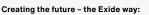


At the speed of life.

Light vehicle battery solutions for every demand.



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exidegroup.com

Innovation Reliability

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TUDOR

Sustainability

пП]

High Performance

The world is changing. That's why we are energizing a new world.

For Exide, now is the time to release new energies to move even more into the future. Our new alignment **"Energizing a new world"** is designed to convey this aspiration. We want to bring change to life, face challenges together with our partners, and develop solutions for today and tomorrow. Let's create the future – the Exide way:

- Innovation is the engine of technology leadership. That's why we are constantly evolving, remaining self-critical, and continue to inspire our customers.
- Reliability defines our business. This applies to our products as well as our innovative development, services, and partnerships. Our responsibility does not end with our products, but starts right there.
- Sustainability is an important part of our responsibility. That's why we rely on renewable energies and intelligent recycling concepts.
- High Performance is the standard we set for our products and services. All our solutions are best of class. This means our customers are optimally equipped for any task.

When the demands raise the bar of expectations. We just jump even higher.

Never stop rethinking.

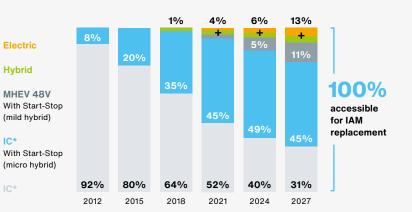
Times change constantly – and there is even one more important constant in our industry: Exide Technologies' aspiration for innovation and pushing things forward. And we prove it with our premium products. We offer one of the largest ranges of diverse batteries for a wide variety of powertrain technologies. Based on expertise in the original equipment business, we are at the forefront of delivering the most advanced solutions. The unparalleled performance in our products allows us to underline our reliability as a leading OE brand. Exide also offers a suite of professional accessories, allowing workshops to provide customers with the highest level of service.

Exploring new horizons.

The ambition for more sustainability and a greener environment has led to an irreversible trend in the evolution of alternative drive systems, thus reducing fuel consumption and CO_2 emissions. This has resulted in a rapidly increasing number of Start-Stop vehicles, which need all OE-compliant AGM and EFB batteries. The change from conventional to alternative and advanced powertrains, like hybrid or full electric, is experiencing a huge shift. As a result, registrations of electric vehicles are breaking records every year. But all alternative powertrains will need the support of lead-acid batteries, meaning that a new generation is just underway.

European car parc and changing powertrains.

- In 2021, cars with Start-Stop powertrains accounted for approximately 45% of the total car parc in Europe
- By 2024, the majority (54%) of vehicles in the car parc will feature a Start-Stop system (micro & mild hybrids)
- The number of cars with Start-Stop systems will have risen from 1% to 54% in just 15 years
- By 2027, 13% of the car parc will either be hybrid (FHEV and PHEV) or full electric (BEV), needing 12V batteries for either cranking or auxiliary functions
- 100% of the car parc will still need a 12V battery by 2027



*IC = Internal combustion engine

Source: Exide estimation, EU28+EFTA (European Free Trade Association inc: Iceland, Liechtenstein, Switzerland and Norway)

	යිං Start-Sto	p	Ģ	➢ conventional	al		
Feature	AGM	EFB	High Tech	Technica	Standard		

Vehicle requirements

Start-Stop powertrain	Recommended OE replacement	Recommended OE replacement	\otimes	\otimes	\otimes
Non Start-Stop powertrain	Unless specified by vehicle manufacturer	Extra life for conventional vehicles	Faster recharge for high equipment level	Widest range to fit al- most 100% of car parc	S Cost effective for older and more basic vehicles
Regenerative braking			\otimes	\otimes	\otimes
Intensive urban use					
Power-hungry equipment					

Battery performance

CCA (cold cranking amperes)	 	 	
Charge acceptance*	 	 	
Cycle life	 	 	
Extra energy**	 	 	

* Charge acceptance (in A/Ah)

** Energy throughput during lifetime





Trusted by

leading carmakers.

Exide has been supplying lead-acid batteries to carmakers for over 100 years. We design the most technically advanced products in the industry, and were the first to introduce Start-Stop technology to the European market in 2004. Carmakers trust the quality of our products and our commitment to excellence in manufacturing.

