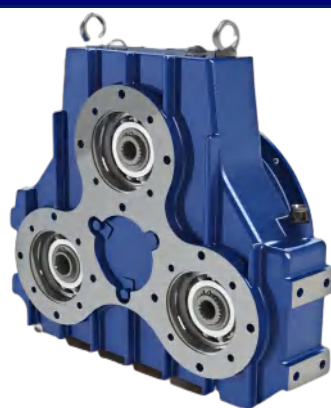
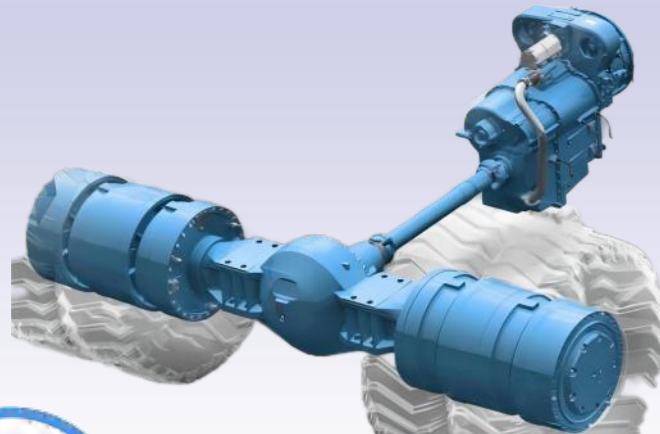


青岛土木金装备科技有限公司 工程机械传动产品介绍 TMG Drive-train System Product Catalog





青岛土木金装备科技有限公司简介

1

Tunnel Mine Equipment Tech Co.,Ltd
www.tmgmachinery.com

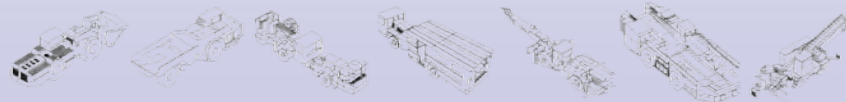
工程机械传动业务简介

2

(Drive-train System Products Introduction)



礦 隧 器 械 所





TMG Drive-train System Product—— Overview

□ Founded in 2016, our predecessor was founded in 1945 XCMG .

As a high-tech enterprise in Shanghai, our company is the only professional Stirling engine (hot gas engine) R&D and marketing application enterprise in China with more than 40 years of R&D experience.

With strong research and development capabilities and complete professional configurations, we have strategic businesses such as hot gas engines, hydraulic torque converters, and power shift transmissions.

Our core technology and products are in a leading position domestically and have international influence .



Gas heating engine



Hydraulic torque converter +power shift gearbox



Qualifications & Honors-XCMG Group

---Received 464 scientific and technological achievements awards, including 2 National Science and Technology Progress Special Prizes and 4 National Science and Technology Progress First Prizes; 253 valid authorized patents

Won the "National Advanced Grassroots Party Organization" and "National May Day Labor Award" multiple times

Won the title of exemplary organization of Scientific and Technological Innovation of the Group for 7 consecutive times

Received high-tech award in 2007 × × × × The Major Contribution Award for Development and Construction Projects was recognized by the Central Committee of the Communist Party of China, the State Council, and the Central Military Commission

Since 1984, it has been awarded the title of "Shanghai Civilized Unit" 15 times

Received the "Shanghai Municipal Government Quality Gold Award" in 2019

Received the title of "National Civilized Unit" in 2020



Capacity

Top first-class facility for integrated production and testing of machinery, electricity, and heat/equipped with advanced imported processing centers and some precision testing equipment/

A digital manufacturing platform that utilizes process planning and auxiliary processing technologies such as ESPRIT CAM, VERICUT, CAPP, etc./with high-level production, testing, and service capabilities





Quality Safety System

Having comprehensive
Quality assurance
system

Conduct annually:
2 internal audits
+1 management review

100%



100%



Final product acceptance rate
Customer satisfaction

QUALITY
POLICY



Refine



Exact test



Good Service



Lean production



Elaborate design



2004年

Obtaining the Military Product
Quality System Certification

2012年

Obtaining the Civil Product
Quality System Certification



工程机械传动业务简介

(Drive-train System Products Introduction)



礦隧器精所



sales@tmgmachinery.com
www.tmgmachinery.com

Tunnel Mine Equipment



地下水泵

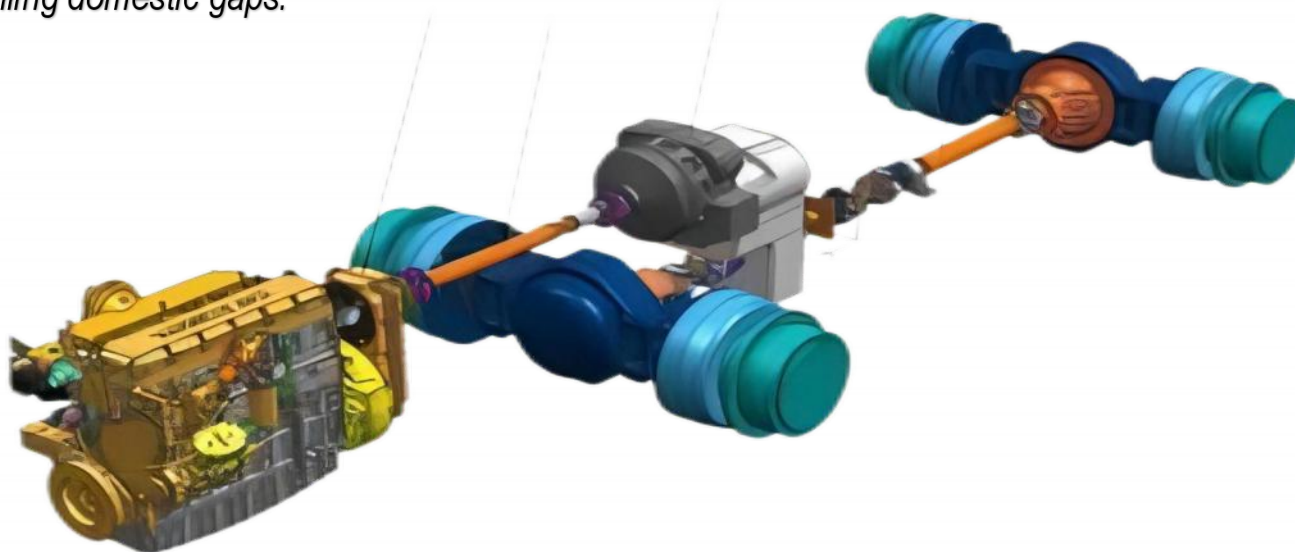
Whatsapp: +86-189-5329-3354

禁止烟火

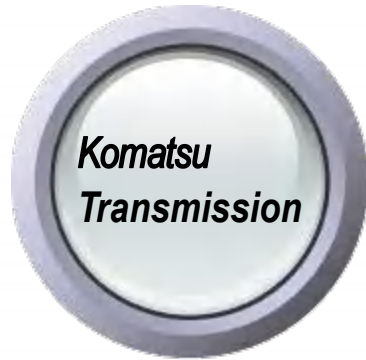


Engineering Machinery Transmission Business - Overview

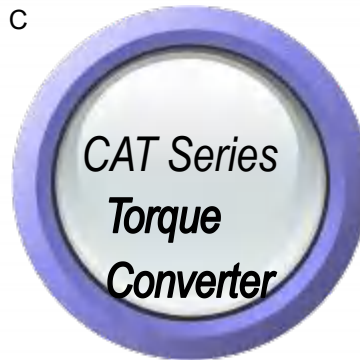
The research and production of hydraulic torque converters for construction machinery began in the late 1980s. After thirty years of technological accumulation and precipitation, the company has developed from a single model of hydraulic torque converter products to a professional transmission component provider covering domestic bulldozer manufacturers, including TY series and D series torque converters, transmissions, and transfer boxes. The product has been continuously improved and has won unanimous praise from our customers. Some models of the TY series have been successively installed by the military, and some products have been widely exported with the host factory. Relying on our strong R&D capabilities and years of professional background in the field of hydraulic transmission, we aim to solve the problems of "neck blockage" and "localization substitution" for customers and provide them with transmission system solutions. At the end of the 13th Five Year Plan, we will target high-end hydraulic transmission products monopolized by Western countries and successfully develop a series of torque converters and transmissions suitable for mining and port machinery, breaking foreign monopolies and filling domestic gaps.



