MANUAL

v1.0

OPERATION
AND MAINTENANCE

VTR Series

BATTERY-POWERED TORQUE WRENCHES

MODELS VTR-250, VTR-500, VTR-750, VTR-1000, VTR-2000, VTR-3000 AND VTR-5000

NOTICE

The Volta VTR Series Battery-Powered Torque Wrenches (VTR-250, VTR-500, VTR-750, VTR-1000, VTR-2000, VTR-3000, and VTR-5000) are engineered for the installation and removal of threaded fasteners that require precise high torque for bolt makeup and maximum torque for bolt breakout.

Please note that TorcUP Inc. is not liable for any modifications made to the tools by customers or for applications where TorcUP Inc. was not consulted.

WARNING

IMPORTANT SAFETY INFORMATION ENCLOSED.
READ THIS MANUAL BEFORE OPERATING THE TOOL.
IT IS THE EMPLOYER'S RESPONSIBILITY TO ENSURE THIS MANUAL IS AVAILABLE TO THE OPERATOR.

FAILURE TO STRICTLY ADHERE TO THE WARNINGS CONTAINED IN THIS MANUAL MAY RESULT IN SERIOUS INJURY.
Your safety is our top priority, and we urge you to follow all safety precautions outlined in this manual.

The Volta VTR Series tools contain alloy components, which may cause a hazard in specific explosive environments.

General Description of TorcUP Volta VTR Series Battery-Powered Torque Wrenches

The Volta VTR Series Battery-Powered Torque Wrench offers torque settings of up to 5,000 lbf-ft in clockwise rotation, and its free joint design allows for random positioning of the tool.

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Website: WWW.TORCUP.COM
Address: 1025 Conroy Place
Easton, PA. 18040
U.S.A.

SAFETY INFORMATION

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY

Always wear ear protection when operating this tool.

The Reaction Arm must be positioned against a positive stop. Do not use the arm as a dead handle. Take precautions to make certain the operator's hand cannot be pinched between the arm and a solid object.

The use of other than genuine TorcUP replacement parts may result in safety hazards, decreased tool performance, increased maintenance, and may invalidate all warranties.

- Repairs should be made only by authorized personnel.
- Consult your nearest TorcUP Authorized Service Center.
- Refer all communications to the nearest TorcUP Office or Distributor.

TorcUP Locations

TorcUP HQ | Ph: 610-250-5800
1025 Conroy Pl. Easton, PA 18045

TorcUP TX | Ph: 281-476-5513
4201 Center St. STE B Deer Park, TX 77536

TorcUP LA | Ph: 225-647-8708
2013 S. Philippe Ave. Gonzales, LA 70737

USING THE TOOL

• Keep hands, loose clothing, and long hair away from the reaction arm and working area during operation.

• This tool will exert a strong reaction force. Use proper mechanical support and correct reaction arm positioning to control these forces. Do not position the reaction arm so that it tilts the tool off the axis of the bolt, and never use the air inlet as a reaction stop.

• Use only accessories recommended by TorcUP.

• Use only impact sockets and accessories rated for appropriate torque output. Do not use hand (chrome) sockets or accessories.

• Use only sockets and accessories that correctly fit the bolt or nut and function without tilting the tool off the axis of the bolt.

• This tool is not insulated against electric shock.

• This equipment must not be operated or serviced unless the operator reads the operating instructions and fully understands the purpose, consequences, and procedures of each step.

Depending on the working environment, your local health and safety regulations may require you to wear protective gear (i.e., safety shoes, hard hat, gloves, coveralls, etc.). In case external forces are exerted on the equipment, non-compliance with these regulations may result in injury.

EAR PROTECTION MUST BE WORN WHEN OPERATING THIS TOOL.

OPERATIONAL SAFETY

1. Inspect, maintain, operate, and install the tool in accordance with all applicable standards and regulations (local, state, county, federal, etc.)
2. Do not remove any labels. Replace any damaged labels immediately.

3. Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel, or jet fuel. Only use TorcUP recommended lubricants.

4. Only use proper cleaning solvents to clean parts. Use only cleaning solvents that meet current safety and health standards. Use cleaning solvents in a well-ventilated area.

5. Keep work area clean, uncluttered, ventilated, and illuminated.

PERSONAL SAFETY

1. When wearing gloves, always be sure that the gloves will not prevent the trigger mechanism from prematurely being released.

2. Always wear eye protection when operating or performing maintenance on this tool.

3. Always wear hearing protection when operating this tool.

4. Always use Personal Protective Equipment appropriate to the tool used, environment, and the material being worked on. This may include a dust mask or other breathing apparatus, safety glasses, earplugs, gloves, an apron, safety shoes, a hard hat, and other necessary equipment.

5. Avoid breathing in any exhaust from tool use.

    a. Some dust may also be created by working in close proximity to the following chemicals:

        i. Lead from lead-based paints

        ii. Crystalline silica from bricks, cement, and other masonry products

        iii. Arsenic and chromium from chemically treated lumber

Your risk from these exposures varies depending on how often you do this type of work. To reduce your exposure to these chemicals, work in a well-ventilated area and work with approved safety equipment, such as dust masks that are specially designed to filter out microscopic particles.

6. Keep others at a safe distance from your work area or ensure they use appropriate personal protective equipment.

7. Be aware of buried, hidden, or other hazards in your work environment. Do not contact or damage cords, conduits, pipes, or hoses that may contain electrical wires, explosive gases, or harmful liquids.

8. Keep hands, loose clothing, long hair, and jewelry away from the working end of the tool.

9. Power tools can vibrate in use. Vibration, repetitive motions, or uncomfortable positions may be harmful to your hands and arms. Stop using any tool if discomfort, tingling, or pain occurs. Seek medical advice before resuming.

10. Keep your body stance balanced and firm. Do not overreach when operating this tool. Anticipate and be alert for sudden changes in motion, reaction torques, or forces during start up and operation.

11. DO NOT USE THE TOOL WHEN TIRED OR WHEN UNDER THE INFLUENCE OF MEDICATION, DRUGS, OR ALCOHOL.

12. Never use a damaged or malfunctioning tool or accessory.

13. Do not modify the tools, safety devices, or accessories.

14. Do not use this tool for purposes other than those recommended.

SAFETY ACCESSORIES AVAILABLE FOR PURCHASE

P.A.S.S. | PINCH AVOIDANCE SAFETY SYSTEM

AVAILABLE FOR ALL VOLTA AND VOLTA VTR SERIES MODELS
PART NUMBER: VTA-PASS

Requiring the operator to use both hands to control the tool prevents the secondary hand approaching critical pinch points.
MUST BE FACTORY INSTALLED ON ALL MODELS

HANGER | HORIZONTAL

AVAILABLE FOR ALL VOLTA VTR SERIES MODELS
PART NUMBERS:

HORIZONTAL MODEL#	PART#
VTR 250/500	VTRA-TCH-05-H
VTR 750/1000	RPA-TCH-10.30-H
VTR 2000	VTRA-TCH-20-H
VTR 3000	VTRA-TCH-30-H
VTR 5000	VTRA-TCH-50-H

Designed for horizontal use to reduce fatigue by easing the tool's weight.

D-HANDLE | MULTI-POSITION TOOL HANDLE

AVAILABLE FOR ALL VOLTA VTR SERIES MODELS
PART NUMBERS:

MODEL#	PART#
VTR 250/500	VTRA-TCH-05-DH
VTR 750/1000	RPA-TCH-10.30-DH
VTR 2000	VTRA-TCH-20-DH
VTR 5000	VTRA-TCH-50-DH

Ergonomic design disperses the weight for a more comfortable hold, plus it doubles as a horizontal hanger.

VTA-BRC | BATTERY RELEASE COVER

AVAILABLE FOR ALL VOLTA VT AND VTR SERIES MODELS
PART NUMBER: VTA-BRC

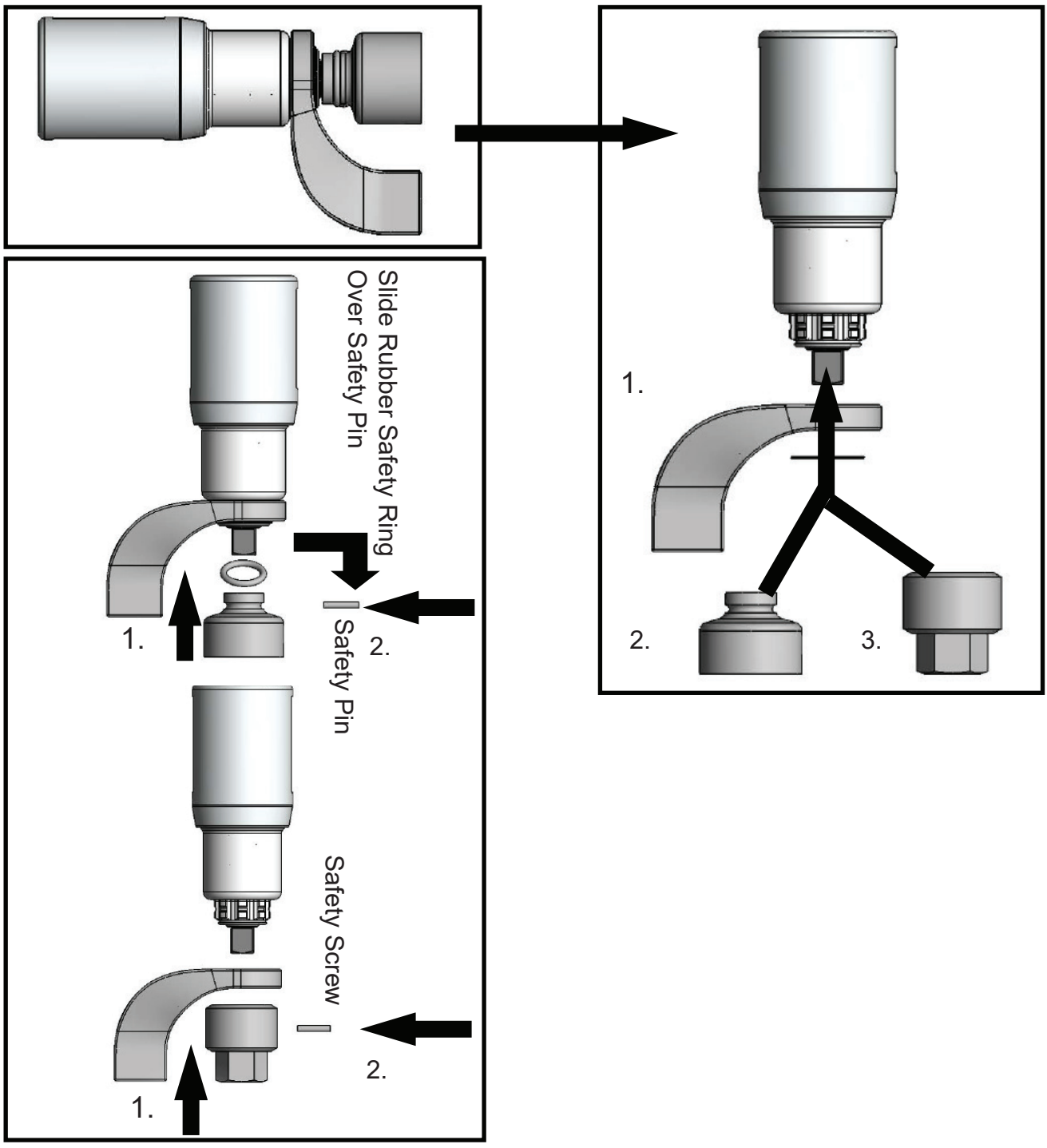
Stops non-intentional release of battery by preventing accidental pushing of battery release button on the Volta VT and VTR Series handle.

PLACING THE TOOL IN SERVICE

1. Ensure the reaction arm is attached correctly and secured to the splined section of the torque tool.

2. Select your desired square drive size and bolt/nut AF size impact socket or hex-drive socket for use.

3. Secure the impact socket onto the tool square drive with a safety pin and secure a safety O-ring on the socket.



OPERATING PROCEDURES

SETTING THE TORQUE

1. Momentarily press the Volta VTR trigger to activate the LCD display. The screen will stay lit for about 30 seconds after you release the trigger.

2. Make sure the Volta VTR has the correct engineering unit selected (either lbf-ft or Nm). You can switch between units by pressing the up and down arrow buttons at the same time. Note that changing units will reset the torque to its lowest setting.

3. Use the two arrow buttons to set the desired torque. Pressing the up arrow increases the torque, while pressing the down arrow decreases it. Holding down an arrow button will rapidly cycle through the torque settings. Remember, any torque adjustments won't take effect until you release the trigger. It's best practice to set the torque before activating the tool.

4. After the LCD times out, press the trigger again to reactivate it. The torque setting will stay the same until you choose to change it.

POSSIBLE OCCURANCES PENDING USAGE

If the tool is used continuously/rapidly to the point that the tool feels hot to the touch, the tool's accuracy can diminish and cause a slight increase in torque. Once the tool cools down, the accuracy should return to normal.

The battery is recommended to be changed before the charge gets to 25% battery life, although the torque should be consistent until the last few fastenings before the battery dies.

This tool is designed for use with right-hand thread fasteners. There is an approximate 15% reverse bias to assist with breakout. If this tool is to be used with left-hand thread fasteners, consult TorcUP.

