Application Guide

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Telescopic Handler Application Guide



The Telescopic Handler industry is one of the fastest evolving in the Building Construction Products Division. In recent years the Telehandler industry has changed as demand for different size classes of machines has increased. The launch of Cat® TL and TH Series Telehandlers has presented significant increase in the product offering within both the smaller and larger size-classes for Cat dealers. This is driving the sales of Cat Telehandlers into different applications, increasing the importance that the machine sold or rented is the correct machine for that application.

The purpose of this application guide is to provide dealer sales and rental personnel with guidelines for providing a Telehandler. It includes application considerations to help dealers evaluate customers' operations and recommend which machine (two, three or four section booms) provides the best cost/value relationship in a given application, taking into consideration the performance, operating costs, productivity and durability of the machine.

More specifically, this guide will provide a detailed explanation of the different design characteristics seen on the boom of two section versus three and four section booms along with the different characteristics of Z-bar linkages and direct-acting linkages. Three and four section machines have been designed to work with buckets for no more than 15% of typical working time – using buckets for longer periods or heavy-duty applications more suited to other types of machines may result in premature damage to the boom assembly or related parts.

It is also essential that the machines are operated in accordance with the Operation and Maintenance Manual (OMM) and that the bucket work is carried out with a fully retracted boom.

Understanding these differences will enable dealer personnel to guide the customer's decision to ensure the correct machine is selected for the relevant application.

This document features the use of tables in order to provide clear guidance on which machines are suited for appropriate applications and to provide dealer sales personnel the ability to ensure that the correct specification of machine is ordered for the customer. The tables match individual models with applications as well as suggesting the work tools that are most commonly used in that application. The following glossary explains the terms used in the tables to describe buckets:

LM = Light Material Bucket
GP = General Purpose Bucket
MP = Multi-Purpose Bucket (4 in 1)

This document also refers to machines as two, three or four section machines – the following categorizes models, dependent on the number of sections contained in the boom:

Two section – TH255, TH406, TH407
Three section boom (with stabs) – TL642, TL943
Four section boom (with stabs) – TL1055, TL1255

Application Definitions

In order to provide guidance on some of the typical applications in which Telehandlers are normally used, it is essential to define the applications referred to in this document.

Grain – rehandling of loose grain or cereal crops in agriculture

Manure handling – rehandling of straw containing manure

Bale – the handling and storage (often stacking) of bales in barns (or fields) - both round and square bales

Feed – the handling of pelleted or loose animal feed

Silage – the handling, storing in bulk and compaction of silage in agriculture

Pallet handling – the handling of palletized material, both from storage location to point of use and loading/unloading trucks and stacking palletized material for storage

Farm maintenance – the digging of earth (both packed and loose) on farms in order to maintain upkeep of dirt tracks and roads for maintenance purposes

Truck loading – the loading of palletized material onto flat-bed trucks

Truck loading (rehandling) – the loading of loose material from a stock pile into a truck

Digging earth – the digging of compacted or fresh earth and material

Rehandling – digging and loading of a bucket of loose material from a pile

Site cleaning – the cleaning of a site (usually construction) once work has been completed

Material handling – the handling/lifting of large or irregular shaped objects that can not be lifted using forks or buckets, such as roof trusses

Grading – levelling of ground and/or roads on jobsites

Access – the lifting of personnel to heights where a work platform is temporarily required, often when the erection of scaffolding is not suitable

Paper handling – the rehandling of waste paper (both loose and bales) in recycling applications and storage into piles

Wood handling – the rehandling of wood (often damp) in waste applications

Metal handling – the handling of scrap metal in waste/recycling applications

Glass handling – the handling of broken glass in waste/recycling applications

Minerals – the rehandling of minerals in industrial applications

Domestic waste – the rehandling of household waste in recycling/waste applications

Green waste – the rehandling of natural waste (leaves, wood, bark,etc) in waste applications

