



TEREX Equipment Limited Maintenance Manual



MAINTENANCE MANUAL
TA300

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TEREX Equipment Limited Maintenance Manual Re-order

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TEREX Equipment Limited Maintenance Manual - Introduction

For further information on the subject matter detailed within this Maintenance Manual, please refer to Terex Equipment Limited Operations Handbooks and Product Parts Books.

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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.



Safety Alert Symbol

The safety alert symbol is used to alert you to a potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

Hazard Classification

A multi-tier hazard classification system is used to communicate potential personal injury hazards. The following signal words used with the safety alert symbol indicate a specific level of severity of the potential hazard. Signal words used without the safety alert symbol relate to property damage and protection only. All are used as attention getting devices throughout this manual as well as on decals and labels fixed to the machinery to assist in potential hazard recognition and prevention.



DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.



WARNING

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

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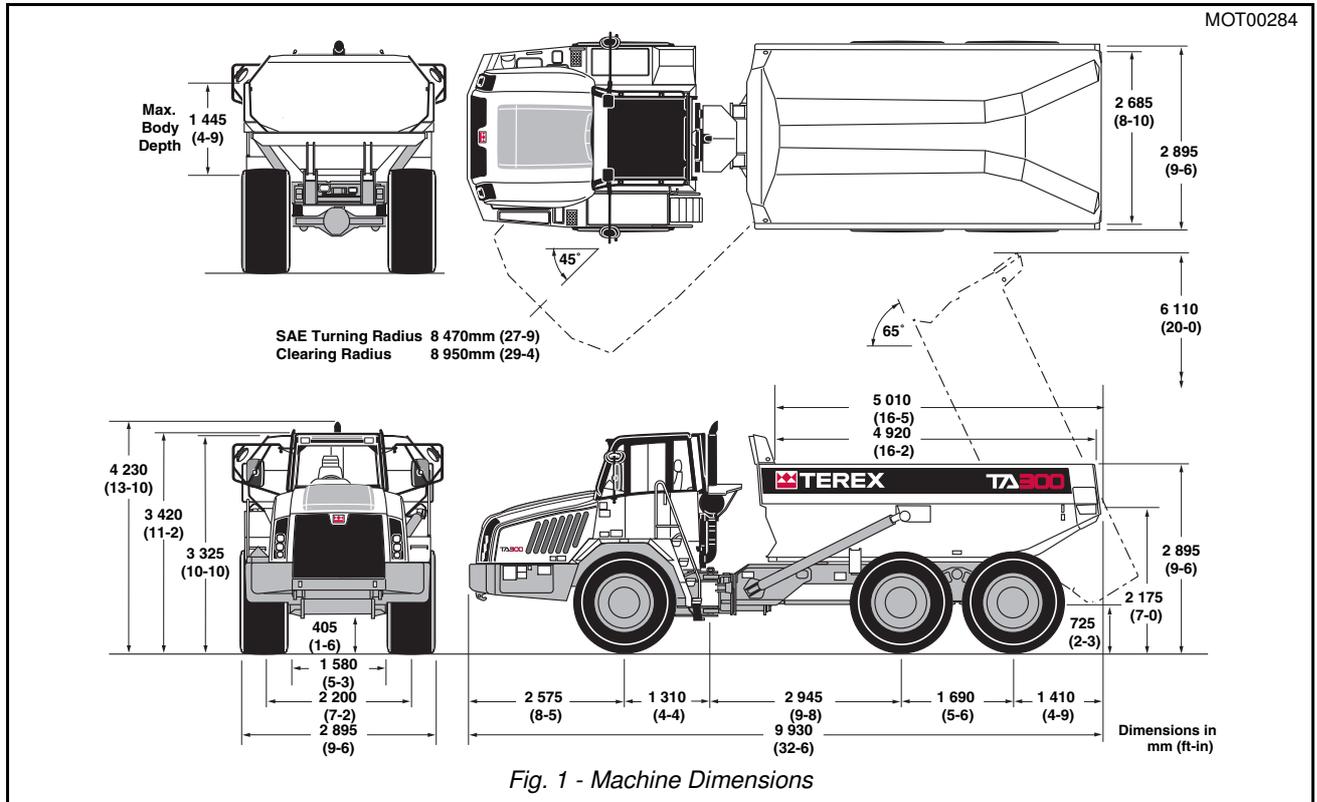
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GENERAL INFORMATION - Technical Data TA300



