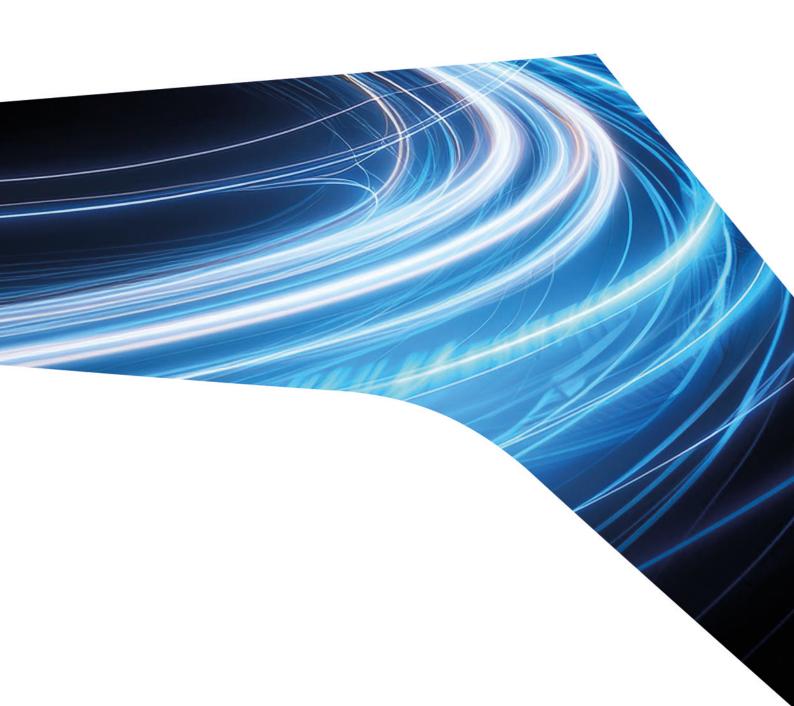


# Off-Highway Drive and Motion Systems Industrial Business



### **Off-Highway** Drive and Motion Systems



As an innovative leader, Dana Off-highway continuously improves the performance and efficiency of vehicles and machines worldwide. We aim to be the global pacesetter in efficient power conveyance and energy-management solutions.

### **Mobile**















### Off-Highway **Brand Portfolio**

Supported by a legacy of innovation in conventional drivetrains, Dana Off-Highway is at the forefront of integrating mechanical and electrical components for alternative propulsion applications. We embrace evolution to be a step ahead in supporting new applications as they emerge and collaborating with customers as they develop tomorrow's vehicles.

**Drivetrain and e-Drive Systems** 



**Motion and e-Motion Systems** 



**BREVINI** 



**FAIRFIELD** 





**Gears and Shifting Solutions** 



**GRAZIANO** 

**Thermal Management** 



**LONG** 





**VICTOR REINZ**™

**Electric and Hybrid e-Drive Systems** 



*TM4*<sup>™</sup>





COMMERCIAL TURF CARE

BULK MATERIAL AND MINING

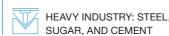


ONSHORE AND OFFSHORE MAR



INDUSTRIAL AND
STATIONARY EQUIPMENT







WASTE MANAGEMENT AND RENEWABLE ENERGY







### **Enhanced Brand Portfolio**

Dana's well-respected brands offer both standard and customized products backed by engineering, manufacturing, and distribution facilities positioned near customer supply chains around the world.



**Planetary Drives** 

**Slewing Drives** 

Winches

Helical and Bevel-Helical Drives

Gearmotors

**Electronic Sensors and Controls** 







Extruder drives



**Custom Gears and Drive Systems** 

### **Dana's Industrial Focus**

Dana's Industrial business team is uniquely positioned to support customers in **specialized sectors with power-transmission technologies**.

We determine each customer's **unique needs** in developing the right solution that delivers reliability, efficiency, and performance for both mobile and industrial applications.

### **Dana Industrial Business**













## Our team dedicated to your industrial business

At Dana, our integrated teams have decades of expertise in developing and supporting precision-made packages for our customers' highly specialized applications.

