

THE COMPETITION MANUAL -1998

List of Components

Cable Tie	11" x 0.14"	Gray Container - Hardware Bag	20	Thomas & Betts Corp.
Cable Tie	8" x 0.09"	Gray Container - Hardware Bag	20	Thomas & Betts Corp.
Cable Tie Mounting Base	Self-Adhesive. Holes For #8 Screws	Gray Container - Hardware Bag	25	Thomas & Betts Corp.
Helical Plastic Wire Wrap	1/4" Ø x 24"	Gray Container - Hardware Bag	1	McMaster-Carr Supply Company
Velcro 1" Hook & Loop Tape (No Adhesive Backing)	18" Lengths	Green Container - Velcro Bag	1	Velcro USA, Inc.
Velcro 1" Hook & Loop Tape (W/ Adhesive backing)	18" Lengths	Green Container - Velcro Bag	1	Velcro USA, Inc.
Velcro 1" One WrapTape	18" Lengths, Red	Green Container - Velcro Bag	1	Velcro USA, Inc.
Velcro 5/8" One WrapTape	60" Lengths, Black	Green Container - Velcro Bag	1	Velcro USA, Inc.
Velcro Sticky Back Coins	5/8" Ø, 15 Sets Per Pack	Green Container - Velcro Bag	15	Velcro USA, Inc.

Field Components

<u>Part Name/Description</u>	<u>Dimensions</u>	<u>Location</u>	<u>Qty/Kit</u>	<u>Product Supplier</u>
Ball	24", Blue	Green Container - Loose	1	Sports Fun

Motors & Pumps

<u>Part Name/Description</u>	<u>Dimensions</u>	<u>Location</u>	<u>Qty/Kit</u>	<u>Product Supplier</u>
Capacitor, Drive Motor Noise Suppression	0.1 µF, 50 V Ceramic Molded Radial	Green Container - Electronics Bag	6	KEMET Electronics Corporation
Drill Gearbox	225 in. lbs Maximum Torque	Green Container - Drill Bag	2	S-B Power Tool
Drill Housing, Left and Right with Shift Lever	T-Handle Style Grip	Green Container - Drill Bag	2	S-B Power Tool
Drill Housing Screws	Pan Head	Green Container - Drill Bag	16	Fastenal Company
Drill Motor	12 Vdc	Green Container - Drill Bag	2	S-B Power Tool
Gear	Use with Window Tape, Window Lift Mechanism	Gray Container - Window Lift Mechanism Bag	2	Delphi Interior and Lighting Systems
Guide Drive	Use with Guide, Channel, Window Tape	Gray Container - Window Lift Mechanism Bag	8	Delphi Interior and Lighting Systems
Guide, Left Hand	Attach to Triangular Mount, Window Lift	Gray Container - Window Lift Mechanism Bag	1	Delphi Interior and Lighting Systems
Guide, Right Hand	Attach to Triangular Mount, Window Lift	Gray Container - Window Lift Mechanism Bag	1	Delphi Interior and Lighting Systems

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Seat Motor	12 Vdc	Gray Container - Loose	2	ITT Automotive
Triangular Mount	White, Window Lift Mechanism	Gray Container - Window Lift Mechanism Bag	2	Delphi Interior and Lighting Systems
Van Door Motor	12 Vdc, 265 in. lbs at 50 Amps	Gray Container - Seat Positioning Unit Bag	2	Delphi Interior and Lighting Systems

Other

Part Name/Description	Dimensions	Location	Qty/Kit	Product Supplier
Carpet Sample	12" x 12", 20 oz., Closed Loop	Gray Container - Loose	1	FIRST
Co-Polymer Gutter Guard	6" x 24"	Gray Container - Loose	1	Home Depot
Folding Table Leg Brace, Left Hand	Heavy Duty Leg Brace	Gray Container - Loose	1	Stanley Hardware
Folding Table Leg Brace, Right Hand	Heavy Duty Leg Brace	Gray Container - Loose	1	Stanley Hardware