ENGINE

Make / Model	Scania DC09	Cooling	Coolant (50% Water and 50% Glycol - antifreeze)
Fuel injection	Scania XPI	Valve clearances, cold engine intake valve (mm/in) outlet valve (mm/in)	0.45/0.02 0.70/0.03
Number of cylinders and configuration	5, straight	Number of teeth on the flywheel	158
Working principle	4 stroke engine	Low idle speed (rpm)	600 - 750
Cylinder diameter (mm/in)	130/5.12	Maximum full-load speed (rpm)	2 100
Cylinder diameter (mm/in)	140/5.51	Maximum torque at speed (rpm)	1 300
Displacement (dm ³ /in ³)	9.3/567.5	Fuel	Diesel (10 PPM)
Firing sequence	1-2-4-5-3	Oil pan capacity	32 - 38 litres
Power Range	276 kW	Weight, without coolant and oil (kg/lb)	950/2 094
Compression ratio	16:1		
Engine direction of rotation, viewed from rear	Anticlockwise		
Fan direction of rotation, viewed from front	Clockwise		

Note: The Tier IV Engines meets ACEA E7 specifications.

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TRANSMISSION

Make/Model.....ZF 6WG 310 RPC Automatic with manual override.

The transmission assembly consists of a torque converter close-coupled to a countershaft-type gearbox with an integral output transfer gearing. There is automatic shifting throughout the range with a kick-down feature. Lockup action in all forward gears. A torque proportioning output differential transmits drive permanently to the front and rear axles. This differential may be locked by the operator for use in difficult traction conditions.

A standard integral hydraulic retarder automatically operates when the engine speed exceeds the threshold value. A blocked filter indicator and filter bypass system provide valve block with additional protection from unfiltered oil.

Pressures:

Main.....16 + 2 bar (232 + 30 lbf/in²)
 Lockup (Wk).....12 ± 2 bar (174 ± 30 lbf/in²)
 Converter 'IN'..10.5 bar (152 lbf/in²) at 2 300 rev/min.
 Converter 'OUT'..4.8 bar (70 lbf/in²) at 2 300 rev/min.
 Converter Relief Valve.....8.5 bar (123 lbf/in²)
 Retarder.....4.5 bar (65 lbf/in²)

Temperatures:

Normal.....80 °C - 110 °C (176 °F - 230 °F)
 Maximum (Retarder Mode).....145 °C (293 °F)
 Stall Speed.....1 805 rev/min.

Ratios:

Torque Converter.....1.84:1
 Transmission.....Refer to table below

Forward						
Gear	1	2	3	4	5	6
km/h	5.6	8.6	13.3	20.6	30.2	50.0
mile/h	3.5	5.4	8.3	12.8	18.8	31.1
Reverse						
Gear	1	2	3			
km/h	5.6	13.3	30.2			
mile/h	3.5	8.3	18.8			

AXLES

There are three heavy duty axles with fully floating axle shafts and outboard planetary reduction gears. The three axles are in a permanent all wheel drive (6x6) with a differential coupling between the front and rear axles. All three axles also have hydraulically

actuated multiple transverse diff-locks for 100% cross-axle lock up. The inter-axle and cross-axle diff-locks are controlled by the operator, and can be actuated when required in poor traction conditions.

Ratios:

Differential3.875:1
 Planetary5.71:1
 Total Reduction.....22.12:1

SUSPENSION

Front: The axle is mounted to the front chassis frame through the top plate of the front axle housing. The complete unit is pivoted through the front frame. Suspension is provided by four spring and damper assemblies (two per side) which are linked to lower wishbones and which are secured at their upper ends to the front frame via spring mounts. Bump-stops limit the travel of the suspension assemblies when fully loaded.

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 equalize 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 the rear suspension linkages are rubber-bushed and maintenance-free.

WHEELS AND TYRES

Wheels: 3-piece earth mover 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 ²)	4.75 bar (69 lbf/in ²)
750/65 R25	3.25 bar (47 lbf/in ²)	3.25 bar (47 lbf/in ²)

Inflation Pressures (Michelin):

	Front	Rear
23.5 R25	4.0 bar (58 lbf/in ²)	4.0 bar (58 lbf/in ²)
750/65 R25	3.0 bar (44 lbf/in ²)	3.0 bar (44 lbf/in ²)

Inflation Pressures (Pirelli):

	Front	Rear
23.5 R25	4.8 bar (70 lbf/in ²)	4.8 bar (70 lbf/in ²)

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Inflation Pressures (Continental):

	Front	Rear
23.5 R25	5.0 bar (73 lbf/in ²)	5.0 bar (73 lbf/in ²)

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

The braking, steering and body hoist hydraulic systems are controlled by a manifold block mounted on the frame. Systems are supplied with oil from a common tank by the main hydraulic pump, driven from the 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 litres/s (77.4 US gal/min.)

