

**SEMITRAILER, CARGO, 12.5 METRE, HEAVY, MC4, FRUEHAUF HEFTY PLATFORM  
LIGHT GRADE REPAIR**

This instruction is authorised for use by command of the Chief of Army. It provides direction, mandatory controls and procedures for the operation, maintenance and support of equipment. Personnel are to carry out any action required by this instruction in accordance with EMEI General A 001.

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## GENERAL

### Introduction

1. This EMEI details all the Light Grade Repair procedures for the Semitrailer, Cargo, 12.5 Metre, MC4 – Fruehauf Hefty Platform.

### Associated Publications

2. Reference may be necessary to the latest version of the following documents:
- a. Defence Road Transport Instructions (DRTI);
  - b. SCES 12078 – Semitrailer, Cargo, 12.5 Metre, Heavy, MC4, Fruehauf Hefty Platform;
  - c. [EMEI Vehicle A 291-1](#) – Tyres and Tubes – Care and Maintenance of B Vehicles;
  - d. [EMEI Vehicle A 291-5](#) – Tyres and Tubes – Australian Defence Force B Vehicles Tyre Guide;
  - e. [EMEI Vehicle H 770](#) – Semitrailer, Cargo, 12.5 Metre, Heavy, MC4, Fruehauf Hefty Platform – Data Summary;
  - f. [EMEI Vehicle H 772](#) – Semitrailer, Cargo, 12.5 Metre, Heavy, MC4, Fruehauf Hefty Platform – Technical Description;
  - g. [EMEI Vehicle H 779](#) – Semitrailer, Cargo, 12.5 Metre, Heavy, MC4, Fruehauf Hefty Platform – Servicing Instruction;
  - h. [EMEI Workshop E 410](#) – Occupational Health and Safety Instruction – Asbestos – General Instruction;
  - i. Australian Army Books – Record book for Service Equipment GM 120;
  - j. Repair Parts Scale 02199;
  - k. [Defence Safety Manual](#) (SAFETYMAN);
  - l. Material Safety Data Sheets (MSDS) – Product Information Sheets; and
  - m. Current version of the Technical Regulation of ADF Materiel Manual - Land (TRAMM-L) (available from DTR-A website <http://intranet.defence.gov.au/armyweb/Sites/DTRA>).

### Authorised Personnel

3. Repairs are to be carried out by the following technical tradespersons:
- a. Mechanic Vehicle ECN 229-2,
  - b. Technician Electrical ECN 418-2,
  - c. Fitter Armament ECN 146-2,
  - d. Metalsmith ECN 235-2, and
  - e. civilian equivalents qualified in accordance with the requirements of the TRAMM-L.

## Safety Precautions

### WARNING

Do not work on the trailer, when raised, without the use of a safety stand beneath the axle. Place the safety stand as close to the raised wheel as possible. This procedure is required for all repairs and maintenance activities involving positioning of body parts in potential crush zones of the trailer. Failure to comply may result in serious injury or death.

Personnel working on this equipment are to adhere to all industrial safety standards, work practices and equipment operating and maintenance instructions relating to the equipment.

Some assemblies contain powerful springs and injury can result if they are not properly disassembled. Use only proper tools and observe all precautions relevant to the use of the tools.

## DETAIL

### General Instructions

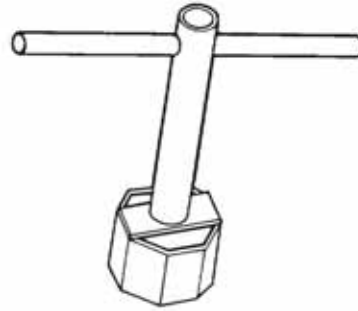
4. Plug or protect openings to prevent dirt/air entering the brake systems. Use plastic plugs or covers only for this purpose. Do not use cloth or paper as plugs or covers.
5. Disconnect the trailer electrical connector from the towing vehicle before removing any electrical system components.
6. When disconnecting electrical connectors, hoses and fittings, remove sufficient clamps in order to gain the necessary slack to avoid damage to connectors and fittings. Re-install all clamps and supporting devices as installed by the manufacturer.
7. Use only genuine replacement parts and components.
8. Replacement hardware, tubing, hose fittings etc. should be of equivalent size, type, length and strength to the original equipment.
9. Use only those lubricants specified in EMEI Vehicle H 779.
10. Any fastenings of fittings being tightened to prescribed torques are to have dry, clean threads unless otherwise specified. When specified, thread sealants are to be applied to dry, clean, oil free threads.
11. Replace any item that has stripped threads or damaged parts.
12. Do not reuse Nyloc nuts.

### Identification Numbers

13. The axle assemblies are the only items that have identification information. This information is stamped on the axle tubes.

### Special Tools and Gauges

14. Special tools required to carry out maintenance tasks on the equipment are shown in Figure 1 and detailed in Table 1. Item 2 has to be fabricated.



JLA 13943

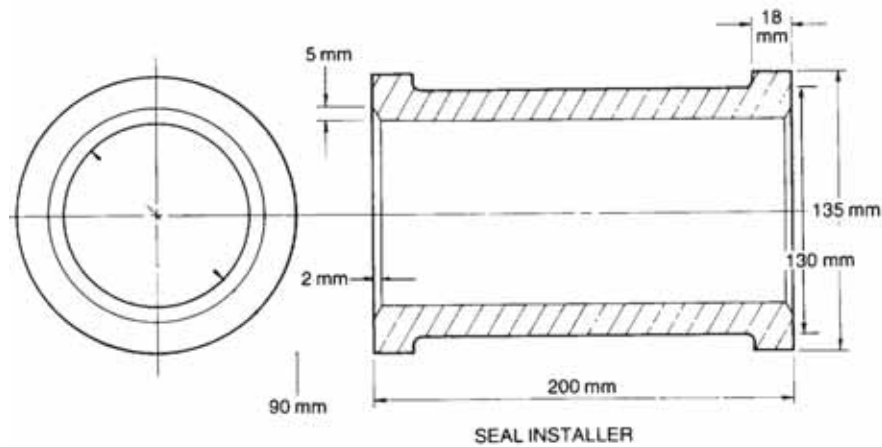


Figure 1 Special Tools

Table 1 Special Tool Identification

Serial	Part No	Item Name	Use	Para No
1	JLA 13943	Hub cap spanner	Hub cap loosening/tightening	52, 53
2	N/A	Seal installer	Hub seal installer	53

### Adjustment and Calibration

15. Light Grade Repair include the following adjustments and calibrations:

- a. axle alignment, and
- b. brake adjustment.

### Removal/Replacement

16. Light Grade Repair include the removal/replacement to the following components:

- a. the brake system components;
- b. axles/suspension including:
  - (1) the radius rods/bushes,
  - (2) the springs,
  - (3) the equaliser beams, and
  - (4) the hub seals and wheel bearings.
- c. electrical system components;

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- d. the frame including:
  - (1) the king pin,
  - (2) the support legs, and
  - (3) the tow coupling.

### Inspection After Repair

17. Light Grade Repair includes the following inspections after any brake component replacement or brake adjustment has been made:

- a. trailer road brake test, and
- b. trailer parking brake test.

### ADJUSTMENT PROCEDURES

#### Axle Alignment

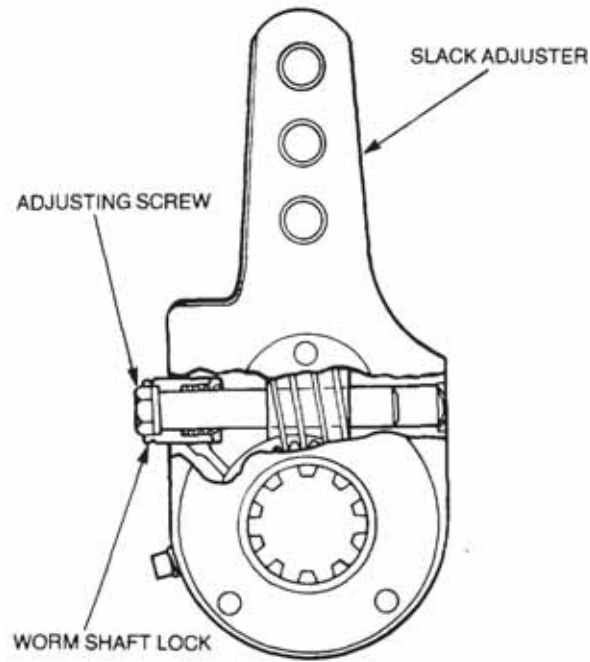
18. Adjust the axle alignment as follows:

- a. Measure the distance from the centre of the king pin to the centre line of the leading axle (or the leading edge of the rim) on both sides of the trailer.
- b. Loosen the four radius rod end clamp bolts on the axle being adjusted.
- c. Using a suitable wrench on the adjusting rod, adjust the rod until both measurements taken above are equal.
- d. Tighten the radius rod clamps to 115 – 122 N.m (85 – 90 lbf.ft).
- e. Recheck that the measurements are still equal.
- f. With the front axle in alignment, measure the distance from the centre line of the front axle hub to the centre line of the next axle hub to be adjusted on each side.
- g. Using the leading axle as a reference point, measure and adjust the remaining axles as described above until the measurements in Para f above are equal.
- h. Tighten the radius rod clamps to 115 – 122 N.m (85 – 90 lbf.ft).
- i. Recheck that the measurements are still equal.

