SECTION/OPERATION

21

ELECTRICAL SYSTEM

COMPONENT	PROCEDURE	PRINT #	TEMPLATE
ELECTRICAL SYSTEM (E35-2000)	Instrument panel	E35-2000	E32-1
	Alternator wiring	E35-2001	E32-2
	Rotor tach sensor	E23-2000	
	Starter relay		
	Battery cables		
	Ignition wiring and spark plugs		
	Overhead switch panel		
	Connect manifold & oil pressure lines		
	Wiring harness		

IMPORTANT: Secure all wiring away from the main shaft.

NOTES

Before wiring: See next section (section 22) for final installation of seat back, floor pan, fresh air collector and tub which is required at this point for routing of electrical wires.

Wire numbering: The wire numbers used in the chart at the end of this section match those on print E35-2001. If you have the Quick Kit, the wiring harness will be numbered differently. Use the "Quick Kit Wire Marking Guide" on the next page to cross-reference these numbers.

TIP When soldering terminal ends to wires, try using a small vise or an alligator clip with a base to hold the wires secure. You can find these items at electronic supply stores, such as Radio Shack.

QUICK KIT WIRE MARKING GUIDE

This guide is a cross reference between the wire numbers given on print E35-2001 and the wire markers on the Quick Kit wiring harness.

PIN POSITION IN PLUG	WIRE MARKER NUMBER	WIRE NUMBER ON PRINT E35-2001
PLUG 1		
1	1	1,38
2	2	4,40
3	3	6,50
4	4	9,60
5	5	3,61
6	6	11,62
PLUG 2		
1	7	2,39
2	8	5,41
3	9	7,52
4	10,11	8,67,78
5	12	10,70
6	13	12,83
PLUG 3		
1	14	88,110
2	15	89,111
3	16	87,112
4	17,11	67,68,113
5	4	60,open
6	open	open
PLUG 4		
1	18	96,117
2	19	97,118
3	20	98,119
4	21	79,120
5	22	99,121
6	open	open
PLUG 5 (builder constructs)		
1	N/A	100,122
2	N/A	101,123
3	N/A	102,124
4	open	open
PLUG 6 (builder constructs engine side)		
1	18	96,(95)
2	19	97,(93)
3	20	98,(94)
4	22	99,(90,91,92)
PLUG 7 (builder constructs cyclic side)		
1	12	73,(72)
2	12	70,(71)
PLUG 8		
1	N/A	69,104
2	17	68,103
PLUG 9 (builder constructs ignition unit side)		
1	25	46,(44)
2	2	40,(42)
PLUG 10 (builder constructs ignition unit side)		
1	24	47,(45)
2	8	41,(43)
PLUG 11 (builder constructs fuel pump side)		
1	26	58,(54)
2	3	50,(51)
PLUG 12 (builder constructs fuel pump side)		
1	26	105,(56)
2	9	52,(53)
PLUG 13		
1	21	79,81
2	10	78,80

TOOLS REQUIRED FOR OPERATION 21:

Crimpers	
Drill bits of the following sizes:	1/8"
	3/16"
	1/4"
	19/64"
	5/16"
Hand drill (air or electric)	
Heat gun	
Pliers	
Ratchet with sockets of the following sizes:	3/8"
	7/16"
	1/2"
Screwdriver	
Soldering iron	
Wire strippers	
Wrenches of the following sizes:	3/8"
	7/16"
	1/2"

