Curtis 1268-ITS



Part Numbers: 1268-5401, 5404, 5411, 5412, 5415, 5416, 5418, 5502, 5505, 5508, 5509

This sheet is provided to aid in the installation of your remanufactured CURTIS controller. Upon installation, you may encounter problems that may, or may not, be due to a faulty controller. The following steps must be taken to help diagnose a possible cart fault or faulty controller. An analog or digital volt ohm meter (VOM) will be needed to perform these checks.

WARRANTY WILL BE VOID

If These Steps are Not Performed Before Installing The Control

STEPS TO PERFORM ***BEFORE*** CONTROL INSTALLATION

CHECK MOTOR WINDINGS:

☐ Set your VOM to RESISTANCE (Ω).
☐ With your motor disconnected, measure A1 to A2. This must measure BETWEEN .2Ω and 2Ω.
☐ With your motor disconnected, measure F1 to F2. This must measure BETWEEN .8Ω and 3Ω.
☐ With your motor disconnected, measure A1 to F1. This must measure OPEN.
☐ With your motor disconnected, measure F1 to motor case. This must measure greater than 5MΩ.

CHECK MAIN SOLENOID:

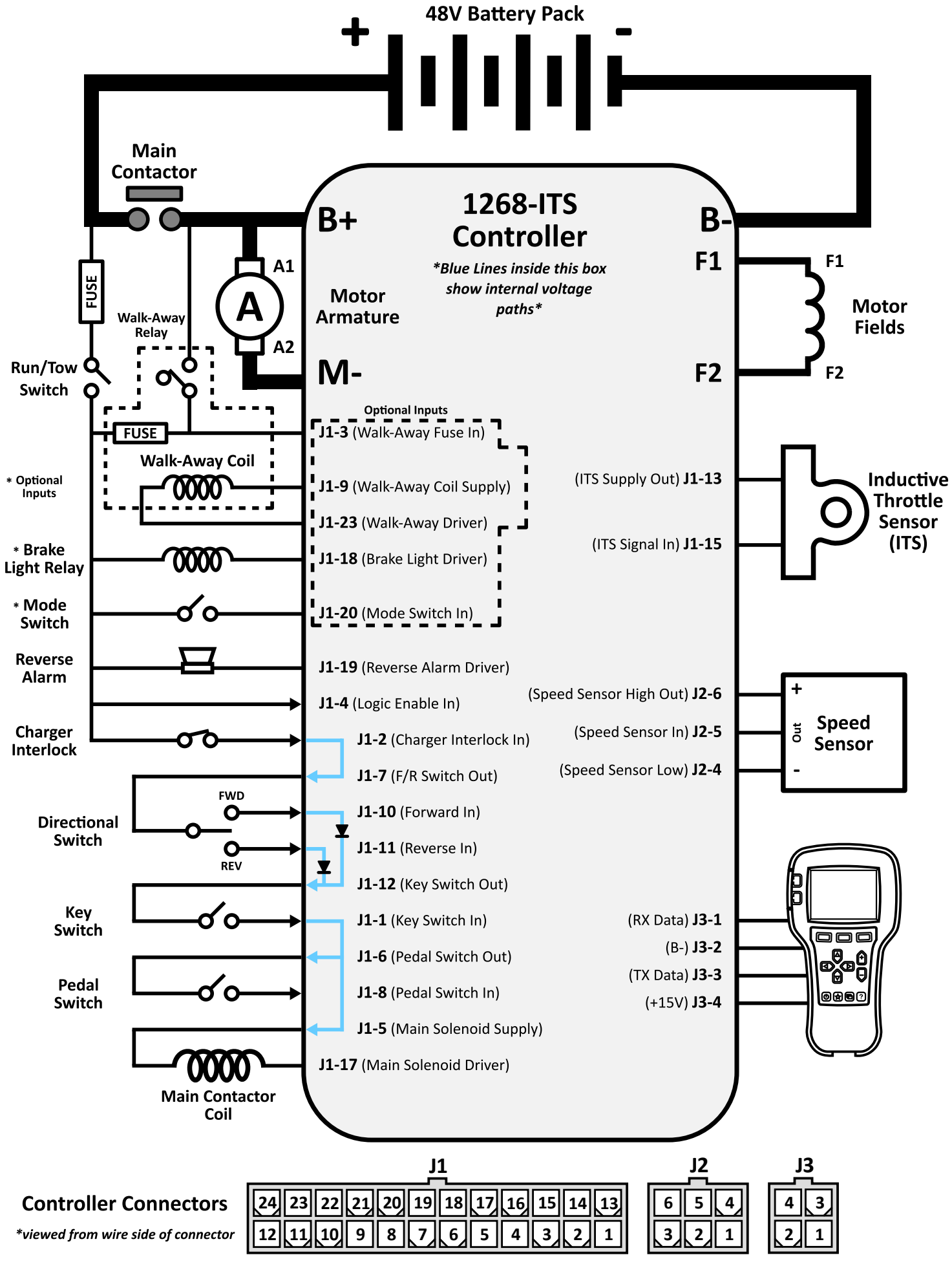
☐ Disconnect all wires from the main solenoid.
☐ Set your VOM to RESISTANCE (Ω).
☐ Measure the solenoid coil. This should measure 100Ω - 250Ω (depending on solenoid type).
☐ Connect VOM leads to the main solenoid lugs.
☐ Attach jumpers from main battery positive and negative to the coil (small terminals).
☐ Meter must jump from infinity to LESS THAN .3Ω.
☐ Remove jumpers and reconnect solenoid wiring from the harness. (If suppression diode is present, the non-banded side must go to the wire from J1-17 from the controller. Be sure to check diode functionality with VOM prior to installation. If pre-charge resister is installed, please remove. This control is equipped with an internal resistor, and installing one on the solenoid could cause damage to the control.)

