

**ROCKET BODY**

| Part                 | Vendor     | Part Number | Quantity |      | Cost    | Total   |
|----------------------|------------|-------------|----------|------|---------|---------|
| 3" Cellular ABS pipe | Home Depot | 193828      | 1        | Each | \$15.86 | \$15.86 |
|                      |            |             |          |      |         | \$15.86 |

**FINS**

| Part  | Vendor       | Part Number | Quantity |      | Cost    | Total   |
|---|--------------|-------------|----------|------|---------|---------|
| 4" x 48" x 1/4" HDPE sheets                 | McMaster.com | 8671K69     | 2        | Each | \$9.72  | \$19.44 |
| Aluminum u-channel                          | McMaster.com | 9001K32     | 1        | Each | \$17.37 | \$17.37 |
| 8-32 Steel machine screw hex nut            | McMaster.com | 90480A009   | 1        | Pack | \$1.49  | \$1.49  |
| 8-32x1/2" Stainless steel machine hex screw | McMaster.com | 92314A194   | 1        | Pack | \$12.26 | \$12.26 |
| 8-32 Steel machine nut with tooth washer    | McMaster.com | 90675A009   | 1        | Pack | \$2.78  | \$2.78  |
| Loctite E-00CL Fast setting epoxy           | McMaster.com | 6430A16     | 1        | Each | \$12.16 | \$12.16 |
| Loctite applicator gun                      | McMaster.com | 74695A71    | 1        | Each | \$27.74 | \$27.74 |
| Loctite mixing nozzle                       | McMaster.com | 74695A12    | 1        | Each | \$1.21  | \$1.21  |
| 6-20 x 3/8" Self tapping screw              | McMaster.com | 94060A146   | 1        | Pack | \$4.15  | \$4.15  |
|   |              |             |          |      |         | \$98.60 |

The Loctite epoxy, applicator and mixing nozzle are for convenience only, any two part epoxy can be used. Many McMaster part numbers are for *packages* of bolts or screws. If only one or two pieces are required and can be purchased individually through another supplier, there would be a considerable savings in the overall project cost.

**If purchased by the piece, the cost for this section would be approximately \$49.00**

**NOSE CONE**

| Part                                       | Vendor             | Part Number | Quantity |      | Cost    | Total   |
|--|--------------------|-------------|----------|------|---------|---------|
| 1/4-20 x 7/8" Coupling nut                 | McMaster.com       | 90264A435   | 2        | Each | \$0.19  | \$0.38  |
| Steel round washer for 1/4" screw          | McMaster.com       | 91090A107   | 1        | Pack | \$4.60  | \$4.60  |
| 1/4-20 Eyebolt with nut - 1 1/2" length    | McMaster.com       | 9489T118    | 1        | Pack | \$3.99  | \$3.99  |
| 1/4-20 x 4" Fully threaded aluminum stud   | McMaster.com       | 93225A874   | 1        | Pack | \$8.05  | \$8.05  |
| 1/4-20 x 3/8" Steel button head hex screw  | McMaster.com       | 91255A535   | 1        | Pack | \$13.55 | \$13.55 |
| Steel wood screw #6 x 1" philips flat head | McMaster.com       | 90252A106   | 1        | Pack | \$6.88  | \$6.88  |
| 16 oz. Plastic wine glass                  | Kidsmartliving.com | CR062-612   | 1        | Each | \$1.99  | \$1.99  |
| 3" Diameter x 2" delrin rod                | McMaster.com       | 9986K13     | 1        | Each | \$18.05 | \$18.05 |
| PVC Drain pipe 3" diameter                 | McMaster.com       | 2426K24     | 1        | Each | \$7.06  | \$7.06  |
|  |                    |             |          |      |         | \$64.55 |

Many McMaster part numbers are for *packages* of bolts or screws. If only one or two pieces are required and can be purchased individually through another supplier, there would be a considerable savings in the overall project cost.

