End Tipping Semi-Trailer

Operator's Handbook

CONTENTS

Fruehauf Limited is registered in England
Registered Office: Houghton Road, Grantham,
Lincolnshire, NG31 6JE

OP-HBK`D'05'26

READER'S GUIDE

This handbook *covers a variety of trailers based on a Model type, it has been compiled to give you, the* ***Driver-Operator****, essential information regarding operation and initial 'Imperative' maintenance. It is not intended to cover detailed stripping of components, this information is contained in the Maintenance Manual which is available on request.* ***Please read the handbook carefully.***

HOW TO USE THIS BOOK

Read the following ***Health and Safety*** *notes before operating.*

Refer to ***Section 1*** *for all the major* ***trailer features****.*

Refer to ***Section 2*** *for* ***trailer operating*** *information.*

Refer to ***Section 3*** *for* ***essential trailer maintenance*** *checks.*

Refer to ***Section 4*** *for* ***trailer problems****.*

Refer to ***Section 5*** *if you carry* ***dangerous substances****.*

Page edge markers define the sections to assist the reader.

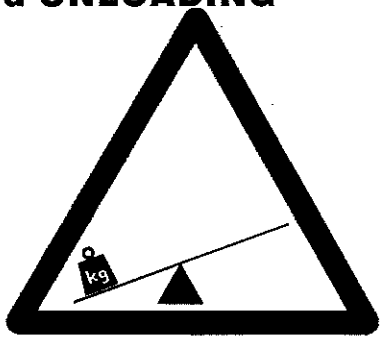
This literature is not intended to overrule any requirements of the Law or of any Local Authorities or any specific operating procedure devised ...If In Doubt, Ask!

YOUR COMMENTS

We are constantly trying to improve the technical information covering our product. Should you, the Reader, find fault with this publication we would appreciate your assistance by forwarding your comments to us. We are obviously keen to amend any inaccuracies you find but would also appreciate comments regarding format, i.e. size, layout, readability, too much / too little information; the 'field is open', please tell us. Of course favourable comments would be useful also, indicating that perhaps we have got it right.

Please forward comments direct to our Grantham address, marked for the attention of: The Engineering Department.

LOADING and UNLOADING



STABILITY WARNING

SOME TRAILERS WITH A LONG DECK LENGTH FORWARD OF THE SUPPORT LEGS OR REWARD OF THE RUNNING GEAR MAY BE UNSTABLE IF LOADED OR UNLOADED WHEN UNCOUPLED FROM THE TRACTOR UNIT.

LOOK FOR THE WARNING DECAL INDICATING THE POTENTIAL PROBLEM AND ONLY LOAD / UNLOAD WITH THE TRAILER COUPLED OR SUPPORTED AS FOLLOWS :

FORWARD SUPPORT (SEMI-TRAILERS)

USE A SUITABLE TRESTLE THE FULL WIDTH OF THE UPPER COUPLER PLATE POSITIONED FORWARD OF THE KING PIN.

REARWARD SUPPORT

USE A SUITABLE TRESTLE (OR BLOCKS). POSITION UNDER THE MAIN BEAMS NEXT TO THE UNDERRUN BUMP BAR, if fitted. ENSURE THE SUPPORT/s ARE CENTRALLY POSITIONED UNDER THE 'I' BEAM AND HAVE A SUPPORT AREA OF AT LEAST 200 x 200mm UNDER EACH BEAM. DO NOT PLACE A SUPPORT UNDER AN UNDERRUN BUMP BAR.

TRAILERS FITTED WITH STABILISER LEGS

USE THE STABILISER LEGS TO SUPPORT THE UNCOUPLED TRAILER.

LOADING and UNLOADING
Public Liability considerations

LOADING AND UNLOADING OPERATIONS MUST BE CARRIED OUT WITH DUE CONSIDERATION TO THE ENVIRONMENT IN WHICH THEY ARE PERFORMED.

LOAD AND UNLOAD AWAY FROM PASSING TRAFFIC, PEDESTRIANS AND ANYONE NOT INVOLVED.

ANY LOADING OR UNLOADING CARRIED OUT ON THE HIGHWAY MAY BE CONSIDERED A TEMPORARY OBSTRUCTION REQUIRING APPROPRIATE WARNING OF OPERATIONS.*

A SAFE WORKING AREA SHOULD BE CLEARLY MARKED TO PREVENT INTRUSION BY PEOPLE OR OTHER VEHICLES.

IF YOU POSITION YOUR VEHICLE SO THAT IT IS UNSIGHTED TO OTHER ROAD USERS OR IF VISIBILITY IN GENERAL IS POOR, YOU SHOULD PROVIDE EARLY WARNING OF THE VEHICLE'S EXISTENCE.*

WHERE POSSIBLE, THE LOAD SHOULD NOT OBSCURE THE VEHICLE LIGHTS DURING LOADING OR UNLOADING OPERATIONS.*

REMEMBER, ON THE HIGHWAY, YOU ARE RESPONSIBLE FOR THE VEHICLE INCLUDING THE OPERATION OF ANY ANCILLARY EQUIPMENT USED TO ASSIST LOADING OR UNLOADING.

PRIOR TO ANY SITE OPERATION:
CHECK WITH SITE MANAGER IF ANY SPECIFIC PROCEDURE EXISTS;
IF A DEFINED LOADING / UNLOADING AREA IS AVAILABLE, USE IT;
IF A SAFE WORKING AREA NEEDS TO BE MADE, ENSURE IT IS CLEARLY DEFINED TO PREVENT INTRUSION BY UNAUTHORISED PERSONNEL;
DO NOT LOAD OR UNLOAD ON AN UNEVEN SURFACE OR GRADIENT;
PRIOR TO LOADING / UNLOADING ENSURE THE OPERATING AREA IS CLEAR;
ENSURE ANCILLARY EQUIPMENT OPERATES AS DESIGNED WITH ALL SAFETY AND OPERATING PROCEDURES FOLLOWED.

**** The use of vehicle hazard warning lamps alone may not be sufficient.***

Also refer to LOADING information in Section 2, the STABILITY information (opposite) and if travelling in Europe the VEHICLE SECURITY information on page vii.

HEALTH AND SAFETY

ASBESTOS

SOME COMPONENTS ON YOUR TRAILER, SUCH AS GASKETS, FRICTION SURFACES (brake linings*) AND HEAT SHIELDS (exhaust systems) MAY CONTAIN ASBESTOS.

WARNING

BREATHING ASBESTOS DUST IS DANGEROUS TO YOUR HEALTH

- ***WORK OUT OF DOORS OR IN A WELL VENTILATED AREA***
- ***WEAR A RESPIRATOR MASK WITH SUITABLE FILTER***
- ***DO NOT REMOVE DUST BY BLOWING***
- ***REMOVE DUST BY EXTRACTION OR BY DAMPENING WITH ATOMISED WATER. USE A WATERY DETERGENT SOLUTION IN GREASE CONTAMINATED AREAS. WIPE DOWN WITH CLEAN DAMPENED RAGS***
- ***DO NOT REUSE CONTAMINATED RAGS (dispose of as waste)***
- ***IF ANY CUTTING, DRILLING, GRINDING etc., IS ATTEMPTED THE ITEM SHOULD BE DAMPENED AND ONLY HAND TOOLS OR LOW SPEED POWER TOOLS USED EQUIPPED, IF NECESSARY, WITH AN APPROPRIATE DUST EXTRACTION FACILITY. IF HIGH SPEED TOOLS ARE USED, THEY SHOULD ALWAYS BE SO EQUIPPED.***
- ***DO NOT USE BRUSHES TO SWEEP UP DUST, USE A SPECIAL (type H) VACUUM CLEANER OR DAMPEN THOROUGHLY AND SCRAPE UP.***
- ***PUT ALL WASTE (old components, dust, rags, etc.) IN A SEALED CONTAINER MARKED TO ENSURE SAFE DISPOSAL.***
- ***FOLLOW MANUFACTURERS INSTRUCTIONS WHEN OPERATING, MAINTAINING OR CLEANING SPECIALISED EQUIPMENT (i.e. Tools, Extraction Systems, Vacuum Cleaners, Specialised Wash Fluids).***

*** Asbestos-Free linings fitted as standard from March `92**
(unless otherwise requested) - also see note *'Asbestos-Free Linings'*

ASBESTOS-FREE BRAKE LININGS

THE BREATHING OF ANY AIRBORNE DUST IS HAZARDOUS THEREFORE IT WOULD BE ADVISABLE TO HANDLE ASBESTOS-FREE BRAKES LININGS WITH THE SAME DEGREE OF CAUTION AS ASBESTOS LININGS see opposite.

AIR PRESSURE SYSTEMS

CAUTION

AVOID DIRECT SKIN CONTACT WITH EXHAUSTING AIR; EXERCISE EXTREME CARE AND WEAR THE APPROPRIATE PROTECTIVE CLOTHING WHEN RELEASING PRESSURE FROM THE SYSTEM.

SYNTHETIC RUBBERS AT HIGH TEMPERATURES

CAUTION

ALL POLYMERIC MATERIALS, ESPECIALLY FLOUROELASTOMERS, SHOULD BE HANDLED WITH CARE FOLLOWING ANY FORM OF HIGH TEMPERATURE DECOMPOSITION (FIRE).

FLUOROELASTOMERS ARE SYNTHETIC RUBBERS COMMONLY USED IN THE MOTOR INDUSTRY. APPLICATIONS INCLUDE TEST RIGS, FUEL SYSTEMS, OIL SEALS, WIRING AND CABLING, BEARING SURFACES, GASKETS, DIAPHRAGMS AND 'O' RINGS.

AVOID SKIN CONTACT WITH FIRE DAMAGED RUBBERS.

POLYURETHANE FOAM

CAUTION

WHEN REPAIRING INSULATED VEHICLES, PRECAUTIONS SHOULD BE TAKEN TO PREVENT HIGH TEMPERATURE CONTACT OR ACCIDENTAL IGNITION OF THE INSULATING MATERIAL IN BODY CAVITY.

CLEANING / PURGING (TANKS)

WHERE A VESSEL IS TO BE CLEANED / PURGED IT SHOULD BE CARRIED OUT AT A SPECIALLY DESIGNED LOCATION FOR THIS TYPE OF WORK UTILISING THE NECESSARY EQUIPMENT REQUIRED FOR THE WORK (i.e. Liquid or Solid reclamation, and / or Vapour Recovery system). APPROPRIATE PROTECTIVE CLOTHING/EQUIPMENT SHOULD BE WORN DURING THESE OPERATIONS AND, WHERE NECESSARY, ITS ATMOSPHERE SHOULD BE CHECKED TO ENSURE THAT ANY REMAINING SUBSTANCE / VAPOUR IS NO LONGER SUFFICIENT TO CREATE A RISK TO THE HEALTH AND SAFETY OF ANY PERSON.

A VESSEL SHOULD NOT BE ENTERED UNTIL MADE 'SAFE'.

CAREFUL CONSIDERATION TO THE SUBSTANCE CARRIED WILL DETERMINE THE DEGREE TO WHICH A VESSEL IS DEEMED 'SAFE' FOR MAINTENANCE WORK TO BE CARRIED OUT.

DANGEROUS SUBSTANCES (CARRIAGE OF)

LEGAL REQUIREMENTS - DANGEROUS SUBSTANCES REGULATION 1992 (SI 1992 No. 743) - ALL SUBSTANCES COVERED BY THE REGULATIONS MUST BE CARRIED IN A VESSEL COMPLYING WITH THE REGULATIONS.

IT IS THE OPERATOR'S RESPONSIBILITY TO ENSURE THAT THE VESSEL IS SUITABLE FOR THE SUBSTANCE AND THAT THE CARRIAGE OF DANGEROUS SUBSTANCES ARE IN ACCORDANCE WITH THE REGULATIONS.

ALWAYS ENSURE THE CORRECT EMERGENCY CARDS OR MARKINGS ARE DISPLAYED.

USED ENGINE OILS

WARNING

PROLONGED AND REPEATED CONTACT WITH USED ENGINE OILS MAY CAUSE SERIOUS SKIN DISORDERS INCLUDING DERMATITIS AND CANCER, THEREFORE PRECAUTIONS SHOULD BE TAKEN IN THE HANDLING OF USED OILS. HAZARDS MAY ALSO ARISE FROM THE INHALATION OF OIL MIST AND THE HANDLING OF GREASES CONTAINING TOXIC METALS.

VEHICLE SECURITY
(Immigration & Asylum Act 1999)
Prevention of the carriage of clandestine entrants to the UK and the recommended checks for drivers.

DURING LOADING AND UNLOADING CHECK THAT NO UNAUTHORISED PEOPLE ENTER OR REMAIN IN YOUR VEHICLE OR TRAILER.

ENSURE YOUR VEHICLE IS SEALED AND/OR PADLOCKED AFTER LOADING / UNLOADING.

ENTER NUMBER OF SEAL / PADLOCK ON VEHICLE DOCUMENTATION.

IF POSSIBLE OBTAIN THIRD-PARTY WITNESS TO SEALING AND/OR PADLOCKING.

WHEN LEAVING VEHICLE UNATTENDED, CHECK WINDOWS ARE CLOSED, IMMOBILISER ARMED AND CAB DEADLOCKS ENGAGED.

AFTER ANY STOP AND PRIOR TO EMBARKATION, CHECK VEHICLE SECURITY - INSPECT SEALS / PADLOCKS, OUTER SHELL / CURTAINS AND (IF SAFELY POSSIBLE) CHECK ROOF.

IF SUSPICION OF A SECURITY BREACH, INFORM THE LOCAL POLICE AUTHORITY - DO NOT ATTEMPT EVICTION - DO NOT EMBARK.

For more information contact the Home Office for the Code of Practice:

CPCAU
Ground Floor
Status Four
Status Park
No 3 Nobel Drive
Harlington
Middlesex
UB3 5EY

Tel: 020 8745 6006 *Fax: 020 8745 5922*
e-mail: civilpenalty.unit@homeoffice.gsi.gov.uk
website: www.ind.homeoffice.gov.uk

Also contact the Road Haulage Association *Tel: 01932 841 515,*
and/or the Freight Transport Association *Tel: 01892 526 171.*

OPERATOR'S HANDBOOK

IN THE INTEREST OF HEALTH & SAFETY THIS HANDBOOK SHOULD ACCOMPANY THE VEHICLE AT ALL TIMES. A SUITABLE DOCUMENT HOLDER IS AVAILABLE (part no. CF4403506) FOR ATTACHMENT TO THE VEHICLE.

REFER TO YOUR HANDBOOK PRIOR TO OPERATING.

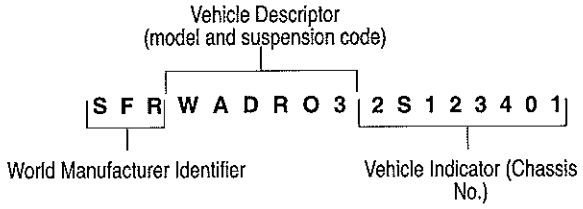
ENSURE ALL RECOMMENDED CHECKS ARE OBSERVED.

ENSURE THE INITIAL 'IMPERATIVE MAINTENANCE' IS CARRIED OUT.

VEHICLE IDENTIFICATION

A plate secured to the main chassis frame incorporates a 17 character vehicle identification number (VIN), *example below.*

Typical VIN number



It is essential that the chassis number is quoted in all communications.

Observe ALL information contained on other plates and labels attached to the vehicle - ***If in doubt, ask!***

NOTES ON WARRANTY

SHOULD THE VEHICLE BECOME UNSERVICEABLE DURING THE STIPULATED WARRANTY PERIOD, PROCEED AS FOLLOWS:*

a) *CONTACT YOUR NEAREST FRUEHAUF SERVICE OR WARRANTY AGENT, WHO WILL INITIALLY ASSESS THE PROBLEM, NOTIFY THE APPROPRIATE AUTHORITY AND TAKE WHATEVER ACTION IS NECESSARY.*

b) *WHEN PURCHASED FROM AN AUTHORISED DISTRIBUTOR OR DEALER, CONTACT THE ESTABLISHMENT CONCERNED WHO WILL ADVISE YOU ACCORDINGLY.*

c) *MAJOR PROBLEMS CAN BE IMMEDIATELY REFERRED TO OUR QUALITY DEPARTMENT:*

FRUEHAUF LIMITED
Houghton Road
Grantham
Lincolnshire
NG31 6JE

Tel: 01476 515515
Fax No: 01476 515516

OUR QUALITY DEPARTMENT WILL NOTIFY YOU OF THE APPROPRIATE ACTION REQUIRED TO ENSURE YOUR VEHICLE IS RECTIFIED AT THE EARLIEST POSSIBLE DATE.

IMPORTANT ALWAYS QUOTE THE VEHICLE CHASSIS NUMBER ON ALL CORRESPONDENCE, OR DURING ALL COMMUNICATIONS...see Vehicle Identification opposite

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The Manufacturer reserves the right to vary the specification with or without notice, and at such times, and in such a manner they think fit. Major as well as minor changes may be involved, in accordance with the Manufacturer's policy of constant product improvement.

Providing the vehicle is operated within its specified limits, the length of life (if properly maintained) is limited only to possible accident or economic obsolescence.

**** Ancillary equipment carries the O.E. manufacturer's warranty.***

SECTION 1

GENERAL DESCRIPTION

Contents

This section briefly describes the trailer's main features; supplementary information may be inserted when applicable.

Typical Smooth Body Tipper

GENERAL DESCRIPTION

The vehicle consists of an end tipping body constructed in aluminium, mounted on a semi-trailer chassis of cranked or straight configuration. Two body types are available either ribbed or smooth. An hydraulic ram mounted at the front of the vehicle raises and lowers the body via a tractor controlled system.

The chassis incorporates specially designed 'I' beams with large box crossmembers creating a torsional stiff construction for safer tipping. The chassis also provides the support for the suspension, axles running gear, and upper coupler connection via a king pin to the prime mover (tractor unit) fifthwheel.

