



Illustrated Catalog of Components



Engineering Tools not Toys

The **GEARS - IDS™** Invention and Design System materials and components are the same materials and components used by practicing engineers.

These structural metal parts are machined from Stainless Steel and Aluminum alloys. The Motors and power transmission components are industry standard equipment, not toy parts. The pneumatic assemblies are the same assemblies that power automated manufacturing systems worldwide.

The **GEARS - IDS™** Invention and Design System gives tomorrows technologists and engineers the best engineering components available today.

DESIGN - BUILD - TEST - PLAY

The **GEARS-IDS™** Invention and Design System gives young designers and engineers the tools they need to turn ideas into working machines, easily and quickly.

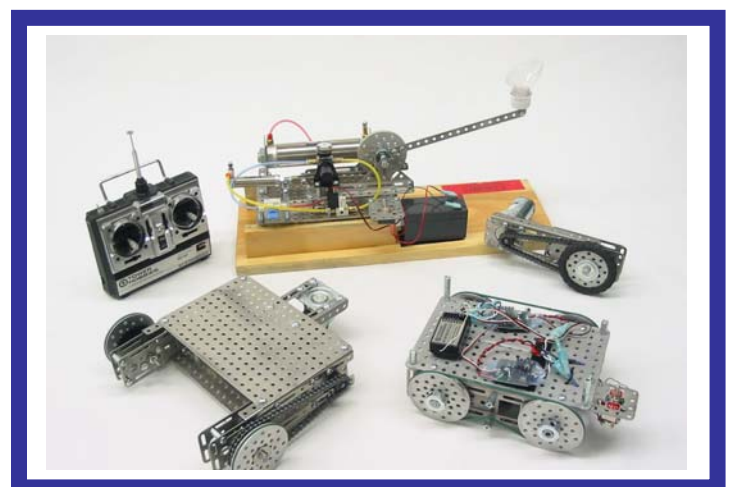
Using basic tools and real components, young designers and engineers can create sophisticated machines capable of playing challenging games or performing complex tasks.

The **GEARS-IDS™** Invention and Design System components are illustrated and explained in this catalog. Each of the parts and assemblies are organized into these 5 groups.

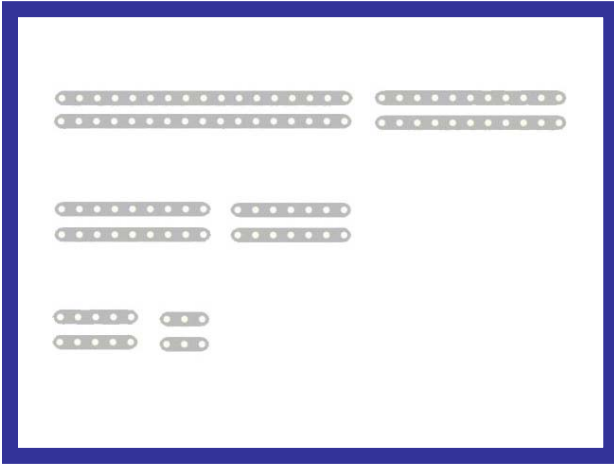
Heading

Part Number

- **Structural Components** GIDS-SC-xxxxx
- **Mechanical Components** GIDS-MC-xxxxx
- **Pneumatic Components** GIDS-PC-xxxxx
- **Electronic Components** GIDS-EC-xxxxx
- **Accessories** GIDS-XC-xxxxx