After extended use of the Volta VTR Torque Wrench, in the case of degrading performance or other apparent damage, immediately send your Volta VTR Series Torque Wrench to TorcUP Inc. or contact your Local Representative or Distributor. The Volta VTR Torque Wrench must be adequately packaged for shipping to help avoid the risk of damage during transit.

TIGHTENING AND LOOSENING OF BOLTS OR NUTS

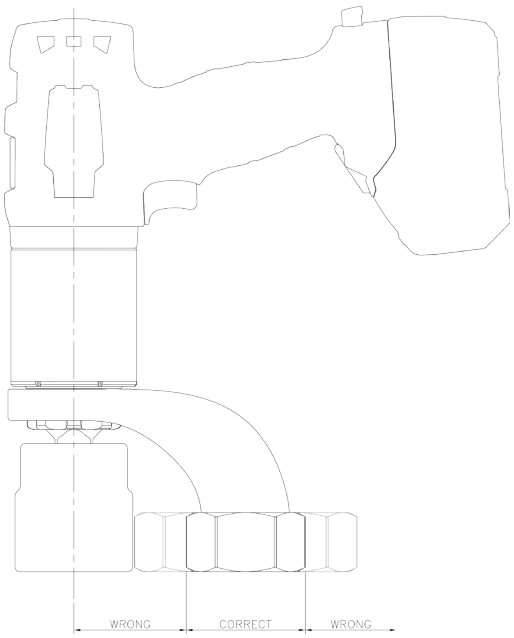
- Beware of non-fixed, freely rotating reaction arms or rotating impact sockets.
- Loose clothes, long hair, cables, etc., are always to be kept away from the danger/rotation area. When the Volta VTR Torque Wrench is put into operation, it is mandatory to wear ear protection, safety shoes, and safety goggles.
- Maintain a safe distance from all reaction points.
- Always place the impact socket or hex driver snugly onto the screw or nut/bolt. Faulty screw, nut/bolt connections may result in exceeding the mechanical stress limit of the material, causing it to break. Parts that splinter off may cause bruises or even life-threatening injuries.

When tightening and loosening fasteners, always hold/position the Volta VTR Series Torque Wrench in line with the fastener axis to avoid damage to the application.

See Figure 1 on the following page.

TIGHTENING AND LOOSENING OF BOLTS OR NUTS

Fig. 1



1. Place your Volta VTR Series Torque Wrench completely over and on the fastener to be tightened or loosened.
2. Ensure the Reaction Arm takes up the reaction area/ movement. Also, ensure the reaction is stable and will support counter torque.
3. Hold the Volta VTR Series Torque Wrench perpendicular to the fastener axis for the complete duration of the rotation process for tightening or loosening.
4. Ensure the direction switch is set to tighten (CW Direction). Then, press the trigger on the pistol grip to tighten the fastener. The tool will rotate until the fastener becomes torqued, and the Volta VTR Series Torque Wrench will then stop/beep.
5. For loosening a fastener, place the direction switch in reverse (CCW Direction). Then, press the trigger on the pistol grip to loosen the fastener. The unit will continue to rotate until the
fastener is removed. Alternatively, once the fastener is loose, it can be removed by hand, and you can proceed to the next fastener.
6. Continue the process of tightening or loosening for each fastener you require.
7. If torque requirements necessitate the use of torque increments, set the Volta VTR Series Torque Wrench to your first torque requirement. Tighten the fastener as per your required tightening bolt sequence. Then, reset for the next setting(s).
8. Your personnel can be trained by your TorcUP Representative or Distributor on the use of this product if so desired.

CHANGING ACCESSORIES

1. Remove the Volta VTR Series Torque Wrench from the application.
2. Disconnect the battery from the Volta VTR Series Torque Wrench.
3. Remove and change the socket or accessory adaptor for the next project. Ensure the socket or accessory is adequately secured to the square drive with a locking pin and safety securing O-ring.

BATTERY SAFETY INSTRUCTIONS

NOTE: BEFORE USE, PLEASE SEE PAGES 22-32 OF THIS USER MANUAL TO REVIEW THE BATTERY PRODUCT SAFETY DATA SHEET.

1. Avoid exposing power tools to rain or wet conditions. Water entering a power tool increases the risk of electric shock and can damage the tool.
2. Disconnect the battery pack from the power tool before changing accessories or storing it. Such safety measures help prevent accidental starting.
3. Store idle power tools out of children's reach and do not let unfamiliar persons operate the tool. Power tools can be dangerous when used by individuals without proper training.

4. Maintain your power tools regularly. Check for misalignment, binding of moving parts, breakage, or any condition that could affect operation. If damaged, have the tool repaired before use. Poor maintenance is a leading cause of many accidents.

5. Use the power tool, accessories, and bits according to these instructions, considering the work conditions and task. Using a power tool for unintended purposes can create a hazardous situation.

BATTERY USE AND CARE

1. Recharge batteries using the charger specified by TorcUP Inc. A charger designed for one type of battery pack may create a fire hazard when used with a different kind of battery pack.

2. Use an authentic TorcUP or Metabo LiHD battery pack. Using counterfeit TorcUP/Metabo or other manufacturers' battery packs can increase the risk of injury and fire.

3. When the battery pack is not in use, keep it away from other metal objects like paper clips, coins, keys, nails, screws, or other small metal items, which can create a connection between the terminals. Shorting the battery terminals can cause burns or a fire.

4. Under abusive conditions, liquid may be expelled from the battery; avoid contact. If contact occurs accidentally, rinse with water. If the liquid comes into contact with your eyes, seek medical attention immediately. Liquid leaking or ejecting from the battery may cause irritation or burns.

5. Protect battery packs from water and moisture.

6. Do not expose battery packs to open flames.

BATTERY TROUBLESHOOTING

If the Volta VTR Series Torque Wrench turns off automatically, it means the electronics have entered automatic protection mode. A warning sound, a continuous beeping will occur. This beeping stops either after a maximum of 30 seconds or when the trigger is released. Despite this safety feature, overloading can still occur with specific tasks and might cause damage to the tool.

CAUSES AND SOLUTIONS:

1. Battery nearing depletion: The electronics protect the battery pack from damage caused by complete discharge. If one LED is flashing, the battery is nearly depleted. Press the button and check the LEDs to gauge the charge level. If the battery is almost depleted, recharge it with a genuine TorcUP/Metabo charger.

2. Prolonged continuous overloading of the tool: This will trigger the temperature cutout. Allow the tool or battery pack to cool down. Note: If the battery pack feels very warm, it will cool down faster in a genuine TorcUP/Metabo speed charger, which features an “AIR COOLED” function. *Note: The tool will also cool more quickly if operated at free speed.*

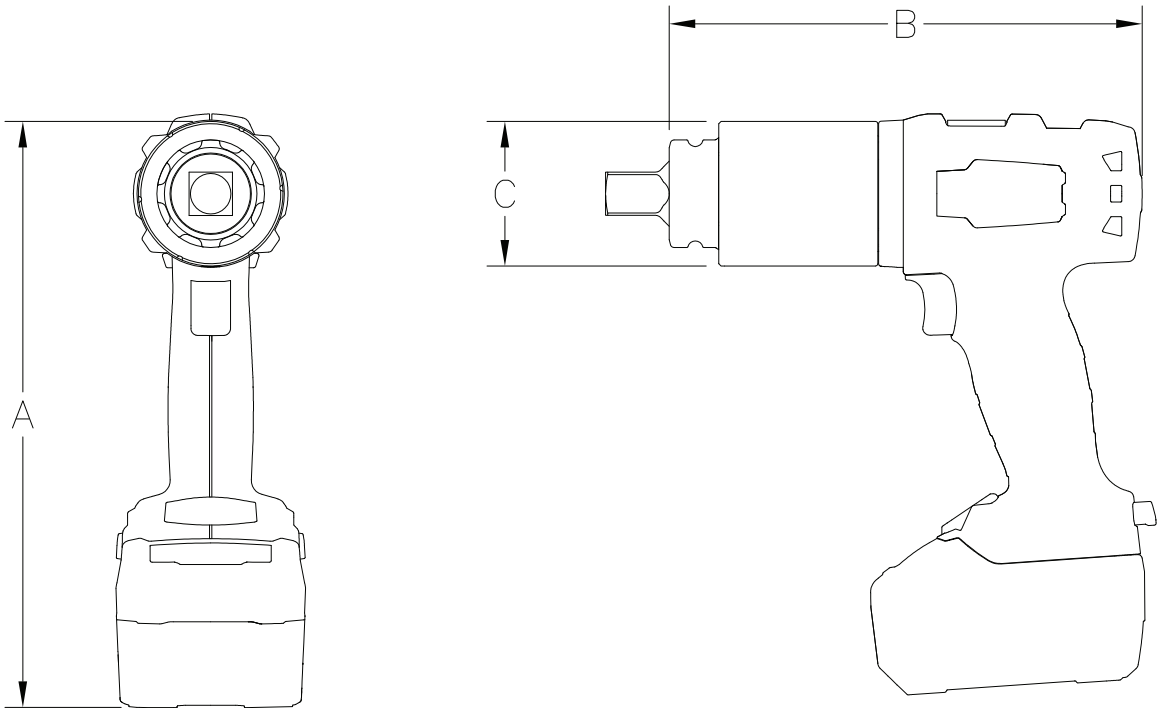
3. Safety Shutdown: The tool has turned off automatically. If the current’s rate of change is too high (for example, if the tool suddenly seizes or kickback happens), the tool will shut down. Turn off the tool by releasing the trigger. Turn it back on by actuating the trigger and resume work as usual. Try to avoid the tool seizing to prevent damage or premature wear on electronic or mechanical components.

Note: The LED display screen automatically turns off after a set period. To reactivate the electronic functions, press the trigger.

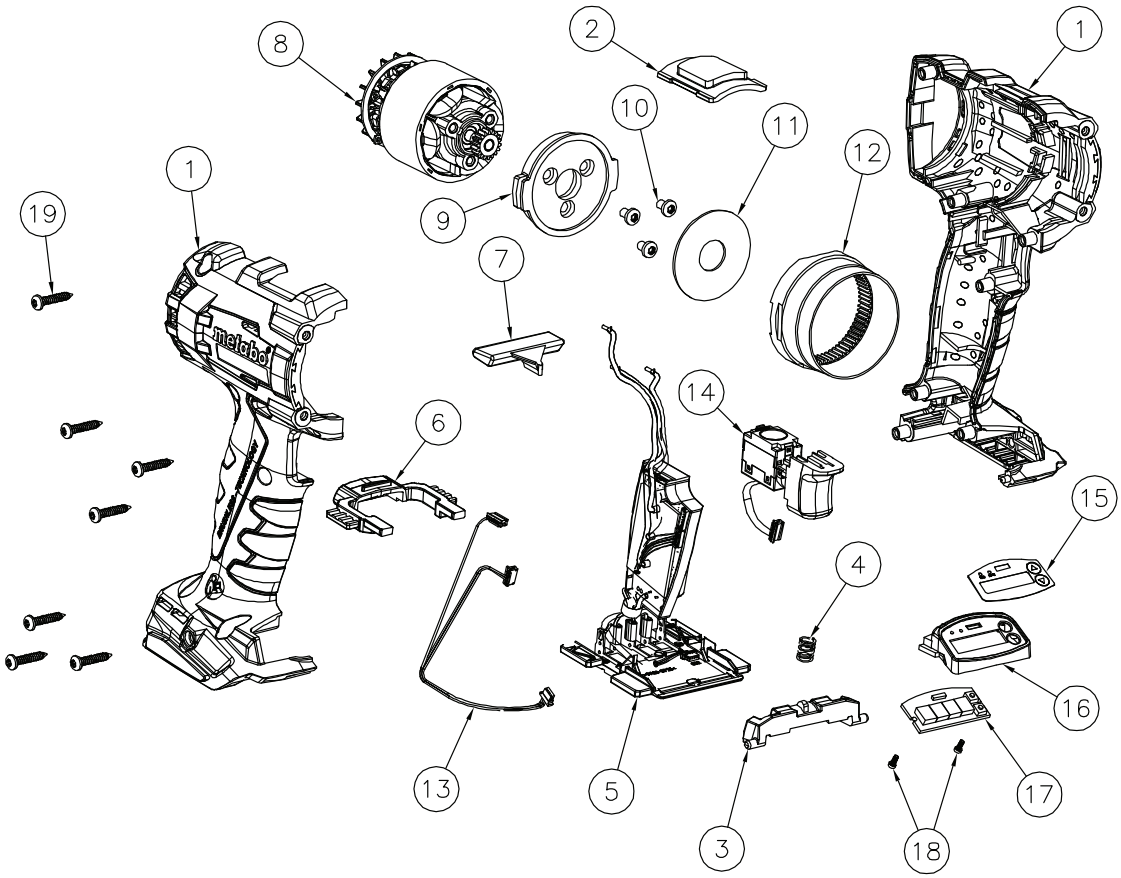
TECHNICAL SPECIFICATIONS

Model Number	VTR-250	VTR-500	VTR-750	VTR-1000-.75	VTR-1000	VTR-2000	VTR-3000	VTR-5000
SQUARE DRIVE	3/4"	3/4"	3/4" or 1"	3/4"	1"	1"	1"	1.5"
MIN. TORQUE (lbf-ft)	60	80	100	200	200	400	650	800
MAX. TORQUE (lbf-ft)	250	500	750	1000	1000	2000	3000	5000
MIN. TORQUE (Nm)	80	110	140	280	280	540	920	1080
MAX. TORQUE (Nm)	340	680	1020	1360	1360	2710	4070	6780
HEIGHT A (w/ battery) (in)	10.04	10.04	10.09	10.09	10.09	10.24	10.41	10.91
HEIGHT A (w/ battery) (mm)	255.0	255.0	256.3	256.3	256.3	260.1	264.4	277.2
LENGTH B (in)	8.17	8.17	9.18	9.18	9.2	9.75	10.39	11.83
LENGTH B (mm)	207.5	207.5	233.2	233.2	233.2	247.7	263.9	300.5
DIAMETER C (in)	2.50	2.50	2.85	2.85	2.85	3.15	3.50	4.50
DIAMETER C (mm)	63.5	63.5	72.4	72.4	72.4	80.0	88.9	114.3
WEIGHT (w/o reaction arm & battery) (lbs)	6.55	6.55	9	9	9	11.5	14.35	25.95
WEIGHT (w/o reaction arm & battery) (kg)	2.97	2.97	4.08	4.08	4.08	5.22	6.51	11.77
WEIGHT (w/ reaction arm & battery) (lbs)	10.85	10.85	14.15	14.15	14.15	16.65	19.5	36.05
WEIGHT (w/ reaction arm & battery) (kg)	4.92	4.92	6.42	6.42	6.42	7.55	8.85	16.35
RPM at Min. Torque	25.75	12.25	8.4	6	6	3	2.25	1.1
RPM at Max Torque	39	19	12.5	8.25	8.25	4.75	3.25	1.75