#### Brake Adjustment

19. Adjust the brakes as follows:

- a. Chock the wheels not being adjusted.
- b. Raise the wheels to be adjusted clear of the ground and support the axle on safety stands.
- c. Release the parking brake and ensure that the wheels rotate freely.
- d. Disengage the worm shaft lock on the slack adjuster (Figure 2) by depressing the spring loaded sleeve with a wrench.

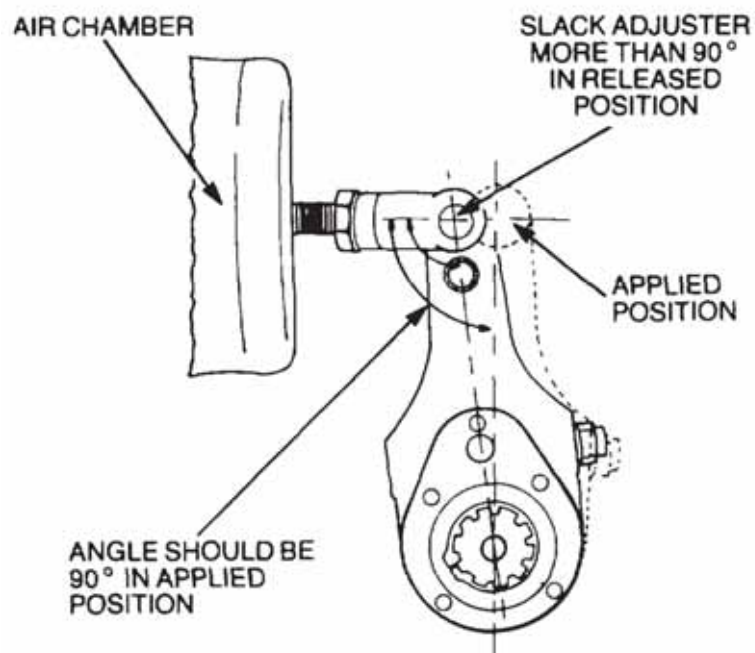


**Figure 2 Slack Adjuster Worm Shaft Lock**

- e. Turn the adjusting screw in a clockwise direction until the brakes become locked.
- f. Turn the adjusting screw in an anticlockwise direction until the wheels begin to rotate freely.
- g. Release the worm shaft lock and ensure that the adjusting screw is secure.
- h. Apply the brakes and check the angle between the slack adjuster and the push rod (Figure 3).

**NOTE**

The minimum allowable angle is 90° with brakes applied. If the angle is incorrect, maximum brake application will not be achieved.



**Figure 3 Slack Adjuster and Push Rod Angle**

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- i. To obtain the correct angle, release the brakes, then remove the split pin and the clevis pin retaining the push rod clevis to the slack adjuster.
- j. Slacken the clevis locknut and adjust the clevis as required.
- k. Install the clevis pin in the slack adjuster and push rod clevis.
- l. Apply the brakes and check the angle between the push rod and the slack adjuster.
- m. If necessary continue the procedure until the correct angle is obtained.
- n. When the correct angle is obtained, install the split pin in the clevis pin and tighten the clevis locknut.
- o. Remove the safety stands and the wheel chocks.

## BRAKE SYSTEM

### NOTES

Inspection after repair as detailed in Para 43 is to be carried out following any brake repairs.

Use Teflon tape or suitable sealant on all air line connections.

### Yard Release Valve

20. **Removal.** Remove the yard release valve as follows (Figure 4):

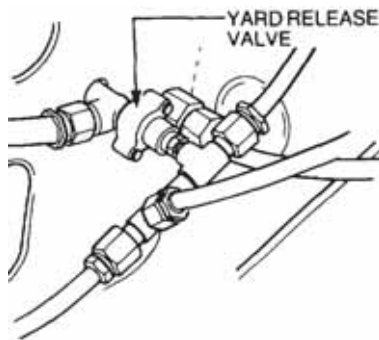


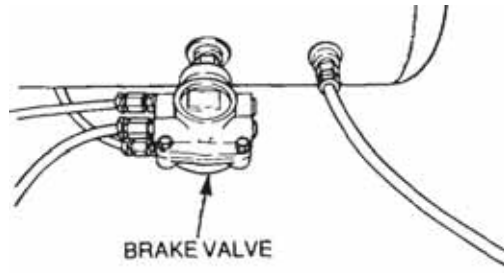
Figure 4 Yard Release Valve

- a. Chock the wheels and drain the air from the air reservoirs.
  - b. Tag and remove the air lines from the valve.
  - c. Remove the knob from the valve stem, then remove the two screws securing the valve to the undercarriage and remove the valve.
21. **Installation.** Install the yard release valve as follows (Figure 4):
- a. Position the new valve on the undercarriage and install the two screws to secure the valve to the undercarriage. Install the knob.
  - b. Connect the air lines to the valve and tighten the connections securely.
  - c. Charge the air reservoirs to normal operating pressure and check for air leaks at the valve.
  - d. Rectify any leaks as necessary.

### Brake Relay Valve (CA43)

22. **Removal.** Remove the brake relay valve as follows (Figure 5):
- a. Chock the wheels and drain the air from the air reservoirs.
  - b. Tag and remove the air lines from the valve.



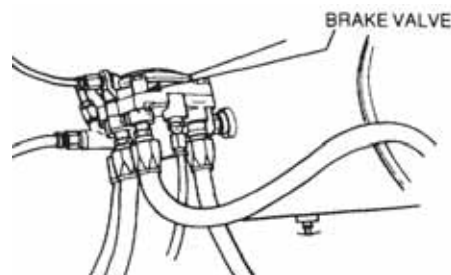


**Figure 5 Brake Relay Valve (CA43)**

- c. Remove the valve from the rear air reservoir.
- 23. **Installation.** Install the brake relay valve as follows (Figure 5):
  - a. Install the valve on the air reservoir.
  - b. Connect the air lines to the valve and tighten the connections securely.
  - c. Charge the air reservoirs to normal operating pressure.
  - d. Operate the foot brake valve and check for air leaks at the relay valve.
  - e. Rectify any leaks as necessary.

**Service Brake Relay Valve (CA38)**

- 24. **Removal.** Remove the service brake relay valve as follows (Figure 6):



**Figure 6 Service Brake Relay Valve (CA38)**

- a. Chock the wheels and drain the air from the air reservoirs.
- b. Tag and remove the air hoses from the unions on the six service brake chambers.
- c. Tag and remove the six service brake air hoses from the service brake relay valve.
- d. Tag and remove the air hose from the yard release valve at the service brake relay valve.
- e. Tag and remove the air hose from the brake relay valve (CA43) at the service brake relay valve.
- f. Tag and remove the air hose from the spring brake relay valve at the service brake relay valve.
- g. Remove the service brake relay valve from the air reservoir.
- 25. **Installation.** Install the service brake relay valve as follows (Figure 6):
  - a. Install the service brake relay valve on the air reservoir.
  - b. Connect the air hoses from the spring brake relay valve, the brake relay valve and the yard release valve to the service brake relay valve.
  - c. Connect the six service brake air hoses on to the service brake relay valve and the service brake chambers.
  - d. Charge the air reservoirs to normal operating pressure.
  - e. Operate the foot brake valve and check for air leaks at all valves and service brake chambers.
  - f. Rectify any leaks as necessary.

