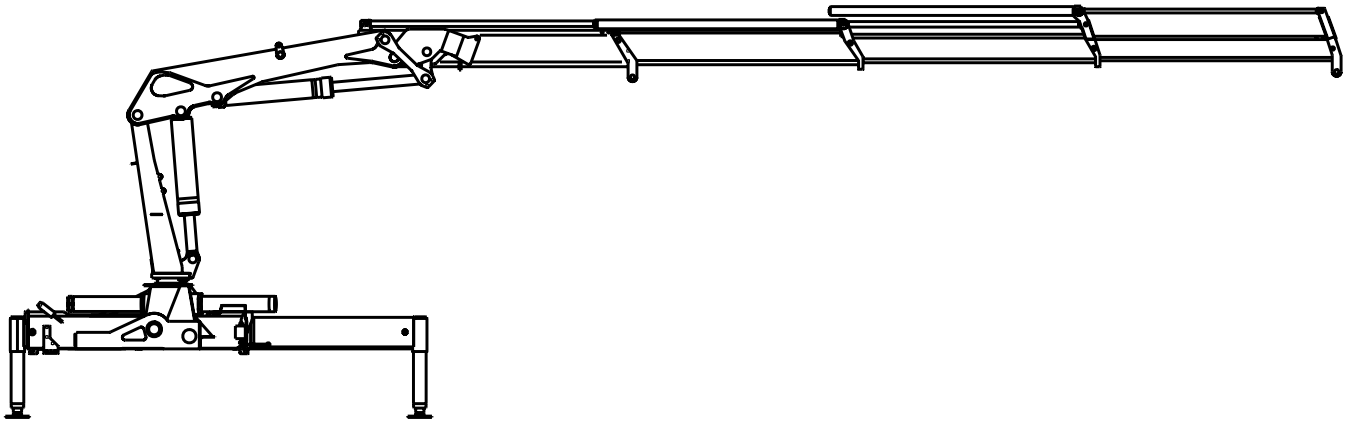
Model 14/103

Instruction Manual



NOTE

Read and understand this manual, the
IMT Operators Crane Safety Manual
and Safety Manual Supplement
before operating or maintaining your crane.

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TABLE OF CONTENTS

REVISIONS LIST

DATE	LOCATION	DESCRIPTION OF CHANGE
-	-	-

Introduction

Read through this instruction manual and ensure that all operation and maintenance personnel are familiar with its contents before operating or performing maintenance on the loader.

We recommend that the first service overhaul takes place at an authorized IMT service center after the first 20 hours of service or after one month of loader use, at the latest. This service check is important since the loader will be properly run in after 20 hours of use.

The first service overhaul should include the following:

1. Change of return filter element and high pressure filter cartridge, if any.

2. Oil level check for tank and rotation system. Oil must be visible in the oil level glass of the oil tank when the loader has been folded up.

3. Overall Iubrication according to the lubrication chart in section 5, Maintenance.

4. Leak check and tightening of fittings, if required.

5. Checking of working pressure and valve lead seals. The correct working pressures are stated in relevant Technical Information sheets.

6. Test of all functions while under load.

7. Checking and, if required, tightening of mounting bolts and pin connections.

8. Checking of all lock bolts and pins.

Important

A. If the operator has not parked the loader in transport position before driving off then he must make sure that the boom system cannot swing out during transport.

B. Use of incorrect or unsuitable attachments, welding onto or drilling into the structural components of the loader, or alterations to the construction will automatically invalidate the warranty.

C. If the lead seal of any of the valves is broken, the warranty is automatically invalidated.

D. Presence of any persons under the working loader is not permitted.

E. If air has entered the system, fill up the oil tank and bleed the loader before putting it back into operation.

F. The outrigger legs should be lowered just enough to raise the truck chassis 2 to 4 inches (5 to 10 cm). The tires of the truck must stay firmly on the ground and the driver must make sure that he has applied the parking brake.

G. Check that the locking devices of the outrigger beams are engaged on both sides before driving off.

1. General

This instruction manual contains a description of the loader, instructions for operation, maintenance and repair of the loader. The instruction manual includes the following sections:

Sections 1 through 8 contain general instructions for the daily operation of the loader.

Sections 9 through 14 are primarily aimed at operators, installation and maintenance personnel and contain instructions for installation, adjustment, inspection, and maintenance.

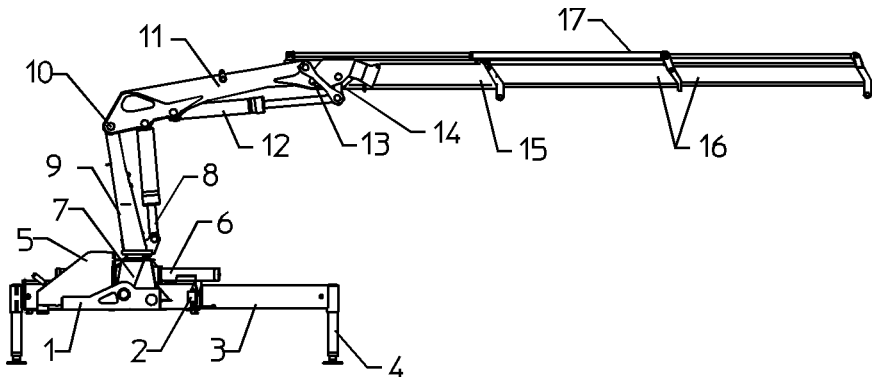
It is important that you familiarize yourself with the contents of this manual before putting the loader into operation. The same applies to any operators and maintenance personnel of the loader. It is also important to follow the recommended service schedules. These service overhauls aid in operational safety. They will also be of importance in the event of any warranty claims since IMT will attach great importance to whether these overhauls have been carried through by an authorized service center or not.

Due to continuous development and improvements, your loader model may have been changed slightly since the printing of this instruction manual.

2. Loader Terminology

The loader is designed as a truck mounted loader and therefore stationary mounting of the loader, mounting on agricultural tractors, special purpose vehicles and the like may only be performed according to specific agreement with IMT.