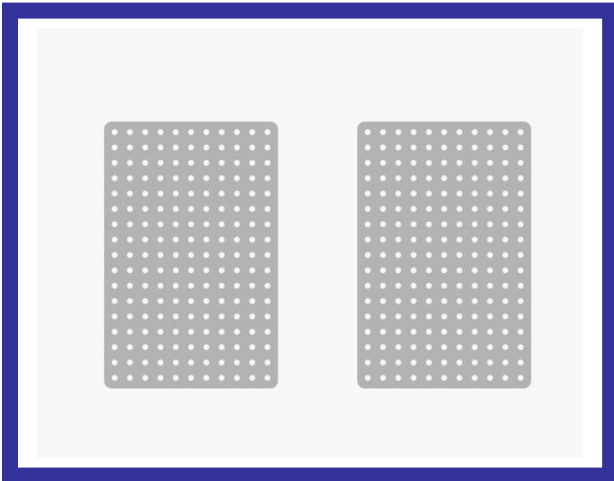


Structural Components



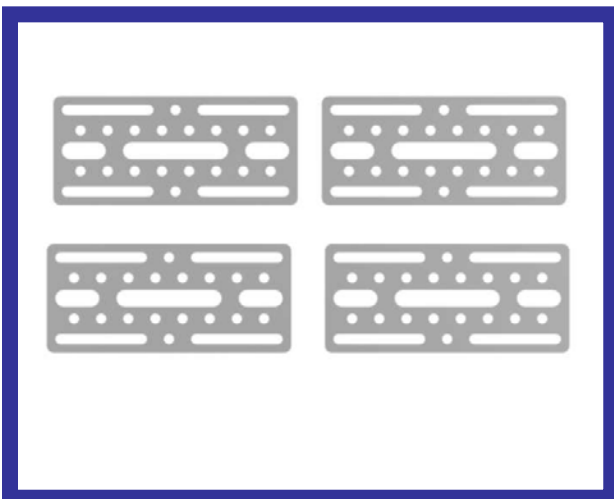
Flat Bar Set 12pcs. GIDS -SC-10001

12 Pieces of #304 stainless steel, 0.060" thick.. These assorted flat bars in 3-5-7-9-11-17 hole lengths are useful for struts, spars, booms and other rigid assemblies. They are also useful for adapting "Found" materials to your mechanical designs.



Flat Plate Set, 2pcs. GIDS -SC-10002

The **GEARS - IDS™** component are easy to organize and mount on these 0.090" thick panels. Coupled with the 7 and 13 hole rigid angles, these aluminum breadboards are tough enough for the high powered after-market components that young engineers like to add to their designs.

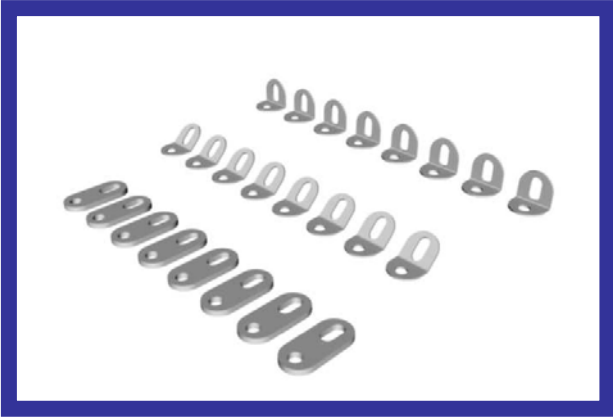


Shaft Plate Set 4pcs. GIDS -SC-10003

These Shaft Plates have slots that can be used in conjunction with the Bushing Brackets to create a wide variety of geared transmissions.

These plates can also be used as structural and adjustable mounting plates.

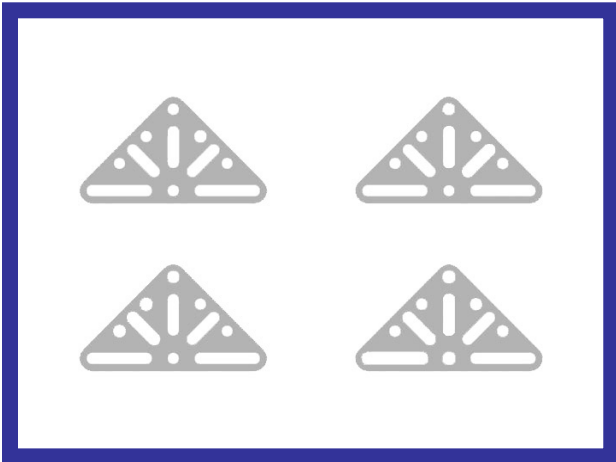
Structural Components



Fish Plate Set 24pcs. GIDS -SC-10004

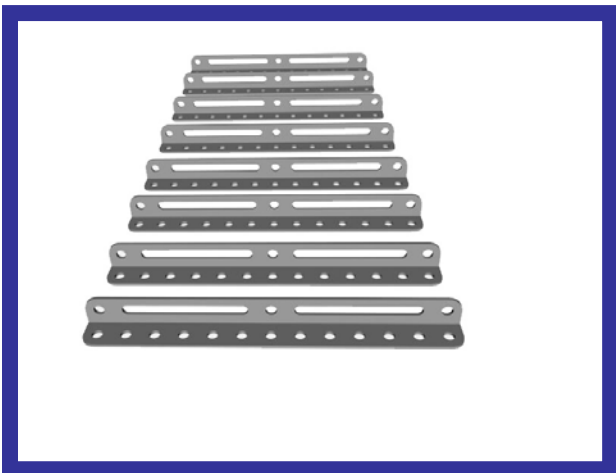
These heavy duty brackets are useful for attaching flat stock and for integrating subassemblies and other components into your mechanical designs.

