SPECIAL BOLT & NUT FITTINGS

JUNG SAN BOLT & NUT

www.jungsan.com

S P E C I A L

B O L T

N U T

F I T T I N G S

CONTENTS

Brief History of Company

1983
Apr, Established company

1998
Mar, Established company
Apr, Registered as a membership partner of DOOSAN ENGINE Co., Ltd. [No.290715]
Aug, Registered as a trade business &membership of Korea trade Association
Sep, Registered as a membership partner of Volvo Construction &machines Korea [No. 2907151]
Sep, Registered as a membership partner of Samsung Heavy industries [No. 2907151]
Sep, Registered as a membership partner of Hyundai Heavy industries [No. UZ 077]
Dec, Joined membership of Korea shipbuilding Materials Union Association

1999
Sep, Certified as a venture company [No. 99121421-189]

2000
Mar, Acquired certificates of ISO 9001 attested by EQA

2006
May, Attested ISO 9001:2000 by ORI

2007
Feb, Win an award superior quality of ENGINE Co., Ltd.
Nov, Acquired Single PPM by Small and Medium business Admn

2008
Apr, Win an award Single PPM group by The Prime
Apr, Acquired Certificate of INNO-BIZ

2009
Mar, Completed the second plant
Oct, Received the best partner award in the 3C division by DOOSAN ENGINE Co., Ltd.

2010
Feb, Received Accident-Free 10-fold certificate
Mar, Received the Busan Regional Tax Administration Award
Oct, Received Single PPM quality certificate 2items acquired From Small and Medium Business Administration

A Venture Company in Heavy Industry Component Sector

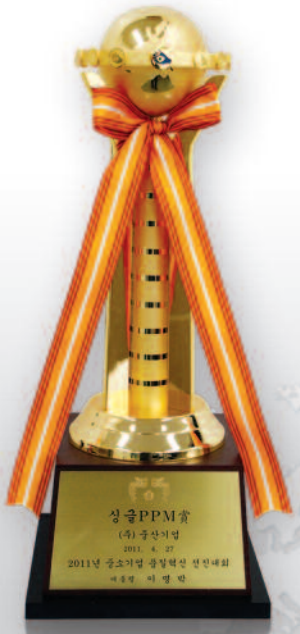
Jungsan Bolt & Nut

Based on its know-how in machinery element components manufacturing concentrating on bolts and nuts for last 20 years, the Company was established in 1998 as a venture company and has developed into a heavy industry component manufacturer with our Ulsan Factory.

In order to meet various demands from our customers, we are providing a various range of machinery components with multi-type small-lot system to cover bolts and nuts for ship engines and generator engines, various fitting products, neck-rings and shafts for still meal facilities.

Also, with ISO9001 (EQA of U.K.) in 2000 and a certificate in nuclear quality system (KEPZC-MN/SN) in July next year and appointment as a qualified company for Gori Nuclear Plant, the Company entered into the electricity generation field.

Thanks to our stable quality system, the Company is actively penetrating into overseas markets, resulting in continuous sales growth backed by quality improvement. Furthermore, in order to secure competitive edge in the industry through technology innovation from our R&D Center in consideration of global trends of technology transit.



CEO **Jung Gwang Soo**

GLOBAL NO 1 : TOP 2020

Nuclear power plants / Marine plants / Wind power generation /
A specialty component maker for the wind power generation assembly field

Quality innovation Customer satisfaction	Technology innovation Creation of infinite value	Securing competitive edge Early advantage of opportunities

Employee-loving Company, Company-loving Employees

2011
- Apr, Received Single PPM group President award

2012
- Jul, Earned a certificate of Approval for ISO 9001 [MSA]
  Earned a certificate of Approval for ISO 14001 [MSA]
  Earned a certificate of Approval for OHSAS 18001 [MSA]

2014
- Feb, Production Management (PMS) LEVEL. 4
- Nov, Single PPM 2 kind obtain additional authentication [TIE ROD / HYD.NUT] Small and Medium Business Administration [No. 1-16-2-2265]
- Jun, Promising Company by Techno Park [ULSAN]

2015
- Dec, Quality System Certificate [KEPIC:MN-662]

2016
- Mar, Qualified supplier registration Certificate [Korea Southern Power, Korea East-West Power, Korea Midland Power, Korea western Power, Korea South-East Power]
- Mar Environment, quality, Safety system certificate[KR Society]

2017
- Jul, DNV GL rules for classification – Ships
  DNV GL-CP-0351- Manufacture of heat treated products Heat treatment workshop

2018
- Mar, Acquired a certificate of PED
- Jun, Acquired a certificate of Russia GOST-R

Production Process

1. Cutting Line

BAND SAW(4)
CIRCULAR SAW(3)

2. Forging Process Line

HYDRAULIC-PRESS(200t other 1)
FRICTION PRESS (1,200t other 2)
POWER PRESS (150t)

3. Heat Treatment Line

HEATING FURNACE(1)
QUENCHING FURNACE(1)
TEMPERING FURNACE(3)

3. CNC Process Line

C.N.C LATHE(PUMA 600L other 31)
HYDRAULIC AUTOMATIC LATHE
CENTERING M/C(2)