Exide works with leading car manufacturers, including: Abarth, Alfa Romeo, Audi, Citroen, Dacia, Ferrari, Fiat, Ford, Hyundai, IVECO, Jaguar, Jeep, Kia, Lancia, Land Rover, Maserati, Mazda, Mitsubishi, Nissan, Opel, Peugeot, Piaggio, Porsche, Renault, Seat, Skoda, Suzuki, Toyota, Volkswagen, Volvo.

70% of European car brands work with Exide batteries.

Tudor AGM

For toughest electrical needs of Start-Stop vehicles.

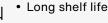
Continuous investments in R&D have allowed Exide to propose the latest innovative AGM batteries from OE to the aftermarket, too. They feature a new innovative framed grid, perfect for advanced Start-Stop systems where the battery needs to be quickly recharged through the energy provided by the regenerative braking system.

AGM Technology

- High dynamic charge acceptance over battery lifespan
- If if energy throughput over battery lifespan thanks to new LifeGrid[®] technology
- Optimized for partial state of charge operations (PSoC)
 - Ideal for large cars, SUVs, vans, and vehicles with Start-Stop and power-hungry electrical equipment
 - Top-level safety features and absolutely no free acid
 - Absorbent glass mat
 - Regenerative braking
- **VRLA** Recombinant VRLA (valve regulated)

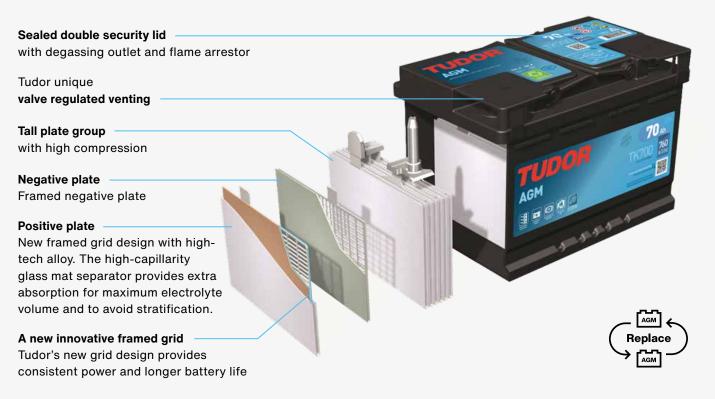
• Latest generation approved by car manufacturers

- Great car parc coverage from a limited number of SKUs



• Designed and built to endure continuous battery discharge and recharge of Start-Stop systems

Typical pattern of State of Charge during a journey with Start-Stop system





Tudor EFB

OEM experience for the aftermarket.

First invented by Exide in 2008, EFB batteries have come to play an increasingly crucial role for car manufacturers in order to reduce fuel consumption and emissions. Now Exide brings the latest OE generation to the aftermarket, featuring **Carbon Boost 2.0**. The new Tudor EFB battery **supports all vehicles, with and without Start-Stop systems,** with

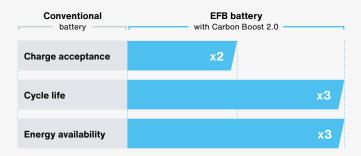
high cycling requirements. When installed in cars with a Start-Stop system, Tudor's new EFB battery shows an unmatched energy recovery and exceptional dynamic charge acceptance. The battery also benefits from a longer overall lifespan, when installed in cars with conventional powertrain.



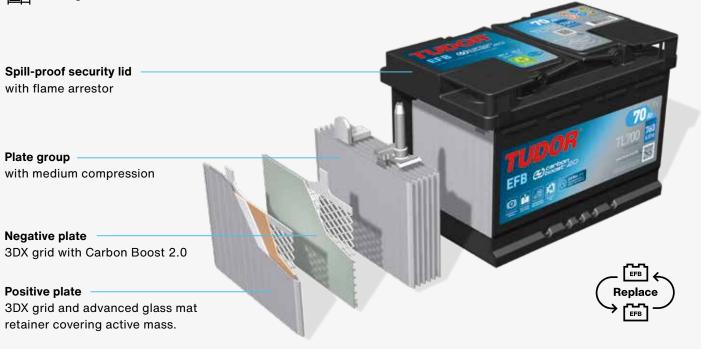


EFB Technology

- High dynamic charge acceptance over battery lifespan
 - Extra energy and extra life for vehicles with and without Start-Stop systems
 - Optimised regenerative braking functionality in vehicles with Start-Stop systems – ensuring maximum fuel savings and less CO₂ emissions
 - High-level safety features
 - Optimal operation in engine compartment
 - 3DX grid technology
 - Latest generation approved by car manufacturers
- Great car parc coverage from a limited number of SKUs
- Long shelf life



Tudor EFB offers significant performance advantages over a conventional battery also when fitted into a car without Start-Stop system.



