## Charging System

The charging system provides electrical current for the lights, radio, heater blower and the engine's electrical systems. It also maintains the batteries in a charged state, recharging them as necessary to provide cranking power.

The charging system has three main components, or component areas: the alternator, the voltage regulator, and the battery.

The alternator is driven by a belt from the engine crankshaft and produces the electrical power to operate the systems on the bus. It also recharges the battery.

The voltage regulator acts as a "control valve" for the alternator output. It senses the current load and maintains a constant voltage in the charging system, independent of the current load, up to its rated output. The Leece Neville™ alternator on the Blue Bird Vision has a "built in" voltage regulator. It is excited (started) by the ignition system.

The battery is the reservoir of chemical electrical power. Its primary purpose is to crank the engine. It also supplies power to the accessories for a short time when the demand is too high for the alternator alone (i.e., while the bus is at idle). Another key role of the battery is to act as a filter for the charging system.

The Blue Bird Vision has a 12-volt electrical system. The alternator is a 175-ampere, 12-volt device. Leece Neville model number A0014834LC is standard.

## Maintenance

Clean the alternator and all connection points. Dirt buildup restricting air flow through to the alternator will cause excessive heat and premature failure. Corrosion at any connecting point will produce resistance to current flow, heat and diminished power for the starter and accessories.

Ensure that all the components in the charging system are mounted securely. Check the torque at all mounting bolts — both the bolts that hold the alternator in the mounting bracket and the bolts that secure the mounting brackets to the engine. The torque value for mounting bolts at the engine and at the alternator should be 70 – 80 ft lb (95 – 108 Nm)

Blue Bird Vision buses are equipped with an automatic belt tensioner. Ensure that all the grooves fit properly into the pulleys in the correct path. The drive belt should be inspected every 11,000 miles (17,700 km), 250 hours of service life, or every 3 months; whichever occurs first.

**Also check:**

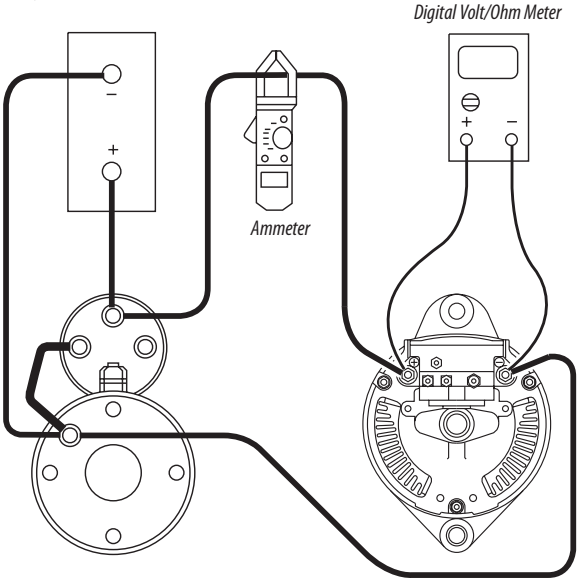
- Battery voltage
- Alternator output
- Starter current draw

## Troubleshooting

Timely preventive maintenance of the charging system should keep it running smoothly. However, when a problem occurs, effective troubleshooting procedures will help locate and correct the problem quickly and economically.

***Batteries emit an explosive gas. Never smoke while working on the charging system. Batteries can explode from a spark. Always remove the negative battery cable at the battery post before removing any other wires in the charging system. Be careful not to short the system while you are working on it. Do not wear jewelry.***

Before you begin to analyze the charging system, it is necessary that you ensure the battery is properly tested and charged to at least 75% of their rated capacity. Failure to confirm the condition of the battery will make the results of any diagnostic testing unreliable. Refer to the battery manufacturer's publications on battery maintenance and testing.




**Alternator Performance Test**

1. Connect a digital volt/ohmmeter (VOM) to the output terminals of the alternator.

   ***Ensure that the test leads are connected properly. Observe the polarity and make secure connections.***

2. Connect an ammeter to the positive terminal of the alternator. Observe that the clamp on the ammeter is located at least 6 inches (15 cm) from the alternator to lessen the possibility of faulty readings due to spurious emissions.

3. Verify that the voltage output from the alternator is between 13.6 and 14.2 volts with the engine at operating RPM (1700 RPM minimum) and not idle.

4. Ensure that all "loads" are in the off position. The reading on the ammeter should be less than 20 amps.

   - If the amp reading is higher than 20 amps, ensure all accessories are turned off.

   - Ensure the battery is charged to at least 75% of their rated capacity.

5. Record the voltage. If the voltage is not within the specified range or the amperage is not within the specified range, the alternator is defective.

6. If the alternator is determined to be defective, repair or replace it in accordance with the instructions below. See Alternator Removal.

7. If the alternator is determined to be functioning properly, proceed as follows:

8. Continue to operate the engine at about 1700 RPM, and with the test equipment set up as illustrated.

9. Turn on vehicle loads (accessories) until the ammeter displays 132 amps, which is 75% of the rated capac-ity (175 amps). Record the voltage at this point.

10. Compare the voltage reading with the voltage reading observed in Step 3 above.

11. If the alternator voltage drops more than .5 (1/2) volt, the alternator is defective.

An alternate method of checking the alternator under load is to use a carbon pile load. Connect the carbon pile across the battery and adjust it until the ammeter reads 75% of the alternator rated capacity. Record the voltage at this point, shut off the engine, and compare the readings.

**Alternator Cable Tests**

To test the positive alternator cable:

1. Clamp the ammeter on the positive cable at least 6 inches (15 cm) from the alternator. See Figure 2.

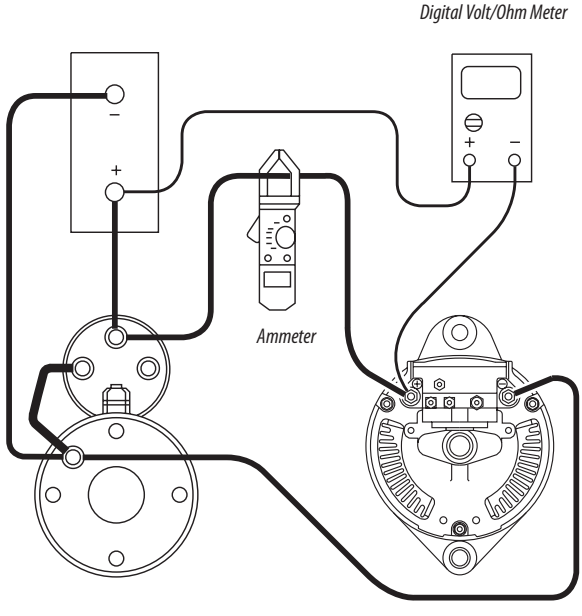
2. Connect the negative lead of the VOM to the positive post of the alternator.

3. Connect the positive lead of the VOM to the positive battery post.

4. Start the engine and let it run at about 1700 RPM.

5. Turn on accessories until the ammeter reads 132 amps, which is 75% of the rated alternator capacity (175 amps). Use a carbon pile if necessary to achieve the load.

6. Record the voltage reading on the VOM.



7. If the VOM reads more than -.25 volts, there is a problem with the positive cable.

   • Check and clean all the connections and the condition of all the cables/wires in the circuit.

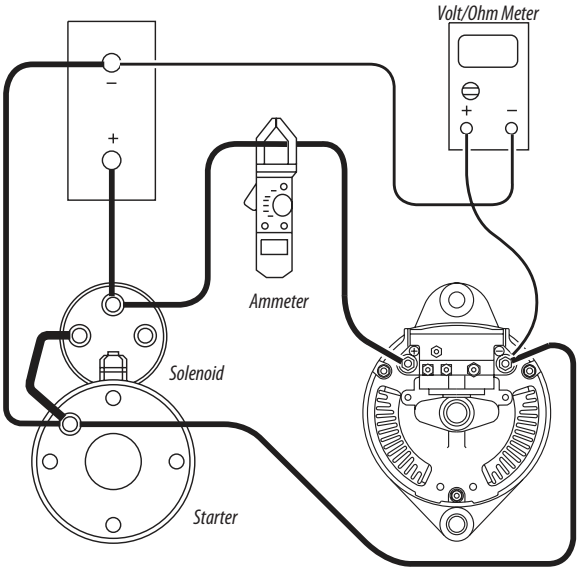
   • Re-test the circuit.

8. If the reading is less than -.25 volts, the cable and connections are good.

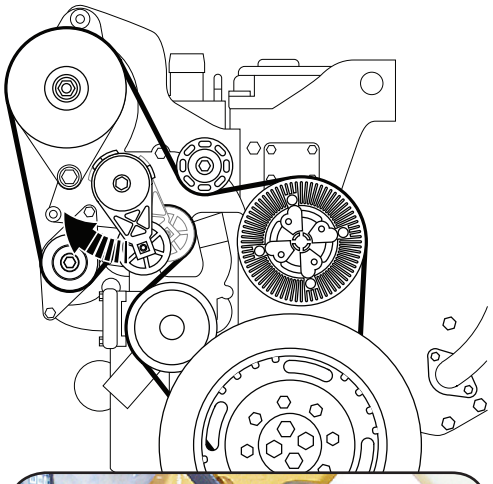
9. Connect the lead negative of the VOM to the negative terminal of the battery.

10. Connect the positive lead of the VOM to the negative terminal of the alternator.

11. Repeat Steps 4 through 8 for the negative cable.

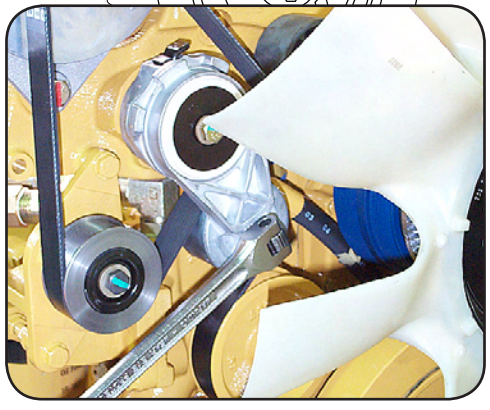


## Alternator Removal

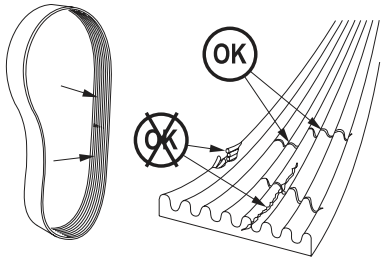


***Always disconnect the negative (-) cable from the battery terminal first to avoid arcing, which could ignite explosive battery gases.***

1. Park the bus on a smooth, flat surface.
2. Chock the wheels in both directions.
3. Ensure the engine is not running, the ignition switch is in the "OFF" position and the key is removed.
4. Disconnect the negative (ground) cable from the battery post.
5. Lift the automatic belt tensioner to remove the drive belt from the alternator.
6. Remove the drive belt.
7. Inspect the drive belt; discard it if any signs of wear are present.

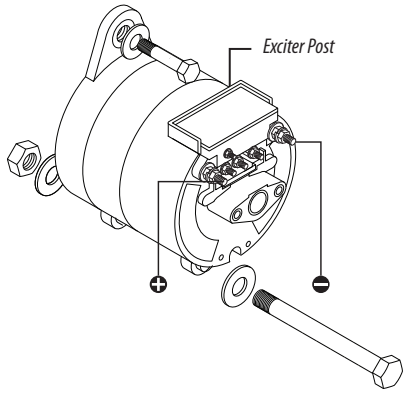


A few minor cracks across the belt are acceptable. Longitudinal cracks are NOT acceptable. Replace the drive belt when any crack is observed to be running lengthwise or with the belt, or when the belt appears frayed.




***Always disconnect the negative (-) battery cable at the battery before removing any wiring from the alternator.***

8. Remove the negative (-) cable from the alternator.
9. Remove the positive (+) cable from the alternator.
10. Remove the ignition wire from the exciter post.
11. Remove the locknut and washer from the bottom mounting bolt. Remove the bolt from alternator mounting bracket.
13. Remove the bolt and split ring lock washer from the top of the alternator.
14. Remove the alternator.



**Alternator Reinstallation**

Installation of the alternator is accomplished in the reverse order of the removal instructions above.

1. Position the alternator under the top holding bracket.
2. Install the washer (7) on the bolt (8). See Figure 7.
3. Install the bolt (8) and washer (7) assembly finger tight.
4. Install lock washer (5) on the through bolt (6).
5. Install the through bolt/washer assembly through the holding bracket and the alternator mounting holes.
6. Install the washer (5) onto the through bolt.
7. Install the locknut (4) on the through bolt.
8. Torque bolts (6 and 8) to 70 – 80 ft lb (95 – 108 Nm)
9. Install the ignition exciter wire on the IGN post (3). Tighten carefully to avoid breaking or stripping the stud. See Figure 6.
10. Install the positive cable (2) on the B+ post. Carefully tighten to avoid breaking or stripping the stud.
11. Install the negative cable (1) on the B - post. Carefully tighten to avoid breaking or stripping the stud.
12. Using a square drive tool, position the automatic tensioner so that the drive belt can be installed. Inspect the drive belt carefully. Replace the belt if any signs of wear are present.
13. Install the drive belt. Ensure that the grooves in the belt fit into the proper places on all the pulleys.

## Automatic Belt Tensioner

The automatic tensioner is spring loaded to provide the proper tension for the drive belt.

The automatic tensioner should travel at least 71º, and the torque to move the tensioner 25º from the "at rest" position must be 9 – 11 ft lb (12.4 – 15.8 Nm). Inspect the belt tensioner for any unusual noise, excessive looseness and shaking at the bearings.

**Automatic Tensioner Removal**

1. Remove the drive belt in accordance with the instruc-tions above.

2. Remove the capscrew (1) from the automatic ten-sioner. See Figure 8.

To install a new automatic tensioner, reverse the removal instructions. Torque the capscrew (1) to 28 – 42 ft lb (38 – 56 Nm).

## Starter

There are 5 main components or component areas in the starting system: the ignition switch, a neutral safety switch, the starter solenoid, the starter motor and the batteries.

When the key is turned to the start position, electrical current flows to the starter solenoid from the batteries. The flow is interrupted if the transmission shift lever is not in the neutral position or if the neutral sensor switch is defective.

The starter solenoid is an electromagnetic switch mounted on the starter motor. When electric current energizes coils inside the solenoid, a magnetic field is induced which pulls a plunger. At one end of this plunger is a shift lever. The lever is connected to the drive pinion and clutch assembly of the starter motor. The plunger also connects the electrical power from the batteries to the starter motor as it engages the flywheel ring gear.

The starter motor is a relatively small electric motor, but it can deliver large amounts of torque for a short time.

When the operator releases the ignition switch it returns to the run position. The solenoid is disconnected from the batteries and the magnetic field collapses. This allows the spring in the solenoid to move the plunger in the opposite direction, disengaging the flywheel and removing electrical current from the starter motor.

The Blue Bird Vision has a 12-volt electrical system. The starter motor is Model 35261110, Presto-lite/Leece/Neville M100R series. The Starter motor is capable of 4kw cranking power for peak loads of no more than 30 seconds duration.

## Preventative Maintenance

There are two preventative maintenance procedures that can greatly enhance the efficiency of the starting system. These two steps are also the first two steps taken when troubleshooting a malfunctioning starting system.



- An engine that needs a tune up will be difficult to crank; over cranking will lead to starter motor failure.
- Poor connections due to road dirt, grease, corrosion, loose connectors, or broken insulation at any connecting point rob the starting system of electrical power and cause it to over-crank.

## Troubleshooting

Before beginning to troubleshoot the starting system, ensure the batteries are properly maintained and charged to at least 75% of their rated capacity. A drained battery will cause any further diagnostic tests to be inaccurate. Common causes of starting system malfunction include:

1. A battery that is low, poorly charged, or defective places high demands on the starting system; voltage at the battery should be 12.4 volts or greater to crank the engine. If the batteries aren't adequately charging, a problem in the charging system. Refer to the Alternator section of this Service Manual for information on the charging system.

2. A starter motor can be damaged by heat that is generated by excessive cranking. The starter should never be engaged for more than 30 seconds. It must "rest" (cool off) a minimum of 2 minutes between starting attempts.

3. Loose, dirty, or corroded connections in the starting system rob the system of the power needed to turn the engine. The case of the starter motor is the ground or "return" connection for the starter motor and solenoid.

4. A loose starter motor will allow vibration that can damage the motor. In addition, the ring gear could be damaged.

5. Improper or excessive use of starting fluid will cause extra stress on the starting system.

6. A defective solenoid will fail to engage the starter motor. A failed pull-up coil will cause the plunger to fail to pull in. A failed hold-in coil may cause the starter to fail to stay engaged, or may fail to switch the starter motor on. If the solinoid is suspect, test the wiring of the solenoid circuit before replacing the solenoid.

The starting circuit is among those incorporated into the Vision's Multiplex System. Therefore, Multiplex diagnostics procedure can help to quickly isolate the root cause of most starting problems, and thereby minimize downtime. Refer to the Multiplex chapter for full details on performing Multiplex diagnostics.

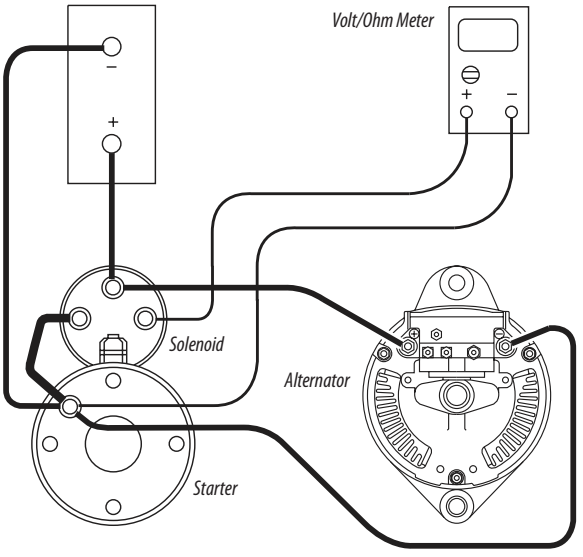
1. Refer to the Multiplex Output Table to find out which Port/Pin (B3-07) and which Output LED (B3-O02) pertain to the Starter Signal Output. The chart also shows which Ladder Logic Line (#20) describes the logic of the circuit.

2. Use the Diagnostic Switch to cycle the MPX Module to the appropriate Diagnostic Mode (Showing B3 Outputs). Check the LED to see if the Starter Signal Output (B3-O03) is Active. If the Output LED is Inactive, refer to Ladder Logic line #20 to systematically verify that each requirement for an Active Output is true.

3. Once the Output is Active, if the starter is still not operating, verify a ground at Pin B3-07 on the MPX Module. If the ground output is present, the problem exists "downstream" of the Multiplex system, and the starter itself is suspect.

**Ignition/Run Test**

Begin by determining whether the problem is with the ignition switch or the pilot relay, and their associated wiring; or if it is in the solenoid and/or starting motor. To begin with the ignition switch:




1. Connect the positive lead of a VOM to the ignition switch terminal on the solenoid.

2. Connect the negative lead of the VOM to the chassis ground.

3. While attempting to crank the engine, record the voltage displayed on the VOM. Observe the following:

   - No voltage
   - Low voltage
   - Normal voltage with slow cranking
   - Normal voltage with no cranking at all.

4. Connect a remote start switch to the positive battery post.

5. Connect the other end of the remote start switch to the ignition post of the solenoid.

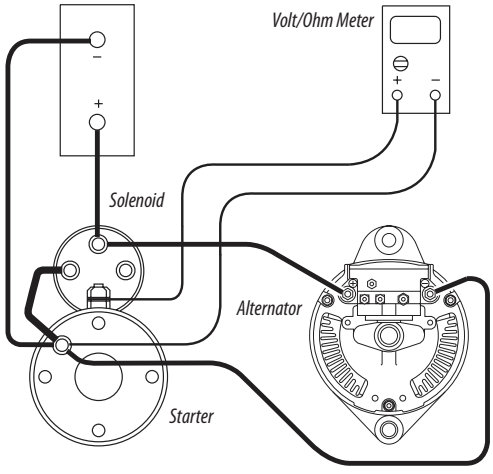
6. Attempt to crank the engine with the remote switch. Record the voltage displayed on the VOM. If there is less than 1 volt difference from the previous reading, the ignition switch is okay. If there is more than 1 volt difference, the switch is defective.

7. With the VOM negative lead connected to the chassis ground, move through the switch system one connection at a time. If your first voltage test has revealed low voltage, the starter motor may be shorted.

8. If the first voltage test indicated normal voltage, but there is slow cranking or no cranking at all, a problem with the batteries, battery cables, or a damaged starter motor is indicated.

**Low Voltage Test**

There are various reasons for low voltage but the troubleshooting methods are the same. If the solenoid clicks, it means that either current is flowing through the solenoid contacts but not through the main contacts; or that the current through the main contacts is insufficient due to low batteries.

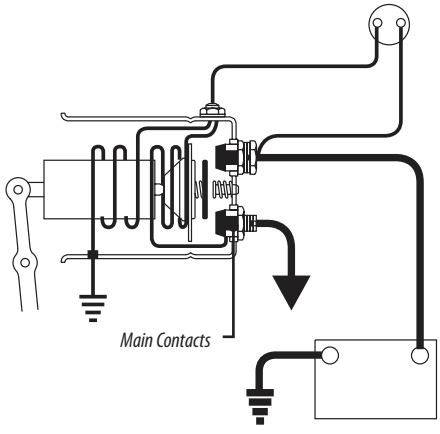



1. Connect the positive lead of the VOM to the starter motor terminal of the solenoid.

2. Connect the negative lead of the VOM to the chassis ground.

3. While attempting to crank the engine, if there is no voltage displayed on the VOM, the main contacts are not functioning properly.

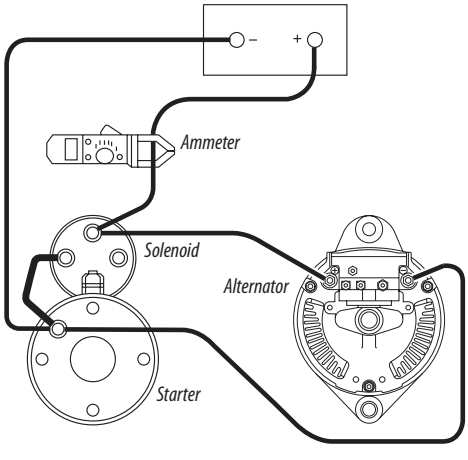
4. If there is voltage present at the solenoid terminal during Step 3, the problem is in the starter motor or its cabling.




5. If the first voltage check in Step 3 under Ignition/Run Test indicated normal voltage but slow or no cranking, the next step is to check the starter motor and its connections.

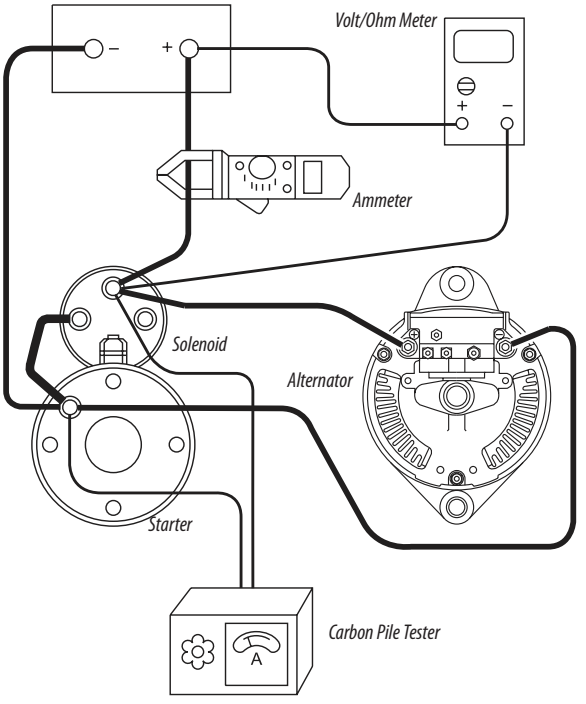
6. If the drive pinion jumps out of mesh with the flywheel ring gear, check for a broken or loose ground wire at the solenoid.

7. While attempting to crank the engine, place an ammeter on the positive battery cable. If the power drain is higher than the OEM specifications, the starter motor is defective. An exception would be if the engine was not properly tuned or is difficult to turn over; in which case, a new starter motor would be a temporary fix.



**Slow Cranking**

Sluggish cranking can be caused by a small amount of extra resistance in the cranking circuit. This extra resistance can come from loose or dirty (corroded) connections, or broken wires and/or cables. First check the positive cables and connections of the starter motor, then the negative circuit.



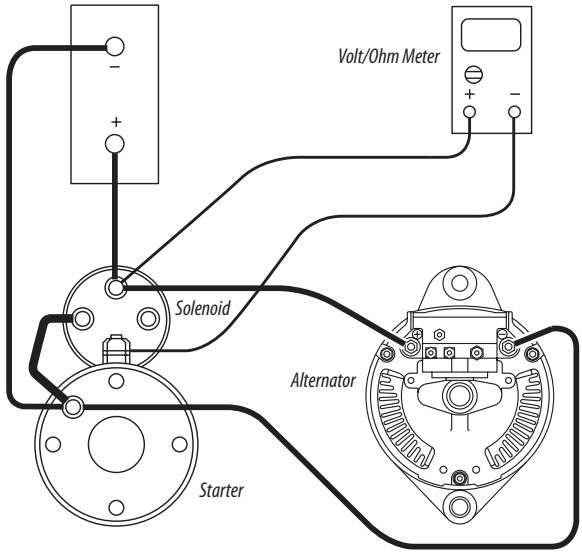

1. Connect the positive lead of a VOM to the positive battery terminal.
2. Position an ammeter between the solenoid and the positive terminal of the solenoid.
3. Connect the negative lead of the VOM to the positive terminal of the solenoid.
4. Connect the negative lead of the VOM to the negative battery post. This is the "unloaded" voltage. Record the reading; leave the VOM connected.
5. Connect one lead of a carbon pile tester to chassis ground.
6. Connect the other lead from the carbon pile tester to the positive terminal of the solenoid.
7. Adjust the carbon pile tester until the ammeter on the tester reads 500 amps.
8. Record the voltage display on the VOM; it should not be less than 0.4-volts less than the unloaded value.
9. Turn the carbon pile tester to the "OFF" position.
10. Connect the positive lead of the VOM to chassis ground.
11. Connect the negative lead of the VOM to the negative battery post. Record the reading; leave the VOM connected.
12. Position the ammeter in on the negative battery cable.
13. Turn on the carbon pile tester and adjust it to read 500 amps.
14. Record the voltage on the VOM; it should not drop more than 0.4-volts from the unloaded reading.

15. Turn the carbon pile tester to the OFF position.

16. If the voltage drop was more than 0.4-volts in step 8, the positive cabling is defective. Look for a broken cable or a loose or corroded connection.

17. If the voltage drop in step 14 is more than 0.4 volts, look for a problem in the negative cabling; look for broken or defective cables, and loose or corroded connections.

**Final check at solenoid terminals.**




1. Disconnect the carbon pile tester.

2. Disconnect the VOM.

3. Remove the ammeter.

4. Connect the positive lead of the VOM to the positive (battery) terminal of the solenoid.

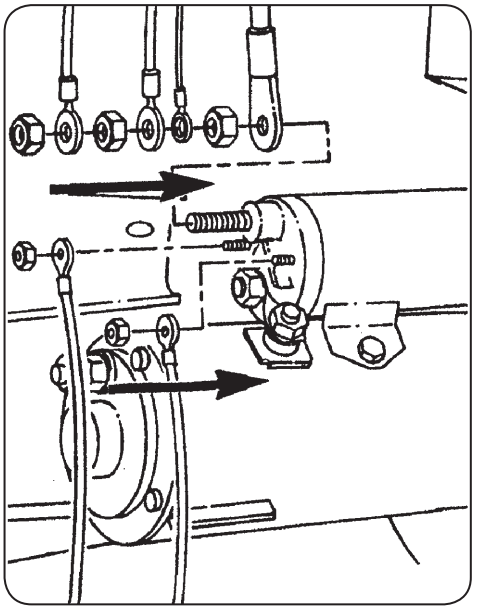
5. Set the VOM so that it can read the full battery volt-age; at least 14 volts.

6. Connect the negative VOM lead to the starter motor terminal of the solenoid.

7. Crank the engine and record the voltage while cranking. There should be no more than 0.2 volts drop between the solenoid contacts while cranking.

8. The voltage reading in these last three tests (the positive cable check, the negative cable check and the solenoid test), should not total more than 1.0 volts. If the voltage drop is more than allowable, repeat the cable tests using a jumper cable. If the tests then indicate an acceptable drop, the cable(s) is (are) defective.

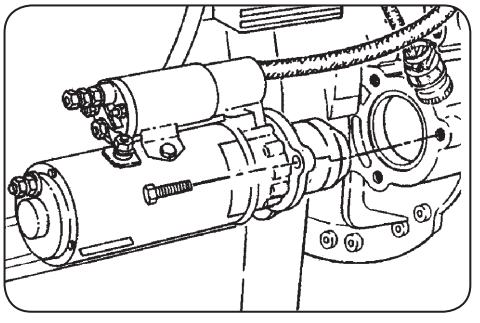
## Starter Motor Removal



1. Disconnect the negative (ground) cable from the battery. Wrap it with tape or other suitable insulation to prevent shorts.
2. Disconnect positive cable from the battery. Wrap it with tape or other suitable insulation to prevent shorts.
3. Identify and tag each wire on the starter motor for reinstallation.
4. Remove all electrical connections from the starter motor. Be sure to identify and tag all electrical connection locations.
5. Remove 3 capscrews.
6. Remove starter motor from flywheel housing.

**Starter Motor Installation**

The starter motor is installed in the reverse order of the removal instructions above.



1. Carefully place the starter motor into position on the flywheel housing.
2. Install 3 capscrews (1). Torque to 32 ft lb (43 Nm). See Figure 8.
3. Being careful to observe the identification of the electrical wires, connect the wires to the appropriate terminal on the starter motor. See Figure 7.



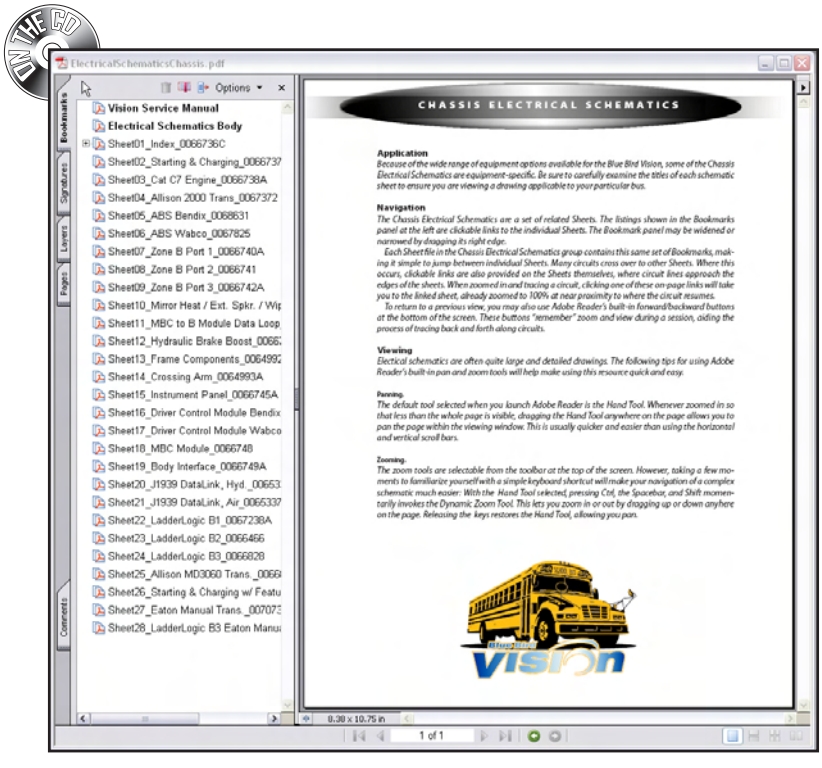
***Always remove the negative (-) cable from the battery terminal first. Always connect the negative (-) cable to the battery terminal last to avoid arcing that could ignite explosive battery gases.***

4. Install the positive cable on the battery post.
5. Install the negative cable on the battery post.

## Chassis Wiring Schematics

The following pages contain the main wiring schematics applicable to most Vision chassis. These are provided for your convenience when you are limited to use of the print manual. However, the Tech Reference CD contains a duplicate set of these drawings which provides additional functionality to aid navigation while tracing circuits. When using the CD, click the Electrical Schematics Chassis link in the Bookmarks pane. The first page of the Chassis Electrical Schematics group contains instructions on how to use the linking and navigation features.