Agriculture

Application	Work Tools	TH406	TH407	TL642	TL943	TL1055	TL1255	TH255
Grain	Light Material Bucket	●	●	!	!	!	!	●
Manure Handling w/Silage Forks, Grapple	Manure Forks	●	●	!	!	!	!	!
Manure Handling w/Bucket	General Purpose Bucket	●	●	!	!	!	!	●
Bale	Bale Handler	●	●	!	!	!	!	!
Feed	Light Material Bucket	●	●	!	!	!	!	●
Silage	Manure Forks	●	●	!	!	!	!	!
Pallet Handling	Forks	●	●	●	●	●	●	●
Farm Maintenance	General Purpose Bucket	●	●	!	!	!	!	●
Truck Loading (Rehandling)	Light Material/General Purpose Bucket	●	●	!	!	!	!	●
Truck Loading	Forks	●	●	●	●	●	●	●

Key: ● - Suitable ! - Unsuitable



Explanation:
Cat two section machines have a much more extensive list of options available than three and four section machines. These options are available to enable the specification of the machine to be matched to use in Agricultural applications. Such items include work tools (light material buckets, balehandlers, manure forks, etc.), integrated boom suspension, reversing fans, wider tires offering better flotation and a comprehensive range of rear hitches enabling improved trailer towing capabilities with trailer braking. (Such optional items are not approved for use on three or four section machines).

Since bucket work is more common in agriculture, the coupler operation differs between two section machines than on three and four section machines. The coupler on two section machines has a Z-bar linkage, whereas the three and four section machines have a direct acting linkage. This Z-bar linkage offers greater breakout force and coupler rotation and the boom head has been optimized to offer resistance to the additional side-loads seen in light bucket applications – making two section machines the ideal choice for agricultural applications. Competitive couplers (John Deere, JCB, and Manitou) are offered on or for the TH406 and TH407.

The two section machines also have a much lower overall machine height than the remainder of the TL Series range, allowing machines to be driven and used inside standard barns.

Application	Work Tools	TH406	TH407	TL642	TL943	TL1055	TL1255	TH255
Pallet Handling	Pallet Forks	●	●	●	●	●	●	●
Digging Earth	General Purpose/Multi Purpose Buckets	●	●	!	!	!	!	●
Rehandling	General Purpose/Multi Purpose Buckets	●	●	●	●	!	!	●
Site Cleaning	MP Bucket	●	●	!	!	!	!	●
	Tipping Hoppers	●	●	●	●	●	●	!
	Pickup Brooms	●	●	!	!	!	!	!
Material Handling	Truss Boom	●	●	●	●	●	●	!
	Lifting Hook	●	●	●	●	●	●	!
	Material Handling Arm	!	!	!	!	●	!	●
Grading	Multipurpose Bucket	●	●	!	!	!	!	●
Truck Loading	Pallet Forks	●	●	●	●	●	●	●
Truck Loading (rehandling)	General Purpose/Multi Purpose Buckets	●	●	●	●	●	●	●
Access Platform	Access Platform	●	●	●	●	●	●	!
Site Maintenance	Access Platform	●	●	●	●	●	●	!
	Truss Boom	●	●	●	●	●	●	!
	Lifting Hook	●	●	●	●	●	●	!
Wind Farms	Pallet Forks	●	●	●	●	●	●	●
Mining	Pallet Forks	●	●	●	●	●	●	●
	Buckets- All	●	●	!	!	!	!	●
	Grapple- All	●	●	!	!	!	!	●

Key: ● - Suitable ! - Unsuitable

Rental (Cont.)



Telehandlers play a vital role in the rental market. There are many applications where Telehandlers are used, thus it is difficult to define every application in this market segment. The Telehandler is being used in various new applications such as wind farms, power generation and ethanol plants to name a few. Cat Telehandlers are particularly suited for the rental market.

