



momentum

GIANT

Liv

MY20

SERVICE MANUAL



HYBRID 
CYCLING TECHNOLOGY



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1. INTRO

WELCOME TO THE E-BIKE SERVICE MANUAL MY20.

This Service Manual contains specific information about the e-bike system components of recent Giant, Liv & Momentum e-bikes. It is designed to be used by a workshop mechanic, as a technical guide and reference work for servicing our E-Bikes.

For information about the basic operation and functionality of e-bikes, please refer to the regular user manual.

Updated or additional information might become available after the initial release of this manual. If the provided information is insufficient or missing, please contact the local Giant Service Team for further assistance.



2. MY20 G-SYSTEMS COMPONENTS OVERVIEW

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2.1 G-SYSTEM

G-System is the group name for the different components and technologies that make a Giant/Liv/Momentum bike an e-bike. It utilizes the CANBUS protocol for digital communication between these components.

Below a quick overview of the main G-System components:

SYNCDRIVE:

SYNCDRIVE is the motor that provides the power assistance to the rider. The SyncDrive motors contain the main processing unit and all but one of the sensors.

There are 3 different types of SyncDrive motors in MY20: Life, Sport & Pro. All three are updated with the latest 6-sensor technology. For MY20 the output for lights has also been increased to 9 Watt max. (6V/1.5A).

PEDALPLUS:

PEDALPLUS 6-sensor technology are all the sensors that register various inputs, like speed, cadence, input torque, motor rotation speed, slope and acceleration. This gives all SyncDrive motors Smart Assist features, to automatically select an assist level based on all sensor data.

RIDECONTROL:

RIDECONTROL is the control unit on the handlebars. It's the interface that gives the user control over the e -bike functions.

- The CHARGE and EVO displays are basically unchanged compared to previous model years, but did receive some small updates in the firmware.

The RideControl ONE combines core functionality and visual feedback in a compact and ergonomic unit with minimalistic aesthetics. For MY20, an ANT+ capability has been added to wirelessly connect to various (3rd party) devices.

ENERGYPAK

The ENERGYPAK is the power source of the system. The Integrated batteries as introduced last year are completely integrated into the frame, and together with the 6A Smart Charger they can be charged faster and more efficiently. For MY20, a more compact, 375Wh battery has been added to the line-up, and an optional 250Wh range extender is added as an optional accessory to increase the range even more. Integrated batteries compatible with the range extender are dubbed **EnergyPak Smart** (500, 400, 375)

Other batteries used for MY19 are semi-integrated side release type, and carrier types, with can be charged with the standard 4A Fast Charger.

2.2 SYNCDRIVE

SYNCDRIVE PRO MY20



FEATURES:

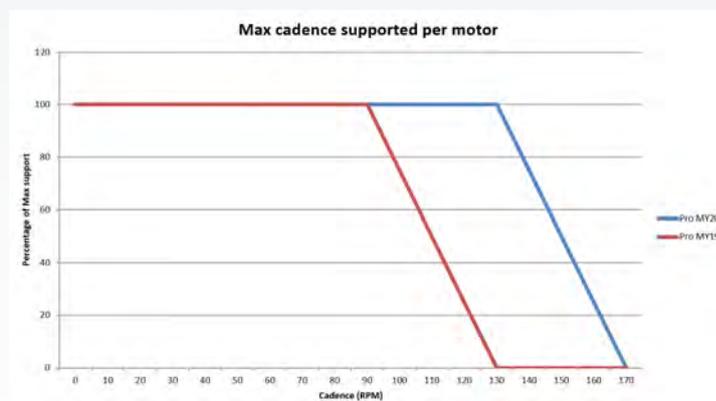
The SyncDrive Pro motor is designed for performance use. Compared to SyncDrive Sport some specific features are enhanced for performance:

- Light and compact
- Most powerful (360% power ratio)
- Faster engagement and response (more teeth and pawls in clutch ratchet mechanism)
- Increased max cadence
- 128mm wide Hollow BB axle with ISIS interface

SMART ASSIST:

Each MY20 SyncDrive Motor is equipped with PedalPlus 6-sensor technology. Switching the assist level down to off, and then one level further, activates the Smart Assist function (AUTO mode). The Smart Assist will automatically select the optimal power ratio depending on the input of all six sensors. While this allows the rider to focus on the ride, it also provides an efficient power consumption

MAXIMUM CADENCE	MY 19	MY20
Power	120 rpm	170 rpm
Sport	120 rpm	170 rpm
Active	120 rpm	155 rpm
Basic	110 rpm	155 rpm
Eco	110 rpm	155 rpm





TUNING:

The SyncDrive Pro motor provides a power ratio of in a range of 0- 360%. The RideControl displays have 5 default modes to choose from, that correspond to 5 power ratio presets in the motor. These modes can be custom tuned, by using the RideControl mobile app, which allows the user to select a different power ratio for each mode. More information about the RideControl app can be found in the app manual.

MOTOR FIRMWARE:

The motor firmware has several layers of programming, that could be described as a core layer, a properties layer and a top layer.

The motor's core firmware and properties are written during the manufacturing stage, and are not accessible to any others beyond this stage. Only the top layer of the firmware is partly accessible to dealers and users, through the app, to allow the tuning of the power ratios. Dealers have read access to certain information stored in the motor, like error codes and motor ODO, by using the Giant Service Tool software and dongle.

SENSORS:

The MY20 SyncDrive Pro motor uses PedalPlus 6 sensor technology to operate: Speed, pedaling torque, pedaling cadence, motor rpm, slope & acceleration. More information about the sensors can be found in the PedalPlus chapter further on in this manual.

CONNECTIONS:

The SyncDrive motor is a central part of the G-system and is connected to all the other G-System parts, like the RideControl display and EnergyPak. There are 3 connectors coming directly from the motor:

1. Main Power wire:
2 pin large connector
Red and Black wires (+ and -)
2. Speed Sensor wire:
3 Pin connector
Green, Dark blue, red wire
3. Main communication signals and 5-6V output wires
8 pin connector
Black, Red, White, Dark Blue, Orange, Green, Brown, Pink wire

Please notice: Most signal or power wires are split and routed to other components via other wires. For example, the 8 pin connector will split into several connections including the RideControl connector and front and/or rear light power supply. See the pages on wiring for more details.

ASSEMBLY OF THE SYNCDRIVE PRO MOTOR:

See the SyncDrive Pro motor assembly guide for more details.



SYNCDRIVE SPORT



FEATURES:

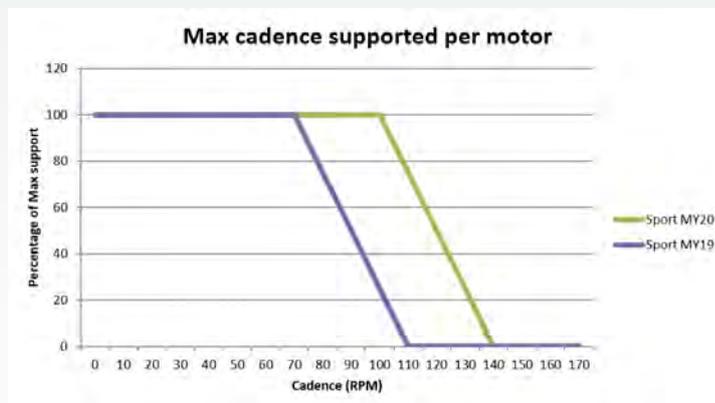
The SyncDrive Sport motor is designed for all-round performance. It is applied on various models ranging from MTB, trekking, commuter and city bikes. Some core features are:

- Powerful: 70Nm Torque (max 350% power ratio)
- Linear support profile (natural and smooth)
- High max cadence (140 rpm)
- Square taper (JIS) BB axle

SMART ASSIST:

Each MY20 SyncDrive Motor is equipped with PedalPlus 6-sensor technology. Switching the assist level down to off, and then one level further, activates the Smart Assist function (AUTO mode). The Smart Assist will automatically select the optimal power ratio depending on the input of all six sensors. While this allows the rider to focus on the ride, it also provides an efficient power consumption.

MAXIMUM CADENCE	MY 19	MY20
Power / Sport+	110 rpm	140 rpm
Sport	110 rpm	140 rpm
Normal	110 rpm	130 rpm
Eco+	110 rpm	130 rpm
Eco	110 rpm	130 rpm





TUNING:

The SyncDrive Sport motor provides a power ratio of in a range of 0- 350%. The RideControl displays have 5 default modes to choose from, that correspond to 5 power ratio presets in the motor. These modes can be custom tuned, by using the RideControl mobile app, which allows the user to select a different power ratio for each mode. More information about the RideControl app can be found in the app manual.

MOTOR FIRMWARE:

The motor firmware has several layers of programming, that could be described as a core layer, a properties layer and a top layer.

The motor's core firmware and properties are written during the manufacturing stage, and are not accessible to any others beyond this stage. Only the top layer of the firmware is partly accessible to dealers and users, through the app, to allow the tuning of the power ratios. Dealers have read access to certain information stored in the motor, like error codes and motor ODO, by using the Giant Service Tool software and dongle.

SENSORS:

The SyncDrive Sport motor uses PedalPlus 6 sensor technology to operate: Speed, pedaling torque, pedaling cadence, motor rpm, slope & acceleration. More information about the sensors can be found in the PedalPlus chapter further on in this manual.

CONNECTIONS:

The SyncDrive motor is a central part of the G-system and is connected to all the other G-System parts, like the RideControl display and EnergyPak. There are 3 connectors coming directly from the motor:



1. Main Power wire:
2 pin large connector
Red and Black wires (+ and -)
2. Speed Sensor wire:
3 Pin connector
Green, Dark blue, red wire
3. Main communication signals and 5-6V output wires
8 pin connector
Black, Red, White, Dark Blue, Orange, Green, Brown, Pink wire



Please notice: Most signal or power wires are split and routed to other components via other wires. For example, the 8 pin connector will split into several connections including the RideControl connector and front and/or rear light power supply. See the pages on wiring for more details.

ASSEMBLY OF THE SYNCDRIVE SPORT MOTOR:

See the SyncDrive Sport motor assembly guide for more details.

SYNCDRIVE LIFE



FEATURES:

The SyncDrive Life motor is designed for recreational and leisure riding. It is applied mostly on models with hub gears and low instep frames. Some core features are:

- PedalPlus 6-sensor technology
- Smart Assist function (automatic optimal power ratio selection)
- Capable: 60Nm Torque (max 300% power ratio)
- Quiet: 5x quieter than the previous version
- Linear support profile (natural and smooth)
- High max cadence (110 rpm)
- Square taper (JIS) BB axle

SMART ASSIST:

Each MY20 SyncDrive Motor is equipped with PedalPlus 6-sensor technology. Switching the assist level down to off, and then one level further, activates the Smart Assist function (AUTO mode). The Smart Assist will automatically select the optimal power ratio depending on the input of all six sensors. While this allows the rider to focus on the ride, it also provides an efficient power consumption.

TUNING:

The SyncDrive Life motor provides a power ratio of in a range of 0- 300%. The RideControl displays have 5 fixed modes to choose from, that correspond to 5 power ratio presets in the motor. Also on the new Life motor, these modes can be custom tuned, by using the RideControl mobile app, which allows the user to select a different power ratio for each mode. More information about the RideControl app can be found in the app manual.



MOTOR FIRMWARE:

The motor firmware has several layers of programming, that could be described as a core layer, a properties layer and a top layer.

The motor's core firmware and properties are written during the manufacturing stage, and are not accessible to any others beyond this stage. Only the top layer of the firmware is partly accessible to dealers and users, through the app, to allow the tuning of the power ratios. Dealers have read access to certain information stored in the motor, like error codes and motor ODO, by using the Giant Service Tool software and dongle.

SENSORS:

The SyncDrive Life motor uses PedalPlus 6 sensor technology to operate: Speed, pedaling torque, pedaling cadence, motor rpm, slope & acceleration. More information about the sensors can be found in the PedalPlus chapter further on in this manual.



CONNECTIONS:

The SyncDrive motor is a central part of the G-system and is connected to all the other G-System parts, like the RideControl display and EnergyPak. There are 3 connectors coming directly from the motor:

1. Main Power wire:
2 pin large connector
Red and Black wires (+ and -)
2. Speed Sensor wire:
3 Pin connector
Green, Dark blue, red wire
3. Main communication signals and 5-6V output wires
8 pin connector
Black, Red, White, Dark Blue, Orange, Green, Brown, Pink wire

Please notice: Most signal or power wires are split and routed to other components via other wires. For example, the 8 pin connector will split into several connections including the RideControl connector and front and/or rear light power supply. See the pages on wiring for more details.

