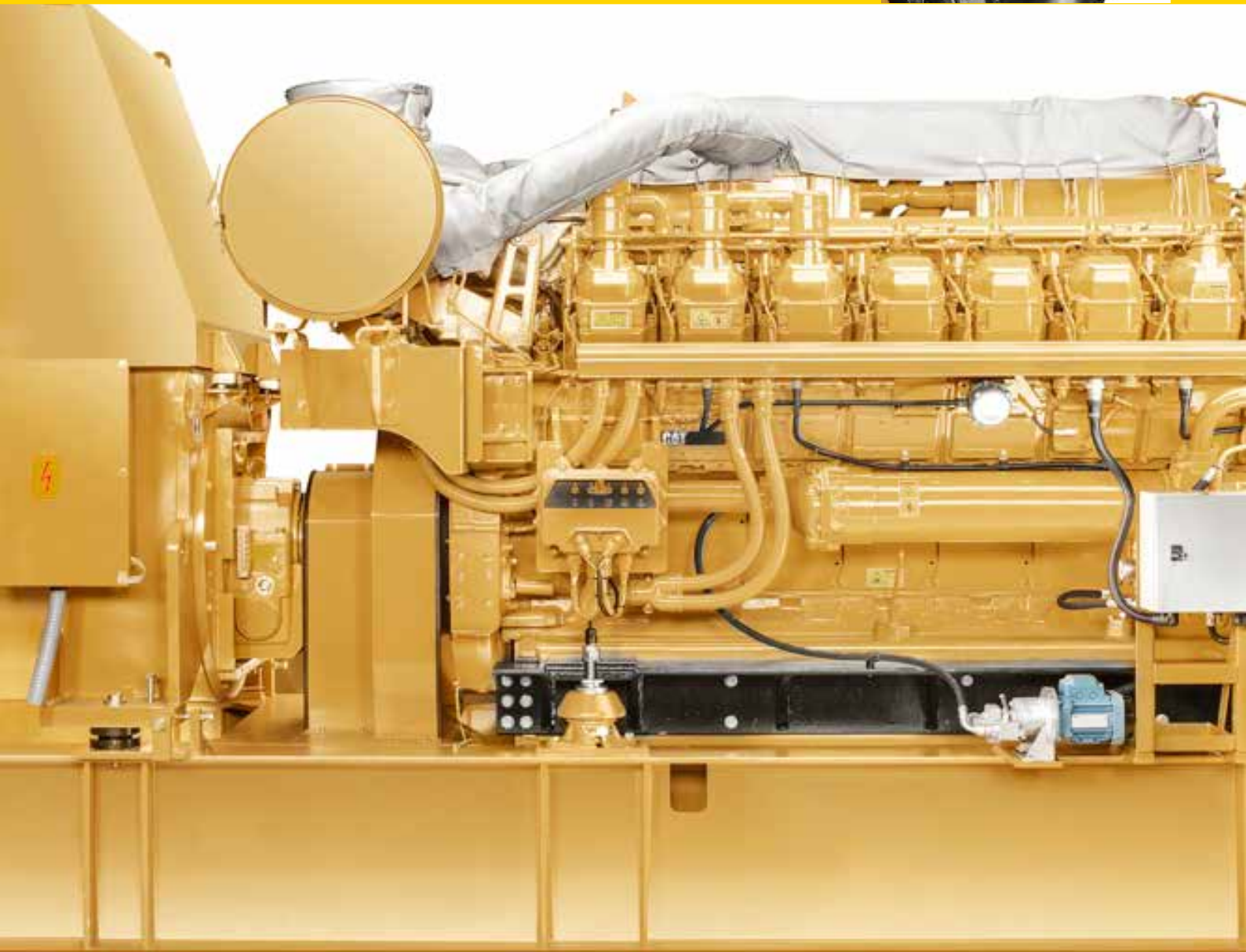


THE PON POWER GENFLEX DESIGN

*Provides maximum reliability and sustainability
for your high-speed generator set!*



CONSIDERABLE

Reduction in the vibration level.



Pon Power is the leading supplier of high speed gensets in Norway, covering marine, oil and gas and electrical power systems.

Throughout our continuous product improvement, supported by the ISO 9000 system, Pon Power has launched the next generation of high speed generator sets called Pon Power Genflex.

The combination of Caterpillar engines and custom made generator sets provides our customers with a state of the art application built to last. Maximum reliability and sustainability is always the major focus of Pon Power Scandinavia and Genflex has extended this even further.

The development of Genflex has been conducted in close cooperation with our customers and Det Norske Veritas, to fulfil all requirements. The key driver for the development is reduced vibration on the generators, to maintain generator service intervals and reduce generator resonant behaviour.

This is achieved by installing flexible mounts between the engine and base frame, thereby isolating the engine excitation forces from the base frame and generator. The Genflex design can be adapted for all free-standing generators, covering different generator brands.

