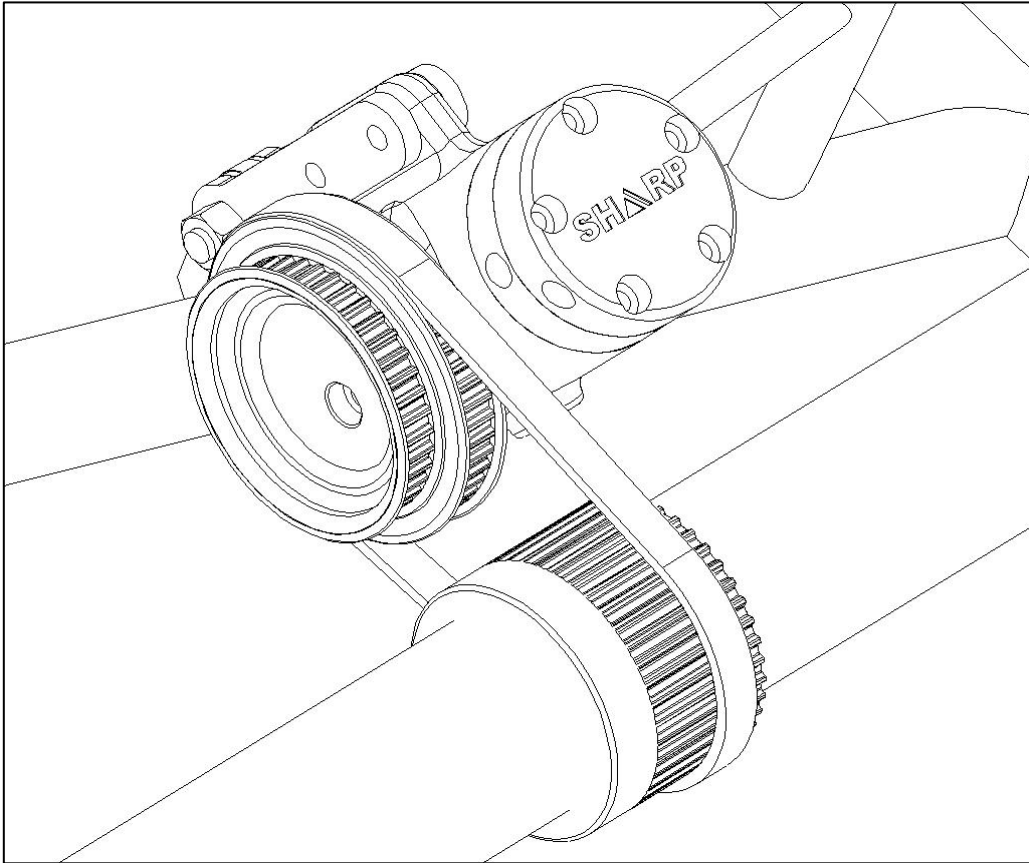


SHARP *Shifter*



Service Manual – Kart (TBD Compressor)

Important Note

Sharp Shifter is a pneumatic gear-changing device specifically designed for *Shifter Karts*. Like all high performance racing products it requires correct installation to ensure safe and reliable operation.

To ensure correct installation and operation it is important that the entire contents of this Service Manual are read and understood. Should additional information be required, contact Sharp Shifter Ltd on:

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Description

The Sharp Shifter comprises of four basic components.

Compressor - (Including the axle pulley, tooth belt and air tank). This uses the axle rotation to compress air to a working pressure of 85 – 140 psi (6 – 10 bar). The compressor is manufactured from fibre reinforced Nylon, with a hardened steel sleeve. The reed valves are carbon fibre. The compressor is driven via a tooth belt from a polymer pulley attached to the back axle. The air tank incorporates a “Pop Off Valve” that is factory set to limit the air pressure to 80psi.

Steering Wheel Button holder – This unit mounts directly to the Steering Wheel, it has both the up and down change buttons on it. On the electrically controlled system the power supply unit is mounted to the back of the Button Holder Bracket. To replace the 9 volt batteries, unscrew the two M3 C’Sink screws from the front of the Button holder Bracket. (using a 2mm Allen Key.) An additional option with the Electric option is a Ignition interrupt unit (IIU) The function of this is to kill the engine ignition when changing up gears. This has a time rang of 0.04 seconds.

Actuator – The Actuator connects to the engine gear lever via the gear change push rod. It utilises the power of compressed air to quickly and positively change gear. It is machined from aluminium and has a hardened steel piston head. Control of the actuator is either using pneumatic valves or electric valves.

Actuator mounting bracket – The actuator bracket is bolted to the side of the engine using the engine and engine to chassis mounts.