Charger Requirements: 110 - 120 V (50-60 Hz) and 230 - 240 V (50-60 Hz)



VOLTA R SERIES HANDLE (ELECTRICAL)

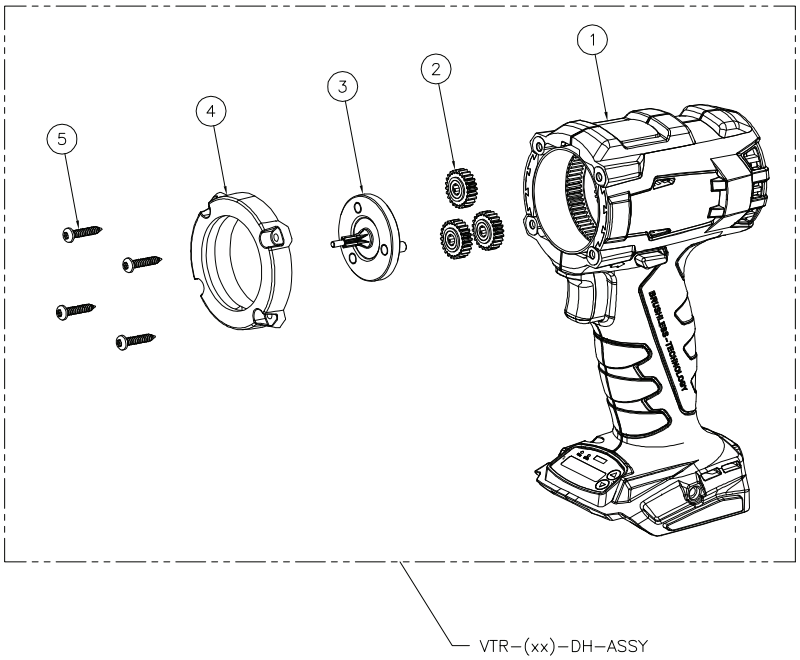


Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Black Handle Housing (Set)	VT-DH-HOUSING	1
2	Transmission Plate	VT-ADPTR-7	1
3	Battery Locking Piece	VT-DH-LOCKPIECE	1
4	Battery Lock Pressure Spring	VT-DH-LOCKSPRING	1
5	Electric Controller (x.xs backoff)	VT-DH-ELECT(x.xs)*	1
6	Battery Lock Slide	VT-DH-LOCKSLIDE	1
7	Handle R/L Slide Switch	VT-DH-R/LSLIDE	1
8	18v Motor	VT-DH-MOTOR	1
9	Gear/Motor Flange	VTR-GEARFLANGE	1
10	Motor Flange Screw	VT-DH-GEARFLANGE-SCREW	3
11	Stage 1 Thrust Bearing	VTR-ST1-TW	1
12	High Speed Annulus	VTR-HSA	1
13	Controller Cable Assembly	VT-CNTRL-WH01	1
14	Trigger Switch	VT-DH-TRIGGER	1
15	Display Cover Label	LBL-VT-DISPLAY	1
16	Display Cover	VT-CNTRL-COVER	1
17	Controller PCB	VT-CNTRL-PCB	1
18	Controller PCB Screw	VT-CNTRL-SCREW	2
19	Housing Screw	VT-DH-SCREW	7

*Electric controller part numbers:	
VTR-250, VTR-500, VTR-750-.75, VTR-750, VTR-1000-.75, VT-1000	VT-DH-ELECT(0.3s)
VTR-2000	VT-DH-ELECT(0.6s)
VTR-3000, VT-5000	VT-DH-ELECT(1.0s)

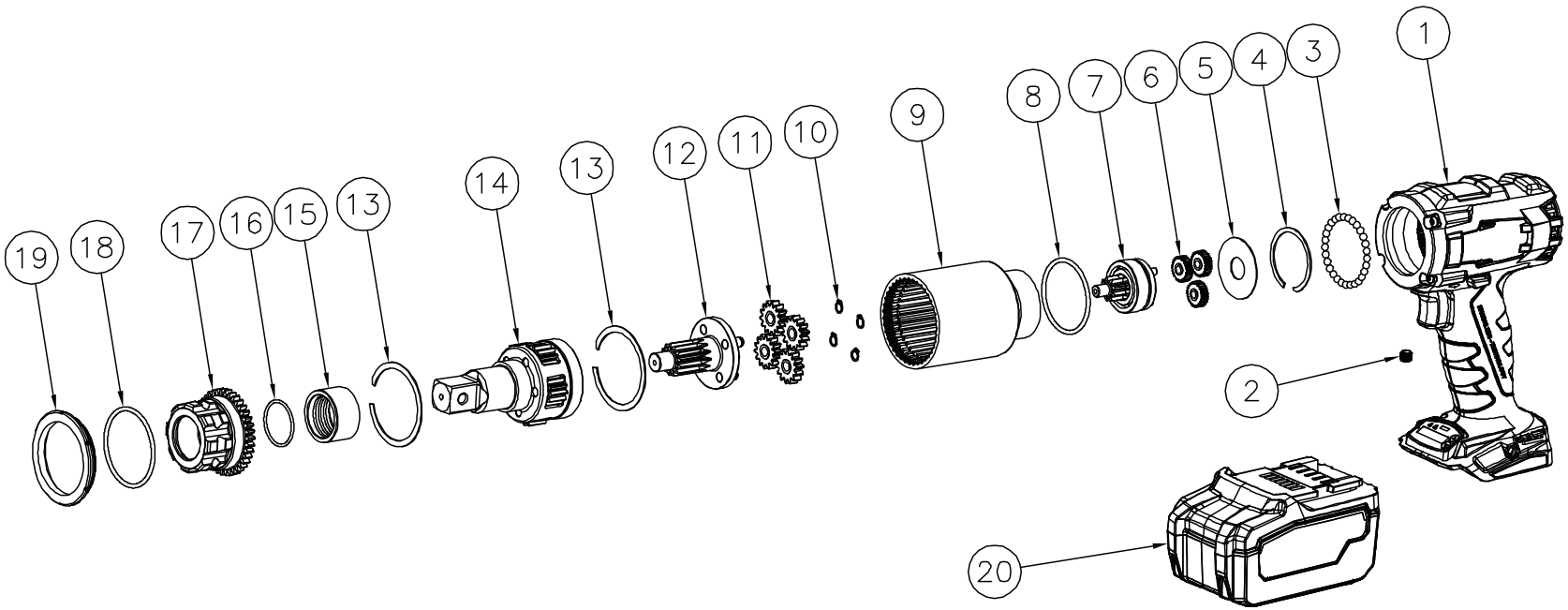
VOLTA R SERIES HANDLE



Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Handle	VTR-(xx)-DH*	1
2	1st Stage Planet Gear	VTR-ST1-G	3
3	1st Stage Gear Carrier	VTR-ST1	1
	1st Stage Gear Carrier (VTR-250 only)	VTR-250-ST1	1
	1st Stage Gear Carrier (VTR-750 only)	VTR-750-ST1	1
4	Gearbox Adapter	VTR-ADPTR	1
5	Housing Screws	VT-DH-SCREW	4
	*Handle part numbers:		
	VTR-250, VTR-500, VTR-750-.75, VTR-750, VTR-1000-.75, VTR-1000	VTR-05.10-DH	
	VTR-2000	VTR-20-DH	
	VTR-3000, VTR-5000	VTR-30.50-DH	

VTR-250 Series Wrench

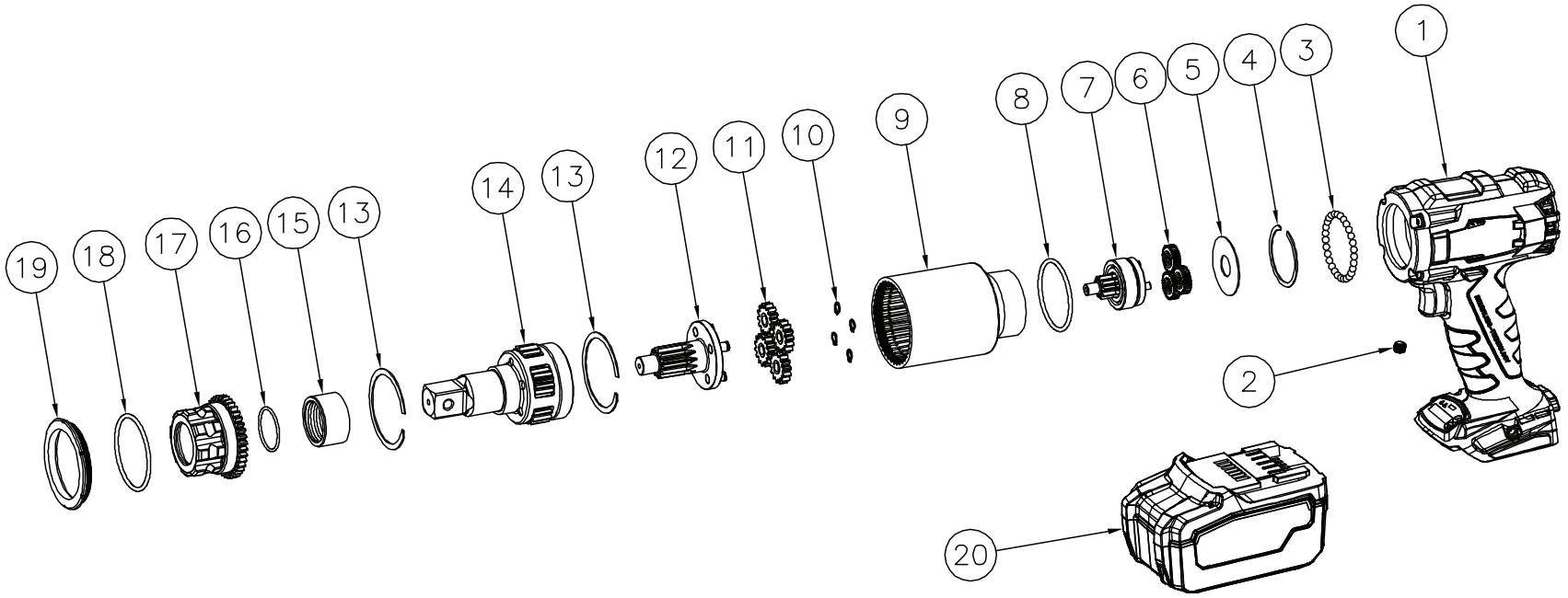


Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Drive Handle Assembly	VTR-05.10-DH-ASSY	1
2	Bearing Ball Retainer	VTR-CM-BR	1
3	Bearing Ball	VTR-CM-BB	29
4	Retaining Ring, Stage 2	VTR-ST2-RR	1
5	Thrust Washer, Stage 2	VTR-ST2-TW	1
6	Planet Gear, Stage 2	VTR-250-ST2-G	3
7	Gear Carrier, Stage 2	VTR-250-ST2A	1
8	O-Ring, Main Annulus	VTR-OR-MA	1
9	Drive Annulus	VTR-05-DA	1
10	Planet Gear Retaining Ring, Stage 3	VTR-05-ST3-G-RR	4
11	Planet Gear, Stage 3	VTR-05-ST3-G	4

ITEM	NAME	PART #	QTY.
12	Gear Carrier, Stage 3	VTR-05-ST3	1
13	Retaining Ring, Drive Annulus	VTR-05-DA-RR	2
14	Caged Drive Stage Assembly	VTR-05-DSTA	1
15	Main Bearing Bushing	RP3-05-MB	1
16	O-Ring, Drive Annulus	RP3-05-OR-DA	1
17	Annulus Head	VTR-05-AH	1
18	O-Ring, Annulus Cap	VTR-05-OR-AC	1
19	Annulus Cap	VTR-05-AC	1
20	LiHD Battery 18v	VT-BATT-18V-#.#AH	1

