

Intelligent Spindle

There's a DGD Spindle for your Application.

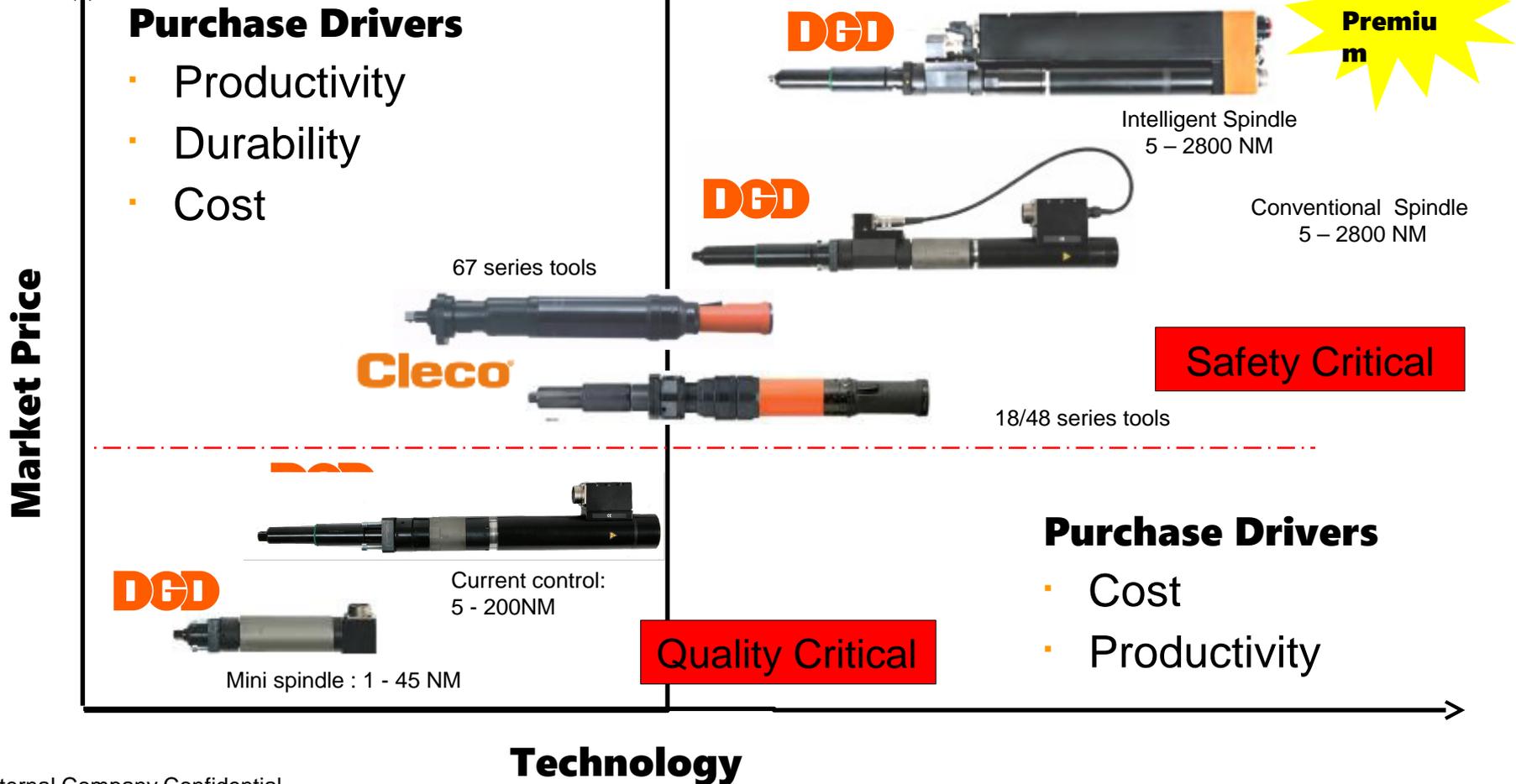


Fixtured Spindle



There's a DGD Spindle for your Application.