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### Spring Brake Relay Valve (CA41 PARC Valve)

26. **Removal.** Remove the spring brake relay valve as follows (Figure 6):

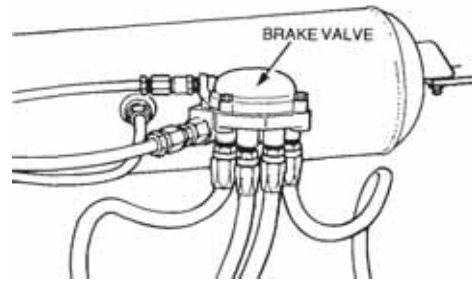


Figure 7 Spring Brake Relay Valve (CA41)

- a. Chock the wheels and drain the air from the air reservoirs.
- b. Tag and remove the four spring brake hoses from the spring brake relay valve.
- c. Tag and remove the air hose from the service brake relay valve at the spring brake relay valve.
- d. Tag and remove the air hose from the yard release valve at the spring brake relay valve.
- e. Remove the spring brake relay valve from the air reservoir.

27. **Installation.** Install the spring brake relay valve as follows (Figure 6):

- a. Install the spring brake relay valve on the air reservoir.
- b. Connect the air hose from the yard release valve to the spring brake relay valve.
- c. Connect the air hose from the service brake relay valve to the spring brake relay valve.
- d. Connect the four spring brake chamber air hoses to the spring brake relay valve.
- e. Charge the air reservoirs to normal operating pressure.
- f. Check for air leaks at the spring brake chambers.
- g. Rectify any leaks as necessary.

### Air Reservoirs

28. **Removal.** Remove the air reservoir as follows:

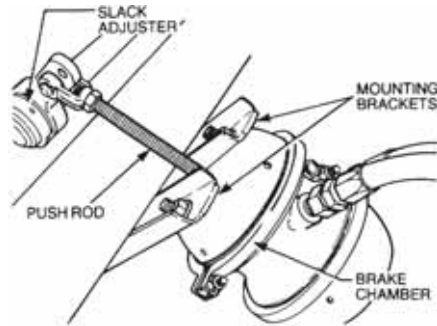
- a. Chock the wheels and drain the air from the air reservoirs.
- b. Remove the relevant relay valve from the reservoir (Paras 22, 24, or 26).
- c. Remove the air hose interconnecting the reservoir to be removed with the other reservoir.
- d. Remove the four bolts, nuts and washers securing the air reservoir to the mounting brackets.
- e. Remove the air reservoir.

29. **Installation.** Install the air reservoir as follows:

- a. Position the air reservoir on the mounting brackets and secure it with the four bolts, washers and nuts.
- b. Connect the reservoir interconnecting air hose.
- c. Install the relevant relay valve on the reservoir.
- d. Charge the air reservoirs to normal operating pressure.
- e. Check for air leaks.
- f. Rectify any leaks as necessary.

### Slack Adjuster

30. **Removal.** Remove the slack adjuster as follows (Figure 8):

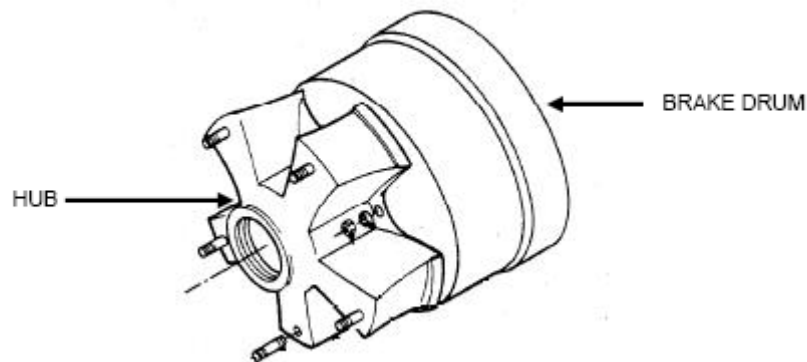


**Figure 8 Slack Adjuster and Push Rod**

- a. Chock the wheels and ensure that the parking brakes are released.
  - b. Back off the adjuster to be removed by placing a wrench on the adjusting bolt and depressing the locking sleeve.
  - c. Turn the adjusting bolt anticlockwise until no pressure is exerted by the push rod on the adjuster.
  - d. Remove the split pin and the clevis pin from the push rod clevis and the slack adjuster.
  - e. Remove the circlip and washer retaining the slack adjuster to the S-cam shaft.
  - f. Remove the adjuster.
- 31. Installation.** Install the slack adjuster as follows (Figure 8):
- a. Align the adjuster with the splines on the S-cam shaft and install the adjuster.
  - b. Install the clevis pin through the clevis and the slack adjuster.
  - c. Install the split pin.
  - d. Adjust the brakes (Para 19).

**Brake Drum**

- 32. Removal.** Remove the brake drum from the hub as follows (Figure 9):



**Figure 9 Brake Drum and Hub**

- a. Remove the hub and drum assembly (Para 52).
  - b. Place the hub on a flat surface with the brake drum uppermost.
  - c. Remove the bolts, nuts and washers securing the drum to the hub.
  - d. Remove the drum from the hub.
- 33. Installation.** Install the brake drum as follows (Figure 9):
- a. Position the new drum on the hub.

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- b. Install the bolts, washers and nuts.
- c. Tighten the bolts to 305–373 N.m (225–275 lbf.ft).
- d. Install the hub and drum (Para 53).
- e. Adjust the brakes (Para 19).

### Brake Shoes

#### WARNING

New brake parts provided by Fruehauf do not contain asbestos. Older parts still fitted to vehicles may contain asbestos. If any doubt exists as to whether parts contain asbestos or not, the procedures described in EMEI Workshop E 410 shall be complied with.

All replacement brake shoes are to be asbestos free.

34. **Removal.** Remove the brake shoes as follows (Figure 10):

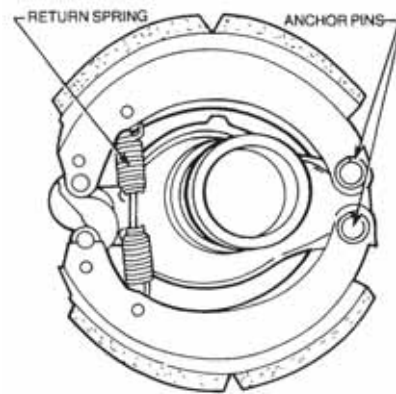


Figure 10 Brake Shoes Removal/Installation

- a. Remove the hub and drum assembly (Paras 52).
  - b. Remove the brake drum from the hub (Para 32)
  - c. Support the lower brake shoe and, using a pair of brake shoe pliers, remove the brake shoe return spring.
  - d. Remove the C clip securing the anchor pins to the brake shoes and the backing plate.
  - e. Support the brake shoe and remove the anchor pin from the shoe and the backing plate.
  - f. Remove the shoe from the backing plate.
35. **Cleaning and Inspection.** Clean and inspect the brake components as follows:

#### WARNING

Under no circumstances is compressed air to be used to remove dust from the brake drums or shoes.

- a. Thoroughly clean the brake dust from the brake components using a suitable cleaning agent.
  - b. Inspect the brake shoes for loose, cracked or excessively worn linings, and replace as necessary.
  - c. Inspect the backing plate for worn anchor pin bushes and replace as necessary.
36. **Installation.** Install the brake shoes as follows (Figure 10):
- a. Position the brake shoes on the backing plate and install the anchor pins and C clips.

- b. Using a pair of brake shoe pliers, install the brake shoe return spring.
- c. Install the brake drum and hub (Paras 33 and 53).
- d. Adjust the brakes (Para 19)

### Brake S-cam

37. **Removal.** Remove the brake S-cam as follows (Figure 11):

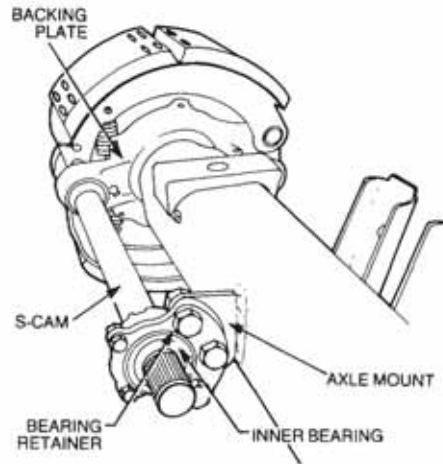


Figure 11 S-cam Mounting

- a. Remove the brake shoes (Para 34).
- b. Remove the slack adjuster (Para 30).
- c. Loosen the bolts and nuts securing the S-cam inner bearing and bearing retainers to the axle mount.
- d. Remove the S-cam by sliding it out from the inner bearing and the backing plate bushing.

38. **Installation.** Install the S-cam as follows (Figure 11):

- a. Install the S-cam through the backing plate bushing and the inner bearing.
- b. Tighten the bolts and nuts securing the S-cam inner bearing and bearing retainer to the axle mount.
- c. Install the brake shoes (Para 36).
- d. Install the slack adjuster (Para 31).
- e. Adjust the brakes (Para 19).