**If purchased by the piece, the cost for this section would be approximately \$37.00**

**APOGEE DETECTOR - PART 1**

| Part   | Vendor       | Part Number | Quantity |      | Cost    | Total    |
|--|--------------|-------------|----------|------|---------|----------|
| 3" Diameter black delrin rod x 6"                    | McMaster.com | 9986K16     | 1        | Each | \$33.25 | \$33.25  |
| Press fit threaded insert 1/4-20 x 15/32"            | McMaster.com | 97191A230   | 2        | Pack | \$14.98 | \$29.96  |
| Structural fiberglass tube 1" x 1" x 60" - 1/8" wall | McMaster.com | 8548K21     | 1        | Each | \$17.11 | \$17.11  |
| Steel U-bolt 1/4-20 x 1 1/2"                         | McMaster.com | 3043T12     | 1        | Pack | \$5.86  | \$5.86   |
| Steel hex nut 1/4-20                                 | McMaster.com | 93827A211   | 1        | Pack | \$6.11  | \$6.11   |
| Aluminum threaded round standoff 10-32 x 1/2"        | McMaster.com | 93330A468   | 4        | Each | \$0.44  | \$1.76   |
| Aluminum threaded round standoff 10-32 x 2"          | McMaster.com | 93330A493   | 4        | Each | \$1.36  | \$5.44   |
| Steel machine screw 1/4-20 x 1 1/2"                  | McMaster.com | 90272A546   | 1        | Pack | \$12.08 | \$12.08  |
| Steel machine screw 10-32 x 4"                       | McMaster.com | 99117A700   | 1        | Pack | \$7.71  | \$7.71   |
| Steel machine screw 10-32 x 1 1/2"                   | McMaster.com | 90272A836   | 1        | Pack | \$8.44  | \$8.44   |
| Touch safe terminal block                            | McMaster.com | 7618K617    | 1        | Each | \$3.31  | \$3.31   |
| Steel ball 3/4" diameter                             | McMaster.com | 96455K59    | 1        | Pack | \$14.43 | \$14.43  |
| No. 6 x 3/4" Steel sheet metal screw                 | McMaster.com | 90190A151   | 1        | Pack | \$3.94  | \$3.94   |
| Steel fully threaded stud 1/4-20 x 1"                | McMaster.com | 95475A542   | 1        | Pack | \$12.69 | \$12.69  |
| Stainless steel cotter pin 3/32" x 2 1/2"            | McMaster.com | 98401A449   | 1        | Pack | \$9.14  | \$9.14   |
| Steel split ring 1.062" ID                           | McMaster.com | 86805T38    | 1        | Pack | \$12.20 | \$12.20  |
| 3M VHB Double sided foam tape                        | McMaster.com | 75935A11    | 1        | Roll | \$18.20 | \$18.20  |
|  |              |             |          |      |         | \$201.63 |

Many McMaster part numbers are for *packages* of bolts or screws. If only one or two pieces are required and can be purchased individually through another supplier, there would be a considerable savings in the overall project cost.

**If purchased by the piece, the cost for this section would be approximately \$115.00**

**APOGEE DETECTOR - PART 2**

| Part  | Vendor       | Part Number | Quantity |      | Cost    | Total   |
|---|--------------|-------------|----------|------|---------|---------|
| Stranded single conductor wire - white      | McMaster.com | 7587K325    | 1        | Roll | \$8.22  | \$8.22  |
| 9 Volt snap in battery holder               | McMaster.com | 7712K62     | 1        | Each | \$2.58  | \$2.58  |
| Snap acting SPDT switch with roller lever   | McMaster.com | 7193K2      | 1        | Each | \$6.10  | \$6.10  |
| Compact spade terminal relay 12vdc DPDT     | McMaster.com | 69585K87    | 1        | Each | \$8.07  | \$8.07  |
| Nylon cable ties 4"                         | McMaster.com | 7130K52     | 1        | Pack | \$2.25  | \$2.25  |
| Double loop shaft coupling 1/4" x 1/4" bore | McMaster.com | 6183K33     | 1        | Each | \$13.30 | \$13.30 |
| Heat shrink tubing 1/2" to 1/4"             | McMaster.com | 7478K94     | 1        | Pack | \$9.92  | \$9.92  |
| Heat shrink tubing 1/4" to 1/8"             | McMaster.com | 7496K435    | 1        | Pack | \$10.96 | \$10.96 |
| Heat shrink tubing 1/8" to 1/16"            | McMaster.com | 7856K631    | 1        | Pack | \$7.21  | \$7.21  |
|   |              |             |          |      |         | \$68.61 |

Many McMaster part numbers are for *packages* of bolts or screws. If only one or two pieces are required and can be purchased individually through another supplier, there would be a considerable savings in the overall project cost.