VTR-500 Series Wrench

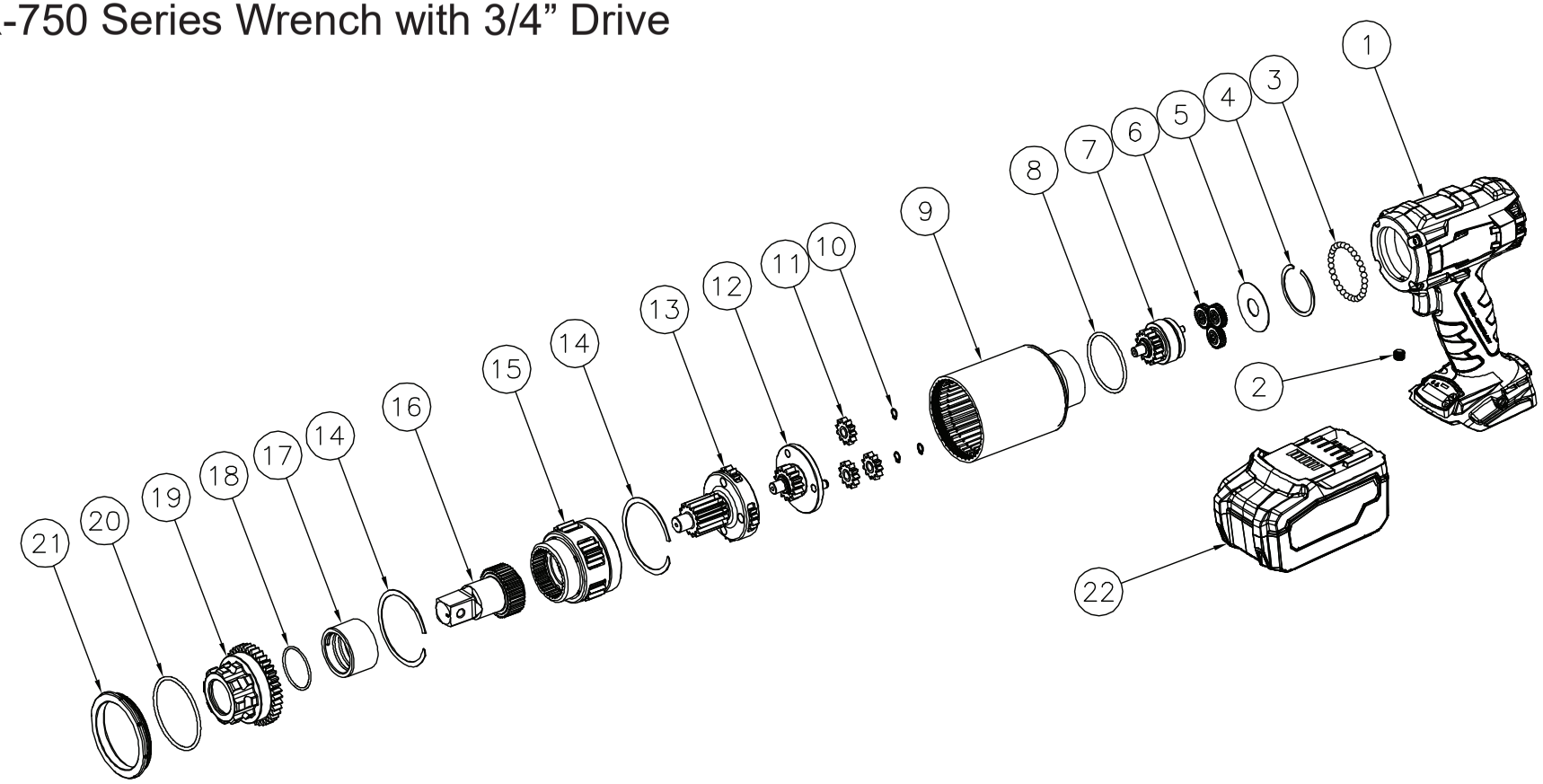


Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Drive Handle Assembly	VTR-05.10-DH-ASSY	1
2	Bearing Ball Retainer	VTR-CM-BR	1
3	Bearing Ball	VTR-CM-BB	29
4	Retaining Ring, Stage 2	VTR-ST2-RR	1
5	Thrust Washer, Stage 2	VTR-ST2-TW	1
6	Planet Gear, Stage 2	VTR-ST2-G	3
7	Gear Carrier, Stage 2	VTR-05-ST2A	1
8	O-Ring, Main Annulus	VTR-OR-MA	1
9	Drive Annulus	VTR-05-DA	1
10	Planet Gear Retaining Ring, Stage 3	VTR-05-ST3-G-RR	4
11	Planet Gear, Stage 3	VTR-05-ST3-G	4

ITEM	NAME	PART #	QTY.
12	Gear Carrier, Stage 3	VTR-05-ST3	1
13	Retaining Ring, Drive Annulus	VTR-05-DA-RR	2
14	Caged Drive Stage Assembly	VTR-05-DSTA	1
15	Main Bearing Bushing	RP3-05-MB	1
16	O-Ring, Drive Annulus	RP3-05-OR-DA	1
17	Annulus Head	VTR-05-AH	1
18	O-Ring, Annulus Cap	VTR-05-OR-AC	1
19	Annulus Cap	VTR-05-AC	1
20	LiHD Battery 18v	VT-BATT-18V-#.#AH	1

VTR-750 Series Wrench with 3/4” Drive

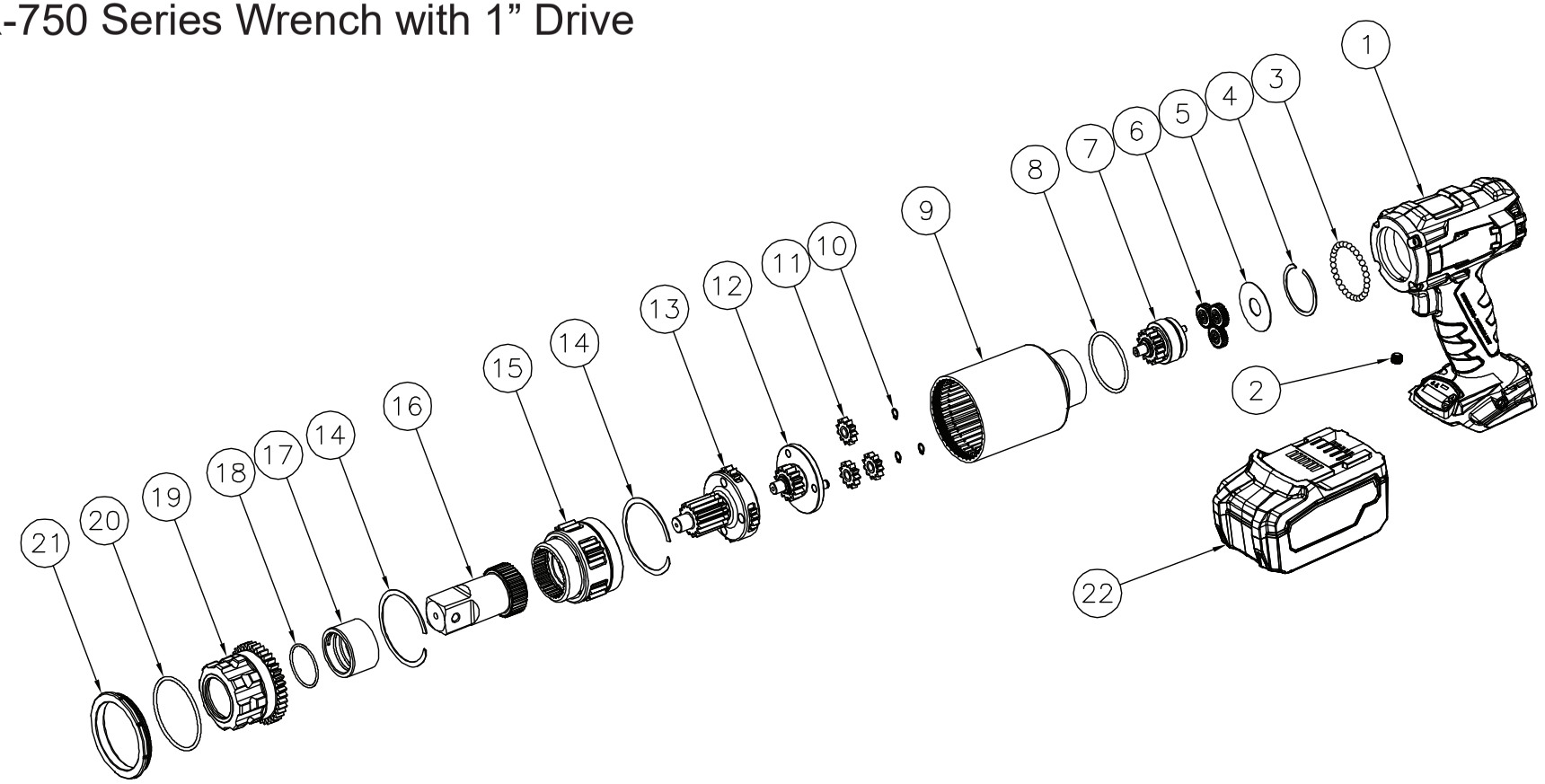


Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Drive Handle Assembly	VTR-05.10-DH-ASSY	1
2	Bearing Ball Retainer	VTR-CM-BR	1
3	Bearing Ball	VTR-CM-BB	29
4	Retaining Ring, Stage 2	VTR-ST2-RR	1
5	Thrust Washer, Stage 2	VTR-ST2-TW	1
6	Planet Gear, Stage 2	VTR-750-ST2-G	3
7	Gear Carrier, Stage 2	VTR-750-ST2A	1
8	O-Ring, Main Annulus	VTR-OR-MA	1
9	Drive Annulus	VTR-10-DA	1
10	Planet Gear Retaining Ring, Stage 3	VTR-05-ST3-G-RR	3
11	Planet Gear, Stage 3	VTR-10-ST3-G	3
12	Gear Carrier Assembly, Stage 3	VTR-10-ST3A	1

ITEM	NAME	PART #	QTY.
13	Caged Gear Carrier, Stage 4	VTR-10-ST4	1
14	Retaining Ring, Drive Annulus	VTR-10-DA-RR	2
15	Caged Drive Stage Assembly	VTR-10-DSCA	1
16	Removable Square Drive - 3/4" Drive	VTR-10-SD-.75	1
17	Main Bearing Bushing	RP3-05-MB	1
18	O-Ring, Annulus Head	VTR-10-OR-AH	1
19	Annulus Head	VTR-10-AH-.75	1
20	O-Ring, Annulus Cap	VTR-10-OR-AC	1
21	Annulus Cap	VTR-10-AC	1
22	LiHD Battery 18v	VT-BATT-18V-#.#AH	1

