TRAILER, CARGO, LIGHT, MC2, 1250 KG

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.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Blank Page

INTRODUCTION

1. This EMEI contains the procedures for removing, dismantling, repairing, assembling and installing the components of the Trailer, Cargo, Light MC2, 1250 kg. Where applicable, instructions for the adjustment, lubrication and minor servicing of these items are included.

Safety

WARNING

All industrial safety, work practices and equipment operating and maintenance instructions pertaining to this instruction are to be adhered to.

WARNING

Chemical substances are to be stored, used and handled in accordance with Para 11.e, h and i.

2. All relevant weights, dimensions and performance figures for the trailer are detailed in the Data Summary, EMEI Vehicle H 120.

CAUTION

Do not use adhesive tape to seal brake fluid openings. The adhesive on most tapes is soluble in oil and can cause contamination. Remove protective caps, plugs or covers before installation.

3. Prevent dirt and foreign objects from entering any component. Place clean temporary covers on all exposed openings. All open hoses and lines are to be protected with plastic or metal caps or plugs.

4. Protect the equipment from dust and inclement weather when performing any of the tasks contained in this manual. If practical, perform these tasks in a sheltered or enclosed area.

CAUTION

Before removing any electrical system components, disconnect the NATO plug from the towing vehicle.

5. When disconnecting electrical connectors, hoses and fittings remove clamps as required to gain slack and avoid damage to connectors and fittings.

6. Discard all used gaskets, seals, split pins, tab washers, lock-pins, nylon lock nuts, nuts and lock-washers. Discard all contaminated lubricants drained from the equipment.

7. Use only those lubricants specified in the Servicing Instruction and the User Handbook when replenishing lubricants.

8. Any fastening or fittings being tightened to prescribed torques are to have dry, clean threads unless thread sealants are specified. Thread sealants are to be applied to dry, clean, oil-free threads.

9. For warranty provisions, refer to the User Handbook.

Trade Requirements

10. ECN 229 or civilian equivalent are authorised to carry out Light Grade Repair on the Trailer, Cargo, Light 1 250 kg, MC2.

Associated Publications

11. The following documents apply to the operation and maintenance of this trailer:

a. EMEI Vehicle A 029-3– Servicing of B Vehicles, Trailers, All Terrain Vehicles (ATV) and Motorcycles;

b. EMEI Vehicle H 120 – Data Summary;

c. EMEI Vehicle H 127-1 Trailer, Cargo, Light, MC2, 1 250 kg – Fitting of Modification Plate and Slinging and Tiedown Plate;

d. EMEI Vehicle H 129 – Servicing Instruction;

e. EMEI Workshop E series;

f. Repair Parts Scale (RPS) 02242;

g. User Handbook – 7610-66-147-1456;

h. Defence Safety Manual – (SAFETYMAN); and

i. Chem Alert 2 (http://dsmachem.defence.gov.au/).

AXLE ASSEMBLY

12. Description. The axles fitted to this trailer are a tandem arm, pivot bush mounted beam assembly, manufactured by N.P. Hauffe and Co. The wheel stations are fitted with 8-inch flange type wheel hubs carried by tapered roller bearings. Each wheel station is fitted with 299 mm x 10.5 mm disc brakes on all road wheels and an integral single expanding shoe, drum type parking brake is fitted to the rear wheel stations.

13. Removal. Remove the axle assembly using the following procedure:

WARNING

Prior to removal of any components of the trailer running gear, ensure that the trailer frame is correctly supported with all weight removed from the suspension components. Loosen the wheel nuts and raise the trailer.

a. Ensure the weight of the beam assembly is correctly supported.

b. Disconnect the brake fluid supply pipe at the centre T piece on the beam assembly and cover it to prevent the ingress of dirt.

c. Disconnect the parking brake cables from the draw links on the backing plates by pushing the links to the actuated position and slipping the cable end off the draw link.

d. Remove the two bolts securing the beam assembly to the inner chassis rail on each side.

e. Remove the six bolts on each side securing the beam assembly to the trailer outer chassis rail.

f. Lower the beam assembly to the ground.

NOTE

Disassembly of wheel stations can be achieved without removal of the beam assembly.

14. Disassembly. Disassemble the axle assembly as follows:

a. Raise the vehicle till the relevant wheel is clear of the ground and support it with an axle stand. Ensure the wheel remains clear of the ground. Remove the wheel nuts and wheel from the axle assembly.

b. Remove the parking brake cable from the draw link on the hub assembly, if fitted. If the wheel hubs are to be removed, refer to Paragraph 18 and Figure 1.

c. Remove the four backing plate mounting bolts and the backing plate assembly, if required.

d. Support the leaf spring and remove the two bolts holding the spring clamp and anti-rattle plate assembly. Lower the leaf spring and remove the spring clamp assembly.

e. Undo the brake calliper fluid supply line at the beam end of the tandem arm and remove the flexible brake hose from the mounting bracket.

NOTE

Tandem arm pivot bolts are different lengths. Care should be taken not to mix the bolts on assembly.

f. Support the tandem arm at the beam assembly end and remove the inside pivot bolt. Remove the outer pivot bolt and lower the tandem arm to the ground.

g. Remove the cam adjusting washer and bolt.

h. Separate the bush adjuster from the tandem arm.

i. Remove the pivot bush thrust washers.

15. Inspection. Check the following items:

a. Check that the beam assembly is straight and there is no cracking at weld sites.

b. Check the pivot bushes for serviceability and replace them if required (Paragraph 16).

c. Check the spring leaves, centre bolts, spring seats, spring clamps and anti-rattle plates for wear or damage and replace as necessary.

16. Assembly. The axle assembly is assembled as follows:

NOTE

During assembly always use new nylon lock nuts and split pins. Replace any damaged washers.

a. Replace the bush in the tandem arm using a hydraulic press, if required.

b. Replace the bush adjuster as an assembly.

c. Fit the bush adjuster to the tandem arm and secure it in place with the cam adjusting washer and bolt.

17. Installation. Install the axle assembly using the following procedure:

NOTE

Tandem arm pivot bolts are of different lengths. Care should be taken not to mix the bolts on assembly.

a. Ensure that the pivot bushes are correctly installed and located and that the polyethylene thrust washers are installed on the protruding ends of the inner steel bush.

b. Using a suitable jacking device, lift the tandem arm assembly up to the beam assembly, insert the outer and inner pivot bolts and torque them to 203 N.m.

c. Position the spring clamp assembly on the end of the leaf spring. Raise the leaf spring assembly and bolt the spring clamp and anti-rattle plate to the tandem arm.

d. Refit the ‘H’ plate and parking brake cable to the draw link on the parking brake assembly if required. If the wheel hub assembly has been removed, refer to Paragraph 23.

e. Refit the brake calliper assembly. Fit and connect the brake fluid tubing.

f. Bleed the braking system using one of the procedures described in Paragraph 61 and Paragraph 62.

g. Adjust the wheel bearings (Paragraph 23) and adjust the park brake (Paragraph 56).

h. Check the wheel alignment and adjust it as required (Paragraph 25).

i. Fit the wheel assembly and tension the wheel nuts to 105 N.m. Lower the wheel to the ground.

j. Road test the vehicle to ensure correct operation of all systems.

Wheel Hub

18. Removal. Remove the wheel hubs as follows (Figure 1):

a. Place a suitable jack beneath the axle and jack the wheel(s) clear of the ground.

b. Place a safety stand or another suitable support beneath the axle.

c. Lower the axle to the stand, ensuring that the wheels remain clear of the ground.

d. Remove the five wheel nuts securing the wheel to the hub and remove the wheel.

e. Undo the brake calliper fluid supply line at the calliper end and cap the pipe. Remove the two calliper mounting bolts and the calliper assembly.

f. Remove the hub dust cap, the cotter pin, wheel bearing adjusting nut and washer.

g. Remove the outer bearing cone from the hub and stub axle.

h. The hub and brake disc assembly is now free to be removed by sliding it off the stub axle.

19. Disassembly. After removal of the wheel hub assembly as detailed above, remove the inner hub seal as follows:

a. Position the wheel hub and brake disc assembly on a solid surface with the wheel studs facing upwards.

b. Using a long brass drift, placed through the centre of the hub, against the inner race of the inner wheel bearing, drive the hub seal and bearing from the hub using the brass drift and a hammer. Discard the seal.

NOTE

If the bearing cups removed are to be refitted, ensure that they are matched and remain with their respective bearing cones.

20. Bearing Cup Removal. With the wheel hub and hub seal removed as described above, remove the wheel bearing cups using the following procedure:

a. Drive each wheel bearing cup out with a long brass drift placed through the hub centre, against the inner face of the respective cup. The drift should be placed in alternate positions around the cup to ensure that it is driven evenly from the hub.

b. Matchmark the disc to the hub (if using the original disc), then separate the disc and hub by removing the three securing bolts from the disc side of the assembly.

21. Cleaning and Inspection. The following items must be cleaned and checked:

a. Wash the bearing cups and cones in a suitable clean solvent, using a stiff (not metal-bristled) brush. Avoid spinning the cone while cleaning it.

b. Wipe the cleaned parts dry with a clean, absorbent cloth or paper or blow them dry without spinning the cones.

c. Inspect the bearing cups for the following:

(1) discolouration, straw or blue colouring;

(2) chips or scoring on the bearing surface; and

(3) flaking of the case hardening.

d. Inspect the bearing cones for:

(1) discolouration of the tapered rollers;

(2) chipping or scoring of the case hardening;

(3) flaking of the case hardening;

(4) acceptable wear limits on wear back surface; and

(5) condition of the tapered roller cage.

e. Inspect the stub axle seal land for wear or deterioration. Replace or reclaim as necessary.

