RED — DC VOLTAGE
BLUE — INPUT SIGNALS
BLACK — GROUNDS, SHIELDS AND RETURNS
PURPLE — OUTPUT SIGNALS
GREEN — DATA LINKS
REPRESENTS FEMALE PIN
REPRESENTS MALE PIN
REPRESENTS TWISTED PAIR
REPRESENTS SHIELD

NOTE: SOME OF THE CIRCUITS SHOWN HERE WILL NOT BE ACTIVE IN ALL APPLICATIONS. CONSULT THE EQUIPMENT MANUFACTURER'S LITERATURE TO DETERMINE WHICH CIRCUITS ARE USED.

OEM RESPONSIBILITY

ELECTRONIC CONTROL MODULE OEM CONNECTOR

OEM BULKHEAD CONNECTOR

MAGNETIC/DIGITAL VEHICLE SPEED SENSOR
MAGNETIC VEHICLE SPEED SIGNAL (+)/DIGITAL VEHICLE SPEED SIGNAL < 33
MAGNETIC VEHICLE SPEED SIGNAL (–) < 23

TELEFLEX MORSE ACCELERATOR PEDAL ASSEMBLY
WILLIAMS ACCELERATOR PEDAL ASSEMBLY
ACCELERATOR POSITION #1 +5 VOLT SUPPLY
ACCELERATOR POSITION #1 SIGNAL < 35
ACCELERATOR POSITION #1 RETURN < 28
ACCELERATOR POSITION #2 +5 VOLT SUPPLY
ACCELERATOR POSITION #2 SIGNAL < 25
ACCELERATOR POSITION #2 RETURN < 22
SENSOR SUPPLY #4 < 27
SENSOR SUPPLY #5 < 26
SENSOR RETURN < 22

9–PIN DEUTSCH CONNECTOR
NOT CONNECTED
NOT CONNECTED
BATTERY (+)
BATTERY (–)
10A FUSE
SERVICE TOOL CONNECTOR
J1708 DATA LINK (+) SAE J1708 DATA LINK (+) < 39
J1708 DATA LINK (–) SAE J1708 DATA LINK (–) < 29
J1939 DATA LINK (+) SAE J1939 DATA LINK (+) < 01
J1939 DATA LINK (–) SAE J1939 DATA LINK (–) < 21
NOT CONNECTED
SAE J1939 DATA LINK TERMINATOR