Portfolio Overview

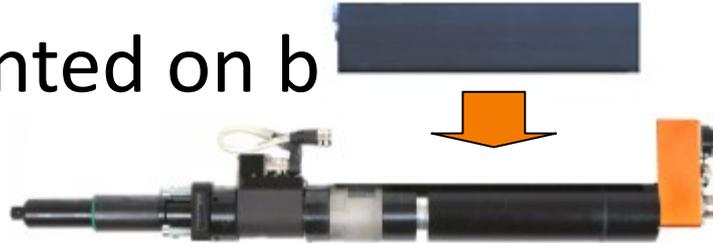


Internal Company Confidential

What is an

Intelligent Spindle?

Conventional spindle with a servo module mounted on b



Brand: Deutsche Gardner-Denver

Developed: 2005, Germany

System Overview of Key Components

① Common controller platform



② Single field cable on average

③ Daisy chain inter-connect cable



⑤ Power Distribution Box

④ Spindle with on board electronics



Compact packaged control system

Specification

Conformance: Compliance to:

Assembly Systems

- European Automotive Homologation Compliance (VDI/VDE 2646 and 2647)
- Approved suppliers of most MVI, GI and Aerospace companies
- Operations are ISO 9001 Quality Systems Certified
- General Motors Assembly Common Controller Assembly



There's a DGD Spindle for your Application.



Benefits -

Nutranners

Nutranners

- Integrated electronic (motor servo amplifier, sensor measurement)
- 1 cable solution for up to 16 spindles
- Compact and slim design
- Fastest Spindle Speed
- Friendly service
- Redudant transducer option available

Productivity:

- High accuracy: $Cmk > 1,67 @ +/- 5\%$
- Fastest in class: Up to 100% faster
- High reliability : $> 3M$ Cycles