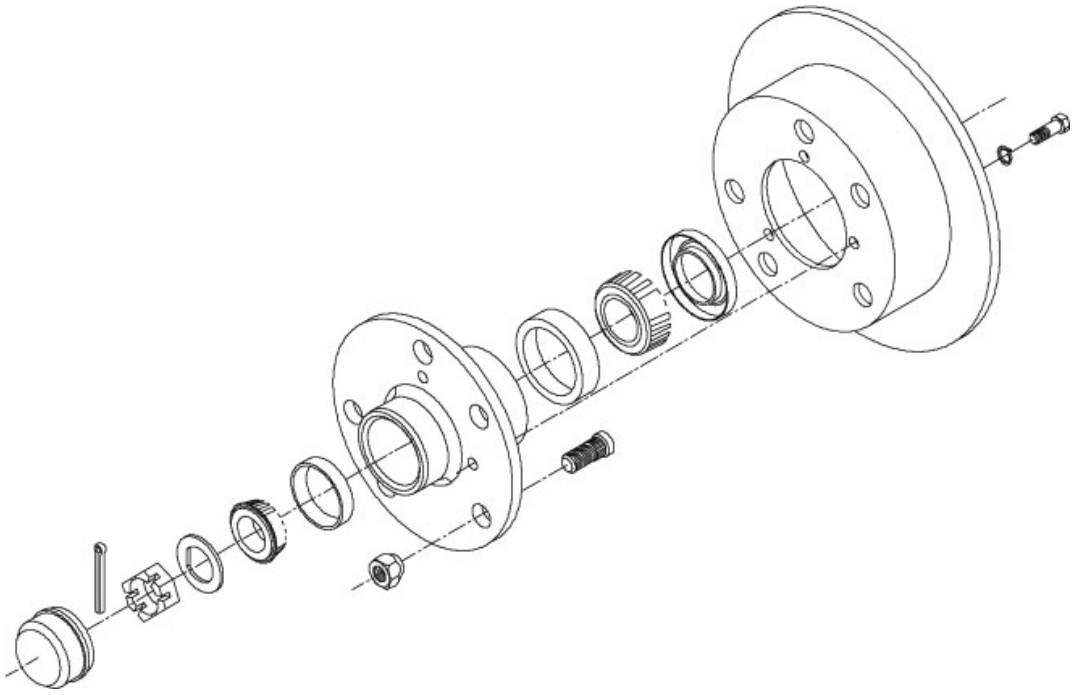

Figure 1 Hub Wheel Assembly – Exploded View

22. Assembly. Prior to fitting the bearing cups, check the following:

a. Ensure the wheel hub is free from any damage etc, which would render it unserviceable or affect the proper fitting of the bearing cups.

b. If refitting used cups, ensure that the bearing surface is serviceable and free from discolouring, chips, flaking, scoring or other damage that would render it unserviceable.

c. Fit the brake disk to the wheel hub if required. Ensure that any match marks are properly aligned and that the mounting bolts are in a serviceable condition. Torque the bolts to 40 N.m.

d. Place a faint smear of grease around the inner surface of the hub through which the cup is to pass.

NOTE

Drifts used for fitting bearing cups must be free of all burrs and jagged edges to prevent dislodging of metal chips into the wheel hub and bearings.

e. Place the bearing cup, smaller internal diameter innermost, in position on the hub and drive it into position using a suitable hammer and brass drift. Ensure that the drift is placed in alternate positions around the cup to ensure the cup moves evenly into the hub. The cup is fully in position when a solid metallic knock is heard in all positions around the cup.

f. Repeat Paragraph 22.e for the other bearing cup.

g. Pack the bearing cones with grease.

h. Insert the packed inner bearing cone.

i. Coat the other circumference of the grease seal with a suitable liquid gasket product, e.g. Loctite Aviation Form-a-Gasket No. 3. Fit the grease seal into the hub.

j. Half fill the hub cavity with grease.

k. Clean the hub seal mounting surface inside the wheel hub to remove all traces of grease.

23. Installation. Install the hub assembly as follows:

a. Check that the stub axle bearing and seal lands are clean and free from dirt, discolouration, cracks, burrs and other foreign material.

b. Smear grease around the lip of the inner hub seal.

c. Slide the wheel hub and brake disc assembly onto the stub axle ensuring that it is pushed on as far as possible and the inner hub seal is seated on its sealing face.

d. Fit the outer wheel bearing cone. Ensure it is correctly packed with grease.

e. Fit the keyed, flat washer and adjusting nut to the stub axle. Adjust the bearing preload by spinning the hub whilst tightening the nut to no more than 25 N.m. Back off 1/4 of a turn and re-tighten to provide nil end float at the bearings. Do not over tighten. If necessary, tighten the nut slightly to obtain proper alignment of the split pin hole and slot on the castellated nut.

f. Fit a new split pin, locking the castellated nut to the stub axle.

g. Check for rough or noisy bearings by spinning the hub. If required, fit the wheel temporarily to assist with turning the hub. If the hub spins correctly, coat the sealing surface of the hub grease cap with a liquid gasket product, e.g. Loctite Aviation Form-a-Gasket No. 3, and fit the grease cap to the hub.

h. Install the disc brake calliper and secure it by torquing the mounting bolts to 77 N.m.

i. Reconnect the brake fluid supply line taking care not to cross thread the flare nut.

j. Bleed the braking system using one of the procedures detailed in Paragraph 61 and Paragraph 62.

k. Fit the wheel to the hub and secure it with the five wheel nuts. Tighten the wheel nuts evenly to the specified torque and tightening procedure (Paragraph 26 and Figure 4).

l. Jack the axle clear of the safety stand, remove the stand and lower the wheels to the ground.

m. Road test the vehicle to ensure correct operation of all systems.

CAUTION

Wheel nuts must be checked and re-torqued after travelling approximately 50 km after refitting the wheels

WHEELS

Wheel Assembly

NOTE

If the trailer is empty, satisfactory ground clearance may be obtained by using suitable dunnage under the trailer support legs to support the trailer frame.

Wheel Balancing

24. The maximum weight allowed for balancing each wheel is 300 grams. If the maximum weight is exceeded, replace the tyre.

Wheel Alignment

25. Wheel alignment adjustment is possible on this trailer to allow for wheel alignment errors. The front wheels are to be aligned so that they have a slight amount of toe-in, max 1.5 mm (+ 0.5 to + 0.75 mm per wheel). The rear wheels are then aligned parallel to the front wheels, i.e. same toe-in as front wheels. The wheel alignment requirements are illustrated in Figure 2. The situation and equipment on hand will dictate how the measurements will be taken. The adjusting mechanism is illustrated in Figure 3. Adjust the alignment of each wheel as follows:

a. Raise the trailer and place it on suitable safety stands.

b. Remove all wheels from the trailer.

c. Clean all rust and scale from the face of the wheel hubs.

d. Take all necessary measurements as shown in Figure 3.

e. Loosen the adjuster bush clamp bolt on the tandem arm.

f. Turn the adjusting cam washer to alter the alignment and achieve the required measurement.

g. When the wheel alignment is correct, tighten the adjuster bush clamp bolt.

h. Repeat steps 25.e. to 25.g. for each wheel that needs adjustment.

i. When adjustment is complete, tighten the adjuster bush clamp bolts to 95 – 110 N.m.

j. Refit the wheels.

k. Jack the vehicle clear of the chassis stands, remove the stands and lower the wheels to the ground.

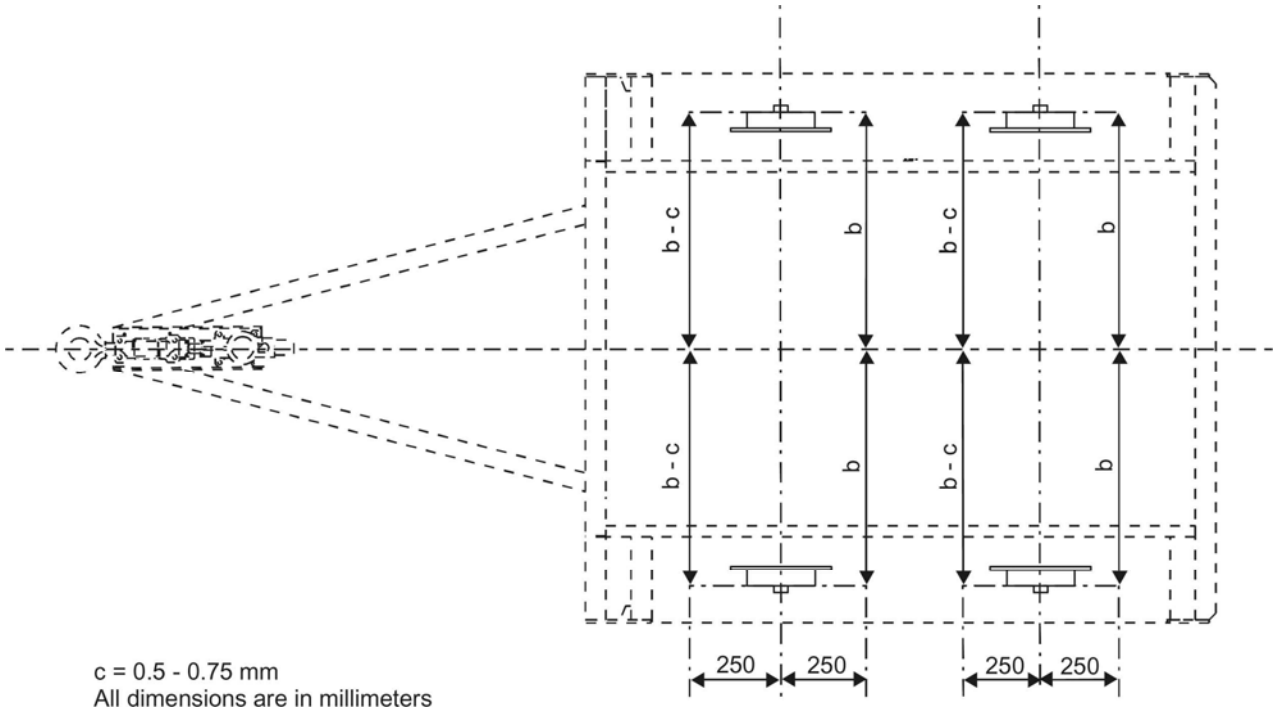

Figure 2 Wheel Alignment Dimensions

Table 1 Annotation to Figure 3

Item	Description	Item	Description
1	Clamp bolt nut	4	Clamp bolt
2	Suspension bush bolt	5	Tandem arm
3	Adjusting cam	6	Suspension bush

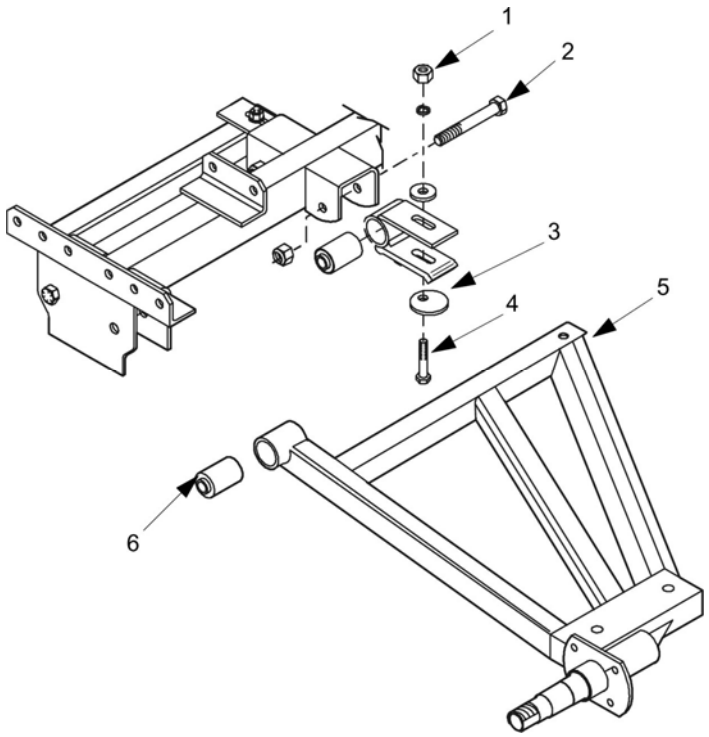

Figure 3 Wheel Alignment Adjustment Mechanism

Wheel Nut Tightening Procedure

26. Wheel nuts are to be tensioned using the following procedure and the sequence illustrated in Figure 4.

a. Fit all nuts finger tight initially.

b. Tighten to approximately 50 N.m.

c. Finally, tension them to 105 N.m.

