

Variable Speed Rack & Pinion Jacking System

Description

The GustoMSC jacking system offers safety, minimum maintenance and a variety of outstanding features from an operational point of view.

The range of jacking systems suits the GustoMSC CJ and NG series and can be easily customized to any other jack-up rig design.

Jacking units

Each jacking unit consists of a special design 7 teeth pinion driven by an electric motor through an input- and planetary gearbox. In general four to eight jacking units engage with a rack of the jack-up leg. The jacking units can be mounted in a floating frame or can be mounted directly into the fixed jacking structure depending on the jack-up design.

Variable Speed Drive

The electric motors of the rack and pinion systems are driven by individual variable speed drives (VSD's). This arrangement allows for stepless speed control between zero and maximum speed. The system automatically distributes the loads equally over the drive units and retorquing can be performed automatically by the VSD control.

Jacking velocities

Maximum jacking velocities vary from 0.3 m/min to 1.2 m/min for platform handling. For leg handling, the speed can be increased by typically 50%.

Model range

The following range of jacking systems and capacities are available:

Module	50 - 105 mm
Rack width	90 - 210 mm
Jacking capacity	80 - 455 tons
Preload jacking capacity	83 - 575 tons
Normal holding capacity	150 - 760 tons



References

GustoMSC rack and pinion jacking systems are fitted on the following jack-ups:

• Maersk Explorer	1976
• Maersk Endeavour (now Energy Endeavour)	1980
• ARB-2 (maintenance)	1981
• Arabiyah 1, 2 & 3 (well-servicing)	1981
• Kolskaja	1982
• Sahalinskaja (now West Janus)	1982
• Seajacks Kraken	2009
• Seajacks Leviathan	2009
• Naga 2	2009
• Perro Negro 6	2009
• Naga 3	2010
• Perro Negro 8	2010
• ARB-3	2010
• GMS Endeavour	2011
• GMS Endurance	2011
• West Elara	2011
• SEP-450 Mussafah (NG2500X), for NPCC	2012
• West Linus (CJ70), for Seadrill	2013
• Falcon Energy TBN1 (CJ46)	2013
• Falcon Energy TBN2 (CJ46)	2014

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Operational features

The GustoMSC electric VSD driven rack and pinion systems offer the following characteristics:

- System suitable for variable and slow / zero speed control
- Use of standard, offshore type electric motors, without special high-slip requirements
- Easy automatic retorquing through the VSD drives
- Easy disengagement of the fixation systems
- Automatic platform leveling during lifting and lowering
- Failsafe brakes with sensorless on/off/wear indication
- Leg position indication and rack phase difference (RPD)
- Load measuring through the VSD drives and optionally through load measuring devices in the upper shock pads for floating units
- Power consumption can be reduced by reducing the jacking speed
- Depending on the size of the emergency generator, jacking is possible on the emergency generator
- Increased leg handling speed
- Easy removal of a drive unit
- Control from central- and local control consoles
- Optional remote access of the control system via secured internet connection

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