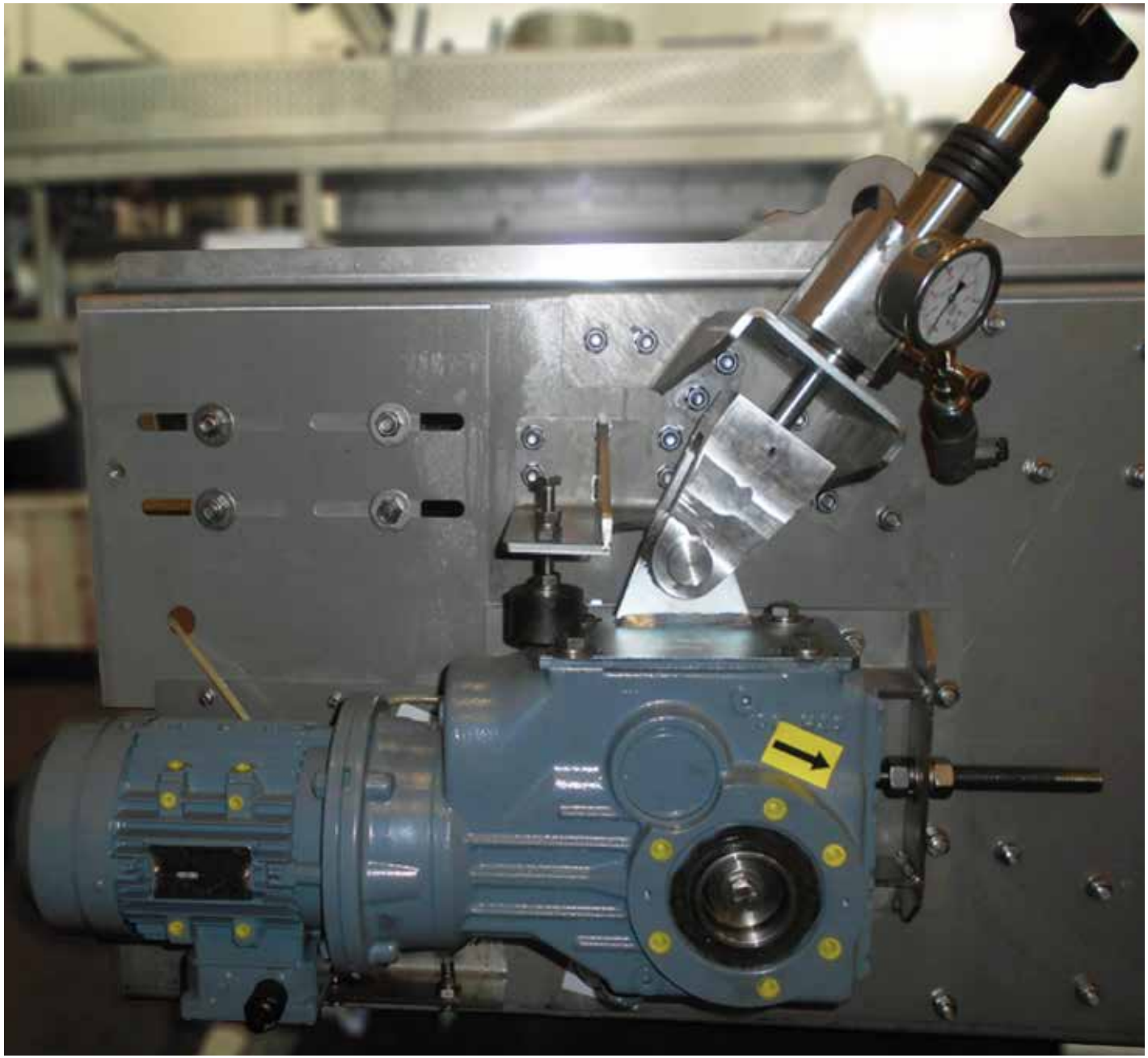


Why is needed

In the power transmission industry, shaft mounted speed reducers provide one possible solution to meet the speed reduction/power generation needs for an application. As the name implies, a Shaft Mounted Speed Reducer (also known more simply as SMSR) is a speed reducer mounted directly onto, and statically supported by, a driven shaft that may be found on a conveyor. Typically, the SMSR incorporates a hollow bore (keyed, Taper-Grip® bushing, etc.) to facilitate mounting onto the driven shaft. The SMSR may be "fixed" to the machine using an output flange or, in certain instances, its housing may be bolted directly onto the machine.

