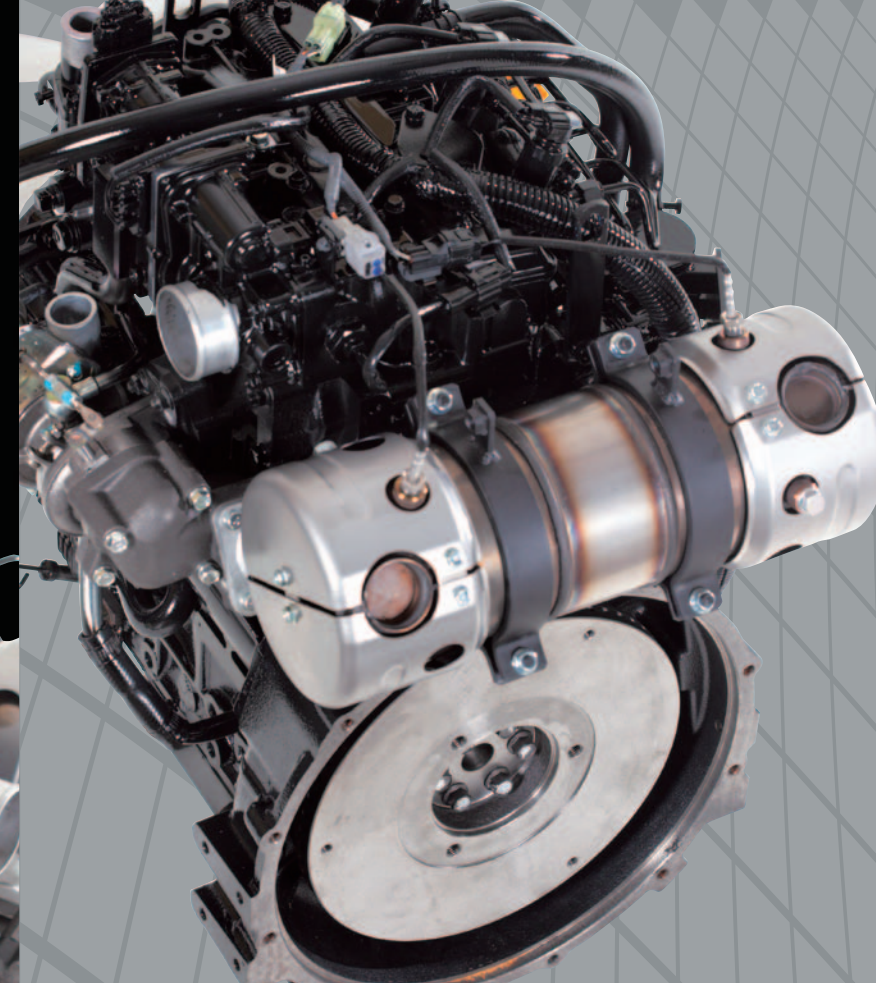
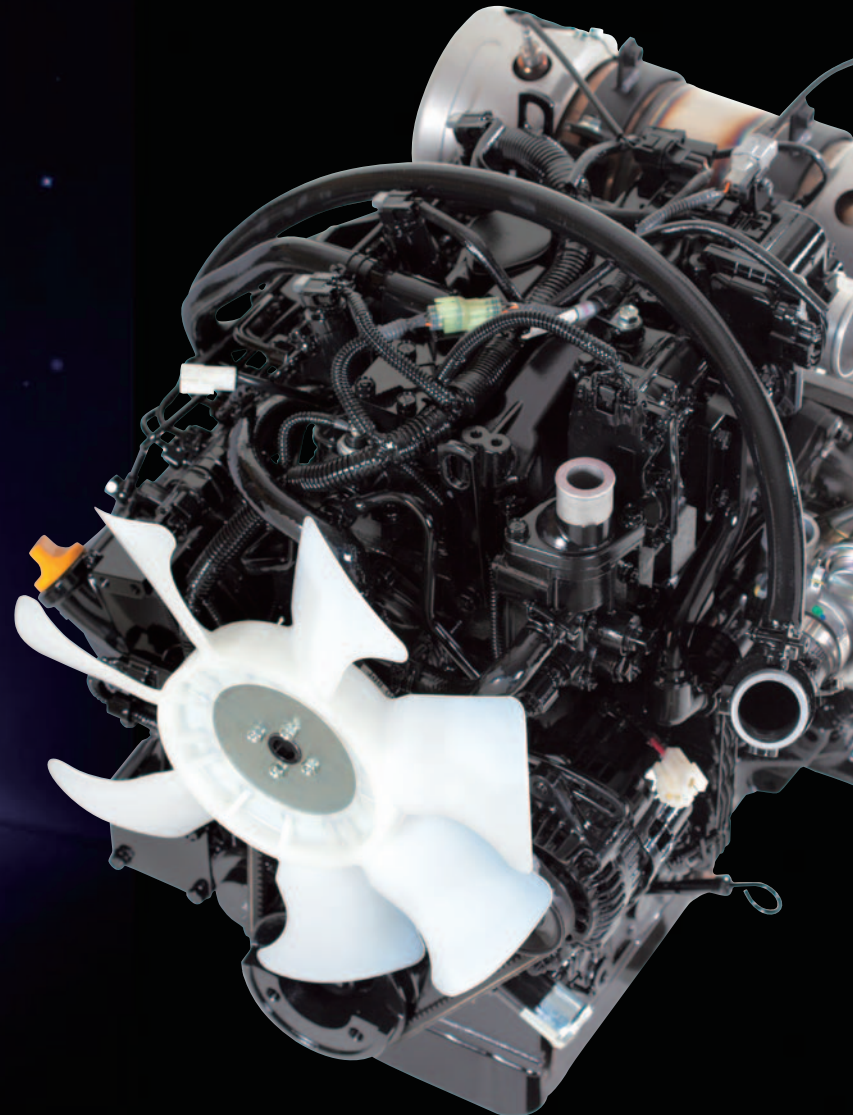
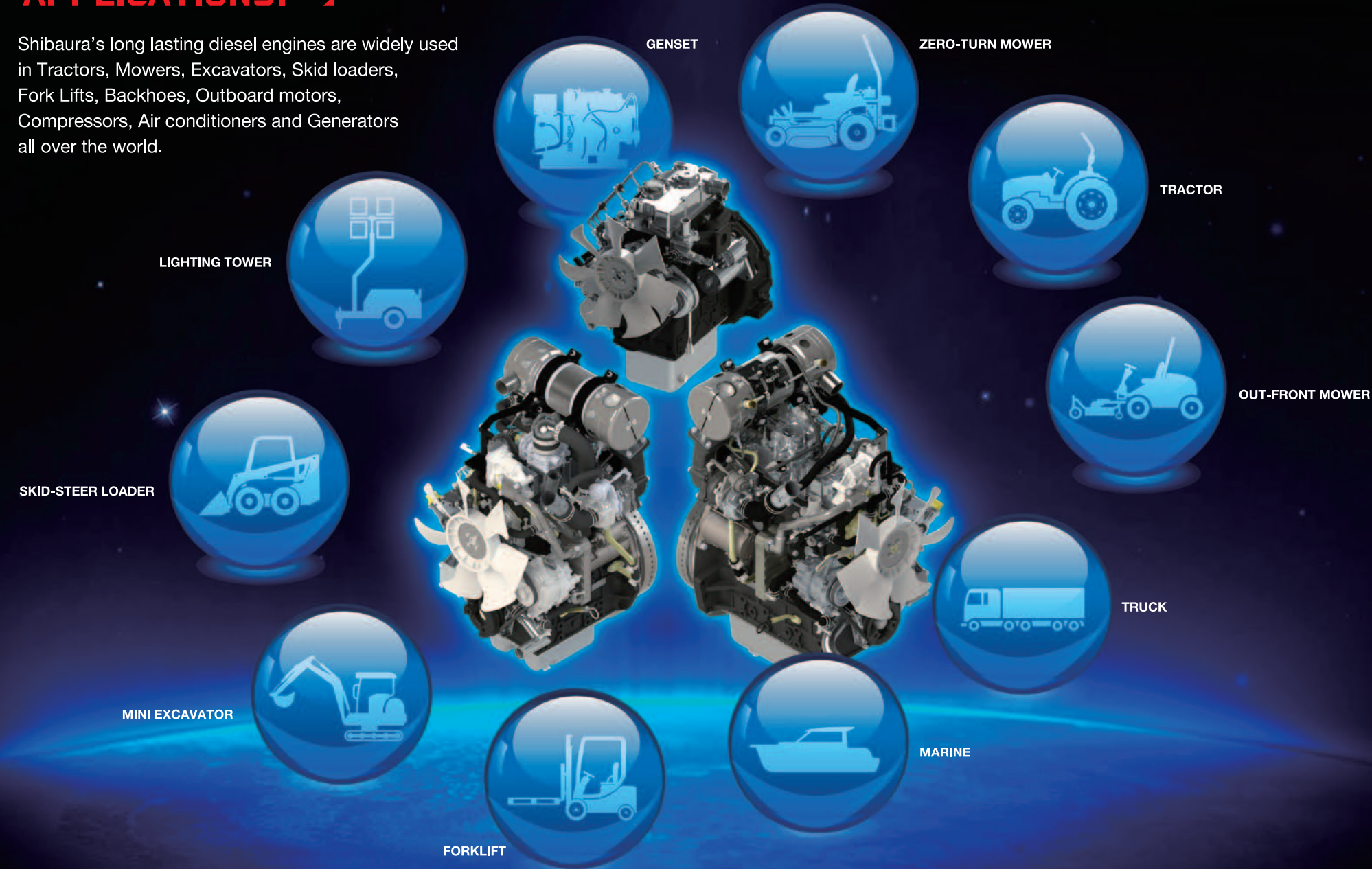
# HISTORY OF SHIBAURA.

