

T6010

T6020

T6030

T6050

T6070

Delta and Plus Tractors

OPERATOR'S MANUAL



Electro-magnetic Interference (EMC)

This tractor complies strictly with the European Regulations on electro-magnetic emissions. However, interference may arise as a result of add-on equipment which may not necessarily meet the required standards. As such interference can result in serious malfunction of the unit and/or create unsafe situations, you must observe the following:

- Ensure that each piece of non-New Holland equipment fitted to the tractor bears the CE mark.
- The maximum power of emission equipment (radio, telephones, etc.) must not exceed the limits imposed by the national authorities of the country where you use the tractor.
- The electro-magnetic field generated by the add-on system should not exceed 24 V/m at any time and at any location in the proximity of electronic components.

Failure to comply with these rules will render the New Holland warranty null and void.

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SECTION 1

GENERAL INFORMATION AND SAFETY

TO THE OWNER

GENERAL

This Manual has been prepared to assist you in the correct procedure for running-in, driving and operating and for the maintenance of your new tractor. Read this Manual carefully. Your tractor is intended for use in normal and customary agricultural applications.

If at any time you require advice concerning your tractor, do not hesitate to contact your authorised dealer. He has factory trained personnel, genuine manufacturers' parts and the necessary equipment to carry out all your service requirements.

Your tractor has been designed and built to give maximum performance, economy and ease of operation under a wide variety of operating conditions. Prior to delivery, the tractor was carefully inspected, both at the factory and by your dealer to ensure that it reaches you in optimum condition. To maintain this condition and ensure trouble-free operation, it is important that the routine services, as specified in Section 4 of this Manual, are carried out at the recommended intervals.

OPERATORS MANUAL STORAGE

A storage pocket for the Operators Manual can be found on the rear of the seat. The manual should be kept in this pocket at all times when not in use.

CLEANING THE TRACTOR

Your tractor is a state-of-the-art machine with sophisticated, electronic controls. This should be borne in mind when cleaning the tractor, particularly if using a high pressure washer. Even though every precaution has been taken to safeguard electronic components and connections, the pressure generated by some of these machines is such that complete protection against water ingress cannot be guaranteed.

When using a high pressure washer, do not stand too close to the tractor and avoid directing the jet at electronic components, electrical connections, breathers, seals, filler caps, etc. Never direct a cold water jet at a hot engine or exhaust.

SAFETY

Pages 1-7 to 1-13 inclusive list the precautions to be observed to ensure your safety and the safety of others. Read the safety precautions and follow the advice offered **before** operating the tractor.

FIRST 50 HOUR SERVICE

In Section 9, at the back of this Manual, you will find the 50-hour service reports.

After you have operated the tractor for 50 hours, take your tractor, together with this Manual, to your dealer. He will then perform the factory recommended 50 hour service and complete the service report sheets (pages 9-1 and 9-3). The first sheet (page 9-1) is the dealer's copy and should be removed by the dealer after the service has been carried out. The second sheet (page 9-3) is your copy of the service performed. **Ensure that you and the dealer sign both copies.**

SERVICE PARTS

It should be pointed out that genuine parts have been examined and approved by the Company. The installation and/or use of 'non-genuine' products could have negative effects upon the design characteristics of your tractor and thereby affect its safety. The Company is not liable for any damage caused by the use of 'non-genuine' parts and accessories. Only genuine New Holland replacement parts should be used. The use of non-genuine parts may invalidate legal approvals associated with this product.

It is prohibited to carry out any modifications to the tractor unless specifically authorised, in writing, by the After Sales Service department of the Company.

WARRANTY

Your tractor is warranted according to legal rights in your country and the contractual agreement with the selling dealer. No warranty shall, however, apply if the tractor has not been used, adjusted and maintained according to the instructions given in the Operator's Manual.

END USER LICENCE AGREEMENT TERMS

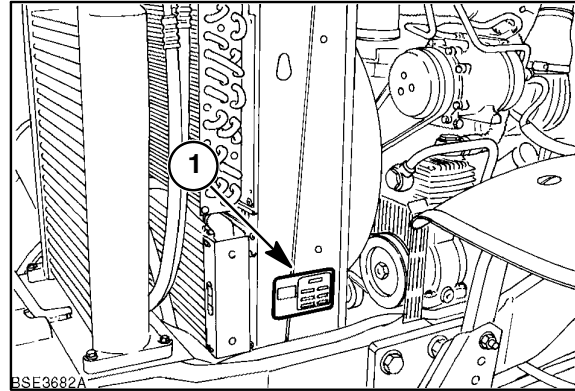
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SECTION 1 - GENERAL INFORMATION AND SAFETY

PRODUCT IDENTIFICATION

The tractor and major components are identified using serial numbers and/or manufacturing codes. Tractor identification data must be supplied to the dealer when requesting parts or service and will also be needed to aid in identifying the tractor if it is ever stolen.

The following provides the locations of the identification data.



1

Vehicle Identification Plate

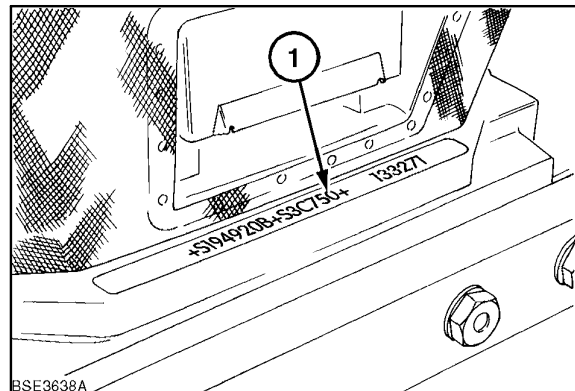
The vehicle identification plate, (1) Figure 1 is located on the left-hand radiator support. Record the information on the sample identification plate provided below.

CNH INTERNATIONAL S.A.	TRACTOR NUMBER	
	MODEL	DRIVELINE
	ENGINE	HYDRAULIC PUMP
	HYDRAULIC LIFT	FRONT AXLE
Made in England		

2

Tractor Identification

The serial number and model identification information is stamped on the top of the front support (1). These numbers are also repeated on the vehicle identification plate reproduced above.



3

SECTION 1 - GENERAL INFORMATION AND SAFETY

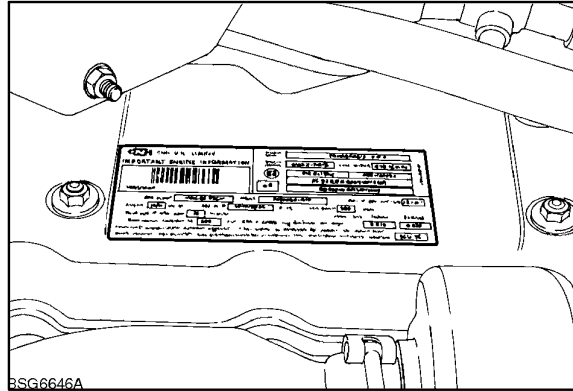
Engine Identification

The engine serial number and date code are stamped on the engine identification plate.

The identification plate is located on top of the engine attached to the valve cover. The plate also provides information on engine adjustments and compliance with Emission Regulations where required.

Record the information below for quick reference.

Engine Serial No. _____

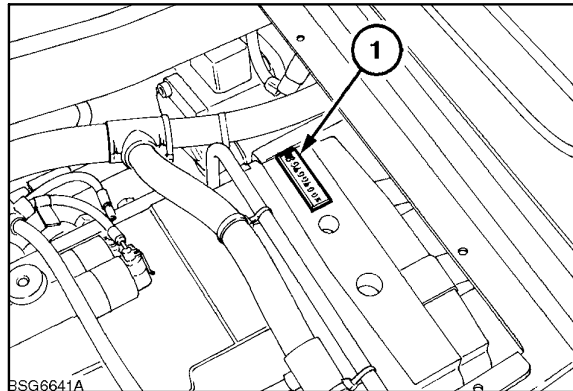


4

Driveline Identification

The serial number plate (1) is located on top of the transmission casing. Access to the number can be gained by removing the plate in the floor of the cab as shown in the illustration. This number is repeated on the vehicle identification plate. Record the information below for quick reference.

Driveline Serial No. _____



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SECTION 1 - GENERAL INFORMATION AND SAFETY

Cab Identification

The cab serial number and other information is on the OECD certification plate. This plate can be found on the right-hand side of the cab trim panel, below the rear window. Record the cab serial number below for quick reference.

Cab Serial No. _____

CNH International SA		Made in the U. K.	
APPROVED SAFETY CAB SLTV 12			
TYPE / VERSION / MODEL			
SERIAL No.			
OECD APPROVAL No.			
GODKENDT AF DIREKTØREN FOR ARBEJDSSTYLSYNET		e18 S157	

6

Vehicle Weight Information

The Vehicle Weighting Plate provides important information on tractor and towed equipment weight combinations. This plate can be found on the right-hand side of the cab trim panel, below the rear window.

The figures shown are the maximum permissible weights and should not be exceeded, to do so may affect the safe operation of the tractor.

CNH International SA		Made in the U. K.	
TYPE			
No.			
IDENTIFICATION No.			
TOTAL PERMISSIBLE MASS :		KG	ABS C O M P L E T E
PERMISSIBLE FRONT AXLE LOAD :		KG	
PERMISSIBLE REAR AXLE LOAD :		KG	
☐ PERMISSIBLE TOWABLE MASS			
UNBRAKED TOWABLE MASS :		KG	CE
INDEPENDENTLY - BRAKED :		KG	
INERTIA - BRAKED :		KG	
ASSISTED BRAKE :		KG	

7

ECOLOGY AND THE ENVIRONMENT

Soil, air and water are vital factors of agriculture and life in general. Where legislation does not yet rule the treatment of some of the substances which are required by advanced technology, common sense should govern the use and disposal of products of a chemical and petrochemical nature.

The following are recommendations which may be of assistance:

- Become acquainted with and ensure that you understand the relative legislation applicable to your country.
- Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti freeze, cleaning agents, etc., with regard to their effect on man and nature and how to safely store, use and dispose of these substances. Agricultural consultants will, in many cases, be able to help you as well.

HELPFUL HINTS

1. Avoid filling tanks using unsuitable containers or inappropriate pressurised fuel delivery systems which may cause considerable spillage.
2. In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of them contain substances which can be harmful to your health.
3. Modern oils contain additives. Do not burn contaminated fuels and/or waste oils in ordinary heating systems.

4. Avoid spillage when draining off used engine coolant mixtures, engine, gearbox and hydraulic oils, brake fluids, etc. Do not mix drained brake fluids or fuels with lubricants. Store them safely until they can be disposed of in a proper way to comply with local legislation and available resources.
5. Modern coolant mixtures, i.e. antifreeze and other additives, should be replaced every two years. They should not be allowed to get into the soil but should be collected and disposed of safely.
6. Do not open the air-conditioning system yourself. It contains gases which should not be released into the atmosphere. Your dealer or air conditioning specialist has a special extractor for this purpose and will have to recharge the system anyway.
7. Repair any leaks or defects in the engine cooling or hydraulic system immediately.
8. Do not increase the pressure in a pressurised circuit as this may lead to the components exploding.
9. Protect hoses during welding as penetrating weld splatter may burn a hole or weaken them, causing the loss of oils, coolant, etc.

SECTION 1 - GENERAL INFORMATION AND SAFETY

SAFETY PRECAUTIONS

A careful operator is the best operator. Most accidents can be avoided by observing certain precautions. To help prevent accidents, read and take the following precautions **before** driving, operating or servicing the tractor. Equipment should be operated only by those who are responsible and instructed to do so.

PRECAUTIONARY STATEMENTS

Throughout this Manual you will see text, preceded by the words **NOTE**, **ATTENTION**, **IMPORTANT**, **CAUTION**, **WARNING** or **DANGER**. Such text has the following significance:

MACHINE SAFETY

NOTE: This text stresses a correct operating technique or procedure.

ATTENTION: This text warns the operator of potential machine damage if a certain procedure is not followed.

IMPORTANT: This text informs the reader of something that he needs to know to prevent minor machine damage if a certain procedure is not followed.

PERSONAL SAFETY

⚠ CAUTION ⚠

The word CAUTION is used where a safe behavioural practice, according to operating and maintenance instructions and common safety practices will protect the operator and others from accident involvement.

⚠ WARNING ⚠

The word WARNING denotes a potential or hidden hazard which could possibly cause serious injury. It is used to warn operators and others to exercise due care and attention to avoid a surprise accident with machinery.

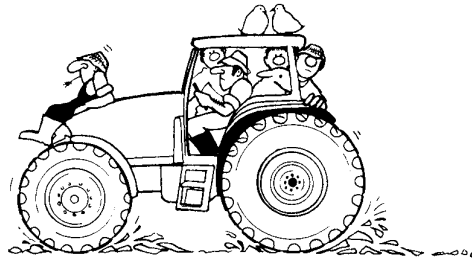
⚠ DANGER ⚠

The word DANGER denotes a forbidden practice in connection with a serious hazard.

Failure to follow the **CAUTION**, **WARNING** and **DANGER** instructions may result in serious bodily injury or even death.

THE TRACTOR

1. Read the Operator's Manual carefully before using the tractor. Lack of operating knowledge can lead to accidents.
2. Only allow properly trained and qualified persons to operate the tractor.
3. To prevent falls, use the handrails and step plates when getting on and off the tractor. Keep steps and platform clear of mud and debris.
4. Replace all missing, illegible or damaged safety decals.
5. Keep safety decals free of dirt or grime.



6. Do not permit anyone but the operator to ride on the tractor except for driver training or instruction. When used for these purposes an additional seat may be fitted in the cab. Passengers should not be carried on the tractor at any time.
7. Keep children away from the tractor and farm machinery at all times.
8. Do not modify or alter or permit anyone else to modify or alter the tractor or any of its components or any tractor function without first consulting your dealer.
9. Install all guards before starting the engine or operating the tractor.

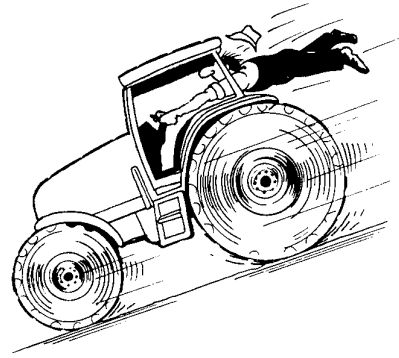
SECTION 1 - GENERAL INFORMATION AND SAFETY

DRIVING THE TRACTOR

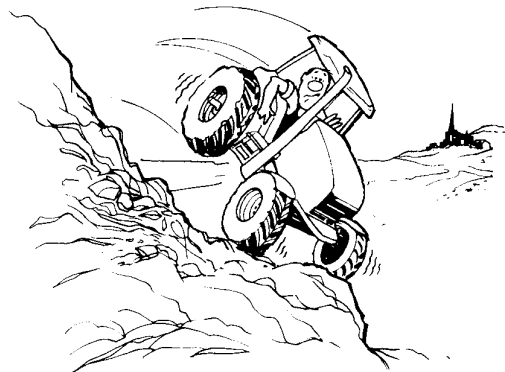
1. Always sit in the driver's seat while starting or driving the tractor.
2. When driving on public roads, have consideration for other road users. Pull in to the side of the road occasionally to allow any following traffic to pass. Do not exceed the legal speed limit set in your country for agricultural tractors.
3. Use a rotating beacon and/or Slow Moving Vehicle warning when driving on public roads to indicate that the vehicle is slow moving and is a possible hazard.
4. Dip the tractor lights when meeting a vehicle at night. Make sure the lights are adjusted to prevent blinding the driver of an oncoming vehicle.
5. Reduce speed before turning or applying the brakes. Brake both wheels simultaneously when making an emergency stop. Ensure that both brake pedals are locked together when travelling at road speeds or when on public roads to ensure correct operation of trailer brakes, balanced operation of the tractor brakes and four wheel braking (4WD tractors only).



6. On four wheel drive tractors, the drive to the front axle is automatically engaged, to provide four wheel braking, when both footbrakes are applied. Owners should be aware of the effectiveness of four wheel braking which greatly enhances braking performance. Appropriate care should be exercised during fierce braking.
7. Use extreme caution and avoid hard application of the tractor brakes when towing heavy loads at road speeds.



8. Keep the tractor in the same gear when going downhill as would be used when going uphill. Do not coast or freewheel down hills.
9. For safe operation any towed vehicle whose total weight exceeds that of the towing tractor must be equipped with a braking system that complies with the legal requirements of that country.
10. Never apply the differential lock when turning. When engaged, the differential lock will prevent the tractor from turning.
11. Always check overhead clearance, especially when transporting the tractor. Watch where you are going, especially at row ends, on roads and around trees and low overhanging obstacles.
12. To avoid overturns, drive the tractor with care and at speeds compatible with safety, especially when operating over rough ground, when crossing ditches or slopes and when turning corners.



13. Use extreme caution when operating on steep slopes.
14. If the tractor becomes stuck or the tyres are frozen to the ground, reverse the tractor out to prevent overturning.

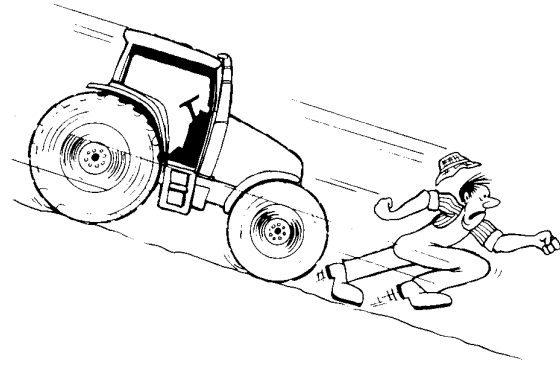
SECTION 1 - GENERAL INFORMATION AND SAFETY

OPERATING THE TRACTOR

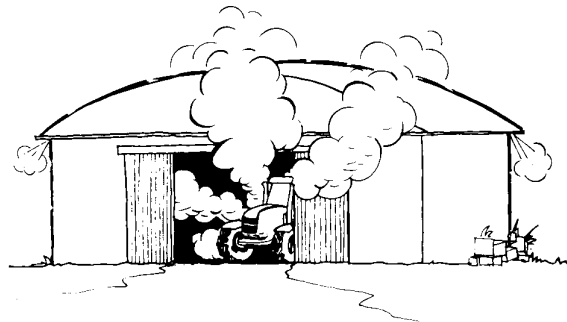
1. Apply the parking brake, place the P.T.O. control in the 'OFF' position, the lift control lever in the down position, the remote control valve levers in the neutral position and the transmission levers in neutral before starting the tractor.
2. Do not start the engine or operate controls (other than externally located hydraulic lift or P.T.O. switches, if fitted) while standing beside the tractor. Always sit in the tractor seat when starting the engine or operating the controls.
3. Do not bypass the transmission and P.T.O. neutral start switches. Consult your authorised dealer if your neutral start controls malfunction. Use jump leads only in the recommended manner. Improper use can result in a tractor runaway.



4. Avoid accidental contact with the gear shift levers while the engine is running. Unexpected tractor movement can result from such contact.
5. Do not get off the tractor while it is in motion.
6. If the power steering or engine ceases operating, stop the tractor immediately as the tractor will be more difficult to control.
7. Before leaving the tractor, park the tractor on level ground, apply the parking brake, lower attached implements to the ground, disengage the P.T.O. and stop the engine.



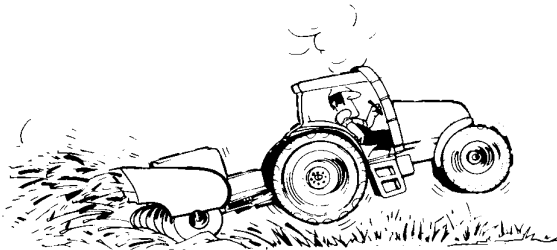
8. Do not park the tractor on a steep incline.
9. The cab is designed to provide the minimum noise level at the operator's ears and meets or exceeds applicable standards in this respect. However, noise (sound pressure level) in the workplace can exceed 85 dB(A) when working between buildings or in confined spaces, with cab windows open. Therefore, it is recommended that operators wear suitable ear protectors when operating in high noise level conditions.



10. Do not run the tractor engine in an enclosed building without adequate ventilation. Exhaust fumes are toxic and can cause death.
11. Pull only from the pick-up hitch, swinging drawbar or the lower link drawbar in the lowered position. Use only a drawbar pin that locks in place. Pulling from the tractor rear axle or any point above the axle may cause the tractor to overturn.

SECTION 1 - GENERAL INFORMATION AND SAFETY

12. Always select Position Control when attaching equipment and when transporting equipment. Be sure hydraulic couplers are properly mounted and will disconnect safely in case of accidental detachment of the implement.



13. If the front end of the tractor tends to rise when heavy implements are attached to the three-point hitch, install front end or front wheel weights. Do not operate the tractor with a light front end.

14. Engage the clutch slowly when driving out of a ditch, gully or up a steep hillside. Disengage the clutch promptly if the front wheels rise off the ground.

15. Ensure any attached equipment or accessories are correctly installed, are approved for use with the tractor, do not overload the tractor and are operated and maintained in accordance with the instructions issued by the equipment or accessory manufacturer.

16. Remember that your tractor, if abused or incorrectly used, can be dangerous and become a hazard both to the operator and to bystanders. Do not overload or operate with attached equipment which is unsafe, not designed for the particular task or is poorly maintained.

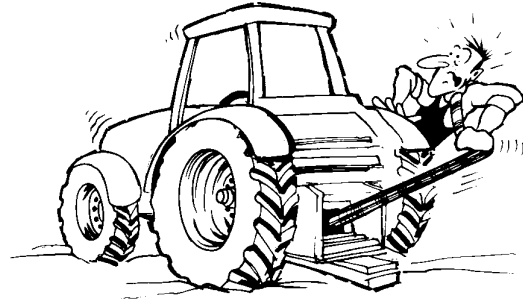
17. Do not leave equipment in the raised position when the vehicle is stopped or unattended.

18. Do not drive equipment near open fires.

19. Always wear a protective mask when working with toxic spray chemicals. Follow the directions on the chemical container.

OPERATING THE P.T.O.

1. When operating P.T.O.- driven equipment, shut off the engine, switch off the P.T.O. and wait until the P.T.O. stops before getting off the tractor and disconnecting the equipment.



2. Do not wear loose clothing when operating the power take-off or especially when near rotating equipment.

3. When operating stationary P.T.O.-driven equipment, always apply the tractor parking brake and block the rear wheels front and back.



4. To avoid injury, do not clean, adjust, unclog or service P.T.O. driven equipment when the tractor engine is running. Ensure that the P.T.O. is switched off.

5. Make sure the P.T.O. guard is in position at all times and always replace the P.T.O. cap when the P.T.O. is not in use.

SECTION 1 - GENERAL INFORMATION AND SAFETY

SERVICING THE TRACTOR



1. The cooling system operates under pressure which is controlled by the expansion tank cap. It is dangerous to remove the cap while the system is hot. Always turn the cap slowly to the first stop and allow the pressure to escape before removing the cap entirely. Never remove the cap from the top of the radiator unless the expansion tank pressure cap has first been removed.
2. Do not smoke while refuelling the tractor. Keep any type of open flame away.
3. Keep the tractor and equipment, particularly brakes and steering, maintained in a reliable and satisfactory condition to ensure your safety and comply with legal requirements.
4. To prevent fire or explosion, keep open flames away from battery or cold weather starting aids. To prevent sparks which could cause explosion, use jumper cables according to instructions.
5. Do not attempt to service the air conditioning system. It is possible to be severely frost bitten or injured by escaping refrigerant. Special equipment and instruments are required to service the air conditioning system. See your authorised dealer for service.
6. Stop the engine before performing any service on the tractor.
7. Hydraulic fluid and fuel oil in the injection system operate under high pressure. Escaping hydraulic fluid or fuel oil under pressure can penetrate the skin causing serious injury.

Unqualified persons should not remove or attempt to adjust a pump, injector, nozzle or any other part of the fuel injection or hydraulic systems. Failure to follow these instructions can result in serious injury.

- Do **not** use your hand to check for leaks. Use a piece of cardboard or paper to search for leaks.
- Stop the engine and relieve pressure before connecting or disconnecting lines.



- Tighten all connections before starting the engine or pressurising lines.
 - If fluid is injected into the skin obtain medical attention immediately or gangrene may result.
8. Do not modify or alter or permit anyone else to modify or alter the tractor or any of its components or any tractor function without first consulting an authorised dealer.
 9. Continuous long term contact with used engine oil may cause skin cancer. Avoid prolonged contact with used engine oil. Wash skin promptly with soap and water.
 10. Keep equipment clean and properly maintained.
 11. Dispose of all drained fluids and removed filters properly.
 12. Tractor wheels are very heavy. Handle with care and ensure, when stored, that they cannot topple and cause injury.

SECTION 1 - GENERAL INFORMATION AND SAFETY

DIESEL FUEL

1. Under no circumstances should gasoline, alcohol or blended fuels be added to diesel fuel. These combinations can create an increased fire or explosive hazard. In a closed container such as a fuel tank these blends are more explosive than pure gasoline. Do not use these blends.
2. Never remove the fuel cap or refuel with the engine running or hot.
3. Do not smoke while refuelling the tractor or when standing near fuel. Keep any type of open flame away.
4. Maintain control of the fuel filler pipe nozzle when filling the tank.
5. Do not fill the fuel tank to capacity. Fill only to the bottom of the filler neck to allow room for expansion.
6. Wipe up spilled fuel immediately.
7. Always tighten the fuel tank cap securely.
8. If the original fuel tank cap is lost, replace it with an approved cap. A non-approved cap may not be safe.
9. Never use fuel for cleaning purposes.
10. Arrange fuel purchases so that summer grade fuels are not held over and used in the winter.



**WHENEVER YOU SEE THIS SYMBOL  IT MEANS: ATTENTION!
BECOME ALERT! YOUR SAFETY IS INVOLVED!**

OPERATOR PROTECTIVE STRUCTURE



WARNING



Your machine is equipped with an operator Protective Structure, such as: a Roll Over Protective Structure (ROPS) or Falling Object Protective Structure (FOPS) or Cab with ROPS. A ROPS may be a cab frame or a two-posted or four-posted structure used for the protection of the operator to minimise the possibility of serious injury.

The Protective Structure is a special safety component of your machine.

DO NOT attach any device to the Protective Structure for pulling purposes. DO NOT drill holes to the Protective Structure.

The Protective Structure and interconnecting components are a certified system. Any damage, fire, corrosion or modification will weaken the structure and reduce your protection. If this occurs, the **Protective Structure MUST be replaced** so that it will provide the same protection as a new Protective Structure. Contact your dealer for Protective Structure inspection and replacement.

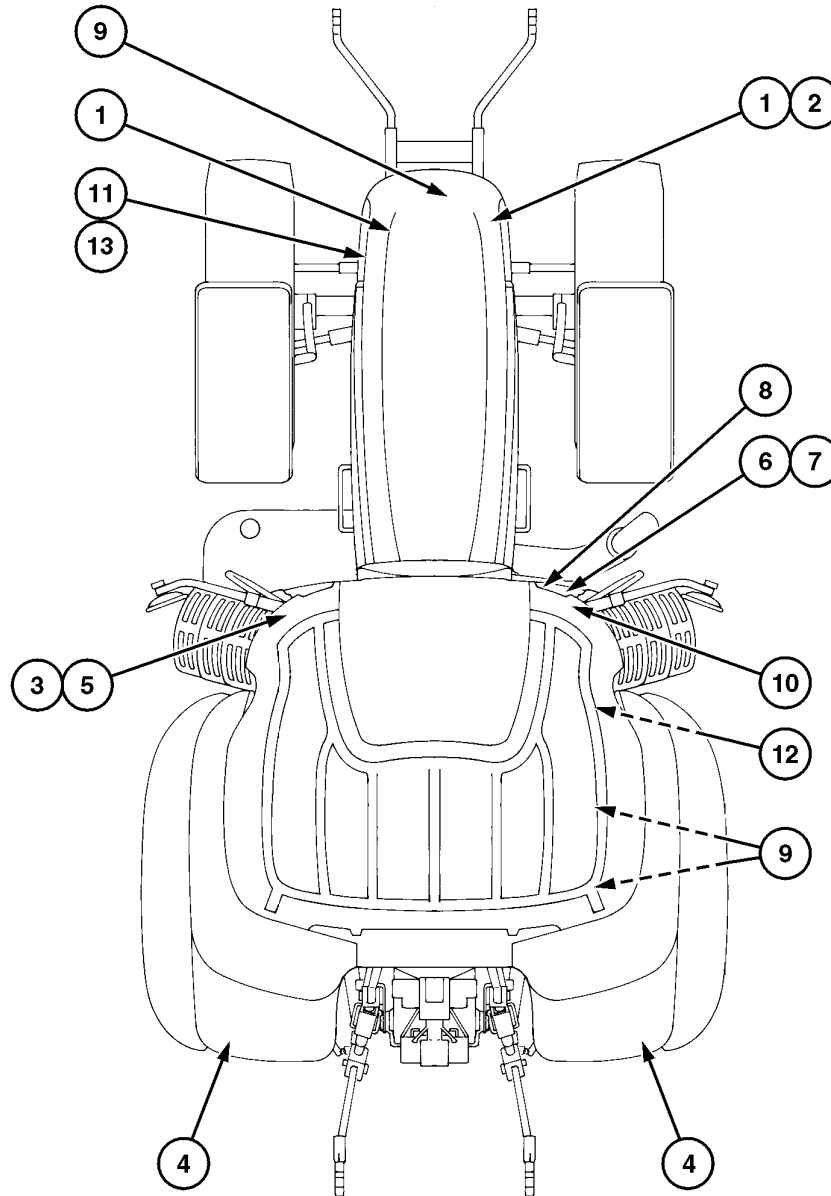
After an accident, fire, tip or roll over, the following **MUST** be performed by a qualified technician before returning the machine to field or job site operation.

- The Protective Structure **MUST be replaced**.
- The mounting or suspension for the Protective Structure, operator seat and suspension, seat belts and mounting components and wiring within the operator's protective system **MUST** be carefully inspected for damage.
- All damaged parts **MUST be replaced**.

DO NOT WELD, DRILL HOLES, ATTEMPT TO STRAIGHTEN OR REPAIR THE PROTECTIVE STRUCTURE. MODIFICATION IN ANY WAY CAN REDUCE THE STRUCTURAL INTEGRITY OF THE STRUCTURE WHICH COULD CAUSE DEATH OR SERIOUS INJURY IN THE EVENT OF FIRE, TIP, ROLL OVER, COLLISION OR ACCIDENT.

SAFETY DECALS

The decals reproduced on the following pages were installed on your tractor in the positions indicated in the drawings below. They are intended for your safety and for those working with you. Please take this Manual and walk around your tractor, noting the location of the decals and their significance. Review the decals and operating instructions detailed in this Manual with the machine operators. Keep the decals clean and legible. If they become damaged or illegible, obtain replacements from your authorised dealer.



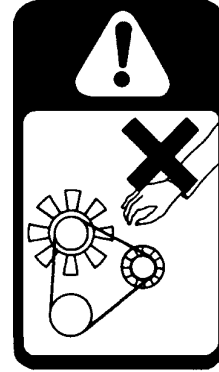
BSF6611A

SECTION 1 - GENERAL INFORMATION AND SAFETY

1. Location: Left and right-hand side of fan guard

To prevent serious injury, keep hands and clothing away from rotating fan and drive belt.

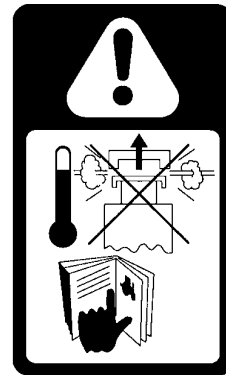
Part No. 81871830



2. Location: Right-hand side of radiator

Warning! Pressurised cooling system. Allow to cool then remove cap carefully. Using a cloth, turn cap to the first stop and allow pressure to subside before removing cap completely.

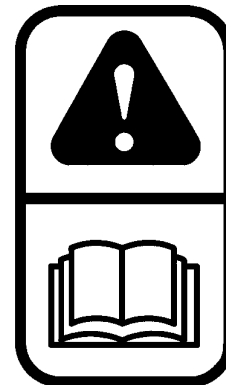
Part No. 5194556



3. Location: Left-hand 'A' pillar, inside cab

General warning. Read and understand all the warning notes printed in this Operator's Manual. In particular, see pages 1-7 to 1-13 inclusive.

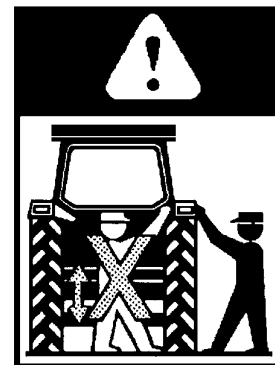
Part No. 82001826



4. Location: Rear of both fenders (with external power controls only)

To avoid injury, do not stand on the implement or between the implement and tractor while operating the external lift or P.T.O. controls.

Part No. 83982553



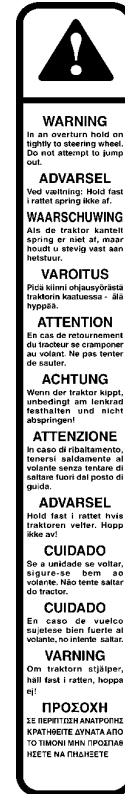
SECTION 1 - GENERAL INFORMATION AND SAFETY

5. Location:

Left-hand 'A' pillar inside the cab

In an overturn, hold on tightly to the steering wheel.
Do not attempt to jump out.

Part No. 82016113

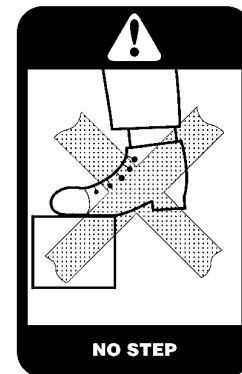


6. Location:

Top of toolbox

Do not stand on toolbox.

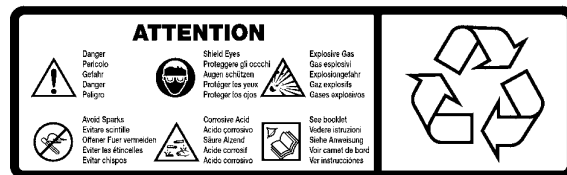
Part No. 82010947



7. Location:

Top of battery

Danger! Corrosive acid. Explosive gas. Wear eye protection. Avoid producing sparks. See Operator's Manual.

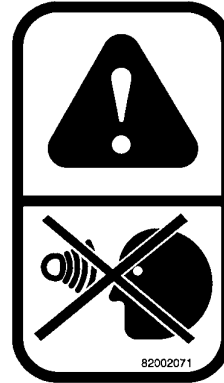


SECTION 1 - GENERAL INFORMATION AND SAFETY

8. Location: Radar sensor mounting bracket

To avoid possible eye damage from micro-wave signals emitted by the radar sensor, do not look directly into the sensor face.

Part No. 82002071



9. Location: Hydraulic Accumulator/s

Caution! High pressure hydraulic/gas accumulator. Follow service manual instructions for removal or repair.

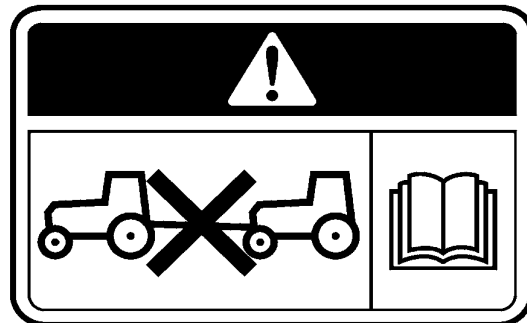
Part No. 82029751



10. Location: Location: Right-hand 'A' pillar inside cab

Caution! Read Operator's Manual. before attempting to tow.

Part No. 82030522



11. Location: Air conditioning compressor

Warning! Fluid under pressure, do not disconnect any lines. Read Operator's Manual.

Part No. 83946774



SECTION 1 - GENERAL INFORMATION AND SAFETY

12. Location:

Right-hand control console

Caution! Always use grab handles when entering or leaving the platform/cab.

Part No. 81871702

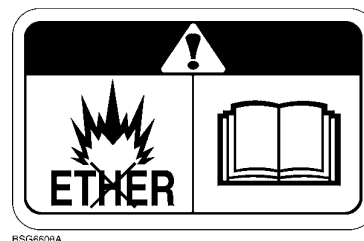


13. Location:

Left-hand side of radiator

Warning! Heater Grid cold start aid. Do not use ether or risk of explosion will occur.

Part No. 87802167

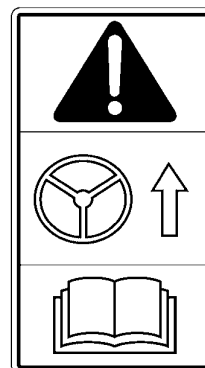


14. Location:

Right-hand 'A' pillar inside cab

Warning! De-activate Fast Steer system before travelling on the highway. Read Operator's Manual.

Part No. 87331567



SECTION 1 - GENERAL INFORMATION AND SAFETY

INTERNATIONAL SYMBOLS

As a guide to the operation of your tractor, various universal symbols have been utilised on the instruments, controls, switches, and fuse box. The symbols are shown below with an indication of their meaning.

	Thermostart starting aid		Radio		P.T.O.		Position Control
	Alternator charge		Keep alive memory		N Transmission in neutral		Draft Control
	Fuel level		Turn signals		Creeper gears		Accessory socket
	Automatic Fuel shut-off		Turn signals -one trailer		Slow or low setting		Implement socket
	Engine speed (rev/min x 100)		Turn signals -two trailers		Fast or high setting		%age slip
	Hours recorded		Front wind-screen wash/wipe		Ground speed		Hitch raise (rear)
	Engine oil pressure		Rear wind-screen wash/wipe		Differential lock		Hitch lower (rear)
	Engine coolant temperature		Heater temperature control		Rear axle oil temperature		Hitch height limit (rear)
	Coolant level		Heater fan		Transmission oil pressure		Hitch height limit (front)
	Tractor lights		Air conditioner		FWD engaged		Hitch disabled
	Headlamp main beam		Air filter blocked		FWD dis-engaged		Hydraulic and transmission filters
	Headlamp dipped beam		Parking brake		Warning!		Remote valve extend
	Work lamps		Brake fluid level		Hazard warning lights		Remote valve retract
	Stop lamps		Trailer brake		Variable control		Remote valve float
	Horn		Roof beacon		Pressurised! Open carefully		Malfunction! See Operator's Manual
			Warning! Corrosive substance				Malfunction! (alternative symbol)

AIRBORNE NOISE EMISSION

In accordance with E.E.C. directives, the noise levels of tractors covered by this manual are as follows:

Tractors with Cabin and Fixed Windscreen with Air Cleaner Extraction System

Model	Transmission	Noise level at operators ear		Drive by noise level
		Closed ⁽¹⁾ Annex II*	Open ⁽²⁾ Annex II*	Annex IV**
T6010	All Transmissions	70.0 dB(A)	75.0 dB(A)	80.0 dB(A)
T6020	All Transmissions	70.0 dB(A)	75.0 dB(A)	80.0 dB(A)
T6030	All Transmissions	73.0 dB(A)	79.0 dB(A)	84.0 dB(A)
T6050	All Transmissions	73.0 dB(A)	79.0 dB(A)	84.0 dB(A)
T6070	All Transmissions	73.0 dB(A)	79.0 dB(A)	84.0 dB(A)

Tractors with ROPS and Canopy with Air Cleaner Extraction System

Model	Transmission	Noise level at operators ear		Drive by noise level
		Closed ⁽¹⁾ Annex II*	Open ⁽²⁾ Annex II*	Annex IV**
T6010	All Transmissions	n/a	85.0 dB(A)	80.0 dB(A)
T6020	All Transmissions	n/a	85.0 dB(A)	80.0 dB(A)
T6030	All Transmissions	n/a	85.0 dB(A)	84.0 dB(A)
T6050	All Transmissions	n/a	85.0 dB(A)	84.0 dB(A)

* Test results are in accordance with directive 77/311/EEC Annex II.

Maximum noise level at the operators ear with:

- 1) all cab windows and doors closed, tractor off load
- 2) rear window and roof hatch open, tractor off load.

** Test results are in accordance with directive 74/151/EEC Annex VI.

SECTION 1 - GENERAL INFORMATION AND SAFETY

In accordance with E.E.C. directives, the noise levels of tractors covered by this manual are as follows:

Tractors with Cabin and Fixed Windscreen without Air Cleaner Extraction System

Model	Transmission	Noise level at operators ear		Drive by noise level
		Closed ⁽¹⁾	Open ⁽²⁾	
		Annex II*	Annex II*	Annex IV**
T6010	All Transmissions	72.0 dB(A)	77.0 dB(A)	81.0 dB(A)
T6020	All Transmissions	72.0 dB(A)	77.0 dB(A)	81.0 dB(A)
T6030	All Transmissions	73.0 dB(A)	79.0 dB(A)	84.0 dB(A)
T6050	All Transmissions	73.0 dB(A)	79.0 dB(A)	84.0 dB(A)
T6070	All Transmissions	73.0 dB(A)	79.0 dB(A)	84.0 dB(A)

Tractors with ROPS and Canopy without Air Cleaner Extraction System

Model	Transmission	Noise level at operators ear		Drive by noise level
		Closed ⁽¹⁾	Open ⁽²⁾	
		Annex II*	Annex II*	Annex IV**
T6010	All Transmissions	n/a	86.0 dB(A)	81.0 dB(A)
T6020	All Transmissions	n/a	86.0 dB(A)	81.0 dB(A)
T6030	All Transmissions	n/a	85.0 dB(A)	84.0 dB(A)
T6050	All Transmissions	n/a	85.0 dB(A)	84.0 dB(A)

* Test results are in accordance with directive 77/311/EEC Annex II.

Maximum noise level at the operators ear with:

- 1) all cab windows and doors closed, tractor off load
- 2) rear window and roof hatch open, tractor off load.

** Test results are in accordance with directive 74/151/EEC Annex VI.

[illegible]

SECTION 2

CONTROLS, INSTRUMENTS AND OPERATION

BEFORE OPERATING



CAUTION

Before driving or operating the tractor, study the safety precautions in Section 1 of this Manual.

Read this section thoroughly. It details the location and operation of the various instruments, switches and controls on your tractor. Even if you operate other tractors, you should thoroughly read this section of the manual and ensure that you are familiar with the location and function of all the features of the tractor.

Do not start the engine or attempt to drive or operate the tractor until you are fully accustomed with all the controls. It is too late to learn once the tractor is moving. If in doubt about any aspect of operation of the tractor, consult your authorised dealer.

Pay particular attention to the recommendations for running-in to ensure that your tractor will give the long and dependable service for which it was designed.

This section is split into various subjects, as follows. Where a feature requires setting up and running adjustments in the field, detailed instructions will be found in Section 3, Field Operation. Instructions for the operation of various optional accessories will be found in Section 7.

Lubrication and maintenance requirements will be found in Section 4. Tractor specifications are listed in Section 8.

A comprehensive index is provided at the end of this book.

PROGRAMMING TRACTOR FUNCTIONS

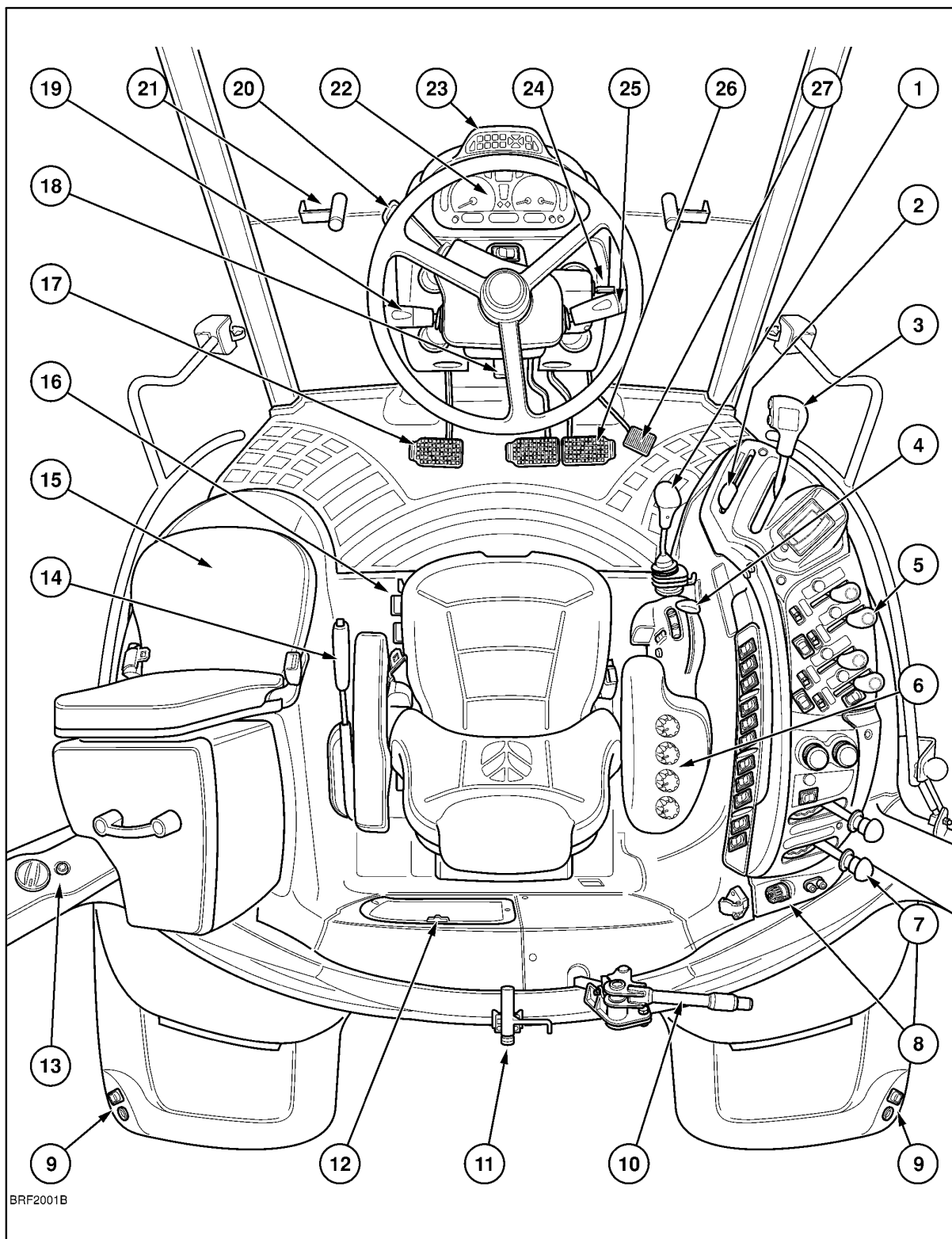
Your tractor utilises two memory facilities to control and memorise settings for the various electronic functions. The operating memory temporarily stores setting adjustments made while operating the tractor and these are uploaded to the main memory when you key-off (engine stop).

If you key-off and key-on again too quickly as data is being uploaded, some of it may be lost or corrupted.

If you have made changes to any memorised settings while operating the tractor, pause for five seconds between key-off and key-on to allow the data to upload from the operating memory to the main memory. Once uploaded, the new settings will remain unchanged until they are re-programmed.

Subject	Page
Cab	2-7
Seats	2-25
Handbrake, Throttle and Foot Controls	2-32
Instrument Console	2-34
Analogue/Digital Instruments	2-37
Transmission Operation	2-65
Synchro Command Transmission (12 x 12)	2-67
Dual Command Transmission (24 x 24)	2-73
Electro Command Transmission (16 x 16 and 17 x 16)	2-84
Differential Lock and Four Wheel Drive	2-102
Front Axle Suspension	2-106

CAB AND PLATFORM CONTROLS



1

General View of Tractor Controls - With Cab

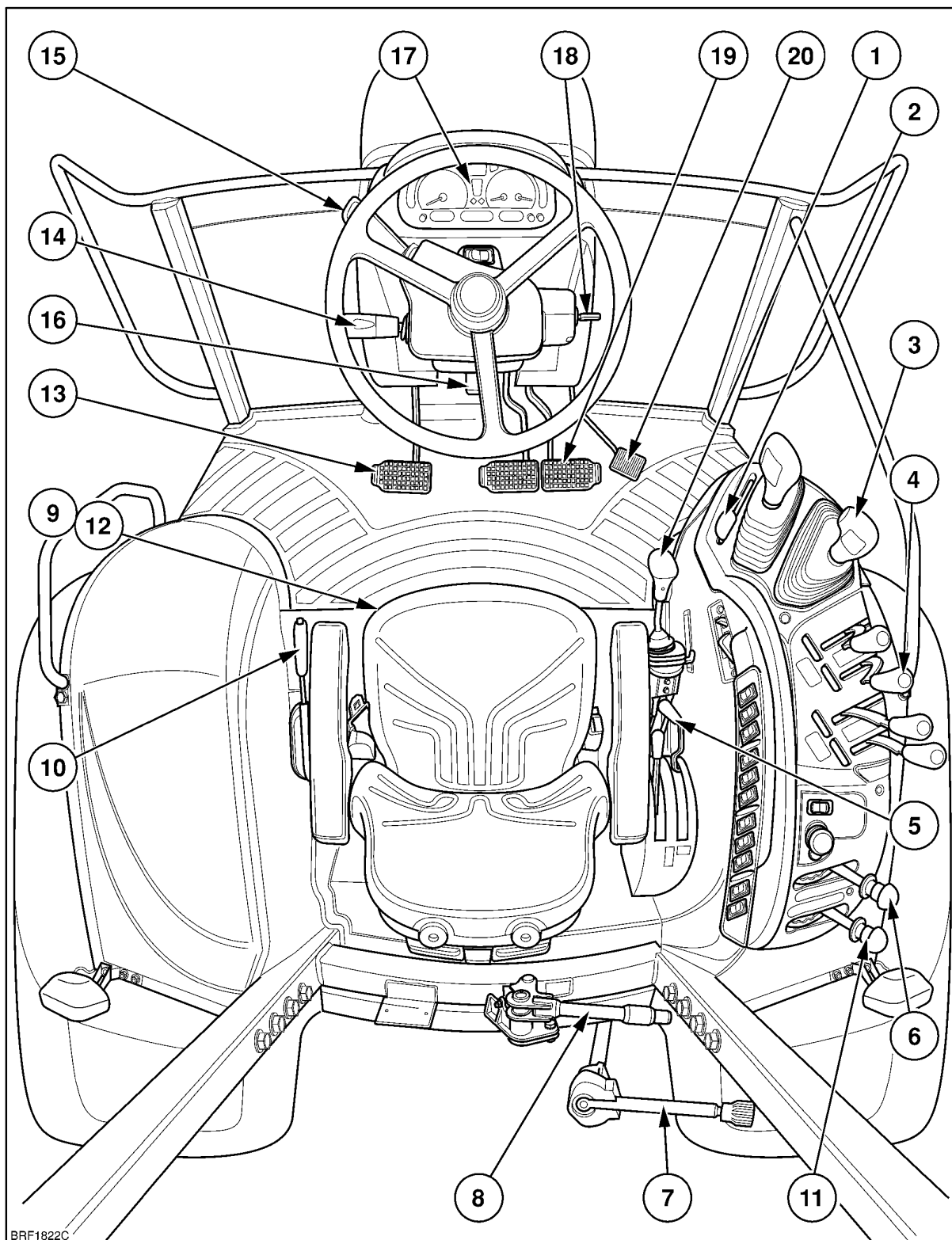
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Key to Figure 1

Page Nos. for Reference

1. Joystick control	3-34, 3-60
2. Hand throttle	2-33
3. Transmission controls	
12x12 Synchro Command transmission	2-67
24x24 Dual Command transmission	2-73
16x16 (17x16) Electro Command transmission	2-84
4. Hydraulics controls	
Mechanical Lower Link sensing	3-41
Electronic Draft Control	3-47
5. Remote control valve levers	
Manual operation	3-59
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7. P.T.O. controls	
Front	3-33
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8. Electrical power panel	2-21
9. External controls (where fitted)	
3-point hitch	3-46, 3-57
Rear P.T.O.	3-31
10. Release handle	
Automatic pick-up hitch	3-108
Tow hitch	3-105
11. Rear window locking handle	2-10
12. Cab air recirculation filter	2-14
13. Cab climate controls ('C' pillar)	2-13
14. Parking brake	2-32
15. Instructional seat	2-31
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18. Steering column adjustment	2-34
19. Multi-function switch	2-35
20. Shuttle lever	2-68, 2-74, 2-86
21. Front window locking handle (where fitted)	2-10
22. Instrument panel	2-37
23. Enhanced keypad (where fitted)	2-56
24. Key-start switch	3-6
25. Wash/wipe control	2-36
26. Foot brakes	2-33
27. Foot throttle	2-32

PLATFORM CONTROLS



2

General View of Tractor Controls - Less Cab

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Key to Figure 2

Page Nos. for Reference

1. Joystick control	3-34, 3-60
2. Hand throttle	2-33
3. Transmission controls	
12x12 Synchro Command transmission	2-67
24x24 Dual Command transmission	2-73
16x16 Electro Command transmission	2-84
4. Remote control valve levers	
Manual operation	3-59
Electro-Hydraulic operation	3-69
5. Hydraulics controls	
Mechanical Lower Link sensing	3-41
Electronic Draft Control	3-47
6. P.T.O. controls	
Front	3-33
Rear	3-14
7. External controls (where fitted)	
3-point hitch	3-46, 3-57
Rear P.T.O.	3-31
8. Release handle	
Automatic pick-up hitch	3-108
Tow hitch	3-105
9. Seat height adjuster	2-25
10. Parking brake	2-32
11. Creep speed selector (12x12 transmission)	2-68
12. Seat controls	2-25
13. Clutch/inching pedal	2-32
14. Multi-function switch	2-35
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16. Steering column adjustment	2-34
17. Instrument panel	2-37
18. Key start switch	3-6
19. Foot brakes	2-33
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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

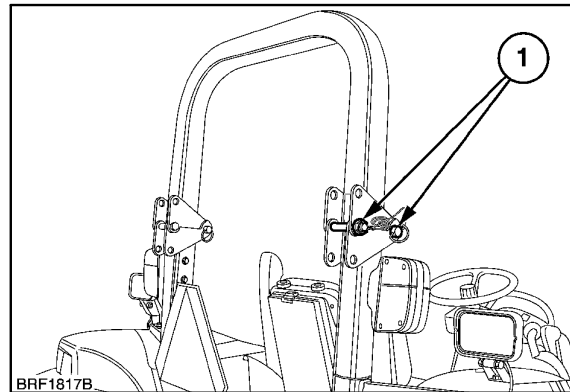
ROLL OVER PROTECTIVE STRUCTURE (ROPS) (where fitted)

The roll bar (ROPS) is designed to be folded rearwards for use in low clearance operations. When in the normal, upright, operating position it is secured by two locking pins (1).

The ROPS is shown folded in the low clearance position in Figure 2.

The ROPS must always be maintained in a serviceable condition.

NOTE: Do not attempt to fold the ROPS if a canopy is fitted.



1

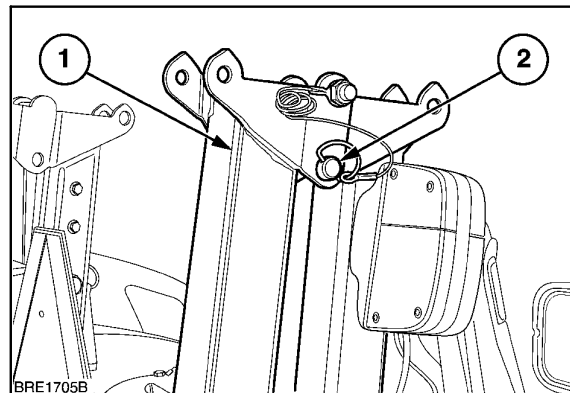
⚠ WARNING ⚠

When improperly operated, a tractor can roll over. For low clearance use only, the roll bar may be lowered. No protection is provided when the tractor is operated with the roll bar in the lowered position. Always raise the roll bar immediately after low clearance use. When the tractor is being driven from a low clearance job, the roll bar should be in the raised position. Always use the seat belt when the roll bar is raised. Seat belts save lives when they are used. Do not use the seat belt when the roll bar is lowered.

To fold the roll bar to the low clearance position, unclip the linch pin and remove the locking pin (2) from both sides of the roll bar. Lower the upper section of the roll bar (1) rearwards and insert the locking pin in the lower hole, as shown. Secure both locking pins with the linch pins.

⚠ WARNING ⚠

Do not attach chains or ropes to the ROPS for pulling purposes as the tractor may tip backwards. Always pull from the tractor drawbar. Be careful when driving through door openings or under low overhead objects. Make sure that there is sufficient overhead clearance for the ROPS. Lower the ROPS, if necessary.



2

⚠ WARNING ⚠

If the machine has rolled over or the ROPS has been in some other type of accident (such as hitting an overhead object during transport), you must replace the damaged ROPS components to get as much protection as you had originally. DO NOT TRY TO WELD OR STRAIGHTEN THE ROPS.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

CAB (where fitted)

NOTE: The controls on tractors without a cab, from the instrument console down, are very similar to those with a cab. Even if your tractor does not have a cab, you should still read the following text to gain an understanding of the function and use of the controls.

Introduction

The cab on your tractor has been designed to provide operator protection, comfort and convenience. Inside, the trim panels, roof, and floor are insulated to reduce noise to a minimum.

Two wide opening doors permit entry to the cab from either side, aided by convenient grab handles and footsteps with anti-slip treads. The doors and rear window are fitted with gas struts to hold them in the fully open position. Additionally, the rear window may be retained in the partially open position for increased ventilation.

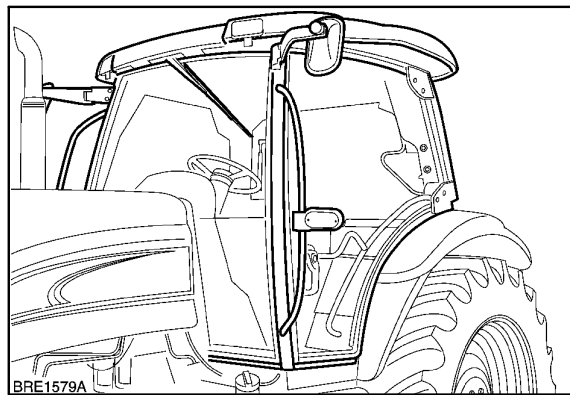
Standard Cab

Standard cab features include a fresh air heater/defroster, high visibility roof panel, front and rear wash/wipe, sun visor, tinted glass, interior light and exterior courtesy lights, cigarette lighter, storage facilities, interior/exterior rear view mirrors and a choice of comfortable seats.

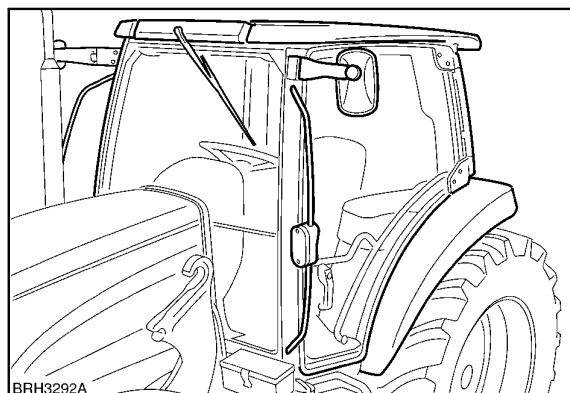
Options include air-conditioning, radio, opening front windscreen and extending exterior rear view mirrors.

Low Profile Cab

When fitted with the optional low roof, the overall cab height is reduced by approximately 2.15 cm. (5.5 in.) allowing operation in areas of restricted height. The standard specification with low roof includes fixed high visibility roof panel, air conditioning and a pre-wired disposition for the optional radio/cassette/CD player.



3

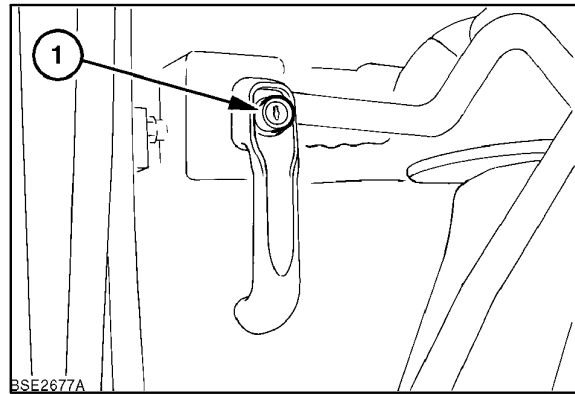


4

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

External Door Handle

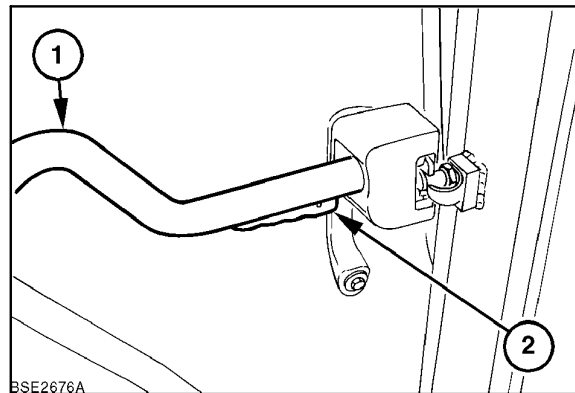
Each door has an external handle with a push button (1). The door may be locked from the outside using the key provided.



5

Interior Door Handle

To open a door from inside the cab, squeeze up the trigger (2) on the underside of the grab handle (1). Use the grab handle to push the door open.



6

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

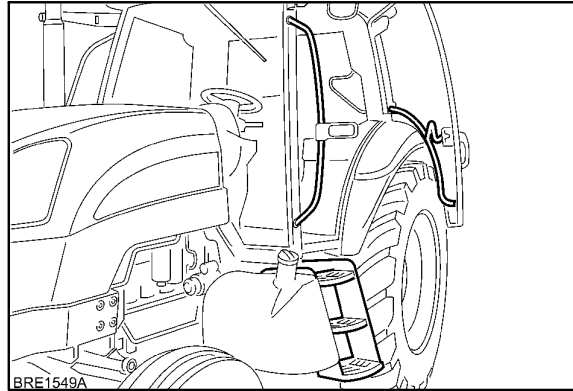
Entering and Exiting the Cab

Wherever possible, the cab should be entered from the left side.



Do not grasp the gear levers when entering the cab from the right-hand side. Use only the grab handles provided on the frame and door.

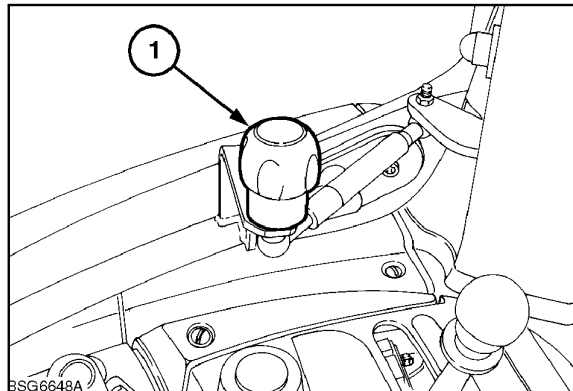
To enter the cab, face the door, then open it. Place one foot on the lowest step plate and, using the grab handles on the 'A' post and inside the door, climb the steps and enter the cab.



7

Sit in the seat and, where fitted, pull the door closed using the knob (1). Fasten the seat belt, if fitted.

To exit the cab, release the seat belt, open the door, grasp the grab handles, back out of the cab and descend the steps using the grab handles.



8

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

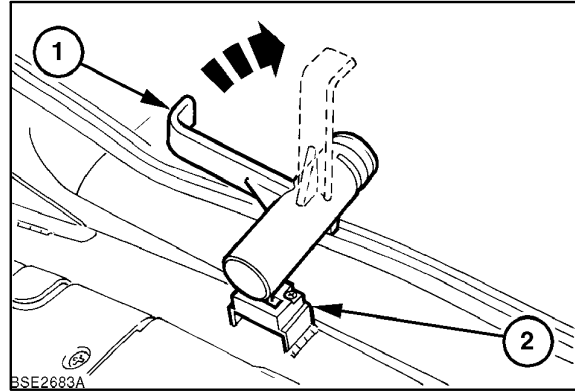
Rear Window

The rear window may be locked in the closed position or retained in the partially open or fully open positions.

To open the window, lift the central locking handle (1) up to the vertical position. Allow the window to open a little then push the handle down so that the locking tongue engages the slot (2) in the framework. Alternatively, the window may be allowed to swing fully open supported by two gas-filled struts.

IMPORTANT: Retain control of the window when opening it fully. Do not allow it to swing open freely.

Using the grab handle, pull the window closed and push the handle down to lock the window.



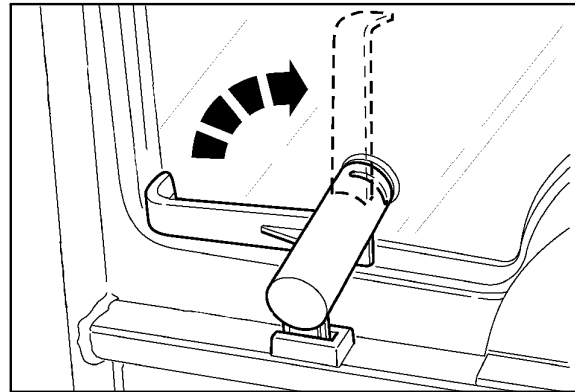
9

Opening Front Windscreen (where fitted)

The front windscreen may also be locked in the closed position or retained in the partially open or fully open positions.

IMPORTANT: Retain control of the window when opening it fully. Do not allow it to swing open freely.

To close the windscreen, pull on both handles equally. Push the locking handles down to lock in position.



10

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

High Visibility Roof Panel - Standard Cab

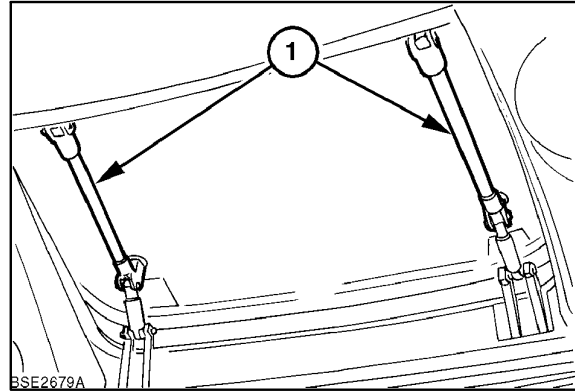
The high visibility roof panel provides the operator with a view to the bucket or grab when the loader is in the raised position.

For extra ventilation the roof panel may be tilted to one of three positions. Using the grab handles (1), push up at the front or rear to angle the panel. Alternatively, pushing up in the centre of the grab handles will fully open the panel.

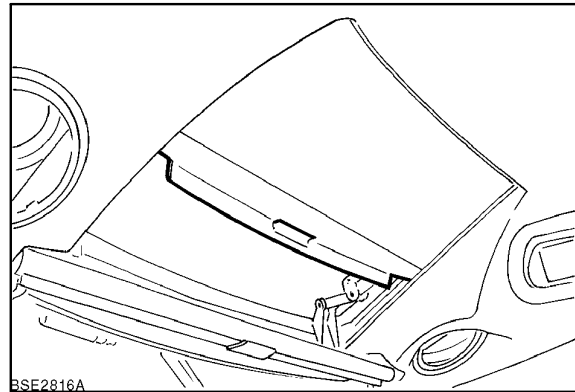
To close the panel, grasp **both** handles and pull the panel down, the spring action of the handles will hold the panel in the closed position.

NOTE: When transporting the tractor on a truck or trailer at speeds above 50 K/mh (31 MPH) ensure the roof panel is secured to prevent accidental opening. See page 3-3 for more information.

The sliding panel may be adjusted to reduce glare or can be fully closed if required.



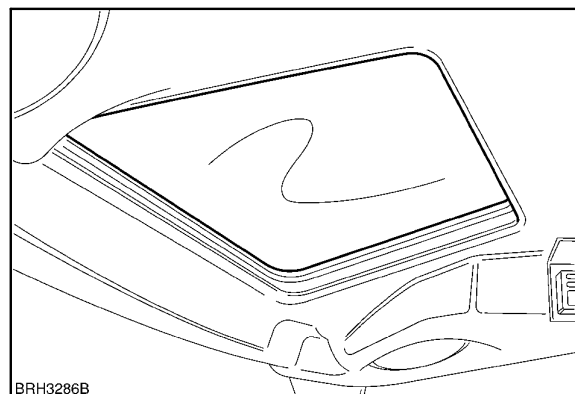
11



12

High Visibility Roof Panel - Low Profile Cab

The high visibility roof panel on low roof cabs is of a fixed type and cannot be tilted.

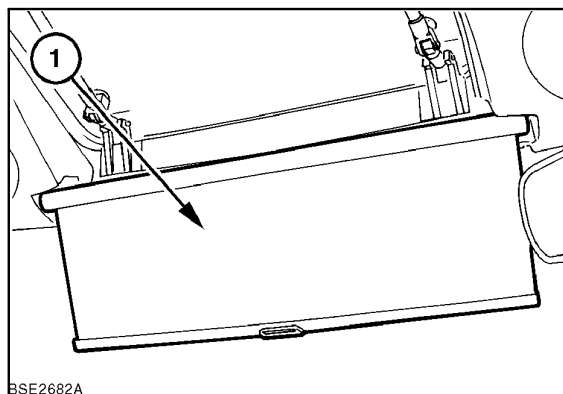


13

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Sun Visor - Standard Cab

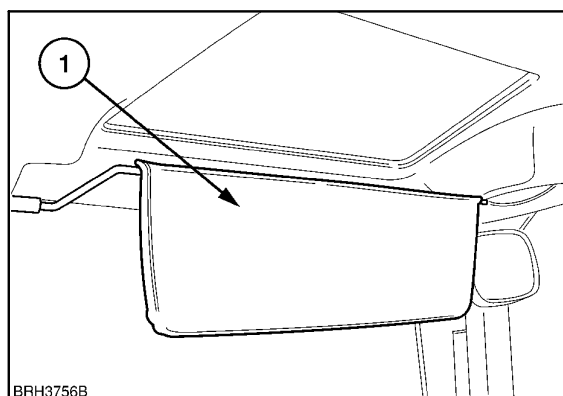
Pull down the sun visor (1) to protect the driver's eyes from the glare of the sun. The visor will remain in the chosen position. Push the visor up to retract.



14

Sun Visor - Low Profile Cab

The sun visor (1) can be used to protect the driver's eyes from the glare of the sun or to shade the interior of the cab from strong sunlight coming through the high visibility roof panel. Rotate downwards for glare protection, upwards to shade the cab interior.



15

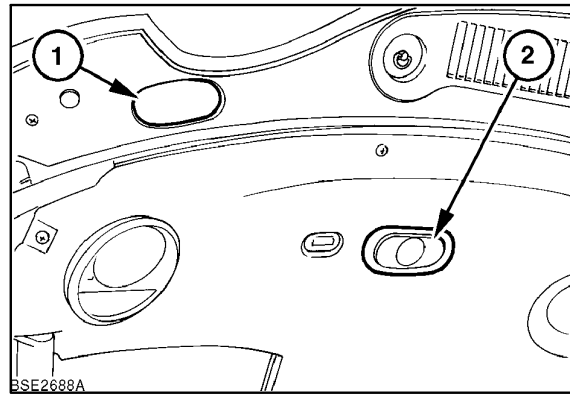
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Interior Light

The interior light (2), has three operating positions. Depress the front and the light will remain on, depress the rear and the light will illuminate when either of the doors are opened.

Where fitted, the courtesy light (1), operates in conjunction with the interior light. This light provides illumination of the step area when the door is opened.

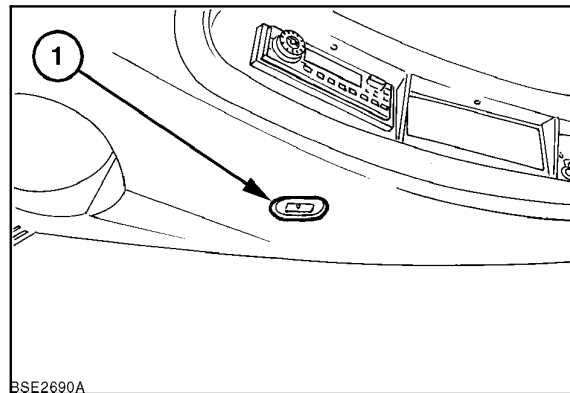
When the switch is in the central position, the light is off, irrespective of the position of the doors.



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Console Light

The light (1) provides a soft glow to the gear levers and hydraulic console. The light is illuminated when the tractor lights are turned on. On cabs with the standard roof a second light is provided on the left-hand side to illuminate the drinks holder and storage box.



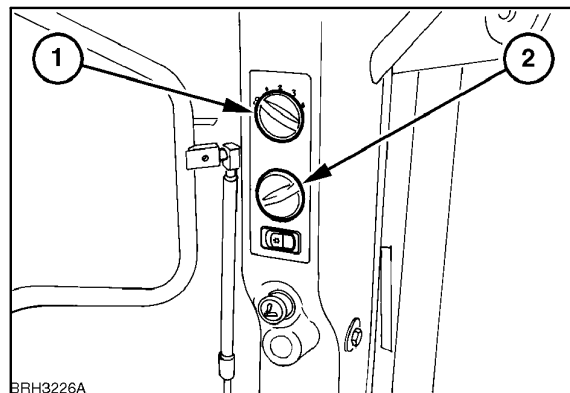
17

Heater Temperature Control

Turn the knob (2) clockwise to increase the temperature of the air from the heater. Turn fully anti-clockwise to obtain unheated air from the heater vents.

Blower Control

A 4-speed blower is installed for the heater (and air conditioner, where fitted). Turn the switch (1) clockwise to the first position for low speed. Further rotation of the switch in a clockwise direction will increase the fan speed.



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With the windows closed, the blower may be used to pressurise the cab to exclude dust etc. Provided that the cab air filters are serviced correctly, maximum pressurisation and optimum dust exclusion may be achieved by operating the blower at maximum fan speed.

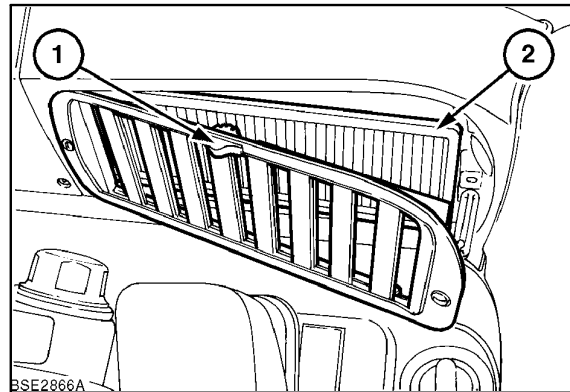
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Air Recirculation

The cab ventilation system has three filters, two external filters through which fresh air is drawn into the cab, and one internal air re-circulation filter (2). Move the slider control (1) fully to the right for maximum air re-circulation.

⚠ WARNING ⚠

The cab air filter is designed to remove dust from the air but will not exclude chemical vapour. Follow the chemical manufacturer's directions regarding protection from hazardous chemicals.



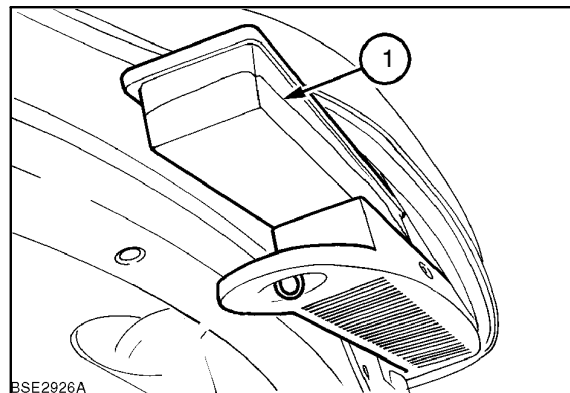
19

Cab Air Filters

When operating with pesticides, both internal (re-circulation) and external cab air filters (1), may be replaced with special charcoal filters. Consult your authorised dealer.

⚠ CAUTION ⚠

Use only genuine New Holland filter elements when renewing cab air filters. When replacing used filters, follow local regulations in the disposal of contaminated elements.



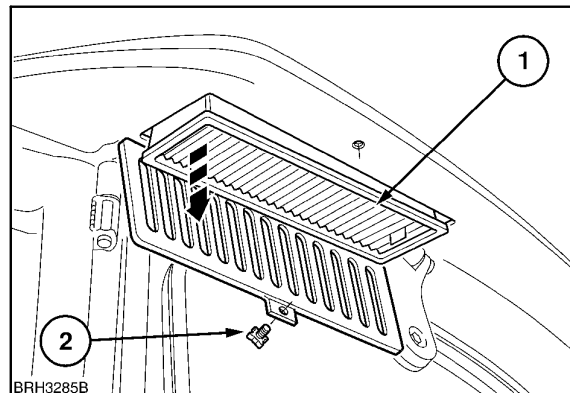
20

Safety Precautions

Although it is possible to pressurise the cab interior to reduce ingress of chemical vapour, the recommended safety procedures, as stipulated by the chemical manufacturer, should be observed at all times.

Protective clothing worn when filling the sprayer with pesticides or when carrying out external adjustments, should be removed and stored away carefully before re-entering the tractor cab.

To prevent build-up of chemical residue inside the cab, the interior trim and floor covering should be wiped clean with a damp cloth on a regular basis.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Cab Pressurisation Monitor (where fitted)

To improve protection against chemical vapours entering the cab when spraying, the blower can be used, in conjunction with charcoal filters, to raise the air pressure inside the cab above that of the external air pressure. Whilst this differential is maintained, chemical vapours should not enter the cab. Ensure all cab apertures are fully closed. To monitor the internal pressure, a gauge is mounted inside the cab.

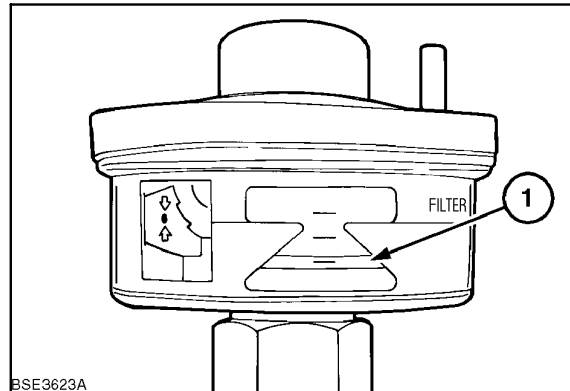
Cab Air Pressurisation Gauge

Observe the reading on the pressure gauge. If the lower edge (1) of the yellow indicator centres in the green area you have an adequate differential between the internal and external air pressure. Adjust the blower speed to maintain that reading. If the yellow indicator rises into the red area, increase blower speed to raise the internal cab pressure.



CAUTION

If, during spray operations, the lower edge of the yellow indicator enters the red section of the gauge, carry out the checks below and follow the chemical manufacturers recommendations for safe operation.



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With the blower in the off position the yellow indicator should move into the red area. If the indicator does not register correctly, the gauge should be replaced **before** operating with chemical spray equipment.

If the blower is unable to maintain the correct pressure inside the cab then the following checks should be made to determine the cause.

1. Check blower is on maximum speed.
2. Ensure all doors, windows and roof panel are fully closed.
3. Check external air filters for blockage or restriction.
4. Examine all cab aperture seals for damage.
5. Check sealing around linkages and levers where they pass through the cab panels.

If, after all the checks have been made the cab interior pressure cannot be maintained, consult your authorised dealer.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Adjustable Air Vents

Adjustable air vents are provided throughout the cab for even distribution of heated or cooled air. Vents are located each side of the operators seat and on the instrument console. Each vent may be independently adjusted to direct the air flow (with the blower control actuated) onto the side windows or the operator. The two vents located on the upper part of the instrument console may be adjusted to demist the windscreen.

To open the circular vents (1) each side of the instrument console, press one side of the disc and then turn it, as required, to direct the air flow.

Lift the tag on the rectangular vents to open, and then adjust for air flow and direction as required.

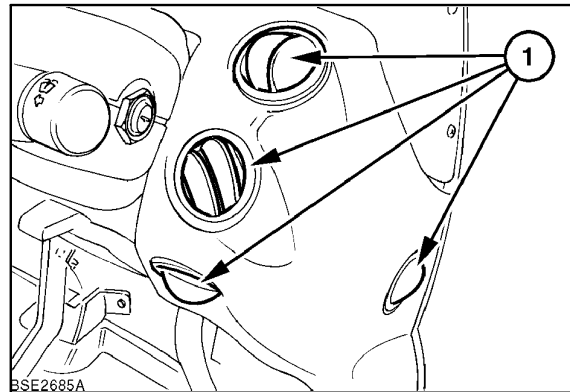
Air Conditioner Switch (where fitted)

Depress the switch (3), to activate the air conditioner compressor and lower the temperature of the air within the cab. The air conditioner will only operate with the blower (1) switched on.

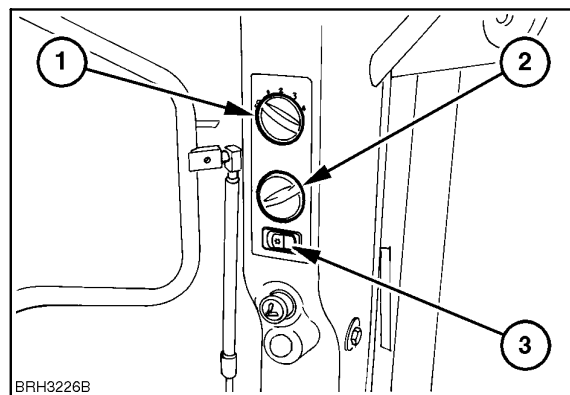
IMPORTANT: The air conditioning system uses R134A refrigerant. Do **not** mix with other refrigerants.

To quickly reduce in cab temperature operate the air conditioner with the blower speed set to maximum and the heater control fully off. When the air has cooled sufficiently, adjust the blower control to maintain the desired temperature. The windows and doors should remain closed.

Under certain conditions, it may be desirable to operate both the air conditioner and heater together, e.g. to demist the windscreen and interior door glass on a cold morning. (The air conditioner, as well as cooling, also removes moisture from the air). Run the engine to normal operating temperature, turn the heater temperature control (2) and blower control (1) to the maximum settings (fully clockwise). Turn on the air conditioner (3) and adjust the air vents to direct the air flow, as required.



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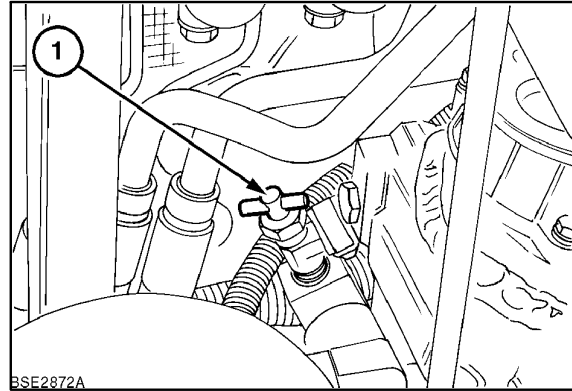
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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

When the windows are clear, turn the air conditioner off and adjust the heater controls to maintain the desired cab air temperature.

NOTE: At the start of the warm season, when the heater is no longer required, it is recommended that you close the heater shut-off valve (1), located at the rear of the cylinder head.

IMPORTANT: Run the engine at idle speed for at least 3 minutes after switching on the air conditioner, if the air conditioner has been out of use for more than 30 days.



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IMPORTANT: Always turn the air conditioner off when cooled or de-humidified air is not required. For proper operation of the air conditioner, ensure that the cab air filters are serviced regularly. See section 4.

WARNING

The refrigerant used in the air conditioner system has a boiling point of -12°C (10°F).

- Never expose any part of the air conditioner system to a direct flame or excessive heat because of the risk of fire or explosion.
- Never disconnect or disassemble any part of the air conditioner system. Escaping refrigerant will cause frostbite. Allowing refrigerant to escape into the atmosphere is illegal in many countries.
- If refrigerant should contact the skin, use the same treatment as for frostbite. Warm the area with your hand or lukewarm water at $32 - 38^{\circ}\text{C}$ ($90 - 100^{\circ}\text{F}$). Cover the area loosely with a bandage to protect the affected area and to prevent infection. Consult a doctor immediately.
- If refrigerant should contact the eyes, wash the eyes immediately with **cold** water for at least 5 minutes. Consult a doctor immediately.

NOTE: It is the normal function of the air conditioner to extract water from the air. Drain hoses lead from the air conditioner unit to a point beneath the cab. Do not be concerned if a pool of water collects beneath the drain hose outlets when the engine is stopped.

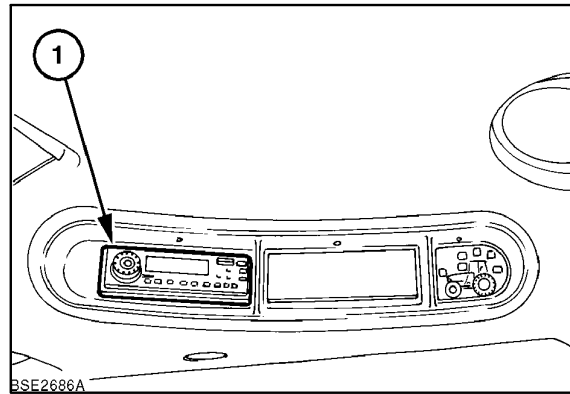
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Radio/Cassette/CD Player (where fitted)

With Standard Cab

The cab is pre-wired and has two speakers installed in the roof (four speakers are available as a dealer installed accessory). A choice of self-seeking AM/FM stereo radio/cassette or radio/CD players (1) are also available as a dealer installed accessory. Separate operating instructions will be supplied with the radio.

NOTE: The radio will only operate with the key-start switch in the **on** or **accessories** position.



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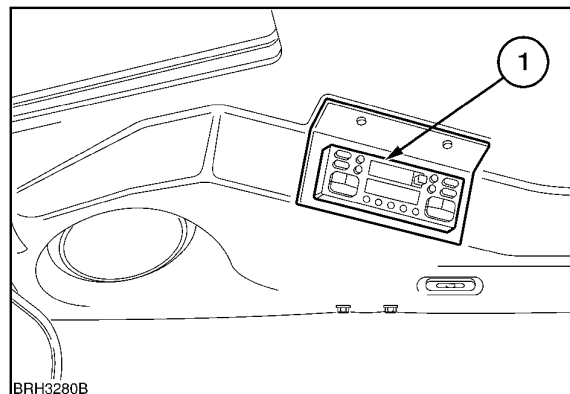
With Low Profile Cab

The dealer installed radio/cassette or radio/CD player (1) is located in the cab roof to the right of the driver. Separate operating instructions will be supplied with the unit.



WARNING

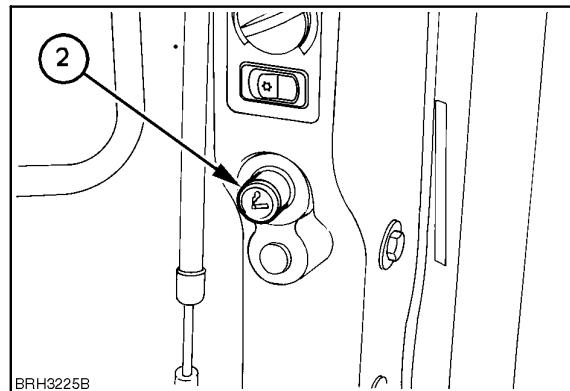
Ensure the aerial is positioned so it cannot touch overhead power lines.



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Cigar/cigarette lighter

Press the lighter button (1) fully in to activate. When the electrical element has reached the correct temperature, it will pop out ready for use.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

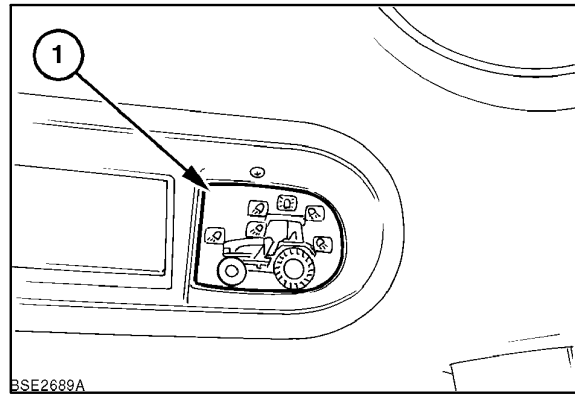
Work Lamp and Beacon Switch Panel

NOTE: The work lamps will only operate with the tractor lights switched on.

With Standard Cab

The switches are located on a panel mounted in the roof console (1). Individual switches control the front and rear work lamps and the rotating beacon (where fitted). Depress the switches once to illuminate, depress again to turn the lamps off.

When the key-start switch is turned on, the switches will be internally illuminated. The light intensity will increase as each switch is activated.



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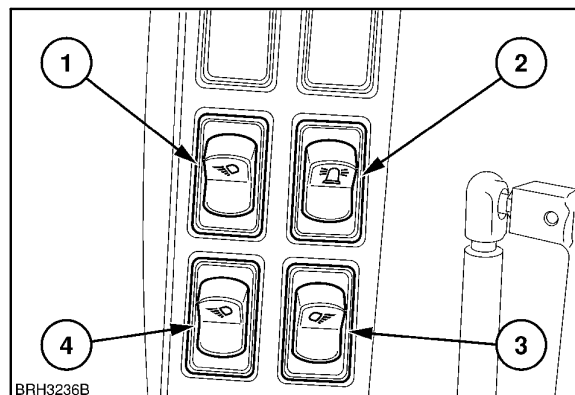
29

With Low Profile Cab

The worklamp and beacon switches are located on the right-hand cab 'C' pillar. Depress the lower part of the switch to operate the light.

1. Grab rail mounted worklamps
2. Roof beacon
3. Rear worklamps
4. Front lower worklamps (engine hood)

NOTE: Do not adjust a fender-mounted, rear work lamp to point fully downwards. The heat generated by the work lamp may distort the plastic housing of the rear lamp cluster.

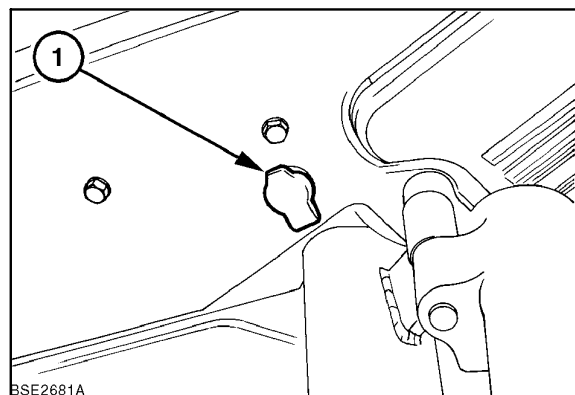


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30

Beacon Power Socket

Two power sockets for the rotating beacon are provided at the rear of the cab, one on each side.



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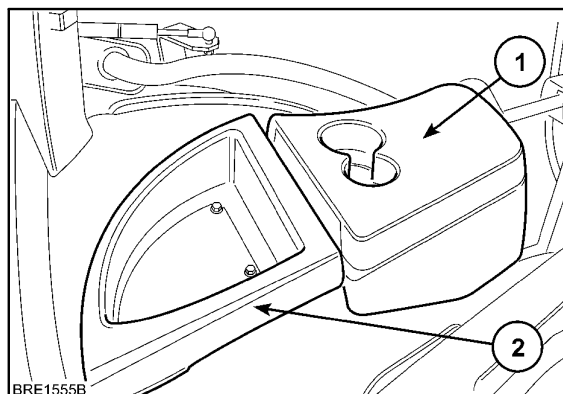
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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

In Cab Storage (where fitted)

A storage box with a hinged lid (1) is located on the left-hand side of the cab. The lid also incorporates a drinks holder.

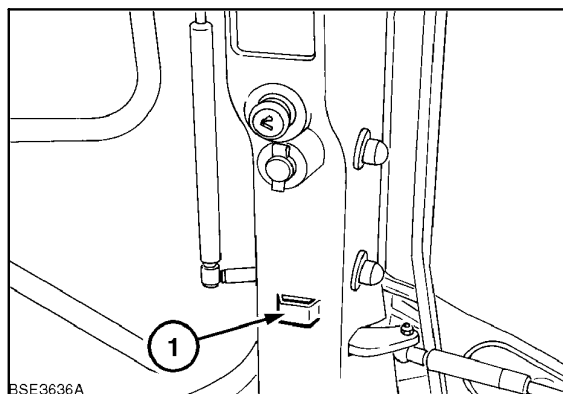
A recessed tray (2) is provided to the rear of the storage box to hold small tools, oddments, etc.



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Mobile Telephone Usage

A storage bracket (1) is provided on the left-hand cab 'C' pillar for a mobile telephone. Auxiliary power for the telephone may be taken from the cigarette lighter socket above.



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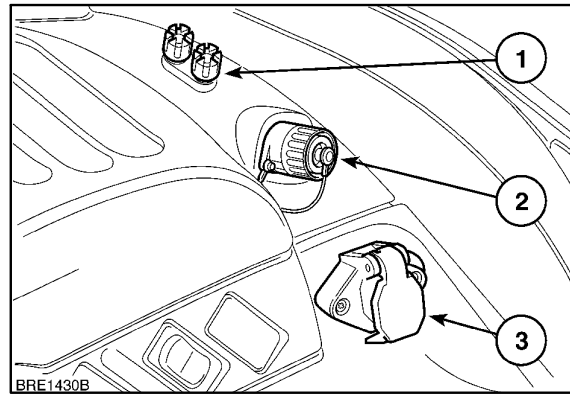
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

ELECTRICAL POWER CONNECTORS

INTERNAL POWER CONNECTORS

Depending on tractor specification there are a number of electrical power connectors provided for various applications. These are as follows:

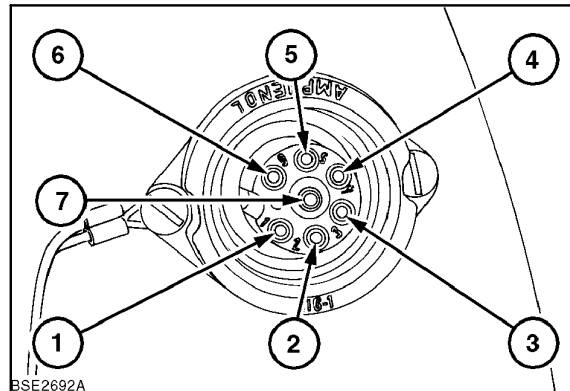
1. 8 amp Screw terminals. The red terminal is positive, the black terminal negative.
2. 7 Pole Din/ISO implement socket (with radar option only) provides the information below.
3. 30 amp ISO/JD implement power socket. Provides constant and key-start switched live feeds.



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7 Pole Din/ISO Implement Socket Connectors

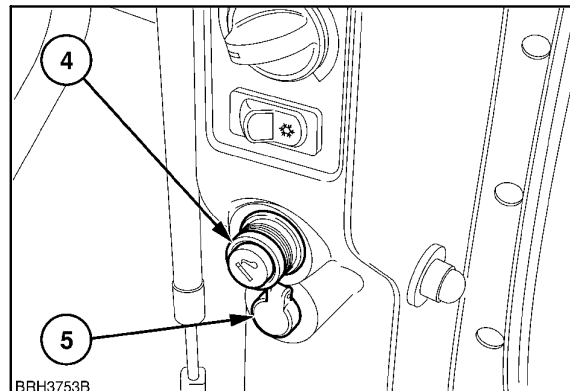
- Pin 1. True ground speed. (Radar Sensed)
- Pin 2. Theoretical ground speed. (Wheel Sensed)
- Pin 3. Rear P.T.O. speed.
- Pin 4. Rear 3-point hitch, in work/out of work.
- Pin 5. Not used
- Pin 6. 5 amp power supply.
- Pin 7. Common ground connection.



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4. Cigarette lighter/auxiliary power socket for mobile telephone or cooler box (where fitted).
5. 8 amp Single pole auxiliary power socket. Live with key-start in 'on' position.

IMPORTANT: To ensure that terminals and connecting cables do not get excessively hot when loaded with near maximum current it is important to make secure, tight connections to prevent overheating and damage. Ensure that equipment is connected to the terminals with cables of suitable gauge and insulation thickness and fitted with appropriate terminal connectors.

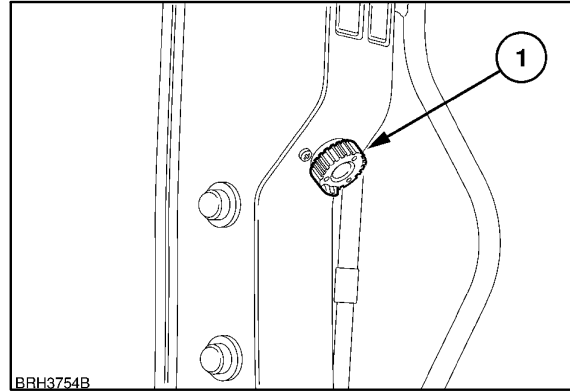


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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Diagnostic Socket

IMPORTANT: The multi-pin socket (1) on the cab 'C' pillar is for use by an authorised dealer for connecting diagnostic equipment to the tractor electronic circuits. **DO NOT** attempt to connect any user electronic equipment to this socket or damage may be caused to the tractor electronic systems or control units.



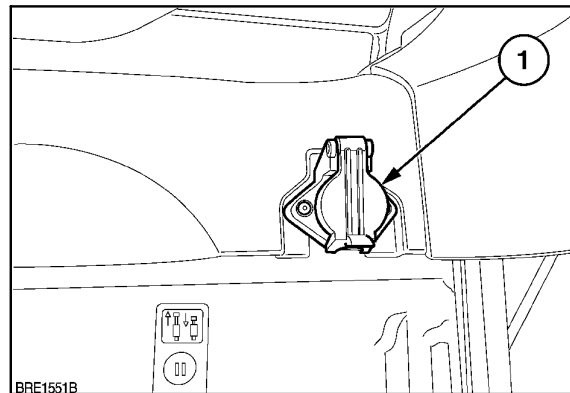
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EXTERNAL POWER CONNECTORS

Four Pin Implement Socket

A 4-pin, 40 amp socket (1) is standard on all tractors with cab. (See Section 7 for adaptor cable).

NOTE: The 4-pin socket provides power up to 40 amps. However, operator's should be aware that the screw terminals (4) Figure 34, share the same 40 amp fuse. The combined output of the 4-pin socket and the screw terminals is, therefore, limited to 40 amps.



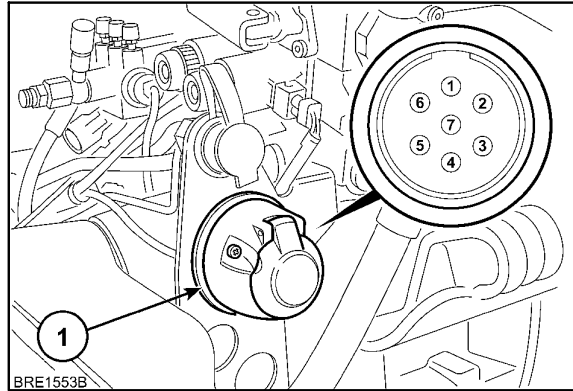
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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Seven Pin Electrical Power Outlet (except North America)

A standard 7-pin trailer lighting socket (1), is provided and is mounted at the rear of the tractor. With reference to the picture inset, the socket connections (viewed from the front of the socket) are as follows:

Pin No.	Wire Colour	Circuit
1.	Yellow	L.H. Turn Signal
2.	Not Used	-
3.	Black	Earth (Ground)
4.	Green	R.H. Turn Signal
5.	Blue	R.H. Parking Light
6.	Red	Brake Lights
7.	Brown	L.H. Parking Light

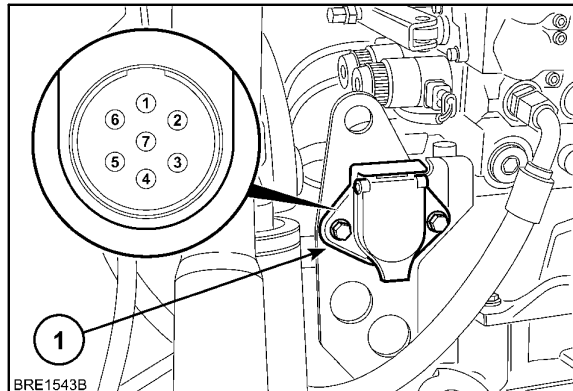


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Seven Pin Electrical Power Outlet (North America only)

A standard SAE 7-pin connector (1) is provided, to operate the electrical system on implements and trailers. With reference to the picture inset, the pin connections (viewed from the front of the socket) are as follows:

Pin No.	Wire Colour	Circuit
1.	Black	Earth (Ground)
2.	Blue	R.H. Parking Light
3.	Yellow	L.H. Turn Signal
4.	Red	Brake Lights
5.	Green	R.H. Turn Signal
6.	Brown	L.H. Turn Signal
7.	Not Used	-

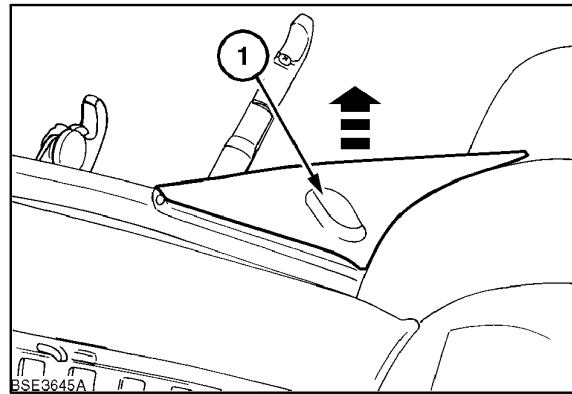


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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Cable and Harness Routing

So the operating cable from the monitor may be conveniently routed to the equipment, a small aperture is provided in the filler plate each side of the lower rear window frame. By making a small incision in the rubber at (1), cables or wiring can be easily routed through the filler plate.



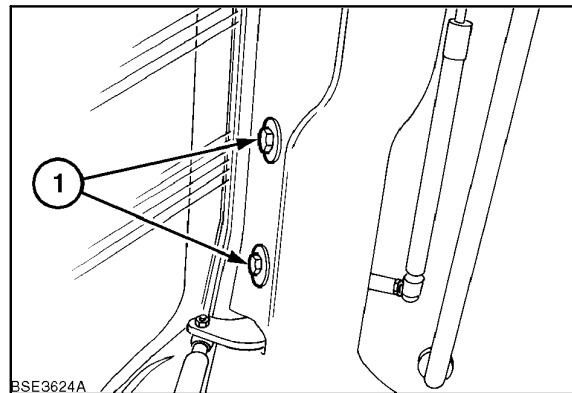
41

Implement Monitor Installation

To facilitate installation of an implement monitor, two mounting points are provided:

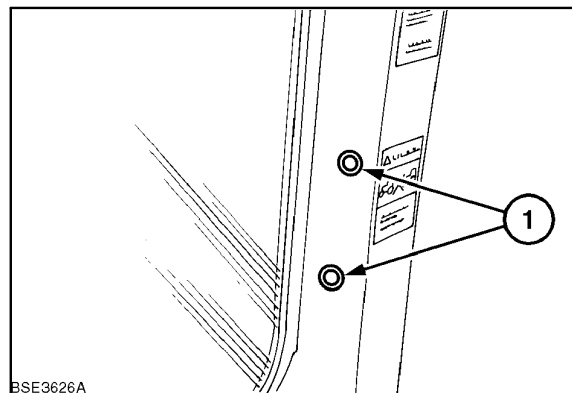
To meet SAE standards, captive bolts (1), protected by plastic covers, are provided on the the right-hand cab 'C' pillar.

It is recommended that a bracket be screwed to the 'C' pillar to mount the monitor. A suitable bracket is available from your authorised dealer.



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An alternative monitor mounting position (1) is provided on the inner face of the right-hand 'A' pillar.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

SEATS

The seat installed on your tractor has a comprehensive range of adjustments. Before operating the tractor, it is important to adjust the seat to the most comfortable position. See the following text and appropriate illustration to identify the seat installed in your tractor.

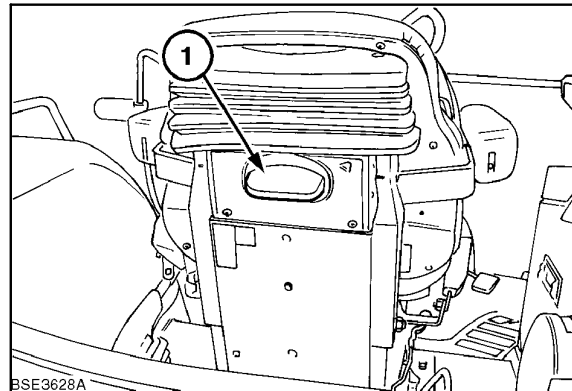
The seats shown have weight indicators registering in kilos. A conversion chart from kg to lb is provided for your convenience.

50 kg = 110 lb	90 kg = 198 lb
60 kg = 132 lb	100 kg = 220 lb
70 kg = 154 lb	110 kg = 245 lb
80 kg = 176 lb	120 kg = 265 lb

Standard Mechanical Seat (where fitted)

Seat height is adjustable in four positions. A release handle (1), is located centrally, on the back of the seat. Lift the release handle with one hand and lift or lower the seat with the other. The seat will lock at the selected height when the handle is released.

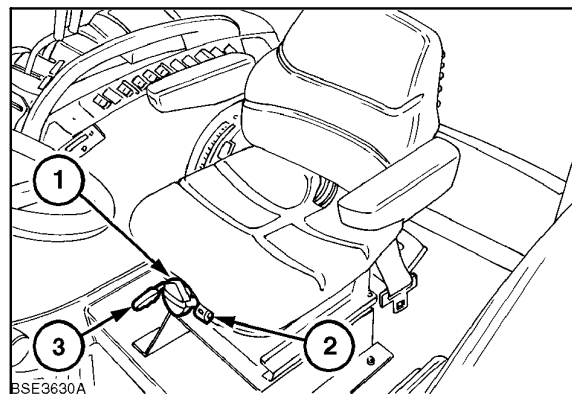
The suspension is adjusted by means of a folding crank handle (1) Figure 45, on the front of the seat frame. Sit in the seat and turn the handle until your approximate weight, in kilos, is indicated in the window (2).



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The lever (3) controls seat travel. Lift the lever and slide the seat forward or backward, as required. When the lever is released, the seat will lock in the position selected.

Folding armrests are provided. If not required, the armrests may be raised to the vertical position.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Deluxe Mechanical Seat (where fitted)

Lift the travel adjustment lever (1) and move the seat forward or backward, as required. The seat will lock in position when the lever is released.

There is a knurled wheel (2) on the underside of each armrest. Turn the wheel to alter the angle of the armrest.

If not required, both armrests may be lifted to the vertical position.

The backrest may be tilted to suit the operator. Lift the lever (3) on the left-hand side of the seat frame and adjust the inclination of the backrest.

To facilitate observation of an implement attached to the rear of the tractor, the seat may be allowed to swivel. Adjustment is available as follows:

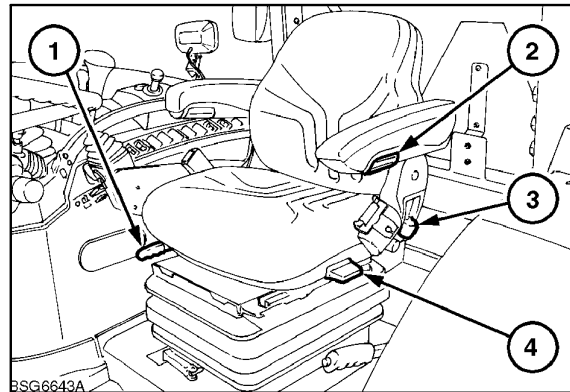
- (a) Lock in one position 10° to the left of centre.
- (b) Lock in one of two positions at 10° and 20°, to the right of centre.

Lift the lever (4) and rotate the seat, as required. The seat will lock in position when the lever is released.

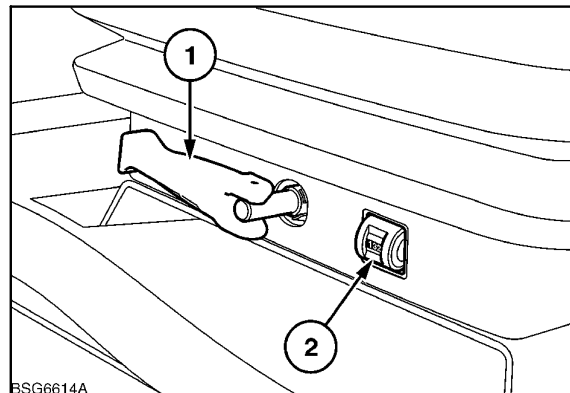
Turn the crank handle (1) to adjust the suspension until your approximate weight, in kilos, is indicated in the window (2). Turn the handle clockwise to increase suspension stiffness to suit a heavier operator and provide a firmer ride. Turn the handle anti-clockwise and the seat suspension will become softer.

The seat height is adjustable in three positions. With the seat in the lowest position, grasp either side of the seat cushion and lift the seat bodily until it locks in the intermediate position. Lift the seat further and it will lock in the maximum height position. To lower the seat, lift the seat bodily to the fullest extent, to trip the mechanism, then allow the seat to lower.

A storage pouch is provided on the back of the seat.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Air Suspension Seat (where fitted)

The air suspension seat provides a full range of adjustments for driver comfort including an electrically controlled air suspension system which can be adjusted to suit individual operator weight.

Lift the travel adjustment lever (1) to move the seat forward or backward.

The seat is permitted a limited, spring controlled fore/aft movement (float) when the travel isolator lever (2) is moved to the left. Moving the lever to the right will lock isolator movement.

The adjusters (3) on the underside of the armrests may be turned to alter the angle of the armrests. Turn them clockwise to raise the front of the armrests, turn anti-clockwise to lower. Both armrests may be raised to the vertical position if required.

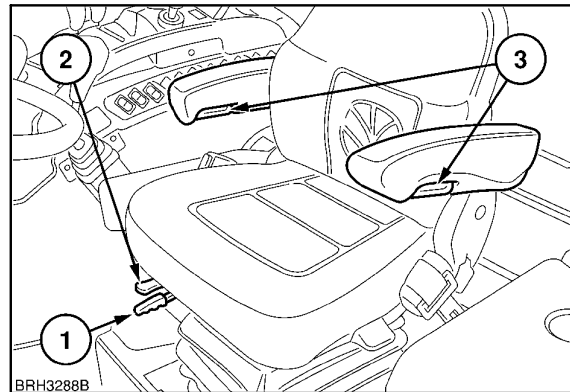
The backrest may be tilted to suit the operator. Lift the lever (4) on the left-hand side of the seat frame and adjust the inclination of the backrest. The backrest will lock in position when the lever is released.

To facilitate observation of an implement attached to the rear of the tractor, the seat may be rotated to the left or right. Lift the lever (5) and rotate the seat as desired. From the straight ahead position there are two positions to the right and one to the left. Release the catch to lock the seat.

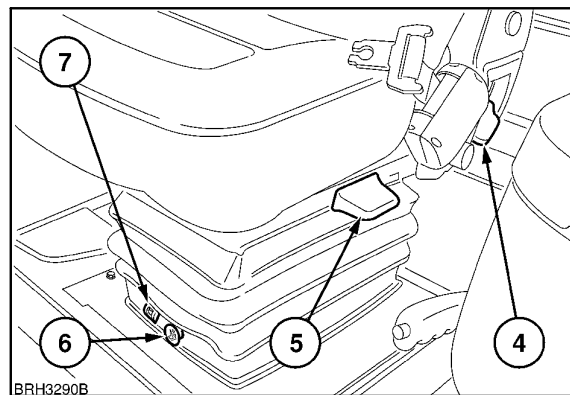
Adjustments to the air suspension are made by operating the air pump control button (6), a weight indicator (7) will show the optimum setting for the seat suspension.

A storage pouch is provided on the back of the seat.

The seat can be fitted with an optional upper back support where required, consult your authorised dealer.



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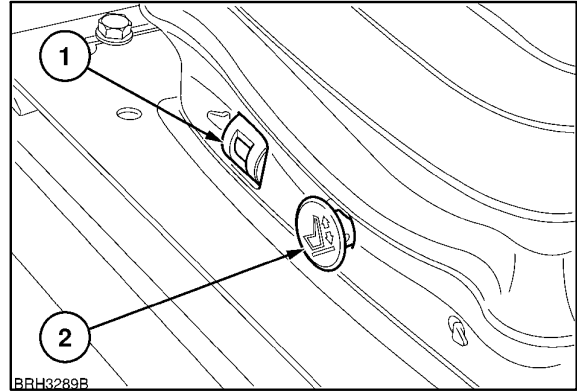
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

To set the initial suspension and ride height, first fully lower the seat. Pull out the air pressure control (2) and hold until all the residual pressure has been released.

Further adjustments are now made with the key-start switch turned on (warning lights illuminated).

Sitting in the seat, push-in and hold the control (2), the air compressor will start to pressurise the suspension. As the seat height increases, observe the weight indicator (1), this will change from yellow to green. When the indicator is completely green release the control. To make further height adjustments, operate the air compressor control, as required, to raise or lower the seat.

NOTE: For optimum suspension performance, the weight indicator should always be set in the green segment with the tractor stationary and the operator in the seat.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Deluxe Air Suspension Seat (where fitted)

The deluxe air suspension seat has electrically controlled suspension. To make the initial suspension adjustment, sit in the seat and hold the lever (2) down until the seat has fully lowered.

Further seat suspension and ride height adjustments are made with the key-start switch turned on. Sit in the seat and lift and release the lever (2). A servo will raise the seat, automatically adjust to your weight and stop when the optimum suspension setting is reached. To make further height adjustments, hold the lever up or down, as required, to raise or lower the seat. When the lever is released, the seat will stop at the height selected.

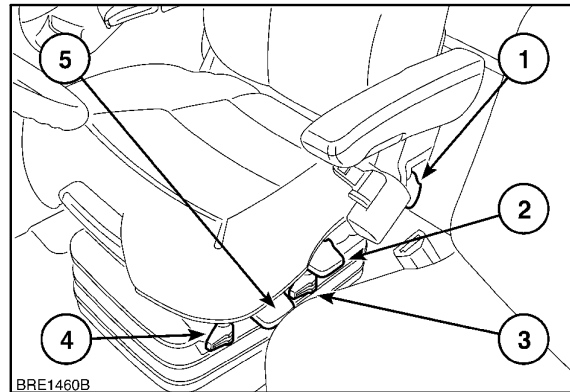
This setting will be maintained every time the key-start switch is turned on or until such time as the setting is re-adjusted.

The backrest may be tilted to suit the operator. Lift the lever (1) on the left-hand side of the seat frame and adjust the inclination of the backrest. The backrest will lock in position when the lever is released.

There are five damping settings for the suspension. Bounce up and down in the seat while swivelling the knob (3) from fully rearward (hard) to fully forward (soft). Correct adjustment of the suspension, ride height and damping, will provide the optimum in ride comfort.

The seat is permitted a limited, spring controlled fore/aft movement (float) when the travel isolator knob (4) is swivelled to point rearward. Swivelling the knob to point forward will lock the isolator movement.

To facilitate observation of an implement attached to the rear of the tractor, the seat may be rotated to the left or right. Lift the lever (5) and rotate the seat as desired. From the straight ahead position there are two positions to the right and one to the left. Release the catch to lock the seat.



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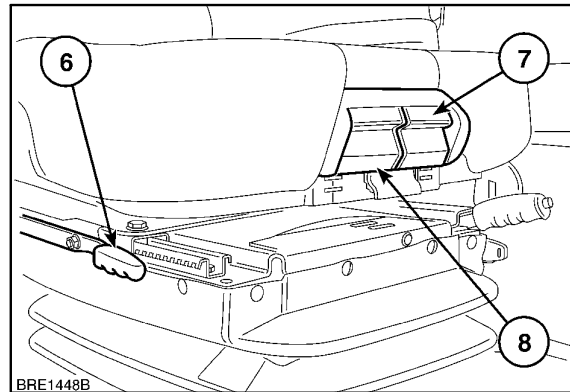
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Lift the travel adjustment lever (6) and move the seat forward or backward, as required. The seat will lock in position when the lever is released.

For optimum comfort, the seat cushion may be adjusted for height and reach.

To move the seat cushion forwards or rearwards, pull up the catch (8), grasp the cushion and move to the desired position. Release the catch to lock.

To adjust the height, lift and hold the release catch (7) and then pull up or push down on the front of the seat cushion. Release the catch to lock. Cushion adjustments are most easily achieved with the operator out of the seat.

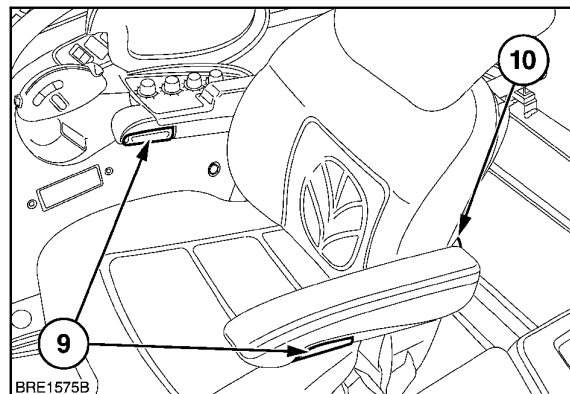


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The adjusters (9) on the underside of the armrests may be turned to alter the angle of the armrests. Turn them clockwise to raise the front of the armrests, turn anti-clockwise to lower. Both armrests may be raised to the vertical position if required.

The seat has a built-in lumbar support actuated by handwheel (10) and on the left-hand side of the backrest. Turn the wheel clockwise to increase lumbar support or anti-clockwise to decrease.

To adjust the height of the upper back support pad on top of the backrest, grasp the pad and raise or lower as desired. The pad has a number of positions in which it will lock. Slowly move the pad until a faint 'click' is heard, the pad will now remain in this position.



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A storage pouch is provided on the back of the seat.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

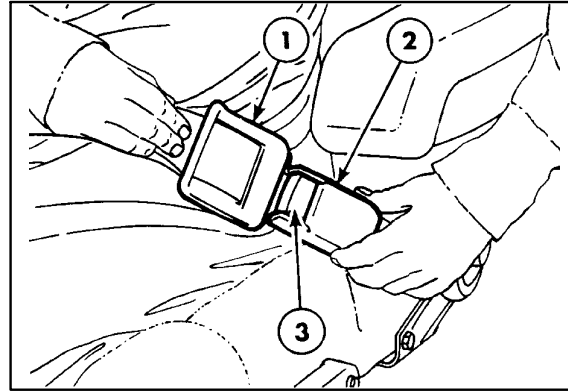
SEAT BELT AND OPERATOR PRESENCE SWITCH (where fitted)



WARNING

Always use the seat belt with a safety cab or ROPS frame installed. Do not use a seat belt if the tractor is not equipped with a safety cab or ROPS.

To fasten the belt, pull the belt from the reel and push the tongue (1) into the buckle end (2) until a 'click' indicates it is properly engaged. Press the red release button (3) on the buckle and remove the tongue from the buckle.



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The operator presence switch, installed beneath the seat, is connected to an audible alarm which will sound if the operator leaves the seat with the P.T.O. engaged.

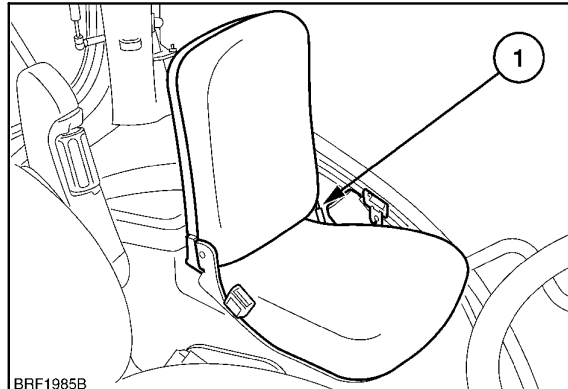
INSTRUCTIONAL SEAT (where fitted)

A folding instructional seat is available where local legislation permits. To raise the seat backrest, lift to the upright position. The seat will be retained in the upright position by the gas strut (1). When not required fold the upper part of the seat down to reveal the drinks holder.



WARNING

Always use the seat belt with a safety cab or ROPS frame installed. Do not use a seat belt if the tractor is not equipped with a safety cab or ROPS.



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IMPORTANT: The fold down seat is fitted for operator training or instructional purposes only, it is not intended for passenger conveyance. Passengers should not be carried in the cab at any time.

