

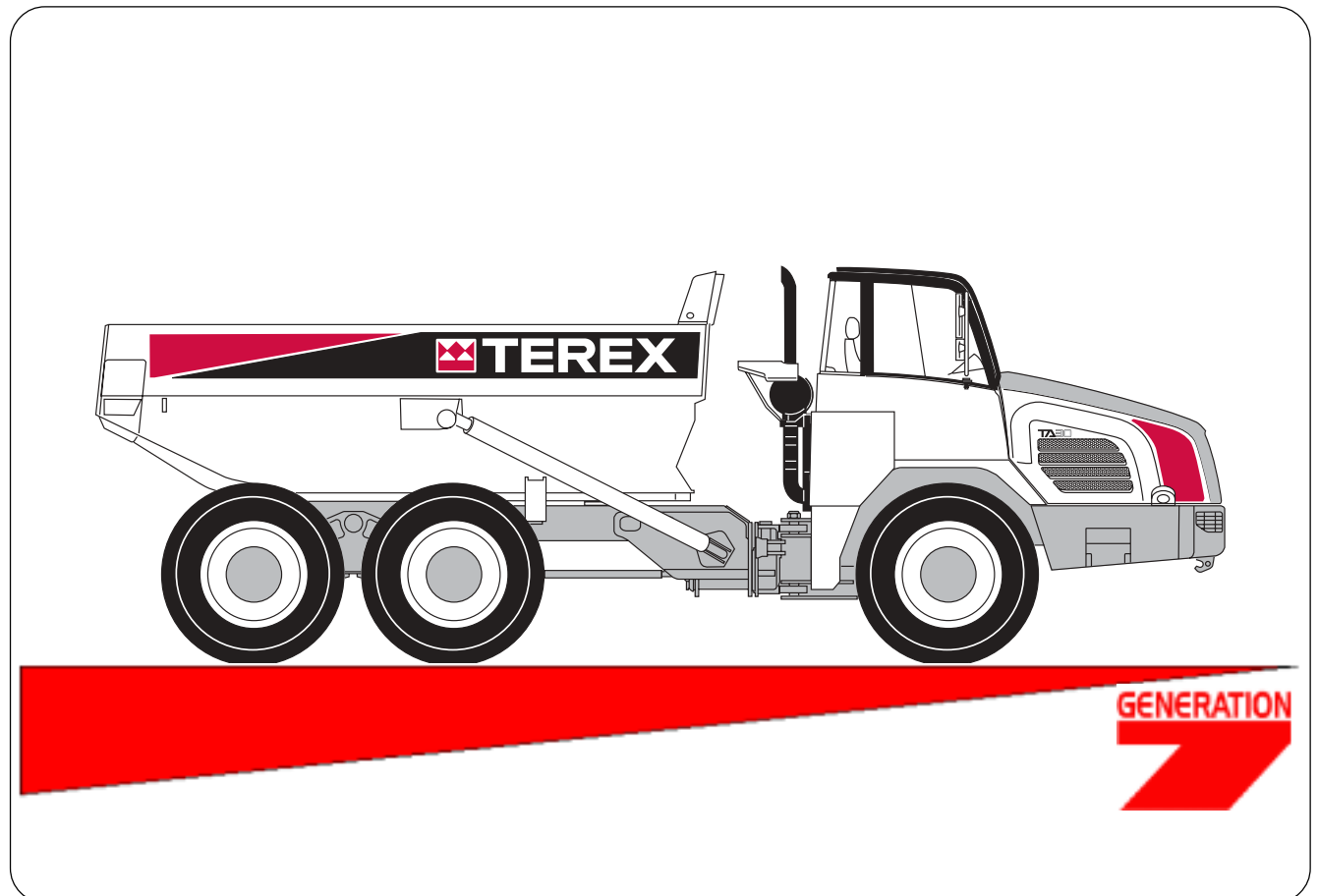
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**TEREX**

**TA30**

# Articulated Dumptruck Maintenance Manual



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CUSTOMER SUPPORT DEPARTMENT

TEREX EQUIPMENT LIMITED  
MOTHERWELL, SCOTLAND ML1 5RY

REF. NO. SM828

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# 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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## 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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\* \* \* \*

## Section 000-0000



# General Information - Technical Data

Section 000-0000

## AXLES

Three axles in permanent all-wheel drive with differential coupling between each axle to prevent driveline wind-up. Heavy duty axles with fully-floating axle shafts and outboard planetary reduction gearing.

Automatic limited slip differentials in each axle. Centre axle incorporates a through-drive differential to transmit drive to the rear axle. Locking of this differential is actuated simultaneously with the transmission output differential lock.

Ratios:

|                       |         |
|-----------------------|---------|
| Differential .....    | 3.44:1  |
| Planetary .....       | 6.35:1  |
| Total Reduction ..... | 21.85:1 |

## SUSPENSION

**Front:** Axle is carried on the leading arms of a sub-frame which pivots on the main frame. Suspension is by rubber elements with four heavy duty hydraulic dampers.

**Rear:** Each axle is coupled to the frame by three rubber-bushed links with lateral restraint by a transverse link. Pivoting inter-axle balance beams equalise load on each axle. Suspension movement is cushioned by rubber/metal laminated compression units between each axle and underside of balance beam ends. Pivot points on rear suspension linkages are rubber-bushed and maintenance-free.

## WHEELS AND TYRES

Wheels: ..... 5-piece earthmover rims with 12 stud fixing Size:

|                |                                      |
|----------------|--------------------------------------|
| Standard ..... | 25 x 19.50 in for 23.5 R25** tyres   |
| Optional ..... | 25 x 22.00 in for 750/65 R25** tyres |

Tyres:

|                |              |
|----------------|--------------|
| Standard ..... | 23.5 R25**   |
| Optional ..... | 750/65 R25** |

Inflation Pressures (Bridgestone):

|                  | Front                              | Rear                               |
|------------------|------------------------------------|------------------------------------|
| 23.5 R25** ..... | 4.75 bar (69 lbf/in <sup>2</sup> ) | 4.75 bar (69 lbf/in <sup>2</sup> ) |
| 750/65 R25** ..  | 3.25 bar (47 lbf/in <sup>2</sup> ) | 3.25 bar (47 lbf/in <sup>2</sup> ) |

Inflation Pressures (Michelin):

|                   | Front                             | Rear                              |
|-------------------|-----------------------------------|-----------------------------------|
| 23.5 R25** .....  | 4 bar (58 lbf/in <sup>2</sup> )   | 4 bar (58 lbf/in <sup>2</sup> )   |
| 750/65 R25** .... | 3.0 bar (44 lbf/in <sup>2</sup> ) | 3.0 bar (44 lbf/in <sup>2</sup> ) |

Inflation Pressures (Pirelli):

|                  | Front                             | Rear                              |
|------------------|-----------------------------------|-----------------------------------|
| 23.5 R25** ..... | 4.8 bar (70 lbf/in <sup>2</sup> ) | 4.8 bar (70 lbf/in <sup>2</sup> ) |

Inflation Pressures (Continental):

|                  | Front                             | Rear                              |
|------------------|-----------------------------------|-----------------------------------|
| 23.5 R25** ..... | 5.0 bar (73 lbf/in <sup>2</sup> ) | 5.0 bar (73 lbf/in <sup>2</sup> ) |

Inflation Pressures (Marangoni):

|                   | Front                             | Rear                              |
|-------------------|-----------------------------------|-----------------------------------|
| 750/65 R25** .... | 3.0 bar (43 lbf/in <sup>2</sup> ) | 3.0 bar (43 lbf/in <sup>2</sup> ) |

**Note:** Tyre pressures should be regarded as nominal only. 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.

## HYDRAULIC SYSTEM

Braking, steering and body hoist systems are controlled by a main hydraulic valve mounted on frame. Systems are supplied with oil from a common tank by the main hydraulic pump, driven from power takeoff on transmission. System components are protected by full flow filtration on the return line.