- 1951 Japan's first Ride-On Tractor AT-III launched.
- 1961 Technical tie-up with Motoren-Werke-Mannheim (MWM)
- 1972 Long term tractor supply agreement with Ford Motor tractor division (now CNH Group).
- 1976 Long term Power Tool supply agreement with STIHL.
- 1985 Long term engine supply agreement with Perkins Engines Ltd .
- 1995 Perkins Shibaura Engines Limited (PSEL) founded as a joint venture with Perkins Group Limite in the UK.
- 1998 EPA Tier 1 diesel engine.
- 1999 Power Tool supply agreement with MTD.
- 2002 Accumulated total engine production reached 1 million units.
- 2004 EPA Tier 2 diesel engine  
2004 Perkins Shibaura Engines LLC (PSEA) founded as a joint venture with Perkins Group Limited in the USA.
- 2007 EPA Tier 3 diesel engine, D series
- 2008 Perkins Shibaura Engines (Wuxi) Company Limited (PSEW) founded in China.
- 2012 EPA Tier 4 diesel engine, F series , the world's first CRDi Engine without DPF launched.
- 2013 Accumulated total engine production reached 2.5 million units.



## APPLICATIONS.

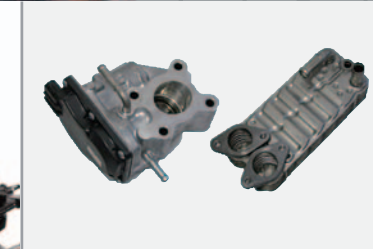
Shibaura's long lasting diesel engines are widely used in Tractors, Mowers, Excavators, Skid loaders, Fork Lifts, Backhoes, Outboard motors, Compressors, Air conditioners and Generators all over the world.



Shibaura's new engine series uses a High Pressure Common Rail fuel system, a maintenance-free Diesel Oxidation Catalyst (DOC)-only solution and Cooled Exhaust Gas Recirculation to reach EPA Final Tier 4 compliance. Shibaura's solutions offer you simplicity and sustainability in a broad power range for all of your applications.



Maintenance free compact DOC without DPF.



Cooled EGR (Exhaust Gas Recirculation) System to reduce NOx emission.