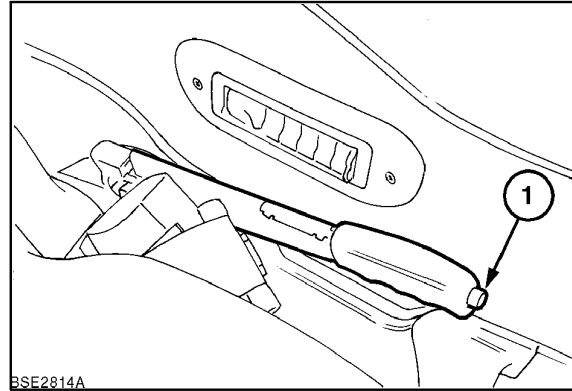
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

HAND BRAKE, THROTTLE AND FOOT PEDALS

Handbrake

A conventional handbrake lever is installed to the left of the driver's seat.

To apply the handbrake, pull the lever up. A warning light will illuminate in the instrument panel when the handbrake is applied. To release, ease the lever up further, depress the button (1) on the end and lower the lever fully.



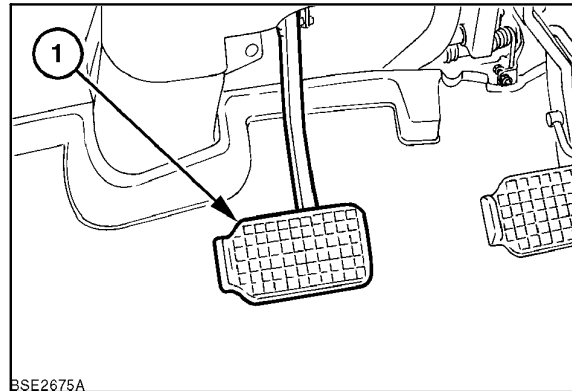
56

IMPORTANT: Ensure that the handbrake is fully released before driving off.

Clutch/Inching Pedal

When the clutch pedal (1) is depressed the drive between the engine and transmission will be disengaged. Use the pedal to transfer engine power smoothly to the driving wheels when moving off from a standstill. See 'TRANSMISSION' later in this section for further details.

NOTE: To avoid premature wear, do not use the clutch pedal as a footrest.

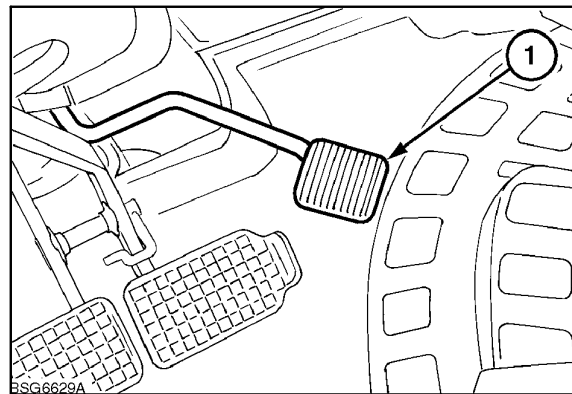


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Foot Throttle

The foot throttle (1) may be used independently of the hand throttle to control the speed of the tractor. It is recommended that you use the foot throttle when driving on the highway.

NOTE: When the foot throttle is released, engine speed will reduce to the level set by the hand throttle. When using the foot throttle, set the hand throttle to the minimum speed position (lever fully rearward).



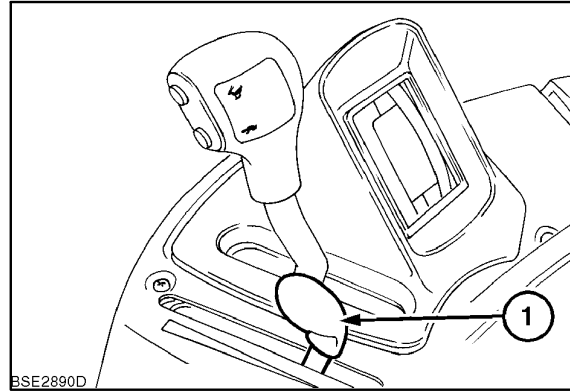
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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Hand Throttle

The hand throttle (1) may be used independently of the foot throttle to control the speed of the tractor. Move the throttle lever forward to increase engine speed.

IMPORTANT: Always return the hand throttle to the idle position when using the foot throttle for road transport applications.



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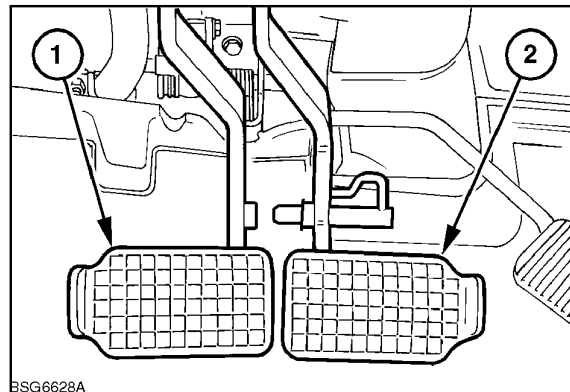
Footbrakes

The brakes are actuated by the two footpedals (1) and (2). When operating in the field they may be unlocked and operated independently, to aid turning in confined spaces. When independent braking is not required, ensure both pedals are locked together to provide normal braking.



WARNING

On four wheel drive tractors the drive to the front axle is automatically engaged at speeds above 8.5 km/h (4 MPH) when the brakes are applied to provide four wheel braking. Owners should be aware of the effectiveness of four wheel braking which greatly enhances braking performance. Appropriate care should be exercised during heavy braking.



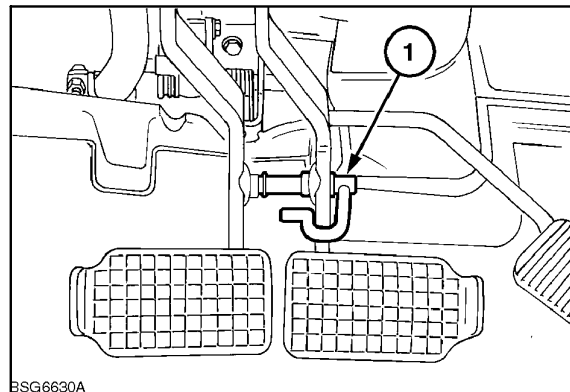
60

IMPORTANT: Hydraulic trailer brakes will only operate when **both** brakes are applied.



WARNING

For your safety, always lock the brake pedals together when travelling at transport speeds or if a hydraulically braked trailer is attached to the tractor. To lock the pedals together, engage the locking pin in the right pedal and swivel the latch (1), over the left pedal support to lock, as shown.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

INSTRUMENT CONSOLE

The following text describes the use of the various switches and controls, etc., mounted on the instrument console and steering column.

Steering Column Tilt Adjustment

The steering column on your tractor may be tilted and telescoped. Pull the end of the clamp lever (2) up (toward you). Move the steering column/wheel to the most convenient position and return the clamp lever to the fully down position to lock the steering column assembly.

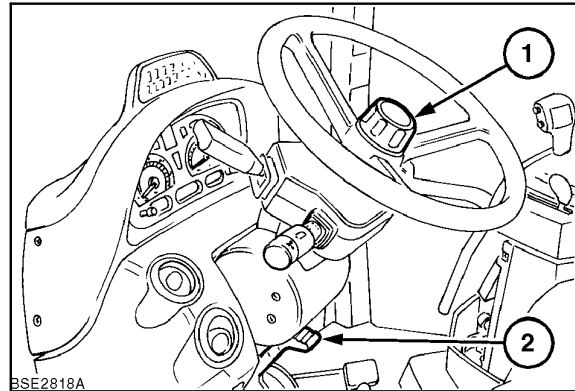
Height Adjustment (where fitted)

To alter the steering column height, loosen the centre boss (1) on the steering wheel by turning anti-clockwise. Move the steering wheel to the most convenient position and re-tighten the centre boss.

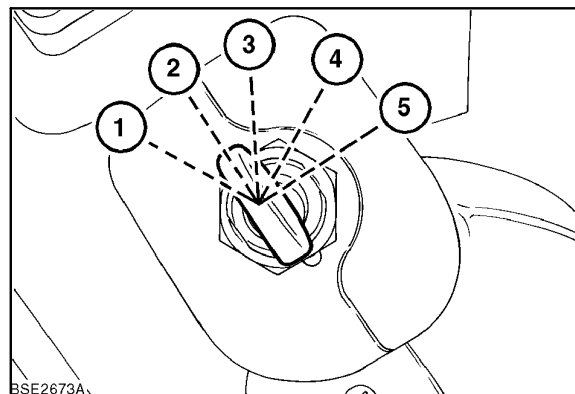
IMPORTANT: Your tractor is equipped with hydrostatic power steering. Never hold the steering wheel at full left or right lock (wheels against the steering stops) for more than 10 seconds or for more than a total of 10 seconds in any one minute. Failure to observe this precaution may result in damage to steering system components.

Key-start Switch

The key-start switch activates the grid heater cold start device, accessories and the starting motor. See 'Starting the Engine' in Section 3.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Multi-function Switch

The stalk-type switch is mounted on the left-hand side of the steering column. The switch controls the tractor lights, horn and turn signals.

The centre of the stalk switch rotates. With reference to Figure 64, turn the switch away from you, to position 1, to turn on the instrument and position lights. Turn the switch to position 2 to select the headlights.

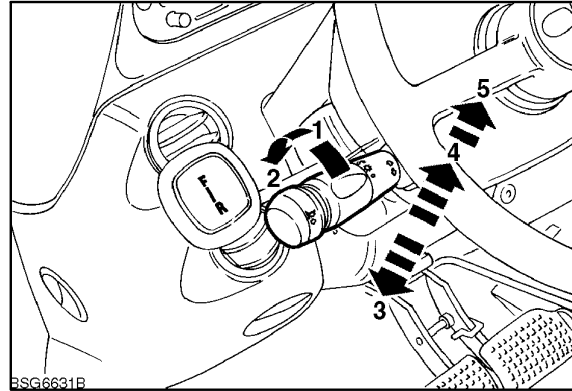
With the headlights on, push the stalk away from you, position 3, to change from dipped to high beam. Pull the stalk toward you, position 4, to change back to dipped beam. With high beam selected, the blue indicator light on the instrument panel is illuminated.

With the headlights off, pull the stalk towards you, position 5, against spring pressure, to flash the headlight high beam. The stalk will return to the central position when released.

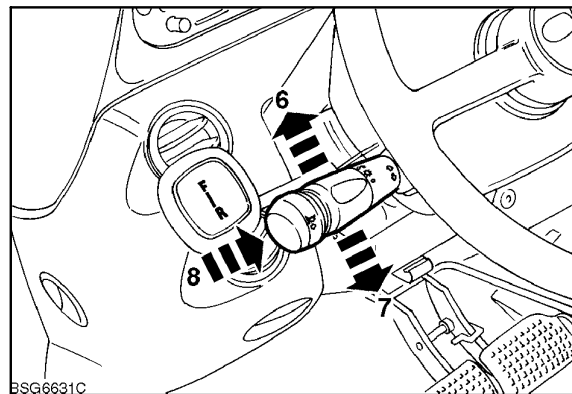
Move the stalk to position 6 to operate the right turn signals, position 7 will activate the left turn signals. Indicator lights on the instrument panel will also flash when the turn signals are actuated. A warning buzzer will sound if the indicators are not cancelled within 20 seconds.

NOTE: The turn signals will only operate with the key-start switch turned on.

Press in the end of the stalk, position 8, to sound the horn.



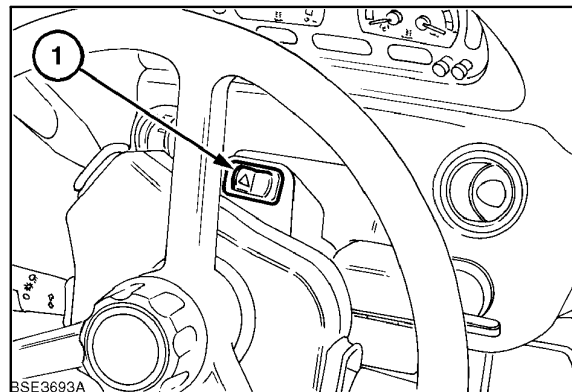
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Hazard Warning Lights Switch

Press the left-hand side of the switch (1) to operate all the turn signals simultaneously. The switch will flash with the turn signals.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Windscreen Wipe/Wash Control (tractors with cab only)

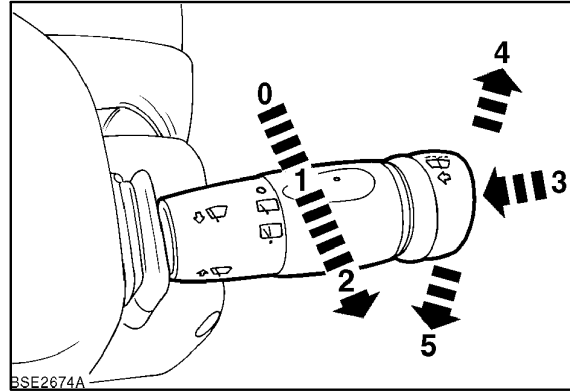
The stalk-type control on the right-hand side of the steering column controls the front and rear screen wipe and wash functions.

With the key-start switch on, move the stalk rearward, to position 1 and the front wiper will operate at the slower of the two wiper speeds, move to position 2 for the faster speed. Press in the end of the stalk, position 3, to operate the electric screen wash.

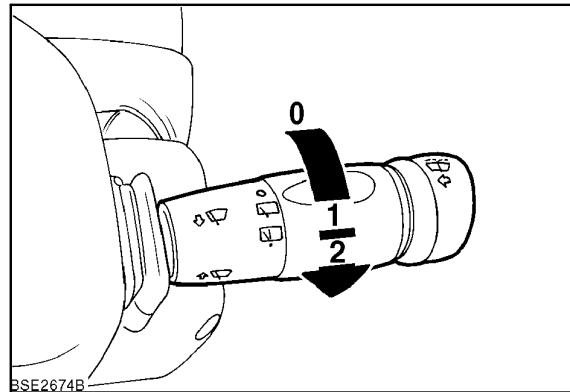
From the centre 'off' position move the stalk downward to position 5 for intermittent front wipe, move the stalk upward against spring pressure for single sweep operation, position 4. On release, the switch will return to the off position.

To operate the rear screen wiper, rotate the centre collar anti-clockwise to position 1 for intermittent rear wipe and to position 2 for rear screen wash. The switch will return automatically to the intermittent mode when released.

NOTE: Windscreen washer jets are mounted in the cab frame, immediately beneath the roof. Insert a pin into the jet nozzle to adjust the angle of the jet.



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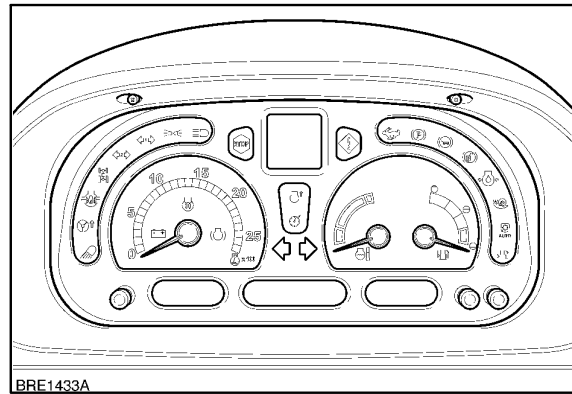
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

ANALOGUE/DIGITAL INSTRUMENTATION

The instrument panel consists of three analogue gauges, three liquid crystal displays (LCD's) and a dot matrix display (DMD).

In addition to the gauges and LCD displays there are 25 coloured lights providing other operating information or warning of system malfunction.

The lower left button on the instrument panel controls the intensity of back lighting for the LCD's and dot matrix displays, the two right-hand buttons adjust the digital clock.

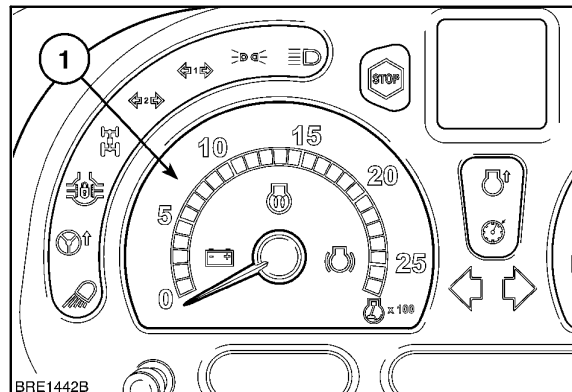


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GAUGES

Engine Tachometer

The tachometer (1) indicates engine revolutions per minute. Each division on the scale represents 100 rev/min., therefore with the needle indicating '20' the engine is running at 2000 rev/min.



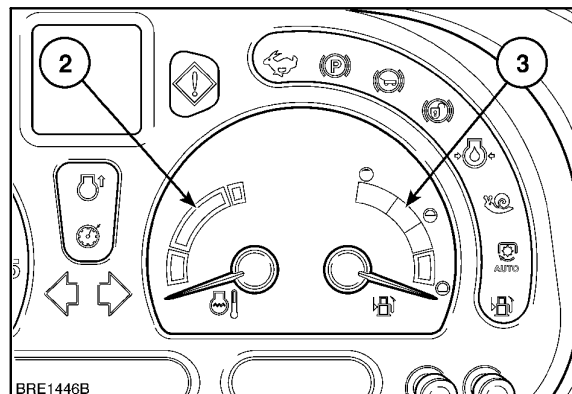
70

Engine Coolant Temperature Gauge

The temperature gauge (2) indicates the temperature of the engine coolant. If the needle enters the upper (red) section of the gauge while the engine is running, stop the engine and investigate the cause.

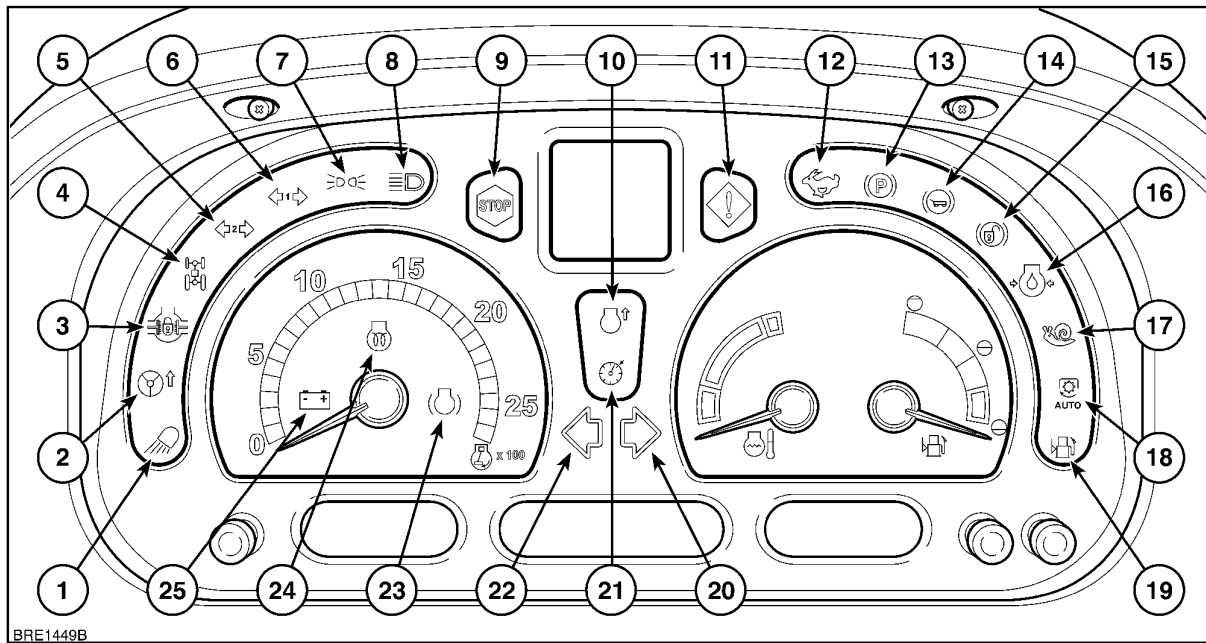
Fuel Level Gauge

The gauge (3) indicates the level of fuel in the tank and is only operative with the key-start switch turned on. See Section 8 for fuel capacities.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION



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INDICATOR AND WARNING LIGHTS

The coloured indicator lights provide operating information or give warning of system malfunction. Illumination of a warning light may be accompanied by an audible alarm. Refer to Alarm Functions on page 2-46

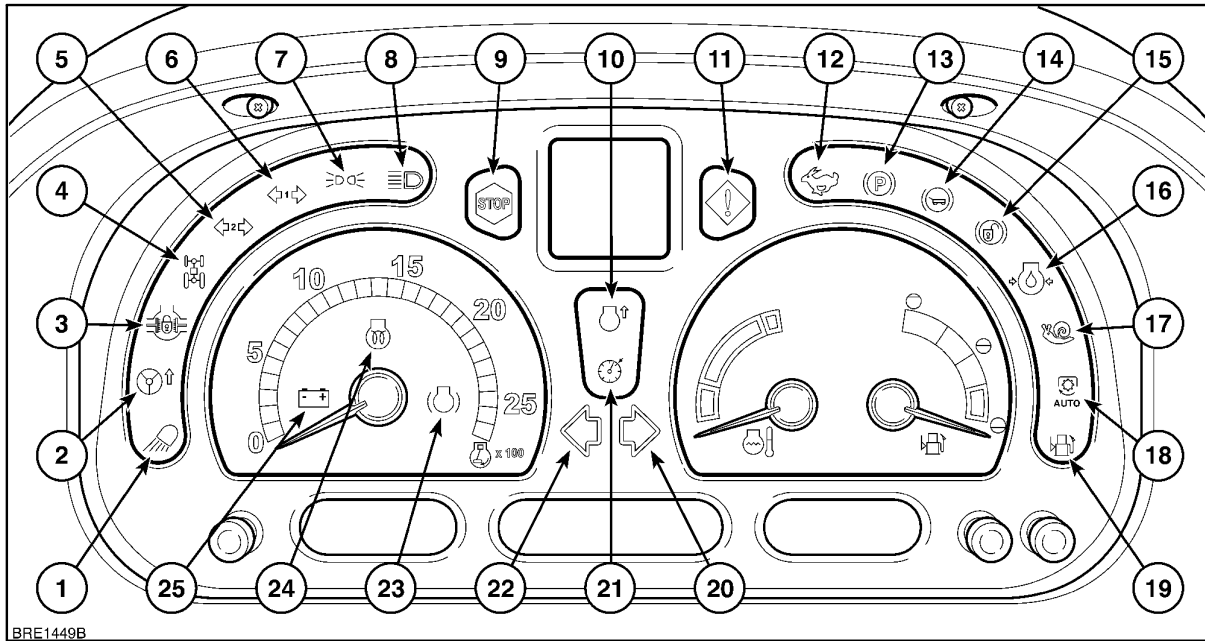
Indicator and Warning Lights

NOTE: All indicator and warning lights will illuminate for a short period at 'key-on' as the electrical systems carry out a self diagnostic check.

1. Not used.
2. Fast Steer - Light will illuminate when fast steer function is activated.
3. Differential lock - Light will illuminate when the differential lock is engaged.

4. Four wheel drive - Light will illuminate when the drive to the front wheels is engaged.
5. Trailer turn signal - Light will flash with tractor/trailer turn signals when a second trailer is attached.
6. Trailer turn signal - Light will flash with tractor/trailer turn signals when a trailer is attached
7. Parking lights - Light will illuminate when the tractor lights are switched on.
8. Headlight high beam - Light will illuminate when the tractor lights are switched to high beam.
9. Red Stop light - If Stop light comes on stop the tractor immediately and investigate the cause. A warning symbol will appear in the Dot Matrix Display to confirm the location of the fault.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

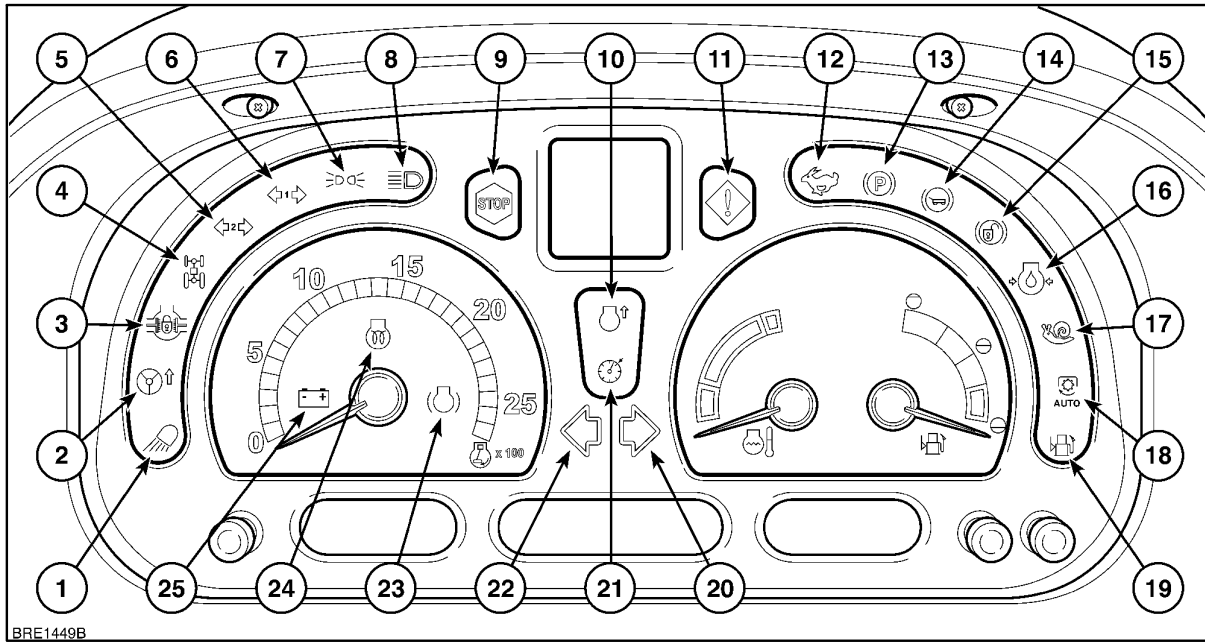


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Indicator and Warning Lights (continued)

- 10. Not used.
- 11. Amber Warning light - Illumination of this light will be accompanied by a warning symbol in the Dot Matrix Display. Stop the tractor and investigate the cause.
- 12. Direct drive indicator (Dual Command transmission only) - Light will illuminate to indicate transmission is in direct drive.
- 13. Parking brake - Light will flash with key-start switch on and parking brake applied. If the key-start switch is turned off and the parking brake not applied, or the operator leaves the seat without applying the handbrake, a warning buzzer will sound for approximately 10 seconds or until the handbrake is applied.
- 14. Trailer brake pressure (Italy only) - Light will illuminate to indicate that hydraulic oil pressure to the trailer brake circuit is low. Stop the tractor and investigate the cause.
- 15. Brake pedals not latched - Light will illuminate to show when pedal latch is unlocked (Japan only).
- 16. Engine oil pressure low - Steady light accompanied by the Red Stop light will indicate low engine oil pressure. Stop the engine and investigate the cause.
- 17. Creeper gears - Light will illuminate when creeper gears are engaged.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION



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Indicator and Warning Lights (continued)

- 18. Auto P.T.O. function - The light will illuminate when the Auto P.T.O. function is enabled. Each time the implement is raised with Auto P.T.O. activated, the light will flash. When the implement is lowered into work the light will cease to flash and become steady.
- 19. Fuel level low - Light will be illuminated when the tractor requires re-fuelling. See Section 8 for fuel capacities.
- 20. Right turn indicator - Light will flash with tractor right-hand turn signal. Intermittent alarm will sound if indicator is not cancelled after 20 seconds (tractor moving) or 5 minutes (tractor Stationary).
- 21. Not used.
- 22. Left turn indicator - Light will flash with tractor left-hand turn signal. Intermittent alarm will sound if indicator is not cancelled after 20 seconds (5 minutes with tractor stationary).
- 23. Not used.
- 24. Cold start device - Light will illuminate when the grid heater is activated using the key-start switch.
- 25. Alternator - Light continuously illuminated indicates that the alternator is not charging the battery.

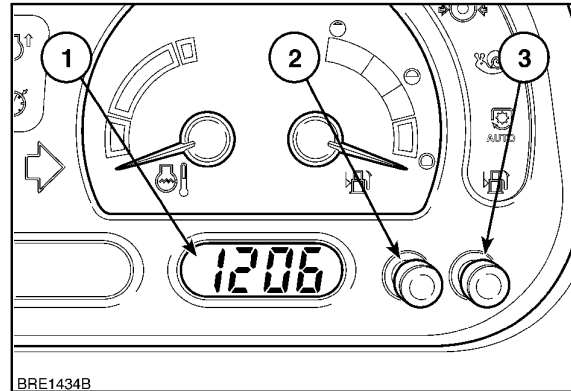
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

LIQUID CRYSTAL DISPLAYS

Clock

A digital clock (1) is installed on the right-hand side of the instrument panel.

To adjust the time display turn the key-start on, depress and hold the Hour or Minute button until the read out starts to Flash. To advance the hour, depress the 'H' button (2). Each time the button is depressed the time will advance by 1 hour. Alternatively, hold in the button and the display will advance automatically. Release the button when the time setting is correct.

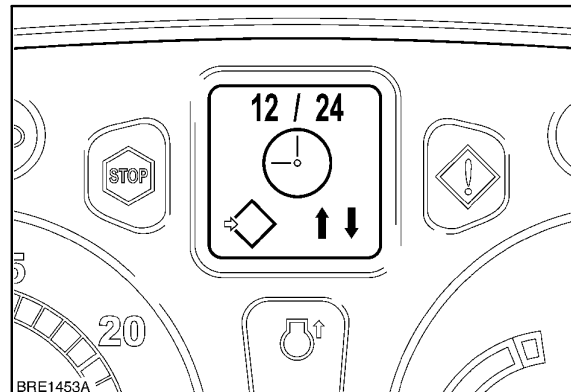


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Repeat the procedure using the 'M' button (3) for the minute display. To memorise the setting do not touch either button for 10 seconds.

Changing the display with 'H' and 'M' buttons

The clock is set at the factory to display a 12 hour reading. To change to a 24 hour reading, depress and hold both 'H' and 'M' buttons with the key-start off. Turn the key-start on and continue to hold both buttons for three seconds, the clock will change to show a 24 hour display. Repeat the procedure to change back to a 12 hour reading. Turn the key-start off to store the setting.

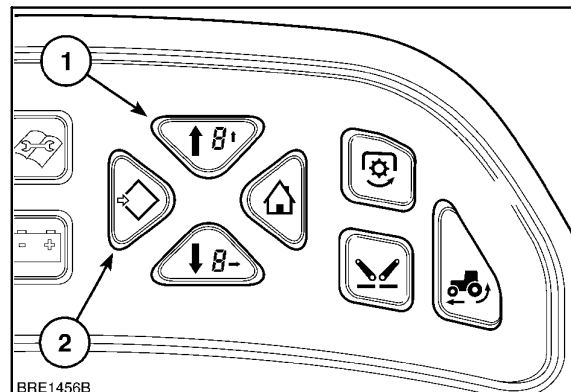


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Changing the display with Enhanced Keypad (where fitted)

With the key-start in the ON position, depress and hold the Menu/Enter key (2) for 3 seconds. The DMD will read **SETUP MENU**, this will change to **CAL** after 2 seconds. Using the Menu Up key (1), scroll through the menu until the clock symbol appears in the display accompanied by **12 / 24**, Figure 76.

Depress the Menu/Enter key again and the display will change to show an arrow pointing to 12 or 24. Using the Menu Up/Down keys move the arrow up or down to the setting required and then depress the Menu/Enter key to save and return to the main menu.

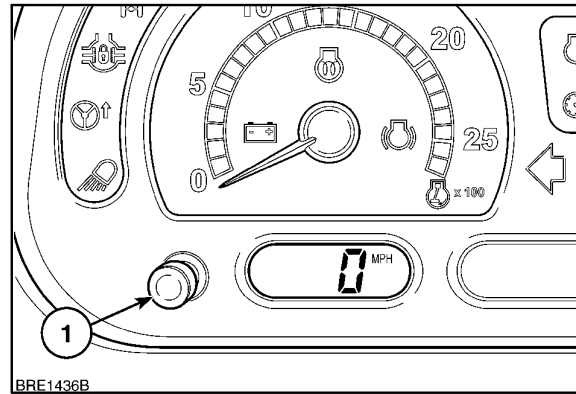


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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Dimming Control

The brightness of the liquid crystal (LCD) and dot matrix displays (DMD) may be varied by using the dimming control button (1). Momentarily depressing the button will alter the backlighting in steps. Depress and hold the button to cycle through the full range of backlighting from low to high intensity. Release the button when the required setting is obtained.



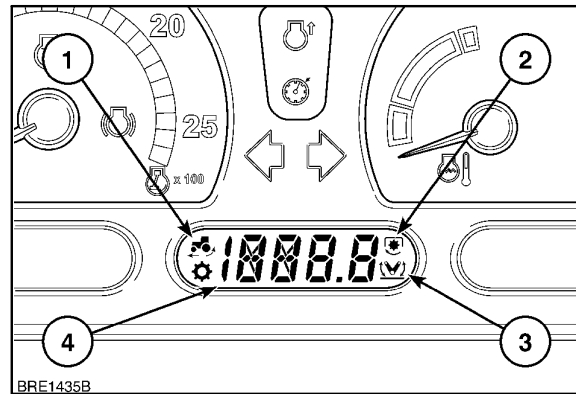
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Centre LCD

The information displayed in the centre LCD, will vary depending on tractor specification. Use the CAL/SEL switch or Enhanced Keypad (where fitted) to toggle between the displays.

The following information may be displayed in the centre LCD.

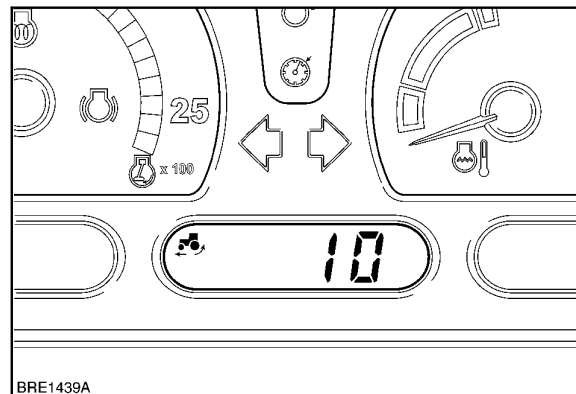
1. Rear wheel slip (with radar option only)
2. Power Take Off speed (front or rear)
3. 3-point hitch position (front or rear)



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Rear Wheel Slip

If your tractor is equipped with optional ground speed radar, the percentage (%) of rear wheel slip may be displayed. The slip figure is calculated from information provided by the transmission speed sensor (theoretical ground speed) and the radar (true ground speed).

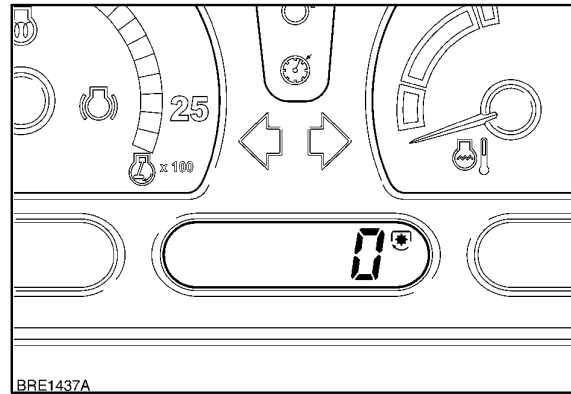


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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Power Take Off Speed

When operating the rear Power Take Off the display may be used to monitor the output shaft speed. Use the CAL/SEL button or Enhanced Keypad (where fitted), to select either rear P.T.O. speed or front P.T.O. speed (where fitted).

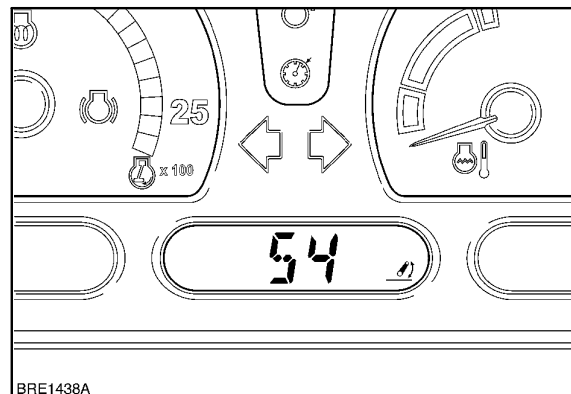


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3-Point Hitch Position

If your tractor is equipped with Electronic Draft Control (EDC) the display may be used to show the position of the 3-point hitch (and implement) by means of numbers ranging from '0' (fully lowered position) to '100' (maximum lift height).

When a front hitch is installed, the display may be used to show the height of the front lift arms. '0' will represent the fully lowered position, '100' the maximum lift height.



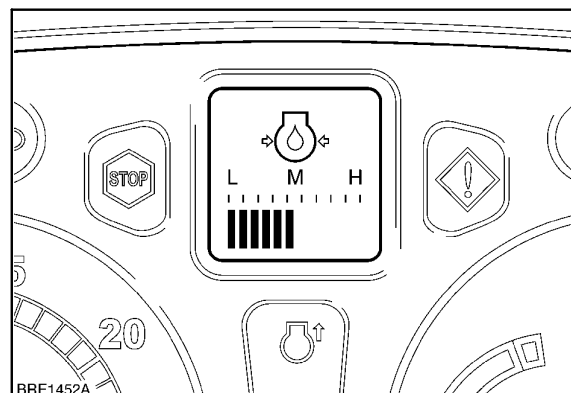
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DOT MATRIX DISPLAY

A number of tractor operating and set-up functions may be shown in the Dot Matrix Display (DMD). To select a function use the CAL/SEL button or the Enhanced Keypad (where fitted). A symbol will appear to confirm the function selected.

NOTE: See page NO TAG for an explanation of warning and advisory symbols.

If an error occurs in the instrument panel or tractor systems circuits, a malfunction warning symbol will appear in this display accompanied by an error code. Consult your authorised dealer.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Error Codes

The advanced electronics on your tractor are able to detect a malfunction or error occurring in key areas such as engine, transmission, electrical and hydraulic systems. Should a malfunction or error occur, a symbol will appear in the DMD with a four digit error code. This may be accompanied by the illumination of a warning light and an audible alarm depending on the severity of the fault. Consult your authorised dealer.

Active and Non Active Warnings

In addition to the error codes previously described, there are a number warning symbols that may appear in the Dot Matrix Display. These symbols will be accompanied by either a Red (critical) or Amber (non-critical) warning light.

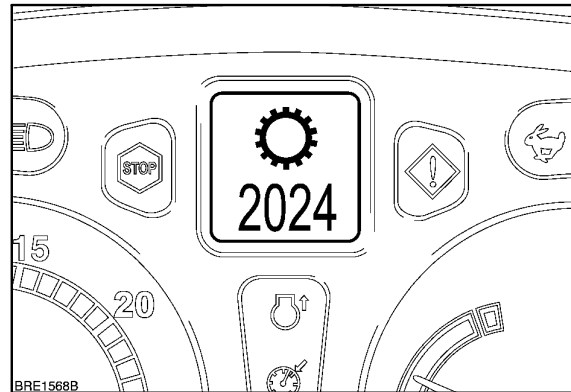
Critical symbols appearing with a Red warning light will remain permanently displayed until the tractor is stopped and the fault rectified.

Non critical symbols accompanied by the Amber light will be displayed for five seconds before the DMD defaults to the symbol previously shown. The amber warning light will continue to illuminate.

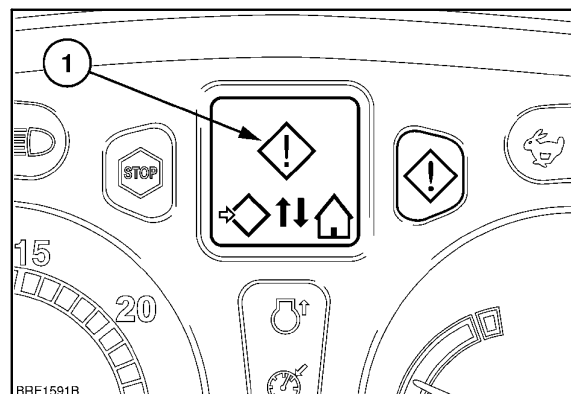
By using the CAL/SEL button, or the Enhanced Keypad where fitted, active warnings that are not permanently displayed may be recalled.

Using the CAL/SEL button

- Depress and hold the CAL/SEL button for three seconds to enter **SETUP MENU**, after two seconds the display will change to **CAL**. Using the clock set buttons H and M to toggle the display, select the the active warning symbol (1), Figure 85.
- Depress the CAL/SEL button and the active symbol will be replaced with a symbol corresponding to the fault detected.
- If more than one warning symbol has been stored, the display will cycle through each one in turn. After the fault symbols have been displayed, the screen will default back to the active warning symbol.
- Momentarily depress the dimming button to exit the display.



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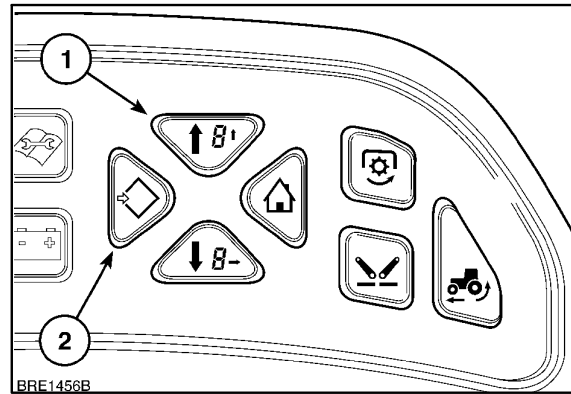
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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

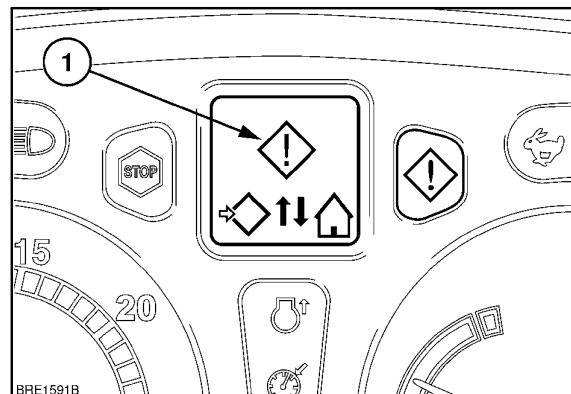
Using the Enhanced Keypad

- With the key-start in the ON position, depress and hold the Menu/Enter key (2) for 3 seconds. The DMD will read **SETUP MENU**, this will change to **CAL** after 2 seconds. Using the Menu Up key (1), scroll through the menu until the active warning symbol (1) Figure 87, is displayed.
- By momentarily depressing the Menu/Enter key again, the active symbol will be replaced with a symbol corresponding to the fault detected.
- If more than one non-active symbol has been stored, the display will cycle through each one in turn. After the fault symbols have been displayed, the screen will default back to the active warning symbol.

Touch the Exit/Cancel key to exit and return to the original display.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

ALARM FUNCTIONS

Illumination of a warning light may be accompanied by an audible alarm. Depending on the severity of the malfunction, an alarm will sound as follows.

Critical Alarm

Alarm will sound continually accompanied by the **red** warning light. The tractor **must** be stopped immediately. The alarm will sound until the fault is corrected or the engine switched off.

Non Critical Alarm

A 5 second continuous alarm will be accompanied by the **amber** warning light. A failure or error has occurred but the operator may continue work. The fault should be rectified as soon as possible.

Action Required

A two pulse alarm will sound for 1 second to advise the operator that a certain action is required. The alarm will continue to be present until the operator carries out the appropriate action or the tractor engine is switched off.

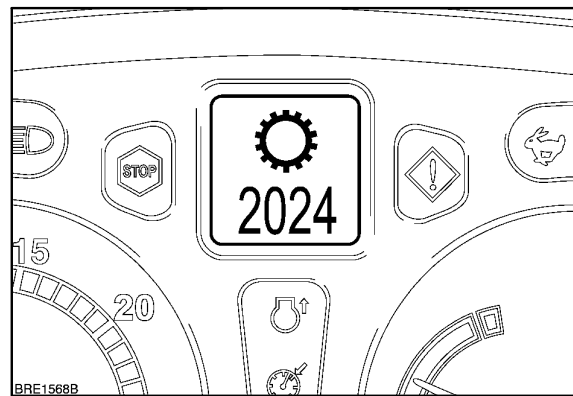
General Alarm

A general alarm will sound if the operator attempts to carry out an inappropriate action i.e. driving the tractor with the parking brake applied.

WARNING and ADVISORY SYMBOLS

There are a number of warning/advisory symbols that may appear in the Dot Matrix Display. The symbols can be categorised into four main groups.

1. **Warning.** These symbols advise of a fault that is critical to the operation of the tractor. Stop the tractor as soon as possible, investigate the cause and rectify the fault.
2. **Maintenance.** These symbols tell the operator there is a concern relating to the basic functions of the tractor, ie. low fuel, low coolant level etc.
3. **System Fault.** The system fault symbols relate to an operational fault in one or more of the tractors main components, either electrical or mechanical. May be accompanied by a four digit fault code. Consult your authorised dealer.
4. **Advisory.** The advisory symbols are not detrimental to the operation of the tractor but should not be ignored. Take appropriate action where necessary.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

DOT MATRIX SYMBOLS - WARNING

SYMBOL / DISPLAY		ALARM	FAULT	ACTION
	Symbol flashing	Critical	Engine coolant temperature too high. Accompanied by RED warning light.	These symbols advise of a fault that is critical to the operation of the tractor. Stop the tractor as soon as possible, investigate the cause and rectify the fault. If the fault cannot be easily rectified, consult your authorised dealer.
	Symbol flashing	Critical	Engine oil pressure low. Accompanied by RED warning light.	
	Symbol flashing	Critical	Transmission/power steering oil pressure low. Accompanied by RED warning light.	
	Symbol flashing	Critical	Hydraulic system charge pressure low. Accompanied by RED warning light.	
	Symbol flashing	Non critical (AMBER). Critical (RED).	Transmission oil temperature too high. Accompanied by RED* or AMBER* warning light.	
	Symbol flashing	Non critical	Air brake pressure low. Accompanied by AMBER warning light.	

* RED warning light, tractors with auto engine shut down.

*AMBER warning light, tractors without auto engine shut down.

DOT MATRIX SYMBOLS - MAINTENANCE

SYMBOL / DISPLAY		ALARM	FAULT	ACTION
	Symbol flashing	Non critical	Engine air filter blocked. Accompanied by AMBER warning light.	These symbols advise of a fault that may be critical to the operation of the tractor. Stop the tractor as soon as possible, investigate the cause and rectify the fault. If the fault cannot be easily rectified, consult your authorised dealer.
	Symbol flashing	Non critical	Brake fluid level low. Accompanied by AMBER warning light.	
	Symbol flashing	Non critical	Hydraulic oil filter blocked. Accompanied by AMBER warning light.	
	Symbol flashing	Non critical	Transmission oil filter blocked. Accompanied by AMBER warning light.	
	Symbol flashing	Non critical	Water contamination in fuel. Accompanied by AMBER warning light.	

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

DOT MATRIX SYMBOLS - SYSTEM FAULT

SYMBOL / DISPLAY		FAULT CODE	AREA of FAULT	ACTION
	Symbol ON	3---	Engine	The system fault symbols relate to an operational fault in one or more of the tractors main components, either electrical, mechanical or hydraulic. The appearance of a fault symbol may be accompanied by a four digit fault code. Consult your authorised dealer.
	Symbol ON	n/a	Engine cooling system	
	Symbol ON	2---	Transmission	
	Symbol ON	7---	Differential lock	
	Symbol ON	n/a	CAN BUS malfunction	
	Symbol ON	1---	Electronic draft control	
	Symbol ON	9---	Front 3-point hitch	
	Symbol ON	n/a	Braking system	
	Symbol ON	5---	Rear P.T.O. system	
	Symbol ON	8---	Front P.T.O. system	
	Symbol ON	10--	Front suspension	
	Symbol ON	6---	Front wheel drive	
	Symbol ON	14--	Instrument panel electrical fault	
	Symbol ON	15--	Fast Steer system	
	Symbol ON	4---	Rear electronic remote valves	
	Symbol ON	45--	Front electronic remote valves	

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

DOT MATRIX SYMBOLS - ADVISORY

SYMBOL / DISPLAY		ALARM	CAUSE	ACTION
	Symbol ON	Action required	Clutch pedal not depressed.	Cycle clutch pedal.
	Symbol ON	Action required	Shuttle lever in drive.	Place shuttle lever in neutral.
	Symbol ON	Action required	Parking brake applied.	Release parking brake.
	Symbol ON	Non critical	Wheel slip limit exceeded. Accompanied by AMBER warning light.	Reduce implement draft load.
	Symbol ON	None	DMD backlighting level.	Adjust backlighting to required level.
	Symbol ON	Critical	Air brake system pressure.	See 'Warning' symbols for air brake pressure.
	Symbol ON	Critical	Engine oil pressure level.	See 'Warning' symbols for engine oil pressure.
	Symbol ON	Critical or non critical	Rear P.T.O. engaged, operator not present. Accompanied by AMBER warning light.	If accompanied by critical alarm apply parking brake.
	Symbol ON	Action required	EHR remote valve not functioning, insufficient oil flow available. (May also show R2, R3, R4).	Reduce oil flow requirements to other services.

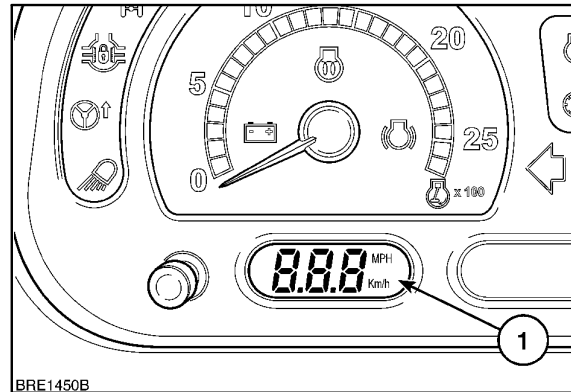
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Tractor Ground Speed Display

The lower left-hand LCD provides a permanent display of ground speed (1) in km/h or MPH dependent upon the country in which the tractor is to be used. If required, the display may be changed to read an alternate ground speed unit from that set at the factory.

NOTE: If the tractor rear tyre size is changed, the ground speed display may require re-calibrating to suit the radius of the new tyre.

NOTE: Illustration shows all displays activated.

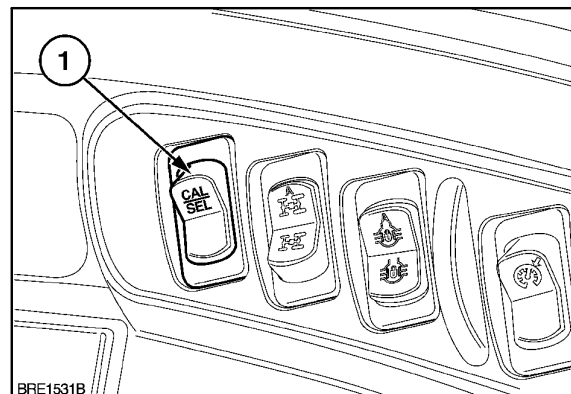


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Changing the Ground Speed Units

Using the CAL/SEL Button

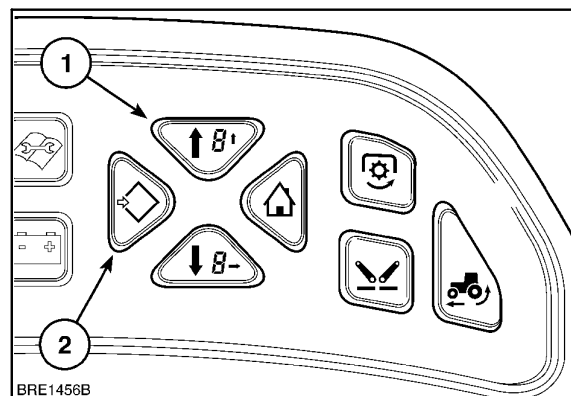
- With the key-start switch in the OFF position, depress and hold in the CAL/SEL button (1) and turn the key-start switch ON. The **Km/h MPH** symbols will appear flashing in the display. Release the button.
- Press the CAL/SEL button again to toggle between **Km/h** and **MPH**. When the required ground speed unit is displayed turn off the key-start to store the selected speed unit in the memory.



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Using the Enhanced Keypad (where fitted)

- With the key-start in the ON position, depress and hold the Menu/Enter key (2) for 3 seconds. The DMD will read **SETUP MENU**, this will change to **CAL** after 2 seconds. Using the Menu Up key (1), scroll through the menu until the **Km/h MPH** screen appears.
- Momentarily depress the Menu/Enter key (2) and, using the Menu Up/Down keys, select the required speed reading. To store the setting and return to the main menu depress the Menu/Enter key again. Depress the Exit/Cancel key to return to the original display.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Calibrating the Ground Speed Display

Should you wish to install alternative rear tyre equipment that would provide a radius difference of more than 13 mm (0.5 in), then the electronic control module should be re-calibrated to display an accurate ground speed figure. To re-calibrate use one of the following methods:

IMPORTANT: If your tractor is equipped with the optional slip control feature, then the ground speed displayed is a true speed as sensed by a radar unit, calibration is therefore **not** required.

- Ensure that the tyre pressures are correct for the load being carried. (See Tyre Load/Inflation tables in Section 3 of this manual).
- Select a stretch of dry, firm, level ground (preferably concrete) and carefully measure out a distance of exactly 100.0 m (328 feet). Mark the start and finish of this measured distance with a bold chalk line.

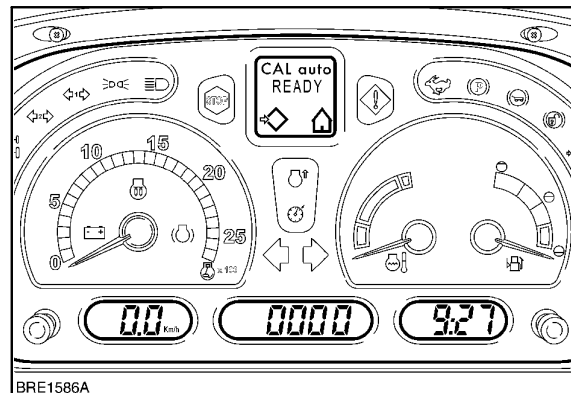
Auto Calibration with CAL/SEL Button

- Park the tractor a short distance from the start line and, with the engine running, depress and hold the CAL/SEL button for 3 seconds to enter the calibration mode. **SETUP_MENU** will appear in the Dot Matrix Display. After approximately two seconds the display will change to **CAL**. Depress the CAL/SEL button again to enter the calibration mode. Using the clock Hour button select **CAL auto**. Depress the CAL/SEL button to confirm selection of **CAL auto**, the central LCD display will read **0000**.

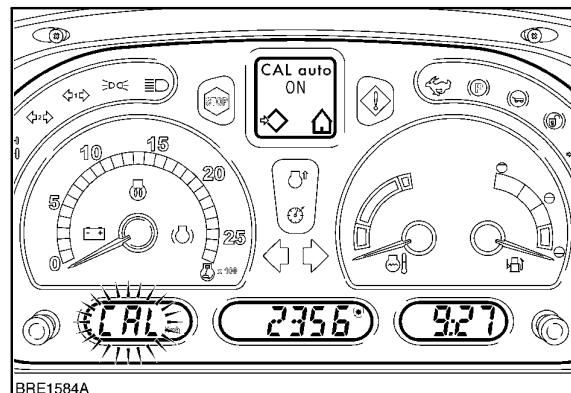
NOTE: The set up procedure may be cancelled at any time by depressing the LCD dimmer control button or by turning the key-start off.

- Select a suitable transmission ratio to provide a speed above 3 km/h (1.8 MPH) and drive up to the start line, **CAL auto READY** will appear in the display. As the centre of the front tyres passes over the start line, press and release the CAL/SEL button. **CAL** will flash in the speed display, **CAL auto ON** will appear in the DMD and the central LCD will show a four digit figure that will increase as the tractor moves forward.

NOTE: If the calibration procedure is incorrectly performed i.e. speed below 3 Km/h (1.8 MPH), **CAL KO** will appear in the display, depress CAL/SEL to restart sequence.



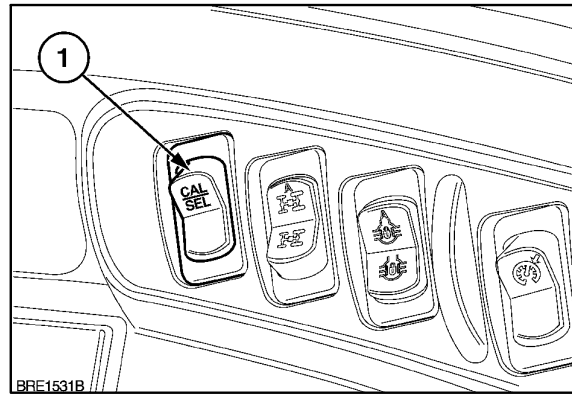
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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

- As the centre of the front tyres passes over the finish line, press and release the CAL/SEL button (1) again, **CAL auto OK** will appear in the Dot Matrix Display. Depress the CAL/SEL button again select **CAL** display. Turn off key-start to save the setting.

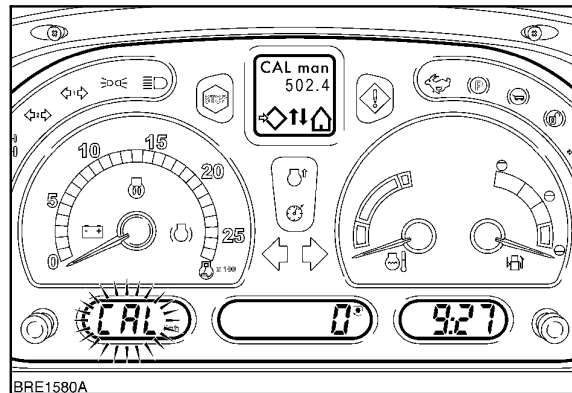


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Manual Calibration with CAL/SEL Button

The manual calibration allows the operator to set the rolling circumference of the rear tyre (if known) without the need to drive over a measured distance.

- With the tractor stationary and the key-start on, depress and hold the CAL/SEL button for 3 seconds to display **SETUP_MENU**. After 2 seconds this will change to **CAL**. Depress the CAL/SEL button again to select **CAL man_000.0**. (The figure **000.0** may differ if a calibration number has previously been entered). **CAL** will flash in the speed display.



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NOTE: The set up procedure may be cancelled at any time by depressing the LCD dimmer control button or by turning the key-start off.

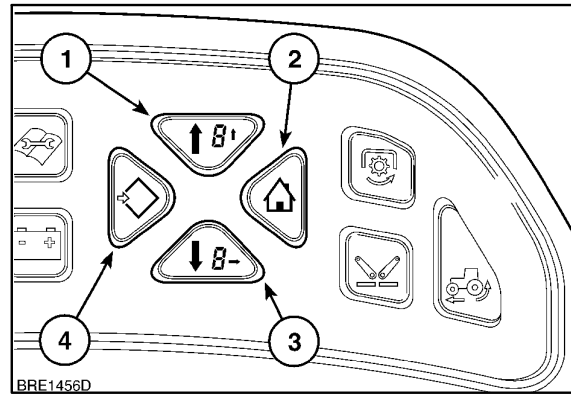
IMPORTANT: When entering new tyre rolling circumference figures, use metric values (centimetres) with **Km/h** speedometer reading and Imperial values (inches) with **MPH** reading, see table on page 2-55.

- By depressing the 'h' and 'm' clock buttons, the rolling circumference of the rear tyre may be entered into the numerical display (**000.0**).
- Depress the 'h' button to select the first digit to be changed, repeated operation of the 'h' button will cycle the cursor through all the digits in turn. To alter the value of the digit selected, momentarily depress the 'm' button until the correct figure is shown.
- With the new rolling circumference figure entered into the display, depress the CAL/SEL button again to display **CAL**. Turn the Key-start off to save the setting.

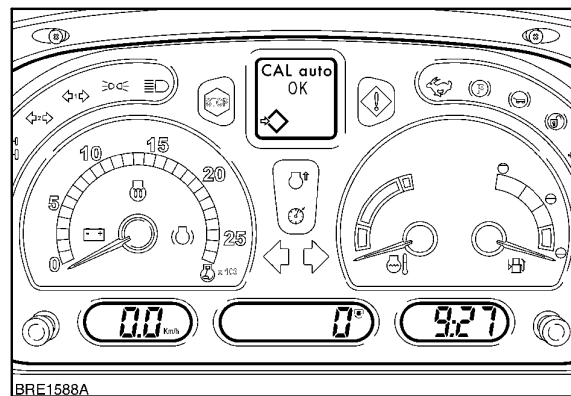
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Auto Calibration with Enhanced Keypad (where fitted)

- With the tractor stationary and the engine running, depress and hold the Menu/Enter key (4) for 3 seconds. The DMD will read **SETUP_MENU**, this will change to **CAL** after 2 seconds. Depress the Enter key again and **CAL manual** will appear. Using the Menu Up key (1), scroll through the menu until **CAL auto** is displayed.
- Depress the Menu/Enter key again and **CAL auto READY** will appear in the DMD. Select a suitable transmission ratio to provide a forward speed above 3 km/h (1.8 MPH). As the centre of the front tyres passes over the start line, press and release the Menu/Enter key. The speed display will start to flash **CAL** and the central LCD will show a four digit figure that will increase as the tractor moves forward. The DMD will change to display **CAL auto ON**.
- As the centre of the front tyres passes over the finish line, press and release the Menu/Enter key. **CAL auto OK** will appear in the Dot Matrix Display. Depress the Menu/Enter key to store the setting. Press and release the Exit/Cancel key (2) Figure 96, to return to the original display.



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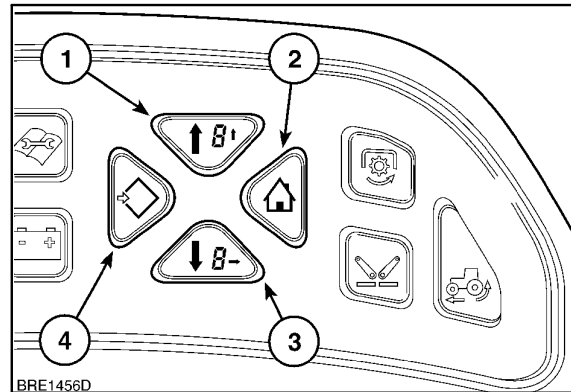


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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Manual Calibration with Enhanced Keypad (where fitted)

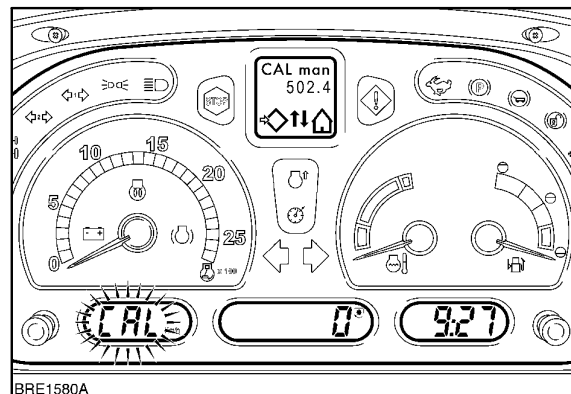
- With the key-start in the ON position, depress and hold the Menu/Enter button (2) for 3 seconds. The DMD will read **SETUP_MENU**, this will change to **CAL** after 2 seconds. Depress the Enter key and **CAL manual** will appear.
- Depress the Menu/Enter key again to change the DMD display to **CAL_Man_000.0**. (The figure **000.0** may differ if a calibration number has previously been entered). **CAL** will flash in the speed display. Using the Digit Select key (↓) move the cursor to the first digit to be set, enter the number using the Digit Value key (↑). **CAL** will appear in the speed display and start to flash. Repeat the procedure to set the remaining calibration figures that correspond to the size of rear tyre fitted to your tractor.



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IMPORTANT: When entering new tyre rolling circumference figures, use metric values (centimetres) with **Km/h** speedometer reading and Imperial values (inches) with **MPH** reading, see table on page 2-55.

- Depress the Exit/Cancel key twice to store the setting and return to the main menu screen, depress again to exit set up and return to the original display.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Ground Speed Calibration Numbers

The rolling circumference for any given tyre size will vary depending on tyre manufacturer. The figures shown in the table are an average based on rolling circumference data supplied by several manufacturers. To obtain an accurate figure for your rear tyres, consult your authorised dealer or tyre supplier.

If the size of tyre on your tractor is not listed, then the road speed calibration may be carried out using one of the following procedures.

Carry out the Auto calibration as previously described or measure the rear tyre rolling circumference.

1. To measure the rolling circumference of the rear tyre, park the tractor on a level surface and make a vertical chalk mark on the sidewall where the tyre tread contacts the ground. Make a second chalk mark on the ground aligning with the mark on the tyre.
2. Slowly drive the tractor forward until the rear wheel has made one revolution and the chalk mark on the sidewall is again in contact with the ground. Mark the ground again and measure the distance between the two chalk marks.

IMPORTANT: If your tractor is equipped with the optional slip control feature, then the ground speed displayed is a true speed as sensed by a radar unit, calibration is therefore **not** required.

WARNING

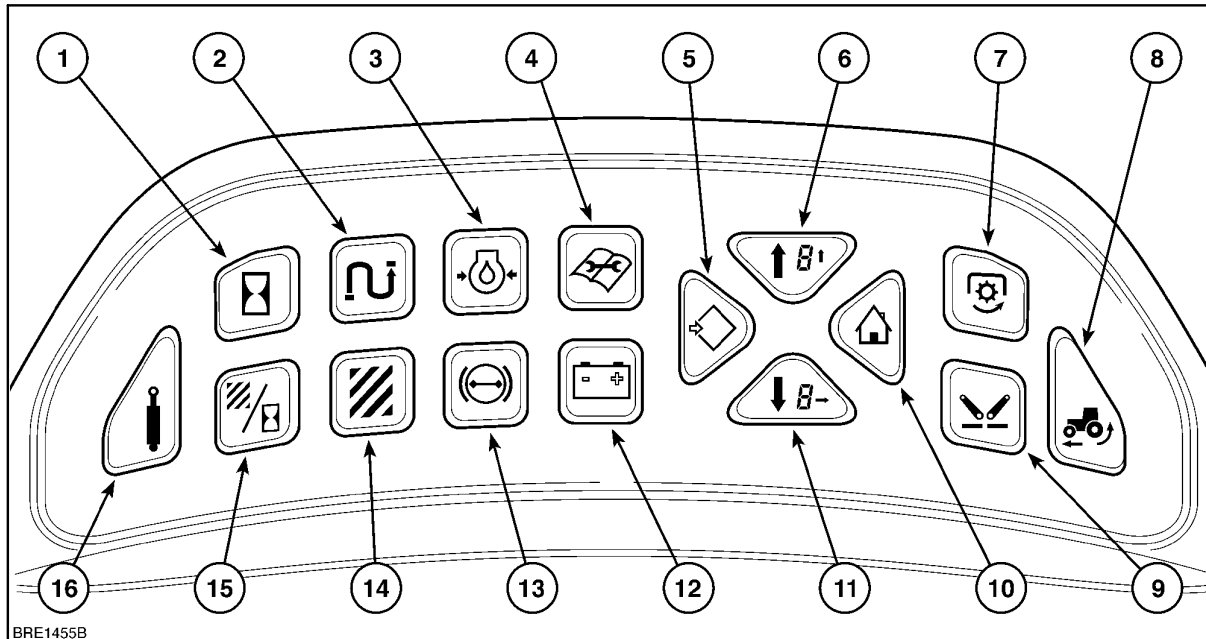
The radar ground speed sensor emits a low intensity microwave signal which will not cause any ill effects in normal use. Although the signal intensity is low, do not look directly into the face of the sensor while in operation so as to avoid eye damage.

Rear Tyre Rolling Circumferences

Tyre Size	Tyre Rolling Circumference	
	Centimetres	Inches
18.4R - 30	461.2	181.6
12.4 - 32	406.9	160.2
16.9R - 34	473.1	186.3
18.4R - 34	494.7	194.8
13.6R - 38	465.6	183.3
16.9R - 38	503.4	198.2
18.4R - 38	525.6	206.9
20.8R - 38	549.3	216.3
18.4R - 42	552.7	217.6
14.9R - 46	554.2	218.2
480/70R - 34	474.5	186.8
520/70R - 34	490.6	193.1
480/70R - 38	506.5	199.4
540/65R - 38	501.5	197.4
520/70R - 38	525.6	206.9
600/65R - 38	523.7	206.2
650/60R - 38	510.8	201.1
650/65R - 38	544.5	214.4
580/70R - 38	549.7	216.4
320/90R - 50	560.3	220.6

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

ENHANCED KEYPAD and PERFORMANCE MONITOR (where fitted)



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The enhanced keypad consists of 16 buttons or 'keys' that select, control or programme various functions and displays in the central and dot matrix screens. Keys 5, 6, 10 and 11 are used to set-up and programme many of the enhanced keypad functions.

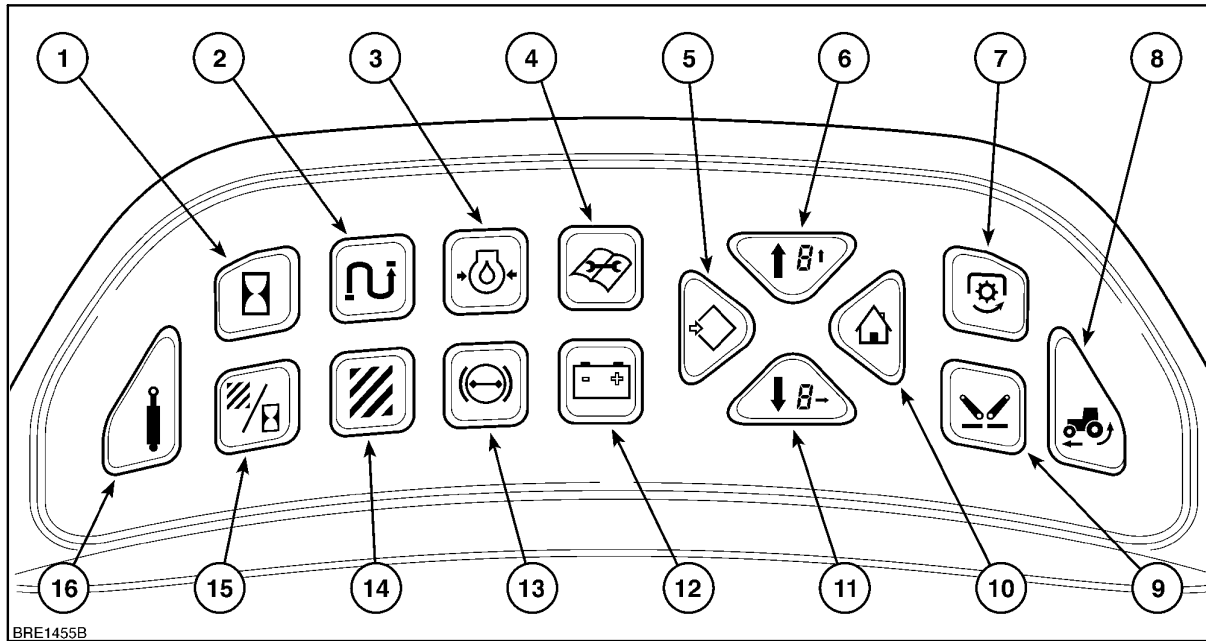
Unless otherwise described, depress the keys once to obtain the appropriate display. A symbol will appear in the display to confirm the function selected.

Legend: (D) = Dot Matrix Display
(C) = Centre Digital Display

1. Hourmeter (D). Touch the key to view total number of hours that the tractor has operated. The hours recorded should be used as a guide to the service intervals for the tractor.
2. Odometer (D). The odometer provides a visual record of the distance travelled in kilometres or miles depending on the ground speed unit selected. Two displays are available, '1' and '2'.
3. Engine Oil Pressure (D). This key will display the engine oil pressure bargraph (where fitted).
4. Programmed Maintenance Reminder (D). The maintenance schedule key provides two levels of reminder identified as 'Heavy' and 'Light'.
5. Menu Enter (D). Depress to select set-up and programming modes.
6. Menu Scroll Up or Digit Value (D). Depress this key repeatedly to scroll upwards through the menu or change the value of a number.
7. P.T.O. Speed (C). Depress once to display rear Power Take Off speed, press again and hold for 3 seconds to show front P.T.O. speed (where fitted).
8. Rear Wheel Slip (C). The level of rear wheel slip will appear as a one or two digit percentage (%) figure (with radar option only).

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

ENHANCED KEYPAD and PERFORMANCE MONITOR (continued)



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9. Linkage Height Position (C). Depress once to display the rear linkage height, press again and hold for 3 seconds to show front linkage height (where fitted). The display will show a figure between '0' (fully lowered) and '100' (maximum raised position).
10. Exit/Cancel (D). Use this key to Exit or cancel set-up and programming modes.
11. Menu Scroll Down or Digit Select (D). Depress this key to scroll downwards through the menu or select an alternative digit in the Dot Matrix Display.
12. Battery Voltage (D). With the engine running, touch the key to display the battery symbol together with a digital display of the battery voltage.
13. Trailer Brake Air Pressure (D). Depress to display the trailer brake air pressure bargraph.

14. Area Accumulator (D). The total area worked will be displayed in hectares or acres depending on the ground speed unit selected.

15. Area Per Hour Forecaster (D). Touch this key and the area/hour symbol will display together with a forecast of the area that will be worked in one hour if the current rate of work is continued.

NOTE: If the radar option is not installed, area per hour calculations are based on axle speed and are subject to inaccuracies caused by any wheel slip that may occur.

16. Remote Valve Operation (D). The display will show the flow rate through each valve as a percentage (%), the direction of cylinder movement (extend or retract) and the number of the valve selected. (See Electronic Remote Control Valves in Section 3).

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Odometer (Distance Record)

The odometer provides a visual record of the distance travelled in kilometres or miles depending on the ground speed unit selected.

Two displays are available, '1' and '2'. '1' may be used for individual journey distances and '2' to provide a total for all journeys travelled. Both '1' and '2' may be reset to zero.

Touch the key once to select reading '1', touch again to select reading '2'. Keeping the key depressed for more than 3 seconds will re-set the selected odometer to zero.

The journey distance in the display (3) will appear in steps of:

0 to 19.999 Km/Miles	0.001 Km/Miles
20 to 199.99 Km/Miles	0.01 Km/Miles
200 to 1999.9 Km/Miles	0.1 Km/Miles
2000 to 19999 Km/Miles	1.0 Km/Miles

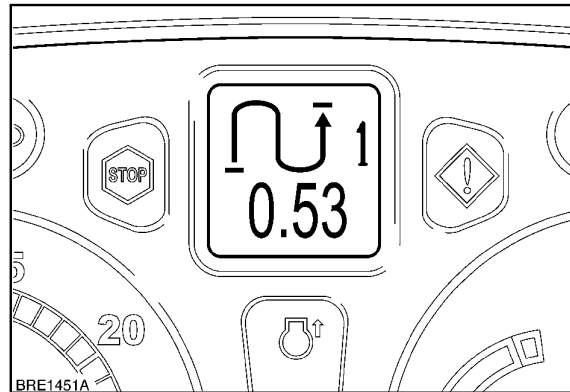
NOTE: If the radar option is not installed, distance calculations are based on axle rotation and are subject to inaccuracies caused by any wheel slip that may occur.

Area per Hour Forecaster

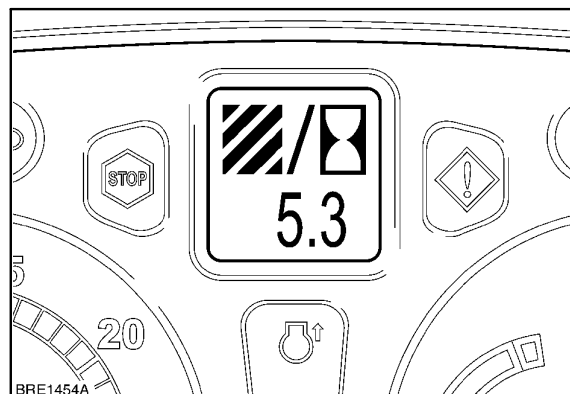
Touch the AREA/HOUR key (1). The 'AREA/HOUR' symbol will display, together with a forecast (2) of the area that will be worked in one hour if the current rate of work is continued.

The area per hour will appear in steps of 0.01 Ha/Acre.

NOTE: If the radar option is not installed, area per hour calculations are based on axle speed and are subject to inaccuracies caused by any wheel slip that may occur.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Area Accumulator

NOTE: Before activating the area accumulator function ensure the correct implement width has been entered into the TPM memory.

The accumulated area (total area worked) can be displayed by depressing the AREA key (1). Depending on the unit set in the tractor speed display (K/mh or MPH) the reading will be in hectares or acres.

Depress the area accumulator key repeatedly to toggle through the three displays in the dot matrix screen:

1. **OFF.** The area accumulator is off.
2. **ON.** Area accumulator on. Area will be accumulated as the tractor moves irrespective of the position of the implement.
3. **A.** Area accumulation will start recording when the tractor moves and the implement is lowered. It will stop accumulating when the implement is raised.

The area accumulator symbol (2) will appear in the display along with the area figure.

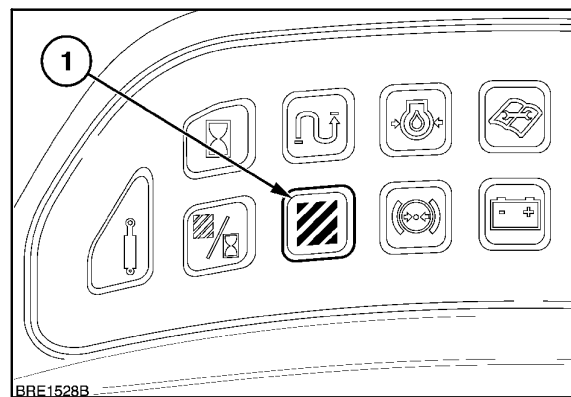
With trailed equipment, area accumulation may be temporarily interrupted, for example, at the headland, by means of a switch connected into the implement status socket (where fitted). See 'Electrical Power Panel' on page 2-21.

The area measurement in the display (3) will appear in steps of:

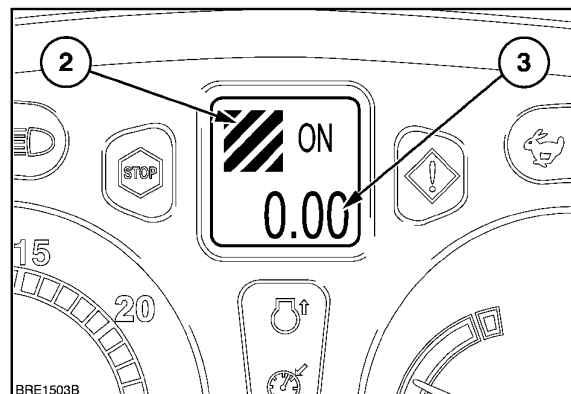
0 to 199.99 Ha/acre	0.01 Ha/acre
200 to 1999.9 Ha/acre	0.1 Ha/acre
2000 to 19999 Ha/acre	1.0 Ha/acre

Area accumulation can be reset to zero at any time by selecting OFF and holding down the AREA key (1) Figure 104, until the display returns to zero.

NOTE: If the radar option is not installed, area per hour calculations are based on axle speed and are subject to inaccuracies caused by any wheel slip that may occur.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

PROGRAMMING THE DISPLAYS



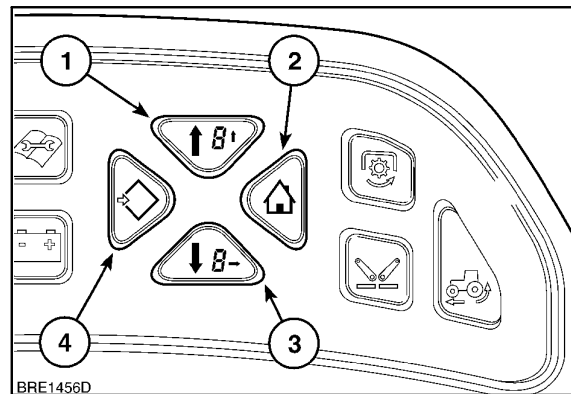
WARNING

The radar ground speed sensor, located in front of the right-hand footsteps, emits a low intensity microwave signal which is completely safe in normal use. Although the signal intensity is low, do not look directly into the face of the sensor while in operation so as to avoid eye damage.

Programming Keys

Four keys are used to select, change or memorise the various functions related to the performance monitor and enhanced keypad. All programme information will appear in the Dot Matrix Display (DMD) along with the relevant symbol for the function selected.

1. Menu Up/Digit Value Key. Use this key to scroll upwards through the function menu or to increase the value of a selected digit during a calibration procedure. Values will increase by one each time the key is depressed.
2. Exit/Cancel Key. Depress this key to exit the calibration mode. The key may be used at any time during a set-up procedure to cancel and exit the calibration mode, however, information not saved will be lost.
3. Menu Down/Digit Select Key. In the calibration mode depress this key to scroll downwards through the menu or to select a digit for re-calibration. Each time the key is depressed the flashing cursor showing the current digit selected will move one space to the right.
4. Menu Enter Key. Depress this key for 3 seconds to enter the programme mode, **SETUP/MENU** will appear initially in the display. After 2 seconds the display will change to read **CAL**. This will be accompanied by the Menu Up/Down arrows and the Menu Enter symbol.



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When the appropriate function screen has been selected, depress the Menu/Enter key again to access the calibration mode.

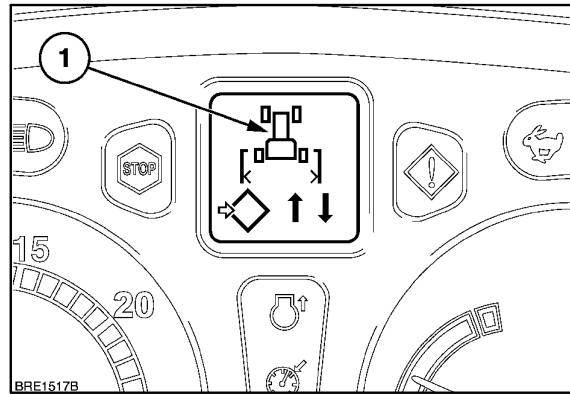
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Setting the Implement Width

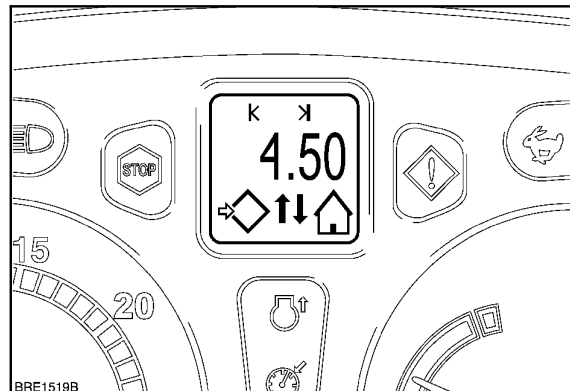
In order that the micro-processor may calculate the cumulative area, the working width of the implement must be entered into the memory. For example, to enter an implement working width of 4.5 metres (14.76 ft.) carry out the following procedure.

- With the key-start in the ON position, depress and hold the Menu/Enter key for 3 seconds. The DMD will read **SETUP_MENU**, this will change to **CAL** after 2 seconds. Using the Menu Up/Down keys, scroll through the menu until the implement width symbol is displayed.
- Depress the Menu/Enter key again to select the set-up screen, a flashing cursor will appear at the first number to be set. Using the Digit Value key enter '0' then move the cursor one space to the right with the Digit Select key and enter '4'. Move the cursor to the right of the decimal point and enter '5'. The reading displayed should now be 04.50 mtrs (14.76 ft.).
- Touch the Menu/Enter key to store the setting and return to the main menu.

NOTE: The micro-processor cannot calculate the area worked unless the correct implement width is entered.



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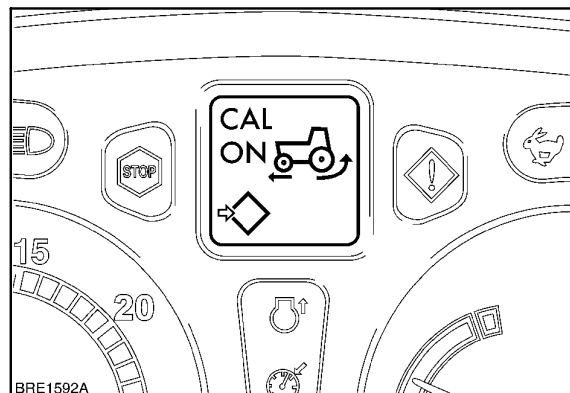
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Calibrating for Wheel Slip (where fitted)

Before setting the slip alarm point, a zero wheel slip factor has to be determined. This calibration must be carried out on a hard level surface where wheel slip is unlikely to occur.

NOTE: The Electronic Draft Control auto slip function (see EDC operation) will not operate unless this procedure is carried out.

- With the tractor stationary and the engine running, depress and hold the Menu/Enter key for 3 seconds. The DMD will read **SETUP_MENU**, this will change to **CAL** after 2 seconds. Using the Menu/Enter key, scroll through the menu until the wheel slip symbol is displayed.
- Drive the tractor at a constant speed above 5 Km/h (3.1 MPH). When a steady speed has been reached, depress the Menu Enter key, **CAL ON** will appear in the display. After a short distance touch the Menu Enter key again, the display will change to **CAL OK**.
- Touch the Menu/Enter key to store the setting and return to the main menu.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Setting the Slip Alarm Point

NOTE: If the optional radar unit is not installed, the slip alarm function will be omitted from the display.

The slip alarm point may be set as a one or two digit figure that, if exceeded, will cause an audible alarm to sound. To set a wheel slip limit of 15% carry out the following procedure.

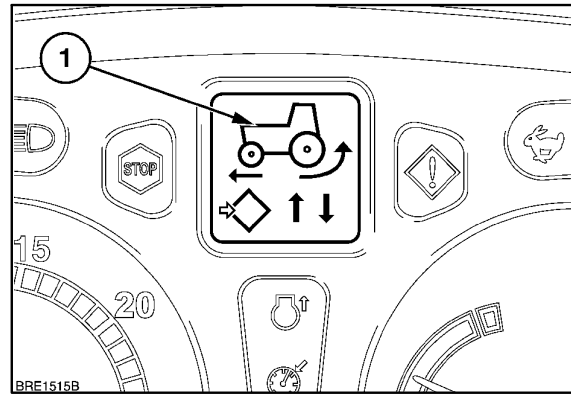
- With the key-start in the ON position, depress and hold the Menu/Enter key for 3 seconds. The DMD will read **SETUP_MENU**, this will change to **CAL** after 2 seconds. Using the Menu Up/Down keys, scroll through the menu until the wheel slip symbol (1) is displayed.
- Depress the Menu/Enter key again to select the set-up screen, a flashing cursor will appear at the first number to be set. Using the Digit Value key enter '1', move the cursor to the right with the Digit Select key and, with the Digit Value key, enter '5'. The slip alarm point is now set at 15%.
- Touch the Menu/Enter key to memorise the setting and return to the main menu.

If wheel slip exceeds the pre-set limit, the slip symbol will appear in the DMD and the amber warning light will illuminate on the instrument console.

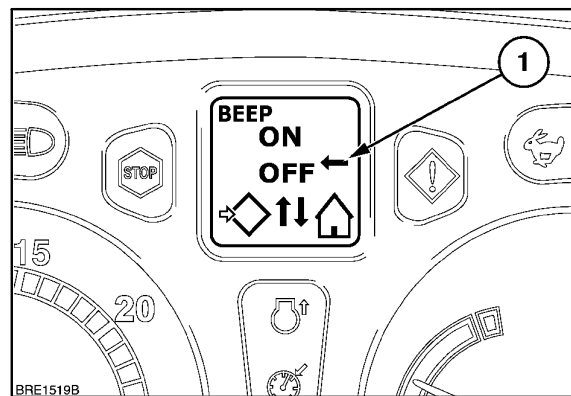
Audible Beep - ON/OFF

Each time one of the keys is pressed, an audible 'beep' sound will be heard. The beep can be switched off if required.

- With the key-start in the ON position, depress and hold the Menu/Enter key for 3 seconds. The DMD will read **SETUP_MENU**, this will change to **CAL** after 2 seconds. Using the Menu Up/Down keys, scroll through the menu until **BEEP ON/OFF** is displayed.
- Depress the Menu/Enter key again to select the set-up screen. Using the Menu Up/Down keys, align the arrow (1) with ON or OFF as required.
- Touch the Menu/Enter key to store the setting and return to the main menu. Depress the Exit/Cancel key to return to the original display.



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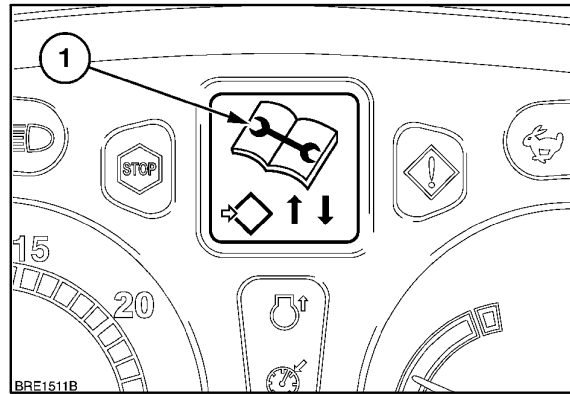
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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Programming the Service Reminder

The service reminder function allows the operator to programme two service interval reminders using the Enhanced Keypad. The following procedure is the same for LIGHT and HEAVY service intervals.

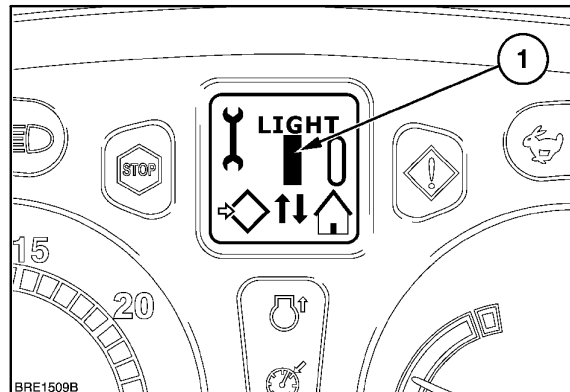
- With the key-start in the ON position, depress and hold the Menu/Enter key for 3 seconds. The DMD will read **SETUP_MENU**, this will change to **CAL** after 2 seconds. Using the Menu Up/Down keys, scroll through the menu until the service reminder symbol (1) appears in the display.



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Setting a Light Service Reminder

- Depress the Menu/Enter key again to select the Service Reminder sub-menu. Using the Menu Up/Down keys display 'LIGHT', touch the Menu/Enter key and a flashing cursor (1) will appear at the first number to be set. Using the Digit Value key enter the first number to be set, move the cursor one space to the right with the Digit Select key and, with the Digit Value key, enter the second digit, repeat for the third digit. The display will now read **LIGHT ---** (where --- will be the selected hours).
- Touch the Menu/Enter key to memorise the setting and return to the main menu. Depress the Exit/Cancel key to return to the original display. The service reminder is now set for the selected period.



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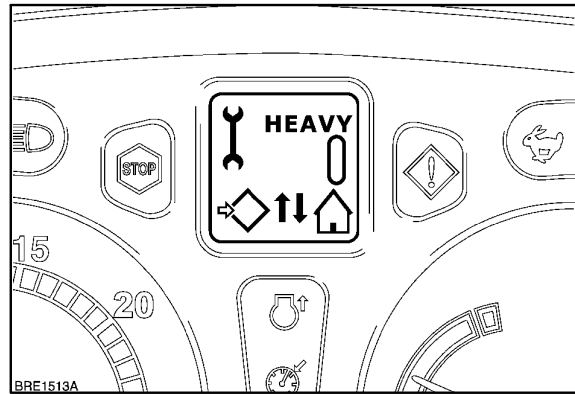
Two hours before the service is due the Light Service symbol and the hours remaining will appear in the DMD at 'key-on' and will remain displayed for 4 seconds after the engine is started.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Setting a Heavy Service Reminder

Select **HEAVY** on the main menu and repeat the procedure used for setting the LIGHT service reminder.

Ten hours before the service is due the Heavy Service symbol and the hours remaining will appear in the DMD at 'key-on' and will remain displayed for 4 seconds after the engine is started.



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Time Expiry Warnings

As the time to service expires, the relevant symbol will appear hourly in the display for 20 seconds. The number of hours remaining before the service will also be shown and this will be accompanied by the Amber warning light. When time to service has expired, only the symbol will appear hourly in the display.

If required, the service time countdown may be terminated by re-setting the Service Reminder interval to zero or by changing the period until the next service is due.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

TRANSMISSION OPERATION

Your tractor may be fitted with one of three transmission options dependent on country and specification.

12 x 12 Synchro Command

This transmission offers 12 forward and reverse synchromesh gears selected by two shift levers conveniently placed to the right of the driver. The forward and reverse synchronised shuttle is operated by a lever to the left of the steering column.

24 x 24 Dual Command

Operating in a similar manner to the 12 x 12, Dual Command offers the additional benefit of a hydraulically engaged underdrive for each of the basic 12 gears. This provides 24 forward and reverse ratios. Underdrive may be engaged on the move without depressing the clutch pedal. A clutchless shuttle function is also featured on the Dual Command transmission.

16 x 16 (17 x 16) Electro Command

The Electro Command transmission has 4 powershift gears and four range gears providing 16 forward and reverse ratios. On 50 Km/h models, an additional gear provides 17 forward ratios. When operated simultaneously, the powershift and range change buttons will provide clutchless changes on the move through ratios 1-8 and 9-16 (17).

Ground Speeds

Ground speeds are displayed in the LCD on the left-hand side of the instrument panel. However, as a guide, ground speed charts for specific tyre sizes are provided at the end of each transmission section.

If the rear tyres of your tractor are of a different size to those shown in the charts, it may be necessary to re-calibrate the speedometer as previously described.

MPH/K/mh Conversion Chart	
K/mh → MPH	MPH → K/mh
5 → 3.1	5 → 8.0
10 → 6.2	10 → 16.0
15 → 9.3	15 → 24.1
20 → 12.4	20 → 32.1
25 → 15.5	25 → 40.2
30 → 18.6	30 → 48.2
35 → 21.7	35 → 56.3
40 → 24.8	
45 → 27.9	
50 → 31.0	

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Ground Speed Conversion Chart

The size of the rear tyres on your tractor may vary from those shown in the ground speed charts. When an alternative size of tyre is fitted, **multiply** the ground speeds shown in the charts by the conversion factors shown:

Models with Light Duty Rear Axle

Tyre Size	Factor	Tyre Size	Factor
18.4R-30	0.935	480/70R-34	0.968
12.4-32	0.839	480/70R-38	1.032
16.9R-34	0.968	540/65R-38	1.032
13.6R-38	0.968	--	--
16.9R-38	1.032	--	--

All Models with Heavy Duty Rear Axle

Tyre Size	Factor	Tyre Size	Factor
18.4R-30	0.879	480/70R-34	0.909
12.4-32	0.788	520/70R-34	0.939
16.9R-34	0.909	480/70R-38	0.970
18.4R-34	0.939	540/65R-38	0.970
13.6R-38	0.909	650/60R-38	1.000
16.9R-38	0.970	650/65R-38	1.061
20.8R-38	1.061	320/90R-50	1.061
18.4R-42	1.061	--	--
14.9R-46	1.079	--	--

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

12 x 12 SYNCHRO COMMAND TRANSMISSION

This transmission offers 12 gear ratios in forward and reverse. Operation is by means of the main shift lever, range lever and a forward/reverse shuttle lever.

An optional reduction gear set (creeper gears) offers a further 8 ratios, forward and reverse.

IMPORTANT: Do not change gear or operate the shuttle lever without depressing the clutch pedal.

Main Shift Lever

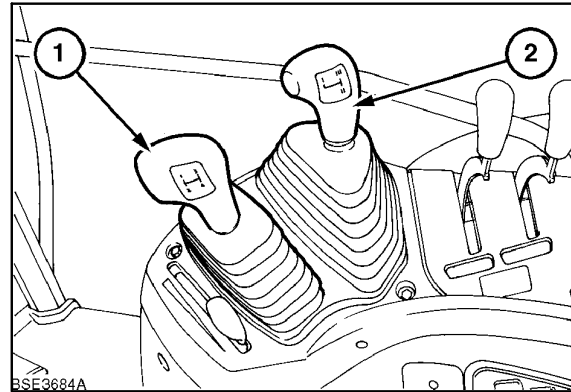
The main shift lever (1) operates in a conventional H-pattern and, in conjunction with the clutch pedal, is used to select any of four gear ratios, whether the tractor is stationary or moving.

IMPORTANT: To avoid premature wear, do not use the clutch pedal as a footrest.

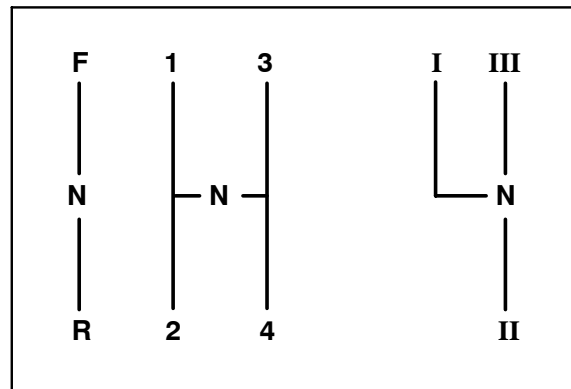
Range Lever

The right-hand lever (2) is the range lever which, in conjunction with the clutch pedal, is used to select any one of three ranges (I - the lowest speed range, II - medium range and III - the highest speed range). This has the effect of tripling the number of gears, both in forward and reverse, from 4 to 12. The design of the transmission permits easy changes between the medium and high ranges while the tractor is moving. Stop the tractor to change between the medium and low ranges.

IMPORTANT: If it is necessary to tow the tractor, the **range lever must be in the neutral position** otherwise damage to transmission components may occur.



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WARNING

To prevent inadvertent tractor movement, take care to avoid accidental contact with the gearshift levers. Always stop the engine, firmly apply the parking brake and place all gear shift levers in neutral before leaving the tractor.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Shuttle Lever

The shuttle lever (1) is used to select forward or reverse travel when any one of the twelve gears is engaged, provided that the clutch pedal is depressed. To reverse the direction of travel, reduce engine and tractor speed to a minimum, depress the clutch and move the shuttle lever rearwards. Re-engage the clutch and increase engine speed, as required.

NOTE: An interlock mechanism prevents movement of the shuttle lever unless the clutch pedal is depressed. The starting motor will not operate unless the shuttle lever is in neutral and the clutch pedal is depressed.

IMPORTANT: Fully depress the clutch pedal when changing gear. Partially depressing the clutch pedal when changing gear may result in damage to transmission components. Also, when changing gear down on the move, select the next consecutive gear in order to avoid damage to the clutch and/or overspeeding of the engine.

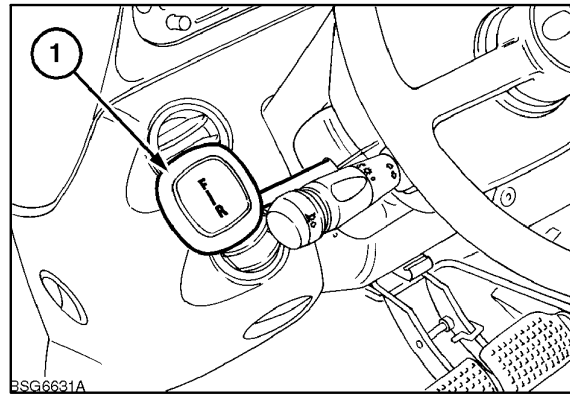
NOTE: When operating in temperatures below -18°C (0°F) with cold transmission oil, avoid shuttle operations, as far as practicable, until the oil has warmed up.

Creeper Gears (where fitted)

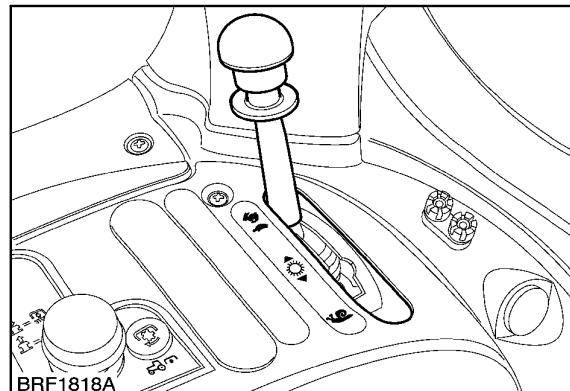
For operations requiring extra low ground speeds, reduction gear sets (creeper gears) are available.

As the name implies, the reduction gear set has the effect of reducing all the ratios within the main transmission to provide an additional twelve gears in forward and reverse.

Creeper gear selection is denoted by the illumination of the creeper gear symbol in the instrument panel.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 30 Km/h 12 x 12 Transmission and Creeper Speeds - Models with Light Duty Rear Axle***

Gear Ratio	Shift Lever Positions		Rear Tyre Size	
	Range lever	Main lever	18.4R-34, 520/70R-34	
FORWARD RATIOS			Standard Speeds	Creeper Speeds
F1	L	1	2.12 (1.32)	0.21 (0.13)
F2	L	2	3.09 (1.92)	0.31 (0.19)
F3	L	3	4.19 (2.61)	0.42 (0.26)
F4	L	4	6.45 (4.03)	0.64 (0.40)
F5	M	1	4.80 (3.00)	0.48 (0.30)
F6	M	2	6.99 (4.36)	0.70 (0.43)
F7	M	3	9.49 (5.92)	0.94 (0.59)
F8	M	4	14.62 (9.12)	1.45 (0.91)
F9	H	1	10.58 (6.60)	1.05 (0.66)
F10	H	2	15.40 (9.60)	1.53 (0.95)
F11	H	3	20.90 (13.04)	2.08 (1.30)
F12	H	4	32.22 (20.09)	3.20 (2.00)

REVERSE RATIOS			Standard Speeds	Creeper Speeds
R1	L	1	3.44 (2.14)	0.34 (0.21)
R2	L	2	5.00 (3.12)	0.50 (0.31)
R3	L	3	6.79 (4.23)	0.68 (0.42)
R4	L	4	10.46 (6.53)	1.04 (0.65)
R5	M	1	7.79 (4.86)	0.77 (0.48)
R6	M	2	11.33 (7.07)	1.13 (0.70)
R7	M	3	9.73 (9.59)	1.53 (0.95)
R8	M	4	23.70 (14.78)	2.36 (1.47)
R9	H	1	10.85 (6.77)	1.08 (0.67)
R10	H	2	15.79 (9.85)	1.57 (0.98)
R11	H	3	21.44 (13.37)	2.13 (1.33)
R12	H	4	33.04 (20.61)	3.29 (2.05)

*See page 3-138

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 30 Km/h 12 x 12 Transmission and Creeper Speeds - Models with Heavy Duty Rear Axle***

Gear Ratio	Shift Lever Positions		Rear Tyre Size			
	Range lever	Main lever	18.4R x 38, 520/70R-38 600/65R-38			
FORWARD RATIOS			Standard Speeds		Creeper Speeds	
F1	L	1	2.01	(1.25)	0.17	(0.10)
F2	L	2	2.92	(1.82)	0.25	(0.15)
F3	L	3	3.96	(2.47)	0.34	(0.21)
F4	L	4	6.11	(3.81)	0.52	(0.32)
F5	M	1	4.55	(2.84)	0.39	(0.24)
F6	M	2	6.62	(4.13)	0.57	(0.35)
F7	M	3	8.98	(5.60)	0.77	(0.47)
F8	M	4	13.84	(8.63)	1.19	(0.73)
F9	H	1	10.02	(6.25)	0.99	(0.61)
F10	H	2	14.58	(9.09)	1.44	(0.89)
F11	H	3	19.79	(12.34)	1.96	(1.21)
F12	H	4	30.50	(19.02)	3.03	(1.88)

REVERSE RATIOS			Standard Speeds		Creeper Speeds	
R1	L	1	2.06	(1.28)	0.28	(0.17)
R2	L	2	3.00	(1.87)	0.40	(0.24)
R3	L	3	4.07	(2.54)	0.55	(0.34)
R4	L	4	6.27	(3.91)	0.85	(0.52)
R5	M	1	4.70	(2.93)	0.63	(0.39)
R6	M	2	6.79	(4.23)	0.92	(0.57)
R7	M	3	9.21	(5.75)	1.25	(0.77)
R8	M	4	14.20	(8.85)	1.94	(1.20)
R9	H	1	10.27	(6.41)	1.02	(0.63)
R10	H	2	14.95	(9.32)	1.48	(0.91)
R11	H	3	20.29	(12.66)	2.01	(1.24)
R12	H	4	31.28	(19.51)	3.10	(1.92)

*See page 3-138

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 40 Km/h 12 x 12 Transmission and Creeper Speeds -Models with Light Duty Rear Axle***

Gear Ratio	Shift Lever Positions		Rear Tyre Size			
	Range lever	Main lever	18.4R-34, 520/70R-34			
FORWARD RATIOS			Standard Speeds		Creeper Speeds	
F1	L	1	2.12	(1.32)	0.21	(0.13)
F2	L	2	3.11	(1.94)	0.31	(0.19)
F3	L	3	4.44	(2.77)	0.44	(0.28)
F4	L	4	6.45	(4.03)	0.64	(0.40)
F5	M	1	5.33	(3.32)	0.53	(0.33)
F6	M	2	7.80	(4.87)	0.78	(0.48)
F7	M	3	11.14	(6.95)	1.11	(0.69)
F8	M	4	16.21	(10.11)	1.61	(1.01)
F9	H	1	12.89	(8.04)	1.43	(0.89)
F10	H	2	18.89	(11.78)	2.10	(1.31)
F11	H	3	26.97	(16.82)	3.00	(1.87)
F12	H	4	39.25	(24.48)	4.36	(2.72)

REVERSE RATIOS			Standard Speeds		Creeper Speeds	
R1	L	1	2.17	(1.34)	0.22	(0.13)
R2	L	2	3.19	(1.98)	0.32	(0.20)
R3	L	3	4.55	(2.82)	0.45	(0.28)
R4	L	4	6.62	(4.11)	0.66	(0.41)
R5	M	1	5.51	(3.42)	0.54	(0.34)
R6	M	2	8.00	(4.97)	0.80	(0.50)
R7	M	3	11.43	(7.10)	1.14	(0.71)
R8	M	4	16.63	(10.33)	1.65	(1.03)
R9	H	1	13.22	(8.21)	1.47	(0.92)
R10	H	2	19.37	(12.03)	2.15	(1.34)
R11	H	3	27.67	(17.19)	3.07	(1.92)
R12	H	4	40.26	(25.01)	4.47	(2.79)

*See page 3-138

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 40 Km/h 12 x 12 Transmission and Creeper Speeds - Models with Heavy Duty Rear Axle***

Gear Ratio	Shift Lever Positions		Rear Tyre Size			
	Range lever	Main lever	18.4R-38, 520/70R-38 600/65R-38			
FORWARD RATIOS			Standard Speeds		Creeper Speeds	
F1	L	1	2.01	(1.25)	0.20	(0.12)
F2	L	2	2.94	(1.83)	0.29	(0.18)
F3	L	3	4.20	(2.62)	0.42	(0.26)
F4	L	4	6.11	(3.81)	0.61	(0.38)
F5	M	1	5.04	(3.14)	0.50	(0.31)
F6	M	2	7.39	(4.61)	0.73	(0.46)
F7	M	3	10.55	(6.58)	1.05	(0.65)
F8	M	4	15.35	(9.57)	1.53	(0.95)
F9	H	1	12.21	(7.61)	1.21	(0.76)
F10	H	2	17.88	(11.15)	1.78	(1.11)
F11	H	3	25.53	(15.93)	1.97	(1.23)
F12	H	4	37.16	(23.17)	3.69	(2.30)

REVERSE RATIOS			Standard Speeds		Creeper Speeds	
R1	L	1	2.06	(1.28)	0.21	(0.13)
R2	L	2	3.02	(1.88)	0.30	(0.19)
R3	L	3	4.31	(2.69)	0.43	(0.27)
R4	L	4	6.27	(3.91)	0.62	(0.39)
R5	M	1	5.21	(3.25)	0.51	(0.32)
R6	M	2	7.57	(4.72)	0.75	(0.47)
R7	M	3	10.82	(6.75)	1.08	(0.67)
R8	M	4	15.74	(9.82)	1.57	(0.98)
R9	H	1	12.52	(7.81)	1.25	(0.78)
R10	H	2	18.34	(11.44)	1.82	(1.14)
R11	H	3	26.19	(16.33)	2.03	(1.26)
R12	H	4	38.11	(23.77)	3.79	(2.36)

*See page 3-138

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

24 x 24 DUAL COMMAND TRANSMISSION

Dual Command transmission has an hydraulically operated clutch pack allowing the operator to select underdrive in any forward or reverse gear while on the move. This effectively increases torque by 22%, reduces tractor speed by approximately 18%.

An optional reduction gear set (creeper gears) offers a further 8 ratios, forward and reverse.

Main Shift Lever

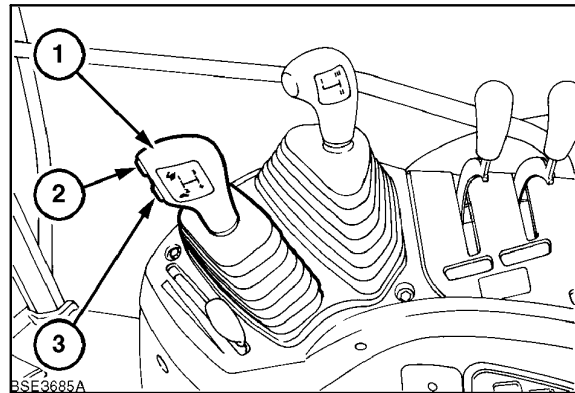
The main transmission lever (1) is provided with electrical push buttons to actuate the Dual Command function. Operation and function is otherwise identical to the 12 x 12 transmission.

Underdrive is hydraulically engaged, the valve being actuated by a solenoid controlled by push buttons (2) and (3) on the main gear shift lever.

Press the lower switch (3) to engage Underdrive (tortoise symbol). Press the upper switch (2) (hare symbol) to disengage Dual Command and return to direct drive.

When direct drive is engaged, the green indicator light on the instrument panel, which has a 'hare' symbol, illuminates to indicate that Dual Command is in direct drive.

IMPORTANT: A tractor with Dual Command transmission must **not** be tow-started. See '**Starting the Tractor with Jump Leads**' in section 3.



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⚠ WARNING ⚠

Always engage the parking brake before dismounting from the tractor. Dual Command will not prevent the tractor from rolling when the engine is shut off.

⚠ WARNING ⚠

To prevent inadvertent tractor movement, take care to avoid accidental contact with the gearshift levers. Always stop the engine, firmly apply the parking brake and place all gear shift levers in neutral before leaving the tractor.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Shuttle Lever

Selection of forward or reverse travel is by means of an electrically operated shuttle lever, located to the left of the steering wheel. The lever is spring-loaded to prevent inadvertent movement, lift to select forward or reverse drive. It is not necessary to depress the clutch pedal when actuating the shuttle lever.

To change from forward to reverse motion, apply the brakes to slow the tractor, move the shuttle lever fully rearward, and control tractor speed by means of the throttle.

NOTE: Forward or reverse drive cannot be engaged unless the operator is in the tractor seat. Additionally, if the vehicle is moved in either direction with the handbrake engaged, an audible alarm will be heard.

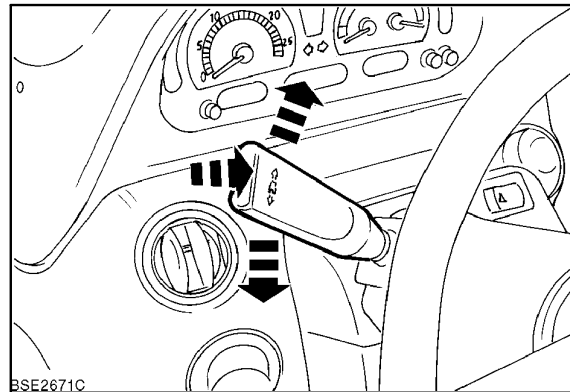
IMPORTANT: To reduce clutch damage caused by shuttle shifting in too high a gear or at too high a speed, a warning bleeper will be heard and the symbol 'N' will flash in the instrument panel when tractor speed is greater than 9 Km/h (5 MPH).

Auto Take Off

The Auto Take Off feature permits the operator to engage drive without using the clutch pedal by simply moving the shuttle lever from neutral to the forward or reverse position.

The Auto Take Off function is automatically enabled under normal starting conditions. i.e. operator in the driving seat, clutch pedal depressed, shuttle lever in neutral.

After selecting the chosen gear ranges, simply move the shuttle lever to the forward or reverse position without depressing the clutch pedal. The Auto Take Off function will provide a controlled start from rest.



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NOTE: The Auto Take Off function will be disabled if the vehicle is at rest with the shuttle lever in the neutral position and the operator leaves the seat.

Should Auto Take Off be disabled for any reason, the operator should carry out the following procedure to re-enable this function.

While sitting in the seat, release the handbrake and cycle the clutch pedal. The vehicle will then move off in the direction selected on the shuttle lever.

Once enabled, the Auto Take Off function will continue to function as long as the operator remains in the seat.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Creeper Gears (where fitted)

For operations requiring extra low ground speeds, reduction gear sets (creeper gears) are available.

The reduction gear set has the effect of reducing all the ratios within the main transmission to provide an additional twenty four gears in forward and reverse.

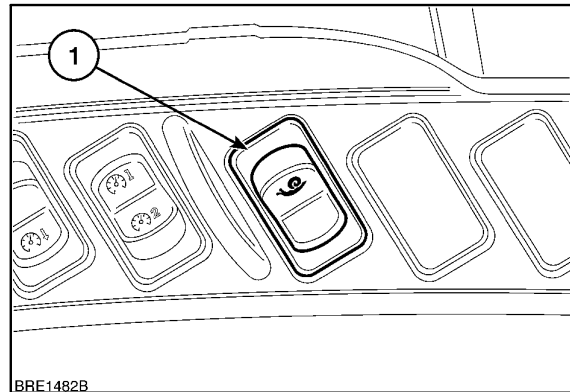
The creeper gears are selected by means of a rocker switch (1) located on the right-hand control console.

With the engine running, clutch depressed and the shuttle lever in neutral, apply and hold down the tractor footbrakes. Momentarily depress the lower part of the selector switch (1), Figure 121, to engage the creeper gears.

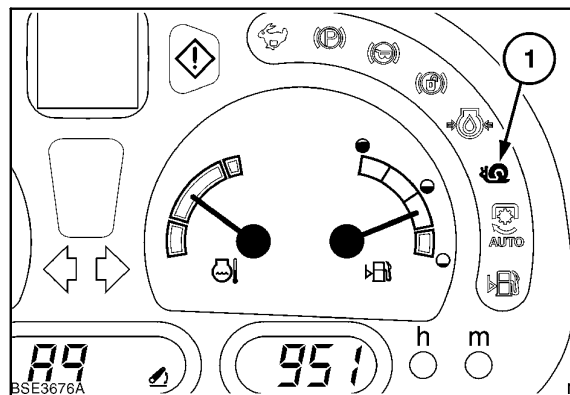
The creep speed symbol (1) Figure 122, will appear in the Instrument panel.

To disengage creeper gears, repeat the above procedure and depress the selector switch again. The creep speed symbol will cease to illuminate.

IMPORTANT: The creeper gears offer very low ground speeds. Do not use the low gearing advantage to apply excessive draft loads to the tractor.



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Error Codes

Should a fault occur in the transmission controls, causing the tractor to become disabled, an error code will be displayed in the instrument panel. If this should happen, contact your authorised dealer and report the error code displayed.

There are a number of 'action required' error codes which can also appear in the Dot Matrix Display, these are listed below.

Error Code	Fault
P	Park brake on, release brake lever.
N	Place the shuttle lever in neutral.
C	Wheel speed too high for creeper gears.
CP	Depress clutch pedal to enable transmission (restore drive).