Our local technical experts can quickly define the exact drive and motion needs of your application, with support as needed from specialist application engineers ready to custom-design an integrated system solution that meets your specific needs.

### Off-Highway Drive and Motion Systems

### Industrial Market Technology Leader with:

Global Reach

Local Presence

Superior Manufacturing and Service



### **Global** Identity

We leverage our global expertise to deliver **premium quality**, technically advanced, and cost-effective solutions - all designed to meet the specific needs of our customers.

### **Local** and Fast

Our network of Service and Assembly Centers and sales offices provide **local support** and expertise for our customers. Our local inventory and assembly capabilities deliver the right product to you at the right time.

### **Solutions** Provider

Dana's experienced team can match **technologies and key components** together to deliver industrial system solutions that integrate seamlessly into your application, improving performance, and simplifying your supply base.

### **Customization**

We **collaborate with our customers** to define your specific application requirements and provide fully customized, tailor-made solutions that check all the boxes for performance, reliability, and efficiency.

### **Technical** Consulting

Dana recognizes that every customer has individual needs. Our engineers discuss the requirements of each customer in detail, calling on their in-depth knowledge of global industrial markets to **develop the right solution**.

### **Extensive** Product Range

Our portfolio of world-class solutions meets the needs of more than 20,000 customers around the world today through standard and customized products that can meet most requirements.

### **Lifetime** Support

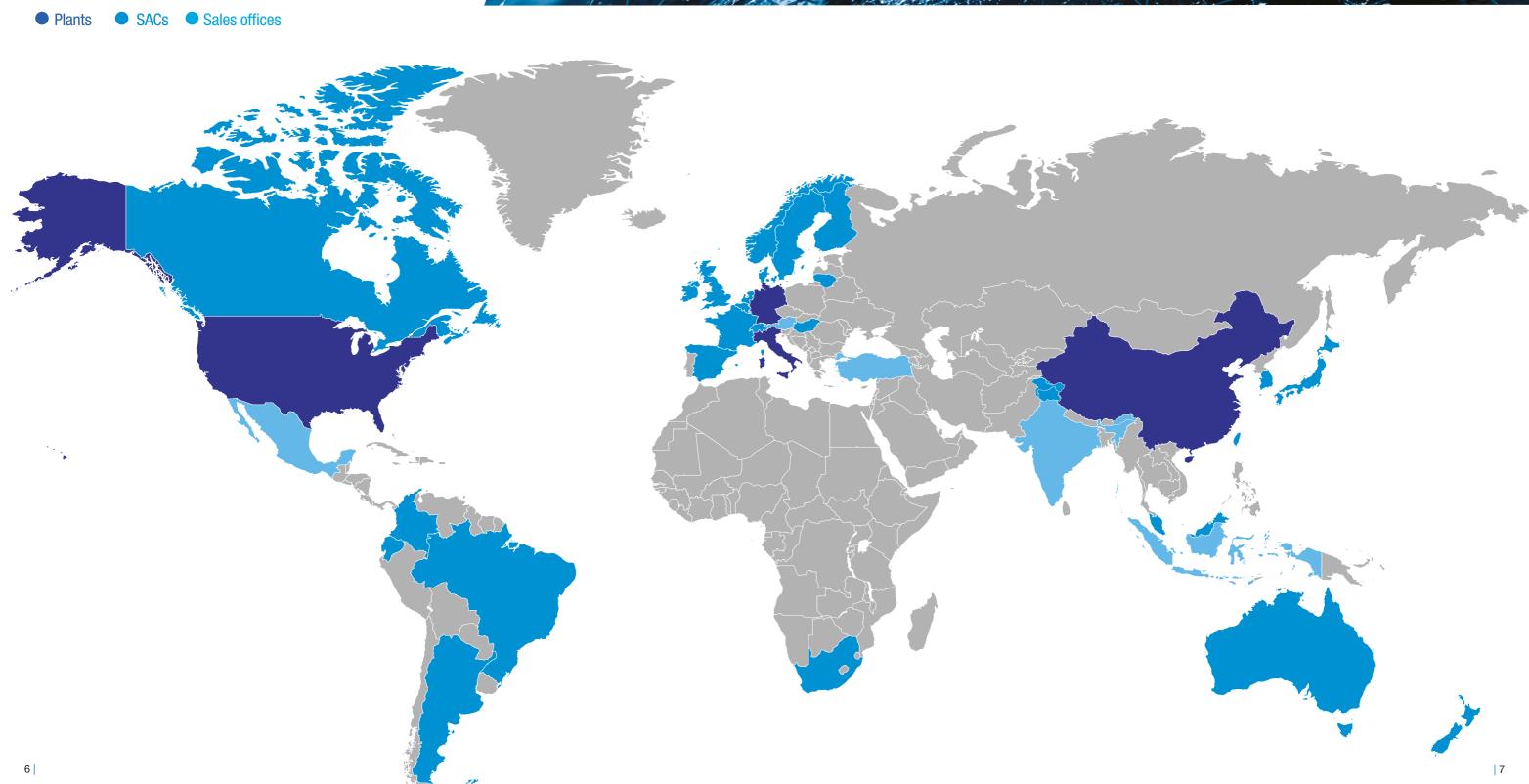
Our global network of Service and Assembly Centers support you throughout the **lifetime of your application** with a wide and flexible portfolio of cost-effective solutions.