Typical Ribbed Body Tipper

Air suspension is fitted as standard. Various makes of running gear are fitted and these will have either disc or drum brakes. Refer to the chassis plate for type; most are covered in this handbook.

A typical air suspension comprises of a heavy duty forged steel trailing arm or fabricated beam pivoting on a rubber bushed mounting in a hanger bracket at the leading end. An air spring assembly comprising of piston and rolling rubber diaphragm (air bag) provides support at the trailing end with shock absorbers to damp the ride. The air springs are supplied with variable air pressure from an automatic height control (levelling) valve which maintains a level and stable attitude. An optional electronic suspension ride control may be fitted

EBS Anti-lock Braking System is fitted as standard, incorporating a two line air pressure system used in conjunction with asbestos-free brakes and spring brake actuators; automatic slack adjusters will be fitted to drum brakes. The system is designed to prevent the trailer wheels from locking over a wide range of road

conditions whether laden or unladen. Electronically controlled load-sensing is a feature of EBS giving the optimum braking performance available from both methods of control**. The trailer brakes are activated by the controls in the tractor unit cab utilising the tractor's air pressure system via flexible coiled tubes to the trailer system; the connectors being either 'C' type couplings (UK) or palm type couplings (Europe). Alternative types of coupling or a 3rd line may be fitted to customer requirements.

The electrical system conforms to the current EEC requirements utilising two ISO seven-pin connectors and a dedicated ISO connector to power the anti-lock braking system**. Alternative connectors wired to customer requirements may be installed.

Two speed support legs are fitted to support the trailer in the uncoupled condition, operated by a winding handle on the nearside leg.

The hydraulic system is usually an integral part of the tractor unit which is connected via a hose to the lower end of the multi-stage ram (when the combination is coupled). Alternatively, the option of an on-board 'Donkey' engine driving an hydraulic pump may be adopted, raising and lowering the body from a trailer mounted control; full details of the engine will be found in the Manufacturer's literature when fitted. The body must NOT be raised when uncoupled from the tractor unit.

Two body designs are available offering great strength with minimum weight. The famous Fruehauf aluminium 'bath tub' utilising the unique rib design and the smooth-sided design utilising extruded aluminium sidewall planks, floor channels, top and bottom rails. Body integrity is maintained during all operating conditions, resisting bending forces through its design. The body is fully welded throughout thus preventing ingress of water to enclosed parts and eliminating problems caused by entrapment of payload or cleaning materials etc. Corner design make for easy discharge, especially with materials known to 'hold up' in the body***. A top hung tailgate ensures maximum protection during tipping operations; release is via a simple lever operated from the rear nearside or offside of the body. A rubber seal around the tailgate aperture allows the carriage of products with a high water content or products which have extremely 'free-running' properties. Barn doors, split tailgates or a combination of both may be installed to customers requirements, together with internal doors or encapsulating roof structures.

The vehicle is suitable for transporting agricultural produce, animal feedstuffs, most common fuels (e.g. coal, coke) and lower density aggregates (e.g. sand, pea shingle, earth) - they are NOT suitable for high density aggregates (e.g. rock, large stone) or scrap metal (baled, crushed or loose). Other materials with high abrasive properties will also shorten the life of the body. Optional thicker floor material or additional overlay may be fitted.

** *EBS braking incorporates electronic controlled load-sensing and electronic controlled anti-lock brakes.*

Roll Stability is an optional safety feature that senses lateral movement and automatically applies the brakes to counteract imminent overturn.

Electronic controlled air suspension is an optional system for ride height control.

*** *Refer to 'Weights and Tipping Angles for Various Commodities' in Section 2.*

LEGAL REQUIREMENTS - Where applicable

The following information details various regulations; if the vehicle is built to any of these it will carry a plate conforming to the regulation.

Dangerous Substances (Carriage of) **Regulations 1992** (SI 1992 No. 743) - all substances covered by the Regulations **must** be carried in a vessel complying with the Regulations (see 'Health & Safety information').

In the event of accident damage, repairs to the substance carrying vessel (tank) and its fittings **must** be carried out in a manner that will reinstate the vehicle to the original design; re-certification under the Regulations (7) will be required.

Similarly no changes to the design of the vehicle can be carried out without re-certification.

ADR Requirements (International Carriage of Dangerous Goods by Road) - only products covered by the ADR classes listed in the ADR-4 approved by the MoT on the ADR-1, may be carried in the hazardous goods range.

IMO Requirements (International Maritime Organisation) - These are requirements covering the conveyance of hazardous goods on board British ships and through British ports.

TIR Requirements - When the vehicle has been TIR'd by Fruehauf in conjunction with MoT, the customer will be issued with TIR documentation and one set of photographs (2).

Changes to the design of the vehicle is not allowed without reference to the TIR Authority (DoE Ministry of Transport).

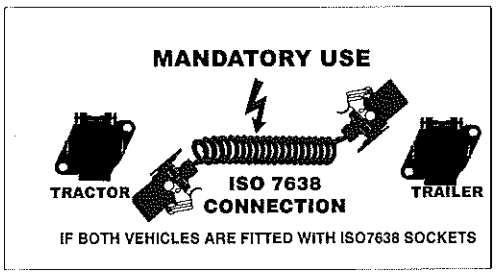
SECTION 2

OPERATING INSTRUCTIONS

Contents

This section covers a wide variety of components that are used on Fruehauf trailers. Not all components will appear on one vehicle, therefore certain instructions contained herein will not apply. Where special instruction beyond the scope of this section is req uired, this will be supplied as supplementary information.

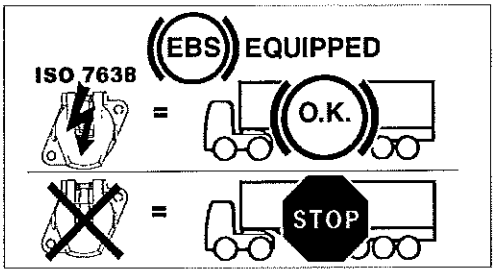
IF IN DOUBT, ASK!



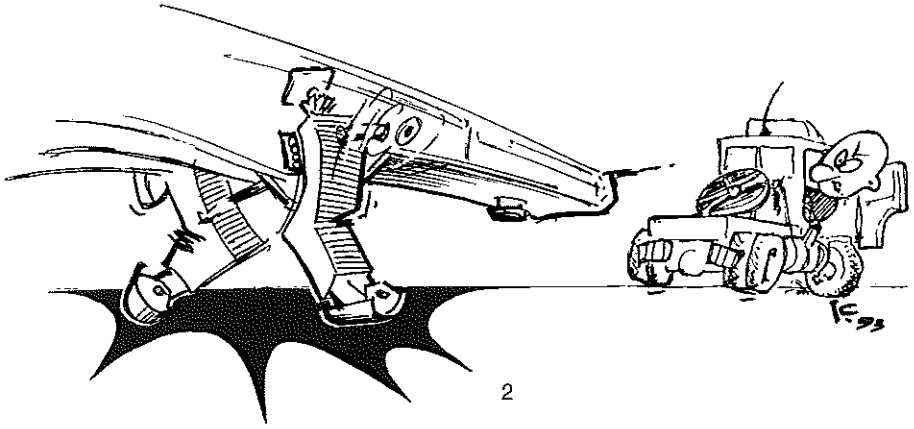
from 1 May 2002
ref C&U SI 2001 No.3208
amendment 4

Do not operate an EBS system without connecting the dedicated ISO7638 electrical supply

7-pin ISO7638 connector EBS
5-pin ISO7638 connector ABS



LOWER LEGS BEFORE UNCOUPLING

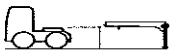


BOLT-IN KING PIN

1. Check for correct position and security (refer to Section 3 of this book).

COUPLING TRAILER TO TRACTOR

1. Ensure the trailer parking brake is applied.
2. Set the trailer support legs to the coupling height (see over).



3. Check the tractor fifthwheel jaws are open (refer to Tractor handbook); tilt fifthwheel so that the rear end is sloping downwards, to assists trailer coupling.
4. Remove stabilising support, if applicable (see *'STABILITY'* below).
5. With the tractor and trailer correctly aligned, slowly reverse the tractor into the coupled position.
6. Ensure the combination is securely coupled by trying to move forward with the trailer parking brake applied. Visually check to ensure correctly coupled and securely locked.
7. Connect the tractor's electrical lines to the sockets on the front of the trailer, include the ISO7638 line when the tractor has the socket fitted, see opposite. Connect the air lines to their respective colour coded couplings and open tractor airline 'shut-off' cocks, if fitted. Couple hydraulic line(s) if applicable.
8. Raise the trailer support legs fully and correctly secure in the running position.
9. Test brakes for operation and carry out 'Checks Before Moving Off' (detailed in this Section of the handbook).
10. Check body is fully lowered and warning lamp is not illuminated (see page 10).
11. Check trailer swing clearance to ensure trailer does not foul eq uipment on tractor unit.

UNCOUPLING TRAILER FROM TRACTOR

1. Ensure the trailer parking brake is applied.
2. Lower the support legs to the ground (detailed in this Section).
3. Disconnect the air and electrical couplings from the trailer. Close tractor airline shut-off cocks, if fitted. Disconnect hydraulic line(s) if applicable.
4. Unlock and release fifthwheel coupling, slowly drive the tractor clear of the trailer.

Some tippers when uncoupled from the tractor unit in a partially laden state forward of the support legs, may be prone to 'nosedive' if the load is not redistributed evenly or additional support used forward.

STABILITY

SUPPORT LEGS

For the purpose of supporting the trailer when uncoupled and for setting the trailer to the required height when coupling; this equipment may also be referred to as the landing legs.

The following instructions should be carried out on firm, level ground; if not, ensure the legs are positioned on suitable footplates to prevent them from sinking.

CAUTION OF BACKLASH FROM CRANKING HANDLE IF RELEASED ABRUPTLY
NEVER LIFT OR LOWER TRAILER USING HIGH GEAR
NEVER LEAVE GEARBOX IN NEUTRAL.

To Lower the Legs when Uncoupling

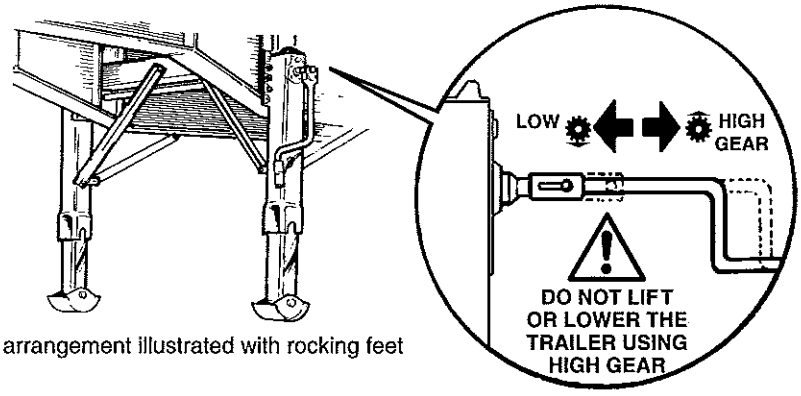
Unclip the cranking handle and pull shaft outwards to select high gear ⚙. Rotate handle until legs reach the ground - **STOP** - select low gear ⚙ and continue until trailer is supported - **Do not raise the trailer.** Secure handle in stowage and uncouple (see p.3).

To Set the Legs for Coupling

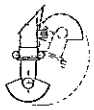
Unclip the cranking handle and push shaft inwards to select low gear ⚙. Rotate handle and adjust trailer height so that the upper coupler is level or slightly lower if lead-up ramps are fitted (20mm max.). Couple tractor (see p.3) and then raise legs when coupled (below).

To Raise the Legs when Coupled

Select high gear ⚙, rotate handle anticlockwise until legs are fully raised - **Do not force beyond this position.** Secure handle in stowage on completion.



Typical arrangement illustrated with rocking feet



Legs may be fitted with folding feet, ensure feet are secure in the lower position prior to supporting trailer. Some vehicles are not fitted with legs but the facility to support the trailer with a trestle is available; legs can be installed, if required.

PARK VALVE

This is fitted to trailers incorporating Spring Brake systems and dispenses with the need for a manually operated handbrake.

On disconnection of the Emergency (RED) Line the brakes are automatically applied (as with any system). However, unlike other systems, as the air is depleted the Spring Brake system maintains a brake through powerful springs in the brake's actuators.

The trailer brakes can be applied when coupled to the tractor or prior to uncoupling from the tractor by pulling the Park Valve control button (a desirable practice when parking); the valve will require resetting before moving off. **Do not use the Trailer Brake Release valve.**

TRAILER (BRAKE) RELEASE VALVE

This valve allows the uncoupled trailer brakes to be released. However, it is **not** recommended that this valve is used for moving the trailer with vehicles that are not suitable for the purpose and, therefore, should only be used in an emergency situation. At all other times the trailer should only be moved when coupled to a vehicle with an appropriate air supply. Ensure this valve is reset to its original position after use.

Note: Spring Brakes need sufficient air pressure in the reservoir to release the powerful spring in the actuators (see Park Valve).

VARIABLE HEIGHT CONTROL - Air Suspension

When fitted, this enables the operator to RAISE or LOWER the vehicle using the trailer suspension. Reset before moving trailer

WARNING

DO NOT OPERATE HEIGHT CONTROL WHEN UNCOUPLED

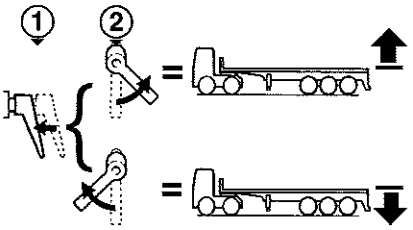
DO NOT OPERATE HEIGHT CONTROL WITH TRAILER BRAKES APPLIED

ALWAYS LEAVE A PARKED TRAILER WITH THE SUSPENSION LOWERED
(unless the support legs incorporate rocking feet, see page 4)

The following instructions cover the standard control fitted to Fruehauf trailers, for alternative controls refer to the operating symbols on the valve.

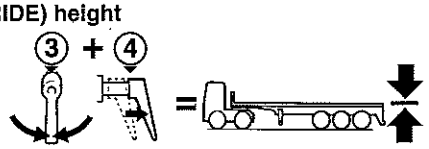
To RAISE or LOWER the suspension

1. Push control handle IN.
2. Set control to either RAISE or LOWER position. On reaching the req uired level (or maximum allowable) set the control back to the central position.



RESET the suspension to the RUNNING (RIDE) height

3. Ensure control is set in central position.
4. Pull handle to reset suspension.



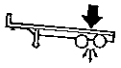
IMPERATIVE

NEVER MOVE TRAILER IN THE RAISED OR LOWERED POSITION

Always reset control to the RUNNING (RIDE)' Position

Note: Some auto-reset systems req uire one application of the brake to reset suspension.

EXHAUST VALVE - Air suspension



When fitted, this enables the operator to lower the suspension fully by exhausting the air system for the suspension for suspension maintenance. This control will be either a push/ pull valve or the above valve with exhaust function only. Reset before moving trailer.

WARNING

DO NOT EXHAUST SUSPENSION WITH A LIFT AXLE IN THE RAISED POSITION

DO NOT EXHAUST SUSPENSION ON TIPPER TRAILERS FOR TIPPING

DO NOT MOVE TRAILER WITH SUSPENSION EXHAUSTED

AUTO-LIFT/LOWER AXLE

This option automatically lifts an axle (usually the front) clear of the ground when the laden condition allows an axle to be raised. The raised axle automatically lowers when the load imposed increases to a level that requires all wheels on the ground for normal running condition.

TRACTION ASSIST

The traction assist option is operated either by a control (switch) in the cab or a control on the trailer that allows the driver to lift the axle in a fully laden condition. Lifting an axle in the laden condition increases the imposed load through the kingpin to the tractor unit's drive axle thereby assisting drive axle traction ~ particularly useful in off-road conditions on inclines; the axle lowers automatically above 25kph (15mph). If the traction assist control is held for 5 seconds it will override the auto-lift system and lower the axle in an unladen condition to shorten the wheelbase and assist low speed manoeuvrability (not applicable to rear lift axle system).

WARNING

RAISING AN AXLE IN THE FULLY LADEN CONDITION WILL EXCEED THE PLATED WEIGHTS AND IS ONLY POSSIBLE FOR LOW SPEED OPERATION

LOWER AXLE WHEN PARKING
(Swith off ignition then unplug ISO7638 socket to lower)

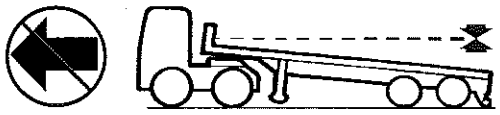
SUSPENSION LOAD GAUGE

When fitted, this gauge provides the operator with a simple method of indicating the load condition of the air suspension. The gauge will require initial calibration on a weighbridge in the fully laden condition (i.e. to the maximum GB axle weight). Mark the gauge with a waterproof marker for future reference.

IMPORTANT

THE GAUGE IS ONLY AN INDICATION OF SUSPENSION LOADS AND SHOULD BE CALIBRATED REGULARLY

THE GAUGE WILL NOT INDICATE GROSS TRAIN WEIGHTS



DO NOT MOVE AIR SUSPENSIONS UNTIL NORMAL 'RIDE' HEIGHT IS REACHED

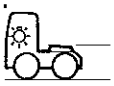
ANTI-LOCK BRAKE SYSTEM

From July 2005 the new generation Fruehauf tipper incorporates full **EBS** Anti-lock Brake System featuring **electronic load sensing equipment** via an on-board electronic control unit (ECU) with self-diagnostic capabilities and full communication links to a tractor EBS system. **EBS power supply is via an ISO7638 connector**; emergency backup (without load sensing facility) is available from the brake light circuit via the ISO1185 (24N) connector. **The dedicated ISO7638 supply must be used if the tractor has a socket.** Roll stability, auto-lift/lower axle, traction assist and suspension ride control are optional EBS functions **only** powered via the ISO7638 connector.

