TYRES AND TUBES

CARE AND MAINTENANCE – B VEHICLES

GENERAL INSTRUCTION

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 instruction details the principles involved in the care and maintenance of B Vehicle tyres. It has been written in line with Reference A; a directive that aims to ensure optimal use of tyres fitted to the Defence GS B vehicle fleet.

2. It details and illustrates the causes of tyre failure, the correct maintenance and inspection methods to ensure maximum tyre life and methods for removing and fitting tyres.

3. This instruction has been completely revised and is to be read in conjunction with EMEI Vehicle A 291.

NOTE

NSN and designations used in this instruction were current at the date of issue. If twelve months or more have expired since issue, the NSN should be checked for supersession.

Associated Publications

4. Reference may be necessary to the latest version of the following documents:

a. Defence Road Traffic Instructions (DRTI);

b. Defence Safety Manual (SAFETYMAN);

c. Land Warfare Procedures General, LWP-G-4-3-1 – Driver's Training Handbook;

d. EMEI Vehicle A 291-5 – Tyres and Tubes – General Service B Vehicles Tyre Guide – Operator Instructions;

e. EMEI Vehicle A 298-2 – Tyres and Tubes – General Service B Vehicle Tyres – Inspection for Useability;

f. EMEI Vehicle A 469-1 – Trailer, Cargo, Lightweight and Light and Land Rover 110 4x4 and 6x6 – All Types – 16 Inch Wheel Rim Identification;

g. EMEI Vehicle G 619-30 – Truck, Medium, MC2 – Unimog – All Types – Identification of Rims and Approved Rim and Tyre Configurations for Unimog 1700;

h. EMEI Vehicle G 799-23 – Truck, Heavy, MC3, Mack – All Types – Identification of Rims and Approved Rim and Tyre Configurations;

i. EMEI Workshop H 019 – Tyre Inflation Safety Cages – Care and Use of Tyre Inflation Safety Cages – Miscellaneous Instruction;

j. Product Material Safety Data Sheets (MSDS) – Product Information Sheets;

k. Technical Regulation of ADF Materiel Manual – Land (TRAMM-L) (available from DTR-A website http://intranet.defence.gov.au/armyweb/Sites/DTRA); and

l. Equipment User/Operator and Servicing Handbooks.

DETAIL

Causes Contributing to Tyre Failure

5. The factors which contribute to tyre failure during operation are as follows:

a. **Heat.** Heat is generated in tyres due to the friction effects caused by flexing of the tyre wall material. As flexing of the tyre wall is increased, so does the amount of generated heat within the tyre. Extremely hot tyres reduce tyre life and can cause rubber compounds in the tyre to become brittle and susceptible to chunking.

b. **Overloading.** Incorrect load distribution or exceeding load limits increases the load normally placed on tyres. This causes excess heat generation and failure. Correct load distribution to minimise tyre or axle overloading is shown in Figure 1.

WARNING

The rated load carrying capacity of a tyre cannot be increased by inflating the tyre above the maximum recommended pressure.

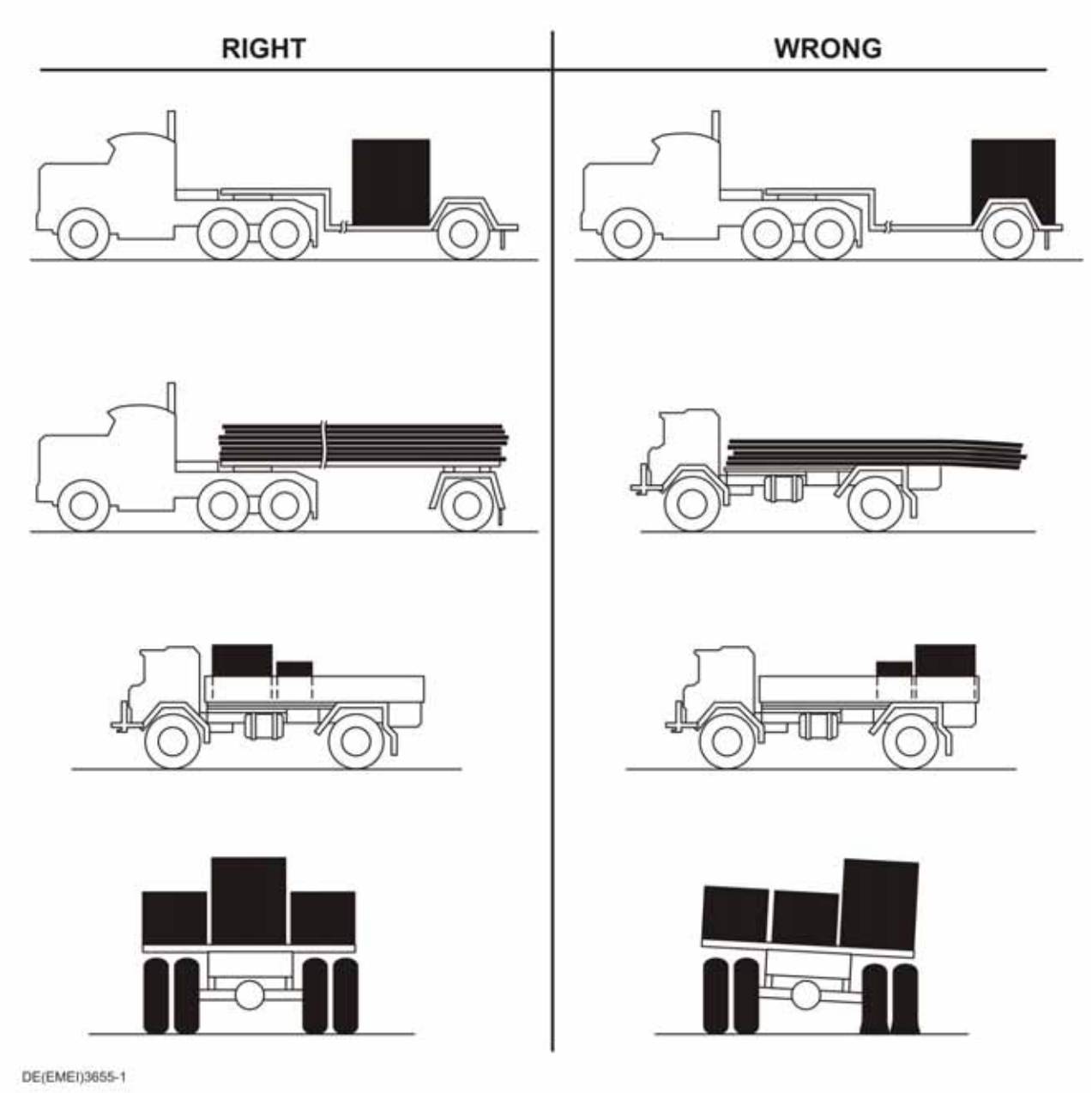

Figure 1 Correct Load Distribution

c. Impact Break. A tyre can be damaged by striking or running over rocks, kerbs, jagged road edges or pot holes. When tyres contact these obstacles the extreme impact forces on the casing cords can result in internal casing damage. A typical impact break is shown in Figure 2. This failure occurs more readily with over-inflated tyres.

