

SERVICE AND WARRANTY GUIDE AND AGREEMENT

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Service and Warranty Guide

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Introduction

The information in this guide is required for a Dealer or Operator to gain Certified Service Center (CSC) and Warranty processing status for the KINETICS hybrid.

Some basic requirements are listed here. Further detail on following pages.

Certified Service Center Business

- a) Must have a Crosspoint Kinetics account.
- b) Required to have specified CK spares in stock.
- c) Will be paid a premium to stock parts for warranty replacement.

Shop facilities:

- a) Proper functioning shop equipment. (Lifts, hoists, tools, etc.)
- b) Clean and well lighted shop environment.
- c) Adequate communications infrastructure. (Phones, email and internet)
- d) Laptop, tablet or suitable computer with specified interfaces.

Certification of technicians:

- a) Technicians must follow good standard maintenance practices.
- b) CSC must have trained technician(s) with the KINETICS hybrid system. Initial training is free of charge and a certificate will be issued. See appendix A.
- c) Dealer/Operators are responsible for training a new tech if one leaves or unable to accomplish the responsibility. They are required to contact Crosspoint Kinetics to set up a new training session. There will be a charge for the additional training.
- d) Recurrent training is required on an annual basis (undefined)

Shipping facilities:

- a) Loading dock or forklift. Lift gate truck is acceptable.
- b) Ability to repackage return components same as the warranty parts delivered.
- c) Adequate communication and printing capability.

Shop Requirements

Tool	Type	Use	Quan	Req
Bus Lift (or Pit)	Drive-on or 4 post	Lift bus	1	Yes
Transmission Jack	Extendable to 5 feet	Raising /lowering components	1	Yes
Basic Tools				
Wrenches	3/8" - 3/4"	General Use		Yes
Wrenches	5/16" - 12 point	Driveline		Yes
Wrenches	3/8" - 12 point	Driveline		Yes
Socket set	3/8" drive - 3/8"-3/4"	General Use		Yes
Sockets	1/2" drive - 9/16" & 3/4"	Main bolts		Yes
3/8" Impact driver	9/16" & 3/4" sockets	Main bolts	1	Yes
3/4" Impact driver	1 5/8" & 1 7/8" sockets	Yokes	1	Yes
Portable driver	6" ext - 1/4" socket 1/4" drive	Cable boot clamps		Opt
Various handtools	Tech or shop tools			Yes
Pry Bar	18"	Line up motor main bolts	1	Yes
Hose Pinchers	2 each. 4 is better	Glycol hoses	2	Yes
Electrical Multi Use Tool	Wire cutter, stripper, butt conn	Repairs	1	Yes
Other Tools				
Crimper for Deutsch pins	HDT-48-00	Crimp solid pins/sockets	1	Equiv
Crimper for Deutsch pins	DTT-12-00	Crimp stamped/pins/sockets	1	Equiv
Crimper for Deutsch pins	DTT-16-00	Crimp stamped/pins/sockets	1	Equiv
Crimper for Deutsch pins	DTT-16-01	Crimp stamped/pins/sockets	1	Equiv
Voltmeter	Fluke or equivalent	Repairs	1	Yes
Impedance Meter	BK 878 or equivalent	Check for internal motor short		Opt
Heat gun or butane torch	Shrinking butt connectors		1	Yes
Extractor for 30 pin Deutsch	0411-291-1405	14, 16 gage	1	Equiv
Extractor for 30 pin Deutsch	114010	12 gage	1	Equiv
Extractor for Deutsch	6757-201-1601	16 gage	1	Equiv
Extractor & lock for rotor	Pull rotor out of stator and lock	For actuator arm servicing		Opt
Lock plate for rotor	Hold rotor in extended pos	For keeping bus in service		Opt
Specific Diagnostic Tools				
J206 Enable breakout		Enable string integrity		Opt
J203B Actuator power conn		Apply battery power to actuator		Opt
J20x Act sensor breakout		Measure resistance of sensor		Opt
J103 Encoder breakout		Access to measure voltage		Opt
J207 Ucap breakout		Measure Ucap voltage		Opt
J205 Cooling Unit breakout		Measure various voltages		Opt

