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NFPA420-A

NFPA1917 Seat Belt Monitor for Ambulance

2009-2012 Ford E-Series, 2009-2012 F-SuperDuty

2008-2012 Chevy Express, GM Savana

2011-2012 RAM 2500-5500



InterMotive also offers a NFPA1917 compliant road speed limiter for ambulance applications. Ask about Speed Sentinel II.

Introduction

The NFPA420 system enables ambulance manufacturers to meet the requirements of NFPA1917 for a seat belt monitoring system. It monitors up to 5 seat positions in the patient area of the ambulance (versions are available which also monitor the cab). The NFPA420 also acts as a "translator" for vehicle chassis data. All monitored seat position data, along with vehicle data collected via the OBDII (CAN) network is transmitted over a separate J1939 network, allowing Vehicle Data Recorders (VDR) to read and record vehicle and seat data.

A dash mounted LED panel indicates seat/seat belt status as well as error conditions such as belt buckled but no seat occupant. A beeper warns of unbuckled conditions when the vehicle is driven. A second LED panel and beeper may also be mounted in the patient area.

The following chassis data is provided by this translator:

- Vehicle Speed - SPN84, PGN 0xFEf1 (65265)
- Accelerator Pedal Position - SPN91, PGN 0xF003 (61443)
- Service Brake - SPN597, PGN 0xFEf1 (65265)
- Transmission Range - SPN163, PGN 0xF005 (61445)
- ABS State - SPN563, PGN 0xF001 (61441)
- Engine RPM - SPN190, PGN 0xF004 (61444)
- Engine Coolant Temperature - SPN110, PGN 0xFEEe (65262)
- Transmission Fluid Temperature - SPN177, PGN 0xFEF8 (65272)
- *Engine Oil Pressure - PGN 0xF00C (61452) (Ford Super Duty Only)
- Parking Brake - SPN619, PGN 0xFEFA (65274) (All but Dodge)
- *Key Position - PGN 0xF00C (61452)
- VIN - SPN237, PGN 0xFEEC (65260) (Requires a J1939 Request)



Seat Position / Belt monitor LED panel. One or two panels per vehicle. Additional NFPA systems are available which support up to 7 positions.

(*) custom-defined data, see below.

In addition, seat occupant & belt buckle status are provided on the J1939 data stream. The NFPA420 acquires chassis data passively except during installation, so it will not interfere with other devices connected to the OBDII connector.

Be sure the vehicle's battery is disconnected before proceeding with installation



WARNING
Disconnect the battery to prevent setting a check engine light.

Remove the lower dash panel below the steering column area and find a suitable location to mount the NFPA420 module. Do not mount the module until all wire harnesses are routed and secure (the last step of the installation is to mount the module).

It is the installer's responsibility to route and secure all wiring harnesses where they cannot be damaged by sharp objects, mechanical moving parts and high heat sources. Failure to do so could result in damage to the system or vehicle and create possible safety concerns for the operator and passengers.

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NFPA420-A-072512-INS

Data Link Harness (6-pin connector at module)

- Locate the vehicle's OBDII Data Link Connector. It will be mounted below the lower left dash panel.
- Remove the mounting screws for the OBDII connector. Plug the red connector from the NFPA420 Data Link Harness into the vehicle's OBDII connector. Ensure the connection is fully seated and secure with the supplied wire tie.
- Mount the black connector from the Data Link Harness in the former location of the vehicle's OBDII connector.
- Leave the 6-pin Data Link connector unplugged from the NFPA420 module.



NFPA420-A Translator Connection Output

- The NFPA420 Data Link Harness has a 4-Pin White connector that provides J1939 data for connecting to a VDR. The pin out is as follows:
Pin #1 Green Wire - J1939 CAN High. Pin #2 Red Wire - Battery Voltage.
Pin #3 Blue Wire - J1939 CAN Low. Pin #4 Gray Wire - Ground.



OBDII Data Link Harness

Vehicle Data Recorder Installation

If used, install the Vehicle Data Recorder per manufacturer's instructions, connecting the Vehicle Data Recorder J1939 signals to the 4 pin Data Link Harness connector.

Customer fabricated seat sensor/belt harness

The NFPA420 kit includes a seat/buckle harness to the back of the cab. It is the upfitters responsibility to fabricate a mating seat/buckle harness for the patient area which will plug into the NFPA420's cab harness. The following parts will be necessary to assemble the harness.