However, situations exist where direct attachment of the SMSR is either not possible, or not desirable.

In such situations, the SMSR is supported only by the shaft that it is intended to drive.

When the SMSR is mounted directly onto a driven shaft with no other external support, it must have a torque arm attached to it.

A torque arm is a pivoted link between the reducer and a fixed anchor point intended to resist the torque developed by the reducer.

Quite simply, a torque arm transmits the reaction torque produced by the SMSR into the structure of the machine, thereby preventing the counter-rotation of an SMSR during operation.

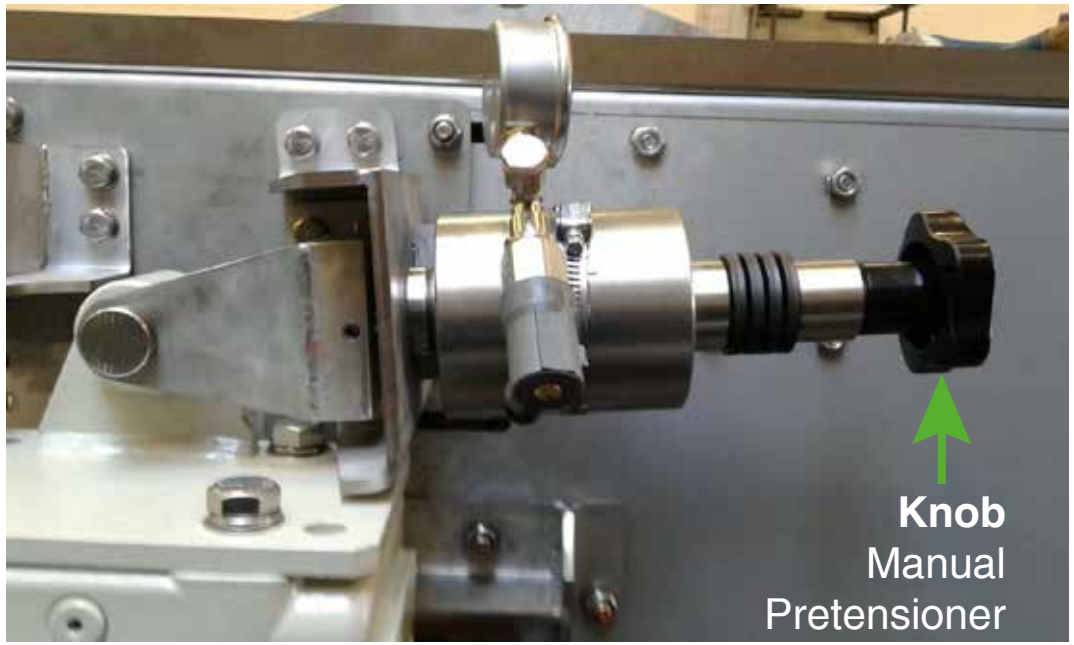
Most manufacturers of shaft mounted speed reducers have designed, and offered for purchase, standard torque arms for their products.

Situations may exist, however where a manufacturers' torque arm does not meet the needs of a certain application (e.g. due to space limitations).

In such situations, the machine designer may be

Torque arm – Our implementation

Designing this machine we have thought from the beginning to adopt a torque arm.
After having studied most of the common proposals of the many suppliers, we were unsatisfied about them, so we have decided to build our own torque arm solution.
Our main goal was to be able to "measure" strength applied to the torque arm and to set a maximum value, after that machine goes into a "safety condition" to prevent major damages to electric motor.
Our torque arm solution combine a mechanical link between SMSR and body of machine plus an hydraulic transducer and a pressure switch.
When the machine is running in empty mode, SMSR needs small force.
When the machine is running in common operating mode, SMSR is subject to continuous variable forces.
These forces will act on the torque arm.