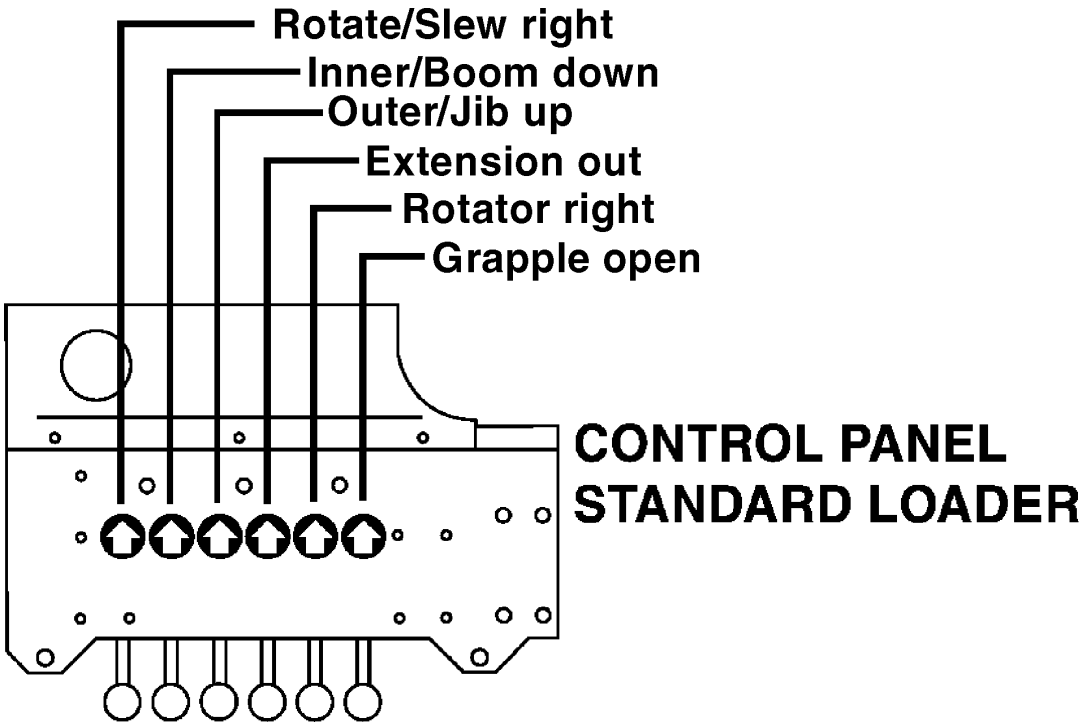
1. **Suspension traverse**
2. **Control valve block**
3. **Outrigger arm/Stabilizer beam**
4. **Outrigger/Stabilizer leg**
5. **Reservoir/Tank**
6. **Rotation/Slewing cylinder**
7. **Base**
8. **Inner Boom cylinder**
9. **Mast/Column**
10. **Hinge pin**
11. **Inner/Main boom**
12. **Outer/Jib cylinder**
13. **Outer/Jib pin**
14. **Link arm, outer/jib**
15. **Outer boom/Jib**
16. **Extension booms**
17. **Extension cylinder**

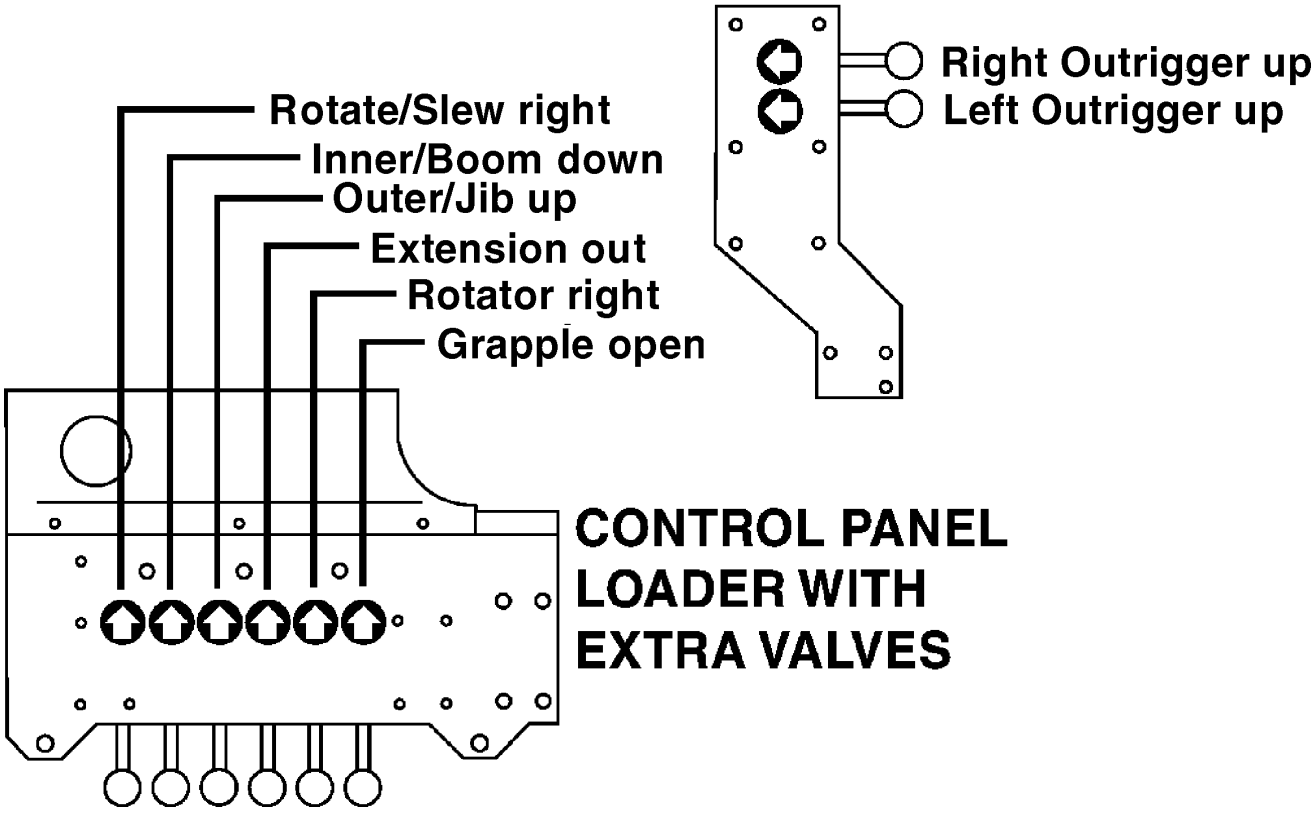


3. Control Valves, Symbols

Each control valve is labeled showing the functions of that particular valve.

Control levers should always be operated steadily and smoothly to avoid unnecessary strain on the loader.





4.0 Operating Instructions

4.1 Start Up

WARNING

Prior to operation, read and understand the IMT Operators Crane Safety manual and any other safety manuals which accompanied the loader.

Before start up the operator must make sure that loader operation does not entail any unnecessary risk. Special attention must be paid to the following factors:

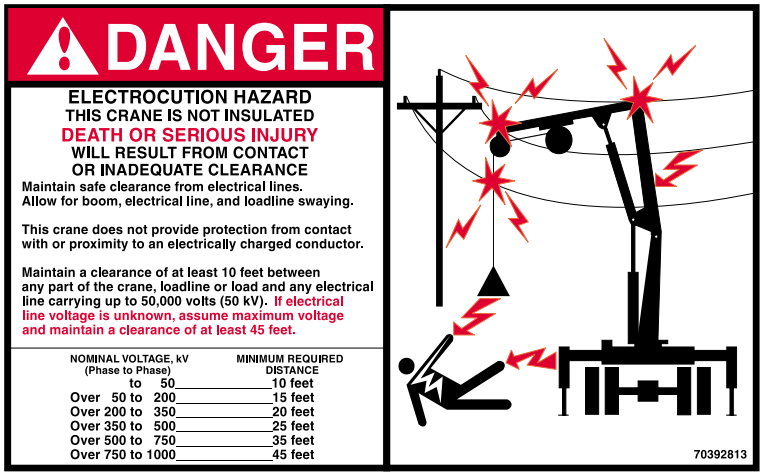
1. The ground must be sufficiently firm to accept the pressure from the outrigger legs. In case of heavy lifts we recommend the use of steel plates under the outrigger foot plates.

2. The ground must not be slippery (i.e., covered with ice, sand, etc.). After the driver has applied the parking brake, the truck must be able to accept the horizontal forces from the loader without skidding or moving.

3. The truck must be parked in such a manner that the operator has a complete and unobstructed view of the field of operation.

4. The operator must make sure that there are no electric wires or any other obstacles within the working radius of the loader.

5. The operator must inform any unauthorized persons that entry into the working area is not permitted.



General Rules:
For all work in proximity to power supply plants or overhead wires, the following general rules apply:

1. Caution must be exercised in the planning, instruction for, and execution of such work to prevent any risk or danger to persons, equip-ment or goods.