TACHOMETER — TACHOMETER OUTPUT SIGNAL < 12
TACHOGRAPH — TACHOGRAPH OUTPUT SIGNAL < 42
ENGINE BRAKE SELECTOR #1 SWITCH — EXHAUST BRAKE/ENGINE BRAKE SELECTOR #1 SWITCH SIGNAL < 05
ENGINE BRAKE SELECTOR #2 SWITCH — ENGINE BRAKE SELECTOR #2 SWITCH SIGNAL < 06
ENGINE BRAKE ON/OFF SWITCH — CRUISE CONTROL/PTO ON/OFF SWITCH SIGNAL < 16
CRUISE CONTROL/PTO ON/OFF SWITCH
CLUTCH/ENGINE PROTECTION OVERRIDE SWITCH — CLUTCH/ENGINE PROTECTION OVERRIDE SWITCH SIGNAL < 15
SERVICE BRAKE POSITION SWITCH — SERVICE BRAKE POSITION SWITCH SIGNAL < 24
CRUISE CONTROL/PTO SET RESUME SELECT SWITCH — CRUISE CONTROL/PTO RESUME ACCELERATE/INCREMENT SWITCH SIGNAL < 19
CRUISE CONTROL/PTO SET/COAST/DECREMENT SWITCH SIGNAL < 30
AIR CONDITIONER PRESSURE SWITCH — AIR CONDITIONER PRESSURE SWITCH/FAN CONTROL SWITCH SIGNAL < 10
FAN CONTROL SWITCH
ACCELERATOR INTERLOCK/ENGINE TORQUE LIMIT SWITCH/DOORS OPEN SIGNAL < 17
ACCELERATOR INTERLOCK SWITCH/DOORS OPEN SWITCH
MAXIMUM VEHICLE SPEED SWITCH/DIAGNOSTIC TEST MODE SWITCH/REMOTE START + SIGNAL < 20
MAXIMUM VEHICLE SPEED SWITCH/DIAGNOSTIC TEST MODE SWITCH/REMOTE START + SIGNAL
MAXIMUM OPERATING SPEED/GOVERNOR TYPE SWITCH/REMOTE START – SIGNAL < 07
MAXIMUM OPERATING SPEED/GOVERNOR TYPE SWITCH/REMOTE START – SIGNAL
REAR AXLE RATIO SWITCH/PARKING BRAKE SIGNAL < 11
REAR AXLE RATIO SWITCH/PARKING BRAKE
SWITCH RETURN < 41
MALFUNCTION INDICATOR LAMP (MIL) — MALFUNCTION INDICATOR LAMP (MIL) RETURN < 57
WAIT TO START LAMP — WAIT TO START LAMP RETURN < 53
RED STOP LAMP — RED STOP LAMP RETURN < 47
AMBER WARNING LAMP — AMBER WARNING LAMP RETURN < 43
SAE J1939 DATA LINK TERMINATOR
SAE J1939 DATA LINK (+) < 45
SAE J1939 DATA LINK (–)
FUSE (AS REQUIRED)
SWITCH RETURN
REMOTE ACCELERATOR ON/OFF/IDLE VALIDATION OFF IDLE SWITCH — REMOTE ACCELERATOR ON/OFF SWITCH SIGNAL/IDLE VALIDATION OFF IDLE SIGNAL < 08
REMOTE PTO ON/OFF/IDLE VALIDATION IDLE SWITCH — REMOTE PTO ON/OFF SWITCH SIGNAL/IDLE VALIDATION IDLE SIGNAL < 18
REMOTE ACCELERATOR PEDAL/LEVER +5 VOLT SUPPLY (SENSOR SUPPLY #5)
REMOTE ACCELERATOR PEDAL/LEVER ASSEMBLY — REMOTE ACCELERATOR PEDAL/LEVER SIGNAL < 37
REMOTE ACCELERATOR PEDAL/LEVER RETURN
ENGINE COOLANT LEVEL +5 VOLT SUPPLY (ONLY FOR 3 WIRE SENSORS) (SENSOR SUPPLY #5)
ENGINE COOLANT LEVEL SENSOR — ENGINE COOLANT LEVEL SIGNAL < 60
ENGINE COOLANT LEVEL RETURN
STARTER LOCKOUT/SWITCHED OUTPUT #2 SWITCH — STARTER LOCKOUT/SWITCHED OUTPUT #2 SIGNAL < 02
STARTER LOCKOUT/SWITCHED OUTPUT #2 RETURN < 44
INTAKE AIR HEATER RELAY — INTAKE AIR HEATER RELAY SIGNAL < 54
INTAKE AIR HEATER RELAY RETURN
FAN CLUTCH — FAN CLUTCH SIGNAL < 52
FAN CLUTCH RETURN < 32
EXHAUST BRAKE/EXHAUST BRAKE LAMP — EXHAUST BRAKE SUPPLY/EXHAUST BRAKE LAMP < 55
EXHAUST BRAKE RETURN
FAN CLUTCH 2 — FAN CLUTCH 2 SIGNAL < 59
FAN CLUTCH 2 RETURN
AFTERTREATMENT DIESEL EXHAUST FLUID TANK TEMPERATURE/LEVEL SENSOR
AFTERTREATMENT DIESEL EXHAUST FLUID TANK LEVEL RETURN
AFTERTREATMENT DIESEL EXHAUST FLUID TANK LEVEL SIGNAL < 49
AFTERTREATMENT DIESEL EXHAUST FLUID TANK TEMPERATURE SIGNAL < 36
AFTERTREATMENT DIESEL EXHAUST FLUID TANK TEMPERATURE RETURN

CUMMINS RESPONSIBILITY
AFTERTREATMENT SCR INTAKE TEMPERATURE SENSOR
AFTERTREATMENT SCR INTAKE TEMPERATURE SIGNAL < 50
AFTERTREATMENT SCR INTAKE TEMPERATURE RETURN
AFTERTREATMENT SCR OUTLET TEMPERATURE SENSOR
AFTERTREATMENT SCR OUTLET TEMPERATURE SIGNAL < 09
AFTERTREATMENT SCR OUTLET TEMPERATURE RETURN
SENSOR RETURN < 38

VEHICLES EQUIPPED WITH DIESEL EXHAUST FLUID HEATING OPTION
OEM AMBIENT AIR TEMPERATURE SENSOR
OEM AMBIENT AIR TEMPERATURE SIGNAL < 40
OEM AMBIENT AIR TEMPERATURE RETURN
AFTERTREATMENT DIESEL EXHAUST FLUID TANK HEATER CONTROL VALVE
AFTERTREATMENT DIESEL EXHAUST FLUID TANK HEATER CONTROL VALVE SUPPLY < 14
AFTERTREATMENT DIESEL EXHAUST FLUID TANK HEATER CONTROL VALVE RETURN
LINE HEATER 1 RELAY
AFTERTREATMENT DIESEL EXHAUST FLUID LINE HEATER 1 RELAY
FUSE (AS REQUIRED)
LINE HEATER 1
AFTERTREATMENT DIESEL EXHAUST FLUID LINE HEATER 1 RELAY SUPPLY < 58
AFTERTREATMENT DIESEL EXHAUST FLUID LINE HEATER 1 RELAY RETURN < 48

