

## **B. Description of Work Accomplished**

*(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)*

1. Removed original Cessna instrument cluster p/n P443-12-RAND-500-5/70 and checked weight, 2.0lbs.
2. Weighed replacement Mitchell instrument cluster, p/n PM-211-6835, with all gauges and wiring pigtail in place, 5.2 lbs. See figure 1.
3. Removed oil pressure line at rear engine and installed Mitchell oil pressure sending unit, p/n PS-211-9039, rated 0 to 100 psi. The new sending unit fit directly into the existing hole. The existing oil line was capped at both ends using an AN9293D cap assembly, and secured. See figure 2 for rear engine sending unit installation. A wire, p/n M22759/16-18, was installed from sending unit to gauge, using the existing wire bundle, routed through the center of the aircraft, just under the floor panels, running fore and aft; and secured with the existing clamps and ty-wraps. A connector, p/n RB14-8X was used to attach the wire to the sending unit. Routing, lacing, and tying comply with AC43.13-1A, Chapter 11, Section 7. Wiring marking complies with Section 4. Electronic equipment complies with the aircraft and equipment manufacturer's instructions and AC43.13-2A, Chapter 2, Paragraph 21 through 26.
4. Removed forward engine oil pressure line at forward bulkhead fitting in engine compartment. Fabricated mount for forward oil pressure sending unit, p/n PS-211-9039, to be located on right side of forward bulkhead, in engine compartment. Mount was constructed of 2024-T3, .040 aluminum, ¾" by 3". A two lug nutplate, p/n MS21069L08, was fitted to the mount, which was then mounted to the firewall vertical channel with four #3 CherryMax rivets, p/n CR3523-3-2. The sending unit was then mounted in an Adel clamp, p/n MS2191DG24, using a fillister head screw, p/n MS35265-46. A 2 ½" length of braided bonding strap was incorporated with the clamp and secured with the said screw, to provide the necessary ground. An AN894 adapter was then installed on sending unit, to adapt the 1/8" pipe thread of sender unit to the original flared fitting, on the original section of oil line. See figure 3 for forward oil pressure sending unit installation. The wire, p/n M22759/16-18, was installed from sending unit to gauge. A connector, p/n RB14-8X, was used to connect the wire to the sending unit. An existing wire bundle was used to route the wire through the bulkhead, using existing ty-wraps and clamps.
5. Removed original oil temp sending units, p/n C669503-0104 from rear and front engine oil coolers, and installed new Mitchell sending units p/n PS-211-8112. The new sending units required no adapters. Original wire and terminals were used to complete this phase.
6. Removed original ammeter shunt support, p/n 1570044-1 and the three ammeter shunts, p/n 1570046-1. A new mount was fabricated from 2024-T3, .040 aluminum. The three new shunts, p/n PS2-9100, were then mounted to the new mount using MS-35207-264 screws and AN310-3 nuts. See figure 6, which is shown in actual size, for mount assembly and shunt placement. The assembly was then mounted in the original location. A stiffener, fabricated out of 2024-T3, .063 aluminum, was added, using eight cherry rivets, p/n CR3223-4-2. Three rivets attach the stiffener to the stringer and five fasteners attach the stiffener to the shunt support. See figure 4.

