

C-7

**Harnischfeger**  
**P&H**

# *OPERATORS* *MANUAL*

**MODEL 440**



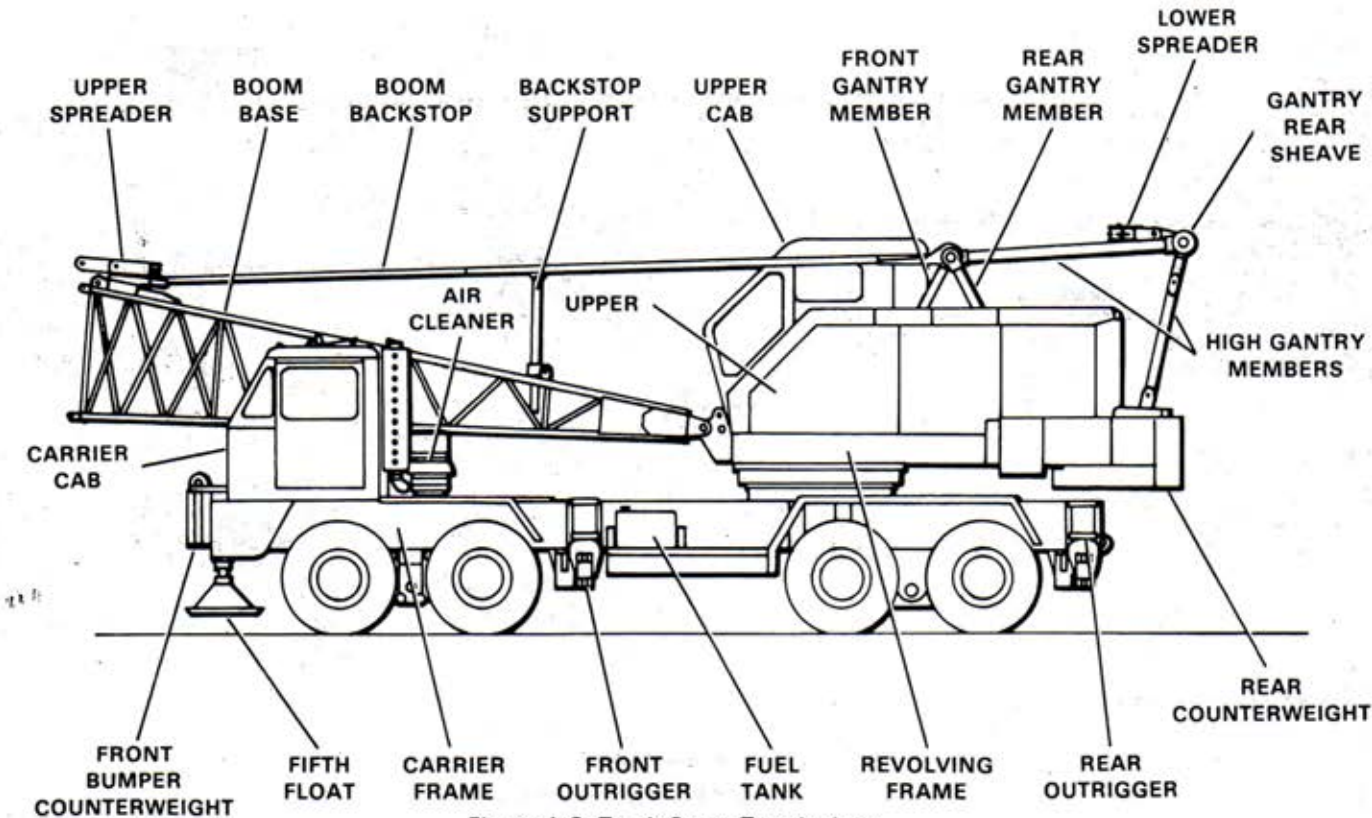


Figure 1-3. Truck Crane Terminology

**TABULATED DATA**

**LIQUID CAPACITIES.** Table 1-1 provides a listing of the liquid capacities for machine components. The capacities are also given in the lubrication charts provided in Section III.

**GENERAL DIMENSIONS.** Figure 1-4 gives the dimensions commonly required for machine shipping and erection.

**RANGE DIAGRAMS.** Figures 1-5, 1-6 and 1-7 illustrate the working ranges when the machine is being used as a crane, clamshell or dragline.

