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SAFETY NOTICES

⚠ WARNING

Study This Handbook Before Starting The Machine

You must understand and follow the instructions in this handbook. You must observe all relevant laws and regulations. If you are unsure about anything, ask your JCB distributor or employer. **Do not guess**, you or others could be killed or seriously injured.

INT-1-1-1

In this handbook and on the machine there are safety notices. Each notice starts with a signal word. The meanings of the signal words 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

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INSTRUMENT CLUSTER (continued)

System Error Codes

The electronic diagnostic system communicates problems to the operator via a series of 'Number Error Codes'.

Number Error Codes

Electronic Control Unit (ECU) errors are drawn to the operator's attention by the flashing of the 'book' icon (see ***Warnings (Visual only)***, item 17). This is accompanied by the showing of error codes on centre display **30**. The error code information alternates with the basic data (i.e. distance travelled) of centre display **30** in the form of 2 second displays of each. The error information begins with a statement of the number of errors in the system e.g. '3 ERRS', followed by up to 20 error codes displayed sequentially, e.g. 'ERR T025', in the order in which they occurred. If there are more than 20 error codes in the system, the opening statement will indicate that number, but only the first 20 will be identified.

Fault Identification and Rectification

The meanings of the number error codes and their effects on the machine can be summarised as follows:
Note: E pefix codes do not apply to 3170 or 3170 Plus.

D001 - D003	Instrument cluster internal fault.
D010 - D240	Instrument cluster system fault.
E000	No communication between the instrument cluster and the engine.
E001 - E164	Engine fault. Engine performance may be affected.
T000 - T003	Transmission will not operate correctly.
T010 - T018	Auto shift fault. Up and down shifts are inhibited. If the currently selected gear is faulty the next best gear will be selected automatically.
T019 - T021	Clutch lubrication fault.
T025 - T057	Selectronic range change fault.
T060 - T063	Transmission speed trigger fault. Selection of "M" or "H" ranges will be ignored.
T070 - T079	Clutch system control fault.
T080 - T085	Column switch fault. Range actually selected is shown on transmission display of instrument cluster.
T100 - T126	Clutch system control fault.
T230	Limp home mode operated.
U000 - U068	Electronic front hitch fault.
V000 - V070	Electronic spool valve green slice fault.
W000 - W070	Electronic spool valve blue slice fault.
X000 - X070	Electronic spool valve brown slice fault.
Y000 - Y070	Electronic spool valve grey slice fault.

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FLUIDS, LUBRICANTS, CAPACITIES AND SPECIFICATIONS

Note: *New engines DO NOT require a running-in period. The engine/machine should be used in a normal work cycle immediately. DO NOT use a special running-in oil but use the oil recommended below from new.*

While 15W/40 oil is recommended for most climates, limited use of low viscosity oils such as 10W/30 is permitted to provide easier starting and sufficient oil flow at ambient temperatures below -5 °C (23 °F). Continued use of low viscosity oils can decrease engine life.

ITEM	CAPACITY Litres (UK Gal)	FLUID/LUBRICANT	MINIMUM INTERNATIONAL SPECIFICATION
Fuel	350 (77)	Diesel Oil (See Types of Fuel)	ASTM D975-66T Nos. 1D, 2D
Engine (Oil)	15 (3.3)	JCB Extreme Performance Engine Oil 15W40	†† API CH-4 or ACEA E3/B3A3, SAE 15W/40
Engine (Coolant)	33 (7.3)	JCB Four Seasons Antifreeze & Summer Coolant/water (See Coolant Mixtures)	ASTM D3306, BS6580
PTO, Speed and Range Boxes (combined)	42 (9.3)	JCB Super Universal Agricultural Oil	API-GL-4, MIL-L-2105
Front Axle Housing Hubs (x2)	 20 (4.4) 2.5 (0.55)	JCB HD90 Gear Oil	API-GL-5, MIL-L-2105C
Rear Axle	27 (6)	JCB HD90 Gear Oil	API-GL-5, MIL-L-2105C
Brake System Front Rear	 0.75 (0.17) 0.75 (0.17)	JCB Universal Brake Fluid **⚠ CAUTION** **Do not use ordinary hydraulic fluid in the brake system.** 13-3-2-6	SAE J1703 DOT 4
† Hydraulic System	120 (26.4)	JCB High Performance Hydraulic Oil JCB Hydraulic Fluid HP32	ISO VG46 (Above 38 °C, 100 °F) ISO VG32 (Below 38 °C, 100 °F)
Grease Points	---	JCB HP Grease	Lithium complex NLGI No. 2 consistency including extreme pressure additives
Front PTO Transfer Box (optional)	3.0 (0.67)	JCB HD90 Gear Oil	API-GL-5, MIL-L-2105C

