Option 4800R-21: Severe Duty Panel-Mount Cable Kit

Components List:

The Severe Duty Panel-Mount Cable Kit consists of:

1. Quantity 2 of AMP CPC Connector Plug/Clamp/Terminal Kit (Part No. 4800R-19). Each kit includes the following:

a.	1	Connector Plug	AMP 206708-1
b.	1	Cable Clamp	AMP 206966-2
c.	6	FemaleTerminals for 24-20 AWG Wire	AMP 66105-4
d.	2	FemaleTerminals for 18-14 AWG Wire	AMP 66360-4

2. Quantity 1 of Fischer Panel-Mount Connector/ID Ring/Sealing Cap Kit, Left Channel/Black (Part No. 4800R-20L). Each kit includes the following:

a.	1	Panel-Mount Connector	Fischer D105A062
b.	1	Black connector ID Ring	Fischer 105.2282
c.	1	Connector Sealing Cap	Fischer 105.2132

3. Quantity 1 of Fischer Panel-Mount Connector/ID Ring/Sealing Cap Kit, Right Channel/White (Part No. 4800R-20R). Each kit includes the following:

a.	1	Panel-Mount Connector	Fischer D105A062
b.	1	White connector ID Ring	Fischer 105.2281
c.	1	Connector Sealing Cap	Fischer 105.2132

4. Quantity 1 of 15’ Severe Duty AFR Cable Extension, Left/Black Channel (Part No. 2400E-30L).

5. Quantity 1 of 15’ Severe Duty AFR Cable Extension, Right/White Channel (Part No. 2400E-30R).

AFR Sensors are supplied with matching severe duty connectors. An AFR sensor with a severe duty connector is Part No. 2400E-1S.

AFRecorder to back-of-panel AFR cabling is not supplied as part of kit unless requested. The following cables or their equivalents are recommended for lengths up to 80’.

The following cables or their equivalents are recommended.

Heater Cable (for heater wires):

Carol #C0456 (2 conductor, 16 AWG, 26/30 Conductors/Strands, PVC, foil shielded plus pigtail).

Signal Cable (for signal wires):
Carol #C0783 (6 conductor, 20 AWG, 10/30 Conductors/Strands, DCR 11 OHM/M, PVC, foil shielded plus pigtail).

Instructions for Installing the Severe Duty Panel-Mount Cable Kit:

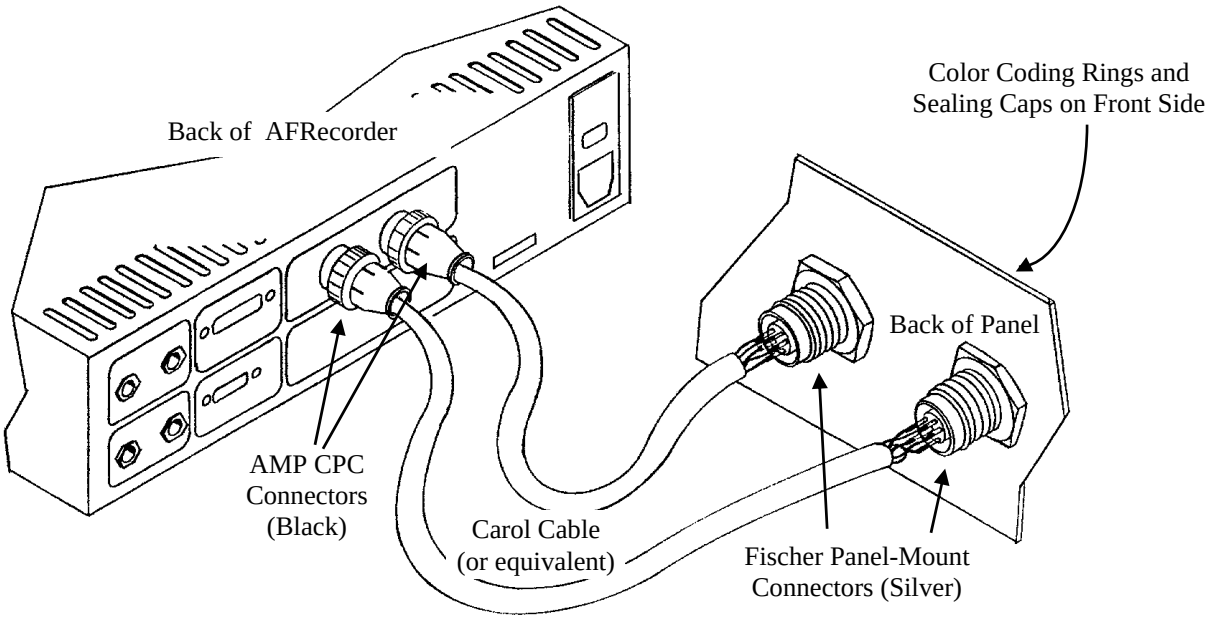

Figure 1: AFRecorder to Panel AFR Cabling

1. Cut D-holes in panel for Fischer panel-mount connectors (see Figure 2) and 1/8" holes for sealing cap tether rings.

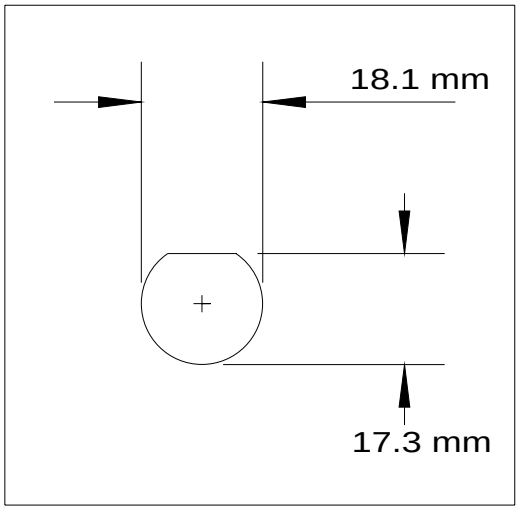

Figure 2: Panel Hole Dimensions for Fischer Panel-Mount Connector

2. Each AFR channel uses two cables: one for the heater wires (terminals 1 and 2) and one for the signal wires. Separating the heater wires from the signal wires reduces the noise coupling from the heater wires to the signal wires. Route these cables from the back of the AFRecorder to the panel and stick them through the nut from the panel-mount connector, then the D-hole in the panel, and then through the appropriate color-coded ID ring (black for left channel, white for right channel).

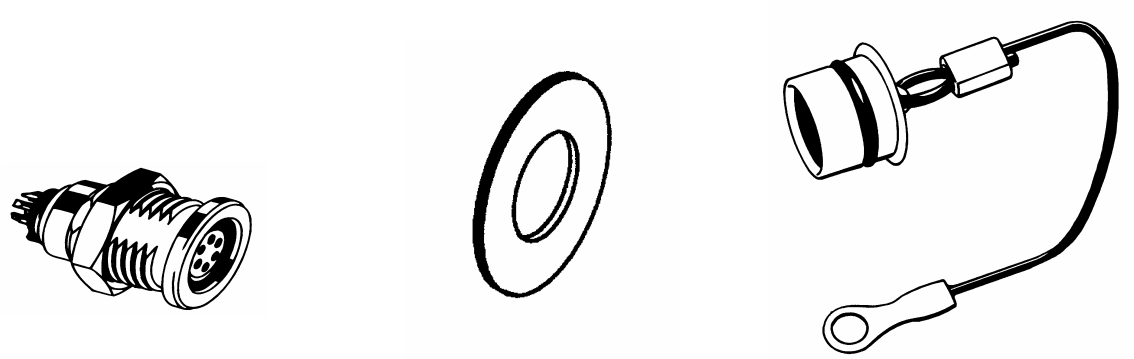

Figure 3: Fischer Panel-Mount connector, Color-Coded ID Ring, and Sealing Cap

3. Solder the wires on the cables to the Fischer Panel-Mount connectors according to the instructions below. Pay attention to the notes!