2. Any power supply plant, installation or wire must be considered live until the responsible power supply authority has provided a declaration that the opposite is true.

3. Any directions or guidelines from the responsible power supply authorities or public bodies must be strictly observed.

Any person or company directly responsible for the implementation of work in the proximity of overhead wires or electric power stations must make sure that all personnel involved in the execution of such work is familiar with any laws, rules or safety regulations, national as well as local, governing such work in the relevant country, territory or zone.

Not until the operator has checked the above may loader operation start.

1. Switch the change-over valve, if any, to “loader”

2. Engage the PTO at low revolutions The engine revolution speed is regulated by means of the hand accelerator to ensure that the oil flow from the hydraulic pump corresponds to the recommended pump flow for the loader. When starting up in the cold, the oil should circulate for a few minutes before operation starts.

3. Apply the vehicle parking brake.

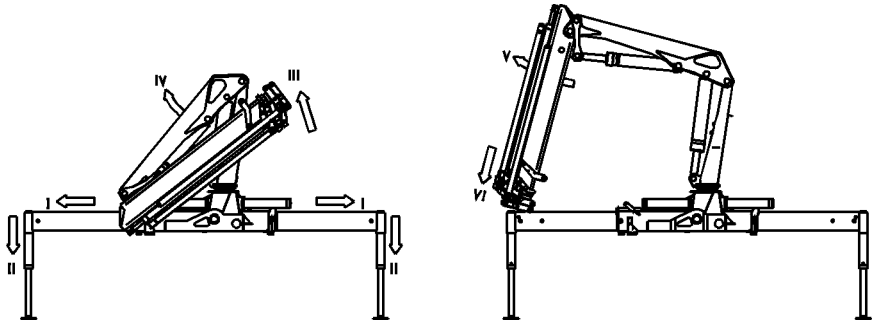
4. The stability of the vehicle and the loader is based on the outrigger legs being fully deployed. The loader should only be used when the outriggers are fully deployed. The operator must make sure that the vehicle has sufficient stability in the area in front of the outriggers (above the cap).The outriggers should be lowered just enough to raise the truck chassis a little in its suspensions. The tires must still have full contact with the ground.

During loading of the truck, the operator must raise the outrigger legs periodically to ensure that the truck and not the outriggers carry the weight. The outrigger legs are not designed to support this excessive load.

5. The vehicle must be positioned as close to horizontal as possible. Therefore, the driver should place the truck in as close a horizontal position as possible by means of the outrigger legs before operating the loader.

6. If the ground is not firm enough to take up the pressure of the outrigger legs, a plate, preferably steel, must be placed under the foot plates.

7. The unfolding of the loader takes place as described below:



I. Extend outrigger beams fully and check that the swivel locks are engaged.

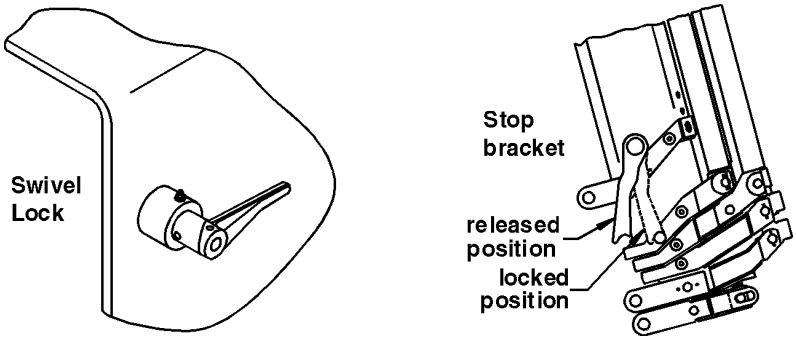
II. The outriggers are lowered (see items 4 & 5).

III. The outer boom is raised (press down outer boom control lever) to release it from the lock bracket on the mast.

IV. The inner boom is raised and released from the stowing bracket on the base. The inner boom is raised approximately 15° above horizontal, so that the outer boom may be moved freely downwards.

V. The outer boom is raised until it forms an angle of 15° with the mast (see above).

VI. Extend the first extension a little, thus releasing it from the stop bracket on the outer boom.



4.2 Using the Loader

After unfolding the loader, work may begin.

The lifting capacity of the loader is shown on the Capacity Chart on the loader and in this instruction manual. The capacity limits indicated must never be exceeded.

The loader is designed to lift loads vertically and therefore diagonal stresses must be avoided. Consequently the dragging of loads across the ground using the extension cylinders or the rotation system must be avoided. These functions should only be activated once the load is free of the ground.

When mounting a grapple, the total weight (grapple, rotator, and contents) must not exceed the lifting capacity of the loader at maximum reach. The grapple may be used to move soil only. It must not be used to excavate earth. Damage caused by improper operation of the loader will not be covered by the Waranty.

If the load is extended so far that the lifting capacity is exceeded, the inner boom will slowly begin to sink. To stop this movement the load should be brought closer to the loader mast by means of the outer or the extension cylinder.

Never stand under the booms when the loader is working.

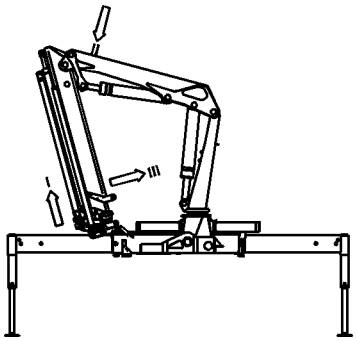
Please Note!
Position the truck as closely to the load as possible to lift the load on the shortest possible boom.

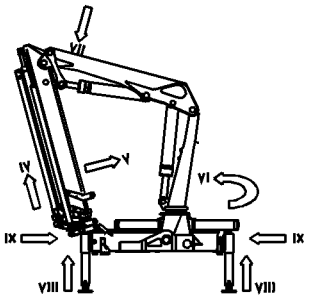
The rotation system should be operated with care, especially when the inner boom is at an acute angle to the outer boom.

The outriggers may not be activated when the loader is working.

Never drive off with a suspended load.

4.3 After Operation





After the operation is completed, fold the loader as described below:

1. Retract the extensions until the first extension is 8 inches (20cms) from the fully retracted position.

2. Position the inner boom 15° above horizontal.

3. Position the outer boom at an angle of approximately 15° towards the mast.

4. Retract the first extension towards the stop bracket on the outer boom.

5. Raise the outer boom to its end position (press down control lever for outer boom).

6. Rotate the loader until the stowing arrows face one another.

7. Slowly lower the inner boom onto the stowing bracket on the base.

8. Raise the outrigger legs.

9. Retract the outrigger beams and check that swivel locks are engaged.

To fold up the loader:
Reverse the procedure described in item 7 in section 4.1 “Starting Up”. If the boom is parked on the truck platform it must be properly secured to prevent the boom from swinging out during transport. The driver should check that the total height does not exceed 158 inches (4000mm).

Also, the operator should make sure that the outrigger swivel locks are in place and properly secured before driving off. If the loader has swing-up outriggers, they must also be secured in position before driving off.

Before the vehicle is started, the PTO must be disengaged.

5. Maintenance

Careful maintenance of the loader is the best way to ensure reliable loader operation.

At regular intervals, every day or every week, depending on frequency of loader application, you should check the following:

1. The oil level in tank and rotation system. Oil must be visible between maximum and minimum indication on the oil level rod, when the loader is folded up. The oil level in the rotation system should also be visible in the inspection tube.

