



Section H

Steering

Service Manual - VM RANGE - TIER III

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Section H - Steering

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Articulation Joint

Disassembly and Assembly

Disassembly

⚠ WARNING

Raised Machine

NEVER position yourself or any part of your body under a raised machine which is not properly supported. If the machine moves unexpectedly you could become trapped and suffer serious injury or be killed.

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⚠ WARNING

Lifting Equipment

You can be injured if you use faulty lifting equipment. Make sure that lifting equipment is in good condition. Make sure that lifting tackle complies with all local regulations and is suitable for the job. Make sure that lifting equipment is strong enough for the job.

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- 1 Support the rear end of the machine's frame with jack stands.
- 2 Support the front part of the machine's rear frame with jack stands.
- 3 Support the machine's front roller frame with jack stands.

⚠ WARNING

Hydraulic Pressure

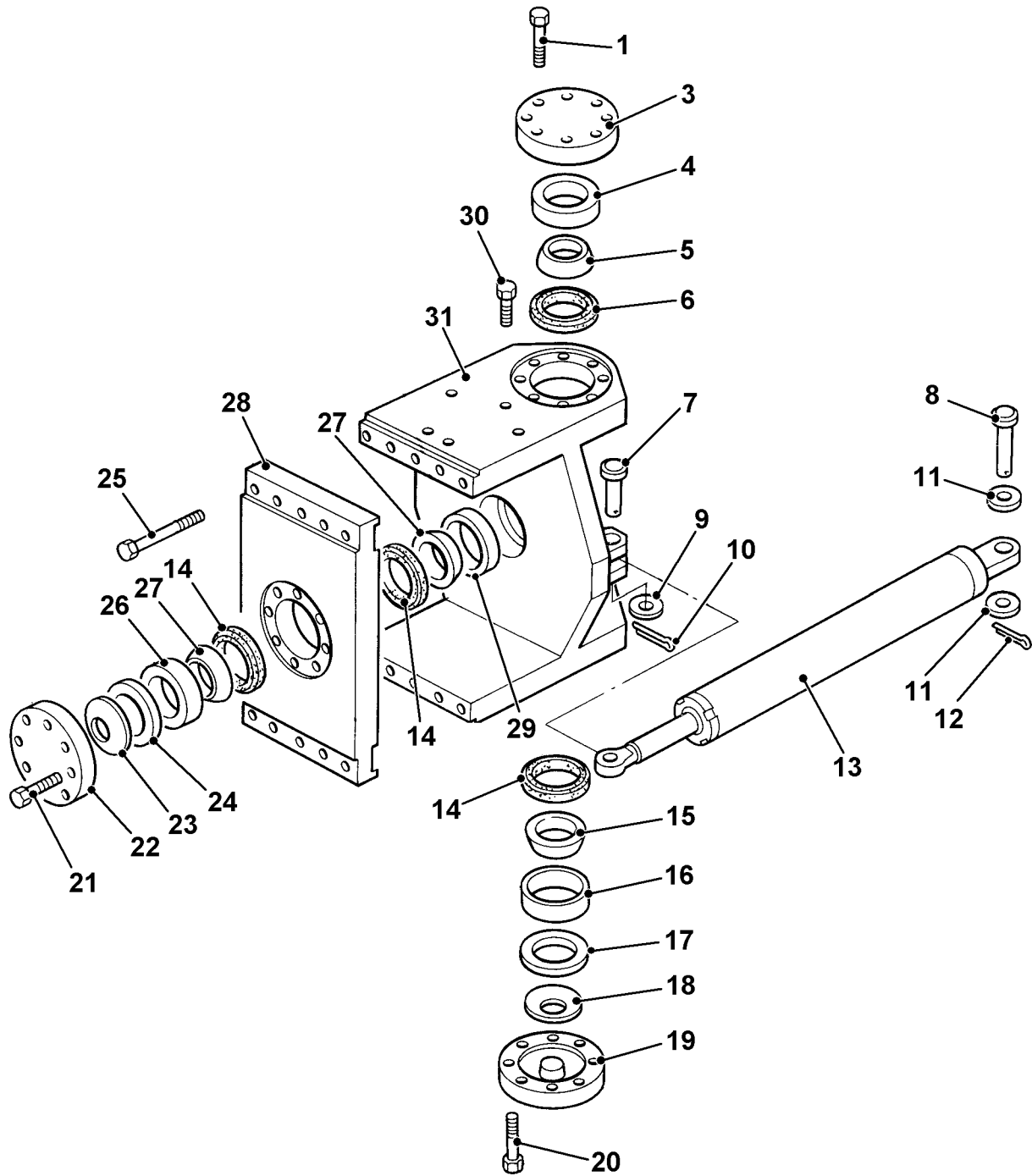
Hydraulic fluid at system pressure can injure you. Before connecting or removing any hydraulic hose, residual hydraulic pressure trapped in the service hose line must be vented. Make sure the hose service line has been vented before connecting or removing hoses. Make sure the engine cannot be started while the hoses are open.

INT-3-1-11_2

- 4 Remove the roller drum. Remember to tag and cap all hydraulic lines.

