LS–308/318/338 Series – Master Keysheet

(21 Prefix On Crane Serial Number)

AREA 00 GENERAL INFORMATION

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SM00–000–000.00 Service Manual General Usage & Instructions

AREA 02 CRAWLER LOWER

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SM02–000–001.00 Lower Frame
SM02–002–008.00 Traction Shaft (Inner)
SM02–002–009.00 Traction Shaft (Outer 318)
SM02–002–010.00 Traction Shaft (Outer 338)
SM02–003–002.00 Tread Sprocket
SM02–004–001.00 Idler Roller
SM02–005–001.00 Track Roller
SM02–006–004.00 Steering Mechanism
SM02–008–001.00 Side Frame Cylinder
SM02–008–001.01 Side Frame Cylinder
SM02–010–007.00 Rotating Joint
SM02–010–008.00 Rotating Joint (Two Piece)
SM02–010–022.00 Hydraulic System Cleaning Procedure

AREA 03 UPPER REVOLVING FRAME

****

SM03–001–011.00 Undecking Machine
SM03–006–006.00 Swing Lock

AREA 04 VERTICAL SHAFTS

****

SM04–001–006.00 Independent Travel Shaft
SM04–003–003.00 Independent Swing Shaft
SM04–005–005.00 Swing Brake & Controls

AREA 05 HORIZONTAL SHAFTS

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SM05–000–005.00 Horizontal Shafts – General
SM05–001–005.00 Independent Swing Reverse Shaft
SM05–001–006.00 Independent Travel Reverse Shaft
SM05–002–002.00 Long Countershaft
SM05–002–003.00 Short Countershaft
SM05–002–004.00 Reduction Shaft
SM05–003–008.00 Front Drum Shaft
SM05–003–009.00 Rear Drum Shaft
SM05–005–004.00 Third Drum Shaft
SM05–007–001.00 Two Speed Planetary
SM05–007–002.00 Planetary Brake
SM05–008–006.00 Boom Hoist Reverse Shaft
SM05–008–007.00 Boom Hoist Drum Shaft
SM05–008–012.00 Boom Hoist Brake
SM05–008–013.00 Boom Hoist Pawl
SM05–009–002.00 Clutches – General
SM05–009–003.00 Clutches (Front & Rear Drum)
SM05–009–004.00 Clutches (Boom Hoist,Travel, & Third Drum)
SM05–009–009.00 Rotating Joints
SM05–012–003.00 Front & Rear Drum Brake
SM05–012–003.01 Front & Rear Drum Brake (6–1/2”)
SM05–012–004.00 Third Drum Brake

AREA 06 UPPER ENGINE

AREA 07 HYDRAULIC POWER SUPPLY

AREA 08 ANGLE BOOM & JIB

AREA 09 TUBULAR BOOM, FLY, & JIB

AREA 10 TAGLINE WINDER

AREA 18 SPECIAL ATTACHMENTS

How To Use This Manual, General Service Instructions, And Safety Procedures

The following information is provided to help guide the user of this manual. An explanation of how this manual is organized, as well as general information and safety considerations which should be understood when performing any service or maintenance procedure, is given. This information is general in nature and should supplement any of the specific procedures in this manual along with a constant awareness of safety and common sense.

How To Use This Manual

This Service Manual is a collection of written procedures which are used to service and maintain a specific crane model. The index, which is called a "Keysheet", is used to organize the procedures within this manual and serve as a Table Of Contents as well. Each procedure, in this manual, is written so that it can stand alone and typically covers only one procedure. Procedures are given a numerical designation, or "SM Code" Number, (Example: SM01—005—034.00) which is unique to that procedure and that procedure only. The following is a listing of the general area definitions which are designated by the first digits in the SM Code Number sequence:

General Area Descriptions

SM01 — Rubber Tire Lower
SM02 — Crawler Lower
SM03 — Upper Revolving Frame & Machinery
SM04 — Vertical Shafts
SM05 — Horizontal Shafts
SM06 — Upper Engine
SM07 — Hydraulic Power Supply
SM08 — Angle Boom
SM09 — Tubular Boom
SM10 — Tagline Winder
SM11 — Fairleader
SM12 — Shovel Attachment
SM13 — Trench Hoe, Logger & Scrapper Attachment & Prop Handler
SM14 — Cab & House Assembly
SM15 — Rotascope Attachment (Discontinued)
SM16 — Wire Rope Requirements
SM17 — Hydraulic Boom And Attachments
SM18 — Special Attachments
SM19 — Diesel Pile Hammer (Discontinued)
SM20 — Tower, Climbing Assembly, Traveling Base & Gantry (Discontinued)
SM21 — Log Skidder (Discontinued)
SM22 — Hydraulic Hammer (Discontinued)

The procedures in this manual are collated by SM Code Number sequence. Use the Keysheet in the front of this manual, the general area descriptions shown previously, and the SM Code title shown on the Keysheet to find the specific procedure required to service the crane.

