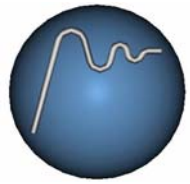

www.evatech.net

RCLM KIT 1

CONVERT YOUR EXISTING LAWN MOWER IN TO A HYBRID REMOTE CONTROL LAWN MOWER

Rev 2

By

Evatech, Inc.

1/22/04

BILL OF MATERIALS

PART NO	DESCRIPTION	QTY	Ave Price	Total
FUTABA	AM or FM Futaba radio, two channel - PISTOL	1	$ 100.00	$ 100.00
RCLMBR01	Dual Speed Controller	1	$ 250.00	$ 250.00
DCMOTOR01	12VDC, 0.24 HP DC MOTOR	2	$ 170.00	$ 340.00
Alternator	Alternator for 1975 Ford Pickup F100 4.9L	1	$ 50.00	$ 50.00
Regulator	Voltage Regulator for 1975 Ford Pickup F100 4.9L	1	$ 20.00	$ 20.00
Battery	12Volt K-Mart Battery	1	$ 25.00	$ 25.00
Wheels	DC Motor Wheels rear wheels	2	$ 20.00	$ 40.00
Frame	1" x 1/16 wall thicknes Square Tube (10ft)	1	$ 20.00	$ 20.00
Batt Holder	6" x 1/8" plate (4 ft)	1	$ 15.00	$ 15.00
Rear Attach	4" x 3/16 plate (3 ft)	1	$ 15.00	$ 15.00
				$ 875.00

ABTRACT
This document contains information that shows how to transform an existing lawn mower into a hybrid remote control lawn mower. The hybrid system described here delivers 50 Amps of 12 DC power. There is enough power in this system to drive the two high torque DC motors, the brain, or any other components. By making the hybrid, one would never run out of electric power.

BASIC OPERATION

The complete unit has two main components, a radio transmitter, and the hybrid remote control lawn mower unit.

The radio transmitter sends two signals for speed and direction. One can purchased the radio unit at any hobby store. Make sure to ask for one that uses FCC approved ground frequencies (75.410MHz, 75.430MHz, …., 75.990MHz). The radio has a range of approximately 2000ft. Typical radios are the Futaba AM or FM two channels, Pistol models. One can find these radios at any hobby store or check the link below.
www.towerhobby.com

The hybrid remote control unit has a RF receiver in the brain. The RF receiver picks up the two radio signals, and converts them into electrical pulses (1mSec to 2mSec). The Brain receives these pulses, calculates the speed, direction, and sends the correct voltage and current to the DC motors. The brain, DC motors, and tires can be purchased at the sites below.
www.evatech.net , www.robotpower.com, www.npcrobotics.com

The unit generates its own DC power from a 50Amp car alternator. The gas engine provides the mechanical energy to move the alternator via a belt connecting the engine shaft and the alternator. The engine size can be any where from 4.5HP to 7.0 HP. Field voltage needs to be applied to the alternator rotor, this would generate a fixed electromagnetic field; then when the engine moves the alternator at let say 1500 RPM, this alternator will be supplying 50 Amps of DC current. It is important to use a voltage regulator to control the output of the alternator. The alternator and voltage regulator can be purchased at the site below or any auto parts.

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INTRUCTIONS

1. Build the frame as per picture 1 using 1” square tube.
2. Make the battery holder as per pictures.
3. Build the lawn mower attachment as per pictures.
4. Make an alternator holder and connected to the engine shaft via a belt.
5. Make DC motor attachments to frame.
6. Make the Brain attachments to frame.
7. Make front wheels free to move as per pictures
8. Follow the electrical connections as per the diagram as per the electrical diagram. Use #10 awg wire for the battery, use #10awg for battery to alternator, and #14 for DCmotors and voltage regulator.

WARNING

Before testing the unit, make sure there are no children or pets around the area.

There is a possibility of interference if some one is using the same frequency. To reduce the possibility of interference, always display your frequency on the unit. Make sure the batteries on the transmitter are charged before operation the unit.

Make sure the radio you select complies with any of these ground frequencies.

Approved surface frequencies good for car, boat, RCLMs, etc.

Channel	Frequency (MHz)
61	75.410
62	75.430
63	75.450
64	75.470
65	75.490
66	75.510
67	75.530
68	75.550
69	75.570
70	75.590
71	75.610
72	75.630
73	75.650
74	75.670
75	75.690
76	75.710
77	75.730
78	75.750
79	75.770
80	75.790
81	75.810
82	75.830
83	75.850
84	75.870
85	75.890
86	75.910
87	75.930
88	75.950
89	75.970
90	75.990

