

IRON HORSE SPARES

300 Watt Ariel Square Four Alternator Conversion

Fitting Instructions

MECHANICAL

Introduction:

Fitting the alternator in place of the dynamo is straightforward since it is designed to fit without modification. It is slightly bulkier than the Lucas dynamo but on a bike with standard plumbing arrangements for the oil feed and breather it should be no problem. If you have additional plumbing for a filter or extra breathers in this area they may need to be re-positioned to suit.

Special tools:

The only special tool that may be required is a puller for the dynamo drive pinion gear. This gear should be an easy push fit onto the dynamo shaft. If it does prove awkward to remove it is worth spending some time dressing out any burrs or damage with an oil stone(s) and ensuring it is an easy push/sliding fit onto the alternator shaft with the woodruff key in place.

Removal of the dynamo:

There is no need for detailed instructions but a checklist of items that will need to be removed may help:

- Battery & carrier
- Timing Cover
- Distributor
- Electrical connections to dynamo output and field coils
- Top Dynamo Strap (Although the alternator fits directly in place of the dynamo the top retaining strap has to be removed completely and then refitted after the alternator is in place)
- Timing chain tensioning blade
- Carburettor (For SU equipped bikes only if Solex can usually be left in place)
- 3rd dynamo retaining screw inside the timing case.
- Drive pinion retaining but

Be careful how you lock the pinion so as to allow the retaining nut to be unscrewed or tightened. The casing is fragile; I normally use a suitably sized piece of steel wedged between the teeth and the boss for the third dynamo retaining stud inside the timing chest.

With the dynamo drive nut and pinion released it is possible to lift the dynamo away but try to keep some tension in the chain so it doesn't drop into the bottom of the timing chest and

IRON HORSE SPARES

possibly jump a tooth on the crank sprocket. It can be useful to use some folded cardboard to wedge the chain against the crank and camshaft gears so as to avoid this possibility.

Preparation for fitting alternator:

Before fitting the alternator make sure you carrying out the following. It's easy to forget and although we all enjoy a good swear it's not good for the blood pressure.

- Check that the bearing retaining plate is fitted to the front of the distributor/dynamo drive housing. If you supplied one with your donor housing it will be there if not you need to exchange the one from your old dynamo.
- Make sure you have either fitted a gasket or applied some silicon gasket to the sealing face on the front of the distributor/dynamo drive housing.
- Check the threads in the dynamo distributor drive housing are clear and that the retaining screws fit nicely. The two screws that pass through the timing cover and into the dynamo can be a little on the short side and can strip the threads so take a careful look.

Dynamo end cap:

If you didn't supply an end cap with the donor parts fit it in place now. The black and red wires can pass out through the holes in the end cap which should be fitted with grommets. The thread in the end of the cap mounting studs is 2BA so you can re-use your original screws if you don't like the look of the brass ones supplied with the kit. A couple of fibre washers under the screw heads are recommended.

The two mounting studs supplied with the kit screw into the rear alternator plate. There are two positions depending on which flavour of end cap you have (43mm or 46mm centres).

The end cap should be fitted with the wires facing down. The position may not match the exact orientation of the original cap since I have had to allow for swinging arm bikes and the two different caps. I have positioned the studs so that wiring holes in the cap will either point down or towards the rear.

Fitting the alternator

Fit the woodruff key in place. If the key is tight fit relieve it on a fine file or oilstone until an easy push fit can be achieved. Rotate the alternator shaft so that it will line up with the keyway in the pinion. Lower the alternator into place noting that the cutaway in the bottom of the alternator fits over the machined saddle on the rear of the crankcase.

With a bit of fiddling the pinion can be pushed on while the alternator is pushed home. Once in place secure by lightly tightening the 3rd fixing inside the timing cover. This is a stud as standard but it may have been replaced by a screw or bolt to make fitting easier.

IRON HORSE SPARES

Final tightening and fitting the front retaining strap:

Fit the front retaining strap by passing the small end between the case of the alternator and the long rod holds the alternator end plates together. If for any reason it will not pass easily between the body and the rod release the domed nut for this rod on the rear of the alternator so allow a bit of extra movement. Re-tighten firmly against the locking nut afterwards. It may help to flatten the strap eye, put the pin through the strap end and holding it on the anvil of vice tap it with hammer to flatten it snugly to the pin.

The over length pin supplied can then be used to secure the front strap to the crankcase eyelet. It has a pointed end and can usually be manoeuvred into place with a pair of needle nose pliers.

Once both straps are in place the packing piece supplied should be placed on top of the smaller diameter section of the alternator housing and the strap gently tightened. An extra long bolt is included in the kit; do not over tighten the strap it just needs to firmly seat the alternator against the machined recess on the crankcase

Tighten and lock the dynamo pinion retaining nut (staking or loctite) and refit the timing chain tensioning blade. Don't forget to properly tighten the 3rd dynamo retaining screw before replace the timing cover.

Cleaning the alternator and removing scratches:

During fitting there will be the inevitable mark or scratch on the case. The recommended way to remove this is using piece of fine wire wool or preferably a green scotch brite pad. These are often sold as paint prep pads.