Pump:

|                                 |                               |
|---------------------------------|-------------------------------|
| Type .....                      | Piston                        |
| Capacity at 2 100 rev/min ..... | 4.9 litre/s (77.4 US gal/min) |

## Brakes

All hydraulic braking system with dry disc on each wheel with two heavy-duty callipers per disc. Independent circuits for front and rear brake systems. Warning lights and audible alarm indicate low brake system pressure. Brake system conforms to ISO 3450, SAE J1473.

Actuating Pressure ..... 103 bar (1 500 lbf/in<sup>2</sup>)

Discs:

|                 |                  |
|-----------------|------------------|
| Diameter .....  | 477 mm (18.8 in) |
| Thickness ..... | 16 mm (0.63 in)  |

Parking: Spring-applied, hydraulic-released disc on rear driveline.

Emergency: Automatic application of driveline brake should pressure fall in main brake hydraulic system. Service brakes may also be applied using the parking-emergency brake control.

Retardation: Hydraulic retarder integral with transmission, or optional engine brake.

## Steering

Hydrostatic power steering by two single-stage, double-acting, cushioned steering cylinders. Emergency steering pressure is provided by a ground driven pump mounted on the rear of the transmission. An audible alarm and warning light indicates should the emergency system activate. Conforms to ISO 5010, SAE J53.

System Pressure ..... 241 bar (3 500 lbf/in<sup>2</sup>)  
Steering Angle to either side ..... 45°  
Lock to Lock Turns, steering wheel ..... 4

## Body Hoist

Two single-stage, double-acting hoist rams, cushioned at both ends of stroke. Electro servo assisted hoist control.

System Pressure ..... 220 bar (3 200 lbf/in<sup>2</sup>)  
Control Valve ..... Pilot Operated, Closed Centre  
Body Raise Time (loaded) ..... 12 sec  
Body Lower Time (power down) ..... 7.5 sec

## ELECTRICAL SYSTEM

Type ..... 24 volt, Negative Ground  
Battery ..... Two, 12 Volt, 143 Ah each  
Accessories ..... 24 Volt  
Alternator ..... 70 Amp

## BODY

Of all welded construction, fabricated from high hardness (min. 360 BHN) 1 000 MPa (145 000 lbf/in<sup>2</sup>) yield strength steel. 25° tail chute angle provides good load retention without tailgate.

### Plate Thicknesses:

|                           |                 |
|---------------------------|-----------------|
| Floor and Tailchute ..... | 14 mm (0.55 in) |
| Sides .....               | 12 mm (0.47 in) |
| Front .....               | 8 mm (0.31 in)  |

### Volume:

|                        |                                             |
|------------------------|---------------------------------------------|
| Struck (SAE) .....     | 13.8 m <sup>3</sup> (18.0 yd <sup>3</sup> ) |
| Heaped 2:1 (SAE) ..... | 17.5 m <sup>3</sup> (22.9 yd <sup>3</sup> ) |

## SERVICE CAPACITIES

|                                           |                             |
|-------------------------------------------|-----------------------------|
| Fuel tank .....                           | 390 litres (103 US gal)     |
| Hydraulic System .....                    | 202 litres (53.4 US gal)    |
| Engine Crankcase and filters .....        | 41 litres (10.8 US gal)     |
| Cooling System .....                      | 54 litres (14.3 US gal)     |
| Transmission (including cooler) .....     | 63 litres (16.6 US gal)     |
| Differentials - Front & Rear (each) ..... | 17 litres (4.5 US gal)      |
| Differential - Centre .....               | 18.5 litres (4.9 US gal)    |
| Planetaries (each) .....                  | 3 litres (0.8 US gal)       |
| Hand Pump Tank .....                      | 1 litres (0.26 US gal)      |
| Air Conditioning Compressor .....         | 0.125 litres (0.033 US gal) |

## TYPICAL NOISE LEVELS

Operator Ear (ISO 6394) ..... 78 dbA

\*Exterior Sound Rating (ISO 6395) ..... 110 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 vehicle 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.

\* \* \* \*

| Vehicle Weights    |        | 23.5 R25 Tyres |  |
|--------------------|--------|----------------|--|
| Standard Vehicle   | kg     | lb             |  |
| Net Distribution   |        |                |  |
| Front Axle         | 11 720 | 25 840         |  |
| Centre Axle        | 5 300  | 11 685         |  |
| Rear Axle          | 5 400  | 11 905         |  |
| Vehicle, Net       | 22 420 | 49 430         |  |
| Payload            | 28 000 | 61 730         |  |
| Gross Distribution |        |                |  |
| Front Axle         | 16 800 | 37 040         |  |
| Centre Axle        | 16 720 | 36 860         |  |
| Rear Axle          | 16 900 | 37 360         |  |
| Vehicle, Gross     | 50 420 | 111 260        |  |
| Bare Chassis       | 17 490 | 38 560         |  |
| Body               | 4 400  | 9 700          |  |
| Body Hoists (Pair) | 530    | 1 170          |  |

| Ground Pressures                                        |                    |                    |
|---------------------------------------------------------|--------------------|--------------------|
| At 15% sinkage of unloaded radius and specified weights |                    |                    |
| 23,5 R25                                                | Net                | Loaded             |
| Front                                                   | 115 kPa (16.7 psi) | 165 kPa (23.9 psi) |
| Rear                                                    | 52 kPa (7.5 psi)   | 165 kPa (23.9 psi) |
| 750/65 R25                                              | Net                | Loaded             |
| Front                                                   | 90 kPa (13.1 psi)  | 128 kPa (18.6 psi) |
| Rear                                                    | 41 kPa (5.9 psi)   | 111 kPa (18.6 psi) |