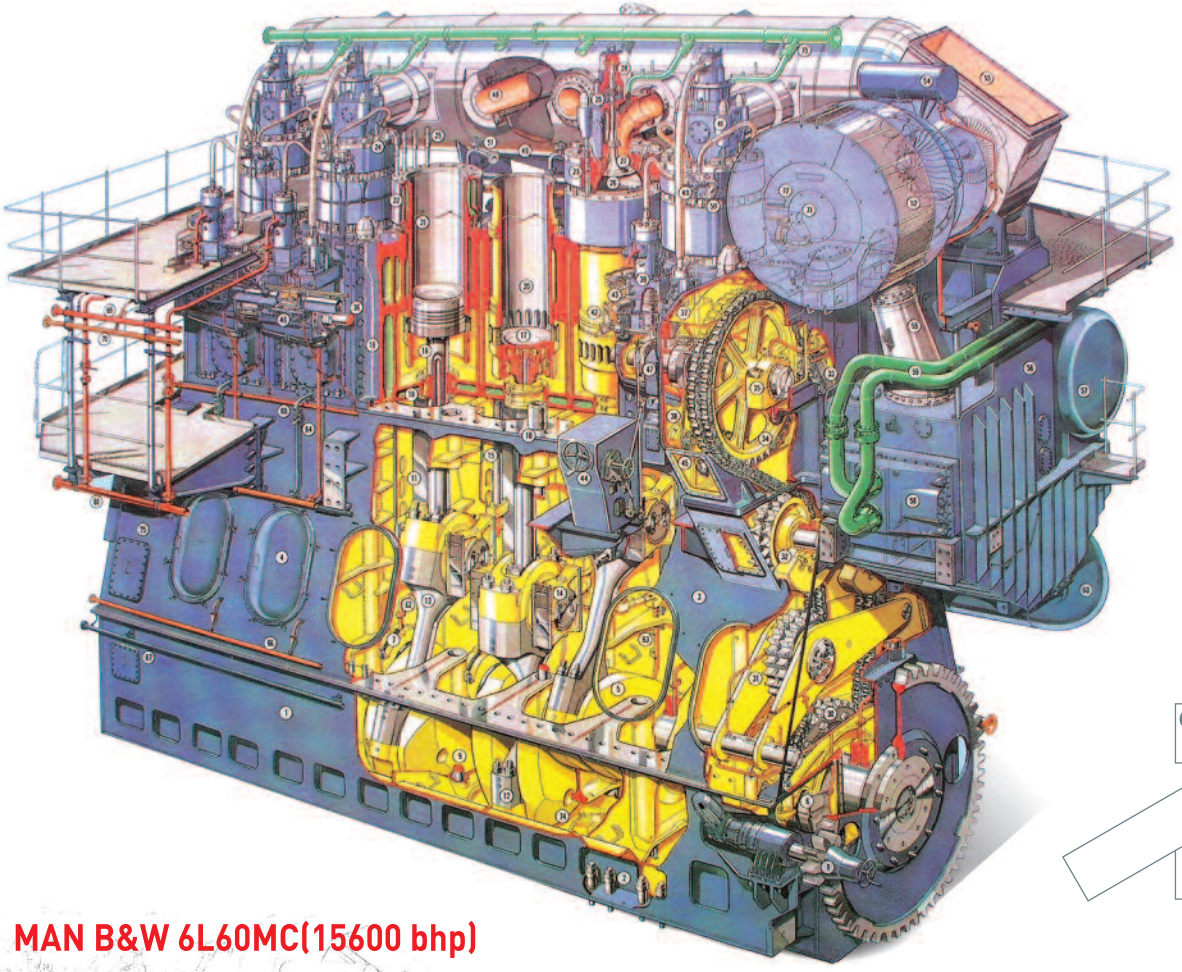
4. Thread Rolling Line

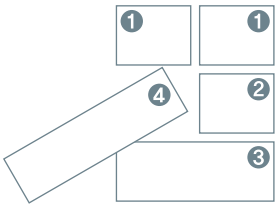
THREAD ROLLING(120t other 15)

6. Storage Warehouse

Products

2 Stroke





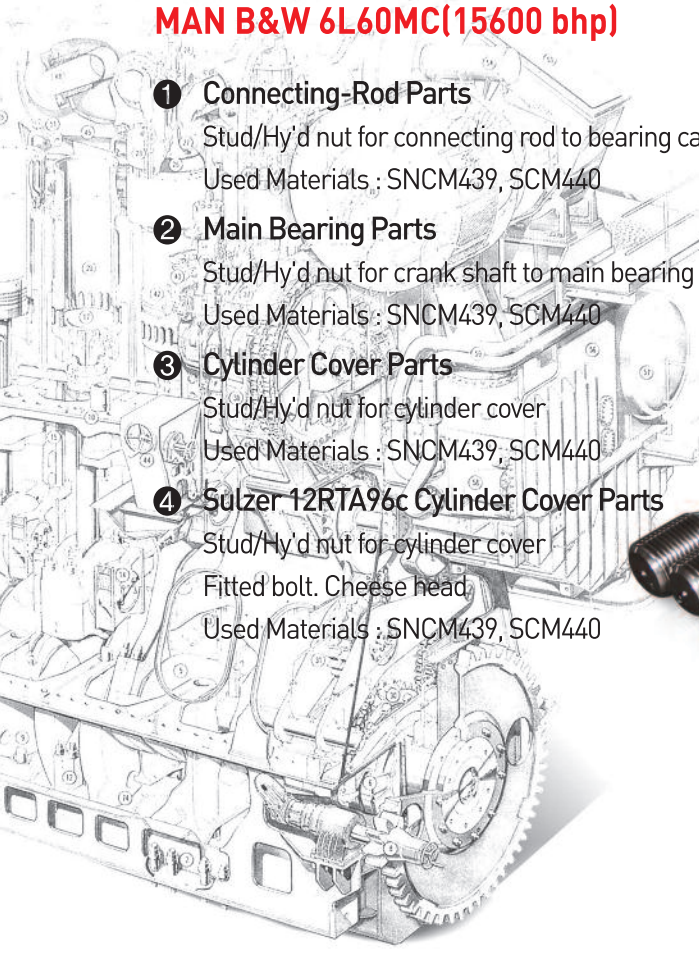
MAN B&W 6L60MC(15600 bhp)