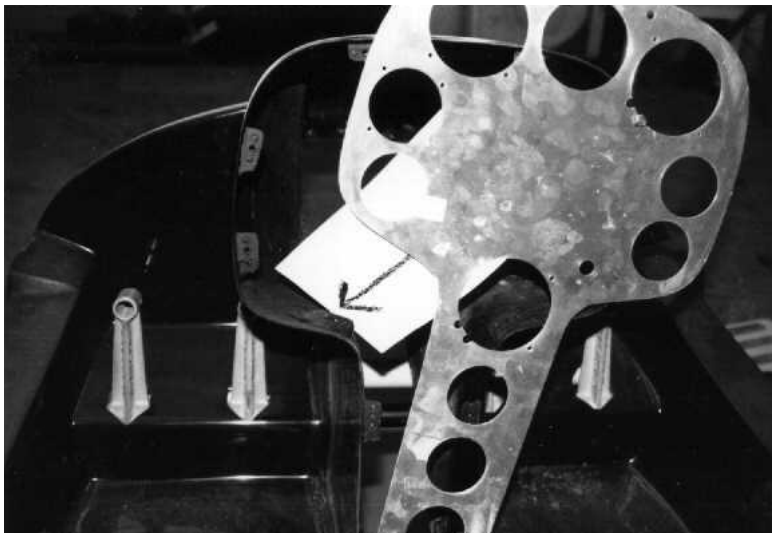


Photo #1

Using template E32-2, cut out the instrument panel and fit it into the opening of the pod. Wax the back of the instrument panel (to prevent the fiberglass resin from sticking) and clamp it in the pod in the desired location. Note: The instrument panel should be recessed at least 1/2" into the pod (from the edge of the opening to the face of the panel). Less space than this will not allow the rubber molding to be mounted around the edge of the pod.

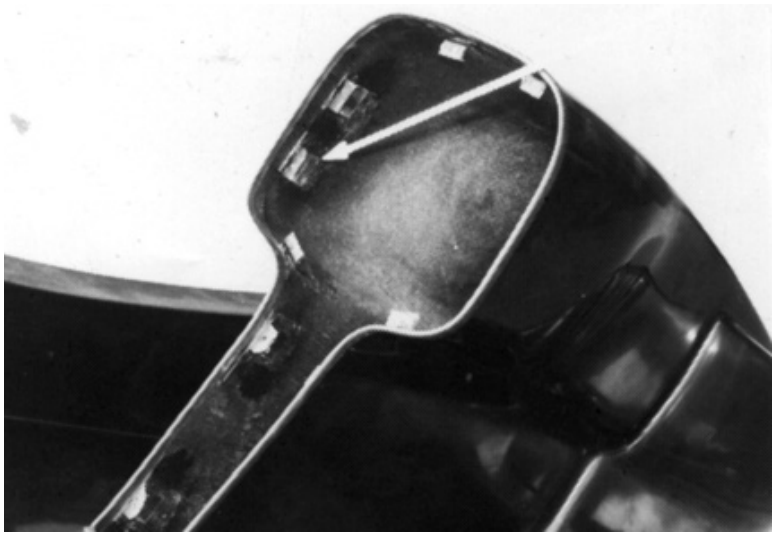


Photo #2

Cut the fiberglass angle into 1-1/4" lengths. Position them on the back of the panel and the inside wall of the pod, as indicated on the template.
Use the resin and mat supplied and fiberglass the angles to the walls of the pod.

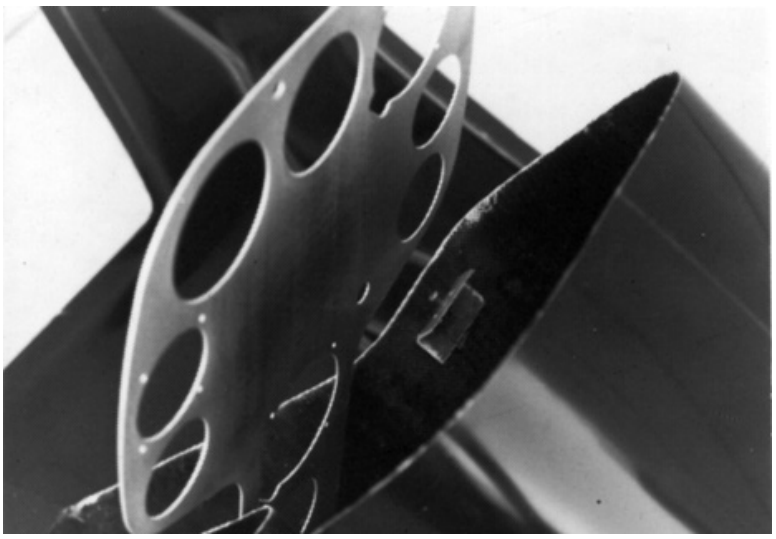


Photo #3

Drill the 1/8" holes in the instrument panel and the angle brackets. Remove the instrument panel and install the nut plates on the fiberglass angles.