Fig 1

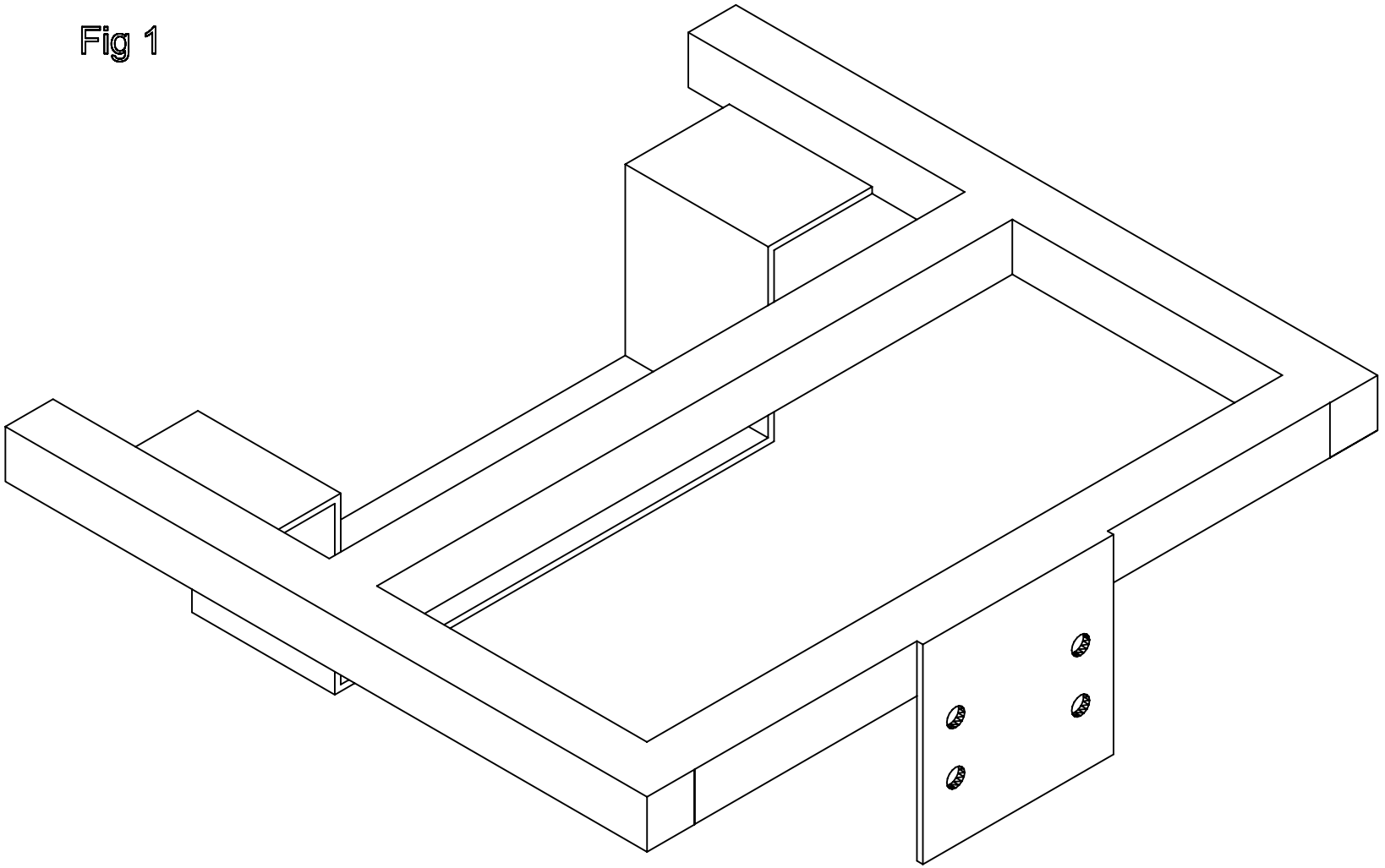


Fig. 2