Spares Recommended

Item	Description	CK part #	Vendor part #	Quan	Req
400 amp fuse	Main fuse	80-5731	4XC85	2	Yes
40 amp fuse	Power box fuses	80-5803	9180K88	2	Yes
80 amp fuse	Main battery fuse	80-9310	MAX-80	2	Yes
Cable Ties	Various sizes			Stock	Yes
Electrical tape	Any suitable	80-5763	76455A22	Stock	Yes
Bellville washers	M10	80-6454	96445K246	10	Yes
Bellville washers	M12	80-6457	9712K74	10	Yes
Bellville washers	M8	80-6453	96445K238	10	Yes
Bolts	3/8"-16 x 1"	80-9151	92865A624	10	Yes
Nuts, plain	3/8" - 16	80-9351	95462A031	10	Yes
Washers	3/8"	80-9152	98023A031	10	Yes
Washers, lock	3/8" split ring	80-9352	91102A760	10	Yes
Cable Boots	Phase and Power cables	80-2433	ATM191419831	2	Yes
Boot Clamps	Phase and Power cables	80-5761	5388K26	2	Yes
Boot Clamps	Phase and Power cables	80-5762	5388K34	2	Yes
Caps for glycol hoses					No
Hose clamps for glycol	Ear clamps for 1/2" hose	80-2311	5435K19	10	Yes
Butt Connector	Red - heat shrink		9895K13	10	Yes
Butt Connector	Blue - heat shrink		9895K15	10	Yes
Butt Connector	Yellow - heat shrink		9895K17	10	Yes
J203 B	Actuator plug - harness	80-4023	DTP06-2S		No
J203B Contacts	Sockets, Stamped	80-4001	1062-12-0166		No
J203B Wedge Lock		80-4031	WP2S		No
J206	Ucap 12 pin plug - harness	80-4024	DT06-12SA		No
J206 Contacts	Sockets , Stamped	80-5751	1062-14-0122		No
J206 Wedge Lock		80-4032	W12S		No
Di-electric Grease	All electrical connections			1	Yes

Warranty Processing

Parts Manager and Warranty Issues:

- a) Warranty action and parts approval recommended prior to repair being commenced. Unapproved actions and parts may not be covered under written warranty policy.
- b) Parts Manager must provide documentation for the failed part. Preferably a form to mail or email Crosspoint Kinetics Warranty Claims Administrator. See App D.
- c) Labor times will be reimbursed according to Standard Replacement Times (SRT's) issued by Crosspoint Kinetics. See App B.
- d) Repair must be completed by a certified technician otherwise it is grounds for warranty denial.
- e) Service intervals on the hybrid components must be followed and records kept to obtain warranty replacement. See App C.
- f) Warranty parts will need to be returned within 7 days.
- g) For warranty replacement, contact Customer Service to obtain a Return Material Authorization (RMA).
- h) Customer must order purchased parts through a certified dealer or Service Center.
- i) Customer will be invoiced for part(s) on their account and the credit will follow post warranty approval.

Failure to do any of the above can result in delayed warranty reimbursement or warranty denial.

Contact us at:

Customer Care: (877) 826-9399 x2905

Or:

CustomerCare@crosspointkinetics.com



Appendix A - Technician Training Outline

Maintenance Training for the Crosspoint Kinetics Hybrid

Tech will be briefed on:

- System components and purpose
- Regen and Boost w/400 ft. lb. torque output
- Start to first shift point is highest fuel usage
- Operation above 35 mph system is in standby
- Maintenance approach, tools and calibration

Hybrid Operation

- Driver dependent accelerator and brake usage and impacts
- Independence of hybrid from engine
- Automatic w/no ECM or CAN interface

Hybrid Components

- Motor features + actuator
- Controller features, indicators and interfaces
- Ultracapacitor energy storage characteristics and safety
- Cooling unit features (two pumps and a fan)
- Power box (2 (40) amp fuses)
- Impact switch
- Driver display (Driver feedback)
- Accelerator sensor components
- Brake pressure transducer

Troubleshooting Guide Available for download

Annual and Periodic

- Inspection Check List in Maintenance Manual
- Coolant life + additive (2 years)

Mileage

- Actuator life 50,000 miles
- Rotor bearing lube (20,000 miles) Refer to manuals