7. Shunts were then wired in accordance with wiring diagram. See figure 6. The front alternator/rear alternator/battery rotary selector switch was removed from the instrument panel, and a blanking plate installed in its location. Original wires were utilized except for wires K-PB49 and K-PB51, since the difference in the shunt size made the original wires too short. The wire used was p/n MS22759/18-8, as indicated on figure 5. The addition of individual gauges allows independent and full time monitoring of battery current and each alternator load, negating the need for the original rotary selector switch.
8. An insulating curtain was fabricated to protect the shunts by bending a 6" by 1 1/4" piece of 2024-T3, .063 aluminum into an "L", and safety wiring two 3" by 6" pieces of Mil Spec ZZR765B Silicone rubber sheet to "L" bracket. This assembly was then attached to the airframe by utilizing existing hardware, as shown in figures 7 and 8.
9. Original fuel quantity sending units and wiring were used. System was tested by de-fueling aircraft and verifying empty gauge readings, then filling tanks to 1/4, 1/2, 3/4, and full, and verifying all readings. System indicated accurately.
10. The original Cessna S-1372-1 Resistive CHT senders were removed from both front and rear engines and Mitchell P/N PS-211-8156 thermocouple senders were installed at the same locations. Wires KEC5 and KEC6 were removed from service and replaced with Mitchell P/N PS-211-8010 type JK thermocouple wire. The new thermocouple wires were installed using the existing wire bundle, secured with existing clamps and ty-wraps and were marked with the original Cessna wire numbers.
11. Mitchell instrument cluster, P/N PM-211-6835, was installed in the original Cessna cluster location, by using four MS24693-48 screws and four MK1000-08 nut plates, two on each side. All wiring connections to the gauges were made by soldering, and heat-shrink tubing was used for insulation.
12. Static loading of the equipment installed meets the requirements of AC43.13-2A, Chapter 1, Paragraph 3, and was found to meet requirements of Paragraph 2. Materials and practices comply with Paragraph 4 through 12.
13. An electrical load analysis was performed in accordance with AC43.13-1A, Chapter 11, Section 2, Paragraph 424 and was found to meet the requirements of Paragraph 424, 426, 428 and 429.
14. Hardware and materials used in the installation conform to AC43.13-1A, Chapter 5 and Chapter 7, Section 1 and 5 as applicable. Circuit breakers, switches, and connectors are of the type recommended by the aircraft manufacturer or a MIL SPEC approved for aircraft use and meet the requirements of AC43.13-2A , Chapter 2, Paragraph 27, and AC43.13-1A, Chapter 11, Section 5 where applicable.
15. Routing, lacing, and tying comply with AC43.13-1A, Chapter 11, Section 7. Wire marking complies with section 4. Electronic equipment complies with the aircraft and equipment manufacturer's instructions and AC43.13-2A, Chapter 2, Paragraph 21 through 26.

16. Weight and balance was revised by computation and equipment list was revised and added to aircraft records, in accordance with AC43.13-2A, Chapter 1, Paragraph 9.
17. STC #ST00811CH was used for guidance where applicable, as this installation, in part, has previously been approved for other aircraft.
18. The manufacturer has customized the new gauges to match original Cessna range markings.
19. Continued airworthiness of this installation will fall under the normal scope and guidelines of the Cessna 100 hr and annual inspections. The new gauges require no additional routine maintenance. Any needed part numbers and/or troubleshooting references, which are a part of this field approval, will remain with the aircraft permanent records. Test results, supplied by Mitchell Aircraft Products, concerning instruments used in this installation, are included as well.
20. The installation was tested by running both engines through full operational range, with all systems operational. All systems functioned normally.

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Figure 1 – Mitchell Replacement Engine Gauge Cluster