Photo #4

Instruments mounted in the instrument panel and pod.
Note: This arrangement has a radio mounted.

Photo #5

This is the rear view of the instrument panel.
Note: The wires should be tied together with tie wraps as often as needed.

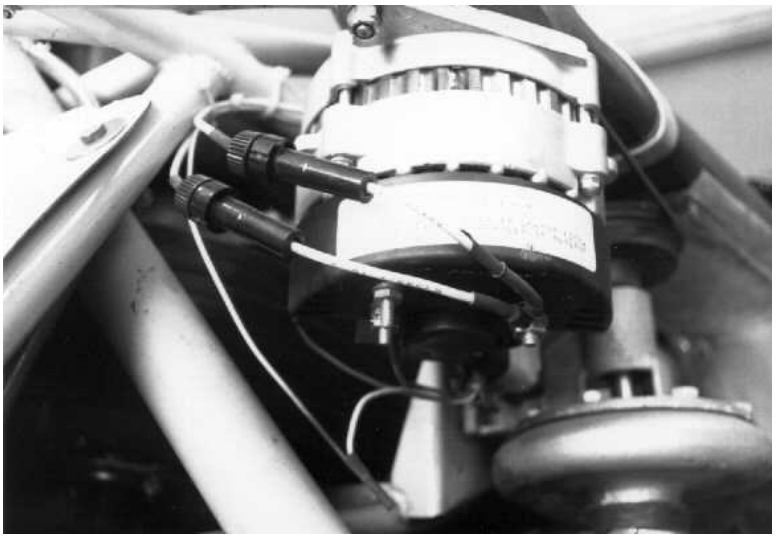


Photo #6

In line fuses installed in the alternator wires at the alternator.

Photo #7

This shows the rotor tach sensor mounted under the hood bracket and the magnets mounted on the main shaft. To minimize interference from the electrical system and to get a steady reading on the tach, route the wire from the sensor to the tach down the pilot side of the airframe.

Photo #8

The starter relay mounts to the top pilot side lower engine mount bolt.

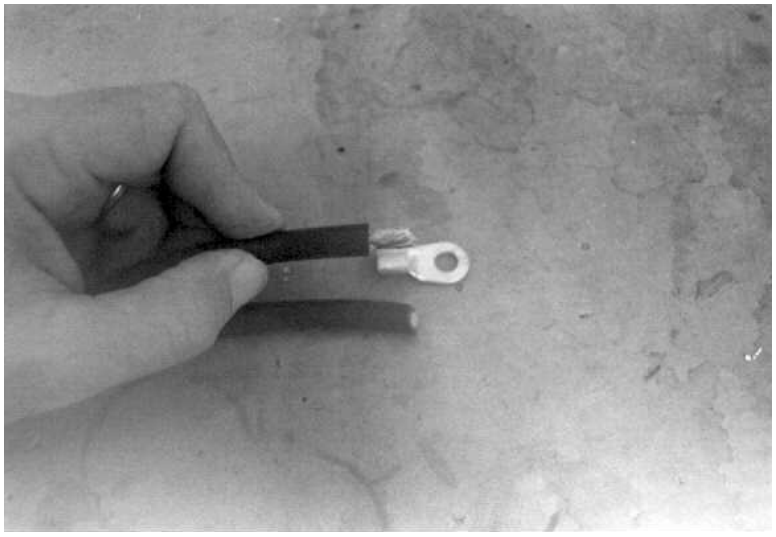


Photo #9

To solder the battery cable to the cable eyelet, strip the cable insulation, leaving a length of exposed wire that will fit in the round part of the eyelet.

