**Introduction.**

The ARTIC-O-MAT range of turntables has been in production since 1984,
we currently offer two versions of the ARTIC-O-MAT

The Standard — for high floor buses
The Standard
and
The Standard basic
The Standard articulations can be used in puller applications
by eliminating the hydraulic control system

The Limbo II 350 — for intermediate and low floor buses
The Limbo II 350 Bz Basic
The Limbo II 350 Bz
The Limbo II 350 CH
The Limbo II 350 FP
The Limbo II 350 NF
The Limbo II 350 Xc
The Limbo II 350 IC
The Limbo II 350 Puller.

The dimensions, weights and scope of delivery for each version is detailed in individual data sheets.

Over 5 500 ARTIC-O-MAT articulations have been manufactured since 1989.

**The control system for Pusher articulations.**

The Artic-O-Mat plays a very important role in the safety and stability of the bus. The anti-jackknife device is located in the articulation between the two vehicle sections. The pivot angle between the front and rear vehicle sections is monitored. Unintended changes in the pivot angle are prevented by two double acting cylinders.

ATG offers three levels of sophistication for the joint control system.

**Basic.**

The hydraulic control system consists of two double acting hydraulic cylinders, four hoses and a hydraulic control block. The hydraulic control block is equipped with three solenoid valves, one of these valves activates vehicle speed dependent damping, the remaining two valves activate a high level of hydraulic damping. These valves are switched on by mechanical switches when approaching the maximum horizontal turning angles.
A pressure switch mounted on the hydraulic block monitors the system pressure and gives an alarm if the system loses pressure (leaks).
The system is delivered with a wiring harness for the hydraulic block and the position switches. The vehicle manufacturer must provide a speed signal to activate speed dependent damping.

Fig. 1. Basic Hydraulic control system on Limbo II 350 articulation,
Articulation mounted on ATG hydraulic test jig.

**Standard.**

This is the most common hydraulic control system. This system consists of two double acting hydraulic cylinders, four hoses and a hydraulic control block. The hydraulic control block is equipped with four solenoid valves, two of these valves activate hydraulic damping and the remaining two are lock valves. The block also has three pressure switches, one of these monitors the system pressure and gives an alarm if the system loses pressure (leaks), the other two pressure switches inform the control system which direction the articulation is turning. Four inductive proximity switches identify the maximum horizontal angles left and right and the damping angles for angle dependent damping. The hydraulic control system allows two step speed dependent damping. The system is controlled by a Programmable Logic Controller manufactured by Parker Vansco in Canada. It is also possible to integrate the control function into the bus manufacturers PLC controller if the bus manufacturer uses such a system. The system is delivered with wiring harnesses for both the hydraulic block and the position switches, these harnesses connect to the PLC controller (if required) or to the vehicle electrical system.

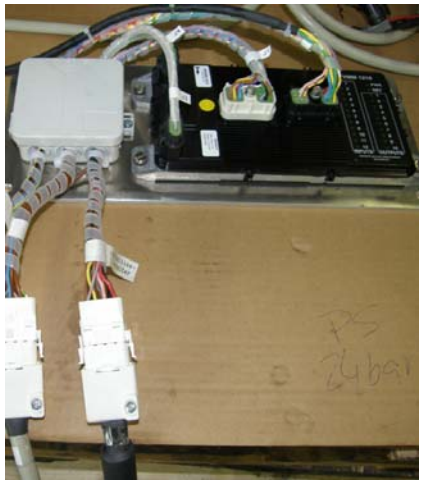

Fig.2 PLC Controller with wiring harnesses

Fig.3. Standard Hydraulic control system mounted on Limbo II 350 NF articulation

**IC / Integrated Cylinders.**

This hydraulic system consists of two double acting hydraulic cylinders with integrated proportional valves. One of the cylinders can be equipped with emergency damping in case the wiring that connects to the cylinders fails. Each cylinder has an independent hydraulic circuit. The proportional valves allow for greater flexibility when programming speed dependent damping. The turntable angle is monitored by a contact free angle sensor. Each cylinder has a pressure sensor that allows continuous monitoring of the damping function and can identify leaks in each system. The system is controlled by a Programmable Logic Controller manufactured by Parker Vansco in Canada. The system is delivered with wiring harnesses for both hydraulic cylinders and the angle sensor that connect to the PLC controller and the vehicle electrical system.

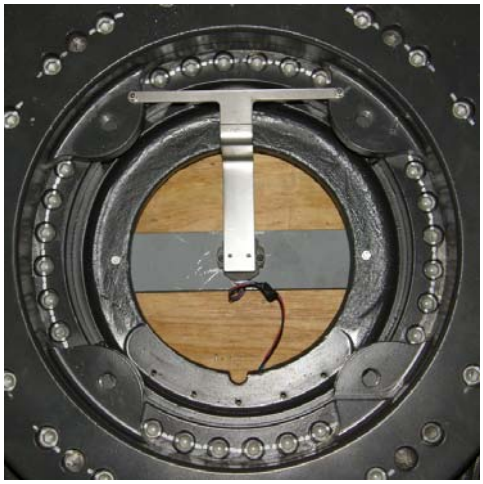

Fig.4 Angle sensor

Fig.5 ARTIC-O-MAT II 350 IC equipped with Integrated cylinders.