2. Any defects, damage or leaks should be repaired at an authorized service center as soon as discovered.

3. Loader to truck mounting hardware.

4. Slide blocks and bushings reduce friction and therefore they are naturally subject to wear. Slide blocks should be replaced when slack is detected in the boom system. Bushings should be replaced before the metal components physically touch each other.

5. Check all hoses for defects and kinks.

6. Check that hooks, straps and safety latches are in good working order.

7. Check all lock pins and bolts for wear.

Service overhauls should be undertaken according to section 10 “Service and Regular Maintenance.” In case of any warranty claims later, great importance will be attached to observance of these service overhauls.

5.1 Lubrication Intervals

Base bearings:
after 20 hours of operation/1 week (whichever occurs first)

Extension system/Slide blocks:
after 50 hours of operation/1 month (whichever occurs first)

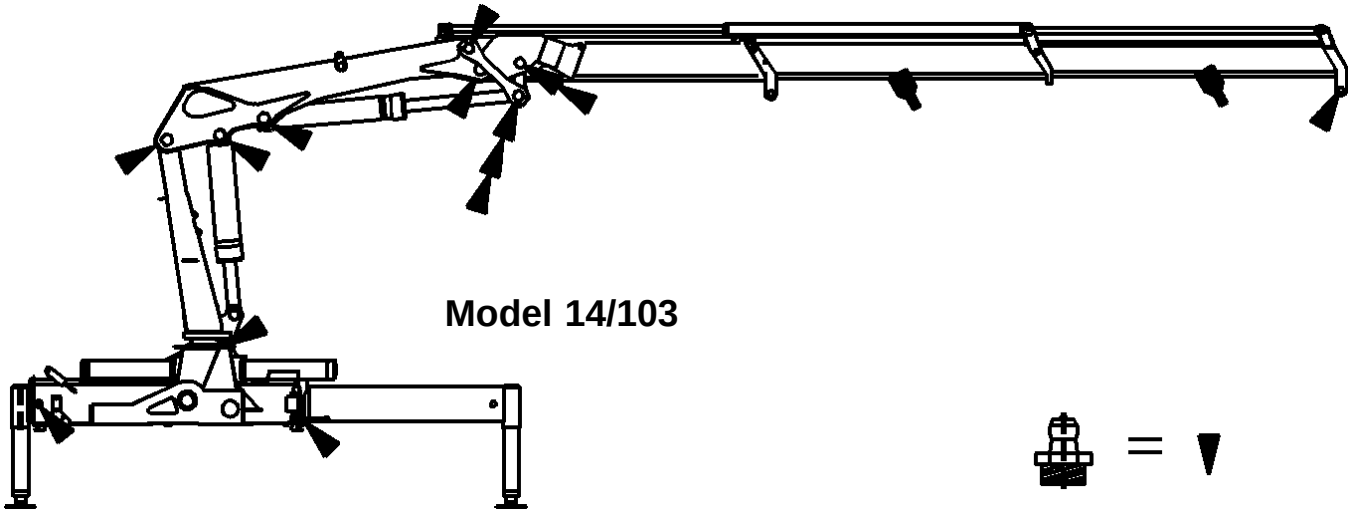
Pin connections/Bolts:
after 50 hours of operation/1 month (whichever occurs first)

Outrigger beams:
as required

Control valves and rod connections (Oil spray):
as required

The loader should be lubricated according to the lubrication chart below.

5.2 Lubrication Chart



The rotation system should be activated and the loader swung from stop to stop several times within the entire rotation area at the same time as the bearings in the base are lubricated.

Hydraulic oil and lubrication grease are chosen according to the table in section 10 “Service and Regular Maintenance.”

The telescopic extensions are lubricated with a special grease (Statoil Grease Way CaH or Castrol ALV).

6. Load Capacity Charts
6.1 Capacity Chart-14/103 (1H)

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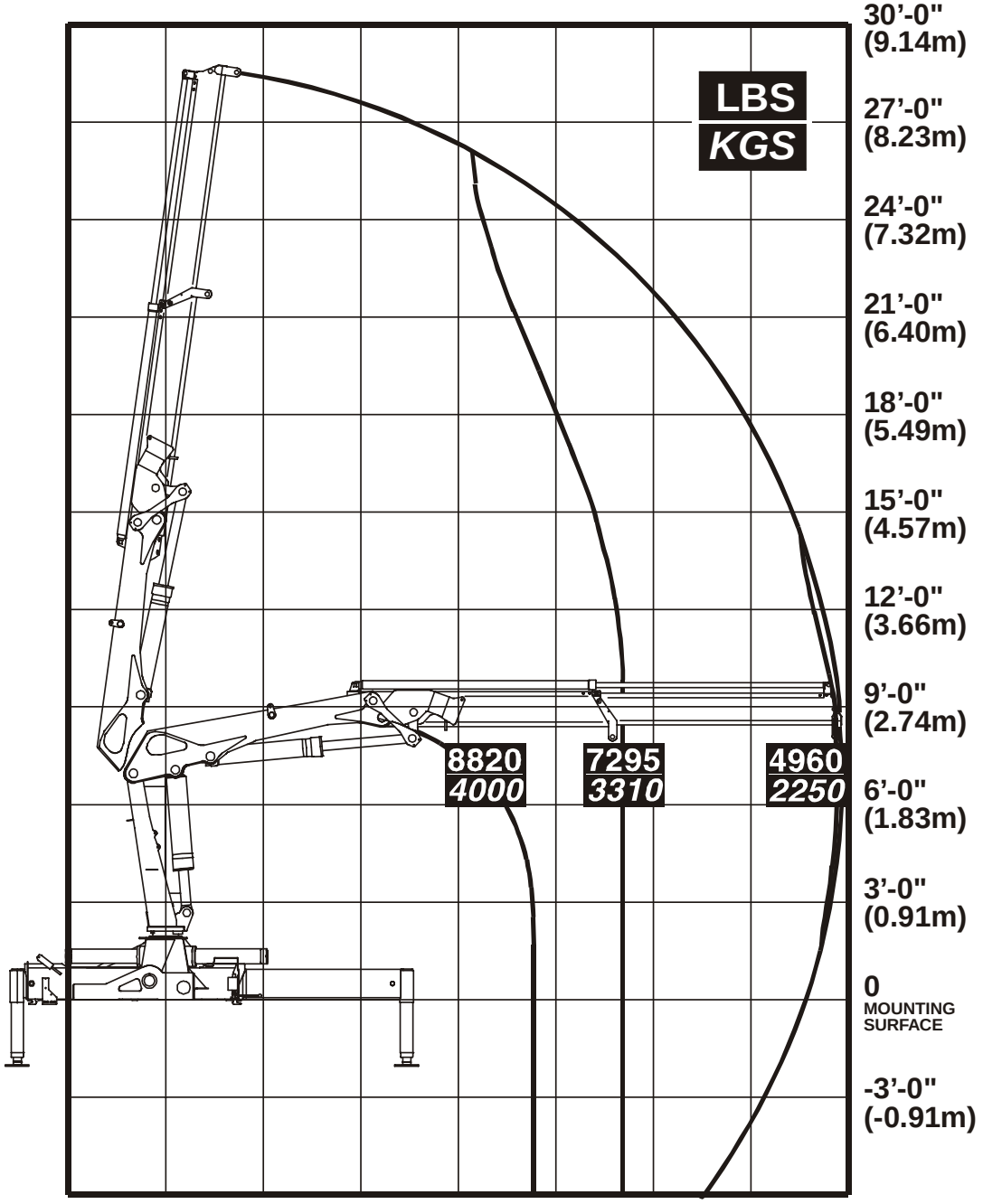
Model 14.0/103 (1H)

- Working loads will be limited to those shown. Deduct the weight of load handling devices.
- Before lift is made, stability must be checked per SAE J765A.