CHECK THE CART WIRE HARNESS:

☐ Check the connectors on the wire harness for corrosion, loose, broken, burnt or missing pins.
☐ Repair or replace pins as necessary.

IF ANY OF THE ABOVE ITEMS ARE NOT WITHIN THE SPECIFICED RANGES THE CONTROLLER WILL FAIL. THESE ITEMS MUST BE CORRECTED BEFORE THE CONTROLLER IS INSTALLED OR WARRANTY WILL BE VOID.

It is recommended to replace your solenoid at the time of controller replacement. FSIP now stocks popular replacement White Rodgers solenoids for your convenience.


48V Battery Pack
+
-
Main Contactor
1268-ITS Controller
Blue Lines inside this box show internal voltage paths
B+
B-
F1
F2
M-
A1
A2
A
Motor Armature
Motor Fields
FUSE
Walk-Away Relay
Run/Tow Switch
FUSE
Walk-Away Coil
* Optional Inputs
Optional Inputs
J1-3 (Walk-Away Fuse In)
J1-9 (Walk-Away Coil Supply)
J1-23 (Walk-Away Driver)
J1-18 (Brake Light Driver)
J1-20 (Mode Switch In)
* Brake Light Relay
* Mode Switch
Reverse Alarm
Charger Interlock
J1-19 (Reverse Alarm Driver)
J1-4 (Logic Enable In)
J1-2 (Charger Interlock In)
J1-7 (F/R Switch Out)
FWD
REV
Directional Switch
J1-10 (Forward In)
J1-11 (Reverse In)
J1-12 (Key Switch Out)
Key Switch
J1-1 (Key Switch In)
J1-6 (Pedal Switch Out)
Pedal Switch
J1-8 (Pedal Switch In)
J1-5 (Main Solenoid Supply)
J1-17 (Main Solenoid Driver)
Main Contactor Coil
(ITS Supply Out) J1-13
(ITS Signal In) J1-15
Inductive Throttle Sensor (ITS)
(Speed Sensor High Out) J2-6
(Speed Sensor In) J2-5
(Speed Sensor Low) J2-4
+
Out
-
Speed Sensor
(RX Data) J3-1
(B-) J3-2
(TX Data) J3-3
(+15V) J3-4
Controller Connectors
*viewed from wire side of connector
J1
24 23 22 21 20 19 18 17 16 15 14 13
12 11 10 9 8 7 6 5 4 3 2 1
J2
6 5 4
3 2 1
J3
4 3
2 1

1268-ITS Troubleshooting Sequence

FOR SAFETY, ALWAYS LIFT THE DRIVE WHEELS OFF THE GROUND WHEN TROUBLESHOOTING!