NFPA420 Seat/Buckle Harness:

- DTM04-12PA - Deutsch 12w connector (mates with the NFPA420 seat harness in the cab).
- WM-12P - Deutsch wedge lock
- Size 20 Terminals
- See CAD for pinout assignment (last page)

Seat Occupant Sensor Connector:

- 12129489 - Delphi 3w connector
- 12129491 - Delphi 3w spacer

Seat Belt Buckle Connector:

- 12052832 - Delphi 2w connector
- 12047664 - Delphi 2w spacer

NFPA420 Seat /Buckle Harness



Mates with Upfitter seat/buckle harness

Beeper spade connector

Plugs into NFPA420 module

Warning Beeper(s) Installation

- Attach the 4 Pin harness to the NFPA420 Module's 4-Pin White connector.
- Attach the 4-Pin connector Pin #2 Orange wire to the Positive side (red painted terminal) of the Warning Beeper.
- Attach the black wire eyelet from the warning beeper to chassis ground.
- Secure the Warning Beeper under the dash.
- An optional second beeper may be installed in the patient area as required.



LED Display Panel(s) Installation

- Locate a suitable position on the dashboard within view of the driver for mounting the LED Display Panel.
- A common place is the space below the left A/C vent in the F-SuperDuty. The length of the display harness is 40". This is the maximum distance the display can be mounted from the NFPA420 module in the cab.
- In addition, the attendant (patient area) must be able to see the LED display as well. A second LED display panel can be mounted in the patient area if needed. An optional extended length harness is also available for a second LED panel and beeper.
- **Note:** You may not want to permanently mount the Display Panel until all upfitting is complete (radios, electronics etc.)
- Attach the 4 Pin LED display harness to the NFPA420 module's 4-Pin Black connector.
- Attach the end of the display harness to the LED Display Panel.



LED Display Panel

NFPA Seat/Buckle Harness Connection

- Connect the seat/buckle harnesses white 12 pin connector to the NFPA420 module.
- Pass the upfitter patient area seat/buckle harness into the cab, and plug it into the NFPA420's 12 pin Deutsch connector.

Preparing to Power Up the module:

- Reconnect the vehicle's battery, but do NOT plug in the six pin OBDII Data Link harness connector into the NFPA420 module until you prepare the system as follows.
- **Seat Selection**—The first time the module is powered up (from the factory), it runs an install routine which establishes which seat positions are active (you may want to monitor fewer seat positions than the system supports). The install routine determines active positions by reading seat belt buckle sensors. For each position to be sensed and deemed "active", it needs a proper harness connection, and ***the seat belt must be buckled (switch closed). Make sure all positions that need to be active are set up this way prior to powering up the module or re-running the install routine.*** Non-active positions are neither displayed nor reported to the VDR (if installed). Once the seat selection is complete, the module will display the seat configuration using *module* LEDs 1-5 (NOT display panel LEDs). The LEDs will indicate (by being ON) which positions are active. Seats are represented as follows:

LED1— Rear Attendant LED3— Rear Passenger2 LED5—Rear Passenger4
LED2— Rear Passenger1 LED4— Rear Passenger3

As stated above, the seat selection routine runs automatically the first time (from the factory) power is applied to the module. ***If seat selection is ever needed at a later time, a "special hard boot" needs to be run.*** Unplug the 6 pin white connector from the NFPA420 module. With the key ON and engine OFF, hold a ground connection to the module's test pad, and plug in the 6-pin Data Link harness connector. This "Hard Boot" will cause the module to go into a special "Install Routine". This routine runs functions that will ensure the module is configured properly to the vehicle in which it is installed. Besides selecting seat positions as above, other initial functions will run:

Installation test functions

- **CAN detect:**

On power up, the NFPA420 first auto-detects the vehicle CAN communication bus to verify it can read vehicle data. If the module fails to detect the CAN bus, module LED6 will turn ON and LEDs 1-4 will scroll. In addition, the far right 2 sets of LEDs (top & bottom row) on the dash LED display panel will be "rotating" and top row LED3 will be ON. The module will not function if this happens.

The most likely problem in this case is something wrong with either the vehicle OBDII connection or in the harness connecting to the module.

- **VIN Capture:**

The first time (from the factory) the module is plugged in (or special hard-boot), it will try to read the vehicle VIN. It needs this to assure that vehicle data will be correctly received and interpreted. If it cannot acquire the VIN or if the acquired VIN is invalid, module LED7 will turn ON and LEDs 1-4 will scroll. In addition, the far right 2 sets of LEDs (top & bottom row) on the dash LED display panel will be "rotating" and top row LED2 will be ON. If VIN acquisition was successful, the module stores and uses it for future reference. If VIN cannot be acquired, the module will not function; contact Intermotive Technical Support at 530-823-1048.