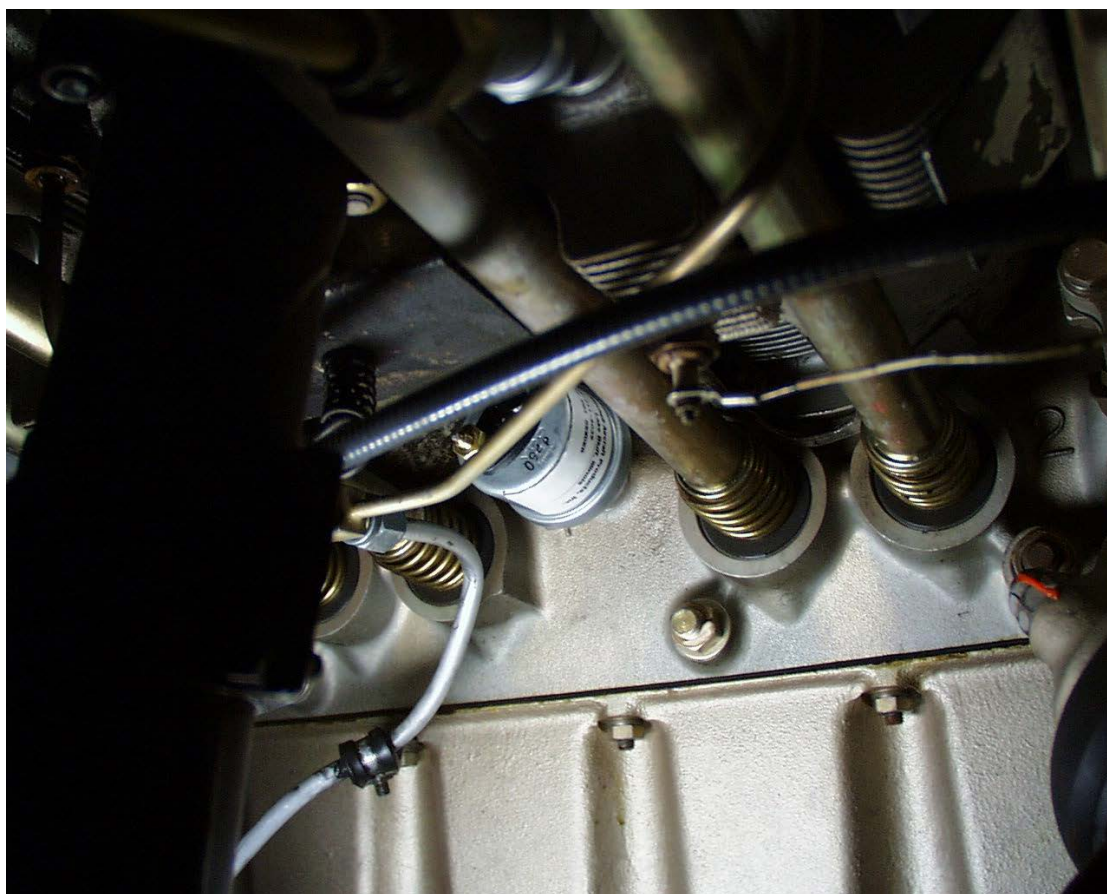


Figure 2 – Rear Engine Oil Pressure Transmitter (Mitchell P/N PS-211-9039)



