REVISIONS				
REV	DESCRIPTION	DRAFTER	CHECKER	APPROVAL
06	040700-211 REVISED	29DEC04 D.M.B.	14DEC04 R.L.W.	

ON ENGINE HARNESSING

FOR DETAILS ON CM850-J1 CONNECTIONS, REFER TO BULLETIN# 4081885(QSL/C) OR 4081886(QSB) SEE NOTE 1

TO ENGINE SENSORS/ACTUATORS

WATER IN FUEL (WIF) SENSOR CONNECTIONS (SEE NOTE 42, DETAIL M)

CM850 ENGINE CONTROL MODULE (PORT)

J1
J3
J2

J1- CM850 ECM CONNECTOR

J2-CM850 OEM CONNECTOR

J3-CM850 POWER CONNECTOR

SYSTEM INTEGRATION MODULE (PORT)

SEE NOTE 2

VESSEL ADAPTER HARNESS
SEE NOTE 39, SCHEMATIC DETAIL SHEET 4

ENG	OPTION	COMMENTS
QSC/L/B	EA9061	+12V COMPATIBLE
QSC/L/B	EA9062	+24V COMPATIBLE

ENGINE OEM HARNESS
SEE NOTE 3, SCHEMATIC DETAIL SHEET 4

- COOLANT LEVEL SENSOR INPUT (SEE NOTE 41)
- GEAR OIL PRESSURE/TEMPERATURE SENSOR INPUT (SEE NOTE 4)
- GEAR AHEAD/ASTERN CONTROL (SEE NOTE 5)
- SEA WATER FLOW SWITCH INPUT (SEE NOTE 6)
- NEUTRAL SAFETY JUMPER PLUG (SEE NOTE 7)
- 9-PIN SERVICE TOOL CONNECTION (SEE NOTE 8)
- MUS ID JUMPER (MASTER/SLAVE)(SEE NOTE 9)

40 PIN ENGINE/VESSEL INTERFACE CONNECTOR

DC/DC CONVERTER NOTE 10 DETAIL J

THROTTLE EXTENSION HARNESS SEE DETAIL G

REMOTE THROTTLE BIAS ADAPTER SEE NOTE 13, DETAIL H

REMOTE THROTTLE EXTENSION HARNESS SEE DETAIL F

- DEPTH/TEMP TRANSDUCER INPUT
- PADDLE WHEEL INPUT
- TANK 1 LEVEL INPUT
- TANK 2 LEVEL INPUT
- STEERING ANGLE INPUT
- KEYSWITCH JUMPER BREAKOUT

(SEE NOTE 12)

CAN 1, CAN 2, CAN 3 TERMINATION RESISTORS (3 @ 120Ω) (SEE NOTE 11, DETAIL E)

GENERATOR SET EXT- HARNESS
(SEE NOTE 45, DETAIL R)

ENG	OPTION	LENGTH
QSC/L/B	EA9085	10'
QSC/L/B	EA9086	20'
QSC/L/B	EA9087	30'

ONAN GENERATOR INTERFACE CONNECTION SEE SHEET 10 FOR DETAILS

OFF ENGINE EXTENSIONS

200Ω

4-20 mA ADAPTER

THROTTLE ADAPTER HARNESS (4-20mA)
(SEE NOTE 17)

ENG	OPTION
QSC/L/B	EA9047

THROTTLE SIGNAL INPUT

IDLE VALIDATION SWITCH SIGNAL INPUT

THROTTLE POT ASM. W/ HARNESS
(SEE NOTE 16)

ENG	OPTION	LENGTH
QSC/L/B	MS9039	20'
QSC/L/B	MS9040	40'
QSC/L/B	MS9041	60'

SINGLE ENGINE REMOTE THROTTLE ASSEMBLY

REMOTE THROTTLE ASM. W/ HARNESS
(SEE NOTE 14)

ENG	OPTION	LENGTH
QSC/L/B	EG9298	20'
QSC/L/B	EG9299	40'
QSC/L/B	EG9300	60'
QSC/L/B	EG9311	30'

MAIN EXTENSION HARNESS
(SEE NOTE 15, DETAIL A)

ENG	OPTION	LENGTH
QSC/L/B	EA9063	20'
QSC/L/B	EA9064	40'
QSC/L/B	EA9065	60'
QSC/L/B	EA9078	30'

SINGLE STATION PATH

DUAL STATION PATH

TO MAIN STATION ADAPTER HARNESS (PORT)

PORT

STBD

SECOND STATION TEE HARNESS (SEE NOTE 18)

TO SECOND STATION EXTENSION HARNESS IF APPLICABLE

TO MAIN STATION ADAPTER HARNESS (STARBOARD)

FOR DETAILS ON CM850-J1 CONNECTIONS, REFER TO BULLETIN# 4081885(QSL/C) OR 4081886(QSB) SEE NOTE 1

TO ENGINE SENSORS/ACTUATORS

WATER IN FUEL (WIF) SENSOR CONNECTIONS (SEE NOTE 42, DETAIL M)

CM850 ENGINE CONTROL MODULE (STBD)

J1
J3
J2

J1- CM850 ECM CONNECTOR

J2-CM850 OEM CONNECTOR

J3-CM850 POWER CONNECTOR

SYSTEM INTEGRATION MODULE (STBD)

SEE NOTE 2

VESSEL ADAPTER HARNESS
SEE NOTE 39, SCHEMATIC DETAIL SHEET 4

ENG	OPTION	COMMENTS
QSC/L/B	EA9061	+12V COMPATIBLE
QSC/L/B	EA9062	+24V COMPATIBLE

ENGINE OEM HARNESS
SEE NOTE 3, SCHEMATIC DETAIL SHEET 4

- COOLANT LEVEL SENSOR INPUT (SEE NOTE 41)
- GEAR OIL PRESSURE/TEMPERATURE SENSOR INPUT (SEE NOTE 4)
- GEAR AHEAD/ASTERN CONTROL (SEE NOTE 5)
- SEA WATER FLOW SWITCH INPUT (SEE NOTE 6)
- NEUTRAL SAFETY JUMPER PLUG (SEE NOTE 7)
- 9-PIN SERVICE TOOL CONNECTION (SEE NOTE 8)
- MUS ID JUMPER (MASTER/SLAVE)(SEE NOTE 9)

40 PIN ENGINE/VESSEL INTERFACE CONNECTOR

DC/DC CONVERTER NOTE 10 DETAIL J

THROTTLE EXTENSION HARNESS SEE DETAIL G

REMOTE THROTTLE BIAS ADAPTER SEE NOTE 13, DETAIL H

REMOTE THROTTLE EXTENSION HARNESS SEE DETAIL F

- PADDLE WHEEL INPUT
- TANK 1 LEVEL INPUT
- TANK 2 LEVEL INPUT
- STEERING ANGLE INPUT
- DEPTH/TEMP TRANSDUCER INPUT
- KEYSWITCH JUMPER BREAKOUT

(SEE NOTE 12)

CAN 1, CAN 2, CAN 3 TERMINATION RESISTORS (3 @ 120Ω) (SEE NOTE 11, DETAIL E)

GENERATOR SET EXT- HARNESS
(SEE NOTE 45, DETAIL R)

ENG	OPTION	LENGTH
QSC/L/B	EA9085	10'
QSC/L/B	EA9086	20'
QSC/L/B	EA9087	30'

ONAN GENERATOR INTERFACE CONNECTION SEE SHEET 10 FOR DETAILS

200Ω

4-20mA ADAPTER

THROTTLE ADAPTER HARNESS (4-20mA)
(SEE NOTE 17)

ENG	OPTION
QSC/L/B	EA9047

THROTTLE SIGNAL INPUT

IDLE VALIDATION SWITCH SIGNAL INPUT

THROTTLE POT ASM. W/ HARNESS
(SEE NOTE 16)

ENG	OPTION	LENGTH
QSC/L/B	MS9039	20'
QSC/L/B	MS9040	40'
QSC/L/B	MS9041	60'

SINGLE ENGINE REMOTE THROTTLE ASSEMBLY

REMOTE THROTTLE ASM. W/ HARNESS (SEE NOTE 14)

ENG	OPTION	LENGTH
QSC/L/B	EG9298	20'
QSC/L/B	EG9299	40'
QSC/L/B	EG9300	60'
QSC/L/B	EG9311	30'

MAIN EXTENSION HARNESS
(SEE NOTE 15, DETAIL A)

ENG	OPTION	LENGTH
QSC/L/B	EA9063	20'
QSC/L/B	EA9064	40'
QSC/L/B	EA9065	60'
QSC/L/B	EA9078	30'

REFER TO MAB 0.15.00-08/04/2003 FOR DETAILED APPLICATION INFORMATION

Cummins Inc.

ITEM NAME	DIAGRAM, WIRING
IDENTIFIER	DIAGRAM DRAWING
DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994	
REF. ITEM NO.: -	
DRAFTER J L ROPER	30SEP03
CHECKER J R RATTIGAN	12DEC03
DESIGN APPROVAL -	
CAGE CODE/IDENT NO. J	ITEM NUMBER 3970189
SCALE NONE	ITEM CONTROL CMU SHEET 1 OF 11

REVISIONS				
REV	DESCRIPTION	DRAFTER	CHECKER	APPROVAL
06	040700-211 REVISED	07DEC04 D M B	14DEC04 R L W	. .

MAIN STATION CONFIGURATION

INSTRUMENT TABLE

ENG	OPTION	COMMENTS	NOTE
QSC/L/B	EG9313	SYSTEM TACHOMETER (85mm)	36
QSC/L/B	EG9309	SYSTEM SPEEDOMETER (85mm)	37
QSC/L/B	EG9305	GEAR OIL PRESSURE GAUGE (52mm)	32
QSC/L/B	EG9306	GEAR OIL TEMPERATURE GAUGE (52mm)	32
QSC/L/B	EG9307	FUEL LEVEL GAUGE (52mm)	32
QSC/L/B	EG9308	FUEL FLOW GAUGE (52mm)	32
QSC/L/B	EG9296	+12V INSTRUMENT PANEL KIT	30
QSC/L/B	EG9297	+24V INSTRUMENT PANEL KIT	30
QSC/L/B	EG9334	FLUID LEVEL GAUGE (52mm)	32
QSL/L/B	EG9341	J1939 ENGINE DATA DISPLAY (SEE DETAIL Q)	44

MAIN STATION INSTRUMENTATION

ENG	OPTION	COMMENTS	NOTE
QSC/L/B	EG9310	+12V QUAD GAUGES (110mm)	31
QSC/L/B	EG9321	+24V QUAD GAUGES (110mm)	31

SEE NOTE 22, DETAIL E

ENG	OPTION	COMMENTS
QSC/L/B	EA9080	TWIN ENGINE
QSC/L/B	EA9069	SINGLE ENGINE

SEE NOTE 23

ENG	OPTION	COMMENTS
QSC/L/B	EG9294	+12/+24 VOLT COMPATIBLE

C-CRUISE SWITCH PANEL
SEE NOTE 24

ENG	OPTION	COMMENTS
QSC/L/B	EG9295	+12/+24 VOLT SWITCH COMPATIBLE

DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
REF. ITEM NO.: .
DRAFTER J L ROPER 30SEP03
CHECKER J R RATTIGAN 12DEC03
DESIGN APPROVAL . .