Pneumatics

Part Name/Description	Dimensions	Location	Qty/Kit	Product Supplier
Adaptor Fitting For Pressure Switch	1/4" NPT Female to 1/8" Barb, Assembly	Green Container - Pneumatics Bag	1	Numatics, Inc.
Air Cylinder	1-1/16" dia. Bore, Rear Pivot, 4" Stroke	Green Container - Pneumatics Bag	1	SMC Pneumatics, Inc.
Air Cylinder	3/8" dia. Bore, Double Clevis, 6" Stroke	Green Container - Pneumatics Bag	1	SMC Pneumatics, Inc.
Air Filter for the Pneumatic Pump	For the Pneumatic Pump	Green Container - Pneumatics Bag	1	Gast Manufacturing Corp.
Barbed T-Connector	1/8" Ø Barbs	Green Container - Pneumatics Bag	2	Value Plastics, Inc.
Check Valve	1/8" Ø Barbs 75 max. psi	Green Container - Pneumatics Bag	2	Air Logic
Double Solenoid Valve	12 Vdc, 2 Position, 5 Port Base	Green Container - Pneumatics Bag	1	SMC Pneumatics, Inc.
Kent™ Connect Fitting, Barbed Female Adaptor	1/4" Ø	Green Container - Pneumatics Bag	1	Value Plastics, Inc.
Kent™ Connect Fitting, Barbed Female Adaptor	1/8" Barb	Green Container - Pneumatics Bag	6	Value Plastics, Inc.
Kent™ Connect Fitting, Barbed Male Adaptor	1/4" Ø	Green Container - Pneumatics Bag	2	Value Plastics, Inc.
Kent™ Connect Fitting, Flanged Male Plug	For Fittings	Green Container - Pneumatics Bag	1	Value Plastics, Inc.
Kent™ Connect Fitting, Manifold	2 Port	Green Container - Pneumatics Bag	1	Value Plastics, Inc.

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Kent™ Connect Fitting, Open Flow	Female Side to 1/4" Ø PTF	Green Container - Pneumatics Bag	2	Value Plastics, Inc.
Kent™ Connect Fitting, Recessed Male Plug	Use with Manifold	Green Container - Pneumatics Bag	1	Value Plastics, Inc.
Kent™ Connect Fitting, Rotating Barbed Male Adaptor	1/8" Ø	Green Container - Pneumatics Bag	1	Value Plastics, Inc.
Kent™ Connector Fitting, Barbed Male Adaptor	1/8" Ø	Green Container - Pneumatics Bag	7	Value Plastics, Inc.
One Touch Fitting	Bulkhead Union, 1/2-20	Green Container - Pneumatics Bag	1	SMC Pneumatics, Inc.
One Touch Fitting	Male Elbow, 1/8" NPT	Green Container - Pneumatics Bag	3	SMC Pneumatics, Inc.
One Touch Fitting	Male Elbow, 10-32 UNF	Green Container - Pneumatics Bag	8	SMC Pneumatics, Inc.
One Touch Fitting	Straight Union Fitting, 1/8 NPT	Green Container - Pneumatics Bag	3	SMC Pneumatics, Inc.
One Touch Fitting	Straight Union Fitting, 10-32 UNF	Green Container - Pneumatics Bag	8	SMC Pneumatics, Inc.
One Touch Fitting	Union Tee	Green Container - Pneumatics Bag	1	SMC Pneumatics, Inc.
Plug For Valves	M5 X 0.8 Pitch	Green Container - Pneumatics Bag	2	SMC Pneumatics, Inc.
Polyurethane Tubing	3/16" I.D., 5/16" O.D. x 4', Clear	Green Container - Pneumatics Bag	1	Value Plastics, Inc.
Polyurethane Tubing	4mm OD, Blue, 10m Bundle	Green Container - Pneumatics Bag	1	SMC Pneumatics, Inc.
Pressure Switch	1/4" NPT Male Thread	Green Container - Pneumatics Bag	2	Numatics, Inc.
Pump	Diaphragm Pump, 1/8HP, 12VDC, 30psi, 1.3 CFM	Green Container - Loose	1	Gast Manufacturing Corp.
Single Solenoid Valve	12 Vdc, 2 Position, 5 Port Base	Green Container - Pneumatics Bag	1	SMC Pneumatics, Inc.
Vacuum Injector	Light Weight, High Density, Resin Body	Green Container - Pneumatics Bag	1	SMC Pneumatics, Inc.
Vacuum Pad	Suction Cup	Green Container - Pneumatics Bag	1	SMC Pneumatics, Inc.
Volume Chamber	Approximately 1 liter, 1/4" NPTF Ports	Green Container - Loose	1	Numatics, Inc.

Rods & Shafts

Part Name/Description	Dimensions	Location	Qty/Kit	Product Supplier
Aluminum Rod	1/2" Ø x 24"	Gray Container - Tube	2	Cohen Steel Supply Inc.