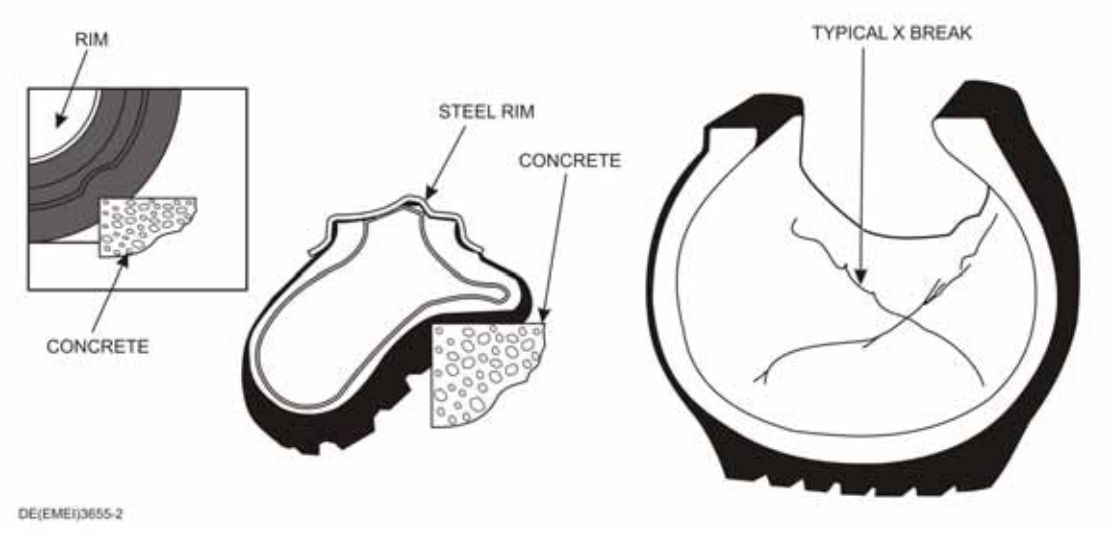

Figure 2 Impact Break

WARNING

Bleeding of air from a tyre while it is still hot will cause the tyre to be under-inflated when cold. This can lead to tyre failures due to under-inflation.

d. Under-Inflation. Running tyres below the recommended pressure for the load being carried generates excessive heat, causing deterioration of the tyre casing, thereby reducing the tyre strength. This can ultimately result in ply and/or tread separation resulting in tyre failure (Figures 3 and 4).

Figure 3 Ply Separation

Factors Affecting Tyre Tread Life

6. Factors which affect tyre tread life are:

a. poor driving technique;

b. mechanical faults;

c. under-inflation/over-inflation;

d. incorrect wheel and/or axle alignment; and

e. adverse operating conditions.

Figure 4 Blow-out

7. Inflation Pressure. Correct inflation pressure is critical to the handling and wear performance of a tyre. The effects of incorrect tyre pressure are shown in Figure 5.

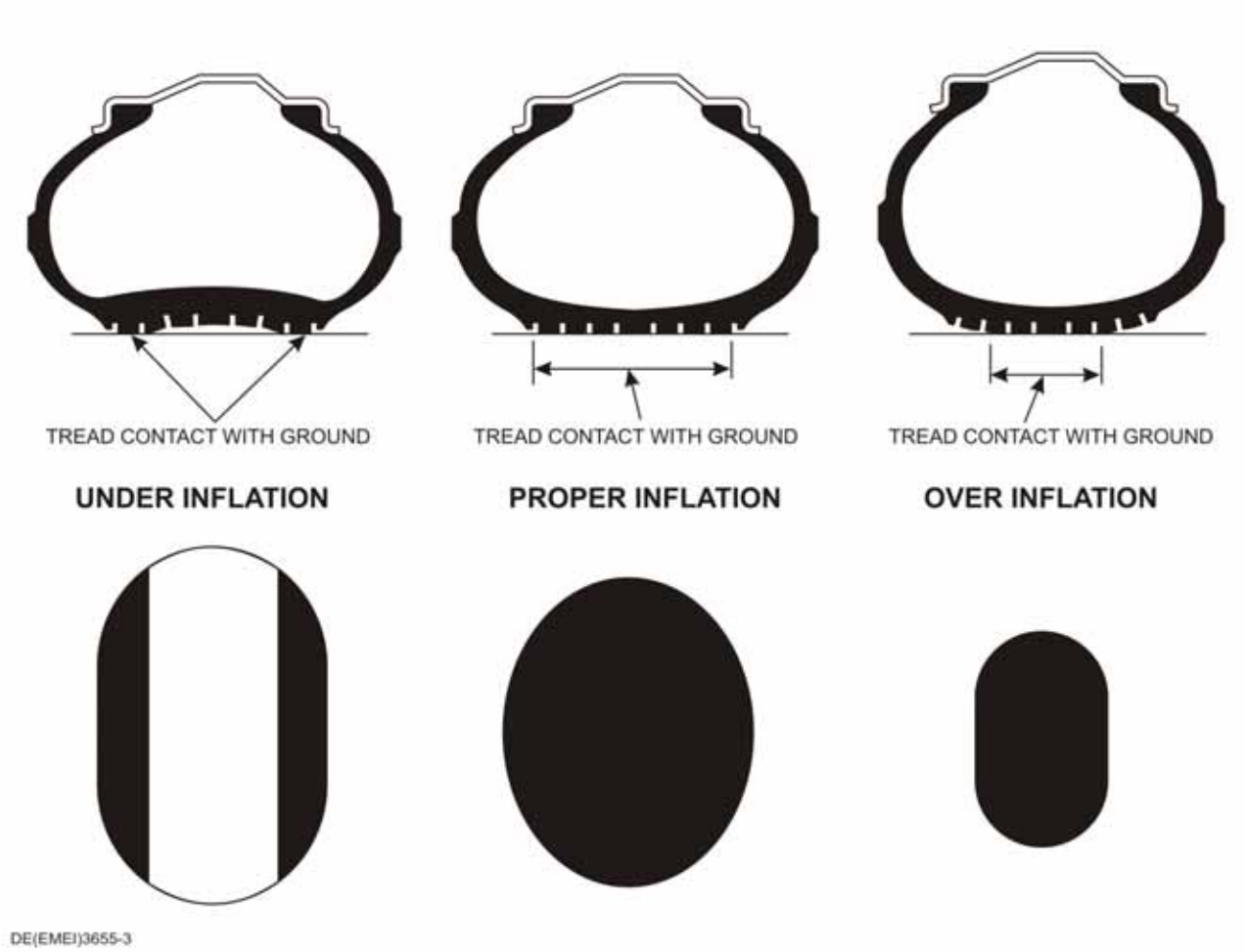

Figure 5 Effects of Inflation on Tread Contact

8. Under-Inflation. Tyres that are continually used in an under-inflated condition will not wear evenly. An example of tread wear due to under-inflation is shown in Figure 6. Under-inflation of tyres can cause the following:

a. poor vehicle handling;

b. shoulder wear;

c. heel and toe wear;

d. heat build-up;

e. upper sidewall cracking;

f. breaks around the edge of the tyre;

g. loose inner cords;

h. bead area separation;

i. ply separation;

j. tread separation; and

k. tyre failure.

Figure 6 Wear Pattern – Under-inflation

9. Over-Inflation. Tyres that are continually used in an over-inflated condition will not wear evenly. An example of tread wear due to over inflation is shown in Figure 7. Over-inflation of tyres can cause the following:

a. rapid centre tread wear;

b. reduced bruise resistance;

c. reduced traction; and

d. rapid wear of suspension components.

Figure 7 Wear Pattern – Over-inflation

10. Tyre Balance. There are two distinct ways a tyre may be out-of-balance. These are generally known as either static or dynamic out-of-balance. These terms are somewhat misleading and have originated because dynamic unbalance can only be detected when a tyre is rotating, whereas static unbalance may be detected when a tyre is rotating or at rest. Both conditions of unbalance contribute to mechanical wear and cause spot or cupping wear of the tread (Figure 8).

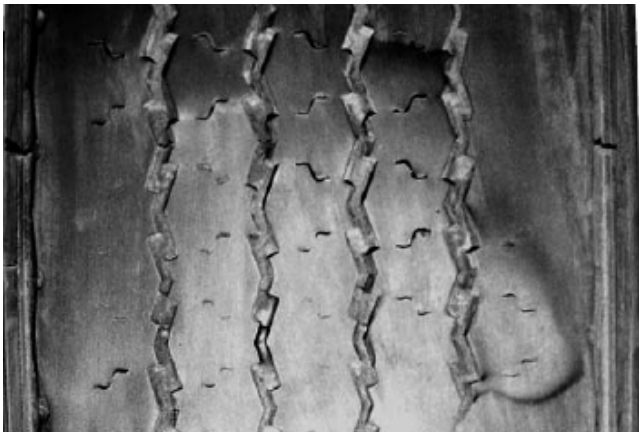

Figure 8 Spot or Cupping Wear

11. Cornering. Fast cornering causes the tyre to slip on the road surface and may result in abnormal shoulder wear, particularly on the front tyres.

12. Braking/Acceleration. Sudden braking and/or acceleration can drastically reduce tread life.

13. Speed. Sustained high speed can markedly increase tread wear.

14. Mechanical Faults. The following mechanical faults can result in irregular tread wear patterns:

a. loose wheel bearings;

b. loose or worn suspension components;

c. faulty shock absorbers;

d. incorrect fitting of the tyre to the wheel rim; and

e. sagging springs.

15. Alignment. Incorrect wheel alignment can contribute to abnormal tyre wear. Figure 9 indicates the wear pattern of excessive camber, whilst Figure 10 indicates the wear pattern of incorrect toe-in and toe-out. When toe-in is excessive, the wear will be evident on the outer edges of the tread blocks. This wear is usually distinguished by the feather edges of the least worn portion of the tread blocks. Once an alignment wear pattern is apparent, wheel alignment is to be checked and adjusted. This may include checking axle alignment on single or multi-axle vehicles to ensure thrust angles are within manufacturer's specifications.

Figure 9 Wear Pattern – Excessive Camber

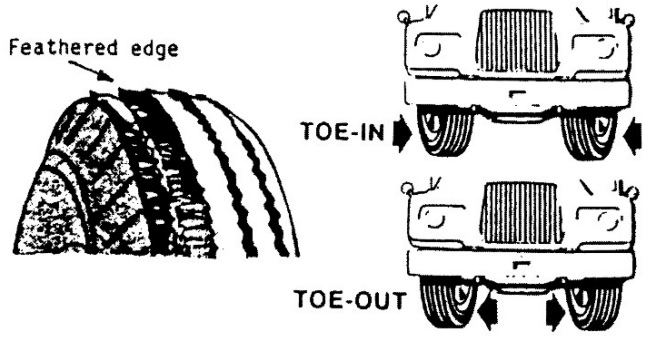

Figure 10 Wear Pattern – Incorrect Toe-in and Toe-out

16. Other Factors. Other factors which can affect tread life are the type of road surfaces, hills, winding roads or climatic conditions.

17. Tyre Rotation. Tyre rotation ensures that tyres share the different wear rates that occur between the front (steering) and rear axles. Rotation of tyres is to be carried out in accordance with the user handbook for the particular vehicle. Information on tyre rotation and placement is as follows:

a. Four-wheel Drive Vehicles. Position new (or best condition) tyres on the steering axle. Recommended tyre rotation is shown in Figure 11.

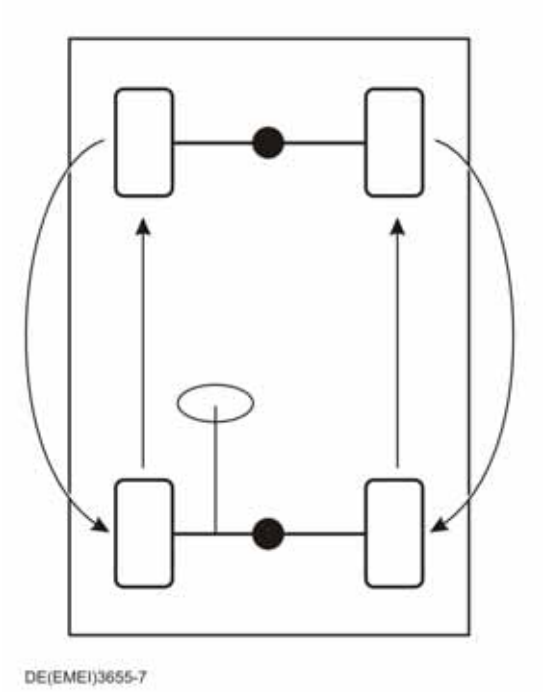

Figure 11 Four-wheel Drive Vehicle Tyre Rotation

b. Six-wheel Drive Vehicles. Position new (or best condition) tyres on the steering axle. Recommended tyre rotation is shown in Figure 12.

