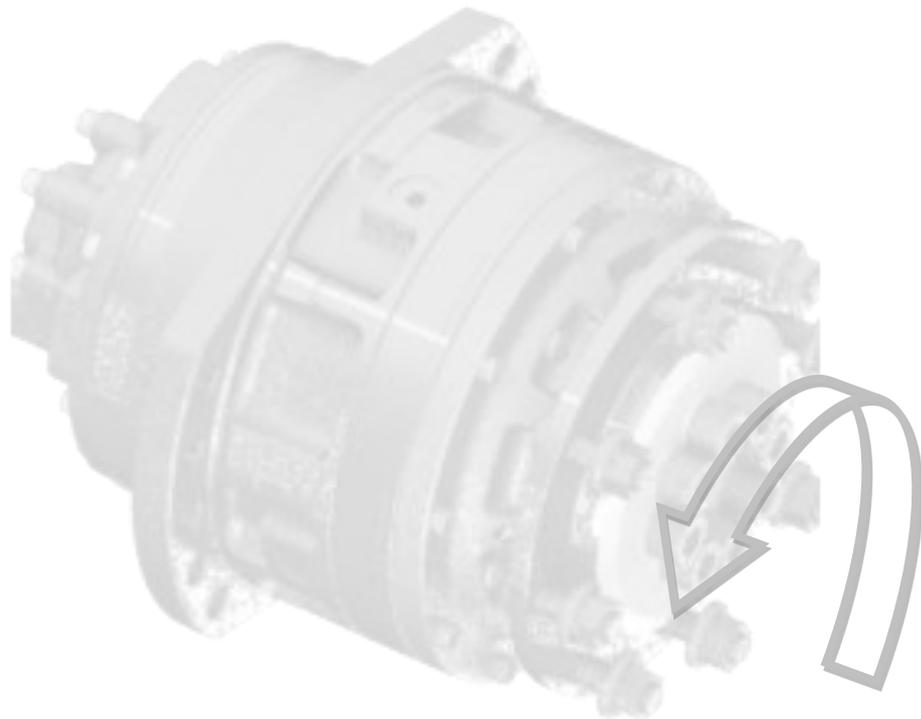




FREEWHEELING INSTRUCTIONS



FREEWHEELING OPTIONS WITH SAI MOTORS:



Freewheeling is the operation to drive a SAI motor disconnected from the hydraulic circuit.

It is a useful feature for instance in auxiliary traction systems, free fall operations, emergency release.

In this condition, the motor is absorbing the smallest power level at the highest rotation speed.

There are several options with SAI motor for the freewheeling, the most suitable should be selected according to the required performances and the motor type.

Applications:

Auxiliary traction systems : trailers, motor graders, combine harvesters, mining equipment.

Hoisting devices : fishing, anchor, towing, piling winches.



FREEWHEELING METHODS INDEX :

LEGEND:

	Suggested for high speed and long time
	Possible but not recommended for high speed and long time
	Not possible

Fixed displacement with bearings on crankshaft (GM/GS)

- Page 04

Short circuit	Vacuum	Zero stroke

Fixed displacement without internal crankshaft bearings (TF)

- Page 06

Short circuit	Vacuum	Zero stroke

Dual/Variable displacement with minimum displacement different from 0 cc/rev

(TD-TV; BD-BV)

