Open front screen

Service Manual

FASTRAC 1115, 1115S, 1125 & 1135

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Introduction

This publication is designed for the benefit of JCB Distributor Service Engineers who are receiving, or have received, training by JCB Technical Training Department.

These personnel should have a sound knowledge of workshop practice, safety procedures, and general techniques associated with the maintenance and repair of hydraulic earthmoving equipment.

Renewal of oil seals, gaskets, etc., and any component showing obvious signs of wear or damage is expected as a matter of course. It is expected that components will be cleaned and lubricated where appropriate, and that any opened hose or pipe connections will be blanked to prevent excessive loss of hydraulic fluid and ingress of dirt. Finally, please remember above all else

SAFETY MUST COME FIRST!

The manual is compiled in sections, the first three are numbered and contain information as follows:

1 = General Information - includes torque settings and service tools.
2 = Care & Safety - includes warnings and cautions pertinent to aspects of workshop procedures etc.
3 = Routine Maintenance - includes service schedules and recommended lubricants for the whole machine.

The remaining sections are alphabetically coded and deal with Dismantling, Overhaul etc. of specific components, for example:

A = Optional Equipment
B = Body & Framework ...etc

The page numbering in each alphabetically coded section is not continuous. This allows for the insertion of new items in later issues of the manual.

Section contents, technical data, circuit descriptions, operation descriptions etc. are inserted at the beginning of each alphabetically coded section.

All sections are listed on the front cover; tabbed divider cards align directly with individual sections on the front cover for rapid reference.

Page cross references are generally made by presenting the subject title printed in bold, followed by the title of the section containing the subject. For example:

"**24** If the axle is still on the machine, fit the brake calipers (see **Brake Caliper Removal and Replacement**, Section G)."

Note: If only the subject title in bold is given, i.e. no section title, the cross reference is to another part of the same section.

Use the contents list at the beginning of each section to find the exact page number.

Where a torque setting is given as a single figure it may be varied by plus or minus 3%. Torque figures indicated are for dry threads, hence for lubricated threads may be reduced by one third.

'Left Hand' and 'Right Hand' are as viewed from the rear of the machine facing forwards.

Colour Coding

The following colour coding, used on illustrations to denote various conditions of oil pressure and flow, is standardised throughout JCB Service Publications.

Blue: Neutral Circuit Pressure.

Red: Pressure generated by the operation of a service. Depending on application this may be anything between Neutral Circuit Pressure and M.R.V. Operating Pressure.

Pink: Pressure that is above Neutral Circuit Pressure but lower than that denoted by Red.

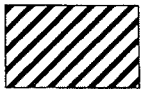
Green: Exhaust.

Light Green: Oil subjected to a partial vacuum due to a drop in pressure (cavitation).

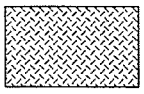
Yellow: Oil trapped within a chamber or line, preventing movement of components (lock-up).

Orange: Oil pressure used in a controlling device (servo).

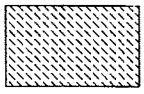
Black/White Coding



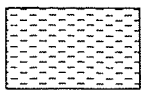
Neutral Circuit Pressure



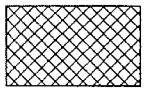
Pressure generated by the operation of a service. Depending on application this may be anything between Neutral Circuit Pressure and M.R.V. Operating Pressure.



Pressure that is above Neutral Circuit Pressure but lower than that denoted above.

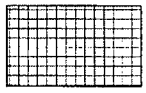


Exhaust.



Oil subjected to a partial vacuum due to a drop in pressure (cavitation).

Oil trapped within a chamber or line, preventing movement of components (lock-up).



Oil pressure used in a controlling device (servo).

A269290

Contents

* Machine Identification Plate

Each machine has an identification plate located on the front of the seat base. Vehicle Identification Number (VIN), and the serial numbers of the engine, gearboxes and axles are stamped on the plate.

Typical Vehicle Identification No. (VIN)

SLP HMV 11 3 30 736256
A B C D E F

A = Manufacturing Code
B = Machine Range
* **C** = Engine Code:
  11 = 1000 Series 1006-6LR (1115)
  12 = 1000 Series, Rating 1815/2400 (Earlier 1135)
  13 = New 1000 Series, Rating 1941/2300 (1115S)
  14 = New 1000 Series, Rating 1929/2300 (1125)
  15 = New 1000 Series, Rating 1947/2300 (Later 1135)
D = Transmission Speed Code:
  3 = 30 km/h
  4 = 40 km/h
  5 = 50 km/h
E = Vehicle Max. Speed Code:
  30 = 30 km/h
  40 = 40 km/h
  50 = 50 km/h
F = Sequential Serial Number

Typical Engine Identification Number

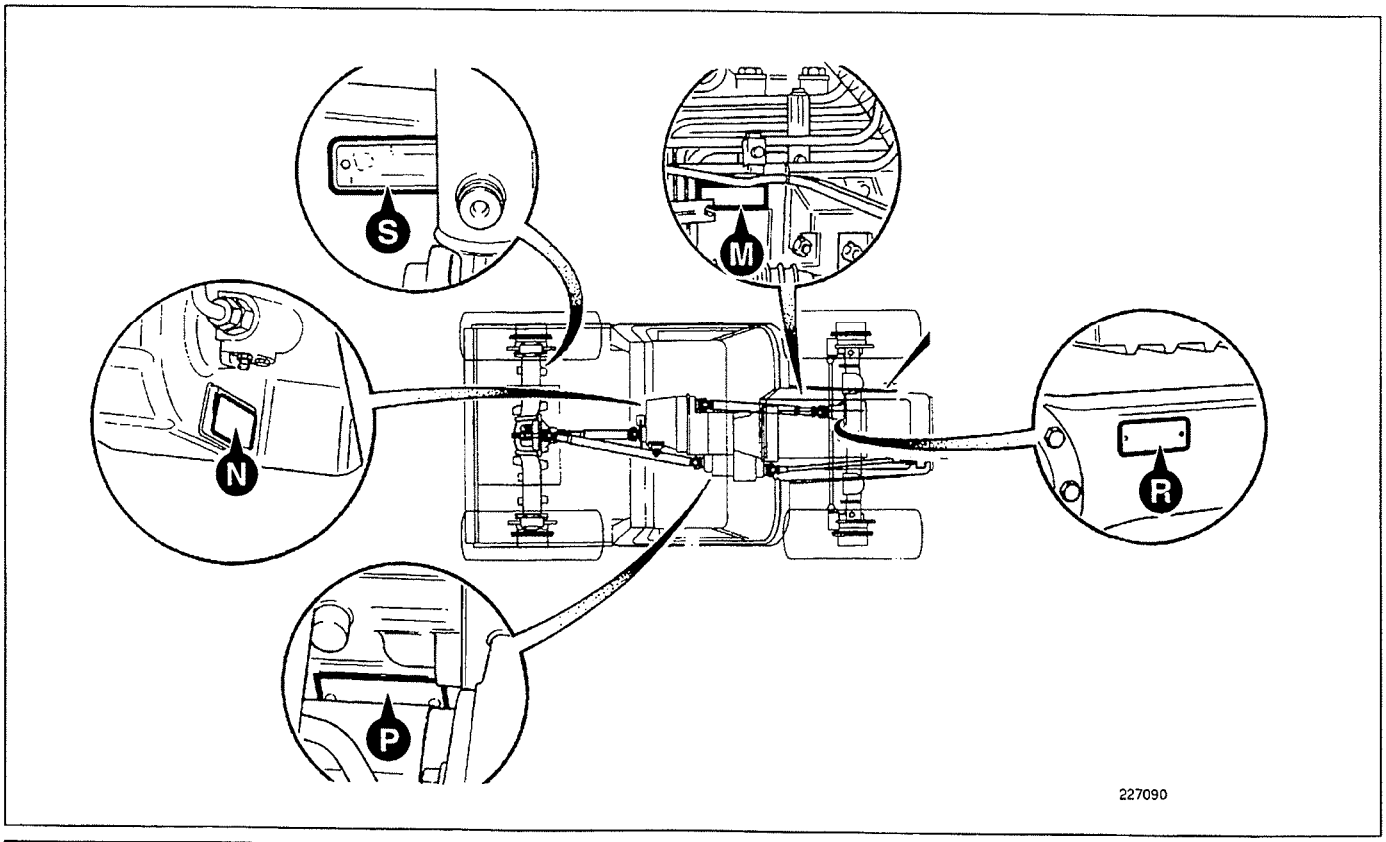
YA 50532 U 123456 X
G H J K L

* **G** = Engine Type:-
  YA = Normally Aspirated 1000 Series 6 cylinder
  YB = Turbocharged 1000 Series, 6 cylinder
  YH = Turbocharged New 1000 Series, 6 cylinder
H = Build List Number
(see **Engine Technical Data** for details)
J = Country of Origin
K = Engine Serial Number
L = Year of Manufacture

Unit Identification

The serial number of each major unit is also stamped on the unit itself as shown below. If a major unit is replaced by a new one, the serial number on the plate will be wrong. Either stamp the new number of the unit on the identification plate, or simply stamp out the old number. This will prevent the wrong unit number being quoted when replacement parts are ordered.