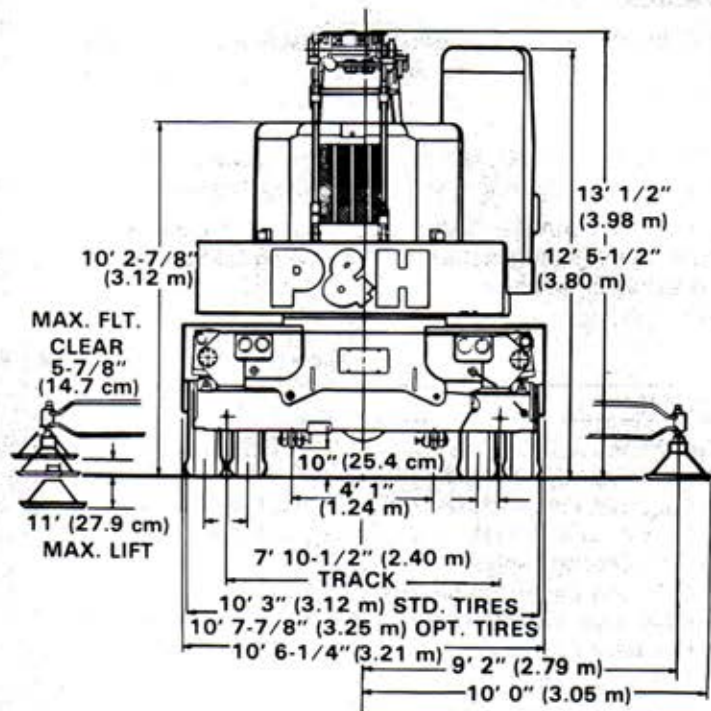
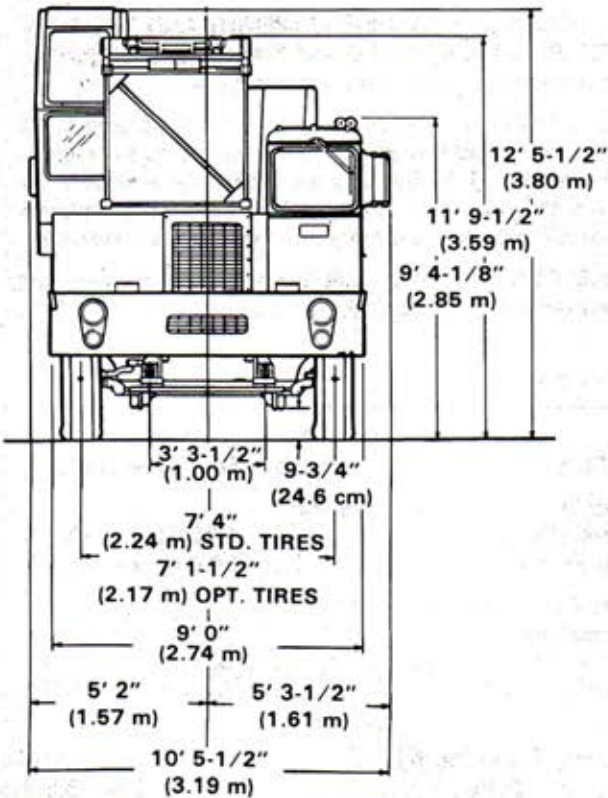
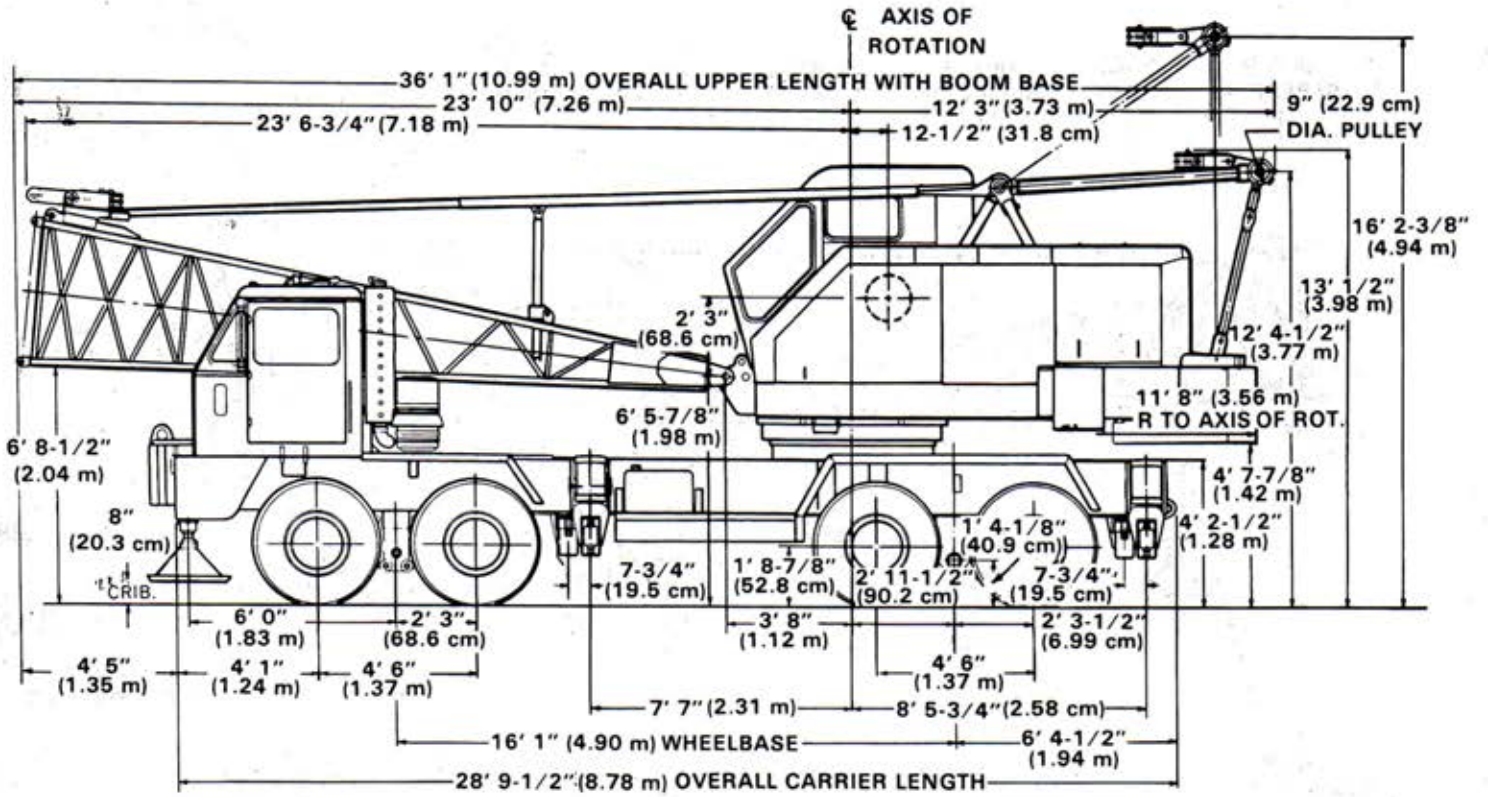
**AXLE LOADING ATTACHMENT WEIGHT AND TIRE RATING CHARTS.** Table 1-2, 1-3 and 1-4 provide the information necessary when roading the machine.

