# Synovia GPS Hardware Installation Overview

# 4200 Series LMU (4200, 4220, 4225, 4250)



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# **TOOLS REQUIRED**

- Voltmeter
- Cordless power drill 18 volt & 12 volt with extra batteries, charger, and the following bits:
  - Magnetized extension
  - #2 Phillips
  - 3/4" Hole saw bit or progressive step bit for antenna mounting hole – 18 volt drill ideal
  - 4 ¼" hole saw (only for special antenna install locations only of there isn't access on the interior bulk head like the child check monitor or 8 way monitor. You must drill behind the amber or red light on the exterior to gain access to tighten the GPS antenna)
     1/2" step bit
- #2 Phillips screwdriver
- 1/4" Flat bladescrewdriver
- 1/8" Flat bladescrewdriver
- 10' Ladder
- 25' Fish tape or HVAC zip ties (3' length, tape 2 together) Lowe's or Home Depot – These work great!
- Caulk gun or Silicon 3 oz tubes
- Electrical tape
- Flashlight or LED head lamp
- Utility knife
- Assorted pick tools
- Wire cutters
- Wire strippers
- Wire terminal crimper
- Auto wire strippers (Radio Shack or Irwin Brand to strip gray harness jacket only, without damaging the signal wires. Other strippers do not work as well.)
- Trash bags
- Dust buster (to clean up drill shavings)

### **GPS KIT**

- GPS Unit LMU 4200 series unit
- GPS / Cellular Combo Antenna
- 12-Conductor Cable with 22 Pin Molex, 4 Pin Power Molex

# **ADDITIONAL PARTS REQUIRED**

The additional parts required for installation will be provided by the customer (unless Synovia provides the installation services). The following is required for each school bus installation, depending on the make/model:

Item	Qty Per Bus
Simple ATC Fuse Holders	2
5A Fuse	2
Nylon Butt Connector (16-14 ga.) blue	5
Nylon Butt Connectors (22-18 ga) red	5
Nylon Butt Connectors (14-12 ga) yellow	3
Ring Terminal (5/16'' 22-18 ga.)	3
Ring Terminals( #8 22-18 ga)	3
Ring Terminals( #10 22-18 ga)	3
Screw MT Tie Wraps (8'' CableTie,blk)	5
Or 1"X1" sticky pads for cable ties	5
Female Disconnect Conn.(22-18 ga, red)	2
Tie Wraps (8'' CableTie,blk)	15
Female Disconnect Conn. Piggyback (22-18 ga, red)	2
Female Disconnect Conn. Piggyback (16-14 ga, blue)	2
Cable Clamp/Blk ( 3/8'')	8
Snap Grommet/ Bushing (hole diameter 3/4")	2
Tek Screw ( #8 X 3/4'' Phillips-Pan)	4
<b>Bosch Relay (For Exit Door Buzzer only)</b>	1
Pigtail for relay (For Exit Door Buzzer only)	1
<b>1n4004 diode (For Exit Door Buzzer only)</b>	1
1/4" Loom (feet)	10
10 Oz Silicone Caulk Tube	0.2
<b>Emergency Button (Optional)</b>	1
<b>Emergency Button Guard (Optional)</b>	1

# WIRING OPTIONS AND DIAGRAMS

Synovia GPS hardware is equipped with two status LEDs, one for GPS signal and one for cellular communication (COMM). These lights may be used to diagnose problems. The light near the gold GPS connector reports on the GPS signal, and the light near the gold COMM connector reports on the cell signal.





To ensure both COMM and GPS are working properly, check the following:

- LED lights should start blinking when key is turned on from initial installation.
- After 1 minute, Communications LED should stay on solid.
- After 1 minute, GPS LED should stay on solid.

The following are wiring options for Synovia's GPS hardware:

### **Basic Wiring**

- 12VDC or 24VDC Battery Power (Voltage does not drop to zero, during start – 8 or 9 volts is ideal) - RED WIRE
- Chassis Ground (Do not ground to brackets or parts that may vibrate loose over time)- BLACK WIRE
- True Ignition (non-accessory, Voltage does not drop to zero, during start - 8 or 9 volts is ideal) - WHITE WIRE

### **Expanded Input Options**

The hardware can detect a state change using either a 12VDC or ground signal from an electrical source, **depending on it's "scripting"**.

- Stop arm **12 volts typical**
- Amber lights **12 volts typical**
- Driver call button (requires additional button) 12 volt or ground optional
- Entrance door open/close (might require additional switch) 12 volt typical
- Chair lift door **12 volts typical**
- Turn signal/hazard lights 12 volts typical
- Reverse lights 12 volts typical
- Child check activation Ground typical
- Engine hood light 12 volts typical
- Exit door/window buzzer Ground typical

#### **MOLEX WIRING**

The GPS kit includes a 12-Conductor Cable with a 22-Pin Molex connector. There are 22 wires connected to the Molex which are outlined below. Sample inputs have been listed as well:

		Typical Monitored Event
1	Green	Entrance Door- 12 VDC when Door open
2	Brown	Emergency Button- Ground when active
3	Yellow	Amber Lights- 12 VDC when active
4	Orange	Stop Arm/Red Lights- 12 VDC when active
5	Violet	Wheelchair Lift Door-12VDC when Door open
6	Tan	
7	Gray	
8	Blank	
9	Blank	
10	Blue	
11	Black	
12	Red	
13	White	
14	Blank	
15	Blank	
16	Blank	
17	Pink	
18	Blank	
19	Blank	
20	Blank	
21	Blank	
22	Blank	

Typical Monitored Event



### 4 Pin Power Molex

1	Red	12 VDC Battery Source with 5A Fuse	
2	Black	Chassis Ground	
3	Blank		
4	White	12 VDC Ignition Source (Not Accessory) With 5A Fuse	



# **INSTALLATION PROCEDURE**

### **PRE-INSTALLATION**

### Non-functional, damaged, or pre-existing issues MUST be noted and reported immediately.

Prior to installing hardware, the following steps should be completed in order to verify that all systems are working on the vehicle:

- 1. Turn Engine On
- 2. Start/Stop Amber Lights
- 3. Open/Close Stop Arm
- 4. Open/Close Exit Door and Windows Listen for Buzzer at Each Point
- 5. Open/Close Chair Lift Door (if applicable)
- 6. Turn Engine Off
- 7. Disarm Child Alert System (if applicable)

Once all systems are verified in working order, tap points should be located using a voltmeter or similar device. As described in the wiring section, the inputs require either a 12VDC+ or a ground signal to register the associated event. Consult a Synovia representative for the proper wiring, based in the desired input.

### **INSTALLATION**

The following are guidelines for proper installation:

- Do not install antenna and cabling near Video Equipment or wiring
- Wire all input tap points (battery, ignition, stop arm, etc) as close to source as possible
- Do not use third party systems (video, child reminder, AC systems, etc) as input sources
- Install grommets in all drilled holes for control/coax cables
- Tie down all cabling with cable tie-wraps
- Minimize control/coax cable exposure use wire loom if cable must be exposed
- Silicone permanent mount antennas to ensure seal on roof of vehicle
- Silicone antenna connectors at GPS unit once installation is complete

### <u>Step 1</u>

### Locate the proper area to mount the GPS box.

- 1. Find suitable mounting location in the vehicle's interior, secure and hidden if possible. Ensure that exposure to moisture, vibration, and temperature extremes is minimized. Also consider accessibility for future maintenance.
- 2. Recommended locations include: inside the bulkhead or within the wiring panel (usually with exterior access).
- 3. Mount the unit to a solid surface using two  $#8 \times 34^{"}$  inch self-tapping screws, one at each end of the mounting bracket.