Double variable bulldozer series



TY130
TY165
TY165A
TY220
TY230
TY320
TY410



D6D
D7G
DTY165
SD7
SD8
SD9



BSX165 transmission
TLH160 main clutch
FDX165 transfer box





Domestic Clients



中联重科

陕西中联重科土方机械有限公司



PENGPU

上海彭浦机器厂有限公司



SANY

三一重机有限公司



河北宣化工程机械股份有限公司



大地工程

内蒙古一机集团大地工程
机械有限公司



天津建筑机械厂



上海龙推机械有限公司



中铁动力

宝鸡中铁工程机械有限公司



中国铁建

中铁二十局(集团)西安工程机械有限公司



厦工(三明)重型机器有限公司



一拖(洛阳)工程机械有限公司

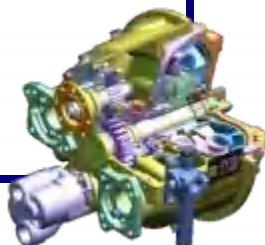


山东奥奇重工机械有限公司

Mining Machinery/Port Machinery Solutions

**270 series
Torque
Converter**

C272 series
C273 series



**32000 series
Transmission**

R32420
R32421
R32369



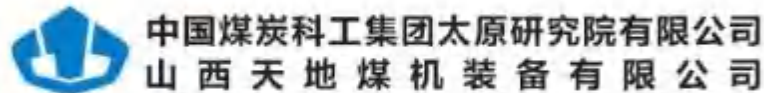
**Integrated
dual
transformer**

MHR32420
MHR32421
13.7HR32334



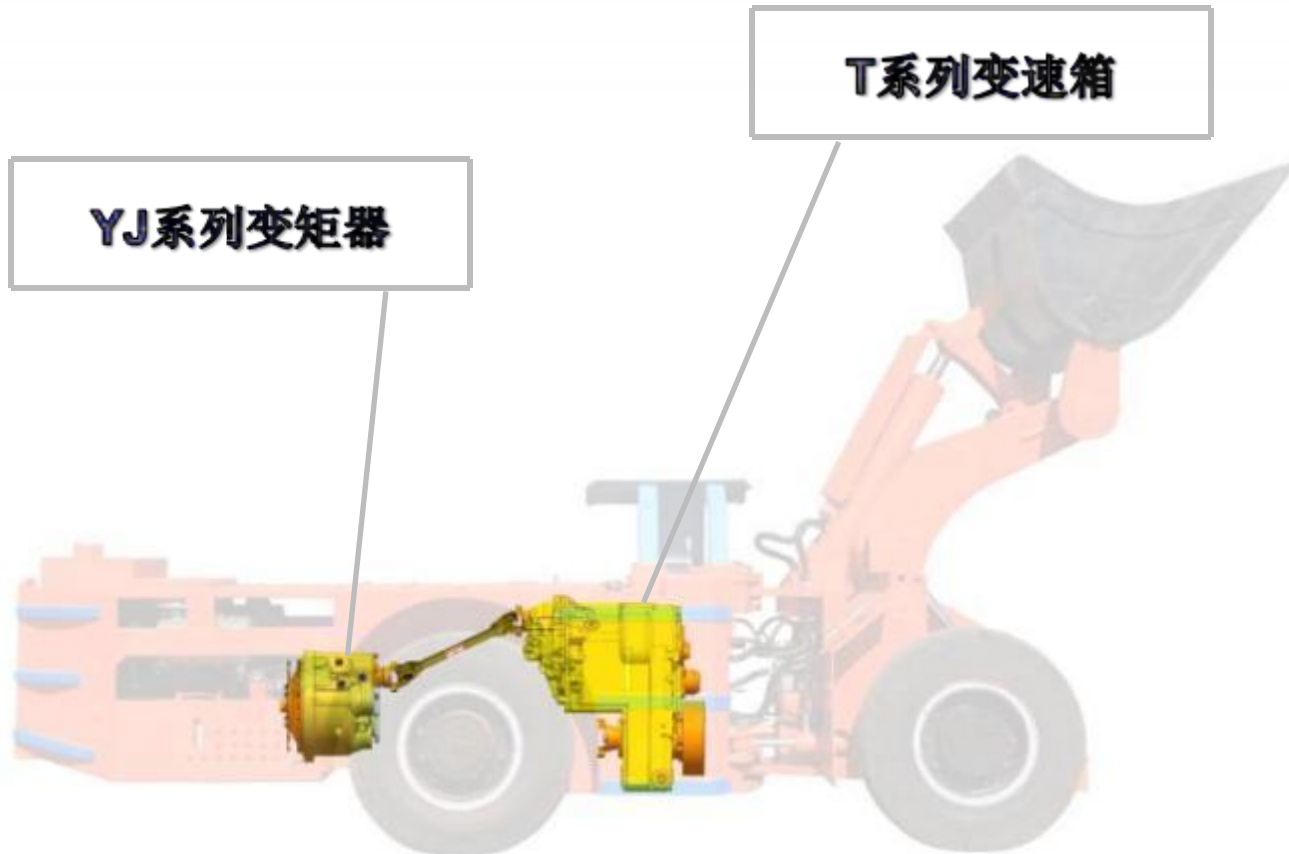


Mining Machinery Customers





Introduction to Mining Machinery Products



T series power transmission

T32 series power transmission (Benchmarking Dena R32000 series)

<i>Items</i>	<i>Parameter</i>
<i>Input flange</i>	<i>5C/6C</i>
<i>Output brake</i>	<i>Option</i>
<i>Box Transition Plate</i>	<i>Option</i>
<i>Control Model</i>	<i>Mechanical hydraulic control/electro-hydraulic control</i>
<i>Gears</i>	<i>3F3R/4F4R</i>
<i>Standard speed ratio</i>	<i>4.3/2.07/0.76</i>
	<i>4.64/2.24/1.29/0.75</i>
	<i>5.01/2.41/1.39/0.8</i>



Rated power: 80-180KW
Max input torque: 1300N.m
Axle Drop: 470.4mm

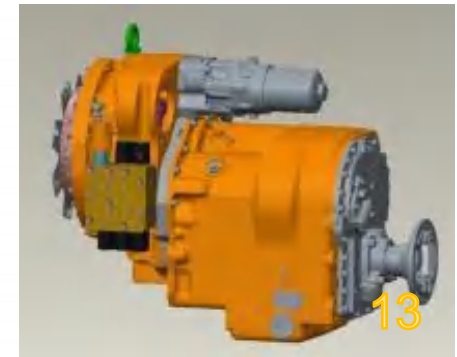


T series power transmission

T32 series product——power shift transmission

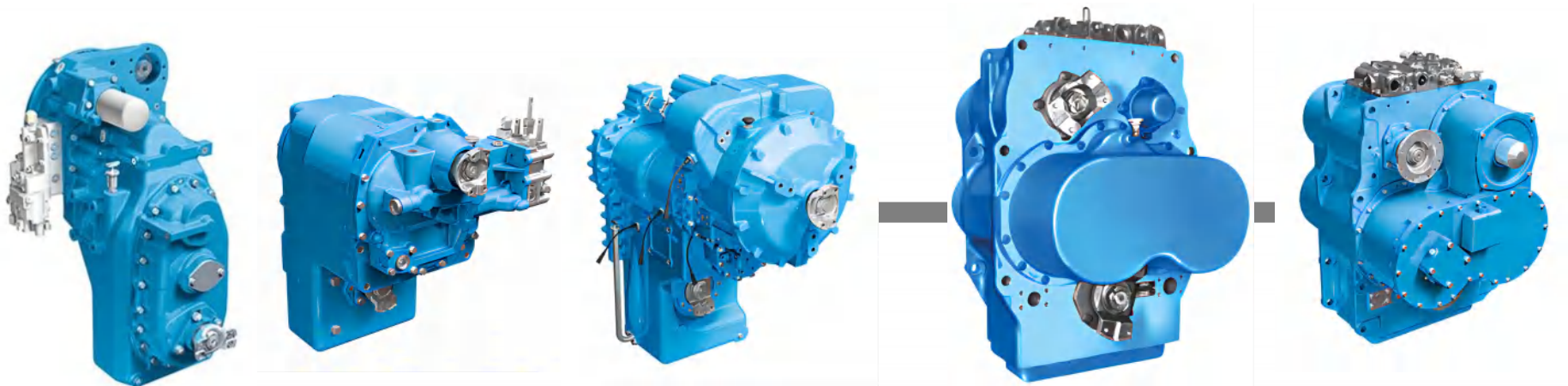
The T32 series gearbox is a fixed-shaft power shift gearbox, widely used in various mining machinery, port machinery and construction machinery vehicles.

Series	Model	Option
R32000	R32365、R32420、 R32421 等	Electro-hydraulic control, machine-hydraulic control, remote machine-hydraulic control, micro valve, flange, speed ratio, etc.
MHR32000	13.7MHR32420、 13MHR32421 13.7HR32334	
R36000		



T series power transmission

➤ Power transmission development process



R32365

13.7MHR32420

R36420

***15.5HR3643
2***

R32420

13MHR32421

R36424

6000

R32421

13.7HR32334

R36425

.....

.....

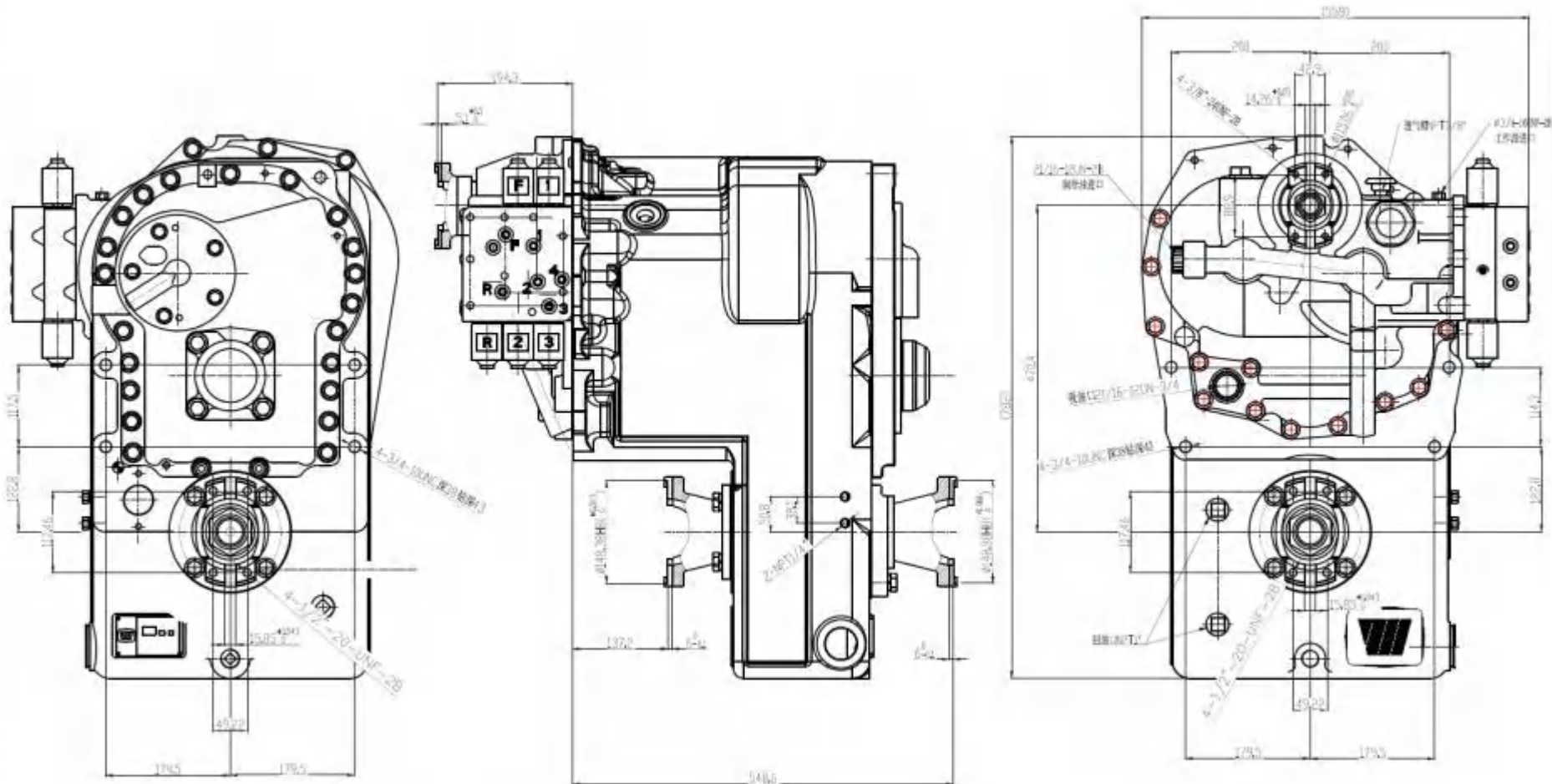
.....

R36441

.....