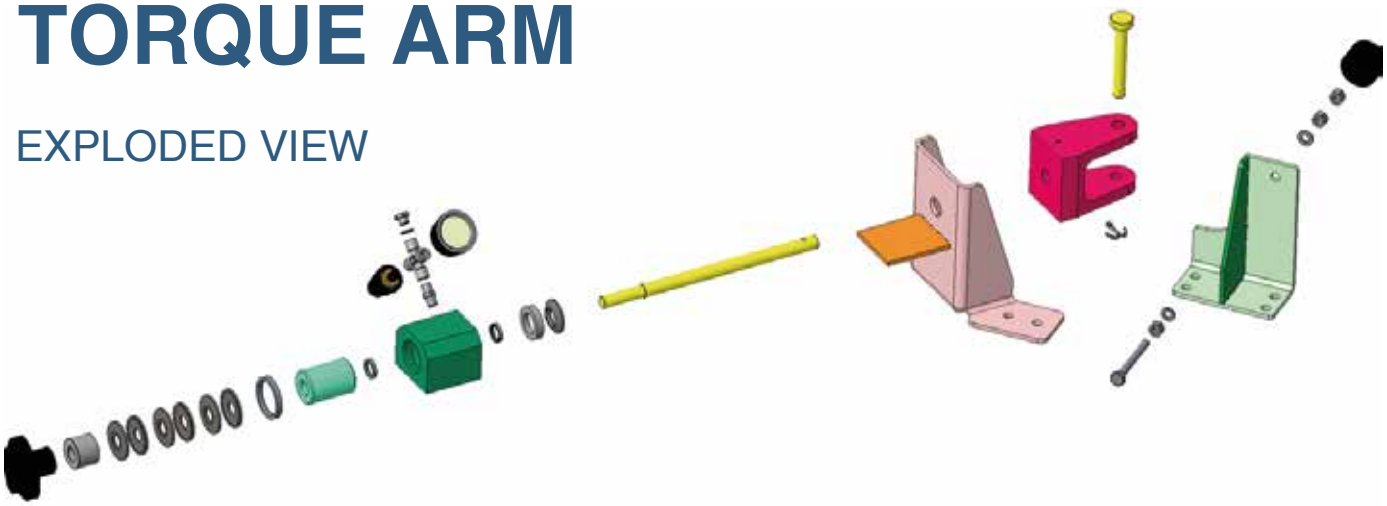
Torque arm - Principle of functioning

Rotating the black knob in clockwise direction, we push the spacer against the cup springs.
Cup springs will push the piston inside the cylinder body that is filled with hydraulic oil. This will force the main shaft to move outwards, pre-tensioning the torque arm. The pressure gauge will show the growing value of pressure.
If the pressure rise to a dangerous value, a pressure switch will send an emergency condition to the machine main electrical system. If this happens, the machine will be kept in a safety condition, cutting-out power to the electrical motor.

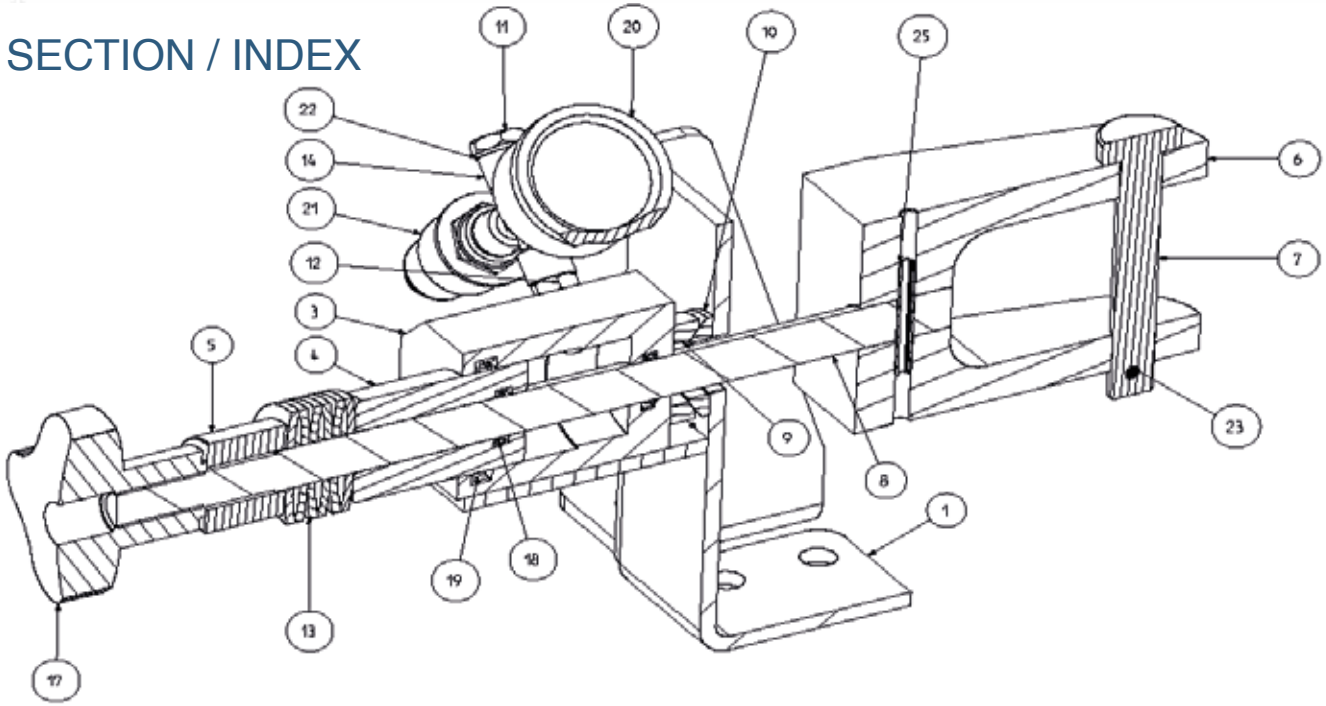
During testing of the machine, we have defined as best-fit values :
a) a pretension value of 3 bar (43 psi) MANUAL PRETENSIONER
b) a safety maximum pressure value of 10 bar (145 psi); if the pressure will grew up, pressure switch will put the machine in safety condition