Cummins Inc.
ITEM NAME DIAGRAM,WIRING
IDENTIFIER DIAGRAM DRAWING
SIZE J | CODE IDENT NO. | ITEM NUMBER 3970189
SCALE NONE | ITEM CONTROL CMU

SECOND STATION CONFIGURATION

REVISIONS				
REV	DESCRIPTION	DRAFTER	CHECKER	APPROVAL
06	040700-211 REVISED	DMB 3DSEP03	RLW 12DEC03	

SECOND STATION KEYSWITCH, START, STOP PIGTAIL ASSEMBLY (SEE DETAIL P)

+12V
CRANK
KEYSWITCH
START
STOP

INSTRUMENT TABLE

ENG	OPTION	COMMENTS	NOTE
QSC/L/B	EG9314	SYSTEM TACHOMETER (85mm)	36
QSC/L/B	EG9319	SYSTEM SPEEDOMETER (85mm)	37
QSC/L/B	EG9315	GEAR OIL PRESSURE GAUGE (52mm)	32
QSC/L/B	EG9316	GEAR OIL TEMPERATURE GAUGE (52mm)	32
QSC/L/B	EG9317	FUEL LEVEL GAUGE (52mm)	32
QSC/L/B	EG9318	FUEL FLOW GAUGE (52mm)	32
QSC/L/B	EG9303	+12V INSTRUMENT PANEL KIT	35
QSC/L/B	EG9304	+24V INSTRUMENT PANEL KIT	35
QSC/L/B	EG9342	J1939 ENGINE DATA DISPLAY (SEE DETAIL Q)	44

ALARM HORN

PORT SIDE-DUAL ENGINE APPLICATION

STARBOARD SIDE-SINGLE ENGINE APPLICATION

SECOND STATION INSTRUMENTATION

ENG	OPTION	COMMENTS	NOTE
QSC/L/B	EG9320	+12V QUAD GAUGE (110mm)	31
QSC/L/B	EG9312	+24V QUAD GAUGE (110mm)	31

HELM ADAPTER HARNESS SEE NOTE 26 DETAIL K

FROM SECOND STATION "T" HARNESS (PORT) SHEET 1

SECOND STATION INSTRUMENT HARNESS SEE NOTE 25

ENG	OPTION	LENGTH
QSC/L/B	EA9066	20'
QSC/L/B	EA9079	30'
QSC/L/B	EA9067	40'
QSC/L/B	EA9068	60'

CAN 2 TERM. RESISTOR (1 @ 120Ω) SEE NOTE 28 DETAIL L

SECOND STATION JUNCTION BLOCK PORT (NOTE 29)

CONNECTOR COVER

NOTE 43

PORT CONNECTION PATH WHEN DIESEL VIEW NOT IMPLEMENTED

(SEE INSTRUMENT TABLE ABOVE)

SEE NOTE 27, DETAIL E

ENG	OPTION	COMMENTS
QSC/L/B	EA9080	TWIN ENGINE
QSC/L/B	EA9069	SINGLE ENGINE

CONNECTION PATH WHEN INSTALLATION USES DIESEL VIEW DISPLAY & ASSOCIATED HARNESSES

DIESEL VIEW HARNESS (SEE DETAIL A)

DIESEL VIEW DISPLAY (SECOND STATION)

A
B

SEE NOTE 33

ENG	OPTION	COMMENTS
QSC/L/B	EG9301	+12/+24 VOLT COMPATIBLE

AMBIENT AIR TEMPERATURE

NMEA 0183 DATA INTERFACE CONNECTION SEE NOTE 38

SECOND STATION JUNCTION BLOCK STBD (NOTE 29)

CAN 2 TERM. RESISTOR (1 @ 120Ω) SEE NOTE 28 DETAIL L

CONNECTOR COVER

NOTE 43

(SEE INSTRUMENT TABLE ABOVE)

STARBOARD CONNECTION PATH WHEN DIESEL VIEW NOT IMPLEMENTED

FROM SECOND STATION "T" HARNESS (STARBOARD) SHEET 1

SECOND STATION INSTRUMENT HARNESS SEE NOTE 25

ENG	OPTION	LENGTH
QSC/L/B	EA9066	20'
QSC/L/B	EA9079	30'
QSC/L/B	EA9067	40'
QSC/L/B	EA9068	60'

HELM ADAPTER HARNESS SEE NOTE 26 DETAIL K

+12V
CRANK
KEYSWITCH
START
STOP

SECOND STATION START/STOP PIGTAIL ASSEMBLY (SEE DETAIL P)

SWITCH MODULE INTERFACE HARNESS (SEE DETAIL B)

C-CRUISE SWITCH PANEL SEE NOTE 34

ENG	OPTION	COMMENTS
QSC/L/B	EG9302	+12/+24 VOLT SWITCH COMPATIBLE

SMART MULTIPLEX MODULE

Cummins Inc.

DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994

REF. ITEM NO.: -

DRAFTER J L ROPER 30SEP03

CHECKER J R RATTIGAN 12DEC03

DESIGN APPROVAL -

ITEM NAME: DIAGRAM, WIRING

IDENTIFIER: DIAGRAM DRAWING

SIZE J | CODE IDENT NO. | ITEM NUMBER 3970189

SCALE NONE | ITEM CONTROL CMU | SHEET 3 OF 11

ENGINE OEM HARNESS
VESSEL ADAPTER HARNESS
SYSTEM INTE-GRATION MODULE
GEAR TEMP.
GEAR PRESSURE
XDUCER POWER
XDUCER GROUND
LEVEL 1
LEVEL 2
STEERING POS.
CAN 1 (+)
CAN 1 (-)
CAN 2 (+)
CAN 2 (-)
KEYSWITCH
PADDLE WHEEL SPEED
SEAWATER FLOW SWITCH
BATTERY (+)
GROUND
GEAR FORWARD
GEAR REVERSE
GEAR OIL TEMP SENSOR
GEAR OIL PRESSURE
SEAWATER FLOW SWITCH
15 AMP
FORWARD SOLENOID
REVERSE SOLENOID
NEUTRAL SAFETY JUMPER PLUG
ENGINE CRANK
CM850 OEM CONNECTOR J2
J1939 (+)
J1939 (-)
KEYSWITCH
J1587 (+)
J1587 (-)
SWITCH COMMON
ON IDLE SWITCH
OFF IDLE SWITCH
THROTTLE RETURN
THROTTLE SIGNAL
THROTTLE SUPPLY
REMOTE THROTTLE RETURN
REMOTE THROTTLE SIGNAL
REMOTE THROTTLE SUPPLY
REMOTE THROTTLE ENABLE SWITCH
MUS ID GROUND
MUS ID PIN 1
MUS ID PIN 2
MUS ID PIN 3
COOLANT SWITCH
MUS ID JUMPER
MASTER
SLAVE
COOLANT LEVEL
CM850 POWER CONNECTOR J3
GROUND
UNSWITCHED VBATT. (+)
25 AMP
5 AMP
9 PIN SERVICE TOOL CONNECTOR
VBATT (+)
TO AUX. MAGNETIC SWITCH COIL. SEE DETAIL C
TO MAIN POWER CONNECTION STUDS
DEPTH TRANSDUCER
PADDLE WHEEL TRANSDUCER
STEERING POSITION SENSOR
SENSORS SHOWN FOR REFERENCE ONLY - NOT AVAILABLE AS CMD OPTIONS.
TANK 1 LEVEL SENSOR
TANK 2 LEVEL SENSOR
MAIN STATION EXTENSION HARNESS
ENG. CRANK
+12V DC
CAN 3 (+)
CAN 3 (-)
10 AMP
TO SECOND STATION "T" HARNESS OR MAIN STATION ADAPTER HARNESS (SINGLE STATION)
TO THROTTLE EXTENSION HARNESS
TO REMOTE THROTTLE EXTENSION HARNESS
120Ω
CAN1,CAN2,CAN3 TERMINATION RESISTOR PLUG (ON ENGINE)
DC/DC CONVERTER

REVISIONS				
REV	DESCRIPTION	DRAFTER	CHECKER	APPROVAL
06	040700-211 REVISED	07DEC04 D M B	14DEC04 R L W	. .

1. SCHEMATIC REPRESENTATION SHOWS SINGLE ENGINE INSTALLATION. DUAL ENGINE INSTALLATIONS ARE IDENTICAL FROM PORT TO STARBOARD SIDE WITH THE POSSIBLE EXCEPTION OF SENSOR/TRANSDUCER CONNECTIONS. SEE NOTE 40 FOR DETAILS ON SENSOR AND TRANSDUCER CONFIGURATION.

Cummins Inc.

DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
REF. ITEM NO.: .
DRAFTER J L ROPER 30SEP03
CHECKER J R RATTIGAN 12DEC03
DESIGN APPROVAL .

ITEM NAME DIAGRAM,WIRING
IDENTIFIER DIAGRAM DRAWING
SIZE J | CODE IDENT NO. | ITEM NUMBER 3970189
SCALE NONE | ITEM CONTROL CMU | SHEET 4 OF 11

MAIN STATION JUNCTION BLOCK CONNECTIONS

REVISIONS				
REV	DESCRIPTION	DRAFTER	CHECKER	APPROVAL
06	040700-211 REVISED	07DEC04 D M B	14DEC04 R L W	.

Cummins Inc.