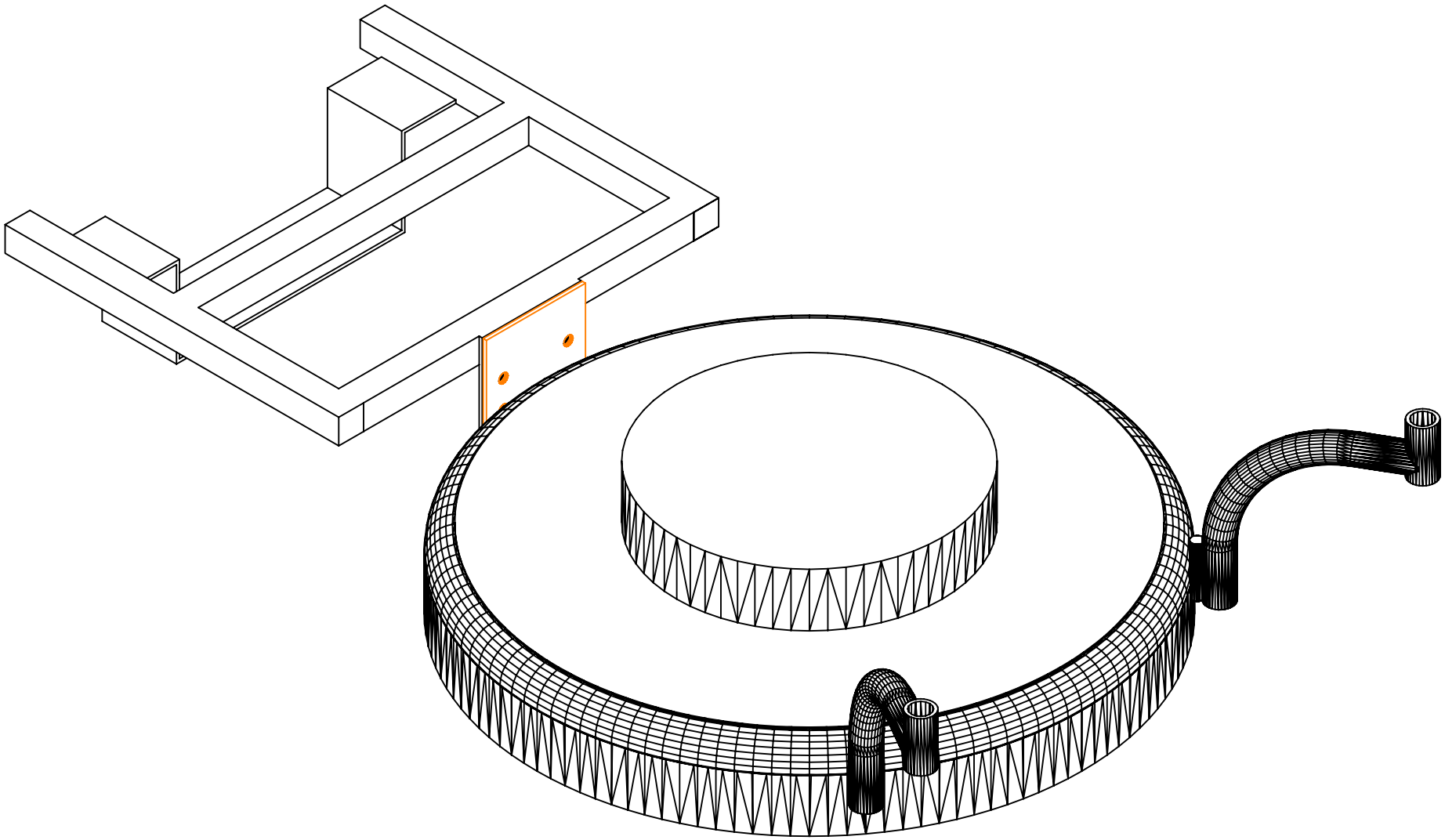