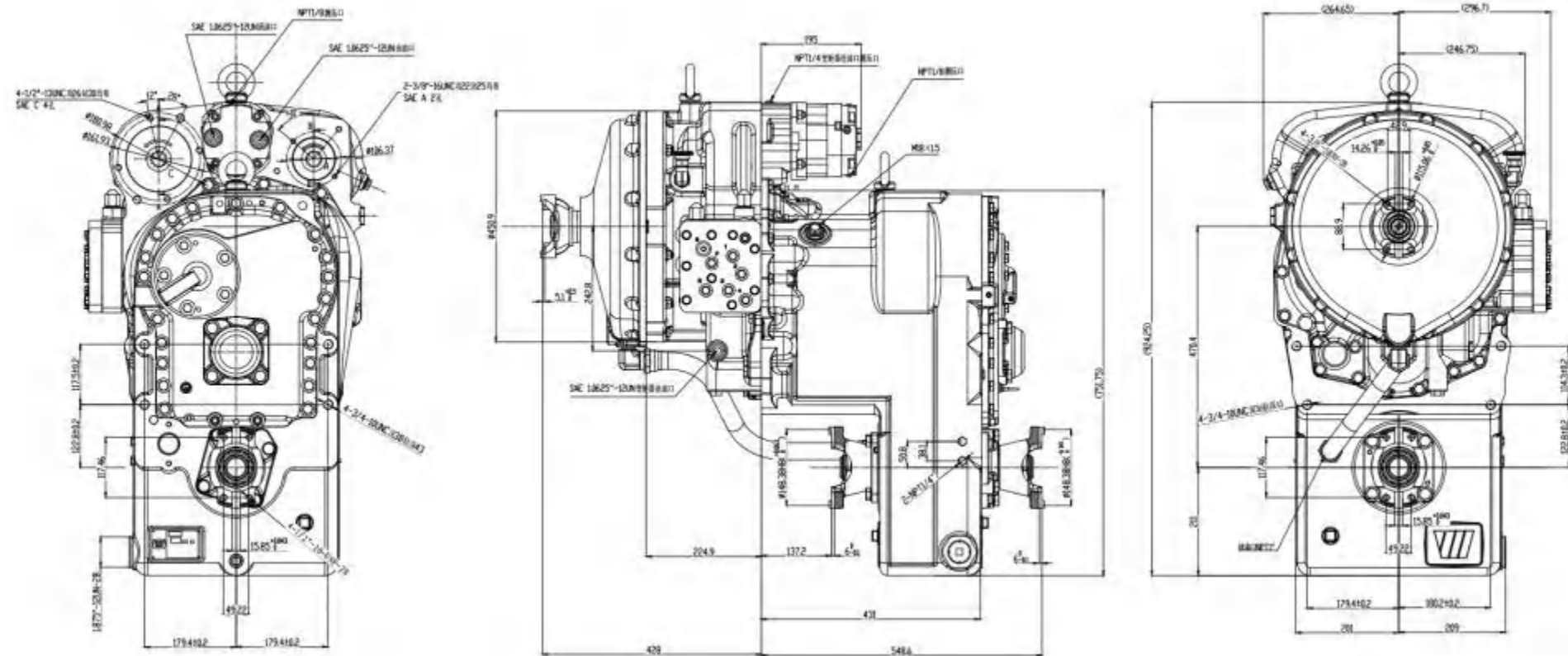
T series power transmission

Outline drawing of T32 power transmission (split type)



T series power transmission

T32 Outline drawing of power transmission (long shaft drop integrated type)



- [illegible]

YJ Series Hydraulic Torque Converter

YJ330 Toque Converter(Benchmark Dana C270 series)

Input power: 80-180KW

Maximum input torque: 743N.m

Maximum stall torque ratio: 1.82~3.12

Output bias ratio: 0.88~1.136



C273 C273.1 C273.7

Circular circle diameter 333mm

C270 series

C272 C272.1

Circular circle diameter 303mm

C5000 series
(under development)



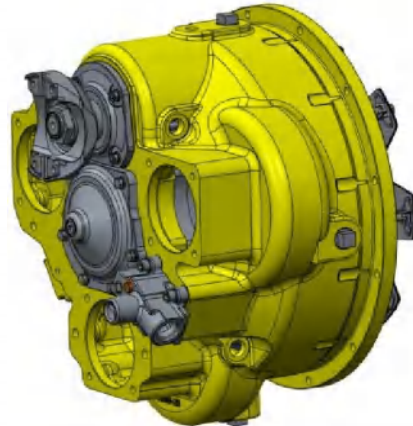
YJ series hydraulic torque converter

➤ Torque Converter Development Process



C273. 1

.....



C272

C273

.....

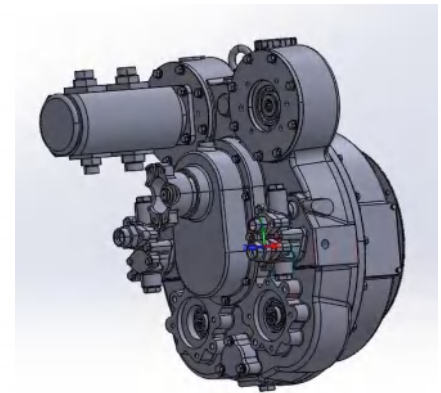


For mining equipment

C5000

CL5000

.....



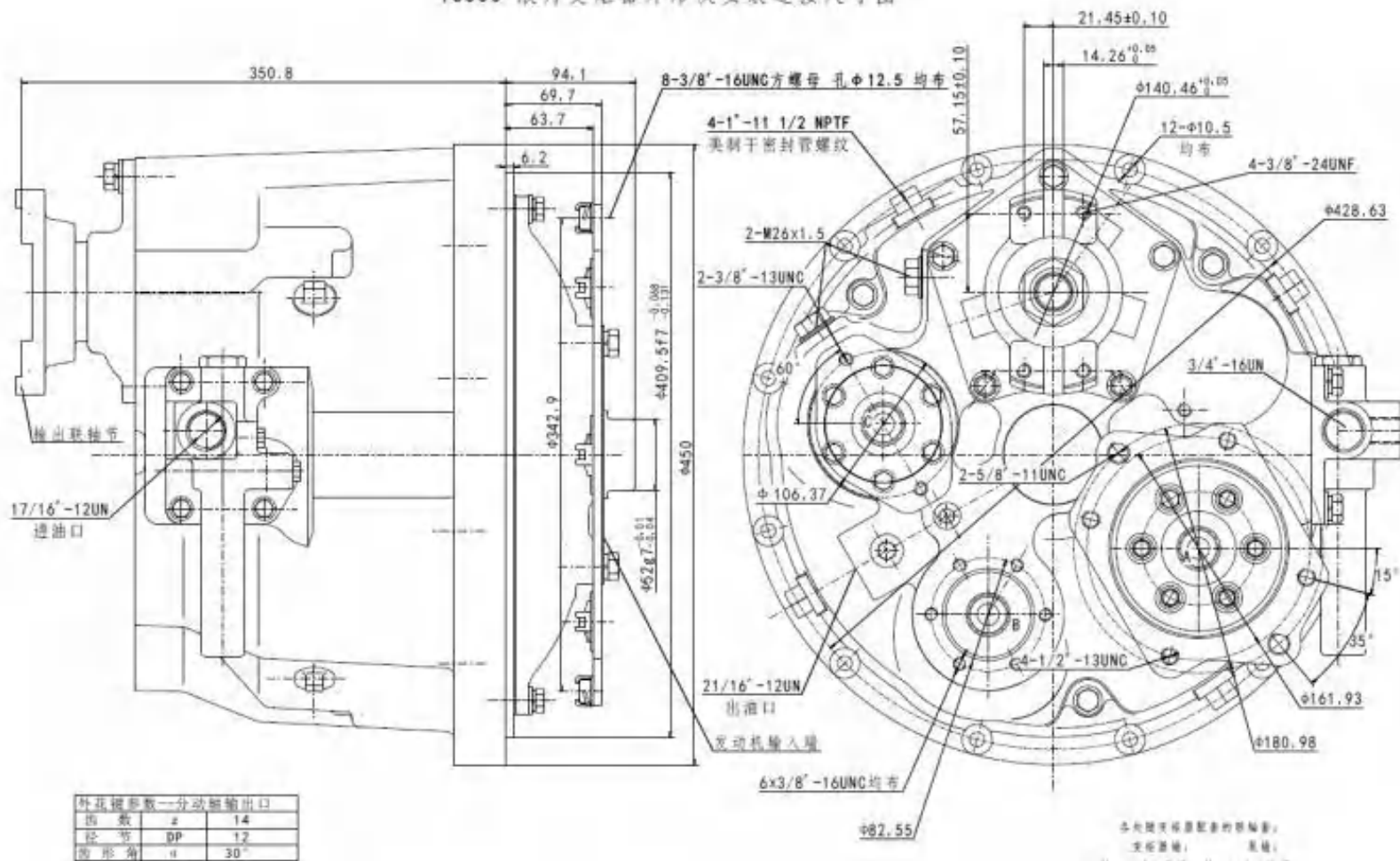
For port machinery

8000

9000

.....

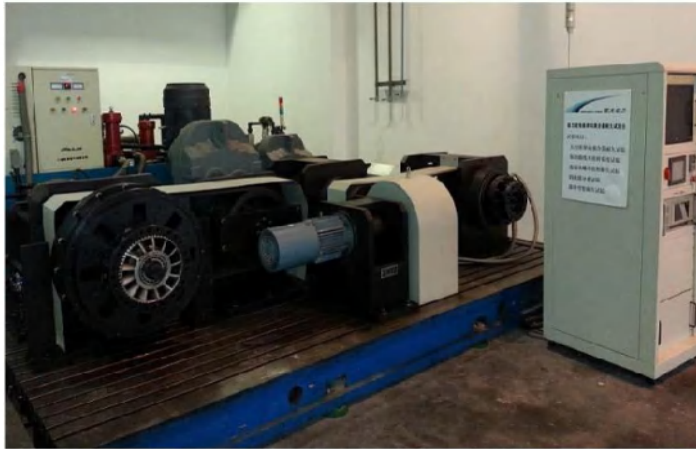
YJ330 液力变矩器外形及安装连接尺寸图



Test Bench



Test Bench

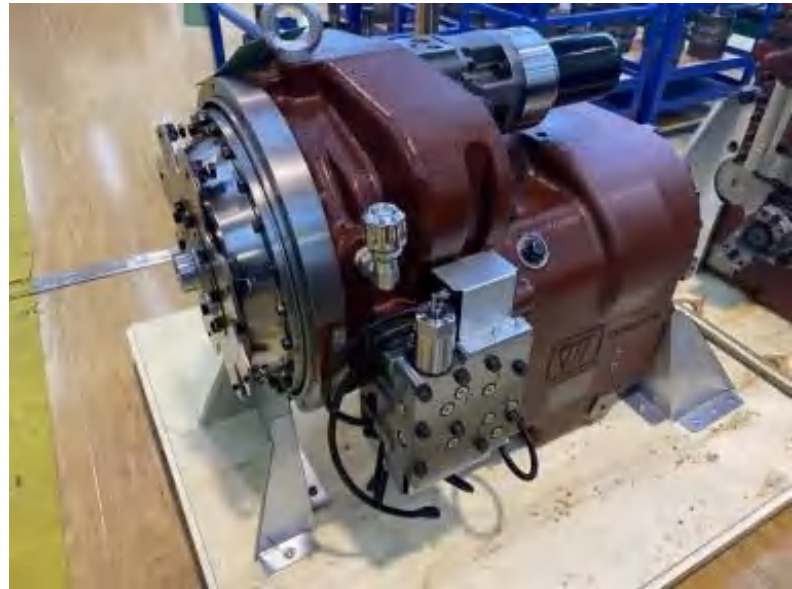


Final assembly









Inspection

Manufacturing Center to produce the Impeller turbine etc parts.



