



For
Technology,
Quality & Value
Start with
erae AMS



Reaching the highest levels of Technology, Quality and Value for Our Customers

1980s

Establishment

- 1984 : JV between GM and Daewoo

1990s

Technology Independence

- 1998 : Established new tech center in Daegu, Korea
- 1999 : Completion of climatic wind tunnel
- Developed independent design and production technology

2000s

Expansion

- 2001 : Changed name to Korea Delphi Automotive Systems
- 2007 : Established manufacturing site and tech center in Changshu, China
- Started to diversify customers and entered the global market

2010s

Globalization & Network Expansion

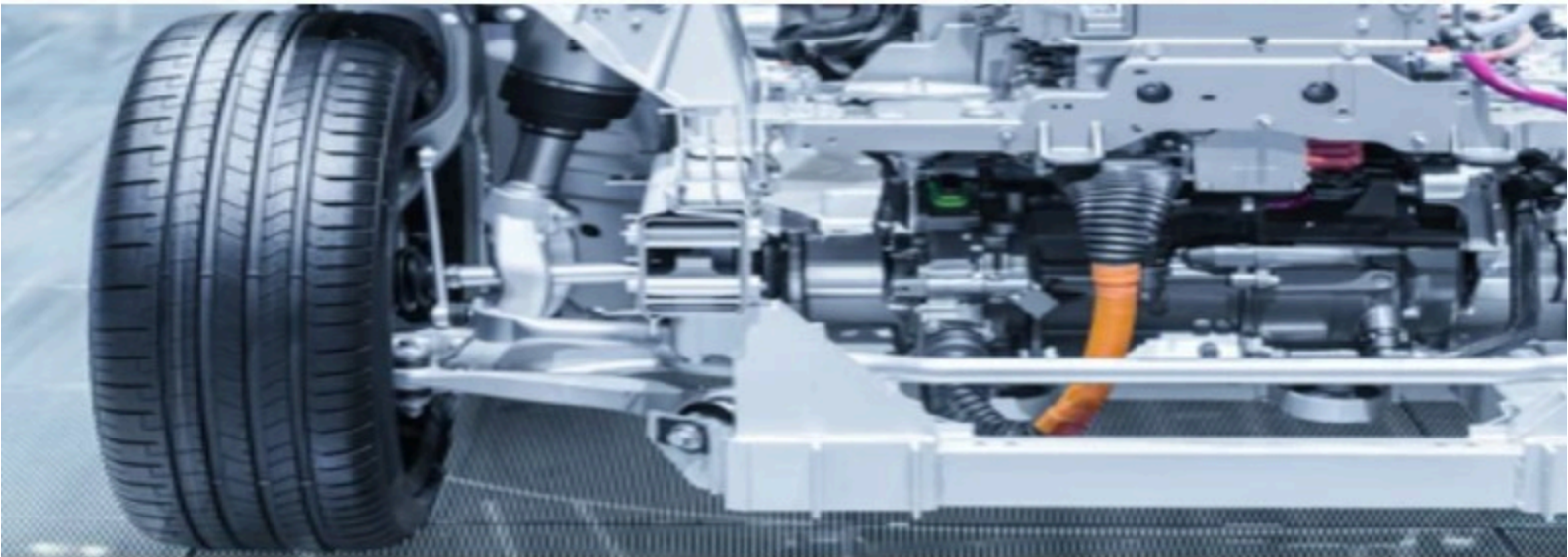
- 2010 : US tech center opened for US business
- 2013 : Established manufacturing site in Jilin, China
- 2014 : e-intelligence founded to develop ADAS tech
- 2017 : FATEC(Future Automotive Tech Center) founded
- 2017 : Changed name to ERAE AMS
- 2018 : Built US production site in Pontiac, Michigan
- Grown into a global company by establishing a global manufacturing, R&D and service network
- Received Excellent Supplier Awards from GM, Stellantis, Toyota

2020s

Transformation into a Future Technology Company

- 2021 : Selected as a “World Class 300+” company by the Korean government (title awarded only to the top 300+ companies in Korea)
- Growing into a company specialized in driveline system and electric powertrain
- Integrated a smart factory line in Daegu plant

Excellence in Developing and Supplying Automotive Components to Global Car Makers



ERAE is an established global automotive parts manufacturer with a diverse portfolio of products.