9-pin female black AMP CPC connector on instrument end of cable		10-pin female silver Fischer connector on panel-mount end of cable
Terminal # (see Notes 4, 5)		Terminal #
H+	1----------Red on Heater Cable----------1 and 9 (see Note 1)	
H-	2----------Black on Heater Cable----------2 and 10 (see Note 2)	
N/C	----------Shield on Heater Cable----------Front Panel (see Note 3)	
Ip+	3----------White on Signal Cable----------3	
N/C	4	
Vs+	5----------Red on Signal Cable----------5	
Ip,Vs-	6----------Black on Signal Cable----------6	
Shield	7----------Shield on Signal Cable----------4 (yes, four),(see Note 6)	
Cal. R	8----------Green on Signal Cable----------7 (yes, seven)	
Cal. R	9----------Orange on Signal Cable----------8 (yes, eight)	

Notes:

1. Because of the large gauge of the heater cable (16 AWG) and the small solder cup size on the back of the Fischer panel-mount connector, two short (3") lengths of 20 AWG wires will have to be connected from the red wire of the heater cable to pins 1 and 9 of the Fischer panel-mount connector.
2. Because of the large gauge of the heater cable (16 AWG) and the small solder cup size on the back of the Fischer panel-mount connector, two short (3") lengths of 20 AWG wires will have to be connected from the black wire of the heater cable to pins 2 and 10 of the Fischer panel-mount connector.

notes continued on next page...

3. Connect the heater cable shield to the backside of the panel. The bolt holding the sealing cap to the panel is a good place to attach the shield to. If the panel is annodized or painted on its backside, remove the coating so that the shield conducts with the panel. The heater shield is not attached at the AFRecorder end of the cable.
4. Use AMP #66360-4 Gold 18-14 AWG Sockets for terminals 1 and 2 of the AMP CPC connector. Use AMP Hand Tool No. 90277-1.
5. Use AMP #66105-4 Gold 24-20 AWG Sockets for terminals 3,5,6,7,8 & 9 of the AMP CPC connector. Use AMP Hand Tool No. 90277-1.
6. The shields of the severe duty AFR Cable Extensions (see Figure 4) that plug into the Fischer panel-mount connectors connect to the shields of the signal cable via terminal 4 (of the Fischer connector). However, the shields are not connected to terminal 4 at the AFR sensor end of the severe duty AFR cable extensions. Keep this in mind when checking for continuity on terminal 4.

4. Pull the panel-mount connectors into their holes and tighten the nut. Attach the sealing cap to the panel via the tether ring and make sure that the heater cable shield conducts with the panel. Do not let the cables tug at the connectors. Use wire ties to hold the cables.

5. At the AFRecorder end of the cables, put the cables through the cable clamps before attaching the terminals.

6. Crimp the terminals to the wires according to the instructions above. Pay attention to the notes! Install the terminals into the AMP CPC connector. If you make a mistake and must extract a terminal, only use AMP Extraction Tool 305183.

7. **CHECK CONTINUITY AND ENSURE ABSENCE OF SHORT CIRCUITS WITH AN OHMMETER. Be careful what you stick into the Fischer Panel-Mount Connectors to check the continuity since it is easy to overstretch the female terminals. <u>The probe on most ohmeters is too big</u>. Use a paperclip.**

8. Spin the Cable Clamps onto the AMP CPC connectors and tighten 30 degrees of rotation from seating. Then attach the clamping insert using the two screws. The clamping insert can be installed two ways for two different amounts of cable compression. Be careful not to strip the Cable Clamp when tightening the screws. Tighten one screw a little then jump to the other; back and forth.

9. Attach the connectors to the back of the AFRecorder. Leave slack so that the instrument can be removed from the rack. Do not let the full weight of the cables pull on the instrument, tugging on the connectors. Use wire ties from the cables to the rack structure.

10. Plug the severe duty AFR Cable Extensions (see Figure 4) into the panel-mount connectors, matching the color of the cables' strain reliefs to the color of the connectors' rings. The black strain relief and ring are for the left AFR channel. The white strain relief and ring are for the right AFR channel. The AFR sensors plug into the free end of the severe duty AFR Cable Extensions.

