

E - Letter May 2008

Comparing the SAB & AAB Brakes

The Stearns catalog includes linkage style and direct acting brakes. The solenoid and coil design is termed the SAB (solenoid actuated brake). The direct acting DC brake is termed the AAB (armature actuated brake).

Both the SAB and AAB designs are spring set, electrically released brakes. The obvious difference is the SAB uses a linkage mechanism to relieve the spring pressure and the AAB armature draws directly back against the spring pressure.



Picture 1: AAB magnet body with potted coil and a SAB support plate (1-087 series SAB shown).



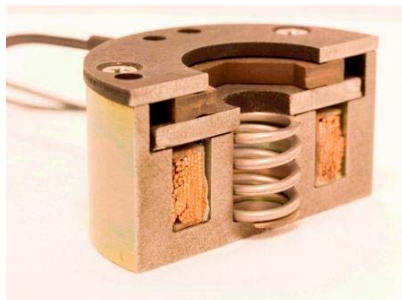
Picture 2: AAB and SAB brakes of the same torque rating. (333 AAB series & 1-056 series SAB shown)

Coils & Electrical Performance:

Comparing designs within the same torque rating,

- Within the same torque rating, the SAB solenoid coil is smaller than the AAB coil.
- The smaller coil will energize and de-energize more rapidly than the larger coil.
- The larger AAB coil will produce more heat than the smaller SAB coil.
- The AAB response time will depend on rectifier choice and AC or DC side switching. Comparative electrical response time is listed in the catalog.
- The solenoid coil has a brief inrush amperage requirement due to the larger air gap.

The AAB coils are not replaceable as the coils are potted into the machined magnet body. Solenoid coils for the SAB style of brakes are easily replaced as a repair item. A possible reason for coil failure in either design is applying the incorrect voltage.



Picture 3: cut-away of a small AAB



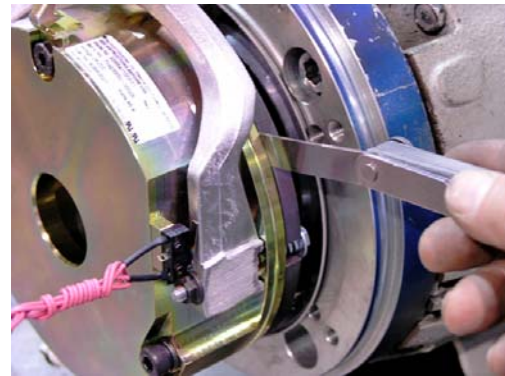
Picture 4: SAB solenoid coils & AAB taped coils

Air Gap Adjustment:

Picture 5: gapping an AAB.

Dynamic use may result in friction disc wear requiring re-set of air gap on AAB and some SAB.

Small AAB brakes are replaced rather than re-gapped following wear. Larger AAB brakes have a precision air gap setting which is measured at several locations around the circumference of the brake using a feeler gage.



Some SAB brakes require manual air gap adjustment, others are self adjusting. Manual adjust air gap is measured with a scale after turning one or two adjustment screws. Auto-adjust SAB designs are self adjusting for disc pack wear.

Neither brake style has to be disassembled for the airgap to be adjusted.

Friction Discs:



Replacing friction discs on both styles of brakes is easy. The difference between the styles of brakes is in the re-assembly.

The SAB is faster to re-assemble as the support plate of the brake mounts to the endplate and fastened with 3 to 6 screws depending on the brake series. After replacing an AAB magnet body, the the airgap must be re-adjusted using feller gages at several points. *(picture 5)*

Picture 6: AAB carrier ring & pressure plate, SAB friction disc & stationary ring.

SAB may have one or more friction discs which are compressed between plates. The AAB has one friction disc bonded to a carrier (metal) plate. Friction discs of either design are located on a gear cut hub. The SAB generally has the better thermal capacity in dynamic use.

Dynamic or Static Use:

All SAB are designed for rapid stop and / or holding applications. The AAB is generally a holding brake due to coil reaction time and thermal capacity limitations. The AAB has a superior mechanical life in holding only use. The SAB is the better selection for dynamic use because of the larger air gap and greater thermal capacity.

Enclosure:

The SAB product has a variety of metal covers and gasket options. All SAB have a maintained external release which is automatically re-set with application of power.

The AAB generally follow the European practice of placing a gasket band around the brake to shield the air gap with the option of a plug in the center clearance area for an IP 53 rating. The 350 & 360 AAB series have a cast iron or ductile iron cover enclosure. Some AAB sizes have a drawn steel cover option. The AAB manual release is usually non-maintained or maintained by threading retracting bolts into the brake to relieve the spring force.



Picture 7: AAB with band

Selection:

The AAB is a DC voltage brake that can be rectified. The SAB single phase coil can be AC or DC with a shunting switch to manage the inrush to holding amperage drop.

The SAB is a proven industrial brake that is forgiving in all kinds of applications and is the easier brake to mount and maintain. The SAB has the more rapid electrical response. The AAB style brake doesn't have a linkage mechanism which results in a longer mechanical life when used for holding only but can be difficult to work on, especially setting the air gap.

A range of options are available for either brake as described in the catalog or by your sales contact.

Picture 8: (SAB) 1082 series, 1087 series, (AAB) 360 series enclosure & release.



The bottom line of AAB vs. SAB brake selection is that whatever your brake design preference, or requirement, you can call Stearns.

Your suggestions and comments are encouraged, your own stories, pictures and experiences most welcome.

Stearns®: Reliable brakes through design, manufacture and support.

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