The fishplates are configured for mounting components at angles of 180, 90 and 45 degrees.



Sine Triangle Set 4pcs. GIDS -SC-10005

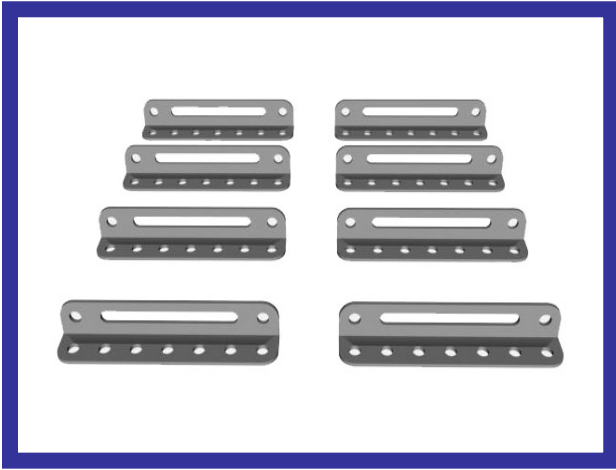
These versatile structural elements can be coupled with construction components found in the kit, in the home or in a hardware store. The Sine Triangles will help you engineer the angled mechanical configuration you need to solve your design objective.



13 Hole Angle Set 8pcs. GIDS -SC-10006

Coupled with the **GEARS - IDS™** bearing plates, these slotted angle components provide the flexibility and range of adjustment necessary to accurately position the center to center distances of sprockets and gears. They are particularly useful as framing members for rigid robot chassis.

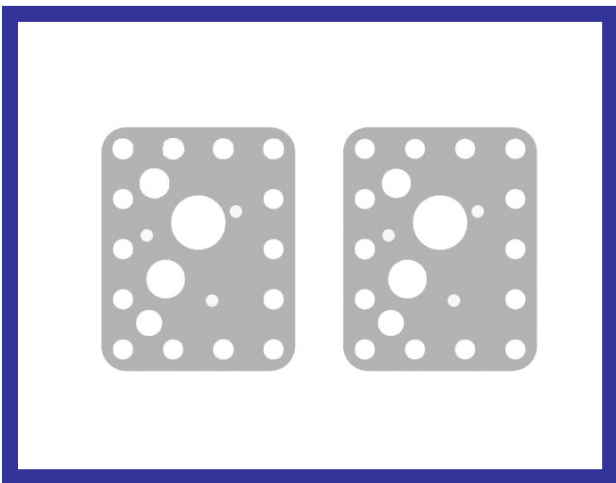
Structural Components



7 Hole Angle Set 8pcs. GIDS -SC-10007

These function just like the larger 13 hole angles, but they are useful where space is tight or extra reinforcement is required.

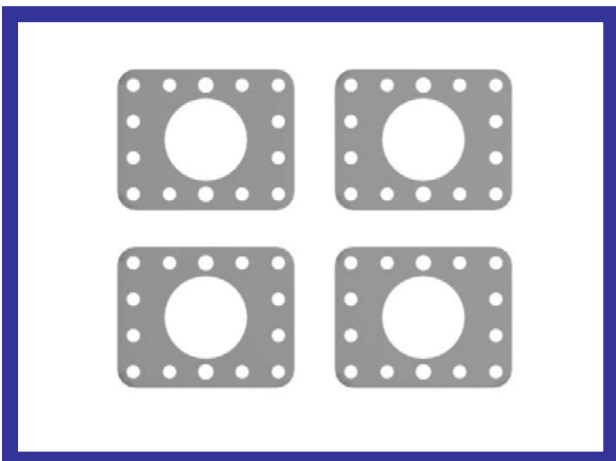
The 7 hole angles are particularly useful for mounting servo brackets and motors.



M13 Motor Mount Set 2pc. GIDS -SC-10008

The three small holes in the center form an industry standard bolt hole pattern for small gear head motors produced by several manufacturers.

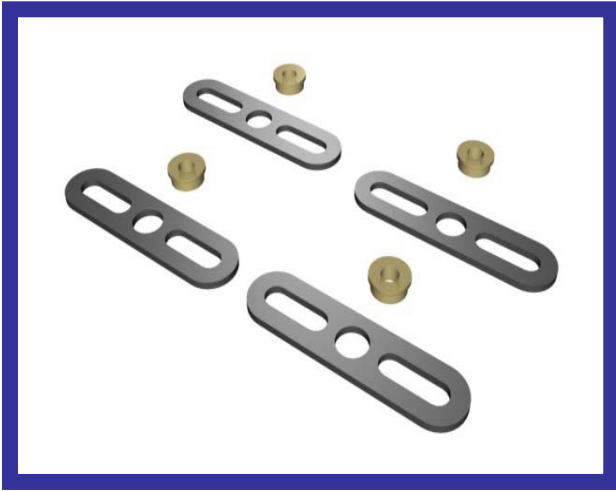
These versatile mounting brackets can also support 1/4", 3/8" and 1/2" shafts.