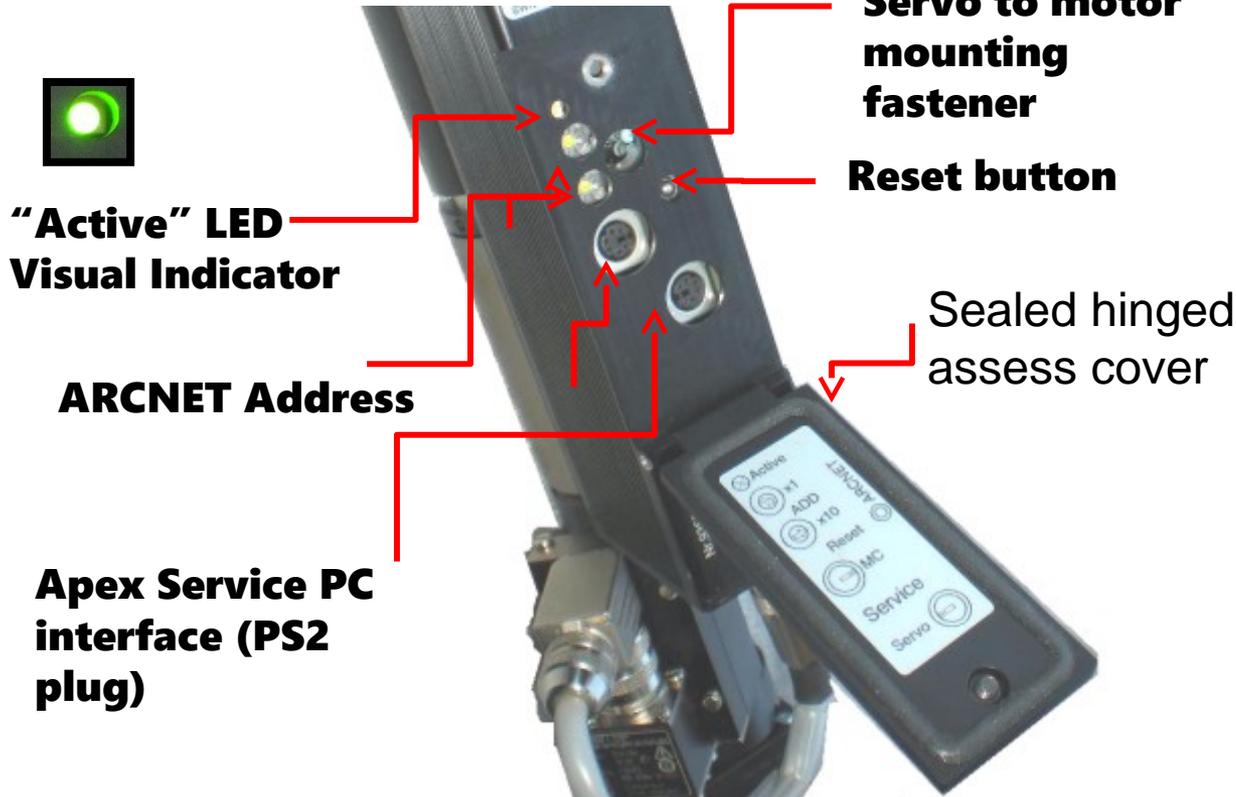


Ease of

Nutrunners

Troubleshooting

Increased Uptime with Easy Troubleshooting



Nutrunner Service Panel

"Ready" LED Visual Indicator



Connector for cross check with optional redundant torque transducer

Intelligent Spindle

Configuration

In line Spindle

Spindle with Angle Head

Spindle with Offset Spindle



U Spindle in line, Angle Heads and Offset Configuration



Torque Range: NM

	0	100	200	300	500	1000	2000	3000
1 BTS/E	2-53							
2 BTS/E	25-200							
3 BTS/E	50-300							
4 BTS/E	100-2800							
4 Models	10							