VTR-750 Series Wrench with 1” Drive

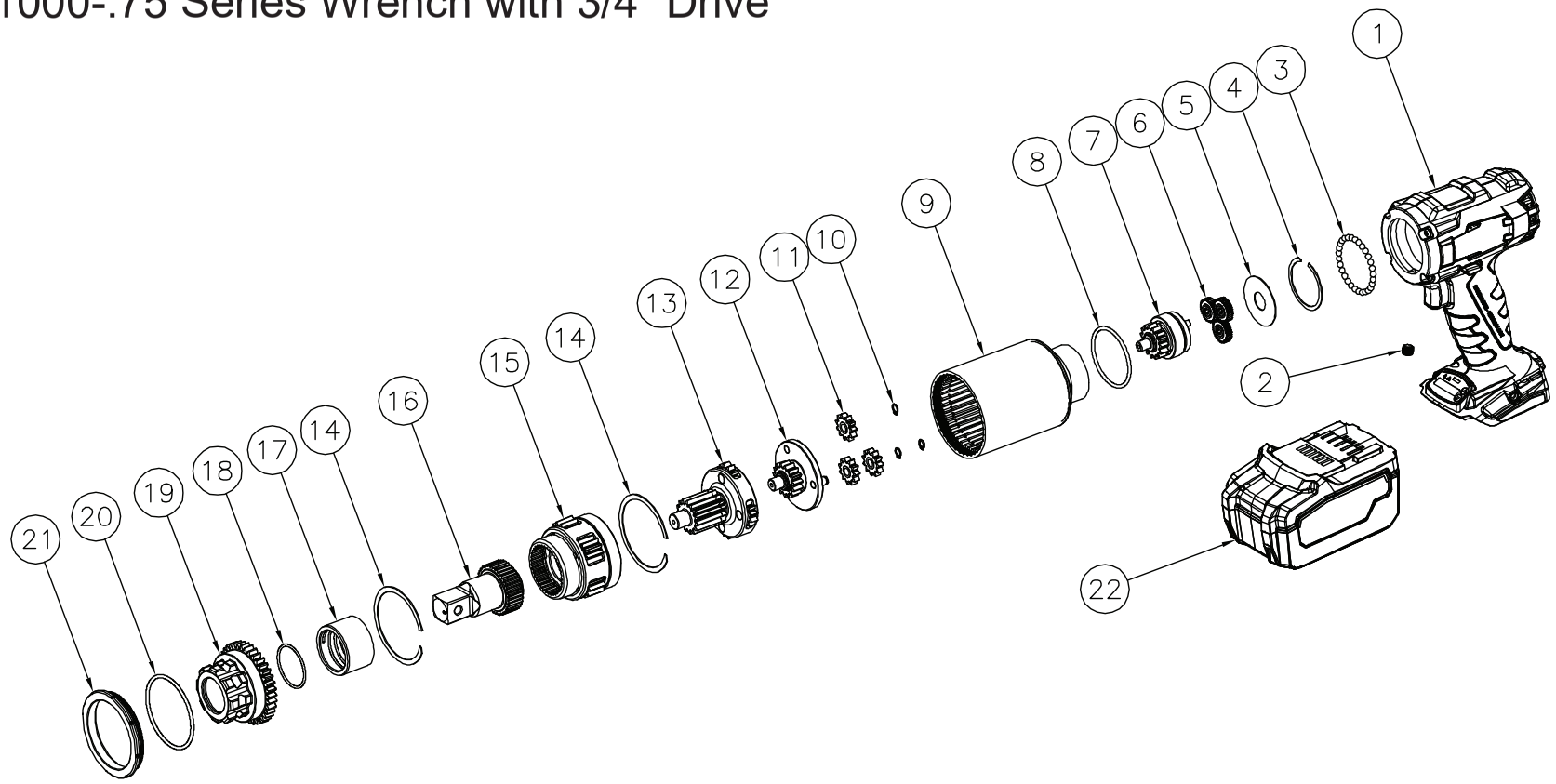


Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Drive Handle Assembly	VTR-05.10-DH-ASSY	1
2	Bearing Ball Retainer	VTR-CM-BR	1
3	Bearing Ball	VTR-CM-BB	29
4	Retaining Ring, Stage 2	VTR-ST2-RR	1
5	Thrust Washer, Stage 2	VTR-ST2-TW	1
6	Planet Gear, Stage 2	VTR-750-ST2-G	3
7	Gear Carrier, Stage 2	VTR-750-ST2A	1
8	O-Ring, Main Annulus	VTR-OR-MA	1
9	Drive Annulus	VTR-10-DA	1
10	Planet Gear Retaining Ring, Stage 3	VTR-05-ST3-G-RR	3
11	Planet Gear, Stage 3	VTR-10-ST3-G	3
12	Gear Carrier Assembly, Stage 3	VTR-10-ST3A	1

ITEM	NAME	PART #	QTY.
13	Caged Gear Carrier, Stage 4	VTR-10-ST4	1
14	Retaining Ring, Drive Annulus	VTR-10-DA-RR	2
15	Caged Drive Stage Assembly	VTR-10-DSCA	1
16	Removable Square Drive	VTR-10-SD	1
17	Main Bearing Bushing	VTR-10-MB	1
18	O-Ring, Annulus Head	VTR-10-OR-AH	1
19	Annulus Head	VTR-10-AH	1
20	O-Ring, Annulus Cap	VTR-10-OR-AC	1
21	Annulus Cap	VTR-10-AC	1
22	LiHD Battery 18v	VT-BATT-18V-#.#AH	1

VTR-1000-.75 Series Wrench with 3/4” Drive

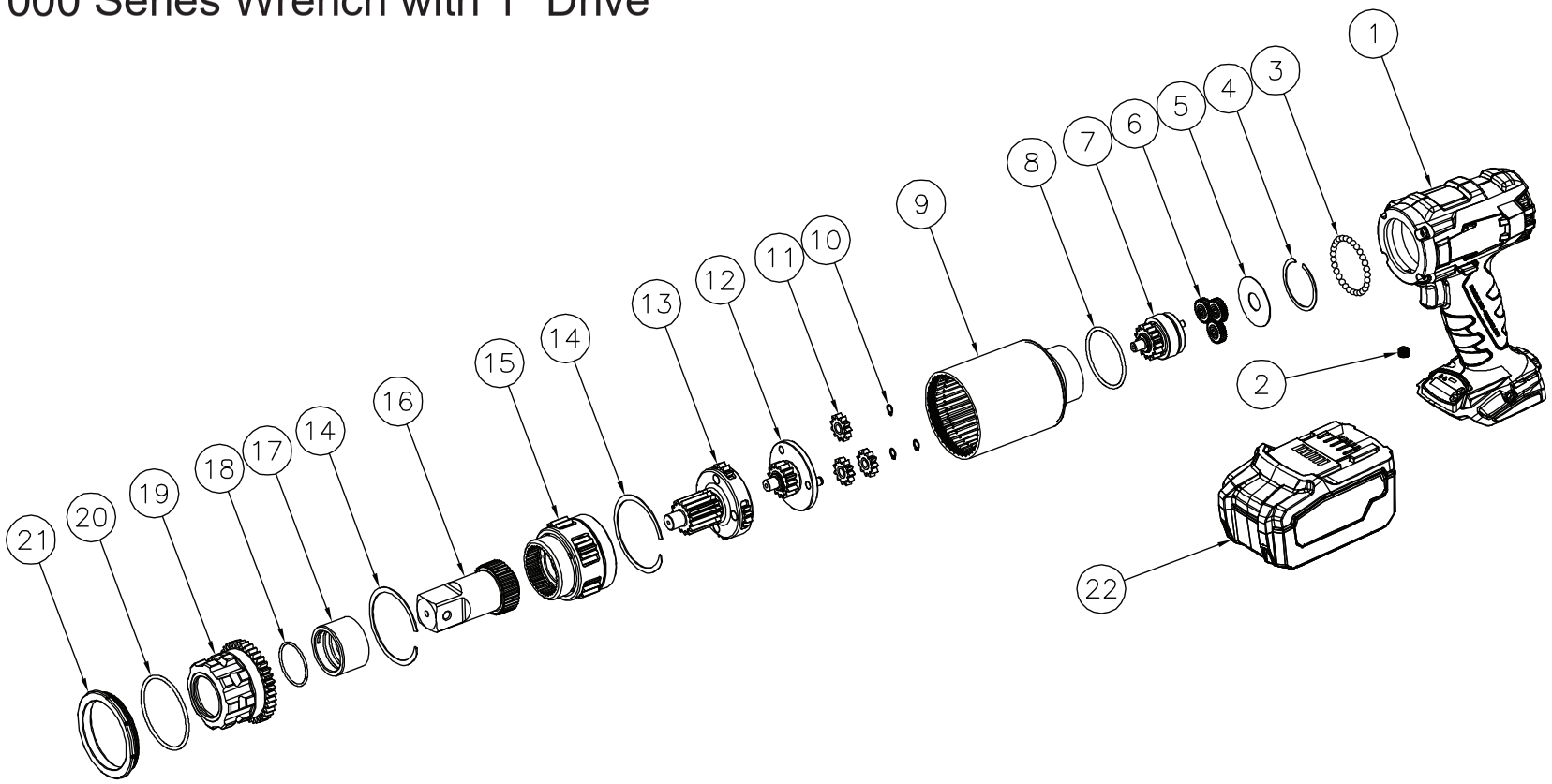


Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Drive Handle Assembly	VTR-05.10-DH-ASSY	1
2	Bearing Ball Retainer	VTR-CM-BR	1
3	Bearing Ball	VTR-CM-BB	29
4	Retaining Ring, Stage 2	VTR-ST2-RR	1
5	Thrust Washer, Stage 2	VTR-ST2-TW	1
6	Planet Gear, Stage 2	VTR-ST2-G	3
7	Gear Carrier, Stage 2	VTR-10-ST2A	1
8	O-Ring, Main Annulus	VTR-OR-MA	1
9	Drive Annulus	VTR-10-DA	1
10	Planet Gear Retaining Ring, Stage 3	VTR-05-ST3-G-RR	3
11	Planet Gear, Stage 3	VTR-10-ST3-G	3
12	Gear Carrier Assembly, Stage 3	VTR-10-ST3A	1

ITEM	NAME	PART #	QTY.
13	Caged Gear Carrier, Stage 4	VTR-10-ST4	1
14	Retaining Ring, Drive Annulus	VTR-10-DA-RR	2
15	Caged Drive Stage Assembly	VTR-10-DSCA	1
16	Removable Square Drive - 3/4" Drive	VTR-10-SD-.75	1
17	Main Bearing Bushing	RP3-05-MB	1
18	O-Ring, Annulus Head	RP3-05-OR-DA	1
19	Annulus Head	VTR-10-AH-.75	1
20	O-Ring, Annulus Cap	VTR-10-OR-AC	1
21	Annulus Cap	VTR-10-AC	1
22	LiHD Battery 18v	VT-BATT-18V-#.#AH	1

VTR-1000 Series Wrench with 1” Drive

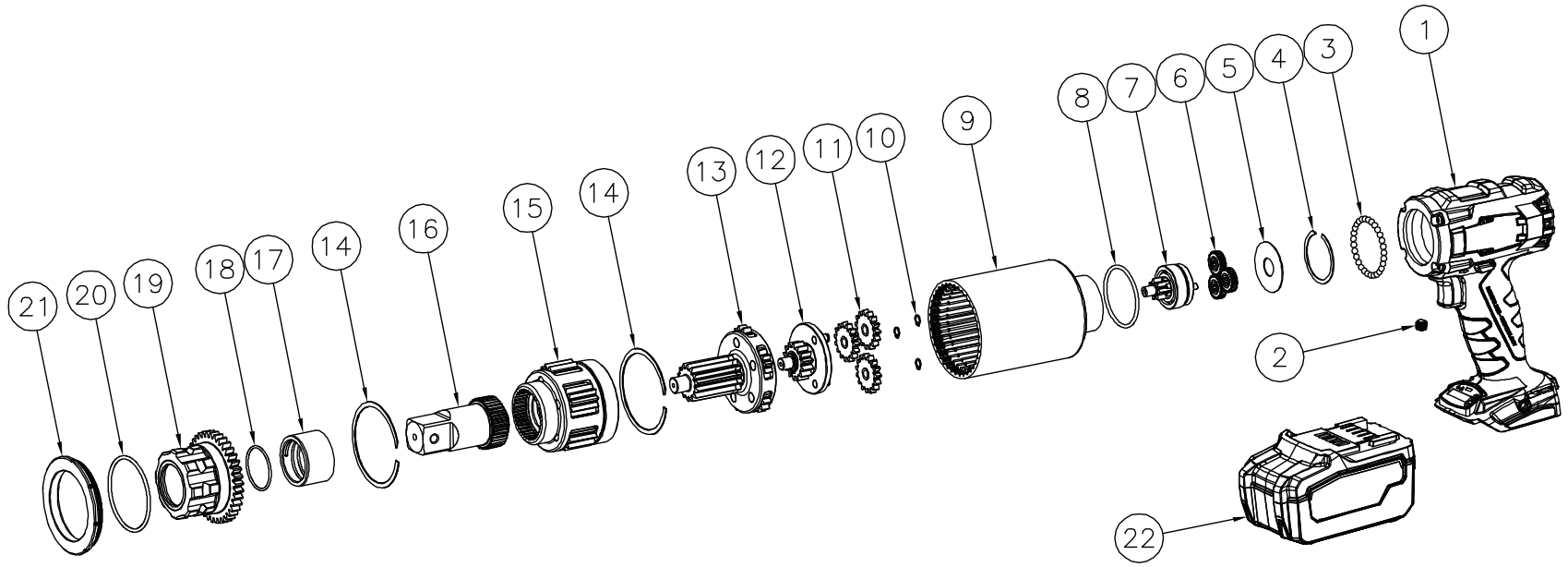


Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Drive Handle Assembly	VTR-05.10-DH-ASSY	1
2	Bearing Ball Retainer	VTR-CM-BR	1
3	Bearing Ball	VTR-CM-BB	29
4	Retaining Ring, Stage 2	VTR-ST2-RR	1
5	Thrust Washer, Stage 2	VTR-ST2-TW	1
6	Planet Gear, Stage 2	VTR-ST2-G	3
7	Gear Carrier, Stage 2	VTR-10-ST2A	1
8	O-Ring, Main Annulus	VTR-OR-MA	1
9	Drive Annulus	VTR-10-DA	1
10	Planet Gear Retaining Ring, Stage 3	VTR-05-ST3-G-RR	3
11	Planet Gear, Stage 3	VTR-10-ST3-G	3
12	Gear Carrier Assembly, Stage 3	VTR-10-ST3A	1

ITEM	NAME	PART #	QTY.
13	Caged Gear Carrier, Stage 4	VTR-10-ST4	1
14	Retaining Ring, Drive Annulus	VTR-10-DA-RR	2
15	Caged Drive Stage Assembly	VTR-10-DSCA	1
16	Removable Square Drive	VTR-10-SD	1
17	Main Bearing Bushing	VTR-10-MB	1
18	O-Ring, Annulus Head	VTR-10-OR-AH	1
19	Annulus Head	VTR-10-AH	1
20	O-Ring, Annulus Cap	VTR-10-OR-AC	1
21	Annulus Cap	VTR-10-AC	1
22	LiHD Battery 18v	VT-BATT-18V-#.#AH	1