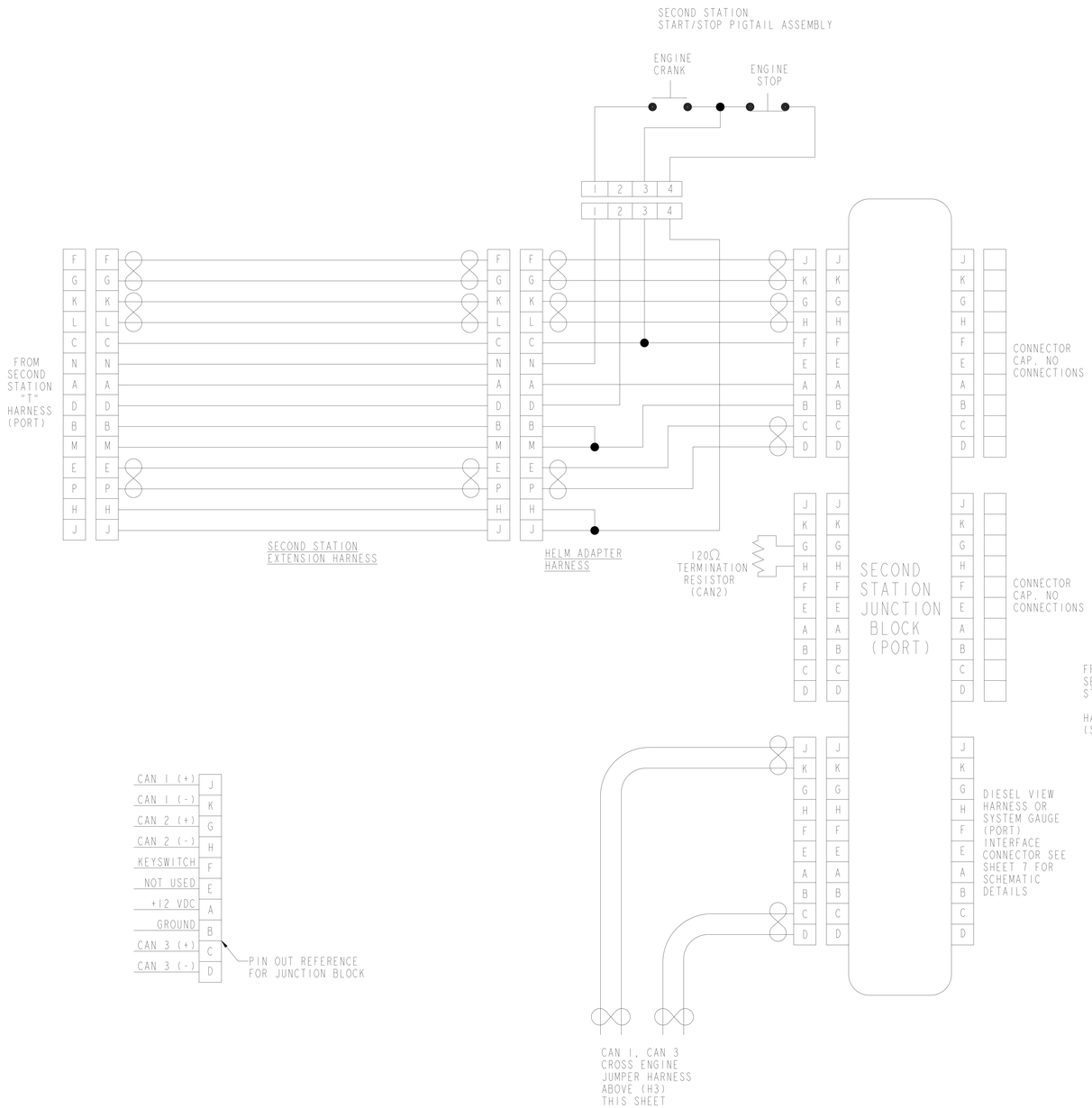
DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
REF. ITEM NO.: .

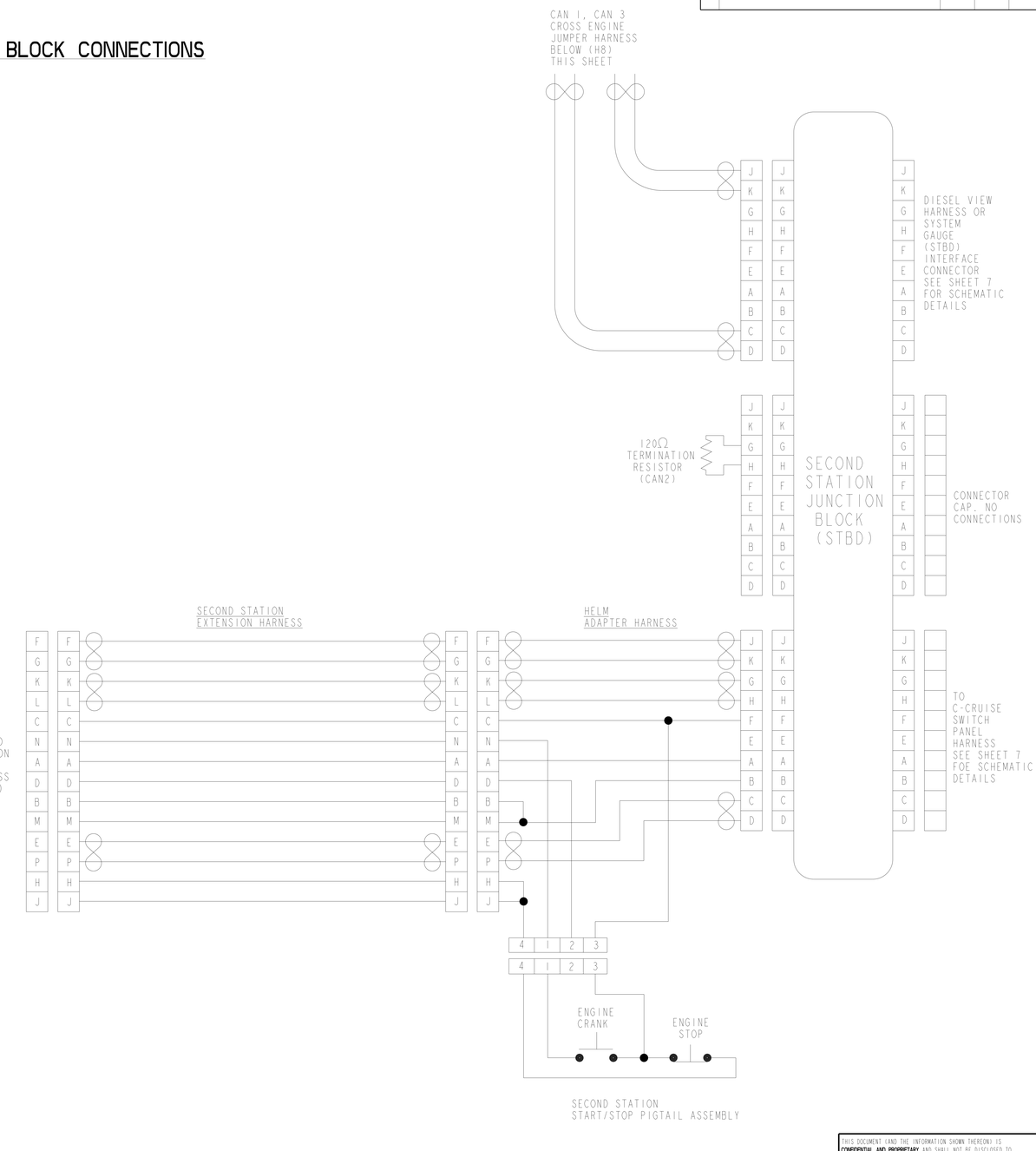
DRAFTER	J L ROPER	30SEP03
CHECKER	J R RATTIGAN	12DEC03
DESIGN APPROVAL	.	.

ITEM NAME: DIAGRAM,WIRING
IDENTIFIER: DIAGRAM DRAWING
SIZE: J | CODE IDENT NO.: | ITEM NUMBER: 3970189
SCALE: NONE | ITEM CONTROL: CMU | SHEET 5 OF 11

REVISIONS					
REV	DESCRIPTION	DRAFTER	CHECKER	APPROVAL	
06	040700-211 REVISED	DMB 05SEP03	RLW 12DEC03		

SECOND STATION JUNCTION BLOCK CONNECTIONS



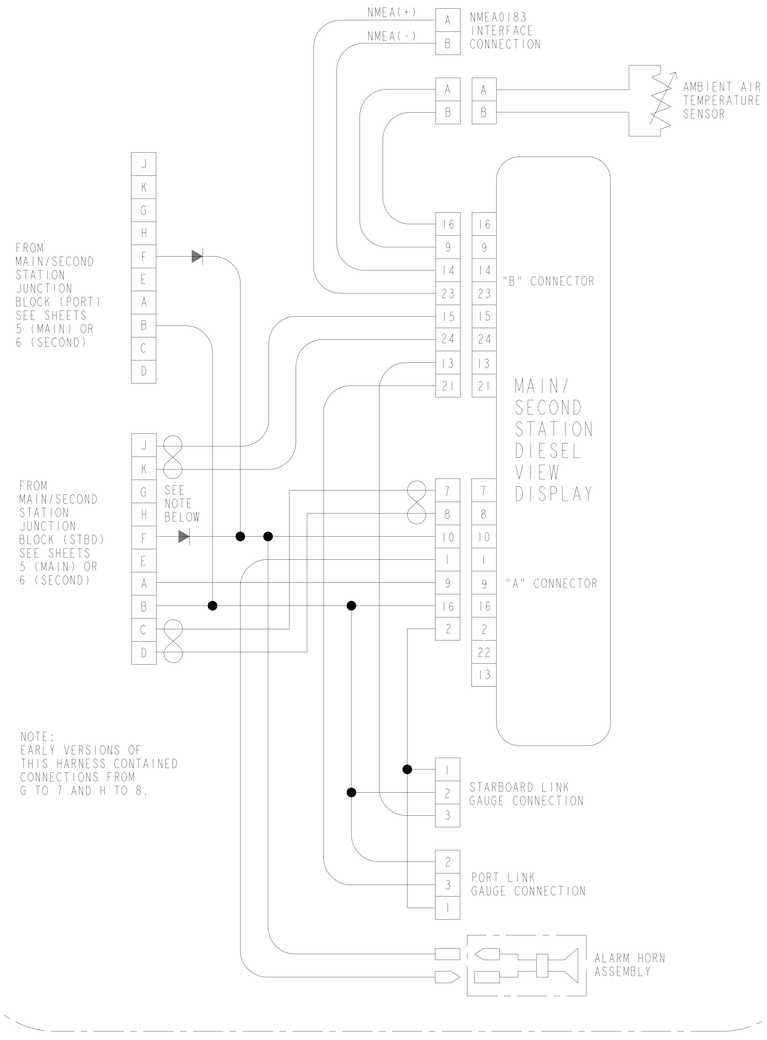


Cummins Inc.