Engine	**M**
Transmission (Assembly of all three gearboxes)	**N**
Speed Gearbox	**P**
Front Axle	**R**
Rear Axle	**S**



Torque Settings

Use only where no torque setting is specified in the text. Values are for dry threads and may be within three per cent of the figures stated. For lubricated threads the values should be REDUCED by one third.

Note: All bolts used on JCB machines are high tensile and must not be replaced by bolts of a lesser tensile specification.

Metric Grade 8.8 Bolts

Bolt size Dia.	(mm)	Hexagon (A/F) mm	Torque Settings Nm	kgf m	lbf ft
M5	(5)	8	7	0.7	5
M6	(6)	10	12	1.2	9
M8	(8)	13	28	3.0	21
M10	(10)	17	56	5.7	42
M12	(12)	19	98	10	72
M16	(16)	24	244	25	180
M18	(18)	27	350	36	258
M20	(20)	30	476	48	352
M24	(24)	36	822	84	607
M30	(30)	46	1633	166	1205
M36	(36)	55	2854	291	2105

Metric - All Internal Hexagon Headed Cap Screws

Diameter mm	Torque Nm	kgf m	lbf ft
M3	2	0.2	1.5
M4	6	0.6	4.5
M5	11	1.1	8
M6	19	1.9	14
M8	46	4.7	34
M10	91	9.3	67
M12	159	16.2	117
M16	395	40	292
M18	550	56	406
M20	770	79	568
M24	1332	136	983

Hydraulic Hose to Adapter Connections

BSP Size (inches)	Torque Settings Nm	kgf m	lbf ft
1/8	14	1.4	10
1/4	24	2.5	18
3/8	33	3.3	24
1/2	44	4.8	35
5/8	58	6.0	43
3/4	84	8.6	62
1	115	11.8	85
1 1/2	244	24.9	180

Hydraulic Adapter into Component Connections with bonded washers

BSP Size (inches)	Torque Settings Nm	kgf m	lbf ft
1/8	20	2.1	15
1/4	34	3.4	25
3/8	75	7.6	55
1/2	102	10.3	75
5/8	122	12.4	90
3/4	183	18.7	135
1	203	20.7	150
1 1/2	305	31	225

Sealing and Retaining Compounds

JCB Multigasket	A medium strength sealant suitable for all sizes of gasket flanges, and for hydraulic fittings of 25-65 mm diameter.	4102/1212	50ml
JCB Threadlocker	For threads of 50mm diameter upwards, eg. suction strainer.	4101/0451	50ml
JCB Threadlocker (High Strength)	A high strength locking fluid for use with threaded components. Gasketing for all sizes of flange where the strength of the joint is important.	4102/0551	50ml
JCB Retainer (High Strength)	For all retaining parts which are unlikely to be dismantled.	4101/0651	50ml
JCB Threadlocker And Sealer	A medium strength locking fluid for sealing and retaining nuts, bolts, and screws up to 50 mm diameter, and for hydraulic fittings up to 25 mm diameter.	4101/0250 4101/0251	10ml 50ml
JCB Threadlocker And Sealer (High Strength)	A high strength locking fluid for sealing and retaining nuts, bolts, and screws up to 50 mm diameter, and for hydraulic fittings up to 25 mm diameter.	4101/0550 4101/0552	10ml 200ml
JCB Threadseal	A medium strength thread sealing compound.	4102/1951	50ml
JCB Activator	A cleaning primer which speeds the curing rate of anaerobic products.	4104/0251 4104/0253	Aerosol (1 ltr) Bottle (200 ml)
JCB Cleaner/Degreaser	For degreasing components prior to use of anaerobic adhesives and sealants.	4104/1557	Aerosol (400ml)
Direct Glazing Kit	For one pane of glass; comprises items marked † below plus applicator nozzle etc.		
† Ultra Fast Adhesive	For direct glazing	4103/2109	310 ml
† Active Wipe 205	For direct glazing	4104/1203	250 g
† Black Primer 206J	For direct glazing	4201/4906	30 ml
Clear Silicone Sealant	To seal butt jointed glass.	4102/0901	

Service Tools Numerical List

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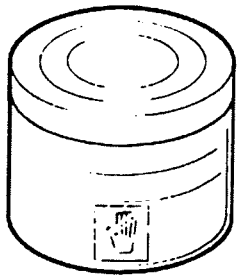
The following parts are replacement items for kits and would normally be included in the kit numbers above.

Replacement items for kit no. 892/00253

892/00201	Gauge 0 - 20 bar	7 - 1
892/00202	Gauge 0 - 40 bar	7 - 1
892/00203	Gauge 0 - 400 bar	7 - 1
892/00254	Hose	7 - 1

Service Tools

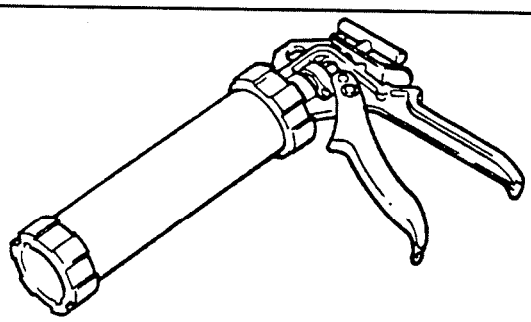
Section B - Body and Framework



S186240

Hand Cleaner - special blend for the removal of polyurethane adhesives.

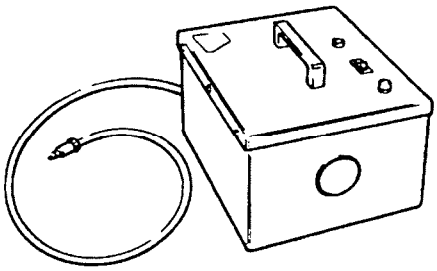
JCB part number - 4104/1310 (454g; 1lb tub)



S186270

Cartridge Gun - hand operated - essential for the application of sealants, polyurethane materials etc.

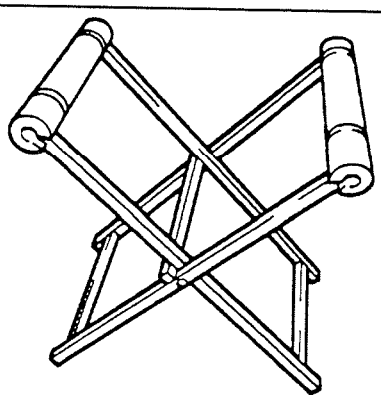
JCB part number - 892/00845



S186250

12V Mobile Oven - 1 cartridge capacity - required to pre-heat adhesive prior to use. It is fitted with a male plug (703/23201) which fits into a female socket (715/04300).

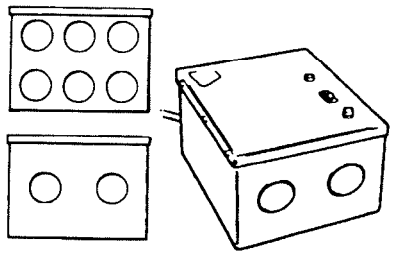
JCB part number - 992/12300



S186280

Folding Stand for Holding Glass - essential for preparing new glass prior to installation.

