



# Guidance for Life Expectancy of a Lorry Loader

ALLMI Guidance Note 001

By definition a lorry loader is a combination of a load carrying vehicle (lorry) and a loader crane, which is intended to facilitate the handling of goods, on and off the vehicle. The object of this document is to clarify the loader crane aspect of a lorry loader for life expectancy.

Loader cranes do not last forever. Life expectancy should be considered when purchasing either new or second hand equipment. Are the loader crane's remaining fully rated load cycles adequate for the duration of a lease hire contract? How many remaining year's service has a second hand loader crane? Loader cranes are designed around the fatigue life of the materials used in its manufacture. The fatigue life of a loader crane can be expressed in load cycles. Loader cranes are designed into categories dependent on their mode of operation.

Loading Group	Typical operation	Average load cycles	Full rated load cycles
B2	Hook Duty	60,000	20,000
B3	Grab or Bucket	200,000	60,000
B4	Timber or Scrap	600,000	200,000

### Example; Brick and Block application

Crane	10 Tonne/metre crane
Crane class	B3, 60,000 full load cycles
Chassis	26 Tonne GVM (GVW)
Chassis	7250kg kerb weight
Body	1000kg
Subframe	300kg
Grab and Rotator	300kg
Age of Loader	5 Years
Weight of Brick Pack	1100kg
Working days per Year	260 days

Assuming that the vehicle is loaded with a fork truck, and that two full trips are made every working day. *(Be aware that if a lorry loader self loads, as well as off loads, then the number of load cycles will be double that shown in the example below).*

Each load is considered a Full Rated load.

**Step One** Add all the component weights of the vehicle and subtract from the GVW to obtain the vehicles Payload.

	Weight
Chassis kerb (inc. fuel)	7250kg
Crane	1500kg
Body	1000kg
Subframe	300kg
Grab + Rotator	300kg
Total	<u>10350kg</u>
Gross Vehicle Weight	26000kg
Payload	<u>15650kg</u>

**Step Two** To calculate the maximum number of packs of bricks the vehicle can carry. Divide the Payload figure by the weight of a single pack of bricks.

$$\frac{15650}{1100} = 14 \text{ Packs}$$

**Step Three** To calculate the number of packs carried in one day. Multiply the maximum number of packs that can be carried by the maximum Number of trips made per day.

$$14 \times 2 = 28 \text{ Packs per day}$$

**Step Four** To calculate how many fully rated load cycles that the crane would have expended during its life. Multiply the number of packs carried per day, by the number of working days in a year, and the age of the loader crane in years.

$$28 \text{ Packs a day} \times 260 \text{ days a year} \times 5 \text{ years} = 36,400 \text{ completed cycles}$$

**Step Five** Calculate the remaining load cycles by subtracting completed load cycles from total number of fully rated load cycles as specified in the loader cranes loading group, ie. B3

$$60,000 - 36400 = 23600 \text{ cycles}$$

**Step Six** To calculate the maximum life remaining in the loader crane. Divide the number of fully rated load cycles remaining by the number of packs carried per year.

$$\frac{23600}{28 \times 260} = 3.2 \text{ years life remaining.}$$

The remaining life expectancy given in the example above is the maximum to be expected. The remaining life of a loader crane is also dependent on the quality of its service history and maintenance.

**HINT** *loaders cranes equipped for bucket or grab operation will almost certainly have performed a much greater number of load cycles than a loader crane equipped with only a hook.*

Should you have any concern regarding the life expectancy of a loader crane, seek the advice of a competent engineer, the manufacturer, manufacturers official representative or an ALLMI member.

#### Reference information.

BS EN 12999	Cranes – Loader Cranes
LOLER	Lifting Operations and Lifting Equipment Regulations
PUWER	The Provision and Use of Work Equipment Regulations
ALLMI	Code of Practice for Installation Application and Operation
BS 7121	Safe use of cranes, Parts 2 and 4.

#### Disclaimer

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