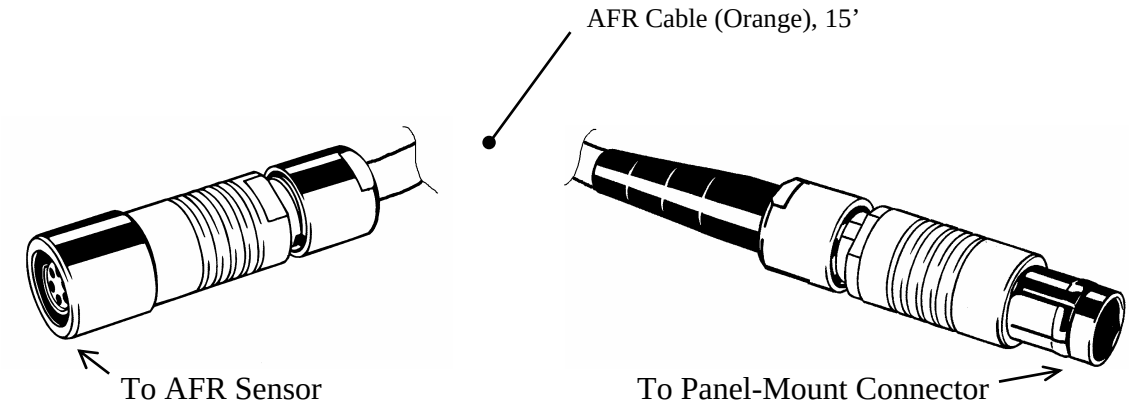

Figure 4: Severe Duty AFR Cable Extension

Grounding and Shielding:

The Model 4800-R separates the case ground, the AFR sensor signal cable shield, the heater cable shield, and the instrument signal output ground.

The case ground is connected to the AC power ground via the AC power cable. The "Case Ground" terminal on the back of the unit is connected internally to the case.

The "Cable Shield" terminal on the back of the unit is connected internally to terminal 7 of the two "AFR Sensor" connectors on the back of the instrument (and hence is connected to the sensor signal cable shields but not the heater cable shields). This allows the instrument case and AFR sensor signal cable shields to be connected to separate external grounds. In some cases, this may improve the noise immunity of the instrument. If separate case and AFR sensor signal shield grounds are not used then the two grounds should be tied together via the supplied coupler and the terminals connected to the dynamometer's ground shield mecca.

The AFR sensor heater cable shields should be connected to the front panel holding the panel-mount connectors. They are not connected to anything at the AFRecorder end of the cables.

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***** IMPORTANT NOTE *****

It is important that any AFR cables that are made be checked for correct wiring. If the wiring is not correct, it is possible to damage the AFRecorder.

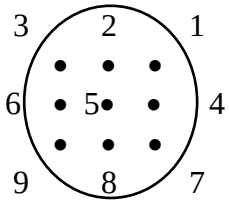
Therefore, check any AFR cables you make before hooking up the instrument.

The connector on the cable that hooks up to the back of the instrument is a "9-pin female black AMP CPC connector". The connector on the cable that hooks up to the AFR sensor is a "10-pin female silver Fischer connector". The Fischer connector is the "severe duty" connector.

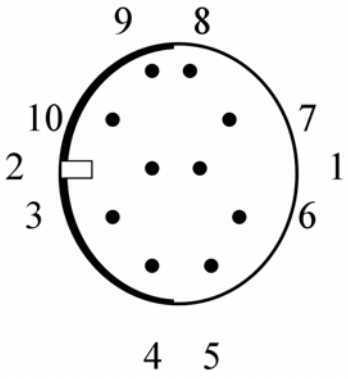
The following describes the required connections on the AFR cable:

9-pin female black AMP CPC connector on instrument end of AFR cable	10-pin female silver Fischer connector on sensor end of AFR cable
1	1 and 9
2	2 and 10
3	3
terminal 4 is not used	
5	5
6	6
7	4 (yes, four)
8	7 (yes, seven)
9	8 (yes, eight)

Looking at the female AMP connector on instrument end of AFR cable:



Looking at the female Fischer connector on sensor end of AFR cable:



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