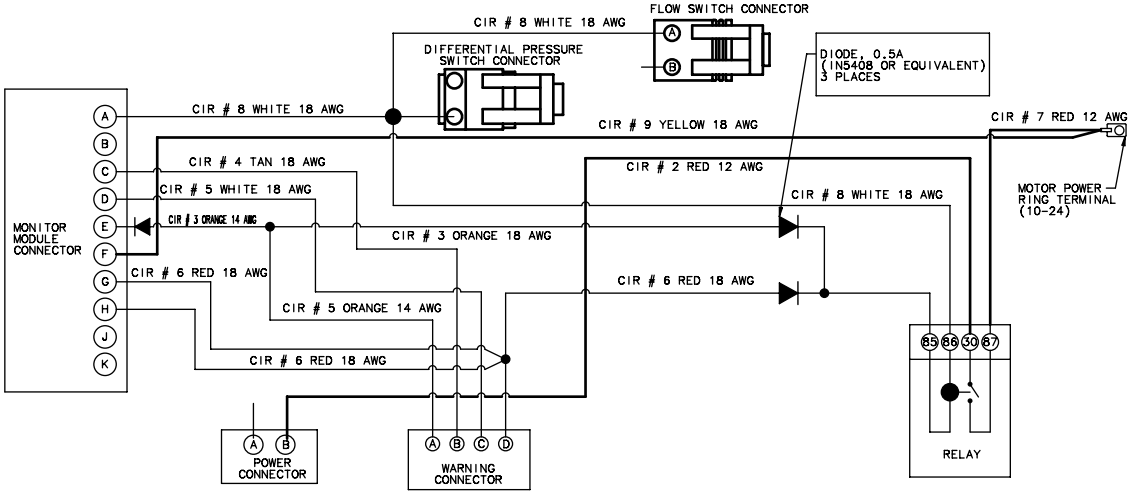
The drawings on the CD are in resolution-independent vector format. This allows you to zoom them at will, without the images becomming jagged as occurs with bitmap formats. This also means that you may print the drawing to your own office or desktop printer while maintaining legibility even at significant reductions.




*Chassis Electrical Schematics*

## Hydraulic Brake Booster Harness

This schematic describes the wiring of the Bendix HydroMax brake master cylinder/ booster harness on Blue Bird Visions equipped with hydraulic brakes.



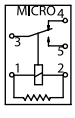
| Description | Sheet | Drawing Number |
|---|---|---|
| Index | 1 | 0080196 |
| Starting And Charging | 2 | 0080197 |
| Starting And Charging (with Florida circuit breakers) | 3 | 0080216 |
| Cat C7 Engine | 4 | 0080198 |
| Cat C7 Engine (with PAC exhaust brake) | 5 | 0083222 |
| Allison 2200/2500 PTS Transmission | 6 | 0080199 |
| Allison 3000 PTS Transmission | 7 | 0083239 |
| Eaton Manual Transmission | 8 | 0083240 |
| ABS - Bendix (air) | 9 | 0080200 |
| ABS - Wabco (hydraulic) | 10 | 0080201 |
| Zone B Port 1 | 11 | 0080202 |
| Zone B Port 1 (with PAC exhaust brake) | 12 | 0083223 |
| Zone B Port 2 | 13 | 0080203 |
| Zone B Port 2 (with PAC exhaust brake) | 14 | 0083224 |
| Zone B Port 3 | 15 | 0080204 |
| Mirror Heat / Exterior Speaker / Wiper Washer | 16 | 0080205 |
| Hydraulic Brake Boost | 17 | 0080206 |
| Frame Components | 18 | 0080207 |
| Frame Components (with PAC exhaust brake) | 19 | 0083225 |
| Crossing Arm | 20 | 0080208 |
| Instrument Panel | 21 | 0080209 |
| Driver's Control Module - Air | 22 | 0080210 |
| Driver's Control Module - Hydraulic | 23 | 0080211 |
| MBC Module | 24 | 0080212 |
| Body Interface | 25 | 0080213 |
| Body Interface With (with PAC exhaust brake) | 26 | 0083226 |
| J1939 Datalink, Hydraulic | 27 | 0080214 |
| J1939 Datalink, Air | 28 | 0080215 |
| Ladder Logic, B1 | 29 | 0083228 |
| Ladder Logic, B2 | 30 | 0083229 |
| Ladder Logic, B3 | 31 | 0083230 |
| Ladder Logic, B3, Eaton Manual Transmission | 32 | 0083231 |

**Wire Colors**

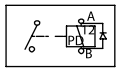
| | |
|---|---|
| BL | BLUE |
| BK | BLACK |
| BN | BROWN |
| TN | TAN |
| WH | WHITE |
| YL | YELLOW |
| PK | PINK |
| OR | ORANGE |
| RD | RED |
| GN | GREEN |
| PU | PURPLE |
| GY | GRAY |

**Schematic Legend**

| | |
|---|---|
| PD | PDU PANEL |
| AC | AIR CLEANER BRACKET |
| IP | INSTRUMENT PANEL |
| FW | FIREWALL |
| SP | SHIFTER PANEL |
| DC | DCM |



*Micro Relay*

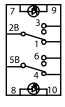


*Heavy Duty Relay*

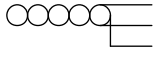

*Fuse*

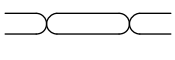
*Voltage Stud*

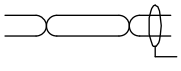

*Shunt*

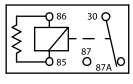


*Switch Ngr Rocker (Non-typical)*


*3 Wire Twisting*


*2 Wire Twisting*


*2 Wire Twisting with Shield*



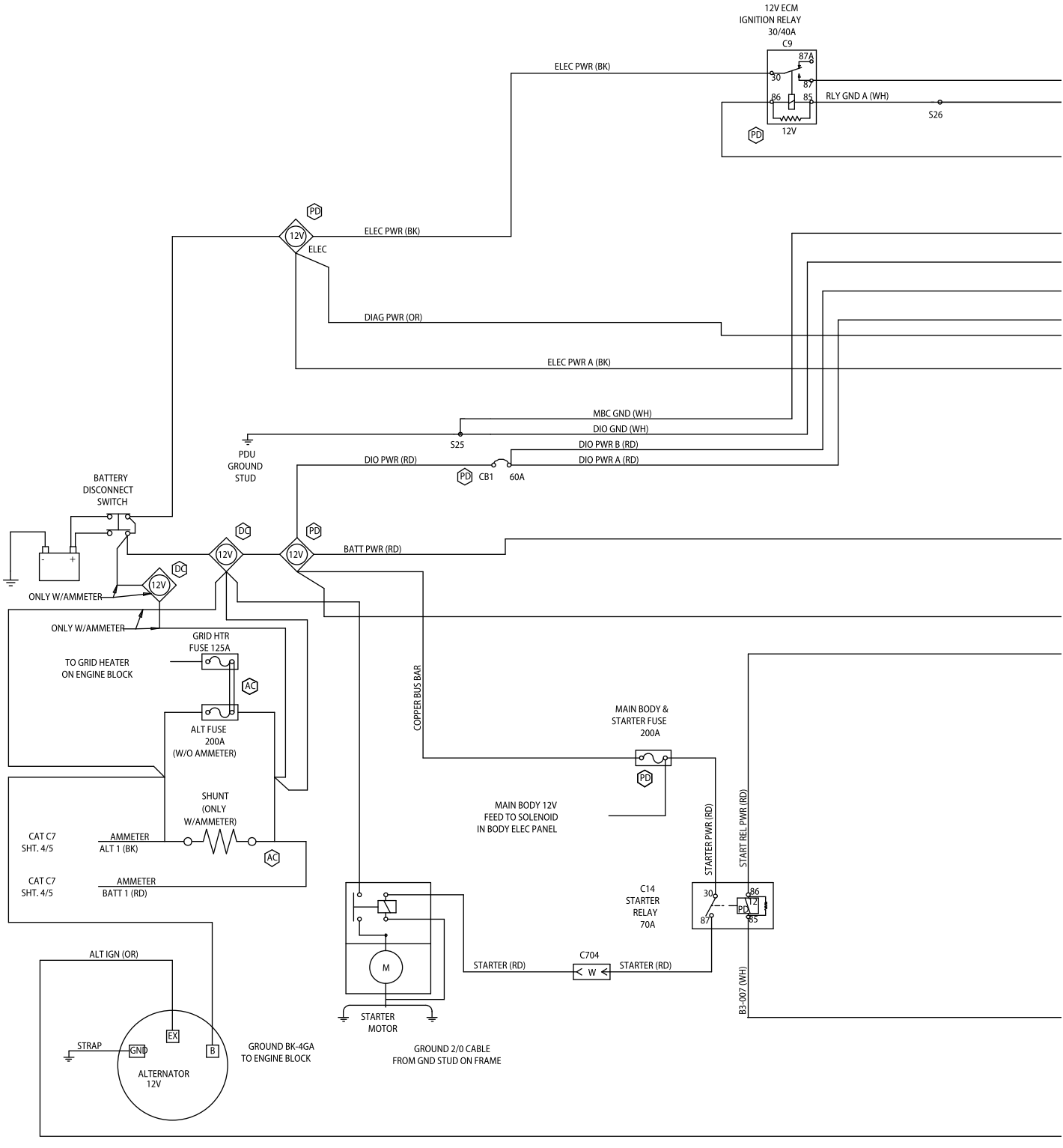
*Mini Relay*

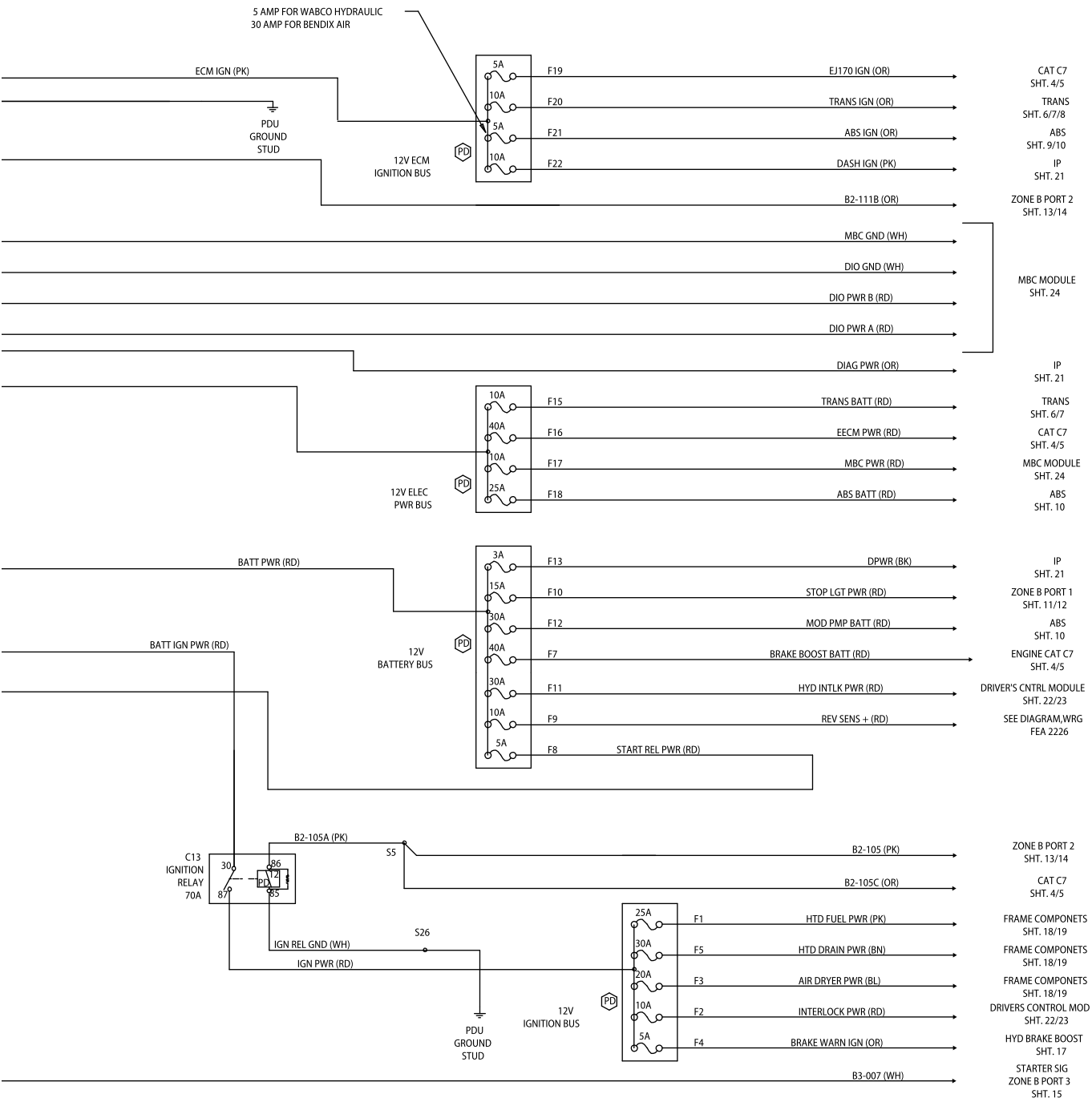

*Horn*

*Speaker*


*Light*


*Circuit Breaker*


12V ECM
IGNITION RELAY
30/40A
C9
87A
30
87
86
85
RLY GND A (WH)
S26
12V
PD
ELEC PWR (BK)
12V
ELEC
DIAG PWR (OR)
ELEC PWR A (BK)
MBC GND (WH)
DIO GND (WH)
S25
DIO PWR B (RD)
DIO PWR A (RD)
PDU
GROUND
STUD
DIO PWR (RD)
CB1
60A
BATTERY
DISCONNECT
SWITCH
DC
BATT PWR (RD)
ONLY W/AMMETER
ONLY W/AMMETER
GRID HTR
FUSE 125A
TO GRID HEATER
ON ENGINE BLOCK
AC
ALT FUSE
200A
(W/O AMMETER)
COPPER BUS BAR
MAIN BODY &
STARTER FUSE
200A
SHUNT
(ONLY
W/AMMETER)
MAIN BODY 12V
FEED TO SOLENOID
IN BODY ELEC PANEL
STARTER PWR (RD)
START REL PWR (RD)
CAT C7
SHT. 4/5
AMMETER
ALT 1 (BK)
CAT C7
SHT. 4/5
AMMETER
BATT 1 (RD)
C14
STARTER
RELAY
70A
M
STARTER (RD)
C704
W
STARTER (RD)
B3-007 (WH)
ALT IGN (OR)
STRAP
GND
EX
B
ALTERNATOR
12V
GROUND BK-4GA
TO ENGINE BLOCK
STARTER
MOTOR
GROUND 2/0 CABLE
FROM GND STUD ON FRAME

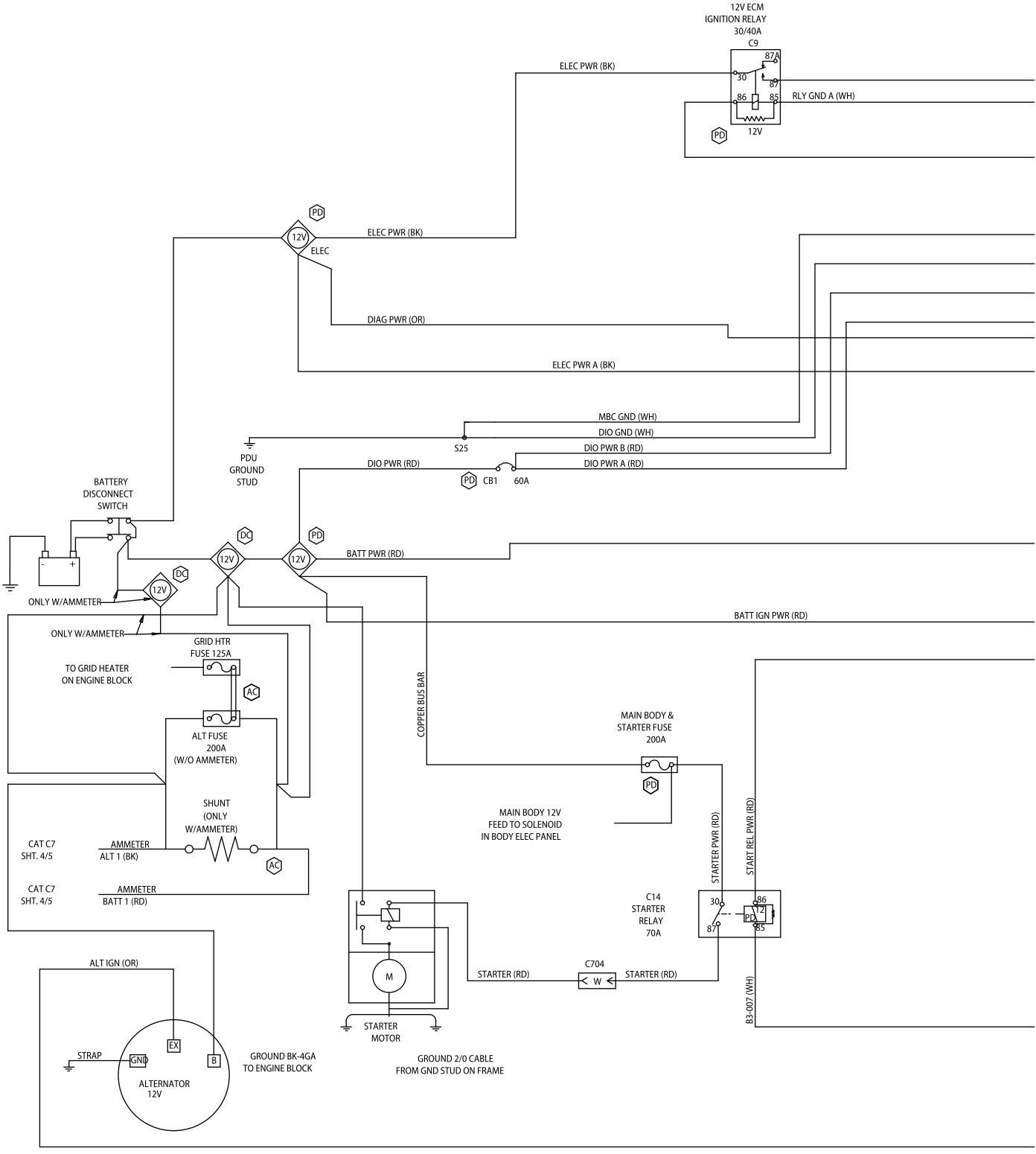


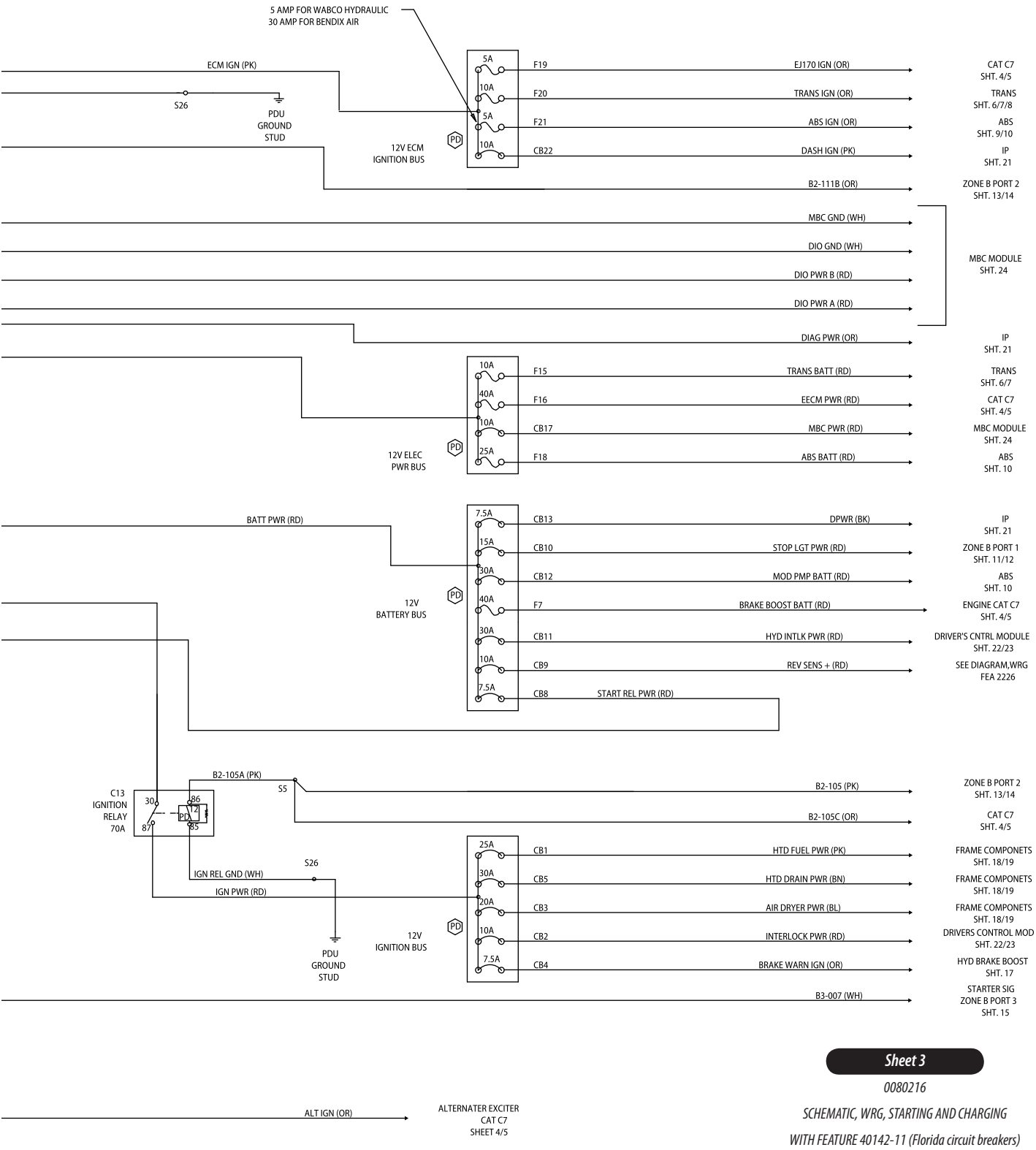



**Sheet 2**

*0080197*

*SCHEMATIC, WRG, STARTING AND CHARGING*


12V ECM
IGNITION RELAY
30/40A
C9
87A
30
87
86
85
RLY GND A (WH)
12V
PD
ELEC PWR (BK)
12V
ELEC
DIAG PWR (OR)
ELEC PWR A (BK)
MBC GND (WH)
DIO GND (WH)
S25
DIO PWR B (RD)
DIO PWR A (RD)
PDU
GROUND
STUD
DIO PWR (RD)
CB1
60A
BATTERY
DISCONNECT
SWITCH
DC
BATT PWR (RD)
ONLY W/AMMETER
BATT IGN PWR (RD)
GRID HTR
FUSE 125A
TO GRID HEATER
ON ENGINE BLOCK
AC
ALT FUSE
200A
(W/O AMMETER)
COPPER BUS BAR
MAIN BODY &
STARTER FUSE
200A
SHUNT
(ONLY
W/AMMETER)
MAIN BODY 12V
FEED TO SOLENOID
IN BODY ELEC PANEL
STARTER PWR (RD)
START REL PWR (RD)
CAT C7
SHT. 4/5
AMMETER
ALT 1 (BK)
CAT C7
SHT. 4/5
AMMETER
BATT 1 (RD)
C14
STARTER
RELAY
70A
ALT IGN (OR)
M
STARTER (RD)
C704
W
STARTER (RD)
B3-007 (WH)
STRAP
GND
EX
B
ALTERNATOR
12V
STARTER
MOTOR
GROUND BK-4GA
TO ENGINE BLOCK
GROUND 2/0 CABLE
FROM GND STUD ON FRAME

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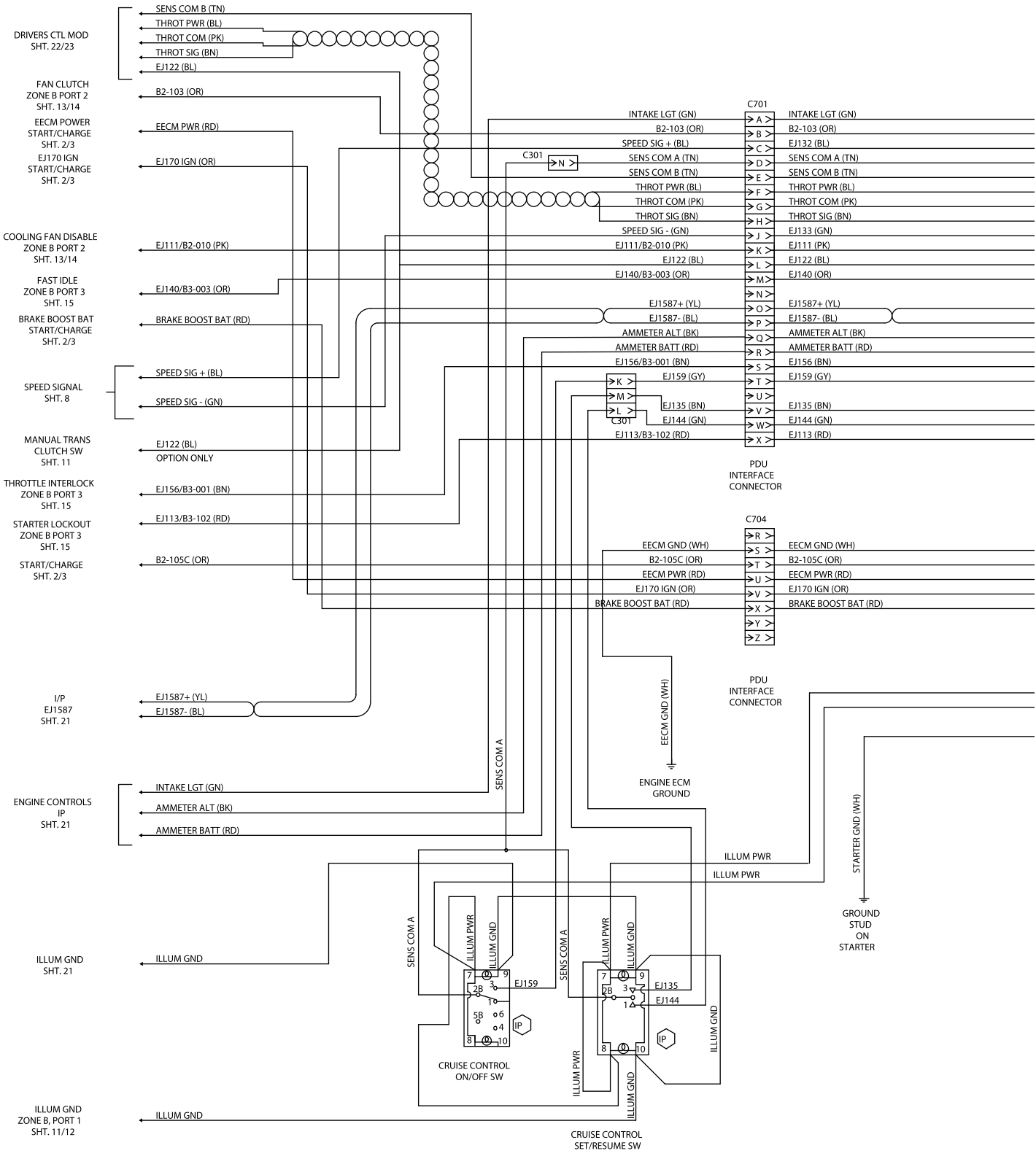
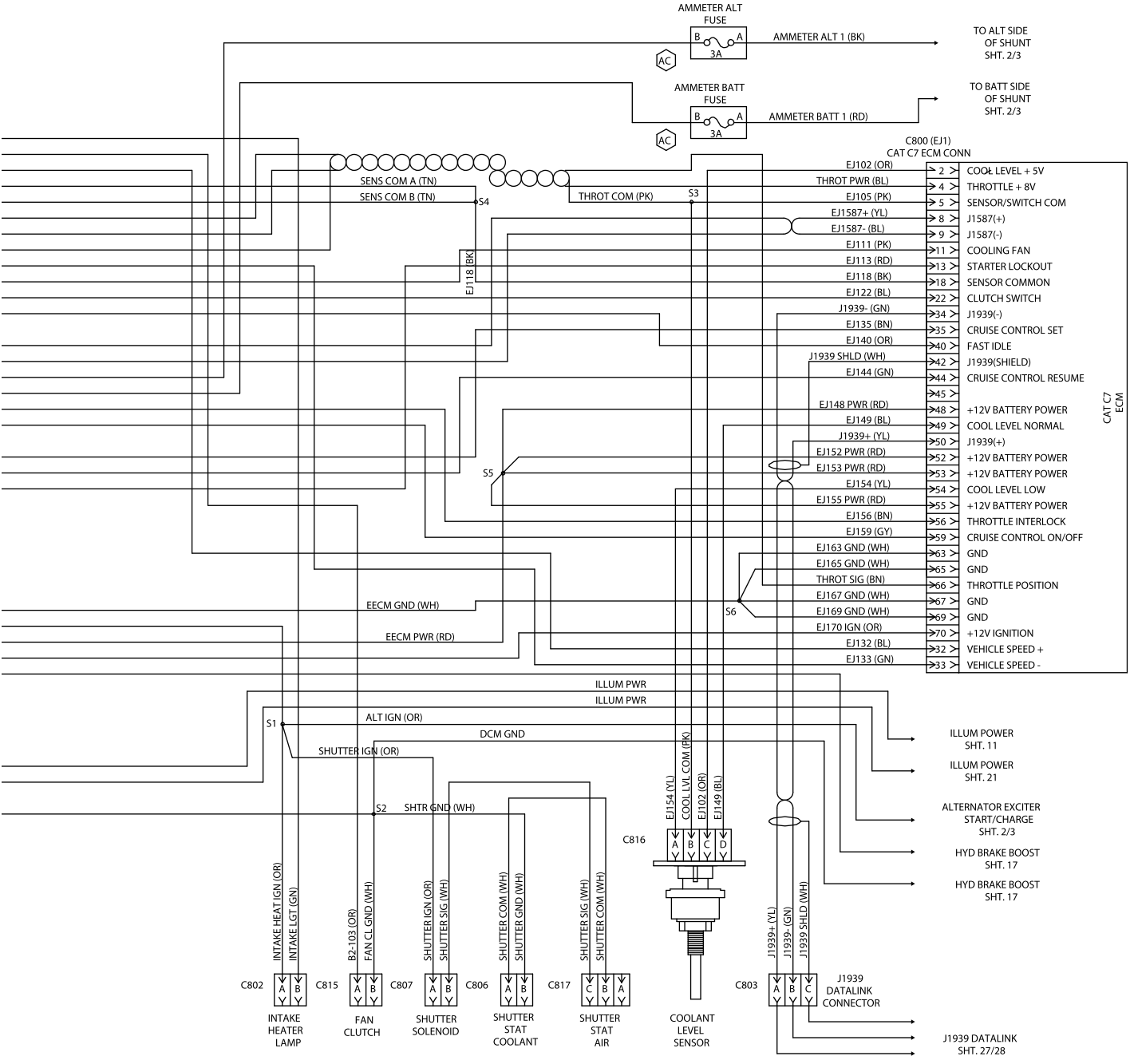
**Sheet 3**

*0080216*

*SCHEMATIC, WRG, STARTING AND CHARGING*

*WITH FEATURE 40142-11 (Florida circuit breakers)*


DRIVERS CTL MOD SHT. 22/23
SENS COM B (TN)
THROT PWR (BL)
THROT COM (PK)
THROT SIG (BN)
EJ122 (BL)
FAN CLUTCH ZONE B PORT 2 SHT. 13/14
B2-103 (OR)
EECM POWER START/CHARGE SHT. 2/3
EECM PWR (RD)
EJ170 IGN START/CHARGE SHT. 2/3
EJ170 IGN (OR)
COOLING FAN DISABLE ZONE B PORT 2 SHT. 13/14
EJ111/B2-010 (PK)
FAST IDLE ZONE B PORT 3 SHT. 15
EJ140/B3-003 (OR)
BRAKE BOOST BAT START/CHARGE SHT. 2/3
BRAKE BOOST BAT (RD)
SPEED SIGNAL SHT. 8
SPEED SIG + (BL)
SPEED SIG - (GN)
MANUAL TRANS CLUTCH SW SHT. 11
EJ122 (BL)
OPTION ONLY
THROTTLE INTERLOCK ZONE B PORT 3 SHT. 15
EJ156/B3-001 (BN)
STARTER LOCKOUT ZONE B PORT 3 SHT. 15
EJ113/B3-102 (RD)
START/CHARGE SHT. 2/3
B2-105C (OR)
I/P EJ1587 SHT. 21
EJ1587+ (YL)
EJ1587- (BL)
ENGINE CONTROLS IP SHT. 21
INTAKE LGT (GN)
AMMETER ALT (BK)
AMMETER BATT (RD)
ILLUM GND SHT. 21
ILLUM GND
ILLUM GND ZONE B, PORT 1 SHT. 11/12
ILLUM GND
C301
C701
PDU INTERFACE CONNECTOR
C704
PDU INTERFACE CONNECTOR
EECM GND (WH)
ENGINE ECM GROUND
SENS COM A
ILLUM PWR
ILLUM GND
EJ159
EJ135
EJ144
CRUISE CONTROL ON/OFF SW
CRUISE CONTROL SET/RESUME SW
STARTER GND (WH)
GROUND STUD ON STARTER