More than 150 units
advanced latch and
Milling ,boring CNC
machins



Digital control



Possess international,
domestic or industry-
leading precision machining
and electronic assembly
equipment from Germany,
the United States,
Switzerland, Japan, France,
Korea, etc.;



Machines



Manufacturing



Assemble Workshop

Workshop



CNC



Torque Converter Production Lines



Horizontal Lathes



CNC Machining Center



Verticle Lathes

Production lines



Riveting and welding



Brazing and cleaning

Test Bench and System



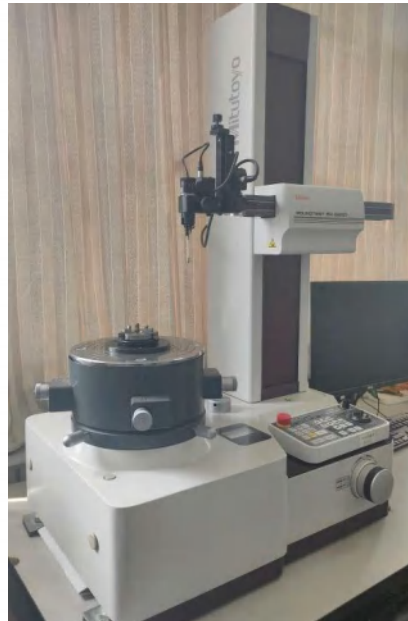
3D Printer



Inspection Device



Gear Scan



Roundness device



Spare Parts



Spare Parts



Spare Parts



Spare Parts





Product Application



Concrete Mixer Truck



Bracket Truck



Product Application

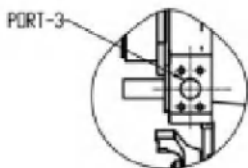
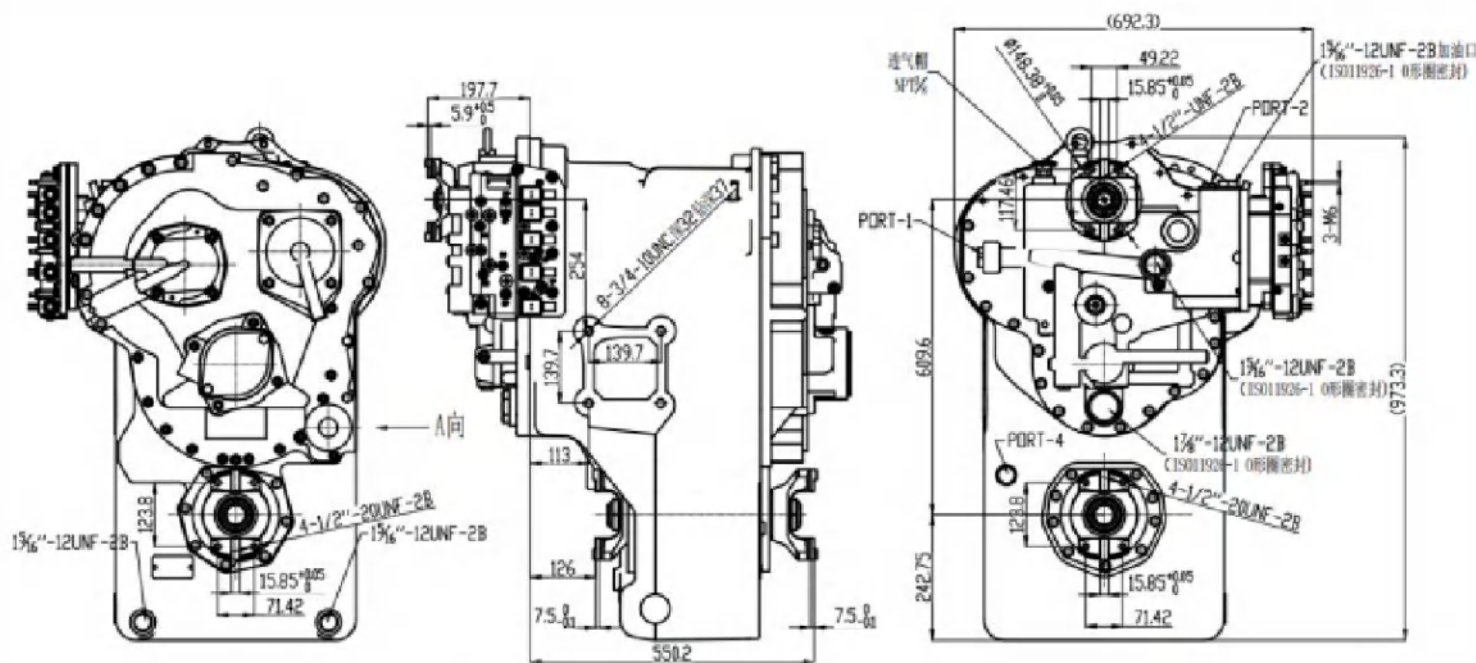


Product Application





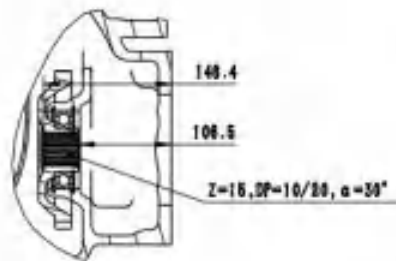
New product development Outline drawing of R36420 power transmission



接口规格		
变速箱入口 (自冷却器)	PORT-1	1 1/2\"-12UN (ISO1192-1 0形圈密封)
变速箱入口 (自调节阀)	PORT-2	3/4\"-16UN (ISO1192-1 0形圈密封)
变速箱出口 (去辅助泵)	PORT-3	SAE 1.5 安装螺孔 4\"-13UN
回油口	PORT-4	1 1/2\"-12UN (ISO1192-1 0形圈密封)
呼吸器规格		3/4\"-18NPTF
加油口规格		1 1/2\"-12UN

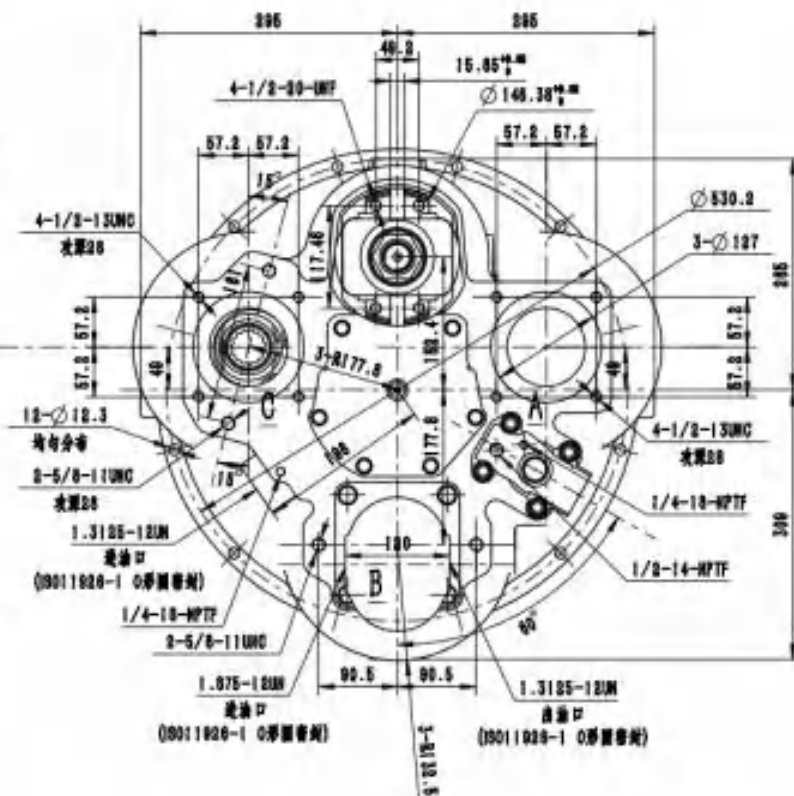
适用功率段	150-235KW	速比	前进	后退
最大输入扭矩	2455Nm	一档	5.33	5.33
额定输入转速	2200rpm	二档	2.44	2.44
工作压力	1.7-1.9MPa	三档	1.39	1.39
控制方式	电控控制	四档	0.790	0.79
输入取轴节	7C			
输出取轴节	8.5C			
重量	630Kg			