## 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.

\* \* \* \*

SM - 2783

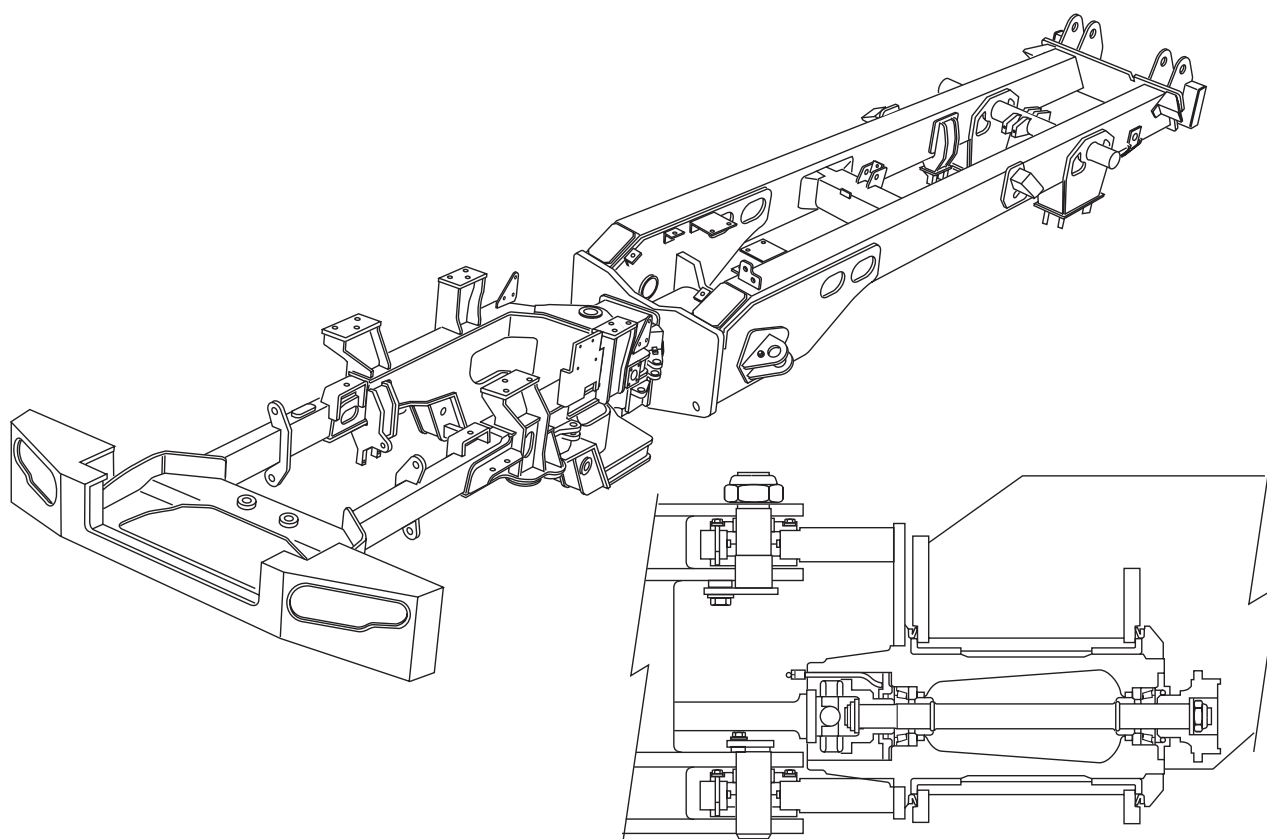


Fig. 1 - General Arrangement of Frame Assemblies

## DESCRIPTION

The chassis consists of two separate frame assemblies which provide the articulation of the unit. The front and rear frames are constructed of all welded high-grade steel fabrications with rectangular box section beams forming main, side and cross members.

The front frame is fabricated to form a rigid structure which carries the cab, power train and suspension system.

The rear frame is fabricated to form a rigid structure which carries the body, body hydraulics, suspension and rear drive axles.

Steering is by frame articulation to 45° either side by two widely spaced vertical pivot pins in taper roller bearings. Oscillation between the front and rear frames is provided by a large diameter cylindrical coupling carried on nylon bushes located in the rear frame. Longitudinal shocks are absorbed by the thrust faces of the nylon bushes. A large thrust nut, which is threaded to the end of the coupling and locked to the frame, secures the coupling in position. Wear on the

thrust faces of the bushes is compensated by tightening this thrust nut.

## INSPECTION AND MAINTENANCE

### Inspection

Inspect the frames and attached parts at intervals not exceeding 250 hours for cracked or broken welds and bending of the frame. Any defects found should be repaired before they progress into major failures.

### Straightening

Hydraulic straightening or aligning equipment should be used to straighten bent or twisted frames whenever possible. However, if heat must be applied, never heat the metal beyond a dull, cherry red colour, as too much heat will weaken the metal. When it is necessary to heat the metal, apply heat uniformly over the area to be straightened and protect the heated surface from sudden cooling. Frame parts that cannot be straightened should be renewed.

# Chassis - Frames

Section 100-0010

## Welding



### WARNINGS

Before any welding is done on a machine equipped with the Quantum Electronic Fuel System, disconnect the following in this order: Battery earth cable, battery supply cable, alternator earth cables, alternator supply cables, body hydraulics joystick and electrical connections at the engine ECM, transmission ECU and hydraulics ECU 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.

## Reinforcement

Frame reinforcement can be made with channel or angle or flat structural stock. Whenever possible, the reinforcement should extend well beyond the bent, broken or cracked area. The reinforcement stock thickness should not exceed that of the frame stock and the material should be of the same tensile strength.

## Painting

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

**WARNING**

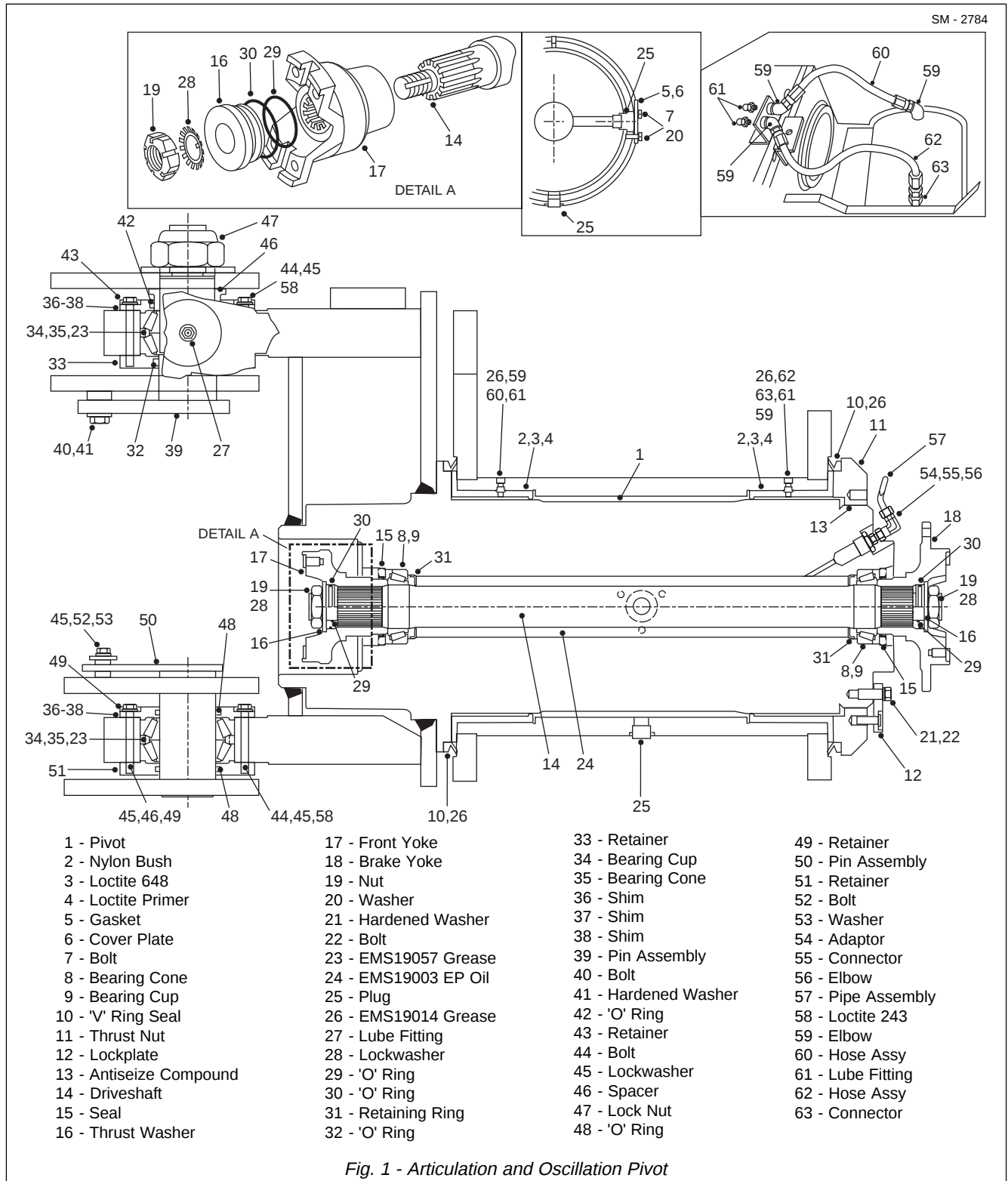
**Welding, burning, heating or dressing surfaces previously painted using polyurethane paint produces fumes which are toxic. Surfaces must be prepared using paint stripper prior to area being reworked. Recommended Industrial Hygiene and Safety Rules should be followed for protection of the welding operator from the fumes.**

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

If painting of a frame is required, thoroughly clean the areas to be painted. Apply a primer coat of polyurethane red oxide and then a finish coat of polyurethane enamel.

\* \* \* \*





## DESCRIPTION AND OPERATION

The articulation and oscillation pivot allows the front and rear frames to rotate horizontally (articulation) and tilt laterally (oscillation) with respect to each other. It is also the main load bearing coupling between the two frames. The pivot assembly houses the driveshaft

connecting the drive between the front and rear frames.