The Cat Telehandler range positioning is such that there are four models with lift heights ranging from 12.8 m - 16.6 m (42 ft - 55 ft) and capacities ranging from 2948 kg - 5443 kg (6,500 lb - 12,000 lb), the design of which have been optimized for lift and place applications. These machines are all fitted with direct acting couplers, which allow increased controllability for placing loads at greater heights. Another feature of these couplers is that they require less maintenance– a critical requirement for rental.

The most common application in which rental machines are seen in is construction. The capacity and lift height of the TL642 (2948 kg,12.8 m/ 6,500 lb, 42 ft) and TL943 (4082 kg, 13.1 m/9,000 lb, 43 ft) present a range of solutions for rental into construction applications with further suitability due to the lower spec MAs (Merchandising Arrangements) that are available. The lower spec includes items such as manual couplers and a cab or canopy. Stabilizers are also offered as an option on these models. The result of this is a lower acquisition cost to rental companies-- one of the key criteria when rental machines are purchased.

In addition to these models, the TL1055 and TL1255 are also well suited to rental due to their 16.8 m (55 ft) of lift height. These TL's come with stabilizers standard. They are typically seen in both large residential and commercial construction applications.

In addition to the TL offerings, access platforms are available and approved for use on all TL models.

In addition to construction, the TH406 and TH407 models are well positioned to meet the needs of many rental applications. These two models represent our two section boom machines with a larger footprint than the compact model. As a result, these models are being used in residential, construction, agriculture, landscaping and nursery applications.

The TH255 Compact Telehandler appeals to rental customers that include all attributes of function, quality and price competitiveness. This model has a rated load capacity of 2500 kg (5,500 lb) with 5.6 m (18 ft) of lift height and is ideal for many construction, landscaping, parking decks and nursery applications. Its small size and excellent maneuverability makes it capable of providing solutions to customers who need compact size combined with reach and lift height.

Construction

Application	Work Tools	TH406	TH407	TL642	TL943	TL1055	TL1255	TH255
Pallet Handling	Pallet Forks	●	●	●	●	●	●	●
Digging Earth	General Purpose/Multi Purpose Buckets	●	●	!	!	!	!	●
Rehandling	General Purpose/Multi Purpose Buckets	●	●	●	●	!	!	●
Site Cleaning	MP Bucket	●	●	!	!	!	!	●
	Tipping Hoppers	●	●	●	●	●	●	!
	Pickup Brooms	●	●	!	!	!	!	!
Material Handling	Truss Boom	●	●	●	●	●	●	!
	Lifting Hook	●	●	●	●	●	●	!
	Material Handling Arm	!	!	!	!	●	!	●
Grading	Multipurpose Bucket	●	●	!	!	!	!	●
Truck Loading	Pallet Forks	●	●	●	●	●	●	●
Truck Loading (rehandling)	General Purpose/Multi Purpose Buckets	●	●	●	●	●	●	●
Access Platform	Access Platform	●	●	●	●	●	●	!
Site Maintenance	Access Platform	●	●	●	●	●	●	!
	Truss Boom	●	●	●	●	●	●	!
	Lifting Hook	●	●	●	●	●	●	!

Key: ● - Suitable ! - Unsuitable

Explanation:
Since most rental machines are predominantly used in construction, the models best suited to construction are the same as those suited to rental– the key difference is in the specification of the machines. A machine going into a fleet owned by a construction company is likely to have a higher spec in order to enable the productivity of the machine to be maximized.



Two section machines (TH255, TH406 and TH407) are suitable for use in construction, however their use will be limited as the lower lift height of these machines restricts them from lifting to the height of construction landing platforms.

Three and four section machines are all fitted with direct acting couplers, which weigh less than Z-bar linkages (therefore optimizing capacity) and also allowing a greater degree of controllability for placing loads at greater heights. The design of the boom head has been

optimized to ensure maximum capacity while being used in lift and place applications. The three and four section machines have been designed for use with a bucket when rehandling only – the use of a bucket for any other application could lead to possible damage to the boom head. Digging of any kind with these models may lead to boom and cylinder damage. Side-loading and bucket dragging are also discouraged.