Do not mount the GPS unit behind a radio. This may be difficult to access in the future and may cause undesired interference.

#### Step 2

### Install antenna and route antenna cables.

1. Locate a proper position on the roof which will keep the antenna as level as possible. Keep the antenna at least 12 inches away from other 2-way or radio antennas. The following is an example of a properly installed antenna:



- 2. If the bus has bulkhead access with an overhead door, determine if the antenna can be mounted directly above the bulkhead with interior access. If no bulkhead access is available, remove the amber and/or red lights on the driver's side. If there isn't access behind the light, a 4 ¼" hole must be drilled behind the light to be able to tighten the antenna. Silicon the light during reassembly.
- 3. Drill a hole in the roof, making sure it is wide enough for both antenna connectors to fit through (34").
- 4. Feed the antenna cables into the bulkhead and toward the GPS unit. Depending on the bus model, you may need to drill another <sup>3</sup>/<sub>4</sub>" hole to feed the cables to the GPS unit, near the A-pillar. If another hole is drilled, use a grommet to protect the cabling loom if exposed and secure to A pillar with Square sticky pads, screwed into pillar.
- 5. Secure the antenna over the hole, applying silicone on the underside to

create a watertight seal. Screw the upper portion onto the lower portion.

- 6. Pull excess cabling into the interior bulkhead and zip tie to keep out of way. Keep excess cabling away from any existing video equipment to avoid possible interference.
- 7. Fasten female GPS and cellular connectors to male receptors on GPS unit. (Snug the connections with pliers, very carefully as to not break the brass connectors. They will loosen if tightened by finger, over time)
- 8. Apply a small bead of silicone on each connector to ensure they do not vibrate loose. This also will help identify any tampering.
- 9. Re-assemble the amber and/or red lights.

### **Step 3 Route the 12-conductor cable and make all the terminations.**

Connect the 12-conductor cable to the GPS unit using the 22-pin Molex connector. Connect 4-pin power Molex to the GPS unit.

Feed the wiring toward the wiring panel on the driver's side (or to the points of termination, if they are located elsewhere). Remove the corner panels or channel tubing along the driver's side window and feed the wiring into the electrical panel. If panels cannot be removed, use wire loom and screw down fasteners to secure and protect the exposed wiring.

Once inside the wiring panel, connect the appropriate wires as outlined in the wiring section. Remember each input (stop arm, door buzzer, etc.) must have the appropriate 12VDC+ or ground signal to register properly. Secure any relays where space is available. Use cable wire ties to keep wiring secure and out of the way.

### **POST-INSTALLATION**

- Test all inputs for 12VDC+ or ground (when applicable) when input is activated (stop arm, ambers, etc).
- Test to make sure that all systems affected during installation function properly.
- Make sure bus has a clear view of the sky (outside of a garage or shelter).
   Waite 2-3 minutes and ensure COMM LED comes on solid, and GPS LED comes on solid. The following is an LED explanation chart:

Condition	LED 1
Modem Off	Off
Comm On - Searching	Slow Blinking
Network Available	Fast Blinking
Registered and Connected	Solid

#### LED #1 (Comm LED) Definitions

#### LED #2 (GPS LED) Definitions

Condition	LED 1
GPS Off	Off
GPS On	Slow Blinking
GPS Time Sync	Fast Blinking
GPS Fix	Solid

 Complete the installation checklist that includes recording of GPS electronic serial number (ESN) associated with each bus number and provide to Synovia representative. The following is an example of the checklist:

#### SCHOOL DISTRICT NAME:

#### SYNOVIA SUPPORT CONTACT - 866-206-7528

#### Non-functional, damaged, or pre-existing issues MUST be noted and reported immediately to district staff.

Install Details	Details (Circle one)	
1. Antenna Location	Bulkhead   Cut out	Other:
2. GPS Unit (and I/O Pod) Location	Bulkhead   Side electrical panel   Dash	Other:
3. Cable Runs	Windshield corner   Driver window channels	Other:

Basic Information	Details
1. Hardware ESN Number	
2. Bus Number	
3. Antenna S/N	
<ol> <li>Mileage at Time of Installation</li> </ol>	
5. Date of Installation	
6. Technician Name	

Inputs	Location	Color	Color Code	Tested
12¥ Battery	Molez	Red wire		
12V with Ignition On				
12V in Accessory Position				
12V with Ignition Off				
12¥ Ignition (non-accessory)	Molez	White wire		
12V with Ignition On				
0V in Accessory Position				
0V with Ignition Off				
Chasis Ground	Molez	Black wire		
12¥ - Stop Arm	Molez	Green wire		
Ground - Emer Event Button	Molez	Brown wire		
12¥ - Amber Lights	Molez	Yellow wire		
12¥ - Entrance Door	Molez	Orange wire		
Post Install Checklist - Perform I	n Order			OK
1. Ensure vehicle has a clear view of the s	ky (for GPS)			
2. Tainki ED - Gubb Leebier, On 1994 2 Mile				

Test LEDs (with Ignition On after 2 Minutes) Comm LED Solid

GPS LED Solid

3. Activate all wired inputs and leave on for 5 seconds each

#### INSTALLATION NOTES:

Do not install antenna and cabling near Video Equipment or wiring

Wire all input tap points (battery, ignition, stop arm, etc) as close to source as possible

Do not use third party systems (video, child reminder, AC systems, etc) as input sources

Install grommets in all drilled holes for control/coax cables

Tie down all cabling with cable-wraps

Minimize control/coax cable exposure - use wire loom if cable must be exposed

Silicone permanent mount antennas to ensure seal on roof of vehicle

Silicone antenna connectors at GPS unit once installation is complete

#### SIGNATURES

TECHNICIAN

SYNOVIA REP

#### DISTRICT REP

## SYNOVIA HARDWARE TROUBLESHOOTING

#### NO DATA FROM BUS-

#### Perform the following in order:

- 1) Turn bus engine on, making sure bus has a clear view of the sky (not in garage or under metal roof)
- 2) Check LEDs (small lights on front of GPS box), Wiring, & Fuses

#### **NOTE** – This testing may require a Voltmeter or test-light.

- a. If both LEDs are off, the hardware is not receiving power or internal components have failed.
  - i. Verify Molex connector of wire harness is securely fastened to GPS unit.
  - ii. Verify red wire is connected to constant 12V battery source
  - iii. Verify black wire is connected to chassis ground
  - iv. Verify white wire is connected to switched 12V source (only hot when engine is on)
  - v. Verify fuses (in line with red and white wires) are in place and functional
  - vi. If all of the above are OK, call Synovia support to remotely troubleshoot. Based on what the customer representative can determine, you may need to remove GPS unit and send to Synovia. Replace with a spare unit and note the original ESN and the new ESN. Provide this information to the district GPS system administrator. Using the Synovia software, the GPS system administrator will need to rename the old unit "Repair ESN xxxx" and the new ESN should be renamed to match the new bus number.
- b. If the COMM LED is off or blinking, the hardware is not connecting to the cellular network.
  - i. Verify the antenna (small, puck-shaped, on roof above driver side) is not damaged
  - ii. Verify the COMM connector is screwed in securely to the GPS unit
  - iii. Verify the wire is not cut or kinked from the GPS unit all the way to the antenna