ASSEMBLY OF THE SYNCDRIVE LIFE MOTOR:

See the SyncDrive Life motor assembly guide for more details.



2.3 PEDALPLUS

6-SENSOR TECHNOLOGY

From MY20, Giant uses 6-sensor technology on the new Life, Sport and Pro motors.

1. PEDALING TORQUE SENSOR

The torque sensor is mounted on the BB axle. It measures the force that the rider is applying on the pedals.

2. PEDALING CADENCE SENSOR

The cadence sensor is mounted on the BB axle. It measures the rotation speed of the axle.

3. SLOPE SENSOR

The slope sensor is mounted on the circuit board. It measures the bicycle's current angle as opposed to horizontal.

4. ACCELERATION SENSOR

The acceleration sensor (accelerometer) is mounted on the circuit board. It detects whether the bicycle is accelerating or decelerating.

5. MOTOR ROTATION SENSOR

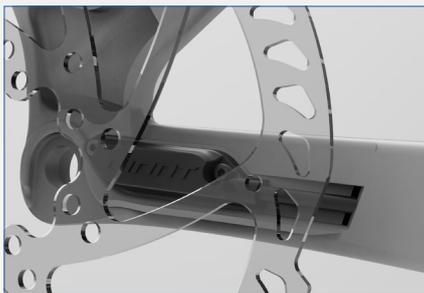
The motor rotation sensor is integrated into the electro motor itself. It measures the rotation speed of the motor.

6. EXTERNAL SPEED SENSOR

The speed sensor is placed on the inside of the rear chainstay, and a magnet is placed on a spoke in the rear wheel. Speed is calculated by the RideControl based on the wheel rotation speed.

6. INTEGRATED SPEED SENSOR

New in MY20 is the integrated speed sensor. This sensor works the same as the external sensor, but is integrated into the left rear dropout. The magnet is mounted on the disc-brake rotor using 2 of the 6 rotor mounting bolts.



SMART ASSIST

The six separate sensor signals are processed by the G-System software, which optimizes the motor output while riding within any set assist mode. The Smart Assist mode (Auto) goes a step further, by using the sensor data to continuously adjust and balance the power ratio automatically between the available 50-360% (depending on motor type).

So for example, when coming from cruising on a flat, at an economic 50% power ratio, into an short uphill, the power ratio will automatically increase to a higher support ratio, up until the maximum 300-360% if necessary. When the gradient eases a little, so will the power ratio. This results in a very efficient battery power consumption and allows the rider to set the mode once and just enjoy the ride with optimized support in all circumstances.

SENSOR ERRORS

If any of the sensors is transmitting an abnormal signal, this should usually result in an error message by the system. An error in an internal sensor will show up on the RideControl as a “SyncDrive Error”.



Detailed information about the error is stored in the motor memory. Always use the Service Tool software to test and create a pdf export of the extensive test results, where the precise error codes are displayed. The integrated Service Tool manual contains a table of all error codes and short description of the error. Make sure this information is available when contacting the service department for support.

GENERAL BIKE INFO	
Motor ODC(km)	942
Given ODC(km)	0
Service Tool system connections (firmas)	20
Distance since latest connection (km)	457
Service Intance(km)	2000
Average speed since latest connection(km/h)	10.9
Percentage of assistance 'OFF' (%)	100
Percentage of assistance 'ECO' (%)	0
Percentage of assistance 'NORMAL' (%)	0
Percentage of assistance 'POWER' (%)	0

RideControl	
Communication	Not tested
Number of fails	0
Remote button	Not tested
Display function	Not tested

SyncDrive	

2.4 RIDECONTROL

RIDECONTROL ONE

The RideControl One is a new RideControl unit in a minimalistic design. It has all the important controls, large ergonomically placed buttons, and integrated clear visual feedback using bright LED lights.

ANT+



In MY20, ANT+ connectivity is added to the RideControl One. Bike computers and other devices that support the ANT+ LEV (Light Electric Vehicle) profile can display various E-bike fields, like battery capacity, remaining range and assist level. If the RC One has the ANT+ logo on it, these features are supported. Consult the device manufacturers information for supported data fields and how to pair the e-bike.

BUTTONS



5 PHYSICAL BUTTONS OF RIDECONTROL ONE:

On/Off button	Short press to turn on the system Long press (3 sec.) to turn system off.
Assist UP button	Press to increase assist level. (In Walk Assist mode, press to activate walk assist.)
Assist DOWN button	Press to decrease assist level.
Walk Assist button	Press to unlock Walk Assist mode for 3 seconds. Press "Assist Up" button within 3 seconds to activate walk assist. (Walk Assist strength and speed depend on current assist level and gear ratio.)
Light/Mode button	Long press to switch Lights On/Off (If lights are connected to the system) Short press to toggle between options (On an external bluetooth accessory)

LED INDICATORS:

BATTERY CHARGE LEVEL INDICATOR



The row of 5 LEDs (B1 - B5) located near the edge of the RideControl One indicate the battery charge level. Each LED represents a block of approx. 20% battery charge. So when all battery LEDs are on, this would mean that the battery is charged to about 80-100%.



When the charge level drops below 10%, the bottom LED (B1) will turn from white to orange. Finally, when the charge level drops below 3%, the bottom LED (B1) will also start blinking (still orange).



CHARGING

When the charger is connected to the battery on the bike, the RideControl One will not show any indication of the charging process. The lights on the charger will indicate the charging status.

ASSIST LEVEL INDICATOR

The row of 5 LEDs (L1 - L5) located next to the Assist UP/DOWN buttons indicate the selected assist level. More lights on means more power assist.

When all assist lights are off, the motor assist will be off.



SMART ASSIST INDICATOR

Press Assist Down button a few times down to Assist OFF, and 1 press more to activate the Smart Assist function. On the assist level indicator only the middle LED (L3) will be on, to indicate Smart Assist is active.



LIGHT INDICATOR

The light indicator LED (LT) The light indicator LED (LT) will light up in white color when the light is switched ON. Also, the brightness of all LEDs will be reduced.



ERRORS

In the case of an error, the RideControl One will indicate with the LT LED blinking in red that there is an error, and one of the white Assist LEDs (L1, L2, L3 or L5). will blink to show which component the error is related to. Below an overview of the errors the RideControl One can show.

Use the Service Tool Software to diagnose the error and generate an extensive report to learn more.



LED	STATE	COLOUR	ERROR
LT	Blinking	Red	On all errors
+			
L5	Blinking	White	System overheating protection
L4	-	-	none
L3	Blinking	White	Speed sensor issue
L2	Blinking	White	SyncDrive issue
L1	Blinking	White	Battery issue

SERVICE TOOL

When connected to the Service Tool Software, RideControl One will show the middle 3 LEDs (L3,LT,B3) to indicate the connection is active. Follow the instructions in the Service Tool. When testing is finished and the RideControl One is disconnected by the Service Tool, the RideControl One will be on in the normal riding state.



LOW SPEED MODE

In some markets, assistance will stop at a lower speed (20 Km/h - 15 mph) due to local requirements. This “Low Speed Mode” is a setting in the motor and can be activated and deactivated by using a certain button sequence on the Ride Control. Older hardware & firmware versions have a very simple sequence (Method 1), later versions have a slightly modified sequence (Method 2), to prevent activating low speed mode by accident. MY20 bikes all have firmware with method 2, modified button sequence



LOW SPEED MODE - METHOD 1 (OLD VERSION)

- 1 Turn on the bike.
(Speed must be 0)
- 2 Push light button 5 times, within 6 seconds.
- 3 Turn the bike off to save the change.

LOW SPEED MODE - METHOD 2 (NEW VERSION)

- 1 Turn on the bike.
(Speed must be 0)
- 2 Push assist down button until assist level is set to “Off”
- 3 Push and hold walk assist button.
- 4 Push light button 5 times, within 6 seconds.
- 5 Release walk assist button.
- 6 Turn the bike off to save the change.

RIDECONTROL EVO



The RideControl EVO remains a core item in MY20 and keeps evolving with new firmware updates, adding improvements and functionalities.

OPERATION

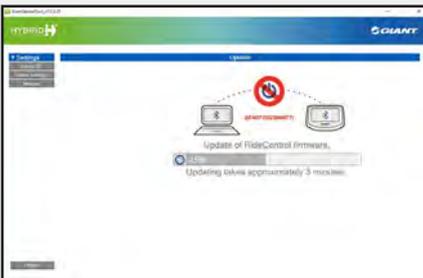
The remote is used for all control of the RideControl EVO functions. For information on how to operate the EVO display, please refer to the e-bike user manual. There it is described how to, for example, reset Trip Distance, or how to change from Km/h to Mph.



COMPATIBILITY.

In principle, all MY20 EVO displays can be connected to any MY20 G-System bike, and even older G-System bikes. Providing it runs the latest firmware, the information on the screen can adapt to almost any G-System e-bike it is connected to. For example, it will show 3 or 5 assist modes depending on the motor type and version, and it will show different assist levels for Pro and other motors.

There are some limitations. Some older EVO displays might not work well on newer bikes because their hardware does not support the latest firmware.



Since both hardware and firmware are subject to change during the MY, please always contact the Giant Service Department for the latest information. Also make sure the latest Service Tool is installed, and the EVO display has received the latest firmware update.



HARDWARE AND FIRMWARE VERSIONS

On the bottom of the EVO display, there's a barcode with the item number (SKU) and the serial number. The SKU can be checked against the bike's BOM. The serial number is important (especially the first 5 letters) to help identify the specific EVO display hardware version.

For checking the firmware version, please connect the RideControl to the Service Tool software. The display software version is displayed in the "Bike Data" screen in Service Tool (shortly after pairing the bike). Please provide this hardware and firmware information whenever Giant Service Department is contacted for support.



SERVICE INTERVAL SETTING

In the latest Service Tool software it is possible to set a service interval. The default setting is 2000km. This will start counting from every last Service Tool connection. When the set distance is reached, the wrench icon will appear in the EVO screen, indicating that the user should go to the dealer for maintenance. Currently dealers can follow their own procedure for service intervals. A list of advised maintenance intervals and procedures will be released in MY20.

GIVEN ODO SETTING

The SyncDrive ODO is stored in the motor and will start counting from the moment it is in use. It cannot be modified.

The Given ODO allows the dealer to manually set the ODO number that is shown in the display by Service Tool. This can be useful for example when a RideControl was replaced, so the original ODO number can be re-entered.

ERRORS

If an error occurs, the RideControl EVO will notify the user. There are 5 error that could be displayed:

- SyncDrive error
- Speed sensor error
- EnergyPak error
- Bluetooth error
- RideControl error

The RideControl will show a sequence of messages, before returning back to the normal riding screen. The normal screen will then show a wrench icon, indicating there was an error. The error message sequence displays as follows:

WRENCH TOOL



1.



2. (example)

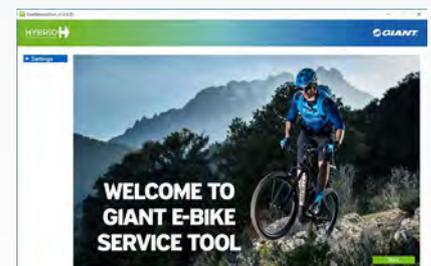


3. (will show only if applicable)



4.

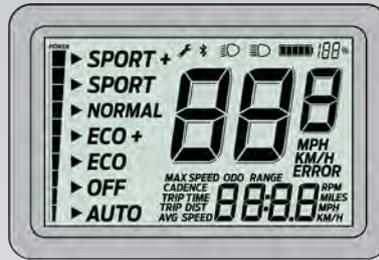
When an error occurs, turn the bike off, and back on, to reset the system. If the error returns, please use the Service Tool software to perform testing and diagnose the issue. The wrench icon will be reset automatically during the diagnose process. The Extensive Service Tool report will contain all the test results and detailed error codes. These codes are explained in the specific Service Tool Manual (pdf) that comes with the Service software.



RIDECONTROL CHARGE



The MY20 Charge displays are compatible with 5 assist modes and Smart Assist. It is also possible to update the firmware, display cadence rpm, set the Given ODO, and connect to the RideControl app.



Charge display

COMPATIBILITY

The Charge display connects to all G-system bikes, just like EVO and RC One. Because Charge uses a segment LCD screen, it can only display one layout. I can't show any data from the app like notifications or navigation cues.



HARDWARE AND FIRMWARE VERSIONS

On the bottom of the Charge display, there's a barcode with the item number (SKU) and the serial number. The SKU can be checked against the bike's BOM. The serial number is important (especially the first 5 letters) to help identify the specific Charge display hardware version.

