

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.

WARNING 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.

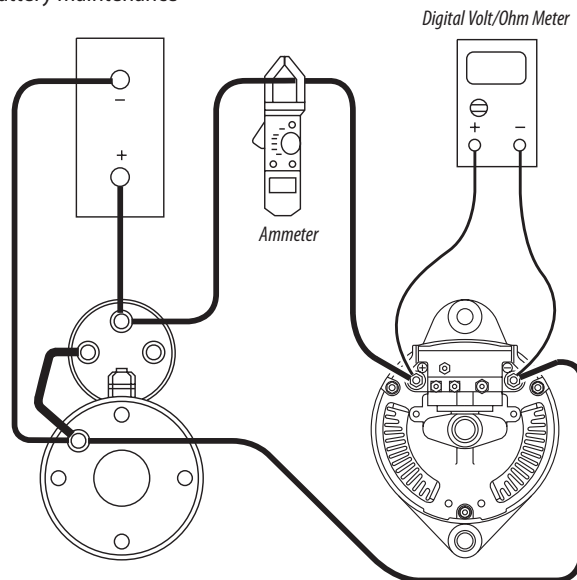
Before you begin to analyze the charging system, it is necessary that you ensure the battery is properly tested and charged to at least 75% of their rated capacity. Failure to confirm the condition of the battery will make the results of any diagnostic testing unreliable. Refer to the battery manufacturer's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

Alternator Performance Test

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

CAUTION 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.



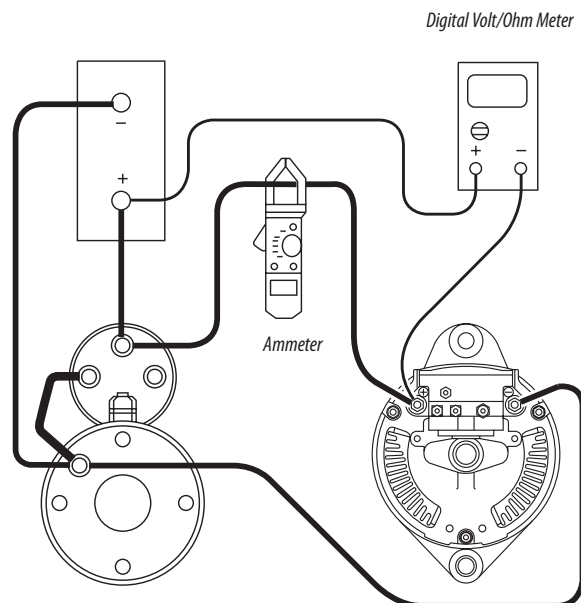
6. If the alternator is determined to be defective, repair or replace it in accordance with the instructions below. See Alternator Removal.
7. If the alternator is determined to be functioning properly, proceed as follows:
8. Continue to operate the engine at about 1700 RPM, and with the test equipment set up as illustrated.
9. Turn on vehicle loads (accessories) until the ammeter displays 132 amps, which is 75% of the rated capacity (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.

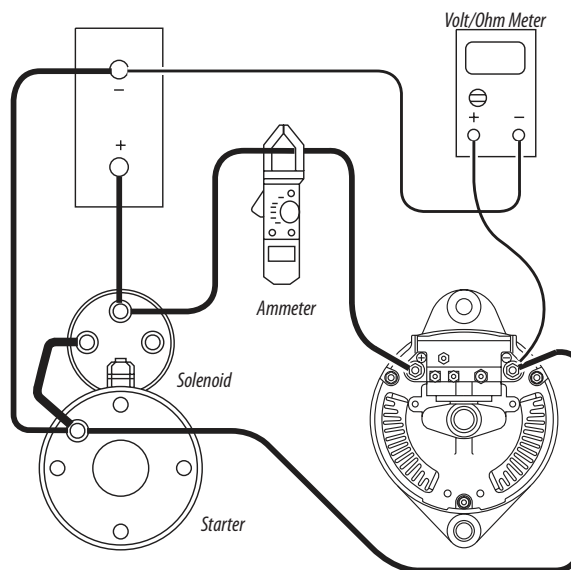
- Check and clean all the connections and the condition of all the cables/wires in the circuit.
- Re-test the circuit.

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.

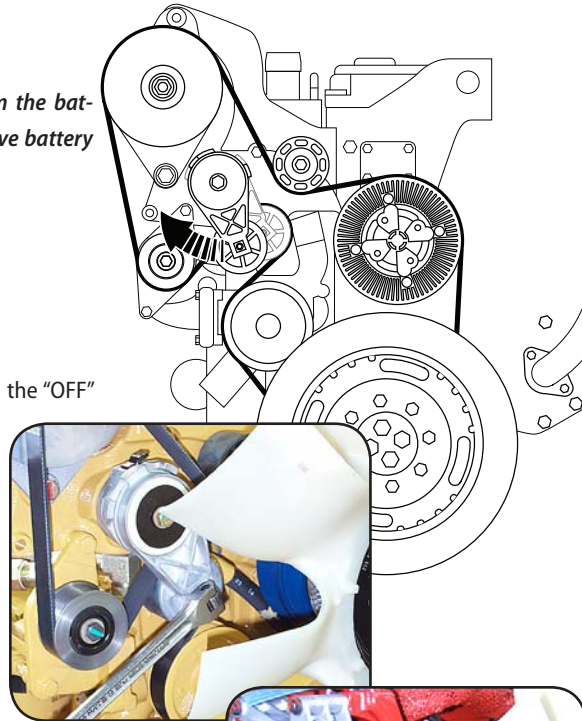
11. Repeat Steps 4 through 8 for the negative cable.



Bosch Alternator Removal

WARNING 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.



Caterpillar

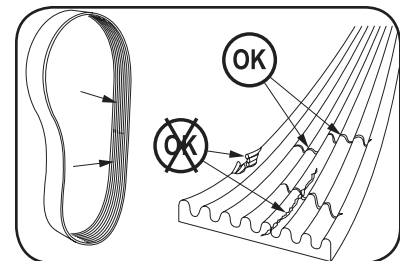
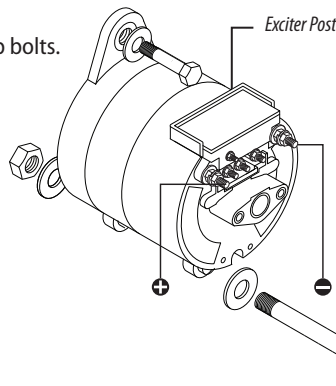
A few minor cracks across the belt are acceptable. Longitudinal cracks are NOT acceptable. Replace the drive belt when any crack is observed to be running lengthwise or with the belt, or when the belt appears frayed.

WARNING 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 bottom mounting bolts.
11. Support the alternator and remove the top bolts.
12. Remove the alternator.



Cummins



Alternator Reinstallation

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

1. Position the alternator and install the top and bottom bolts. Torque bolts to 33-35 ft. lbs.
2. Install the positive cable on the positive (B+) post. Carefully tighten to avoid breaking or stripping the stud.
3. Install the negative cable on the negative (B-) post. Carefully tighten to avoid breaking or stripping the stud.
4. 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.
5. Install the drive belt. Ensure that the grooves in the belt fit into the proper places on all the pulleys.
6. Start the engine and test the alternator output.



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 71°, and the torque to move the tensioner 25° 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 instructions above.
2. Remove the capscrew (1) from the automatic tensioner. 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.

730

- 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 solenoid is suspect, test the wiring of the solenoid circuit before replacing the solenoid.

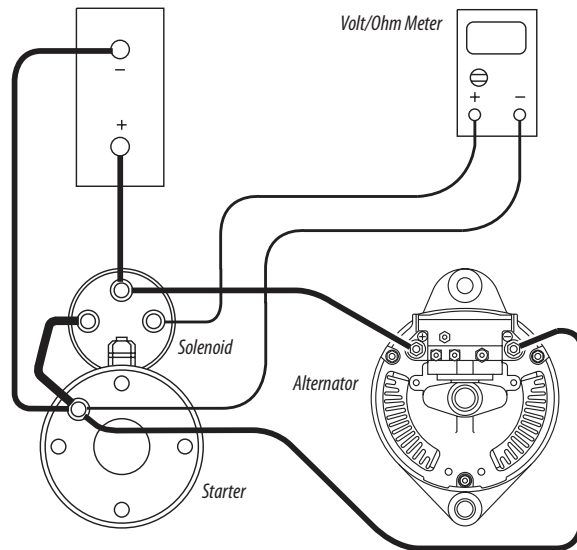
The starting circuit is among those incorporated into the Vision's Multiplex System. Therefore, Multiplex diagnostics procedure can help to quickly isolate the root cause of most starting problems, and thereby minimize downtime. Refer to the Multiplex chapter for full details on performing Multiplex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

1. Refer to the Multiplex Output Table to find out which Port/Pin (B3-07) and which Output LED (B3-002) 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 (B3-003) 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:

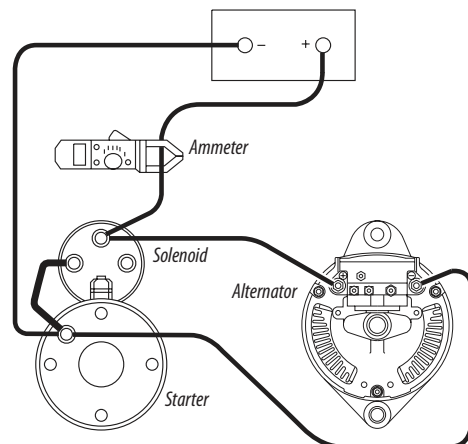
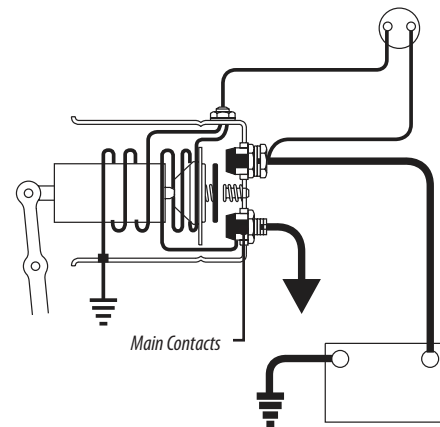
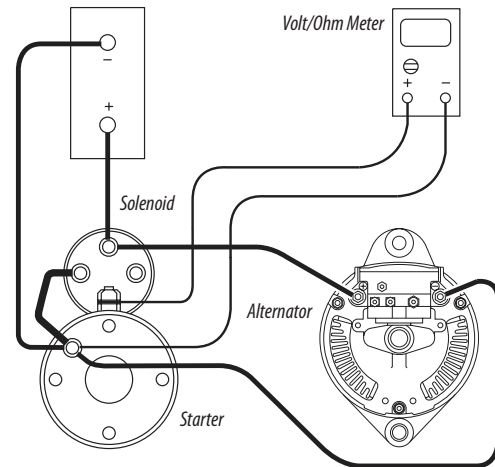
1. Connect the positive lead of a VOM to the ignition switch terminal on the solenoid.
2. Connect the negative lead of the VOM to the chassis ground.
3. While attempting to crank the engine, record the voltage displayed on the VOM. Observe the following:
 - No voltage
 - Low voltage
 - Normal voltage 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.

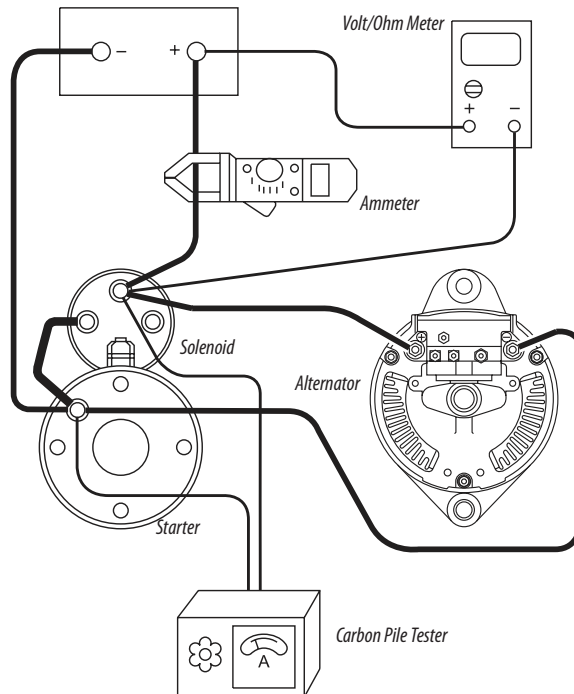
1. Connect the positive lead of the VOM to the starter motor terminal of the solenoid.
2. Connect the negative lead of the VOM to the chassis ground.
3. While attempting to crank the engine, if there is no voltage displayed on the VOM, the main contacts are not functioning properly.
4. If there is voltage 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.

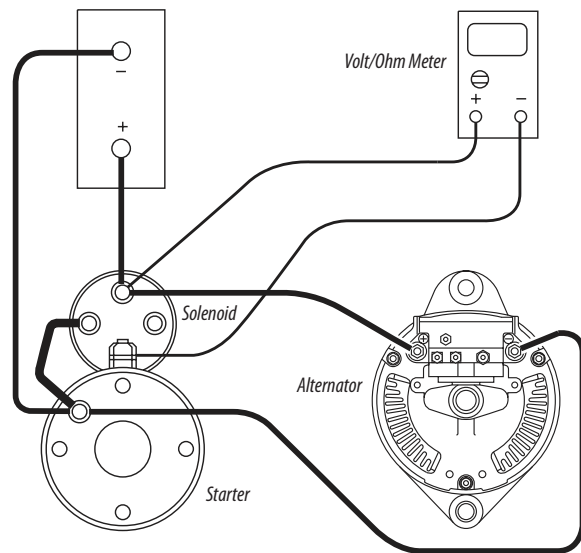
1. Connect the positive lead of a VOM to the positive battery terminal.
2. Position an ammeter between the solenoid and the positive terminal of the solenoid.
3. Connect the negative lead of the VOM to the positive terminal of the solenoid.
4. Connect the negative lead of the VOM to the negative battery 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.

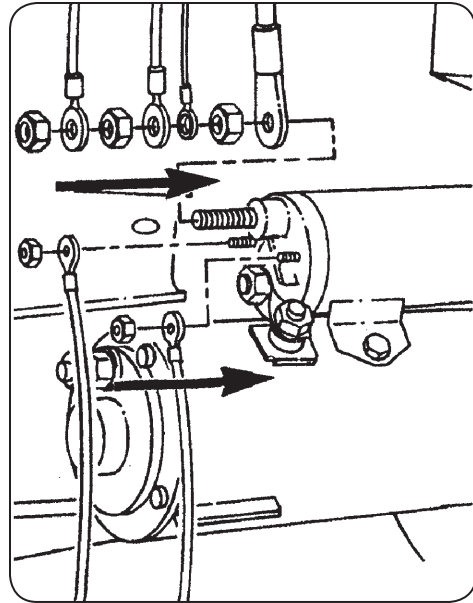
Final check at solenoid terminals.

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

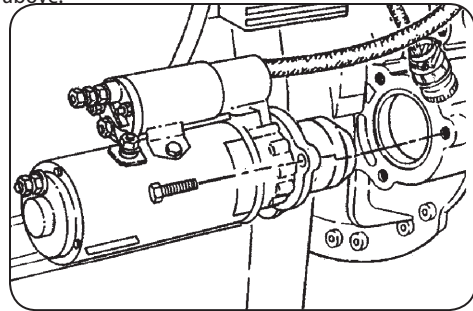
1. Disconnect the negative (ground) cable from the battery. Wrap it with tape or other suitable insulation to prevent shorts.
2. Disconnect positive cable from the battery. Wrap it with tape or other suitable insulation to prevent shorts.
3. Identify and tag each wire on the starter motor for reinstallation.
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.



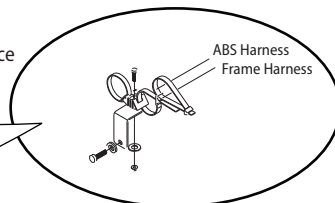
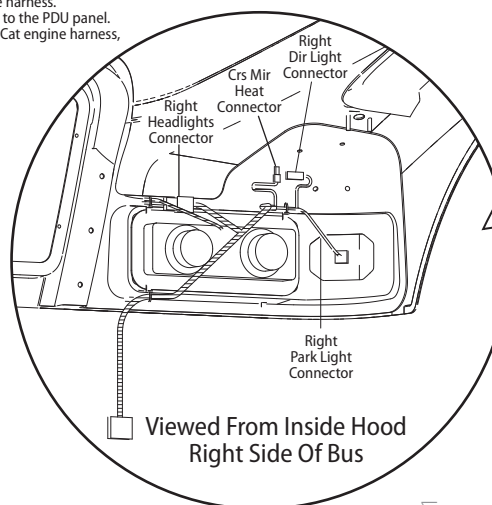
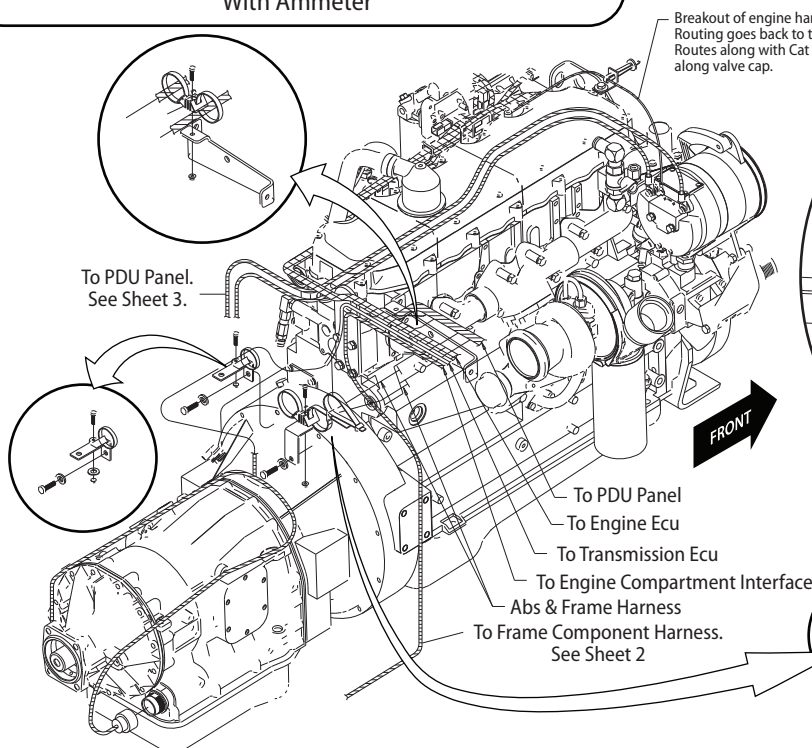
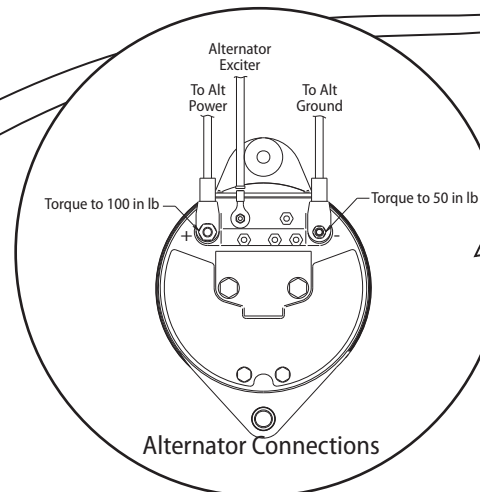
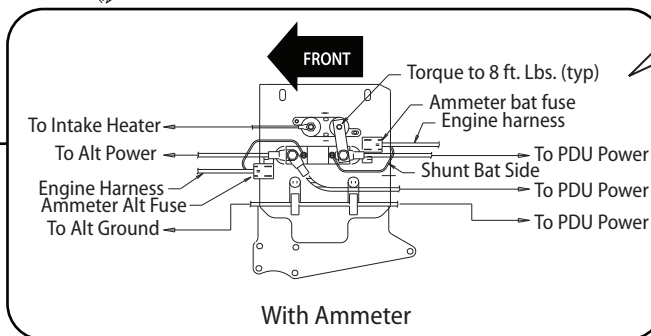
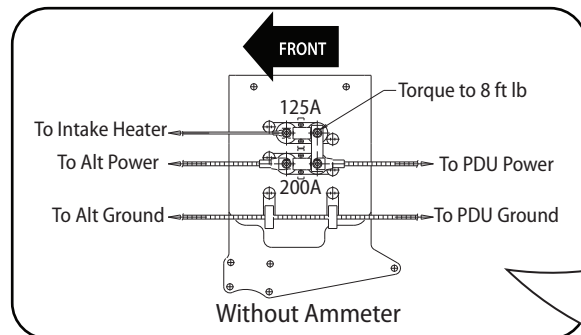
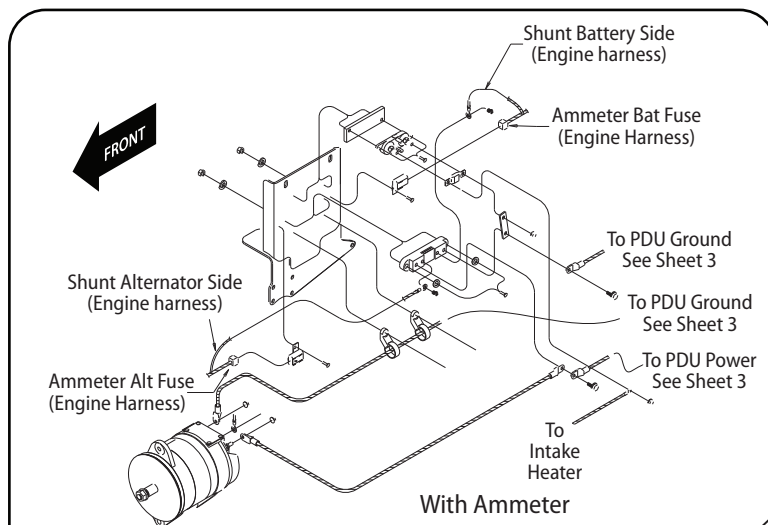
WARNING Always remove the negative (-) cable from the battery terminal first. Always connect the negative (-) cable to the battery terminal last to avoid arcing that could ignite explosive battery gases.

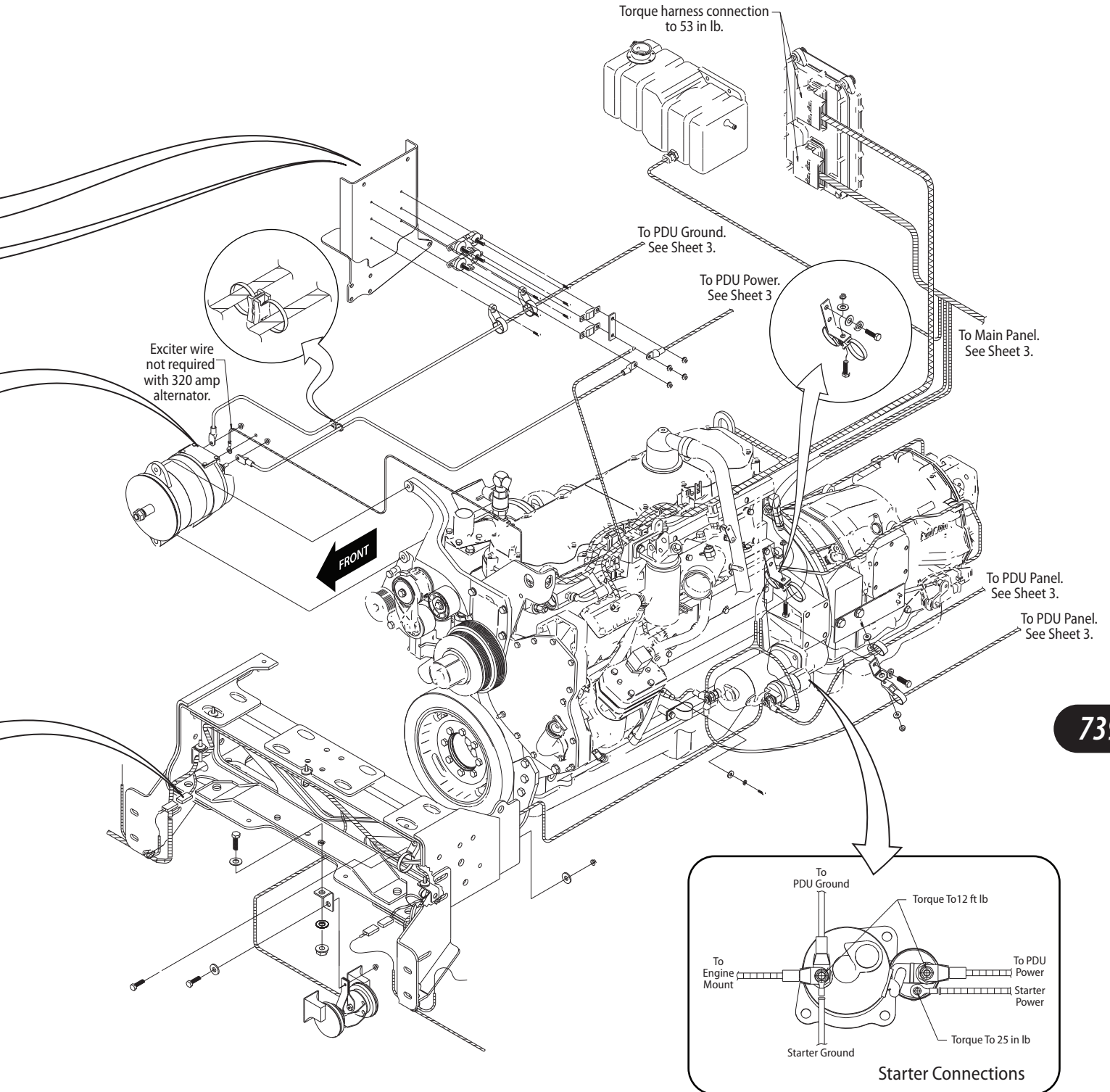
4. Install the positive cable on the battery post.
5. Install the negative cable on the battery post.

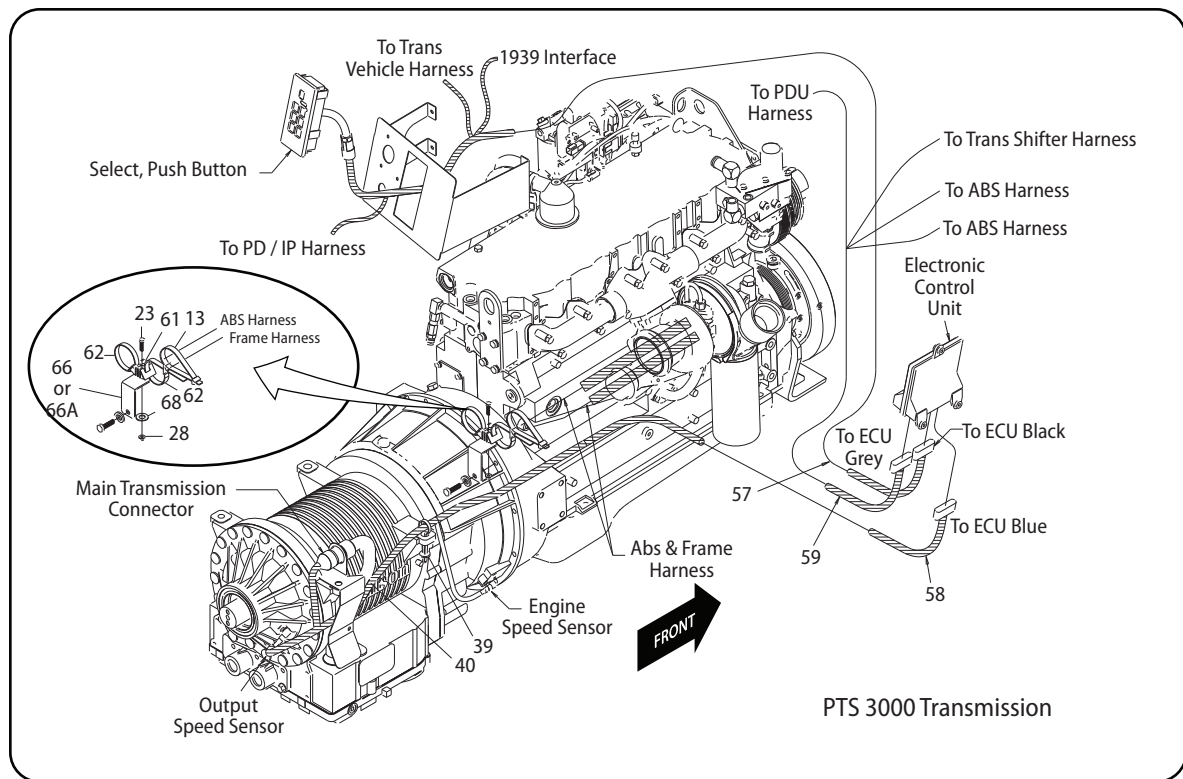


Chassis Harness Routing Diagrams

The following pages illustrate the routings of the main chassis wiring harnesses applicable to most Vision chassis.







Chassis Harness Routing Sheet 1 of 5 (continued)

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DIAGRAM, RTG, HARNESS W/AUTOMATIC TRANS

0074133 SHEET 1

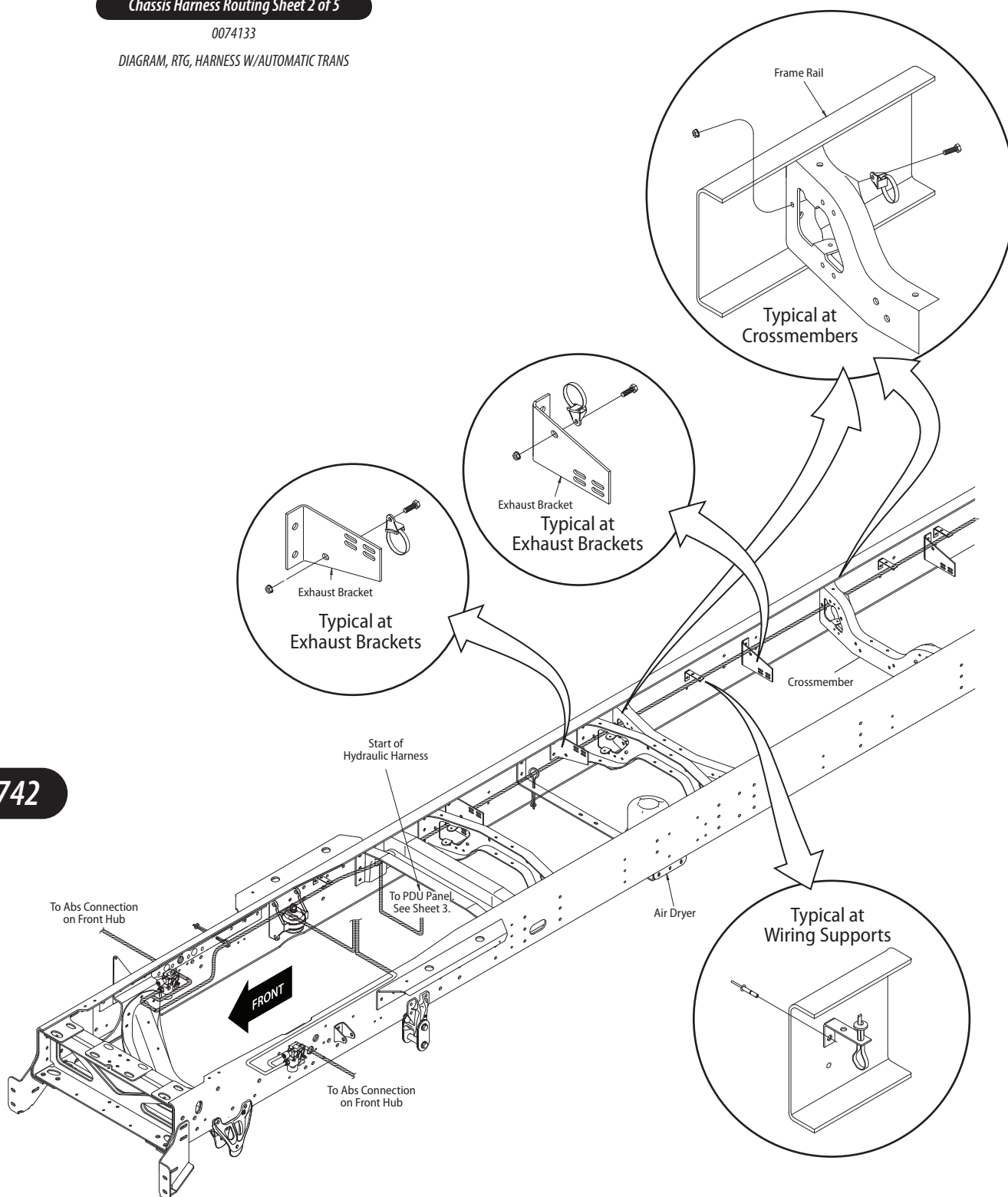


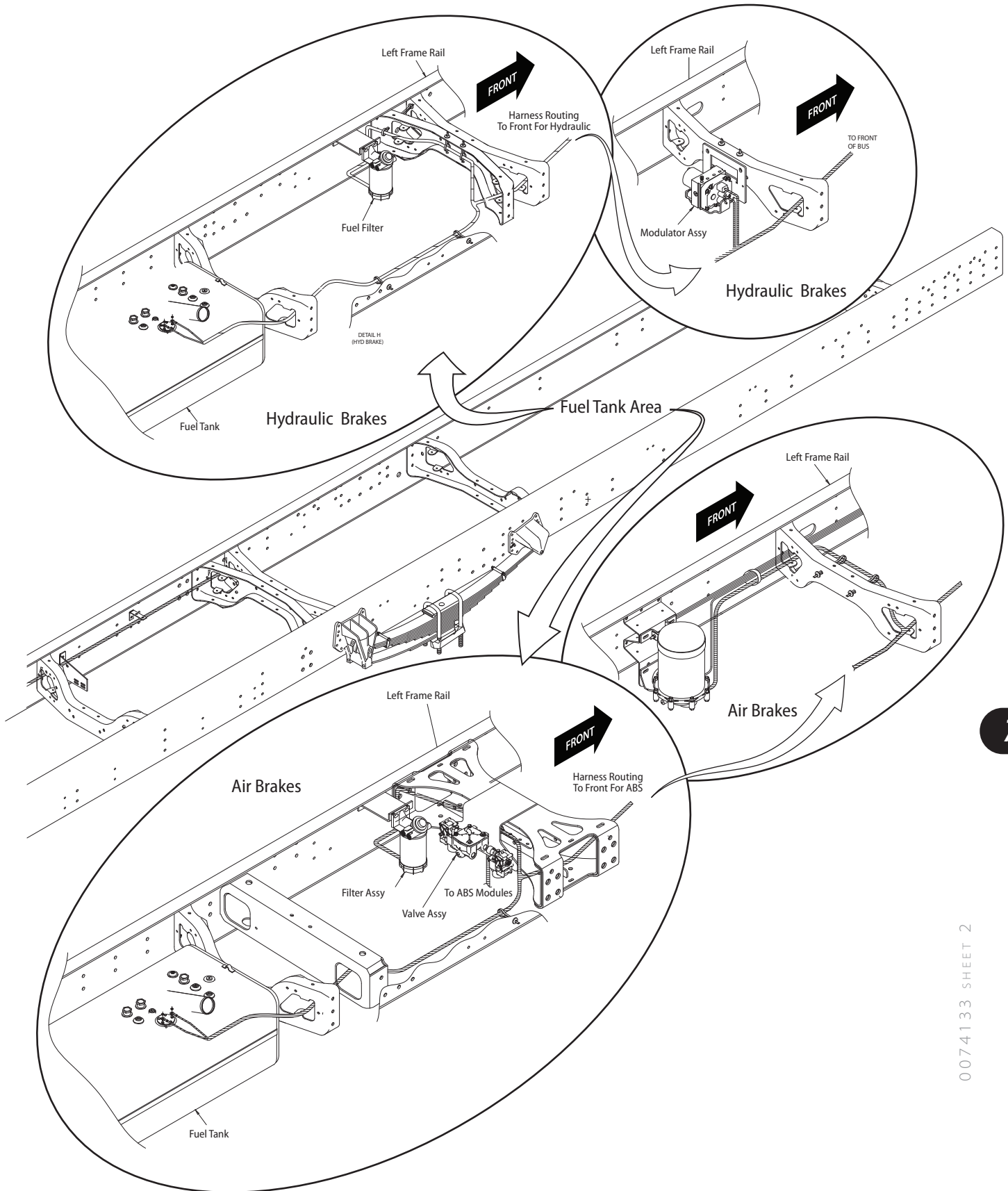
Chassis Harness Routing Sheet 2 of 5

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DIAGRAM, RTG, HARNESS W/AUTOMATIC TRANS

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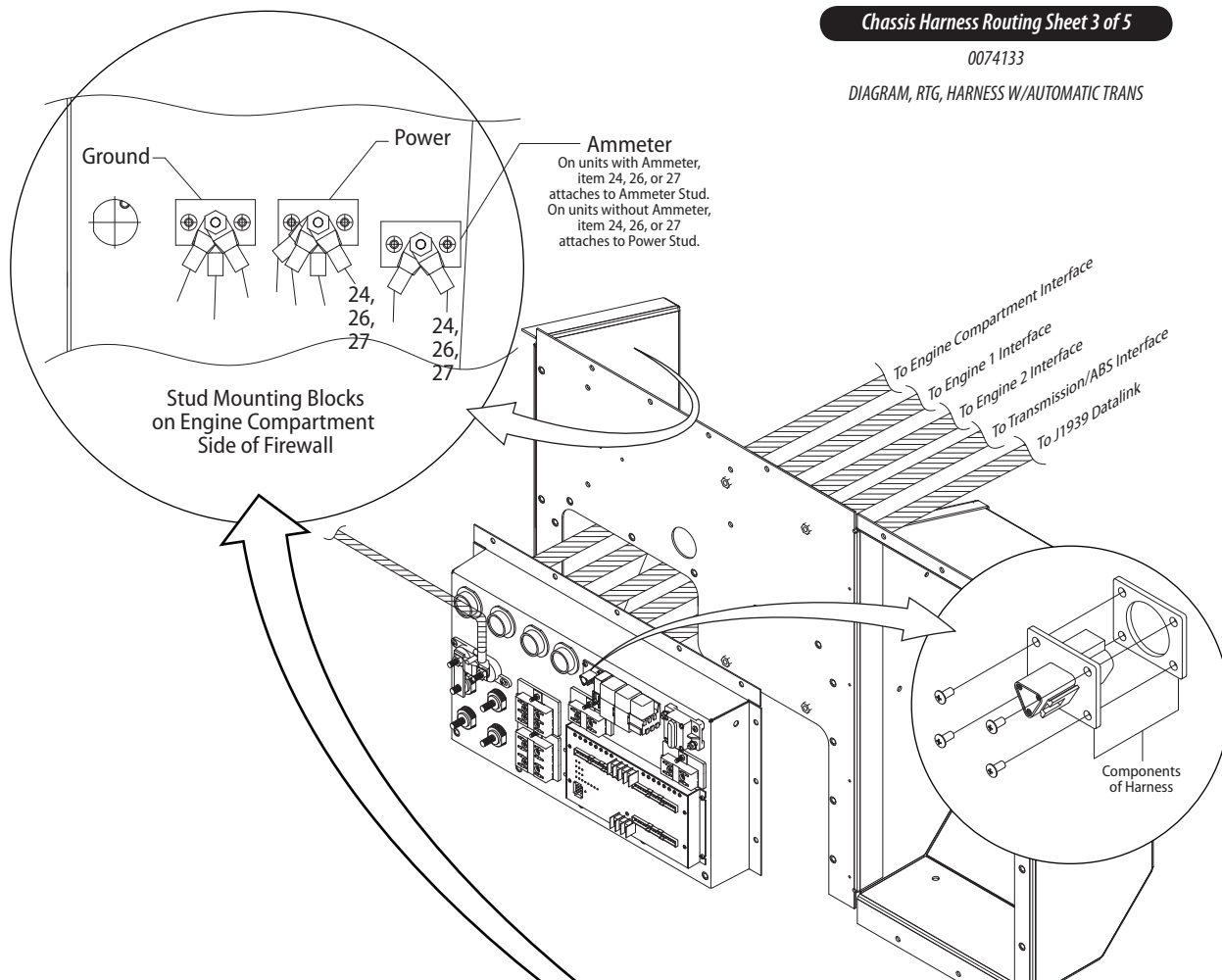