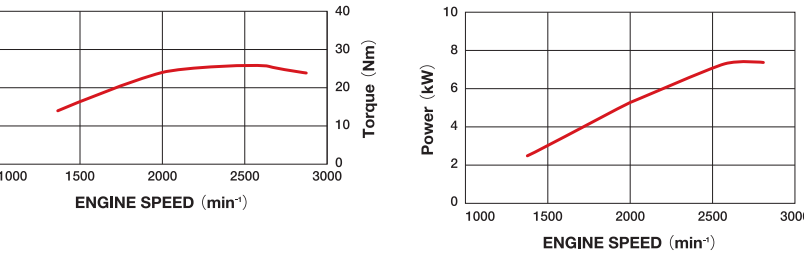
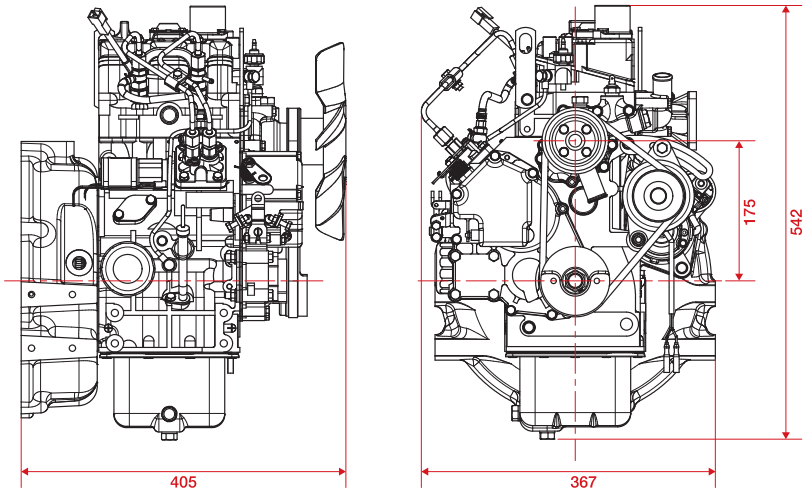
High pressure common rail fuel system to reduce the amount of PM generated during combustion.



Advanced IHI Compact turbo charger unit with waste gate valve.

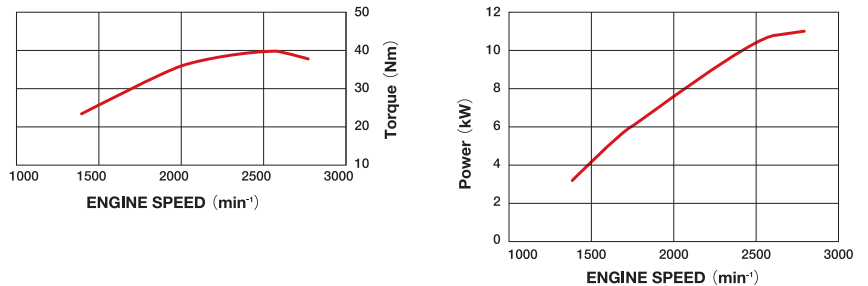
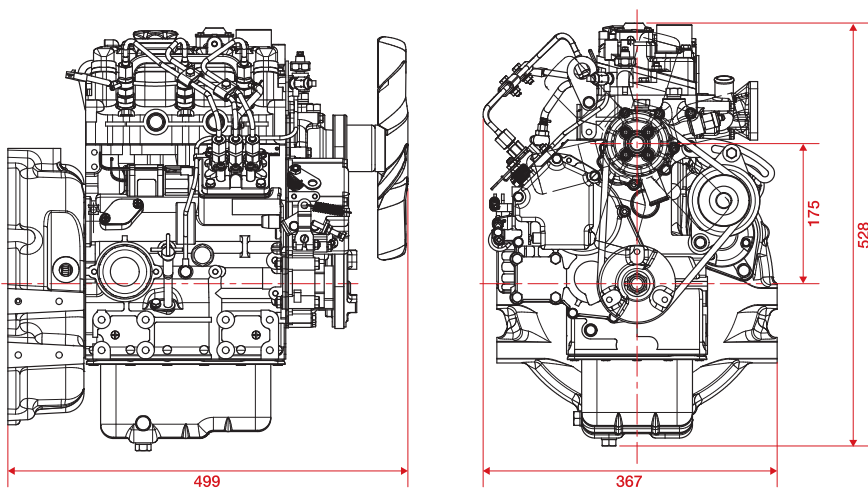
## EPA TIER 4 TECHNOLOGY.

E672L-F



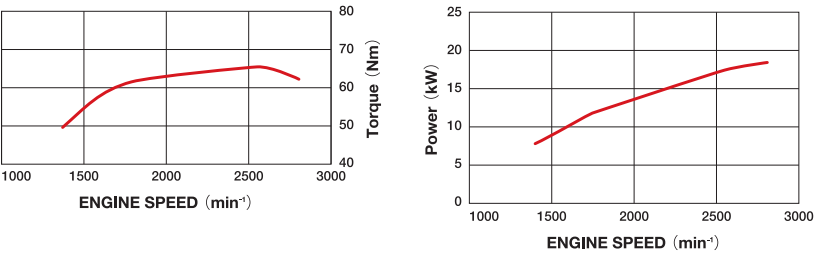
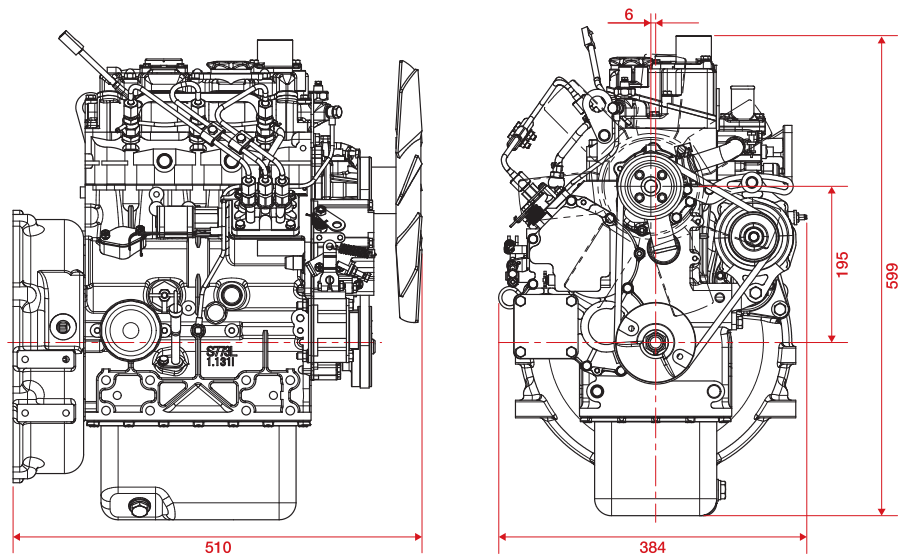
| Engine model name                                                                              |      |                   |  | E672L-F                                       | E673L-F     |
|------------------------------------------------------------------------------------------------|------|-------------------|--|-----------------------------------------------|-------------|
| Cylinder type                                                                                  |      |                   |  | Vertical in-line water-cooled 4 stroke diesel |             |
| The number of cylinders                                                                        |      |                   |  | 2                                             | 3           |
| Cylinder bore × stroke                                                                         |      | mm                |  | 67 × 72                                       | 67 × 72     |
| Displacement                                                                                   |      | cc                |  | 508                                           | 761         |
| Combustion system                                                                              |      |                   |  | IDI (Swirl-chamber)                           |             |
| Compression ratio                                                                              |      |                   |  | 23.5                                          | 23.5        |
| Emission regulation                                                                            |      |                   |  | Tier4                                         | Tier4       |
| Rated power based on SAE J1995 (without fan, intake&exhaust resistance ). Equal to EPA kW (HP) | 1800 | min <sup>-1</sup> |  | -                                             | 7.4 (9.9)   |
|                                                                                                | 2200 | min <sup>-1</sup> |  | 5.9 (7.9)                                     | 8.8 (11.8)  |
|                                                                                                | 2400 | min <sup>-1</sup> |  | 6.4 (8.5)                                     | 9.8 (13.1)  |
|                                                                                                | 2600 | min <sup>-1</sup> |  | 7.0 (9.3)                                     | 10.5 (14.0) |
|                                                                                                | 2800 | min <sup>-1</sup> |  | 7.2 (9.6)                                     | 10.9 (14.6) |