Articulation bearings, oscillation bushes, pivot driveshaft bearings and associated parts can be removed, inspected and replaced or renewed by

# Chassis - Articulation and Oscillation Pivot

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following the procedures outlined in this section.

## THRU-DRIVE DRIVESHAFT

Numbers in parentheses refer to Fig. 1, unless otherwise specified.

**Note:** The following procedures assume that only thru-drive components require repair.

**Note:** Tighten all fasteners without special torques specified to torques listed in Section 300-0080, STANDARD BOLT AND NUT TORQUE SPECIFICATIONS.



### WARNINGS

**To prevent personal injury and property damage, be sure wheel blocks are properly secured and of adequate capacity to do the job safely.**



**When necessary to drive out or drive on components during disassembly/assembly, be sure to use a soft drift to prevent property damage and personal injury.**

## Removal and Disassembly

1. Position the vehicle on a level work area and apply parking brake.

2. Raise body and install body safety prop to secure body in partially raised position.

3. Shut down engine and block all wheels securely.

4. Identify the relationship of the driveline caps to the transmission yoke and front yoke (17). Remove capscrews and remove driveline from vehicle. Refer to Section 130-0010, FRONT AND REAR DRIVELINES.

**Note:** Take extra care when handling drivelines as any deformity on a rotating mass creates vibration and excessive wear during any operation.

5. Remove wheel blocks, start engine and steer vehicle into a full left-hand lock. Shut down engine and block all wheels securely.

6. Remove front nut (19), lockwasher (28) and thrust washer (16) from driveshaft (14). Reinstall nut (19) temporarily onto driveshaft (14) to protect the threads.

7. Remove and discard 'O' rings (29 & 30) from thrust washer (16).

8. Place a suitable container under the front of the pivot and pull front yoke (17) from driveshaft (14).

9. Disconnect mounting hardware securing protective guard (if fitted), from beneath the parking brake disc, to the rear frame.

10. Release the parking brake by turning the hex-head on the parking brake slack adjuster fully anticlockwise.



### WARNING

**Tensioned spring on adjuster.**

11. Remove mounting hardware securing parking brake assembly to mounting bracket on frame, then secure parking brake assembly clear of brake disc.

12. Identify the relationship of the driveline caps to brake yoke (18). Remove capscrews, disconnect driveline and secure clear of brake yoke.

13. Remove mounting hardware securing parking brake disc to brake yoke (18) and remove brake disc.

14. Withdraw driveshaft assembly (14) from housing by pulling rearwards on parking brake disc/brake yoke assembly (18). If necessary, tap front end of driveshaft (14) to ease removal, take care to avoid damaging threads. Place driveshaft (14) assembly on work bench for further disassembly.

15. Prise out and discard seal (15) from front of the housing.

16. Lift out front bearing assembly cup (9) from front of the housing.

17. If bearing replacement is required, use a suitable puller to remove front and rear bearing assembly cups (9) from the housing.

**Note:** If either bearing assembly cup or cone (9 or 8) need replacing, they must be replaced as a set.

18. If retaining rings (31) need replacing, use a suitable drift or puller to remove them from the housing.

19. Remove front nut (19) then temporarily install front yoke (17) fully onto front of driveshaft (14) and suitably restrain to resist rotation.

20. Remove rear nut (19), lockwasher (28), thrust washer (16), and brake yoke (18) from driveshaft (14). Identify front and rear ends of driveshaft (14).

21. Remove and discard 'O' rings (29 & 30) from thrust washer (16).

22. Remove and discard seal (15) from driveshaft (14).

23. If bearing replacement is required, use a suitable puller or drift to remove rear bearing assembly cone (8) from driveshaft (14).

24. Reinstall nuts (19) on driveshaft (14) to protect the threads.

## Inspection

1. Clean all parts with a suitable solvent and let dry. DO NOT spin bearings with compressed air. Place bearings on a clean surface, cover with a lint free cloth and allow to dry.

2. Check bearing assemblies cups and cones (9 & 8) for wear or damage. Renew as necessary.

**Note:** If either bearing assembly cup or cone (9 or 8) need replacing, they must be replaced as a set.

3. Inspect splines of driveshaft (14) and yokes (17 & 18) for nicks, burrs or excessive wear. Replace if wear is excessive or splines are nicked. Burrs may be removed with a fine file or medium India stone.

4. Check yokes (17 & 18) for damage in region polished by oil seal lip; even slight damage in this area can cause leakage. Very slight marks may be polished out with fine emery cloth but it is essential that polishing marks are parallel to the seal lip.

5. Replace all seals and 'O' rings with new parts.

## Assembly and Installation

1. If removed, use a suitable driver and install retaining rings (31) into housing, ensuring that they butt hard against abutment shoulders.

2. Using a suitable driver, install front and rear bearing assembly cups (9) into housing, ensuring that they butt hard against abutment shoulders.

3. Lightly oil both bearing assembly cones (8) with EMS19003 E. P. gear oil (24).

4. Using a suitable driver, install rear bearing assembly cone (8) on rear end of driveshaft (14). Temporarily install brake yoke (18), thrust washer (16) and nut (19) to driveshaft (14). Tighten nut (19) until the yoke (18) bottoms out on the driveshaft (14).

5. Remove nut (19), thrust washer (16) and brake yoke (18) from driveshaft (14). The distance from the end of the bearing cone (8) to the end of the spline should be 60mm.

6. Install driveshaft (14) through the housing from the rear.

7. Using a suitable driver, install front bearing assembly cone (8) on driveshaft (14).

8. Using a suitable driver, install seals (15) into ends of housing, ensuring that they butt hard against abutment shoulders.

9. Install brake yoke (18) on rear of driveshaft (14) until it butts against bearing assembly cone (8).

10. Install 'O' rings (29 & 30) to thrust washer (16) and install assembly on rear of driveshaft (14).

11. Install rear nut (19) temporarily on rear of driveshaft (14) and tighten.

12. Install front yoke (17) on driveshaft (14) until it butts against bearing assembly cone (8).

13. Install 'O' rings (29 & 30) to thrust washer (16) and install assembly on front of driveshaft (14).

14. Install nut (19) and lockwasher (28) to front threads of driveshaft (14). Prevent driveshaft (14) from turning by restraining brake yoke (18).

15. Tighten nut (19) and bend at least one lockwasher (28) tab into nut (19). If required back off nut (19) until the first available tab lines up with a slot in the nut (19).

16. Tighten nut (19) at rear of driveshaft (14) to a torque of 250 Nm (180 lbf ft) to seat bearing cup and cone assemblies (9 & 8).

17. Chap driveshaft (14) at both ends with a hide-faced hammer. Re-torque nut (19) to 250 Nm (180 lbf ft).

18. Back off nut (19) four flats, and chap rear end of driveshaft (14) with a hide-faced hammer to remove pre-load from bearing cup and cone assemblies (9 & 8).

19. Remove nut (19) from rear of driveshaft (14), install lockwasher (28) and reinstall nut (19).

20. Set up dial indicator with pointer positioned on rear

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end face of driveshaft (14). Push and pull on parking brake disc to move driveshaft (14) backwards and forwards, remembering to rotate shaft at the same time to obtain an accurate reading. Note dial indicator reading.

21. Tighten nut (19) until end play on driveshaft (14) can just be felt. Take dial indicator reading of end play. Tighten nut (19) until end play on driveshaft (14) is 0.05 - 0.15 mm (0.002 - 0.006 in).

**Note:** One flat on nut (19) turned is equivalent to 0.025 mm (0.001 in) axial movement.

22. When correct end play is obtained, remove dial indicator and secure nut (19) by bending the first available lockwasher (28) tab into nut (19). Recheck end play.

23. Install parking brake disc on brake yoke (18) and secure with bolts and washers. Tighten bolts to a torque of 49 Nm (36 lbf ft).

24. Install parking brake assembly to mounting brackets and secure with bolts, washers and nuts. Tighten bolts to a torque of 75 Nm (55 lbf ft). Refer to Section 170-0010, PARKING BRAKE AND MOUNTING.