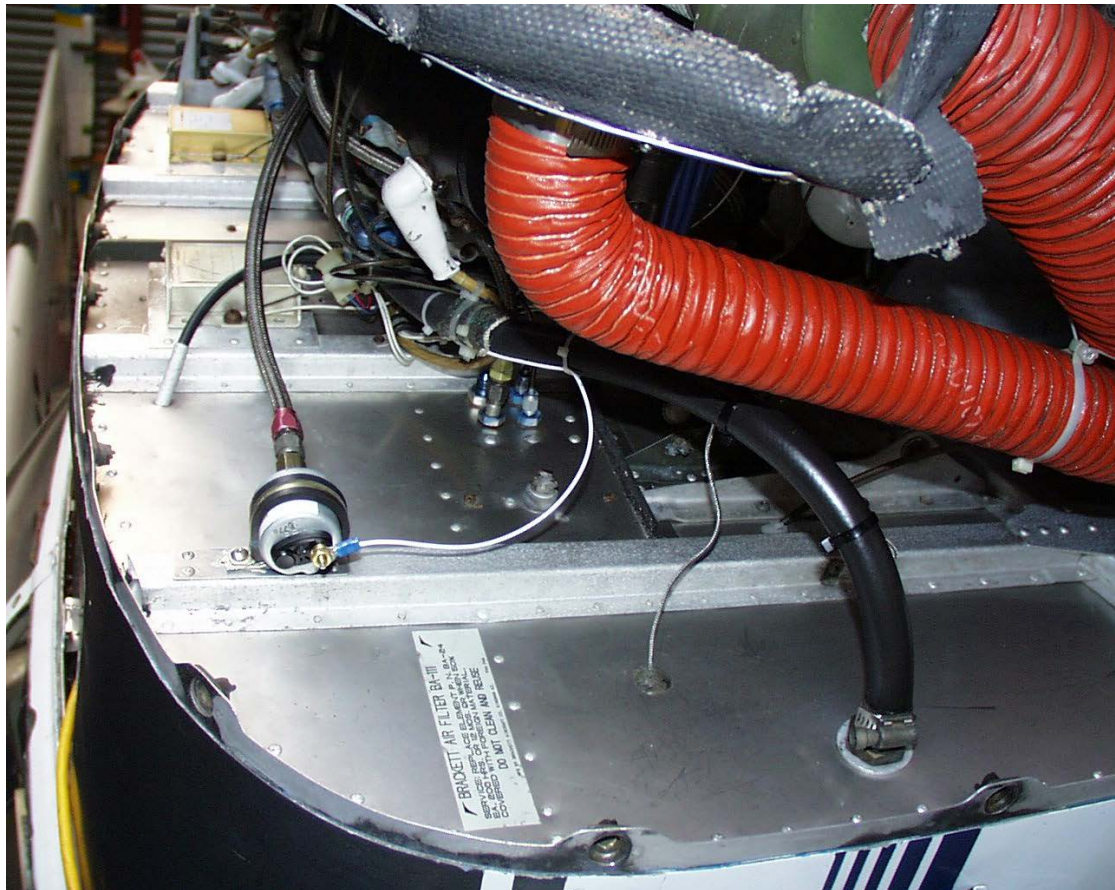


Figure 3 – Front Engine Oil Pressure Transmitter (Mitchell P/N PS-211-9029)

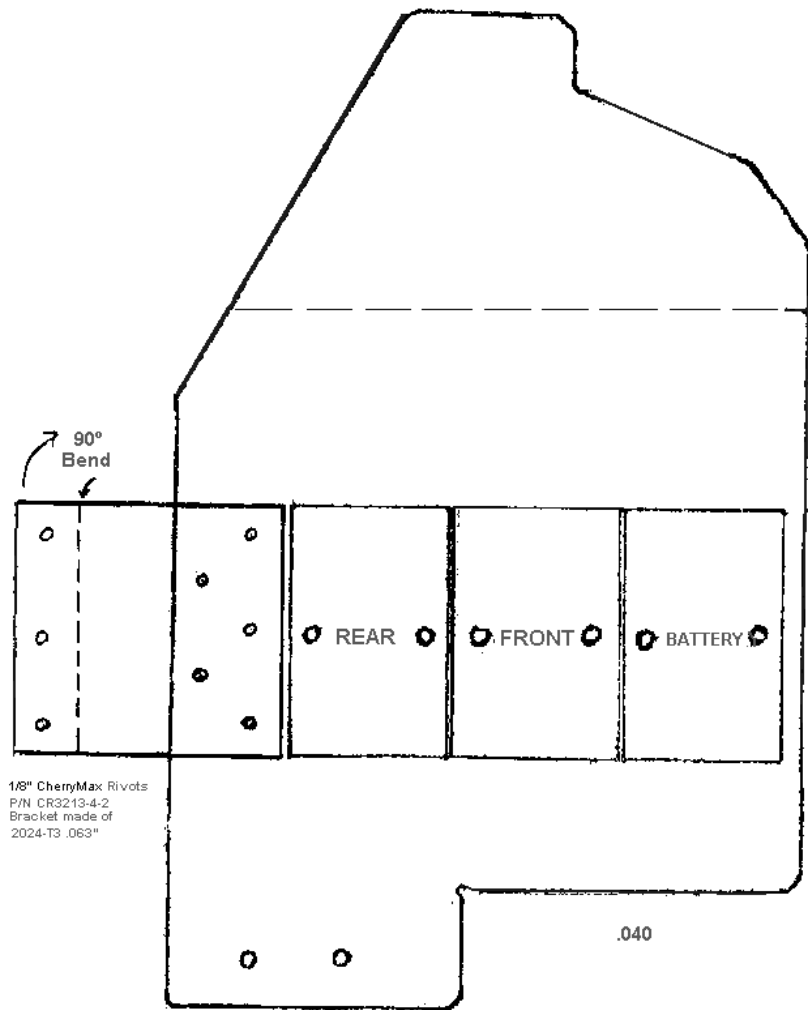


Fig.4-2024-T3 .040 Sheet Metal Shunt Mounting Base with Stiffner Bracket.

Fig 4 – 2024-T# .040 Sheet Metal Shunt Mounting Base with stiffner bracket.