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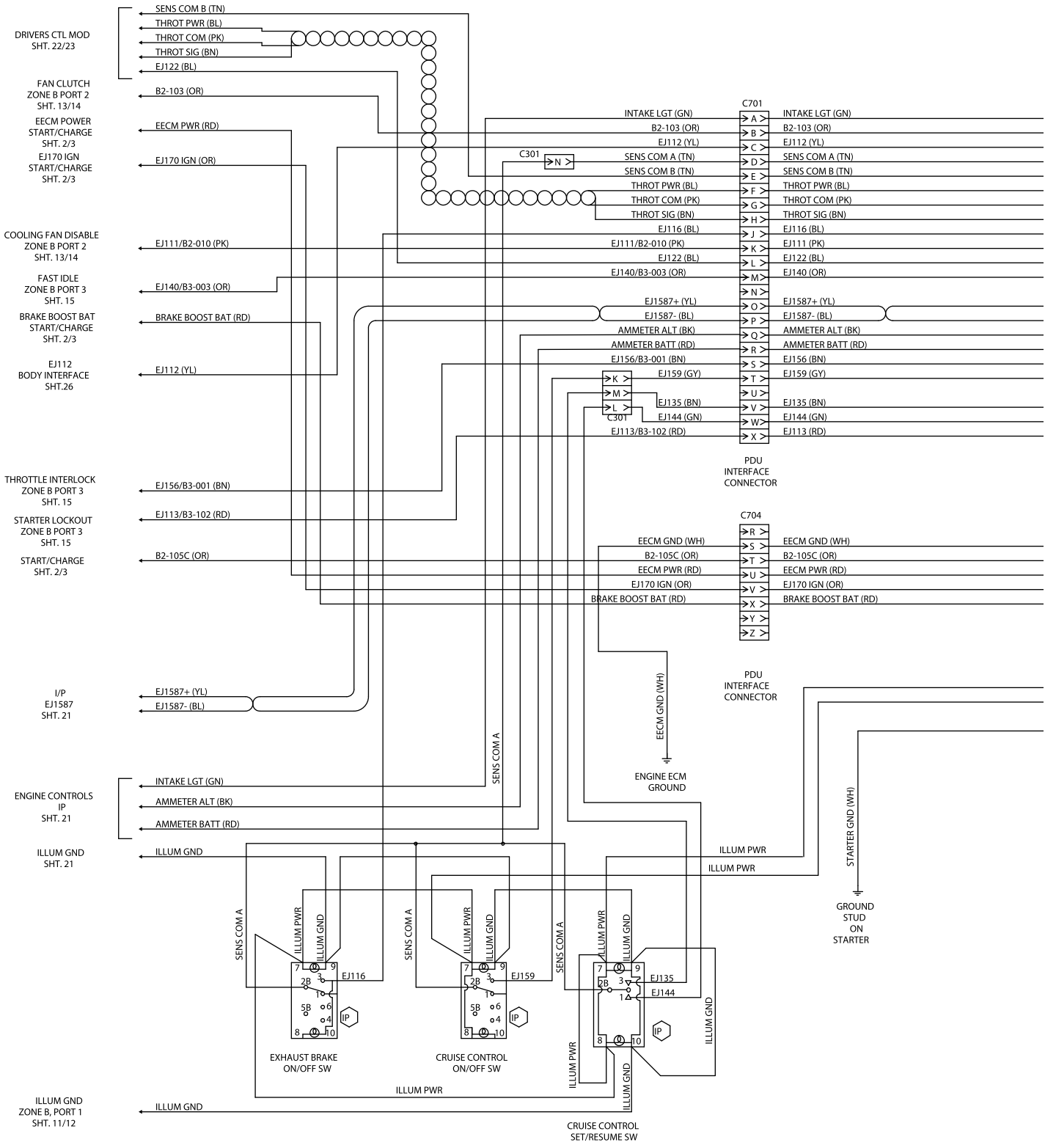
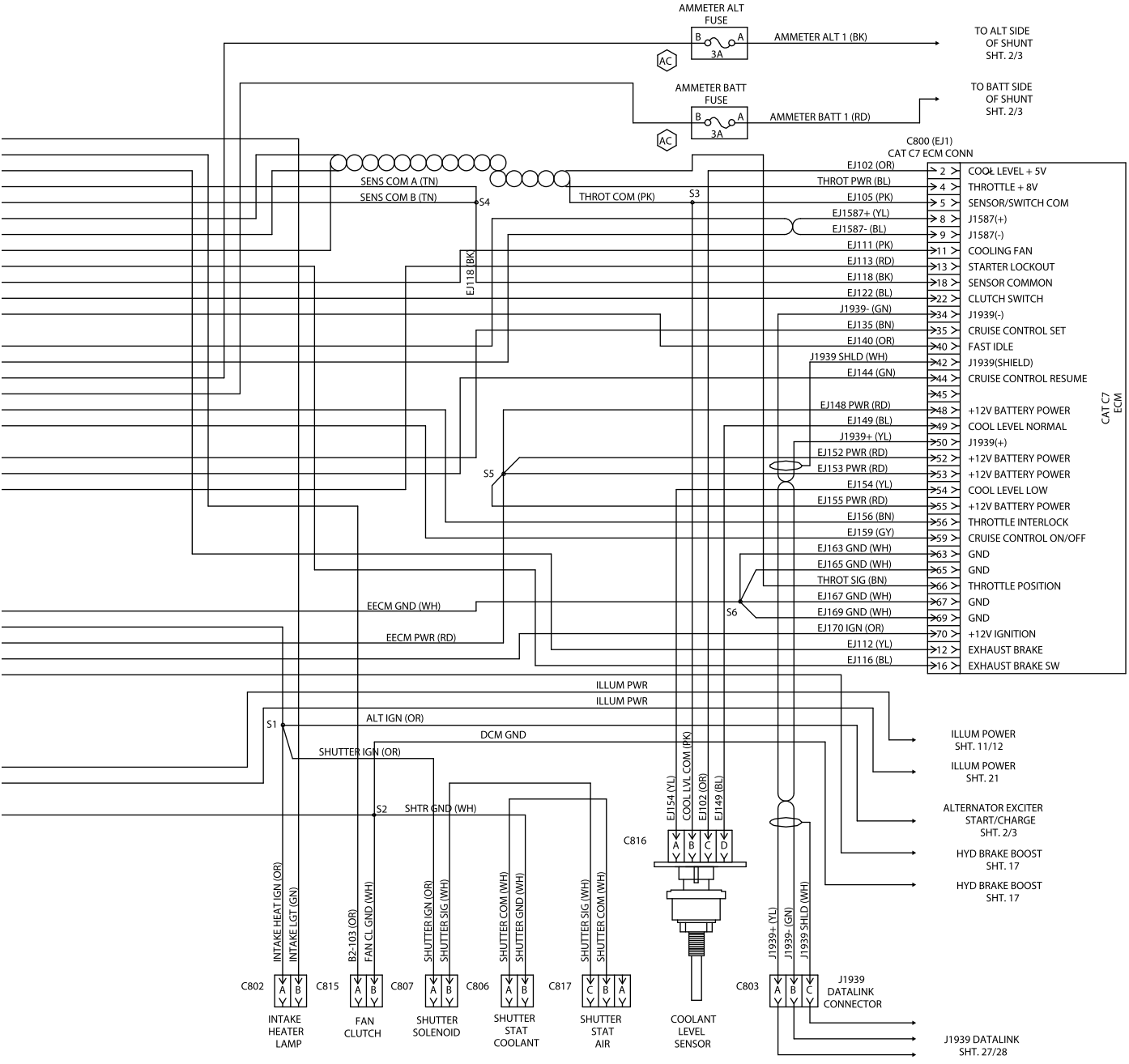
**Sheet 4**

*0080198*

*SCHEMATIC, WRG, CAAT C7 ENGINE*


DRIVERS CTL MOD SHT. 22/23
SENS COM B (TN)
THROT PWR (BL)
THROT COM (PK)
THROT SIG (BN)
EJ122 (BL)
FAN CLUTCH ZONE B PORT 2 SHT. 13/14
B2-103 (OR)
EECM POWER START/CHARGE SHT. 2/3
EECM PWR (RD)
EJ170 IGN START/CHARGE SHT. 2/3
EJ170 IGN (OR)
COOLING FAN DISABLE ZONE B PORT 2 SHT. 13/14
EJ111/B2-010 (PK)
FAST IDLE ZONE B PORT 3 SHT. 15
EJ140/B3-003 (OR)
BRAKE BOOST BAT START/CHARGE SHT. 2/3
BRAKE BOOST BAT (RD)
EJ112 BODY INTERFACE SHT.26
EJ112 (YL)
THROTTLE INTERLOCK ZONE B PORT 3 SHT. 15
EJ156/B3-001 (BN)
STARTER LOCKOUT ZONE B PORT 3 SHT. 15
EJ113/B3-102 (RD)
START/CHARGE SHT. 2/3
B2-105C (OR)
I/P EJ1587 SHT. 21
EJ1587+ (YL)
EJ1587- (BL)
ENGINE CONTROLS IP SHT. 21
INTAKE LGT (GN)
AMMETER ALT (BK)
AMMETER BATT (RD)
ILLUM GND SHT. 21
ILLUM GND
ILLUM GND ZONE B, PORT 1 SHT. 11/12
C701
C301
PDU INTERFACE CONNECTOR
C704
PDU INTERFACE CONNECTOR
EECM GND (WH)
ENGINE ECM GROUND
SENS COM A
ILLUM PWR
ILLUM GND
STARTER GND (WH)
GROUND STUD ON STARTER
EJ116
EXHAUST BRAKE ON/OFF SW
EJ159
CRUISE CONTROL ON/OFF SW
EJ135
EJ144
CRUISE CONTROL SET/RESUME SW
IP

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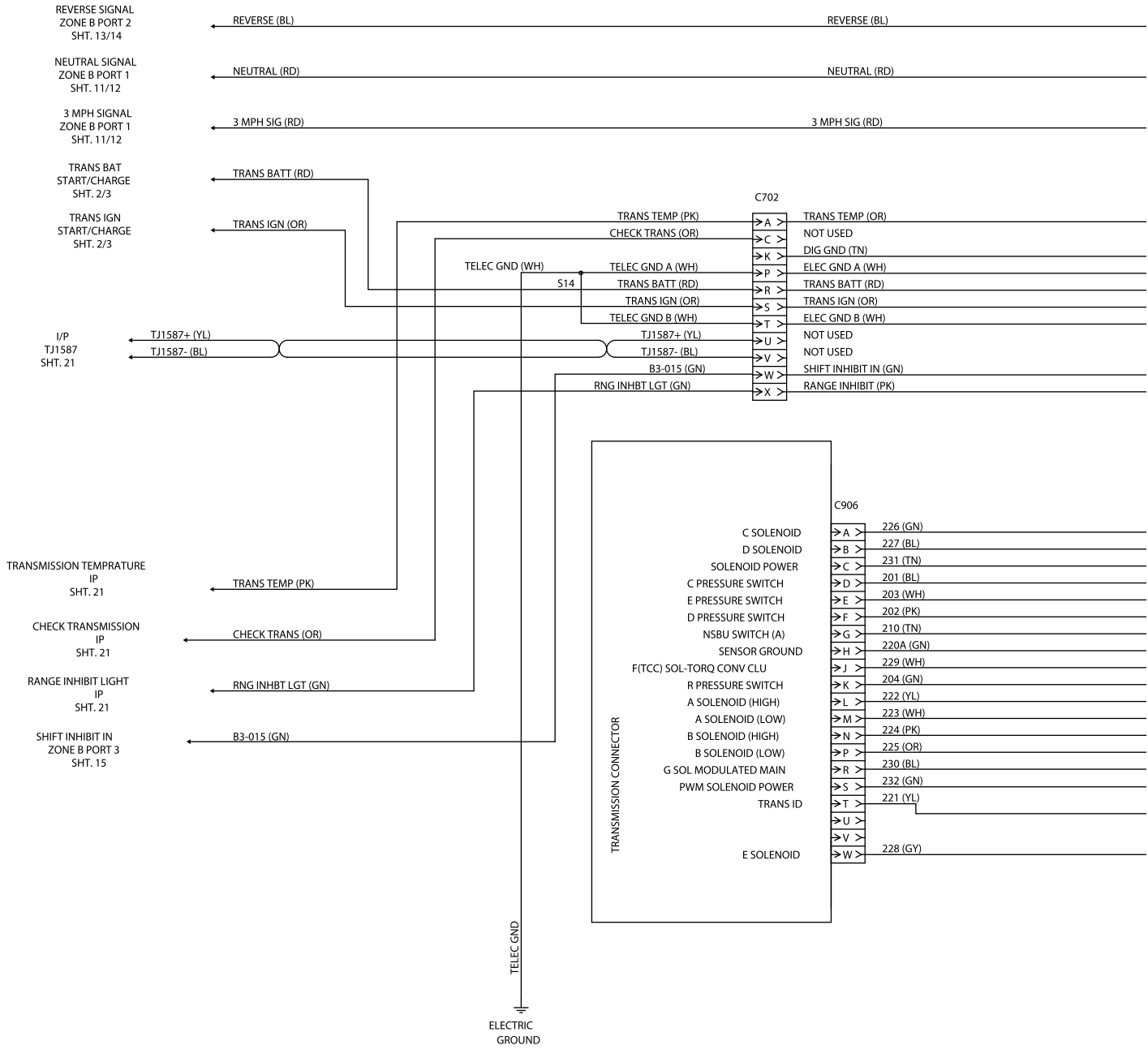
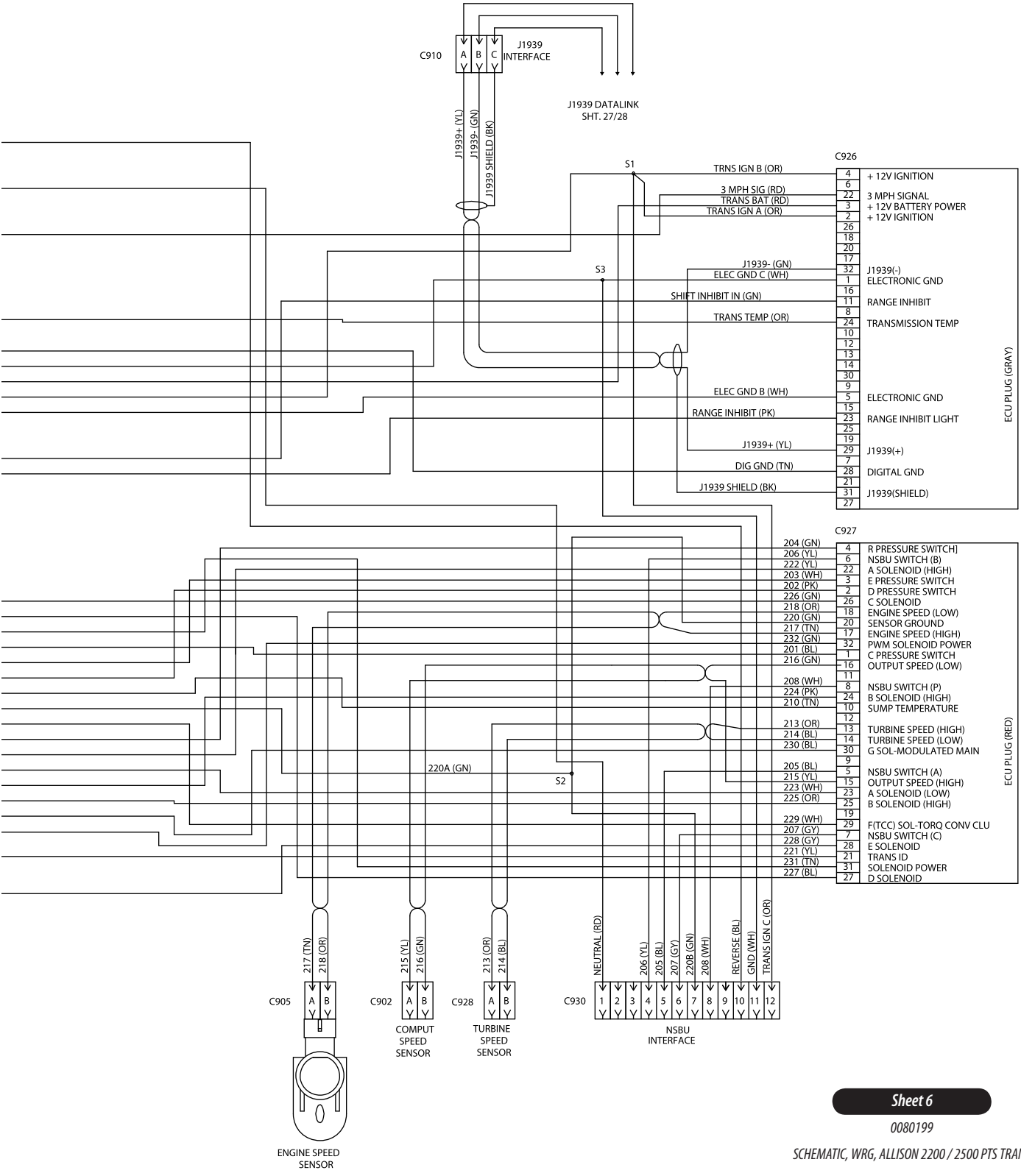
**Sheet 5**

*0083222*

*SCHEMATIC, WRG, CAT C7 ENGINE*

*WITH FEATURE 40050-01 (PAC exhaust brake)*

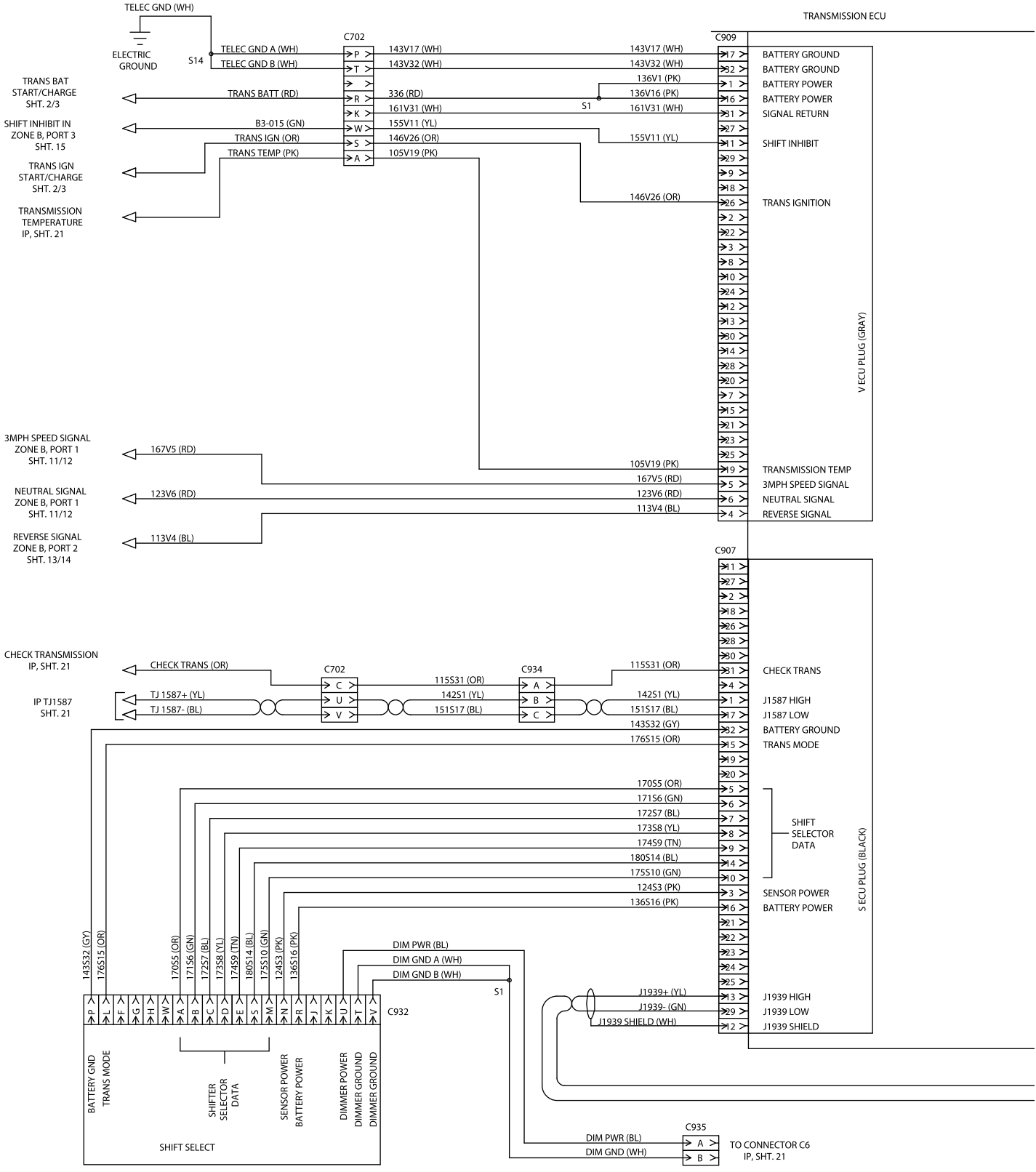

REVERSE SIGNAL
ZONE B PORT 2
SHT. 13/14
REVERSE (BL)
REVERSE (BL)
NEUTRAL SIGNAL
ZONE B PORT 1
SHT. 11/12
NEUTRAL (RD)
NEUTRAL (RD)
3 MPH SIGNAL
ZONE B PORT 1
SHT. 11/12
3 MPH SIG (RD)
3 MPH SIG (RD)
TRANS BAT
START/CHARGE
SHT. 2/3
TRANS BATT (RD)
TRANS IGN
START/CHARGE
SHT. 2/3
TRANS IGN (OR)
C702
TRANS TEMP (PK)
CHECK TRANS (OR)
TELEC GND (WH)
TELEC GND A (WH)
S14
TRANS BATT (RD)
TRANS IGN (OR)
TELEC GND B (WH)
TJ1587+ (YL)
TJ1587- (BL)
B3-015 (GN)
RNG INHBT LGT (GN)
A
C
K
P
R
S
T
U
V
W
X
TRANS TEMP (OR)
NOT USED
DIG GND (TN)
ELEC GND A (WH)
TRANS BATT (RD)
TRANS IGN (OR)
ELEC GND B (WH)
NOT USED
NOT USED
SHIFT INHIBIT IN (GN)
RANGE INHIBIT (PK)
I/P
TJ1587
SHT. 21
TJ1587+ (YL)
TJ1587- (BL)
C906
TRANSMISSION CONNECTOR
C SOLENOID
D SOLENOID
SOLENOID POWER
C PRESSURE SWITCH
E PRESSURE SWITCH
D PRESSURE SWITCH
NSBU SWITCH (A)
SENSOR GROUND
F(TCC) SOL-TORQ CONV CLU
R PRESSURE SWITCH
A SOLENOID (HIGH)
A SOLENOID (LOW)
B SOLENOID (HIGH)
B SOLENOID (LOW)
G SOL MODULATED MAIN
PWM SOLENOID POWER
TRANS ID
E SOLENOID
A
B
C
D
E
F
G
H
J
K
L
M
N
P
R
S
T
U
V
W
226 (GN)
227 (BL)
231 (TN)
201 (BL)
203 (WH)
202 (PK)
210 (TN)
220A (GN)
229 (WH)
204 (GN)
222 (YL)
223 (WH)
224 (PK)
225 (OR)
230 (BL)
232 (GN)
221 (YL)
228 (GY)
TRANSMISSION TEMPRATURE
IP
SHT. 21
TRANS TEMP (PK)
CHECK TRANSMISSION
IP
SHT. 21
CHECK TRANS (OR)
RANGE INHIBIT LIGHT
IP
SHT. 21
RNG INHBT LGT (GN)
SHIFT INHIBIT IN
ZONE B PORT 3
SHT. 15
B3-015 (GN)
TELEC GND
ELECTRIC
GROUND

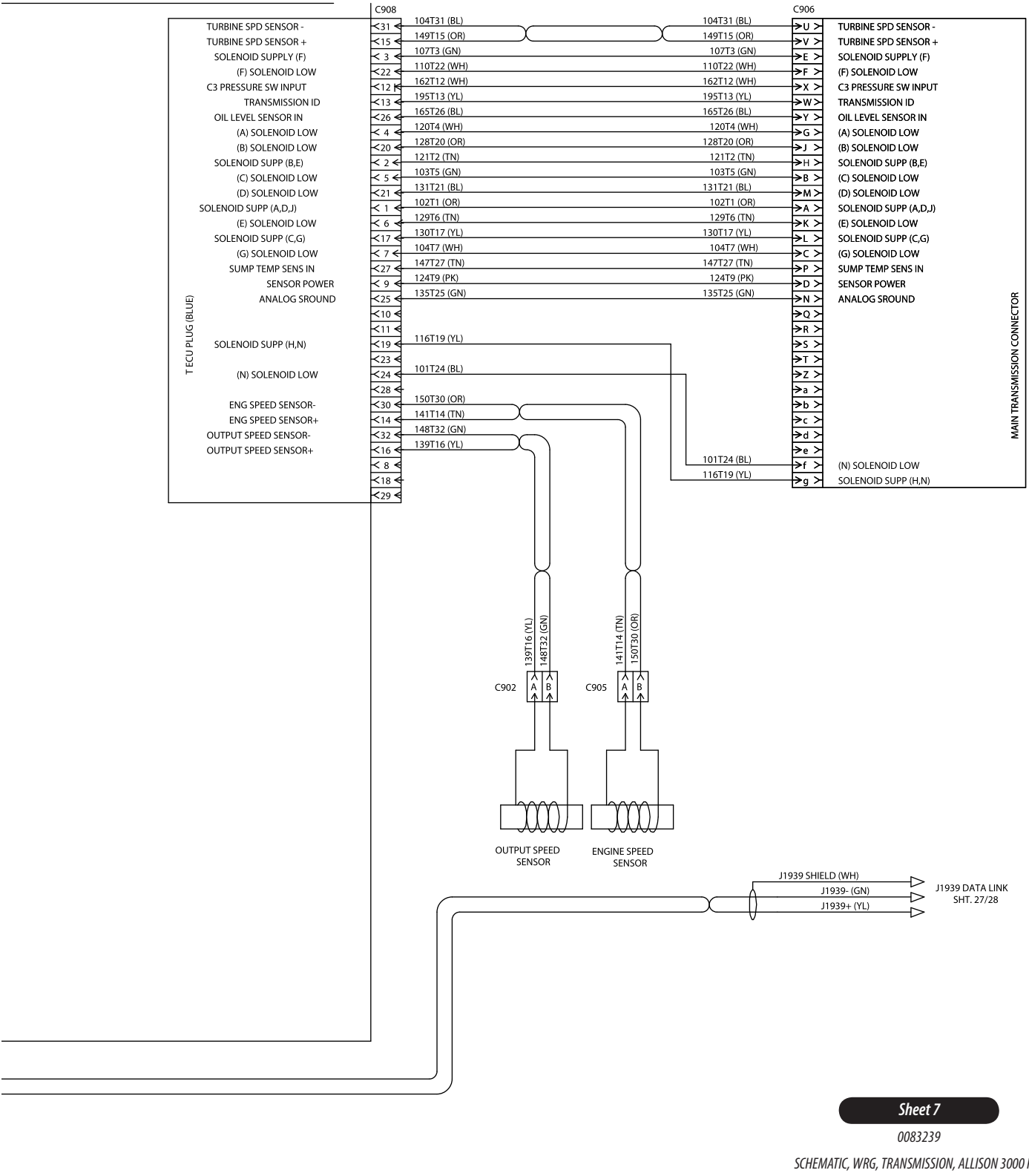



**Sheet 6**

*0080199*

*SCHEMATIC, WRG, ALLISON 2200 / 2500 PTS TRANS*


TELEC GND (WH)
ELECTRIC GROUND
S14
TELEC GND A (WH)
TELEC GND B (WH)
C702
TRANSMISSION ECU
C909
TRANS BAT START/CHARGE SHT. 2/3
TRANS BATT (RD)
336 (RD)
161V31 (WH)
136V1 (PK)
136V16 (PK)
S1
SHIFT INHIBIT IN ZONE B, PORT 3 SHT. 15
B3-015 (GN)
155V11 (YL)
TRANS IGN START/CHARGE SHT. 2/3
TRANS IGN (OR)
146V26 (OR)
TRANSMISSION TEMPERATURE IP, SHT. 21
TRANS TEMP (PK)
105V19 (PK)
143V17 (WH)
143V32 (WH)
BATTERY GROUND
BATTERY GROUND
BATTERY POWER
BATTERY POWER
SIGNAL RETURN
SHIFT INHIBIT
TRANS IGNITION
TRANSMISSION TEMP
3MPH SPEED SIGNAL
NEUTRAL SIGNAL
REVERSE SIGNAL
V ECU PLUG (GRAY)
3MPH SPEED SIGNAL ZONE B, PORT 1 SHT. 11/12
167V5 (RD)
NEUTRAL SIGNAL ZONE B, PORT 1 SHT. 11/12
123V6 (RD)
REVERSE SIGNAL ZONE B, PORT 2 SHT. 13/14
113V4 (BL)
C907
CHECK TRANSMISSION IP, SHT. 21
CHECK TRANS (OR)
C934
115S31 (OR)
IP TJ1587 SHT. 21
TJ 1587+ (YL)
TJ 1587- (BL)
142S1 (YL)
151S17 (BL)
143S32 (GY)
176S15 (OR)
CHECK TRANS
J1587 HIGH
J1587 LOW
BATTERY GROUND
TRANS MODE
170S5 (OR)
171S6 (GN)
172S7 (BL)
173S8 (YL)
174S9 (TN)
180S14 (BL)
175S10 (GN)
124S3 (PK)
136S16 (PK)
SHIFT SELECTOR DATA
SENSOR POWER
BATTERY POWER
S ECU PLUG (BLACK)
DIM PWR (BL)
DIM GND A (WH)
DIM GND B (WH)
C932
J1939+ (YL)
J1939- (GN)
J1939 SHIELD (WH)
J1939 HIGH
J1939 LOW
J1939 SHIELD
BATTERY GND
TRANS MODE
SHIFTER SELECTOR DATA
SENSOR POWER
BATTERY POWER
DIMMER POWER
DIMMER GROUND
DIMMER GROUND
SHIFT SELECT
C935
DIM PWR (BL)
DIM GND (WH)
TO CONNECTOR C6 IP, SHT. 21

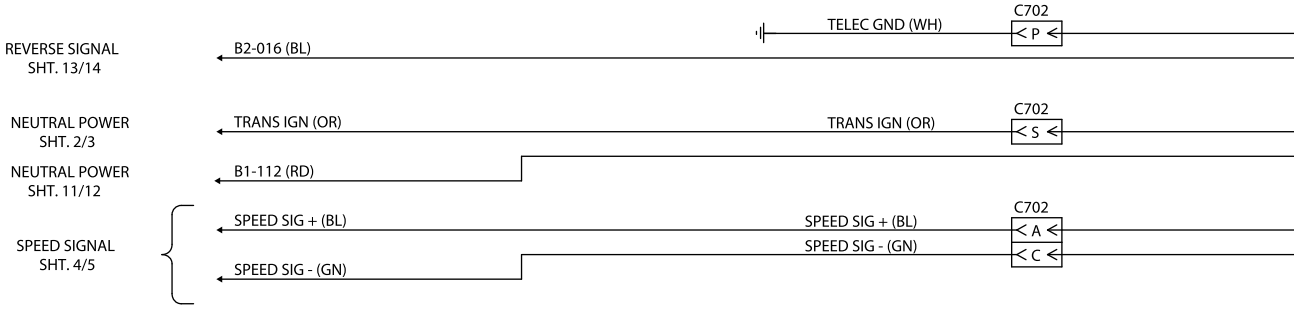


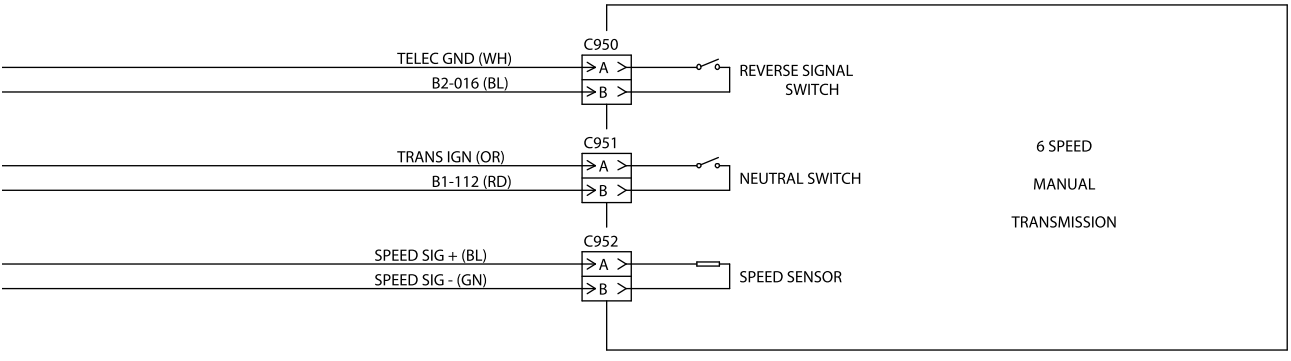



**Sheet 7**

*0083239*

*SCHEMATIC, WRG, TRANSMISSION, ALLISON 3000 PTS*


C702
TELEC GND (WH)
P
REVERSE SIGNAL
SHT. 13/14
B2-016 (BL)
NEUTRAL POWER
SHT. 2/3
TRANS IGN (OR)
TRANS IGN (OR)
C702
S
NEUTRAL POWER
SHT. 11/12
B1-112 (RD)
C702
SPEED SIG + (BL)
SPEED SIG + (BL)
A
SPEED SIGNAL
SHT. 4/5
SPEED SIG - (GN)
SPEED SIG - (GN)
C