25. Apply the parking brake by turning the hex-head on the parking brake slack adjuster fully clockwise.

26. Apply Loctite 638 to the threads of capscrews used to mount driveline to brake yoke (18). Align match marks and install driveline. Tighten capscrews to a torque of 153 Nm (113 lbf ft). Refer to Section 130-0010, FRONT AND REAR DRIVELINES.

27. Apply Loctite 638 to the threads of capscrews used to mount driveline between transmission yoke and front yoke (17). Align match marks and install driveline. Tighten capscrews to a torque of 153 Nm (113 lbf ft). Refer to Section 130-0010, FRONT AND REAR DRIVELINES.

28. Remove bolts (7), washers (20), gasket (5) and cover plate (6) from side of oscillation hub to gain access to filler/level hole plug (25) on pivot assembly (1). Remove filler/level plug (25).

29. Add EMS19003 E. P. gear oil (24) through filler/level hole in pivot assembly (1) until the oil is level with the bottom of filler/level hole.

30. Remove plug (25) from underside of oscillation hub to drain the cavity between the oscillation hub and

pivot assembly (1) of any oil that entered while filling the driveshaft bearing housing.

31. Install plug (25) into filler/level hole on pivot assembly (1). Install gasket (5) and cover plate (6) on side of oscillation hub, secure with bolts (7) and washers (20).

32. Install plug (25) into cavity drain port on underside of oscillation hub.

33. Install parking brake disc protective guard (if fitted) and secure with bolts, washers and nuts.

34. Start engine, raise body, lower body safety prop and lower body.

35. Remove wheel blocks.

## ARTICULATION COMPONENTS

Numbers in parentheses refer to Fig. 1, unless otherwise specified.

**Note:** The following procedures assume that only components associated with articulation require repair.

**Note:** It is essential that the grease used for articulation components is EMS19057 grease (23), as specified in Section 300-0020, LUBRICATION SYSTEM.

**Note:** Tighten all fasteners without special torques specified to torques listed in Section 300-0080, STANDARD BOLT AND NUT TORQUE SPECIFICATIONS.



### WARNINGS

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



**When necessary to drive out or drive on components during disassembly/assembly, be sure to use a soft drift to prevent property damage and personal injury.**

## Disconnecting Front and Rear Frames

**Note:** The front and rear frames can be separated sufficiently to permit disassembly/assembly of the articulation components without disconnecting hydraulic lines or electrical wiring.

1. Position the vehicle on a level work area and apply parking brake.
2. Raise body and install body safety prop to secure body in partially raised position.
3. Shut down engine and block all wheels securely.
4. Identify the relationship of the driveline caps to the transmission yoke and front yoke (17). Remove capscrews and remove driveline from vehicle. Refer to Section 130-0010, FRONT AND REAR DRIVELINES.
5. Support tractor frame at front and rear with suitably placed stands or timbers so the frame will remain level during and after pin removal.
6. Remove bolts, washers and pins securing steering cylinders to pivot. Secure steering cylinders clear of pivot. Refer to Section 220-0120, STEERING CYLINDER.
7. Release the parking brake by turning the hex-head on the parking brake slack adjuster fully anticlockwise.



**WARNING**  
Tensioned spring on adjuster.

8. Attach suitable lifting equipment to pivot/rear frame assembly. Lifting equipment must prevent pivot from oscillating after separation, and, be capable of pulling pivot/rear frame assembly clear of front frame. Raise lifting equipment to support pivot/rear frame assembly.
  9. Remove nut (47) securing upper pin (39). Remove bolt (40) and washer (41) securing upper pin (39) to tractor frame.
  10. Remove upper pin (39). If necessary tap upper pin (39) to ease removal taking care to avoid damaging the threads.
- Note:** It may be necessary to relieve binding between the pin and pin bores by raising or lowering the pivot/rear frame assembly.
11. Remove bolt (52), lockwasher (45) and washer (53) securing lower pin (50).
  12. Remove lower pin (50). If necessary tap lower pin (50) to ease removal taking care to avoid damaging the pin.

**Note:** Only separate the frames sufficiently to permit removal of the articulation bearings or damage to

hydraulic and electrical connections could result.

13. Remove blocks from rear wheels and use lifting equipment to pull pivot/rear frame assembly clear of the front frame. After moving, block pivot/rear frame assembly and block the wheels.

14. Remove spacer (46) noting orientation to ensure correct installation.

## Disassembly

1. Identify retainers (33, 43, 49 & 51) to ensure correct location on assembly/installation.

**Note:** Retainers (33, 43, 49 & 51) are not interchangeable.

2. Remove bolts (44), lockwashers (45), retainers (33, 43, 49 & 51) and upper and lower shims (36, 37 & 38).
3. Prise out and discard 'O' rings (32, 42 & 48) from the retainers.
4. Remove and tag all bearing assemblies (34 & 35) with spacers to ensure correct assembly/installation.

**Note:** Bearing assemblies (34 & 35) and spacers are a matched set, never interchange cups, cones or spacers between sets.

## Inspection

1. Clean all parts with a suitable solvent and let dry. DO NOT spin bearings with compressed air. Place bearings on a clean surface, cover with a lint free cloth and allow to dry.
2. Check bearing assemblies (34 & 35) and spacers, and pins (39 & 50) for wear or damage. Renew as necessary.

**Note:** Bearing assemblies (34 & 35) and spacers must be renewed as a matched set.

3. Replace all seals with new parts.

## Assembly

1. Secure retainers (33 & 51) temporarily to pivot bores with bolts (44).

**Note:** Bearing assemblies (34 & 35) and spacers are a matched set, never interchange cups, cones or spacers between sets.

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2. Using EMS19057 grease (23), pack bearing assemblies (34 & 35), including end faces, and install bearings using a suitable driver.

3. Remove bolts (44) and retainers (33 & 51) from pivot bores.

4. Temporarily install retainers (43 & 49) to pivot bores. Ensure pressure relief hole is opposite the grease nipple (27). Install retainers (33 & 51) to pivot bores and secure with bolts (44) and washers (45). Tighten bolts (44) to a torque of 27 Nm (20 lbf ft).

5. Using feeler gauges, as shown in Fig. 2, measure the dimension between the top pivot faces and retainers (43 & 49). Measure at 3 positions equally spaced around retainers and determine average dimension, this is the size of shims (36 - 38) required.

6. Remove bolts (44), washers (45) and retainers (43 & 49).

7. Install shims (36 - 38) as calculated at Step 5, reinstall retainers (43 & 49) and secure with bolts (44), coated with sealant (58), and washers (45). Tighten bolts (44) to 106 - 116 Nm (78 - 86 lbf ft).

8. Install seals (32, 42 & 48) into retainers (33, 43, 49 & 51).

4. Remove blocks from rear wheels and blocking from pivot/rear frame assembly. Using lifting equipment, pull pivot/rear frame assembly to align pivot bearing bores and front frame pin bores. Block wheels and block pivot/rear frame assembly to remain level and stationary.

5. Freeze upper and lower pins (39 & 50) to ease installation.

6. Smear upper pin (39) and bearing bores with EMS19057 grease (23) and install through front frame and bearing bores. Fit nut (47), with anti-seize compound, and tighten to pull assembly into position. Tighten nut (47) to a torque of 1425 Nm (1050 lbf ft).

**Note:** It may be necessary to relieve binding between the pin and pin bores by raising or lowering pivot/rear frame assembly.

7. Secure upper pin (39) with bolt (40) and hardened washer (41).

8. Smear lower pin (50) and bearing bores with EMS19057 grease (23) and install through front frame and bearing bores.

9. Secure lower pin (50) with bolt (52), lockwasher (45) and washer (53).

### Connecting Front and Rear Frames

1. Install spacer (46) in upper outer seal housing (43), as noted on removal.

2. Smear bearing and pin bores with EMS19057 grease (23).

3. Attach suitable lifting equipment to pivot/rear frame assembly. Lifting equipment must prevent pivot from oscillating and be capable of pulling pivot/rear frame assembly to align pivot bearing bores and front frame pin bores. Raise lifting equipment to support pivot/rear frame assembly.