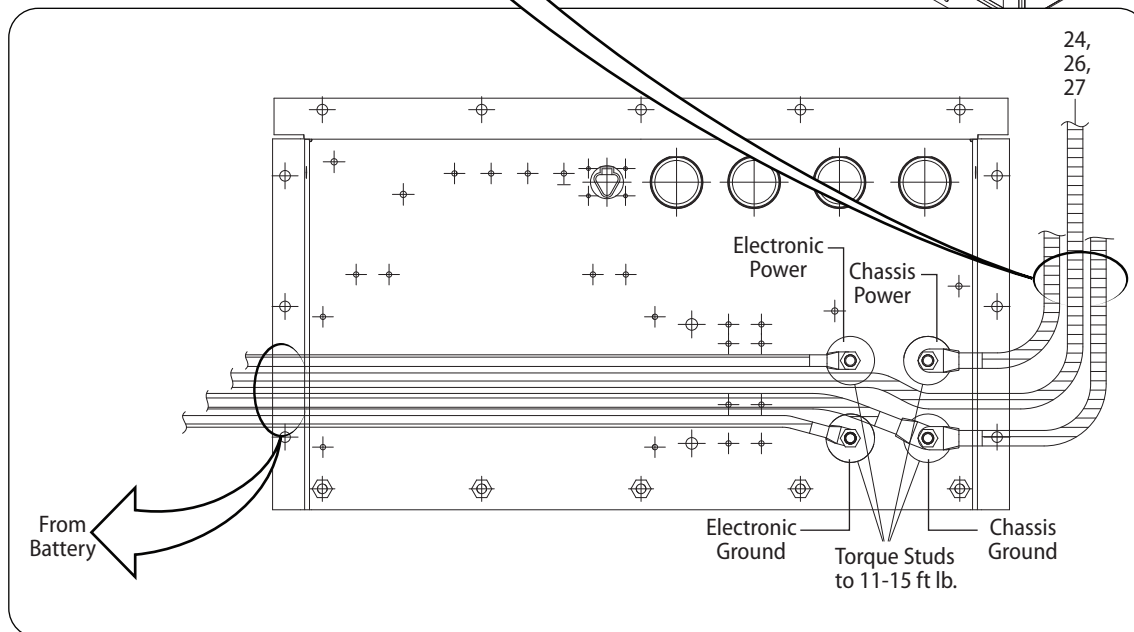
Chassis Harness Routing Sheet 3 of 5

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DIAGRAM, RTG, HARNESS W/AUTOMATIC TRANS



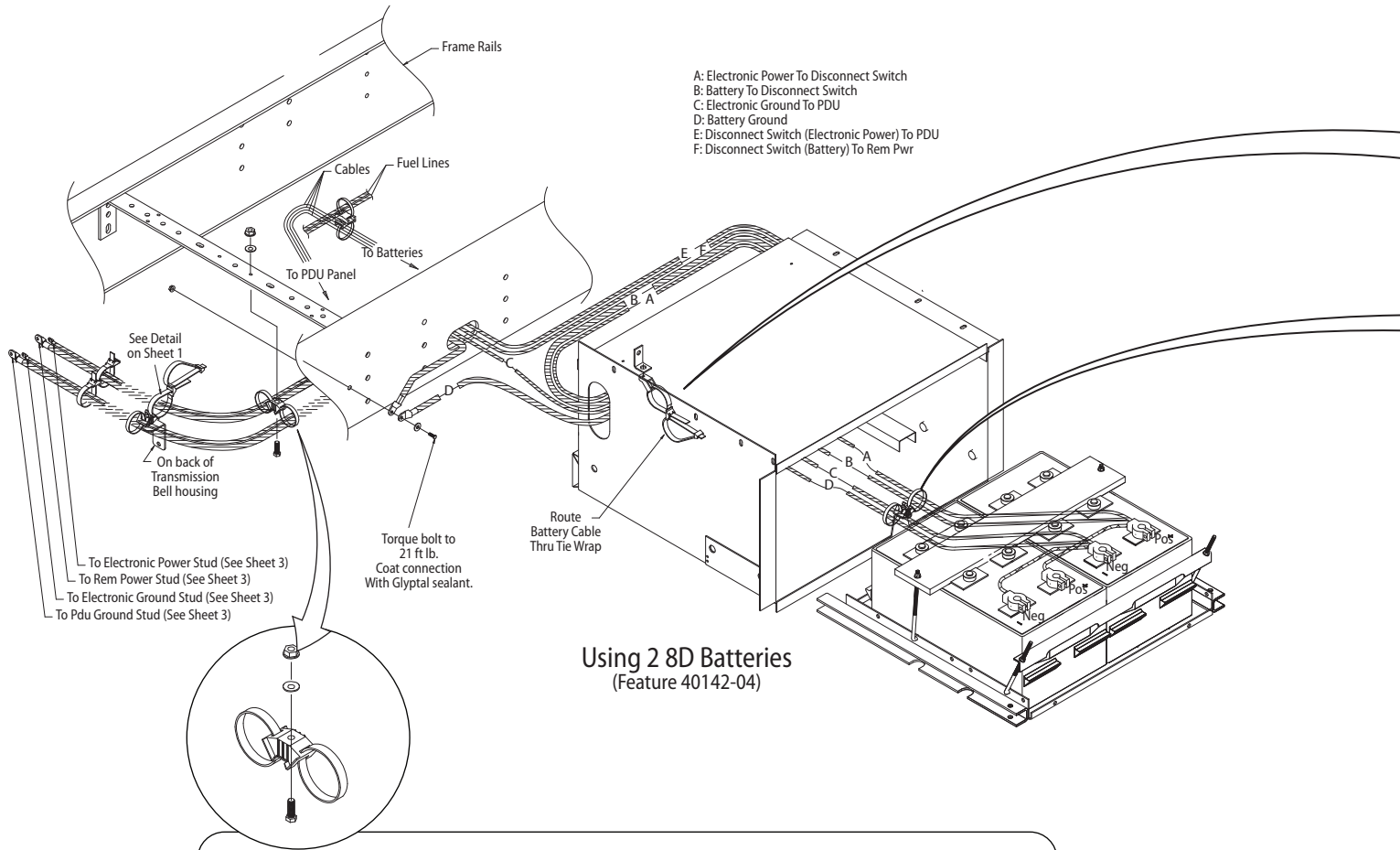
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0074133 SHEET 3

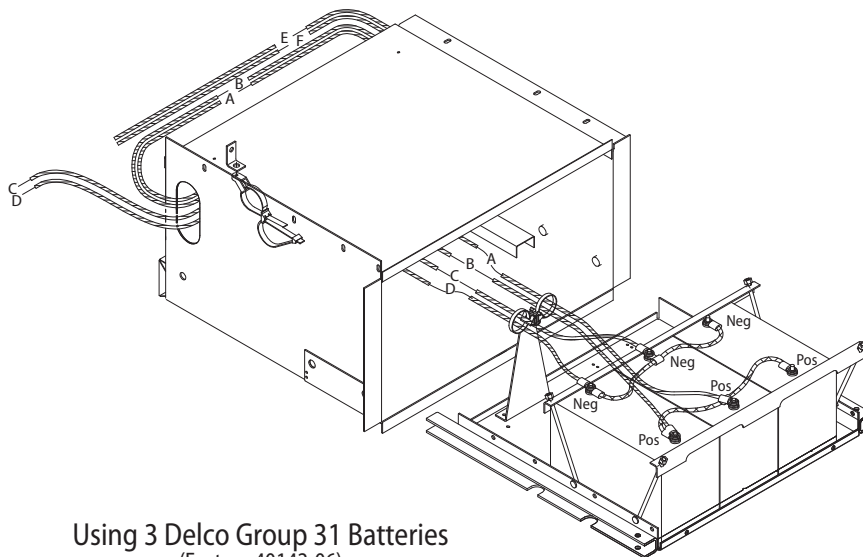
CHASSIS ELECTRICAL



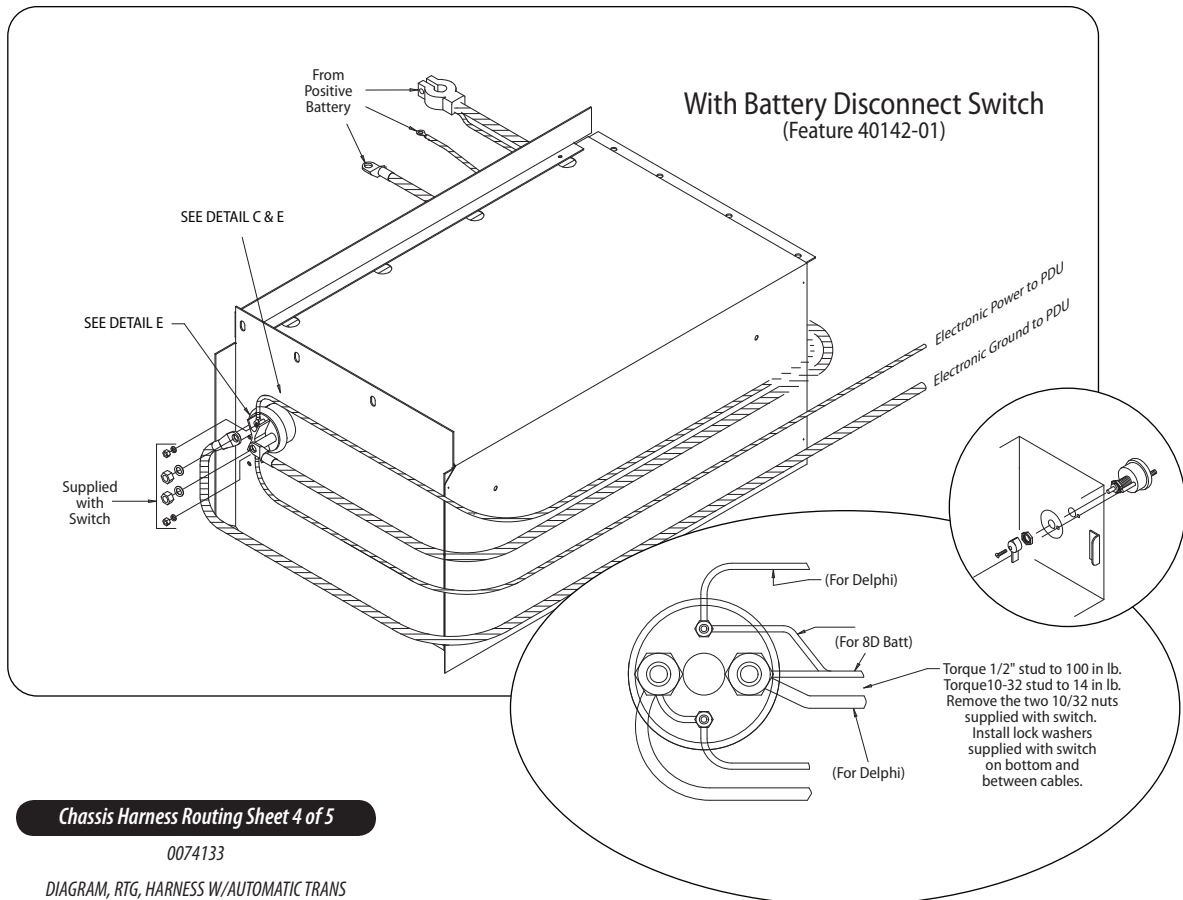
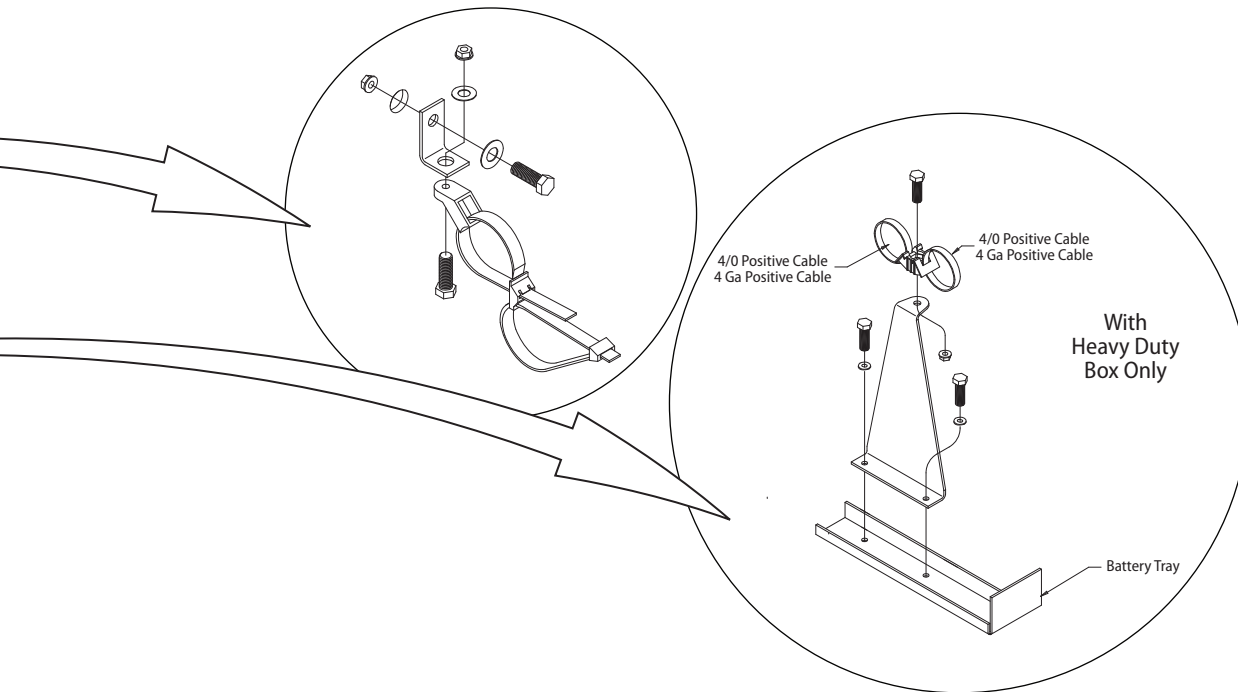


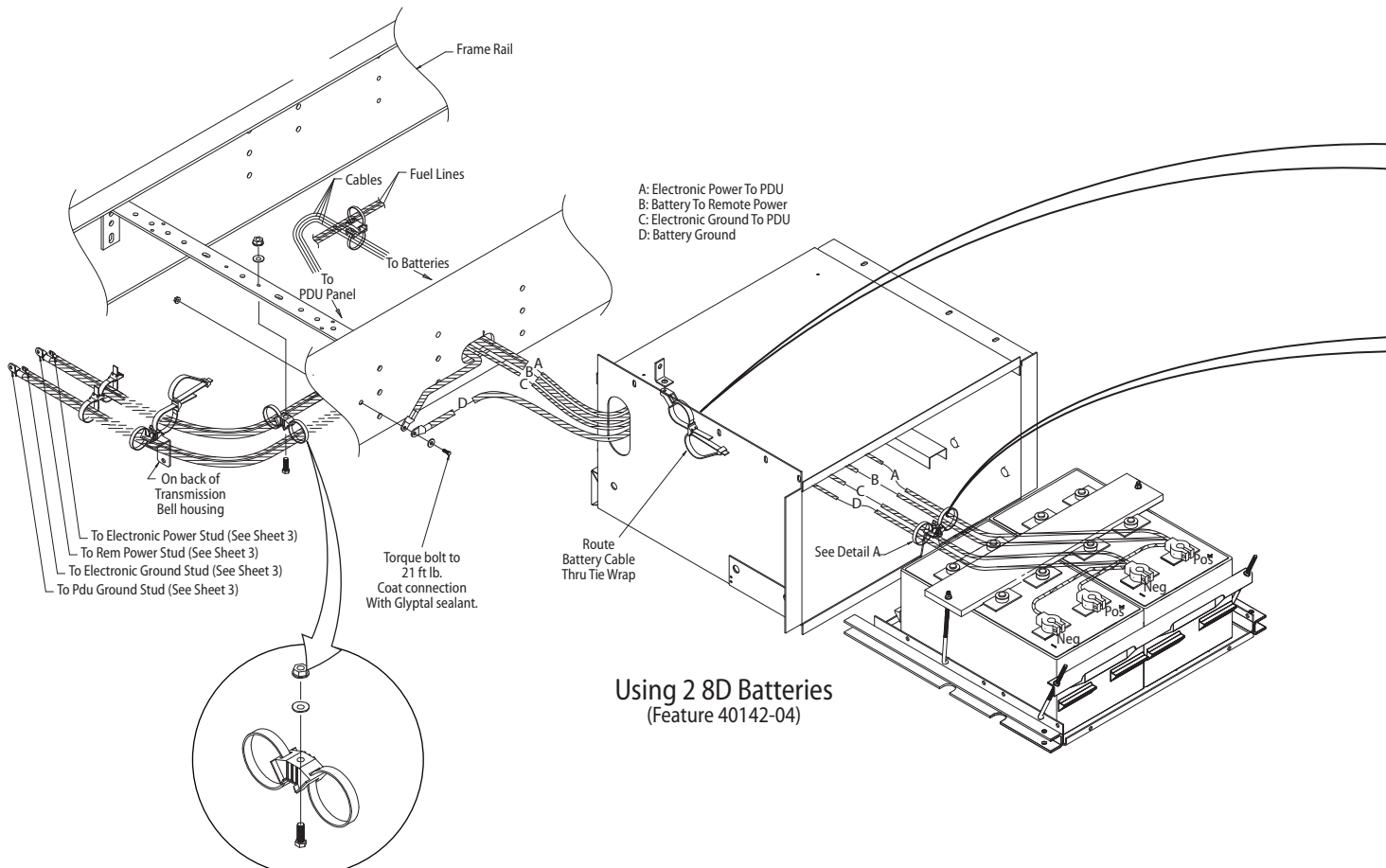
Using 2 8D Batteries
 (Feature 40142-04)

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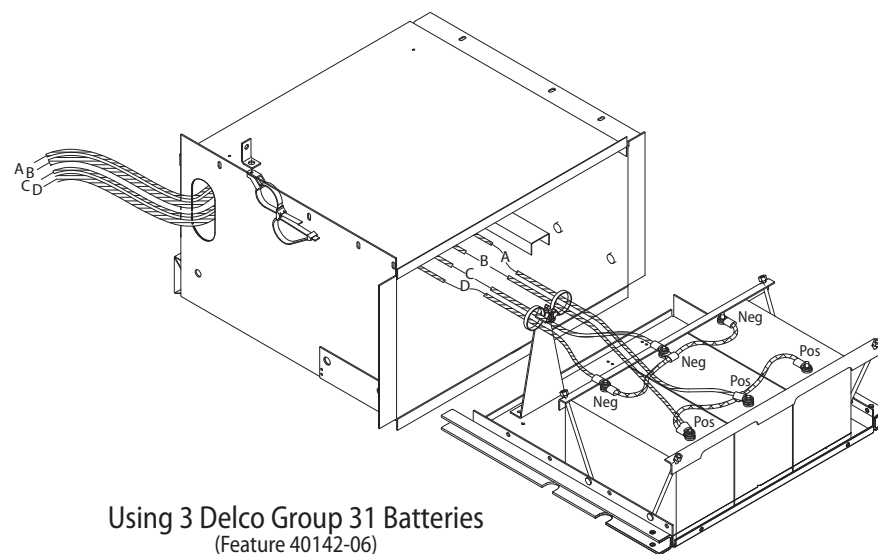


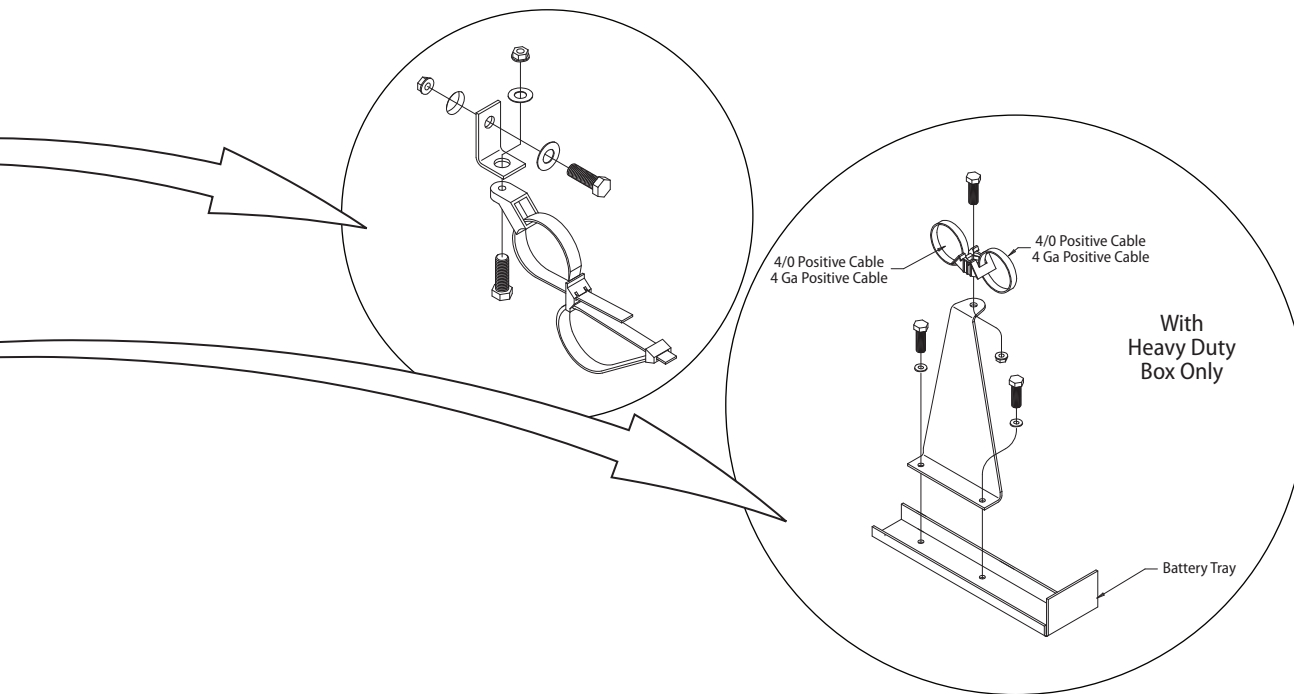
Using 3 Delco Group 31 Batteries
 (Feature 40142-06)





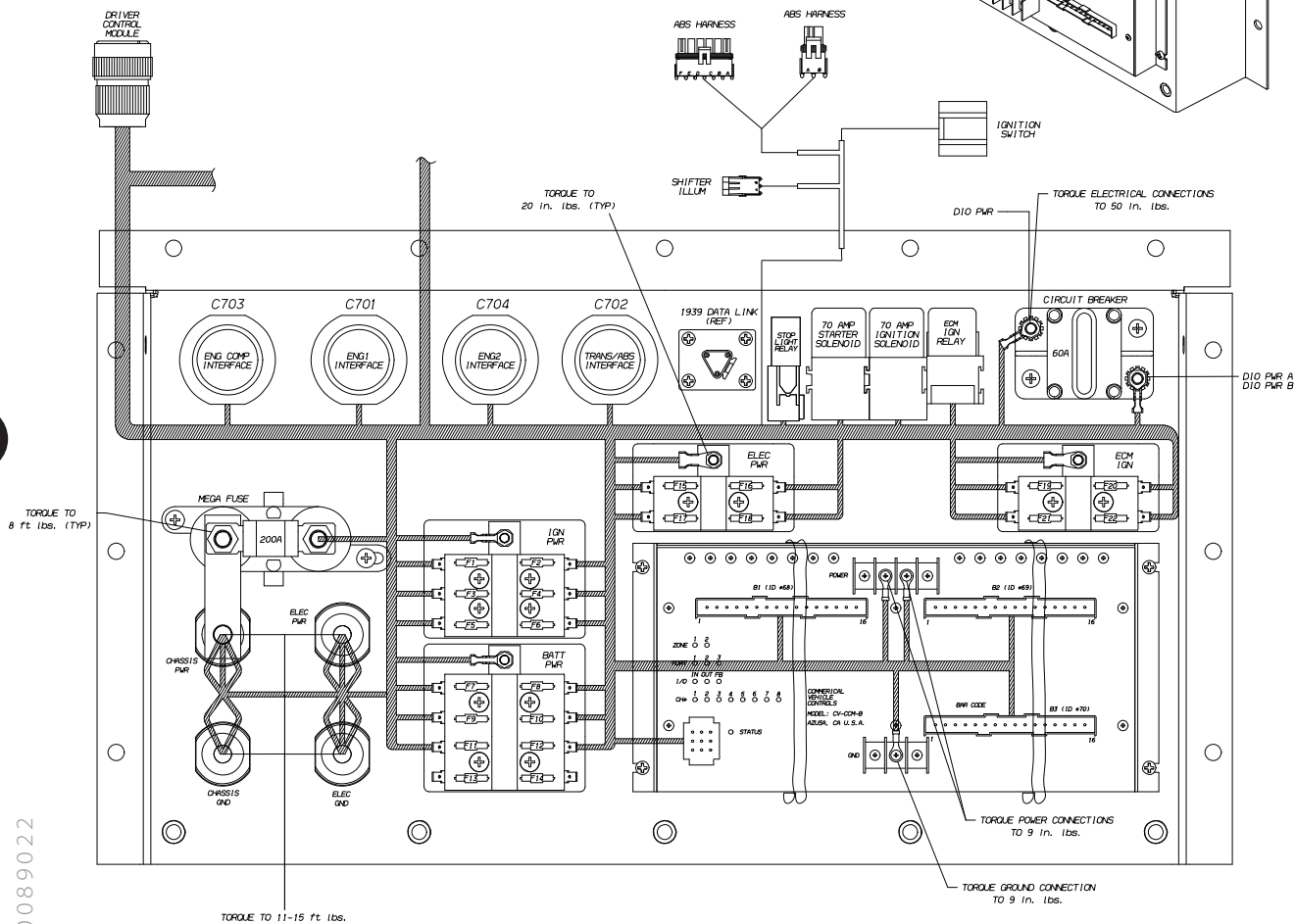
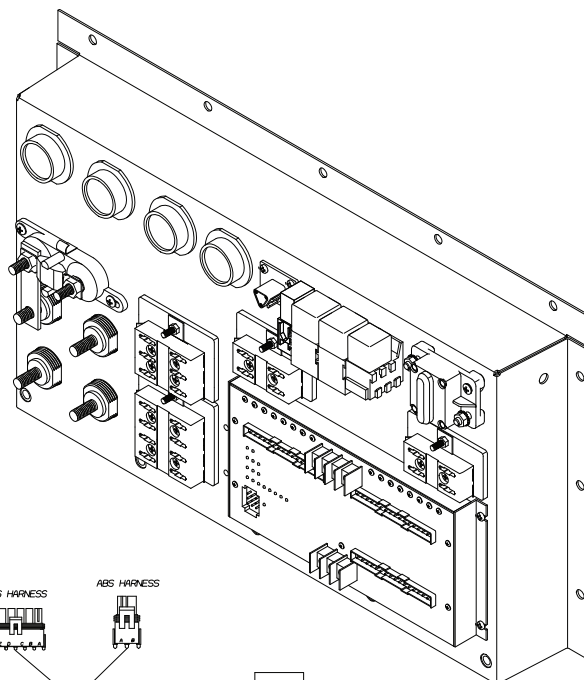
748





Power Distribution Unit Layout

The PDU houses the Main Bus Controller of the Multiplex system (MPX Module), chassis fuses, relays and interface connections to some of the main chassis harnesses. The diagram shown here is representative of standard equipment Visions with air or hydraulic brakes. Although some differences occur in the cases of specific equipment options (such as circuit breakers in lieu of fuses, exhaust brake, or manual transmission), the general layout of the PDU components is the same.





IGN PWR

F1	HTD FUEL PWR (20A)	
F2	INTERLOCK PWR (10A)	
F3	AIR DRYER PWR (10A)	
F4	SPARE	Units with Air Brakes
	BRAKE WARN IGN (15A)	Units with Hydraulic Brakes
F5	HTD DRAIN PWR (20A)	
F6	BODY IGN (15A)	

BATT PWR

F7	SPARE	Units with Air Brakes
	BRK BOOST (40A)	Units with Hydraulic Brakes
F8	START REL PWR (5A)	
F9	REV SENS+ (10A)	
F10	STOP LIGHT PWR (15A)	
F11	SPARE	Units with Air Brakes
	HYD INTLK (30A)	Units with Hydraulic Brakes
F12	ABS BATT (30A)	Units with Air Brakes
	MOD PMP BATT (30A)	Units with Hydraulic Brakes
F13	DPWR (3A)	
F14	SPARE	

ELEC PWR

F15	TRANS BATT (10A)	
F16	EECM PWR (40A)	
F17	MBC PWR (10A)	
F18	SPARE	Units with Air Brakes
	ABS BATT (25A)	Units with Hydraulic Brakes

ECM IGN

F19	EJ170 IGN (10A)	
F20	TRANS IGN (40A)	
F21	ABS IGN (10A)	
F22	DASH IGN (10A)	

0089022

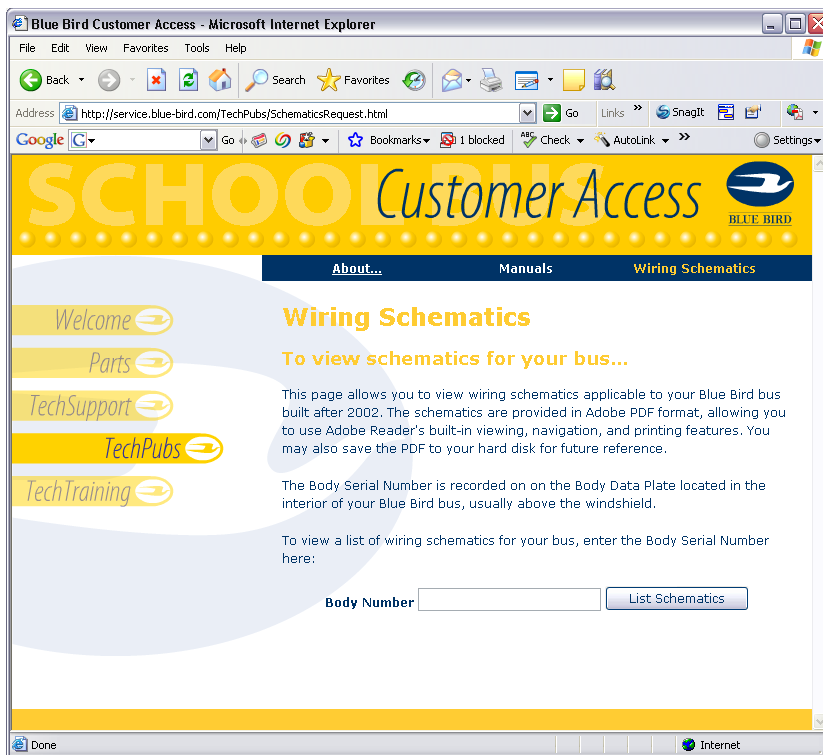


Chassis Wiring Schematics

The following pages contain the main wiring schematics applicable to most Blue Bird Vision chassis. Two sets of schematics are provided in this chapter, one set for Caterpillar-equipped Visions, and another for Cummins-equipped Visions.

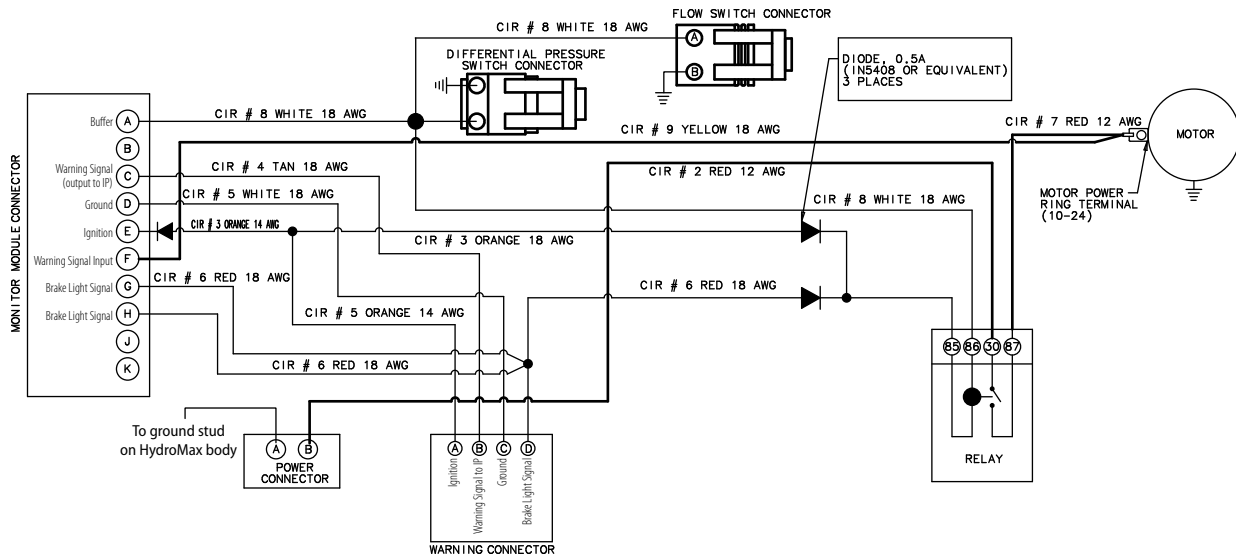
The schematics are provided for your convenience when you are limited to use of the print manual. Additional schematics specific to your bus may be viewed, printed, or downloaded in Adobe® PDF® format by pointing your web browser to the Customer Access website at:

<http://service.blue-bird.com/TechPubs/SchematicsRequest.html>



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.





Electrical Diagrams for Caterpillar C7-07 Engines

Description	Sheet	Drawing Number
Index	1	0116467F
Starting And Charging, Cat 2007 C7	2	0116401C
Starting And Charging (with Florida circuit breakers)	3	0115329C
2007 Cat C7 Engine	4	0113152A
Allison Gen 4 2000 Transmission	5	0116646
Allison Gen 4 3000 Transmission	6	0116649A
Dimmer / Backlights	7	0116651
ABS - Bendix (air)	8	0116652
ABS Hyd-E (hydraulic)	9	0118822A
AA Multiplex Module	10	0116694C
AB Multiplex Module	11	0116695A
AC Multiplex Module	12	0116696
Mirror Heat / Exterior Speaker / Wiper Washer	13	0116697
Hydraulic Brake Boost, Cat	14	0116698
Frame Components	15	0116699
Crossing Arm	16	0116700
Instrument Cluster	17	0119063
Driver's Control Module, Cat, Air	18	0116702
Driver's Control Module, Cat, Hydraulic	19	0116703
MBC Module	20	0116704
Body Interface	21	0116705
J1939 Datalink, Hyd-E	22	0118820
J1939 Datalink, Air	23	0116707

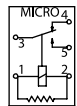
Wire Colors

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

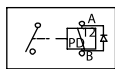
Schematic Legend

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

Electrical Component Index



Micro Relay



Heavy Duty Relay



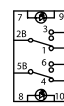
Fuse



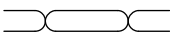
Voltage Stud



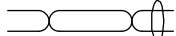
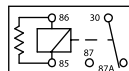
Shunt

Switch Ngr Rocker
(Non-typical)

3 Wire Twisting



2 Wire Twisting

2 Wire Twisting
with Shield

Mini Relay



Horn



Speaker

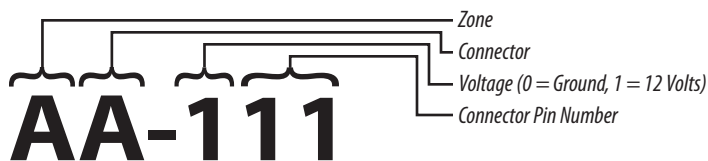


Light



Circuit Breaker

Multiplex Wire Indexing (Circuit Number Code)

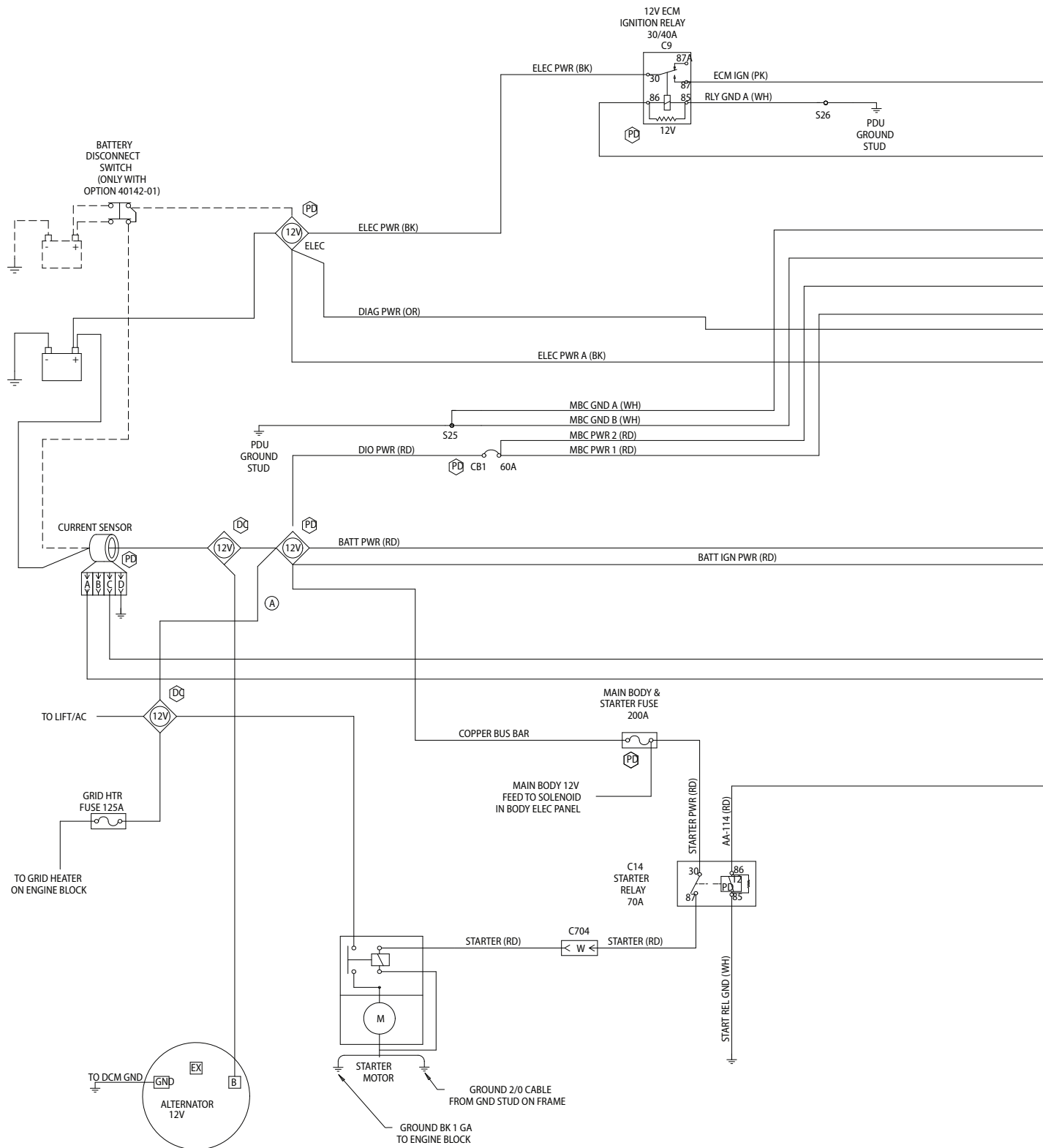


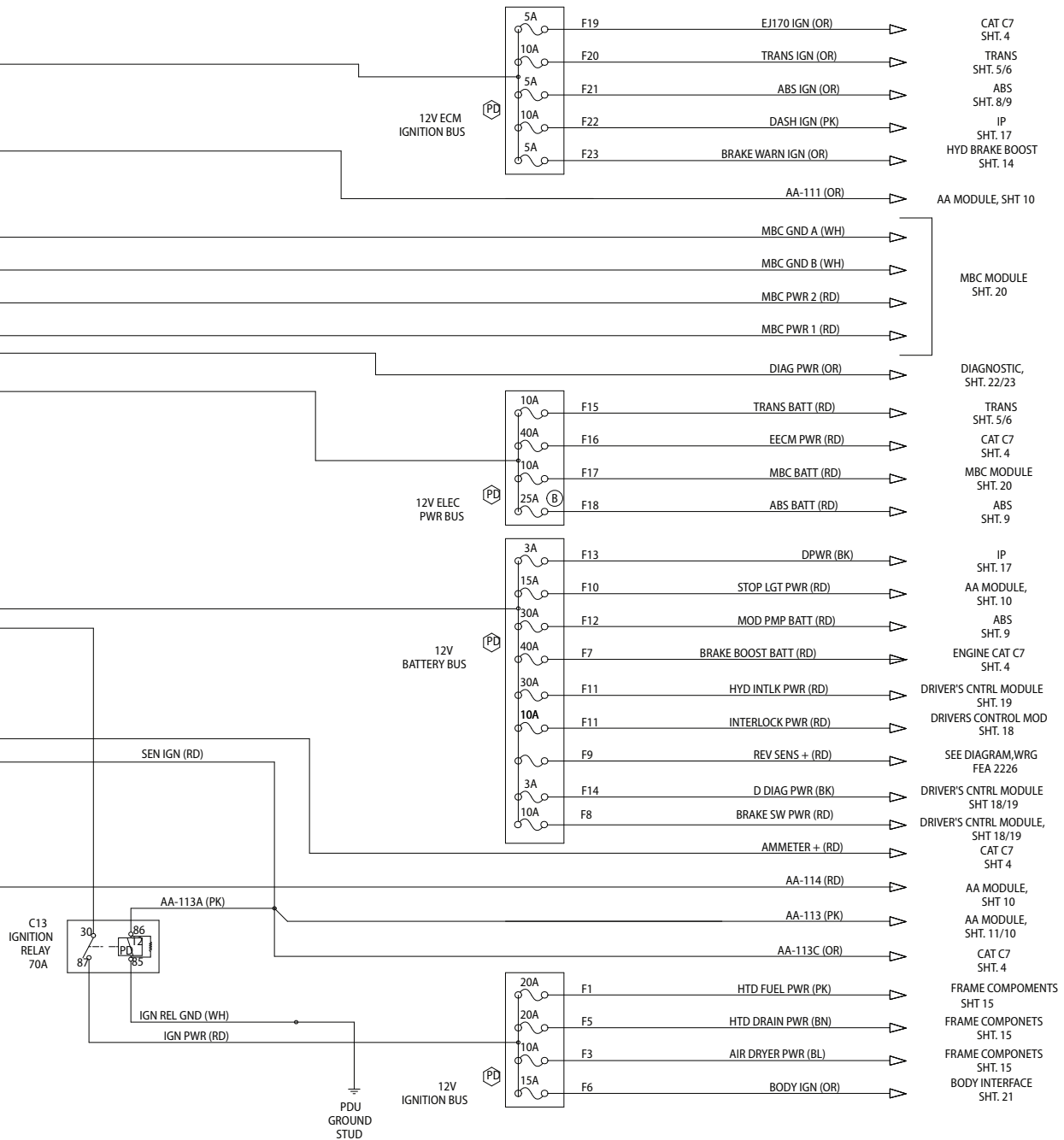
Example: (Zone A, Connector A, 12 Volts, Pin #11)