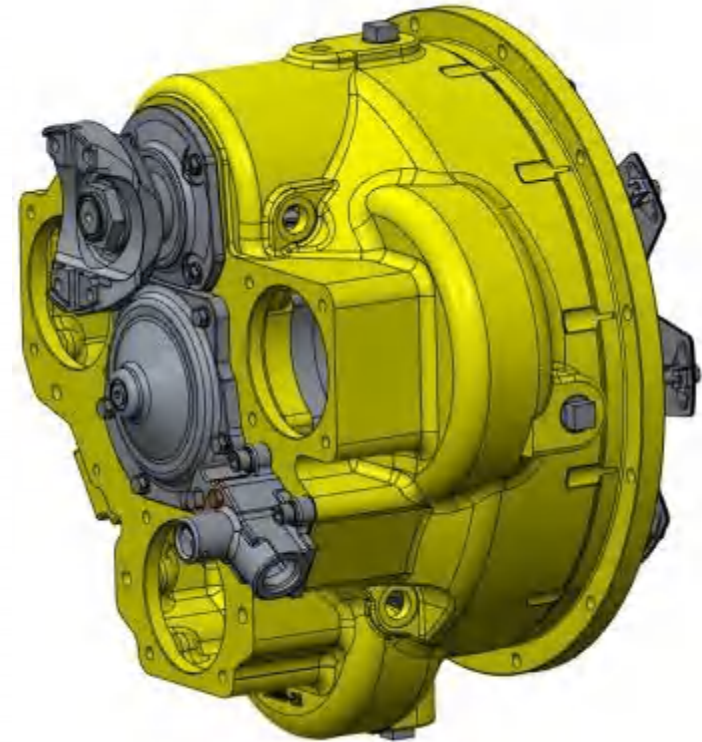
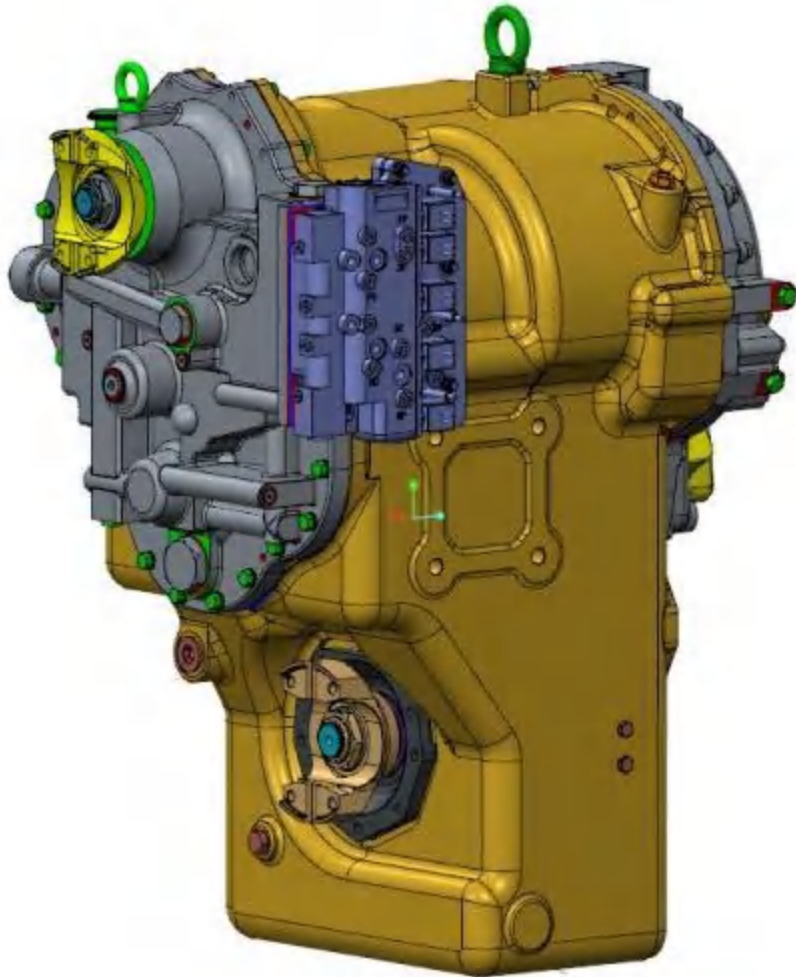
T364-200-01									
图号	01	02	03	04	05	06	07	08	09
比例	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
材料	HT200	HT200	HT200	HT200	HT200	HT200	HT200	HT200	HT200
热处理									
检验									
备注	T364变速箱总成图								



A. 中國先軍方印創視

備置比	1
油圧比	-0.955
油圧流量	128L/min@2000r/min
規定輸入速度	2000r/min
適用功率	150-235kw
最大輸入扭矩	1700Nm
重量	100kg

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Our Advantage

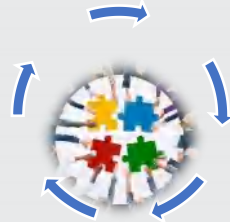
Made In China, Serve Gloabally

**Power transmission
system solutions**



**Transmission
Torque Converter
Axle**

**Collaboration based on the
entire product lifecycle**



**Sales
Application match
Design
Test/Commissioning
After service**

Manufacturing&Logistics

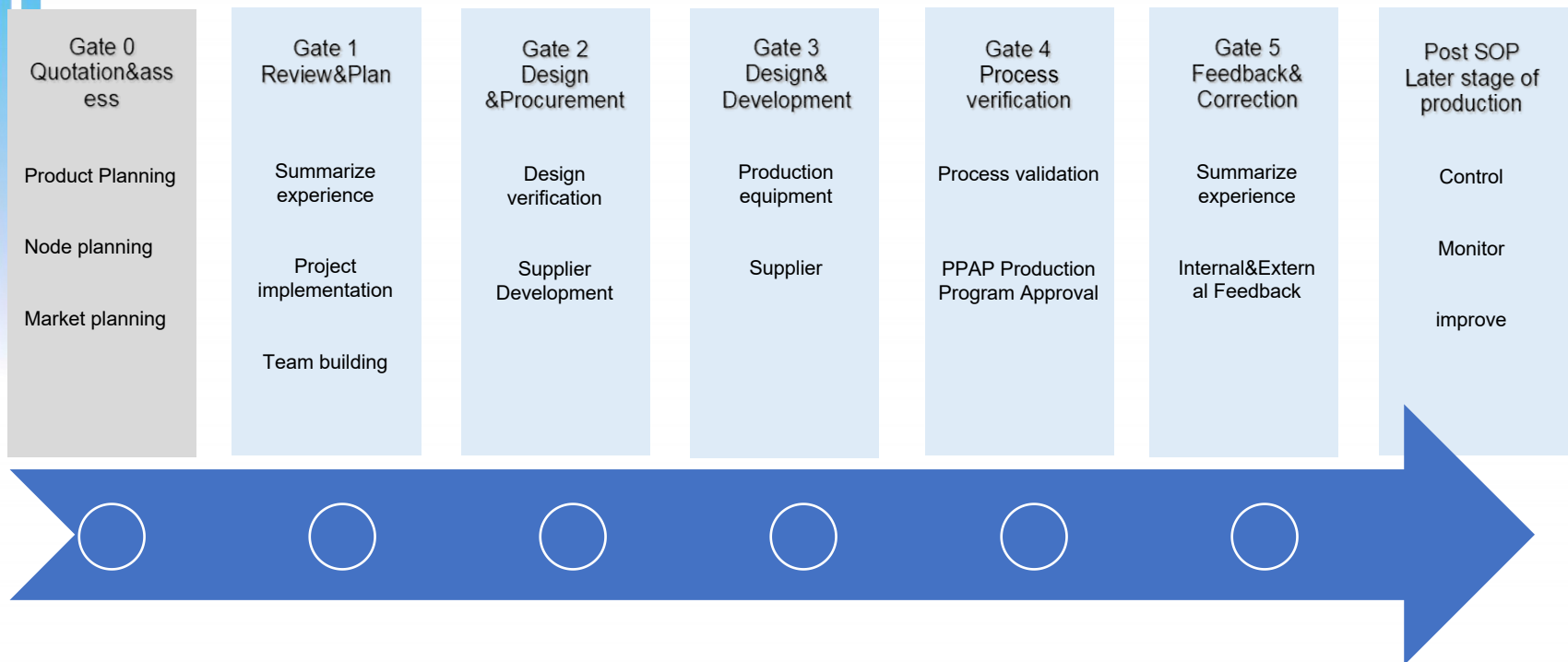


**Manucture
Storage
Import & Export
Distribution and after-sales center**



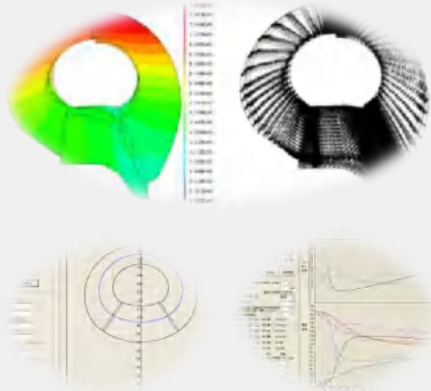
Product Development & Process Control

R&D&Control Process



Strong R&D Capabilities

Self designed torque converter



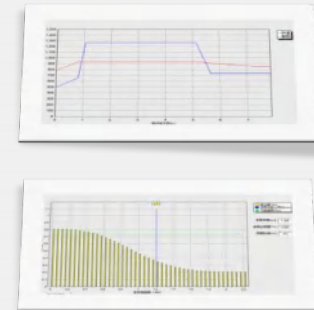
The only torque converter design software in China

Independently designed transmission



32 working conditions to calculate the bearing capacity of gears and bearings, shaft system design module, various gear parameter design modules, and can generate two-dimensional diagrams based on design parameters

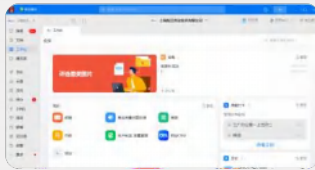
Heat treatment process simulation



Powerful guarantee of the quality of key core components such as gears/shafts

Powerful delivery and validation capabilities

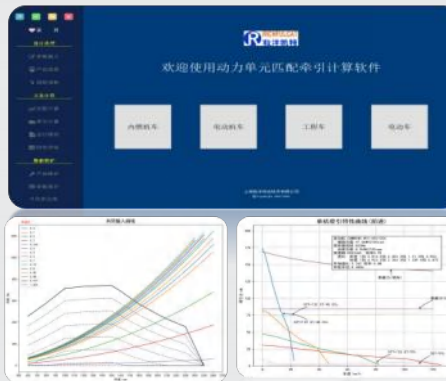
Digital management of production processes



Dingding, OA Management

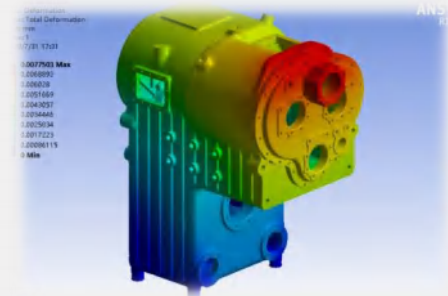
Manage the OA system from research and development to delivery throughout the entire cycle to ensure production delivery

Application software support



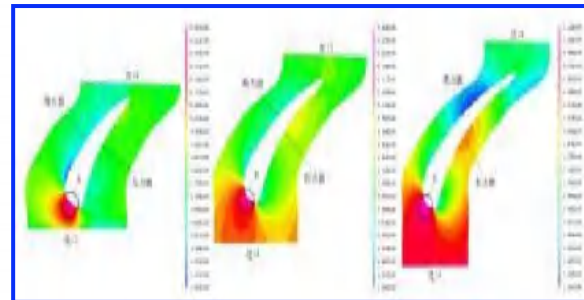
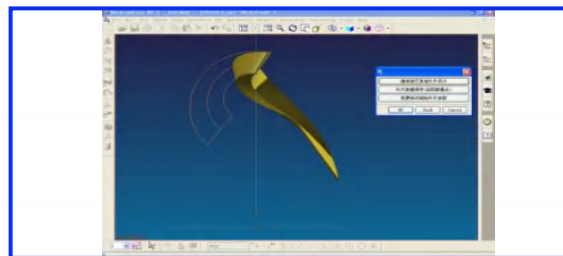
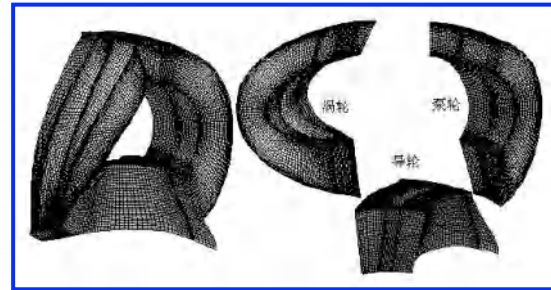
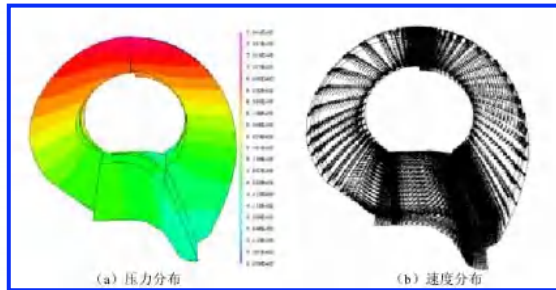
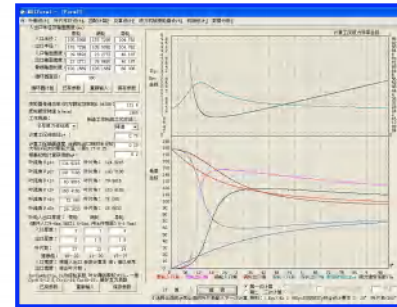
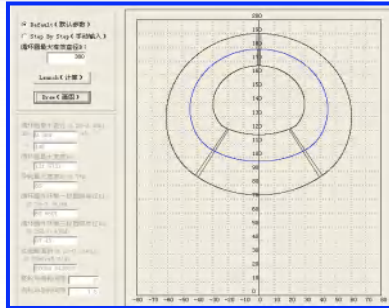
Accurate matching of internal combustion/motor and other driving methods