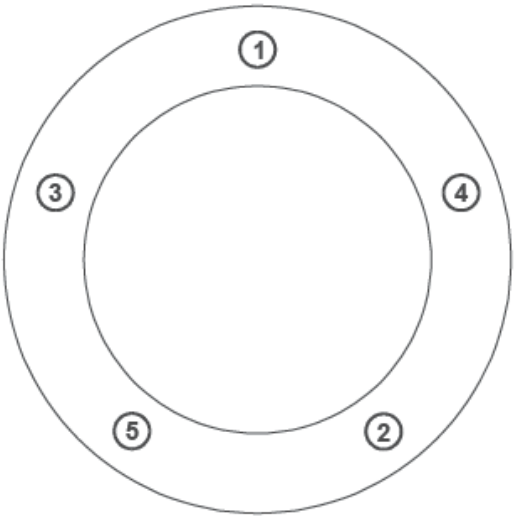

Figure 4 Wheel Nut Torque Sequence

BRAKES

Description

27. The foundation brakes are a 299 mm x 10.5 mm disc and hydraulic operated calliper assembly fitted to each wheel. Application is achieved by a mechanical override system acting on the master cylinder. The master cylinder is fitted with an electric solenoid that locks the master cylinder out unless the brake lights are activated to prevent unwanted application.

NOTE

Cover the ends of the open brake fluid lines to prevent ingress of dirt. Do not use adhesive tape to cover the brake fluid lines and couplings. Remove any plugs or covers prior to assembly.

Master Cylinder

28. The master cylinder is a Cebco model C500 that has an electrical lockout solenoid fitted to prevent unwanted application.

29. Removal. Remove the master cylinder as follows:

a. Clean the area around the master cylinder and tow ring using a suitable cleaning agent. Dry the area before removing the master cylinder from the drawbar.

b. Disconnect the wiring connector at the override lockout solenoid situated on the side of the master cylinder.

c. Disconnect the brake pipe from the master cylinder and cover the pipe to prevent entry of foreign matter.

d. Remove the four mounting bolts, washers and self-locking nuts used to secure the master cylinder to the coupling mount.

e. Slide the master cylinder to the rear until it is clear of the tow coupling dust boot and protection bracket. The dust boot may stay fixed to the master cylinder. Separate the master cylinder from the tow coupling assembly.

30. Disassembly. Using Figure 5 and Figure 6 as a reference, disassemble the master cylinder as follows:

a. Remove the weather cap, reservoir cap (Figure 5, Item 5) and moisture seal (Figure 5, Item 6). Discard any residual brake fluid.

b. Remove the brake outlet pipe adaptor and washer from the body. Discard the washer.

c. Remove the lockout solenoid from the master cylinder housing.

d. Remove the rubber boot at the actuating shaft end (if fitted).

e. Remove the bleed nipple (Figure 5, Item 3) and housing (Figure 5, Item 2) from the body.

f. Remove the compensating valve nut (Figure 5, Item 4) with compensating valve (Figure 5, Item 9) from the base of the reservoir.

g. Remove the equalising valve (Figure 5, Item 7) from the base of the reservoir.

h. Remove the two bolts with spring washers securing the end-cap (Figure 5, Item 1) to the housing. Then remove the end-cap and the piston return spring (Figure 5, Item 12).

i. Remove and discard the end-cap inner and outer O-rings.

j. Slide the piston (Figure 5, Item 8) out of the body.

k. Remove the circlip located centrally in the piston bore, Remove the O-ring and backup ring and discard the old O-ring.

l. Remove the buffer and washer situated in the end of the piston cavity.

m. Remove and discard the O-ring at the actuating shaft body.

Table 2 Annotation to Figure 5

Item	Description	Item	Description
1	End-cap	7	Equalising valve
2	Bleed nipple housing	8	Piston
3	Bleed nipple	9	Compensating valve
4	Compensating valve nut	10	Body
5	Reservoir cap	11	Breather/Filter
6	Moisture seal	12	Return spring

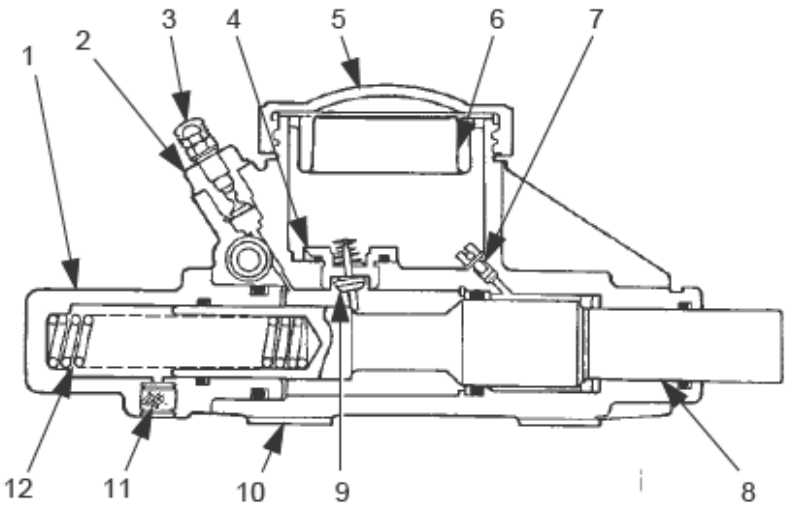

Figure 5 Brake Master Cylinder – Sectional View

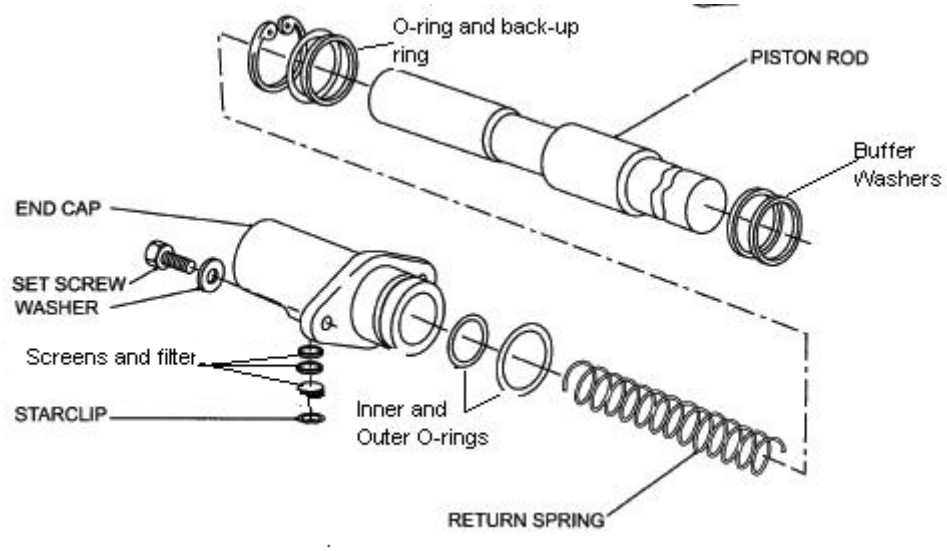

Figure 6 Master Cylinder Exploded View

31. Cleaning and Inspection. The master cylinder and components are cleaned and inspected as follows:

a. Wash the parts in methylated spirits and blow them dry with compressed air. Pay particular attention to the internal passages of the cylinder body.

b. Inspect all components for nicks, burrs, corrosion, excessive wear or damage. Replace components as necessary.

c. Inspect the rubber boot between the cylinder and the tow coupling. Replace if required.

32. Reassembly. Reassemble the master cylinder as follows (Figure 5 and Figure 6):

NOTE

It is important that all components of the overhaul kit are used during reassembly.

a. Lubricate all internal components with clean brake fluid, including the cylinder bore.

b. Install the new O-ring in the piston bore at the actuating shaft end.

c. Install the buffer and washer, the back-up ring, the new O-ring and the circlip into the piston body.

d. Slide the piston (Figure 5, Item 8), with the open end facing backwards, into the body from the rear.

e. Install the inner and outer O-rings on the end-cap (Figure 5, Item 1).

f. Fit the piston return spring (Figure 5, Item 12) and end-cap. Secure the end-cap to the housing with the two bolts fitted with spring washers. Torque the bolts to 34 N.m.

g. Install the equalising valve (Figure 5, Item 7) in the base of the reservoir. Torque the valve nut to 3 N.m.

h. Install the compensating valve (Figure 5, Item 9) and compensating valve nut (Figure 5, Item 4) into the base of the reservoir. Torque the valve nut to 82 – 95 N.m.

i. Install the bleed nipple and housing into the body. Torque the bleed nipple housing to 14 – 20 N.m and the bleed nipple to 9 – 14 N.m.

j. Prime the master cylinder with clean brake fluid, and then push on the end of the piston to check for smooth operation.

k. Install the override solenoid into the cylinder housing. Install the outlet pipe adaptor, fitted with a new copper washer, and tighten it securely.

l. Top up the cylinder reservoir and install the moisture seal (Figure 5, Item 6), reservoir cap (Figure 5, Item 5) and weather cap. Seal the cylinder outlet port with a plastic plug.

m. Install the rubber boot on the operating shaft end.

33. Installation. Fit the master cylinder to the trailer as follows:

a. Slide the master cylinder into its mounting position.

b. Fit the mounting bolts, using new lock washers and self-locking nuts. Do not tighten the nuts until the procedure at Paragraph 33.e has been completed.

c. Connect the brake pipe to the master cylinder, ensuring the connectors are not cross-threaded. Move the master cylinder slightly to enable the connector to be fitted. Torque the brake pipe nut to 12 N.m.

d. Set the master cylinder piston and towing eye shaft gap to a maximum of 1 mm.

e. Torque the nuts securing the master cylinder to 105 N.m.

f. Connect the wiring connector at the lockout solenoid.

g. Remove the reservoir cap and fill the master cylinder with clean brake fluid.

h. Bleed the brake system using one of the procedures described in Paragraph 61 and Paragraph 62 and check for leaks and solenoid adjustment (Paragraph 36).

i. Check that the gap between the master cylinder and the towing eye assembly shaft is a maximum of 1 mm. Adjust as necessary.

j. Install the dust boot over the tow coupling and master cylinder, securing each end with cable ties.

