



REV.	DESCRIPTION	APPROVAL	DATE
0	ALT. CHARGE WIRE FROM 100A TO 60A. FUSE LINK INSTEAD OF 100A MAIN FUSE		01/02/18
1	CIRCUITS UNCHANGED. NEW KNOCK SENSOR PIN. NEW STARTER SOLENOID CONNECTOR.		10/03/18
2	ADDED WHITE WIRE NOTE. WIRE TOL. NOTE. COP SHELD ROUTING		11/06/18
3	UPDATED PIN NUMBERING ON CRANK (#33) AND CAM (#32) POSITION SENSORS. PHYSICAL WIRE LOCATIONS AND SCHEMATIC LAYOUT ARE UNCHANGED.		11/16/18
4	CHANGED CRANK WIRE FROM 18 TO 12 AWG. ADDED SPK_GND_4 AND ITEM 56 SPARK GROUND TERMINAL. ADDED OLD "85_LOCKOFF2_GND" WIRE CONNECTION INTO PIN 75 AND 90 AND DELETED CONNECTION TO PIN 85. RESPECTIVELY, CHANGED THE WIRE CONNECTION NAME FROM "85_LOCKOFF2_GND" TO "75 90 FP GND". CHANGED PIN 85 FROM LOCKOFF2(DEFAULT) OR WARNING LAMP GROUND TO (AUX PWM1) OR WARNING LAMP GROUND. CHANGED PIN-OUT 85 FROM 85_LOCKOFF2 (AUX PWM1) OR WARN_LMP_GND TO 85_(AUX PWM1) OR WARNING LAMP GROUND. ADDED 16 AWG BLACK TO "75 90 FP GND". CHANGED "89_FRAME_GND" FROM 18 TO 16 AWG. CORRECTED PIN 75 FROM AUX PWM 3 TO UEGDH_3. ADDED 16 AWG BLACK TO "75 90 FP GND". CHANGED "MTR_LOCKOFF_DEPR" AND CHANGED TO 16 AWG RED. TWISTED SHIELDED CABLE NOTE CHANGED BS40P1 TO TIE# 2019D0301-0. CHANGED 50_PIN_17 AND 50_PIN_26 FROM DIAGNOSTIC CONNECTOR AND ECM. ON PIN 1 OF DIAGNOSTIC CONNECTOR CHANGED "20 5V REF -DIAG" TO "20 5V REF GND". CHANGED PIN 40 FROM (OPEN-NG, GND-LPG). CHANGED PIN 83 FROM ALTERNATOR DUTY CONTROL (AUX PWM3) RECIRC DIODE (AUX PWM3). CHANGED INJECTOR NAMES ON PIN-OUTS, PIN AND WIRES. CHANGED CYLINDER COIL NAMES ON PIN-OUTS, PIN AND WIRES. REMOVED "19 5V REF +DIAG" WIRE CONNECTION FROM DIAGNOSTIC CONNECTOR. 250PK COLOR CHANGED FROM LT BRN TO YEL. 250PK COLOR CHANGED FROM BRN TO GRN. ADDED RESISTOR TO ITEM 20. RESERVED WIRE CONNECTION TO PIN A ON ITEM 20.	DA/CW	02/06/19
5	REV CREATED TO MATCH LAYOUT	DA	04/04/19
6	UPDATED COLORS	DA	E190508-02 05/06/19
7	ADDED VERTICAL TRIANGLE AT TOP OF REV BOX. ADDED ROTATED TRIANGLES TO LIST OF NOTES. REPLACE COP SHIELDED WIRE WITH TWISTED-PAIR WIRES IN CRANK POSITION SENSOR CIRCUIT (#33). REMOVE GROUND WIRE CONNECTED TO PIN 69 FROM #33. ADD NOTE FLAG B AT FOUR PLACES (#32, #33, #37, #8). ADD NOTE FLAG C AT ONE PLACE (#37).	DG	E191010-02 10/15/19

