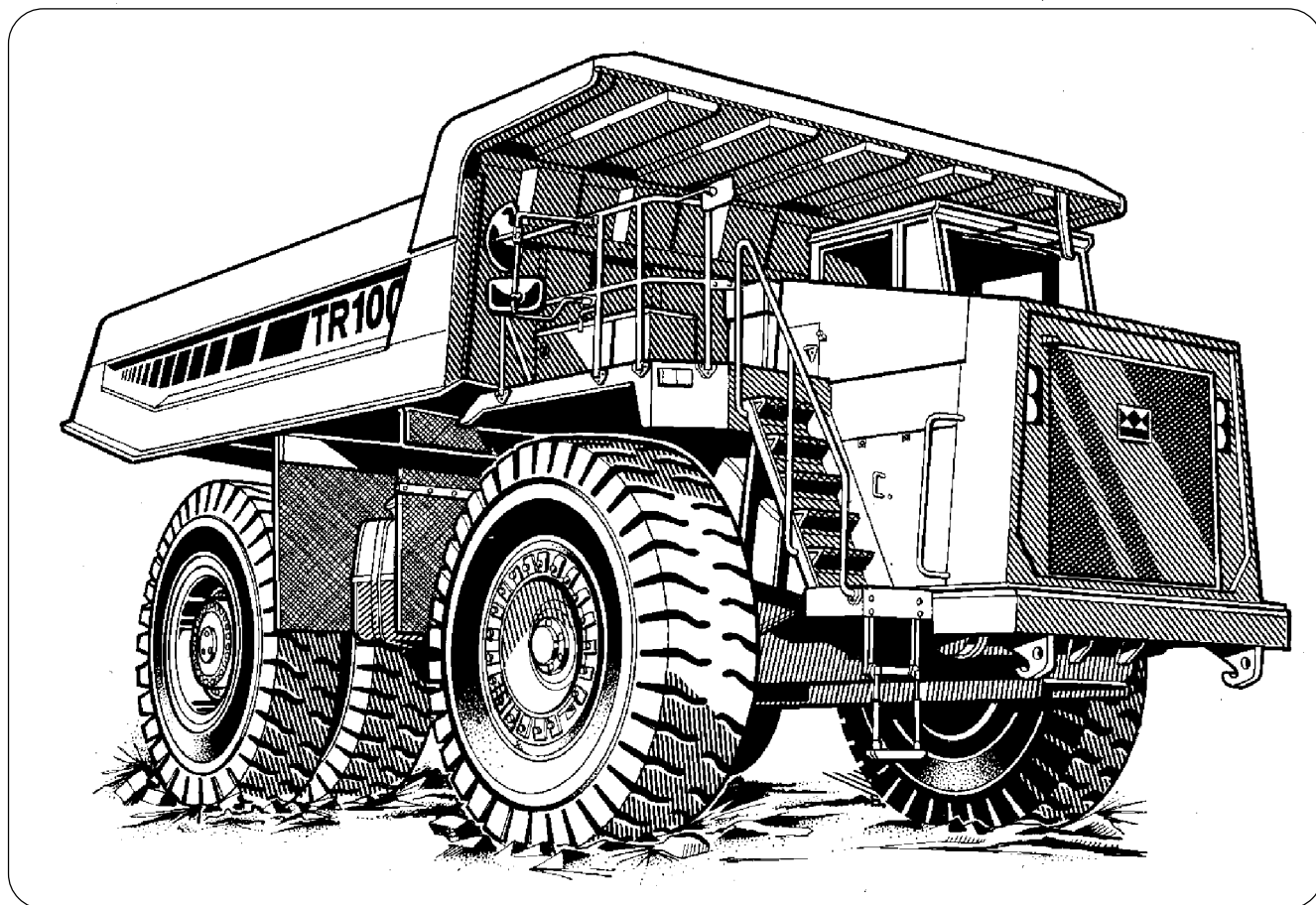


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# TR100 Mining Truck Maintenance Manual



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TECHNICAL PUBLICATIONS DEPARTMENT  
TEREX EQUIPMENT LIMITED,  
MOTHERWELL, SCOTLAND, ML1 5RY  
REF. NO. SM755/783




## IMPORTANT SAFETY NOTICE

Proper service and repair is important to the safe, reliable operation of all motor vehicles. The service procedures recommended and described in this publication, are effective methods for performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when, and as recommended.

It is important to note that this publication contains various WARNINGS and NOTES which should be carefully read in order to minimize the risk of personal injury to personnel, or the possibility that improper service methods will be followed which may damage the vehicle or render it unsafe. It is also important to understand these WARNINGS and NOTES are not exhaustive. It is not possible to know, evaluate and advise the service trade of ALL conceivable ways in which service might be carried out, or, of the possible hazardous consequences of each way. Consequently, no such broad evaluation has been undertaken. Accordingly, anyone who uses a service procedure, or tool, which is not recommended, must first satisfy themselves thoroughly that neither their safety, nor vehicle safety, will be jeopardized by the service method he/she selects.

Two types of heading are used in this manual to attract your attention.

1.  **WARNING** - This symbol is used when an operating procedure, practice, etc., which, if not correctly followed could result in personal injury or loss of life. Look for this symbol to point out important safety precautions. It means - **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

2. **Note** - This is used when an operating procedure, practice, etc., which, if not strictly observed, could result in damage to or destruction of equipment.



### **WARNING**

**Never use parts which are altered, modified, or weakened in operation. This can seriously jeopardize the integrity of the machine and could result in property damage or serious personal injury.**

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The information contained within this Alert must not be made available to third parties not authorised to receive it.

# Service Information Alert

**DATE:** April 1994

**B168**

**MODEL:** General

**SUBJECT:** VITON 'O' RINGS AND SEALS (FLUORO-ELASTOMERS) - SAFETY HAZARDS

**PURPOSE:**

To advise potentially hazardous condition.

**DETAIL:**

It has been brought to our attention that 'Viton' material used in manufacture of oil seals and 'O' rings, produces a highly corrosive acid (Hydrofluoric) when subjected to temperatures above 315° C.

The resulting contamination can have extreme consequences on human tissue since it is almost impossible to remove after contact.

We therefore recommend the following procedure when it is necessary to inspect any equipment that has been subjected to a high temperature i.e. fire.