Tudor Start-Stop Auxiliary

Auxiliary batteries power the electrical equipment in certain cars, as a complement to the main starter battery.





- Absorbent glass mat
- ₩... High cycle life
- Long shelf life
- VRLA VRLA (valve regulated) for leak-proof security
- Original equipment experience inside





Installation advice on top labels – always equipped safely.

Exide is the first in the market to add a distinctive 'CAUTION' label on its High Tech, Technica, and Standard standard flooded batteries to ensure that they are not installed into cars that are equipped with a Start-Stop system.





Battery replacement will be a breeze.

Our Online Battery Finder makes battery replacements safer, quicker, and more cost-efficient thanks to its newly integrated battery replacement instructions. Once the correct battery is identified, the tool guides



mechanics to the battery location, estimates the approximate labour time, and provides helpful information on the installation, and registration process.

Use the app or visit our website to see the Online Battery Finder: exidegroup.com/eu/en/brand/tudor

Tudor Technica



- Updated top label 'CAUTION' label to avoid conventional batteries being installed in Start-Stop vehicles
- If + 15% extra starting power
- All-round battery for standard use
 - 3DX grid technology
 - Original equipment experience inside

Tudor Standard





 Updated top label – 'CAUTION' label to avoid conventional batteries being installed in Start-Stop vehicles

• Economy solution



- Ideal for cars with basic power needs
- 3DX grid technology

RIGINA

Tudor High Tech

The latest High Tech with Carbon Boost 2.0 now recharges up to two times faster compared to other conventional batteries, thanks to Exide's proprietary application of carbon additives on the negative plates. While battery failure remains the number one cause of car breakdowns*, fast recharging considerably reduces the risk of breakdowns by helping the battery retain a healthy state of charge for longer.

Matching QUALITY Part



The High Tech Carbon Boost battery is designed to withstand extreme temperature, powerhungry electrical equipment, and intensive urban driving.

*Source: ADAC 2019

- New recycled plastic components to reduce CO2 emissions by over 2,700 tons and to save 8 million liters of water and 1.2 million liters of crude oil every year
- Recharges up to 2 times faster compared to other conventional batteries
 - · Latest plate design for greater robustness and increased resistance to high temperatures
- Updated top label 'CAUTION' label to prevent conventional batteries being installed in Start-Stop vehicles

- [4] + 30% extra starting power
- K[™]្ល Ideal for highly equipped cars with powerful engines and demanding electrical needs
- · Ideal for extreme weather and urban driving conditions



- 3DX grid technology
- Original equipment experience inside
 - Meets OE requirements



Good to know!

Cold weather significantly impairs battery performance. But it is during the cold season that more energy is needed for light and heating. Hot weather accelerates self-discharge, grid corrosion and active material shedding. It could lead to shorter service life if batteries are not reinforced for extreme climates. In urban environments the engine is often turned off or idles, and the electrical system may consume more power than the alternator can supply. This puts extra pressure on the battery.

Power-hungry electrical equipment, such as media players or navigation equipment, put extra pressure on the battery.

Carbon Boost 2.0

Carbon Boost® is Exide's unique recipe for carbon additives on the negative plates that was first developed for Exide's Start-Stop OEM batteries. Continuous investments in R&D, tighter emissions regulations, and the increasing demands from the OEMs in regards to charge acceptance and energy availability have lead to the deve-

ORIGINAL

lopment of the new Carbon Boost 2.0.

Carbon Boost 2.0 uses improved carbon additives, combining an optimized surface structure with significantly better conductivity. This enables a better current flow within the battery, resulting in unmatched charge acceptance.



The plates are covered with sulfate



With Carbon Boos Sulfate is reduced due to Carbon Boost technology

It also helps to dissolve the lead sulfate deposits that usually consolidate on a battery's discharged negative plates, reducing its ability to charge back efficiently.

Tudor High Tech

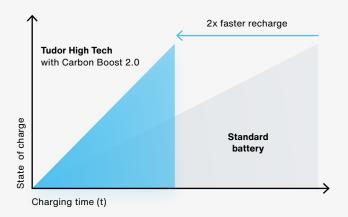
Carbon Boost was first introduced in the aftermarket High Tech range in 2014. The new Carbon Boost 2.0. brings performance to the next level.