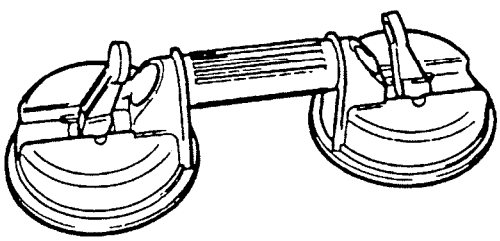
JCB part number - 892/00843



S186260

240V Static Oven - available with 2 or 6 cartridge capacity - required to pre-heat adhesive prior to use. No plug supplied. Note: 110V models available upon request - contact JCB Technical Service

JCB part number:
992/12400 - 2 cartridge x 240V
992/12600 - 6 cartridge x 240V



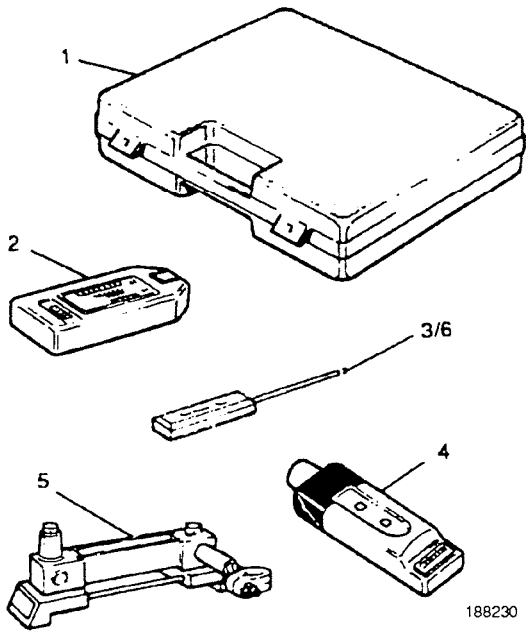
S186300

Glass Lifter - minimum 2 off - essential for glass installation, 2 required to handle large panes of glass. Ensure suction cups are protected from damage during storage.

JCB part number - 892/00842

Service Tools

Section C - Electrics



Electrical Test Equipment

1 892/00283 Tool Kit Case

2 892/00281 AVO Meter

3 892/00286 Surface Temperature Probe

4 892/00284 Microtach Digital Tachometer

5 892/00282 100 Amp Shunt - open type

6 892/00285 Hydraulic Oil Temperature Probe

7 892/00298 Fluke 85 Multimeter

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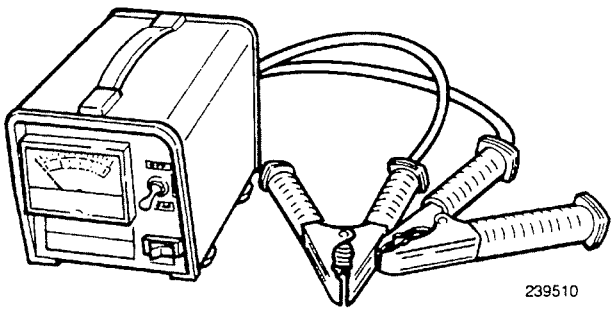
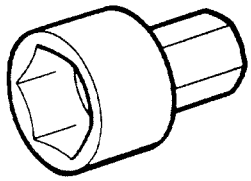


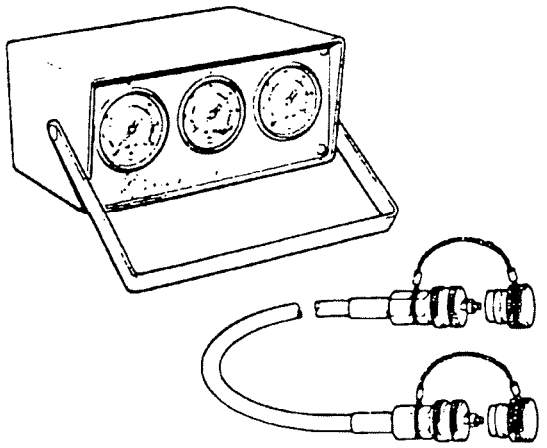
993/85700 Battery Tester



892/00882 Socket for Pulley Nut on Magneti Marelli Alternator.

Service Tools

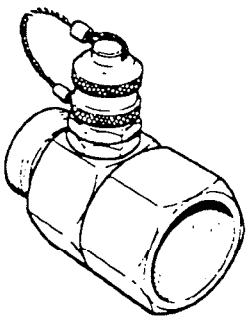
Section E - Hydraulics



Hydraulic Circuit Pressure Test Kit

892/00253	Pressure Test Kit
892/00201	Replacement Gauge 0-20 bar (0-300 lbf/in²)
892/00202	Replacement Gauge 0-40 bar (0-600 lbf/in²)
892/00203	Replacement Gauge 0-400 bar (0-6000 lbf/in²)
892/00254	Replacement Hose
:993/69800	Seal Kit for 892/00254 (can also be used with probe 892/00706)

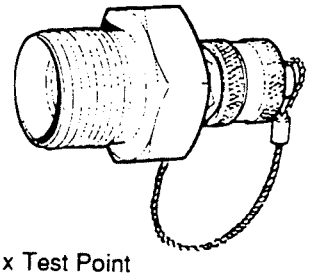
S188120



Pressure Test 'T' Adapters

892/00262	1/4 in M BSP x 1/4 in F BSP x Test Point
816/55038	3/8 in M BSP x 3/8 in F BSP x Test Point
816/55040	1/2 in M BSP x 1/2 in F BSP x Test Point
892/00263	5/8 in M BSP x 5/8 in F BSP x Test Point
892/00264	3/4 in M BSP x 3/4 in F BSP x Test Point
892/00265	1 in M BSP x 1 in F BSP x Test Point

S188130



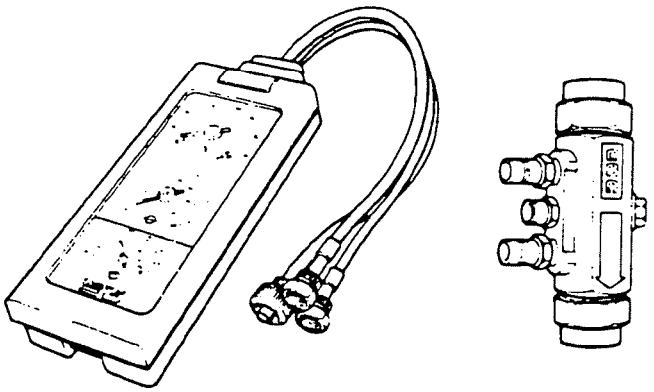
Pressure Test Adapters

892/00255	1/4 in BSP x Test Point
892/00256	3/8 in BSP x Test Point
892/00257	1/2 in BSP x Test Point
892/00258	5/8 in BSP x Test Point
816/15118	3/4 in BSP x Test Point
892/00259	1 in BSP x Test Point
892/00260	1.1/4 in BSP x Test Point
892/00261	5/8 in UNF x Test Point

S200140

Flow Test Equipment

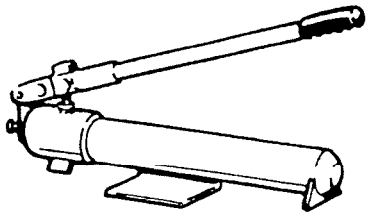
892/00268	Flow Monitoring Unit
892/00269	Sensor Head 0 - 100 l/min (0 - 22 UK gal/min)
892/00293	Connector Pipe
892/00270	Load Valve
1406/0021	Bonded Washer
1604/0006	Adapter 3/4 in M x 3/4 in M BSP
1612/0006	Adapter 3/4 in F x 3/4 in M BSP
892/00271	Adapter 3/4 in F x 5/8 in M BSP
892/00272	Adapter 5/8 in F x 3/4 in M BSP
816/20008	Adapter 3/4 in F x 1/2 in M BSP
892/00275	Adapter 1/2 in F x 3/4 in M BSP
892/00276	Adapter 3/4 in F x 3/8 in M BSP
892/00277	Adapter 3/8 in F x 3/4 in M BSP
892/00273	Sensor Head 0 - 380 l/min
892/00294	Connector Pipe
1606/0015	Adapter 1.1/4 in M BSP x 1 in M BSP
892/00078	Connector 1 in F x 1 in F BSP
1604/0008	Adapter 1 in M x 1 in M BSP
1606/0012	Adapter 1 in M x 3/4 in M BSP
816/20013	Adapter 3/4 in F x 1 in M BSP



S188150

Service Tools (continued)

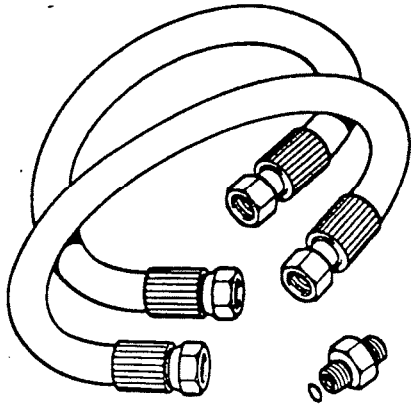
Section E - Hydraulics (continued)



S193850

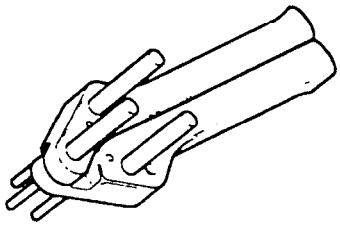
Hand Pump Equipment

892/00223	Hand Pump
892/00137	Micro-bore Hose 1/4 in BSP x 5 metres
892/00274	Adapter 1/4 in BSP male x 3/8 BSPT male
892/00262	Test Point on 1/4 in BSP male x 1/4 BSP female adapter
892/00706	Test Probe
892/00278	Gauge 0-40 bar (0-600 lbf/in²)
892/00279	Gauge 0-400 bar (0-6000 lbf/in²)



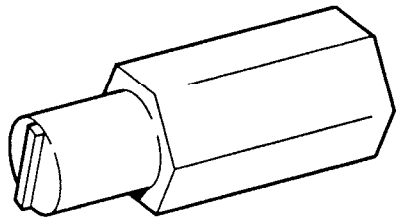
197210

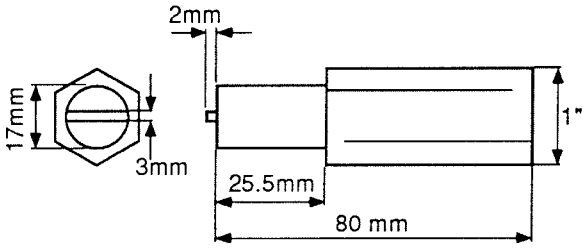
892/00318 Hose And Adapter Kit
To enable flow and pressure test equipment to be connected to adapters fitted with 'O' ring face seals.