- Page 07

Short circuit	Vacuum	Zero stroke

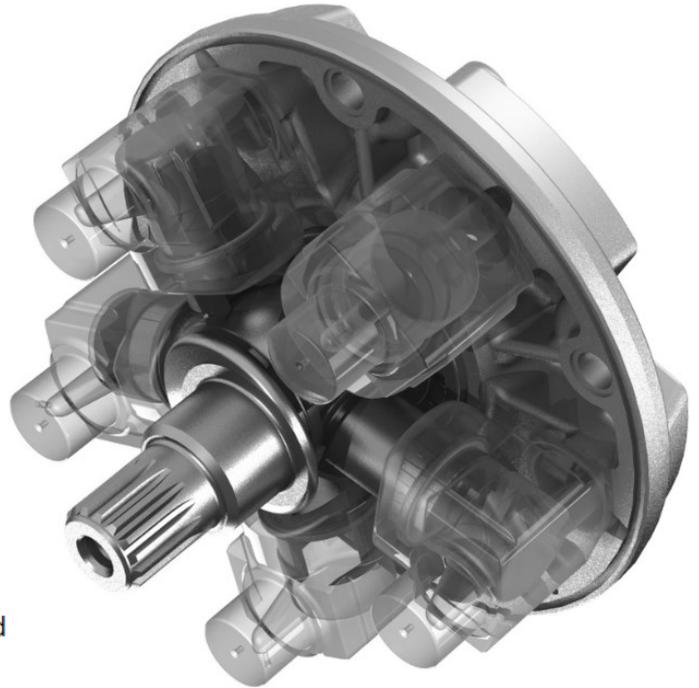
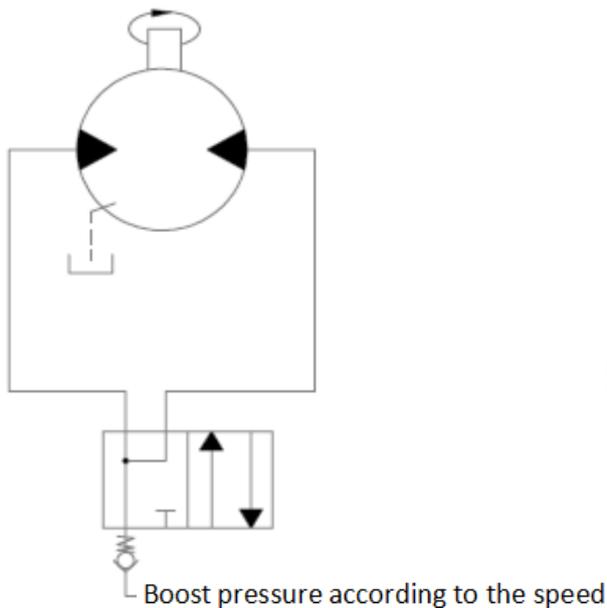
Dual/Variable displacement with minimum displacement equal to 0 cc/rev

(TD-TV; BD-BV)

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Short circuit	Vacuum	Zero stroke

GM and GS series (fixed displacement with internal crankshaft bearings):



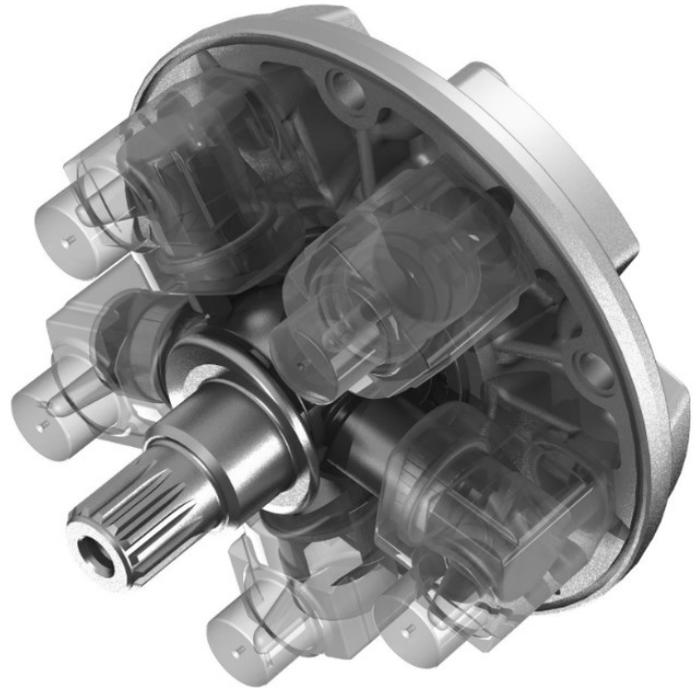
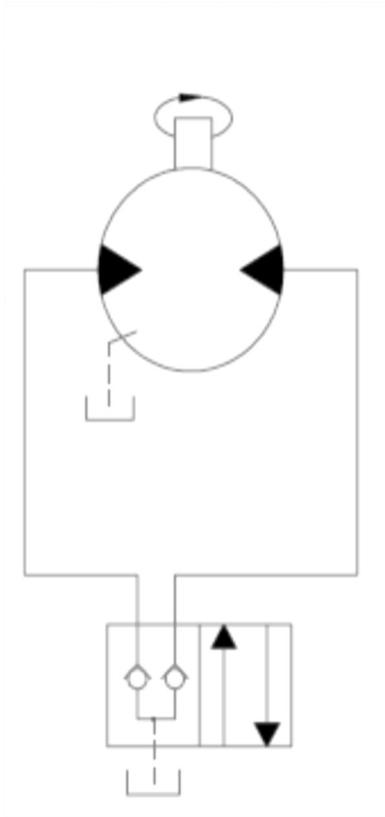
1) SHORT CIRCUIT FREEWHEELING :

In this condition A and B ports are connected, the shaft driven externally will create a flow on the two lines that will depend on the speed and the displacement of the motor.