E673L-F



| Engine model name                        |        |    | E672L-F                              | E673L-F |
|------------------------------------------|--------|----|--------------------------------------|---------|
| Dry weight (with after treatment system) |        | kg | 58                                   | 75      |
| Weight of after treatment system         |        | kg | —                                    | —       |
| Dimensions                               | Length | mm | 369                                  | 443     |
|                                          | Width  | mm | 385                                  | 385     |
|                                          | Height | mm | 523                                  | 523     |
| Direction of rotation                    |        |    | CCW (view from flywheel side)        |         |
| Cooling system                           |        |    | Radiator type                        |         |
| Lubricating system                       |        |    | Forced lubrication by hydraulic pump |         |
| Engine oil to be applied                 |        |    | Equivalent to CH-4                   |         |
| Fuel                                     |        |    | Diesel fuel (ultra low sulfur)       |         |
| Governor                                 |        |    | Mechanical All-speed                 |         |
| Injection pump                           |        |    | Bosch PFR                            |         |

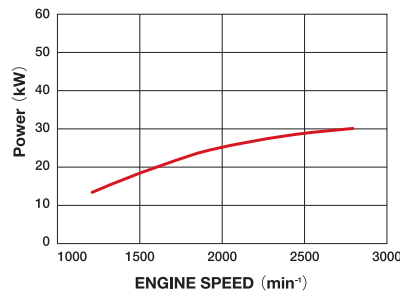
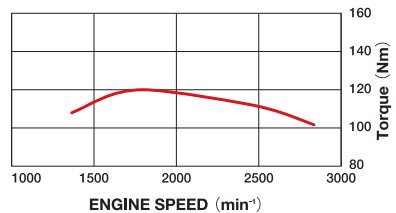
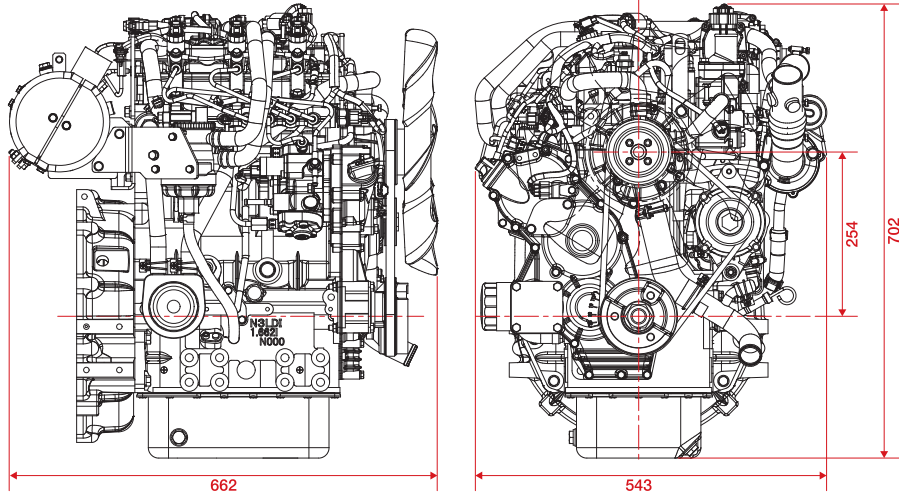
S773L-F



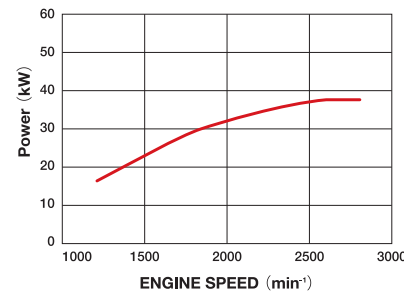
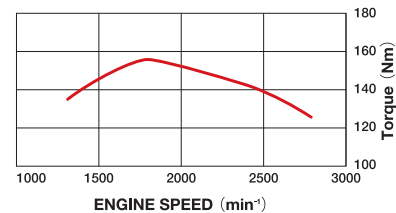
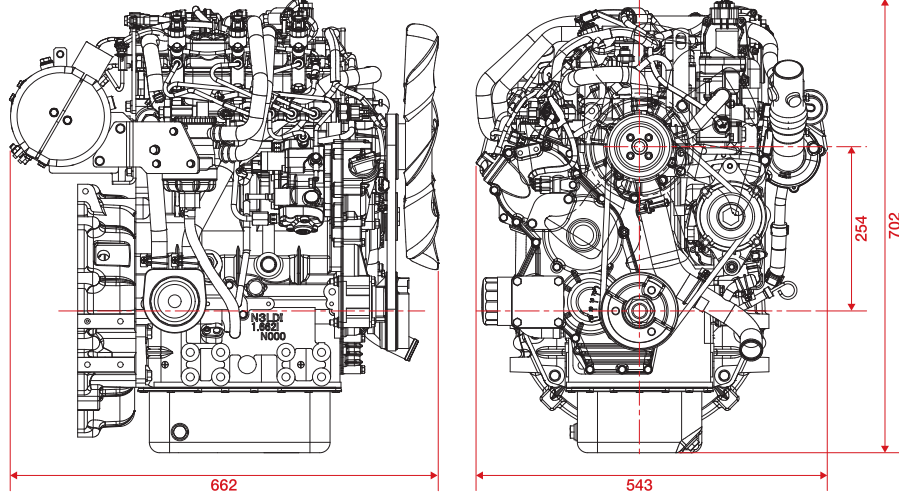
| Engine model name                                                                              |      |                   |  | S773L-F                                       |
|------------------------------------------------------------------------------------------------|------|-------------------|--|-----------------------------------------------|
| Cylinder type                                                                                  |      |                   |  | Vertical in-line water-cooled 4 stroke diesel |
| The number of cylinders                                                                        |      |                   |  | 3                                             |
| Cylinder bore × stroke                                                                         |      | mm                |  | 77 × 81                                       |
| Displacement                                                                                   |      | cc                |  | 1131                                          |
| Combustion system                                                                              |      |                   |  | IDI (Swirl-chamber)                           |
| Compression ratio                                                                              |      |                   |  | 23.5                                          |
| Emission regulation                                                                            |      |                   |  | Tier4                                         |
| Rated power based on SAE J1995 (without fan, intake&exhaust resistance ). Equal to EPA kW (HP) | 1800 | min <sup>-1</sup> |  | 11.2 (15.0)                                   |
|                                                                                                | 2200 | min <sup>-1</sup> |  | 14.4 (19.3)                                   |
|                                                                                                | 2400 | min <sup>-1</sup> |  | 16.1 (21.5)                                   |
|                                                                                                | 2600 | min <sup>-1</sup> |  | 17.3 (23.1)                                   |
|                                                                                                | 2800 | min <sup>-1</sup> |  | 18.4 (24.6)                                   |