### Service and Spring Brake Chambers

39. **Removal.** Remove the service and spring brake chamber as follows (Figure 12):

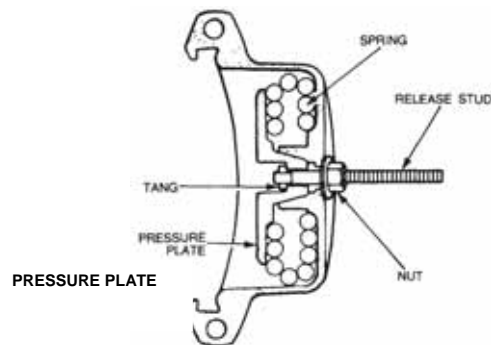


Figure 12 Spring Brake Release Stud

- a. Chock the wheels.

- b. Remove the dust cap from the spring brake housing and insert the spring brake release stud through the opening in the rear of the chamber into the spring pressure plate.
- c. Rotate the stud one-quarter of a turn in either direction to engage the tangs of the release stud into the slot in the pressure plate.
- d. Ensure that the release stud remains engaged in the pressure plate, then tighten the nut with a wrench to fully compress the spring.
- e. Drain the air from the air reservoirs.
- f. Tag and remove the service and spring brake air hoses from the chamber.
- g. Remove the split pin and the clevis pin from the push rod clevis and the slack adjuster.
- h. Remove the two nuts and washers retaining the brake chamber to the axle mounting bracket (Figure 8).
- i. Remove the chamber.

**40. Installation.** Install the service and spring brake chamber as follows (Figure 12):

- a. Secure the brake chamber to the axle mounting using the two washers and nuts.
- b. Tighten the mounting nuts to 122–149 N.m (90–110 lbf.ft) ensuring the push rod does not bind.
- c. Align the slack adjuster and the push rod clevis, then install the clevis pin and the split pin.
- d. Connect the service and spring brake air hoses to the brake chambers.
- e. Charge the air reservoirs to normal operating pressure.
- f. Remove the release stud and nut to uncage the spring brake pressure plate and spring.
- g. Apply the service and spring brakes in turn and check for correct operation.
- h. Adjust the brakes (Para 19).
- i. Check for any air leaks and rectify as necessary.

**Air Lines**

**41. Removal.** Remove the air line as follows:

- a. Drain the air from the air reservoirs.
- b. Release the compression nut from each end of the line.
- c. Remove any clamps securing the line to the trailer.
- d. Remove the line from the trailer.

**42. Installation.** Install the air line as follows:

- a. Cut a length of air line, of the same diameter and pressure rating as the line removed, to the required length.
- b. Install the compression nut and new nipple on the air line.
- c. Install the air line on the trailer and tighten the compression nuts securely.
- d. Charge the air reservoirs to normal operating pressure.
- e. Check for any air leaks.
- f. Rectify any leaks as necessary.

**Inspection After Repair**

**43.** The following inspections are to be conducted following brake repairs or adjustments:

- a. Brakes:
  - (1) Apply the trailer brakes by use of the foot brake and the hand control on the towing vehicle and note any erratic action, excessive binding, side pull or noise. Rectify as necessary.

- (2) Disconnect the emergency supply line and check for automatic application of the spring brakes.
- b. Parking Brakes:
  - (1) Apply the emergency/parking brake control in the towing vehicle and check for application of the spring brakes.
  - (2) Apply the parking brake on a gradient of approximately 25% with a 20 tonne payload. The parking brake must be able to hold the laden vehicle. Rectify as necessary.

**Brake System Fault Finding**

44. Table 2 details common faults and rectifications, for the brake system.

**Table 2 Brake System Fault Finding**

Serial	Symptom	Probable Cause	Remedial Action
1	Insufficient braking	Mechanical components damaged	Check for damaged parts, replace as required
		Worn brake linings	Replace brake shoes
		Low air pressure in the brake system	Check supply pressure from the prime mover
		Incorrect adjustment	Adjust brakes
		Reservoir drain cock open	Close drain cock
2	Brakes apply too slowly	Brakes require adjusting or lubrication	Adjust brakes. Lubricate brake components
		Relay valve (CA43) faulty	Replace valve
		Blocked or restricted air lines/hoses	Clear blockage. Replace air line or hose
		Leaking brake chamber diaphragm	Replace brake chamber
3	Brakes release too slowly	Brakes require adjusting or lubrication	Adjust brakes. Lubricate brake components
		Relay valve (CA43) faulty	Replace valve
		Blocked or restricted air lines	Clear blockage. Replace air line
4	Brakes do not release	Brake shoe return spring weak or broken	Replace spring
		Spring brake chamber diaphragm faulty	Replace brake chamber
		Faulty spring brake relay valve, service brake relay valve (CA38) or relay valve (CA43)	Replace faulty valve
5	Brakes grab or are erratic	Grease on brake linings	Replace brake shoes and seal
		Faulty brake chamber(s)	Replace chamber(s)
		Eccentric brake drum(s)	Replace drum(s)
		Loose brake lining	Replace brake shoe
		Brake shoe return spring weak or broken	Replace spring
6	Uneven brakes	Grease on brake linings	Replace brake shoes and seal
		Incorrect adjustment	Adjust brakes
		Eccentric brake drum(s)	Replace drum(s)
		Brake chamber diaphragm leaking	Replace brake chamber

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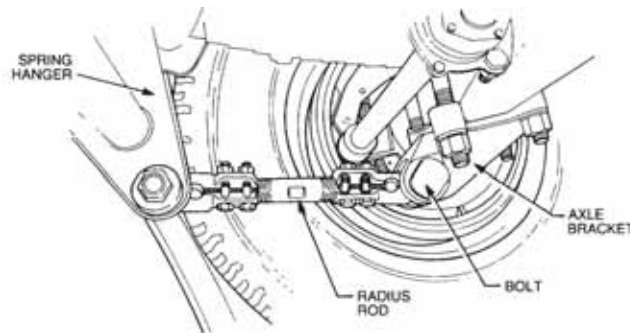
**Table 2 Brake System Fault Finding (Continued)**

Serial	Symptom	Probable Cause	Remedial Action
7	Spring brake does not hold	Power spring broken	Replace brake chamber
		Brakes require adjusting	Adjust brakes
		Faulty spring brake relay valve	Replace valve
8	Brakes drag after spring brakes have been used	Low spring brake hold-off air pressure	Check air pressure in system
		Leaking air lines	Repair leaks
9	Spring brakes will not release	Insufficient air pressure	Check air pressure in system
		Faulty spring brake relay valve	Replace valve
		Spring brake chamber diaphragm faulty	Replace chamber

## AXLES/SUSPENSION

### Radius Rod/Bushes

45. **Removal.** Remove the radius rod/bushes as follows (Figure 13):



**Figure 13 Radius Rod Mounting**

- a. Remove the wheels (Para 54).
- b. Remove the bolts, nuts and washers securing the radius rod in the front spring hanger and the axle bracket.
- c. Support the radius rod and using a suitable lever, pry the bushes out of the spring hanger and the axle bracket.
- d. Remove the radius rod and discard the bushes.

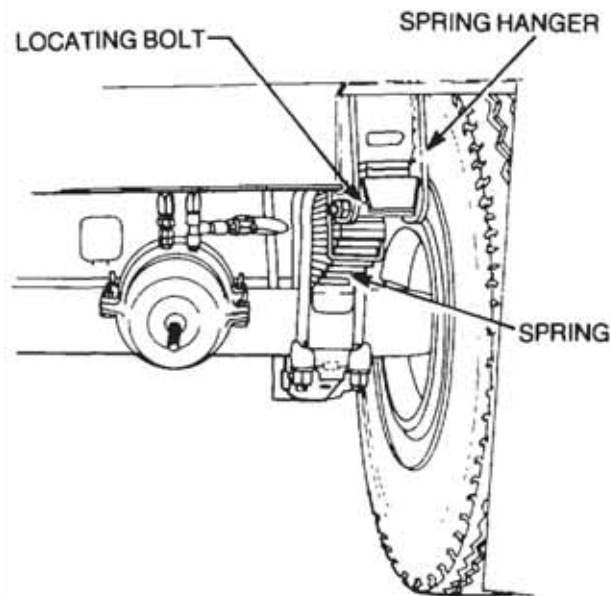
46. **Installation.** Install the radius rod/bushes as follows (Figure 13):

- a. Position the radius rod in the spring hanger. Install a new bush in both sides of the spring hanger.
- b. Using a suitable length bolt, flat washers and nut, seat the bushes into the radius rod and the spring hanger.
- c. Remove this bolt, nut and washers. Install the original retaining bolt, washer and nut.
- d. Align the radius rod in the axle bracket. Install a new bush in both sides of the bracket.
- e. Using a suitable length bolt, flat washers and nut, seat the bushes into the radius rod and the axle bracket.
- f. Remove this bolt, nut and washers. Install the original retaining bolt, washer and nut.
- g. Tighten both retaining bolts to 460 – 490 N.m (340 – 360 lbf.ft).
- h. Replace the wheels (Para 55).