VTR-2000 Series Wrench

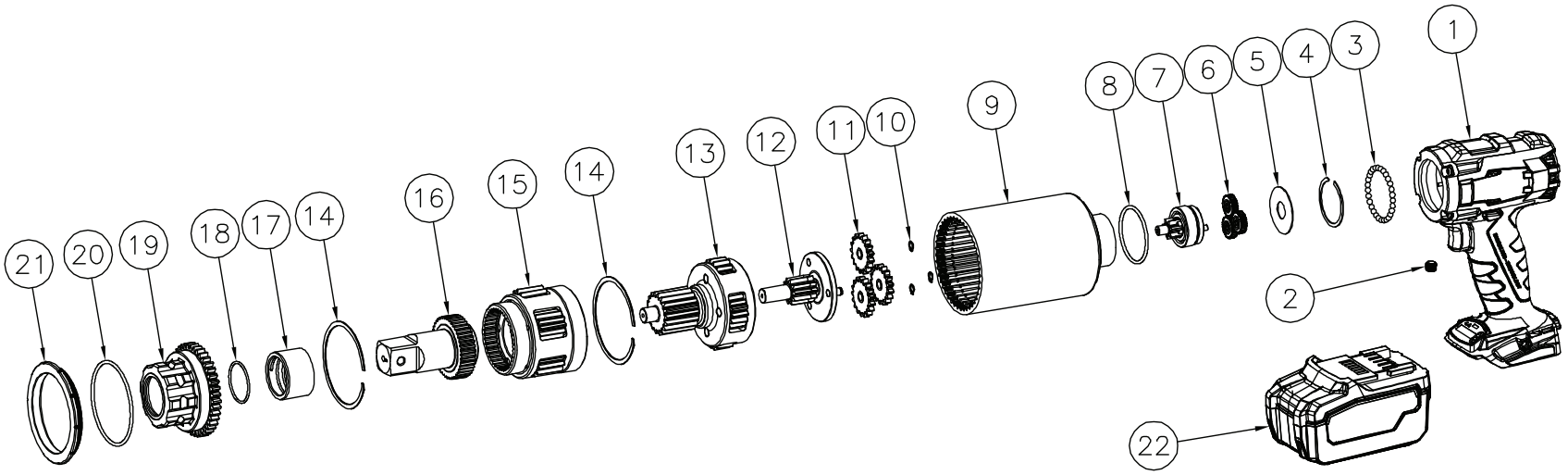


Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Drive Handle Assembly	VTR-20-DH-ASSY	1
2	Bearing Ball Retainer	VTR-CM-BR	1
3	Bearing Ball	VTR-CM-BB	29
4	Retaining Ring, Stage 2	VTR-ST2-RR	1
5	Thrust Washer, Stage 2	VTR-ST2-TW	1
6	Planet Gear, Stage 2	VTR-ST2-G	3
7	Gear Carrier, Stage 2	VTR-20-ST2A	1
8	O-Ring, Main Annulus	VTR-OR-MA	1
9	Drive Annulus	VTR-20-DA	1
10	Planet Gear Retaining Ring, Stage 3	VTR-05-ST3-G-RR	3
11	Planet Gear, Stage 3	VTR-20-ST3-G	3
12	Gear Carrier Assembly, Stage 3	VTR-20-ST3A	1

ITEM	NAME	PART #	QTY.
13	Caged Gear Carrier, Stage 4	VTR-20-ST4	1
14	Retaining Ring, Drive Annulus	VTR-20-DA-RR	2
15	Caged Drive Stage Assembly	VTR-20-DSCA	1
16	Removable Square Drive	VTR-10-SD	1
17	Main Bearing Bushing	VTR-10-MB	1
18	O-Ring, Annulus Head	VTR-10-OR-AH	1
19	Annulus Head	VTR-20-AH	1
20	O-Ring, Annulus Cap	VTR-10-OR-AC	1
21	Annulus Cap	VTR-20-AC	1
22	LiHD Battery 18v	VT-BATT-18V-#.#AH	1

VTR-3000 Series Wrench

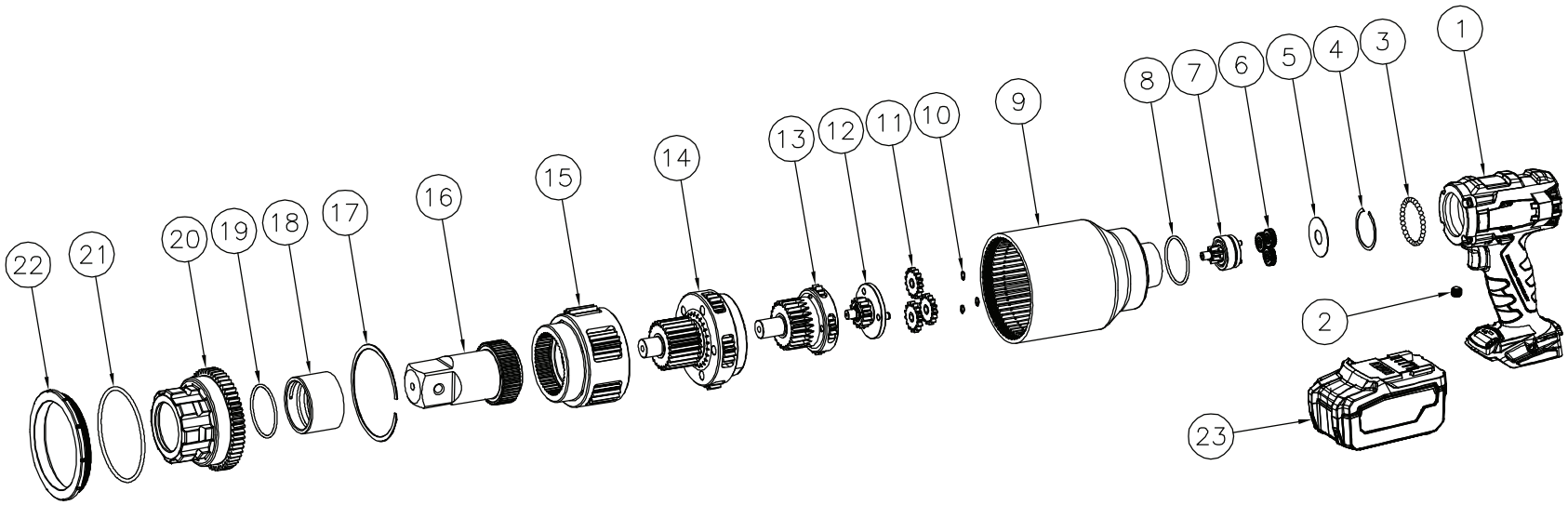


Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Drive Handle Assembly	VTR-30.50-DH-ASSY	1
2	Bearing Ball Retainer	VTR-CM-BR	1
3	Bearing Ball	VTR-CM-BB	29
4	Retaining Ring, Stage 2	VTR-ST2-RR	1
5	Thrust Washer, Stage 2	VTR-ST2-TW	1
6	Planet Gear, Stage 2	VTR-ST2-G	3
7	Gear Carrier, Stage 2	VTR-20-ST2A	1
8	O-Ring, Main Annulus	VTR-OR-MA	1
9	Drive Annulus	VTR-30-DA	1
10	Planet Gear Retaining Ring, Stage 3	VTR-05-ST3-G-RR	3
11	Planet Gear, Stage 3	VTR-30-ST3-G	3
12	Gear Carrier Assembly, Stage 3	VTR-30-ST3	1

ITEM	NAME	PART #	QTY.
13	Caged Gear Carrier, Stage 4	VTR-30-ST4	1
14	Retaining Ring, Drive Annulus	VTR-30-DA-RR	2
15	Caged Drive Stage Assembly	VTR-30-DSCA	1
16	Removable Square Drive	VTR-30-SD	1
17	Main Bearing Bushing	VTR-10-MB	1
18	O-Ring, Annulus Head	VTR-10-OR-AH	1
19	Annulus Head	VTR-30-AH	1
20	O-Ring, Annulus Cap	VTR-10-OR-AC	1
21	Annulus Cap	VTR-30-AC	1
22	LiHD Battery 18v	VT-BATT-18V-#.#AH	1

VTR-5000 Series Wrench



Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Drive Handle Assembly	VTR-30.50-DH-ASSY	1
2	Bearing Ball Retainer	VTR-CM-BR	1
3	Bearing Ball	VTR-CM-BB	29
4	Retaining Ring, Stage 2	VTR-ST2-RR	1
5	Thrust Washer, Stage 2	VTR-ST2-TW	1
6	Planet Gear, Stage 2	VTR-ST2-G	3
7	Gear Carrier, Stage 2	VTR-20-ST2A	1
8	O-Ring, Main Annulus	VTR-OR-MA	1
9	Drive Annulus	VTR-50-DA	1
10	Planet Gear Retaining Ring, Stage 3	VTR-05-ST3-G-RR	3
11	Planet Gear, Stage 3	VTR-20-ST3-G	3
12	Gear Carrier Assembly, Stage 3	VTR-20-ST3A	1

ITEM	NAME	PART #	QTY.
13	Caged Gear Carrier, Stage 4	VTR-50-ST4	1
14	Caged Gear Carrier Assembly, Stage 5	VTR-50-ST5A	1
15	Caged Drive Stage Carrier	VTR-50-DSC	1
16	Removable Square Drive	VTR-50-SD	1
17	Retaining Ring, Caged Drive Stage Carrier	VTR-50-DSC-RR	1
18	Main Bearing Bushing	VTR-50-MB	1
19	O-Ring, Annulus Head	VTR-50-OR-AH	1
20	Annulus Head	VTR-50-AH	1
21	O-Ring, Annulus Cap	VTR-50-OR-AC	1
22	Annulus Cap	VTR-50-AC	1
23	LiHD Battery 18v	VT-BATT-18V-#.#AH	1

JET-LUBE, INC.

MATERIAL SAFETY DATA SHEET

I

Product Name: **MARINE MOLY™**
Chemical Family: Petroleum based lubricating anti-seize and anti-seize compound
Use: Equipment lubrication and assembly compound.

Manufacturer/Supplier: JET-LUBE, INC.
Address: 4849 Homestead Rd., Ste. #232
Houston, TX, 77028 USA **Phone:** 713-670-5700
Emergency Phone: 713-670-5700 **Fax:** 713-678-4604
Chemtrec 24 hours (USA): 800-424-9300
Outside the USA: 703-527-3887

II

Hazardous Components	CAS No.	Wt%	OSHA PEL	ACGIH TLV	Other Limits of Exposure
Petroleum oil	64742570/64742525	70-100	Oil mist TWA-5mg/M³	N/A	STEL: 10mg/M³
Nonhazardous Blend	1317335/68953582 68411461	20-30	10mg/M³	10mg/M³	UN

III

Main Hazards–Health Effects
Eyes: May cause irritation. **Inhalation:** Viscous nature may block breathing passages if inhaled. **Ingestion:** May cause diarrhea.
Skin: Possible rash for persons with persensitivity.

IV

Eyes: Flush with water until all residual material is gone. If irritation persists, seek medical help. **Inhalation:** Clear air passage. If respiratory difficulty continues, seek medical help. **Ingestion:** Wash out mouth immediately. Consult physician. **Skin:** Wash thoroughly with hand cleanser, followed by soap & water. Contaminated clothing should be dry cleaned before reuse.

V

Extinguishing Media: Foam, dry powder, Halon®, carbon dioxide, sand, earth & water mist. **Unsuitable Extinguishing Media:** Water jet.
Protective Equipment for Fire fighting: Self-contained breathing apparatus.

VI

Personal Precautions: Wear gloves & protective overalls. **Environmental Precautions:** Do not allow it to enter drains. **Spillage:** Scrape up bulk, then wipe up remainder with cloth. To prevent walking hazard, pick up remaining residue with diatomaceous earth.

VII

Handling: No special handling precautions necessary. **Storage:** Do not store at elevated temperatures.

VIII

Respiratory Protection: None needed. **Hand Protection:** Protective gloves for hypersensitive persons. **Eye Protection:** Glasses, if applied to parts in motion. **Body Protection:** Overalls.

IX

Physical State: Semisolid paste **Color:** Black **Odor:** Petroleum **pH:** Neutral **Boiling Range/Point °F (°C):** >700 (371)
Melting Point °F (°C): None **Flash Point (COC) °F (°C):** 560 (293) **Propellant Flash Point °F (°C):** 76 (-60) **OAR Value:** 5 (aerosol)
Autoignition Temperature °F (°C): >680 (360) **Explosive Properties:** **LEL:** 0.9% **UEL:** 7% **Evaporation Rate (Butyl Acetate):** <0.01
Partition Coefficient (Log Pow): N/A **Vapor Pressure (kPa):** <0.01 **Percent Volatiles:** Nil **Density (g/cm³):** 1.06
Flammability: Not flammable at ambient temperatures (aerosol only). **Oxidizing Properties:** None **Water Solubility:** Nil **Vapor Density:** >5

X

Stability: Chemically stable under normal conditions. No photoreactive agents. **Conditions to Avoid:** Powerful sources of ignition & extreme temps. **Materials to Avoid:** Strong inorganic & organic acids, oxidizing agents. **Hazardous Decomposition Products:** Burning generates smoke, airborne soot, hydrocarbons & oxides of carbon, sulfur & nitrogen. Residue mainly comprised of soot & mineral oxides.