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Brazing Rod	1/16" Ø x 18"	Gray Container - Tube	6	McMaster-Carr Supply Company
Brazing Rod	1/8" Ø x 18"	Gray Container - Tube	2	McMaster-Carr Supply Company
Delrin (Acetal) Rod	1/4" Ø x 20"	Gray Container - Tube	1	McMaster-Carr Supply Company
Drill Rod	1/2" Ø x 18"	Gray Container - Tube	2	Cohen Steel Supply Inc.
Drill Rod	1/4" Ø x 18"	Gray Container - Tube	2	Cohen Steel Supply Inc.
Drill Rod	3/8" Ø x 18"	Gray Container - Tube	2	Cohen Steel Supply Inc.
Drill Rod	5/16" Ø x 18"	Gray Container - Tube	2	Cohen Steel Supply Inc.
Flexible Motor Shaft	13.5" Long, Fits Seat Motor	Gray Container - Loose	4	Grand Rapids Controls
LDPE Rod	1" Ø x 24"	Gray Container - Tube	1	Plastic Supply Inc.
Lead Screw	18.75" Long	Gray Container - Loose	1	Kerk Motion Products, Inc.
Threaded Rod	1/4" Ø x 24", 20 Pitch Coarse Thread, Alloy	Gray Container - Tube	1	McMaster-Carr Supply Company

Sheets & Boards

Part Name/Description	Dimensions	Location	Qty/Kit	Product Supplier
Aluminum Plate	1/4" x 3" x 12"	Gray Container - Loose	1	Cohen Steel Supply Inc.
HDPE Block	1" x 2" x 6"	Gray Container - Loose	1	McMaster-Carr Supply Company
Polycarbonate Sheet	1/16" x 12" x 12"	Gray Container - Loose	1	Plastic Supply Inc.
Rubber Sheet, Black	3/32" x 6" x 9"	Gray Container - Loose	1	McMaster-Carr Supply Company
Rubber Sheet, Red	1/16" x 6" x 18"	Gray Container - Loose	1	McMaster-Carr Supply Company

Small Parts

Part Name/Description	Dimensions	Location	Qty/Kit	Product Supplier
Channel For Tape Drive	30" Long	Gray Container - Loose	4	Delphi Interior and Lighting Systems
Double Magnet Cabinet Catch		Gray Container - Hardware Bag	1	Stanley Hardware
Flange Nut for Seat Positioning Unit	1/16 x 1.0 Pitch	Gray Container - Seat Positioning Unit Bag	8	Delphi Interior and Lighting Systems

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Flat Washers	1/4" I.D., 7/8" O.D.	Gray Container - Hardware Bag	4	Fastenal Company
Flexible Shaft Coupling	Black	Gray Container - Hardware Bag	2	DEKA
Folding Table Brace	9-1/2" Brass plated	Gray Container - Hardware Bag	1	Stanley Hardware
Gate Latch	Steel/Zinc Plated	Gray Container - Hardware Bag	1	Stanley Hardware
Hex Head Bolt for Seat Positioning Unit	M6 x 1.0 Pitch x 30mm	Gray Container - Seat Positioning Unit Bag	4	Delphi Interior and Lighting Systems
Hex Nuts	1/4" I.D., 20 Pitch Coarse Thread	Gray Container - Hardware Bag	8	Fastenal Company
Horiz. Act. for Seat Positioning Unit, Left Hand	Natural Color	Gray Container - Seat Positioning Unit Bag	1	Delphi Interior and Lighting Systems
Horiz. Act. for Seat Positioning Unit, Right Hand	Black and Natural Color	Gray Container - Seat Positioning Unit Bag	1	Delphi Interior and Lighting Systems
Lower Channel for Seat Positioning Unit	2.25" x 17" Channel	Gray Container - Loose	2	Delphi Interior and Lighting Systems
Magnet	1/4-20 Plastic Thread	Gray Container - Hardware Bag	4	Honeywell - Microswitch Division
Pivot	5/16" Ø	Gray Container - Hardware Bag	2	Stanley Hardware
Roller Guide	7/8" Ø x 1/4" Wheel	Gray Container - Hardware Bag	2	Stanley Hardware
Screen Door Catch	Zinc-Plated	Gray Container - Hardware Bag	1	Stanley Hardware
Seat Recliner Actuator Assembly, Left Hand	9" Tube with Actuator	Gray Container - Loose	1	Excellence Manufacturing, Inc.
Seat Recliner Actuator Assembly, Right Hand	9" Tube with Actuator	Gray Container - Loose	1	Excellence Manufacturing, Inc.
Trantorque Coupling	3/8" I.D., 3/4" O.D.	Gray Container - Hardware Bag	2	Small Parts, Inc.
Upper Channel for Seat Positioning Unit	1.3125" x 9.875" Channel with Gear Rack	Gray Container - Seat Positioning Unit Bag	2	Delphi Interior and Lighting Systems
Wheelchair Wheel	6" Ø, 5/16" I.D. Bearings, 1-1/2" Wide Flange	Gray Container - Loose	2	Skyway Recreation Products
Wheelchair Wheel	8" Ø, 5/16" I.D. Bearings, 1-1/2" Wide Flange	Gray Container - Loose	2	Skyway Recreation Products
Window Lift Bracket, Left Hand	Color Natural	Gray Container - Window Lift Mechanism Bag	1	Delphi Interior and Lighting Systems
Window Lift Bracket, Right Hand	Color Natural	Gray Container - Window Lift Mechanism Bag	1	Delphi Interior and Lighting Systems