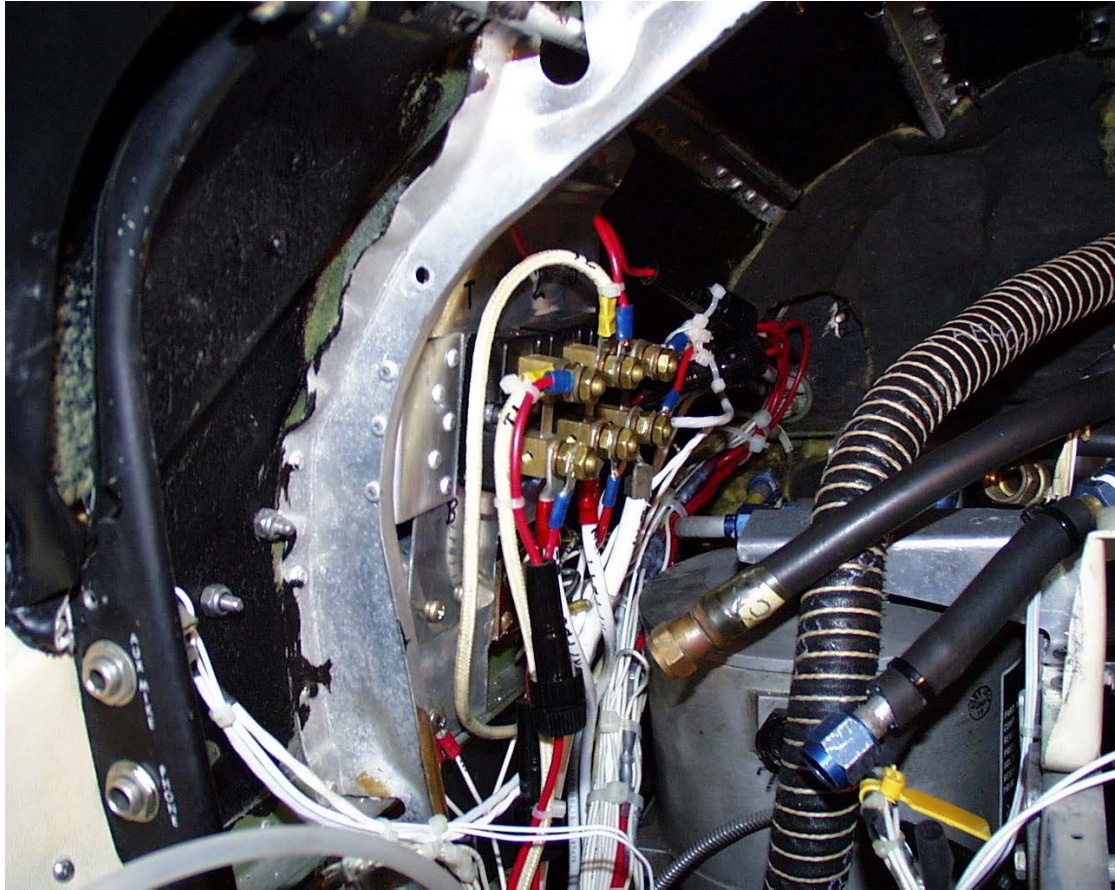


Figure 5 – New Shunt Mounting Base with Stiffener Bracket

### Cessna Skymaster N2362S S/N 337-0662 