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6.2 Capacity Chart-14/103 (2H)

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MATERIAL HANDLING SYSTEMS

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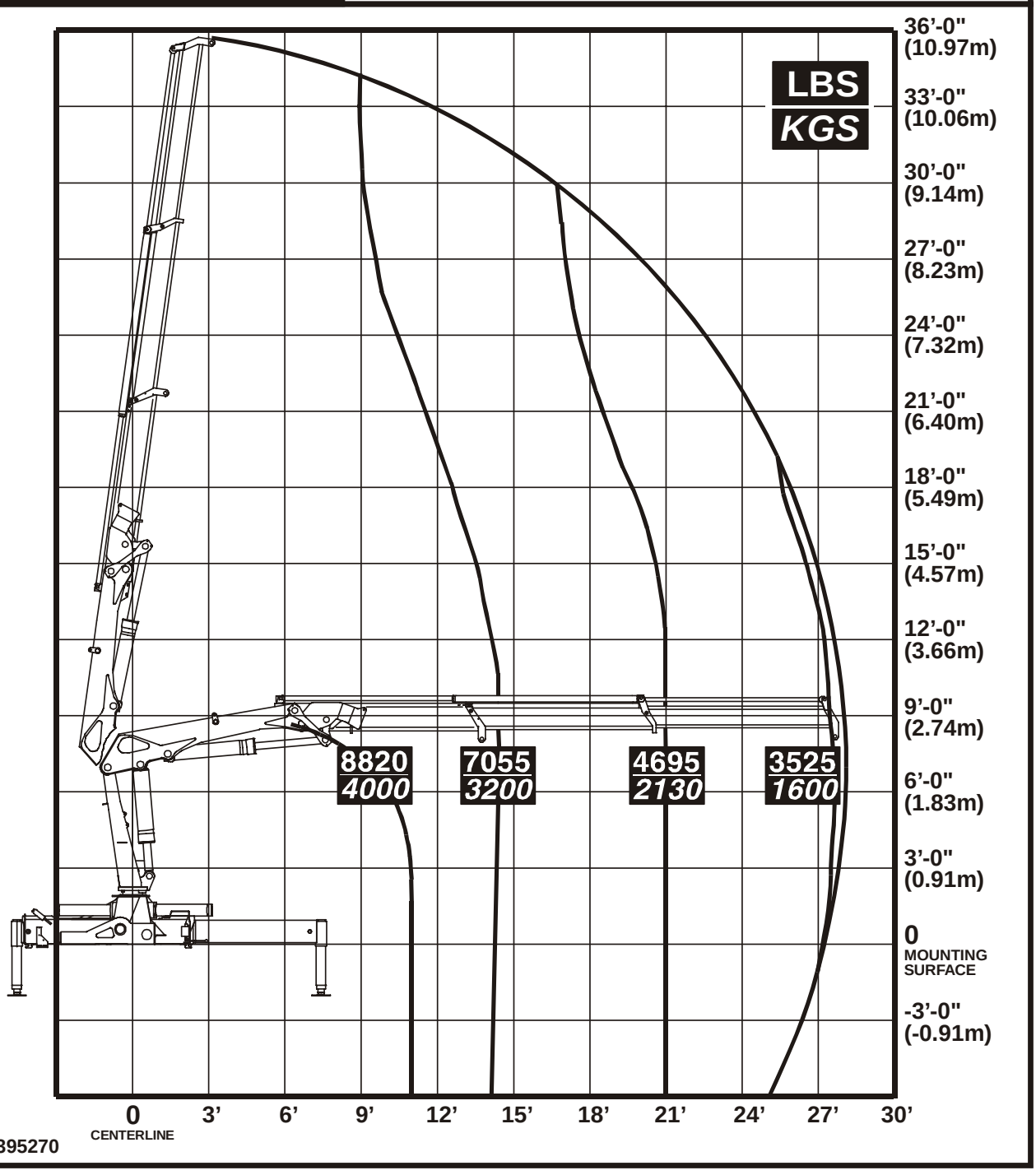
Model 14.0/103 (2H)

- Working loads will be limited to those shown. Deduct the weight of load handling devices.
- Before lift is made, stability must be checked per SAE J765A.



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6.3 Capacity Chart-14/103 (3H)

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MATERIAL HANDLING SYSTEMS

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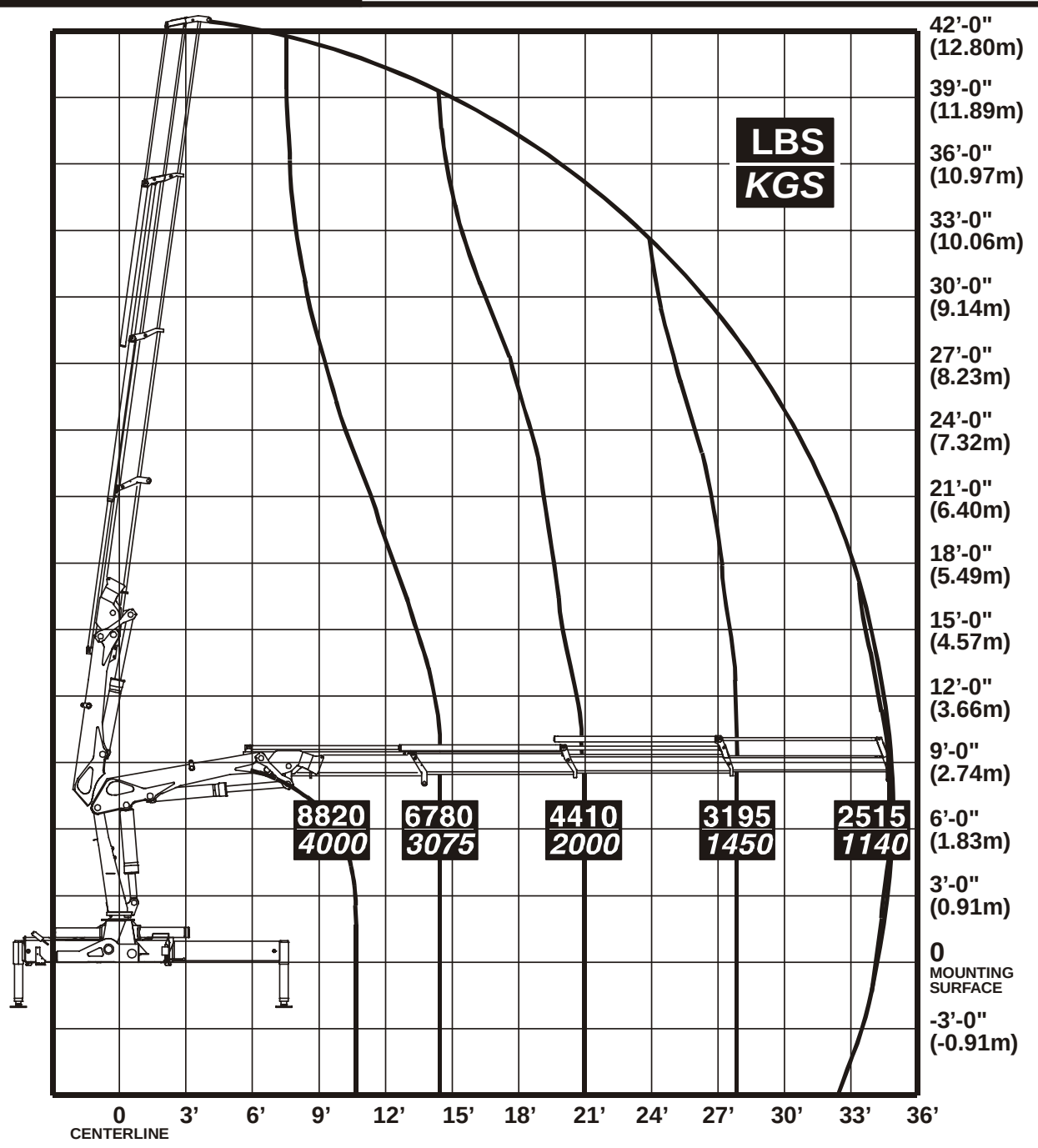
Model 14.0/103 (3H)

- Working loads will be limited to those shown. Deduct the weight of load handling devices.
- Before lift is made, stability must be checked per SAE J765A.