Transmission Calibration

Should transmission shifts become slow or jerky, the clutches in the transmission may require re-calibrating. Consult your authorised dealer.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 30 Km/h Transmission (24 x 24) and Creeper Speeds - Models with Light Duty Rear Axle***

Gear Ratio	Shift Lever Positions			Rear Tyre Size			
	Range lever	Main lever	Hi / Lo Button	18.4R-34 520/70R-34			
FORWARD RATIOS				Standard Speeds		Creeper Speeds	
F1	L	1	Low	1.73	(1.08)	0.15	(0.10)
F2	L	1	High	2.12	(1.32)	0.19	(0.12)
F3	L	2	Low	2.52	(1.57)	0.22	(0.14)
F4	L	2	High	3.09	(1.92)	0.27	(0.17)
F5	L	3	Low	3.42	(2.14)	0.30	(0.19)
F6	L	3	High	4.19	(2.61)	0.37	(0.23)
F7	L	4	Low	5.28	(3.29)	0.47	(0.29)
F8	L	4	High	6.45	(4.03)	0.57	(0.36)
F9	M	5	Low	3.93	(2.45)	0.35	(0.22)
F10	M	5	High	4.80	(3.00)	0.42	(0.26)
F11	M	6	Low	5.71	(3.56)	0.51	(0.31)
F12	M	6	High	6.99	(4.36)	0.62	(0.39)
F13	M	7	Low	7.76	(4.84)	0.69	(0.43)
F14	M	7	High	9.49	(5.92)	0.84	(0.52)
F15	M	8	Low	11.95	(7.46)	1.06	(0.66)
F16	M	8	High	14.62	(9.12)	1.29	(0.81)
F17	H	9	Low	8.65	(5.40)	0.77	(0.48)
F18	H	9	High	10.58	(6.60)	0.94	(0.58)
F19	H	10	Low	12.59	(7.85)	1.11	(0.69)
F20	H	10	High	15.40	(9.60)	1.36	(0.85)
F21	H	11	Low	17.09	(10.66)	1.51	(0.94)
F22	H	11	High	20.90	(13.04)	1.85	(1.15)
F23	H	12	Low	26.34	(16.43)	2.33	(1.45)
F24	H	12	High	32.22	(20.09)	2.85	(1.78)

***See page 3-138**

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 30 Km/h Transmission (24 x 24) and Creeper Speeds -Models with Light Duty Rear Axle***

Gear Ratio	Shift Lever Positions			Rear Tyre Size			
	Range lever	Main lever	Hi / Lo Button	18.4R-34 520/70R-34			
REVERSE RATIOS				Standard Speeds		Creeper Speeds	
R1	L	1	Low	1.79	(1.12)	0.16	(0.10)
R2	L	1	High	2.19	(1.37)	0.19	(0.12)
R3	L	2	Low	2.61	(1.63)	0.23	(0.14)
R4	L	2	High	3.19	(1.99)	0.28	(0.18)
R5	L	3	Low	3.54	(2.21)	0.31	(0.20)
R6	L	3	High	4.33	(2.70)	0.38	(0.24)
R7	L	4	Low	5.46	(3.40)	0.48	(0.30)
R8	L	4	High	6.67	(4.16)	0.59	(0.37)
R9	M	5	Low	4.06	(2.53)	0.36	(0.22)
R10	M	5	High	4.97	(3.10)	0.44	(0.27)
R11	M	6	Low	5.91	(3.69)	0.52	(0.33)
R12	M	6	High	7.23	(4.51)	0.64	(0.40)
R13	M	7	Low	8.02	(5.00)	0.71	(0.44)
R14	M	7	High	9.81	(6.12)	0.87	(0.54)
R15	M	8	Low	12.36	(7.71)	1.09	(0.68)
R16	M	8	High	15.12	(9.43)	1.34	(0.83)
R17	H	9	Low	8.95	(5.58)	0.79	(0.49)
R18	H	9	High	10.94	(6.83)	0.97	(0.60)
R19	H	10	Low	13.02	(8.12)	1.15	(0.72)
R20	H	10	High	15.92	(9.93)	1.41	(0.88)
R21	H	11	Low	17.67	(11.02)	1.56	(0.97)
R22	H	11	High	21.62	(13.48)	1.91	(1.19)
R23	H	12	Low	27.24	(16.99)	2.41	(1.50)
R24	H	12	High	33.31	(20.78)	2.94	(1.84)

*See page 3-138

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 30 Km/h Transmission (24 x 24) and Creeper Speeds - Models with Heavy Duty Rear Axle***

Gear Ratio	Shift Lever Positions			Rear Tyre Size			
	Range lever	Main lever	Hi / Lo Button	18.4R-38, 520/70R-38 600/65R-38			
FORWARD RATIOS				Standard Speeds		Creeper Speeds	
F1	L	1	Low	1.64	(1.02)	0.16	(0.10)
F2	L	1	High	2.01	(1.25)	0.20	(0.12)
F3	L	2	Low	2.39	(1.49)	0.24	(0.15)
F4	L	2	High	2.92	(1.82)	0.29	(0.18)
F5	L	3	Low	3.24	(2.02)	0.32	(0.20)
F6	L	3	High	3.96	(2.47)	0.39	(0.25)
F7	L	4	Low	4.99	(3.12)	0.50	(0.31)
F8	L	4	High	6.11	(3.81)	0.61	(0.38)
F9	M	5	Low	3.72	(2.32)	0.37	(0.23)
F10	M	5	High	4.55	(2.84)	0.45	(0.28)
F11	M	6	Low	5.41	(3.37)	0.54	(0.34)
F12	M	6	High	6.62	(4.13)	0.66	(0.41)
F13	M	7	Low	7.34	(4.58)	0.73	(0.46)
F14	M	7	High	8.98	(5.60)	0.89	(0.56)
F15	M	8	Low	11.32	(7.06)	1.12	(0.70)
F16	M	8	High	13.84	(8.63)	1.38	(0.86)
F17	H	9	Low	8.19	(5.11)	0.81	(0.51)
F18	H	9	High	10.02	(6.25)	1.00	(0.62)
F19	H	10	Low	11.92	(7.43)	1.19	(0.74)
F20	H	10	High	14.58	(9.09)	1.45	(0.90)
F21	H	11	Low	16.18	(10.09)	1.61	(1.00)
F22	H	11	High	19.79	(12.34)	1.97	(1.23)
F23	H	12	Low	24.93	(15.55)	2.48	(1.55)
F24	H	12	High	30.50	(19.02)	3.03	(1.89)

*See page 3-138

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 30 Km/h Transmission (24 x 24) and Creeper Speeds - Models with Heavy Duty Rear Axle***

Gear Ratio	Shift Lever Positions			Rear Tyre Size			
	Range lever	Main lever	Hi / Lo Button	18.4R-38, 520/70R-38 600/65R-38			
REVERSE RATIOS				Standard Speeds		Creeper Speeds	
R1	L	1	Low	1.70	(1.06)	0.17	(0.11)
R2	L	1	High	2.08	(1.29)	0.21	(0.13)
R3	L	2	Low	2.47	(1.54)	0.25	(0.15)
R4	L	2	High	3.02	(1.88)	0.30	(0.19)
R5	L	3	Low	3.35	(2.09)	0.33	(0.21)
R6	L	3	High	4.10	(2.56)	0.41	(0.25)
R7	L	4	Low	5.17	(3.22)	0.51	(0.32)
R8	L	4	High	6.32	(3.94)	0.63	(0.39)
R9	M	5	Low	3.84	(2.40)	0.38	(0.24)
R10	M	5	High	4.70	(2.93)	0.47	(0.29)
R11	M	6	Low	5.59	(3.49)	0.56	(0.35)
R12	M	6	High	6.84	(4.27)	0.68	(0.42)
R13	M	7	Low	7.59	(4.74)	0.75	(0.47)
R14	M	7	High	9.29	(5.79)	0.92	(0.58)
R15	M	8	Low	11.70	(7.30)	1.16	(0.73)
R16	M	8	High	14.31	(8.93)	1.42	(0.89)
R17	H	9	Low	8.47	(5.28)	0.84	(0.53)
R18	H	9	High	10.36	(6.46)	1.03	(0.64)
R19	H	10	Low	12.32	(7.69)	1.23	(0.76)
R20	H	10	High	15.07	(9.40)	1.50	(0.93)
R21	H	11	Low	16.73	(10.43)	1.66	(1.04)
R22	H	11	High	20.46	(12.76)	2.03	(1.27)
R23	H	12	Low	25.78	(16.08)	2.56	(1.60)
R24	H	12	High	31.53	(19.67)	3.14	(1.96)

*See page 3-138

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 40 Km/h Transmission (24 x 24) and Creeper Speeds - Models with Light Duty Rear Axle***

Gear Ratio	Shift Lever Positions			Rear Tyre Size			
	Range lever	Main lever	Hi / Lo Button	18.4R-34 520/70R-34			
FORWARD RATIOS				Standard Speeds		Creeper Speeds	
F1	L	1	Low	1.73	(1.08)	0.17	(0.11)
F2	L	1	High	2.12	(1.32)	0.21	(0.13)
F3	L	2	Low	2.54	(1.58)	0.25	(0.16)
F4	L	2	High	3.11	(1.94)	0.31	(0.19)
F5	L	3	Low	3.63	(2.26)	0.36	(0.22)
F6	L	3	High	4.44	(2.77)	0.44	(0.28)
F7	L	4	Low	5.28	(3.29)	0.52	(0.33)
F8	L	4	High	6.45	(4.03)	0.64	(0.40)
F9	M	5	Low	4.35	(2.72)	0.43	(0.27)
F10	M	5	High	5.33	(3.32)	0.53	(0.33)
F11	M	6	Low	6.38	(3.98)	0.63	(0.40)
F12	M	6	High	7.80	(4.87)	0.78	(0.48)
F13	M	7	Low	9.11	(5.68)	0.91	(0.56)
F14	M	7	High	11.14	(6.95)	1.11	(0.69)
F15	M	8	Low	13.25	(8.27)	1.32	(0.82)
F16	M	8	High	16.21	(10.11)	1.61	(1.01)
F17	H	9	Low	10.54	(6.58)	1.05	(0.65)
F18	H	9	High	12.89	(8.04)	1.28	(0.80)
F19	H	10	Low	15.44	(9.63)	1.54	(0.96)
F20	H	10	High	18.89	(11.78)	1.88	(1.17)
F21	H	11	Low	22.05	(13.76)	2.19	(1.37)
F22	H	11	High	26.97	(16.82)	2.68	(1.67)
F23	H	12	Low	32.09	(20.02)	3.19	(1.99)
F24	H	12	High	39.25	(24.48)	3.90	(2.43)

***See page 3-138**

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 40 Km/h Transmission (24 x 24) and Creeper Speeds - Models with Light Duty Rear Axle***

Gear Ratio	Shift Lever Positions			Rear Tyre Size			
	Range lever	Main lever	Hi / Lo Button	18.4R-34 520/70R-34			
REVERSE RATIOS				Standard Speeds		Creeper Speeds	
R1	L	1	Low	1.79	(1.12)	0.18	(0.11)
R2	L	1	High	2.19	(1.37)	0.22	(0.14)
R3	L	2	Low	2.63	(1.64)	0.26	(0.16)
R4	L	2	High	3.21	(2.00)	0.32	(0.20)
R5	L	3	Low	3.75	(2.34)	0.37	(0.23)
R6	L	3	High	4.59	(2.86)	0.46	(0.28)
R7	L	4	Low	5.46	(3.40)	0.54	(0.34)
R8	L	4	High	6.67	(4.16)	0.66	(0.41)
R9	M	5	Low	4.50	(2.81)	0.45	(0.28)
R10	M	5	High	5.51	(3.43)	0.55	(0.34)
R11	M	6	Low	6.60	(4.11)	0.66	(0.41)
R12	M	6	High	8.07	(5.03)	0.80	(0.50)
R13	M	7	Low	9.42	(5.88)	0.94	(0.58)
R14	M	7	High	11.52	(7.19)	1.15	(0.71)
R15	M	8	Low	13.71	(8.55)	1.36	(0.85)
R16	M	8	High	16.76	(10.46)	1.67	(1.04)
R17	H	9	Low	10.90	(6.80)	1.08	(0.68)
R18	H	9	High	13.33	(8.32)	1.33	(0.83)
R19	H	10	Low	15.97	(9.96)	1.59	(0.99)
R20	H	10	High	19.53	(12.18)	1.94	(1.21)
R21	H	11	Low	22.81	(14.22)	2.27	(1.41)
R22	H	11	High	27.89	(17.40)	2.77	(1.73)
R23	H	12	Low	33.19	(20.70)	3.30	(2.06)
R24	H	12	High	40.59	(25.32)	4.04	(2.52)

*See page 3-138

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 40 Km/h Transmission (24 x 24) and Creeper Speeds - Models with Heavy Duty Rear Axle***

Gear Ratio	Shift Lever Positions			Rear Tyre Size			
	Range lever	Main lever	Hi / Lo Button	18.4R-38, 520/70R-38 600/65R-38			
FORWARD RATIOS				Standard Speeds		Creeper Speeds	
F1	L	1	Low	1.64	(1.02)	0.16	(0.10)
F2	L	1	High	2.01	(1.25)	0.20	(0.12)
F3	L	2	Low	2.40	(1.50)	0.24	(0.15)
F4	L	2	High	2.94	(1.83)	0.29	(0.18)
F5	L	3	Low	3.43	(2.14)	0.34	(0.21)
F6	L	3	High	4.20	(2.62)	0.42	(0.26)
F7	L	4	Low	4.99	(3.12)	0.50	(0.31)
F8	L	4	High	6.11	(3.81)	0.61	(0.38)
F9	M	5	Low	4.12	(2.57)	0.41	(0.26)
F10	M	5	High	5.04	(3.14)	0.50	(0.31)
F11	M	6	Low	6.04	(3.77)	0.60	(0.37)
F12	M	6	High	7.39	(4.61)	0.73	(0.46)
F13	M	7	Low	8.62	(5.38)	0.86	(0.53)
F14	M	7	High	10.55	(6.58)	1.05	(0.65)
F15	M	8	Low	12.55	(7.83)	1.25	(0.78)
F16	M	8	High	15.35	(9.57)	1.53	(0.95)
F17	H	9	Low	9.98	(6.22)	0.99	(0.62)
F18	H	9	High	12.21	(7.61)	1.21	(0.76)
F19	H	10	Low	14.62	(9.12)	1.45	(0.91)
F20	H	10	High	17.88	(11.15)	1.78	(1.11)
F21	H	11	Low	20.88	(13.02)	2.08	(1.29)
F22	H	11	High	25.53	(15.93)	2.54	(1.58)
F23	H	12	Low	30.38	(18.95)	3.02	(1.88)
F24	H	12	High	37.16	(23.17)	3.69	(2.30)

*See page 3-138

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 40 Km/h Transmission (24 x 24) and Creeper Speeds - Models with Heavy Duty Rear Axle***

Gear Ratio	Shift Lever Positions			Rear Tyre Size			
	Range lever	Main lever	Hi / Lo Button	18.4R-38, 520/70R-38 600/65R-38			
REVERSE RATIOS				Standard Speeds		Creeper Speeds	
R1	L	1	Low	1.70	(1.06)	0.17	(0.11)
R2	L	1	High	2.08	(1.29)	0.21	(0.13)
R3	L	2	Low	2.49	(1.55)	0.25	(0.15)
R4	L	2	High	3.04	(1.90)	0.30	(0.19)
R5	L	3	Low	3.55	(2.21)	0.35	(0.22)
R6	L	3	High	4.34	(2.71)	0.43	(0.27)
R7	L	4	Low	5.17	(3.22)	0.51	(0.32)
R8	L	4	High	6.32	(3.94)	0.63	(0.39)
R9	M	5	Low	4.26	(2.66)	0.42	(0.26)
R10	M	5	High	5.21	(3.25)	0.52	(0.32)
R11	M	6	Low	6.24	(3.89)	0.62	(0.39)
R12	M	6	High	7.64	(4.76)	0.76	(0.47)
R13	M	7	Low	8.92	(5.56)	0.89	(0.55)
R14	M	7	High	10.91	(6.80)	1.08	(0.68)
R15	M	8	Low	12.97	(8.09)	1.29	(0.80)
R16	M	8	High	15.87	(9.90)	1.58	(0.98)
R17	H	9	Low	10.32	(6.44)	1.03	(0.64)
R18	H	9	High	12.62	(7.87)	1.26	(0.78)
R19	H	10	Low	15.12	(9.43)	1.50	(0.94)
R20	H	10	High	18.49	(11.53)	1.84	(1.15)
R21	H	11	Low	21.59	(13.47)	2.15	(1.34)
R22	H	11	High	26.41	(16.47)	2.63	(1.64)
R23	H	12	Low	31.41	(19.59)	3.12	(1.95)
R24	H	12	High	38.42	(23.97)	3.82	(2.38)

*See page 3-138

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

ELECTRO COMMAND TRANSMISSION

This transmission offers 16 or 17 forward, and 16 reverse ratios. An optional reduction gear set (creeper gears) offers a further 16 ratios, forward and reverse.

In the following text, operational information is based on the 16 x 16 transmission (30 and 40 Km/h). However, the 17 x 16 transmission (50 Km/h) functions in exactly the same way.

IMPORTANT: When travelling at high road speeds with trailed or semi-mounted equipment attached to the tractor, ensure the equipment is rated for 50K/mh operation in respect to its construction, brakes and tyres.

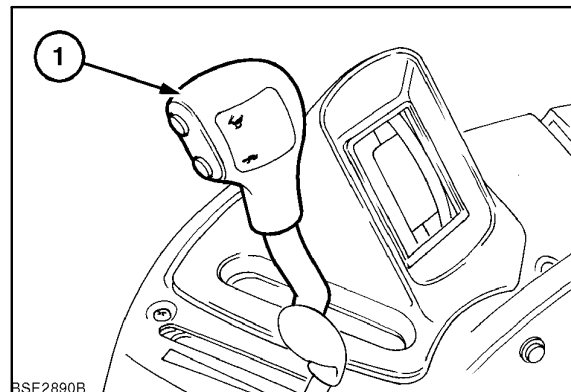
The transmission is controlled by means of a main shift lever, two powershift buttons and a range change button. A shuttle lever mounted to the left of the steering wheel selects forward or reverse drive. Transmission and throttle controls are colour-coded orange.

This transmission provides four powershift gears in each of the four intermediate ranges A (1-4), B (5-8), C (9-12), and D (13-16). Clutchless shifts between gears 4 and 5, 12 and 13 are made by using the range button in conjunction with the powershift buttons. Range shifts between Low and High (8th. and 9th. gears), can only be made with the clutch pedal fully depressed.

Main Shift Lever

The main shift lever (1), is used to select both range gears and main gears. When selecting High or Low ranges (moving the lever forwards or rearwards) the clutch pedal must always be depressed.

With the shuttle lever in neutral and clutch pedal fully depressed, move the main shift lever rearward into the Low (field) range. In this range, powershift gears 1-4 or 5-8 can be selected. Move the lever fully forward to select powershift gears 9-12 or 13-16 in the High range. To engage neutral, move the lever to the mid position.

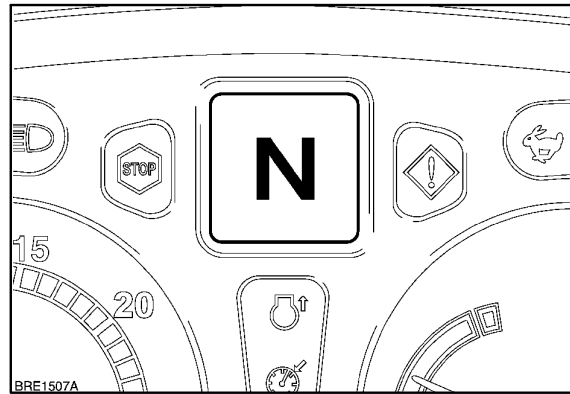


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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

NOTE: With the tractor stationary and the shuttle lever in forward or reverse drive, moving the main shift lever from neutral without first depressing the clutch pedal will result in the drive not being engaged. Error code 'N' will appear in the transmission display and an audible alarm will sound. Depress the clutch pedal and shift the shuttle lever to neutral to clear the display and re-engage the drive.

NOTE: To avoid power losses due to internal friction, place both gearshift lever and the shuttle lever in neutral when performing stationary operations.

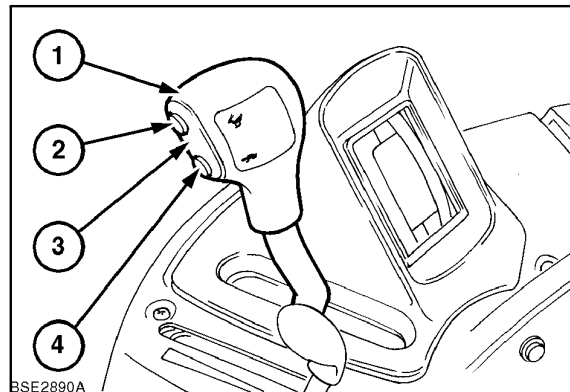


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The shift lever (1), incorporates two electrical push buttons that are used to make instantaneous up or down powershifts. Button (2) is depressed to make upward changes, button (4) for downward changes. It is not necessary to use the clutch pedal to make a powershift.

For convenience, a duplicate set of shift buttons are located on the right-hand control panel, see Figure 126.

To make an upward change between gears 4 and 5 hold in the intermediate range change button (3) and depress the upshift button (2). The change will be indicated in the gear display. Use the same procedure to change from gear 12 to 13.



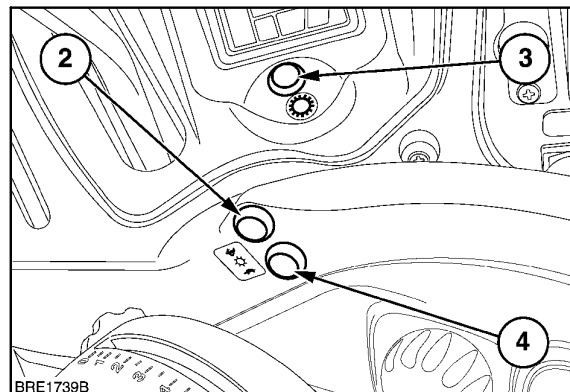
125

Downward changes are made using the same procedure but depressing the downshift button (4). If preferred, the clutch pedal may be used instead of the intermediate range change button.

NOTE: Attempting to shift from one range to another without using the range change button or clutch pedal will cause the audible alarm to sound.

When the main shift lever is moved forward from neutral or from any gear within the 1-8 range, 9th. gear will always be selected.

Conversely, if the lever is moved rearward from neutral or from the 9-16 range with the tractor moving, the speed matching function will select the most suitable gear between 5th and 8th. To select an alternative gear, maintain pressure on the clutch pedal and use the powershift buttons to engage a different gear, then release the clutch pedal.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Shuttle Lever

Selection of forward or reverse travel is by means of an electrically operated shuttle lever (1), located to the left of the steering wheel. The lever is spring-loaded to prevent inadvertent movement, lift toward the steering wheel before selecting forward or reverse drive. It is not necessary to depress the clutch pedal when operating the shuttle lever.

NOTE: Forward or reverse drive cannot be engaged unless the operator is in the tractor seat. Additionally, if the vehicle is moved in either direction with the handbrake engaged, an audible alarm will be heard and 'P' will be displayed in the Dot Matrix and Digital Gear Displays (where fitted).

NOTE: To avoid power losses due to internal friction, place both gearshift lever and the shuttle lever in neutral when performing stationary operations.

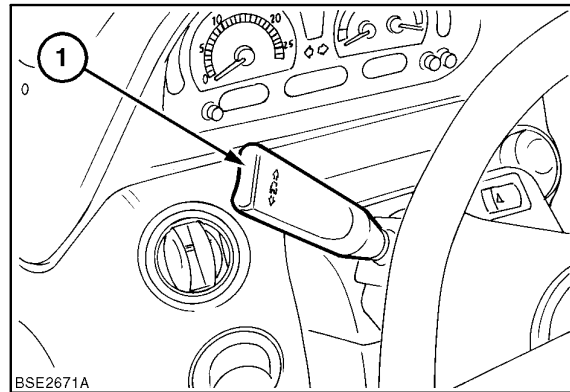
To reduce clutch damage caused by shuttle shifting in too high a gear or at too high a speed, the tractor will slow using engine braking and the transmission will then downshift to the lowest gear within the selected intermediate range before changing direction.

Shuttle Mode

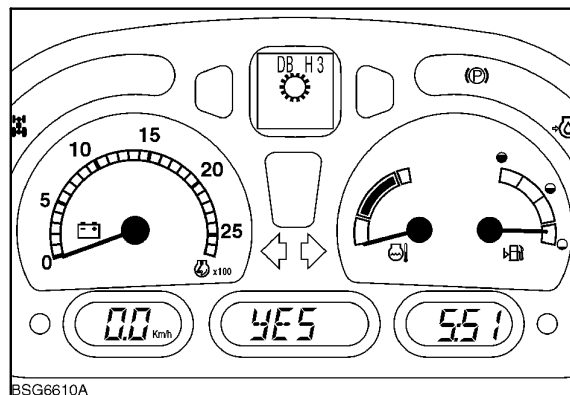
During normal shuttle operations the same gear is used for both forward and reverse. However, if 13th gear or above is selected, the shuttle gear will be 9th.

With Shuttle Mode selected, the electronic control unit for the transmission is able to memorise shuttle gear combinations within a range of gears. To activate Shuttle Mode, carry out the following procedure.

- With the key start off, move the shuttle lever to the reverse position. Depress and hold the transmission upshift button and turn the key start on. Do not start the engine.
- The transmission symbol and DB H3 will appear in the dot matrix display and the centre LCD will show 'no' or 'YES'. Release the upshift button.
- 'no' indicates memory function is disabled, 'YES' shows the memory function is activated.
- Use the upshift and downshift buttons to toggle between 'no' and 'YES'. With the appropriate selection made, turn the key start off and return the shuttle lever to neutral.



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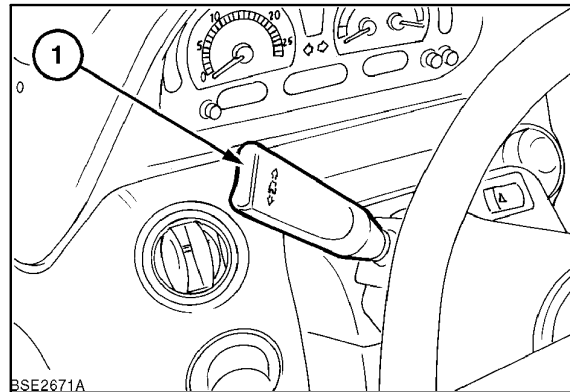
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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Setting the Forward/Reverse Shuttle Gear

Start the engine and, with the clutch pedal depressed, place the shuttle lever (1) in the forward position. Do not release the clutch pedal. Using the upshift/downshift buttons, set the forward gear. Move the shuttle lever into reverse and repeat the procedure to set the reverse gear. With the forward and reverse gears set, return the shuttle lever to neutral and release the clutch pedal. Shuttle Mode is now activated.

NOTE: Selecting the shuttle gear with the lever in neutral will result in the same ratio being set for both forward and reverse.



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WARNING

To prevent inadvertent tractor movement, always stop the engine, place the shuttle lever in neutral and firmly apply the parking brake before leaving the tractor. The transmission will not prevent the tractor from rolling when the engine is shut off.

Auto Take Off

The Auto Take Off feature permits the operator to engage drive without using the clutch pedal by simply moving the shuttle lever from neutral to the forward or reverse position.

The Auto Take Off function is automatically enabled under normal starting conditions. i.e. operator in the driving seat, clutch pedal depressed, shuttle lever in neutral.

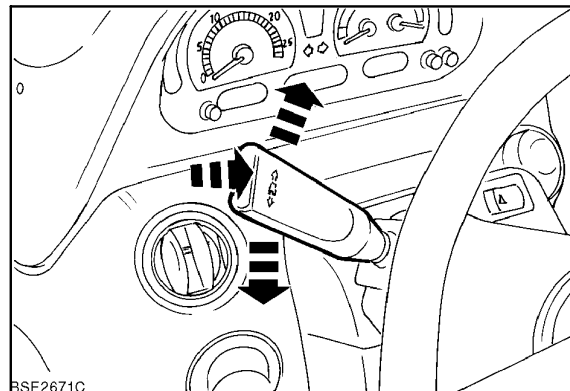
After selecting the appropriate gear ranges with the main shift lever simply move the shuttle lever to the forward or reverse position without depressing the clutch pedal. The Auto Take Off function will provide a controlled start from rest.

NOTE: The Auto Take Off function will be disabled if the vehicle is at rest with the shuttle lever in the neutral position and the operator leaves the seat.

Should Auto Take Off be disabled for any reason, the operator should carry out the following procedure to re-enable this function.

While sitting in the seat, release the handbrake and cycle the clutch pedal. The vehicle will then move off in the direction selected on the shuttle lever.

Once enabled, the Auto Take Off function will continue to function as long as the operator remains in the seat.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Gear Displays

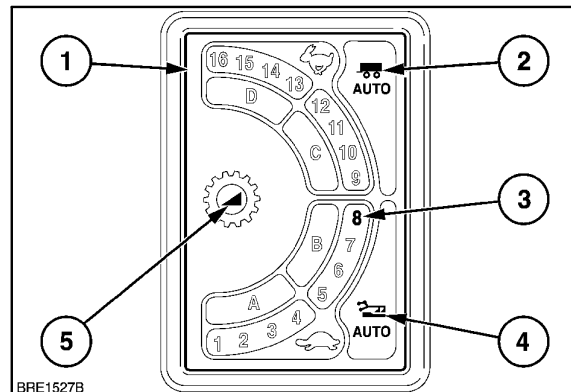
Dependent upon tractor specification, two types of gear display may be fitted.

LED Gear Display

An illuminated display (1), to the right of the main shift lever indicates the gear selected.

As each gear is selected, the appropriate number (3) will be illuminated in the display. With Auto Shift engaged, the symbols for Active Road (2) and Active Field (4) will also be illuminated. When changing the Auto Shift point, symbol (5) will flash during the programming procedure.

NOTE: Auto Shift is an option and may not be fitted to your tractor.



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Digital Gear Display

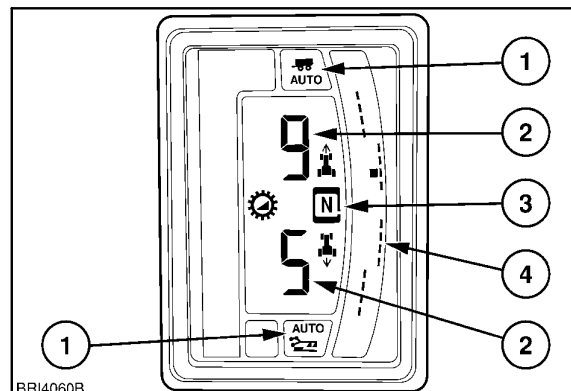
The digital display provides a comprehensive range of information that includes:

Field and road Auto Shift (1) symbols.

Forward and reverse gears (2). The display shows the current forward gear and the corresponding reverse or 'shuttle' gear.

Shuttle lever position. Forward, neutral and reverse (3).

Gear span for each range (4).



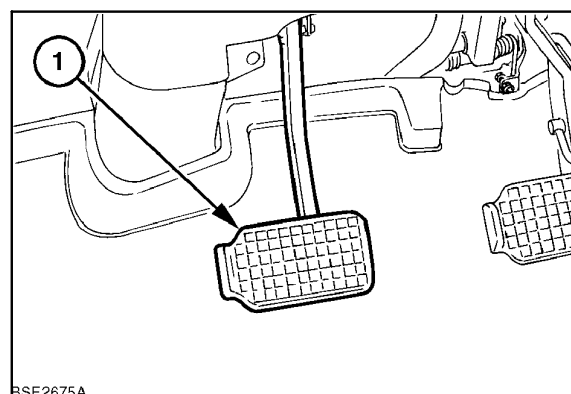
132

Clutch Pedal

It is not necessary to use the clutch pedal (1) to make a powershift or when shuttle shifting (changing direction between forward and reverse). Use of the clutch is recommended for positioning the tractor when attaching equipment or operating in confined spaces when the low gears are not slow enough, at moderate/low engine speeds, to give precise control.

IMPORTANT: To avoid premature clutch wear, do not use the clutch pedal as a footrest.

NOTE: There may be occasions when error codes 'N' or 'CP' flash in the Dot Matrix and Digital Gear Displays (where fitted). Should this occur, move shuttle lever to neutral ('N') or cycle the clutch pedal ('CP') to clear the error.



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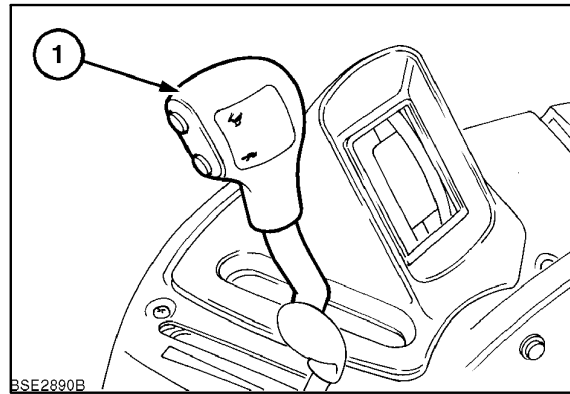
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Driving the Tractor

With the main shift and shuttle levers in neutral, depress the clutch pedal and start the engine.

NOTE: A neutral start switch prevents operation of the starting motor unless the shuttle lever is in neutral and the clutch pedal is depressed.

For forward travel, with the engine idling, depress the clutch pedal and move the range lever (1), forward to the High range or rearward to the Low range, as required.

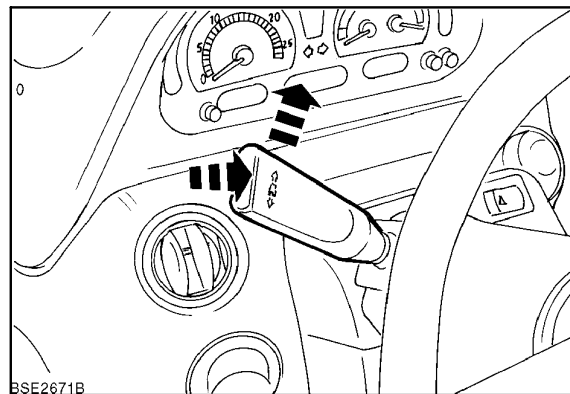


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When the tractor is initially started and the main shift lever placed in gear, the electronic control will automatically select the appropriate powershift ratio for a smooth pull away, as follows:

Gear Lever Positions	Ratio Selected
Field range (Low), 1 to 8	5th. gear
Road range (High), 9 to 16	9th. gear

For forward travel, with the engine idling, pull the shuttle lever, toward the steering wheel, against light spring-pressure, and move it up. It is not necessary to depress the clutch pedal.

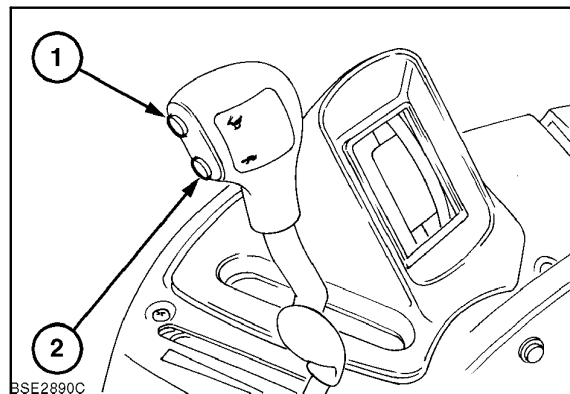


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IMPORTANT: To select 14th gear or above, the tractor must be travelling at a suitable speed before the higher gears will engage. 14th gear or above cannot be engaged when the tractor is stationary.

Once moving, press the upshift button (1), three times and gears 6, 7 and 8 will be selected in sequence. Alternatively, hold the button in and the transmission will make sequential gear changes at 1.75 second intervals until the button is released or 8th. gear is reached. Use the downshift button (2) in the same manner to make down shifts.

IMPORTANT: Downshifts of either one or more gears, cannot be made if the tractor engine speed is too high. To downshift, reduce tractor speed (and therefore engine speed) before attempting to downshift.



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IMPORTANT: Always use the clutch pedal when changing between ranges 8th and 9th gears.

NOTE: When operating in temperatures below -18°C (0°F) with cold transmission oil, avoid excessive shuttle operations until the oil has warmed up.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

To reverse the direction of travel pull the shuttle lever toward the steering wheel, then move it down. Transmission output speed and clutch pack engagement are automatically monitored to take up the drive smoothly in the opposite direction. Control tractor speed by means of the throttle.

NOTE: If, for example, 3rd. gear is selected in forward travel, then the same ratio will be selected when the shuttle lever is moved to the reverse travel position.

If it is necessary to hillstart with a heavy trailer in low range then, when 8th. speed is reached, change to the high range, the transmission will automatically select the lowest ratio (9th.) in the high range.

When starting off in the highest range, the transmission will always try to set off in 9th. gear. If required, this feature may be overridden and a higher gear selected by partially releasing the clutch then powershifting up to the required gear before the clutch 'bite' point is reached.

IMPORTANT: A tractor with electronic transmission cannot be tow-started and must not be towed other than to remove it from a field or onto a trailer or truck.

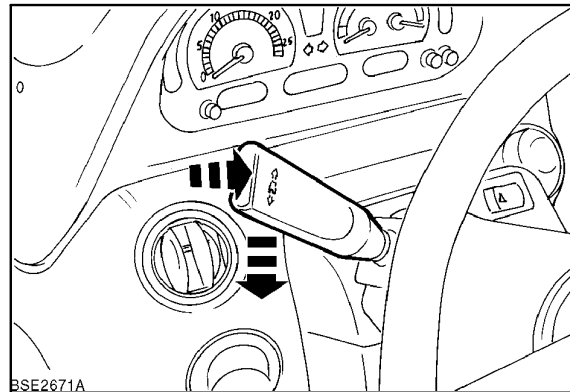
Changing the Shuttle (reverse) Gear (Digital Gear Display Only)

For certain applications it may be beneficial to change the reverse gear ratio from the one normally selected when shuttling i.e. 4th forward gear will be matched by 4th reverse gear. If required, a reverse ratio up to three gears higher, or lower, may be set **providing they are within the same range.**

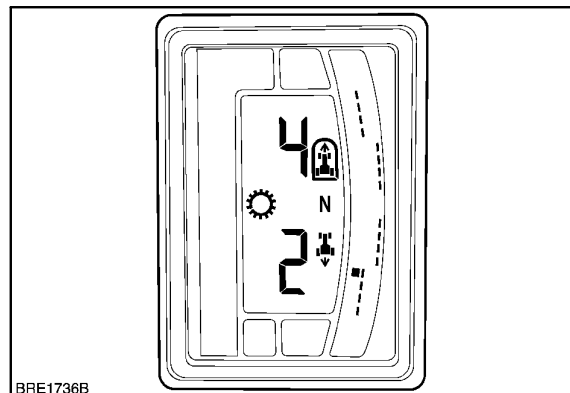
To select an alternative reverse ratio to the default gear i.e. 4th, move the shuttle lever into reverse and, with the tractor moving select 2nd gear using the downshift button. The transmission will now automatically select 2nd gear when moving the shuttle lever into reverse.

This procedure may be applied in gear ranges 1-4 and 5-8. When moving from one range to another, either upwards or downwards, the default reverse gear will always be selected until the operator chooses an alternative ratio.

When operating in the higher ratios 13-16, the default reverse gear will always be 9th unless a lower ratio is selected by the operator.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Speed Matching

Speed matching will normally only permit a downshift to a lower gear. It will however, select a higher gear if the the engine attempts to overspeed.

When travelling on the road in High range, gears 13 to 16, the transmission will automatically select a gear to match engine speed to road speed if the following method is adopted:

To downshift: Decrease engine speed, depress the clutch pedal while simultaneously increasing engine speed by pressing the foot throttle further down. When the clutch pedal is released, the transmission will automatically select a lower gear (provided 13th. speed is not already selected) matching engine speed to road speed.

NOTE: *When operating in Auto Shift high range, the lowest downshift gear will become 9th, see text on Auto Shift.*

In high range, the operator can manually select another gear without affecting the speed matching function.

With the range lever placed in low, speed matching will operate down to 5th gear.

NOTE: *The speed matching function will be disabled if the operator manually selects a gear when in the low range.*

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Auto Shift Function (Active Electro Command Only)

With Auto Shift engaged, the transmission on your tractor is able to make automatic gearshifts, both up and down, within a 4 gear span based on speed and load. This can be extended to an 8 gear auto shift in the high range for road use.

Auto Shifting in Active Field Gears

In Active Field, auto shifts can be made within gear spans 1-4 or 5-8. With the main shift lever in the low range (lever fully rearward), momentarily depress the Auto Shift button (1). The Active Field symbol (plough) will appear in the gear display and the Auto switch will illuminate to confirm engagement.

Moving off in 1st gear, the transmission will automatically upshift through gears 2 and 3 until 4th gear is engaged. To Auto Shift through gears 5 to 8, select 5th gear using the range change button and depress the Auto Shift button again, the transmission will now automatically upshift through gears 5 to 8.

As the tractor speed reduces, or the load on the engine increases, the transmission will automatically downshift to a lower gear.

If necessary, Active Field can be extended to include gears 9 to 12. To engage, move the main shift lever fully forward to select any gear in the 9 to 12 range, then depress the Auto Shift button again. To confirm engagement, both Active Field and Active Road symbols will illuminate.

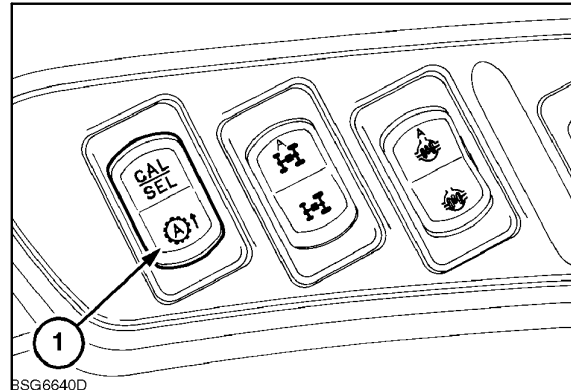
In ranges 1-4, 5-8 and 9-12, Auto Shift may be linked to 3-point hitch operation. Raising the 3-point hitch with the fast raise switch will put Auto Shift into standby mode, lowering the hitch will re-activate the Auto Shift function.

NOTE: If the 3-point hitch was in the raised position when the Auto Shift function was activated and has not been moved, then Auto Shift will operate without lowering the hitch.

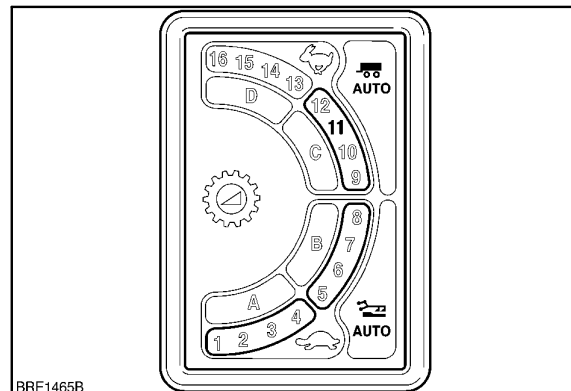
Auto Shift will also enter standby mode if the clutch pedal is depressed or the shuttle lever is moved from the forward drive position.

To cancel Auto Shift press and release the switch or operate the upshift or downshift button.

NOTE: When using engine braking to slow the tractor, operating the upshift or downshift buttons will not disable Auto Shift unless the selected gear is outside the Auto Shift range.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Changing the Active Field Auto Shift Gear Span

In some field operations it may be beneficial to reduce the number of Auto Shift gears in the span to provide a more consistent tractor speed or engine speed.

The Active Field Auto Shift function normally operates within a four gear span, such as 1-4, 5-8 or 9-12. However, the number of auto shifts within a selected range may be reduced from a 4 gear span to a 3, or a 2 gear span as required.

NOTE: All adjustments to the Auto Shift span must be made with the tractor moving and the relative Auto Shift range selected.

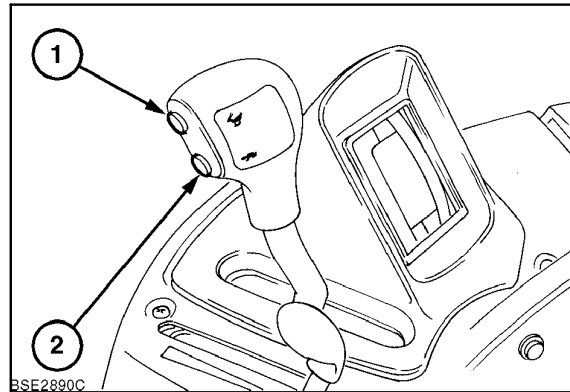
NOTE: Changes made to the Auto Shift gear span will not be retained at key-off.

Reducing the gear span upper limit: Increase tractor speed until the current Auto Shift upper gear is engaged then momentarily depress the downshift button (2). The transmission will downshift one gear which becomes the new upper limit Auto Shift gear. To reduce the span further, depress the downshift button again.

Raising the gear span upper limit: Increase tractor speed until the upper gear is engaged then momentarily depress the upshift button (1). Providing the currently engaged gear is not the highest in the range, the transmission will upshift to the next gear. This becomes the new Auto Shift upper limit gear.

Reducing the gear span lower limit: Slow the tractor until the lowest Auto Shift gear is engaged and depress the downshift button (2) once. Providing the currently engaged gear is not the lowest in the range, the transmission will downshift one gear. This becomes the new lower limit Auto Shift gear.

Raising the gear span lower limit: Reduce tractor speed until the lowest Auto Shift gear is engaged and momentarily depress the upshift button (2). The transmission will upshift one gear, this becomes the new lower limit Auto Shift gear.



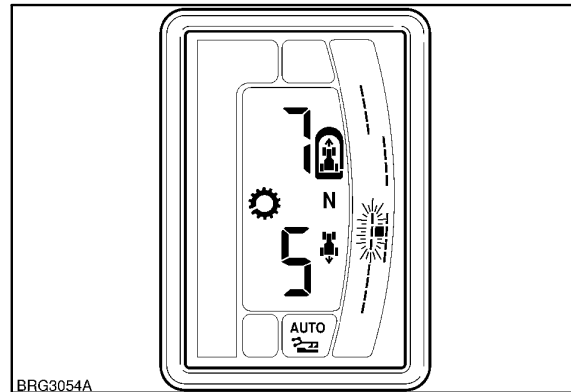
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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

The Auto Shift gear span is shown in the transmission display. Figures 142 and 143 show a 3 gear span of 6, 7 and 8. The currently selected gear is 7th.

Digital Display: The span of gears will be represented by flashing bars and the selected gear by the solid block, see Figure 142.

LED Display: The span of gears will be identified by flashing digits and the engaged gear by the permanently lit digit, see Figure 143.



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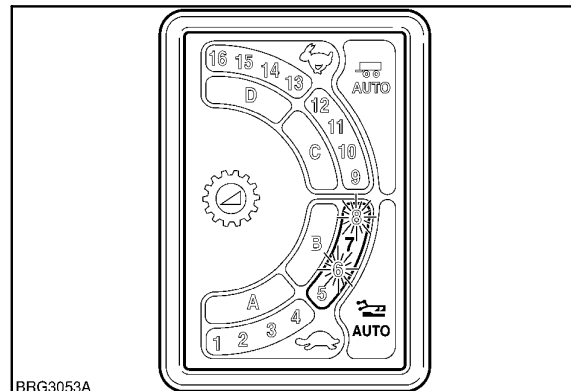
142

With Auto Shift in standby mode, the operator can manually shift to any gear, even if it is outside the current range of Auto Shift gears. Providing the operator selects a gear within the current Auto Shift range prior to exiting standby mode (i.e. lowering the 3-point hitch), then the Auto Shift function will be resumed.

However, if the gear selected is outside the current range when exiting standby, the Auto Shift function will be cancelled.

If 8th gear is selected and the Auto Shift span is 5, 6 and 7, then the transmission will immediately downshift to 7th gear on exiting standby mode.

If the Auto Shift span is 6, 7 and 8 and 5th gear is selected on exiting the standby mode, then the transmission will remain in 5th until conditions permit a normal auto upshift to 6th gear. At this point the original Auto Shift gear span of 6, 7, and 8 will be re-instated.



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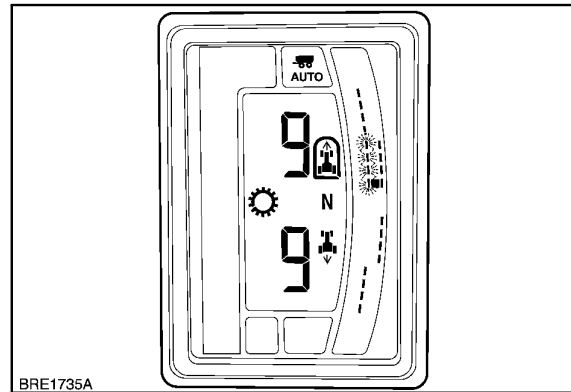
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Auto Shifting in Road Gears

In Active Road, Auto Shift will make upshifts or downshifts through gears 9-12 or 13-16. With the main shift lever moved fully forward, momentarily depress the Auto Shift button (1), the Active Road symbol (trailer) will illuminate in the gear display to confirm engagement.

The transmission will now make automatic shifts through gears 9 to 12 or 13 to 16 dependant on the range selected.

By depressing the Auto Shift button twice, Active Road can be programmed to automatically upshift or downshift through gears 9 to 16 including the range change from 12th to 13th gear.



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Changing the Shift Point

To suit different applications, the point at which the transmission makes an automatic gear shift may be adjusted from the default setting of 20%. Auto Shift gear changes are related to an increase or decrease in engine speed which can be set at 5, 10, 15, 20 or 25 percent.

NOTE: For transport operations the shift point will automatically default to 20% if a lower figure has been set. If the shift point is set at 25%, it will remain at that setting.

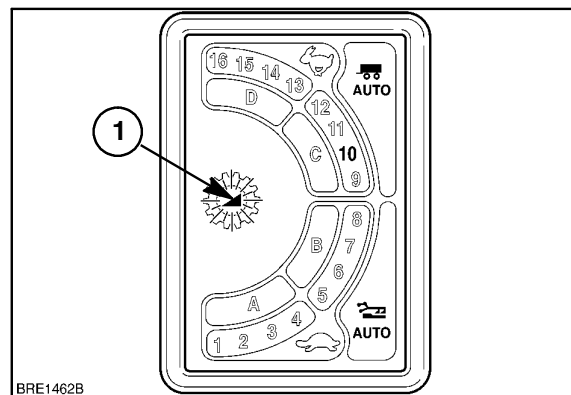
With the shift point set at 10%, a transmission upshift will occur every time the engine speed increases by 10%. Consequently, as the engine speed decreases by the same amount, the transmission will make a downshift.

It is recommended that during field operations the shift point is set at a low percentage, and for road transport applications, set at a higher figure.

To change the shift point, depress and hold the Auto Shift button for at least one second. The current shift point figure appears in the Display of Gears and the 'ramp' symbol (1) begins to flash. Depress the Auto Shift button repeatedly to scroll through the shift points.

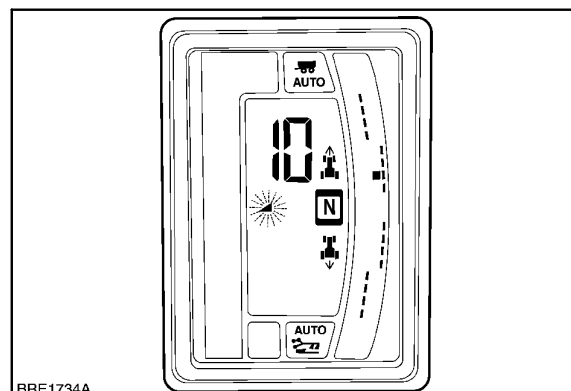
With the new shift point selected, release the Auto Shift button and pause for five seconds. The new setting will be memorised and the display will return to normal.

IMPORTANT: At key-off (engine stop), electronic programme settings made during tractor operation are transferred from the operating memory to the main memory. To provide sufficient time for the data to transfer, allow a minimum of five seconds delay before turning the key on again.



BRE1462B

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BRE1734A

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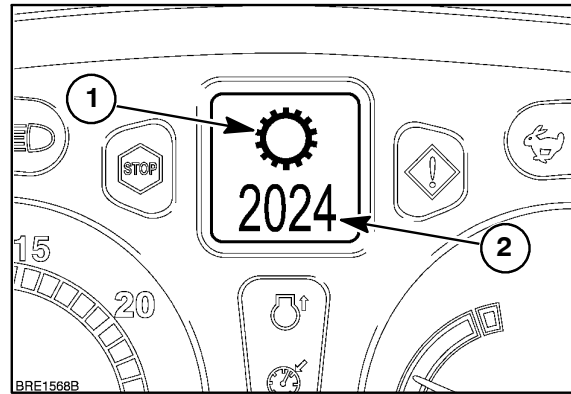
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Error Codes

In the unlikely event of a fault occurring in the transmission controls or electronic circuitry, the malfunction symbol (1) and a four-digit error code (2), will appear in the Dot Matrix Display.

The code indicates the faulty circuit or sensor and the type of fault, e.g., open circuit, short circuit, etc. In this event, the tractor will require the attention of your authorised dealer.

Should a fault occur causing the tractor to become disabled, contact your authorised dealer and report the error code displayed.



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There are a number of 'action required' error codes which can also appear in the Dot Matrix Display, these are listed below.

Error Code	Fault
P	Park brake on.
N	Place the shuttle lever in neutral.
CP	Depress clutch pedal to enable transmission (restore drive).

Transmission Calibration

Should transmission shifts become slow or jerky, the clutches in the transmission may require re-calibrating. Consult your authorised dealer.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Creeper Gears (where fitted)

For operations requiring extra low ground speeds, reduction gear sets (creeper gears) are available. The reduction gear set is installed within the rear axle assembly.

As the name implies, the reduction gear set has the effect of reducing all the ratios within the main transmission to provide an additional sixteen gears in forward and reverse.

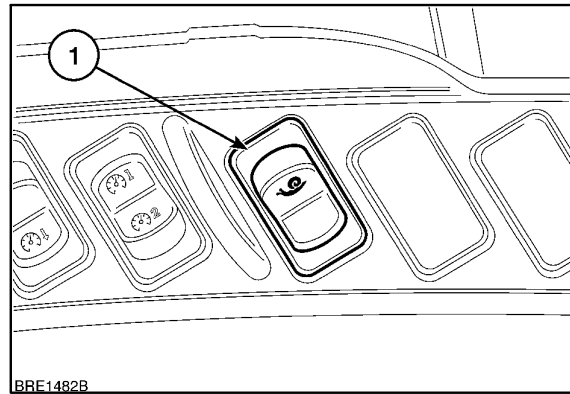
The creeper gears are selected by means of a rocker switch (1) located on the right-hand control console.

With the engine running, clutch depressed and the shuttle lever in neutral, apply and hold down the tractor footbrakes. Momentarily depress the upper part of the selector switch (1), Figure 148, to engage the creeper gears.

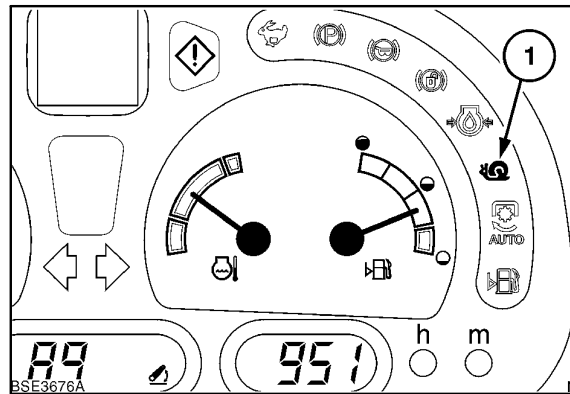
The creep speed symbol (1), will appear flashing in the transmission display. When the creep gears are fully engaged the symbol will cease to flash and become steady.

To disengage creeper gears, repeat the above procedure and depress the selector switch again. The creep speed symbol will cease to illuminate.

IMPORTANT: The creeper gears offer very low ground speeds. Do not use the low gearing advantage to apply excessive draft loads to the tractor.



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 30 Km/h Transmission (16 x 16) and Creeper Speeds -Models with Light Duty Rear Axle***

Gear Ratio	Range	Rear Tyre Size			
		18.4R-34, 520/70R-34			
FORWARD RATIOS		Standard Speeds		Creeper Speeds	
F1	A	2.40	(1.50)	0.24	(0.15)
F2	A	2.94	(1.83)	0.29	(0.18)
F3	A	3.59	(2.24)	0.36	(0.22)
F4	A	4.39	(2.74)	0.44	(0.27)
F5	B	5.65	(3.52)	0.56	(0.35)
F6	B	6.90	(4.30)	0.69	(0.43)
F7	B	8.44	(5.26)	0.84	(0.52)
F8	B	10.31	(6.43)	1.02	(0.64)
F9	C	7.47	(4.66)	0.74	(0.46)
F10	C	9.12	(5.69)	0.91	(0.57)
F11	C	11.16	(6.96)	1.11	(0.69)
F12	C	13.63	(8.50)	1.35	(0.84)
F13	D	17.54	(10.94)	1.74	(1.09)
F14	D	21.43	(13.36)	2.13	(1.33)
F15	D	26.21	(16.35)	2.60	(1.62)
F16	D	32.02	(19.97)	3.18	(1.98)

REVERSE RATIOS		Standard Speeds		Creeper Speeds	
R1	A	2.38	(1.48)	0.24	(0.15)
R2	A	2.90	(1.81)	0.29	(0.18)
R3	A	3.55	(2.21)	0.35	(0.22)
R4	A	4.34	(2.71)	0.43	(0.27)
R5	B	5.58	(3.48)	0.56	(0.35)
R6	B	6.82	(4.25)	0.68	(0.42)
R7	B	8.34	(5.20)	0.83	(0.52)
R8	B	10.19	(6.35)	1.01	(0.63)
R9	C	7.38	(4.60)	0.73	(0.46)
R10	C	9.01	(5.62)	0.90	(0.56)
R11	C	11.03	(6.88)	1.10	(0.68)
R12	C	13.47	(8.40)	1.34	(0.84)
R13	D	17.33	(10.81)	1.72	(1.07)
R14	D	21.18	(13.21)	2.11	(1.31)
R15	D	25.90	(16.16)	2.57	(1.61)
R16	D	31.65	(19.74)	3.15	(1.96)

***See page 3-138**

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

**GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min)
with 30 Km/h Transmission (16 x 16) and Creeper Speeds - Models with Heavy Duty Rear Axle***

Gear Ratio	Range	Rear Tyre Size			
		18.4R-38, 520/70R-38, 600/65R-38			
FORWARD RATIOS		Standard Speeds		Creeper Speeds	
F1	A	2.28	(1.42)	0.23	(0.14)
F2	A	2.78	(1.73)	0.28	(0.17)
F3	A	3.40	(2.12)	0.34	(0.21)
F4	A	4.15	(2.59)	0.41	(0.26)
F5	B	5.35	(3.33)	0.53	(0.33)
F6	B	6.53	(4.07)	0.65	(0.40)
F7	B	7.98	(4.98)	0.79	(0.50)
F8	B	9.75	(6.08)	0.97	(0.61)
F9	C	7.07	(4.41)	0.70	(0.44)
F10	C	8.63	(5.39)	0.86	(0.54)
F11	C	10.56	(6.58)	1.05	(0.65)
F12	C	12.90	(8.04)	1.28	(0.80)
F13	D	16.60	(10.35)	1.65	(1.03)
F14	D	20.28	(12.65)	2.02	(1.26)
F15	D	24.80	(15.47)	2.47	(1.54)
F16	D	30.30	(18.90)	3.01	(1.88)

REVERSE RATIOS		Standard Speeds		Creeper Speeds	
R1	A	2.25	(1.40)	0.22	(0.14)
R2	A	2.75	(1.71)	0.27	(0.17)
R3	A	3.36	(2.10)	0.33	(0.21)
R4	A	4.11	(2.56)	0.41	(0.25)
R5	B	5.28	(3.29)	0.53	(0.33)
R6	B	6.45	(4.03)	0.64	(0.40)
R7	B	7.89	(4.92)	0.78	(0.49)
R8	B	9.64	(6.01)	0.96	(0.60)
R9	C	6.98	(4.36)	0.69	(0.43)
R10	C	8.53	(5.32)	0.85	(0.53)
R11	C	10.44	(6.51)	1.04	(0.65)
R12	C	12.75	(7.95)	1.27	(0.79)
R13	D	16.41	(10.23)	1.63	(1.02)
R14	D	20.05	(12.50)	1.99	(1.24)
R15	D	24.52	(15.29)	2.44	(1.52)
R16	D	29.96	(18.67)	2.98	(1.86)

*See page 3-138

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min) with 40 and 50 Km/h Transmission (16 x 16 or 17 x 16) and Creeper Speeds - Models with Light Duty Rear Axle*

Gear Ratio	Range	Rear Tyre Size			
		18.4R-34, 520/70R-34			
FORWARD RATIOS		Standard Speeds		Creeper Speeds	
F1	A	2.39	(1.49)	0.24	(0.15)
F2	A	2.94	(1.83)	0.29	(0.18)
F3	A	3.58	(2.23)	0.36	(0.22)
F4	A	4.39	(2.74)	0.44	(0.27)
F5	B	5.62	(3.51)	0.56	(0.35)
F6	B	6.90	(4.30)	0.69	(0.43)
F7	B	8.40	(5.24)	0.84	(0.52)
F8	B	10.30	(6.43)	1.02	(0.64)
F9	C	9.36	(5.84)	0.93	(0.58)
F10	C	11.48	(7.16)	1.14	(0.71)
F11	C	13.98	(8.72)	1.39	(0.87)
F12	C	17.15	(10.70)	1.71	(1.06)
F13	D	21.99	(13.72)	2.19	(1.36)
F14	D	26.98	(16.82)	2.68	(1.67)
F15	D	32.85	(20.49)	3.27	(2.04)
F16	D	40.29	(25.13)	4.01	(2.50)
F17	D	45.65	(28.36)	-	-

NOTE: Ratio F17 not available with 40 km/h transmission

NOTE: Creeper Speeds not available with 50 km/h transmission

REVERSE RATIOS		Standard Speeds	Creeper Speeds
R1	A	2.37 (1.48)	0.24 (0.15)
R2	A	2.90 (1.81)	0.29 (0.18)
R3	A	3.53 (2.20)	0.35 (0.22)
R4	A	4.34 (2.70)	0.43 (0.27)
R5	B	5.56 (3.47)	0.55 (0.34)
R6	B	6.82 (4.25)	0.68 (0.42)
R7	B	8.30 (5.18)	0.83 (0.51)
R8	B	10.89 (6.35)	1.01 (0.63)
R9	C	9.25 (5.77)	0.92 (0.57)
R10	C	11.35 (7.08)	1.13 (0.70)
R11	C	13.82 (8.62)	1.37 (0.86)
R12	C	16.95 (10.57)	1.69 (1.05)
R13	D	21.73 (13.56)	2.16 (1.35)
R14	D	26.66 (16.63)	2.65 (1.65)
R15	D	32.46 (20.25)	3.23 (2.01)
R16	D	39.82 (24.84)	3.96 (2.47)

*See page 3-138

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

GROUND SPEEDS in Km/h and (MPH) at Rated Engine Speed (2200 rev/min) with 40 and 50 Km/h Transmission (16 x 16 or 17 x 16) and Creeper Speeds - Models with Heavy Duty Rear Axle*

Gear Ratio	Range	Rear Tyre Size			
		18.4R-38, 520/70R-38, 600/65R-38			
FORWARD RATIOS		Standard Speeds		Creeper Speeds	
F1	A	2.27	(1.41)	0.19	(0.12)
F2	A	2.78	(1.73)	0.23	(0.14)
F3	A	3.39	(2.11)	0.28	(0.17)
F4	A	4.15	(2.59)	0.34	(0.21)
F5	B	5.32	(3.32)	0.53	(0.33)
F6	B	6.53	(5.32)	0.65	(0.40)
F7	B	7.95	(4.96)	0.79	(0.49)
F8	B	9.75	(6.08)	0.97	(0.61)
F9	C	8.86	(5.53)	0.88	(0.55)
F10	C	10.87	(6.78)	1.08	(0.67)
F11	C	13.24	(8.26)	1.32	(0.82)
F12	C	16.24	(10.13)	1.61	(1.01)
F13	D	20.82	(12.98)	2.07	(1.29)
F14	D	25.54	(15.93)	2.54	(1.58)
F15	D	31.09	(19.39)	3.09	(1.93)
F16	D	38.14	(23.79)	3.79	(2.37)
F17	D	45.82	(28.47)	-	-

NOTE: Ratio F17 not available with 40 km/h transmission

NOTE: Creeper Speeds not available with 50 km/h transmission

REVERSE RATIOS		Standard Speeds		Creeper Speeds	
R1	A	2.24	(1.40)	0.19	(0.12)
R2	A	2.75	(1.71)	0.23	(0.14)
R3	A	3.35	(2.09)	0.28	(0.17)
R4	A	4.10	(2.56)	0.34	(0.21)
R5	B	5.26	(3.28)	0.52	(0.33)
R6	B	6.45	(4.03)	0.64	(0.40)
R7	B	7.86	(4.90)	0.78	(0.49)
R8	B	9.64	(6.01)	0.96	(0.60)
R9	C	8.76	(5.46)	0.87	(0.54)
R10	C	10.74	(6.70)	1.07	(0.67)
R11	C	13.08	(8.16)	1.30	(0.81)
R12	C	16.05	(10.01)	1.60	(0.99)
R13	D	20.57	(12.83)	2.05	(1.28)
R14	D	25.24	(15.74)	2.51	(1.56)
R15	D	30.73	(19.17)	3.06	(1.91)
R16	D	37.70	(23.51)	3.75	(2.34)

*See page 3-138

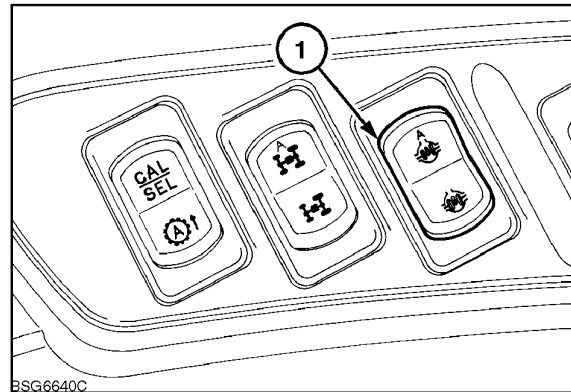
SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

DIFFERENTIAL LOCK

Four wheel drive tractors have a differential lock installed in the front and rear axles to lock all four wheels together in conditions where wheel slip may occur. Two wheel drive tractors have a differential lock in the rear axle only.

The differential locks are controlled by a spring centered rocker switch on the console to the right of the seat.

The differential lock(s) may be operated in manual mode or automatic mode. To confirm mode selected, the appropriate symbol on the switch will illuminate when engaged.



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WARNING

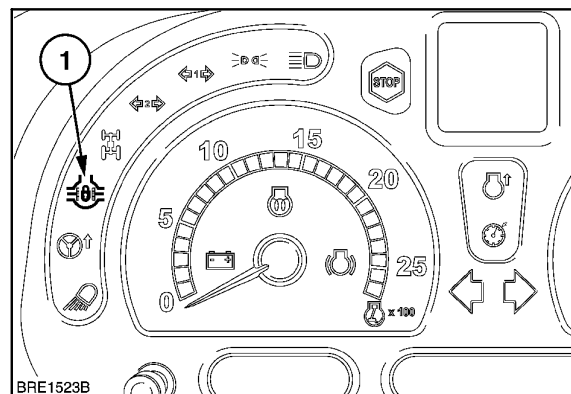
Avoid using the differential lock at speeds above 8km/h (5 MPH) and never at speeds above 15 km/h (9 MPH) or at any time when turning the tractor. When engaged, the differential lock will make steering the tractor very difficult.

IMPORTANT: If wheel spin is encountered, reduce engine speed before engaging the differential lock, to avoid shock loads to the transmission.

Operating in Manual Mode

In slippery conditions, momentarily depress the bottom of the switch (1) Figure 150 , to lock both wheels together. The differential lock(s) will engage and a warning light in the switch and on the instrument panel (2) will light up.

When one or both brake pedals are applied or if the switch is returned to the off (central) position, disengagement will occur and the warning lights in the switch and instrument panel will go out. Alternatively, depress the bottom of the switch again to disengage the differential lock(s).



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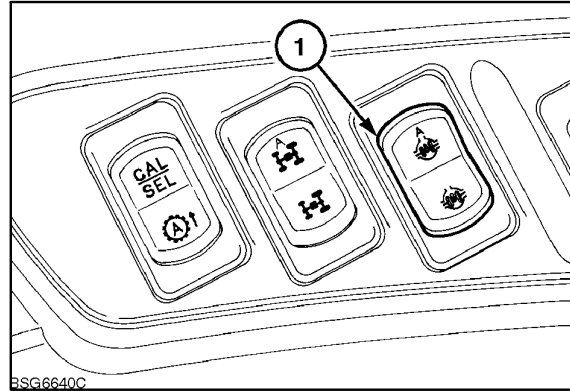
NOTE: The lock(s) will remain engaged until traction at the wheels equalises.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

Operating in Automatic Mode (where fitted)

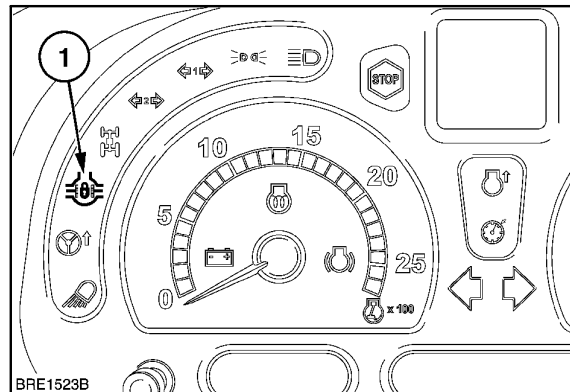
To engage both front and rear differential locks in automatic mode, depress the top of the switch (1). The warning light in the switch will illuminate. The indicator light (1) Figure 153 on the instrument panel will also illuminate but will only remain lit while the differential locks are engaged.

In automatic mode, disengagement of the locks will occur as follows:



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Fast raise switch activated (to raise the rear 3-point hitch)	Temporary disengagement (will re-engage when 3-point hitch is lowered)
Either brake pedal is applied	Temporary disengagement
Both brake pedals are applied simultaneously	Differential lock remains engaged
Tractor speed exceeds 15 Km/h (9 MPH)	Differential locks will permanently disengage
Front steering angle exceeds pre-set limits (where fitted)	Temporary disengagement (will re-engage when steering angle is reduced)
Momentarily depress the top of the differential lock rocker switch	Differential locks will permanently disengage



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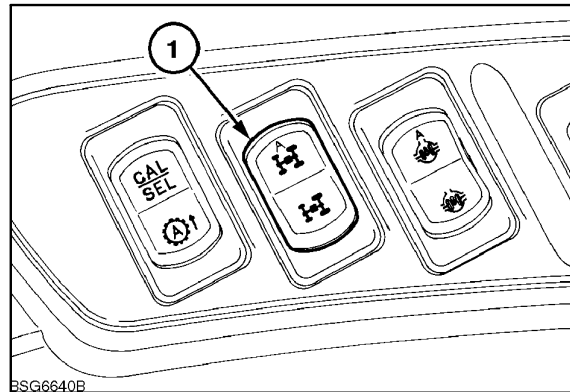
NOTE: If the differential lock is active when the key-start is turned off, it will remain active when the key-start is switched on again.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

FOUR WHEEL DRIVE (where fitted)

Four wheel drive greatly improves traction in difficult conditions. The drive to the front wheels is designed to be engaged or disengaged with the tractor stationary or moving.

NOTE: The drive to the front wheels is actuated by a three position rocker switch on the right-hand control console. To confirm mode selected, the appropriate symbol on the switch will illuminate when engaged.



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Operating in Manual Mode

Press the bottom of the switch to engage the drive to the front wheels. Warning lights in the switch and instrument panel will illuminate when four wheel drive is engaged. To disengage four wheel drive return the switch to the off (central) position.

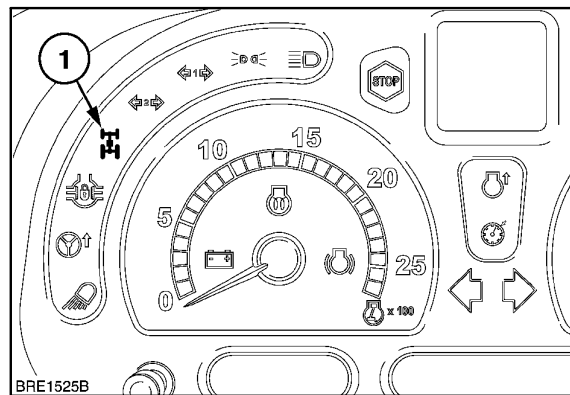
NOTE: If four wheel drive is engaged when the key-start is turned off, it will remain engaged when the key-start is switched on again.

Operating in Automatic Mode (where fitted)

To engage automatic four wheel drive mode momentarily depress the top of the four wheel drive switch (1) Figure 154. The warning light in the switch will illuminate. The indicator light (1) Figure 155 on the instrument panel will also illuminate but will only remain lit while four wheel drive is engaged.

Four wheel drive will remain permanently engaged unless one of the following occurs:

- Wheel speed exceeds 20 Km/h (12.4 MPH). Four wheel drive will re-engage when wheel speed falls below 18 Km/h (11.1 MPH)



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SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

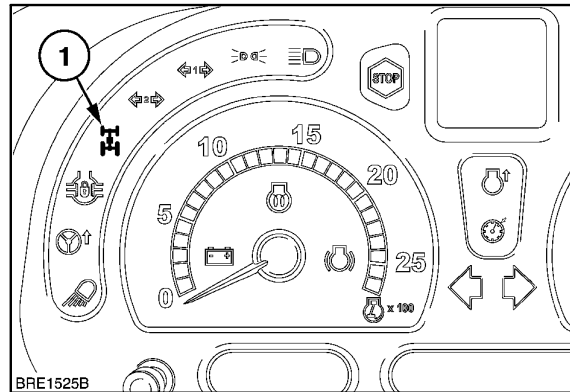
NOTE: The following applies only to tractors fitted with a steering angle sensor.

- Wheel speed falls below 10 Km/h (6.2 MPH) and steering angle exceeds 30° (21° with SuperSteer). Four wheel drive will re-engage when the steering angle is reduced.
- Wheel speed is between 10 and 20 Km/h (6.2 and 12.4 MPH) and steering angle exceeds 25° (17° with SuperSteer). Four wheel drive will re-engage when the steering angle is reduced.

NOTE: The above steering angles are set during manufacture, if an alternative angle setting is required, consult your authorised dealer.

The indicator light (1) Figure 156 on the instrument panel will also illuminate but will only remain lit when four wheel drive is engaged.

NOTE: To avoid excessive tyre wear when travelling on the public highway or any hard surface, it is recommended that four wheel drive be disengaged.



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⚠ WARNING ⚠

Tractors with four wheel drive engaged or disengaged should not be allowed to overspeed by towing or coasting downhill with clutch depressed or transmission in neutral. This may cause loss of control, personal injury to the operator or bystanders or failure of the drive shaft.

NOTE: Keep the tractor in the same gear going downhill as would be used when going uphill.

⚠ WARNING ⚠

Your tractor is equipped with very efficient, hydraulically actuated rear wheel brakes. On four wheel drive tractors the drive to the front axle is automatically engaged, at speeds above 8.5 km/h (5.2 MPH), when the brakes are applied, to provide four wheel braking. Owners should be aware of the effectiveness of four wheel braking which greatly enhances braking performance. Care should be taken during heavy braking, particularly if the rear of the tractor is unballasted.

SECTION 2 - CONTROLS, INSTRUMENTS AND OPERATION

TERRAGLIDE™ FRONT AXLE SUSPENSION (where fitted)

The optional, self-levelling, front axle suspension will provide improved stability, control, comfort and traction. Terraglide is automatically activated each time the tractor is started but will not function at speeds below 1.5 k/mh (0.9 MPH).

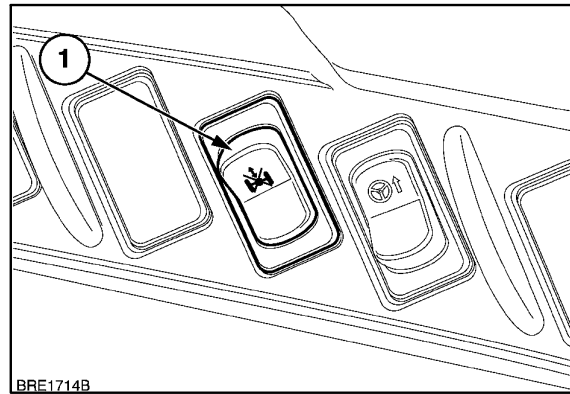
When operating at speeds up to 12 k/mh (7.4 MPH), the front axle suspension may be locked out if not required. A warning light in the switch will indicate lock out is engaged.

To lock out the suspension, press the top of the switch (1) on the right-hand control panel. Press the top of the switch again to reactivate the suspension facility.

At speeds above 12 k/mh (7.4 MPH), the suspension will automatically re-engage, overriding axle lock out. In this situation the warning light will remain on.

NOTE: Should the lock out switch warning light begin to flash, this would indicate a malfunction of the suspension system. Consult your authorised dealer.

IMPORTANT: See *Ballasting and Tyres*, page 3-136, regarding the use of front end weights with front axle suspension.



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⚠ WARNING ⚠

Hydraulic oil in the front axle suspension system operates under very high pressure. Escaping hydraulic oil under pressure can penetrate the skin causing serious injury. Unqualified persons should not attempt to disconnect any pipework in the front axle hydraulic system. Failure to follow these instructions can result in serious injury.

⚠ WARNING ⚠

If a transmission ratio is engaged, with the engine running and the tractor supported on axle stands, the self-levelling function of the suspension may cause the axle to make corrections (move up and down). The suspension should be locked out to maintain stability.

SECTION 3 FIELD OPERATION

BEFORE OPERATING

 **CAUTION**  —————
Before driving or operating the tractor, study the safety precautions in Section 1 of this Manual.

Read this section carefully for a thorough understanding of operational requirements. Even if you operate other tractors, you should thoroughly read this section of the manual and ensure that you are familiar with the location and function of all the features of the tractor.

Do not start the engine or attempt to drive or operate the tractor until you are fully accustomed with all the controls. It is too late to learn once the tractor is moving. If in doubt about any aspect of operation of the tractor, consult your authorised dealer.

See Section 4 for lubrication and maintenance requirements. Tractor specifications will be found in Section 8.

This section is split into a number of different subjects, as follows. A comprehensive index is provided at the end of this manual.

PROGRAMMING TRACTOR FUNCTIONS

Your tractor utilises two memory facilities to control and memorise settings for the various electronic functions. The operating memory temporarily stores setting adjustments made while operating the tractor and these are uploaded to the main memory when you key-off (engine stop).

If you key-off and key-on again too quickly as data is being uploaded, some of it may be lost or corrupted.

If you have made changes to any memorised settings while operating the tractor, pause for five seconds between key-off and key-on to allow the data to upload from the operating memory to the main memory. Once uploaded, the new settings will remain unchanged until they are re-programmed.

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SECTION 3 - FIELD OPERATION

RUNNING-IN PROCEDURE

Your new tractor will provide long and dependable service if given proper care during the 50 hour running-in period and if serviced at the recommended intervals.

Avoid overloading the engine. Operating in too high a gear under heavy load may cause excessive engine overloading. Overloading occurs when the engine will not respond to a throttle increase.

Do not operate without a load on the engine. This can be as harmful to the engine as overloading. Vary the type of operation undertaken so that the engine is subjected to heavy as well as light loads during the running-in period.

Use the lower gear ratios when pulling heavy loads and avoid continuous operation at constant engine speeds. Operating the tractor in too low a gear with a light load and high engine speed will waste fuel. You will save fuel and minimise engine wear by selecting the correct gear ratio for each particular operation.

Check the instruments and warning lights frequently and keep the radiator and various oil reservoirs filled to the recommended levels.

PRE-OPERATION CHECKS

Before operating the tractor, ensure that you are thoroughly familiar with the location and operation of the controls.

Perform all daily lubrication and maintenance operations in accordance with Section 4.

After completing the daily maintenance operations, perform a walk around visual inspection of the tractor. Pay particular attention to the following items:

- Fan belt for cracks
- Engine area for accumulation of debris
- Hoses, lines and fittings for leaks or damage.
- Tyres for damage
- Hardware for looseness
- Driveline and hydraulic pump areas for leaks or debris accumulation

Make any necessary repairs before using the tractor.

PRESSURE WASHING THE TRACTOR

Your tractor is equipped with a number of electronic control units (ECU's) that are linked to various sensors throughout the vehicle. The ECU's control, monitor, and provide information relating to engine, transmission, P.T.O. and hydraulic functions.

It is very important therefore, when cleaning the tractor body or chassis with a high pressure water jet, that care should be taken not to aim the water jet directly at any electrical component, wiring harness or connector.

SECTION 3 - FIELD OPERATION

TOWING THE TRACTOR

IMPORTANT: The tractor should only be towed a short distance, such as out of a building. Do not tow on roadways or as a method of transport.

IMPORTANT: If it is necessary to tow the tractor, all **gear levers must** be moved to the **neutral position** **before** stopping the engine otherwise damage to transmission components may occur during towing. If creeper gears (reduction gear set) are fitted, then the selector control must be in the **off** position.

Use a strong chain when towing the tractor. Tow the tractor from the rear using only the drawbar, rear tow hitch or the three-point hitch. Tow the tractor from the front using the tow pin in the front weights or front support. Have an operator steer and brake the tractor.

To avoid damaging the transmission or other components that turn but are not lubricated during towing, observe the following:

- Only tow a short distance
- Keep speed below 5 MPH (8 km/h)
- If possible, run the engine to provide lubrication to the transmission and power steering.

CAUTION

Do not tow the tractor faster than 8 Km/h (5 MPH). The steering is much slower and steering wheel effort is much greater without the engine running.

WARNING

Do not use cables or rope to tow the tractor. If the cable or rope breaks or slips, it may whip with sufficient force to cause serious injury. When using a chain, attach the chain with the hook open side facing up. If the hook slips, it will drop down instead of flying up.

NOTE: Four wheel drive will be engaged if the engine is not running, regardless of the position of the 4WD activation switch.

CARRYING THE TRACTOR ON A TRANSPORTER

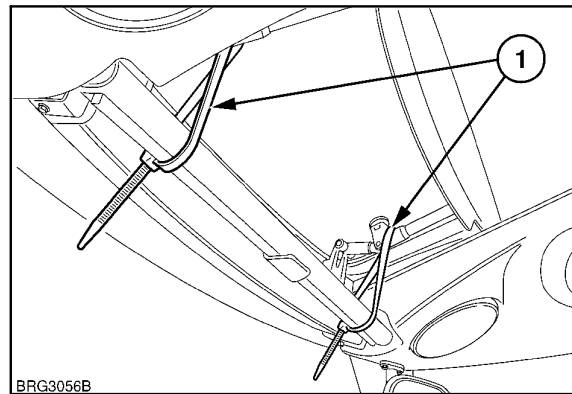
Transport the tractor with all four wheels on a flat bed trailer or truck. Securely chain the tractor to the transporter.

IMPORTANT: Do not chain around the four wheel drive shaft, steering cylinders, front wheel drive axle or other components that could be damaged by contacting the chain or by heavy loading.

Use the drawbar or drawbar hanger for a rear tie down point.

IMPORTANT: Cover the silencer outlet so that the wind does not spin the turbocharger and damage the bearings. Turbocharger turbine freewheeling (turning without engine running) must be avoided since lubrication will not be provided to the turbocharger bearings.

Where road speeds in excess of 50 Km/h (31 MPH) are likely to occur when transporting the tractor, it is advisable to secure the high visibility roof panel with ties to prevent it from opening.



1

Secure **both** handles to the sunvisor support using a flexible strap such as a cable tie (1) as shown in the illustration above. Do not use wire or metal straps as these may damage the paintwork.

BOOSTING THE TRACTOR BATTERY

Using Remote Jump Terminals



WARNING

Always sit in the driver's seat to operate the starter motor. If the key-start switch is by-passed and the tractor has been left in gear, sudden and unexpected movement of the tractor or a tractor runaway may result which could cause serious injury. Wear eye protection when starting the tractor with jump leads or when charging the battery.

If it is necessary to use jump leads (booster cables) to start the tractor, use only heavy duty leads and proceed as follows:

The remote jump terminals, installed on the right-hand side of the engine, provide an easy method of boosting the tractor battery without having to remove the battery cover.

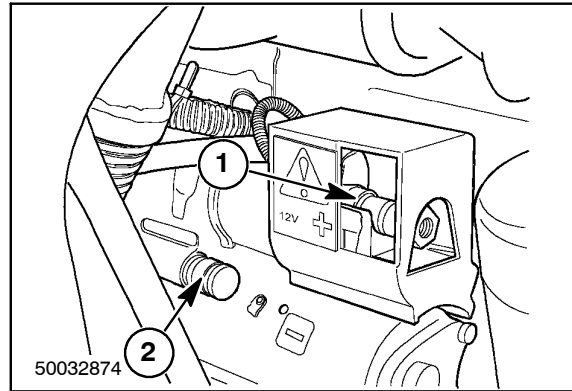
The positive terminal (1), is attached to the starter solenoid, and is encased in a plastic housing.

The negative terminal (2) attaches to the upper mounting bolt of the starter.

Connect one end of red jump lead, to the positive, (+), remote jump terminal, (1), and the other end to the positive, (+), terminal of the auxiliary battery.

Connect one end of black jump lead, to the negative, (-), remote jump terminal, (2), and the other end to negative, (-), terminal of auxiliary battery.

When the engine starts allow it to run at idle speed, turn on all electrical equipment (lights, etc.) then disconnect the jump leads in the reverse order to the connecting procedure. This will help protect the alternator from possible damage due to extreme load changes.



2

SECTION 3 - FIELD OPERATION

Turn off all electrical equipment not required and run the tractor engine until the battery is fully charged.

IMPORTANT: When using an auxiliary battery to start the engine, ensure that the polarity of the jump leads is correct - **positive to positive, negative to negative**, otherwise the alternator may be damaged. Only use an auxiliary battery if the tractor batteries are discharged. Excessive amperage (above 1600 cca) may damage the starting motor. In the event of the batteries being severely discharged, such that terminal voltage is below 7 volts, recovery will require a special charging procedure. See your authorised dealer.

STARTING THE ENGINE

Before starting the engine, always carry out the following procedure:

- Sit in the driver's seat.
- Ensure that the parking brake is firmly applied.
- Ensure that **all** gearshift levers are in neutral.
- Ensure the shuttle lever is in neutral.
- Ensure that the P.T.O. knob is in the 'off' position.
- Place the remote control valve levers in the neutral position.
- Move the hydraulic lift control lever fully forward.



WARNING



Check the area beneath the equipment to ensure that no injury or damage will be caused when equipment is lowered.

- Depress and hold the clutch pedal.

IMPORTANT: The high operating speed of the turbo-charger makes it essential that adequate lubrication is assured when the engine is started. Therefore, idle the engine at 1000 rev/min for approximately one minute before driving the tractor.

SECTION 3 - FIELD OPERATION

THERMOSTART COLD START AID (where fitted)



WARNING

Your tractor is equipped with an electronic cold weather starting aid. **Do not use ether with the cold start aid installed.** It will explode in the intake manifold. If any difficulty is experienced when trying to start your tractor in cold temperatures, consult your authorised dealer.

The Thermostart, which is effective in ambient temperatures down to -18°C (0°F), consists of a heating element installed in the intake manifold. When operated by the key-start switch, the Thermostart will ignite fuel in the inlet manifold, heating the indrawn air prior to entering the combustion chamber.

A warning light on the instrument panel will illuminate to confirm operation.

If temperatures below -18°C (0°F) are encountered, a block coolant heater is available as an accessory. The block coolant heater is effective in ambient temperatures down to -29°C (-20°F) when used in conjunction with the Thermostart.

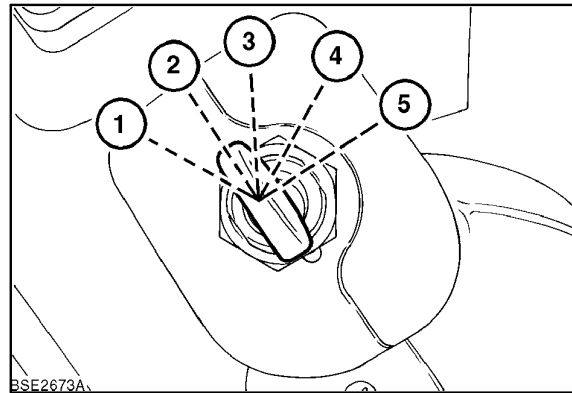
Key Start Switch (with Thermostart)

A five-position key-start switch is installed. The key-start switch positions are as follows:

Position 1	Thermostart activated
Position 2	Off
Position 3	Accessories on
Position 4	Warning lights and instruments on
Position 5	Starter motor engaged

IMPORTANT: Never push or tow the tractor to start the engine. Use an auxiliary battery and jump leads.

NOTE: Neutral start switches prevent operation of the starting motor unless the shuttle lever is in the neutral (N) position.

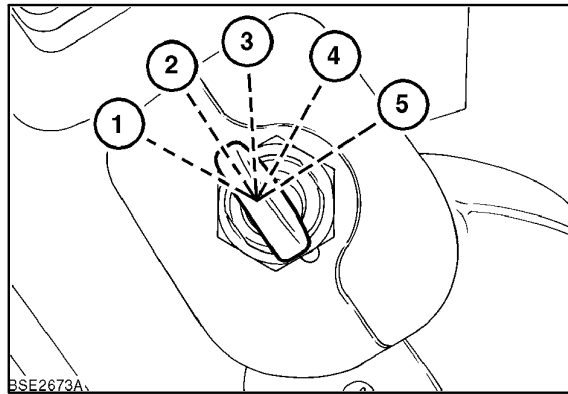


3

SECTION 3 - FIELD OPERATION

Starting in cold weather (with cold engine)

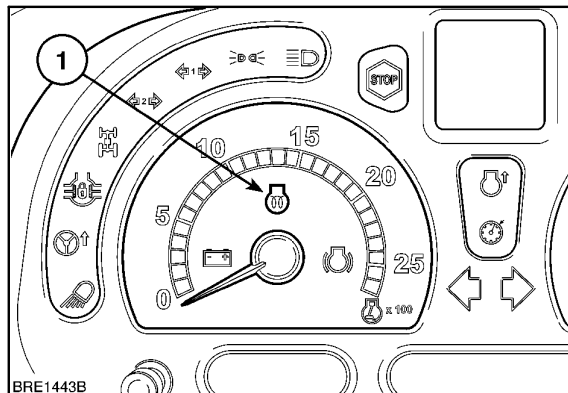
- Open the hand throttle halfway and turn the key-start switch anti-clockwise to position (1) and hold.
- An indicator light (1) Figure 5, will illuminate to show that the Thermostart heater is active.
- When the light extinguishes, turn the key fully clockwise to position (5). Crank the engine until it starts but do not operate the starting motor for more than 60 seconds.



4

NOTE: Providing that the key is turned to the crank position (5) within 3 seconds of the indicator light going out, the Thermostart will be re-activated during cranking.

- If the engine fails to start, repeat the foregoing procedure. If the engine still fails to start, allow the battery to recover for 4 - 5 minutes then repeat the procedure.
- When the engine starts, return the throttle to the idle position and check that all warning lights extinguish and gauge readings are normal.



5

Starting in warm weather or when the engine is hot

- Open the hand throttle halfway and turn the key-start switch fully clockwise to position (5) to operate the starting motor. Crank the engine until it starts but do not operate the starting motor for more than 60 seconds.

NOTE: Once the starter motor has been operated, it is necessary to return the key-start switch back to the 'off' position before the starting motor can be re-activated.

- Return the throttle to the idle position and check that all warning lights extinguish and gauge readings are normal.

SECTION 3 - FIELD OPERATION

GRID HEATER COLD START AID (where fitted)



WARNING

If your tractor is equipped with a Grid Heater electronic cold weather starting device, **do not use ether as a starting aid**. It will explode in the intake manifold. If any difficulty is experienced when trying to start your tractor in cold temperatures, consult your authorised dealer.

The grid heater, which is effective in ambient temperatures down to -18°C (0°F), consists of a heating element installed in the intake manifold. Operation of the grid heater is automatic when the the engine coolant temperature falls to 0° (32°F) or below.

A warning light on the instrument panel will illuminate to confirm operation.

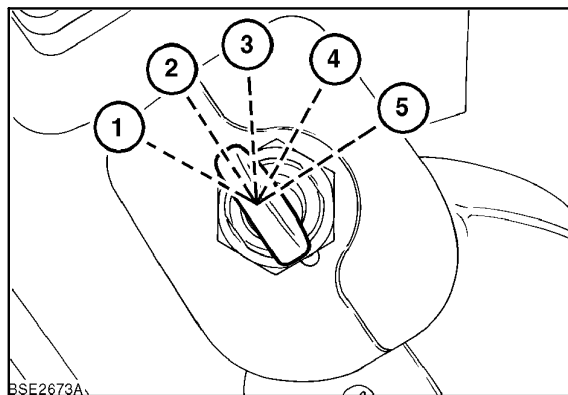
Key Start Switch (with Grid Heater)

A five-position key-start switch is installed. The key-start switch positions are as follows:

Position 1	Not used
Position 2	Off
Position 3	Accessories on
Position 4	Warning lights, instruments and Grid Heater on
Position 5	Grid heater on, starter motor engaged

IMPORTANT: Never push or tow the tractor to start the engine. Use an auxiliary battery and jump leads.

NOTE: Neutral start switches prevent operation of the starting motor unless the shuttle lever is in the neutral (N) position.



SECTION 3 - FIELD OPERATION

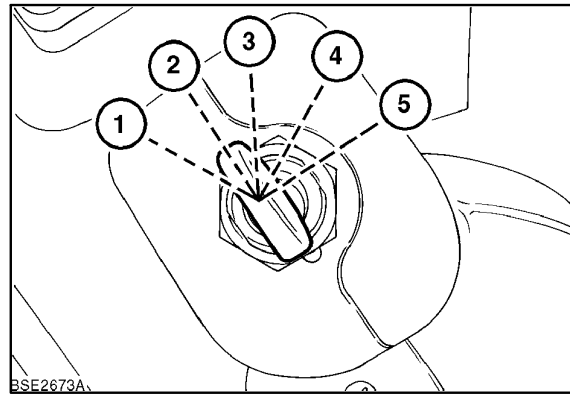
Starting in cold weather (with cold engine)

- Open the hand throttle halfway and turn the key-start switch clockwise to position (4). An indicator light (1) Figure 8, on the instrument panel will illuminate for 10 to 15 seconds to show the grid heater has been activated.
- When the light extinguishes, turn the key fully clockwise to position (5). Crank the engine until it starts but do not operate the starting motor for more than 60 seconds.

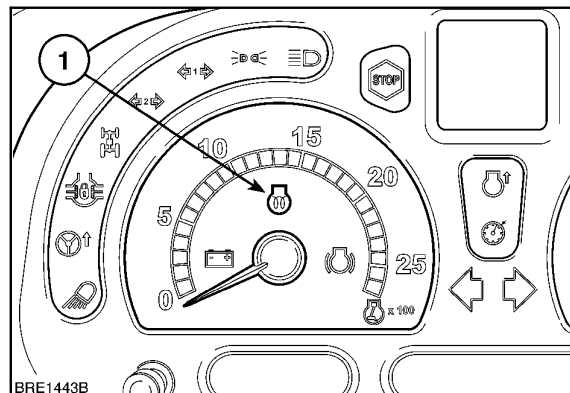
NOTE: If cranking is not carried out within 30 seconds of the light extinguishing, turn the key-start to the 'off' position, pause and re-start the sequence.

- If the engine fails to start, repeat the foregoing procedure. If the engine still fails to start, allow the battery to recover for 4 - 5 minutes then repeat the procedure.
- When the engine starts, return the throttle to the idle position and check that all warning lights extinguish and gauge readings are normal.

If temperatures below -18°C (0°F) are encountered, a block coolant heater is available as an accessory. The block coolant heater is effective in ambient temperatures down to -29°C (-20°F) when used in conjunction with the grid heater.



7



8

Starting in warm weather or when the engine is hot

- Open the hand throttle halfway and turn the key-start switch fully clockwise to position (5) to operate the starting motor. Crank the engine until it starts but do not operate the starting motor for more than 60 seconds.

NOTE: Once the starter motor has been operated, it is necessary to return the key-start switch back to the 'off' position before the starting motor can be re-activated.

- Return the throttle to the idle position and check that all warning lights extinguish and gauge readings are normal.

SECTION 3 - FIELD OPERATION

STOPPING THE ENGINE

IMPORTANT: Before stopping, idle the engine at 1000 rev/min for approximately one minute. This will allow the turbo-charger and manifold to cool and prevent possible distortion of components.

To stop the engine, carry out the following procedure:

- Sit in the driver's seat.
- Close the throttle.
- Ensure that the parking brake is firmly applied.
- Ensure that **all** gearshift levers are in neutral.
- Ensure the P.T.O. is disengaged.
- Place the remote control valve levers in the neutral position.
- Lower 3 point hitch mounted equipment to the ground.
- Turn the key-start switch off - position (2).

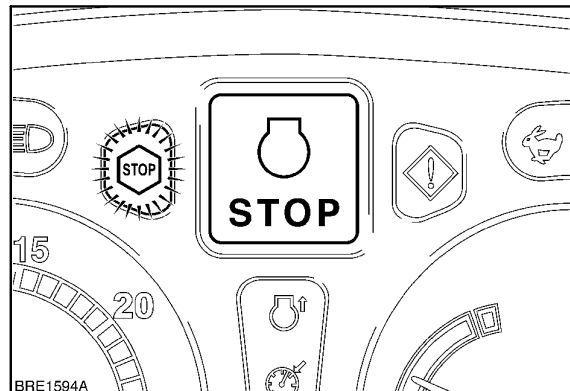
AUTOMATIC ENGINE SHUTDOWN (where fitted)

Automatic engine shutdown is standard on tractors equipped with the optional Enhanced Keypad.

The system monitors four key areas that are critical to the safe operation of engine and driveline and, in the unlikely event that one or more of these reaches a critical level, the engine will be shut down.

- Engine oil pressure falls below safe limits.
- Engine coolant temperature exceeds safe limits.
- Driveline oil pressure falls below safe limits.
- Driveline oil temperature rises above safe limits.

Prior to engine shutdown the red Stop light will start to flash and the critical alarm will sound. In addition, the engine fault warning and malfunction symbols will flash alternately in the Dot Matrix Display. If, after 30 seconds, the operator has not stopped the engine, the automatic shutdown feature will be activated and the engine will be shut down.



SECTION 3 - FIELD OPERATION

After the engine has shut down, the red Stop light will remain on but the alarm will cease to sound. Both engine and malfunction symbols will continue to flash alternately.

The automatic engine shutdown function may be programmed by your authorised dealer to operate in one of three modes:

1. No engine shutdown. In this mode the engine is not capable of automatic shutdown.
2. Always engine shutdown. The engine will shutdown at any time if one or more of the monitored conditions reaches a critical level.
3. Stationary engine shutdown. The engine will shutdown only during stationary operations if one or more of the monitored conditions reaches a critical level.

IMPORTANT: *Before attempting to start an engine that has automatically shutdown, check for, and rectify, the fault that caused the engine to be stopped.*

SECTION 3 - FIELD OPERATION

FAST STEER (where fitted)

The optional Fast Steer system is designed to provide fast steering response when required i.e. when operating with a front loader.

From the straight ahead position, Fast Steer will provide full right or left hand steering lock with less than a 10° movement of the steering wheel.

IMPORTANT: Before travelling on the public highway Fast Steer must be de-activated and normal steering re-instated. To check normal steering operation, turn the wheel fully from lock to lock before starting your journey.

NOTE: Fast Steer will not operate if the tractor speed is above 10 K/mh (6.2 MPH).

To activate the Fast Steer function, depress the isolator switch (1). A warning light in the switch will illuminate to confirm activation.

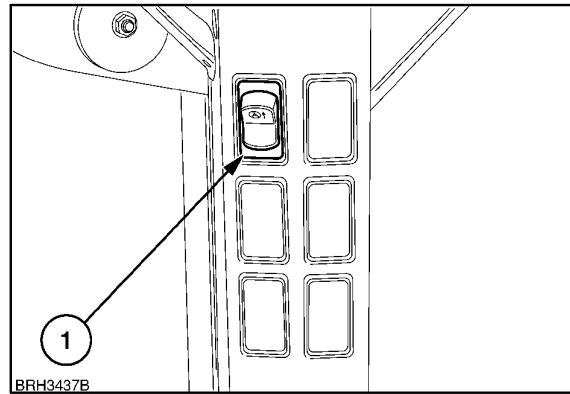
To operate Fast Steer, depress and hold the centre ring (3) on the steering wheel, to disengage, release the ring. With the centre ring depressed, the indicator light (2) will illuminate on the instrument panel. It will extinguish when the centre ring is released.

NOTE: If the isolator switch (1) is left in the 'ON' position at engine key-off, then Fast Steer will be de-activated at key-on. The isolator switch warning light will not illuminate and the indicator light (2) will flash if the centre ring is depressed. To re-activate Fast Steer turn the isolator switch 'OFF' and then 'ON'.

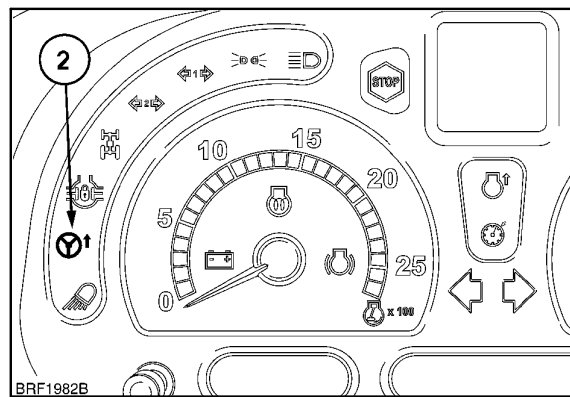
Fast Steer can only be operated if the following three conditions are met.

1. The isolator switch is in the ON position and the switch warning light is illuminated.
2. The speed of the tractor is below 10 K/mh (6.2 MPH)
3. The transmission oil temperature is above 5° C.

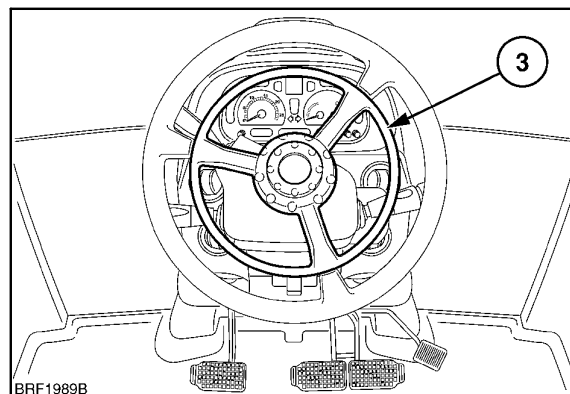
NOTE: Attempting to use the Fast Steer function without meeting all the above conditions, will cause the indicator light (2) to flash.



10



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SECTION 3 - FIELD OPERATION

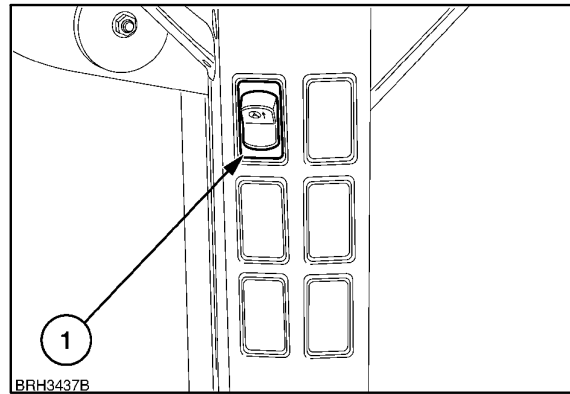
NOTE: If tractor speed exceeds 10 K/mh (6.2 MPH) with Fast Steer in operation, it will be disengaged and the indicator light (2) will flash.

NOTE: Where the transmission oil temperature is low and Fast Steer is to be used, it is recommended to turn the steering wheel twice, from full lock to full lock, before commencing Fast Steer operation.

Fast Steer will be disabled if a fault occurs. Should the system become disabled, an audible warning will sound and an error code will appear in the Dot Matrix Display. If the fault is of a critical nature, the 'STOP' warning lamp will also flash on the instrument panel, consult your authorised dealer.

To re-activate Fast Steer, turn the isolator switch (1) 'OFF', correct the fault, and then turn the isolator switch 'ON'.

IMPORTANT: To promote safe operation of Fast Steer, it is advised that the operator become familiar with the system before operating in the field.



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SECTION 3 - FIELD OPERATION

REAR POWER TAKE-OFF

Description

The P.T.O. is engaged and disengaged by means of a knob (1) on the right-hand console. The adjacent warning light (2) will illuminate when the P.T.O. is engaged.

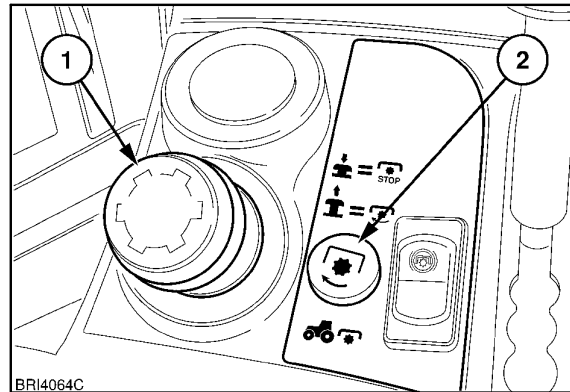
Four types of rear P.T.O. system are available, dependent upon tractor model and country.

- a) Two-speed P.T.O. with inter-changeable output shafts.
- b) Two-speed, shiftable P.T.O. with inter-changeable output shafts and the option of fender-mounted switches for stationary P.T.O. work.
- c) Three-speed, shiftable P.T.O. with inter-changeable output shafts and the option of fender-mounted switches for stationary P.T.O. work.
- d) Three-speed ground drive P.T.O., available in conjunction with three speed shiftable P.T.O. above.

An automatic 'soft start' facility is provided on all models to permit easy start up of heavy, high inertia, P.T.O.-driven equipment.

Soft start modulates P.T.O. clutch torque over the first 5 seconds of engagement to provide a slower, gradual take up of the drive.

NOTE: Soft start only operates at engine speeds of 1800 rev/min and below. Above this speed, normal P.T.O. engagement will occur.



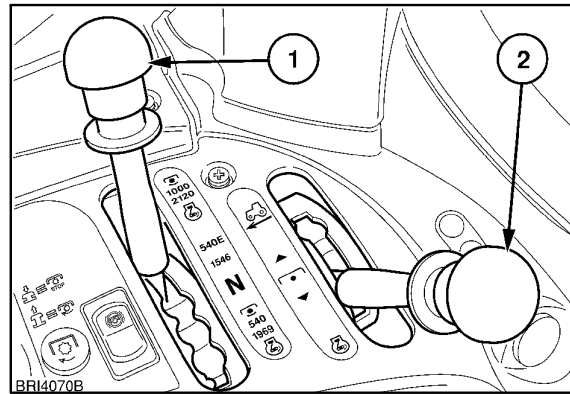
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SECTION 3 - FIELD OPERATION

With shiftable P.T.O., a range lever is provided. The lever is used to select one of two or three P.T.O. speed ranges to provide power or economy. The range lever (1), is located at the rear of the right-hand console.

Ground drive P.T.O. is available, in conjunction with 3-speed, shiftable P.T.O., on all models. As suggested by the name, ground drive P.T.O. speed is directly related to rotation of the rear wheels rather than engine speed. When ground drive P.T.O. is installed, a second lever (2) is provided.

Three ground speed ranges are provided, selected by means of the P.T.O. range lever (1). The lever (2) is used to select ground drive.



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ATTACHING P.T.O. DRIVEN EQUIPMENT



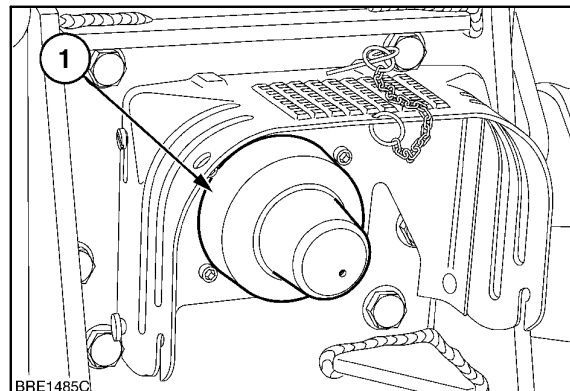
Before attaching or detaching equipment or changing the P.T.O. shaft:

- Firmly apply the parking brake.
- Ensure that **all** gearshift levers are in neutral.
- Disengage the P.T.O. (knob fully down) and wait until the P.T.O. and equipment stops. Switch off the engine before getting off the tractor.

With the engine stopped, the P.T.O. brake is released and the shaft may be turned by hand to aid implement shaft alignment.

Mount or hitch the equipment to the tractor as outlined in THREE-POINT LINKAGE on page 3-83.

The P.T.O. guard serves as a support for drive-line shields used with P.T.O.-driven equipment and provides for your safety. Do not modify the guard. A plastic P.T.O. cap (1) is also supplied and should always be installed over the shaft when the P.T.O. is not in use.



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SECTION 3 - FIELD OPERATION

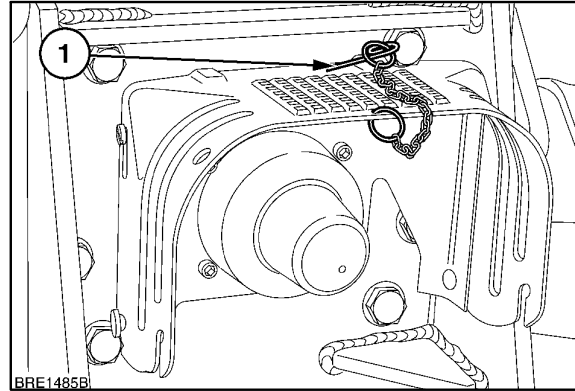
A flip-up P.T.O. guard is fitted as standard. Remove the 'R' clip (1) from the locating pin and slide the guard upwards to clear the pin. Rotate the guard to gain access to the P.T.O. shaft. A second locating pin allows the guard to be fixed at 45° if required.

To connect P.T.O.-driven equipment to the P.T.O. shaft, tilt the guard up for access. Pull the plastic cap from the shaft and store it in the tractor toolbox.

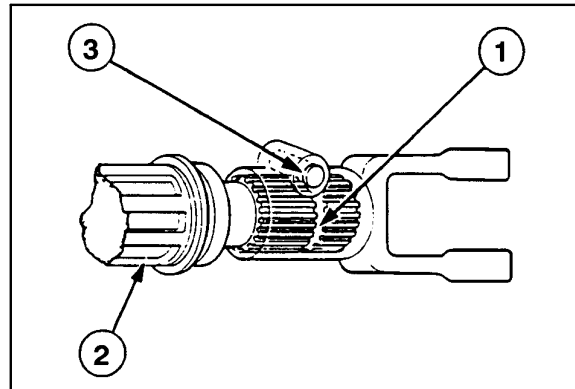
NOTE: Tractors with slider type, vertically adjustable drawbars have a flip-up P.T.O. guard plate fixed to the slider frame. See 'Slider Frame Drawbars' in Section 7.

Attach the implement to the P.T.O. shaft, ensuring that the implement driveshaft coupler lock pin (3) or detent balls engage the groove in the P.T.O. shaft (2). If the coupler does not have a locking arrangement, pin the coupler to the shaft. Lower the flip-up guard and replace the 'R' clip.

IMPORTANT: After attaching mounted equipment, carefully raise and lower using Position Control and check clearances and P.T.O. shaft slide range and articulation. When attaching trailed equipment, ensure that the drawbar is correctly set.



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SECTION 3 - FIELD OPERATION

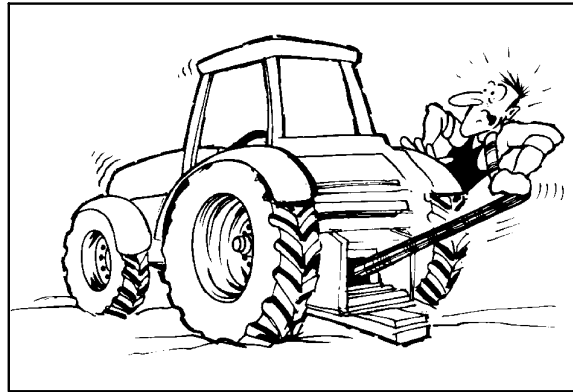
P.T.O. OPERATING PRECAUTIONS



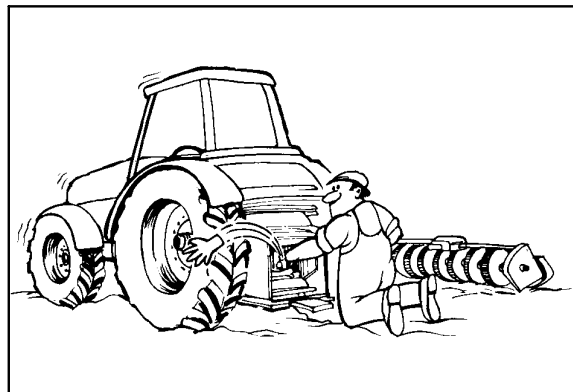
WARNING

Whenever operating P.T.O. equipment, observe the following precautions:

- Check that you are using the correct P.T.O. speed for the implement. Follow the instructions in the equipment operator's manual.
- Ensure that the P.T.O. guard is installed when using P.T.O. driven equipment.
- Do not wear loose clothing when operating P.T.O. driven equipment.
- Firmly apply the parking brake, place **all** gearshift levers in neutral and block all four wheels before operating any stationary P.T.O. equipment.
- Do not approach, clean or adjust P.T.O. driven equipment while the tractor engine is still running. Disengage the P.T.O. (knob fully down) and wait until the P.T.O. and equipment stops. Switch off the engine before getting off the tractor.
- With the engine stopped, the P.T.O. brake is released and the shaft may be turned by hand to aid the installation or removal of the implement P.T.O. shaft.



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TWO and THREE-SPEED P.T.O. SYSTEMS

General Information

Generally speaking, P.T.O. driven equipment not having a high power requirement is designed to run at 540 P.T.O. rev/min and will have a 6-spline female coupling. A P.T.O. shaft speed of 540 rev/min is obtained at an engine speed of 1970 rev/min.

Equipment having a high power requirement is designed to operate at 1000 P.T.O. rev/min and will be provided with a 21-spline female coupling. With the 21-spline shaft installed, run the engine at 2120 rev/min to provide a P.T.O. speed of 1000 rev/min.

Equipment that requires very low power to operate may be run in the alternative P.T.O. speed range at a lower engine speed with a consequent reduction in fuel consumption and engine wear.

Tractors with 3-speed P.T.O. have the advantage of running low power 540 P.T.O. driven equipment at a reduced engine speed by selecting 540E on the lever. See page 3-24 for P.T.O. and engine speeds.

IMPORTANT: *Implements with a high power requirement should be operated with the 1000 rev/min. P.T.O. (21-spline shaft). If it is necessary to use the 6-spline shaft (at 540 rev/min.) to operate implements having a power requirement of more than 75 horsepower, then it is strongly recommended that the implement is fitted with a slip clutch to avoid damage to the P.T.O. output shaft and other tractor components.*

NOTE: *When required, change the P.T.O. shaft to suit the operation and equipment in use, as described under 'Changing the P.T.O. Output Shaft' on page 3-31 .*

SECTION 3 - FIELD OPERATION

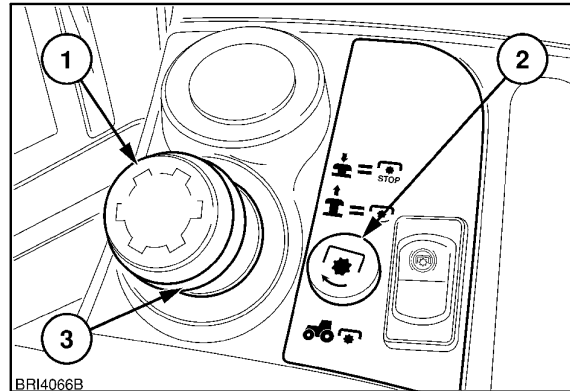
TWO-SPEED P.T.O. WITH REVERSIBLE OUTPUT SHAFT (where fitted)

Tractors with a reversible shaft P.T.O. system will be supplied with a single output shaft having 6 and 21 splines.

Operating

With the engine running at 1000 rev/min., press the knob (1) and lift the collar (3) and knob up to engage the P.T.O. The knob will remain up while the P.T.O. is engaged and the adjacent warning light (2) will be illuminated.

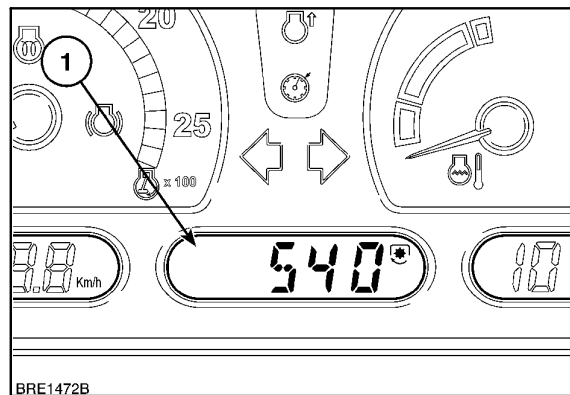
IMPORTANT: To avoid shock loads to the P.T.O., reduce engine speed to approximately 1000 rev/min when engaging the P.T.O.



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Open the throttle to obtain the required engine/P.T.O. speeds. The P.T.O. speed can be displayed in the central LCD on the instrument panel (1).

NOTE: The light (2) Figure 21, will be illuminated when the P.T.O. is engaged. If overspeeding of the P.T.O. occurs (P.T.O. speed exceeds 630 rev/min) the light will flash for 5 seconds, then remain steady. When the 1000 rev/min/shaft is in use, the light may also flash (but may be ignored) as P.T.O. shaft speed passes through the 630 rev/min range. The light will flash again at 1170 P.T.O. rev/min to indicate that overspeeding has occurred in the 1000 rev/min P.T.O. range.

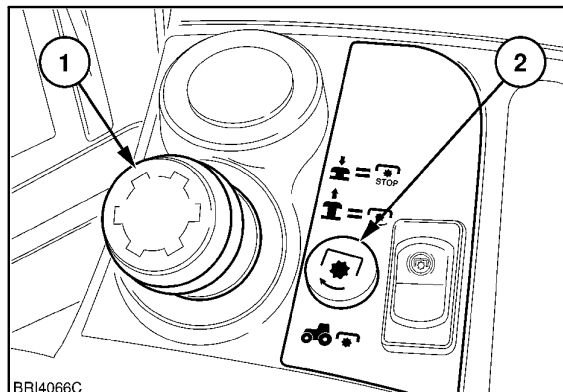


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Press the knob firmly down to disengage the P.T.O.

SECTION 3 - FIELD OPERATION

NOTE: If the engine is stopped, the P.T.O. will not operate when the engine is restarted until the P.T.O. knob (1) is reset. Return the control knob manually to the 'off' position (by pressing the knob down) then re-engage the P.T.O., as previously described.



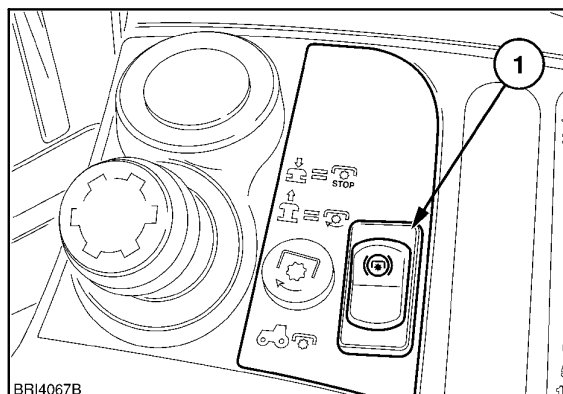
23

IMPORTANT: An automatic P.T.O. brake is installed to stop shaft rotation quickly when the P.T.O. is disengaged. To avoid overstressing the P.T.O. brake, slow down the implement by reducing engine speed **before** disengaging the P.T.O. This is particularly important with implements having a high inertia. Such implements should, ideally, be equipped with an overrun clutch. To avoid damage to the brake when operating high inertia implements, hold down the switch (1), to disengage the brake and allow the implement to come to rest naturally.



DANGER

To avoid inadvertent movement of the implement, disengage the P.T.O. after each use.



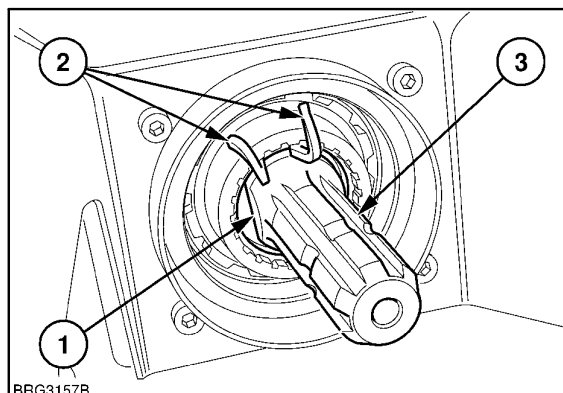
24

CHANGING THE P.T.O. SHAFT SPEED

IMPORTANT: Before changing the speed of the output shaft, switch off the P.T.O., stop the engine and apply the handbrake.

Using a suitable tool, compress the lugs on the circlip and remove it from the P.T.O. housing. Carefully withdraw the output shaft.

NOTE: To aid removal, rotate the circlip until the lugs (2), align with the flat on the P.T.O. shaft (1).



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Thoroughly clean the P.T.O. shaft before re-inserting it into the housing. Ensure the number of splines on the shaft (3), correspond to those on the implement drive shaft.

Replace the circlip ensuring it engages fully with the groove in the P.T.O. housing.

IMPORTANT: After re-fitting, rotate the circlip 180° in the housing so the lugs are opposite the flat on the output shaft.

SECTION 3 - FIELD OPERATION

TWO-SPEED, SHIFTABLE P.T.O. (where fitted)

A 6-spline P.T.O. output shaft of 1.375 in. (34.9 mm) diameter is supplied, designed to operate at 540 rev/min.

Dependent upon tractor specification, an alternative 21-spline shaft of 1.375 in. (34.9 mm) diameter, designed to operate at 1000 rev/min., may also be supplied with the tractor or is available from your dealer.

Operating

Before engaging the P.T.O., select a P.T.O. ratio, as follows:

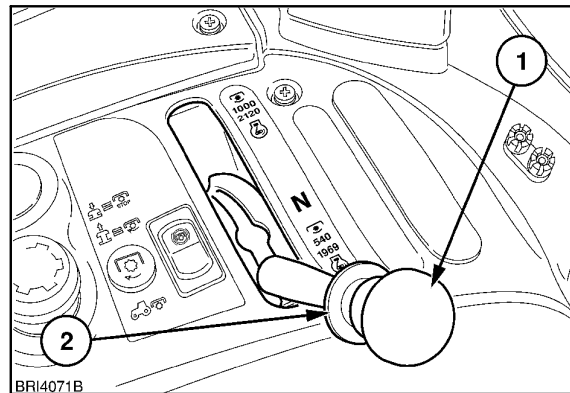
With 6-spline shaft installed

- With the tractor **stationary** and the P.T.O. control knob in the **disengaged** position, select the required speed by means of the range lever (1). Lift the spring-loaded collar (2) beneath the knob and move the lever to engage the power or economy range.

Engine and P.T.O. shaft speeds are as follows:

Range Lever Position	Engine Speed (rev/min)	P.T.O. Speed (rev/min)
Fully rearward (6-spline shaft)	1970	540
Fully forward (6-spline shaft)	1145 (light operations only)	540

IMPORTANT: The P.T.O. range lever cannot be moved until the spring-loaded collar beneath the knob is lifted. This feature is incorporated to prevent inadvertent selection of the economy range which could result in overspeeding of a P.T.O. driven implement.