- a. Visually inspect for any gaskets or seals which have suffered from heat; they will appear black and sticky.
- b. If this is affirmed - **Do Not Touch**
- c. Make enquiries to ascertain the material composition. Any Fluoro-elastomer (Viton, Fluorel or Tecmoflon) should be considered dangerous but natural rubber and nitrile are non-hazardous.
- d. If Fluoro-elastomer seals have been used, then the affected area **MUST** be decontaminated before undertaking further work.
- e. Disposable Heavy Duty Gloves (Neoprene) **MUST** be worn and the affected area decontaminated by washing thoroughly with Limewater (Calcium Hydroxide solution).
- f. Any cloths, residue and gloves used **MUST** be safely discarded after use.

**Note:** Burning of the discarded items is **NOT RECOMMENDED**, except in an approved incineration process where the gaseous products are treated by alkaline scrubbing.

**TEREX SERVICE DEPARTMENT**

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# GENERAL INFORMATION - TR100 Mining Truck

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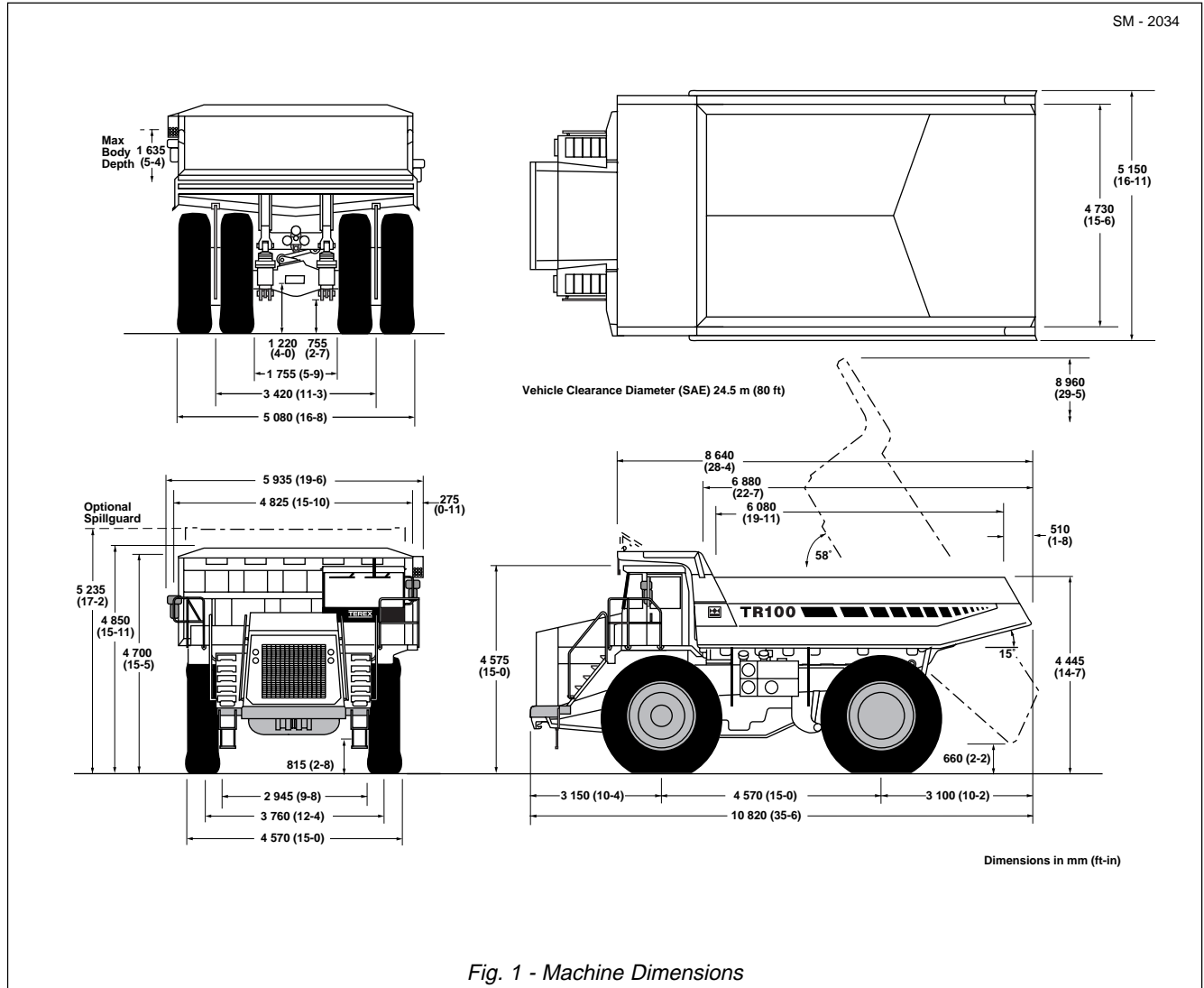


Fig. 1 - Machine Dimensions

## ENGINE

Make/Model ..... Cummins KTA-38-C1050  
 Type ..... 4 Cycle, Turbocharged/Aftercooled  
 Gross Power  
 at 2 100 rev/min ..... 783 kW (1 050 hp, 1 094 PS)  
 Net Power at 2 100 rev/min ..... 727 kW (975 hp, 988 PS)

**Note:** Power ratings to SAE J1995 June 1990. Net Power is after deductions for fan and alternator. Engine requires no derating up to 3 050 m (10 000 ft) altitude.

Maximum Torque ..... 4 631 Nm (3 415 lbf ft)  
 at 1 300 rev/min  
 Number of Cylinders/Configuration ..... 12V  
 Bore x Stroke ..... 159 x 159 mm (6.25 x 6.25 in)  
 Total Displacement ..... 37.7 litres (2 300 in<sup>3</sup>)  
 Starting ..... Electric  
 Maximum Speed, Full Load ..... 2 100 rev/min  
 Maximum Speed, No Load ..... 2 400 rev/min  
 Idle Speed ..... 750 rev/min  
 Safe Operating Angle ..... 30°/60% Grade

## TRANSMISSION

Make/Model ..... Allison DP-8963 CEC  
 Automatic electronic control with soft shift feature.  
 Remote mounted in the frame with integral TC 890 torque converter and planetary gearing. Six speeds forward, one reverse. Automatic converter lockup action in all speed ranges. Downshift inhibitor. Hydraulic retarder.