| Engine model name                        |        |    |                                      | S773L-F |
|------------------------------------------|--------|----|--------------------------------------|---------|
| Dry weight (with after treatment system) |        | kg |                                      | 87      |
| Weight of after treatment system         |        | kg |                                      | —       |
| Dimensions                               | Length | mm |                                      | 453     |
|                                          | Width  | mm |                                      | 384     |
|                                          | Height | mm |                                      | 600     |
| Direction of rotation                    |        |    | CCW (view from flywheel side)        |         |
| Cooling system                           |        |    | Radiator type                        |         |
| Lubricating system                       |        |    | Forced lubrication by hydraulic pump |         |
| Engine oil to be applied                 |        |    | Equivalent to CH-4                   |         |
| Fuel                                     |        |    | Diesel fuel (ultra low sulfur)       |         |
| Governor                                 |        |    | Mechanical All-speed                 |         |
| Injection pump                           |        |    | Bosch PFR                            |         |

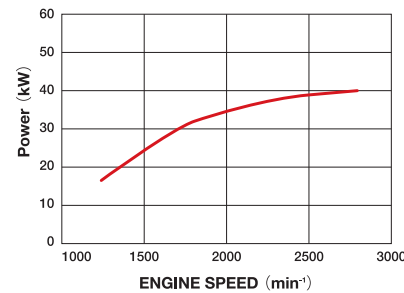
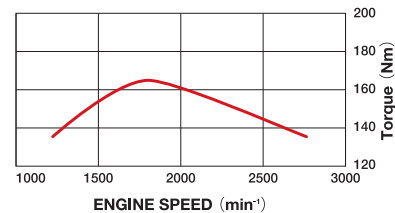
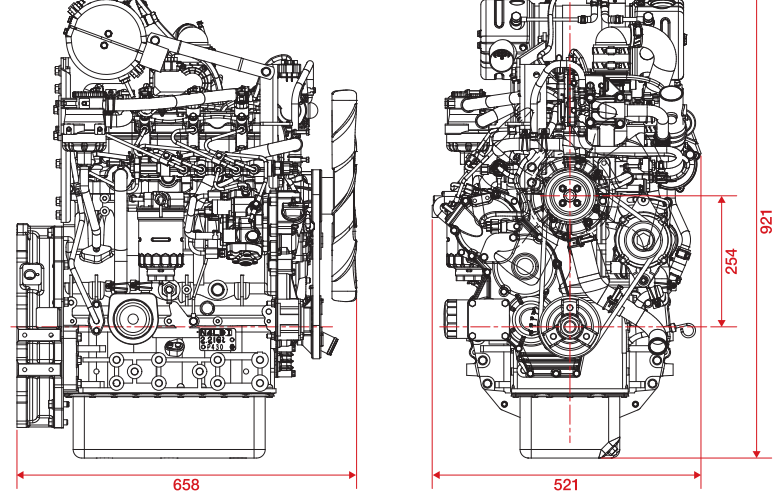
N3LDI-T



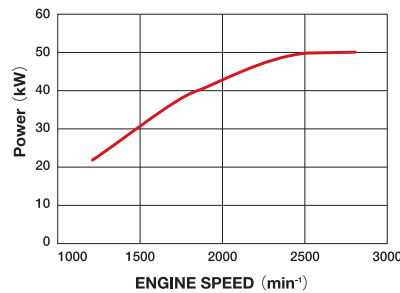
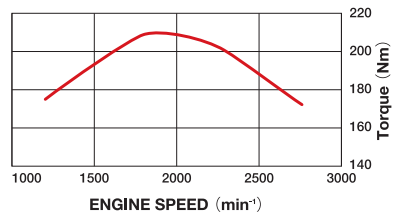
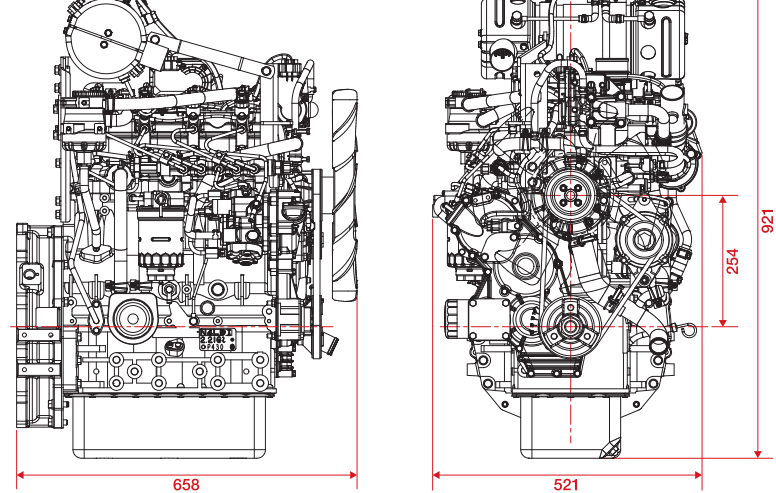
N3LDI-TA



