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Penguin / Beaver Parts and Service Tips

Penguin / Beaver Parts Tips

I have recently posted several videos on Youtube ranging from a walk-around of a Penguin to taking a Penguin engine apart. I will add to these as I make progress on two engines I am working on, plus other Penguin and Beaver related projects. A Google search for "Penguin ATV Clayton Cruiser" should find at least one and you should be able to click on my username to see the others.

Last updated 12 August 2016 - I have listed a few part numbers for replacement parts. These numbers were found either on original parts, or on the packaging for original parts. I have pictures of some of the items listed, click on the highlighted text to see them.

This list is intended as a guide to help anyone who is restoring a Penguin or Beaver find replacement parts. I will mention any differences between a part listed and the original item. There may be other sources besides those listed here, if you have any information that could be added please E-Mail me. Any tips I suggest here originate from damage I have seen done to machines I have repaired.

Rear Tires - The original rear tires on the model "A" Penguin were 16" x 12" x 6" turf tread Goodyear Terra Tires. The "B" and "D" models used 16" x 15" x 6" Goodyear Terra Tread Terra Tires. The Beavers used 16" x 14.5" x 6" Goodyear Terra Tread Terra Tires, they may also have used the 16" x 15" x 6" size. I do not know of any sources for tires in these sizes. They were also used on other machines that were built around the same time as the Penguin and Beaver, the rims used on these other machines will not easily fit a Penguin or Beaver . The Sperry Rand Tri Cart used the 16" x 15" x 6" size. I have installed 18" x 8.5" x 8" tubes in these tires so they would at least hold air. This tube is a common lawn tractor size.

Front Tires - Both Goodyear Rib Tread All-Weather 2-ply and Firestone Transport Speed King 4-ply tires were used. They are 4.8 x 4 x 8. The Goodyear tires were also used on some lawn tractors in the 60's (Cub Cadet's) and wheelbarrows and can be found used on eBay. I have seen a 4 ply Goodyear tire with the same tread used on some Case and New Idea round balers and they may be available from dealers of this equipment (I have not confirmed this). This size is a common for wheelbarrow/trailer tires. The 2 ply wheelbarrow tire is preferred because of its ability to absorb bumps and is cheaper. The 4-ply trailer tire has stiffer sidewalls and will give a rougher ride. Tubes are available from anyone that sells wheelbarrow or trailer tires (Home Depot, Canadian Tire, Wal-Mart, etc).

Engine / Transmission Parts / Original Villiers Parts and Service Manuals and Special Service Tools - Contact Villiers Services or Moto-Ward . Give them the engine model number you have, telling them you are looking for parts for a motor in a Penguin or Beaver probably won't help them. They also have the English pitch chain between the motor and the jackshaft. Some of the parts on the fan-cooled electric start engine are the same as the kick-start equipped motorcycle engine and may be found on eBay. There is a Penguin Parts Manual posted on Bev Wigney's site, click here to see it and the Penguin photos from her family's collection.

Siba Dynastart parts - the units used on Villiers engines were produced by Siba for Villiers and other engine makers. The Messerschmitt 3-wheeler and BMW Isetta used Dynastart units and their ignition points, starter brushes and relays may be the same. Harley Davidson golf carts used a Siba voltage regulator, their part number is 74508-63A. The terminals are bent where the Penguin/Beaver ones are straight but it is otherwise the same. I have seen these on eBay.

The ignition system is a battery type, 12V negative ground system and the engine will not run without a battery, even if you try to push start it. Push starting in any case should only be done in an emergency as it tends to bend the chain adjuster between the jackshaft and rear axle. If your starter does not work, find the cause and fix it. Running the engine with worn out brushes will damage the commutator surface of the Dynastart rotor.

If your engine does not have spark check the points for dirt before replacing any parts as it only takes a small piece of grit to keep the points from making contact. I clean/polish the contact surfaces using a Dremel Motor Tool with a small wire wheel without removing the stationary contact from the sidecover so the gap and timing settings are not disturbed. The sidecover can be removed without removing the engine from the machine.

If you can hear your starter solenoid clicking but the engine does not crank over, check for sticking starter brushes. The springs get rusty and weak and the brushes may be gummed with carbon and not making contact with the commutator on the rotor. Springs can be replaced without replacing the brushes, I have found ones that fit in an assortment available at Princess Auto.