ERAE, formerly known as Korea Delphi, is an automotive components & systems supplier headquartered in Korea with nearly 40 years of corporate history and a global footprint (13 locations in 9 countries, including Michigan, US). We produce a wide array of auto components & systems ranging from more traditional products (e.g., driveline, chassis, brake, steering products) to products geared towards the future (electric powertrain). Since its establishment, its excellent technology has been acknowledged by world renowned automobile manufacturers (e.g., GM, Stellantis, Volkswagen, Rivian) as it has supplied compact and lightweight automotive components with outstanding performance and durability based on robust capabilities in management, production, and technology.

Our product quality has been acknowledged by the largest car makers.

Namely, ERAE received the "Supplier of the Year Award" for 5 years from GM which is granted only to 2% of GM's suppliers worldwide. ERAE is fully dedicated to becoming a global leader in the automotive components industry by achieving a combination of world-class technology, quality, price competitiveness and service.

We have robust production and R&D capabilities.

ERAE has multiple state of the art manufacturing and R&D facilities worldwide. Our manufacturing facilities, including in Korea and Michigan, US ensure stable, reliable production of high quality products. The annual global production volume is over 2 million vehicle parts. They are backed by our strong R&D centers in which we invest significant resources.

We supply components to global auto makers, including new EV makers.

Below are a few examples of our customers :

- Established car makers (longstanding and main customers) :
GM, Stellantis, Volkswagen
- High-end car makers : Audi, Porsche, Maserati
- New EV makers : Rivian, Canoo

ERAE is transforming into a future technology company.

We are making continuous efforts to transition into the new electric vehicle paradigm. We have developed and are enhancing advanced new products, such as electric powertrain, and competitive core products for the next generation automotive business environment, will be unveiled soon.



Establishment

1984



Headquarters

Republic of Korea



Business

Driveline, Chassis & Electric Powertrain



Intellectual Property

Domestic : 245
International : 137



Global Presence

11 Locations
9 Countries



Production Capacity

Over 2 Million
Vehicle Parts



Employees

1,237



R&D Personnel

127



erae AMS

CONTENTS

- + Product Portfolio
- + Driveline
- + Brake
- + Steering
- + Electric powertrain
- + Alternator
- + Capability
- + Global Footprint
- + Customers

ERAE's Vision is to lead the Advanced Driveline System and Electric Powertrain to our customers

01. Driveline

- Halfshaft
- Rz/TP/DO/CG Joint
- Propeller shaft joint
- Monobloc tubular shaft
- Ball splined shaft



02. Electric Powertrain

- Micro to M segment available (2WD or 4WD)
- 1 or 2 speed transmission
- Motor -Inverter Module
- Various options : e-Parking, e-LSD, e-DD, Dual clutch torque vectoring



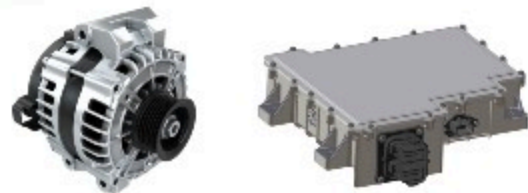
03. Brake & Steering

- Wheel Brake
- Steering column
- Electric tilt & tele. Column
- Intermediate shaft



04. Electronics

- Alternator
- Inverter for Electric Powertrain



Driveline

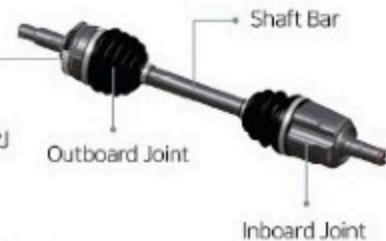
Halfshaft

Features

- Outboard Joint : Rzeppa / High Angle Rzeppa / High Efficiency Rzeppa / CGJ / CTPJ
- Inboard Joint : CGJ / CTPJ / TPJ / VSJ

Customer Benefits

- Light weight
- High durability
- Stable power delivery and enhanced driving feel



Ball Spline Halfshaft

Features

- By separation of absorbing function of angular and length displacement
 - Extremely low GAF (maximum 15N)
 - Extension of plunging capacity (100mm max.)