N4LDI-T



N4LDI-TA



| Engine model name                                                                                    |      |                   |  | N3LDI-T                                       | N3LDI-TA    |
|------------------------------------------------------------------------------------------------------|------|-------------------|--|-----------------------------------------------|-------------|
| Cylinder type                                                                                        |      |                   |  | Vertical in-line water-cooled 4 stroke diesel |             |
| The number of cylinders                                                                              |      |                   |  | 3                                             | 3           |
| Cylinder bore × stroke                                                                               |      | mm                |  | 84 × 100                                      | 84 × 100    |
| Displacement                                                                                         |      | cc                |  | 1662                                          | 1662        |
| Combustion system                                                                                    |      |                   |  | Common-rail DI                                |             |
| Compression ratio                                                                                    |      |                   |  | 18.0                                          | 18.0        |
| Emission regulation                                                                                  |      |                   |  | Tier4,Stage III B                             |             |
| Rated power based on SAE J1995<br>(without fan, intake&exhaust resistance ).<br>Equal to EPA kW (HP) | 1800 | min <sup>-1</sup> |  | 20.0 (26.8)                                   | 25.0 (33.5) |
|                                                                                                      | 2200 | min <sup>-1</sup> |  | 25.0 (33.5)                                   | 30.0 (40.2) |
|                                                                                                      | 2400 | min <sup>-1</sup> |  | 27.0 (36.2)                                   | 32.0 (42.9) |
|                                                                                                      | 2600 | min <sup>-1</sup> |  | 29.0 (38.9)                                   | 35.0 (46.9) |
|                                                                                                      | 2800 | min <sup>-1</sup> |  | 30.0 (40.2)                                   | 37.0 (49.6) |
| Dry weight (with after treatment system)                                                             |      | kg                |  | 192                                           |             |
| Weight of after treatment system                                                                     |      | kg                |  | 72                                            |             |

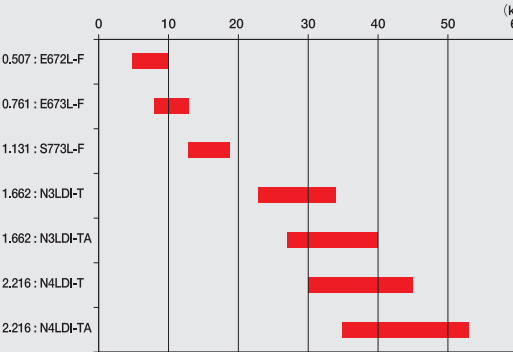
| Engine model name        |                       |    |  | N3LDI-T                                | N3LDI-TA                               |
|--------------------------|-----------------------|----|--|----------------------------------------|----------------------------------------|
| Dimensions               | Length                | mm |  | 670 (DOC rear mount)                   |                                        |
|                          | Width                 | mm |  | 535                                    |                                        |
|                          | Height                | mm |  | 715                                    |                                        |
| Direction of rotation    |                       |    |  | CCW (view from flywheel side)          |                                        |
| Cooling system           |                       |    |  | Radiator type                          | Radiator type (with Charge air cooler) |
| Lubricating system       |                       |    |  | Forced lubrication by hydraulic pump   |                                        |
| Engine oil to be applied |                       |    |  | API CJ4 Low Ash Oil                    |                                        |
| Fuel                     |                       |    |  | Diesel fuel (ultra low sulfur)         |                                        |
| Governor                 |                       |    |  | Common-rail system (CAN-bus compliant) |                                        |
| Injection pump           |                       |    |  | High pressure CR                       |                                        |
| Emission control         | Basic strategy        |    |  | HPCR                                   |                                        |
|                          | NOx reduction         |    |  | Cooled EGR                             |                                        |
|                          | Active regeneration   |    |  | No need                                |                                        |
|                          | Emission purification |    |  | DOC                                    |                                        |

| Engine model name                                                                                    |      |                   |  | N4LDI-T                                       | N4LDI-TA    |
|------------------------------------------------------------------------------------------------------|------|-------------------|--|-----------------------------------------------|-------------|
| Cylinder type                                                                                        |      |                   |  | Vertical in-line water-cooled 4 stroke diesel |             |
| The number of cylinders                                                                              |      |                   |  | 4                                             | 4           |
| Cylinder bore × stroke                                                                               |      | mm                |  | 84 × 100                                      | 84 × 100    |
| Displacement                                                                                         |      | cc                |  | 2216                                          | 2216        |
| Combustion system                                                                                    |      |                   |  | Common-rail DI                                |             |
| Compression ratio                                                                                    |      |                   |  | 18.0                                          | 18.0        |
| Emission regulation                                                                                  |      |                   |  | Tier4,Stage III B                             |             |
| Rated power based on SAE J1995<br>(without fan, intake&exhaust resistance ).<br>Equal to EPA kW (HP) | 1800 | min <sup>-1</sup> |  | 25.0 (33.5)                                   | 30.0 (40.2) |
|                                                                                                      | 2200 | min <sup>-1</sup> |  | 33.0 (44.2)                                   | 39.0 (52.3) |
|                                                                                                      | 2400 | min <sup>-1</sup> |  | 36.0 (48.2)                                   | 43.0 (57.6) |
|                                                                                                      | 2600 | min <sup>-1</sup> |  | 39.0 (52.2)                                   | 46.0 (61.6) |
|                                                                                                      | 2800 | min <sup>-1</sup> |  | 40.0 (53.6)                                   | 50.0 (67.0) |
| Dry weight (with after treatment system)                                                             |      | kg                |  | 228                                           |             |
| Weight of after treatment system                                                                     |      | kg                |  | 7                                             |             |

| Engine model name        |                       |    |  | N4LDI-T                                | N4LDI-TA                               |
|--------------------------|-----------------------|----|--|----------------------------------------|----------------------------------------|
| Dimensions               | Length                | mm |  | 764 (DOC rear mount)                   |                                        |
|                          | Width                 | mm |  | 535                                    |                                        |
|                          | Height                | mm |  | 730                                    |                                        |
| Direction of rotation    |                       |    |  | CCW (view from flywheel side)          |                                        |
| Cooling system           |                       |    |  | Radiator type                          | Radiator type (with Charge air cooler) |
| Lubricating system       |                       |    |  | Forced lubrication by hydraulic pump   |                                        |
| Engine oil to be applied |                       |    |  | API CJ4 Low Ash Oil                    |                                        |
| Fuel                     |                       |    |  | Diesel fuel (ultra low sulfur)         |                                        |
| Governor                 |                       |    |  | Common-rail system (CAN-bus compliant) |                                        |
| Injection pump           |                       |    |  | High pressure CR                       |                                        |
| Emission control         | Basic strategy        |    |  | HPCR                                   |                                        |
|                          | NOx reduction         |    |  | Cooled EGR                             |                                        |
|                          | Active regeneration   |    |  | No need                                |                                        |
|                          | Emission purification |    |  | DOC                                    |                                        |