For checking the firmware version, please connect the RideControl to the Service Tool software. The display software version is displayed in the "Bike Data" screen in Service Tool (shortly after pairing the bike). Please provide this hardware and firmware information whenever Giant Service Department is contacted for support.



SERVICE INTERVAL SETTING

In the latest Service Tool software it is possible to set a service interval. The default setting is 2000km. This will start counting from every last Service Tool connection. When the set distance is reached, the wrench icon will appear in the Charge screen, indicating that the user should go to the dealer for maintenance.

Currently dealers can follow their own procedure for service intervals. A list of advised maintenance intervals and procedures will be released in MY20.

GIVEN ODO SETTING

The SyncDrive ODO is stored in the motor will start counting from the moment it is in use. It cannot be modified.

The Given ODO allows the dealer to manually set the ODO number that is shown in the display by Service Tool. This can be useful for example when a RideControl was replaced, so the original ODO number can be re-entered.



ERROR INDICATION

If an error occurs, the RideControl Charge will notify the user. All digits will blink 3 times. Then the screen will show the error-code in the right hand corner of the display. There are 5 different errors that could be displayed:

- A1 (represents SyncDrive error)
- A2 (represents RideControl error)
- A3 (represents Bluetooth error)
- A4 (represents EnergyPak error)
- A5 (represents Speed sensor error)

When an error occurs, turn the bike off and back on to reset the system. If the error returns, please use the Service Tool software to perform testing and diagnose the issue. The wrench icon will be reset automatically during the

diagnose process. The Extensive Service Tool report will contain all the test results and detailed error codes. These codes are explained in the specific Service Tool Manual (PDF) that comes with the Service software.

REMOTE (CHARGE & EVO)



There is one type of remote controller. It has six buttons and one type of connector for the G-system; This single remote controller can operate all G-system displays on any G-system Syncdrive motor unit.

Three different mounts are available:

- Standard grip-mount on the left side of the handlebar.
- Bracket mount city, for placement integrated with toolless adjustable stem (for Prime-E etc.).
- Bracket mount road, for placement next to the EVO display (for Road-E etc.).

The button-unit itself can be removed from the mount by removing the 3 screws on the bottom. More information on the (dis)assembly of the remote, displays, brackets and mounts can be found at the assembly guides in this service manual. Information on how to operate the remote and display can be found in the Consumer User Manual.



RIDECONTROL FEATURES OVERVIEW

	FEATURE	CHARGE	EVO	ONE
RANGE	EnergyPak Capacity (block)	• (5 blocks)	• (10 blocks)	• (5 leds)
	EnergyPak Capacity %	•	•	• On connected device*
	Remaining Range	•	•	• On connected device*
ASSIST	Assist Mode	• (6 modes + off)	• (6 modes + off)	• (6 modes + off)
	Smart Assist	•	•	•
	Assist Power Bar	•	-	-
	Walk assist	•	•	•
LIGHT	Light on/off switch at grip	•	•	•
	Light Indication	•	•	•
CYCLING INFO	Speed km/h	•	•	• On connected device*
	Speed mph	•	•	• On connected device*
	Average Speed	•	•	• On connected device*
	Maximum Speed	•	•	• On connected device*
	Trip Time	•	•	• On connected device*
	Trip Distance	•	•	• On connected device*
	Total Distance	•	•	• On connected device*
	User Cadence Indication	•	•	• On connected device*
	Heart rate Indication	-	•	• On connected device*
	Human power Indication	-	•	• On connected device*
USB	5V USB Charger	•	•	-
SERVICE	Error Code Indication	•	•	•
	Wireless link to Service Tool	•	•	•
	Wireless Software Update	•	•	•
	Service Range	•	•	•
EXTRA	Second screen compatible	-	•	-
	Navigation indicator	-	•	-
	Upgradeable by app	•	•	•
	Bluetooth connectivity	•	•	•
	ANT+ (LEV) display connectivity	-	-	•
APP NOTIFICATION	Phone call	-	•	-
	E-mail	-	•	-
	Short message	-	•	-
*On connected device: The data that can be displayed will depend on the device capabilities.				

2.5 ENERGYPAK

CARRIER ENERGYPAK



This type of battery is positioned on the carrier of a city E-bike. They can be charged with the standard fast charger, on the bike or off the bike.

Available in 3 capacities:

- 500Wh
- 400Wh
- 300Wh

SIDE RELEASE ENERGYPAK



Side Release EnergyPaks are used on some E-MTBs and trekking models and are semi-integrated into the frameset. They can be removed from the frame by moving it sideways. This allows for more compact frame designs, lower stand-over heights and XS sizes. They can be charged with the standard fast charger, on the bike or off the bike. Available in 2 capacities:

- 500Wh
- 400Wh

ENERGYPAK SMART



In MY20, the integrated EnergyPaks got a few updated internals and updated Battery Management System (BMS) These EnergyPaks are now called EnergyPak Smart. Among other small improvements, the update makes them compatible with accessories like EnergyPak Plus (Range extender battery). The original MY19 batteries are not compatible with EnergyPak Plus.

The EnergyPak Smart is integrated in the downtube of our E-bikes. There are models that can have the battery loaded from the bottom, the top, or side of the downtube. The batteries themselves are encased in an aluminum sleeve for ultimate protection and safety.



MY20 EnergyPak Smart

The EnergyPak Smart can be charged on the bike by connecting the Smart Charger to the charge port on the bike. The integrated EnergyPak can be easily removed from the downtube by opening the battery lock and releasing the safety lock lever (for bottom loading battery). It can then be charged off the bike with the Smart Charger and the adapter cable.



EnergyPak Plus (accessory)

The EnergyPak Smart batteries are available in 3 capacities:

- 500Wh
- 400Wh
- 375Wh (smaller size)

CAPACITY	INTEGRATED (MY19)	SMART (MY20)
500wh	244M36500I-01V	244M36500I-03V
400Wh	244M36400I-01V	244M36400I-02V
375Wh	-	244-XP36VF-02

THE FIRST CHARGE (ALL ENERGYPAKS)

All new bikes have an EnergyPak that arrives in so-called 'hibernate state'. Delivering the EnergyPaks in a hibernate state is done in order to maintain the quality of the EnergyPak before first use. These EnergyPaks are charged to approximately 60%. Pushing the button on a hibernate state EnergyPak results in no LED blinking. A hibernate state EnergyPak has an output power of 0 Volt.



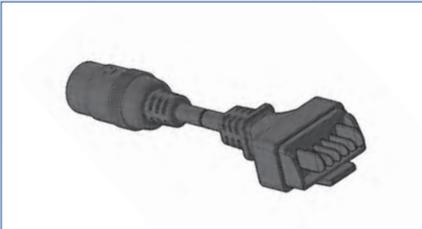
Waking up these new hibernate EnergyPaks can be done by simply charging the battery until it is fully charged. After this initial charging, the EnergyPak can be used as normal. It is not possible (not even by accident) to get a used EnergyPak back into hibernate state.

ENERGYPAK RANGE TABLE

ENERGYPAK	SYNCDRIVE LIFE			SYNCDRIVE SPORT			SYNCDRIVE PRO		
	MODE	RANGE (KM)		MODE	RANGE (KM)		MODE	RANGE (KM)	
500WH Integrated (MY19) 244M36500I-01V Smart (MY20) 244M36500I-03V	Eco	75	150	Eco	75	150	Eco	65	110
	Eco+	65	110	Eco+	65	110	Basic	40	85
	Normal	45	90	Normal	40	85	Active	25	60
	Sport	35	70	Sport	25	60	Sport	20	55
	Sport+	25	55	Sport+	20	50	Power	15	45
400WH	Eco	60	120	Eco	60	120	Eco	50	90
	Eco+	50	90	Eco+	50	90	Basic	30	60
	Normal	35	65	Normal	30	60	Active	20	45
	Sport	25	55	Sport	20	45	Sport	15	40
	Sport+	20	45	Sport+	15	35	Power	10	35
375WH	Eco	56	113	Eco	56	113	Eco	47	84
	Eco+	47	84	Eco+	44	79	Basic	26	53
	Normal	33	61	Normal	25	49	Active	16	37
	Sport	23	52	Sport	15	35	Sport	12	31
	Sport+	19	42	Sport+	11	25	Power	7	25
300WH	Eco	45	90	Eco	45	90	Eco	35	75
	Eco+	35	75	Eco+	35	75	Basic	25	55
	Normal	30	60	Normal	25	55	Active	15	35
	Sport	20	45	Sport	15	35	Sport	10	30
	Sport+	15	35	Sport+	10	30	Power	10	25

2.6 CHARGER

SMART CHARGER



The integrated EnergyPaks require the Smart Charger. The high charge current (up to 6A), the advanced BMS in the batteries and the “smart” capabilities of the charger make it possible to charge the battery very quickly, yet also optimize battery health and lifespan.

In MY20 a new Smart Charger version is added, with an 90 degree angled charge plug. It functions exactly the same as the existing Smart Charger, but this charger works only with 220V AC outlets. It can charge all existing MY19 and MY20 Integrated batteries.

The Smart Charger can charge the battery when it is still in the bike, by connecting it directly to the integrated connector in the bikeframe. MY20 bikes, that are compatible with EnergyPak Plus, have a charge socket with 2 extra pins. These 2 extra pins allow the EnergyPak Plus to connect the bike. Both straight and angled 5-pin smart charger plugs fit into this socket. For charging the battery when it's removed from the bike, the Charge Adapter (147L-HDC000-02) is needed.

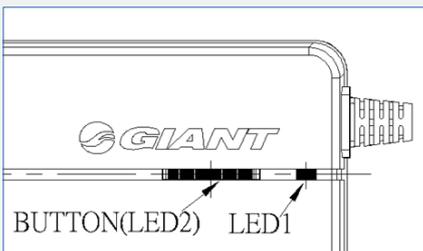
The first stage of the charge will have a high speed using the maximum 6A current. The Battery Management System works together with the charger to monitor the battery cells temperature, and other health indicators. When certain cells are getting too hot or otherwise less than optimal, current is reduced or diverted to other cells.

During the final stage of the charge, the overall charge current is reduced to balance and equalize the cells and reach the 100% charge at a steady pace. This charging process optimizes not only each individual charge, but also continuously adapts as the battery ages, extending the lifespan of the battery.

STORAGE MODE (60% CHARGE FUNCTION)

For long term storage, a 60% charge level is optimal for the maximum lifespan of the EnergyPak. The Smart Charger has this functionality built-in. It works and behaves exactly like a regular charge, except it is needed to activate the storage charge mode by pushing the LED2 button.

During storage charge, the LED2 button will light up (yellow) and the normal led sequence will be visible on LED1; First blinking green while charging, then constant green when the storage charge to 60% is completed.



STANDARD FAST CHARGER

The Standard charger is compatible with all the other MY19 EnergyPaks; The Side Release, Top Pull and Carrier EnergyPaks. It has a 3-pin charge connector and can charge the batteries on or off the bike. Charge times are still relatively fast. There are versions for 220V, with a max. charge current of 4A, and for 110V, with a max. current of 3A



CHARGING DURATION TABLE

Below table indicates charge times for different batteries derived from calculations and testing. These times can vary, depending on various factors like ambient temperature, battery health etc.

	110V AC 3A FAST CHARGER		220V AC 4A FAST CHARGER		100-240V AC 6A SMART CHARGER	
	400WH	500WH	400WH	500WH	400WH	500WH
60% CHARGE	--	--	--	--	1:00h	1:30h
80% CHARGE	3:00h	3:40h	2:00h	2:45h	1:50h	2:20h
100% CHARGE	6:00h	7:20h	4:30h	5:00h	3:00h	3:40h



3. TOOLS

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3.1 GIANT SPECIFIC TOOLS AND GENERAL TOOLS

In order to perform best maintenance and repairs on G-System E-bikes, some general and specific tools are required, such as:

- Service Tool, software & USB Dongle (Giant specific)
- Sockets, wrenches and keys (Giant specific)
- Any/DailyTour Lock assembly jig (Giant specific)
- Battery tester / discharge tool (Giant specific attachments)
- Multimeter
- Torque tool



Service Tool, software & USB Dongle (Giant specific)



Sockets and keys (Giant specific)



Multimeter



Any/DailyTour Lock assembly jig (Giant specific)



Battery capacity tester



Discharge tool (Giant specific)



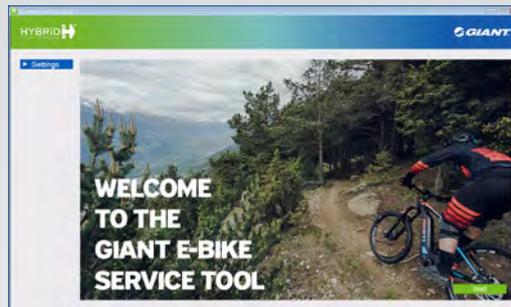
Torque tool

3.2 SERVICE TOOL SOFTWARE & USB DONGLE

The Service Tool Software is THE essential tool for G-System error diagnostics. For diagnosing G-system, a wireless connection can be made using the Bluetooth USB dongle key (252MDONGLE-01 or 600000045) on a Windows PC running the Service Tool software.