† Note: *The total hydraulic system capacity depends on the equipment being used. Watch level indicator on hydraulic tank.*

†† Note: *IF API CH-4 OR ACEA E3/B3A3 ENGINE OIL AT SAE 15W/40 IS NOT AVAILABLE THE ENGINE OIL MUST BE CHANGED AT 250 HOURS. Refer to the Service Schedule* ***Every 250 Operating Hours*** *for suitable alternative oils.*

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SERVICE SCHEDULES

Apart from the daily jobs, the schedules are based on machine running hours. Consult the hourmeter section of the **Engine/PTO Data Display** (see item 28, ***Instrument Cluster***) to establish when a service is due. Do not use a machine which is due for a service. Make sure any defects found during the regular maintenance checks are rectified immediately.

⚠ WARNING

Maintenance must be done only by suitably qualified and competent persons. Before doing any maintenance make sure the machine is safe. It should be correctly parked on firm level ground.

To prevent anyone starting the engine, remove the starter key. Disconnect the battery and chock the wheels when you are working beneath the machine.

If you do not take these precautions you could be killed or injured.
9-3-1-1

Every 10 Operating Hours or Daily whichever occurs first

Clean
1 Machine generally.

Drain
2 Empty hydraulic coupling drain reservoir (if fitted).
3 Fuel filter.
4 Trailer air tank.

Check (Engine Stopped)
5 Generally for damage.
6 Engine oil level and condition.
7 Check radiator and coolers for blockage and clean if required.
8 Engine coolant level and condition.
9 Fuel system for leaks and contamination.
10 Air cleaner and air inlet hose condition and security.
11 Fan belt condition.
12 Crankcase Breather Condition.
13 Hydraulic fluid level.
14 Hydraulic system for leaks.
15 Machine generally for oil leaks (axles, engine, transmission).
16 Gearbox oil level.
17 Tightness of wheel nuts.
18 Windscreen washer level.
19 Tyre pressures and condition.
20 Security of front weights (if fitted).
21 Seat belt condition and security .
22 Brake fluid levels.

Every 10 Operating Hours or Daily whichever occurs first (continued)

Check (Engine Running)
23 Instrument readings and warning lights.
24 Operation of all electrical equipment.
25 Exhaust for excessive smoke.
26 Operation of clutch and footbrakes.
27 Operation of steering.
28 Operation of transmission.
29 Operation of 3-point linkage
30 Operation of front linkage (optional equipment).
31 Parking brake operation.
32 Throttle and stop controls.

Every 50 Operating Hours or Weekly whichever occurs first

Do the Daily jobs plus:

Drain
1 Fuel pre-filter (type shown on page 157 only).
***Note**: Some machines have a one-piece pre-filter which cannot be drained.*

Clean
2 Air filter dust valve.

Check (Engine Stopped)
3 Air conditioning compressor drive belt.
4 Front PTO transfer gearbox oil level (optional equipment).
5 Brake pad condition.
6 Cab air filter (clean if required).
7 Propshaft security.

Grease
8 Rear PTO drive shaft splines and universal joints.
9 Rear PTO drive shaft bearings.
10 Rear axle propshaft.
11 Front axle propshaft.
12 Front PTO drive shaft (if fitted).
13 Rear anti-roll bar joints.
14 Rear hydraulic lift cross-shaft.
15 Rear hydraulic lift ram pivots.
16 Front agricultural 3 point linkage cross shaft (if fitted).
17 Front agricultural 3 point linkage lift ram pivots (if fitted).
18 Steering swivels.
19 Steering column universal joints.
20 Suspension cylinder pivots.
21 3-point linkage lift rods and top link.
22 Automatic trailer coupling (if fitted).
23 Roller drawbar (if fitted).

***Note:** It is essential that drive shaft and propshaft joints are lubricated as specified.*

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BEFORE STARTING THE ENGINE

Note: *Read* ***Operating in Low Temperatures*** *or* ***Operating in High Temperatures*** *if you will be using the machine in very cold or very hot climates.*

1 Engage the Parking brake

The parking brake should have been engaged when the machine was last parked. But if it is not already engaged, engage it now.