ALL TESTS ARE CONDUCTED WITH RUN-TOW/MAINTENANCE SWITCH IN THE RUN. ALSO, THE CONNECTOR MUST BE ATTACHED TO THE CONTROLLER WHEN MAKING THESE CHECKS. YOU WILL NEED TO 'BACK PROBE' THE PINS FROM THE WIRE SIDE OF THE CONNECTOR. USE A PAPERCLIP IF NECESSARY.

Attach voltmeter negative (-) lead to main battery – for the following tests

Use the following sequence when checking individual pins (don't skip steps). **If you find a fault, do not move on to the next step until the fault is corrected:**

☐ Measure the voltage at the main battery positive post (let's call it Pack Voltage)

☐ **Pin J1-3** Must equal Pack Voltage
- *If not Pack Voltage, check wiring, Run/Tow switch and fuse for an open condition.*

☐ **Pin J1-4** Must equal Pack Voltage
- *If not Pack Voltage, check wiring, Run/Tow switch and fuse for an open condition.*

☐ **Pin J1-2** ***With charger disconnected***, must equal Pack Voltage
- *If not Pack Voltage, check wiring and charger interlock switch for an open condition.*

☐ **Pin J1-7** ***With charger disconnected***, must equal Pack Voltage
- *If not Pack Voltage, check continuity between J1-2 and J1-7. If open, internal trace in controller has been damaged.*

☐ **Pin J1-10** ***With F/R Switch in Forward***, must equal Pack Voltage
- *If not Pack Voltage, check wiring and F/R Switch for an open condition.*

☐ **Pin J1-11** ***With F/R Switch in Reverse*** must equal Pack Voltage
- *If not Pack Voltage, check wiring and F/R Switch for an open condition.*

☐ **Pin J1-12** ***With F/R Switch in Forward or Reverse*** must equal Pack Voltage
- *If not Pack Voltage, and previous directional switch tests are good, then internal trace in controller has been damaged.*

☐ **Pin J1-1** ***With Key Switch On*** must equal Pack Voltage
- *If not Pack Voltage, check wiring and Key Switch for an open condition.*

☐ **Pin J1-5** ***With Key Switch On*** must equal Pack Voltage
- *If not Pack Voltage, check continuity between J1-1 and J1-5. If open, internal trace in controller has been damaged.*

☐ **Pin J1-17** ***With Key Switch On*** must equal Pack Voltage (Solenoid should NOT be engaged at this time)
- *If not Pack Voltage, check wiring and Key Switch for an open condition. Also check main contactor coil and wiring for an open condition.*

☐ **Pin J1-6** ***With Key Switch On*** must equal Pack Voltage
- *If not Pack Voltage, check continuity between J1-6 and J1-1. If open, internal trace in controller has been damaged.*

☐ **Pin J1-8** ***With Pedal Up***, must equal 0V
- *If not 0V, check wiring and Pedal Switch for a shorted condition.*

☐ **Pin J1-8** ***With Pedal Down***, must equal Pack Voltage
- *If not Pack Voltage, check wiring and Pedal Switch for an open condition.*

☐ **Pin J1-17** ***With Key Switch On***, **and Pedal Down**, must equal less than 1V (Solenoid should be engaged)
- *If not less than 1V, check solenoid coil/wiring for faulty condition. Ensure no active fault occurring.*

☐ **Pin J1-19** ***With F/R Switch in Neutral***, must equal approximately Pack Voltage
- *If not approximately Pack Voltage, check wiring and Reverse Alarm for an open condition.*

☐ **Pin J1-19** ***With F/R Switch in Reverse****,* must equal less than approximately 1V (and Reverse Alarm beeps)
- *If correct voltage, but no sound from Reverse Alarm, replace Alarm.*