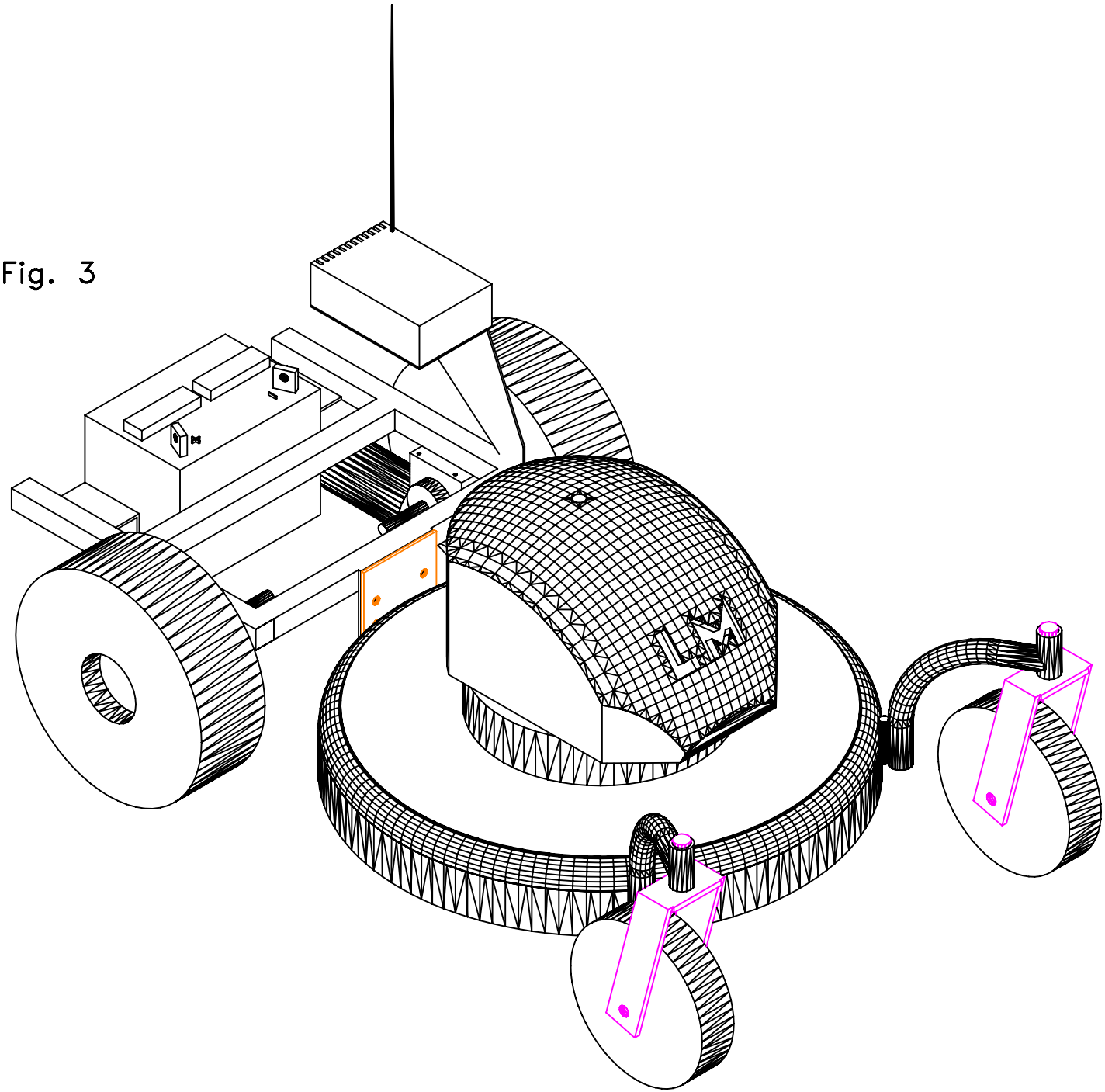
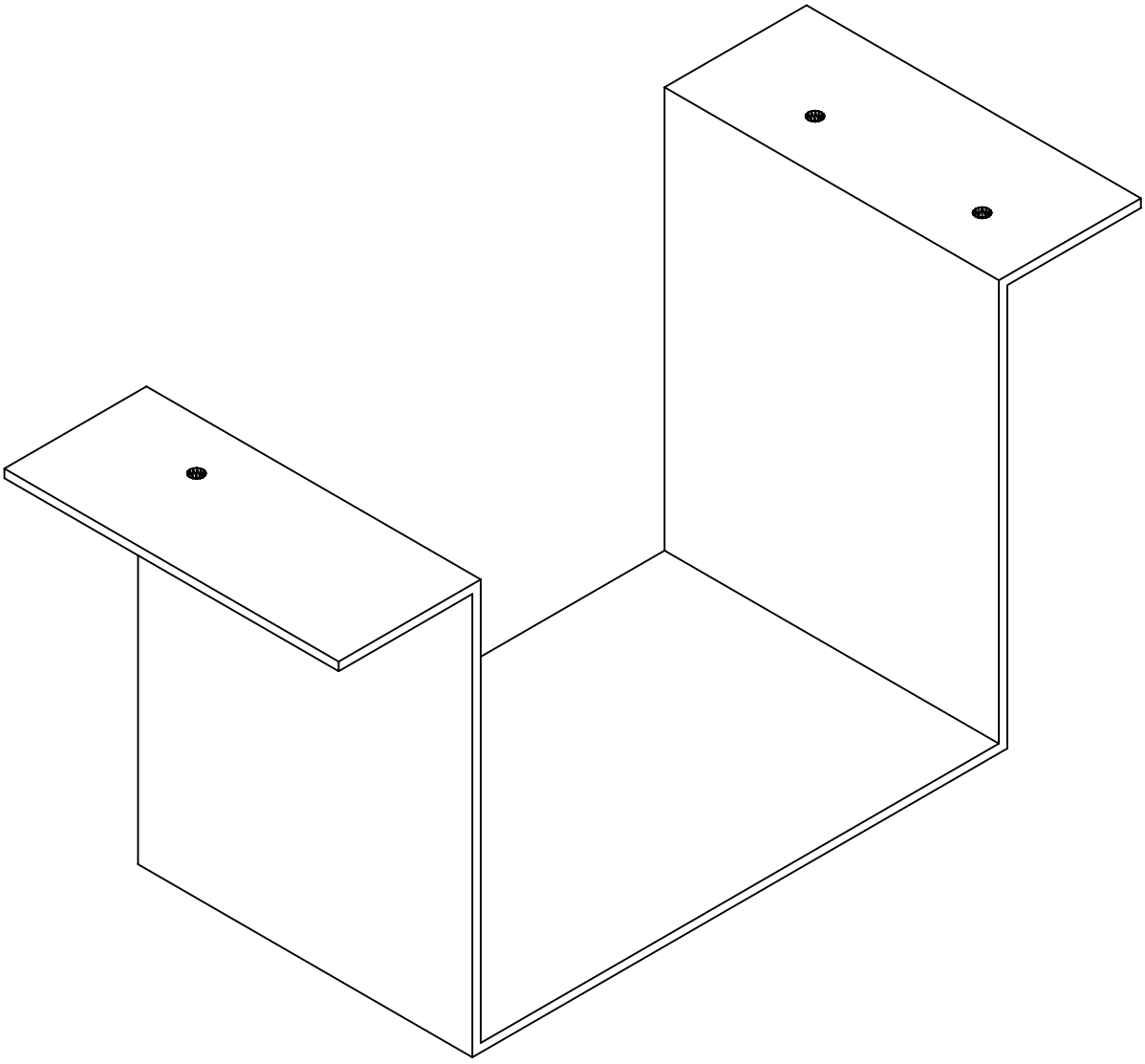