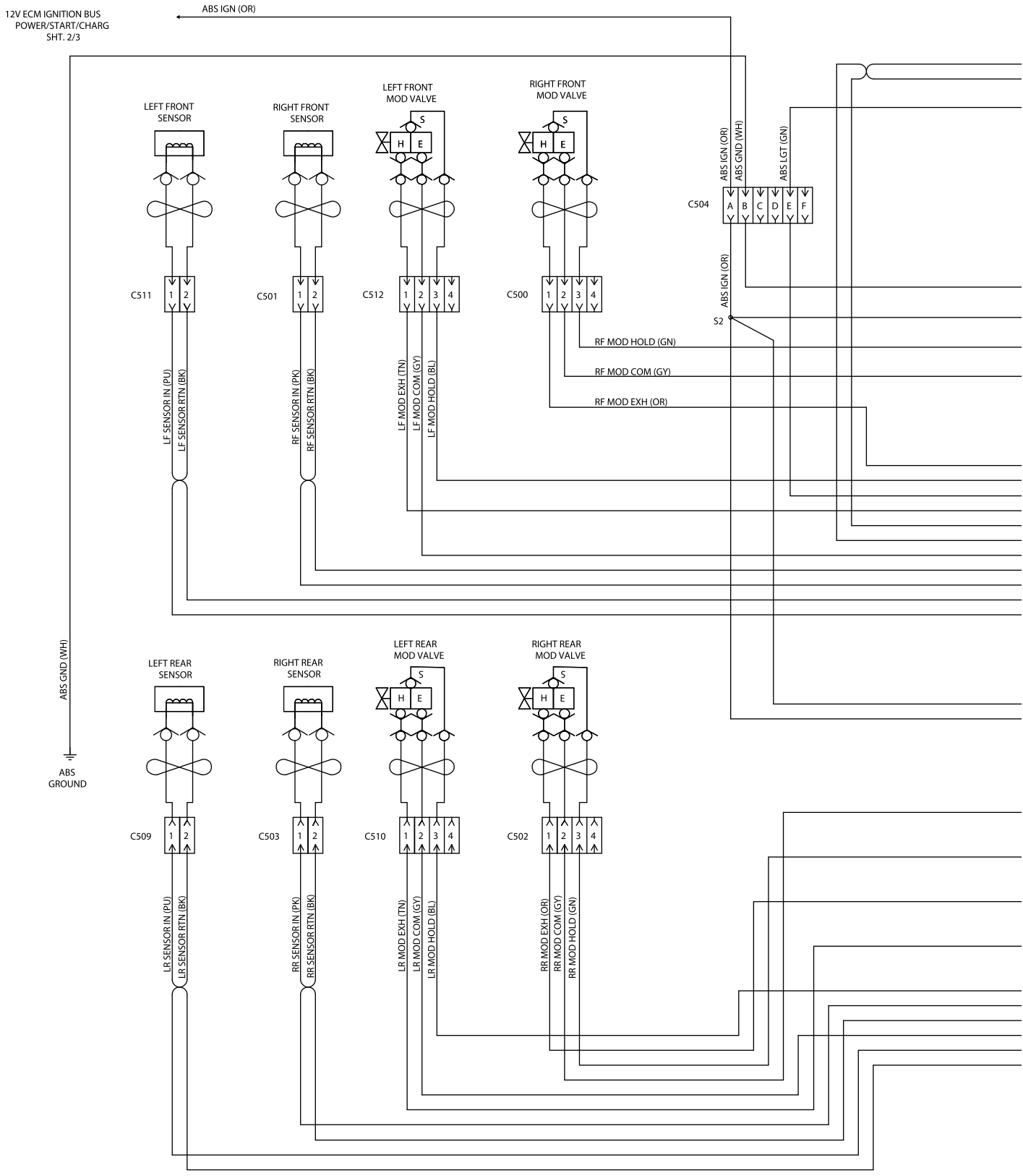


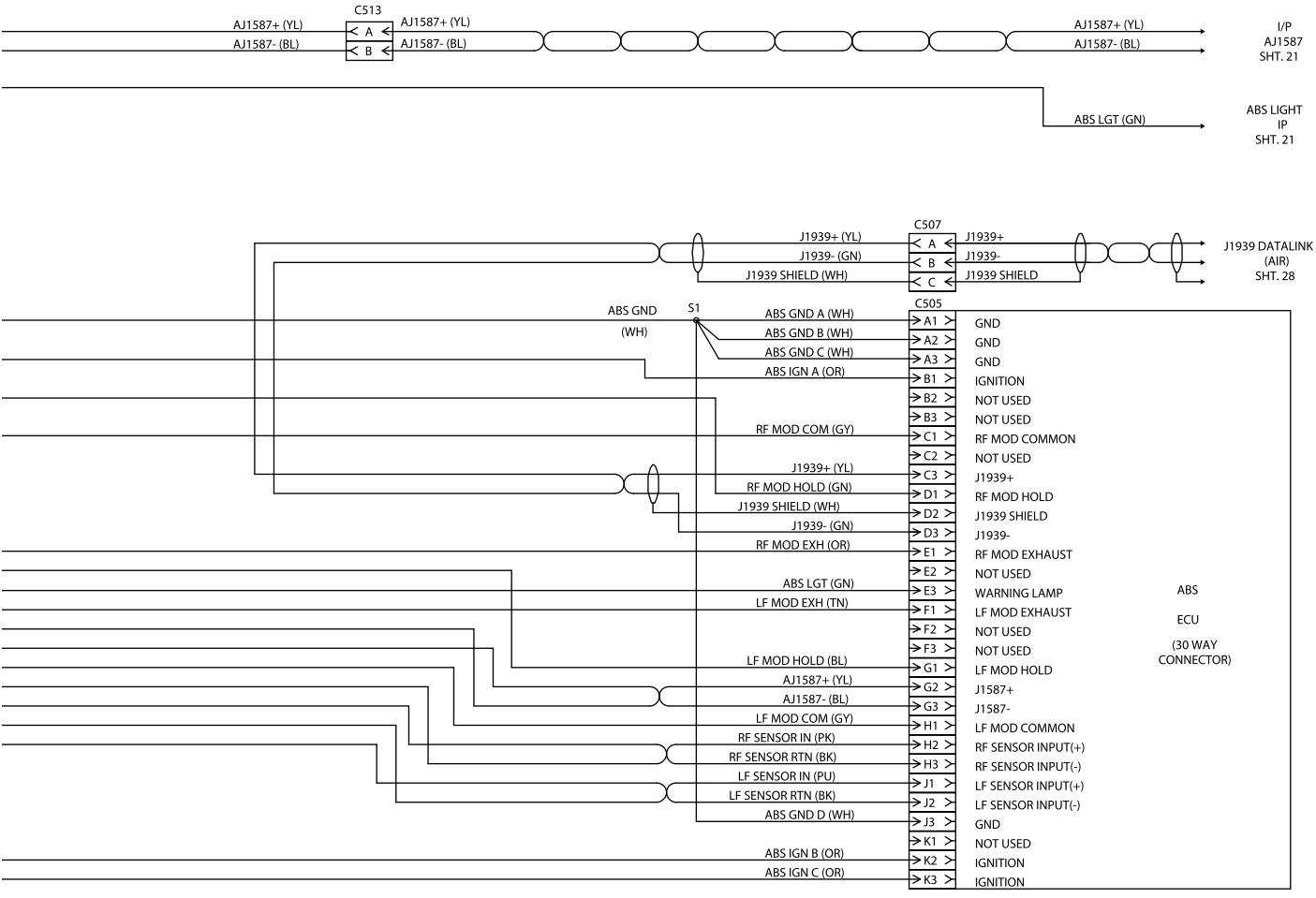


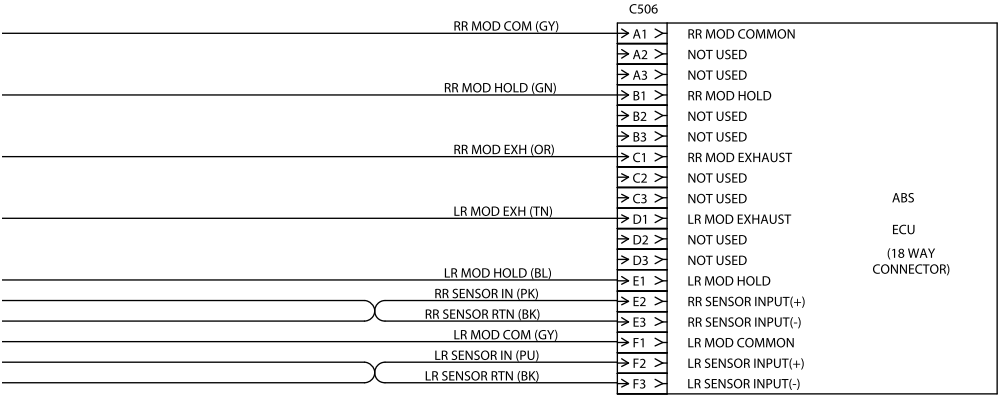

**Sheet 8**

*0083240*

*SCHEMATIC, WRG, EATON MANUAL TRANS*


12V ECM IGNITION BUS
POWER/START/CHARG
SHT. 2/3
ABS IGN (OR)
LEFT FRONT SENSOR
RIGHT FRONT SENSOR
LEFT FRONT MOD VALVE
RIGHT FRONT MOD VALVE
C504
ABS IGN (OR)
ABS GND (WH)
ABS LGT (GN)
C511
C501
C512
C500
S2
LF SENSOR IN (PU)
LF SENSOR RTN (BK)
RF SENSOR IN (PK)
RF SENSOR RTN (BK)
LF MOD EXH (TN)
LF MOD COM (GY)
LF MOD HOLD (BL)
RF MOD HOLD (GN)
RF MOD COM (GY)
RF MOD EXH (OR)
ABS GND (WH)
ABS GROUND
LEFT REAR SENSOR
RIGHT REAR SENSOR
LEFT REAR MOD VALVE
RIGHT REAR MOD VALVE
C509
C503
C510
C502
LR SENSOR IN (PU)
LR SENSOR RTN (BK)
RR SENSOR IN (PK)
RR SENSOR RTN (BK)
LR MOD EXH (TN)
LR MOD COM (GY)
LR MOD HOLD (BL)
RR MOD EXH (OR)
RR MOD COM (GY)
RR MOD HOLD (GN)



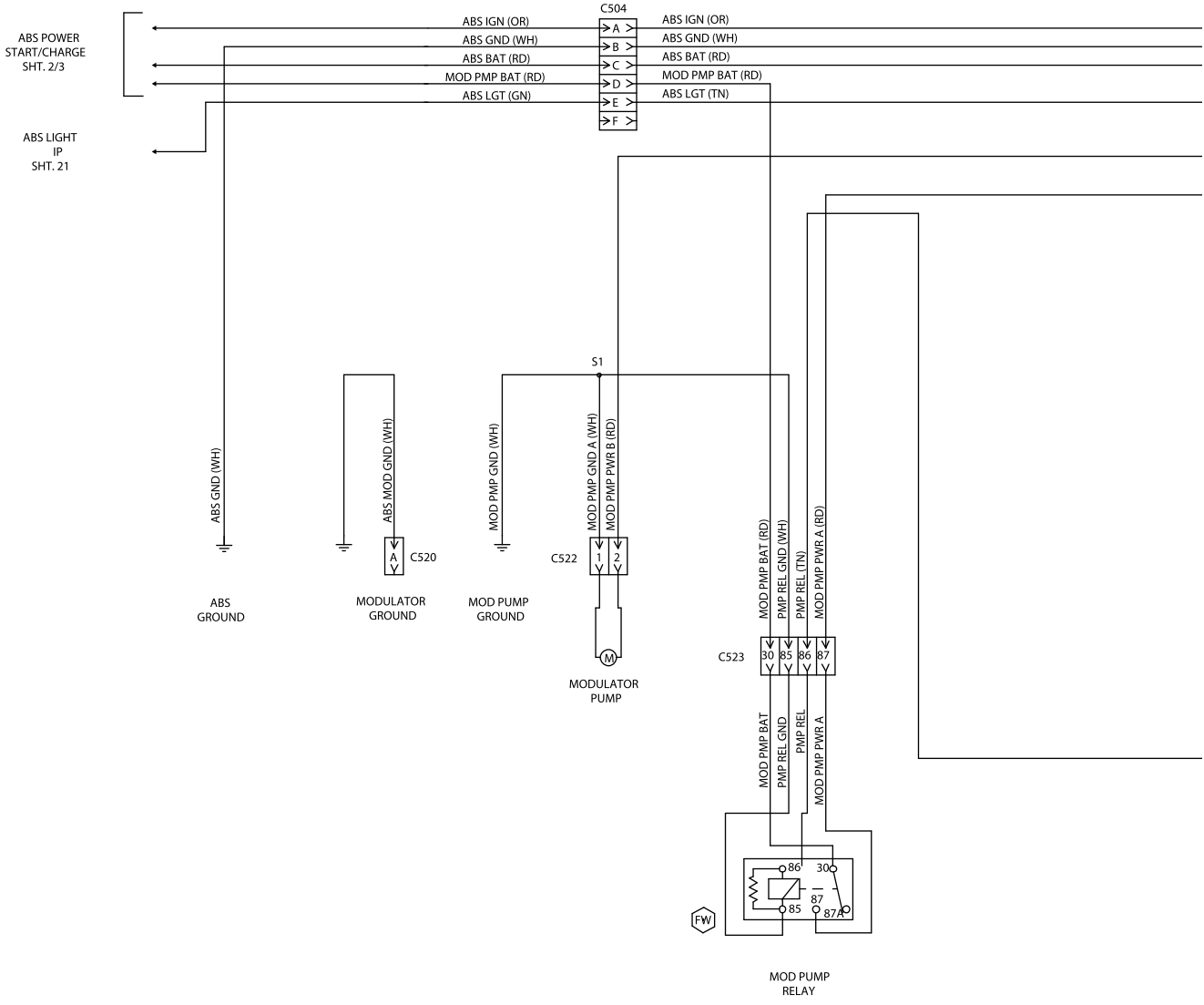



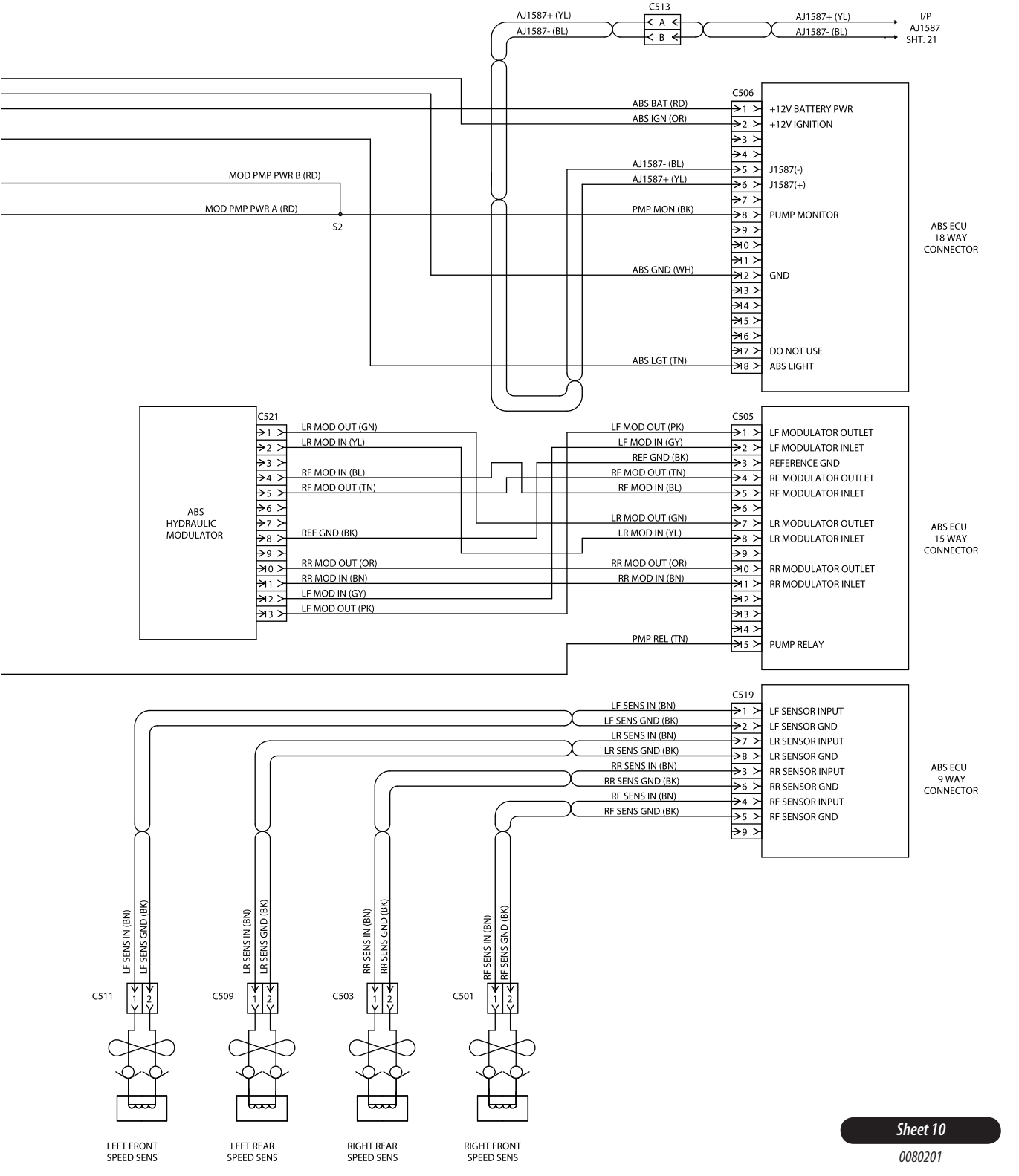



**Sheet 9**

*0080200*

*SCHEMATIC, WRG, ABS BENDIX (air)*


ABS POWER START/CHARGE SHT. 2/3
ABS LIGHT IP SHT. 21
C504
ABS IGN (OR)
ABS GND (WH)
ABS BAT (RD)
MOD PMP BAT (RD)
ABS LGT (GN)
A
B
C
D
E
F
ABS IGN (OR)
ABS GND (WH)
ABS BAT (RD)
MOD PMP BAT (RD)
ABS LGT (TN)
S1
ABS GND (WH)
ABS MOD GND (WH)
MOD PMP GND (WH)
MOD PMP GND A (WH)
MOD PMP PWR B (RD)
C520
C522
C523
ABS GROUND
MODULATOR GROUND
MOD PUMP GROUND
MODULATOR PUMP
MOD PMP BAT (RD)
PMP REL GND (WH)
PMP REL (TN)
MOD PMP PWR A (RD)
30
85
86
87
MOD PMP BAT
PMP REL GND
PMP REL
MOD PMP PWR A
87A
FW
MOD PUMP RELAY

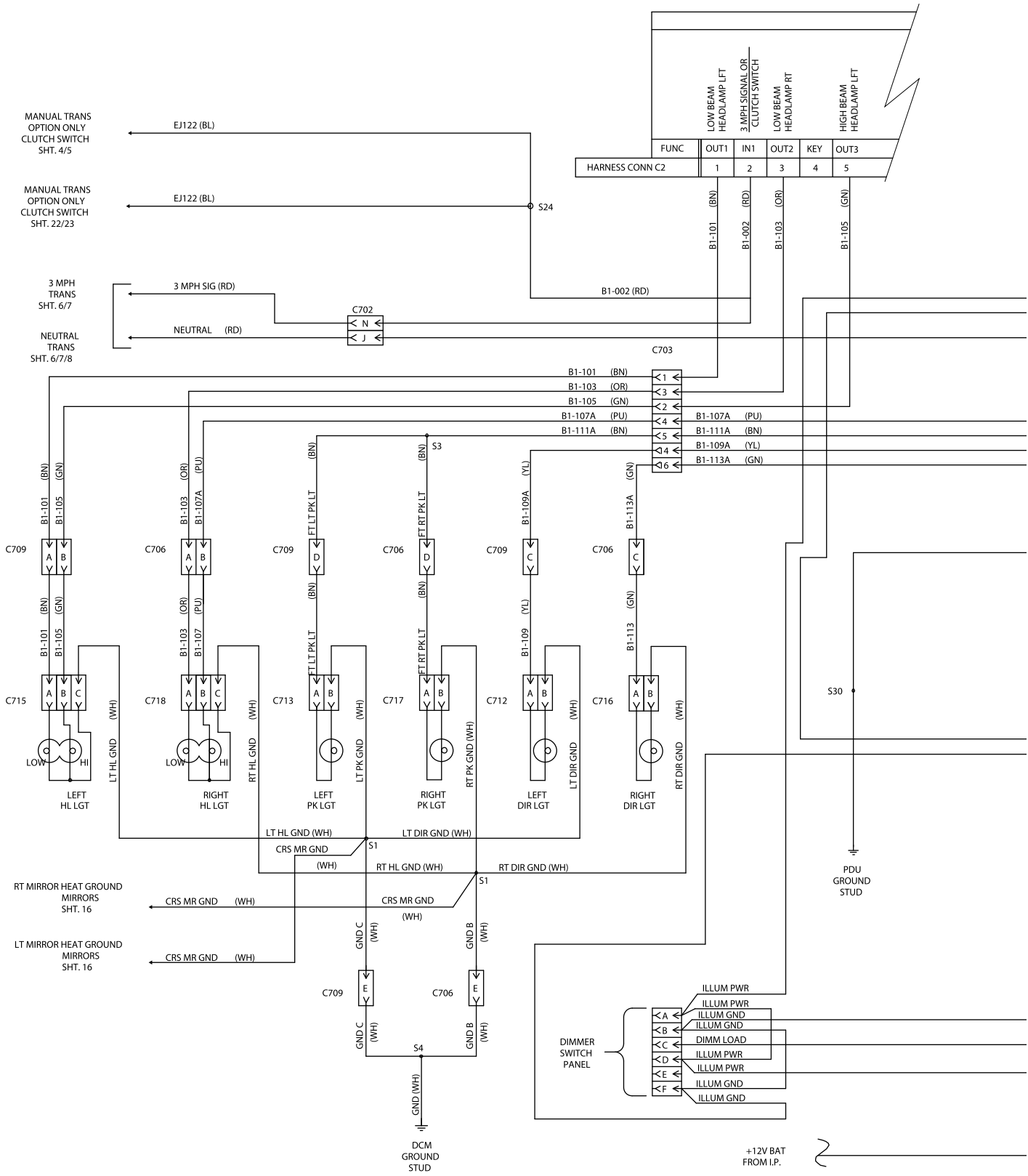


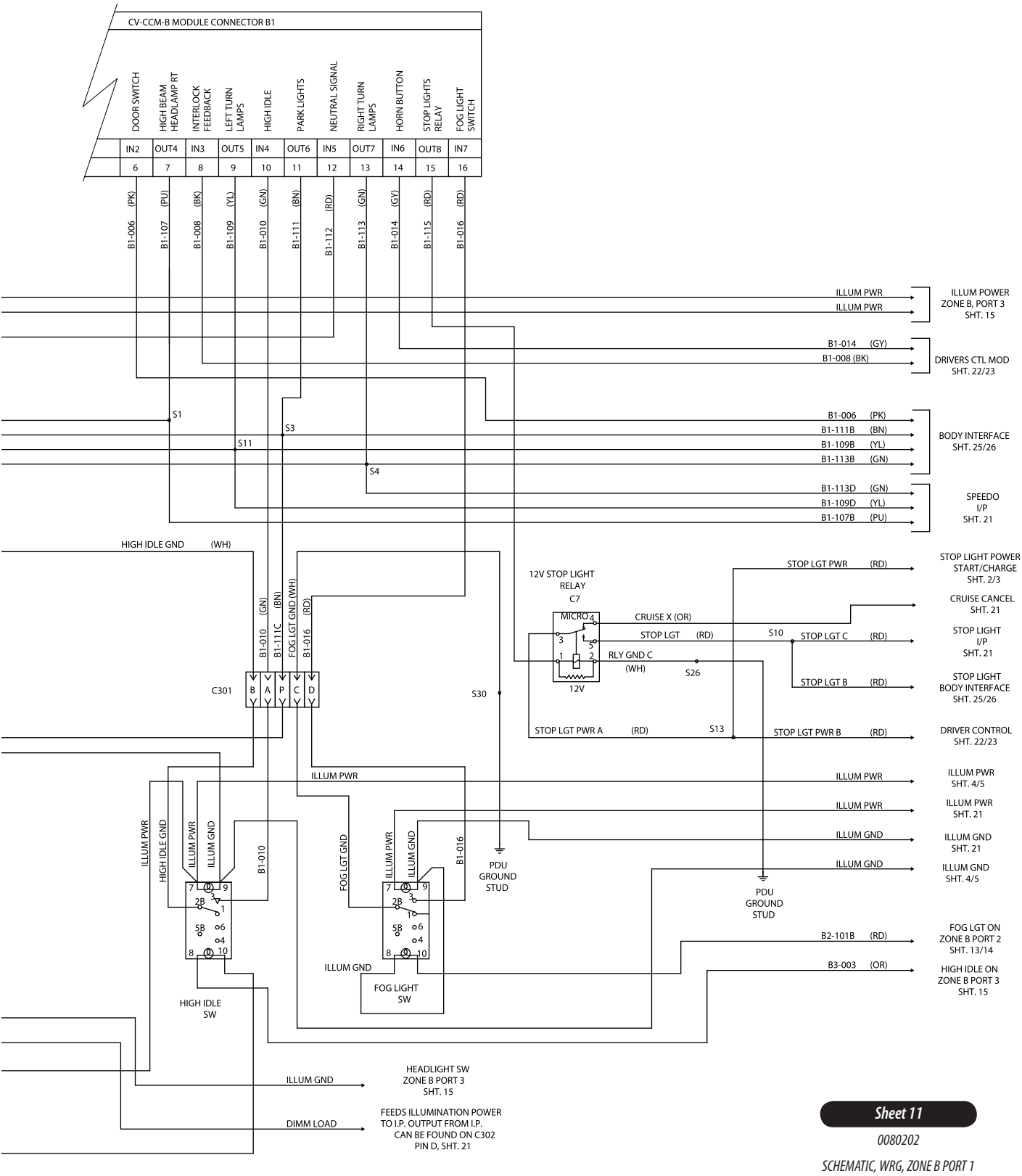



**Sheet 10**

*0080201*

*SCHEMATIC, WRG, ABS WABCO (hydraulic)*

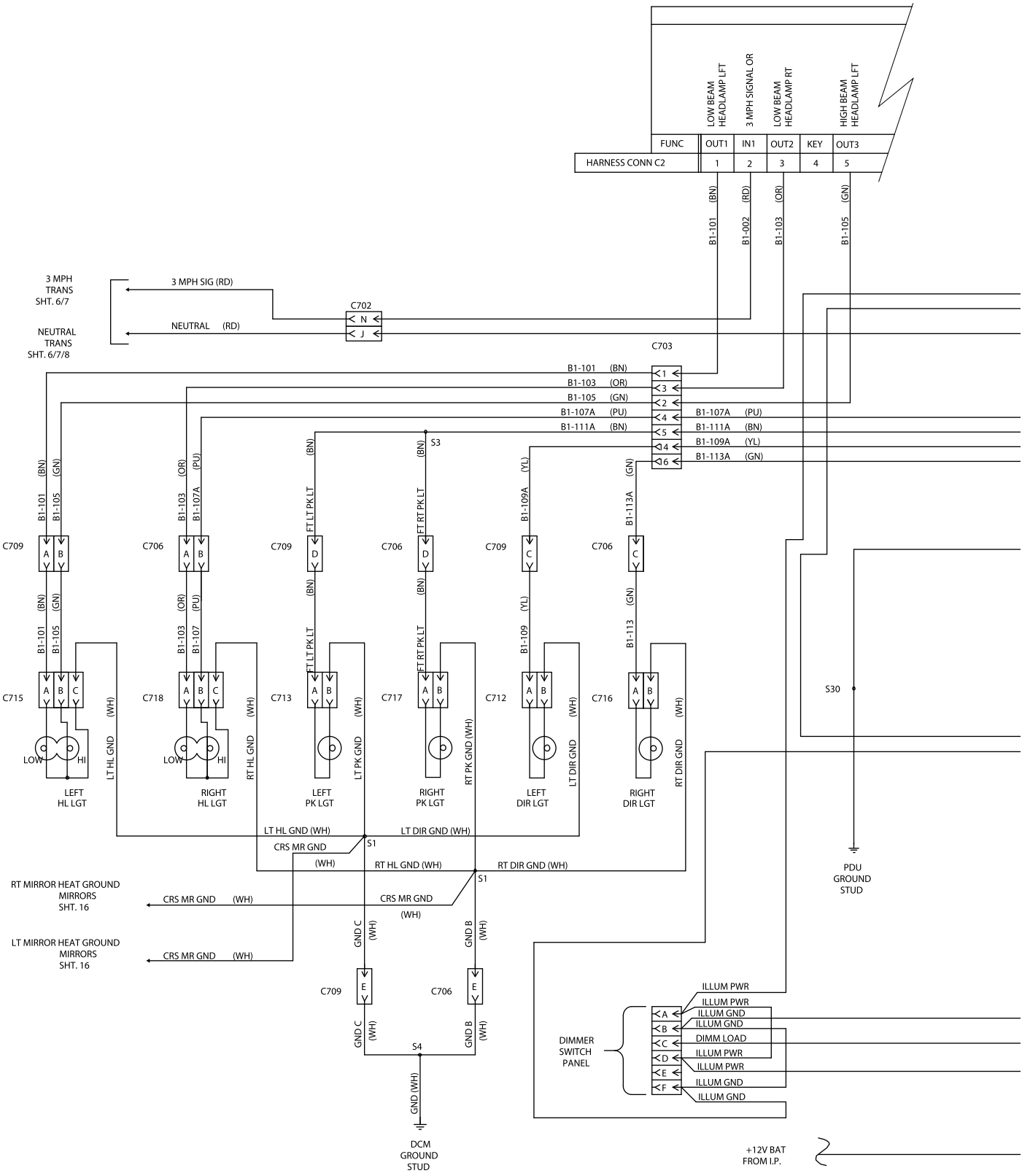

LOW BEAM HEADLAMP LFT
3 MPH SIGNAL OR CLUTCH SWITCH
LOW BEAM HEADLAMP RT
HIGH BEAM HEADLAMP LFT
FUNC
OUT1
IN1
OUT2
KEY
OUT3
HARNESS CONN C2
1
2
3
4
5
MANUAL TRANS OPTION ONLY CLUTCH SWITCH SHT. 4/5
EJ122 (BL)
MANUAL TRANS OPTION ONLY CLUTCH SWITCH SHT. 22/23
EJ122 (BL)
S24
3 MPH TRANS SHT. 6/7
3 MPH SIG (RD)
NEUTRAL TRANS SHT. 6/7/8
NEUTRAL (RD)
C702
N
J
B1-002 (RD)
C703
B1-101 (BN)
B1-103 (OR)
B1-105 (GN)
B1-107A (PU)
B1-111A (BN)
B1-107A (PU)
B1-111A (BN)
B1-109A (YL)
B1-113A (GN)
S3
C709
C706
C715
C718
C713
C717
C712
C716
LEFT HL LGT
RIGHT HL LGT
LEFT PK LGT
RIGHT PK LGT
LEFT DIR LGT
RIGHT DIR LGT
LOW
HI
LT HL GND (WH)
RT HL GND (WH)
LT PK GND (WH)
RT PK GND (WH)
LT DIR GND (WH)
RT DIR GND (WH)
CRS MR GND (WH)
S1
RT MIRROR HEAT GROUND MIRRORS SHT. 16
LT MIRROR HEAT GROUND MIRRORS SHT. 16
GND C (WH)
GND B (WH)
S4
GND (WH)
DCM GROUND STUD
S30
PDU GROUND STUD
DIMMER SWITCH PANEL
ILLUM PWR
ILLUM GND
DIMM LOAD
+12V BAT FROM I.P.