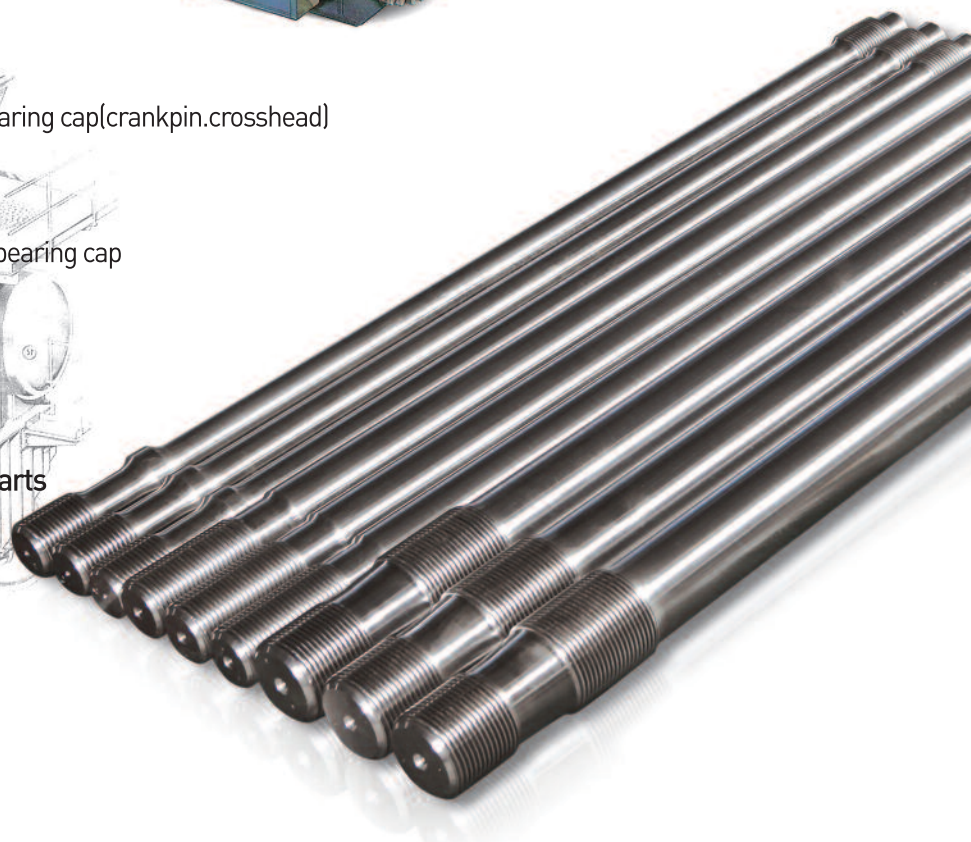
❶ Connecting-Rod Parts
Stud/Hy'd nut for connecting rod to bearing cap(crankpin.crosshead)
Used Materials : SNCM439, SCM440

❷ Main Bearing Parts
Stud/Hy'd nut for crank shaft to main bearing cap
Used Materials : SNCM439, SCM440

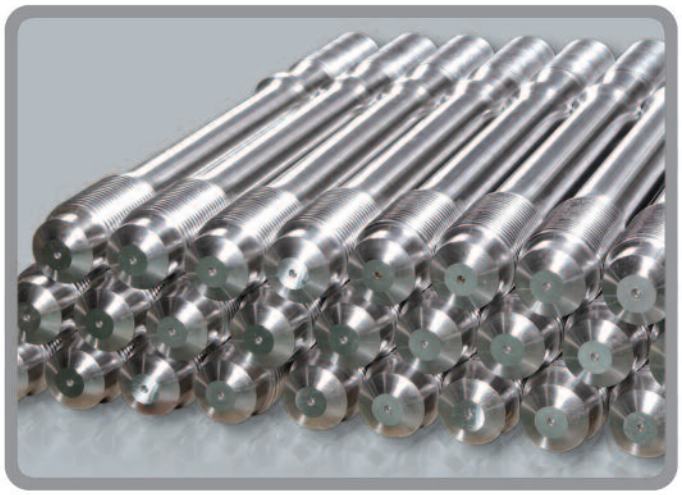
❸ Cylinder Cover Parts
Stud/Hy'd nut for cylinder cover
Used Materials : SNCM439, SCM440