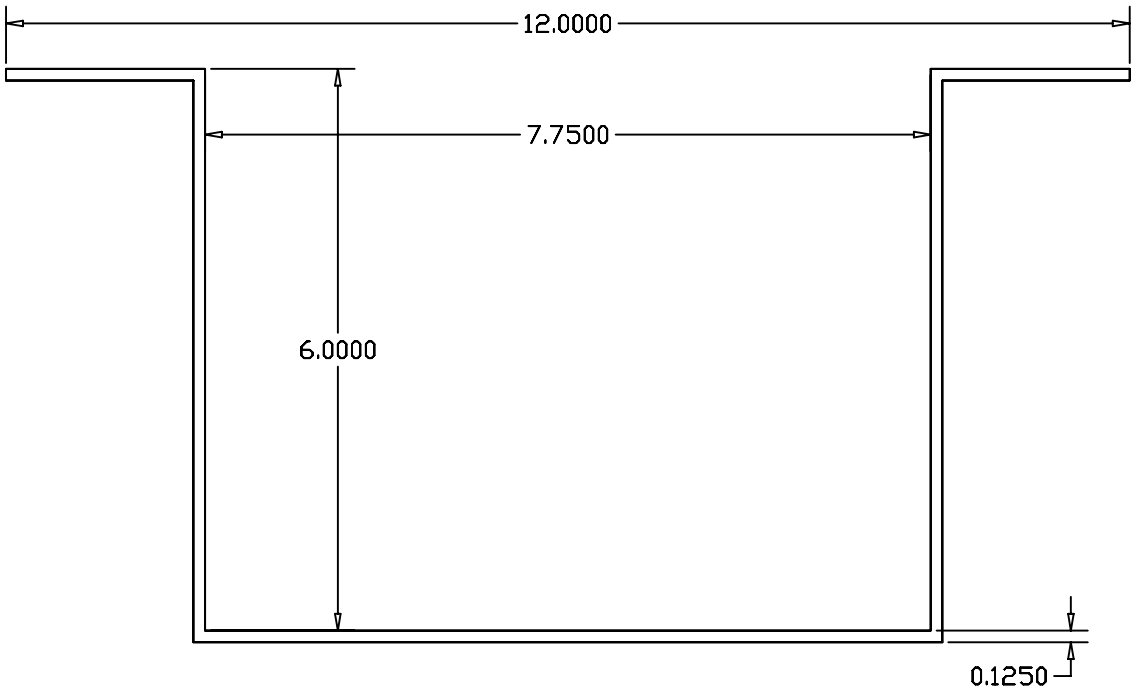