**If purchased by the piece, the cost for this section would be approximately \$38.00**

**PARACHUTE PISTON**

| Part   | Vendor       | Part Number | Quantity |       | Cost    | Total   |
|--|--------------|-------------|----------|-------|---------|---------|
| 1/2" PVC union slip x slip                       | Home Depot   | 451132      | 1        | Each  | \$2.44  | \$2.44  |
| 1/2" PVC cap                                     | Home Depot   | 188166      | 1        | Each  | \$0.31  | \$0.31  |
| 1/2" PVC coupling                                | Home Depot   | 188069      | 1        | Each  | \$0.25  | \$0.25  |
| 1" PVC cap                                       | Home Depot   | 188182      | 2        | Each  | \$0.51  | \$1.02  |
| 1/2" PVC pipe x 2'                               | Home Depot   | 193682      | 1        | Each  | \$1.20  | \$1.20  |
| 1" PVC pipe x 2'                                 | Home Depot   | 193755      | 1        | Each  | \$2.72  | \$2.72  |
| PVC glue   | Home Depot   | 798363      | 1        | Each  | \$4.97  | \$4.97  |
| Quad cross setion o-ring 13/16" ID x 1" OD       | McMaster.com | 90025K244   | 1        | Pack  | \$13.00 | \$13.00 |
| Delrin plastic disc 3" diameter x 1"             | McMaster.com | 9986K12     | 1        | Each  | \$15.65 | \$15.65 |
| Plumber's grease                                 | Home Depot   | 678831      | 1        | Each  | \$2.36  | \$2.36  |
| Stranded single conductor wire - white           | McMaster.com | 7587K325    | 1        | Roll  | \$8.22  | \$8.22  |
| 1/4-20 x 7/8" Steel button head socket cap screw | McMaster.com | 91255A541   | 1        | Pack  | \$7.75  | \$7.75  |
| Nickel Chromium wire 32 AWG 1/8 lb. Spool        | McMaster.com | 8880K83     | 1        | Spool | \$21.08 | \$21.08 |
| Polyethylene 1/2" square foam tape               | McMaster.com | 75785T11    | 1        | Pack  | \$4.08  | \$4.08  |
| 1/4-20 Nylon insert hex locknuts                 | McMaster.com | 97135A210   | 1        | Pack  | \$3.28  | \$3.28  |
| 5 lbs. Potassium Nitrate - Kno3                  | Various      | N/A         | 1        | Each  | \$10.00 | \$10.00 |
| 2 lbs. Powdered sugar                            | Various      | N/A         | 1        | Each  | \$2.50  | \$2.50  |
|  |              |             |          |       |         | \$88.33 |

Many McMaster part numbers are for *packages* of bolts or screws. If only one or two pieces are required and can be purchased individually through another supplier, there would be a considerable savings in the overall project cost.

**If purchased by the piece, the cost for this section would be approximately \$62.00**

Some of the parts used in this section are duplicated in other sections.

**PARACHUTE AND PARACHUTE RIGGING**

| Part  | Vendor       | Part Number | Quantity |      | Cost    | Total    |
|---|--------------|-------------|----------|------|---------|----------|
| Double braided polyester rope 1/4" diameter 400#  | McMaster.com | 3789T312    | 1        | Roll | \$22.27 | \$22.27  |
| Steel threaded connector 3/16" diameter 600#      | McMaster.com | 8947T15     | 2        | Each | \$1.15  | \$2.30   |
| Double pinch steel hose clamp 5/16" to 7/16"      | McMaster.com | 6541K51     | 1        | Pack | \$8.03  | \$8.03   |
| Straight jaw installation pincer                  | McMaster.com | 6541K67     | 1        | Each | \$22.81 | \$22.81  |
| Polyoefin heat shrink tubing 3/4" to 3/8" - black | McMaster.com | 7496K19     | 1        | Pack | \$18.48 | \$18.48  |
| Buna-N o-ring 3/8" ID x 1/2" OD                   | McMaster.com | 2418T118    | 1        | Pack | \$9.90  | \$9.90   |
| Natural latex rubber bands #14                    | McMaster.com | 12205T52    | 1        | Pack | \$6.96  | \$6.96   |
| 60" White surplus parachute                       | Aerocon.com  | P60WHITE    | 1        | Each | \$12.00 | \$12.00  |
|   |              |             |          |      |         | \$102.75 |

Many McMaster part numbers are for *packages* of bolts or screws. If only one or two pieces are required and can be purchased individually through another supplier, there would be a considerable savings in the overall project cost.