Sheet 1

0116467F

SCHEMATIC, WRG, 2007 CAT C7, INDEX





757

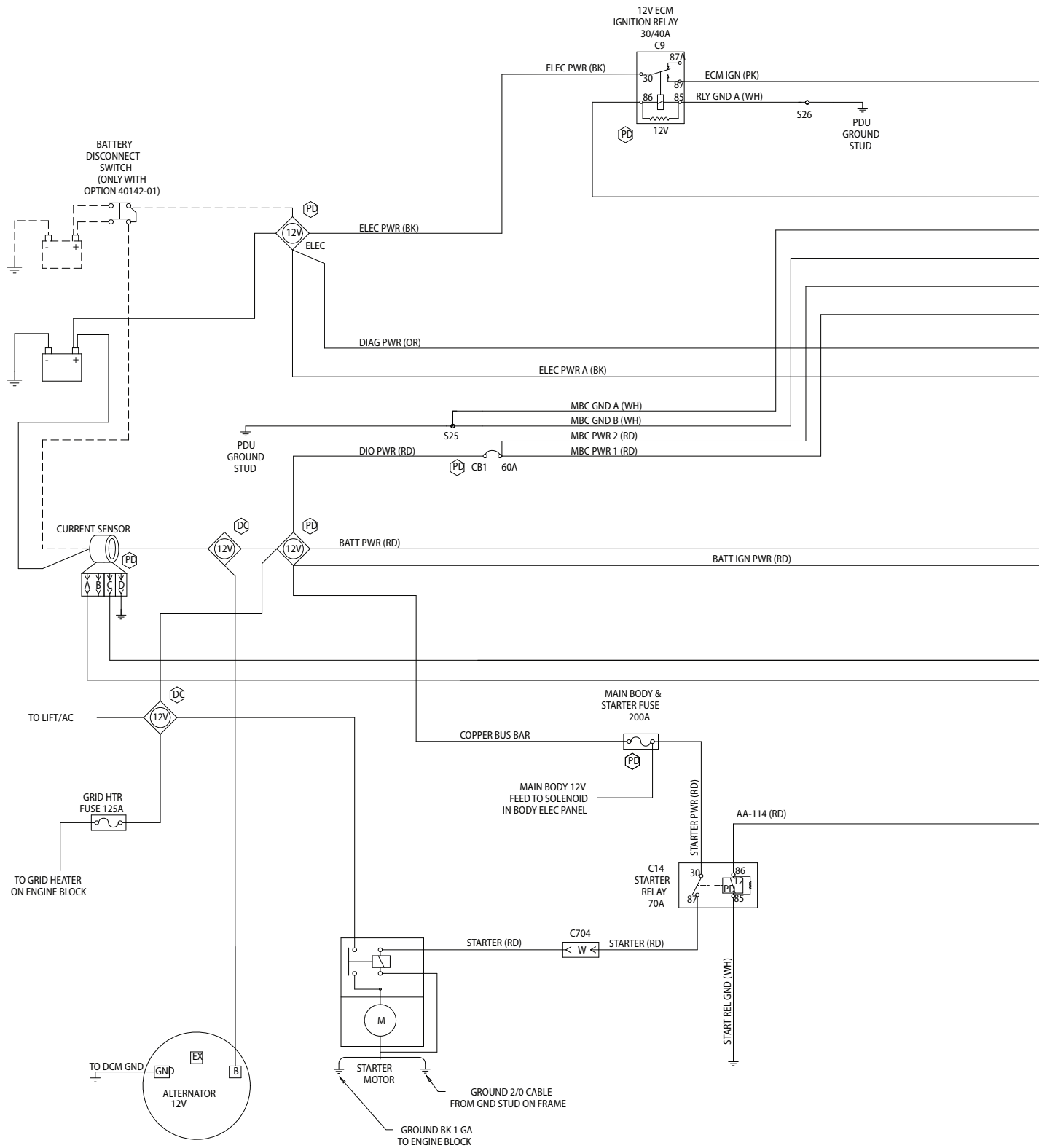
CAT C7-07

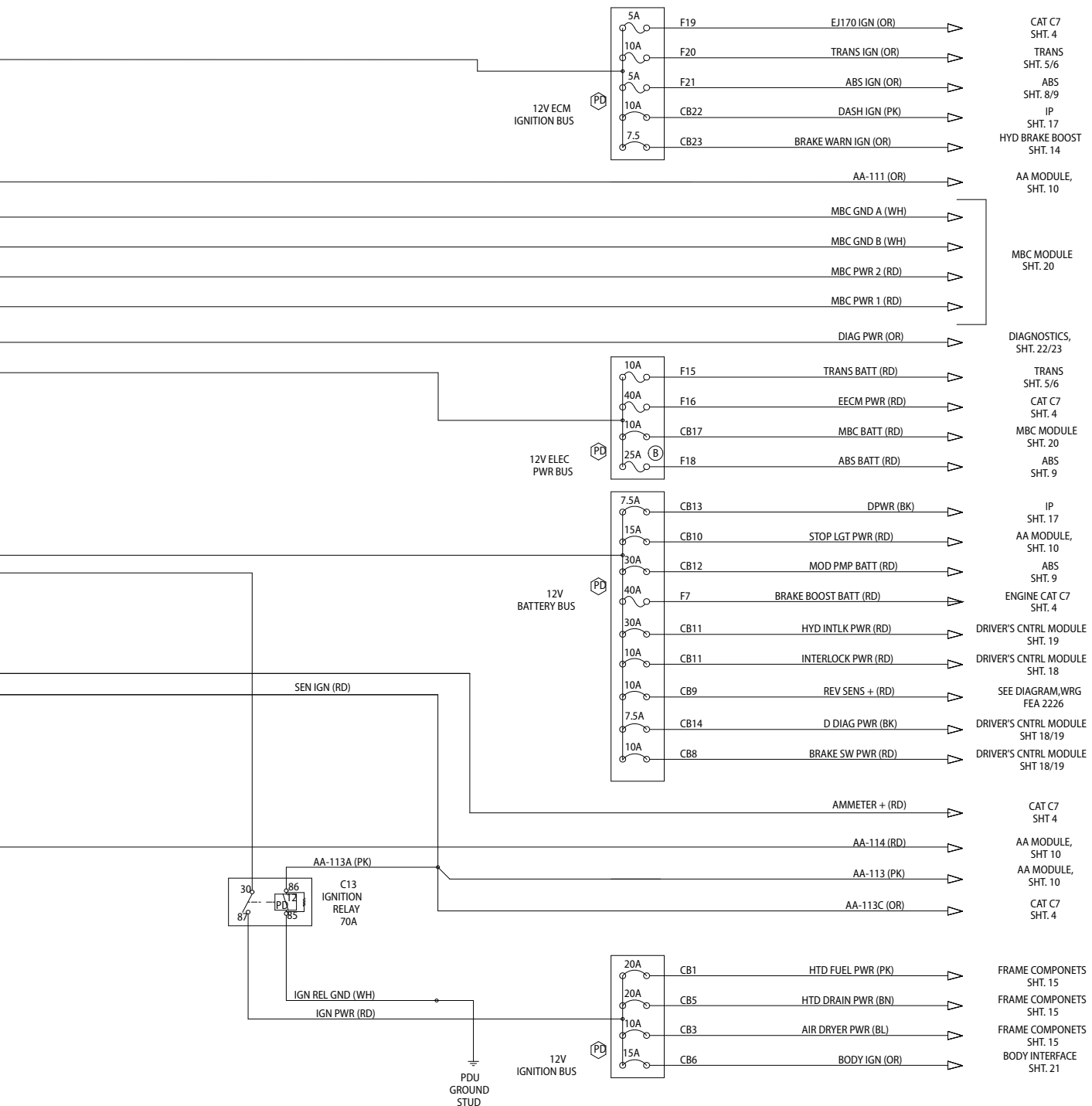
Sheet 2

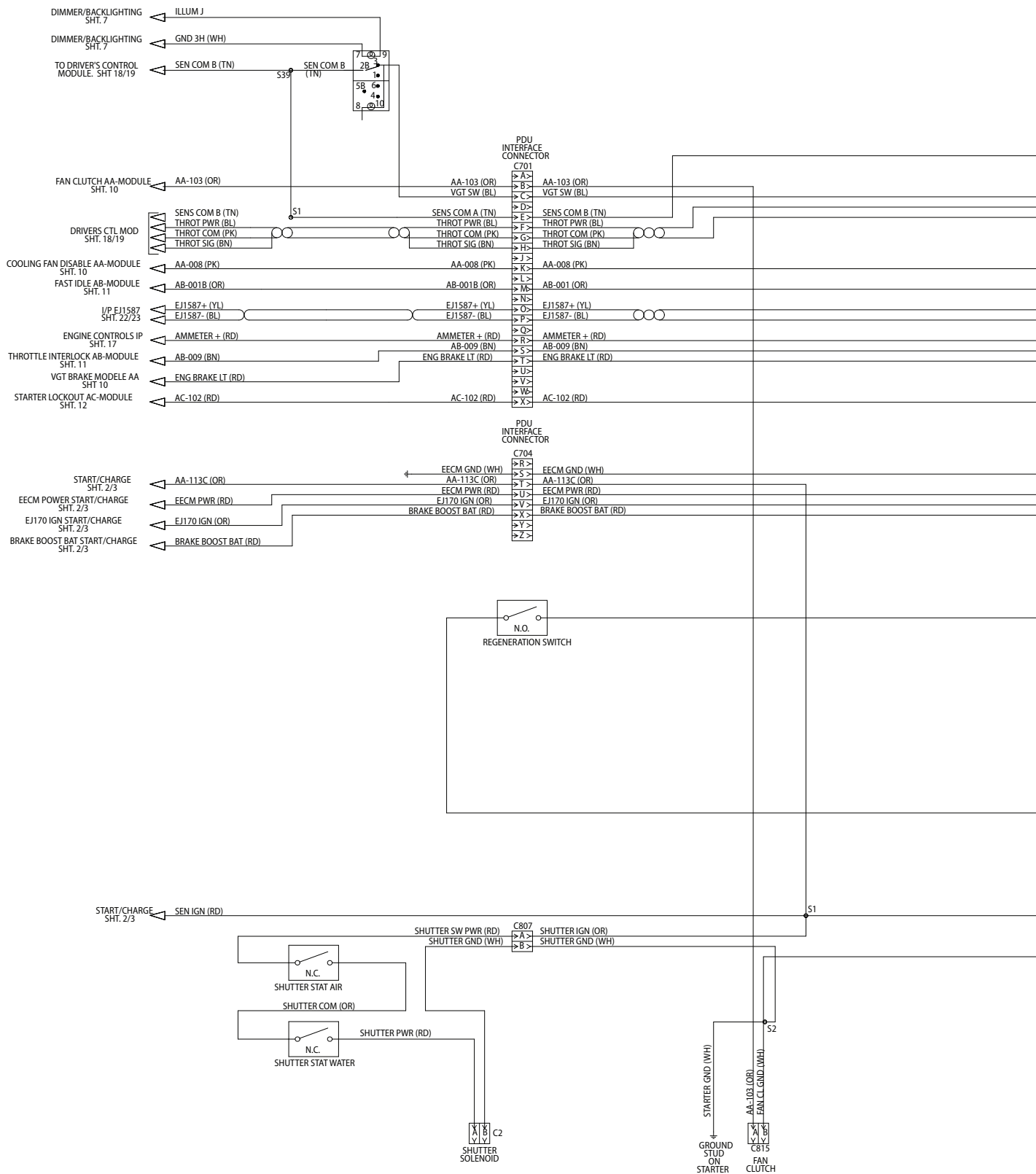
0116401C

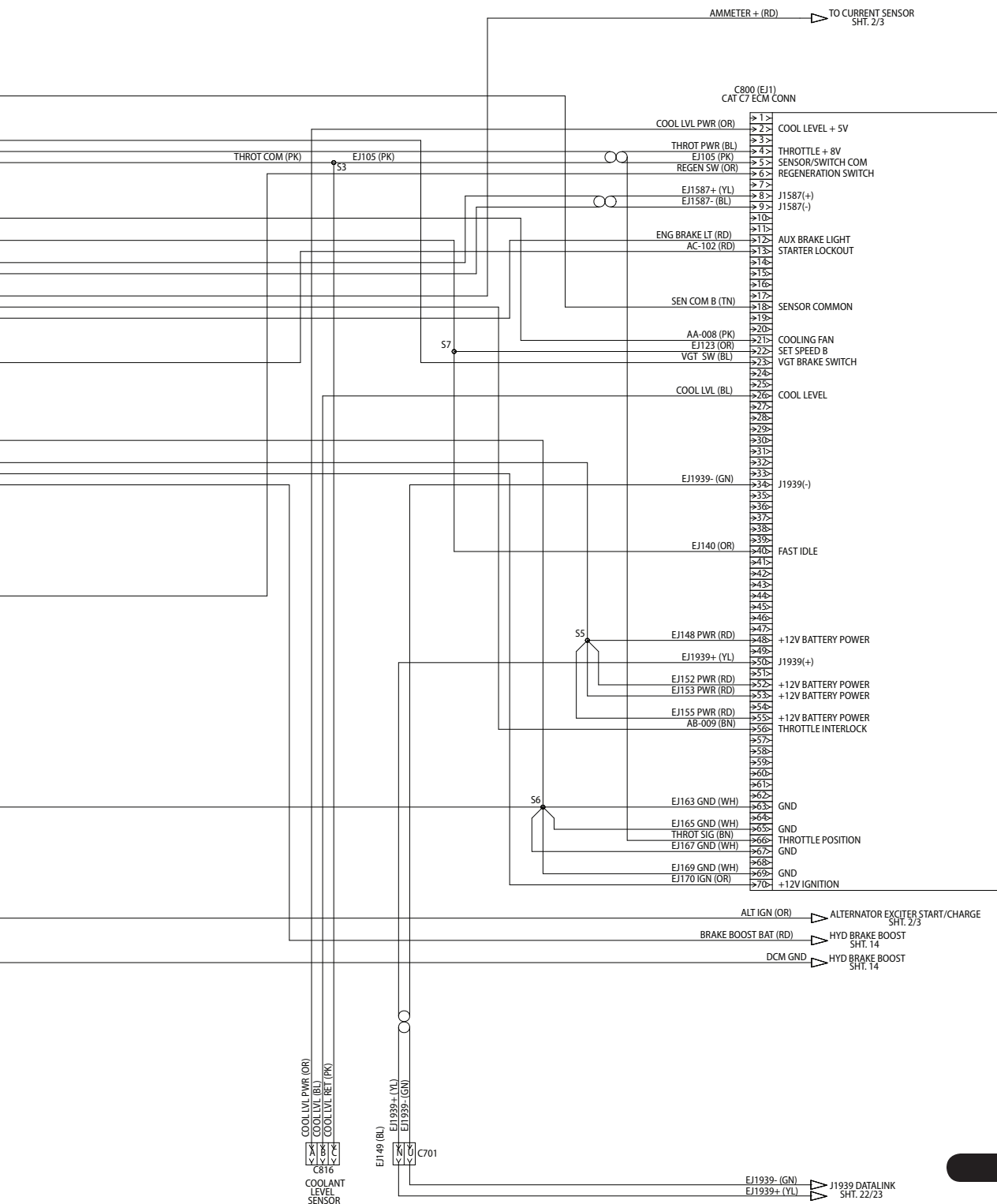
STARTING AND CHARGING, CAT 2007 C7

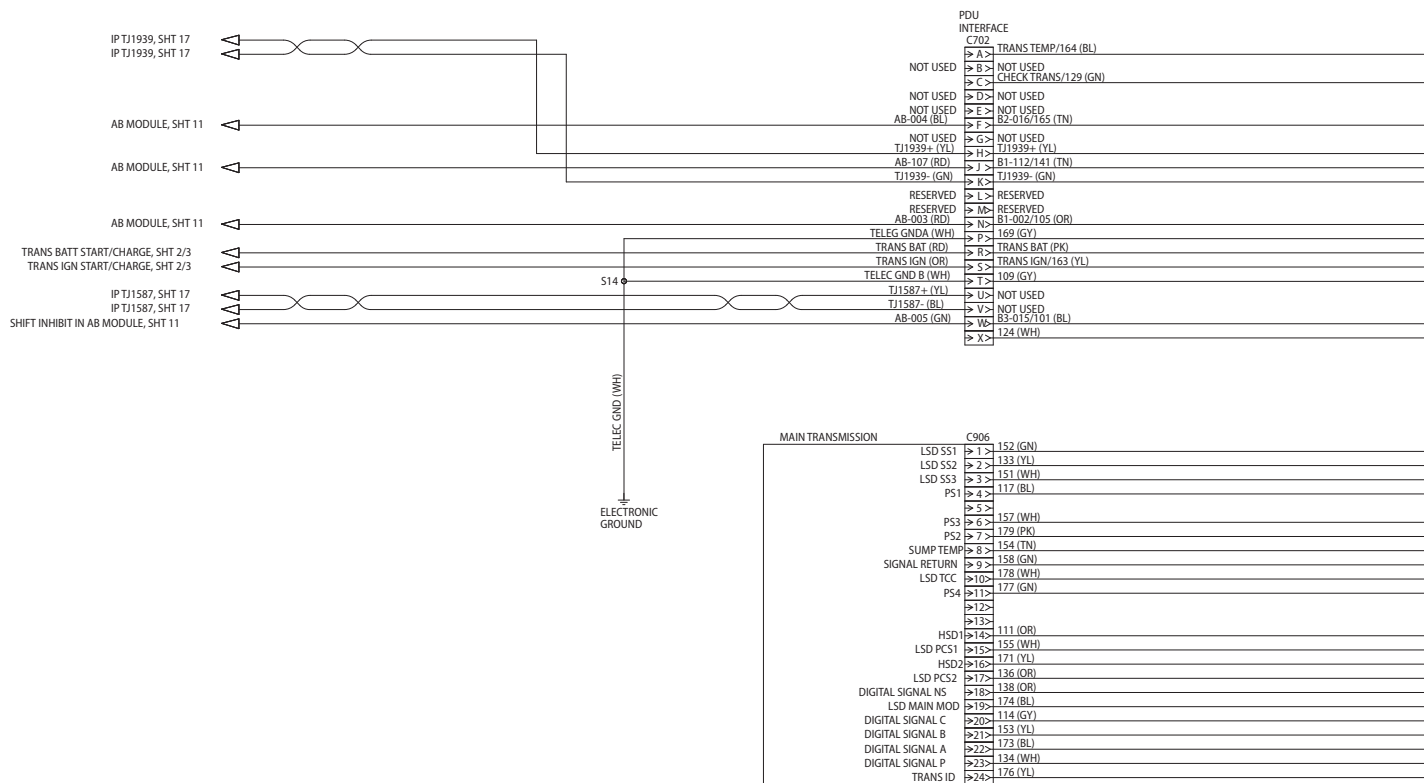


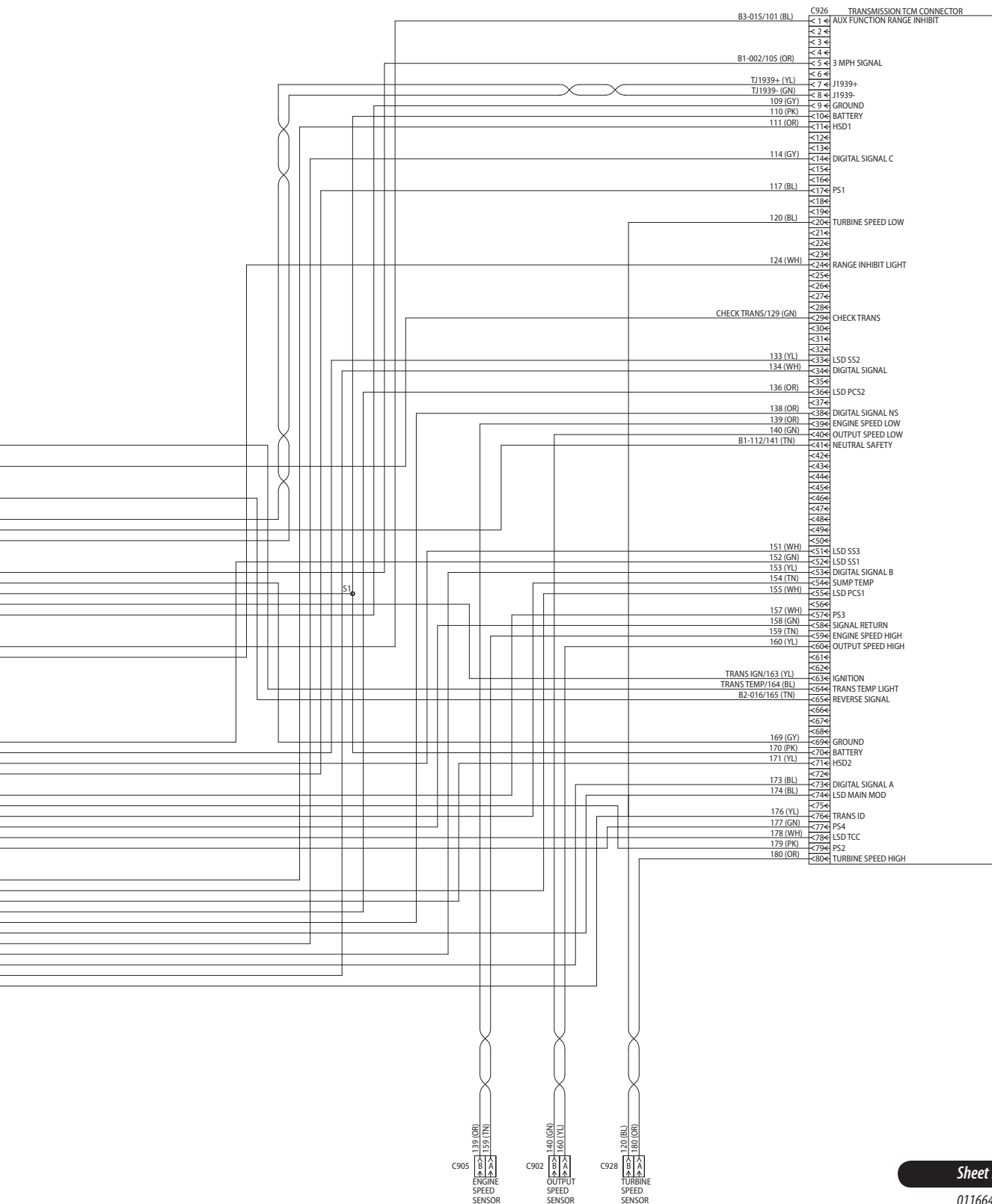


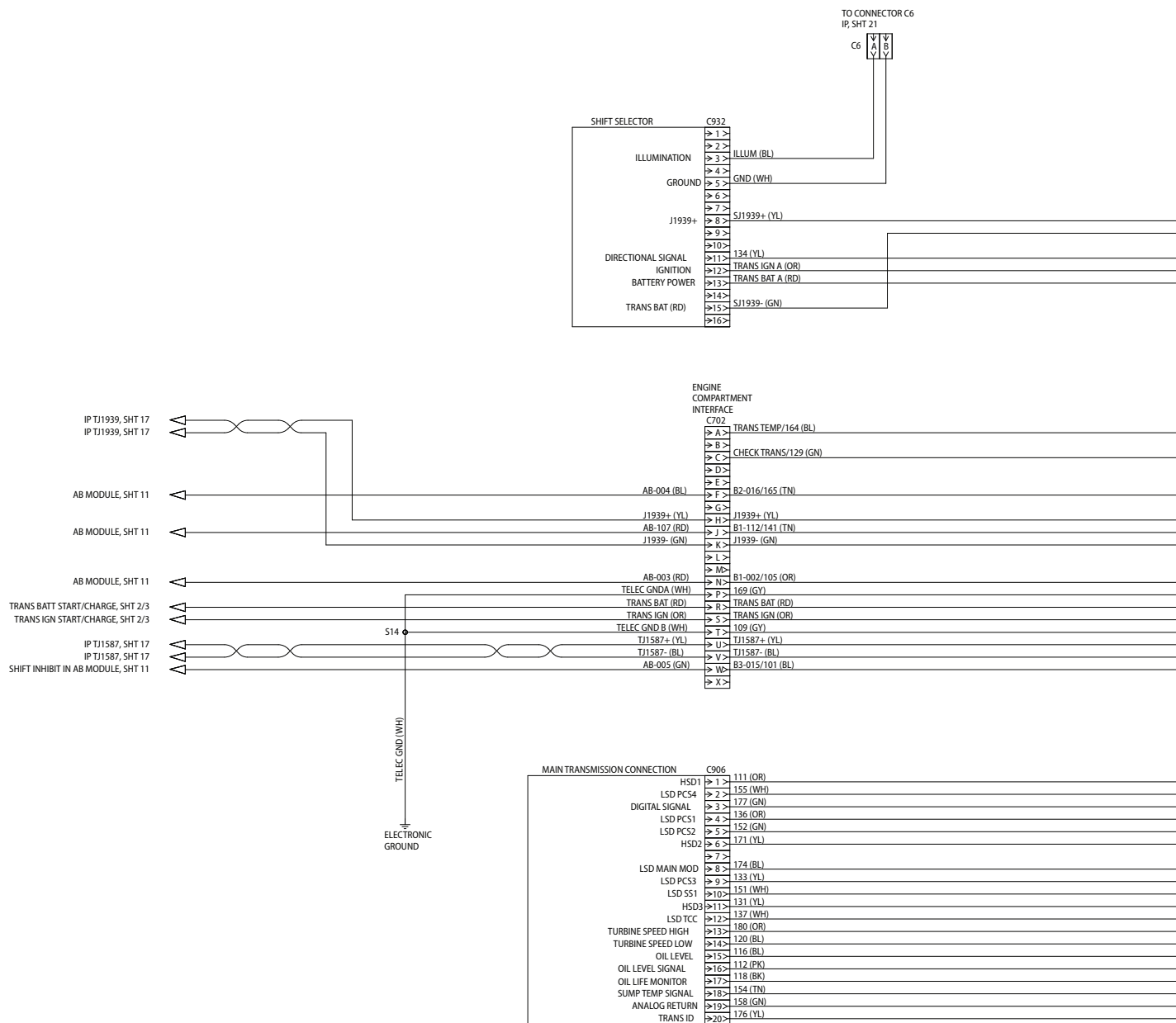


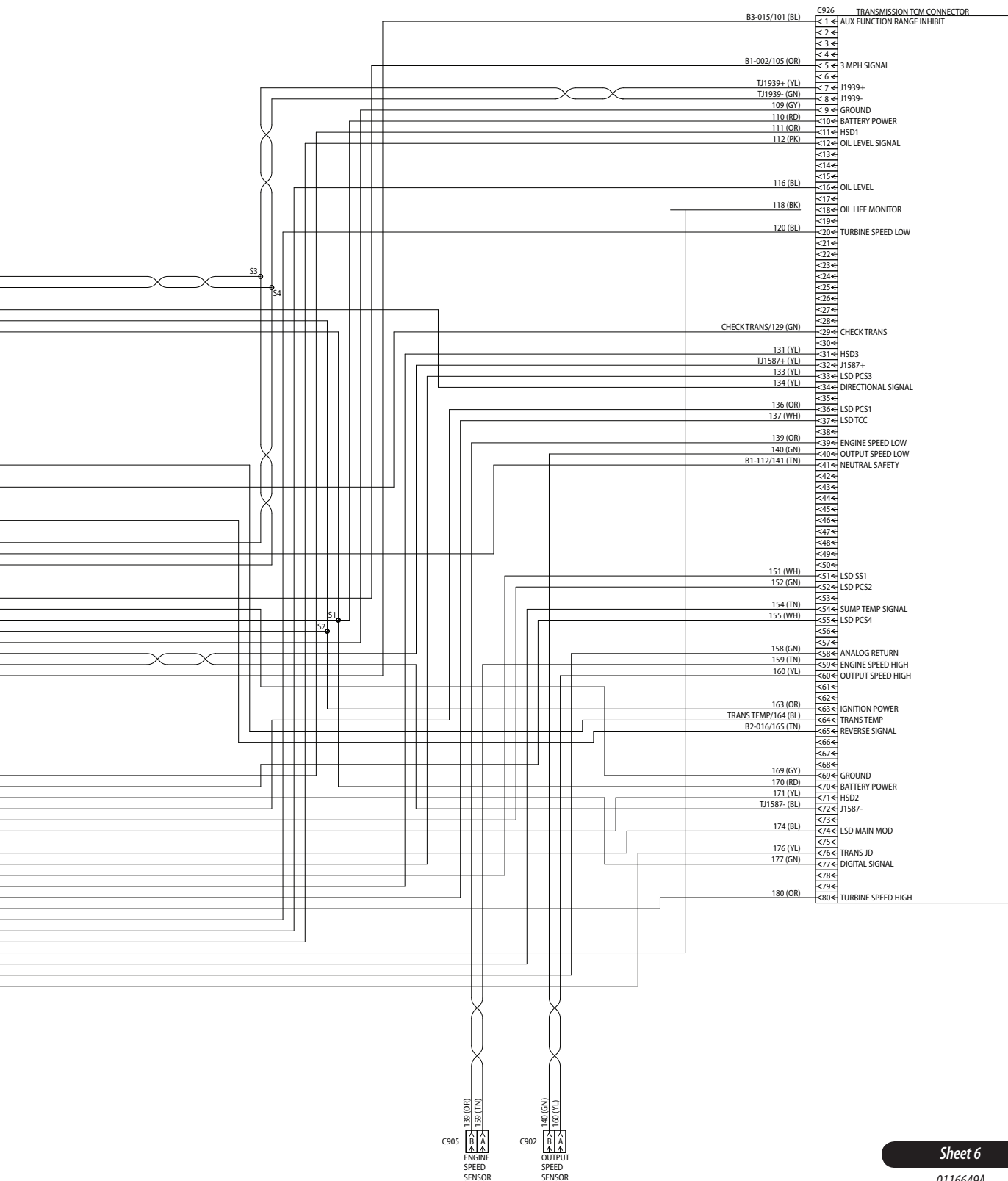


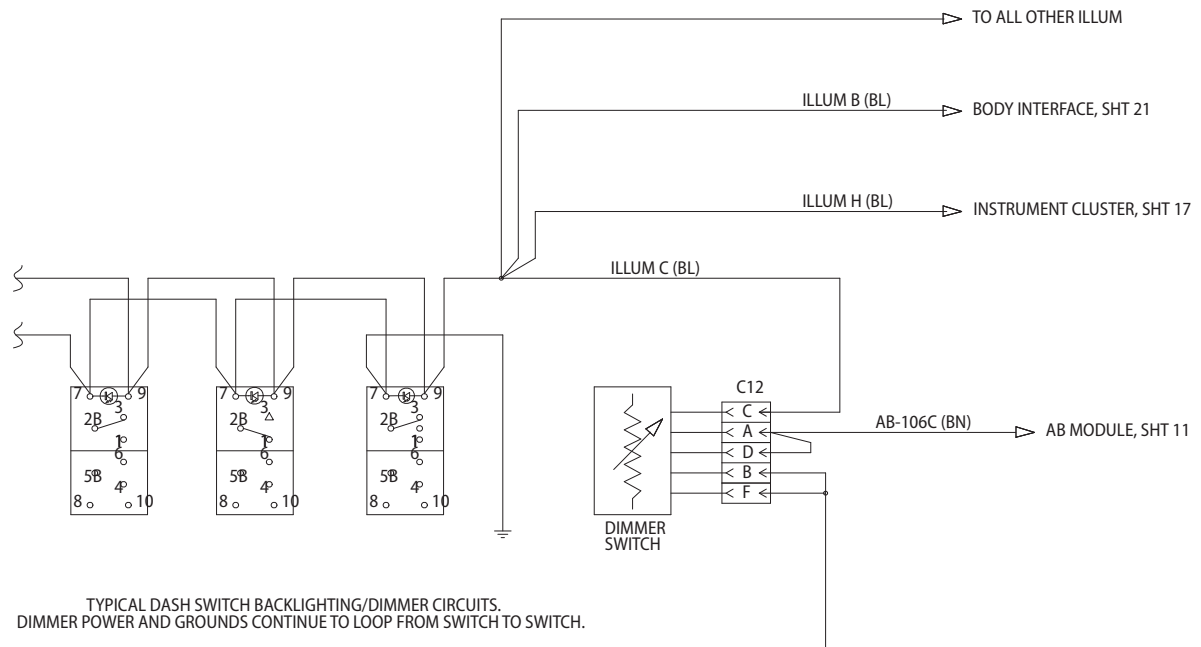




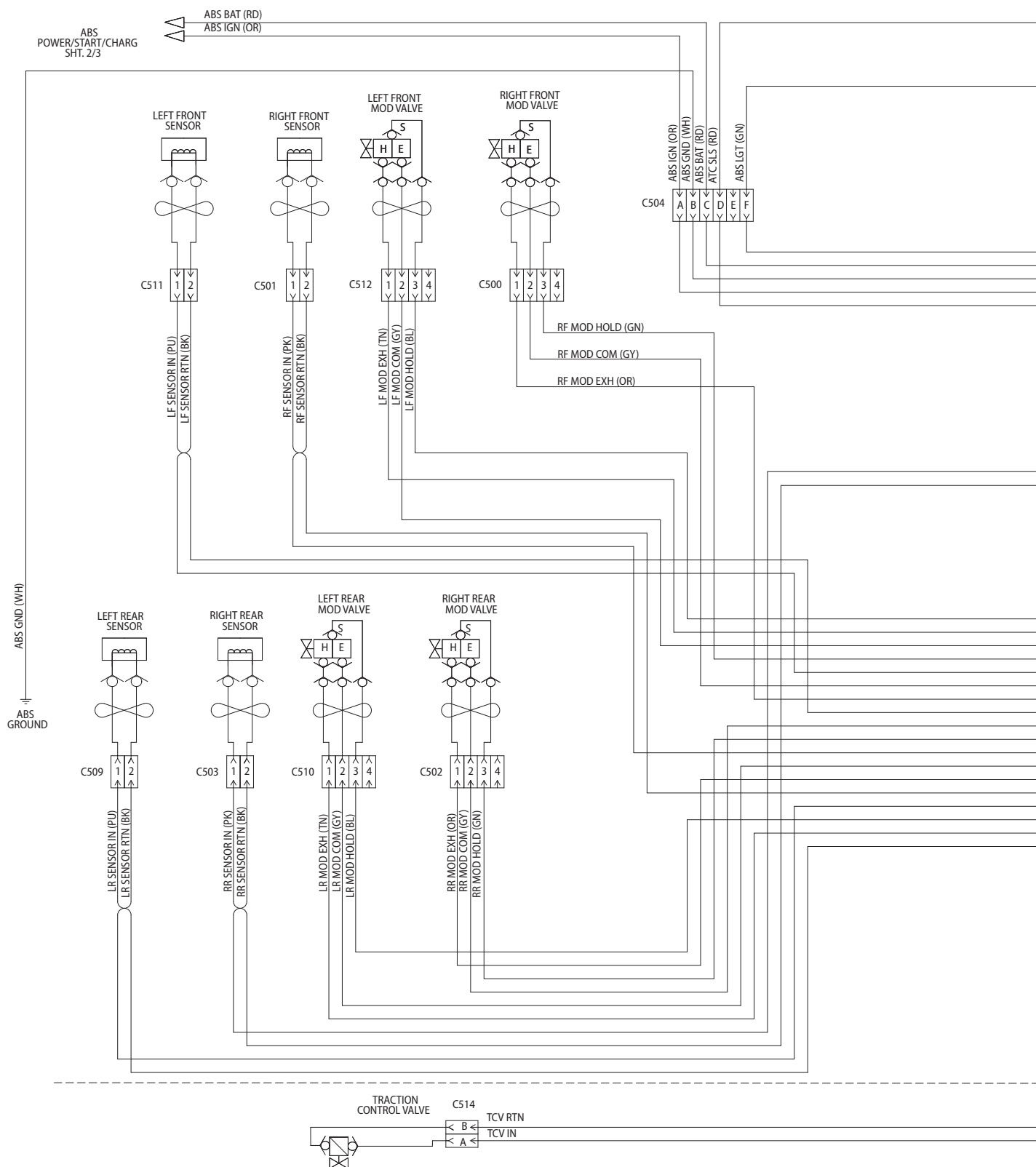


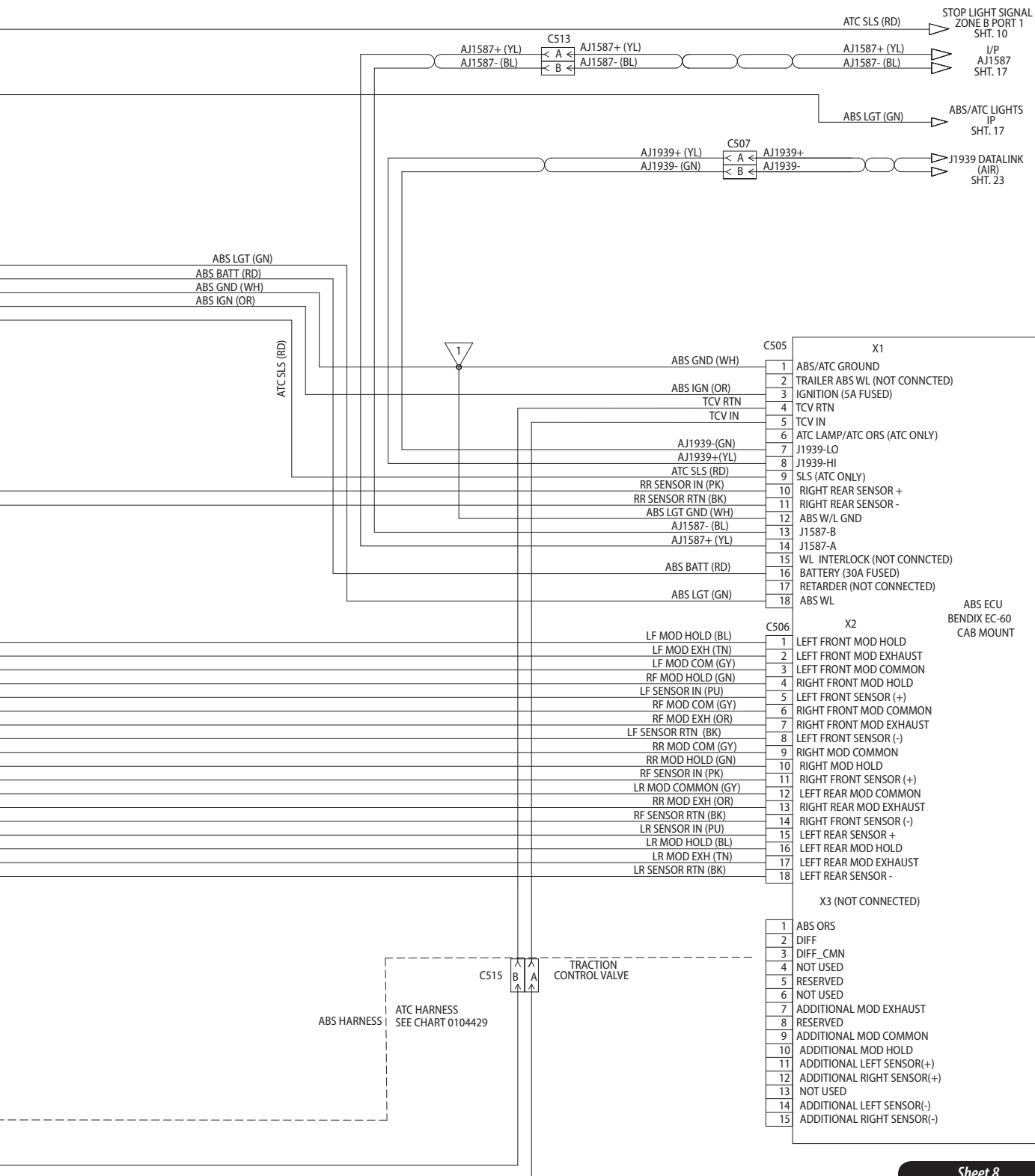






TYPICAL DASH SWITCH BACKLIGHTING/DIMMER CIRCUITS.
DIMMER POWER AND GROUNDS CONTINUE TO LOOP FROM SWITCH TO SWITCH.