197220

892/00334 Gland Seal Fitting Tool



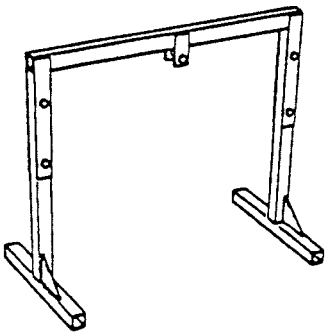


A234740

*Extractor Tool - Pump P1 Line Filter Retainer.
Manufacture locally.

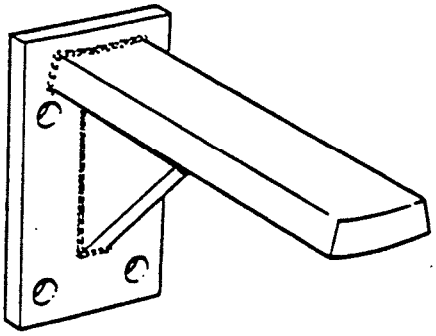
Service Tools

Section F - Transmission



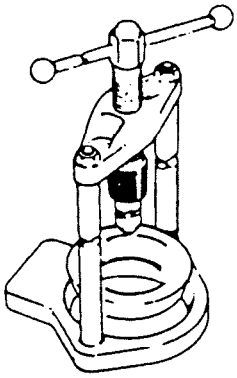
* 197260

892/00800 Splitting Frame (complete with ratchet hoist)



* 197270

892/00315 Engine Support Bracket

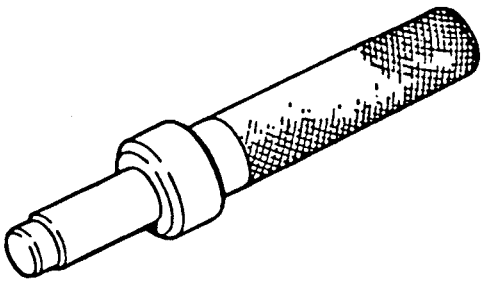


* 188200

892/00179 Bearing Press

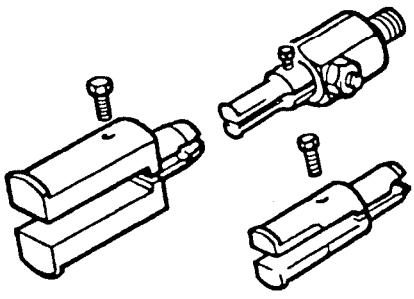
* 107750

892/00812 Drive Coupling Spanner for front and rear axle yoke couplings



* 197280

892/00313 Clutch Alignment Tool

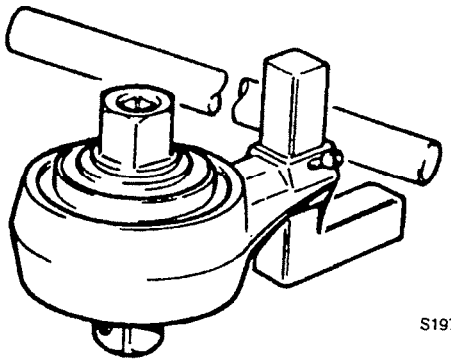


* 197080

892/00225 Adapter - Impulse Extractor
Small 17mm to 25mm
Medium 25mm to 45mm
Large 45mm to 80mm

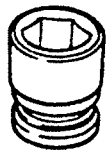
Service Tools (continued)

Section F - Transmission (continued)



S197030

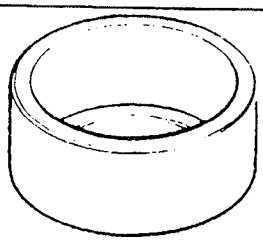
993/45400 Torque Multiplier
(use in conjunction with a torque wrench to give a 5 : 1 multiplication)



197250

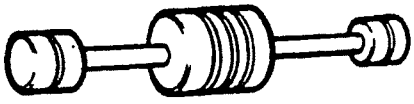
Heavy Duty Sockets

892/00817	17 mm A/F x 3/4in. square drive
892/00818	22 mm A/F x 3/4in. square drive
892/00819	15 mm A/F x 1/2in. square drive
892/00333	19 mm A/F x 3/4in. square drive



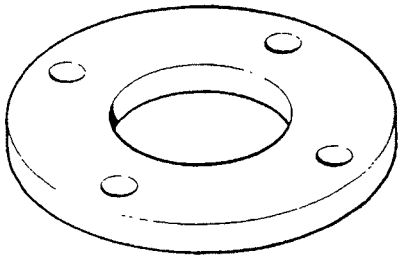
S190770

892/00174 Measuring Cup - Pinion Head Bearing



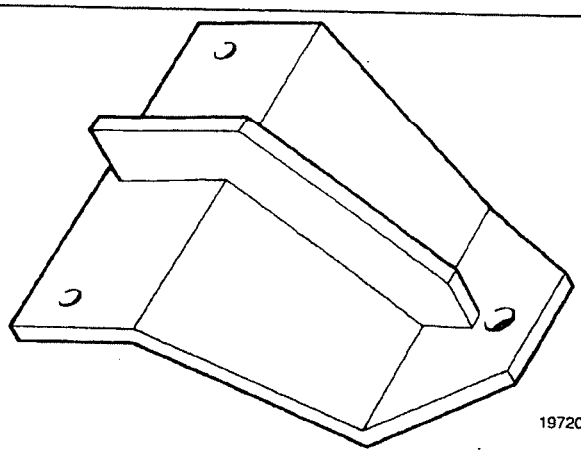
S197070

892/00224 Impulse Extractor Set for Hub Bearing Seals



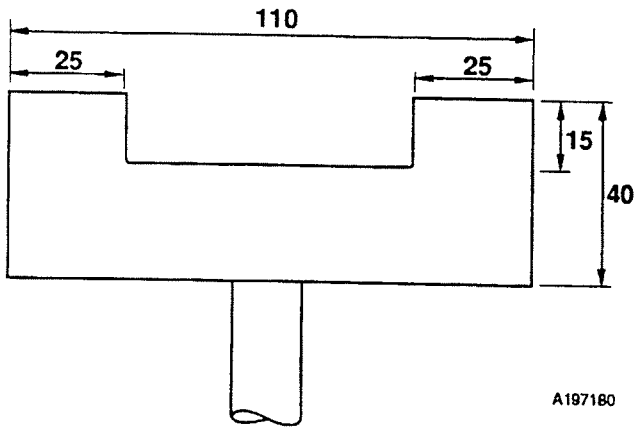
S197240

892/00312 Dummy End Plate for Range Gearbox



197200

477/00437 Gearbox Lifting Adapter

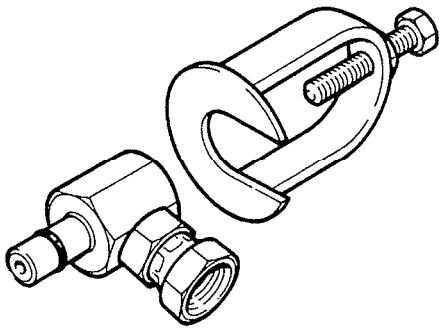


A197180

Rear Differential Setting Key
Cut from 5 mm plate to dimensions shown. Fabricate handle to suit.