Customer Benefits

- Excellent NVH Performance due to lower GAF even high angle condition
- Absorption capacity of extremely wide suspension displacement



Monobloc Tubular Shaft (MTS)

Features

- Optimally sized monobloc tubular shaft
- Extended tubular section for the maximum weight reduction

Customer Benefits

- Light weight and fuel saving
- Highly stabilized NVH performance



Anti-shudder Tripod Joint (VSJ)

Features

- Low GAF in any running angle
- Simplified spider assembly
- Wide guiding housing structure

Customer Benefits

- Highly stabilized NVH performance
- Low cost achieved by less number of components and simplified assembly



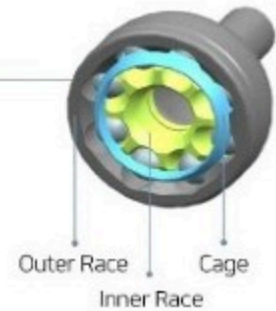
Ultra High Angle Rzeppa Joint (UARz)

Features

- Compact Joint with 6 ~ 8 balls
- Reverse ball track design

Customer Benefits

- Light and compact package
- Increased joint angle capacity (52°)



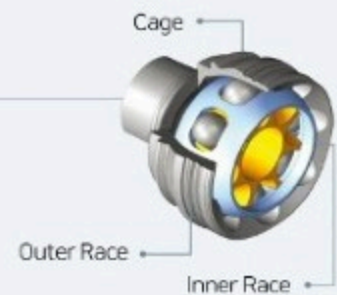
High Efficiency Rzeppa Joint (HERz)

Features

- Compact Joint with 8 balls
- Multi curve shaped ball track design

Customer Benefits

- High efficiency performance
- Light and compact package
- Increased joint angle capacity (50°)



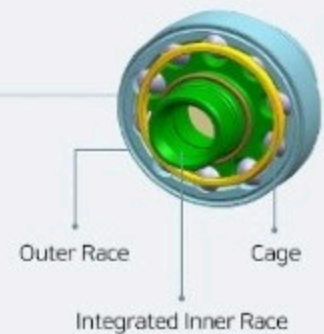
Counter Track Rzeppa Joint for Propeller Shaft (CTRz)

Features

- 8~10 balls design
- Counter ball track
- Closed design without clamp

Customer Benefits

- Light and compact package
- High efficiency Propeller Joint



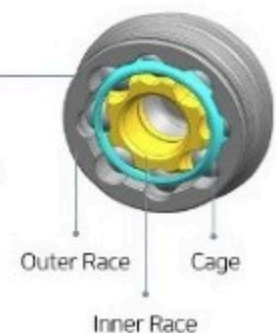
Counter Track Plunging Joint (CTPJ)

Features

- Compact Joint with 8 balls
- Counter ball track
- Plunging Joint for rear application

Customer Benefits

- Light and compact package
- High efficiency Joint



Brake

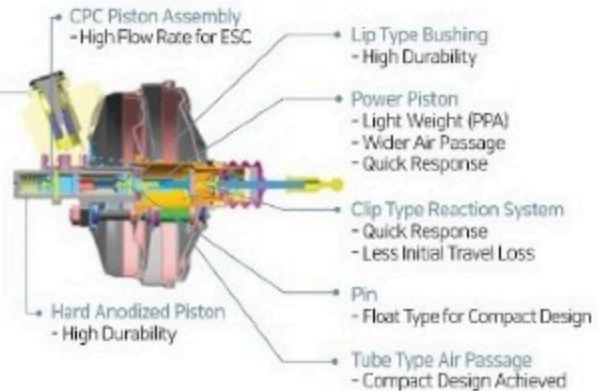
Power Brake

Features

- High stiffness booster : Tie-rod or Thru bolt type
- High flow rate master cylinder : DCV (Double Center Valve) fixed seal type

Customer Benefits

- Less initial travel loss
- Quick response
- Efficient package size
- High flow rate for ESC



Caliper Brake

Features

- Separated function (Bracket mounted)
- Self-adjusted gap between disc and pad

Customer Benefits

- High performance
- Low residual drag
- Compact size and light weight
- Reduced noise