Throughout this manual, reference is made to the left, right, front, and rear, pertaining to directions and locations. These reference directions are relative to the operator, sitting in the operator's seat, with the upper directly over the front of the carrier, unless otherwise stated. (Crawler mounted cranes: upper over the front of the crane with travel motors to the rear.)

Danger, warning, and caution captions as well as special notes are used throughout this manual and on the crane to emphasize important and critical instructions. **If any instruction, caution, warning, or danger labels, decals, or plates become lost, damaged, or unreadable, they must be replaced.** Information contained on such labels, decals, and plates is important and failure to follow the information they contain could result in an accident. Replacement labels, decals, and plates can be ordered through a Link-Belt Distributor. For the purpose of this manual, danger, warning, and caution captions and notes are defined as follows:

DANGER

An operating procedure, practice, etc. which, if not correctly followed, may result in severe personal injury, dismemberment, or loss of life.

WARNING

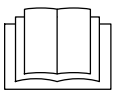
An operating procedure, practice, etc. which, if not correctly followed, may result in personal injury.

CAUTION

An operating procedure, practice, etc. which, if not correctly followed, may result in damage to, or destruction of, equipment or property.

NOTES

Note: An operating procedure step, condition, etc. which is essential in order for the process to be completed properly.



This symbol may appear in manuals or on a label on the crane to alert personnel that additional instructions are included in the crane Operator's Manual.

Figure 1
Keep hands and tools clear of moving parts.

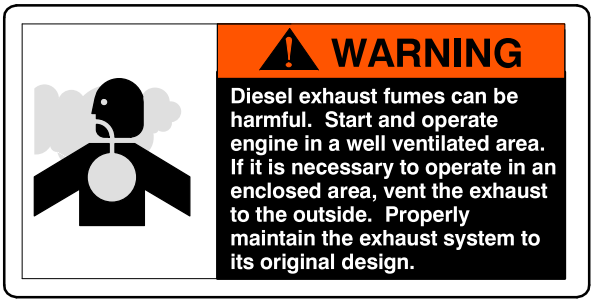


Figure 2
Diesel Exhaust Fumes.

Service Safety And Set Up Guidelines

The following is a list of safety and set up considerations which may apply to any service or maintenance procedure. Review the entire list and understand the type of things you must consider to perform a safe service procedure and then apply these guidelines to each specific service or maintenance procedure.

DANGER

Do not operate the crane unless you are qualified. Unauthorized operation by untrained personnel could result in an accident. Crane operation is to be performed by a certified operator only.

Service Safety

1. Read and understand the service or maintenance procedure to be performed before beginning work. By reading the procedure ahead of time, you can be sure to have the replacement parts and tools on hand that are required to complete the job.
2. Wear protective gear to prevent injury; hard hat, safety glasses, gloves, steel toed shoes, etc.

Figure 3
Pinch Point Label

3. First aid supplies and a fire extinguisher should be on the job site to assist in an unexpected situation. The location of these items should be known to all as well as access to a telephone for emergencies.
4. Work in a clean, dry, firm, level area whenever possible. Choosing the correct work site can make a big difference on how well the job goes.
5. Use caution around flammable materials. Be aware of all the materials in the work area which are a threat. Also make others aware of volatile materials; post signs if necessary.
6. Release all trapped pressure in air and hydraulic circuits before disconnecting any line or component. Shutdown the crane, exhaust all pressure from the crane's air reservoir(s) and work the hydraulic control levers back and forth before servicing the crane.
7. Do not disconnect any hydraulic line from a crane which has its attachment in the air. Trapped pressure may be all that is suspending it. Disconnecting a line could release the trapped pressure, causing the attachment to fall. Lower the attachment to the ground or on to its rest before servicing the crane.
8. Do not work on a crane which is in motion. Fans, belts, gear trains, etc. can catch an unexpecting person and quickly dismember them.
9. Do not climb on the attachment or other hard to reach areas. If the steps and/or ladders which are installed on the crane do not provide adequate access to the area of the crane which needs servicing, use a step ladder or other approved device.
10. Pinch points exists between the upper and lower frames. Death or dismemberment may result from personnel caught in these points. Learn where these pinch points are and stay clear of the rotating upper frame.

