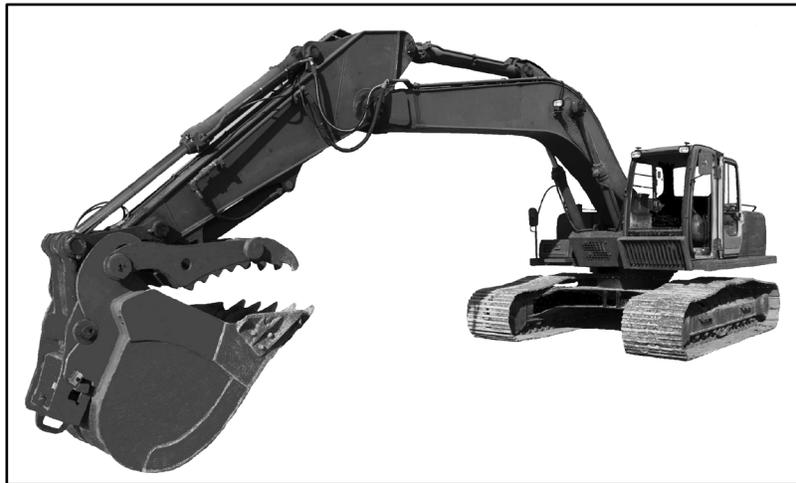


**GTA 05-04-041**

# **Hydraulic Excavator**

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**Headquarters, Department of the Army  
June 2010**

1. Lift capacities for the 240D LC hydraulic excavator (HYEX) are shown in table 1. For table 1—

- Hydraulic-limited capacities are in ***bold italic*** text, and stability-limited capacities (in pounds) are in normal text.
- The ratings are at the bucket lift hook.
- The HYEX is equipped with a 1.38-cubic-yard, 42-inch, 2,195-pound bucket; a 11,904-pound counterweight; and a standard gauge.
- The HYEX is situated on a firm, uniform supporting surface.
- The total load includes the weight of the cables, hook, and such.
- The figures do not exceed 87 percent of hydraulic capacities or 75 percent of the weight needed to tip the machine.
- All lift capacities are based on Society of American Military Engineers (SAE) J1097.
- The load point is the horizontal distance from the centerline of rotation.

2. The lift capacities for the 230 LCR/LCRD HYEX are shown in table 2, page 5. For table 2—

- Hydraulic-limited capacities are in ***bold italic*** text, and stability-limited capacities (in pounds) are in normal text.
- The ratings are at the bucket lift hook.
- The HYEX is equipped with a 1.38-cubic-yard, 42-inch, 1,785-pound bucket; a standard counterweight; and a standard gauge.
- The HYEX is situated on a firm, uniform supporting surface.
- The total load includes the weight of the cables, hook, and such.
- The figures do not exceed 87 percent of hydraulic capacities or 75 percent of the weight needed to tip the machine.
- All lift capacities are based on SAE J1097.
- The load point is the horizontal distance from the centerline of rotation.

3. The HYEX hourly production is shown in table 3, page 6. For table 3—

- One hour equals 60 minutes.
- Buckets are at 100 percent capacity.
- The average production is in **bold** text.

4. An estimating cycle time chart for the HYEX is shown in table 4, page 8.

5. A trenching conversion chart for the HYEX is shown in figure 1, page 10.

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**Table 1. 240D LC lift capacities**