Brakes

The machine has a full hydraulic braking system with enclosed, oil-immersed multiple discs on each wheel. Independent circuits serve the front and rear brake systems. Warning lights and audible alarm indicate low brake system pressure. The brake system conforms to ISO 3450, SAE J1473.

Actuating Pressure.....	60 bar (870 lbf/in ²)
Braking surface.....	22 000 mm ² (34.1 in ²)

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

Emergency: There is automatic application of drive line brake should pressure fall in the main brake hydraulic system. Service brakes may also be applied using the parking-emergency brake control.

Retardation: Standard engine brake and standard hydraulic retarder integral with transmission.

Steering

Hydrostatic power steering is provided 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 illu-

minates should the emergency system activate. Conforms to ISO 5010, SAE J53.

System Pressure.....	241 bar (3 500 lbf/in ²)
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 ²)
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

The body is an all welded construction, fabricated from high hardness (min. 360 BHN) 1 000 MPa (145 000 lbf/in²) yield strength steel. A 25° tail chute angle provides good load retention without the 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 ³ (18.0 yd ³)
Heaped 2:1 (SAE).....	17.5 m ³ (22.9 yd ³)

SERVICE CAPACITIES

Fuel tank.....	370 litres (98 US gal)
Hydraulic System.....	256 litres (67.6 US gal)
Engine Crankcase and filters....	45 litres (11.9 US gal)
Cooling System.....	48.8 litres (12.9 US gal)
Transmission (including cooler).....	55 litres (14.5 US gal)
Transmission Cooler.....	8.25 litres (2.18 US gal)
Differential - Front, IFS.....	26 litres (7 US gal)
Differentials	
Front [not IFS] and Rear (each).....	28 litres (7.4 US gal)
Differential - Centre.....	31 litres (8.2 US gal)
Planetaries (Front).....	11 litres (3.0 US gal)
Planetaries - Centre&Rear.....	7.5 litres (2.0 US gal)
Hand Pump Tank.....	1 litre (0.26 US gal)
Air Conditioning Compressor.....	0.125 litres (0.033 US gal)
DEF tank capacity.....	52 litres (13.74 US gal)

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EXHAUST SYSTEM

Diesel Exhaust Fluid (DEF) - Reductant for SCR Reductant

Diesel Exhaust Fluid is a urea solution which acts as a reductant. On the Selective Catalytic Reduction (SCR), the reductant is added to the exhaust gases before the catalytic converter. As a result the emissions of nitrogen oxides are reduced.

Diesel Exhaust Fluid specified should be in accordance with DIN 70070. Diesel Exhaust Fluid is a solution of urea and water, with 32.5% by weight of urea. This solution freezes at approximately -11 °C. Then both ice and water always have the same concentration.

Recommended urea content.....32.5%

Limit value, urea content.....30 - 34%

VIBRATION

Hands and Arm Vibration

The weighted root mean square acceleration to which hand and arms of the operator are exposed is less than 2.5 m/s² under normal operating conditions.

Whole Body Vibration	TA300
Vibration Emission Value a	0.52 m/s ²
Uncertainty K	0.26 m/s ²
Operating Mode: Value obtained under simulated field duty cycle.	

Note: The whole body vibrations on construction machines are influenced by many factors independent of machine design, for example ground conditions, working methods, correct seat adjustment, operator input to vehicle speed. The single whole-body emission value listed above is determined under particular operating and terrain conditions. In accordance with EN474, it is not intended to be used to determine the whole-body vibration exposure to the operator using the machine.

Note: It is recognized that the appropriate design of the operator's seat is the most effective construction measure to minimize the whole - body vibration emission of a particular machine family. This machine is equipped with an operator's seat which meets the criteria of EN ISO 7096 representing vertical vibration under severe operating conditions. The seat in this machine has been tested with input spectral class EMI and has a seat transmissibility factor SEAT > 1.1.

Vehicle Weights		23.5 R25 Tyres	
Standard Vehicle	kg	lb	
Net Distribution			
Front Axle	12 720	28 043	
Centre Axle	5 480	12 081	
Rear Axle	5 340	11 773	
Vehicle, Net	23 540	51 897	
Payload	28 000	61 730	
Gross Distribution			
Front Axle	17 788	39 216	
Centre Axle	16 988	37 452	
Rear Axle	16 764	36 958	
Vehicle, Gross	51 540	113 626	
Bare Chassis	17 555	38 703	
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	128 kPa (18.6 psi)	180 kPa (26.1 psi)
Rear	54 kPa (7.8 psi)	172 kPa (24.9 psi)
750/65 R25	Net	Loaded
Front	90 kPa (13.1 psi)	128 kPa (18.6 psi)
Rear	41 kPa (5.9 psi)	128 kPa (18.6 psi)

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NOISE EMISSIONS

Sound Power Level ISO6395	TA300
A - Weighted sound power level Lwa in decibels	109
Uncertainty Kwa, in decibels	0.4
Sound Pressure Level at Operators Station ISO6396	TA300
A - Weighted emission sound pressure level Lpa in decibels	75
Uncertainty Kwa, in decibels	2.47
The sound level values are in compliance with Directive 2000/14/EC and BS EN 474.	