- Faster recharging (2x times faster than other ШЪ conventional batteries)

· Longer lifespan (higher average state-ofcharge throughout battery life)



Lab tests show that it takes significantly less time to recharge an Tudor High Tech Carbon Boost battery than a standard battery under the same conditions.

Tudor EFB

Tudor's new EFB batteries feature Carbon Boost 2.0. with exceptional dynamic charge acceptance, offering important benefits for drivers, especially in intensive urban driving conditions.





- - 75% more energy recovered in the same amount of time compared to older EFB
 - Optimized regenerative braking functionality ensuring fuel savings and reduction of CO₂ emissions

Longer overall lifespan



WLTP Worldwide Harmonised Light Vehicle Test Procedure

Strict new EU regulations have imposed a CO₂ emissions limit of 95g/km in vehicle homologation testing by 2021*. The WLTP test measures how much battery capacity is depleted in testing and converts it to equivalent fuel consumed and CO2 emitted. The battery should retain a high percentage of its initial capacity to help car makers avoid being penalized when passing certain thresholds. Since the recharging process accounts for only 8% of test duration, the battery needs to achieve the highest possible energy recovery in a short time. With Carbon Boost 2.0, the dynamic charge acceptance of EFB batteries is maximized:

- The battery accepts 75% higher average recharging current than previous generation
- It preserves a higher capacity at the end of the test (2.5x less state-of-charge loss compared to previous generations)

*Fleet average/bonus included

Innovative workshop tools.

Exide has a comprehensive range of accessories and support. We help you test, charge, select, replace, and recycle batteries – everything workshops need to keep work in house, provide quality service, and grow profitability.

Standard Testers

Conductance

Battery Tester EBT-965P and EBTP Battery Tester program

Our advanced and easy-to-use nextgeneration tester is designed for the most reliable diagnostics of any make or type of battery. It enables preventative maintenance and ensures maximum customer satisfaction. Previous testers only measured the conductance, but the new EBT-965P also features Conductance Profiling[™], including battery health and the remaining available energy in the test results.









Our **EBTP Web app** lets workshops analyse battery test results and give customers battery replacement options – all within five minutes. Discover the EBTP on **ebtp.exidegroup.com/login**

Battery Charger

Exide chargers can be used on cars, boats, motorcycles, trucks, and motorhomes and are ideal for both consumers and professionals alike.

Workshops use the device to ensure customers leave with a fully charged battery every time.

EFB

GEL



BRT-12 Battery Replacement Tool

Our Battery Replacement Tool comes pre-loaded with battery codes, and makes it easy to replace batteries and clear faults from the dashboard.



Battery Finder App

AGM

Search by car model or registration number to quickly find the right battery on the go.





Battery Finder Online

The Tudor Battery Finder tool helps guide mechanics through the replacement process for passenger cars, including hybrid and electric, and light commercial vehicles. Exide offers



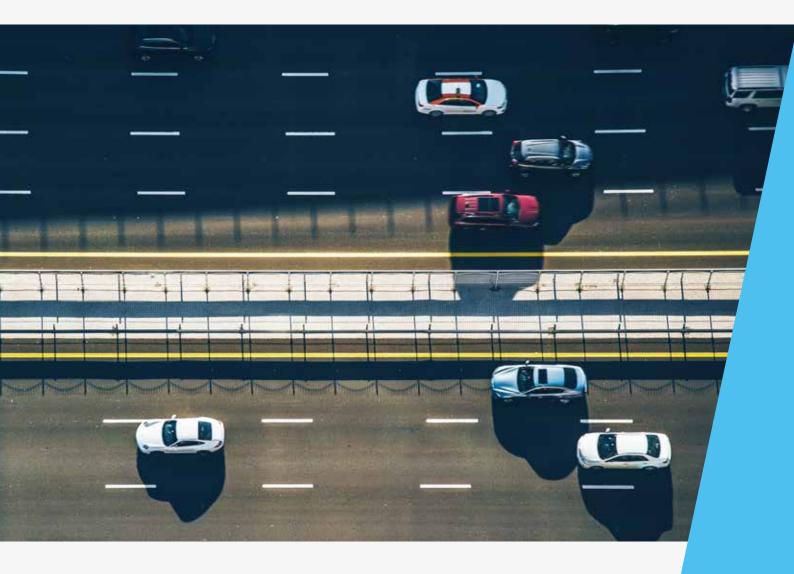
accessible and detailed instructions on battery location, labour time, precise guidelines on how to replace the battery, and much more!

exidegroup.com/eu/en/brand/tudor



Cranking Capability (CCA)

Especially when you go full speed ahead.