### Speeds With Standard Planetary

Forward						
Gear	1	2	3	4	5	6
Ratio	4.24	2.32	1.69	1.31	1.00	0.73
km/h	8.2	15.0	20.6	26.5	34.8	47.6
mile/h	5.1	9.3	12.8	16.5	21.6	29.6
Reverse						
Ratio	5.75					
km/h	6.0					
mile/h	3.8					

# General Information - TR100 Mining Truck

Section 000-0000

## DRIVE AXLE

Heavy duty axle with full floating axle shafts, single reduction spiral bevel gear differential and planetary reduction at each wheel.

Ratios:	Standard	Optional
Differential .....	2.16:1	2.16:1
Planetary .....	13.75:1	10.50:1
Total Reduction .....	29.70:1	22.68:1

## SUSPENSION

**Front:** King pin strut type independent front wheel suspension by self-contained, variable rate, nitrogen/oil cylinders.

**Rear:** Variable rate nitrogen/oil cylinders with A-frame linkage and lateral stabilizer bar.

Maximum Strut Stroke	
Front .....	235 mm (9.25 in)
Rear .....	175 mm (6.9 in)
Maximum Rear Axle Oscillation .....	± 7.0 Degrees

## WHEELS AND TYRES

Wheel Rim Width .....	19.5 in
Tyres (Front & Rear)	
Standard .....	27.00 R 49** Radial
Optional .....	27.00-49 (48 PR) E-4

**Note:** It is recommended that for tyres both listed and unlisted, the user should consult the tyre manufacturer and evaluate all job conditions in order to make the proper selection.

## BRAKES

### Service

All hydraulic brake system. Transmission mounted pressure compensating pump provides hydraulic pressure for brakes and steering. Independent circuits front and rear. Each circuit incorporates a nitrogen accumulator which stores energy to provide consistent braking response.

Front Brake Circuit Pressure .....	159 bar (2 300 lbf/in <sup>2</sup> )
Rear Brake Circuit Pressure .....	52 bar (750 lbf/in <sup>2</sup> )
Accumulators:	
Nitrogen Precharge Pressure .....	55 bar (800 lbf/in <sup>2</sup> )

### Front:

Type .....	Dry Disc with 1 calliper per wheel
Disc Diameter .....	965 mm (38 in)
Pad Area, Total .....	2 015 cm <sup>2</sup> (320 in <sup>2</sup> )

### Rear:

Type .....	Oil cooled, multiple friction discs, completely sealed from dirt and water.
Braking Surface, Total .....	87 567 cm <sup>2</sup> (13 573 in <sup>2</sup> )

## Parking

Application of rear brakes by springs in brake disc pack. Hydraulically released.  
Hold-off Pressure ..... 83 bar (1 200 lbf/in<sup>2</sup>)

## Retardation

Modulated lever control of rear disc pack.  
Retarder Actuation Pressure ..... up to 33 bar (480 lbf/in<sup>2</sup>)

## Emergency

Push button solenoid control applies service and parking brakes. Automatically applies when engine is switched off. Parking brake applies should system pressure fall below a predetermined level.

Brakes conform to ISO 3450, SAE J1473 OCT 90.

## STEERING SYSTEM

Independent hydrostatic steering with closed-centre steering valve, accumulator and pressure compensating piston pump.

Accumulator provides uniform steering regardless of engine speed. In the event of loss of engine power it provides steering of approximately two lock-to-lock turns.

A low pressure indicator light warns of system pressure below 83 bar (1 200 lbf/in<sup>2</sup>). Steering conforms to ISO 5010, SAE J53.

System Pressure .....	159 bar (2 300 lbf/in <sup>2</sup> )
Relief Pressure .....	207 bar (3 000 lbf/in <sup>2</sup> )
Steering Cylinders .....	Double Acting, Single Stage
Accumulator:	
Oil Capacity .....	16.4 litres (4.33 US gal)
Nitrogen Precharge Pressure .....	55 bar (800 lbf/in <sup>2</sup> )
Steering Angle (Left and Right) .....	39°
Pump:	
Type .....	Piston
Capacity at 2 100 rev/min .....	2.0 litres/s (32 US gal/min)

## BODY HYDRAULICS

Two body hoist cylinders are mounted between the frame rails. Cylinders are two-stage with power down in the second stage.

System Relief Pressure .....	190 bar (2 750 lbf/in <sup>2</sup> )
Pump:	
Type .....	Gear
Capacity at 2 100 rev/min .....	6.1 litres/s (97 US gal/min)
Control Valve .....	Servo Controlled, Open Centre
Body Raise Time .....	16.3 Seconds
Body Lower Time .....	18 Seconds

## ELECTRICAL

Type .....	24 Volt, Negative Ground
Battery .....	Four, 12 Volt, 210 Ah each, Maintenance Free
Accessories .....	24 Volt
Alternator .....	70 Amp
Starter .....	Two, 8.9 kW

# General Information - TR100 Mining Truck

Section 000-0000

## BODY

Longitudinal 'V' type floor with integral transverse box-section stiffeners. The body is exhaust heated and rests on resilient impact absorption pads.

Body wear surfaces are high hardness (360-440 BHN) abrasion resistant steel. Yield strength of plates 1 000 MPa (145 000 lbf/in<sup>2</sup>).

### Plate Thicknesses:

Floor .....	19 mm (0.75 in)
Side .....	10 mm (0.39 in)
Front, lower .....	10 mm (0.39 in)

ROPS Cabguard SAE J1040 Feb 86. ISO 3471

### Volumes:

Struck (SAE) .....	41.6 m <sup>3</sup> (54.4 yd <sup>3</sup> )
Heaped 2:1 (SAE) .....	57.0 m <sup>3</sup> (74.5 yd <sup>3</sup> )

## TYPICAL NOISE LEVELS

OPERATOR EAR (ISO 6394) ..... 83 dbA

### \*EXTERIOR SOUND RATING

(SAE J88 JUN 86) ..... 93 dbA

\*The above result is for the mode giving the highest exterior sound level when measured and operated as per the prescribed procedures of the standard. Results shown are for the unit in base configuration.

**Note:** Noise Level Exposure to the operator and bystander personnel may be higher depending upon proximity to buildings, rock piles, machinery etc.. The actual job site Noise Level Exposure must be measured and applicable regulations complied with in respect to Employee Hearing Protection.