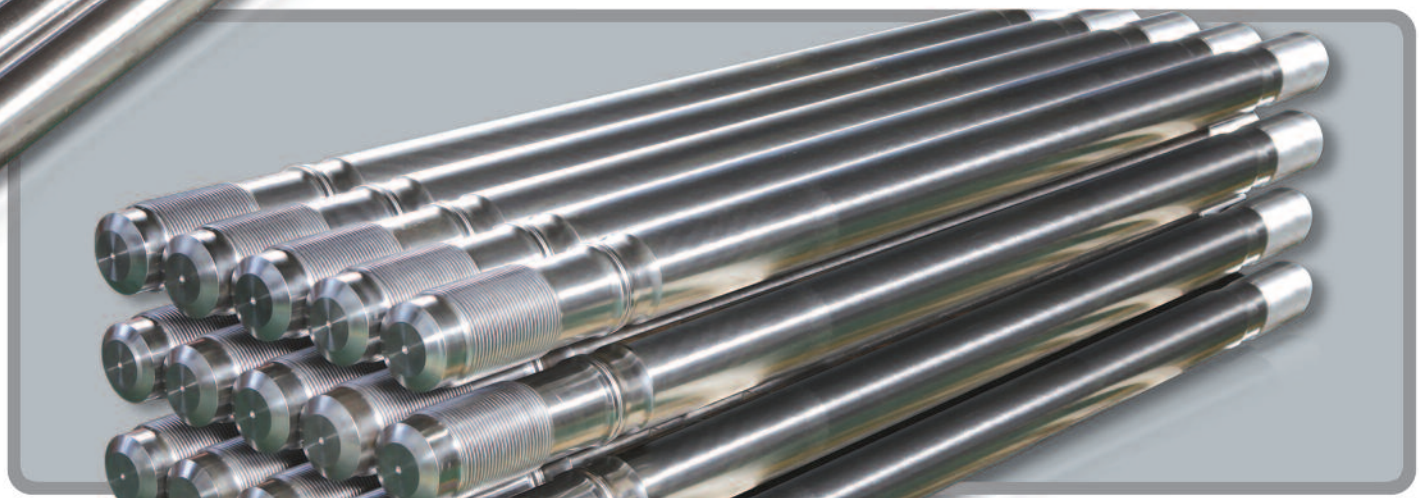
❹ Sulzer 12RTA96c Cylinder Cover Parts
Stud/Hy'd nut for cylinder cover
Fitted bolt. Cheese head
Used Materials : SNCM439, SCM440