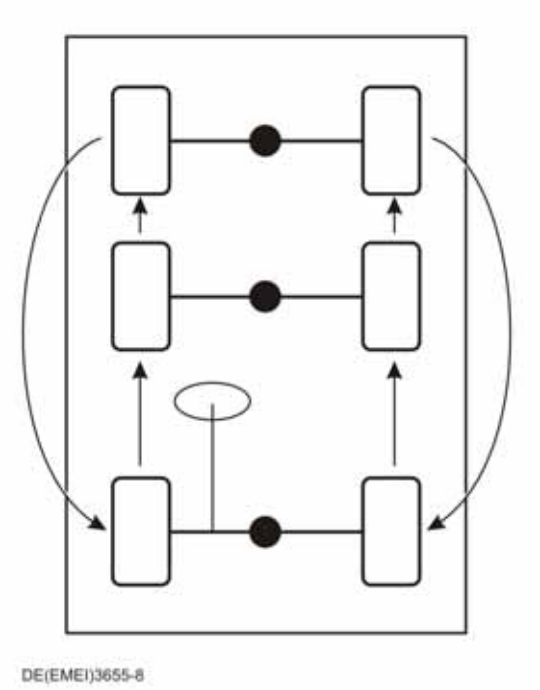

Figure 12 Six-wheel Drive Vehicle Tyre Rotation

c. Unimog. Position new (or best condition) tyres on the steering axle. Recommended tyre rotation is shown in Figure 11.

d. Trucks, Tractors and Semi-trailers. Position new (or best condition) tyres on the steering axle. Position the remaining tyres ensuring compliance with Paragraph 19.

Factors Affecting Dual and Tandem Tyre Life

18. The factors affecting tread life, as detailed in Paragraphs 5 to 16, also affect dual and tandem tyres. However, there are other unique factors that affect dual and tandem tyre life, which are provided in the following paragraphs.

19. Matching of Dual Tyres. When changing dual tyres, every precaution must be taken to properly match tread design, ply rating and overall tyre diameter. Mismatching of dual tyres forces the larger tyre into an overloaded condition causing over-deflection and over-heating. The smaller diameter tyre, lacking proper road contact, will experience accelerated wear. Permissible diameter and rolling circumference differences between dual tyres are detailed in Table 1.

Table 1 Permissible Tyre Diameter/Rolling Circumference Differences

Serial	Tyre Type	Tyre Range Width (inches)	Tolerance	
			Overall Diameter	Rolling Circumference
1	Bias	Up to 8.25	±6 mm	±20 mm
2	Bias	9.00 and upwards	±12 mm	±40 mm
3	Radial	All sizes	±5 mm	±15 mm

20. Matching Tyres on Tandem Drive Axles. Where there are axles in constant drive with each other without a third differential, for example Truck, Cargo, Heavy, MC3 – Mack, the tyres on the same side of the tandem drive are to be matched according to Table 1. Any one tyre on axles in constant drive may lose as much as 60 mm in circumference due to normal wear. This will result in the drive train wind-up and can cause mechanical failure.

Tyre Life Limit

WARNING

Failure to replace tyres when beyond useable limits can cause serious injury to personnel and damage to equipment.

NOTE

The tread wear limit indicator for some imported tyres is 1.5 mm.

21. Tread Wear Limit. The tread wear limit for all pneumatic tyres is 1.6 mm. A tyre is not to be used if any portion of the tread pattern, which is in contact with the road surface, is less than 1.6 mm in depth. Tread depth is a measure of the amount of tread remaining on a tyre and is measured radially outwards from the tyre casing.

22. Tread Wear Indicators. Tread wear indicators are to be used as a guide to tyre wear. A tyre with worn tread wear indicators has reached its tread wear limit.

WARNING

Tyres exhibiting signs of ozone degradation; cuts or splits; sidewall damage or deformation are to be replaced regardless of age as failure to comply can cause serious injury to personnel and damage to equipment.

23. Age. As the materials used in the manufacture of tyres degrade over time, tyres have a finite life. The Date Of Manufacture (DOM) is displayed as a four digit number on the sidewall of the tyre. The first two digits denote the week of manufacture and the third and fourth digits denote the year. For example the code "4109" would be the 41st week of 2009.

24. In order to reduce the likelihood of tyre failure as a result of age and environmental degradation, the following directions are to be complied with:

- **a.** Tyres fitted to a vehicle are to be inspected in accordance with extant technical and non-technical inspection procedures.
- **b.** Tyres that exceed ten years from date of manufacture are not to be used. Any vehicle fitted with tyres that are/or exceed ten years from date of manufacture are to be classified "XX – Do Not Use."
- **c.** Tyres that have been in store and are over six years from DOM are not to be fitted to a vehicle regardless of age.

Inspection of Tyres

25. Tyres are to be inspected in accordance with EMEI Vehicle A 298-2.

26. Inspection Intervals. Tyres fitted to vehicles are subject to the following:

- **a.** Annual inspection by a suitably qualified tradesman as part of the specified vehicle servicing task.
- **b.** Inspection by qualified vehicle operators as part of the vehicle non technical inspection.
- **c.** Inspection during first, last and halt parade services.

Approved Tyre and Rim Combinations

27. The approved tyre and rim combinations for vehicles are detailed in EMEI Vehicle A 469-1 EMEI Vehicle G 619-30 and EMEI Vehicle G 799-23 or the appropriate EMEI for the vehicle variant.

TYRES AND RIMS – MOUNTING/DEMOUNTING

Mounting/Demounting – General

WARNING

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

The handling, storage and use of chemical substances are to be in accordance with SAFETYMAN, MSDS and EMEI Workshop series requirements.

Only suitably trained personnel are to operate the mounting/demounting machines. Failure to comply could cause serious injury to personnel.

28. The three most common types of rims in use on heavy vehicles are the one-piece drop-centre rim, the two-piece flat base rim and three-piece flat base rim. Tyres can be mounted with tubes on all types of rims or tubeless on one-piece drop-centre rims or special three-piece flat base rims with a rim seal.

29. Personnel. ECN 229 Vehicle Mechanic or suitably trained personnel are to operate mounting/demounting machines.

30. The normal method for mounting/demounting tyres is to use one of the mounting/demounting machines that are currently in-service within the ADF. This section details manual methods of mounting and demounting tyres when the mounting/demounting machines are unavailable.