ACCESSORY
IGNITION
IGNITION/KEYSWITCH INPUT SIGNAL
5A FUSE
20A FUSE
20A FUSE
KEYSWITCH
START
BATTERY
BATTERY
GROUND TERMINAL

OEM POWER CONNECTOR
ECM BATTERY RETURN (–) < 01
02
03
30A FUSE
ECM BATTERY SUPPLY (+) < 04

CUMMINS RESPONSIBILITY

ELECTRONIC CONTROL MODULE ENGINE HARNESS CONNECTOR

ENGINE CRANKSHAFT SPEED/POSITION SENSOR
ENGINE CRANKSHAFT SPEED/POSITION +5 VOLT SUPPLY — SENSOR SUPPLY #3 < 26
ENGINE CRANKSHAFT SPEED/POSITION RETURN < 44
ENGINE CRANKSHAFT SPEED/POSITION SIGNAL < 42
ENGINE CAMSHAFT SPEED/POSITION SENSOR
ENGINE CAMSHAFT SPEED/POSITION +5 VOLT SUPPLY — SENSOR SUPPLY #1 < 36
ENGINE CAMSHAFT SPEED/POSITION RETURN < 48
ENGINE CAMSHAFT SPEED/POSITION SIGNAL < 37
FUEL RAIL PRESSURE SENSOR
FUEL RAIL PRESSURE RETURN
FUEL RAIL PRESSURE SIGNAL < 29
FUEL RAIL PRESSURE +5 VOLT SUPPLY (SENSOR SUPPLY #1)
INTAKE MANIFOLD TEMPERATURE/PRESSURE SENSOR
INTAKE MANIFOLD PRESSURE SIGNAL < 19
INTAKE MANIFOLD TEMPERATURE/PRESSURE +5 VOLT SUPPLY (SENSOR SUPPLY #1)
INTAKE MANIFOLD TEMPERATURE SIGNAL < 11
INTAKE MANIFOLD TEMPERATURE/PRESSURE RETURN
BAROMETRIC PRESSURE SENSOR
BAROMETRIC PRESSURE RETURN
BAROMETRIC PRESSURE SIGNAL < 20
BAROMETRIC PRESSURE +5 VOLT SUPPLY (SENSOR SUPPLY #1)

ENGINES EQUIPPED WITH ENGINE OIL PRESSURE SENSOR
ENGINE OIL PRESSURE SENSOR
ENGINE OIL PRESSURE +5 VOLT SUPPLY (SENSOR SUPPLY #1)
ENGINE OIL PRESSURE RETURN — SENSOR RETURN
ENGINE OIL PRESSURE SIGNAL < 27

ENGINES EQUIPPED WITH ENGINE OIL PRESSURE SWITCH
ENGINE OIL PRESSURE SWITCH — ENGINE OIL PRESSURE SWITCH SIGNAL < 32
ENGINE OIL LEVEL SENSOR
ENGINE OIL LEVEL SUPPLY < 40
ENGINE OIL LEVEL RETURN < 33
ENGINE OIL LEVEL SIGNAL < 22
ENGINE COOLANT TEMPERATURE SENSOR
ENGINE COOLANT TEMPERATURE SIGNAL < 49
ENGINE COOLANT TEMPERATURE RETURN — SENSOR RETURN < 47
WATER IN FUEL SENSOR
WATER IN FUEL SIGNAL < 34
WATER IN FUEL RETURN
FUEL PUMP ACTUATOR
FUEL PUMP ACTUATOR SIGNAL < 10
FUEL PUMP ACTUATOR RETURN < 14
REAL TIME CLOCK BATTERY BACKUP
REAL TIME CLOCK BATTERY BACKUP SUPPLY < 28
REAL TIME CLOCK BATTERY BACKUP RETURN < 43
SAE J1939 DATA LINK/SERVICE TOOL CONNECTOR
SAE J1939 DATA LINK (+) < 38
SAE J1939 DATA LINK (–) < 39