- iv. Test another spare antenna and hold it outside of the bus. The COMM LED should lock on solid within 3 minutes. If the new antenna connects, replace with a spare, noting the old and new antenna Serial Numbers (S/N). Ship the nonfunctional antenna to Synovia. Provide this information to the district GPS system administrator.
- v. If the spare antenna does not solve the issue, call Synovia support to remotely troubleshoot. Based on what the customer representative can determine, you may need to remove the GPS unit, note the ESN, and send to Synovia. Replace the unit with a spare and note the new ESN. Provide this information to the district GPS system administrator along with the bus number and explanation of problem.
- vi. Using the Synovia software, the GPS system administrator will need to rename the old unit "Repair – ESN xxxx" and the new ESN should be renamed to match the new bus number.
- c. If the GPS LED (light closest to the GPS connector) is off or blinking, the hardware is having problems connecting to GPS satellites.
  - i. Verify the antenna (small, puck-shaped, on roof above driver side) is not damaged
  - ii. Verify the GPS connector is screwed in securely to the GPS unit
  - iii. Verify the wire is not cut or kinked from the GPS unit all the way to the antenna
  - iv. Test another spare antenna and hold it outside of the bus. The GPS LED should lock on solid within 3 minutes. If the new antenna connects, replace with a spare, noting the old and new antenna Serial Numbers (S/N). Ship the nonfunctional antenna to Synovia. Provide this information to the district GPS system administrator.
  - v. If the spare antenna does not solve the issue, call Synovia support to remotely troubleshoot. Based on what the customer representative can determine, you may need to remove the GPS unit, note the ESN, and send to Synovia. Replace the unit with a spare and note the new ESN. Provide this information to the district GPS system administrator along with the bus number and explanation of problem.

- vi. Using the Synovia software, the GPS system administrator will need to rename the old unit "Repair – ESN xxxx" and the new ESN should be renamed to match the new bus number.
- 3) If the wiring is secure, fuses are in place, the COMM LED is solid, and the GPS LED is solid, then call Synovia with the ESN and bus number. A Synovia representative will be able to connect to the unit remotely and diagnose the problem.

The following is a chart to follow:

Α	В	C	D	E		
Bus has clear view of the sky	Vehicle ignition key is in <b>ON</b> position	GPS AND COMM LEDs are <b>ON</b> constantly	Antenna is connected and damage free	If COMM LED is not ON constantly, does a spare antenna solve the problem		
YES/NO	YES/NO	YES/NO*	YES/NO	YES/NO		
*The LEDs will take some time to acquire the signal and lock in (solid, not blinking)						

# **Bluebird Vision**



### Antenna Installation/Location

The GPS/ wireless antenna should be installed on the driver's side of the bus when possible.

This prevents the antenna getting hit with tree limbs.

It also is the only side that permits access to tighten the antenna nut, on the interior.

The driver's side is the preferred location for the LMU, so the antenna coax will be run down the driver's side A-pillar.

TIP: Have someone insert their arm through the hole form the inside and tap on the roof to find the best location to drill a  $\frac{3}{4}$ " hole. This will make tightening of the antenna easier. The child check hole is limited in size to insert your arm.



Remove the Child Minder display to gain access and tighten the antenna firmly.

\* **Caution** – DO NOT touch the pins on the circuit board against the bulkhead. Shorting is possible and will damage the display.



Insert a fish tape through the existing hole and run it out through the hole of the child minder hole. Pull the antenna co-ax down through and secure it behind the A-pillar cover. Secure the cover.

TIP: Put electrical tape over the exposed pins, prior to reinstalling the display. \*Be careful to NOT pinch the co-ax wires when tightening down the cover. Shorting of the cables will cause loss of GPS and/or wireless signals.



## LMU Installation/Location

Install the LMU behind the corner panel, under the AM/FM radio. Try to aim the LED lights to where they can be observed easily.



# **General Installation Guidelines**

### **Antenna Installation/ Location**





The GPS/ wireless antenna should be installed on the driver's side of the bus when possible, through a  $\frac{3}{4}$ " hole.

This prevents the antenna from getting hit with tree limbs.

It also is the only side that permits access to tighten the antenna nut, on the interior. The driver's side is the preferred location for the LMU, so the antenna coax will be run down the driver's side A-pillar.

Some situations may require passenger side installation.

# LMU Mounting/ Installation





The LMU can be placed on the bulk head, behind an access door or behind switch panels, depending on the bus model.

Be aware of any location that could be prone to water intrusion, spillage or excessive moisture.

Always add a service loop to the main harness to prevent stress on the connections.



### **Tap Points/ Inputs**

Tap points or input signals vary from manufacturer as well as model year. Facilities should refer to their vehicle schematics for proper identification of tap points.





### **Main Power Supply/ Connections**





The power sources must not drop to 0 volts while starting the bus. They may drop no more than approximately 8 volts. The GPS ignition wire should only have power while in the on/ run position and 0 volts in "accessory". This is known as "true ignition". If not wired correctly, false idle reports will be generated as well as peripherals not functioning properly.

# **Engine Diagnostics Connections**

# **Heavy Duty**

Deutsch Y-cable

6 or 9 pin Deutsch connector



The Deutsch Y-cable connects to the LMU DB15 connector and the vehicle Deutsch port.



#### WARNING!

If you're installing an LMU 4225 with a heavy-duty connection, you'll need to cut a wire in the ED harness to prevent overheating, as follows:

- 1. Remove the JPOD from the ED port.
- 2. Cut the sheath just above the zip tie for a type 2 connector. For type 1, cut open the insulation jacket.

3. For a JPOD type 2 connector (green), pull out the orange wire that connects to the DB15 connector (that terminates at the LMU).

For a JPOD type 1 connector (black), pull out the red wire that connects to the DB15 connector (that terminates at the LMU).



Make sure that you select the correct orange wire for a JPOD type 2 connector, as there are two!

Likewise, make sure to pull out the correct red wire for a JPOD type 1 connector!

4. Cut the orange or red wire you pulled out.



5. Wrap the loose end of the cut wire in electrical tape.



- 6. Place the loose end back in the sheath.
- 7. Wrap the wires and top of the sheath securely with electrical tape.



8. Reconnect the JPOD.

# Light Duty

OBDII port



The vPOD connects to the LMU Aux 2 connector and the vehicle OBDII port.



#### WARNING!

NEVER use a power booster if a vPOD is connected to either Aux 1 or Aux 2 on **any** LMU! This can cause the power booster to overheat.