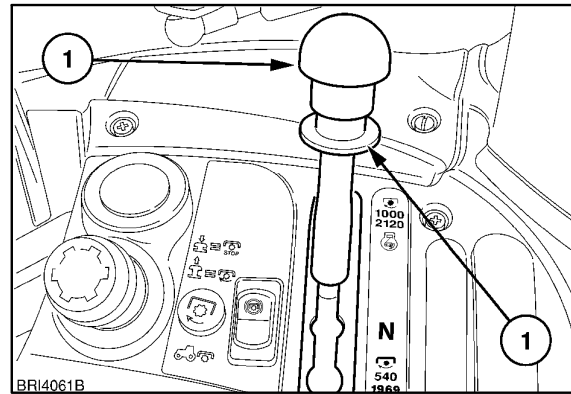
26

SECTION 3 - FIELD OPERATION

With 21-spline shaft installed

- With the tractor **stationary** and the P.T.O. control knob in the **disengaged** position, lift the spring-loaded collar (2), beneath the knob, and move the lever (1) fully to the right. This will provide a P.T.O. speed of 1000 rev/min at 2120 engine rev/min.

NOTE: The P.T.O. range lever should always be in the 2120 position when the 21-spline shaft is installed. If you only ever operate with a 21-spline shaft, leave the range lever in this position.



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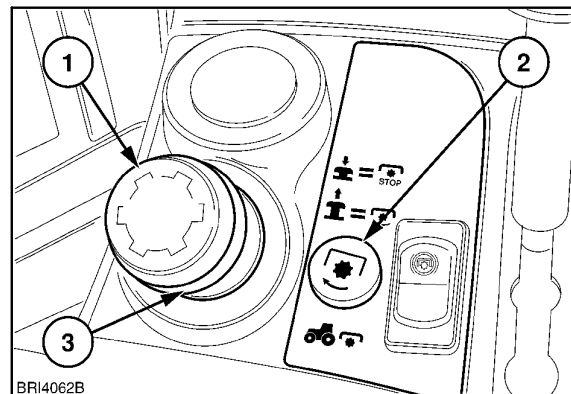
With 6- or 21-spline shaft installed

IMPORTANT: To avoid shock loads to the P.T.O., reduce engine speed to approximately 1000 rev/min when engaging the P.T.O., then increase engine speed by means of the throttle to obtain the required P.T.O. speed.

With the engine running at 1000 rev/min. or less, press the knob (1) and lift the collar (3) and knob up to engage the P.T.O. The knob will remain up while the P.T.O. is engaged and the adjacent warning light (2) will be illuminated.

To disengage the P.T.O., press the P.T.O. control knob (1), down.

NOTE: If the engine is stopped, the P.T.O. will not operate when the engine is restarted until the P.T.O. knob is reset. Return the control knob manually to the 'off' position (by pressing the knob down) then re-engage the P.T.O., as previously described.

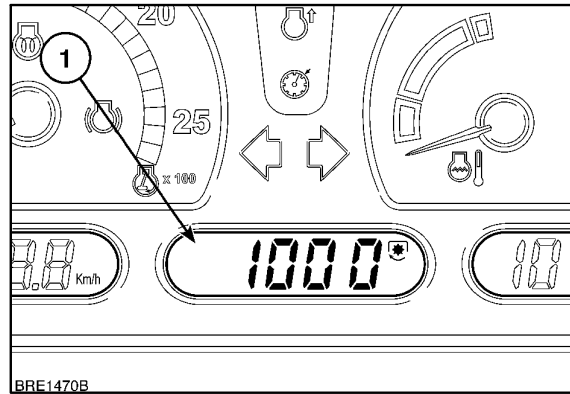


28

IMPORTANT: Although the P.T.O. may be engaged or disengaged with the tractor moving or stationary, **do not** attempt to change from one P.T.O. speed range to another unless the tractor is stationary and the P.T.O. disengaged - control knob (1), fully down.

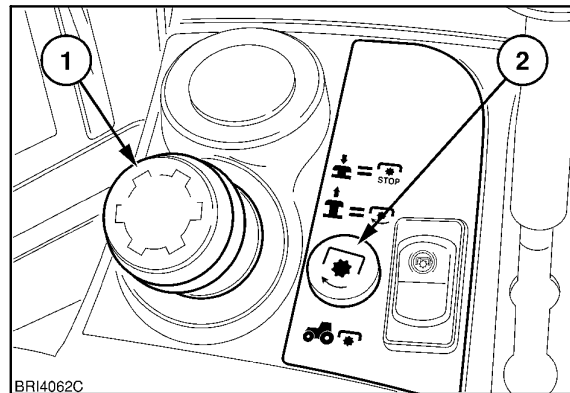
SECTION 3 - FIELD OPERATION

NOTE: The P.T.O. shaft speed (1) may be displayed in the central LCD if required.



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NOTE: If overspeeding of the P.T.O. occurs (i.e. P.T.O. speed exceeds 630 rev/min) the light (2) will flash for 5 seconds, then remain steady. When the 1000 rev/min shaft is in use, the light may also flash (but may be ignored) as P.T.O. shaft speed passes through the 630 rev/min range. The light will flash again at 1170 P.T.O. rev/min to indicate that overspeeding has occurred in the 1000 rev/min P.T.O. range.



30

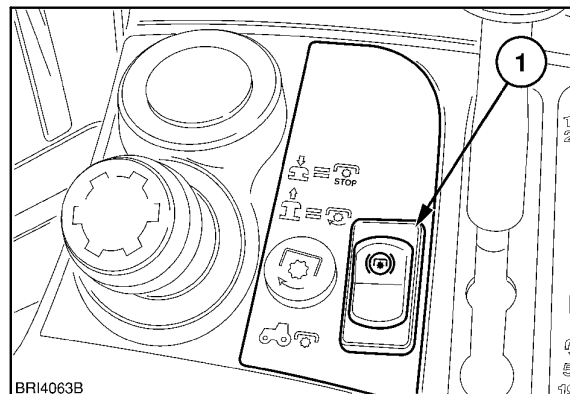
IMPORTANT: An automatic P.T.O. brake is installed to stop shaft rotation quickly when the P.T.O. is disengaged. To avoid overstressing the P.T.O. brake, slow down the implement by reducing engine speed **before** disengaging the P.T.O. This is particularly important with implements having a high inertia. Such implements should, ideally, be fitted with an overrun clutch. To avoid damage to the brake when operating high inertia implements, hold down the switch (1), to disengage the brake and allow the implement to come to rest naturally.



DANGER



To avoid inadvertent movement of the implement, disengage the P.T.O. after each use.



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SECTION 3 - FIELD OPERATION

THREE-SPEED, SHIFTABLE P.T.O. (where fitted)

A 6-spline P.T.O. output shaft of 1.375 in. (34.9 mm) diameter is supplied, designed to operate at 540 rev/min.

Dependent upon tractor specification, an alternative 21-spline shaft of 1.375 in. (34.9 mm) diameter, designed to operate at 1000 rev/min., may also be supplied with the tractor or is available from your dealer.

Operating

Before engaging the P.T.O., select a P.T.O. ratio, as follows:

IMPORTANT: If your tractor has the optional ground drive P.T.O., an additional lever (2) is provided. To prevent damage to the P.T.O. driveline, ensure that this lever is moved fully to the **left**, as shown, before operating the engine-driven P.T.O. (The forward position is used to engage ground drive P.T.O.).

With 6-spline shaft installed

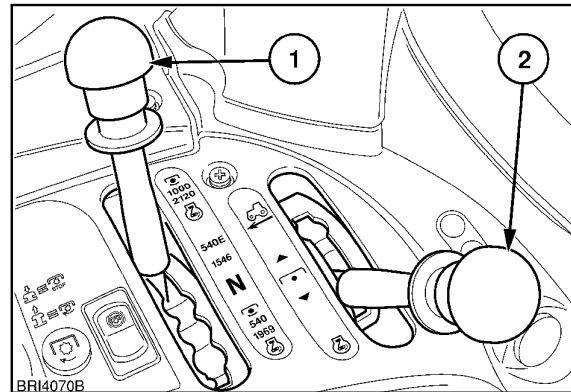
- With the tractor **stationary** and the P.T.O. control knob in the **disengaged** position, select the required speed by means of the range lever (1). Lift the spring-loaded collar (2) beneath the knob and move the lever fully to the right to engage 1000 speed, to the intermediate position for 540 Economy, and fully to the left for standard 540 speed.

IMPORTANT: The P.T.O. range lever cannot be moved until the spring-loaded collar beneath the knob is lifted. This feature is incorporated to prevent inadvertent selection of the economy range which could result in overspeeding of a P.T.O. driven implement.

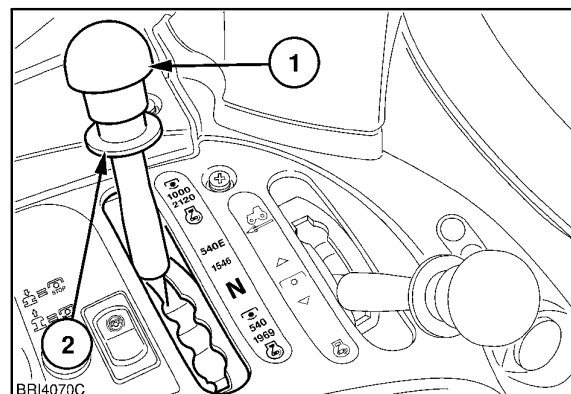
Operating

NOTE: The 3-speed P.T.O. range lever has a neutral position, denoted by the letter 'N'. See Figure 33.

Engine and P.T.O. shaft speeds are as follows:



32



33

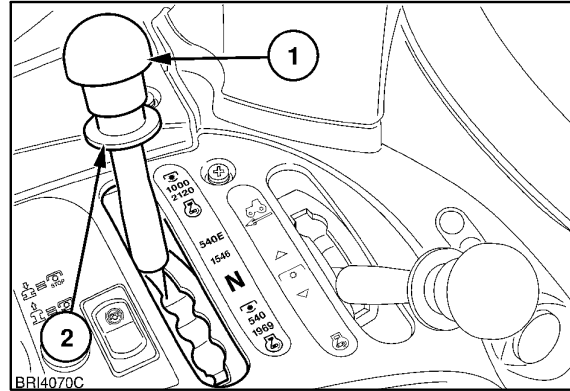
Range Lever Position	Engine Speed (rev/min)	P.T.O. Speed (rev/min)
Fully rearward (6-spline shaft)	1970	540
Intermediate position (6-spline shaft)	1546	540
Fully forward (6-spline shaft)	1145 (light operations only)	540

SECTION 3 - FIELD OPERATION

With 21-spline shaft installed:

- With the tractor **stationary** and the P.T.O. control knob in the **disengaged** position, select the required speed by means of the range lever (1). Lift the spring-loaded collar (2) beneath the knob and move the lever fully to the right. This will provide a P.T.O. speed of 1000 rev/min at 2120 engine rev/min.

NOTE: The P.T.O. range lever should always be in this position when the 21-spline shaft is installed.



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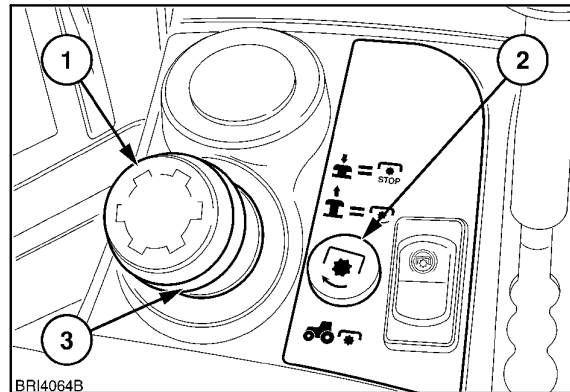
With 6- or 21-spline shaft installed

IMPORTANT: To avoid shock loads to the P.T.O., reduce engine speed to approximately 1000 rev/min when engaging the P.T.O., then increase engine speed by means of the throttle to obtain the required P.T.O. speed.

With the engine running at 1000 rev/min. or less, press the knob (1) and lift the collar (3) and knob up to engage the P.T.O. The knob will remain up while the P.T.O. is engaged and the adjacent warning light (2) will be illuminated.

To disengage the P.T.O., press the P.T.O. control knob (1) down.

NOTE: If the engine is stopped, the P.T.O. will not operate when the engine is restarted until the P.T.O. knob is reset. Return the control knob manually to the 'off' position (by pressing the knob down) then re-engage the P.T.O., as previously described.

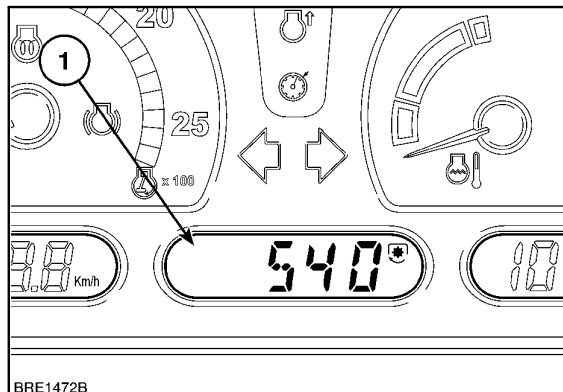


35

IMPORTANT: Although the P.T.O. may be engaged or disengaged with the tractor moving or stationary, **do not** attempt to change from one P.T.O. speed range to another unless the tractor is stationary and the P.T.O. disengaged - control knob (1), fully down.

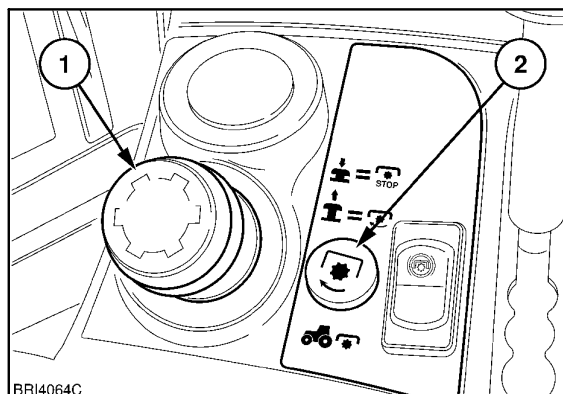
SECTION 3 - FIELD OPERATION

NOTE: The P.T.O. shaft speed (1) may be displayed in the central LCD if required.



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NOTE: If overspeeding of the P.T.O. occurs (i.e. P.T.O. speed exceeds 630 rev/min) the light (2), will flash for 5 seconds, then remain steady. When the 1000 rev/min shaft is in use, the light may also flash (but may be ignored) as P.T.O. shaft speed passes through the 630 rev/min range. The light will flash again at 1170 P.T.O. rev/min to indicate that overspeeding has occurred in the 1000 rev/min P.T.O. range.



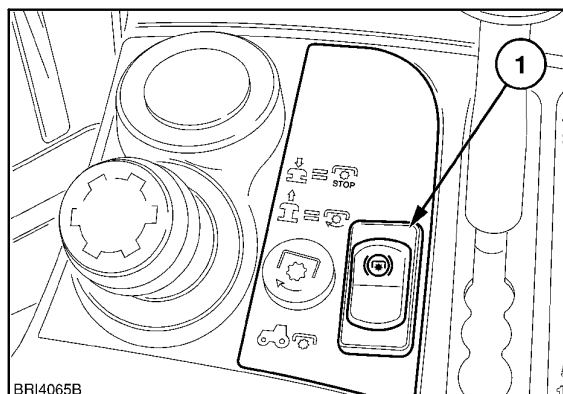
37

IMPORTANT: An automatic P.T.O. brake is installed to stop shaft rotation quickly when the P.T.O. is disengaged. To avoid overstressing the P.T.O. brake, slow down the implement by reducing engine speed **before** disengaging the P.T.O. This is particularly important with implements having a high inertia. Such implements should, ideally, be fitted with an overrun clutch. To avoid damage to the brake when operating high inertia implements, hold down the switch (1), to disengage the brake and allow the implement to come to rest naturally.



DANGER

To avoid inadvertent movement of the implement, disengage the P.T.O. after each use.

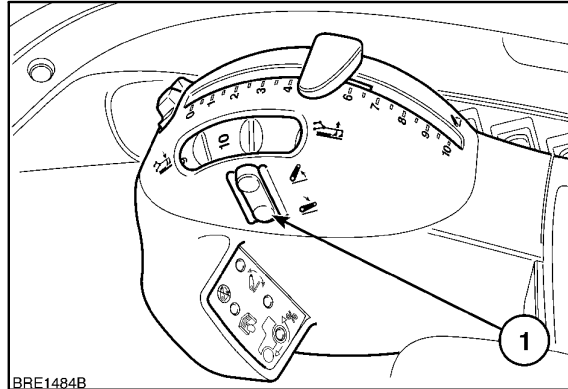


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AUTO P.T.O. FUNCTION (where fitted)**With Electronic Draft Control**

The Auto P.T.O. function provides automatic engagement or disengagement of the rear P.T.O. drive when using the EDC raise/lower switch (1). Operating the switch to raise the implement will automatically disengage P.T.O. drive. Lowering the implement with the switch will re-engage P.T.O. drive.

The height at which the P.T.O. is engaged or disengaged can be set using the following method.



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IMPORTANT: The tractor must be stationary and the P.T.O. switched off before attempting this procedure.

- With the engine running and the P.T.O. switched off, operate the lift control to capture the hitch.
- Depress and hold the P.T.O. switch for 2 seconds. The central display will show 'u' followed by two figures, for example, 'u38'. The figure 38 representing the current height of the hitch.
- Raise the hitch to point at which the P.T.O. is to disengage. Depress the P.T.O. switch once, the central display will show 'd xx' (where 'xx' is the current height of the hitch).
- Lower the hitch to the point where the P.T.O. is to re-engage and depress the P.T.O. switch again. The central display will show 'End' for two seconds and then return to the option selected prior to entering set-up mode.

Providing the tractor is stationary and the P.T.O. is disengaged, this procedure can be carried out at any time. The new settings will remain in the memory until re-programmed.

SECTION 3 - FIELD OPERATION

To activate the Auto function, engage the P.T.O. as previously described and then depress and hold the AUTO side of the switch (1), for more than one second. The Auto P.T.O. lamp on the instrument panel will illuminate to confirm activation.

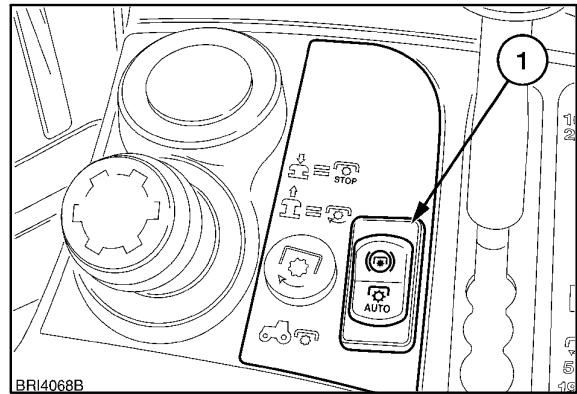
With the 3 point hitch in the lowered position and the P.T.O. engaged, the Auto lamp will remain on. Raising the implement will disconnect P.T.O. drive and cause the Auto lamp to flash. Lowering the implement will re-engage P.T.O. drive, the Auto lamp will cease to flash and will remain on.

Depressing the Auto P.T.O. switch again will de-activate the function and the Auto lamp will extinguish.

NOTE: The Auto P.T.O. function will be de-activated every time the key start is switched off.

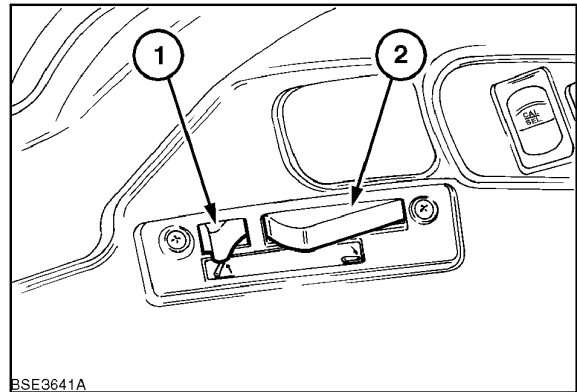
With Mechanical Draft Control

The P.T.O. will be disengaged one second after the fast raise switch (1) is moved rearwards to the raise position. P.T.O. drive will re-engage one second after the hitch lowering switch (2) is fully depressed to lower the 3-point hitch.



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SECTION 3 - FIELD OPERATION

Auto P.T.O. De-Activation

With either Electronic Draft Control or Mechanical Draft Control, Auto P.T.O. will be de-activated should one or more of the following occur:

- The tractor speed is above 0.5 Km/h (0.3 MPH) with the 3 point hitch in the raised position for more than 2 minutes.
- With the 3 point hitch raised, the tractor speed falls below 0.5 Km/h (0.3 MPH), or the tractor is stationary for more than 10 seconds with the 3-point hitch in the raised position.
- If one of the external switches for P.T.O. or 3 point hitch are operated.
- The P.T.O. is switched off using the internal or external switches.
- Operating both internal and external P.T.O. switches simultaneously.
- Ground drive P.T.O. is selected.
- The operator leaves the seat for more than 2 minutes with Auto P.T.O. activated and the 3 point hitch in the raised position.

To re-activate Auto P.T.O., clear the error and re-engage the function as previously described.

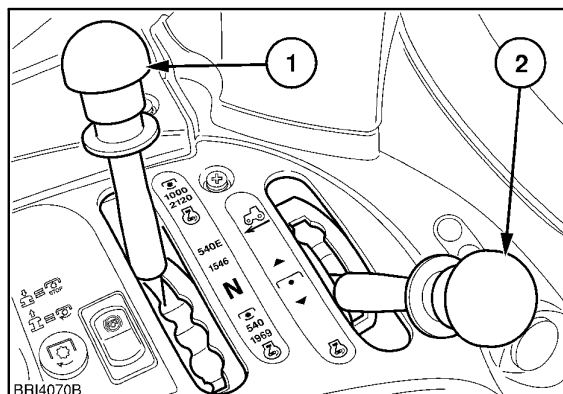
NOTE: *The Auto P.T.O. function will be de-activated every time the key start as switched off.*

SECTION 3 - FIELD OPERATION

GROUND DRIVE P.T.O. (where fitted)

Three-speed ground drive P.T.O. is available on all models in conjunction with the 3-speed engine-driven, shiftable P.T.O. previously described. Ground drive P.T.O. speed is directly related to rotation of the rear wheels rather than engine speed.

Three speed ranges are provided, selected by means of the P.T.O. range lever (1). An additional lever (2) is provided to select ground drive.

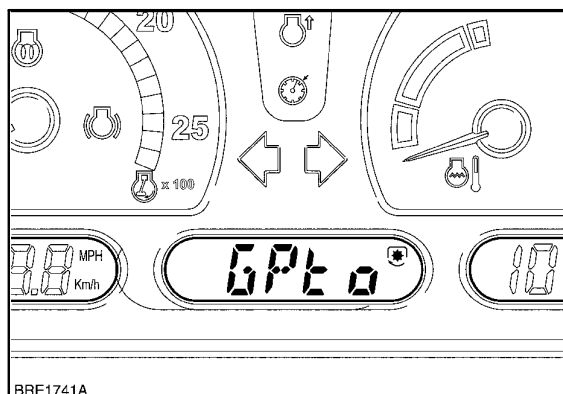


42

To engage ground drive P.T.O.:

With the tractor **stationary**, ensure that the engine P.T.O. is **disengaged** by pressing the selector knob down. With reference to Figure 42, move the lever (1), to the required P.T.O. speed range and then select ground drive with selector lever (2). Engagement of ground drive will be confirmed by the appearance of 'GPto' in the central LCD display.

NOTE: To aid smooth engagement of ground drive P.T.O., depress and hold both brake pedals whilst moving the selector lever.



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Fully depress the clutch pedal, select a transmission gear and open the throttle to increase engine speed. Allow the clutch pedal to rise. Initial movement of the clutch pedal will cause the tractor to move and the P.T.O. shaft (and attached equipment) to rotate.

The speed of rotation of the P.T.O. shaft is directly related to rotation of the rear wheels. Shaft revolutions for each revolution of the rear wheels are as shown in the table on the right.

NOTE: Selecting ground drive with the engine P.T.O. function engaged will automatically disable engine P.T.O. drive. To re-enable engine P.T.O. drive, move the selector lever to the engine drive position, disengage and then re-engage the main P.T.O. switch.

Light duty axle	P.T.O. shaft revolution per wheel revolution
Lever position	
540 range engaged	8.83 : 1
540E range engaged	11.24 : 1
1000 range engaged	15.19 : 1

Heavy duty axle	P.T.O. shaft revolution per wheel revolution
Lever position	
540 range engaged	9.93 : 1
540E range engaged	12.65 : 1
1000 range engaged	17.08 : 1

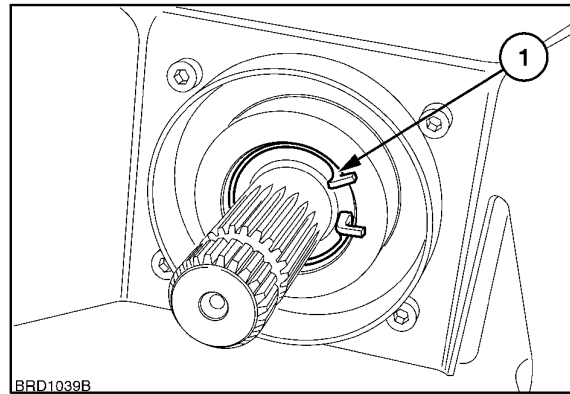
CHANGING THE P.T.O. OUTPUT SHAFT

Using a suitable tool, compress and remove the circlip (1) from the P.T.O. housing and carefully withdraw the P.T.O. stub shaft.

With the shaft removed, check the 'O' ring seal in the P.T.O. housing for any damage. Replace 'O' ring if worn or damaged.

Thoroughly clean the replacement stub shaft before inserting it into the housing. Replace the circlip ensuring it engages fully with the groove in the P.T.O. housing.

Protect the removed shaft by wrapping in a clean cloth and place in the tool box.

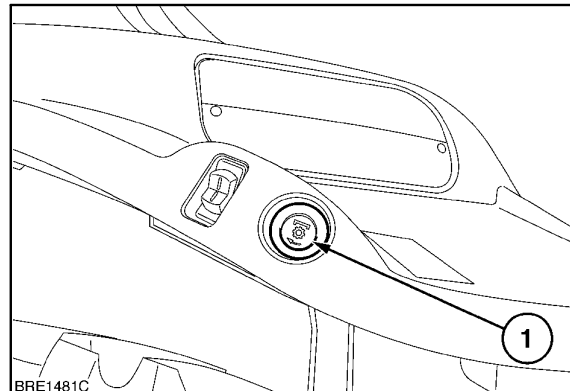


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**EXTERNAL P.T.O. CONTROLS
(where fitted)**

An optional, fender-mounted P.T.O. switch (1), may be installed on both rear fenders to aid alignment of the P.T.O. shaft splines with equipment and facilitate stationary P.T.O. operations.

With the engine running, touch the switch momentarily to cause the P.T.O. shaft to index round to align the shaft splines. If the switch is pressed for less than 5 seconds, the shaft will stop turning when the switch is released.



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Press and hold in the switch for more than 5 seconds and the P.T.O. will operate continuously. Press the switch again to stop the P.T.O. Alternatively, the P.T.O. may be stopped by means of the in-cab controls, as previously described.

NOTE: The warning light, on the P.T.O. control panel, will illuminate when the P.T.O. is engaged, momentarily or permanently.

NOTE: The P.T.O. may be engaged or disengaged from the fender switch, whether the in-cab control is in the on or off position.

NOTE: Simultaneous operation, within two seconds, of in cab and external P.T.O. controls will result in an error code showing in the central LCD. A 10 second delay will also occur before P.T.O. control operation will recommence.

NOTE: The soft start function will operate irrespective of whether the P.T.O. is engaged from inside the cab or from a fender switch.

SECTION 3 - FIELD OPERATION

CAUTION

Before leaving the tractor to operate the external Power Take Off switches:

- Move the gearshift levers to neutral.
- Disengage the P.T.O.
- Apply the parking brake.

With the engine running, move the hand throttle lever to the low idle position (fully rearwards).

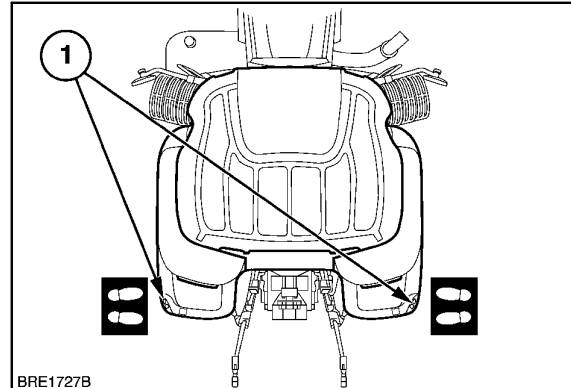
The operator must only activate the external Power Take Off switches (1) while standing to the side of the tractor (outboard of the rear tyres). To avoid damage to implement or tractor, operation of the in cab and external P.T.O. switches should **not** be carried out simultaneously.

WARNING

Before using the external Power Take Off switches, ensure that no person or object is in the area of the implement, 3-point linkage or P.T.O. shaft.

Never operate the external switches while standing:

- Directly behind the tractor or tyres.
 - Between the lower links.
 - On or near the implement.
 - Never extend arms, legs, any part of the body or any object into the area near the 3-point linkage, P.T.O. shaft or implement while operating the external switch.
 - Never have an assistant working the opposite set of controls.
 - When moving to the opposite set of controls, move around the tractor or implement.
 - Do not cross between the implement and tractor.
-



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SECTION 3 - FIELD OPERATION

FRONT P.T.O. AND THREE-POINT HITCH (where fitted)

Tractors with four wheel drive may be equipped with an engine-driven P.T.O. and front hydraulic lift. These features are available as a factory installed option or dealer installed accessory.

FRONT P.T.O.

The front power take-off (P.T.O.) transfers engine power directly to front-mounted equipment via a 6 spline shaft. The P.T.O. shaft rotates anti-clockwise (as viewed from the front).

NOTE: A 21 spline shaft is available as a dealer installed accessory.

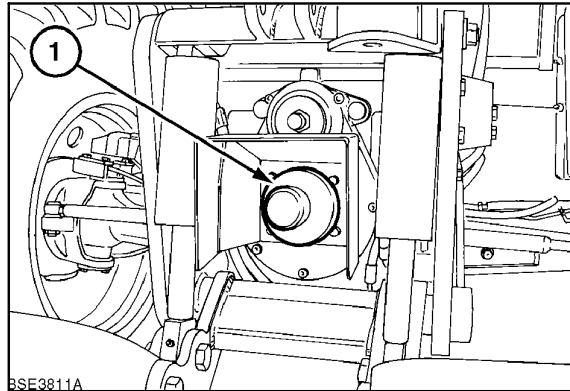
A plastic cap (1) is provided over the P.T.O. shaft. Pull the cap to remove.

NOTE: With the engine stopped, the P.T.O. brake is released and the shaft may be turned by hand to aid implement shaft alignment.

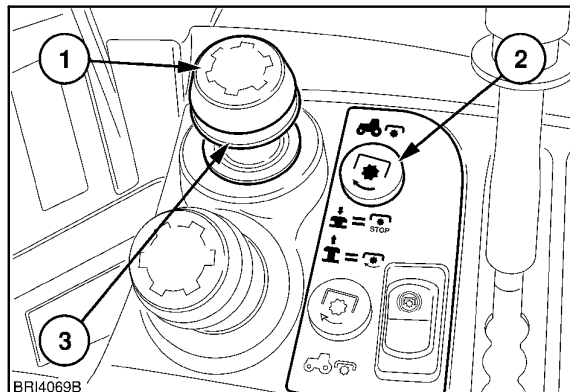
The front P.T.O. is electro-hydraulically operated and is activated by a selector knob on the right-hand console, similar to the rear P.T.O.

With the engine running at 1000 rev/min. or less, press the knob (1) and lift the collar (3) and knob up to engage the P.T.O. The knob will remain up while the P.T.O. is engaged and the adjacent warning light (2) will be illuminated. Open the throttle to increase engine speed to 2120 rev/min and provide a P.T.O. shaft speed of 1000 rev/min. To disengage the P.T.O., press the P.T.O. selector knob (1), down.

NOTE: If the engine is stopped, the P.T.O. will not operate when the engine is restarted until the P.T.O. knob is reset. Return the selector knob manually to the 'off' position (by pressing the knob down) then re-engage the P.T.O., as previously described.



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DANGER

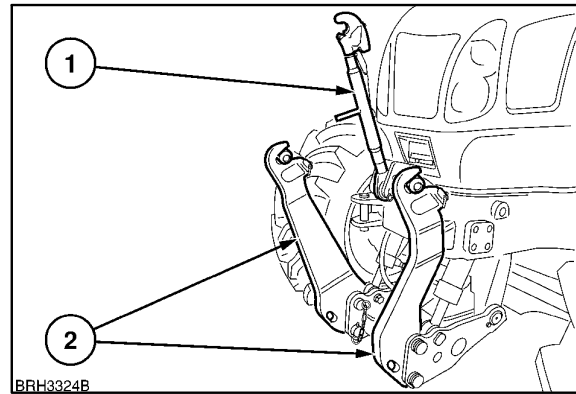


To avoid inadvertent movement of the implement, disengage the P.T.O. after each use.

SECTION 3 - FIELD OPERATION

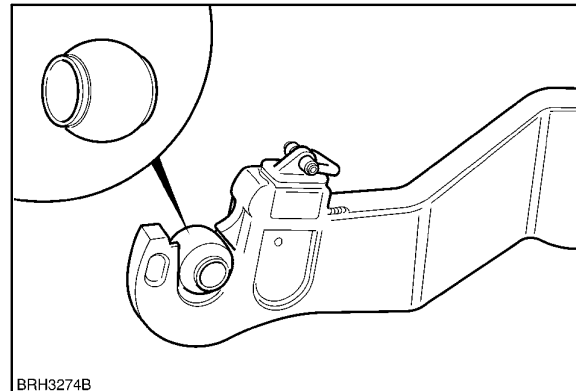
FRONT THREE-POINT HITCH (where fitted)

The optional front hitch consists of an adjustable top link (1) and a pair of folding lower links (2). The top link and the lower links have open claw ends that permit rapid coupling and uncoupling of implements. The claws are equipped with self-locking latches to ensure positive retention of the tractor linkage to the implement.



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Three ball-bushings are supplied for installation on the implement, if required.



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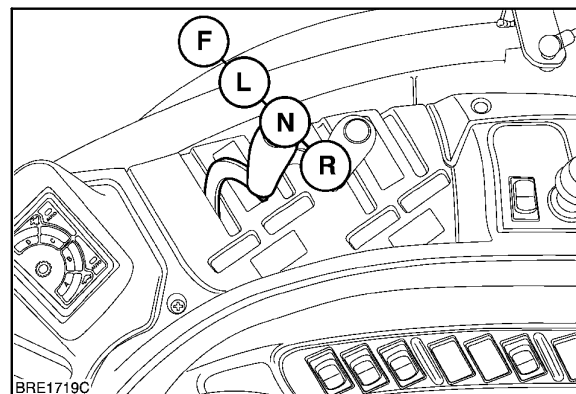
Operating the Front Linkage

The front hitch may be controlled through the rear remote valves, or by a dedicated mid-mounted twin spool remote valve.

- with mechanical rear remote valves:

Using valves I or II at the rear of the tractor, operation of the front hitch may be controlled via the remote valve levers.

With the front linkage connected to valve number I, pull the lever rearwards (R) to raise the front linkage. Move the lever to (N) to halt linkage movement, the linkage will maintain its height position. Select (L) to lower the linkage. With the lever in the float position (F), the linkage can move up and down (float) allowing the implement to follow the ground contours.



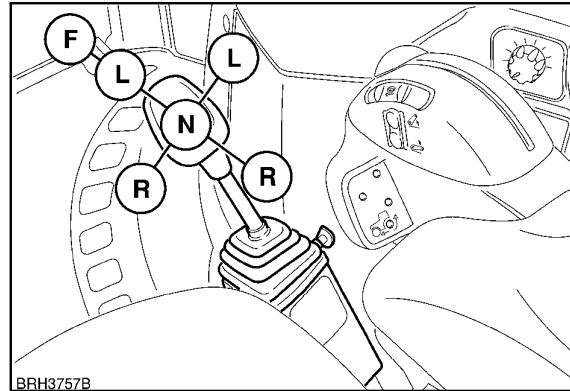
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SECTION 3 - FIELD OPERATION

If the implement requires additional hydraulic services, these may be connected to any unused remote valve. However, for convenience, it is recommended the second valve (II) is used for this purpose.

As an alternative, the levers operating remote valves I and II may be replaced by a joystick located in a forward position on the right-hand side of the operators seat.

IMPORTANT: With the joystick operating the rear remote valves, a float position (F) is available by moving the lever fully to the right. This function is **not** available when operating with a mid-mounted 2-spool remote valve.



52

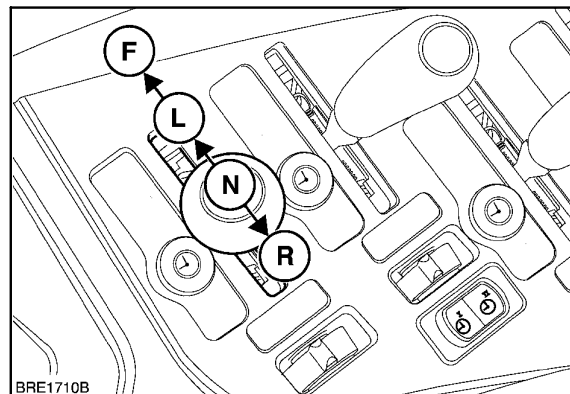
- with Electro Hydraulic remote valves:

Electro Hydraulic valves may be used to operate the front hitch using the remote valve lever or electronic joystick (where fitted). The Electro Hydraulic levers function in a similar way to the mechanical levers.

The standard default valve to operate the hitch will always be valve number IIII. However, it is possible to set the default to alternative remote valve if required.

The default valve (IIII) is programmed to operate in conjunction with the front hitch height limiter. If an alternative valve is used, the height limiter will not function until the new valve has been programmed.

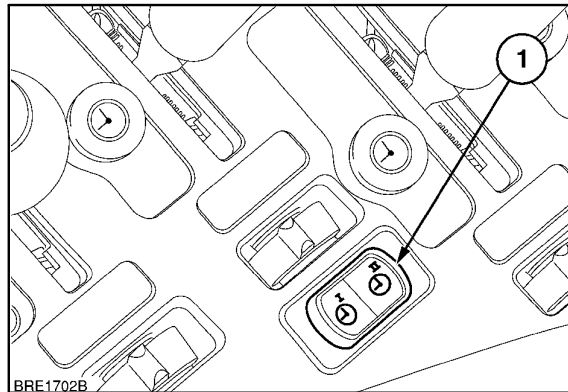
To reset the default valve, the tractor must be stationary with the parking brake applied, ensure all hydraulic lines are disconnected from the remote valve couplings.



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SECTION 3 - FIELD OPERATION

- Ensure all EHR timer switches (1), are in the off position.
- Turn the key-start on, but do not start the engine.
- Depress the timer switch for remote valve No.1 then, within five seconds, depress the timer switch for valve No. 2.
- 'FEhr' will appear in the Dot Matrix Display, after two seconds this will change to show the current default valve, for example 'Ehr4'.
- Choose the new default valve and depress the timer switch for that valve three times, the display will change to show the new selection, for example 'Ehr1'.
- Turn the key-start off, the new default valve for front linkage operation is now memorised.



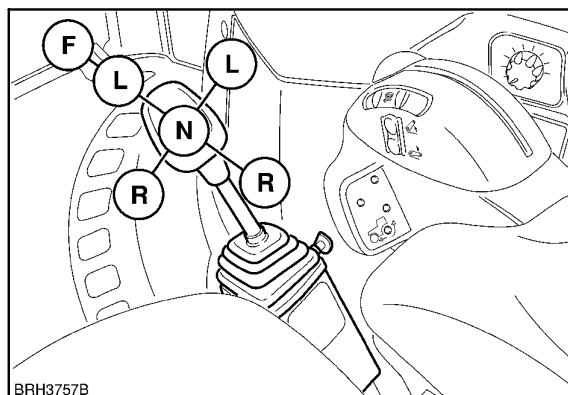
54

NOTE: For programming procedures on EHR remote valves, see page 3-66.

With twin spool mid mounted remote valve: (where fitted)

The optional mid mount remote valve is controlled by a joystick located on the right-hand side of the seat. The mid mount valve provides two additional double acting services, one of which may be utilised to operate the front hitch.

Pull the joystick rearwards (R) to raise the implement. When the hydraulic lift reaches the height set by the height limit rotary control the joystick will return automatically to neutral (N). Alternatively, the hydraulic lift will stop raising when the joystick is manually returned to the neutral position. Moving the joystick fully rearward against spring pressure will provide a faster rate of lift.



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Pushing the joystick forward to the 'lower' position (L) will cause the implement to lower to the ground at a controlled rate of descent.

Further forward movement of the joystick will select 'float' (F) which will allow the cylinder to extend or retract freely. When in the float position, pushing the joystick fully forward against spring pressure will slow the movement of the cylinder.

NOTE: Always use the 'float' position to lower a single-acting cylinder. The 'lower' position is for double-acting cylinders only.

SECTION 3 - FIELD OPERATION

The joystick may also be moved laterally, (R) and (L), to provide oil flow for equipment connected to the optional front couplers.

NOTE: With the joystick operating the rear remote valves, a float (F) position is available by moving the lever fully to the right. This float facility is **not** available when operating with a mid-mounted 2-spool remote valve.

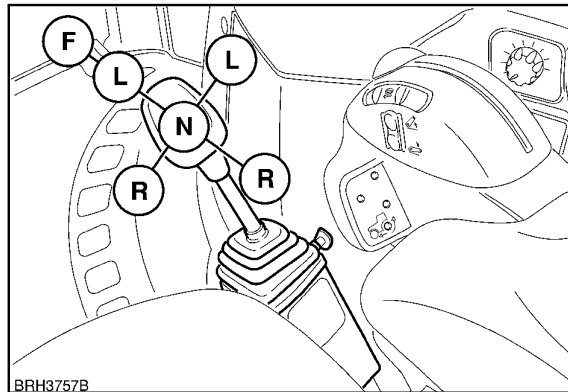
The joystick has the added advantage of being able to operate two cylinders simultaneously by moving it diagonally.

IMPORTANT: When operating with a hydraulic motor always use 'lower' and 'float' positions to control motor rotation. To stop the motor, move the lever from the 'lower' (drive) position to the 'float' position. The motor will then slow to a gradual halt and not stop abruptly which may cause internal damage to the motor.

The joystick safety lock lever is used to prevent accidental operation of the remote valve(s).

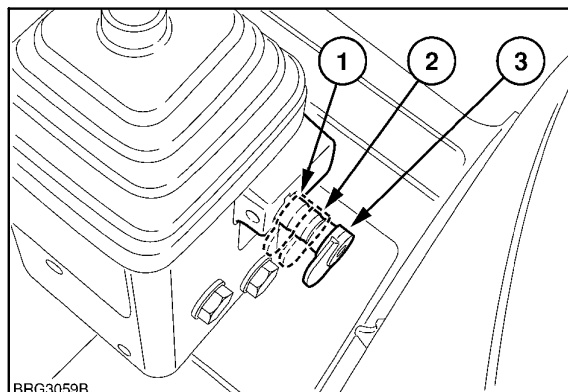
The safety lock on the joystick has three positions:

1. Fully out. All joystick movements available.
2. Mid Position. Lateral movement locked out.
3. Fully in. All joystick movements locked.



BRH3757B

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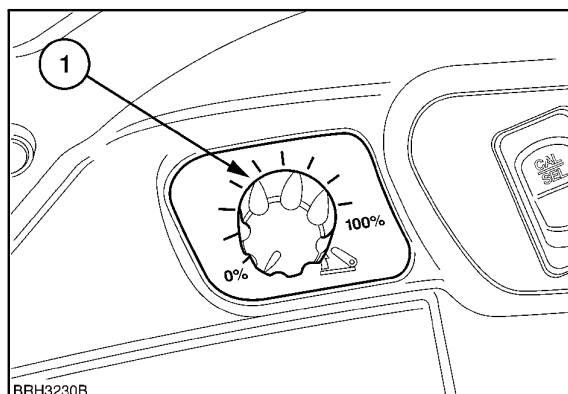
BRG3059B

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Setting the Height of the Front Hitch

Height limit control is provided by a rotary knob (1) on the right-hand console. Fully clockwise is maximum height. Turn anti-clockwise for minimum height.

NOTE: The height limit setting is affected by the oil flow through the system. For example, if the flow control setting is set to maximum and engine speed is high then hitch height may be up to 100 mm (4 in.) higher than would be achieved if engine speed and oil flow rate were low.



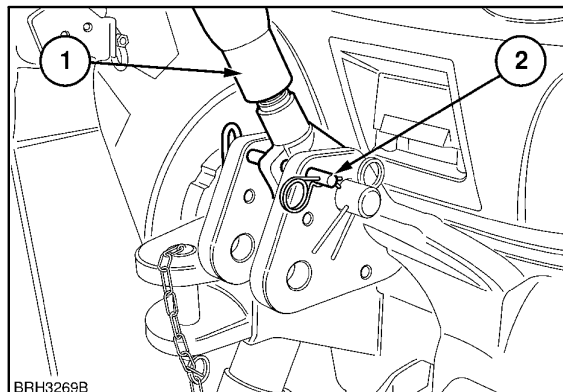
BRH3230B

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SECTION 3 - FIELD OPERATION

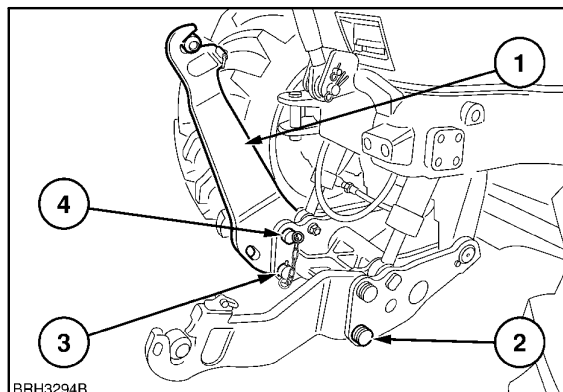
Transport Position

The top link and lower links should be placed in the transport position when not in use. Raise the top link (1) to the vertical position and secure by inserting the lock pin (2) through the top link and anchor bracket. Secure the pin with the spring clip as shown.



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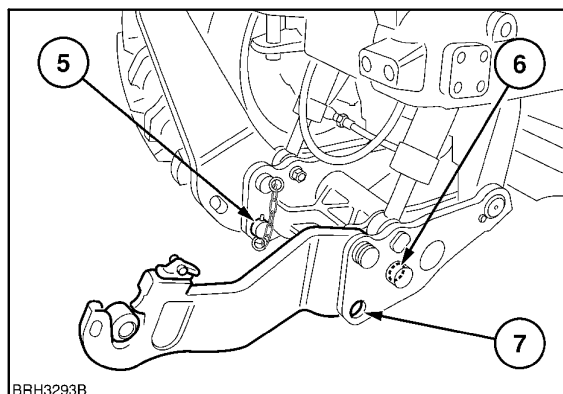
Each lower link pivots about the pivot bolt (2). The pivot bolt should not be removed unless it is required to remove the lower links. Extract the lower pin (3) from the link assembly and raise the lower link (1) to the vertical position, as shown. Insert the pin through the upper hole in the inner link arm when the holes in the inner and outer links (4) are correctly aligned. Before operating the tractor ensure both pins are secured with lynch-pins.



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To convert to the working position, remove the lynch-pin, pull out the pin (5) and manually lower the link arm down to the operating position, as shown. Install the removed pin in one of the holes (6) or (7), as required.

When installed in the rear hole (6) as shown, the lower link will be locked as a rigid unit. If the pin is installed in the front hole (7), the lower link will be allowed to move up and down freely (float) through a range of approx. 75 mm (3 in). Secure the pin with the lynch-pin.



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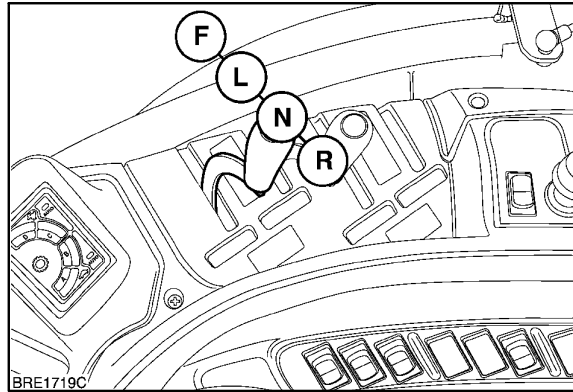
Repeat on the other lower link, ensuring that both lower links are set up the same, i.e., both are locked as rigid units or both are allowed to float.

SECTION 3 - FIELD OPERATION

NOTE: With the lower links pinned in the float position, the left and right-hand sides of the implement can move up and down independently to allow for operation on uneven surfaces. In addition, the remote control valve float function will allow the whole implement to move up or down as it passes over uneven ground.

Coupling Implement to Tractor

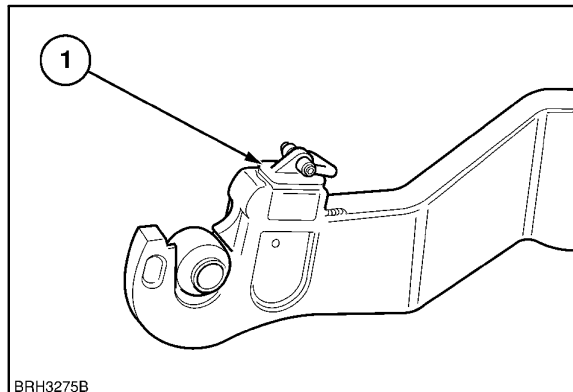
Start the engine. Move the remote valve lever or joystick (where fitted) from neutral (N) to lower (L) until the link arms are just clear of the ground. Position the tractor so that the open claw ends are beneath the implement hitch pins.



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Slowly move the remote valve lever or joystick rearward to raise the lower links until the claw couplers engage the ball-bushings. An audible click will be heard as the self-locking latches engage the ball-bushings on the implement. The lift control should be returned to the neutral position before the lower links start to lift the implement from the ground.

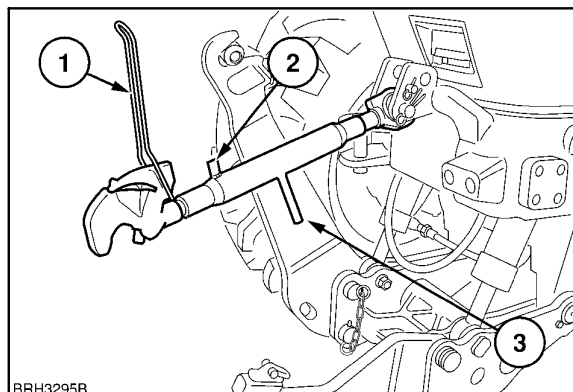
IMPORTANT: Before operating the tractor, ensure the release latches (1), are fully retracted into the link end.



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Attach the top link to the implement, adjusting to the correct length by rotating the threaded centre section using the handle (3) as leverage. To prevent the centre section from rotating while in work, place the locking latch (1) over the pin (2) or adjuster handle (3). The top link has a similar claw end to the lower links. Lower the top link claw onto the upper implement ball-bush and press down until the latch is heard to engage.

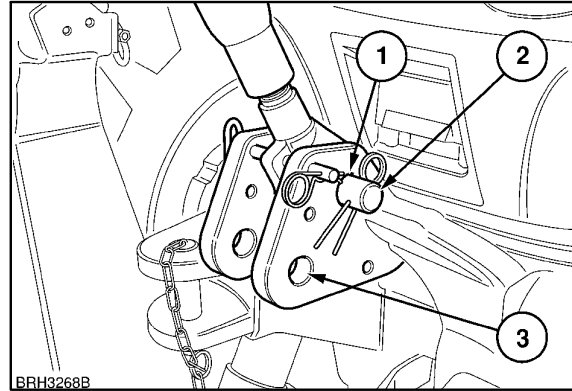
The implement supports, where fitted, may now be removed or retracted and the implement supported on the front linkage.



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SECTION 3 - FIELD OPERATION

The top link is connected to the bracket with the pin (2) secured by the spring pin. Two holes are provided in the top link bracket for location of the top link. Use the top hole (1), as shown, for maximum lift capacity. Use the lower hole (3), to provide the greatest implement height, when raised.



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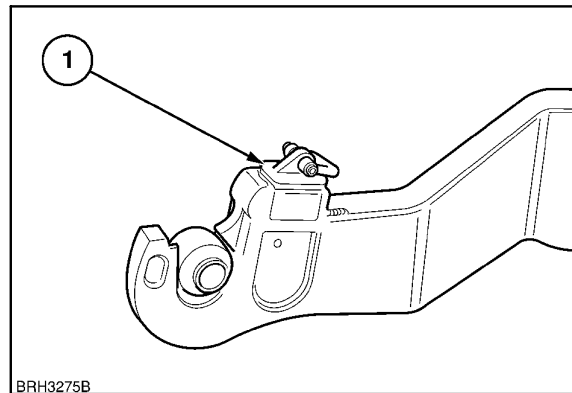
Uncoupling Implement from Tractor

Using the remote lever or joystick, lower the implement to the ground, ensuring that it cannot fall when disconnected from the front hitch. Use the implement supports (where fitted).

Pull back the lever on the top link to release the claw from the implement upper hitch pin.

Pull the ring (1) on both lower links fully rearwards. The lever will lock in position with the latch retracted. This will allow the links to clear the ball-bushings on the implement lower hitch pins when the links are lowered fully.

Fully lower the lower links using the remote lever or joystick and reverse the tractor clear of the implement.



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MECHANICAL LOWER LINK SENSING HYDRAULICS (where fitted)

Your tractor is equipped with an hydraulic system providing accurate and sensitive control over a wide range of operating conditions. Two systems are employed, dependent upon the specification level of your tractor.

The basic hydraulic system, as discussed in this section of the Manual, is a mechanically controlled system that offers Position Control and Draft Control sensed through the lower links of the 3-point linkage.

The system is controlled by the Draft Control lever (3) the Position Control lever (2) and the fast raise button (1). The fast raise button will fully raise the 3-point linkage (and attached implement) independently of the Position or Draft Control levers.

Position Control provides accurate and sensitive control of implements, such as sprayers, rakes, graders, etc., that operate above the ground. Once set, the position of the lower links will remain at a constant height unless adjusted using the lift control lever.

Draft Control is most suitable for mounted implements operating in the ground. Changes in the working depth or changes in soil resistance cause the draft loading on the implement to increase or decrease.

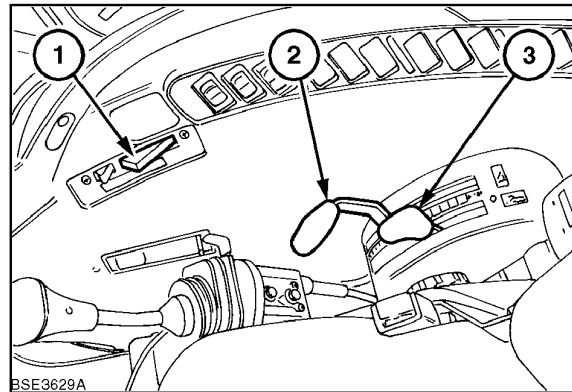
Pre-operation Checks



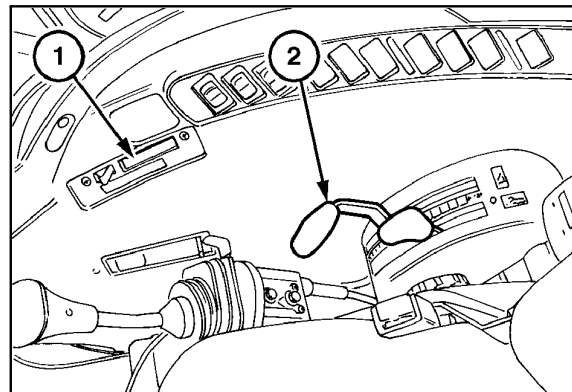
CAUTION

Before starting the engine, always ensure that the fast raise button (1) is pushed in, as shown, to prevent inadvertent raising of the 3-point linkage.

IMPORTANT: Some mounted or semi-mounted equipment may interfere with, and damage the cab. To avoid the possibility of cab damage, check for adequate clearance by slowly raising the equipment using the **Position Control** lever (2). If any part of the equipment comes closer than 100 mm (4 in.) to the cab, stop raising. Stop the engine, lower equipment to the ground and adjust the height limiter cam.



67

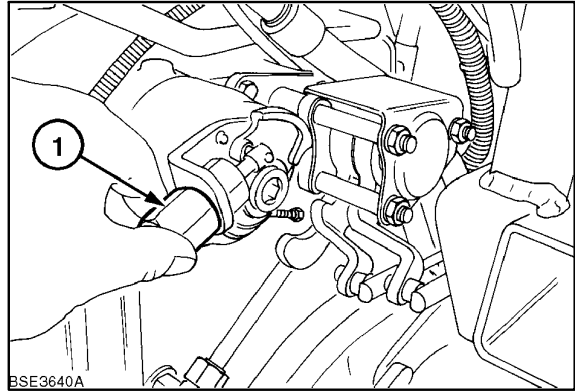


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SECTION 3 - FIELD OPERATION

Height Limiter Cam

The height limiter cam is on the right-hand end of the hydraulic rocker shaft. Turn the cam adjuster (1) clockwise to decrease implement height, turn anti-clockwise to increase implement height. The cam adjuster is self locking and will remain in position once set.

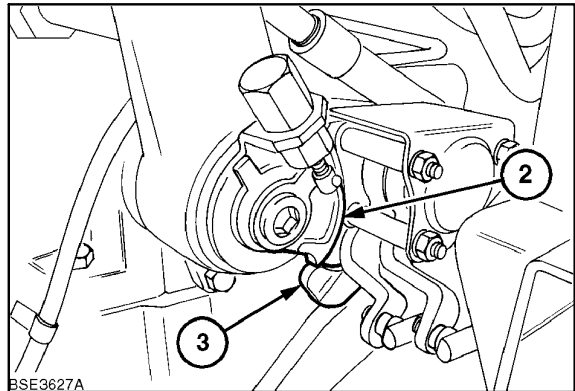


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The cam (2) is shown in contact with the lever (3) at the maximum height position. To achieve full lift height, turn the cam adjuster fully anti-clockwise until the cam is clear of the lever when the lower links are in the fully raised position.

NOTE: The height limiter cam only affects operation of the fast raise button. When the cam comes into contact with the lever, it cancels the signal from the fast raise button and stops the 3-point linkage from raising further.

Repeat the previous step to check for implement to cab clearance. If clearance is inadequate, move the cam further in a clockwise direction. When clearance is satisfactory, proceed to operate.



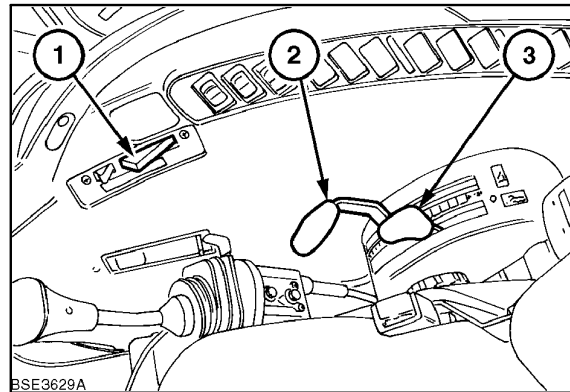
70

SECTION 3 - FIELD OPERATION

POSITION CONTROL OPERATION

IMPORTANT: Always set the system to Position Control at any time when not actually operating in Draft Control, such as when attaching or transporting equipment or when no equipment is attached.

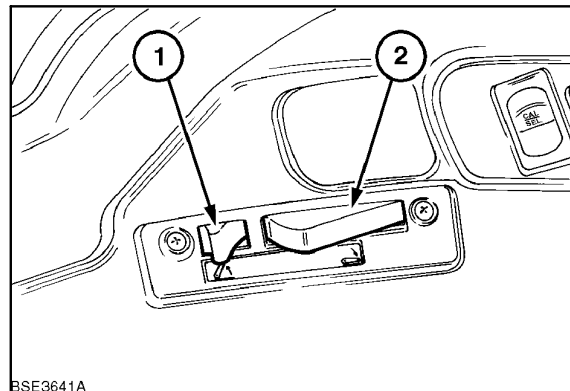
Move the Draft Control lever (3), fully forward in the quadrant. Set the required implement height/depth using the Position Control lever (2). Pull the lever back to raise the implement, push forward to lower. Implement height/depth is relative to the position of the lever in the quadrant.



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To raise the implement at the end of each pass, or whenever required, move the latch (1) rearward to release the fast raise button. The button (2) will pop out, as shown and the 3-point linkage (and implement) will raise to full lift height (as determined by the height limiter cam setting) without the need to move the Position Control lever.

To lower the implement, simply press the fast raise button (2) fully in, as shown, and the implement will lower to the height/depth set by the Position Control lever.



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CAUTION

When transporting equipment on the 3-point linkage, raise the implement using the Position Control lever. The hydraulic system will maintain the equipment at the height set by the Position Control lever and prevent the equipment lowering and becoming damaged, damaging the road surface or causing personal injury.

SECTION 3 - FIELD OPERATION

DRAFT CONTROL OPERATION

When starting work, move the Position Control lever (2) fully forward and lower the implement into work using the Draft Control lever (3). Push the lever forward to increase the draft loading. Pull rearwards to reduce the draft loading. In most circumstances forward movement of the lift control lever will increase implement depth and rearward movement will reduce the depth.

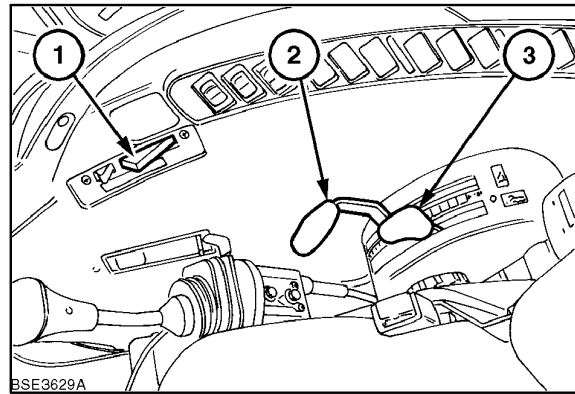
Once set, the tractor hydraulic system will automatically adjust the implement depth to maintain an even pull on the tractor and so reduce wheel slip to a minimum.

Observe the implement as it pulls through the soil. If the hydraulic system reaction (vertical movement of the implement) is too great or too frequent then system sensitivity may be reduced by adjustment of the sensor bar spacers.

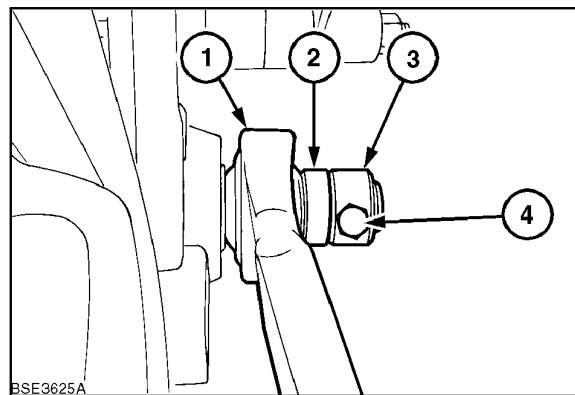
To move a spacer, remove the nut and bolt (1), end stop (2), lower link (3) and spacer (4). Re-install the spacer link first, followed by the lower link and end stop. Secure the end stop with the nut and bolt. Tighten the nut securely. This is the most sensitive position, recommended for light implements or light draft loads.

To reduce system sensitivity, move the spacers at each end of the sensor bar to the outside of the lower links as shown in Figure 74. This is the least sensitive position, recommended for heavier implements or heavy draft conditions.

As with Position Control operation, use the fast raise button to raise and lower the 3-point linkage (and implement) at the end of each pass. Do not move the Draft Control lever as this will affect the previously determined setting.



73



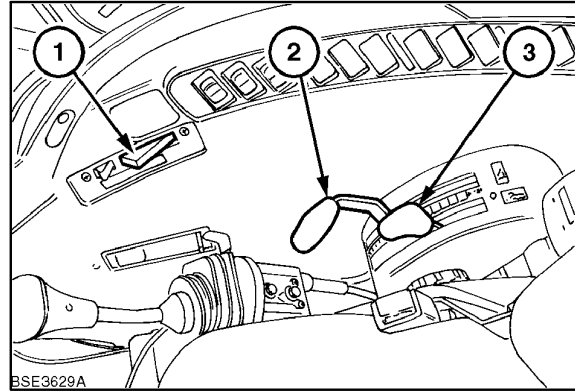
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SECTION 3 - FIELD OPERATION

Combined Position and Draft Control Operation

When starting work, lower the implement to the required depth by means of the Draft Control lever (3), as previously described. Observe the implement as it pulls through the soil.

When the implement stabilises at the required depth, ease the Position Control lever (2) back until the lift arms tend to rise. The lift linkage is now operating in Draft Control but the implement is prevented, by the Position Control function, from sinking too far when the draft load reduces.



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Float Operation

To operate with the lift in float mode move the Draft and Position Control levers fully forward. This will enable the lift arms to move up and down freely allowing the implement to follow the ground contours.

SECTION 3 - FIELD OPERATION

EXTERNAL HYDRAULIC POWER LIFT CONTROL

To aid the connection of implements, an external power lift control lever is provided inboard of the rear right-hand fender.

Before leaving the tractor to operate the external power lift control:

- Apply the parking brake
- Move the gearshift levers to neutral
- Disengage the P.T.O.
- Move the Draft Control lever fully forward
- Move the hand throttle lever to the low idle position (fully rearwards)

IMPORTANT: The operator must only activate the external power lift control lever while standing to the right of the tractor, outboard of the rear tyre (the shaded area in Figure 76).



WARNING

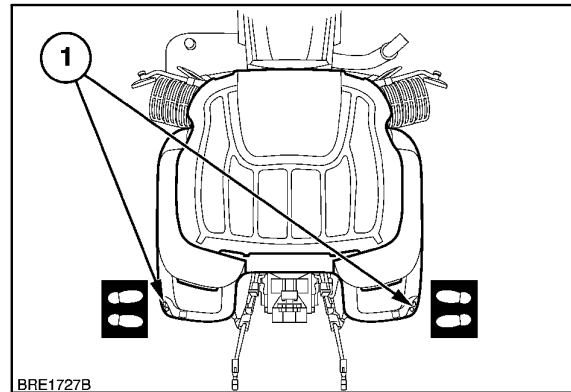
Before using the external hydraulic power lift control, ensure that no person or object is in the area of the implement or 3-point linkage. Never extend arms, legs, any part of the body or any object into the area of the 3-point linkage or implement. Never operate the external power lift control while standing:

- Directly behind the tractor or tyres
- Between the lower links
- On or near the implement

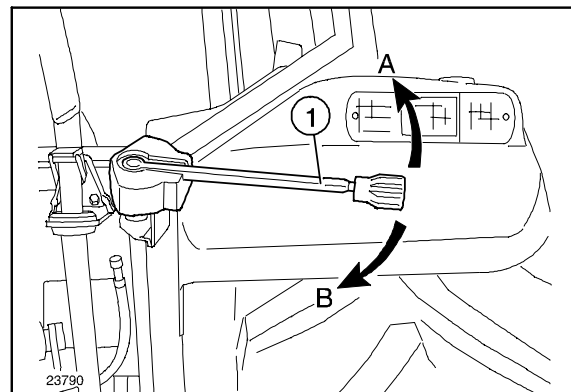
To operate the external lift control, extract the lever from its housing and locate in the top of the lift control mechanism as shown.

Move the lever upwards (anti-clockwise) to raise the 3-point linkage.

Move the lever downwards (clockwise) to lower the 3-point linkage.



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ELECTRONIC DRAFT CONTROL (where fitted)

NOTE: Depending on tractor specification, some of the Electronic Draft Control features shown in this section may not be fitted.

This system described here is known as Electronic Draft Control. This electronically controlled hydraulic system senses changes in the draft loading via sensors in the lower link pins of the 3-point linkage and changes in the position of the linkage via a sensor on the cross shaft. The system functions in Position Control or Draft Control.

Position Control provides accurate control of implements, such as sprayers, rakes, graders, etc., that operate above the ground. Once implement height has been set, the system will maintain the selected position irrespective of any external forces acting upon it.

Draft Control is designed for mounted or semi-mounted implements operating in the ground. Changes in soil resistance cause the draft loading on the implement to increase or decrease.

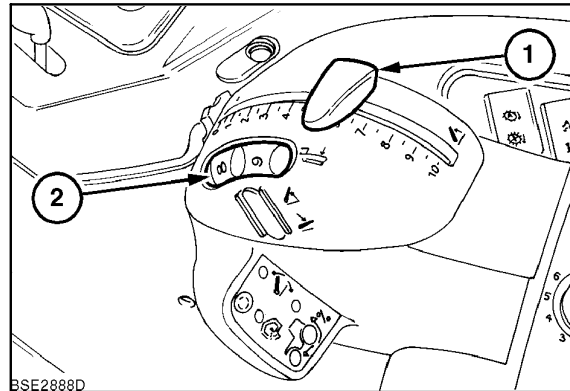
Draft Control Operational Notes

Draft control sets the working depth in the soil by maintaining a constant draft load. If the Position Control lever (1), is set just below the normal Draft Control working depth, it will prevent the implement from 'diving' or working too deep if an area of soft or light soil is encountered.

Position Control will override draft control when the Position Control lever is moved above the working depth set by the draft loading wheel (2). Therefore, the Position Control lever can be used to lift the implement out of the ground, from the normal Draft Control working depth, without changing the Draft Control setting.

This function can be useful when a gradual lift out is required. The thumbwheel stop can be set so that the Position Control lever can be returned quickly to a lower limit position just below the normal Draft Control working depth.

The raise/lower switch would normally be used to raise or lower an implement during a work cycle.



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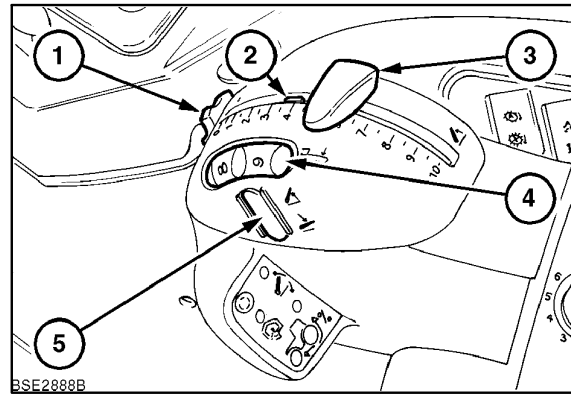
SECTION 3 - FIELD OPERATION

Control Pod

The thumbwheel (1), when rotated, will move the adjustable stop (2).

The position control lever (3), is used to set implement height, when operating in Position Control. Use it to set the maximum implement depth when operating in Draft Control.

The draft loading wheel (4), determines the draft load and therefore implement working depth by setting a force on the draft sensitivity pins. Selecting position 10 will provide maximum load and therefore maximum implement depth.



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The raise/lower switch (5) Figure 79, is a three position, spring centered switch that enables the operator to rapidly raise the implement to the position set by the height limit control and to lower the implement back down to the working depth/height set by the Position or Draft Controls, without disturbing the settings. The switch also provides for faster ground engagement, if required. For detailed information, see text on page 3-54.

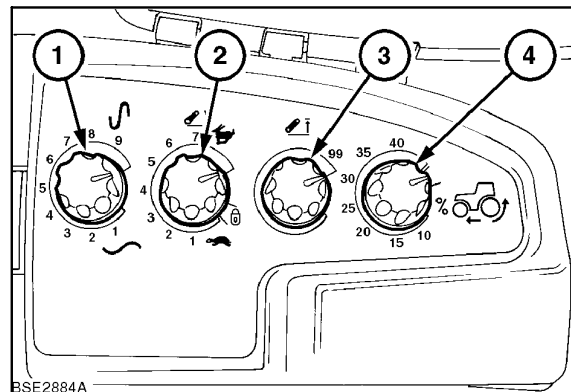
EDC Panel

The draft sensitivity control (1), is used to make the system more sensitive or less sensitive to changes in draft loading. Maximum sensitivity is obtained by rotating the control fully clockwise.

The drop rate control (2), adjusts the speed at which the three-point linkage drops during the lowering cycle. Position 1 selects the slowest drop and is denoted by the tortoise symbol, position 7 provides the fastest rate of drop.

The height limit control knob (3), limits the height to which the linkage may be raised. Adjust this knob to avoid the possibility of a large implement damaging the tractor when fully raised.

The slip limit control knob (4), available only with the optional radar sensor unit, enables the operator to select a wheel slip threshold, above which the implement will raise until wheel slip returns to the set level.



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SECTION 3 - FIELD OPERATION

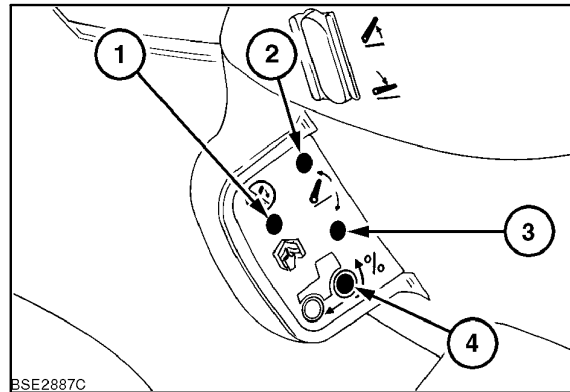
Indicator Lights

The malfunction warning light (1), serves two purposes:

- **Flashing light** means that there is a malfunction in the system circuits. This will be accompanied by the hitch error symbol appearing in the Dot Matrix Display.
- **Steady light** signifies 'hitch disabled'. Again, the 'hitch disabled' warning is repeated in the Dot Matrix Display with the hitch symbol.

The indicator lights (2) and (3), operate when the position control lever is used to raise or lower the implement or as lift and lower corrections occur during normal tractor operation. The lower light (3) will illuminate when the 3-point linkage lowers. The upper light (2) will illuminate when the linkage raises.

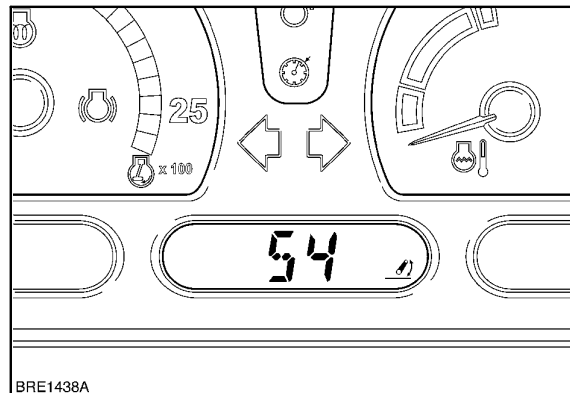
A slip limit 'on' indicator (4), illuminates when the wheel slip limit control is activated.



81

Hitch Position Display

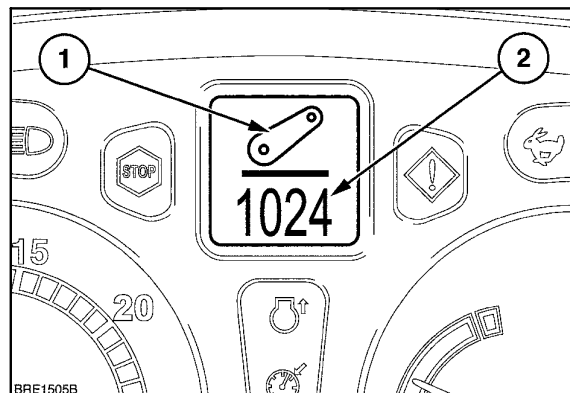
The digital display in the instrument panel indicates the position of the lower links over a scale of '0' to '100'. A display of '0' indicates that the links are fully lowered. '100' indicates they are fully raised. Select the display using the CAL/SEL switch or the Enhanced keypad (where fitted).



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Malfunction Warning Light

In the unlikely event that a fault occurs in the EDC, the malfunction warning light (1) Figure 81, will start to flash. The warning light will be accompanied by the appearance of the hitch symbol (1), and error code (2), in the Dot Matrix Display.



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SECTION 3 - FIELD OPERATION

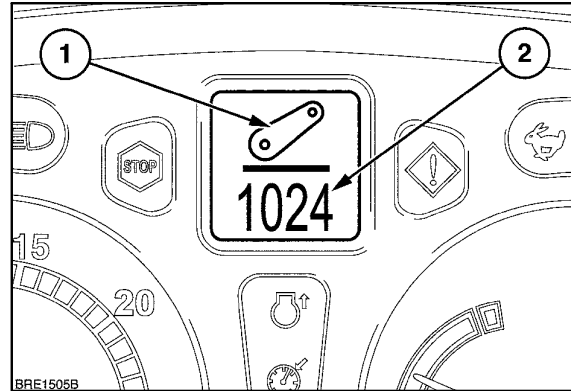
The code indicates the tractor circuit or sensor in which the fault lies and the type of fault, e.g. short circuit, open circuit, sensor failure, etc. In this event your tractor will require the attention of your authorised dealer.

A steady malfunction warning light signifies 'hitch disabled' which is repeated in the Dot Matrix Display by the appearance of the hitch symbol (1) and error code '1024' (2).

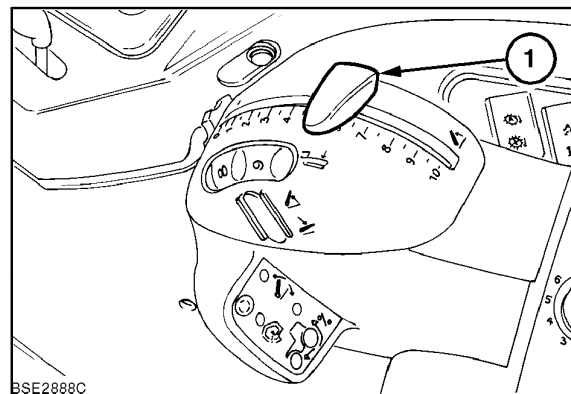
The 'hitch disabled' warning light signifies that the position control setting does not correspond to the position of the lower links with the result that the lower links cannot be raised or lowered using the in-cab controls. The 'hitch disabled' warning will display if:

- The Position Control lever has been moved with the engine stopped.
- One of the external power lift switches has been operated to raise or lower the three-point linkage. See 'External Hydraulic Power Lift Controls' on page 3-57.

To put the Position Control lever back into phase with the lower links, place the raise/lower switch in the central position and, with the engine running, move the Position Control lever (1) slowly forward or rearward, as required, until the position of the lever matches the linkage height. The 'hitch disabled' warning light will go out and the hitch error symbol will disappear from the Dot Matrix Display. The 3-point linkage will now raise or lower normally.



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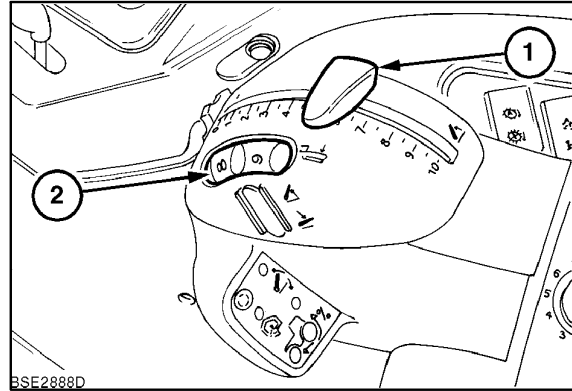
SECTION 3 - FIELD OPERATION

PRE-OPERATION SETTINGS

Attach the implement to the 3-point linkage.

Turn the draft loading wheel (2) fully forward to position 10 - this is the Position Control setting.

Start the engine and, using the Position Control lever (1), raise the implement in stages, ensuring that there is at least 100 mm (4 in.) clearance between the implement and any part of the tractor. Note the digital display reading on the instrument panel. If the reading is less than '99' it means that the implement is not fully raised.

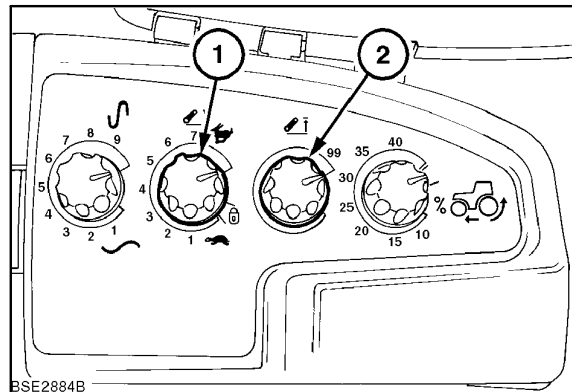


86

Adjust the height limit control knob (2) to prevent the linkage being raised further and so avoid the possibility of the implement damaging the tractor when fully raised.

When the raise/lower switch or the Position Control lever is used to raise the implement, it will only raise to the height set by the height limit control, as determined in the previous step.

Adjust the rate of drop, to suit the size and weight of the attached implement, by rotating the drop rate control knob (1). Turn the knob clockwise to speed up the drop rate or anti-clockwise to slow down the drop rate.



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IMPORTANT: When first setting the implement up for work, keep the drop rate control knob in the slow drop position ('tortoise' symbol).

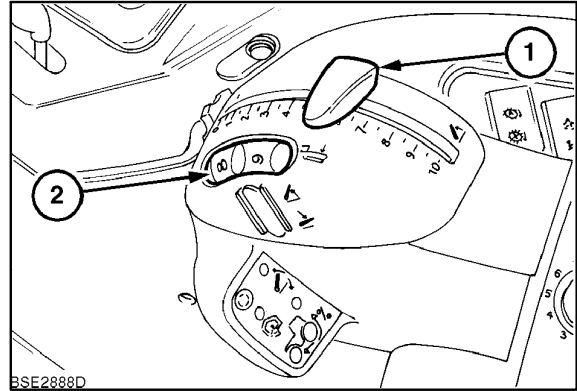
When the raise/lower switch is used to lower the implement, it will lower at a controlled rate as determined in the previous step.

SECTION 3 - FIELD OPERATION

DRAFT CONTROL OPERATION

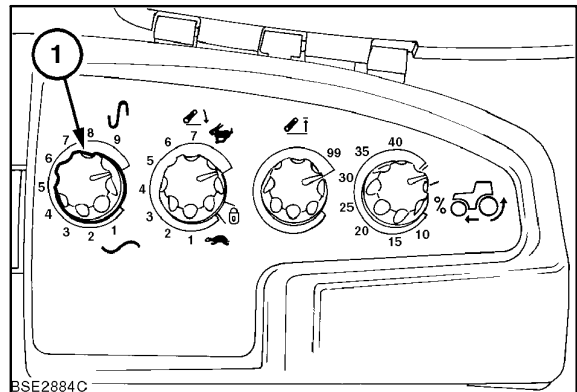
To operate in Draft Control adjustment of several controls is necessary to suit the implement and field conditions.

The draft loading wheel (2), determines implement depth by setting a required force on the draft sensing pins. Set the wheel to the mid-position (position 5) prior to commencing work.



88

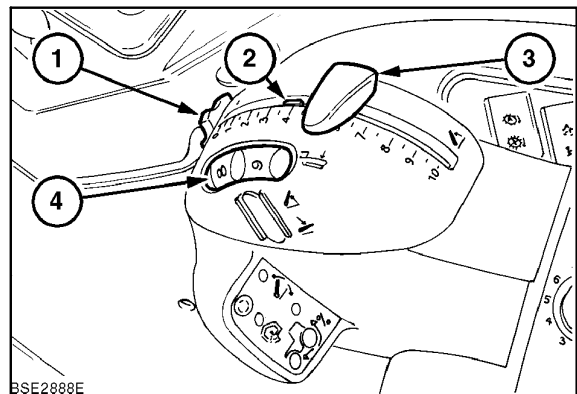
The position of the draft sensitivity knob (1), determines the sensitivity of the system. Set the knob to the mid-position before entering the field.



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Drive the tractor into the field and lower the implement into work by moving the Position Control lever (3), forward. Use the Position Control lever to set the maximum depth and so prevent 'diving' when areas of light soil are encountered. Set the required implement working depth by rotating the draft loading wheel (4).

Rotate the thumbwheel (1) to move the adjustable stop (2) against the Position Control lever so that the selected setting may be quickly found.

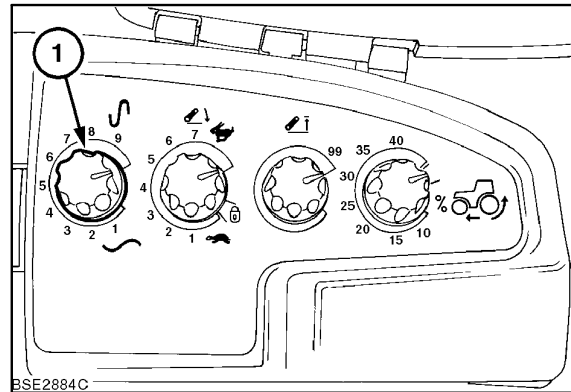


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SECTION 3 - FIELD OPERATION

Observe the implement as it pulls through the soil and adjust the draft sensitivity knob (1), until the tendency to raise or lower, due to variations in soil resistance, is satisfactory. Once set, the tractor hydraulic system will automatically adjust implement depth to maintain an even pull (draft load) on the tractor.

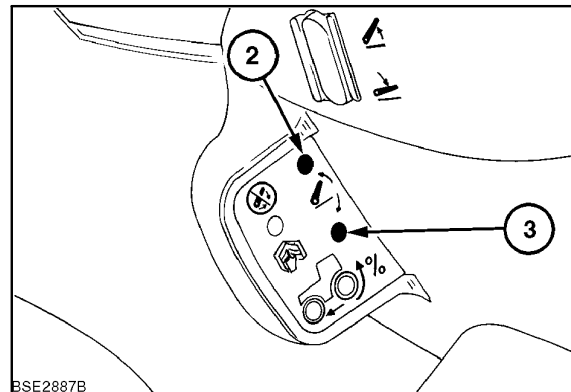
The optimum setting will be achieved by observing the movement indicator lights (2) and (3). The upper light (2) will illuminate every time the system raises the implement as normal draft corrections occur. The lower light (3) will illuminate as the implement lowers.



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Turn the draft sensitivity knob (1) slowly clockwise. The system will respond with smaller, quicker movements as will be seen by both the indicator lights flickering. At this point, turn the knob slightly anti-clockwise until either of the indicator lights flashes once every 2 or 3 seconds or, as required, to suit the soil conditions.

Once the required working conditions have been established there is no need to move the position control lever again until the work in hand is completed.

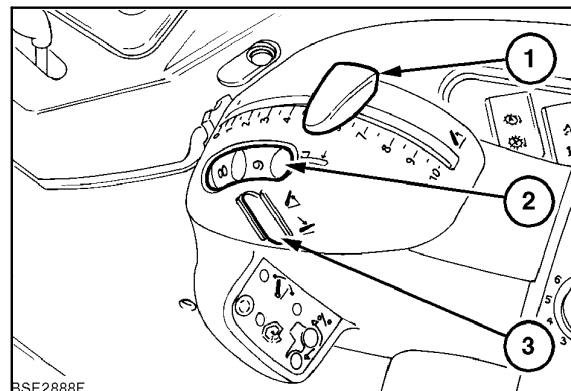


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Upon reaching the headland, momentarily depress the top of the raise/lower switch (3) to quickly lift the implement to the position set by the height limit control knob. When re-entering the working area, momentarily depress the lower part of the switch and the implement will descend at the rate set by the drop rate control knob and stop when it reaches the depth set by the draft loading wheel (2).

During the raise cycle, momentarily depressing the top of the raise/lower switch will pause implement lift. Depress the top of the switch again to resume the cycle.

Depressing the lower part of the switch during the lowering cycle will also pause implement drop.



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SECTION 3 - FIELD OPERATION

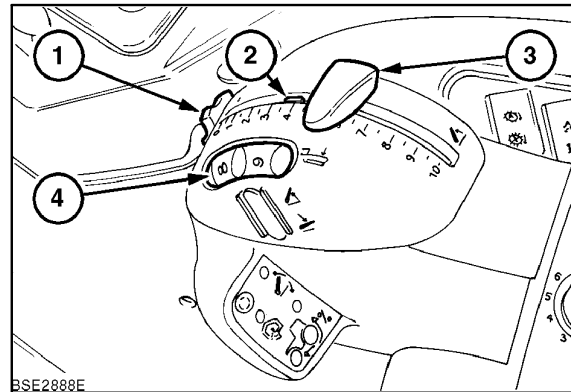
Faster implement penetration may be required, for example, after turning at a narrow headland. Also, some implements are reluctant to penetrate, particularly if the ground is heavy. Press and hold the bottom of the raise/lower switch (4) and the implement will lower at the rate set by the drop rate control knob, until it contacts the ground. The drop rate and the Position Control settings will then be overridden and the implement will quickly penetrate the ground, rising to the preset working depth when the switch is released.

Alternatively, the adjustable stop may be used to set the implement depth. When the required implement depth has been established, rotate the thumbwheel (1). This will move the stop (2) so that it is against the front edge of the position control lever (3). Whenever the implement is raised, using the Position Control lever, it will always return to the same working depth when the lever is moved forward to contact the stop.

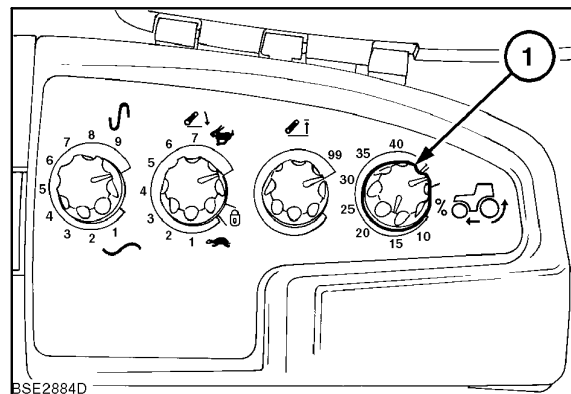
NOTE: If required, the Position Control may be eased sideways (to the left), in order to bypass the stop, to lower the implement further.

The slip limit control knob (1), available only with the optional radar sensor unit, enables the operator to select a wheel slip threshold, above which the implement will raise until wheel slip returns to the preset level. The system overrides the normal Draft and Position Control sensing signals of the hydraulics so care must be taken not to select too low or too high a slip limit. Setting the slip limit to a very low level, unobtainable in wet conditions, may have a detrimental effect on the work rate/depth.

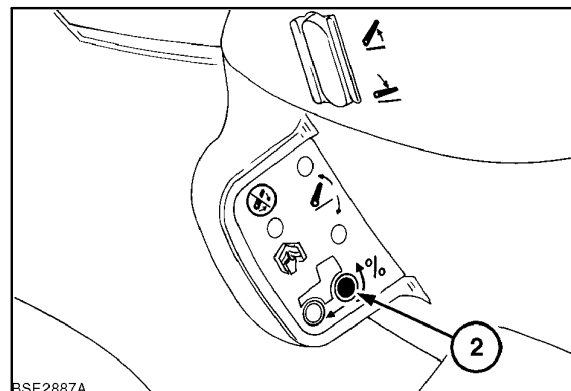
The slip limit 'on' indicator (2) will illuminate when slip control is activated and the implement is raising to restore the selected slip rate. The knob is detented at the 'off' position (knob fully clockwise).



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SECTION 3 - FIELD OPERATION

POSITION CONTROL OPERATION

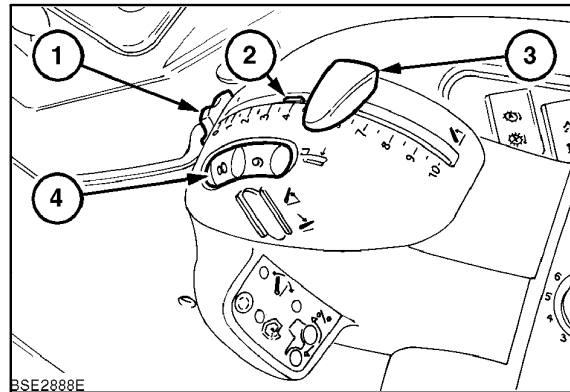
To operate in Position Control, the draft loading wheel (4) should, ideally, be rotated fully forward to position 10.

Use the Position Control lever (3) to raise and lower the 3-point linkage. The implement will raise and stop at the height set by the height limit control knob.

NOTE: The rate of lift will be adjusted automatically. If a large movement of the position control lever is made then the lower links will respond by moving rapidly. As the links approach the position set by the Position Control lever, implement movement will be slower.

When the implement is at the required working height, use thumbwheel (1) to set the adjustable stop (2) against the Position Control lever (3). Every time the Position Control lever is moved, it may be quickly returned to its original position, against the stop, to maintain the required implement height.

If it is required to raise the implement at the headland, momentarily depress the top of the raise/lower switch (5), to lift the implement to the position set by the height limit control knob. When re-entering the work area, depress the lower part of the switch and the implement will return to the height originally set by the Position Control lever (3).



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SECTION 3 - FIELD OPERATION

TRANSPORT LOCK

When transporting equipment on the 3-point linkage, turn the drop rate control knob (2), fully anti-clockwise to the transport lock position (padlock symbol). This will prevent the implement from accidentally lowering and damaging the road surface.

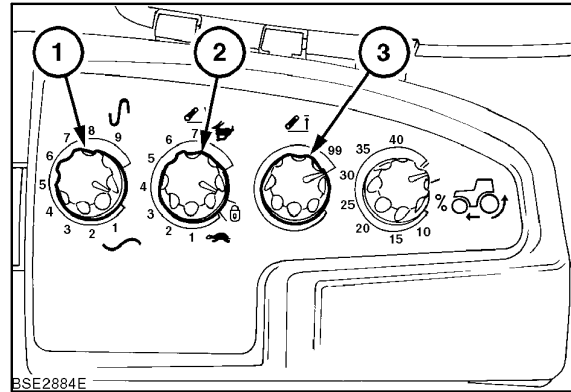
DYNAMIC RIDE CONTROL

When transporting equipment on the 3-point linkage, implement bounce can lead to lack of steering control at transport speeds. With Ride Control selected, when the front wheels hit a bump, causing the front of the tractor to rise, the hydraulic system will immediately react to counter the movement and minimise implement bounce to provide a smoother ride.

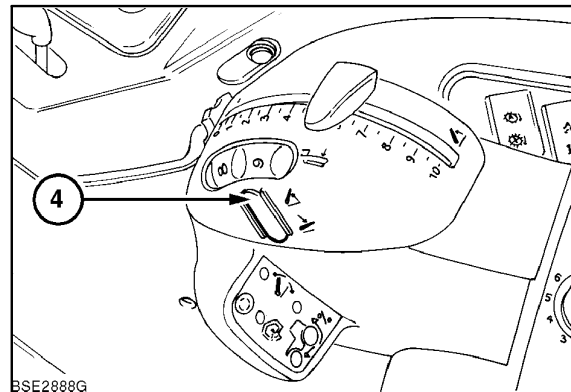
To engage Ride Control, turn the draft sensitivity knob (1), fully anti-clockwise. Using the raise/lower switch (4) Figure 99, raise the implement to the height set by the height limit control (3).

Turn the drop rate control knob (2) fully anti-clockwise to the transport lock position (padlock symbol).

Ride Control will only operate at speeds above 8 kph (5 MPH). When tractor speed exceeds 8 kph (5 MPH), the implement will drop by 4 - 5 points (as displayed on the instrument panel) as the hydraulic system makes corrections to counteract implement bounce. When tractor speed falls below 8 kph (5 MPH) the implement will raise again to the height set by the height limit control and Ride Control will become inoperative.



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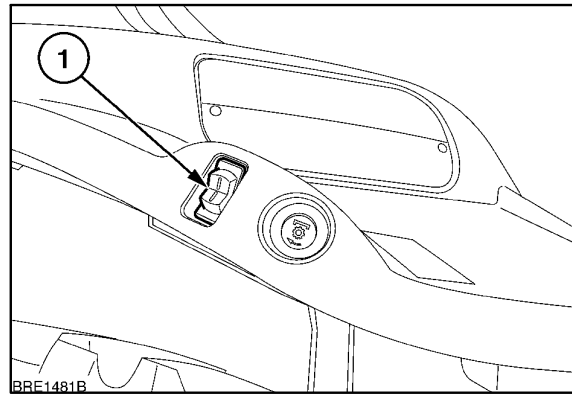
SECTION 3 - FIELD OPERATION

EXTERNAL HYDRAULIC POWER LIFT CONTROLS (where fitted)

An external, rocker type switch (1) is provided on each rear fender assembly. The switches are of a three-position design, spring-loaded to return to the central, off position.

⚠ WARNING ⚠

Do not stand on or near the implement or between the implement and tractor when operating the external hydraulic power lift controls.



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Before leaving the tractor to operate the external switches:

- Move the gearshift levers to neutral.
- Disengage the P.T.O.
- Apply the parking brake.

With the engine running, move the hand throttle lever to the low idle position (fully rearwards).

⚠ WARNING ⚠

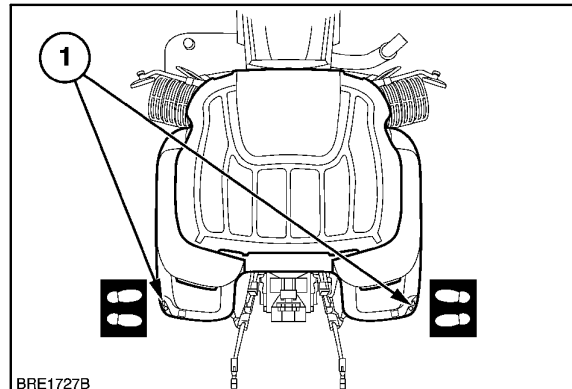
Before using the external hydraulic power lift switches, ensure that no person or object is in the area of the implement or 3-point linkage.

Never operate the external switches while standing:

- Directly behind the tractor or tyres.
- Between the lower links.
- On or near the implement.

⚠ WARNING ⚠

Never extend arms, legs, any part of the body or any object into the area near the 3-point linkage or implement while operating the external switch.



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SECTION 3 - FIELD OPERATION

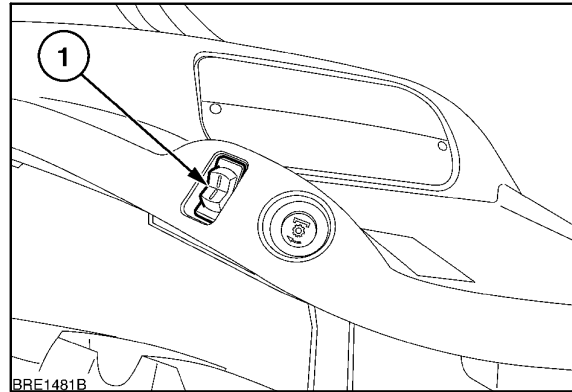
Never have an assistant working the opposite set of controls. When moving to the opposite set of controls, move around the tractor or implement. Do **not** cross between the implement and tractor.

The operator must only activate the external switches while standing to the side of the tractor (outboard of the rear tyres).

Pressing the upper part of the rocker switch (1) will cause the lift linkage to raise slowly. Pressing the lower part will cause the linkage to lower. When the lower links align with the implement, release the switch and attach the implement to the 3-point linkage in the normal way.

To transfer control of the hydraulic power lift back to the lift control lever, move the lift control lever fully rearwards and push forward again, more slowly. The 'hitch enabled' symbol will display in the instrument panel, indicating that the 3-point linkage is in phase with the lift control lever (see page 3-50).

IMPORTANT: When control of the 3-point linkage is transferred back to the lift control lever, an attached implement may raise fully and damage the rear of the cab. Operator's should be aware of this and take appropriate action to stop raising before full lift height is reached. Adjust the height limit control knob as described under Position Control Operation.



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HYDRAULIC REMOTE CONTROL VALVES

**WARNING**

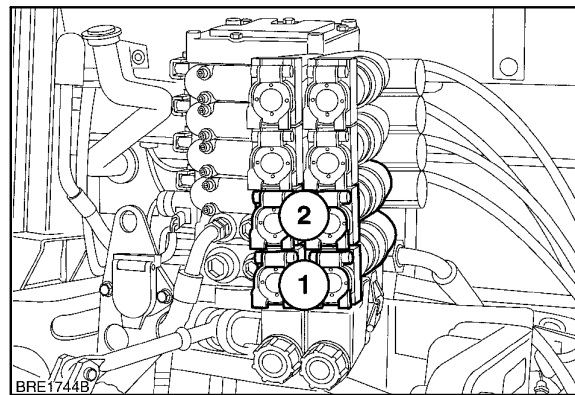
Hydraulic fluid escaping under pressure can penetrate the skin causing serious injury. If any fluid is injected into the skin, obtain medical attention immediately or gangrene may result.

- Do **not** use your hand to check for leaks. Use a piece of cardboard or paper.
- Stop the engine and relieve pressure before connecting or disconnecting hydraulic lines.
- Tighten all connections before starting the engine or pressurising lines.

Hydraulic remote control valves are available to operate external hydraulic cylinders, motors etc. All models have two valves as standard, installed at the rear of the tractor adjacent to the top link.

On tractors with four valves, the first and second valves may be controlled by levers or by a 4-way joystick control mounted to the right of the operator's seat.

Each control lever is coloured to correspond to the colour marking on the remote valve.

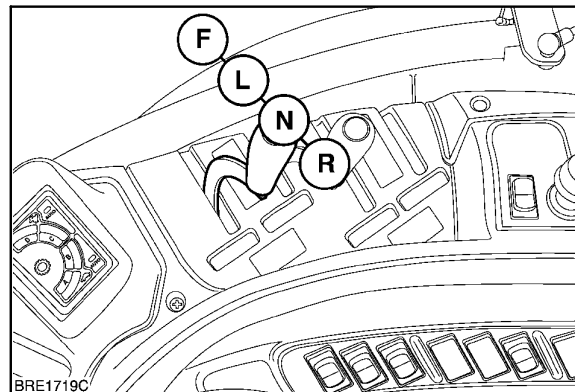


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Control Levers

Each valve is controlled by a separate lever providing four operating positions, raise (R), neutral (N), lower (L) and float (F). The levers and their respective valves are colour coded for identification.

Move the lever rearward from the neutral position and the cylinder will extend to raise the implement. Push the lever forward, past neutral, to retract or lower the cylinder. Pushing it fully forward, beyond the 'retract' position, will select 'float' which will permit the cylinder to extend (raise) or retract (lower) freely, thereby allowing equipment such as scraper blades to 'float or follow the ground contour.



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SECTION 3 - FIELD OPERATION

Joystick Control (where fitted)

The joystick (1), actuates valves I and II, operating in a cross pattern.

Moving the joystick backwards and forwards in a straight line actuates valve No. I.

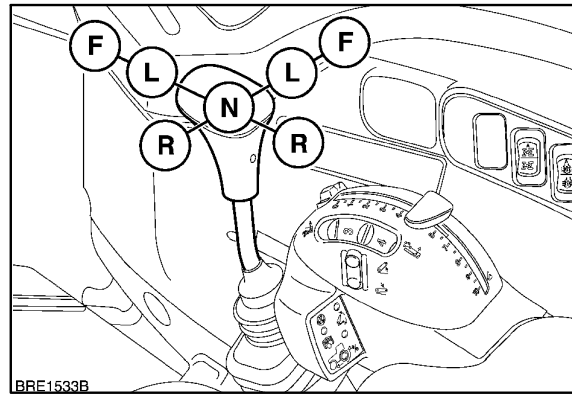
Moving the joystick sideways in a straight line actuates valve No. II.

Moving the joystick diagonally will actuate both valves simultaneously. By applying directional bias, one valve can be made to actuate at a faster or slower rate than the other.

Move the joystick rearward from the neutral position and the cylinder connected to valve No. I will extend to raise the implement. Push the joystick forward, past neutral, to retract (lower) the cylinder. Pushing it fully forward, beyond the 'retract' position, will select 'float' which will permit the cylinder connected to remote control valve No. I to extend or retract freely, thereby allowing equipment such as scraper blades to 'float or follow the ground contour.

Move the joystick to the left from the neutral position and the cylinder connected to valve No. II will extend to raise the implement. Move the joystick to the right, past neutral, to retract the cylinder. Move the it fully to the right, beyond the 'retract' position, will select 'float' which will permit the cylinder connected to remote control valve No. II to extend or retract freely.

The joystick and it's respective valves are colour coded for identification.



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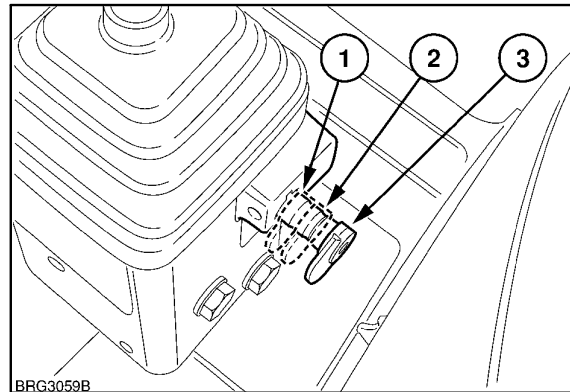
SECTION 3 - FIELD OPERATION

Joystick Lock

The lever lock provides selective control of the joystick. With the lock pushed fully in, position (1), the joystick is fixed in neutral and the remote valves cannot be operated, either by accident or by choice.

If the lock is pulled fully out, position (3), valves I and II may be operated independently or together by moving the joystick control in the appropriate direction.

In the intermediate position (2), lateral movement of the joystick that operates valve II is locked.



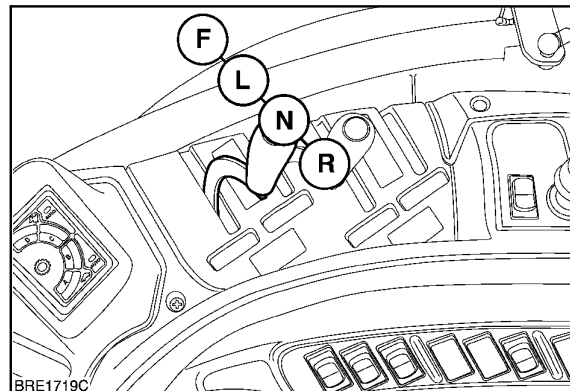
BRG3059B

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Joystick or Lever Controls

The extend (raise), neutral, retract (lower) and float positions are identified by symbols on a decal next to the joystick and/or control levers.

A detent will hold the joystick/lever in the selected extend or retract position until the remote cylinder reaches the end of the stroke when the control lever will automatically return to neutral. Alternatively, the lever may be returned to neutral manually. The lever will not return automatically from the float position.



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NOTE: Do not hold the joystick/lever in the extend or retract position once the remote cylinder has reached the end of the stroke as this will cause the relief valve to 'blow'. Forcing oil through the relief valve for extended periods will overheat the oil and may lead to failure of hydraulic and driveline components.

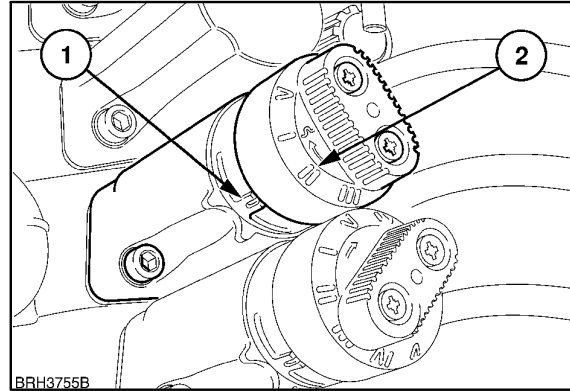
SECTION 3 - FIELD OPERATION

Configurable Detent Operation (where fitted)

Your tractor may be fitted with two remote valves having configurable detents. The rotary control (1), is used to select one of five detent settings.

To select a setting, rotate the control until the number (2), on the end cap, aligns with the mark (1), on the valve body.

NOTE: If the number on the rotary control is not aligned correctly with the reference mark on the valve body, the performance of the valve may be affected.



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Before turning the selector, ensure any residual pressure in the hydraulic system is exhausted. To do this, stop the tractor engine, cycle the remote valve lever through all positions and then place the lever in neutral.

Each position offers the following functions:

- I. Raise (R), Neutral (N), Lower (L) and Float (F) positions available.
Detent position in Float only.
No lever auto return to neutral (kick out).
- II. Raise, Neutral and Lower positions only.
No Float facility.
No detent positions available.
No lever auto return to neutral (kick out).
- III. Raise, Neutral, Lower and Float positions available.
Detents in Raise, Lower and Float.
Lever auto return to neutral (kick out) in Raise and Lower positions.
- IV. Raise, Neutral, Lower and Float positions available.
Detents in Raise, Lower and Float.
No lever auto return to neutral (kick out).
- V. *Raise and Float positions available.
Detents in Raise and Float.
No lever auto return to neutral (kick out).

*To select position 5, place the remote valve lever in neutral, select position I or IV then move the lever to the Float position. With the lever in Float select position V.

To de-select position V, put the remote valve lever into float, turn the selector control to position I or IV and then move the remote valve lever to neutral. It is now possible to select positions I to IV.

IMPORTANT: To prevent inadvertent movement of attached equipment when starting the tractor engine, ensure the remote valve levers are in the correct position before operating the key-start switch:

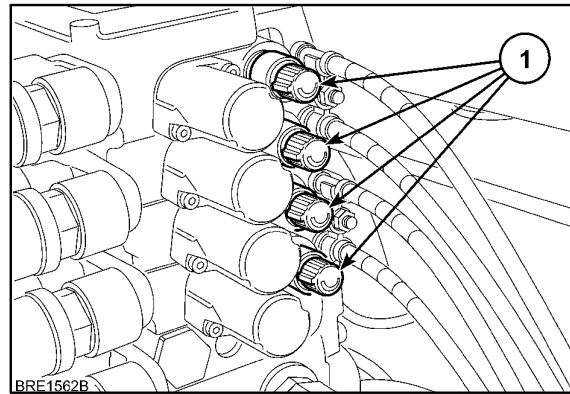
With the selector in positions I to IV - **Neutral**
With the selector in position V - **Float**

SECTION 3 - FIELD OPERATION

Flow Control

The flow control valve (1), meters the flow of oil to the remote cylinder and thus controls the rate of response of the cylinder. Rotate the flow control anti-clockwise to increase the oil flow to the implement, rotate clockwise to reduce the oil flow.

For flow rates, see Section 8 - Specifications.



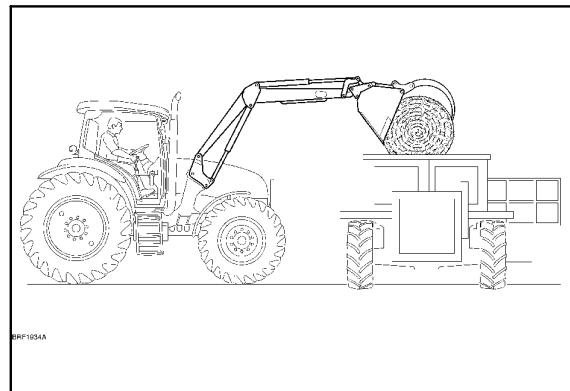
109

Operating with a Front Loader

If your tractor is fitted with a non New Holland front loader, the rear remote valves may be used to provide the hydraulic power.

For loader control it is recommended that remote valves 1 and 2 are fitted with a joystick and converted to non detent operation (position 1 with adjustable detents).

See Accessories, Section 7 for details on Zero Detent kits for non adjustable remote valves

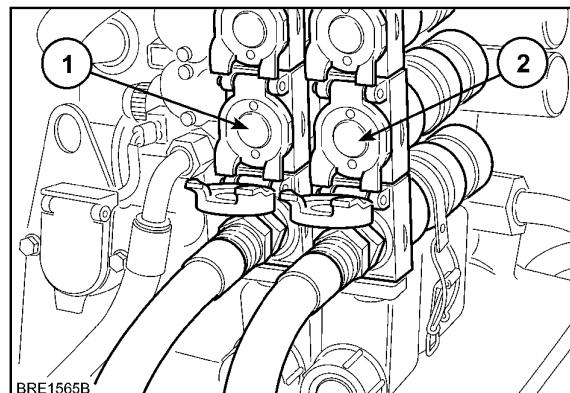


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Remote Valve Couplers

Each remote control valve has a pair of $\frac{1}{2}$ in. quick-disconnect, female couplers. These are of a self-sealing/locking design but will allow remote cylinder hoses to pull free if the implement should become disconnected from the tractor. The raise (lift) coupler (1), is on the left-hand side, the lower (drop) coupler (2), on the right-hand side.

The flip-up covers are colour coded black, brown, blue and green to corresponding to the control levers in the cab.



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SECTION 3 - FIELD OPERATION

Connecting Remote Cylinders



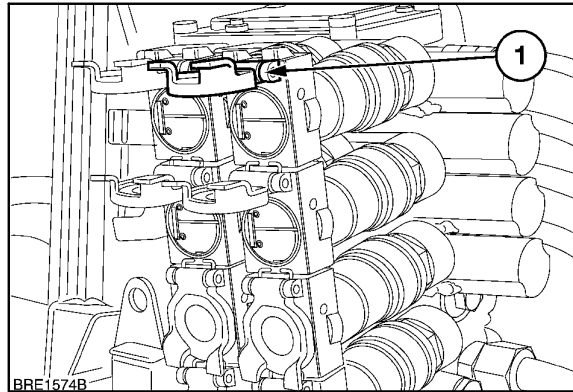
Before connecting or disconnecting hydraulic hoses at the remote cylinders, stop the engine and relieve the pressure in the circuit by moving the remote control valve lever(s) or joystick fully forward to the 'float' position then back to neutral. Never work under or allow anyone near raised equipment as it will drop when relieving pressure in the system.



Before disconnecting cylinders or equipment ensure the equipment or implement is supported securely.

To connect a remote cylinder, lift the hinged cover(1), until it locks in the raised position, insert the feed and/or return hose through the slit in the secondary dust cover, ensuring it is correctly seated in the coupler. Ensure that there is sufficient slack in the hose(s) to allow the tractor/implement to turn in either direction.

IMPORTANT: Before connecting remote cylinder hoses, stop the engine and thoroughly clean the connections to prevent oil contamination.



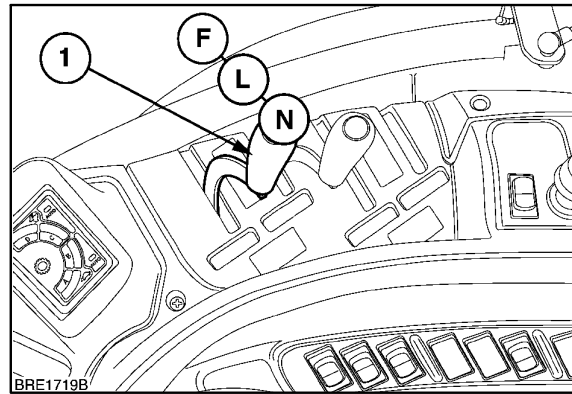
112

SECTION 3 - FIELD OPERATION

To equalise the pressure in the hose and tractor couplers, start the engine and move the joystick or valve control lever (1), to the 'float' position, then return it to neutral. To disconnect, grip the hose a short distance from the coupler, push the hose forward, into the coupler, then quickly pull on the hose to 'pop' the coupler free. Close the hinged cover to protect the valve.

WARNING

Never work under equipment supported by a hydraulic device because it may drop if the control is actuated (even with the engine stopped) or in the event of hose failure. Always use a secure support for equipment which must be serviced while in the raised position.



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NOTE: Remote cylinders are operated by oil drawn from the tractor hydraulic system, therefore, always check and replenish the hydraulic system oil after remote cylinder equipment has been connected and cycled a few times. Operating the tractor with a low oil level may result in damage to the rear axle and transmission components.

When topping up the rear axle to accommodate the requirement of remote cylinders, no more than 20 litres (5.28 U.S. Gallons) should be added to bring the oil level up to the full mark on the dipstick.

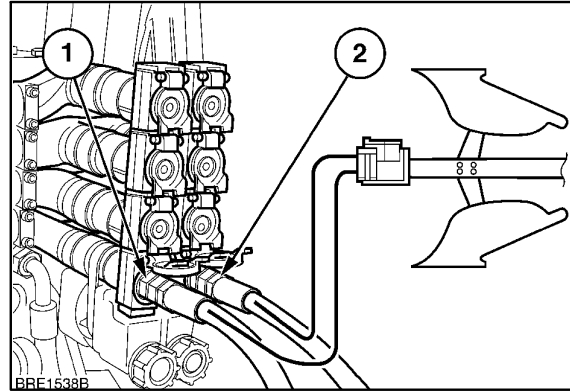
Alternatively, remote cylinders with a total oil capacity of up to 18 litres (4.75 U.S. Gallons) may be connected to the tractor hydraulic system without adding oil, provided that the tractor is being operated on level ground.

SECTION 3 - FIELD OPERATION

Operating Double-Acting Cylinders

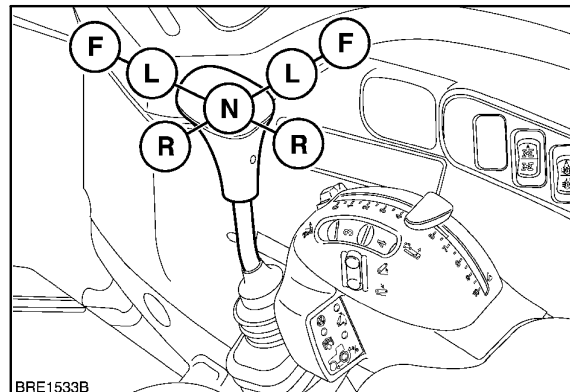
Connect the feed hose (1) between the piston end of a double-acting cylinder and the left-hand coupler on the remote control valve. Connect the hose (2) between the right-hand coupler on the same valve and the rod end of the cylinder. To extend a double-acting cylinder, move the control lever or joystick to the 'extend' (raise) position.

To retract a double-acting cylinder, move the control lever or joystick through neutral to the 'retract' (lower) position.



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Further movement of the lever or joystick, beyond the 'retract' position, will select 'float' which will allow the cylinder to extend or retract freely. This feature is of material assistance when carrying out work with equipment such as scraper blades and loaders.



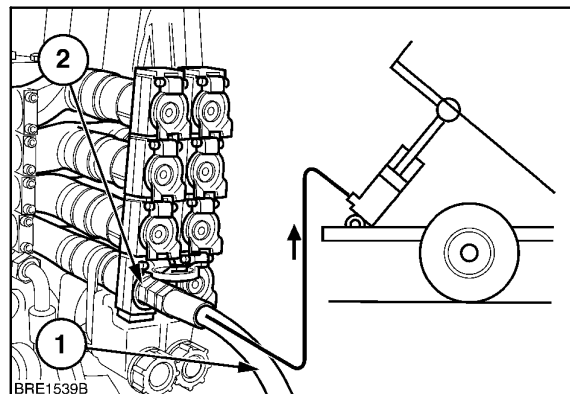
115

Operating Single-Acting Cylinders

Connect the hose (1) from a single-acting cylinder to the left-hand coupler (2) on the remote control valve.

To extend a single-acting cylinder, move the control lever or joystick to the 'extend' (raise) position.

Manually return the lever or joystick to the neutral position to stop the cylinder before it is fully extended or allow the valve to return to the neutral automatically when the cylinder reaches the end of its stroke.



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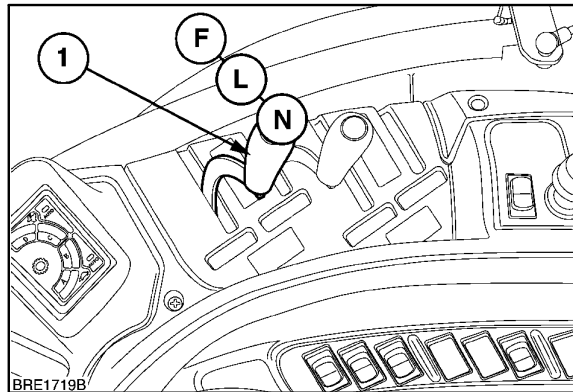
To retract a single-acting cylinder, move the lever or joystick beyond the 'retract' (lower) position to the 'float' position.

SECTION 3 - FIELD OPERATION

IMPORTANT: Always use the 'float' position to retract a single-acting cylinder. The 'retract' position is for double-acting cylinders only.

NOTE: If a single-acting cylinder is disconnected in the extended position, while supporting a load, the hose may be reconnected to the remote control valve but will not operate until the pressure is released. Proceed as follows:

- Connect the hose, as described above.
- Start the engine and momentarily pressurise the cylinder by moving the remote control valve lever/joystick to the extend position and then immediately to the float position to retract the cylinder and lower the implement.

