How to select a new telescopic cylinder for your tipper?

In most cases when asking for a replacement cylinder it is common for the sales person to ask what stroke cylinder do you require? You could just check the part number of your current cylinder on the name tag and all the necessary info can be gained from it.

For example: GHS116 - 3 - 2940B

GHS – Jost / Hydromas cylinder

116mm Outside Diameter of biggest first stage.

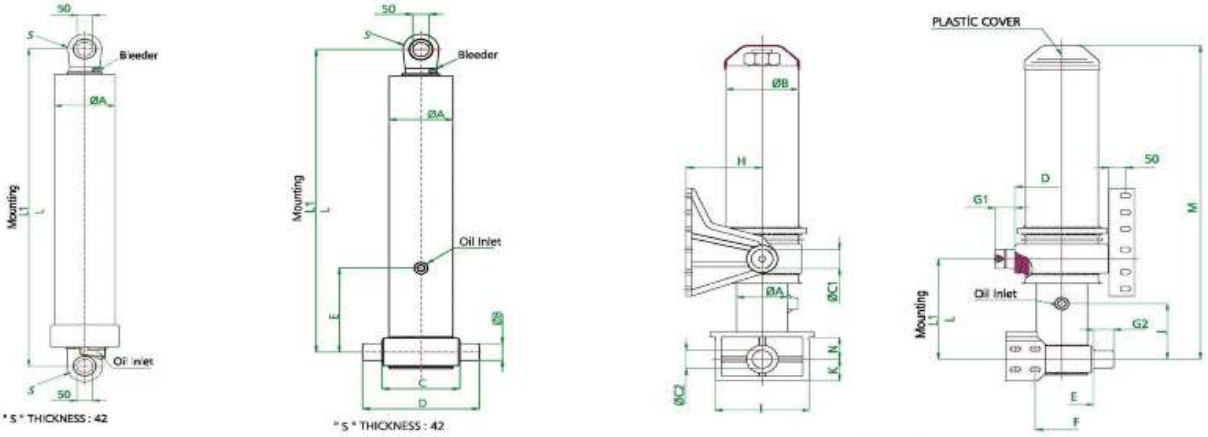
3 Number of stages

2940 Stroke of the cylinder is 2940mm

B Type B Cylinder as shown below eye to eye mounting.

The 116mm first stage diameter will determine the weight that the cylinder will be able to lift with the first stage. Area x Pressure = Force. To increase the speed of the cylinder, a higher flow would be required, fitting a bigger pump in the system will increase flow and speed but only if the hoses are large enough not to restrict the increased flow provided by a bigger pump. Restrictions in the hoses, fitting and valves will lead to increased friction and temperatures reducing hydraulic oil viscosity. Heat and dirt are the leading causes of failures in any hydraulic system.

JOST front of body Cylinders - standard inventory items. (Other models available on request)



TYPE B TYPE C TYPE H

TYPE B	CODE	ØA	ØB	C	D	E	L	L1	Inlet	Oil Capacity	Weight
	GH98-3-2835B	116	-	-	-	-	1318	1348	M18x1,5	17	75
	GHS116-3-2940B	116	-	-	-	-	1367	1397	M22x1,5	24,5	94
	GHS116-3-3330B	116	-	-	-	-	1518	1548	M22x1,5	27,5	105

TYPE C	CODE	ØA	ØB	C	D	E	L	L1	Inlet	Oil Capacity	Weight
	GHS116-3-3450C	136	60	170	290	200	1452	1482	R3/4	29	111
	GHS116-3-4125C	136	60	170	290	200	1675	1705	R1"	29	130
	GHS135-3-3450C	156	60	193	313	200	1452	1482	R3/4"	38,5	135
	GHS154,5-4-4600C	175	60	215	335	200	1450	1480	R3/4"	70	184
	GHS175-5-5750C	197	60	240	360	200	1448	1478	R1"	90,5	270
	GHS175-5-6650C	197	60	240	360	300	1650	1680	R1"	115	275
	GHS175-5-7100C	197	60	240	360	400	1750	1780	R1"	122	291

TYPE H	CODE	ØA	ØB	C	D	E	L	L1	Inlet	Oil Capacity	Weight
	GHS135-4-4260H	156	219	-	283	193	343	373	R3/4"	58	244
	GHS154,5-4-5140H	175	242	-	340	215	343	373	R3/4"	84	255

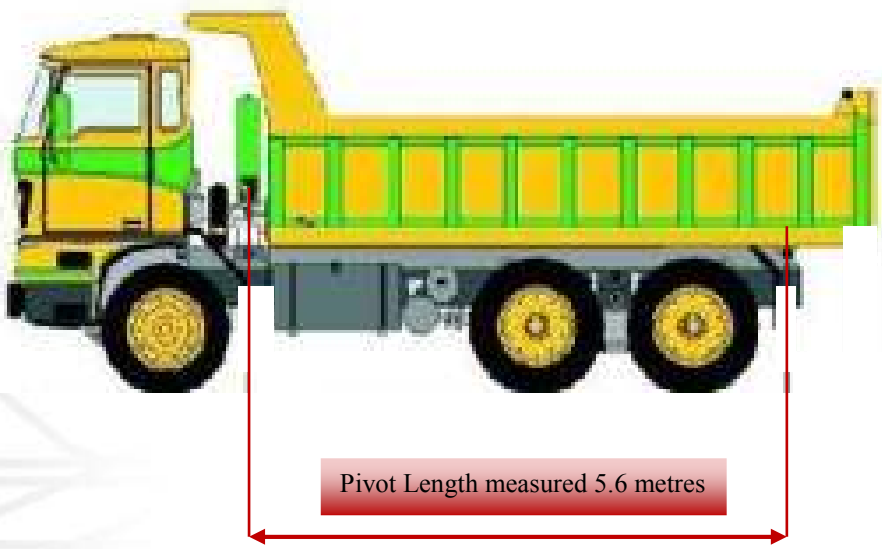
Note that Type B, C and H cylinders have different mounting requirements and this also needs to be taken into account when making your selection.