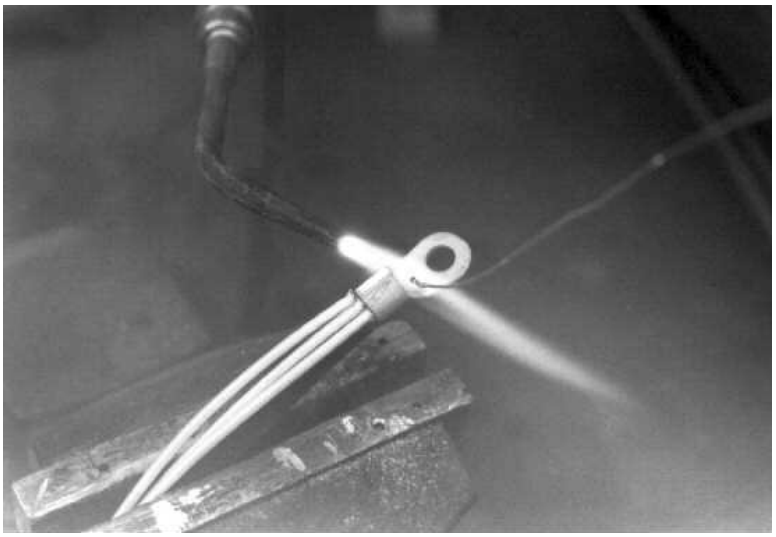


Photo #10

Remove the insulation of the smaller wires to be soldered and install them in the eyelet. With a small flame, heat the eyelet until it melts the solder. Add solder until it comes out the bottom of the eyelet.

Photo #11

When the joint is cool, slide the shrink wrap over the wires and the round part of the eyelet. Heat the shrink wrap until it is tight around the wires and eyelet.

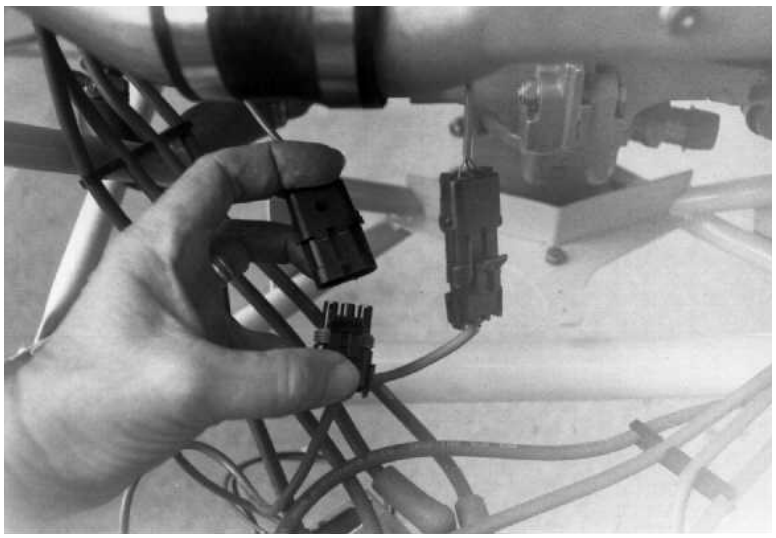


Photo #12

The quick disconnect of the ignition sensor and the ignition power packs.