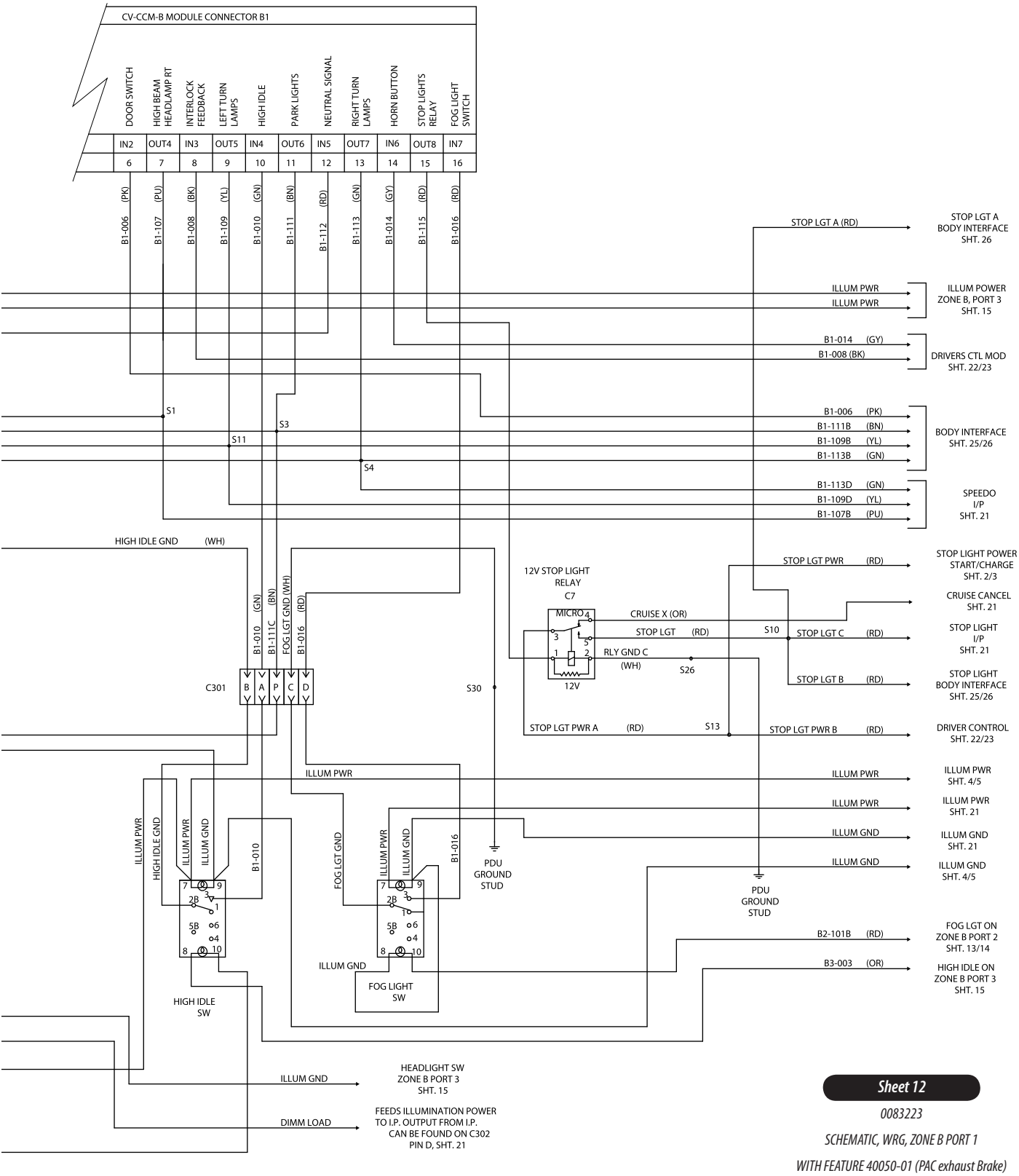



**Sheet 11**

*0080202*

*SCHEMATIC, WRG, ZONE B PORT 1*


LOW BEAM HEADLAMP LFT
3 MPH SIGNAL OR
LOW BEAM HEADLAMP RT
HIGH BEAM HEADLAMP LFT
FUNC
OUT1
IN1
OUT2
KEY
OUT3
HARNESS CONN C2
1
2
3
4
5
B1-101 (BN)
B1-002 (RD)
B1-103 (OR)
B1-105 (GN)
3 MPH TRANS SHT. 6/7
3 MPH SIG (RD)
NEUTRAL TRANS SHT. 6/7/8
NEUTRAL (RD)
C702
N
J
C703
B1-101 (BN)
B1-103 (OR)
B1-105 (GN)
B1-107A (PU)
B1-111A (BN)
B1-109A (YL)
B1-113A (GN)
S3
C709
C706
C715
C718
C713
C717
C712
C716
LEFT HL LGT
RIGHT HL LGT
LEFT PK LGT
RIGHT PK LGT
LEFT DIR LGT
RIGHT DIR LGT
LT HL GND (WH)
RT HL GND (WH)
LT PK GND (WH)
RT PK GND (WH)
LT DIR GND (WH)
RT DIR GND (WH)
LOW
HI
S1
CRS MR GND (WH)
RT MIRROR HEAT GROUND MIRRORS SHT. 16
LT MIRROR HEAT GROUND MIRRORS SHT. 16
GND C (WH)
GND B (WH)
S4
GND (WH)
DCM GROUND STUD
S30
PDU GROUND STUD
DIMMER SWITCH PANEL
ILLUM PWR
ILLUM GND
DIMM LOAD
+12V BAT FROM I.P.

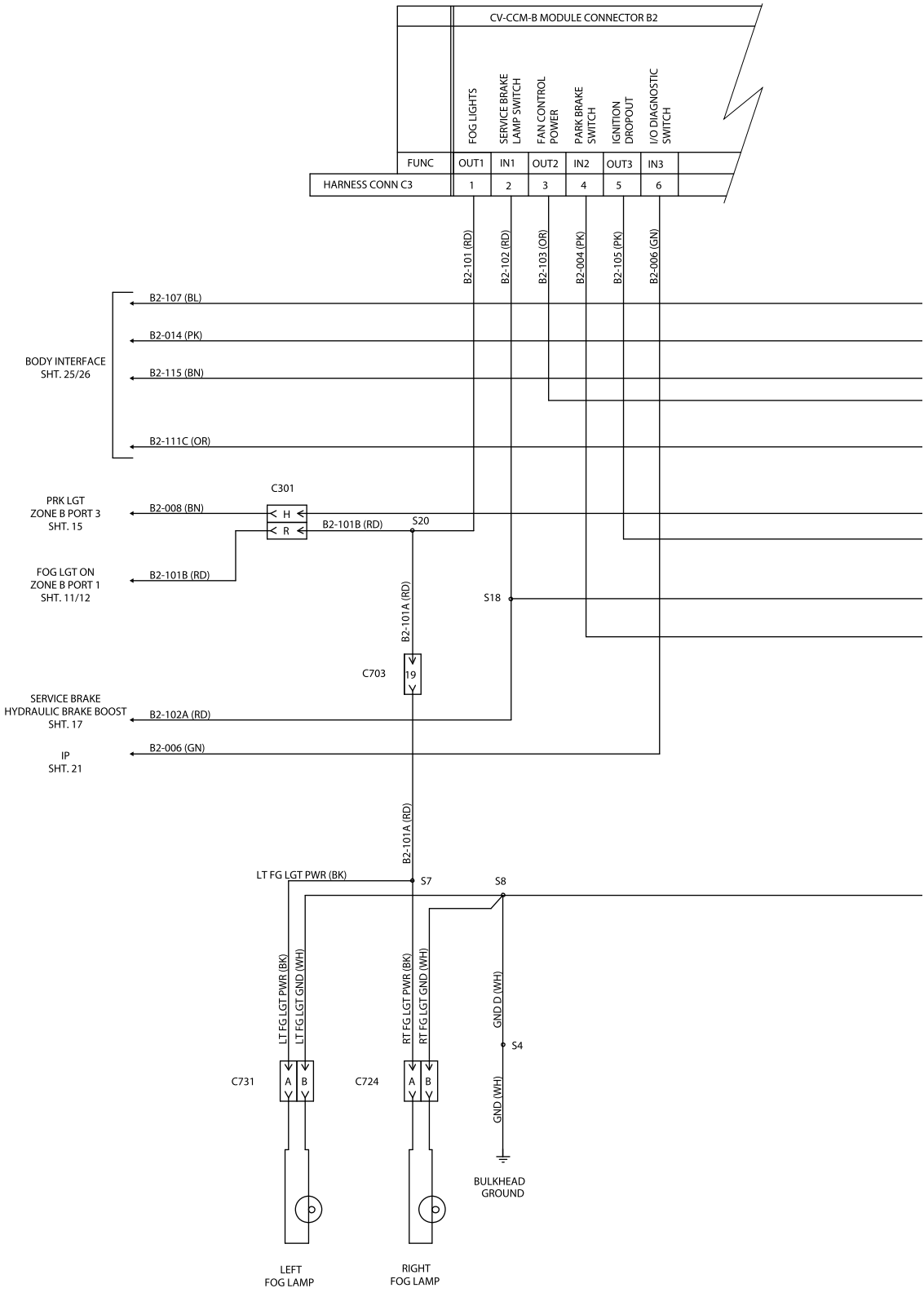


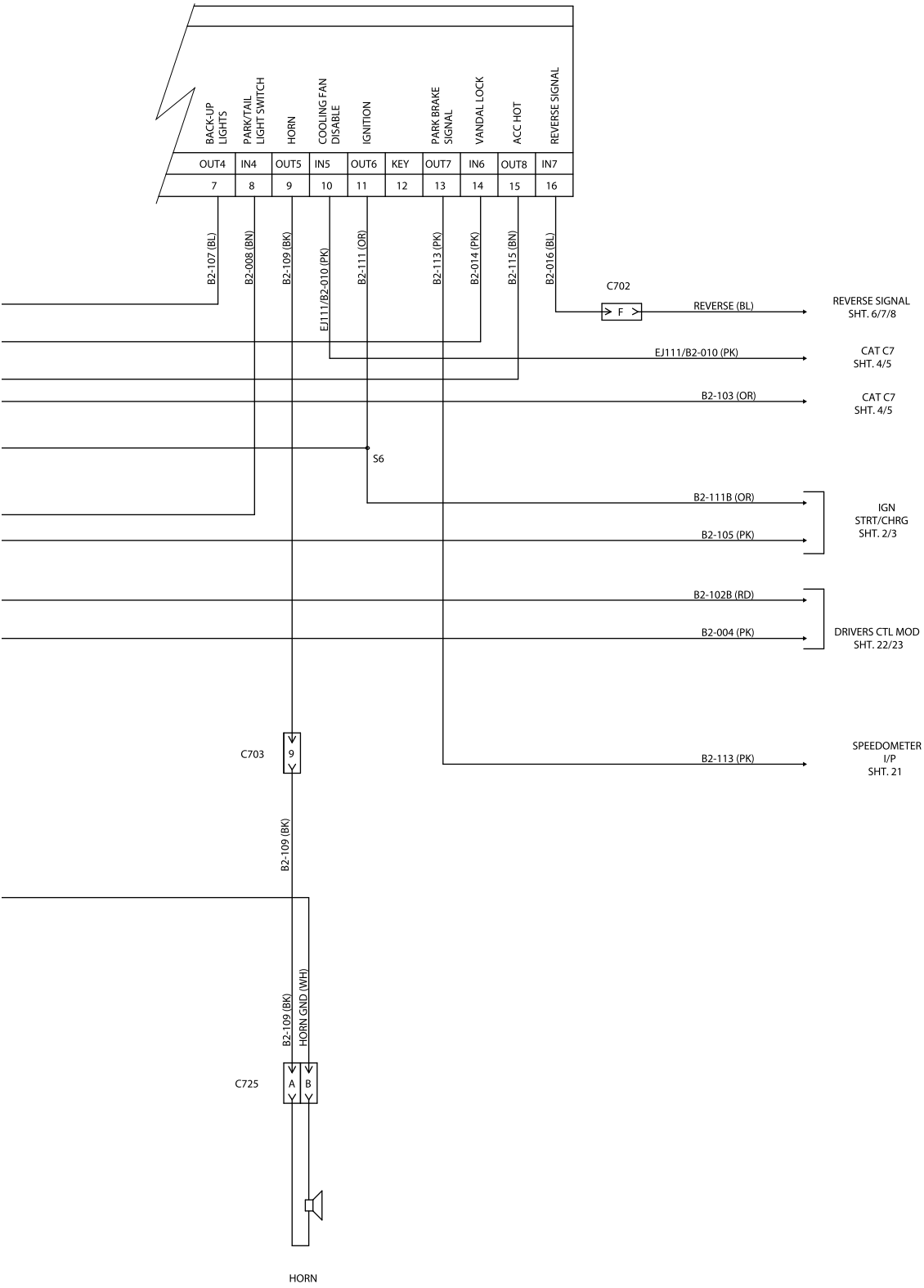

**Sheet 12**

*0083223*

*SCHEMATIC, WRG, ZONE B PORT 1*

*WITH FEATURE 40050-01 (PAC exhaust Brake)*


CV-CCM-B MODULE CONNECTOR B2
FOG LIGHTS
SERVICE BRAKE LAMP SWITCH
FAN CONTROL POWER
PARK BRAKE SWITCH
IGNITION DROPOUT
I/O DIAGNOSTIC SWITCH
FUNC
OUT1
IN1
OUT2
IN2
OUT3
IN3
HARNESS CONN C3
1
2
3
4
5
6
B2-101 (RD)
B2-102 (RD)
B2-103 (OR)
B2-004 (PK)
B2-105 (PK)
B2-006 (GN)
B2-107 (BL)
B2-014 (PK)
B2-115 (BN)
B2-111C (OR)
BODY INTERFACE
SHT. 25/26
C301
PRK LGT
ZONE B PORT 3
SHT. 15
B2-008 (BN)
H
R
B2-101B (RD)
S20
FOG LGT ON
ZONE B PORT 1
SHT. 11/12
B2-101B (RD)
S18
B2-101A (RD)
C703
19
SERVICE BRAKE
HYDRAULIC BRAKE BOOST
SHT. 17
B2-102A (RD)
IP
SHT. 21
B2-006 (GN)
B2-101A (RD)
LT FG LGT PWR (BK)
S7
S8
LT FG LGT PWR (BK)
LT FG LGT GND (WH)
RT FG LGT PWR (BK)
RT FG LGT GND (WH)
GND D (WH)
S4
C731
A
B
C724
A
B
GND (WH)
BULKHEAD
GROUND
LEFT
FOG LAMP
RIGHT
FOG LAMP

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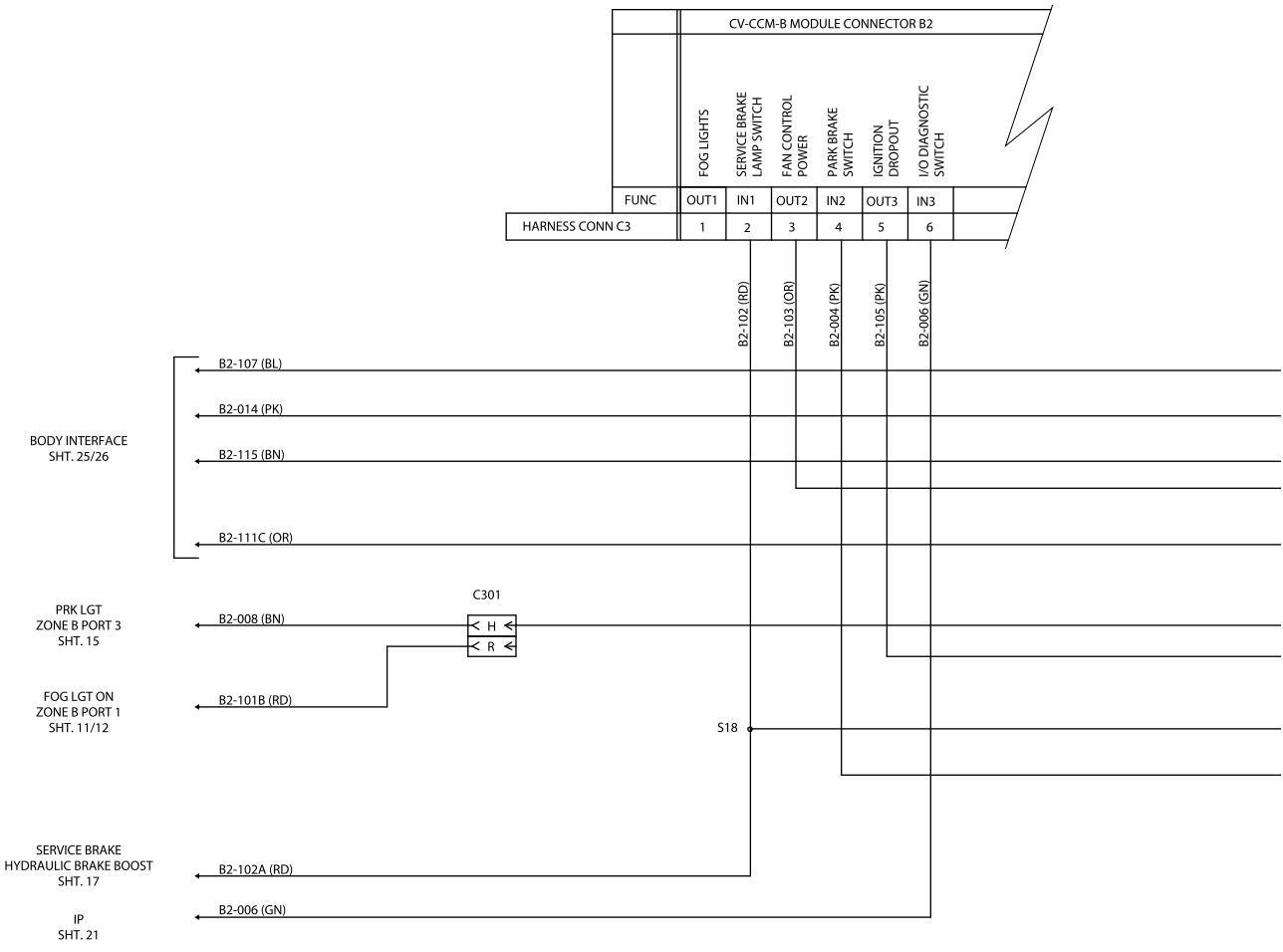
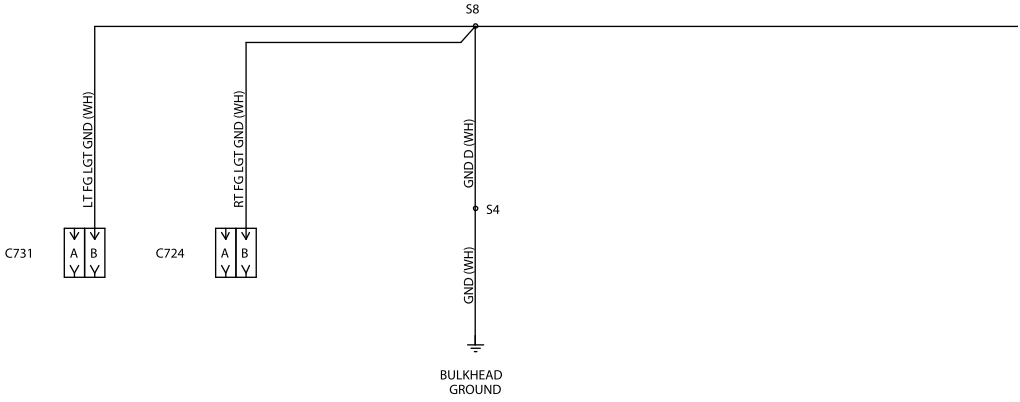
**Sheet 13**

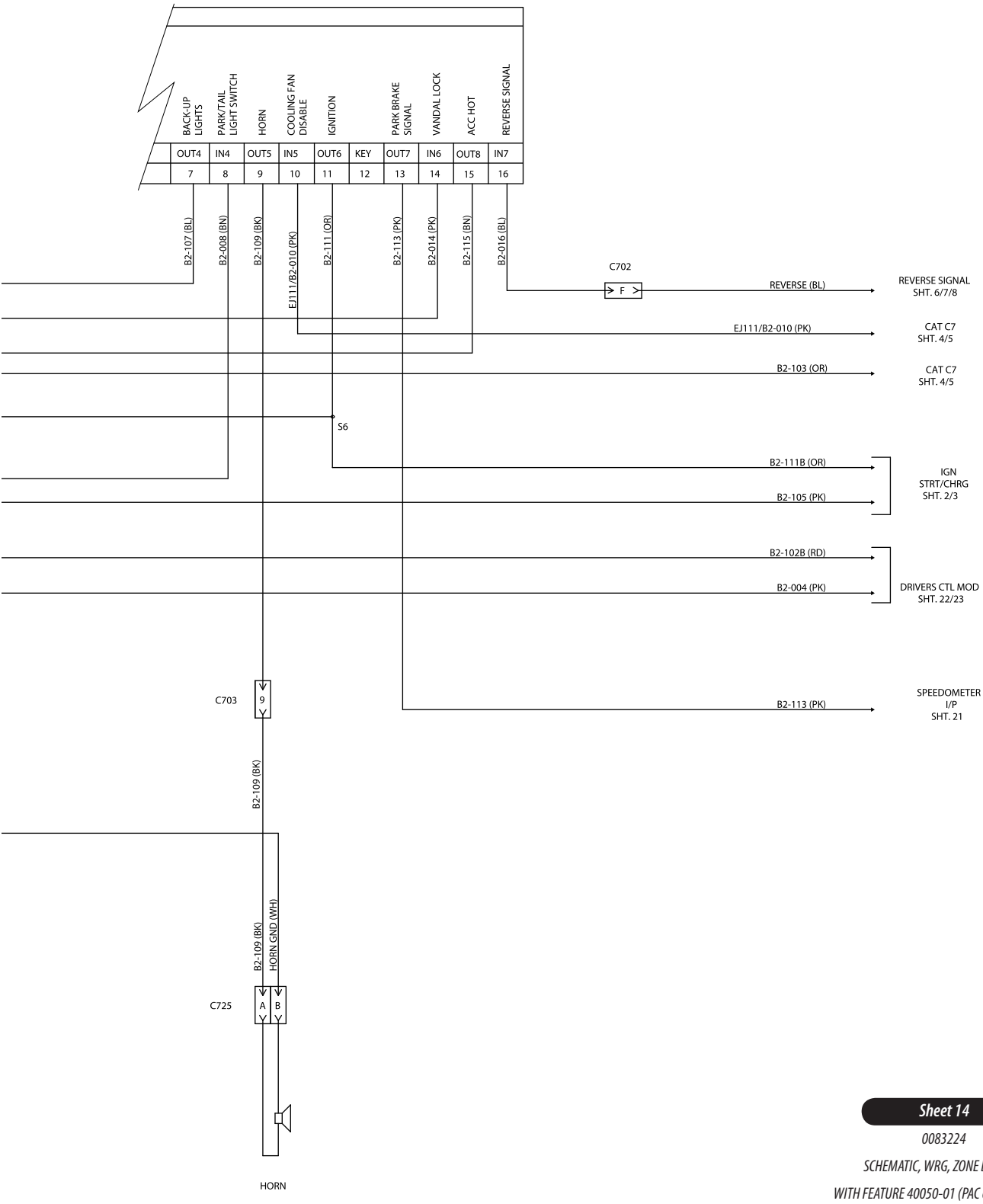
*0080203*

*SCHEMATIC, WRG, ZONE B PORT 2*


CV-CCM-B MODULE CONNECTOR B2
FOG LIGHTS
SERVICE BRAKE LAMP SWITCH
FAN CONTROL POWER
PARK BRAKE SWITCH
IGNITION DROPOUT
I/O DIAGNOSTIC SWITCH
FUNC
OUT1
IN1
OUT2
IN2
OUT3
IN3
HARNESS CONN C3
1
2
3
4
5
6
B2-102 (RD)
B2-103 (OR)
B2-004 (PK)
B2-105 (PK)
B2-006 (GN)
B2-107 (BL)
B2-014 (PK)
B2-115 (BN)
B2-111C (OR)
BODY INTERFACE
SHT. 25/26
C301
H
R
PRK LGT
ZONE B PORT 3
SHT. 15
B2-008 (BN)
FOG LGT ON
ZONE B PORT 1
SHT. 11/12
B2-101B (RD)
S18
SERVICE BRAKE
HYDRAULIC BRAKE BOOST
SHT. 17
B2-102A (RD)
IP
SHT. 21
B2-006 (GN)




S8
LT FG LGT GND (WH)
RT FG LGT GND (WH)
GND D (WH)
S4
C731
A
B
C724
A
B
GND (WH)
BULKHEAD
GROUND

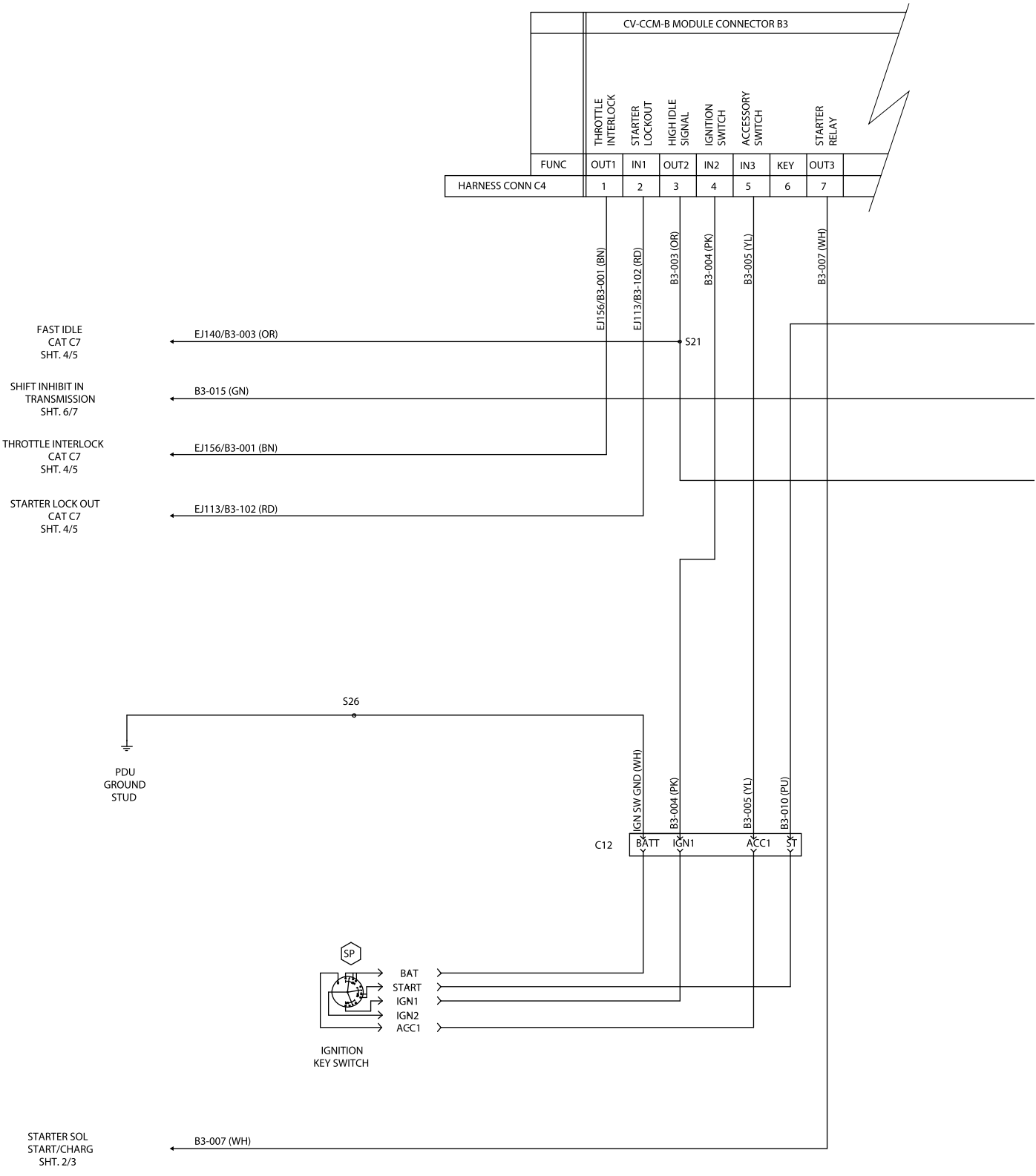


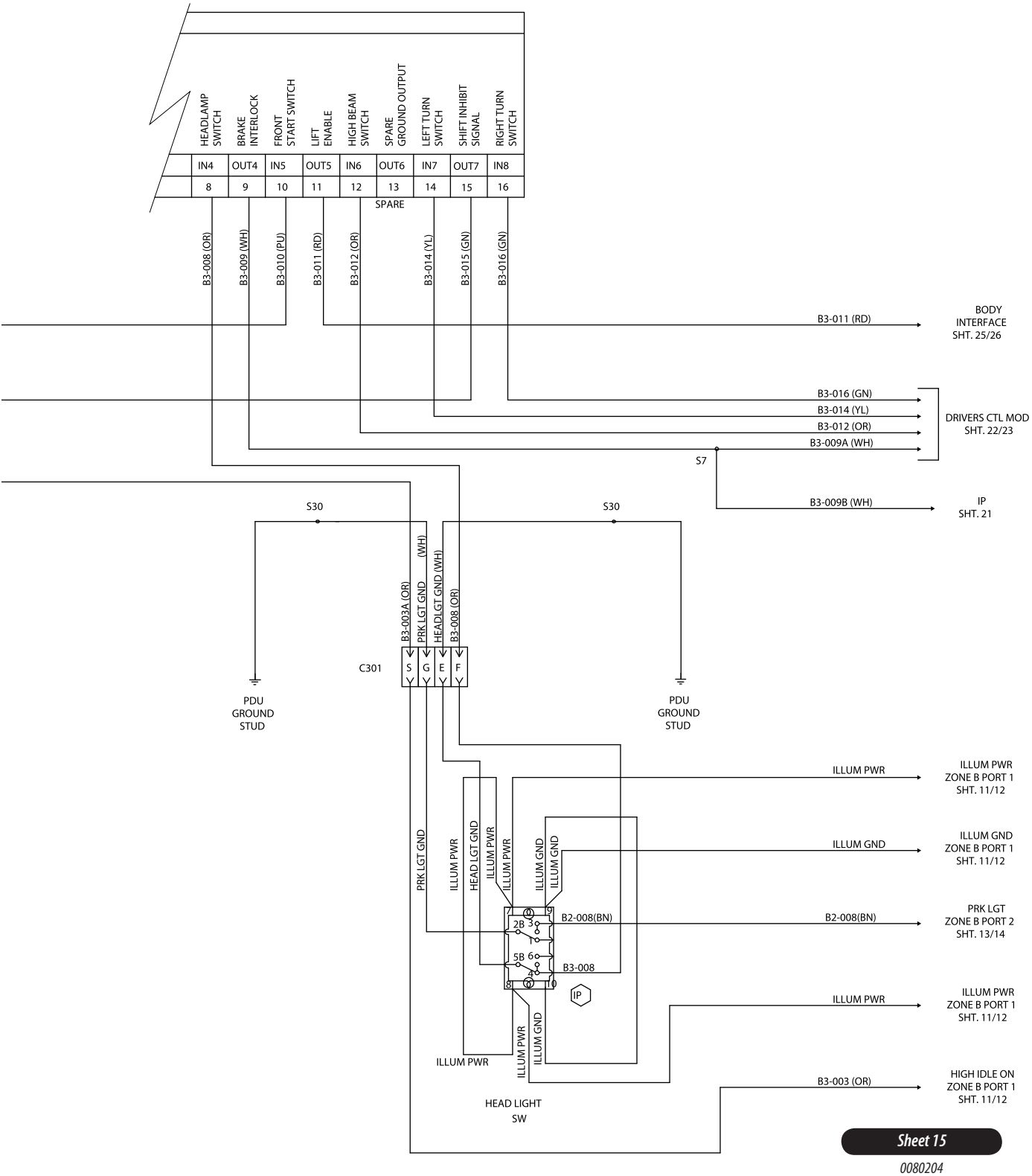

**Sheet 14**

*0083224*

*SCHEMATIC, WRG, ZONE B PORT 2*

*WITH FEATURE 40050-01 (PAC exhaust Brake)*

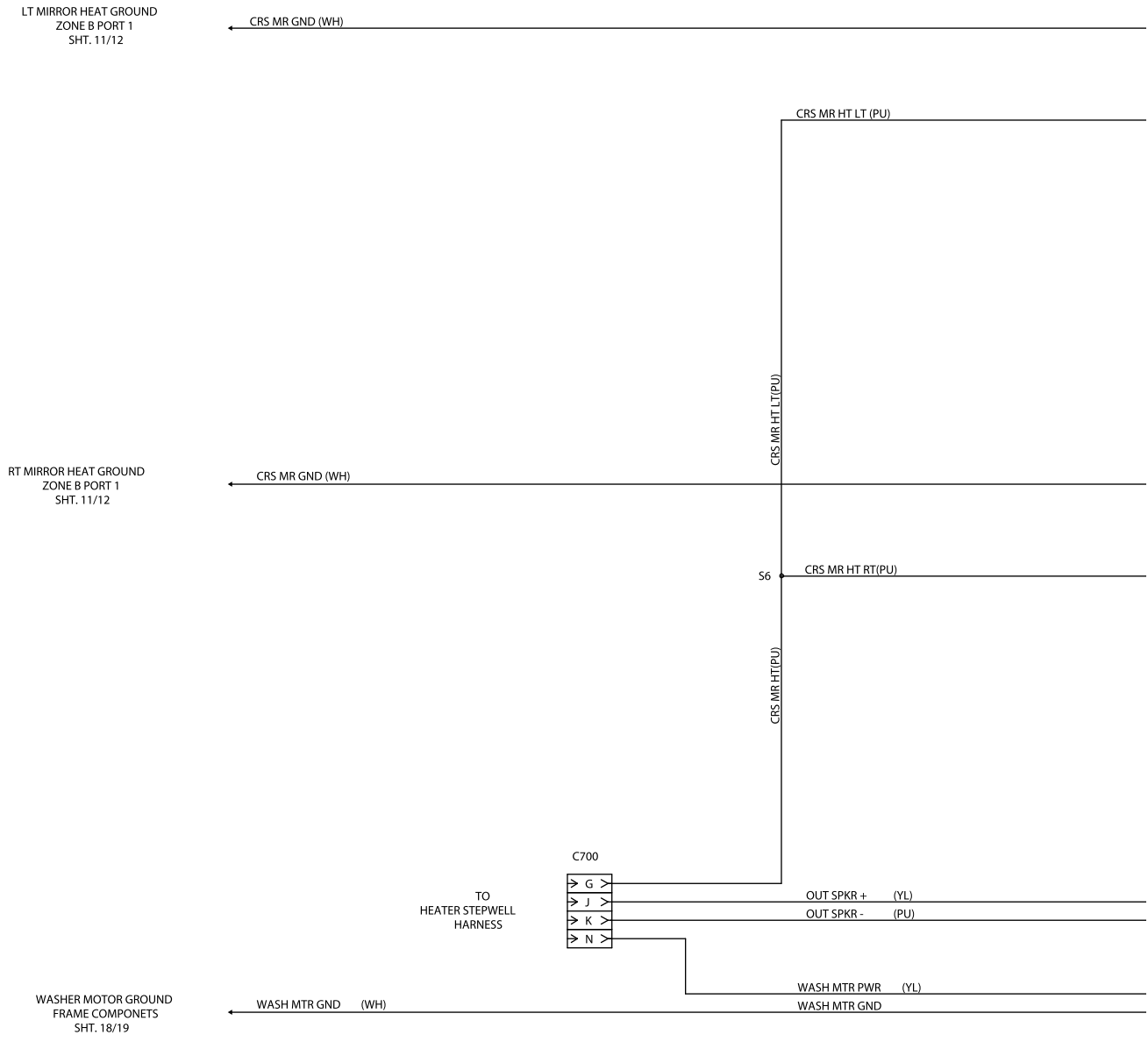

CV-CCM-B MODULE CONNECTOR B3
THROTTLE INTERLOCK
STARTER LOCKOUT
HIGH IDLE SIGNAL
IGNITION SWITCH
ACCESSORY SWITCH
STARTER RELAY
FUNC
OUT1
IN1
OUT2
IN2
IN3
KEY
OUT3
HARNESS CONN C4
1
2
3
4
5
6
7
EJ156/B3-001 (BN)
EJ113/B3-102 (RD)
B3-003 (OR)
B3-004 (PK)
B3-005 (YL)
B3-007 (WH)
FAST IDLE
CAT C7
SHT. 4/5
EJ140/B3-003 (OR)
S21
SHIFT INHIBIT IN
TRANSMISSION
SHT. 6/7
B3-015 (GN)
THROTTLE INTERLOCK
CAT C7
SHT. 4/5
EJ156/B3-001 (BN)
STARTER LOCK OUT
CAT C7
SHT. 4/5
EJ113/B3-102 (RD)
S26
PDU
GROUND
STUD
IGN SW GND (WH)
B3-004 (PK)
B3-005 (YL)
B3-010 (PU)
C12
BATT
IGN1
ACC1
ST
SP
BAT
START
IGN1
IGN2
ACC1
IGNITION
KEY SWITCH
STARTER SOL
START/CHARG
SHT. 2/3
B3-007 (WH)