Note: The results shown 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 machine in base configuration.

Note: Noise exposure level to the operator and bystander personnel may be higher depending upon proximity to buildings, rock piles, machinery, etc. The actual job site noise exposure level must be measured and applicable regulations complied with respect to employee hearing protection.

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GENERAL INFORMATION - Technical Data TA300

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GENERAL INFORMATION - Welding Procedure

WELDING



WARNING

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 the electrical components. Turn off the battery master switch to isolate the batteries before disconnecting any components. After welding connect all of the above in the reverse order.



WARNING

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 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 odorless 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, vapors, 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 within 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

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3. Pre-heat the 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 the electrodes are protected from moisture pick-ups at all times.
5. Allow the repair weld to cool slowly.
6. Grind and blend repair to original contour. Paint the 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 the area to 200 °C (392 °F), measure 3 - 4" either side of the repair prior to gouging. On completion of gouging grind to remove thin carbon layer.

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

3. Pre-heat the 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 the electrodes are protected from moisture pick-ups at all times.

5. On completion of welding, post-heat the repair area to 400 °C (752 °F), measured 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.

* * * *

CHASSIS - Frames

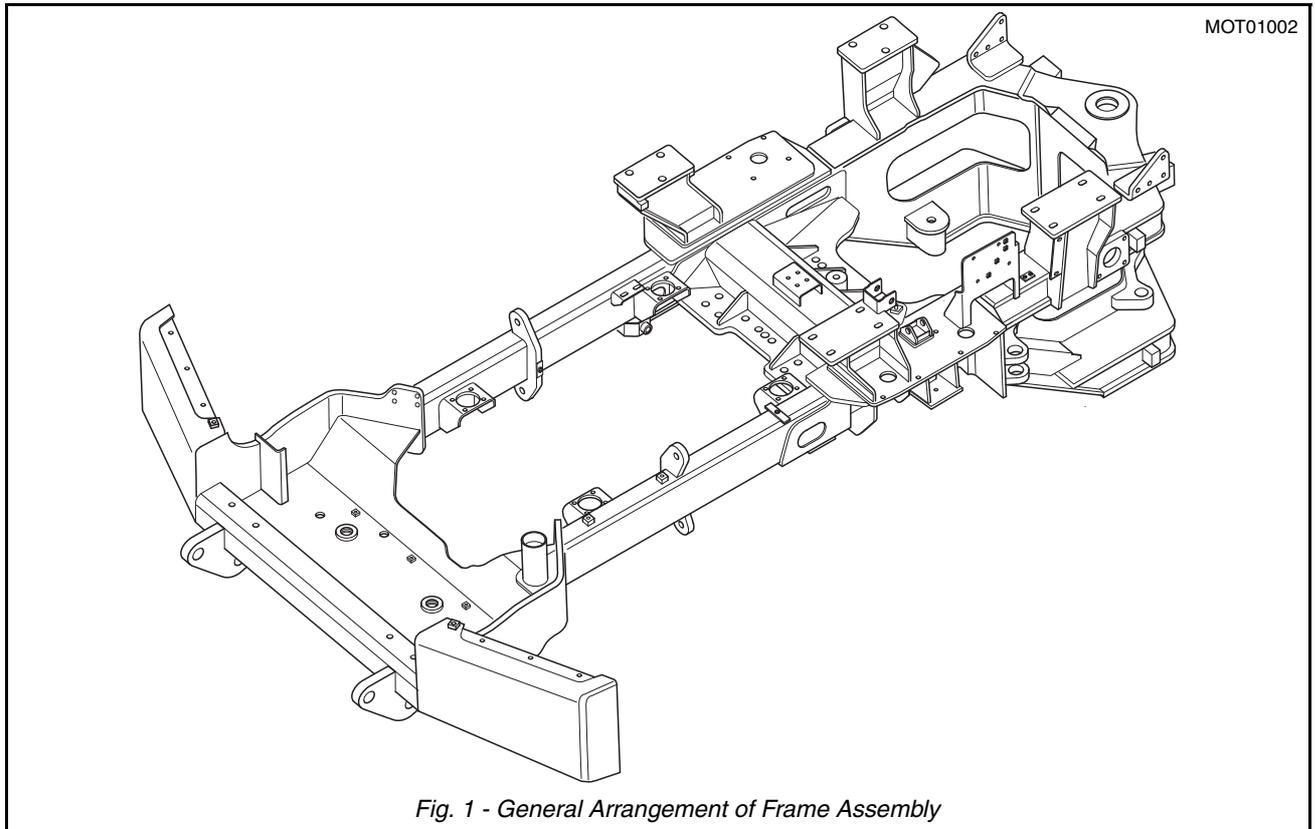


Fig. 1 - General Arrangement of Frame Assembly

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 of 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 color, 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



WARNING

Before any welding is done on a machine equipped with the XPI 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 ECU, TCU, body control lever, MCU and cab bulkhead to avoid damage to electrical components. Turn off the 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.

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



WARNING

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 machine's 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 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 odorless 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, vapors, 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 a channel or an angle or a 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.

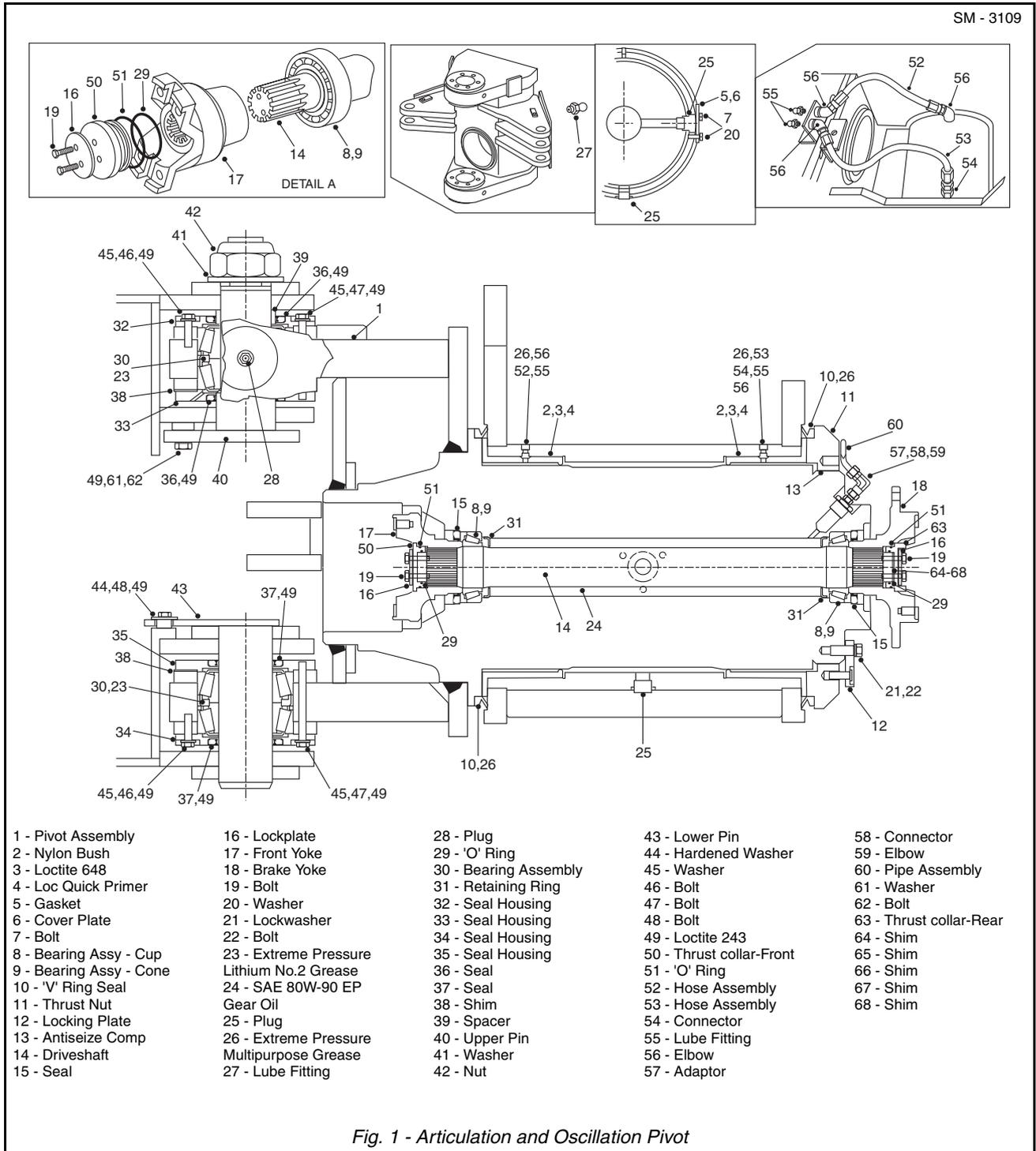
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CHASSIS - Frames

Section 100-0010

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CHASSIS - Articulation and Oscillation Pivot



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 bearing and associated parts can be removed, inspected and replaced or renewed by following the procedures outlined in this section.