### **Today** and Tomorrow

Our culture of continuous improvement drives us to deliver best-in-class **reliability and performance** through cost-effective solutions available today while developing advanced technologies for the future.

### **Our Global Network**

Our worldwide network of **Service and Assembly Centers (SACs)**, **Plants** and **Sales Offices**, provide a fast response, local market knowledge, product expertise, and after-sales support close to our customers across all market segments.



### Service and Assembly Centers SACs



requirements

Customer **Needs** 

Customers often require solutions with **low production** volumes and exceptionally specific requirements while managing costs.

Small batch quantities

product range

Local inventory

Local assembly capabilities

Customers often require short **delivery times** for complete product solutions.

Industrial customers serve exceptionally specific

market needs through highly engineered applications with exacting requirements.

can benefit from a broader engineering perspective **informed** by best practices from around the world.

of market experience

Decades

Local market presence

Industrial customers Most local suppliers have limited industry expertise and resources to **develop** state-of-the-art technologies.

**Dana SACs** 

Dana has an extensive range of modular, flexible solutions that can be **precisely** customized into highly specialized, cost-effective solutions.

To help accelerate the delivery of solutions to customers, our significant and continued investment in local inventory, logistics, and IT infrastructure enables our SACs to reliably forecast, monitor, and achieve each customer's delivery requirements.

Our SACs have deep expertise across all industrial markets, enabling them to deliver tailored system solutions that provide **superior** overall performance.

Our SACs offer in-market application **engineering** capabilities bolstered by a close alignment with Dana's global industry expertise and technical resources.

Our SACs leverage

Dana's global network

of comprehensive engineering and manufacturing resources to develop customized, precision-engineered solutions deployed and supported by a local team working within your time zone and language.

### Repair and Maintenance Services

We provide three levels of superior repair and maintenance services:

- We repair virtually most makes, models and styles of gearboxes.
- We manufacture individual gears precision-made to customer requirements.
- Our dedicated field service teams can be deployed on-site for inspections, installation, and commissioning.



Our approach to gearbox repairs goes beyond getting your equipment working again. We make it work better.

#### The Benefits at a Glance:

### Fast, Definitive Solutions

versus frequent stoppages due to regular repairs that do not solve the problem.

### Improved Gearbox Performance

thanks to an engineered solution, designed and manufactured in-house. Root Cause Analysis, Proactive Support, and In-House Engineering

versus inconclusive, expensive repairs that never completely address the issue.



#### **Gearbox Repair**

We leverage our extensive knowledge to assess the condition of your gearbox and recommend a cost-effective long-term solution.

We are equipped to repair virtually most size and style of gearbox, even those in excess of 30 tons.