**TORQUE VALUES.** Unless otherwise specified, torque all common bolts and screws on this machine to the values shown in Table 1-5. The torques provided are to be used with dry threads. The use of thread lubricant or plated threads will substantially lower the torque values required.

**METRIC CONVERSIONS.** Use Table 1-6 to convert the English units in this manual to metric units.

**Table 1-1. Liquid Capacities (U.S. and Metric Units)**

| CARRIER  | UPPER  |
|--|--|
| Fuel Tank ..... 75 gallons (283.9 l)                       | Fuel Tank ..... 40 gallons (151.4 l)                       |
| Engine Lube Oil, including filter                          | Engine Lube Oil, including filters                         |
| Cummins Engine (NHF-240) ..... 6 gallons (22.7 l)          | Detroit Diesel 4-53N ..... 14.5 quarts (13.7 l)            |
| DDA Engine (6-71N) ..... 6 gallons (22.7 l)                | Cummins V378 ..... 30.0 quarts (28.4 l)                    |
| Engine Cooling System                                      | Engine Cooling System (engine and radiator)                |
| Cummins Engine (Initial fill)..... 12.25 gallons (46.4 l)  | Detroit Diesel 4-53N ..... 5.4 gallons (20.4 l)            |
| DDA Engine (6-71N) (Initial fill) . 12.25 gallons (46.4 l) | Cummins V378 ..... 5.5 gallons (20.8 l)                    |
| Cummins Engine (Radiator) ..... 6.25 gallons (23.7 l)      |  |
| DDA Engine (Radiator)..... 6.25 gallons (23.7 l)           | Air Cleaner  |
| Steering/Outrigger Hydraulic Oil                           | Donaldson (on Detroit Diesel 4-53N)..... 7.5 pints (3.5 l) |
| Hydraulic System ..... 19 gallons (71.9 l)                 | Transmission   |
| Hydraulic Reservoir ..... 8 gallons (30.3 l)               | New Process ..... 9.0 pints (4.3 l)                        |
| Steering Gear ..... 2.5 pints (1.2 l)                      | Gear and Chain Case..... 7.0 gallons (26.5 l)              |
| Main Transmission (Fuller RT-906) ..... 26 pints (12.3 l)  | Hydraulic system..... 1.5 gallons (5.7 l)                  |
| Auxiliary Transmission (Spicer R8031-R) . 12 pints (5.7 l) |  |
| Rear Axle (each) ..... 21 pints (9.9 l)                    |  |
| Planetary Hub, each end..... 8 pints (3.81 l)              |  |



NOTE: WHEN USING OPTIONAL TIRES, (14.00 x 20 - 18 PR) ADD 1-3/8" (3.3 cm) TO ALL GROUND LINE DIMENSIONS.