2 Do a Pre-start Inspection

Note: *If the engine has not been run for a long period (e.g. 3 months) it may be necessary to bleed the fuel system.*

For your own safety (and others) and for a maximum service life of your machine, do a pre-start inspection before starting the engine.

a If you have not already done it, do a walkround inspection of the outside of the machine. See ***Before Entering the Cab***. Also do the daily checks as detailed in the Service Schedules.

b Remove dirt and rubbish from the cab interior, especially around the pedals and control levers.

⚠ WARNING

Keep the machine controls clean and dry. Your hands and feet could slide off slippery controls. If that happens you may lose control of the machine.
7-2-2-8

c Remove oil, grease and mud from the pedals, control levers and the steering wheel.

d Make sure that your hands and shoes are clean and dry.

⚠ WARNING

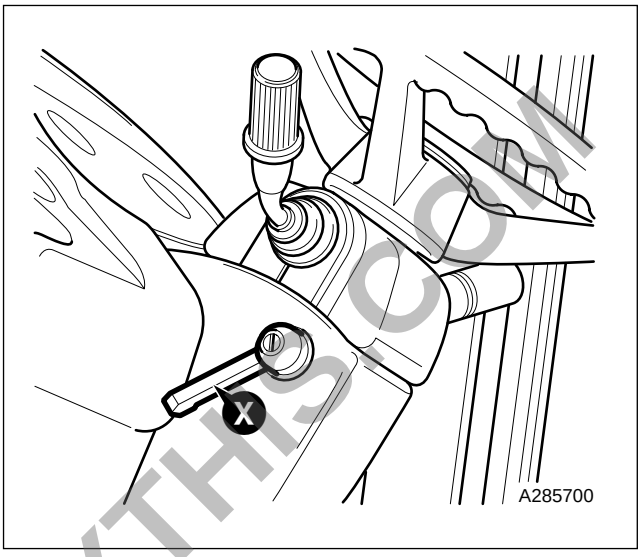
Loose articles can fall and strike you or roll on the floor. You could be knocked unconscious, or the controls could get jammed. If that happens you will lose control of the machine.
2-2-3-7/1

e Remove or secure all loose articles in the cab - such as lunch boxes, tools etc.

f Make sure that power take-off guards are in position and that the bonnet is closed firmly.

g Check round the cab for loose or missing bolts, screws etc. Renew or tighten where necessary.

h Check that the following are in working order :- Lights, Warning Lights, Rotating Beacon, Horn, Indicator Lights, All Switches, Direction Indicators, Hazard Warning Lights, Windscreen Washers and Wipers.



3 Sit in the Driving Seat and adjust the Seat and the Steering Column

⚠ WARNING

The ROPS cab is designed to give you protection in an accident. If you do not wear your seat belt you could be thrown about inside the cab, or thrown out of the machine and crushed. You must wear a seat belt when using the machine. Fasten the seat belt before starting the engine.
2-2-1-9

Slacken handle **X** and adjust the rake and length of the column. Tighten the handle securely when the wheel is in the most comfortable position.

⚠ CAUTION

Make sure the steering column is fully clamped before driving the machine.
5-2-1-3

4 Set the Rear View Mirror(s)

Set the rear view mirror(s) to give you a good view close behind the machine when you are correctly seated.

5 Make sure that other people are clear of machine and equipment

6 Ensure that both PTO switches (when fitted) are in the brake position and that the PTO shields are in place

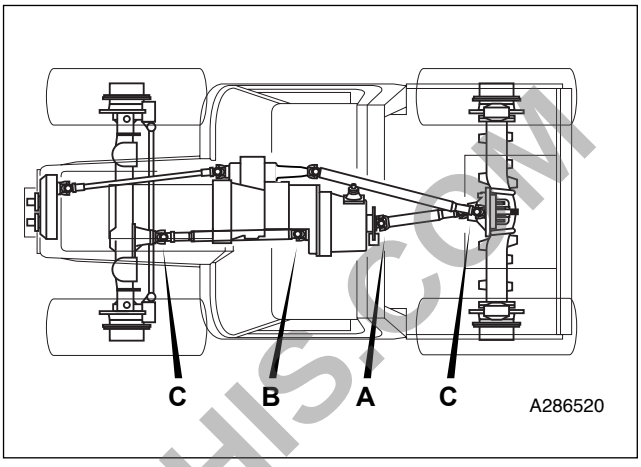
The engine will not start unless the PTO switches are in the brake position.