## Springs

47. **Removal.** Remove the springs as follows (Figure 14):



**Figure 14 Spring Locating Bolt**

- a. Remove the wheels (Para 54).
- b. Remove the four nuts and washers retaining the U-bolts to the axle bracket.
- c. Remove the U-bolts and the saddle.

### WARNING

**This assembly is very heavy. Extreme care must be taken to avoid personal injury.**

- d. Position a jack under the axle adjacent to the spring and remove the safety stand.
- e. Lower the axle until the weight of the spring is lightly supported on the axle and replace the safety stand.
- f. Remove the bolts securing the spring to the equaliser beam and the spring hanger and remove the spring.

48. **Installation.** Install the springs as follows:

- a. Position the spring on the axle. Locate the spring ends in the spring hanger and the equaliser beam and secure it with the bolts.
- b. Raise the axle and spring assembly and support the axle on a safety stand.
- c. Position the U-bolt saddle on top of the spring and install the U-bolts.
- d. Install the washers and nuts on the U-bolts and tighten them to 461 – 488 N.m (340 – 360 lbf.ft).

### NOTE

The U-bolts must be retightened after approximately 1 000 km with the trailer loaded.

- e. Replace the wheels (Para 55).

49. **Spring Centre Bolt Replacement.** Replace the spring centre bolt as follows:

- a. Remove the spring (Para 47).
- b. Remove the broken centre bolt from the spring.
- c. Align the spring leaves and install the centre bolt and nut. Tighten the nut securely.
- d. Install the spring (Para 47.a).

### Equaliser Beams

50. **Removal of Bushes.** Remove the equaliser beam bushes as follows (Figure 15):

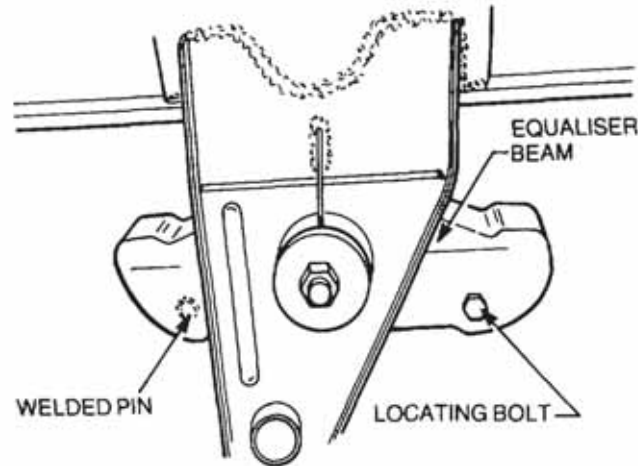


Figure 15 Spring Locating Bolt and Pin

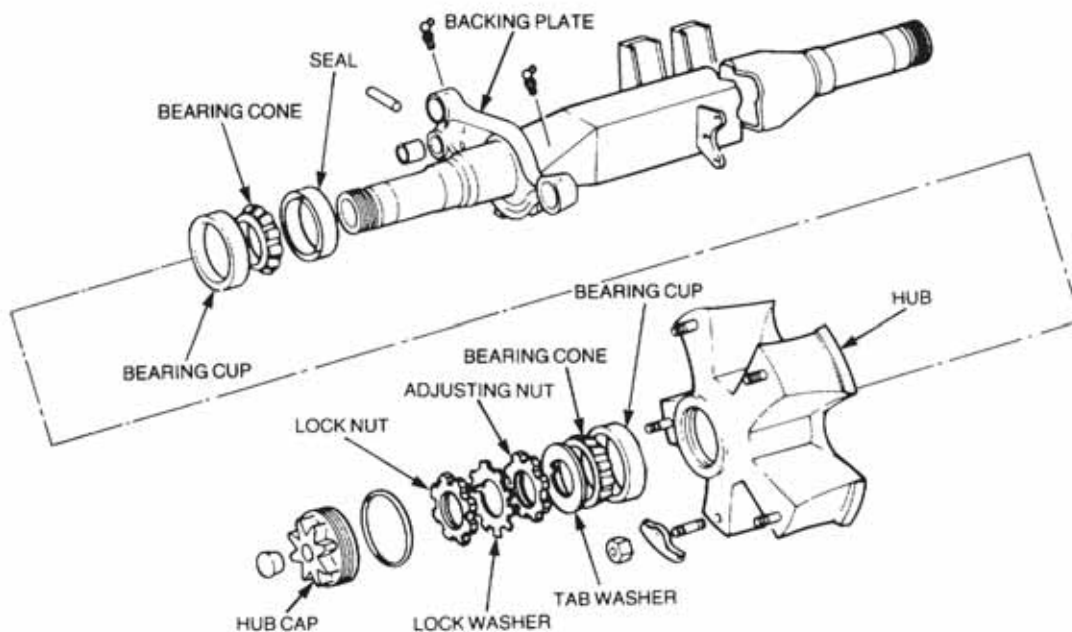
- a. Support the trailer frame on suitable safety stands.
- b. Remove the spring locating bolt from the equaliser beam.
- c. Remove the bolt, nut and washer retaining the equaliser beam in the equaliser hanger.
- d. Using a suitable lever, pry the bushes from the equaliser hanger and beam.
- e. Manipulate the equaliser beam from the hanger.

51. **Installation.** Install the equaliser beam bushes as follows (Figure 15):

- a. Position the equaliser beam in the hanger.
- b. Install a new bush in both sides of the hanger.
- c. Using a suitable length bolt, flat washer and nut, seat the bushes into the equaliser hanger and the equaliser beam.
- d. Remove the bolt, nut and washers.
- e. Install the retaining bolt, washer and nut.
- f. Tighten the retaining bolt to 461 – 488 N.m (340 – 360 lbf.ft).
- g. Install the spring locating bolt in position.

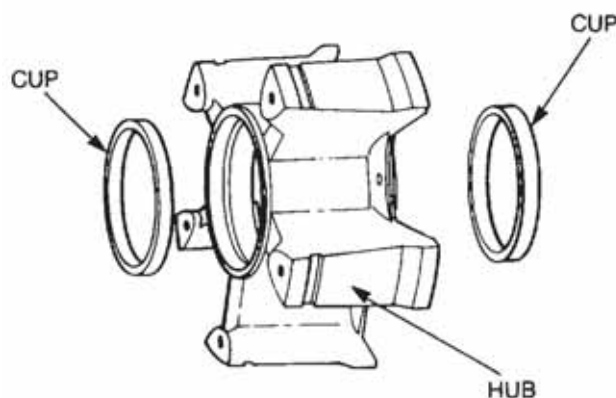
### Hub Seal and Wheel Bearings

52. **Removal.** Remove the hubs and bearings as follows (Figure 16):



**Figure 16 Axle Assembly – Exploded View**

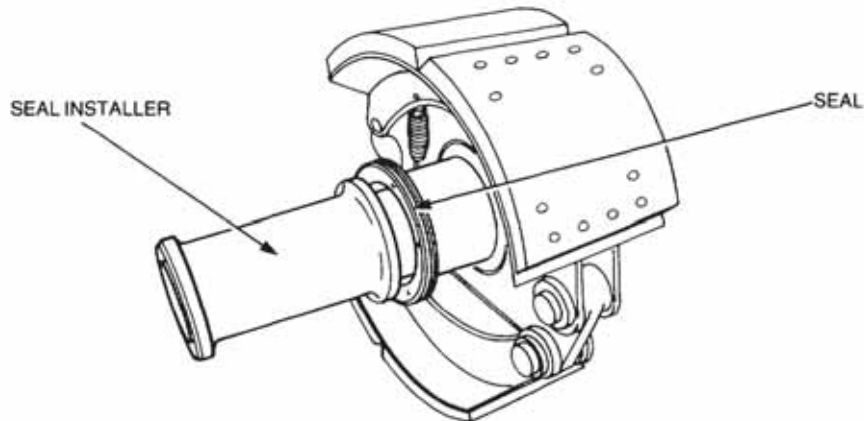
- a. Cage the spring brake (Para 39a. to d.) adjacent to the hub to be removed and apply the parking brake.
- b. Using a suitable jack under the axle, raise the trailer until the wheels are clear of the ground and support the axle on safety stands.
- c. Using special tool JLA 13943 (Table 2, Item 1) remove the hub cap and O ring and discard the O ring.
- d. Position a wheel trolley jack under the wheels and support the weight. Straighten the lock tabs on the lock washer and remove the locknut using special tool JLA 13943.
- e. Remove the lock washer. Remove the adjusting nut using tool JLA 13943.
- f. Remove the outer wheel bearing. Remove the wheel hub and brake drum from the axle shaft.
- g. Remove the inner wheel bearing from the axle shaft. Tap the seal from the axle shaft and discard it.
- h. Using a suitable drift, remove the inner and outer wheel bearing cups (Figure 17).