#### **Loose Gearing**

We expedite the manufacture of new loose gearing through expert reverse-engineering capabilities as well as an in-house loose-gear hobber and two-meter gear grinder. We also manufacture our own shafts and other components to make the process faster, more economical, and better suited to your needs.



#### Field Service

Our technical teams are available around the clock to provide on-site assessments and recommendations, especially in emergency situations and when equipment cannot be relocated. They are fully equipped to perform laser alignment, vibration analysis, start-up commissioning, and other services to expedite repairs and minimize downtime.





### CONSTANT SUPPORT

Our global network of technicians works overtime to fast-track your service and minimize interruptions.



LIKE-NEW REPAIRS AND UPGRADES We repair gearboxes to better-than-OEM standards backed by warranties and with options for technical upgrades.



TIMELY AND ECONOMICAL REPAIRS Our efficient repair process quickly and effectively returns your gearbox to operation, minimizing the economic impact to your business.

10 |

### **Product Portfolio**

We leverage our global expertise to offer a complete portfolio of highly efficient power-transmission technologies and for industrial and stationary equipment applications.

#### **Brevini**<sup>™</sup> Planetary Gearboxes



Range	Nominal Torque [Nm]
S300-S20000	34,000-2,170,000



Industrial Slewing Drives

Range	Nominal Torque [Nm]
RPR030-RPR2050	5,000-24,000
SLS300-SLS850	34,000-200,000



Industrial and E-Range Planetary Gearboxes

Range	Nominal Torque [Nm]
E10-E260	1,300-25,000
EM1010-EM1320	1,000-24,000

#### Brevini<sup>™</sup> Helical and Bevel Helical Gearboxes



Brevini EvoMax™ Gearbox

Range	Nominal Torque [Nm]
E2H-E3H- E4H-E3B- E4B-E3C- E4C	10,000-290,000



Posired<sup>™</sup> 2

Range	Nominal Torque [Nm]
PC-PD-PE-PLC 60 - 91	S-PLD 340,000-1,100,000
PB / PLB 16 - 4	5,700-113,000



Posired™ N

Range	Nominal Torque [Nm]
ND-NE 18 - 56	8,200-286,000



Posired<sup>™</sup> TS

Range	Nominal Torque [Nm]
TS18 - TS63	8,200-400,000



Range	Nominal Torque [Nm]
ILC14 - ILC25	3,100-22,800

#### Brevini<sup>™</sup> Gearboxes



Gearboxes

Range	Power [Kw]
ML32 - 52	10-100
B585 - 602	30-55
RD33 -52	6-12

#### Brevini<sup>™</sup> Plano Helical Gearboxes



High Power

Range	Nominal Torque [Nm]
SL2PLB85016 SL2PLB200031	90,000-2,170,000

Posiplan			
	Range	Nominal Torque [Nm]	
	PH, BPH 13-28	3,900-35,000	

### **Brevini**<sup>™</sup> Pump Drives



Range	Nominal Power [Kw]
BZ265	110-130
BZ290	170-190
BZ340	220-240
BZ470	380-480

#### Brevini<sup>™</sup> Gearmotors



Range	Nominal Torque [Nm]
M, N, K, D 00-97	50-18,000

#### **Brevini**<sup>™</sup> Winches



**Hoisting Winches** 

Range	Max Line Pull at First Layer [kg]
DW 050-090	500-900
BWE 015-160	1,500-16,000

Recovery Winches

Range	Max Line Pull at First Layer [kg]	
BWT 10.000-30.000	10,000-30,000	

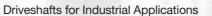


Winch Drives

Range	Max Output Torque [Nm]
PWD 2100-31100	10,000-110,000
SLW 300-850	85,000-190,000
SMW 1200-3500	300,000-850,000
RCW 908-913	80,000-130,000

#### **GWB**<sup>™</sup> Industrial Driveshafts





Range	Torque Range Tcs [Nm]	Flange Diameter [mm]
687/688-598	35 up to 21,500	00-225 / 600-1,300
687-688	2,400-35,000	100-225
587	43,000-57,000	225-285
390/392/393/492	60,000-1,170,000	225-550
498/598	210,000-15,000,000	600-1,200

super short coupling, tunnel shaft, high speed design, carbon fiber tube electrical insulation, remote lubrication, automatic lubrication, condition monitoring