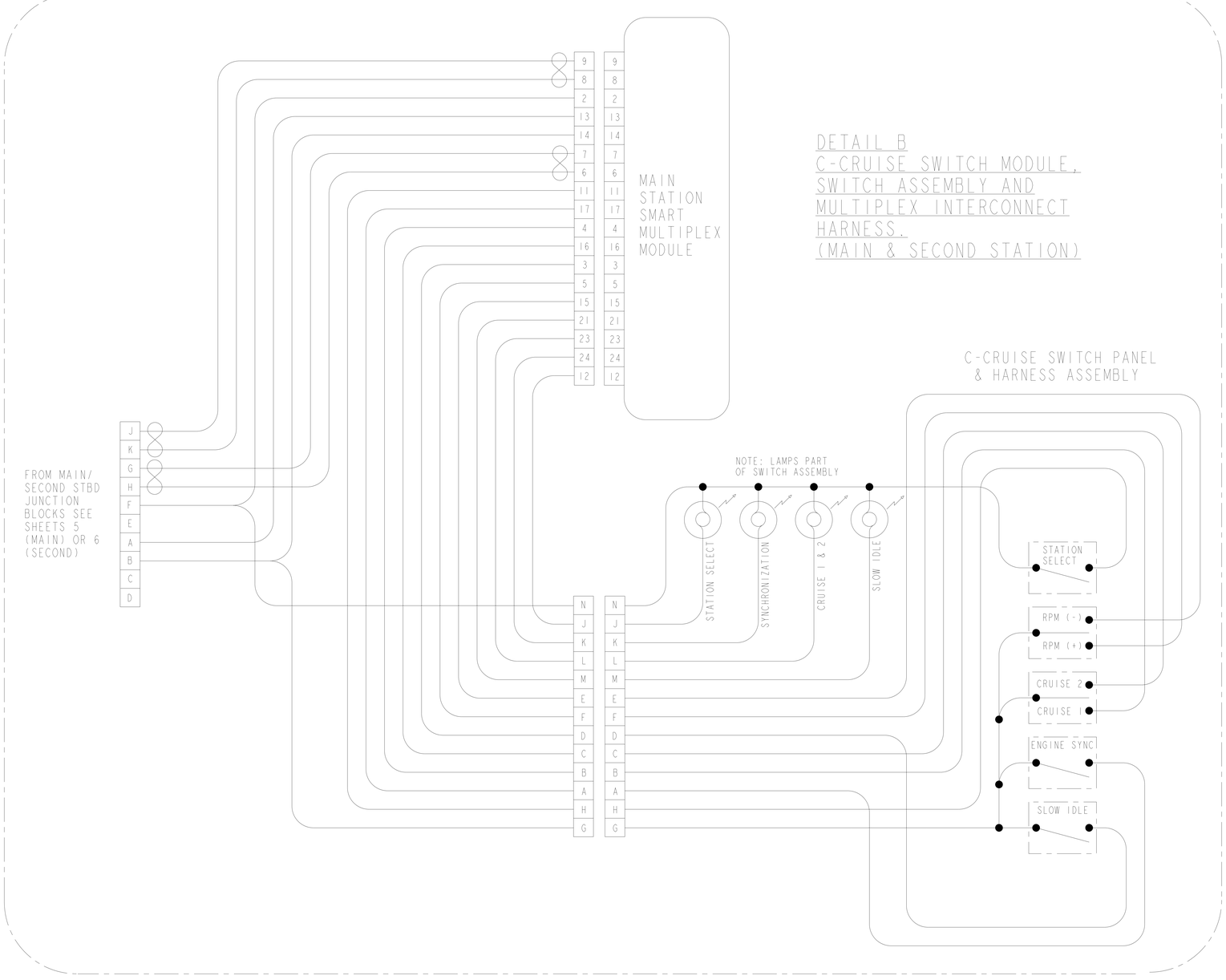
DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994	
REF. ITEM NO.:	
DRAFTER J L ROPER	30SEP03
CHECKER J R RATTIGAN	12DEC03
DESIGN APPROVAL	
ITEM NAME	DIAGRAM, WIRING
IDENTIFIER	DIAGRAM DRAWING
SIZE / CODE IDENT NO.	J
ITEM NUMBER	3970189
SCALE NONE	ITEM CONTROL CMU SHEET 6 OF 11

REVISIONS				
REV	DESCRIPTION	DRAFTER / CHECKER	CHECKER / APPROVAL	
06	040700-211 REVISED	DMB	RLW	

DETAIL A
DIESEL VIEW INTERFACE HARNESS (MAIN & SECOND STATION)



DETAIL B
C-CRUISE SWITCH MODULE, SWITCH ASSEMBLY AND MULTIPLEX INTERCONNECT HARNESS. (MAIN & SECOND STATION)



Cummins Inc.

DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994

REF. ITEM NO.: --

DRAFTER J L ROPER 30SEP03

CHECKER J R RATTIGAN 12DEC03

DESIGN APPROVAL -

ITEM NAME: DIAGRAM, WIRING

IDENTIFIER: DIAGRAM DRAWING

SIZE J | CODE IDENT NO. | ITEM NUMBER 3970189

SCALE NONE | ITEM CONTROL CMU | SHEET 7 OF 11

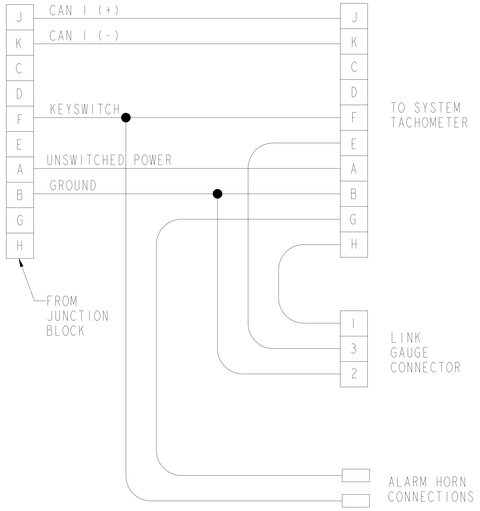
REVISIONS					
REV	DESCRIPTION	DRAFTER	CHECKER	APPROVAL	
06	040700-211 REVISED	DRAFTER D.M.B.	CHECKER R.L.W.		

DETAIL A

MAIN/SECOND STATION EXTENSION HARNESS

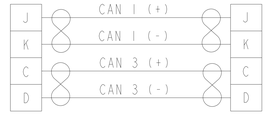
DETAIL B

SYSTEM TACHOMETER HARNESS

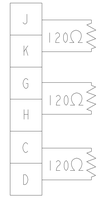


DETAIL E

CAN I- CAN 3 JUMPER HARNESS



CAN I, CAN 2, CAN 3 TERMINATION RESISTOR



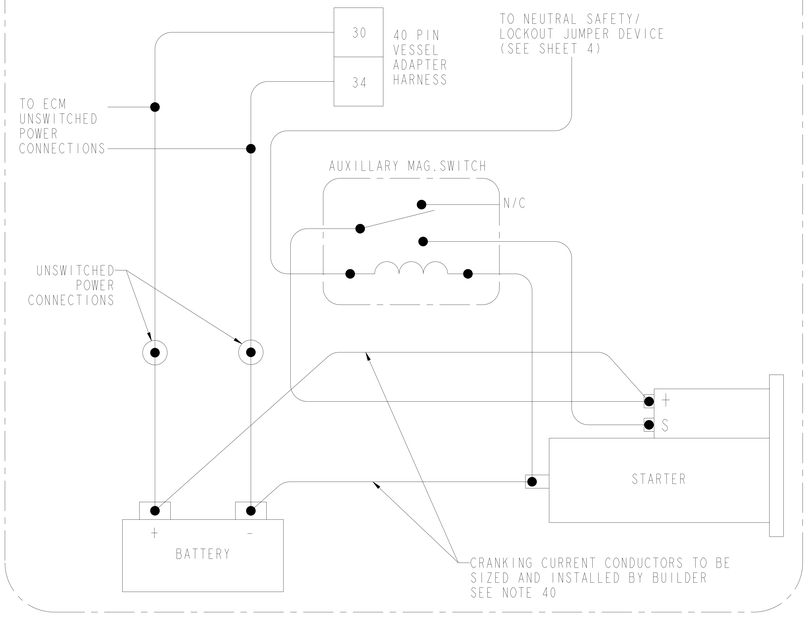
DETAIL F

REMOTE THROTTLE EXTENSION HARNESS

REMOTE THROTTLE

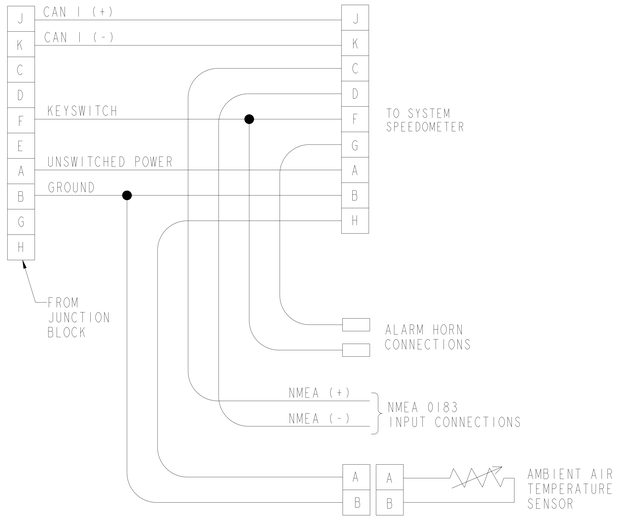
DETAIL C

DC POWER INTERCONNECT



DETAIL D

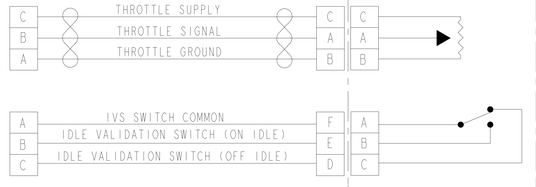
SYSTEM SPEEDOMETER HARNESS



DETAIL G

THROTTLE EXTENSION HARNESS

THROTTLE ASM.

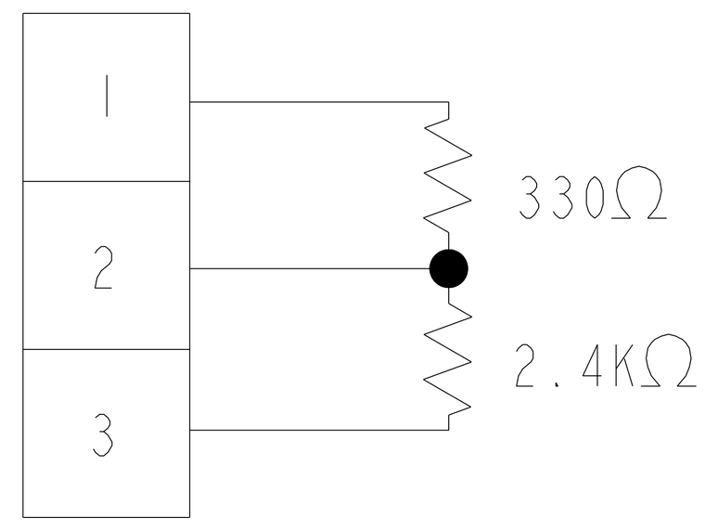


Cummins Inc.