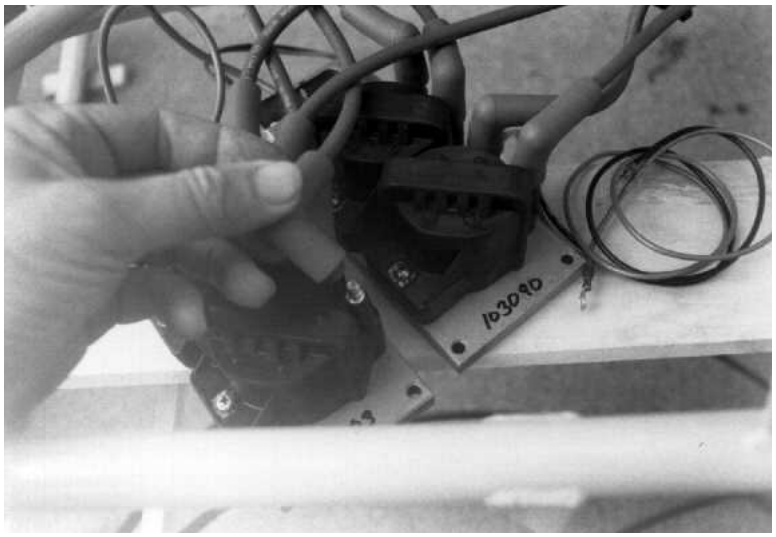


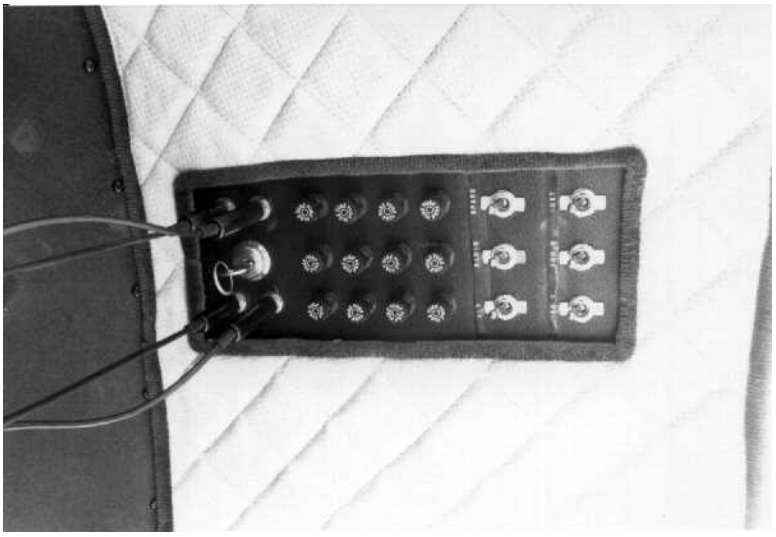
Photo #13

Spark plug wires and ignition power packs. Refer to the engine manual and template E32-1 for location of installing ignition packs.

Photo #14

Two complete ignition power packs with spark plug wires installed.

OVERHEAD SWITCH PANEL



Note: The body must be final fitted before the switch panel is installed, but details are given in this section so the wiring detail can be seen.

Photo #15

This is the overhead switch panel as shown from inside of the cabin.

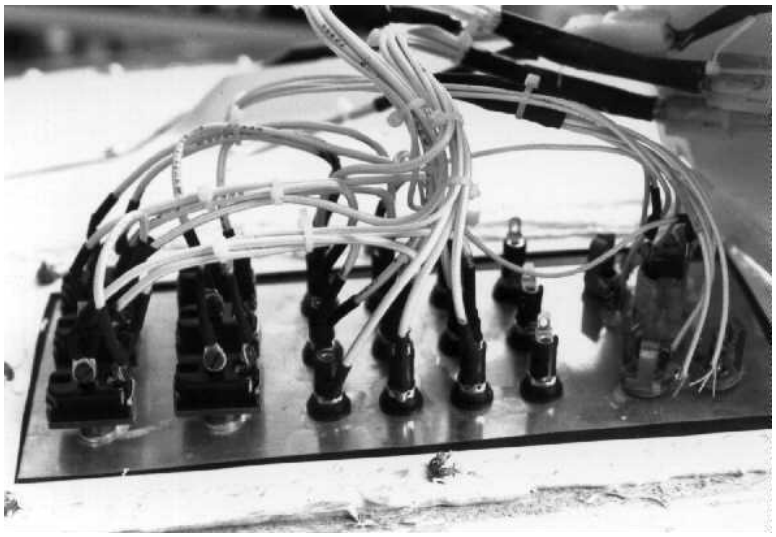


Photo #16

This shows the overhead switch panel as seen from the outside.