Figure 1-4. General Dimension (8105J277)

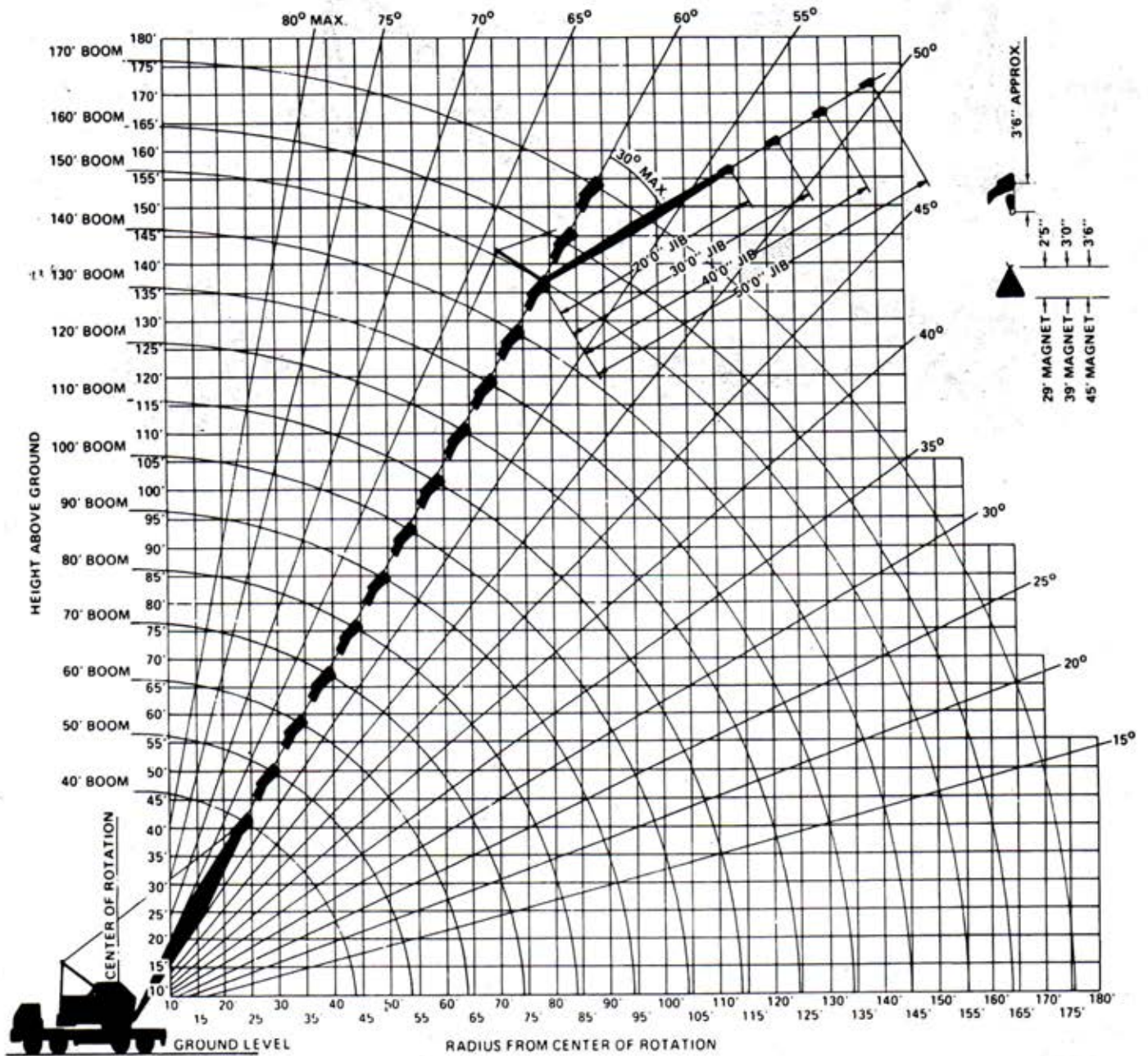


Figure 1-5. Crane Range Diagram

# P&H MODEL 440 T.C. — 40 TON TRUCK CRANE

RATED CRANE LOADS IN POUNDS — MAIN BOOM (48"W x 48"D) IN OVER SID

| Over Rad Ft | Angle | 40 ft Boom   |             | 50 ft Boom   |             | 60 ft Boom   |             | 70 ft Boom   |             | 80 ft Boom   |             | 90 ft Boom   |             | 100 ft Boom  |             |
|-------------|-------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
|             |       | Boom Pt. Lt. | Rating Lbs. | Boom Pt. Lt. | Rating Lbs. | Boom Pt. Lt. | Rating Lbs. | Boom Pt. Lt. | Rating Lbs. | Boom Pt. Lt. | Rating Lbs. | Boom Pt. Lt. | Rating Lbs. | Boom Pt. Lt. | Rating Lbs. |
| 12          | 79    | 47.0         | 80,000      |              |             |              |             |              |             |              |             |              |             |              |             |
| 15          | 75    | 46.3         | 70,000      | 78           | 56.6        | 70,000       |             |              |             |              |             |              |             |              |             |
| 20          | 67    | 44.6         | 54,900      | 72           | 55.3        | 54,600       | 75          | 65.7         | 54,300      | 77           | 76.0        | 53,900       |             |              |             |
| 25          | 59    | 42.0         | 43,200      | 66           | 53.3        | 43,100       | 70          | 64.1         | 42,700      | 73           | 74.7        | 42,500       | 75          | 85.0         | 42,100      |
| 30          | 50    | 38.4         | 33,800      | 59           | 50.7        | 33,700       | 65          | 62.0         | 33,600      | 69           | 72.9        | 33,400       | 71          | 83.6         | 33,300      |
| 35          | 40    | 33.2         | 26,800      | 52           | 47.2        | 26,700       | 59          | 59.4         | 26,500      | 64           | 70.7        | 26,400       | 67          | 81.7         | 26,200      |
| 40          | 26    | 25.0         | 22,500      | 44           | 42.7        | 22,000       | 53          | 56.0         | 21,800      | 59           | 68.0        | 21,700       | 64          | 79.4         | 21,500      |
| 45          |       |              |             | 35           | 36.4        | 18,600       | 47          | 51.8         | 18,400      | 54           | 64.7        | 18,300       | 59          | 76.7         | 18,100      |
| 50          |       |              |             | 23           | 27.1        | 16,300       | 40          | 46.4         | 15,800      | 49           | 60.7        | 15,700       | 55          | 73.4         | 15,500      |
| 60          |       |              |             |              |             |              | 21          | 28.9         | 12,500      | 37           | 49.9        | 12,000       | 47          | 65.8         | 11,800      |
| 70          |       |              |             |              |             |              |             |              |             | 21           | 32.8        | 10,000       | 36          | 54.2         | 9,600       |
| 80          |       |              |             |              |             |              |             |              |             |              |             |              | 20          | 34.5         | 8,000       |
| 90          |       |              |             |              |             |              |             |              |             |              |             |              | 19          | 36.1         | 6,450       |
| 100         |       |              |             |              |             |              |             |              |             |              |             |              |             |              |             |
| 110         |       |              |             |              |             |              |             |              |             |              |             |              |             |              |             |