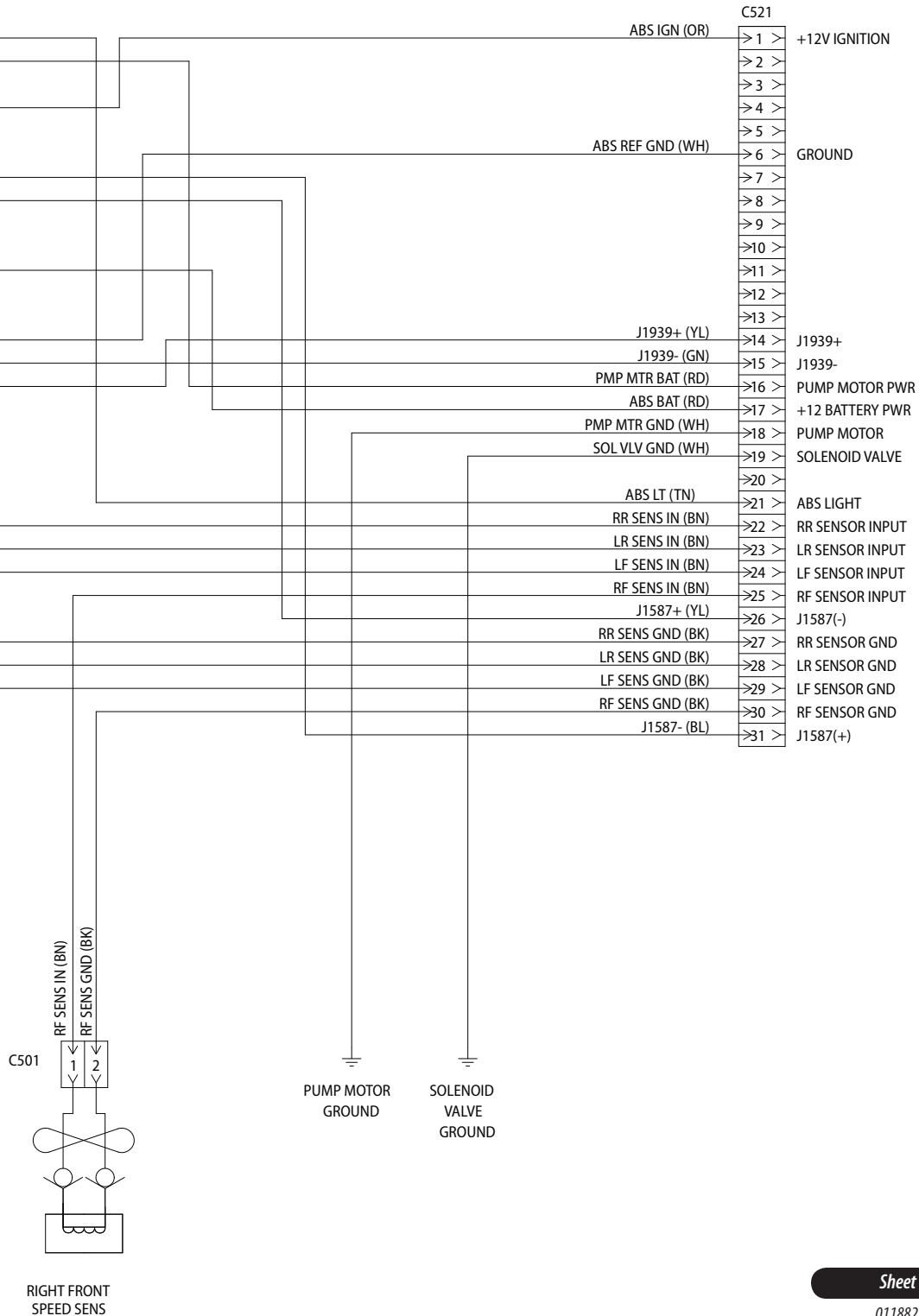




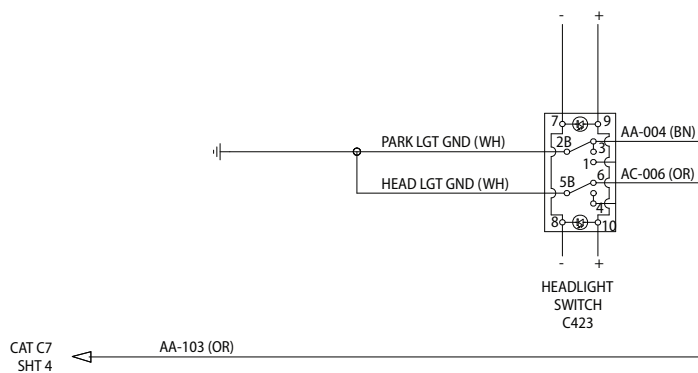
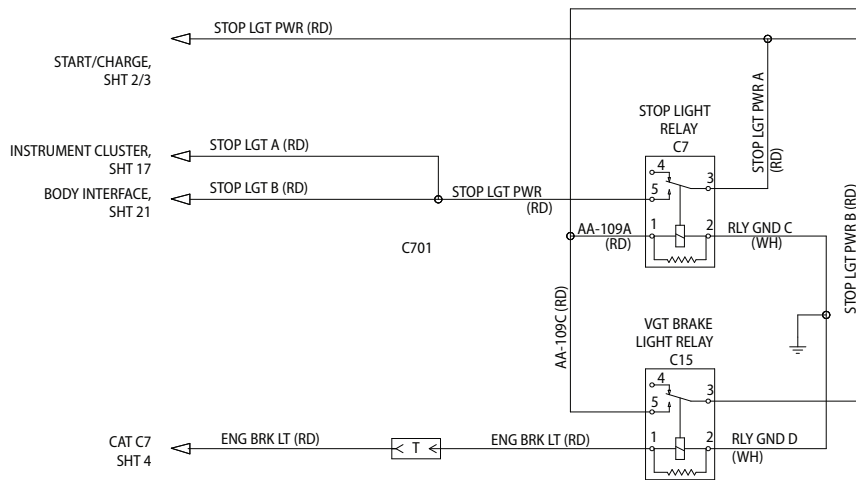


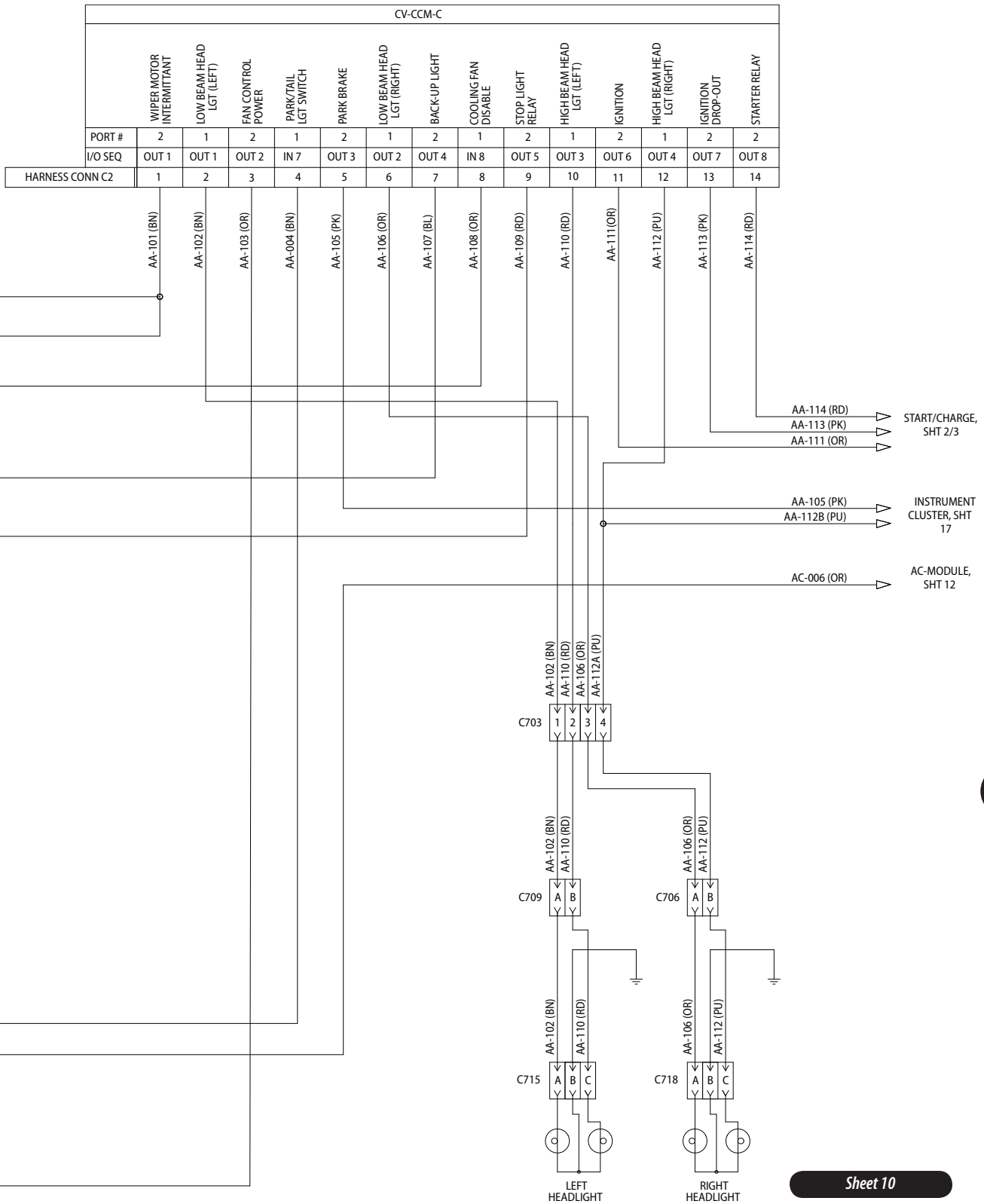


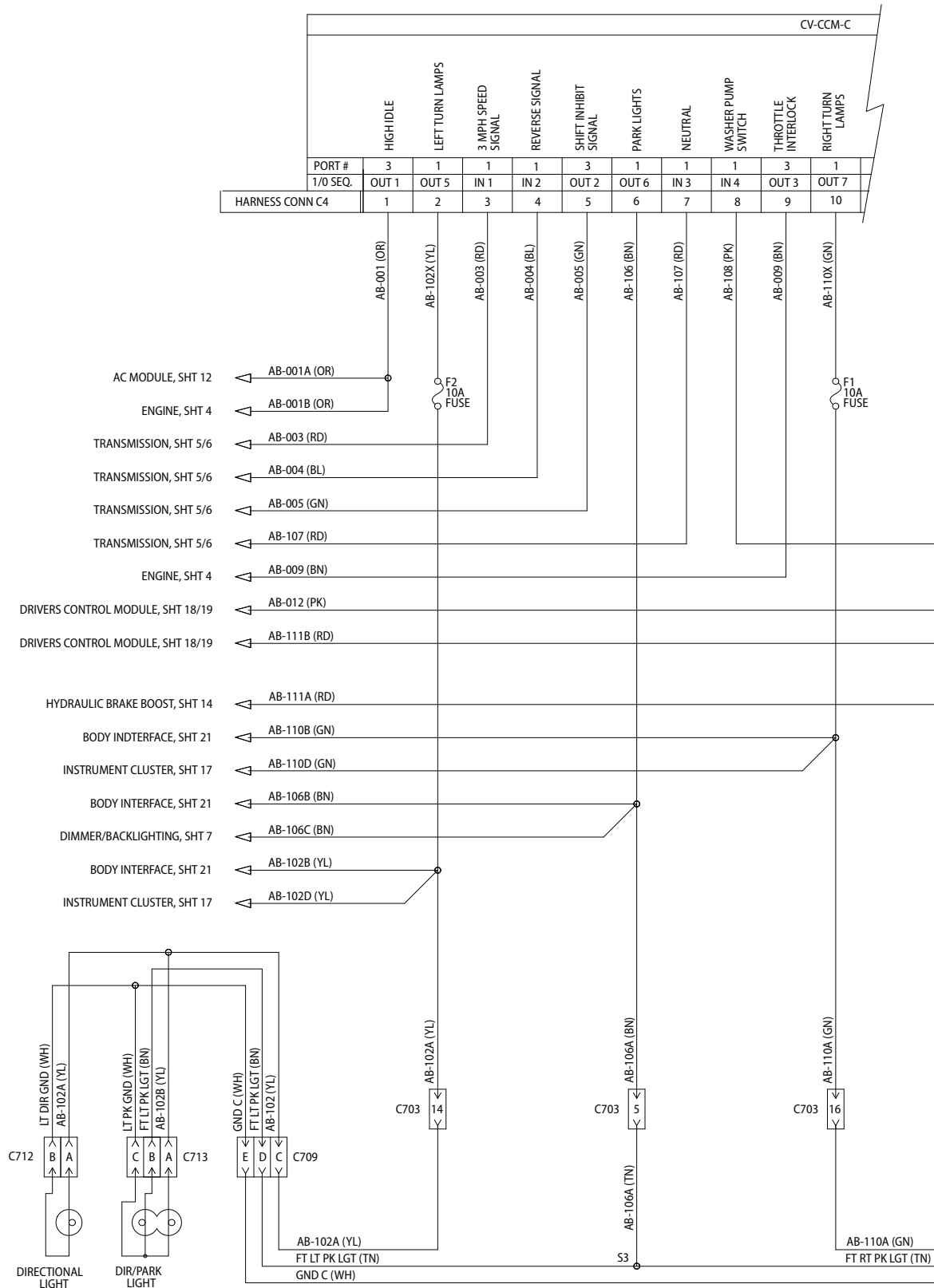
MODULATOR PUMP
31 WAY
CONNECTOR

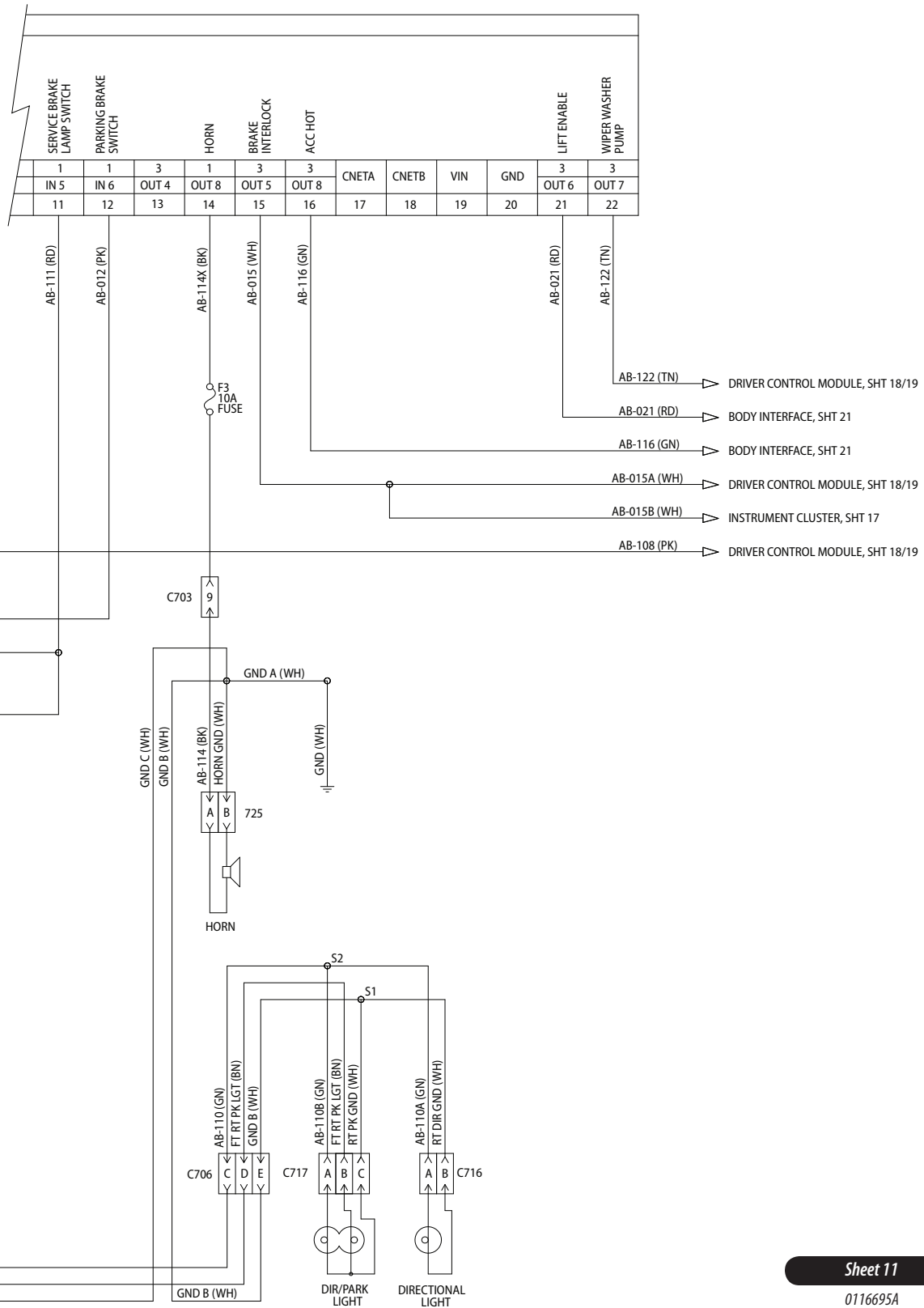


BODY INTERFACE, SHT 21 ← AA-101A (BN)
 DRIVER CONTROL MODULE SHT 18/19 ← AA-101B (BN)
 CAT, SHT 4 ← AA-108 (OR)
 BODY INTERFACE, SHT 21 ← AA-107 (BL)

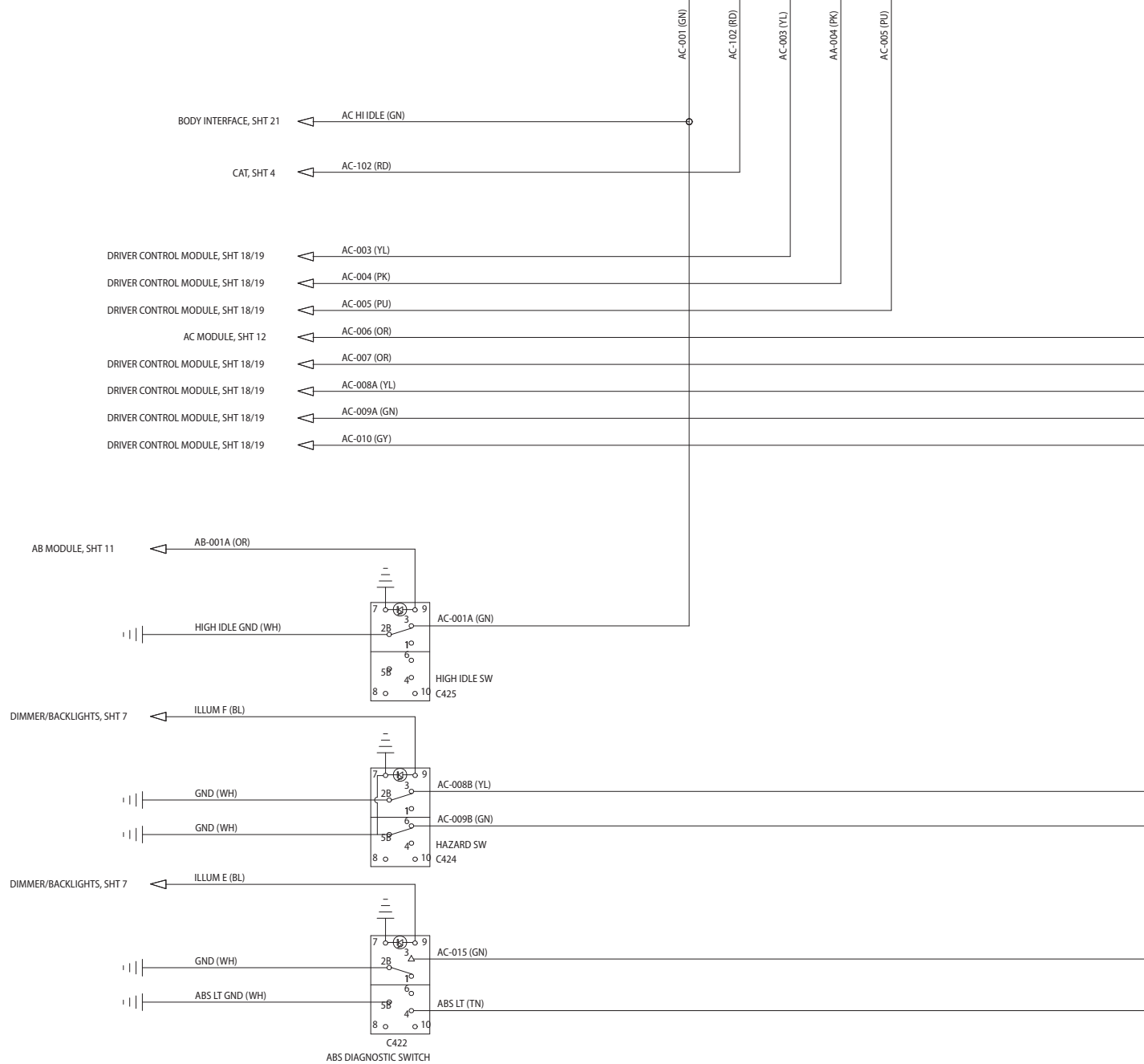






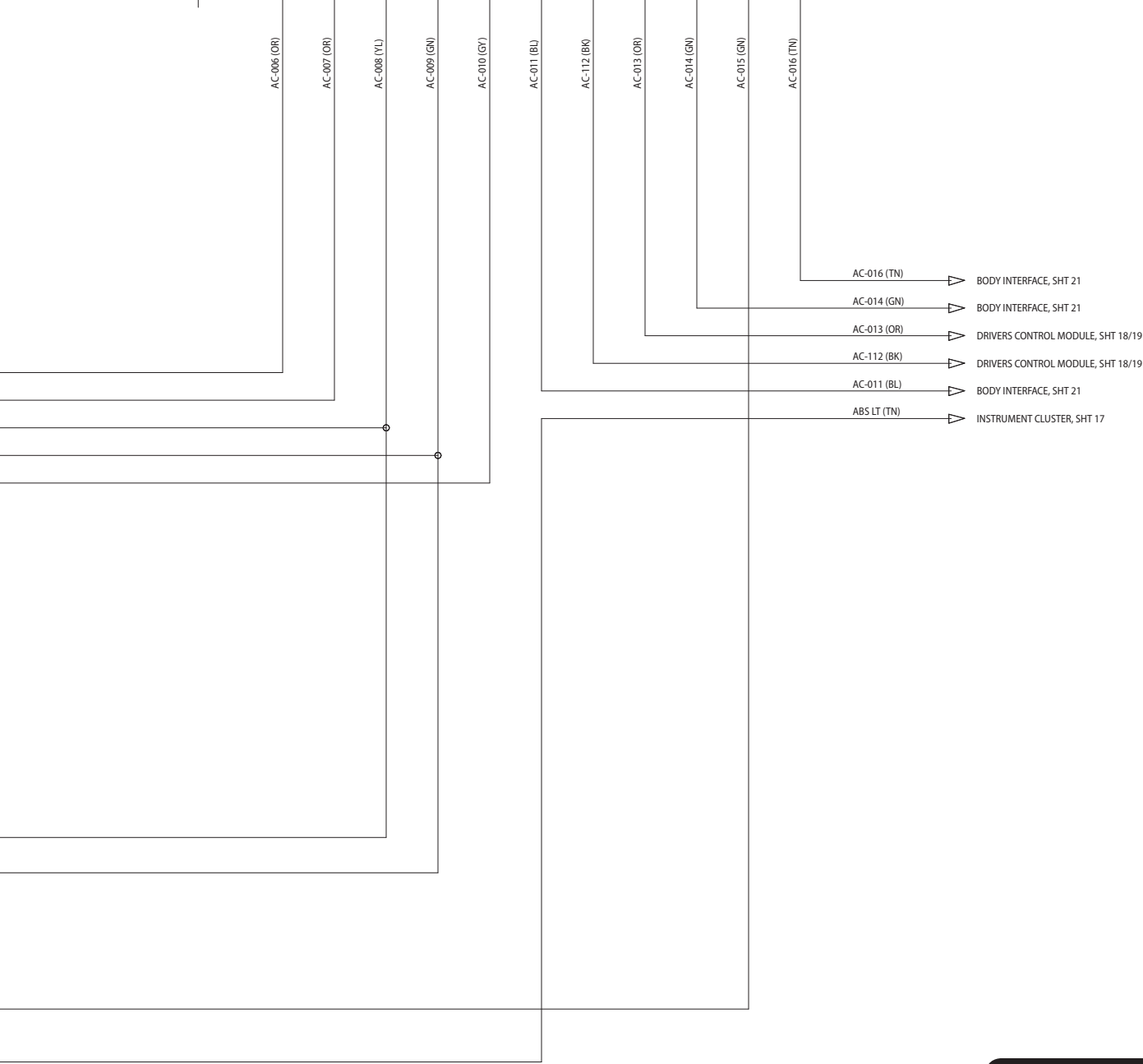


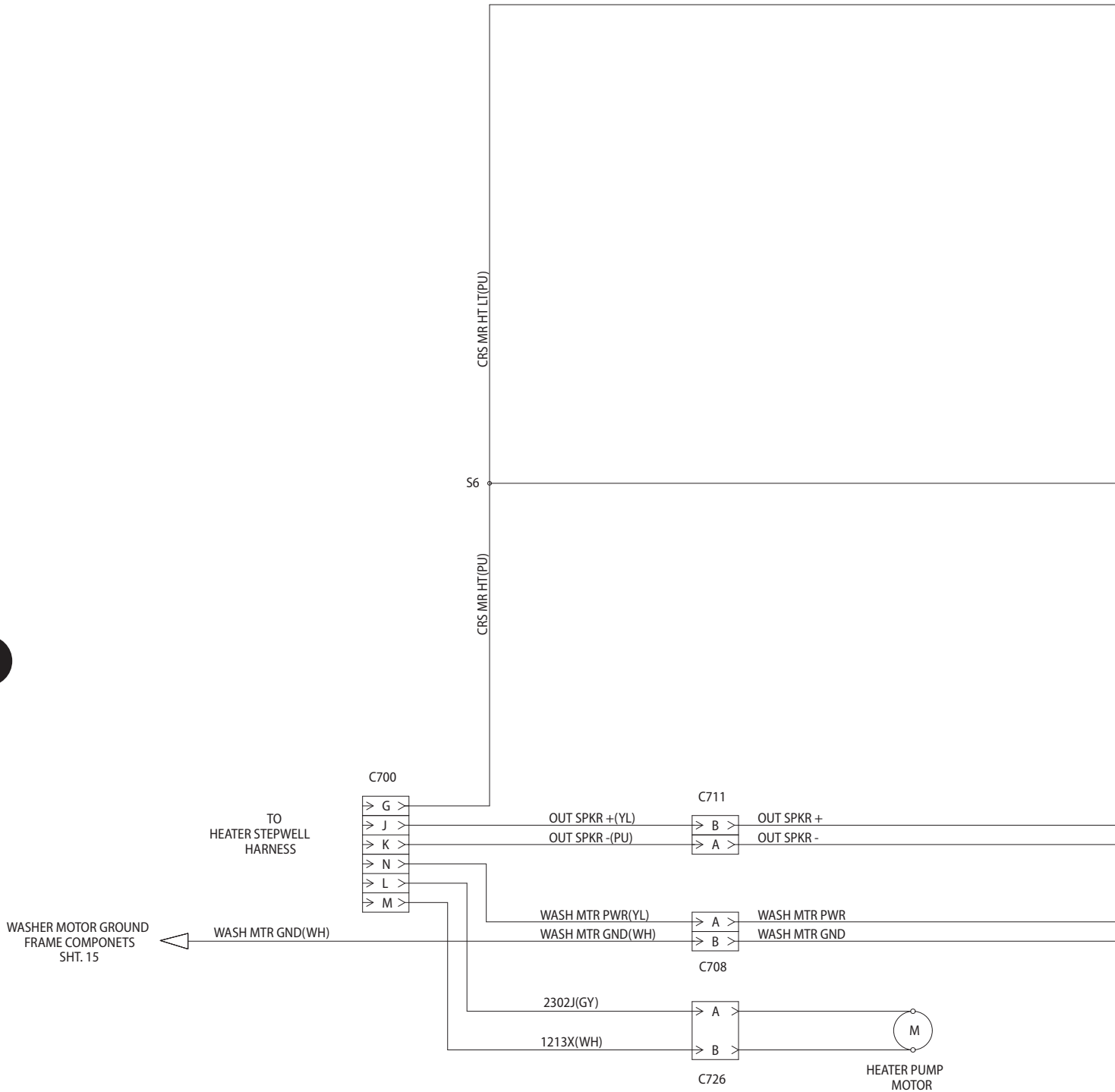
PORT#	2	2	2	2	2	
I/O SEQ	IN 1	IN 2	IN 3	IN 4	IN 5	
HARNESS CONN C1	1	2	3	4	5	

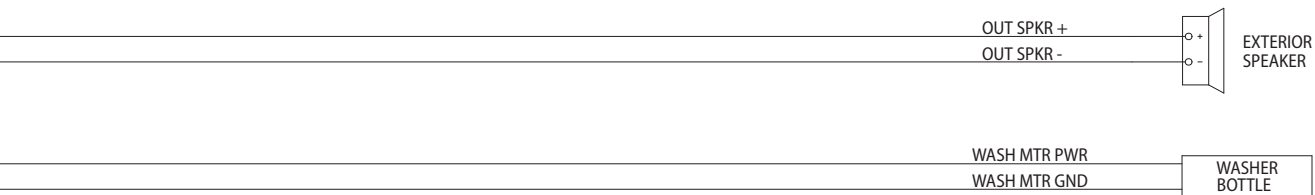
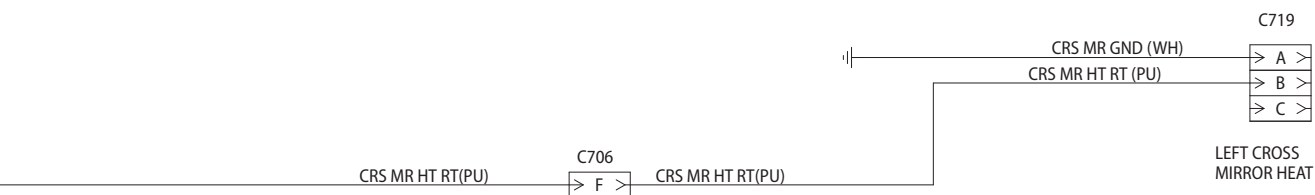
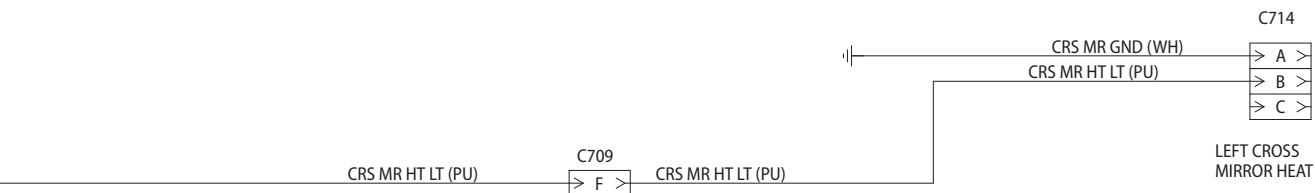


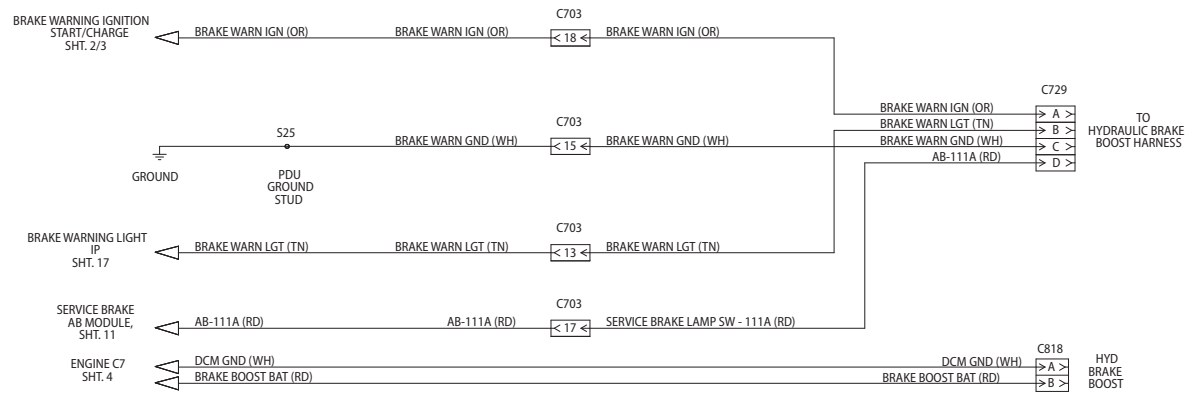


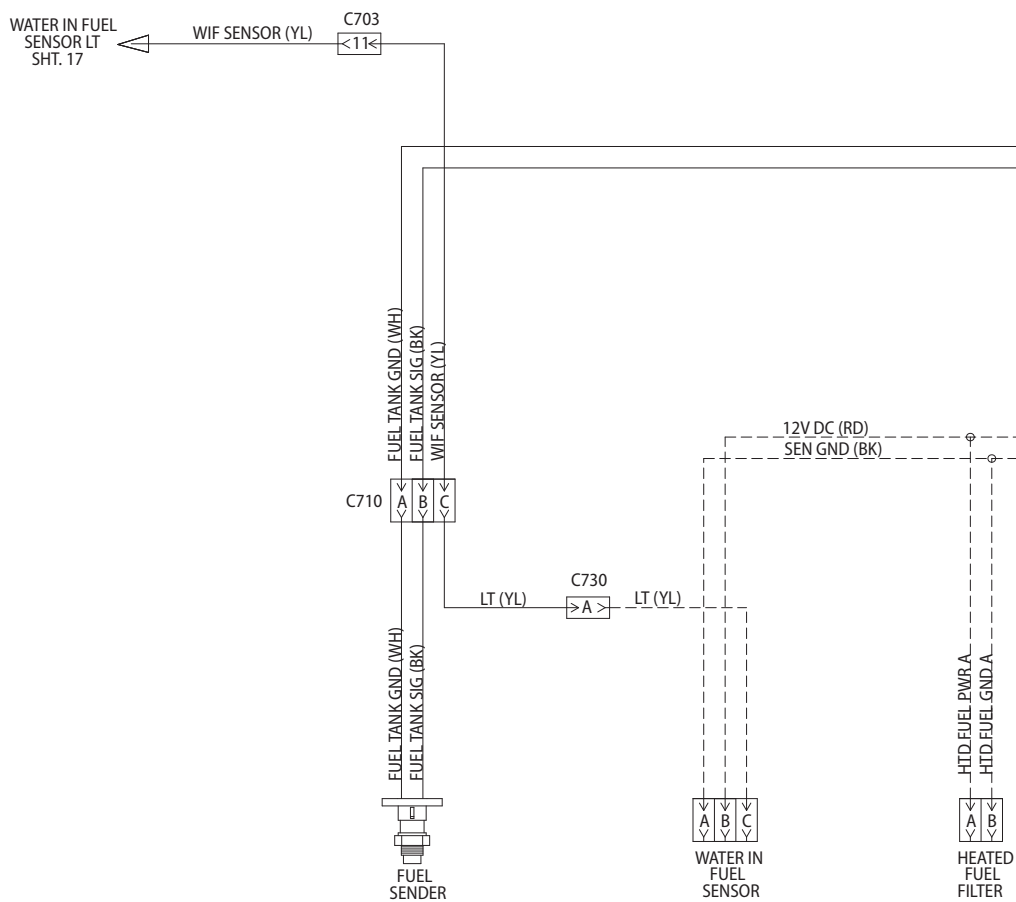
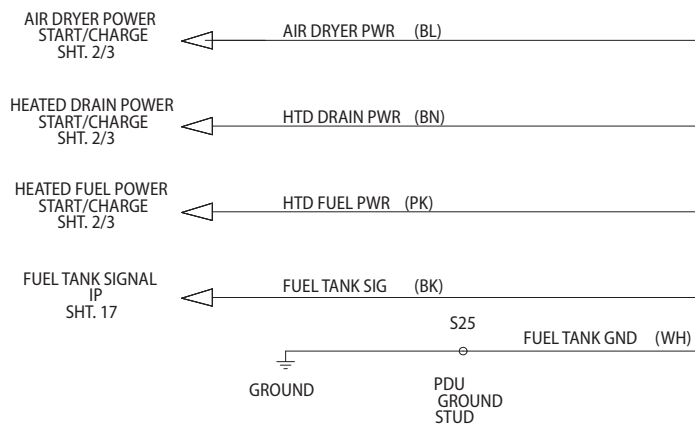
CV-CCM-C													
	HEADLAMP SWITCH	HIGH BEAM SWITCH	LEFT TURN SWITCH	RIGHT TURN SIGNAL	HORN BUTTON	EXTERIOR DOOR SWITCH	INTERMITTANT WIPER SWITCH	INTERLOCK FEEDBACK	SCC ALARM	I/O DIAGNOSTIC SWITCH	VANDAL LOCK		
	2	2	2	3	3	3	3	3	3	3	3	N/A	N/A
	IN 6	IN 7	IN 8	IN 1	IN 2	IN 3	IN 4	IN 5	IN 6	IN 7	IN 8		
	6	7	8	9	10	11	12	13	14	15	16	17	18