## SERVICE CAPACITIES

Engine Crankcase and Filters .....	134 litres (35.4 US gal)
Transmission and Filters .....	100 litres (26 US gal)
Cooling System .....	304 litres (80.3 US gal)
Fuel Tank .....	1 090 litres (288 US gal)
Steering Hydraulic Tank .....	61 litres (16.1 US gal)
Steering System .....	72 litres (19 US gal)
Body and Brake Cooling Tank .....	297 litres (78.5 US gal)
Body and Brake Cooling System .....	564 litres (149 US gal)
Planetaries (Total) .....	57 litres (15.1 US gal)
Differential .....	61 litres (16.1 US gal)
Front Ride Strut (Each) .....	27 litres (7.1 US gal)
Rear Ride Strut (Each) .....	18 litres (4.8 US gal)
Power Takeoff .....	4 litres (1.1 US gal)
Air Conditioning Compressor .....	0.135 litres (0.036 US gal)

VEHICLE WEIGHTS (MASS)		
	kg	lb
Chassis, with hoists	53 240	117 380
Body, standard	15 380	33 900
Net Weight	68 620	151 280
<b>PAYLOAD, maximum</b>	<b>90 720</b>	<b>200 000</b>
Maximum Gross Weight*	159 340	351 280
FOR UNIT EQUIPPED WITH OPTIONAL BODY LINER PLATES:		
Chassis, with hoists	53 240	117 380
Body, with wear plates	20 910	46 100
Net Weight	74 150	163 480
<b>PAYLOAD, maximum</b>	<b>85 190</b>	<b>187 800</b>
Maximum Gross Weight*	159 340	351 280
* Maximum permissible gross vehicle weight with options, attachments, full fuel tank and payload.		
<b>WEIGHT DISTRIBUTION</b>	Front Axle	Rear Axle
Empty %	49	51
Loaded %	34	66

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## Welding



### WARNINGS

Before any welding is done on a machine equipped with any electronic systems, disconnect the following (if applicable) in this order: Battery earth cable, battery supply cable, alternator earth cables, alternator supply cables and electrical connections at the engine ECM, transmission ECU, body control lever, hydraulics ECU and cab bulkhead to avoid damage to electrical components. Turn off battery master switch to isolate the batteries before disconnecting any components. After welding connect all of the above in the reverse order.



Before any welding is done ensure all paint has been removed from the area to be welded. Failure to do so may result in hazardous fumes being given off from the paint.

**Note:** Always fasten the welding machines ground cable to the piece/frame being welded if possible.

Electric arc welding is recommended for all welded frame repairs. Since the nature and extent of damage to the frame cannot be predetermined, no definite repair procedure can be established. As a general rule however, if parts are twisted, bent or pulled apart, or a frame is bent or out of alignment, no welding should be done until the parts are straightened or realigned.

Successfully welded repairs will depend to a great extent upon the use of the proper equipment, materials and the ability of the welder. The Customer Support Department can be consulted regarding the feasibility of welding repairs.



### WARNING

Welding and flame cutting cadmium plated metals produce odourless fumes which are toxic. Recommended industrial hygiene practice for protection of the welding operator from the cadmium fumes and metallic oxides requires enclosure ventilation specifically designed for the welding process. A respiratory protective device such as the M.S.A. 'Gasfoe' respirator with G.M.A. cartridge will provide protection against cadmium, fumes and metallic oxides. The 'Gasfoe' respirator has been approved by the U.S. Bureau of Mines: Approval number 23B-10, and is designed to protect against gases, vapours, and/or metal fumes.

**Note:** The current from the welding rod always follows the path of least resistance. If, for example, the ground clamp is attached to the rear frame when welding is performed on the front frame, the current must pass a frame connection to return to the welding machine. Since the pivot coupling offers the least resistance but not a sound electrical connection, small electric arcs may be set up across the moving parts which may cause welding blotches on their wearing surfaces and increase the wear rate of these components.

## General Welding Procedure

The following general procedure should be used for the repair of defects outwith the vicinity of alloy steel castings.

1. Completely ARC-AIR gouge or grind out the crack until sound metal is reached. If ARC-AIR method is employed, pre-heat area to 100° C (212° F), measure 3 - 4" either side of repair prior to gouging. On completion of gouging grind to remove thin carbon layer.
2. Apply dye-penetrant check to ensure crack has been completely removed.

## General Information - Welding Procedure

---

Section 000-0010

3. Pre-heat area to 100° C (212° F), measured 3 - 4" either side of repair. Avoid local overheating.

4. Weld completely using E-7016 electrodes. Care must be taken to ensure electrodes are protected from moisture pick-ups at all times.

5. Allow repair weld to cool slowly.

6. Grind and blend repair to original contour. Paint heat damaged areas.

The following general procedure should be used for the repair of defects in alloy steel castings and in the welds joining steel castings.

1. Completely ARC-AIR gouge or grind out the crack until sound metal is reached. If ARC-AIR method is employed, pre-heat area to 200° C (392° F), measure

3 - 4" either side of repair prior to gouging. On completion of gouging grind to remove thin carbon layer.