- 5 Remove the hose clamps and hoses from the front drum frame.
- 6 Remove the split pins → [Fig 1. \(□ H-3\)](#) 10 and washers 9 from the two steering cylinder pivot pins.
- 7 Remove the cylinder pivot pins 7.
- 8 Sling the front roller frame in preparation for removal. The roller frame weight is (4910 Kg) 10,827 lbs.
- 9 Remove the 16mm capscrews 21 from the bearing cover 22.
- 10 Remove the bearing cover 22, spring washer 23, and the thrust collar 24.
- 11 Install a 12mm lifting eye bolt in the tapped hole provided in the link plate 28 and support the plate for removal.
- 12 Remove the ten 20mm capscrews 25 which secure the plate 28 to the steering link 31 and remove the link plate 28.
- 13 Remove bearing cup 26 from the link plate 28 with an internal bearing puller.
- 14 Remove the machine's front roller frame from the steering link 31.
- 15 Remove the sealing rings 14 and pull the bearing cones 27 from the roller frame lugs by use of an external bearing puller.
- 16 Remove capscrew 30 from the steering link and install a 16mm lifting eye bolt and support the link for removal. The steering link weight is 190 Kg (420 lbs).
- 17 Remove the lower bearing cover 19, spring washer 18, and thrust collar 17 by removing capscrews 20.
- 18 Remove the bearing cover 3 by removing capscrews 1.
- 19 Install the service bushing into the upper steering link bearing bore.

- 20 Install the bearing cover **3** over the special bushing using two M16x120 capscrews.
- 21 Tighten the capscrews alternately until the bearing cover is drawn down to the steering link. This will force the link upward and expose the lower bearing cone **15**.
- 22 Remove the sealing ring from the lower bearing and use an external bearing puller to remove the bearing cone **15** from the lower rear frame lug.
- 23 Support the steering link **31** from the bottom with a floor jack.
- 24 Remove the upper bearing cover **3** and the special service bushing.
- 25 Allow the steering link **31** to drop downward by lowering the jack under the link. Drop the link down until the upper bearing cone **5** is fully exposed.
- 26 Remove the sealing ring **6** and the bearing cone **5** from the top rear frame lug.
- 27 With the steering link fully lowered and the bearing cones removed pull the link clear of the lower rear frame lug ⇒ [Fig 2. \(□ H-4\)](#).
- 28 Lift the steering link upward and off the upper rear frame lug.
- 29 Remove the bearing cup ⇒ [Fig 1. \(□ H-3\)](#) **29** from the steering link **31**.



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Fig 1.

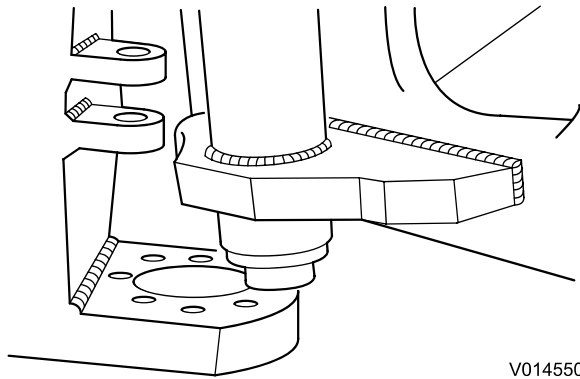


Fig 2.

Assembly

Note: The bearings in the steering articulation joints are designed to be assembled without grease or other lubricants. Lubrication of these bearings will actually shorten bearing life.

- 1 Install bearing cup ⇒ [Fig 1. \(□ H-3\)](#) **28** into the steering link **31** until it is fully seated.
- 2 With the eye bolt inserted in place of cap screw **30** lift the steering link up and over the upper rear frame lug.
- 3 Lower the link and guide it over the lower rear frame lug ⇒ [Fig 2. \(□ H-4\)](#).
- 4 Lift the link upward and evenly space the link between the upper and lower lugs.
- 5 Install a new sealing ring ⇒ [Fig 1. \(□ H-3\)](#) **6** into the upper link bearing bore. Make sure it is pressed into place.
- 6 Install the new bearing cone **5** onto the upper rear frame lug.
- 7 Install the new bearing cup **4** into the bearing bore and make sure it is fully seated.
- 8 Install the upper bearing cover **3** using Loctite 271 and cap screws **1**. Torque the cap screws to (247 Nm) 182 ft lbs.
- 9 Install a new sealing ring into the lower bearing bore and press into place.
- 10 Install a new bearing cone **15** onto the lower rear frame lug.
- 11 Install the new bearing cup **16** into the bearing bore and make sure it is fully seated.
- 12 Install the spring washer **18** and thrust collar **17** into the lower bearing cover **19**. The spring washer's outer diameter should contact the thrust collar.
- 13 Install the lower bearing cover using Loctite 271 on cap screws **20** and torque the cap screws to (247 Nm) 182 ft lbs.
- 14 Remove the lifting eye bolt from the steering link and install cap screw **30**.
- 15 Install new front and rear sealing rings **14** onto the roller frame lugs.
- 16 Install new front and rear bearing cones **27** onto the roller frame lugs.

WARNING

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- 17 Move the roller frame into position in the steering link. Roller frame weight = (4910 Kg) 10,827 lbs. Be careful not to damage the bearing parts.
- 18 Install link plate **28** with the ten cap screws **15** using Loctite 271 and torque the cap screws to (402 Nm) 297 ft lbs.
- 19 Install the bearing cup **26** into the link plate **28** bore and make sure it is fully seated.
- 20 Install the spring washer **23** and the thrust collar **24** into the bearing cover **22**. The spring washer's outer diameter must contact the thrust collar.

- 21 Secure the bearing cover 22 using Loctite 271 and capscrews 21. Torque the capscrews to (247 Nm) 182 ft lbs.
- 22 Install the steering cylinder pivot pins 7 and secure with washer 9 and split pin 10.
- 23 Position and clamp the hydraulic hoses into the proper locations on the frame.

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- 24 Install the front drum.
- 25 Remove all jack stands.



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