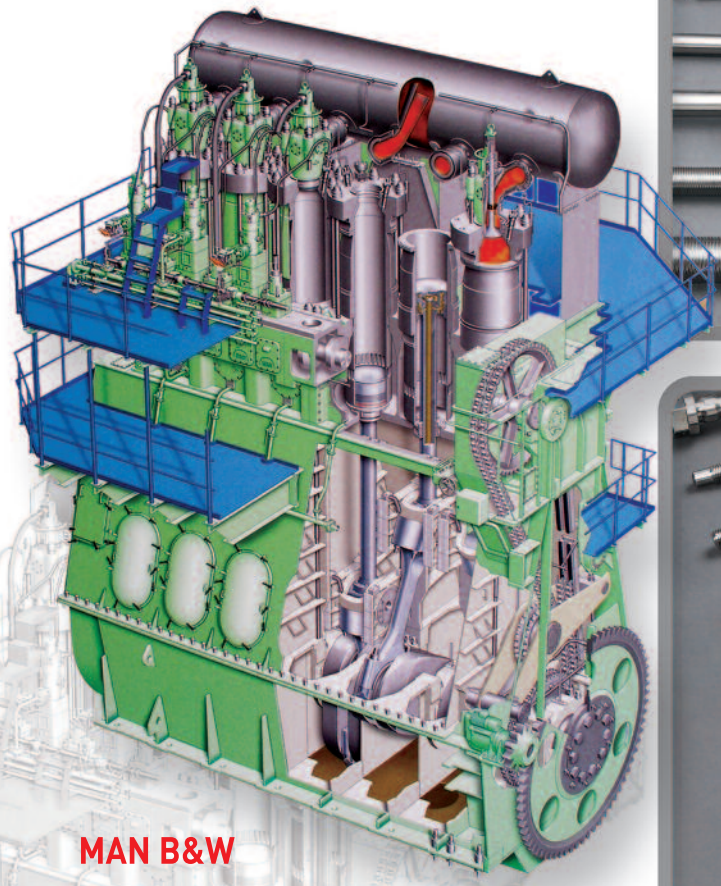
2 Stroke

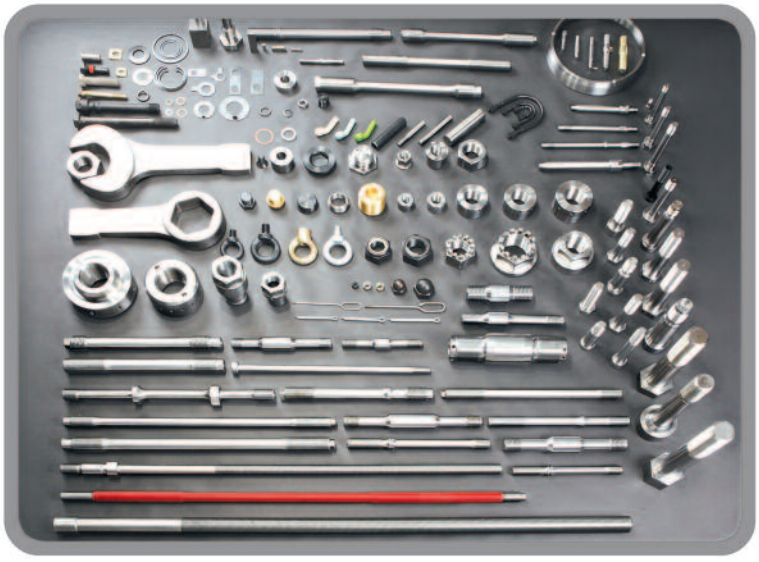




Products

2 Stroke





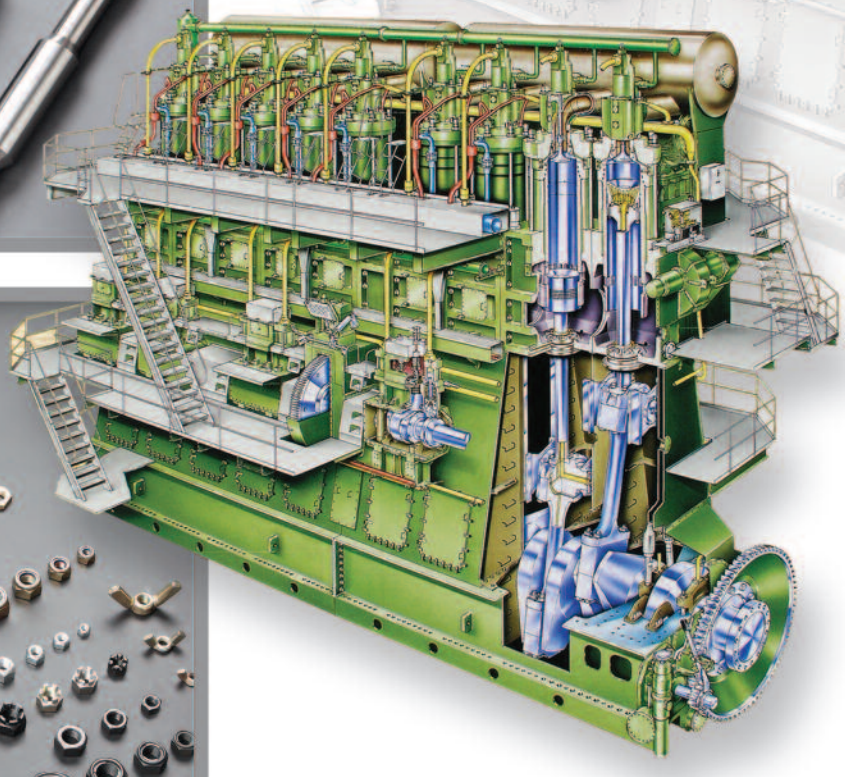
MAN B&W

1. **Exhaust Valve Parts**
   Stud/Hy'd nut for exhaust valve
   Used Materials : SNCM439, SCM440
2. **Piston Rod part**
   Used Materials : SNCM439, SCM435, SCM440
3. **Special Plug Parts**
   Used Materials : S45C, SUH3, SUS304,
   C3604BD, SUH660, SNB16

2 Stroke

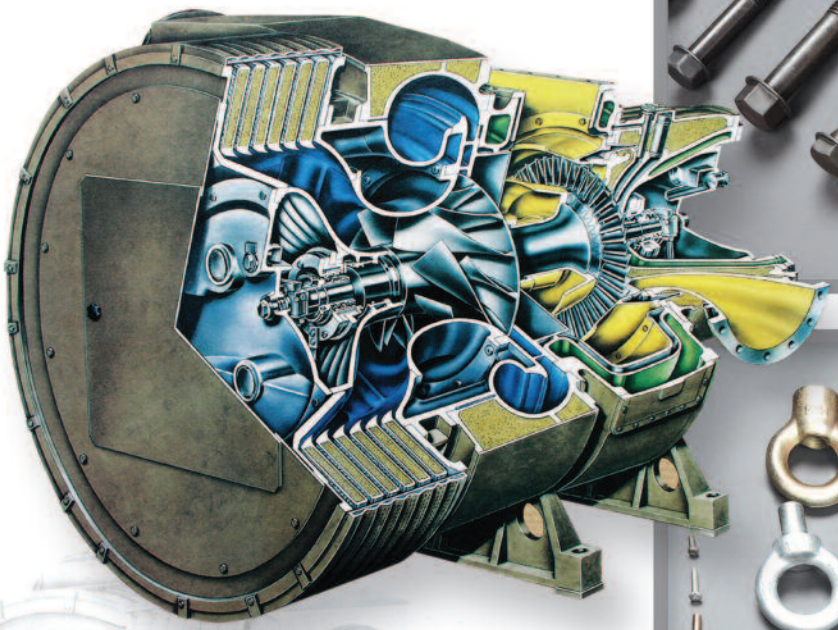
SULZER (9RTA84C TYPE)