### Final Assembly

1. Apply parking brake by turning the hex-head on the parking brake actuator fully clockwise.

2. Remove lifting equipment from pivot/rear frame assembly.

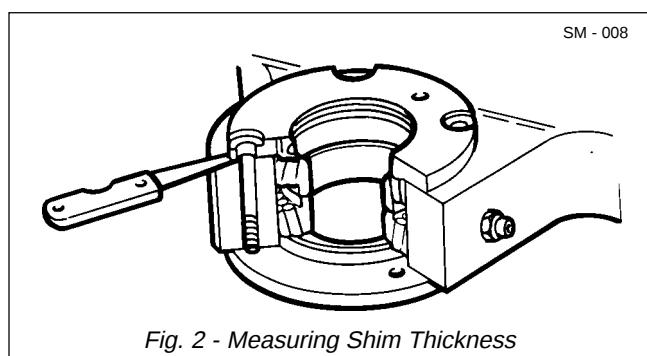
3. Remove stands or timbers from front frame.

4. Apply Loctite 270 to the threads of capscrews used to mount driveline between transmission yoke and front yoke (17). Align match marks and install driveline. Tighten capscrews to a torque of 153 Nm (113 lbf ft).

5. Align steering cylinder bores and mounting pin bores on pivot, install pins and secure with bolts and washers.

6. Fill bearing housings with EMS19057 grease (23), through lube fittings (27), until excess grease starts to escape from retainers (43 & 49).

7. Start engine, raise body, lower body safety prop and lower body.



8. Remove wheel blocks.

## OSCILLATION COMPONENTS

Numbers in parentheses refer to Fig. 1.

**Note:** The following procedure assumes that only components associated with oscillation require repair.

**Note:** It is necessary to disconnect the front and rear frames at the articulation point to service the oscillation components.

**Note:** It is essential that the grease used for oscillation components is EMS19014 grease (26), as specified in Section 300-0020, LUBRICATION SYSTEM.

**Note:** Tighten all fasteners without special torques specified to torques listed in Section 300-0080, STANDARD BOLT AND NUT TORQUE SPECIFICATIONS.



### WARNINGS

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



**When necessary to drive out or drive on components during disassembly/assembly, be sure to use a soft drift to prevent property damage and personal injury.**



**Hydraulic fluid pressure will remain within the braking system after engine shut down. Operate the treadle pedal continuously until the pressure has dissipated before carrying out any work on the braking system or serious injury could result.**

## Disconnecting Front and Rear Frames

1. Position the vehicle on a level work area and apply parking brake.

2. Raise body and install body safety prop to secure body in partially raised position.

3. Shut down engine and block all wheels securely.

4. Depress and release brake pedal continuously to relieve the pressure in the braking system.

5. Identify the relationship of the driveline caps to the transmission yoke and front yoke (17). Remove

capscrews and remove driveline from vehicle. Refer to Section 130-0010, FRONT AND REAR DRIVELINES.

6. Support tractor frame at front and rear with suitably placed stands or timbers so the frame will remain level during and after pin removal.

7. Remove bolts, washers and pins securing steering cylinders to pivot. Secure steering cylinders clear of pivot. Refer to Section 220-0120, STEERING CYLINDER.

8. Release the parking brake by turning the hex-head on the parking brake slack adjuster fully anticlockwise.



### WARNING

**Tensioned spring on adjuster.**

9. Attach suitable lifting equipment to pivot/rear frame assembly. Lifting equipment must prevent pivot from oscillating after separation, and, be capable of pulling pivot/rear frame assembly clear of front frame. Raise lifting equipment to support pivot/rear frame assembly.

10. Remove nut (47) securing upper pin (39). Remove bolt (40) and washer (41) securing upper pin (39) to tractor frame.

11. Remove upper pin (39). If necessary tap upper pin (39) to ease removal taking care to avoid damaging the threads.

**Note:** It may be necessary to relieve binding between the pin and pin bores by raising or lowering the pivot/rear frame assembly.

12. Remove bolt (52), lockwasher (45) and washer (53) securing lower pin (50).

13. Remove lower pin (50). If necessary tap lower pin (50) to ease removal taking care to avoid damaging the pin.

14. Remove blocks from rear wheels and use lifting equipment to pull pivot/rear frame assembly clear of the front frame. After moving, block pivot/rear frame assembly and block the wheels.

15. Remove spacer (46) noting orientation to ensure correct installation.

## Disassembly

1. Remove protective guard (if fitted) from beneath parking brake disc by removing mounting hardware

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securing guard to the rear frame. Refer to Section 170-0010, PARKING BRAKE AND MOUNTING.

2. Remove mounting hardware securing parking brake assembly to mounting bracket on frame. Remove and secure parking brake assembly clear of brake disc.

3. Identify the relationship of the driveline caps to brake yoke (18). Remove capscrews, disconnect driveline and secure clear of brake yoke (18).

4. Remove mounting hardware securing parking brake disc to brake yoke (18) and remove brake disc.

5. Place a suitable container under rear brake yoke (18) to catch oil released when pulling brake yoke (18) from driveshaft (14).

6. Remove rear nut (19), lockwasher (28) and thrust washer (16) from driveshaft (14) and pull brake yoke (18) from driveshaft (14). Reinstall nut (19) on driveshaft (14) to protect the threads.

7. Remove adaptor (54), connector (55), elbow (56) and pipe assembly (57) from oscillation hub.

8. Remove bolts (22) and washers (21) securing locking plate (12). Remove locking plate (12).

9. Restrain pivot assembly (1) to prevent it oscillating, by placing a heavy bar between the steering cylinder mountings. Lock the bar in position using suitable trestles or stands. See Fig. 3.

10. Using a suitable tool, remove thrust nut (11). If wear area of thrust nut (11) is damaged, replace thrust nut (11).

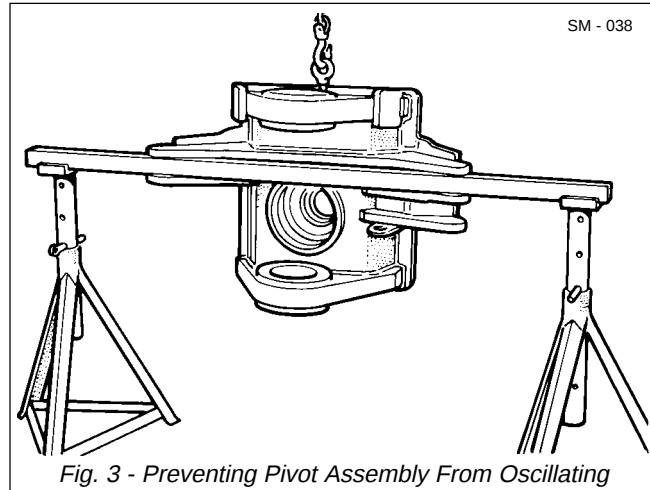
11. Insert an eyebolt into tapped pad provided on top of pivot assembly (1) and attach suitable lifting equipment.

12. Remove pivot restraining bar.

13. Using lifting equipment, carefully pull pivot assembly (1) clear of oscillation hub. Place pivot assembly (1) in a suitable work area for further disassembly.

14. Reinstall thrust nut (11) on pivot assembly (1) to protect the threads.

15. Note position of front 'V' ring (10) to aid in 'Installation'. Remove and discard 'V' ring (10).



16. Inspect nylon oscillation bushes (2) as described in 'Inspection'. If bushes are to be renewed, proceed with step 17.

17. Remove nylon oscillation bush/es (2) with hammer and chisel.

**Note:** The suggested method is to make an axial cut along the bush then to lever the bush in order to collapse it upon itself.