☐ **Pin J1-13** ***With Key Switch on****,* must equal 14 to 15V
- *If not 14 to 15V, remove ITS sensor and recheck. If voltage returns, check ITS sensor and wiring, ITS sensor or wiring may be faulty. If voltage does not return, controller may be defective.*

☐ **Pin J1-15** ***With Key Switch on, and Pedal up***, must equal approximately 0.8V **±0.3V**
- *If voltage is out of tolerance, ITS may be defective. Replace as necessary.*

☐ **Pin J1-15** ***With Key Switch on, and Pedal fully depressed***, must equal approximately 2V **±0.3V**
- *If voltage is out of tolerance, ITS may be defective. Replace as necessary.*

☐ **Pin J2-4** Must equal 0V
- *If not 0V, harness and/or harness connector is defective, check wiring.*

☐ **Pin J2-6** Must equal 14 to 15V
- *If not 14 to 15V, check wiring and check with Speed Sensor removed – if voltage returns to 14 to 15V, Speed Sensor may be faulty.*

☐ **Pin J2-5** ***While <u>slowly</u> turning the drive wheel***, must toggle between 0V and approximately 5V
- *If not toggling, check wiring and if necessary, replace Speed Sensor and/or magnet.*

*** Note: This controller is capable of many optional features and functions that may or may not be present on your cart. ***

<u>If no wire in the mentioned position, skip the step</u>

See checks below for optional vehicle features:

☐ **Pin J1-3** Must equal Pack Voltage
- *If not Pack Voltage, check wiring and Walkaway Fuse for an open condition.*

☐ **Pin J1-9** Must equal Pack Voltage
- *If not Pack Voltage, controller may be defective.*

☐ **Pin J1-23** Must equal Pack Voltage
- *If not Pack Voltage, check wiring and Walkaway Relay for an open condition.*

☐ **Pin J1-23** ***While pushing on cart,*** *m*ust equal approximately 0V
- *If not approximately 0V, controller may be mis programmed or faulty.*

☐ **Pin J1-18** Must equal Pack Voltage
- *If not approximately Pack Voltage, check wiring and Brake Light Relay coil for an open condition.*

☐ **Pin J1-20** ***With Mode Switch open,*** *m*ust equal 0V
- *If not 0V, check wiring and Mode Switch for a shorted condition.*

☐ **Pin J1-20** ***With Mode Switch closed,*** *m*ust equal Pack Voltage
- *If not Pack Voltage, check wiring and Mode Switch for an open condition.*

☐ **Pin J1-16** Must equal 0V

☐ **Pin J1-22** Must toggle between approximately 0 and 2V and must be same as the Status LED on the controller
- *If not toggling between approximately 0 and 2V, check wiring and remote LED for an open condition.*