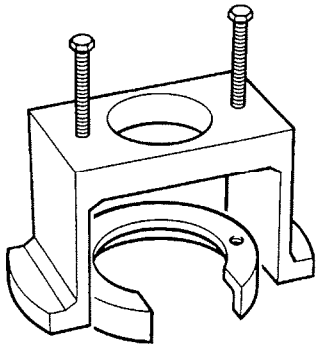
Service Tools (continued)

Section F - Transmission (continued)



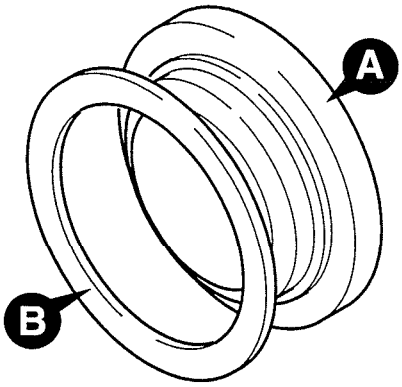
S196750

993/59300 2/4 WD Pressure Test Adaptor & Clamp



S267310

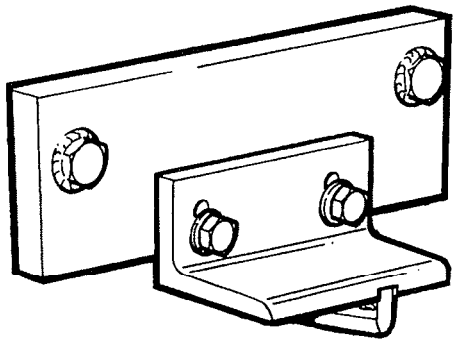
*892/00916 Spring Compressor for Splitter & PTO Clutches



A234900

*234900

892/00891 Oil Seal Insertion Tool Assembly

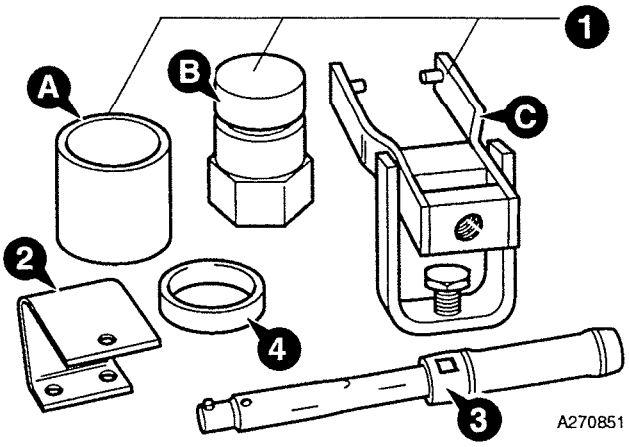


S226300

892/00892 Speed Gearbox Locking Tool

Service Tools (continued)

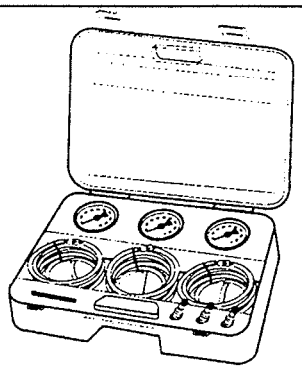
Section F - Transmission (continued)



***Solid Spacer Setting Tools**

1	892/00918		Setting Tool Kit. Contains the following:
		A	Sleeve for M24 Pinion
		B	Adapter for M30 Pinion
		C	Fork (suitable for all axles)
	The following setting tools must be purchased separately:		
	892/00945	**A**	Sleeve for M30 Pinion
	997/11100	**B**	Adapter for M24 Pinion
2	997/11000		Drive Head Setting Bracket
3	993/70111		Break-back Torque Wrench
4	-		Solid spacer (see parts CD or michrofiche for part numbers)

Section G - Brakes



892/00311 Brake Test Kit

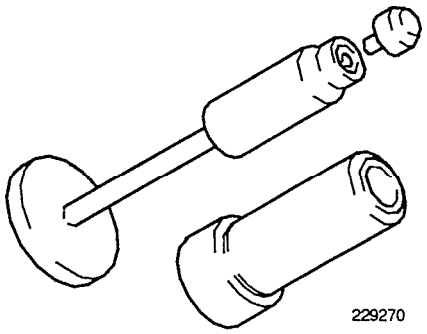
3 x Calibrated Test Gauges - 0-20 bar (0 - 290 lbf/in²)

3 x 5 Metre Hoses with Quick Release Adapters

3 x ISO Test Point Adapters

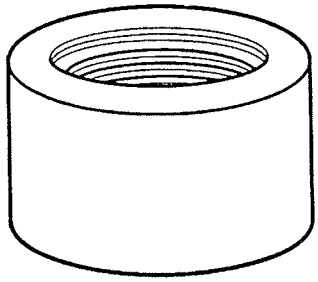
Service Tools (continued)

Section H - Steering



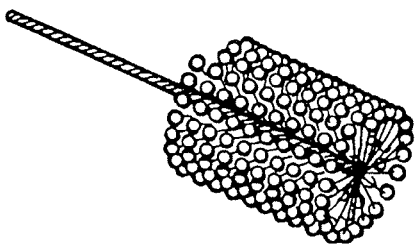
892/00180	Seal Tool for fitting 'O' ring and back-up ring to Danfoss Orbitrol Unit.
892/00181	Replacement Plastic Boss

Section S - Suspension



892/00314	Accumulator and Gas Spring Pressure Test Adapter

Section T - Engine



892/00041	De-glazing Tool for Cylinder Bores (to assist bedding-in of new piston rings)

Note: For other engine tools refer to the relevant Engine Service Manual.

General

Do not tow a machine unless there is no alternative. Remember that more damage might be caused to the machine by towing it. If at all possible repair the machine where it stands.

Note: It is not possible to tow-start a machine fitted with JCB Powersplit.

Make sure you will be obeying all pertinent laws and regulations before towing the machine on public roads.

⚠ DANGER

If the engine is not running, there will not be enough pressure to apply the service brakes. Carefully follow the precautions on this page before moving the machine or there may be a serious accident.

13-2-4-4

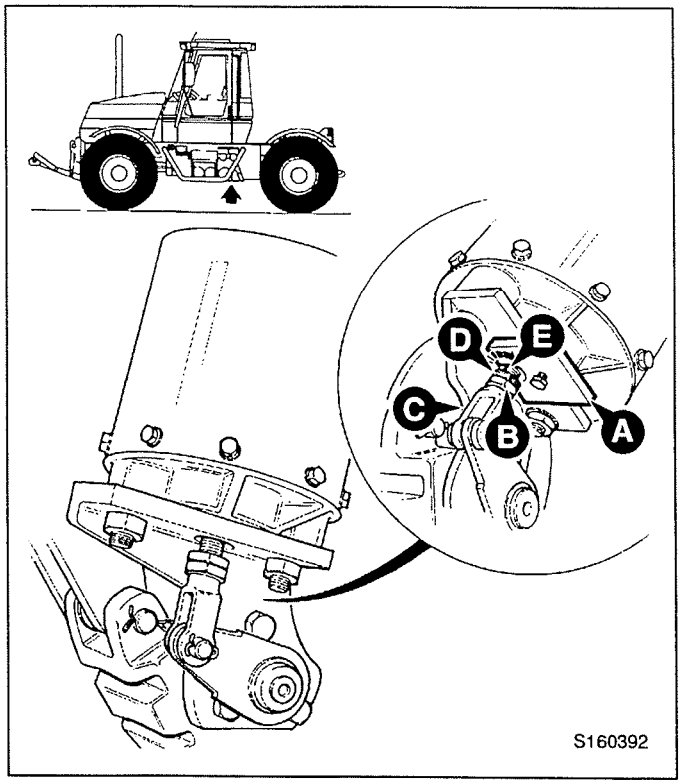
⚠ CAUTION

Towing a machine too far or too fast can damage the transmission. Do not tow the machine further than one mile. Use a trailer for greater distances. When towing do not travel faster than 25 km/h (15 mph).

Use a rigid drawbar. If you must use towing chains, then use two towing vehicles. One towing vehicle should be coupled to the front of the disabled machine. The other towing vehicle should be coupled to the rear of the disabled machine, to provide braking power.

The towing vehicle(s) must have enough pulling and braking power to move and stop the machine.

2-2-7-3



* Preparation for Towing

1 **Connect the towing vehicle.**
- **a** Apply the parking brakes on the towing vehicle and securely chock the wheels on the Fastrac.
- **b** Fit the drawbar between towing vehicle and Fastrac.

2 **Prepare the machine.**
- **a** Make sure that the range and speed gearboxes are both in neutral.
- **b** If the gearbox has failed, disconnect both propshafts (see Section F).
- **c** If an axle has failed, remove the sun gears (see Section F).