But how do you calculate the stroke required when you have no information on the cylinder:

Measure the Pivot Length on your tipper, the Pivot Length is measured from the centre of the rear hinge on the tipper bucket to the centre of the mounting pin on the cylinder.
Example Pivot Length measures 5.6 metres.

$$\text{Cylinder Stroke required} = \frac{\text{Tipping angle x Pivot Length}}{60}$$

How to calculate the tip angle?



The tipping angle is determined by the customer or body builder depending on the length of the bucket and the load to be tipped.
Shorter tipping buckets can tip from 50 to 54 degrees in asphalt aplications where the load can be sticky and needs a high tipping angle.
Standard tipping angles for most medium to short buckets should be in the region of 47 to 50 degrees.
Longer sloper buckets going to 10 or 12 metre Pivot Legths can tip at 45 to max 47 degrees.

$$\text{Cyllinder stroke required} = \frac{\text{50 degrees x 5.6 metre Pivot Length}}{60}$$

$$= \text{4.667 metre cylinder stroke required.}$$

A Cylinder with a 4667mm stroke will produce a 50 Degree tipping angle for a Pivot Length measured at 5.6 metres.

At this point consult your selection guide again; we are looking for a cylinder with a stroke of 4667mm or as close as possible to this figure.
The closest match will be the GHS154,5-4-4600C. 4667mm – 4600mm = 67mm shorter than required, This cylinder installed in a Pivot length of 5,6 metres will tip the bucket at slightly less than 50 Degrees as required and therefore would be a perfect fit for this application.

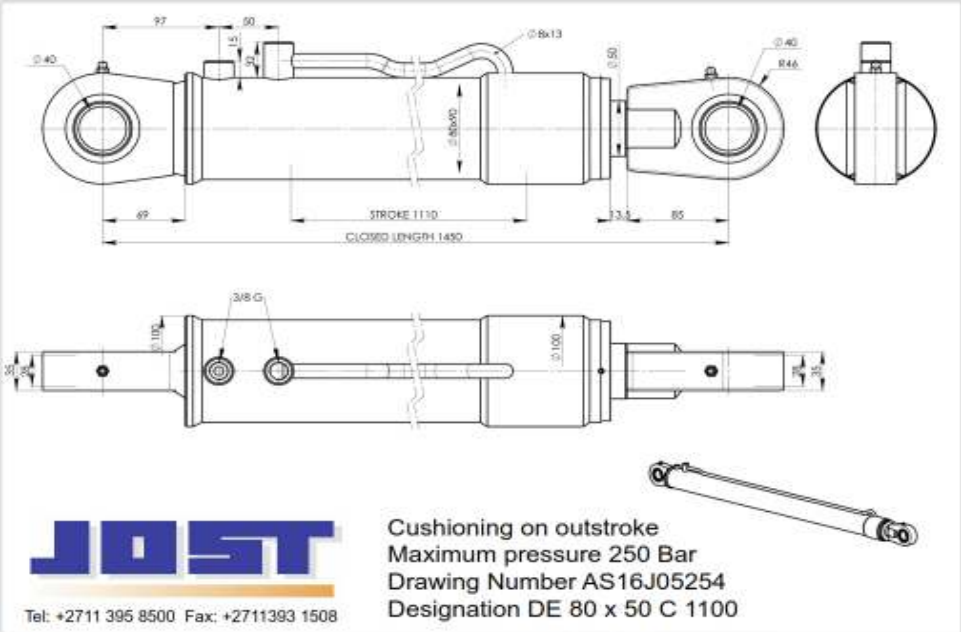
TYPE C	CODE	ØA	ØB	C	D	E	L	L1	Inlet	Oil Capacity	Weight
	GHS116-3-3450C	136	60	170	290	200	1452	1482	R3/4	29	111
	GHS116-3-4125C	136	60	170	290	200	1675	1705	R1"	29	130
	GHS135-3-3450C	156	60	193	313	200	1452	1482	R3/4"	38,5	135
	GHS154,5-4-4600C	175	60	215	335	200	1450	1480	R3/4"	70	184
	GHS175-5-5750C	197	60	240	360	200	1448	1478	R1"	90,5	270
	GHS175-5-6650C	197	60	240	360	300	1650	1680	R1"	115	275
	GHS175-5-7100C	197	60	240	360	400	1750	1780	R1"	122	291

Jost also has a full range of UCB or under body cylinders in the following sizes available:

UCB107-4-1050
UCB107-4-1500
UCB107-4-1510
UCB126-5-1880
UCB145-5-1900
UCB165-5-2500

UCB 107 - 4 – 1050
UCB : Under body cylinder
107 Largest outside diameter on the first stage of the cylinder
4 Stages in the cylinder
1050 stroke of the cylinder

Jost cushioned double acting side tipper cylinder:



For more Jost bulletins please visit the Jost SA website: http://www.jost.co.za/bulletins.asp,
For further information or assistance please contact
Christo de Clerk on 082 774 9818 or christo@jost.co.za