| 120         |       |              |             |              |             |              |             |              |             |              |             |              |             |              |             |

RATINGS ABOVE HEAVY LINE ARE LIMITED BY STRENGTH OF MATERIALS

RATED CRANE LOADS IN POUNDS — MAIN BOOM — WITHOUT OUTRIGGERS — TIRES AT 95 P.S.I.

| Over Rad Ft | Angle | 40 ft Boom |           | 50 ft Boom |           | 60 ft Boom |           | 70 ft Boom |           | 80 ft Boom |           | 90 ft Boom |           | 100 ft Boom |           | Over Rad Ft |        |
|-------------|-------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|-------------|-----------|-------------|--------|
|             |       | Over Side  | Over Rear | Over Side  | Over Rear | Over Side  | Over Rear | Over Side  | Over Rear | Over Side  | Over Rear | Over Side  | Over Rear | Over Side   | Over Rear |             |        |
| 12          | 79    | 39,500     | 48,600    |            |           |            |           |            |           |            |           |            |           |             |           | 12          |        |
| 15          | 75    | 32,900     | 38,400    | 78         | 32,800    | 38,200     |           |            |           |            |           |            |           |             |           | 15          |        |
| 20          | 67    | 24,300     | 26,400    | 72         | 24,100    | 26,300     | 75        | 24,000     | 26,100    | 77         | 23,900    | 25,900     |           |             |           | 20          |        |
| 25          | 59    | 18,000     | 19,900    | 66         | 17,800    | 19,800     | 70        | 17,700     | 19,600    | 72         | 17,500    | 19,400     | 75        | 17,300      | 19,200    | 77          | 17,100 |
| 30          | 50    | 14,100     | 15,800    | 59         | 13,900    | 15,700     | 65        | 13,800     | 15,500    | 69         | 13,600    | 15,300     | 71        | 13,400      | 15,100    | 73          | 13,200 |
| 35          | 40    | 11,800     | 13,000    | 52         | 11,700    | 12,800     | 59        | 11,500     | 12,600    | 64         | 11,300    | 12,400     | 67        | 11,100      | 12,200    | 70          | 10,900 |
| 40          | 26    | 10,200     | 11,800    | 44         | 9,600     | 11,100     | 63        | 9,500      | 10,000    | 65         | 9,300     | 10,700     | 68        | 9,100       | 10,500    | 67          | 8,900  |
| 45          |       |            |           | 35         | 8,150     | 9,450      | 47        | 8,000      | 9,250     | 54         | 7,800     | 9,050      | 59        | 7,600       | 8,900     | 63          | 7,400  |
| 50          |       |            |           | 23         | 7,300     | 8,450      | 40        | 6,800      | 7,950     | 45         | 6,650     | 7,800      | 55        | 6,450       | 7,600     | 59          | 6,250  |
| 60          |       |            |           |            |           |            | 21        | 5,350      | 6,300     | 37         | 4,900     | 5,700      | 47        | 4,700       | 5,700     | 52          | 4,500  |
| 70          |       |            |           |            |           |            |           |            |           | 21         | 3,950     | 4,800      | 36        | 3,500       | 4,350     | 44          | 3,300  |
| 80          |       |            |           |            |           |            |           |            |           |            |           |            | 19        | 2,850       | 3,600     | 33          | 2,450  |
| 90          |       |            |           |            |           |            |           |            |           |            |           |            |           |             |           | 19          | 1,950  |
| 100         |       |            |           |            |           |            |           |            |           |            |           |            |           |             |           | 18          | 1,200  |