Installation

Steering wheel buttons - These come with a bracket that will mount onto a vertical spoke in the steering wheel. Some modification of this may be required to suit the driver's preferred button position.

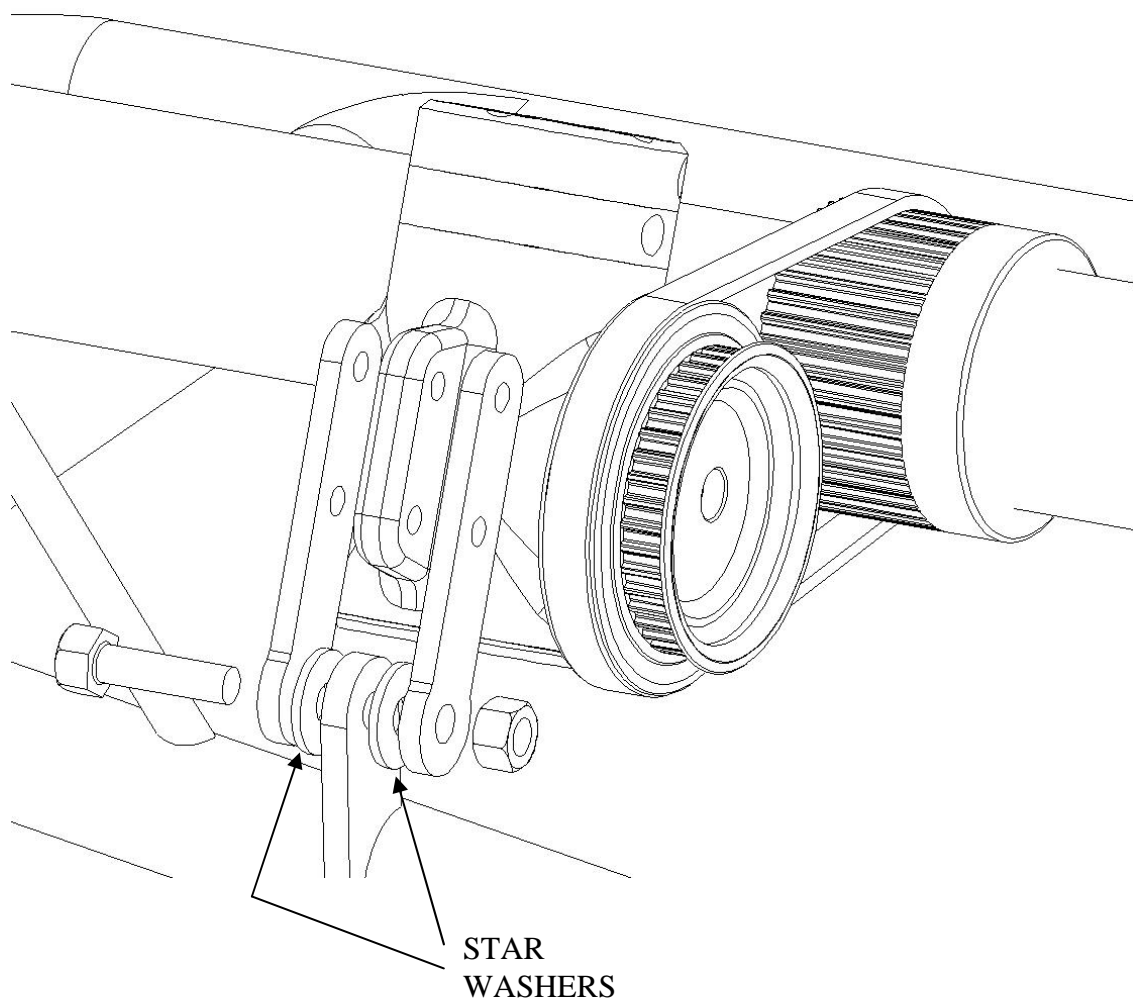
Air Tank - Care should be taken when mounting the Air Tank, as it must not be subjected to impact loads. It is suggested that the Air Tank is either mounted on the floor tray or on the back of the driver's seat.

Compressor - Correct mounting of the Compressor is essential to ensure correct operation. There are many positions that the compressor can be mounted in, depending on the Kart Chassis Design. **The compressor is designed to rotate in either direction.**

The compressor requires 20/25ml of oil via the air breather elbow

The compressor must be fixed tightly using the star washers supplied. Failure to do this may cause the compressor to move in operation. This could cause the tooth belt to come off.

Refer to the following drawing.



Actuator – The actuator is mounted to the engine via a specially designed actuator to engine mounting bracket.

Attach the M8 cap screw to the underside of the Actuator.