CHASSIS - Articulation and Oscillation Pivot

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THRU-DRIVE DRIVESHAFT

Numbers in parentheses refer to Figure 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.



WARNING

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



WARNING

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 machine 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 machine.
- 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 machine into a full left-hand lock. Shut down engine and block all wheels securely.
 6. Remove Lockplate (16), 2 Off Front bolts (19) & Front thrust collar (50).
 7. Remove and discard 'O' rings (29 & 51) from Thrust collar (50).
 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 actuator 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. 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.

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

15. Lift out front bearing assembly cup (8) from front of the housing.

16. If bearing replacement is required, use a suitable puller to remove front and rear bearing assembly cups (8) from the housing.

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

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

18. Temporarily install front yoke (17) fully onto front of driveshaft (14) and suitably restrain to resist rotation.

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

20. Remove Lockplate (16), 2 off Rear bolts (19), Rear Thrust collar (63) & Brake yoke (18) from driveshaft (14). Identify front and rear ends of driveshaft (14).

21. Remove and discard 'O' rings (29 & 51) from Rear Thrust collar (63).

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 (9) from driveshaft (14).

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 (8 & 9) for wear or damage. Renew as necessary.

Note: If either bearing assembly cup or cone (8 or 9) 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.

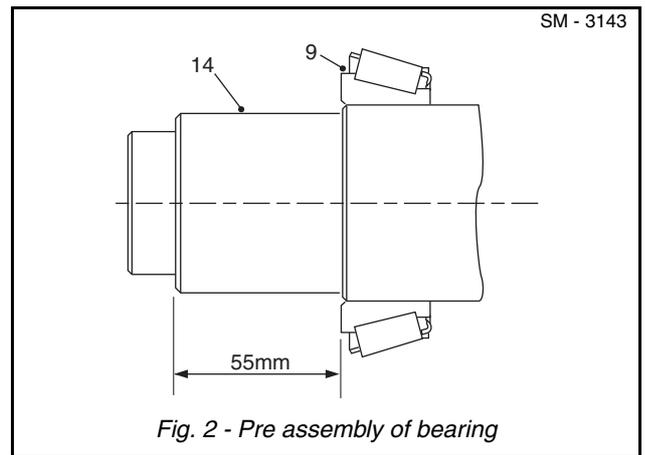
Assembly and Installation

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 bearing cup (8) into tractor end of pivot casing. Ensure it is firmly seated & that a 0.05 mm (0.002") feeler gauge cannot be inserted between cup and mating face.

3. Check rear bearing cup (8) is firmly seated in the body end of the pivot casing, again ensuring that a 0.05mm (0.002") feeler gauge cannot be inserted between cup and mating face.

4. Lightly oil both bearing assembly cones (9) with SAE 80W - 90 E. P. gear oil (24).



5. Support driveshaft (14) in a suitable fixture & tap one Bearing assembly cone (9) onto driveshaft (14) using a tubular mandrel.

6. Refer to Fig. 2, Maintain end face of cone approximately 55mm from end of spline face.

7. Insert driveshaft (14) into truck end of pivot casing until bearing assembly cone (9) seats firmly in the bearing assembly cup (8).

8. Apply loctite (3) to new seal (15) and fit over the driveshaft (14) with seal 'Lip' to bearing side. Press seal home using a mandrel.

9. Apply grease to splines of Front yoke (17) and slide onto the drive shaft (14).

10. Fit new 'O'-rings (29 & 51) to Front thrust collar (50) and fit collar over stub end of driveshaft (14) (align mating holes). Fit 2 off front bolts (19).

11. Tighten Front bolts (19); alternately 1/4 - 1/2 turns, drawing driveshaft (14) hard against the inner face of Front thrust collar (50). Shaft will be visible through inspection hole on the collar.

12. Lock Front yoke (17) from rotation by a suitable method / bar acting on the ground. Torque front bolts (19) to 54 Nm/39 lbf ft.