Master Cylinder Override Solenoid

34. Removal. Remove the override solenoid as follows:

a. Clean the area around the override solenoid and the brake outlet pipe adaptor using a recommended cleaning agent and blow it dry with compressed air.

b. Disconnect the wiring connector at the master cylinder lockout solenoid.

c. Remove the brake outlet pipe adaptor and washer from the body. Discard the washer.

d. Remove the solenoid from the master cylinder housing.

35. Installation. Install the solenoid as follows:

a. Install the solenoid into the cylinder housing.

b. Install the brake outlet pipe adaptor with a new copper washer and tighten it securely.

c. Connect the wiring connectors to the master cylinder lockout solenoid.

36. Adjustment – General. The master cylinder is adjusted in two ways as follows:

NOTE

The adjustment after the installation of an overhaul kit differs because a seal between the new plunger ball and brass adapter needs to be established. If the procedure is not carried out as specified, the master cylinder solenoid will always allow fluid to pass freely.

a. standard adjustment, after repair; or

b. initial adjustment, completed the first time the solenoid is adjusted after the master cylinder has been overhauled.

37. Adjustment – Procedure. Proceed as follows:

a. Disconnect the brake outlet pipe at the master cylinder.

b. Adjust the screw as follows:

CAUTION

There are two types of adjustment. Ensure the correct adjustment procedure is completed for the type of maintenance that is being conducted.

CAUTION

Once the valve has bottomed, exercise care when tightening further. Do not damage the screw.

(1) When completing a standard adjustment, loosen the solenoid lock nut and screw the adjusting screw in until the valve bottoms (Figure 7).

(2) When completing an adjustment after installation of an overhaul kit, loosen the solenoid lock nut and screw the adjusting screw in until it will not turn any further (Figure 7).

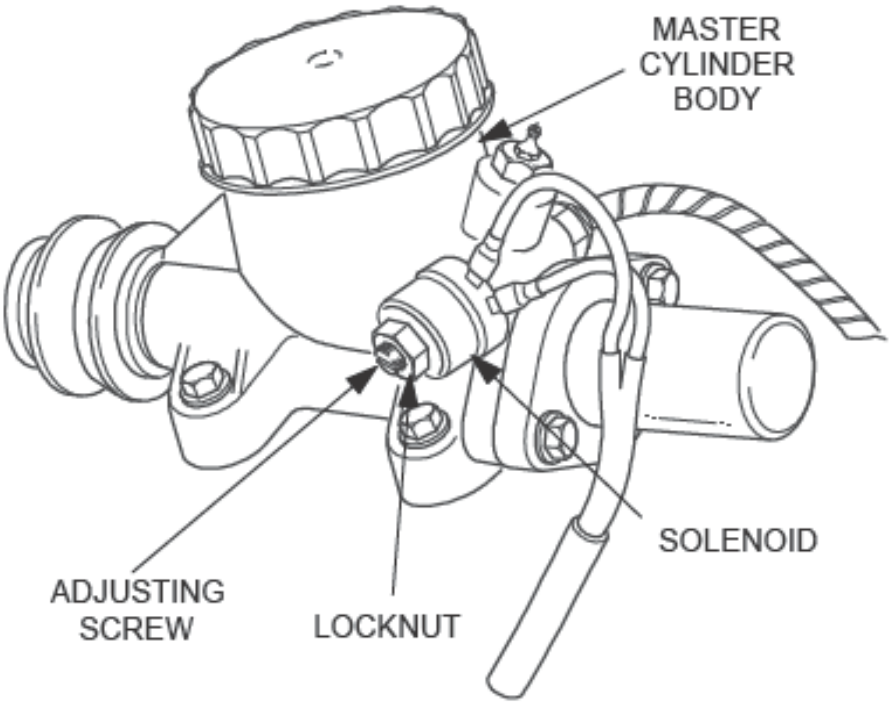

Figure 7 Master Cylinder Solenoid – Adjustment

c. Back off the adjusting screw three-quarters of a turn.

d. Tighten the lock nut without altering the adjusting screw setting.

e. Bleed the master cylinder using one of the procedures detailed in Paragraph 61 and Paragraph 62.

f. Energise the solenoid with a 12-volt dc source.

g. Operate the coupling by hand.

NOTE

Brake fluid should flow freely from the outlet port.

h. De-energise the solenoid.

i. Operate the coupling by hand.

NOTE

No brake fluid should flow from the outlet port.

NOTE

If brake fluid does not flow freely with the solenoid energised, the adjusting screw can be backed off to a maximum of one and three-quarters of a turn. If the brake fluid still does not flow freely, after the maximum adjustment has been reached, replace the solenoid.

NOTE

In the event of the solenoid valve not sealing, with the solenoid de-energised, the adjusting screw may be screwed in to a minimum of one-half of a turn out from its bottomed position. If the solenoid valve does not seal, after the minimum distance has been reached, replace the solenoid.

j. Connect the brake outlet pipe.

k. Energise the solenoid.

l. Operate the coupling and at the same time torque the outlet pipe union nut to 12 N.m.

m. De-energise the solenoid.

n. Bleed the brake system using one of the procedures detailed in Paragraph 61 and Paragraph 62.

Brake Pad

38. Removal. Remove the brake pads as follows:

WARNING

Ensure that the park brakes are applied and the opposite wheel is chocked to prevent trailer movement prior to the removal of a brake calliper.

a. Jack up the trailer until the wheels are clear of the ground. Place safety stands beneath the axle.

b. Remove the five wheel nuts securing the wheel to the hub and remove the wheel.

c. Disconnect the brake fluid supply pipe at the calliper.

d. Remove the calliper housing upper mounting bolt.

e. Rotate the calliper housing about the lower calliper mounting bolt.

f. Remove the inner and outer brake pads from the calliper.

g. Position a ‘G’ clamp so that one end rests against the rear of the calliper housing and the other end against a piece of wood placed across the face of the calliper piston.

h. Tighten the clamp until the calliper piston bottoms in the calliper housing.

i. Repeat Paragraph 38.a to 38.h for the opposite wheel.

39. Cleaning and Inspection. Clean and inspect the brake pad as follows:

NOTE

Brake pads must only be replaced as an axle set, not on one side only.

a. Inspect the inner and outer brake pads. Replace the pads if the lining is less than 4 mm thick.

b. Clean the brake pad guide surfaces on the calliper housing.

c. Inspect the calliper guide pins for freedom of movement in the anchor bracket. Replace the guide pins if corroded or the boots show any weathering or cracking. Place a thin film of lubricant on the pins.

d. Inspect the calliper assembly for fluid leaks and damage. Overhaul the calliper if required (Paragraphs 42 to 44).

40. Installation. Install the brake pads as follows:

a. Install new brake pads in the calliper and lubricate the sliding points on the anchor bracket with about 0.1 g of approved high melting point grease.

b. Rotate the calliper housing into its mounting position. If springs are sticking through the calliper housing inspection hole, lift the calliper housing and make the necessary corrections to ensure the springs are fully retained in the housing.

c. Install the calliper upper mounting bolt and torque it to 77 N.m.

d. Connect the brake fluid supply line to the calliper and tighten the union.

e. Bleed the braking system using one of the procedures detailed in Paragraph 61 and Paragraph 62.

f. Energise the master cylinder lockout solenoid and pump the towing eye several times. Check for fluid leaks and rectify as required.

g. De-energise the master cylinder lockout solenoid and check the fluid level in the master cylinder reservoir. Fill to the specified level with new brake fluid.

h. Install the wheels and secure them with the wheel nuts as detailed in Paragraph 26 and Figure 4.

i. Jack up the trailer, remove the safety stands and lower the trailer to the ground.

Brake Calliper

41. Removal. Remove the brake callipers as follows:

WARNING

Ensure that the parking brake is applied and the opposite wheel is chocked to prevent trailer movement prior to the removal of a brake calliper.

a. Jack up the trailer on the side of the calliper that is to be replaced until the wheel is clear of the ground. Place a safety stand beneath the axle.

b. Remove the nuts securing the wheel to the hub and remove the wheel.

c. Disconnect the brake fluid supply pipe from the calliper and cover open pipe connections.

d. Remove the upper and lower brake calliper mounting bolts.

e. Remove the calliper assembly from the brake disc and mounting bracket.

42. Disassembly. Disassemble the brake calliper as follows:

a. Disassemble the housing assembly, guide pins and boots. Discard the boots. Plug the guide pin mounting holes in the anchor bracket to prevent the ingress of moisture.

b. Remove the brake pads (Paragraph 38).

WARNING

Keep fingers clear when expelling the piston from the calliper.

NOTE

Apply light air pressure initially, progressively increasing the pressure until the piston is forced out of the bore.

c. Place soft, clean packing between the piston and the calliper housing finger. Apply air pressure at the housing inlet port to remove the piston.

d. Remove the wiper seal with a small pointed tool. Take care not to damage the calliper bore or seal groove. Remove the dust boot from the piston. Discard the boot and wiper seal.

e. Remove the bleed screw and dust cover.

43. Cleaning and Inspection. Clean and inspect the brake calliper as follows:

WARNING

Care must be taken to keep alcohol and debris away from the eyes. Eye protection is to be worn.

CAUTION

Keep components away from any type of mineral oil as it will damage the rubber components.

NOTE

Methylated spirits should be used for cleaning. Compressed air should also be used to dry all components and blow out all passages in the calliper housing and bleed screw.

a. Thoroughly clean the calliper components in methylated spirits and dry them with compressed air or a lint-free cloth. Ensure all deposits on the brake pad guide surfaces on the anchor brackets and the calliper housing are removed.

NOTE

Brake pads must only be replaced as a complete axle set.

b. Inspect the inner and outer brake pads. Discard the pads if the brake lining is thinner than 4 mm.

c. Inspect the anchor bracket. Replace it if it is corroded, worn or damaged.

d. Inspect the piston. Replace it if scoring, nicks, corrosion, wear or damage is evident.

e. Inspect the calliper housing. Replace it if scoring, corrosion, wear or damage is evident.

44. Reassembly. Assemble the brake calliper as follows:

a. Lubricate the new piston seal and housing bore with approved brake grease.

b. Lubricate the piston with brake fluid.

c. Install the piston seal in the housing bore seal groove, ensuring it is not twisted.

d. Install the piston boot over the open end of the piston and feed it along the piston towards the closed end. Fully extend the boot away from the closed end of the piston with the boot still mounted on the ground surface of the piston. Introduce the boot on to the housing bore boot groove.

e. Slowly enter the piston into the bore, applying a steady pressure by hand until the piston is fully seated in the bore. This action ensures the boot and seal are correctly positioned, reducing the risk of piston/housing bore scoring.

f. Assemble the bleeder screw and dust cover and install them in the housing.

g. Inspect the piston and boot. Check that the boot is correctly engaged in the piston groove.

h. Lubricate the guide pins with silicone grease and fit new guide pin dust boots if required.

i. Install the brake pads (Paragraph 40).