XI

Acute Toxicity: Not known. **Irritancy–Skin:** Very mild. **Skin Sensitization:** Not known. **Subacute/Sub-chronic Toxicity:** Not known.
Genotoxicity: None known. **Chronic Toxicity:** None known. **California Prop 65:** N/A **Carcinogen:** **NTP:** No **IARC:** No **OSHA:** No
EC Class (67/548/EEC): No **Allergens:** None known. **LC-50:** >2000mg/kg-(extrapolated from component data) **LD-50:** N/A

XII

Possible Effects: May gernerate oil fractions that could act as a marine pollutant, but is unlikely.
Behavior: Relatively well behaved. Bioaccumulation potential nil. **Environmental Fate:** Highly unlikely to cause noteable contamination.

XIII

Product Disposal: Do not incinerate. Contact waste disposal company or local authority for advice.
Container Disposal: Pails without liner–see Product Disposal section above. Pails with plastic liner–pail may only be disposed of via standard waste disposal services, recycled or reused. Liner–see Product Disposal section above.

XIV

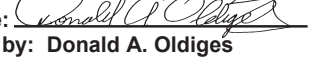
Not classified as hazardous for transport. **D.O.T.:** Nonhazardous **UN No.:** Nonhazardous
Air Transport (ICAO & IATA): Nonhazardous **Sea Transport (IMO & IMDG):** Nonhazardous
Road & Rail Transport (ADR/RID): Nonhazardous

XV

Labeling Information: None needed **EC Annex 1 Classification:** Not Applicable. **R Phrases:** R22—harmful if swallowed.
S Phrases: None applicable, as known. **Ozone Depleting Chemicals:** Not applicable. **TSCA:** All components are listed.
WHMIS (Canada): Not controlled. **Canadian DSL:** All components listed. **SARA 311/312:** None **TSCA 12B Components:** None
40 CFR Part 372 (SARA Section 313): N/A **CERCLA:** Nonhazardous **RCRA Hazard Class:** Nonhazardous

XVI

SDS first issued. SDS data revised. **New Jersey Right To Know:** See Section II

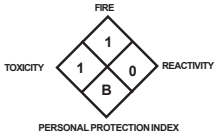
Signature: 
Prepared by: Donald A. Oldiges
Date Issued: September 21, 2009

LEGEND

I. Identification of the substance/preparation and company
II. Composition information on ingredients
III. Hazards identification
IV. First aid measures
V. Fire fighting measures
VI. Accidental release measures
VII. Handling and storage
VIII. Exposure control/personal protection
IX. Physical and chemical roperties
X. Stability and reactivity
XI. Toxicological information
XII. Ecological information
XIII. Waste Disposal
XIV. Transport information
XV. Regulatory Information
XVI. Other information

HMIS SYMBOL

HEALTH	1
FLAMMABILITY	1
REACTIVITY	0
PPI	B



SAFETY DATA SHEET
(According to Regulation 2015/830)

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1. 1. Product identifier

Product name: ***Samsung INR21700-40T; Lithium Ion Rechargable Battery***
Product numbers: 321000980, 321001170

1. 2. Relevant identified uses of the substance or mixture and uses advised against

Power tool battery pack

1. 3. Details of the supplier of the safety data sheet

Manufacturer/ Supplier: KEP Elektronikai Alkatrészgyártó Kft.
Address: 8700 Marcali, 55 Kossuth Lajos Street
Tel.: +36-82/502-100 Fax: Email: vtep@vtep.videoton.hu

Distributor: KEP Elektronikai Alkatrészgyártó Kft.
Address: 7400 Kaposvár, 3 Izzó Street
Tel.: +36-82/502-100 Fax: Email: vtep@vtep.videoton.hu

Importer/ Distributor Metabowerke GmbH
Address: 72622 Nürtingen, Metabo-Allee 1
Tel.: +49 (0) 7022 - 72 3230 Fax: Email: anwendungsberatung@metabo.de

Responsible for the Safety Data Sheet: Metabowerke GmbH
+49 (0) 7022 - 72 3230
anwendungsberatung@metabo.de

1. 4. Emergency telephone number

EGÉSZSÉGÜGYI TOXIKOLÓGIAI TÁJÉKOZTATÓ SZOLGÁLAT (ETTSZ)
1096 Budapest, Nagyvárad tér 2.
Tel: 06-80-20-11-99 (24 h, for emergency only)

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification according to 1272/2008/EC

This / these product (s) comply with REACH Article 3 (3). The article does not apply to mandatory labeling requirements for dangerous substances. The product is a CLP Regulation (Classification, Labeling and Packaging Declaration of Materials and Mixtures) does not constitute a substance that is hazardous to health or the environment.
-

2.2. Label elements

Label elements according to 1272/2008/EC directive

Identity of all substances in the mixture that contribute to the classification of the mixture: -

Hazard Statements (H- phrases)
- - Not assigned

Precautionary Statements (P- phrases)
- - Not assigned

Supplemental hazard infomation

2.3. Other hazards

The litium cell/battery covered in this Data Sheet is hermetically sealed in a stainless steel container and not hazardous if used as recommended by the manufacturer. Under a normal condition of use, the electrode materials and liquid electrolyte contained in a cell/battery are non-reactive provided the battery integrity is maintained. Risk of exposure exists only in case of mechanical, electrical or thermal abuse. Warning: the cells/batteries should not be short circuit, recharged, punctured, incinerated, crushed, immersed in water, forced discharge, or exposed to a temperatures above the declared operation temperature range of the cell or battery. Risk of fire or explosion may occur in the above condition of abuse.

The full text of H phrases see Section 16 point.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

The product is a mixture, not a substance.

3.2. Mixtures

Product identifiers — Designation and Classification of components — Amount

(You can see full text of H sentences at 16 point.)

	Chemical Name	CAS No.	*Mass range in cell (g/g %)
Electrolyte	Contains Electrolyte salt and solvents.	-	5-20
Electrolyte salt	Lithium hexafluorophosphate	21324-40-3	0.05-5
Electrolyte solvent	Includes one or more of the following;		
	Ethelyne Carbonate	96-49-1	
	Ethyl methyl Carbonate	623-53-0 616-38-6	5-20
	Diethyl Carbonate	114435-02-8	
	Fluoroethylene Carbonate		
PVDF	Polyvinylidenfluoride	24937-79-9	<1
Copper	Cu	7440-50-8	3-15
Aluminium	Al	7429-90-5	2-10
Cathode	Lithium nickel cobalt aluminium oxide	177997-13-6	20-50
Anode	Graphite	7782-42-5	10-30
Steel, Nickel, and inert components		Various	Balance

Because of the cell structure the dangerous ingredients will not be available if used properly.
During charge process a lithium graphite intercalation phase is formed.

Description
Lithium Ion Rechargable Battery:

Name / Type	Number of cells	Efficiency [Wh]
LiHD 8.0 Ah Battery pack	10	144

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

4.1.1. Inhaling

Expose the person to fresh air and use artificial respiration if needed. Seek medical attention if necessary.

4.1.2. Eyes

Rinse eyes with plenty of water for 15 minutes (remove contact lenses if possible). Seek immediate medical attention.

4.1.3. Skin

Remove contaminated clothes and rinse skin with plenty of water or take a shower for 15 min. Seek medical attention if necessary.

4.1.4. Swallowed

Rinse mouth with water first and then drink plenty of water. DO NOT induce vomiting. Seek immediate medical attention.

4.2. Most important symptoms and effects, both acute and delayed

See section 11.

4.3. Indication of any immediate medical attention and special treatment needed

In case of battery rupture, major leakage or explosion, follow the instructions described above. Provide good ventilation to clear out any corrosive fumes, gases or the pungent odor. Seek immediate medical attention.

SECTION 5: FIREFIGHTING MEASURES

Fire class according to the National Fire Protection Code (54 / 2014. (XII. 5) BM)

Non-flammable class

5.1. Extinguishing media

CO_2 extinguishers or copious quantities of water or water-based foam can be used to cool down burning materials that contain or separate lithium batteries, as long as the extent of the fire has not progressed to the point that the lithium metal the batteries contain is exposed.

5.1.1. Unsuitable extinguishing materials

No information available.

5.2. Special hazards arising from the substance or mixture

If possible, remove cell(s) from fire fighting area. If heated above 125°C, cell(s) can explode/vent. Cell is not flammable but internal organic material will burn if the cell is incinerated. Batteries emit toxic hydrogen fluoride fumes when burning, and may eject small amounts of molten metal. Damaged batteries may self-ignite.

5.3. Advice for firefighters

Respiratory protection: In all fire situations, wear self-contained breathing apparatus. Skin protection: Wear protective clothing to prevent body contact with electrolyte solution. Eye protection: Safety glasses are recommended.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Under a normal condition of use, a battery is hermetically sealed and not hazardous.
In the event of battery rapture and leakage: ventilate the contaminated area.

6.2. Environmental precautions

Keep spill/waste away from water, rain, snow or moisture. Placed them in approved containers and dispose them according tot he local, state or federal regulations.

6.3. Methods and material for containment and cleaning up

Cover the spills or leakage with sodium carbonate (Na_2CO_3) or 1:1 mixture of soda ash and slaked lime.

6.4. Reference to other sections

See Section 7 for information on safe handling. See Section 8 for information on personal protective equipment. See Section 13 for disposal information.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

7.1.1. Technical precautions

Avoid any contact with the contents in case of rupture, leakage or explosion.
Protect from heat, short circuit of terminals, which may induce dangerous elevated temperatures.

7.1.2. Safe handling guidance

Do not short circuit, disassemble, open, alter or directly solder to.
Do not crush, pierce, incinerate or expose to water.
Advice on protection against fire and explosion: Keep away from open flames, hot surfaces and sources of ignition.

7.2. Conditions for safe storage, including any incompatibilities

7.2.1. Technical measures/storage conditions

Recommended store temperature 20 °C. Store in a dry and ventilated area. Do not place the battery near heating or electrical equipment, nor expose to direct sunlight for a long period. Elevated temperatures can result in shortened battery life and degrade perdormance. Do not store batteries in high humidity environment for a long period.

7.2.2. Incompatible products

Do not store together with oxidizing and acidic materials.
Keep the water away.
Do not store with electrical conductive materials.

7.2.3. Packaging materials

Keep in closed original container.

7.3. Specific end use(s)

Section 1.2. Partially mentioned partial use, no other special use.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

Limit values of Joint Decree 25/2000 ACGIH TLV:

Component name:	AK value (mg/m3)	CK value (mg/m3)	MK value (mg/m3)
	-	-	-

Other

8.2. Exposure controls

Special ventilation is not required when using these products in normal use scenarios.Ventilation is required if there is leakage from the cell or battery.
Other Protective Equipment: Have a safety shower or eye wash station readily available.
Hygiene Measures: Do not eat, drink or smoke in work areas. Avoid storing food, drink or tobacco near the product. Practice and maintain good housekeeping.
Environmental exposure controls: Avoid release to the environment.

8.2.1. Appropriate engineering controls

8.2.2. Individual protection measures, such as personal protective equipment

8.2.2. a) Eye/face protection

In case of leakage or exposure of internal components/materials:
Use Safety goggles, or a face shield with full face protection.

8.2.2. b) Skin protection

In case of leakage or exposure of internal components/materials:
Wear long sleeved clothing to avoid skin contact if handling.

8.2.2. b)i. Hand protection

In case of leakage or exposure of internal components/materials:
Use Nitrile or PVC gloves at least 15 mil thick.

8.2.2. c) Respiratory protection

During routine operation, a respirator is not required. However, if dealing with an electrolyte leakage and irritating vapors are generated, an approved half face inorganic vapor and gas/acid/particulate respirator is required.

8.2.2. d) Thermal hazard

Not applicable.

8.2.3. Environmental exposure control

See sections 6, 7, 12, 13.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

9.1. a)	**Appearance**	
	Consistence:	Not available.
	Colour:	Various
9.1. b)	**Odour**	Pungent odor if leaking
9.1. c)	**Odour Threshold**	None established.
9.1. d)	**pH-value**	Not available.
9.1. e)	**Melting point/freezing point**	Not available.
9.1. f)	**Initial boiling point and boiling range**	Not available.
9.1. g)	**Flash-point:**	Not available.
9.1. h)	**Evaporation rate**	Not available.
9.1. i)	**Flammability (solid, gas)**	Not flammable.
9.1. j)	**Upper/lower Flammability or explosive limits**	
	- lower:	Not available.
	- upper:	Not available.
9.1. k)	**Vapour Pressure (20°C):**	Not available.
9.1. l)	**Vapour Density:**	Not available.
9.1. m)	**Relative density**	Not available.
9.1. n)	**Solubility(ies)**	
	- Water:	Insoluble
	- Other solvents:	Not available.
9.1. o)	**Partition coefficient (n-octanol/water):**	Not available.
9.1. p)	**Auto-ignition temperature**	Not available.
9.1. q)	**Decomposition Temperature:**	Not available.
9.1. r)	**Viscosity:**	Not applicable to batteries. Not known for the free electrolyte.
9.1. s)	**Explosive properties**	Not available.
9.1. t)	**Oxidising properties**	Not available.

9.2. Other Informations

Specific gravity (water=1), (20°C): Not available.
Other items:

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

Regarding its reaction, the product is not hazardous.

10.2. Chemical stability

The batteries are stable under normal operation and storage conditions.

10.3. Possibility of hazardous reactions

There is no hazardous reaction during the prescribed application.
Hazardous polymerization: will not occur.