The software provides step-by-step walkthroughs for diagnostics of all G-system components on Giant E-bikes. It collects data from various components of the E-Bike, has built-in solutions and assembly guides for a majority of issues that could arise, and can export the results in detailed reports. Warranty on batteries are judged by Service Tool results.

A detailed manual for the Service Tool Software is supplied with the software package, and is accessible from within the program.



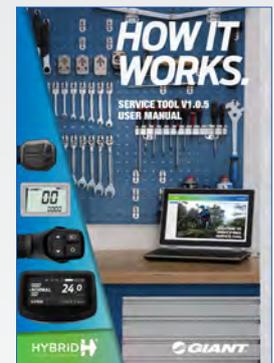
Service Tool Software



Bluetooth USB Dongle key



EVO display screen connected to Service Tool



Service Tool manual

3.3 SOCKETS AND KEYS

For only a few items, dedicated tools are needed to (dis)assemble). All other (dis)assembly can be performed with standard workshop tools that are commonly available.

SPEED SENSOR AND INTEGRATED BATTERY LOCK

For (dis)assembly or adjustment of the integrated battery lock and (dis)assembly of the external speed sensor a Security Torx key (item number 2520-T25-01V) is needed.

SPIDER SOCKET, 2-SPROCKET SPIDER

For (dis)assembly of the Hex-locknut on a 2-sprocket front chain wheel on the SyncDrive Sport motor, a conventional 36mm hex-socket will not fit, because the outside diameter is too large to fit the spider. A special socket with smaller outside diameter can be ordered from Giant: 2520-36NUT-02V.



Security Torx key:
2520-T25-01V



Socket M36 for 3/8" Torque
Wrench: 2520-36NUT-02V

SPIDER SOCKET, 8 NOTCH

For the 8-notch locknut as used for the chain wheel on the SyncDrive Pro motors (with ISIS BB) there are already sockets available in the market, like Parktool BBT-18 or Truvativ TL2340 bracket tools.



Chainwheel with 8-notch
locknut on a SyncDrive Pro
Motor



Truvativ TL2340

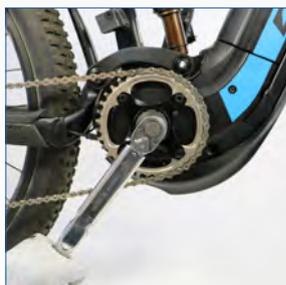


Parktool BBT-18

3.4 TORQUE TOOL

For applying correct torque to motor bolts and spider nut, a torque tool is required that can handle 45Nm.

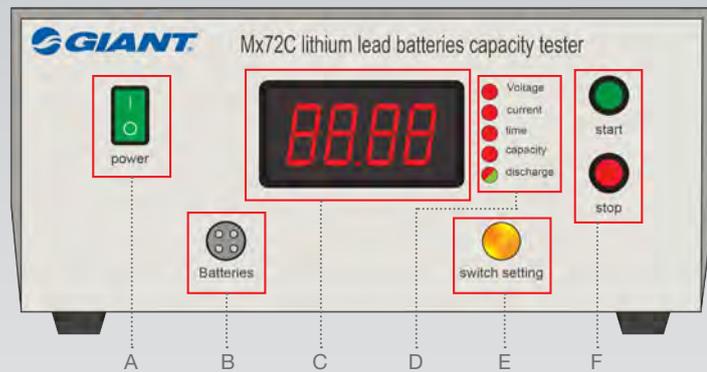
NOTE: Torque value for spider nut needs to be applied counter clockwise.
Not all electrical torque tools have that feature.



Mechanical torque tool

3.5 BATTERY CAPACITY TESTER & CABLE

G-system battery quality can be checked quickly and easily with the Service Tool Software, so the Battery Capacity Tester (5481-test-06V) is not necessary for these batteries. For discharging EnergyPak battery, the capacity tester is still useful.



A: Power On/Off switch

Switches the tester On or Off.

B: Battery Connector Socket

For connecting the battery to the tester with a battery connector cord.

- 147LMHDC000-02 for integrated G-System batteries

- 147LMHDBXXX-01 for all other G-System batteries

The supplied extension cord can be used if necessary.

C: Display Screen

Shows the value of the selected mode.

When the value is flashing, it indicates that the value can then be adjusted.

D: Display Mode Indicators

- **Voltage LED is on:** The display shows the Voltage value of a connected battery.

When the display is flashing, it shows the set termination Voltage at which the discharge test will stop.

- **Current LED is on:** The display shows the current value of the battery. When the value is flashing, it shows the discharge current that will be applied during the test.

- **Time LED is on:** The display shows the elapsed time of the discharge test.

- **Capacity LED is on:** The display shows the capacity that was released from the batterypack during the test

- **Discharge LED is OFF:** The tester is on standby.

- **Discharge LED is RED:** The testing is in progress.

- **Discharge LED is GREEN:** The testing is finished.

E: Selector switch

The switch can be rotated to select a display mode.

Push the switch to enter the setting for the selected mode. Rotate the switch to change the value. Push it again to confirm the changes and exit the setting mode.

F: Start & Stop button

The **Start** button to start the test

Press the **Stop** button to cancel the test.

3.6 MULTIMETER

A multimeter can be a useful and versatile tool for diagnosing issues. It can be used for checking Voltages, short circuits and damaged wiring and connectors. It does require at least some basic knowledge and understanding of electricity and electrical circuits. In addition, often some kind of reference data is needed to be able to interpret the measurements made with a multimeter.

It is not the intention of this manual to elaborate on this subject. For G-system, the Service Tool (and some additional spare parts) should suffice for diagnosing most issues. If this is somehow not the case, the Giant service department can provide further information and guidance.



Multimeter



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4.1 SYNCDRIVE - MOTOR

SYNCDRIVE PRO MOTOR

Motors can only be serviced by Giant Service Center. Contact your local Giant Service Center for further directions.

DISASSEMBLE

ATTENTION

General operational procedures, to be taken into account before any repairs are done.

- Remove the battery, to prevent accidental motor support engagement!
- Before working on batteries, be aware of safety issues! Take all necessary precautions.
- Reaching into an active system can cause serious injury!
- Pull connectors, do not pull wires.



- 1 Remove EnergyPak. Remove crank bolts left and right.



- 2 Remove cranks left and right, using a suitable ISIS/Octalink crank puller.



- 3 Remove the chainwheel-locknut, using an 8-notch BB-tool. Block axle rotation by firmly holding the rear wheel, and rotate locknut clockwise to loosen.

ATTENTION! Left hand threaded locknut!



- 4 Remove the chain wheel by pulling it straight of the spindle. If present, slightly loosen the bolts of the chain guide pulley.



- 5** Loosen and remove all motor cover bolts. For Full Suspension bikes: Slightly loosen battery connector cover/base plate bolts (just a few turns anti- clockwise) to create some movement in all directions.



- 6** Remove the motor covers. For Full Suspension bikes: Both Left and right covers are attached to the battery connector cover with a “snap- hook” type connection. Gently unhook the covers. If necessary, loosen the battery connector cover/base plate bolts some more, to create more room.



- 7** Slightly loosen all 4 motor bolts (2x M6 & 2x M8) a few turns.



- 8** First take out the 2 motor bolts on the front side, starting with the smaller M6 bolt (right side). Lightly tap the head of the M6 bolt with a plastic hammer, then completely remove it. Remove the bigger M8 bolt on the other side, making sure to support the motor from underneath, as it will drop down.



- 9** With the rear motor bolts acting as a hinge, lower the motor as far as it will go. Disconnect all connectors from the motor.



- 10** Remove first the rear M6 motor bolt (Lightly tap with plastic hammer first) and then the M8 Motor bolt, while supporting the motor’s weight from underneath. Remove the motor.

ASSEMBLE:



M8 / 22Nm



M6 / 11Nm

1

Follow all the previous steps in reversed order. Use Loctite 263 thread locker on M8 and M6 motor bolts to prevent bolts from loosening over time due to vibrations. Be sure to tighten the motor bolts to the specified torque using a calibrated torque wrench:

Left side M8 bolts tightening torque: 22 Nm

Right side M6 bolts tightening torque: 11 Nm



45 Nm

2

Mount the left crank first. Mount the chain wheel-locknut, using the 8-notch BB-tool. Block axle rotation by holding the left crank. Be sure to tighten the locknut to the specified torque using a calibrated torque wrench:

ATTENTION! Left hand threaded locknut!

Locknut tightening torque: 45N

4.1 SYNCDRIVE - MOTOR

SYNCDRIVE COMFORT / SPORT / LIFE MOTOR

Motors can only be serviced by Giant Service Center. Contact your local Giant Service Center for further directions.

DISASSEMBLE

ATTENTION

Yamaha have designed a sideways play of 1 mm in the bottom bracket axle Of Sport & Life motors to reduce strain inside the motor. This is a feature, not a flaw.



- 1 First remove EnergyPak. Remove the cranks. Cranks can be removed with a regular pulley.



- 2 Remove the big chain wheel nut. Usage of the special tool (part number 2520-36NUT-01V) is advised.
NOTE! Opens clockwise. Block the rear wheel. The chain ring can be removed from the axle together with the chain now.



- 3 Remove the frame cover and the right motor cover.



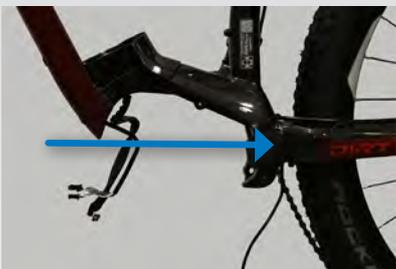
- 4 Remove the battery holder, accessible by 4 bolts from the top.



- 5 Remove the left motor cover.



- 6 Loosen the three frame bolts. The rear bolt should remain inside the frame. The two front bolts can be removed. The motor now can twist, but will not fall out.



- 7 Disconnect all the wires. Remove the third motor bolt and remove the motor.

ASSEMBLE:



- 1 To reassemble, follow the complete procedure in reversed order. The frame bolts should be tightened with 30Nm.



- 2 Use the mounted left crank and the Yamaha lock nut tool (part number 2520-36NUT-01V) to tighten the chain wheel nut. The chain wheel nut tightens with 40Nm.

4.1 SYNCDRIVE - MOTOR

BATTERY CONNECTOR SPACER

ASSEMBLY INSTRUCTION FOR INTEGRATED BATTERY



- 1 Remove the battery



- 2 Remove the 4 screws of the battery connector



- 3 Lift the connector up out of the bracket, as far as it will go without too much force. Avoid pulling too hard on the connector, as this might damage the wires.
On some occasions, it could be that the power wires are clamped or stuck between the motor and the frame. Then it will be necessary to partly disassemble the motor to free up the wires.



- 4 Take the special spacer (set of spacers and screws: 2120MWASH-ER-520V) and hold it with the open side up.



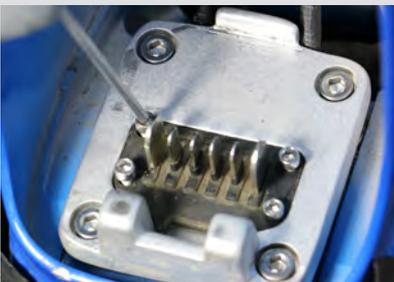
- 5 Place the spacer underneath the connector in the recess of the connector bracket. It can be helpful to use needle nose pliers.