Electronic Stability Control (ESC)

Features

- Optimized design
- High efficiency and durability
- Available to ADAS like AEB

Customer Benefits

- Low weight and compact package
- High performance and fast response
- Provide driver with various function



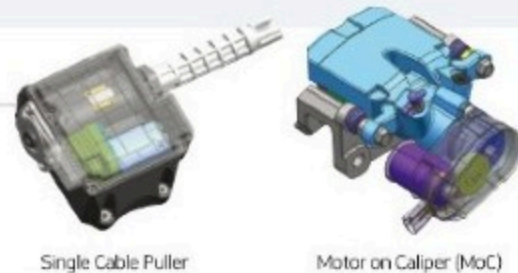
Electric Parking Brake (EPB)

Features

- Optimized response time and clamping force
- High efficiency gear train
- Drive away assist (Auto release)
- Auto apply
- Dynamic braking (Prevent rear wheel locking)
- Integrated parking and service brake (MoC)
- Integrated ECU (Controller, Cable Puller)

Customer Benefits

- Emergency release
- Compact package & fast response
- Provide variety of additional functions for driver comfort and safety
- Mass reduction by aluminum housing and plastic gears (MoC)



Steering

Rake and Telescope Column

Features

- Rake and Telescope Column
- Energy absorbing mechanism
- Rake & Telescope Positive lock
- ESCL Module

Customer Benefits

- High column stiffness
- Good NVH performance
- Cost competitive



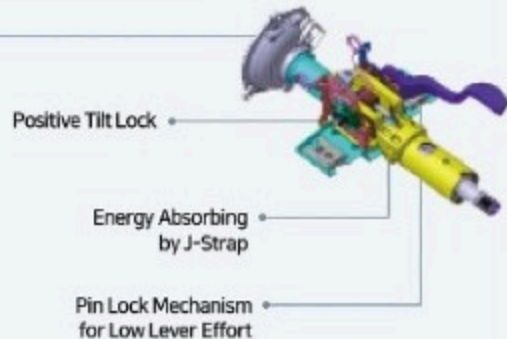
Tilt and Telescope Column (for CEPS)

Features

- Positive Tilt Lock
- Energy absorbing by J-Strap
- Pin lock mechanism for low lever effort

Customer Benefits

- Light weight & Compact design
- Smooth telescope operation
- Good NVH performance



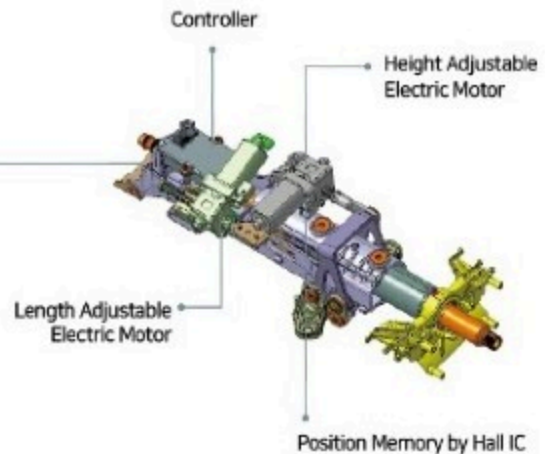
Electric Tilt and Telescope Column

Features

- Electrically adjustable in height and length
- Position memory function by hall IC
- Controller available

Customer Benefits

- PWM Motor control available (Operation Noise Enhancement)
- Good NVH performance



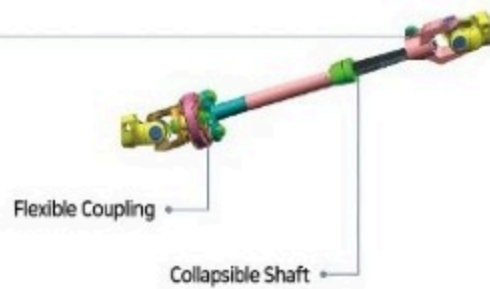
Collapsible Intermediate Shaft with Coupling