Simulation verification



Simulation experiment

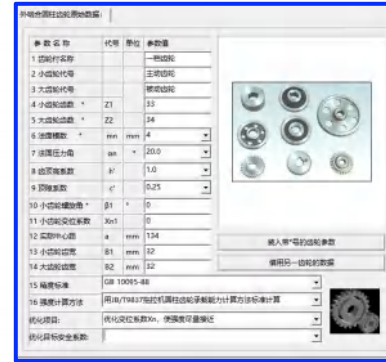
Industrial software - Torque converter design software (only in China)



Industrial Software - Transmission design software

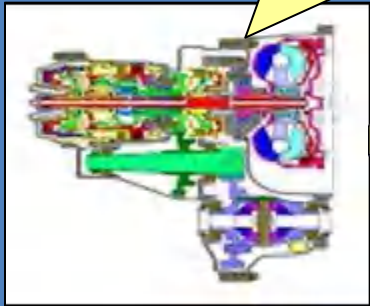
Features:

- It has 32 working conditions to calculate the bearing capacity of gears and bearings
- With shafting design module
- All kinds of gear parameter design module
- Can according to the design parameters of the two-dimensional diagram

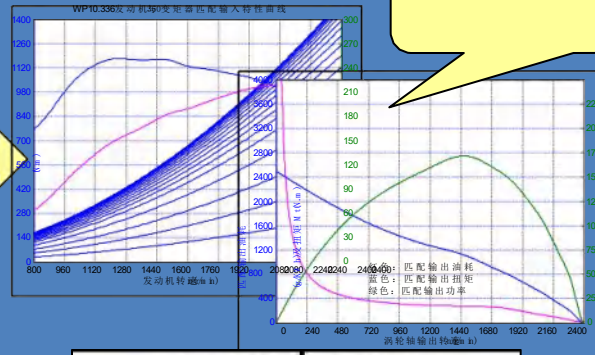


Power matching technology

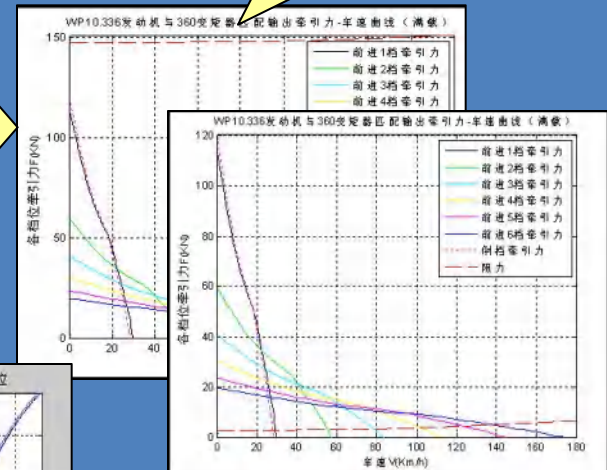
POD



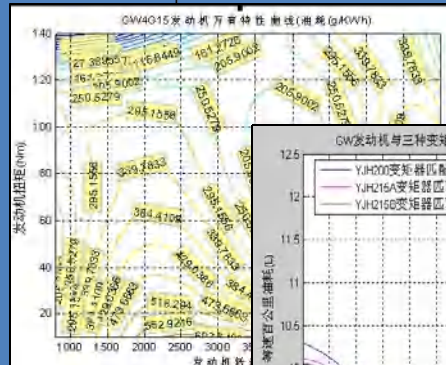
Engine/Torque Converter Matching



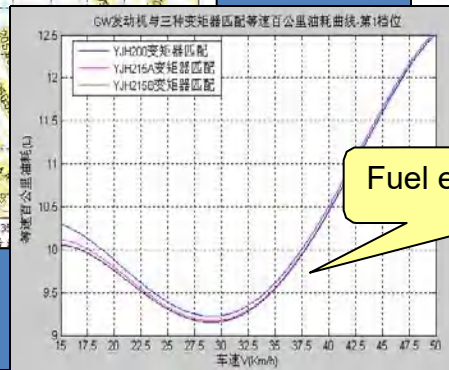
Dynamic simulation analysis



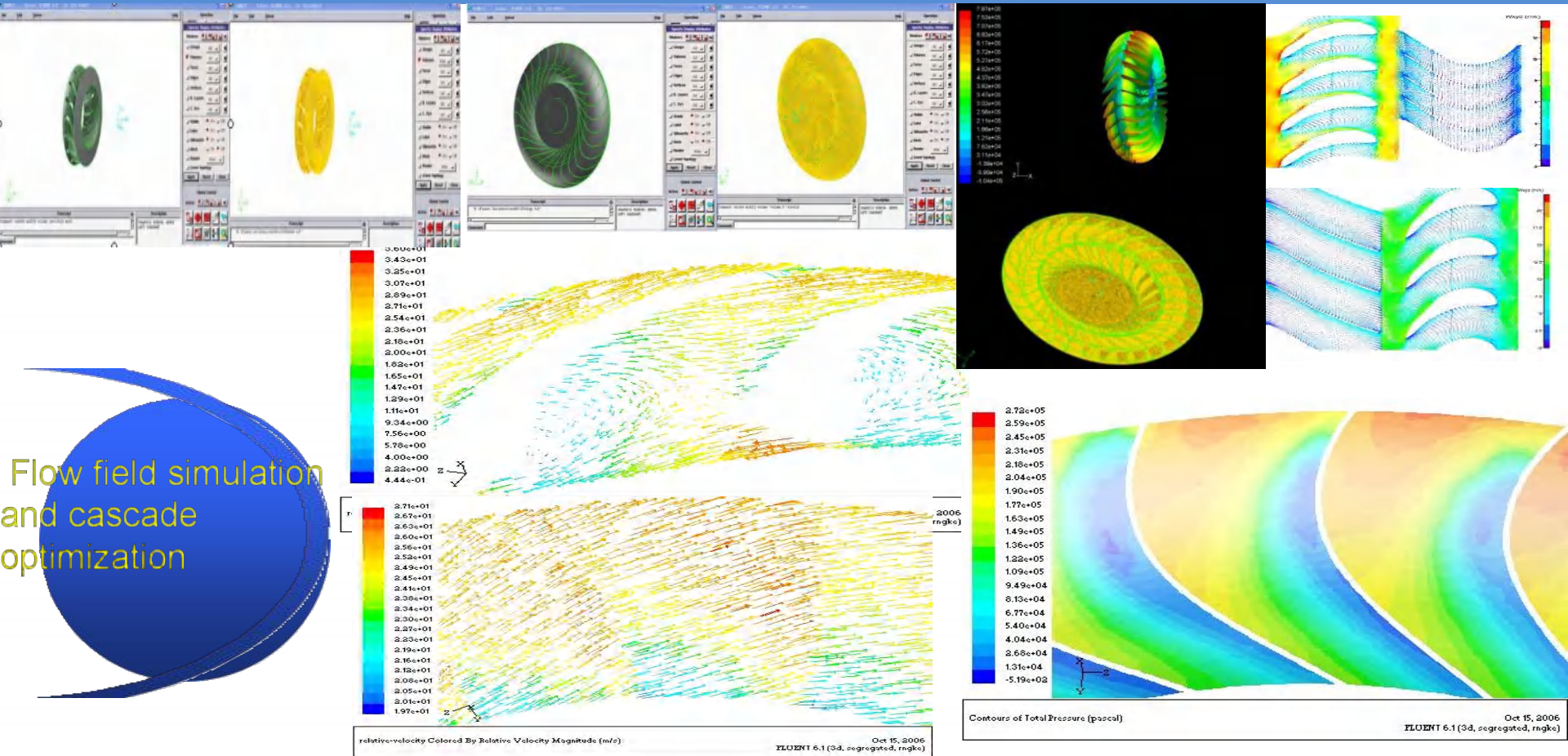
Power
Matching
Technology



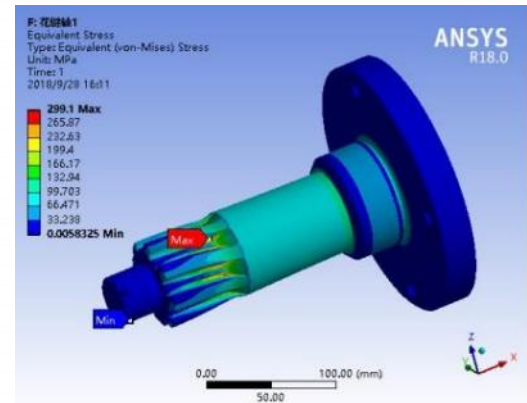
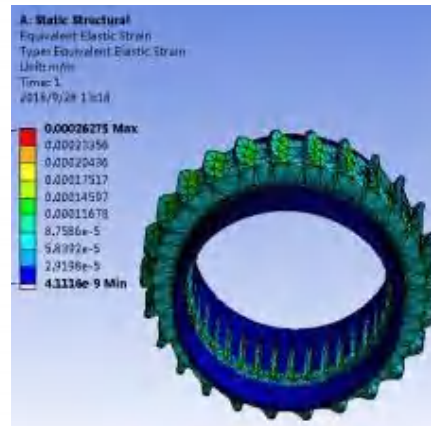
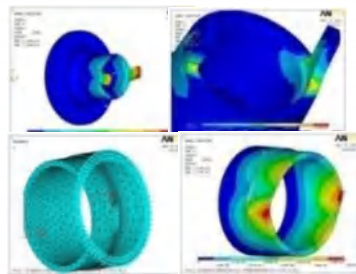
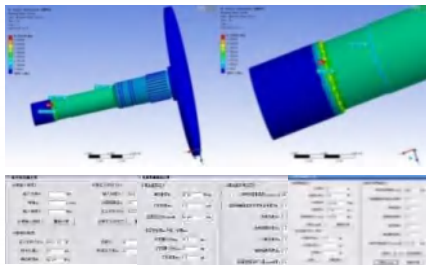
Fuel economy analysis