RATINGS ABOVE HEAVY LINE ARE LIMITED BY STRENGTH OF MATERIALS

**WARNING:** When operating crane "without outriggers" loads lifted over rear and swing over side, will increase in radius due to tire deflection. This increase in radius must be compensated for by raising boom, or machine may tip over.

Operating radius is the horizontal distance from centerline of rotation to a vertical line through the center of gravity of the load

Ratings shown are only for combination of P&H manufactured upper, boom, counterweight, carrier, and outriggers. Boom backstops are required for all boom lengths. Boom inserts must be arranged as shown in boom make up chart. Standard boom hoist reeving is 12 part line. Gantry must be in raised position for all crane operations. When boom is equipped with job main hook ratings must be reduced by 1,500 lbs. for 20 ft. or 30 ft. job, 2,000 lbs. for 40 ft. job, and 2,500 lbs. for 50 ft. job.

Ratings shown are based on freely suspended loads and make no allowance for such factors as wind effect on lifted load, ground conditions, out of level operating speeds or any other condition that could be detrimental to the safe operation of this equipment. The operator, therefore, has the responsibility to judge the existing conditions and reduce lifted load and operating speeds accordingly. Ratings do not exceed 85% of liquid.

**WARNING:** The wind effect on the lifted load can cause sufficient side load to overstress boom or job structure. When suspended load will not remain in line with boom detail chart 25. We recommend stopping operation when wind is above 30 M.P.H. and being off, or lowering, boom when wind is above 50 M.P.H. When continued operation under windy conditions is necessary, consult factory for special derated load rating chart.

P&H Type 4 Wire Rope 6x25 with filler wire, preformed plain steel wire rope, 7x7 TWRC.

Maximum approved travel speed with 5,050 pound front bumper counterweight installed is 5 M.P.H. All tires must be evenly inflated to 100 P.S.I. Booms must be positioned over the crest of carrier. Maximum approved boom length for travel is 100 ft boom or 80 ft boom and 20 ft job. Gantry must be in raised position to travel with boom attached.

**NOTE:** When three-quarter inch diameter P&H Type II Wire Rope (18 x 7 non-rotating construction) is used, the rated load capacity is reduced by 10%.

Table 1-2. Axle Loading Chart (8105N87)