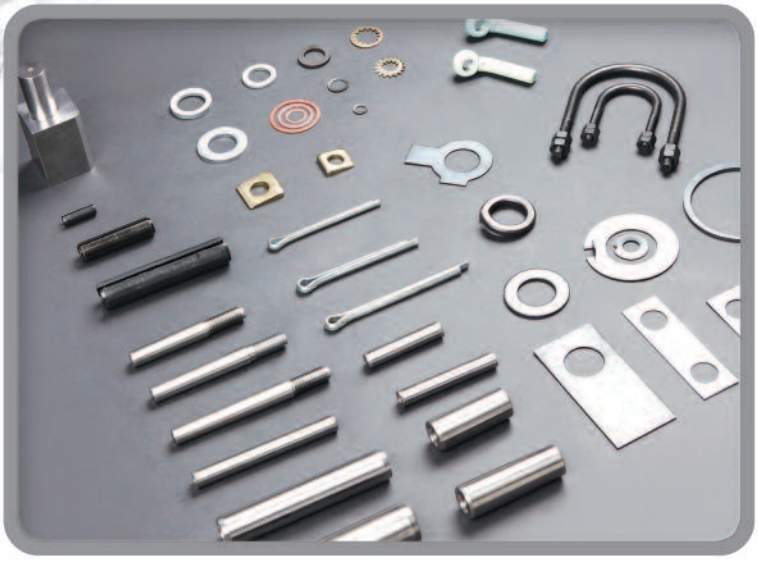
1. **Special Bolt part**
   Used Materials : SNCM439, SCM435, SCM440
2. **Special Fitted Stud part**
   Used Materials : SNCM439, SCM435, SCM440
3. **Special Nut Parts**
   Used Materials : SCM435, S45C, SS400



Products

2 Stroke



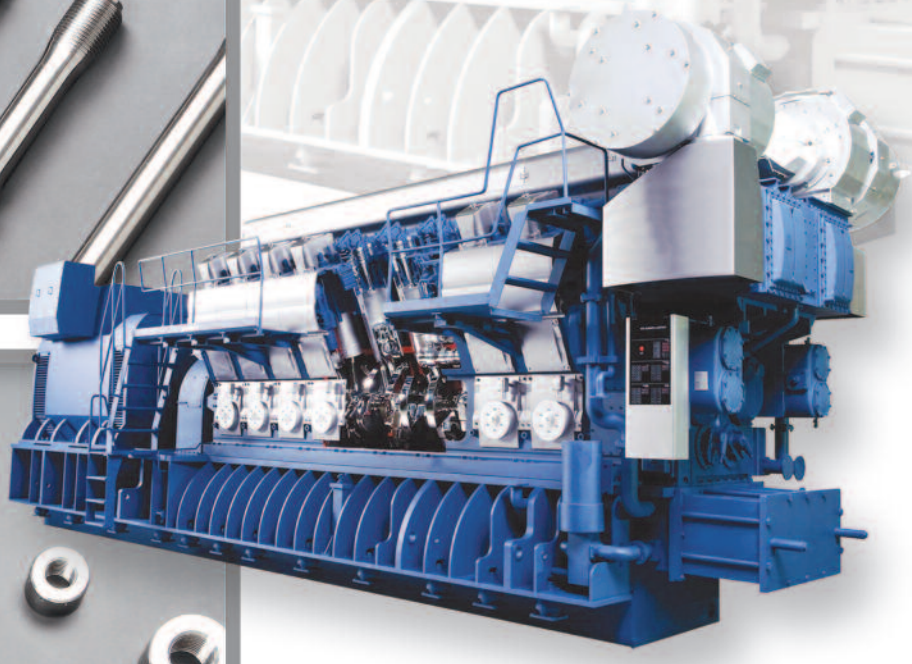


TURBOCHARGER

1. **Turbocharger Parts Used**
   Materials : Ni80A, SUH660, SNB16, SUS316, SUS304, Nitrated Bolt
2. **Receiver Parts**
   Used Materials : SCM435, SS400
3. **Special Plate, Pin, U-Bolt, washer Parts**
   Used Materials : S45C, SS400, SUS304, SUS316

4 Stroke

1. **Main Bearing Parts**
   Stud/Hy'd nut for crank shaft to main bearing cap
   Used Materials : SNCM439, SCM435, SCM440
2. **Connecting-Rod Parts**
   Stud/Hy'd nut for connecting rod to bearing cap (crankpin.crosshead)
   Used Materials : SNCM439, SCM435, SCM440
3. **Cylinder Cover Parts**
   Stud/Hy'd nut for cylinder cover
   Used Materials : SNCM439, SCM435, SCM440



Production Facilities

Innovation for the Best Quality

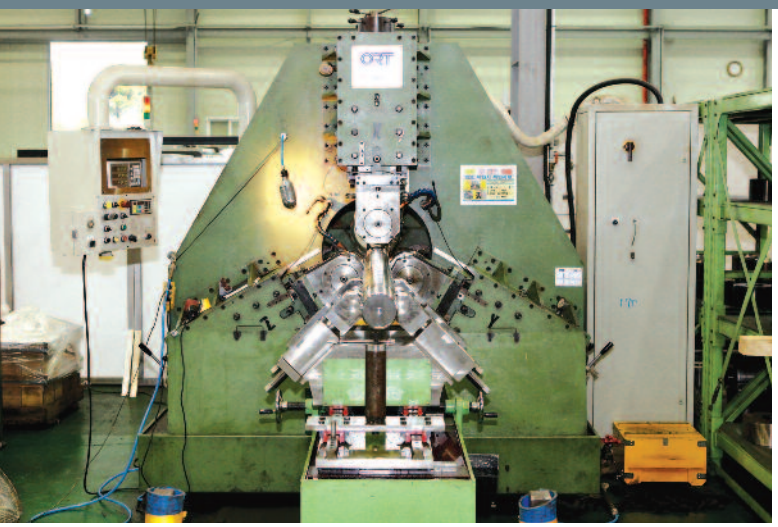
The Company will do its best to create infinite value out of our cutting-edge facilities and technology innovation.