SIX CYLINDER ENGINE
INJECTOR #1
INJECTOR #2
INJECTOR #3
INJECTOR #4
INJECTOR #5
INJECTOR #6
INJECTOR SOLENOID DRIVER CYLINDER 1 SIGNAL < 57
INJECTOR SOLENOID DRIVER CYLINDER 1 RETURN < 53
INJECTOR SOLENOID DRIVER CYLINDER 2 SIGNAL < 48
INJECTOR SOLENOID DRIVER CYLINDER 2 RETURN < 52
INJECTOR SOLENOID DRIVER CYLINDER 3 SIGNAL < 56
INJECTOR SOLENOID DRIVER CYLINDER 3 RETURN < 51
INJECTOR SOLENOID DRIVER CYLINDER 4 SIGNAL < 54
INJECTOR SOLENOID DRIVER CYLINDER 4 RETURN < 60
INJECTOR SOLENOID DRIVER CYLINDER 5 SIGNAL < 55
INJECTOR SOLENOID DRIVER CYLINDER 5 RETURN < 59
INJECTOR SOLENOID DRIVER CYLINDER 6 SIGNAL < 45
INJECTOR SOLENOID DRIVER CYLINDER 6 RETURN < 58

FOUR CYLINDER ENGINE
INJECTOR #1
INJECTOR #2
INJECTOR #3
INJECTOR #4
INJECTOR SOLENOID DRIVER CYLINDER 1 SIGNAL < 57
INJECTOR SOLENOID DRIVER CYLINDER 1 RETURN < 53
INJECTOR SOLENOID DRIVER CYLINDER 2 SIGNAL < 45
INJECTOR SOLENOID DRIVER CYLINDER 2 RETURN < 58
INJECTOR SOLENOID DRIVER CYLINDER 3 SIGNAL < 55
INJECTOR SOLENOID DRIVER CYLINDER 3 RETURN < 59
INJECTOR SOLENOID DRIVER CYLINDER 4 SIGNAL < 56
INJECTOR SOLENOID DRIVER CYLINDER 4 RETURN < 51

AFTERTREATMENT OUTLET NOx SENSOR
SAE J1939 DATA LINK (+)
SAE J1939 DATA LINK (–)
AFTERTREATMENT OUTLET NOx RETURN
AFTERTREATMENT OUTLET NOx SUPPLY
AFTERTREATMENT DIESEL EXHAUST FLUID DOSING UNIT
SAE J1939 DATA LINK (+)
SAE J1939 DATA LINK (–)
AFTERTREATMENT DIESEL EXHAUST FLUID DOSING UNIT SUPPLY
AFTERTREATMENT DIESEL EXHAUST FLUID DOSING UNIT RETURN
IGNITION/KEYSWITCH INPUT SIGNAL
AIR SOLENOID SIGNAL
AIR SOLENOID RETURN
AIR SOLENOID

ELECTRONIC CONTROL MODULE (ECM)
ENGINE PORT
OEM PORT

ENGINE OIL PRESSURE SWITCH CONNECTOR MATING FACE
ENGINE OIL PRESSURE SENSOR CONNECTOR MATING FACE
TYPE A
BAROMETRIC PRESSURE SENSOR, ENGINE OIL LEVEL SENSOR CONNECTOR MATING FACE
TYPE B
SAE J1939 ENGINE DATA LINK/ SERVICE TOOL CONNECTOR ENGINE OEM MODULE SIDE
SAE J1939 DATA LINK/SERVICE TOOL CONNECTOR MATING FACE
AFTERTREATMENT DIESEL EXHAUST FLUID DOSING UNIT CONNECTOR MATING FACE

ELECTRONIC CONTROL MODULE (ECM) ENGINE HARNESS CONNECTOR MATING FACE
INTAKE MANIFOLD TEMPERATURE AND PRESSURE SENSOR CONNECTOR MATING FACE
ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR MATING FACE
ENGINE CRANKSHAFT SPEED/POSITION SENSOR, ENGINE CAMSHAFT SPEED/POSITION SENSOR CONNECTOR MATING FACE
TYPE D
INTAKE MANIFOLD TEMPERATURE/PRESSURE SENSOR CONNECTOR MATING FACE
AIR SOLENOID CONNECTOR MATING FACE
SAE J1939 DATA LINK 9–PIN SERVICE PORT CONNECTOR

ELECTRONIC CONTROL MODULE (ECM) OEM HARNESS CONNECTOR MATING FACE
INJECTOR PASS THROUGH (ROCKER LEVER HOUSING) POWER HARNESS CONNECTOR MATING FACE
FUEL RAIL PRESSURE SENSOR CONNECTOR MATING FACE
FUEL PUMP ACTUATOR CONNECTOR MATING FACE
FUEL RAIL PRESSURE SENSOR CONNECTOR MATING FACE
AFTERTREATMENT OUTLET NOx SENSOR CONNECTOR MATING FACE
WATER–IN–FUEL SENSOR CONNECTOR MATING FACE

ISB4.5, ISB6.7, ISD4.5 and ISD6.7 CM2150 SN Wiring Diagram

Bulletin 4022164–02

Cummins Inc.