

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Reduction Gear for Diesel Propulsion

with type designation(s)

HD 295 HR, HL, UR, UL, HD 295 PTI-HFR, PTI-HFL, PTI-VFR, PTI-VFL, ,

Issued to

Servogear AS
RUBBESTADNESET, Norway

is found to comply with

Det Norske Veritas' Rules for Classification of Ships/High Speed and Light Craft

Application :

The approval is valid for propulsion with limitations as given on page 2.

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Type	Input torque	Input speed	Reduction ratio
HD 295 HR, HL, UR, UL	see page 2	see page 2	see page 2
HD 295 PTI-HFR, PTI-HFL, PTI-VFR, PTI-VFL	see page 2	see page 2	see page 2

This Certificate is valid until **2020-12-16**.

Issued at **Høvik** on **2015-12-17**

DNV GL local station: **Stord**

Approval Engineer: **Terje Sollie**

for **DNV GL**

Oddvar Deinboll
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Certificate No: **TAM0000049**
File No: **716.30**
Job Id: **262.1-010944-3**

Product description

Reduction gears with built-in clutch(es) and controllable pitch mechanism. The gears are available in the following versions:

H-drive – Engine forward

U-drive – Engine aft

Power Take In (PTI) – Twin input, single output drive (one engine aft)

Max. Output PTO: 460 Nm

Both rotational directions of the output shaft are available.

Application/Limitation

The reduction gear is approved for use in Ships and High Speed Light Craft (HSLC) with the following limitations:

Ships and HSLC with Class Notation Passenger:

Application factor $K_A = 1.25$

Gear type	Input torque	Input speed	Reduction Ratio
HD 295 HR, HL, UR, UL	5730 Nm	2200 RPM	2,742:1 & 3,296:1
HD 295 PTI-HFR, PTI-HFL, PTI-VFR, PTI-VFL	2 x 5730 Nm	2200 RPM	2,742:1 & 3,296:1

Application factor $K_A = 1.15$

Gear type	Input torque	Input Power	Input speed	Reduction Ratio
HD 295 HR, HL, UR, UL	4548 Nm	1000 kW	2100 RPM	4,2:1
HD 295 PTI-HFR, PTI-HFL, PTI-VFR, PTI-VFL	2 x 4548 Nm	1000 kW	2100 RPM	4,2:1

HSLC with Class Notation: Crew, Yacht and Patrol

Application factor $K_A = 1.15$

Gear type	Input torque	Input Power	Input speed	Reduction Ratio
HD 295 HR, HL, UR, UL	5002 Nm	1100 kW	2100 RPM	4,2:1
HD 295 PTI-HFR, PTI-HFL, PTI-VFR, PTI-VFL	2 x 5002 Nm	1100 kW	2100 RPM	4,2:1

Type Approval documentation



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Marking of product

Identification: Manufacturers name or trademark
Type number identification

Periodical assessment

For retention of the Type Approval, a DNV GL surveyor shall perform a survey every second year and before the expiry date of this certificate to verify that the conditions of the type approval are complied with.

The objective of the Periodical Assessment is to verify that the conditions for the Type Approval are not altered since the Type Approval Certificate was issued. The main scope of the Periodical Assessment will normally include:

- Verification of the Type Approval applicant's production and quality system w.r.t. ensuring continued consistent production of the Type Approved products at the Type Approval applicant's own premises and at other companies that are given the responsibility for manufacturing of the products.
- Review of the Type Approval documentation and that this is still used as basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking.

Other conditions

The Type Approval does not cover lubrication, control and monitoring systems. These systems are to be approved for each application.

END OF CERTIFICATE