45. Installation. Fit the brake calliper as follows:

a. Position the calliper assembly in its operating position on the brake disc and the backing plate or axle.

b. Install the upper and lower brake calliper mounting bolts. Torque the bolts to 77 N.m.

c. Connect the brake pipe to the calliper and bleed the brake system using one of the procedures detailed in Paragraph 61 and Paragraph 62.

d. Install the wheel to the hub. Torque the nuts to 105 N.m as detailed in Paragraph 26 and illustrated in Figure 4.

e. Jack up the trailer, remove the safety stand(s) and lower the trailer to the ground.

f. Check the level of the master cylinder reservoir. Top up with clean brake fluid as required and check for leaks.

Brake Disc

46. Removal and Installation. The brake disc is a component of the hub assembly. The removal and installation procedures are described in Paragraphs 18 to 20 and Paragraphs 21 to 23 respectively.

47. Inspection (on Vehicle). Inspect the brake disc as follows:

NOTE

Remove the wheel to inspect the brake disc.

a. Jack up the trailer until the wheel is clear of the ground. Place a safety stand beneath the axle.

b. Remove the wheel nuts, securing the wheel to the hub, and remove the wheel.

c. Check the disc for scoring. Minor scores need not be removed.

d. If the rotor is excessively scored, it is to be machined to the specifications listed in Table 6.

NOTE

Prior to checking brake disc run out, ensure that the wheel bearings are adjusted.

e. Clamp a dial indicator to the calliper housing so that the stylus contacts the brake disc at a point approximately 25 mm from the outer edge.

f. Rotate the disc and take an indicator reading. If the reading exceeds a total lateral run out of 0.08 mm, replace or machine the brake disc.

g. Measure the brake disc thickness at 12 points about 30 degrees apart and 25 mm in from the edge using a micrometer. If the specified limit for thickness is exceeded, machine or replace the brake disc.

Brake Hoses

48. Replacement. The following points are to be observed:

a. A flexible brake hose should be replaced if it shows signs of softening, cracking, leaks, abrasion or bubbling.

b. When installing a brake hose, it must not be twisted or under tension and must be positioned to avoid contact with suspension parts.

c. If a hose or pipe is replaced, bleed the brakes using one of the procedures described in Paragraph 61 and Paragraph 62.

d. Install the wheel to the hub as detailed in Paragraph 26 and Figure 4.

e. Jack up the trailer, remove the safety stand(s) and lower the trailer to the ground.

Brake Pipes

49. Replacement. If a section of brake tubing becomes damaged, the entire section is to be replaced with tubing of the same type, size, shape and length, observing the following:

CAUTION

Only use double wall steel tubing conforming to specification AS 1751 in this brake system.

a. Brake lines should be manufactured using the old line as a template. When bending the brake tubing, use approved bending tools and avoid kinks and cracks in the lines.

b. The brake tubing is to have the ends formed to be identical to the existing ends (using an approved pipe flaring tool) to provide leak proof connections. The tube nuts are to be tensioned to 12 N.m.

c. New brake lines are to be flushed with clean brake fluid prior to installation.

d. If a hose or pipe is replaced, bleed the brakes using one of the procedures described in Paragraph 61 and Paragraph 62.

Park Brake Assembly

50. Description. The parking brakes consist of an adjustable, internal, expanding, single shoe and drum type brake assembly fitted to the rear axle only. The brakes are activated by an over-centre type lever situated on the left-hand side of the front cross-member behind the toolbox.

51. Operate the park brake as follows:

a. Push forward and down on the lever to apply the trailer park brakes. To release the park brakes, pull the lever up.

b. A fine adjustment to the park brake is carried out by turning the knurled knob on the end of the park brake lever. Turning the knob clockwise increases tension to the cables applying the brakes with more pressure. If the lever is hard to apply, back the knurled knob off until firm over-centering can be achieved.

52. Removal. Remove the park brake as follows:

a. Jack up the trailer until the wheel is clear of the ground. Place a safety stand under the axle and lower the jack to rest the axle securely on the stand.

b. Remove the wheel nuts and the wheel.

c. Release the park brake and screw the knurled adjusting knob on the lever, out to its maximum.

d. Remove the calliper assembly as described in Paragraph 41.

e. Remove the hub assembly as described in Paragraph 18 and shown in Figure 1.

NOTE

The left and right park brake assemblies and park brake cables are different. Avoid mixing components.

f. Move the brake shoe draw link to the applied position and remove the cable end from the lever.

g. Remove the backing plate to axle flange mounting bolts and the backing plate.

53. Disassembly. Disassemble the park brake as follows (Figure 9):

NOTE

If only replacing the brake shoe, ensure that the actuating mechanism does not fall apart. Use a tie or wire to hold together securely.

a. Remove the shoe hold-down plate.

NOTE

Ensure hands are clean and free from grease.

b. Carefully lift the shoe ends out of the tappet slots and remove the shoe.

c. Remove the dust boot retaining plate screws and plate.

d. Remove the draw link and dust boot. The dust boot may require some levering to free it from its retaining lip.

e. Remove the tappets and pushrod, then remove the adjusting nut and pawl from the backing plate.

54. Cleaning and Inspection. Clean and inspect the park brake assembly as follows:

WARNING

High flashpoint, oil-free solvents may be harmful if vapours are inhaled for prolonged periods. OEM warnings and instructions are to be strictly adhered to.

a. Clean the backing plate with an approved high flash point, oil-free solvent. Ensure all traces of grease and dirt are removed from the brake actuator cavity in the backing plate.

b. Inspect the draw link, adjusting nut, screw and pawl, tappet and push rod for wear or damage. Inspect the dust boot for holes, cracking and deterioration. Replace any worn or defective parts.

55. Assembly and Installation. Referring to Figures 8 to 11, assemble the park brake as follows:

a. Slide the draw link into the dust boot until the dust boot lip is located in the correct notches, as shown in Figure 8.

b. Position the draw link (Figure 9, Item 1) and dust boot (Figure 9, Item 3) on the backing plate (Figure 9, Item 4) with the draw link facing rearwards. Stretch the dust boot over the retaining lip on the back of the backing plate then fit the retaining plate and secure it with the two mounting screws fitted with spring washers.

c. Ensure the internal surfaces of the actuator cavity are covered with high melting point grease.

NOTE

Adjuster pawls are left and righthand. Ensure correct fitting.

d. Install the adjuster pawl (Figure 9, Item 7).

e. Screw the tappet (Figure 9, Item 6) into the adjusting nut (Figure 9, Item 5) until fully home.

f. Press down on the adjuster pawl with the aid of a small pointed tool and insert the adjusting nut with tappet into the backing plate. Align the shoe slot so that it is parallel with the backing plate face.

g. Install the push rod (Figure 9, Item 12) into the tappet (Figure 9, Item 13).

h. Install the push rod and tappet into the backing plate ensuring the rod end is aligned in the lever socket. Align the shoe slot so that it is parallel with the backing plate face.

i. Clean any excess grease from the backing plate.

NOTE

Ensure hands are clean and free from grease.

j. Fit the park brake shoe (Figure 9, Item 9) in the operating position.

k. Apply thread sealant to the hold-down plate mounting screw and install the plate (Figure 9, Item 8). Torque the screw to between 2 and 5 N.m.

l. Back off the adjuster nut one-quarter of a turn.

m. Inspect the shoe assembly position. The shoe must be located centrally on the backing plate and the ends in the slots in the actuating mechanism. Operate the park brake lever by hand to ensure the mechanism works.

n. Release the park brake lever and screw the lever adjusting knob out to its maximum.

o. Adjust the shoe diameter (Paragraph 56).

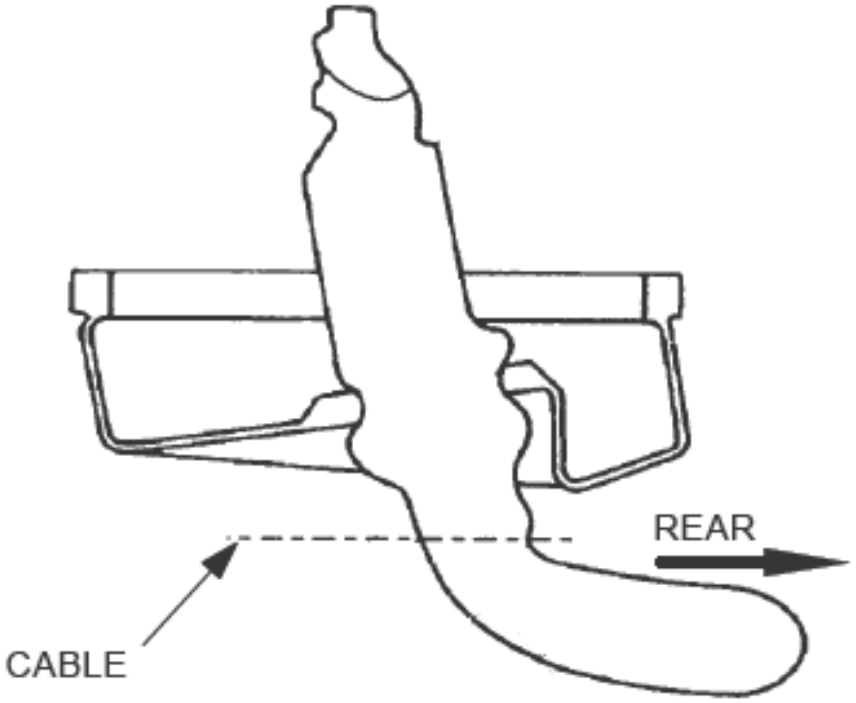

Figure 8 Draw Link and Dust Boot – Installation

p. Install the backing plate on the axle flange and secure it with the four bolts (Figure 9, Item 14), spring washers (Figure 9, Item 11) and nuts (Figure 9, Item 10). Torque the bolts to 45 N.m.

q. Fit the 'H' plate to the cable end, move the brake shoe draw link to the fully applied position and slip the cable connecting piece onto the lever (Figure 10).

r. Install the wheel hub (Paragraph 23).

s. Install the brake calliper (Paragraph 45) and bleed the brakes using one of the procedures described in Paragraph 61 and Paragraph 62.

t. Install the wheel and secure it with the five wheel nuts. Torque the nuts to 105 N.m as described in Paragraph 26 and Figure 4.

u. Jack up the trailer, remove the safety stand and lower the trailer.

v. Adjust the park brake cables via the adjusting knob at the end of the park brake lever. The park brake should apply with a firm over-centre action at the lever when it is pushed down. To increase brake pressure, turn the knob clockwise and to decrease brake pressure, turn the knob anticlockwise.