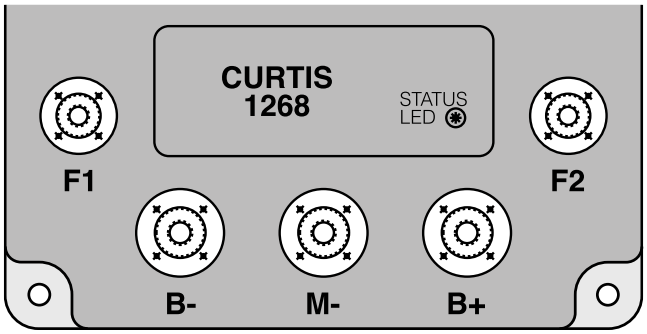
TROUBLESHOOTING CHART

LED CODE	Programmer LCD Display	Explanation	Possible Causes
1,1	HW FAILSAFE	Self-test or watchdog fault.	1. Controller defective.
1,2	THROTTLE FAULT 1	Wiper signal out of range.	1. Throttle input wire open. 2. Throttle input wire shorted to B+ or B-. 3. Throttle pot defective.
1,3	SPEED SENSOR FAULT	No pulses from Speed Sensor.	1. Speed Sensor not connected. 2. Speed Sensor defective.
1,4	HPD	High Pedal Disable fault.	1. Improper sequence of direction and throttle inputs.
1,5	MOTOR STALL	Motor Stall at current.	1. Slope too steep for vehicle weight. 2. Mechanically locked motor. 3. EM Brake wiring failure. 4. Speed Sensor defective.
2,1	LOW BATTERY VOLTAGE	Low Battery Voltage.	1. Battery Voltage < Undervoltage cutback threshold. 2. Corroded Battery terminal. 3. Loose Battery or Controller terminal.
2,2	OVERVOLTAGE	Overvoltage.	1. Battery Voltage > Overvoltage shutdown threshold. 2. Vehicle operating with charger attached. 3. Battery disconnected during Regen Braking.
2,3	THERMAL CUTBACK	Over/Under Temperature cutback.	1. Temperature > 85°C or < -25°C. 2. Excessive load on vehicle. 3. Improper mounting of controller. 4. Operation in extreme environments.
2,4	MAIN DRIVER ON	Main Contactor Coil held low.	1. Main Contactor missing or wire to solenoid coil open. 2. Controller defective.
2,5	AUX COIL FAULT	Missing Aux (Brake, Relay) Coil.	1. Aux Coil open or not connected.
3,1	MAIN DRIVER OFF	Main Contactor Driver held high.	1. Main Contactor Coil shorted. 2. Controller fault.
3,2	MAIN WELDED	Main Contactor welded.	1. Main Contactor stuck closed. 2. Main Contactor Driver shorted.
3,3	PRECHARGE FAULT	Internal Voltage too low at startup.	1. External short, or leakage path to B- on external B+ connection. 2. Controller fault.
3,4	FIELDING MISSING	Field Winding fault.	1. Motor Field wiring loose. 2. Motor Field wiring open.
3,5	AUX DRIVER OFF	Aux (brake/relay) Driver High.	1. Aux Coil shorted. 2. Controller fault.
4,1	CURRENT SENSE FAULT	Armature/Field Current Sensor Fault.	1. Motor or motor wiring. 2. Controller fault.
4,2	DRIVER OVERCURRENT	Contactor/Aux Driver Overcurrent.	1. Contactor or Aux Coil shorted.
4,3	M- SHORTED	M- shorted to B-.	1. Motor Armature shorted. 2. Controller fault.
4,4	AUX RELAY DNC	Aux Relay did not close.	1. Aux Relay missing or wire to coil open.

Continued on the next page...

TROUBLESHOOTING CHART CONTINUED

LED CODE	Programmer LCD Display	Explanation	Possible Causes
4,5	WELDED AUX RELAY	Welded Aux Relay.	1. Aux Relay stuck closed. 2. Aux Relay shorted.
5,1	KEY SWITCH SRO	SRO fault.	1. Key Switch ON at power-up. 2. Key Switch shorted.
5,2	MAIN COIL OPEN	Missing Main Contactor.	1. Main Contactor Coil open or not connected.
5,3	AUX DRIVER ON	AUX (EM Brake or WalkAway Relay) Driver Coil held low.	1. Improper sequence of direction and throttle inputs.
5,4	CIRCUIT BRKR OPEN	Circuit Breaker or Fuse open in WalkAway circuit.	1. Breaker/Fuse tripped or open. 2. Breaker/Fuse defective. 3. Relay/Fuse sense line broken.
5,5	MAIN DROPOUT	Main Contactor open.	1. Main Contactor defective.



LED DIAGNOSTICS

A built-in Status LED is visible through a window in the label on top of the controller. When the controller detects a fault, the Status LED flashes the 2-digit fault code. The code is flashed continuously until the fault is corrected. For example, code "3,2" – MAIN WELDED – appears as:

✳ ✳ ✳ *..PAUSE..* ✳ ✳

3 **2**

FSIP Electronics also offers the following Technical Support options …

Troubleshooting Manuals / Codes
www.shop.fsip.biz/en/content/technical-documents

Live Tech Support Chat
www.shop.fsip.biz

Technical Support Forum
fsip.websitetoolbox.com

PRE-INSTALLATION INSTRUCTIONS MUST BE FOLLOWED OR WARRANTY WILL BE VOID

IMPORTANT! 1268-ITS(THROTTLE) TROUBLESHOOTING INFORMATION INCLUDED IN THIS PACKET

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