## **Appendix A: Bluebird schematics**









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IPP HONET       IPP HONET       IPP HONET       IPP HONET       IPP HONET         IPP HONET       IPP HONET       IPP HONET       IPP HONET       IPP HONET         IPP HONET       IPP HONET       IPP HONET       IPP HONET       IPP HONET         IPP HONET       IPP HONET       IPP HONET       IPP HONET       IPP HONET         IPP HONET       IPP HONET       IPP HONET       IPP HONET       IPP HONET         IPP HONET       IPP HONET       IPP HONET       IPP HONET       IPP HONET         IPP HONET       IPP HONET       IPP HONET       IPP HONET       IPP HONET         IPP HONET       IPP HONET       IPP HONET       IPP HONET       IPP HONET       IPP HONET         IPP HONET <td>BRE NO. T (DR) HE (NLET)         Image: Second and the second an</td> <td>20122004050130005</td> <td>30</td> <td>SHOVIA</td> <td>HINESS, MO, THELET CONVENTER, TELEPHITICS</td> <td>ner .</td> <td>11/ 20222 02</td> <td>ETF OLETT 6</td> <td></td> <td></td>	BRE NO. T (DR) HE (NLET)         Image: Second and the second an	20122004050130005	30	SHOVIA	HINESS, MO, THELET CONVENTER, TELEPHITICS	ner .	11/ 20222 02	ETF OLETT 6		
UPU PE FRANT       Image: State in the state is an intermed and inter	UPB Pie Fiel Piel Piel         Image: State St	RAM MOUNT	F	SMOVIA	HADNESS, WAD, CONVENTER TO SERVIC, TELEPHILICS	DEF	W 30333-07	all offer 5		
Image: Note Note:	N         Normal         Number of the state of the sta	(FOR THE TABLET)	36	00024158	MOUNT, HEAVY DUTY, . 25 HOLE SIZE	1				
NOTES:       Display       The CORE AND MARK STAND.       TO       TO         NOTES:       Display       THE ORDER THE THENTICS SHOULD INTO THE LEBING CONFECT PRE-VINE       THE DISPLAY       THE DISPLAY       THE DISPLAY         NOTES:       Display       THE ORDER THE THENTICS SHOULD INTO THE LEBING CONFECT PRE-VINE       THE DISPLAY       THE DISPLAY       THE DISPLAY       THE DISPLAY         NOTES:       Display       THE DISPLAY AND AND ADD THE THENTICS SHOULD INTO THE DISPLAY AND ADD THE DISPLAY AND THE DISPLAY AND ADD THE DISPLAY AND ADD THE DISPLAY	No.         No.         I.         I.         I.           87 ID RODER         10 0001 3250 425 V.M. NO. 00 01 42 700 0 0001 3250 425 V.M. NO. 00 01 42 700 0 0001 3250 425 V.M. NO. 00 01 42 700 0 0001 3250 425 V.M. NO. 00 01 42 700 0 0001 3250 425 V.M. NO. 00 01 42 700 0 0001 3250 425 V.M. NO. 00 01 42 700 0 0001 100 00000 1000 000 1000 000 1000 000 1000 000 0 0001 100 00000 1000 000		34	00019062	WIGHER, FLAT, 13/64 X 1/2 X 3/64, BLACK ZINC	1				
H       H	HP ID ROOR         44         BOOKIN         REGIST ID DUPLIES IN UNIT IN UNIT ID DUPLIES         REF           HP ID ROOR         4         BOOKIN         REGIST ID DUPLIES IN UNIT IN UNIT ID DUPLIES         ID DUPLI		3.0	00599704	TIE, CABLE, MILON	1				
PF 10 RR00R       B <th< td=""><td>Prince       Prince       Prince</td><td></td><td>4A</td><td>SMOVIA</td><td>READER, RF ID, TELEMATICS, SYNOVIA</td><td>REF</td><td>G</td><td>N</td><td></td><td></td></th<>	Prince		4A	SMOVIA	READER, RF ID, TELEMATICS, SYNOVIA	REF	G	N		
MID HARDER       4.       BURINST, 1924, A.B.S. XM, MP, R.C. & BLX / INC.       2       4       MID XM, SA         MID HARDER       6.       BURINST, 1024, A.B.S. XM, MP, R.C. & BLX / INC.       7       7         MID HARDER       6.       BURINST, 1024, BLX / INC.       MID YM, SA       7         MID HARDER       6.       BURINST, 1024, BLX / INC.       MID YM, SA       7         MID HARDER       6.       BURINST, 1024, BLX / INC.       1       WID XXXX, 102, BLX / INC.       1         MID HARDER       6.       BURINST, 1024, BLX / INC.       1       WID XXXX, 102, BLX / INC.       1         MID HARDER       6.       BURINST, 1024, BLX / INC.       1       WID XXXX, 102, BLX / INC.       1         MID HARDER       6.       BURINST, 1024, BLX / INC.       1       WID XXXX, 102, BLX / INC.       1       1         MID HARDER       6.       BURINST, 1024, BLX / INC.       7       VID XXXX, 102, BLX / INC.       1	IN INFREE       C. 000105 JS22 VITH BLCE BIRD CONFECT FRE-VIRE       2       V 3033-02       SE 94ET 4         INFREESE       INFREESE       INFREESE VITH BLCE BIRD CONFECT FRE-VIRE       V 3033-02       SE 94ET 6         INFREESE       INFREESE       INFREESE       INFREESE       INFREESE       INFREESE       INFREESE         INFREESE       INFREESE       INFREESE       INFREESE       INFREESE       INFREESE       INFREESE         INFREESE       INFREESE       INFREESE       INFREESE       INFREESE       INFREESE       INFREESE         INFREESE       INFR	1	48	SYNOVIA	HARNESS, ARC, SERIAL, ADAPTER, RFID & TABLET	REF				
NOTES:         State of the state of t	NOTES:         Distance of the second second process of the second proces of the second proces of th	RFID READER	40	01401587	SCREW, 8-32 X 3/4, PH1, RD H0, BLK ZINC	2	W/ 30333-08	SEE SHEET 4		
NOTES:       300001       200001	Image: Second		40	02001152	LOOKWGHER, SPLIT RING, 3/16, MED, YEL ZN DICH	2				
Bit ODE REGOR       Bit ODE STATUS       DESCR       Bit ODE REGOR	Bit ODE FERER         Bit ODE STALL NULL ALL ALL DISCUSSION NULL NULL NULL NULL NULL NULL NULL NU		4E 50	02001253	NUT. HEX HEU. 8-32, HELLOW DIOHRAWIE DEADED BADYONE DEDUIDES BLIE BIDD MTC BEACHET 10035127	2			4	
BRI CODE READR       INFLOR MELLA USA DI CON ANTE       I       W 2013-00       SEE DHET 4         BRI CODE READR       INFLOR MELLA USA DI CON ANTE       I       I       W 2013-00       SEE DHET 4         BRI CODE READR       INFLOR MELLA USA DI CON ANTE       I       I       W 2013-00       SEE DHET 4         BRI CODE READR       INFLOR MELLA USA DI CON ANTE       I       I       W 2013-00       SEE DHET 4         BRI CO SUITOL       INFLOR MELLA USA DI CON ANTE       I       W 2013-00       SEE DHET 4         BRI CO SUITOL       INFLOR MELLA USA DI CON ANTE       I       W 2013-00       SEE DHET 4         BRI CO SUITOL       INFLOR MELLA USA DI CON ANTE       I       W 2013-00       SEE DHET 4         BRI DONA       MIDHAM ANDE AND ANDE AND ANDE AND ANDE ANDE AN	Beel Code: Revises         Str. Distribution         Distribution <thdistribution< th="">         Distribution         Dis</thdistribution<>	<u></u>	- 49	SMOVIA	HADNERS LOR GEDIAL ANADTER BARTTE	259				