7 Put the Speed Gearbox Lever in Neutral

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MOVING A DISABLED MACHINE

Preparation for Towing (continued)



Removing the Propshafts

⚠ DANGER

Ensure that the blocks and towing vehicle will prevent the Fastrac from moving, as it is necessary to work under the machine to do this job. Note that this job should be done by a qualified mechanic.

13-2-4-3

1 Mark end flange **2** of the rear propshaft (end flange **5** of the front propshaft) and range box rear flange **3** (range box front flange **6**) to ensure correct positioning on re-assembly.

2 Mark the propshaft end flange **8** and axle flange **9** for both shafts to ensure correct positioning on re-assembly.

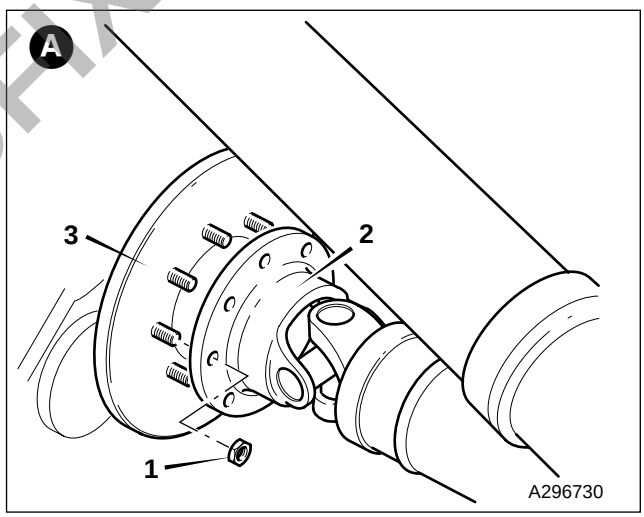
3 **a** Remove self-locking nuts **1** securing rear propshaft flange **2** to the range box rear flange **3**. Lower this end to the ground.

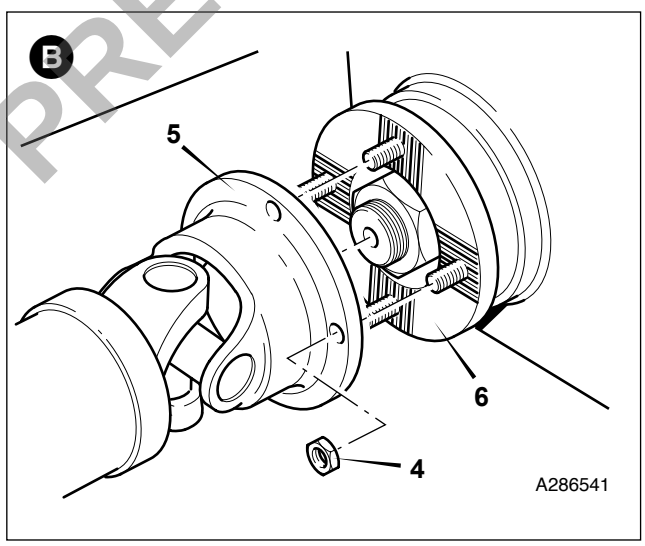
b Remove nuts **7** securing rear propshaft flange **8** to rear axle flange **9**. Lower the propshaft to the ground and remove.

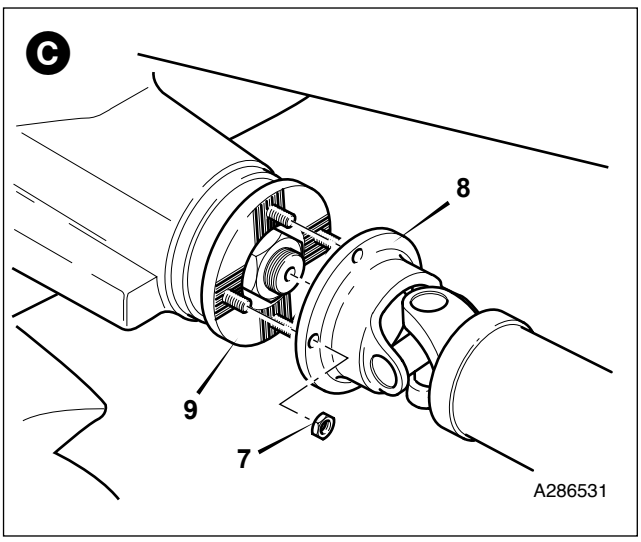
4 **a** Remove nuts **4** securing front propshaft flange **5** to range box front flange **6**. Lower this end of the shaft onto the propshaft bracket.

b Remove nuts **7** securing front propshaft flange **8** to front axle flange **9**. Remove the propshaft by withdrawing it from the propshaft bracket.