According to these parameters a certain level of boost pressure on the connection line must be guaranteed to avoid cavitation on the suction line.

The boost pressure must be bigger than the delta pressure due to the restriction of the connection (see boost pressure curves in the GM catalogue).

This freewheeling option is recommended only in case of low rotation speed and for a short time due to the overheating risk.



2) VACUUM FREEWHEELING :

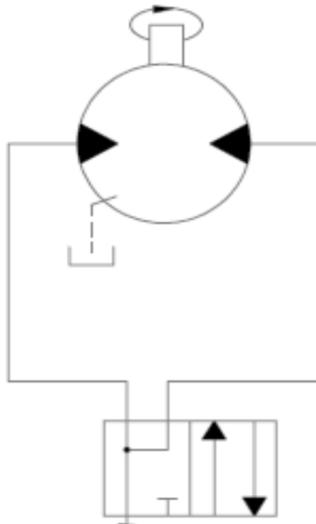
In this condition A and B port are disconnected from the hydraulic circuit with check valves or equivalent ones.

The suction line will not receive any oil creating the vacuum and the outlet line must be connected to the tank. With this configuration the shaft can be driven up to the max speed indicated into the catalogue. The case of the motor should stay always filled with oil.

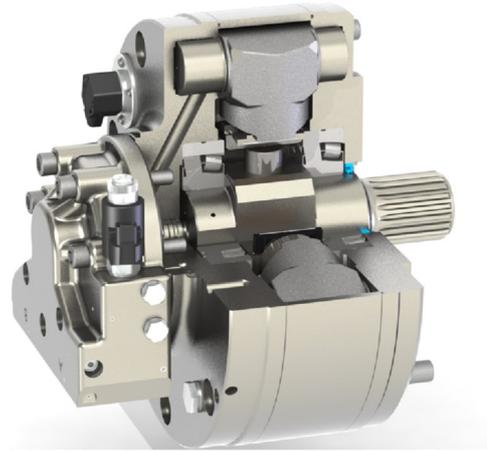
This condition is recommended for high speed and for long lasting operations.

The transition to or from the normal operation must be done at low level of pressure and speed to prevent shocking to the system.

TF series (fixed displacement without internal crankshaft bearings):



Boost pressure according to the speed



1) **SHORT CIRCUIT FREEWHEELING :**

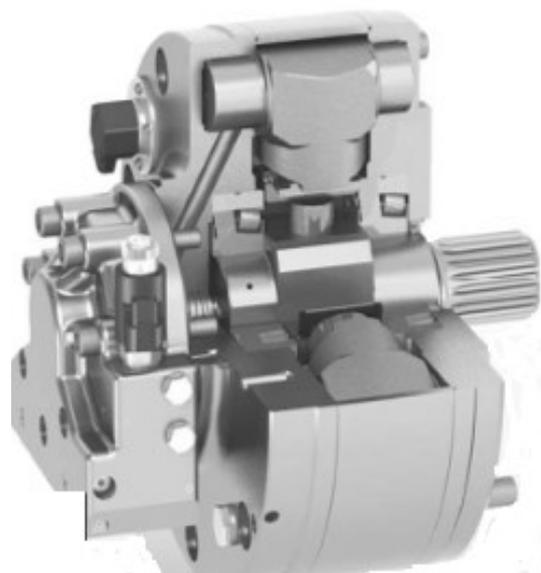
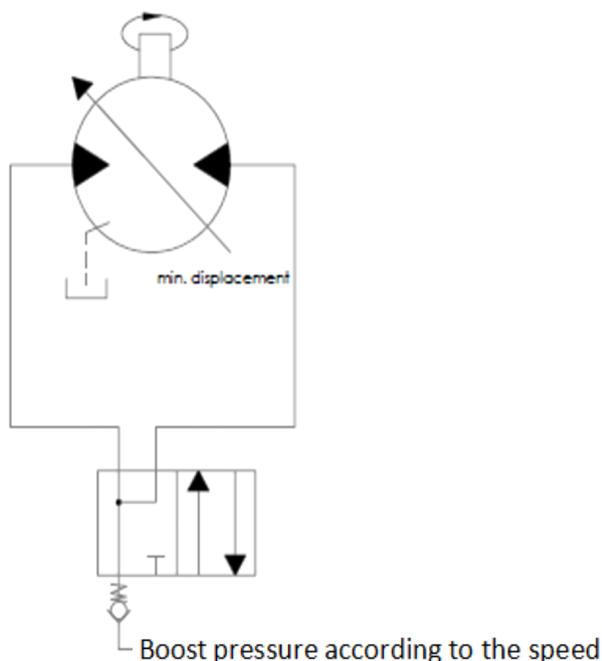
In this condition A and B ports are connected, the shaft driven externally will create a flow on the two lines that will depend on the speed and the displacement of the motor.