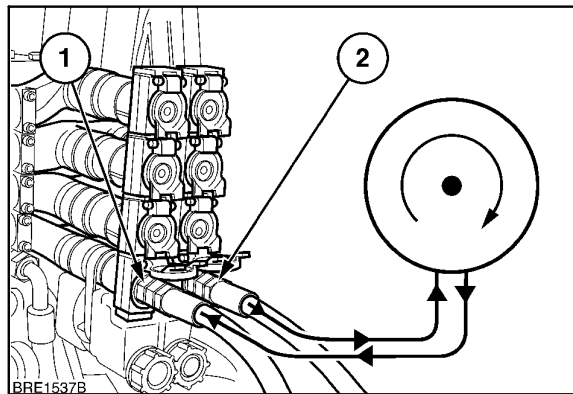


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Operating Continuous Flow Hydraulic Equipment

Continuous flow hydraulic equipment (e.g. hydraulic motors) should be connected to a remote control valve coupler with the feed hose (2) connected to the right-hand coupler and the return hose (1) connected to the left-hand coupler of the same valve.

With the remote control valve lever or joystick in the 'float' position the motor will be stationary. The hydraulic motor will operate if the lever or joystick is moved to the 'retract' (lower) position.

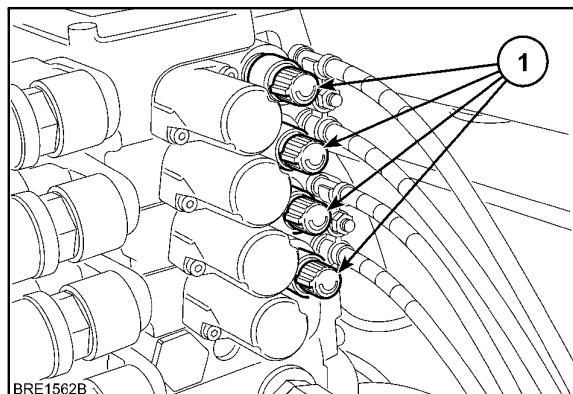


118

IMPORTANT: To stop the motor, move the lever or joystick to the 'float' position. The motor will then slow to a halt and not stop abruptly causing internal line pressures which could damage the motor seals.

Observe the following to further protect the tractor and equipment:

- Do not open any by-pass valve in the equipment or motor. Use the flow control valve to control the rate of flow or speed of the motor.
- To assure optimum hydraulic oil cooling and prevent overheating, operate continuous flow equipment at the highest flow setting (by use of the flow control valve (1), and lowest engine speed that will give the required machine performance and speed.



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SECTION 3 - FIELD OPERATION

- It is recommended that a temperature gauge, where available, is installed in the remote circuit when using hydraulic motors for continuous operation. If over-heating occurs, stop the hydraulic motor until the oil cools. Ensure the flow control setting is at maximum and the engine speed at a minimum, appropriate to machine performance.

If operating conditions are normal and high temperatures persist, install an oil cooler in the motor return circuit. The maximum recommended operating temperature of the oil is 110°C (230°F). Your authorised dealer can supply a suitable oil cooler and the necessary fittings or make the installation for you.

Operating Several Remote Valves Simultaneously or Remote Valves and Hydraulic Lift Simultaneously

NOTE: *The hydraulic load-sensing system on your tractor adjusts the oil flow according to the individual flow control settings up to the maximum output possible, dependent upon engine speed. The oil flow will be relatively constant in the remote control valve circuits if the flow control valves are used to regulate the flow, thus providing constant operating speed for hydraulic motors, etc., even if engine speed varies. Maintain the engine speed above the minimum required for simultaneous operation of all the required circuits and vary ground speed by selection of the appropriate gear ratio.*

If operating two or more remote control valves simultaneously or remote valves and the hydraulic lift, all the flow control valves should be adjusted to provide a partial flow. If not so adjusted, all the available flow may be directed to the full flow circuit when the pressure in that circuit is less than that of the other circuits in use.

Bleeding Remote Cylinders

When connecting a cylinder with trapped air, i.e., a new cylinder, one that has been out of service or one that has had the hoses disconnected, it will be necessary to bleed the cylinder to remove the air.

With the hoses connected to the remote control valve couplers at the rear of the tractor, position the cylinder with the hose end uppermost and extend and retract the cylinder seven or eight times using the remote control valve lever or joystick.

Check the rear axle oil level before and after operating a remote cylinder.

ELECTRO-HYDRAULIC REMOTE CONTROL VALVES (where fitted)

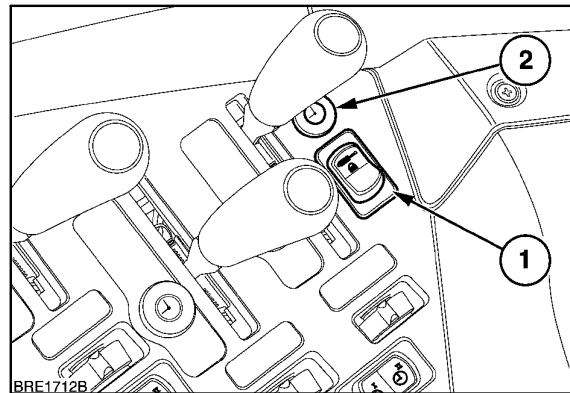
NOTE: The Electro-hydraulic remote valves are only available in conjunction with the Enhanced keypad.

The electro-hydraulic remote valves operate in a similar manner to the mechanical valves previously described. However, with these remote valves, a number of additional automated functions are available, supported by visual displays in the Dot Matrix screen.

Remote Valve Isolator Switch

The remote valves cannot be operated unless the system is energised using the isolator switch (1). Depress the lower part of the switch to activate the electrical circuit, depress the upper part to de-activate. When activated, the amber warning light (2) will be illuminated. The remote valve(s) are now operational whenever the tractor engine is running.

IMPORTANT: The isolator switch may be used to immediately stop operation of the rear remote valves by depressing the top of the switch. The isolator switch will only control the remote valves, it has no effect on three point linkage operation.

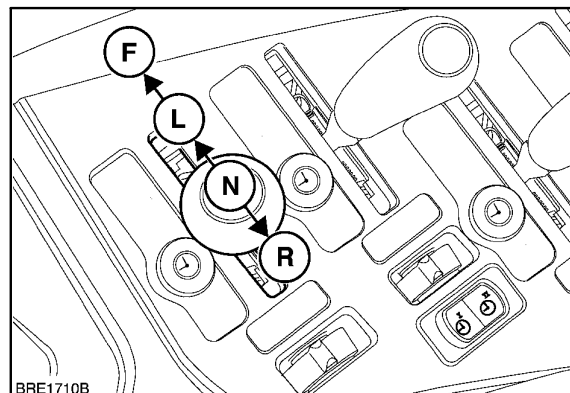


120

Control Levers

Each remote valve lever has four positions, extend, neutral, retract, and float. In extend and retract modes, the detented positions are used for timed remote valve functions.

Pull the lever back from the neutral position, (N), to the "extend" (Raise) position, (R). From neutral, push forward to the "retract" (Lower) position, (L). Push the lever fully forward to the Float position, (F). Float will permit the cylinder to extend or retract allowing equipment such as scraper blades to "float" or follow the ground contour.



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The "float" position is also used for retracting a single-acting cylinder and is the OFF position for hydraulic motors.

SECTION 3 - FIELD OPERATION



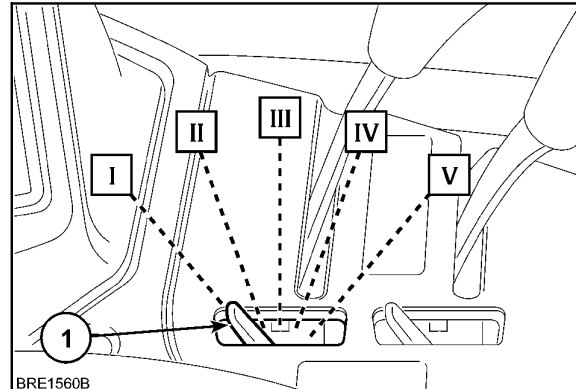
CAUTION

Electro Hydraulic Remote Control Valves have detented lever positions. It is not recommended these control valves be used for front loader operation. Consult your authorised dealer.

IMPORTANT: In the unlikely event that the remote valve ceases to operate or responds incorrectly to lever movements, the system will require the attention of your authorised dealer.

Each control lever has a 'rolling gate' which is used to select or lock-out individual remote valve functions. Detents on the lever (1) will lock the 'gate' in one of five positions.

- I. Neutral and Raise locked out: Lower and Float functional. Move the lever into float before selecting this position.
- II. Raise detent locked out: Neutral, Lower and Float functions operative.
- III. All valve functions are operative.
- IV. Float locked out: Raise, Neutral and Lower functional.
- V. Lever locked in neutral: No valve functions are available.

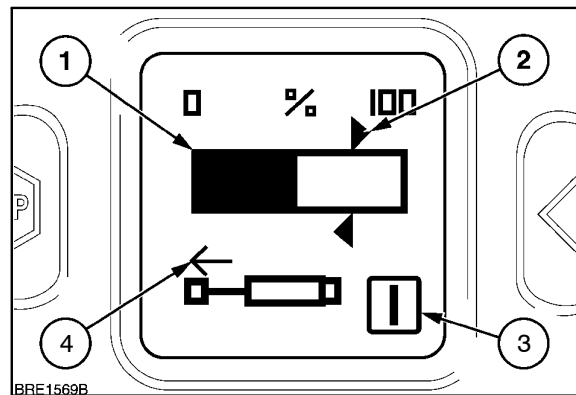


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Visual Displays

Depress the remote valve key on the keypad and the following information will be displayed in the DMD for each valve:

1. Momentary oil flow from the valve. The shaded area represents the percentage of oil flow, this will change as the flow increases or decreases.
2. Maximum flow rate (%) as set by the operator. The extend/retract directional arrows represent the maximum flow setting.
3. Number of the remote valve in operation.
4. Direction of cylinder movement, extend (Raise) or retract (Lower). The direction of cylinder travel is identified by the arrow.



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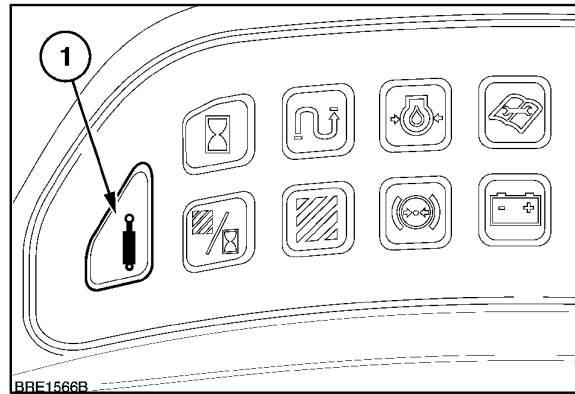
SECTION 3 - FIELD OPERATION

Setting the Maximum Flow Rate

The maximum flow rate for each remote valve can be set using the menu keys on the Enhanced keypad.

To adjust the remote valve flow rate, the key-start must be switched ON.

Using the remote valve key (1), select the appropriate valve (1, 2, 3, or 4).

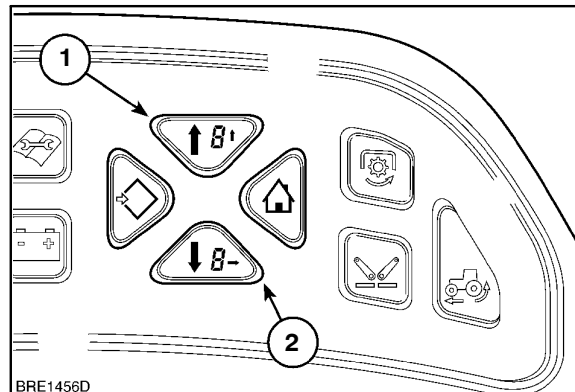


124

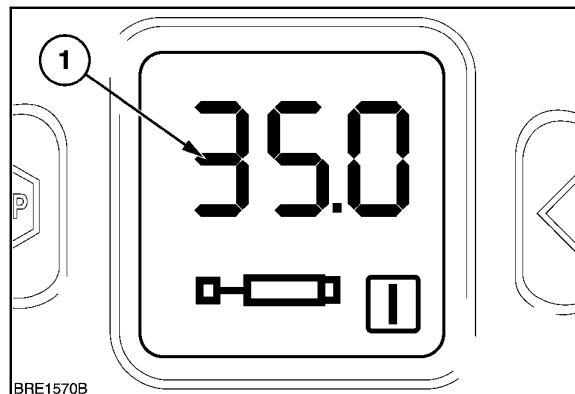
With the selected valve number displayed in the DMD, Use the **MENU UP/DOWN** keys (1 and 2), to increase or decrease the maximum flow rate of the selected valve. The flow rate will be stored in the tractor control module until re-programmed, turning the key-start off will not erase the setting.

NOTE: The remote valve flow rate setting (1), Figure 126, will apply to both extend and retract movements of the cylinder.

IMPORTANT: During remote valve set-up, a pause of more than two seconds in key operation will exit set-up and return to the previous setting, re-enter set-up mode again to continue.



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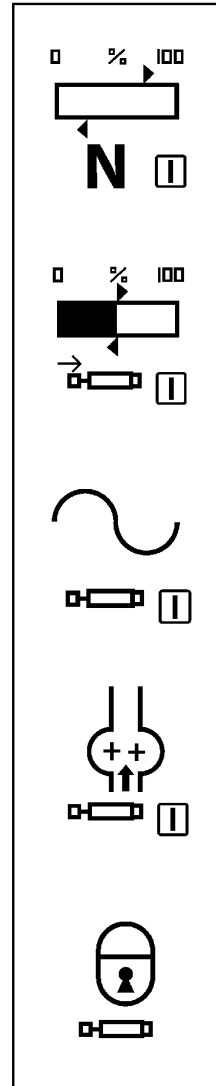
SECTION 3 - FIELD OPERATION

Additional Displays

As each of the electro-hydraulic remote valve functions are selected, a corresponding visual display will appear in the Dot Matrix Screen.

NOTE: The following illustrations relate to remote valve number 1, see page 3-70 for details on remote valve numbering.

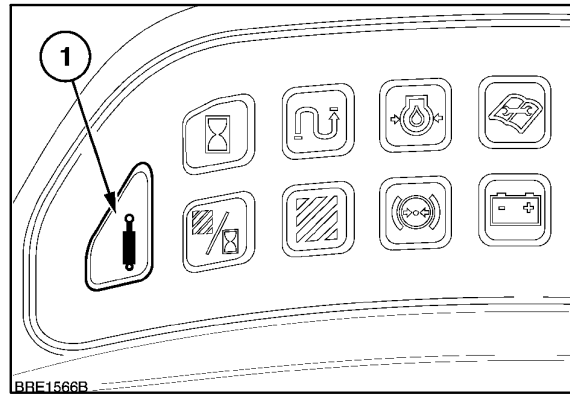
1. Remote valve in neutral position.
2. Remote valve operating at maximum flow set by the operator. The illustration shows cylinder operating in retract mode.
3. Remote valve lever in 'float' position.
4. Remote valve locked in hydraulic motor mode. Retract and Float positions only available.
5. Electro-Hydraulic Remote Valve system switched OFF. All valve functions de-activated.



Manual and Programmable Lever Operation

The Enhanced keypad is used to select and programme the timed functions for each of the electro-hydraulic remote valves. As each remote valve is selected using the remote valve key (1), a visual display of the valve functions will appear in the Dot Matrix screen.

Depress the key once to activate the remote valve display in the DMD. Repeated operation of the key will cycle through each valve display individually.



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Manual Operation

When used in manual mode, without the timer function, the electronic remote valves will operate in a similar way to the mechanical valves previously described.

IMPORTANT: Care must be taken when operating in the manual mode that the remote valve lever is not left in the detented extend or retract positions when using remote cylinders. When the cylinder has reached the end of its stroke the control lever **must** be returned to the neutral position manually. Failure to observe this procedure will overheat the oil and may lead to failure of hydraulic or driveline components.

IMPORTANT: Never use the neutral position from the extend or retract position to stop a hydraulic motor. Sudden hydraulic lock up of the system may cause extensive damage to the motor.

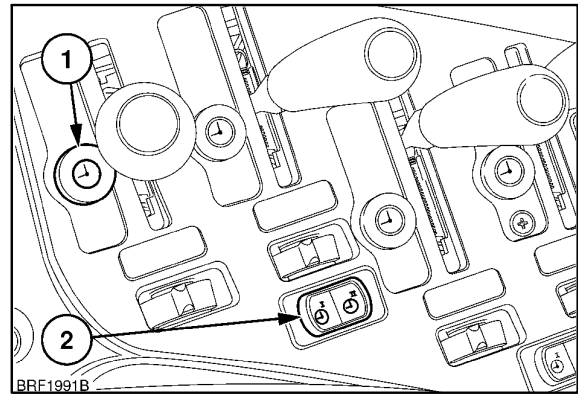
In manual mode, oil flow through each valve is adjusted using the flow rate setting as previously described.

SECTION 3 - FIELD OPERATION

Timed Programme Operation

Timed programme operation is provided primarily for operation of hydraulic cylinders. This feature allows the operator to programme a time delay between when the control levers are activated and when the oil flow to the implement is stopped.

To operate the electronic remote valves in programmed mode, depress the appropriate side of timer control switch (2) as shown. When the switch is depressed, the green light (1) adjacent to the remote valve lever will start to flash. The system is now in standby mode ready to accept a programme sequence. The light will continue to flash for ten seconds allowing the operator sufficient time to begin the programming sequence. If a programme is not started within this period, the system will automatically de-activate, depress the timer control switch again to re-start the sequence.



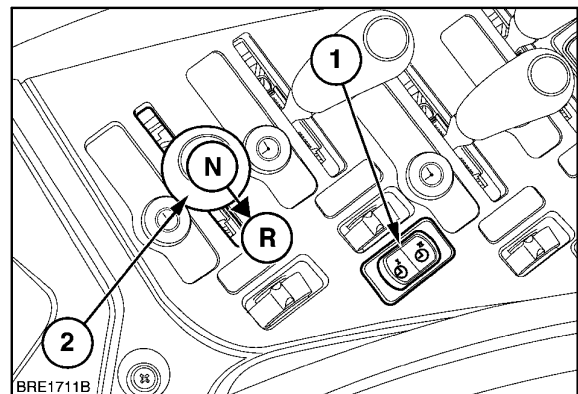
128

Programming a Double Acting Service

To programme the remote valves, first ensure the cylinder hydraulic hoses are properly connected to the appropriate rear remote valve. Start the tractor engine and set at the normal operating speed in which the cylinder is to be operated. This is important as the programming of the control levers is based on a time interval corresponding to the time it takes the cylinder rod to extend and retract. Any change in engine rpm will have an effect on hydraulic flow and therefore the time taken for the cylinder to extend and retract.

The timed period for control lever operation remains the same regardless of oil flow, therefore consistent operation is required for the system to function correctly. Using the corresponding timer switch (1) depress the switch so the light begins to flash. While the light is flashing move control lever (2) to extend the cylinder (R). At this point the light ceases to flash and will remain on.

Hold the lever until the cylinder is extended to the desired position and then return the lever to the neutral position. When the lever is returned to the neutral position the programming light will begin to flash again indicating the retract phase of the cycle should now be programmed.



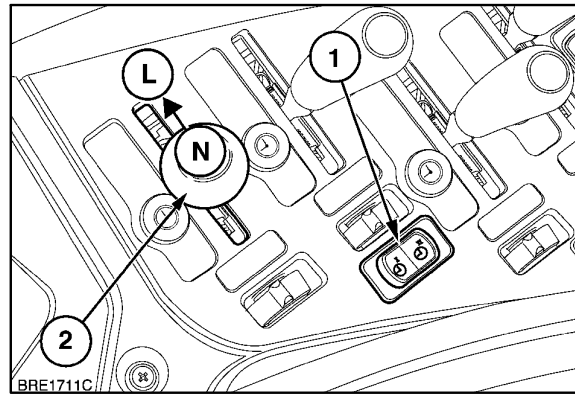
129

SECTION 3 - FIELD OPERATION

Operate the control lever (2) to retract the cylinder (L), and the programming light will cease to flash and remain on. Hold the lever until the cylinder has completed the retract cycle and then return to the neutral position. After the second phase has been programmed the light will remain on.

After the second phase has been completed and the lever has been returned to neutral, the programme will be automatically stored.

Repeat the above sequence to programme the remaining control levers if required.



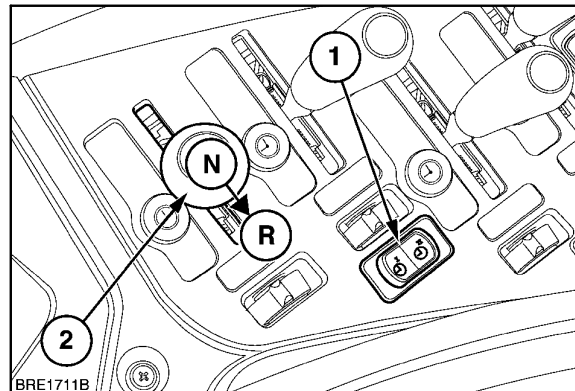
130

Programming of the control lever can be performed in either sequence, extend/retract, retract/extend or for one movement only, extend or retract. The maximum allowable time span for any timed operation is 30 seconds.

Programming a Single Acting Service

To programme a single acting service carry out the same set-up procedure as previously described for a double acting service.

With the programme light flashing, move the remote valve lever from neutral to the extend position (R). When the cylinder has extended to the desired position, manually return the lever to the neutral position. To store the setting, depress the timer switch. In single acting mode the sequence will NOT be automatically stored.



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A single acting service can be programmed to operate in either extend or retract modes.

NOTE: When using a timed sequence for a single acting service i.e. programmed in extend mode only, the retract mode will not function until the programme sequence has been deleted.

If the control lever is moved to the float position no timed programme is possible and the control lever must be returned to neutral manually.

SECTION 3 - FIELD OPERATION

Setting Remote Valve Priority

A remote valve with oil flow priority will always take precedence over other remote valves for hydraulic oil flow. Irrespective of flow demand by the other valves, the priority valve will always maintain a constant output.

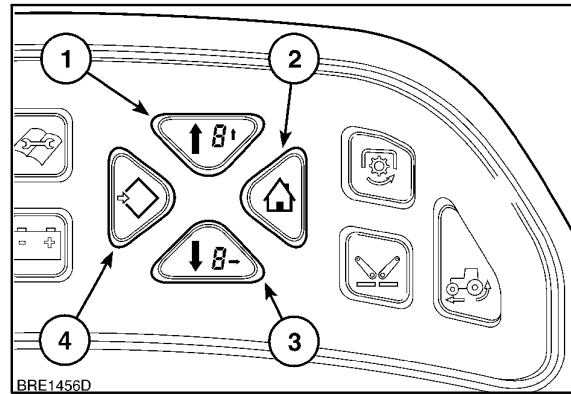
For implements requiring multiple remote valve services, there may be a need for one of the valves to have oil flow priority, i.e. to provide oil flow for a hydraulic motor.

With Electro-Hydraulic remote valves, the operator can select one remote valve as the priority valve.

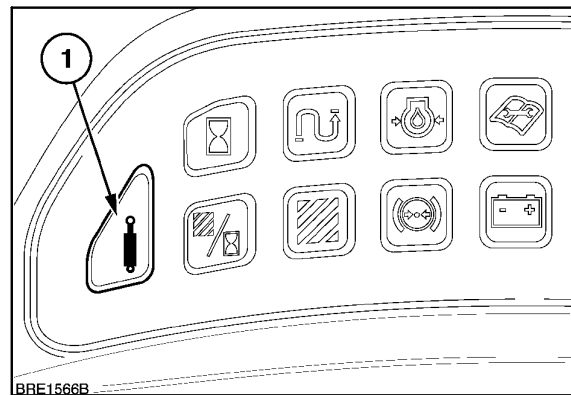
- With the key-start in the ON position, depress and hold the Menu/Enter key (4) Figure 132, until the central LCD display reads **Ehrx** (where 'x' is the current priority valve number).

NOTE: If a dash (-) appears in the display, the remote valves are not prioritised.

- After a few seconds the LCD display will change to read **PEhr**.
- Momentarily depress the EHR remote valve key (1) Figure 133, to select the valve required for prioritisation. Depressing the key repeatedly will scroll through the valve numbers.
- When the desired valve number is shown in the display, depress the Exit/Cancel key (2) Figure 132, to exit set-up and return to the previous display. The valve priority setting is now memorised.



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SECTION 3 - FIELD OPERATION

Replaying a Timed Programme

The timed sequence begins as soon as the lever is placed in the extend or retract detent position. On reaching the end of the timed period, oil flowing through the remote valve will be halted, the remote valve lever should now be returned to the neutral position ready for the next operation. Throughout the replay sequence, the green warning light will remain illuminated.

Deleting Programmes

To delete a programme, depress the programme switch to de-activate timer operation. The light will extinguish and the memorised sequence will be cleared from the programme in the memory.

Recalling a Stored Programme

With the key-start on and all remote valve levers in neutral, hold down the timer switch for the EHR required. Keep the timer switch depressed until the light illuminates and remains on, the previously stored timer sequence is now re-activated.

IMPORTANT: At key-off (engine stop), electronic programme settings made during tractor operation are transferred from the operating memory to the main memory. To provide sufficient time for the data to transfer, allow a minimum of five seconds delay before turning the key on again.

Relieving System Pressure



Before connecting or disconnecting hydraulic hoses at the remote cylinders, relieve the pressure in the circuit by first starting the engine and then move the control levers fully forward to the “float” position. Then stop the engine. Make sure no one will be injured by moving equipment when relieving pressure in the system. Before disconnecting cylinders or equipment, make sure the equipment or implement is supported securely.

Never work under equipment supported by a hydraulic device because it may drop if the control is actuated (even with the engine stopped) or in the event of hose failure, etc. always use a secure support for equipment which must be serviced while in the raised position. Make sure that oil contained within the remote cylinders is clean and is of the correct grade.

SECTION 3 - FIELD OPERATION

Connecting Single-Acting Cylinders

Connect the hose from a single-acting cylinder to the extend (left-hand) coupler on the remote control valve, as previously described.

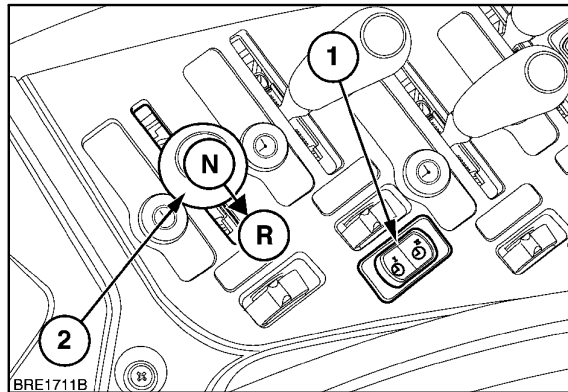
To extend a single-acting cylinder, pull the control lever back to the extend position (R).

Manually return the lever to the neutral position to stop the cylinder when it has reached the desired position. (see page 3-75).

To retract a single-acting cylinder, move the lever fully forward to the float (F) position.

NOTE: In single acting timer mode the remote lever will lock in the extend position and will **not** automatically return to the neutral position.

IMPORTANT: Always use the "float" position to lower a single-acting cylinder. The "retract" position is for double-acting cylinders only.



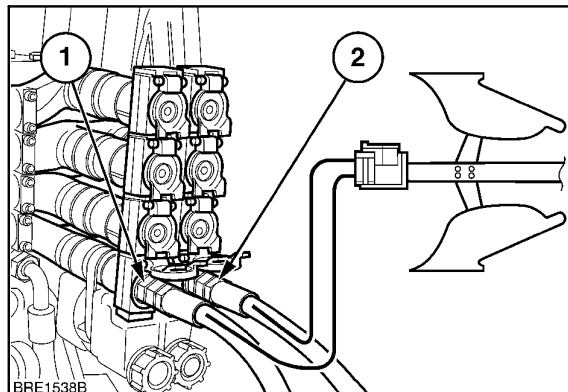
134

Connecting Double-Acting Cylinders

Connect the feed hose from a double-acting cylinder to the left-hand coupler (1) on the remote control valve and the return hose to the right-hand coupler (2), as previously described. To extend a double-acting cylinder, pull the control lever back to the extend position.

To retract a double-acting cylinder, push the control lever forward past neutral to the retract position. Further forward movement of the lever will select float which will allow the cylinder to extend or retract freely. This feature is very helpful when carrying out work with equipment such as scraper blades and loaders.

NOTE: To prevent cylinders creeping under load, always connect the hose from the load supporting side of the cylinder to the left-hand coupler.



135

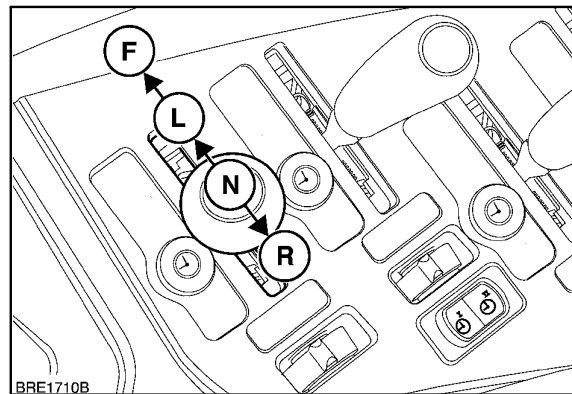
Operating Continuous Flow Hydraulic Equipment

Continuous flow hydraulic equipment (e.g., hydraulic motors) should be connected to the lower (1st) remote control valve couplers with the pressure hose connected to the right-hand coupler and the return hose connected to the low pressure return circuit (see page 3-81, 'Return Oil Line').

The oil flow should be adjusted to regulate the motor speed. If the flow is too high, the 3-point hitch and other remote valves may slow down or stop. Controlling the flow in this way will ensure that the hydraulic system will only supply the oil required by the motor.

With the remote control valve lever fully forward in the float (F) position, the motor will be stationary. The hydraulic motor will operate if the lever is pulled back to the retract position (Lower). To stop the motor, move the lever from the lower position to the float position. In the float position the motor will be able to stop slowly, which will not damage the motor.

IMPORTANT: When operating continuous flow equipment, the remote control valve lever must not be moved rearward to the neutral (N) or raise (R) positions as damage to the equipment may result. Select position 1 on the rolling gate to lock out the neutral and extend services (see page 3-70)



136

Observe the following to further protect the tractor and equipment.

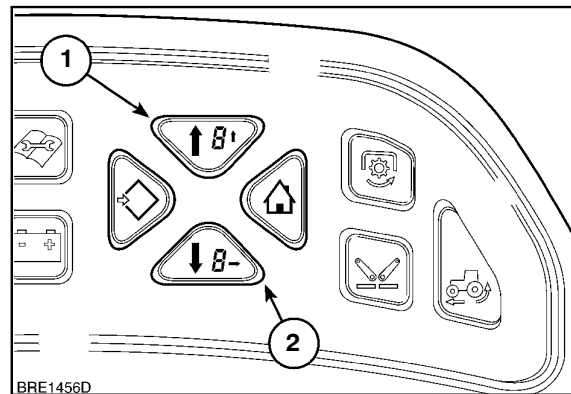
- Do not open any bypass valve in the equipment or motor. Adjust the oil flow through the valve to regulate the rate of flow or speed of the motor.
- To ensure optimum hydraulic oil cooling, operate continuous flow equipment at the highest flow setting and lowest engine speed that will give the required machine performance and speed.

SECTION 3 - FIELD OPERATION

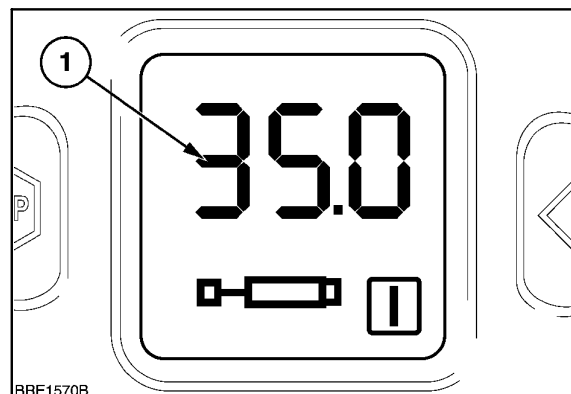
Operating Several Remote Valves Simultaneously or Remote Valves and Hydraulic Lift Simultaneously

If operating two or more remote control valves simultaneously or remote valves and the hydraulic lift, the flow through the valves should be adjusted using the enhanced keypad to provide a partial flow, as previously described. If not so adjusted, all the available flow may be directed to the full flow circuit when the pressure in that circuit is less than that of the other circuits in use.

NOTE: The oil flow (1), Figure 138, through remote valve number one (lower valve) will always take priority over the other valves. For equipment using more than one remote valve, the hydraulic service with the highest priority should be connected to valve number one.



137



138

Bleeding Remote Cylinders

When connecting a cylinder with trapped air, i.e., a new cylinder, one that has been out of service or one that has had the hoses disconnected, it will be necessary to bleed the cylinder to remove the air.

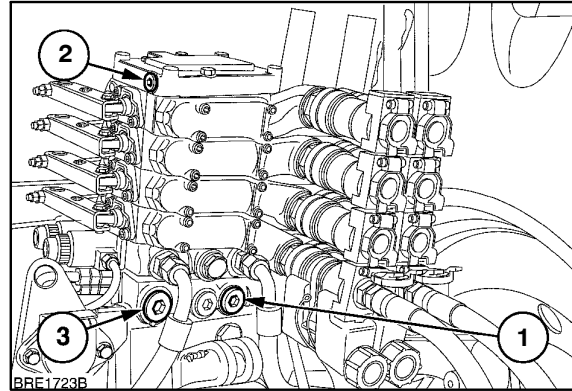
With the hoses connected to the remote control valve couplers at the rear of the tractor, position the cylinder with the hose end uppermost and extend and retract the cylinder seven or eight times using the remote control valve operating lever.

Check the rear axle oil level before and after operating a remote cylinder.

ADDITIONAL OIL SUPPLY FOR REMOTE HYDRAULIC SERVICES (Power Beyond Port, where fitted)

For implements or attachments requiring continuous or high oil flows from the tractor hydraulic system, provision is made to connect directly into the main hydraulic circuit at the rear of the tractor.

To operate correctly the implement **must** be fitted with a variable flow hydraulic system that will, through a sensing line, control oil flow from the main tractor hydraulic pump.

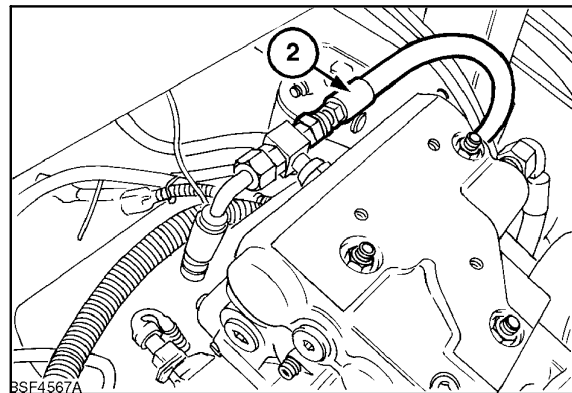


139

IMPORTANT: Before attempting to remove any blanking plugs or attach pipework, switch OFF the engine and ensure the areas around the plugs and pipe connections are thoroughly clean to prevent contamination of the tractor hydraulic system.

P - Pressure Line (1)

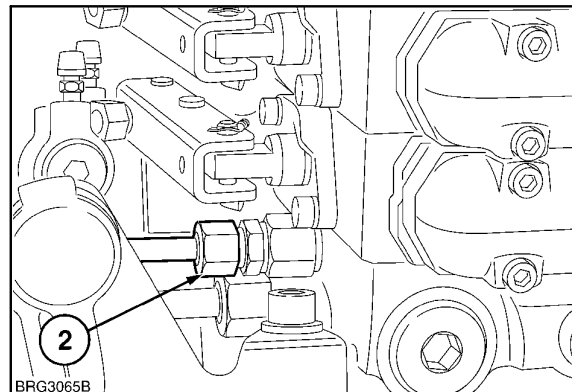
To connect the implement pressure line, remove the plug (1) from the external services 'power beyond' port below the remote valve manifold. Using a suitable connector, M22 x 1.5/15.5 (ISO 6149), attach the implement supply line to this port. With the implement control valve in neutral, a low standby pressure of 21 to 24 bar (305 to 348 lbf. in.) will be maintained in the pressure line connected to this port.



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LS - Load Sensing (LS) Line (2)

Connect the sensing line from the M12 x 1.5/11.5 (ISO 6149) port (2), to the implement control valve. It is the sensing line which generates and controls the oil pressure and flow from the tractor hydraulic pump. When an implement control valve is operated, the low standby pressure from port 'P', is diverted down the sensing line to 'switch on' the tractor hydraulic pump. In operation, the load sensing line constantly monitors pressure and flow to ensure supply never exceeds demand.



141

LS Port Location (2)

1. Figure 139, with mechanically operated remote valves and Electronic Draft Control.
2. Figure 140, with electronically operated remote valves and Electronic Draft Control.
3. Figure 141, with mechanically operated remote valves and Mechanical Draft Control.

SECTION 3 - FIELD OPERATION

To connect the load sensing line from the implement in Figures 140 and 141, a 'T' piece will need to be inserted in to the hydraulic line. Consult your authorised dealer.

IMPORTANT: *To ensure correct operation of the system, the implement control valve, when in neutral, **must** be capable of directing the pressure from the sensing line back to sump through the return line (3) to the tractor. The hydraulic system will then return to the low pressure standby mode.*

R - Return Oil Line (3)

The return oil line from the implement control valves should be connected to the M27 x 2/19 (ISO 6149) port (3). This will permit the oil to return directly back into the tractor hydraulic system.

NOTE: *Ensure the hoses have a suitable capacity to accommodate the required oil flow, and that both the sensing line and hoses are sufficiently long enough to allow for implement movement or articulation when in work.*

SECTION 3 - FIELD OPERATION

THREE-POINT LINKAGE

ATTACHING 3-POINT EQUIPMENT

NOTE: Before attaching equipment, adjust lift rods and select the correct top link hole for the implement and work to be carried out.

Ensure that the telescopic stabilisers are installed and correctly adjusted. Remove the swinging drawbar if close-mounted equipment is being attached.

IMPORTANT: Always select Position Control when attaching equipment, transporting equipment, when no equipment is attached or at any time when not operating in Draft Control. With Mechanical Lower Link Sensing hydraulics, set the Draft Control lever fully forward. With Electronic Draft Control, turn the Position/Draft sensitivity knob fully anti-clockwise

Most equipment can be attached to your tractor as follows:

1. Position the tractor so that the lower link hitch points are level with and slightly ahead of the implement hitch pins. Carefully inch the tractor rearwards to align the tractor and implement hitch points.
2. Attach the implement to the lower links, as described in 'FLEXIBLE LINK ENDS' on page 3-89 or 'QUICK HITCH' on page 3-90.



WARNING



Engage the parking brake before leaving the tractor to make the connections. It is essential to have the engine running to operate the external lift controls when making lower link connections. If your tractor does not have these switches or when making other connections, stop the engine.

IMPORTANT: Before transporting or operating equipment, ensure that the flexible link ends (where fitted) are locked in the operating position.

1. With the engine stopped and parking brake engaged, adjust the top link until the implement mast pin can be inserted through the mast and top link. Ensure sufficient thread remains in the adjuster tube to prevent the threaded ends from pulling out under load.
2. Connect remote equipment, where applicable.
3. After attaching implement and before actual operation check that:
 - No interference occurs with tractor components.
 - The top link does not contact the PTO guard with the implement at its lowest position.

IMPORTANT: Before operating PTO driven equipment, check to make sure that the PTO driveline will not over-extend so as to become disengaged, bottom out or be at an excessive angle. Ensure that the driveline shield does not contact the PTO guard or drawbar. See '**Attaching P.T.O. Driven Equipment**'.

IMPORTANT: When attaching mounted or semi-mounted equipment to the 3-point linkage or when attaching trailed equipment to the drawbar or hitch, ensure that there is adequate clearance between the implement and the tractor. Semi-mounted or trailed equipment may interfere with the tractor rear tyres. If necessary, adjust steering stops (four wheel drive only) or stabilisers.

SECTION 3 - FIELD OPERATION

Implement to Cab/Platform Clearance



Some mounted and semi-mounted equipment may interfere with and damage the cab or platform. You may be injured by broken glass or the cab ROPS may be damaged if equipment interferes with the cab or platform.

To prevent tractor damage, proceed as follows:

- Attach the equipment as outlined previously.
- Check for adequate clearance by slowly raising the equipment with the lift control lever in Position Control. If any part of the equipment comes closer than 100 mm (4 in.) to the cab, adopt one of the following options:

If your tractor has Mechanical Lower Link Sensing hydraulics, adjust the height limiter cam to prevent excessive lift. If your tractor is equipped with Electronic Draft Control, adjust the height limit control knob to limit upward movement.

If Draft Control is needed or if insufficient ground clearance is obtained with adequate cab clearance, you can adjust the lift linkage, open the cab rear window, or modify the equipment to clear the cab. Linkage adjustments, while increasing cab clearance, may have an adverse effect on the implement operating characteristics

- Set the lift rods in the front hole in the lower links. This will reduce the lift height (dependent upon the lift rod length).
- Lengthen the lift rods.
- Connect the top link to the upper hole in the top link attachment bracket and use the lowest possible equipment mast hole.
- Make only the minimum adjustments required to clear the cab. If equipment performance is unsatisfactory, it may be necessary to modify the equipment, consult your authorised dealer.

Removing Equipment

When removing equipment, the procedure is the reverse of attaching. The following information will make disconnection easier and safer.

- Always park the equipment on a firm, level surface.
- Support equipment so that it will not tip or fall when detached from the tractor.
- Always relieve all hydraulic pressure in remote cylinders by selecting the float position before disconnecting.

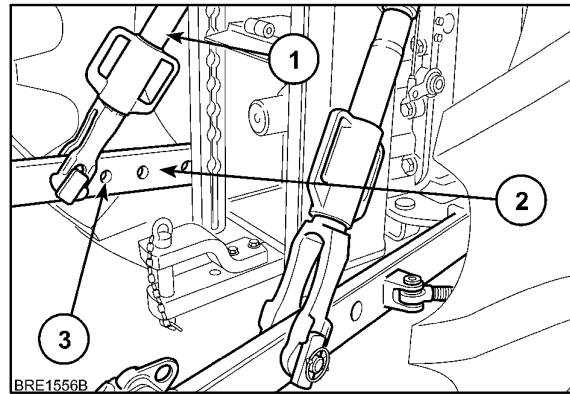
When attaching mounted equipment to the three-point linkage, the following adjustments may be made to ensure satisfactory operation:

SECTION 3 - FIELD OPERATION

LIFT RODS, LOWER LINKS AND TOP LINK

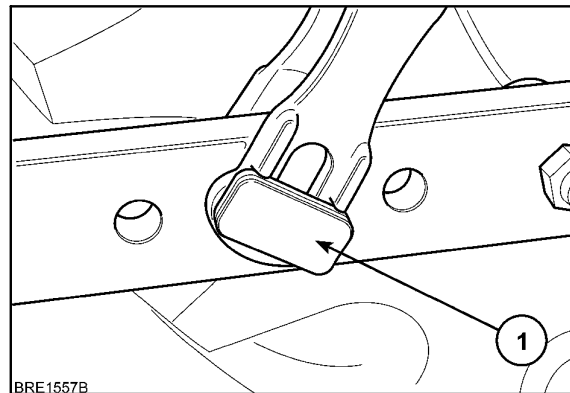
Lower Links and Lift Rod Adjustment

Each lower link (3) has three holes for attachment of the lift rods. When the tractor leaves the factory, the lift rods (1) are connected to the rear hole in each lower link to give maximum lift capacity. If required, attach the lift rods to the front hole (nearest the tractor) for maximum lift height. The centre hole offers a compromise between the optimum lift height and lift capacity.



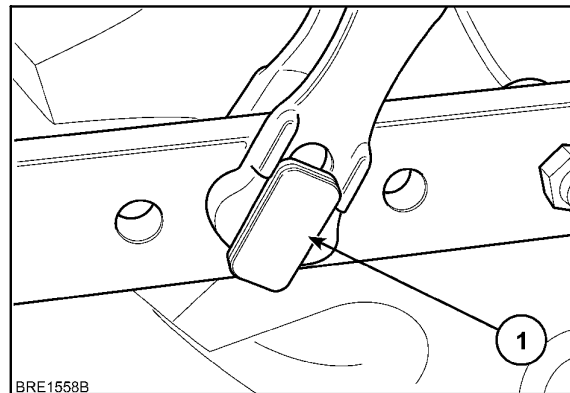
142

Both left and right-hand lift rods have a slot at the lower end which is used to provide a limited amount of float on the lower link arms. For normal operation the rectangular plate on the securing pin (1) is positioned so the lift arm remains fixed in relation to the lower link arm.



143

If the securing pin (1) is rotated through 90° as shown, this will allow an implement limited vertical movement independent of the tractor which is a useful feature for the operation of wide implements. After carrying out the adjustment ensure the outer retaining plate and spring clip are replaced and securely locked.



144

Before disconnecting a lift rod from the lower link, lower attached equipment to the ground, apply the handbrake and stop the engine. Prior to removing the securing pin ensure that attached equipment is correctly supported and that no residual pressure remains in the hydraulic system.

Move the hydraulic lift control lever backwards and forwards several times, in order to remove residual pressure, then move the lever fully forward.

With electronic draft control (EDC) move the hydraulic lift control lever to the fully lowered position **before** switching off the engine.

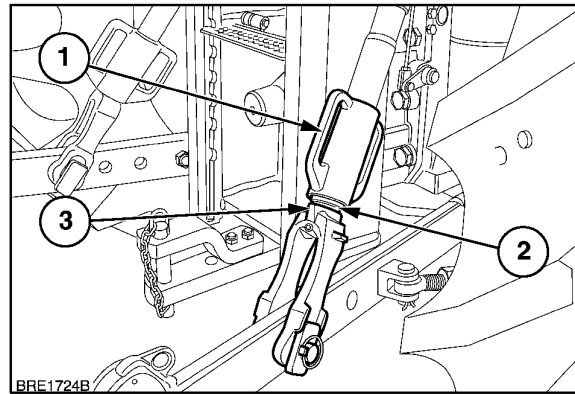
SECTION 3 - FIELD OPERATION

To increase or decrease lift rod length, rotate the upper part of the lift rod by means of the handles on the turnbuckle (1).

Before the turnbuckle can be rotated, it is necessary to lift the turnbuckle to disengage the slot (2) from the lug (3) on the lower section of the lift rod. Rotate the turnbuckle to lengthen or shorten the lift rod assembly.

When adjustment is satisfactory, allow the turnbuckle to lower into position. Ensure that the turnbuckle is fully down and that the slot engages with the lug to prevent unintentional rotation.

IMPORTANT: When attaching mounted or semi-mounted equipment to the 3-point linkage or when coupling trailed equipment to the drawbar or automatic pick-up hitch, ensure that there is adequate clearance between the implement and the cab or rear window in any open position.



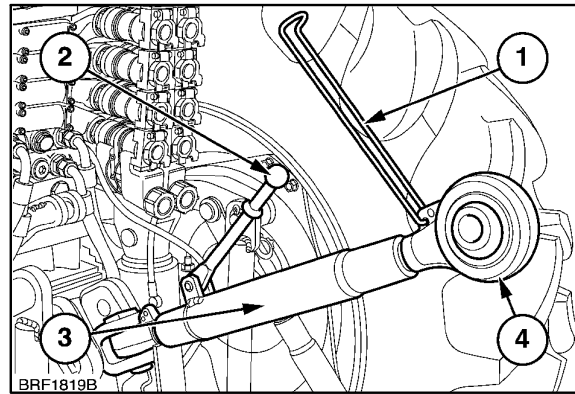
145

SECTION 3 - FIELD OPERATION

Top Link

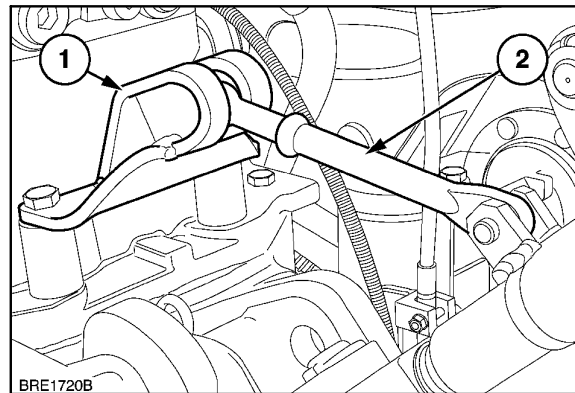
The top link has a threaded centre section (3), which, when rotated, will shorten or lengthen the top link, as required. Lift up the spring retainer (1) to allow the centre section (3) to rotate. To ease adjustment, lift the handle (2) and use it as a lever. Alternatively, rotating the link end (4) will permit limited adjustment of top link length.

To lock the sleeve after adjustment, push the spring retainer down so that it holds the handle flush against the sleeve.



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When not in use, the top link can be removed and stored or left in an upright position. Hook the ball end of the handle (2), into the bracket (1) on the rear axle housing, as shown.

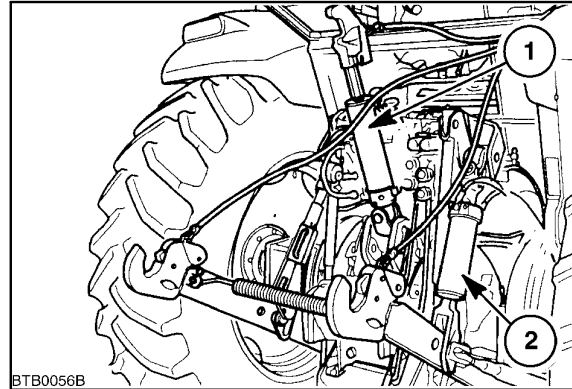


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SECTION 3 - FIELD OPERATION

TOP LINK AND RIGHT-HAND LIFT ROD (hydraulic adjust)

The hydraulic adjust top link (1) is available in conjunction with a hydraulic adjust right-hand lift rod (2). Both the top link and the lift rod incorporate a double-acting ram cylinder connected into No. III remote control valve.



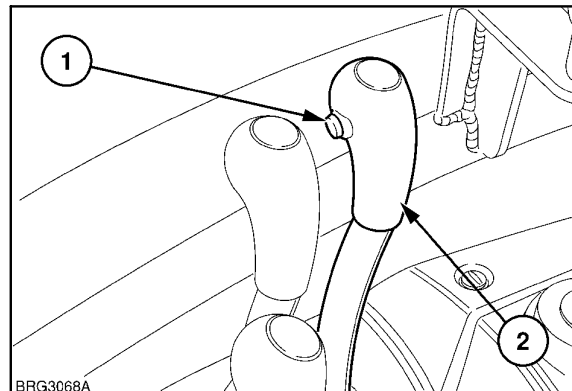
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148

With Electro-Mechanical Operation

To lengthen the right-hand lift rod and move the lower link downwards, pull No. III remote control valve lever (2) towards you. Push the lever away from you, past the neutral position to retract the cylinder and shorten the right-hand lift rod.

To lengthen the top link, depress and hold in the button (1) on No. III remote control valve lever (2) and pull the lever towards you. Push the lever away from you, past the neutral position to retract the cylinder and shorten the top link assembly.



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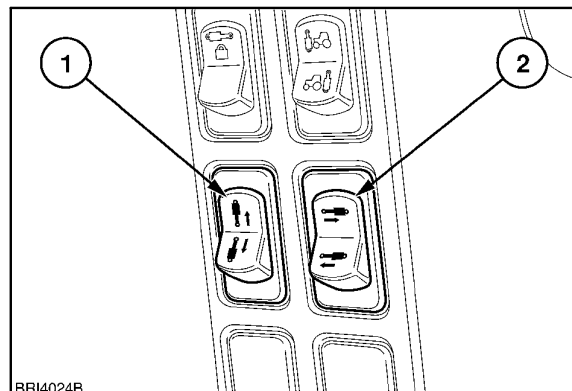
149

With Electronic Operation

Two switches located on the cab 'C' pillar operate the hydraulic top link and right-hand lift rod. Both switches are spring centered and will return to the neutral position when released.

Depress and hold the top of the left-hand switch (1) to retract the top link, depress the bottom of the switch to extend the link.

Depressing the top of the right-hand switch (2) will retract the hydraulic cylinder and raise the link arm, depress the bottom of the switch to extend the cylinder and lower the link arm.



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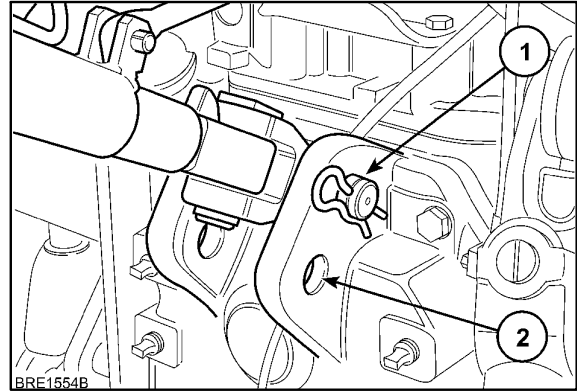
Automatic check valves on the top link and lift rod cylinders will prevent them from 'creeping'.

SECTION 3 - FIELD OPERATION

TOP LINK BRACKET (Lower Link Sensing hydraulics only)

Draft loads are sensed by the lower links, therefore the top link is attached to a bracket rigidly fixed to the rear axle housing.

Two holes are provided in the bracket for attachment of the top link. Insert the pin (1) through the upper hole, as shown, for maximum lift capacity and the greatest implement to cab clearance. Use the lower hole (2) for the best ground penetration and greatest implement to ground clearance (when the implement is raised).

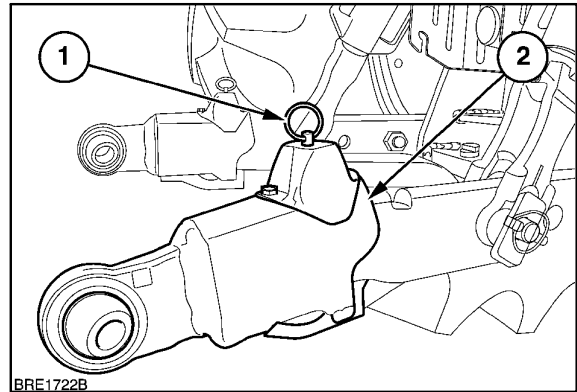


151

FLEXIBLE LINK ENDS (where fitted)

Pull the levers (1) up to release the link ends. With the link ends released, connection to the implement will be easier. The link end (2) is shown in the extended position. The link end (3) is shown in the closed (operating) position.

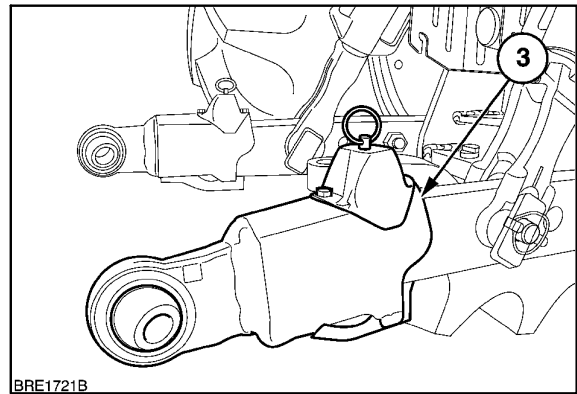
With both link ends extended, connect the link ends to the equipment and secure with lynch pins. Start the engine and carefully inch the tractor rearwards until both flexible link ends lock in the operating (closed) position (3). Stop the engine and engage the parking brake.



152

Attach the top link.

IMPORTANT: Before transporting or operating the equipment, make sure the flexible link ends are locked in the operating position. Remove the drawbar if it interferes with close-mounted equipment.



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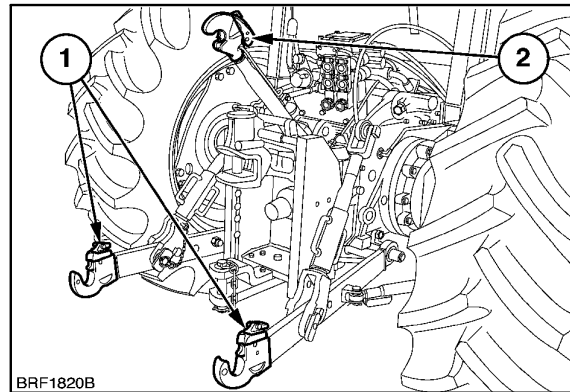
SECTION 3 - FIELD OPERATION

QUICK HITCH (where fitted)

The quick hitch consists of an alternative pair of lower links (1) and an adjustable top link (2). The lower links and the top link have open claw ends that permit rapid coupling and uncoupling of implements without leaving the cab. The claws are equipped with self-locking latches to ensure positive retention of the tractor linkage to the implement. Cables are provided for attachment to the latches.

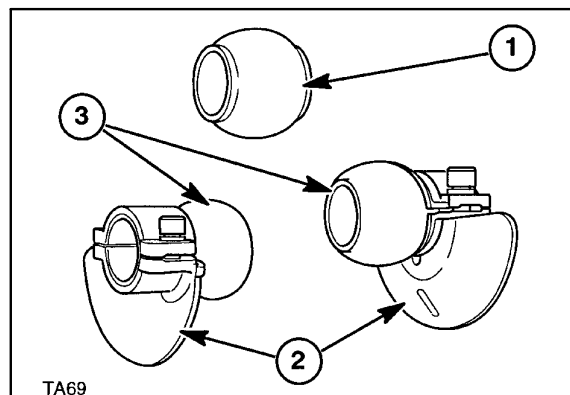
An adjustable spacer spring is available as an accessory. The spring maintains the lower links at the width setting required to match that of the implement.

Three ball-bushings are supplied for installation on the implement, if required. The ball-bushing with projecting lips (1) should be installed on the implement upper hitch pin. The two plain ball-bushings (3) with their detachable guides (2) should be installed on the implement lower hitch pins.



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Coupling Implement to Tractor

Adjust the stabilisers to maintain the tractor lower links at the correct distance apart so they align with the ball-bushings installed on the implement lower hitch pins. Alternatively, use the optional, adjustable spacer, if available. The spacer consists of a closed spring, with a rod screwed into one end. To adjust, remove the 'R' clip and disconnect the spacer rod from the bracket on the right-hand lower link. Screw the rod into or out of the spring to shorten or lengthen the assembly.

SECTION 3 - FIELD OPERATION

Place the top link in the transport position. With the lower links fully lowered and the self-locking latches (1) in the open position as shown, reverse the tractor until the lower link claw couplers are beneath the implement hitch pins. The combination of large claw openings and the guides on the implement ball-bushes make accurate alignment of tractor to implement unnecessary.

Raise the lower links using the hydraulic lift lever until the claw couplers engage the ball-bushes. An audible click will be heard as the self-locking latches engage the implement ball-bushes. Lower the top link claw onto the upper implement ball-bush and press down until the latch is heard to engage. Increase or decrease top link length, as necessary.

The implement supports, where fitted, may now be removed or retracted and the implement supported on the 3-point linkage.

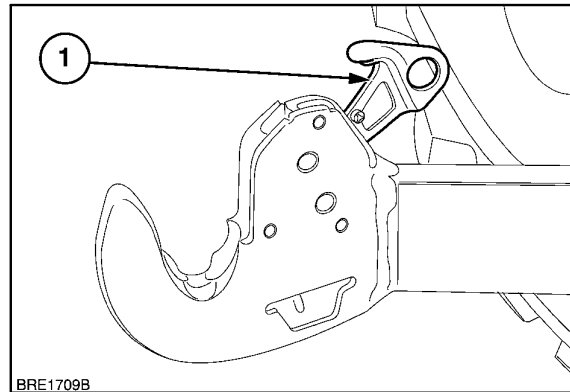
Uncoupling Implement from Tractor

Using the hydraulic lift control lever, fully lower the implement to the ground ensuring that it cannot fall when disconnected from the tractor. Use the implement supports (where fitted).

Pull the release cable on the top link to release the claw from the implement hitch.

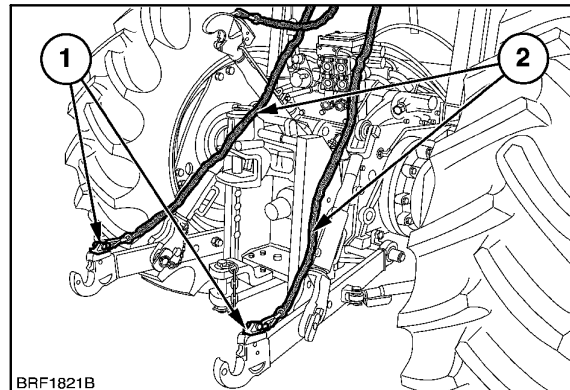
Pull the release cable (2), on both lower links. The lever will lock in position with the latch (1) retracted. This will allow the links to clear the ball-bushings on the implement lower hitch pins when the links are lowered fully. Fully lower the lower links and drive the tractor forward, clear of the implement.

NOTE: Ensure the release cables do not foul wheels, or moving parts of the hydraulic linkage or implement. When not in use, secure the cables to the rubber strap on the rear right-hand side of the cab frame.



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LINKAGE STABILISERS

TELESCOPIC STABILISERS (round section type - where fitted)



WARNING

Never operate steerable equipment unless the telescopic stabilisers are correctly adjusted to prevent excessive lateral movement.

Telescopic stabilisers control the sway of the lower links and attached equipment when in work or when being transported.

Each stabiliser consists of a round-section tube (3), anchored by a pin (2) to a bracket (1) bolted to the outer ends of the rear axle housing. A smaller diameter inner section (4), attached to a bracket on the lower links, is a loose, sliding fit within the outer tube. The overall length of the stabiliser is determined by the position of a pin (5) that passes through holes in the tube and inner section.

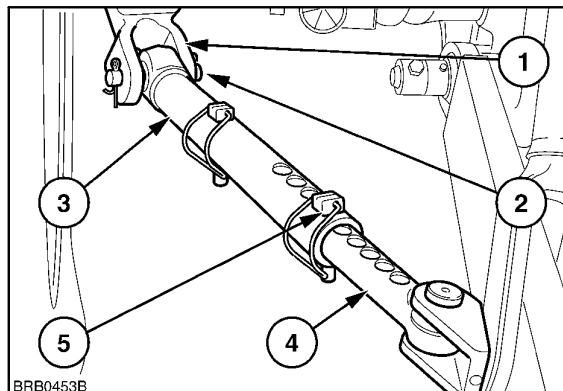
The holes in the inner section and outer tube are drilled at different centres so a wide range of stabiliser settings may be achieved by passing the pin through the most suitable pair of holes.

To adjust, attach the implement to the 3-point linkage with the locating pin removed from both stabilisers. When the implement is satisfactorily aligned, the locating pins should be passed through any one of the four holes in the outer tubes that align with one of the holes in the sliding inner section. With the pins inserted in this manner, both stabilisers will be locked as rigid units and the implement will be prevented from swaying both in work or when raised to the transport position.

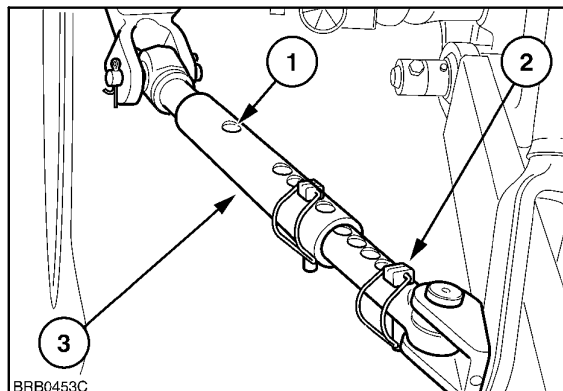
If the pin is removed from the front hole (1) Figure 159, the front end of the stabiliser (3) will be allowed to telescope and a limited degree of sway will be permitted. The unused pin should be re-inserted in one of the spare holes (2) of the inner section for safe storage.

IMPORTANT: Always ensure locking pin is replaced in front stabiliser hole when no implement is attached.

IMPORTANT: When setting the stabiliser length, particularly if using the sway facility, ensure that there is no possibility of the rear tyres fouling the stabilisers or lower links.



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SECTION 3 - FIELD OPERATION

TELESCOPIC STABILISERS

(round section screw type - where fitted)



WARNING

Never operate steerable equipment unless the telescopic stabilisers are correctly adjusted to prevent excessive lateral movement.

Telescopic stabilisers control the sway of the lower links and attached equipment when in work or when being transported.

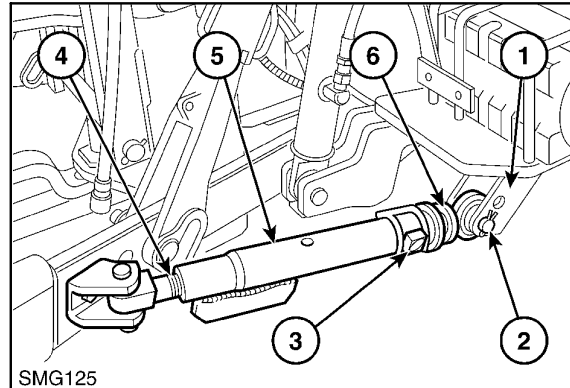
Each stabiliser consists of a tube (5), with a coupling at each end. The front, sliding end (6) is attached to a bracket (1) bolted to the outer end of the rear axle housing. This coupling is a loose, sliding fit within the tube. The overall length of the stabiliser is determined by the position of a pin (3) that passes through a hole in the tube. The rear end (4) is attached to the 3-point linkage and is threaded to provide fine adjustment.

To adjust, attach the implement to the 3-point linkage with the locating pin removed from both stabilisers. To remove the pin, pull back the securing clip. When the implement is satisfactorily aligned, the locating pin should then be passed through the holes and the securing clip replaced. With the pin removed, the tube may be rotated to provide fine adjustment and the pin re-inserted.

With the pins inserted in the front holes, both stabilisers will be locked as a rigid unit and the implement will be prevented from swaying both in work or or when raised to the transport position.

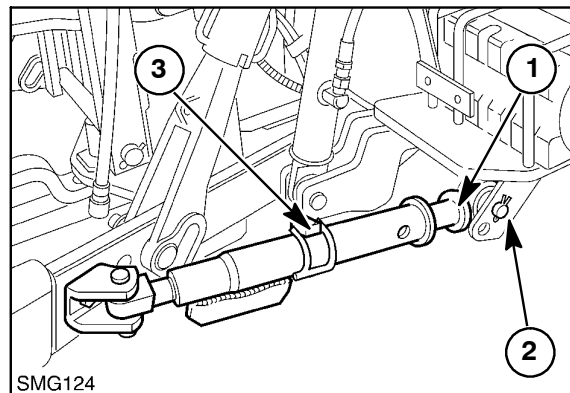
The front of each stabiliser is attached by a pin (2), passing through holes in the mounting brackets. The stabilisers are normally attached to the **lower** hole in each bracket, to provide parallel lift.

IMPORTANT: The **lower** hole is the **only** hole to which the stabilisers may be connected when locked as a **rigid** unit, as described above, otherwise damage to the lower links may occur when the linkage is raised.



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SMG124

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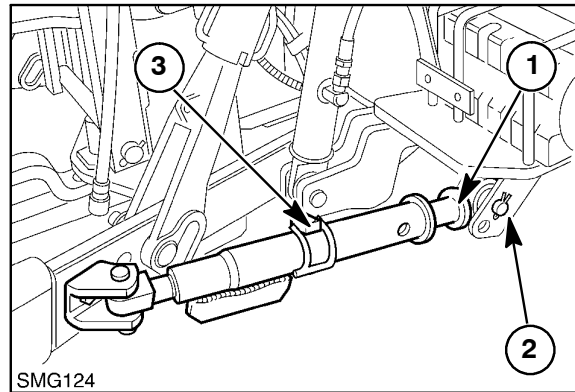
SECTION 3 - FIELD OPERATION

It may be desirable to allow equipment such as ploughs etc., to sway from side to side.

If the pin is removed from the front hole, the front end (1) of the stabiliser will be allowed to telescope and a limited degree of sway will be permitted. The pin should be re-inserted through the central hole, as shown at (3) in Figure 161.

When the front of the stabiliser is attached to the **upper** hole (2) in the front mounting bracket the stabilisers will allow the implement to sway in work with reduced sway when the implement is raised. This feature provides greater implement control when turning on the headlands of a field.

IMPORTANT: When setting the stabiliser length, particularly if using the sway facility, ensure that there is no possibility of the rear tyres fouling the stabilisers or lower links.



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SECTION 3 - FIELD OPERATION

AUTOMATIC STABILISERS

Automatic stabilisers may be fitted in place of the standard telescopic stabilisers, described previously.

⚠ WARNING ⚠

Never operate steerable equipment unless the stabilisers are installed and correctly adjusted to prevent excessive lateral movement.

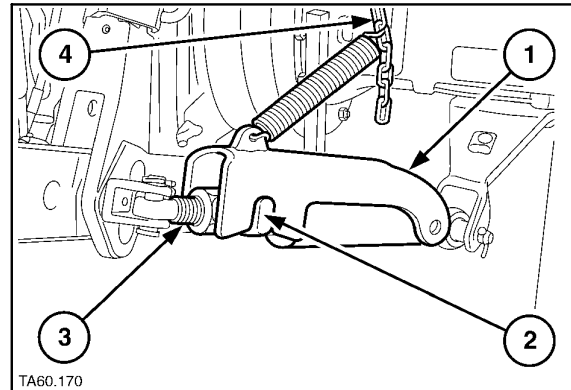
Each stabiliser consists of a telescopic tube assembly internally threaded at the rear end. The tube assembly is attached to a mounting bracket bolted to the outer ends of the rear axle housing.

An externally threaded rod (3) is attached to the lower links. The threaded rod engages with the screwed thread in the tube assembly and the overall length of the assembly is determined by screwing the rod in or out, as required.

An adjustable chain (4) is attached, at one end, to the rear fender and at the other end, via a spring, to a hinged cover (1) on the telescopic part of the stabiliser. A lug (2) on the telescopic part of the stabiliser engages a notch in the cover.

When the chain is correctly adjusted it will be slack when the lower links are raised from the operating position, so allowing the cover to drop down over the lug on the stabiliser. When the cover is down, as shown, the stabiliser is locked at the preset length. The lower links are, therefore, retained at a set distance apart, preventing them (and attached equipment) from swaying.

However, when the 3-point hitch is lowered into the work position, the chain becomes taut and lifts the cover from the stabiliser allowing it to telescope freely. The stabilisers (and implement) will then sway when engaged in the ground. This feature is useful as it provides greater implement control when turning on the headlands of a field.



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SECTION 3 - FIELD OPERATION

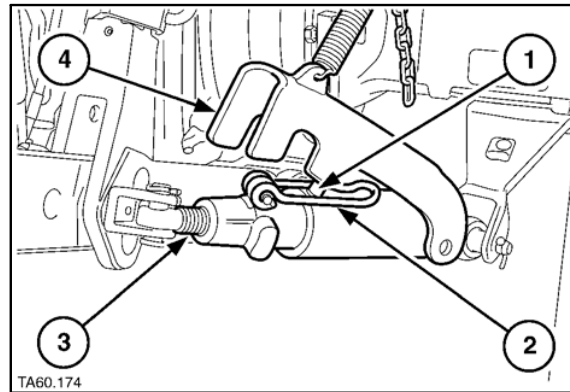
Adjusting the Stabilisers

In practice, the implement should be attached to the three-point linkage with the cover (4) on both stabilisers raised, so as to allow the stabilisers to telescope freely.

Lift the locking/adjusting lever (2) up over the peg (1) so that the lever is at right-angles to the stabiliser. Turn the telescopic section, by means of the lever, so that the threaded section (3) screws into or out of the stabiliser. When the length is satisfactory, i.e., the notch in the cover aligns with the lug on the stabiliser, lower the lever back down over the peg and close the cover.

The chain should then be adjusted, by placing the appropriate link over the attaching hook, so that the cover on the stabiliser is lifted when the implement is lowered into work.

IMPORTANT: When setting the stabiliser length to provide sway, ensure that there is no possibility of the rear tyres fouling the stabilisers or lower links.



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SECTION 3 - FIELD OPERATION

DRAWBARS AND TOWING ATTACHMENTS

NOTE: Before attaching trailed equipment to the tractor, read the following text carefully.

ATTACHING/DETACHING TRAILED EQUIPMENT

IMPORTANT: Regulations in some areas require brakes on towed equipment when operating on the public highway. Before travelling on public roads, make sure you comply with the legal requirements for your country.

To attach the tractor to trailed equipment and implements:

1. Ensure that the implement is at draw bar height.
2. Slowly inch rearwards to allow the drawbar and implement hitch to align.
3. Apply the parking brake and stop the engine.
4. Insert the hitch pin and ensure that the retainer is in the latched position.

IMPORTANT: When attaching mounted or semi-mounted equipment to the 3-point linkage or when attaching trailed equipment to the drawbar or hitch, ensure that there is adequate clearance between the implement and the tractor. Semi-mounted or trailed equipment may interfere with the tractor rear tyres. If necessary, adjust steering stops (four wheel drive only) or linkage stabilisers.

NOTE: For implements that require hitch extensions or interfere with the tractor clevis, remove and store the clevis and hitch pin.

Always use a safety chain installed between the tractor and implement hitch when transporting equipment on the highway. See page 3-101.

Observe the following precautions for towing equipment not equipped with brakes:

- Do not tow equipment weighing more than twice the tractor weight.
- Do not exceed 10 MPH (16 km/h) if towed equipment weighs more than the tractor.
- Do not exceed 20 MPH (32 km/h) while towing equipment that weighs less than the tractor.

DRAWBAR SAFETY

 **WARNING** 

Do not pull from the lower links with the links above the horizontal position. Always use the drawbar, pick-up hitch or lower links in the lowered position for pull-type work, otherwise the tractor may overturn rearwards.

NOTE: When supporting equipment on the drawbar ensure that the total weight on the rear axle does not exceed the maximum static downward load or the rear tyre load capacity, whichever is the lower (see Tyre Pressures and Permissible Loads at the end of Section 3).

IMPORTANT: When transporting equipment on the highway it is recommended that a safety chain having a tensile strength equal to the gross weight of the implement be installed between the tractor and implement hitch. See Safety Chain on page 3-101.

SECTION 3 - FIELD OPERATION

SWINGING DRAWBARS

Two types of swinging drawbar are available. The sliding type is illustrated in Figure 165. This drawbar may be installed as part of a tow hitch or as an independent unit.

The roller type, shown in Figure 168, is recommended when heavy draft, trailed equipment is used for extended periods. This drawbar is mounted on rollers and offers additional turning ease when compared with the sliding type.

Sliding Type Swinging Drawbar

The drawbar (2) pivots about a single pin at the front end so as to allow the rear of the drawbar to swing the full width of the hanger. By inserting the swing limiter pins (1) in the appropriate holes, restricted movement of the drawbar is permitted. Alternatively, the drawbar can be pinned in any one of three positions by insertion of the pins in the appropriate holes. In Figure 165, the drawbar is shown pinned in the central position to prevent swinging.

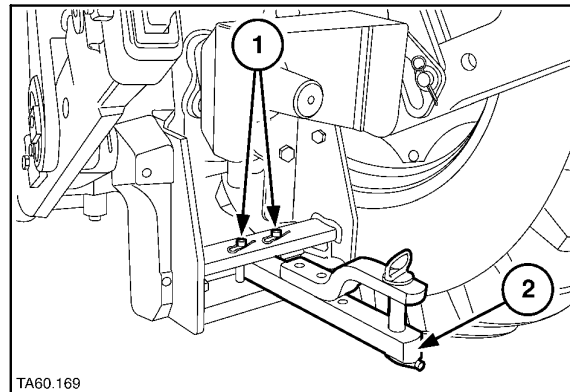
Pin the drawbar to prevent swinging when pulling equipment which requires accurate positioning and when transporting equipment.

Allow the drawbar to swing when pulling ground engaging equipment which does not require accurate positioning. This will make steering and turning easier.

**WARNING**

Always secure the drawbar to prevent swinging when transporting equipment or when operating any but ground engaging equipment.

The drawbar is adjustable for height and projection relative to the end of the P.T.O. shaft. To vary the height of the drawbar/implement hitch point, remove the drawbar and invert it.



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SECTION 3 - FIELD OPERATION

All Countries Except North America

The front securing pin may be inserted in one of three holes in the drawbar to vary the P.T.O. shaft to hitch point distance. See Figure 166 and the following table:

Hole (see Fig. 166)	P.T.O Shaft to Drawbar Hitch Point	Maximum Static Downward Load
Drawbar clevis uppermost		
1	406 mm (16 in.)	1140 kg (2513 lb.)
2	356 mm (14 in.)	1330 kg (2932 lb.)
3	243 mm (9.6 in.)	2040 kg (4497 lb.)
Drawbar clevis underneath		
1	406 mm (16 in.)	1045 kg (2300 lb.)
2	356 mm (14 in.)	1225 kg (2700 lb.)
3	243 mm (9.6 in.)	1305 kg (2875 lb.)

Use of hole 1 is required for 1000 rev/min P.T.O. operations and hole 2 for 540 rev/min P.T.O. operations.

When towing equipment exerting high static downward forces, such as two-wheeled trailers, etc., use the close-coupled position - hole 3.

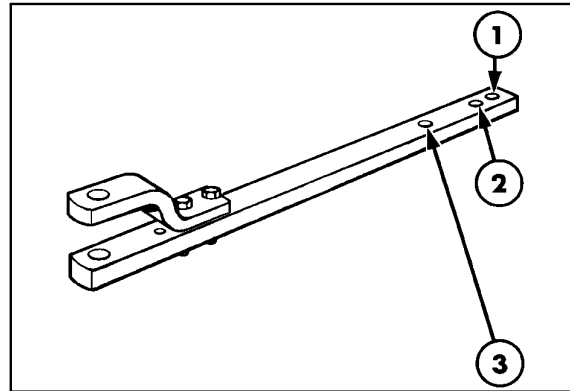
North America only

The front securing pin may be inserted in one of four holes in the drawbar to vary the P.T.O. shaft to hitch point distance. See Figure 167 and the following table:

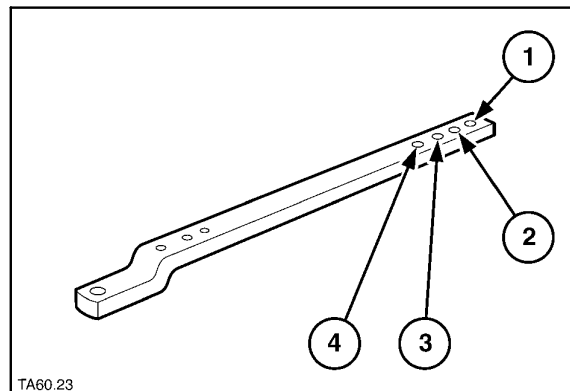
Hole (see Fig. 167)	P.T.O Shaft to Drawbar Hitch Point	Maximum Static Downward Load
1	406 mm (16 in.)	1140 kg (2513 lb.)
2	356 mm (14 in.)	1330 kg (2932 lb.)
3	304 mm (12 in.)	1535 kg (3384 lb.)
4	228 mm (9 in.)	2040 kg (4497 lb.)

Use of hole 1 is required for 1000 rev/min P.T.O. operations and hole 2 for 540 rev/min P.T.O. operations.

When towing equipment exerting high static downward forces, such as two-wheeled trailers, etc., use the close-coupled positions - holes 3 or 4.



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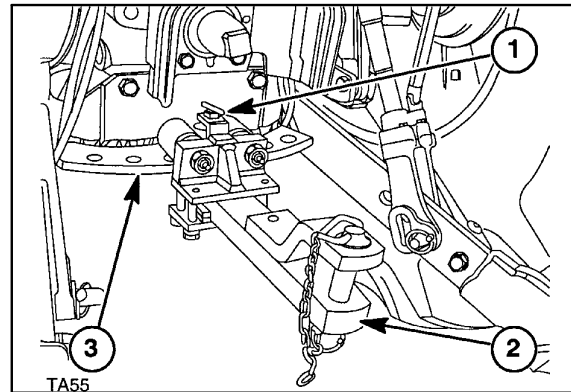
167

SECTION 3 - FIELD OPERATION

Roller Type Swinging Drawbar

The drawbar (2) Figure 168, pivots about a single pin at the front end so as to allow the rear of the drawbar to swing the full width of the hanger. By inserting the swing limiter pin (1) in the appropriate hole and through the drawbar, the drawbar can be pinned in any one of seven positions. Alternatively, the drawbar may be allowed to swing the full width of the hanger (3).

Pin the drawbar to prevent swinging when pulling equipment which requires accurate positioning and when transporting equipment. Allow the drawbar to swing when pulling ground engaging equipment which does not require accurate positioning. This will make steering and turning easier.



168

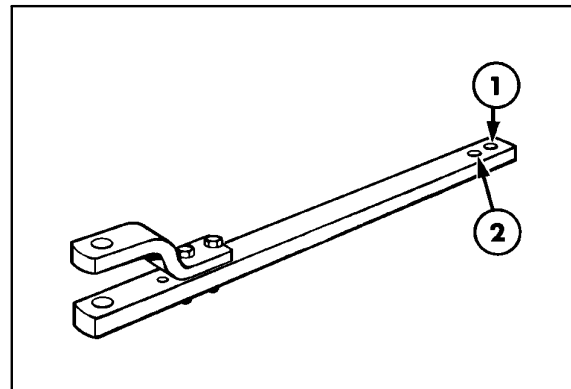
WARNING

Always secure the drawbar to prevent swinging when transporting equipment or when operating any but ground engaging equipment.

The drawbar is adjustable for height and projection relative to the end of the P.T.O. shaft. To vary the height of the drawbar/implement hitch point, remove the drawbar and invert it.

The front securing pin may be inserted in one of two holes in the drawbar to vary the P.T.O. shaft to hitch point distance. See Figure 169 and the following table:

Hole (see Fig. 169)	P.T.O Shaft to Drawbar Hitch Point	Maximum Static Downward Load
Drawbar clevis uppermost		
1	406 mm (16 in.)	1360 kg (2995 lb.)
2	356 mm (14 in.)	1630 kg (3590 lb.)
Drawbar clevis underneath		
1	406 mm (16 in.)	1045 kg (2303 lb.)
2	356 mm (14 in.)	1225 kg (2700 lb.)



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Use of hole 1 is required for 1000 rev/min P.T.O. operations and hole 2 for 540 rev/min P.T.O. operations.

When towing equipment exerting high static downward forces, such as two-wheeled trailers, etc., use hole 2.

SECTION 3 - FIELD OPERATION

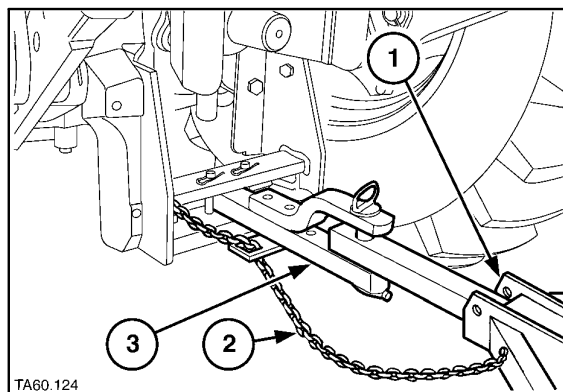
SAFETY CHAIN

When towing implements on public roads, use a safety chain (2) with a tensile strength equal to or greater than the gross weight of the implement to be towed. This will control the implement (1) in case the drawbar (3) and implement become disconnected.

After attaching the safety chain, make a trial run by driving the tractor to the right and to the left for a short distance to check the safety chain adjustment. If necessary, re-adjust to eliminate a tight or loose chain.

Check the implement operator's manual for implement weight and attaching hardware specifications.

Safety chains, attaching hardware and chain guide are available from your authorised dealer.



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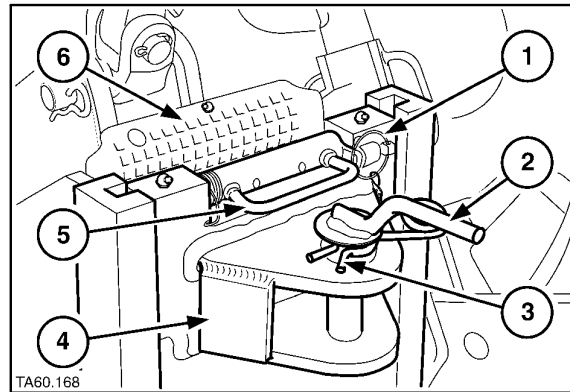
SECTION 3 - FIELD OPERATION

REAR TOW HITCH

Description

Various rear tow hitch options are available. All versions consist of a fabricated steel frame bolted to the rear axle centre housing. A tow pin is provided, adjustable for height.

The slider type frame is shown in Figures 172 and 173. Rotating pins in the tow pin assembly engage in notches in the frame to secure the tow pin at the required height. With this type of frame, a second, fixed tow pin (piton) is available as an option. The piton is installed at the bottom of the assembly.



171

Four types of tow pin assembly are available :-

- Non-swivelling tow pin.
- Heavy duty non-swivelling tow pin.
See Figure 173.
- Swivelling tow pin - manual operation.
See Figure 177.
- Swivelling tow pin - auto operation.
See Figure 179.

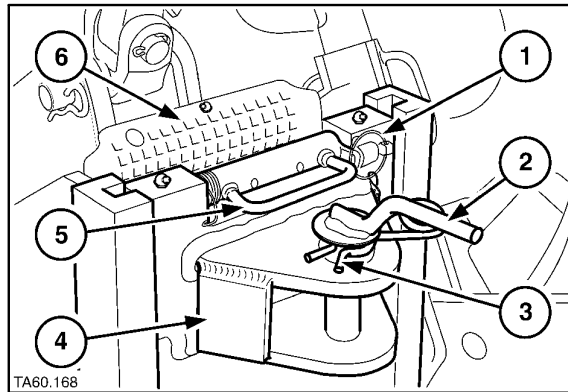
A swinging drawbar may also be provided as part of the assembly. See 'Sliding Type Swinging Drawbar' on page 3-98 for details of drawbar operation.

NOTE: The tow hitch is designed primarily for use with four wheel trailers which do not place a heavy downward load on the tow pin. Observe the maximum static downward loads quoted in the text.

SECTION 3 - FIELD OPERATION

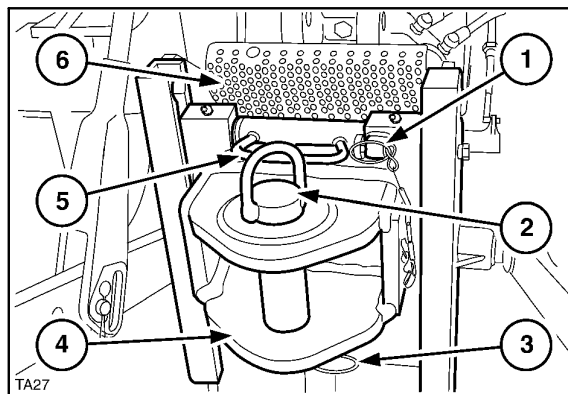
Slider Frame with non-swivelling Tow Pins (dealer installed accessory)

The tow hitches shown are equipped with a height adjustable, non-swivelling, tow pin assembly. The standard tow pin is shown in Figure 172. Figure 173 shows the heavy duty tow pin.



172

Remove the securing clip (1) and lift the handle (5) to the vertical position. Lifting the handle will rotate the pins and disengage them from the notches in the frame. Using both hands on the handle (5) lift or lower the tow pin assembly (4), as required. When at the required height, support the tow pin with one hand and lower the handle to the horizontal position, as shown in Figures 172 and 173. The pins will rotate and re-engage the notches in the frame. Lower the P.T.O. guard (6).

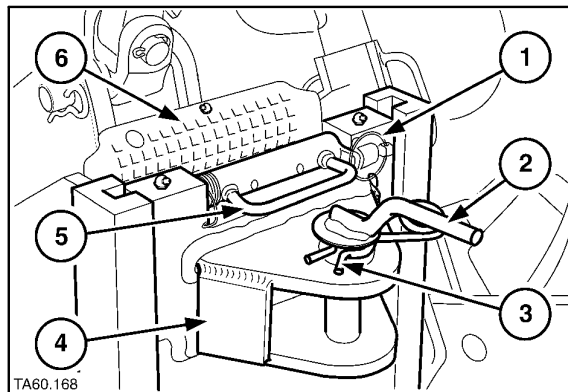


173

To attach a trailer drawbar to the tow pin, remove the 'R' clip (3) from the tow pin and lift out using the handle (2). Re-insert the tow pin so that it passes through the eye of the trailer drawbar. Replace the 'R' clip.

NOTE: The static downward load on the tow pin must not exceed the rear tyre load capacity or the following values, whichever is lower. (See Tyre Pressures and Permissible Loads at the end of Section 3).

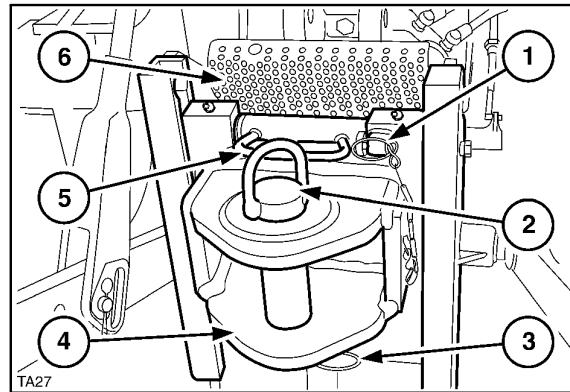
Standard tow pin (Fig. 172)	1500 kg (3300 lb.)
Category D2 tow pin (Fig. 173)	2000 kg (4400 lb.)



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SECTION 3 - FIELD OPERATION

NOTE: A Category D3 tow pin (with housing) is available as a dealer installed accessory. The static downward load on the Category D3 tow pin should not exceed 2500 kg (5500 lb.) or the rear tyre load capacity, whichever is lower. (See Tyre Pressures and Permissible Loads at the end of Section 3).



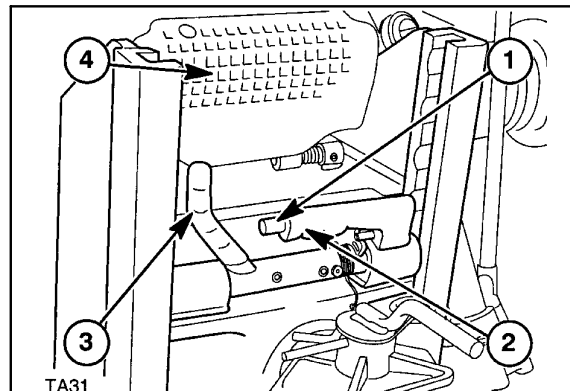
175

Slider Frame with Swivelling Tow Pins

The tow hitches shown are equipped with a height adjustable, swivelling tow pin assembly with manual or auto operation.

With reference to Figure 176, adjust the height of the tow pin assembly, as follows:

Grasp the handle (2) with the right hand. Press and hold in the button (1) to release the locking mechanism. Pull the handle (3) down to the horizontal position with the left hand and release the push button to lock the handle (3) in the horizontal position. Lowering the handle will rotate the pins and disengage them from the frame. Using both handles, lift or lower the complete tow pin assembly. When at the required height, hold in the push button and lift the left-hand handle up to the vertical position, as shown in Figure 176. The pins will rotate and re-engage the notches in the frame. Lower the P.T.O. guard (4).

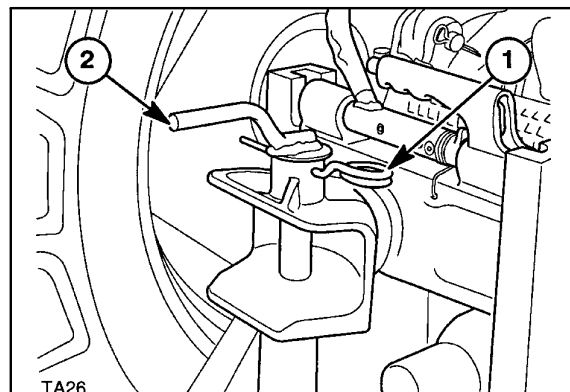


176

WARNING

Before attaching a trailer, ensure that the pins are fully engaged in the notches, i.e. the handle (3) Figure 176, is in the vertical position. The tow pin assembly must not rest on the P.T.O. guard or on the bolt heads at the end of the slider guides.

To attach a trailer drawbar to the upper tow pin, see the following text:



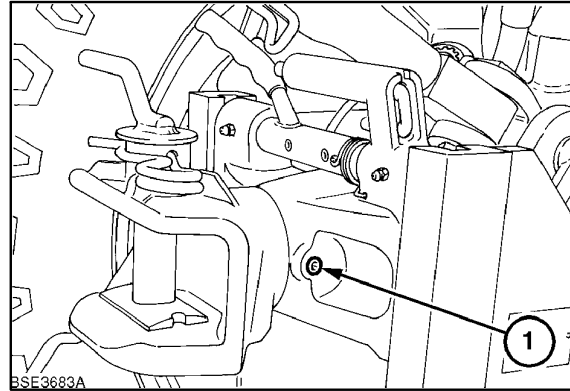
177

SECTION 3 - FIELD OPERATION

Swivelling Tow Pin - Manual Engagement

To attach a trailer drawbar to the tow pin, remove the 'R' clip (1) Figure 177, from the tow pin and lift out using the handle (2). Re-insert the tow pin so that it passes through the eye of the trailer drawbar. Replace the 'R' clip.

The tow pin may be allowed to swivel after loosening the socket-headed screw (1) Figure 178 on the side of the tow pin assembly. This feature will permit a trailer with a non-swivelling drawbar to articulate relative to the towing tractor.



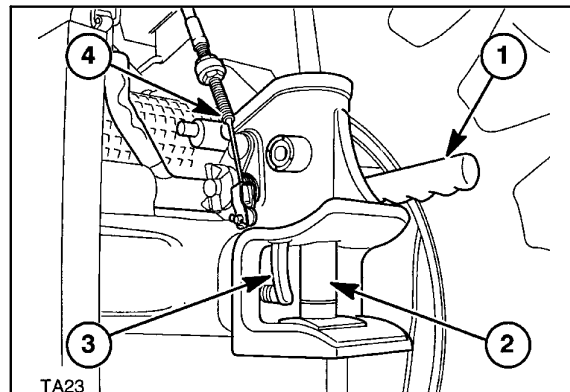
178

NOTE: The static downward load on the tow pin must not exceed 2000 kg (4400 lb.) or the rear tyre load capacity, whichever is lower. (See Tyre Pressures and Permissible Loads at the end of Section 3).

Swivelling Tow Pin - Auto Engagement

The tow pin (2) Figure 179, is spring-loaded in the engaged (down) position, as shown. To attach a trailer to the tow pin, lift the release lever (1) to the vertical position to retract the tow pin up into its housing.

The release lever is connected by the cable (4) to a handle in the cab. This will permit trailer attachment without leaving the cab. To actuate the cable release and retract the tow pin, slide the collar (1) upwards to release the lock and then pull up the handle.

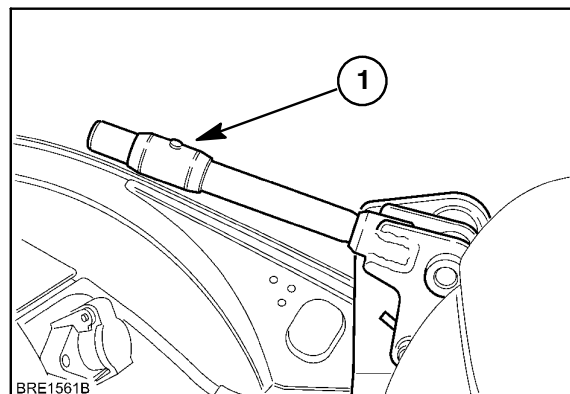


179

The pin will stay in the raised position until the trailer drawbar is located beneath it. The eye of the drawbar will contact the trip lever (3) Figure 179 and cause the pin to drop down into the engaged position. Alternatively, the tow pin will drop down into the engaged position if the lever (1) is pulled down.

⚠ WARNING ⚠

Do not attempt to trip the lever by hand as the fingers may be trapped by the action of the spring-loaded tow pin.



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SECTION 3 - FIELD OPERATION

The tow pin may be allowed to swivel after loosening the socket-headed screw (1) Figure 178 on the underside of the tow pin assembly. This feature will permit a trailer with a non-swivelling drawbar to articulate relative to the towing tractor.

IMPORTANT: Do not allow the tractor tow pin to swivel if the trailed equipment is equipped with a swivelling tow pin connector.

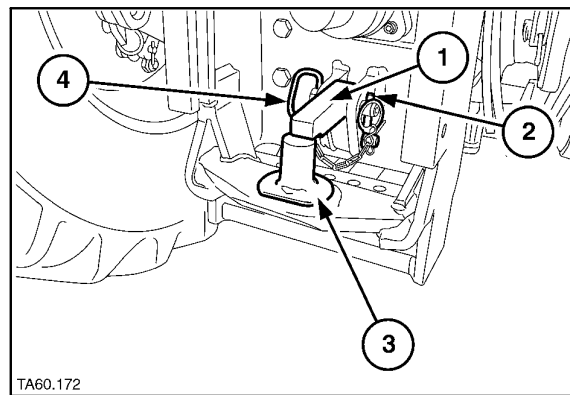
NOTE: The static downward load on the tow pin must not exceed 2000 kg (4400 lb.) or the rear tyre load capacity, whichever is lower. (See Tyre Pressures and Permissible Loads at the end of Section 3).

Fixed Tow Pin (Piton)

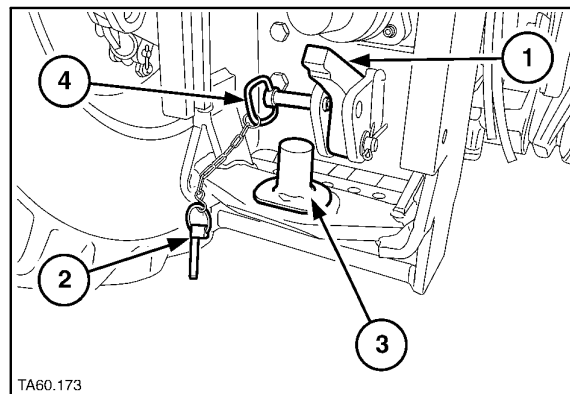
An optional fixed tow pin (piton) may be provided at the bottom of the assembly.

To attach a trailer to the piton, remove the linch pin (2) and withdraw the retaining pin (4). Lift the security latch (1) and lower the eye of the trailer drawbar over the piton (3). Drop the security latch down, re-insert the retaining pin and secure with the linch pin. The security latch will ensure that the trailer cannot become accidentally detached from the piton

NOTE: The static downward load on the piton must not exceed 3000 kg (6600 lb.) or the rear tyre load capacity, whichever is lower. (See Tyre Pressures and Permissible Loads at the end of Section 3).



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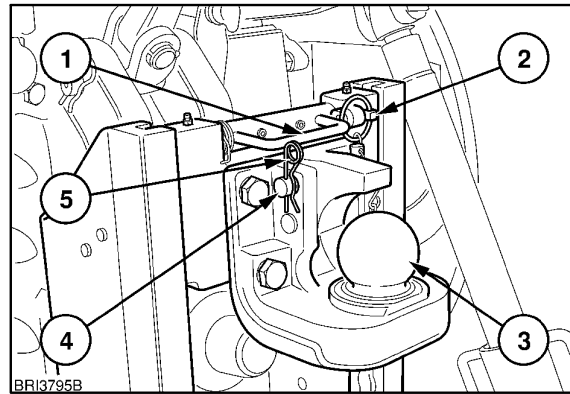
182

SECTION 3 - FIELD OPERATION

Slider Frame with K 80 Ball

The tow hitch shown is equipped with a height adjustable, 80 mm ball assembly.

Remove the securing clip (2) and lift the handle (1) to the vertical position. Lifting the handle will rotate the pins and disengage them from the notches in the frame. Using both hands on the handle, lift or lower the tow ball assembly (3) as required. When at the required height, support the tow ball with one hand and lower the handle to the horizontal position. The pins will rotate and re-engage the notches in the frame. Lower the P.T.O. guard.



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NOTE: When setting the height of the tow ball, it should be adjusted to the lowest position relative to the correct operating height of the implement drawbar.

To attach a trailer, remove the 'R' clip (5) and pull out the locking pin (4). This will allow the security latch to pivot forwards toward the tractor. When the implement drawbar has been securely attached, replace the locking pin so it passes through the security latch and re-insert the 'R' clip.

NOTE: The static downward load on the tow ball must not exceed 3000 kg (6600 lb.) or the rear tyre load capacity, whichever is lower. (See Tyre Pressures and Permissible Loads at the end of Section 3).

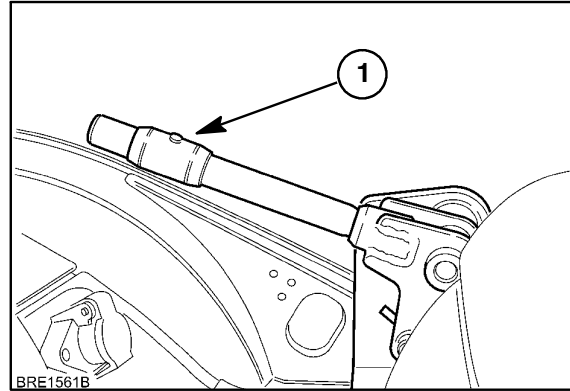
SECTION 3 - FIELD OPERATION

AUTOMATIC PICK-UP HITCH AND DRAWBAR

The automatic pick-up hitch and drawbar on your tractor may be the drop down type, swing back type or the hydraulic extending type.

All pick-up hitches are raised and lowered using the 3-point lift and are fully self-supporting when locked in the operating (raised) position.

Depending on type, the pick-up hitch will be equipped with a reversible hook and clevis drawbar or interchangeable hook and clevis drawbars.



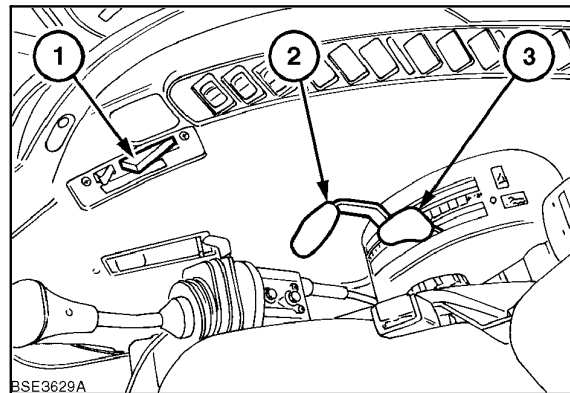
184

Raising and Lowering the Hitch (All Types)

With Mechanical Draft Control

Move both position (2) and draft (3) control levers fully rearwards until the 3-point lift is supporting the weight of the hitch.

To unlock the hitch, slide the collar (1) upwards Figure 184, and then pull up and hold the release handle. Lower the hitch to the ground by means of the **position** control lever.

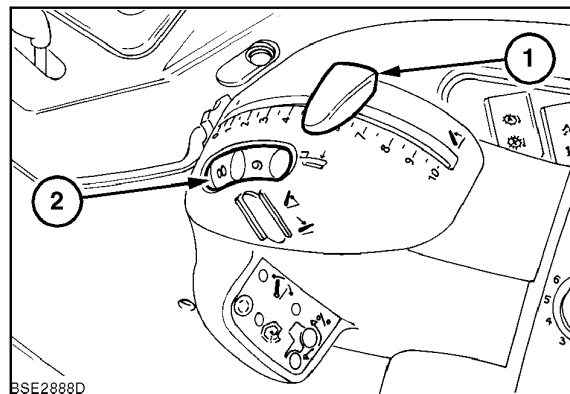


185

With Electronic Draft Control

Rotate the thumb wheel (2) fully forward to position 10. Move the Position Control lever (1) fully rearwards until the 3-point lift is supporting the weight of the hitch.

To unlock the hitch, slide the collar (1) upwards Figure 184, and then pull up and hold the release handle. Lower the hitch to the ground by means of the **position** control lever.



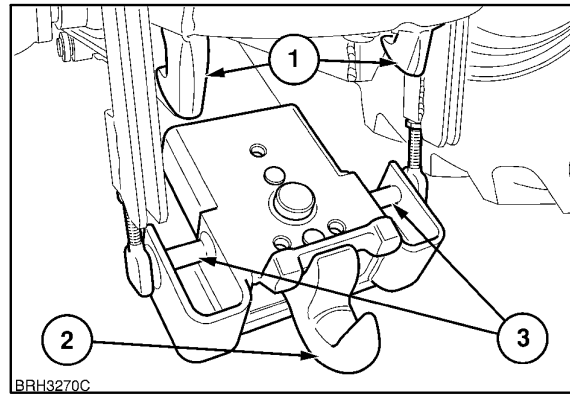
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SECTION 3 - FIELD OPERATION

Position the tractor so that the hitch hook (2) is beneath the eye of the implement drawbar and, using the **position** control lever, raise the hitch slowly until an audible click indicates the locking latches (1) have engaged the cross tubes (3).

IMPORTANT: Ensure that the height limit control is at the maximum height position. Failure to observe this may result in the hitch failing to latch correctly.

Push the position control lever forward so that the weight of the pick-up hitch (and attached implement) is supported by the locking latches.

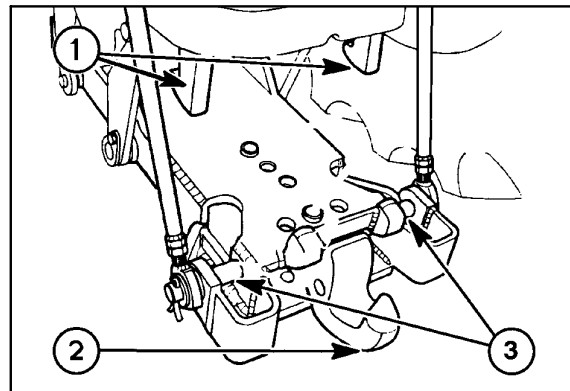


187

NOTE: The maximum static downward load on the hitch hook (all types) must not exceed 3000 kg (6610 lb.)

When towing equipment exerting high static downward forces, such as two-wheeled trailers, etc., always use the close-coupled drawbar position. Alternatively, change to the hitch hook mode.

IMPORTANT: When supporting equipment on the drawbar or pick-up hitch ensure that the total weight on the rear axle does not exceed the maximum static downward load or the rear tyre load capacity, whichever is the lower (See Rear Tyre Pressures and Loads at the end of Section 3).



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SECTION 3 - FIELD OPERATION

Drop Down Pick-Up Hitch (where fitted)

The hook on the drop down hitch is interchangeable with the clevis drawbar.

To change from the hook to drawbar, lower the pick-up hitch, extract the two securing pins (2) Figure 189 and withdraw the hook assembly.

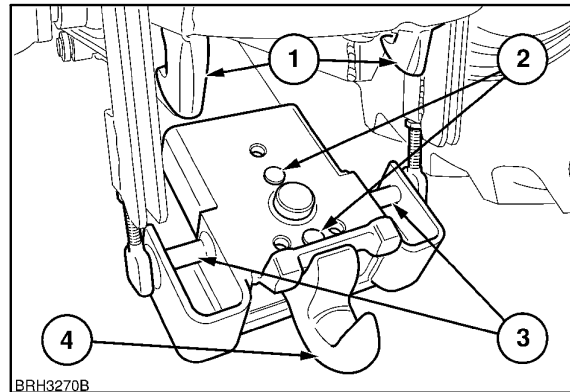
Install the clevis drawbar assembly and secure with the two pins.

IMPORTANT: Never raise or lower the pick-up hitch when in the drawbar mode with a trailer attached.

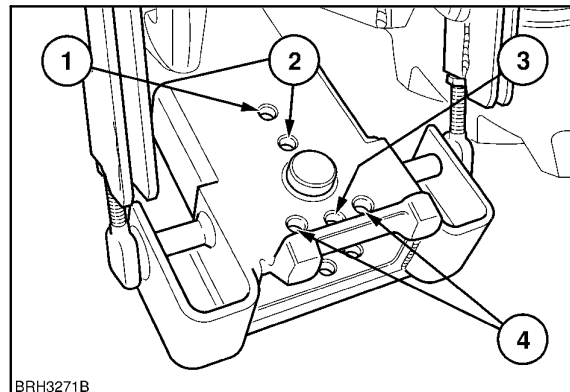
There are three holes in the drawbar support. When using holes (1), (2), and (3) in conjunction with the holes in the clevis drawbar, a choice of implement/drawbar hitch points, relative to the end of the P.T.O. shaft may be achieved. See Figure 190 and the table below for hitch point position and maximum permitted static downward load on the drawbar:

The two additional holes (4), are provided in the hanger for the rear securing pin so the drawbar may be offset to the left or right of the centre line.

The drawbar, Figure 191, may be inverted to vary the height of the drawbar/implement hitch point.

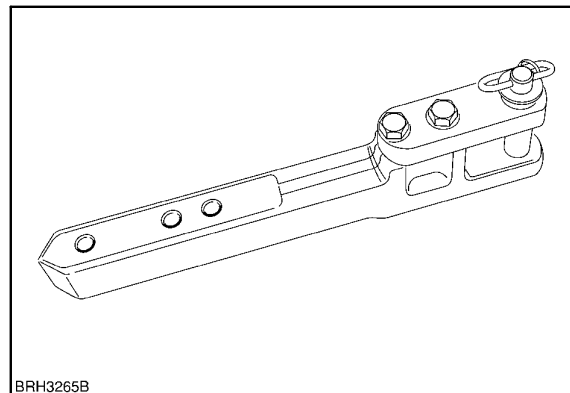


189



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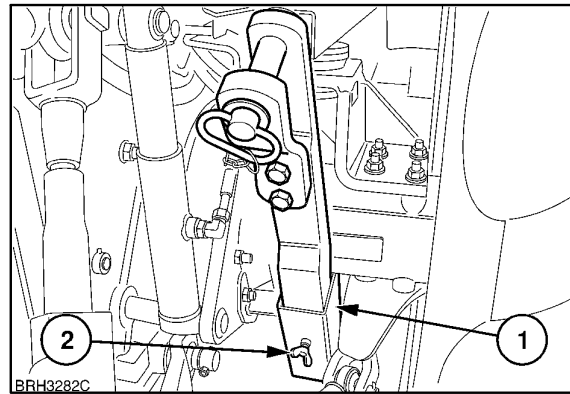
Hole (see Fig. 190)	P.T.O Shaft to Drawbar Hitch Point	Maximum Static Downward Load
Drawbar clevis uppermost		
1	356 mm (14 in.)	1650 kg (3630 lb.)
2	406 mm (16 in.)	1500 kg (3300 lb.)
Drawbar clevis underneath		
1	356 mm (14 in.)	1650 kg (3630 lb.)
2	406 mm (16 in.)	1500 kg (3300 lb.)



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SECTION 3 - FIELD OPERATION

When not in use, the hook or clevis drawbar may be stored in the bracket (1), attached to the rear axle. Ensure the clamp screw (2), is fully tightened to retain the drawbar in the bracket.



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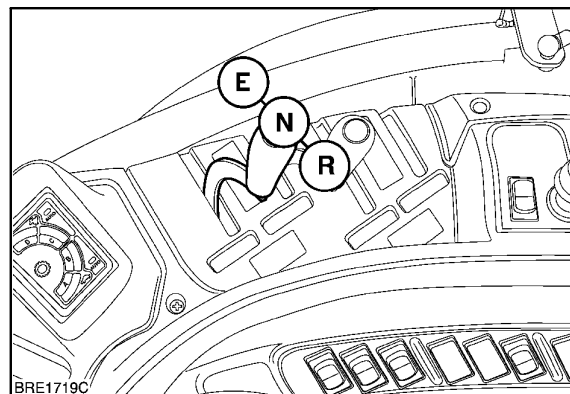
Extendible Pick-Up Hitch (where fitted)

The extendible pick-up hitch can be hydraulically extended to aid visibility when attaching towed equipment.

Operated through one of the rear remote valves, the hitch is extended or retracted using the remote valve lever. The hoses should be connected in such a way that moving the remote valve lever to E (Extend) will extend the hitch, moving the lever to R (Retract) will retract the hitch.

NOTE: The illustration shows hitch operation through remote valve number 1, however, it may be operated using an alternative valve where required.

Lower the hitch until it is clear of the locking latches and then extend the hook or clevis rearwards by moving the remote valve lever to E (Extend). With the drawbar extended continue to lower the hitch until it is just above the ground.

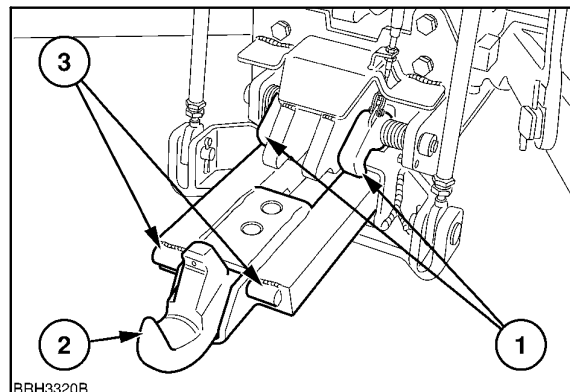


193

Position the tractor so that the hitch hook (2) is beneath the eye of the implement drawbar and, using the position control lever, raise the hitch until the implement drawbar is just clear of the ground.

Fully retract the pick-up hitch by moving the remote valve lever to (R). To assist in retracting the hitch release the tractor brakes to allow movement of the tractor towards the implement. Re-apply the handbrake before leaving the tractor seat.

With the hitch in the fully retracted position raise it slowly until an audible click indicates the locking latches (1) have engaged the cross tubes (3).



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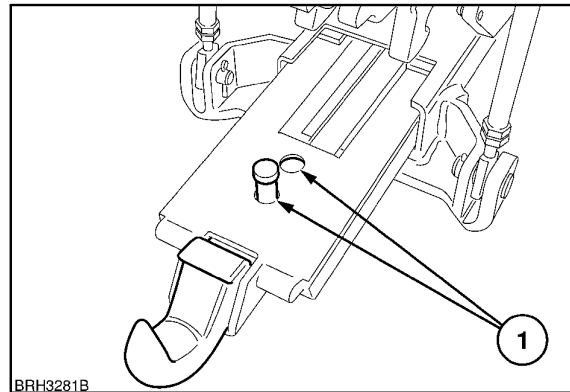
SECTION 3 - FIELD OPERATION

IMPORTANT: The hitch must be fully retracted before it will lock correctly. Always ensure the hitch is locked before operating the tractor.

NOTE: The maximum static downward load on the hitch hook must not exceed 3000 kg (6610 lb.)

To change from the hook to drawbar, lower the pick-up hitch, extract the two securing pins (1) and withdraw the hook assembly.

Install the clevis drawbar assembly and secure with the two pins.



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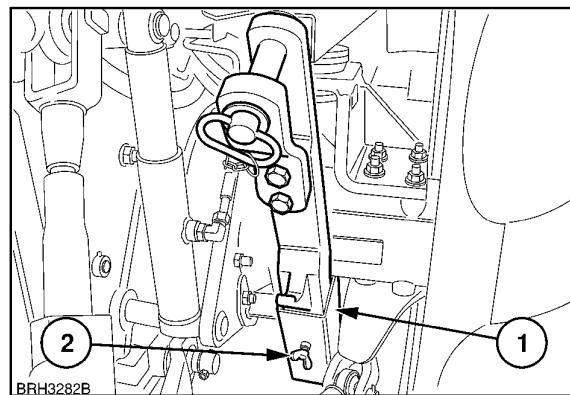
Maximum Permissible Clevis Load

P.T.O Shaft to Drawbar Hitch Point	Maximum Static Downward Load
406 mm (16 in.)	1500 kg (3300 lb.)

IMPORTANT: When supporting equipment on the drawbar or pick-up hitch ensure that the total weight on the rear axle does not exceed the maximum static downward load or the rear tyre load capacity, whichever is the lower (See Rear Tyre Pressures and Loads at the end of Section 3).

When not in use, the hook or clevis drawbar may be stored in the bracket (1), attached to the rear axle. Ensure the clamp screw (2), is fully tightened to retain the drawbar in the bracket.

If the hydraulic hitch pressure lines are disconnected from the remote valve, ensure the male couplings are protected from contamination and the pressure lines secured to the tractor to avoid possible damage.



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TRAILER BRAKES (where fitted)

Hydraulic Trailer Brakes (except Italy)

Hydraulic trailer brakes may be connected into the hydraulic system via a quick-release coupling (1) at the rear of the tractor.

NOTE: The position of the trailer brake coupling may vary slightly from that shown, dependent upon the type of remote control valves installed.

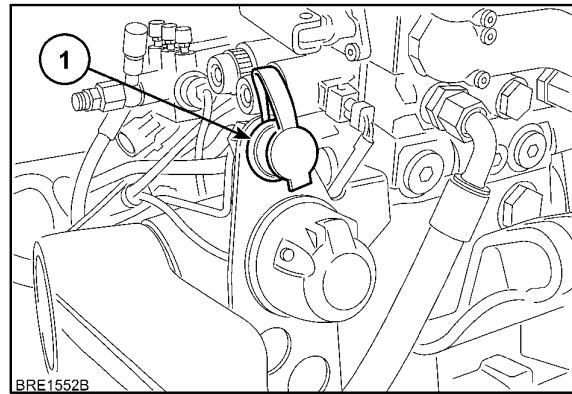
If the trailer brake hose is connected into the coupling the trailer brakes will be automatically applied when the footbrakes are used to stop the tractor.

IMPORTANT: It is essential that the brake pedals are locked together to ensure correct operation of trailer brakes, balanced operation of the tractor brakes and four wheel braking (four wheel drive tractors only).

⚠ WARNING ⚠

With the tractor engine off, hydraulic pressure cannot be applied to the trailer braking system. When parking the tractor/trailer combination apply the tractor and trailer parking brakes while the engine is still running. With the footbrakes locked together apply the parking brake, stop the engine and immediately block the wheels. Always lock the brake pedals together when a hydraulically braked trailer is attached to the tractor.

NOTE: Always keep the dust-cap in place when the trailer brake coupling is not in use. It is a legal requirement in most countries that trailer brakes may only be connected to the tractor coupling by means of a compatible female coupling.



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SECTION 3 - FIELD OPERATION

Hydraulic Trailer Brakes (Italy only)

The hydraulic trailer braking system on tractors for the Italian market function in a slightly different way to the universal system previously described.

If the trailer brake hose is connected into the coupling the trailer brakes will be automatically applied when the footbrakes are used to stop the tractor or when the tractor handbrake is applied when the engine is running. When the engine is switched off, the trailer brakes will remain applied.

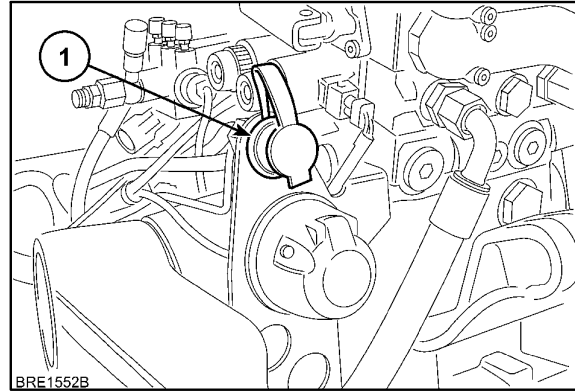
IMPORTANT: It is essential that the brake pedals are locked together to ensure correct operation of trailer brakes, balanced operation of the tractor brakes and four wheel braking (four wheel drive tractors only).

To release hydraulic pressure and free the trailer brakes, start the engine, depress both brake pedals and release the tractor handbrake.

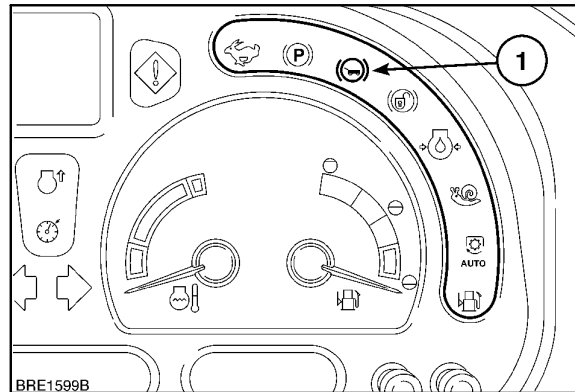
NOTE: The light (1), on the instrument panel will flash, accompanied by **critical alarm**, to indicate that hydraulic oil pressure to the trailer brake circuit is low. Stop the engine and investigate the cause.

ATTENTION: Should the trailer brake warning light commence to flash, the trailer brakes will apply automatically.

NOTE: Always keep the dust-cap in place when the trailer brake coupling is not in use. It is a legal requirement in most countries that trailer brakes may only be connected to the tractor coupling by means of a compatible female coupling.