When the propshafts have been removed they should be re-installed by a qualified mechanic as instructed in the Fastrac Service Manual.







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TYRES AND WHEELS (continued)

Tyre Inflation

⚠ WARNING

An exploding tyre can kill, inflated tyres can explode if overheated. Do not cut or weld the rims. Use a tyre/wheel specialist for all repair work.
2-3-2-7

These instructions are for adding air to a tyre which is already inflated. If the tyre has lost all its air pressure, call in a qualified tyre mechanic. The tyre mechanic should use a tyre inflation cage and the correct equipment to do the job.

1 Prepare the Wheel

Before you add air to the tyre, make sure it is correctly fitted on the machine or installed in a tyre inflation cage.

2 Prepare the Equipment

Use only an air supply system which includes a pressure regulator. Set the regulator no higher than 1.38 bar (20 lbf/in^2) above the recommended tyre pressure. See ***Pressures, Speeds and Loads*** for recommended tyres and pressures for your machine.

Use an air hose fitted with a self-locking air chuck and remote shut-off valve.

3 Add the Air

Make sure that the air hose is correctly connected to the tyre valve. Clear other people from the area. Stand behind the tread of the tyre while adding the air. Inflate the tyre to the recommended pressure. Do not over-inflate.

⚠ CAUTION

The high speed capability of the Fastrac dictates that water ballasting of the tyres is not recommended.
13-3-1-12

Checking Wheel Nut Torques

On a new machine check the wheel nut torques every ten hours until they stay correct. If a wheel has been removed and refitted, check the wheel nut torques every ten hours until they stay correct. Do not apply oil to the wheel nut threads. Every day, before starting work, check that the wheel nuts are tight.

Wheel nut torque setting

Item	Nm	kgf m	lbf ft
Rear axles with 12 nuts per wheel	600	60.0	440
All other axles	500	51.0	370

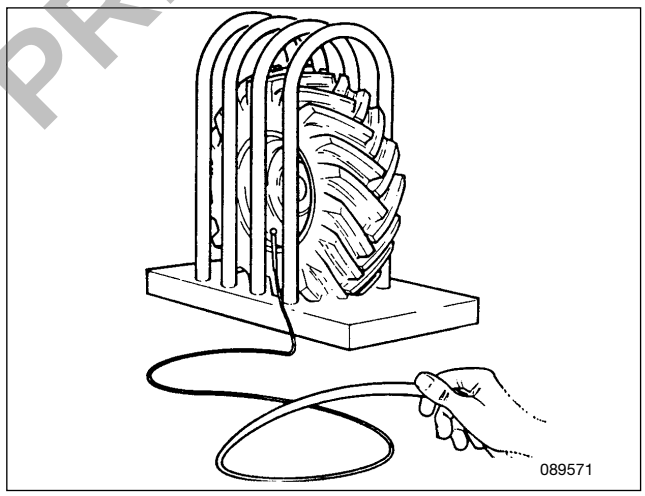
Adjustable Track Width

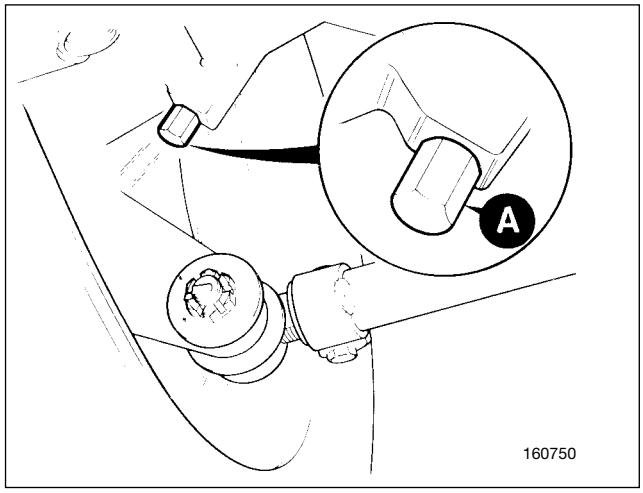
The standard wheels provide a track width of 80 in (2015 mm). To obtain an alternative track of 74 in (1880 mm), move the wheels from one side of the machine to the other and reverse the wheels on the hubs. The **'V'** of the tyre tread pattern must always point forward when at the top of the wheel.