6 The spacer should fit in the recess easily and all the holes should line-up nicely.



7 Insert all screws and engage the threads a few turns.



8 Tighten the 4 screws to 1Nm.



9 Place the battery.

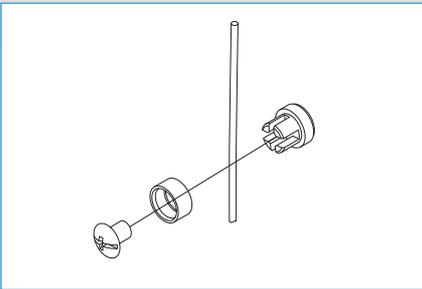
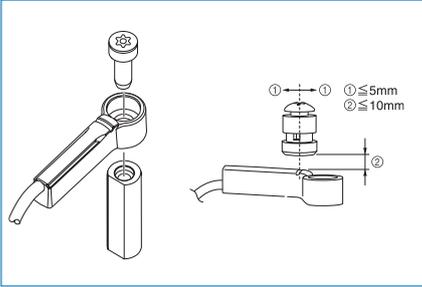


10 The bike is now ready for use.

4.1 SYNCDRIVE - MOTOR

SYNCDRIVE EXTERNAL SPEED SENSOR

Follow illustration for proper speed sensor and spoke magnet assembly:
To prevent unneeded replacements, start by making sure the speed sensor is positioned correctly:



4.1 SYNCDRIVE - MOTOR

INTEGRATED SPEED SENSOR REPLACEMENT

SOP FOR INTEGRATED SPEED SENSOR



1 General operational procedures, to be taken into account before any repairs are done.

- Remove the battery, to prevent accidental motor support engagement!
- Switch the system on, display will fade out.
- Reaching into an active system can cause serious injury!
- Pull connectors, do not pull wires.



2 Loosen the bolt in the frame which secures the EnergyPak, using the Torx 25 tool



3 Remove the EnergyPak by releasing the safety lock



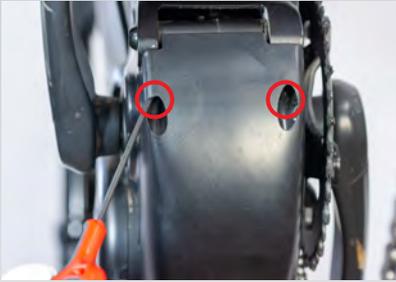
4 Remove the back-wheel, the axle can be removed using a Allen key size 6



5 Measure air pressure and write it down.
Release the pressure out of the rear suspension.



6 Remove the cable protector using a Allen key size 2.5



7 Remove the two bolts of the motor cover, using a Allen key size 2.5



8 Remove the bolt of the motor cover, using a Allen key size 4



9 Remove the left cranck arm, using a Allen key size 8



10 Remove the 4 bolts from the side cover, using a Allen key size 2.5



11 Remove the 2 bolts from the side cover, using a Allen key size 2.5



- 12** Loosen the bolt at the rear right side of the motor, using a Torx 30 tool, do not remove the bolt



- 13** Remove the bolt at the front right side of the motor, using a Torx 30 tool



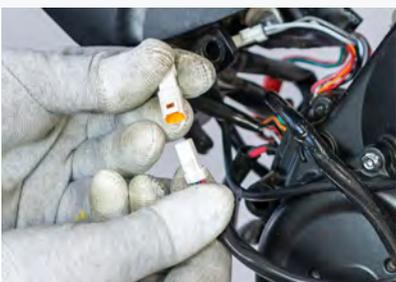
- 14** Remove the bolt at the front left side of the motor, using a Torx 30 tool



- 15** Loosen the bolt at the rear left side of the motor, using a Torx 30 tool, do not remove the bolt



- 16** With the rear motor bolts acting as a hinge, lower the motor as far as it will go.



- 17** Disconnect the connector of the speed sensor.

Pull connectors, do not pull wires.



18 Remove the two bolts out of the speed sensor, using a Allen key size 2.5



19 Guide the cable trough the chain stay, and take it out of the frame.



M6 / 11Nm



M8 / 22Nm

20 Follow all the previous steps in reversed order. Use Loctite 263 thread-locker on M8 and M6 motor bolts to prevent bolts from loosening over time due to vibrations. Be sure to tighten the motor bolts to the specified torque using a calibrated torque wrench:

- Left side M8 bolts tightening torque: 22 Nm.
- Right side M6 bolts tightening torque: 11 Nm.

Inflate the rear suspension.

4.2 RIDECONTROL – REMOTE & DISPLAY

REMOTE BUTTON & BRACKET

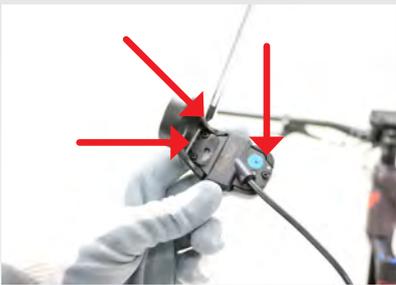
DISASSEMBLE



- 1 Disconnect the display wire connector from the remote wire connector. Loosen the grip/remote mounting bracket clamping screw.



- 2 Remove the handlebar endcap. Remove the grip and bracket from the handlebar. Remove the grip from the remote mounting bracket.



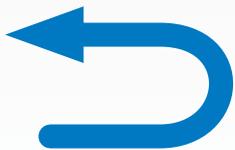
- 3 Remove the 3 screws from the bottom of the remote.



- 4 Remove the remote from the mounting bracket.

ASSEMBLE

- 1 Reverse the previous steps for re-assembly.



4.3 RIDECONTROL - REMOTE & DISPLAY

EVO DISPLAY & BRACKET (MTB TYPE)

DISASSEMBLE:



- 1 Remove the screw from the cable exit hole cover. Then take the rubber out of the hole and slide it out of the way.



- 2 Locate the display cable at the cable exit hole in the frame, and take out the connectors. Please note that other cables can obstruct the exit hole. Try to avoid using too much force while pulling out the connector to prevent damage to the cable. When the connector is pulled completely out of the frame, disconnect the displaywire connector from the mainwire connector.



- 3 Disconnect the second displaywire connector from the remotewire connector.



- 4 Remove the 4 bolts from the 2 display mounting bracket clamps.



- 5 Remove the display mounting bracket clamps.



6 Remove the mounting bracket including display from the handlebar



7 Remove the 4 screws on the bottom of the display bracket



8 Remove the display from the bracket.

ASSEMBLE:



1 Repeat steps in reverse for re-assembly. When placing the bracket back on the handlebar, make sure that the wires exit on the front side, in front of the handle stem cap.

4.3 RIDECONTROL - REMOTE & DISPLAY

EVO DISPLAY & BRACKET (CITY TYPE)

DISASSEMBLE:



- 1** Locate the display cable at the cable exit hole in the frame, and take out the connectors. Remove any cable binders or tie-wraps if needed. Please note that other cables can obstruct the exit hole. Try to avoid using too much force while pulling out the connector to prevent damage to the cable.



- 2** When the connector is pulled completely out of the frame, disconnect the displaywire connector from the mainwire connector.



- 3** Disconnect the second displaywire connector from the remotewire connector.



- 4** Remove the 4 screws on the bottom of the display bracket.



- 5** To remove the display bracket, first remove the handlebar clamp.



- 6 Remove the 2 bolts from the display bracket clamps.



- 7 Remove the display bracket.

ASSEMBLE:



- 1 Repeat steps in reverse for re-assembly. When placing the bracket back on the handlebar, make sure that the wires exit on the front side, in front of the handle stem cap.

4.4 ENERGYPAK-BATTERY

INTEGRATED BATTERY COVER TRANCE-E/INTRIGUE E+

DISASSEMBLE:



- 1** Remove side rubber between battery and battery cover.



- 2** Remove cover screw.



- 3** Slide cover over battery.

ASSEMBLE:



- 1** Make sure all surfaces are clean and degreased. Make sure 4 rubbers and 1 screw are present. Rubbers are dedicated for one side, the tabs should be oriented as shown.



- 2** Stick the finger-notch rubber onto the inside of the cover. Make sure the edges line up neatly with the cover.



- 3** Now place the bottom side rubber against its slider



- 4** Slide the battery towards the fixing screw's mounting bracket of the cover. Make sure the fixing screw's mounting bracket sits tight against the face of the battery.



- 5** The ridges on both sides of the inside of the cover should go into the grooves in both sides of the battery. Slide in one side first, snap the other side in by hand. Push the ridges of the bottom side of the cover into the grooves in the battery. It should require some force, but not too much, to firmly snap them in place.



- 6** Secure the cover with the screw. Do not overtighten, just hand-tight is ok



- 7** Peel off a small part of the paper film of the side rubber. Start with the flattened, "pointy" side of the rubber as shown.



8 Make sure the rubber lips line up with the ridges in the cover.



9 Insert and stick the first end of the rubber onto the battery. Make sure everything is properly aligned. Make any necessary adjustments before continuing to the next step.



10 Carefully peel away the film, while guiding and securing the rubber in place with the other hand. Repeat on the other side to finish.



11 The battery is now ready to place in the bike.

4.4 ENERGOPAK-BATTERY

REPLACING RIDECONTROL ONE S.O.P.

FOR MODELS WITH INTEGRATED BATTERY



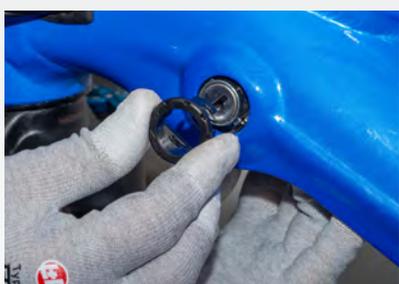
- 1 Unlock the battery and remove the battery.



- 2 While unlocking, support the battery to prevent damage due to falling out.



- 3 Remove the two tamper proof bolts of the locking mechanism using the pin-in torx tool, part-number: 2520-T25-01V.



- 4 Disassemble the plastic lock ring by turning it anti clockwise. To prevent damage to the paint do not use any sharp tools.



- 5 Remove the locking mechanism..



- 6** Take the rubber out of the frame and push the cable of the RC One further in to the frame..



- 7** Take the connectors out of the frame and disconnect them.



- 8** Pull the connector of the RC One out of the frame.



- 9** Pull the connector of the RC One through the rubber.



- 10** Remove the screw of the RC One.



- 11** Remove the RC One.



12 New RC One, part-number: 245-FLED28-03.



13 Place the RC One onto the handlebar.



14 Tighten the screw of the RC One at 1 Nm.



15 Push the connector of the RC One through the rubber..



16 Put the connector back in to the frame.



17 Make sure you have enough length to pull the cable out of the frame.



- 18** Spray a little bit of WD-40 on to the rubber hose, this makes it easier to slide the hose onto the connectors. WD-40 also drives out moisture.



- 19** Connect the connectors to each other and slide the hose over the connectors.



- 20** Make sure that all the cables are aligned correct into the frame. If the cables are not aligned correctly the battery won't fit and the locking mechanism won't function properly.



- 21** Mount the locking mechanism back in to the frame. Make sure the cables are aligned between point A and B.



- 22** Place the plastic lock ring back by turning it clockwise.

To ensure that the lock ring is mounted correctly, make sure that the lock- and unlock sign are on top of the ring.



- 23** Tighten the two screws of the locking mechanism at 1 Nm..



24 Put the battery back into the frame and hold it. The locking mechanism will align now with the battery. Tighten the screws at 4 to 5 Nm.



25 Check if the battery can smoothly move in and out of the frame when locking and unlocking.
Check if the secondary lock functions properly so the battery cannot accidentally drop out of the frame.

If everything works properly, the process is finished.

4.4 ENERGYPAK-BATTERY

SIDE-RELEASE BATTERY COVER & CASING

DISASSEMBLE:



- 1** To remove the battery covers: Start with the rear end of the battery as pictured. Use a tire-lever to prevent damage. Start at the corner of the cover, lift it up until the first hook snaps out of its groove.



- 2** Continue to lift and snap the next hook out of its groove.



- 3** Turn the battery around to the front end. Lift up the corner of the cover and snap the first hook on this side out of its groove. Continue all the way down the length of the battery, until the topside of the cover is completely released.



- 4** On the bottom side of the battery cover there are "L" shaped hooks. Don't pull the cover. Just hold it lightly and lift the battery up a bit. The hooks should release without any force. Gently push the cover downward if necessary.



- 5** Start with the cover on the other side, at the corner on the rear end of the battery.



6 Continue down the length of the battery until the topside of the cover is completely released. Remove the cover the same way as the previous one.



7 To remove the battery casing: Please note that this operation could cause some (minor) damage to the battery case. If there is any more than superficial damage, the case should be replaced. Remove the 4 screws on the corners on the bottom of the battery.



8 Place the battery with the charging plug facing up. Use a small and thin flathead screwdriver as a lever between the connector and the casing, to create a small gap. Place a tire-lever upside down next to the charging plug, and use a little pressure to further open the gap.



9 Put another tire-lever next to the other side of the charging plug. Push the levers over to further open the gap.



10 Keep the second lever in place. Take out the first, and place it a bit further down the length of the battery. Push the lever over again.