According to these parameters a certain level of boost pressure on the connection line must be guaranteed to avoid cavitation on the suction line.

The boost pressure must be bigger than the delta pressure due to the restriction of the connection (see boost pressure curves in the GM catalogue).

This freewheeling option is recommended only in case of low rotation speed and for a short time due to the overheating risk.

BD BV TD TV series (dual/variable displacement hydraulic motors if minimum displacement different from 0 cc/rev):



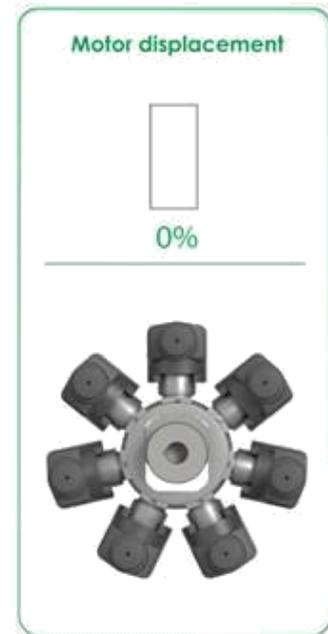
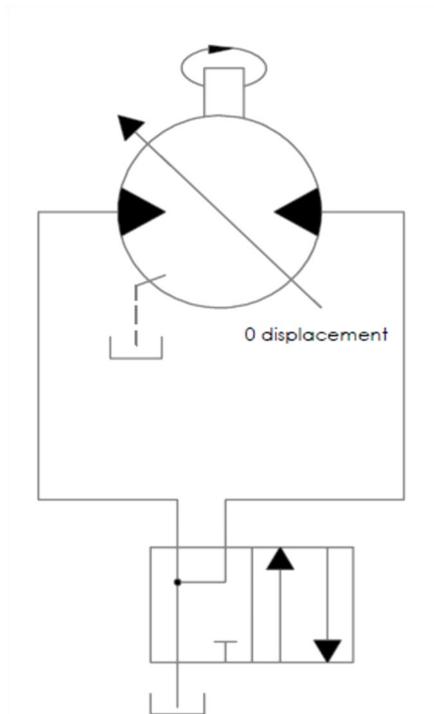
1) SHORT CIRCUIT FREEWHEELING :

This freewheeling mode is suggested only in minimum displacement:

In this condition A and B ports are connected, the shaft driven externally will create a flow on the two lines that will depend on the speed and the displacement (it must be the minimum displacement) of the motor.

According to these parameters a certain level of boost pressure on the connection line must be guaranteed to avoid cavitation on the suction line.

BD or BV and TD or TV series (dual/variable displacement hydraulic motors with minimum displacement equal to 0 cc/rev):



3) ZERO STROKE FREEWHEELING :

This is an innovative freewheeling mode that runs forcing the motor to zero displacement and connecting A and B ports directly to the tank or the low pressure line :

In this condition the motor can run at speed even higher than the ones indicated in the catalogue (2000-3000 rpm), please contact SAI for freewheeling speed higher than the catalogue ones.

The displacement must be kept at zero stroke hydraulically (for example piloting EP connection if any residual pressure remains into A and B ports) or mechanically (option M) that will force the displacement of the motor to zero if there is no pressure in the system.

Generally, there is no overheating at any speed reachable if the pressure on A and B ports will not exceed a few bar(3-5 bar).

THE RECOMMENDED ZERO STROKE FREEWHEELING SEQUENCE IS:

- 1) Forcing the motor to zero displacement.
- 2) When the motor is at zero displacement, A and B ports can be connected together to the tank, the position of the eccentric at zero cc/rev is kept mechanically without hydraulic power available (with option M).
- 3) In this condition, no pressure is required in the system to lubricate the rotating parts and the speed.
- 4) The motor in this condition can generally run continuously without any extra flushing of the case, because of the minimum absorbed torque, therefore power.
- 5) The motor case must be filled with oil as in every working condition.