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AIR-OPERATED TRAILER BRAKING SYSTEMS

Air-Operated Trailer Brakes (except Italy)



WARNING



Single line trailer braking systems are designed for use up to a maximum speed of 25 km/h (15 MPH). Tractor/trailer combinations with dual line braking systems may be used at a higher speed but must at all times comply with local legal requirements. Gross train weight, i.e., tractor plus trailer(s) and/or individual trailer weight must not exceed that laid down in local regulations governing the use of trailers.

The following text covers operation of the air-operated trailer braking systems that may be installed as an alternative to hydraulically-actuated trailer brakes.

The system consists of an engine-driven air compressor, one or two air reservoirs, dependent upon type of system installed, a pressure gauge, control valves, two or three couplers and related pipework.

A filter/dryer unit in the braking system extracts moisture from the pressurised air helping to avoid component failure in the implemented braking system from freezing in low temperatures. Any moisture collected is automatically exhausted through the system unload valve.

The couplers installed at the back of the tractor may be connected to single or dual line trailer braking systems. Either or both types may be installed. The air lines connected to the couplers are colour-coded black, red and yellow. The black line is used for a single line system, the red and yellow lines are used for dual line systems.

IMPORTANT: *The trailer brakes will only operate when **both** tractor brake pedals are applied. Therefore, always lock the brake pedals together when a trailer is attached to the tractor.*

NOTE: *The tractor handbrake is connected to the main control valve. Whenever the handbrake is applied, the trailer brakes are activated.*

SECTION 3 - FIELD OPERATION

Operation

When starting the engine with a trailer connected into the tractor air brake system, chock the wheels and release the parking brake and footbrakes. The warning light (1) Figure 200, will illuminate until air pressure builds up to 4.5 – 5.5 bar.

The pressure will continue to rise, as indicated by the air pressure bargraph in the Dot Matrix Display, Figure 201. To select the air pressure bargraph, use the CAL/SEL switch or, where fitted, the enhanced keypad.

The air tank(s) should reach operating pressure within 3 minutes of start-up but may take longer, dependent upon the size of the trailer brake reservoir(s).

Once required pressure has been reached a loud 'pop' will be heard, signifying that the unload valve has opened to allow excess pressure to escape to atmosphere.

IMPORTANT: Apply the footbrakes several times, ensuring that the pressure, as indicated by the gauge, drops as the brakes are applied and rises again when they are released. Never drive the tractor with the trailer brake warning light on.

IMPORTANT: When the footbrakes are applied, with the handbrake off, ensure that the front wheel drive indicator light (1) Figure 202 illuminates and that all stop lights are functional.

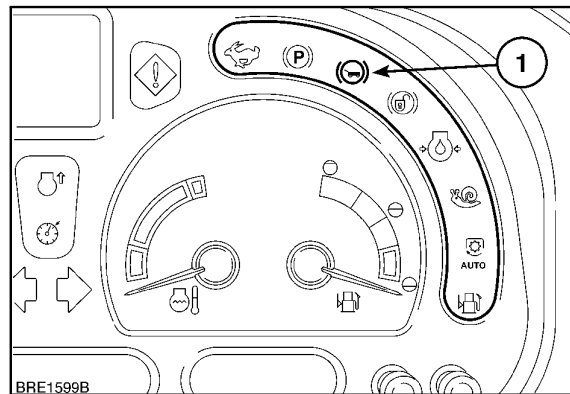
IMPORTANT: Various types of trailer braking systems are available. Check the trailer manufacturers' instruction manual before making connections to the tractor air brake system.

Clean the trailer and tractor connectors before coupling up the hose(s). Ensure that connections are secure. Check the trailer brakes regularly to ensure that they are functioning correctly.

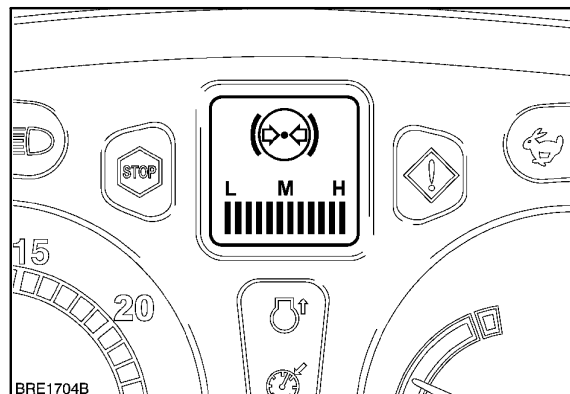


CAUTION

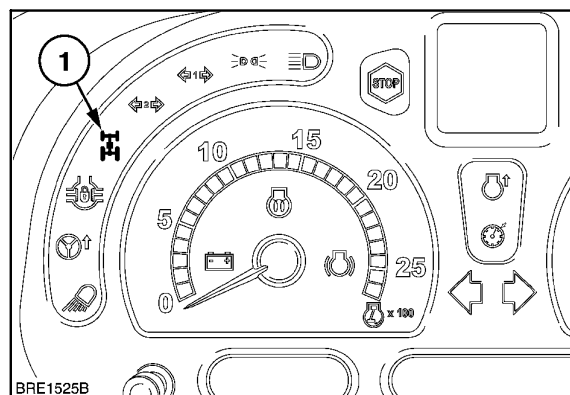
Do not over use the brakes on steep down hill gradients. Use the same gear going down hill as you would use for going up the same hill.



200



201



202

SECTION 3 - FIELD OPERATION

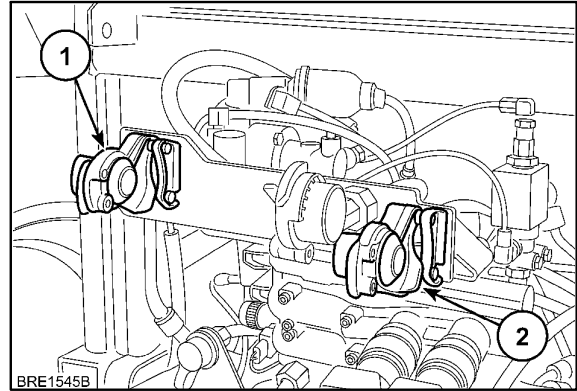
Dual Line System

For a trailer with a dual line braking system, connect the supply line hose to the red coupler (1) and the control line hose to the yellow coupler (2).

IMPORTANT: The dual line system will only operate if both the red and yellow lines are connected.

Red line (brake supply line) - (1): Air is supplied to the red coupler at full system pressure. This is the brake supply line and charges the reservoir(s) on the trailer. If the trailer braking system is disconnected from the tractor for any reason, the air pressure will fall to zero and the trailer brakes will be applied.

Yellow line (control line) - (2): As the tractor brakes are applied, increasing air pressure is supplied, via the yellow coupler, to the control valve on the trailer until full system pressure is generated. Application of the trailer brakes is proportional to the pressure applied to the tractor brake pedals.

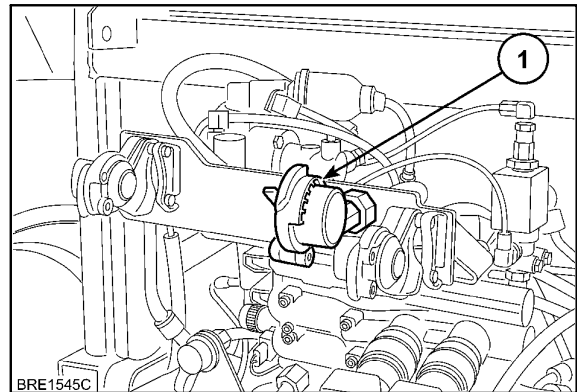


203

Single Line System

If the trailer has a single line system an additional coupler is supplied. Connect the hose to the **black** coupler (1) Figure 204.

A pressure of 5.5 bar is available at the coupler at all times when the tractor brake pedals and parking brake are released. Application of the tractor brakes causes the pressure to drop to zero allowing the trailer brakes to be applied.



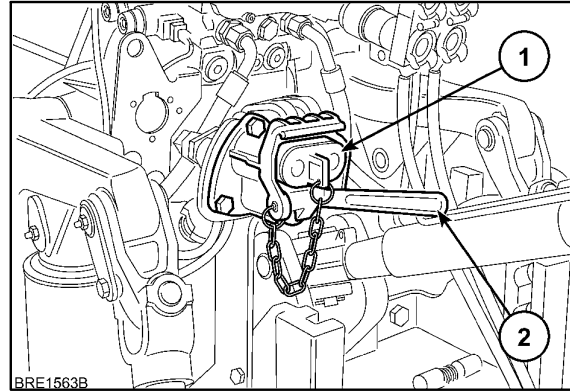
204

SECTION 3 - FIELD OPERATION

Air-Operated Trailer Brakes (Italy Only)

This system operates in a similar manner to the dual line system, previously described, except that a combined dual coupler is utilised. Please read all the previous text relating to pneumatic trailer brakes plus the following:

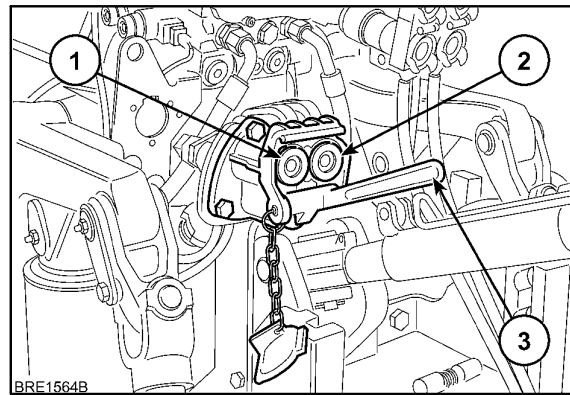
The coupler is protected by a metal cover. To remove the cover, press the handle (2) down. The handle is held in position by a stiff spring and some pressure is required to move it down to release the cover (1).



205

Connections

The lines to the couplers are colour-coded for ease of use. The supply line to the left-hand coupler (1) is red and the control line to the right-hand coupler (2) is yellow. The trailer hoses will have a male dual coupler. Press down the handle (3) and insert the trailer coupler. When the handle is released, it will lock the trailer and tractor couplers together.



206

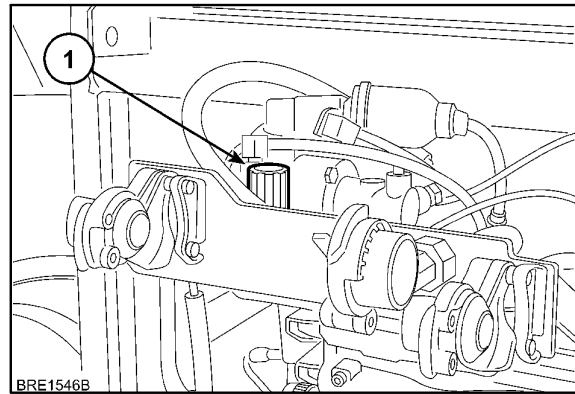
SECTION 3 - FIELD OPERATION

Tractor/Trailer Brake Bias Control

When the tractor leaves the factory, this control is set to allow maximum available braking effort to the trailer. Under most conditions, the control will remain in this position and will give well balanced braking.

Occasionally, with some trailers this setting may provide a greater braking bias to the trailer than is ideal. In this case the braking force to the trailer may be reduced slightly by turning the adjuster (1) in an anti-clockwise direction.

To turn the valve, it is first necessary to pull the knob out. After adjustment, push the knob in to lock the setting. The adjuster must be reset to the fully clockwise position when a different trailer is used.



207

⚠ WARNING ⚠

The brake balance adjustment is extremely sensitive and should not be rotated more than one half turn before testing with the attached trailer fully loaded. If further adjustments are required, they should be carried out following the same procedure. Failure to do this may result in an imbalance between tractor and trailer braking forces if the valve is rotated too far in the anti-clockwise direction.

SECTION 3 - FIELD OPERATION

EQUIPMENT MOUNTING POINTS

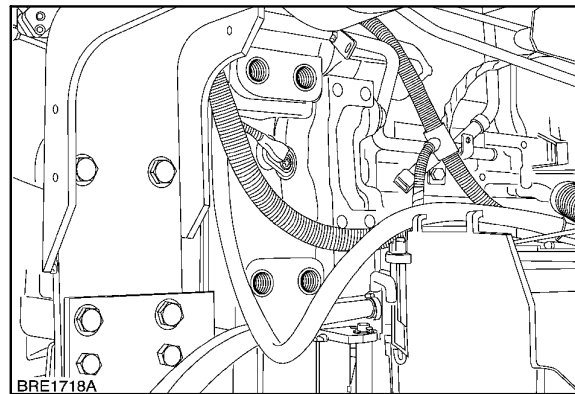
Your tractor is provided with a number of threaded holes for the purpose of attaching optional equipment. All threaded holes will accept M20 x 2.5 fixings. The depth of the holes will vary depending on location, therefore it is important the hole is checked before inserting any mounting bolt or stud to avoid damage to the thread or metal casting.

Transmission Housing

Figure 208 shows the mounting points on the left-hand side of the tractor. There are matching threaded holes on the right-hand side.

NOTE: Care should be taken when using holes in the transmission housing when mounting equipment to avoid any conflict with the cab or components below the tractor.

IMPORTANT: Do not attach any equipment or brackets to the cab mounting points

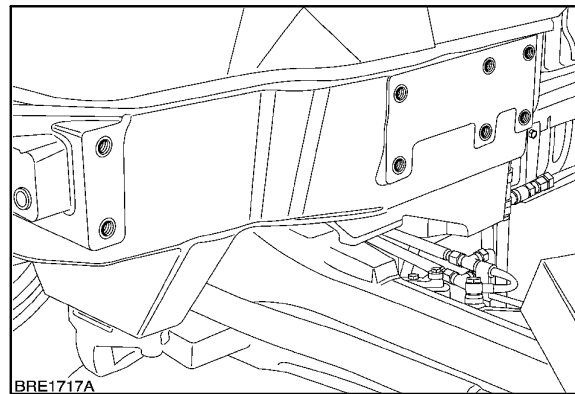


208

Front Axle Support Casting

Depending on tractor specification, the number of holes in the side of the axle support casting may vary.

NOTE: Consult the hardware torque chart in Section 8 for correct torque settings when attaching equipment to the mounting points. Re-check the torque settings after one hour of operation and on a daily basis thereafter.

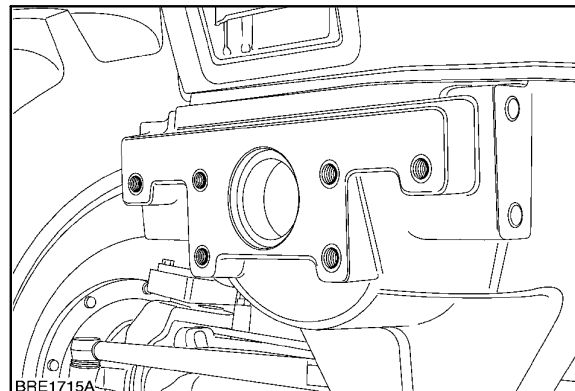


209

NOTE: If you have front end weights on your tractor then these holes will have already been utilised for the weight carrier.

CAUTION

When attaching equipment to the mounting points, adjust the tyre pressures to compensate for the additional weight. Ensure the maximum axle loads for the tractor are not exceeded, see page 3-132.



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SECTION 3 - FIELD OPERATION

FRONT WHEEL TRACK ADJUSTMENT (two wheel drive)



WARNING

Your tractor is produced with lights that meet lighting regulations when operating or travelling on the public highway. If the wheel track setting is adjusted beyond the initial factory position then you may be required to reposition the lights or fit auxiliary lighting to comply with legal requirements. Before travelling on the highway, ensure that the overall tractor width does not exceed the maximum permitted in your country.

The front axle consists of a hollow centre beam with a telescopic section at each end. Adjustment of the front wheel track width is effected by extending **both** ends of the axle **equally**. A number of holes at approximately 50 mm (2 in.) intervals are provided in the telescopic sections for track adjustment purposes.

NOTE: The track width is the distance between the centre of each tyre, measured at ground level.

NOTE: The track settings shown are approximate. The front wheel discs are dished. The track settings in the tables above are with the convex side of the discs facing outwards. If the front wheels are reversed on the hubs the track settings shown in the tables will be increased by approximately 100 mm (4 in.).

To extend the axle, apply the handbrake and place blocks at the front and rear of the rear wheels. Jack up the front axle and place on axle stands. Remove the securing bolts (1) Figure 211, securing the right-hand telescopic section to the centre beam.

Repeat on the left-hand side of the axle.

Loosen the locknuts and remove the locating bolts (2) Figures 212 and 213, from both ends of the track control rod behind the axle.

Figure 212 shows the left-hand end of the track control rod. Figure 213 shows the right-hand end. The extendible sections are drilled at 50 mm (2 in.) intervals and two locating bolts pass through the tube and into the solid sections to lock the track rod assembly at the required length. Additionally, the left-hand end of the solid section is threaded to provide fine adjustment.

Standard Axle (6 stud fixing - where fitted)

Securing Bolt Locations Refer to Figure 211	Track Width 7.50 x 16 Tyres
A - C	1465 mm (57.6 in.)
B - D	1567 mm (61.6 in.)
C - E	1669 mm (65.7 in.)
D - F	1770 mm (69.6 in.)
E - G	1872 mm (73.7 in.)
F - H	1974 mm (77.7 in.)
G - J	2076 mm (81.7 in.)
H - K	2177 mm (85.7 in.)

Note: Reversing the wheels will increase track width by 134.4mm (5.29")

Heavy Duty Axle (8 stud fixing - where fitted)

Securing Bolt Locations Refer to Figure 211	Track Width 10.00 x 16 Tyres
A - C	1580 mm (62.2 in.)
B - D	1667 mm (65.6 in.)
C - E	1754 mm (69.0 in.)
D - F	1841 mm (72.4 in.)
E - G	1928 mm (75.9 in.)
F - H	2016 mm (79.3 in.)
G - J	2103 mm (82.7 in.)
H - K	2190 mm (86.2 in.)

Note: Reversing the wheels will increase track width by 108.2mm (4.25")

Wide Axle (North America only) (8 stud fixing - where fitted)

Securing Bolt Locations Refer to Figure 211	Track Width 10.00 x 16 Tyres
A - C	1782 mm (70.1 in.)
B - D	1869 mm (73.5 in.)
C - E	1956 mm (77.0 in.)
D - F	2043 mm (80.4 in.)
E - G	2130 mm (83.8 in.)
F - H	2218 mm (87.3 in.)
G - J	2305 mm (90.7 in.)
H - K	2392 mm (94.1 in.)

Note: Reversing the wheels will increase track width by 108.2mm (4.25")

SECTION 3 - FIELD OPERATION

Reset the left and right-hand axle telescopic sections, passing the securing bolts through the centre beam and telescopic sections, as indicated in Figure 211 and the track setting tables.

Position both front wheels straight ahead and install the locating bolts (2) Figures 212 and 213, in the appropriate drilling (1) at each end of the track control rod.

Tighten the nuts on the axle extension securing bolts to 400 Nm (300 lbf.ft.). Tighten the locating bolts (2) Figures 212 and 213, to 150 Nm (110 lbf. ft.) and their locknuts to 75 Nm (55 lbf. ft.). Re-check all torque settings after 50 hours of operation.

Front Wheel Alignment

After resetting the track width, the front wheel toe-in may require adjustment. For correct operation, the front wheels should be parallel or toe **in** slightly.

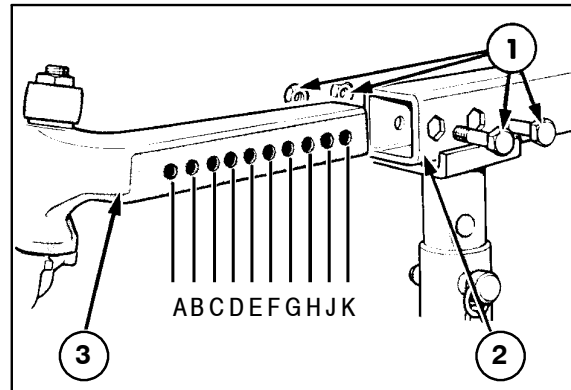
Measure the distance between the wheel rims at hub height at the **front** of the wheels. Rotate both front wheels 180° and check the measurements again, this time at the **rear** of the wheels. This will eliminate wheel rim run-out errors. The correct toe-in setting is 0 – 13 mm (0 – 0.5 in.), i.e. the measurement taken at the front of the rims should be the same as the rear or be **smaller** by up to 13 mm (0.5 in.).

Should it be necessary to adjust the front wheel toe-in, proceed as follows:

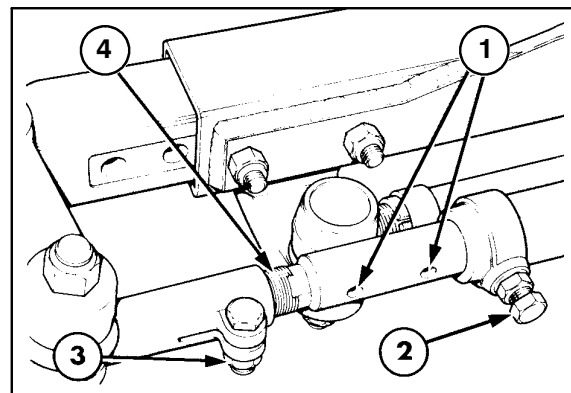
Remove the locating bolt (2) from the left-hand end of the track rod, slacken the clamp bolt (3) and turn the threaded section of the track rod (4) in or out until the toe-in is correct when the locating bolt is re-inserted. Tighten the clamp bolt to 100 Nm (75 lbf.ft.), the locating bolts to 150 Nm (110 lbf. ft.) and their locknuts to 75 Nm (55 lbf. ft.).

⚠ WARNING ⚠

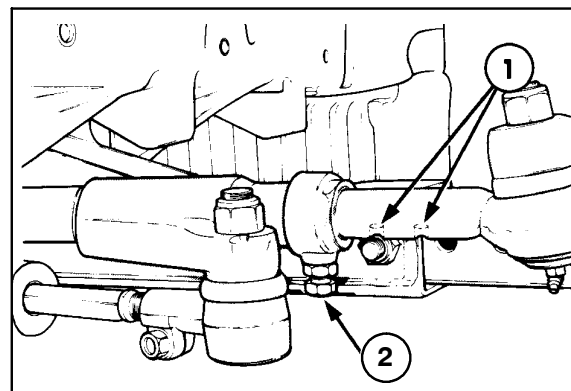
Owners should ensure that all steering components are maintained in a reliable and satisfactory condition to ensure safe operation and comply with legal requirements.



211



212



213

SECTION 3 - FIELD OPERATION

FRONT WHEEL TRACK ADJUSTMENT (four wheel drive)

Front Axle with Variable Track Front Wheels

The sectioned drawings illustrate the wheel rim and disc positions relative to the hub at various track settings. The track widths available are as follows:

Track settings with 24" and 28" front wheels

Position (Figure 214)	Track Width
A	1566 mm (61.6 in.)
B	1662 mm (65.4 in.)
C	1766 mm (69.5 in.)
D	1862 mm (73.3 in.)
E	1966 mm (77.4 in.)
F	2062 mm (81.1 in.)
G	2166 mm (85.2 in.)
H	2262 mm (89.0 in.)

The track widths in the above table are based on a tractor fitted with a **Standard** 4WD front axle.

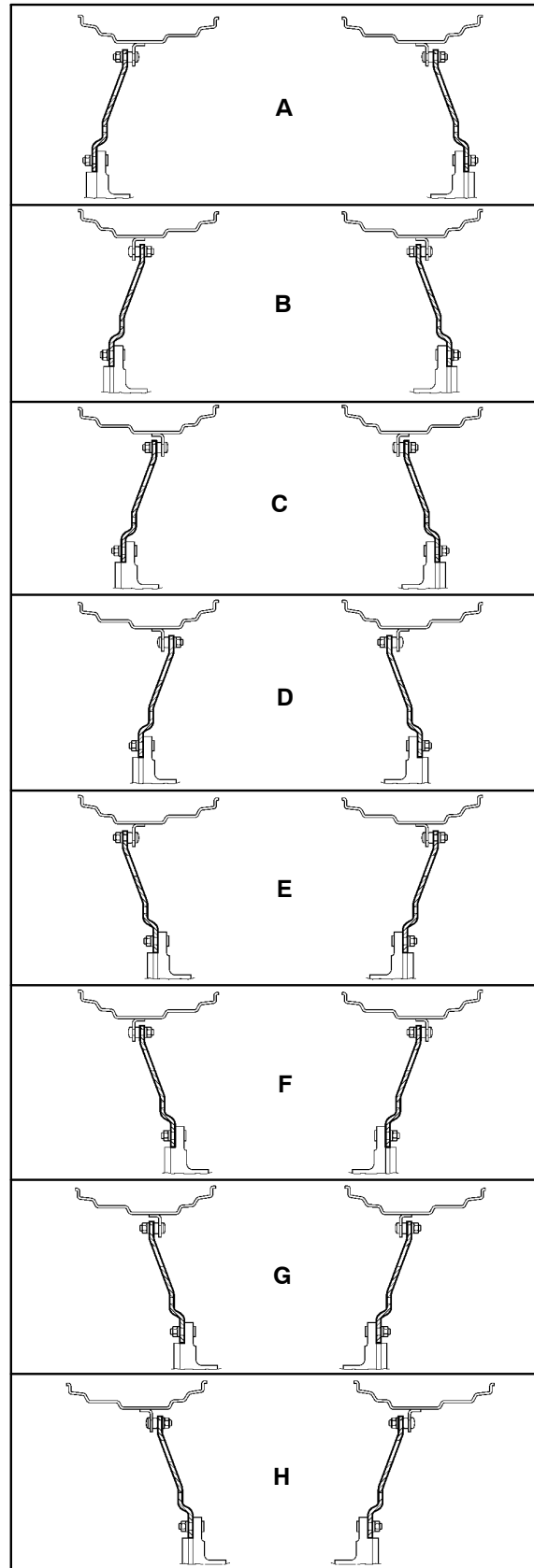
With front axle **Suspension**, add 18mm (0.7 in.).

With **SuperSteer** front axle, add 18mm (0.7 in.).

NOTE: The track widths in the table above are nominal and may vary by up to 25 mm (1 in.) dependent upon tyre size.

IMPORTANT: With optional Dynamic fenders fitted, narrower track settings may not be attainable due to insufficient clearance between the tyre or rim and any part of the fender or attaching hardware.

IMPORTANT: If your tractor is equipped with front fenders, ensure there is adequate clearance between fender and wheel under all operating conditions. With the smaller track settings a foul condition may occur between the tyre or fender and the tractor when the wheels are turned to the full lock position particularly when the axle is fully articulated. To avoid this condition, adjust the fenders and/or steering stops.



214

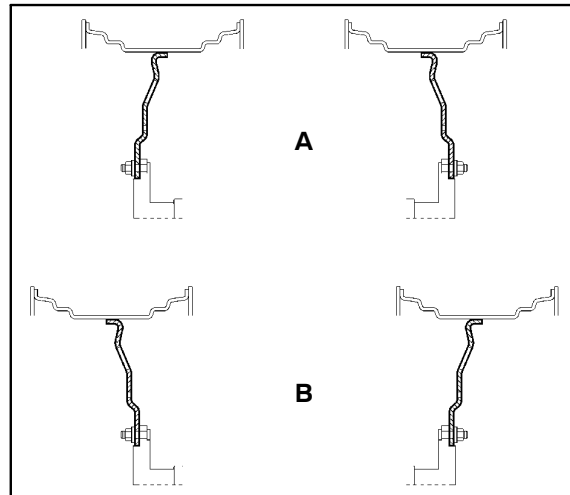
SECTION 3 - FIELD OPERATION

With Non Adjustable Front Wheels

Tractors equipped with non adjustable front wheels offer a choice of two track settings. To alter the track width, interchange both front wheels to provide a narrow (A) or wide (B) track setting as required.

NOTE: Tractors with a 50 K/mh (31 MPH) transmission will be fitted with non adjustable front wheels).

NOTE: When interchanging left and right-hand wheel assemblies, ensure the "V" of the tread at the top of the tyre remains pointing in the direction of forward travel.



215

Track settings with 24" and 28" Wheels

4WD Front axle type	Position	Track Setting
Standard - min. setting	A	1854 mm (73.0 in.)
Standard - max. setting	B	2080 mm (81.9 in.)
Suspended - min. setting	A	1821 mm (71.7 in.)
Suspended - max. setting	B	1978 mm (77.9 in.)
Supersteer - min. setting	A	1821 mm (71.7 in.)
Supersteer - max. setting	B	1978 mm (77.9 in.)

NOTE: The track widths in the table above are nominal and may vary by up to 28 mm (1.1 in.) dependent upon wheel rim offset.

REFITTING THE FRONT WHEELS

When refitting or adjusting a wheel, tighten the bolts to the following torques then re-check after 50 hours of operation and, thereafter as required.

Disc to hub nuts 294 Nm (217 lbf.ft.)
 Disc to rim nuts 250 Nm (184 lbf.ft.)
 (where applicable)



WARNING



Never operate the tractor with a loose wheel rim or disc. Always tighten nuts to the specified torque and at the recommended intervals. Owners should ensure that all steering components are maintained in a reliable and satisfactory condition to ensure safe operation and comply with legal requirements.

SECTION 3 - FIELD OPERATION

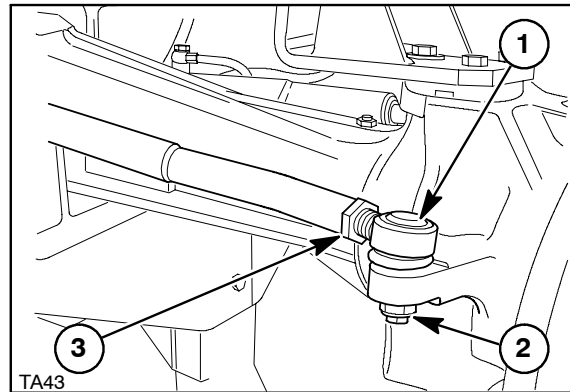
FRONT WHEEL ALIGNMENT

After resetting the track width, the front wheel alignment may require adjustment. For correct operation, the front wheels should be parallel.

Measure the distance between the wheel rims at hub height at the **front** of the wheels. Rotate both front wheels 180° and check the measurements again, this time at the **rear** of the wheels. This will eliminate wheel rim run-out errors. The correct setting is 0 +/- 3 mm (0 - 0.12 in.)

Should it be necessary to adjust the front wheel alignment, proceed as follows:

Remove and discard the self-locking nut (2), on the left-hand end of the track control rod (1) and extract the track rod end. Loosen the lock nut (3) and screw the track rod end into or out of the track rod to shorten or lengthen the assembly, as required. Re-insert the track rod end and, when the setting is correct, secure with a new self-locking nut. Tighten the self-locking nut to 100 Nm (74 lbf. ft.) and the lock nut to 180 Nm (133 lbf. ft.).

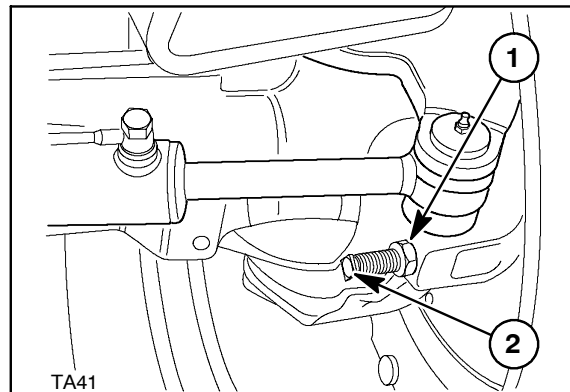


216

STEERING STOPS

Two steering stops are incorporated in the axle, one at each end. The stops are adjustable and should be set to provide a minimum clearance of 20 mm (0.75 in.) between the tyres and any part of the tractor on full left and right lock with the axle fully articulated.

To adjust, slacken the locknut and turn the stop bolt anti-clockwise to reduce the steering angle of the wheels or clockwise to increase the steering angle. Tighten the locknut to 150 Nm (110 lbf. ft.).



217

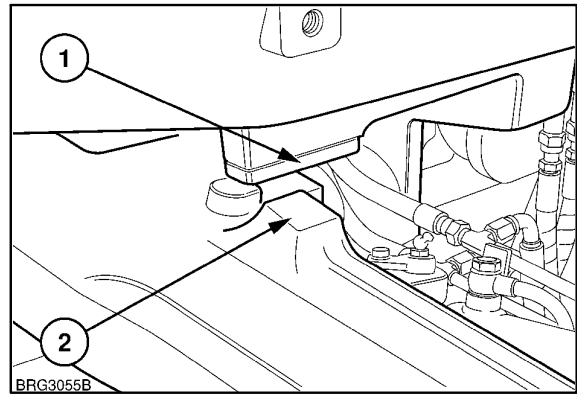
SECTION 3 - FIELD OPERATION

FRONT AXLE OSCILLATION STOPS (where fitted)

Where fitted, the axle oscillation stops are installed one each side of the axle. Each stop consists of a plate (1), secured to the underside of the front axle support by two flush fitting, socket head screws. Oscillation of the axle causes the stop plate to contact the projection (2) on the axle casing, so preventing further movement. With the stop plates in position, as shown, axle oscillation is 8°.

Extract the screws and remove the stop plates to increase axle oscillation to 12°.

NOTE: *If the oscillation stops are removed, ensure that there is adequate clearance between the front tyres and any part of the tractor with the axle fully articulated.*



218

DYNAMIC FRONT FENDERS (where fitted)

Two types of optional front fender are available, both offering a full range of adjustment to suit varying tyre sizes and track widths. The method of adjustment is very similar for both, but the following text describes the setting of the dynamic fender. Ensure all fixing bolts are re-tightened after adjustment.

Dynamic fenders turn with the front wheels as the tractor is steered. As the steering angle increases, a spring centered pivot in the fender mount restricts the turn angle of the fenders. This prevents interference with the tractor hood or loader frame while allowing the wheels to continue turning beneath the fender. As a result, tighter turns can be achieved that would not be possible with a conventional fender, particularly at narrower track settings.

Lateral adjustment, fender support

A fender may be moved horizontally, towards or away from the tractor, by relocating the metal shims (2) either side of the fender support (1).

Vertical adjustment

The fender may be moved vertically by relocating the bolts (3) in the appropriate holes in the fender support. A number of the holes are elongated allowing the fender to be tilted forward or rearward.

Fender turn stop

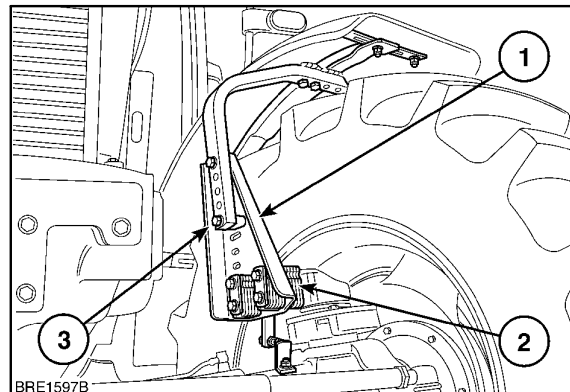
An adjustable stop bolt (3), is fitted to both fender support brackets. When turning, the bolt contacts a fixed stop (2) on the axle housing restricting the angle at which the fender will turn while allowing the wheels to continue turning beneath the fender. The stops may require adjusting if the track width or tyre size is changed.

Lateral adjustment, fender

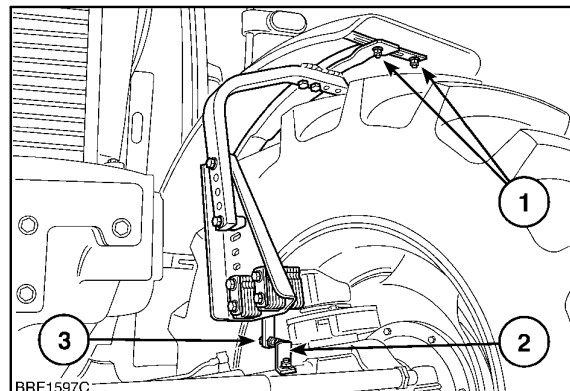
The support and bracket attachment points (1) beneath the fender, provide further lateral adjustment allowing the fender to be centered over the tyre.

Narrow Track Settings

With certain options and/or tyre sizes, the smaller track settings may not be attainable due to minimal clearance between tyre or rim and any part of the fender or attaching hardware.



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SECTION 3 - FIELD OPERATION

REAR WHEEL TRACK ADJUSTMENT



CAUTION

Your tractor is produced with lights that meet lighting regulations when operating or travelling on the public highway. If the wheel track setting is adjusted beyond the initial factory position then you may be required to reposition the lights or fit auxiliary lighting to comply with legal requirements. Additionally, before travelling on the highway, ensure that the overall tractor width does not exceed the maximum permitted in your country.

Rear wheel track adjustment is effected by changing the wheel rim relative to the centre disc, the rim and/or the disc relative to the axle hub or by inter-changing the rear wheels.



CAUTION

Tractor wheels are very heavy. Handle with care and ensure, when stored, that they cannot topple and cause injury.

NOTE: There are three different designs of centre disc dependent upon tyre size and tractor model. The centre discs shown are as follows:

Square centre disc - variable track (Type 1)

Round centre disc - variable track (Type 2)

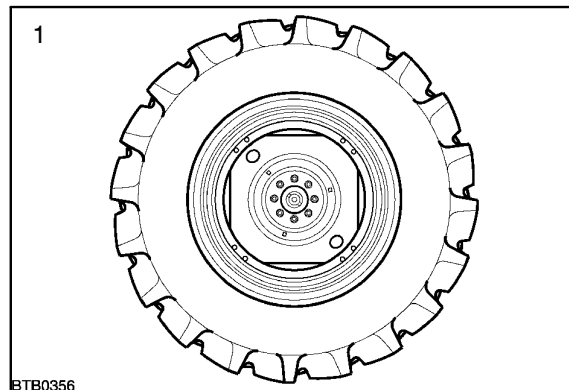
Round centre disc - fixed track (Type 3)

The type of centre disc installed will affect the track setting. Identify the type of centre disc fitted to your tractor wheels, then refer to the following table and Figure 224 to see the wheel rim and disc positions necessary to achieve the required track setting.

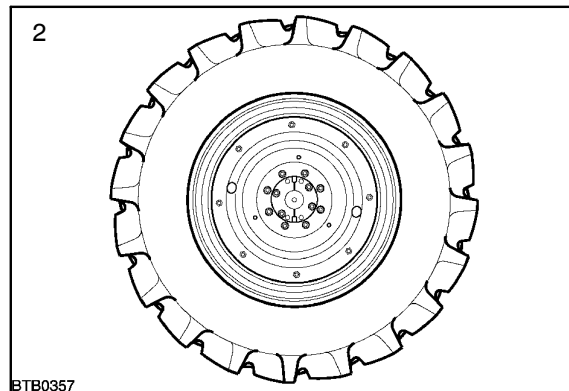


WARNING

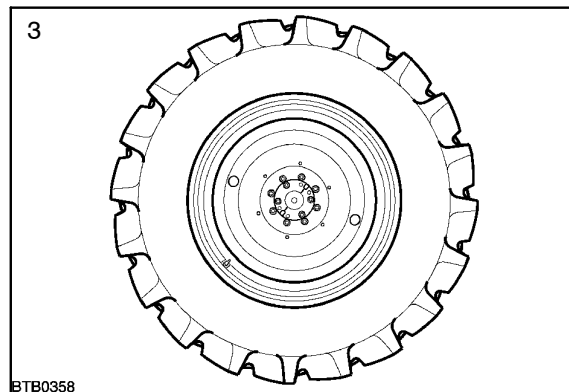
Never operate the tractor with a loose wheel rim or disc. Always tighten nuts to the specified torque and at the recommended intervals.



221



222



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SECTION 3 - FIELD OPERATION

The sectioned drawings shown, illustrate the wheel rim and disc positions relative to the hub at various track settings.

IMPORTANT: When interchanging left and right-hand wheel assemblies, ensure the "V" of the tread at the top of the tyre remains pointing in the direction of forward travel.

When refitting or adjusting a wheel, tighten the bolts to the following torques then re-check after 50 hours of operation and thereafter as required.

Rear disc to hub nuts 250 Nm (184 lbf. ft.)

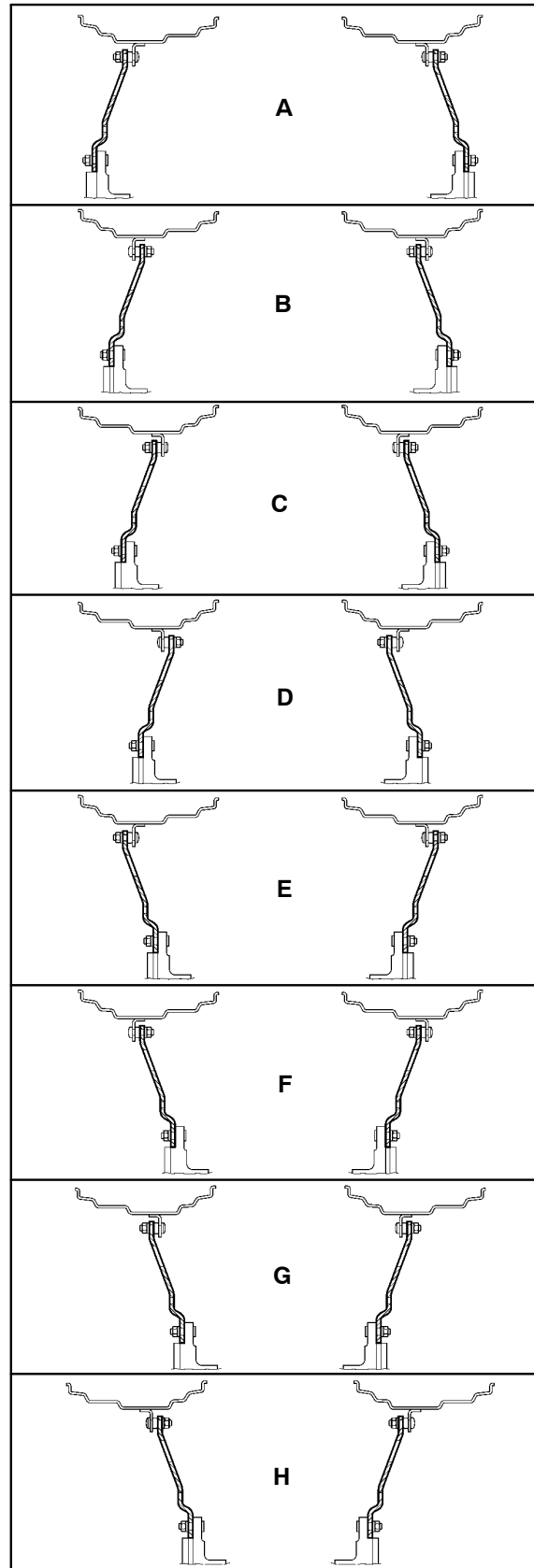
Rear disc to rim nuts
M16 nuts 250 Nm (184 lbf. ft.)

Track Settings

Adjustable Rim (Types 1 and 2)

Track setting Figure 224	All Models 34" and 38" Wheels Figures 221, 222
A	1412 mm (55.5 in.)
B	1510 mm (59.4 in.)
C	1614 mm (63.5 in.)
D	1710 mm (67.3 in.)
E	1812 mm (71.3 in.)
F	1910 mm (75.1 in.)
G	2014 mm (79.2 in.)
H	2110 mm (83.0 in.)

NOTE: With the larger tyre sizes, the narrower track settings may not be attainable due to minimal clearance between tyres and fenders or equipment. The dimensions shown in the above chart relating to Figure 224 are nominal and should be used as a guide only. Track settings may vary dependent upon wheel type and tyre size.



224

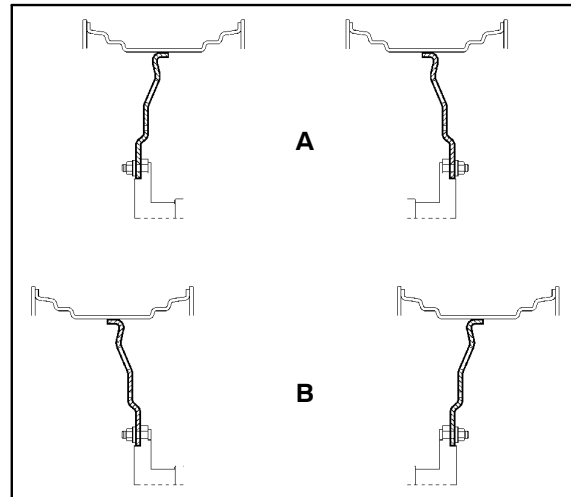
SECTION 3 - FIELD OPERATION

Fixed Rim (Type 3)

A track adjustment of approximately 50 mm (2.0 in.) each side, may be achieved by interchanging wheel assemblies.

Track setting Figure 225	Disc type 3 (18.4 x 38 tyre) Figure 223
A	1730 mm (68.1 in.)
B	1834 mm (72.2 in.)

NOTE: Depending on rim type, the above settings may vary by approximately 10.0mm (0.4 in.).



225

TOBACCO AXLE (North America only)

If your tractor has the optional Tobacco axle, then the track settings shown in the table on page 3-129 are increased by 152 mm (6 in) by the addition of spacers between the wheels and the rear axle flanges.

When refitting or adjusting a wheel, tighten the bolts to the following torques then re-check after 50 hours of operation and thereafter as required.

Disc to hub nuts 250 Nm (184 lbf. ft.)

Disc to rim nuts 250 Nm (184 lbf. ft.)

Track setting Figure 224	Tobacco Axle 34" and 38" Wheels Figures 221, 222
A	1564 mm (61.5 in.)
B	1662 mm (65.4 in.)
C	1766 mm (69.5 in.)
D	1862 mm (73.3 in.)
E	1964 mm (77.3 in.)
F	2062 mm (81.1 in.)
G	2166 mm (85.2 in.)
H	2262 mm (89.0 in.)

BAR AXLE (where fitted)



Your tractor is produced with lights that meet lighting regulations when operating or travelling on the public highway. If the wheel track setting is adjusted beyond the initial factory position then you may be required to reposition the lights or fit auxiliary lighting to comply with legal requirements. Additionally, before travelling on the highway, ensure that the overall tractor width does not exceed the maximum permitted in your country.

INTRODUCTION

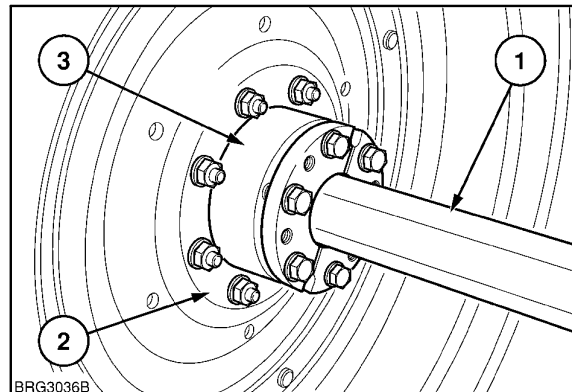
Tractors equipped with a bar axle may have fixed or manual adjust wheels. The wheels are attached to a cast iron hub (3) which is clamped to the bar axle (1).

After unclamping the hub, the wheel may be moved along the bar to provide a range of track widths. A range of 190 mm (7.5 in.) of movement per wheel, or 380 mm (15 in.) overall, is available with the 98 inch axle.

Track width adjustment is effected by moving the complete wheel/hub assemblies in or out on the axle shaft. Reduce the track width by moving the wheel towards the tractor, increase the width by moving the wheel outwards.

Additionally, repositioning the wheel rim on the centre disc or reversing the centre disc on the axle hub will provide a wider range of adjustment.

Tractor wheels are very heavy so it is recommended that you do not remove them to reposition the rims on the disc unless the track setting required is outside the slide range of the bar axle.



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SECTION 3 - FIELD OPERATION

MOVING A WHEEL ON THE AXLE SHAFT

Block the front wheels and jack up and support the rear axle.

Adjustment of the track setting is achieved by sliding the complete wheel/hub assembly on the axle shaft.

Loosen the two centre wedge bolts (1) Figure 227, approximately 0.5 in. (12 mm). Remove the four outer wedge bolts (2).

Clean the bolts and threaded holes in the wedges before lubricating and installing the outer wedge bolts at (1) Figure 228. These bolts are used as jack bolts to push against the wedges. Tighten the jack bolts evenly until the wedges loosen on the axle shaft. The wheel assembly will now be free to slide in or out on the axle shaft.

IMPORTANT: Do not use a torque greater than 300 ft.lbs. (407 N·m) on the jack bolts. The use of penetrating oil between the wedge and axle shaft will be of benefit. If difficulty is experienced, place a shaft protector over the end of the axle shaft and strike with a hammer to 'shock' the wedge free.

WARNING

Take suitable precautions, including the use of safety glasses, against the possibility of flying metal particles.

Set the wheel to the desired position on the shaft. Remove the jack bolts and replace them in the outer holes (2) Figure 228.

Tighten all six wedge retaining bolts in increments of 50 ft.-lbs. (68 Nm) until a final torque of 221 ft.-lbs. (300 Nm) is achieved.

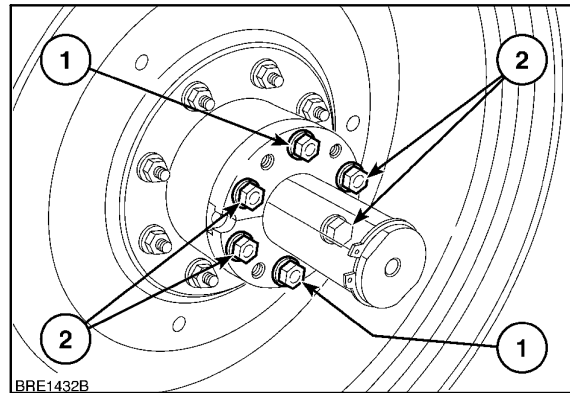
IMPORTANT: The wedge bolts must be tightened evenly.

Repeat the procedure on the other wheel, making sure that both rear wheels are the same distance from the ends of the axle shafts.

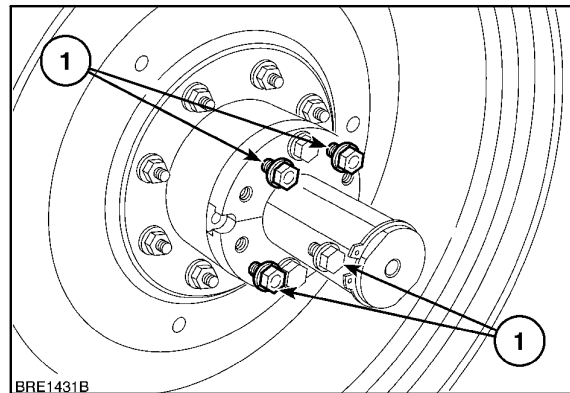
NOTE: Check the torque of all six wedge retaining bolts on each wheel after driving the tractor for 200 yards (200 m), after 1 hour and 10 hours operation and thereafter at the 50-hour service intervals.

WARNING

Never operate the tractor with a loose wheel rim or disc. Always tighten nuts to the specified torque and at the recommended intervals.



227

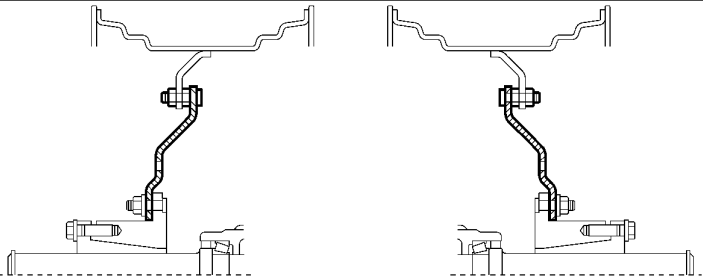
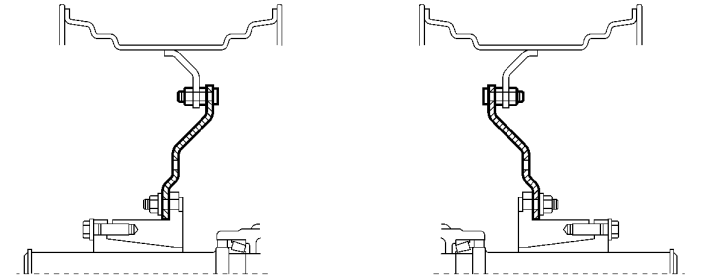
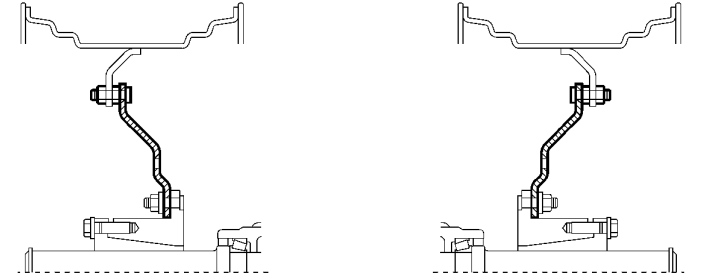
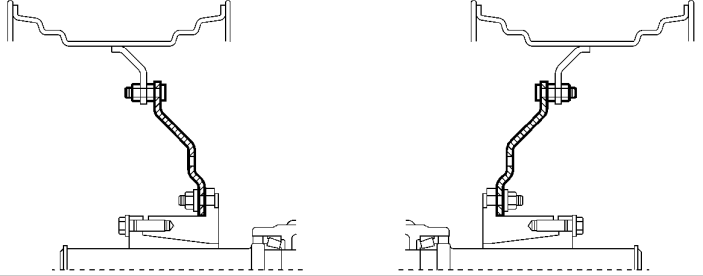


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SECTION 3 - FIELD OPERATION

WHEEL ADJUSTMENT

The sectioned drawings shown in Figures 229 and 230 illustrate the wheel rim and disc positions at various track settings. In each table, two track width settings are quoted for each axle type. These are the minimum and maximum achievable with both wheel assemblies moved fully in (toward the tractor) and fully out (away from the tractor).

Track Adjustment	Rim and Disc Position	
1524 - 1830 mm (60 - 72 in.)		
1727 - 2030 mm (68 - 80 in.)		
1930 - 2235 mm (76 - 88 in.)		
2133 - 2438 mm (84 - 96 in.)		

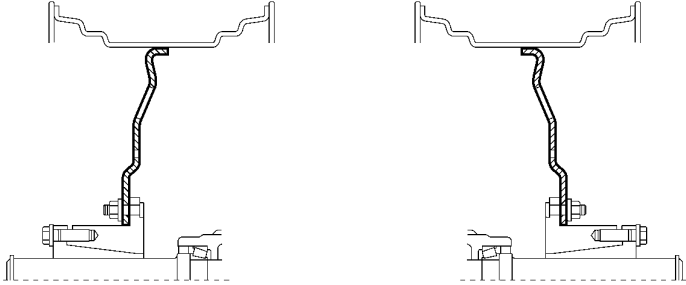
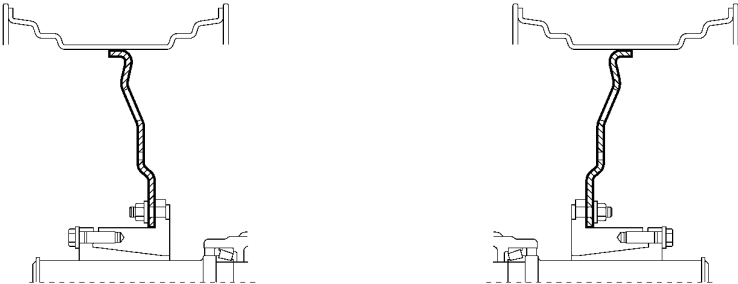
229

Wheels with steel centre disc bolted to flange on the rim

NOTE: With the larger width tyres, it may not be possible to move the wheels to the narrower settings due to limited clearance between the tyre and fender.

NOTE: The track widths shown in Figure 229 are nominal and may vary from that shown dependent on wheel and tyre size.

SECTION 3 - FIELD OPERATION

Track Adjustment	Rim and Disc Position
1524 - 2133 mm (72 - 84 in.)	
1625 - 2235 mm (64 - 88 in.)	

230

Wheels with steel centre disc welded to flange on the rim

NOTE: The track widths in Figure 230 are nominal and may vary from that shown dependent on wheel and tyre size.

NOTE: With the larger width tyres, it may not be possible to move the wheels to the narrower settings due to limited clearance between the tyre and fender.

CAUTION

Tractor wheels are very heavy. Handle with care and ensure, when stored, that they cannot topple and cause injury.

WARNING

Never operate the tractor with a loose wheel rim or disc. Always tighten nuts to the specified torque and at the recommended intervals.

When refitting or adjusting a wheel, tighten the bolts to the following torques then re-check after 50 hours of operation and thereafter as required.

IMPORTANT: When interchanging left and right-hand wheel assemblies, ensure the "V" of the tread at the top of the tyre remains pointing in the direction of forward travel.

Disc to hub nuts

8 Stud, steel disc wheels 260 Nm (190 lbf. ft.)

Disc to rim nuts

Steel disc wheels
M16 nuts 240 Nm (177 lbf. ft.)

SECTION 3 - FIELD OPERATION

BALLASTING AND TYRES

GENERAL

Maximum tractor performance is dependent upon proper ballasting and tyre selection. Maximum efficiency will be achieved when tractor weight is correct for the application.

The tyres selected for your tractor must be able to support the weight of the tractor and equipment and must also be able to provide adequate traction to utilize the tractor horsepower and turn it into useful drawbar horsepower.

Always maintain the correct air pressure in the tyre to carry the load. Do not over inflate tyres.

NOTE: Radial tyres will work with lower air pressures and will show up to 20% sidewall deflection or bulge when correctly inflated.

Factors Affecting Tyre Performance

- Correct air pressure for the load
- Correct sidewall deflection
- Correct wheel slip
- Correct tyre size for expected load
- Correct fill of liquid ballast
- Maintaining equal tyre pressure in both tyres on a given axle

Selecting Ballast

When tractor horsepower loads vary, the optimum weight of the tractor will change. This means that ballast may have to be added or removed to maintain the best tractor performance. Proper ballast will greatly improve tractor operation and ride.

The amount of ballast required is affected by:

- Weight of tractor
- Soil and traction conditions
- Type of implement: fully-mounted, semi-mounted or trailed
- Working speed
- Tractor horsepower load
- Type and size of tyres
- Tyre pressures

Do not use more ballast than needed. Excess ballast should be removed when it is not required.

IMPORTANT: Only sufficient weight should be added to provide traction and stability. Adding more weight than necessary results in unnecessary loads being imposed on the tractor and a higher fuel consumption. When adding weight, adhere to the maximum tyre capacity loading stated in the tables commencing on page 3-144. If further information or assistance is required on tractor weighting consult your authorised dealer.

SECTION 3 - FIELD OPERATION

Too little ballast:

- Rough ride
- Excessive wheel slip
- Power loss
- Tyre wear
- Excessive fuel consumption
- Lower productivity

Too much ballast:

- Higher maintenance costs
- Increased driveline wear
- Power loss
- Increased soil compaction
- Excessive fuel consumption
- Lower productivity

For maximum performance in heavy draft conditions weight should be added to the tractor in the form of liquid ballast, cast iron weights or a combination of both.

Front end ballast may be required for stability and steering control when weight is transferred from the front to the rear wheels as rear mounted implement is raised by the tractor 3-point linkage.

When a rear mounted implement is raised to the transport position, the weight on the front wheels should be at least 20% of total tractor weight.



Additional front ballast may be needed when transporting large 3-point mounted equipment. Always drive slowly over rough terrain, no matter how much front ballast is used.

For optimum performance and efficiency, two wheel drive tractors should be ballasted so that approximately one third of the total tractor weight (less implement) is on the front wheels. Four wheel drive tractors should be ballasted so the weight on the front wheels is approximately 40 - 45% of the total tractor weight.

Add additional front end ballast, as required, for stability during operation and transport. Ballasting of the front end may not always provide adequate stability if the tractor is operated at high speed on rough terrain. Reduce tractor speed and exercise caution under these conditions.

When using front mounted implements it may be necessary to add weight to the rear wheels to maintain traction and stability.

BALLASTING WITH FRONT AXLE SUSPENSION

IMPORTANT: On tractors fitted with front axle suspension, correct ballasting is essential to optimise suspension operation, particularly when using heavy rear mounted equipment. For this application, sufficient front ballast must be added by the use of wafer weights in preference to liquid ballast in the tyres

In certain conditions, with insufficient front weight added, suspension operation may become disabled and error code 10007 displayed. Stop the tractor, switch off the engine and restart again to clear the error code and re-enable the suspension. If the error code re-occurs, then further front weight should be added ensuring maximum axle and vehicle weights are not exceeded.

Ballast Limitations

Ballast should be limited by the tyre capacity or tractor capacity. Each tyre has a recommended carrying capacity which should not be exceeded, (see pages 3-144 and 3-145).

If a greater amount of weight is needed for traction, larger tyres should be used.

Ballast can be added by bolting on cast iron weights or by adding liquid calcium chloride in the tyres. Bolt-on cast iron weights are recommended because they can easily be removed when not needed.

SECTION 3 - FIELD OPERATION

TRACTOR WEIGHT INFORMATION

Maximum Gross Vehicle Weight

The maximum axle loads and vehicle weights will differ by model, depending on the type and combination of front and rear axles fitted to the tractor.

2WD Models	Maximum Axle Load		G.V.W.
	Front (kg)#	Rear (kg)	Total (kg)
T6010/T6020	2449 (LF)	6260 (LR)	7500
	2449 (LF)	6500 (HR)	7500
	2994 (HF)	6260 (LR)	7500
	2994 (HF)	7000 (HR)	8100
	1361 (WD)	6260 (LR)	7500
	1361 (WD)	7000 (HR)	8100
T6030/T6050	2449 (LF)	6500 (HR)	7500
	2994 (HF)	7000 (HR)	8100
	1361 (WD)	7000 (HR)	8100

- (LF) = Light Duty front axle with six stud wheel fixing at maximum **72"** track setting.
 (HF) = Heavy Duty front axle with eight stud wheel fixing at maximum **72"** track setting.
 (WD) = Wide front axle with eight stud wheel fixing.

4WD Models	Maximum Axle Load		G.V.W.
	Front (kg)#	Rear (kg)	Total (kg)
T6010/T6020	3600	6260 (LR)	7500
	3600	7000 (HR)	8100
T6030/T6050 T6070	3600	7000 (HR)	8700
	3600	7000 (HR)	8700

IMPORTANT: # Includes front mounted equipment or loader in the raised position but with no load in the bucket.

- (LR) = Light Duty rear axle.
 (HR) = Heavy Duty rear axle.
 (see page 3-138 for axle identification)

Restricted Operation

IMPORTANT: For *intermittent* operation, the front axle loading (including loaded loader bucket) may be increased (see **Restricted Operation**), provided that the ground speed does not exceed 8 km/h (5 MPH) and the front track width settings are maintained within the limits shown:

2WD Models	Maximum Front Axle Loading (Restricted Operation)*	
	kg	lb
Standard Axle	5000	11022
Heavy Duty Axle	5000	11022

* Maximum track setting 1829 mm. (72.0 in.).

4WD Class 3 Axle	Maximum Front Axle Loading (Restricted Operation)			
			Track Setting	
	kg	lb	mm	in
T6010	6200	13668	1727 - 2032	68 - 80
T6020	6200	13668	1727 - 2032	68 - 80
T6030	6200	13668	1727 - 2032	68 - 80
T6050	6200	13668	1727 - 2032	68 - 80
T6070	6200	13668	1727 - 2032	68 - 80

NOTE: Total axle weight is measured with only the front **or** rear wheels on the scales inclusive of liquid and cast iron ballast and with mounted equipment in the raised position.

IMPORTANT: Do not exceed the tractor gross vehicle weights shown. This can cause an overload condition that may invalidate the warranty and may exceed the load rating of the tyres. The maximum recommended gross vehicle weight is the weight of the tractor plus ballast plus any mounted equipment such as sprayers, tanks etc. in the raised position.

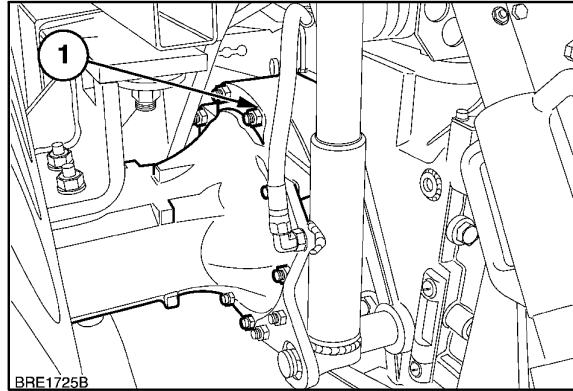
IMPORTANT: Braking regulations in some countries may impose lower gross vehicle weight limits for road transport than the figures quoted in the above tables.

SECTION 3 - FIELD OPERATION

REAR AXLE RECOGNITION

Light Duty Rear Axle

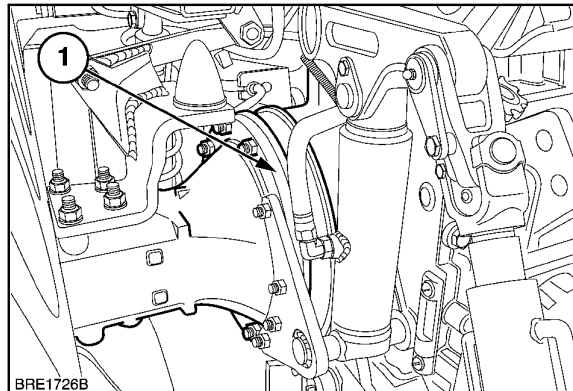
Your tractor may be fitted with a light duty, heavy duty or bar type rear axle depending on specification. The rear axles can be identified by the shape of the planetary reduction housings (1) shown in the two illustrations.



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Heavy Duty and Bar Type Rear Axle

NOTE: Total rear axle weight is measured with only the rear wheels on the scales inclusive of liquid and cast iron ballast and with mounted equipment in the raised position.



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CAST IRON WEIGHTS (where fitted)

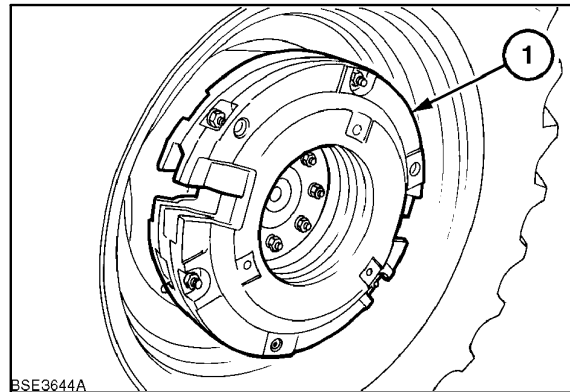
Rear wheel weights

Up to three cast iron weights (1), may be added to each rear wheel.

With flanged axle: 6 x 45 kg (6 x 99 lb.) permitting a maximum of 270 kg (594 lb.) to be carried.

With bar axle: 6 x 65 kg (6 x 143 lb.) permitting a maximum of 390 kg (860 lb.) to be carried.

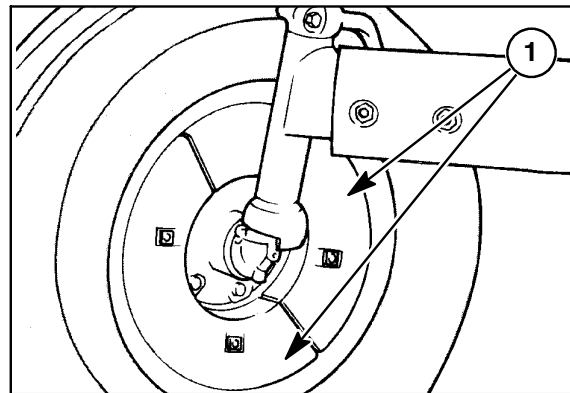
IMPORTANT: It is not recommended to fit rear wheel weights on tractors operating at speeds in excess of 40 k/mh (25 MPH).



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Front wheel weights

For two wheel drive front wheels, segmented, cast iron wheel weights (1), are available as an accessory. The set of four (two per wheel) provides a total front wheel ballast weight of 78 kg (172 lb.).



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Front end wafer weights

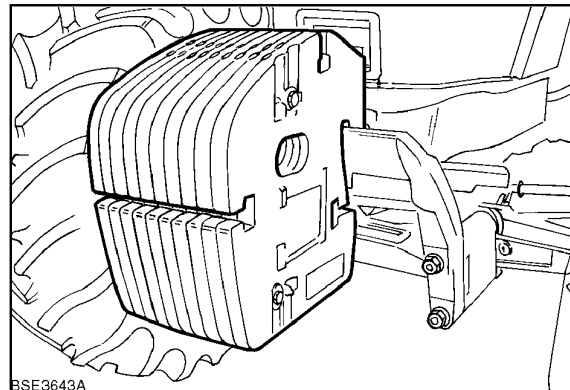
Front end wafer weights are available in sets as described in the following text.

45 kg (99 lb.) wafer weights are available in sets of 6, 10 and 18 which, together with the support carrier and tow hook, weigh:

6 weights, including carrier and tow hook. 360 kg. (793 lb.)

10 weights, including carrier and tow hook. 540 kg. (1190 lb.)

18 weights, including carrier and tow hook. 900 kg. (1984 lb.)



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SECTION 3 - FIELD OPERATION

The weights are clamped together by means of the long through bolts (1) and (3) and secured to the carrier by the clamp bolts (2).

The weights may be removed as a complete set with the aid of suitable lifting gear. Loosen the clamp bolts (2) and slide the clamp assembly sideways out of the weight pack. With a lifting bar passed through the central hole, the complete weight set may now be lifted off the carrier.

Alternatively, the weights can be removed individually after loosening the clamp bolts and removing all four through bolts (1) and (3).

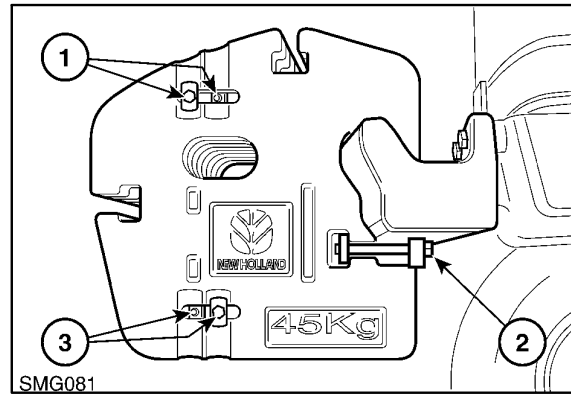


WARNING

The tractor must not be operated unless all four through bolts and the clamp bolts are in position with the bolts tightened to 169 Nm (125 lbf.ft.). Recheck the bolt torques after 50 hours of operation.

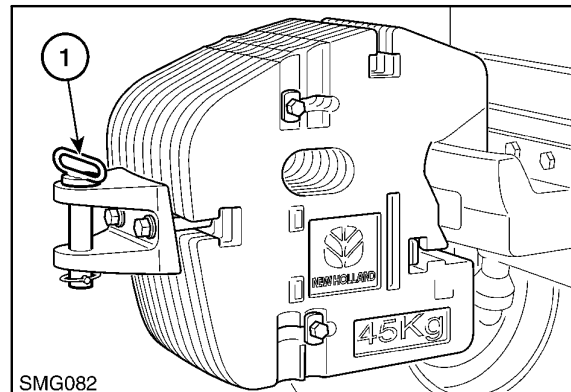
A towing facility is built into the weight carrier. However, if the weights are installed a tow pin (1), is available that clamps onto the front of the weight pack.

If the front weights and weight carrier are not installed, a tow pin is available for bolting directly to the front axle support.



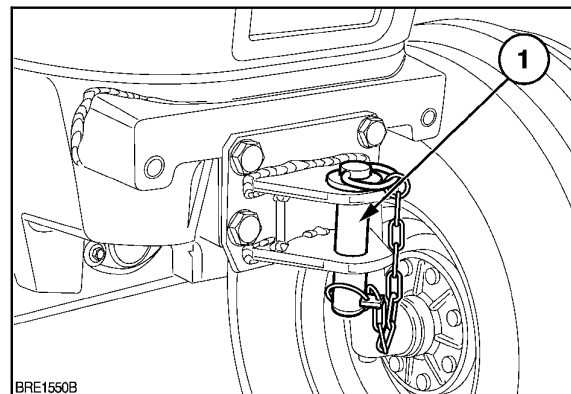
SMG081

236



SMG082

237



BRE1550B

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SECTION 3 - FIELD OPERATION

LIQUID BALLAST

IMPORTANT: It is not recommended to use liquid ballast on tractors operating at speeds in excess of 40 Km/h (25 MPH) as ride quality may be adversely affected.

Filling the front and rear tyres with liquid ballast is a convenient method of adding weight. A solution of calcium chloride and water is recommended. This gives a low freezing point and provides a higher density than plain water.

IMPORTANT: In some countries it is illegal to use calcium chloride as a ballast solution for tyres. Ensure that you comply with the legal requirements of your country. Use cast iron weights as an alternative to liquid ballast.

The following tables show the quantity of calcium chloride and water required for each tyre size option and is based on 0.6 kg of calcium chloride per litre of water.

The figures in the table will give a 75% fill of the tyre. This calcium chloride/water solution will give protection from freezing down to an ambient temperature of -50°C (-58°F).



WARNING



When mixing the ballast solution it is imperative the calcium chloride flakes are added to the water and the solution stirred until the calcium chloride is dissolved.

Never add water to calcium chloride as considerable heat is generated. If the flakes should contact the eyes, wash the eyes immediately with clean, **cold** water for at least 5 minutes. Consult a doctor as soon as possible.

Front Tyre Ballast

Tyre Size	Water Litres	Calcium Chloride kg.	Total Weight of solution per tyre kg.	Water US gallons	Calcium Chloride lb.	Total Weight of solution per tyre lb.
11.4 - 24	77	46	123	21	102	273
12.4R - 24	94	56	150	25	124	331
13.6R - 24	123	73	196	33	162	433
14.9R - 24	151	90	241	40	176	471
13.6R - 28	119	71	190	31	157	417
14.9R - 28	170	102	272	45	224	599
16.9R - 28	219	131	350	58	290	774
14.9R - 30	174	104	278	46.0	231	616
380/70R - 24	117	70	187	31	155	414
420/70R - 24	149	89	238	39	197	526
380/70R - 28	144	86	230	38	190	508
420/70R - 28	166	99	265	44	219	585
440/65R - 28	167	100	267	44	220	588
480/65R - 28	200	120	320	53	264	705
480/70R - 28	222	133	355	59	294	785
520/60R - 28	210	126	336	56	278	742
540/65R - 28	251	150	401	66	332	886
320/85R - 34	107	64	171	28	142	379

NOTE: Liquid ballasting of front tyres on a two wheel drive installation is not recommended.

SECTION 3 - FIELD OPERATION

Rear Tyre Ballast

Tyre Size	Water Litres	Calcium Chloride kg.	Total Weight of solution per tyre kg.	Water US gallons	Calcium Chloride lb.	Total Weight of solution per tyre lb.
18.4R - 30	286	171	457	76	377	1007
12.4 - 32	123	73	196	33	163	436
16.9R - 34	270	162	432	71	357	952
18.4R - 34	292	175	467	77	386	1031
13.6R - 38	176	105	281	47	233	622
16.9R - 38	275	165	440	73	364	972
18.4R - 38	312	187	499	83	413	1102
20.8R - 38	429	257	686	113	567	1513
18.4R - 42	352	211	563	93	465	1241
14.9R - 46	245	147	392	65	324	865
480/70R - 34	248	148	396	66	328	875
520/70R - 34	307	184	491	81	406	1083
480/70R - 38	270	162	432	72	357	954
520/70R - 38	318	190	508	84	420	1121
540/65R - 38	316	189	505	84	418	1115
600/60R - 38	365	219	584	97	483	1289
600/65R - 38	419	257	670	111	554	1479
650/60R - 38	436	261	697	115	576	1538
650/65R - 38	510	306	816	135	674	1800
320/90R - 50	153	91	244	40	202	539

IMPORTANT: Only sufficient weight should be added to provide traction and stability. Adding more weight than necessary results in unnecessary loads being imposed on the tractor and a higher fuel consumption. When adding weight, adhere to the maximum tyre capacity loading stated in the tables commencing on page 3-144. If further information or assistance is required on tractor weighting consult your authorised dealer.

**WARNING**

Tractor wheels are very heavy. Handle with care and ensure, when stored, that they cannot fall and cause injury.

Never operate the tractor with a loose wheel rim or disc. Always tighten nuts to the specified torque and at the recommended intervals.

SECTION 3 - FIELD OPERATION

TYRE CARE

Upon receiving your tractor, check the air pressure in the tyres and recheck every 50 hours or weekly.

When checking tyre pressures, inspect the tyres for damaged tread and side walls.

Inflation pressure affects the amount of weight that a tyre may carry.

See the Tyre Pressure and Load tables, pages 3-144 and 3-145. Do not exceed the load for the pressures listed. Do not over or under inflate the tyres. If the tyre fitted to your tractor is not listed, consult your authorised dealer for pressure and load information.

 WARNING

Inflating or servicing tyres can be dangerous. Whenever possible, trained personnel should be called in to service or install tyres. In any event, to avoid the possibility of serious or fatal injury, follow the safety precautions below:

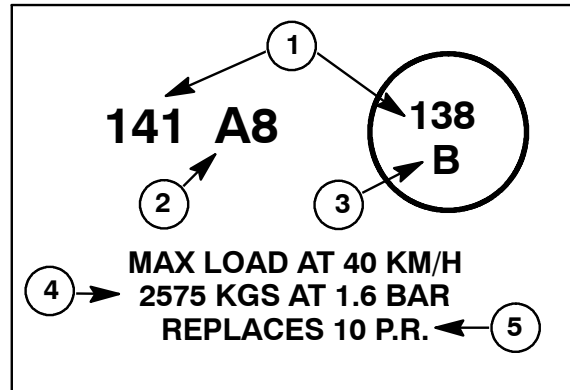
- *Never attempt tyre repairs on a public road or highway.*
- *Do not inflate a steering tyre (front tyre on a two wheel drive tractor) above the manufacturer's maximum pressure shown on the tyre or beyond the maximum recommended by your authorised dealer or tyre supplier.*
- *Never inflate a traction tyre (front tyre on a four wheel drive tractor or any rear tyre) over 2.8 bar (40 lbf/in²). If the bead does not seat on the rim by the time this pressure is reached, deflate the tyre, relubricate the bead with a soap/water solution and re-inflate. Do not use oil or grease. Inflation **beyond** 2.8 bar with unseated beads may break the bead or rim with explosive force sufficient to cause a serious injury.*
- *After seating the beads, adjust inflation pressure to the recommended operating pressure.*
- *Do not re-inflate a tyre that has been run flat or seriously under-inflated until it has been inspected for damage by a qualified person.*
- *Torque wheel to axle nuts to specification after re-installing the wheel. Check nut tightness daily until torque stabilises.*
- *Refer to tractor weighting section before adding ballast to the tyres.*
- *Ensure the jack is placed on a firm, level surface.*
- *Ensure the jack has adequate capacity to lift your tractor.*
- *Use jack stands or other suitable blocking to support the tractor while repairing tyres.*
- *Do not put any part of your body under the tractor or start the engine while the tractor is on the jack.*
- *Never hit a tyre or rim with a hammer.*
- *Ensure the rim is clean and free of rust or damage. Do not weld, braze, otherwise repair or use a damaged rim.*
- *Do not inflate a tyre unless the rim is mounted on the tractor or is secured so that it will not move if the tyre or rim should suddenly fail.*
- *When fitting a new or repaired tyre, use a clip-on valve adaptor with a remote gauge that allows the operator to stand clear of the tyre while inflating it. Use a safety cage, if available.*

SECTION 3 - FIELD OPERATION

TYRE PRESSURES AND PERMISSIBLE LOADS

Radial tyre performance is denoted by a Load Index and Speed Symbol replacing the Ply Rating commonly found on cross ply tyres. Figure 239 shows typical markings to be found on the side wall of radial ply tyres.

NOTE: Radial tyres will have a speed symbol of 'A8' and/or 'B' which identifies the maximum speed rating for that tyre. Tyres marked with the A8 symbol are suitable for speeds up to 40km/h (25 MPH), those marked with a 'B' symbol may be operated at speeds up to 50k/mh (31 MPH).



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The maximum load that may be carried by the tyre is dependent upon the Load Index shown on the side wall. In the following charts the loads given are for individual tyres operated at speeds up to 40 or 50 km/h (25 or 31 MPH). The two right-hand columns indicate the maximum permissible load **per tyre** at speeds of 40 or 50 km/h (25 or 31 MPH).

1. Load Index
2. Speed Symbol for 40 km/h (25 MPH)
3. Speed Symbol for 50 km/h (31 MPH)
4. Maximum load/inflation pressure at 40 km/h (25MPH)
5. Old ply rating mark

⚠ WARNING ⚠

When operating at high road speeds, tyre pressures and maximum load capacities advised by the tyre manufacturer should be strictly adhered to. Consult your authorised dealer or tyre supplier for the correct pressures and loads for the tyres fitted to your tractor.

Tyre Size	Load Index	Inflation Pressure - bar										Tyre Load Capacity @	
		1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	40 k/mh	50 k/mh
		Load Capacity per TYRE (kg) @ 30k/mh											
380/70 R24	125A8	1295	1415	1530	1650	-	-	-	-	-	-	1650	-
	122B	1295	1415	1530	1650	-	-	-	-	-	-	1650	-
13.6R-28	123A8	1170	1275	1320	1400	-	-	-	-	-	-	1400	-
	120B	1285	1400	1450	1550	-	-	-	-	-	-	1550	-
18.4R-30	142A8	1930	2095	2275	2430	-	-	-	-	-	-	2430	-
	139B	2120	2300	2500	2650	-	-	-	-	-	-	2650	-
480/70 R38	145A8	2300	2500	2700	2900	-	-	-	-	-	-	2900	-
	145B	2300	2500	2700	2900	-	-	-	-	-	-	2900	-
20.8R-38	153A8	-	-	-	-	2210	2410	2460	2865	3140	3350	3350	-
	150B	-	-	-	-	2430	2650	2900	3150	3450	3650	3650	-
18.4R-42	148A8	-	-	-	-	-	-	2300	2725	2900	3150	3150	-
	148B	-	-	-	-	1800	2120	2300	2725	2900	3150	3150	-

IMPORTANT: The above table provides an example of the maximum load limitations that occur at various tyre pressures on a representative range of rear tyre sizes available for your tractor. These figures are **per tyre** and should be used for guidance only. For exact information regarding inflation pressures and loads for your particular tyres, consult your authorised dealer.

SECTION 3 - FIELD OPERATION

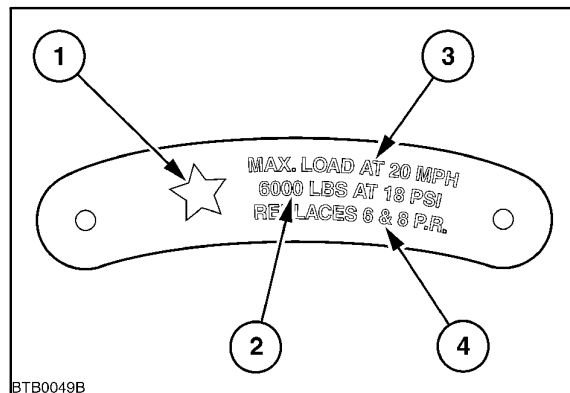
Tyre Size	Load Index	Inflation Pressure - lbf/in ²										Tyre Load Capacity @	
		15	17	20	23	26	29	31	35	37	40	25 MPH	31 MPH
		Load Capacity per TYRE (lbs.) @ 18.6 MPH											
380/70 R24	125A8	2854	3119	3373	3637	-	-	-	-	-	-	3637	-
	122B	2854	3119	3373	3637	-	-	-	-	-	-	3637	
13.6R-28	123A8	2579	2810	2910	3086	-	-	-	-	-	-	3086	-
	120B	2832	3086	3196	3417	-	-	-	-	-	-	3417	
18.4R-30	142A8	4255	4618	5015	5357	-	-	-	-	-	-	5357	-
	139B	4673	5070	5511	5842	-	-	-	-	-	-	5842	
480/70 R38	145A8	5070	5511	5952	6393	-	-	-	-	-	-	6393	-
	145B	5070	5511	5952	6393	-	-	-	-	-	-	6393	
20.8R-38	153A8	-	-	-	-	4872	5313	5423	6316	6922	7385	7385	-
	150B	-	-	-	-	5357	5842	6393	6944	7605	8046	8046	
18.4R-42	148A8	-	-	-	-	-	-	5070	6007	6393	6944	6944	-
	148B	-	-	-	-	3968	4673	5070	6007	6393	6944	6944	

IMPORTANT: The above table provides an example of the maximum load limitations that occur at various tyre pressures on a representative range of rear tyre sizes available for your tractor. These figures are **per tyre** and should be used for guidance only. For exact information regarding inflation pressures and loads for your particular tyres, consult your authorised dealer.

SYMBOL MARKED RADIAL TYRES (North America Only)

Conventional sized radial agricultural tractor drive tyres are marked with *, **, or *** symbols. The maximum load rating for tyres marked with a * is calculated at 18 psi inflation pressure. Tyres marked with ** or *** have maximum load carrying capacities at pressures of 24 psi and 30 psi respectively.

For information regarding specific inflation pressures and load carrying capacities for the tyres fitted to your tractor, consult your authorised dealer.



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1. Load symbol
2. Maximum recommended load at marked pressure
3. Maximum load at 20 MPH
4. Previous ply ratings

[illegible]

SECTION 4 LUBRICATION AND MAINTENANCE

GENERAL INFORMATION

INTRODUCTION

Section 4 provides the step by step requirements necessary to maintain your new tractor in peak condition. A lubrication and maintenance chart on page 4-7 provides a ready reference to these requirements. If in doubt about any aspect of lubrication and maintenance, consult your dealer.

CONTENTS

The subjects covered in this section are as listed below. A full index is provided at the back of the book.

Subject	Page
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Lubricants and Coolants	4-8
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General Maintenance - as required	4-52

SAFETY PRECAUTIONS

Read and observe all safety precautions listed in 'Servicing the Tractor' in the Introduction section at the front of this Manual.

NOTE: *Dispose of used filters and fluids properly.*



CAUTION



Do not check, lubricate, service or make adjustments to the tractor with the engine running.

DURING THE FIRST 50 HOURS OPERATION

In addition to the regular maintenance operations listed, check the following items every 10 hours or daily during the first 50 hours of operation of your new tractor:

- Check transmission/rear axle/hydraulics oil level
- Wheel nuts for tightness
- Front axle hub oil levels (four wheel drive)

CHECKING OIL LEVELS

IMPORTANT: *Park the tractor on level ground and, where applicable, extend all cylinders before checking oil levels. With some front/rear wheel combinations, it may be necessary to raise the front or rear of the tractor to ensure it is level before checking the oil.*

SECTION 4 - LUBRICATION AND MAINTENANCE

THE FIRST 50 HOUR SERVICE

At the first 50-hour service, ensure that the following additional service operations are carried out. The items are listed in the 'First 50-Hour Service' checklist in Section 9.

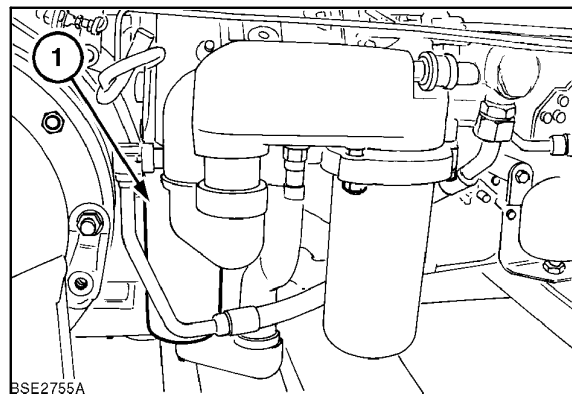
- Check engine oil level
- Change hydraulic oil filters (all models)*
- Check transmission/rear axle/hydraulics oil level
- Check FWD differential oil level
- Check FWD axle hub oil level
- Check and adjust parking brake
- Check all engine air intake connections
- Check torque of exhaust manifold bolts
- Inspect Poly V-belt
- Check and adjust compressor drive belt tension (air operated trailer brakes-where fitted)
- Tighten all cooling system hose connections
- Check torque of safety cab or frame mounting bolts
- Check torque of front end weight clamp bolts (where fitted)

NOTE: Items listed in the first 50-hour check are important. If not performed, early component failure and reduced tractor life may result.

*Tractors with Variable Displacement Hydraulic Pump only

IMPORTANT: At the First 50 Hour service the hydraulic filter (2) **MUST** be changed for the larger capacity service replacement filter. Do **NOT** replace with one of the same size as this may reduce hydraulic system performance.

Filter Dimensions	Length	Diameter
Original (factory fit)	204mm	94.3mm
Service replacement filter	254mm	116.8mm



SECTION 4 - LUBRICATION AND MAINTENANCE

PREVENTING SYSTEM CONTAMINATION

To prevent contamination when changing oils, filters, etc., always clean the area around filler caps, level and drain plugs, dipsticks and filters prior to removal. Before connecting remote cylinders, ensure that oil contained within them is clean, has not degenerated due to long storage and is of the correct grade.

To prevent dirt entry during greasing, wipe dirt from the grease fittings before greasing. Wipe excess grease from the fitting after greasing.

FLEXIBILITY OF MAINTENANCE INTERVALS

The intervals listed in the lubrication and maintenance chart are guidelines to be used when operating in normal working conditions.

Adjust the intervals for environment and working conditions. Intervals should be shortened under adverse (wet, muddy, sandy, extremely dusty) working conditions.

LUBRICATION AND MAINTENANCE CHART

The chart on page 4-7 lists the intervals when routine checks, lubrication, service and/or adjustments should be performed. Use the chart as a quick reference guide when servicing the tractor. The operations follow the chart.

FUELLING THE TRACTOR



CAUTION



When handling diesel fuel, observe the following:

Do not smoke around diesel fuel. Under no circumstances should gasoline, alcohol, gasohol or dieselhol (a mixture of diesel fuel and alcohol) be added to diesel fuel because of increased fire or explosion risks. In a closed container such as a fuel tank they are more explosive than pure gasoline. Do not use these blends. Additionally, dieselhol is not approved due to possible inadequate lubrication of the fuel injection system.

- Clean the filler cap area and keep it free of debris.
- Fill the tank at the end of each day to reduce overnight condensation.
- Never take the cap off or refuel with the engine running.
- Keep control of the fuel nozzle while filling the fuel tank.
- Don't fill the tank to capacity. Allow room for expansion. If the original fuel tank cap is lost, replace it with a genuine original equipment cap and tighten securely.
- Wipe up spilled fuel immediately.

SECTION 4 - LUBRICATION AND MAINTENANCE

FUEL REQUIREMENTS

The quality of fuel used is an important factor for dependable performance and satisfactory engine life. Fuels must be clean, well-refined, and non-corrosive to fuel system parts. Be sure to use fuel of a known quality from a reputable supplier.

Use Number 2-D in temperatures above -7°C (20°F).

Use Number 1-D in temperatures below -7°C (20°F).

To obtain optimum combustion and minimum engine wear, the fuel selected for use should conform to the application and property requirements outlined in the following chart.

DIESEL FUEL SELECTION CHART

General Fuel Classification	Final Boiling Point(Max)	Cetane Rating (Min)	Sulphur Content (Max)
No. 1-D	288°C (550°F)	40*	0.3%
No. 2-D	357°C (675°F)	40	0.5%

NOTE: When long periods of idling or cold weather conditions below 0°C (32°F) are encountered or when continuously operating at an altitude above 5,000 ft. (1500 m) use Number 1-D fuel.

* When continually operating at low temperatures or high altitude, a minimum cetane rating of 45 is required.

Using diesel fuel with sulphur content above 0.5% requires more frequent oil and filter changes as noted in the maintenance schedule.

The use of diesel fuel with a sulphur content above 1.3% is not recommended.

For the best fuel economy, use Number 2-D fuel whenever temperatures allow.

Do not use Number 2-D fuel at temperatures below -7°C (20°F). The cold temperatures will cause the fuel to thicken, which may prevent the engine from running. (If this happens, contact your dealer.)

To be sure that a fuel meets the required properties, enlist the aid of a reputable fuel oil supplier. The responsibility for clean fuel lies with the fuel supplier as well as the fuel user.

FUEL STORAGE

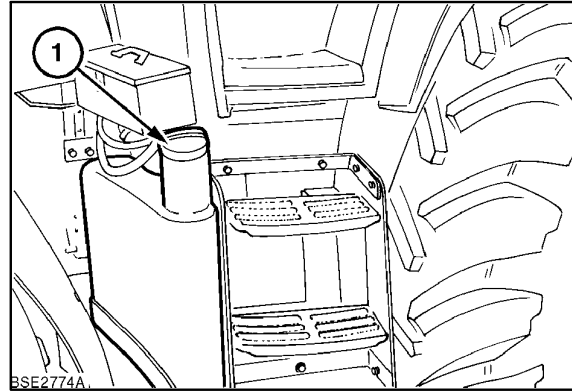
Take the following precautions to ensure that stored fuel is kept free of dirt, water and other contaminants.

- Store fuel in black iron tanks, not galvanized tanks, as the zinc coating will react with the fuel and form compounds that will contaminate the injection pump and injectors.
- Install bulk storage tanks away from direct sunlight and angle them slightly so sediment in the tanks will settle away from the outlet pipe.
- To facilitate moisture and sediment removal, provide a drain plug at the lowest point at the end opposite the outlet pipe.
- If fuel is not filtered from the storage tank, put a funnel with a fine mesh screen in the fuel tank filler neck when refuelling.
- Arrange fuel purchases so summer grade fuels are not held over and used in winter.

SECTION 4 - LUBRICATION AND MAINTENANCE

FILLING THE FUEL TANK

1. Clean the area around the fuel filler cap (1) to prevent dirt from entering tank and contaminating the fuel .
2. Remove the cap and place in a clean area during refuelling. The cap is attached to the fuel tank by a chain to prevent loss.
3. After filling the tank, replace and tighten the fuel cap.



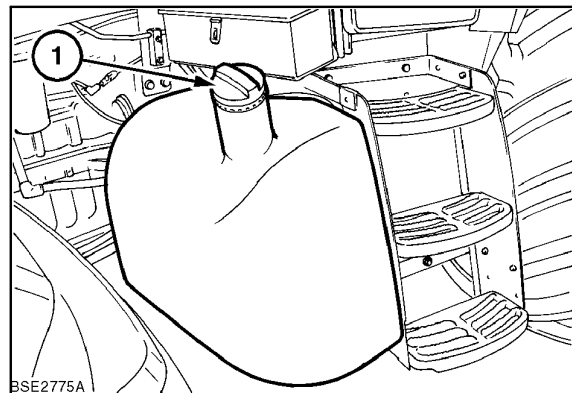
Fuel filler cap

The fuel filler cap on your tractor is of the vented type, should it become lost or damaged always replace it with one of the same type. Consult your authorised dealer.

Fuel Capacity

T6010, T6020	
Standard	180 litres (47.5 U.S. galls)
With SuperSteer	156 litres (41.2 U.S. galls)

T6030 ,T6050, T6070	
Standard	254 litres (67.0 U.S. galls)
With SuperSteer	236 litres (62.3 U.S. galls)



GUARDS

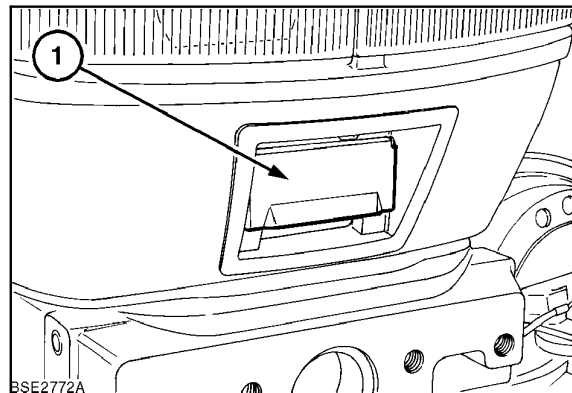
ENGINE HOOD

For safety the hood must be closed and correctly latched before operating the tractor.

Additional guards are provided to prevent the fingers being trapped by the fan/air conditioner drive belt when the hood is lowered to the operating position.

The hood is hinged at the rear to provide easy access to the engine area for routine maintenance. Two gas struts (located under the hood) assist in raising the hood to either of two positions. A safety stay holds the hood in the selected position.

To open the hood, lift the release handle (1), Figure 3. The gas struts will take over and raise the hood to the first position secured by the nylon retaining strap located at the front of the hood. All routine maintenance operations may be performed with the hood raised to this position.

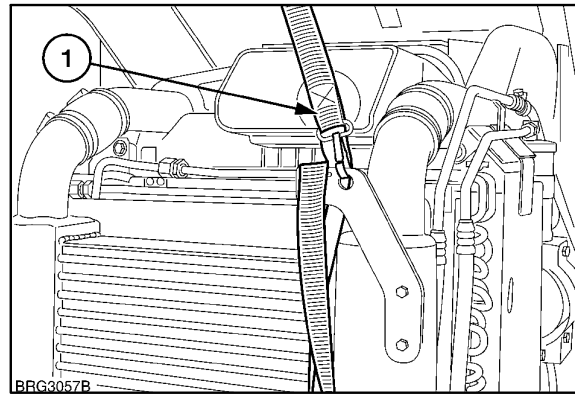


SECTION 4 - LUBRICATION AND MAINTENANCE

Should it become necessary to raise the hood to its full extent, unclip the retaining strap (1) from its anchor bracket and, holding firmly onto the strap, allow the hood to raise fully on the gas struts.

NOTE: Raising the hood to full height is only necessary for service requirements that are best left to your dealer.

To close the hood, pull it fully down ensuring the retaining strap has been re-fitted to the anchor bracket. An audible click will signal engagement of the locking catch. Check that the hood is properly closed.



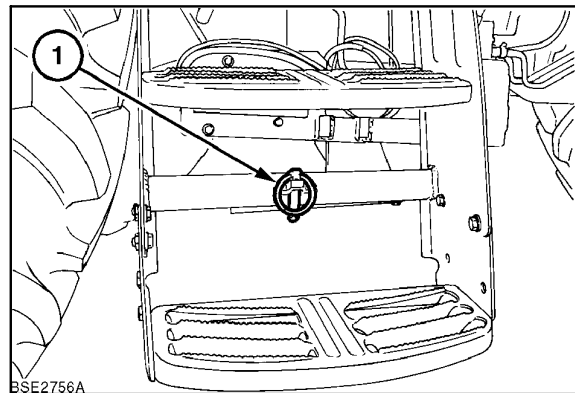
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RIGHT-HAND FOOTSTEPS (Where fitted)

Hinged footsteps may be installed on your tractor.

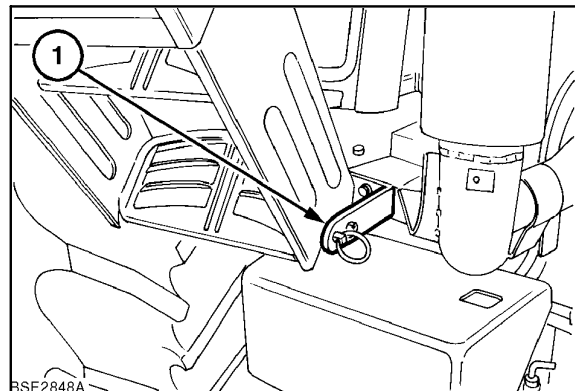
For improved access to the right-hand brake adjuster, hydraulic oil filter(s), battery, etc., the footsteps may be lifted and secured in the raised position.

To raise the steps, remove the securing pin (1).



5

Raise the step (1) and replace the securing pin in the hole provided to retain the step in the horizontal position.

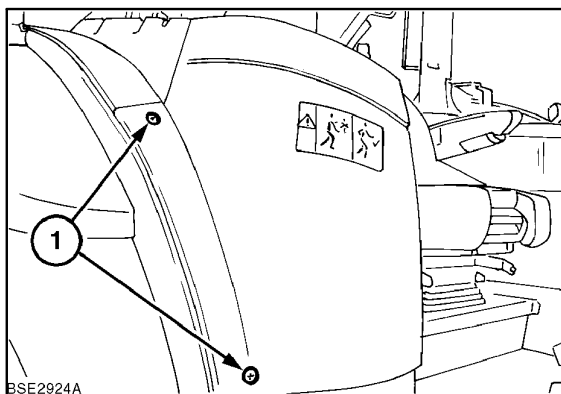


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SECTION 4 - LUBRICATION AND MAINTENANCE

RELAY AND FUSE PANEL COVER

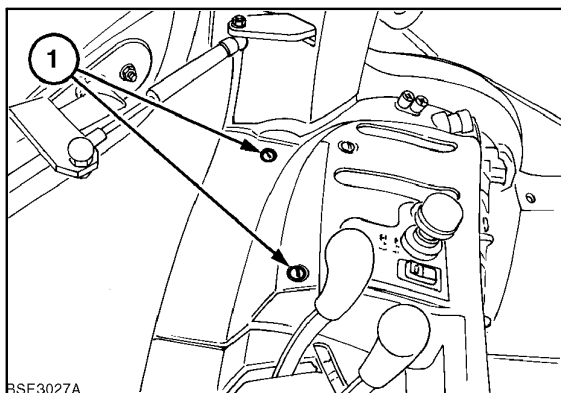
The moulded panel on the right hand side of the cab may be easily removed for service. Remove the four screws (1) and remove the panel to gain access to the relays and connectors.



7

Fuse Box Cover

To gain access to the fuses, undo the two retaining screws (1) from the panel on the right-hand side of the cab.



8

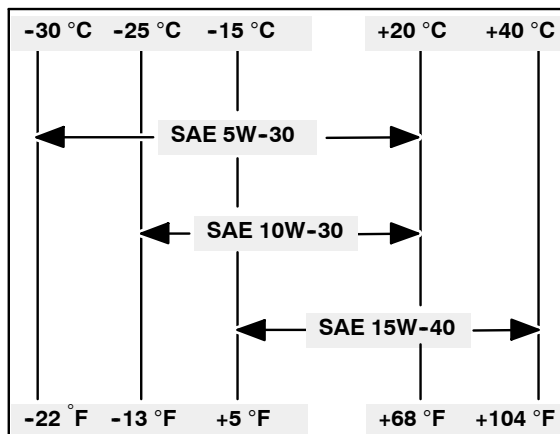
SECTION 4 - LUBRICATION AND MAINTENANCE

LUBRICANTS AND COOLANTS

Lubricants

The correct engine oil viscosity grade is dependent upon ambient temperature. Refer to the chart on the right when selecting oil for your tractor engine.

NOTE: In areas where prolonged periods of extreme temperatures are encountered, local lubricant practices are acceptable; such as the use of SAE 5W30 in extreme low temperatures or SAE 50 in extreme high temperatures.



Sulphur in Fuel

The engine oil and filter change period are shown in section 4. However, locally available fuel may have a high sulphur content, in which case the engine oil and filter change period should be adjusted as follows:-

Sulphur Content %	Oil Change Period
Below 0.5	Normal
From 0.5 – 1.0	Half the normal
Above 1.0	One quarter normal.

NOTE: The use of fuel with a sulphur content above 1.3% is not recommended.

Coolants

To reduce the amount of deposits and corrosion, the water used in the cooling system must comply with the following values.

Total Hardness:	Chloride:	Sulphate:
300 ppm	100 ppm	100 ppm

IMPORTANT: See Operation 30, page 4-43, regarding use of coolant inhibitor where the above mentioned antifreeze is not available. In those hot countries where antifreeze is not available, use **clean** water only.

NOTE: See Operation 30, page 4-43, for further details before topping up or changing the engine coolant.

SECTION 4 - LUBRICATION AND MAINTENANCE

LUBRICANT AND COOLANT SPECIFICATION

RECOMMENDED FLUIDS AND APPLICATIONS	Approximate Quantities	New Holland Specification	International Specification
Engine Oil Ambra Mastergold HSP (15W40) Ambra Mastergold HSP (10W30)	4 Cyl. engines: 10 Litres (10.6 U.S. qts.) 6 Cyl. engines: 15 Litres (15.9 U.S. qts.)	NH 330 H NH 324 H	API CH-4, ACEA E5,
Transmission, Rear Axle and Hydraulic System Oil Ambra Multi G (10W30) -Synchro Command with HD rear axle -Synchro Command with LD rear axle -Dual Command with HD rear axle -Dual Command with LD rear axle -Electro Command with HD rear axle -Electro Command with LD rear axle	65 Litres (17.1 U.S. gal) 58 Litres (15.3 U.S. gal) 65.5 Litres (17.3 U.S. gal) 58.5 Litres (15.4 U.S. gal) 62 Litres (16.3 U.S. gal) 55 Litres (14.5 U.S. gal)	NH 410 B	API GL4, ISO VG 32/46 M2C 134D
Front Wheel Drive Oil Axle - Ambra Multi G (10W30) -All Models Hubs - Ambra Multi G (10W30) -All Models - Per Hub -All Models with Brakes - Per Hub	9.0 Litres (9.5 U.S. qts.) 1.5 Litres (1.3 U.S. qts.) 3.0 Litres (3.2 U.S. qts.)	NH 410 B	API GL4, ISO VG 32/46 M2C 134D
Front P.T.O. Gearbox Oil Ambra Multi G (10W30)	400 ml. (13.5 U.S. oz.)	NH 410B	API GL4, ISO VG 32/46 M2C 134D
Engine Radiator Coolant System Capacity -T6030/T6050/T6070 with cab -T6010/T6020 with cab -T6030/T6050 less cab -T6010/T6020 less cab Water Ambra Agriflu	25 Litres (6.6 U.S. gal.) 23 Litres (6.0 U.S. gal.) 23 Litres (6.0 U.S. gal.) 21 Litres (5.5 U.S. gal.) 50% 50%	NH 900 A	Ethylene Glycol
Air Conditioning Compressor Oil Low Viscosity Oil SP10	As Required	n/a	PAG-E13, ISO100 Viscosity
Brake Oil Ambra LHM Brake	As Required	NH 610 A	ISO 7308
Grease Fittings and Bearings Ambra GR9	As Required	NH 710 A	NLGI2, Li-Ca

SECTION 4 - LUBRICATION AND MAINTENANCE

LUBRICATION AND MAINTENANCE CHART

Service Interval	Operation No.	Maintenance Requirement	Check	Clean	Lube	Change	Adjust	Drain	Wash	Page No.
When warning lamp lights	1	Engine air cleaner outer element	X	X						4-11
	2	Brake fluid level	X				X			4-13
	3	Fuel system water separator	X					X		4-13
Every 10 hours or daily	4	Engine coolant level	X				X			4-14
	5	Engine oil level	X				X			4-15
	6	Windscreen washer reservoir (where fitted)	X				X			4-15
	7	Air reservoir(s) trailer brakes (where fitted)	X					X		4-16
Every 50 hours	8	Radiator, oil cooler and air conditioner condenser	X	X						4-17
	9	Cab air filters	X	X						4-18
	10	All grease fittings			X					4-20
Every 100 hours	11	A/C & Brake Compressor drive belts (where fitted)	X				X			4-26
Every 300 hours	12	Poly V-belt	X				X			4-27
	*13	Battery electrolyte level (tropical climates)	X	X			X			4-27
	14	4WD suspension cylinder upper bearing			X					4-28
	15	Transmission/rear axle/hydraulics oil level	X				X			4-29
	16	Parking brake	X				X			4-30
	17	Front P.T.O. gearbox oil level (where fitted)	X							4-30
Every 600 hours	#18	Engine oil and filter				X				4-31
	19	Hydraulic and transmission oil filters				X				4-33
	20	Air cleaner outer element				X				4-34
	21	Engine air intake connections	X							4-34
	22	Fuel Pre-filter and fuel filter elements	X			X				4-35
	23	Four wheel drive front axle and hubs oil level	X				X			4-37
Every 1200 hours or annually	24	Cab air filters				X				4-38
	25	Transmission/rear axle/hydraulic oil and filter				X				4-39
	26	Four wheel drive axle differential oil				X				4-40
	27	Four wheel drive axle hub oil				X				4-41
	28	Front P.T.O gearbox oil				X				4-41
	29	Battery electrolyte level (temperate climates)	X	X			X			4-42
Every 1200 hours or two years	30	Engine coolant				X				4-43
	31	Engine air cleaner inner element				X				4-47
	32	Check and adjust tappet clearance	X				X			4-48
	33	Air brake drier reservoir				X				4-49
Every 1800 hours	34	Fuel injectors	X	X			X			4-50
Every Three Years	35	Air Conditioner System	X	X		X				4-51
General Maintenance	36	Bleeding the fuel injection system	X				X			4-52
	37	Footbrakes	X				X			4-52
	38	Front and rear wheel nut torque	X				X			4-53
	39	Tyre pressures and condition	X				X			4-53
	40	Engine idle speed	X				X			4-54
	41	Automatic pick-up hitch	X				X			4-55
	42	Remote control valve drain bottle(s)	X							4-56
	43	Headlight and worklamp adjustment	X			X				4-57
	44	Bulb replacement	X			X				4-58
	45	Fuse replacement	X			X				4-62
	46	Cleaning the tractor	X	X						4-72

* Batteries on tractors operating in temperate climates need only be checked every 1200 hours. See Operation 29.

Oil and filter change interval will be reduced if the diesel fuel has a high sulphur content or if the tractor is operated in extremely cold temperatures.

WHEN THE WARNING LAMP LIGHTS**OPERATION 1
SERVICE THE ENGINE AIR
CLEANER OUTER ELEMENT**

Service the outer element when the restriction indicator light on the instrument console illuminates or every 600 hours, whichever comes first. If the indicator lights up, perform the service within one hour of operation.

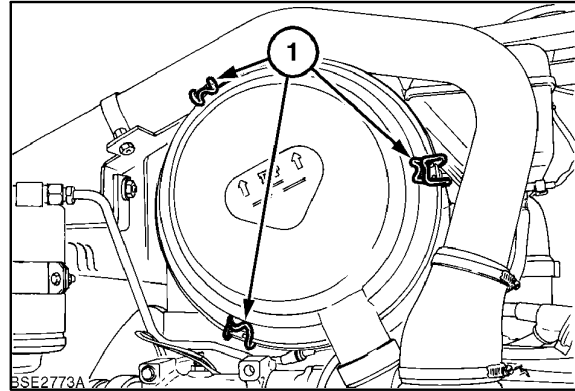
IMPORTANT: Service the outer element only when the restriction indicator light illuminates or at the recommended service intervals. Cleaning the filter too frequently will decrease the service life of the filter.

The dry air cleaner, which is located under the rear, right-hand side of the hood, consists of an inner and outer paper element within a metal casing. See Figure 9.

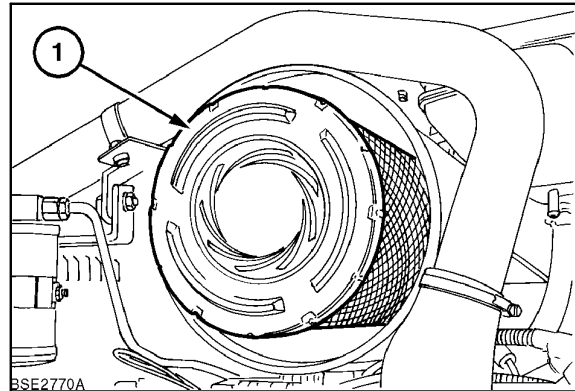
1. Unlatch the three retaining clips (1) Fig. 9, and lift off the air cleaner assembly cover.
2. Remove the outer element (1) Fig. 10 from the air cleaner assembly by gently twisting the end of the filter clockwise to disengage the seal. Then pull the filter straight out of the housing, not at an angle, ensuring the inner element remains in place.

IMPORTANT: Do not disturb or remove the inner element.

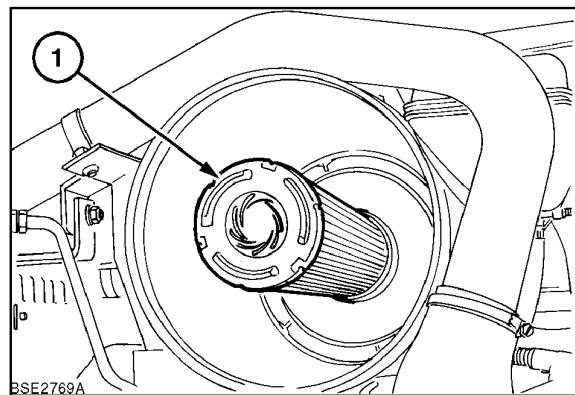
3. Examine the inside of the outer element. If dust is present, the outer element is defective and must be replaced. The inner element should also be replaced at this time.
4. Clean the outer element using either method A or B, depending on the element's condition.



9



10



11

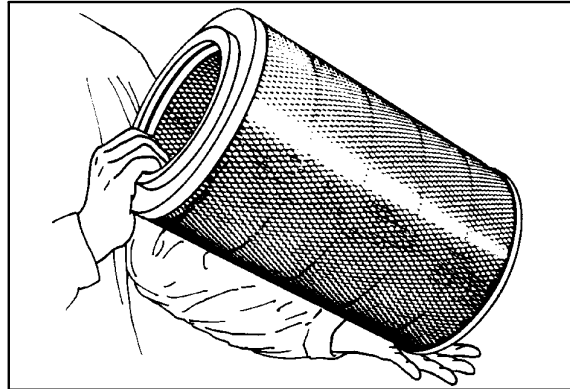
SECTION 4 - LUBRICATION AND MAINTENANCE

Method A

NOTE: An outer element may be dry cleaned (methods A or B) up to 5 times prior to replacement.

Lightly tap the ends of the element against the palm of the hand. See Figure 12.

IMPORTANT: Do not tap the element against a hard surface as this will damage the element.



12

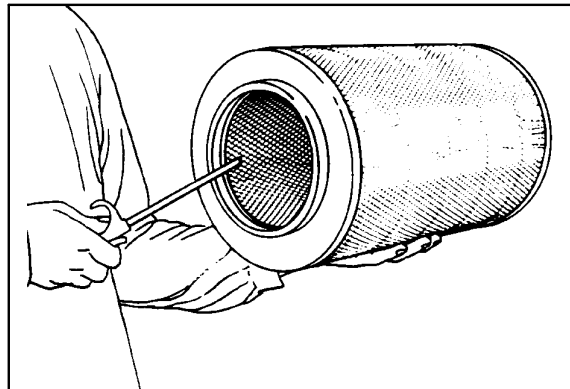
Method B

Use compressed air, not exceeding 2 bar (30 lbf/in²). Insert the air line nozzle inside the element. Hold the nozzle 150 mm (6 in.) from the element and blow the dust from the inside through the element to the outside. See Figure 13.



WARNING

Wear eye protection and a face mask when carrying out this operation.



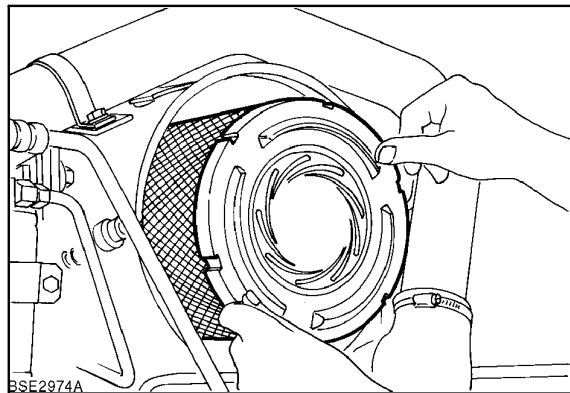
13

Before installing a cleaned or replacement filter check that there is no damage such as cuts, dents or punctures. A dent can make a good seal impossible and a filter with bunched pleats can drain engine power and increase fuel costs.

Clean the inside and outside of the sealing surface of the outlet tube before installing the filter.

Apply a thin film of engine or silicone oil to the sealing surfaces on the inside of the outer element and on the outside of the inner element.

Locate the outer element into the housing and press firmly on the outer rim (not the flexible centre) of the element.



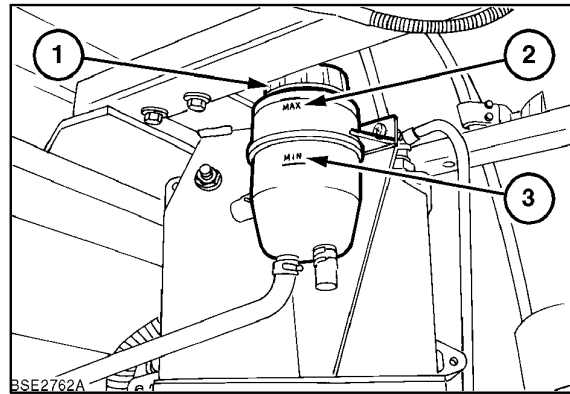
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SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 2 CHECK BRAKE FLUID LEVEL

If the indicator light on the instrument panel signals low brake fluid, check the level in the reservoir.

The reservoir is located under the rear of the hood on the right-hand side and supplies fluid to the rear brakes and front brakes (where fitted). Visually check the level of fluid in the reservoir. It should never be allowed to fall below the 'MIN' line (3) moulded into the bottle. If necessary, remove the filler cap (1) and top up with the correct brake/clutch mineral oil to the 'MAX' line (2). Do not overfill. Tractors with 12 x 12 transmission have a combined brake/clutch reservoir. The reservoir on all other models is for the brakes only.



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IMPORTANT: Take care not to spill brake fluid on the tractor as it may damage the paintwork.



WARNING

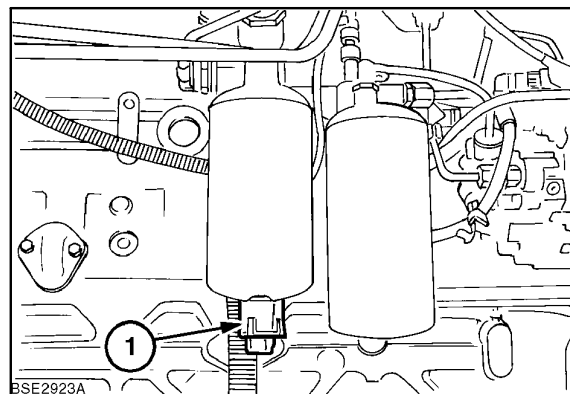
Use only the correct type of brake/clutch mineral oil. Mixing different types of fluid may cause damage to internal hydraulic braking components and result in brake failure. Adhere to the instructions on the brake fluid container. See page 4-9 for correct brake fluid specification.

OPERATION 3 DRAIN FUEL SYSTEM WATER SEPARATOR

IMPORTANT: Before loosening or disconnecting any part of the fuel injection system, thoroughly clean the area to be worked on to prevent contamination.

If the indicator light on the instrument panel signals the presence of water in the fuel sediment, immediately drain the fuel filter and sediment assembly as follows:

1. Remove the sensor wire from the drain plug
2. Open the drain plug on the sedimenter by loosening the knob.
3. Allow contaminated fuel to drain until only clean fuel runs out. Catch the fuel in a suitable container and dispose of properly. Close the drain plug and replace the sensor wire.



16

SECTION 4 - LUBRICATION AND MAINTENANCE

**EVERY 10 HOURS OR DAILY
(whichever comes first)****OPERATION 4
CHECK ENGINE COOLANT LEVEL**

Check the coolant level in the recovery tank when the engine is cold. The coolant level should be above the bottom line on the recovery tank. If coolant is required, remove the pressure cap and add a 50/50 water and antifreeze mixture as specified on page 4-9 of this manual.

**WARNING**

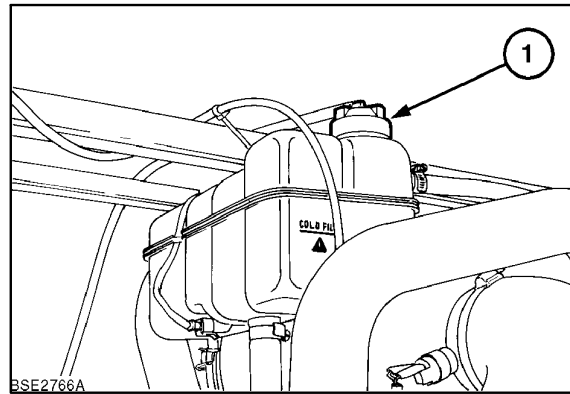
The cooling system operates under pressure which is controlled by the radiator pressure cap (1) Figure 17. The radiator pressure cap should **not** be used for top up purposes. It is dangerous to remove the radiator pressure or filler caps while the system is hot. When cool, use a thick cloth and turn the radiator pressure cap slowly to the first stop and allow any pressure to escape. Coolant should be kept off the skin. Adhere to the precautions outlined on the anti-freeze and inhibitor containers.