3 **Release the Fastrac parking brake.**
- **a** Machines to Serial No. 737000
  Release the machine parking brake by means of the hand lever.
- **b** Machines from Serial No. 737001
  If there is not enough air pressure to release the brake, start the engine to charge up the air system. If the engine cannot be run but the brake air system is serviceable, charge the system to 120 psi (8 bar) through Schrader valve **X. This job must be done by a qualified mechanic, using the correct equipment.**

⚠ DANGER

Ensure that the chocks and towing vehicle will prevent the Fastrac from moving as it is necessary to work under the machine to release the parking brake. When the parking brake has been manually released as described below, it will be impossible to apply the brake until plate A has been removed.

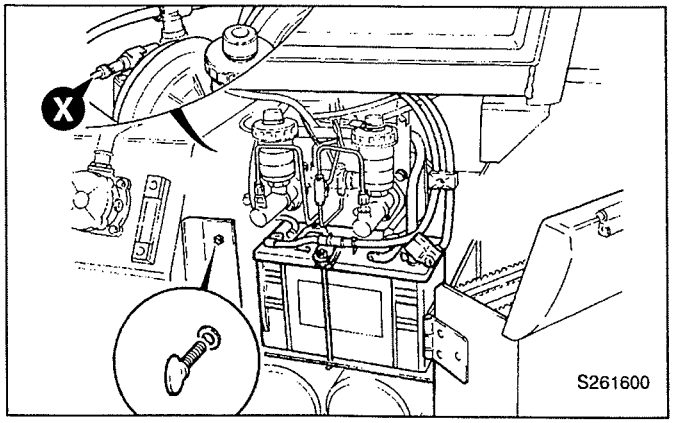
13-2-2-11

Alternatively, position plate **A** (if provided with the machine) as shown. Keeping nut **B** tight against clevis **C**, turn nut **D** against the plate so that rod **E** is drawn out of the actuator body and the parking brake is released.

Note: If the parking brake cannot be released, remove both propshafts (see Section F).

The machine is now ready for towing. If you will be steering the Fastrac, make sure you understand what the towing driver will be doing. Obey his instructions and all relevant regulations.

Remember that the steering will be much heavier if the engine is not running.



* Transporting the Machine

The safe transit of the load is the responsibility of the transport contractor and driver. Any machine, attachments or parts that may move during transit must be adequately secured.
5-2-5-9

Note: Before transporting the machine make sure you will be obeying the rules and laws of all the areas that the machine will be carried through.

Make sure that the transporting vehicle is suitable. See **Static Dimensions** (SPECIFICATIONS section in the machine handbook) for the dimensions of the machine.

⚠ WARNING

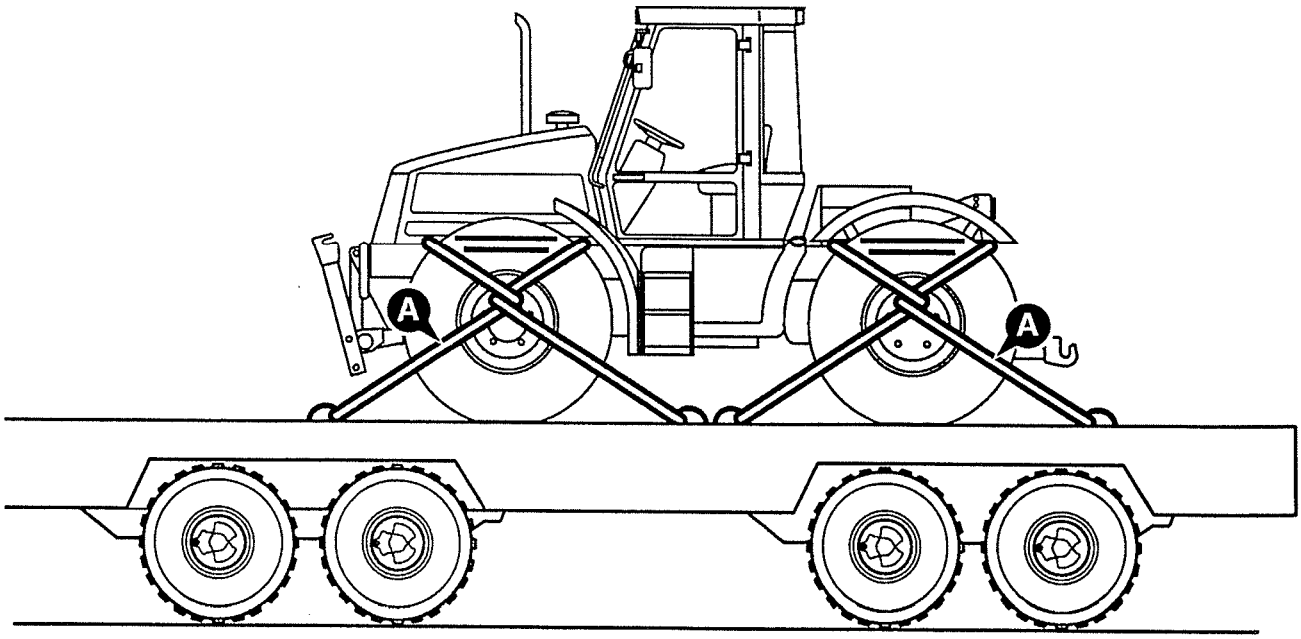
Before moving the machine onto the trailer, make sure that the trailer and ramp are free from oil, grease and ice. Remove oil, grease and ice from the machine tyres. Make sure the machine will not foul on the ramp angle. See Static Dimensions in SPECIFICATIONS **section for the minimum ground clearance of your machine.**
2-2-7-5/1

1 Place blocks at the front and rear of the trailer wheels.

2 Move the machine on to the trailer as follows:
- **a** Make sure the ramps are correctly in place and secure.
- **b** Carefully drive the machine onto the trailer.
- **c** Set the drive to neutral and engage the parking brake.
- **d** Switch off the engine.
- **e** Ensure that the overall height of the load is within regulations.
- **f** Secure the cab.

3 Anchor the machine to the trailer with chains or suitable webbing straps. The preferred fixing is to use webbing straps individually fixing all four wheels to the deck of the trailer as at **A**. If chains are used they should be connected to a suitable part of the drawbar at the rear of the machine. At the front, use the tie down points. Avoid chaining any part of the machine where the chains may damage critical componentry. For example, chaining around either axle provides the possibility of damaging the steel brake pipes running along their length.

4 Measure the maximum height of the machine from the ground. Try to make sure the truck driver knows the clearance height before he drives away.



Contents

Page No.

In this publication and on the machine, there are safety notices. Each notice starts with a signal word. The signal word meanings are given below.

⚠ DANGER

Denotes an extreme hazard exists. If proper precautions are not taken, it is highly probable that the operator (or others) could be killed or seriously injured.

INT-1-2-1

⚠ WARNING

Denotes a hazard exists. If proper precautions are not taken, the operator (or others) could be killed or seriously injured.

INT-1-2-2

⚠ CAUTION

Denotes a reminder of safety practices. Failure to follow these safety practices could result in injury to the operator (or others) and possible damage to the machine.

INT-1-2-3

All construction and agricultural equipment can be hazardous. When a JCB Fastrac is correctly operated and properly maintained, it is a safe machine to work with. But when it is carelessly operated or poorly maintained it can become a danger to you (the operator) and others.

Do not work with the machine until you are sure that you can control it.

Do not start any job until you are sure that you and those around you will be safe.

If you are unsure of anything, about the machine or the job, ask someone who knows. Do not assume anything.

Remember

BE CAREFUL
BE ALERT
BE SAFE

GEN-1-6

As well as the warnings in the following pages, specific warnings are given throughout the book. This section is designed to give a safety code for use of the machine generally and for operation and maintenance practices.

Note: This section includes a certain amount of operating safety information. But remember that whenever you drive the machine or operate its controls you are in effect a machine operator. Therefore you should read and understand the information given in the Operator Handbook before driving the machine or operating its controls.

General Safety

⚠ WARNING

Lifting Equipment

You can be injured if you use faulty lifting equipment. Make sure that lifting equipment is in good condition. Make sure that lifting tackle complies with all local regulations and is suitable for the job. Make sure that lifting equipment is strong enough for the job.

INT-1-3-7

⚠ WARNING

Clothing

You can be injured if you do not wear the proper clothing. Loose clothing can get caught in the machinery. Wear protective clothing to suit the job. Examples of protective clothing are: a hard hat, safety shoes, safety glasses, a well fitting overall, ear-protectors and industrial gloves. Keep cuffs fastened. Do not wear a necktie or scarf. Keep long hair restrained.