2. Apply dye-penetrant check to ensure crack has been completely removed.

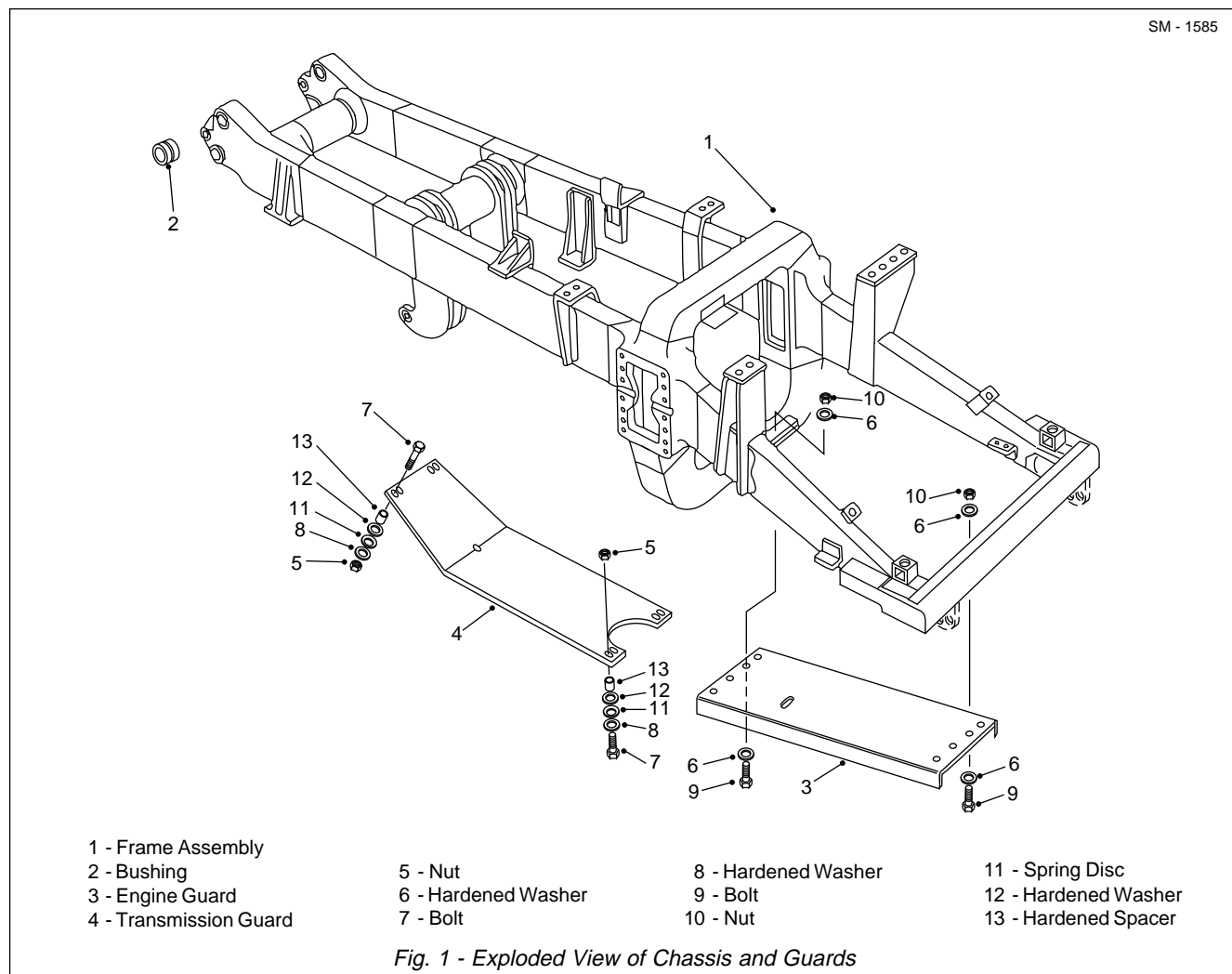
3. Pre-heat area to 200° C (392° F), measured 3 - 4" either side of repair. Avoid local overheating.

4. Weld completely using E-7016 electrodes. Care must be taken to ensure electrodes are protected from moisture pick-ups at all times.

5. On completion of welding, post-heat repair area to 400° C (752° F), measure 3 - 4" either side of repair.

6. If welding has to be interrupted for any reason, e.g. overnight, post-heat immediately as in Step 5.

\* \* \* \*



## REMOVAL



### WARNING

To prevent personal injury and property damage, be sure wheel chocks, blocking materials and lifting equipment are properly secured and of adequate capacity to do the job safely.

To remove any of the components shown in Figs. 1 through 6 (or similar components) the following procedures should be carried out.

1. Position the vehicle in a level work area, apply the parking brake and switch off the engine.
2. Turn steering wheel several times to relieve pressure in the steering circuit. Block all road wheels.

3. Attach a suitable lifting device to the component and remove mounting hardware. Remove the component from the vehicle.

## INSTALLATION

**Note:** Tighten all fasteners to standard torques listed in Section 300-0080, STANDARD BOLT AND NUT TORQUE SPECIFICATIONS.



### WARNING

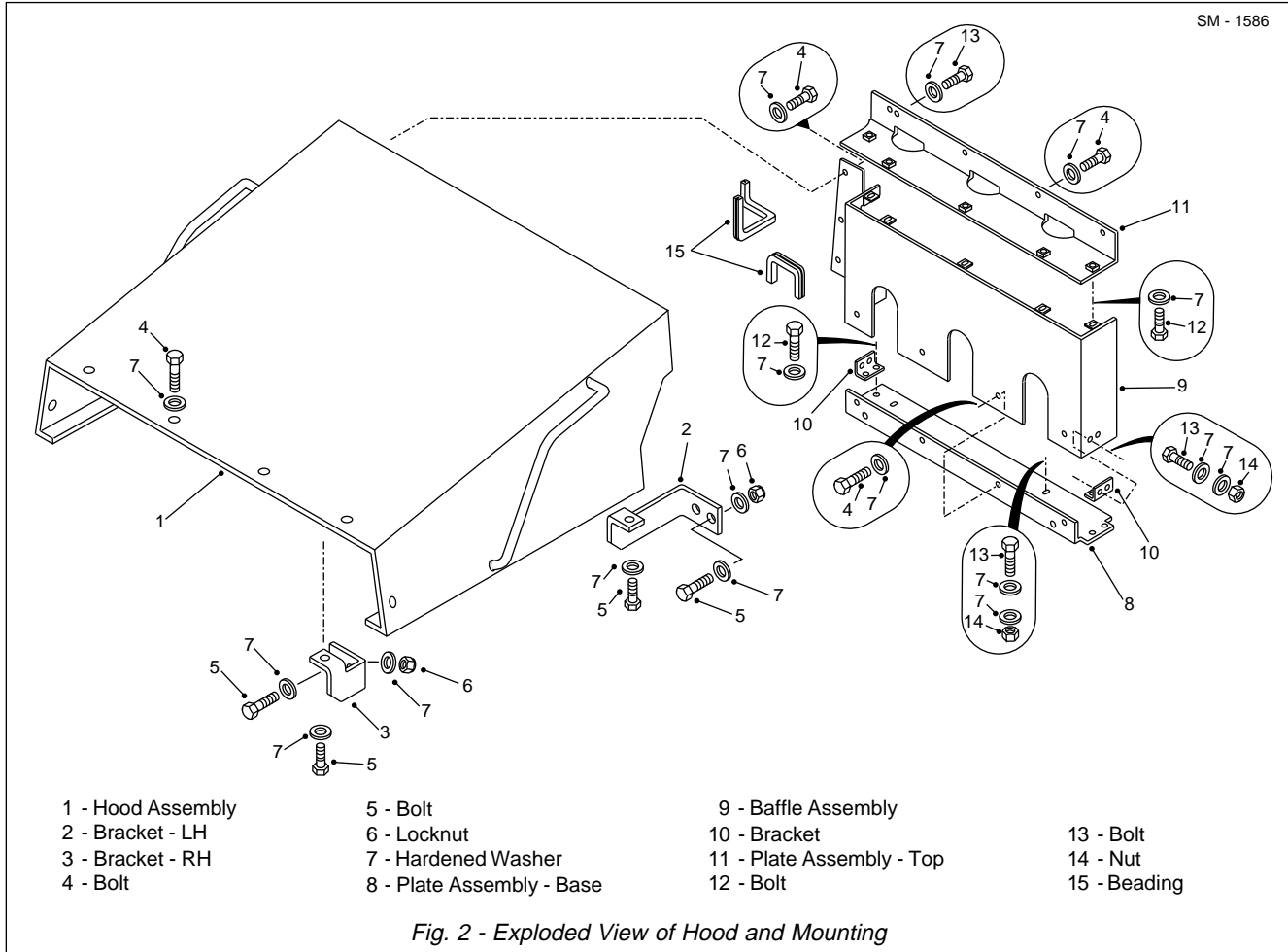
To prevent personal injury and property damage, be sure wheel chocks, blocking materials and lifting equipment are properly secured and of adequate capacity to do the job safely.