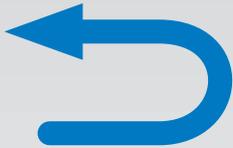


11 Repeat along the length of the battery, step by step, until one side of the case is completely released.



- 12 Now pull the battery casing apart. Hold the top half in one hand and wiggle off the bottom half with the other hand.

ASSEMBLE:



- 1 For battery casing: Gently slide in cell pack in bottom side housing. Position battery & charge connector. Slide over top side housing, pay attention of no cables getting stuck inside. Gently increase pressure for the hooks to engage. Be careful not to damage the waterproof foil over the battery.
- 2 For battery covers: Make sure charge cover rubber is located correctly in battery cover. Place battery cover on top hooks. Gently press bottom side to engage bottom hooks.

4.4 ENERGYPAK-BATTERY

ENERGYPAK FITTING IMPROVEMENT S.O.P. MY19 FITTING INTEGRATED TOP RELEASE ENERGYPAK

PART 1: REPLACEMENT OF COVER RUBBERS



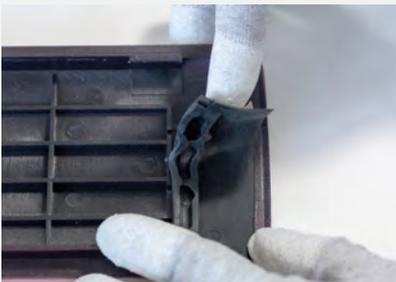
- 1 Open the lock and remove the battery from the bike. Place the battery on a non-scratching surface.



- 2 Remove the small screw from the cover attachment plate on the bottom of the Battery.



- 3 Slide the battery cover off the battery.



- 4 Pull off the existing bottom rubber from the cover. This rubber can be discarded.



- 5 Peel the paper from the tape from the bottom rubber.



- 6** Carefully align and place the bottom rubber on the cover.



- 7** Position of the rubberplug is good:



- 8** Gently slide the cover onto the battery until the cover attachment plate sits against the bottom of the battery.



- 9** Place the small screw from the cover attachment plate on the bottom of the battery and tighten it. Do not over tighten.



- 10** Place the battery into the bike.

Proceed with Part 2 of the EnergyPak Fitting Improvement S.O.P:
Checking/Adjustment of Battery Lock.

4.4 ENERGYPAK-BATTERY

ENERGYPAK FITTING IMPROVEMENT S.O.P.

MY19 FITTING INTEGRATED TOP RELEASE ENERGYPAK

PART 2: CHECKING AND ADJUSTING LOCK ALIGNMENT



- 1 Before proceeding, make sure part 1 of the S.O.P. is finished (Replacement of cover rubbers).

Open the lock and remove the EnergyPak from the bike. Place the EnergyPak on a non-scratching surface.



- 2 Loosen and take out the upper bolt of the lock assembly.



- 3 Place the battery positioning tool in to the frame and make sure it's secured by the lock.



- 4 Fix the battery positioning tool onto the lock assembly by tightening the bolt, this bolt will come with the battery positioning tool.



- 5 Locate the 3 bolts that fix the lock in place and loosen them. Do not take them out.



- 6** Loosen the bolt on the bottom of the down tube.



- 7** Push the upper side of the battery positioning tool carefully as close as possible towards the frame.

Tighten the 3 bolts that keep the lock assembly in place. (5-6 Nm.)



- 8** Push the battery positioning tool as close as possible towards the bottom of the tube.



- 9** Tighten the bolt on the bottom of the down tube.



- 10** Loosen the single bolt that fixes the battery positioning tool onto the lock assembly and take it out.

Then remove the battery positioning tool out of the frame.



- 11** Add dampening foam frame to reduce vibration. Peel off the paper cover, and stick each foam piece in the middle on both “bridges” in the frame. One up near the lock, the other down near the power connector.





- 12** Apply Battery Terminal Grease onto the power connector. By using this type of grease the battery slides more easily into place, the grease will also protect the connectors against moisture.



- 13** Place the battery back into the tube. **Make sure the EnergyPak is locked;** Only if the lock assembly makes a clear *click* sound, the battery is locked properly.

It is unsafe to ride with a battery that is not locked properly.



- 14** Check if the EnergyPak can smoothly move in and out of the frame when locking and unlocking.



- 15** If everything works properly, the process is finished.

4.4 ENERGYPAK-BATTERY

BATTERY CARRIER BATTERY CASING

DISASSEMBLE:



- 1** To remove the battery casing: Please note that this operation could cause some (minor) damage to the battery case. If there is any more than superficial damage, the case should be replaced. Remove the 4 screws on the corners on the bottom of the battery.



- 2** Use a small and thin flathead screwdriver as a lever between the connector and the casing, to create a small gap.



- 3** Place a tire-lever in the gap as pictured, and apply some force to open the gap a bit further.



- 4** Place another tire-lever next to the first, and push it over to pop the battery open.

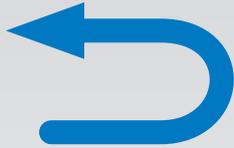


- 5** Repeat along the length of the battery, step by step, until one side of the case is completely released.



- 6 Now pull the battery casing apart. Hold the bottom half in one hand and wiggle the top off with the other hand.

ASSEMBLE:



- 1 For battery casing: Gently slide in cell pack in bottom side housing. Position battery & charge connector. Slide over top side housing, pay attention of no cables getting stuck inside. Tighten the 4 screws on the corners on the bottom of the battery. Be careful not to damage the waterproof foil over the battery.

4.5 REMAINDERS

SIDE-PULL BATTERY LOCK

DISASSEMBLE:



- 1** Loosen and remove the 4 bolts of the inner cover of the lock compartment.



- 2** Remove the inner cover. There is a hook on the bottom. Use a tire-lever to lift it out without damage. Gently pull out the inner cover. If necessary use the tire-lever to create some room around the edges.



- 3** Take out the two screws on the most left, so the lock can move.



- 4** Take out the two screws on the most right and bottom to release the lock assembly from the base plate.



- 5** Now remove the lock assembly from the frame.



6 Remove the 4 screws to remove the cover from the assembly.



7 Replace the lock if necessary.

ASSEMBLE:



1 Reverse previous steps when only lock replacement is needed.



2 The battery could jam or fall out during riding if the lock isn't properly adjusted! Adjust the lock assembly base plate when the battery doesn't fit well in the frame.



3 If the lock assembly base plate needs to be replaced, copy the distance from the original plate by extending a tape-measure between the battery base and lock base plate, and lock the tape-measure. Another method is to mark the position of the base plate with a pencil and use this as a reference for the new base plate.



- 4 Use the locked extended tape-measure and/or pencil marking as a reference for mounting the new base plate.



- 5 Repeat steps in reverse for re-assembly. Make sure all bolts are tightened properly. Double check if the battery fits well, and locks securely.

4.5 REMAINDERS

HEAD TUBE LIGHT

DISASSEMBLE:



- 1 If the bike hangs in a bike lift or a work stand, lower the bike so the front tire just touches the floor. Block wheel rotation by squeezing the brake lever and secure it with a strap, rubber band or something similar.



- 2 Create some slack on all cables by gently pulling them out of the frame as far as they will go. Remove the handlebar and any headset spacers from the fork stem. Let the handlebar hang down alongside the frame.



- 3 Lift the bike up as much as just the top of the fork stem is still inside the headtube and the complete light becomes accessible from inside the headtube.



- 4 Depress the upper hook with a tool like a flathead screwdriver, while pushing the light out of the headtube with your thumb.



- 5 Take out the light and look for the connector inside the downtube. Pull it out gently. Don't force the connector or other cables to prevent damage. If there is still not enough slack on the cable, it could be stuck between the motor and the frame. In that case it is necessary to lower the motor, to free up the cable.



- 6 Disconnect the light and replace it.

ASSEMBLE:

- 1 Reverse the previous steps for re-assembly.





5. TROUBLE SHOOTING

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5.1 TROUBLE SHOOTING OVERVIEW

QUESTION	ANSWER
A wrench tool appears on the EVO screen. What is going on?	See chapter 4.2: Ridecontrol EVO error
A code appears on the Charge screen. What is going on?	See chapter 4.3: RideControl Charge error
What do the error codes stand for?	See chapter 4.4: Error Codes
My system can't switch on or off. What to do?	See chapter 4.5: System Malfunction
How come Giant Syncdrive Central motor makes a different noise than some competitors?	See chapter 4.6: Other issues - Motor noise issues
How come range can vary?	See chapter 4.6: Other issues - Range issues
The battery won't charge. What to do?	See chapter 4.6: Other issues - Charging issues

5.2 RIDECONTROL EVO ERROR

RideControl EVO error notifications

A wrench tool appears on the EVO screen. What is going on?

In case a problem is detected in the system., the EVO display will show;

- **system message:** for 2 seconds.



One of these root causes:

- **SyncDrive error**
- **Speed sensor error**
- **EnergyPak error**
- **Bluetooth error**
- **RideControl error**

Followed by the message:

- **Your E-bike needs servicing**



The EVO display will then return to the normal screen, but with the wrench tool icon displayed as well. For most errors, the motor assist will remain functional. Motor assist will only stop in case of a 'SyncDrive error'. The wrench tool will show on the screen for as long as the problem persists.

Hardly ever there is reason for immediate concern. Simply restarting the system will remove the error notification. If the error returns after the restart, use the Service Tool to diagnose the problem. The Service Tool will identify the exact error code(s). The error codes are described in the Service Tool manual, and also a few pages further down in this G-System Service Manual.

Unless stated otherwise by Service Tool or Giant information, no part replacement is needed.,



5.3 RIDECONTROL CHARGE ERROR

RideControl Charge error notifications



A code appears on the Charge screen. What is going on?

An error notification (location L) will be shown on the display in case a problem is detected in the system.

EnergyPak indicator % (J), EnergyPak indicator bars (H) and Error code indicator (L) will blink 3 times. The root cause will be displayed by Error code indicator (L).

For most errors, the motor assist will remain functional. Motor assist will only stop in case of a A1 (SyncDrive error).

The error code will show on the screen for as long as the problem persists.

Hardly ever there is reason for immediate concern. Simply restarting the system will remove the error notification. If the error returns after the restart, use the Service Tool to diagnose the problem. The Service Tool will identify the exact error code(s). The error codes are described in the Service Tool manual, and also a few pages further in this G-System Service Manual.

Unless stated otherwise by Service Tool or Giant information, no part replacement is needed.

5.4 ERROR CODES

As mentioned before, error codes are just an indication of hick-ups that happened. Unless stated otherwise by Service Tool or Giant information, no part replacement is needed when an error code appears.