INT-1-3-6

⚠ WARNING

Alcohol and Drugs

It is extremely dangerous to operate machinery when under the influence of alcohol or drugs. Do not consume alcoholic drinks or take drugs before or whilst operating the machine or attachments. Be aware of medicines which can cause drowsiness.

INT-1-3-9

⚠ WARNING

Care and Alertness

All the time you are working with or on the machine, take care and stay alert. Always be careful. Always be alert for hazards.

INT-1-3-5

⚠ WARNING

Raised Equipment

Raised equipment can fall and injure you. Do not walk or work under raised equipment unless safely supported.

13-1-1-6

⚠ WARNING

Machine Modifications

This machine is manufactured in compliance with legislative and other requirements. It should not be altered in any way which could affect or invalidate any of these requirements. For advice consult your JCB Distributor.

Reference should also be made to Optional Attachments section where appropriate.

INT-1-3-10

Operating Safety

⚠ DANGER

Parking

Leaving the machine in gear will not prevent it running away. Do not leave the driving seat under any circumstances unless the parking brake is on.

13-2-1-10

⚠ WARNING

Roll Over Protection Structure (ROPS)

The machine is fitted with a Roll Over Protection Structure (ROPS). You could be killed or seriously injured if you operate the machine with a damaged or missing ROPS. If the ROPS has been in an accident, do not use the machine until the structure has been renewed. Modifications and repairs that are not approved by the manufacturer may be dangerous and will invalidate the ROPS certification.

13-1-1-8/1

⚠ WARNING

Entering/Leaving

Always face the machine when entering and leaving the cab. Use the step(s) and handrails. Make sure the step(s), handrails and your boot soles are clean and dry. Do not jump from the machine. Do not use the machine controls as handholds, use the handrails.

INT-2-1-7

⚠ WARNING

Seat

Position the seat so that you can comfortably reach the machine controls. You could have an accident if you operate the machine with the seat in the wrong position.

INT-3-3-5

⚠ WARNING

Seat Belt

Operating the machine without a seat belt can be dangerous. Before starting the engine, make sure your seat belt is fastened. Check the tightness and condition of the seat belt securing bolts regularly (see maintenance schedules).

INT 2 -1-8/1

⚠ WARNING

Passengers

Ensure that passengers use the seat provided in the cab. Passengers must not be carried on the rear deck of the vehicle under any circumstances.

13-1-1-1/1

⚠ WARNING

Reversing

Reversing at high speeds can cause accidents. Always drive at a safe speed to suit working conditions

13-1-1-3

⚠ WARNING

Visibility

Accidents can be caused by working in poor visibility. Keep windows clean and use your lights to improve visibility. Do not operate the machine if you cannot see properly.

INT-2-1-11

⚠ WARNING

Practice

You or others can be killed or seriously injured if you do unfamiliar operations without first practising them. Practise away from the work site on a clear area. Keep other people away. Do not perform new operations until you are sure you can do them safely.

INT-2-1-1

⚠ WARNING

Machine Limits

Operating the machine beyond its design limits can damage the machine, it can also be dangerous. Do not operate the machine outside its limits. Do not try to upgrade the machine performance with unapproved modifications.

INT-2-1-4

⚠ WARNING

Brakes

Do not coast the machine with the engine stopped as the main brakes will only operate for a limited number of applications and hydraulic trailer brakes will not function at all. Also the steering will become very heavy.

13-1-1-5/2

⚠ CAUTION

Hydraulic Trailer Brakes

Trailers with single line hydraulic brakes used in the United Kingdom are subject to a maximum speed of 20 mph (32 kph).

13-2-2-8

⚠ CAUTION

Trailer Brakes

Trailers with single line air brakes used in the Republic of Germany are subject to a maximum speed of 25 km/h (15 mph).

13-2-2-13

⚠ WARNING

Engine

The engine has rotating parts. Do not open the engine cover while the engine is running. Do not use the machine with the cover open.

INT-2-1-6

Operating Safety (cont'd)

⚠ WARNING

Banks and Trenches

Banked material and trenches can collapse. Do not work or drive too close to banks and trenches where there is danger of collapse.

INT-2-2-5

⚠ WARNING

Ramps and Trailers

Water, mud, ice, grease and oil on ramps or trailers can cause serious accidents. Make sure ramps and trailers are clean before driving onto them. Use extreme caution when driving onto ramps and trailers.

INT-2-2-6

⚠ WARNING

Communications

Bad communications can cause accidents. Keep people around you informed of what you will be doing. If you will be working with other people, make sure any hand signals that may be used are understood by everybody. Work sites can be noisy, do not rely on spoken commands.

INT-2-2-3

⚠ WARNING

Engine/Steering Failure

If the engine or steering fails, stop the machine as quickly as possible. Do not operate the machine until the fault has been corrected.

INT-2-1-5

⚠ DANGER

Sparks

Explosions and fire can be caused by sparks from the exhaust or the electrical system. Do not use the machine in closed areas where there is flammable material, vapour or dust.

INT-2-2-10

⚠ WARNING

Controls

Keep the machine controls clean and dry. Your hands and feet could slide off slippery controls. If that happens you will lose control of the machine.

2-2-3-6

⚠ WARNING

Exhaust Gases

Breathing the machine exhaust gases can harm and possibly kill you. Do not operate the machine in closed spaces without making sure there is good ventilation. If possible, fit an exhaust extension. If you begin to feel drowsy, stop the machine at once. Get out of the cab into fresh air.

INT-2-1-10

⚠ WARNING

Connecting the Power Take-off

Rotating equipment is dangerous. Always disengage the PTO and stop the engine before attempting to attach or detach an implement to or from a PTO shaft or before making adjustments to an implement connected to the machine via a PTO shaft.

13-2-1-5

⚠ WARNING

Power Take-off Operation

When operating PTO equipment, always observe the following safety precautions:

Follow the instructions in the implement operator's handbook.

Rotating equipment is dangerous. Do not wear loose fitting clothing when working close to rotating shafts.

Always disengage the PTO, stop the engine and wait until the equipment stops, before:

1 Leaving the cab

2 Attempting to attach or detach an implement to or from a PTO shaft or

3 Working on or cleaning an implement connected to the machine via a PTO shaft.

Always ensure that the PTO shaft and driveline are fully guarded before use.

When using stationary PTO equipment, ensure that the parking brake is applied.

13-2-1-6

⚠ WARNING

Power Take-off Jamming

If the PTO becomes jammed, disengage the PTO, stop the engine and clear the blockage. Wait until the PTO shaft stops before working on the equipment. If the PTO clutch slips, immediately disengage the PTO and stop the engine.

13-2-2-2

⚠ WARNING

Hitching Trailers and Equipment

When the vehicle is approaching a trailer or equipment to be hitched, make sure that no persons are present between vehicle and trailer or equipment. When mounting equipment at the rear of the vehicle, you must ensure that proper steering control is maintained. The reduction of front axle loading must not exceed 80%.

13-1-1-13

Operating Safety (cont'd)

⚠ WARNING

Tyres - General

You could be killed or injured if a machine tyre bursts. Do not use the machine with damaged, incorrectly inflated or excessively worn tyres. Recognize the speed limitation of the tyres fitted and do not operate at more than their recommended maximum speed.

13-2-1-2

⚠ WARNING

Certain tyres fitted as after-market equipment may have maximum permitted speeds below the maximum speed of the vehicle. Brake efficiency is slightly reduced and stopping distance is increased when these tyres are fitted. They will suffer damage if operated at speeds higher than those recommended and may endanger life.

13-3-2-5

⚠ WARNING

Tyre Speed Limitations

Running tyres outside recommended guidelines may result in failure of the tyres which at high speeds may endanger life. BE WARNED.

13-3-1-6

⚠ WARNING

Rear Deck

Passengers must not be carried on the rear deck of the vehicle. Ensure that loads carried on the rear deck are secured adequately to prevent them rolling about, falling off or toppling over.

13-1-1-12/1

⚠ WARNING

Weight Distribution

The machine must never be loaded such that less than 20% of the unladen vehicle weight is carried on the front axle.

13-1-1-11

⚠ CAUTION

Weight Distribution

The Fastrac has to comply with certain braking regulations which in some countries control weight distribution between front and rear axles. Travelling on the road with implements or weights carried on the front when no implement is on the rear may break the law. In this case you should transfer the front mounted equipment to the rear linkage. It is the operator's responsibility to know and observe the laws in the country concerned.

13-2-2-5

⚠ WARNING

Travel Speed

Be aware of the load the machine is carrying or towing and the speed at which you are travelling. Do not corner fast when carrying heavy mounted implements or towing trailers. Reduce speed when towing non-suspended implements on rough ground.

13-2-2-1

⚠ WARNING

Stability

In the event of the machine becoming unstable, keep firm hold of the steering wheel and do not try to leave the cab.

