

## Diagnostic Trouble Codes—StarFire 3000

| SPN Number | SPN Name                                                                   | FMI Address | FMI Name                                       | DM1 Lamp Status    | Engineering Code Description                                        | Level 1 Text   | Level 2 Text                                                                    |
|------------|----------------------------------------------------------------------------|-------------|------------------------------------------------|--------------------|---------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------|
| 158.03     | Keyswitch Battery Potential                                                | 3           | Voltage Above Normal or Shorted to High Source | Amber Warning Lamp | The StarFire is operating with high switched voltage. Check wiring. | System Voltage | Switched power > 32V. Check vehicle charging system, wiring, and connections    |
| 158.04     | Keyswitch Battery Potential                                                | 4           | Voltage Below Normal or Shorted to Low Source  | Amber Warning Lamp | The StarFire is operating with low switched voltage. Check wiring.  | System Voltage | Switched power < 9V. Check vehicle battery, harnessing and connectors.          |
| 168.03     | Battery Potential/Power Input 1                                            | 3           | Voltage Above Normal or Shorted to High Source | Protect Lamp       | Unswitched power to GPS receiver has high voltage.                  | System Voltage | Unswitched power > 32V. Check vehicle charging system, wiring, and connections. |
| 168.04     | Battery Potential/Power Input 1                                            | 4           | Voltage Below Normal or Shorted to Low Source  | Protect Lamp       | Unswitched power to GPS receiver has low voltage.                   | System Voltage | Unswitched power < 9V. Check vehicle charging system, wiring, and connections.  |
| 232.02     | DGPS Differential Correction                                               | 2           | Data Erratic, Intermittent, or Incorrect       | Amber Warning Lamp | Corrected GPS position is not available.                            | GPS System     | Corrected GPS position is not available.                                        |
| 444.04     | Configuration                                                              | 4           | Special Instructions                           | Amber Warning Lamp | Invalid application configuration                                   | Configuration  | Invalid application configuration                                               |
| 639.12     | J1939 Network #1, Primary Vehicle Network (previously SAE J1939 Data Link) | 12          | Special Instructions                           | Amber Warning Lamp | Missing messages from the CAN bus                                   | CAN Network    | Loss of CAN Data                                                                |
| 639.14     | J1939 Network #1, Primary Vehicle Network (previously SAE J1939 Data Link) | 14          | Special Instructions                           | Amber Warning Lamp | CAN in bus-off. Check wiring and connections.                       | CAN Network    | Loss of CAN Data                                                                |
| 841.07     | Global Positioning System (GPS)                                            | 7           | Mechanical System not Responding               | Red                | The GPS receiver controller has lost serial                         | GPS            | Communication Lost with GPS Processor                                           |

| SPN Number | SPN Name                              | FMI Address | FMI Name                                                              | DM1 Lamp Status    | Engineering Code Description                                                              | Level 1 Text          | Level 2 Text                                                                                      |
|------------|---------------------------------------|-------------|-----------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------------------------|
|            |                                       |             | or Out of Adjustment                                                  |                    | communication with the Navigation Processor (MPC5200)                                     |                       |                                                                                                   |
| 841.31     | Global Positioning System (GPS)       | 31          | Not Available or Condition Exists                                     | Amber Warning Lamp | Signal interference (from jammer).                                                        | GPS Position          | Signal interference (from jammer).                                                                |
| 2850.05    | Communications Carrier                | 5           | Not Available or Condition Exists                                     | Protect Lamp       | Reflected antenna power level too high                                                    | RTK Rover             | Reflected antenna power                                                                           |
| 2854.09    | Communications Carrier                | 9           | Not Available or Condition Exists                                     | Protect Lamp       | Corrections age has been exceeded for mobile RTK corrections                              | RTK Rover             | Corrections age exceeded                                                                          |
| 2854.31    | Communications Carrier                | 31          | Not Available or Condition Exists                                     | Protect Lamp       | Loss of RTK radio link at Rover                                                           | RTK Rover             | Loss of Radio Link                                                                                |
| 3141.14    | GPS Differential Corrections License  | 14          | Special Instructions                                                  | Protect Lamp       | The GPS receiver is not authorized to receive corrections on the RTK base station.        | RTK Rover             | The GPS receiver is not authorized on this RTK network.                                           |
| 3141.31    | GPS Differential Corrections License  | 31          | Not Available or Condition Exists                                     | Protect Lamp       | The GPS corrections license has expired.                                                  | GPS Corrections       | The GPS corrections license has expired.                                                          |
| 3144.13    | Differential Source, Secondary        | 13          | Out of Calibration                                                    | Amber Warning Lamp | The StarFire receiver cannot link to the StarFire network on the alternate frequency.     | SF1/SF2               | StarFire Signal Not Found                                                                         |
| 516198.16  | Base Station Quality Indicator (BSQI) | 16          | Data Valid but Above Normal Operating Range – Moderately Severe Level | Protect Lamp       | Any of the position standard deviations received from the base exceed the high threshold. | Base position average | Bad base position. Check for obstructions or presence of interfering signal around base receiver. |
| 522394.13  | Terrain Compensation Module           | 13          | Out of Calibration                                                    | Protect Lamp       | The TCM has not been calibrated. Run the level calibration prior to operation.            | TCM not calibrated    | The system has detected that the TCM was previously calibrated on a machine but is now            |