1 BTS/E	3
2 BTS/E	2
3 BTS/E	1
4 BTS/E	4
4 Models	10

Best in class free

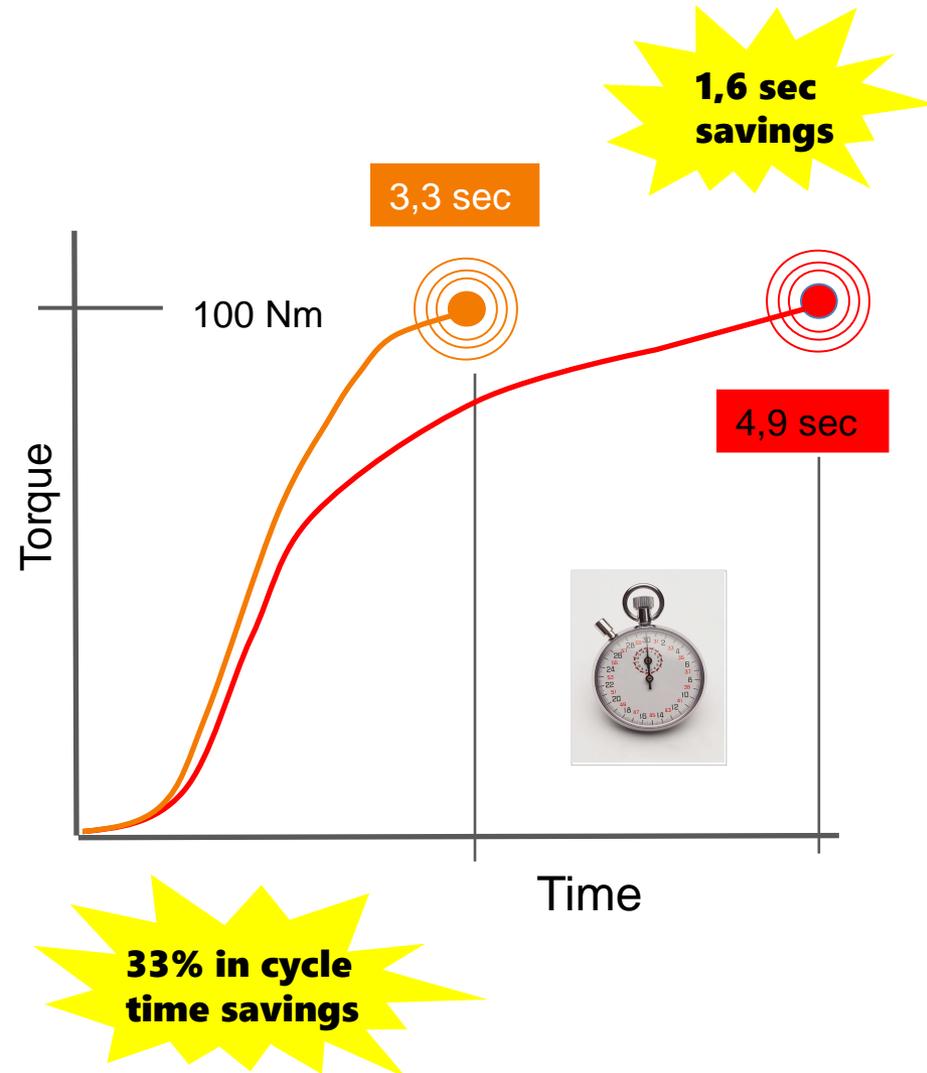


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Nutrunners

speed

Torque (Nm)	Spindle RPM by Manufacturer			DGD RPM Advantage
	A	B	DGD BTSE	
25	700	740	890	20%
50	700	740	890	20%
100	450	410	890	98%
150	450	340	502	12%
175	330	340	502	48%
200	330	340	502	48%



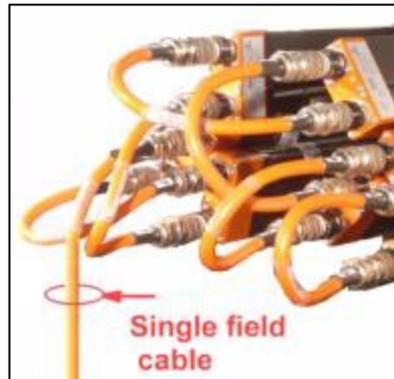
Benefits – Cables



There's a DGD Spindle for your Application.

Cables

- Reduced program cost
- Ease of installation
- Cable festooning savings
- Ease of troubleshooting
- Reduced spare parts cost
- Highly flexible cables
- Ease of operation for manually operated multiples



Acquisition/Installation

Cables

ion Cost: Field Cable Installation reference



Conventional Spindles

Conventional	Description	Intelligent
\$8,000	Festooning Hardware Including Installation	\$5,000
\$20,000	System Field Cables (Life expected 1 -1.2M cycles)	\$5,000
\$120,000	Replacement Spare Parts Cables (1.05 cycles/yr.) every year approximately @ \$2,000/cable	\$12,000
\$7,200	Labor/ trouble shooting / cable (2) hrs @ \$60/hr	\$1,200
\$148,000	Total	\$18,700

Intelligent Spindle Savings \$
 Source: Chrysler, Ford, GM and Ford powertrain plants
129,300.00



Intelligent Spindles

Benefits – Control



There's a DGD Spindle for your Application.

Package

Control Panel Savings

- No Air Conditioning or heat sinks needed
- Reduced systems controller floor space



<u>Innovation / Feature</u>	<u>Benefit</u>	<u>Value</u>
<p>Intelligent Spindle</p> 	<ul style="list-style-type: none"> • Durable /Reliable (3M cycles MTBF) • Exceptional accuracy • Fastest spindle speeds • Saves on floor space foot print • Simplified installation • Modular construction 	<ul style="list-style-type: none"> • Unique to Apex • Productivity • Cost Savings
<p>mPRO400Global Controller</p> 	<ul style="list-style-type: none"> • Same controller for hand tools , intelligent Spindle and Live Wire and V Max • 1 controller up to 32 spindle in multiple configurations • Less controllers required • Less back-ups required • Built in HMI • Smaller floor space footprint 	<ul style="list-style-type: none"> • Unique to Apex • Flexibility • Modularity • One system to learn • Commonality • Cost Savings
<p>One cable per system</p> 	<ul style="list-style-type: none"> • One cable per system • Greatly simplified installation • Less material consumed • Reliable/Robust • Less back-up cables required 	<ul style="list-style-type: none"> • Unique to Apex • Flexibility • Commonality • Cost Savings