Tyre and Rim Preparation

31. Preparation. Where not specified below the term rim includes single piece rims and any associated components that form part of the rim assembly such as multi piece rims. The procedure to prepare a tyre and rim before mounting is as follows:

WARNING

Wheel rims and associated components such as flanges and locking rings with evidence of corrosion are to be replaced. Failure to comply could result in failure of the rim assembly that could cause death and/or serious personal injury, and damage to equipment.

a. Inspect the rim and associated components for corrosion, cracks, deformations, damage to the flange and elongation of mounting holes. Replace rim and components as required.

b. The rim should be free of scale and dirt. Scale and dirt is to be cleaned off with a wire brush. After removal of scale any rim exhibiting signs of corrosion that penetrates the metal of the rim or associated components is to be replaced. Figure 13 depicts a severely corroded rim that resulted in catastrophic failure of the split rim locking ring after assembly.

Figure 13 Severely Corroded Wheel Rim

WARNING

Split rim locking rings are to be free from scale, dirt and corrosion. Failure to remove scale and dirt build up on the locking ring may prevent correct engagement of the locking ring in the wheel rim. This combined with failure to follow the correct inflation procedure may result in disengagement of the locking ring under pressure with explosive force that could cause death and/or serious personal injury, and damage to equipment.

c. Ensure split rim flanges and locking rings are free from scale, dirt and corrosion. Split rim flanges or locking rings are not to be used if they are:

(1) not matched to the rim;

(2) out of round;

(3) deformed, distorted or bent;

(4) have indentations deeper than 1 mm; and

(5) have burrs, corrosion and other defects.

d. Remove any burrs from around the rim valve hole with emery paper if required.

e. The tube and tyre interior should be clean, dry and free of stick-on labels.

f. Check the tyre and tube are the correct size and type for the rim as detailed in the appropriate EMEI for the vehicle variant.

NOTE

When fitting a new tyre, a new tube (for tube type tyres) or a new valve stem (for tubeless tyres) is to be fitted.

General Tube and Tyre Mounting Procedures

32. The mounting procedures for a tube and tyre are as follows:

a. Prepare the rim as detailed in Paragraph 31.

b. Lubricate the tube and tyre beads (tubes are to be slightly inflated). Tyre beads are lubricated by applying a solution of one part of liquid soap (pure soap only) to four parts water. Lubrication ensures

correct positioning of the tube and beads. It also prevents thinning of the tube in the rim-well area, as shown in Figure 14.

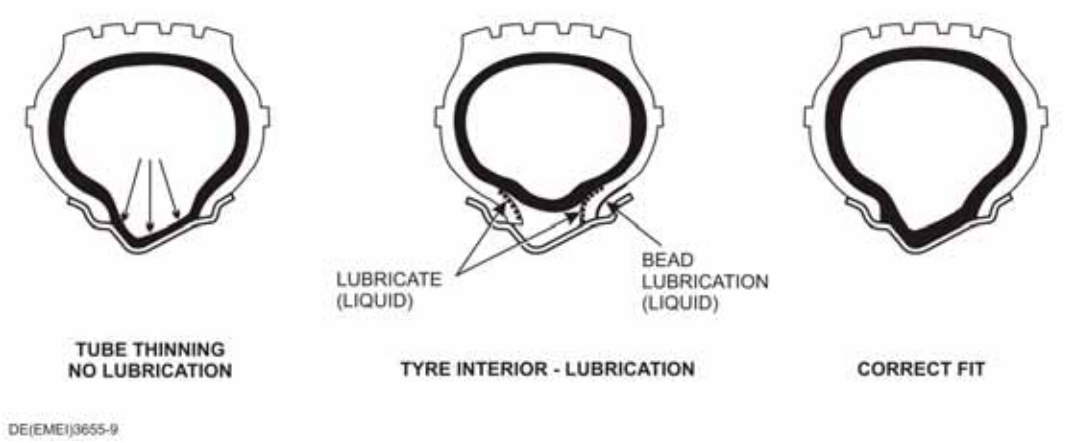

Figure 14 Tyre and Tube Lubrication

c. Place one section of the tyre bead over the side of the rim so that it rests in the well of the rim. The remaining section of the bead is to be eased over the rim using a rubber mallet. Where a rim has different bead seat widths fit the bead to the narrow side first.

d. Fit the tube, ensuring correct positioning of the valve stem. Screw the Repair Tool, Pneumatic Tyre Valve (NSN 5120-99-401-9663) onto the valve stem to prevent the valve stem from pulling back through the hole.

e. Fit the second bead, commencing at a point diagonally opposite the valve stem. Ensure that the balance mark, if present (approximately 13 mm dot of coloured paint) is aligned with the valve stem.

WARNING

Do not attempt to force the bead onto the seat by applying more than the recommended air pressure. This may cause the tyre to burst with explosive force causing serious injury.

CAUTION

Do not force the tyre bead onto the rim as this will cause localised bead distortion resulting in uneven tyre wear.

f. Apply more lubricant if necessary and inflate the tyre to seat the beads. Do not inflate the tyre more than the recommended inflation pressure to seat the beads. If the beads will not seat at this pressure, deflate the tyre, relubricate, recentralise and reinflate.

g. Remove the valve core to deflate the tyre. This allows the tube to settle correctly within the tyre.

h. Replace the valve core and inflate the tyre to the recommend pressure in accordance with EMEI Vehicle A 291-5.

Mounting Procedure – Tubeless Tyre

33. Procedures for mounting of a tubeless tyre are as follows:

a. Prepare the rim as detailed in Paragraph 31.

b. A new snap-in valve (Figure 15) is to be installed each time a tubeless tyre is fitted to a light vehicle rim. It is installed to the rim by first immersing it in clean water, then installing it in the rim from the inside and levering into position by using a tubeless tyre valve inserter as shown in Figure 16.

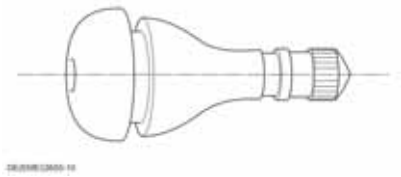

Figure 15 Snap-in Valve

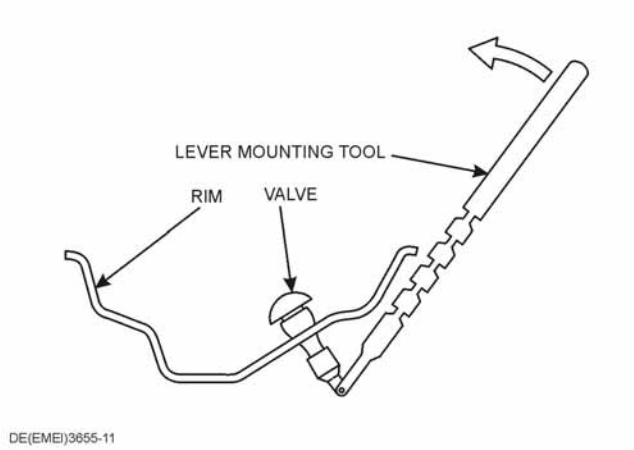

Figure 16 Fitting Snap-in Valve

c. Fit the tyre to the rim as detailed in Paragraph 32.a, b, d and e (omit references to tube fitting). When fitting the tyre, care is to be taken to avoid damaging the ribbed surface of the bead which provides the air sealing capability of the tyre.

d. Remove the valve core.

e. There are several methods available to seat tubeless tyre beads before commencing inflation. The methods to seat tyre beads are as follows:

WARNING

When the beads are seated and before internal pressure builds up, release the constrictor to prevent injury to the operator.