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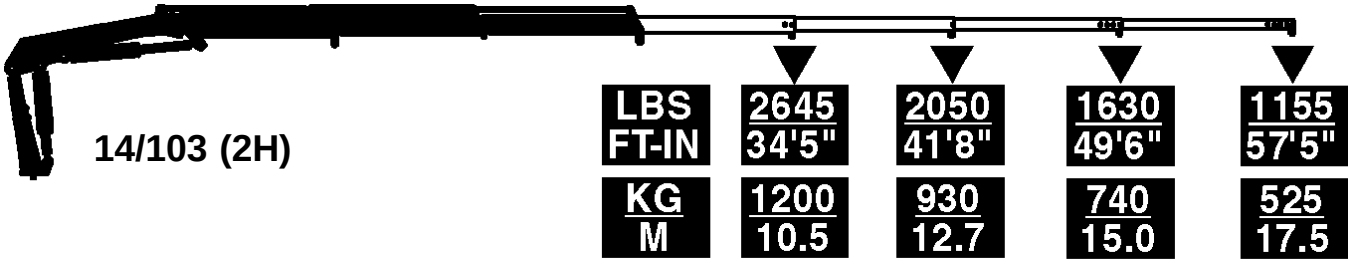
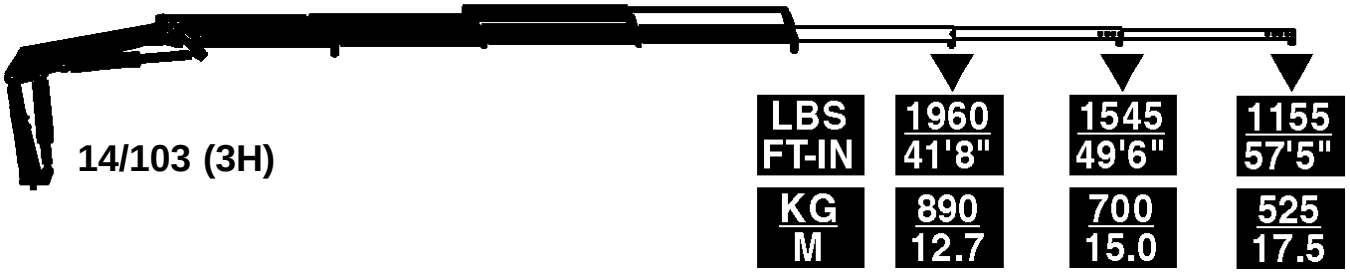
6.4 Manual Extensions





The load capacity limits shown above must never be exceeded.

NOTE

The load capacity limits indicated above for the hydraulic extensions will be reduced if the loader is mounted with manual extensions. This reduction in loader lifting capacity will correspond to the weight of the manual extensions mounted.

7. Accessories

Various accessories are available for the loader:

Grapple and rotator
Manual extensions
Remote control
Radio remote control
Stand-up controls

You should always consult an authorized IMT dealer or service center before mounting any kind of accessory. This also applies to equipment that you may already have in your possession.

WARNING

Welding onto or drilling into the structural components of the loader will automatically invalidate any liability on the part of IMT.

7.1 Use of Manual Extensions

When working with manual extensions, please note:

As a rule, the load limits indicated for manual extension must never be exceeded. Not all extensions are protected by the safety system of the loader.

For the 14/103 Series loader with all hydraulic extensions fully extended, the following applies:

2H:
The first three manual extensions are protected by the safety system of the loader, but the load limits indicated on the last extension must never be exceeded.

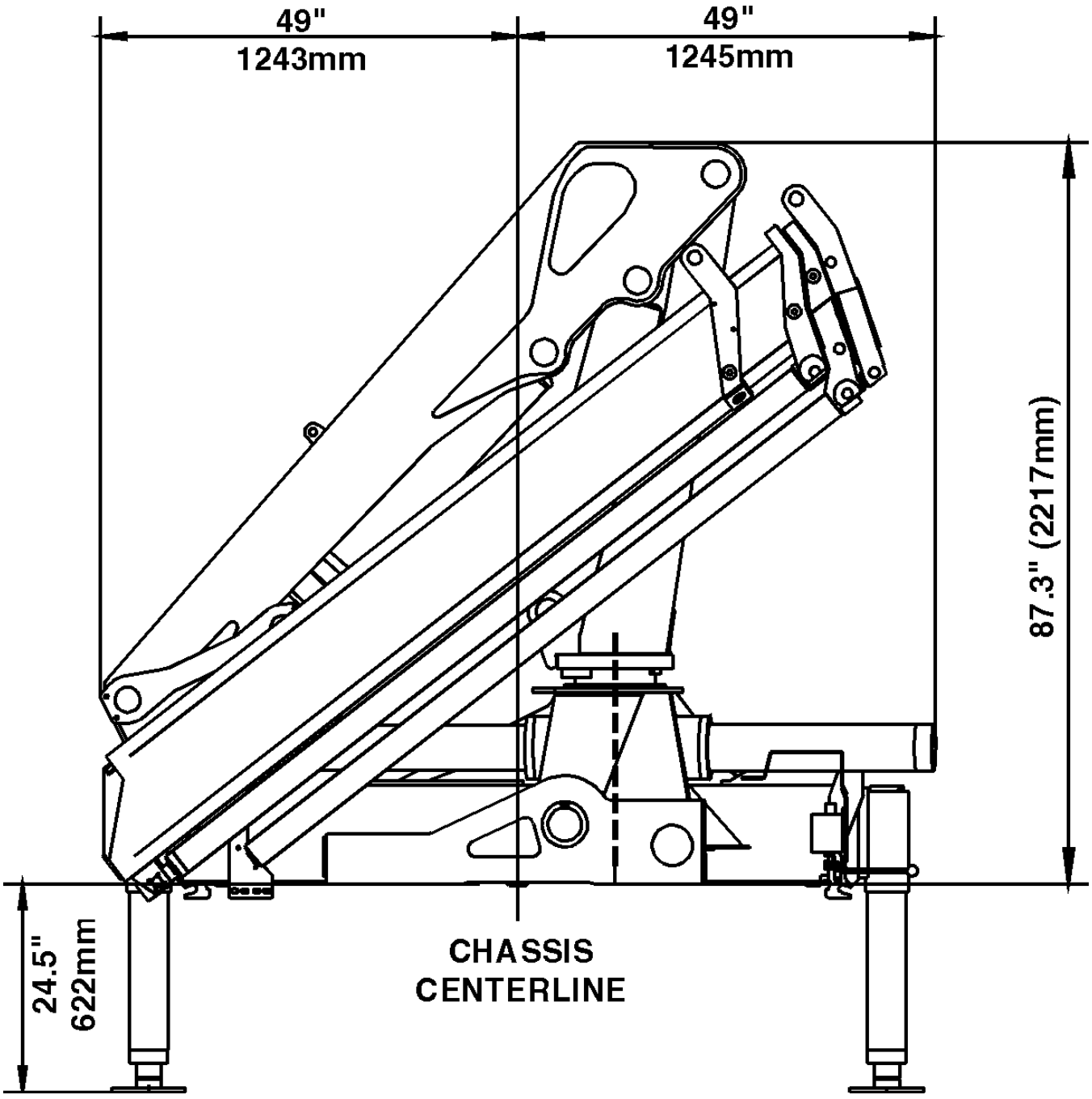
3H:
The first two manual extensions are protected by the safety system of the loader, but the load limits indicated on the last extension must never be exceeded.