Does your engine seem to be seized ? If it has been sitting for a couple of years it could be caused by rust built up between the Dynastart Rotor and Stator. Removing the right side cover from the engine and tapping the rotor carefully with a soft faced (rubber) hammer may loosen it. Usually you will find the starter will not work after freeing the rotor up. I usually find weak starter brush springs or sticky brushes as the cause.

The "trailer hitch" shown here in the Kay Family Photos is what I would call a "tow bar". It allowed you to pull a Penguin behind your car. If you have one of these, don't use it. They put a lot of stress on the body of the Penguin and can actually cause it to break. Here is a sketch of one original Penguin hitch used to tow a trailer behind the Penguin that is reasonably easy to make.

The exploded diagram and parts listing for the transmission which is shown in the Penguin Parts List for the B and D models, page 8, does not show a set of 14 loose 3/16" ball bearings. These are between the 27 tooth gear (item 11 in the Penguin parts List) and the Pressure washer (item 12) and are listed but not shown in the Villiers Parts Manual and the parts look up on Moto-Wards site.

The chain between the jackshaft and rear axle, the rear axle seals and bearings and front wheel bearings and seals are all sizes that should be available from auto parts stores or bearing suppliers or farm machinery places. Take what you need with you so they can determine the sizes. I will list the ones I know.

Rear Axle Bearing Cup / Cone p/n - LM6710 / LM67048

Countershaft bearing (2 req'd) - 6005-2RS

Countershaft outboard bearing (chain adjuster side) - 6205RS

There are two different chain and sprocket sizes used between the jackshaft and rear axle, the A models originally used a size which was replaced on later models with a larger size.

Penguin and Beaver headlights were units made by Wipac that were originally sold as back-up ( reversing) lights for some European cars. Hella brand lights used on 1967 Volkswagens look very similar and their lenses will actually fit the Wipac brand housings.

Tail lights - there were at least three different one used on Penguins, two of these appear to have been used on the Beaver. Both machines used an oval light made by Dominion Auto (now defunct) that was a trailer tail light which required three mounting holes. Similar ones are now sold as "cat-eye" units for custom motorcycles. The ones on the Penguin and Beaver had a grey finish, they can now be found in chrome. Both machines also appear to have used a Wipac brand tail light made for motorcycles which used a single mounting hole. The Lens of the Wipac light has S179 on it, the base S142. These may be the p/n's for the components of the light. The Penguin may have also used a light with a round glass lens but I have not been able to determine who made the one on my machine, or if it was a factory installed item.

Keys - If your machine has the ignition switch that turns to the left for reverse and you want a spare key, blanks are available. The original key is a "Union" brand and the replacements are made by ILCO and the p/n is UN20. You may be able to get them locally, check anywhere that cuts keys. I have purchased them off of eBay (search "ILCO UN20"). If you have no key and are unsure which switch you have contact me and I should be able to explain the differences. There was only one key that fit the "left for reverse" switch that I am aware of so if necessary I could copy one of mine and it should fit your machine. I have not located key blanks for the "push and turn right for reverse" switch, the original is a "Huf" brand item.

If your ignition switch is missing or broken it is possible to replace it with a generic automotive ignition switch available from an auto parts store. It must be an automotive style unit for a battery ignition system. One for an electric start snowmobile, lawn mower etc., won't work. A toggle switch can be added for reverse (I hang one on a bracket mounted to the ignition switch so I don't have to drill a hole in the dash). Wire the switch so it gets power from the ignition/coil terminal of the ignition switch, so the reversing solenoid can't be turned on / left on while the engine is off.

Horn Button - Bosch p/n 0343003001

Headlight Switch - Bosch p/n 0340002002

Clutch Cable - Romac p/n TG444 5706

Brake Parts - Parts for the drum brake used on the Penguin and Beaver are still available. It is a Bendix 6" expanding drum brake used on Go-Karts. Brake shoes, hold-down springs, return springs, actuating levers and backing plates are available new. The only part of the brake assembly not available is the drum with the sprocket attached. One supplier is Go Kart Galaxy, I have not dealt with them but the parts they have listed under "renewal components" on this page will all fit Penguins and Beavers.

The 4 digit part numbers they reference also appear in other supplier listings with different prefixes added (ie AZ8100 ).

Handles - The dash and rear lift handles and the front deck handle were off-the-shelf boat items that were available from Canadian Tire in the 60's.

Gas Cap - A replacement gas cap is available here in Canada that looks very similar to the original one used on the Penguin and the Beaver. MotoRad p/n MGC-23 is available from Canadian Tire, their #23-0531-2. It may also be available from other sources. It may be necessary to remove the vent valve from the cap, try it first before you modify the cap.