Using a suitable lifting device, align the component to be installed in position on the chassis. Secure the component securely to the chassis with mounting hardware removed during removal.

# Chassis - Chassis, Hood and Fenders

Section 100-00100

SM - 1586



## MAINTENANCE

### Inspection

Inspect the frame and attached parts at intervals not exceeding 250 hours for cracked or broken welds and bending/twisting of the frame. Any defects found should be repaired before they progress into major failures. Contact your dealer for recommended weld and repair instructions.

### Welding

**Note:** It is important that the electrical connections are disconnected in the following order to prevent damage to the electrical components:

- Disconnect battery equalizer ground cables.
- Disconnect battery cables from terminal posts (ground cable first).
- Disconnect battery equalizer positive cables.
- Disconnect electrical connections at the ECU.

After welding, reconnect all of the above in the reverse order.

### ⚠ WARNING

**Welding and flame cutting cadmium plated metals produce odourless fumes which are toxic. Recommended industrial hygiene practice for protection of the welding operator from the cadmium fumes and metallic oxides requires enclosure ventilation specifically designed for the welding process. A respiratory protective device such as the M.S.A. 'Gasfoe' respirator with G.M.A. cartridge will provide protection against cadmium, fumes and metallic oxides. The 'Gasfoe' respirator has been approved by the U.S. Bureau of Mines: Approval number 23B-10, and is designed to protect against gases, vapours, and/or metal fumes.**

Electric arc welding is recommended for all chassis welding. Since the nature and extent of damage to the frame cannot be predetermined, no definite repair procedure can be established. As a general rule however, if parts are twisted, bent or pulled apart, or a frame is bent or twisted, no welding should be done



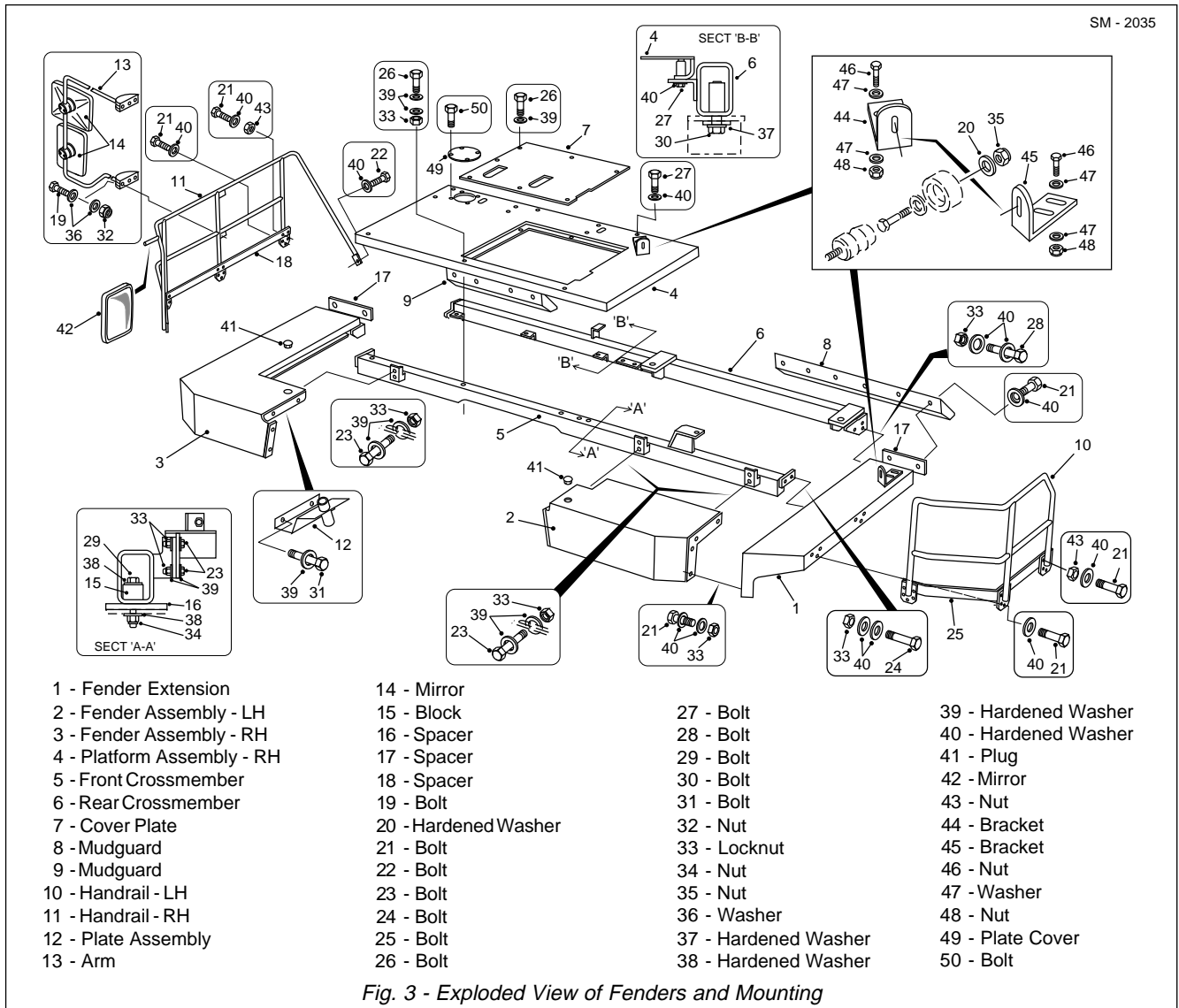


Fig. 3 - Exploded View of Fenders and Mounting

until the parts are straightened or realigned.