Do not operate EBS system without the dedicated ISO7638 supply.

A **7-pin ISO7638** connector fitted to the tractor indicates full **EBS** communication links;
A **5-pin ISO7638** connector fitted to the tractor indicates **ABS** system only.

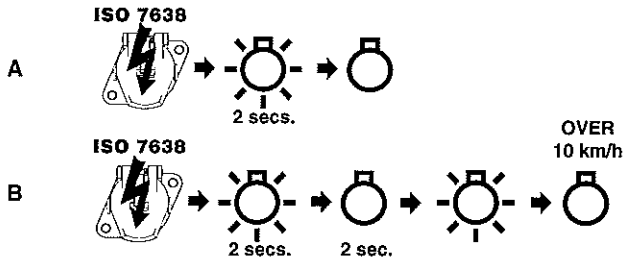
A lamp in the cab on the dashboard will display trailer EBS function; **the cab lamp is the only indicator for the trailer system.**



Anti-Lock Brake System Check

Two systems are fitted (**A** or **B** below) and the following lamp seq uences indicate correct operation for each method of power supply.

Tractor with ISO7638 supply - on initial power-up (ignition ON) - use cab lamp in tractor:



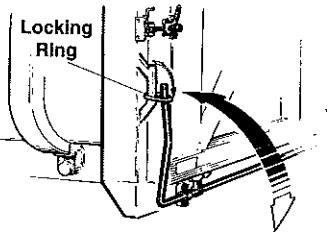
Malfunction: No light or a continuous light on power-up and/or a continuous light above 10 km/h indicates a fault.

Switch the ignition ON, depress the brake pedal and check above lamp seq uence with pedal depressed. If seq uence is correct, check the dedicated ISO7638 supply is connected. If dedicated ISO7638 supply is connected a fault exists with the supply and the trailer is operating on brake light power only. Check out any fault immediately. Refer to Section 3.

BLOWER DISCHARGE SYSTEM

Discharge may be assisted by a *Priden Engineering* blower system incorporating an auger mounted in the floor at the rear of the tipper that feeds the load into a blow-through rotary valve under the floor to which the discharge hose is attached; refer to *Priden*'s literature for operation.

TAILGATE



The standard tailgate is a single door arrangement hinged from the top and secured (in the closed position) with a full width lockbar located on the bottom rear crossmember of the body. For safety the operator stands to one side of the trailer when manually opening the tailgate; the lockbar is operated from either side of the trailer. An optional remote operated locking device may be fitted, controlled from the cab or from a valve on the trailer. Additional security is provided with screw-down swingbolts (cattle clamps). Ensure tailgate is fully secured closed on completion of discharge operation.

BARN DOORS

Barn doors are either a single or double door arrangement vertically hung from the rear sidewall frame. Beware of load bearing on door when opening; release locking arrangement with care; be prepared for partial discharge of load as door opens. Ensure door(s) are fully secured closed on completion of discharge operation.

COMBINATION TAILGATE and BARN DOOR

Combination tailgate/barn door assembly comprise a top hung tailgate frame with vertically (side) hung barn door. Extra caution is req uired during operation to avoid tailgate frame distortion when opening.

Opening the barn door: ensure the tailgate frame is locked to the tipper body with the bottom and side clamps, and lower lockrod. Beware of load bearing on door, release locking arrangement with care; be prepared for partial discharge of load as door opens. Ensure door is fully secured closed on completion of discharge operation.

Opening tailgate: ensure the barn door is locked to the tailgate frame before releasing the clamps and bottom lock rod to open the tailgate. Ensure tailgate is fully secured closed on completion of discharge operation.

GRAIN HATCH

If fitted the grain hatch may be used for the discharge of a 'free-flowing' commodity. These, usually, are used in conjunction with a grain sock which is attached to the hatch surround by the 'anti-luce' fasteners provided. Progressively raise the body during tipping to avoid overloading the tailgate / doors *i.e.* do not pile the load against the tailgate / doors.

INTERNAL (Intermediate) DOORS

Internal (intermediate) doors may be fitted which, effectively, divide the body into compartments allowing different products to be carried, usually animal feed. Open and close doors as described above for tailgates. All doors should be locked closed before loading each compartment; doors are released as req uired for discharge.

TIPPING OPERATIONS

The tipping gear is a multi-staged telescopic ram installed at the front of the trailer between the body and chassis. Operation, usually, is from a control lever (see below) situated in the tractor cab utilising a tractor's hydraulic system with supply to the ram via a hose. Alternatively the trailer may have an on-board engine driven system; refer to separate literature

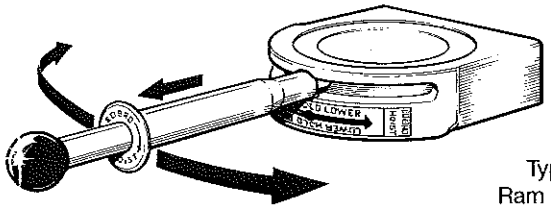
BODY RAISED WARNING SYSTEM

A lamp is fitted to the offside front which flashes a warning if the body is not fully lowered - DO NOT LOAD OR MOVE WITH THE BODY RAISED - see operating seq uence below.

Operating sequence on start-up: When the tractor's ignition is first switched on, the lamp should flash for about 15 seconds and then extinguish if the body if fully lowered. The lamp will only flash when the body is raised. Note: the lamp is powered through pin 7 of the ISO1185 (24N) connector.

RAM OPERATION

The control used to operate the ram may differ from the one illustrated but the procedures for use are basically the same for all types. Prior to operating tipping gear, read the tractor manufacturer's handbook or the literature supplied with the 'Donkey' engine when fitted.



Typical
Ram Control

The ram control has three positions - 'RAISE', 'LOWER' and 'HOLD' with the latter taking the central position.

To Raise the Body: Observe all instructions detailed under 'Important - When Tipping'. Start engine, engage the P.T.O. for the hydraulic pump. Select 'RAISE' on ram control and commence tipping operations; **progressively raise the body as the load is discharged.**

To maintain body at any position select 'HOLD' and disengage P.T.O.

CAUTION
DO NOT LEAVE P.T.O. ENGAGED WITH RAM IN 'HOLD' POSITION

To Lower the Body: Select 'LOWER' on the ram control and allow the body to lower. If the body is partially laden, carefully lower to eliminate possible damage to ram or chassis; avoid jerky movement of control.

IMPORTANT - WHEN LOADING

Ensure the tailgate/rear doors are securely closed. The load must be evenly distributed during loading; refer to the trailer identification plate for the 'plated weights' - do NOT overload. If body is fitted with internal (intermediate) doors ensure all doors are locked closed before loading.

Ensure the body is fully down and supported on the chassis whilst loading. If an on-board weigher is fitted only raise the body to check load distribution - do NOT load with the body raised off the chassis (see opposite).

Ensure the load is secure and unable to shed contents *en route*; cover load as req uired, ensuring sheet / cover is correctly secured also.

Ensure body is fully lowered (see opposite) and carry out 'Checks Before Moving Off' detailed later in this Section of the handbook.

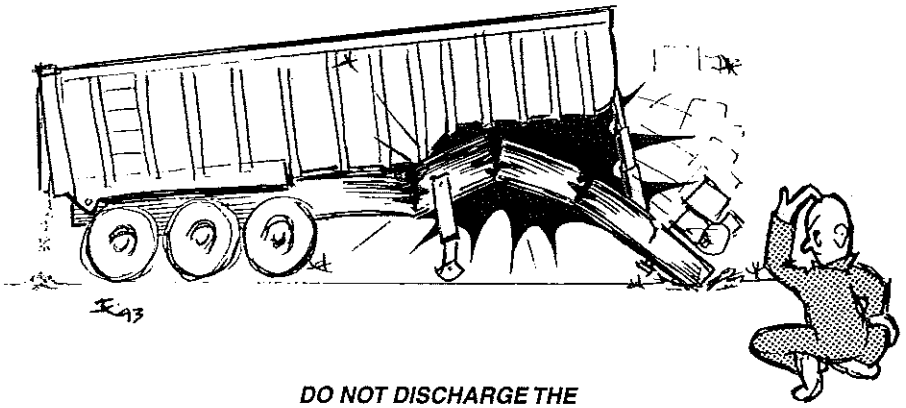
IMPORTANT - WHEN TIPPING

Ensure the tractor and trailer are positioned in a straight line, on firm level ground, with ALL wheels in contact with the ground and the brakes applied.

Only discharge load with tractor and trailer coupled.

Air suspension: NEVER tip with suspension deflated.

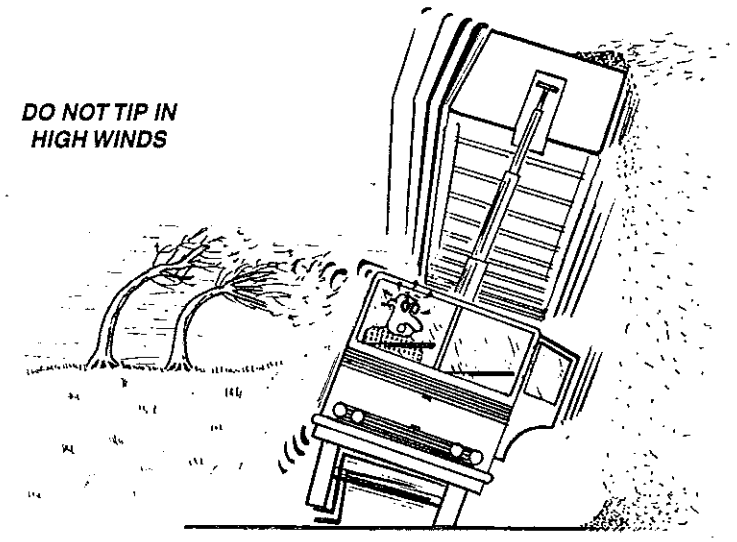
Progressively raise the body as the load is discharged.



DO NOT DISCHARGE THE LOAD FROM AN UNCOUPLED TRAILER

- When Tipping continues over...

DO NOT TIP IN HIGH WINDS



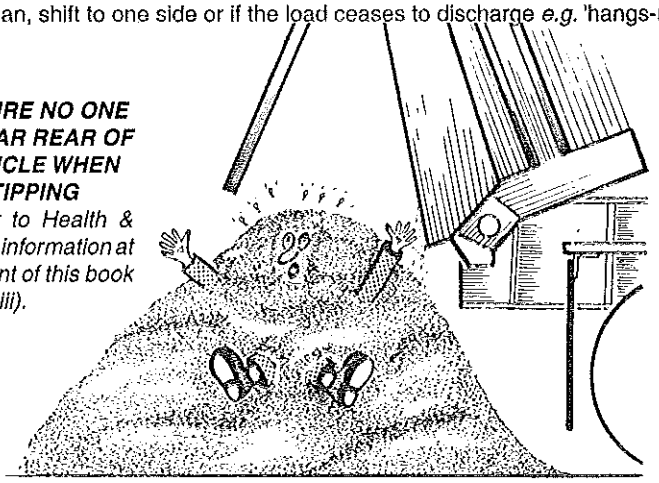
Do NOT attempt tipping operations in high wind conditions.

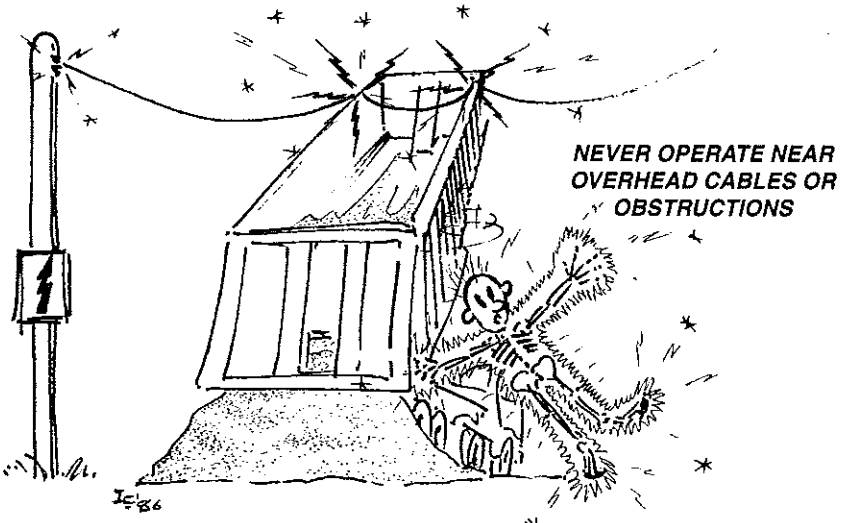
Ensure the tailgate / rear doors is unlocked before tipping. If a grain hatch is fitted and the load is a free-flowing commodity, discharge may be possible (without opening the tailgate / doors) via the hatch. Attach grain sock, open hatch before tipping and progressively raise the body to avoid overloading the tailgate / doors *i.e.* do not pile load against tailgate / doors.

Always make certain that no one is behind or near the rear of the trailer when releasing tailgate / doors or during the tipping operations; if necessary erect warning signs - refer to Health & Safety information at the front of this book (*page iii).*

Stay at the tipper controls during all tipping operations and lower body immediately should it start to lean, shift to one side or if the load ceases to discharge *e.g.* 'hangs-up'.

ENSURE NO ONE IS NEAR REAR OF VEHICLE WHEN TIPPING
- refer to Health & Safety information at the front of this book (page iii).





NEVER discharge load in the vicinity of overhead cables or obstructions of any other nature.

Do NOT race engine while raising the tipper body.

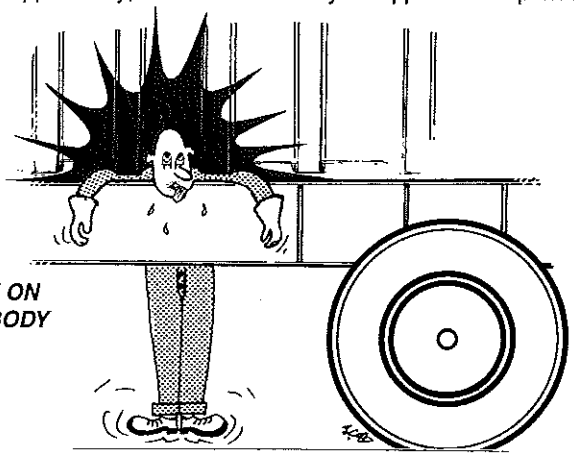
NEVER loosen a wet or sticky load by moving the trailer and hitting the brakes; return body to lowered position and dislodge load appropriately.

NEVER allow the tailgate to dig into the load or the ground when discharging..

Set the ram control in the 'HOLD' position when not in use and disengage the P.T.O. when the ram is not in use.

Only move the trailer when the body is completely lowered.

NEVER work on an unpropped body; make sure the body is supported independently.



CHECKS BEFORE MOVING OFF

The following checks to be carried out in addition to 'Driver's Routine Checks' (Section 3).

Electrical and Air Lines (and Hydraulic lines where applicable)

All connections should be tight and clean. They should be well supported to prevent pinching or entanglement, but long enough to permit a 90° lock.

Lights and Markers

Check all lights and reflectors are clean and functioning correctly. Replace damaged components promptly; it's illegal for components to be functioning (or positioned) incorrectly.

Ensure correct Emergency Cards or Markings are displayed, if applicable (refer to Health and Safety information 'Dangerous Substances').

Ensure correct number plate is affixed to the trailer. **NEVER use illegal markings.**

Check Brake Operation

Allow system to pressurise, check tractor pressure gauges and if necessary run up to 4.76bar (70 psi).

Try the Service (foot) and third line (hand) controls (where applicable). Listen for air leaks during each application.

Carry out an Anti-lock brake check as detailed earlier in this Section.

Air Suspension

On trailers fitted with air suspension, allow the suspension to reach 'RIDE' height before moving off.

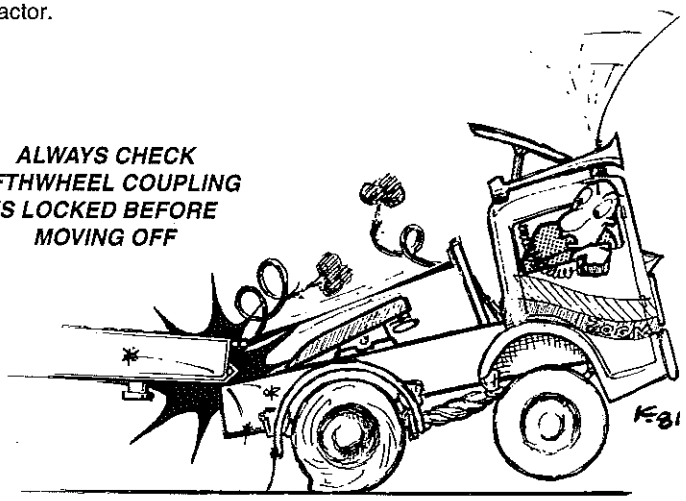
Ensure Raise/Lower or Exhaust control (if fitted) is reset prior to moving. Some auto-reset systems req uire initial energising via the brake light circuit; press the brake pedal prior to moving.

Lift Axle

If axle is raised ensure the configuration is within legal plated weights.

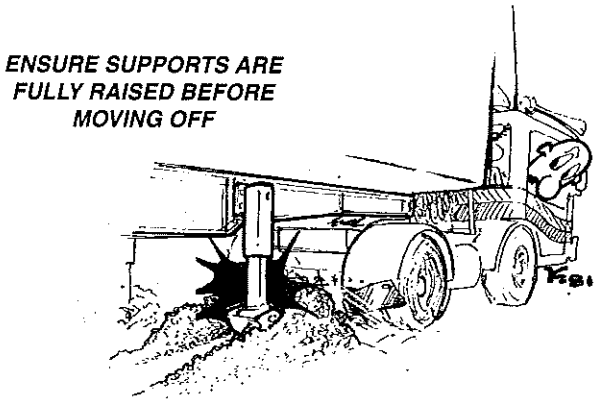
Fifthwheel

Ensure fifthwheel is locked by pulling forward slightly with the trailer parking brake applied. If the fifthwheel is fitted with a safety locking mechanism, visually check it has locked after coupling to tractor.