Do not inflate the tyre more than the recommended inflation pressure to seat the beads.

(1) apply additional lubricant (mild soap solution) to the beads if necessary;

(2) apply pressure around the circumference of the tyre by using a constrictor, tubeless tyre;

(3) use a piece of rope as a tourniquet using the method in sub-sub Paragraph (2) to commence seating the beads; or

(4) with the tyre and rim assembly held vertical, place your foot in the centre of the rim and try to push the rim through the tyre. Repeat the process for the other side. Position the wheel upright and inflate the tyre until the beads slip into position.

f. Install the valve core and inflate the tyre to the recommended pressure in accordance with EMEI Vehicle A 291-5.

One-piece Drop-centre Rims

34. Removal Procedure. To remove the tyre from the one-piece drop centre rim, proceed as follows:

a. Place the wheel on the floor with the narrow bead seat side up and remove the valve core.

b. Using a bead breaker, free both beads from their seats. It may be necessary to lubricate the beads.

c. Safety rims must have both beads pushed over the hump and into the rim well.

d. Commence at the valve, insert the tyre levers and, in small increments, ease the bead over the rim (Figure 17).

e. Remove the tube if fitted.

f. Ensure that the bead is located in the rim well and by using a tyre lever and rubber mallet remove the second bead from the rim (Figure 18).

g. Remove the valve stem if fitted.

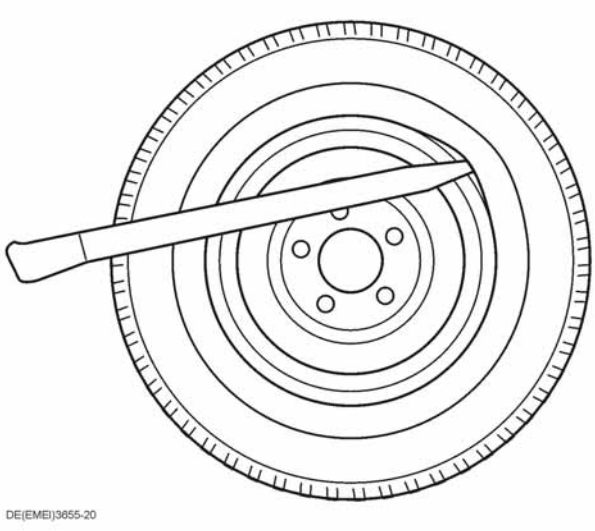

Figure 17 Removing First Bead

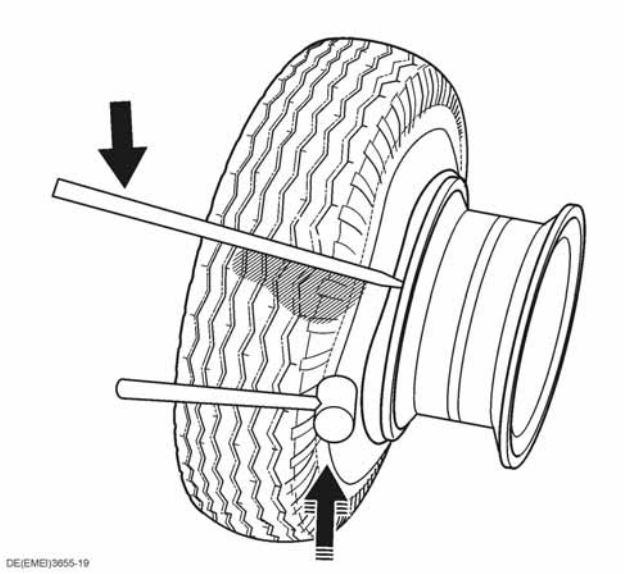

Figure 18 Removing Second Bead

Two-piece Flat Base Rims

35. The procedures for preparation, removal and mounting of tyres and tubes on a two-piece flat base rim are as follows:

CAUTION

The split sprung-flange should not be extended more than what is required for removal and installation on a rim. Over extension of the split sprung-flange will result in failure of the locking rim.

a. Remove the valve core to completely deflate the tyre.

b. Place the wheel assembly on the ground with the lock-ring side uppermost. Insert the hooked end of the tyre tools between the split sprung-flange and the sidewall of the tyre and lever the bead loose from the lock-ring (Figure 19). Continue prying progressively around the tyre until the bead is completely free from the lock-ring. Other mechanical devices may be used to break the bead if necessary.

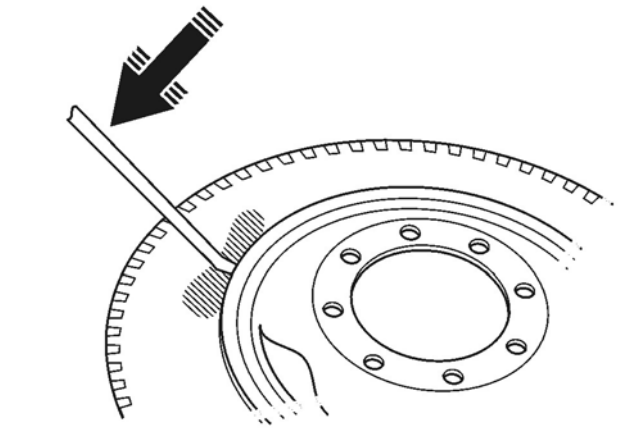

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Figure 19 Breaking the Bead

c. Insert the tapered end of the tyre tool into the notch in the split sprung-flange. Lever the split sprung-flange from its groove and by levering in increments (walking), pry the split sprung-flange over and clear of the rim edge, taking care not to distort it (Figure 20).