Successfully welded repairs will depend to a great extent upon the use of the proper equipment, materials and the ability of the welder. The Service Department can be consulted regarding the feasibility of welding repairs.

## Painting

A check of the condition of the paint should be made approximately twice a year and chassis repainted if necessary.

If painting of the actual frame of the unit is required,

thoroughly clean the areas to be painted. Apply a primer coat of red oxide and then a finish coat of polyurethane enamel.

To keep rust and corrosion to a minimum, periodic painting of abrasions and other exposed metal areas on the frame is highly recommended.

## SPECIAL TOOLS

There are no special tools required for procedures outlined in this section. Refer to Section 300-0070, SERVICE TOOLS for part numbers of general service tools required. These tools are available from your dealer.

# Chassis - Chassis, Hood and Fenders

Section 100-00100

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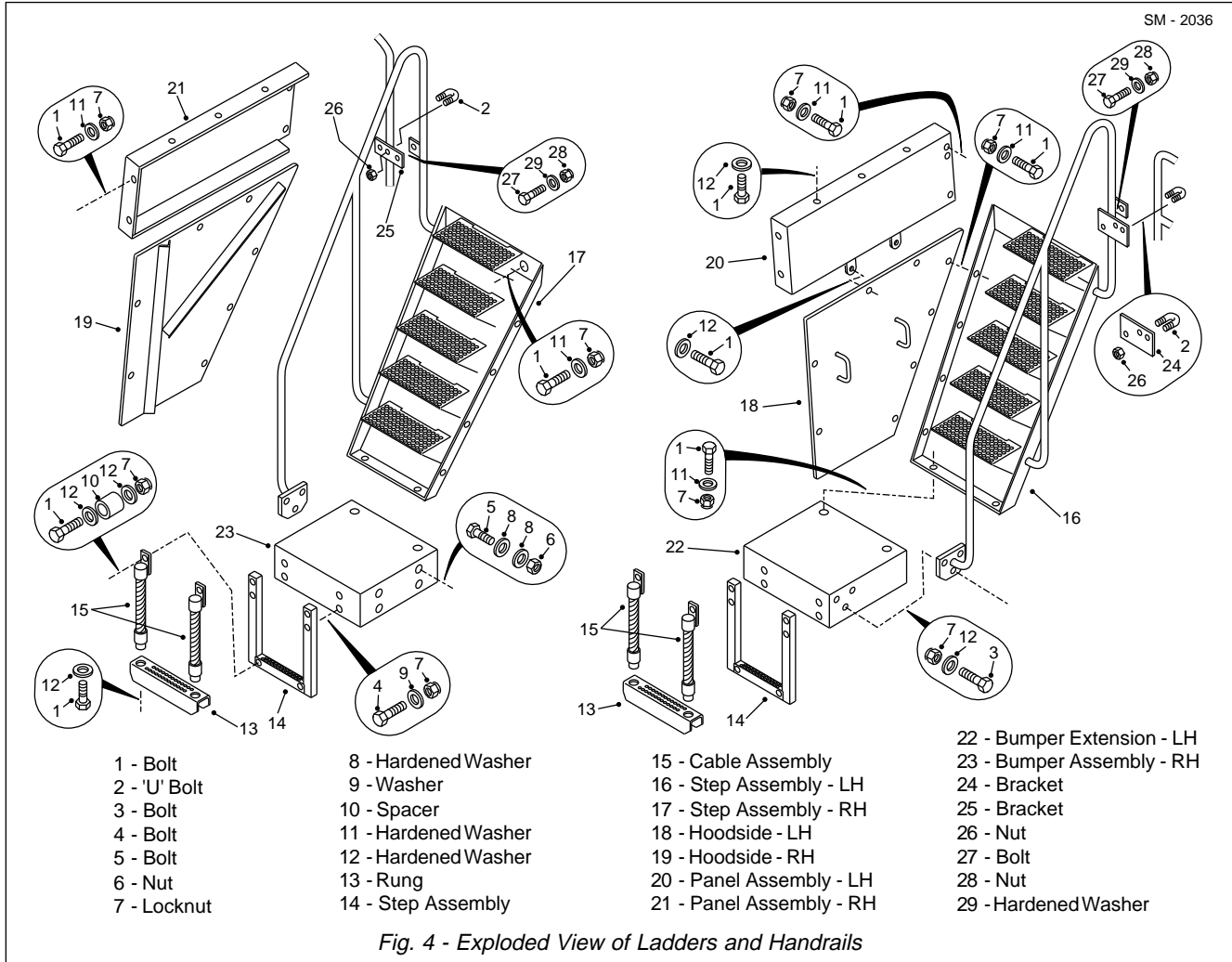
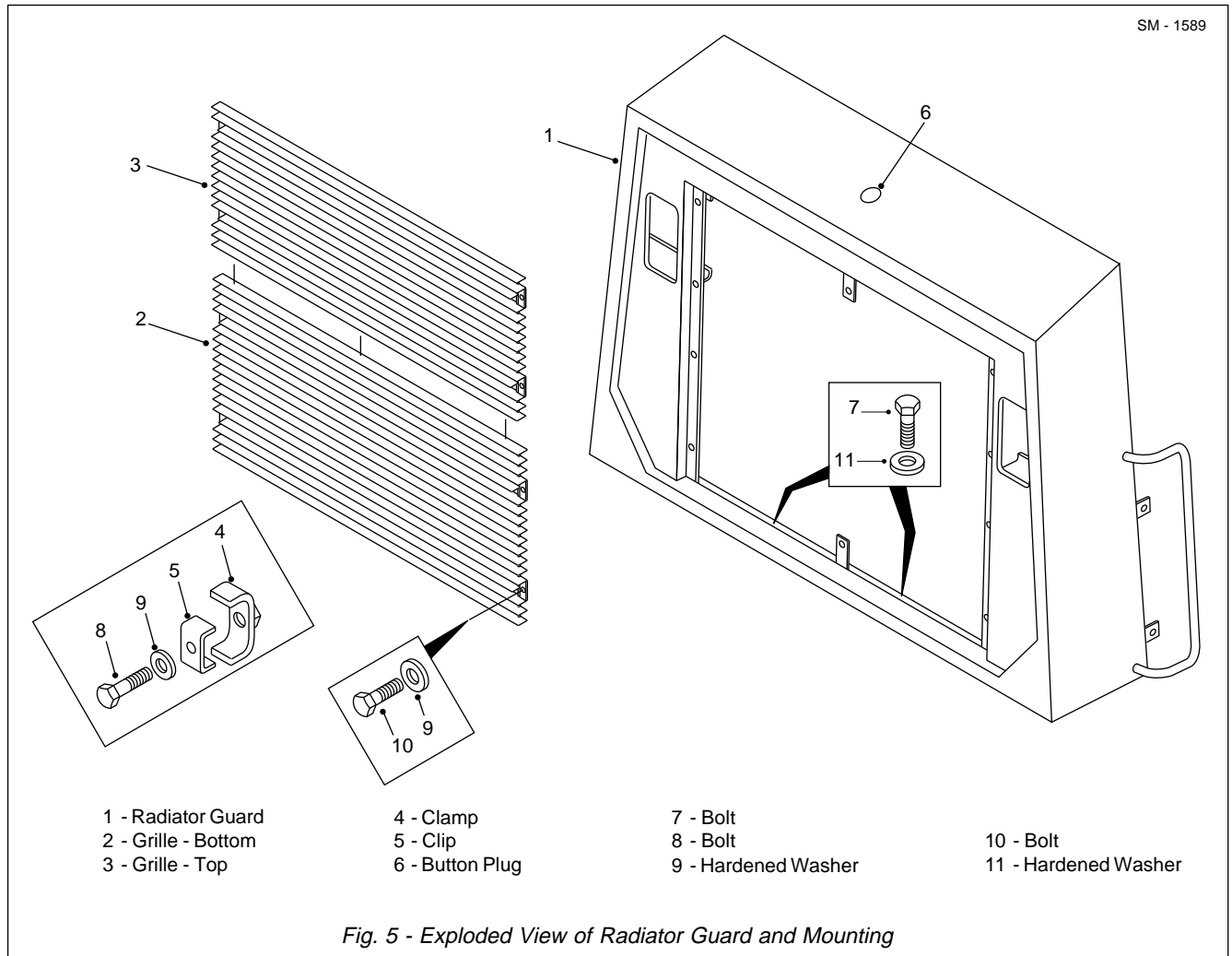