M15 Motor Mount 4pcs. GIDS - SC-10009

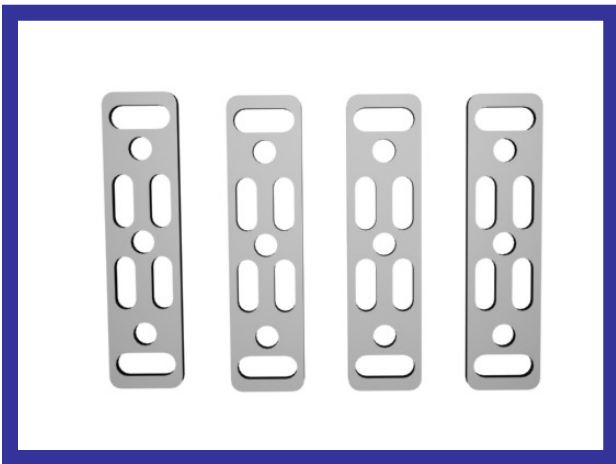
Two perimeter holes in addition to the large center hole, form an industry standard bolt pattern for larger gear head motors produced by several manufacturers. These mounting brackets are also used to mount the pneumatic reservoir.

Structural Components



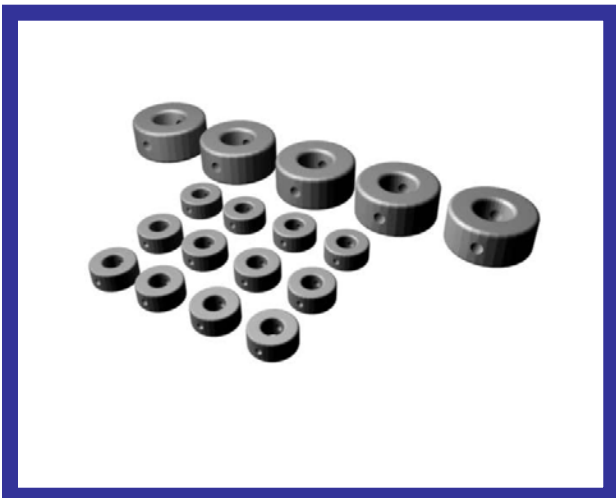
Bushing Bracket Set 4pcs. GIDS -SC-10010

These 0.060" Stainless Steel slotted brackets are designed with press fit, 3/16" ID, bronze bushings. Bronze bushings provide accurate and robust constraints for transmission shafts, axles and powered drive train shafts.



Servo Brackets 4 pcs. GIDS -SC-10017

Custom brackets that make it possible to mount any size servo to your mechanical inventions. The two directional slots make these brackets useful for a variety of design applications.



Shaft Collar Set 17 pcs. GIDS -SC-10012

5 pieces 1/2" ID collars with set screw. The 1/2" shaft collars are used to lock wheels, sprockets and other assemblies to the Hex Adapters pictured below.

12 pieces 3/16" ID collars with set screw. The 3/16" shaft collars are used to constrain axles and other rotating parts.

Structural Components

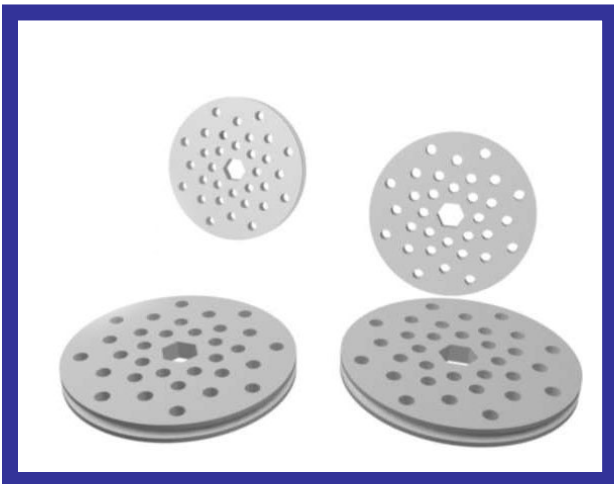


Hex Adapter Set 6pcs. GIDS -SC-10013

4 pieces with 3/16" bore are used to fit sprockets and wheels to the 3/16" axles and shafts