Load Point Height	10 ft		15 ft		20 ft		25 ft		30 ft	
	Over Front	Over Side	Over Front	Over Side						
With an 11-ft, 10-in arm and 32-in triple, semigrouser shoes										
20 ft							<b>7,549</b>	<b>7,549</b>		
15 ft					<b>8,518</b>	<b>8,518</b>	<b>8,607</b>	<b>8,607</b>	<b>6,261</b>	<b>6,261</b>
10 ft			<b>14,688</b>	<b>14,688</b>	<b>11,557</b>	<b>11,557</b>	<b>10,049</b>	<b>10,049</b>	<b>8,091</b>	<b>8,091</b>
5 ft			<b>20,756</b>	<b>18,889</b>	<b>14,486</b>	<b>12,098</b>	<b>11,624</b>	<b>8,385</b>	<b>9,678</b>	<b>6,038</b>
Ground line			<b>24,563</b>	<b>17,619</b>	<b>16,877</b>	<b>11,347</b>	<b>12,785</b>	<b>7,956</b>	<b>9,457</b>	<b>5,809</b>
-5 ft	<b>13,061</b>	<b>13,061</b>	<b>25,705</b>	<b>17,163</b>	<b>17,903</b>	<b>10,923</b>	<b>12,480</b>	<b>7,678</b>	<b>9,308</b>	<b>5,670</b>
-10 ft	<b>22,506</b>	<b>22,506</b>	<b>25,004</b>	<b>17,154</b>	<b>17,768</b>	<b>10,804</b>	<b>12,387</b>	<b>7,593</b>		
-15 ft	<b>29,633</b>	<b>29,633</b>	<b>22,540</b>	<b>17,460</b>	<b>16,709</b>	<b>10,961</b>	<b>12,307</b>	<b>7,768</b>		
-20 ft			<b>17,275</b>	<b>17,275</b>	<b>12,097</b>	<b>11,532</b>				
With an 11-ft, 10-in arm and 28-in triple, semigrouser shoes										
20 ft							<b>7,549</b>	<b>7,549</b>		
15 ft					<b>8,518</b>	<b>8,518</b>	<b>8,607</b>	<b>8,607</b>	<b>6,261</b>	<b>6,261</b>
10 ft			<b>14,688</b>	<b>14,688</b>	<b>11,557</b>	<b>11,557</b>	<b>10,049</b>	<b>8,775</b>	<b>8,091</b>	<b>6,206</b>
5 ft			<b>20,756</b>	<b>18,696</b>	<b>14,486</b>	<b>11,961</b>	<b>11,624</b>	<b>8,282</b>	<b>9,578</b>	<b>5,955</b>
Ground line			<b>24,563</b>	<b>17,417</b>	<b>16,877</b>	<b>11,210</b>	<b>12,627</b>	<b>7,853</b>	<b>9,332</b>	<b>5,726</b>
-5 ft	<b>13,061</b>	<b>13,061</b>	<b>25,705</b>	<b>16,960</b>	<b>17,687</b>	<b>10,786</b>	<b>12,322</b>	<b>7,574</b>	<b>9,183</b>	<b>5,587</b>
-10 ft	<b>22,506</b>	<b>22,506</b>	<b>25,004</b>	<b>16,952</b>	<b>17,551</b>	<b>10,666</b>	<b>12,229</b>	<b>7,489</b>		
-15 ft	<b>29,633</b>	<b>29,633</b>	<b>22,540</b>	<b>17,257</b>	<b>16,709</b>	<b>10,824</b>	<b>12,307</b>	<b>7,664</b>		
-20 ft			<b>17,275</b>	<b>17,275</b>	<b>12,097</b>	<b>11,395</b>				

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**Table 1. 240D LC lift capacities (continued)**

Load Point Height	10 ft		15 ft		20 ft		25 ft		30 ft	
	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side
With a 9-ft, 9-in arm and 32-in triple, semigrouser shoes										
20 ft							<b>8,237</b>	<b>8,237</b>		
15 ft					<b>10,540</b>	<b>10,540</b>	<b>9,885</b>	<b>9,122</b>		
10 ft			<b>17,515</b>	<b>17,515</b>	<b>13,047</b>	<b>12,726</b>	<b>11,074</b>	<b>8,728</b>	<b>7,205</b>	<b>6,196</b>
5 ft			<b>23,155</b>	<b>18,262</b>	<b>15,755</b>	<b>11,858</b>	<b>12,482</b>	<b>8,288</b>	<b>9,206</b>	<b>6,004</b>
Ground line			<b>25,634</b>	<b>17,416</b>	<b>17,721</b>	<b>11,241</b>	<b>12,744</b>	<b>7,930</b>	<b>9,235</b>	<b>5,837</b>
-5 ft	<b>12,761</b>	<b>12,761</b>	<b>25,654</b>	<b>17,248</b>	<b>17,922</b>	<b>10,954</b>	<b>12,530</b>	<b>7,734</b>		
-10 ft	<b>19,352</b>	<b>19,352</b>	<b>24,124</b>	<b>17,398</b>	<b>17,921</b>	<b>10,953</b>	<b>12,548</b>	<b>7,750</b>		
-15 ft	<b>27,603</b>	<b>27,603</b>	<b>20,730</b>	<b>17,836</b>	<b>15,487</b>	<b>11,247</b>				
With a 9-ft, 9-in arm and 28-in triple, semigrouser shoes										
20 ft							<b>8,237</b>	<b>8,237</b>		
15 ft					<b>10,540</b>		<b>9,885</b>	<b>9,018</b>		
10 ft			<b>17,515</b>	<b>17,515</b>	<b>13,047</b>	<b>10,540</b>	<b>11,074</b>	<b>8,625</b>		
5 ft			<b>23,155</b>	<b>18,059</b>	<b>15,755</b>	<b>12,589</b>	<b>12,482</b>	<b>8,184</b>		
Ground line			<b>25,634</b>	<b>17,213</b>	<b>17,721</b>	<b>11,721</b>	<b>12,586</b>	<b>7,826</b>	<b>7,205</b>	<b>6,113</b>
-5 ft	<b>12,761</b>	<b>12,761</b>	<b>25,654</b>	<b>17,045</b>	<b>17,706</b>	<b>11,104</b>	<b>12,372</b>	<b>7,630</b>	<b>9,206</b>	<b>5,921</b>
-10 ft	<b>19,352</b>	<b>19,352</b>	<b>24,124</b>	<b>17,196</b>	<b>17,705</b>	<b>10,817</b>	<b>12,389</b>	<b>7,646</b>	<b>9,235</b>	<b>5,753</b>
-15 ft	<b>27,603</b>	<b>27,603</b>	<b>20,730</b>	<b>17,634</b>	<b>15,487</b>	<b>11,110</b>				
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**Table 2. 230 LCR/LCRD lift capacities**