Mitchell Engine Gauge Cluster Wiring Diagram

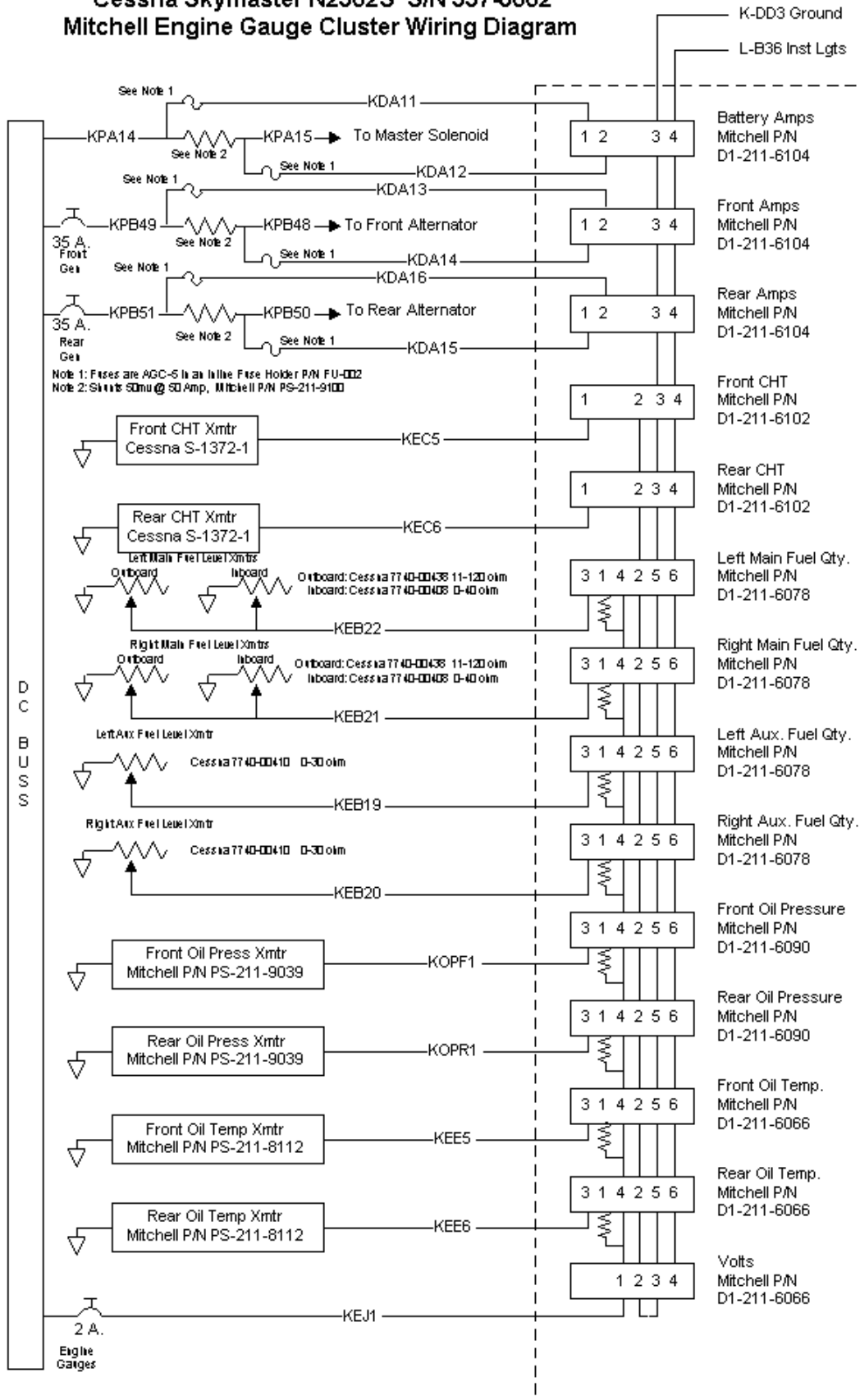


Figure 6. Engine Gauge Cluster Wiring Diagram.