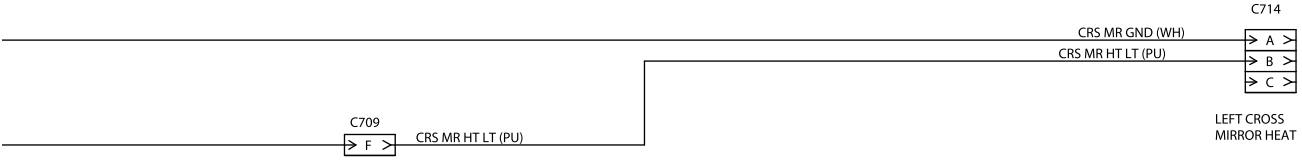


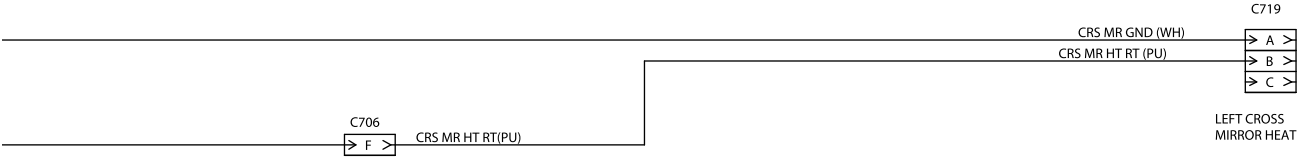

**Sheet 15**

*0080204*

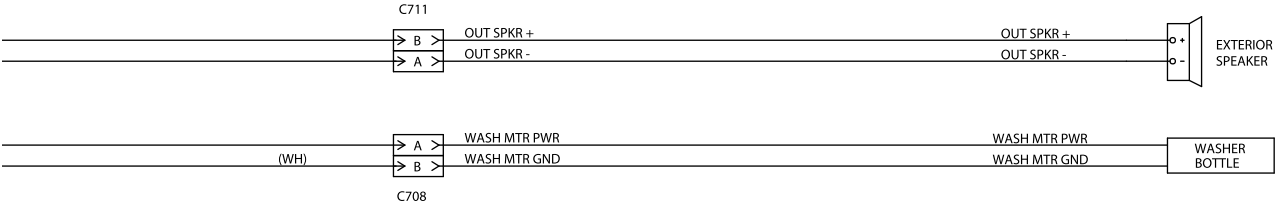
*SCHEMATIC, WRG, ZONE B PORT 3*


LT MIRROR HEAT GROUND
ZONE B PORT 1
SHT. 11/12
CRS MR GND (WH)
CRS MR HT LT (PU)
CRS MR HT LT(PU)
RT MIRROR HEAT GROUND
ZONE B PORT 1
SHT. 11/12
CRS MR GND (WH)
S6
CRS MR HT RT(PU)
CRS MR HT(PU)
C700
G
J
K
N
TO
HEATER STEPWELL
HARNESS
OUT SPKR + (YL)
OUT SPKR - (PU)
WASH MTR PWR (YL)
WASH MTR GND
WASHER MOTOR GROUND
FRAME COMPONETS
SHT. 18/19
WASH MTR GND (WH)



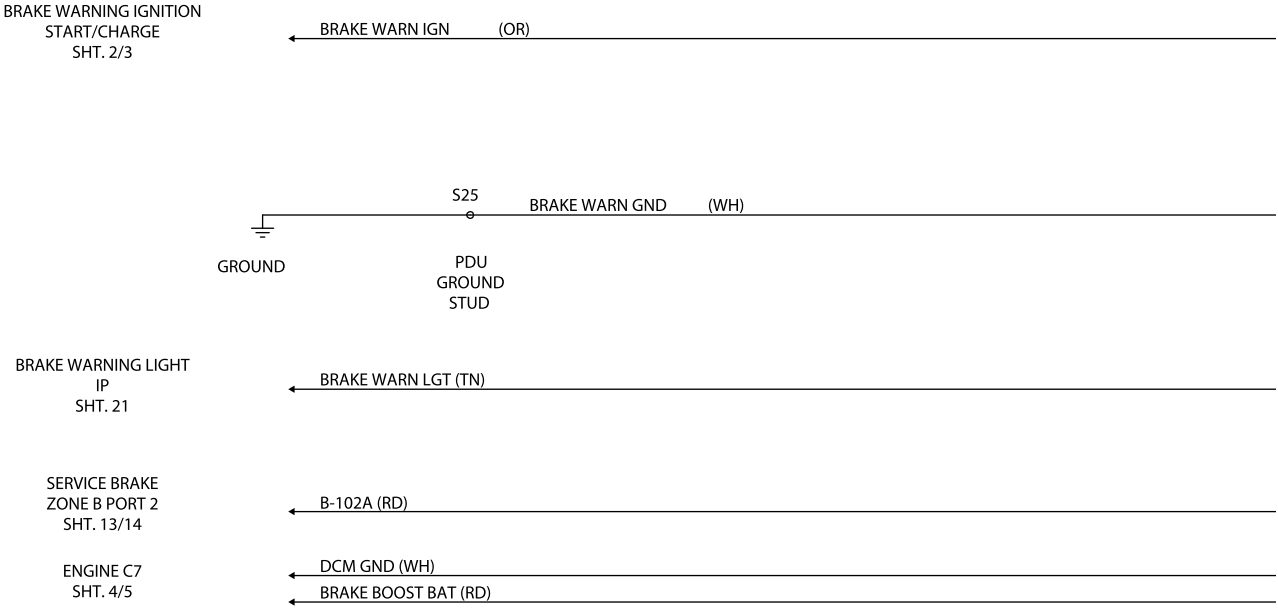


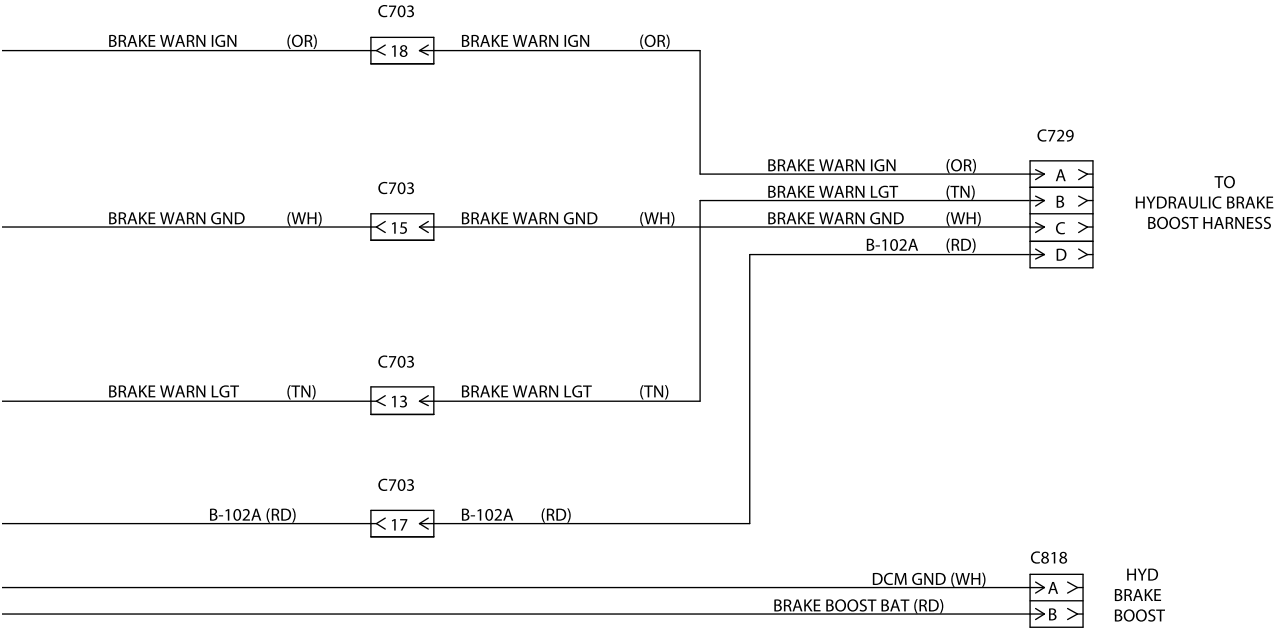




**Sheet 16**

*0080205*

*SCHEMATIC, WRG, MIRRORS / SPEAKERS / WASHER*


BRAKE WARNING IGNITION
START/CHARGE
SHT. 2/3
BRAKE WARN IGN (OR)
S25
BRAKE WARN GND (WH)
GROUND
PDU
GROUND
STUD
BRAKE WARNING LIGHT
IP
SHT. 21
BRAKE WARN LGT (TN)
SERVICE BRAKE
ZONE B PORT 2
SHT. 13/14
B-102A (RD)
ENGINE C7
SHT. 4/5
DCM GND (WH)
BRAKE BOOST BAT (RD)

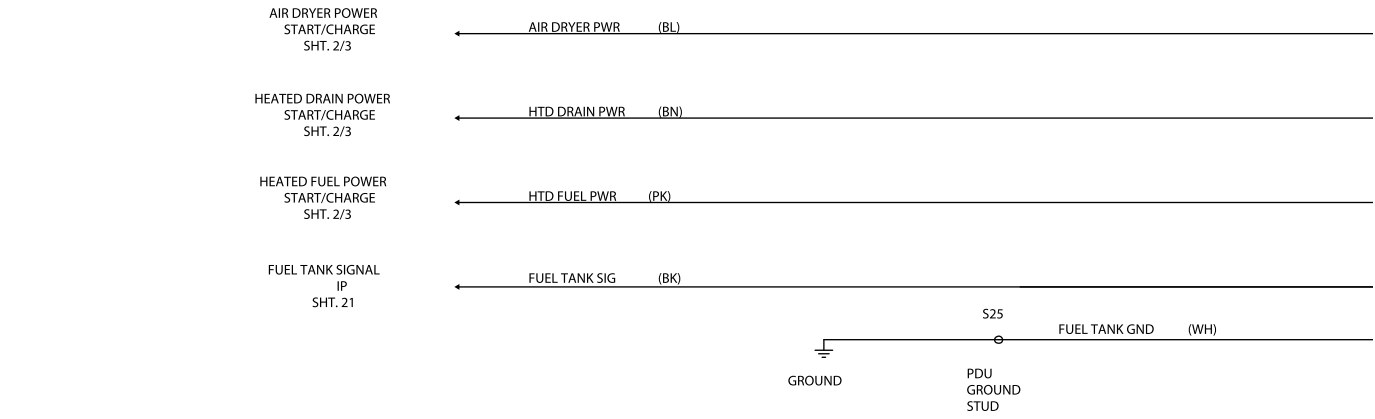


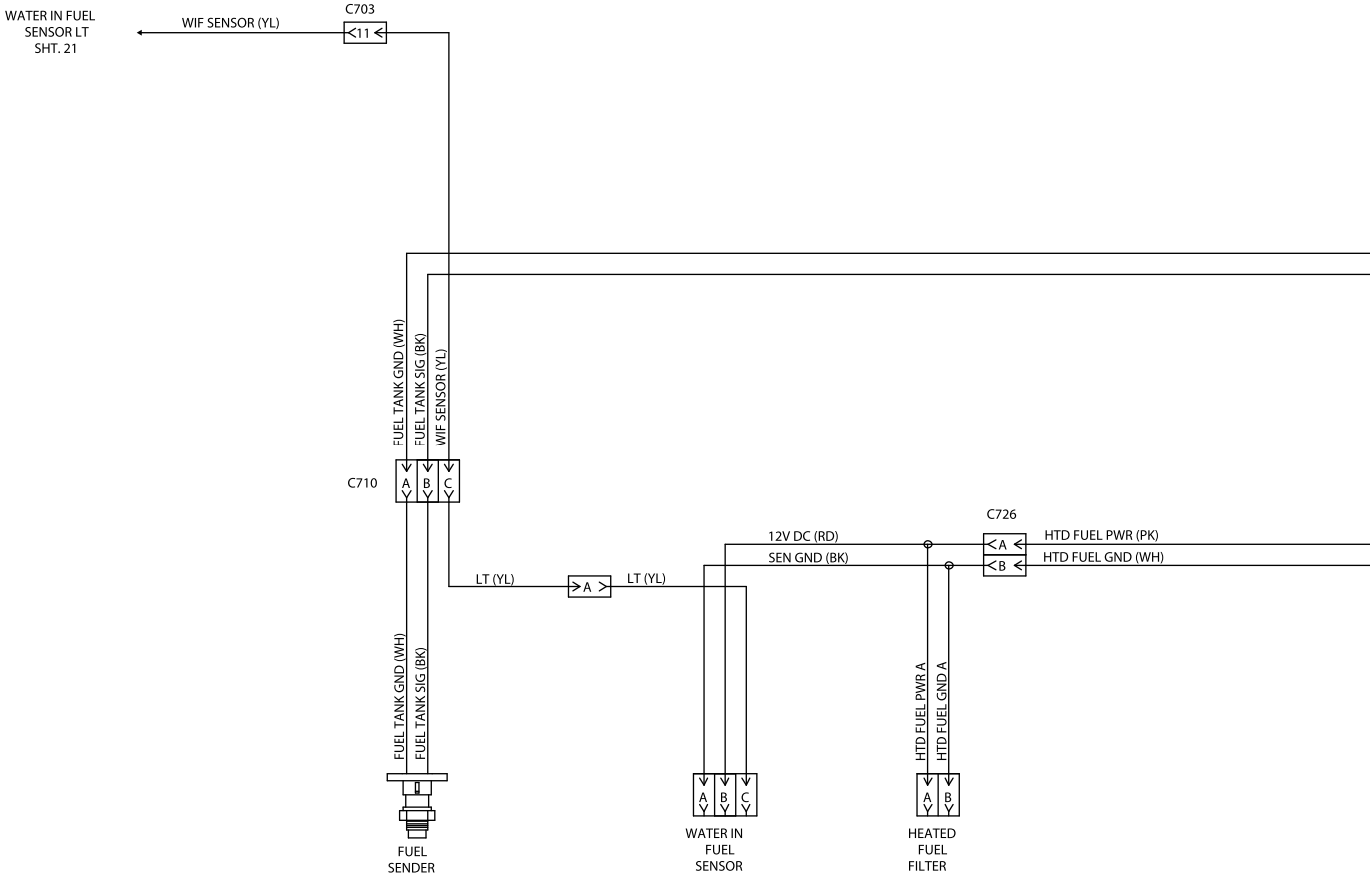



**Sheet 17**

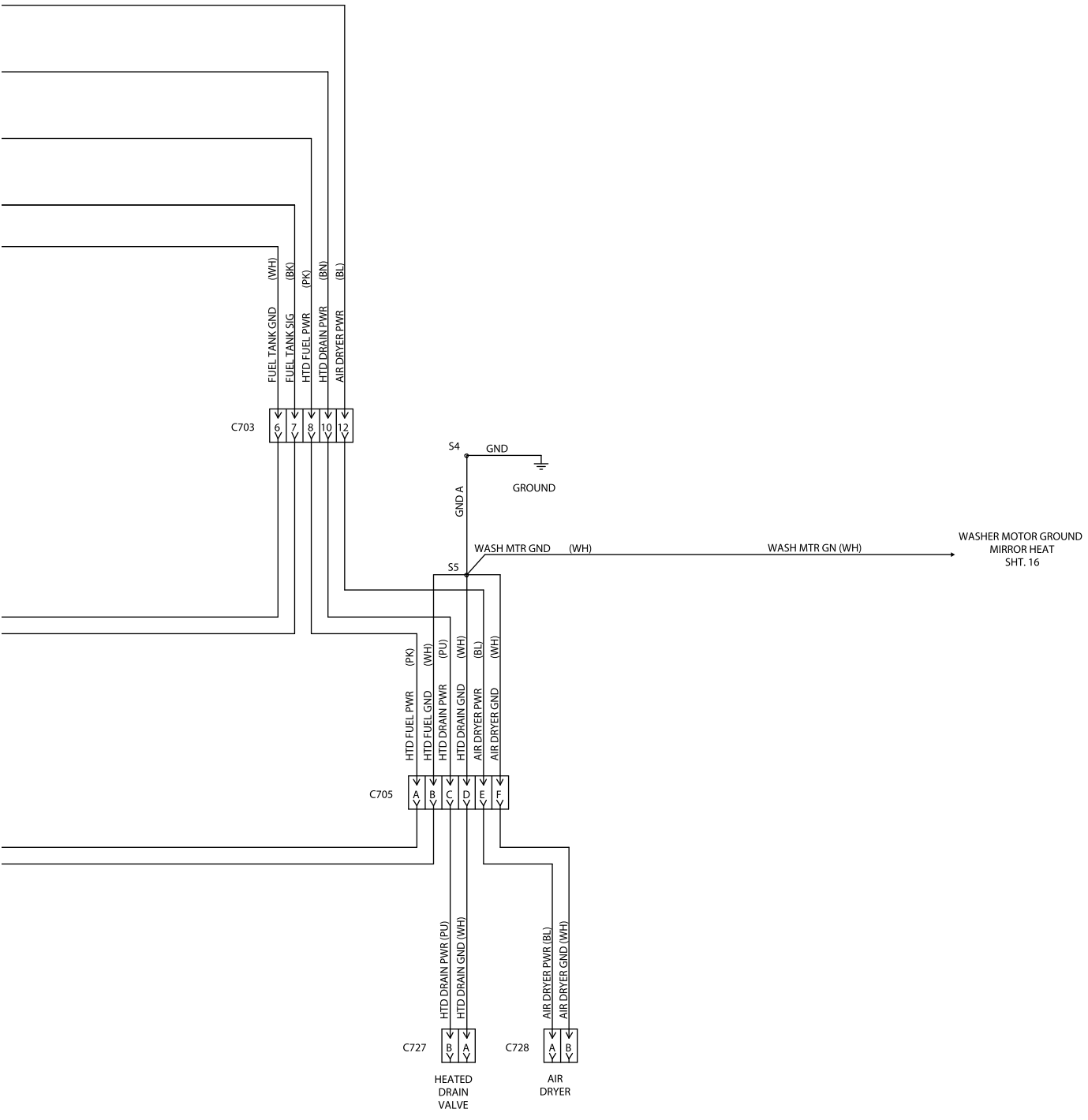
*0080206*

*SCHEMATIC, WRG, HYDRAULIC BRAKE BOOST*




NOTE: DASHED LINES INDICATE THAT THERE IS AN ADDITIONAL HARNESS INSTALLED FOR THE WATER IN FUEL OPTION.

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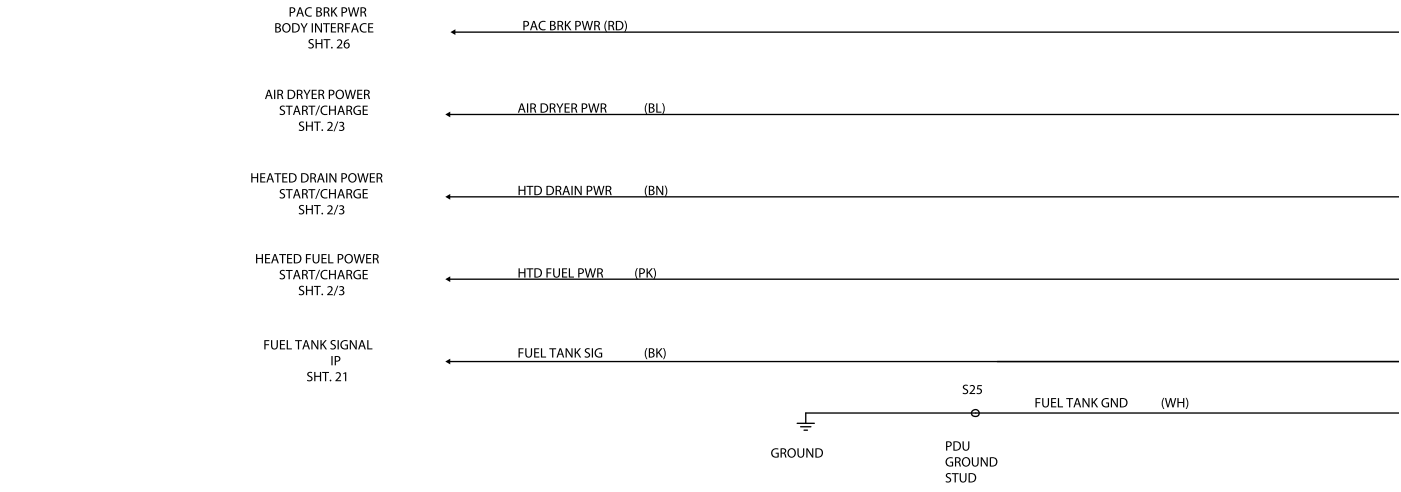
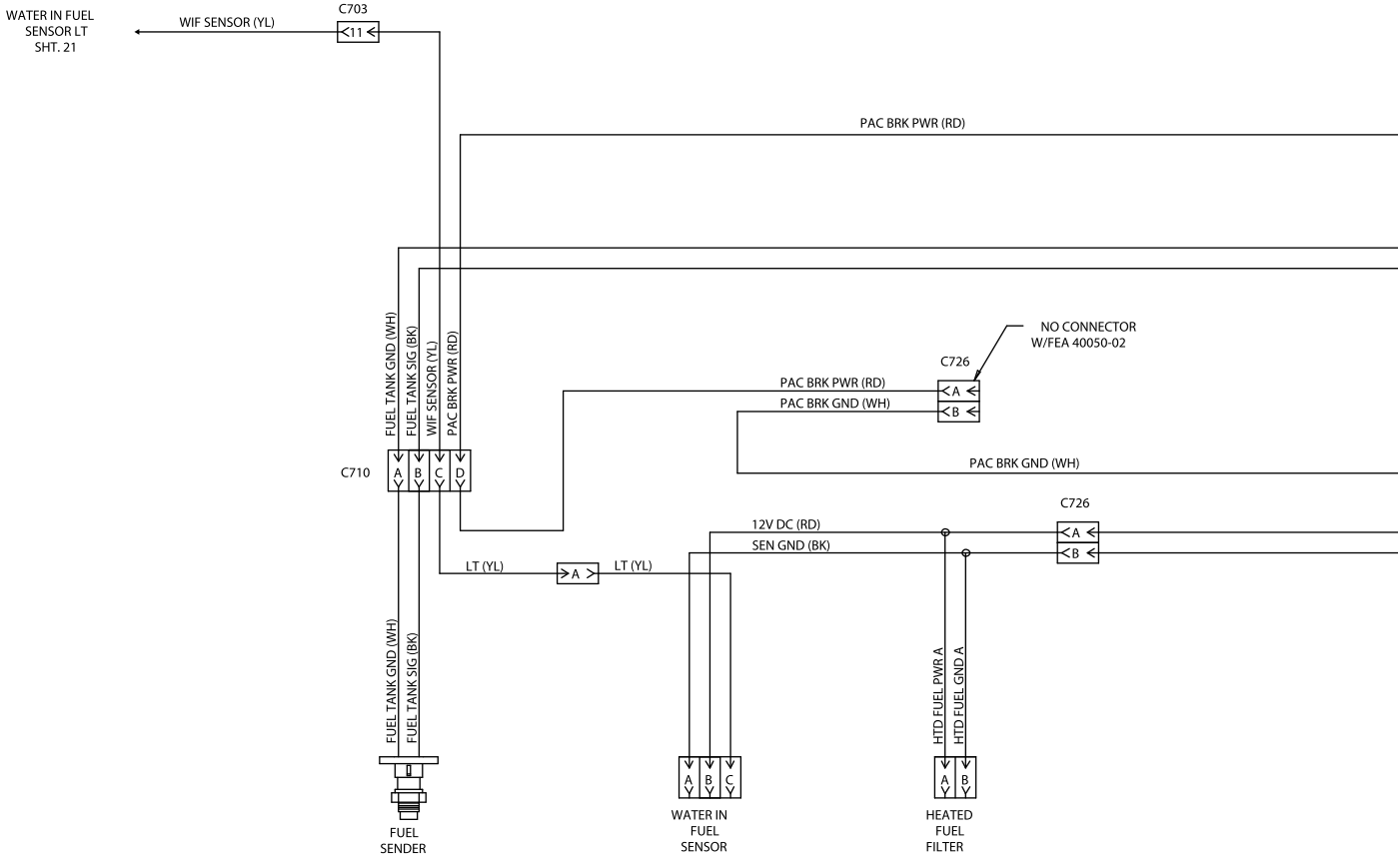
**Sheet 18**

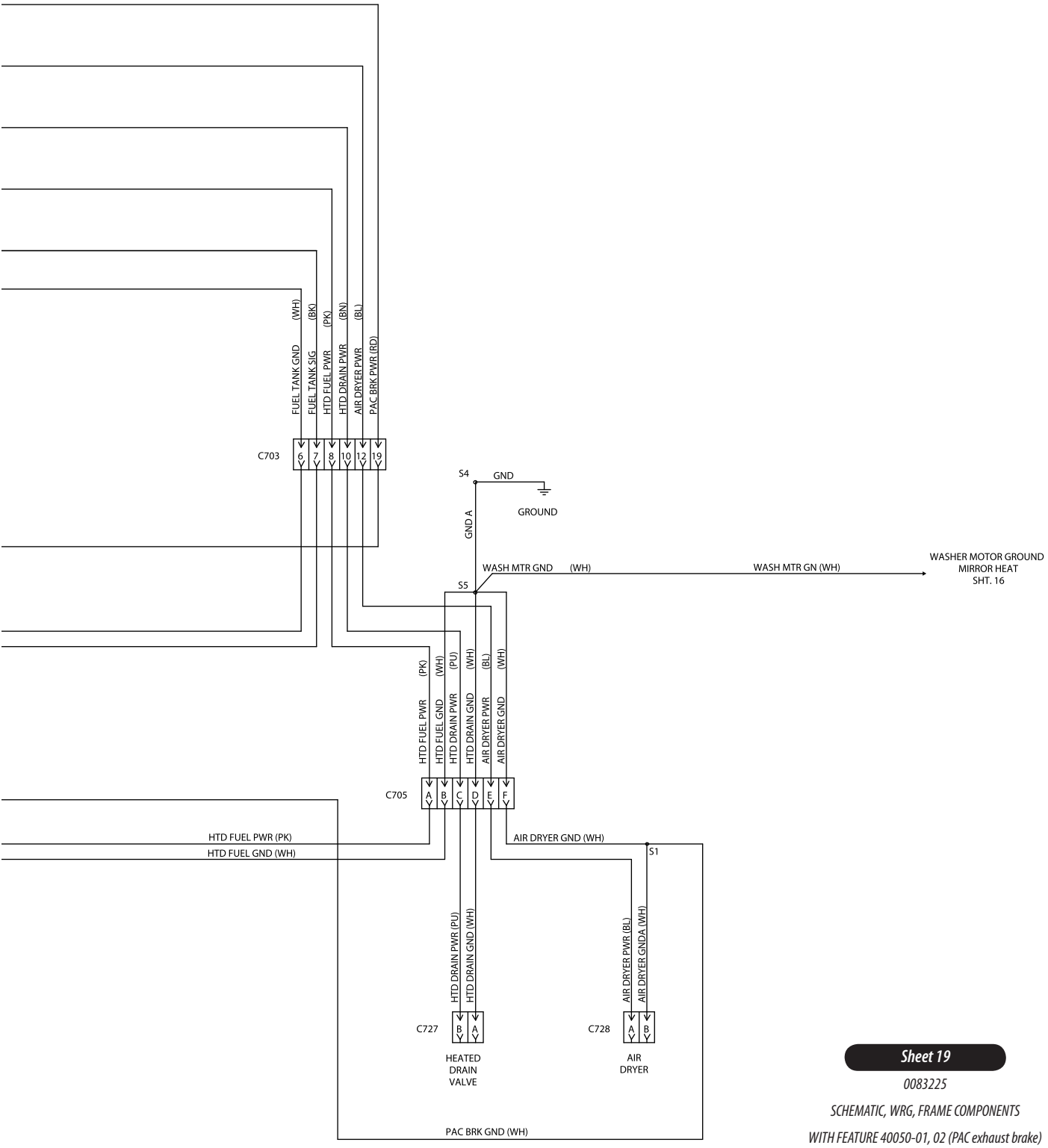
*0080207*

*SCHEMATIC, WRG, FRAME COMPONENTS*




NOTE: DASHED LINES INDICATE THAT THERE IS AN ADDITIONAL HARNESS INSTALLED FOR THE WATER IN FUEL OPTION.