Load Point Height	5 ft		10 ft		15 ft		20 ft	
	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side
With 9-ft, 9-in triple, semigrouser shoes								
20 ft	<b>7,863</b>	<b>7,863</b>						
15 ft	<b>10,238</b>	<b>10,238</b>	<b>9,746</b>	<b>8,645</b>				
10 ft	<b>16,697</b>	<b>16,697</b>	<b>12,664</b>	<b>12,664</b>	<b>4,935</b>	<b>8,303</b>		
5 ft	<b>22,483</b>	<b>17,575</b>	<b>15,402</b>	<b>11,348</b>	<b>12,296</b>	<b>7,905</b>	<b>8,789</b>	<b>5,711</b>
Ground line	<b>25,492</b>	<b>16,696</b>	<b>17,526</b>	<b>10,761</b>	<b>12,292</b>	<b>7,572</b>	<b>8,824</b>	<b>5,559</b>
-5 ft	<b>12,015</b>	<b>12,015</b>	<b>25,928</b>	<b>16,482</b>	<b>17,293</b>	<b>10,470</b>	<b>12,082</b>	<b>7,380</b>
-10 ft	<b>27,586</b>	<b>27,586</b>	<b>24,741</b>	<b>16,586</b>	<b>18,218</b>	<b>10,443</b>	<b>12,081</b>	<b>7,379</b>
-15 ft	<b>29,580</b>	<b>29,580</b>	<b>21,733</b>	<b>16,956</b>	<b>16,128</b>	<b>10,685</b>		
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**Table 3. Hourly production**

Estimated Bucket Payload Loose Cubic Yards											
Estimated Cycle Times										Estimated Cycle Times	
Sec	Min	0.5	0.75	1.0	1.5	2.0	2.5	3.0	Cycles per Minute	Cycles per Hour	
10.0	0.17								6.0	360	
11.0	0.18	164.0	245.0	327	491	655	818	982	5.5	327	
12.0	0.20	150.0	225.0	300	450	600	750	900	5.0	300	
13.0	0.22	138.0	208.0	277	415	554	692	831	4.6	277	
14.0	0.23	129.0	193.0	257	386	514	643	771	4.3	257	
15.0	0.25	120.0	180.0	240	360	480	600	720	4.0	240	
17.5	0.29	103.0	154.0	206	309	411	514	617	3.4	206	
20.0	0.33	90.0	135.0	180	270	360	450	540	3.0	180	
25.0	0.42	72.0	108.0	144	216	288	360	432	2.4	144	
30.0	0.50	60.0	90.0	120	180	240	300	360	2.0	120	
35.0	0.58	51.4	77.1	103	154	206	257	309	1.7	103	
40.0	0.67	45.0	67.5	90	135	180	225	270	1.5	90	
45.0	0.75	40.0	60.0	80	120	160	200	240	1.3	80	
50.0	0.83			72	108	144	180	216	1.2	72	
55.0	0.92							196	1.1	65	
60.0	100.00								1.0	60	

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**Table 3. Hourly production (continued)**