0       0       0000165       00001656       0000165       00000165       0000165       0	Dot notified         Dot not notified         Dot notif	BAR CODE READER	50	01401587	SOEV. PAN HD 8-32 X 3/4 PD HD B.K ZINC	3	W/ 30333-09	STE SHET 4		
Image: Second State S	Ref         Bit Object         3         7           PARC SUITOR         64         Should ALE 21 ALE ALE DIR MIG SPECT 1000110         2         VIDING         SEE SHET 4           PRICE SUITOR         64         Should ALE 21 ALE	on our restor	50	02001152	LODKINGHER, SPLIT RING, 3/16, MED, YEL, ZN DICH	3				
PANIC SUITOR         44         SMORTA         NUCL SUITOR         44         SMORTA         NUCL SUITOR         47         VIDIAL         NUCL SUITOR         SEE SMORTA	AND C SUTION         AND C SUTION<		5E	02001253	NUT, HEX HED, 8-32, YELLOV DICHROMATE	3				
BYNIC SUITON         BE 0400591         STRUE, ALE # 374, PRE, BUD CONCOMMING         2           AVIENUE         BUD CONCOMMING         BUD CONCOMMING         BUD CONCOMMING         BUD CONCOMMING           AVIENUE         BUD CONCOMMING         BUD CONCOMMING         BUD CONCOMMING         BUD CONCOMMING         BUD CONCOMMING           AVIENUE         BUD CONCOMMING         BUD CONCOMMING         BUD CONCOMMING         BUD CONCOMMING         BUD CONCOMMING         BUD CONCOMMING           AVIENUE         BUD CONCOMMING         BUD CONCOMING	BNIC SUITON         BE SHET 4         SEE SHET 4           60 000003         MULE NU RAL ULA BURG 1, AN TURK ULA ALS NU DUPONTE         2         W 2003-00 H         BE SHET 4           60 000003         MULE NU RAL ULA BURG 1, AN TURK ULA ALS NU DUPONTE         2         W 2003-00 H         BE SHET 4           60 000003         MULE NU RAL ULA BURG 1, AN TURK ULA ALS NU DUPONTE         2         W 2003-00 H         BE SHET 4           7         0000035         MULE NU DUPONTE         1         W 2003-00 H         BE SHET 4           7         0000035         MULE NU DUPONTE         1         W 2003-00 H         BE SHET 4           7         0000035         MULE NU DUPONTE         1         W 2003-00 H         BE SHET 4           7         0000035         MULE NU DUPONTE         1         W 2003-00 H         BE SHET 5           7         0000035         MULE NU DUPONTE         1         W 2003-00 H         SE SHET 5           109RESSES         8         000000000000000000000000000000000000		64	SYNOVIA	PANIC SWITCH WOUNFO, REQUIRES BLUE BIRD MTG BRACKET 1003511	IO REF	8		1	
Prince (B) (D)       CC       CONDUCT       Discretion       Discretion         10       10       0000162       (D) (D)       10       (D) (D)       (D)         11       10       10       10       (D)       (D)       (D)       (D)         11       10       10       (D)       (D)       (D)       (D)       (D)       (D)         11       10       (D)	Print         Bit India         Bi	DANIC GUITON	68	01401587	SCREW, 8-32 X 3/4, PH1, R0 HD, BLK ZINC	2	W/20777-10	STE GLEET A		
Bit         Bit <td>Bit Status         Constraint         Product         Product</td> <td>Privic Switch</td> <td>6C</td> <td>02001152</td> <td>LODXWASHER, SPLIT RING. 3/16, MED. YEL ZN DICH</td> <td>2</td> <td>N 30333-10</td> <td>ALL SELV C</td> <td></td> <td></td>	Bit Status         Constraint         Product	Privic Switch	6C	02001152	LODXWASHER, SPLIT RING. 3/16, MED. YEL ZN DICH	2	N 30333-10	ALL SELV C		
An Endown         All Shown (25 GM (125 MP) (125 U))         Ref         W (25 GM (125 MP) (125 U))         Ref         W (25 GM (125 MP) (125	NITEWN         NORMA         NORMALE         1/2 DIMETER         NO         NORMALE         NO         NORMALE         NO         NORMALE         NO         NO         NORMALE         NO         NO         NORMALE         NO         <	-	60	02001253	NUT. HEX HO, 8-32, YELLON DIOHROMATE	2			-	
MIENNA         IN         Display of the	MIENN         Image: District of the second of the sec		78	SMOVIA	ANTENNA, OPS. OSM, TELEMATICS	ADF .	W/ 30333-02.04	SEE SHET 2	-	
NUCL         NO         N	MICHNI         TO         DOUBLING         DOUBLING <thdoubling< th=""> <thdoubling< th=""> <thdoubli< td=""><td>CALTERAN</td><td>75</td><td>01812049</td><td>UNE M CA SM BY 12 CHARGE / DO</td><td>70 in</td><td>W/ 30333-02.04 W/O RMDIO</td><td>E PENNOCOMO ENCO</td><td></td><td></td></thdoubli<></thdoubling<></thdoubling<>	CALTERAN	75	01812049	UNE M CA SM BY 12 CHARGE / DO	70 in	W/ 30333-02.04 W/O RMDIO	E PENNOCOMO ENCO		
NOTES:         30333-02         BLE         BIRD         CONNECT.         GPV         JISS         GPV	Image: Notice is a constraint of the initial of the initis of the initial	ANA CHAN	70	00038394	COMER ACCESS ANTENNA ASTRO UNITE	1/3 1/1	W/ 30333-02.01 W/ SING E DOME W/O RADIO	SEE SHEET 3		
Bit 100001005         NUMBERS	Bit         10035195         HIMMESS, MRC, DISSNER, DISSNER, DISSNER, DISSNER, DISSNER, DISSNER, DISSNER, DISSNER,		TE	02194025	SCREV, 8-18 X 3/4, AB, PHI, PAN HD, YEL, ZN DICH	2	W/ 30333-02, 04 W/ SINGLE DONE W/O RADIO	1		