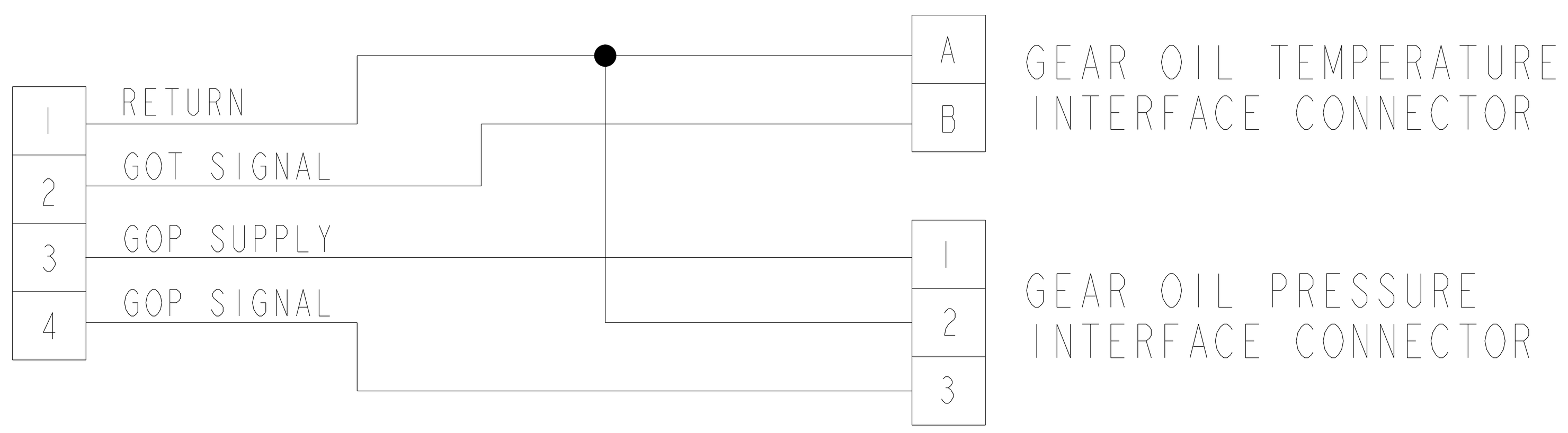
DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994	
REF. ITEM NO.: -	
DRAFTER J L ROPER	30SEP03
CHECKER J R RATTIGAN	12DEC03
DESIGN APPROVAL -	
ITEM NAME	DIAGRAM, WIRING
IDENTIFIER	DIAGRAM DRAWING
SIZE / CODE IDENT NO.	J
ITEM NUMBER	3970189
SCALE NONE	ITEM CONTROL CMU
SHEET 8 OF 11	

REVISIONS				
REV	DESCRIPTION	DRAFTER	CHECKER	APPROVAL
06	040700-211 REVISED	07DEC04 D M B	14DEC04 R L W	. .