Safety Features

- GFI monitoring and reset
- Impact switch
- Ultracapacitor Palm button

Towing the Hybrid

- Removal of rear shaft (short distance and low tow speed do not do)
- Put on rollback if highway speeds are expected

Welding safety

- Disconnect items (follow Welding guide)
- Reconnect items (Manual has standard practices)

Enable String

- Show/explain wiring diagram
- How to troubleshoot enable string

Details Under Bus

- Show details of actuator. Remove cover and cycle system
- Details of Controller, Ucap and Cooling unit area (reservoir)

Driver Lights

- Light sequences with hybrid on and off

HCal Use Realtime

- Fault Code Reading
- GFI demonstration
- Entering Parameters and Saving Data
- Driving using HCal
- Phase Encoder scope

Driving Using Animation

- Understand good driving practices
- Understand Boost/Regen
- Turbo Boost Parameters

Appendix B – Standard Replacement Time (SRT)

Item replaced	Part #	Labor allowance
Vibration Mount, hybrid motor	30-982	1.5
Vibration Mount, hybrid controller	80-2280	1.5
Brake Transducer Pressure, Hydraulic	80-2550	1.5
*Accelerator String Pot Assembly	80-2532	2
*Accelerator Throttle Board	80-2600	1
40 amp fuse	80-5803	1.5
80 amp fuse	80-9315	1.5
400 amp fuse	80-5731	1.5
Hybrid Driver Panel	80-2520	0.5
Impact Switch	80-2540	0.5
Actuator 6" Stroke Assembly	30-3016	2
Ultra Capacitor Assembly	9380C11A	2
*Motor Generator Unit	3106A41A	4
*Controller Assembly	8381C08B	3
Coolant Reservoir	30-3094	1
Cooling Assembly	80-3300	1
**Cooling Blower Assembly	80-3005	2
Power Box	80-4501	2
Main Contactor	80-2580	2

Replacement times only.

Troubleshooting and Testing labor are .5 hours each.

*These include calibration.

**Plug style blower

Labor rate Not to exceed 3X Technician labor rates
(subject to audit)



Appendix C - Maintenance and Service Parts Identification

Recommended Maintenance Intervals for Vehicles in Transit Service:

- Monthly – Review driver comments about hybrid operation, perform visual inspection, perform GFI test per driver manual procedure. With engine running, turn hybrid switch OFF and verify flashing red LED (disabled state). Turn hybrid switch ON and verify green LED (Ready state).
- Every 6 months or 20,000 miles– (whichever comes first)
 - Check hybrid coolant reservoir for correct level, add standard 50 / 50% water / glycol coolant as needed. With ignition ON but engine OFF, have a helper cycle hybrid from ON to OFF and then back ON. Verify the shift actuator on hybrid motor moves and shifts quietly. If operation is noisy, replace actuator.
 - Conduct hybrid motor linear bearing lube procedure: With ignition ON, turn driver panel switch to off – this will shift magnet rotor to the full forward position. Turn OFF ignition. Disconnect forward driveshaft at front motor yoke. Remove 1/8 NPT pipe plug from center of motor shaft. Use a hand operated grease gun containing Mobil 1 high temp grease and verify this is primed and pumps grease. Connect to the 1/8 “ NPT thread, and pump the handle six (6) times to dispense a measured amount of grease to the motor shaft ball slide. Disconnect grease gun, replace plug and drive shaft. Turn ON ignition and engine, turn ON hybrid switch. Test drive vehicle to verify correct hybrid and driveline operation.
 - Check hybrid system for correct boost and regen performance using a driving test. Visually inspect for cable and connector sealing.
- Every 24 months *OR if using extended life coolant, every 100,000 mi.* – Disconnect hose at the bottom of the coolant reservoir and drain coolant. Turn ON the ignition and hybrid system to drain hybrid coolant for approx. 2 min. Do Not allow pumps to run dry for more than 5 minutes or damage will result. Turn OFF, reconnect hose to reservoir and refill with new 50% automotive water / glycol coolant while the hybrid is ON. Verify coolant flow back into reservoir and run for 5 minutes. Top off coolant. ***After purging and filling the hybrid system, add 8 ml per gallon of Triadine 20 microbiocide additive (sold by ITW / Rustlick PN 77116) to the hybrid reservoir to prevent bacterial growth. (Available at www.mscdirect.com PN 07559974)***

Service Intervals (cont)



- Inspect and test actuator operation at 25,000 miles or 6 months. (See '*Actuator Removal/Install*' section earlier in this manual)
- 150,000 miles – Replace shift actuator PN 30-3016. (See '*Actuator Removal/Install*' section earlier in this manual.
- Replace motor at 250,000 miles.
- Expected service life of the Kinetics Hybrid is 250,000 miles with 6 start/stop per mile cycle.