DIESEL ENGINE TIER 4 FINAL PRODUCT LINE

| Engine model name                                                                              |                       |                  | E672L-F                                         | E673L-F     | S773L-F     | N3LDI-T                                       | N3LDI-TA                               | N4LDI-T              | N4LDI-T                                |
|------------------------------------------------------------------------------------------------|-----------------------|------------------|-------------------------------------------------|-------------|-------------|-----------------------------------------------|----------------------------------------|----------------------|----------------------------------------|
| Cylinder type                                                                                  |                       |                  | Vertical in-line water-cooled 4 stroke diesel   |             |             | Vertical in-line water-cooled 4 stroke diesel |                                        |                      |                                        |
| The number of cylinders                                                                        |                       |                  | 2                                               | 3           | 3           | 3                                             | 3                                      | 4                    | 4                                      |
| Cylinder bore × stroke                                                                         | mm                    |                  | 67 × 72                                         | 67 × 72     | 77 × 81     | 84 × 100                                      | 84 × 100                               | 84 × 100             | 84 × 100                               |
| Displacement                                                                                   | cc                    |                  | 508                                             | 761         | 1131        | 1662                                          | 1662                                   | 2216                 | 2216                                   |
| Combustion system                                                                              |                       |                  | IDI (Swirl-chamber)                             |             |             | Common-rail DI                                |                                        |                      |                                        |
| Compression ratio                                                                              |                       |                  | 23.5                                            | 23.5        | 23.5        | 18.0                                          | 18.0                                   | 18.0                 | 18.0                                   |
| Emission regulation                                                                            |                       |                  | Tier4                                           | Tier4       | Tier4       | Tier4,StageIIIB                               |                                        |                      |                                        |
| Rated power based on SAE J1995 (without fan, intake&exhaust resistance ). Equal to EPA kW (HP) | 1800                  | min <sup>1</sup> | -                                               | 7.4 (9.9)   | 11.2 (15.0) | 20.0 (26.8)                                   | 25.0 (33.5)                            | 25.0 (33.5)          | 25.0 (33.5)                            |
|                                                                                                | 2200                  | min <sup>1</sup> | 5.9 (7.9)                                       | 8.8 (11.8)  | 14.4 (19.3) | 25.0 (33.5)                                   | 30.0 (40.2)                            | 33.0 (44.2)          | 33.0 (44.2)                            |
|                                                                                                | 2400                  | min <sup>1</sup> | 6.4 (8.5)                                       | 9.8 (13.1)  | 16.1 (21.5) | 27.0 (36.2)                                   | 32.0 (42.9)                            | 36.0 (48.2)          | 36.0 (48.2)                            |
|                                                                                                | 2600                  | min <sup>1</sup> | 7.0 (9.3)                                       | 10.5 (14.0) | 17.3 (23.1) | 29.0 (38.9)                                   | 35.0 (46.9)                            | 39.0 (52.2)          | 39.0 (52.2)                            |
|                                                                                                | 2800                  | min <sup>1</sup> | 7.2 (9.6)                                       | 10.9 (14.6) | 18.4 (24.6) | 30.0 (40.2)                                   | 37.0 (49.6)                            | 40.0 (53.6)          | 40.0 (53.6)                            |
| Dry weight (with after treatment system)                                                       |                       | kg               | 58                                              | 75          | 87          | 192                                           |                                        | 228                  |                                        |
| Weight of after treatment system                                                               |                       | kg               | —                                               | —           | —           | 7                                             |                                        | 7                    |                                        |
| Dimensions                                                                                     | Length                | mm               | 369                                             | 443         | 453         | 670 (DOC rear mount)                          |                                        | 764 (DOC rear mount) |                                        |
|                                                                                                | Width                 | mm               | 385                                             | 385         | 384         | 535                                           |                                        | 535                  |                                        |
|                                                                                                | Height                | mm               | 523                                             | 523         | 600         | 715                                           |                                        | 730                  |                                        |
| Direction of rotation                                                                          |                       |                  | CCW (view from flywheel side)                   |             |             | CCW (view from flywheel side)                 |                                        |                      |                                        |
| Cooling system                                                                                 |                       |                  | Radiator type                                   |             |             | Radiator type                                 | Radiator type (with Charge air cooler) | Radiator type        | Radiator type (with Charge air cooler) |
| Lubricating system                                                                             |                       |                  | Forced lubrication by hydraulic pump            |             |             | Forced lubrication by hydraulic pump          |                                        |                      |                                        |
| Engine oil to be applied                                                                       |                       |                  | Equivalent to CH-4                              |             |             | API CJ4 Low Ash Oil                           |                                        |                      |                                        |
| Fuel                                                                                           |                       |                  | Diesel fuel (ultra low sulfur)                  |             |             | Diesel fuel (ultra low sulfur)                |                                        |                      |                                        |
| Governor                                                                                       |                       |                  | Mechanical All-speed                            |             |             | Common-rail system (CAN-bus compliant)        |                                        |                      |                                        |
| Injection pump                                                                                 |                       |                  | Bosch PFR                                       |             |             | High pressure CR                              |                                        |                      |                                        |
| Emission control                                                                               | Basic strategy        |                  | Injection control depend on barometric pressure |             |             | HPCR                                          |                                        |                      |                                        |
|                                                                                                | NOx reduction         |                  | —                                               |             |             | Cooled EGR                                    |                                        |                      |                                        |
|                                                                                                | Active regeneration   |                  | —                                               |             |             | No need                                       |                                        |                      |                                        |
|                                                                                                | Emission purification |                  | —                                               |             |             | DOC                                           |                                        |                      |                                        |