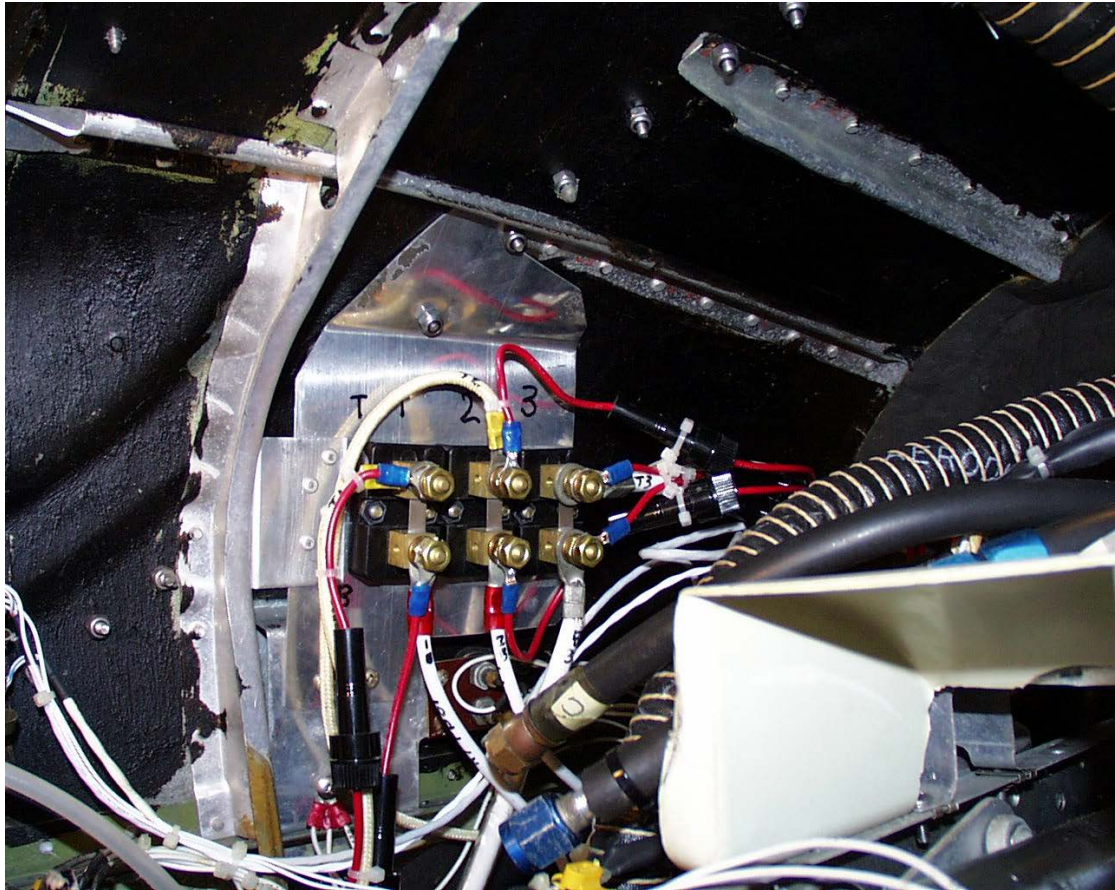


Fig. 7 – Installed Shunts.

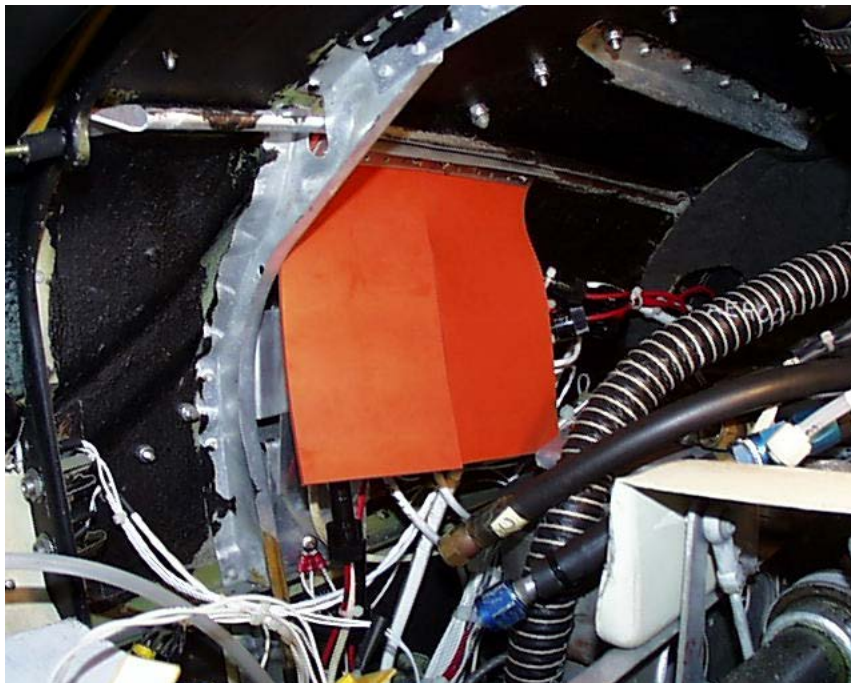


Fig 8 – Insulating  
Curtain over Shunt  
Assembly.