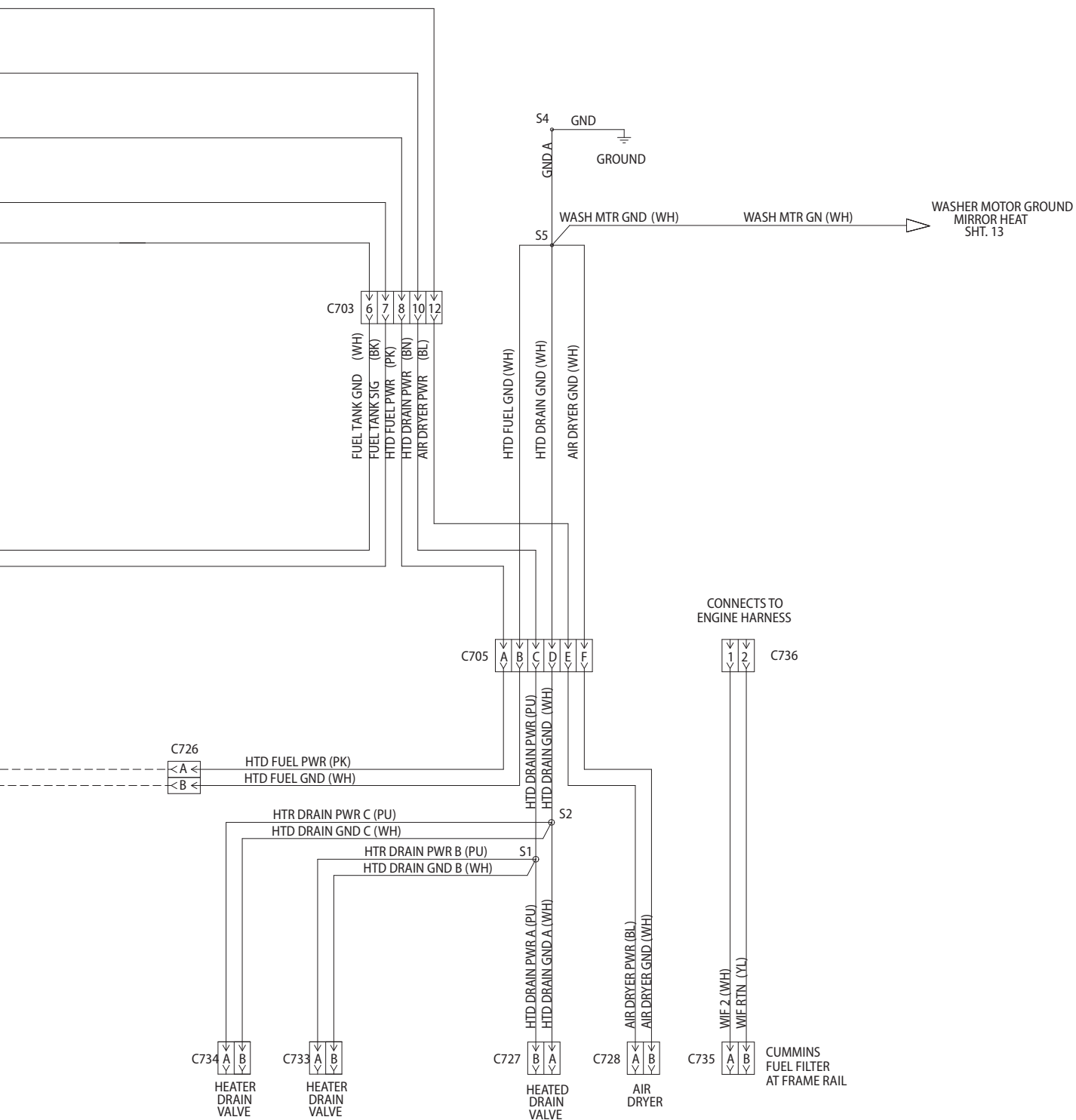






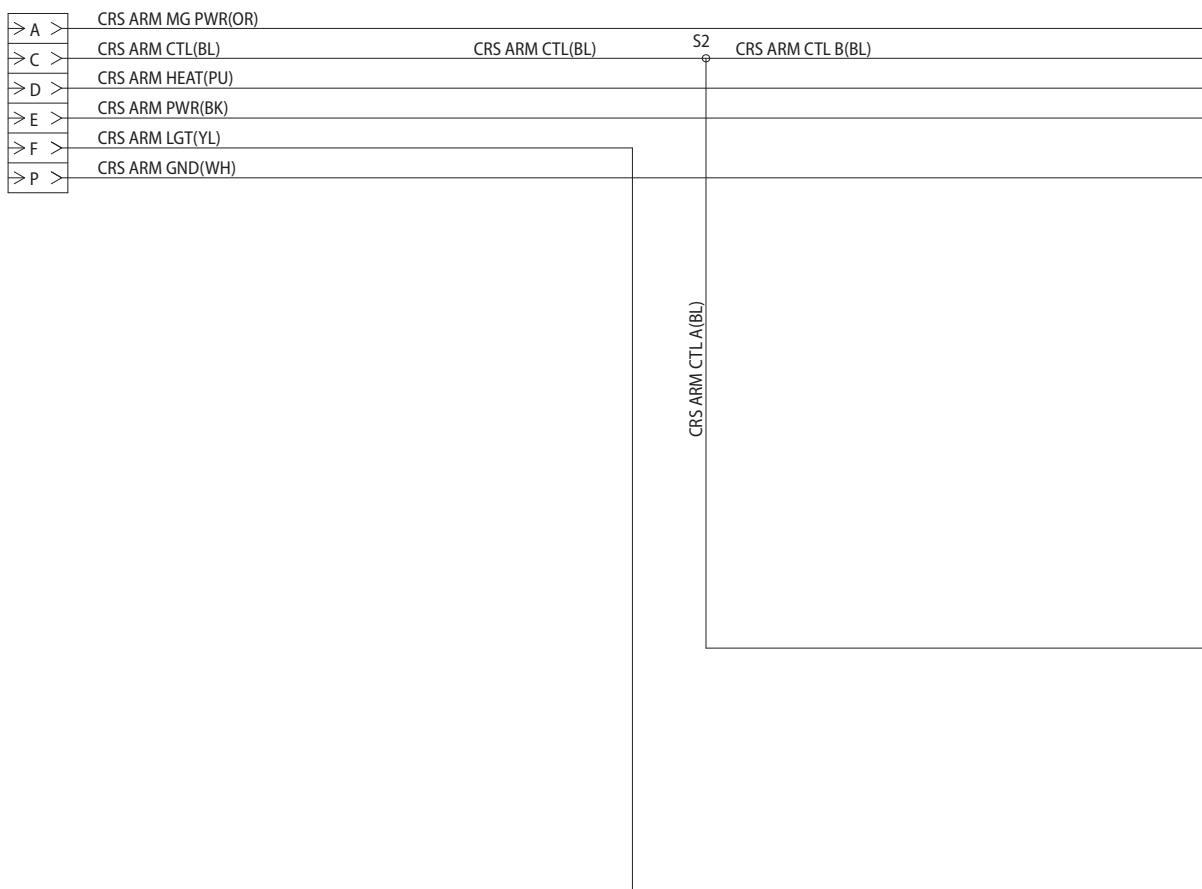


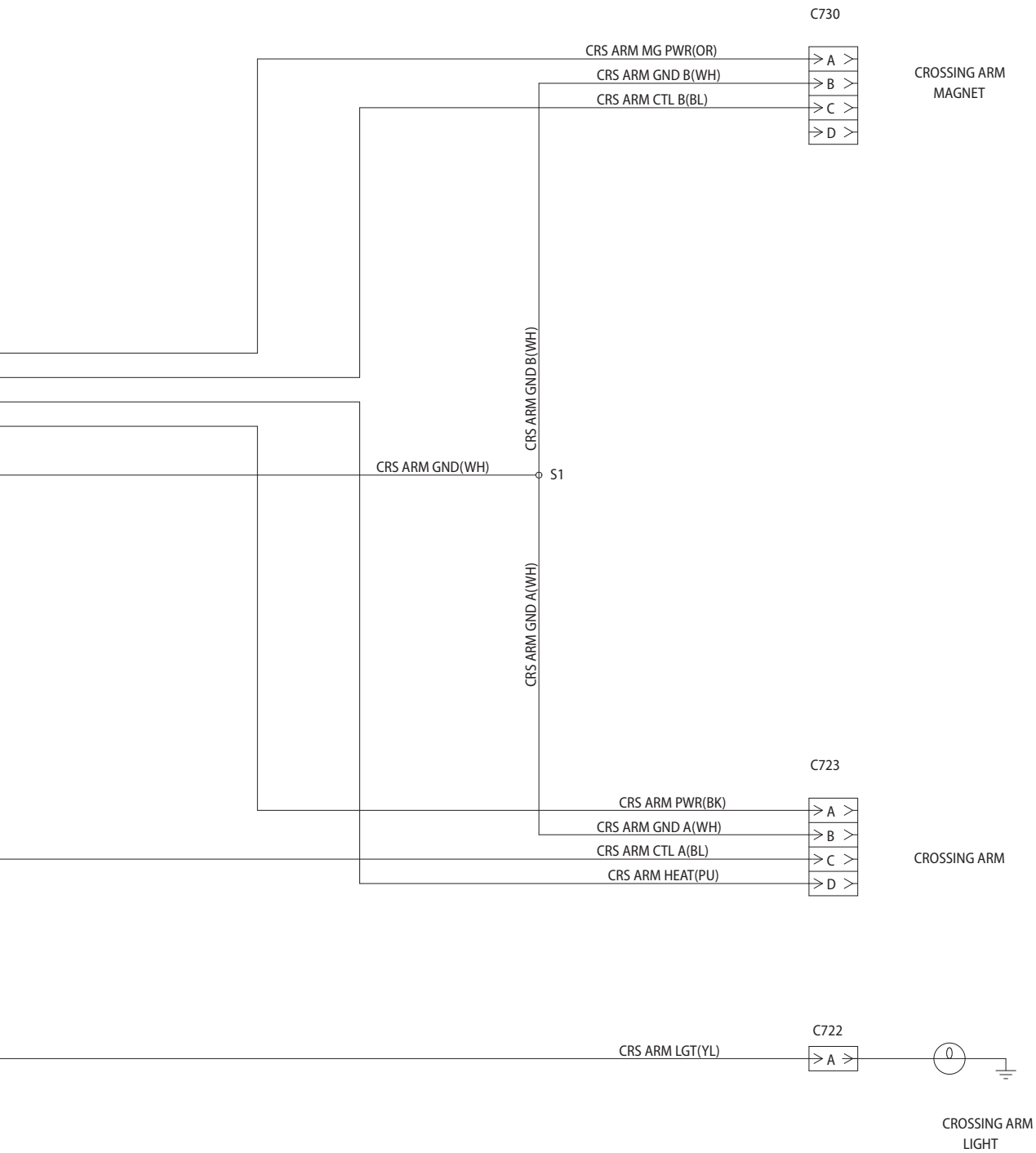
NOTE: DASHED LINES INDICATE THAT THERE IS AN ADDITIONAL HARNESS INSTALLED FOR THE WATER IN FUEL OPTION.



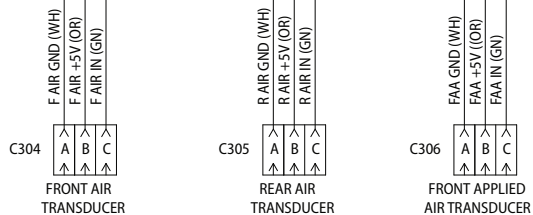
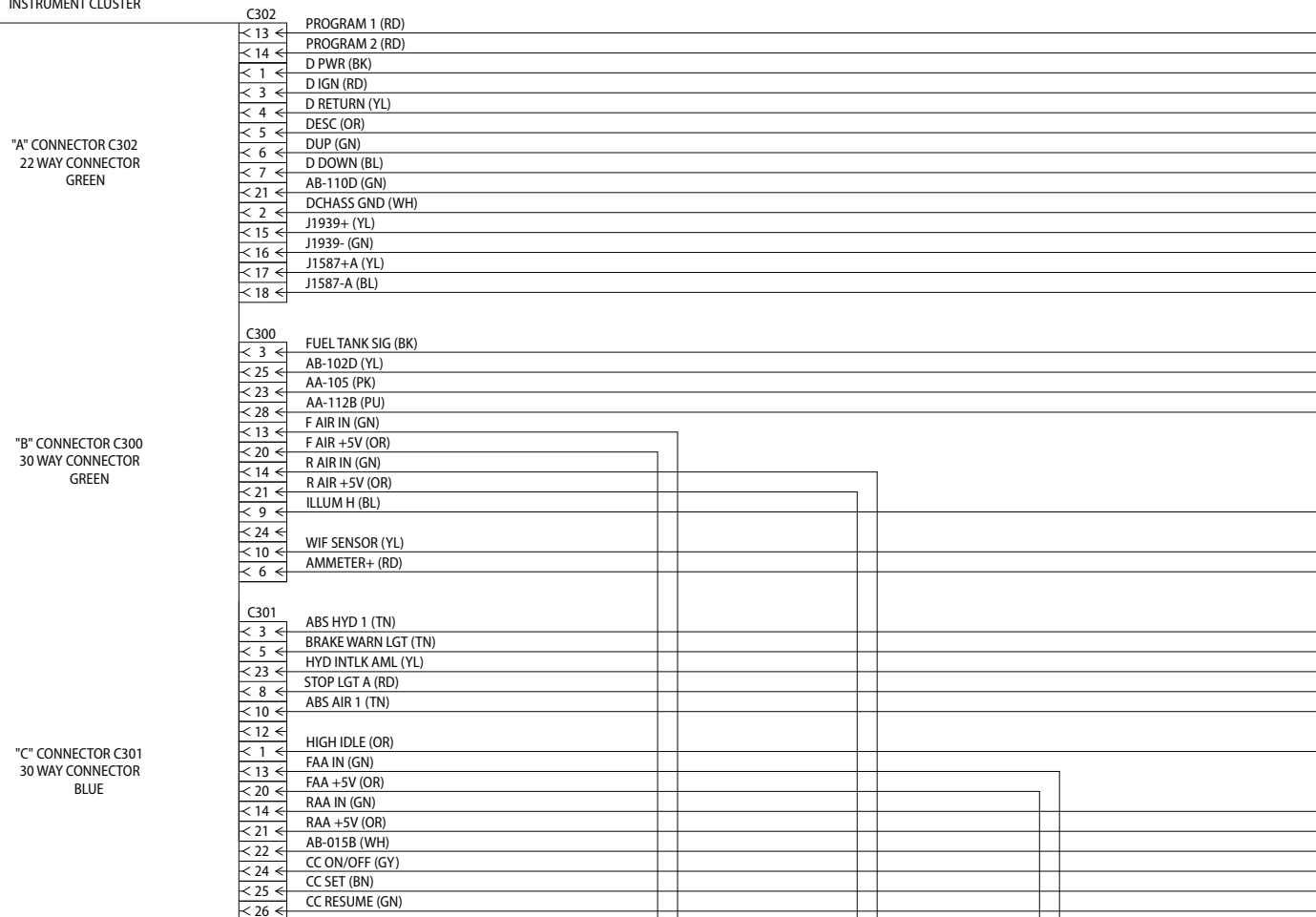
TO
HEATER/STEPWELL
HARNESS

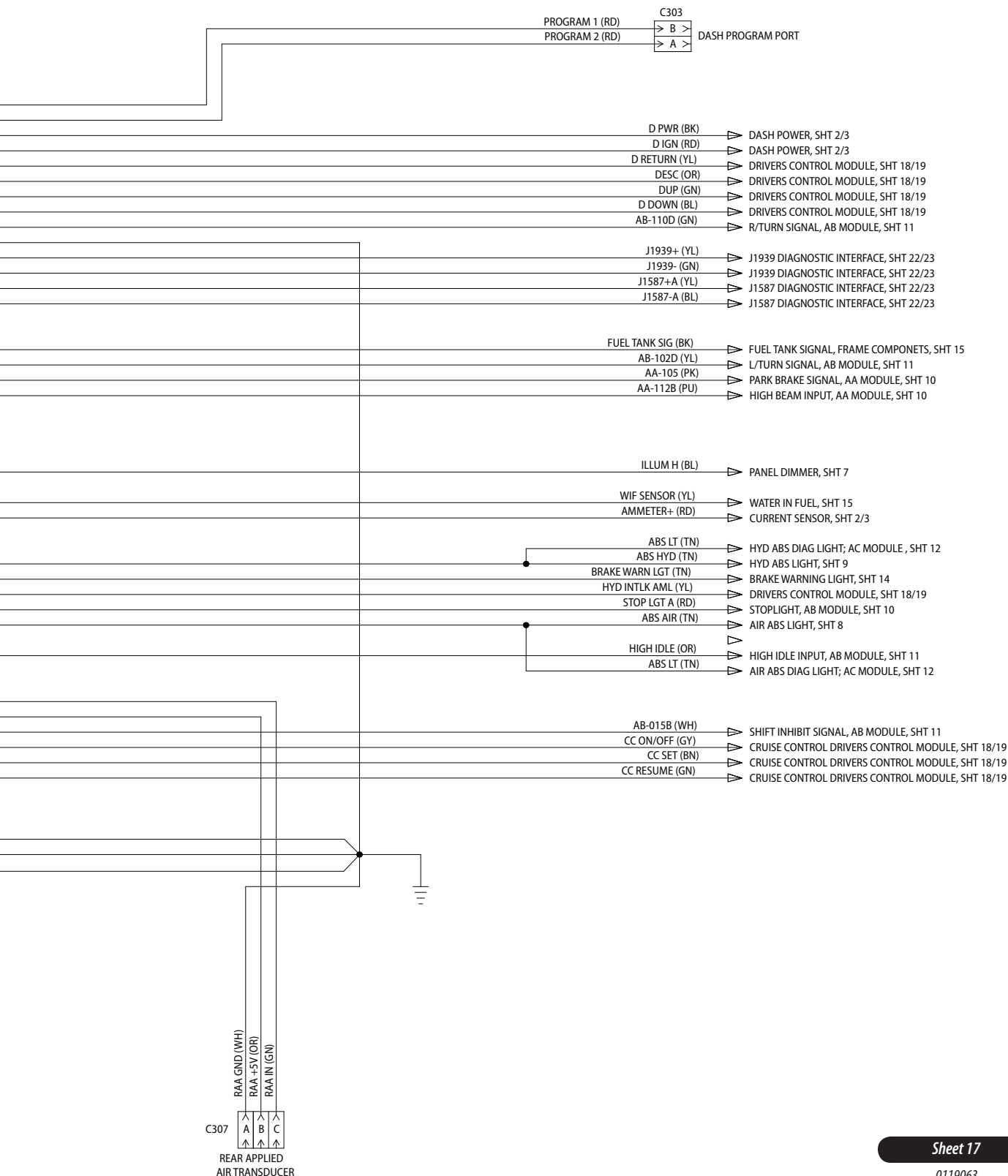
C700

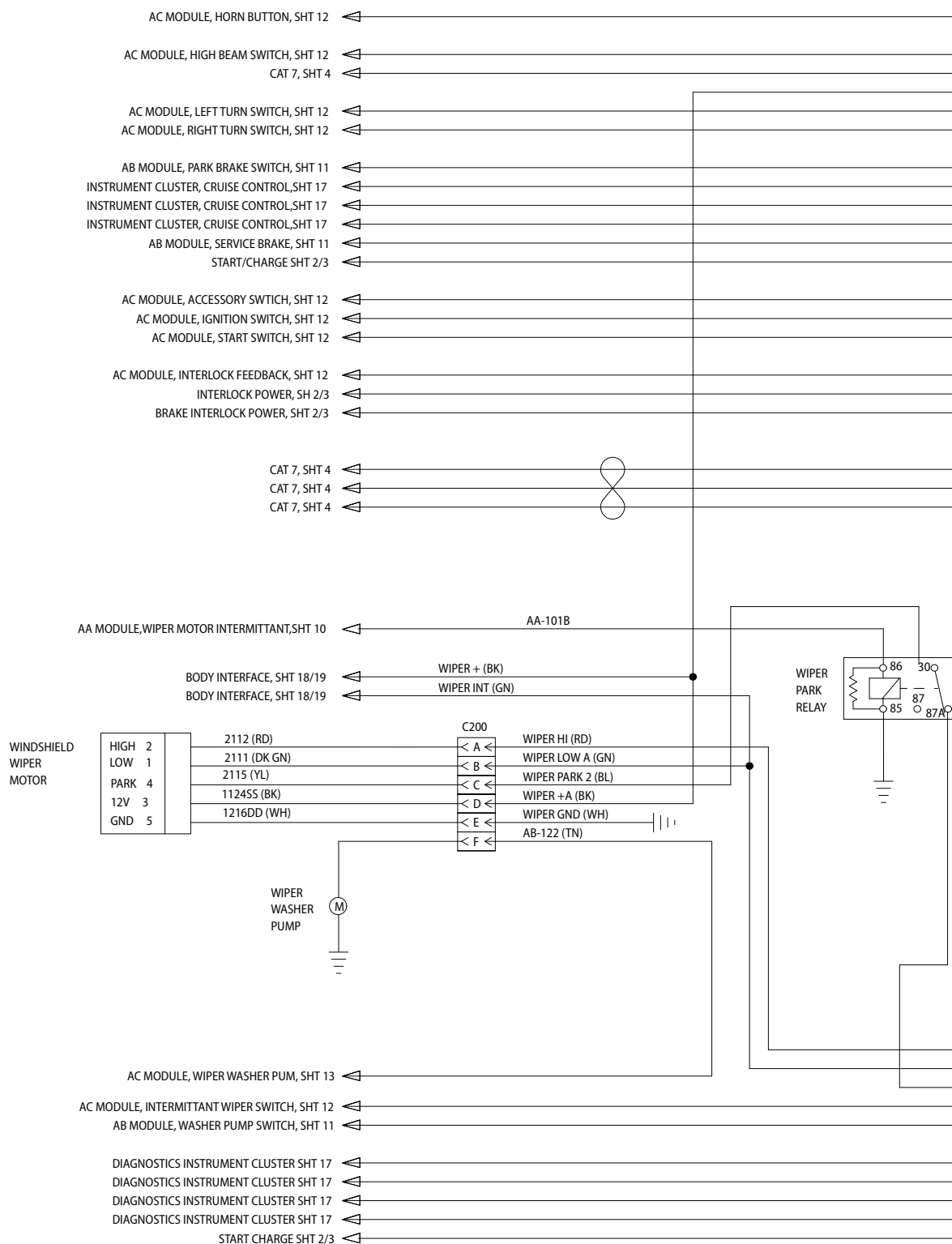


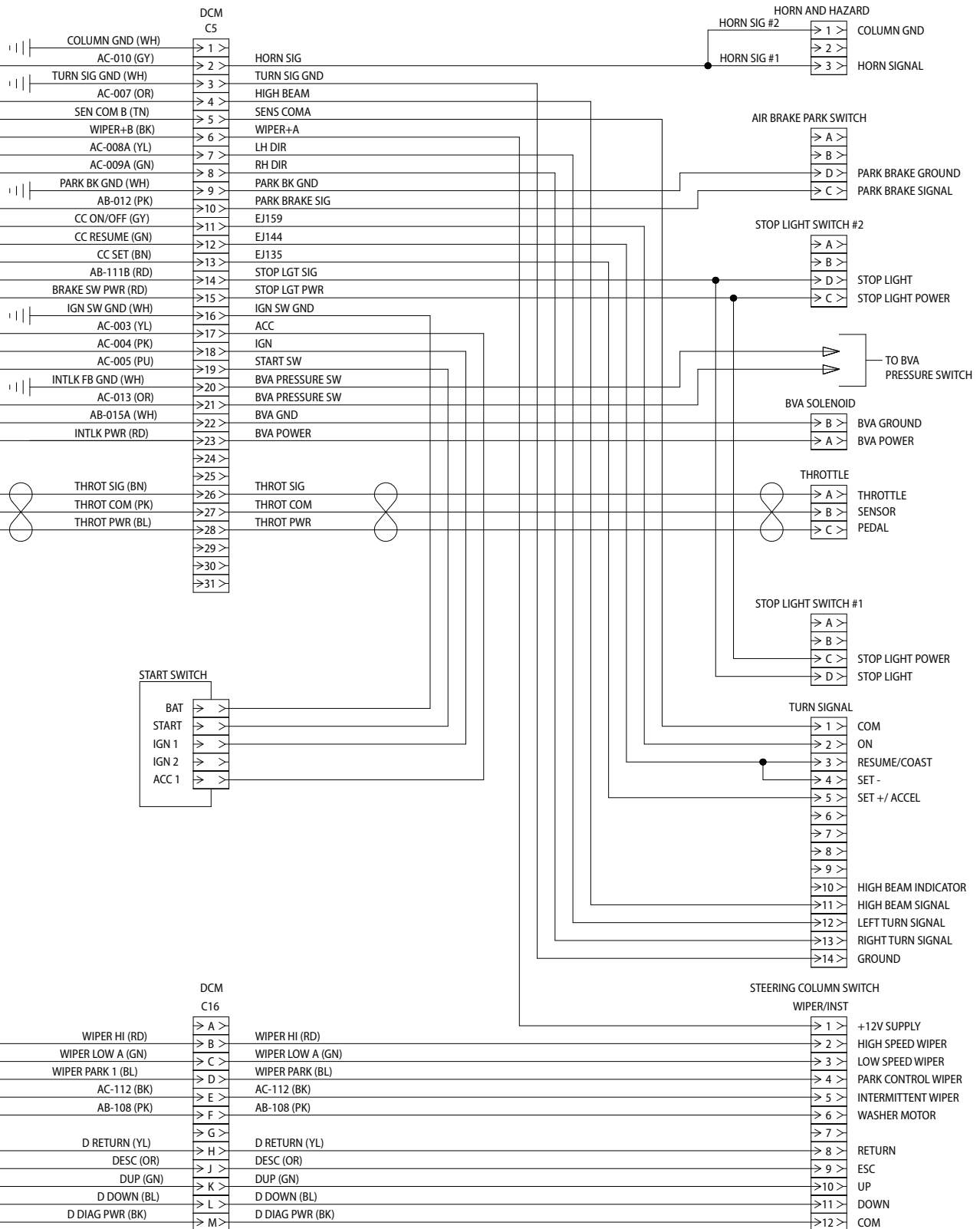


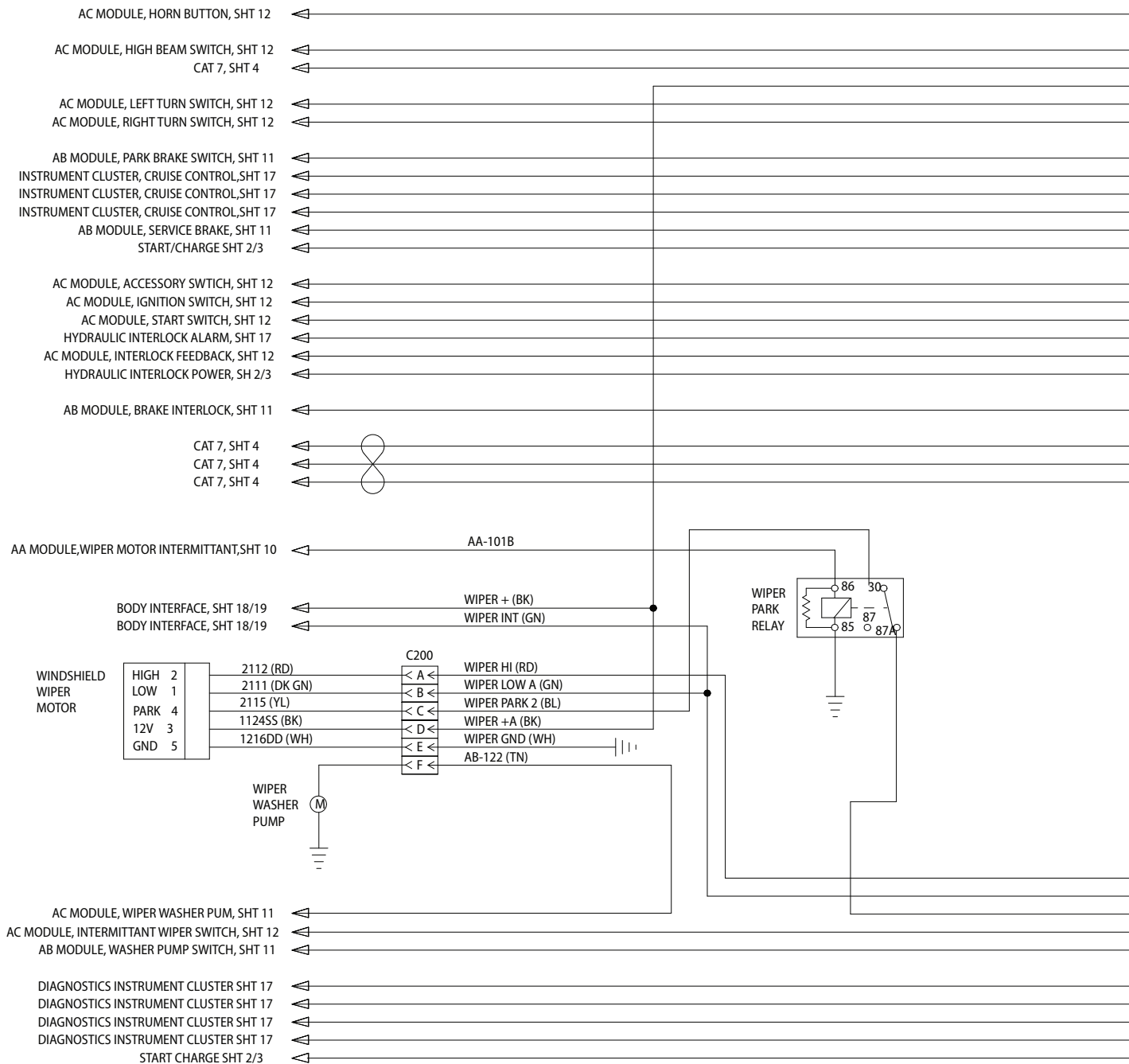
INSTRUMENT CLUSTER

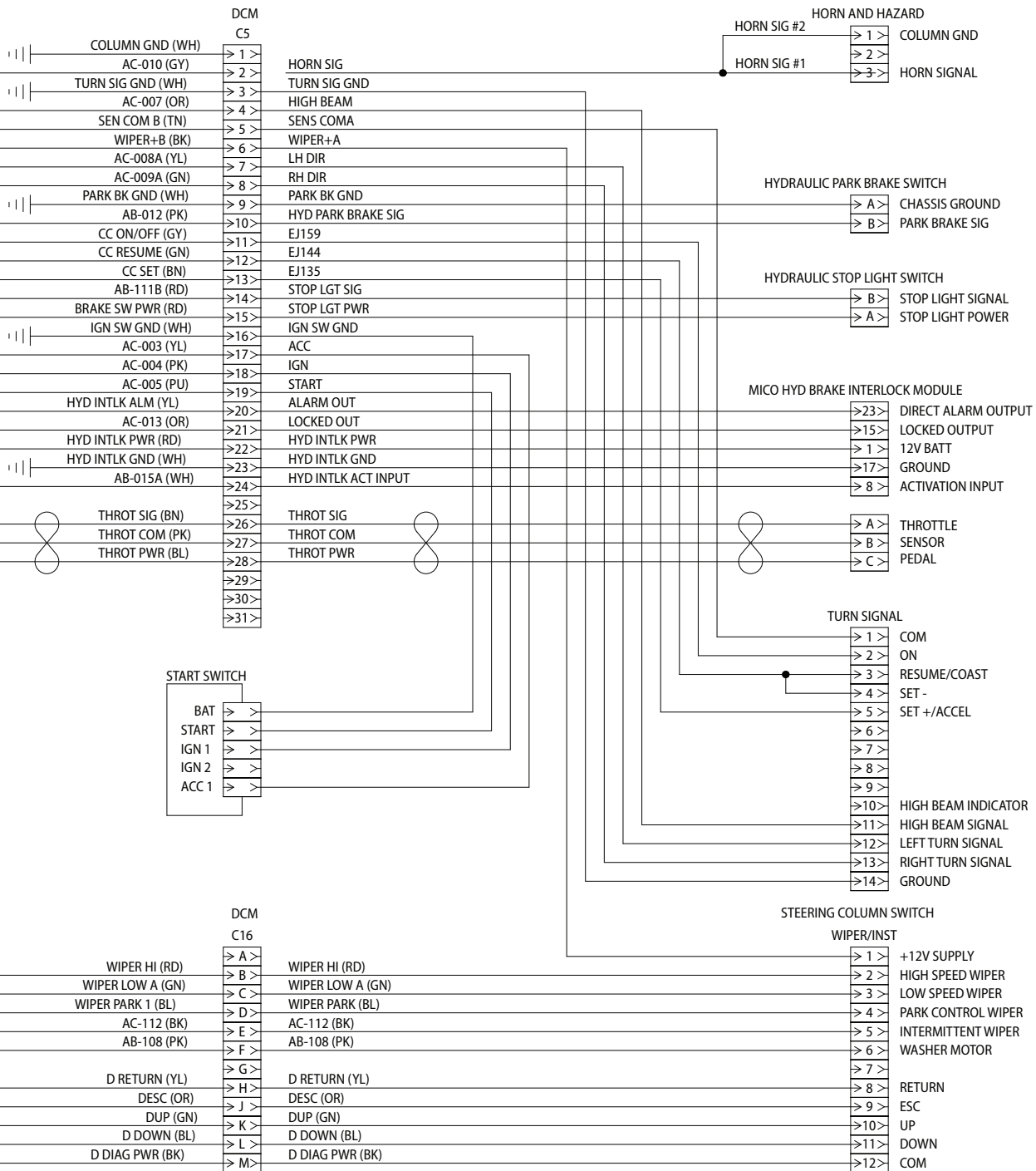


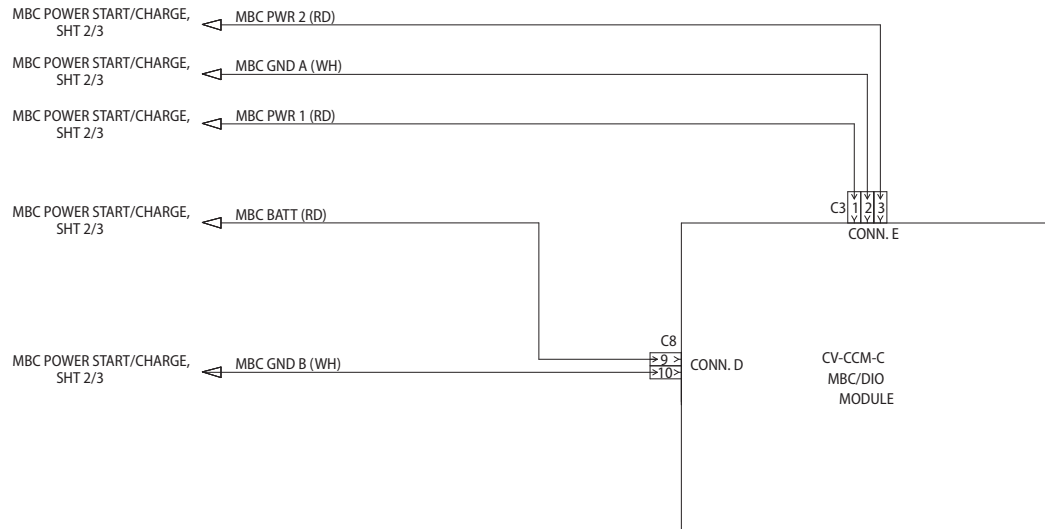








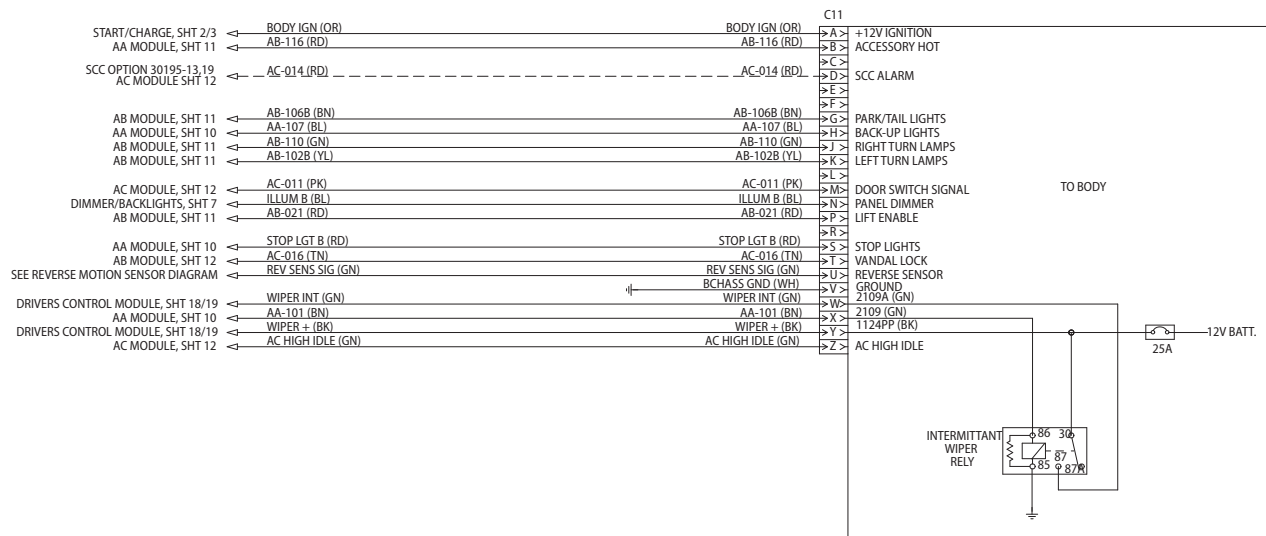




Sheet 20

0116704

MBC MODULE



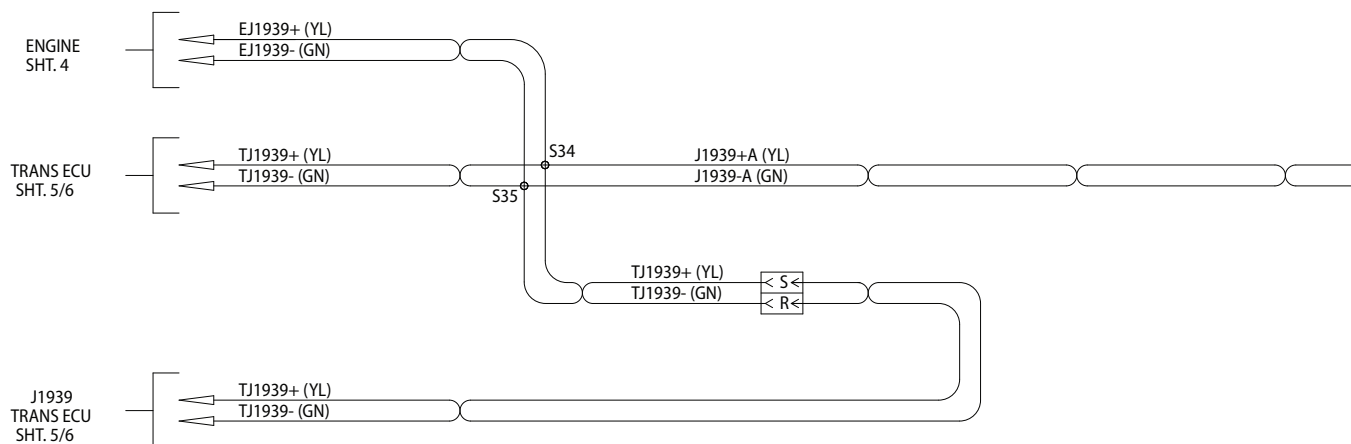
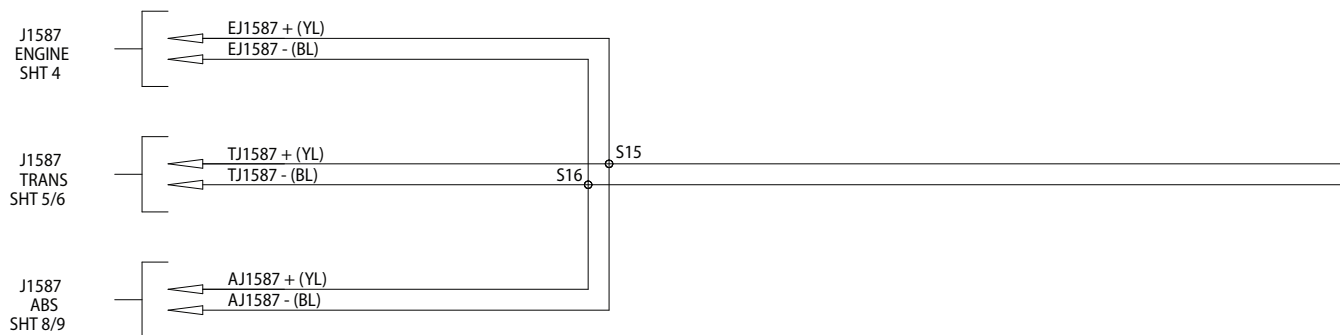
Sheet 21