ECM CONNECTOR WIRE COLOR AND FUNCTION	IF USING ALL WHITE WIRE, IDENTIFY WIRE BY "LABELS" ON SCHEMATIC.
1 - GRN - SPK_COIL_1a	46 - YEL - LOW COOLANT SIG (AUX PUD1)
2 - PUR - SPK_COIL_1b	47 - GRN - TPS1 SIGNAL
3 - BLK (16GA) SPARK GROUND	48 - YEL - TPS2 SIGNAL
4 - BLK (16GA) SPARK GROUND	49 - TAN - FUEL SELECT (OPEN-NG, GND-LPG)
5 - BLU - SPK_COIL_2a	50 - TAN - AUX DIGITAL INPUT 2
6 - PUR - SPK_COIL_2b	51 - TAN - FUEL SELECT (OPEN-NG, GND-LPG)
7 - TAN - AUX ANALOG PULL DOWN 1	52 - LT GRN - KNOCK SENSOR
8 - PUR - GASOLINE PULL DOWN 1	53 - BLU - ACCEL PEDAL POSITION A (FPP1)
9 - PUR - GASOLINE PULL DOWN 2	54 - PUR - ACCEL PEDAL POSITION B (FPP2)
10 - PUR - GASOLINE PULL DOWN 3	55 - PUR - ACCEL PEDAL POSITION C (FPP3)
11 - PUR - GASOLINE PULL DOWN 4	56 - PUR - ACCEL PEDAL POSITION D (FPP4)
12 - TAN - AUX ANALOG PULL DOWN 1	57 - PUR - ACCEL PEDAL POSITION E (FPP5)
13 - PUR - GASOLINE PULL DOWN 1	58 - PUR - ACCEL PEDAL POSITION F (FPP6)
14 - PUR - GASOLINE PULL DOWN 2	59 - PUR - ACCEL PEDAL POSITION G (FPP7)
15 - BLU - CAN(-)	60 - RED - (16GA) BATTERY+ SUPPLY TO ECM
16 - YEL - AUX ANALOG PULL DOWN 3	61 - GRN - POST-CAT O2 HEATER GROUND
17 - LT GRN - 5V REFERENCE POWER	62 - GRN - PRE-CAT O2 HEATER GROUND
18 - BLK - 5V REFERENCE GROUND #1	63 - BRN - INJ_LS_C1L1
19 - GRN - 5V REFERENCE GROUND #2	64 - YEL - INJ_LS_C1L2
20 - BLK - 5V REFERENCE GROUND #3	65 - YEL - INJ_LS_C1L3
21 - GRN - PRE-CAT O2 SIGNAL	66 - GRN - INJ_LS_C1L4
22 - GRN - POST-CAT O2 SIGNAL	67 - LT BLU - INJ_LS_C1L5
23 - BLU - MAP SIGNAL	68 - GRN - INJ_LS_C1L6
24 - GRN - CRANK POSITION (+)	69 - BLK - (16GA) FRAME GROUND
25 - GRN - CRANK POSITION (-)	70 - BLK - (16GA) GASOLINE FUEL PUMP GROUND
26 - GRN - CRANK POSITION (+)	71 - BLK - (16GA) LOCKOFF GROUND
27 - GRN - CRANK POSITION (-)	72 - PUR - FUEL PUMP RELAY GROUND DRIVER
28 - BLK - CRANK POSITION (+)	73 - PUR - BATTERY+ SUPPLY TO ECM
29 - GRN - CRANK POSITION (-)	74 - GRN - MIL (PIN GROUNDS TO TURN ON MIL)
30 - PUR - MAP SIGNAL	75 - BLK - (16GA) GASOLINE FUEL PUMP GROUND
31 - PUR - MAP SIGNAL	76 - PUR - FUEL PUMP RELAY GROUND DRIVER
32 - LT GRN - 5V REFERENCE GROUND #2	77 - BLK - BATTERY+ SUPPLY TO ECM
33 - GRN - TPS1 SIGNAL	78 - LT BLU - TB MOTOR+ (DBW+)
34 - GRN - TPS2 SIGNAL	79 - BLK - (16GA) FRAME GROUND
35 - PUR - OIL PRESSURE SWITCH	80 - GRN - TB MOTOR- (GRN-)
36 - RED - MAT (AT) SIGNAL	81 - WHI - RECIRC DIODE (AUX PWM3)
37 - PUR - ENGINE COOLANT TEMP SIGNAL	82 - BRN - AUX PWM3 WITHOUT RECIRCULATION DIODE
38 - PUR - GASOLINE TEMP (AUX ANA PUD)	83 - TAN - (AUX PWM1) OR WARNING LAMP GROUND
39 - BLU - AUX ANALOG PULL UP 3	84 - BLU - AUX PWM3 WITHOUT RECIRCULATION DIODE
40 - GRN - AUX ANALOG PULL UP 2	85 - BLU - AUX PWM3 WITHOUT RECIRCULATION DIODE
41 - GRN - AUX ANALOG PULL UP 1	86 - BLU - VVT VALVE GROUND (AUX PWM 4)
42 - BRN - SPEED SWITCH 2	87 - BLU - AUX FRAME OUTPUT
43 - GRN - TACH DRIVER	88 - PUR - AUX PWM 3 RECIRC
44 - BRN - SPEED SWITCH 1	89 - PUR - AUX PWM 3 RECIRC
45 - PUR - TACH DRIVER	90 - BLK - (16GA) GASOLINE FUEL PUMP GROUND

NOTES:

- SEE DRAWING 202493L FOR HARNESS DIMENSIONAL LAYOUT AND CONNECTOR PINS.
- ALL WIRE SIZES ARE 18 AWG TXL DR EQUIV UNLESS OTHERWISE NOTED
- ALL CONNECTOR TERMINATIONS ARE SHOWN LOOKING AT BACK OF CONNECTOR WHERE WIRES ARE INSERTED. 5V_REF_GND1/2 (PIN 20/32) AND FRAME_GND (PINS 69&81) SHOULD NOT BE CONNECTED IN THE HARNESS. THESE CIRCUITS ARE ELECTRICALLY ISOLATED.
- ALL 5V_REF_GND WIRES SHOULD BE ROUTED SUCH THAT THE SPLICES ARE AS CLOSE AS POSSIBLE TO THE ECM (WITHIN 12")
- NUMBERED CIRCLES INDICATE INDIVIDUAL CONNECTOR TERMINATIONS IN LAYOUT DRAWING
- CAN +/- WIRES TO BE TWISTED PAIR IN ACCORDANCE WITH ISO 11898-2 AND SAE J-1939
- TWISTED WIRE PAIRS SHOULD HAVE A MIN. OF 10 TURNS FOOT, AND BE TWISTED OVER WHOLE LENGTH.
- FOR TWISTED SHIELDED CABLES USE TIE# 2019D0301-0 OR EQUIVALENT
- ALL SPLICES TO BE SOLDERED OR SONIC WELDED AND SEALED. ULTRASONIC WELD IS ALSO ACCEPTABLE.
- HARNESS MAY ALTERNATIVELY BE MANUFACTURED USING WHITE WIRE WITH PRINTED LABELS, INSTEAD OF COLORED WIRE. LABELS ARE SPECIFIED IN "QUOTATIONS", AND MUST BE PRINTED DIRECTLY BEHIND EACH CONNECTOR, AND REPEATED ALONG ENTIRE LENGTH OF WIRE.
- WIRE LENGTH TOLERANCES AS FOLLOWS:

0-50mm:	+/-6mm
51-150mm:	+/-10mm
151-305mm:	+/-20mm
306-915mm:	+/-25mm
916-2540mm:	+/-6mm
>2540mm:	+/-50mm

INTERFACE CONNECTOR #1 (FEMALE PINS)
NOTE: IF USING ALL WHITE WIRE, IDENTIFY WIRE BY "LABELS" ON SCHEMATIC.

A	44 - PNK - 12V KEY SWITCH POWER TO ECM (HOT IN RUN/CRANK)
B	34 - GRN - SPEED SWITCH1
C	42 - BRN - SPEED SWITCH2
D	PNK - (16GA) GASOLINE FUEL PUMP +12VDC
E	PNK - (16GA) STARTER REQUEST (AUTOCRANKING)
F	PLUG
G	74 - GRN - MIL (OPEN-OFF, GND-ON)
H	90 - BLK - (16GA) GASOLINE FUEL PUMP GROUND
J	PLUG
K	PLUG
L	20 - BLK - 5V REFERENCE GROUND #1 (SENSOR GROUND)
M	19 - LT GRN - 5V REFERENCE POWER (SENSOR POWER)
N	14 - WHI - CAN+
P	15 - BLU - CAN-
R	32 - LT GRN - 5V REFERENCE GROUND #2 (SENSOR GROUND)
S	49 - TAN - FUEL SELECT (OPEN-NG, GND-LPG)

INTERFACE CONNECTOR #2 (MALE PINS)
NOTE: IF USING ALL WHITE WIRE, IDENTIFY WIRE BY "LABELS" ON SCHEMATIC.

A	85 - TAN - ENGINE WARNING/SHUTDOWN LAMP GROUND
B	83 - WHI - AUX PWM5 WITH RECIRCULATION DIODE
C	84 - BRN - AUX PWM5 WITHOUT RECIRCULATION DIODE
D	45 - GRN - TACH DRIVER
E	81 - BLK - FRAME GROUND
F	87 - BLU - AUX PWM2 OUTPUT
G	PUR - ALTERNATOR CHARGING TROUBLE LAMP
H	40 - BLU - AUX ANALOG PULL UP 3
J	54 - PUR - ACCEL PEDAL POSITION B (FPP2)
K	53 - BLU - ACCEL PEDAL POSITION A (FPP1)
L	50 - TAN - AUX DIGITAL INPUT 2
M	41 - GRN - AUX DIGITAL INPUT 3
N	PLUG
P	45 - RED - AUX CONFIG ANALOG INPUT 2 (PULL UP/DOWN)
R	12 - TAN - AUX ANALOG PULL DOWN 1
S	18 - YEL - AUX ANALOG PULL DOWN 3

PRODUCTION

ITEM	DASH	QUAN	DESC
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SHEET 1 OF 1		ZENITH POWER PRODUCTS	
SCALE:		DRAWN BY: G CHIUINI	
DATE:		CHK BY:	
DO NOT SCALE DRAWING		APPROVED:	
		DATE: 07/26/18	
TOLERANCES (UNLESS NOTED OTHERWISE):			
X	± .01		
Ø	± .01		
ANGULAR	± .01		
FRONT SURFACE	± .01		
ORIGINAL PARTS	± .01		
ESL	± .01		
USED ON:		SCHEMATIC, 416G MAIN ENGINE HARNESS (ALL FUELS)	
		DRAWING NUMBER: 202493-S	
		REVISION: 7	