When coupled with material handling work tools (truss booms, lifting hooks and material handling arms), three and four section machines are ideally suited for lifting roofing materials.

The features of Cat Telehandlers result in them being particularly suited to construction applications in numerous ways – key purchasing criteria are productivity, serviceability and comfort. Maximum productivity has played an integral role in the design of Cat Telehandlers and has been achieved through lift performance and capacity at height, coupled with large axle steering angles allowing for excellent maneuverability. Serviceability, cost of ownership and comfort were also at the forefront of design, providing a machine that offers outstanding service access with low operating costs and an operator station offering the high level of comfort required ensuring maximum productivity.

With an increasing amount of material being palletized, the capacity traditionally required in lift and place applications is increasing and as such, the boom and boom head design has been optimized to ensure maximum lifting capacity at height, within the load chart specifications.

Further to this, 4536 kg and 5443 kg (10,000 lb and 12,000 lb) machines are fitted with stabilizers, while stabilizers are optional on the 2948 kg and 4082 kg (6,500 lb and 9,000 lb) machines.

Industrial

Application	Work Tools	TH406	TH407	TL642	TL943	TL1055	TL1255	TH255
Pallet Handling	Pallet Forks	●	●	●	●	●	●	●
Digging Earth	General Purpose/Multi Purpose Buckets	●	●	!	!	!	!	●
Rehandling	General Purpose/Multi Purpose Buckets	●	●	●	●	!	!	●
Paper Handling	Bale Handler, Bucket Grapples, Fork Grapples	●	●	!	!	!	!	●
Wood Handling	Bucket Grapple, Fork Grapple	●	●	!	!	!	!	●
Metal Handling	General Purpose Bucket	●	●	!	!	!	!	●
Glass Handling	General Purpose Bucket	●	●	!	!	!	!	●
Minerals	General Purpose Buckets	●	●	!	!	!	!	●
Truck Loading (rehandling)	General Purpose Bucket	●	●	●	●	!	!	●
	Light Material Bucket	●	●	●	●	!	!	●
Access	Access Platform	●	●	●	●	●	●	!
Site Maintenance	Access Platform	●	●	●	●	●	●	!
	Truss Boom	●	●	●	●	●	●	!
	Lifting Hook	●	●	●	●	●	●	!
	Material Handling Arm	!	!	!	!	●	!	●

Key: ● - Suitable ! - Unsuitable

Explanation:
A great deal of care is required when selling Telehandlers in industrial applications. There is a perception by customers that since a Telehandler can be fitted with buckets that it is able to replace a wheel loader. While the use of buckets is permitted, it must be understood that the a Telehandler is not a suitable replacement for a wheel loader due to the significant differences in design.



Telehandlers are primarily designed for use in lift and place applications. In order to achieve the lift capacity at height without compromise, it is essential to provide longitudinal strength – if the boom was designed to be suitable for wheel loader applications there would be a decrease in the lifting capacities. Wheel loader applications are very arduous and generate substantial side loads transferred from the bucket through the loader arms and as a result, the arms' design is strong enough to ensure the desired reliability in such applications. Telehandlers are not suitable for wheel loader applications.

Industrial (Cont.)

The TH406 & TH407 are better suited to industrial applications for a variety of reasons – as mentioned in the agriculture section, the linkage to the coupler is much better suited to bucket work, providing better coupler rotation and breakout force. The work tools available with these machines enable easier handling of material (balehandlers, light material buckets, etc.). The more compact dimensions of the machine also enable it to be operated beneath machinery.

Some three section machines (i.e. stabilized models) are also suitable for use in industrial applications requiring access or site utility work to be carried out (such as the maintenance of conveyor belts in quarries for example).