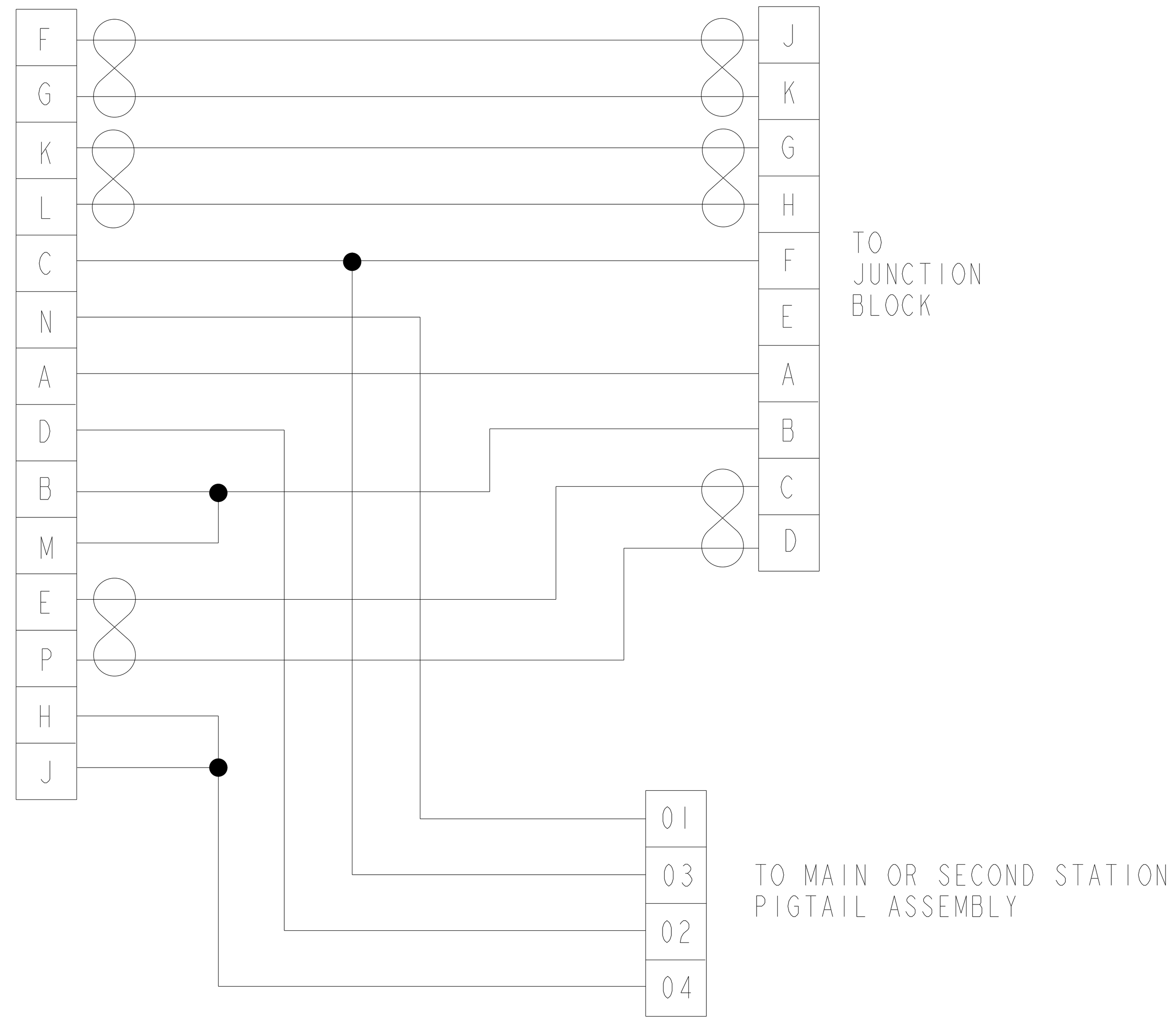
DETAIL H
REMOTE THROTTLE BIAS PLUG



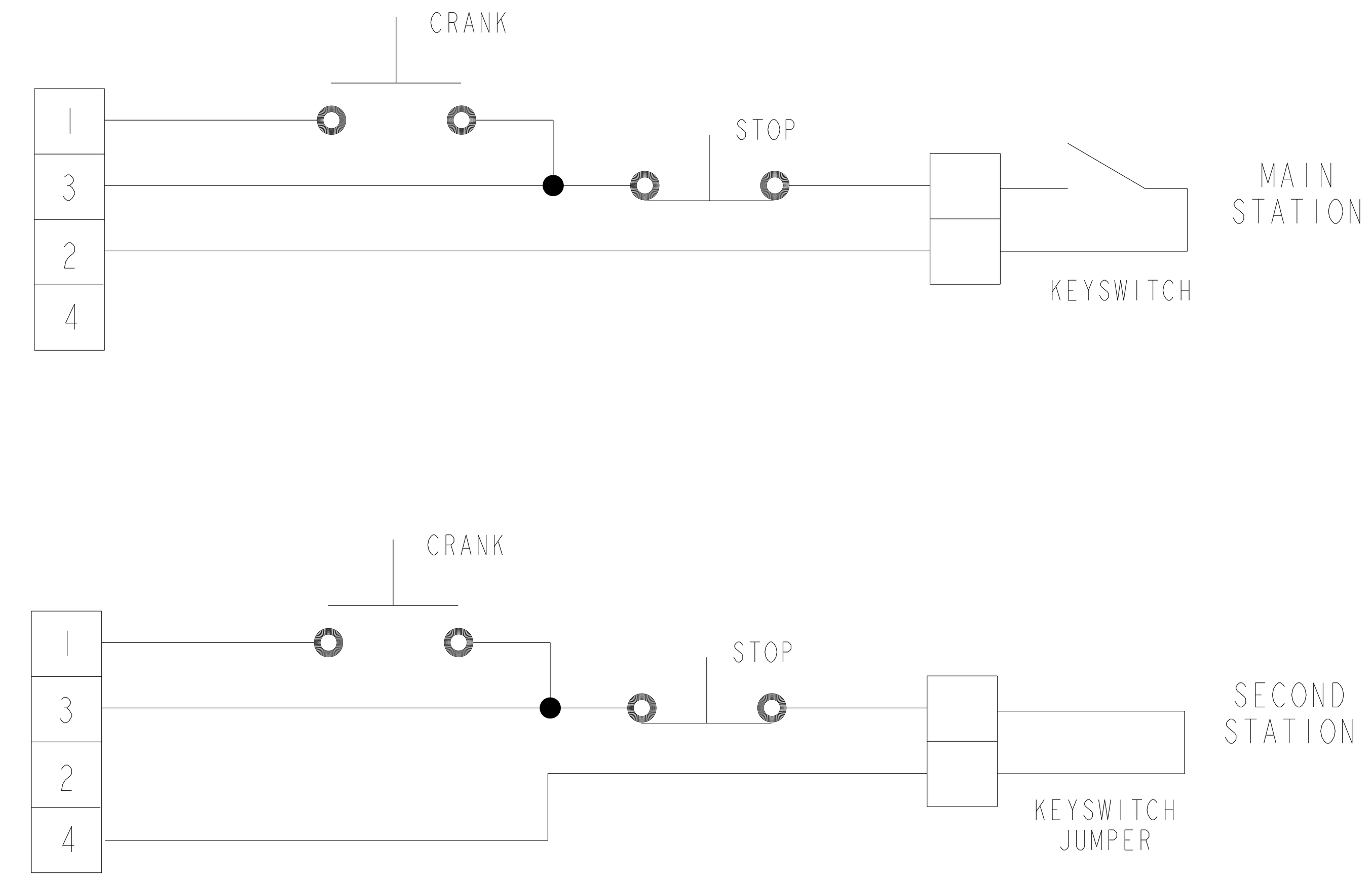
DETAIL N
GEAR OIL PRESSURE/TEMPERATURE EXTENSION HARNESS



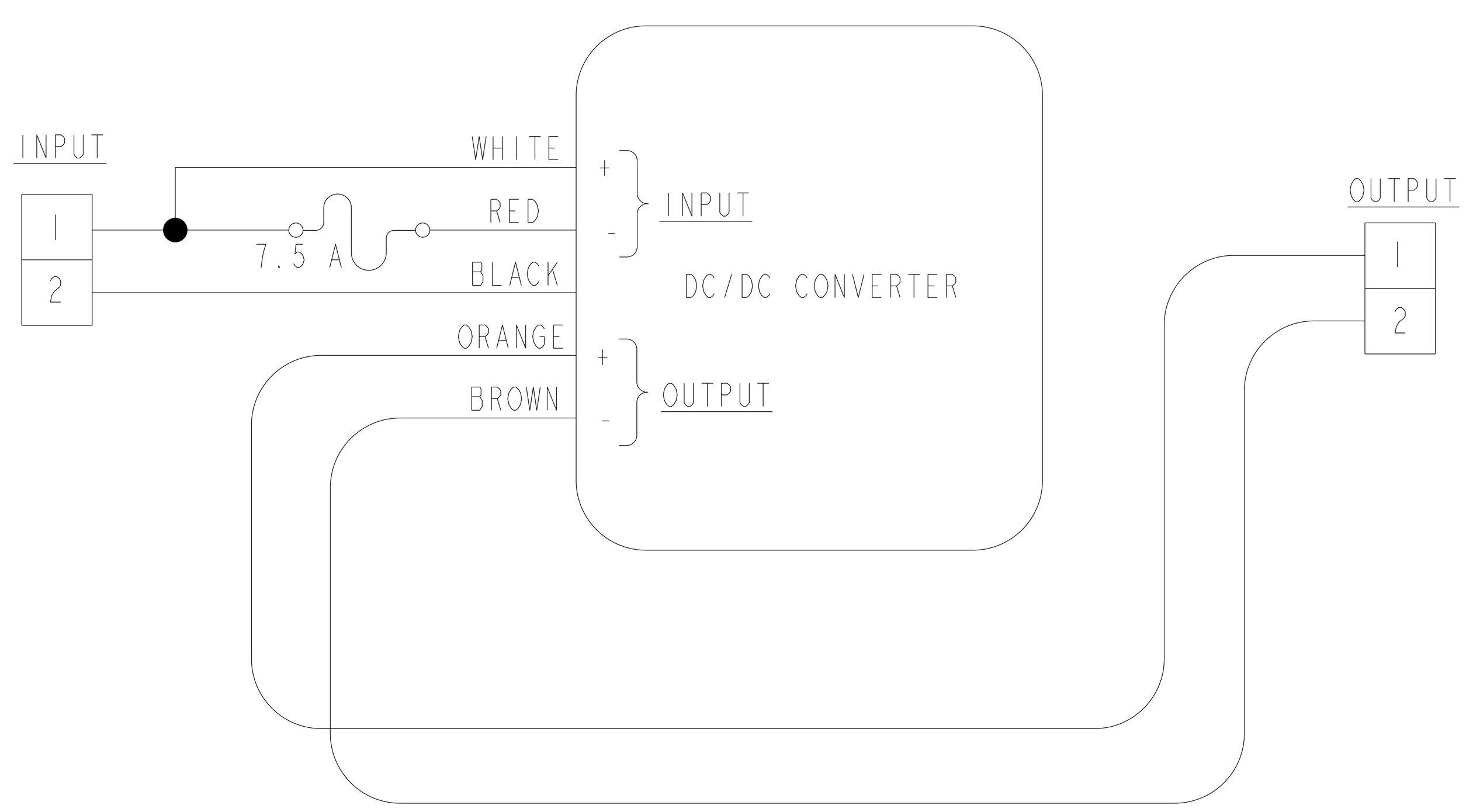
DETAIL K
HELM ADAPTER HARNESS



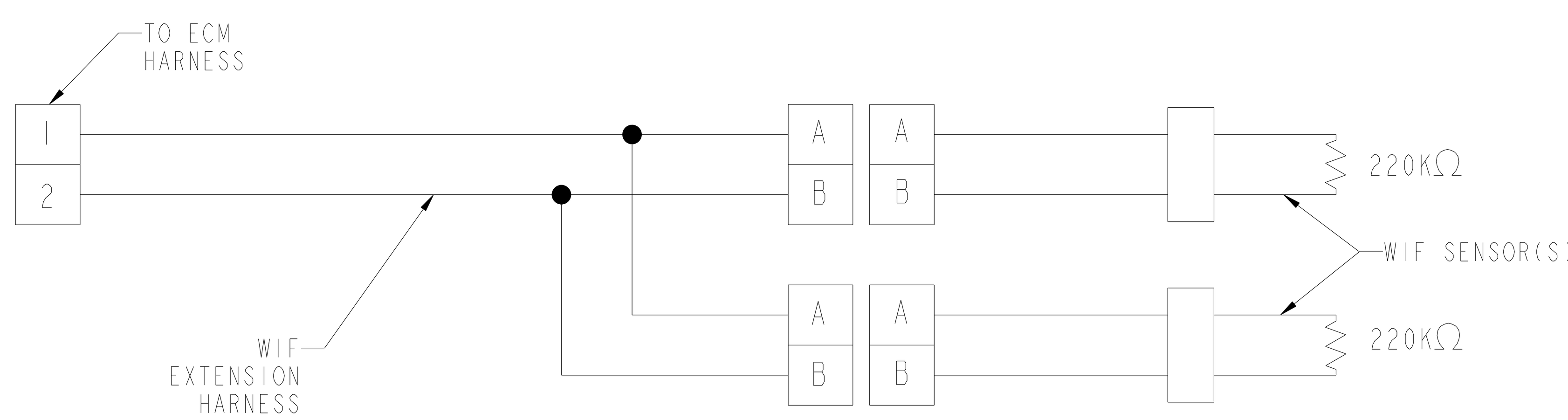
DETAIL P
MAIN & SECOND STATION KEYSWITCH, START, STOP PIGTAIL ASSEMBLY



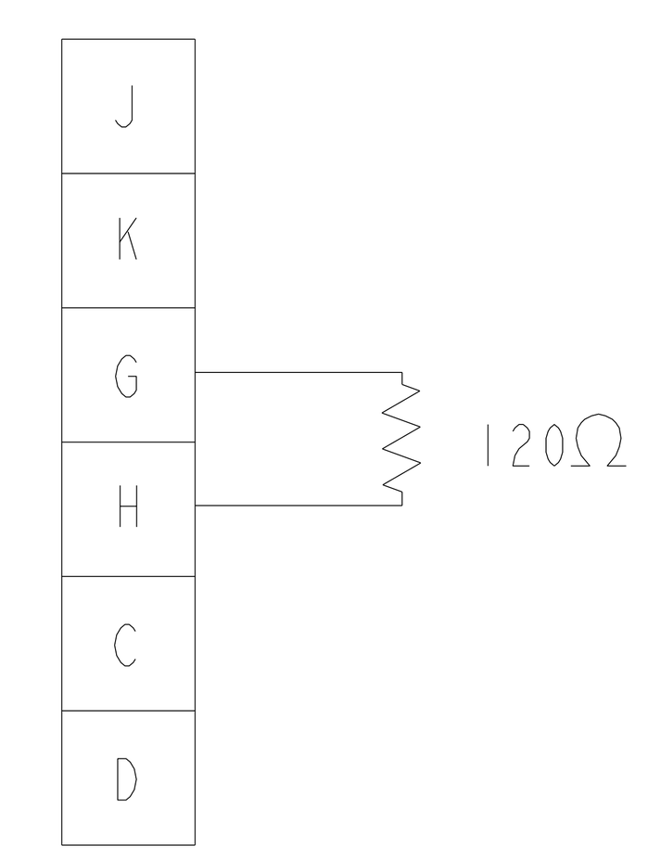
DETAIL J
DC/DC CONVERTER



DETAIL M
WATER IN FUEL SENSOR(S)



DETAIL L
CAN 2 TERMINATION RESISTOR



Cummins Inc.

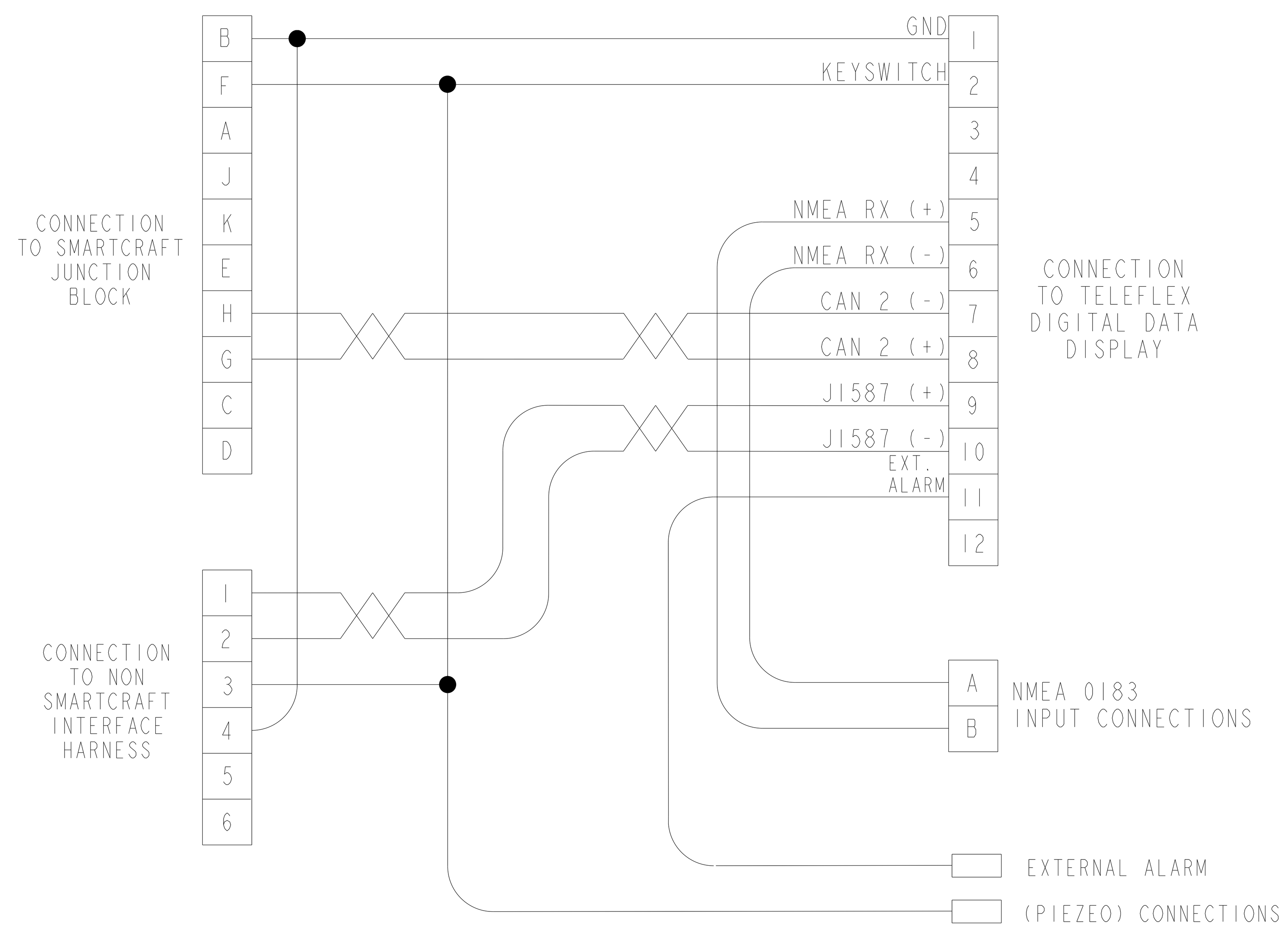
DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994	
REF. ITEM NO.: .	
DRAFTER J L ROPER	30SEP03
CHECKER J R RATTIGAN	12DEC03
DESIGN APPROVAL .	.