**If purchased by the piece, the cost for this section would be approximately \$52.00**

**ASSEMBLING THE UPPER BODY SECTION**

| Part                                    | Vendor       | Part Number | Quantity |      | Cost    | Total   |
|---|--------------|-------------|----------|------|---------|---------|
| 3/4" x 5/16" Foam weather stripping     | Home Depot   | 518425      | 1        | Roll | \$3.48  | \$3.48  |
| 9 Volt battery                          | McMaster.com | 71455K56    | 1        | Each | \$2.69  | \$2.69  |
| 1/4-20 x 5/8" Button head hex cap screw | McMaster.com | 91255A539   | 1        | Pack | \$14.40 | \$14.40 |
| Nylon cable ties 15"                    | McMaster.com | 7130K572    | 1        | Pack | \$10.55 | \$10.55 |
|   |              |             |          |      |         | \$31.12 |

Many McMaster part numbers are for *packages* of bolts or screws. If only one or two pieces are required and can be purchased individually through another supplier, there would be a considerable savings in the overall project cost.

**If purchased by the piece, the cost for this section would be approximately \$12.00**

### NOZZLE AND ENGINE CASING

| Part  | Vendor       | Part Number | Quantity |      | Cost    | Total   |
|---|--------------|-------------|----------|------|---------|---------|
| Thick steel washer .906" ID 1.75" OD .17" thick | McMaster.com | 98029A037   | 1        | Pack | \$5.24  | \$5.24  |
| 1/4-20 Brass threaded inserts                   | McMaster.com | 92395A116   | 1        | Pack | \$9.30  | \$9.30  |
| 2" Schedule 40 PVC coupling                     | Home Depot   | 232750      | 2        | Each | \$0.94  | \$1.88  |
| 2" Schedule 40 PVC pipe x 10'                   | Home Depot   | 754826      | 1        | Each | \$5.87  | \$5.87  |
| 1/4-20 x 5/8" Steel button head hex screws      | McMaster.com | 91255A539   | 1        | Pack | \$14.40 | \$14.40 |
| Hydraulic anchoring cement                      | McMaster.com | 7569T92     | 1        | Box  | \$8.17  | \$8.17  |
|   |              |             |          |      |         | \$44.86 |

Many McMaster part numbers are for *packages* of bolts or screws. If only one or two pieces are required and can be purchased individually through another supplier, there would be a considerable savings in the overall project cost.

**If purchased by the piece, the cost for this section would be approximately \$21.00**

### ENGINE IGNITER

| Part                                      | Vendor       | Part Number | Quantity |       | Cost    | Total   |
|---|--------------|-------------|----------|-------|---------|---------|
| Nickel Chromium wire 32 AWG 1/8 lb. Spool | McMaster.com | 8880K83     | 1        | Spool | \$21.08 | \$21.08 |
| 1" PVC pipe x 2'                          | Home Depot   | 254977      | 1        | Each  | \$1.67  | \$1.67  |
| Stranded single conductor wire - white    | McMaster.com | 7587K325    | 1        | Roll  | \$8.22  | \$8.22  |
| Nylon cable ties 4"                       | McMaster.com | 7130K52     | 1        | Pack  | \$2.25  | \$2.25  |
| 5 lbs. Potassium Nitrate - Kno3           | Various      | N/A         | 1        | Each  | \$10.00 | \$10.00 |
| 2 lbs. Powdered sugar                     | Various      | N/A         | 1        | Each  | \$2.50  | \$2.50  |
|   |              |             |          |       |         | \$33.22 |

Many McMaster part numbers are for *packages* of bolts or screws. If only one or two pieces are required and can be purchased individually through another supplier, there would be a considerable savings in the overall project cost.

**If purchased by the piece, the cost for this section would be approximately \$3.00**

Some of the parts used in this section are duplicated in other sections.