Great care should be exercised if the rotation system is activated during work with manual extensions.

The lifting capacity of the loader is reduced if the loader has manual extensions or other accessories. The reduction corresponds to the weight of these accessories. If the loader is mounted with several extensions and a lift requires the use of one extension, only the extension with the largest box profile should be used.

Manual extensions should only be pulled out when the outer boom is as close to horizontal as possible. If the outer boom is pointing downwards when the lock bolt is removed, the extensions will drop out at uncontrollable speed that may ruin the stop and cause serious injury. The load may not be extended from the stop, i.e., the extension lock pins must always remain in place.

8. Technical Data



Technical Data (domestic)

Performance	Unit	1H	2H	3H
Load moment	ft-lbs	100506	99783	97614
Hydraulic reach	ft&in	20’-8”	27’-10”	34’-9”
Rotation torque	ft-lbs	14466	14466	14466
Rotation angle	degrees	410	410	410

Measures				
Height above chassis when folded	in	87	87	87
Width when folded	in	98.5	98.5	98.5
Length, without extra valves	in	33	33	33
Outrigger spread, std	in	165	201	201

Weights				
Std loader excl. outrigger legs	lbs	3384	3770	4100
Outrigger legs, std	lbs	441	551	551

Power consumption I pump performance				
Working pressure	psi	3770	3770	3770
Pump performance	gal/min	13.2	13.2	13.2
Power consumption	hp	29.5	29.5	29.5
Oil capacity in base	gal	5.28	5.28	5.28
Oil capacity in separate tank	gal	22.46	22.46	22.46

Technical Data (metric)

Performance	Unit	1H	2H	3H
Load moment	tm	13.9	13.8	13.5
Hydraulic reach	m	6.3	8.5	10.6
Rotation torque	kgm	2000	2000	2000
Rotation angle	degrees	410	410	410

Measures				
Height above chassis when folded	mm	2217	2217	2217
Width when folded	mm	2500	2500	2500
Length, without extra valves	mm	830	830	830
Outrigger spread, std	mm	4200	5100	5100

Weights				
Std loader excl. outrigger legs	kg	1535	1710	1860
Outrigger legs, std	kg	200	250	250

Power consumption I pump performance				
Working pressure	MPa	26	26	26
Pump performance	l/min	50	50	50
Power consumption	KW	22	22	22
Oil capacity in base	l	20	20	20
Oil capacity in separate tank	l	85	85	85

8.1 Loader designation

Different loader applications apply different types of stress to the loader structure, and consequently the loaders are divided into loading groups according to application.

As standard the 14/103 (3H) loader designation describes a loader with a 14 ton-meter/103000 foot-pound load moment and utilizing 3 hydraulic extensions.

If the loader is stationary, the lifting moment of the loader is reduced.

9. Working Pressure and Pump Performance

The working pressure should be set with a pressure gauge and the limits stated in the tables below must be kept.

The working pressure must be checked during the annual service overhaul and in the event of any major repairs.

The procedure for checking and setting of load-holding valves is described in Service Information. All adjustable valves must be resealed after pressure setting adjustment.

Please note that any warranty obligations on the part of IMT will be invalidated if the conditions stated in this manual are not complied with.

Working pressure-14/103 (domestic)

Working pressure on main-relief valve & port-relief valves

Function		Port	Unit	14/103
Main-relief valve			psi	3770
Outrigger legs/grapple, rotator	up	A-port		2175
	down	B-port		2175
		A-port		2175
		B-port		2175
Extension cylinders	extend	A-port		2900
	retract	B-port		P
Outer boom cylinder	Up	A-port		3915
	down	B-port		2175
Inner boom cylinder	down	A-port		1015
	Up	B-port		P
Rotation system	right	A-port		2175
	left	B-port		2175
Separate outrigger valve				1812

Opening pressure on load holding valves

Inner boom cylinder				5075
External relief valve				4132
Outer boom cylinder				4350
Extension cylinders	extend	A-port		3262
	retract	B-port		4712

Pressure setting for load moment limitation

LMB				3625

Max. Pump performance

Pump performance			gal/min	13.2

Working pressure-14/103 (metric)

Working pressure on main-relief valve & port-relief valves

Function		Port	Unit	14/103
Main-relief valve			MPa	26.0
Outrigger legs/grapple, rotator	up	A-port		15.0
	down	B-port		15.0
		A-port		15.0
		B-port		15.0
Extension cylinders	extend	A-port		20.0
	retract	B-port		P
Outer boom cylinder	Up	A-port		27.0
	down	B-port		15.0
Inner boom cylinder	down	A-port		7.0
	Up	B-port		P
Rotation system	right	A-port		15.0
	left	B-port		15.0
Separate outrigger valve				12.5

Opening pressure on load holding valves

Inner boom cylinder				35.0
External relief valve				28.5
Outer boom cylinder				30.0
Extension cylinders	extend	A-port		22.5
	retract	B-port		32.5

Pressure setting for load moment limitation

LMB				25.0

Max. Pump performance

Pump performance			l/min	50.0

1 MPa = 10 bar

10. Service and Regular Maintenance

10.1 First Service Overhaul

We recommend that the first service overhaul takes place at an authorized IMT service center after the first 20 hours of service or after one month of loader use at the latest. This service check is rather important since the loader will be properly run in after 20 hours of use.

The first service overhaul should include the following:

1. Change of return filter element and high pressure filter cartridge, if any.

2. The oil level in tank and rotation system. Oil must be visible between maximum and minimum lubrication on the oil level rod, when the loader is in the folded position. The oil level in the slewing system should also be visible in the inspection tube.

3. Overall lubrication according to the lubrication chart in section 5 “Maintenance”.

4. Leak check and tightening of fittings, if required

5. Checking of working pressure and lead seals. The correct working pressures are stated in relevant Technical Information sheets.