Table 3 Annotation to Figure 9

Item	Description	Item	Description
1	Draw link	8	Hold-down plate
2	Retaining plate	9	Brake shoe
3	Dust boot	10	Nut
4	Backing plate	11	Shake-proof washer
5	Adjusting nut	12	Push rod
6	Tappet	13	Tappet
7	Adjuster pawl	14	Mounting bolt

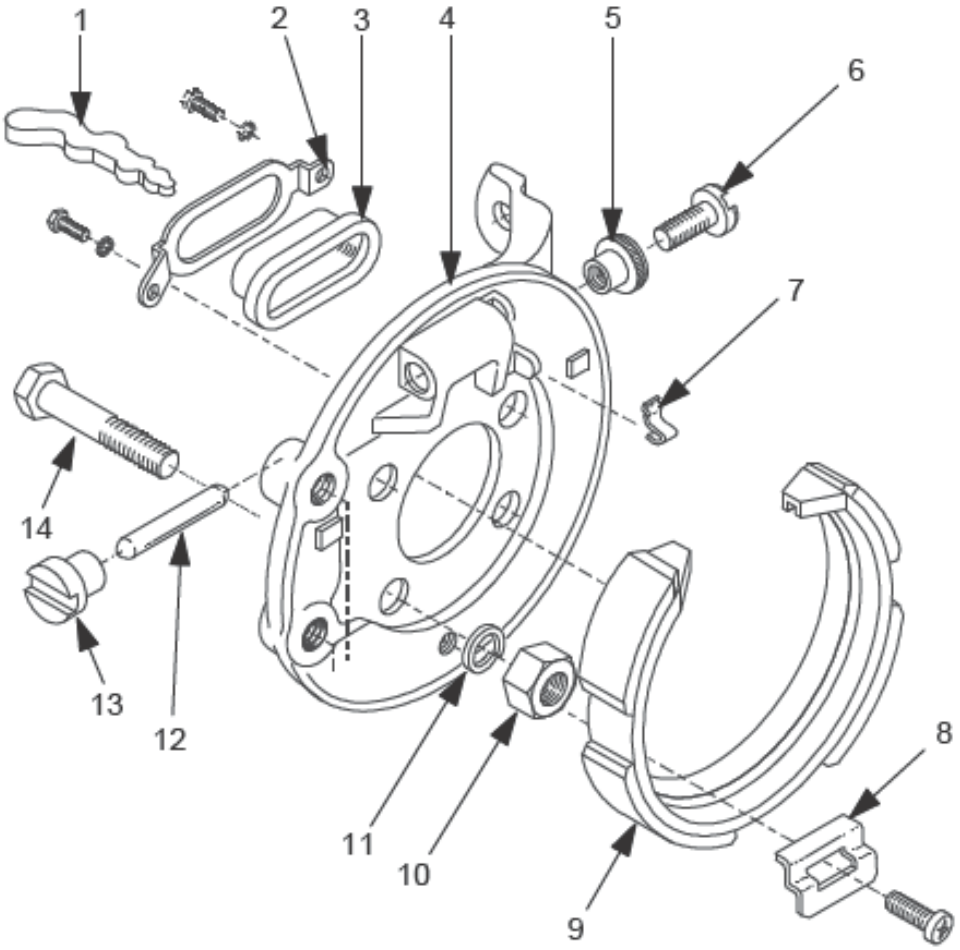

Figure 9 Park Brake Assembly – Exploded View

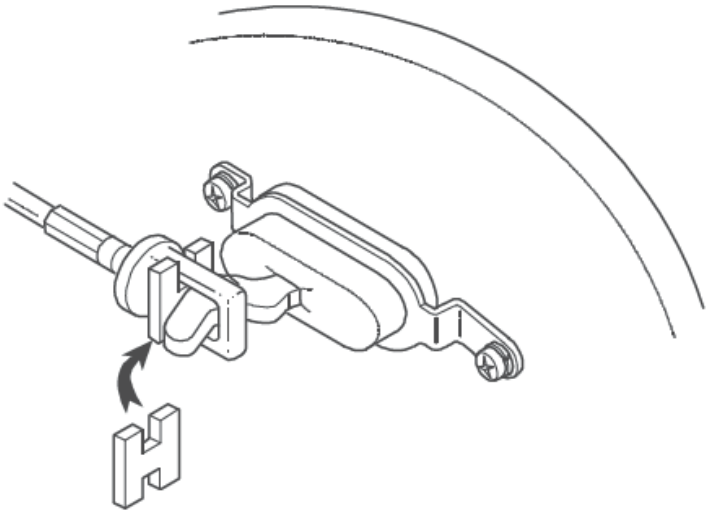

Figure 10 Fitting of Brake Cable and 'H' Plate

56. Shoe Diameter Adjustment. Parking brake shoe adjustment is carried out as follows:

a. Measure the shoe diameter at the centre of the lining material, using a vernier calliper.

b. Adjust the shoe diameter to 189.7 ± 0.1 mm (Figure 11).

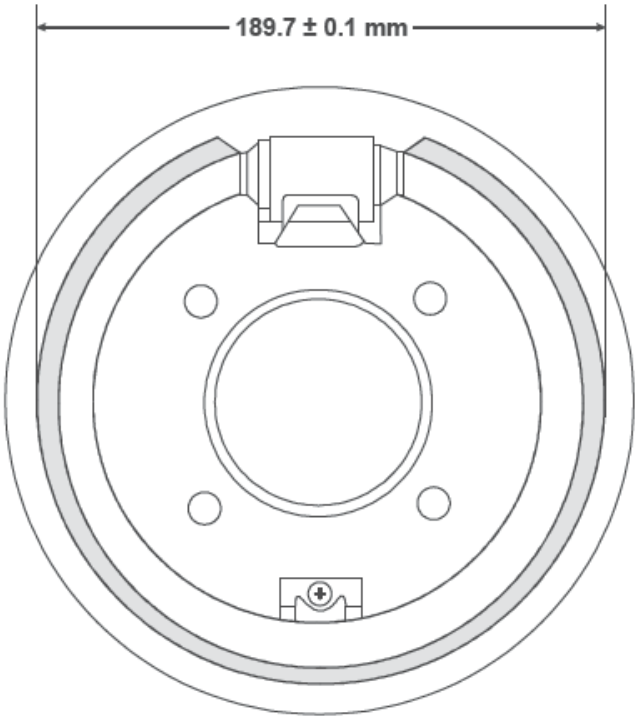

Figure 11 Park Brake Shoe Diameter – Adjustment

Park Brake Lever and Cable Assembly

57. Removal. To remove the park brake lever and cable assembly carry out the following:

a. Release the park brake lever and screw the lever adjusting knob out to its maximum.

b. Tag the cables left and right for identification purposes when re-installing.

c. Move the brake shoe draw link to the fully applied position and slip the left and right cable connecting pieces off the lever.

d. Remove the 'H' plates from the brake cables.

e. Remove the mounting bolts, nuts and washers securing the park brake lever assembly to the frame.

f. Remove the park brake lever assembly towards the front and pull the two cables through the support brackets in the cross-member and the support clips provided on the frame.

58. Disassembly. Disassemble the park brake lever as follows:

a. Remove the self-locking nut, flat washer and bolt securing the cable outer locating blocks to the park brake carrier assembly, then slide the blocks out of the carrier.

b. Remove the split pin, washer and sliding straight-headed pin locating the lever in the park brake carrier assembly.

c. Rotate the carrier assembly until the lever cable connection is accessible, then remove the split pin, flat washer and straight-headed pin securing the cable to the lever yoke. Remove the cable then repeat the procedure for the other cable.

59. Reassembly. Reassemble the park brake lever as follows:

a. Rotate the carrier assembly until the lever cable connection is accessible. Align the inner cable mounting hole (round end hole) with the offset mounting holes in the lever yoke. The offset yoke holes must be positioned to the rear of the assembly. Secure the cable to the lever with the straight-headed pin, flat washer and split pin. Repeat the procedure for the other cable.

b. Slide the cable outer locating blocks over the cables and into position in the park brake carrier assembly.

c. Secure the cable outer locating blocks with the bolt, flat washer and self-locking nut ensuring the cable outer ends are located flush with the inside edges of the blocks.

60. Installation. Install the park brake lever and cable assembly as follows:

a. Tag the cables left and right for identification purposes during installation.

b. Feed the left- and right-hand cables through the support clips provided on the frame and the retaining bracket in the cross-member.

c. Position the park brake lever assembly in its mounting position.

d. Move the brake shoe draw link to the fully applied position and slip both cable connecting pieces into position on their respective draw link at each backing plate. Ensure the 'H' plates are fitted into the cable ends (Figure 10).

e. Secure the park brake lever assembly to the frame with the six mounting bolts, nuts and washers.

f. Adjust the park brake cables via the adjusting knob at the end of the park brake lever. The park brake should apply a firm over-centre action at the lever when it is pushed down. To increase brake tension, turn the knob clockwise and to decrease tension, turn the knob anticlockwise.

Brake Bleeding

61. Pressure Method. Bleed the brakes with a pressure bleeder as follows:

WARNING

Ensure that the pressure bleeder is secured to the reservoir before applying pressure. Install the adaptor as per the manufacturer's instruction.

NOTE

The pressure bleeder must contain enough new brake fluid to complete the bleeding operation. Lower the front end of the trailer slightly to reduce the possibility of air being trapped in the cylinder during bleeding.

a. Operate and charge the pressure bleeder in accordance with the manufacturer's instructions.

b. Disconnect the override solenoid at the master cylinder.

c. Energise the override solenoid by connecting a 12- or 24-volt dc power source to the solenoid spade terminals.

d. Attach a length of clear plastic tube to the master cylinder bleed screw and have on hand a glass jar containing a quantity of clean, fresh brake fluid.

e. Slide a ring spanner over the hose and onto the bleed screw at the master cylinder.

f. Open the valve on the bleeder tank to admit pressurised brake fluid into the master cylinder reservoir.

g. Submerge the free end of the hose in the brake fluid in the glass jar and loosen the master cylinder bleed screw.

h. When air bubbles cease to appear in the glass jar containing brake fluid, close the bleed screw, remove the spanner and hose. Torque the bleed screw to 9 – 14 N.m.

i. Bleed each brake calliper in turn using the same method as described for the master cylinder.

j. When the bleeding operation is completed, close the bleeder tank valve and remove the bleeder hose, adaptor and the bleeder cap.

k. Check the brake fluid level in the reservoir. Top up if required.

l. Remove the power source and reconnect the solenoid to the trailer wiring loom.

m. Attach the trailer to a tow vehicle and test the brakes.