Note: *Check the wheel to axle hub nuts as detailed under* ***Checking Wheel Nut Torques.***

Lock Stops

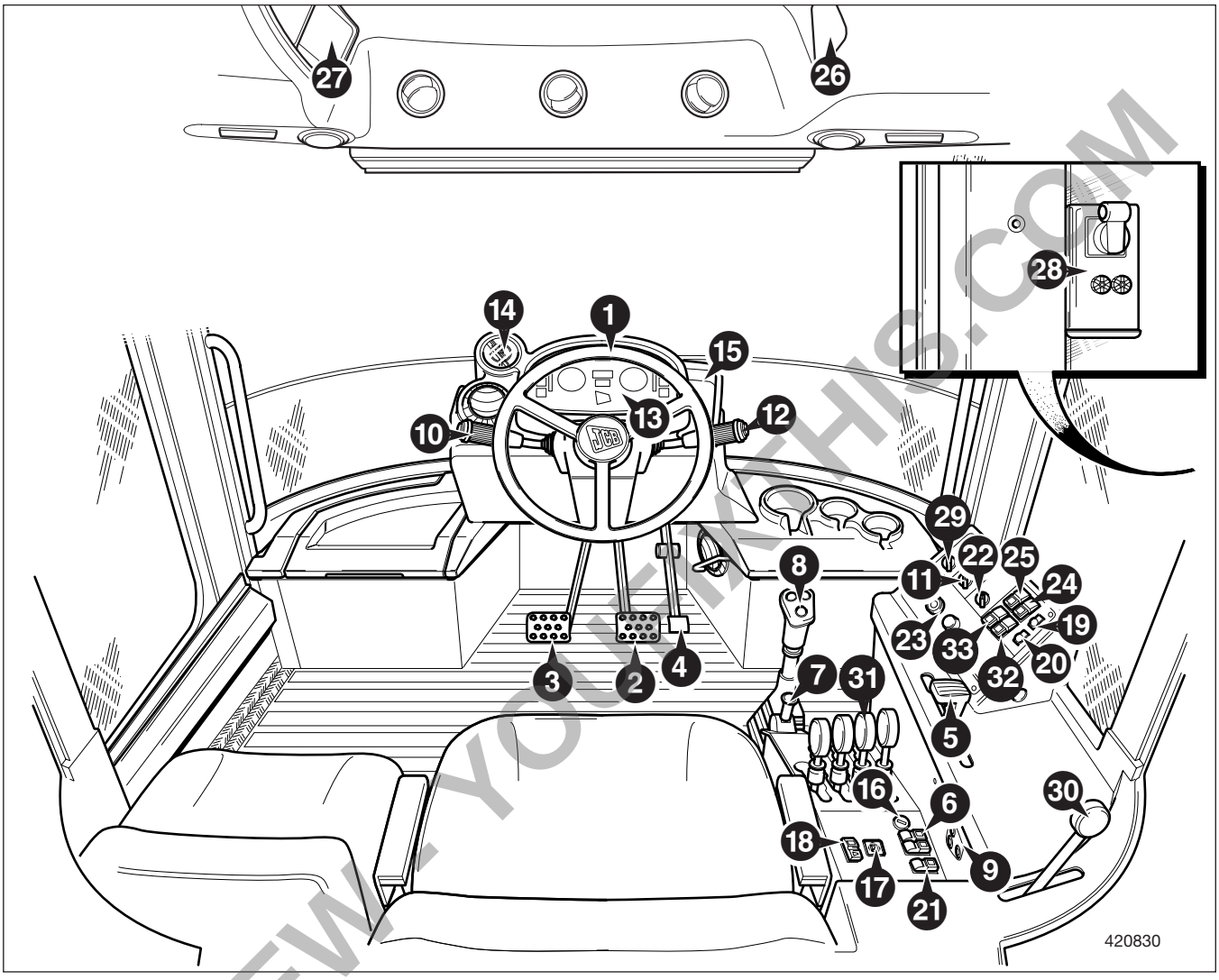
To prevent the tyres from fouling on the vehicle chassis, lock stops **A** must be fitted to the inside of each steering axle swivel. The correct size of lock stop is fitted at the factory to suit the tyre and wheel configuration supplied as original equipment. If a different tyre and wheel configuration is to be used, consult your JCB dealer about the need to change the lock stops and make other essential adjustments to the steering box.





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CAB LAYOUT AND CONTROLS - 3170, 3190 & 3220



Controls

1 Steering Wheel

2 Brake Pedal
Push down on the brake pedal to slow or stop the machine. The stop lights should operate when the brake pedal is applied. Do not operate the machine unless both stop lights work correctly.