### Inspection

1. Clean nylon oscillation bushes with a suitable solvent and allow to dry.

2. Inspect nylon oscillation bushes for wear, scoring, erosion and 'out of round'. Pay particular attention to the thrust faces of the bushes which should also be inspected for cracking/splitting. Renew if required.

3. Replace all seals with new parts.

### Assembly

Numbers in parentheses refer to Fig. 1.

**Note:** Tighten all fasteners without special torques specified to torques listed in Section 300-0080, STANDARD BOLT AND NUT TORQUE SPECIFICATIONS.



#### WARNING

To prevent personal injury and property damage, be sure wheel blocks are properly secured and of adequate capacity to do the job safely.

1. Wipe bush housing clean using a suitable solvent and allow to dry.
  2. Apply Loctite (3) and Loc Quick Primer (4) and align new bushes (2) in rear frame with grease holes aligned vertically and identification 'PAINT DOT' at Top Dead Centre. Refer to Fig. 4. Drift bushes (2) into rear frame using hammer with soft packing for protection.
  3. Install plug (25) in filler/level hole on pivot assembly (1). Install gasket (5) and cover plate (6) on side of oscillation hub and secure with bolts (7) and washers (20).
  4. Install plug (25) in cavity drain port on underside of oscillation hub.
  5. Lightly coat 'V' ring (10) and machined surfaces of pivot with EMS19014 grease (26) and, install 'V' ring (10), with lip towards rear, on front of oscillation hub.
  6. Using suitable lifting equipment, and taking care to prevent damaging bushes (2) or pivot threads, install pivot assembly (1) into rear frame.
  7. Thread thrust nut (11) on pivot assembly (1) and tighten as follows:
    - a) Restrain pivot assembly (1) to prevent it oscillating, by placing a heavy bar between the steering cylinder mountings. Lock the bar in position using suitable trestles or stands. See Fig. 3.
    - b) Secure a special tool, which can be manufactured as shown in Fig. 5, to pivot thrust nut (11) and tighten thrust nut (11) until there is no end float/ clearance at thrust face of either bush. Slacken thrust nut (11) until pin of the locking plate (12) can be inserted in the first available hole in the thrust nut (11).
    - c) Secure locking plate (12) with bolts (22) and lockwashers (21). Torque tighten bolts (22) to 94 Nm (69 lbf ft).
  8. Install adaptor (54), connector (55), elbow (56) and pipe assembly (57) to oscillation hub.
  9. Install brake yoke (18) on driveshaft (14) until it butts against bearing assembly cup and cone (9 & 8).
  10. Install parking brake disc on brake yoke (18) and secure with bolts and washers. Tighten bolts to a torque of 49 Nm (36 lbf ft).
  11. Install thrust washer (16) on rear of driveshaft (14).
  12. Install nut (19) at rear of driveshaft (14), and tighten to a torque of 250 Nm (180 lbf ft) to seat bearing cup and cone assemblies (9 & 8).
  13. Chap driveshaft (14) at both ends with a hide-faced hammer. Re-torque nut (19) to 250 Nm (180 lbf ft).
  14. Back off nut (19) four flats, and chap rear end of driveshaft (14) with a hide-faced hammer to remove pre-load from bearing cup and cone assemblies (9 & 8).
  15. Remove nut (19) from rear of driveshaft (14), install lockwasher (28) and reinstall nut (19).
  16. Set up dial indicator with pointer positioned on rear end face of driveshaft (14). Push and pull on parking brake disc to move driveshaft (14) backwards and forwards, remembering to rotate shaft at the same time to obtain an accurate reading. Note dial indicator reading.
  17. Tighten nut (19) until end play on driveshaft (14) can just be felt. Take dial indicator reading of end play. Tighten nut (19) until end play on driveshaft (14) is 0.05 - 0.15 mm (0.002 - 0.006 in).
- Note:** One flat on nut (19) turned is equivalent to 0.025 mm (0.001 in) axial movement.
18. When correct end play is obtained, remove dial indicator and secure nut (19) by bending the first available lockwasher (28) tab into nut (19). Recheck end play.
- ## Connecting Front and Rear Frames
1. Install spacer (46) in upper retainer (43), as noted on removal.
  2. Smear bearing and pin bores with EMS19057 grease (23).
  3. Attach suitable lifting equipment to pivot/rear frame assembly. Lifting equipment must prevent pivot from oscillating and be capable of pulling pivot/rear frame assembly to align pivot bearing bores and front frame pin bores. Raise lifting equipment to support pivot/rear frame assembly.
  4. Remove blocks from rear wheels and blocking from pivot/rear frame assembly. Using lifting equipment, pull pivot/rear frame assembly to align pivot bearing bores and front frame pin bores. Block wheels and block pivot/rear frame assembly to remain level and

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stationary.

5. Freeze upper and lower pins (39 & 50) to ease installation.

6. Smear upper pin (39) and bearing bores with EMS19057 grease (23) and install through front frame and bearing bores. Fit nut (47), with anti-seize compound, and tighten to pull assembly into position. Tighten nut (47) to a torque of 1425 Nm (1050 lbf ft).

**Note:** It may be necessary to relieve binding between the pin and pin bores by raising or lowering pivot/rear frame assembly.

7. Secure upper pin (39) with bolt (40) and hardened washer (41).

8. Smear lower pin (50) and bearing bores with EMS19057 grease (23) and install through front frame and bearing bores.

9. Secure lower pin (50) with bolt (52), lockwasher (45) and washer (53).

## Final Assembly

1. Install parking brake assembly to mounting brackets and secure with bolts, washers and nuts. Tighten bolts to a torque of 75 Nm (55 lbf ft).

2. Apply parking brake by turning the hex-head on the parking brake actuator fully clockwise.

3. Remove lifting equipment from pivot/rear frame assembly.

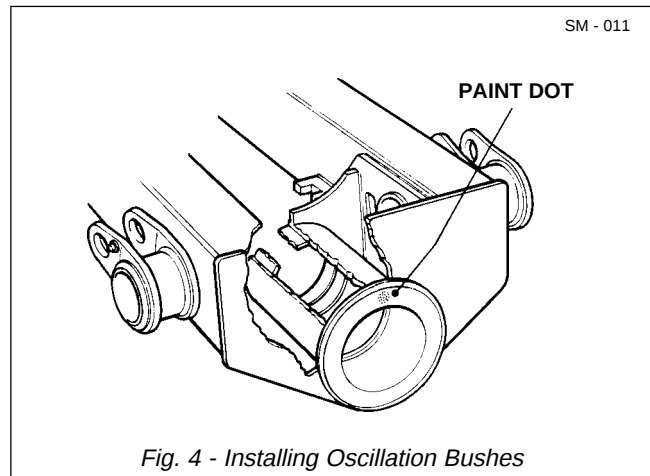
4. Remove stands or timbers from front frame.

5. Apply Loctite 270 to the threads of capscrews used to mount driveline between transmission yoke and front yoke (17). Align match marks and install driveline. Tighten capscrews to a torque of 153 Nm (113 lbf ft).

6. Align match marks and reconnect driveline to brake yoke (18). Tighten capscrews to a torque of 153 Nm (113 lbf ft).

**Note:** Take extra care when handling drivelines as chips, dents, burrs or deformity on any rotating mass creates vibration and excessive wear during any operation.

7. Align steering cylinder bores and mounting pin bores on pivot, install pins and secure with bolts and



washers.

8. Connect hydraulic lines and electrical wiring as noted on disassembly.

9. Remove bolts (7), washers (20), gasket (5) and cover plate (6) from side of oscillation hub to gain access to filler/level plug (25) on pivot assembly (1). Remove filler/level plug (25).

10. Add EMS19003 E. P. gear oil (24) through filler/level hole in pivot assembly (1) until the oil is level with the bottom of filler/level hole.

11. Remove plug (25) from underside of oscillation hub to drain the cavity between the oscillation hub and pivot assembly (1) of any oil that entered while filling the driveshaft bearing housing.