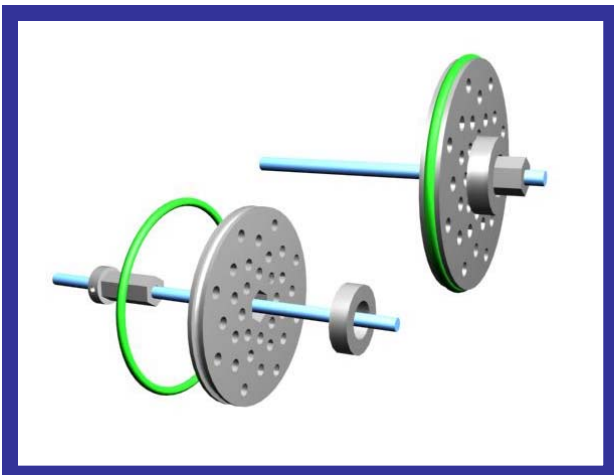
2 pieces with 1/4" bore fit the IM15 motor shafts.

These 304 Stainless Steel adapters are part of the wheel assembly system shown in the illustration below.



3" Wheel Set 4pcs. GIDS -SC-10014

The 3" diameter wheels are machined from 1/4", 6061 T-6 Aluminum. They can be fitted with high traction rubber tires or polycord treads (included). They can even be assembled as paired pulleys with polycord tank style tracks. The complete wheel assembly is illustrated below.

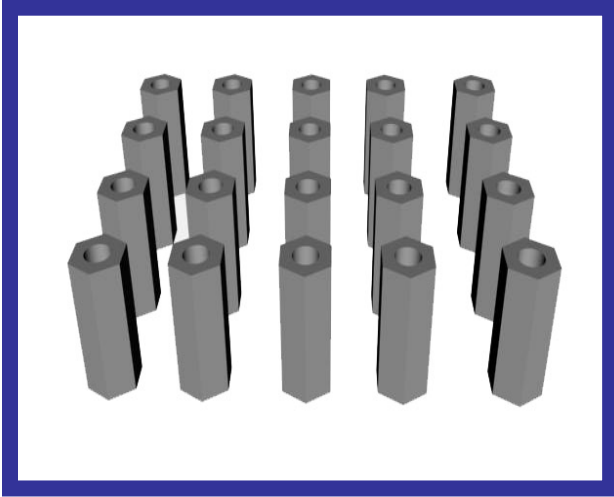


Wheel Assembly System Illustrated

This illustration shows the integration of the five components described above.

3/16" Axle
Hex Adapter
3" Wheel
1/2" Shaft Collar
Poly-cord Belting

Structural Components



Standoff Set 25pcs. GIDS -SC-10015

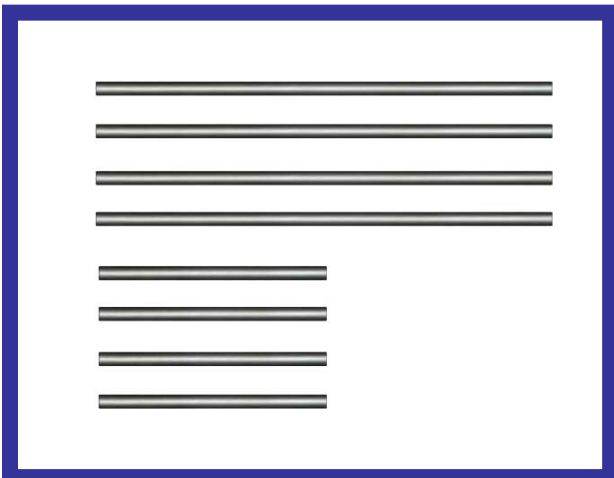
These threaded standoffs are used to separate components such as bearing plates and flat plates, or for adding rigidity and height to machine designs.



Hardware Set. GIDS -SC-10016

More than 450 nuts, bolts and washers are included in the kit. The majority of components are assembled with #10-24 machine screws, nuts, lock washers and flat washers.

Note: The motors are attached with #10-32 machine screws.