| Item | Description of Item(s)  | Total Weight Or Adjustment<br>Lbs/Kgs | Boom Over Front of Carrier     |                               | Boom Over Rear of Carrier      |                               |
|------|---|---------------------------------------|--------------------------------|-------------------------------|--------------------------------|-------------------------------|
|      |   |                                       | Front Tandem<br>Weight Lbs/Kgs | Rear Tandem<br>Weight Lbs/Kgs | Front Tandem<br>Weight Lbs/Kgs | Rear Tandem<br>Weight Lbs/Kgs |
| 1    | Basic Machine Including:<br>Hyd. O/R Assembly w/Floats (4)<br>12:00 x 20/G (14PR) Tires (12)<br>Upper<br>Gantry — Lowered Position<br>Slewing Rim<br>Cast Counterweight<br>40 Gal. Fuel — Upper<br>75 Gal. Fuel — Lower<br>No Crane Attachments*  | 75840/34401                           | 9560/4336                      | 66280/30065                   | 37900/17191                    | 37940/17210                   |
| 1A   | Complete Basic Machine Including:<br>Carrier<br>Upper<br>40 Ft. Basic Boom<br>Backstop Assembly<br>Cast Counterweight<br>Gantry — Lowered Position<br>0.500 In. Dia. x 430 Ft. Wire Rope (Boom Hoist)<br>0.750 In. Dia. x 360 Ft. Wire Rope (Load Hoist)<br>40 Gal. Fuel — Upper<br>75 Gal. Fuel — Lower* | 81200/36832                           | 19340/8773                     | 61860/28060                   | 30080/13644                    | 51120/23188                   |
| 2    | Effect of Removing:<br>Cast Counterweight   | -16200/-7348                          | 7460/3384                      | -23660/-10732                 | -13660/-6196                   | -2540/-1152                   |
| 3    | O/R Beams — Frt. (2)  | -1000/-454                            | -675/-306                      | -325/-147                     | -675/-306                      | -325/-147                     |
| 4    | O/R Beams & Horiz. Cyl. — Frt. (2)  | -1190/-540                            | -804/-365                      | -386/-175                     | -804/-365                      | -386/-175                     |
| 5    | O/R Boxes, Beams & Horiz. Cyl. — Frt. (2)   | -2310/-1048                           | -1560/-708                     | -750/-340                     | -1560/-708                     | -750/-340                     |
| 6    | O/R Vert. Cyl. & Trunnions — Frt. (2)   | -880/-399                             | -594/-269                      | -286/-130                     | -594/-269                      | -286/-130                     |
| 7    | O/R Beams — Rear (2)  | -1000/-454                            | 323/147                        | -1323/-600                    | 323/147                        | -1323/-600                    |
| 8    | O/R Beams & Horiz. Cyl. — Rear (2)  | -1190/-540                            | 384/174                        | -1574/-714                    | 384/174                        | -1574/-714                    |
| 9    | O/R Boxes, Beams & Horiz. Cyl. — Rear (2)   | -2310/-1048                           | 746/338                        | -3056/-1386                   | 746/338                        | -3056/-1386                   |
| 10   | O/R Vert. Cyl. & Trunnions — Rear (2)   | -880/-399                             | 284/129                        | -1164/-528                    | 284/129                        | -1164/-528                    |
| 11   | 20 Ft. Std. Boom Tip Including:<br>Tip Guy Lines<br>Boom Point Sheave Assembly<br>Idler Sheave Assembly   | -2400/-1089                           | -5930/-2690                    | 3530/1601                     | 5047/2289                      | -7447/-3378                   |
| 12   | 20 Ft. Boom Base Including:<br>Backstop Assembly<br>Upper Spreader  | -1955/-887                            | -2240/-1016                    | -285/-129                     | 1521/690                       | -3476/-1577                   |
| 13   | Backstop Assembly   | -290/-132                             | -220/-100                      | -70/-32                       | 113/51                         | -403/-183                     |
| 14   | Upper Spreader  | -585/-265                             | -1533/-695                     | 984/446                       | 733/332                        | -1318/-598                    |
| 15   | Basic Upper Including:<br>Gantry — Lowered Position<br>40 Gal. Fuel*  | -35900/-16284                         | 7220/3275                      | -43120/-19559                 | -21120/-9580                   | -14780/-6704                  |
| 16   | Slewing Rim w/Bolts   | -1740/-789                            | -316/-143                      | -1424/-646                    | -316/-143                      | -1424/-646                    |
| 17   | Hydraulic O/R for Manual O/R  | -2150/-975                            | -379/-172                      | -1771/-803                    | -379/-172                      | -1771/-803                    |
| 18   | Basic Carrier Including:<br>Hyd. O/R Assembly w/Floats (4)<br>12:00 x 20/G (14 PR) Tires (12)<br>Slewing Rim<br>Removable Rear Housing<br>25 Gal. Fuel*   | 39940/18117                           | 16780/7611                     | 23160/10505                   | 16780/7611                     | 23160/10505                   |
| 19   | Miscellaneous Weights:<br>Wire Rope 0.500 In. Dia. (Lbs/Ft) (Kgs/mm)  | 0.456/6.79 x10 <sup>-4</sup>          |                                |                               |                                |                               |
| 20   | Wire Rope 0.750 In. Dia. (Lbs/Ft) (Kgs/mm)  | 1.044/1.553 x10 <sup>-3</sup>         |                                |                               |                                |                               |
| 21   | Wire Rope 1.250 In. Dia. (Lbs/Ft) (Kgs/mm)  | 2.892/4.303 x10 <sup>-3</sup>         |                                |                               |                                |                               |
| 22   | Float Standard  | 78/35                                 |                                |                               |                                |                               |
| 23   | Bottom Block (1 Sheave — 10T)   | 360/163                               |                                |                               |                                |                               |
| 24   | Bottom Block (2 Sheave — 20T)   | 350/159                               |                                |                               |                                |                               |
| 25   | Bottom Block (2 Sheave — 30T)   | 400/181                               |                                |                               |                                |                               |
| 26   | Bottom Block (3 Sheave — 40T)   | 590/268                               |                                |                               |                                |                               |
| 27   | Jib Block   | 364/165                               |                                |                               |                                |                               |
| 28   | Swivel  | 37/17                                 |                                |                               |                                |                               |
|      | Effect of Adding:<br>None   |                                       |                                |                               |                                |                               |