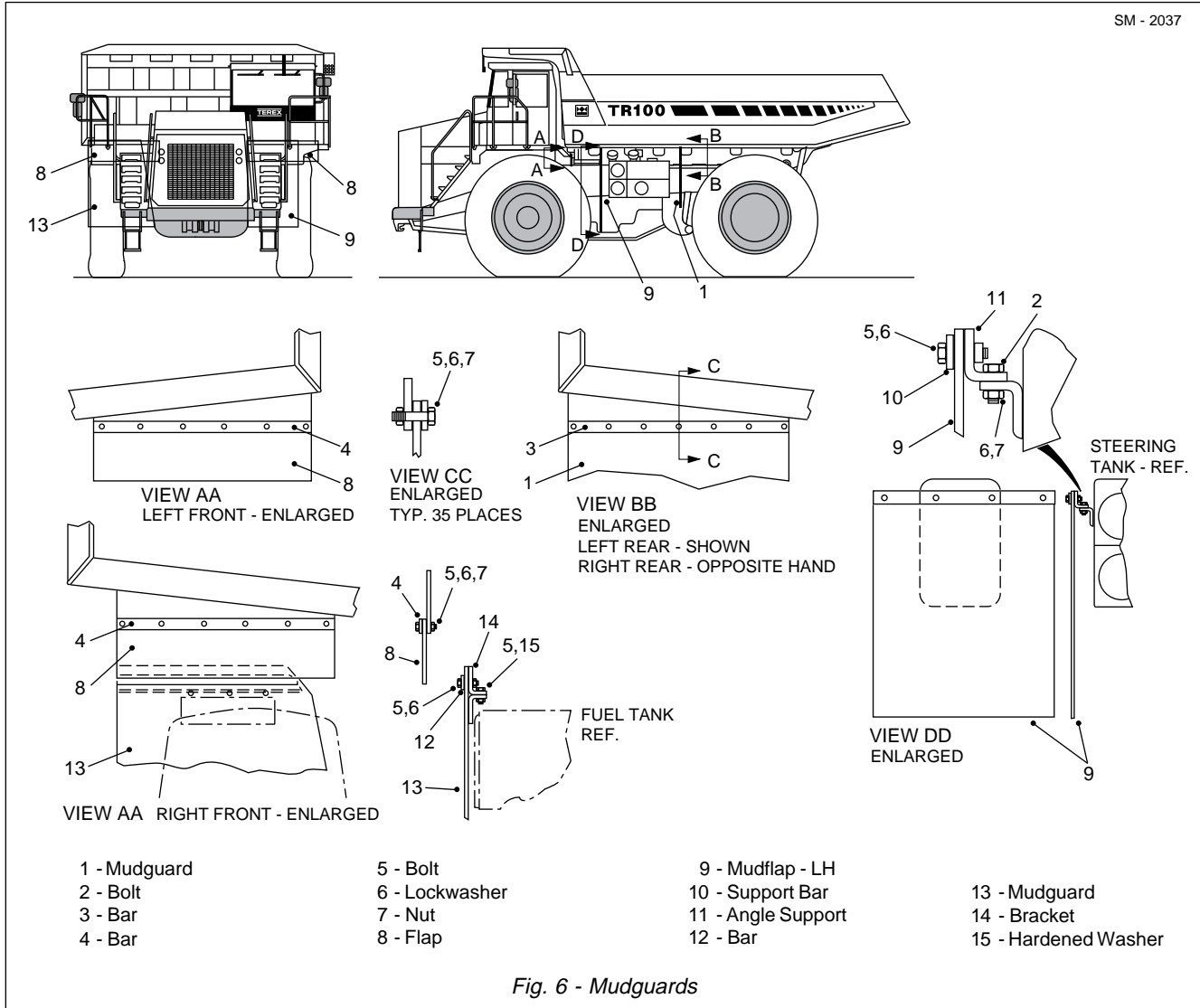
Fig. 4 - Exploded View of Ladders and Handrails



# Chassis - Chassis, Hood and Fenders

Section 100-00100

SM - 2037



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