Estimated Bucket Payload Loose Cubic Yards										
Estimated Cycle Times								Estimated Cycle Times		
Sec	Min	3.5	4.0	4.5	5.0	5.5	6.0	Cycles per Minute	Cycles per Hour	
10.0	0.17							6.0	360	
11.0	0.18	1,145.0						5.5	327	
12.0	0.20	1,050.0	1,200	1,350	1,500.0	1,650	1,800	5.0	300	
13.0	0.22	969.2	1,108	1,246	1,385.0	1,523	1,662	4.6	277	
14.0	0.23	900.0	1,029	1,157	1,286.0	1,414	1,543	4.3	257	
15.0	0.25	840.0	960	1,080	1,200.0	1,320	1,440	4.0	240	
17.5	0.29	720.0	823	926	1,029.0	1,131	1,234	3.4	206	
20.0	0.33	630.0	720	810	900.0	990	1,080	3.0	180	
25.0	0.42	504.0	576	648	720.0	792	864	2.4	144	
30.0	0.50	420.0	480	540	600.0	660	720	2.0	120	
35.0	0.58	360.0	411	463	514.0	566	617	1.7	103	
40.0	0.67	315.0	360	405	450.0	495	540	1.5	90	
45.0	0.75	280.0	320	360	400.0	440	480	1.3	80	
50.0	0.83	252.0	288	324	360.0	396	432	1.2	72	
55.0	0.92	229.1	262	295	327.3	360	393	1.1	65	
60.0	100.00							1.0	60	

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**Table 4. Estimating cycle time**

Cycle Time (Seconds)	200D LC	225D LC	240D LC	270D LC	350D LC	450D LC	600D LC	850D LC	Cycle Time (Minutes)
10	Min	Min							0.17
					Min				
			Min	Min					
						Min		Min	
15							Min		0.25
20	Max	Max							0.33
25			Max	Max					0.42

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Table 4. Estimating cycle time (continued)

Cycle Time (Seconds)	200D LC	225D LC	240D LC	270D LC	350D LC	450D LC	600D LC	850D LC	Cycle Time (Minutes)
30					Max				0.5
						Max			
35							Max	Max	0.58
40									0.67
45									0.75

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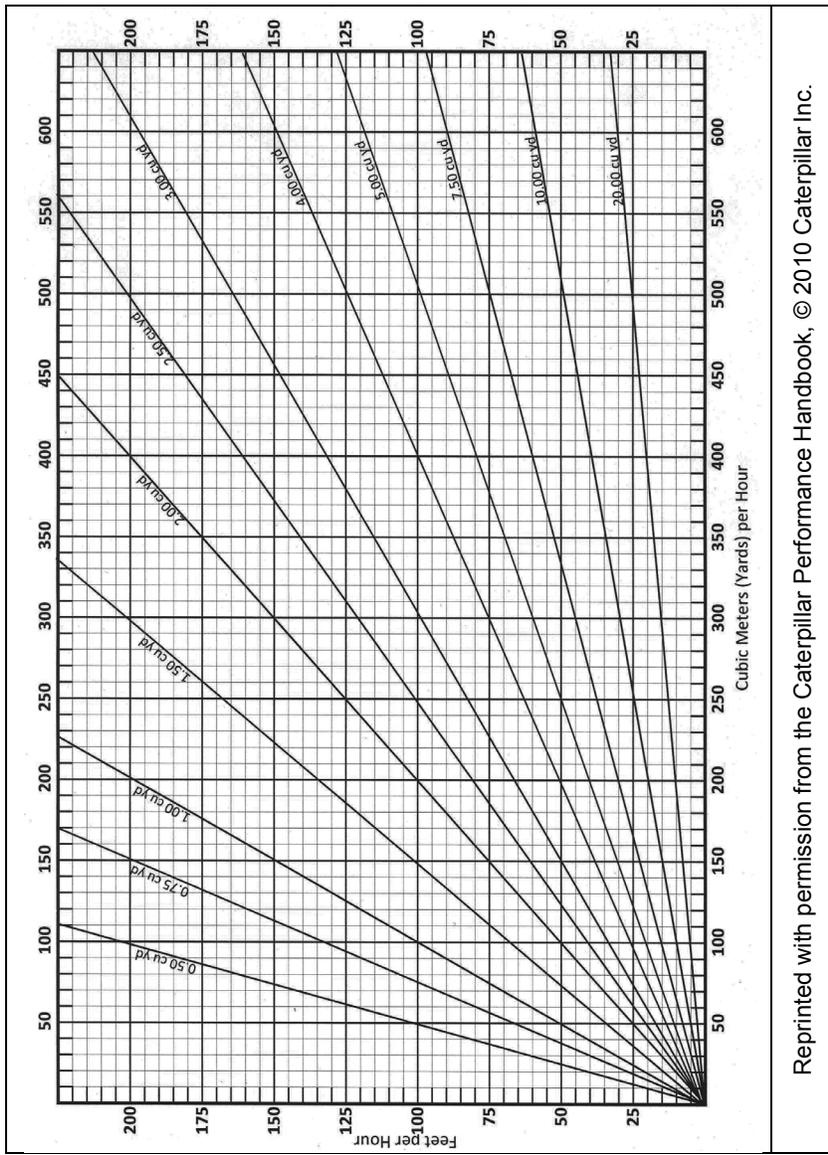


Figure 1. Trenching conversion chart