Raise Support Legs

Check the support legs are fully retracted and handle is secure in its stowage.



Check Wheels and Tyres

Generally check the condition of all wheels and tyres, including spares. Also check mudwings, mudflaps/spray suppression.

Cont...

Loading - General

Determine the amount and nature of the payload. If the load is a dangerous commodity, the driver should be informed of the commodity and what to do in case of an emergency i.e. fire or leakage (see Health and Safety information 'Dangerous Substances' and Section 5 'Dealing with Emergencies').

Check distribution and security of load.

Ancillary Equipment

Where applicable, check the condition of all ancillary eq uipment and ensure it is correctly positioned/stowed.

Unsafe Equipment

Report all unsafe eq uipment before its condition becomes an operational hazard.

Check the general condition of your vehicle e.g. load carrying area, doors, covers, sidewalls, ladders, handrails, walkways, etc.

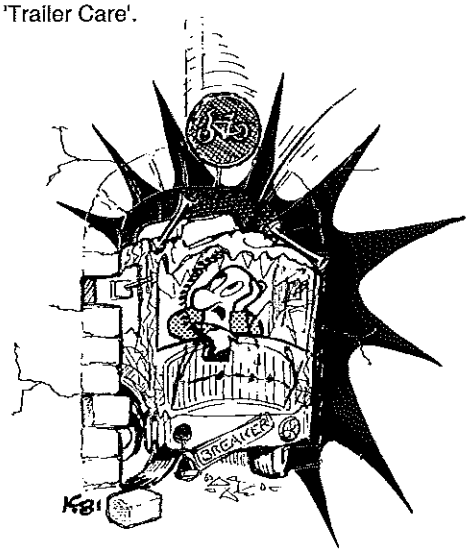
Know Your Vehicle

Your life and others depend on your knowledge and experience, ensure your vehicle is safe **before** moving off - **never assume**. For trailer maintenance information and 'Driver's Routine Checks' refer to Section 3 'Trailer Care'.

KNOW THE HEIGHT, WIDTH AND LENGTH OF YOUR VEHICLE

KNOW ANY SPECIAL OPERATING PROCEDURES

IF IN DOUBT, ASK !



ROLL-OVER COVER/SHEET (Manually Operated)

When fitted, this arrangement (generally) is opened from ground level using a long detachable winding handle with knuckled drive point*. The cover is attached the full length of the body along one top siderail and pulled closed manually. The cover is tensioned via straps in ratchet devices on the other side of the body at ground level.

WARNING

NEVER RUN TRAILER WITH COVER IN THE ROLLED OPEN POSITION
ALWAYS CLOSE COVER AND TENSION SHEET BEFORE MOVING OFF
NEVER TIP THE BODY WITH THE SHEET TENSIONED
RELEASE RATCHET TENSIONERS BEFORE TIPPING (roll cover open if required)
OPEN AND CLOSE COVER AS DETAILED BELOW
OBSERVE THE LOADING AND TIPPING INFORMATION IN THIS HANDBOOK

To Open Cover:

1. Release tension on the ratchet straps and unhook straps (straps may be completely detachable, depending on type of system) and attach the 'pull-back' strap to the ring on the central tensioning strap.

2. Remove the winding handle from its stowage and insert the drive point in the 'roll-over' pole (i.e. the central pole or side pole, depending on type). Turn handle and open the cover fully to one side of the body; the sheet will wrap around the pole as it rotates and rest against stops on the top body siderail when fully open.

3. Remove the winding handle and relocate in its stowage on trailer. Throw the free end of the 'pull-back' strap over the vehicle body to allow loading/unloading.

4. Vehicles fitted with sheet support bows are pivoted at one end, these may be swung to one side to give clear access to body top if req uired; retain bow in socket provided.

* *Some covers are opened from a gantry at sheet level by attaching a 'T' handle directly to 'roll-over' poll.*

To Close Cover:

1. Ensure the sheet support bows (if fitted) are positioned across the body (laterally).

2. Throw the 'pull-back' strap over body and pull on the strap end until sheet fully covers top of body and hangs over siderail. Remove the 'pull-back' strap and stow away.

3. Attach tensioning straps and tension sheet using the ratchets.

ROLL-OVER COVER (Mechanically operated) - Option

Electro-pneumatic and/or electro-hydraulic roll-over cover systems are available. These may be operated from controls in the driver's cab or via controls on the trailer; both systems req uire the tractor services (air and electrical) connected.

DO NOT OPERATE IN VICINITY OF OVERHEAD OBSTRUCTIONS
DO NOT MOVE TRAILER WITH COVER OPEN
REFER TO MANUFACTURER'S INSTRUCTIONS FOR OPERATION AND MAINTENANCE

TIPPING ANGLES for VARIOUS COMMODITIES

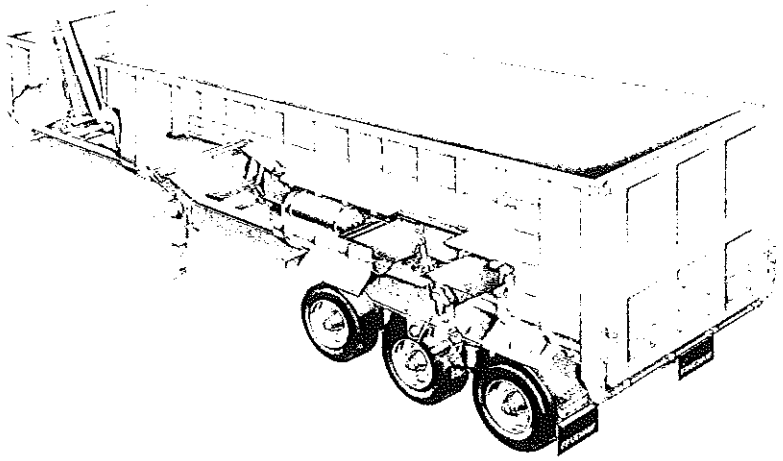
Ashes	- Dry	33°	Cinders and Clay	30°	Gravel	40°
	- Moist	36°	Clay	45°	Ore - Dry	30°
	- Wet	30°	Coal - Hard	24°	- Fresh Mined	37°
Asphalt		45°	- Soft	30°	Rubble	45°
Brick		40°	Coke	23°	Sand - Dry	35°
Cinders	- Dry	33-°	Concrete	30°	- Moist	40°
	- Moist	34°	Earth - Loose	28°	Sand and Crushed Stone	27°
	- Wet	31°	- Compact	50°	Shingles	40°
			Garbage	30°	Stone - Whole	30°
					- Broken	27°
					- Crushed	30°

APPROXIMATE MATERIAL WEIGHTS and MEASUREMENTS

		tonne / cu.m	Ton / cu. yd	cu.m / tonne	cu.yd / Ton
Ashes	- Damp / Dry	0.8 - 1.03	0.6 - 0.78	1.0 - 1.25	1.3 - 1.7
	- Wet	1.01 - 1.33	0.76 - 1.0	0.75 - 1.0	1.0 - 1.3
Asphalt		1.59	1.2	0.6	0.8
Ballast	- Dry	1.53 - 1.73	1.15 - 1.3	0.6 - 0.7	0.8 - 0.9
	- Wet	1.73 - 1.93	1.3 - 1.45	0.5 - 0.6	0.7 - 0.8
Barley (bulk)		0.63	0.48	1.6	2.1
Bricks, weight / 1000	- Common Brick	3.05 - 3.56t (3 - 3.5T)			
	- Facing Brick	3.56 - 4.06t (3.5 - 4T)			
	- Rustic Brick	4.06 - 4.46t (4 - 4.5T)			
Bricks	- Stacked	1.48 - 1.99	1.11 - 1.5	0.6	0.8
	- Tipped	1.26 - 1.66	0.95 - 1.25	0.6 - 0.8	0.8 - 1.0
Cement	- Natural	0.9	0.68	1.1	1.5
	- Portland (loose)	1.45	1.09	0.7	0.9
Clay	- Dry	1.01	0.76	1.0	1.3
	- Wet	1.76	1.33	0.6	0.75
Coal	- Anthracite	0.9	0.68	1.1	1.5
	- Bituminous	0.76	0.58	1.3	1.75
	- Pulverised	0.55	0.4	1.8	2.4
Coke	- Loose	0.6	0.45	1.7	2.2
	- Breeze	0.4 - 0.55	0.3 - 0.4	1.8 - 2.5	2.4 - 3.3
Concrete	- Dry Mix	1.25	0.94	0.8	1.1
	- Wet Mix	2.38	1.8	0.4	0.6
Corn	- Rye (bulk)	0.76	0.58	1.3	1.75
Earth	- Dry (loose)	1.11	0.84	0.9	1.2
	- Damp (loose)	1.25	0.94	0.8	1.1
Fertiliser (bulk)		1.03	0.78	1.0	1.3
Flour (bulk - loose)		0.45	0.34	2.2	3.0
Fluedust (blast furnace)		1.76 - 1.99	1.33 - 1.5	0.5 - 0.6	0.7 - 0.75
Garbage		0.68	0.51	1.5	2.0
Gravel	-Dry	1.68	1.26	0.6	0.8

Cont...

	tonne / cu.m	Ton / cu. yd	cu.m / tonne	cu.yd / Ton
Gravel & Sand - Dry	1.46 - 1.73	1.1 - 1.3	0.6 - 0.7	0.8 - 0.9
- Wet	1.93	1.45	0.5	0.7
Hardcore - Fine	1.66	1.25	0.6	0.8
- Rough	1.2 - 1.46	0.9 - 1.1	0.7 - 0.8	0.9 - 1.1
Iron - Hemalite Ore (loose)	2.12 - 2.56	1.58 - 1.93	0.4 - 0.5	0.5 - 0.6
Lime - Gypsum (loose)	0.91 - 1.0	0.69 - 0.75	1.0 - 1.1	1.3 - 1.6
Limestone (loose)	1.53	1.15	0.7	0.9
Oats (bulk)	0.42 - 0.51	0.31 - 0.39	1.9 - 2.4	2.6 - 3.2
Road Metals				
- Asphalt - Mastic or Rolled	2.39	1.8	0.4	0.55
- Macadam - Bitumen	2.13	1.6	0.5	0.6
- Macadam - Tar	1.88 - 2.51	1.41 - 1.89	0.4 - 0.5	0.5 - 0.7
Rubble	1.05	0.79	1.0	1.3
Sand - Dry Pit	1.33	1.0	0.75	1.0
- Wet Washed Pit	1.66	1.25	0.6	0.8
- Dry Silica	1.45 - 1.59	1.09 - 1.2	0.6 - 0.7	0.8 - 0.9
- Foundry	1.45 - 1.59	1.09 - 1.2	0.6 - 0.7	0.8 - 0.9
Shale - Crushed	1.43	1.06	0.7	0.9
Shingles - Dry	1.73	1.3	0.6	0.8
- Wet	1.93	1.45	0.5	0.7
Slag - Blast Furnace	1.26 - 1.66	0.95 - 1.25	0.6 - 0.8	0.8 - 1.1
Street Sweeping	0.5	0.4	2.0	2.7
Stone - Crushed	1.59	1.2	0.6	0.8
Sugar - Refined (bulk)	0.8 - 0.88	0.6 - 0.66	1.1 - 1.3	1.5 - 1.7
Urea - Powder	0.6 - 0.73	0.45 - 0.55	1.4 - 1.7	1.9 - 2.2
Wheat (bulk)	0.76	0.56	1.3	1.75



Section through typical End Tipping Semi-trailer

SECTION 3

TRAILER CARE

Contents

This section covers a wide variety of components that are used on *Fruehauf* Trailers. Not all components shown will appear on one vehicle, therefore, certain instructions contained herein will not apply. Where special instruction beyond the scope of this section is required, this will be supplied as supplementary information.

IF IN DOUBT, ASK!

This section details three areas of trailer care:

Imperative Maintenance (to be carried out during the first four weeks of operation)

Preventive Maintenance (a schedule designed for maintenance staff)

Driver's Routine Checks (a schedule designed for the driver)

Sufficient information is provided here for the first four weeks of trailer operation, it does not cover detail stripping of components. More information is obtainable from:

Fruehauf Limited
Houghton Road
Grantham
Lincolnshire
NG31 6JE

Tel: 01476 515515
Fax No: 01476 515516

Engineering Department

When requesting any information, please quote the vehicle Chassis Number (see front cover of this book).

IT IS THE OPERATOR'S RESPONSIBILITY TO ENSURE MAINTENANCE IS CARRIED OUT AT REGULAR INTERVALS BY COMPETENT PERSONNEL.

TRAILER CARE

IMPERATIVE MAINTENANCE FOR THE FIRST FOUR WEEKS OF NEW TRAILER OPERATION

Operation		Initially	Daily for first week	Weekly for first four weeks	First Month
Torque:	Wheel nuts	Prior to First Journey	X	X	
	Suspension nuts	Times vary, refer to the relevant page in this section for the maintenance to the suspension fitted to your trailer.			
Check:	Brakes	X		X	
	Hub bearing	First 1600km (1000mls)			X
Clean:	In-line air filters	First 1600km (1000mls)			X
Check:	King Pin security				X
	Body clamp bolts (vans)		X		X

PREVENTIVE MAINTENANCE

A conscientious driver has a direct contribution to make to preventive maintenance through his ability to recognise faults and inform maintenance personnel. To assist with this, a list of routine checks is included in this section. It should be remembered that several different semi-trailers may be used with the same prime mover in the course of a working day - all of which require checking.

The remainder of the section contains sufficient technical information to cover maintenance during the first four weeks of new trailer operation followed by preventive maintenance charts to assist workshop staff with future planned servicing. These may be used in conjunction with the Maintenance Manual which is available on request.

Drivers routine checks and preventive maintenance schedules overlap on weekly tasks with daily tasks listed under the former, although it is recognised that the policy of individual operators may differ over responsibility for certain areas. Both charts are purely for guidance and may be amended to cover operators' individual requirements or to comply with laid down procedures.

FLEET OPERATOR

Recognise need for servicing

Ensure qualified personnel available

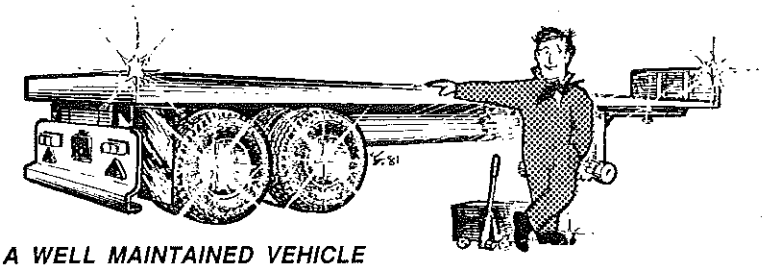
Gather technical information

Understand operating parameters

Limited time off road

Attack problems early

Respond to drivers problems



A WELL MAINTAINED VEHICLE IS A SAFE VEHICLE

DRIVER

Smell unusual odours

Evaluate handling defects

Report defects regularly

Verify defects rectified

Investigate unusual noises

Carry out regular checks

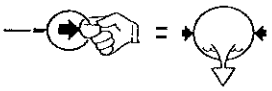
Inspect components for damage

Never ignore safety checks

Guard against complacency.

IT IS THE OPERATOR'S RESPONSIBILITY TO ENSURE MAINTENANCE IS CARRIED OUT AT REGULAR INTERVALS BY COMPETENT PERSONNEL.

DRIVERS ROUTINE CHECKS

OPERATION		DAILY	WEEKLY or 1600km (1000 miles)
Inspect for damage or wear:	Securing devices	X	X
Drain air reservoir (During freezing conditions)*		*(X)*	X
Inspect tyres for damage		X	X
Check tyre pressures			X
Inspect for security and corrosion:	Identification plates	X	
	TIR fasteners	X	
Grease and	King pin and rubbing plate		X
Inspect:	Fifthwheel (tractor unit)		X
Torque load wheel nuts			X
Check oil level, hoses & connections	(where hydraulic systems are fitted)	X	X

NOTE: Above tasks to be carried out by the driver in addition to 'Checks Before Moving Off' detailed in the previous Section.

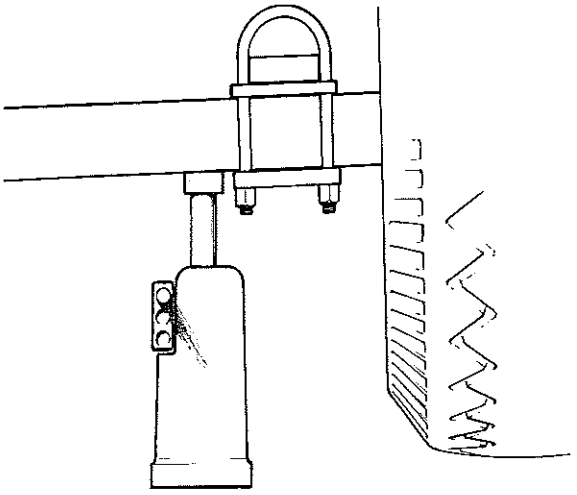
** Read the Health & Safety instruction 'Air Pressure Systems' at the front of this book.*

JACKING POINTS

All jacking operations are to be carried out on firm level ground with the parking brake applied. The vehicle must be securely chocked at the wheels on the opposite side and suitable blocks placed under the axles for additional safety.

Most suspensions allow for jacking under the axle on the inside of the axle chair, as near as possible to the road spring or trailing arm (air suspension). A typical example is illustrated below.