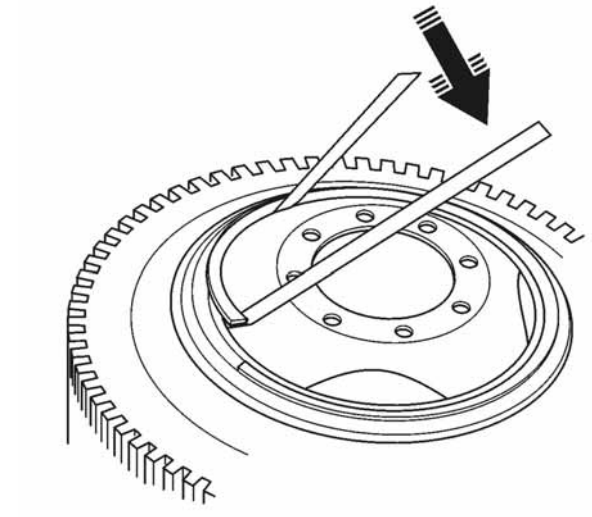

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Figure 20 Removing the Lock-ring

d. Turn the wheel over and unseat the second tyre bead from the rim.

e. Push the valve stem clear of the rim slot and lift the rim from the tyre.

f. Remove the tube and flap from the tyre.

36. Preparation. Preparation of the tyre, tube, rim and flap is as follows:

a. The rim, tyre and tube are to be prepared as detailed in Paragraph 31.

b. Ensure that the detachable split sprung-flange is not damaged or distorted and has not lost tension.

WARNING

Manufacturer's rim components are not interchangeable. Positively identify all rim components as being from the same manufacturer before assembling.

c. When fitting a new tube, ensure that it has the correct valve stem for the rim on which it is to be mounted.

d. The tube and tyre are to be clean, dry and free from contamination.

37. Mounting Procedure. To mount the tyre assembly to the rim, proceed as follows:

a. Place the rim on the ground with the split sprung-flange side uppermost.

b. Fit the tube to the tyre and partially inflate it until it is rounded out.

c. Dust the flap with French chalk and fit it over the tube making sure the edges are tucked inside the tyre bead. Ensure that the tube is not creased or pinched (Figure 21).

d. Apply lubricant to the outside surfaces of both beads. Ensure that the tyre mounting lubricant does not enter the inside of the tyre (Figure 21).

NOTE

Ensure that the valve stem is located correctly and facing the correct direction when fitting the tube and tyre to the rim.

e. Align the tyre assembly above the rim and insert the valve stem through the valve slot in the rim. Allow the tyre assembly to fall onto the rim.

f. Place the split sprung-flange on the rim base so that the ring split is opposite the valve stem.

g. Insert the leading end of the split sprung-flange into the rim groove and progressively 'walk' it into position (Figure 22).

h. Check to ensure that the split sprung-flange is fully seated in the groove.

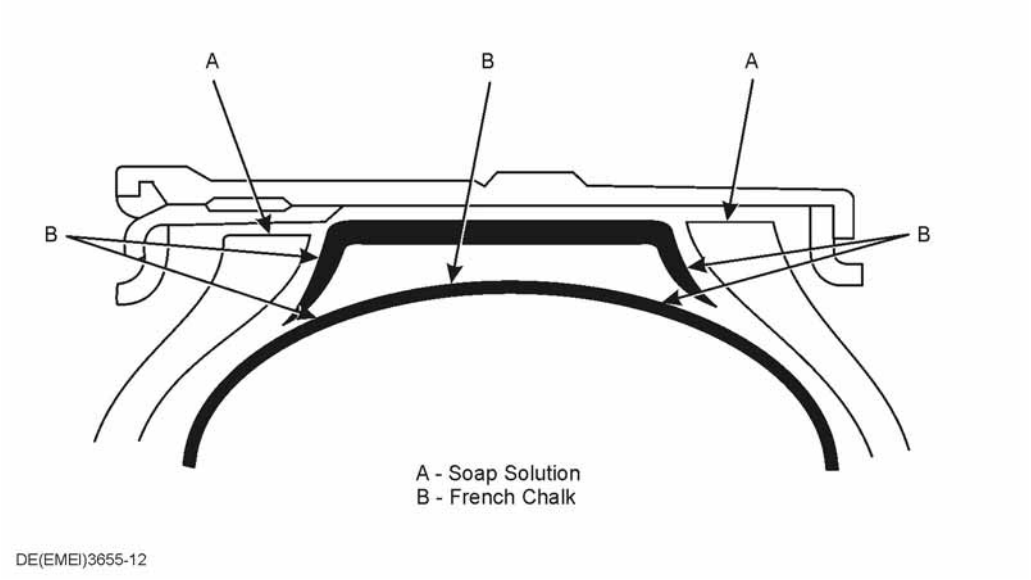

Figure 21 Tyre and Tube Lubrication

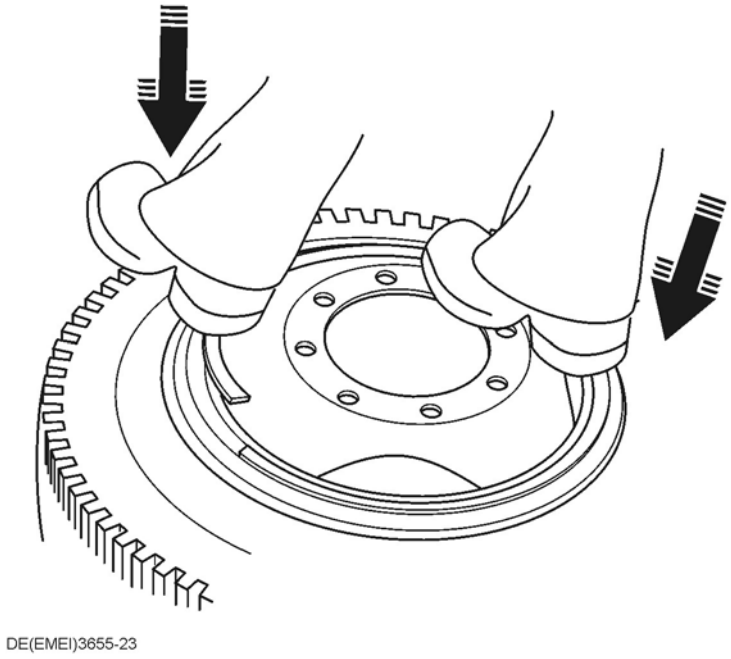

Figure 22 Walking Lock-ring into Position

Three-piece Flat Base Rim

38. The procedures for preparation, mounting and removal of tyres and tubes mounted on a three-piece flat base rim are as follows:

CAUTION

The lock-ring should not be extended more than what is required for removal and installation on a rim. Over extension of the lock-ring will result in failure of the rim.