**Figure 17 Bearing Cup Removal**

**53. Installation.** Install the wheel bearings and hub as follows (Figure 16):

- a. Thoroughly clean the hub assembly and the axle shaft, then using a suitable drift, install the inner and outer bearing cups into the hub.
- b. Lubricate the outer surface of the seal and position the seal on the axle shaft.
- c. Using the fabricated seal installer (Table 2, Item 2), seat the seal against the axle flange (Figure 18).



**Figure 18 Seal Installation**

- d. Pack the inner and outer bearings with grease XG-291.
- e. Install the inner wheel bearing on the axle shaft. Using a wheel trolley jack, position the brake drum, hub and wheels on the axle shaft.

**NOTE**

The wheel bearings are fully floating on the axle shaft.

- f. Install the outer wheel bearing and the adjusting nut. While rotating the wheels, tighten the nut using special tool JLA 13943 (Table 2, Item 1) to seat the bearings and the seal in the hub.
- g. Back off the adjusting nut anticlockwise until the wheels rotate freely.
- h. Install the lock washer and locknut. Bend the lock tabs to secure the adjusting nut and the locknut.
- i. Install a new O ring on the hub cap.
- j. Lubricate the O ring and the hub cap threads. Fill the hub cavity with XG-291 grease. Install the cap and tighten it securely using special tool JLA 13943.
- k. Remove the safety stands and lower the wheel to the ground..
- l. Release the parking brake and uncage the spring brake (Para 40).

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**WHEELS**

- 54. **Removal.** Remove the wheels as follows:
  - a. Chock the wheels not being removed and apply the parking brake.
  - b. Position a jack under the appropriate axle, then loosen the wheel nuts on the wheels to be removed.
  - c. Raise the axle until the wheels are clear of the ground and support the axle on a safety stand.
  - d. Loosen the wheel nuts and tap the clamps lightly with a hammer, then remove the wheel nuts and clamps.
  - e. Remove the outer wheel using suitable lifting equipment.
  - f. Remove the spacer, then remove the inner wheel using suitable lifting equipment.
- 55. **Installation.** Replace the wheels as follows (Figures 19 and 20):

**NOTE**

Ensure that the drive lugs are positioned as shown in Figure 19 for a left side wheel or Figure 20 for a right side wheel.

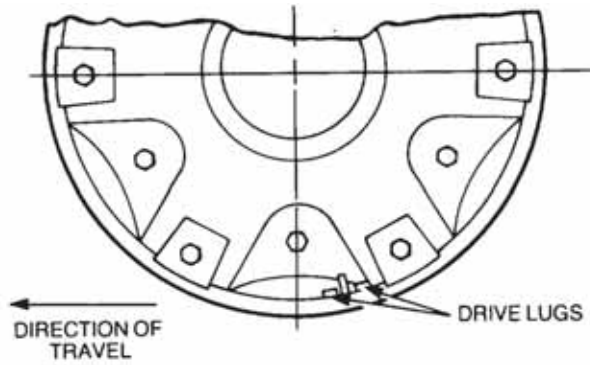


Figure 19 Left Side Wheel – Drive Lug Location

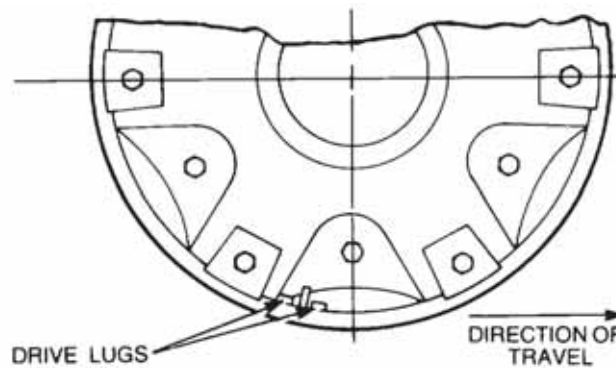


Figure 20 Right Side Wheel – Drive Lug Location

- a. Position the inner wheel on the hub using suitable lifting equipment, ensuring that the valve stem points away from the trailer and the drive lugs are positioned correctly (Figures 19 and 20).
- b. Install the spacer and then the outer wheel.
- c. Install the wheel clamps and nuts. Place a block of wood adjacent to the outer tyre. Revolve the wheels and check for excessive run out. Adjust the nuts progressively to eliminate any run out.
- d. Tighten the nuts to 237 – 271 N.m (175 – 200 lbf.ft) in the sequence shown in Figure 21.

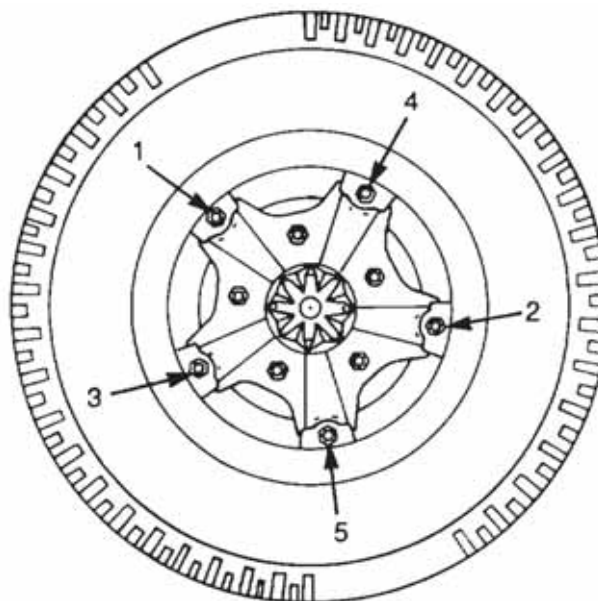


Figure 21 Wheel Nut – Tightening Sequence

- e. Remove the safety stand and lower the wheel to the ground. Remove the wheel chocks.

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ELECTRICAL

NOTE

Replacement lamps must be of correct rating as detailed in the RPS 02199.

Stop, Tail, Reversing and Indicator Lights.

56. **Lamp Replacement.** Replace faulty lamps as follows (Figure 22):

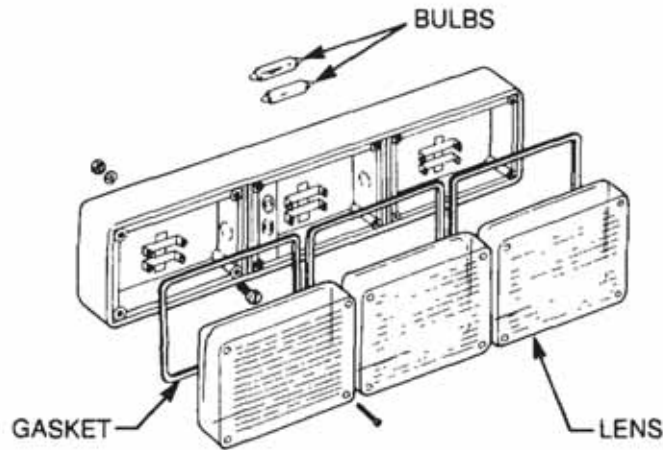


Figure 22 Stop/Tail, Reversing and Indicator Light – Exploded View

- a. Remove the four screws securing the lens cover to the light unit.
- b. Replace the lamp as required.
- c. Install the lens and secure with the four screws ensuring that the gasket is seated correctly.
- d. Test the lights for correct operation and rectify as necessary.

57. **Light Assembly Replacement.** Replace the light unit assembly as follows (Figure 22):

- a. Remove the four screws securing each lens cover to the light unit.
- b. Tag and disconnect the light unit wiring from the unit.
- c. Remove the two screws and nuts securing the light unit to the coaming rail, then remove the unit.
- d. Install the light unit and secure it to the coaming rail with the two screws and nuts.
- e. Connect the light unit wiring, then install and secure the lens covers with the screws.
- f. Test the lights for correct operation and rectify as necessary.