### **PIV** Extruder Drives



Posirex



Range	Nominal Torque [Nm]
XC-XD-XE 16 - 80	5,100-720,000



Positwin



Special Gearboxes for Plastic & Rubber

Range	Center Distance	Torque / Shaft [Nm]
15B2N 146B2N	15-146	40-35,000

#### Fairfield<sup>™</sup> Custom Drives



Jacking System Drives



System Drives



Transfer Case



Custom D Components

	Range	Max Jacking Torqu [Nm]
Drive	S60A-S2000	82,000-2,260,00

### **Product Portfolio**

#### Brevini<sup>™</sup> Pumps



Axial Piston Pumps, Variable Displacement, Closed Loop

Range	Displacement [cc/rev]	Max Pressure [bar]
HD1	55	450
S6CV	75-128	400



Axial Piston Pumps, Variable Displacement, Open Loop

Range	Displacement [cc/rev]	Max Pressure [bar]
H1V	54.8-225.1	350



Axial Piston Pumps, Fixed Displacement, Open Loop

Range	Displacement [cc/rev]	Max Pressure [bar]
H1C	6.1-225.1	350
SH11C	10.3-178.1	430



Fixed Displacement, Open Loop

Range	Displacement [cc/rev]	Max Pressure [bar]
OT groups 1 - 2 -3	0.73 – 90	270
Hercules group 2	4.1 – 30	270
Silent plus group 2	4.1 – 30	250

#### Brevini<sup>™</sup> Valves



Pre-Compensated Directional Control Valves

Range	Inlet Flow [I/min]:	Max Pressure [bar]
HPV 41- 77-310	160-250-600 <sup>(*)</sup>	370-370-370



Range	Max Flow [I/min]	Туре
CDC3 - CD3M - CD3 - CDH3 - CD5	80	ON / OFF
CX3 - CXQ3 - CXDH - CFS3	55	Proportiona

(\*) = per Inlet Section



**CETOP Valves** 

Range	Inlet Flow [I/min]	Max Pressure [bar]	
Size 2 (NG4) – Size 8 (NG25)	up to 600	up to 400	





Axial Piston Motors, Variable Displacement, Bent Axis

Range	Displacement [cc/rev]	Max Pressure [bar]
SH7V/VR	61-216	430
SH9V	62-216	430



Axial Piston Motors, Fixed Displacement, Bent Axis

Range	Displacement [cc/rev]	Max Pressure [bar]
H1C	6.1-225.1	350
SH11C/CR	10.3-178.1	430



Orbital Motors, Gerotor and Roller

Range	Displacement [cc/rev]	Max Pressure [bar]	
BGM, BG	13-400	225 / 165	
AR, BR, BRZV	50-400	175	
HR, HT	80-500	210	



Gear Motors, Fixed Displacement

Range	Displacement [cc/rev]	Max Pressure [bar]	
OT groups 1 - 2 - 3	0.73 – 90	260	
Hercules gr 2	4.1 – 30	270	

### **Brevini** Power Units



Range

MC

FP

DTR

MK



Type

With 4 cavities for single and double acting circuits

With flexible design thanks

to multiple valve seats. Several circuits layout available Custom mini powerpacks for telescopic dock levellers

Custom mini powerpack for hanged/swing lip dock levellers

Range

ΕP

MP

9	
Туре	
Nith Ø115 motors	

Micro Powerpacks

Range	Туре
FR	Micro Powerpack for space demanding applications, 4 cavities for single and double acting circuits
FW	Micro Powerpacks for double acting circuits with

Туре		Range	Туре
With Ø115 motors and gr. 1 gear pumps		FR	Micro Powerpack for space demanding applications, 4 cavities for single and double acting circuits
With Ø80 motors and gr. 0.5 gear pumps			
and great gen parties		FW	Micro Powerpacks for double acting circuits with