6. Test of all functions under load.

7. Checking and, if required, tightening of mounting bolts and pin connections.

8. Checking of all lock bolts and pins.

10.2 Annual Service Overhaul

Once a year the loader should be given a main service overhaul at an authorized IMT service center. The loader should be thoroughly checked and special attention should be paid to the following items:

1. Change of hydraulic oil in tank and rotation system, if any.

2. Change of return filter element and high pressure filter cartridge.

3. Cleaning or replacement of air filter.

4. Checking of working pressure and valve lead seals.

5. Idling pressure check.

6. Test of all functions under load.

7. Checking of slide blocks and bearing bushings for wear and, if required, replacement of the same.

8. Check of hydraulic hoses.

9. Leak check and tightening of all connections.

10. Check of pump and transmission.

11. Check of loader base to chassis mounting hardware.

12. Checking of all bolt connections and tightening, if required.

13. Overall checking of loader structure for damage. Any damage found should be repaired immediately.

14. Checking of all bolts and lock plates.

10.3 Recommended Hydraulic Oil Types

Oil Brand	Oil Type	Low Temp Oil Type
BP	Bartran HV 32	Bartran HV 22
Castrol	Hyspin AWS 32	Hyspin AWH 32
ESSO	Nuto H 32	Univis N 22
Kuwait petroleum Q8	Harmony 32 AW	Hydraulic L 32
Mobil	DTE 13	DTE 11
Shell	Tellus S 32	Tellus T 32
Statoil	Hydra Way HM 32	Hydra Way HV 22
Texaco	Rando HD 32	Rando HDZ 32

10.4 Recommended Lubrication Grease

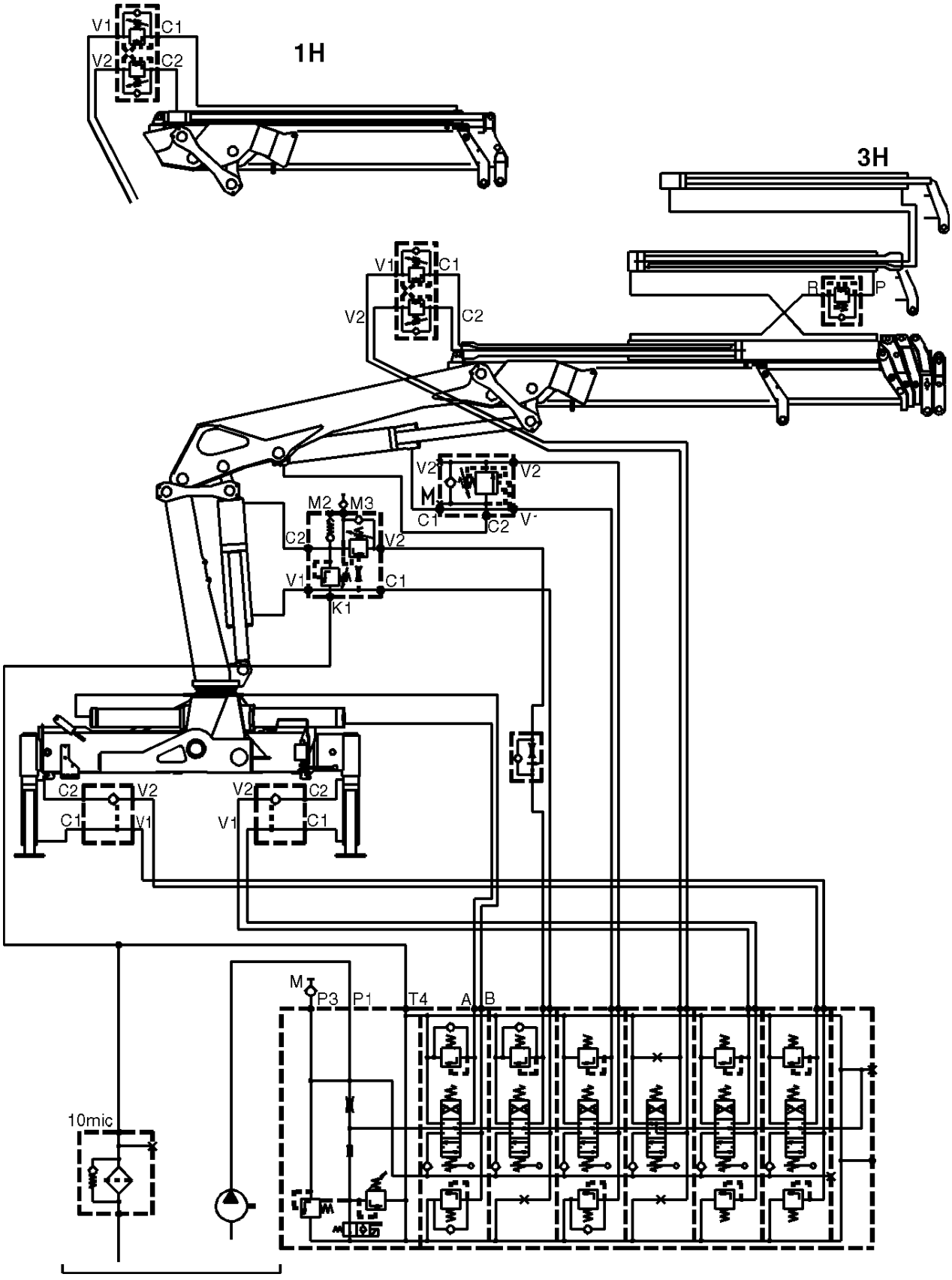
Grease Brand	Grease for Bearings
BP	Energrease L52
Castrol	LM Grease
ESSO	MP Grease I Beacon EP 2
Mobil	Mobilux EP 2 or Mobilgrease HP
Shell	Retinox MS
Statoil	Uni Way EP 2
Texaco	Multifak All Purpose EP 2

Grease containing molybdenum disulphide must not be used.

Grease Brand	Grease for Telescopic Extensions
Statoil	Grease Way CaH 92
Castrol	ALV

11. The Hydraulic System

11.1 The Hydraulic System-Standard



11.2 Description of the Hydraulic System

The valve block of the loader is of the “stack” type, i.e., it is made up of a number of separate control valves. This ensures great flexibility and low Maintenance costs.

A main relief valve is fitted in the inlet section of the valve block to ensure that the oil pressure in the pump line does not exceed the permissible limit. This valve is adjustable and must always remain sealed.

Port relief valves are mounted at the ports of the individual control valves to limit the pressure in the individual circuits. Normally the port relief valves will be pre-set and not adjustable.

The inner, outer, and extension cylinders are mounted with load holding valves with the following functions:

1. Protection of cylinders against excessive pressure.

2. Checking of the lowering speed of the boom.

3. Maintain the boom in position during operations where a fixed boom position is required.

4. To lock the boom and maintain the load in position in case of hose or pipe rupture.

The outrigger legs are equipped with a piloted check valve that locks the cylinder in case of damage to the hydraulic system.

Important
The main relief valve, the load holding valves, and the LMB-valve are sealed. If these seals are broken or removed the warranty will automatically be invalidated. Therefore, it is in your own interest to have the lead seals checked from time to time and to make sure that they are replaced by an authorized IMT service center should they be damaged.

Any modification or alteration to the hydraulic system must be in accordance to specific agreement with IMT and such alterations should always take place at an IMT service point.

12. Hoses and Hydraulic Pipes

The hoses must comply with the SAE R100 2AT standard.

The pipes are manufactured in St.35.4C-NBK.

The following dimensions are used:
ø 12 x 1.5
ø 16 x 2

13. Bleeding of Cylinders

If air has entered into the hydraulic system the loader is bled as follows:

1. Raise and lower each outrigger leg twice

2. The rotation cylinders are bled by swinging the loader from stop to stop 2-3 times.

3. The inner boom cylinder is fully extended and retracted twice

4. The outer boom cylinder is extended and retracted twice with the inner boom pointing upwards and twice with the inner boom pointing downwards

5. The extension cylinders are extended and retracted twice with the outer cylinder pointing almost vertically upwards and then twice with the outer cylinder pointing almost vertically downwards.

14. Repair

If you discover defects, damage or leaks, they should be repaired as soon as possible. Always take your repairs to an authorized IMT service center. Repairs to the hydraulic system can only be made by an authorized service center.

When you order spare parts for your loader, please state:

- Loader type
- Loader serial number

This information may be found in this instruction manual or stamped into the metal plate on the back side of the loader mast.

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