NOTE

The procedure for tyre removal off a special three-piece rim with a rim seal (tubeless tyre) is the same as for a standard three-piece rim with the exception the tyre bead and flange have to be pushed down further to clear the toe of the lock-ring.

a. Remove the valve core to completely deflate the tyre.

b. Place the wheel assembly on the ground with the flange and lock-ring side uppermost. Insert the hooked end of the tyre tools between the flange (and lock-ring) and the sidewall of the tyre and lever the bead loose from the flange (Figure 19). Continue prying progressively around the tyre until the bead is completely free from the flange. Other mechanical devices may be used to break the bead if necessary.

c. With the flange and tyre bead pushed down clear of the lock-ring, insert the tapered end of the tyre tool into the notch in the lock-ring and lever the lock-ring from its groove. Pry the lock-ring out taking care not to distort it (Figure 20) and remove the flange.

d. Turn the wheel over and unseat the second tyre bead from the rim.

e. Push the valve stem clear of the slot and lift the rim from the tyre.

f. Remove the tube and flap from the tyre.

39. Preparation. Preparation of the tyre, tube, rim and flap is as follows:

a. The rim, tyre and tube are to be prepared as detailed in Paragraph 31.

b. Ensure that the detachable flange and/or lock-ring is not damaged or distorted and that the lock-ring has not lost tension.

WARNING

Manufacturers rim components are not interchangeable. Positively identify all rim components as being from the same manufacturer before assembling.

c. When fitting a new tube, ensure that it has the correct valve stem for the rim on which it is to be mounted.

d. The tube and tyre is to be dry and the tube is to be dusted with French chalk.

40. Mounting Procedure. To mount the tyre assembly to the rim, proceed as follows:

a. Place the rim on the ground with the removable flange/lock-ring side uppermost.

b. Fit the tube to the tyre and partially inflate it until it is rounded out.

c. Dust the flap with French chalk and fit it over the tube making sure the edges are tucked inside the tyre bead. Ensure that the tube is not creased or pinched (Figure 21).

d. Apply lubricant to the outside surfaces of both beads. Ensure that the tyre mounting lubricant does not enter the inside of the tyre (Figure 21).

NOTE

Replace the rim seal (tubeless tyres) on a special three-piece rim if required.

Ensure that the valve stem is located correctly and facing the correct direction when fitting the tube and tyre to the rim.

e. Align the tyre assembly above the rim and insert the valve stem through the valve slot in the rim. Allow the tyre assembly to fall onto the rim.

f. Place the flange on the rim base and push down on it to position the flange below the lock-ring grooves.

g. Place the leading end of the lock-ring into the groove and progressively 'walk' it into position (Figure 22).

h. Check to ensure that the lock ring is fully seated in the groove.

Tyre Inflation and Wheel Nut Tightening

WARNING

EMEI Workshop H 019 is to be adhered to for use of the tyre inflation safety cage.

Failing to inspect lock ring engagement after partial inflation may result in disengagement of the locking ring at full inflation with explosive force

Do not hammer the lock ring or flange while the tyre is inflated.

Inflating a tyre under a vehicle is less safe than using a safety cage or steel chains. Extreme care must be taken to avoid personnel injury.

Non adherence to these procedures may result in injury or death.

41. Tyre Inflation Using a Safety Cage. Place the tyre in a safety cage and inflate to approximately 70 kPa, using an extension hose equipped with an air gauge and clip on connector (Figure 23). Once partially inflated, check to ensure proper engagement of the lock ring by referencing any circumference design element on the tyre to the top of the rim flange. Check for any gaps in the locking ring to the rim and the removal flange. These should be equally spaced.

Figure 23 Tyre Inflation – Safety Cage

NOTE

If a safety cage is not available, tyre inflation is to be carried out in accordance with DRTI Chapter 8.

42. Once lock ring is confirmed as fully engaged inflate tyre to recommended pressure. Reinspect lock ring to ensure correct engagement. If any uneven gaps are evident the tyre is to be deflated and the lock ring reinspected and reassembled.

43. Tyre Inflation – No Safety Cage. If there is no safety cage available, the tyre is to be inflated in accordance with Land Warfare Procedures General, LWP-G-4-3-1 – Driver's Training Handbook, Chapter 4, Section 4-3.

Wheel Nut Tightening Sequence

44. The correct sequence for tightening lug/stud nuts is shown in Figures 24 and 25. The sequence for rims and spiders is interchangeable.

45. After the initial tightening of the rim on the spider hub, the wheel assembly must be checked for run-out.

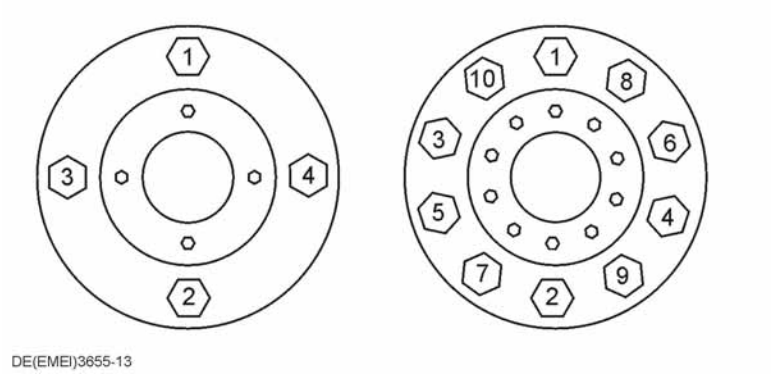

Figure 24 Rim Stud Sequence

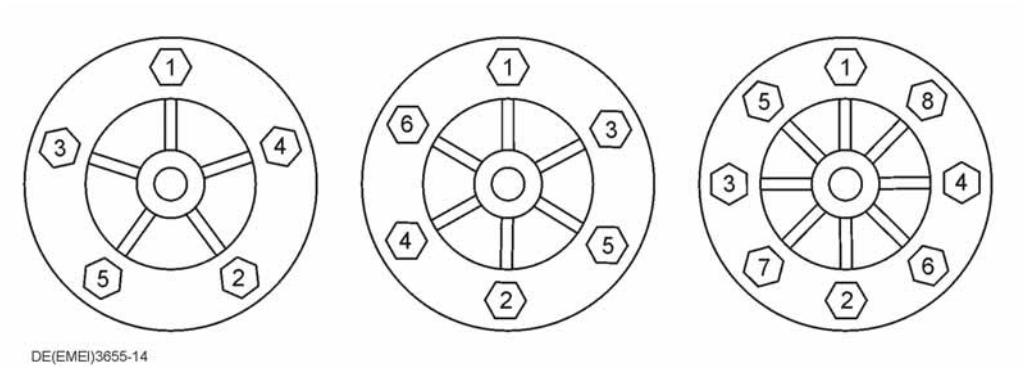

Figure 25 Spider Lug Sequence

END

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