DISPLAY	FAILURE CATEGORY	ERROR CODE	FAILURE TYPE	ASSIST
A1	SyncDrive	3A	MEMS self-test failure.	On
		3B	No any data from MEME for constant time.	
		21	Drive chain system A communication failure	Off
		31	Torque sensor failure.	
		32	Torque sensor sudden fluctuation.	
		33	Torque sensor zero point shift.	
		34	Torque sensor locked with crank rotating.	
		35	Torque sensor locked at high voltage.	
		36	Torque sensor locked at middle voltage.	
		37	Torque sensor locked at low speed.	
		38	Auto running without crank rotating.	
		39	Crank rev sensor failure.	
		61	Current sensor offset.	
		62	Motor over current.	
		63	EEPROM failure.	
		64	Thermistor failure.	
		65	Circuit board over heat.	
		66	Invalid parameter.	
		67	Motor wire breaking.	
68	Encoder failure.			
		F2	Drive chain system A wheel diameter failure	
A2	RideControl	27	LCD module failure.	Off
		F5	Data ROM failure.	On
		F6	Charging function failure.	On
A3	Bluetooth	28	Bluetooth module failure	On
A4	EnergyPak	72	Battery under voltage.	off
		73	Battery over voltage.	
		CA	Data ROM error.	
		CB	Precharge time-out.	
		C1	Over charge.	
		C2	Over discharge.	
		C3	Charge over current.	
		C4	Discharge over current.	
		C5	Cell over temperature.	
		C6	Cell thermistor open.	
		C7	FET over temperature.	
		C8	FET thermistor open.	
		71	No battery message.	
		F1	Over charge 1 & 2.	
				F9
A5	Speed sensor	69	Speed sensor failure	on

5.5 SYSTEM MALFUNCTION

Switching on/off issues

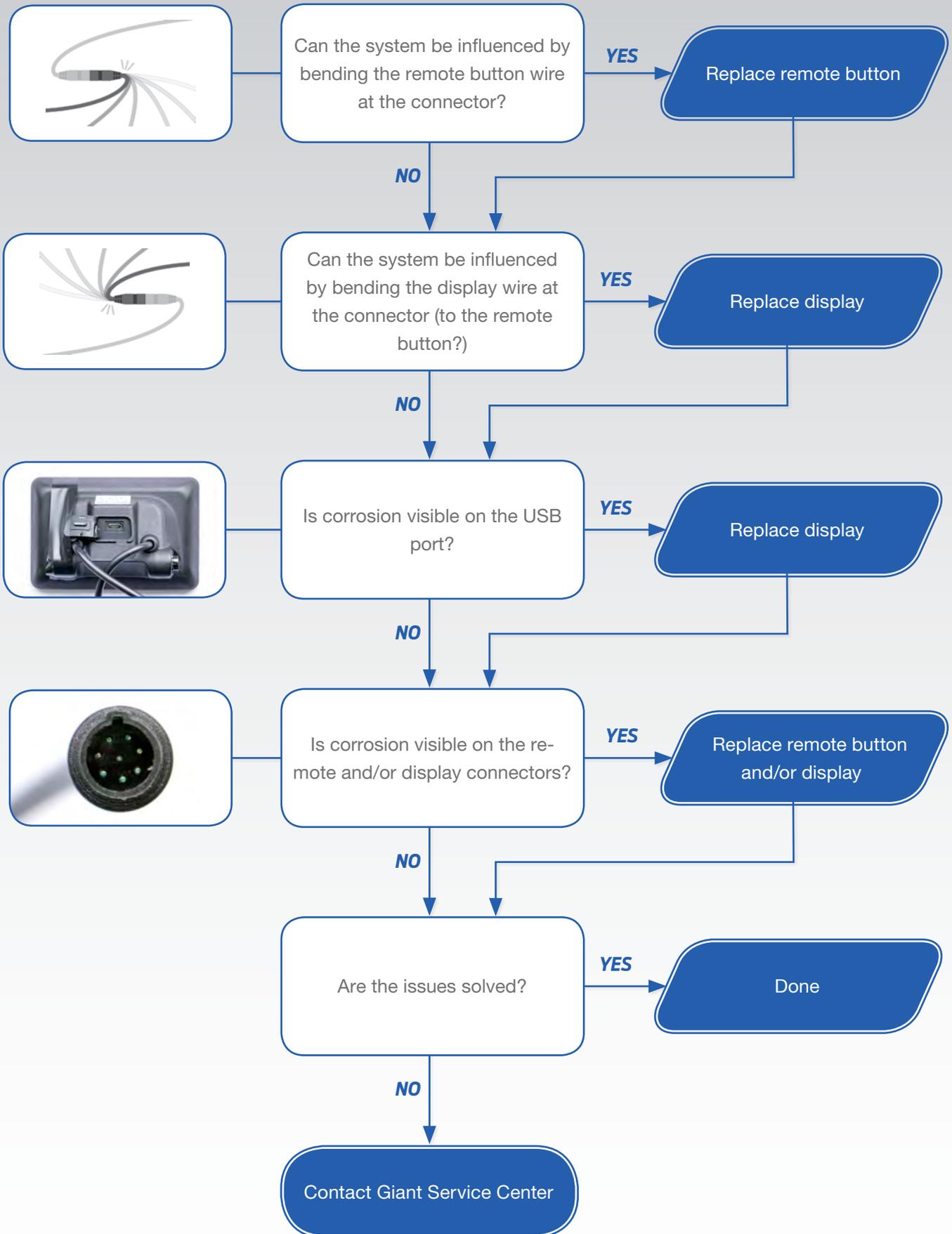
My system can't switch on. What to do?

If the system can't be switched on, the Service Tool can't provide correct solution.

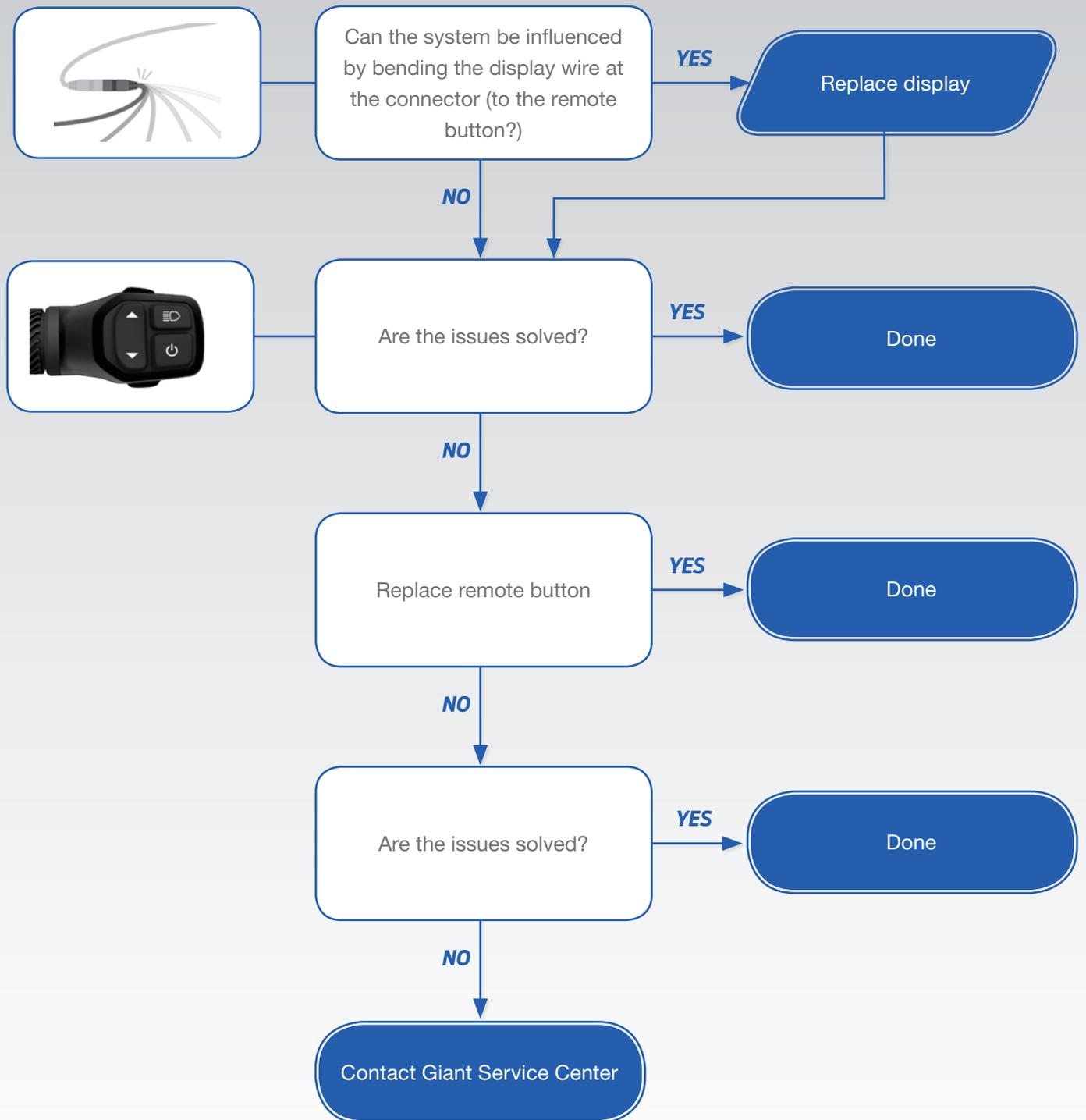
In that case, choose the correct response from the table below:

ISSUE	BEHAVIOUR	ACTION
Switch on impossible	Switching system on is impossible.	Response 1
Immediate switch off	After switching on, system switches off immediately.	Response 1
Switching off impossible	Switching off the system is impossible.	Response 2
Walk assist	With system switched on, walk assist functions without pressing corresponding button.	Response 2
Remote button function loss	System is switched on, and the display does function. No response from remote buttons.	Response 3

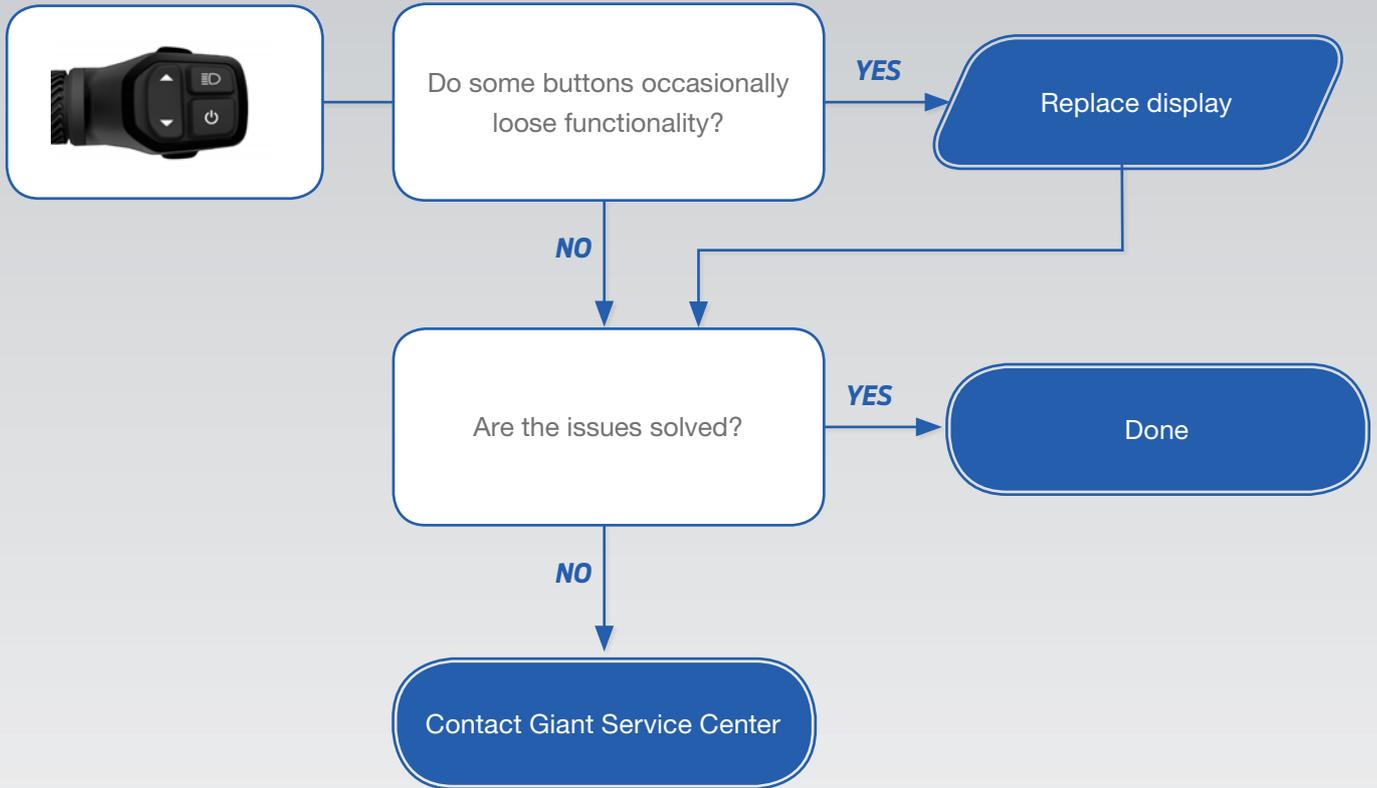
RESPONSE 1, SWITCHING ON IMPOSSIBLE



RESPONSE 2, SWITCHING OFF IMPOSSIBLE / WALK ASSISTANCE



RESPONSE 3, BUTTON FUNCTION LOSS



5.6 MOTOR NOISE QUESTIONS

How come Giant Syncdrive Central motor makes a different noise than some competitors?



Engineering of the hardware from the Yamaha motor has been done according to choices made. As a consequence, the motor has a higher pitch of motor noise compared to some competitors.

Engineering fundamentals are:

High torque, zero cadence support at 0km/h

Motor durability

Compact

Secondary:

Possibility for two chain wheels

Usage of standard bike parts (Chain wheels , derailleurs)

5.7 RANGE QUESTIONS

How come range can vary ?

The range strongly depends on several circumstances, such as (but not only):

Weather conditions such as ambient temperature and wind;

Road conditions such as elevation and road surface;

Bike conditions such as tire pressure and maintenance level;

Bike usage such as acceleration and shifting;

Rider, bike and luggage weight;

Charge and discharge cycles.