It is enormously important to have someone by your side





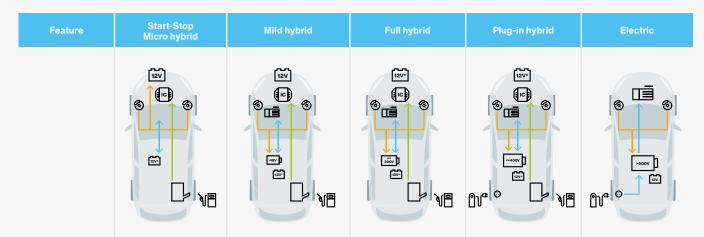




Batteries that every vehicle is keen on. And some are even more electrified.

In any modern vehicle, a 12 volt power source is essential for a number of devices and uses:

- For all electrical vehicles types, to guarantee the functioning of driver assistance systems (ADAS), lighting, navigation, heating and conditioning, door locking, and more.
- For micro hybrid and mild hybrid, to crank the internal combustion engine (ICE) at low temperatures.
- For **BEV** (battery electrical vehicles), to activate and connect the high-voltage battery to the board net and the electric engine.



Propulsion		Internal combustion engine	Internal combustion engine	Internal combustion engine + electric drive (10-30km range)	Internal combustion engine + electric drive (50-100km range)	Electric drive (200-500km range)
Fuel		Petrol/diesel	Petrol/diesel	Petrol	Petrol + electric	Electric
(Hybrid) type		Micro	MHEV (mild)	FHEV	PHEV	BEV
Battery type & technology	Main	12V AGM or EFB (cold cranking)	12V AGM or EFB (cold cranking) 48V Li-Ion (warm cranking + boosting)	150-300V Li-lon or NiMh (electric drive & ICE boosting)	200-400V Li-Ion (electric drive & ICE boosting)	500-800V Li-lon (electric drive) 1 or 2 12V AGM or Li-lon (auxiliary)
(function)	Optional	12V AGM (auxiliary)	12V AGM or Li-Ion (auxiliary)	12V AGM or Li-Ion (crank/auxiliary) or 12V AGM or EFB (cold cranking)	12V AGM or Li-Ion (crank/auxiliary) or 12V AGM or EFB (cold cranking)	
	년 12V AGM 전 EFB 50-70		12V AGM or EFB 60-90Ah 48V Li-Ion 0.5-1 kWh	150-300V NiMh or Li-lon 2-4 kWh 12V auxiliary 20-30Ah	200-400V Li-Ion 8-20 kWh 12V auxiliary 20-30Ah	500-800V Li-lon 40-90 kWh 12V auxiliary 30-45Ah
Battery size	Optional	12V auxiliary 10-15Ah	12V auxiliary 10-15Ah	12V AGM or EFB 60-70Ah	12V AGM or EFB 60-70Ah	
Example		Fiat Panda S&S Volvo XC60	Mercedes C200d Mild Hybrid BMW 320d Mild Hybrid	Toyota Yaris Hybrid Suzuki Vitara Strong Hybrid	Toyota Prius Plug-in Jeep Renegade 4xe	Tesla Model 3
Number of poten- tial 12V replace- ment batteries		ගිගි	a a	(F)	ß	۵œ

Supporting the change of tomorrow.

A 12V lead-acid battery is a reliable source of power for electric vehicles. It provides the necessary energy to activate the safety relay and connect the high-voltage battery to the board net and the electric engine.

When the lead-acid battery is discharged, the car cannot be started. It keeps the entire electrical system running before the traction battery is connected and while the electric car is parked. This includes the security system, the keyless system sensors, the clock, and the memory in many of the car's computer systems.

Model

Once on the road, the **Auxiliary battery** is the crucial back-up item to support relevant features such as power steering, brake boosting, and door locks in case of a breakdown of the main power unit.

All these exceptional features are provided within a highly safe and reliable setup with wide operational temperature windows compared to lithium-ion batteries.

When the battery comes to the end of its useful life, the entire battery can be **recycled up to almost 100%**, as it is part of a closed-loop manufacturing process and therefore has a positive effect on the carbon footprint.