Product Overview



There's a DGD Spindle for your Application.

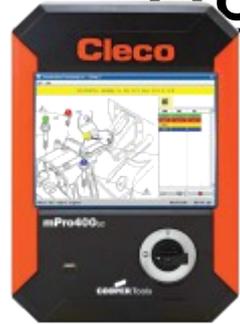
mPro400GC Global Controller for Safety Critical Application

- Flexible Product Configuration
 - Corded and Cordless
 - Fixtured and Hand Held
- Up to 50% Cost Savings
 - Acquisition & Facility
- Modular System Builds
 - Up to 32 Tools
- Key Communication Protocols
- Data Management Options



Software –

Tightening Advanced Control Strategies



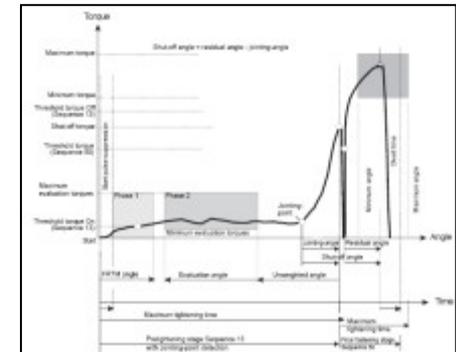
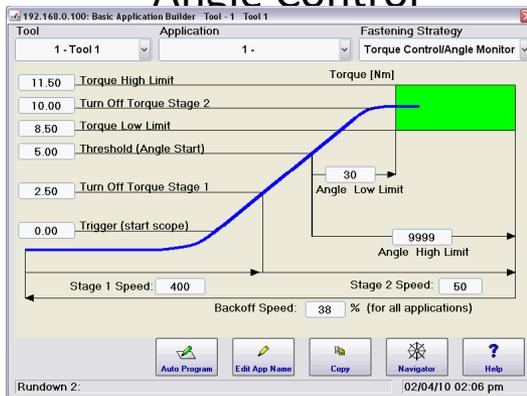
Strategies

- Up to 6 Programmable Stages Standard
- Yield Point Control
- Reject Management
- Angle and Gradient Monitoring
- Friction Torque Measurement
- Residual Torque Monitoring
- Self Tap Screw Control
- Engagement Control
- Re-hit Detection
- Cross Thread Detection
- Spindle Synchronization



Basic

- Torque Control
- Angle Control



ATG largest MVI



There's a DGD Spindle for your Application.

Projects

Segment	Customer	ATG Intelligent Spindle – BTSE (as of 17/2012)
LPV Final Assembly and Powertrain	General Motors	2500 *
	Chrysler	>800 *
	BMW	500
	Daimler	250
	Audi/Porsche	85
	VW	45
Off Road and Heavy Truck	Detroit Diesel	10
	Caterpillar	0
	Man-Europe	0
	Dana	0

* Install through Q42013



There's a DGD Spindle for your Application.

Thank you for your attention.