**CAUTION**

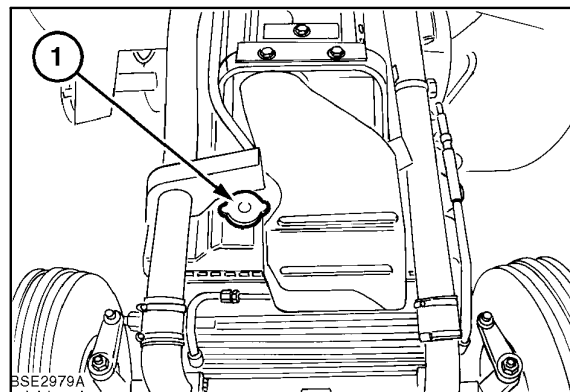
Coolant should be kept off the skin. Adhere to the precautions outlined on the coolant filter and antifreeze container.

NOTE: If no coolant is visible in the recovery tank, the coolant level must be checked in the radiator. Check the system for leaks and repair as required.

Remove the radiator filler cap when the system is cold. Add coolant as required to bring the level to just below the top of the filler neck. Install the cap and add coolant to the recovery tank as described above.



17



18

SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 5 CHECK ENGINE OIL LEVEL

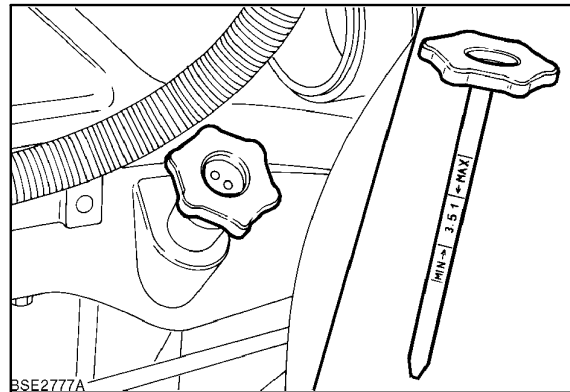
Check the oil level when the tractor is parked on a level surface and after the engine has been stopped for a minimum of five minutes.

1. Remove the dipstick, wipe clean and re-insert fully.
2. Pull the dipstick out again and check the oil level. The oil level should fall between the 'MIN' and 'MAX' indicators on the dipstick.
3. If more oil is required remove the dipstick and add fresh oil until the level is between the 'MIN' and 'MAX' indicators on the dipstick. The quantity of oil represented between the two indicators is 3.5 litres (3.7 U.S.qts).

NOTE: Do not fill above the 'MAX' indicator on the dipstick. Excess oil will burn off, creating smoke and give a false impression of oil consumption. Do not operate the engine with the oil level below the MIN indicator.

4. Re-install the dipstick cap.

See page 4-9 for the correct oil specification and viscosity.

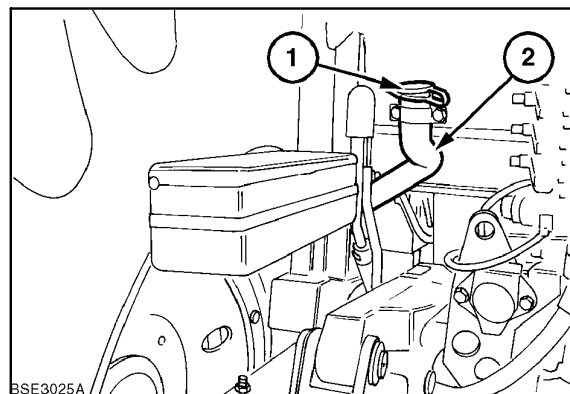


19

OPERATION 6 CHECK WINDSCREEN WASHER RESERVOIR

The reservoir for the windscreen washers is located beneath the rear of the cab on the left-hand side. The same reservoir is utilised for both front and rear windscreen washers.

Lift off the cap (1) and fill with washer solvent solution up to the bend (2) in the filler neck. In cold weather, use a solvent with anti-freeze properties.



20

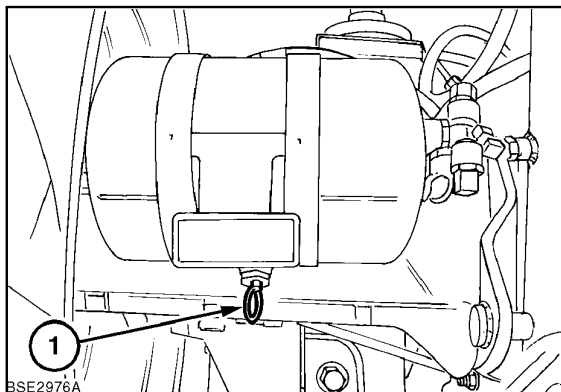
**OPERATION 7
DRAIN THE AIR RESERVOIR(S)
(AIR OPERATED TRAILER BRAKES
(where fitted))**

Every 10 hours or daily , whichever comes first, drain the air reservoir(s).

Firmly apply the tractor handbrake, block all wheels and switch off the engine.

All pneumatic trailer braking systems have an air reservoir located beneath the left hand end of the rear axle.

There is a plunger on the base of each reservoir. To drain a reservoir , move the plunger (1) laterally, in any direction, and allow air to escape. The reservoirs will recharge with air when the tractor is restarted.



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SECTION 4 - LUBRICATION AND MAINTENANCE

EVERY 50 HOURS carry out the preceding checks plus the following:

OPERATION 8 CLEAN THE RADIATOR, OIL COOLER AND AIR CONDITIONER CONDENSER CORES

Check the cores for chaff accumulation or blockage. If any is noted, clean as follows:

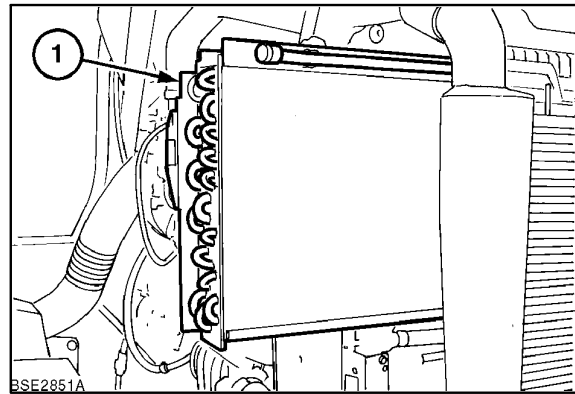


CAUTION

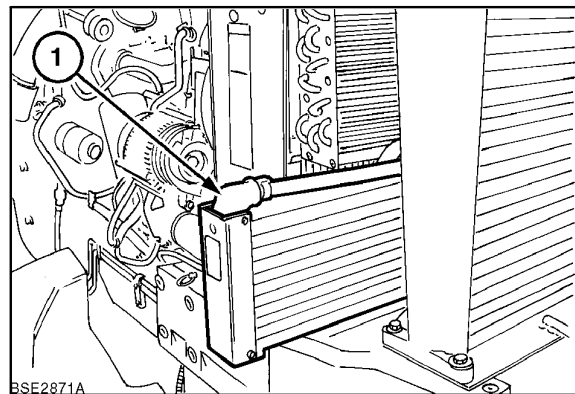
Wear eye protection and protective clothing during the cleaning process. Clear the area of bystanders so they are not struck by flying particles.

1. For cleaning, use compressed air or a pressure washer not exceeding 7 bar (100 lbf/in²).
2. The air conditioner condensor (1) Figure 22 and the driveline oil cooler figure 22, located in front of the engine radiator, have a slide out facility for ease of service. Turn the two quick-release fasteners (3) anti-clockwise to release.
3. Slide the oil cooler and the air conditioner condensor (where fitted) out (to the right) to gain access to the engine coolant radiator (1) Figure 23
4. Direct the air or water through each core from the back to the front. Clean the radiator first, then the air conditioner condenser and, finally, the driveline oil cooler. Carefully straighten any bent fins.

NOTE: If the cores are blocked with any oily substances, apply a detergent solution and remove it with a pressure washer.



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SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 9 CLEAN THE CAB AIR FILTERS

Air drawn into the cab by the blower fan passes through three filters, two externally mounted, and one recirculation filter located inside the cab.

Before servicing the filters, switch off the blower and close the roof hatch, all windows and one door. Forcibly close the other door. The resulting back pressure will dislodge most of the loose dirt from the underside of the external filters.

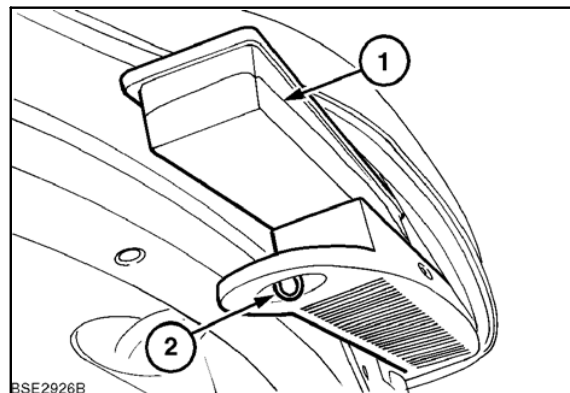
NOTE: In humid conditions, do **not** switch on the blower prior to servicing the filter. Damp particles drawn into the filter may be difficult to remove without washing.

External Filters

NOTE: The filters are made of specially treated media with a rubber sealing strip bonded to the upper surface. Take care not to damage the element during removal.

Filter Removal - Deluxe Cab

The filters are located each side of the cab. To remove the external filter, unscrew the securing clip (2), from the front end of the filter cover. Remove the cover and extract the filter element (1).

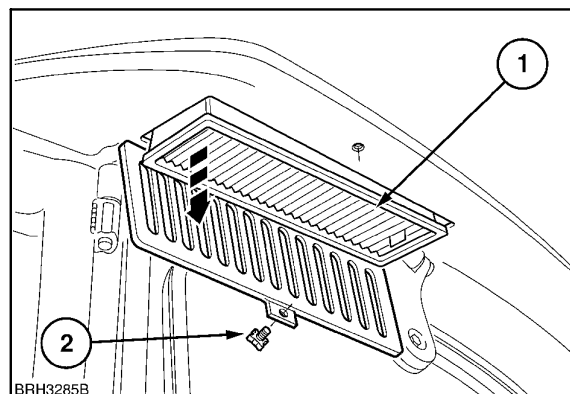


24

Filter Removal - Low Profile Cab

The two filters are located at the rear of the cab. Unscrew the securing clip (2), and lower the filter cover. Carefully remove the filter from the housing taking care not to damage the element.

Clean the elements by blowing with compressed air not exceeding 30 lbf. in² (2 bar). Blow the dust from the **upper** surface through the element to the underside. Hold the nozzle at least 12 in. (300 mm) from the element to prevent damage to the filter media.



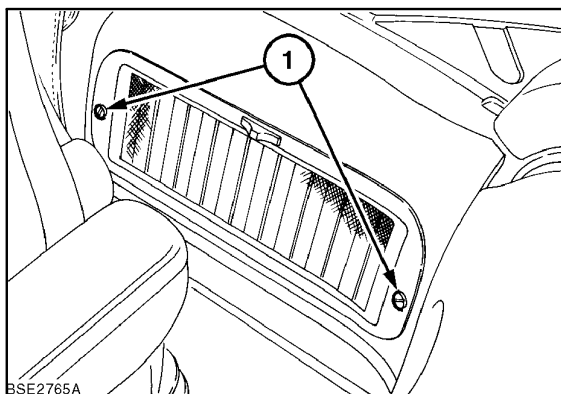
25

Clean all filter chambers with a damp, lint-free cloth. Re-install the filter elements with the clean side uppermost and re-install the covers.

SECTION 4 - LUBRICATION AND MAINTENANCE

Internal Filter

To remove an internal filter, loosen the retaining screws (1) anti clockwise and remove the filter cover.

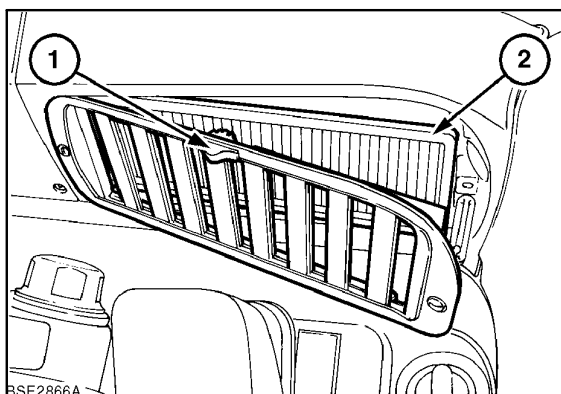


26

Remove the cover (1) and extract the filter from the housing.

NOTE: The filter (2) is made of specially treated media with a rubber sealing strip bonded to the upper surface. Take care not to damage the element during removal.

Clean the elements by blowing with compressed air not exceeding 30 lbf. in² (2 bar). Blow the dust from the **clean** surface through the element to the dirty side. Hold the nozzle at least 12 in. (300 mm) from the element to prevent damage to the filter media.



27

SECTION 4 - LUBRICATION AND MAINTENANCE

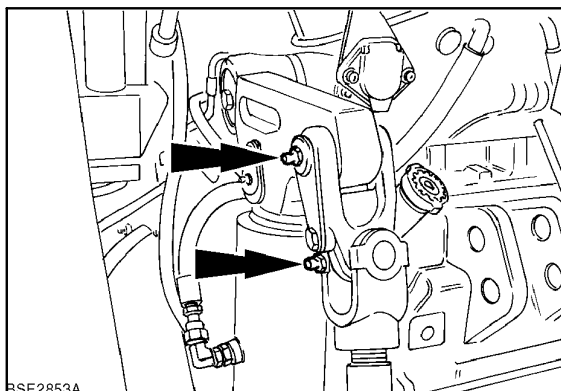
OPERATION 10 ALL GREASE FITTINGS

Oil all pivots and apply a grease gun to the lubrication fittings as shown in figures 28 to 49 inclusive.

See page 4-9 for correct grease specification.

Right and Left hand Lift Rod (with turnbuckle adjustment).

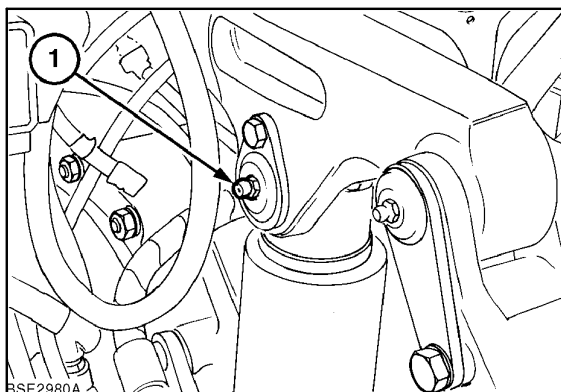
Apply a grease gun to the lubrication fittings as shown.



28

External Lift Cylinder (Where Fitted)

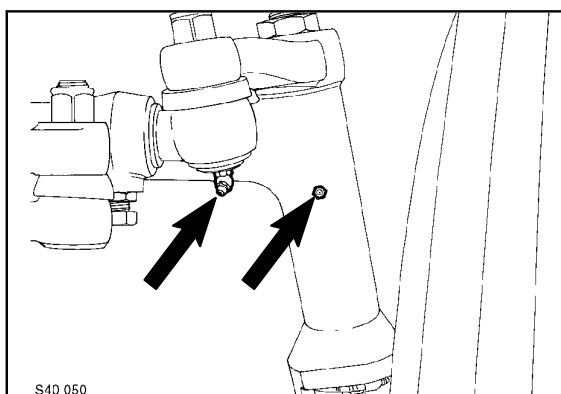
Apply a grease gun to the lubrication fittings as shown.



29

2WD Front Wheel Spindles and right hand steering arm

Apply a grease gun to the lubrication fittings as shown.

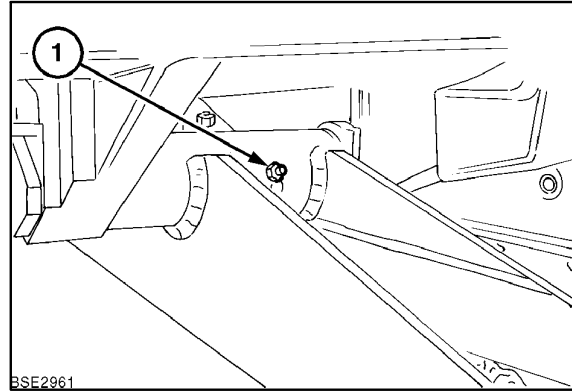


30

SECTION 4 - LUBRICATION AND MAINTENANCE

2WD Front Trunnion Pin

Apply a grease gun to the lubrication fittings as shown.



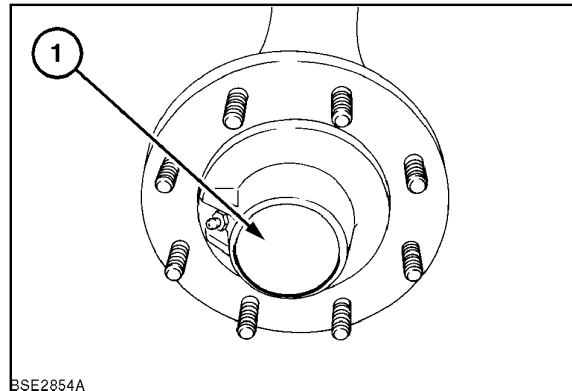
31

2WD Front Hubs

Remove the centre cap (1) , and pack the cap with fresh grease and re-install.

Repeat on opposite wheel.

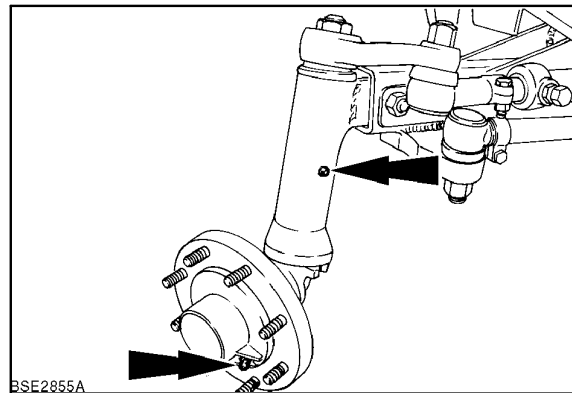
NOTE: Grease the hubs of both front wheels daily when operating in adverse conditions.



32

2WD Axle , Outer Steering Components and Front Hubs

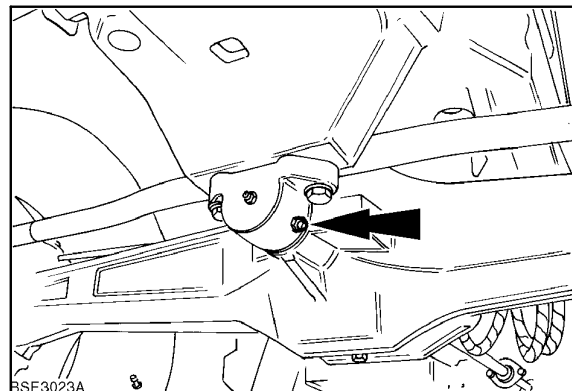
Apply a grease gun to the lubrication fittings as shown. (Wheel removed for clarity).



33

Front Trunnion Pin (Standard 4WD axle)

Apply a grease gun to the lubrication fittings as shown.

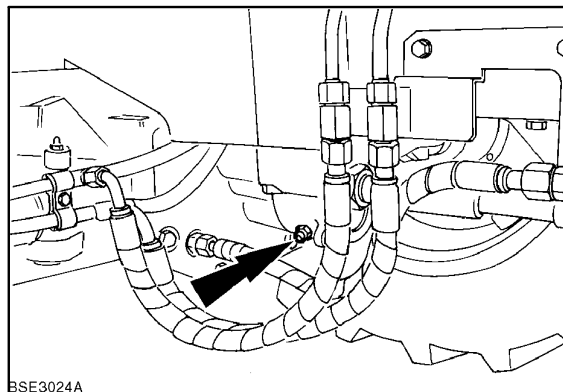


34

SECTION 4 - LUBRICATION AND MAINTENANCE

Rear Trunnion Pin (Standard 4WD axle)

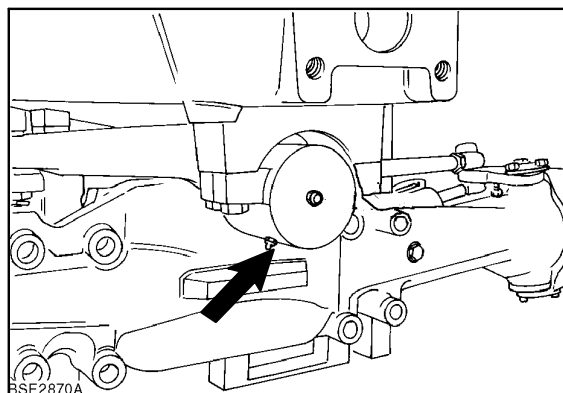
Apply a grease gun to the lubrication fittings as shown.



35

Front Trunnion Pin (Supersteer 4WD axle)

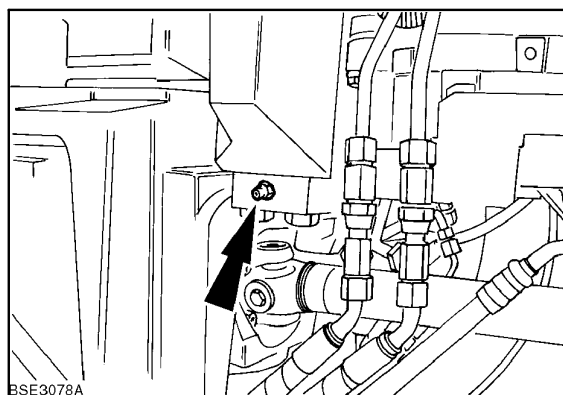
Apply a grease gun to the lubrication fittings as shown.



36

Rear Trunnion Pin (Supersteer 4WD axle)

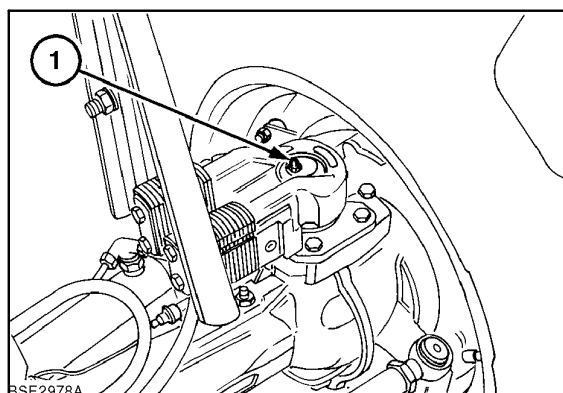
Apply a grease gun to the lubrication fittings as shown.



37

Dynamic Front Fenders (where fitted)

Apply a grease gun to the lubrication fittings as shown.

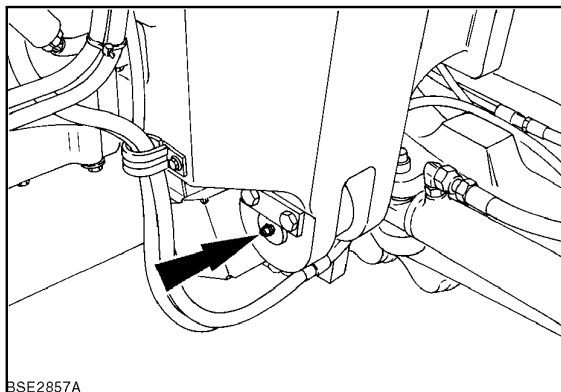


38

SECTION 4 - LUBRICATION AND MAINTENANCE

Panhard Rod Pivot (Suspended 4WD axle)

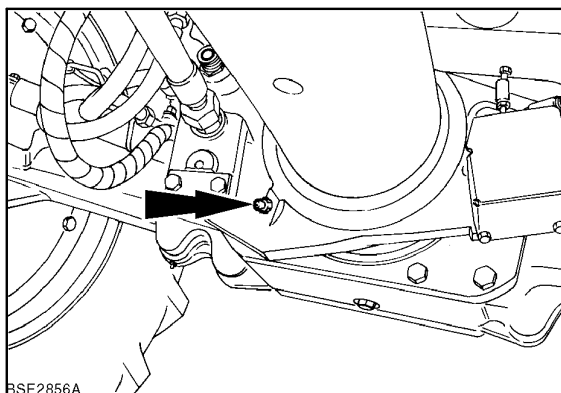
Apply a grease gun to the lubrication fittings as shown.



39

Suspension Arm (Suspended 4WD axle)

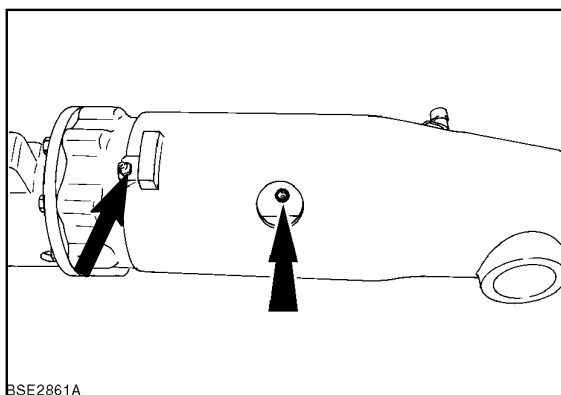
Apply a grease gun to the lubrication fittings as shown.



40

Driveshaft Universal Joint (Suspended and Supersteer axles)

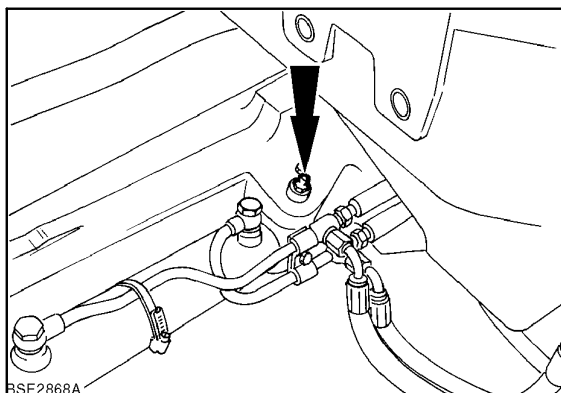
Apply a grease gun to the lubrication fittings as shown.



41

Steering Cylinders (all 4WD axles)

Apply a grease gun to the lubrication fittings as shown.

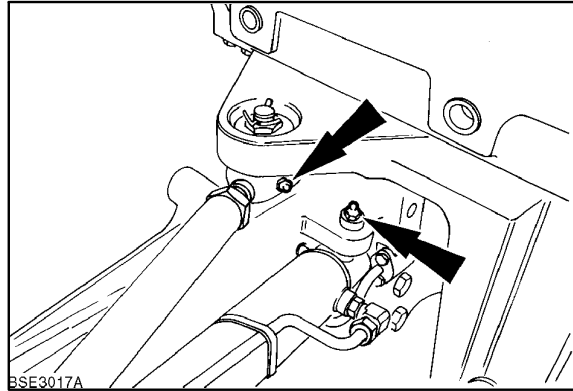


42

SECTION 4 - LUBRICATION AND MAINTENANCE

Steering Cylinders and Track Rods (Supersteer 4WD axle)

Apply a grease gun to the lubrication fittings as shown.

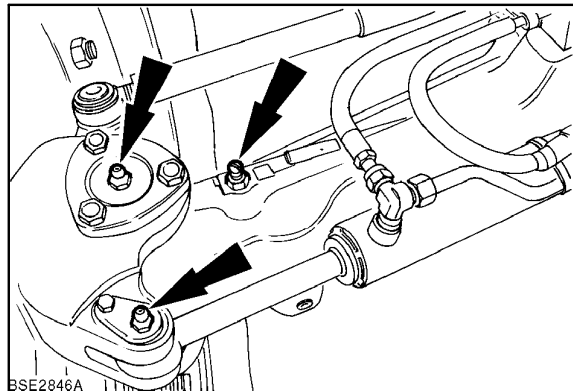


43

Upper Swivel Bearings, Axle Housing and Steering Cylinder end (all 4WD axles)

Apply a grease gun to the lubrication fitting as shown.

NOTE: The left hand swivel bearing is shown. There is a similar grease fitting on the right-hand swivel bearing.

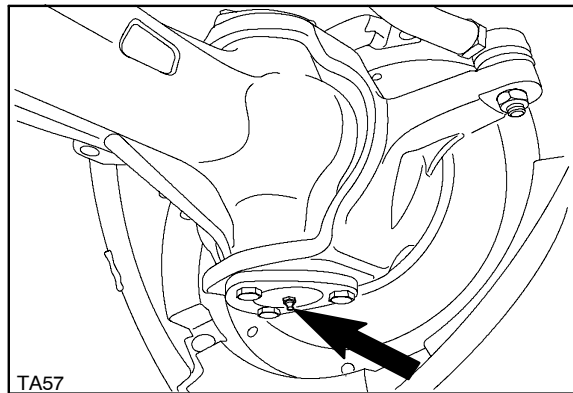


44

Lower Swivel Bearings (all 4WD axles)

Apply a grease gun to the lubrication fitting as shown.

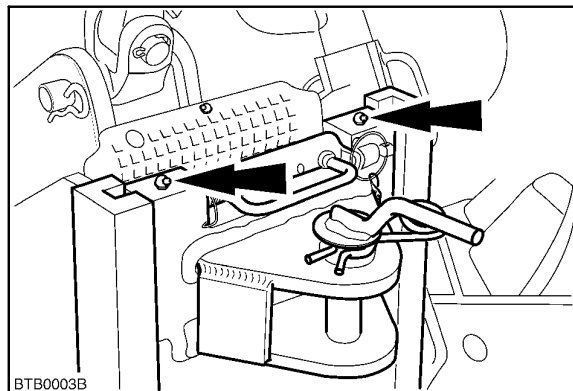
NOTE: The left hand swivel bearing is shown. There is a similar grease fitting on the right-hand swivel bearing.



45

Rear Tow Hitch (with slider frame)

Apply a grease gun to the lubrication fitting as shown.

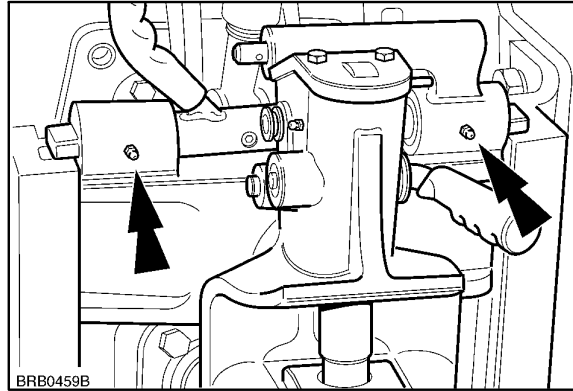


46

SECTION 4 - LUBRICATION AND MAINTENANCE

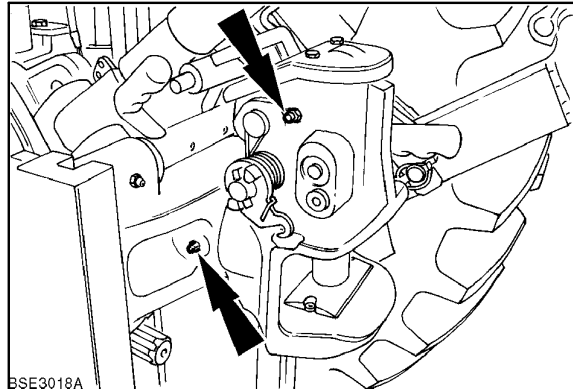
Rear Tow Hitch (auto engagement type)

Apply a grease gun to the lubrication fittings as shown.



47

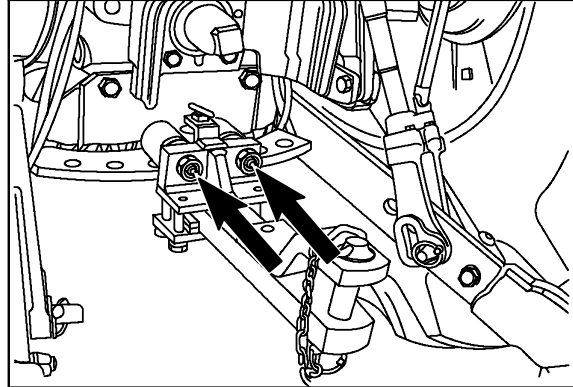
Apply a grease gun to the lubrication fittings as shown.



48

Heavy Duty Roller Drawbar

Apply a grease gun to the lubrication fitting as shown.

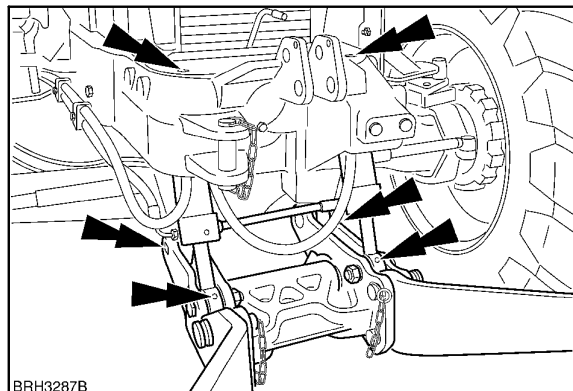


49

Front Hitch

Apply a grease gun to the lubrication fittings as shown. To gain access to the fittings on top of the lift cylinder, the engine hood must be raised and the two rubber covers removed.

To avoid a build up of dust or debris around the lubrication points, the rubber covers must be replaced after greasing.

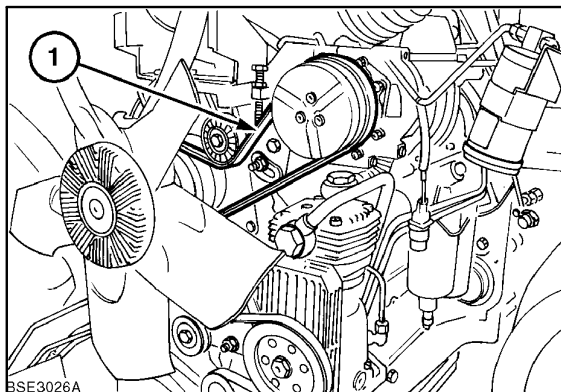


50

EVERY 100 HOURS carry out the following checks :

**OPERATION 11
AIRCONDITIONING COMPRESSOR
DRIVE BELT**

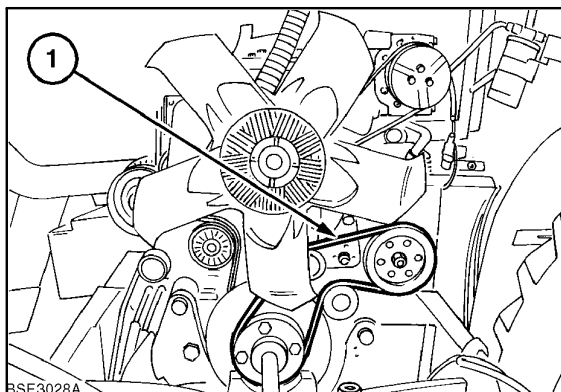
Inspect the belt over it's entire length, checking for chafing, cracking, cuts and general wear. If in doubt, install a new belt.



51

**COMPRESSOR DRIVE BELT TENSION
(Air operated trailer brakes - where fitted)**

Inspect the belt over it's entire length, checking for chafing, cracking, cuts and general wear. If in doubt, install a new belt.



52

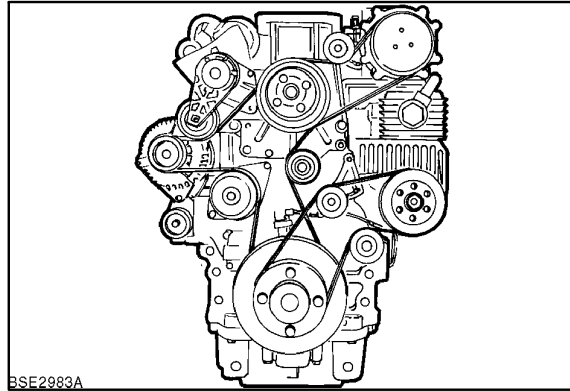
SECTION 4 - LUBRICATION AND MAINTENANCE

EVERY 300 HOURS carry out the preceding checks plus the following:

OPERATION 12 INSPECT POLY V-BELT

Inspect the belt over its entire length, checking for chafing, cracking, cuts and general wear. If in doubt, install a new belt.

Ensure that the belt is correctly located on the pulleys and check that the belt tensioner is operating correctly.

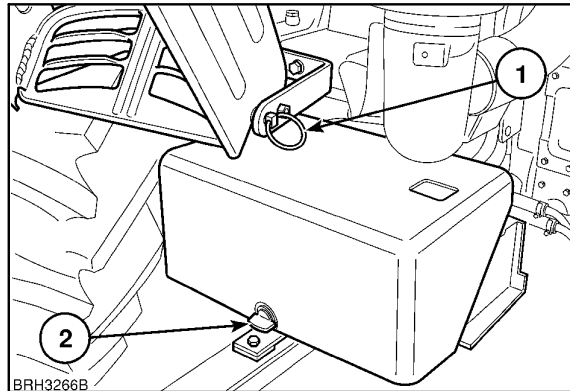


53

OPERATION 13 BATTERY

IMPORTANT: This operation applies to the battery on tractors operating in tropical climates. Tractors operating in temperate climates should have the battery electrolyte level checked every 1200 hours or 12 months.

To gain access to the battery, raise the right hand step as shown earlier in this section, using the securing pin (1) Figure 54 to retain the step in an upright position.



54

Remove the battery cover by rotating the cover retaining screw (2), 90 degrees anti-clockwise.

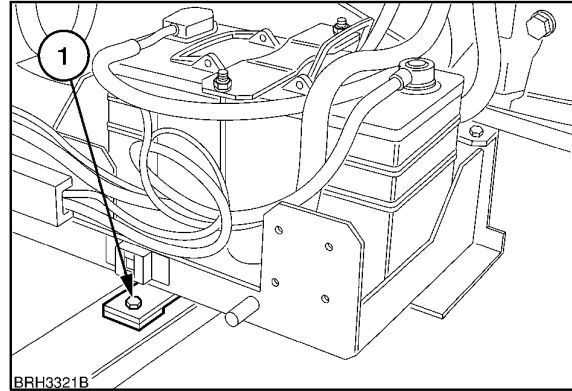
SECTION 4 - LUBRICATION AND MAINTENANCE

Remove the securing bolt and nut (1), and swing the battery tray towards the front of the tractor.

Unscrew and remove the six vent plugs from the top of the battery (tractors with heavy duty battery only).

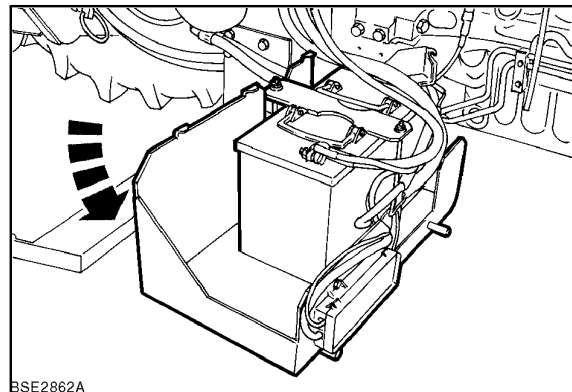
Check that the electrolyte level is above the top of the separator plates in each cell.

If necessary, on tractors with heavy duty batteries, top up with distilled or de-mineralised water until the level is correct. Do not overfill. Never use tap water or water from a rain barrel or other source.



55

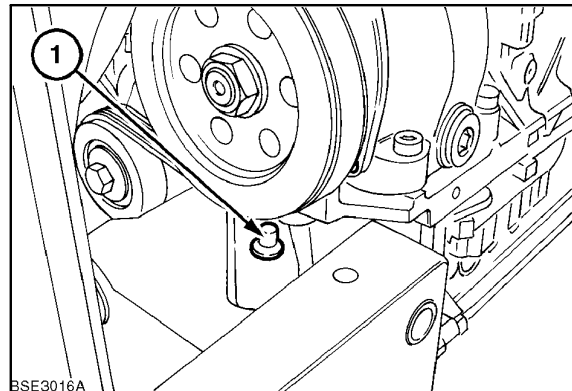
IMPORTANT: In the event of the battery being severely discharged, such that the terminal voltage is below 7 volts, recovery will require a special charging procedure. See your authorised dealer.



56

OPERATION 14 4WD SUSPENSION CYLINDER UPPER BEARING

Apply a grease gun to the lubrication fitting as shown.



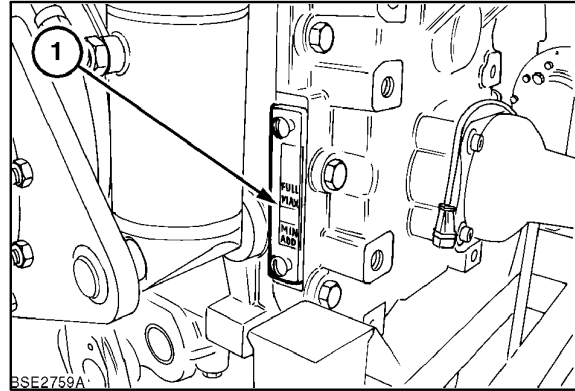
57

SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 15 CHECK TRANSMISSION/REAR AXLE AND HYDRAULIC OIL LEVEL

Check the oil level with the tractor parked on a level surface, with all cylinders extended and the engine shut off for at least five minutes.

Check the oil level in the sight glass on the left hand side of the rear axle housing. Ensure that the oil level is between the high and low marks, in the sight glass.

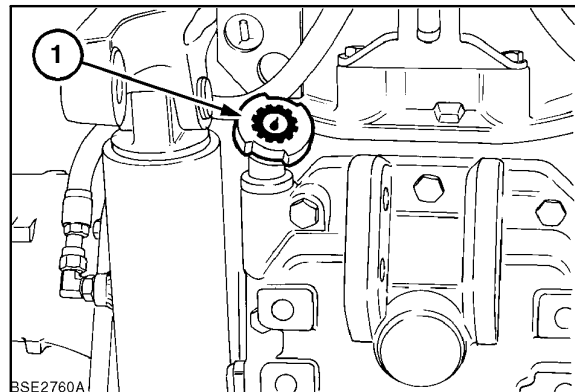


58

If necessary, remove the filler cap and add oil, as required.

See page 4-9 for the correct oil specification.

IMPORTANT: Park the tractor on level ground and, where applicable, extend all cylinders before checking oil levels. With some front/rear wheel combinations, it may be necessary to raise the front or rear of the tractor to ensure it is level before checking the oil.



59

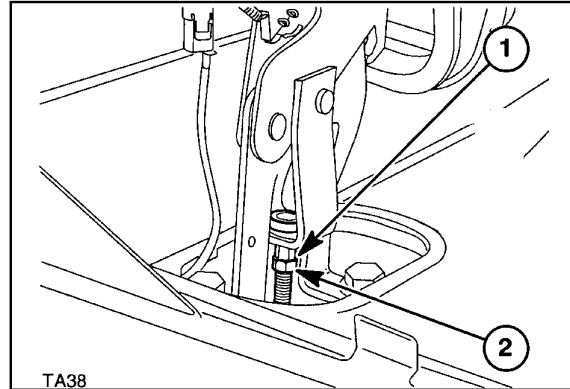
SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 16 ADJUST PARKING BRAKE

Block the front wheels, jack up the rear of the tractor and support the rear wheels just clear of the ground. Unlatch the brake pedals.

Apply the handbrake so that the 4th. notch of the ratchet is engaged. Remove or ease back the rubber boot, loosen the locknuts and turn the adjuster nuts on the operating cables until both wheels start to lock. Release the handbrake and ensure that both wheels are free to rotate. Apply the handbrake to ensure that the system operates freely. Tighten the locknuts.

Road test, using the handbrake to stop the tractor. The tractor should stop in a straight line if the cables have been correctly adjusted.

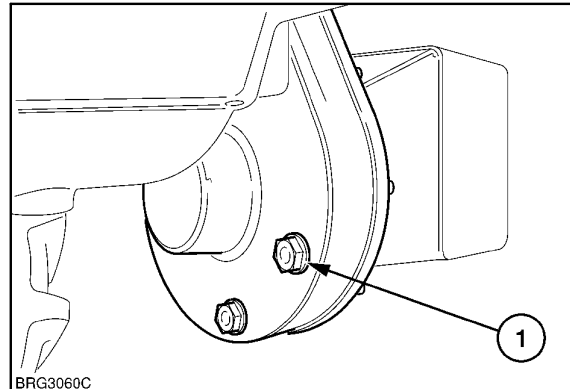


60

OPERATION 17 CHECK FRONT P.T.O. GEARBOX OIL LEVEL

Remove the combined level/filler plug (1) and ensure that the oil reaches the bottom of the opening. If necessary, top up through the opening with clean oil and replace the plug.

See page 4-9 for the correct oil specification.



61

EVERY 600 HOURS carry out the precedeing checks plus the following:

**OPERATION 18
ENGINE OIL AND FILTER**

IMPORTANT: Operation 18 depicts the normal 600 hour engine oil and filter change period. However, the oil change period may be affected by other factors:

Cold Temperature Operation

Engines operating in temperatures below - 12 ° C (10 ° F) or in arduous conditions should have the oil changed every 300 hours of operation. (The oil filter need only be changed at the normal 600 hour service interval).

Tractor Usage

In the event your tractor accumulates less than 600 working hours annually, it is recommended the engine oil and filter be changed every 12 months.

Diesel Fuel Sulphur Content

In some countries, locally available diesel may have a high sulphur content, in which case the oil and filter change period should be adjusted, as follows:

- Sulphur content between 0.5 and 1.0%
- change engine oil every 300 hours.
- Sulphur content between 1.0 and 1.3%
- change engine oil every 150 hours.

If in doubt, follow the engine oil and filter change recommendations on the decal affixed to the underside of the hood.



WARNING



Be very careful to avoid contact with hot engine oil. If the engine oil is extremely hot, allow it to cool to a moerately warm temperature before proceeding.

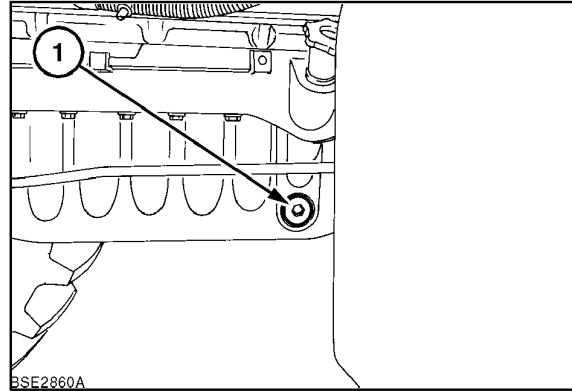
Oil Capacity (including filter):

4 cylinder engines	10 litres (10.6 U.S qts.)
6 cylinder engines	15 litres (15.9 U.S qts.)

SECTION 4 - LUBRICATION AND MAINTENANCE

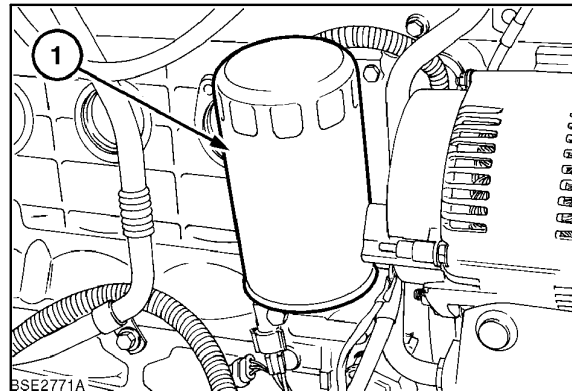
To change the oil and filter:

1. Warm the engine to operating temperature. Stop the engine, remove the engine oil drain plugs (1) which are located at the rear of the sump on either side of the engine. Catch the oil in a suitable container and dispose properly.
2. Replace the drain plugs after the oil has drained.



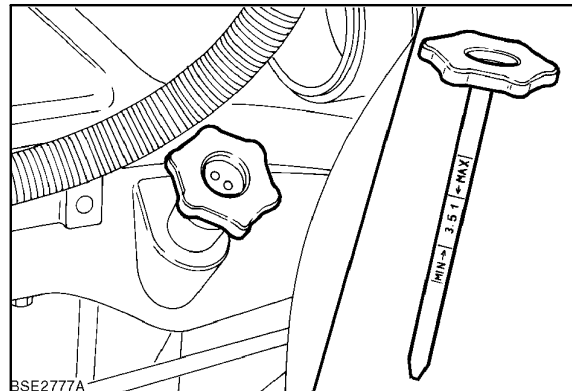
62

3. Clean the oil filter area. Unscrew the oil filter (1) and discard. Catch any residual oil and dispose of properly.
4. Clean the new filter mounting surface and apply a thin coat of oil on the new filter sealing ring and install the filter. Turn until the sealing ring contacts the mounting surface, then tighten an additional $\frac{3}{4}$ to 1 full turn. Do **not** overtighten..
5. Remove Dipstick/Filler cap, Figure 64, and fill with the correct amount of fresh oil as indicated below. Ensure the oil is of the correct grade and viscosity.



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6. Start the engine and run for 3 minutes at idle speed then stop the engine.
7. Check the drain plugs and oil filter areas for leaks.
8. Wait 5 minutes to allow the oil to drain into the crankcase, then check the oil level on the dipstick. The oil level should fall between the 'MIN' and 'MAX' on the dipstick. Add more oil as required.



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NOTE: Do not fill above the 'MAX' indicator on the dipstick. Excess oil will burn off, creating smoke and give a false impression of oil consumption. Do not operate the engine with the oil level below the lower notch.

9. Re-install the dipstick/filler cap.

See page 4-9 for the correct oil specification.

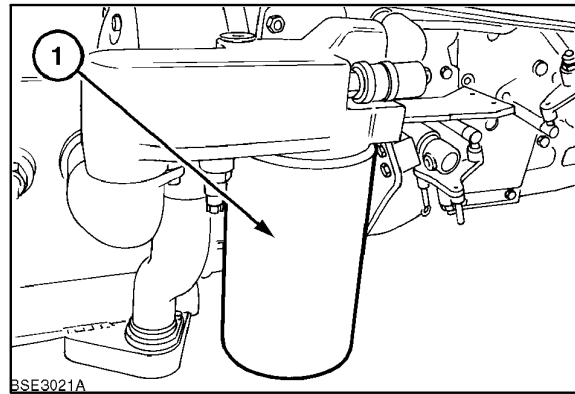
SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 19 CHANGE HYDRAULIC AND TRANSMISSION OIL FILTERS

The type of filter is dependant upon tractor specification. All the filters are located under the right-hand side of the floor.

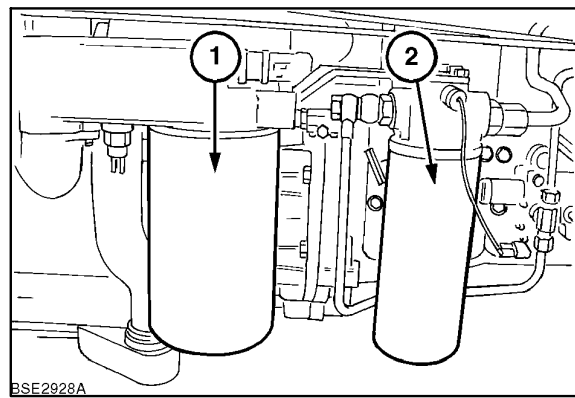
Clean the area around the hydraulic oil filters, then unscrew and discard the filters.

Figure 65 shows the main hydraulic filter (1) for tractors fitted with 12 x 12 Transmission with mechanical draft control.



65

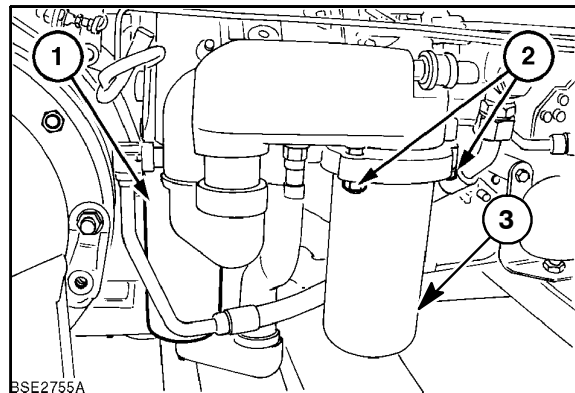
Figure 66 shows the main hydraulic filter for tractors with fixed displacement hydraulic pump. this type of pump is only fitted to tractors with 24 x 24 with mechanical draft control.



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The main filter (3) and the charge filter (1) Figure 67 are only installed on tractors with variable displacement hydraulic pump.

1. Charge Filter
2. Main Filter Retaining Nuts
3. Main Intake Filter



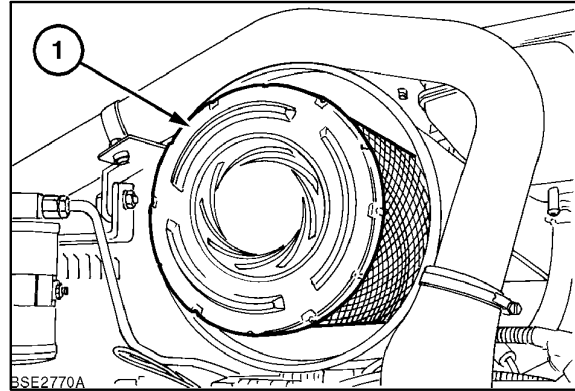
67

SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 20 CHANGE THE ENGINE AIR CLEANER OUTER ELEMENT

Remove the outer element as described in Operation 1 and discard it.

Clean the inside of the air cleaner housing using a damp lint-free cloth on a probe, taking care not to damage the inner element. Install a new outer element.

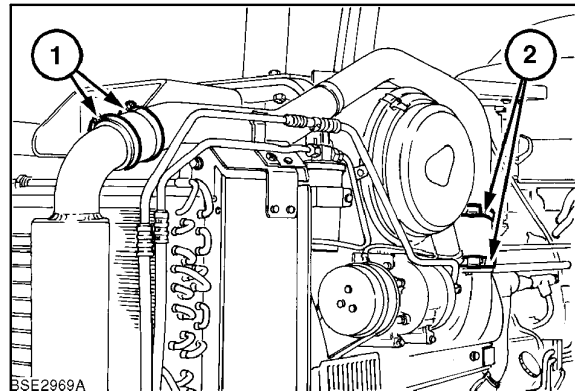


68

OPERATION 21 CHECK ENGINE AIR INTAKE CONNECTIONS

Working from both sides of the engine, check all intake system connection clamps for tightness.

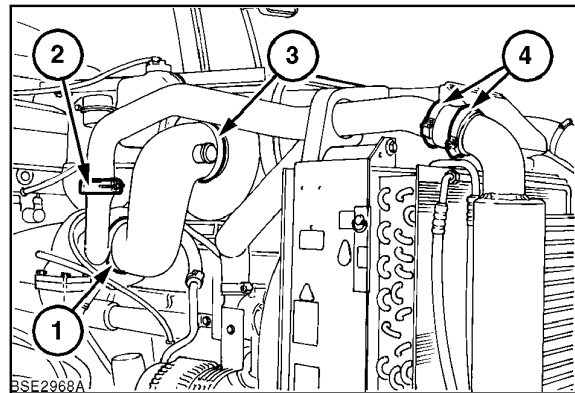
From the left-hand side of the engine, check the air cleaner intake connections at points (1) and (2) and the turbocharger to intercooler connections at points (2) and (4). Do not overtighten.



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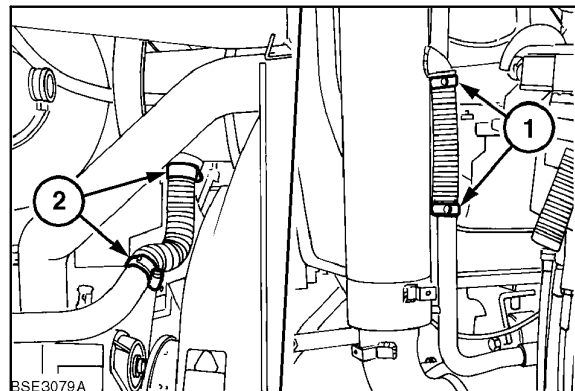
From the right-hand side of the engine, check the intercooler to inlet manifold connections at points (1) and (2). Do not overtighten.

It is essential that the clean air side of the filtration system is sealing correctly at the connections (1) and (3).



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From the right-hand side of the engine, check the exhaust aspirator connections at points (1) and (2) for proper sealing and the clamps for tightness.



71

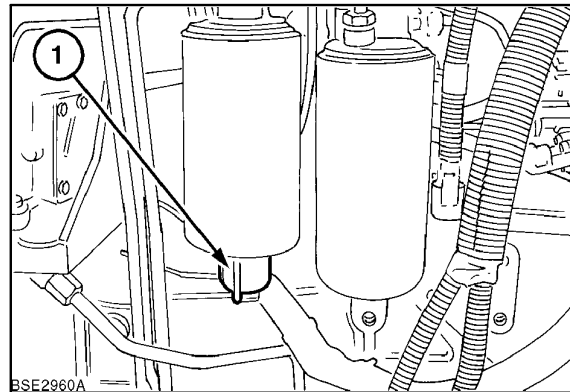
OPERATION 22 CHANGE FUEL PRE-FILTER AND FUEL FILTER ELEMENTS

FUEL PRE-FILTER

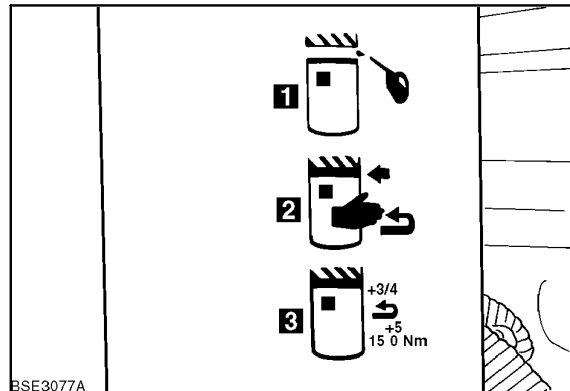
IMPORTANT: Before loosening or disconnecting any part of the fuel injection system, thoroughly clean the area to be worked on to prevent contamination.

1. Remove the drain plug (1) at the base of the filter.
2. To allow full rotation of the drain plug, remove the sensor wire.
3. Open the drain plug on the sedimenter/filter by loosening the knob. Allow the fuel to drain out. Catch the fuel in a suitable container and dispose of properly.
4. Unscrew and remove the filter from the filter head and dispose of properly.
5. Install a new filter to the head assembly.
6. Before installing the new filter lightly coat the filter gasket with oil.
7. Rotate the filter until the filter gasket is touching the filter head. Then give the filter a further $\frac{3}{4}$ turn to tighten to correct torque (15Nm). Do not overtighten.
8. Remove and replace the fuel filter in the same manner.

Procede to bleed the fuel system as follows:



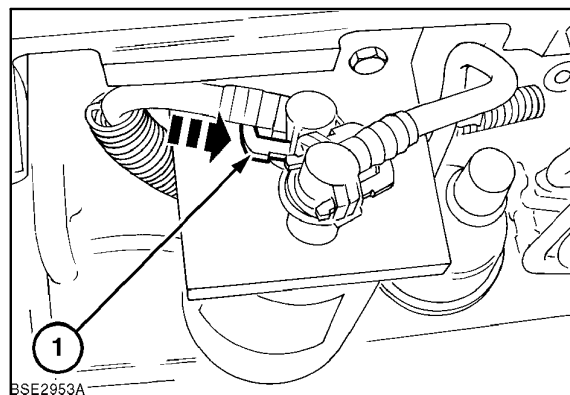
72



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To Bleed the Fuel System

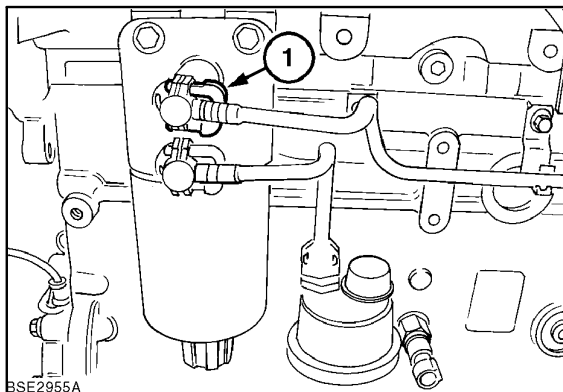
1. Press in the retaining clip (1) to release the pipe from the filter head (4 cylinder engine shown).



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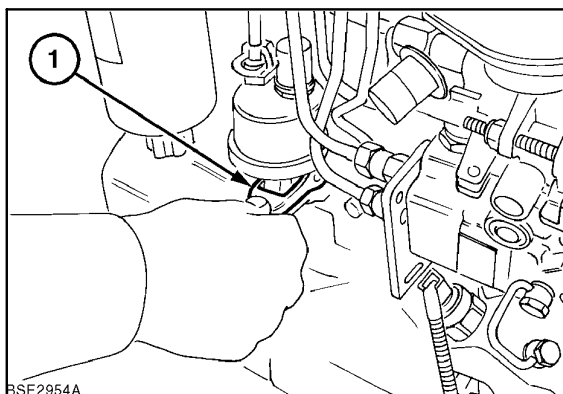
SECTION 4 - LUBRICATION AND MAINTENANCE

2. Press in the retaining clip (1) to release the pipe from the filter head (6 cylinder engine shown).



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3. Rotate the engine to make sure the primer pump lever is on the cam stroke.
4. Pump the hand primer lever (1) until the fuel emitted from the filter head opening is free of air bubbles.
5. Install the pipe and ensure the clip is correctly re-fitted.

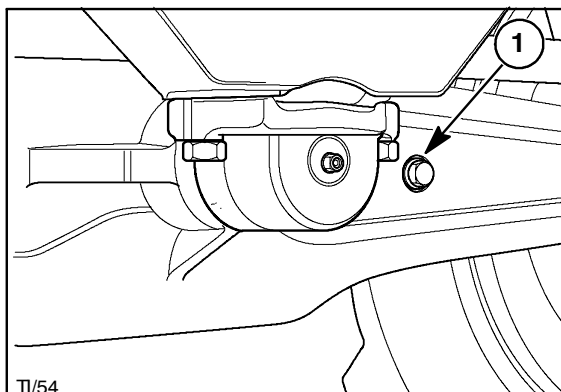


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OPERATION 23 FOUR WHEEL DRIVE LUBRICATION

Front Axle

Remove the combined level/filler plug (1) and ensure that the oil reaches the bottom of the opening. If necessary, top up through the opening with clean oil and replace the plug.



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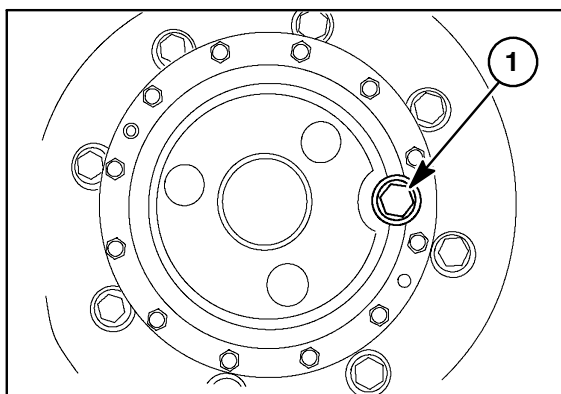
Front hub

Position a front wheel with the oil level plug at the 3 o'clock position, as shown.

Remove the combined level/filler plug and ensure that the oil reaches the bottom of the opening. If necessary, top up through the opening with clean oil and replace the plug.

Repeat on the other front wheel.

See page 4-9 for correct oil specification.



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SECTION 4 - LUBRICATION AND MAINTENANCE

EVERY 1200 HOURS OR 12 MONTHS (whichever occurs first) carry out the preceding checks plus the following:

OPERATION 24 CHANGE CAB AIR FILTERS

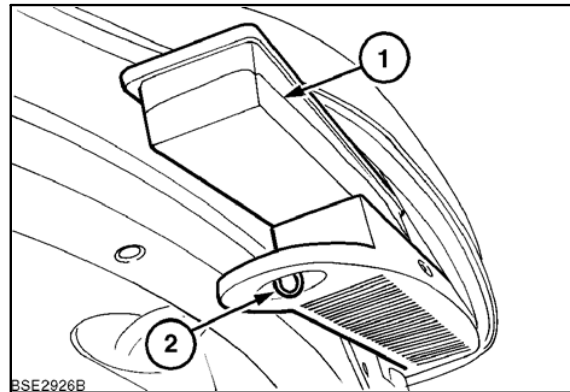
External Filters

To remove an external filter, turn the quick release fastener ⁽²⁾ anti-clockwise to free the filter cover. Remove the cover and the filter element (1). Dispose of the filter elements properly.

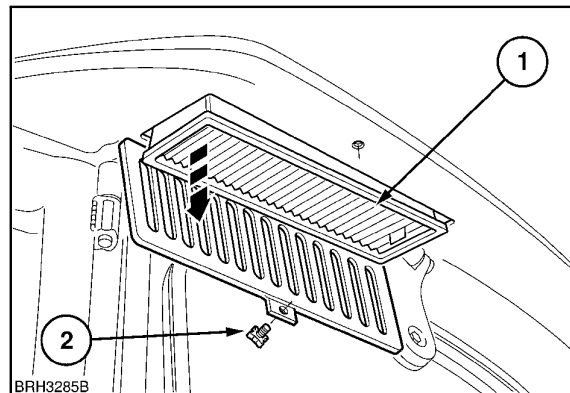
Clean both filter chambers with a damp, lint-free cloth.

Install new filter elements. A flow direction arrow is moulded into the side of the filter. Install the filters with the arrow pointing upwards. Re-install the covers.

NOTE: The filters are made of specially treated media with a rubber sealing strip bonded around the sides. Take care not to damage the element during installation.



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Internal Filter

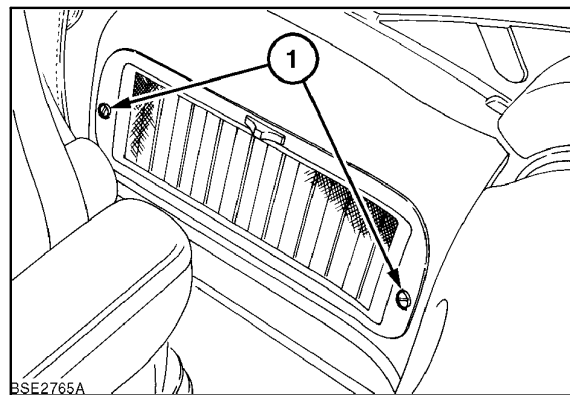
To remove the internal filter turn captive screws (1) until the cover is loose.

Remove the filter cover and the filter element. Dispose of the filter element properly.

Clean the filter chamber with a damp lint-free cloth.

Install the new filter element making sure that the arrow on the filter points to the rear of the tractor.

Re-install the filter cover.



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SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 25 CHANGE TRANSMISSION/REAR AXLE/ HYDRAULIC OIL AND FILTERS

Prior to changing the oil, run the engine and operate the hydraulic system until the oil is warm. Park the tractor on level ground, lower the three-point linkage and stop the engine. Engage the parking brake and chock the wheels on both sides.

WARNING

Be very careful to avoid contact with hot engine oil. If the engine oil is extremely hot, allow it to cool to a moderately warm temperature before proceeding.

To change the oil:

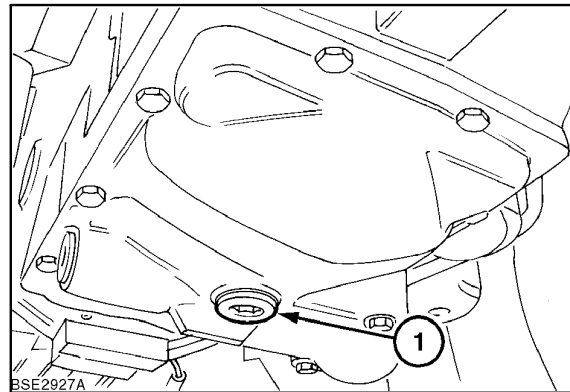
1. Remove the drain plug (1) Figure 82 and completely drain all oil into a suitable container. Dispose of oil properly.
2. Re-install the drain plug after the oil has drained.

IMPORTANT: Perform operation 23 (change hydraulic and transmission filters) before refilling with oil.

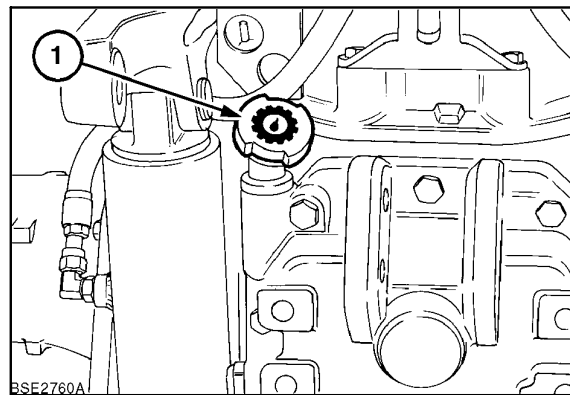
3. Remove the filler plug cap (1) figure 83 and refill with new oil.
4. Run the engine and operate the hydraulic system. Fully raise the three-point linkage.
5. Stop the engine and wait five minutes while checking the system for leaks.
6. Check the oil level by means of the sight glass (1) figure 84. Add oil as required until the oil level is between the 'MIN' and 'MAX' marks.

NOTE: Do not fill above the full mark

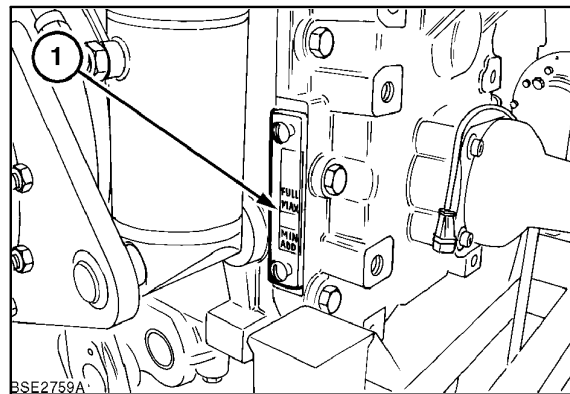
See page 4-9 for the correct oil specification.



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SECTION 4 - LUBRICATION AND MAINTENANCE

Oil Capacity:

12 x 12 Light Duty Axle	58.0 litres (15.3 U.S. gals)	12 x 12 Heavy Duty Axle	65.0 litres (17.2 U.S. gals)
24 x 24 Light Duty Axle	58.5 litres (15.4 U.S. gals)	24 x 24 Heavy Duty Axle	65.5 litres (17.3 U.S. gals)
16 x 16 Light Duty Axle	55.0 litres (14.5 U.S. gals)	16 x 16 Heavy Duty Axle	62.0 litres (16.4 U.S. gals)

OPERATION 26 CHANGE 4WD DIFFERENTIAL OIL

Park the tractor on level ground and engage the park brake.

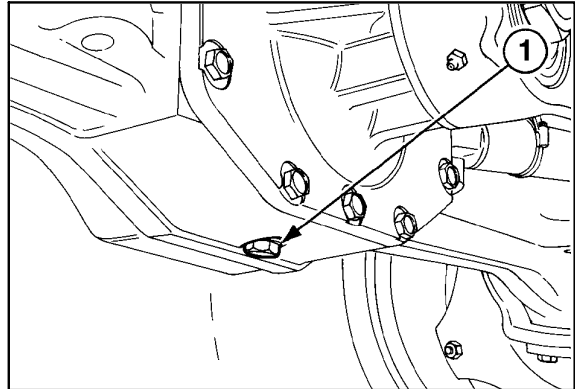
To change the oil:

1. Remove the drain plug (1) and completely drain oil into a suitable container. Dispose of the oil properly.
2. Re-install the drain plug. Remove the level/filler plug
3. Fill with new oil until it reaches the bottom of the level/filler plug hole. Re-install level/filler plug.

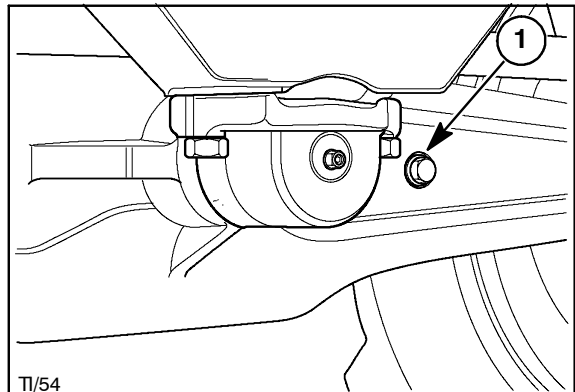
See page 4-9 for the correct oil specification.

Oil Capacity:

All Axles	9.0 litres (9.5 U.S. qts)
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SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 27 CHANGE 4WD PLANETARY HUB OIL

Park the tractor on level ground and engage the park brake.

To change the oil:

1. Position the wheel so the filler/drain/level plug (1) is at the lowest point. Remove the plug and completely drain all oil into a suitable container. Dispose of oil properly.
2. Rotate the wheel so that the combined level/filler plug (1) is at the 3 o'clock position, as shown.
3. Refill the hub with new oil until it reaches the bottom of the level/filler plug hole. Install the plug.
4. Repeat the process on the other hub.

See page 4-9 for the correct oil specification.

Oil Capacity (each hub):

All axles **without** brakes 1.5 litres
(1.3 U.S. qts)

Standard and Suspended axles 3.0 litres
with brakes (3.2 U.S. qts)

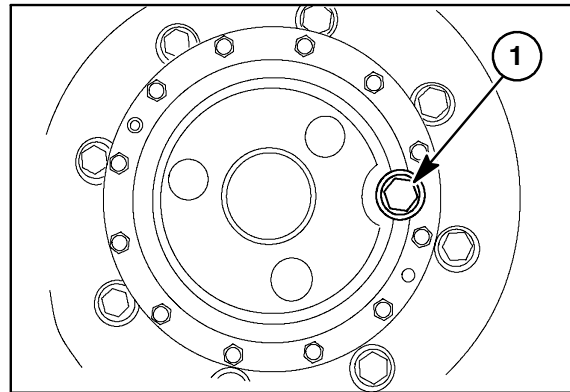
OPERATION 28 CHANGE FRONT P.T.O. GEARBOX OIL

Park the tractor on level ground and engage the park brake.

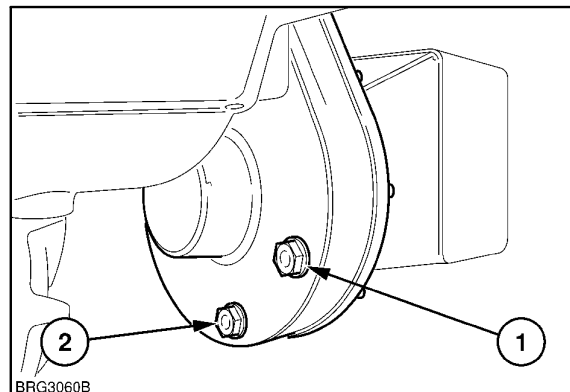
1. Place a suitable container below the gearbox and remove the level plug (1) and drain plug (2). Allow the oil to completely drain into the container and replace the plug (2). Dispose of oil properly.
2. Refill the gearbox through the combined level/filler plug until the oil reaches the bottom of the opening.

The oil quantity to refill the gearbox is approximately 400 ml. (13.5 U.S. oz.).

See page 4-9 for the correct oil specification.



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SECTION 4 - LUBRICATION AND MAINTENANCE

**OPERATION 29
BATTERY**

IMPORTANT: This operation applies only to batteries on tractors operating in temperate climates. Tractors operating in tropical climates should have the battery electrolyte level checked every 300 hours. See operation 13.

To gain access to the battery, raise the right hand step as shown earlier in this section, using the securing pin (1) Figure 89 to retain the step in an upright position.

Remove the battery cover by turning the retaining screw (2) 90 degrees anti-clockwise.

Remove the securing bolt and nut (1), and swing the battery tray towards the front of the tractor.

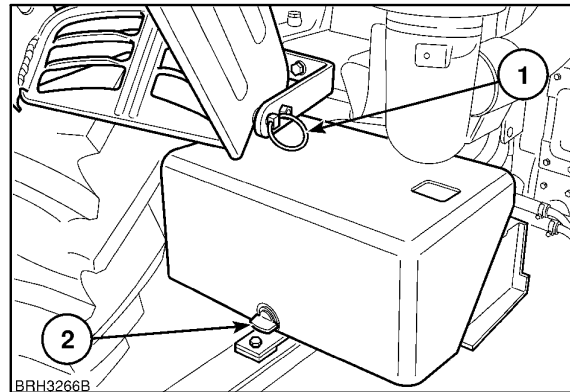
Unscrew and remove the six vent plugs from the top of the battery (tractors with heavy duty battery only).

Check that the electrolyte level is above the top of the separator plates in each cell.

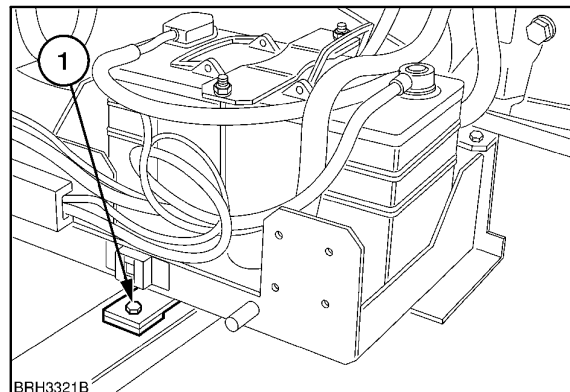
If necessary top up with distilled or de-mineralised water until the level is correct. Do not overfill. Never use tap water or water from a rain barrel or other source.

To prevent the formation of verdigris (corrosion) the terminals should be cleaned and lightly coated with petroleum jelly (Vaseline or similar).

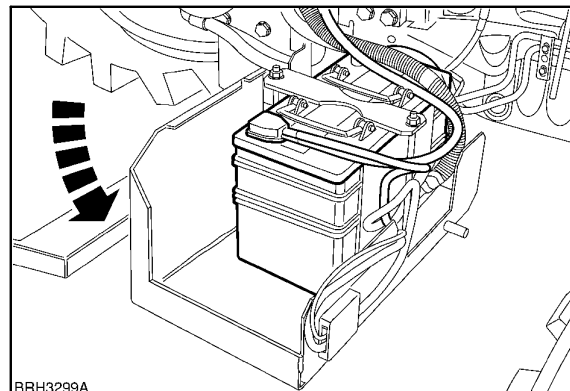
IMPORTANT: In the event of the battery being severely discharged, such that the terminal voltage is below 7 volts, recovery will require a special charging procedure. See your authorised dealer.



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EVERY 1200 HOURS OR 2 YEARS (whichever occurs first) carry out the preceding checks plus the following:

OPERATION 30 COOLING SYSTEM

During manufacture, the engine cooling system is filled with a high quality antifreeze and water solution. The antifreeze contains a chemical inhibitor. This inhibitor increases and extends the protection offered by conventional antifreezes.

The inhibitor will:

- Increase rust prevention.
- Reduce scale formation.
- Minimise cylinder wall erosion (pitting).
- Reduce foaming of the coolant.

The chemical inhibitor must be replenished, at intervals, to maintain the optimum protection level. This protection is provided by draining and flushing the system and refilling with a 50% solution of ethylene glycol antifreeze or, where a suitable type of antifreeze is not available, with a measured dosage of chemical inhibitor. See the following text.

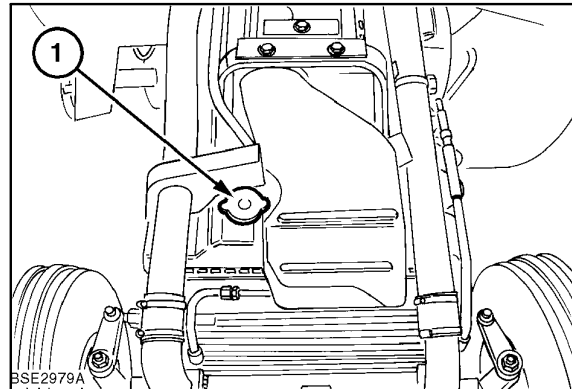
See page 4-9 for Antifreeze specification.

Draining and Refilling the Cooling System



WARNING

Allow the engine to cool before draining the coolant. The cooling system operates under pressure which is controlled by the radiator pressure cap. It is dangerous to remove the pressure cap while the system is hot. When cool, use a thick cloth and turn the cap slowly to the first stop and allow the pressure to escape before fully removing the cap. Coolant should be kept off the skin. Adhere to the precautions outlined on the antifreeze and inhibitor containers, where used.

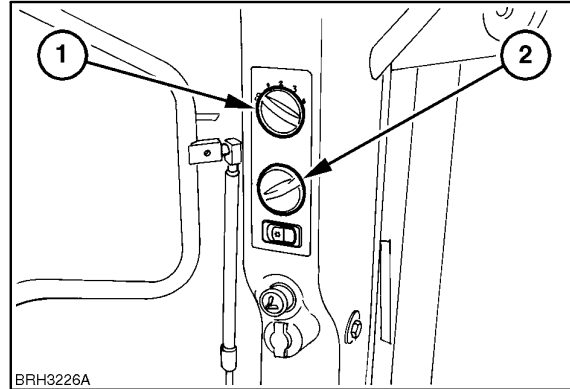


92

IMPORTANT: It is essential that an approved pressure cap is used. If the cap is mislaid or damaged, obtain a replacement from your dealer.

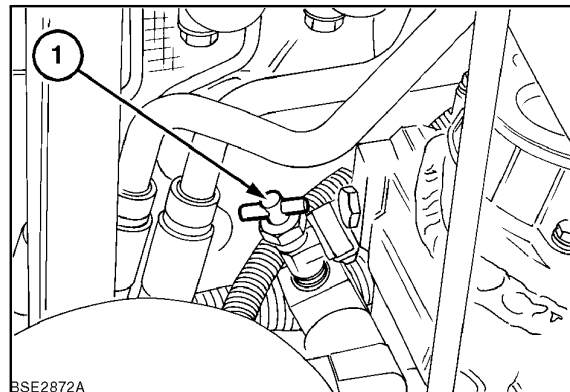
SECTION 4 - LUBRICATION AND MAINTENANCE

1. Turn the heater control knob (2) to the maximum heat position (fully clockwise).



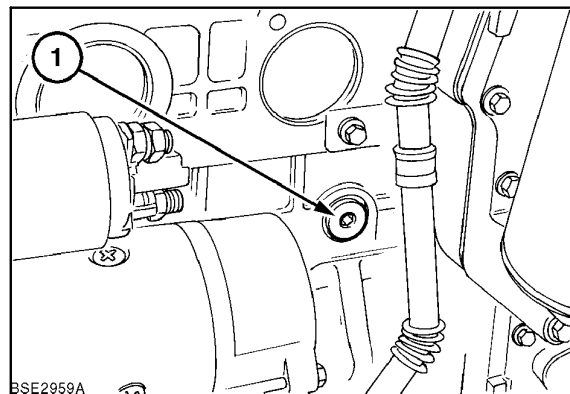
93

2. Check that the heater shutoff valve is open. This valve is on the rear, right hand side of the engine cylinder head.
3. Disconnect the radiator lower hose and drain all the coolant into a suitable container. Dispose of the coolant properly.



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4. Remove the coolant drain plug (1) from the left hand rear of the engine block. Drain all the coolant into a suitable container. Dispose of the coolant properly.
5. To increase the drainage rate, remove the radiator cap and recovery tank cap.
6. Flush the system with a commercial cooling system cleaner. Follow the instructions supplied with the cleaner. Drain the cleaner and let the engine cool.



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IMPORTANT: Never put cold coolant in a hot engine. The difference in temperature could cause the the block or head to crack.

SECTION 4 - LUBRICATION AND MAINTENANCE

7. Re-install the radiator lower hose.
8. Fill the system with clean water and run the engine for 10 minutes, then drain all the water. Allow the engine to cool.
9. Fill the system with a blend of antifreeze and clean soft water. Add coolant slowly through the radiator filler neck until the coolant reaches the bottom of the filler neck.

NOTE: *To avoid trapping air in the system, fill the radiator as slowly as possible thereby allowing any air pockets to disperse.*

The coolant to be used is dependent upon local availability. See the following text:

Using Antifreeze

Use a solution of 50% clean water and 50% antifreeze. The inhibitor already in this antifreeze is sufficient to protect your engine for a further 1200 hours or two years, whichever occurs first.

See page 4-9 for Antifreeze specification.

Using Plain water

If you reside in a country where antifreeze is not available, use clean water pre-mixed with 5% chemical inhibitor. Contact your authorised dealer.

Following the instructions on the container mix the recommended quantity of inhibitor with 28.5 litres (7.5 U.S. gal.) of clean water. This will provide more coolant mixture than is actually required. The excess coolant should be kept in a specially marked container and used for top up purposes.



WARNING



Inhibitor solution is irritating to eyes and skin. It contains buffered potassium hydroxide.

- Avoid contact with eyes or prolonged or repeated skin contact.
 - Wear protective eyewear when using.
 - In case of contact with eyes, flush with water for 15 minutes and obtain medical attention.
 - Wash skin with soap and water after use.
 - Keep out of reach of children.
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SECTION 4 - LUBRICATION AND MAINTENANCE

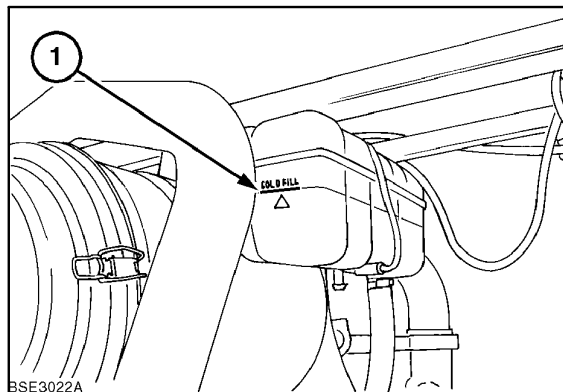
After Refilling the System - All Coolant Solutions

1. Inspect cooling system hoses and connections for leaks.
2. Fill the coolant recovery tank to the cold fill mark (1).
3. Start the engine and run it until normal operating temperature is reached.

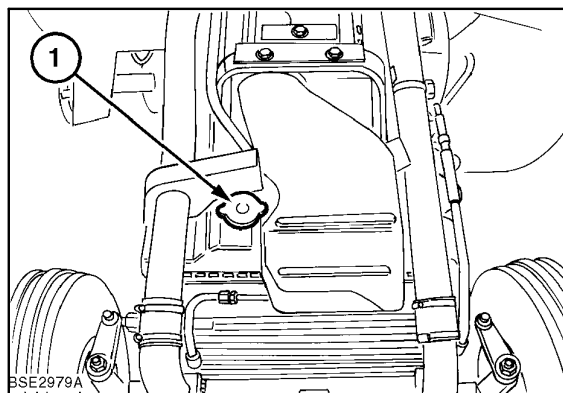
NOTE: The coolant level will drop as coolant is pumped around the system.

4. Stop the engine and allow the coolant to cool.
5. Remove the radiator cap (1), and add coolant to the radiator to bring the coolant level to the bottom of the filler neck. Install the radiator cap. Add coolant to the recovery tank as required to bring the level up to the cold mark.

NOTE: If the engine is not going to be operated immediately following this coolant change, run the engine for one hour to ensure that the antifreeze and/or chemical inhibitor is dispersed throughout the cooling system. Allow the engine to cool and make a final check to ensure that the coolant level is satisfactory.



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Coolant Capacities

Tractors with 4 cylinder engines:

With Cab	23.0 litres (6.07 U.S. gals)
Less Cab	21.0 litres (5.54 U.S. gals)

Tractors with 6 cylinder engines:

With Cab	25.0 litres (6.6 U.S. gals)
Less Cab (except T6070)	23.0 litres (6.07 U.S. gals)

Clean Water Specification:

Total Hardness	300 parts per million
Chlorides	100 parts per million
Sulphates	100 parts per million

Antifreeze Specification:

See page 4-9 for Antifreeze specification.

Chemical Inhibitor

There are three part numbers for the inhibitor. The content of each bottle is identical, only the instructions on the label differ, by language:

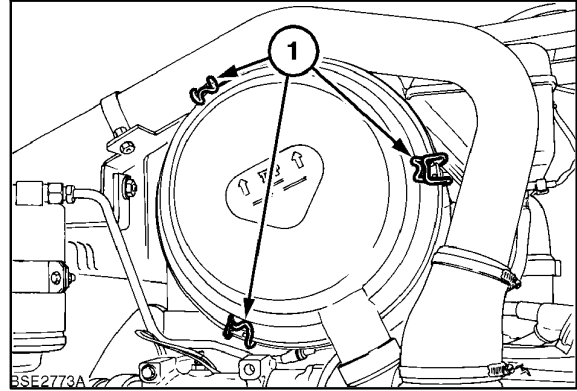
Part No.	Languages on Label
83958743	English, French, Spanish, Portuguese and Greek
83958744	English, French, German, Italian and Dutch
83958745	English, Danish, Norwegian, Finnish and Swedish

SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 31 CHANGE ENGINE AIR CLEANER INNER ELEMENT

The air cleaner is accessible from the right-hand side of the engine

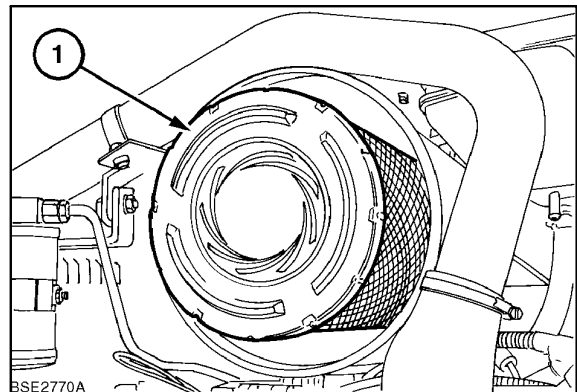
1. Unlatch the three retaining clips (1) Fig. 98, and lift off the air cleaner assembly cover.



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2. Remove the outer element (1) Fig. 99 from the air cleaner assembly by gently twisting the end of the filter clockwise to disengage the seal. Then pull the filter straight out of the housing, not at an angle, ensuring the inner element remains in place.

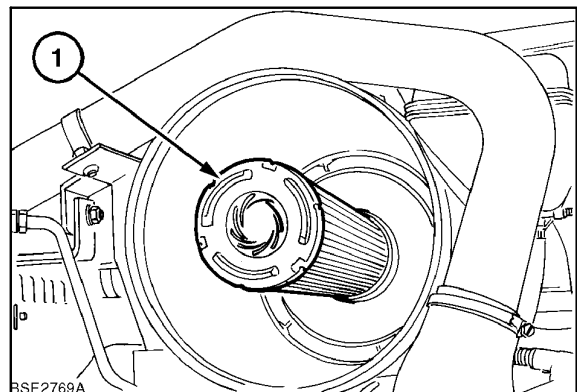
NOTE: Examine the inside of the outer element. If dust is present, the outer element is defective and must be replaced.



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3. Pull the inner element straight out of the housing and dispose of properly.
4. Clean the inside of the air cleaner housing using a damp lint-free cloth.
5. Install a new inner element and a new outer element (if required). Ensure both elements are correctly seated before replacing the housing cover.

IMPORTANT: Failure to install the inner filter element properly could result in engine damage. Therefore it is recommended that the element be installed by an authorised dealer.



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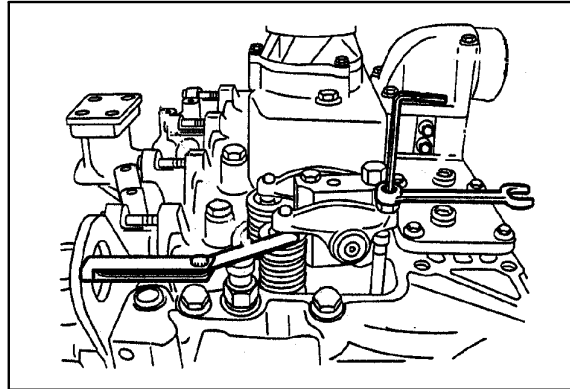
SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 32 CHECK VALVE TAPPET CLEARANCE

With the engine cold, ease the ventilation tube from the valve rocker cover after removing the retaining bolt. Undo the retaining nuts and remove the valve cover.

The correct valve clearance for all models are:

Inlet	0.25 ⁺ / ₋ 0.05mm (0.010 ⁺ / ₋ 0.002in.)
Exhaust	0.51 ⁺ / ₋ 0.05mm (0.020 ⁺ / ₋ 0.002in.)



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Check the valve clearance for **6 cylinder** engines as follows:

Cylinder No.	1	2	3	4	5	6
Intake	-	-	*	-	*	*
Exhaust	-	*	-	*	-	*

Rotate the crankshaft and balance No. 1 cylinder valves. Adjust the valves marked by the asterisk (*) as shown in the table above:

Cylinder No.	1	2	3	4	5	6
Intake	*	*	-	*	-	-
Exhaust	*	-	*	-	*	-

Rotate the crankshaft and balance No.6 cylinder valves. Adjust the valves marked by the asterisk (*) as shown in the table above:

Check the valve clearance for **4 cylinder** engines as follows:

Cylinder No.	1	2	3	4
Intake	-	*	*	*
Exhaust	-	-	-	*

Rotate the crankshaft and balance No.1 cylinder valves. Adjust the valves marked by the asterisk (*) as shown in the table above:

Cylinder No.	1	2	3	4
Intake	*	-	-	-
Exhaust	*	*	*	-

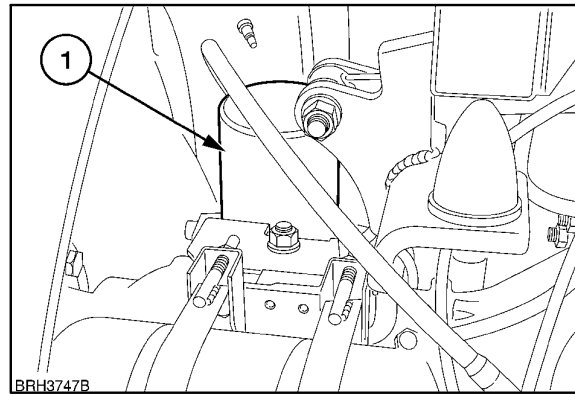
Rotate the crankshaft and balance No.4 cylinder valves. Adjust the valves marked by the asterisk (*) as shown in the table above:

**OPERATION 33
CHANGE AIR BRAKE DRIER RESERVOIR**

Removing the Drier Reservoir

Before attempting to change the drier reservoir (1), thoroughly clean the area around the reservoir to prevent debris from entering the air braking system.

1. Exhaust all air pressure in the system by opening the drain tap on the main air tank/s.
2. Using a filter release tool, unscrew and remove the drier reservoir. Dispose of properly according to local regulations.



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Installing a New Drier Reservoir

1. Clean the seal flange on the drier body and the threaded pin, check for damage to the pin and the seal contact surface of the flange.
2. Lightly grease the sealing ring on the reservoir and the threaded pin on the drier body.
3. Screw the reservoir onto the drier body until the seal touches the contact surface of the flange. Tighten a further half-turn by hand. Tighten to a maximum of 15 Nm (11 lbf. ft.) DO NOT overtighten.
4. Pressurise the reservoir and check for leaks. If further tightening is necessary, depressurise the system before tightening.
5. Re-pressurise the air braking system and check again for leaks.

EVERY 1800 HOURS carry out the following:

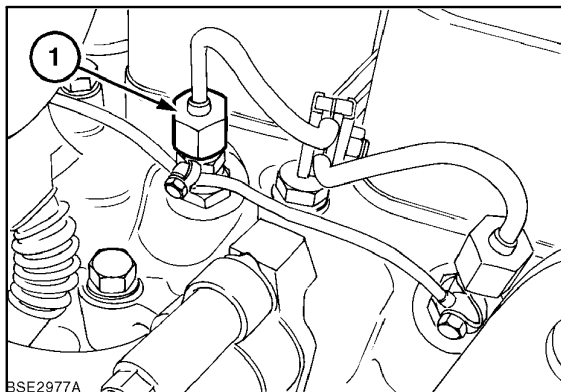
**OPERATION 34
CLEAN AND RESET FUEL INJECTORS**

⚠ WARNING ⚠

Diesel fuel escaping under pressure can penetrate the skin causing serious injury.

Do not use your hand to check for leaks. Use a piece of cardboard or paper to search for leaks. Wear protective gloves and eye protection.

If any fluid is injected into the skin, obtain medical attention immediately or gangrene may result.



BSE2977A

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The removal of the fuel injectors (1) for servicing requires the use of special tools to extract the injectors from the cylinder head. It is therefore recommended that your authorised dealer should carry out this procedure.

EVERY 3 YEARS carry out the following:

**OPERATION 35
SERVICE THE AIR CONDITIONER
SYSTEM**

After 3 seasons work, the performance of the air conditioner may be reduced. At this time it is recommended to have the receiver/drier (1) changed and the complete system checked by your authorised dealer using specialised equipment.

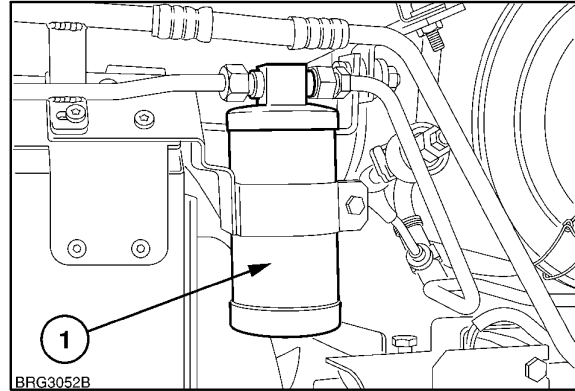


WARNING



The refrigerant used in the air conditioner system has a boiling point of -12°C (10°F).

- Never expose any part of the air conditioner system to a direct flame or excessive heat because of the risk of fire or explosion.
- Never disconnect or disassemble any part of the air conditioner system. escaping refrigerant will cause frostbite. Allowing refrigerant to escape into the atmosphere is illegal in many countries.
- If refrigerant should contact the skin, use the same treatment as for frostbite. Warm the area with your hand or lukewarm water at $32 - 38^{\circ}\text{C}$ ($90 - 100^{\circ}\text{F}$). Cover the area loosely with a bandage to protect the affected area and to prevent infection. Consult a doctor immediately.
- If refrigerant should contact the eyes, wash the eyes immediately with **cold** water for at least 5 minutes. consult a doctor immediately.



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SECTION 4 - LUBRICATION AND MAINTENANCE

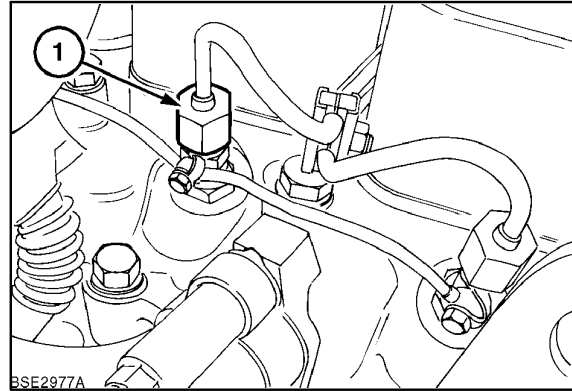
GENERAL MAINTENANCE (to be performed as and when required).

OPERATION 36 BLEEDING THE FUEL INJECTION SYSTEM

It may be necessary after injection pump removal, replacement of injector high pressure lines or after running out of fuel, to purge the system of air to allow the engine to start.

If the engine fails to start after several turns, after one of the above situations has occurred, bleed the system using the following procedure:

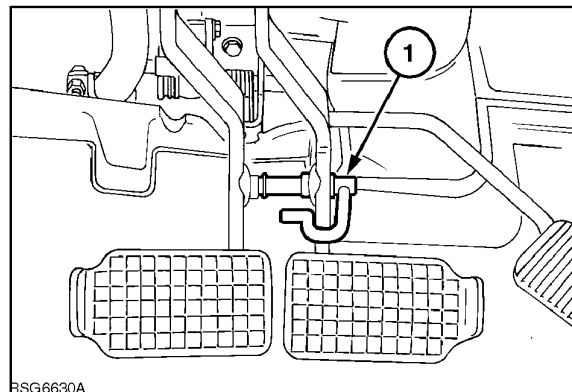
1. Ensure the tractor has adequate fuel and the battery is fully charged.
2. Bleed the fuel system as described in Operation 26.
3. 'Crack' open the nuts (1) on the high pressure lines to each of the injectors. With the aid of an assistant, crank the engine on the starter motor to expel the air. Tighten the injector nuts as the engine begins to fire.



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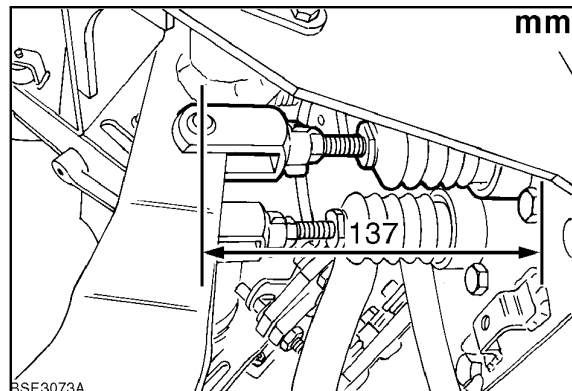
OPERATION 37 CHECK BRAKE PEDAL LATCHING/UNLATCHING

The hydraulically actuated brakes require no adjustment. However, if any part of the brake pedal linkage or the master cylinder assembly is replaced or if the pedal latch will not readily engage the hole in the right-hand pedal shank, adjust the pedal as follows:



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Adjust the clevis by loosening the locknut. The distance from the bulkhead to the centre of the clevis hole should be 137mm (5.4 in.). Adjust both pedals and ensure pedal latch engages properly.



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SECTION 4 - LUBRICATION AND MAINTENANCE

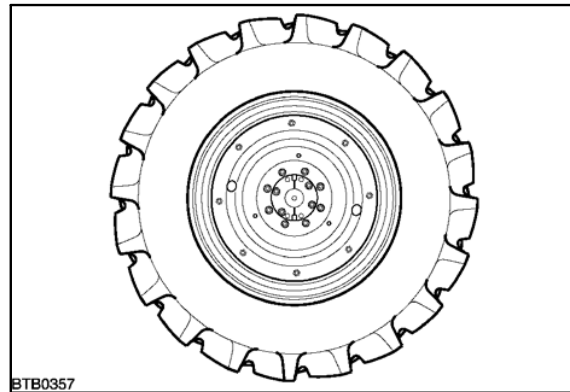
OPERATION 38 CHECK FRONT AND REAR WHEEL NUTS

Check the front and rear wheel nuts for tightness using a torque wrench (with a torque multiplier, where necessary).

The specified torque figures are shown in the following table:

Wheel Nut Torque Settings

Two wheel drive -	
Front disc to hub nuts	133 Nm (98 lbf.ft)
Four wheel drive - Adjustable front wheels	
Front disc to hub nuts	294 Nm (217 lbf.ft)
Front disc to rim nuts	250 Nm (184 lbf.ft)
Adjustable rear wheels - Flanged axle	
Disc to hub nuts	250 Nm (184 lbf.ft)
Disc to rim nuts	250 Nm (184 lbf.ft)
Bar Axle	
Disc to hub nuts	260 Nm (190 lbf.ft)
Disc to rim nuts	250 Nm (184 lbf.ft)
Split wedge bolts	300 Nm (221 lbf.ft)



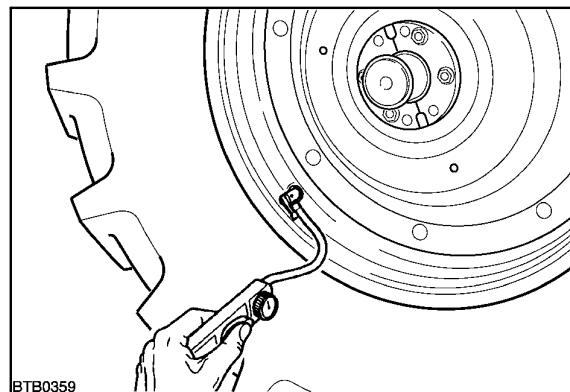
108

OPERATION 39 CHECK TYRE PRESSURES AND TYRE CONDITION

Check and adjust the front and rear tyre pressures. Inspect the tread and sidewalls for damage.

Adjust the tyre pressures to suit the load being carried. See 'Tyre Pressures and Permissible Loads' in Section 3.

NOTE: If the tyres are ballasted with a calcium chloride/water solution, a special tyre gauge should be used as the solution will corrode a proprietary type gauge. Check pressure with the valve stem at the bottom.



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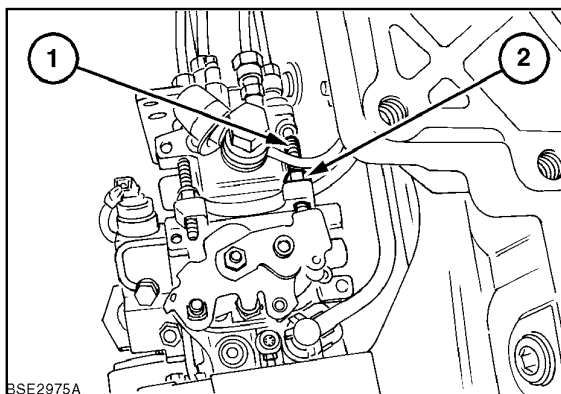
SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 40 ENGINE IDLE SPEED

6 cylinder models

Loosen the locknut (2) and turn the stop screw (1) to adjust the engine idle speed.

Engine idle speed: 800 - 850 rpm

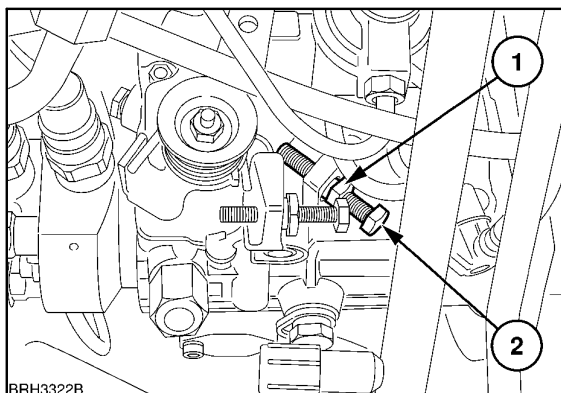


110

4 cylinder models

Loosen the locknut (1) and turn the stop screw (2) to adjust the engine idle speed.

Engine idle speed: 800 - 850 rpm



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OPERATION 41 AUTOMATIC PICK-UP HITCH

Place a load on the pick-up hitch hook. A trailer or implement is suggested. Ensure that the hitch will latch and unlatch satisfactorily. If adjustment is necessary, remove the load from the hitch before adjusting the latch.

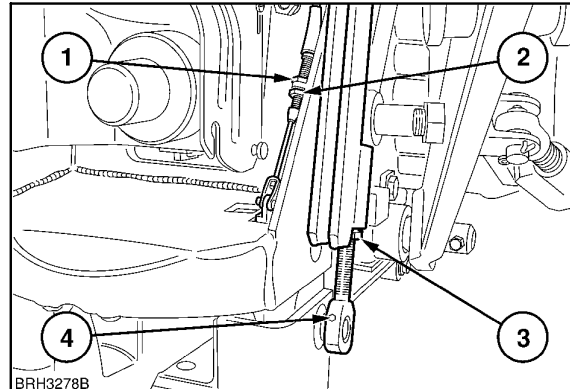
Drop Down Hitch

Loosen the locknut (3) and remove the clevis bolt (4). Slide the lift rod from the hitch and rotate to adjust the length. Refit the lift rod to the hitch and temporarily replace the clevis bolt. Repeat the procedure on the the opposite lift rod ensuring an equal amount of adjustment is applied.

Test hitch operation to ensure that both lift rods support the hitch equally at the start of raise. Check the hitch will latch and unlatch correctly, then tighten the lift rod locknuts and clevis bolts.

When fully raised ensure that the hydraulic system relief valve does not blow or that the hitch lift rods are not under tension. Both these symptoms indicate that the hitch lift rods are too short.

If the tension on the hitch release cable requires adjustment, loosen the locknut (2). Adjust the tension by re-positioning the nut (1) on the cable adjuster. After re-setting, check for satisfactory operation and re-tighten the locknut.



112

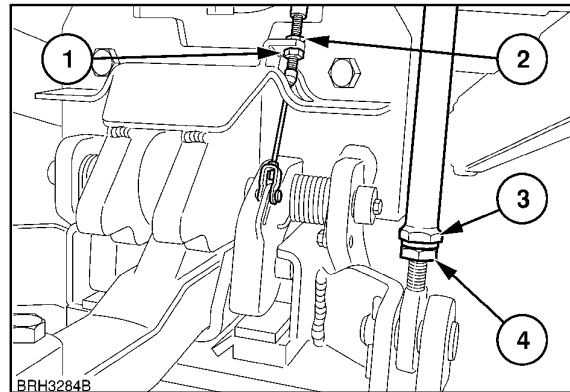
SECTION 4 - LUBRICATION AND MAINTENANCE

Hydraulic Extending Hitch

Loosen the locknut (4) and turn the adjuster (3) on each lift rod equally. Ensure that both hitch lift arms are supporting the hitch equally at the start of raise. Check that the hitch will latch and unlatch correctly and re-tighten the locknut.

When fully raised ensure that the hydraulic system relief valve does not blow or that the hitch lift rods are not under tension. Both these symptoms indicate that the hitch lift rods are too short.

If the tension on the hitch release cable requires adjustment, loosen the locknut (2). Adjust the tension by re-positioning the nut (1) on the cable adjuster. After adjustment, check for satisfactory operation and re-tighten the locknut.

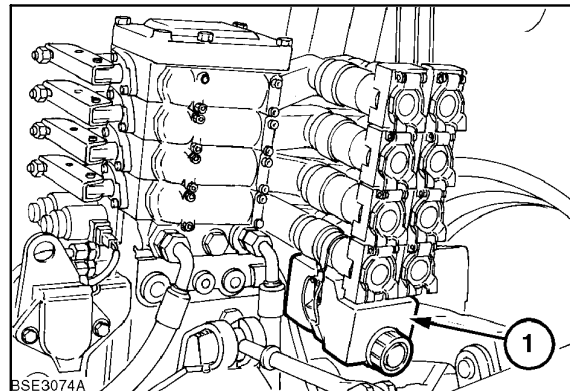


113

OPERATION 42 CHECK REMOTE CONTROL VALVE DRAIN BOTTLES

Every time a hydraulic hose is connected and disconnected, a small amount of oil is discharged from the remote control valve coupler. Drain bottles (1) are located below each remote valve to catch the discharged oil.

Visually check the oil level in the bottles. If necessary, unclip the bottle, remove the cap and empty the oil into a suitable container. Re-install the bottle, ensuring it is correctly seated below the valve.



114

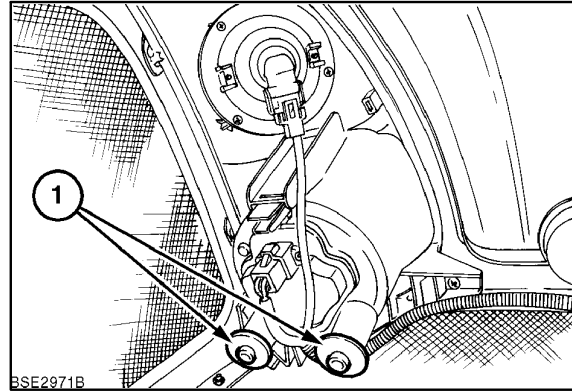
SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 43 HEADLIGHT AND WORKLAMP ADJUSTMENT

Headlights

To avoid blinding on coming drivers, adjust the angle of the headlight beams.

Each headlight is adjusted by rotating the two adjusters (1) clockwise or anti-clockwise according to the amount of correction required.



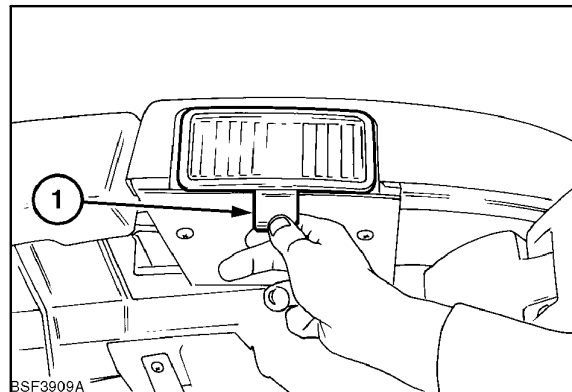
115

Worklamps

Dependant upon model and specification, adjustable worklamps may be installed on the front and rear of the cab roof, low down at the front of the cab or on the rear fenders. Non-adjustable worklamps are mounted on the front of the hood, adjacent to the headlights.

Roof Mounted with Standard Cab

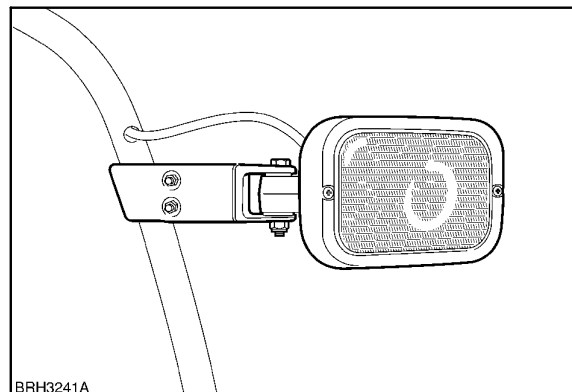
Cab roof mounted worklamps are adjusted by moving the protruding lever (1), backwards or forwards.



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Grab Rail Mounted with Low Profile Cab

To adjust the position of the light, grasp the lamp assembly and rotate upwards or downwards.



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SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 44 BULB REPLACEMENT

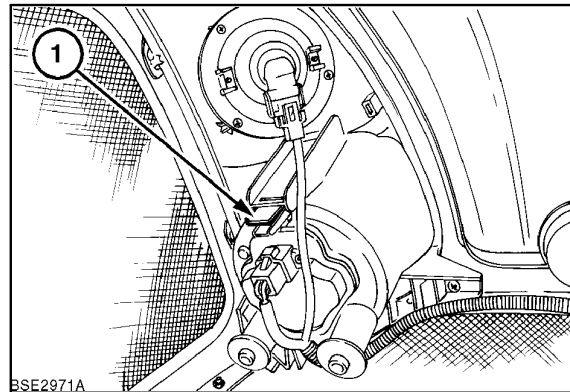
Headlights and Hood-mounted Worklamps

IMPORTANT: All headlights and worklamps have halogen bulbs. Never touch a halogen bulb with the fingers. Natural moisture in the skin may cause the bulb to fail prematurely when switched on. Always use a clean cloth or tissue when handling halogen bulbs.

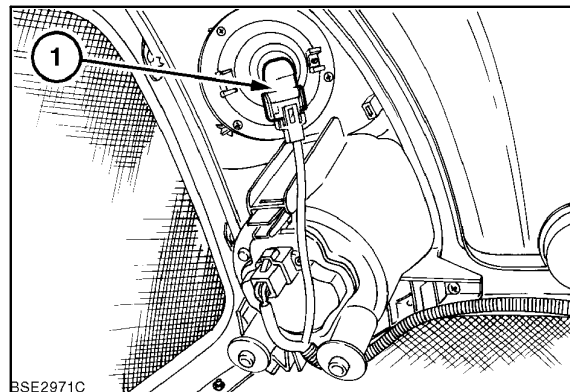
The headlights and two non-adjustable worklamps are mounted in a moulded unit attached to the front hood assembly. All bulbs are accessible from the rear of the lamp unit inside the hood area.

To remove bulb from front headlight assembly, raise hood as previously described in this section. Press the retaining clip (1) to unhinge the rear part of the headlight. Detach the retaining spring and remove the bulb.

To remove the bulb from the integral worklamp simply rotate the bulb holder assembly (1) anti-clockwise approximately 20 degrees. The bulb can then be removed by pressing in the bulb and then releasing it.



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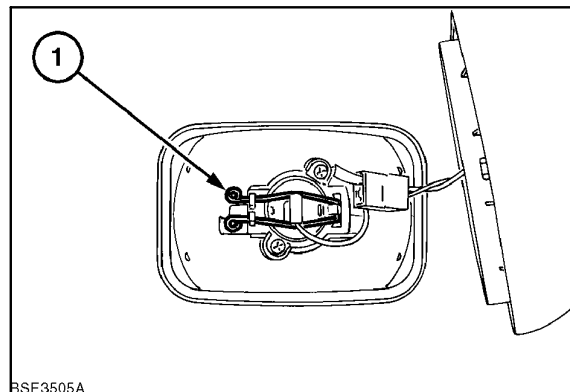


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Adjustable Worklamps

Grabrail mounted worklamps

To replace the bulbs on the grabrail mounted worklamps, remove the two retaining screws. Pull out the lens housing from the main lamp housing. Squeeze together the ends of the wire retaining clip (1) and pull the bulb holder from the assembly. Remove the bulb making sure to use a clean cloth or tissue.

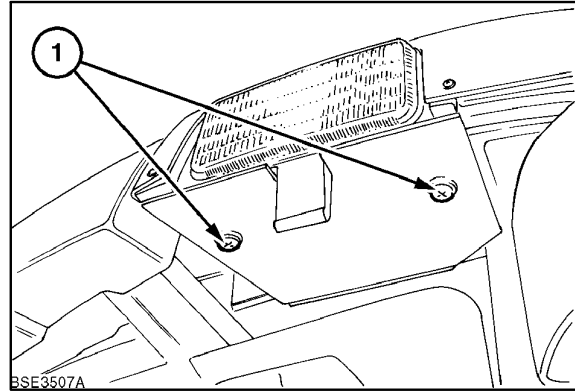


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SECTION 4 - LUBRICATION AND MAINTENANCE

Cab roof mounted worklamps

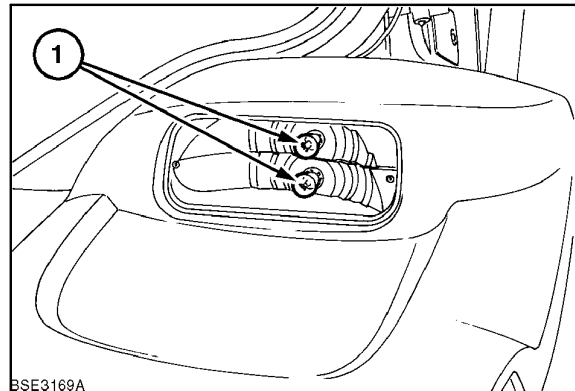
Remove the two retaining screws (1) and lower the lamp assembly from the roof. Rotate the bulb holder counter-clockwise and pull from the lamp housing. Rotate the bulb counterclockwise and remove from the bulb holder making sure to use a clean cloth or a tissue.



121

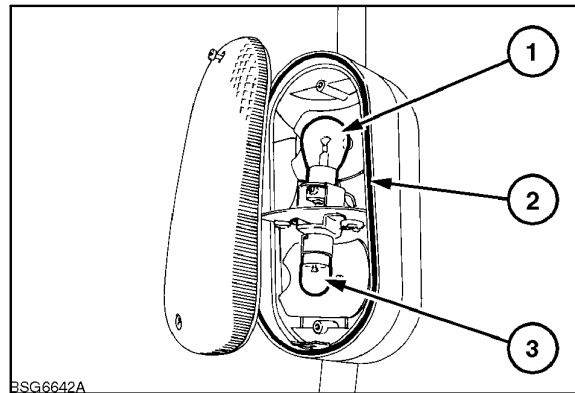
Turn/Position Lights

To gain access to the **lower rear** turn/position bulbs remove the two retaining screws. Remove the lens. To remove the bulbs (1) rotate counter clockwise.



122

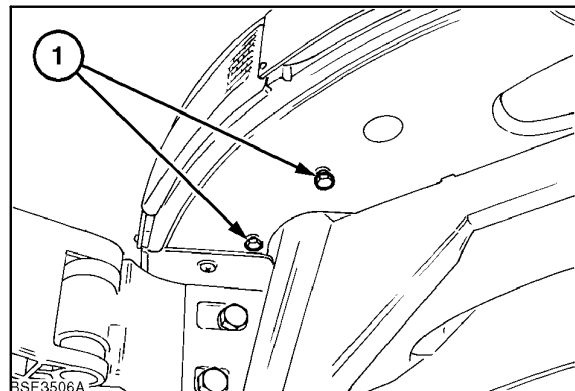
The **front** turn/position lamps are located on the grabrails. Remove the two retaining screws. Remove the lens. To remove the turn indicator bulb (1) or the position bulb (3) rotate counter clockwise. When re-fitting the lens ensure the sealing rubber (2) is fully seated in the lamp housing.