### **Product Portfolio**

#### Brevini<sup>™</sup> Sensoring and Control



Solenoid Valve Drivers

Туре	Description
MAV1152	Control unit for one proportional and up to 5 ON/OFF directional valves
MAV4211	Control unit for up to 4 proportional bidirectional valves



Levelling Control Units

Туре	Description	Axis	On-Off / PWM
GP200	Outriggers / stabilizers self levelling controller	2	ON/OFF
IDXYmp-ID3	Single or dual axis ON/OFF self levelling	1-2	ON/OFF



Motors and Pumps Drivers

Туре		Description
	MAV4211SH	Control unit for pumps, motors and hydrostatic transmissions control



**Electronic Control Units** 

Туре	Description
M92	Pre programmed limitation controller

### Brevini<sup>™</sup> Sensoring and Control



Angle / Tilt Sensors

Туре	Description	Axis	Range
IDXYm- p-MKII	Double axis (X-Y) programmable tilt switch	1-2	±20
IDXYmp- ID3-MKII	Double axis programmable tilt switch	1-2	±20
TAC MKII	Single axis inclinometer	1	90-180- 270-60
SP MKII	High accuracy double axis inclinometer		



Load Sensors

Туре	Description	Load range [kg]	Integrated amplification
П	Shear beam load cell	350 - 10.000	Optional
TPE	Pin load cell	200 - 100.000	Optional
TC	Compression load cell	200 - 100.000	Optional
TR	Traction load cell	500 - 50.000	No
TAN	Ring load cell	500 - 3.000	No



Length Sensors

Туре	Description	Maximum displacement [m]
AS-TL	Aluminum enclosure. High accuracy lengh measurment. Integrated angle sensor (optional)	12.5
ASu55-TLu66	Low profile body. High accuracy length measurment. Integrated angle sensor (optional)	5
ASu-TLu	Compact body. High accuracy length measurment. Integrated angle sensor (optional)	5.5



Туре	Description	Range [bar]	Output
TPV	Single pressure transducer	0-250 0-400	0.5-4.5 V
TPA	Single pressure transducer	0-250 0-400	4-20 mA
TPA	Doublele pressure transducer	0-250	4-20 mA 20-4 mA

### Integrated **System Solutions**

With decades of experience providing customized packages for highly specialized applications, we can deliver complete, integrated solutions with the enhanced performance, packaging optimization, and reduced maintenance requirements that can help improve your bottom line.



### Customized **Product Solutions**

The Dana Industrial business team has many years of commercial and technical experience gathered from every market and application around the world.

We use this bank of expertise to understand the specific needs of each individual customer and then design, manufacture, and deliver a customized product solution that meets the precise needs of your unique application.

## Dana Industrial Business **Bulk Materials**

Dana provides high-performance solutions for mobile and stationary equipment used in the bulk material handling sector.

















### Dana Industrial Business **Heavy Industry**

Dana provides a complete range of mechanical transmissions products to meet numerous requirements in heavy industry.

Our deep experience across all the heavy-industry market segments combined with a broad selection of technologies enable Dana to fulfill the requirements for the most diverse applications.

Initial consulting, design, and engineering are essential in supporting heavy-industry sectors such as steelmaking, sugar processing, and cement production.

Our custom-developed solutions and aftermarket support are essential for enterprises looking for reliable, efficient solutions.

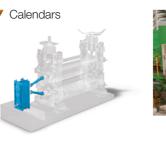
### **Customization Excellence**

### Edging

Typically used at the start of the rolling process, edging drives are used to reduce the width of steel slabs.





























Ball / Rod Mills

























Luffing Cranes



Rubber Tyred Gantry (RTG) Cranes





Ship to Shore (STS) Cranes





(MHC)



Shipyard Applications





Shipyard frolleys



## Dana Industrial Business Offshore Marine

Offshore applications covered by our range of solutions include cable- and pipe-laying vessels, cargo ships, subsea systems, oil platform equipment, remotely operated vehicle (ROV) launch and recovery systems, and more.