For reference only - refer to current publications for any changes



Appendix D - Warranty Claim Report Example

Customer name	Phone	Bus No.
Date:	[Date]	VIN No.
Status of call	Choose an item.	Address
Instructions from CK Rep	City, ST ZIP Code	On
		[Date]

- Hybrid Issue

Problem reported + Fault Codes

Call reported by	Make
Date time	[Date time]
Part No.	Part Item
	Part Serial No.

- Service Details

Part Installed

Technician Remarks

Status after service	<input type="radio"/> Complete	<input type="radio"/> Incomplete	<input type="radio"/> Pending for spares
	<input type="radio"/> Under observation	<input type="radio"/> Working solution provided	

Defects found on inspection

- EVENTS | Date | time [Date | time] Start of service [Date | time] | End of service [Date | time]

- Customer Feedback

Remarks

CK Rep	Designation
CIR	RMA
	Email



Signature

Date

- Form available at Crosspoint Kinetics, LLC
- Customer substitute must be approved



Appendix E – Limited Warranty

**Crosspoint Kinetics, LLC**
Parallel Electric Hybrid Drive**LIMITED WARRANTY (USA and Canada)**

Crosspoint Kinetics, LLC ("Crosspoint") issues the following express Limited Warranty for KINETICS Parallel Electric Hybrid Drive, subject to the following terms, conditions and limitations:

1. **What is Covered:** This Limited Warranty covers the costs of material and labor to repair, or replace at Crosspoint's sole option, with new or refurbished parts or components, Purchaser's KINETICS Parallel Electric Hybrid Drive and component parts (the "Hybrid System"), purchased from Crosspoint, which have failed or malfunctioned during the warranty period as a result of a defect in material or workmanship under normal use and service.
2. **Who is Covered:** (a) Anyone who purchases a vehicle from an authorized Crosspoint retailer which is equipped with a new Hybrid System or (b) anyone who purchases a new Hybrid System from an authorized Crosspoint retailer to be installed in an existing vehicle by an authorized Crosspoint installer (each referred to herein as a "Purchaser") is entitled to coverage under this Limited Warranty. This Limited Warranty is non-transferable.
3. **Warranty Period:** The term of this Limited Warranty shall be in effect two (2) years from the date of installation of your Hybrid System, or the first thirty-six thousand (36,000) miles of operation of the Hybrid equipped vehicle, whichever occurs first. This is a repair warranty, not a future performance warranty. Any defect discovered or reported after the expiration of the
4. **Obtaining Repairs:**
 - a) To obtain repairs, the Purchaser must first complete and submit the Limited Warranty Registration Information.
 - b) The Purchaser must contact Crosspoint's warranty administrator at 1-855-435-4301 within thirty (30) days after the alleged defect is discovered or in the exercise of ordinary diligence should have been discovered. Prior to calling, please have the date of purchase and installation of the Hybrid System, the vehicle identification number, and the current mileage on the Hybrid equipped vehicle available for the representative. The representative will provide Purchaser with instructions regarding obtaining repairs, which may include:



- i) Taking the vehicle to the nearest authorized Crosspoint service location. The Purchaser is responsible for any costs in transporting the vehicle to and from the designated authorized Crosspoint service location.
- ii) Having an authorized field technician perform an onsite inspection and/or repair of the Hybrid System and, if necessary, having the Hybrid System or component parts shipped to an authorized Crosspoint repair facility. The Purchaser is responsible for any costs in transporting the Hybrid System or component parts to and from the designated authorized repair facility.
- c) In the event a warranty claim is denied by Crosspoint, the Purchaser may be given the option to pay an authorized Crosspoint repair facility to make the necessary repairs.