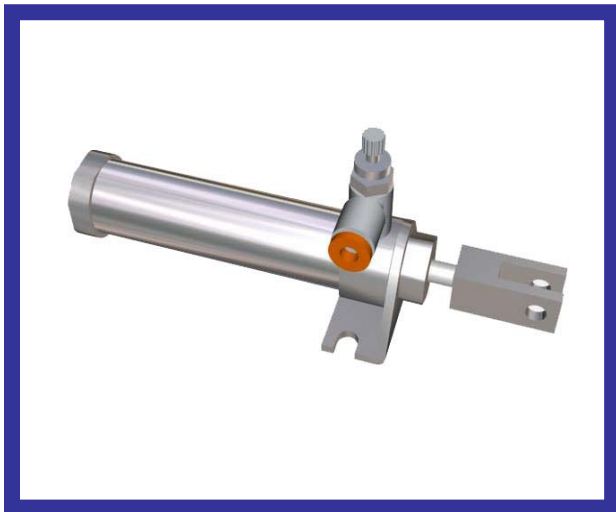


3/16" Axle Set 8pcs. GIDS -SC-10027

2 Pieces 8" x 3/16"
2 pieces 4" x 3/16"
4 pieces 1.25" x 3/16"
4 pieces 2.5" x 3/16"

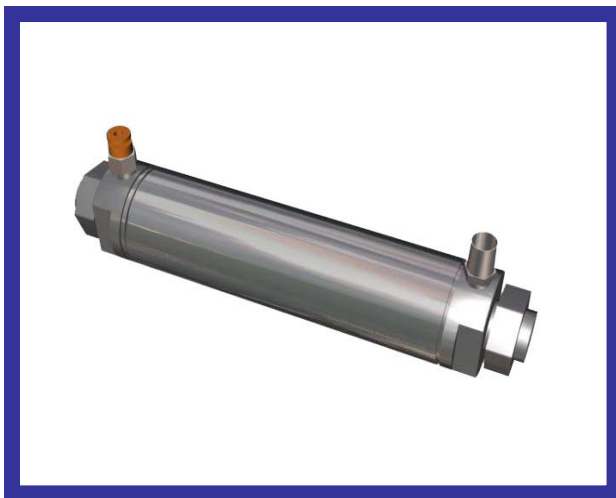
Note: These precision stainless steel axles can be easily cut to any required size using a Hack Saw and a Vice.

Pneumatic Components



Pneumatic Cylinder 1pc. GIDS - PC-10001

This 1" stroke cylinder can produce forces in excess of 20 lbf at rated pressure. The cylinder includes 1 flow valve, clevis and custom mounting bracket. (pictured)



Storage Tank 1pc. GIDS - PC-10002

This 6" reservoir can store enough air to fire the pneumatic cylinder dozens of times. Tank assembly includes a 4mm one touch valve and a Schrader one way fill valve.

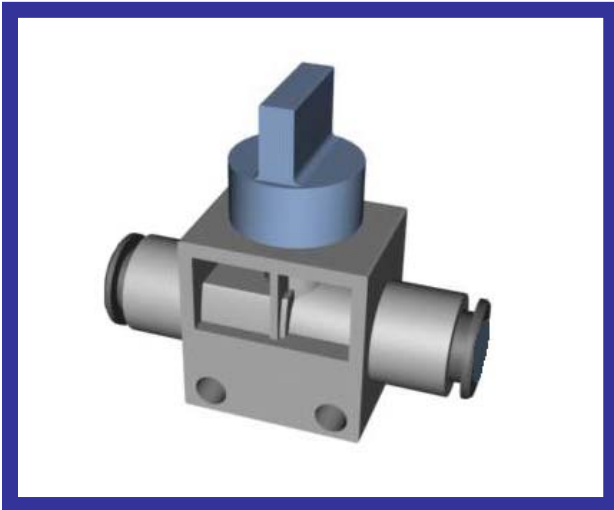


Pneumatic Regulator 1pc. GIDS -PC-10003

This regulator is adjustable from 0-145 psi. and offers a built in overpressure relief system for enhanced safety and protection.

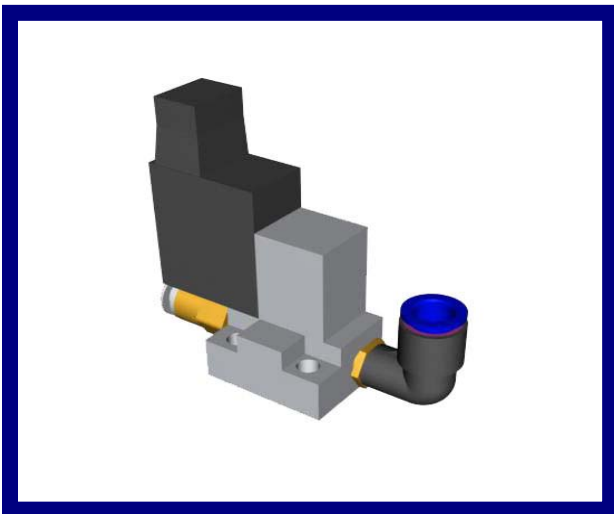
The regulator includes 2, 4mm one touch fittings, a pressure gauge and a mounting bracket.