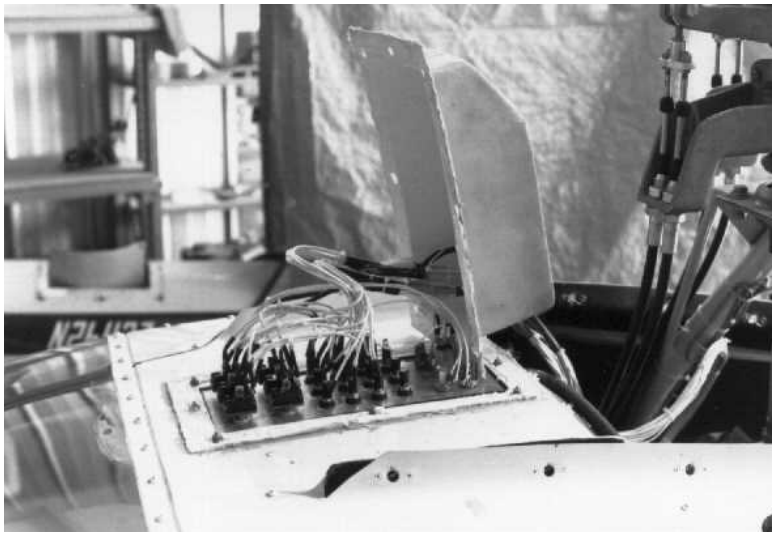


Photo #17

The fiberglass cover shown with the wires going through the rear of the cover.

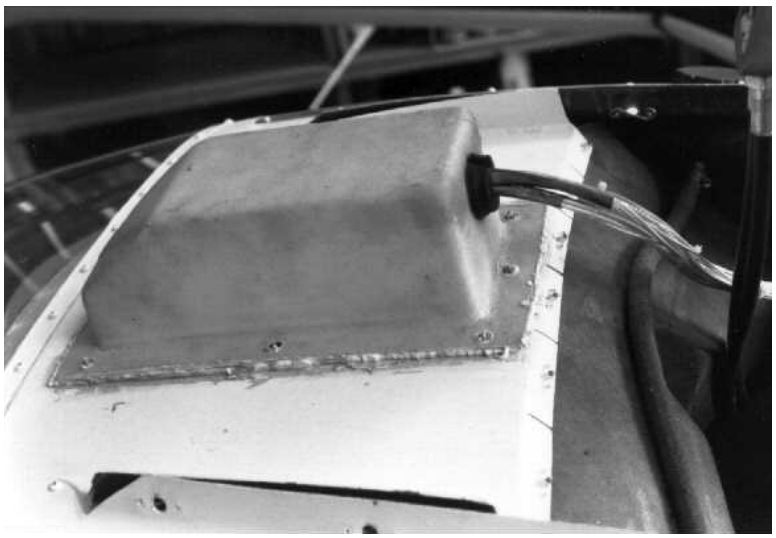


Photo #18

The overhead switch panel cover siliconed in place.