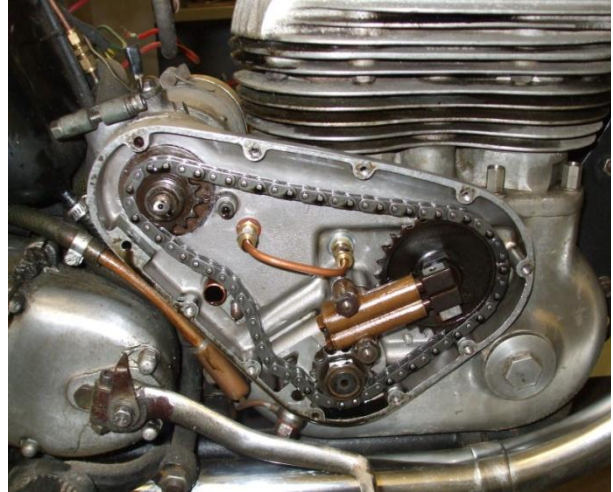
Other maintenance:

Should not be required! In the event of any problems please contact me in the first instance. It is not recommended that the alternator is dismantled for any reason.

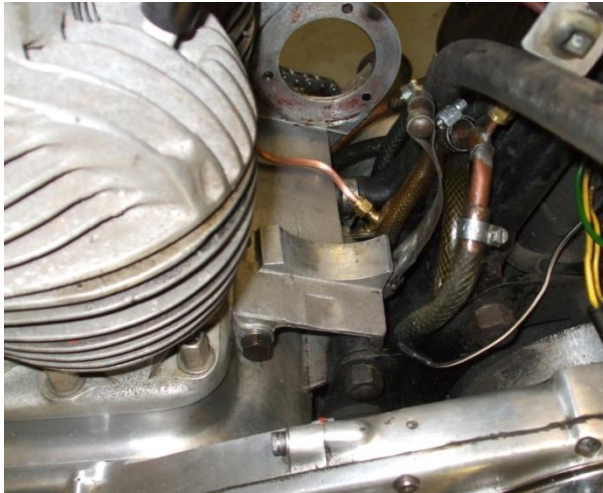
IRON HORSE SPARES



Drive side prepared for dynamo removal



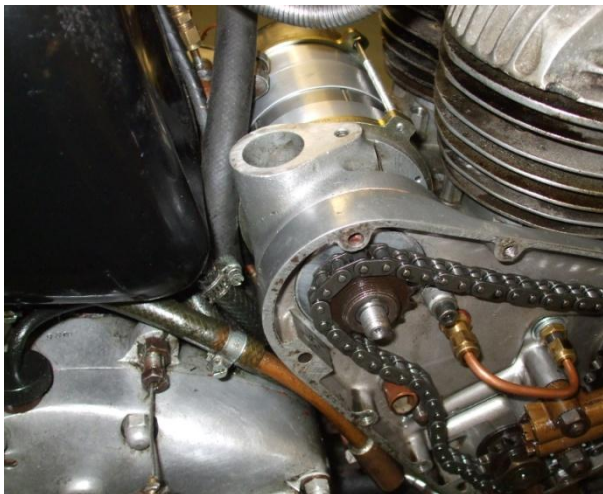
Timing side prepared for dynamo removal



Dynamo removed and ready for installation of the alternator. The top strap has been removed.



Inserting the alternator. Start from this position and gradually straighten.



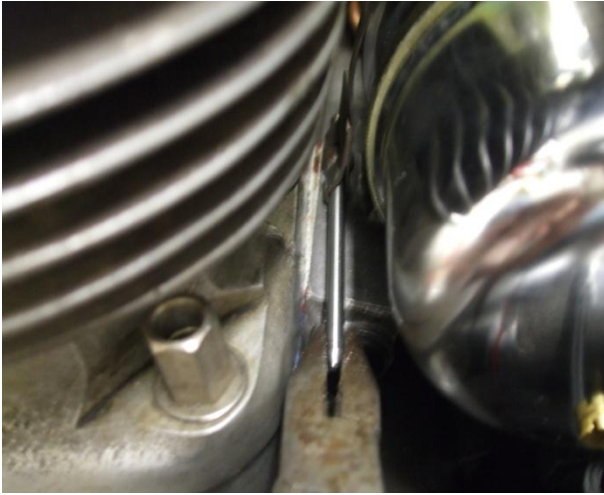
With alternator in place the 3rd dynamo retaining screw or stud should be gently



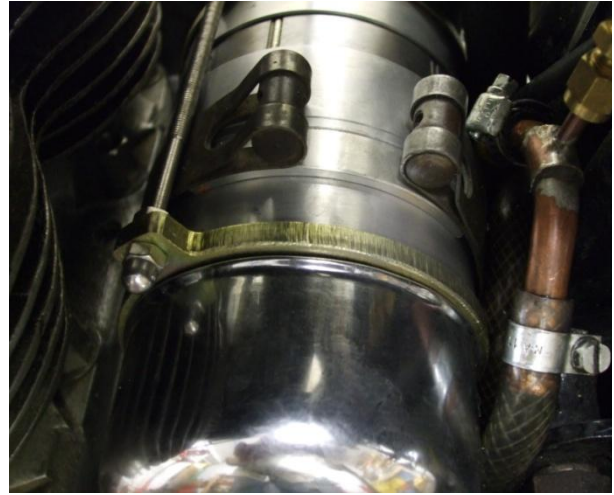
The domed nut removed to allow top strap to pass between threaded rod and case.

IRON HORSE SPARES

tightened.



Extra long retaking pin in place to hold dynamo top strap.



Packing piece inserted under the dynamo strap prior to final tightening.