NAMESSES         at locate if winness, was bischerts, statubilities, etc.v         RF         alle Bino instrute v 3033-05         see SHET 6           NOTES:         30333-02         BLE BIRD CONNECT, GPS W/ J1939, US         30333-02         BLE BIRD CONNECT, GPS W/ J1939, US           1) SEE SO-EMATIC D0015582 VITH BLUE BIRD CONNECT PRE-VIRE         30333-02         BLE BIRD CONNECT, GPS W/ J1939, US         30333-04         BLE BIRD CONNECT, GPS W/ J1939, US           2) SEE SO-EMATIC D0015582 VITH BLUE BIRD CONNECT PRE-VIRE         30333-06         BLE BIRD CONNECT, TIME & ATTENDANCE, DRIVER KEYPAD           2) SEE SO-EMATIC D0018247 VITHOUT BLUE BIRD CONNECT PRE-VIRE         30333-06         BLE BIRD CONNECT, RE-VIRE         30333-06           30333-06         BLE BIRD CONNECT, RE-VIRE         30333-06         BLE BIRD CONNECT, TIME & ATTENDANCE, DRIVER KEYPAD           2) SEE SO-EMATIC D0018247 VITHOUT BLUE BIRD CONNECT PRE-VIRE         30333-06         BLE BIRD CONNECT, RE-VIRE         30333-06           30333-06         BLE BIRD CONNECT, RE-VIRE         30333-06         BLE BIRD CONNECT, RE-VIRE         30333-06           30333-06         BLE BIRD CONNECT, RE-VIRE         30333-06         BLE BIRD CONNECT, RE-VIRE         30333-06           30333-06         BLE BIRD CONNECT, RE-VIRE         30333-06         BLE BIRD CONNECT, RE-VIRE         30333-06           30333-06         BLE BIRD CONNECT, RE-VIRE	MARKESSES       BE       INDIGENT       IMPRESS, MOL DISDETES, SHAVIA       REF       BLUE BIRD INSTALLED V/0.0000-05       SEE SHET 6         NOTES:       30333-02       BLUE BIRD CONNECT, GPS W/ J1939, US       30333-02       BLUE BIRD CONNECT, GPS W/ J1939, US         1) SEE SO-EMATIC D0015582 WITH BLUE BIRD CONNECT FRE-WIRE       30333-04       BLUE BIRD CONNECT, GPS W/ J1939, US       30333-04         2) SEE SO-EMATIC D0018247 WITHOUT BLUE BIRD CONNECT FRE-WIRE       30333-05       BLUE BIRD CONNECT, FRE-WIRE       30333-06         30333-08       BLUE BIRD CONNECT, FRE-WIRE       30333-07       BLUE BIRD CONNECT, FRE-WIRE       30333-08         30333-09       BLUE BIRD CONNECT, FRE-WIRE       30333-09       BLUE BIRD CONNECT, FRE OLLY       30333-08         30333-09       BLUE BIRD CONNECT, FRE OLLY       BIRD CONNECT, FRE OLLY       30333-08       BLUE BIRD CONNECT, FRE OLLY         30333-09       BLUE BIRD CONNECT, FRE OLLY       30333-09       BLUE BIRD CONNECT, FRE OLLY       30333-09         30333-09       BLUE BIRD CONNECT, FRE OLLY       30333-08       BUE BIRD CONNECT, FRE OLY       30333-09         30333-09       BLUE BIRD CONNECT, FRE OLY       BIRD CONNECT, FRE OLY       BIRD CONNECT, FRE OLY       BIRD CONNECT, FRE OLY         30333-09       BLUE BIRD CONNECT, FRE OLY       BIRD CONNECT, FRE OLY       BIRD CONNECT, FRE OLY	i ja	84	10035109	HARNESS, URG. J1939 ADAPTER, TELEWATICS	1	W/ 30333-02.04	8	1	
AC         SMOUA         HARSES, VALDISDETES, SMOULA         REF         DELER INSTALLED V/0.3033-05           NOTES:         30333-05         BLE         BIRD CONNECT, GPS W/ J1939, US           30333-04         BLE         BIRD CONNECT, GPS W/ J1939, US           30333-05         BLE         BIRD CONNECT, GPS W/ J1939, CANNDA           1)         SEE         SO-EMATIC D0015582 WITH BLUE BIRD CONNECT PRE-WIRE         30333-05         BLE BIRD CONNECT, TIME & ATTENDANCE, DRIVER KEYPAD           2)         SEE         SO-EMATIC D0018247 WITHOUT BLUE BIRD CONNECT PRE-WIRE         30333-06         BLE BIRD CONNECT, TIME & ATTENDANCE, DRIVER KEYPAD           30333-09         BLE BIRD CONNECT, RE-WIRE         30333-09         BLE BIRD CONNECT, RE-WIRE ONLY         30333-08         BLE BIRD CONNECT, RE-WIRE ONLY           2)         SEE SO-EMATIC D0018247 WITHOUT BLUE BIRD CONNECT PRE-WIRE         30333-09         BLE BIRD CONNECT, RE-WIRE ONLY         30333-08         BLE BIRD CONNECT, RE-WIRE ONLY         30333-08         BLE BIRD CONNECT, RANCE DRIVER KEYPAD         30333-08         BLE BIRD CONNECT, RE-WIRE ONLY         30333-09         BLE BIRD CONNECT, RE-WIRE ONLY         BUR ONNECT, WIRE WERE WERE WERE WERE WERE WERE WERE	C     SNOVIA     HARNESS, URL DISDETES, SNOVIA     REF     DEALER INSTALLED WO 3333-05       NOTES:     30333-02     BLLE BIRD CONNECT, GPS W/ J1939, US       1) SEE SO-EMATIC D0015582 WITH BLUE BIRD CONNECT FRE-WIRE     30333-05     BLLE BIRD CONNECT, GPS W/ J1939, CANVDA       2) SEE SO-EMATIC D0016247 WITHOUT BLUE BIRD CONNECT FRE-WIRE     30333-06     BLLE BIRD CONNECT, TIME & ATTENDANCE, DRIVER KEYPAD       30333-08     BLLE BIRD CONNECT, FRE-WIRE     30333-07     BLLE BIRD CONNECT, FRE-WIRE       30333-09     BLLE BIRD CONNECT, FRE-WIRE     30333-08     BLLE BIRD CONNECT, FRE-WIRE       30333-09     BLLE BIRD CONNECT, FRE-WIRE     30333-09     BLLE BIRD CONNECT, FRE-WIRE       30333-09     BLLE BIRD CONNECT, FRE-WIRE     30333-09     BLLE BIRD CONNECT, FRE-WIRE       30333-09     BLLE BIRD CONNECT, FRE-WIRE     30333-09     BLLE BIRD CONNECT, FRE-WIRE       30333-09     BLLE BIRD CONNECT, FRE-WIRE     30333-09     BLLE BIRD CONNECT, FRE-WIRE       30333-09     BLLE BIRD CONNECT, FRE-WIRE     30333-09     BLLE BIRD CONNECT, FRE-WIRE       30333-09     BLLE BIRD CONNECT, FRE-WIRE     30333-09     BLLE BIRD CONNECT, FRE-WIRE       30333-09     BLLE BIRD CONNECT, FRE-WIRE     30333-09     BLLE BIRD CONNECT, FRE-WIRE       30333-09     BLLE BIRD CONNECT, FRE-WIRE     30333-09     BLLE BIRD CONNECT, FRE-WIRE       30333-09     BLL	HARNESSES	88	10032517	HIRNESS, IRG, DISCRETES, TELEMITICS, BECV	ÆF	BLUE BIRD INSTALLED W/ 30333-05	SEE SHEET 6		
NOTES:       30333-02 BLE BIRD CONECT, GPS W/ J1939, US         1) SEE SO-EMATIC D0015582 WITH BLE BIRD CONECT FRE-WIRE       30333-05 BLE BIRD CONECT, GPS W/ J1939, CANADA         2) SEE SO-EMATIC D0018247 WITHOUT BLE BIRD CONECT FRE-WIRE       30333-05 BLE BIRD CONECT, TIME & ATTENDANCE, DRIVER KEYPAD         30333-05 BLE BIRD CONECT, FRE-WIRE       30333-06 BLE BIRD CONECT, TIME & ATTENDANCE, DRIVER KEYPAD         30333-06 BLE BIRD CONECT, FRE-WIRE       30333-06 BLE BIRD CONECT, TIME & ATTENDANCE, DRIVER KEYPAD         30333-06 BLE BIRD CONECT, FRE-WIRE       30333-06 BLE BIRD CONECT, TIME & ATTENDANCE, DRIVER TABLET         30333-07 BLE BIRD CONECT, FRE-WIRE       30333-06 BLE BIRD CONECT, FRE-WIRE         30333-08 BLE BIRD CONECT, FRE-WIRE       30333-06 BLE BIRD CONECT, FRE-WIRE         30333-09 BLE BIRD CONECT, FRE-WIRE       30333-06 BLE BIRD CONECT, FRE-WIRE         30333-09 BLE BIRD CONECT, FRE-WIRE       30333-06 BLE BIRD CONECT, FRE-WIRE         30333-09 BLE BIRD CONECT, FRE-WIRE       30333-06 BLE BIRD CONECT, FRE-WIRE         30333-09 BLE BIRD CONECT, FRE-WIRE       30333-06 BLE BIRD CONECT, FRE-WIRE         30333-09 BLE BIRD CONECT, FRE-WIRE       30333-06 BLE BIRD CONECT, FRE-WIRE         30333-09 BLE BIRD