ITEM NAME DIAGRAM,WIRING			
IDENTIFIER DIAGRAM DRAWING			
SIZE J	CODE IDENT NO.	ITEM NUMBER 3970189	
SCALE NONE		ITEM CONTROL CMU	SHEET 9 OF 11

REVISIONS				
REV	DESCRIPTION	DRAFTER	CHECKER	APPROVAL
06	040700-211 REVISED	07DEC04 D M B	14DEC04 R L W	. .

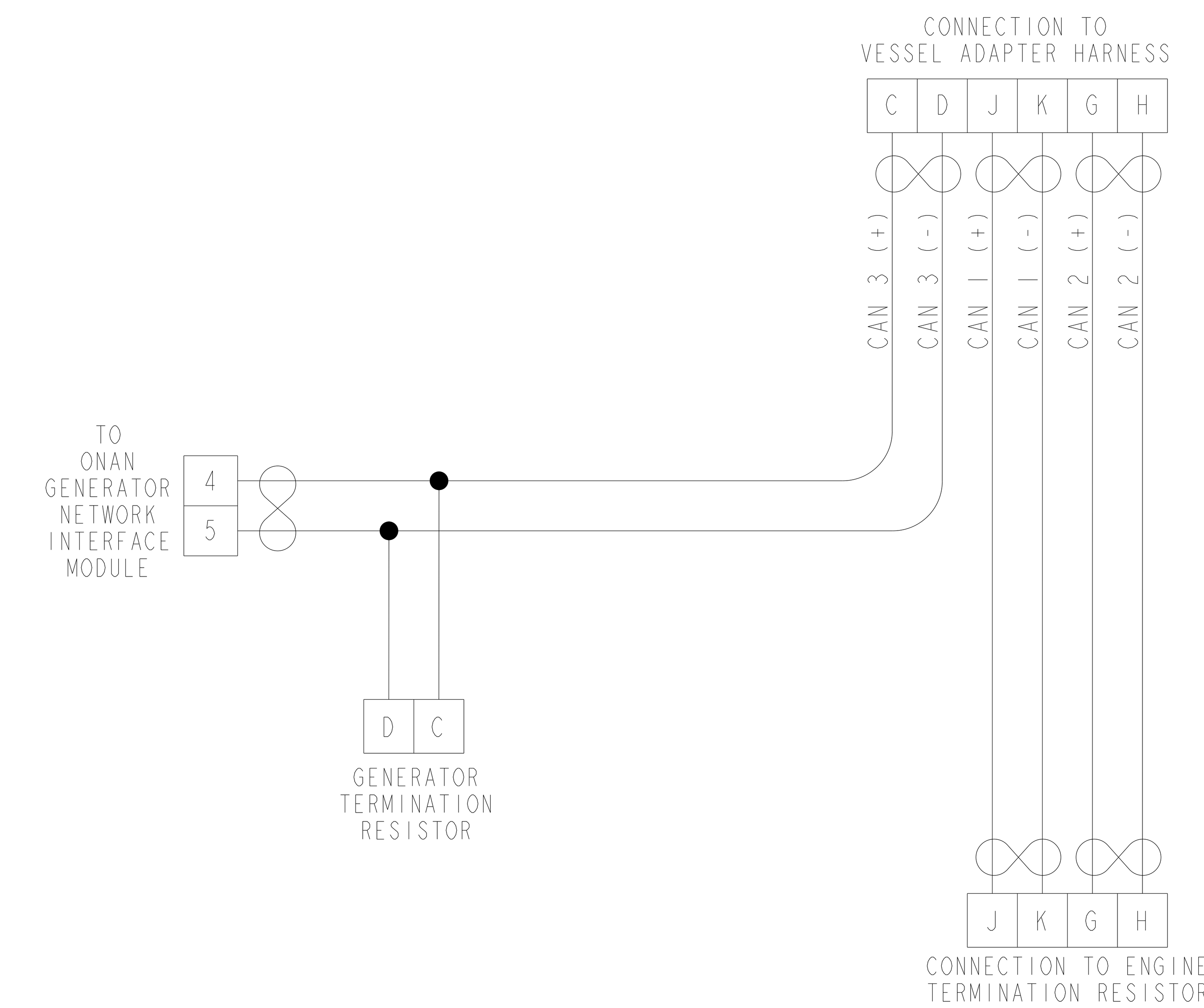
DETAIL Q

DIGITAL DISPLAY INTERFACE HARNESS



DETAIL R

ONAN GENERATOR INTERFACE HARNESS



DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994

REF. ITEM NO.: .

DRAFTER	J L ROPER	30SEP03
CHECKER	J R RATTIGAN	12DEC03
DESIGN APPROVAL	.	.

Cummins Inc.

ITEM NAME: DIAGRAM,WIRING

IDENTIFIER: DIAGRAM DRAWING

SIZE: J | CODE IDENT NO.: | ITEM NUMBER: 3970189

SCALE NONE | ITEM CONTROL CMU |

REVISIONS				
REV	DESCRIPTION	DRAFTER	CHECKER	APPROVAL
06	040700-211 REVISED	07DEC04 D M B	14DEC04 R L W	. .

1. ALL CONNECTIONS TO THE ECM J1 CONNECTOR ARE FOR SENSOR/ACTUATOR SIGNALS. NO MODIFICATION TO THIS HARNESS BY THE INSTALLER ARE ALLOWED. FOR SCHEMATIC DETAILS, SENSOR INFORMATION AND SYSTEM FAULT DEFINITION REFER TO CUMMINS BULLETIN(S) 4081885/4081886.

2. THE SYSTEM INTEGRATION MODULE (SIM) IS PRE-PROGRAMED TO FUNCTION AS DESIGNED WITHOUT INSTALLER MODIFICATION. THE SIM IS PART OF THE ECM MOUNTING PLATE ASSEMBLY. PLEASE REFER TO SHEET 4 OF THIS DRAWING FOR INPUT/OUTPUT PIN ASSIGNMENTS.

3. ENGINE OEM HARNESS IS SUPPLIED AS PART OF THE PH OPTION AND IS MOUNTED ON THE SIM/ECM MOUNTING PLATE ASSEMBLY. FOR A DETAILED SCHEMATIC OF THIS HARNESS ASSEMBLY REFER TO SHEET 4 OF THIS DRAWING.

4. GEAR OIL TEMPERATURE & PRESSURE SENSOR MOUNTED IN THE GEAR OIL COOLER. NO ADDITIONAL OEM CONNECTIONS REQUIRED.

5. GEAR DIRECTION CONTROL CONNECTOR. REFER TO SHEET 4 FOR DETAILED SCHEMATIC REFERENCE. INTERFACE POINT FOR DIRECT CONNECTIONS TO GEAR SHIFT SOLENOIDS MOUNTED ON GEAR HOUSING.

6. HARNESS SUPPLIED WITH SWITCH JUMPER PLUG ATTACHED. IF INCORPORATING A SEA WATER FLOW SWITCH, CONNECT TO OPEN TO ACTIVATE SWITCH.

7. HARNESS SUPPLIED WITH NEUTRAL SAFETY JUMPER PLUG ATTACHED. THE INSTALLER SHALL EXERCISE CAUTION WHEN CRANKING ENGINES WITH THIS JUMPER PLUG ATTACHED REMOVAL OF THIS JUMPER PLUG WILL PREVENT THE ENGINE FROM BEING CRANKED.

8. 9 PIN DIAGNOSTIC CONNECTOR LOCATED ON ENGINE. THIS IS THE PRIMARY CONNECTION POINT FOR ENGINE DIAGNOSTIC TOOL (INSITE). FOR DETAILED SCHEMATIC OF THIS CONNECTOR REFERENCE SHEET 4 OF THIS DRAWING.

9. MULTI-UNIT SYNC ID JUMPER. SEE SHEET 4 FOR MASTER & SLAVE ADDRESS PIN ASSIGNMENTS.

10. DC/DC CONVERTER USED IN APPLICATIONS WHERE VESSEL DC SYSTEM IS 24VDC. THE DC/DC CONVERTER IS SUPPLIED AS PART OF THE VESSEL ADAPTER HARNESS OPTION. THE CONVERTER IS ONLY SUPPLIED WHEN THE +24V COMPATIBLE HARNESS IS ORDERED. REFER TO MAB NO. 0.15.00-08/04/2003 FOR ADDITIONAL INSTRUCTIONS.

11. TERMINATION RESISTORS REQUIRED FOR BALANCED LOADING OF THE CAN BUSSES. RESISTOR PLUG ASSEMBLY SUPPLIED AS PART OF THE VESSEL ADAPTER HARNESS OPTIONS.

12. VESSEL SENSORS ARE NOT OFFERED AS CMD OPTIONS AT THIS TIME. REFER TO MAB NO. 0.15.00-08/04/2003 FOR ADDITIONAL INFORMATION.

13. REMOTE THROTTLE BIAS RESISTORS SUPPLIED AS PART OF THE VESSEL ADAPTER HARNESS. THIS BIAS RESISTOR MUST BE LEFT IN PLACE UNLESS A REMOTE THROTTLE ASSEMBLY IS IMPLEMENTED.

14. REMOTE THROTTLE ASSEMBLY AND EXTENSION HARNESSES PACKAGED IN SINGLE OPTION. OPTION TO BE USED IN APPLICATIONS REQUIRING REMOTE THROTTLE CAPABILITY OR AS BACK-UP FOR PRIMARY THROTTLE.

15. MAIN EXTENSION HARNESS TO RUN FROM ENGINE TO MAIN HELM AREA. INSTALLER MUST BE AWARE THAT CONNECTORS AT EACH END ARE DIFFERENT AND MUST BE INSTALLED PROPERLY TO AVOID INSTALLATION PROBLEMS.