Shifting recommendations:

High speed, high gear.

Low speed, low gear.

Release power during shifting.

For better range, Giant advises to shift according to the speed. For low speeds and setting off, low gearing is best. The higher the speed, the higher the gear can be chosen. For smooth support and optimum range, it is best to release pedal pressure while shifting gears.

5.8 CHARGER QUESTIONS

The battery won't charge. What to do?



Always make sure battery and charger are the correct type and compatible with each other. Visually check both for any obvious issues or damages. Look for:

- Water damage (corrosion, greenish oxides on any contacts)
- Wire damage (clamped or torn, inner wires exposed)
- Excessive play on connections (charge socket & plug)
- Drop damage (cracks & scuffs)



To identify which one of the two causes the problem, cross-check with another battery and charger of the same type. If it's clear from this that the charger is defect, replace the charger.

If the problem isn't the charger, measure the battery's output with a multimeter. For this the wire attachment for the capacity tester is needed (147LM-HDBXXX-01, only for non-integrated batteries).

Connect the wire attachment to the output (discharge) connector of the battery, and connect the multimeter probes to either number 4 & 1, or 3 & 2 terminals on the round connector of the wire attachment (as pictured). A G-system (36V) battery's voltage should read between roughly 29V (empty battery) and 42V (full battery).



When a steady voltage is displayed on the multimeter, connect the charger to the battery. Normally, the voltage should slowly raise from then on as the battery is being charged. The light on the charger should change from green to red (charging).

When the Voltage is between 0V and 29V, the battery can be in deep sleep. With the right equipment, the battery can be charged very slowly with a very low current (0,5A) to 29V. Once this Voltage is reached, the battery will accept a normal charge again.

Contact Giant service department if battery Voltage is 0 or much lower than 29V, or when voltage is normal (between 29-42V) but doesn't raise when charger is connected.



6. SUPPLEMENT

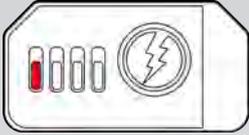
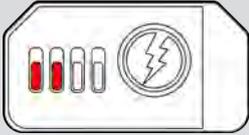
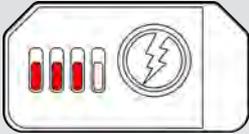
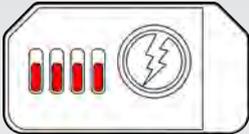
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6.1 ENERGYPAK LED INDICATOR

FOR BATTERIES WITH 4 LED INDICATION

State of charge (not charging): Push and release the button on the EnergyPak to read out the current state of charge.

LED Indication	State of charge (%)
	0 - 25
	26 - 50
	51 - 75
	76 - 100

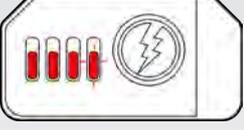


: Led On

6.2 ENERGYPAK LED INDICATOR CHARGING

FOR BATTERIES WITH 4 LED INDICATION

State of charge while charging: When the charger is connected, the LED board will display the current state of charge

LED Indication	State of charge (%)
	0 - 25
	26 - 50
	51 - 75
	76 - 100

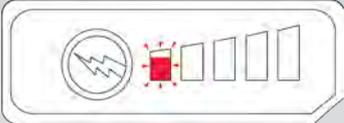
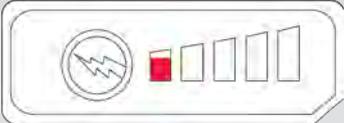
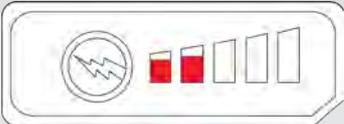
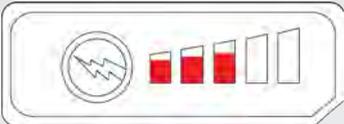
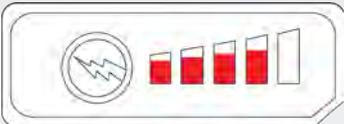
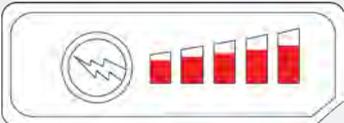


6.3 LED INDICATION ENERGYPAK

FOR BATTERIES WITH 5 LED INDICATION

State of charge while charging: When the charger is connected, the LED board will display the current state of charge

State of charge (not charging): Push and release the button on the EnergyPak to read out the current state of charge.

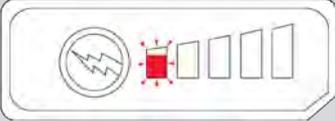
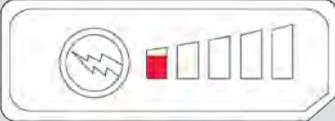
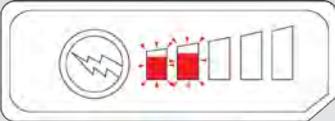
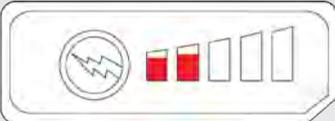
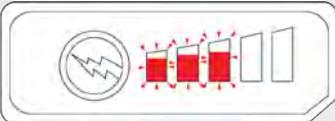
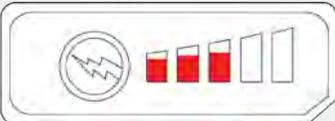
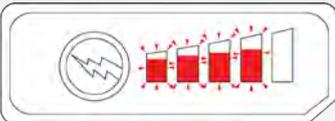
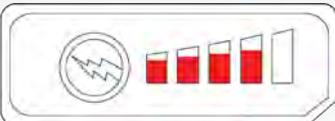
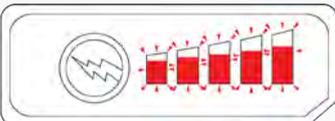
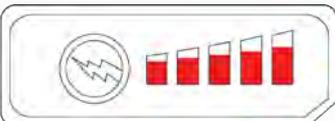
LED Indication	State of charge (%)
	0 - 10
	11 - 20
	21 - 40
	41 - 60
	61 - 80
	81 - 100



6.4 LED INDICATION COUNT OF CYCLE

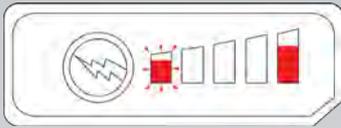
FOR BATTERIES WITH 5 LED INDICATION

To read out the count of cycle (number of times the battery has been fully charged), press the button twice in a row.

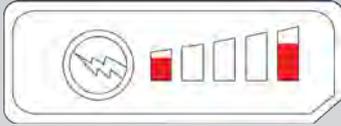
LED Indication	Count of Cycle
	0 - 50
	51 - 100
	101 - 150
	151 - 200
	201 - 250
	251 - 300
	301 - 350
	351 - 400
	401 - 450
	451 - 500

LED Indication

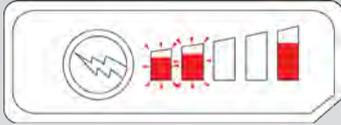
Count of Cycle



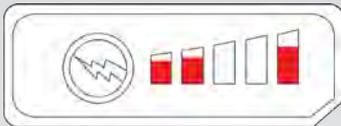
501 - 550



551 - 600



601 - 650



651 - or more



: Led On



: Led Blinking

6.5 SERVICE MODE ENERGYPAK

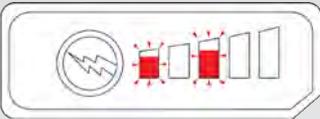
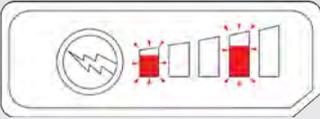
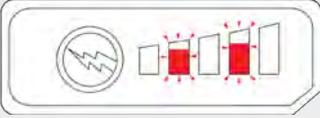
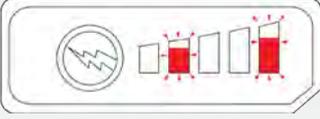
FOR BATTERIES WITH 5 LED INDICATION

The service mode is displaying 5 stages, in these stages you can read out error codes and the condition of the battery.

Entering service mode: Keep the button  pressed in, after 7 to 8 seconds the LED will indicate the 1st service stage.

After entering the 1st service stage, the error code will be displayed on the LED board.

To enter the next stage, release the button after the error code disappears (LED off) and press it in again within 3 seconds (keep it pressed in).

LED Indication	Count of Cycle
	Stage 1 / ERR1 (1)
	Stage 2 / ERR1 (2)
	Stage 3 / ERR2 (1)
	Stage 4 / ERR2 (2)



6.5 SERVICE MODE ENERGYPAK

FOR BATTERIES WITH 5 LED INDICATION

The service mode is displaying 5 stages, in these stages you can read out error codes and the condition of the battery.

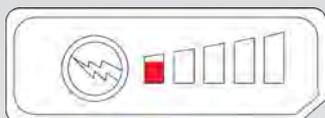
STAGE 1 / ERR1 (1)

LED Indication

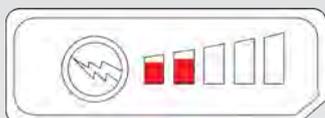
Error



No error



Over charge



Over discharge



Over charge current



Over discharge current



6.5 SERVICE MODE ENERGYPAK

FOR BATTERIES WITH 5 LED INDICATION

The service mode is displaying 5 stages, in these stages you can read out error codes and the condition of the battery.

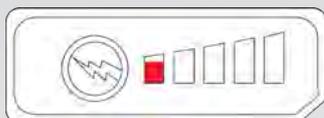
STAGE 2 / ERR1 (2)

LED Indication

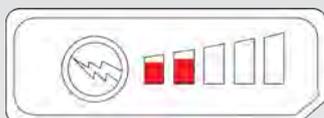
Error



No error



Cell over temp



Cell thermistor open



Fett over temp



Fett thermistor open



6.5 SERVICE MODE ENERGYPAK

FOR BATTERIES WITH 5 LED INDICATION

State of charge while charging: When the charger is connected, the LED board will display the current state of charge. The service mode is displaying 5 stages, in these stages you can read out error codes and the condition of the battery.

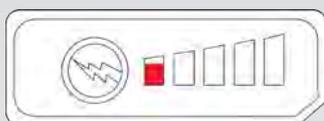
STAGE 3 / ERR2 (1)

LED Indication

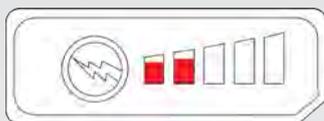
Error



No error



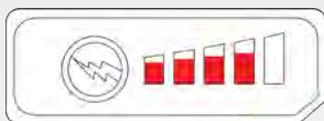
Cell imbalance



Data rom error



Precharge time-out



Over charge 1 & 2



6.5 SERVICE MODE ENERGYPAK

FOR BATTERIES WITH 5 LED INDICATION

State of charge while charging: When the charger is connected, the LED board will display the current state of charge. The service mode is displaying 5 stages, in these stages you can read out error codes and the condition of the battery.

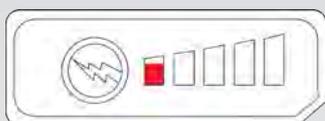
STAGE 4 / ERR2 (2)

LED Indication

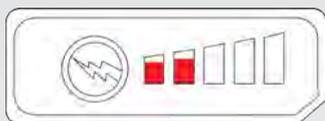
Error



No error



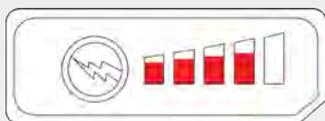
Reserved / not in use



Reserved / not in use



Reserved / not in use



Reserved / not in use



: Led On



: Led Blinking

6.5 SERVICE MODE ENERGYPAK

FOR BATTERIES WITH 5 LED INDICATION

State of charge while charging: When the charger is connected, the LED board will display the current state of charge. The service mode is displaying 5 stages, in these stages you can read out error codes and the condition of the battery.

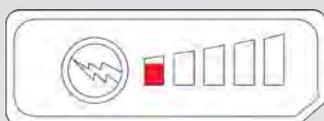
STAGE 3 / ERR2 (1)

LED Indication

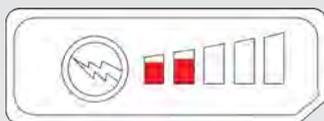
Error



No error



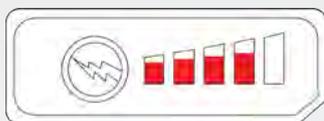
Cell imbalance



Data rom error



Precharge time-out



Over charge 1 & 2





momentum

GIANT

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**POWER
YOUR
JOURNEY.**