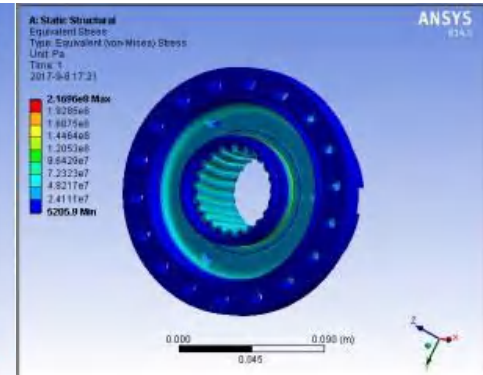
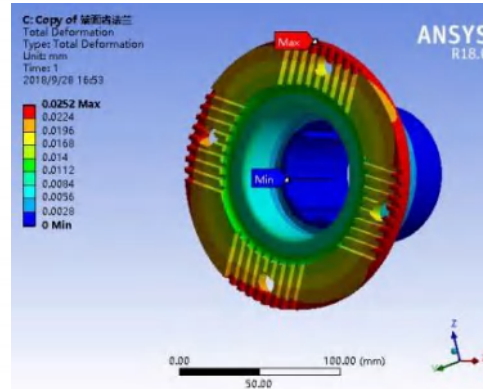
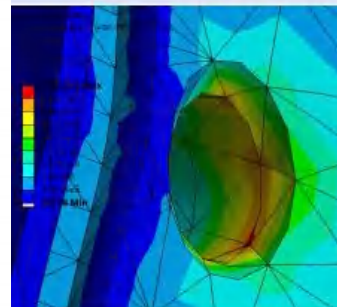
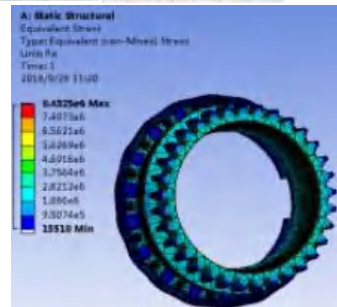
Key Component strength analysis technology

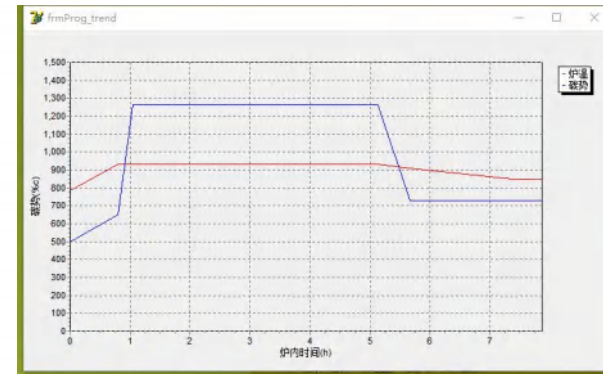


Element Analysis



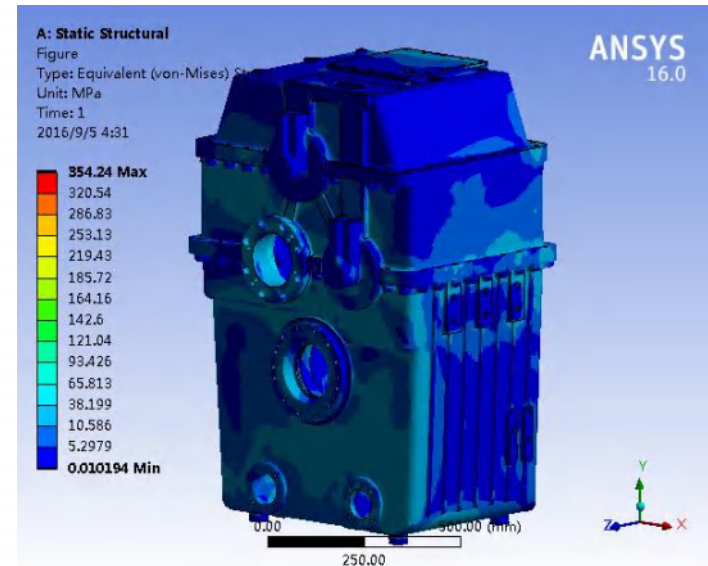
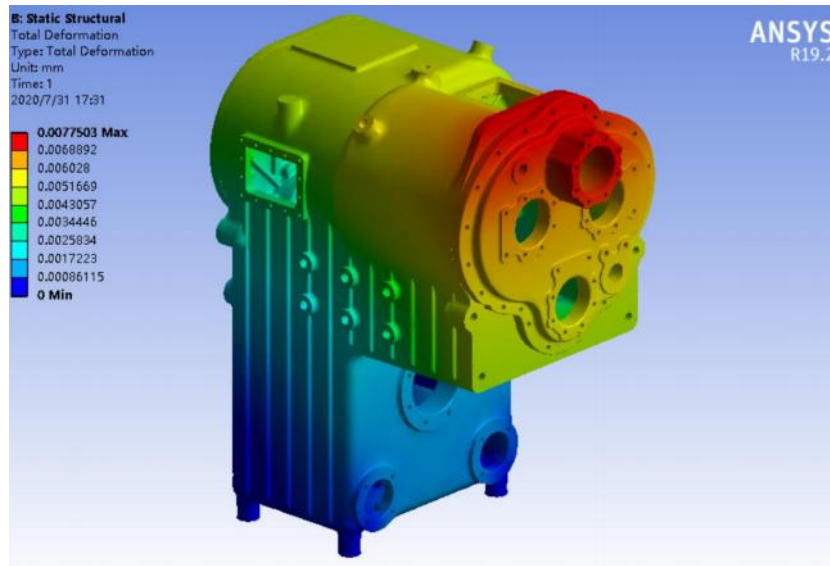
Key Components Strength Analysis Technology





Power shift transmission reliability verification

Finite element analysis of box:



System solutions across the entire industry sector

OFFROAD TRANSMISSION SYSTEM SOLUTIONS

Agriculture



Construction Equipment



Mining



Railway



Petroleum machinery



Heavy duty + High-efficiency + Reliable

Product Series

OFFROAD TRANSMISSION SYSTEM SOLUTIONS

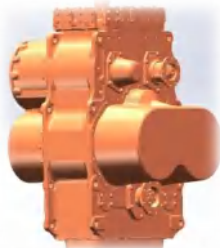
Agriculture



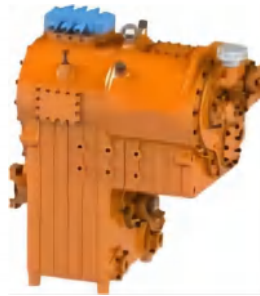
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Transmission
models

Construction Equipment



Mining



2

2 Power method

Railway



36

Torque converter
models

Petrol Machinery



Product Catalog



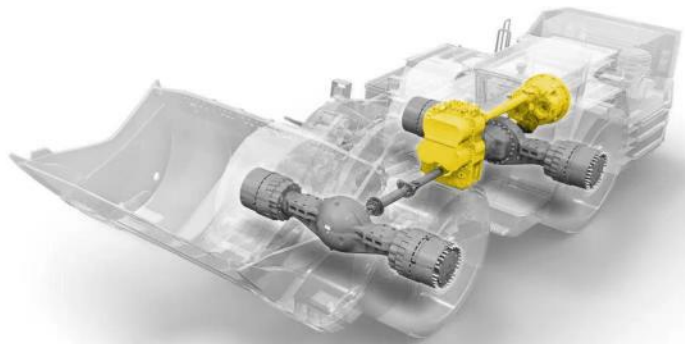


Comparison with Top Euro brand

- Customized design to solve customer pain points;
- Short lead time, 3 months;
- Electrically controlled shifting and automatic shifting mode are adopted to reduce shifting impact and protect gears from damage;
- Hydraulic torque converter has large circulation, large transmitted torque, large traction and strong climbing ability. Changed torque is not easy to heat up.
- The clutch structure is improved to reduce the friction plate burning phenomenon caused by the inaccurate control of the engagement time of the two clutches during the shifting process.
- The gear is thickened to improve the reliability of the gearbox. Higher reliability and longer life.



Application-Underground loader LHD



Torque converter series

- Combination of torque converter and power take-off
- More torque transmission than similar torque converters
- There are many power take-off ports to meet the needs of multiple working conditions, and locking is optional
- The torque converter with the same type of flywheel housing has a large circulation circle

Transmission series

- No calibration, full power shifting, no unboxing for five years
- Advanced shifting control software technology, fully automatic shifting, no impact during shifting
- Front and rear output, driving front and rear axles, excellent off-road functionality
- Long and short axis descent to meet the needs of different working conditions
- Supports multiple installation modes such as integrated and split transmission and torque converter



Underground Loader Solutions -transmission,torque converter

Model	Traditional Solutions	Our Solutions	Remarks
3m ³ LHD	C273 + R32420	YJ330/RCV273 + RC32428	Interchangeability design
4m ³ LHD	C5502 + R36420	RCV5502 + RC38425	Interchangeability design
6m ³ LHD	C8602 or C9602+R6422	RCV8602 + RC6422	Interchangeability design
8m ³ LHD	C9672 + R8420H	RCV9672 + RC8420	Interchangeability design

Notes :

- The transmission system solution needs to be calculated in detail based on the application situation, vehicle operating conditions, engine curve, axle speed ratio, etc.