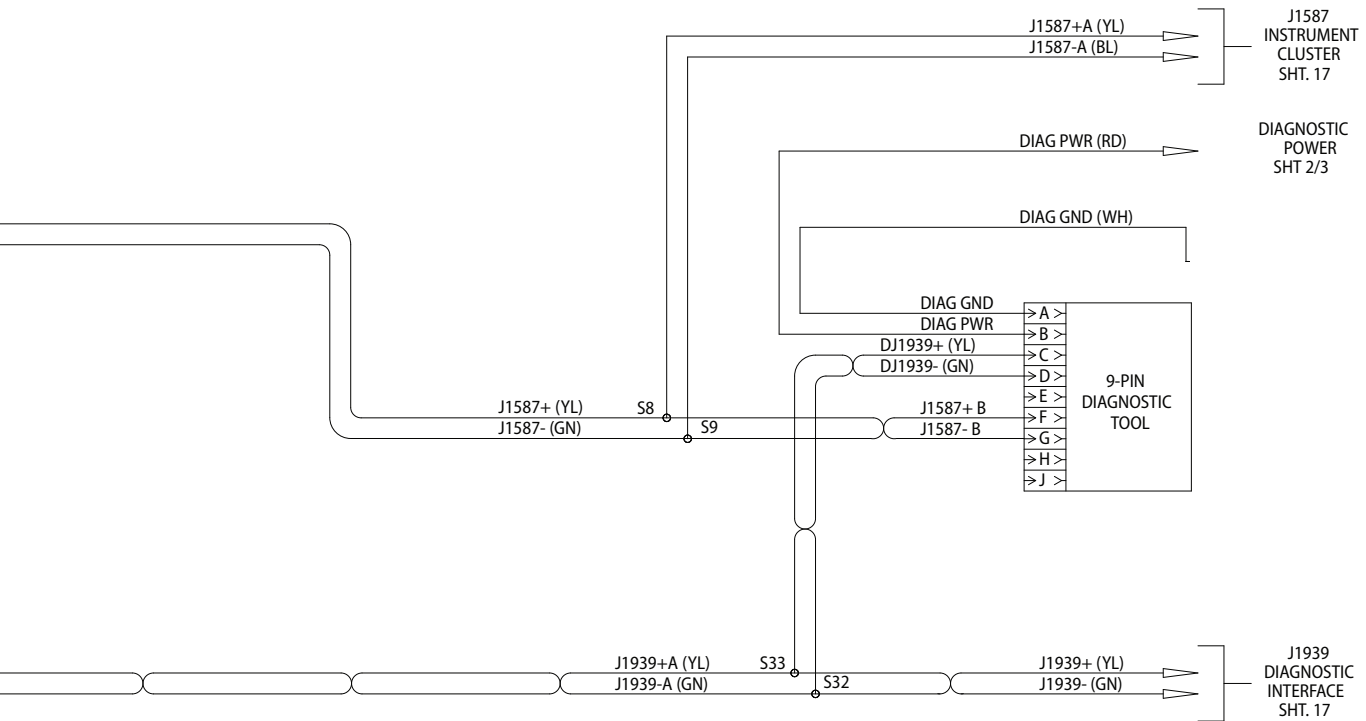
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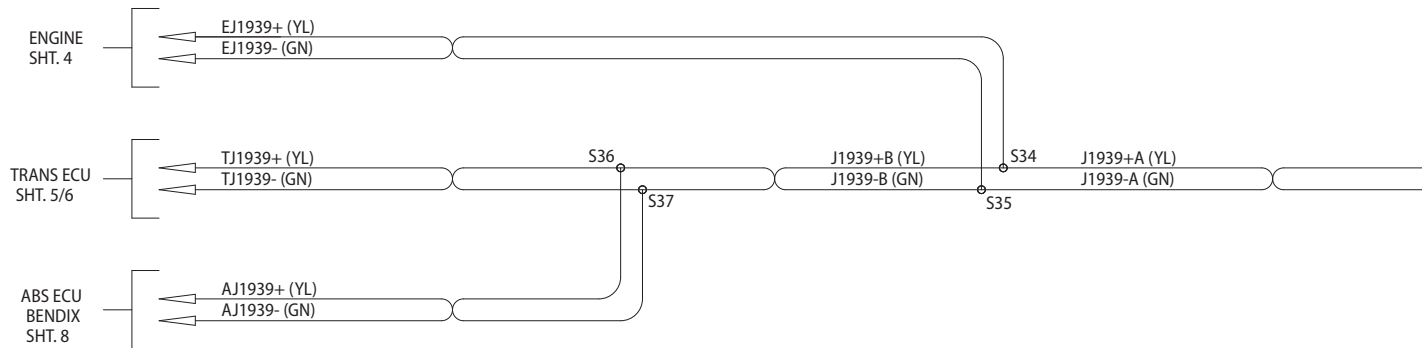
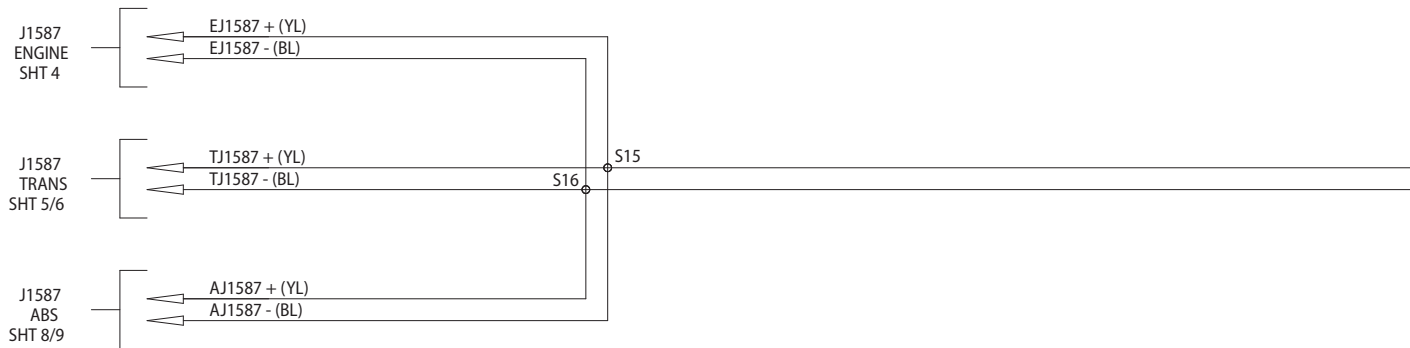
BODY INTERFACE

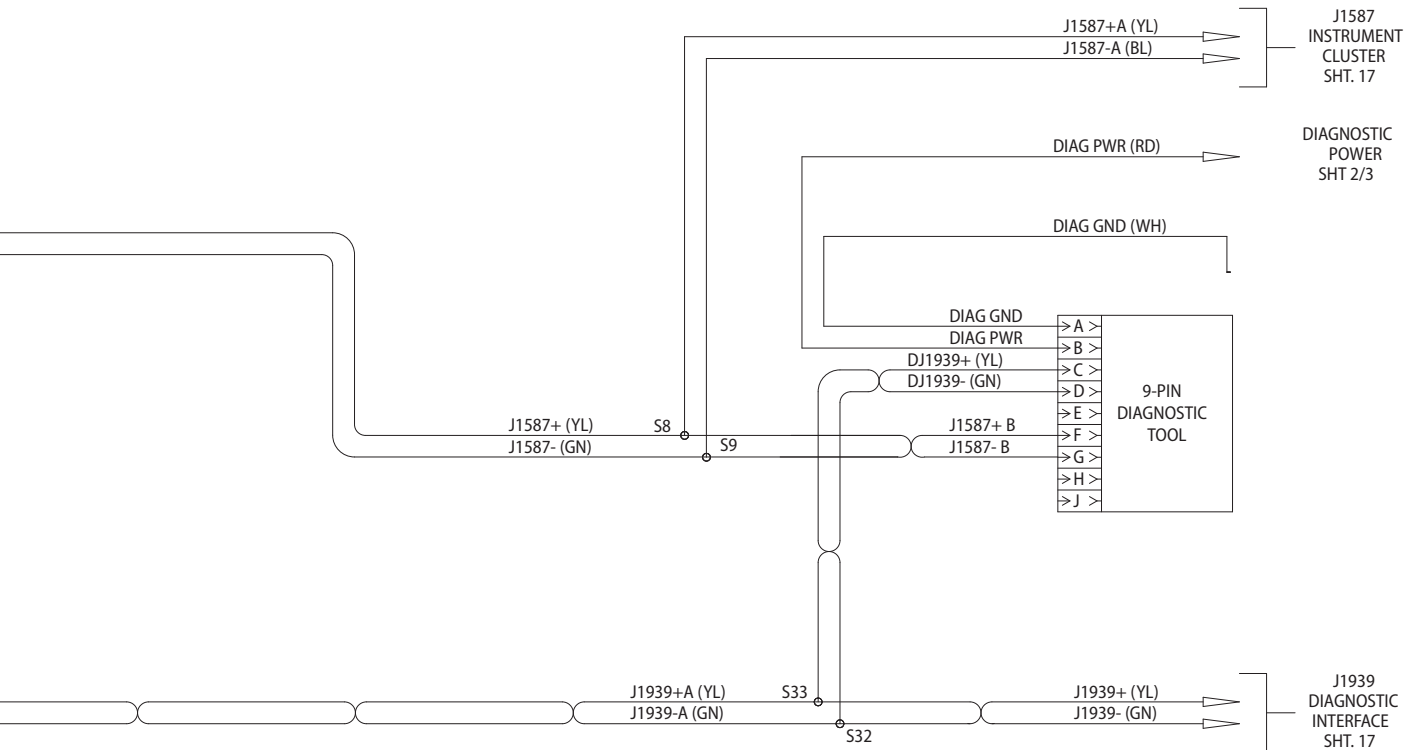
793

CAT C7-07











Electrical Diagrams for Cummins ISB-07 Engines

Description	Sheet	Drawing Number
Index	1	0117178C
Starting And Charging, Cummins	2	0117347A
Starting And Charging (with Florida circuit breakers)	3	0117348A
Cummins ISB07 Engine	4	0112291C
Allison Gen 4 2000 Transmission	5	0112276
Allison Gen 4 3000 Transmission	6	0112292A
Dimmer / Backlights	7	0112293
ABS - Bendix (air)	8	0112294
ABS - Wabco (hydraulic)	9	0117179A
AA Multiplex Module	10	0112296C
AB Multiplex Module	11	0112297B
AC Multiplex Module	12	0112298
Mirror Heat / Exterior Speaker / Wiper Washer	13	0112299
Hydraulic Brake Boost	14	0112300
Frame Components	15	0112301A
Crossing Arm	16	0112302
Instrument Cluster	17	0117181
Driver's Control Module - Air	18	0112304A
Driver's Control Module - Hydraulic	19	0112305A
MBC Module	20	0112306A
Body Interface	21	0112307
J1939 Datalink, Hydraulic	22	0117183
J1939 Datalink, Air	23	0112310

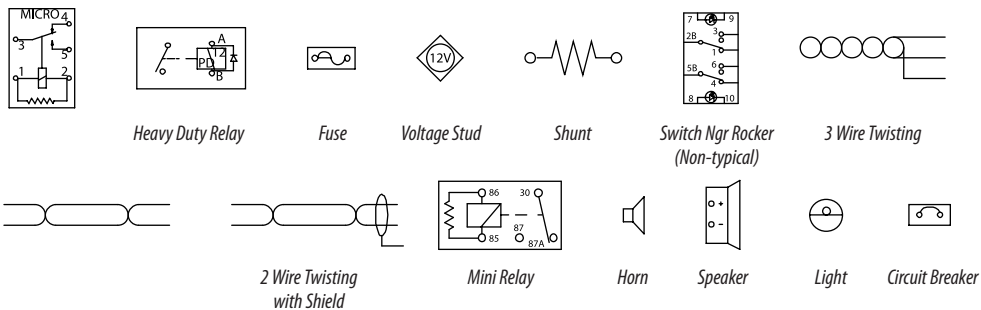
Wire Colors

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

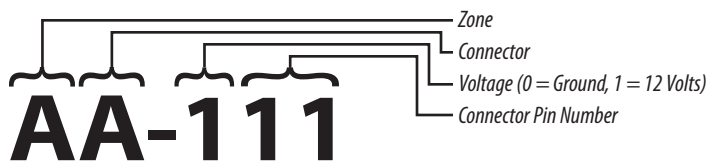
Schematic Legend

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

Electrical Component Index



Multiplex Wire Indexing (Circuit Number Code)



Example: (Zone A, Connector A, 12 Volts, Pin #11)

Sheet 1

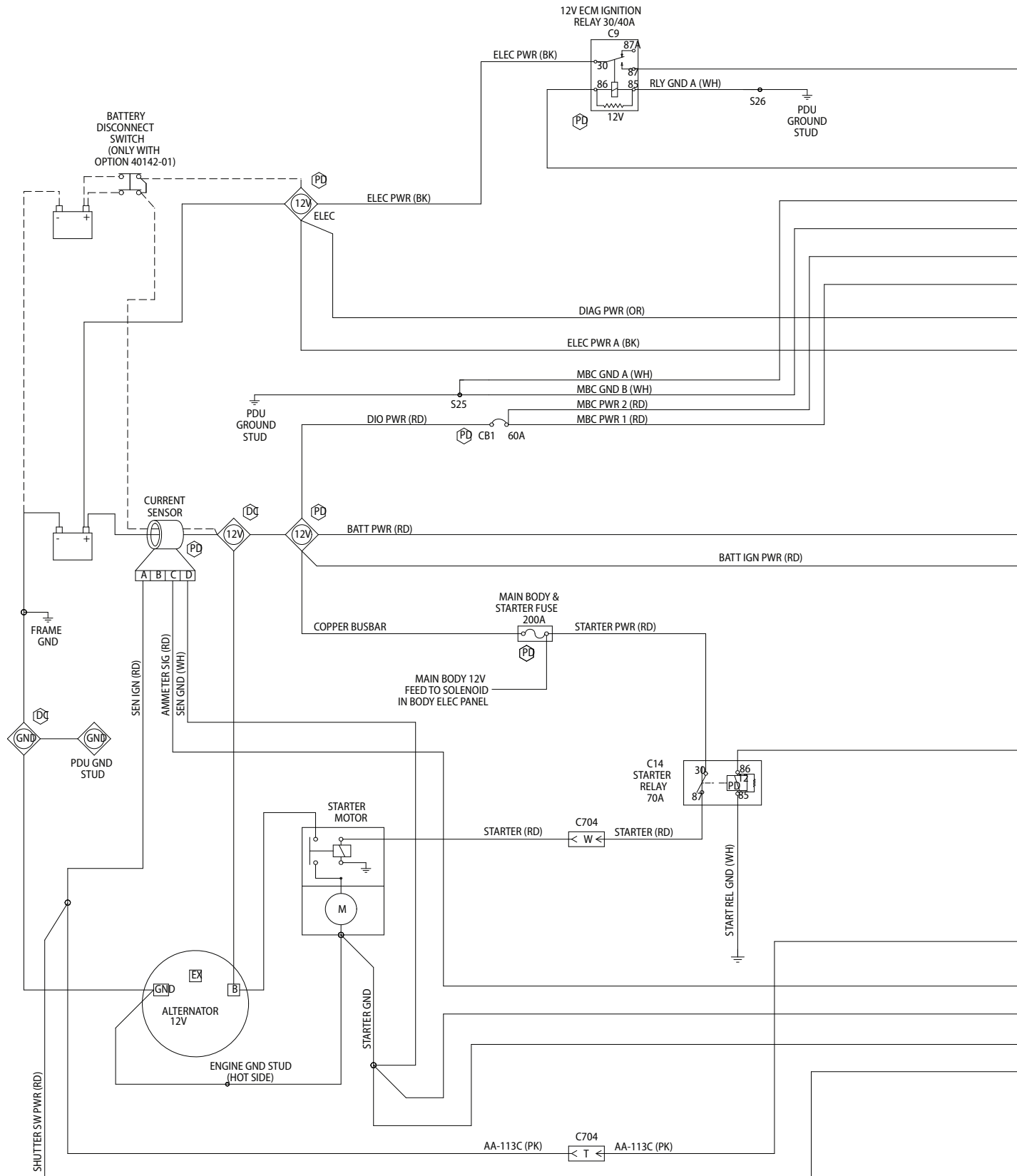
0117178C

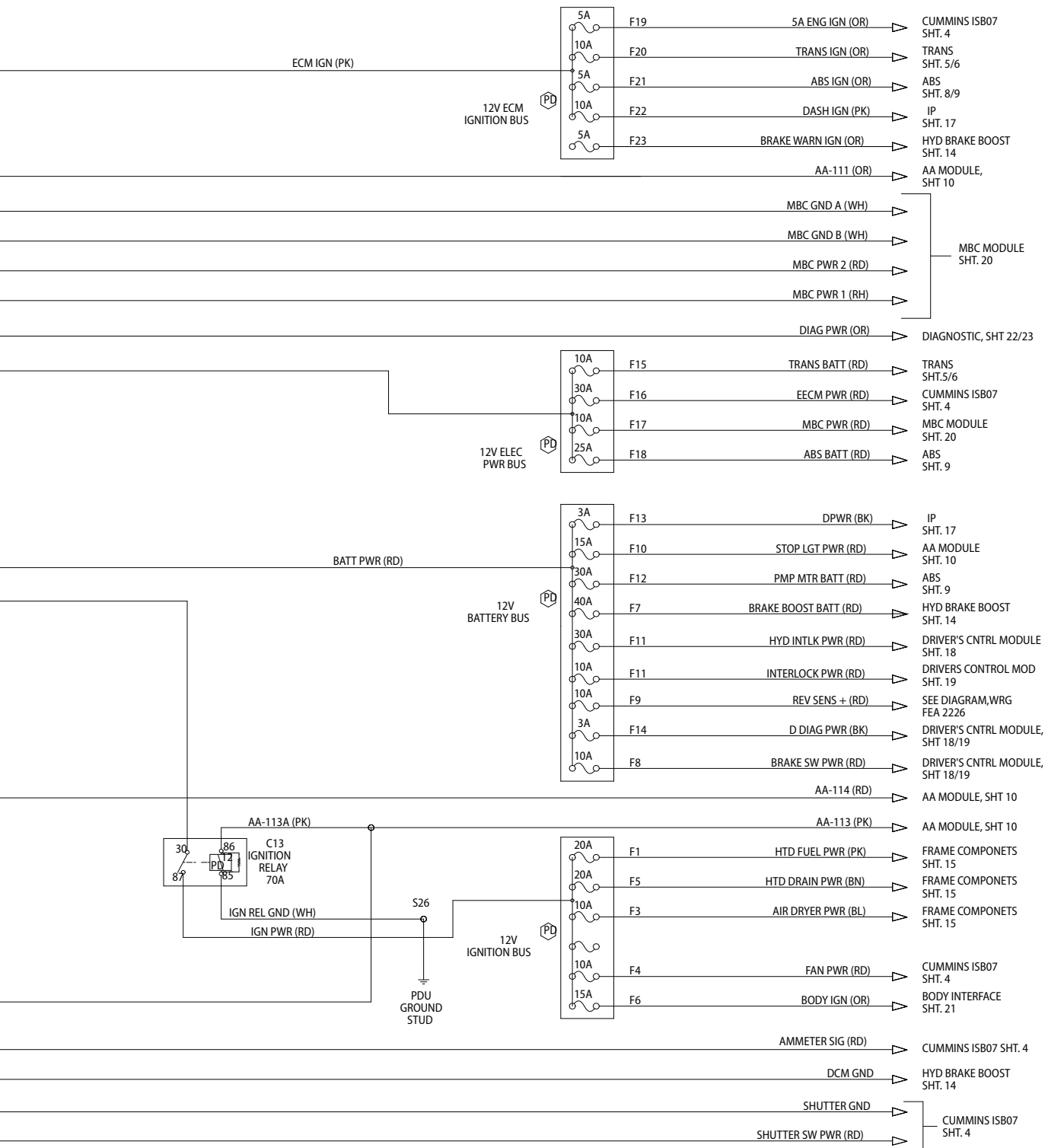
SCHEMATIC, WRG, CUM ISB07, INDEX

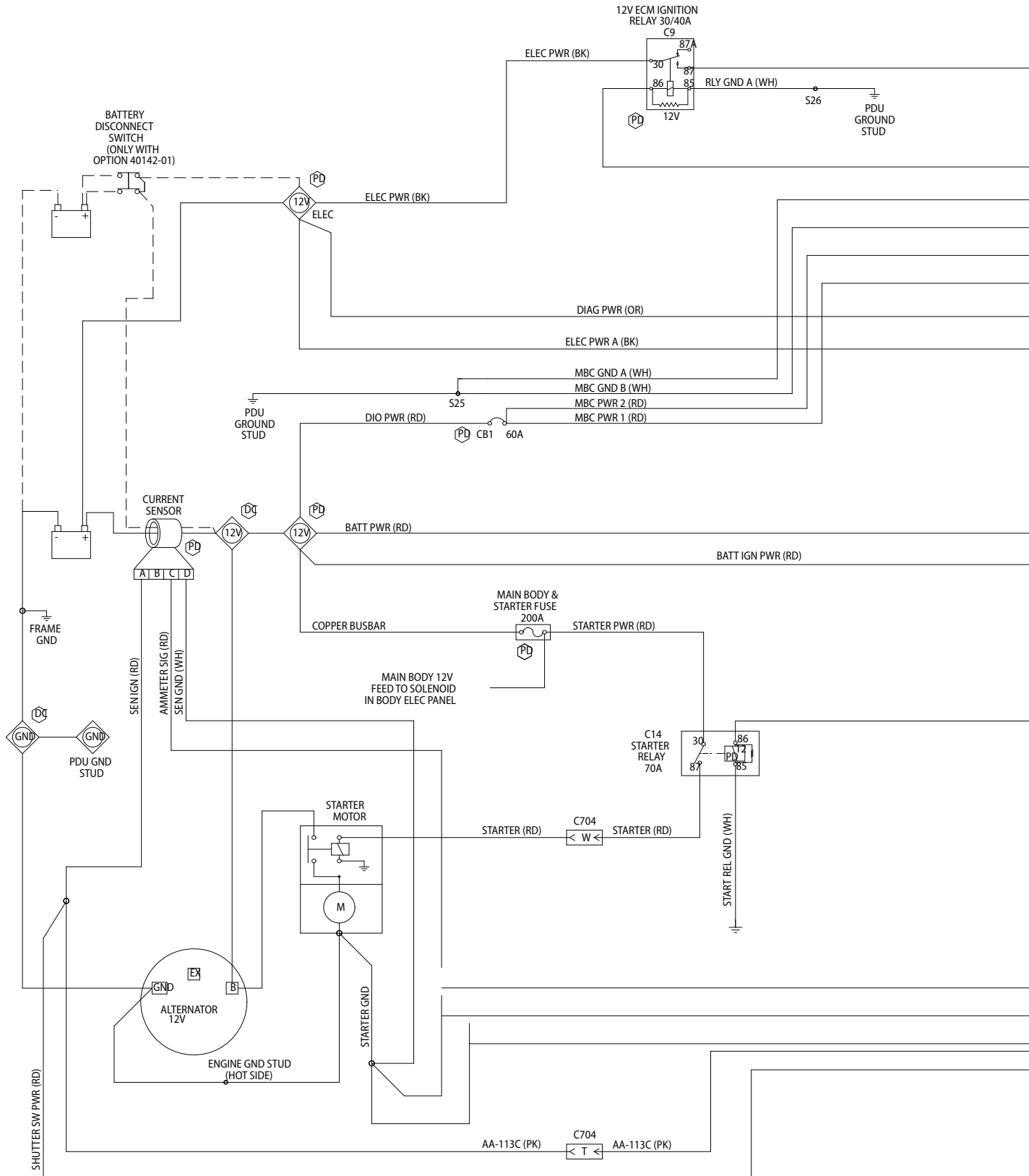
799

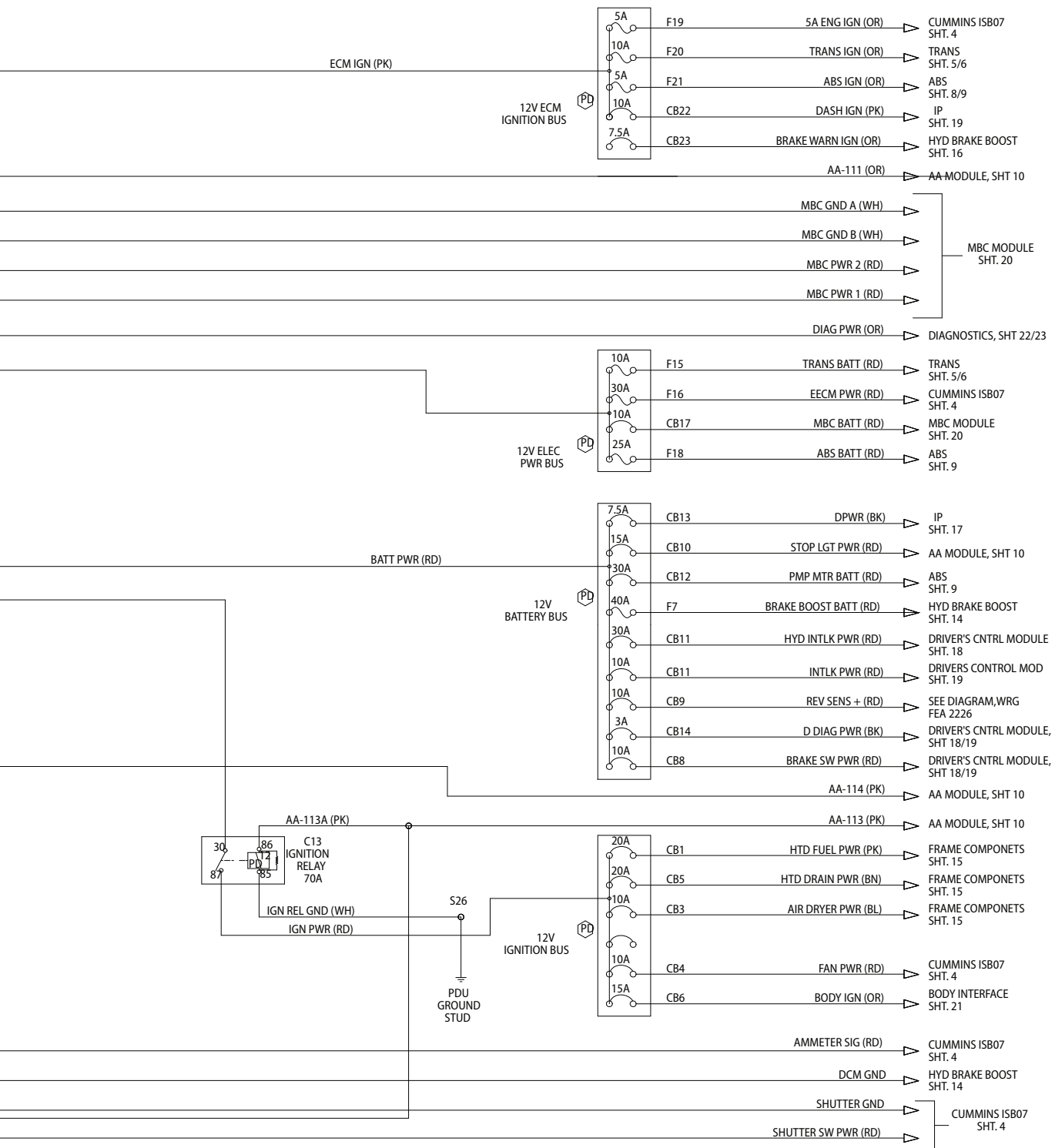
CUM ISB-07











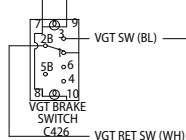
EECM POWER START CHARGE SHT. 2/3
ENGINE IGN START CHARGE SHT. 2/3

INSTRUMENT PANEL SHT. 19
MODULE AB SHT. 11
MODULE AC SHT. 12
MODULE AC SHT. 12
MODULE AC SHT. 12

DRIVER'S CONTROL MODULE
SHT. 18/19

DIMMER/BACKLIGHTS SHT. 7
DIMMER/BACKLIGHTS SHT. 7

GND 3H
ILLUM K



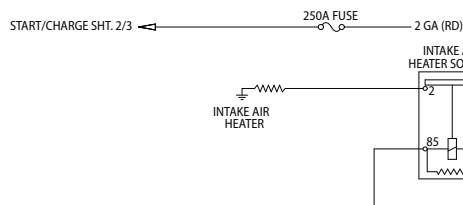
9100RESISTOR
.5W 5%

START CHARGE SHT. 2/3 FAN PWR (RD)

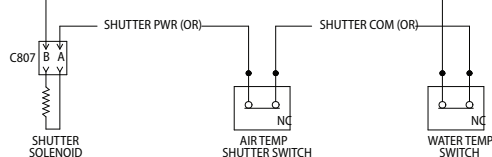


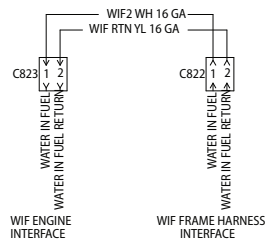
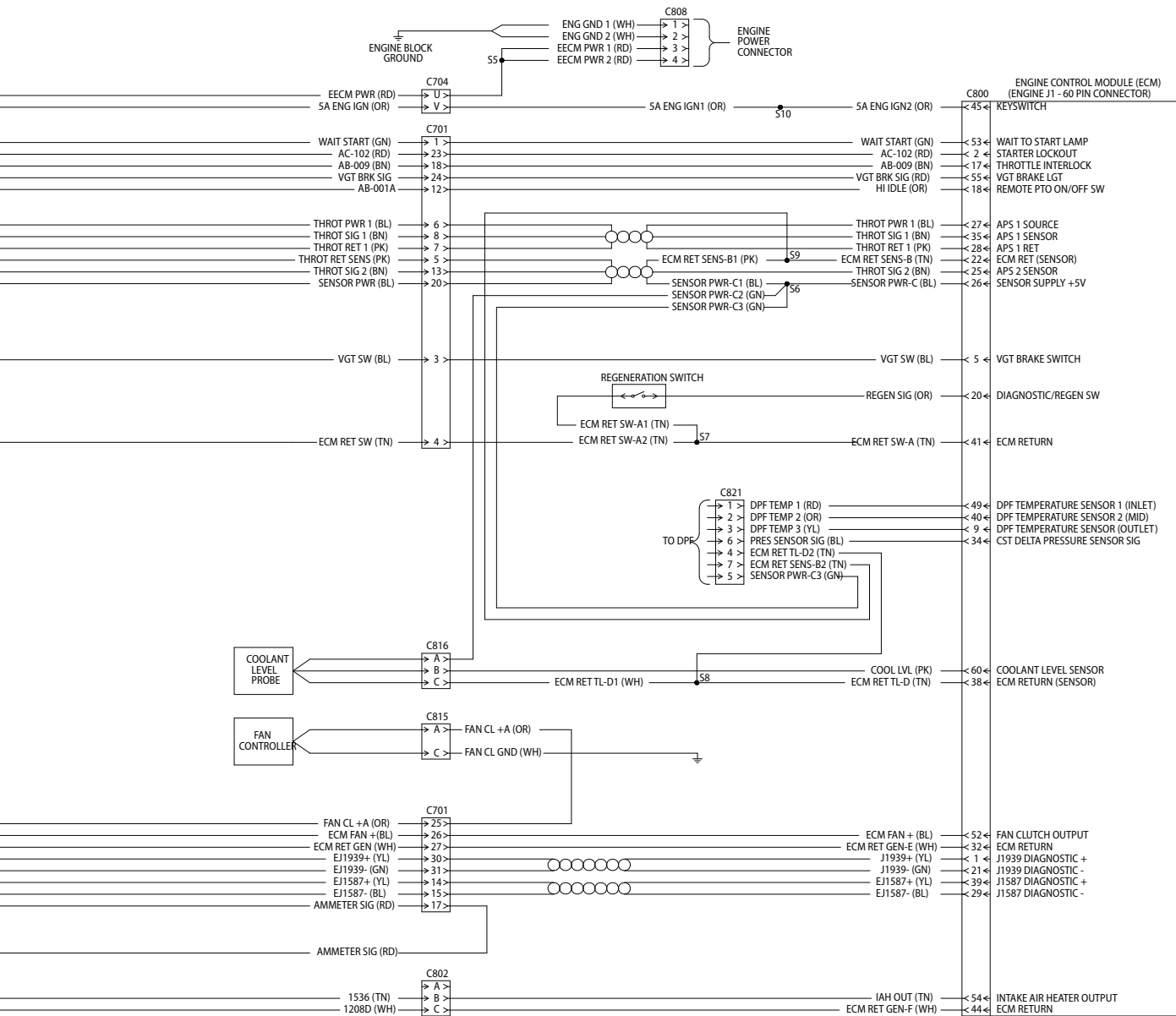
J1939 DATALINK SHT. 22/23
J1939 DATALINK SHT. 22/23
INSTRUMENT PANEL SHT. 17
START/CHARGE SHT. 2/3

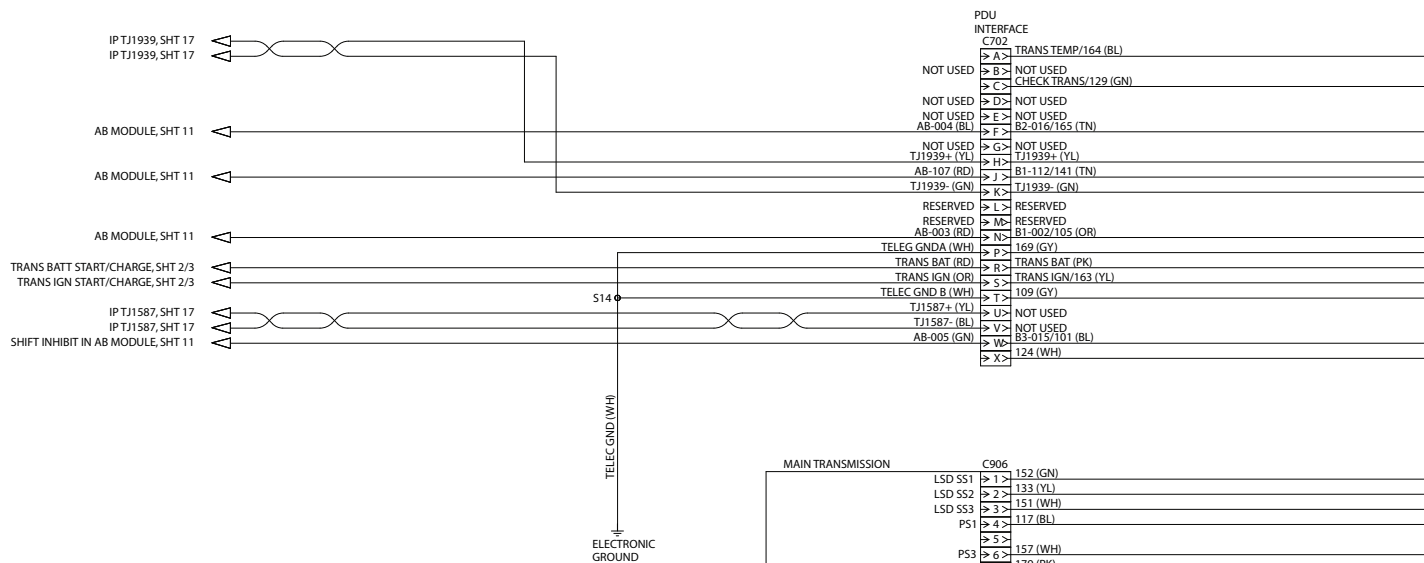
INSTRUMENT PANEL SHT. 17



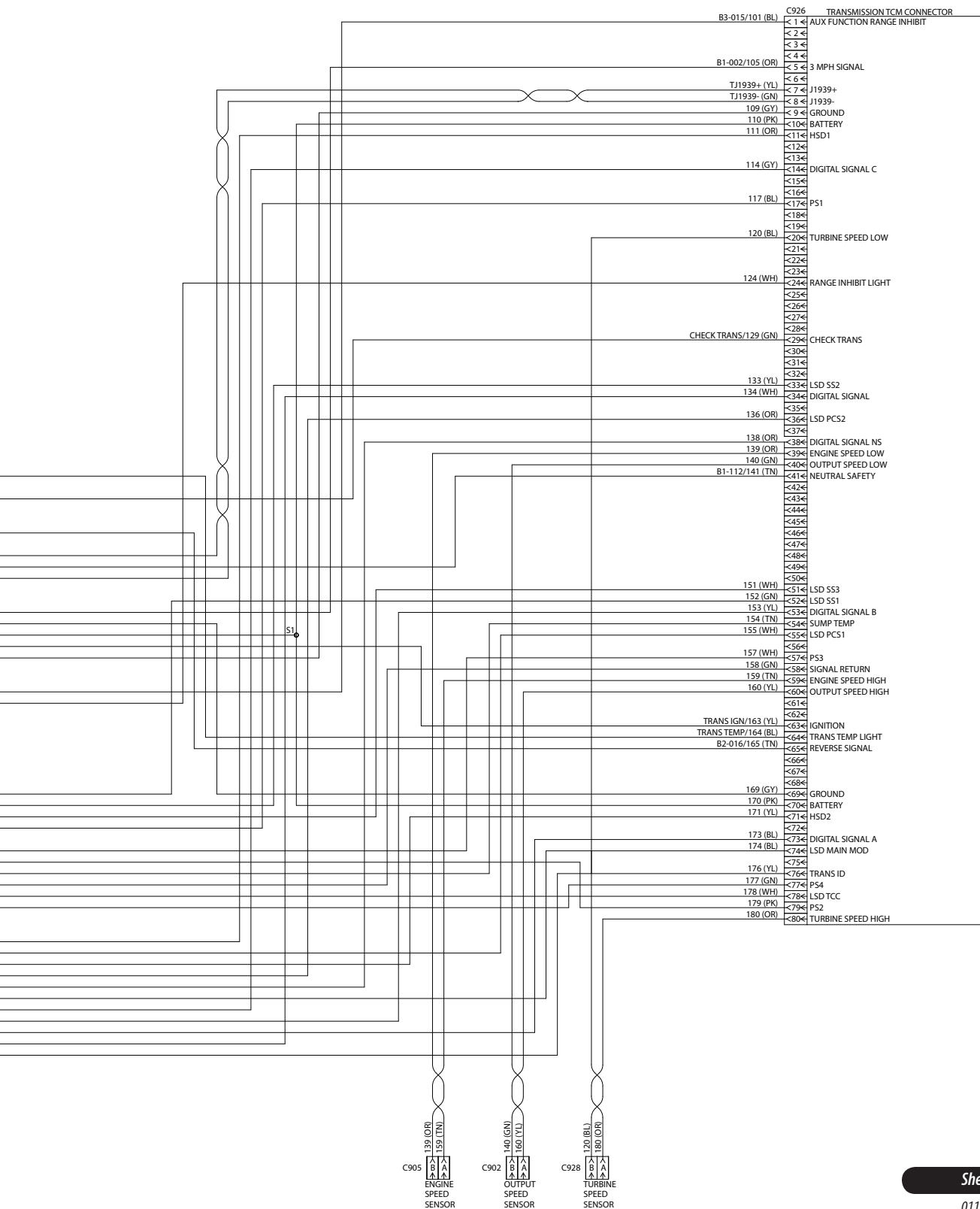
START/CHARGE SHT. 2/3 SHUTTER SW PWR (RD)
START/CHARGE SHT. 2/3 SHUTTER GND (WH)