3 Clutch Pedal
Depress the pedal to disengage the clutch during gear selection. Release pedal slowly.

Note: Do not rest your foot on either the clutch or brake pedal unless you are using these controls. Otherwise increased component wear may result. A buzzer will sound if you keep your foot on the clutch pedal for too long.

4 Accelerator Pedal
Gently depress the pedal to increase engine speed. Release to reduce the speed.

5 Hand Throttle Lever
Push lever away from you to increase engine speed or pull towards you to decrease engine speed. The position of the handle will determine the engine speed unless the accelerator pedal is depressed to give a greater speed than the setting of the hand throttle.

6 Field Speed Controls (3190 and 3220 only)

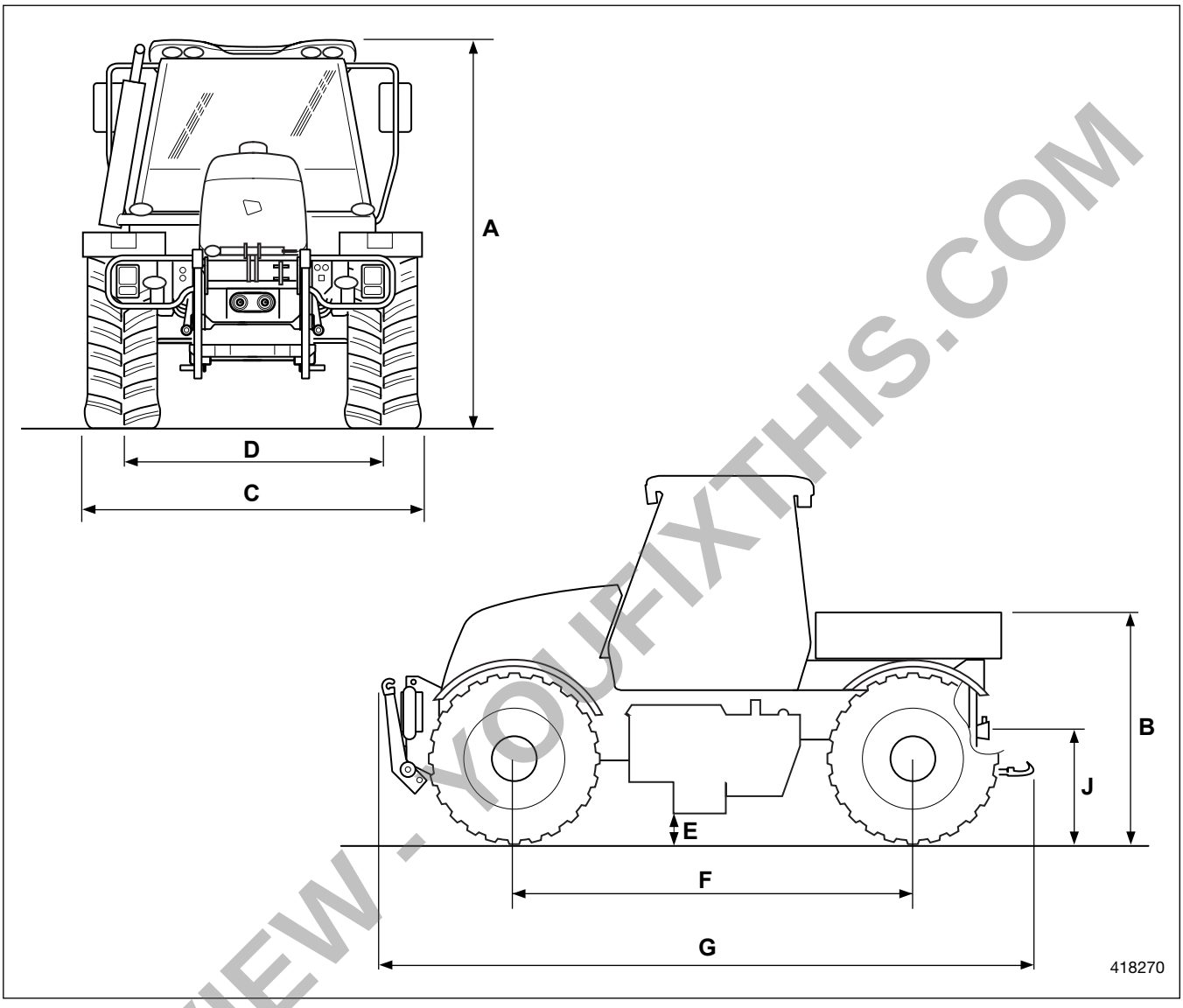
(For utilisation, see ***Travelling***)