Traditionally, industrial applications are more specialized than any other application that Telehandlers are sold into. Certain industrial applications require custom fit tires or high capacity filters to be used. Care must be taken when specifying such items – the use of unapproved tire fills and unapproved tires can lead to increased stress on axle bearings and could ultimately invalidate driveline warranty – product group guidance should be sought before fitting such items.

Waste

Application	Work Tools	TH406	TH407	TL642	TL943	TL1055	TL1255	TH255
Pallet Handling	Pallet Forks	●	●	●	●	●	●	●
Domestic Waste	General Purpose Bucket	●	●	!	!	!	!	●
	Grapple Bucket	●	●	!	!	!	!	●
Green Waste	General Purpose Bucket	●	●	!	!	!	!	●
	Grapple Bucket	●	●	!	!	!	!	●
Digging Earth	General Purpose/Multipurpose Buckets	●	●	!	!	!	!	●
Rehandling	Bucket Grapple, Fork Grapple	●	●	●	●	!	!	●
Paper Handling	General Purpose Bucket	●	●	!	!	!	!	●
Wood Handling	General Purpose Bucket	●	●	!	!	!	!	●
Metal Handling	General Purpose Bucket	●	●	!	!	!	!	●
Glass Handling	General Purpose Bucket	●	●	!	!	!	!	●
Minerals	General Purpose Bucket	●	●	!	!	!	!	●
Truck Loading	Pallet Forks	●	●	●	●	●	●	●
Truck Loading (rehandling)	General Purpose Bucket	●	●	●	●	!	!	●
	Light Material Bucket	●	●	●	●	!	!	●
Access	Access Platform	●	●	●	●	●	●	!
Site Maintenance	Access Platform	●	●	●	●	●	●	!
	Truss Boom	●	●	●	●	●	●	!
	Lifting Hook	●	●	●	●	●	●	!
	Material Handling Arm	!	!	!	!	●	!	●

Key: ● - Suitable ! - Unsuitable



Explanation:
A great deal of care is also required when selling Telehandlers in waste applications. Traditionally, Wheel Loaders are more commonly found in waste applications. There is the same perception in waste applications, like industrial, that since a Telehandler can be fitted with buckets that it is able to replace a wheel loader. While the use of buckets is permitted, it must be understood that Telehandlers are not suitable for wheel loader applications.

Another important consideration is the material being handled – waste applications see the rehandling of a variety of material including paper, glass and metal. These materials all have varying densities – material

with a higher density results in very arduous applications and as such deems Telehandlers unsuitable.

The TH255, TH406 and TH407 are better suited to industrial applications for a variety of reasons – as mentioned in the agriculture section, the linkage to the coupler is much better suited to bucket work, providing better coupler rotation and breakout force. The more compact dimensions of the machines also enable them to be operated beneath machinery.

It is also essential to ensure that correct work tool is used with the machine – naturally a tough application requires a heavy-duty bucket in order to ensure maximum lifetime of the bucket. Use of the wrong work tool will lead to increased wear and decreased life of the machine and work tool.

It is common in waste applications that either tire fill or tires designed for prolonged puncture resistance are required.

Applications

The following guide will assist dealer salespeople in selecting the correct machine for the task, taking into consideration the performance, operating cost, traction, stability and productivity of the machine.

		TL	TH	Compact
Applications	Abrasive Material	N/R	N/R	N/R
	Dry Soil	N/R	Good	Good
	Hard Surfaces	N/R	N/R	N/R
	Landscaping/Nursery	N/R	Good	Best
	Sand	Good	Best	Best
	Sensitive Surface/Sod	N/R	Good	Best
	Snow	N/R	Good	Good
	Wet	Good	Good	Good
	Palletized Load	Best	Best	Good
	Stacked Wood	Good	Best	Good
	Debris Removal	Good	Best	Good
	Trash	Good	Best	Best
	Truss Placement	Best	Good	N/R
	Feed Material	N/R	Best	Best
	Hay	N/R	Best	Good

N/R = Not Recommended

1 Abrasive Material – Is defined as quarry, aggregates, rock, gravel, coal (anthracite and bituminous), as well as skeletal (any soil type that exceeds 35 percent rock content) soils, igneous, chert, flint, sandstone, limestone and granite. These types of materials are not considered normal for Telehandler operation and should be avoided.