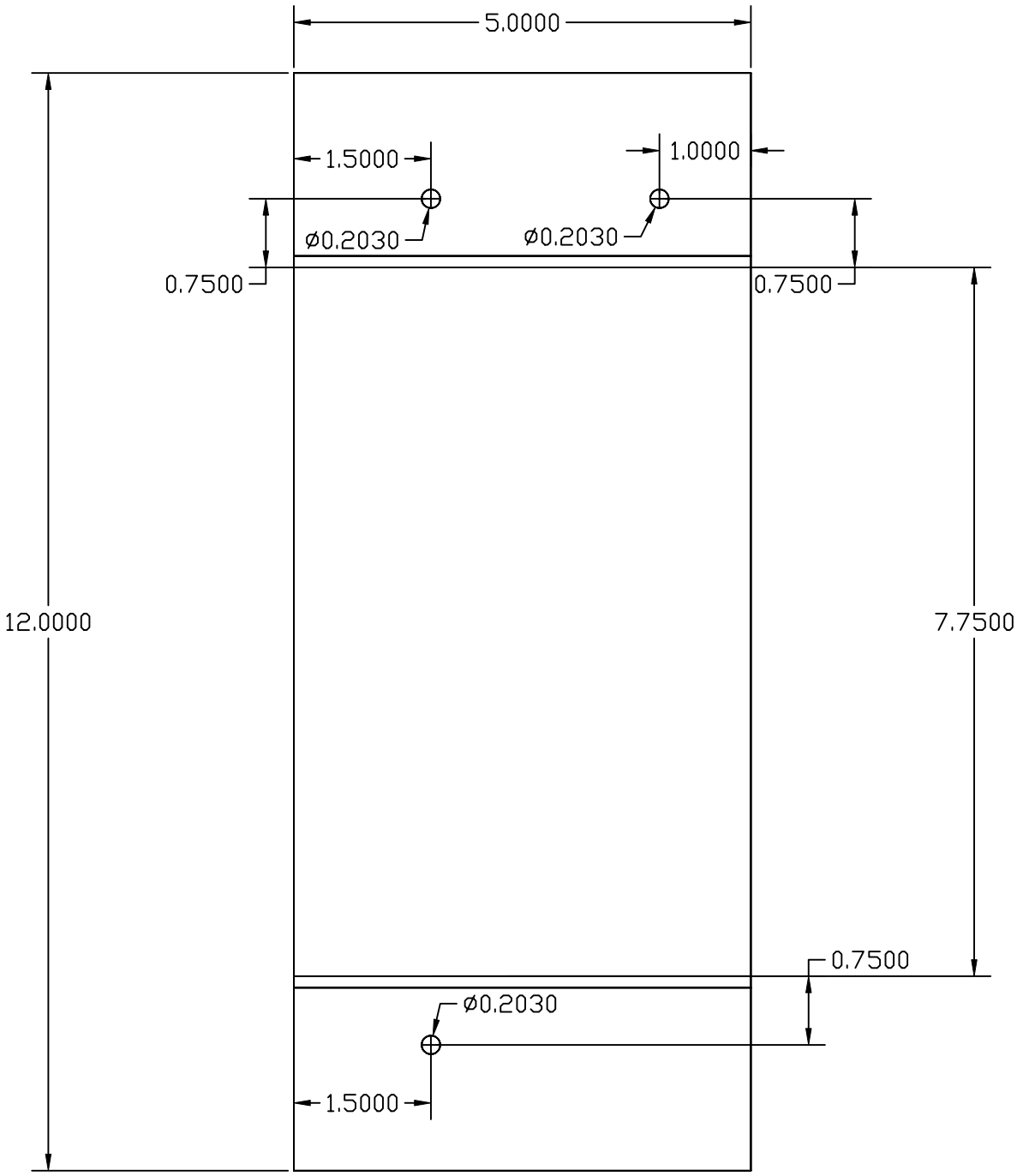
Fig. 3



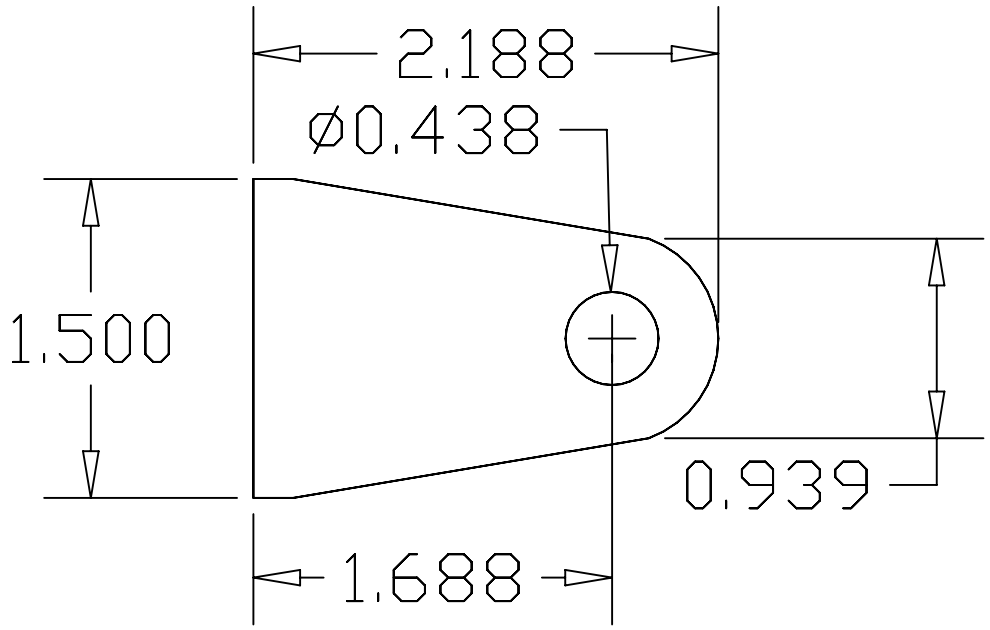



12.0000
7.7500
6.0000
0.1250

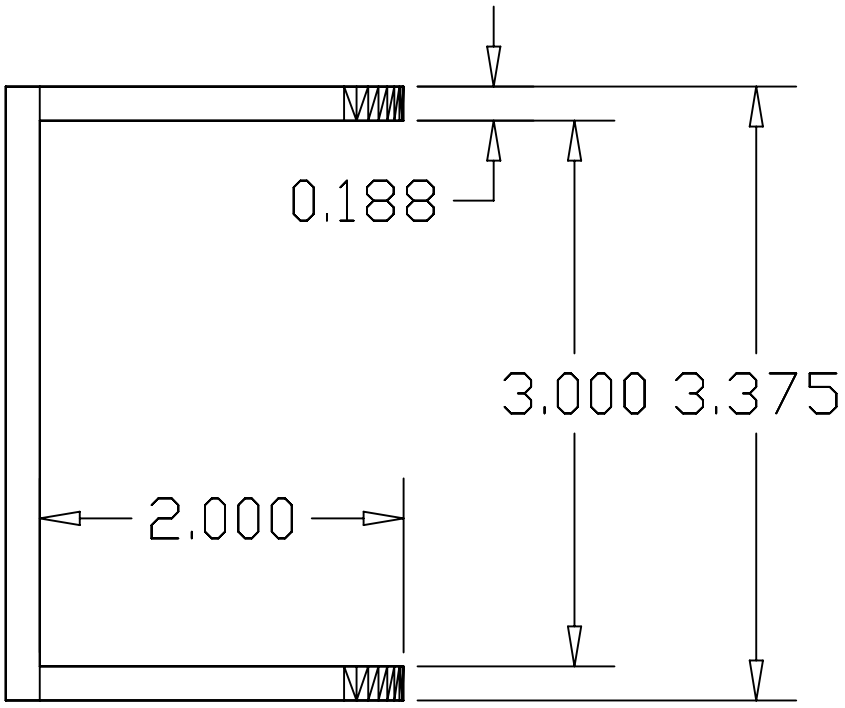