Apex Tool Group GmbH & Co.
OHG
Industriestrasse 1
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Appendix

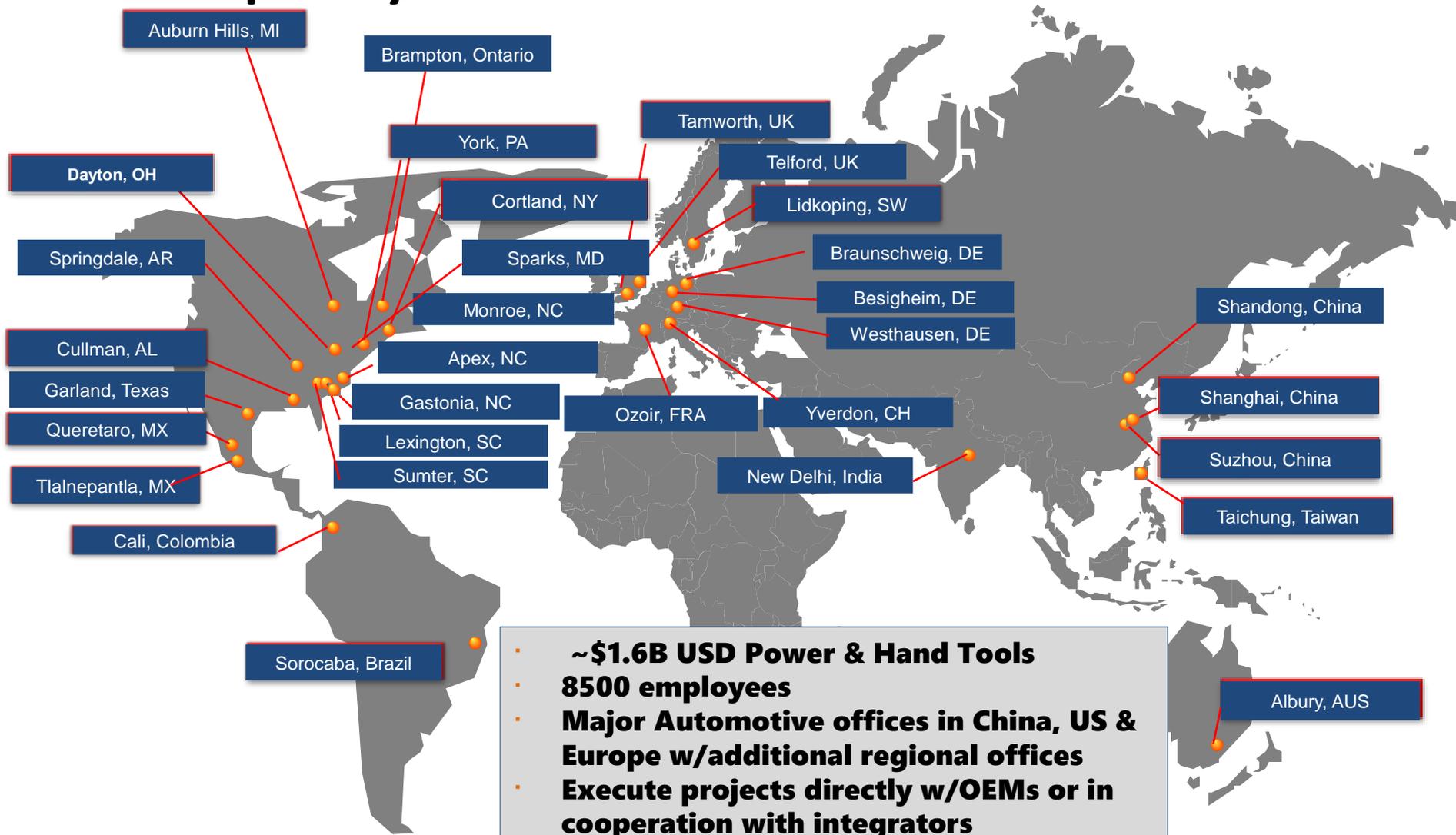
Vision & Values



There's a DGD Spindle for your Application.

- Customers come first
- Integrity in all we do
- Continuous improvement
- Innovation for growth

Company Overview



- **~\$1.6B USD Power & Hand Tools**
- **8500 employees**
- **Major Automotive offices in China, US & Europe w/additional regional offices**
- **Execute projects directly w/OEMs or in cooperation with integrators**
- **Additional Sales/Support in other regions**

Company Overview



There's a DGD Spindle for your Application.