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Window Lift Mechanism Tape	16' Length	Gray Container - Window Lift Mechanism Bag	1	Dymetrol Company, Inc.
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Springs

<u>Part Name/Description</u>	<u>Dimensions</u>	<u>Location</u>	<u>Qty/Kit</u>	<u>Product Supplier</u>
Compression Spring	0.600" O.D. x 3" Long x 0.059" Wire Diameter	Gray Container - Hardware Bag	2	Associated Spring Raymond
Constant Force Spring, Medium	0.85" I.D.	Gray Container - Hardware Bag	2	Associated Spring Raymond
Constant Force Spring, Small	0.56" I.D.	Gray Container - Hardware Bag	2	Associated Spring Raymond
Latex Tubing	1/4" I.D., 3/8" O.D., 5'	Green Container - Loose	1	Gulf South Medical Supply
Small Extension Spring	0.500" O.D. x 2.875-3.000" Long x	Gray Container - Hardware Bag	2	Associated Spring Raymond
Snugger	Spring With Plastic Guide	Gray Container - Hardware Bag	2	Stanley Hardware
Spring Loaded Hinge	4" x 4", 30 in/lb Maximum	Gray Container - Hardware Bag	2	Stanley Hardware
Torsion Spring, Left Hand	180 Degrees, 500" Dia, 0.063" Wire Diameter	Gray Container - Hardware Bag	1	Associated Spring Raymond
Torsion Spring, Right Hand	180 Degrees, 500" Dia, 0.063" Wire Diameter	Gray Container - Hardware Bag	1	Associated Spring Raymond

Sprockets & Pulleys

<u>Part Name/Description</u>	<u>Dimensions</u>	<u>Location</u>	<u>Qty/Kit</u>	<u>Product Supplier</u>
Pulley With Fixed Eye	1" Ø, For 5.16" Rope	Gray Container - Hardware Bag	3	Stanley Hardware

Tool

<u>Part Name/Description</u>	<u>Dimensions</u>	<u>Location</u>	<u>Qty/Kit</u>	<u>Product Supplier</u>
Crimping Tool for Spade Connectors	Orange Color	Green Container - Electronics Bag	1	Thomas & Betts Corp.

3.3 Additional Hardware List

The parts listed on this page may be purchased from Small Parts, Inc. or other sources, and are subject to the limitations mentioned in Appendix A paragraphs K1 through K19.

Control System

Heat Shrink Tubing	Any Amount, Any Ø
Speed Controller	Tekin Rebel (up to 4)

Fasteners

Hose Clamp	Up to 10 of Any Size
Rubber Band, Large	3-1/2" x 1/4" Wide, Up to 5
Rubber Band, Small	3-1/2" x 1/8" Wide, Up to 5

Other

Fiberglass Matting	1 Sheet 4' x 8' Up to 1/8"
Resin + Hardner	As Needed for Fiberglass

Rods & Shafts

Closet Rod	1 Rod 1 1/4" Ø x 6'
Copper Water Pipe	1 Length 1/2" Ø x 10'
Electrical Conduit Pipe (EMT)	1 Length 1" Ø x 10'
Electrical Conduit Pipe (EMT)	1 Length 1/2" Ø x 10'
Electrical Conduit Pipe (EMT)	1 Length 3/4" Ø x 10'
Flexible Conduit (ENT)	1 Length 1/2" Ø x 10', PVC
PVC Pipe	1 Length 1" ID x 10',
PVC Pipe	1 Length 1-1/2" ID x 10',
PVC Pipe	1 Length 1/2" ID x 10',
PVC Pipe	1 Length 3/4" ID x 10',

Rope, Belts, & Chain

Chain/Belt	Up to 12' Total, Any Combo
Nylon Braided Rope	1 Length 5/16"Ø x 20'

Sheets & Boards

1/2" Plywood OR 7/16" Chipboard	1 Sheet 4' x 4'
1/4" Plywood OR 1/2" Plywood OR 7/16"	1 Sheet 4' x 4'
Aluminum Plate	1 Piece 1/4" x 1' x 2'
Aluminum Plate	1 Plate 1/32" x 4' x 4'
Pine Board	1 Board 3/4" x 3-1/2" x 10'
Polycarbonate Sheet	1 Sheet 1/16" x 4' x 4'
Polycarbonate Sheet	1 Sheet 1/4" x 4' x 4'
Polycarbonate Sheet	1 Sheet 3/8" x 2' x 4'

Sprockets & Pulleys

Sprockets and Pulleys	Up to 4 Total, Any
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