TORQUE ARM

EXPLODED VIEW



SECTION / INDEX



Torque arm – Exploded view, Sections and Bill of material

Our hydraulic transducer is equipped with best in class lip seals and this will assure you a long time of proper working. Despite this, if you see signs of hydraulic oil leakage, along the main shaft and parts related to it, you need to replace lip seals. Please refer to the exploded view to correctly identify spare parts. Prior to proceed to replace lip seals, be sure to rotate the black knob count-clockwise to remove the pretension pressure.

BILL OF ITEMS

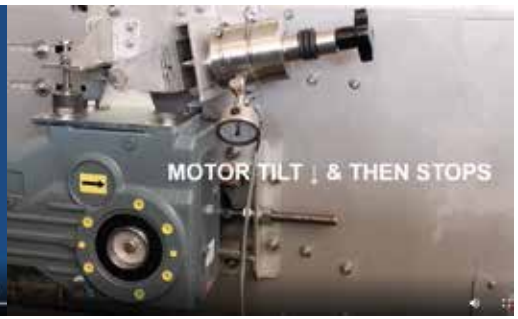
INDEX	QUANTITY	CODE	DESCRIPTION
1	1	TP060200901	MAIN BRACKET
2	1	TP060200900	AUXILIARY BRACKET
3	1	MU80SMC6001	CYLINDER BODY
4	1	MU45SMC6001	MU45SMC6001 PISTON
5	1	MU40SMC6001	MU40SMC6001 SPACER
6	1	MU20A000466	MU20A000466 TORQUE ARM FORK
7	1	MU20A000465	MU20A000465 TORQUE ARM PIN
8	1		MU18SMC6001 MAIN SHAFT
9	1	_____	SP MALE PLUG G1/4"
10	1	_____	BSPT NIPPLE R1/4"
11	1	_____	CONICAL SEAT - DIN6319 - 23050.0424
12	6	_____	CUP SPRING - DIN2093 - 50-18,4-3
13	1	_____	FEMALE CROSS G1/4"
14	1	_____	HEX HEAD SCREW - DIN933 - M10x90 A2
15	6	_____	HEX NUT - DIN 934 - M10 A2
16	1	_____	KNOB
17	2	_____	LIP SEAL DI-DIM 18-25
18	1	_____	LIP SEAL DI-DIM 45
19	1	_____	PRESSURE GAUGE
20	1	_____	PRESSURE SWITCH
21	1	_____	SEAL GVF 1/4"
22	1	_____	SPHERICAL WASHER - DIN6319 - 23050.0324
23	1	_____	SPLIT PIN - DIN94 - Ø8 A2
24	3	_____	SPLIT WASHER - DIN127-B - Ø10 A2
25	1	_____	SPRING PIN - DIN1481 - Ø6x50 A2
26	1	_____	VIBRATION DAMPING

Troubleshooting

Following guidelines will give you a chance to better understand what is not going in the correct way

PROBLEM	CAUSE	SOLUTION
pressure gauge signs no oil pressure	Cylinder body is empty. Hydraulic oil leakage	During test of the machine we have completely filled with hydraulic oil cylinder body. Replace lip seals with new ones. Refill with hydraulic oil and pretension as described.
SMSR suffers about rebounds	Improper pretension value	Vibration damping must be in contact with SMSR surface Pretension at described value
Pressure switch is not properly working	Pressure switch is set by us during test of the machine, and doesn't need for any other setting. Pressure switch failure	Replace pressure switch.