Pneumatic Components



On/Off Purge Valve 1pc. GIDS - PC-10004

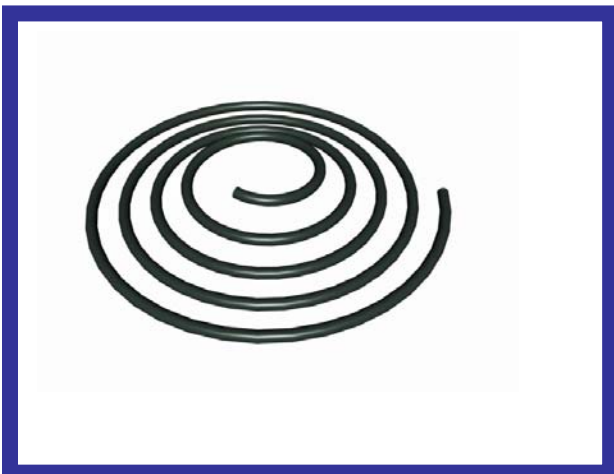
In addition to hand operated on/off control, this valve offers an automatic safety feature that purges downstream pressure each time the valve is closed.



Solenoid Valve 1pc. GIDS - PC-10006

This 3 way valve allows for electronic actuation of pneumatic circuits and components. The valve operates on 12 volts and can be triggered remotely using either RC Radio or microprocessors control in conjunction with the **GEARS - IDS™** valve controller.

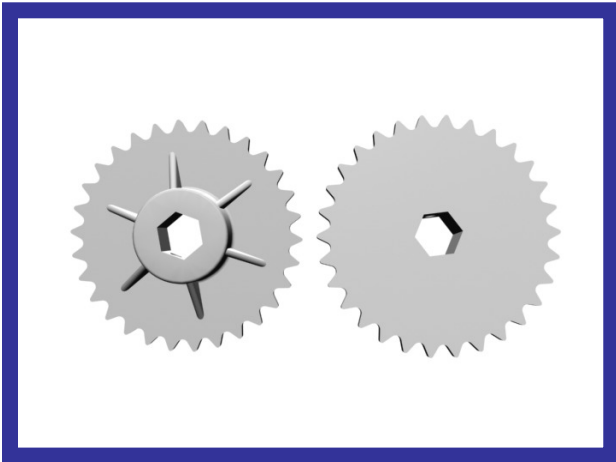
Electronic valve controller sold separately.



4 MM tubing GIDS - PC-10007

Plastic, pressure rated tubing designed for use with SMC pneumatic components.

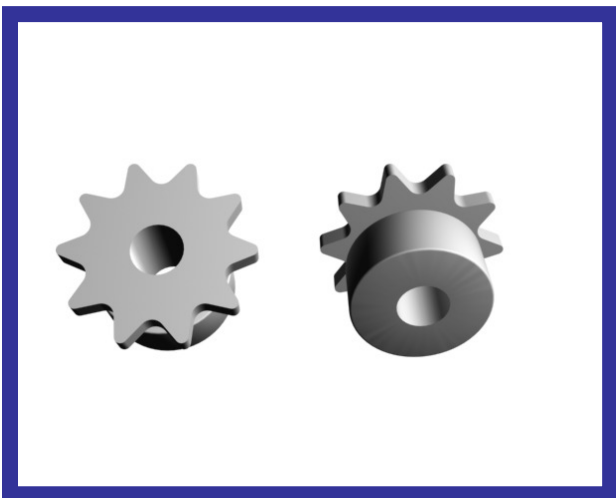
Mechanical Components



30 Tooth Sprockets 2pcs. GIDS - MC-10001

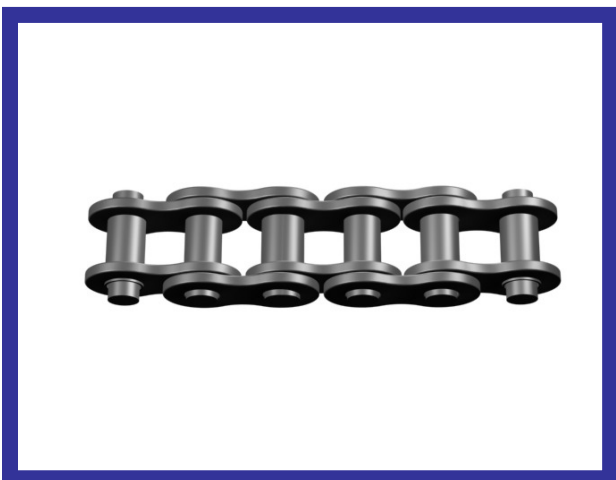
Tough , molded sprockets of nylon/fiberglass reinforced plastic, with hexagonal bore to accommodate rapid attachment and removal from the **GEARS - IDS™** hex adapter shaft.