- Apex Tool Group Management foundations in Danaher and Cooper Industries (2010)
- Industrial, commercial, and do-it-yourself customers
- Unparalleled selection of over 30 leading brands with over 100 years of tools experience: DGD, Cleco, Dotco, Apex, Recoules, Quackenbush and more
- Over \$1.6B in annual sales
- Over 8500 employees
- World's largest tools company

Brands Portfolio



There's a DGD Spindle for your Application.



History of Apex Tool

Standard Business Tools Group Business

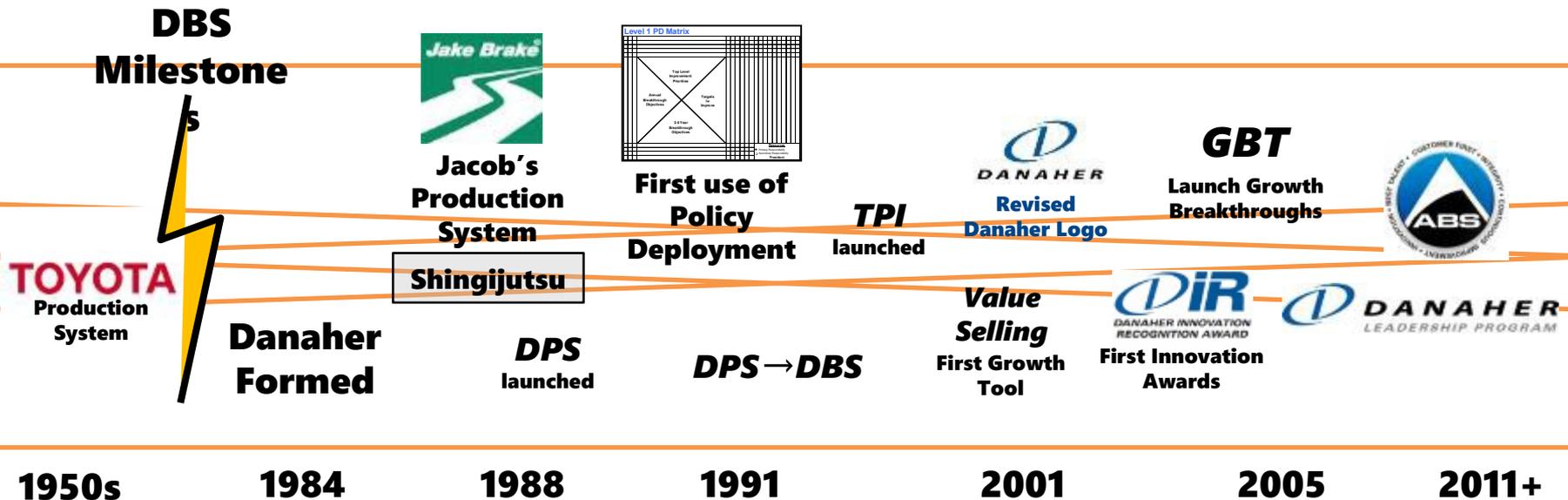
DBS/ABS Evolution

Lean Manufacturing only

Lean Manufacturing + Transactional

Lean + Growth

Growth + Lean + Leadership



History of Apex Tool

Group Business

The European Power Tools headquarter in Westhausen System provides the development and production of the Cleco pulse tools series, the Cleco LiveWire- and the DGD series. Additionally, it is a sales and service center for the complete portfolio of the Power Tools sector.

The concentrated know-how at this site is complemented by the software development center for DGD- and Cleco tightening technology



History of Apex Tool

Group Business

With more than 50 years of experience in compressed air and electric tools and the thoroughness as well as know-how of technicians and engineers, the Apex Tool Group Competence Center has risen to a serious benchmark.

Our portfolio includes hand- and electric solutions for torque measurement, drilling applications and ventilation as professional electronic tools.