62. Manual Method. Carry out the following procedure:

NOTE

Ensure that the brake fluid level in the master cylinder is continuously monitored during the brake bleeding procedure. Do not allow the fluid level to fall below 1/4 full. To reduce the possibility of air being trapped in the cylinder during bleeding, lower the front end of the trailer slightly.

a. Disconnect the override solenoid electrical lead at the solenoid on the master cylinder.

b. Energise the override solenoid by connecting a 12- or 24-volt dc power source to the solenoid spade terminals.

c. Attach a length of clear plastic tube to the master cylinder bleed screw and have on hand a glass jar containing a quantity of clean brake fluid.

d. Slide a ring spanner over the hose and onto the bleed screw at the master cylinder.

e. Submerge the free end of the hose in the brake fluid filled jar and loosen the master cylinder bleed screw.

f. Join a link in each of the safety chains together, using a suitable bolt and nut, to provide a fulcrum point for a lever.

g. Pump the master cylinder through the tow coupling as shown in Figure 12. Continue pumping until a solid column of brake fluid appears in the plastic tube.

h. Torque the bleed screw to 9 – 14 N.m.

i. Repeat the above steps for each of the brake callipers.

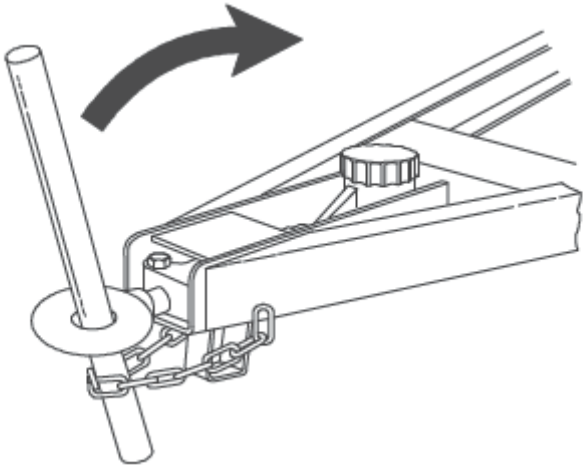

Figure 12 Tow Coupling Compression Method

j. When the bleeding operation is completed, check the brake fluid level in the reservoir. Top up if necessary.

k. Remove the power source and reconnect the solenoid to the trailer wiring loom.

l. Attach the trailer to a tow vehicle and test the brakes.

Fault Finding

63. Table 4 details the fault finding procedures applicable to the brake system.

Table 4 Fault Finding

Serial	Symptom	Probable Cause	Action
1	Brakes do not apply on override	Low fluid level	Top up fluid level
		Air in system	Bleed brakes
		Defective compensating valve	Replace compensating valve
		Broken/leaking brake line or hose to callipers	Replace brake line/hose
		Brake fluid by-passing piston O-rings in master cylinder	Overhaul/replace master cylinder
		Solenoid valve out of adjustment	Adjust solenoid
		Tow coupling shaft seized in body	Strip tow coupling and lubricate
		Tow coupling shaft jamming, trailer overloaded	Load trailer in accordance with rated payload of 1 250 kg
		Tow coupling shaft jamming, trailer incorrectly loaded	Redistribute load evenly over axles
		Tow coupling to master cylinder gap excessive	Adjust gap 0 – 1 mm maximum
		No dc current to solenoid	With vehicle brakes applied, check power supply at the solenoid
		Solenoid unserviceable	Replace solenoid
2	Brakes do not release when reversing	Solenoid valve out of adjustment	Adjust solenoid
		Tow coupling shaft seized in body	Free up tow coupling and lubricate
		Tow coupling shaft jamming, trailer overloaded	Load trailer in accordance with rated payload of 1 250 kg
		Tow coupling shaft jamming, trailer incorrectly loaded	Redistribute load evenly over axles

Table 4 Fault Finding (Continued)

Serial	Symptom	Probable Cause	Action
3	Brake fluid leaking from master cylinder	Leak in brake lines, hoses or callipers	Replace/repair as required
		Damaged/leaking O-rings in master cylinder	Overhaul/replace master cylinder
4	Brake fluid leaking from master cylinder	Damaged/leaking O-rings in master cylinder	Overhaul/replace master cylinder
		Damaged/leaking O-rings in master cylinder end cap	Overhaul/replace master cylinder
		Crack in master cylinder body	Replace master cylinder unit
5	Brakes apply suddenly	Broken spring in master cylinder end-cap	Overhaul or replace master cylinder
6	Brakes shudder when applied	Overloaded trailer (jamming shaft)	Load trailer in accordance with rated payload of 1 250 kg
		Disc run out excessive	Machine disc or replace if necessary

SUSPENSION

Springs

64. Description. The springs are seven-leaf, semi-elliptic, sliding shackle type, fixed to the axle assembly by steel clamps and located by polyethylene spring seats to the axle assembly.

65. Removal. Remove the springs as follows:

a. Raise the wheels clear of the ground and support the weight of the trailer frame with all weight off the suspension components. Remove the wheel(s).

b. Place safety stands under the relevant stub axles to support the weight of the axle.

c. Support the suspension spring with a jack placed under the centre bolt.

d. Remove the spring clamp and anti-rattle plate from both ends of the spring then slowly lower the jack. A lever may be placed above the spring centre bolt to assist in freeing the spring seat assembly from the beam assembly if required.

66. Cleaning and Inspection. Clean the springs and check for cracked leaves, broken centre bolt, damaged or worn spring seat, spring hangers and bushes. Replace faulty items as required.

67. Installation. Install the springs as follows:

a. Position the spring centrally on the jack. Locate the jack centrally under the tandem arms with the spring seat in line with the locating housing in the beam assembly.

b. Raise the spring and locate the spring seat.

c. Fit the spring clamp and anti-rattle plates to both ends of the spring and tension the spring clamp bolts to 285 N.m.

d. Fit the wheels and raise the axles clear of the safety stands.

e. Remove the safety stands from the axles and lower the jack.

f. Raise the trailer frame and remove any supports.

g. Lower the trailer and torque the wheel nuts as detailed in Paragraph 26 and Figure 4.

Bump Stop

68. Description. The suspension bump stops are fitted to brackets that are welded to the underside of the chassis rails above the wheel stations.

69. Inspection. Bump stops are to be replaced if splitting, cracking or separation has occurred.

ELECTRICAL

Description

70. The electrical system is a 12- or 24-volt dc electrical system coupled to the towing vehicle by a 12-pin NATO socket and plug. All lighting connected to the electrical system is compatible with both 12- and 24-volt dc towing vehicles. The brake master cylinder has a solenoid fitted to lock out the trailer brakes unless the towing vehicle brake lights are activated. An electrical wiring diagram is shown in Figure 13.

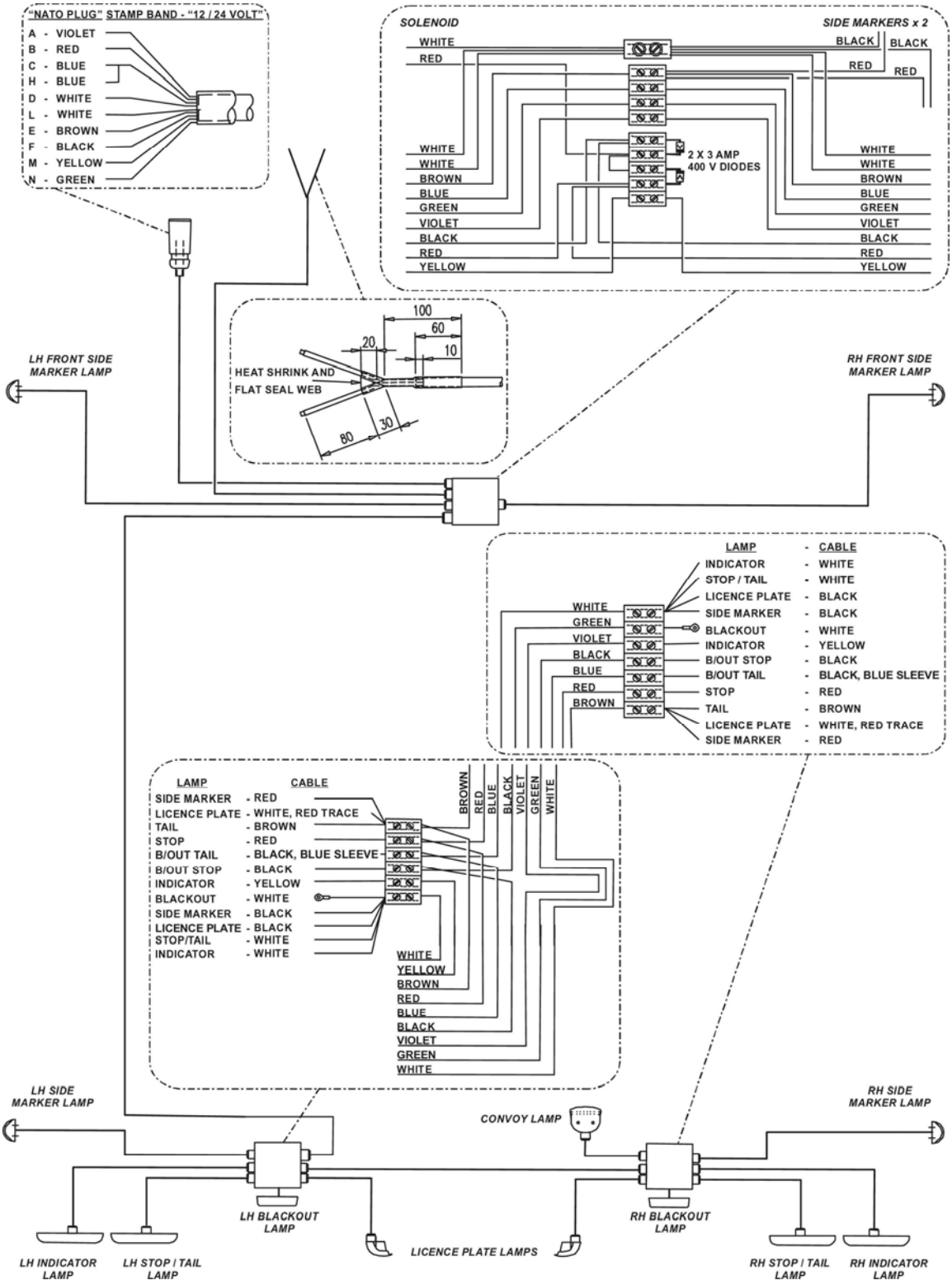

Figure 13 Electrical Wiring Diagram

71. The system includes two diodes fitted into the forward junction box on the trailer. These diodes are fitted to allow the brake override solenoid to be energised by either the normal stop light circuit or the blackout stop light circuit, whichever system is active. Each diode allows power to pass to the solenoid from its respective circuit, whilst preventing power passing from the other circuit. If normal brake lights illuminate when on blackout and the brakes are applied, check the polarity of the diodes in the front junction box as shown in Figure 13.