12. Install plug (25) in filler/level hole on pivot assembly (1). Install gasket (5) and cover plate (6) on side of oscillation hub, secure with bolts (7) and washers (20).

13. Install plug (25) in cavity drain port on underside of oscillation hub.

14. Fill bearing housings with EMS19057 grease (23) through lube fittings (27) until excess grease starts to escape from retainers (43 & 49).

15. Add EMS19014 grease (26) to oscillation bushing lube fittings (61) on top of oscillation hub. Lube until excess grease is seen.

16. Install parking brake disc protective guard (if fitted) and secure with bolts, washers and nuts.

17. Start engine to charge hydraulic systems, raise body, lower body safety prop and lower the body.

18. Bleed the braking system as described in Section 165-0010, BRAKE PARTS.

19. Remove wheel blocks.

## MAINTENANCE

Numbers in parentheses refer to Fig. 1.

Every 250 hours, oscillation bushes must be lubricated. Add EMS19014 grease (26) to oscillation bushing lube fittings (61) on top of oscillation hub. Lube until excess grease is seen.



### WARNING

**To prevent personal injury and property damage, be sure wheel blocks are properly secured and of adequate capacity to do the job safely.**

Every 250 hours, check the end float/clearance at the thrust face of the oscillation bushes. Any clearance found must be removed by adjustment of the thrust nut, as described in step 7 of 'Assembly' procedure.

**Note:** A practical method of establishing the effective adjustment of the thrust nut is to use movement of the machines body in the raised position. Move the body from fully raised to almost fully raised while watching the effect of this action on the frame and pivot arrangement. Any slackness between the thrust nut and thrust faces will be clearly visible by movement of the frame.

Every 1 000 hours (6 months), follow the procedure given below to check the oil level in the driveshaft bearing housing, and, lubricate the articulation and oscillation bearings.

**Note:** It is essential that the grease used for articulation and oscillation components is EMS19057 grease (23), as specified in Section 300-0020, LUBRICATION SYSTEM.

1. Position the vehicle on a level work area and apply parking brake.

2. Raise body and install body safety prop to secure body in partially raised position.

3. Shut down engine and block all wheels securely.

4. Remove protective guard (if fitted) from beneath parking brake disc by removing nuts, washers and bolts securing guard to rear frame.

5. Remove bolts (7), washers (20), gasket (5) and cover plate (6) from side of oscillation hub to gain access to filler/level plug (25) on pivot assembly (1). Remove filler/level plug (25).

6. Add EMS19003 E. P. gear oil (24) through filler/level hole in pivot assembly (1) until the oil is level with the bottom of filler/level hole.

7. Remove plug (25) from underside of oscillation hub to drain the cavity between the oscillation hub and pivot assembly (1) of any oil that entered while filling the driveshaft bearing housing.

8. Install plug (25) into filler/level hole on pivot assembly (1). Install gasket (5) and cover plate (6) on side of oscillation hub, secure with bolts (7) and washers (20).

9. Install plug (25) into cavity drain port on underside of oscillation hub.

10. Fill bearing housings with EMS19057 grease (23) through lube fittings (27) until excess grease starts to escape from retainers (43 & 49).

11. Add EMS19014 grease (26) to oscillation bushing lube fittings (61) on top of oscillation hub. Lube until excess grease is seen.

12. Install parking brake disc protective guard (if fitted) and secure with bolts, washers and nuts.

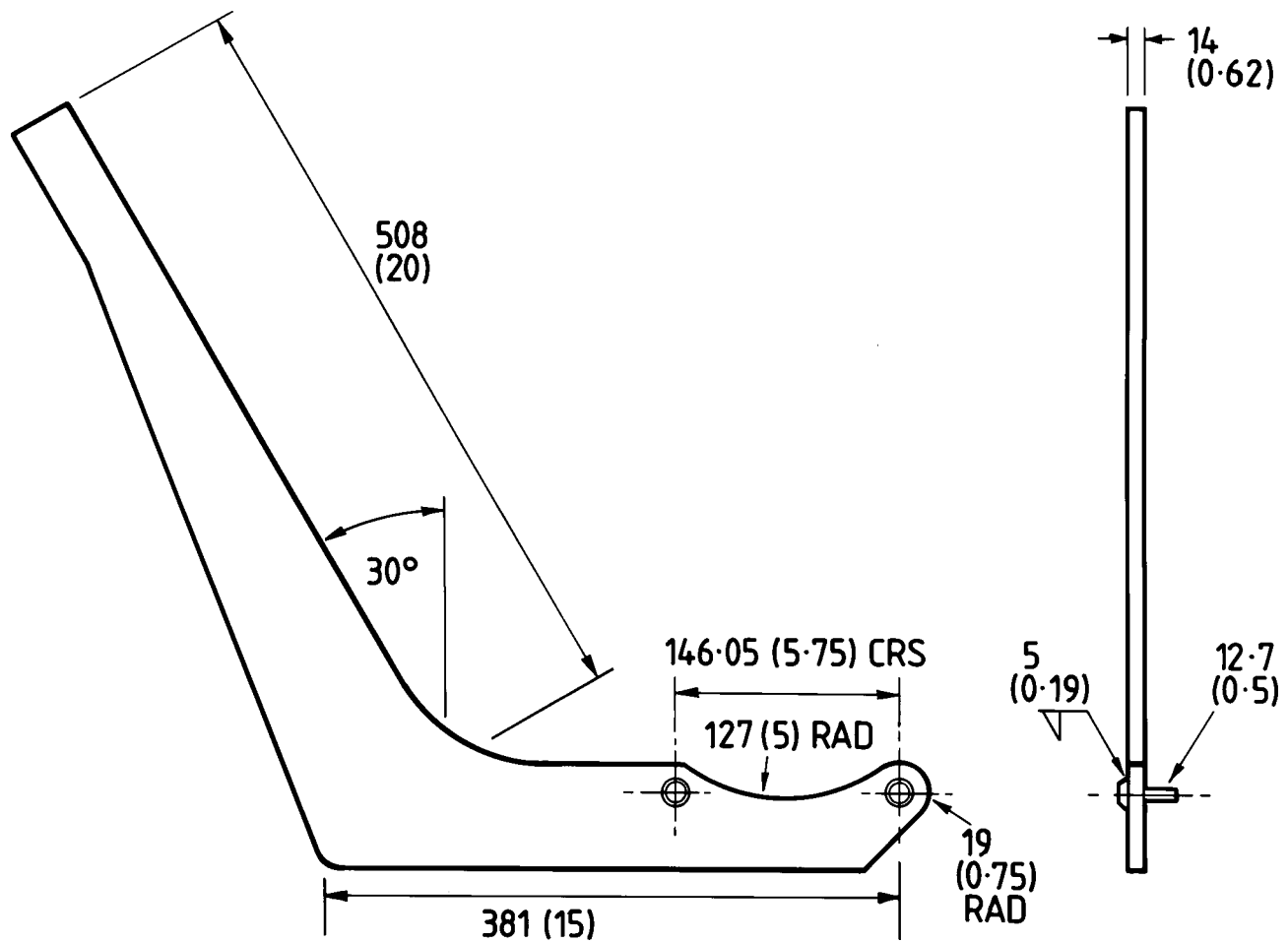
13. Start engine, raise body, lower body safety prop and lower body.

14. Remove wheel blocks.

## Chassis - Articulation and Oscillation Pivot

Section 100-0020

SM - 844



Dimensions in mm (in)

Fig. 5 - Fabrication Details of Thrust Nut Removal and Installation Tool

### SPECIAL TORQUE SPECIFICATIONS

|          |          |           | TORQUE |        |
|----------|----------|-----------|--------|--------|
| FIG. NO. | ITEM NO. | ITEM NAME | Nm     | lbf ft |
| 1        | 44       | Bolt      | 106    | 78     |
| 1        | 22       | Bolt      | 94     | 69     |
| 1        | 47       | Nut       | 1 425  | 1 050  |