Features

- Collapsible I-Shaft
- Vibration absorption by coupling

Customer Benefits

- Low lash
- Stiffness tunable coupling



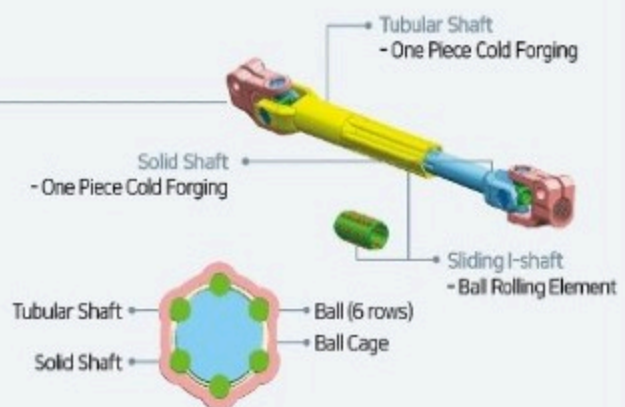
Low Friction Intermediate Shaft

Features

- Ball rolling element
- One piece solid yoke (Cold forging)

Customer Benefits

- Low sliding force
- Low lash
- High stiffness



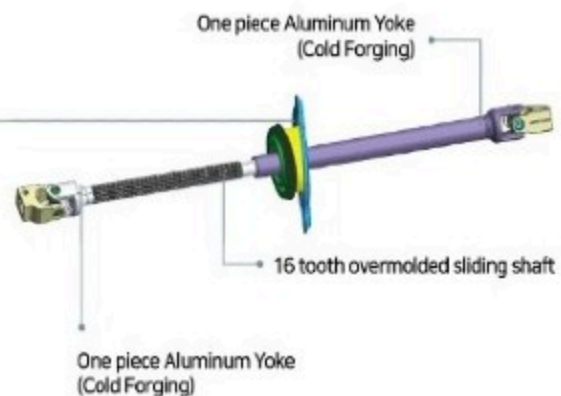
Aluminium Intermediate Shaft

Features

- Sliding spline
- Cold forged aluminum one piece yoke

Customer Benefits

- Low lash
- Light weight



Electric Powertrain

Introduction

• Product Range

- Main ePowertrain : Micro to D segment
- Main & Auxiliary ePowertrain : D to J segment
- Vehicle drive type : FWD/RWD/AWD available

• Product Features

- Increased energy efficiency & Driving performance
- Improved driving stability by torque vectoring option (Dual electric clutch, e-LSD, e-DD)
- Integrated motor-inverter and co-axial typed for optimized compact package

• Advanced Products

- 2 speed shift transmission
- Torque vectoring by dual electric clutch

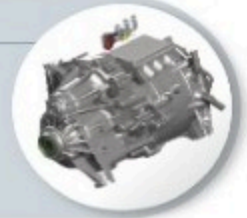
Parallel type (3 axes)

- T/M gear ratio : 1 speed
- Motor + Reducer + Differential Gear
- Option : e-Parking, e-DD
- Commercialization Technology
- For A Segment



Co-axial type (1 axis)

- T/M gear ratio : 1 speed
- Motor + Reducer + Differential Gear
- Option : e-LSD, e-DD, e-Parking
- Integrated motor - inverter
- Commercialization Technology
- For B/C Segment



Co-axial type (1 axis)

- T/M gear ratio : 2 speed
- Motor + 2 speed T/M + Dual electric clutch (Torque Vectoring)
- Option : e-Parking
- Integrated motor - inverter - TCU
- Advanced Technology
- For C/D Segment



ePowertrain (EM80-2SPC)

- EV Powertrain with Max 150kW, TCU(Inverter integrated), 2-Speed T/M and Torque Vectoring



System Description

- 2 speed gear ratio, Dual electric clutch torque vectoring by EOP, Intergrated Motor-Inverter-TCU, e-Parking

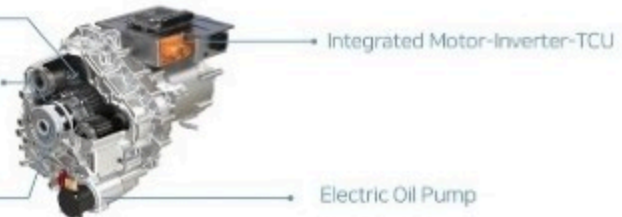
2 Speed Gear Ratio

Dual Electric Clutch with Torque Vectoring

Co-Axial Type

Applicable Vehicles

- ① Main powertrain : C~D segment EV, Small sports utility vehicles
- ② Main or Auxiliary Powertrain : D~J segment EV, Multi-purpose vehicles