LIMITATION OF WARRANTIES: THIS WARRANTY IS GIVEN EXPRESSLY AND IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. THERE ARE NO UNDERSTANDINGS, AGREEMENTS, REPRESENTATIONS, OR WARRANTIES NOT SPECIFIED HEREIN.

To the extent implied warranties cannot be excluded by law, any such warranties shall be limited to the term of this Limited Warranty.

*** Important additional exclusions on the next page. ***

5. **What is NOT Covered:** This Limited Warranty covers only the items expressly provided herein. Some examples of items not covered include:
- a) Normal maintenance tasks and consumables, such as, lubrication, filters, belts, hoses, gaskets, bearings, coolant, and connectors.
 - b) Failures, malfunctions, or non-conformities of the Hybrid System attributable in whole or in part to the failure to preserve, maintain, or operate the Hybrid System in accordance with applicable recommendations of Crosspoint.
 - c) Failures, malfunctions, or non-conformities of the Hybrid System attributable in whole or in part to acts of God, misuse, abuse, neglect, corrosion, wear, abrasion, erosion, flooding, fire, theft, vandalism, or accident.
 - d) Failures, malfunctions, or non-conformities of the Hybrid System caused by parts or components of the vehicle which are not part of the Hybrid System.
 - e) Failures, malfunctions, or non-conformities of the Hybrid System caused by improper installation, service, or repairs of the Hybrid System by an unauthorized Crosspoint installer, service provider or repair facility.
 - f) Other non-Hybrid System parts or components of the vehicle.
 - g) Hybrid Systems manufactured by Variable Torque Motors, Inc. or not sold by Crosspoint Kinetics, LLC.
6. **Actions Which Will Void The Purchaser's Benefits In This Limited Warranty:** Purchaser's rights and benefits under this Limited Warranty will be voided and extinguished upon the occurrence of any of the following events. (Notwithstanding the voiding and extinguishing of Purchaser's rights and benefits, the provisions of the Limited Warranty for the benefit of Crosspoint, including but not limited to the limitations of liability and of warranties, shall not be voided or extinguished.)
- a) Removing the Hybrid System from the vehicle.
 - b) Disconnecting or altering the Hybrid System or the odometer.
 - c) Operating your vehicle outside the United States or Canada.
 - d) Opening any of the sealed components of the Hybrid System.



7. **Other Terms:**

- a) **The obligations of Crosspoint under this Limited Warranty are limited to the repair of the Hybrid System as provided herein. In no event, whether as a result of breach of contract or warranty, negligence, product liability or otherwise, shall Crosspoint be subject to liability for incidental, consequential, special or punitive damages of any kind, including without limitation to, damage to other property, personal injuries, commercial losses, lost profits, loss of use, inconvenience, loss of time, cost of capital, cost of replacement or substitute vehicles, downtime, towing, delivery, shipping costs or claims of customers.**
- b) **This Limited Warranty is expressly in lieu of any non-contractual liabilities including negligence or product liability.**
- c) Crosspoint's failure to enforce any of the terms or conditions stated herein shall not be construed as a waiver of such provision or of any other terms and conditions of this Limited Warranty.
- d) If any one or more of the provisions contained in this Limited Warranty shall be invalid, illegal or unenforceable in any respect, the validity, legality or enforceability of the remaining provisions contained therein shall not in any way be affected or impaired thereby.
- e) This Limited Warranty shall be construed and interpreted in accordance with the laws of the State of Indiana, without reference to its choice of law rules.
- f) Any controversy or claim arising out of or relating to this Limited Warranty or breach thereof shall be litigated only in the Circuit or Superior Courts of Marion County, Indiana or the United States District Court for the Southern District of Indiana, Indianapolis Division. In connection with the foregoing, the purchaser consents to the jurisdiction and venue of such courts and expressly waives any claims or defenses of lack of jurisdiction or proper venue by such courts.
- g) In no event shall the liability of Crosspoint arising under this Limited Warranty exceed the retail price of the Hybrid System.
- h) To the extent applicable law does not permit certain limitations set forth in this Limited Warranty, such limitations shall not be applied or invoked. Nothing in this Limited Warranty will be interpreted to disclaim liability of Crosspoint for gross negligence or willful misconduct.

By signing below you are acknowledging that you and your company and will abide by these rules and guide lines for providing services for Crosspoint Kinetics.

Company

Position

Signature

Date