⚠ WARNING

When driving the machine on the road, use the accelerator pedal and not the hand throttle or Field Speed Control to control the engine speed. Always set the hand throttle to 'idle' and disable the Field Speed Control before road use.
0096

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STATIC DIMENSIONS



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Dimensions

		With 495/70 R 24 Tyres		With 520/70 R 30 Tyres	
		mm	in	mm	in
A	Height to top of Exhaust	3075	121	3150	124
B	Deck Height	1475	58	1550	61
C	Overall Width	2370	93	2535	100
D	Track Width	1875	74	2015	79
E	Minimum Ground Clearance	330	12	410	16
Note: *The position of the minimum ground clearance varies according to machine specification.*					
F	Wheelbase	3056	120	3056	120
G	Overall Length	5200	205	5200	205
J	Height to Trailer Coupling (Adjustable)	540-1010	21.3-39.3	640-1110	25.2-43.3

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Tyre Sizes and Pressures - See *MAINTENANCE* section

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LADDER HITCH

Coupling Procedure

Note: *There are several different sizes and types of ladder hitch available. The illustrations show typical hitches. Make sure that the trailer and hitch are compatible (see data plate on hitch).*

1 Make sure the trailer cannot move but allow the front axle to pivot.

2 Adjust the height of the hitch to match the trailer draw bar *(see **Height Adjustment**)*.

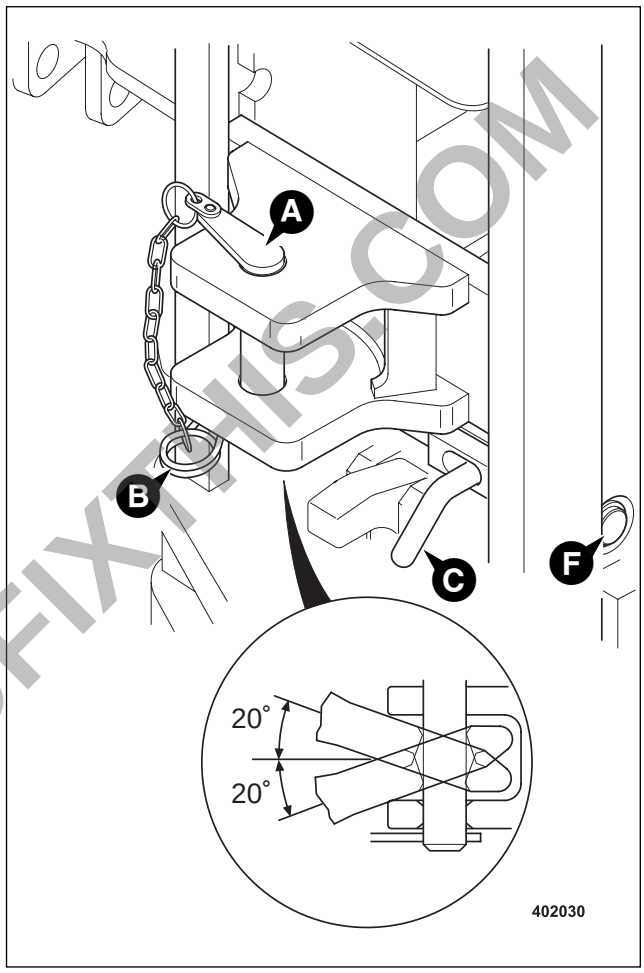
3 Remove pin **A**.

⚠ WARNING

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

13-1-1-13/1

4 Reverse up to the trailer and make sure that the drawbar enters the hitch. Refit pin **A** and secure with the clip **B** as shown.



De-Coupling

1 Make sure the trailer cannot move.

2 Remove pin **A**. Drive the tractor clear of the trailer.

Height Adjustment (Hitch Type 1)

Note: *The height of the coupling should ideally be adjusted so that the trailer drawbar is horizontal. If this is not possible, you must ensure that the maximum angle does not exceed 20° as shown.*

1 Pull handle **C** to the left and then upwards so that the support pins disengage from the ladder frame, then slide the trailer coupling up or down as necessary.

2 When the trailer coupling is at the required height, release handle **C** and make sure that the support pins **F** engage in the holes in the ladder frame.

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