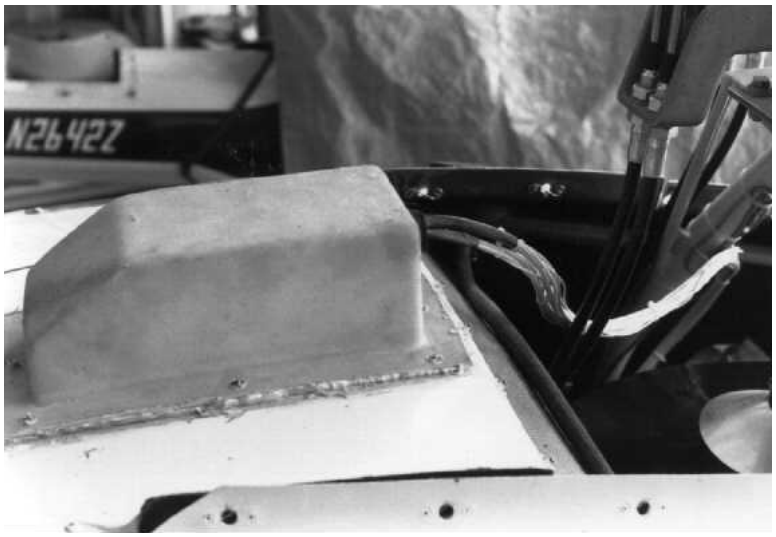


Photo #19

After the cover is glued, secure the wires so they do not get damaged.

Photo #20

Overall view of wiring from the overhead switch panel.

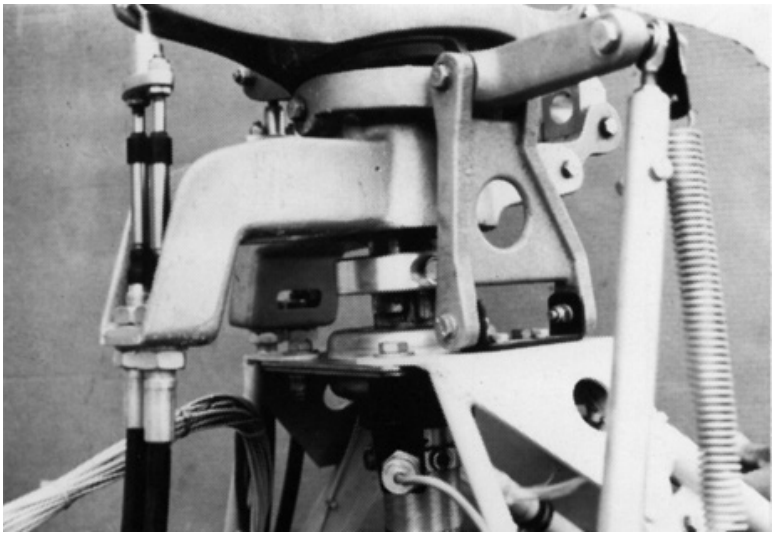


Photo #21

Important: Securely attach the wires away from the main shaft.

CONNECTOR TYPES

F	= FEMALE	R1/4	= RING 1/4" TERMINAL
S	= SOLDER	R3/16	= RING 3/16" TERMINAL
M	= MALE PIN	R5/16	= RING 5/16" TERMINAL
R6-14	= RING #6 (14 GAUGE)	FQ3/16	= FEMALE QUICK CONNECTOR 3/16"
R6-20	= RING #6 (20 GAUGE)	FQ1/4	= FEMALE QUICK CONNECTOR 1/4"
FE	= FUSE END	R	= RING BATTERY CABLE TERMINAL

OVERHEAD SWITCH PANEL

WIRE NO.	WIRE GAUGE	WIRE END CONNECTORS	
1	14	F	S
2	14	F	S
3	14	F	S
4	14	F	S
5	14	F	S
6	20	F	S
7	20	F	S
8	14	F	S
9	14	F	S
10	20	F	R3/16
11	20	F	R6-20
12	14	F	R6-14
13	14	R6-14	R6-14
14	20	R3/16	S
15	14	S	R6-14
16	14	S	R6-14
17	20	S	R6-20
18	14	S	R6-14
19	14	S	R6-14
20	20	S	R6-20
21	14	S	R6-14
22	14	S	R6-14
23	20	R6-20	R6-20
24	14	S	R6-14
25	20	S	R6-20

PANEL FUSES	
1. BATTERY	30 AMP
2. BATTERY	30 AMP
3. BATTERY	30 AMP
4. IGNITION 1	15 AMP
5. IGNITION 2	15 AMP
6. INST. & STARTER	7 AMP
7. FUEL 1	7 AMP
8. FUEL 2	7 AMP
9. AVIONICS	7 AMP