IMPORTANT Ensure the jack head is suitably shaped to accept the profile of the axle, to prevent it slipping off the jack.



Where it is not possible to jack in the position previously described, jacking must then be carried out with consideration to the following:

Do not jack under castings.
Do not jack under springs or air suspension trailing arms.
Do not jack under radius/panhard rods or mountings.
Do not jack under hanger brackets.
Do not jack under the rear under-run bump bar.
Do not jack under chassis/subframe forward of suspension.

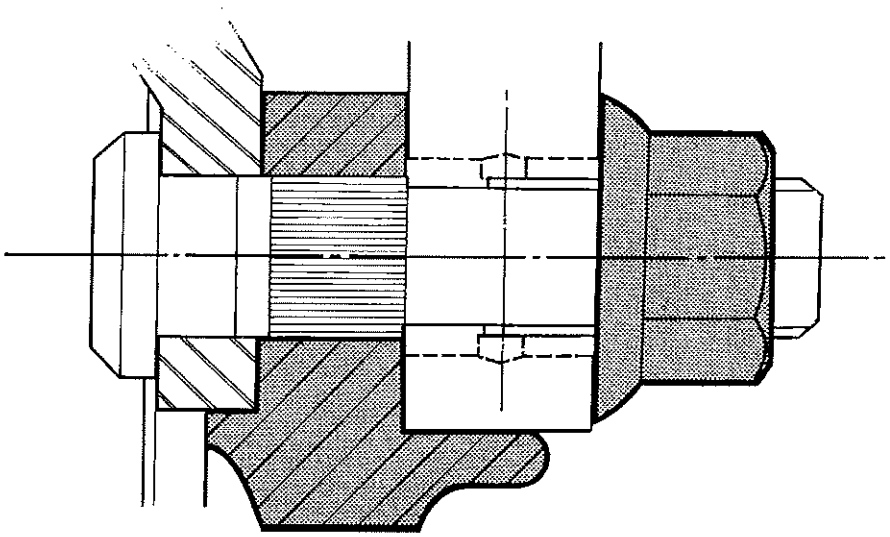
Jack under the 'I' beams **behind** the suspension, only where **stiffeners** are provided between top and bottom flanges. Spread the loads over as much length of the beam as possible by using timber packing between the jack and frame. The timber packing should be in excess of 75mm thick and should extend longitudinally at least 200mm either side of the jack position.

WHEEL CHANGING - ISO SPIGOT WHEELS

ISO spigot mounting is where the wheel is centralised to the hub on a protruding lip (spigot) and secured by ISO nuts with the captive collar; the wheel nave will usually feature parallel fixing holes. However, wheels with conical* or spherical** faced holes can be used on spigots hubs, providing the wheel has **never** been used on alternative types of mounting and that the nave bore complies with the following tolerance:

$$281\text{mm}^{+0.2\text{mm}}_{-0\text{mm}}\ \text{Dia.}$$

All wheel nuts have right-hand threads.



For non-spigot mounted wheels see note at the end of this instruction.

Note: Protective wheelnut covers and loose nut indicators may be fitted, replace on completion.

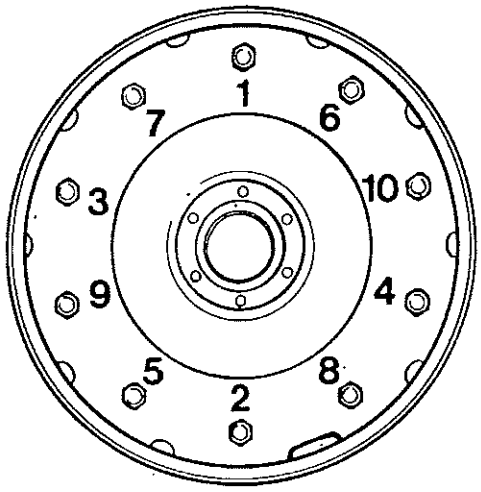
1. To remove a road wheel: slacken the wheel nuts and jack up as previously described, adjacent to the respective wheel/s.

2. Remove wheel nuts and wheel/s.

3. To fit a wheel: lightly lubricate the **thread** of the wheel nuts and check that the captive collar on ISO spigot nuts, rotate freely.

4. Position the wheel to be fitted as near as possible to the hub, place a bar underneath the base of the tyre and lever the wheel upwards and over the studs, taking care not to damage the threads. Repeat this operation for second wheel where necessary.

5. Refit the wheel nuts and tighten by hand.



Wheelnut Tightening Sequence

6. Tighten in sequence by spanner. Remove jack and finally torque load the nuts in sequence, repeating after the first 80km (50 miles) and daily for first week. Replace protective wheelnut covers and loose nut indicators (if applicable).

Fruehauf recommend the nuts are tightened manually with a correctly calibrated torque wrench.

7. **Torque load all wheel nuts WEEKLY**

IF DOUBT EXISTS CONCERNING WHEEL NUT TORQUE FIGURES - REFER TO THE PLATE POSITIONED ADJACENT TO THE CHASSIS PLATE.

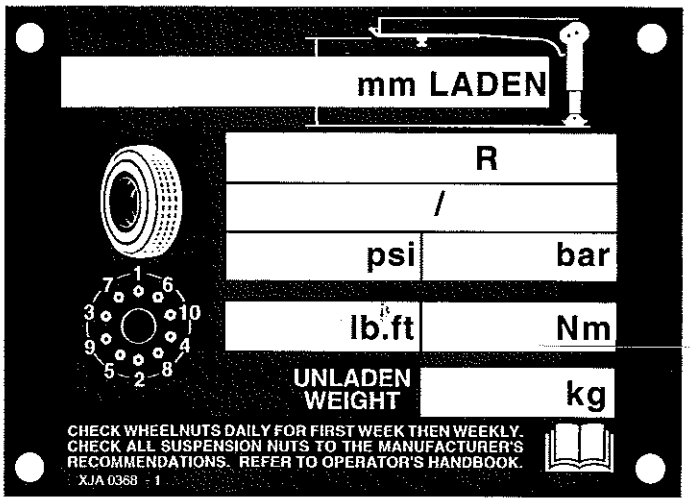
IMPORTANT INFORMATION - WHEEL FIXINGS

The plate detailing the recommended torque figures are applicable to the manufacturer's original equipment only and may not apply should wheel nuts ever be replaced with alternative items.

It is recommended that all wheel stud holes are checked periodically for ovality as an early indication of wheel problems. Over-tightening of wheel nuts will cause the hole to distort radially, while fretting as a result of under-tightening causes circumferential distortion.

The mating surfaces on wheels between hubs, wheel or wheel nuts should be left in the manufacturer's **original** finish: it is **NOT** recommended that these areas be painted.

It is essential all wheel nuts are torque tightened **WEEKLY.**



Wheel Nut Torque

NON-SPIGOT MOUNTED WHEELS (not illustrated)

Wheels not mounted to ISO spigot hubs will require the installation of cones. Check correct installation before fitting wheel; if in doubt, ask! The wheel needs centralising on the studs by leverage whilst tightening.

CARE AND MAINTENANCE OF TRAILER TYRES

TYRE PRESSURES

Refer to plate positioned adjacent to the Chassis plate for tyre pressures.

Neglect of inflation pressures is one of the principal causes of premature tyre failure and for this reason the importance of regular checks cannot be overstressed. Although they are often overlooked the same priority should be given to trailer tyres as those of the tractor unit and this is of paramount importance if maximum tyre mileage is to be obtained. Drivers and maintenance staff share the responsibility for ensuring that tyres are operated within the bounds of safety and efficiency.

Important - It should be borne in mind that recommended inflation pressures are given for a 'cold' tyre. An increase in temperature as a result of running will cause pressure to rise giving a false indication. This pressure increase must **never** be reduced as the tyre is designed to safely withstand this condition. Any reduction in pressure at this stage will cause the tyre to flex abnormally with subsequent heat generation and premature tyre failure.

The following checks are recommended for maximum tyre life:

Pre-journey Checks By Drivers and/or Maintenance Staff	Periodic Checks by Maintenance Staff
1. Obvious signs of underinflation.	1. Correct inflation pressures.
2. State of wear on crown and shoulders.	2. Leakage at valves.
3. Cuts in tread or sidewalls.	3. Missing valve caps.
4. Bulges in sidewalls.	4. Remaining tread depth, state of wear and correct alignment.
5. Stones and foreign objects trapped in tread pattern.	5. Valve accessibility. (Twin wheels correctly positioned so that inner valves can be reached, provision of correct extension where necessary).
6. Objects trapped between tyres in twin wheel combinations.	

ROLLING CIRCUMFERENCE - An Important Note

The rolling circumference is the distance a tyre travels with a single turn of the wheel. When replacing tyres **ensure** the rolling circumference (or 'turns per mile' value) is consistent with specification. Any change may result in the need to change hubodometers. Also, re-calibration of tachographs may be necessary if different specification tyres are fitted to the tractor unit.

TYRE PROBLEMS

SYMPTOMS	CAUSES	END RESULTS
Uneven tread wear	Underinflation	Fire Risk Fracture or Rupture of cords
Excessive heat build up		
Wear concentrated in centre of tread	Overinflation or Worn shock absorbers	More susceptible to damage. Fracture of cords
Spotty tread wear	Grabbing brakes. Slack, worn or broken wheel bearings Oval brake drums	Reduction in tyre life
Scrubbing	Axle misalignment	
Tread Cuts	Stone, gravel, sharp metal debris etc.	Damage to tyre cords
Irregular wear on shoulder of tyre	Overloading	Bursting
Rapid Wear	Excessive deflection due to mismatching of tyres	Premature failure

CHOICE OF REPLACEMENT TYRES

Whilst choice of tread pattern designs for trailer tyres is usually limited to one which offers minimum rolling resistance (such as circumferentially ribbed design) it is extremely important that the tyre selected is capable of safely withstanding the axle load imposed upon it under normal operating conditions.

When tyres are used in twin wheel combinations they should be properly matched for diameter. If the tread depth between two tyres varies by more than 5mm the tyres are mismatched.

Care must be taken when pairing part worn tyres with regrooved tyres. A tread depth which appears identical will in fact mean that the diameter of the tyres are different. In order to match this combination of tyres correctly, the difference in diameter must not exceed 10mm.

Mismatching results in the larger of the two tyres carrying extra weight and suffering excessive deflection. Wear now becomes more rapid increasing the risk of premature failure. Reference should be made to relevant legislation when mixing radial and cross ply tyres.

SUSPENSION SYSTEMS - Identification (Code) of Type

The suspension system is identified by three character code within the **VIN No.** (e.g. RO3 indicates a three axle ROR air suspension). Refer to the Manufacturer's Plate secured to the main frame of the vehicle. The ride height is stamped on a separate plate.

GENERAL MAINTENANCE - Air Suspensions at the periods shown

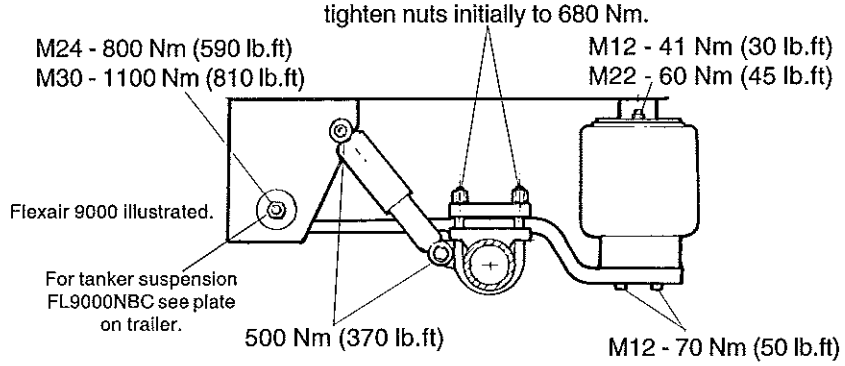
Torque check all fixing (see suspension type) and inspect the following:

Check shock absorbers for hydraulic leaks and mounting bushes for degradation.
Clean air springs and check air bags for damage / leaks.
Check air spring pistons for signs of fatigue at bottom mountings.
Check pivot bushes, wear plates and trailing arms for wear / damage / fatigue
Check ride height (stamped on a plate).
Clean primary circuit in-line air filter element (if fitted).
Test levelling valve operation.
Check exhaust valve and variable height valve for correct operation (if fitted).
Check security of lift axle components and test for correct operation (if fitted).

ROR Flexair 9000 and 11000 Series Suspension (RO code)

Prior to the first journey, after the first 1000km (620 miles) and thereafter EVERY 10 000km (6200 miles) or 3 monthly. Torque all nuts and bolts as follows:

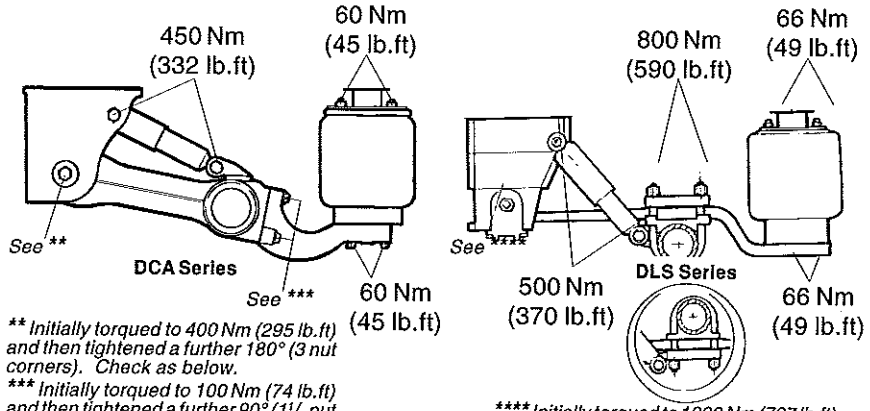
Initial torque: 680 Nm (500 lb.ft)
Check torque*: 575 Nm (425 lb.ft)
* if a nut moves before 575 Nm, then replace the U-bolt and tighten nuts initially to 680 Nm.



Refer to the *MERITOR* Maintenance Manual for further information.

DAIMLER CHRYSLER DCA & DLS Air Suspensions (DA code)

Prior to the first journey, after the first 2 weeks, thereafter EVERY 120 000km (75,000 miles) or 12 monthly. Check/torque all nuts and bolts:



** *Initially torqued to 400 Nm (295 lb.ft) and then tightened a further 180° (3 nut corners). Check as below.*

*** *Initially torqued to 100 Nm (74 lb.ft) and then tightened a further 90° (1 1/2 nut corners). Check as below.*

Check for signs of slackening e.g. cracked paint or traces of rust. If there is evidence of slackening it will be necessary to torque as above.

**** *Initially torqued to 1000 Nm (737 lb.ft). Check as below.*

Check for signs of slackening e.g. cracked paint or traces of rust. If there is evidence of slackening it will be necessary to torque as above.

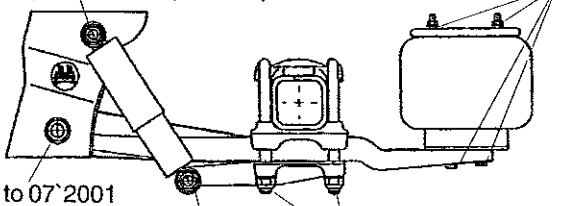
Refer to the *Daimler Chrysler* Maintenance Manual for further information.

BPW Air Suspension (BA code)

Prior to first journey, after 2 weeks and thereafter 6 monthly.
Torque all nuts and bolts:

Alum. hanger: 325 Nm (240 lb.ft)
Steel hanger: 425 Nm (315 lb.ft)

M8 19 Nm (15 lb.ft)
M12 66 Nm (50 lb.ft)
M16 230 Nm (170 lb.ft)



Hanger brackets up to 07`2001
750 Nm (550 lb.ft)
Hanger brackets from 08`2001
900 Nm (665 lb.ft)
Channel Cross-member
900 Nm (665 lb.ft)

425 Nm
(315 lb.ft)

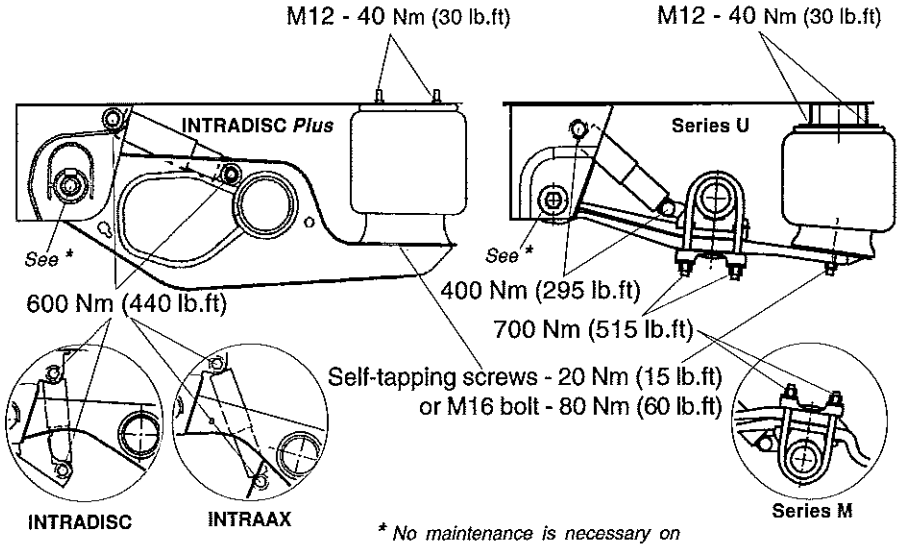
M22 550Nm (410 lb.ft)
M24 650 Nm (480 lb.ft)

***Airlight II** suspension with **70mm wide trailing arms** do not need retightening if only used in on-road application i.e. no off-road use at all. If any off-road use, check as above.*

Refer to the *BPW* Maintenance Manual for further information.