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Turn/Position Lights with Standard Cab (North America Only)

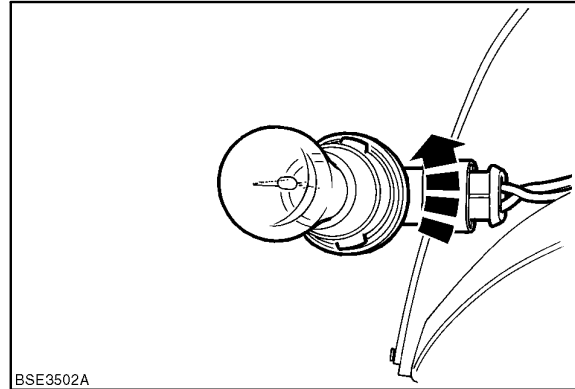
The turn position lamps (Front and Rear) are located in the cab roof. Remove the two retaining bolts (1) and pull the lamp assembly from the housing. Rotate the harness connector counter-clockwise to remove the bulb holder from the lamp housing.



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SECTION 4 - LUBRICATION AND MAINTENANCE

To remove the bulb rotate the bulb counter-clockwise and pull from the bulb holder.

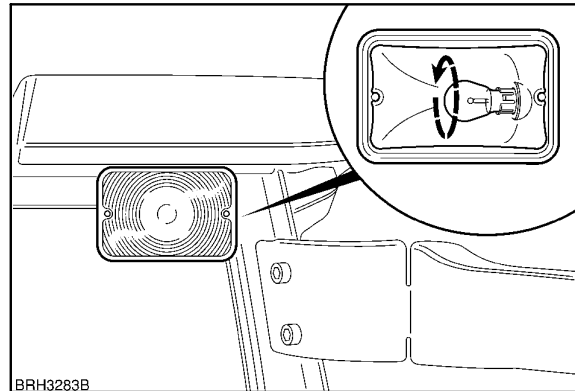


125

Turn/Position Lights with Low Profile Cab (North America Only)

To gain access to the bulb remove the two screws retaining the lens and withdraw the lens from the light unit.

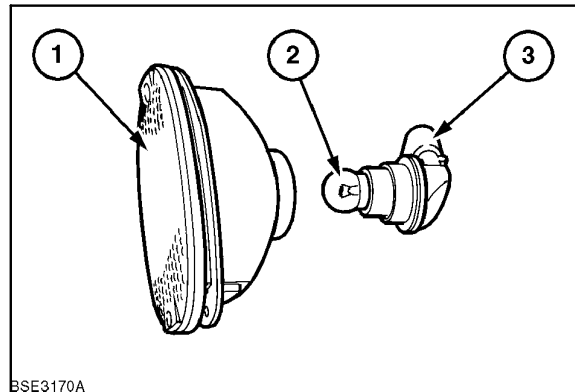
To remove the bulb rotate the bulb anti-clockwise and pull from the bulb holder. Re-assemble in the reverse order.



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Courtesy Lights

Remove the two retaining screws. Remove the lens housing assembly (1) from the cab roof. Disconnect the harness connector and remove the light assembly. To remove the bulb housing (3) rotate the harness connector counter clockwise. To remove the bulb (2) rotate counter clockwise.



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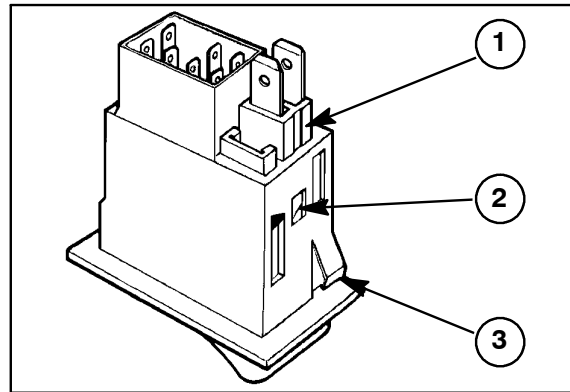
Rocker Switch Bulbs

Certain of the rocker switches are internally illuminated, the bulb being removeable from the rear of the switch assembly.

The switch assembly is retained by a sprung tag (3) at either end. Use a small screwdriver to pry one end of the rocker switch from the sheet metal and withdraw the switch assembly.

To change a bulb, press in the tag (2) using a small screwdriver and pull the bulb retainer (1) from the back of the assembly. The bulbs are of the capless type, rated at 1.2w and are a push fit in the retainer.

After changing the bulb, push the retainer into the back of the switch assembly until the tag locates in the aperture. Re-install the switch assembly.



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SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 45 FUSES AND RELAYS

The fuse box is located behind a panel on the right-hand side of the instrument console.

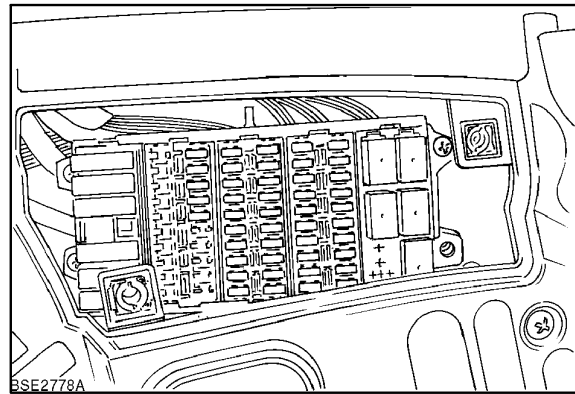
To check or change fuses, remove the right-hand panel from the instrument console. Pull off the lid of the fuse box to gain access to the fuses and relays. The fuses and relays are shown diagrammatically in Figures 132 and 133. In addition to the main fuses there are additional 'maxi' fuses which are provided to protect the main fuses and electrical circuitry.

There is provision for 60 fuses although they may not all be fitted to your tractor. In addition, certain items of equipment may not be installed on your tractor. However, the fuses for these features are still fitted and may be used as spares.

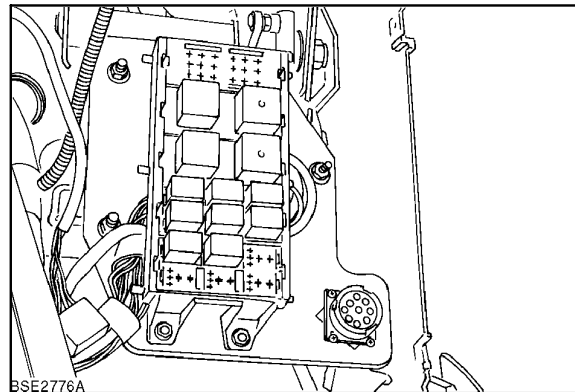
IMPORTANT: Do not replace a blown fuse with another of a different rating.

The fuses are numbered and colour-coded. Their position and rating are shown in the chart on the next page.

More relays are located at the front of the right-hand instrument console.

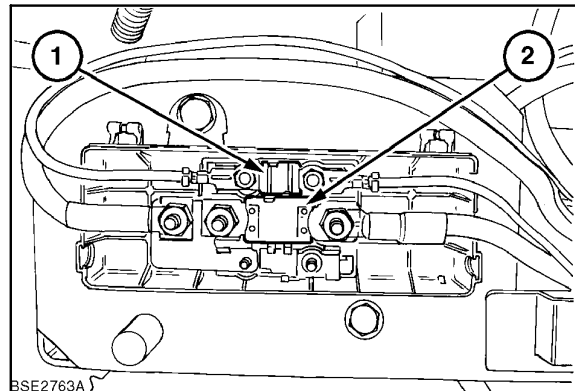


129



130

In addition to the fuses in the internal fuse box, there are also extra fuses located on the battery tray. A 250 amp 'MEGA' fuse which protects the main electrical system and two 30 amp fuses which protect the front lift electrical system and the electronics supply.

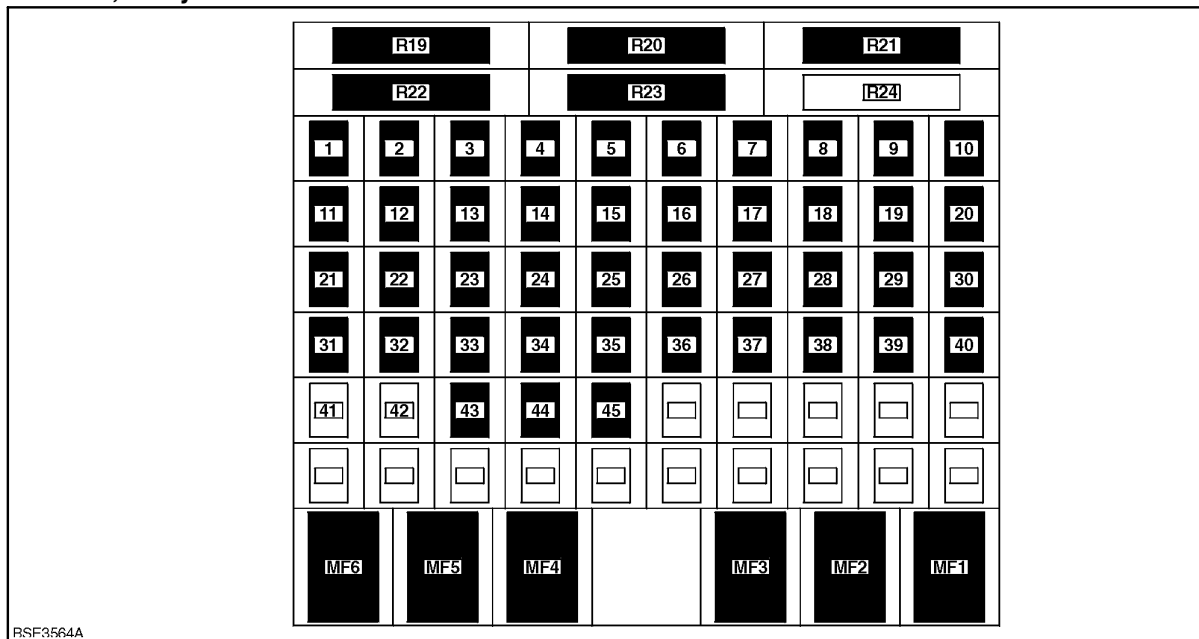


131

SECTION 4 - LUBRICATION AND MAINTENANCE

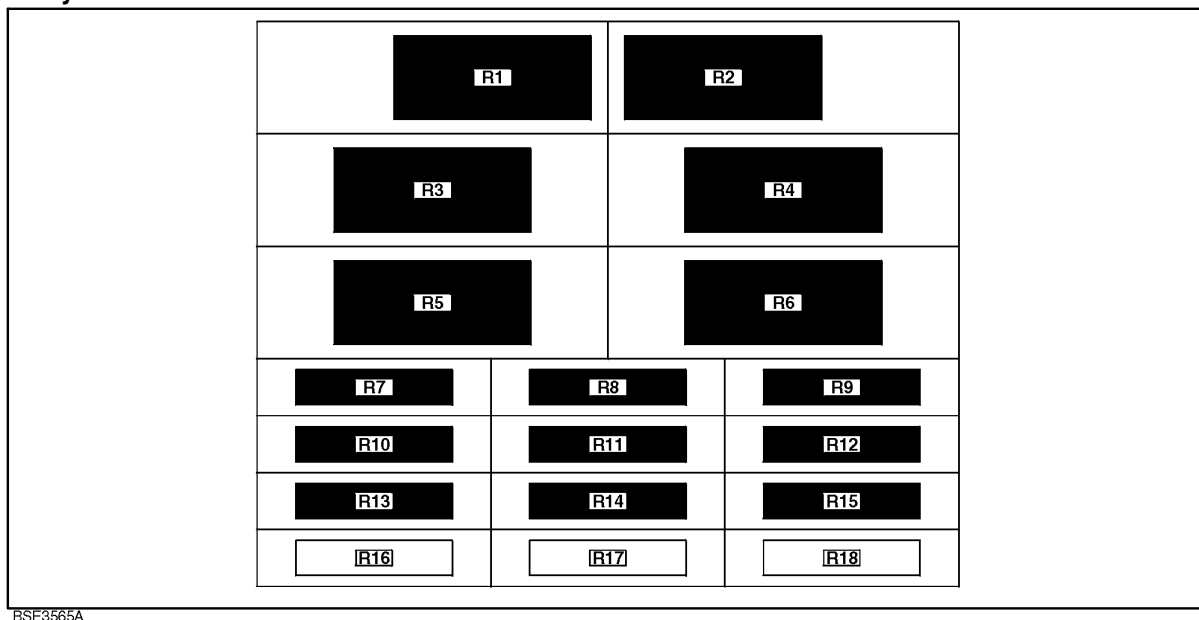
FUSE AND RELAY LOCATIONS

Fusebox, Relays and Maxi-Fuses



132

Relays



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SECTION 4 - LUBRICATION AND MAINTENANCE

RELAY DESCRIPTIONS

12x12 - With and Less Cab

Refer to Figures 132/ 133

Relay	Function
1	Blank (Less cab) Windshield Wiper - Front
2	Blank (Less cab) Windshield Wiper - Rear
3	Ignition Relay
4	Lights
5	Starter
6	Blower Motor
7	Dip Beam Headlamps
8	Stoplamps
9	Main Beam Headlamps
10	Hydraulic Trailer Brake Pressure
11	Hydraulic Trailer Brake Supply
12	Stoplamps Switch Feed (Less cab) + Pnuematic Trailer Brake (With cab)

13	Blank (Less cab) Engine Run and Cold Start (With cab- Mechanical Engines Only)
14	Reverse Alarm
15	A/C Clutch Relay
16	Blank
17	Blank
18	Blank
19	Worklamps - Front Lower
20	Worklamps - Rear Lower
21	Electrical Supply
22	Blank
23	Blank
24	Blank

16x16 and 24x24 - Less Cab

Refer to Figures 132/ 133

Relay	Function
1	Blank
2	Blank
3	Ignition Relay
4	Lights
5	Starter
6	Blank
7	Dip Beam Headlamps
8	Stoplamps
9	Main Beam Headlamps
10	Pneumatic Trailer Brake Pressure
11	Hydraulic Trailer Brake Supply
12	Stoplamps Switch Feed

13	Engine Cold Start Advance + Engine Shutdown (Mechanical Engines Only)
14	Reverse Alarm
15	Blank
16	Blank
17	Blank
18	Blank
19	Worklamps - Front Lower
20	Worklamps - Rear Lower
21	Electrical Supply
22	Blank
23	Blank
24	Blank

SECTION 4 - LUBRICATION AND MAINTENANCE

16x16 and 24x24 - With Cab

Refer to Figures 132/ 133

Relay	Function
1	Front Windscreen Wiper Module
2	Rear Window Wiper Module
3	Ignition Relay
4	Side/Tail Lights and Illumination
5	Starter
6	Blower Motor
7	Dipped Beam Headlamps
8	Stoplamps
9	Main Beam Headlamps
10	Pneumatic Trailer Brake Supply
11	Hydraulic Trailer Brake Supply
12	Stoplamps Switch Feed and Pneumatic Brakes

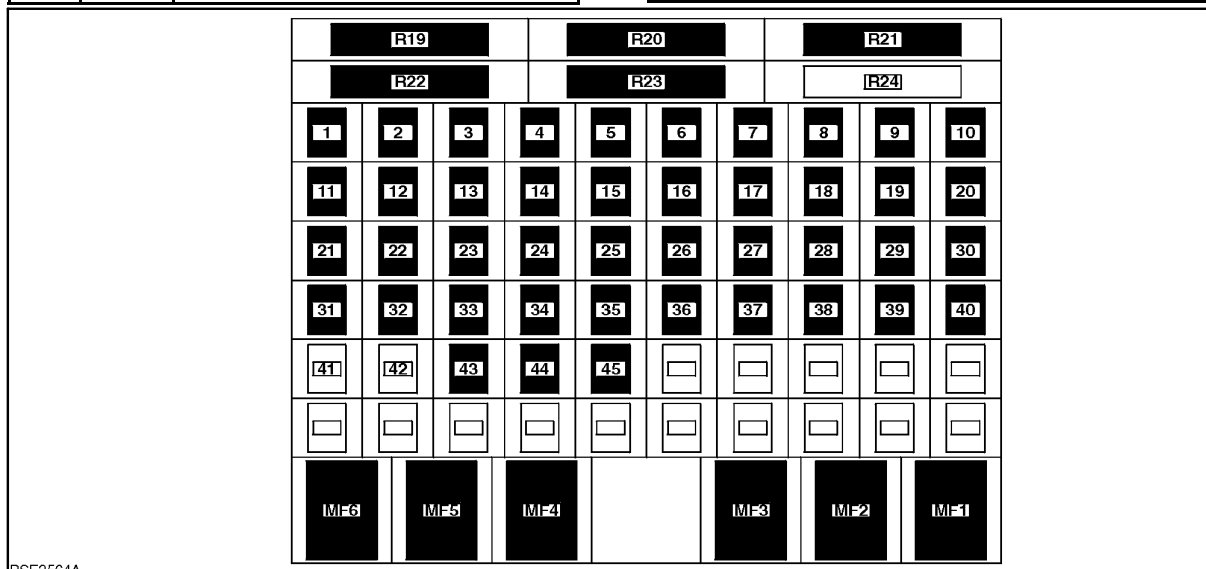
13	Engine Cold Start Advance (Mechanical Engines Only)
14	Reverse Alarm
15	A/C Clutch Relay Feed
16	Electronic Remote Valve Power (16 x 16 Transmissions Only)
17	Blank
18	Blank
19	Front Lower Worklamps (Hood)
20	Rear Lower Worklamps
21	Electrical Supply
22	Blank
23	Blank
24	Blank

SECTION 4 - LUBRICATION AND MAINTENANCE

Mini Fuses 12x12 - Less Cab

No.	Amps	Circuit
1	10	Handbrake Lamp
2	-	Blank
3	-	Blank
4	-	Blank
5	-	Blank
6	-	Blank
7	20	Main Lights
8	20	Starter Switch
9	-	Blank
10	-	Blank
11	-	Blank
12	-	Blank
13	15	Stoplamps
14	15	Main Light Switch + Flasher Unit
15	20	Stoplamp Switch + Hydraulic Trailer Brake + Pedal Latch
16	-	Blank
17	-	Blank
18	15	Seat
19	-	Blank
20	10	Back up Alarm + Transmission Diagnostic
21	15	Grid Heater + Water In Fuel Sensor + Brake Fluid Level Switch
22	15	Sidelamps RH

23	15	Sidelamps LH
24	10	Illumination
25	15	Dip Beam Headlamps
26	15	Main Beam Headlamps
27	15	Front Headlamps
28	-	Blank
29	-	Blank
30	15	Rear/Lower Worklamps
31	-	Blank
32	30	Flasher Unit
33	25	Diagnostic Connector
34	10	Instrument Cluster
35	10	SCM (Small Control Module)
36	10	Instrument Cluster
37	15	Front Switch Group + Transmission Ignition
38	10	SCM + Switch Panel + Ground Speed + Rear PTO Warning Lamp + PTO Brake
39	10	Seat
40	-	Blank
41	-	Blank
42	-	Blank
43	10	Starter Switch (Run Position)
44	-	Blank
45	25	Front Ignition

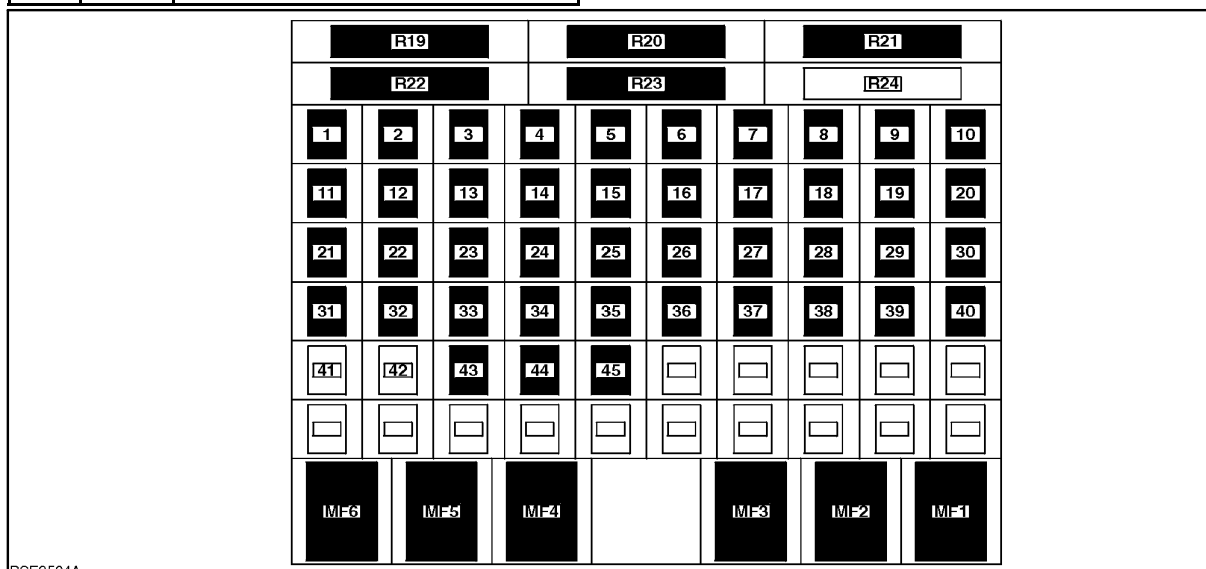


SECTION 4 - LUBRICATION AND MAINTENANCE

Mini Fuses 12x12 - With Cab

No.	Amps	Circuit
1	10	Interior and Courtesy Lights
2	25	Cigar Lighter + Power studs
3	10	A/C Clutch
4	10	Accessory Sockets
5	30	Blower Motor
6	10	Radio KAM + Worklamp ECU
7	20	Main Lights + Hazard Switch
8	20	Starter Switch
9	25	Loader
10	-	Blank
11	10	Front and Rear Windscreen Wiper
12	10	Wiper Switch and Rear Wiper Park
13	15	Stoplamps
14	15	Main Light Switch + Turn Signal
15	20	Stoplamps Switch + Hydraulic-Trailer Brake + Pedal Latch
16	15	Pneumatic Trailer Brake
17	25	Accessory Sockets
18	15	Blower Motor + seat
19	-	Blank
20	10	Radar Socket + Transmission Diagnostic Socket + ADIC keypad + Radar + Backup Alarm
21	15	Grid Heater + Water In Fuel Sensor + Brake Fluid Level Switch
22	15	Sidelamps RH

23	15	Sidelamps LH
24	10	Illumination
25	15	Dip Beam Headlamps
26	15	Main Beam Headlamps
27	15	Front Worklamps (Hood)
28	15	ECU Worklamp
29	30	ECU Worklamp
30	15	Rear Lower Worklamps
31	15	ECU Worklamp
32	30	Flasher Unit
33	25	Diagnostic Connector + Engine ECU
34	10	Instrument Cluster
35	10	SCM (Small Control Module)
36	10	Instrument Cluster Ignition
37	15	Transmission Ignition
38	10	SCM + Switch Panel + Ground Speed PTO Switch + Rear PTO Warning Lamp + PTO Brake
39	10	Seat
40	10	Radio
41	-	Blank
42	-	Blank
43	10	Starter Switch (Run Position)
44	25	Front Implement Power Socket
45	25	Front Ignition + 8 Amp Socket



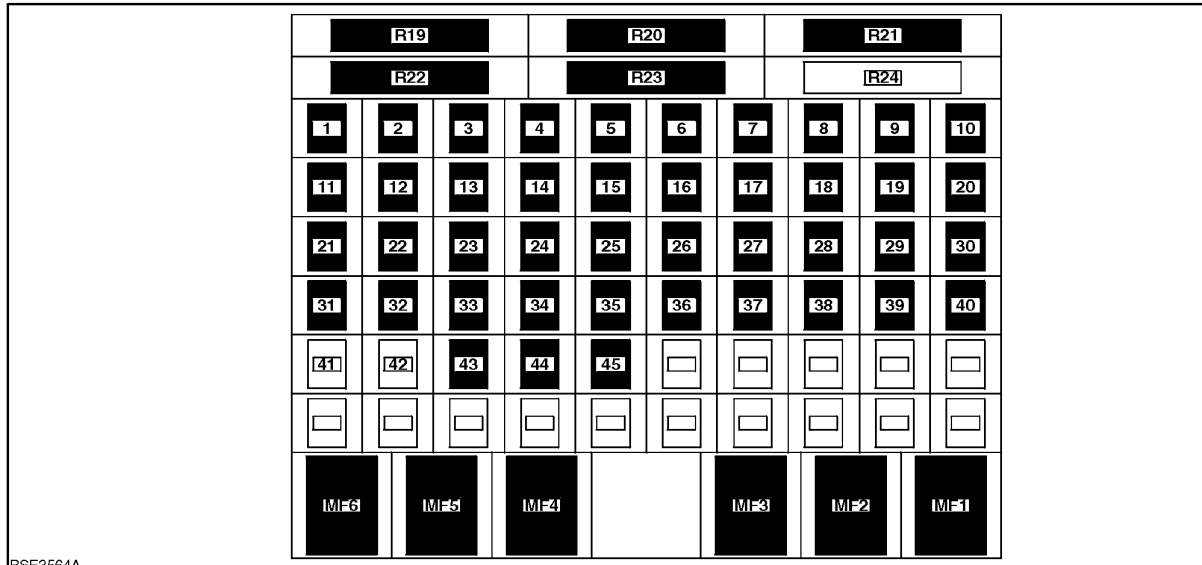
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SECTION 4 - LUBRICATION AND MAINTENANCE

Mini Fuses 16x16 and 24x24 - Less Cab

No.	Amps	Circuit
1	10	Handbrake Lamp
2	-	Blank
3	-	Blank
4	-	Blank
5	-	Blank
6	-	Blank
7	20	Main Lights + Hazard Switch
8	20	Starter Switch
9	25	Loader
10	-	Blank
11	-	Blank
12	-	Blank
13	15	Stoplamps
14	15	Main Light Switch + Flasher Unit
15	20	Stoplamp Switch + Hydraulic Trailer Brake + Pedal Latch
16	-	Blank
17	-	Blank
18	15	Seat
19	10	Blank
20	10	Standard Control Module Diagnostic + Auxiliary Control Module Diagnostic + Keypad+Reverse Alarm + Radar
21	15	Grid Heater + Water In Fuel Sensor + Brake Fluid Level Switch
22	15	Sidelamps RH
23	15	Sidelamps LH

24	10	Illumination
25	15	Dip Beam Headlamps
26	15	Main Beam Headlamps
27	15	Front Worklamps
28	-	Blank
29	-	Blank
30	15	Rear Lower Worklamps
31	-	Blank
32	30	Flasher Unit
33	25	Diagnostic Connector + Engine ECU
34	10	Instrument Cluster
35	10	DC Mem + Standard Control Module + Auxiliary Control Module
36	10	Instrument Cluster Ignition
37	15	Transmission Ignition
38	10	HPL + Switch Panel + Ground Speed PTO + SCM + Rear PTO Warning Lamp + PTO Brake + Display Of Gears Connector
39	10	HPL + Seat + Hand Throttle + Armrest
40	-	Blank
41	10	Front Suspension and PTO
42	10	Front Suspension
43	10	Starter Switch (Run Position)
44	25	Front Implement Power Socket
45	-	Blank



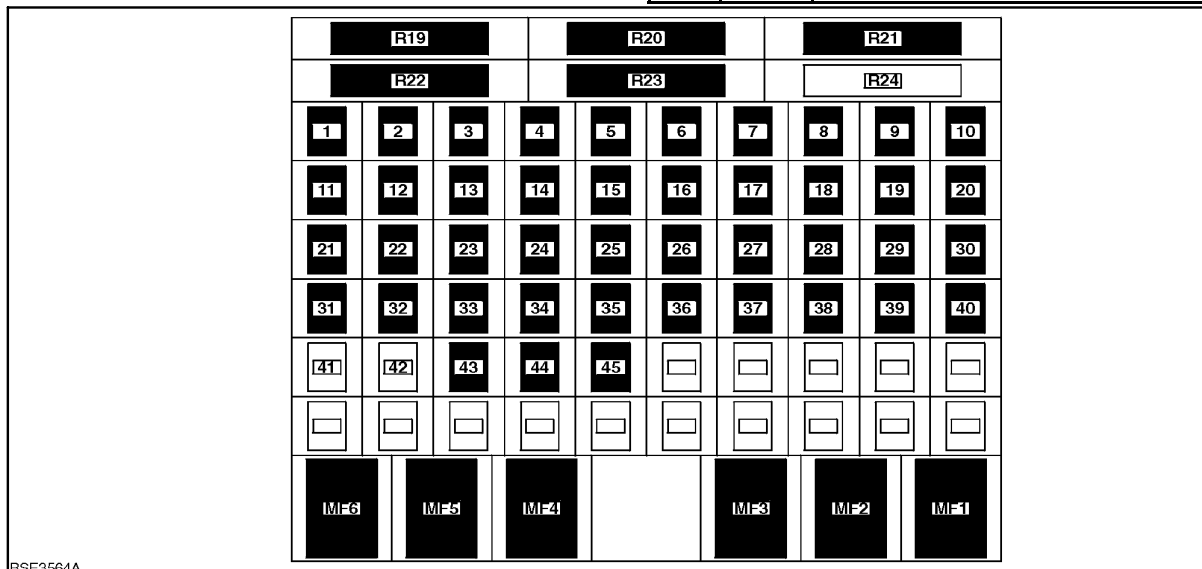
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SECTION 4 - LUBRICATION AND MAINTENANCE

Mini Fuses 16x16 and 24x24 - With Cab

No.	Amps	Circuit
1	10	Interior and Courtesy Lights + Handbrake Lamp
2	25	Cigar Lighter + Power Studs
3	10	A/C Clutch
4	10	Accessory Sockets
5	30	Blower Motor
6	10	Radio KAM + Worklamp ECU
7	20	Main Lights + Hazard Switch
8	20	Starter Switch
9	25	Loader
10	-	Blank
11	10	Front and Rear Windscreen Wiper
12	-	Wiper Switch and Rear Wiper Park
13	10	Stoplamps
14	15	Main Light Switch + Flasher Unit
15	20	Stoplamp Switch + Pedal Latch
16	15	Trailer Brake
17	25	Accessory Sockets
18	15	Blower Motor + Seat
19	-	Blank
20	10	Radar Socket + Transmission Diagnostic Socket + Auxiliary Diagnostic Socket + ADIC KeyPad + Radar + BackUp Alarm
21	10	Grid Heater + Water In Fuel Sensor + Brake Fluid Level Switch
22	15	Sidelamps RH
23	15	Sidelamps LH

24	10	Illumination
25	15	Dip Beam Headlamps
26	15	Main Beam Headlamps
27	15	Front Worklamps (Hood)
28	15	ECU Worklamp
29	30	ECU Worklamp
30	15	Rear Lower Worklamps
31	15	ECU Worklamp
32	30	Flasher Unit
33	25	Diagnostic Connector + Engine ECU
34	10	Instrument Cluster B+
35	10	DC Mem + SCM + ACM
36	10	Instrument Cluster Ignition
37	15	Transmission Ignition
38	10	Rear PTO Switch + Rear PTO Lamp + HPL + SCM + Ground Speed PTO + Display Of Gears Connector
39	10	HPL + Seat + Armrest + EDC + EHR Levers (16 x 16 Only)
40	10	Radio
41	15	Front Suspension and PTO + EHR Levers (16 x 16 Only)
42	10	Front Suspension
43	10	Starter Switch (Run position)
44	25	Front Implement Power Socket
45	25	Front Ignition + 8 Amp Socket



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SECTION 4 - LUBRICATION AND MAINTENANCE

Maxi Fuses 12 x 12 - Less Cab

No.	Amps	Protected Components
MF1	80	Engine
MF2	30	Lighting
MF3	40	B + KAM ADIC
MF4	40	Implement Socket Rear
MF5	100	Lighting
MF6	80	Accessories Cab

Maxi Fuses 12 x 12 - With Cab

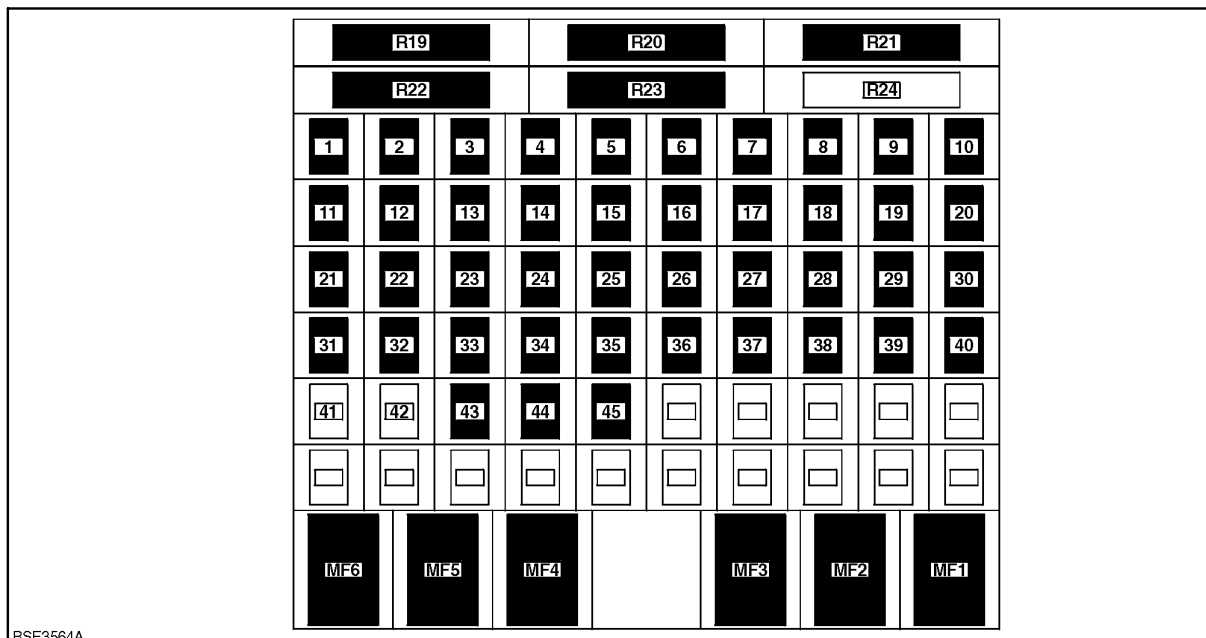
No.	Amps	Protected Components
MF1	80	Engine, Ignition Relay
MF2	30	Lighting, Ignition Switch, Radio, Worklamp ECU
MF3	40	B + KAM ADIC, SCM
MF4	40	Implement Socket Rear
MF5	100	Lighting
MF6	80	Accessories Cab

Maxi Fuses 16 x 16 and 24 x 24 - Less Cab

No.	Amps	Protected Components
MF1	80	Engine
MF2	30	Lighting
MF3	40	B + KAM ADIC
MF4	40	Implement Socket Rear
MF5	100	Lighting
MF6	80	Accessories Cab

Maxi Fuses 16 x 16 and 24 x 24 - With Cab

No.	Amps	Protected Components
MF1	80	Engine, Ignition Relay
MF2	30	Lighting, Ignition Switch, Main Lighting Switch, Radio, Worklamp ECU
MF3	40	B + KAM ADIC, Engine ECU, Transmission ECU
MF4	40	Implement Socket Rear
MF5	100	Lighting
MF6	80	Accessories Cab

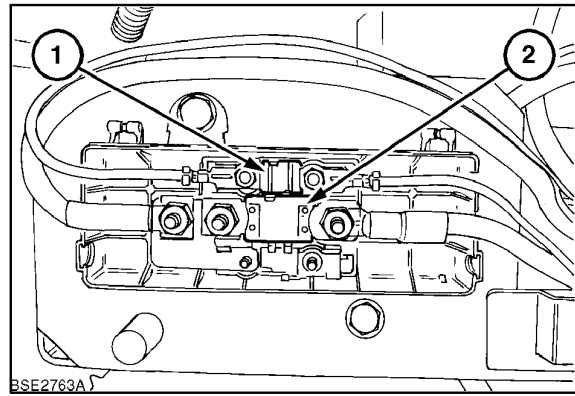


SECTION 4 - LUBRICATION AND MAINTENANCE

POWER FUSES

All Models

Fuse No.	Amps	Protected Supply
PF1	30	Power E Electronic Supply
PF2	250	Power B + Main Supply
PF3	30	Power B + Front Implement Socket



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SECTION 4 - LUBRICATION AND MAINTENANCE

OPERATION 46 CLEANING THE TRACTOR

Cab Interior

When the soft trim material inside the cab becomes dirty, it should be wiped clean. Dip a cloth in a warm water/detergent solution and squeeze out as much of the water as possible.

The rubber floor covering is designed to allow water to flow out through the open doors. Wash the covering carefully and allow to dry naturally. Avoid getting water under the mat.

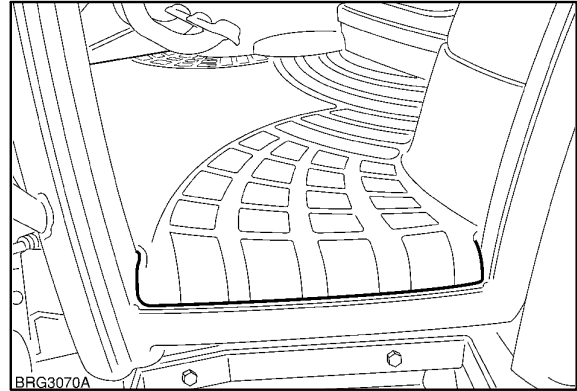
NOTE: When operating with chemical sprayers, clean the interior of the cab on a more frequent basis to prevent a build up of chemical residue.

Cleaning the Seat and Seat Belt

The belt may be sponged with clean, soapy water. Do not use solvents, bleach or dye on the belt as these chemicals will weaken the webbing.

Replace the belt when it shows signs of fraying, damage or general wear.

Do not use solvents to clean the seat. Use only warm water with a little detergent added or a propriety brand of automotive upholstery cleaner. Avoid wetting the seat more than is absolutely necessary.



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SECTION 4 - LUBRICATION AND MAINTENANCE

Cleaning the Exterior of the Tractor

Maintenance of the paintwork is normally carried out by washing, at intervals that depend on the conditions of use and the environment. In areas prone to atmospheric pollution and coastal zones, washing should be carried out more frequently, whereas if organic or chemical substances are present, wash immediately after the tractor is used. Use a low pressure water spray, sponge down with a solution of automotive shampoo and water, rinsing the sponge frequently. Rinse the tractor thoroughly and dry off.

Avoid washing the tractor if it is hot or has been standing in the sun. This will help to protect the shine on the paintwork.

Protect the paintwork by means of periodical polishing with special products (silicone waxes) which are available from your authorised dealer. Use wax polish should the paintwork start to dull as this has a slightly abrasive action.

NOTE: *When carrying out operations involving materials or crops which may become airborne, frequently check the tractor for build up of debris around the radiator, engine and exhaust system to prevent overheating or the possibility of catching fire.*

In the event of abrasions or deep scratches that expose the metal under the paintwork, the area concerned will need to be retouched and treated immediately with specified original products as follows:

- Rub down the immediate area surrounding the damage with fine abrasive paper.
- Apply a coat of primer.
- Leave to dry and then rub down with fine abrasive paper to 'key' the surface.
- Apply the paint. For best results apply several light applications of paint rather than one heavy coat. Paint and primer are available from your authorised dealer.
- When fully dry, apply a good quality polish and buff to a shine.

SECTION 4 - LUBRICATION AND MAINTENANCE

PROTECTING THE ELECTRONIC AND ELECTRICAL SYSTEMS DURING BATTERY CHARGING OR WELDING

Precautions

To avoid damage to the electronic/electrical systems, always observe the following:

1. Never make or break any of the charging circuit connections, including the battery connections, when the engine is running.
2. Never short any of the charging components to earth.
3. Do not use a slave battery of higher than 12 volts nominal voltage.
4. Always observe correct polarity when installing the batteries or using a slave battery to jump start the engine. Follow the instructions in the operator's manual when jump starting the tractor. Connect positive to positive and negative to negative.
5. Always disconnect the earth cable from the batteries before carrying out arc welding on the tractor or on any implement attached to the tractor.

6. Position the welder earth cable clamp as close to the welding area as possible.
7. If welding is to be carried out in close proximity to a computer module, then the module should be removed from the tractor. It is recommended that this procedure be carried out by an authorised dealer.
8. Never allow welding cables to lay on, near or across any electrical wiring or electronic component while welding is in progress.
9. Always disconnect the negative cable from the batteries when charging the batteries in the tractor with a battery charger.



WARNING



Batteries contain sulphuric acid. In case of contact with skin, flush the affected area with water for five minutes. Seek medical attention immediately. Avoid contact with the skin, eyes or clothing. Wear eye protection when working near batteries.

IMPORTANT: Failure to disconnect the two earth cable connections at the battery prior to charging the batteries or welding on the tractor or attached implement will result in damage to the electronic and electrical systems.

SECTION 5 FAULT FINDING

INTRODUCTION

The following information is intended as a guide to assist in identifying and correcting possible tractor malfunctions and fault conditions.

The information provided is as follows:

- ERROR CODES
- SYSTEM TROUBLESHOOTING

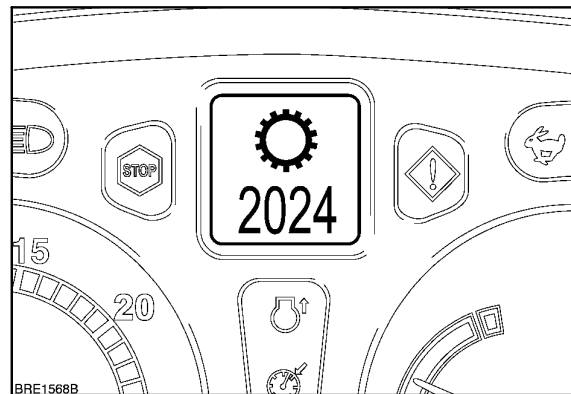
ERROR CODES

Your tractor makes extensive use of electronics to control and monitor major components within the driveline and hydraulic system. In the unlikely event of a fault occurring in one of these areas, the malfunction will be identified with a symbol (1) and a four-digit error code in the Dot Matrix Display on the instrument panel. The first digit(s) of each number provide the general location of the fault and the subsequent numbers confirm the exact nature of the fault.

First Digit	Area of Fault
0---	General fault
1---	Electronic draft control
2---	Transmission
3---	Engine
4---	Electronic Remote Valves
5---	Rear PTO
6---	Four wheel drive
7---	Differential lock
8---	Front Power Take Off
9---	Front 3-Point Hitch
10---	4WD Front Axle Suspension
14---	Instrument cluster
15---	Fast Steer

The code indicates the faulty circuit or sensor and the type of fault, e.g., open circuit, short circuit, etc. Each error code will be supported by the relevant symbol displayed above the number. In this event, the tractor will require the attention of your New Holland dealer.

Should a fault occur causing the tractor to become disabled, an error code will be displayed in the instrument panel. If this should happen and you are unable to rectify the fault yourself, contact your authorised dealer and report the error code displayed.



1

SYSTEM TROUBLE SHOOTING

The following information lists possible problems, their cause and corrective action. The systems are listed as follows:

Subject	Page
Engine	5-2
Transmission	
- Synchro Command - 12 x 12	5-5
- Dual Command - 24 x 24	5-6
- Electro Command - 16 x 16 and 17 x 16	5-7
Hydraulics	5-8
3-point linkage	5-9
Brakes	5-10
Cab	5-10
Electrical	5-11

SECTION 5 - FAULT FINDING

ENGINE

PROBLEM	POSSIBLE CAUSE	CORRECTION
Engine will not start or is difficult to start	Incorrect starting procedure. Low or no fuel. Air in fuel lines. Low ambient temperature. Contaminated fuel system. Fuel pump inoperative. Clogged fuel filter(s). Malfunctioning fuel injectors. Malfunctioning fuel solenoid or solenoid relay. Incorrect engine oil viscosity. Incorrect fuel for operating temperature. Slow starter speed.	Review starting procedure. Check fuel level. Bleed fuel system. Use cold starting aid. Clean and bleed fuel system. Check fuse. If satisfactory, replace pump. Replace fuel filter element(s). See your authorised dealer. See your authorised dealer. Use correct viscosity oil. Use correct type fuel for temperature conditions. See slow starter speed in Electrical.
Engine runs roughly and/or stalls	Clogged fuel filter(s). Contaminated fuel system. Fuel solenoid incorrectly adjusted. Fuel cap vent blocked.	Replace fuel filter element(s). Clean and bleed fuel system. See your authorised dealer. Wash cap in clean fuel oil.
Engine knocks	Fuel injection pump timing. Low engine oil level. Low engine oil pressure. Low engine operating temperature. Engine overheats.	See your authorised dealer. Add oil, as required. See your authorised dealer. Check thermostats. See Engine overheats.

SECTION 5 - FAULT FINDING

ENGINE (continued)

PROBLEM	POSSIBLE CAUSE	CORRECTION
Engine lacks power	Engine overloaded.	Shift to lower gear, reduce draft load or ballast carried.
	Air cleaner restricted.	Service air cleaner.
	Low engine operating temperature.	Check thermostats.
	Engine overheats.	See Engine overheats.
	Clogged fuel filter(s).	Replace fuel filter element(s).
	Incorrect fuel.	Use correct type fuel.
	Incorrect engine valve clearance.	Check and adjust.
	Malfunctioning fuel injectors.	See your authorised dealer.
	Malfunctioning fuel injection pump.	See your authorised dealer.
	Maximum 'no-load' speed set too low.	See your authorised dealer.
	Leaking air intake or exhaust manifold.	Check and rectify or see your authorised dealer.
	Turbocharger malfunctioning.	See your authorised dealer.
	Implement incorrectly adjusted.	See implement Operator's Manual.
Engine overheats	Low engine oil level.	Add oil, as required.
	Low engine coolant level.	Fill coolant recovery tank. Check cooling system for leaks.
	Defective thermostat(s).	Check thermostat(s).
	Dirty/blocked radiator core.	Clean.
	Excessive engine overload.	Shift to lower gear, reduce draft load or ballast carried.
	Faulty radiator pressure cap.	Replace cap.
	Cooling system blocked.	Flush cooling system.
	Loose or worn fan belt.	Check automatic tensioner, replace belt if worn.
	Leaking hose or connection.	Tighten connection and/or replace hose.
	Malfunctioning temperature gauge or sender.	See your authorised dealer.
	Malfunctioning vistronic fan.	See your authorised dealer.

SECTION 5 - FAULT FINDING

ENGINE (continued)

PROBLEM	POSSIBLE CAUSE	CORRECTION
Low engine operating temperature	Malfunctioning thermostat(s).	Replace thermostat(s).
	Vistronic fan locked up.	See your Authorised dealer.
Low engine oil pressure	Low oil level.	Add oil, as required.
	Wrong oil grade or viscosity.	Drain and refill with oil of the correct specification.
Excessive engine oil consumption	Engine oil level too high.	Reduce oil level, as required.
	Wrong oil grade or viscosity.	Drain and refill with oil of the correct specification.
	Blocked rocker box ventilation tube filter.	Replace ventilation filter.
	Malfunctioning turbocharger.	See your authorised dealer.
	External oil leaks.	Repair leaks.
	Worn valve guides/seals.	See your authorised dealer.
Excessive fuel consumption	Low engine operating temperature.	See Low engine operating temperature.
	Malfunctioning turbocharger.	See your authorised dealer.
	Engine overloaded.	Shift to lower gear, reduce draft load or ballast carried.
	Air cleaner restricted.	Service air cleaner.
	Incorrect fuel.	Use correct type fuel.
	Incorrect engine valve clearance.	Check and adjust.
	Malfunctioning fuel injectors.	See your authorised dealer.
	Malfunctioning fuel injection pump.	See your authorised dealer.
	Leaking air intake or exhaust manifold.	Check and rectify or see your authorised dealer.
	Implement incorrectly adjusted.	See implement Operator's Manual.

SECTION 5 - FAULT FINDING

TRANSMISSION - SYNCHRO COMMAND

PROBLEM	POSSIBLE CAUSE	CORRECTION
High transmission operating temperature	Low oil level. Incorrect oil grade/viscosity. Dirty or blocked transmission oil cooler.	Add oil, as required. Drain and refill with oil of the correct specification. Clean.
Noisy transmission	Low oil level. Incorrect oil grade/viscosity. Worn bearings or failed parts.	Add oil, as required. Drain and refill with oil of the correct specification. See your authorised dealer.
Gear engagement difficult	Incorrect linkage adjustment or worn linkage. Worn shift forks/selectors. Worn bearings. Air in hydraulic clutch system.	Adjust linkage, replace worn parts or see your authorised dealer. See your authorised dealer. See your authorised dealer. Bleed system or see your authorised dealer.
Jumping out of gear	Incorrect linkage adjustment or worn linkage. Worn shift forks/synchronisers. Worn bearings. Faulty detents.	Adjust linkage, replace worn parts or see your authorised dealer. See your authorised dealer. See your authorised dealer. Replace detent balls and springs or see your authorised dealer.
Holding in gear	Incorrect linkage adjustment or worn linkage. Worn couplers.	Adjust linkage, replace worn parts or see your authorised dealer. See your authorised dealer.

SECTION 5 - FAULT FINDING

TRANSMISSION - DUAL COMMAND

PROBLEM	POSSIBLE CAUSE	CORRECTION
Tractor does not drive in any gear	Error code will indicate source of malfunction.	See your authorised dealer.
Poor inching control when using inching pedal (clutch pedal)	Transmission clutch fill time out of adjustment.	See your authorised dealer.
Jerky gear shifting	Transmission clutches require calibration.	Perform transmission clutch calibration procedure or see your authorised dealer.
Jumping out of gear or holding in gear	Worn synchronisers/couplers.	See your authorised dealer.
High transmission operating temperature	Low oil level. Incorrect oil grade/viscosity. Dirty or blocked transmission oil cooler.	Add oil, as required. Drain and refill with oil of the correct specification. Clean.
Low transmission oil pressure	Low oil level. Incorrect oil grade/viscosity. Blocked transmission oil filter.	Add oil, as required. Drain and refill with oil of the correct specification. Replace filter.
Noisy transmission	Low oil level. Incorrect oil grade/viscosity. Worn bearings or failed parts.	Add oil, as required. Drain and refill with oil of the correct specification. See your authorised dealer.
Gear engagement difficult	Incorrect linkage adjustment or worn linkage. Worn shift forks/selectors. Worn bearings.	Adjust linkage, replace worn parts or see your authorised dealer. See your authorised dealer. See your authorised dealer.
Engine stalls when changing from Hi drive to Lo drive	Defective Hi drive clutch pack.	See your authorised dealer.
Engine stalls when changing from Lo drive to Hi drive	Defective Lo drive clutch pack.	See your authorised dealer.

SECTION 5 - FAULT FINDING

TRANSMISSION - ELECTRO COMMAND

PROBLEM	POSSIBLE CAUSE	CORRECTION
Tractor does not drive in any gear	Error code will indicate source of malfunction.	See your authorised dealer.
Poor inching control when using inching pedal (clutch pedal)	Transmission clutch fill time out of adjustment.	See your authorised dealer.
Jerky gear shifting	Transmission clutches require calibration.	Perform transmission clutch calibration procedure or see your authorised dealer.
Jumping out of gear or holding in gear	Worn synchronisers/couplers. Gear linkage out of adjustment.	See your authorised dealer.
High transmission operating temperature	Low oil level. Incorrect oil grade/viscosity. Dirty or blocked transmission oil cooler.	Add oil, as required. Drain and refill with oil of the correct specification. Clean.
Low transmission oil pressure	Low oil level. Incorrect oil grade/viscosity. Blocked transmission oil filter.	Add oil, as required. Drain and refill with oil of the correct specification. Replace filter.
Noisy transmission	Low oil level. Incorrect oil grade/viscosity. Worn bearings or failed parts.	Add oil, as required. Drain and refill with oil of the correct specification. See your authorised dealer.
Gear engagement difficult	Incorrect linkage adjustment or worn linkage. Worn shift forks/selectors. Worn bearings.	Adjust linkage, replace worn parts or see your authorised dealer. See your authorised dealer. See your authorised dealer.
Clutch squeal/whine when inching	Clutch leaking or drive plates worn.	See your authorised dealer.
Jerky powershifting or tractor stops	Transmission requires calibrating.	See your authorised dealer.

SECTION 5 - FAULT FINDING

HYDRAULICS

PROBLEM	POSSIBLE CAUSE	CORRECTION
Hydraulic system does not operate	Error code will indicate source of malfunction. Hydraulics oil level very low. Blocked hydraulic oil filter(s).	See your authorised dealer. Add oil, as required. Replace oil filter(s).
Hydraulic oil overheats	Hydraulics oil level too low or too high. Hydraulics oil cooler blocked. Blocked hydraulic oil filter(s). Flow control incorrectly adjusted. Hydraulic load not matched to tractor.	Adjust oil level, as required. Clean. Replace oil filter(s). Allow to cool, adjust flow control before operating again. See your authorised dealer.
Remote control valve detent disengages prematurely	Detent release pressure set too low.	Adjust detent pressure or see your authorised dealer.
Remote equipment cylinder operates too fast or too slowly	Flow control incorrectly set.	Adjust flow control.
Remote equipment does not operate	Hoses not correctly connected. Load exceeds system capacity. Remote control valve lever movement restricted.	Attach hoses correctly. Reduce load or use correct size cylinder (see your authorised dealer). Adjust cables or see your authorised dealer.

SECTION 5 - FAULT FINDING

THREE-POINT LINKAGE

PROBLEM	POSSIBLE CAUSE	CORRECTION
3-point linkage does not move when control lever is moved	Error code will indicate source of malfunction. Hitch not in phase with the control lever. Fast raise switch in external control position. Height limit control incorrectly positioned.	See your authorised dealer. Put lift control lever back in phase with lower links. Put switch in correct position. Adjust height limit control.
External power lift control does not operate	Fast raise switch not in external control position.	Centralise switch (external control position).
3-point linkage does not raise fully	Height limit control incorrectly positioned.	Adjust height limit control.
3-point linkage drops slowly	Drop rate control incorrectly positioned.	Adjust drop rate control.
3-point linkage slow to respond to draft loads	Position/draft control incorrectly adjusted. Drop rate too slow. Implement not functioning properly.	Adjust position/draft control. Adjust drop rate control. See implement operator's manual.
3-point linkage too responsive to draft loads	Position/draft control incorrectly adjusted.	Adjust position/draft control.
3-point linkage status light flashes continually	Position/draft control incorrectly adjusted.	Adjust position/draft control.

SECTION 5 - FAULT FINDING

BRAKES

PROBLEM	POSSIBLE CAUSE	CORRECTION
Pedal(s) feel spongy	Air in system.	System requires bleeding. See your authorised dealer.
Excessive brake pedal travel	Brake piston seal leaking. Brake bleed valve leaking. Leakage in brake valve(s) Worn brake discs.	See your authorised dealer. See your authorised dealer. See your authorised dealer. See your authorised dealer.

CAB

PROBLEM	POSSIBLE CAUSE	CORRECTION
Dust enters the cab	Improper seal around filter element(s). Blocked filter(s). Defective filter. Damaged seals around doors/windows or roof hatch.	Check seal condition. Clean or replace filters. Replace filter. Replace seal(s).
Low pressuriser air flow	Blocked filter(s). Heater or evaporator core blocked.	Clean or replace filters. See your authorised dealer.
Air conditioner does not produce cool air	Heater control turned on. Condenser blocked. Drive belt slipping, worn or damaged. Low refrigerant level.	Turn temperature control knob fully anti-clockwise. Clean radiator, condenser and oil cooler. Check automatic belt tensioner and belt condition. See your authorised dealer.

SECTION 5 - FAULT FINDING

ELECTRICAL SYSTEM

PROBLEM	POSSIBLE CAUSE	CORRECTION
Electrical system completely inoperative	Loose or corroded battery connections. Sulphated batteries.	Clean and tighten connections. Check battery open circuit voltage for minimum 12.6 volts. Check electrolyte level and specific gravity.
Starter speed slow - engine cranks slowly	Loose or corroded battery connections. Low battery output. Incorrect viscosity engine oil.	Clean and tighten connections. Check battery open circuit voltage for minimum 12.6 volts. Check electrolyte level and specific gravity. Use correct viscosity oil for ambient temperature.
Starter inoperative	Loose or corroded battery or starter motor connections. Dead batteries. Starter safety switch(es) operative.	Clean and tighten connections. Charge or replace batteries. Place all gear shift levers in neutral and fully depress clutch pedal.
Alternator light stays on with engine running	Low engine idle speed. Broken/loose drive belt. Malfunctioning batteries. Malfunctioning alternator	Increase engine idle speed. Check belt and automatic belt tensioner. Check battery open circuit voltage for minimum 12.6 volts. Check electrolyte level and specific gravity. Have alternator checked by your authorised dealer.
Batteries will not charge	Malfunctioning alternator Loose or corroded terminals. Loose or worn drive belt. Malfunctioning batteries.	Have alternator checked by your authorised dealer. Clean and tighten connections. Check belt and automatic belt tensioner. Replace belt, if required. Check battery open circuit voltage for minimum 12.6 volts. Check electrolyte level and specific gravity.

This image shows a full page of blank handwriting practice paper. It features 20 evenly spaced, horizontal blue lines running across the entire width of the page. The lines are uniform in thickness and color, providing a guide for letter height and placement. There are no margins, text, or other markings on the paper.

SECTION 6 VEHICLE STORAGE

The following text is given for your information and guidance. For further information concerning long term storage of your tractor, please consult your authorised dealer.

TRACTOR STORAGE

Before storing the tractor for an extended period, the following precautions should be taken:

- Clean the tractor.
- Drain the engine and transmission/rear axle and refill with clean oil.
- Drain the fuel tank(s) and pour approximately two gallons of special calibrating fuel into the tank. Run the engine for at least 10 minutes to ensure complete distribution of the calibrating fuel throughout the injection system. See the next item before running the engine.
- Check the radiator coolant level. If the coolant is within 200 hours of the next change, drain, flush and refill the system. See Operation 32 in Section 4. Run the engine for one hour to disperse the coolant throughout the system.
- Lubricate all grease fittings.
- Using the tractor hydraulic system in Position Control, raise the lift linkage and support the lift arms in the raised position.
- Lightly coat all exposed hydraulic piston rods with petroleum jelly, e.g., power steering cylinder rams, lift assist rams, spool valves, etc.
- Remove the batteries and store in a warm, dry atmosphere. Recharge periodically.

- Raise the tractor and place supports under the axles to take the weight off the tyres.
- Cover the exhaust pipe opening.

PREPARATION FOR USE AFTER STORAGE

After extended storage, prepare the tractor for further use, as follows:

- Inflate the tyres to the correct pressure and lower the tractor to the ground.
- Refill the fuel tank(s).
- Check the radiator coolant level.
- Check all oil levels.
- Install fully charged batteries.
- Remove the exhaust pipe covering.
- Start the engine and check that all instruments and controls are functioning correctly. Using the tractor hydraulic system in Position Control, fully raise the lift linkage and remove the supports.
- Check operation of heating and air conditioning systems (where fitted).
- Drive the tractor without a load to ensure that it is operating satisfactorily.

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SECTION 7 ACCESSORIES

This section of the Manual describes the function and operation of features that are available for your tractor as dealer installed accessories. Unless otherwise stated, these features may also be available as factory fitted options.

Maintenance requirements for these features will be found in Section 4 - Lubrication and Maintenance.

This subjects covered in this section are shown on the right. A comprehensive index is provided at the end of this book.

Subject	Page
Engine Coolant Immersion Heater	7-2
Transmission Oil Heater	7-2
40 Amp Socket and Cable	7-3
Auxiliary Headlights	7-3
Battery Isolator Switch	7-4
Loader Subframe and Control Valve (Joystick)	7-5
Remote Valve Zero Detent Kits	7-8

COOLANT IMMERSION HEATER

This dealer installed accessory consists of a heating element fitted into one of the core plug apertures on the right-hand side of the block. The heater is available in 115 volts A.C only. This accessory provides easier starting down to -29°C (-20°F).



WARNING



To avoid shocks or other injuries, never use an unearthed or inadequate extension lead. Always use an earthed, three core extension lead, which is rated for at least a 15 amp load, in conjunction with a residual current circuit breaker or earth leakage trip device.

To operate the heater, connect the plug on the free end of the heater cable (1) to a suitable 115 volt outlet (or 230 volt using a transformer), for up to four hours before carrying out the cold weather starting procedure.

NOTE: *The heater may be left plugged in for more than four hours without harm. However, no noticeable increase in the heater's effectiveness will be achieved after this period.*

TRANSMISSION OIL HEATER

This dealer installed accessory consists of a 115 volts A.C. heating element installed in the transmission housing. A cable connected to the heater is clipped to the left of P.T.O. shaft housing. This accessory provides for faster warm up of the transmission/hydraulic oil when operating in cold climates.



WARNING



To avoid shocks or other injuries, never use an unearthed or inadequate extension lead. Always use an earthed, three core extension lead, which is rated for at least a 15 amp load, in conjunction with a residual current circuit breaker or earth leakage trip device.

To operate the heater, connect the plug on the free end of the heater cable (1) to a suitable 115 volt outlet (using a voltage transformer, if necessary) for up to four hours before starting the engine.

NOTE: *The heater may be left plugged in for more than four hours without harm. However, no noticeable increase in the heater's effectiveness will be achieved after this period.*

SECTION 7 - ACCESSORIES

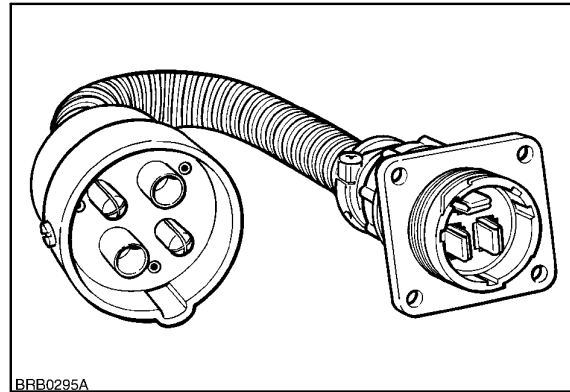
ADDITIONAL 40 AMP SOCKET

A second 4-pin, 40 amp socket is available as a dealer installed accessory. The socket is mounted on the underside of the lower, right-hand windscreen frame.

A 4-pin to SAE 3-pin adaptor cable is available as an accessory from your dealer. (See Figure 2).

4-PIN TO 3-PIN ADAPTOR

A 4-pin to SAE 3-pin adaptor cable is available as an accessory from your dealer. The adaptor may be used with the 4-pin, 40 amp implement socket.

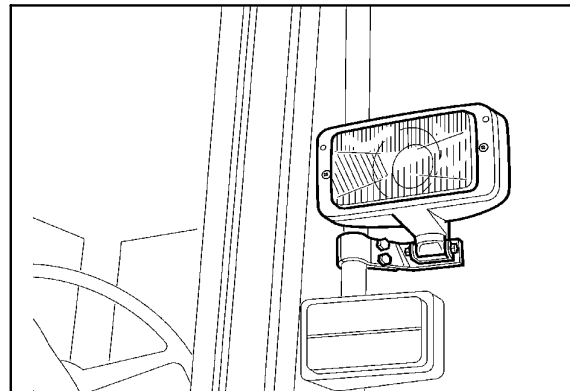


2

AUXILIARY HEADLIGHTS

A set of additional dipping headlights are available for use with front mounted equipment. Located on the upper right and left-hand grab rails, the headlight beams pass over front mounted equipment to illuminate the road ahead.

To turn on the auxiliary headlights, depress the switch on the lower left side of the instrument panel. When switched on the auxiliary headlight beams may be dipped using the multi-function switch on the left of the steering column.



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SECTION 7 - ACCESSORIES

BATTERY ISOLATOR SWITCH

Before disconnecting battery power with the isolator, ensure the key-start and any other electrical switches are turned OFF.

IMPORTANT: After turning the tractor key-start off, wait for 60 seconds before isolating the battery power. This will permit any unsaved information in the tractor electronic processors to be memorised.

An inbuilt power reserve will maintain a small amount of power to supply the electronic processors and radio memories when the tractor battery is isolated.

Electronic Operation

The solenoid operated battery isolator is controlled by a switch (1) located on the left-hand cab 'C' pillar.

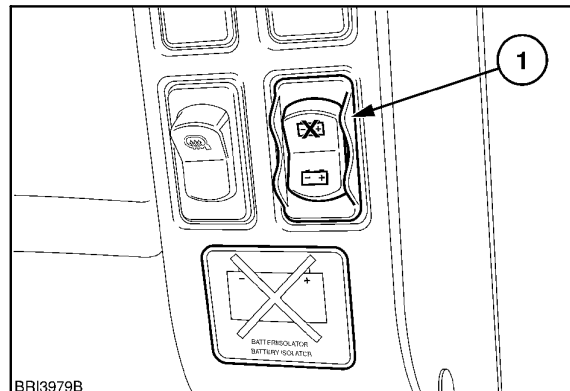
Depress the top of the switch to disconnect battery power, an audible warning will sound for approximately 5 seconds. Depress the bottom of the switch to re-connect battery power.

IMPORTANT: When in the 'ON' position, the isolator switch solenoid consumes a small amount of electrical power. If the tractor is left for an extended period of time with the isolator on, battery power may be reduced. Always turn the battery isolator switch 'OFF' when the tractor is not in use.

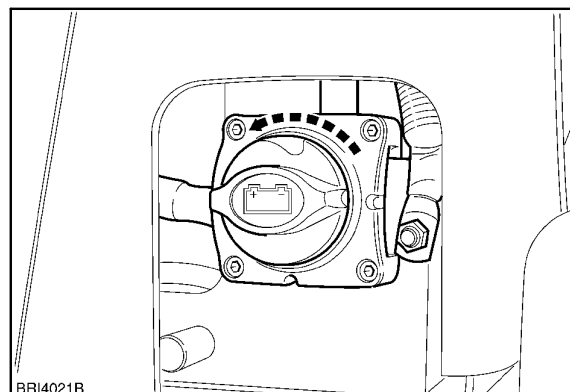
NOTE: The key-start switch must be in the 'OFF' or 'ACCESSORIES' position to operate the battery isolator, it will not function with the key-start in the 'ON' (run) position.

Mechanical Operation

The mechanical isolator switch is attached to the battery carrier on the right-hand side of the tractor. Rotate the switch $\frac{1}{4}$ turn anti-clockwise (position 'O', red background) to disconnect battery power.



4



5

LOADER SUBFRAME and CONTROL VALVE (JOYSTICK)

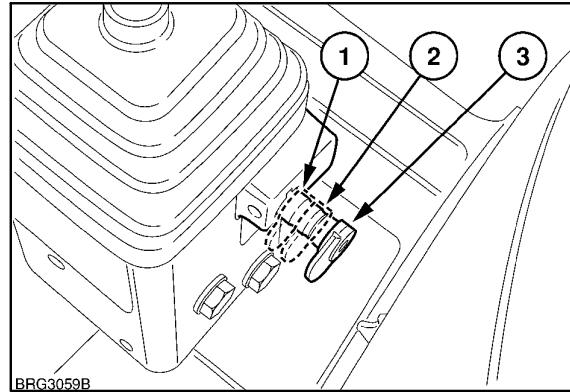
Operating

If your tractor is equipped with the optional front loader, a mid mounted remote control valve with two spools will have been fitted. The valves are controlled by a joystick mounted on the right-hand side of the seat. The joystick is able to operate two services simultaneously by moving it diagonally.

The lever lock provides selective control of the joystick. With the lock pushed fully in, position (1), the joystick is fixed in neutral and the remote valves cannot be operated, either by accident or by choice.

If the lock is pulled fully out, position (3), valves I and II may be operated independently or together by moving the joystick control in the appropriate direction.

In the intermediate position (2), lateral movement of the joystick that operates valve II is locked.



6

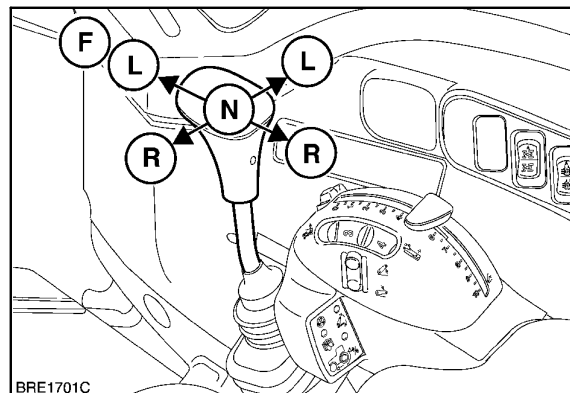
Joystick Operation

Pull the joystick rearwards (R) to raise the loader. If required, pulling the joystick fully rearward against spring pressure will provide a faster rate of lift.

Pushing the joystick forward to the 'lower' position (L) will cause the loader to lower to the ground at a controlled rate of descent.

Further forward movement of the joystick will select 'float' (F) which will allow the loader arms to move up and down freely. When using the float position to lower the loader, pushing the joystick fully forward against spring pressure will cause the rate of drop to slow.

Moving the joystick to the left (R) will cause the bucket to roll upwards (crowd), moving the joystick to the right (L) will roll the bucket out (dump).



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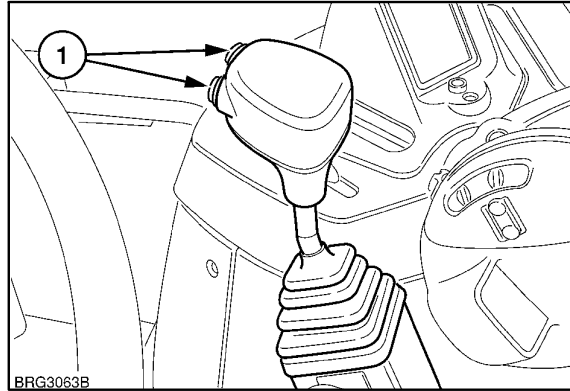
IMPORTANT: Do not hold the lever in the raise or lower positions once the loader or bucket cylinder has reached the extent of its travel. This will cause the relief valve to 'blow' which, if occurring over an extended period, may overheat the oil.

SECTION 7 - ACCESSORIES

Additional Services (where fitted)

Your loader may be equipped with additional functions activated using the buttons (1) on the joystick knob.

Depending on loader specification, up to three buttons may be fitted to the joystick. Consult the loader Operator's Manual for further information.



8

Attaching the Loader to the Subframe



CAUTION



Before attempting to connect or disconnect the loader hydraulic services, switch OFF the tractor engine and relieve any pressure in the hydraulic hoses by individually selecting both FLOAT positions. Place the joystick control in Neutral.

Dependent on country, different procedures are used for removing and attaching the front loader arms. Consult the installation instructions in your loader manual.

IMPORTANT: Before connecting the loader hydraulic hoses, stop the engine and thoroughly clean the connections to prevent oil contamination. Loader cylinders are operated by oil drawn from the tractor hydraulic system, therefore, always check and replenish the hydraulic system oil after the loader cylinders have been connected and cycled a few times. Operating the tractor with a low oil level may result in damage to the rear axle and transmission components.

SECTION 7 - ACCESSORIES

Connecting the Loader Hydraulics

IMPORTANT: To ensure good contact between the tractor and loader hydraulic manifolds, ensure the mating surfaces of both manifolds are clean and free of debris before clamping together.

With the loader securely mounted on the tractor sub-frame, lift the protective cover (2) on the tractor hydraulic connector manifold until it locks in the vertical position.

Pull out the lock button (1), and lift the handle (4) of the clamp arm upwards until sufficient clearance is obtained to manoeuvre the loader manifold into position. Ensure the two guide pins on the loader manifold align with the holes (3) in the tractor manifold.

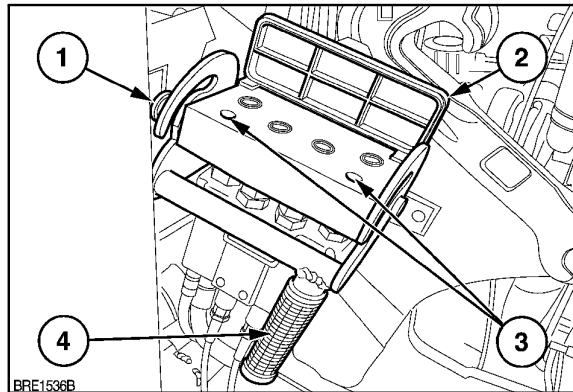
Pull down the clamp handle until the lock button engages in the manifold block.

IMPORTANT: Whenever the loader is removed from the tractor, always ensure the cover for the manifold is fully closed to prevent ingress of dust and debris.

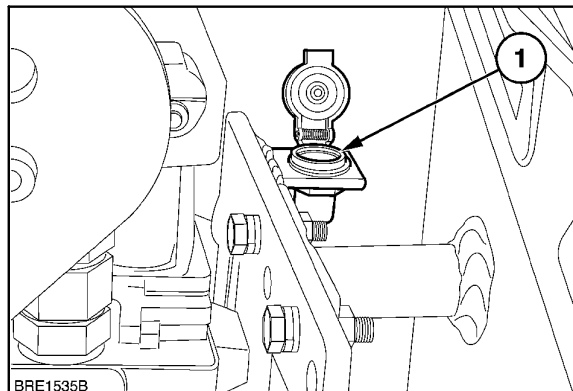
Connecting Additional Services

Additional services are electronically controlled via a cable that connects to a socket (1) on the loader subframe. When the loader is removed from the tractor ensure the cover on the electrical socket is closed to protect the internal components.

After re-fitting the loader, start the tractor engine and cycle the loader joystick through all movements, stop the engine and check for any oil leaks.



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10

REAR REMOTE VALVE ZERO DETENT KITS

If your tractor is fitted with a non New Holland front loader, the rear remote valves may be used to provide the hydraulic power. For efficient operation it is recommended valves 1 and 2 are converted to non detent functionality.

Valve 1. Convert using kit part No. 719.362.010.
This kit retains detent operation on the float position only, used for grading or backfilling applications.

Valve 2. Convert using kit part No. 718.362.010.
Removes the detents from all positions and restricts valve operation to Raise, Neutral and Lower (float removed).

SECTION 8

TRACTOR SPECIFICATION

GENERAL

The specification figures in this section are provided for your information and guidance. For further information concerning your tractor and equipment, consult your New Holland dealer.

New Holland policy is one of continuous improvement and the right to change prices, specification or equipment at any time without notice is reserved.

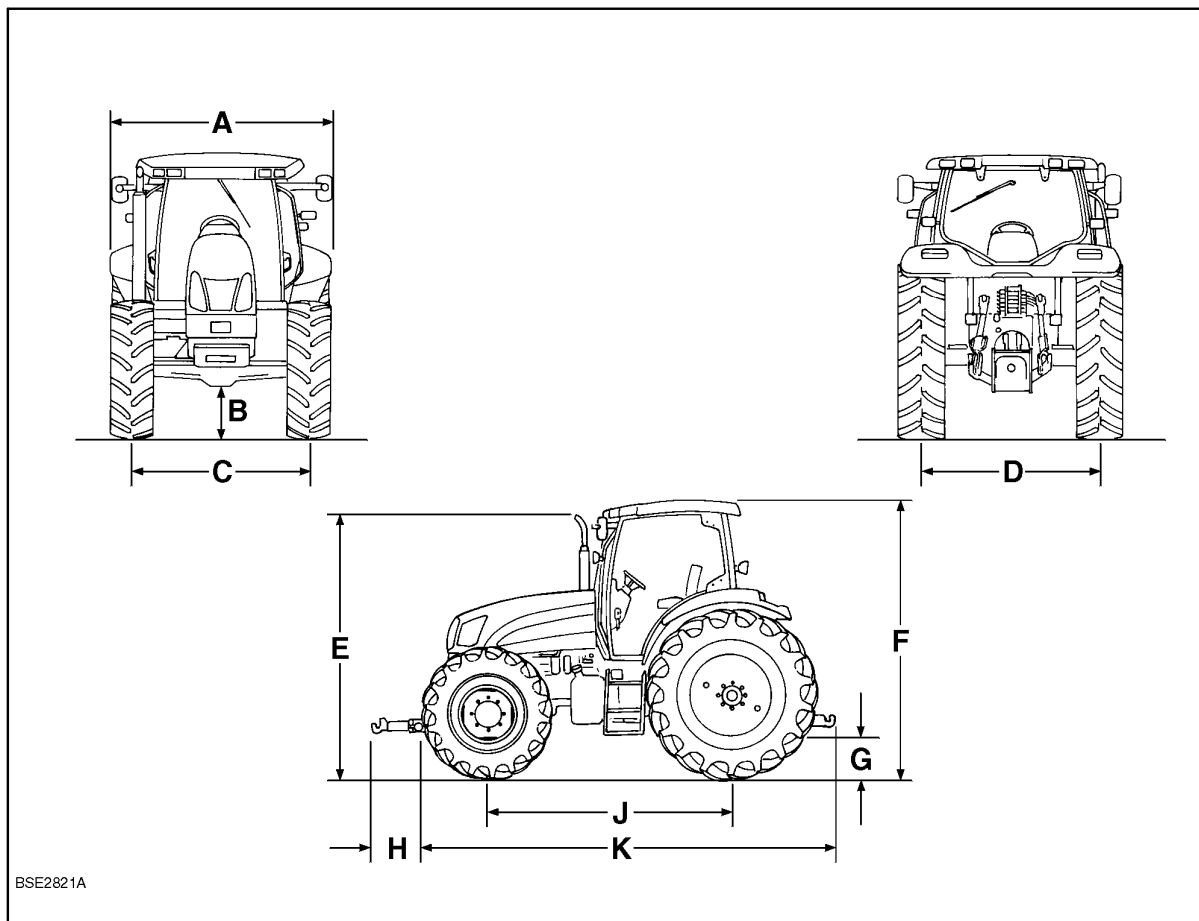
All data given in this manual is subject to production variations. Dimensions and weight are approximate only. The illustrations do not necessarily show tractors in standard condition or imply that these features are available in all countries. For exact information about any particular tractor, please consult your New Holland dealer.

Subject	Page
General Dimensions	8-2
Vehicle Weights	8-6
Lubricant and Fluid Capacities	8-8
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SECTION 8 - SPECIFICATIONS

GENERAL DIMENSIONS

T6010 and T6020,



NOTE: The following dimensions are based on **standard** tractors fitted with tyre sizes as shown. Allowance must be made for tyres of larger or smaller dimensions:

		T6010 and T6020	
		2WD	4WD
The following dimensions are based on tractors with tyre sizes shown:	Front	7.50 x 16	14.9 R24
	Rear	16.9 R38	16.9 R38
A. Width across fenders			
Standard fenders	mm	2170	2170
	in	85.4	85.4
Extended fenders	mm	2550	2550
	in	100.3	100.3

SECTION 8 - SPECIFICATIONS

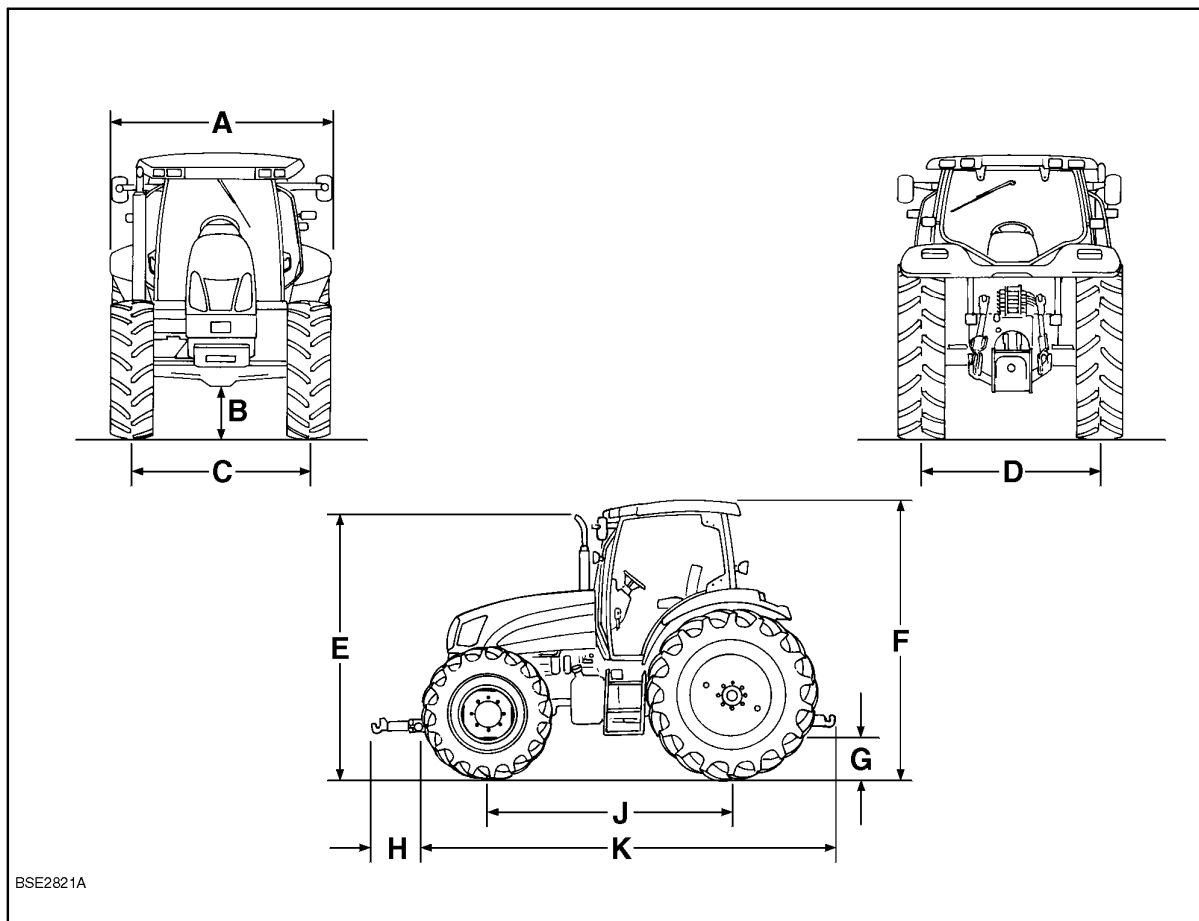
GENERAL DIMENSIONS		T6010 and T6020	
		2WD	4WD
B. Ground clearance below front axle	mm	472 Std / 522 HD	427
	in	18.5 Std / 20.5 HD	16.8
C. Front track setting	mm	1422 - 2134	1407 - 2108
	in	56.0 - 84.0	55.4 - 83.0
D. Rear track setting	mm	1426 - 2026	1426 - 2026
	in	56.1 - 79.8	56.1 - 79.8
E. Height to top of exhaust (with Standard Cab)	mm	2876	2876
	in	113.2	113.2
(with Low Profile Cab)	mm	2726	2726
	in	107.3	107.3
F. Height to: - Top of Standard Cab	mm	2856	2856
	in	115.0	115.0
- Top of Low Profile Cab	mm	2775	2775
	in	109.2	109.2
- Top of ROPS	mm	2856	2856
	in	112.4	112.4
G. Ground clearance below drawbar	mm	426	426
	in	16.7	16.7
H. Front hitch projection	mm	-	725
	in	-	28.5
J. Wheelbase	mm	2370	2412
	in	93.3	94.9
K. Overall length to end of lower links	mm	4145	4182
	in	163.1	164.6
Minimum turn radius (with brakes)	mm	3277	3540
	in	129.0	139.3
(without brakes)	mm	3660	4940
	in	144.0	194.4

NOTE: If your tractor has tyres of a different size then the above dimensions will vary due to the difference in the rolling radius and section width of the tyres fitted.

SECTION 8 - SPECIFICATIONS

GENERAL DIMENSIONS

T6030, T6050 and T6070



NOTE: The following dimensions are based on **standard** tractors fitted with tyre sizes as shown. Allowance must be made for tyres of larger or smaller dimensions:

		T6030, T6050 2WD	T6030, T6050, T6070 4WD
The following dimensions are based on tractors with tyre sizes shown:	Front	10.00 x 16	14.9 R28
	Rear	18.4 R38	18.4 R38
A. Width across fenders			
Standard fenders	mm	2170	2170
	in	85.4	85.4
Extended fenders	mm	2550	2550
	in	100.3	100.3

SECTION 8 - SPECIFICATIONS

GENERAL DIMENSIONS		T6030, T6050 2WD	T6030, T6050, T6070 4WD
B. Ground clearance below front axle	mm	507 Std / 557 HD	478
	in	19.9 Std / 21.9 HD	18.8
C. Front track setting	mm	1422 - 2134	1407 - 2108
	in	56.0 - 84.0	55.4 - 83.0
D. Rear track setting	mm	1426 - 2026	1426 - 2026
	in	56.1 - 79.8	56.1 - 79.8
E. Height to top of exhaust (with Standard Cab)	mm	2920	2920
	in	114.9	114.9
(with Low Profile Cab)	mm	2770	2770
	in	109.0	109.0
F. Height to: - Top of Standard Cab	mm	2900	2900
	in	116.7	116.7
- Top of Low Profile Cab	mm	2819	2819
	in	111.0	111.0
- Top of ROPS (n/a on T6070)	mm	2900	2900
	in	114.1	114.1
G. Ground clearance below drawbar	mm	470	470
	in	18.5	18.5
H. Front hitch projection	mm	-	675
	in	-	26.5
J. Wheelbase	mm	2652	2661
	in	104.4	104.7
K. Overall length to end of lower links	mm	4385	4481
	in	172.6	176.4
Minimum turn radius (with brakes)	mm	3277	3720
	in	129.0	146.4
(without brakes)	mm	3660	5360
	in	144.0	211.0

NOTE: If your tractor has tyres of a different size then the above dimensions will vary due to the difference in the rolling radius and section width of the tyres fitted.

SECTION 8 - SPECIFICATIONS

WEIGHTS		T6010	T6020	T6030	T6050	T6070
2WD - with Standard Cab						
On front axle	kg	1362	1362	1482	1482	1482
	lb	3002	3002	2367	2367	2367
On rear axle	kg	3178	3178	3458	3458	3458
	lb	7006	7006	7623	7623	7623
Total weight	kg	4540	4540	4940	4940	4940
	lb	10008	10008	10890	10890	10890
2WD - with Low Profile Cab						
On front axle	kg	1500	1500	ina	ina	ina
	lb	3807	3807			
On rear axle	kg	2710	2710	ina	ina	ina
	lb	5974	5974			
Total weight	kg	4210	4210	ina	ina	ina
	lb	9281	9281			
4WD - with Standard Cab						
On front axle	kg	1884	1884	2044	2044	2044
	lb	4153	4153	4506	4506	4506
On rear axle	kg	2826	2826	3066	3066	3066
	lb	6230	6230	6759	6759	6759
Total weight	kg	4710	4710	5110	5110	5110
	lb	10383	10383	11265	11265	11265
4WD - with Low Profile Cab						
On front axle	kg	1872	1872	2008	2008	2008
	lb	4127	4127	4426	4426	4426
On rear axle	kg	2706	2706	3134	3134	3134
	lb	5966	5966	6909	6909	6909
Total weight	kg	4578	4578	5142	5142	5142
	lb	10093	10093	11336	11336	11336

NOTE: The above weights are based on standard production tractors with full fuel tank, but without driver, ballast or additional equipment.

SECTION 8 - SPECIFICATIONS

WEIGHTS (continued)		T6010	T6020	T6030	T6050	T6070
2WD - with ROPS						
On front axle	kg	1233	1233	1359	1359	1359
	lb	2718	2718	2996	2996	2996
On rear axle	kg	2877	2877	3171	3171	3171
	lb	6342	6342	6990	6990	6990
Total weight	kg	4110	4110	4530	4530	4530
	lb	9060	9060	9986	9986	9986
4WD - with ROPS						
On front axle	kg	1712	1712	1880	1880	1880
	lb	3774	3774	4144	4144	4144
On rear axle	kg	2568	2568	2820	2820	2820
	lb	5661	5661	6216	6216	6216
Total weight	kg	4280	4280	4700	4700	4700
	lb	9435	9435	10361	10361	10361

NOTE: The above weights are based on standard production tractors with full fuel tank, but without driver, ballast or additional equipment.

SECTION 8 - SPECIFICATIONS

CAPACITIES		T6010	T6020	T6030	T6050	T6070
Fuel tank	Litres	180	180	254	254	254
	US gals	47.5	47.5	67.0	67.0	67.0
Cooling system (with cab)	Litres	23	23	25	25	25
	US gals	6.07	6.07	6.6	6.6	6.6
Cooling system (less cab)	Litres	21	21	23	23	23
	US gals	5.54	5.54	6.07	6.07	6.07
Engine (including filter)	Litres	10	10	15	15	15
	US gals	2.64	2.64	3.96	3.96	3.96
Transmission and rear axle						
(with 12 x 12, light duty axle)	Litres	58	58	-	-	-
	US gals	15.3	15.3	-	-	-
(with 12 x 12, heavy duty axle)	Litres	65	65	65	65	-
	US gals	17.1	17.1	17.1	17.1	-
(with 24 x 24, light duty axle)	Litres	58.5	58.5	-	-	-
	US gals	15.4	15.4	-	-	-
(with 24 x 24, heavy duty axle)	Litres	65.5	65.5	65.5	65.5	65.5
	US gals	17.3	17.3	17.3	17.3	17.3
(with 16 x 16, light duty axle)	Litres	55	55	-	-	-
	US gals	14.5	14.5	-	-	-
(with 16 x 16, heavy duty axle)	Litres	62	62	62	62	62
	US gals	16.3	16.3	16.3	16.3	16.3
4WD Front axle differential (Class 3 axles)	Litres	9.0	9.0	9.0	9.0	9.0
	US qts	9.5	9.5	9.5	9.5	9.5
4WD Front hubs						
(Class 3)	Litres	1.25	1.25	1.25	1.25	1.25
	US qts	1.3	1.3	1.3	1.3	1.3
(Class 3 with brakes)	Litres	3.0	3.0	3.0	3.0	3.0
	US qts	3.2	3.2	3.2	3.2	3.2

NOTE: When operating remote cylinders, the rear axle oil level will be affected. When topping up the rear axle to accommodate the oil requirement of remote cylinders, no more than 20 litres (5.28 U.S. gallons) should be added to bring the oil level up to the upper mark on the dipstick when all rams are fully extended.

Alternatively, remote cylinders with an oil capacity of up to 18 litres (4.75 U.S. gallons) may be connected to the tractor hydraulic system without adding oil, provided the tractor is being operated on level ground.

SECTION 8 - SPECIFICATIONS

ENGINE		T6010	T6020	T6030	T6050	T6070
Advertised engine power (at rated speed, ISO TR 14396)	Kw	74	82	86	93	104
	Hp (cv)	101	112	117	127	142
Number of cylinders		4	4	6	6	6
Valves per cylinder		2	2	2	2	2
Aspiration		Turbo	Turbocharged and intercooled			
Bore	mm	104	104	104	104	104
	in.	4.0	4.0	4.0	4.0	4.0
Stroke	mm	132	132	132	132	132
	in.	5.19	5.09	5.09	5.19	5.19
Displacement	cm ³	4485	4485	6728	6728	6728
	in ³	273	273	410	410	410
Compression ratio		17.5:1	17.5:1	17.5:1	17.5:1	17.5:1
Firing order		1.3.4.2.		1.5.3.6.2.4.		
Rated engine speed	rev/min	2200	2200	2200	2200	2200
Idle speed	rev/min	850-950			850-950	
Maximum no-load speed	rev/min	2375			2375	
Valve tappet clearance (cold)						
Intake	mm	0.25	0.25	0.25	0.25	0.25
	in.	0.010	0.010	0.010	0.010	0.010
Exhaust	mm	0.51	0.51	0.51	0.51	0.51
	in.	0.020	0.020	0.020	0.020	0.020
FUEL SYSTEM						
System type		Mechanical fuel injection				
Fuel injection pump		Delphi		Bosch VE mechanical		
Dynamic timing (BTDC)		0°	1.5°	5°	5°	5°

SECTION 8 - SPECIFICATIONS

COOLING SYSTEM		T6010	T6020	T6030	T6050	T6070
Type		Pressurised, with full flow bypass and recovery tank				
Cooling fan, number of blades						
Fixed drive		5	5	5	5	5
Viscous drive		5	5	5	5	5
Diameter	mm	510	510	510	510	510
	in.	20.0	20.0	20.0	20.0	20.0
Thermostat						
Begins to open at:	° C	81	81	81	81	81
	° F	178	178	178	178	178
Fully open at:	° C	96	96	96	96	96
	° F	205	205	205	205	205
Radiator pressure cap	bar	1.0	1.0	1.0	1.0	1.0
	lbf.in ²	14.5	14.5	14.5	14.5	14.5
TRANSMISSION						
Synchro Command	12x12	30 km/h	30 km/h	30 km/h	30 km/h	-
Dual Command	24x24	30 km/h	30 km/h	30 km/h	30 km/h	30 km/h
	24x24	*40 km/h	*40 km/h	*40 km/h	*40 km/h	*40 km/h
Electro Command	16x16	30 km/h	30 km/h	30 km/h	30 km/h	30 km/h
	16x16	*40 km/h	*40 km/h	*40 km/h	*40 km/h	*40 km/h
	17x16	*50 km/h	*50 km/h	*50 km/h	*50 km/h	*50 km/h
* 4WD tractors only						
Clutch type - 12x12	mm	330	330	355	355	-
	in.	13.0	13.0	14.0	14.0	-
Clutch type - 24x24						
Oil immersed disc, No. of plates			6 friction plates + 6 steel plates			
Clutch type - 16x16 (17x16)						
Oil immersed disc, No. of plates			4 friction plates + 4 steel plates			
Creeper Gear Operation						
12x12 transmission		Lever	Lever	Lever	Lever	-
24x24 and 16x16 transmission		Switch	Switch	Switch	Switch	Switch

SECTION 8 - SPECIFICATIONS

BRAKES	T6010	T6020	T6030	T6050	T6070
Service Brake	Self adjusting, oil immersed disc acting on differential shafts				
Number of discs per side	1 friction and 1 steel				
Parking brake	Oil immersed discs acting on bevel pinion shaft				
Number of discs	3	3	3	3	3
REAR POWER TAKE-OFF					
Availability					
- Two speed	540/1000 shiftable, independent				
- Two Speed	540/1000 non-shiftable, independent				
- Three Speed	540/540E/1000 shiftable, independent				
- Groundspeed	540/540E/1000 shiftable, independent				
Engine speed @ PTO speed					
- 540	1969	1969	1969	1969	1969
- 540E	1546	1546	1546	1546	1546
- 1000 (shiftable and non-shiftable)	2120	2120	2120	2120	2120
Groundspeed PTO					
PTO Shaft revolutions per rear wheel revolution					
- With light duty rear axle					
- 540	8.83 : 1		-	-	-
- 540E	11.24 : 1		-	-	-
- 1000	15.19 : 1		-	-	-
- With heavy duty rear axle					
- 540	9.93 : 1	9.93 : 1	9.93 : 1	9.93 : 1	9.93 : 1
- 540E	12.65 : 1	12.65 : 1	12.65 : 1	12.65 : 1	12.65 : 1
- 1000	17.08 : 1	17.08 : 1	17.08 : 1	17.08 : 1	17.08 : 1
Fender mounted PTO controls (except North America)	Optional (except 12 x 12 trans)				

SECTION 8 - SPECIFICATIONS

FRONT POWER TAKE-OFF

(4WD tractors only)

T6010

T6020

T6030

T6050

T6070

Type - Single speed, fully independent

- Shaft

6 Spline 39.4mm (1.375 in.)

- Operation

Electro-hydraulic

- Direction of rotation

Anti-clockwise

Engine speed @ PTO speed

- with 1000 rpm shaft

All models, 2120 e.r.p.m.

STEERING

Type

Hydrostatic with tilt/telescoping steering wheel

Turns from lock to lock

- 2WD

3.35

3.35

3.35

3.35

3.35

- 4WD

3.9

3.9

3.9

3.9

3.9

- 4WD with Fast Steer activated

10° right or left from the straight ahead position

Front wheel alignment

mm

0 - 13

0 - 13

0 - 13

0 - 13

0 - 13

2 wheel drive

in.

0 - 0.5

0 - 0.5

0 - 0.5

0 - 0.5

0 - 0.5

Front wheel alignment

mm

0°/- 3

0°/- 3

0°/- 3

0°/- 3

0°/- 3

4 wheel drive

in.

0°/-0.12

0°/-0.12

0°/-0.12

0°/-0.12

0°/-0.12

MAXIMUM OPERATING ANGLE

Front end up

All models, 35°

Rear end up

All models, 35°

Right-side up

All models, 30°

Left-side up

All models, 30°

SECTION 8 - SPECIFICATIONS

HYDRAULIC SYSTEM		T6010	T6020	T6030	T6050	T6070
Hydraulic pump availability:						
63 ltr fixed displacement pump		With Mechanical or Electronic Draft Control				-
80 ltr fixed displacement pump		With Electronic Draft Control				
113 ltr variable displacement pump		With Mechanical Draft Control				-
113 ltr variable displacement pump		With Electronic Draft Control				
Flow at rated engine speed						
Fixed displacement pump	Litres/min	63	63	63	63	-
	US gal/min	16.6	16.6	16.6	16.6	-
High flow fixed displacement pump	Litres/min	80	80	80	80	80
	US gal/min	21.1	21.1	21.1	21.1	21.1
Variable displacement pump	Litres/min	113	113	113	113	113
	US gal/min	29.8	29.8	29.8	29.8	29.8
Maximum system pressure at rated engine speed						
63 ltr fixed displacement pump	bar	200 ⁺ / ₅	200 ⁺ / ₅	200 ⁺ / ₅	200 ⁺ / ₅	-
	lbf.in ²	2900 ⁺ / ₇₂	2900 ⁺ / ₇₂	2900 ⁺ / ₇₂	2900 ⁺ / ₇₂	-
80 ltr fixed displacement pump	bar	200 ⁺ / ₅	200 ⁺ / ₅	200 ⁺ / ₅	200 ⁺ / ₅	200 ⁺ / ₅
	lbf.in ²	2900 ⁺ / ₇₂	2900 ⁺ / ₇₂	2900 ⁺ / ₇₂	2900 ⁺ / ₇₂	2900 ⁺ / ₇₂
Variable displacement pump	bar	210 ⁺ / ₅	210 ⁺ / ₅	210 ⁺ / ₅	210 ⁺ / ₅	210 ⁺ / ₅
	lbf.in ²	3046 ⁺ / ₇₂	3046 ⁺ / ₇₂	3046 ⁺ / ₇₂	3046 ⁺ / ₇₂	3046 ⁺ / ₇₂

SECTION 8 - SPECIFICATIONS

REAR THREE POINT LIFT

Linkage Category

- with MDC*	Cat II w/fixed link ends	-
- with MDC	Cat II w/flexible link ends	-
- with EDC*	Cat II w/flexible link ends	
- with EDC	Cat II/III w/flexible link ends	
- with MDC	Cat II w/quick attach link ends	-
- with MDC	Cat II/III w/quick attach link ends	-
- with EDC	Cat II/III w/quick attach link ends	

*MDC = Mechanical Draft Control

*EDC = Electronic Draft Control

LIFT CAPACITIES

Manufacturers' figures to OECD criteria - maximum lift capacity, 610 mm (24 in) behind link ends through full lift range at 90% of maximum hydraulic pressure:

without assist ram

- with Fixed link ends	kg	2248	2248	2248	2248	-
	lbs	4957	4957	4957	4957	-
- with Flexible link ends	kg	1992	1992	1992	1992	-
	lbs	4390	4390	4390	4390	-
- with Quick attach link ends	kg	2248	2248	2248	2248	-
	lbs	4957	4957	4957	4957	-

with 1 x 50mm assist ram

- with Fixed link ends	kg	3341	3341	3341	3341	-
	lbs	7365	7365	7365	7365	-
- with Flexible link ends	kg	3069	3069	3069	3069	-
	lbs	6765	6765	6765	6765	-
- with Quick attach link ends	kg	3344	3344	3344	3344	-
	lbs	7372	7372	7372	7372	-

with 2 x 50mm assist ram

- with Fixed link ends	kg	3762	3762	3762	3762	3762
	lbs	8293	8293	8293	8293	8293
- with Flexible link ends	kg	3609	3609	3609	3609	3609
	lbs	7956	7956	7956	7956	7956
- with Quick attach link ends	kg	3762	3762	3762	3762	3762
	lbs	8293	8293	8293	8293	8293

NOTE: All lift capacity values are theoretical

SECTION 8 - SPECIFICATIONS

LIFT CAPACITIES**(continued)****T6010****T6020****T6030****T6050****T6070**

Manufacturers' figures to OECD criteria - maximum lift capacity at link ends at maximum hydraulic pressure:

without assist ram

- with Fixed link ends	kg	4170	4170	4170	4170	-
	lbs	9195	9195	9195	9195	-
- with Flexible link ends	kg	3814	3814	3814	3814	-
	lbs	8408	8408	8408	8408	-
- with Quick attach link ends	kg	4170	4170	4170	4170	-
	lbs	9195	9195	9195	9195	-

with **1 x 50mm** assist ram

- with Fixed link ends	kg	5241	5241	5241	5241	-
	lbs	11555	11555	11555	11555	-
- with Flexible link ends	kg	4833	4833	4833	4833	-
	lbs	10654	10654	10654	10654	-
- with Quick attach link ends	kg	5241	5241	5241	5241	-
	lbs	11554	11554	11554	11554	-

with **2 x 50mm** assist ram

- with Fixed link ends	kg	6332	6332	6332	6332	6332
	lbs	13959	13959	13959	13959	13959
- with Flexible link ends	kg	5853	5853	5853	5853	5853
	lbs	12905	12905	12905	12905	12905
- with Quick attach link ends	kg	6332	6332	6332	6332	6332
	lbs	13959	13959	13959	13959	13959

NOTE: All lift capacity values are theoretical

SECTION 8 - SPECIFICATIONS

LIFT CAPACITIES**(continued)****T6010****T6020****T6030****T6050****T6070**

Manufacturers' figures to OECD criteria - maximum lift capacity, 610 mm (24 in) behind link ends through full lift range at 90% of maximum hydraulic pressure:

with **2 x 80mm** assist ram

- with Flexible link ends	kg	3742	3742	3742	3742	3742
	lbs	8249	8249	8249	8249	8249
- with Quick attach link ends	kg	3783	3783	3783	3783	3783
	lbs	8339	8339	8339	8339	8339

with **2 x 90mm** assist ram

- with Flexible link ends	kg	4741	4741	4741	4741	4741
	lbs	10451	10451	10451	10451	10451
- with Quick attach link ends	kg	4782	4782	4782	4782	4782
	lbs	10542	10542	10542	10542	10542

Manufacturers' figures to OECD criteria - maximum lift capacity at link ends at maximum hydraulic pressure:

with **2 x 80mm** assist ram

- with Flexible link ends	kg	5516	5516	5516	5516	5516
	lbs	12160	12160	12160	12160	12160
- with Quick attach link ends	kg	5628	5628	5628	5628	5628
	lbs	12407	12407	12407	12407	12407

with **2 x 90mm** assist ram

- with Flexible link ends	kg	6985	6985	6985	6985	6985
	lbs	15399	15399	15399	15399	15399
- with Quick attach link ends	kg	7117	7117	7117	7117	7117
	lbs	15690	15690	15690	15690	15690

NOTE: All lift capacity values are theoretical

SECTION 8 - SPECIFICATIONS

LIFT CAPACITIES
T6010**T6020****T6030****T6050****T6070**

Manufacturers' figures to SAE J283/ASAE - maximum lift capacity, 610 mm (24 in) behind link ends through full lift range at 90% of maximum hydraulic pressure:

without assist ram

- with Fixed link ends	kg	2896	2896	2896	2896	-
	lbs	6385	6385	6385	6385	-
- with Flexible link ends	kg	2560	2560	2560	2560	-
	lbs	5643	5643	5643	5643	-
- with Quick attach link ends	kg	2896	2896	2896	2896	-
	lbs	6385	6385	6385	6385	-

with **1 x 50mm** assist ram

- with Fixed link ends	kg	3905	3905	3905	3905	-
	lbs	8610	8610	8610	8610	-
- with Flexible link ends	kg	3742	3742	3742	3742	-
	lbs	8249	8249	8249	8249	-
- with Quick attach link ends	kg	3905	3905	3905	3905	-
	lbs	8610	8610	8610	8610	-

with **2 x 50mm** assist rams

- with Fixed link ends	kg	4384	4384	4384	4384	4384
	lbs	9664	9664	9664	9664	9664
- with Flexible link ends	kg	4211	4211	4211	4211	4211
	lbs	9285	9285	9285	9285	9285
- with Quick attach link ends	kg	4384	4384	4384	4384	4384
	lbs	9664	9664	9664	9664	9664

NOTE: All lift capacity values are theoretical

SECTION 8 - SPECIFICATIONS

LIFT CAPACITIES**(continued)****T6010****T6020****T6030****T6050****T6070**

Manufacturers' figures to SAE J283/ASAE - maximum lift capacity at link ends at maximum hydraulic pressure:

without assist ram

- with Fixed link ends	kg	4170	4170	4170	4170	-
	lbs	9195	9195	9195	9195	-
- with Flexible link ends	kg	3813	3813	3813	3813	-
	lbs	8408	8408	8408	8408	-
- with Quick attach link ends	kg	4170	4170	4170	4170	-
	lbs	9195	9195	9195	9195	-

with **1 x 50mm** assist ram

- with Fixed link ends	kg	5241	5241	5241	5241	-
	lbs	11554	11554	11554	11554	-
- with Flexible link ends	kg	4833	4833	4833	4833	-
	lbs	10654	10654	10654	10654	-
- with Quick attach link ends	kg	5241	5241	5241	5241	-
	lbs	11554	11554	11554	11554	-

with **2 x 50mm** assist ram

- with Fixed link ends	kg	6332	6332	6332	6332	6332
	lbs	13959	13959	13959	13959	13959
- with Flexible link ends	kg	5853	5853	5853	5853	5853
	lbs	12905	12905	12905	12905	12905
- with Quick attach link ends	kg	6332	6332	6332	6332	6332
	lbs	13959	13959	13959	13959	13959

NOTE: All lift capacity values are theoretical

SECTION 8 - SPECIFICATIONS

LIFT CAPACITIES

(continued)

T6010

T6020

T6030

T6050

T6070

Manufacturers' figures to SAE J283/ASAE - maximum lift capacity, 610 mm (24 in) behind link ends through full lift range at 90% of maximum hydraulic pressure:

with **2 x 80mm** assist ram

- with Flexible link ends	kg	4364	4364	4364	4364	4364
	lbs	9620	9620	9620	9620	9620
- with Quick attach link ends	kg	4354	4354	4354	4354	4354
	lbs	9598	9598	9598	9598	9598

with **2 x 90mm** assist ram

- with Flexible link ends	kg	5527	5527	5527	5527	5527
	lbs	12185	12185	12185	12185	12185
- with Quick attach link ends	kg	5506	5506	5506	5506	5506
	lbs	12138	12138	12138	12138	12138

Manufacturers' figures to SAE J283/ASAE - maximum lift capacity at link ends at maximum hydraulic pressure:

with **2 x 80mm** assist ram

- with Flexible link ends	kg	5516	5516	5516	5516	5516
	lbs	12160	12160	12160	12160	12160
- with Quick attach link ends	kg	5628	5628	5628	5628	5628
	lbs	12407	12407	12407	12407	12407

with **2 x 90mm** assist ram

- with Flexible link ends	kg	6985	6985	6985	6985	6985
	lbs	15399	15399	15399	15399	15399
- with Quick attach link ends	kg	7117	7117	7117	7117	7117
	lbs	15690	15690	15690	15690	15690

NOTE: All lift capacity values are theoretical

SECTION 8 - SPECIFICATIONS

REMOTE CONTROL VALVES		T6010	T6020	T6030	T6050	T6070
With 63 ltr fixed displacement pump and MDC	Std	2 valves, non configurable				-
	Opt	3 valves, non configurable				-
With 80 ltr fixed displacement pump and EDC	Std	2 valves, non configurable				
	Opt	2 valves, configurable				
	Opt	2 configurable and 1 non configurable valve				
	Opt	2 configurable and 2 non configurable valves				
With 113 ltr variable displacement pump and MDC	Opt	2 valves, non configurable				-
	Opt	2 valves, configurable				-
	Opt	2 configurable and 1 non configurable valve				-
	Opt	2 configurable and 2 non configurable valves				-
With 113 ltr variable displacement pump and EDC	Opt	2 valves, non configurable				
	Opt	2 valves, configurable				
	Opt	2 configurable and 1 non configurable valve				
	Opt	2 configurable and 2 non configurable valves				
	Opt	2, 3 or 4 electronic valves (EHR's)				
FRONT THREE-POINT HITCH						
Linkage Category		Category II				
Lift capacity through full lift range at 610 mm (24 in) in front of link ends	kg	2750	2750	2750	2750	2750
	lbs	6063	6063	6063	6063	6063

SECTION 8 - SPECIFICATIONS

FRONT HYDRAULIC COUPLERS

(with front hitch only)

T6010 T6020 T6030 T6050 T6070

Number of couplers

Four couplers (two double acting valves) - optional

Maximum flow through one coupler at rated engine speed

With 63 ltr/min pump	litres/min	63	63	63	63	-
	US gal/min	16.6	16.6	16.6	16.6	-
With 80 ltr/min pump	litres/min	77	77	77	77	77
	US gal/min	20.3	20.3	20.3	20.3	20.3
With 113 ltr/min pump	litres/min	100 ⁺ /5	100 ⁺ /5	100 ⁺ /5	100 ⁺ /5	100 ⁺ /5
	US gal/min	25 ⁺ /1.3	25 ⁺ /1.3	25 ⁺ /1.3	25 ⁺ /1.3	25 ⁺ /1.3

ELECTRICAL EQUIPMENT

Alternator

- all models

12 volt, 120 amp

Battery

- standard

Minimum maintenance 12 volt, 107 Ah, 800 cca

- heavy duty

Minimum maintenance 12 volt, 132 Ah, 960 cca

Starting motor

Positive engagement, solenoid operated

4.2 kw - geared reduction

Cold starting aid

Std

Thermostart in inlet manifold

Opt

Inlet manifold grid heater

Bulb rating and type

- headlights	60/55W - H4
- parking lights (front)	5W - R5W
- parking lights (rear)	5W - P21/5W
- work lights (auxiliary)	50W - GE866
- turn indicators (front)	21W - PY21W
- turn indicators (rear)	21W - R21W
- SMV lights (N. America)	21W - PY21W
- stop lights	21W - P21/5W
- licence plate lights	5W - R5W

SECTION 8 - SPECIFICATIONS

MINIMUM HARDWARE TIGHTENING TORQUES

IN FOOT-POUNDS (NEWTON METERS) FOR NORMAL ASSEMBLY APPLICATIONS

INCH HARDWARE AND LOCKNUTS

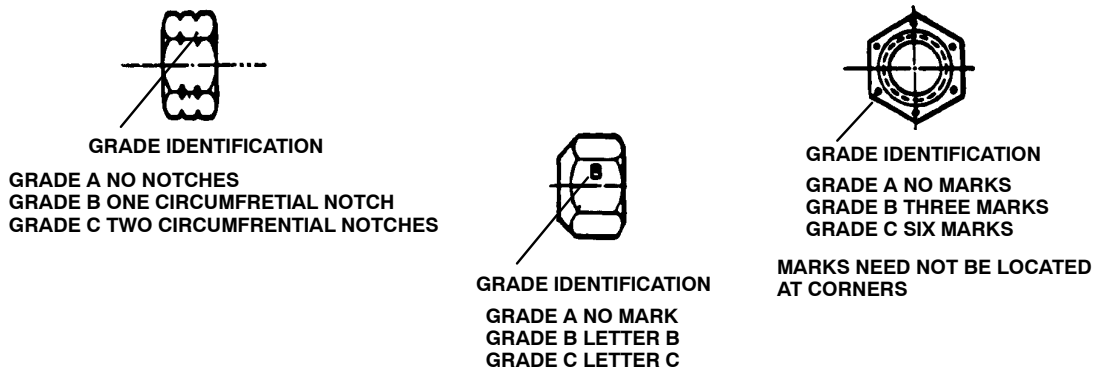
NOMINAL SIZE	SAE GRADE 2		SAE GRADE 5		SAE GRADE 8		LOCKNUTS	
	UNPLATED or PLATED SILVER	PLATED w/ZnCr GOLD	UNPLATED or PLATED SILVER	PLATED w/ZnCr GOLD	UNPLATED or PLATED SILVER	PLATED w/ZnCr GOLD	GR.B w/GR5 BOLT	GR.C w/GR8 BOLT
1/4	55* (6.2)	72* (8.1)	86* (9.7)	112* (13)	121* (14)	157* (18)	61* (6.9)	86* (9.8)
5/16	115* (13)	149* (17)	178* (20)	229* (26)	250* (28)	324* (37)	125* (14)	176* (20)
3/8	17 (23)	22 (30)	26 (35)	34 (46)	37 (50)	48 (65)	19 (26)	26 (35)
7/16	27 (37)	35 (47)	42 (57)	54 (73)	59 (80)	77 (104)	30 (41)	42 (57)
1/2	42 (57)	54 (73)	64 (87)	83 (113)	91 (123)	117 (159)	45 (61)	64 (88)
9/16	60 (81)	77 (104)	92 (125)	120 (163)	130 (176)	169 (229)	65 (88)	92 (125)
5/8	83 (112)	107 (145)	128 (174)	165 (224)	180 (244)	233 (316)	90 (122)	127 (172)
3/4	146 (198)	189 (256)	226 (306)	293 (397)	319 (432)	413 (560)	160 (217)	226 (305)
7/8	142 (193)	183 (248)	365 (495)	473 (641)	515 (698)	667 (904)	258 (350)	364 (494)
1.0	213 (289)	275 (373)	547 (742)	708 (960)	773 (1048)	1000 (1356)	386 (523)	545 (739)

NOTE: Torque values shown with * are inch pounds.

IDENTIFICATION CAP SCREWS AND CARRIAGE BOLTS



LOCKNUTS



SECTION 8 - SPECIFICATIONS

MINIMUM HARDWARE TIGHTENING TORQUES

IN FOOT-POUNDS (NEWTON METERS) FOR NORMAL ASSEMBLY APPLICATIONS

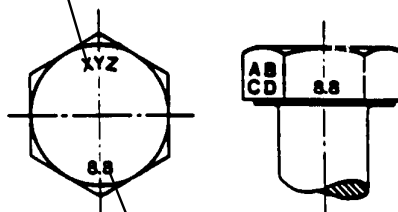
METRIC HARDWARE AND LOCKNUTS

NOMINAL SIZE	CLASS 5.8		CLASS 8.8		CLASS 10.9		LOCKNUT CL.8 w/CL8.8 BOLT
	UNPLATED	PLATED w/ZnCr	UNPLATED	PLATED w/ZnCr	UNPLATED	PLATED w/ZnCr	
M4	15* (1.7)	19* (2.2)	23* (2.6)	30* (3.4)	33* (3.7)	42* (4.8)	16* (1.8)
M6	51* (5.8)	67* (7.6)	79* (8.9)	102* (12)	115* (13)	150* (17)	56* (6.3)
M8	124* (14)	159* (18)	195* (22)	248* (28)	274* (31)	354* (40)	133* (15)
M10	21 (28)	27 (36)	32 (43)	41 (56)	45 (61)	58 (79)	22 (30)
M12	36 (49)	46 (63)	55 (75)	72 (97)	79 (107)	102 (138)	39 (53)
M16	89 (121)	117 (158)	137 (186)	177 (240)	196 (266)	254 (344)	97 (131)
M20	175 (237)	226 (307)	277 (375)	358 (485)	383 (519)	495 (671)	195 (265)
M24	303 (411)	392 (531)	478 (648)	619 (839)	662 (897)	855 (1160)	338 (458)

NOTE: Torque values shown with * are inch pounds.

IDENTIFICATION HEX CAP SCREWS AND CARRIAGE BOLTS CLASSES 5.6 AND UP

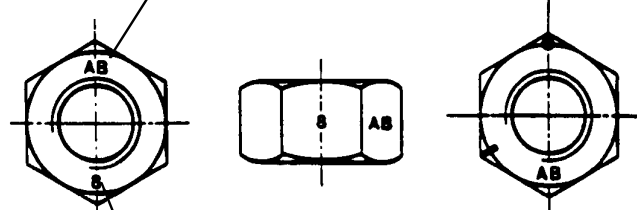
MANUFACTURERS IDENTIFICATION



PROPERTY CLASS

HEX NUTS AND LOCKNUTS CLASSES 05 AND UP

MANUFACTURERS IDENTIFICATION



PROPERTY CLASS

CLOCK MARKING

[illegible]

SECTION 9 - 1ST 50 HOUR SERVICE SHEETS

DEALER'S COPY**CHECK AND ADJUST, AS REQUIRED****INOPERATIVE SERVICE CHECKS:**

1. Check tyre pressures and condition ☐
2. Clean radiator, oil cooler and A/C condenser cores (where fitted) ☐
3. Check radiator coolant level and specific gravity (1.071 - 1.083 at 16 ° C (60 ° F) ☐
4. Change fuel filter, drain water separator and bleed system ☐
5. Inspect Poly V-belt ☐
6. Check engine oil level ☐
7. Change hydraulics/transmission filters ☐
8. Check transmission/rear axle oil level ☐
9. Check front axle differential oil level (4wd) ... ☐
10. Check front axle hub oil level (4wd) ☐
11. Check brake/clutch master cylinder fluid level ☐
12. Check clutch pedal free play ☐
13. Check brake adjustment and pedal equalisation ☐
14. Handbrake cable adjustment ☐
15. Check exhaust manifold bolt torque ☐
16. Wheel-to-rim clamp bolts and lock nuts for tightness ☐
17. Wheel disc-to-hub nuts for tightness ☐
18. Front end weight clamp bolts for tightness .. ☐
19. Grease front wheel bearings (2WD) ☐
20. Lubricate all grease fittings ☐
21. Clean cab air filter (where fitted) ☐
22. Clean air cleaner element and check hose connections ☐

SAFETY ITEMS CHECKS:

1. Cab or safety frame bolt torque (where applicable) ☐
2. Neutral start switches operative ☐
3. Operator's Manual supplied ☐

OPERATIVE SERVICE CHECKS:

All operative checks are to be performed with the tractor at normal operating temperature.

1. Lights/instruments for proper operation ☐
2. Windscreen wipe/wash operation ☐
3. Fluid and oil leaks ☐
4. Maximum no-load speed and idle speed adjustments and fuel shut-off ☐
5. P.T.O. operation ☐
6. Hydraulic System:
 - Draft and Position Control operation ☐
 - Flow control operation ☐
 - Remote control valve operation ☐

PERFORMANCE SERVICE CHECKS:

1. Engine operation including throttle and governor operation ☐
2. Transmission, including clutch ☐
3. Steering control ☐
4. Differential lock engagement and disengagement ☐
5. Brake action ☐
6. All optional equipment and accessories ☐

SERVICE PERFORMED

TRACTOR MODEL NO. **TRACTOR SERIAL NO.**

OWNER'S SIGNATURE**DATE****DEALER'S SIGNATURE****DATE**

SECTION 9 - 1ST 50 HOUR SERVICE SHEETS

SECTION 9 - 1ST 50 HOUR SERVICE SHEETS**OWNER'S COPY****CHECK AND ADJUST, AS REQUIRED****INOPERATIVE SERVICE CHECKS:**

1. Check tyre pressures and condition ☐
2. Clean radiator, oil cooler and A/C condenser cores (where fitted) ☐
3. Check radiator coolant level and specific gravity (1.071 - 1.083 at 16 ° C (60 ° F) ☐
4. Change fuel filter, drain water separator and bleed system ☐
5. Inspect Poly V-belt ☐
6. Check engine oil level ☐
7. Change hydraulics/transmission filters ☐
8. Check transmission/rear axle oil level ☐
9. Check front axle differential oil level (4wd) ... ☐
10. Check front axle hub oil level (4wd) ☐
11. Check brake/clutch master cylinder fluid level ☐
12. Check clutch pedal free play ☐
13. Check brake adjustment and pedal equalisation ☐
14. Handbrake cable adjustment ☐
15. Check exhaust manifold bolt torque ☐
16. Wheel-to-rim clamp bolts and lock nuts for tightness ☐
17. Wheel disc-to-hub nuts for tightness ☐
18. Front end weight clamp bolts for tightness .. ☐
19. Grease front wheel bearings (2WD) ☐
20. Lubricate all grease fittings ☐
21. Clean cab air filter (where fitted) ☐
22. Clean air cleaner element and check hose connections ☐

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6. All optional equipment and accessories ☐

SERVICE PERFORMED

TRACTOR MODEL NO. **TRACTOR SERIAL NO.**

OWNER'S SIGNATURE**DATE****DEALER'S SIGNATURE****DATE**

SECTION 9 - 1ST 50 HOUR SERVICE SHEETS

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AFTER SALES - Technical Information

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