NOTE

This trailer has an insulated earth circuit.

NOTE

All wiring is to be installed in soft conduit.

72. Access to the fitting hardware of the stop/tail and indicator light assemblies is illustrated in Figure 14. Slide a small flat-tip screwdriver between the innermost corner of the black plastic cover and the lens to remove the cover.

73. The lamps fitted to the trailer are sealed, multi-voltage modules containing Light Emitting Diodes (LED). The stop, tail lamp assemblies and the indicator lamps consist of 36 LEDs each. Compliance with regulations fails if 10 or more LEDs do not illuminate in a module. The stop light compliance fails if two LEDs fail to illuminate in the top or bottom row with the brakes applied. The clearance, side and number plate lamps must have all LEDs operating.

74. The stop/tail lamp assembly has a blue wire that is not used on this trailer. The conductor is to be cut flush with the insulation. The blue wire is to be bent through 180 degrees, secured to the outer sheath and insulated using heat-shrink tubing.

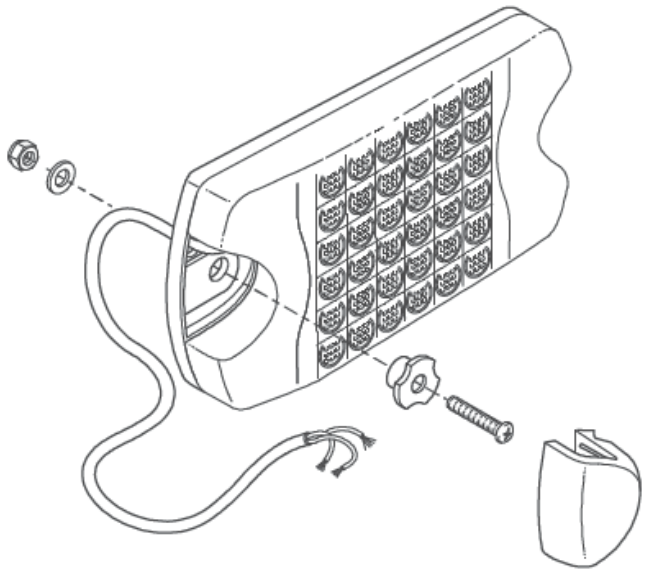

Figure 14 Stop, Tail and Indicator Fittings

FRAME ASSEMBLY

Description

75. The trailer is a prefabricated steel frame construction with two major components. These are:

a. the drawbar, trailer main frame; and

b. the trailer box.

76. The drawbar and main frame are of a prefabricated galvanised steel channel construction.

77. The trailer box is made of a 2.5 mm thick aluminium sheet floor and pressed galvanised steel removable side gate panels. Five cargo lashing points are located on either side of the tray floor. The trailer floor has four recessed mounting points to accommodate the anchoring of a 16 kVA generator for transportation.

78. The three canopy bows are attached by fitting the bows into cavities in the side gates. The canopy is fitted over the bows and lashed to the lashing hooks located at the bottom of the lashing rail mounting brackets. When not in use, the canopy bows are stored in two pockets located on the front cross-member.

Tow Coupling Assembly

79. Removal. Remove the tow coupling assembly as follows:

a. Apply the handbrake.

b. Support the trailer on the jockey wheel at the front and the stabiliser legs at the rear.

c. Remove the four self-locking nuts, bolts and eight washers securing the tow coupling to the trailer drawbar.

d. Slide the dust boot out of the retaining lip on the coupling housing.

e. Remove the coupling.

80. Disassembly. Disassemble the tow coupling unit as follows:

a. Drive out the pin locking the keeper nut to the coupling ring shaft using a suitable pin punch.

NOTE

Early production tow couplings had a return spring and a spacer washer fitted, which are to be removed.

b. Unscrew the keeper nut off the tow ring shaft.

c. Remove the shaft.

d. Remove and discard the spring (if fitted) and spacer washer (if fitted) from the body.

81. Inspection. The tow coupling is manufactured to strict specifications with maximum allowable wear limits. Towing eyes that are worn beyond the wear limits are to be removed and discarded. They are not to be recovered by welding. Inspect the tow coupling components as follows:

CAUTION

When replacing tow couplings, the tow ring shaft nut must be fitted with a new roll pin.

CAUTION

Do not weld the tow coupling body. The towing capacity of the coupling could be affected.

a. Inspect the towing eye shaft and the towing eye for wear or damage. Wear limits for the towing eye and the coupling body are given in Table 5.

b. Inspect the towing eye shaft for straightness and the thread for functionality (replace if required).

c. Inspect the keeper nut for damage (replace if required).

d. Inspect the tow coupling housing for wear/damage (replace if required).

Table 5 Tow Coupling Assembly Wear Limits

Serial	Item	Size New (mm)	Wear Limit (mm)
1	Towing eye shaft – ring end	40.00	39.50
2	Body bore – ring end	40.25	40.75
3	Towing eye shaft – machined end	31.50	31.00
4	Body bore – machined end	32.00 +/-0.25	32.75
5	Ring diameter - internal	76.2 +/-0.8	-
6	Ring thickness	41.3 +/-0.8	37.00

82. Reassembly. Reassemble the tow coupling as follows:

a. Slide the tow ring shaft through the body.

b. Install the keeper nut on the tow ring shaft.

c. Align the locking pin holes in the shaft and the nut.

d. Install the locking pin using a suitable pin punch.

83. Installation. Install the coupling assembly as follows:

a. Place the coupling in its mounted position on the drawbar.

b. Slide the dust boot into the retaining lip on the coupling housing.

c. Install the four bolts, each fitted with a washer at the bolt head, through the mounting holes in the tow coupling and the tow bar.

d. Install four washers and new self-locking nuts to secure the tow coupling to the drawbar.

CAUTION

If the clearance between the end of the towing eye shaft and the end of the override cylinder piston shaft (at rest) is exceeded, excessive peak pressures are generated in the brake hydraulic circuit when the trailer brakes are applied and damage to brake components can occur.

e. Check the clearance between the end of the towing eye shaft and the end of the override cylinder piston shaft.

NOTE

If the clearance exceeds 1 mm, the tow coupling is to be adjusted in accordance with EMEI Vehicle H 077-1.

f. Torque the tow coupling securing nuts to 105 N.m (Table 6).

Support Leg

84. The support legs are designed to stabilise the trailer when loading and unloading. Any bending of the leg will weaken it severely and render it unusable.

85. Removal. Remove the drop down support leg as follows:

a. Place a jack under the corner of the trailer frame adjacent to the defective leg. Raise the vehicle to a satisfactory height and place it on a safety stand.

b. Remove the support leg locking pin clip and pin. Lower and withdraw the leg.

86. Inspection. If a support leg is damaged, inspect the support leg mount and cross-member for cracked welds, twisting or bending. Any damage is to be rectified.

87. Installation. Install the support leg as follows:

a. slide the support leg up into its mounting;

b. insert the pin and lock clip; and

c. raise the vehicle, remove the stand and lower the vehicle to the ground.

Jockey Wheel

CAUTION

The jockey wheel is designed to maintain the drawbar height while coupling/decoupling from the vehicle. If the trailer is to be manoeuvred or stored (static), the jockey wheel should be retracted so no undue strain or excessive sideways force is placed on the assembly.

CAUTION

Users are reminded to use the trailer in accordance with the appropriate user handbook and/or instruction(s) located on the side of the trailer drawbar.

CAUTION

If the mounting bracket is found to be distorted and/or bent, it is not to be straightened; it is to be removed and replaced as a complete assembly.

88. The jockey wheel mounting bracket is bolted to the left-hand side of the drawbar.

89. Removal. Remove the jockey wheel as follows:

a. Ensure the park brakes are applied. Support the trailer on its support legs.

b. Fully retract the jockey wheel in the vertical position.

c. Remove the spare wheel from its support bracket. Remove the two jockey wheel mounting bolts from the drawbar.

90. Installation. Install the jockey wheel as follows:

a. Allow the jockey wheel to hang vertically and insert the two drawbar mounting bolts.

b. Tighten the mounting bolts to 40 N.m (Table 6) and test for the operations of extension and pivot.

c. Refit the spare wheel to its support bracket.

Table 6 Specifications

Serial	Assembly	Item	Specification
1	Master cylinder	Main bore diameter	46.23 mm
		Compensating valve nut torque	82 – 95 N.m
		Equalising valve torque	3 N.m
		End-cap securing bolt torque	34 N.m
		Mounting nut torque	105 N.m
		Bleed screw housing torque	14 – 20 N.m
		Bleed screw nipple torque	9 – 14 N.m
		Master cylinder piston shaft clearance to lunette shaft	0 – 1 mm
2	Override solenoid	Voltage	12 – 24 V dc

Table 6 Specifications (Continued)

3	Brake disc	Diameter	299 mm
		Nominal thickness	10.5 mm
		Maximum thickness variation	±0.3 mm
		Minimum thickness	8.5 mm
		Maximum run-out	0.08 mm
		Mounting bolt torque	77 N.m
		Wear limit	2.0 mm
4	Disc pad	Minimum lining thickness	4.0 mm
5	Calliper	Mounting bolt torque	77 N.m
		Bleed screw torque	9 – 14 N.m
		Brake pipe union nut torque	12 N.m
6	Park brake	Maximum drum diameter	190 +0.15 – 0.05 mm
		Brake shoe diameter	189.7 ±0.1 mm
		Backing plate mounting bolt torque	77 N.m
7	Axle assembly	Wheel nut torque	105 N.m
		Wheel bearing end float	Nil
		Brake calliper mounting bolt torque	77 N.m
		Brake disc to hub bolt torque	40 N.m
8	Wheel assembly	Tyre pressures (cold)	250 kPa
		Maximum balance weight per wheel	300 g
		Bush adjuster clamp bolt	95 – 110 N.m
9	Wheel alignment	Front axle toe in (aggregate)	1.0 – 1.5 mm
		Rear axle toe in (aggregate)	1.0 – 1.5 mm
10	Suspension	Spring centre bolt torque	100 N.m
		Spring clamp bolt torque	285 N.m
11	Electrical system	System voltage	12 – 24 V dc
		Blackout module voltage	24 V dc
		Connector plug	12-pin NATO
		Polarity	Negative earth
12	Towing eye assembly	Override gap to master cylinder	0-1 mm
		Maximum allowable side movement	1.75 mm
		Mounting bolt torque	105 N.m
13	Jockey wheel	Mounting bolts tightening torque	40 N.m

END

Distribution List: **VEH H 03.1 – Code 2** (Maint Level)
(Sponsor: CGSVSPO, Light B Vehicle Section)
(Authority: ECO CGSVSPO 113/10)