SAF Air Suspensions (SF code)

Prior to the first journey, after first 500km (300 miles), after first 5000km (3000 miles) thereafter EVERY 30 000km (18,500 miles) or 3 monthly. Check/torque all nuts and bolts:



* *No maintenance is necessary on STEEL hanger brackets.*

* *ALUMINIUM brackets require a 6 monthly 1200Nm torque check.*

* *If a pivot bolt is slackened or removed it will be necessary to initially torque the nut to 400Nm and then tighten either a further 120° (2 flats) on the INTRA Plus series and U & M series, or a further 300° (5 flats) on the Series 1 INTRADISC and INTRAAX arrangements.*

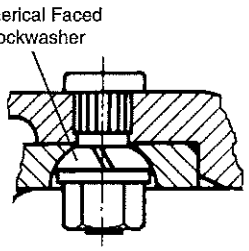
Refer to the *SAF* Maintenance Manual for further information.

BOLT-IN KING PINS

Two type of bolt-in king pin (detailed below) are in general use. Ensure the pin is correctly positioned (dual position upper couplers) and secure.

*THE FOLLOWING KING PIN TYPES ARE **NOT** INTERCHANGEABLE*

Stud with Lockwasher and Nut fixing



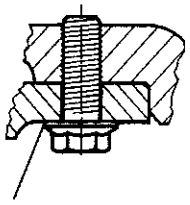
This type of fixing uses eight nuts with spherical faced spring lockwashers requiring a king pin with spherical machined locations to accept this type of fixing; this king pin bears the manufacturer's identification **KZ0912-01**. It can be removed or repositioned (dual position upper couplers), providing the lockwashers are located and the nuts tightened to the following figures. This king pin must ***not*** be fitted to the arrangement detailed below.

Torque nuts (with lockwashers) in a crosswise sequence: 190 Nm (19.3 kg.m or 140 lb.ft).

Check security after first month (following removal/repositioning) and thereafter 6 monthly.

If during routine checking the nuts repeatedly require tightening, replace the lockwashers with new and torque as above.

Lockbolt fixing



This type of fixing uses eight locking bolts with serrated flange heads; the king pin does not incorporate any spherical locating feature (see previous description) but will bear one of the following manufacture's marks; either, **KZ1012-1**. These king pins can be removed or repositioned (dual position upper couplers), providing a ***new*** set of lockbolts are used and tightened to the following figures. This king pin must ***not*** be fitted to the arrangement detailed above.

Torque lockbolts in a crosswise sequence to: 190 Nm (19.3 kg.m or 140 lb.ft).

If bolts are removed, replace them with new lockbolts and torque as above.

Check security* after first month (following removal/repositioning) and thereafter 6 monthly.

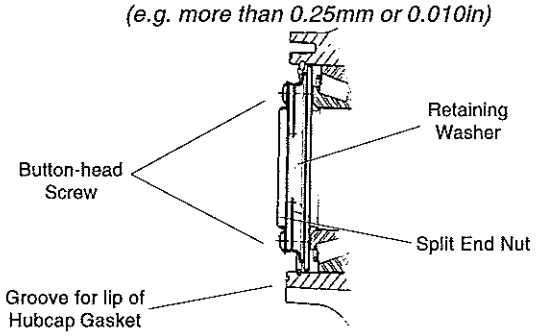
If during routine checking the bolts repeatedly require tightening, replace the lockbolts with new and torque as above.

KING PINS MUST BE SECURED BY CORRECT METHOD OF ATTACHMENT

HUB BEARING ADJUSTMENT *

ONLY REQUIRED IF EXCESSIVE END FLOAT IS EVIDENT

(e.g. more than 0.25mm or 0.010in)



MERITOR (Rubery Owen Rockwell)

'LM' and 'TA' Series AXLES only *

1. Remove the button-head screws from axle end nut and slacken the nut off.

2. Ensure hub is fully seated. Using a hub nut socket, run axle end-nut back on until resistance is felt ...do not use an impact driver.

3. Tighten the nut to 100Nm (74 lb.ft) whilst rotating the hub. The hub MUST be rotated 5 to 10 revolutions whilst the end-nut torque is continuously applied.

3. Back off the nut anti-clockwise by one flat (i.e. 1/8 turn).

4. Check if the corners of the nut align with the index marks on the rim of the retaining washer - if the corners line up exactly with the marks do not further rotate the nut, if the corners do not line up with the marks then the nut should be further rotated **clockwise** until the corners align with the next set of marks.

6. Fit the two button-head screws in the nut and tighten evenly until the heads are flush with the face of the nut. Ensure the screws locate the holes in the washer.

   Note: screws incorporating nylon thread locking patches must be replace after two applications whereupon the locking properties of the patch become ineffective ...if in doubt renew the screws.

7. Tighten the screws to 15-20Nm (11-15 lb.ft) to pinch the slits in the axle end nut.

8. Check for free rotation of the hub and ensure the bearing clearance is not excessive. If in doubt readjust.

9. Check the hubcap seal location groove in the hub face is clean. Fit the hubcap gasket with the raised rib fully engaged in the groove and the holes aligned. Refit the hubcap and tighten the screws evenly to 11-15Nm (7.5-11 lb.ft).

* ***Do not adjust LMC or TAC Series utilising cartridge bearings. Refer to MERITOR literature.***

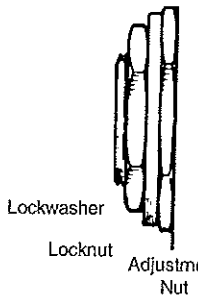
A note on drum brakes:
The brake drum is mounted on the outside of the hub so that brake maintenance can be carried out without disturbing the hub and bearing assembly; remove the wheel first.

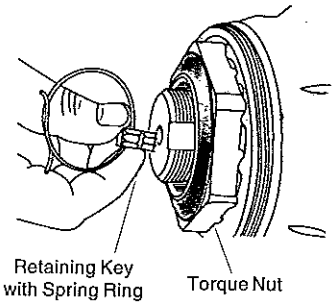
For further information refer to the Manufacture's literature.

HUB BEARING ADJUSTMENT *

ONLY REQUIRED IF EXCESSIVE END FLOAT IS EVIDENT

(e.g. more than 0.25mm or 0.010in)





MERITOR (ROR)	BPW
'TM' Series AXLE only*	ECOplus Series AXLE only
1. Rotate hub whilst at the same time tightening the adjustment nut to 70Nm (52 lb.ft) ...do not use an impact driver. 2. Back off adjustment nut 2½ to 3 flats (112° - 135°). 3. Position lockwasher on axle so that a hole locates the dowel on the nut exactly. 4. Tighten the locknut to 350 - 375Nm (258 - 277 lb.ft) 5. Replace hubcap and tighten screws to 16 - 30Nm (12 - 22 lb.ft) * ***Do not adjust R.O.R. TE9000 Series axles. Refer to MERITOR literature.***	If bearing play is detected, remove the hubcap, unhook the spring ring and remove the retaining (wedge) key from the axle nut. Adjust as follows: 1. Rotate hub whilst at the same time tightening the axle 'torque' nut with a spanner until the torque-limiter operates ...do not use an impact driver. 2. Refit the retaining key in the groove between the stub axle and the axle 'torque' nut ...do not reset the axle nut. 3. Clip the hooked spring ring, depending on version, either behind the flange on the nut or in the thread on the stub axle. 4. Replace hubcap and tighten to 800Nm (590 lb.ft)

* ***DaimlerChrysler DCA axle and SAF SK1000ET range incorporate maintenance free hubs. Refer to the Manufacture's literature if bearing end play is evident.***

BRAKE ADJUSTMENT - DRUM BRAKES

Automatic Brake Adjusters have been fitted as standard equipment to Fruehauf trailers since 1992. They are designed to maintain brake efficiency by automatically keeping the operating clearance between the brake lining and the drum to a minimum through adjustment of the pushrod stoke.

Check weekly for the first four weeks:

Check adjuster movement; the push rod travel should only be sufficient to move the slack adjuster from the 'off' (brakes released) position to the fully applied position, where the adjuster should be about **90°** to the push rod. Also check for camshaft bearing wear and lubricate in accordance with axle manufacturer's instructions.

3 Monthly or 40,000km (25,000 miles) and at brake shoe replacement.

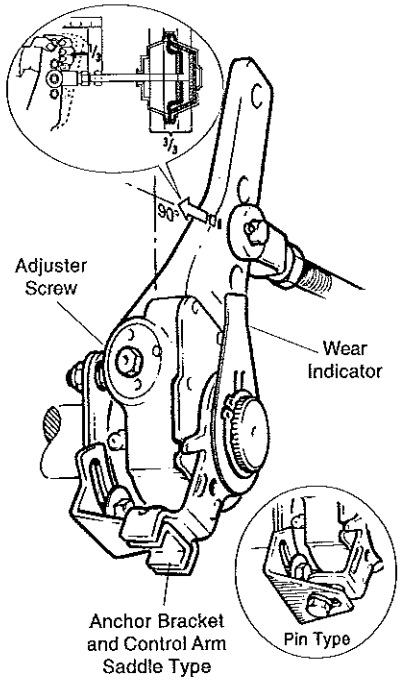
Check as follows:

1. Ensure wheels are chocked and brakes are fully released (Spring brakes **must** be held off by air pressure or manually 'caged').

2. Visually check the integrity of the anchor bracket and the control arm.

3. Manually pull adjusters; the movement should be **no more** than 1/3 stroke of the brake actuator service chamber.

4. Back off brakes using adjuster screw 180° with a ring-spanner anti-clockwise and carry out a functional test. With the ring-spanner still attached, apply the brakes 5 times observing the spanner moves back (clockwise) with each application of the brake to a fully adjusted position.



Refer to the Manufacturer's literature for more information and adjuster set-up

BRAKE LINING WEAR INDICATOR - DRUM BRAKES

As the brakes are adjusted the lining wear indicator rotates. When the indicator has moved 60° from the vertical position (illustrated above) visually check the linings for wear; when the indicator has moved through 90° to the horizontal position, the linings will be worn and require replacement. If the linings are allowed to wear beyond this point, the brake camshaft can over-rotate and lock the brakes on.

DISC BRAKES

Prior to first journey, after first 150km (100 miles), after first 1500km (1000 miles) and thereafter EVERY 50 000km (32,000 miles) or 3 monthly.

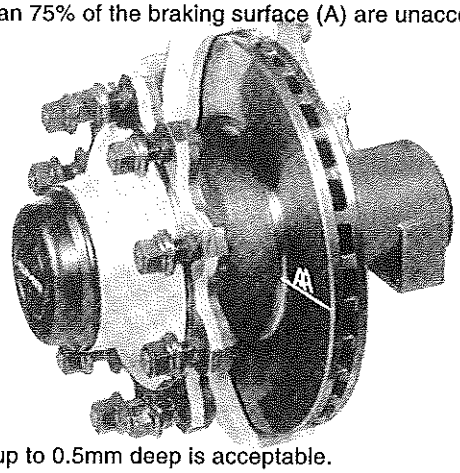
Brakes adjust automatically; check pad wear.

NEVER allow pad lining thickness to fall below 2mm, replace pads as an axle set.

Check security of pads, caliper, rotor (disc) and actuator.

Inspect condition of rotor:

1. Light crazing is acceptable.
2. Short radial cracks up to 0.5mm wide x 1.0mm deep are acceptable, see 3 below.
3. Radial cracks longer than 75% of the braking surface (A) are unacceptable.



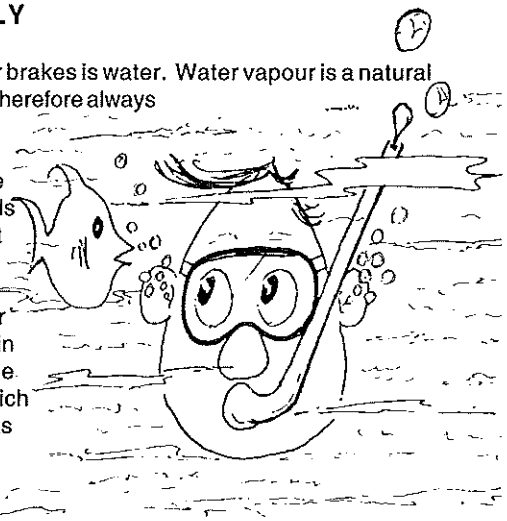
4. Light circular grooving up to 0.5mm deep is acceptable.
5. Heat spotting indicates a structural change due to extreme high temperatures; the rotor is more susceptible to cracking, see 2 and 3 above.
6. Light corrosion on braking surface should clear under normal braking; do not allow heavy corrosion layering to occur.
7. Check rotor run-out is within manufacture's tolerance; brake judder may indicate a problem with run-out.
8. Remove any wear debris and rust from edge of rotor and pad location points in the caliper.
9. Check pad anti-rattle clips for damage. Check seals for cracks or damage. Check caliper operation for free movement on slide pins.

BRAKE OVERHAUL

COMPLETELY STRIP DOWN BRAKE ASSEMBLIES ANNUALLY PRIOR TO M.O.T. TEST

Read the Health & Safety information for Asbestos and Asbestos-free materials at the front of this handbook

BRAKE SYSTEM AIR SUPPLY



Undoubtedly the biggest enemy of air brakes is water. Water vapour is a natural constituent of the atmosphere and will therefore always pass into the air brake system, condensing and causing problems. It all starts when hot air from the compressor cools as it travels towards the reservoirs. The resultant condensate (water) can cause corrosion, wash away lubricants and possibly freeze during extreme winter conditions. Also a build up of water in the reservoir reduces the storage capacity - **a dangerous situation** which will not show up on the cab gauges as they indicate pressure not volume.

Worn compressor piston rings may also allow oil into the system and mixed with the water will form a thick sludge.

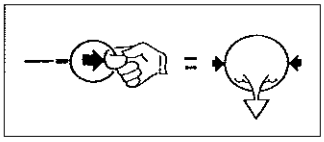
Leaking automatic drain valves may be a symptom of this.

The use of release agents (WD40 or similar) are **not** recommended as they may cause the seals to deteriorate prematurely.

In order to function correctly under all operating conditions it is important that you ensure your trailer air brake system is fed with a clean dry air supply.

To ensure trouble free operation, especially in sub zero temperatures, tractor mounted air system dryers are recommended.

It is strongly recommended that reservoirs are drained at weekly intervals and at daily intervals during freezing conditions. This may, however, not be totally successful where air lines or valves are part of a 'closed' system such as the Service (yellow) line.



All the above problems effect brake efficiency, ensure the **system threshold** conforms to the *IRTE Code of Practice* for braking compatibility, i.e. the onset of braking is within **0.6 bar - 0.9 bar** at the coupling head. Check all valves regularly for correct operation, remove and clean filters (if fitted) at 3 monthly intervals or 20 000 km (12,000 miles).

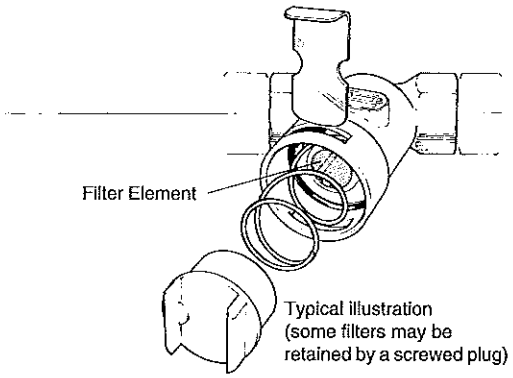
IN-LINE AIR FILTERS

These are optional equipment. They may be found in the brake system between the trailer couplings and valves and/or next to the reservoir supplying the air suspension system.

To prevent accumulation of dirt particles. Clean the element after the first 1600 km (100 miles) and thereafter at least every 20 000 km (12,000 miles) or 3 monthly.

1. Release all trailer air pressure (brakes and suspension).

2. Remove clip retaining filter plate and remove plate, spring and element.



3. Clean element in a suitable solvent and allow to dry.

4. Assemble in reverse order, ensuring 'O' ring seal is fitted.

ELECTRICAL SYSTEM

The electrical system is of the insulated return type, utilising two 7-pin connectors wired to the ISO1185 and ISO3731 configuration detailed.

An ISO7638 connector will be fitted for anti-lock EBS dedicated power, see over page.

Alternative systems may be fitted to customers requirements and these may utilise 10, 12, 14 or 15 pin connectors (supplementary information will be inserted, if applicable).

Compatibility between tractor and trailer electrical connections should always be checked to ensure correct functioning of individual circuits; the fact that a plug and socket may be easily mated should not be an indication that this is so.

On occasions additional connectors may be fitted for auxiliary equipment, e.g. inspection lamps, removable lighting panel and winches, or to control independent circuits like the load cells fitted to tippers.

Cont....

Daily Checks

To ensure the serviceability of equipment, check the following:

a) The electrical connector(s) are correctly located and secure.

b) The wiring is properly insulated and clipped.

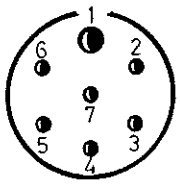
c) All lights, reflectors and marker boards are secure, clean and functioning.

d) Damaged lens, bulbs, reflectors etc. are replaced.

e) Check function of the Anti-Lock warning lamp; use trailer ABS lamp in tractor cab if the dedicated ISO7638 connection is used (see Section 2 page 8).

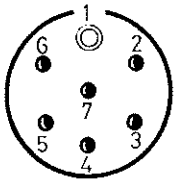
Standard ISO Electrical System

ISO 1185



24N (NORMAL) Connector

1	Common Return
2	LH Front, Side & Tail
3	LH Indicator
4	Stop Lights (see note)
5	RH Indicator
6	RH Front/Side/Tail/Int. Lights
7	Warning Body Raised (see note)



ISO 3731

24S (SUPPLEMENTARY) Connector

1	Common Return
2	-
3	Reverse
4	Lift-axle (cab op., if fitted)
5	Cab op., Tailgate (if fitted)
6	-
7	Rear Fog Lights

Note: ISO 1185 Pin 4 provides supplementary power for trailer anti-lock brake system via the brake light circuit and Pin 7 is used to power a body raised warning system on Tipper vehicles.