### MAKING AND CASTING THE FUEL

| Part                              | Vendor       | Part Number | Quantity |      | Cost    | Total   |
|-----------------------------------|--------------|-------------|----------|------|---------|---------|
| 1" PVC pipe x 2'                  | Home Depot   | 254977      | 1        | Each | \$1.67  | \$1.67  |
| 2" Schedule 40 PVC coupling       | Home Depot   | 232750      | 1        | Each | \$0.94  | \$0.94  |
| PVC glue                          | Home Depot   | 798363      | 1        | Each | \$4.97  | \$4.97  |
| 2" x 1" PVC slip bushing          | Home Depot   | 544404      | 1        | Each | \$0.96  | \$0.96  |
| 1" x 6' Aluminum rod - alloy 6061 | McMaster.com | 8974K37     | 1        | Each | \$31.07 | \$31.07 |
| 5 lbs. Potassium Nitrate - Kno3   | Various      | N/A         | 1        | Each | \$10.00 | \$10.00 |
| 2 lbs. Powdered sugar             | Various      | N/A         | 1        | Each | \$2.50  | \$2.50  |
| 16 oz. Corn syrup                 | Various      | N/A         | 1        | Each | \$2.50  | \$2.50  |
| WD-40 Lubricant - 16 oz. Aerosol  | McMaster.com | 1347K17     | 1        | Each | \$6.15  | \$6.15  |
|                                   |              |             |          |      |         | \$60.76 |

Many of the parts in this section only need to be purchased once. Subsequent engines will therefore be much less expensive.

Some of the parts used in this section are duplicated in other sections.

### INSTALLING THE IGNITER, SMOKE ELEMENT AND END CAP

| Part                                   | Vendor       | Part Number | Quantity |      | Cost    | Total   |
|--|--------------|-------------|----------|------|---------|---------|
| 2" Schedule 40 PVC cap                 | Home Depot   | 232777      | 1        | Each | \$1.21  | \$1.21  |
| PVC glue                               | Home Depot   | 798363      | 1        | Each | \$4.97  | \$4.97  |
| 2" x 1" PVC slip bushing               | Home Depot   | 544404      | 1        | Each | \$0.96  | \$0.96  |
| 1/4-20 x 1" Button head hex screw      | McMaster.com | 91255A542   | 1        | Pack | \$8.69  | \$8.69  |
| 5 lbs. Potassium Nitrate - Kno3        | Various      | N/A         | 1        | Each | \$10.00 | \$10.00 |
| West Systems 105-A epoxy resin         | McMaster.com | 7480A41     | 1        | Each | \$38.90 | \$38.90 |
| West Systems 205-A fast epoxy hardener | McMaster.com | 7480A42     | 1        | Each | \$19.57 | \$19.57 |
| Vinyl cap with dome top                | McMaster.com | 9343K59     | 1        | Pack | \$6.58  | \$6.58  |
|  |              |             |          |      |         | \$90.88 |

Many McMaster part numbers are for *packages* of bolts or screws. If only one or two pieces are required and can be purchased individually through another supplier, there would be a considerable savings in the overall project cost.

**If purchased by the piece, the cost for this section would be approximately \$11.00**

Some of the parts used in this section are duplicated in other sections.

**ASSEMBLING THE UPPER AND LOWER BODY SECTIONS**

| Part                                | Vendor       | Part Number | Quantity |      | Cost    | Total   |
|-------------------------------------|--------------|-------------|----------|------|---------|---------|
| 1/4" ID 1/2" OD x 1/8" Nylon spacer | McMaster.com | 94639A567   | 1        | Pack | \$7.58  | \$7.58  |
| 1/4" ID 1/2" OD x 3/8" Nylon spacer | McMaster.com | 94639A570   | 1        | Pack | \$8.87  | \$8.87  |
| 1/4-20 x 5/8" Button head hex screw | McMaster.com | 91255A539   | 1        | Pack | \$14.40 | \$14.40 |
| 1/4-20 x 1" Button head hex screw   | McMaster.com | 91255A542   | 1        | Pack | \$8.69  | \$8.69  |
| 1/4" x 1 1/4" Steel fender washer   | McMaster.com | 91090A109   | 1        | Pack | \$5.85  | \$5.85  |
|                                     |              |             |          |      |         | \$45.39 |

Many McMaster part numbers are for *packages* of bolts or screws. If only one or two pieces are required and can be purchased individually through another supplier, there would be a considerable savings in the overall project cost.

**If purchased *by the piece*, the cost for this section would be approximately \$5.00**

Some of the parts used in this section are duplicated in other sections.