OTHER FUSES	
1. ALTERNATOR (2)	30 AMP
2. STARTER RELAY (1)	30 AMP
3. ENGINE TACH (1)	1/4 AMP
4. FULL RANGE TACH	1/4 AMP

AIRFRAME WIRING

WIRE NO.	WIRE GAUGE	WIRE END CONNECTORS	
38	14	S	M
39	14	S	M
40	14	M	M
41	14	M	M
42	14	F	MODULE
43	14	F	MODULE
44	14	F	MODULE
45	14	F	MODULE
46	14	M	S
47	14	M	S
48	14	M	R1/4
49	--	-	-
50	20	M	M
51	20	F	FUEL PUMP
52	20	M	M
53	20	F	FUEL PUMP
54	20	F	FUEL PUMP
55	--	-	-
56	20	F	FUEL PUMP
57	--	-	-
58	20	S	S
59	14	S	S
60	14	M	F
61	14	M	S
62	20	M	M
63	20	F	VOLTAGE REG.
64	20	R3/16	VOLTAGE REG.
65	20	R3/16	VOLTAGE REG.
66	20	FQ1/4	VOLTAGE REG.
67	20	M	F
68	20	M	F
69	20	F	R1/4
70	20	M	M
71	20	F	S
72	20	F	S
73	20	M	FQ1/4
74	(RELAY IS BOLTED TO FRAME)		
75	14	FQ1/4	F.E.
76	14	FQ1/4	R3/16
77	14	F.E.	R5/16
78	20	M	M
79	20	F	M
80	20	F	FUEL GAUGE
81	20	F	FUEL GAUGE
82	20	R3/16	FUEL GAUGE
83	14	M	F.E.
84	14	F.E.	R1/4

AIRFRAME WIRING CONT'D.

WIRE NO.	WIRE GAUGE	WIRE END CONNECTORS	
80	20	F	FUEL GAUGE
81	20	F	FUEL GAUGE
82	20	R3/16	FUEL GAUGE
83	14	M	F.E.
84	14	F.E.	R1/4
85	14	F.E.	R1/4
86	14	F.E.	R5/16
87	14	S	F
88	20	FQ1/4	F
89	20	FQ1/4	F
90	SENSOR WIRE	F	SENSOR WIRE
91	SENSOR WIRE	F	SENSOR WIRE
92	SENSOR WIRE	F	SENSOR WIRE
93	SENSOR WIRE	F	SENSOR WIRE
94	SENSOR WIRE	F	SENSOR WIRE
95	SENSOR WIRE	F	SENSOR WIRE
96	20	M	F
97	20	M	F
98	20	M	F
99	20	M	F
100	28	F	ROTOR TACH SENDER
101	28	F	ROTOR TACH SENDER
102	28	F	ROTOR TACH SENDER
103	20	M	F
104	20	M	R1/4
105	20	M	M
106	BATTERY CABLE	R	R
107	BATTERY CABLE	R	R
108	BATTERY CABLE	R	R

INSTRUMENT PANEL WIRING

WIRE NO.	WIRE GAUGE	WIRE END CONNECTORS	
110	20	M	FQ3/16
111	20	M	FQ3/16
112	14	M	S
113	14	M	S
114	14	M	OPEN
115	20	S	FQ3/16
116	20	S	FQ3/16
117	20	M	F
118	20	M	F
119	20	M	F
120	20	M	F
121	20	M	S
122	28	M	F
123	28	M	F
124	28	M	F
125	20	F	S
126	20	F	S
127	20	F	S
128	20	F	S
129	20	F	S
130	20	F	S
131	20	S	S
132	20	F	S
133	20	F	S
134	20	F	S
135	20	F	S
136	20	F	S
137	20	F	S
138	20	F	S
139	20	F	S
140	14	S	OPEN
141	20	M	S
142	20	F	S
143	20	F	F
144	20	F	F
145	20	F	S
146	20	F	S