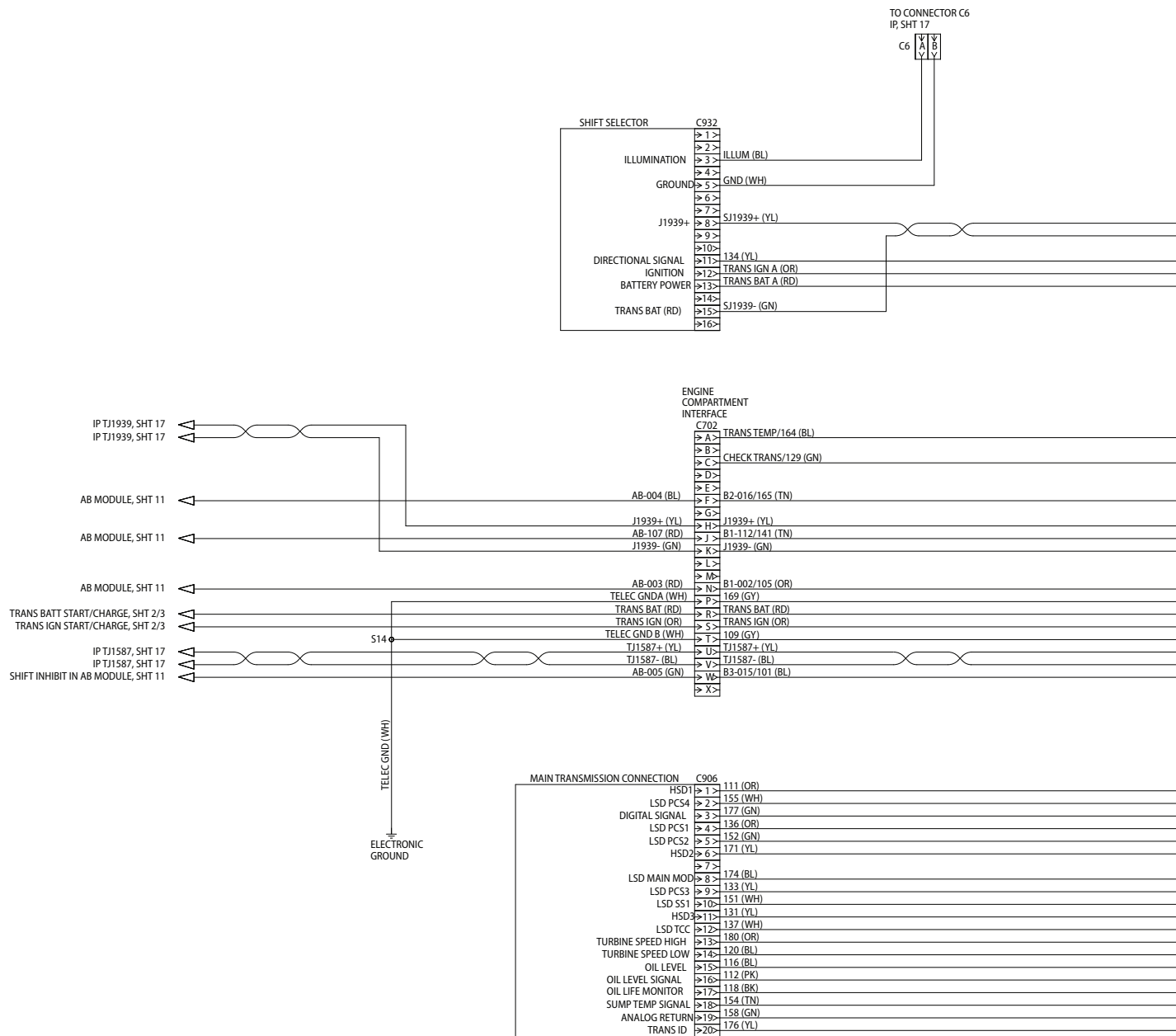


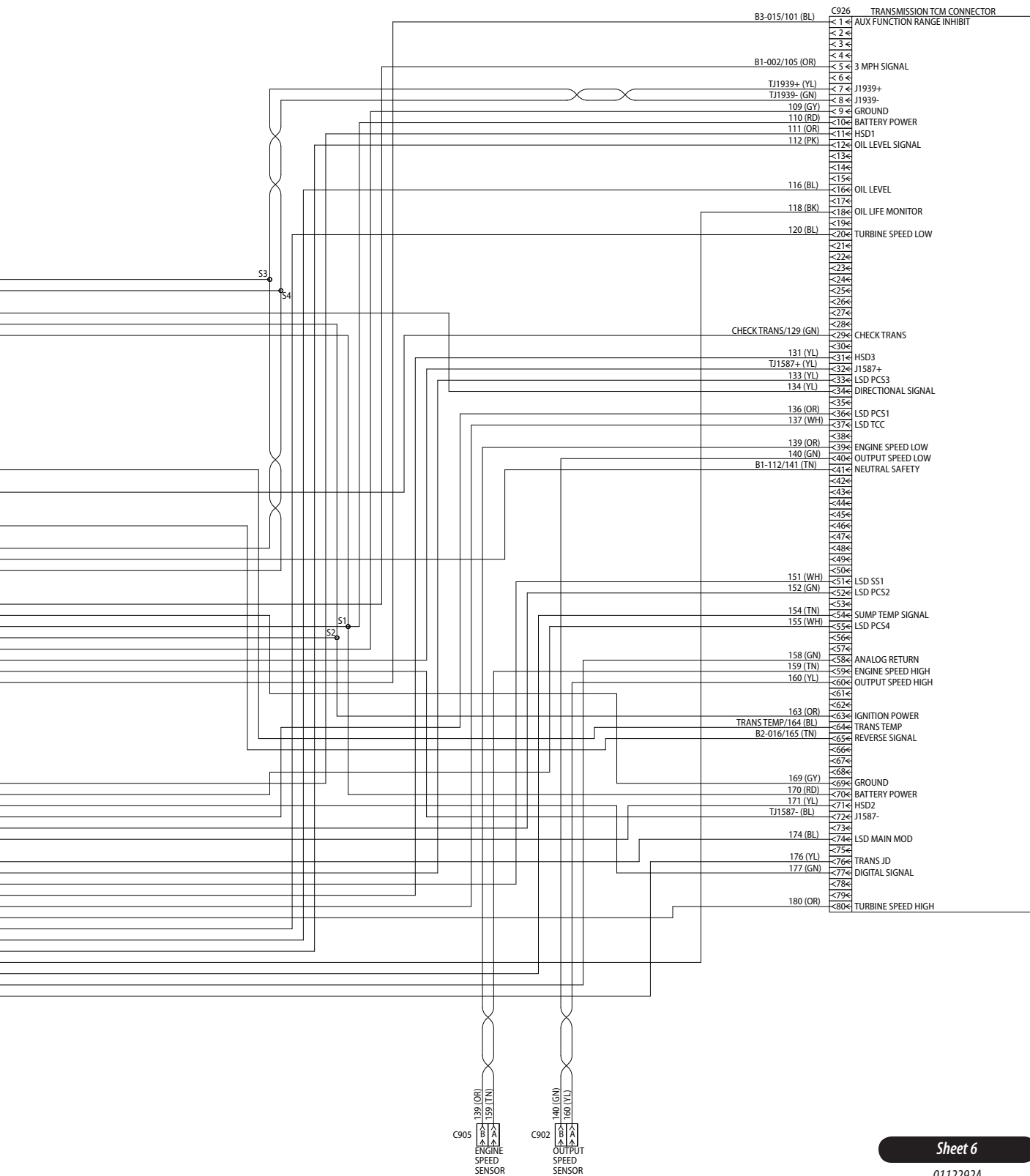


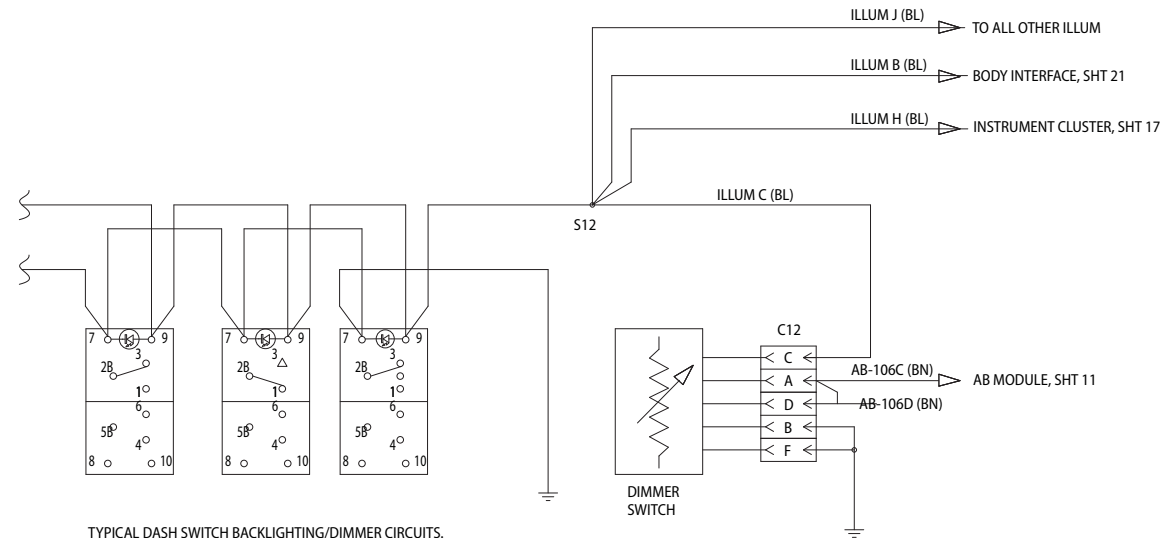


MAIN TRANSMISSION		C906
LSD SS1	1	152 (GN)
LSD SS2	2	133 (YL)
LSD SS3	3	151 (WH)
PS1	4	117 (BL)
	5	
PS3	6	157 (WH)
PS2	7	179 (PK)
SUMP TEMP	8	154 (TN)
SIGNAL RETURN	9	158 (GN)
LSD TCC	10	178 (WH)
PS4	11	177 (GN)
	12	
	13	
HSD1	14	111 (OR)
LSD PCS1	15	155 (WH)
HSD2	16	171 (YL)
LSD PCS2	17	136 (OR)
DIGITAL SIGNAL NS	18	138 (OR)
LSD MAIN MOD	19	174 (BL)
DIGITAL SIGNAL C	20	114 (GY)
DIGITAL SIGNAL B	21	153 (YL)
DIGITAL SIGNAL A	22	173 (BL)
DIGITAL SIGNAL P	23	134 (WH)
TRANS ID	24	176 (YL)

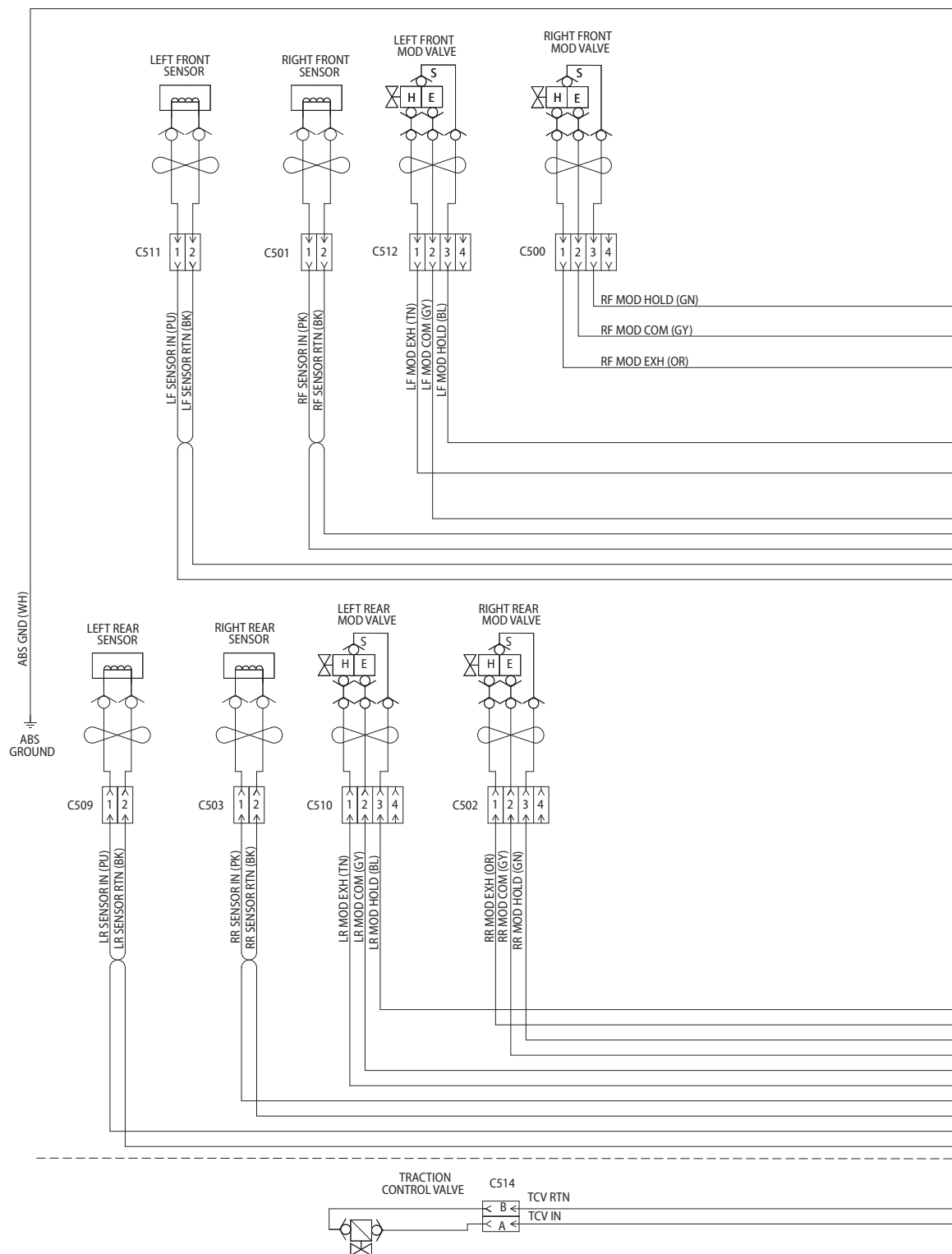


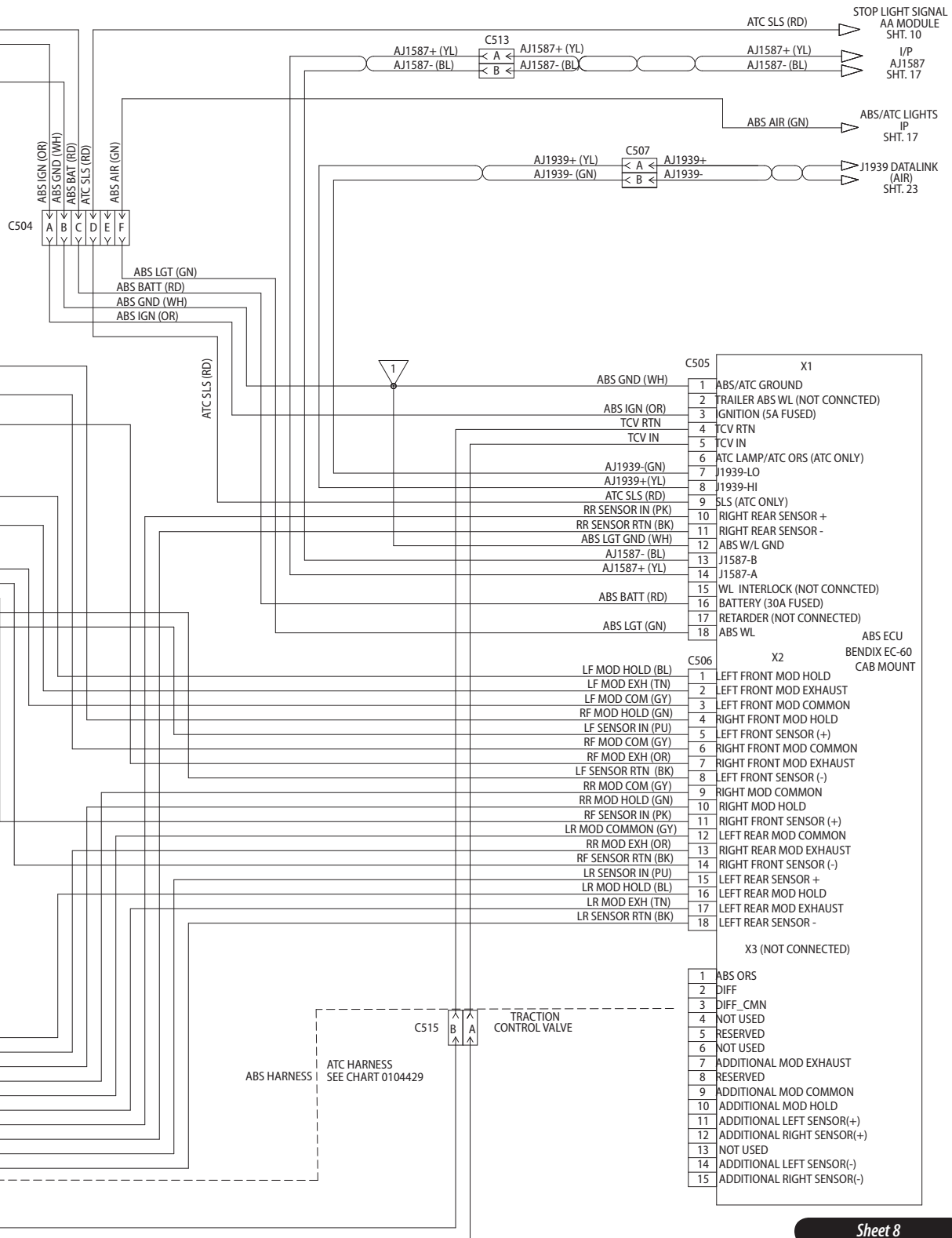






ABS BAT (RD)
ABS IGN (OR)
ABS
POWER/START/CHARG
SHT. 2/3





Sheet 8

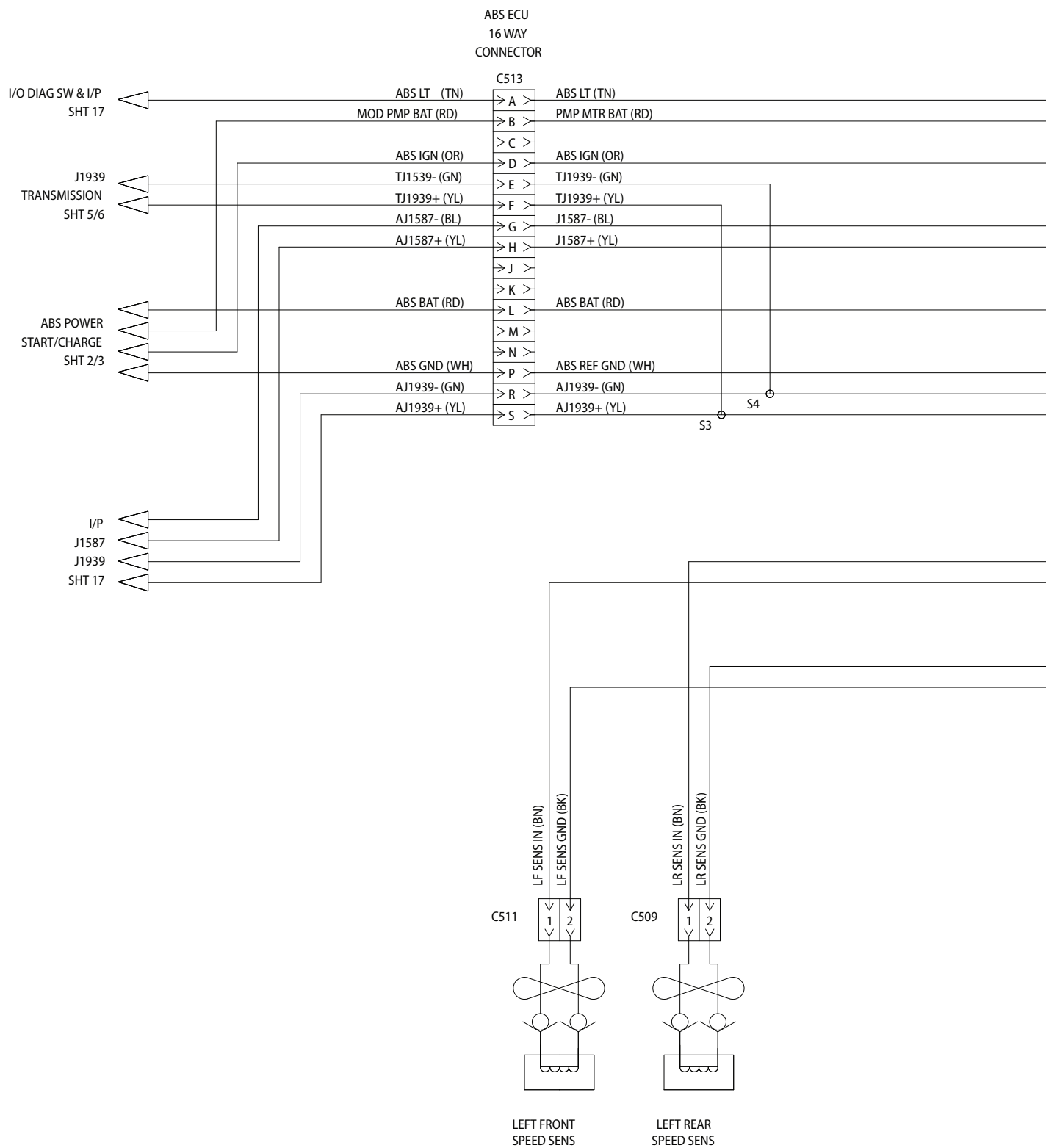
0112294

ABS - BENDIX

813

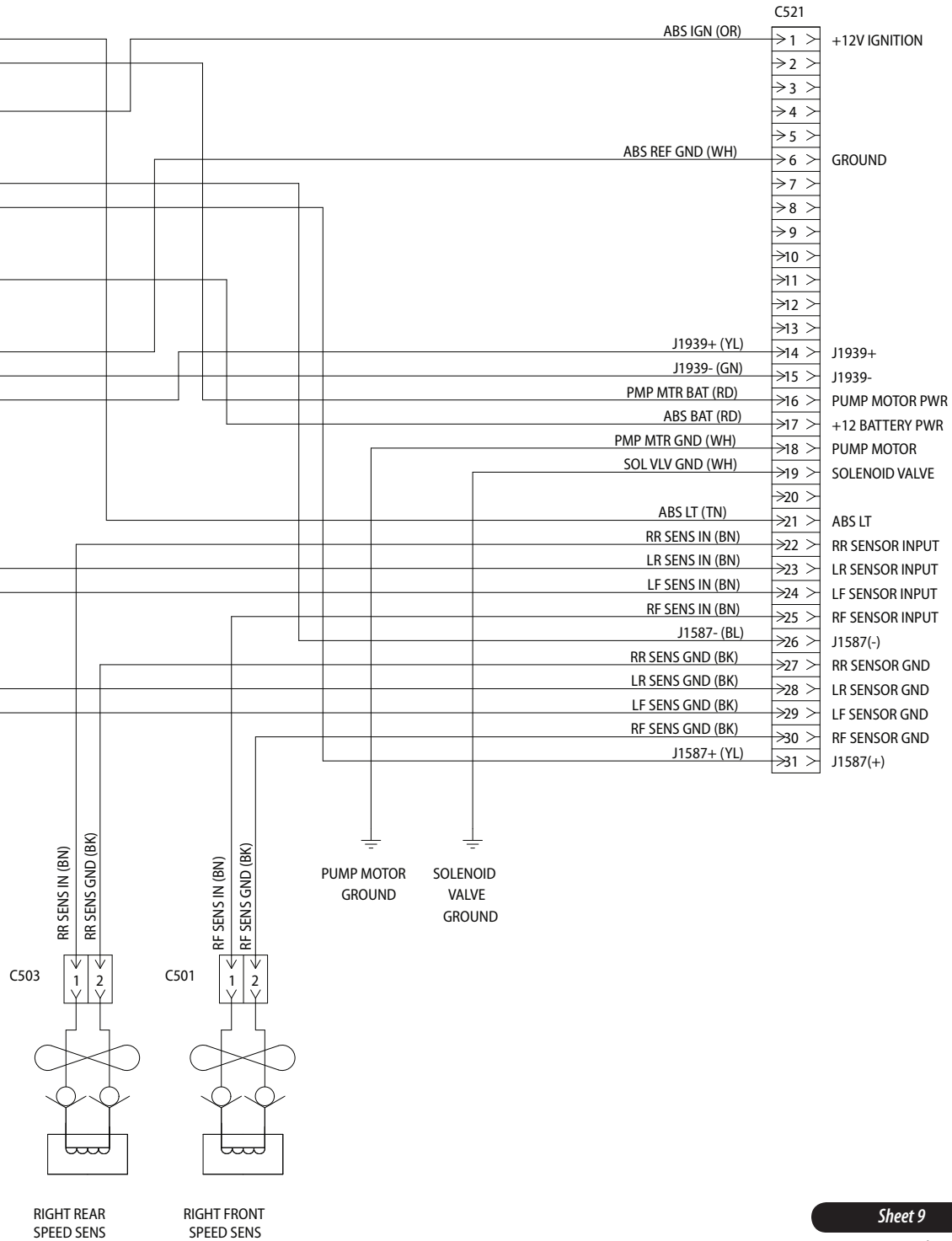
CUM ISB-07





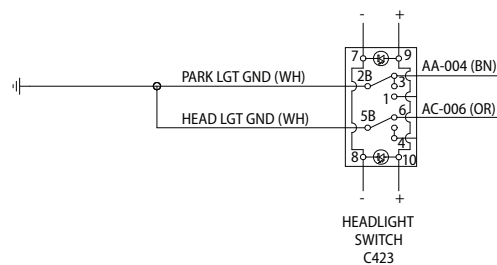
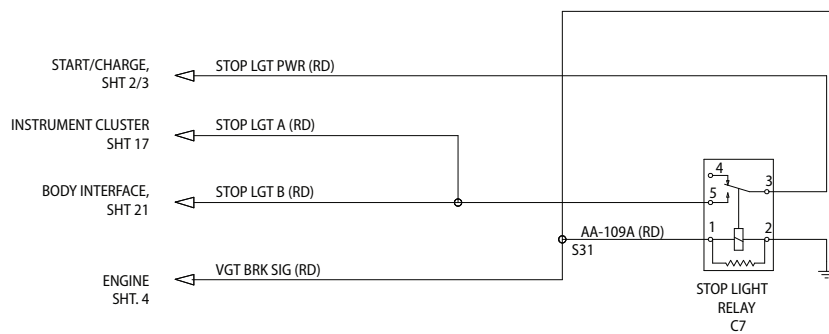


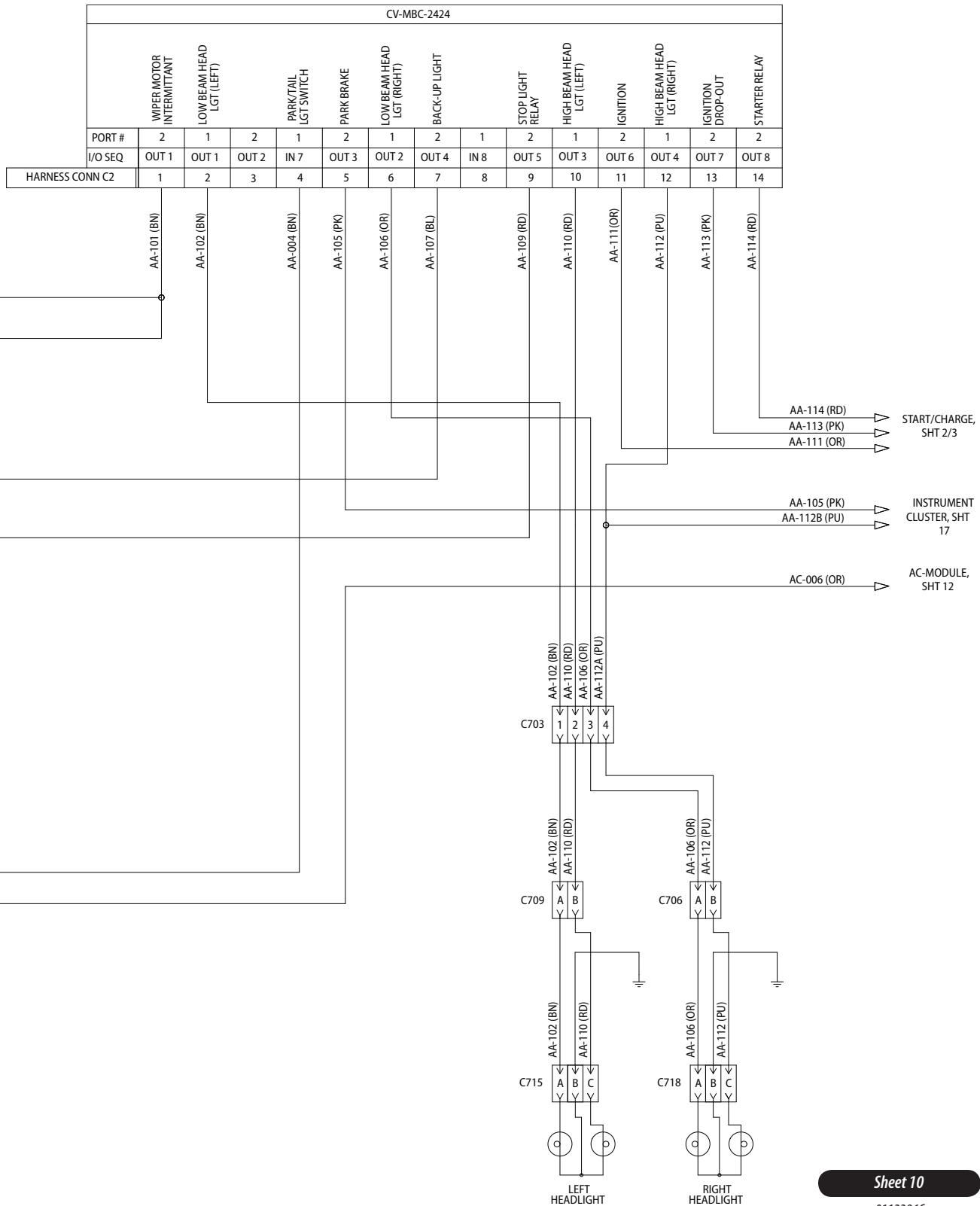
MODULATOR PUMP
31 WAY
CONNECTOR

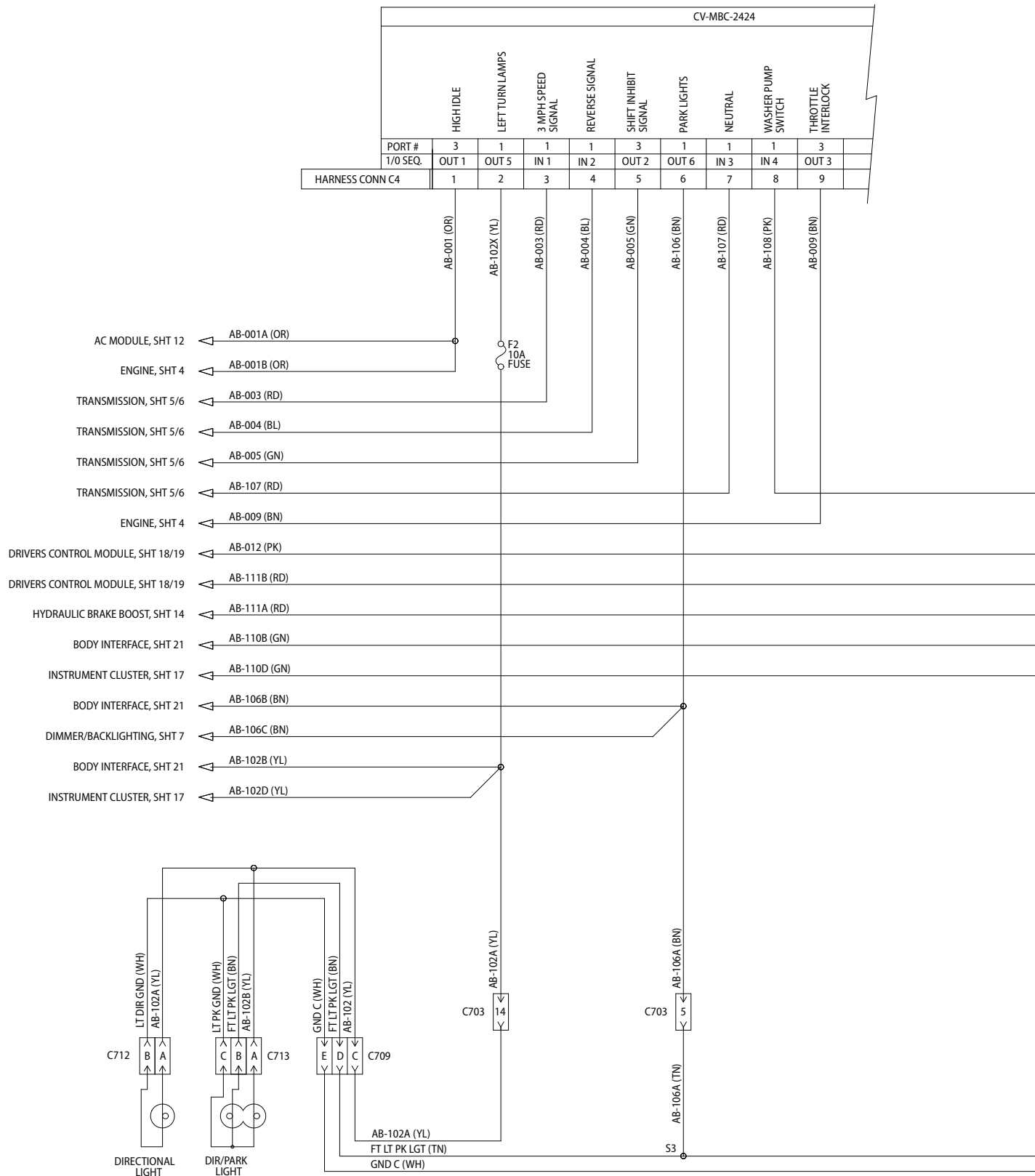


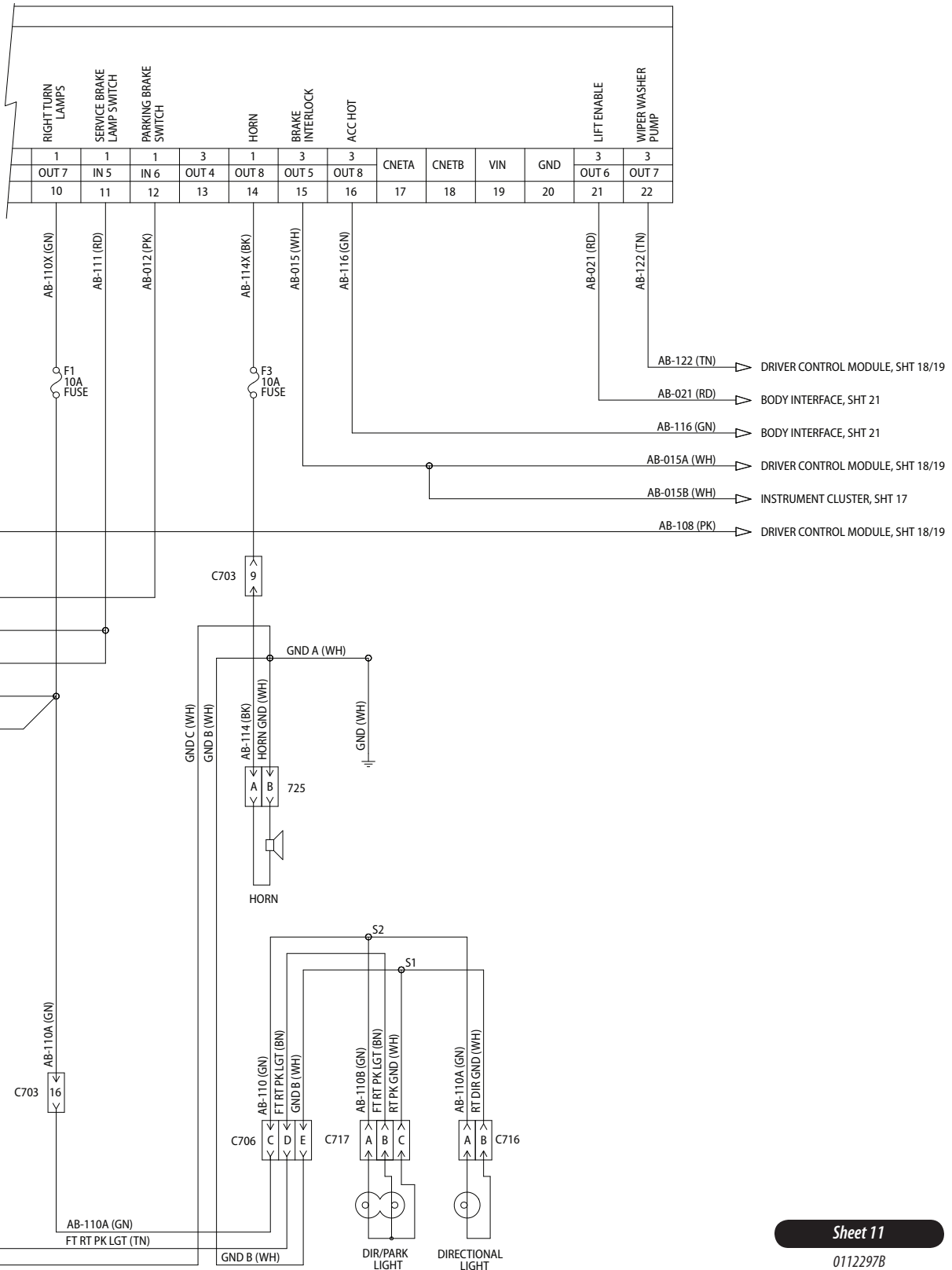
BODY INTERFACE, SHT 21 ← AA-101A (BN)
 DRIVERS CONTROL MODULE SHT 22/23 ← AA-101B (BN)

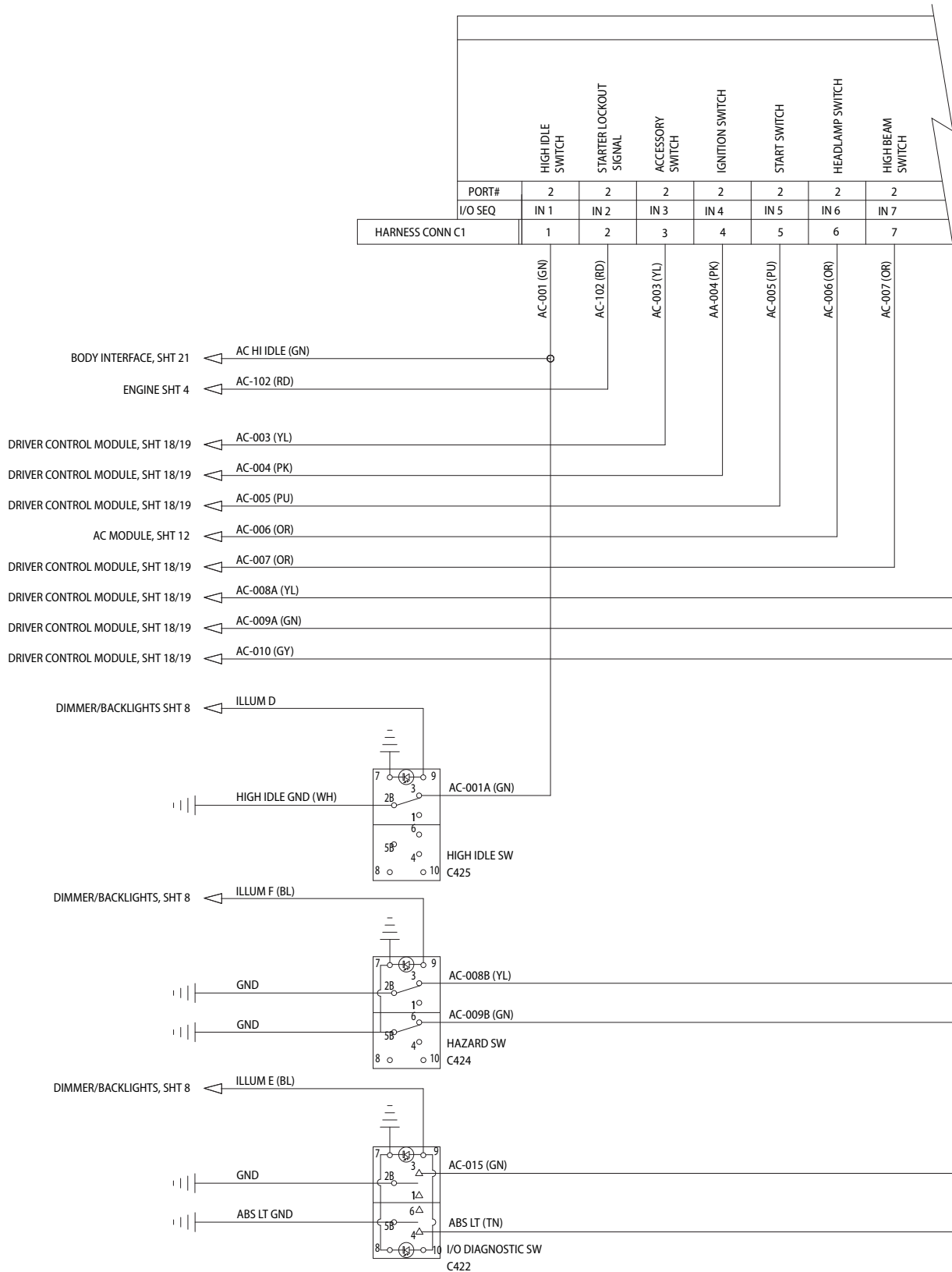
BODY INTERFACE, SHT 21 ← AA-107 (BL)













CV-MBC-2424											
	LEFT TURN SWITCH	RIGHT TURN SIGNAL	HORN BUTTON	EXTERIOR DOOR SWITCH	INTERMITTANT WIPER SWITCH	INTERLOCK FEEDBACK	SCC ALARM	I/O DIAGNOSTIC SWITCH	VANDAL LOCK		
	2	3	3	3	3	3	3	3	3	N/A	N/A
	IN 8	IN 1	IN 2	IN 3	IN 4	IN 5	IN 6	IN 7	IN 8		
	8	9	10	11	12	13	14	15	16	17	18