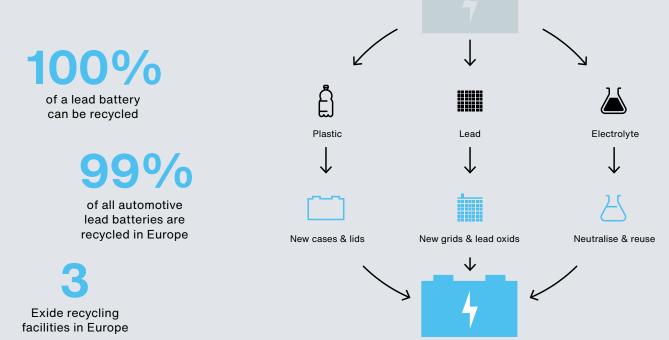
Battery recommendations for the most popular BEV (battery electrical vehicles) models.

Best-fit options for selected full-electric vehicles. Please use our Online Battery Finder to discover more models and other available manufacturers.



Audi	e-Tron	2018/09	ТК700					
BMW	i3	2013/08			AGM12-23			
Hyundai	Kona	2018/04		TL550		TA530	TB500	
Hyundai	loniq	2016/03				TA406	TB356	
Jaguar	I-Pace	2018/02				TA640	TB620	
Kia	Niro	2018/08		TL550		TA530	TB504, TB500	
Kia	Soul II	2014/09					TB504	
Mercedes-Benz	EQC	2019/05	ТК700					
Nissan	NV200/Evalia Bus, Van	2014/07		TL550		TA530	TB500	
Nissan	Leaf	2010/11		TL550		TA456, TA530	TB454, TB500	
Peugeot	208 II	2019/06		TL600		TA640	TB620	
Renault	Kangoo	2011/10		TL700		TA770	TB740	
Renault	Zoe	2012/06		TL550		TA530	TB500	
Smart	fortwo	2010/12		TL550, TL600		TA530, TA640	TB440, TB620	
Smart	forfour	2017/05		TL600		TA640	TB620	
Tesla	Model 3	2017/01				TA456	TB454	
Tesla	Model X	2016/10					TB357	
VW	Golf VII	2014/03		TL600				
VW	ID.3	2019/11		TL550		TA530	TB500	
VW	Up	2013/07		TL550		TA530	TB440, TB500	TC400, TC440

Responsible manufacturer with recycling system.



Tudor light vehicle batteries type list



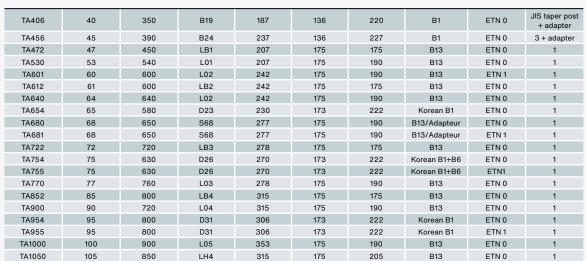
Tudor	Performance			Dimer	isions		Technical characteristics		
Code	Capacity Ah	CCA A (en)	Container	L (mm)	H (mm)	W (mm)	Hold down	Polarity	Terminal
AGM									
TK508	50	800	G34	260	173	206	B7	ETN 9	1
TK600	60	680	L02	242	175	190	B13	ETN 0	1
TK700	70	760	L03	278	175	190	B13	ETN 0	1
TK800	80	800	L04	315	175	190	B13	ETN 0	1
TK950	95	850	L05	353	175	190	B13	ETN 0	1
TK1050	105	950	L06	392	175	190	B13	ETN 0	1
EFB									
TL550	55	540	L01	207	175	190	B13	ETN 0	1
TL600	60	640	L02	242	175	190	B13	ETN 0	1
TL604	60	520	D23	230	173	222	В0	ETN 0	1
TL605	60	520	D23	230	173	222	В0	ETN 1	1
TL652	65	650	LB3	278	175	175	B13	ETN 0	1
TL700	70	760	L03	278	175	190	B13	ETN 0	1
TL752	75	730	LB4	315	175	175	B13	ETN 0	1
TL754	75	750	D26	270	173	222	В0	ETN 0	1
TL800	80	800	L04	315	175	190	B13	ETN 0	1
	95	800	D31	306	173	222	Korean B1	ETN 0	1
TL954			D31	306	173	222	Korean B1	ETN 1	1
TL954 TL955	95	800	201						
	95 100	900	L05	353	175	190	B13	ETN 0	1