EM85/60/35-1SPC&1SPP

• EV Powertrain with Reducer and Various Option (e-Parking / e-LSD / e-DD)



ePowertrain MTG

System Description

- Selectable gear ratio reducer to each vehicle, e-Parking, e-LSD, e-DD



B/C Segment






A/B Segment

- 1 Speed
- Selectable Gear Ratio
- e-Parking
- e-LSD
- e-DD

Applicable Vehicles

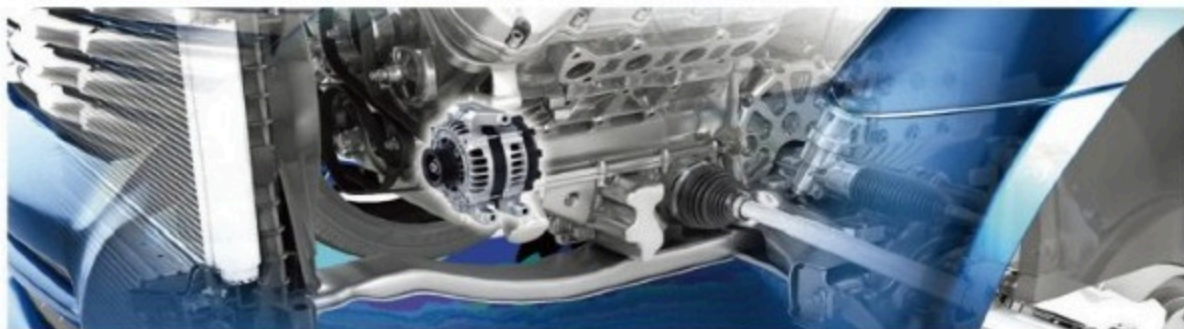
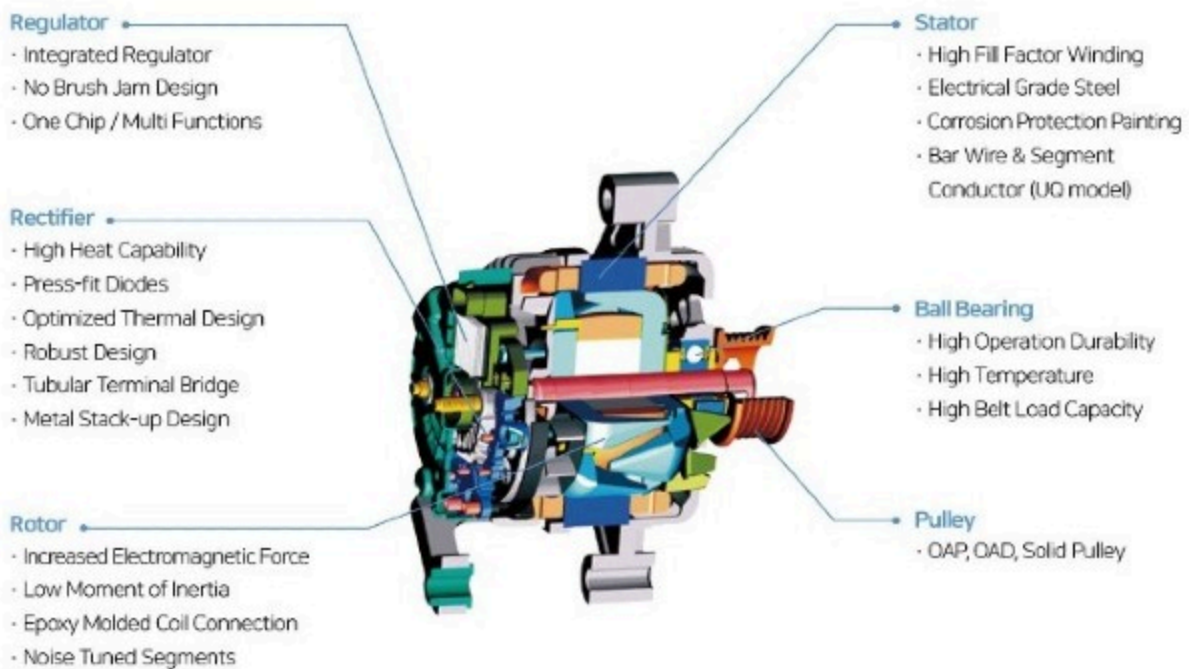
- ① Main powertrain : A~C segment EV, Small sports utility vehicles
- ② Main or Auxiliary Powertrain : D~F segment EV, Multi-purpose vehicles