AC-008 (YL)

AC-009 (GN)

AC-010 (GY)

AC-011 (BL)

AC-112 (BK)

AC-013 (OR)

AC-014 (GN)

AC-015 (GN)

AC-016 (TN)

AC-016 (TN) → BODY INTERFACE, SHT 21

AC-014 (GN) → BODY INTERFACE, SHT 21

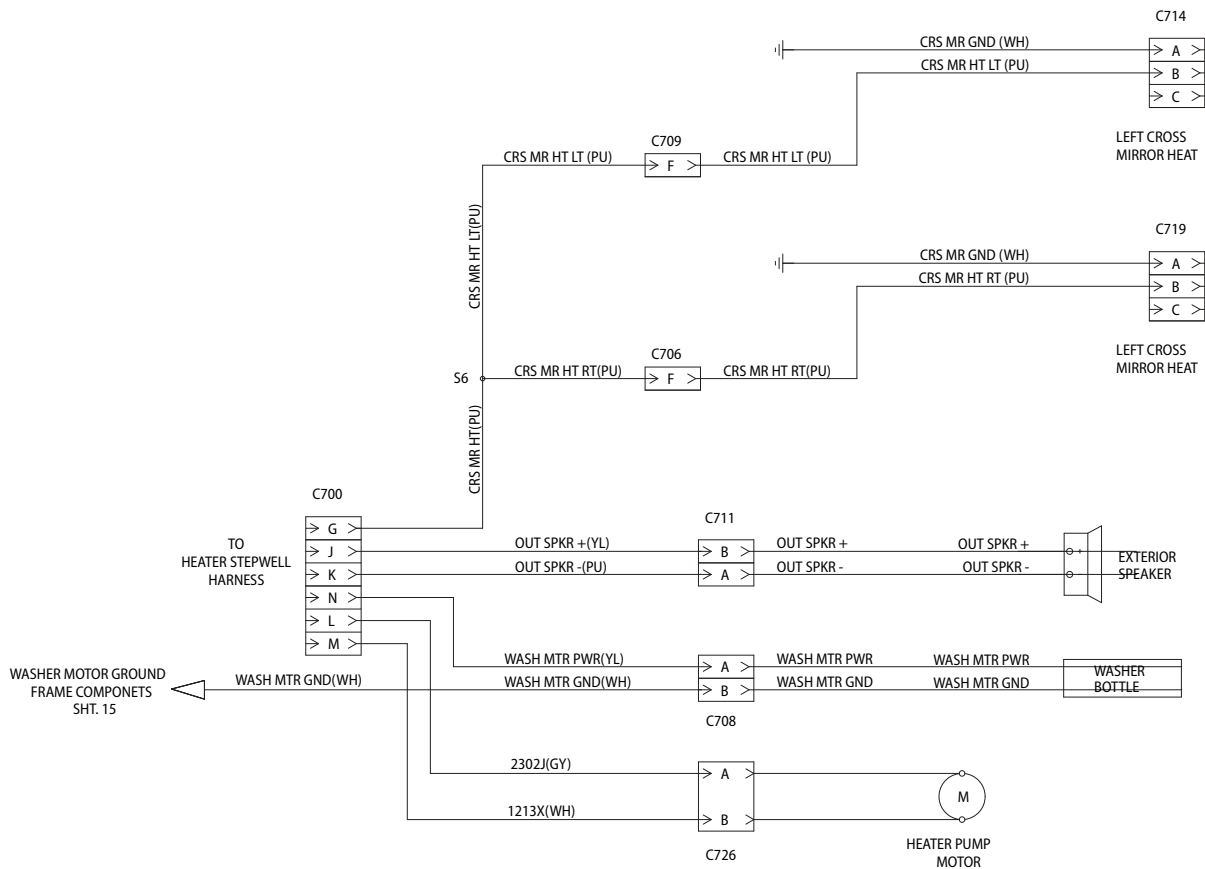
AC-013 (OR) → DRIVERS CONTROL MODULE, SHT 18/19

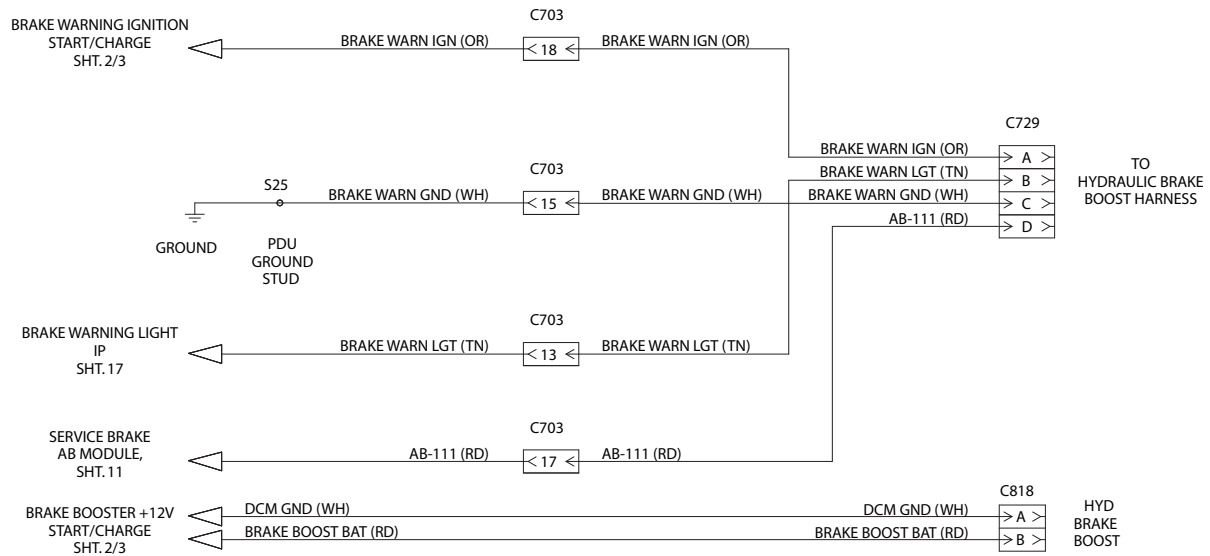
AC-112 (BK) → DRIVERS CONTROL MODULE, SHT 18/19

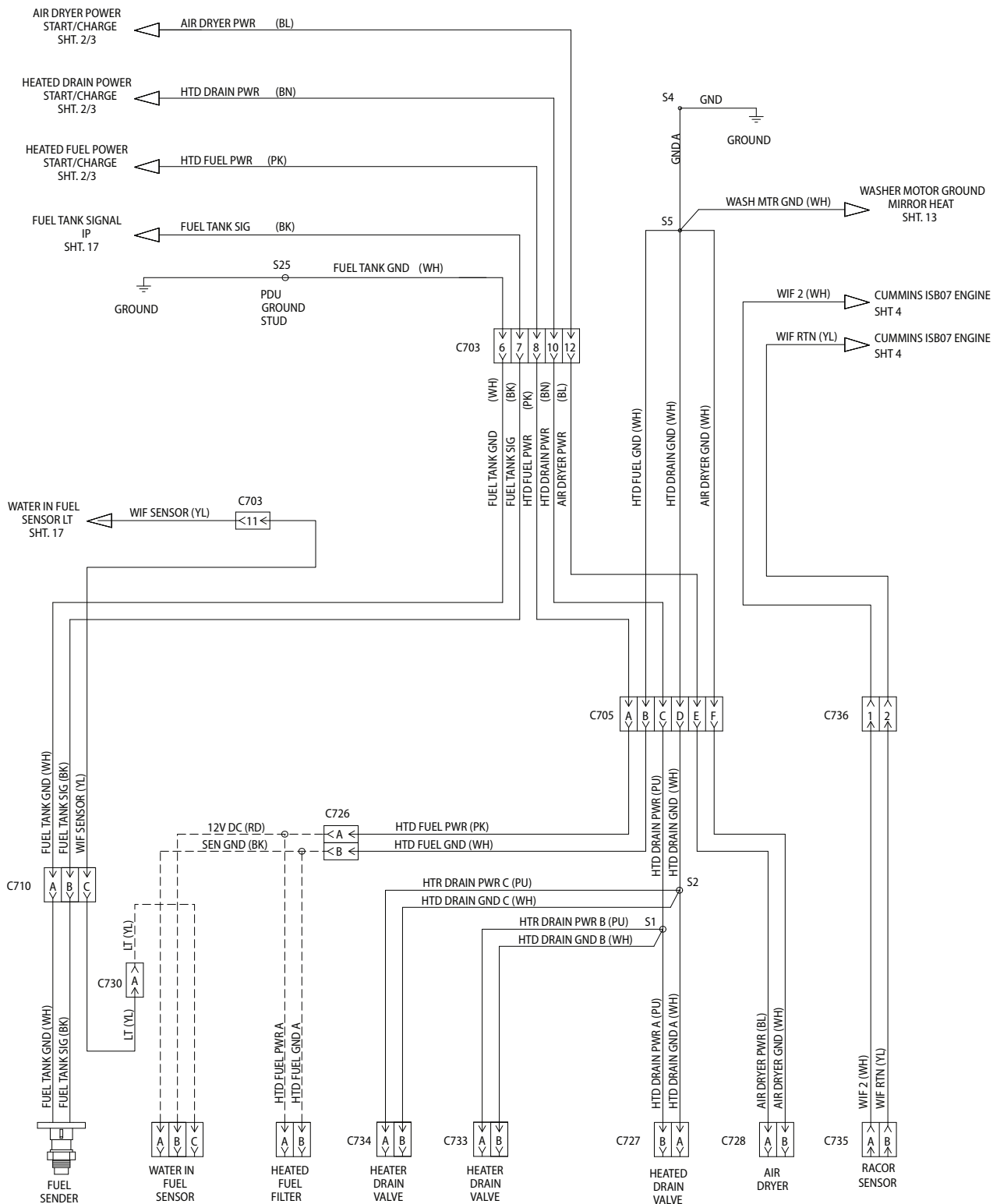
AC-011 (BL) → BODY INTERFACE, SHT 21

ABS LT (TN) → I/P, SHT 17









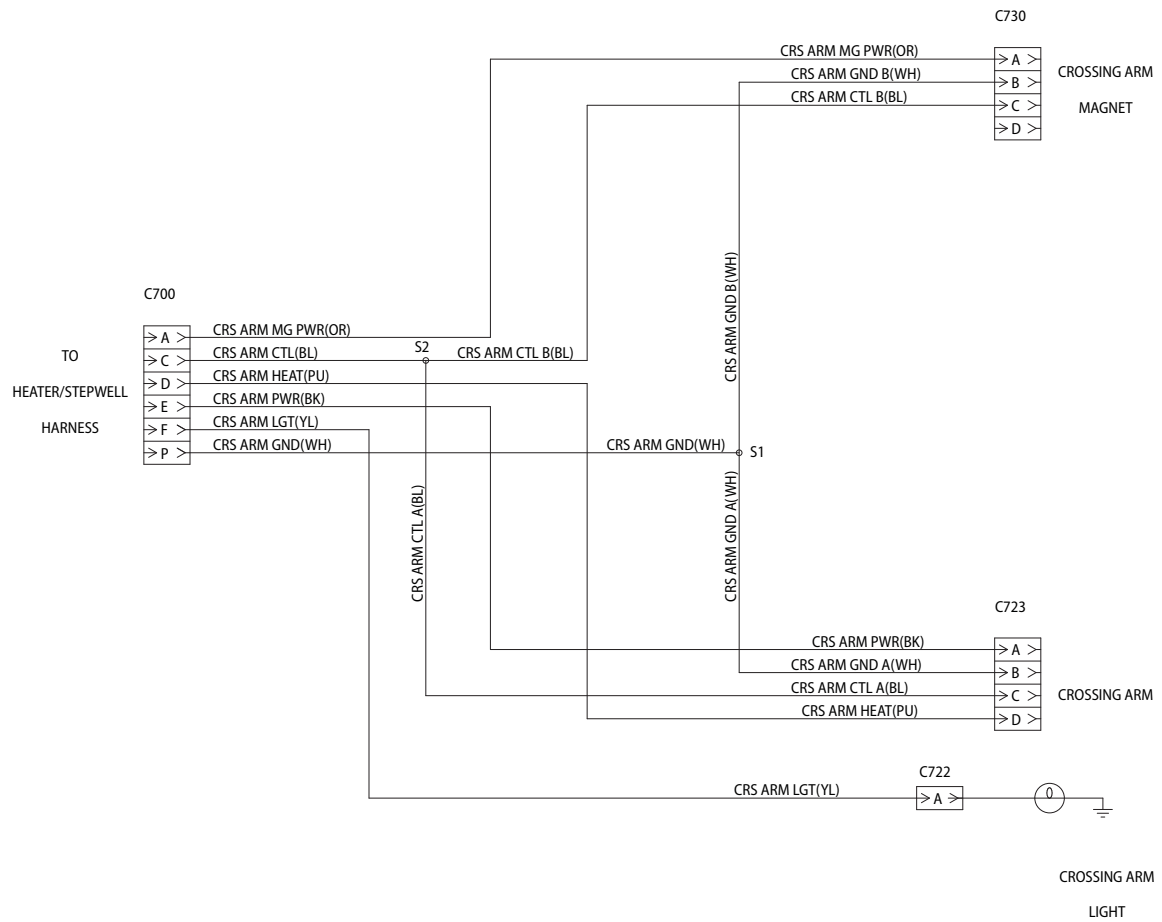
824

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

Sheet 15

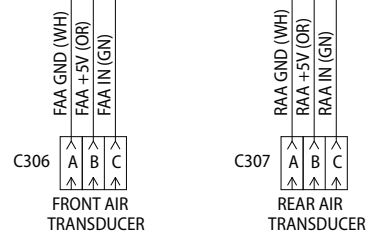
0112301A

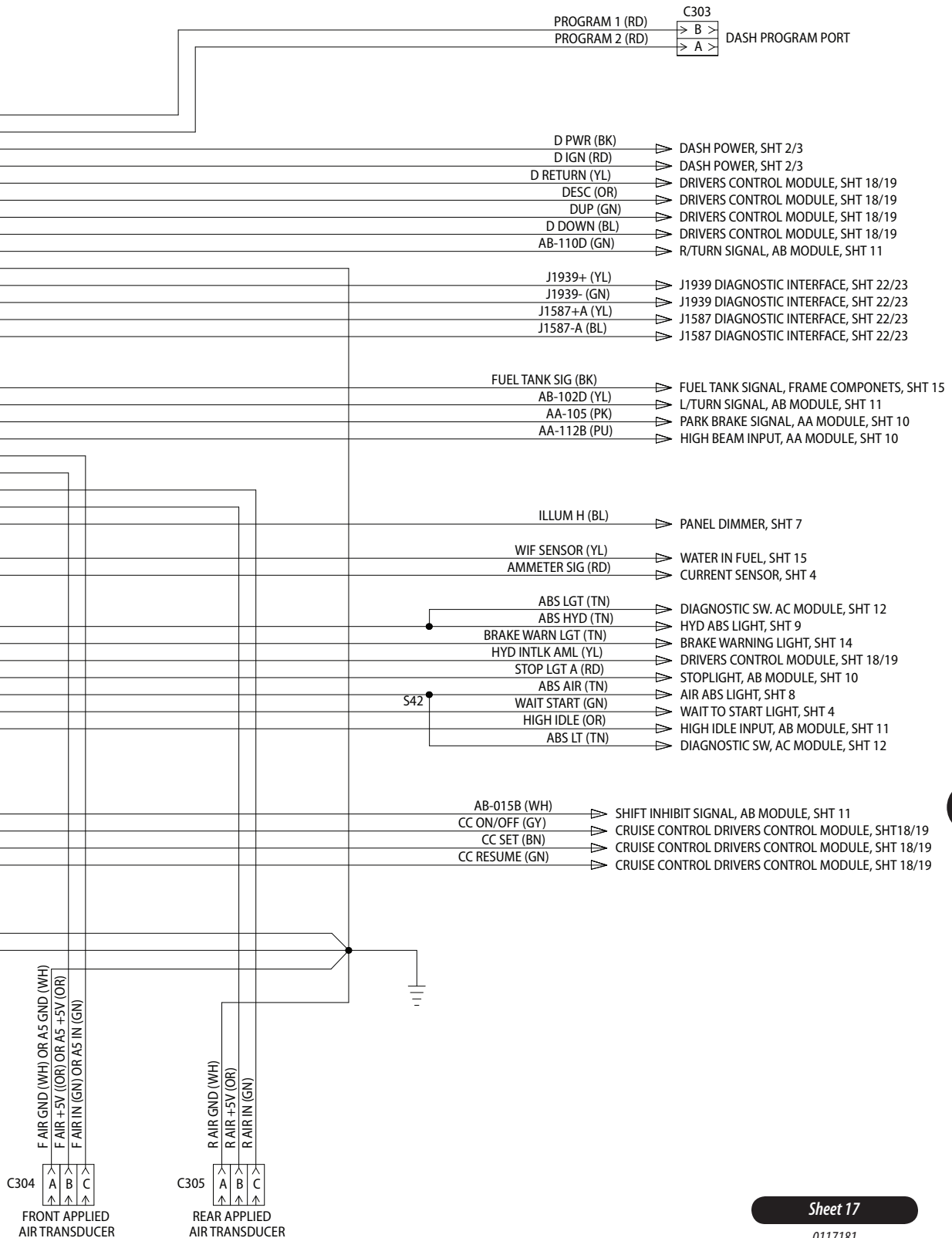
FRAME COMPONENTS

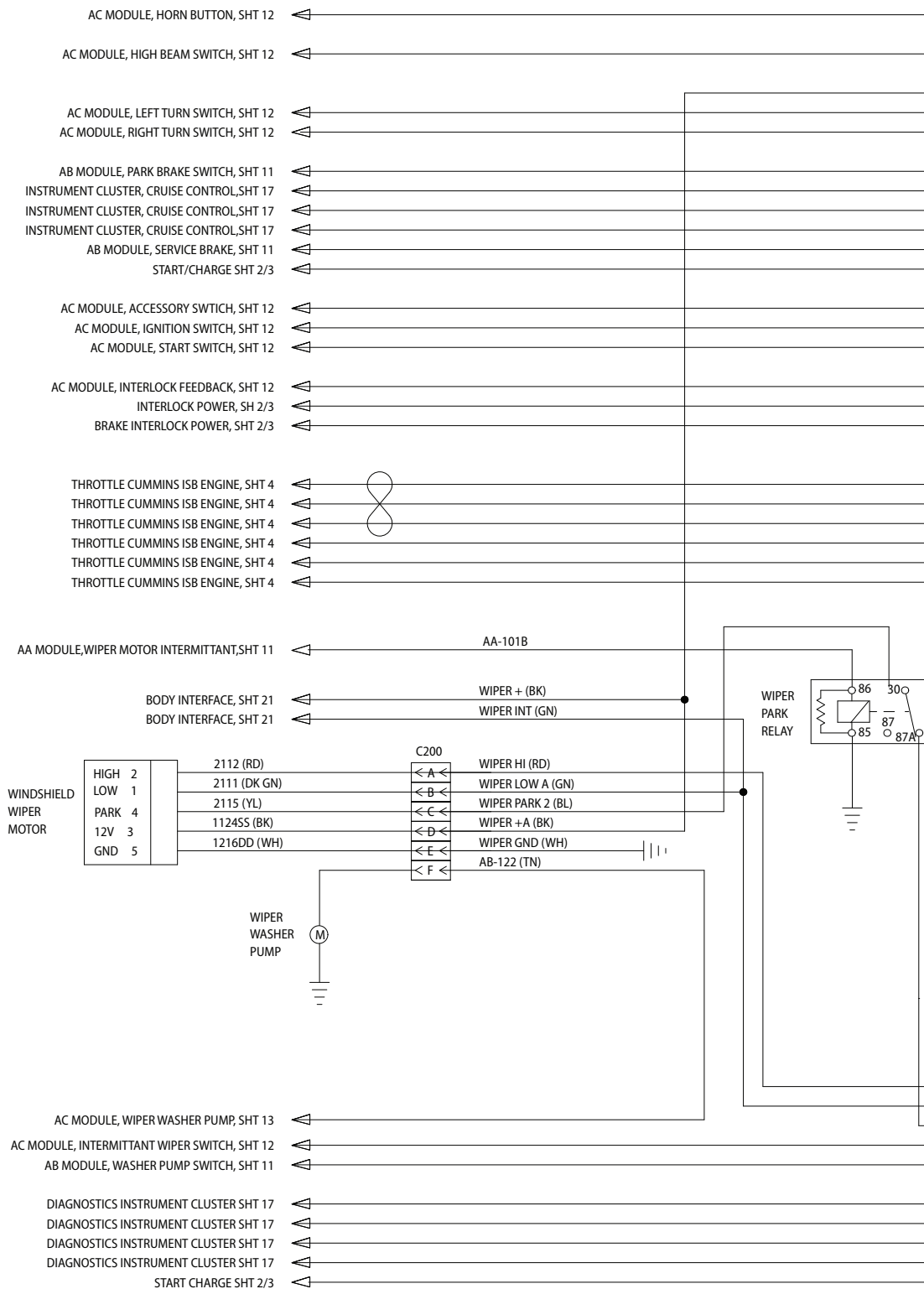


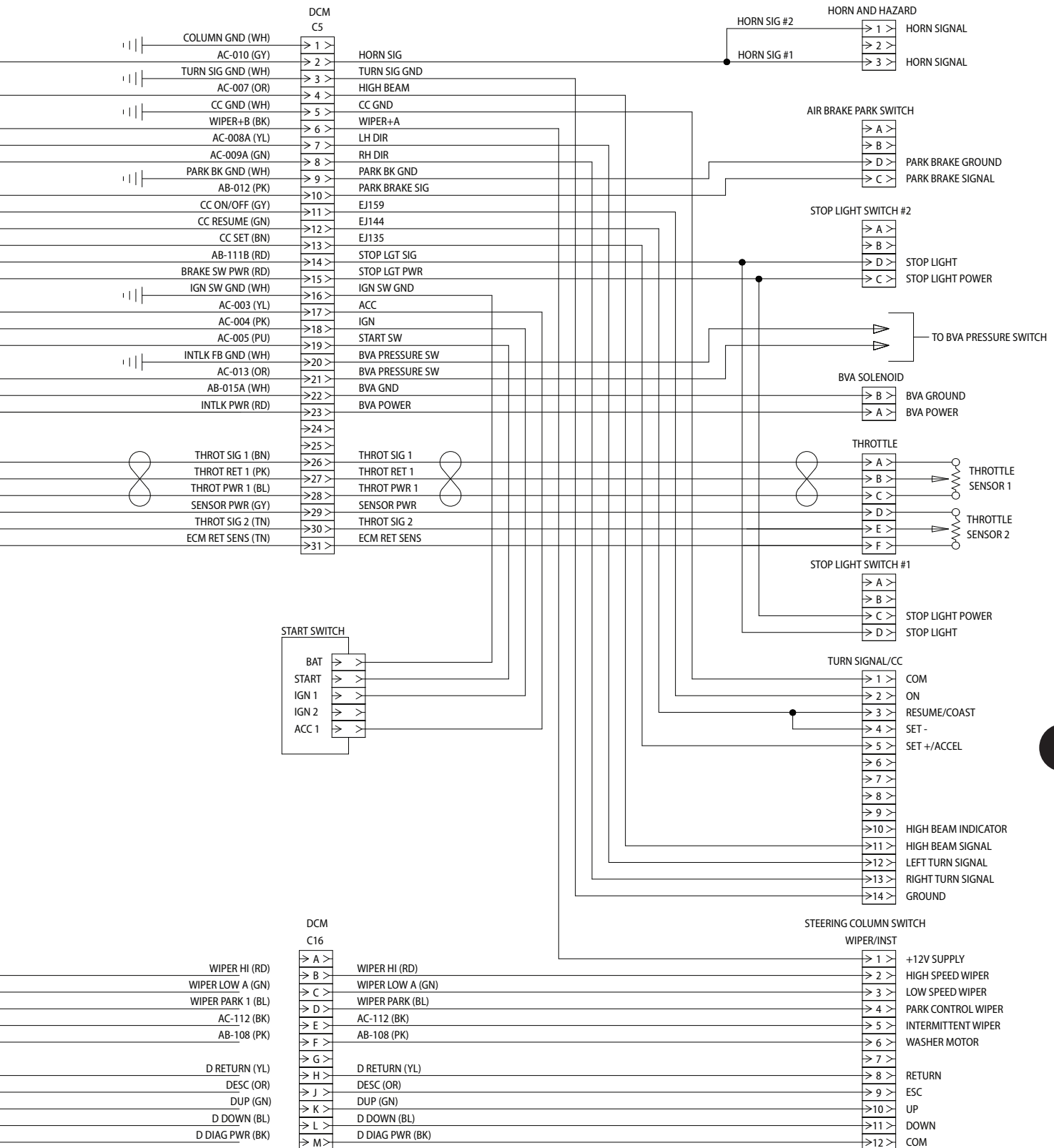
INSTRUMENT CLUSTER

"A" CONNECTOR C302 22 WAY CONNECTOR GREEN	< 13 <	PROGRAM 1 (RD)
	< 14 <	PROGRAM 2 (RD)
	< 1 <	D PWR (BK)
	< 3 <	D IGN (RD)
	< 4 <	D RETURN (YL)
	< 5 <	DESC (OR)
	< 6 <	DUP (GN)
	< 7 <	D DOWN (BL)
	< 21 <	AB-110D (GN)
	< 2 <	DCHASS GND (WH)
	< 15 <	J1939+ (YL)
	< 16 <	J1939- (GN)
	< 17 <	J1587+A (YL)
	< 18 <	J1587-A (BL)
"B" CONNECTOR C300 30 WAY CONNECTOR GREEN	< 3 <	FUEL TANK SIG (BK)
	< 25 <	AB-102D (YL)
	< 23 <	AA-105 (PK)
	< 28 <	AA-112B (PU)
	< 13 <	F AIR IN (GN) OR A5 IN (GN)
	< 20 <	F AIR +5V (OR) OR A5 +5V (OR)
	< 14 <	R AIR IN (GN)
	< 28 <	R AIR +5V (OR)
	< 9 <	ILLUM H (BL)
	< 24 <	WIF SENSOR (YL)
	< 10 <	AMMETER+ (RD)
	< 6 <	
"C" CONNECTOR C301 30 WAY CONNECTOR BLUE	< 3 <	ABS HYD (TN)
	< 5 <	BRAKE WARN LGT (TN)
	< 23 <	HYD INTLK AML (YL)
	< 8 <	STOP LGT A (RD)
	< 10 <	ABS AIR 1 (TN)
	< 12 <	WAIT START (GN)
	< 1 <	HIGH IDLE (OR)
	< 20 <	FAA +5V (OR)
	< 13 <	FAA IN (GN)
	< 21 <	RAA +5V (OR)
	< 14 <	RAA IN (GN)
	< 22 <	AB-015B (WH)
	< 24 <	CC ON/OFF (GY)
	< 25 <	CC SET (BN)
	< 26 <	CC RESUME (GN)

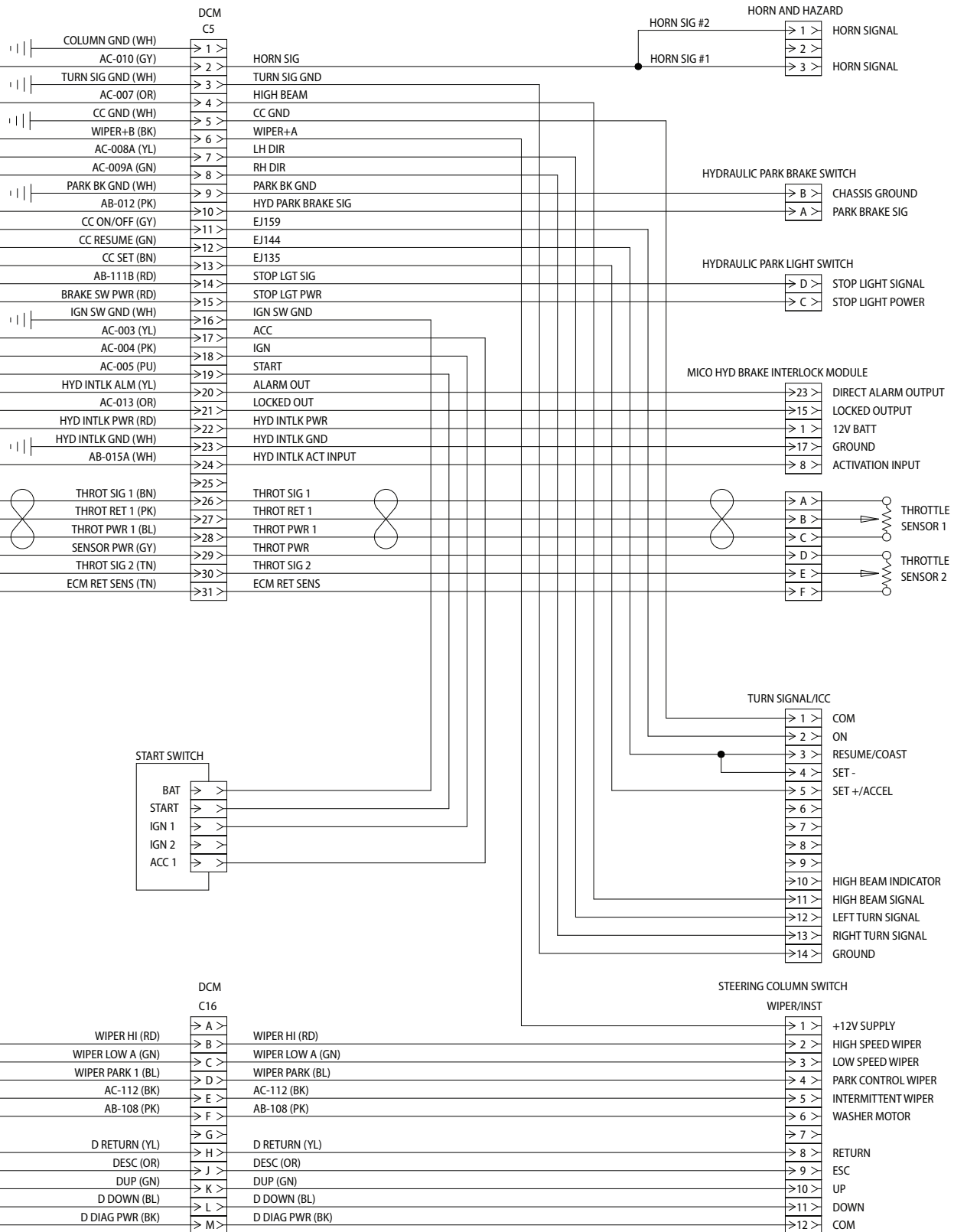


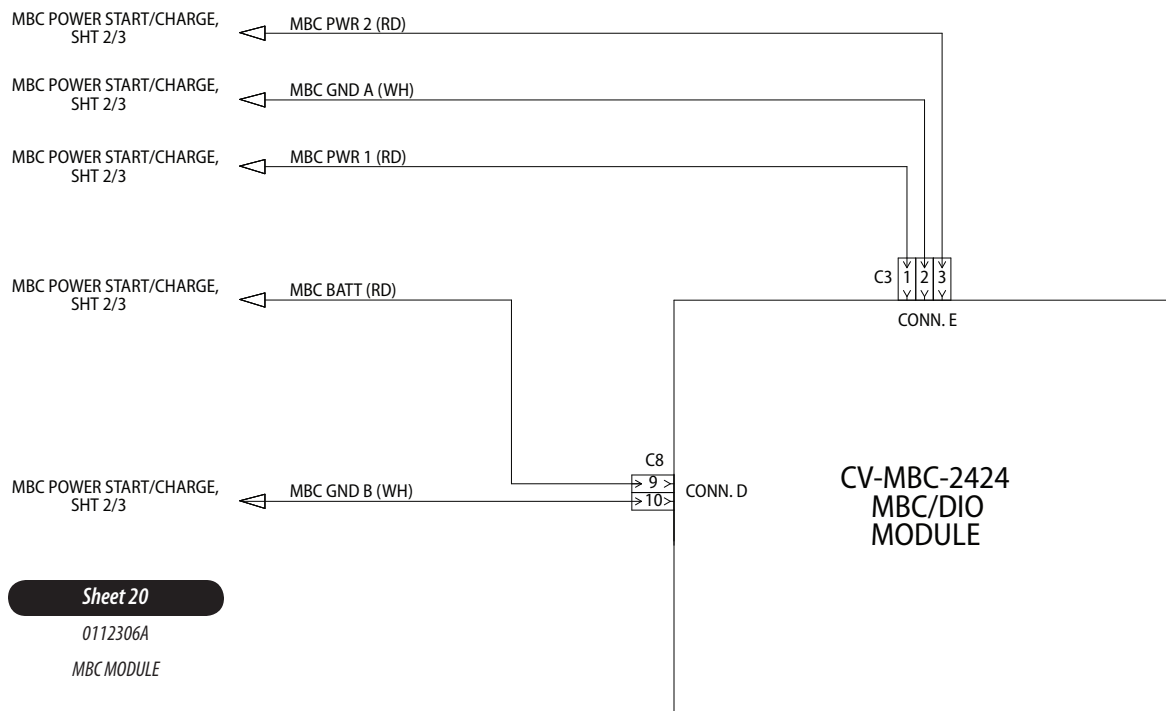




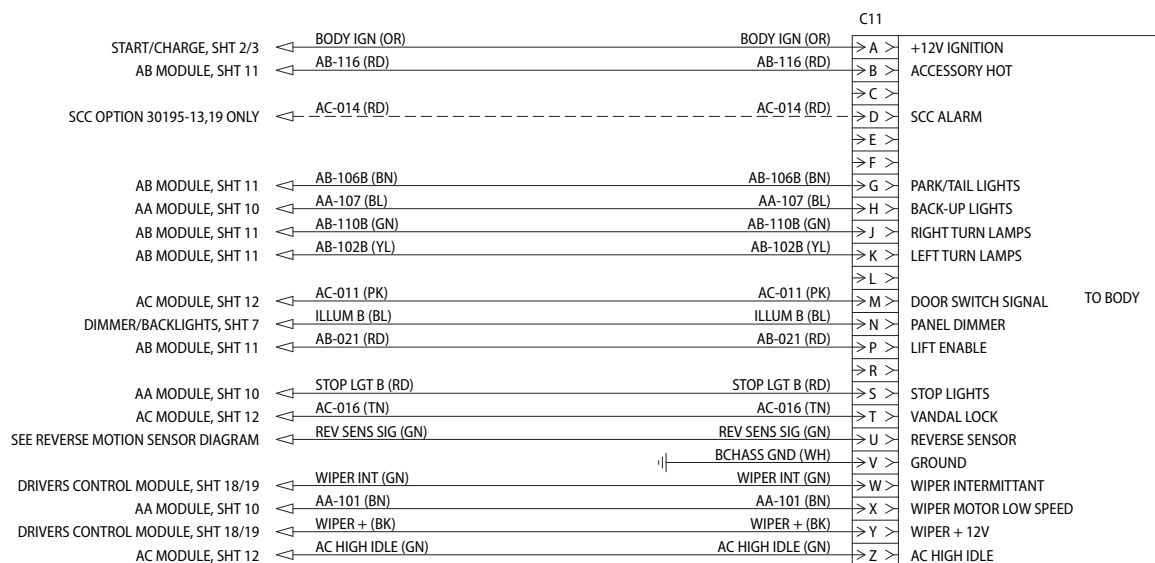


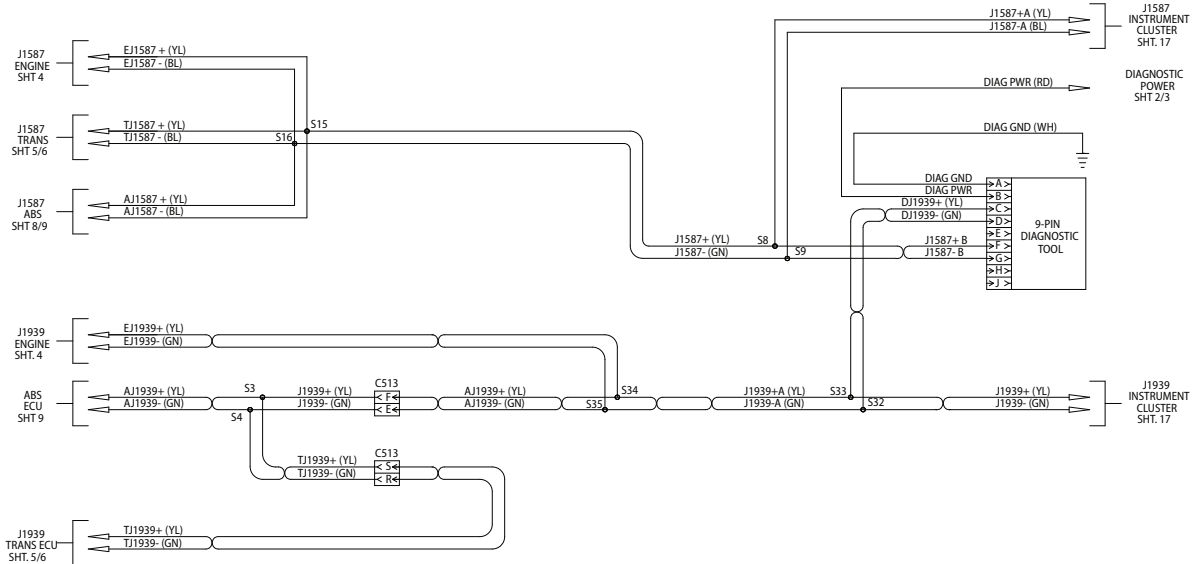






832

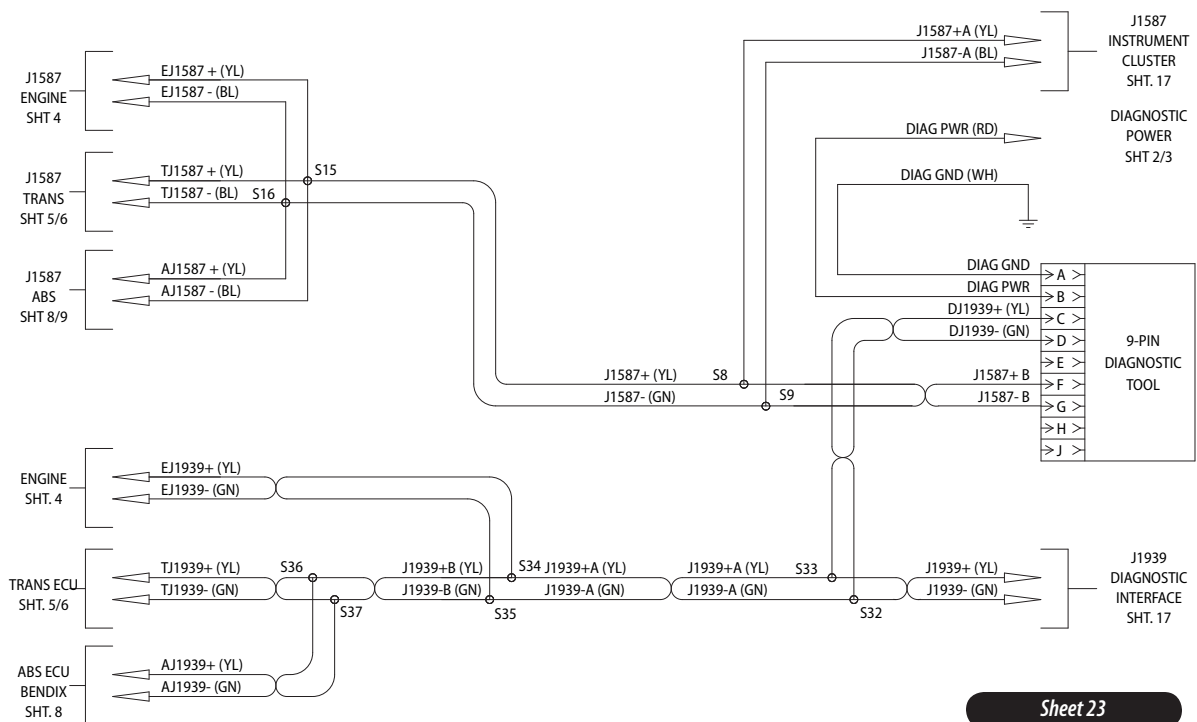




Sheet 22

0117183

J1939 DATALINK, HYD



Sheet 23

0112310

J1939 DATALINK, AIR

833

CUM ISB-07