CONECT, FRE-WIRE       30333-06 BLE BIRD CONECT, FRE-WIRE         30333-09 BLE BIRD CONECT, FRE-WIRE       30333-06 BLE BIRD CONECT, FRE-WIRE         30333-09 BLE BIRD CONECT, FRE-WIRE       300333-06 BLE BIRD CONECT, FRE-WIRE </td <td>NOTES:       30333-02 ELLE BIRD CONNECT, GPS W/ J1939, US         1) SEE SO-EMATIC D0015582 WITH BLUE BIRD CONNECT FRE-WIRE       30333-04 BLUE BIRD CONNECT, FRE-WIRE         2) SEE SO-EMATIC D0018247 WITHOUT BLUE BIRD CONNECT FRE-WIRE       30333-05 BLUE BIRD CONNECT, THE &amp; ATTENDANCE, DRIVER KEYPAD         30333-06 BLUE BIRD CONNECT, RF LURE &amp; ATTENDANCE, DRIVER TABLET       30333-07 BLUE BIRD CONNECT, RF LURE &amp; ATTENDANCE, DRIVER TABLET         30333-08 BLUE BIRD CONNECT, RF LURE &amp; BIRD CONNECT, RF LURE &amp; BIRD CONNECT, RF LURE BIRD CONNECT, RF LORADER       30333-08 BLUE BIRD CONNECT, RF LURE &amp; ATTENDANCE, DRIVER TABLET         30333-08 BLUE BIRD CONNECT, RF LURE &amp; BIRD CONNEC</td> <td></td> <td>8C</td> <td>SMOVIA</td> <td>HARNESS, URO, DISOFETES, SYNOVIA</td> <td>ÆF</td> <td>DEALER INSTALLED W/O 30333-05</td> <td>1</td> <td></td> <td></td>	NOTES:       30333-02 ELLE BIRD CONNECT, GPS W/ J1939, US         1) SEE SO-EMATIC D0015582 WITH BLUE BIRD CONNECT FRE-WIRE       30333-04 BLUE BIRD CONNECT, FRE-WIRE         2) SEE SO-EMATIC D0018247 WITHOUT BLUE BIRD CONNECT FRE-WIRE       30333-05 BLUE BIRD CONNECT, THE & ATTENDANCE, DRIVER KEYPAD         30333-06 BLUE BIRD CONNECT, RF LURE & ATTENDANCE, DRIVER TABLET       30333-07 BLUE BIRD CONNECT, RF LURE & ATTENDANCE, DRIVER TABLET         30333-08 BLUE BIRD CONNECT, RF LURE & BIRD CONNECT, RF LURE & BIRD CONNECT, RF LURE BIRD CONNECT, RF LORADER       30333-08 BLUE BIRD CONNECT, RF LURE & ATTENDANCE, DRIVER TABLET         30333-08 BLUE BIRD CONNECT, RF LURE & BIRD CONNEC		8C	SMOVIA	HARNESS, URO, DISOFETES, SYNOVIA	ÆF	DEALER INSTALLED W/O 30333-05	1		
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CVETEM	LITEM .	DACT N MEET	DESCRIPTION	OTY	APP ICATION	75M02/	
515164	1104.0		INTERNITICS W/ JIG19 15	900	W/ 10171-02		
	IA	SYNOVIA	LINEL TELEMETICS, W. JUSIS, CANADA	REF	W/ 30333-04		
( M/	IC.	01531845	VE CR0. HOX. B. ACK. 1, 00, X, 50, YDS, SU3572	6°	W/ 30333-02 04	SEE 946ET 6	
LECTRONIC UNIT)	10	01631852	VELCRO. LOOP. BLACK. 1. 00 X 50 YDS. 5,/3571	6*	W 30333-02.04		
	24	SYNDVIA	PANEL, OPERATORS, KEYPAD, TELENATICS	<b>FET</b>		92 92 92	
	28	10035371	HARNESS, MRG, OPERATOR PAWEL, TELEMATICS	1			
IVER'S OPERATOR	26	01401587	SCREV, PAN HO, 8-32 X 3/4, RD HO, BLK ZINC	6	N 20 20 20 20 20 20 20 20 20 20 20 20 20	12.02112312312	
PANEL	20	02001162	LOOKWASHER, SPLIT RING, 3/16, MED, YEL ZN DICH	6	W/ 30333-06	SEE SHET 5	
	Æ	02001253	NUT, HEX HED, 8-32, YELLOV DIO-FOMITE	6			
	Ŧ	10032516	BRACKET, MTG, ORIVER'S OPERATOR PANEL, TELEMATICS	1		85 85	
DEALER TABLET	34	SYNOVIA	PANEL, OPERATORS, TABLET, TELENATICS	REF			
AND MOUNT	æ	SYNOVIA	KIT, MOUNT, TABLET, TELEMATICS	REF		SEE 9-6E7 5	
	<i>.</i>	SYNOVIA	KIT, MOUNT, RAM MOUNT, TELEMATICS	REF		15 (FEEDERS) - 24	
	Œ.	SYNDVIA	HARNESS, MRG, TABLET CONVERTER, TELEMATICS	REF			
DOW NO ALT	호	SYNDVIA	HARNESS, WRG, CONVERTER TO SERIAL, TELEVATICS	REF	W/ 30333-07	NOT SHOWN, SEE SCHEMATIC,	
FOR THE TAP ET	5	SYNOVIA	HARNESS, WAG, SERIAL ADAPTER, AFID & TABLET	REF			
on the thereit	30	00024158	MOUNT, HEAVY DUTY, .25 HOLE SIZE	1			
	34	00019062	WGHER, PLAT, 13/64 X 1/2 X 3/64, BLACK ZINC	1		SEE SHEET 5	
	31	00599704	TIE, CABLE, NALON	1			
	4A	SYNOVIA	READER, RF 10, TELEMATICS, SYNOVIA	REF		14	
	48	SYNOVIA	HARNESS, WAG, SERIAL ADAPTER, AFID & TABLET	REF			
	40	01401587	SOREV, 8-32 X 3/4, PHI, RD HD, BLX ZINC	2		and spectrometers are	
RFID READER	40	02001162	LOOKWISHER, SPLIT RING, 3/16, MED, YEL ZN DICH	2	W/ 30333-08	SEE SHEET 4	
	Æ	02001253	NUT, HEX HED, 8-32, YELLON DIOHROMATE	2		1100 Carbolic #12150	
	45	00051810	MOUNT, CABLE TIE, BLIND	3			
	4G	00599704	TIE, CAELE, MILON	3			
	54	SYNDVIA	REAGER, BARCODE, REQUIRES BLUE BIRD MTG BRACKET 10035	127 FEF		24	
	58	SYNDVIA	HARNESS, MRG, SERIAL ADAPTER, TELEMATICS	REF			
	SC	01401587	SOREV, PAN HO, 8-32 X 3/4, RO HO, BLK ZINC	3		And an	
WR CODE READER	50	02001162	LOOKWASHER, SPLIT RING, 3/16, MED, YEL ZN DICH	3	W/ 30333-09	SEE SHEET 4	
	星	02001253	NUT, HEX HED, 8-32, YELLOW DICHROMATE	3		2019/2019/2019/2010	
	5	00051810	MOUNT, CHELE THE, BLIND	3			
	50	00599704	TIE, CABLE, NALON	3			
RANIC SUITON	6A	SYNOVIA	SVITCH WOUARD, REQUIRES BLUE BIRD MTG BRACKET 10035	133 REF	N/201373-10	SE DET A	
Philo Skilon	68	01401587	SOREV, 8-32 X 3/4, PHI, RO HO, BLK ZINC	2	R/30333-10	at strive	
	7A.	SYNDVIA	ANTENNA, OPS, CEM, TELENATICS	FEF	W/ 30333-02, 04	SEE SHEET 2	
	78	01812049	CONDUIT, OREENFIELD, FLEXIBLE, 1/2 DIAMETER	85 in	W/ 30333-02.04 W/O RADIO	- CS	
ANTENNA	ĸ	00517532	VIRE, 14 CA, 54L, BK 32, DHH ORS-LK, POL	185 In	W/ 30333-02.04 W/O RADIO	GE OVET 3	
	70	00038394	COMER, ACCESS, ANTENNA, ASTRO WHITE	- <b>1</b> - 6	W/ 30333-02,04 W/ DOLELE DOME W/O RADIO		
	Æ	02194025	SOREV, 8-18 X 3/4, /B, PHI, PAN HD, YEL ZN DICH	2	W/ 30333-02,04 W/ DOUBLE DOME W/0 RMD10		
102533222	84	10035109	HARNESS, MRG. J1939 ADAPTER, TELEMATICS	1	W 30333-02, 04	an and a second	
HARNESS	88	NA	HARNESS, WRO, DISCRETES	REF	BLUE BIRD INSTALLED W/ 30333-05	SEE SHEET 6	
	8C	SYNOVIA	HARNESS, MAG, DISCRETES, SYNOVIA	REF	DEALER INSTALLED W/O 30333-05		
ES:				FEA	TURES:		
EE SCHEMATI EE SCHEMATI	C D00 C D00	15582 Wi 18247 Wi	TH BLUE BIRD CONNECT PRE-WIRE THOUT BLUE BIRD CONNECT PRE-WIRE	303 303 303	33-02 BLUE BIRD CONNECT, GPS W/ J193 33-04 BLUE BIRD CONNECT, GPS W/ J193 33-05 BLUE BIRD CONNECT, PRE-WIRE ON	9, US 9, CANADA LY	
				30.3	33-06 BLUE BIRD CONNECT. TIME & ATTE	NDANCE, DRIVER KEYPAD	
				202	33-07 BUE BIRD CONNECT TIME & ATTE	MANCE DRIVED TAR ET	
				303		Contract Contract (MOLE)	
				303	33-08 BLUE BIRD CUNNECT, HE ID READER		
				303	33-09 BLUE BIRD CONNECT, BAR CODE RE	ADER	T3FE / T3RE
				303	33-10 BLUE BIRD CONNECT, PANIC BUTTO	N	
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#### **BLUE BIRD CONNECT TROUBLESHOOTING NO DATA FROM BUS ON SILVERLINING WEBSITE:**