Stop/Tail and Number Plate Light.

58. **Lamp Replacement.** Replace faulty lamps as follows (Figure 23):

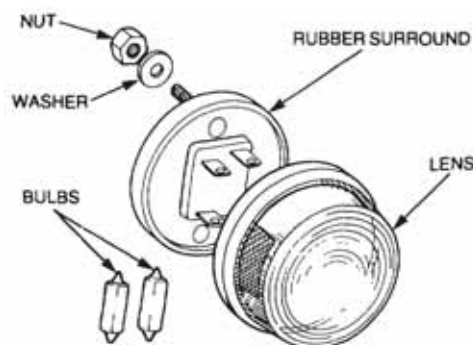


Figure 23 Stop/Tail and Number Plate Light – Exploded View

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- a. Carefully ease the lens cover out of the rubber light surround.
- b. Replace the lamp as required.
- c. With a push/twist action install the lens cover into the rubber light surround, ensuring that the clear section of the lens is facing the number plate.
- d. Test the lights for correct operation and rectify as necessary.

**59. Light Unit Replacement.** Replace the light unit assembly as follows (Figure 23):

- a. Carefully ease the lens cover out of the rubber light surround.
- b. Tag and disconnect the wiring from the unit.
- c. Remove the two nuts and washers securing the unit to the coaming rail.
- d. Remove the unit.
- e. Install the light unit and secure to the coaming rail with the two washers and nuts.
- f. Connect the wiring to the unit.
- g. With a push/twist action install the lens cover into the rubber light surround, ensuring that the clear section of the lens is facing the number plate.
- h. Test the lights for correct operation and rectify as necessary.

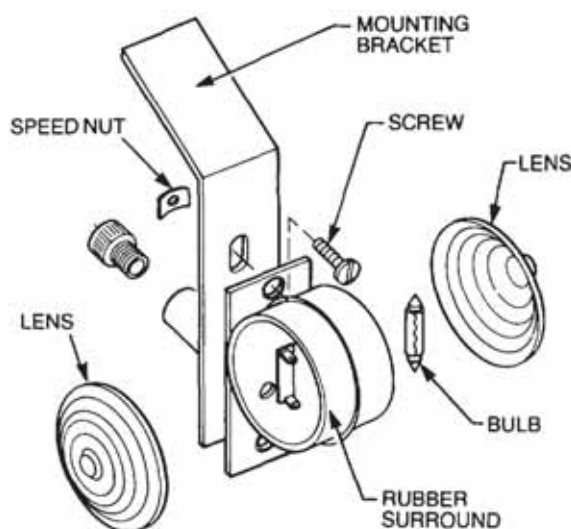
**Blackout Stop/Tail Light**

**60. Light Unit Replacement.** Replace the blackout light assembly as follows:

- a. Tag and disconnect the light unit wiring harness from the main wiring harness.
- b. Remove the two nuts and washers securing the light unit to the coaming rail.
- c. Insert the unit wiring harness through the coaming rail
- d. Secure the unit to the rail with the two washers and nuts.
- e. Connect the light unit wiring harness to the main wiring harness according to the labelling attached during removal.
- f. Test the lights for correct operation and rectify as necessary.

**Clearance Light**

**61. Lamp Replacement.** Replace the lamp as follows (Figure 24):



**Figure 24 Clearance Light – Exploded View**

- a. Carefully ease one lens cover out of the rubber light surround.

- b. Replace the lamp as required.
- c. With a push/twist action install the lens cover into the rubber light surround.
- d. Test the lights for correct operation and rectify as necessary.

**62. Light Unit Assembly Replacement.** Replace the light unit assembly as follows (Figure 24):

- a. Carefully ease one lens cover out of the rubber light surround.
- b. Tag and disconnect the wiring from the light unit.
- c. Remove the two screws and speed nuts, securing the unit to the bracket.
- d. Remove the light unit assembly.
- e. Feed the unit wiring through the rubber surround and secure the new light assembly onto the bracket with the two screws and speed nuts.
- f. Connect the wiring to the unit.
- g. Install the lens cover with a push/twist action into the rubber surround.
- h. Test the lights for correct operation and rectify as necessary.

**NATO Socket**

**63. Replacement.** Replace the NATO socket as follows:

- a. Disconnect the NATO plug from the towing vehicle.
- b. Slide the rubber cover away from the rear of the socket.
- c. Tag and remove each individual wire from the socket pins using a soldering iron. Refer to Figure 25 for pin outs and wiring colour coding.
- d. Remove the four screws and speed nuts securing the socket to the mounting plate and remove the socket.
- e. Position and secure the replacement socket to the mounting plate with the four screws and speed nuts.
- f. Solder each individual wire into its corresponding socket pin according to Figure 25.
- g. Slide the rubber boot over the rear of the socket.

**64. Test Procedure.** Test the wiring as follows:

- a. Using a NATO plug lead, connect the trailer's NATO socket to the towing vehicle's NATO socket.
- b. With the vehicle ignition and light switches OFF, all lights on the trailer should be extinguished.
- c. Switch on the left side indicator and check that the left side indicators flash.
- d. Switch on the right side indicator and check that the right side indicators flash.
- e. Apply the foot brake and check that the stop lights illuminate.
- f. Switch on the park lights and check that the tail lights and clearance lights illuminate.
- g. Switch to blackout mode and check that all green blackout lights illuminate.
- h. Apply the foot brake and check that the red blackout stop lights illuminate.
- i. Ensure that no other lights illuminate whilst switched to blackout mode.

**Wiring Diagram.**

**65.** The wiring diagram for the trailer is as shown in Figure 25. The diagram shows only one side clearance light per side (Figure 25, Item 1) even though there are five per side on the trailer, however they are wired in parallel.



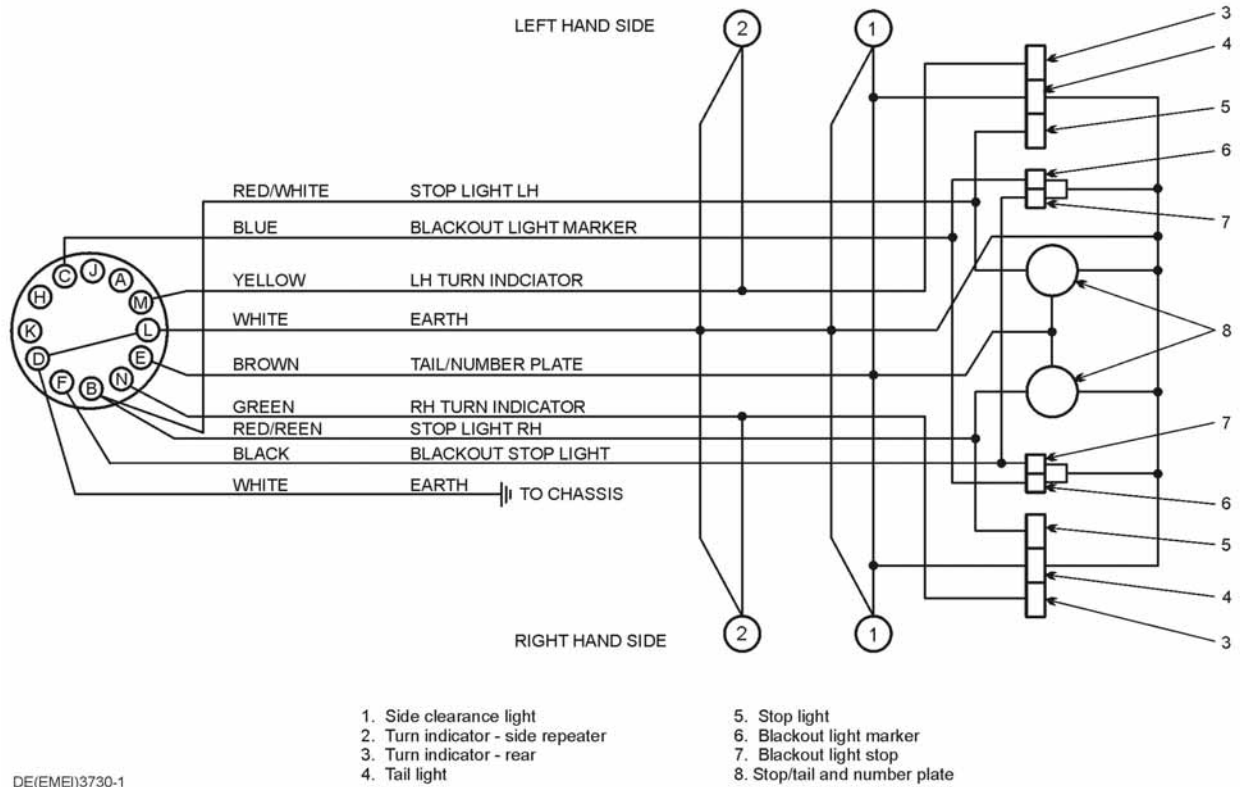


Figure 25 Wiring Diagram

FRAME

King Pin

66. **Replacement.** Replace the king pin as follows (Figure 26):
- Remove the eight nuts and washers securing the king pin to the retention plate.
  - Remove the king pin.
  - Position the replacement king pin on the retention plate bolts, install the washers and nuts.
  - Tighten the nuts to 130 N.m (96 lbf.ft).