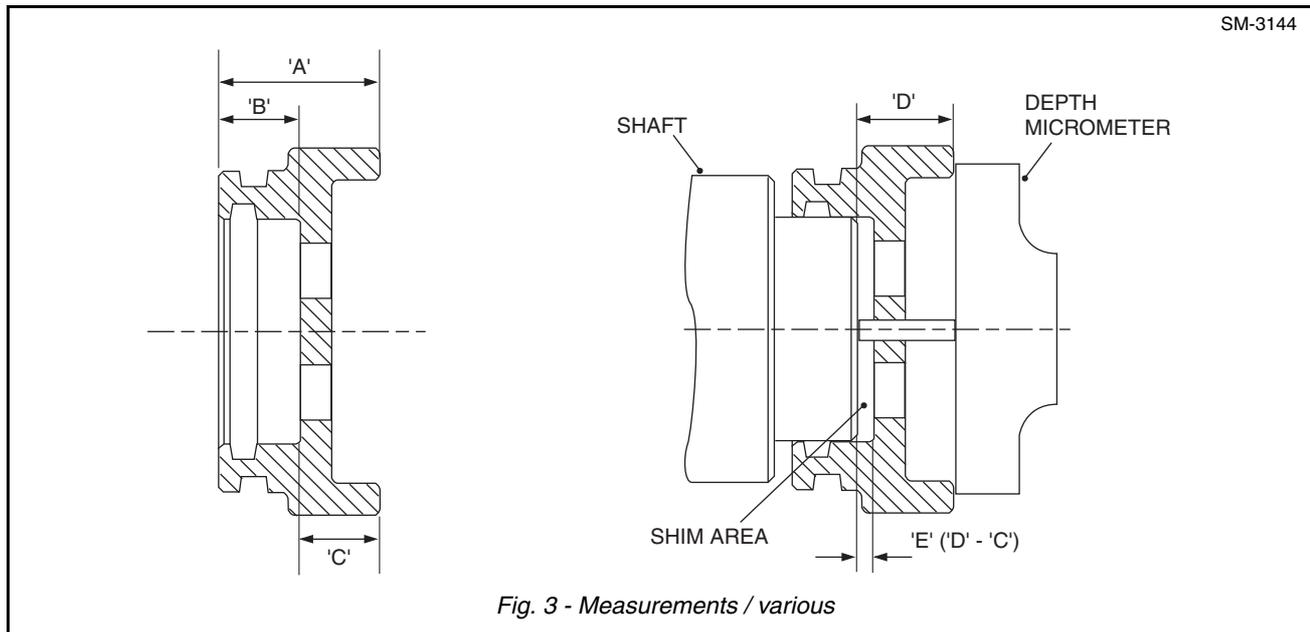
13. Using special mandrel (15270104) home locking plate (16) onto Bolts (19). Remove the clamping bar.

14. Slide Rear bearing assembly cone (9) onto rear end of drive shaft (14) until it seats in bearing assembly cup (8).

15. Position clamping bar assembly and screw central bolt hard against bolts (19) of front thrust collar (50), enabling body end bearing to be fully seated home.

CHASSIS - Articulation and Oscillation Pivot

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16. Using mandrel and heavy hammer, drive Rear bearing assembly cone, fully into cup. Now remove clamp bar assembly from front end.

17. Take remaining seal (15), apply loctite (3) and fit over drive shaft with seal 'Lip' to bearing side. Press seal home using a mandrel.

18. Apply grease to splines of brake yoke (18) and slide onto drive shaft (14). Ensure milled slots of driving flanges are aligned with those of brake yoke.

Note: For Measurement letters- refer to Fig. 3, unless otherwise stated.

19. Before fitting of Rear Thrust collar (63) record Measurements as stated:

- i) Measure total width 'A' of Rear thrust collar (63)
- ii) Using Depth micrometer, measure inner bore depth 'B' of collar (63) and record value.
- iii) Subtract 'B' from 'A' to determine recess dimension 'C'.

20. Fit Rear thrust collar (63) without 'O'-rings onto Drive shaft (14) and tighten Rear bolts (19) to a nominal torque of 15 Nm/11lbf ft.

Note: a gap should be visible between end of shaft and inner face of collar.

21. Using a Depth micrometer, measure distance 'D' from collar (63) outer face to end face of drive shaft (14) via the hole in the collar and record the value.

22. The actual free air space 'E' to be shimmed between end of drive shaft (14) and compression face of Thrust collar (63) equals: $E = 'D' - 'C'$.

23. Now add 0.6 mm (0.024") to dimension 'E' to allow for oversize shims. This value is dimension 'F' (End float will be determined by subtraction).

24. Remove Rear bolts (19) and Rear thrust collar (63) from pivot body end and chap drive shaft (14) to free bearing.

25. Calculate the nominal combination of minimum number of shims (64) to achieve the size nearest to dimension 'F'. Record the appropriate part numbers and total nominal thickness value.