From March `92 an ISO7638 connector dedicated to power ABS / EBS systems is fitted to EEC requirements. If the tractor is fitted with an ISO7638 connector this supply should be used**. If EBS (electronic braking system *i.e.* anti-lock with electronic load-sensing), ECAS (electronic controlled air suspension) or Roll stability system is fitted the ISO7638 connection **must** be used.

** *mandatory use from May 2002*

TRAILERS WITH AN ALTERNATIVE WIRING SYSTEM WILL HAVE A SUPPLEMENTARY SHEET INSERTED IN THIS HANDBOOK

ANTI-LOCK BRAKE SYSTEM (EBS)

The **Anti-lock Brake System** features an on-board **electronic control unit** (ECU) with self-diagnostic capabilities. **The dedicated source of power is via the ISO7638** connector.** Alternative power is via the brake light circuit ISO1185 (24N) 'Normal' connector; the ECU will detect the primary source of supply. **EBS systems incorporate electronic load-sensing equipment; Roll Stability is an optional safety feature that senses lateral movement which automatically applies the brakes to counteract imminent overturn; ECAS (Electronic Controlled Air Suspension) is an option utilising sensors to monitor ride height; Auto-lift/lower and Traction Assist options affect axle configuration. All systems are powered via the ISO7638 connector.**

TO BE SURE, POWER THE SYSTEM VIA THE DEDICATED ISO7638** CONNECTION

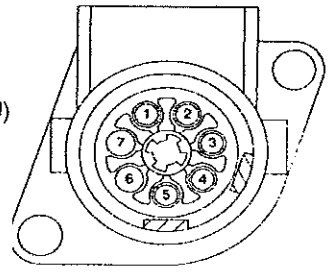
If the tractor unit is designed to permanently power the trailer via the dedicated ISO7638** connect there will be a red lamp in the cab on the dashboard that indicates the trailer anti-lock system is functioning; check out the system as detailed in Section 2 of this Handbook.

A failure is indicated if the warning lamp stays ON above 10 kph or does not follow the correct check-out sequence on initial power-up; should this occur the system reverts to normal operation giving full trailer braking without the advantage of anti-lock. The self-diagnostic ECU will indicate the fault. If EBS (anti-lock with electronic load-sensing) fails both functions cease to operate.

Circuit Testing

ONLY test anti-lock systems with specially wired equipment.
A 5-pin connector indicates ABS only and a 7-pin connector indicates EBS is fitted.

ISO 7638 Wiring



1 POWER (+) SUPPLY ELECTROVALVE
2 POWER (+) SUPPLY ELECTRONICS (ECU)
3 RETURN (-) ELECTROVALVE
4 RETURN (-) ELECTRONICS (ECU)
5 WARNING DEVICE (1)
6 CANH(2)
7 CANL (2)

(1) THE WARNING DEVICE IS CONTROLLED THROUGH PIN 5. THIS CONTACT HAS OPEN CIRCUIT DURING NORMAL OPERATION

(2) INTERCHANGE OF DIGITAL INFORMATION BETWEEN TRACTOR AND TRAILER to ISO11992-1 and ISO11992-2 } EBS

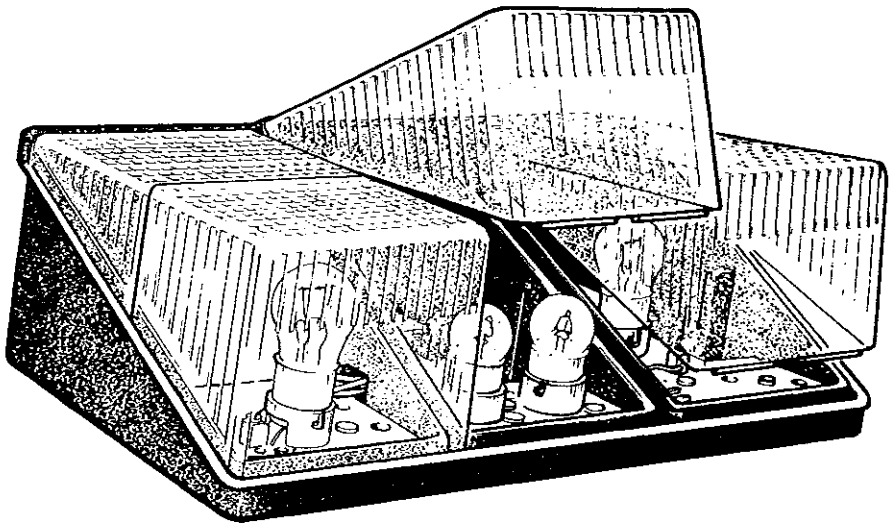
Other normative references: ISO4009; ISO4091; ISO4141.

*** mandatory use from May 2002*

TRAILERS WITH ALTERNATIVE WIRING SYSTEMS WILL HAVE A SUPPLEMENTARY SHEET INSERTED IN THIS HANDBOOK.

`37

A variety of lamps are fitted to trailers as follows:



Rear Combination Lamps

To gain access to the bulbs in the type of combination lamp shown above, pull the hinged lens upwards and outwards from the bottom of the lamp. Closure is effected by lowering the lens and pushing it firmly into the rubber surround ensuring that the two raised lips on the bottom of the lens are correctly embedded.

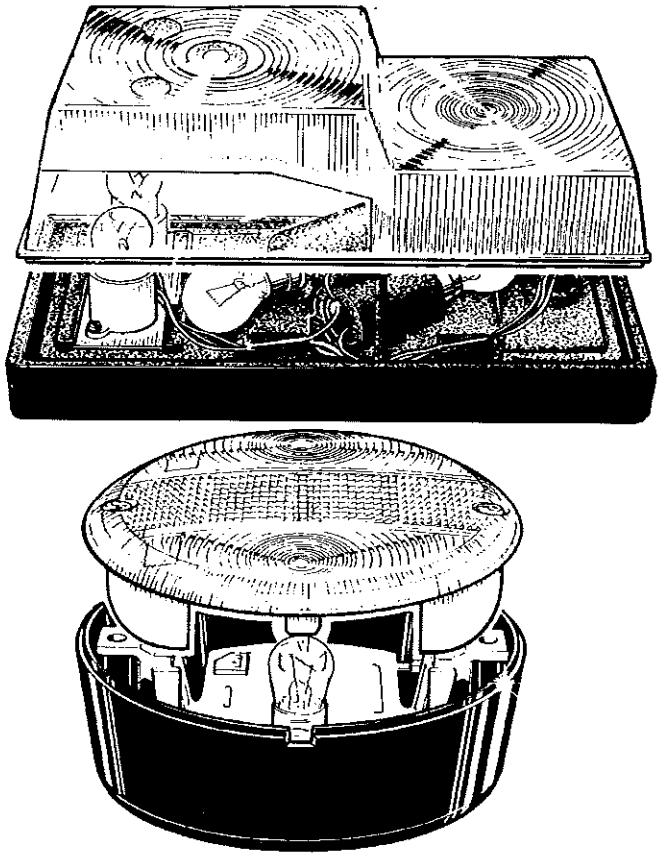
To gain access to the bulbs in other types of rubber bodied lamps (illustrated over page), ease back the rim on the rubber body and remove the lens. When replacing lens, ensure the rim of the rubber body is correctly seated over the flange of the lens to effect a water tight seal.

Where the lens is held in position with set screws, remove the screws and lift off the lens (if lens is also set in a rubber bodied type of lamp ease back the rim of the body to release the lens).

After fitting replacement bulb ensure that lens is securely fitted and always test for correct function by operation.

LED lamps
Failure of LED lamps may require the whole lamp replacing; test wiring for continuity before changing lamps.

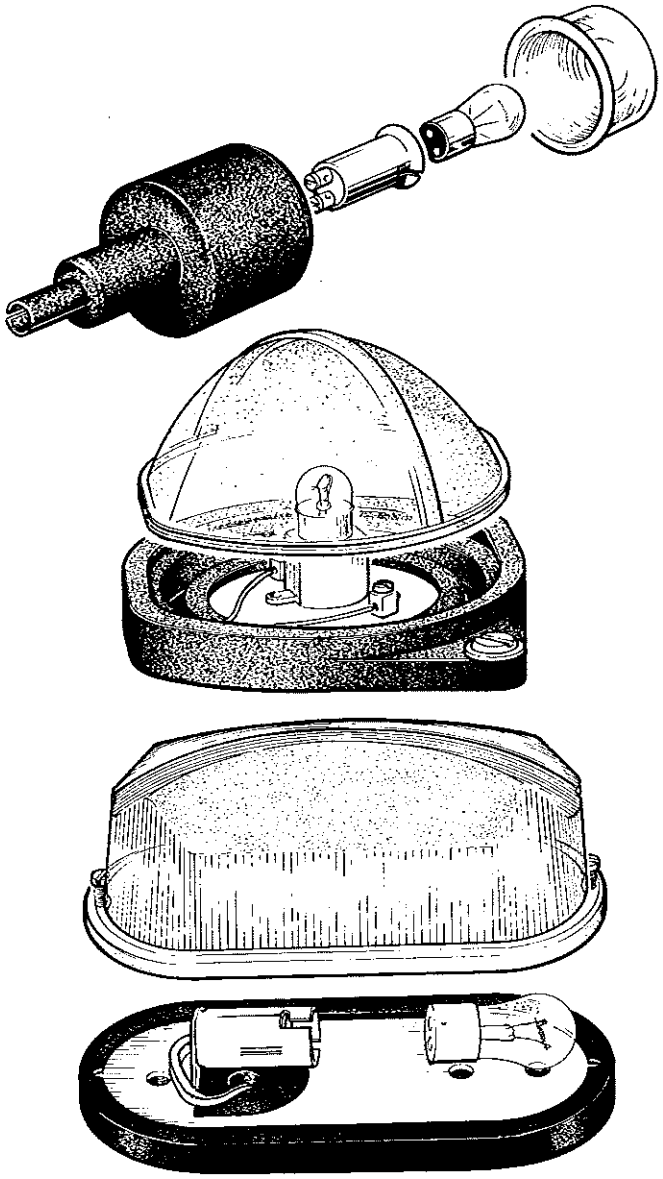
Typical Rear Combination Lamps



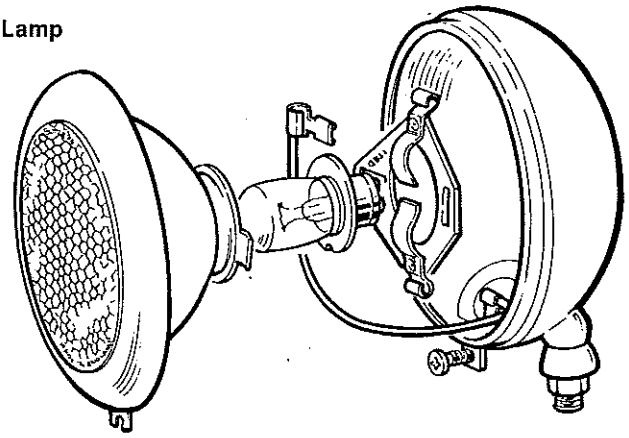
Bulbs Where applicable the following bulbs are fitted:

Lamp	Volts	Watts
Front Corner Marker	24	5
Side Marker	24	5
Tail Light	24	5
Stop Light	24	21
Number Plate Light	24	5
Indicator Light	24	21
Fog Light	24	21
Reverse	24	21
Tipper Body Raised light	24	21

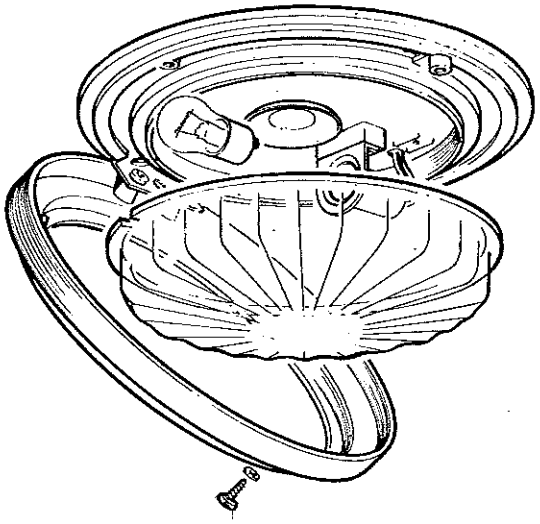
Typical Marker Lamps



Supplementary Lamp



Interior Lamp



TRAILER MAINTENANCE DURING FREEZING WEATHER

The trailer maintenance mechanic should ensure that the air pressure system is drained regularly*. Ice and mud accumulation must also be removed** to allow easy detection of air leaks that may exist in the system.

Mud, snow tyres, and tyre chains are helpful aids to braking and should be fitted if continuous subzero use is intended. Tyre chains should be fitted carefully as the use of wrong sized chains, or the loose fitting of the chains, can result in very rapid tyre wear together with other possible damage, consult a tyre specialist.

* see 'Brake System Air Supply'.
** see 'Appearance Maintenance'.

APPEARANCE MAINTENANCE

Vehicle Cleaning Systems

Many vehicle components (brake valves etc.) are manufactured from an aluminium material which is susceptible to corrosive attack from the alkaline cleaning solutions generally used. It is therefore recommended that components of this nature or material of this type are **NOT** cleaned with these solutions.

If you cannot avoid using cleaning systems then the following may provide assistance:

(i) Ensure that the pH of the cleaning fluid and water solution is not greater than 10.5

(ii) Ensure that after vehicle cleaning by the solution all chassis components are given a thorough water rinse.

This will be necessary even if 'Drive Through' cleaning and rinsing arches are used.

The need to thoroughly remove the solution by rinsing cannot be overstressed as even at a pH of 10.5 corrosive attack will occur.

GUIDELINES FOR OVERPAINTING ORIGINAL PRIMER (Trailers supplied with primer finish)

It is important to understand that although the original factory applied primer is of a high quality and gives corrosion protection to the steel substrate, it is, like all primers, of limited durability. **We therefore recommend that a finish paint system is applied to the factory primer as soon as possible.**

Where other finishes are applied it is important that the following instructions are followed carefully:-

1. Thoroughly clean with warm water containing a suitable mild detergent of pH not above 8.5 or, alternatively, steam clean. In both cases a final rinse with fresh clean water is recommended.

2. Damaged areas must be cleaned back to bright metal and treated with a suitable High Build anti-corrosive primer for steel (minimum 3-thou. dry film thickness). On aluminium and other nonferrous metal areas a 2-Pack Etch Primer should be used before applying the High Build Primer.

3. All visible areas where cosmetic finish is important that are to be overpainted should be wet or dry flatted using 320 grade abrasive paper and all surplus dust or slurry removed.

4. All painted areas should then be thoroughly degreased with degreasing solvent and allowed to dry, paying particular attention to areas which have not been flatted.

   Suitable solvent: ICI Spirit Wipe or equivalent

5. The use of an adhesion promoting intermediate primer surfacer coat is necessary before applying enamel. Application methods and drying time before overcoating should be checked with the paint manufacturer.

   Suitable primer: ICI NON-SAND P540-332 or equivalent

6. If different manufacturer's products are mixed, it is advisable to establish suitability by prior testing of a small area before proceeding with full coat.

7. Particular care should be taken when considering chemical curing finish systems, for example:

   2-Pack Acrylic; 2-Pack Polyurethane; 2-Pack Epoxy and/or Cellulose materials.

   The use of an isolating bond primer is normally considered necessary with these materials in place of the primer surfacer coat. This should be obtained from the supplier of the finish but, again, a small test area should precede bulk use.

8. Further information should be obtained from the paint manufacturer.

9. ***WARNING***

   DO NOT OVERPAINT MATING SURFACES ON WHEELS, BETWEEN HUBS OR WHEEL NUTS AS THIS CAN CAUSE SLACKENING OF THE WHEELS.

10. When wheels are removed for painting it is imperative on refitting that the wheel nuts are tightened with a correctly calibrated torque wrench (see index). Also drivers must be informed that a check is **required** after the first 50 miles of operation and daily for the first week.

PREVENTIVE MAINTENANCE SCHEDULE (pages 31 - 34)

The following schedule is for guidance only and may be adapted to your operating environment. The schedule is designed to indicate either a time or distance frequency of maintenance; applying the logic of which ever occurs first should be the frequency to follow. Manufacturers of axle and suspension equipment often differ in their frequency for maintenance; where possible the Manufacture's frequency will be detailed earlier in this handbook and therefore the Manufacturer's schedule should be followed.

For further information contact:

Fruehauf Limited
Houghton Road
Grantham
Lincolnshire
NG31 6JE

Tel: 01476 515515
Fax No: 01476 515516

When requesting any servicing information, please quote the vehicle Chassis Number.

IT IS THE OPERATOR'S RESPONSIBILITY TO ENSURE MAINTENANCE IS CARRIED OUT AT REGULAR INTERVALS BY COMPETENT PERSONNEL.