THREAD ROLLING (R30A)

MACHINE SCREW(TK5C-72GL)

C.N.C LATHE(TL-2)

ROLLING MACHINE HAVING THREE DIES

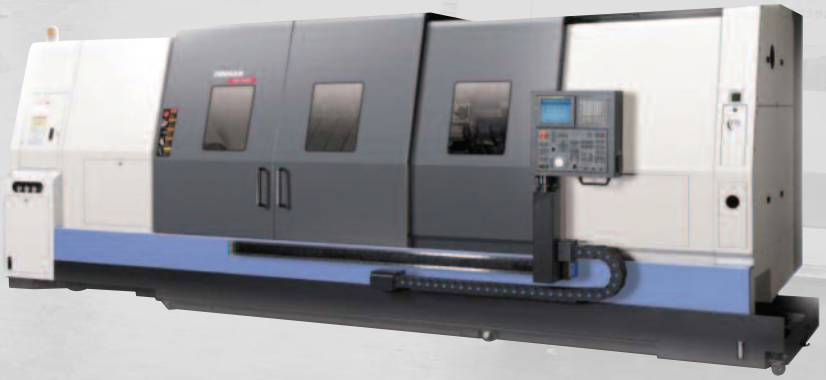


CIRCULAR SAW

SPECIAL BOLT & NUT, FITTINGS

C.N.C LATHE(PUMA 280)

C.N.C LATHE(PUMA 400)



C.N.C LATHE(PUMA 600LM)

HEAT TREATMENT

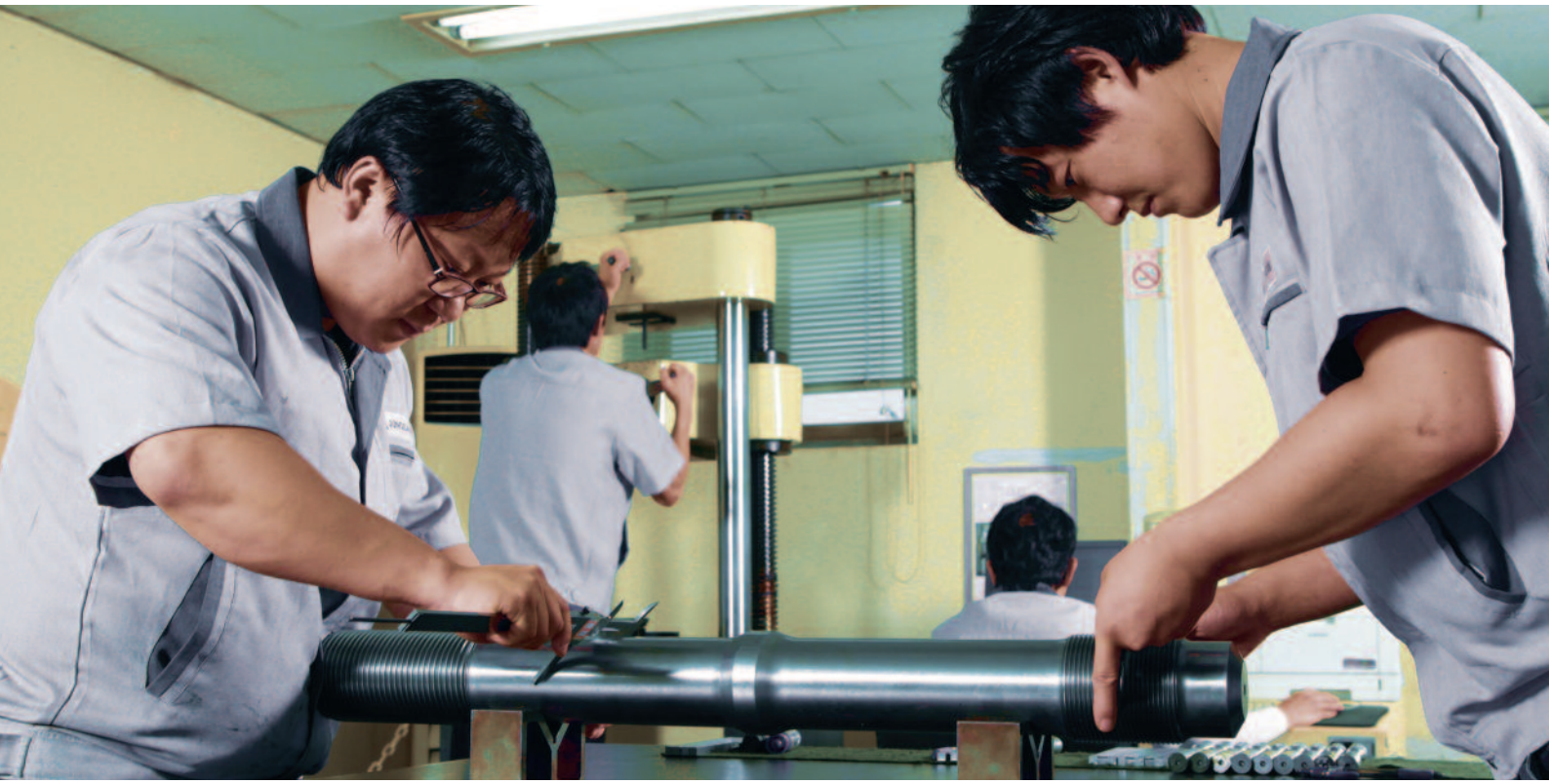
POWER PRESS (150t)