We supply products for lifting, pulling, and slewing machinery used in various marine and offshore applications, such as cranes, dredgers, gangways, anchor and mooring winches, and hatch covers. Additionally, our gearboxes are used on lifeboats.

Our extensive lineup of Brevini<sup>™</sup> planetary gearboxes and slewing gear drives are engineered with the reliability and durability needed to deliver optimal performance in the harsh temperatures and weather common to marine applications.

#### **Customization Excellence**

### Cable-Laying Vessel

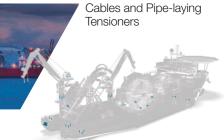
Dana can serve as a single supplier for the complex variety of products and applications used on cable-laying vessels.





Jack-up Systems













### Dana Industrial Business

### **Environmental and Renewable Energy Applications**

Dana embraces the movement toward a sustainable planet with environmentally friendly technologies and solutions for this emerging industry.

Dana offers a complete range of solutions used in applications for the environmental, renewable energy, and recycling industries. We leverage our experience gained since the initial emergence of these segments to provide solutions for biogas plants, water treatment systems, renewable energy applications, recycling shredders, and wind turbine nacelle cranes.

#### **Customization Excellence**

### Agitator for Biogas Plant

As the paddles were conceived to run at a peripheral speed of 132 m/minute covering a stirring diameter of 4 meters, we felt it was necessary to integrate a flange shaft into each gearbox, providing additional strength and operational safety. A short delivery schedule plus a tailored service and warranty concept for short-



#### **APPLICATIONS**













### Dana Industrial Business

### **Stationary Equipment**

Dana has the extensive knowledge needed to provide the efficiency, reliability, and sustainability required by stationary applications used throughout the industrial sector.

Dana provides numerous solutions for stationary equipment used in material-handling, construction, food processing, and many other sectors. We leverage synergies with our mobile business to supply tailored solutions that optimize performance and reduce the total cost of ownership.

#### **APPLICATIONS**









Overhead Gantry Cranes





### **Tower Crane**

Used extensively in the construction industry, tower cranes provide the best combination of height and lifting capacity. Our full range of specifically designed gearboxes are used for transport, slewing, hoisting, and luffing.









Petrochemical / Pulp and Paper Equipments













Rubber Extrusion









Injection Molding Machines





Blow Molding Machines









### Market-Driven

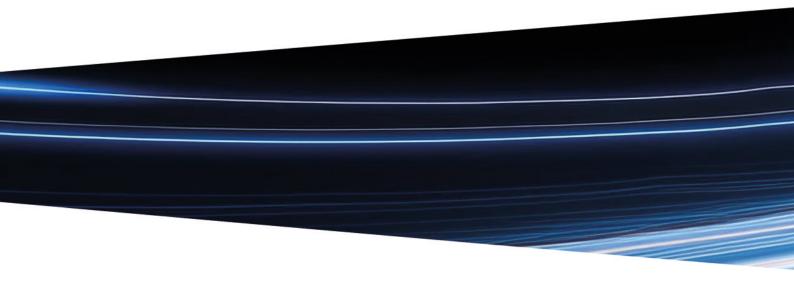
### **Off-Highway Innovation**

#### **About Dana Incorporated**

Over 39,000 Dana dreamers in over 30 countries drive mobility and transportation forward — wherever the road, or offroad, takes our customers and communities.

A leader in the design and manufacture of propulsion and energy-management solutions, Dana powers vehicles and machines in all mobility markets across the globe. Delivering groundbreaking drive systems. Advancing revolutionary motion technologies. Championing leading-edge power management innovations across thermal technologies for e-Propulsion; controls and software; battery management systems; and fuel cell plates.

With a balanced portfolio — including complete in-house electrification capabilities — Dana provides classleading products and systems supporting traditional, hybrid, and EV manufacturers. **Everywhere**.



#### Dana-industrial.com/contact-us

#### Application Policy

Capacity ratings, features, and specifications vary depending upon the model and type of service. Application approvals must be obtained from Dana; contact your representative for application approval. We reserve the right to change or modify our product specifications, configurations, or dimensions at any time without notice.