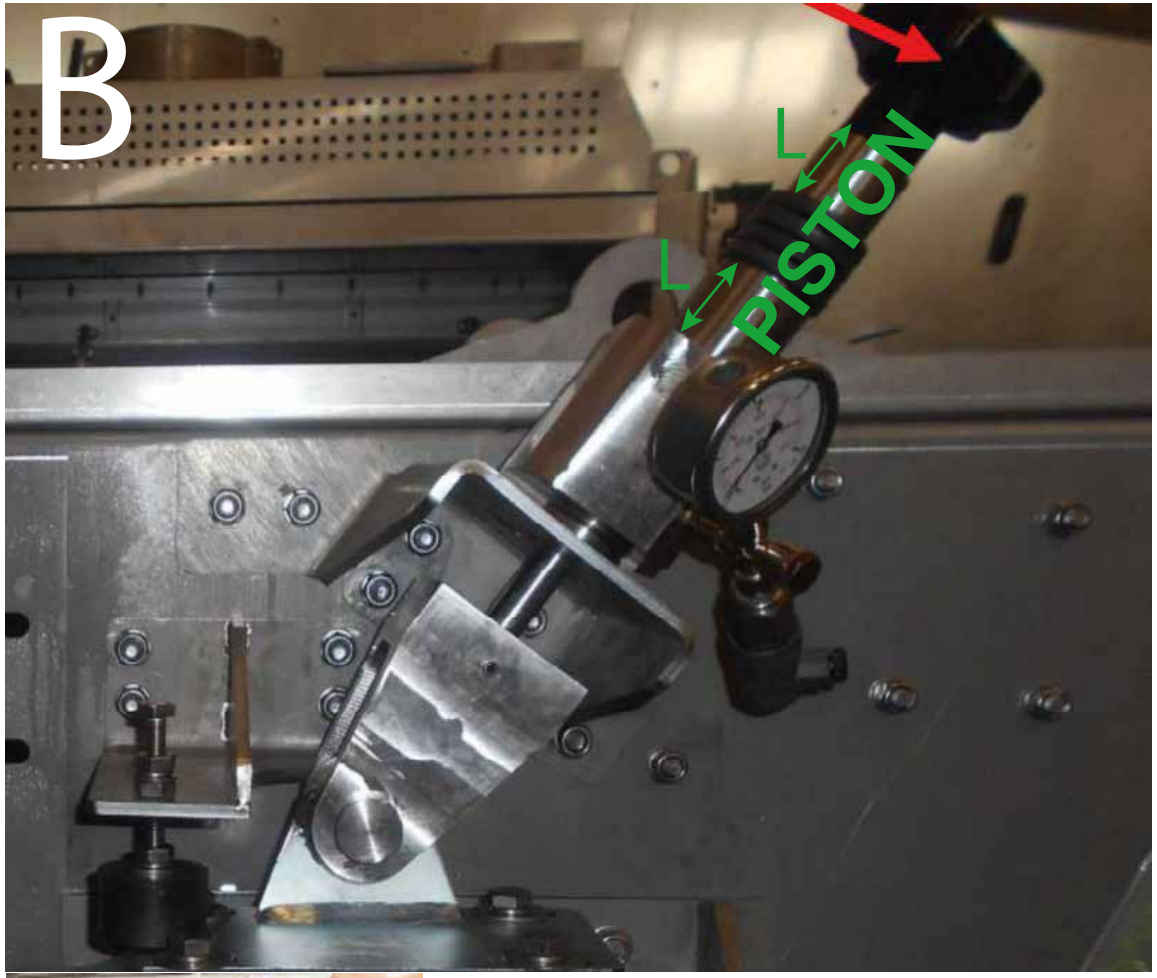


Mechanical Torque Limiter - Oil Refill

See from photo A, the piston is completely closed.

OIL TYPE
ATF DX III - TRANSMISSION OIL



It is therefore necessary to unscrew the knob and reposition it as shown in photo B, then open the indicated cap / bolt, fill it with oil and then close it again.