2 Hard Surfaces – Are defined as Asphalt or Cement.

Training and Application Precautions

Thorough operator training is essential and is an OSHA requirement. JLG offers periodic operator "Train the Trainer" courses specifically for Cat dealers. The Train-the-Trainer Course is structured to allow Dealer resident instructors to train and qualify operators of telehandlers. The training material (workbooks, CD-ROM video, etc) from this course is also offered for purchase through the JLG Parts Department as P/N 31201434.

To a great extent, training must be individualized to the applications of the user. It is imperative to ask questions regarding the potential use of the Telehandler to ensure that proper training is administered. Coverage of the proper use of the machine and work tools as outlined in the Operation and Maintenance Manual (OMM) is also required. Training should always cover use of work tools and telehandler operations that may result in machine damage or downtime.

The TL Series Telehandlers are versatile machines that allow multiple tool use but are designed optimally as a "lift and place" application machine. This requires a machine with a boom having a high rear pivot with a long drop at the boom head to allow for enhanced operator visibility. To place the materials at high levels, the machines are designed with multi-section (three to four section) boom assemblies.

As with any three or four section boom assembly, the structure is at its strongest in the fully retracted position when the collective strength of each of the boom sections is fully utilized. The individual boom sections lose support of the adjacent structures as they are extended. In these extended positions, the boom structures have the least amount of strength and become most vulnerable to damage.

The load bearing capability and overall strength of the boom structures are directly correlated to the load ranges specified in the load charts for each model. The Telehandlers have been designed with structural design characteristics and safety factors to handle loads and forces associated with proper use of machine as described in the OMM.

We recognize that there is a growing need to make the Telehandlers more versatile and new applications are being utilized. However, it is critical that users recognize the limitations of the application of Telehandlers. Telehandlers should never be a substitute for a wheel loader or placed into a dedicated wheel loader application.

With this in mind, the following information has been prepared to educate Dealers and to assist Dealers in the education and reinforcement of proper bucket and fork use to end-users.

Bucket Use

Buckets for TL Series Telehandlers are intended for light duty use and not intended for digging, scraping, or dragging. Ensure that operators are trained to observe the following precautions when using buckets:

- Except for lifting or dumping a load, the boom must fully retracted position for all bucket operations.
- Drive into stockpile slowly with boom fully retracted to load bucket. Loading bucket with boom extended could result in boom damage.
- Do not corner load bucket. Distribute material evenly within the bucket. Bucket load charts are for evenly distributed loads only.
- Do not use bucket as a lever to pry material. Excessive prying forces could damage bucket or boom structure.

- Always know the weight and consistency of the material being loaded. Do not overload the bucket or try to scoop the bucket into hard or frozen material.
- Do not use bucket for "back dragging". This could cause severe damage to quick coupler.
- To unload or dump the load in the bucket, the boom assembly may be raised or extended within the confines of the bucket load chart.

Fork Use

Ensure that operators are trained to observe the following precautions when using forks on a Telehandler:

- Know the weight of the load and the rated load capacities of the Telehandler. Lift the load only within the confines of the load chart.
- With a load on the forks, avoid contact with any structure or object. Know the clearances around the boom structure and the load.
- Never use forks to dig or pry the load. Excessive forces of this type could damage the forks, carriage, or boom structure.
- Do not attempt to raise the load with only one fork or uneven loading of forks.
- Do not attempt to lift loads that are attached or connected. This greatly amplifies the load.
- Drive slowly when carrying loads. Minimize the bouncing of loads on forks while driving.

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