PREVENTIVE MAINTENANCE SCHEDULE

	WEEKLY or 1600km (1000 Miles)	MONTHLY or 6400km (4000 Miles)	3 MONTHLY or 20 000km (12,000 miles)	6 MONTHLY or 40 250km (25,000 Miles)	ANNUALLY or 80 500km (50,000 Miles)
Check brakes for correct functioning	X	X	X	X	X
Check linings for wear and adjust if required			X	X	X
Check pad and rotor wear (disc brakes)			X	X	X
Check caliper operation (disc brakes)			X	X	X
Overhaul brakes (lubricate anchor pins etc. and if necessary linish* the brake lining and drum surfaces)					X
Inspect brake hoses for damage			X	X	X
Drain air reservoir (Daily in sub-zero temperatures)	X	X	X	X	X
Check camshaft bearings & lubricate			X	X	X
Grease – Slack adjusters (where applicable)			X	X	X
Grease – Handbrake and Brake cables			X	X	X
Test Anti-Lock brake system			X	X	X
Check all brake system valves for correct operation			X	X	X
Check slack adjusters and actuators for correct operation				X	X
Check brake system for correct pressures					X
Inspect handbrake cable for damage				X	X

Read the Health & Safety information for Asbestos and Asbestos-free materials at the front of this handbook

* *Linish is a pattern of very fine lines. This is achieved by abrading the surfaces by hand, using a suitable production paper on brake linings and emery cloth on the drum. The pattern should be in two directions, each at 45° across the surface to give a cross hatch effect. Observe Health and Safety guidelines; do NOT use hand or power tools. Do not linish disc brakes.*

PREVENTIVE MAINTENANCE SCHEDULE

	WEEKLY or 1600km (1000 Miles)	MONTHLY or 6400km (4000 Miles)	3 MONTHLY or 20 000km (12,000 miles)	6 MONTHLY or 40 250km (25,000 Miles)	ANNUALLY or 80 500km (50,000 Miles)
Inspect tyres for damage	X	X	X	X	X
Check tyre pressures	X	X	X	X	X
Torque load wheel nuts	X	X	X	X	X
Check hub bearing adjustment*				X	X
Clean out hubs, bearings* and replenish with fresh grease (or oil)					X
Torque load axle and suspension nuts			X	X	X
Inspect axle and suspension components for wear or damage			X	X	X
Check axle ends/tubes for cracks after ***5 years*** and thereafter *every year*					X
Check axle alignment				X	X
Check air suspension system for leaks			X	X	X
Clean in-line air filter (if fitted)			X	X	X
Check ride height			X	X	X
Check lift axle components			X	X	X
Check shock absorbers				X	X
Check electrical system for correct function	X	X	X	X	X
Inspect electrical cables for damage and security				X	X
Inspect ancillary equipment (winches, pumps, blowers etc) for security			X	X	X

* ***Important: refer to axle Manufacturer's literature for maintenance.***

PREVENTIVE MAINTENANCE SCHEDULE

		WEEKLY or 1600km (1000 Miles)	MONTHLY or 6400km (4000 Miles)	3 MONTHLY or 20 000km (12,000 miles)	6 MONTHLY or 40 250km (25,000 Miles)	ANNUALLY or 80 500km (50,000 Miles)
Grease, inspect & check for security	Support legs				X	X
	Fifthwheel		X	X	X	X
	Rubbing plate and kingpin				X	X
if LUBELINER ® (Upper coupler 'lubrication' disc) fitted, do NOT grease						
Clean the inside of the upper coupler (if accessible) and Inspect upper coupler for cracks and distortion				X	X	X
Check freedom of movement and lubricate: Doors, Tailgates, locking devices etc.			X	X	X	X
Inspect for security and corrosion	Steelwork and finished surfaces				X	X
	Identification plates	X	X	X	X	X
	TIR Fastenings	X	X	X	X	X
Automatic Lubrication Systems require filling before the reservoir completely empties - Check and replenish with the lubricant specified by the Manufacturer				X	X	X
Hydraulic Components:	Check reservoir oil level	X	X	X	X	X
	Check components for leaks	X	X	X	X	X
	Check components for security				X	X

PREVENTIVE MAINTENANCE SCHEDULE

	WEEKLY or 1600km (1000 Miles)	MONTHLY or 6400km (4000 Miles)	3 MONTHLY or 20 000km (12,000 miles)	6 MONTHLY or 40 250km (25,000 Miles)	ANNUALLY or 80 500km (50,000 Miles)
Check ram mounting for security				X	X
Check the security of bolt-on body hinge brackets and bolt-on chassis hinge brackets				X	X
Grease ram pivot & body hinge bar			X	X	X
Roll-Over Cover - Tipper body:-					
Check, the condition of sheet and webbing, especially the 'pull-back' strap in the area where body contact occurs.		X	X	X	X
Check, clean and lubricate ratchet tensioners.		X	X	X	X
Check and lubricate knuckle joint on winding handle.		X	X	X	X
Check mechanically operated covers in accordance with manufacturer's instructions.					

SECTION 4

FAULT FINDING

Contents

To assist in the diagnosis and remedy of common faults, the following information has been prepared to minimise delay in servicing by endeavouring to pinpoint the cause.

For more serious problems outside the scope of this information, contact your nearest FRUEHAUF Service or Warranty agent, or the FRUEHAUF Quality Department.

IF IN DOUBT, ASK!

BRAKES

Brakes will not release

PROBABLE CAUSE	REMEDY
Park valve or handbrake applied	Reset Park valve or release handbrake
Insufficient air supply	Check Emergency line is connected and tractor is supplying sufficient air.
	Check for restricted or damaged pipework.
	Check for leaks from valves or pipework, replace as required.
	Open reservoir drain valve to eject any water.
Brakes rolled over camshaft (Drum brakes)	Check brake lining wear; shoes probably need replacing.
Calliper seized (Disc brakes)	Check calliper slide pins for free movement.
Hub bearing failure (misaligned hub to brake)	Replace bearing.
Faulty or Frozen valve(s)	Check system for correct pressures at test points and check valves for correct function, replace or allow to defrost as required.
Faulty brake interlock (where fitted)	Check interlock system for correct function and rectify as required.

Grabbing and Dragging brakes

PROBABLE CAUSE	REMEDY
Contaminated brake linings / pads	Replace brake shoes / pads; check for cause and rectify.
Drum brakes out of adjustment	Readjust brakes. If auto-slack adjusters are fitted, check for correct operation and rectify if required.
Disc brake pad / rotor clearance incorrect	Carry out initial calliper setup and check slide pins for free movement.
Brakes not releasing fully	Lubricate camshaft bushes (drum brakes). If auto-slack adjusters fitted, check for correct operation and rectify if required.

Brakes not releasing fully (continued)	Check calliper slide pins for free movement.
	Strip down brake assemblies, check components, replace as required and lubricate where required.
	Check actuators for correct function and leaks; rectify if required. Check lowest vent holes in chambers are clear (unplugged).
	Contact your FRUEHAUF Service agent for correct actuation geometry (drum brakes).
	Check system for leaks and valves for correct function; rectify as required.
Oval brake drums	Ovality should not exceed 0.12mm (0.005"), consult axle manufacturer for allowable machining.

Uneven braking

PROBABLE CAUSE	REMEDY
Contaminated brake linings / pads	Replace brake shoes / pads; check for cause and rectify.
Drum brakes out of adjustment	Readjust brakes. If auto-slack adjusters are fitted, check for correct operation and rectify if required.
Disc brake pad / rotor clearance incorrect	Carry out initial calliper setup and check slide pins for free movement.
Brakes not releasing fully	Lubricate camshaft bushes (drum brakes). If auto-slack adjusters fitted, check for correct operation and rectify if required.
	Check calliper slide pins for free movement.
	Strip down brake assemblies, check components, replace as required and lubricate where required .
	Check actuator for correct function and leaks; rectify if required.
	Contact your FRUEHAUF Service agent for correct actuation geometry (drum brakes).

Inefficient braking

PROBABLE CAUSE	REMEDY
Contaminated brake linings / pads	Replace brake shoes / pads; check for cause and rectify.
Drum brakes out of adjustment	Readjust brakes. If auto-slack adjusters are fitted, check for correct operation and rectify if required.
Disc brake pad / rotor clearance incorrect	Carry out initial calliper setup and check slide pins for free movement.
Brakes require overhaul	Strip down brake assemblies, check components, replace as required and lubricate where required.
	Check actuator for correct function and leaks; rectify if required.
	Contact your FRUEHAUF Service agent for correct actuation geometry (drum brakes).
Linings 'glazed'	Linish lining and brake drum surfaces (see Section 3, page 33). Do not linish discs.
Spurious replacement shoes / pads fitted	Fit new replacement equipment available from your FRUEHAUF Parts supplier.
Low brake (Service) line pressure	Check for leaks in Service line and at valves with brakes applied; replace as required.
	Check tractor system, i.e. brake valve.
	Check brake tractor and trailer system threshold, ensure onset of braking is within 0.6bar and 0.9bar coupling head pressure.
Load Sensing Valve incorrectly set	Check valve for laden and unladen setting, if in doubt contact your FRUEHAUF Service agent

Slow brake application

PROBABLE CAUSE	REMEDY
Drum brakes out of adjustment	Readjust brakes. If auto-slack adjusters are fitted, check for correct operation and rectify if required.
Disc brake pad / rotor clearance incorrect	Carry out initial calliper setup and check slide pins for free movement.
Brakes require overhaul	Lubricate camshaft bushes (drum brakes). If auto-slack adjusters fitted, check for correct operation and rectify if required.
	Check calliper slide pins for free movement.
	Strip down brake assemblies, check components, replace as required and lubricate where required .
	Check actuator for correct function and leaks; rectify if required.
	Contact your FRUEHAUF Service agent for correct actuation geometry (drum brakes).
Leak in system when brakes applied	Check for leaks with brakes applied; replace as required.
Low brake (Service) line pressure	See opposite.

Noise and/or Vibration

PROBABLE CAUSE	REMEDY
Incorrectly assembled components	Check brake assemblies and rectify
Oval brake drum	Ovallity should not exceed 0.12mm (0.005"), consult axle manufacturer for allowable machining.
Excessive cracking / grooving in brake disc	Replace disc rotor.
Disc run-out not within tolerance	

Anti-lock system fault

INDICATION	REMEDY
Continuous ABS warning lamp above 10kph (6mph)	Contact your FRUEHAUF Service agent for advice. *Note: If the tractor is fitted with an ABS warning lamp for the trailer, this lamp becomes the primary one to use (see Section 2 page 8).*
Incorrect ABS warning lamp sequence on start up	
No ABS warning lamp on start up	Check bulb; use the dedicated ISO supply. Contact your FRUEHAUF Service agent

Excessive water in reservoirs

PROBABLE CAUSE	REMEDY
Reservoirs not drained often enough	Drain once a week or daily during freezing weather.
Tractor air drier faulty	Check drier and rectify.

Excessive oil in the air system

PROBABLE CAUSE	REMEDY
Tractor compressor faulty	Service compressor.

RUNNING GEAR (Underconstruction)

Uneven tyre wear

Refer to 'Tyre Problems' in Section 3 and check 'Hard Pulling - axle alignment' below.

Hard pulling (crabbing)

PROBABLE CAUSE	REMEDY
Axle(s) out of alignment	Realign axles, check all suspension/axle components for damage ('U' bolts, pivot pins/bushes, shock absorbers etc.) and replace as required. Torque tighten all fittings.

Broken road spring/trailing arm	Replace.
Air suspension down one side	Refer to 'Air suspension faults'

Lift axle will not lift

PROBABLE CAUSE	REMEDY
Insufficient air supply	Build tractor air pressure up to 5.8bar (85psi)
Leak in system	Inspect for damage, leaks and rectify.
Faulty valve(s).	Check hand control and pressure regulating valves
Electrical fault (cab operated version)	Check wiring (pin 4 on 24S connector).

Lift axle will not lower

PROBABLE CAUSE	REMEDY
Faulty valve(s)	Check hand control, single check/flow-back and pneumatic (inhibitor) valves.

AIR SUSPENSION

Air bags flat

PROBABLE CAUSE	REMEDY
Insufficient air supply	Build tractor air pressure up to 5.8bar (85psi)
Pressure protection/charging valve	Should be set to supply 5 bar (72 psi), reset or replace.
Clogged in-line air filter (where fitted)	Clean or replace element.
Leak in air lines, connections or air bag assembly	Inspect for damage and test for leaks, locate and repair or replace.
Faulty levelling valve	Inspect, test and replace, as required.
Faulty air load sensing valve	
Faulty exhaust valve (if fitted)	
Faulty Raise/Lower valve (if fitted)	

Suspension deflates rapidly when parked

PROBABLE CAUSE	REMEDY
Leak in air lines, connections or air bag assemblies	Inspect for damage and test for leaks, locate and repair or replace.

Excessively worn air bags

PROBABLE CAUSE	REMEDY
Bag contacting the frame, tyres or rims	Check for correct tyre sizes and inflation. Measure clearances, contact *FRUEHAUF*.
Over extension of air bags	Adjust 'Ride Height'.
	Check variable height control (Raise/Lower) valve and set to 'Ride' position.
Operating with insufficient air pressure	Check items listed under 'Air bags flat'.
Worn shock absorbers	Replace.

Trailer rides too high or too low

PROBABLE CAUSE	REMEDY
Levelling valve linkage disconnected or broken.	Repair or replace.
Incorrectly set levelling valve	Adjust 'Ride Height'.
Incorrectly set variable height (Raise/ Lower) valve, if fitted	Set to 'Ride' position.

Trailer rides too low

PROBABLE CAUSE	REMEDY
Incorrectly set exhaust valve	Push knob in.

Excessive shock absorber wear

PROBABLE CAUSE	REMEDY
Levelling valve (over active suspension)	Check for correct function; replace if faulty.
Off-road operation (over active suspension)	Contact FRUEHAUF for advice if off-road operation is necessary.

SUPPORT LEGS

Difficult to operate

PROBABLE CAUSE	REMEDY
Leg set in high gear	Push shaft in for low gear, if it cannot be selected strip down gearbox and repair/ lubricate as required.
Lack of lubrication	Remove top covers of leg, clean out old grease, inspect and overhaul if necessary. Lubricate on reassembly.
Bent leg	Replace leg.
Gears or components damaged	Overhaul leg.

ELECTRICAL SYSTEM

Any electrical fault

PROBABLE CAUSE	REMEDY
Poor connection or broken wire	Check: wiring, junction boxes, connections Ensure continuity, check the insulated earth return. Replace as required.
	Contact your FRUEHAUF Service agent if component is burnt.

INSULATION (If fitted)

Deterioration of insulating efficiency

PROBABLE CAUSE	REMEDY
Ingress of moisture into insulation due to damage or gaps in panelling. If this is left it can lead to a breakdown of the insulating material and on Composite body panels, reduce the structural integrity of the panel.	Check and seal if possible, if not contact your nearest FRUEHAUF Service agent regarding repair or replacement. *See Health & Safety note 'Polyurethane Foam'*

HYDRAULIC SYSTEM

Fails to pump or is sluggish in operation

PROBABLE CAUSE	REMEDY
Shortage of oil in supply tank	Fill tank to correct level (single acting rams must be retracted when filling).
	Check for leaks.
Air locked in system	Bleed system.
Oil blockage	Check for restriction in pipework (i.e. damaged/kinked).
	Check filter.
	Check control valve.

Tipper ram fails to extend

PROBABLE CAUSE	REMEDY
Overload valve not set high enough	Set to 103bar (1,500psi) max.

Tipper ram creeps down slowly

PROBABLE CAUSE	REMEDY
Dirt wedged in control valve	Attempt to clear by opening and closing quickly with pump running. If this does not cure the problem then remove and clean valve.

SECTION 5

DEALING WITH EMERGENCIES
(Dangerous Substances)

Contents

This Section is included for guidance only, it is not intended to over-rule any emergency procedures the driver already knows but to assist where uncertainty may exist.

If you are conveying hazardous / dangerous substances you must

DISPLAY THE CORRECT EMERGENCY CARDS OR MARKERS

IF IN DOUBT, ASK!

NOTIFICATION OF THE EMERGENCY

If an emergency occurs at a loading or discharging point you should follow the instructions of the supervisors or other qualified staff.

At other times you will probably be the only person on the spot with any knowledge of what to do in an emergency - at least until the police, fire, ambulance or other specialised services arrive. The action taken by the driver in the first few minutes may therefore be vitally important. In all emergency situations your first concern must be to save life and prevent injury.

Three things to do:

1. If the load is spilling/discharging or seems to be in danger - immediately notify the following services, giving details of the emergency and the product involved:

    a) Public Emergency Services (i.e. Police, Fire and Ambulance Service)
    b) Manufacturer's Emergency Centre

If the danger is such that you have to stay with your vehicle ask someone else to make the telephone call for you.

2. Never leave spillage, leaking packages or leaking tanks unattended.

3. Think whether there is any other immediate action you should take to safeguard other people or to limit the effect of your emergency - this could include:

    Applying battery isolation switch if spillage is of a low flashpoint (e.g. petroleum or any other inflammable liquid).

    Operating the emergency warning flashers (not with low flash point products)

    Moving the vehicle to a spot where leakage causes least harm or damage.

    Wearing protective clothing.

    Keeping people away.

    Keeping other vehicles out of the emergency area.

    Moving casualties away from emergency area.

CO-OPERATION WITH THE EMERGENCY SERVICES

When the emergency services arrive they will take charge and you should:

a) Show them the transport Emergency card or marker.

b) Tell them what action has been taken.

c) Tell them all you know about the load that may be helpful.

REPORTING AN INCIDENT

You must report incidents as soon as possible to your base whether there has been a spillage or not, with details of:

Injury of any person

Damage to any vehicle

Spillage of any product

FIRE EXTINGUISHERS

An extinguisher suitable for putting out fires involving engine or tyres should be carried. Such extinguishers should be of ample capacity for dealing with the initial fire and of a type that will prevent re-ignition, particularly of tyres.

PROTECTIVE CLOTHING

Protective clothing should be provided suitable for working with the type of product being transported, this may include:

Goggles; Gloves; Boots; Apron;

Hood; Visor; Trousers / overalls.

Recommendations are given on the hazard warning labels and transport emergency cards regarding the need and type of protective clothing required. The material of the protective clothing must be resistant to the product involved.

PROTECTIVE AND EMERGENCY EQUIPMENT

Where specialised equipment is provided (for operational or emergency use) it should be regularly checked for correct functioning and training provided in its use where applicable.

EMERGENCY CARDS AND MARKERS

Ensure the correct Emergency Cards or Markers are displayed for the product being transported.