FRICTION PRESS (400t)

Quality Assurance Process

Quality Assurance

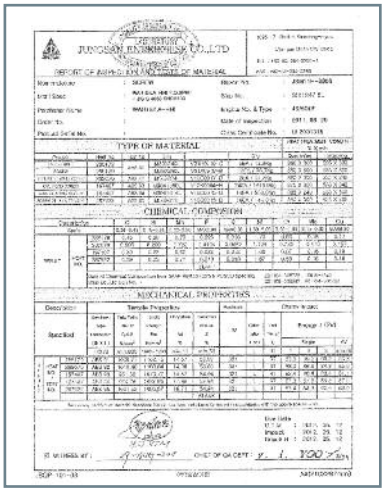
With high productivity and precision, all products of Joong San come from the complete quality management over the process from materials to manufacturing/delivery.

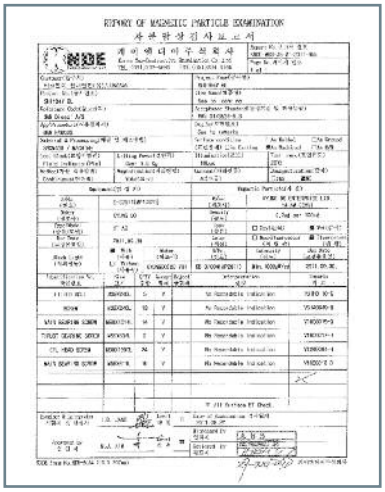


Process to inspect major products

1. Chemical experiment for materials
2. Hardness and tensile strength test after heat treatment
3. Measuring after processing
4. Magnetic particle inspection

MT Test Report





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Certificates

Your Best Partner

Innovative creation and ceaseless challenging spirits will move us up to a World Best position. We will develop the future.

Major Customers

Customers

The status of major Customers

Hyundai Heavy Industries Engine Part
- Stud Bolt/Nut for Marine engine part
- Stud Bolt/Nut for Nuclear Power Plant part

HSD Engine
- Stud Bolt/Nut for Marine engine part

Doosan Heavy Industries Casting-forging Parts
- ERolling facility of Iron foundry
- Emergency generator parts at Wolsung Nuclear Power Plant
- Emergency generator parts at Uljin Nuclear Power Plant

WÄRTSILÄ Hyundai Engine Part
- Stud Bolt/Nut for Marine engine part

KEPCO
- Local Plant Special parts

2011 Presidential Award Scene

What made Titanic sink under the sea

Many people present the reasons of what made Titanic go under the sea.

One of them attracts our attention, which is made by scientists of U.S. Academy of Standard Technology. They pointed that it is attributable to defected rivets all over the body of it. Those rivets are said to have been made out of faulty metals comprising slag (wastes being created when ores are melt)

Dr. Timothy Focke, a specialist metallurgist of the Academy, said Titanic could have stayed on the water for 12 hours if it had been normal, adding that it could have returned to a harbor if it had not been serous.

However, the inspection using microscopes and video analyzer on the remains revealed that the steel for the rivets comprised a large portion of impurities, particularly the slag which is two times more than limit. According to theories of metallurgy, impurities exceeding the limit may make the structure easily broken at small damage.

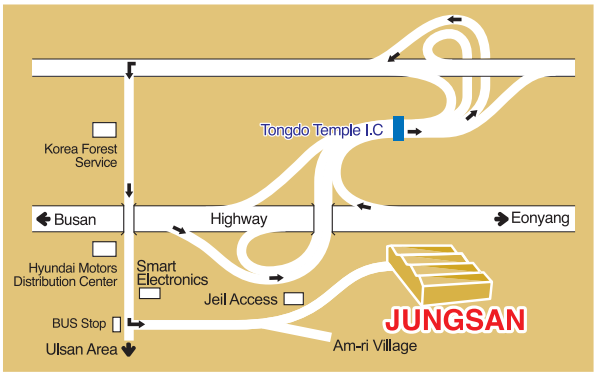
Furthermore, Dr. Focke assured that it could have saved time until a rescue ship arrived if only one watertight compartment (a partition shuts down so that water cannot flow into neighboring compartments) out of 6 had been out of water and could have returned to a harbor safely if two had worked alright.

Incredibly, however, all 6 compartments were filled with water and the ship sank in 2 hours. In early 1996, French divers found 6 places of big and small damaged parts, all of which were corroded because of defected joints to be fastened by rivets.

A small detection of the divers went through scientist' study and did a lot to get the root of the reason. Other than that, a witness gave testimony which backed their theory. This witness saved its life from the terrible disaster and testified it was clearly seen that water was leaking from each joint when she was sinking.

At the end, Titanic sank because of defects of small components called rivet.

Reference books: You only ruin yourself. (Wang Gyeong Gook, Jang Yoon Cheol, StarBooks)



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