Figure 1, clearly shows the significant difference of generator vibration levels with genflex design versus rigid base frame design. Up to 80 % reduction of the vibration levels in the generator end shields can be achieved by incorporating the genflex design.

Pon Power GenFlex is now our standard generator set design when we offer new units with Cat 3500 engines. We also offer conversion of existing generator sets from the rigid base frame solution to Genflex, provided that the generator can be free standing and thereby isolated from the engine.

EXAMPLE OF 3516B GENSET WITH GENFLEX AND WITH RIGID BASEFRAME DESIGN (OLD)

Vibrations generator drive end

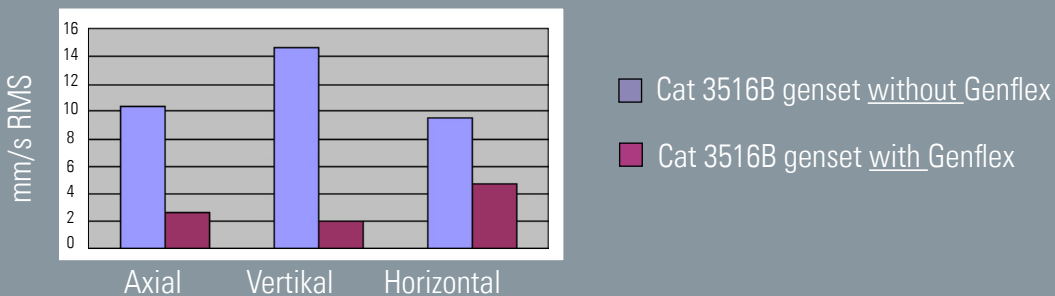


FIGURE 1

Pon Power Genflex - Provides maximum reliability

DESIGNED TO ISOLATE

Engine vibration from the frame and foundation.



After years of product development, we can provide GenFlex, designed to isolate engine vibration away from the frame and foundation.

DESIGN FEATURES:

1. Engine combustion forces are isolated on the engine by flexible mounts. The base frame and generator are rigid to the ships foundation.
2. Number of flexible mounts are reduced
3. Free moving engine towards all engine interface connections
4. Torsion in the base frame is eliminated as the base frame is rigidly bolted to the ships foundation

ADVANTAGES:

1. Lower vibration levels and highly reduced dynamic forces on the generator, resulting in the best possible operating conditions for the generator
2. Better reliability and predictability for maintenance cost
3. Increased security for long term operation

UPGRADING!

Pon Power developed the GenFlex design also with a view to upgrading the previous design to achieve the same excellent properties. The genflex conversion must be performed in co-operation with a shipyard/ship repair facility.

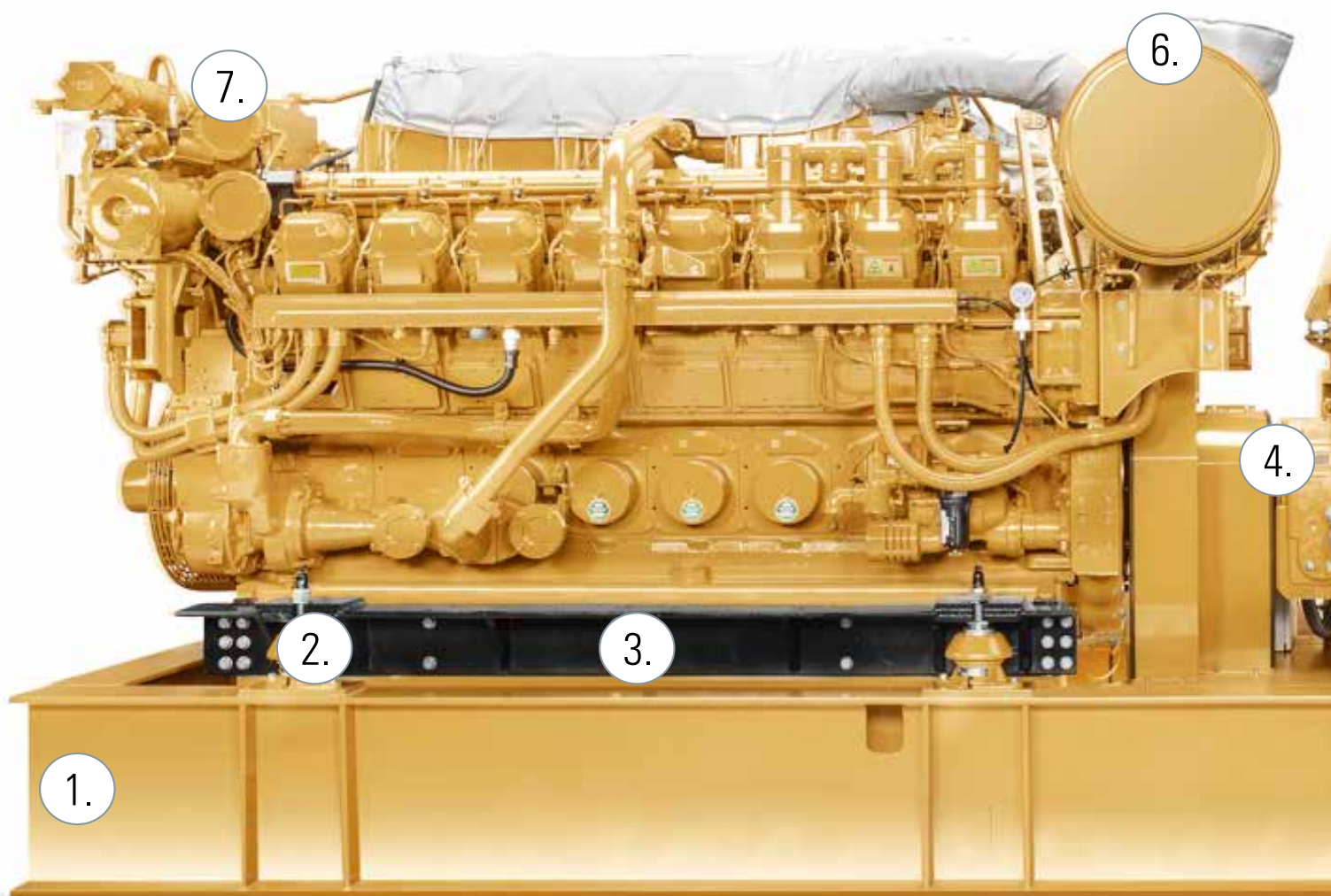
PROCESS FOR UPGRADING:

1. Pre-inspection onboard to determine if the engine room is suitable for Genflex conversion
2. Project management & engineering with complete documentation
3. Base frame moved down and bolted to ships foundation. Pre-lubricating & preheating pumps moved to base-frame
4. Engine ledge rails reinforced and engine + generator lifted to accommodate flexible mounts. (End result = engine & generator approx 115mm higher than original position)
5. New highly flexible coupling and longer flexible exhaust bellow
6. All flexible engine connections upgraded and ship pipe-work modified accordingly
7. Generator; earth cable renewed, ship pipe-work position revised and power cable length reviewed
8. New TVA, Class certificates and Class approval
9. Alignment and vibration control

and sustainability for your high speed generator set

OUR GENFLEX DESIGN

Design features and advantages.



1.



FRAME

The Base frame is rigidly connected to the ships foundation by bolting.

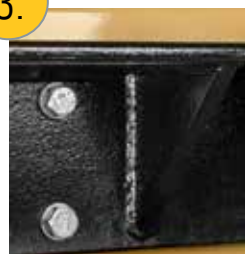
2.



FLEXIBLE MOUNTS

The flexible dampers attached to the engine safeguard that only a minimum of engine excitation forces and vibration are transferred to the base frame and generator.

3.





ENGINE MOUNTED RAILS
Ledge profile engine rails are reinforced with extra triangular stiffeners.

4.



FLEXIBLE COUPLING
The new flexible coupling has been selected to maintain full flexibility between the engine and generator. The engine has full flexibility allowing all 6 degrees of freedom.

7.



WATER CONNECTIONS

Due to engine movements, the cooling water pipes will be fitted with a double bellow arrangement. The two bellows will be located with a 90 degree difference and a free moving pipe neck to prevent pipe and flange stress.

6.



EXHAUST BELLOW

A twin exhaust below is delivered by Pon Power, designed to absorb all movements

5.



ADJUSTABLE GENERATOR BASE
the generator mount is adjustable in all three directions to facilitate alignment with the engine.

PON POWER AS

Pon Power is the distributor of Cat® and MaK™ engines and generators in Norway.

We offer complete systems throughout the product spectrum, ranging from 6.4 to 16,200 kW, which are mainly used as propulsion and auxiliary engines, primary power or emergency power. In addition, we offer engines for fire-fighting pumps and cranes for offshore installations.

At Pon Power, we have built up a network with great expertise and reliability around our products and services, and we place high priority on the development of human resources throughout our organisation. Pon Power is certified according to ISO 9001, ISO 14001, SKS and OHSAS 18001 as well as DANAK, reg.no.417.

CATERPILLAR

Caterpillar is the world's leading manufacturer of diesel and natural gas engines, generator sets, construction and mining equipment, industrial turbines and combined heat and power plants. Pon Power's collaboration with Caterpillar and our industrial owners offers our customers security through its professional global network.

PON HOLDINGS

Pon Holdings is a family-owned Dutch group. Pon Holdings has a group of 50 branches in 11 countries, employing approximately 10,000 people. Pon Holdings has a long-term strategy and puts its customers and business partners at the centre of attention. This strategy is adapted and continued in Pon Power AS.



NORWAY

phone: +47 23 17 05 00

fax: +47 23 17 05 01

power.no@pon-cat.com



VISIT OUR WEBSITE:

www.pon-cat.com

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