3m³ Underground Loaders Solution

Torque converter - RCV273



Transmission - RC32428



Product Model	RCV273	Product Model	RC32428
Circular diameter mm	330	Max input torque N.m	1400
Maximum input speed rpm	3000	Max.input rotation speed rpm	3000
Matching power range KW	118-168	Matching power range KW	118-168
Zero speed torque ratio	2.64	Gears	Gear 1 4.73
Zero speed operating condition nominal torque MBg0	82.3		Gear 2 2.24
Efficient working condition nominal torque MBg η	85.33		Gear 3 1.10
			Gear 4 0.75
Maximum efficiency %	83	Oil storage capacity L	30
Weight kg	145	Weight KG	485
		Axle drop distance mm	508



4m³ Underground Loaders Solution

TORQUE CONVERTER - RCV5502



TRANSMISSION - RC38420



Product Model	RCV5502	Product Model	RC38420
Circular circle diameter mm	358	Max input torque N.m	2300
Max Input rotation speed rpm	2700	Max.input rotation speed rpm	3000
Matching power range KW	118-220	Matching power range KW	151-279
Zero speed torque ratio	2.64	Gears	Gear 1
Zero speed operating condition nominal torque MBg0	190		Gear 2
Efficient working condition nominal torque MBg η	139		Gear 3
Maximum efficiency %	87.5		Gear 4
Weight kg	195	Oil storage capacity L	30
		Weight KG	505
		Axle drop distance mm	508

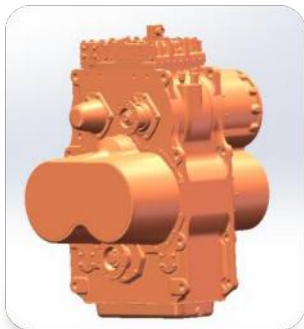


6m³ Underground Loaders Solution

TORQUE CONVERTER - RCV8602



TRANSMISSION – RC6422



Product Model	RCV8602	Product Model	RC6422
Circular circle diameter mm	380	Max input torque N.m	2900
Max Input rotation speed rpm	2400	Max.input rotation speed rpm	2300
Matching power range KW	147-309	Matching power range KW	224-320
Zero speed torque ratio	2.28	Gears	Gear 1 4.39
Zero speed operating condition nominal torque MBg0	266.9		Gear 2 2.45
Efficient working condition nominal torque MBg η	190		Gear 3 1.39
Maximum efficiency %	89		Gear 4 0.77
Weight kg	280	Oil storage capacity L	32
		Weight KG	780
		Axle drop distance mm	500.9



8m³ Underground Loaders Solution

TORQUE CONVERTER – RCV9672



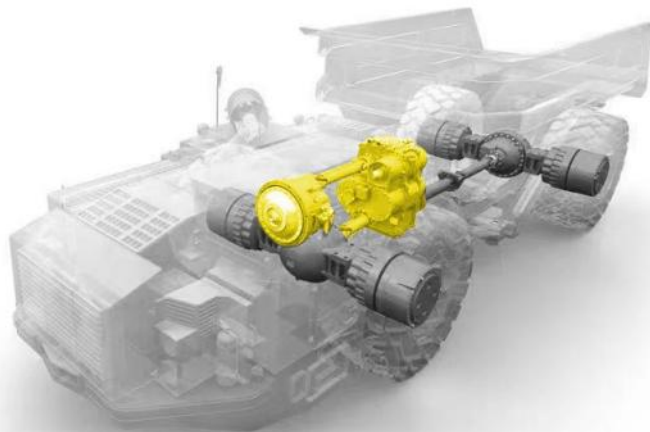
TRANSMISSION – RC8420



Product Model	RCV9672	Product Model	RC8420
Circular circle diameter mm	409	Max input torque N.m	4200
Max Input rotation speed rpm	2400	Max.input rotation speed rpm	2200
Matching power range KW	260-410	Matching power range KW	298-450
Zero speed torque ratio	2.4	Gears	Gear 1 5.31
Zero speed operating condition nominal torque MBg0	363		Gear 2 2.71
Efficient working condition nominal torque MBg η	275.4		Gear 3 1.40
Maximum efficiency %	89		Gear 4 0.71
Weight kg	330	Oil storage capacity L	32
		Weight KG	1320
		Axle drop distance mm	605



Application-Underground Mining Dump Truck



Torque converter series

Combination of torque converter and power take-off

More torque transmission than similar torque converters

There are many power take-off ports to meet the needs of multiple working conditions, and locking is optional

The torque converter with the same type of flywheel housing has a large circulation circle

Transmission Series

- No calibration, full power shifting, no unboxing for five years
- Advanced shifting control software technology, fully automatic shifting, no impact during shifting
- Front and rear output, driving front and rear axles, excellent off-road functionality
- Long and short axes will meet the needs of different working conditions
- Supports multiple installation modes such as integrated and split transmission and torque converter



Underground Mining Truck Solutions

Model	Traditional Proposal	Our Proposal	Remarks
20T underground mining truck	CL5572 + R36425	RCVL5572 + RC38425	Interchangeability design
30T underground mining truck	C8672 + R6422	RCVL8672 + RC6422	Interchangeability design
40T underground mining truck	C9672 + R8821	RCVL9672 + RC8821	Interchangeability design
55T underground mining truck	18.5RLMTE50821	RCVL9672 + RC52421	Interchangeability design

Notes:

- The transmission system solution needs to be calculated in detail based on the application situation, vehicle operating conditions, engine curve, axle speed ratio, etc.



20 ton Underground Mining Truck Solutions

**TORQUE CONVERTER-
RCVL5572**



TRANSMISSION – RC38425



Product Model		RCVL5572	Product Model		RC38425
Circular circle diameter mm		380	Max input torque N.m		2300
Max Input rotation speed rpm		2400	Max.input rotation speed rpm		3100
Matching power range KW		132-300	Matching power range KW		151-279
Zero speed torque ratio		2.28	Gears	Gear 1	3.984
Zero speed operating condition nominal torque MBg0		266.7		Gear 2	2.087
Efficient working condition nominal torque MBg η		190		Gear 3	1.197
Maximum efficiency %		89		Gear 4	0.719
Weight kg		290	Oil storage capacity L		30
			Weight KG		500
			Axle drop distance mm		508



30 ton Underground Mining Truck Solutions

**TORQUE CONVERTER-
RCVL8672**



TRANSMISSION – RC6422



Product Model	RCVL8672	Product Model	RC6422
Circular circle diameter mm	409	Max input torque N.m	2900
Max Input rotation speed rpm	2400	Max.input rotation speed rpm	2500
Matching power range KW	167-353	Matching power range KW	224-320
Zero speed torque ratio	2.4	Gears	Gear 1 4.39
Zero speed operating condition nominal torque MBg0	363		Gear 2 2.45
Efficient working condition nominal torque MBg η	275		Gear 3 1.39
			Gear 4 0.77
Maximum efficiency %	89	Oil storage capacity L 30	
Weight kg	330	Weight KG 766	
		Axle drop distance mm 501	



40 ton Underground Mining Truck Solutions

**TORQUE CONVERTER-
RCVL9672**



TRANSMISSION – RC8821



Product Model	RCVL9672	Product Model	RC8821
Circular circle diameter mm	450	Max input torque N.m	4500
Max Input rotation speed rpm	2400	Max.input rotation speed rpm	2200
Matching power range KW	353-588	Matching power range KW	261-410
Zero speed torque ratio	2.65	Gears	Gear 1 4.07/1.29
Zero speed operating condition nominal torque MBg0	530		Gear 2 3.08/0.97
Efficient working condition nominal torque MBg η	460		Gear 3 2.26/0.71
Maximum efficiency %	88.5		Gear 4 1.71/0.54
Weight kg	335	Oil storage capacity L	49.3
		Weight KG	1327
		Axle drop distance mm	605

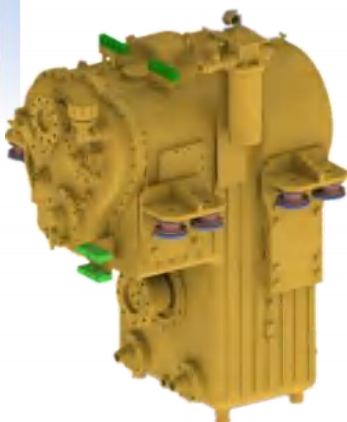


55 ton Underground Mining Truck Solutions

**TORQUE CONVERTER-
RCVL9672**



TRANSMISSION – RC52421



Product Model	RCVL9672	Product Model	RC52421
Circular circle diameter mm	480	Max input torque N.m	6000
Max Input rotation speed rpm	2300	Max.input rotation speed rpm	2500
Matching power range KW	353-588	Matching power range KW	350-588
Zero speed torque ratio	2.35	Gears	Gear 1 4.50
Zero speed operating condition nominal torque MBg0	822		Gear 2 2.15
Efficient working condition nominal torque MBg η	605		Gear 3 1.24
Maximum efficiency %	89		Gear 4 0.72
Weight kg	355	Oil storage capacity L	
		Weight KG	1723
		Axle drop distance mm	778



Product Features

- Modular design, reliable quality, easy to use, and fast delivery



Modular & Specialized Design

- Complete intellectual property, providing customized requirements.
- Modular design with multiple types of speed ratios, suitable for products on the same platform
- Wide power range, suitable for products on the same platform



High security and reliability

- Strict process control
- High level gear technology and craftsmanship
- High bearing capacity design of bearings
- Global procurement of key core components
- Strong anti pollution ability



Easy to use

- Easy to use through user manual
- Using standard component design to enhance the convenience of purchasing torque converter after-sales parts
- Error proof design for easy lifting and disassembly



Fast delivery

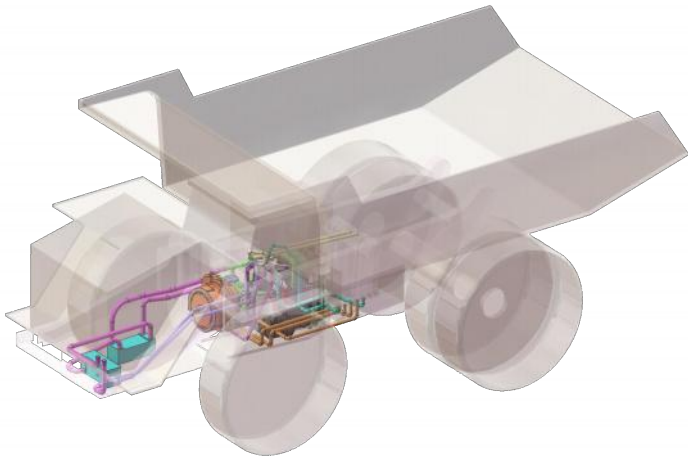
- Using PLM+ERP+MES system, digital factory management system and other measures to ensure quality and quantity delivery

Application Case—Underground Loader



- Application of 6 cubic meter underground loader.

Application Case—Underground Truck



Application Case—Track/Tunnel/Industrial and Mining Locomotive



Typical projects:

- Guangzhou-Foshan Metro
- Zhuhai Metro Airport Line
- Guangzhou Metro Line 18
- Guangzhou Metro Line 22
- Nanchang Metro Line 1

Application Case—Metro Vehicles



Typical projects:

- CRRC Ziyang won the bid for Chengdu Metro in 2022;
- Kunming Railway Construction won the bid for Zhengzhou Metro in 2022
- Baoji Times won the bid for Fuzhou Metro in 2023
- Jinying Heavy Industry won the bid for Chengdu Metro in 2023

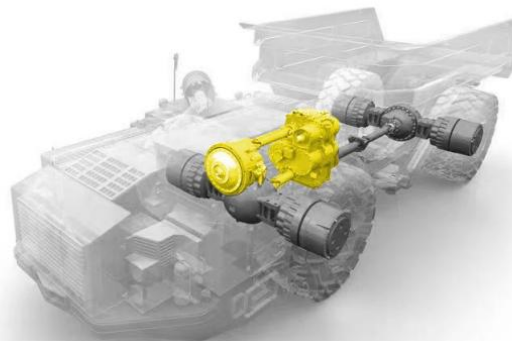
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