#### Perform the following in order:

1) Turn ignition key on; ensure bus has a clear view of the sky (not in garage or under metal roof).

2) Wait two minutes and verify the COMM LED is solid ORANGE; the GPS LED is solid GREEN; (see details below of LED locations and definitions).



#### LED #1 (Comm LED) Definitions

Condition	LED 1
Modem Off	Off
Comm On - Searching	Slow Blinking
Network Available	Fast Blinking
Registered and Connected	Solid

#### LED #2 (GPS LED) Definitions

Condition	LED 1	
GPS Off	Off	
GPS On	Slow Blinking	
GPS Time Sync	Fast Blinking	
GPS Fix	Solid	

3) Verify bus wiring, fuses, or breakers. See detail below of "4 Pin Power Connector".

**NOTE** – This step will require a voltmeter or test-light.

Blue Bird Connect Schematics can be viewed at http://service.blue-bird.com/WiringSchematics/

Synovia Support - 1-877-SYNOVIA and http://www.synoviasolutions.com/customer-support/

a. If both the COMM and GPS LED's are off, the hardware is not receiving power or internal components have failed.

i. Verify both Molex connectors of wire harness are securely fastened to GPS unit.



NOTE: On buses NOT pre-wired by Blue Bird wire colors differ from those shown above. Please see steps noted (\*) for applicable color on Non pre-wired buses.

ii. Verify "RED" wire labeled "TELEM BATT" is connected to constant 12V battery source

(\* Verify "RED" wire is connected to constant 12V battery source)

- iii. Verify "WHITE" wire labeled "TELEM GND" is connected to chassis ground
  - (\* Verify "BLACK" wire is connected to chassis ground)
- iv. Verify "PINK" wire labeled "TELEM IGN" is connected to switched 12V source , 12V ONLY with ignition keyon
  - (\* Verify "WHITE" wire is connected to switched 12V source, 12V ONLY with ignition key on)
- v. Verify either 5 amp fuses or breakers (located in body electrical panel on driver side of bus) are in place and functional. (See decal located on inside of electrical panel access door for fuse or breaker location.
- vi. If all of the above tests OK, and both COMM and GPS LED's remain off, contact Synovia customer support to remotely troubleshoot. Based on what the customer representative can determine, you may need to remove GPS unit and send to Synovia. Replace with a spare unit and note the original ESN and the new ESN. Provide this information to the district GPS system administrator. Using the Synovia software, the GPS system administrator will need to rename the old unit "Repair ESN xxxx" and the new ESN should be renamed to match the new bus number.
- b. If the COMM LED is off or blinking, the hardware is not connecting to the cellular network.

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i. Verify the antenna (small, puck-shaped, on roof above driver side) is not damaged

ii. Verify the COMM connector is screwed in securely to the GPS unit



- iii. Verify the wire is not cut or kinked from the GPS unit all the way to the antenna
- iv. Test another spare antenna and hold it outside of the bus. The COMM LED should lock on solid within 3 minutes. If the new antenna connects, replace with a spare, noting the old and new antenna Serial Numbers (S/N). Ship the non-functional antenna to Synovia.

Provide this information to the district GPS system administrator.

- v. If the spare antenna does not solve the issue, call Synovia support to remotely troubleshoot. Based on what the customer representative can determine, you may need to remove the GPS unit, note the ESN, and send to Synovia. Replace the unit with a spare and note the new ESN. Provide this information to the district GPS system administrator along with the bus number and explanation of problem.
- vi. Using the Synovia software, the GPS system administrator will need to rename the old unit "Repair ESN xxxx" and the new ESN should be renamed to match the new bus number.
- c. If the GPS LED (light closest to the GPS connector) is off or blinking, the hardware is having problems connecting to GPS satellites.
  - i. Verify the antenna (small, puck-shaped, on roof above driver side) is not damaged
  - ii. Verify the GPS connector is screwed in securely to the GPS unit



- iii. Verify the wire is not cut or kinked from the GPS unit all the way to the antenna
- iv. Test another spare antenna and hold it outside of the bus. The GPS LED should lock on solid within 3 minutes. If the new antenna connects, replace with a spare, noting the oldand new antenna Serial Numbers (S/N). Ship the non-functional antenna to Synovia.

Provide this information to the district GPS system administrator.

- v. If the spare antenna does not solve the issue, call Synovia support to remotely troubleshoot. Based on what the customer representative can determine, you may need to remove the GPS unit, note the ESN, and send to Synovia. Replace the unit with a spare and note the new ESN. Provide this information to the district GPS system administrator along with the bus number and explanation of problem.
- vi. Using the Synovia software, the GPS system administrator will need to rename the old unit "Repair ESN xxxx" and the new ESN should be renamed to match the new bus number.

4) If the wiring is secure, fuses are in place, the COMM LED is solid, and the GPS LED is solid, then call Synovia with the ESN and bus number. A Synovia representative will be able to connect to the unit remotely and diagnose the problem.

**5**) The following is a chart to follow:

Α	в	с	D	E	
Bus has clear view of the sky	Vehicle ignition key is in ON position	GPS AND COMM LEDs are ON constantly	Antenna is connected and damage free	If COMM LED is not ON constantly, does a spare antenna solve the problem	
YES/NO YES/NO YES/NO* YES/NO YES/NO					
and lock in (solid, not blinking)					