13-2-2-10

⚠ WARNING

Audible Warnings

When you hear an audible warning, stop the machine as soon as possible. Get the fault put right before using the machine again.

13-2-1-9

⚠ WARNING

Controls

When driving the machine on the road, use the accelerator pedal and not the hand throttle to control the engine speed.

13-2-1-8

Maintenance Safety

⚠ WARNING
Working Under the Machine

Make the machine safe before getting beneath it. Do the following: Park on level ground. Engage the parking brake. Lower any mounted implements to the ground. Stop the engine, remove the starter key, disconnect the battery. Chock the wheels.

13-3-1-1

⚠ WARNING
Soft Ground

A machine can sink into soft ground. Never work under a machine on soft ground.

INT-3-2-4

⚠ WARNING
Jacking

A machine can roll off jacks and crush you unless the wheels have been chocked. Always chock the wheels at the opposite end of the machine to that which is to be jacked. Do not work underneath a machine supported only by jacks. Always support a jacked-up machine on axle stands before working underneath it.

INT-3-2-8

⚠ WARNING
Transmission Testing

The transmission is in 4 wheel drive until de-selected by hydraulic pressure to 2 wheel drive. If the machine is to be raised and the engine/transmission run, make sure all four wheels are off the ground and supported by axle stands as if only the rear wheels were raised, the machine could still drive through the front axle. Note that when a NoSpin differential is fitted, both front wheels will be driven even if one is jacked up and the other is on the ground.

TRAN 8-1/2

⚠ WARNING
Diesel Fuel

Diesel fuel is flammable; keep naked flames away from the machine. Do not smoke while refuelling the machine or working on the engine. Do not refuel with the engine running. There could be a fire and injury if you do not follow these precautions.

INT-3-2-2

⚠ WARNING
Petrol

Do not use petrol in this machine. Do not mix petrol with the diesel fuel; in storage tanks the petrol will rise to the top and form flammable vapours.

INT-3-1-6

⚠ WARNING
Battery

A battery with frozen electrolyte can explode if it is used or charged. Do not use a machine with a frozen battery. To help prevent the battery from freezing, keep the battery fully charged.

INT-3-1-7

⚠ WARNING
Battery Gases

Batteries give off explosive gases. Keep flames and sparks away from the battery. Do not smoke close to the battery. Make sure there is good ventilation in closed areas where batteries are being used or charged. Do not check the battery charge by shorting the terminals with metal; use a hydrometer or voltmeter.

INT-3-1-8

⚠ WARNING
Battery Terminals

The machine is negatively earthed. Always connect the negative pole of the battery to earth.

When connecting the battery, connect the earth (-) lead last.

When disconnecting the battery, disconnect the earth (-) lead first.

INT-3-1-9

⚠ WARNING
Electrical Circuits

Understand the electrical circuit before connecting or disconnecting an electrical component. A wrong connection can cause injury and/or damage.

INT-3-1-4

⚠ WARNING
Hydraulic Hoses

Damaged hoses can cause fatal accidents. Inspect the hoses regularly for:
Damaged end fittings
Chafed outer covers
Ballooned outer covers
Kinked or crushed hoses
Embedded armouring in outer covers
Displaced end fittings.

INT-3-3-2

⚠ WARNING
Rams

The efficiency of the rams will be affected if they are not kept free of solidified dirt. Clean dirt from around the rams regularly. When leaving or parking the machine, close all rams if possible to reduce the risk of weather corrosion.

INT-3-2-10

Maintenance Safety (cont'd)

⚠ WARNING
Hydraulic Pressure

Hydraulic fluid at system pressure can injure you. Before disconnecting or connecting hydraulic hoses, stop the engine and operate the controls to release pressure trapped in the hoses. Make sure the engine cannot be started while the hoses are open.

INT-3-1-11/1

⚠ WARNING
Hydraulic Fluid

Fine jets of hydraulic fluid at high pressure can penetrate the skin. Do not use your fingers to check for hydraulic fluid leaks. Do not put your face close to suspected leaks. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of hydraulic fluid. If hydraulic fluid penetrates your skin, get medical help immediately.

INT-3-1-10/1

⚠ WARNING
Oil

Oil is toxic. If you swallow any oil, do not induce vomiting, seek medical advice. Used engine oil contains harmful contaminants which can cause skin cancer. Do not handle used engine oil more than necessary. Always use barrier cream or wear gloves to prevent skin contact. Wash skin contaminated with oil thoroughly in warm soapy water. Do not use petrol, diesel fuel or paraffin to clean your skin.

INT-3-2-3

⚠ WARNING
Hot Coolant

The cooling system is pressurised when the engine is hot. Hot coolant can spray out when you remove the radiator cap. Let the system cool before removing the radiator cap. To remove the cap; turn it to the first notch and let the system pressure escape, then remove the cap.

INT-3-2-9

⚠ WARNING
Wheels

Wheels are heavy. Handle and store with care to ensure that they cannot fall and cause injury.

13-3-1-7

⚠ WARNING
Metal Splinters

You can be injured by flying metal splinters when driving metal pins in or out. Use a soft faced hammer or drift to remove and fit metal pins. Always wear safety glasses.

INT-3-1-3

⚠ WARNING

Always wear safety glasses when dismantling assemblies containing components under pressure from springs. This will protect against eye injury from components accidentally flying out.

GEN 6-2

⚠ WARNING
Communications

Bad communications can cause accidents. If two or more people are working on the machine, make sure each is aware of what the others are doing. Before starting the engine make sure the others are clear of the danger areas; examples of danger areas are: the rotating blades and belt on the engine, the attachments and linkages, and anywhere beneath or behind the machine. People can be killed or injured if these precautions are not taken.

INT-3-1-5

⚠ WARNING
Cleaning

Cleaning metal parts with incorrect solvents can cause corrosion. Use only recommended cleaning agents and solvents.

INT-3-2-11

⚠ WARNING
'O' rings, Seals and Gaskets

Badly fitted, damaged or rotted 'O' rings, seals and gaskets can cause leakages and possible accidents. Renew whenever disturbed unless otherwise instructed. Do not use Trichloroethane or paint thinners near 'O' rings and seals.

INT-3-2-12

⚠ WARNING
Clutch Fluid

Do not use ordinary hydraulic fluid in the clutch system.

13-3-2-4

⚠ WARNING
Welding and Modifications

To prevent the possibility of damage to electronic components, disconnect the battery and withdraw the plug from the electronic draft control unit before arc-welding on the machine or attached implements.

Parts of the machine are made from cast iron; welds on cast iron can weaken the structure and break. Do not weld cast iron. On no account weld or drill the chassis structure. Non-approved modifications can cause injury and damage. Contact JCB before modifying the machine.

GEN 8-1

Maintenance Safety (cont'd)

⚠ WARNING

Fluoroelastomeric Materials

Certain seals and gaskets (e.g. crankshaft oil seal) on JCB machines contain fluoroelastomeric materials such as Viton, Fluorel and Technoflon. Fluoroelastomeric materials subjected to high temperatures can produce highly corrosive hydrofluoric acid. THIS ACID CAN SEVERELY BURN.

New fluoroelastomeric components at ambient temperature require no special safety precautions.

Used fluoroelastomeric components whose temperatures have not exceeded 300°C require no special safety precautions. If evidence of decomposition (e.g. charring) is found, refer to the next paragraph for safety instructions DO NOT TOUCH COMPONENT OR SURROUNDING AREA.

Used fluoroelastomeric components subjected to temperatures greater than 300°C (e.g. engine fire) must be treated using the following safety procedure. Make sure that heavy duty gloves and special safety glasses are worn:

1 Ensure that components have cooled then remove and place material in plastic bags.

2 Thoroughly wash contaminated area with 10% calcium hydroxide or other suitable alkali solution, if necessary use wire wool to remove burnt remains.

3 Thoroughly wash contaminated area with detergent and water.

4 Contain all removed material, gloves etc used in this operation in sealed plastic bags and dispose of in accordance with Local Authority Regulations.

DO NOT BURN FLUOROELASTOMERIC MATERIALS.

If contamination of skin or eyes occurs, wash the affected area with a continuous supply of clean water or with calcium hydroxide solution for 16-60 minutes. Get medical attention immediately.

INT - 3 - 3 - 5/1

⚠ WARNING

Brake Pads

Always renew brake pads and locating pins in complete axle sets, using genuine JCB parts, otherwise braking will be unsafe.

13-3-1-10

⚠ WARNING

Cleaning Agents

When using cleaning agents, solvents or other chemicals, you must adhere to the manufacturer's instructions and safety precautions.

GEN-1-9

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