DIESEL ENGINE TIER 4 INTERIM PRODUCT LINE

| Series                                              |                       | E SERIES                                     |                 | S SERIES                                     |                 | N SERIES                                     |                 |                 |
|-----------------------------------------------------|-----------------------|----------------------------------------------|-----------------|----------------------------------------------|-----------------|----------------------------------------------|-----------------|-----------------|
| Model                                               |                       | E672L-D                                      | E673L-D         | S773L-D                                      | S774L-D         | N843-D                                       | N844L-D         | N844LT-D        |
| Engine Type                                         |                       | Vertical 4 Stroke Diesel Engine              |                 | Vertical 4 Stroke Diesel Engine              |                 | Vertical 4 Stroke Diesel Engine              |                 |                 |
| No. of Cylinders                                    |                       | 2                                            | 3               | 3                                            | 4               | 3                                            |                 |                 |
| Bore and Stroke                                     |                       | 67 × 72                                      |                 | 77 X 81                                      | 77 X 81         | 84 X 90                                      | 84 X 100        |                 |
| Displacement      cc                                |                       | 507                                          | 761             | 1131                                         | 1508            | 1496                                         | 2216            |                 |
| Combustion System                                   |                       | IDI (Swirl Chamber)                          |                 | IDI (Swirl Chamber)                          |                 | IDI (Swirl Chamber)                          |                 |                 |
| Compression Ratio                                   |                       | 23.5                                         |                 | 23.5                                         |                 | 22.5                                         |                 |                 |
| Net Power<br>Kw (PS)<br>(JIS D0006)                 | 1500min <sup>-1</sup> | 4.0 (5.4)                                    | 6.1 (8.3)       | 9.3 (12.6)                                   | -               | 13.3 (18.1)                                  | 20.3 (27.6)     | 25.6 (34.7)     |
|                                                     | 1800min <sup>-1</sup> | 4.9 (6.6)                                    | 7.6 (10.3)      | 11.6 (15.8)                                  | -               | 15.8 (21.5)                                  | 23.8 (32.4)     | 31.1 (42.2)     |
|                                                     | 2200min <sup>-1</sup> | 6.1 (8.3)                                    | 9.4 (12.8)      | 14.4 (19.6)                                  | 19.1 (25.9)     | 20.0 (27.2)                                  | 30.1 (40.9)     | 37.7 (51.3)     |
|                                                     | 2600min <sup>-1</sup> | 7.1 (9.7)                                    | 11.0 (15.0)     | 16.8 (22.8)                                  | 22.7 (30.8)     | 22.3 (30.3)                                  | 34.5 (46.9)     | 41.5 (56.4)     |
|                                                     | 2800min <sup>-1</sup> | 7.6 (10.3)                                   | 11.8 (16.0)     | 17.9 (24.3)                                  | 24.6 (33.5)     | 23.0 (31.3)                                  | 35.4 (48.1)     | 42.8 (58.2)     |
|                                                     | 3000min <sup>-1</sup> | 8.1 (11.0)                                   | 12.5 (17.0)     | 19.0 (25.8)                                  | 26.5 (36.0)     | 23.4 (31.8)                                  | 35.7 (48.5)     | 43.2 (58.7)     |
|                                                     | 3600min <sup>-1</sup> | 9.2 (12.5)                                   | 14.3 (19.4)     | 21.1 (28.7)                                  | 29.9 (40.6)     | -                                            | -               | -               |
| Continuous<br>Rated Power<br>Kw (PS)<br>(JIS B8014) | 1500min <sup>-1</sup> | 3.6 (4.9)                                    | 5.6 (7.6)       | 8.7 (11.8)                                   | -               | 12.1 (16.5)                                  | 18.5 (25.2)     | 23.2 (31.6)     |
|                                                     | 1800min <sup>-1</sup> | 4.5 (6.1)                                    | 6.9 (9.4)       | 10.8 (14.7)                                  | -               | 14.4 (19.6)                                  | 21.7 (29.5)     | 28.2 (38.4)     |
|                                                     | 3000min <sup>-1</sup> | 7.4 (10.1)                                   | 11.4 (15.5)     | 17.1 (23.2)                                  | 23.9 (32.4)     | 20.2 (27.5)                                  | 27.1 (36.8)     | -               |
|                                                     | 3600min <sup>-1</sup> | 8.4 (11.4)                                   | 13.1 (17.8)     | 19.2 (26.1)                                  | 26.9 (36.6)     | 21.1 (28.7)                                  | -               | -               |
| Dry Weight              kg                          |                       | 58                                           | 75              | 87                                           | 106             | 150                                          | 195             | 203             |
| Length×Width×Hight   mm                             |                       | 369 × 385 × 523                              | 443 × 385 × 523 | 453 × 384 × 600                              | 550 × 380 × 575 | 534 × 459 × 657                              | 637 × 453 × 678 | 666 × 516 × 725 |
| Rotation                                            |                       | Anticlockwise viewed from Flywheel           |                 | Anticlockwise viewed from Flywheel           |                 | Anticlockwise viewed from Flywheel           |                 |                 |
| Cooling System                                      |                       | Water cooling with Water Pump & radiator     |                 | Water cooling with Water Pump & radiator     |                 | Water cooling with Water Pump & radiator     |                 |                 |
| Coolant Capacity                                    |                       | 1.1                                          | 1.3             | 1.9                                          | 2.5             | 2.7                                          | 3.6             |                 |
| Lubricating System                                  |                       | Force Lubrication                            |                 | Force Lubrication                            |                 | Force Lubrication                            |                 |                 |
| Lubrication Oil                                     |                       | 10W-30, CC or DE Grade (API)                 |                 | 10W-30, CC or DE Grade (API)                 |                 | 10W-30, CC or DE Grade (API)                 |                 |                 |
| Lubrication Oil Capacity   Lit                      |                       | 2.1                                          | 3.1             | 4.9                                          | 5.3             | 6.0                                          | 10.6            |                 |
| Starting System                                     |                       | Electric Starting with Glow Plug (12V-0.8kW) |                 | Electric Starting with Glow Plug (12V-1.4kW) |                 | Electric Starting with Glow Plug (12V-2.0kW) |                 |                 |
| Alternator              V - A                       |                       | 12-14                                        |                 | 12-40                                        |                 | 12-40                                        |                 |                 |
| Fuel                                                |                       | No.2 Diesel Oil (JIS)                        |                 | No.2 Diesel Oil (JIS)                        |                 | No.2 Diesel Oil (JIS)                        |                 |                 |
| Governing System                                    |                       | Mechanical All-Speed with Angleich           |                 | Mechanical All-Speed with Angleich           |                 | Mechanical All-Speed with Angleich           |                 |                 |
| Injection Pump                                      |                       | Bosch In-Line Type                           |                 | Bosch In-Line Type                           |                 | Bosch In-Line Type                           |                 |                 |
| Battery (Recommend) V - Ah                          |                       | 12-35                                        | 12-45           | 12-65                                        |                 | 12-70                                        | 12-100          |                 |