4. Custom-defined J1939 PGNs

Key Position—PGN 0xF00C, byte 0, bits 0-3

0000—OFF

0010—ACC

0100—RUN

1000—CRANK

1111—Invalid

Engine Oil Pressure—PGN 0xF00C, byte 1, bits 0-1

00—NO

01—YES

11— Invalid

The Seat and Buckle sense data is contained in PGN 0xE000 and defined as follows:

Byte1/bit0 — Rear Attendant Seat

Byte1/bit2 — Rear Attendant Buckle

Byte1/bit4 — Passenger1 Seat

Byte1/bit6 — Passenger1 Buckle

Byte2/bit0 — Passenger2 Seat

Byte2/bit2 — Passenger2 Buckle

Byte2/bit4 — Passenger3 Seat

Byte2/bit6 — Passenger3 Buckle

Byte3/bit0 — Passenger4 Seat

Byte3/bit2 — Passenger4 Buckle

5. Post Installation Test

With vehicle in Park, Parking Brake applied, and Key OFF (module in low-power mode):

- Turn Key ON. Verify all Display Panel LEDs blink on briefly (prove out).
- Sit in each seat location, and verify respective red LED illuminates on the panel.
- While sitting in the seat, buckle the seatbelt, and verify red LED extinguishes and green LED illuminates.

While sitting in a seat (seat belt unbuckled, vehicle in Park, and Park Brake applied):

- Move transmission selector out of Park position **and** disengage the Park Brake. Verify audible beeper activates.
- Press Silence button (on Display Panel), and verify beeper stops. Shift back into Park position and reapply the Park Brake.

Leave the seat for 3 sec, then sit back down again. This resets the alarm function.

If the NFPA420 fails any step in the Post Installation Test, review the installation instructions and check all connections.

If necessary, call

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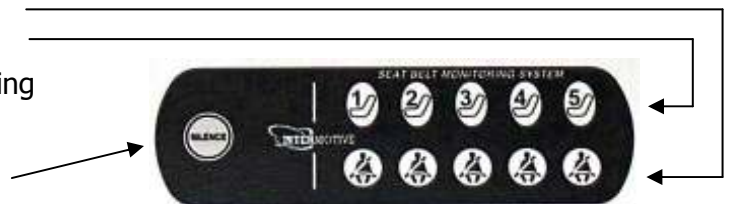
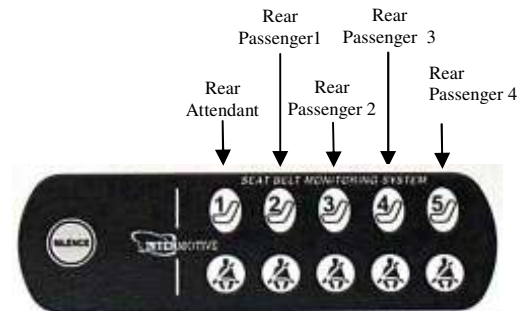
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2009-2012 Ford E-Series, 2009-2012 F-SuperDuty

2008-2012 Chevy Express/GM Savana

2011-2012 Dodge Ram 2500-5500

- The NFPA420 is a seat belt monitoring system for Ambulances which meets the requirements of NFPA1917.
- It can monitor up to five seat positions in the patient area. It provides an LED panel which indicates the presence of an occupant in the seat, and whether they have their seat belt buckled. A beeper will sound if the Ambulance is driven without all occupied positions belted in place.
- To test the system, turn the ignition key on.
- All of the Display Panel LEDs will blink on briefly.
- Sitting in each seat location will illuminate the respective **Red** LED on the panel.
- When sitting in an unbelted seat, moving the transmission selector out of Park and releasing the Park Brake will sound the beeper, indicating an unsafe condition.
- Inserting the seatbelt into the buckle while sitting in each seat will extinguish the respective **Red** LED and illuminate the respective **Green** LED.
- Inserting the seatbelt into the buckle without sitting in the seat will flash the respective **Red** LED.
- Pressing the Silence button anytime the beeper is sounding will stop the beeper for that offending seat position only.



If the NFPA420 fails any step in the Operating Instructions, review the installation instructions and check all connections.

If necessary, call