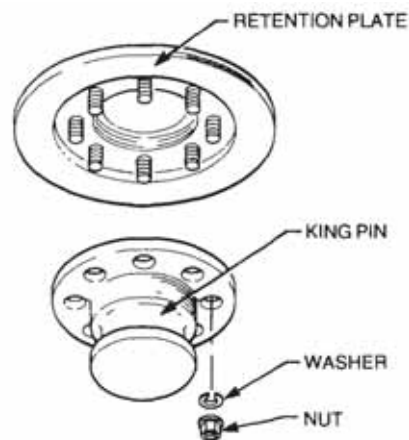


Figure 26 King Pin and Retention Plate

Support Legs

67. **Removal.** Remove the support legs as follows (Figures 27 and 28):

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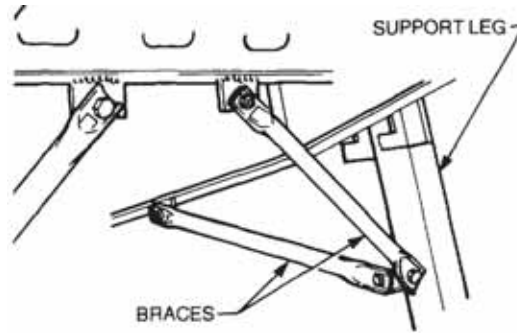


Figure 27 Support Leg and Support Braces

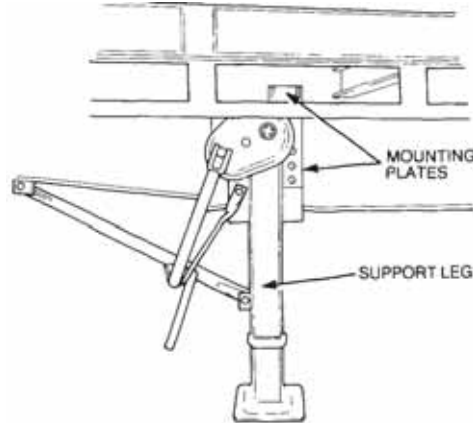


Figure 28 Support Leg Mounting

- a. Support the frame assembly at the front using a suitable stand, then raise the support legs until the weight is relieved from the sandshoes.
- b. Remove the bolt, nut and washers securing the two support leg braces from each brace and the mounting plate on the support leg.

**WARNING**

**This assembly is very heavy. Extreme care must be taken to avoid personal injury.**

- c. Support the leg, then remove the ten bolts, nuts and washers securing the leg to the mounting plates.
- d. Remove the support leg from the trailer.

**68. Installation.** Install the support legs as follows (Figures 27 and 28):

- a. Position the support leg on the trailer mounting plates and engage the connecting shaft on the gearbox drive shaft.
- b. Install the ten mounting bolts, washers and nuts and tighten them securely.
- c. Position the support braces at the mounting plates on the legs and install the bolt, washer and nut to each brace and tighten them.
- d. Lower the support legs and raise the trailer, then remove the stand from under the frame.

### Tow Coupling

#### WARNING

This assembly is very heavy. Extreme care must be taken to avoid personal injury.

69. **Removal.** Remove the tow coupling as follows (Figures 29):

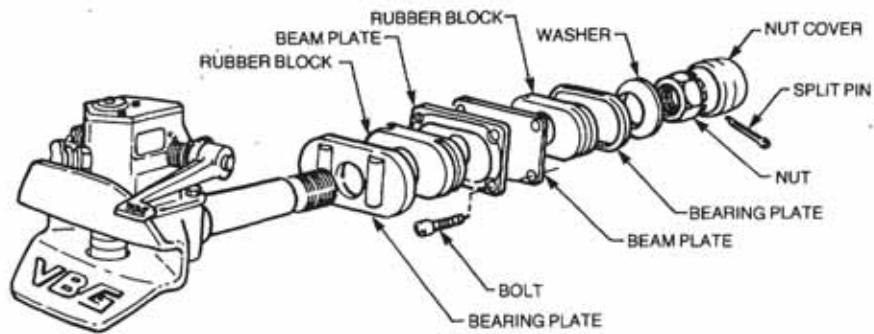


Figure 29 Tow Coupling – Exploded View

- a. Remove the nut cover from the nut and shaft.
  - b. Support the tow coupling then remove the split pin and the nut.
  - c. Remove the washer, inner bearing plate and the rubber block from the rear of the drawbeam.
  - d. Remove the coupling, the outer bearing plate and the rubber block from the drawbeam.
  - e. Remove the four Allen-head bolts securing the outer and inner beam plates to the drawbeam and remove the beam plates.
70. **Installation.** Install the tow coupling as follows (Figures 30 and 31):

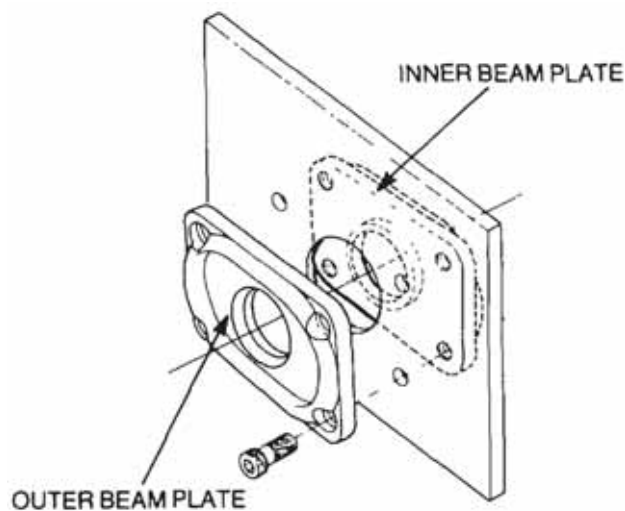
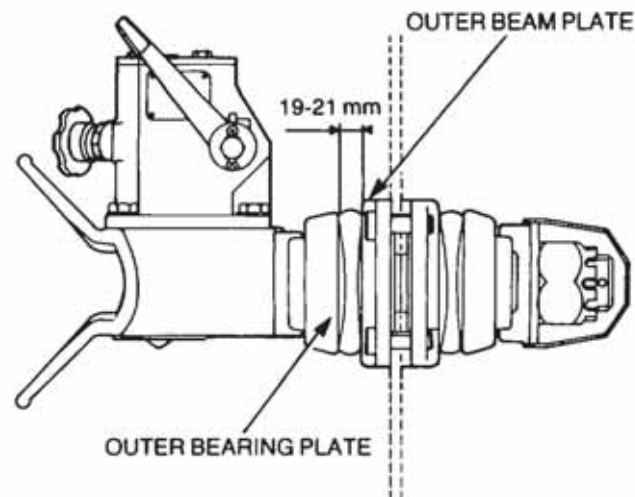


Figure 30 Drawbeam and Beam Plates



**Figure 31 Tow Coupling Adjustment**

**NOTE**

The beam plate with the tapped threads is to be installed inside the drawbeam.

- a. Position the inner and outer beam plates onto the drawbeam.
- b. Install the four Allen-head bolts and tighten them to 203–237 N.m (150–175 lbf.ft).
- c. Install the outer bearing plate and the rubber block on the coupling shaft.
- d. Install the coupling in the drawbeam.
- e. Install the rubber block, the inner bearing plate, the washer and the castellated nut on the shaft.
- f. Tighten the nut until the outer rubber block is compressed to 19–21 mm (0.75–0.84 in) between the edges of the outer bearing plate and the outer beam plate.
- g. Install the split pin through the nut and the coupling shaft, then partly fill the nut cover with grease.
- h. Install the nut cover over the nut and shaft.

**END**

Distribution List: **VEH H 06.1 – Code 2** (Maint Level)  
(Sponsor: CGSVSPO Mdm/Hvy B Vehicles)  
(Authority: ECO LVSP0 046/08)

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