16. THROTTLE ASSEMBLY SUPPLIED WITH INTERCONNECT HARNESSING OFFERED IN VARIOUS LENGTHS. REFER TO MAB 0.9.06-04/24/2001 FOR SPECIFIC INSTRUCTIONS ON MOUNTING AND CONFIGURATION OF THE THROTTLE.

17. THROTTLE ADAPTER. TO BE USED WHEN A 4-20ma THROTTLE SIGNAL IS SUPPLIED BY THE VESSEL MANUFACTURER.

18. SECOND STATION "T" HARNESS ADAPTER. TO BE USED ONLY WHEN APPLICATION REQUIRES INSTRUMENTATION AND CONTROL AT THE SECOND STATION. THE SECOND STATION "T" HARNESS IS CONTAINED IN THE SECOND STATION EXTENSION HARNESS OPTIONS.

19. MAIN STATION ADAPTER HARNESS SUPPLIED AS PART OF MAIN STATION EXTENSION HARNESS OPTIONS. ADAPTER HARNESS INCLUDES STOP PUSH BUTTON, START PUSH BUTTON, AND ENGINE KEYSWITCH.

20. CAN 2 TERMINATION RESISTOR SUPPLIED AS PART OF THE MAIN EXTENSION HARNESS OPTIONS. THESE TERMINATION RESISTORS MUST BE INSTALLED AT THE MAIN STATION JUNCTION BLOCK IN SINGLE STATION APPLICATIONS OR AT THE SECOND STATION JUNCTION BLOCK IN TWIN STATION CONFIGURATIONS.

21. JUNCTION BLOCKS SUPPLIED AS PART OF THE MAIN EXTENSION HARNESS OPTIONS. JUNCTION BLOCKS TO BE CONNECTED AS SHOWN ON SHEET 2 (MAIN STATION) OR SHEET 3 (SECOND STATION). ALL UNUSED CONNECTIONS SHOULD HAVE CONNECTOR COVER.

22. CAN 1, CAN 3 JUMPER HARNESS USED IN TWIN ENGINE APPLICATIONS ONLY. FOR SINGLE ENGINE APPLICATIONS A CAN 1, CAN 2, CAN 3 TERMINATION RESISTOR (EA9069) IS CONNECTED TO THE JUNCTION BLOCK AT THE CONNECTION POINT SHOWN. IN TWIN STATION APPLICATIONS THIS JUMPER HARNESS WILL BE LOCATED AT THE SECOND STATION JUNCTION BLOCK. SEE NOTE 27. FOR EA9080, ONLY ONE (1) PER ENGINE PAIR IS REQUIRED. ORDER THIS OPTION ON THE STARBOARD ENGINE SPEC. ONLY.

23. PARTS CONTAINED WITHIN THIS OPTION INCLUDE: DIESEL VIEW DISPLAY, DIESEL VIEW INTERCONNECT HARNESS, ALARM HORN, AND AMBIENT AIR TEMPERATURE SENSOR. THESE PARTS ARE ONLY USED IF THE DIESEL VIEW OPTION IS SELECTED FOR THE MAIN STATION.

24. PARTS CONTAINED WITHIN THIS OPTION INCLUDE: C-CRUISE SWITCH PANEL ASSEMBLY, SMART MULTIPLEX MODULE, AND SWITCH MODULE INTERCONNECT HARNESS. THESE PARTS ARE ONLY USED IF THE C-CRUISE OPTION IS SELECTED.

25. PARTS CONTAINED WITHIN THIS OPTION INCLUDE: SECOND STATION "Y" HARNESS, SECOND STATION EXTENSION HARNESS, SECOND STATION ADAPTER HARNESS, AND 6 WAY JUNCTION BLOCK.

26. SECOND STATION ADAPTER HARNESS SUPPLIED AS PART OF THE SECOND STATION EXTENSION HARNESS OPTIONS. ADAPTER HARNESS INCLUDES: STOP PUSHBUTTON, START PUSHBUTTON, AND KEYSWITCH JUMPER PLUG ASSEMBLY.

27. FOR TWIN STATION APPLICATIONS, THE JUMPER HARNESS OR TERMINATION RESISTOR DETAILED IN NOTE 22 SHALL BE PLACED AT THE SECOND STATION JUNCTION BLOCK CONNECTIONS. REFER TO MAB NO. 0.15.00-08/04/2003 FOR SPECIFIC DETAILS ON CONFIGURATION OF THE DATABUS TERMINATION RESISTORS.

28. FOR TWIN STATION APPLICATIONS THE CAN 2 TERMINATION RESISTORS ARE LOCATED AT THE SECOND STATION. THERE SHOULD BE NO CAN 2 TERMINATION RESISTORS LOCATED AT THE MAIN STATION AS DETAILED BY NOTE 20.

29. THE SECOND STATION JUNCTION BLOCKS ARE STRUCTURED WITHIN THE SECOND STATION EXTENSION HARNESS OPTIONS. THE JUNCTION BLOCKS ARE TO BE CONNECTED AS SHOWN ON SHEET 3. JUNCTION BLOCKS ARE SHIPPED WITH 4 CONNECTOR CAPS TO BE USED AS REQUIRED. ALL UNUSED CONNECTORS SHOULD HAVE CONNECTOR COVER.

30. MAIN STATIONS UNPOPULATED INSTRUMENT PANEL THAT INCLUDES THE FOLLOWING PARTS: INTERCONNECT HARNESS, BLANK PANEL, ENGINE OIL PRESSURE GAUGE, ENGINE COOLANT TEMPERATURE GAUGE, VOLTMETER, 4000 RPM SYSTEM TACHOMETER.

31. OPTIONS INCLUDE 110mm QUAD FUNCTION GAUGE (OIL PRESSURE,COOLANT TEMP, BATTERY VOLTAGE, AND FUEL LEVEL) AS WELL AS A 110mm TACHOMETER (0-4000 RPM). THESE GAUGES REQUIRE A DIESEL VIEW DISPLAY FOR PROPER OPERATION.

32. INDIVIDUAL GAUGE INSTRUMENT OPTIONS FOR USE WHEN SYSTEM TACHOMETER IS BEING USED AS PRIMARY INSTRUMENTATION. A SYSTEM TACHOMETER IS REQUIRED TO DRIVE THESE INDIVIDUAL GAUGES.

33. PARTS CONTAINED WITHIN THIS OPTION INCLUDE: DIESEL VIEW DISPLAY, DIESEL VIEW INTERCONNECT HARNESS, ALARM HORN, AND AMBIENT AIR TEMPERATURE SENSOR. THESE PARTS ARE ONLY USED IF THE DIESEL VIEW OPTION IS SELECTED FOR THE SECOND STATION.

34. PARTS CONTAINED WITHIN THIS OPTION INCLUDE: C-CRUISE SWITCH PANEL ASSEMBLY, SMART MULTIPLEX MODULE, AND SWITCH MODULE INTERCONNECT HARNESS. THESE PARTS ARE ONLY USED IF THE C-CRUISE OPTION IS SELECTED FOR THE SECOND STATION.

35. SECOND STATIONS UNPOPULATED INSTRUMENT PANEL THAT INCLUDES THE FOLLOWING PARTS: INTERCONNECT HARNESS, BLANK PANEL, ENGINE OIL PRESSURE GAUGE, ENGINE COOLANT TEMPERATURE GAUGE, VOLTMETER, 4000 RPM SYSTEM TACHOMETER.

36. SYSTEM TACHOMETER WITH LCD READOUT REQUIRED TO DRIVE OTHER LINK GAUGES. OPTION SUPPLIED WITH TACHOMETER, INTERCONNECT HARNESS AND ALARM HORN.

37. SYSTEM SPEEDOMETER WITH NMEA 0183 INPUT CONNECTIONS. INCLUDES INTERCONNECT HARNESSING, AMBIENT AIR TEMPERATURE SENSOR, AND ALARM HORN CONNECTIONS.

38. REFER TO MAB NO. 0.15.00-08/04/2003 FOR SPECIFIC INSTRUCTIONS ON INTERFACING GPS INPUTS TO THE NMEA INPUT.

39. VESSEL ADAPTER HARNESS SUPPLIED AS KITTED OPTION. +24V OPTION CONTAINS DC/DC CONVERTER. FOR SPECIFIC DETAILS ON PART REFERENCE MAB NO. 0.15.00-08/04/2003.

40. TO CALCULATE PROPER SIZING OF CRANKING CABLE FROM THE BATTERY TO THE STARTER REFER TO THE APPLICABLE TECHNICAL PACKAGE. AVAILABLE ON THE MARINE DATABASE.

41. COOLANT LEVEL SENSOR TO BE MOUNTED INTO EXPANSION TANK. OEM HARNESS ON "B" AND "C" ENGINES CONNECT DIRECTLY TO THE SENSOR IN THE TANK. ON "L" ENGINES, THERE IS A SHORT EXTENSION HARNESS REQUIRED TO REACH THE TANK MOUNTED ON THE TOP FRONT OF THE ENGINE.

42. WATER IN FUEL (WIF) SENSORS ARE STRUCTURED INTO THE FS OPTIONS. THE SIGNAL INPUT CONNECTOR IS LOCATED ON THE ENGINE SENSOR HARNESS. FOR DETAILS ON SPECIFIC WIF SENSOR COMPATIBILITIES, REFER TO THE ENGINE SPECIFIC TECHNICAL PACKAGE.

43. CONNECTION POINT FOR SYSTEM TACH OR SYSTEM SPEEDOMETER IF USED IN CONJUNCTION WITH A DIESEL VIEW DISPLAY. THE CONNECTION SHOULD ALWAYS BE THE CENTER CONNECTOR ON THE JUNCTION BLOCK.

44. MK3 DIGITAL DATA DISPLAY AVAILABLE TO PROVIDE REAL TIME DATA MONITORING OF J1939 ENGINE DATA. DOES NOT PROVIDE DATA ON VESSEL SENSORS. SUPPLIED WITH INTERFACE HARNESS REQUIRED TO CONNECT DISPLAY WITH JUNCTION BLOCK. REFER TO MAB NO. 0.15.00 - 09/02/2004 FOR SPECIFIC DETAILS ON THIS DISPLAY.

45. GENERATOR SET EXTENSION HARNESS TO BE USED TO CONNECT COMPATIBLE ONAN EQ-D GENERATOR SET TO SMARTCRAFT SYSTEM. FOR SPECIFIC INSTRUCTIONS ON INTERFACE REQUIREMENTS REFER TO MAB NO. 0.13.04 - 12/01/04.

Cummins Inc.

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ITEM NAME: DIAGRAM,WIRING		
IDENTIFIER: DIAGRAM DRAWING		
SIZE: J	CODE IDENT NO.	ITEM NUMBER: 3970189
SCALE: NONE	ITEM CONTROL: CMU	SHEET 11 OF 11