TOP VIEW

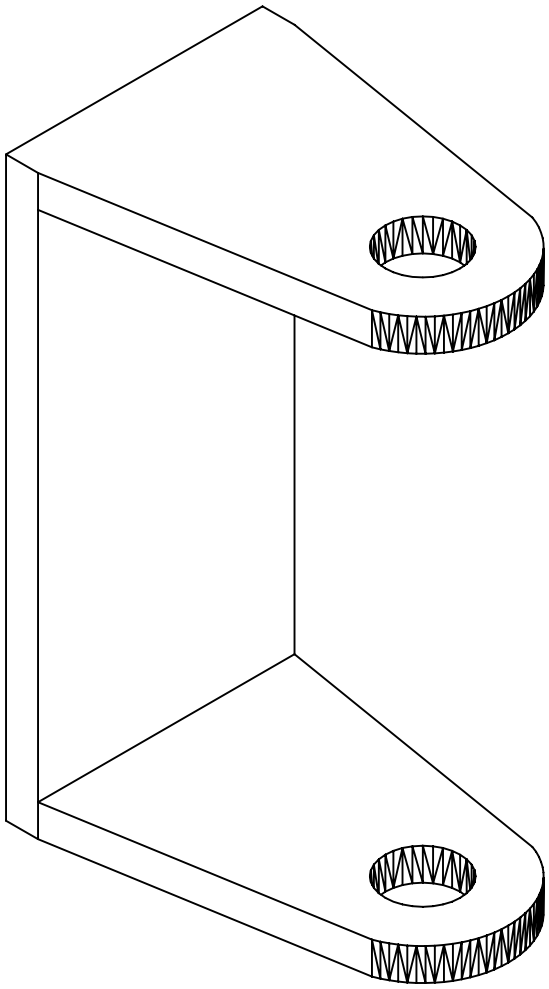

5.0000
1.5000
1.0000
ø0.2030
ø0.2030
0.7500
0.7500
12.0000
7.7500
0.7500
ø0.2030
1.5000