Note

Do not over tighten the cap screw from actuator mount to actuator as some movement is required to allow the actuator to move in an arc and have some sideways movement.

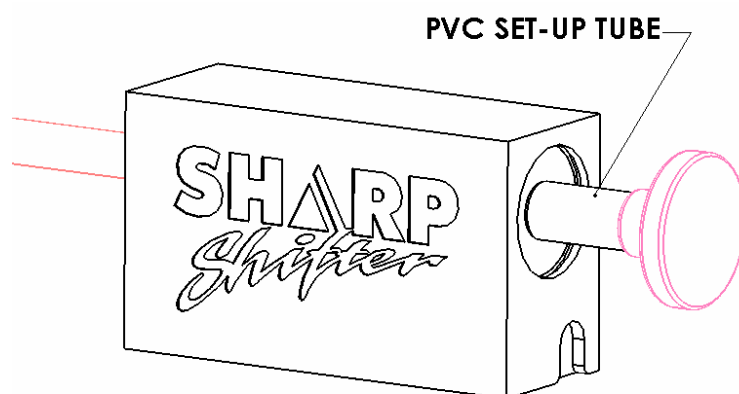
The Actuator rod is connected to the kart's gear change push rod by way of an external 10mm metric thread. The gear change push rod may need shortening to position the Actuator correctly.

Correct positioning of the Actuator is vital to ensure that the Sharp Shifter operates correctly. The actuator is factory supplied with a PVC set-up tube fitted to the knob end rod. This indicates the central position of the Actuator.

To position the Actuator correctly, connect it to the engine gear lever via the push rod.

With the set-up tube in position and the gear lever in its rest position, clamp the Actuator to the chassis. Once clamped, remove the set up tube. Do not discard the set-up tube as this process will need to be repeated every time the engine position is changed (when changing gearing or chain adjustments).

Refer the following drawing.



Electrical Wiring

The Power supply is pre wired with 4 output wires. These have plugs connected to them. The plugs are identified with tags (U & D) The up chance wires have an additional white plug and socket approximately 4 inches from the actuator end of the loom. This is only required for the optional ignition interrupt device if required.

Battery connection - The Power supply requires one 9-volt battery to power the system. The battery should be replaced every 3rd race meeting.

WARNING:

Flat batteries will cause the system to fail resulting in possible serious or fatal injuries and/or property damage.

Maintenance

At the start and end of every race day:

Remove the air cleaner from the compressor and place three small drops of light oil into the inlet port, refit the air cleaner and rotate the rear axle a few times. Check the compressor belt tension.

Every third race meeting:

Replace the 9-volt battery. To replace the battery, unscrew the two M3 screws from the front of the button bracket & remove the power supply cover from the back of the bracket. Replace the Battery, and then replace the power supply cover. Remove the compressor and check or replace the crankcase oil. The crankcase requires 20mls of standard motor oil.

Specifications

Power Supply

Batteries 9-volt rectangular type ANSI-1604

IIU – Ignition Interrupt Unit (optional item not legal in some classes)

Ignition kill time 0.04 seconds
Ignition kill current rating 5.0 amp @ 250volt

Air Tank

Body Aluminium
End Caps Glass fibre reinforced nylon
Tank Capacity 228cm³ (13.9in³)
Pop off Valve pressure 6 Bar (80psi)

Compressor

Bore and Stroke 28mm diameter (1.1") x 13mm (0.5")
Capacity 8cm³ (0.5in³)

Actuator

Bore 25mm diameter (0.635")
Stroke 4mm (0.158")
Push force at 7 bar (100psi) 34.36 kgf (75.76lb)
Set-up tube length 27mm

Air-line

Compressor to Air Tank ¼ inch Nylon
Air tank to Actuator 5/16 inch Nylon

Trouble shooting chart

Not changing gear both up and down	<ul style="list-style-type: none">- Low or no air pressure- No Battery or Flat Battery- Power Supply not connected- Faulty wiring
Changing one way only either up or down	<ul style="list-style-type: none">- Actuator not in the correct position- Actuator Valve not connected- Actuator valve faulty- Steering wheel button either not connected or faulty
Not changing up gear at full throttle	<ul style="list-style-type: none">- The ignition kill function not operating- The ignition kill time set too short.- Battery becoming flat.
Low air pressure	<ul style="list-style-type: none">- Compressor not set up correctly- Tooth belt too loose- Worn compressor piston seal- Leak in the air system- Faulty compressor reed valve

Liability

The Sharp Shifter is specifically designed for motorised kart racing.

The purchaser of this product agrees that under no circumstances will Sharp Concepts or its agents, whether based on contract, negligence, strict liability, or otherwise be liable for any special, incidental, consequential, or exemplary damages associated with the operation of this product.

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