• Various Option (e-Parking / e-LSD / e-DD) According to Customer Requirement

e-Parking	e-LSD	e-DD
<ul style="list-style-type: none"> · Electric locking device for ePowertrain TM on parking · Mechanism meeting the gradability Min, 30% for GVW · Actuator separated or integrated controller <div style="text-align: center; margin-top: 10px;">  <p>Locking state</p>  <p>Unlocking state</p> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>Actuator separated controller</p> </div> <div style="text-align: center;">  <p>Actuator integrated controller</p> </div> </div>	<ul style="list-style-type: none"> · Torque vectoring technology to improve the driving safety (@ tuning, rough or rainy road, etc.) · Mechanism meeting the capacity, Min, 50% for Max, torque of TM · Electro-hydraulic actuator separated or integrated controller <div style="text-align: center; margin-top: 10px;">  </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>Electro-hydraulic control</p> </div> <div style="text-align: center;">  <p>Actuator separated controller</p> </div> <div style="text-align: center;">  <p>Actuator integrated controller</p> </div> </div>	<ul style="list-style-type: none"> · Power cut-off & connecting device of auxiliary epowertrain for energy saving (4WD ↔ 2WD) · Wet type multi-disc clutch by electro-hydraulic system (on-demand type) · Electro-hydraulic actuator separated or integrated controller <div style="text-align: center; margin-top: 10px;">  </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>Actuator separated controller</p> </div> <div style="text-align: center;">  <p>Actuator integrated controller</p> </div> </div>

Alternator

New NP Series Alternator



Features

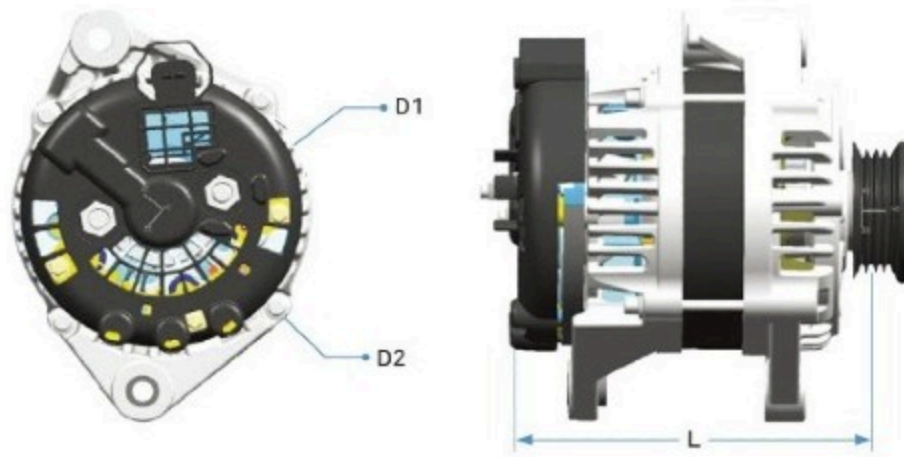
- Increased output and efficiency
- Several size ranges
- Up to 200Amps (Air-cooled)
- High temperature capability
- Packaging flexibility
- Long service life

Customer Benefits

- Increased efficiency up to 80%
- Superior performance in light weight and compact sizes
- Improved performance and durability at higher temperature, 125°C
- Reduced magnetic and mechanical noise
- System integration (ECU communication type)
- 150,000 miles durability service life
- Ultra quiet noise level (UQ Model)