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|------------|-----------------------------------|-------------|-----------------------------------------------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------|
|            |                                   |             |                                                                       |                    |                                                                                                                                 |                        | mounted on an implement or has not yet been calibrated. Please calibrate the TCM to ensure optimized system performance. |
| 522552.11  | Navigation Bus 1                  | 11          | Root Cause not Known                                                  | Protect Lamp       | The StarFire network has a problem.                                                                                             | StarFire Network       | Problem with StarFire Network. Resolution in Progress.                                                                   |
| 523187.02  | Remote License Activation         | 2           | Data Erratic, Intermittent or Incorrect                               | Protect Lamp       | Incorrect license activation received from StarFire satellite.                                                                  | Over-the-Air Messaging | Invalid license code received                                                                                            |
| 523274.02  | Navigational System Position Data | 2           | Data Erratic, Intermittent or Incorrect                               | Protect Lamp       | GPS position is not available.                                                                                                  | GPS Position           | GPS position is not available.                                                                                           |
| 523310.02  | Non-Volatile Memory read/write    | 2           | Data Erratic, Intermittent or Incorrect                               | Amber Warning Lamp | StarFire memory error has occurred.                                                                                             | Critical Memory        | Read/Write Failure                                                                                                       |
| 523348.07  | Inertial Measurement Unit (IMU)   | 7           | Data Erratic, Intermittent or Incorrect                               | Amber Warning Lamp | DTC created from Table 6-6 of 5200-5216 ICD (Value -1: IMU Communication Failure)                                               | TCM                    | TCM Communication Failure                                                                                                |
| 523348.16  | Inertial Measurement Unit (IMU)   | 16          | Data Valid but Above Normal Operating Range - Moderately Severe Level | Protect Lamp       | The reported temperature from the IMU is outside of its calibrated range. This can lead to inaccurate pitch, roll, and heading. | TCM                    | TCM Temperature out of range                                                                                             |
| 523348.12  | Inertial Measurement Unit (IMU)   | 12          | Bad Intelligent Device or Component                                   | Amber Warning Lamp | DTC created from Table 6-6 of 5200-5216 ICD (Value -2:                                                                          | TCM                    | TCM Sensor Failure                                                                                                       |

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|------------|-----------------------------|-------------|-----------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------|
|            |                             |             |                                                                       |                 | IMU Sensor Failure)                                                             |                            |                                                                        |
| 523441.31  | Antenna location (Z axis)   | 31          | Not Available or Condition Exists                                     | None            | The GPS antenna height not set.                                                 | TCM                        | StarFire Height Dimension Not Set, press setup tab on main page        |
| 523442.31  | Antenna location (X axis)   | 31          | Not Available or Condition Exists                                     | None            | The GPS fore-aft dimension not set.                                             | TCM                        | StarFire Fore/Aft Dimension Not Set, Press setup tab on main page      |
| 523773.03  | CAN High line               | 3           | Voltage Above Normal or Shorted to High Source                        | None            | The StarFire CAN HI voltage is too high. Check wiring.                          | CAN HI Voltage Too High    |                                                                        |
| 523773.04  | CAN High line               | 4           | Voltage Below Normal or Shorted to Low Source                         | None            | StarFire CAN HI voltage is too low. Check wiring.                               | CAN HI voltage is too low  |                                                                        |
| 523774.03  | CAN Low line                | 3           | Voltage Above Normal or Shorted to High Source                        | None            | The StarFire CAN LO voltage is too high. Check wiring.                          | CAN LO voltage is too high |                                                                        |
| 523774.04  | CAN Low line                | 4           | Voltage Below Normal or Shorted to Low Source                         | None            | The StarFire CAN LO voltage is too low. Check wiring.                           | CAN LO voltage is too low  |                                                                        |
| 524209.16  | RTK Rover relative distance | 16          | Data Valid but Above Normal Operating Range - Moderately Severe Level | Protect Lamp    | The RTK rover is too far from the base station for the corrections to be valid. | RTK Rover                  | Vehicle too far from Base Station                                      |
| 524257.14  | RTK base station location   | 14          | Special Instructions                                                  | Protect Lamp    | The RTK base station is in survey mode. Corrections are unavailable.            | RTK Base Station           | The RTK base station is in survey mode. Corrections are not available. |
| 524257.16  | RTK base station location   | 16          | Data Valid but Above Normal Operating Range - Moderately              | Protect Lamp    | The RTK base station has been moved. Corrections are not valid.                 | RTK Base Station           | Base Station has been Moved                                            |

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|------------|---------------------------|-------------|--------------------------------|-----------------|-------------------------------------|--------------|--------------------------------------------------------------------------------------------------------|
|            |                           |             | Severe Level                   |                 |                                     |              |                                                                                                        |
| 524257.19  | RTK base station location | 19          | Received Network Data in Error | Protect Lamp    | Multiple RTK Base Stations Detected | RTK system   | Interference between neighboring RTK base stations. Adjust your RTK Network settings to unique values. |

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