Alternator Mount



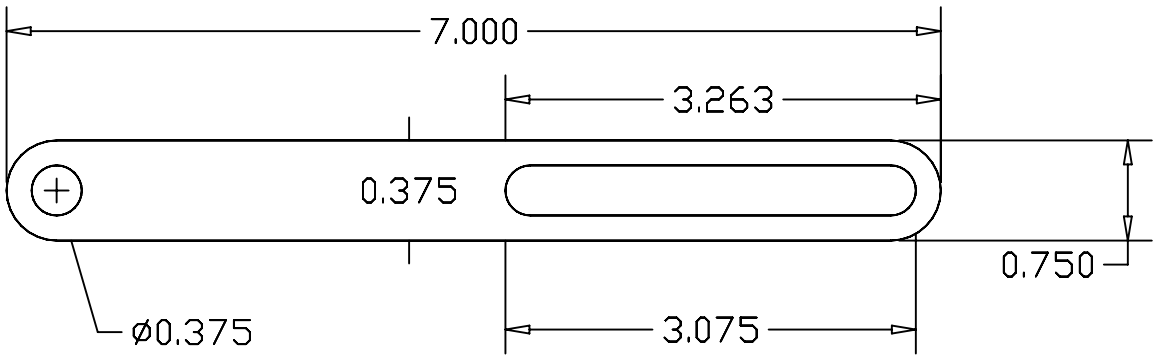
Side View

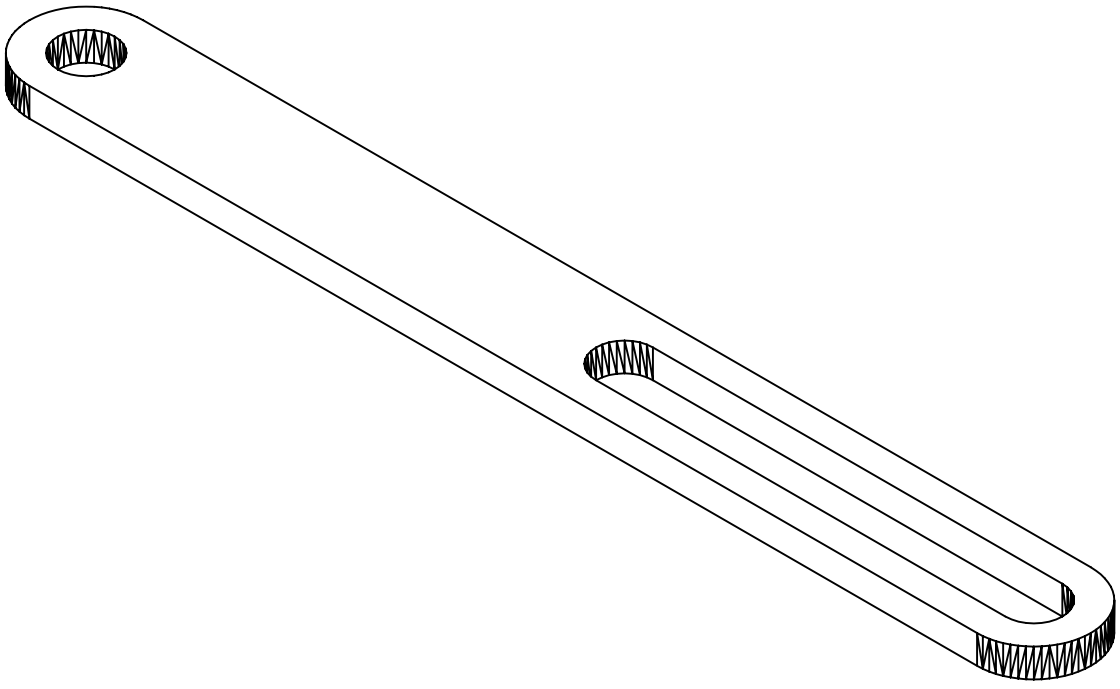




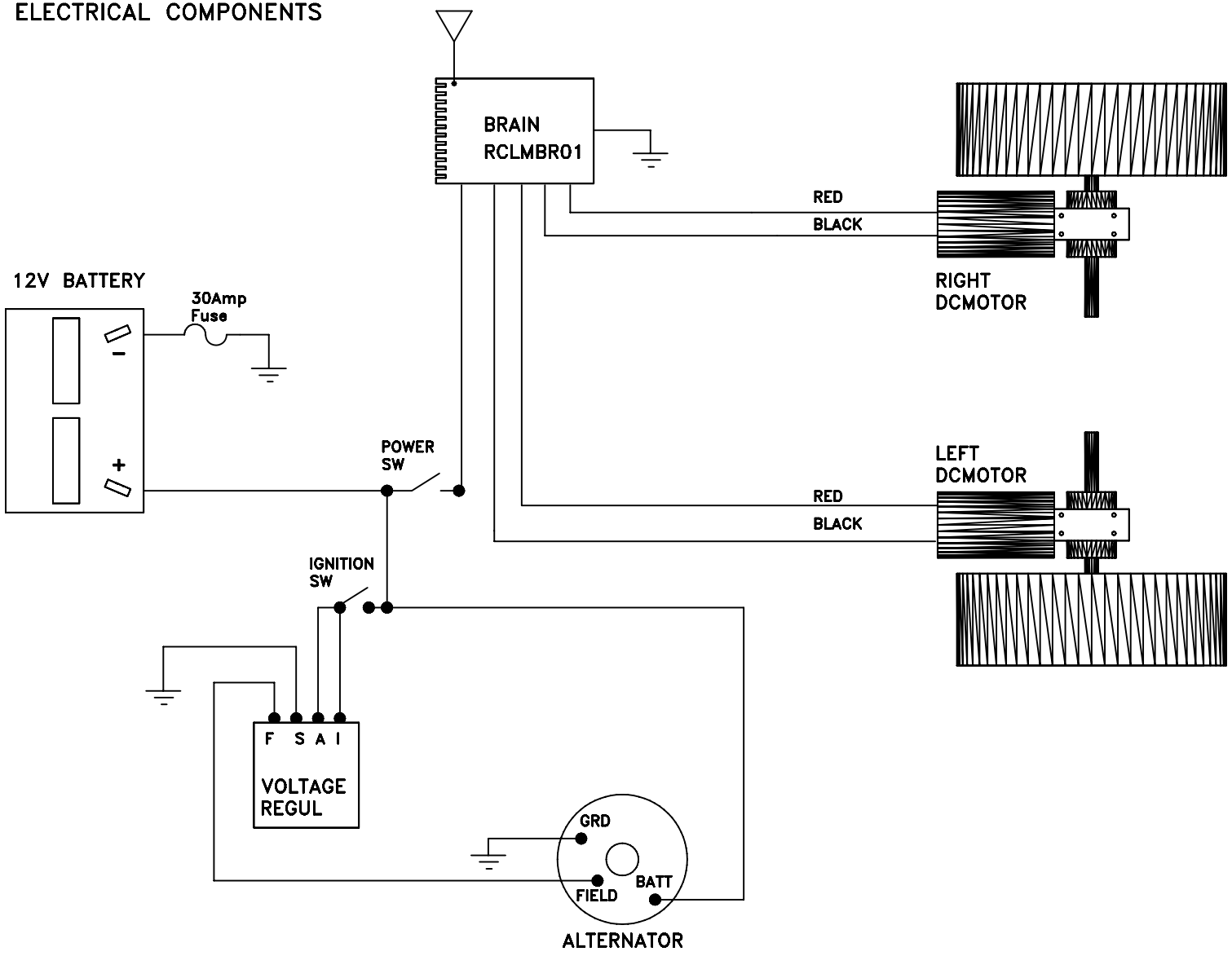
Alternator Tesion Member

The thiknes of
metal is 3/16"





ELECTRICAL COMPONENTS



RCLM2004S
BRAIN