Regulator Types Available

- Conventional Type : Fixed Setting Voltage
- ECU (Electronic Control Unit) Communication Type
 - Setting voltage controlled by PWM signal (RVC, C-terminal, etc)
 - Setting voltage controlled by LIN protocol
- Specification

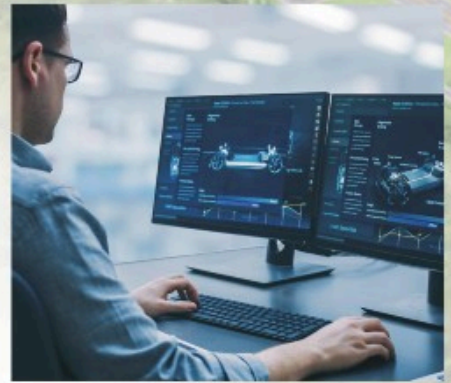


MODEL		NP08	NP10	NP14	NP16	NP13Q	NP16Q	NP18Q	
		High Efficiency				Ultra Quiet			
Performance (Amp@1,800 / 6,500rpm@14V,25°C)		40/90	50/100	76/140	90/160	76/150	85/160	90/180	
Temperature Capability (°C)		125							
Package (mm)	D1	120	126	142	148	136	136	136	
	D2	133	144	156	165	146	146	146	
	L	140	140	140	142	130	130	132	
Rotor Inertia (kg·cm ²)		15	15	32	36	26	26	28	
VDA Efficiency (%)		64	6	67	67	72	72	72	
Typical Mass (kg)		4.5	5.2	6.2	6.9	5.8	5.8	6.0	
Noise (dB)		Standard				Ultra Quiet			
Speed Capability(rpm) (Continuous / Intermittent)		18.000 / 21.000							

※ Note : VDA Efficiency = $[0.25 \cdot N(1800)] + [0.40 \cdot N(3000)] + [0.25 \cdot N(6000)] + [0.1 \cdot N(10000)]$ where N(1800), N(3000), N(6000), N(10000) are alternator efficiency values obtained at each of alternator rpm at 25°C when supplying 50% of rated current at 6000rpm

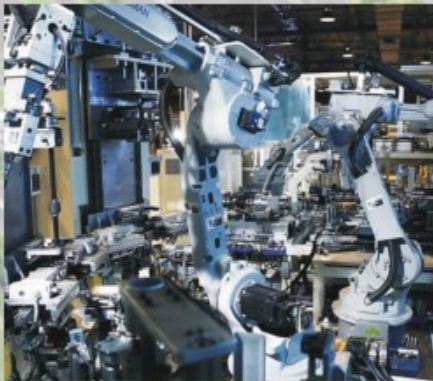
Engineering Capability Research & Development

A highly qualified and dedicated teams of Product Engineers, Technicians, Researchers and Program Managers are delivering the next generation of high technology, quality and value driven systems and components. ERAE has a complete range of Research, Test & Computer Aided Engineering facilities located at our main Technical Center in Daegu, Korea. ERAE is also expanding our global presence with satellite Tech Centers in the USA and China

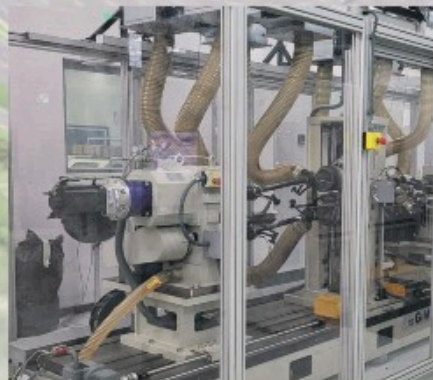


Production Capability **Production Technology**

Production processes are highly automated as well as supporting functions such as material procurement, parts processing, manufacturing and testing are optimized to deliver efficient manufacturing of high quality products.



Vehicle Proving Ground



Global Footprint

4 Manufacturing Sites in 3 Countries

3 Technical Centers and 4 Customer Support Offices in 7 Countries



Korea Plant



USA Plant



China Plant

Customers

ERAЕ Has gained trusted partnerships with customers through many years of technology & service.

These relationships enable us to uncover market trends, understand the challenges and develop new solutions.



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