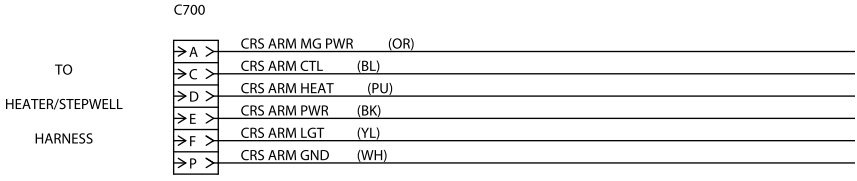


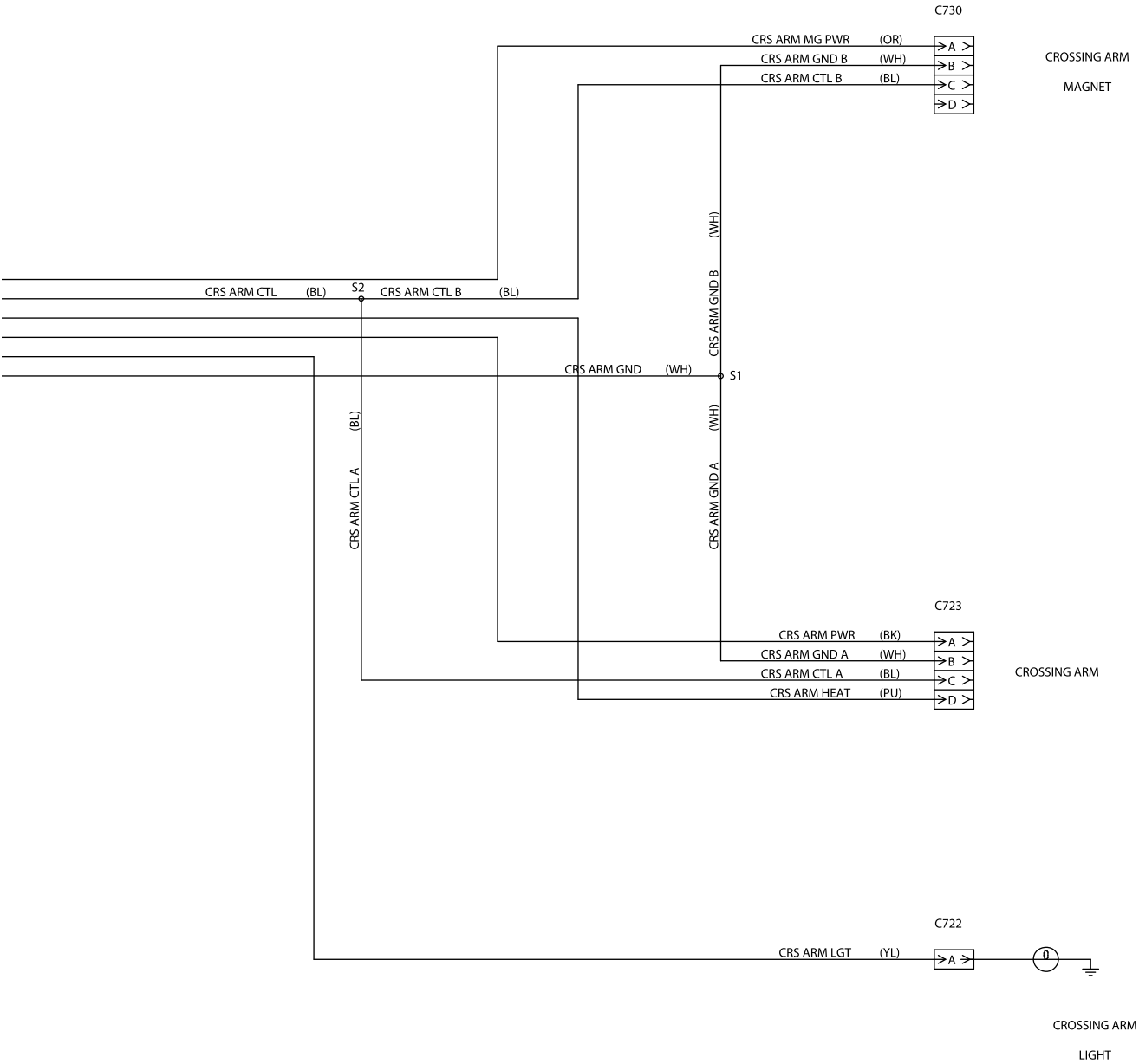

**Sheet 19**

*0083225*

*SCHEMATIC, WRG, FRAME COMPONENTS*

*WITH FEATURE 40050-01, 02 (PAC exhaust brake)*


C700
TO
HEATER/STEPWELL
HARNESS
A
C
D
E
F
P
CRS ARM MG PWR (OR)
CRS ARM CTL (BL)
CRS ARM HEAT (PU)
CRS ARM PWR (BK)
CRS ARM LGT (YL)
CRS ARM GND (WH)

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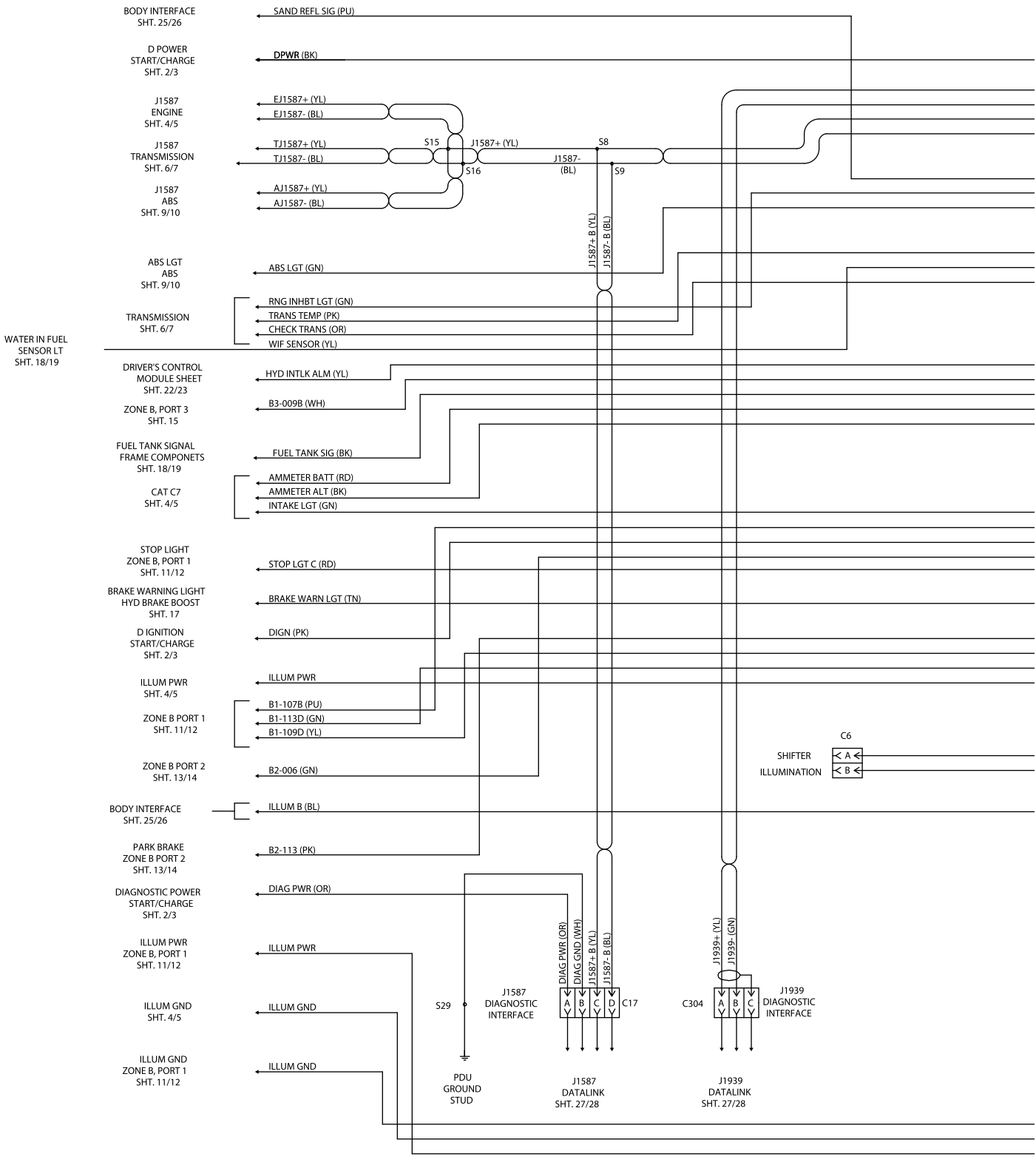
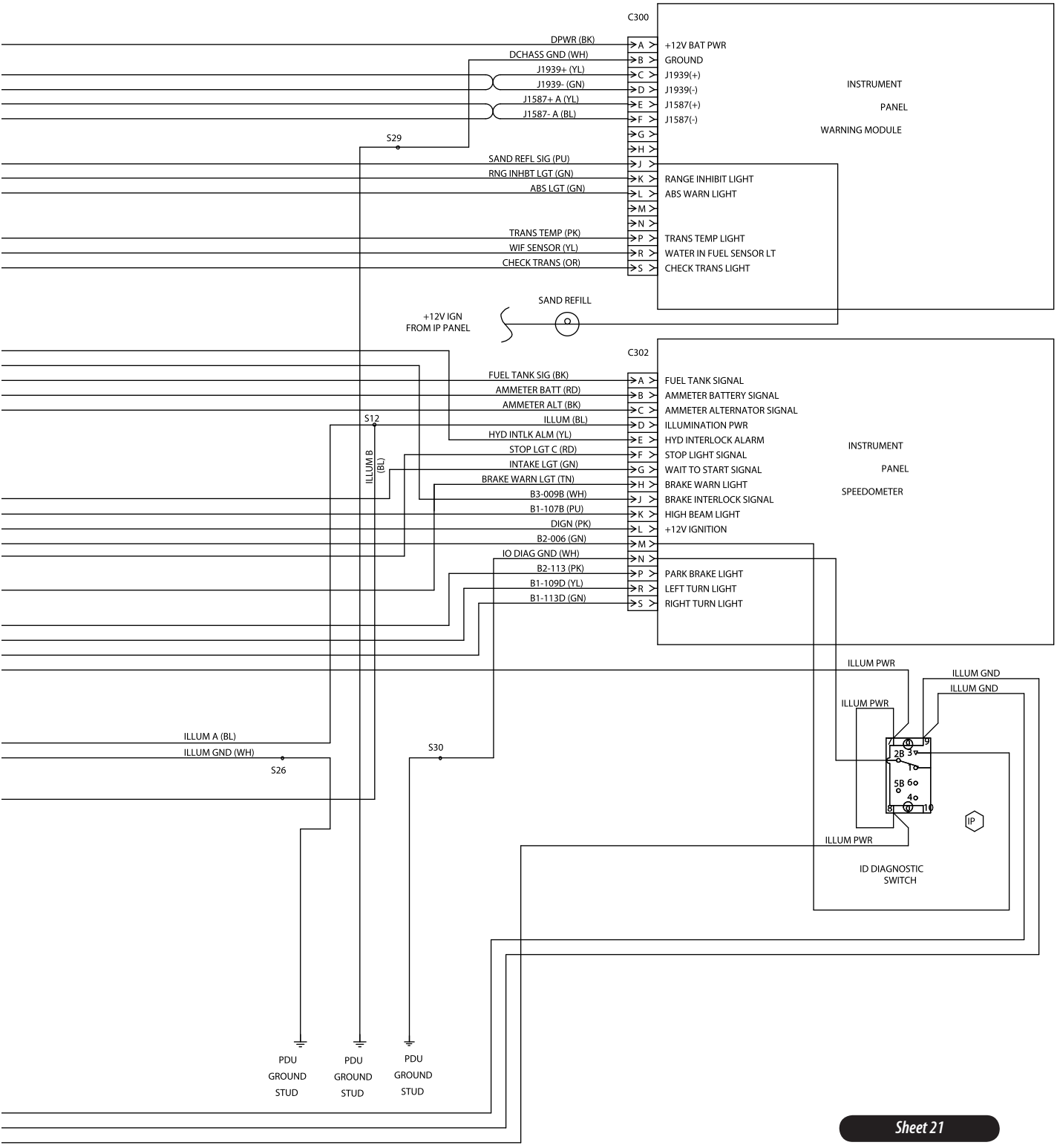
**Sheet 20**

*0080208*

*SCHEMATIC, WRG, CROSSING ARM*


BODY INTERFACE SHT. 25/26
SAND REFL SIG (PU)
D POWER START/CHARGE SHT. 2/3
DPWR (BK)
J1587 ENGINE SHT. 4/5
EJ1587+ (YL)
EJ1587- (BL)
J1587 TRANSMISSION SHT. 6/7
TJ1587+ (YL)
TJ1587- (BL)
S15
J1587+ (YL)
S8
J1587- (BL)
S16
S9
J1587 ABS SHT. 9/10
AJ1587+ (YL)
AJ1587- (BL)
J1587+ B (YL)
J1587- B (BL)
ABS LGT ABS SHT. 9/10
ABS LGT (GN)
TRANSMISSION SHT. 6/7
RNG INHBT LGT (GN)
TRANS TEMP (PK)
CHECK TRANS (OR)
WIF SENSOR (YL)
WATER IN FUEL SENSOR LT SHT. 18/19
DRIVER'S CONTROL MODULE SHEET SHT. 22/23
HYD INTLK ALM (YL)
ZONE B, PORT 3 SHT. 15
B3-009B (WH)
FUEL TANK SIGNAL FRAME COMPONETS SHT. 18/19
FUEL TANK SIG (BK)
CAT C7 SHT. 4/5
AMMETER BATT (RD)
AMMETER ALT (BK)
INTAKE LGT (GN)
STOP LIGHT ZONE B, PORT 1 SHT. 11/12
STOP LGT C (RD)
BRAKE WARNING LIGHT HYD BRAKE BOOST SHT. 17
BRAKE WARN LGT (TN)
D IGNITION START/CHARGE SHT. 2/3
DIGN (PK)
ILLUM PWR SHT. 4/5
ILLUM PWR
ZONE B PORT 1 SHT. 11/12
B1-107B (PU)
B1-113D (GN)
B1-109D (YL)
C6
SHIFTER ILLUMINATION
A
B
ZONE B PORT 2 SHT. 13/14
B2-006 (GN)
BODY INTERFACE SHT. 25/26
ILLUM B (BL)
PARK BRAKE ZONE B PORT 2 SHT. 13/14
B2-113 (PK)
DIAGNOSTIC POWER START/CHARGE SHT. 2/3
DIAG PWR (OR)
ILLUM PWR ZONE B, PORT 1 SHT. 11/12
ILLUM PWR
ILLUM GND SHT. 4/5
ILLUM GND
ILLUM GND ZONE B, PORT 1 SHT. 11/12
ILLUM GND
S29
J1587 DIAGNOSTIC INTERFACE
DIAG PWR (OR)
DIAG GND (WH)
J1587+ B (YL)
J1587- B (BL)
A
B
C
D
C17
C304
J1939+ (YL)
J1939- (GN)
J1939 DIAGNOSTIC INTERFACE
PDU GROUND STUD
J1587 DATALINK SHT. 27/28
J1939 DATALINK SHT. 27/28

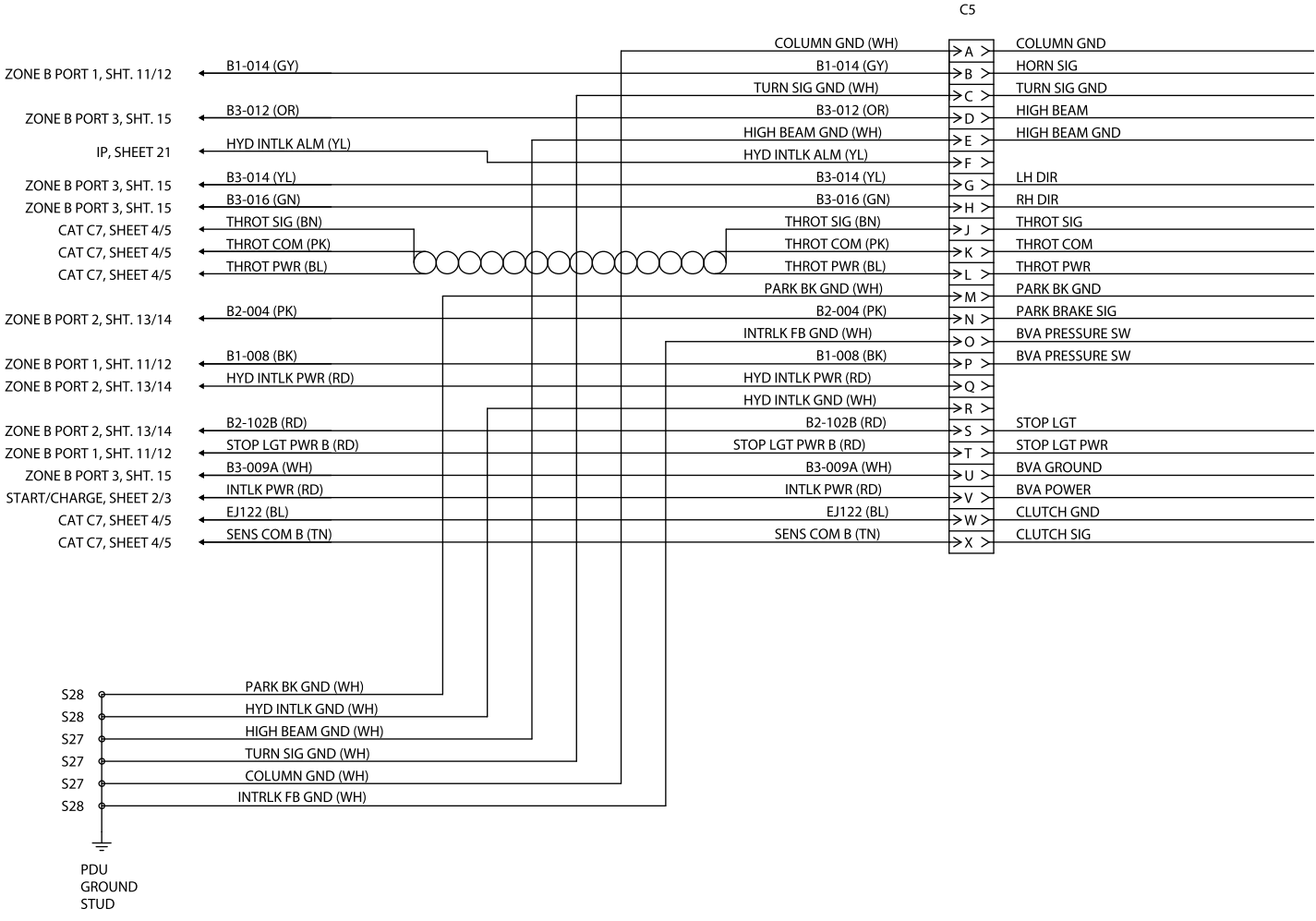


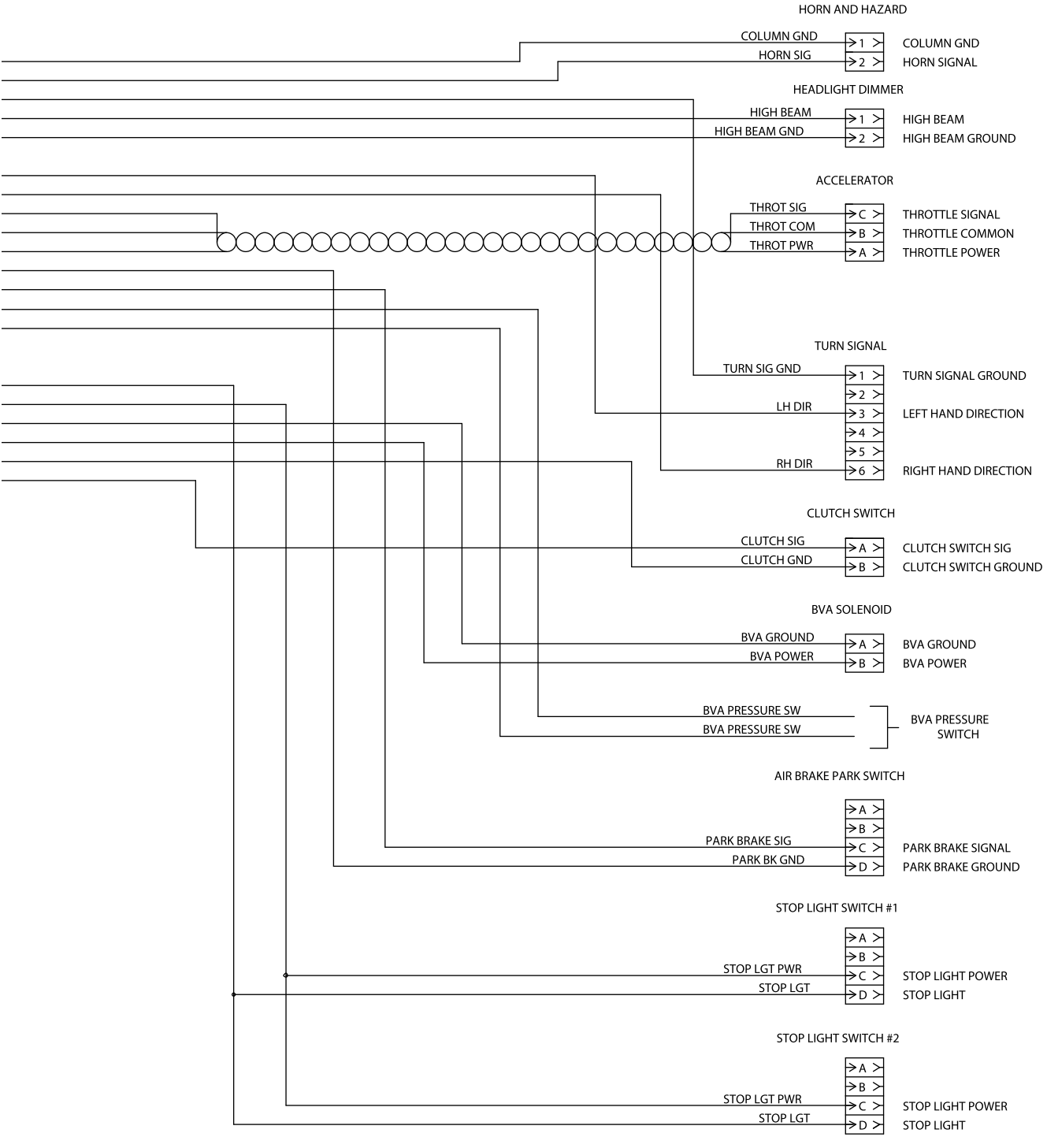



**Sheet 21**

*0080209*

*SCHEMATIC, WRG, INSTRUMENT PANEL*

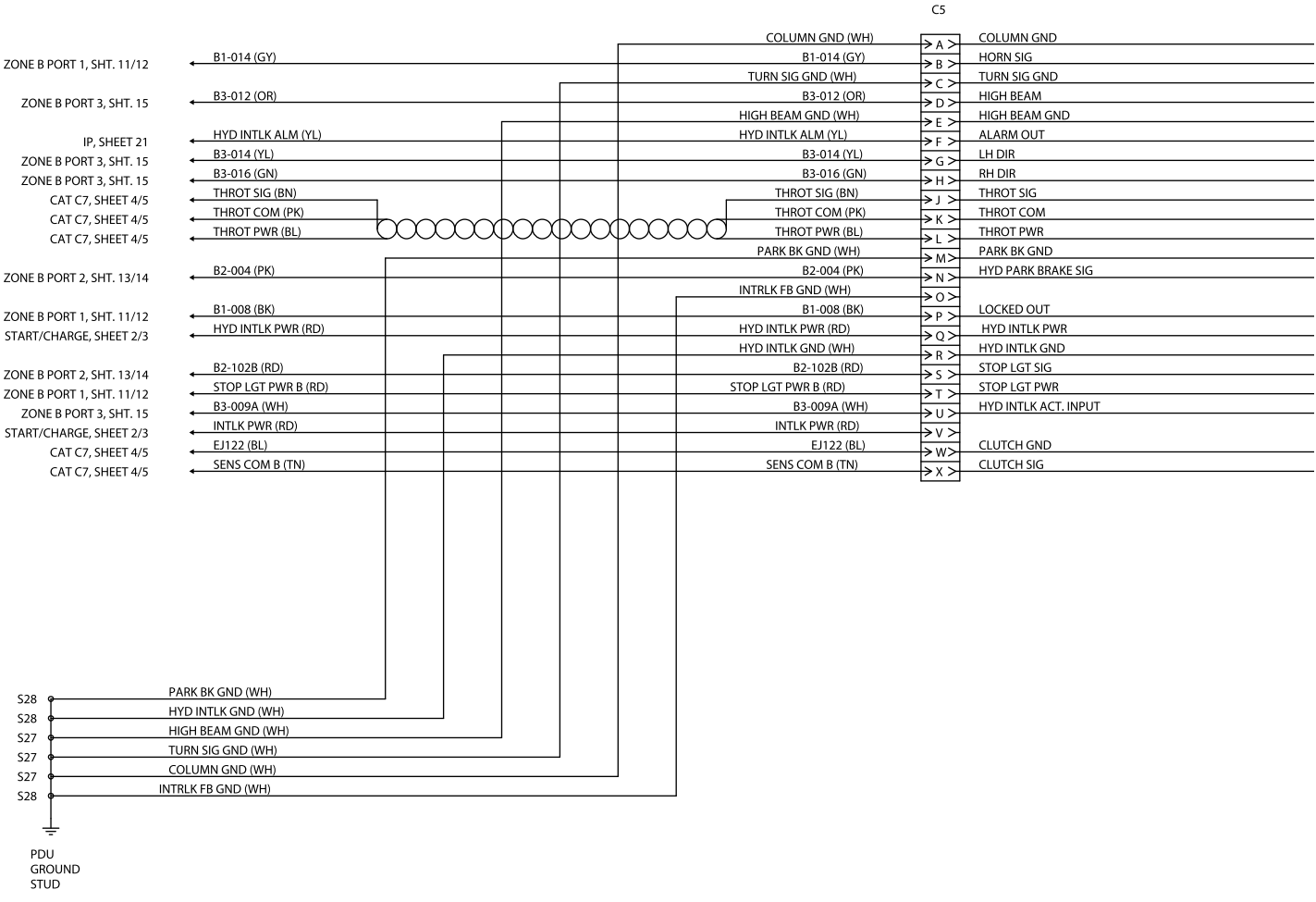

C5
ZONE B PORT 1, SHT. 11/12
B1-014 (GY)
ZONE B PORT 3, SHT. 15
B3-012 (OR)
IP, SHEET 21
HYD INTLK ALM (YL)
ZONE B PORT 3, SHT. 15
B3-014 (YL)
ZONE B PORT 3, SHT. 15
B3-016 (GN)
CAT C7, SHEET 4/5
THROT SIG (BN)
CAT C7, SHEET 4/5
THROT COM (PK)
CAT C7, SHEET 4/5
THROT PWR (BL)
ZONE B PORT 2, SHT. 13/14
B2-004 (PK)
ZONE B PORT 1, SHT. 11/12
B1-008 (BK)
ZONE B PORT 2, SHT. 13/14
HYD INTLK PWR (RD)
ZONE B PORT 2, SHT. 13/14
B2-102B (RD)
ZONE B PORT 1, SHT. 11/12
STOP LGT PWR B (RD)
ZONE B PORT 3, SHT. 15
B3-009A (WH)
START/CHARGE, SHEET 2/3
INTLK PWR (RD)
CAT C7, SHEET 4/5
EJ122 (BL)
CAT C7, SHEET 4/5
SENS COM B (TN)
COLUMN GND (WH)
B1-014 (GY)
TURN SIG GND (WH)
B3-012 (OR)
HIGH BEAM GND (WH)
HYD INTLK ALM (YL)
B3-014 (YL)
B3-016 (GN)
THROT SIG (BN)
THROT COM (PK)
THROT PWR (BL)
PARK BK GND (WH)
B2-004 (PK)
INTRLK FB GND (WH)
B1-008 (BK)
HYD INTLK PWR (RD)
HYD INTLK GND (WH)
B2-102B (RD)
STOP LGT PWR B (RD)
B3-009A (WH)
INTLK PWR (RD)
EJ122 (BL)
SENS COM B (TN)
A
B
C
D
E
F
G
H
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
COLUMN GND
HORN SIG
TURN SIG GND
HIGH BEAM
HIGH BEAM GND
LH DIR
RH DIR
THROT SIG
THROT COM
THROT PWR
PARK BK GND
PARK BRAKE SIG
BVA PRESSURE SW
BVA PRESSURE SW
STOP LGT
STOP LGT PWR
BVA GROUND
BVA POWER
CLUTCH GND
CLUTCH SIG
S28
S28
S27
S27
S27
S28
PARK BK GND (WH)
HYD INTLK GND (WH)
HIGH BEAM GND (WH)
TURN SIG GND (WH)
COLUMN GND (WH)
INTRLK FB GND (WH)
PDU
GROUND
STUD

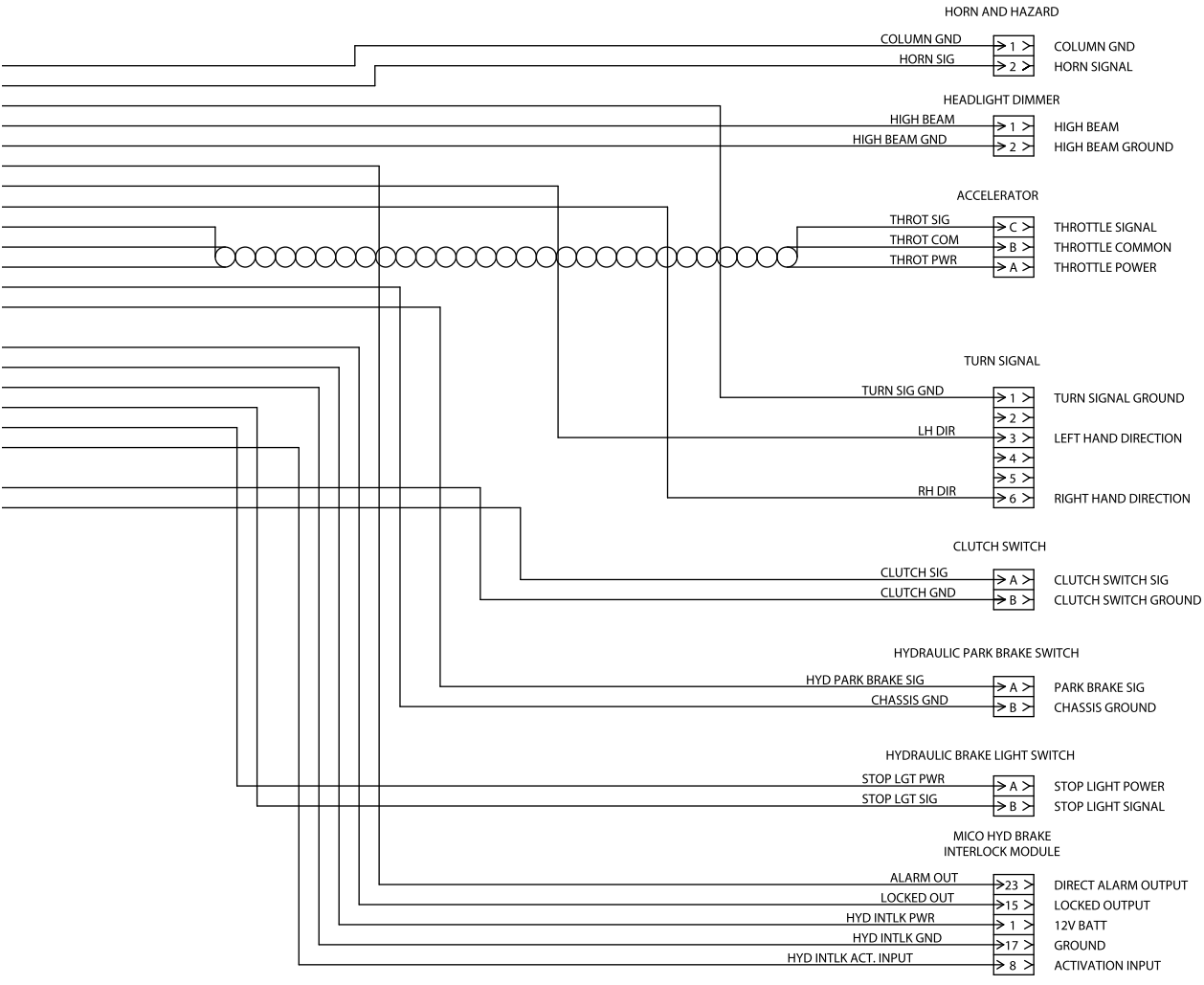



**Sheet 22**

*0080210*

*SCHEMATIC, WRG, DRIVER'S CONTROL MODULE-AIR*


C5
ZONE B PORT 1, SHT. 11/12
B1-014 (GY)
COLUMN GND (WH)
A
COLUMN GND
B1-014 (GY)
B
HORN SIG
ZONE B PORT 3, SHT. 15
B3-012 (OR)
TURN SIG GND (WH)
C
TURN SIG GND
B3-012 (OR)
D
HIGH BEAM
HIGH BEAM GND (WH)
E
HIGH BEAM GND
IP, SHEET 21
HYD INTLK ALM (YL)
HYD INTLK ALM (YL)
F
ALARM OUT
ZONE B PORT 3, SHT. 15
B3-014 (YL)
B3-014 (YL)
G
LH DIR
ZONE B PORT 3, SHT. 15
B3-016 (GN)
B3-016 (GN)
H
RH DIR
CAT C7, SHEET 4/5
THROT SIG (BN)
THROT SIG (BN)
J
THROT SIG
CAT C7, SHEET 4/5
THROT COM (PK)
THROT COM (PK)
K
THROT COM
CAT C7, SHEET 4/5
THROT PWR (BL)
THROT PWR (BL)
L
THROT PWR
PARK BK GND (WH)
M
PARK BK GND
ZONE B PORT 2, SHT. 13/14
B2-004 (PK)
B2-004 (PK)
N
HYD PARK BRAKE SIG
INTRLK FB GND (WH)
O
ZONE B PORT 1, SHT. 11/12
B1-008 (BK)
B1-008 (BK)
P
LOCKED OUT
START/CHARGE, SHEET 2/3
HYD INTLK PWR (RD)
HYD INTLK PWR (RD)
Q
HYD INTLK PWR
HYD INTLK GND (WH)
R
HYD INTLK GND
ZONE B PORT 2, SHT. 13/14
B2-102B (RD)
B2-102B (RD)
S
STOP LGT SIG
ZONE B PORT 1, SHT. 11/12
STOP LGT PWR B (RD)
STOP LGT PWR B (RD)
T
STOP LGT PWR
ZONE B PORT 3, SHT. 15
B3-009A (WH)
B3-009A (WH)
U
HYD INTLK ACT. INPUT
START/CHARGE, SHEET 2/3
INTLK PWR (RD)
INTLK PWR (RD)
V
CAT C7, SHEET 4/5
EJ122 (BL)
EJ122 (BL)
W
CLUTCH GND
CAT C7, SHEET 4/5
SENS COM B (TN)
SENS COM B (TN)
X
CLUTCH SIG
S28
PARK BK GND (WH)
S28
HYD INTLK GND (WH)
S27
HIGH BEAM GND (WH)
S27
TURN SIG GND (WH)
S27
COLUMN GND (WH)
S28
INTRLK FB GND (WH)
PDU
GROUND
STUD