26. Select the shims (64) and measure the total actual thickness of the combination. Record this value.

27. Place the shim pack (64) in the rear thrust collar (63), lock off the Brake yoke (18) from rotation by suitable method / bar on ground. Torque bolts (19) to full torque.

28. Remove the clamp and spin the yoke (18) to ensure driveshaft (14) free rotation.

29. Take a magnetic clock gauge located on the flange of pivot casing, needle acting on rear thrust collar (63) end face. Check Brake yoke (18) float movement.
30. Take reading obtained and subtract a figure sufficient to give an end float in the range 0.05 mm - 0.15 mm (0.002" - 0.006"), reduce shim pack (64) accordingly.
31. Remove Rear thrust collar (63) and shims (64) and re-assemble with the appropriate shims. Ensure 'O'-rings (29 & 51) are now fitted.
32. Lock Brake yoke (18) flange as before, applying alternate 1/4 -1/2 turns on bolts (19). Torque to 54 Nm (39 lbf ft).
33. Remove the locking bar and confirm that the driveshaft (14) end float is in the range 0.05 mm - 0.15 mm (0.002" - 0.006") by moving the brake yoke (18) for and aft against the clock gauge.
34. Adjust and refit the shim pack (63) as necessary.
35. Float set correctly; Drive home locking plate (16) using a mandrel (15270104). Re-check the end float.
36. Install parking brake disc on brake yoke (18) and secure with bolts and washers. Tighten bolts to a torque of 73 Nm (54 lbf ft).
37. Install parking brake assembly to mounting brackets and secure with bolts, washers and nuts. Refer to Section 170-0010, PARKING BRAKE AND MOUNTING.
38. Apply parking brake by turning the hex-head on the parking brake actuator fully clockwise.
39. 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).
40. 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).
41. 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).

42. Add SAE 80W - 90 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.
43. 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.
44. 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).
45. Install plug (25) into cavity drain port on underside of oscillation hub.
46. Install parking brake disc protective guard (if fitted) and secure with bolts, washers and nuts. Tighten nuts to a torque of 73 Nm (54 lbf ft).
47. Start engine, raise body, lower body safety prop and lower body.
48. Remove wheel blocks.

ARTICULATION COMPONENTS

Numbers in parentheses refer to Figure 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 Extreme Pressure Lithium Complex No. 2 (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.



WARNING

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.



WARNING

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.

CHASSIS - Articulation and Oscillation Pivot

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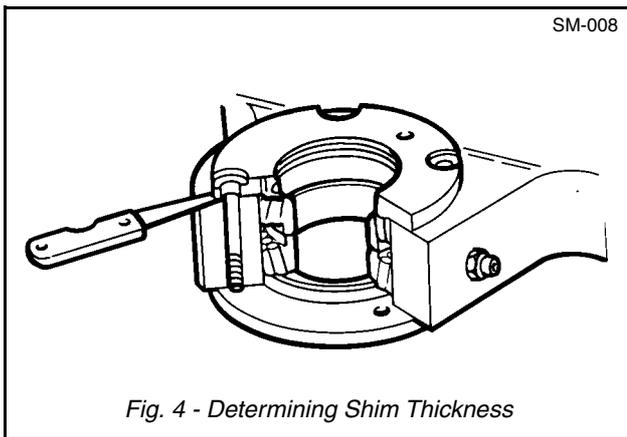


Fig. 4 - Determining Shim Thickness

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 machine 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 machine.
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.
7. Release the parking brake by turning the hex-head on the parking brake actuator 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 bolt (62), washer (61), large nut (42) and washer (41) securing upper pin (40).

10. Remove upper pin (40). If necessary tap upper pin (40) 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 (48) and hardened washer (44) securing lower pin (43).

12. Remove lower pin (43). If necessary tap lower pin (43) to ease removal taking care to avoid damaging the pin.

Note: Only separate the frames sufficient 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 (39) noting orientation to ensure correct installation.

Disassembly

1. Identify seal housings (32, 33, 34 & 35) to ensure correct location on assembly/installation.

Note: Seal housings (32, 33, 34 & 35) are not interchangeable.

2. Remove bolts (46 & 47), washers (45), seal housings (32, 33, 34 & 35) and upper and lower shims (38).

3. Prise out and discard seals (36 & 37) from the housings.

4. Remove and tag all bearing assemblies (30) with spacers to ensure correct assembly/installation.

Note: Bearing assemblies (30) and spacers are a matched set, never interchange cups, cones or spacers between sets.