#10-32 set screw included. Compatible with standard #25 pitch steel and plastic chain.



10 Tooth Sprockets 2pcs. GIDS - MC-10002

Tough , molded sprockets of nylon/fiberglass reinforced plastic attach to the gear head motor shafts with #10-32 set screws.



#25 Pitch Chain 4ft. GIDS - MC-10003

Nylatron plastic chain. 65 lbs test strength. Separated and snapped together using a jewelers flathead screwdriver and a pair of needle nose pliers.

Mechanical Components



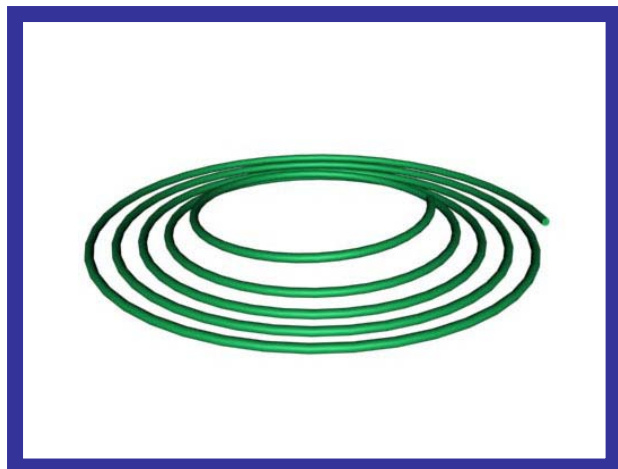
3" Rubber Tires 4pcs. GIDS - MC-10004

3" Traction Compound rubber tires designed to slip snugly over the **GEARS - IDS™** 3" aluminum wheels pictured above. These tires provide maximum traction and design flexibility



2" Swivel Caster 1pcs. GIDS - MC-10005

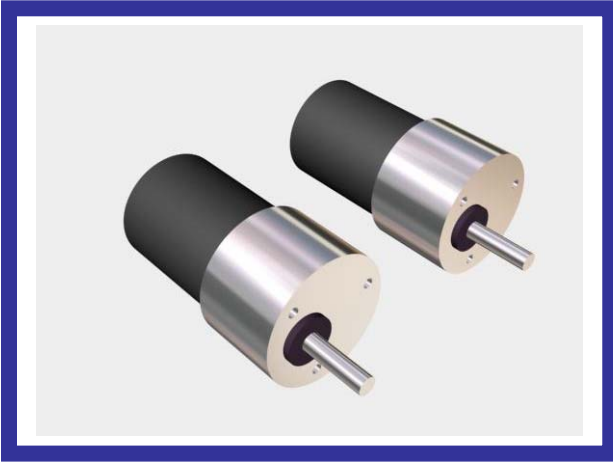
2" diameter wheels mounted to ball bearing swivel plates. These rugged casters can support 75 lbs. each and provide two wheeled robots with the stability and maneuverability needed to play the most demanding games. Casters mate to the slotted angle (GIDS-SC-10006) pieces in the kit.



1/16" Polycord GIDS -MC-10006

Make O-ring tires, pulley belting and tracks for your robot or other mechanical creations. Simply cut the material to the required size, melt both ends simultaneously and while they are melted, press both ends together and hold until solid (about a minute). Trim the excess with a razor knife and you have a joint that is nearly as strong as the parent material.

Electric Components



2" Gear Head Motors 2pcs. GIDS- IM15

500RPM @12V No Load

72 continuous oz. in. of torque at 175 RPM @ 2 amps. (Gear head shaft speed)

The **GEARS - IDS™** Electronic Speed Controllers are specifically designed for use with these motors. This means your not paying for unused capacity!



12 Volt Battery Charger GIDS-EC-10006BC

With alligator clips and leads for fast, easy and flexible connection to GEARS-IDS SLA Batteries.



12V, 1.2 Amp Hour SLA Battery GIDS-EC-10006

Every **GEARS - IDS™** Invention and Design System kit includes an easily maintained SLA battery and wall mount charger.

Miscellaneous Components



20" Storage Box **GIDS- MC-90018**

Large heavy-duty storage case with dual latches, comfort grip plastic handle and inside tote tray.

This rugged tote box is particularly useful for difficult storage problems in crowded classrooms and makes fast work of set up and tear down between classes.