Fuel Economy
Concrete Boom Pumps

Choosing The Right Brand Can Affect Your Bottom Line

Fuel economy is sometimes overlooked when selecting a concrete pump. High diesel prices and the green building movement have elevated fuel economy into the consciousness of pump owners everywhere. In the past several years the Schwing Group has conducted several tests of their concrete pumps with Open Loop Hydraulic Systems in pursuit of fuel efficiency.

Most recently, Schwing America conducted a fuel efficiency test of two popular models of boom pumps, the S 61 SX (61-Meter boom pump) and the 32 XG (32-Meter boom pump). The two tests were conducted near Orlando, Florida on February 18, 2008. The objective was to compare the fuel efficiency of each model versus a competitive brand. Both tests lasted five hours. Since fuel consumption in concrete pumps varies with boom movement and pumping pressure, the units were arranged so the concrete could be pumped from one unit into the other. The booms remained in similar configurations and were not moved during the test.

Ready mix concrete was provided by KMR Concrete Inc., Bartow, FL. The 3,000 psi mix design used for both tests included chemical admixtures to delay the setting of the concrete.

Test #1
2006 Schwing S 61 SX vs 2007 Competitive 61-Meter

The 2006 Schwing S 61 SX was mounted on a 2006 Mack MR 688S with a 427 hp engine. The S 61 SX operates in 7th gear at 1850 maximum rpm. The 2007 competitive 61-Meter was mounted on a 2007 Mack MR 688S with a 460 hp engine that operates in 7th gear at 1760 maximum rpm.

The fuel test compared competitive 61-Meter and 32-Meter boom pumps.

The 2006 Schwing S 61 SX and the 2007 competitive 61-Meter were set-up level and all fuel tanks were topped off prior to priming out at 1:40 pm. At the time of the test the S 61 SX had 3614 pump hours and the competitive 61-Meter had 2228 pump hours. Schwing's hour meter runs whenever the unit's PTO is engaged whereas the competitive unit's hour meter only runs while the unit is pumping, which would explain some of the difference in hours for these units. At 1:45 pm the prime was complete and the units began pumping.

The S 61 SX was timed between 16 and 17 strokes per minute. The pump on the S 61 SX was the 2525H-6 120/85 MPS, rated at 213 cubic yards per hour, 1169 psi, with 250 mm by 2500 mm material cylinders and up to 22 strokes per minute.

The competitive 61-Meter was timed between 24 and 25 strokes per minute. The pump kit on the 61-Meter had 140/80 differential cylinders, and was rated at 210 cubic yards per hour, 1233 psi, with 230 mm by 2100 mm material cylinders and up to 31 strokes per minute.

At 5:30 pm the Schwing S 61 SX was operating at 1780 rpm. The operating temperature of the unit was 68˚C, up from 54˚C at the start of the test. Pumping pressure was 68 bar up from 56 bar at the start of the test.

Also at 5:30 pm the competitive 61-Meter was operating at 1800 RPM. The operating temperature was 65˚C, up from 55˚C at the start of the pour.

At 5:45 pm, both 61s stopped pumping and began their wash out procedure. Given the average strokes of the 61s, it was estimated that they pumped approximately 165 cubic yards per hour, 825 cubic yards total.

Results

Both 61s were driven to the on-site fuel tanks prior to going to the wash bay for further clean up. Total fuel added to the S 61 SX was 41.34 gallons. Total fuel added to the competitive 61-Meter was 52.10 gallons. It was noted the difference in fuel consumption was 26% in favor of the Schwing.

Test #2
2004 Schwing 32 XG vs 2006 Competitive 32-Meter

The 2004 Schwing 32 XG was mounted on a 2005 Mack MR 688S with a 350 hp engine. The 32 XG operates in 7th gear at 1650 maximum rpm.

The 2006 competitive 32-Meter was mounted on a 2006 Mack MR 688S with a 427 hp engine that operates in 9th gear at 1850 maximum rpm.

Once Test #1 was underway, the 32 meter concrete pumps, which were already set up level and topped off, were primed out at 2:20 pm. At the time of the test the Schwing 32 XG had 3958 pump hours and the competitive 32-Meter had 2080 pump hours. At 2:25 pm both 32s began pumping and both were timed at approximately 20 strokes per minute.

The pump kit on the 2004 Schwing 32 XG was the 1200 125/80 Single Circuit rated at 170 cubic yards per hour, 758 psi, with 230 mm by 2000 mm material cylinders and up to 26 strokes per minute.

The pump kit on the 2006 competitive 32-Meter had 140/80 differential cylinders, and was rated at 210 cubic yards per hour, 1233 psi, with 230 mm by 2100 mm material cylinders and up to 31 strokes per minute.

At 5:40 pm the Schwing 32 XG was operating at 1650 RPM. The operating temperature of the unit was 70˚C (the operating temp at the start was not noted). Pumping pressure was between 80 and 90 bar.

At 5:40 pm the competitive 32-Meter was operating at 1750 RPM. The operating temperature was approximately 70˚C.

At 7:20 pm the 32s stopped pumping and began their washout procedure. The concrete temperature was 143˚F. The average strokes of the 32s indicated a rate of approximately 143 cubic yards per hour, 720 cubic yards total.

Pump to pump operation is monitored using Schwing's Vector Control System which provides valuable two-way communication between pump and operator.

TEST #1 - Projected Fuel Savings @ 1,290 hrs/yr

	S 61 SX	61-Meter
Gallons Per Day	41	52
Gallons Per Week	205	260
Gallons Per Month	882	1,118
Gallons Per Year	10,584	13,416
Gallons Saved Per Year	(2,832)	
Annual Savings	$9,912	
5 Year Savings	$49,560	
10 Year Savings	$99,120	
20 Year Savings	$198,240	

TEST #2 - Projected Fuel Savings @ 1,290 hrs/yr

	32 XG	32-Meter
Gallons Per Day	28	45
Gallons Per Week	140	225
Gallons Per Month	602	968
Gallons Per Year	7,224	11,610
Gallons Saved Per Year	(4,386)	
Annual Savings	$15,351	
5 Year Savings	$ 76,755	
10 Year Savings	$ 153,510	
20 Year Savings	$ 307,020	

Results

Both 32s were also driven to the on-site fuel tanks prior to going to the wash bay for further clean up. The total fuel added to the Schwing 32 XG was 27.76 gallons. The total fuel added to the competitive 32-Meter was 45.34 gallons. It was noted that the difference in fuel consumption was 63% in favor of the Schwing.

Industry statistics estimate fuel expense at more than 10% of operating expense for a concrete pump. As this test shows, Schwing's design, including their Open Loop Hydraulic System, can significantly affect fuel consumption and profitability for owner operators and fleet owners. ❑