Table 1-3. Attachment Weight Chart

| CRANE ATTACHMENTS (48" X 48" W/STD. TIP) |                         |                            |                                    |                                |                              |                             |                       |                              |                             |                       |
|--|-------------------------|----------------------------|------------------------------------|--------------------------------|------------------------------|-----------------------------|-----------------------|------------------------------|-----------------------------|-----------------------|
| Boom Length Ft./mm                       | Insert(s) Ft./mm        | Attachment Wt. Lbs./Kgs ** | Attachment C of G From Base In./mm | Gross Vehicle Wt. Lbs./Kgs *** | Front Tandem Weight Lbs./Kgs | Rear Tandem Weight Lbs./Kgs | Overall Length Ft./mm | Front Tandem Weight Lbs./Kgs | Rear Tandem Weight Lbs./Kgs | Overall Length Ft./mm |
| 40/12192                                 | Basic                   | 4355/1975                  | 282.6/7178                         | 80195/36376                    | 17694/8026                   | 62502/28351                 | 56.86/17331           | 31345/14218                  | 48850/22158                 | 64.23/19577           |
| 50/15240                                 | 10/3048                 | 4935/2239                  | 343.0/8712                         | 80775/36630                    | 20330/9222                   | 60445/27418                 | 66.83/20370           | 28913/13115                  | 51862/23525                 | 74.23/22625           |
| 60/18288                                 | 20/6096                 | 5240/2377                  | 405.6/10302                        | 81080/36778                    | 22689/10292                  | 58391/26486                 | 76.79/23406           | 26658/12092                  | 54422/24686                 | 84.23/25673           |
| 70/21336                                 | 10-20/3048-6096         | 5820/2640                  | 462.8/11755                        | 81660/37041                    | 25860/11730                  | 55900/25311                 | 86.75/26441           | 23688/10745                  | 57972/26296                 | 94.23/28721           |
| 80/24384                                 | 10-30/3048-9144         | 6145/2787                  | 552.4/14031                        | 81985/37188                    | 28660/13000                  | 53325/24188                 | 96.71/29477           | 20977/9524                   | 60988/27644                 | 104.23/31769          |
| 90/27432                                 | 20-30/6096-9144         | 6450/2926                  | 587.3/14917                        | 82290/37327                    | 31769/14410                  | 50521/22916                 | 106.67/32513          | 17990/8160                   | 64300/29166                 | 114.23/34817          |
| 100/30480                                | 10-20-30/3048-6096-9144 | 7030/3189                  | 640.3/16264                        | 82870/37590                    | 35690/16189                  | 47180/21401                 | 116.64/35552          | 14268/6472                   | 68602/31118                 | 124.23/37865          |

Table 1-4. Tire Rating Chart

| Tire Size            | ALLOWABLE LOAD/TIRE (LBS./KGS) |                          |                          |                            |                            |                            |                            |                    | Tire Pressure |
|----------------------|--------------------------------|--------------------------|--------------------------|----------------------------|----------------------------|----------------------------|----------------------------|--------------------|---------------|
|                      | 0-1.5 MPH /0-2.41 KPH          | 1.5-5 MPH /2.41-8.05 KPH | 5-10 MPH /8.05-16.09 KPH | 10-20 MPH /16.09-32.19 KPH | 20-30 MPH /32.19-48.28 KPH | 30-40 MPH /48.28-64.37 KPH | 40-50 MPH /64.37-80.47 KPH |                    |               |
| 12.00 x 20/G (14 PR) | 16040/<br>7276                 | 10510/<br>4767           | 9090/<br>4123            | 8100/<br>3674              | 7610/<br>3452              | 7120/<br>3230              | 6690/<br>3035              | At 80 PSI/5.5 BARS |               |
| 14.00 x 20/J (18 PR) | 23160/<br>10505                | 15020/<br>6813           | 12990/<br>5892           | 10570/<br>4795             | 9880/<br>4482              | 9350/<br>4241              | 8740/<br>3964              | At 85 PSI/5.9 BARS |               |

\*Actual scaled weights from "Truck Crane Weight and Compliance to B30.5-1988 Code." Dates: 7-13-71, 10-4-71, 11-4-71, 8-18-76.

\*\*Crane attachment weights include boom, guy lines, boom backstops, and upper spreaders. Less bottom block.

\*\*\*Component list for gross vehicle weight is found under complete basic machine list. Subsequent tandem loads are calculated for the boom in travel position less bottom block.

**NOTES:** The structural material used to fabricate this model has a nominal weight tolerance of ±3%. Therefore the weight data provided should be used for reference only. To insure that any specific configuration meets local highway regulations, it is suggested that the calculated weight distribution be verified by actual scaled weights.

To obtain total allowable axle load, multiply the allowable single tire load by the number of tires per axle.

For general dimensions see Dwg. 8105J277.