10.4. Conditions to avoid

Short-circuiting, recharge, over-discharge, heating over the declared operation temperature range of the product.
Keep away from open flames, hot surfaces and sources of ignition.
Do not puncture, crush or incinerate.

10.5. Incompatible materials

SECTION 11: TOXICOLOGICAL INFORMATION

Actual material

Samsung INR21700-40T; Lithium Ion Rechargable Battery
Product numbers: 321000980, 321001170

11.1. Information on toxicological effects

11.1.a. Acute toxicity

Inhalation

Inhalation of vapors from a leaking cell or battery is expected to cause severe irritation of the mouth and upper respiratory tract with a burning sensation, pain, burns and inflammation in the nose and throat; there may also be coughing or difficulty breathing.
According to reports in animals

Oral

The electrolyte contained within the cell or battery is a corrosive liquid. Ingestion of this electrolyte would be harmful. Swallowing may result in nausea, vomiting, diarrhea, abdominal pain and chemical burns to the gastrointestinal tract. During normal usage ingestion should not be a means of exposure.
According to reports in animals

Dermal

The electrolyte contained within the cell or battery is a corrosive liquid and it is expected that it would cause skin burns or severe irritation to the skin if not washed off immediately. Correct handling procedures should minimize the risk of skin irritation. People with pre-existing skin conditions, such as dermatitis, should take extreme care so as not to exacerbate the condition.
According to reports in animals

11.1.b. Skin corrosion/ Skin irritation

The electrolyte contained within the cell or battery is classified as a corrosive liquid and is expected to exhibit Dermal Corrosivity/Irritation.

11.1.c. Serious eye damage/ Eye irritation

The electrolyte contained within the cell or battery is classified as a corrosive liquid and is expected to exhibit serious Damage/Corrosivity.

11.1.d. Respiratory or skin sensitisation

The electrolyte contained within the cell or battery is not expected to be a skin sensitizer according to OECD test 406, based on the available data and the known hazards of the components. The electrolyte contained within the battery is not expected to be a respiratory tract sensitizer, based on the available data and the known hazards of the components.

11.1.e. Germ cell mutagenicity

The electrolyte contained within the cell or battery is not expected to be mutagenic according to test such as OECD tests 471, 475, 476, 478 and 479, based on the available data and the known hazards of the components.

11.1.f. Carcinogenicity

The electrolyte contained within the cell or battery is a corrosive liquid. Ingestion of this electrolyte would be harmful. Swallowing may result in nausea, vomiting, diarrhea, abdominal pain and chemical burns to the gastrointestinal tract. During normal usage ingestion should not be a means of exposure.

11.1.g. Reproductive toxicity

The electrolyte contained within the cell or battery is not expected to be a reproductive hazard according to test such as OECD tests 414 and 421, based on the available data and the known hazards of the components.

11.1.h. Specific target organ toxicity — single

The electrolyte contained within the cell or battery is corrosive and is expect to cause respiratory irritation by inhalation. Inhalation of vapors may lead to severe irritation of the mouth and upper respiratory tract with a burning sensation, pain, burns and inflammation in the nose and throat; there may also be coughing or difficulty breathing.

11.1.i. Specific target organ toxicity — repeated exposure

The cells or batteries are not expected to cause organ damage from prolonged or repeated exposure according to tests such as OECD tests 410 and 412, based on the available data and the known hazards of the components.

11.2. Delayed and immediate effects as well as chronic effects from short and long-term exposure

Not available.

11.3. Other informations

The hazardous components of the cell or battery are contained within a sealed unit. Under recommended use conditions, the electrode materials and liquid electrolyte are non-reactive provided that the cell or battery integrity remains and the seals remain intact. The potential for exposure should not exist unless the battery leaks, is exposed to high temperature or is mechanically, electrically or physically abused/damaged. The following toxicology data is in respect to if a person comes into contact with the electrolyte.

SECTION 12: ECOLOGICAL INFORMATION

Actual material

Samsung INR21700-40T; Lithium Ion Rechargable Battery
Product numbers: 321000980, 321001170

12.1. Toxicity

12.1.1. Water toxicity

The cell/battery does not present environmental hazard when being properly used or disposed.
The cell/battery does not contain mercury, cadmium, or lead.
The internal components can harm marine environments. Avoid any release to waterways, groundwater, or waste systems.

12.1.2. Terrestrial toxicity

The cell/battery does not present environmental hazard when being properly used or disposed.

12.1.3. Behaviour in waste water treatment plants

The cell/battery does not present environmental hazard when being properly used or disposed.

12.2. Persistence and degradability

12.2.1. General

The cell/battery does not present environmental hazard when being properly used or disposed.

12.2.2. In water

The cell/battery does not present environmental hazard when being properly used or disposed.

12.2.3. In air

The cell/battery does not present environmental hazard when being properly used or disposed.

12.2.4. In soils and sediments

The cell/battery does not present environmental hazard when being properly used or disposed.

12.3. Bioaccumulative potential

The cell/battery does not present environmental hazard when being properly used or disposed.

12.4. Mobility in soil

The cell/battery does not present environmental hazard when being properly used or disposed.

12.5. Results of PBT and vPvB assessment

PBT and vPvB ingredients are not present.

12.6. Other adverse effects

The cell/battery does not present environmental hazard when being properly used or disposed.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste disposal must be in accordance with the applicable regulations and laws.

13.2. Package disposal

Disposal of the Lithium batteries should be performed by permitted, professional firms knowledgeable in Federal, State or Local requirements of hazardous waste treatment and hazardous waste transportation.
Incineration should never be performed by battery users, but by trained professional in authorized facilities with proper

Packing: 20 01 33* batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries

Residue: 20 01 33* batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries

SECTION 14: TRANSPORT INFORMATION

14.1. UN number 3480

ADR/ADN/RID

14.2.	Proper shipping name:	LITHIUM ION BATTERIES
14.3.	Transport hazard class(es):	9
	Labels:	9A
	Classification code	M4
14.4.	Packing group:	-
	Hazard identification number:	90
14.5.	Environmental hazards:	NO
	Tunnel restriction code:	(E)

IMDG

14.2.	Proper shipping name:	LITHIUM ION BATTERIES
14.3.	Transport hazard class(es)	9
	Labels	9A
14.4.	Packing group:	-
	EmS:	F-A, S-I
	Marine pollutant:	NO

IATA

14.2.	Proper shipping name:	LITHIUM ION BATTERIES
14.3.	Transport hazard class(es):	9
	Labels	9A
14.4.	Packing group:	-
	PAX:	Forbidden
	CAO:	965 Section IA
	UN number:	3480

14.6. Special precautions for user

No information available.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

There is no limit according to Annex XVII of REACH. Does not contain substances in the REACH candidate list.

15.2. Chemical Safety

Chemical safety assessment has not been performed.

15.3. Seveso category

(219/2011. (X.20.) Korm.rendelet szerint)

It is not covered by SEVESO.

15.5. WGK - German Water hazard classes

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15.6. Other relevant national regulations

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC
Commission Regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulations Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006
2000 XXV. law Chemical Safety
Decree No. 44/2000 (XII. 27.) of the Minister of Health on the detailed rules of certain procedures and activities related to hazardous substances and hazardous products, as amended by Decree No.
25/2000. (IX. 30.) Joint Decree of the Minister of Health, Ministry of Social and Family Affairs chemical safety of workplaces
54/2014. (XII. 5) Minister of Interior on the National Fire Protection Regulations
1993. XCIII. law occupational protection Act on Occupational Health and Safety at Work Decree 5/1993. (XII.26.) MüM regulations in a uniform structure
Waste: 2012 CLXXXV. Law on waste; 225/2015. (VIII.7.) Government Decree on detailed rules for certain activities related to hazardous waste.
Decree 72/2013 (VIII.27.) Of the Ministry of Agriculture on the Waste List; 442/2012. (XII.29.) On packaging waste and packaging waste management activities.
Road transport Class: 2015 LXXXIX. Law and the European Agreement concerning the International Carriage of Dangerous Goods 61/2013 "A" on certain issues and Annex "B" and the promulgation of the domestic application. NFM Regulation (X.17.); 178/2017. (VII.5.) government decree;
Rail transport: 2015 LXXXIII. International Railway Act, the appendix, the Protocol dated 3 June 1999 amending Transport Convention (COTIF), adopted in Vilnius Annex C promulgation and application of certain aspects of the domestic and the domestic application of the promulgation of 62/2013. NFM Regulation (X.17.); 179/2017. (VII.5.) government decree;
Inland transport: the 2015 LXXXIV. Done at Geneva Act, 2000, the day of May 26, Dangerous Goods annexed to the European Agreement concerning the International Inland Waterway (ADN) promulgation of the Rules and domestic application; 177/2017. (VII.5.) government decree;

SECTION 16: OTHER INFORMATION

16.1.a. The review affected this chapters:

16.1.b. The abbreviation and acronyms used in Safety data sheet

REACH Registration, Evaluation, Authorisation and restriction of Chemicals
CSR Chemical Safety Report
ÁK value (permissible average concentration): the average concentration of air pollutant ina workplace air for a shift which does not normally have an adverse effect on the worker's health,
CK value (permissible peak concentration) (shortest allowable maximum air contamination):
MK value (maximum concentration): highest concentration tolerated during shift
OEL Occupational Exposure Limit
DNEL Derived No Effect Level
PNEC Predicted No Effect Concentration
LD50 Lethal Dose 50%
LC50 Lethal Concentration 50%
EC50 Effective Concentration 50%
NOEL No Observable Effect Level
NOEC No Observable Effect Concentration
NOAEC No Observable Adverse Effect Concentration
NOAEL No Observable Adverse Effect Level
STP Sewage Treatment Plant
PBT Persistent, Bioaccumulative, and Toxic
vPvB Very persistent and very bioaccumulative

16.1.c. Key literature references and sources for data

Source: SAMSUNG Safety Data Sheet - Lithium-ion battery INR21700-40T

16.2. Technical advisory services

KEP Elektronikai Alkatrészgyártó Kft.
Address: 7400 Kaposvár, Izzó utca 3.
Tel.: +36-82/502-100 Fax: +36-82/502-190

16.3. Further information

The data for the hazardous ingredients were taken respectively from the last version of the contractor's safety data sheet. This / these product (s) comply with REACH Article 3 (3). The article does not apply to mandatory labeling requirements for dangerous substances. The product is a CLP Regulation (Classification, Labeling and Packaging Declaration of Materials and Mixtures) does not constitute a substance that is hazardous to health or the environment.

16.4. General information

This information relates TO THE PRODUCT AS SUCH and is in compliance with the specifications of the enterprise.
In case of products and mixtures, it should be ensured that no new risks arise.
The information on this data sheet is based on our best knowledge at the time of printing the safety data sheet and is provided in good faith. However, certain data are being reviewed.
Users should note the potential for additional risks in case of using the product for purposes other than the recommended application. This data sheet may be used and reproduced for prevention and safety purposes only. The references to legislation, regulations and practical rules, and documents should not be considered complete.
It is the responsibility of the person receiving the product to consult all documents related to the use and handling of the product.
The responsibility of parties handling the product also includes to pass on the whole of the information listed on the safety data sheet and necessary for work safety and for the protection of health and the environment, to the next person who may get in contact in any way with the product (use, storage, cleaning of containers, other operations).

BATTERY SPECIFICATIONS

Nominal Voltage	18V		
Typical Capacity	4 Ah	5.5 Ah	8 Ah
Energy	72Wh	99Wh	144Wh
Chemical system	Lithium Transition Metal Oxcide (Li[M]m[O]n)		
Designed for Recharge	Yes		

⚠ **WARNING:**

Only use TorcUP approved batteries.

Do not allow battery packs to come in contact with water.

Do Not expose battery packs to heat or fire.

Discharge battery pack befor disposal. Prevent contacts from short-circuting.

Do not dispose of battery packs with hosehold waste. Observe national regulations on proper disposal.

CHARGER SPECIFICATIONS

Air cooled	
Input	110v or 220v
Mains frequency	50-60 Hz
Output	18 VDC
Charge time	30 minutes at 1.5 Ah

VIBRATION INFORMATION (ALL TOOL SIZES)

Vibration	< 2.5 M/s2
Uncertainty	1.5 M/s2
In accordance with EN 60745	

WARNING: The vibration emmision value during actaul use of the power tool can differ from the declared value depending on ways in which the tool is used.

NOISE INFORMATION (ALL TOOL SIZES)

LpA / KpA	dB(A)	76 / 3
LWA / KWA	dB(A)	87 / 3
In accordance with EN 60745		

WARNING: Wear ear protection when sound pressure is over: 80dB(A)

ENVIRONMENTAL SPECIFICATIONS

⚠ **CAUTION!**

Only operate the Volta Series Battery wrenches if the following storage and operations condidtions have been met.

TEMPERATURE RANGE	**FAHRENHEIT**	**CELSIUS**
Operating	5-122	-15 - 50
Charging	32-122	0 - 50
Storage	50 - 86	10 - 30
Humidity	10% - 90% non condensing	
Required Operating Conditions	Non Explosive Atmoshere. Dry Location	

SAVE THESE INSTRUCTIONS. DO NOT DESTROY.

NOTES:

TorcUP HQ | Ph: 610-250-5800 | Email: sales@torcup.com
1025 Conroy Pl. Easton, PA 18045

WWW.TORCUP.COM