TK091	9	120	C54	150	90	105	B0	ETN 1	M12
TK111	11	150	C55	150	90	130	B0	ETN 1	M04
TK131	13	200	C56	150	90	145	В0	ETN 1	M04
TK143	14	80	C76	150	100	100	В0	ETN 3	Screwed/lug
TK151	15	200	C56	150	90	145	В0	ETN 1	Small taper post



Tudor	Perfor	mance	Dimensions				Technical characteristics		
Code	Capacity Ah	CCA A (en)	Container	L (mm)	H (mm)	W (mm)	Hold down	Polarity	Terminal

High Tech





Technica

TB320	32	270	E01	178	135	225	B1	ETN 0	1
TB356	35	240	B19	187	127	220	B0	ETN 0	3
TB356A	35	240	B19	187	136	220	Korean B1 Long	ETN 0	3
TB357	35	240	B19	187	127	220	B0	ETN 1	3
TB440	44	400	L00	175	175	190	B13	ETN 0	1
TB442	44	420	LB1	207	175	175	B13	ETN 0	1
TB450	45	330	E02	220	135	225	B1	ETN 0	1
TB451	45	330	E02	220	135	225	B1	ETN 1	1
TB454	45	330	B24	237	127	227	B0	ETN 0	1
TB455	45	330	B24	237	127	227	B0	ETN 1	1
TB456	45	330	B24	237	127	227	B0	ETN 0	3
TB457	45	330	B24	237	127	227	B0	ETN 1	3
TB500	50	450	L01	207	175	190	B13	ETN 0	1
TB501	50	450	L01	207	175	190	B13	ETN 1	1
TB504	50	360	D20	200	173	222	Korean B1	ETN 0	1
TB505	50	360	D20	200	173	222	Korean B1	ETN 1	1
TB558	55	620	575	230	180	186	В7	ETN 1	SAE S side Terminal 3/8"
TB602	60	540	LB2	242	175	175	B13	ETN 0	1
TB604	60	480	D23	230	173	222	Korean B1	ETN 0	1
TB605	60	480	D23	230	173	222	Korean B1	ETN 1	1
TB620	62	540	L02	242	175	190	B13	ETN 0	1
TB621	62	540	L02	242	175	190	B13	ETN 1	1
TB704	70	540	D26	270	173	222	Korean B1+B6	ETN 0	1
TB705	70	540	D26	270	173	222	Korean B1+B6	ETN 1	1
TB708	70	740	G78	260	180	186	В7	ETN 1	SAE S side Terminal 3/8"
TB712	71	670	LB3	278	175	175	B13	ETN 0	1
TB740	74	680	L03	278	175	190	B13	ETN 0	1
TB741	74	680	L03	278	175	190	B13	ETN 1	1
TB800	80	640	L04	315	175	190	B13	ETN 0	1
TB802	80	700	LB4	315	175	175	B13	ETN 0	1
TB852	85	760	LB5	353	175	175	B13	ETN 0	1
TB858	85	800	G65	306	192	192	B1	ETN 1	EN taper post
TB950	95	800	L05	353	175	190	B13	ETN 0	1
TB954	95	760	D31	306	173	222	Korean B1	ETN 0	1
TB955	95	760	D31	306	173	222	Korean B1	ETN 1	1
TB1000	100	720	LH4	315	175	205	B13	ETN 0	1
TB1100	110	850	L06	392	175	190	B13	ETN 0	1



Standard

TC400	40	320	L00	175	175	190	B13	ETN 0	1
TC412	41	370	LB1	207	175	175	B13	ETN 0	1
TC440	44	360	L01	207	175	190	B13	ETN 0	1
TC542	54	500	LB2	242	175	175	B13	ETN 0	1
TC550	55	460	L02	242	175	190	B13	ETN 0	1
TC605	60	440	D26	270	173	222	Korean B1+B6	ETN 1	1
TC652	65	540	LB3	278	175	175	B13	ETN 0	1
TC700	70	640	L03	278	175	190	B13	ETN 0	1
TC900	90	720	L05	353	175	190	B13	ETN 0	1
TC904	90	680	D31	306	173	222	Korean B1	ETN 0	1
TC905	90	680	D31	306	173	222	Korean B1	ETN 1	1