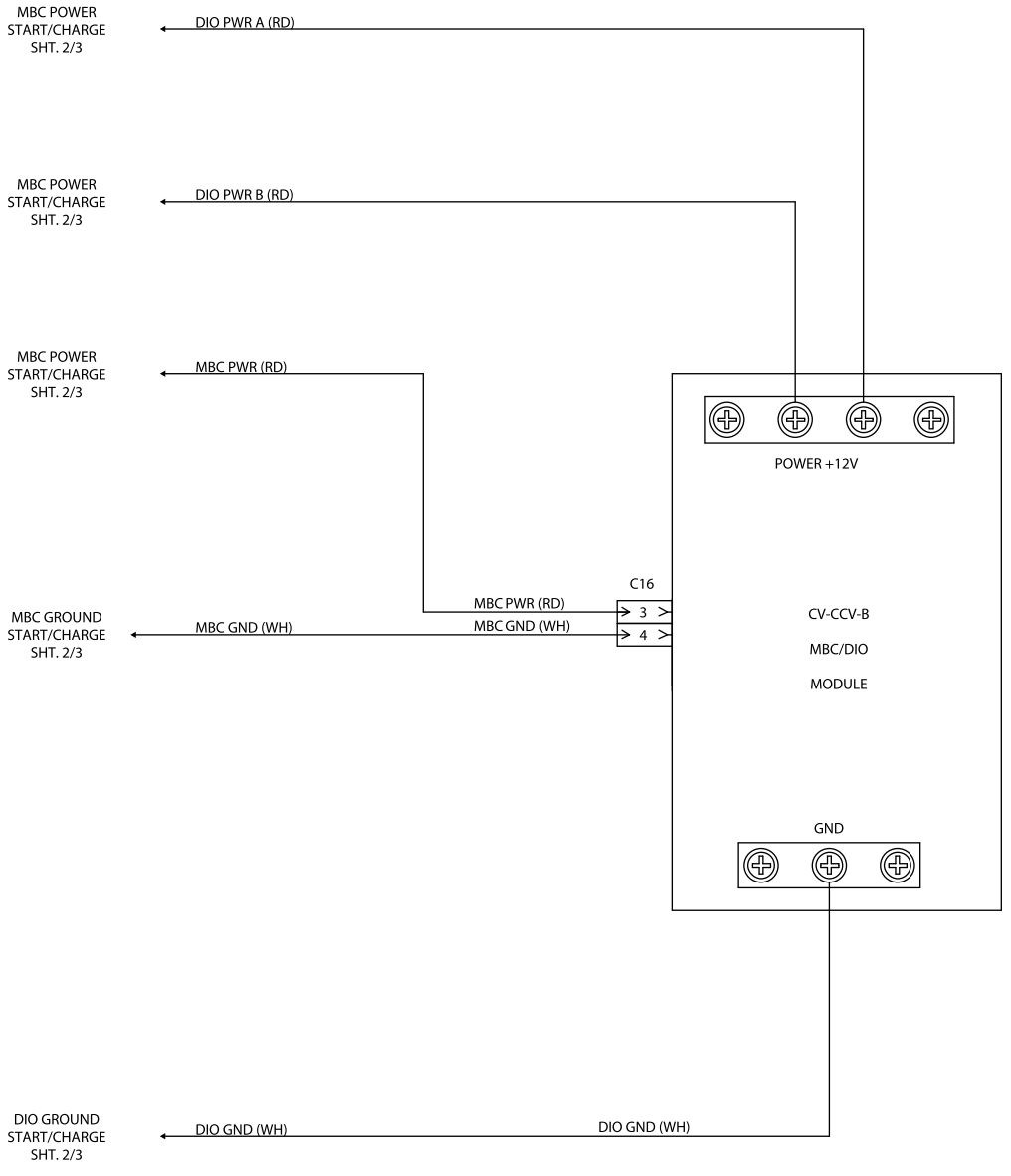





**Sheet 23**

*0080211*

*SCHEMATIC, WRG, DRIVER'S CONTROL MODULE-HYDRAULIC*

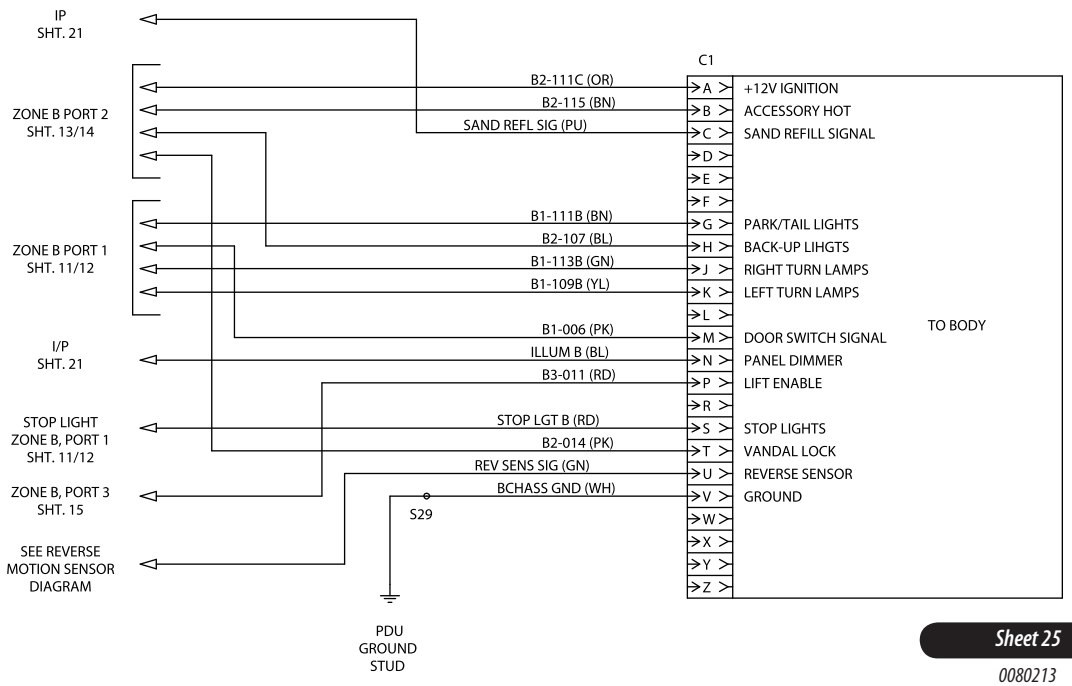





*Sheet 24*

*0080212*

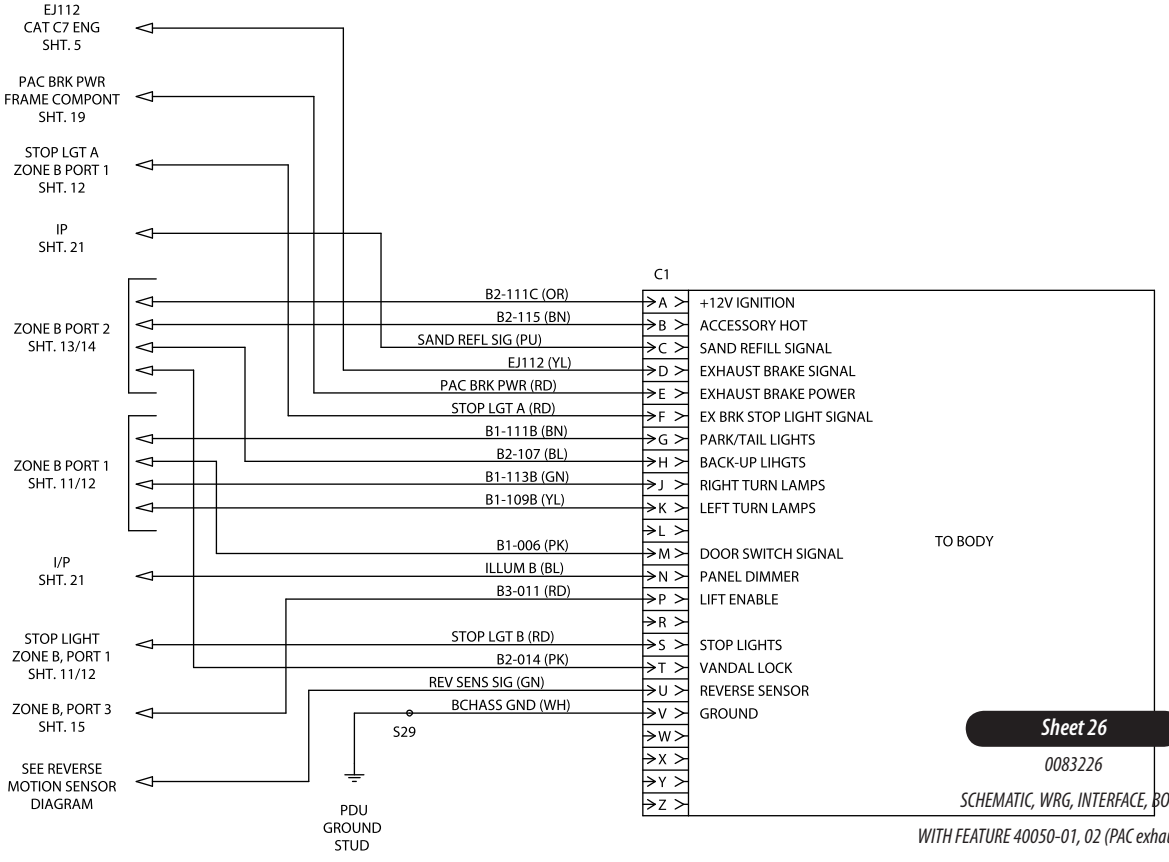
*SCHEMATIC, WRG, MBC MODULE*




**Sheet 25**

*0080213*

*SCHEMATIC, WRG, INTERFACE, BODY*



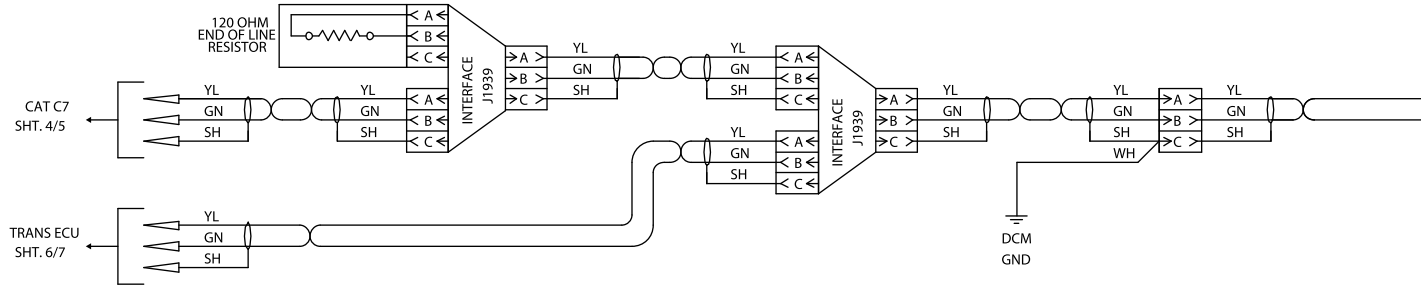

**Sheet 26**

*0083226*

*SCHEMATIC, WRG, INTERFACE, BODY*

*WITH FEATURE 40050-01, 02 (PAC exhaust brake)*

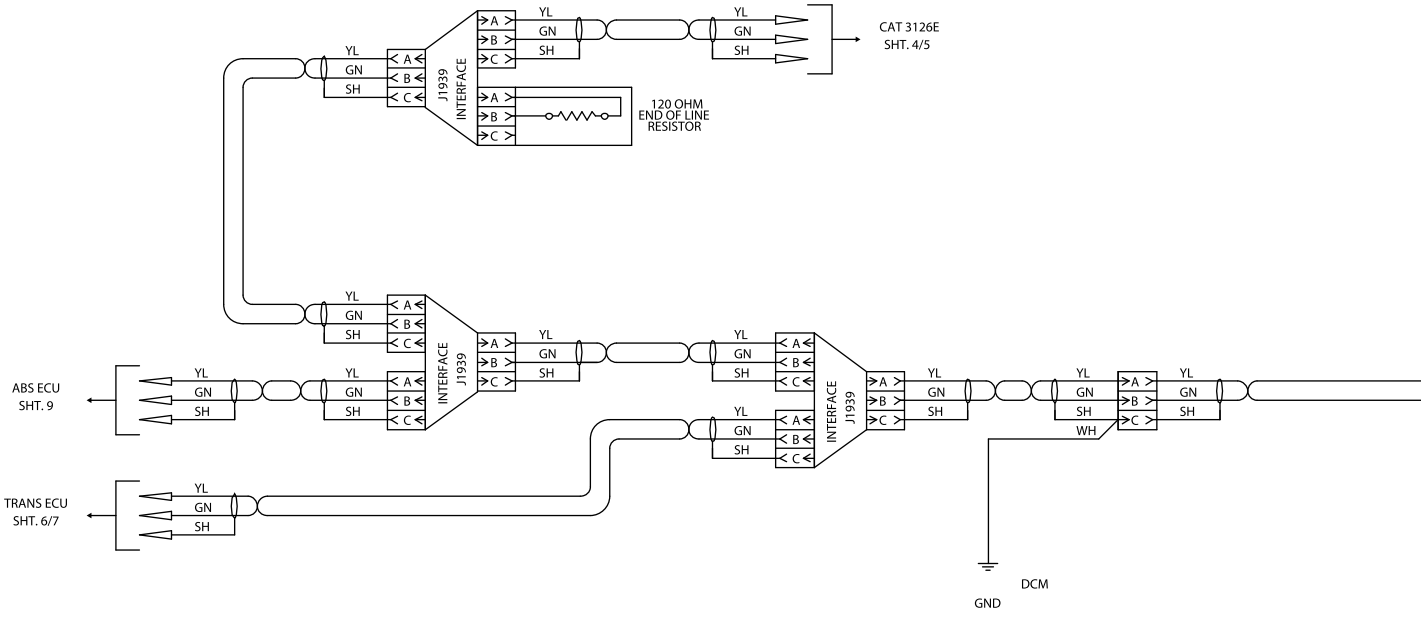
715

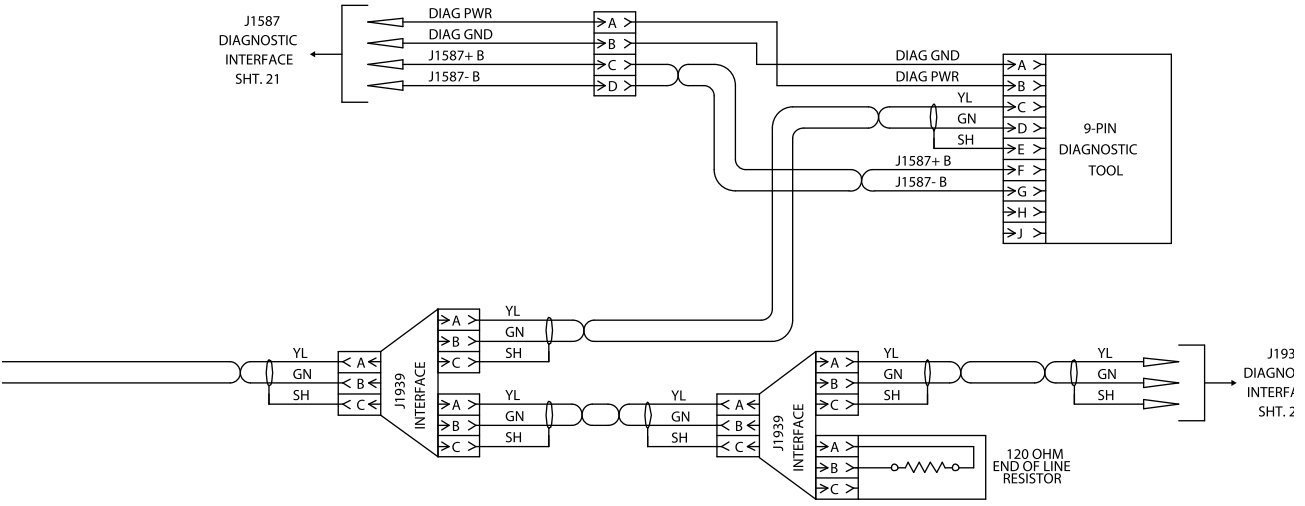


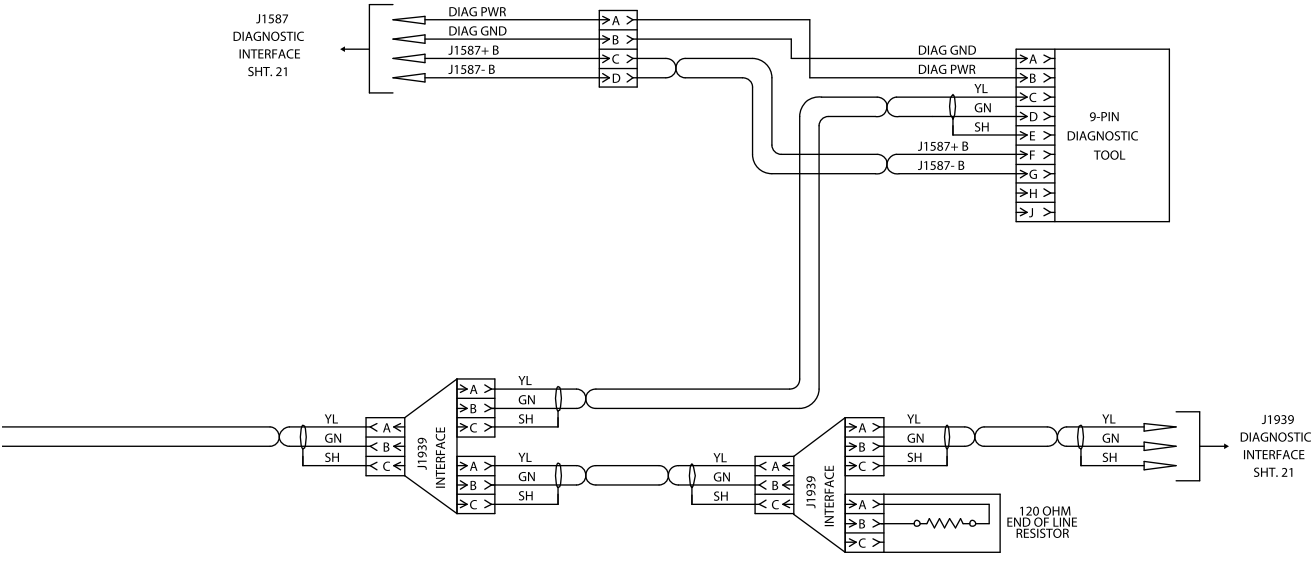

Sheet 27

0080214

SCHEMATIC, WRG, J1939 DATALINK, HYDRAULIC





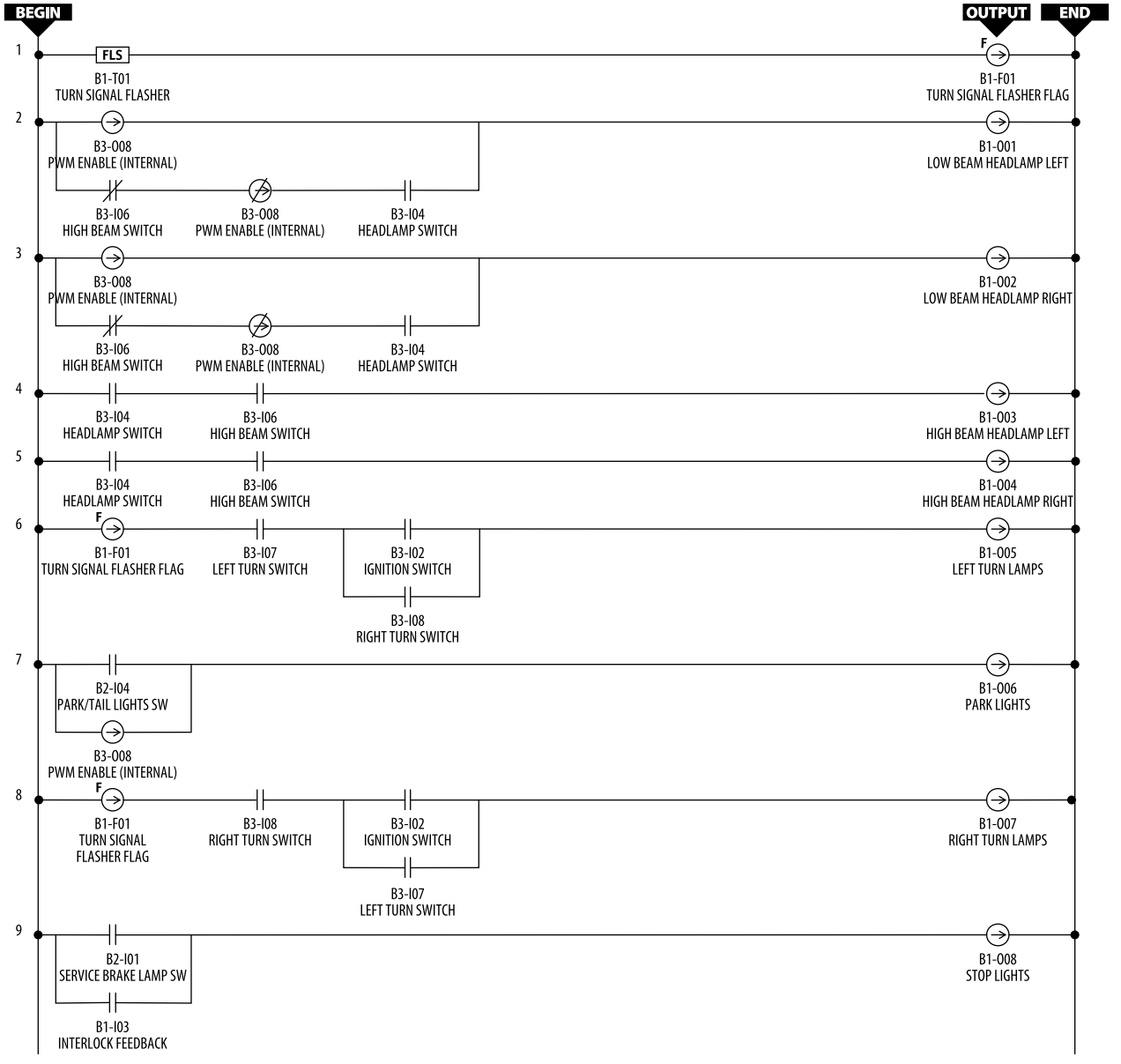




717

**Sheet 28**

*0080215*

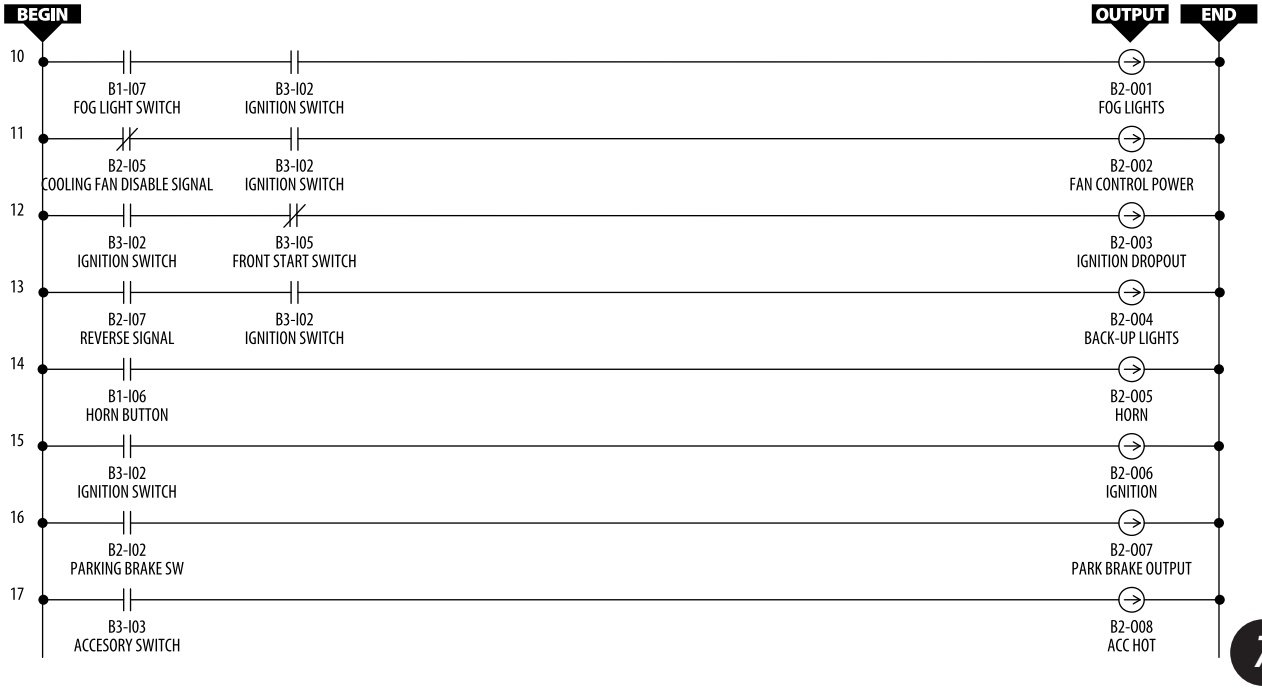
*SCHEMATIC, WRG, J1939 DATALINK, AIR*




**Sheet 29**

*0083228*

*SCHEMATIC, WRG, LADDER LOGIC, B1*

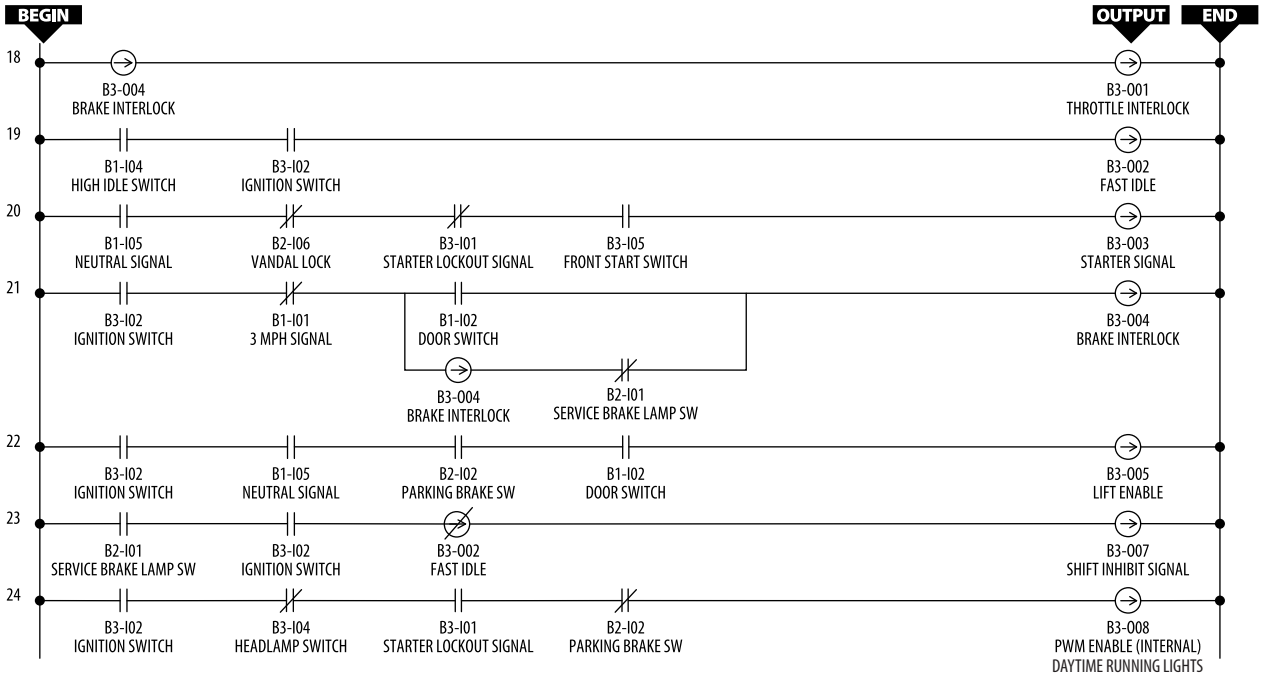





*Sheet 30*

*0083229*

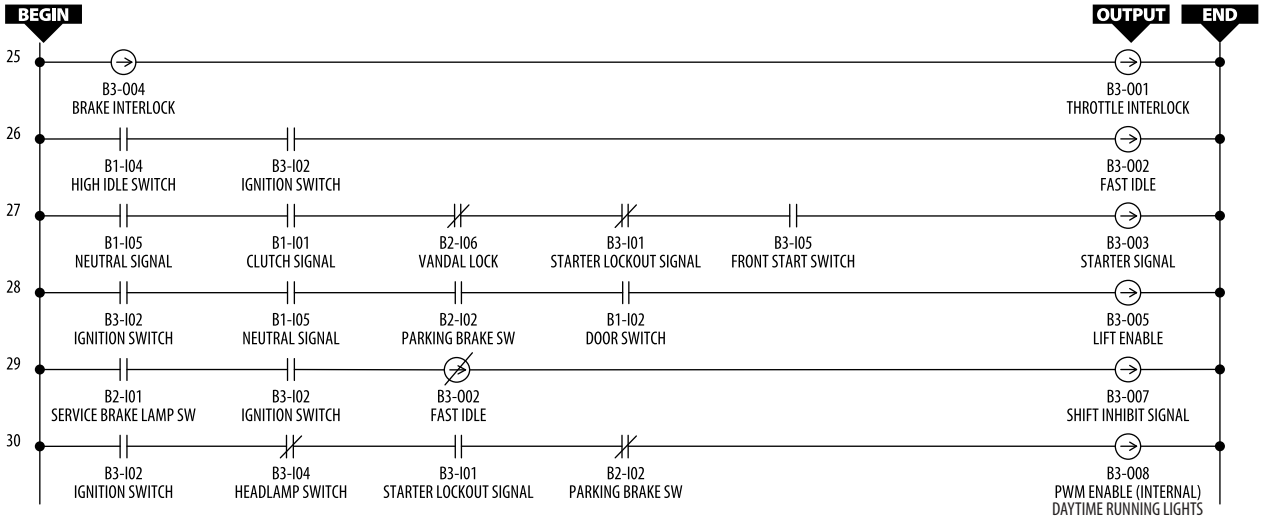
*SCHEMATIC, WRG, LADDER LOGIC, B2*




**Sheet 31**

*0083230*

*SCHEMATIC, WRG, LADDER LOGIC, B3*




**Sheet 32**

*0083231*

*SCHEMATIC, WRG, LADDER LOGIC, B3, M/TRANS*