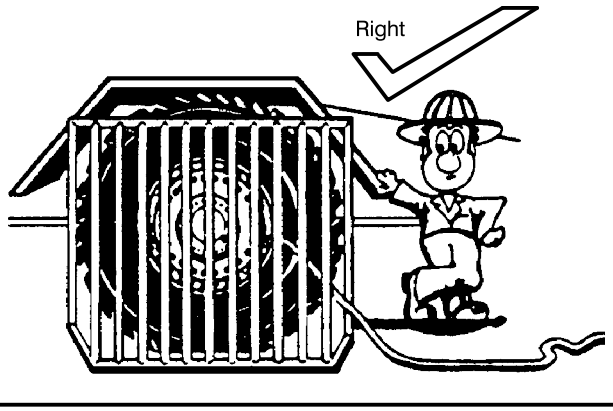


Figure 4
Use a guard when inflating tires.

11. If working in a confined area, be sure to provide adequate ventilation when running the engine(s), using toxic solvents, welding, or any other operation which contaminates the fresh air supply.
12. Post a sign in the operator's cab to alert others that the crane is under service. Starting the crane while it is being serviced could severely injure someone. Crane damage could also occur if systems are operated prematurely. Imagine starting the engine(s) before the oil is replaced.
13. Secure access panels, doors, and machinery hoods when in the open position to ensure they do not fall or slam shut due to wind or accidental disruption.
14. Crane parts may be heavy. Always use an appropriate lifting device to support work. Do not attempt to lift an object without knowing its weight. Get help if necessary.
15. Always use a safety rim cage when inflating or deflating tires. Worn or misassembled parts can "explode" from the assembly causing serious injury. Use a safety rim cage, clip on air chuck, and stand aside when inflating or deflating tires.

Crane Set Up And Disassembly

1. Properly park the crane as described in the Operator's Manual. Park the crane in an area which provides the most comfortable working conditions. However, do not park the crane where it will be an obstruction or an intrusion to traffic, coworkers, or to the public. Keep in mind that a major service procedure, or a repair part which requires a long lead time, could have the crane disabled for an extended period of time.
2. Keep in mind the mess which is sometimes caused by a crane under repair. Oil or other fluid leaks should be contained or prevented. Consider your responsibility of maintaining a safe clean work area and a healthy environment for all.

Figure 5
Allow engine to cool before removing the radiator cap.

3. If the crane is equipped with outriggers, it may be safer as well as an advantage to raise and level the crane on outriggers to provide easier access to areas underneath. Do not work under a crane that is improperly supported.
4. Shutdown the engine(s) per the instructions given in the Operator's Manual.
5. Post a sign in the operator's cab to alert others that the crane is being serviced.
6. Engines, transmissions, hydraulic systems, etc. generate extreme heat during operation. Temperatures can reach levels which may cause serious burns. Allow the crane to cool before attempting to service it.

WARNING

Engine coolant is hot. Failure to allow engine(s) to sufficiently cool before draining coolant could result in severe burns or other personal injury. Allow the engine(s) and radiator(s) to cool before draining coolant from the radiator(s).

7. Pressure is generated inside the engine's cooling system due to the heat transfer process from the engine(s) to the radiator(s). Do not attempt to open or drain the radiator(s) until it/they has/have had sufficient time to cool. Disconnecting hoses before the engine(s) and radiator(s) has/have cooled is even more dangerous. Wait until the engine(s) and radiator(s) have cooled and then drain the radiator(s) before disconnecting any hoses. Properly store or dispose of used coolant.

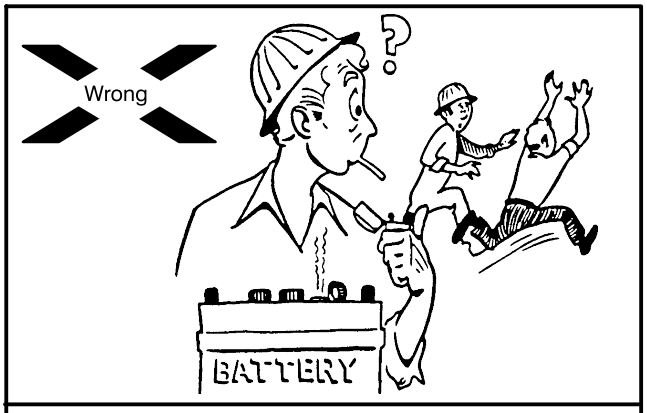


Figure 6
Do not use an open flame near the battery.

⚠ WARNING

Solvents and cleaning solutions can be hazardous. Serious personal injury may result from misuse of these products. Read and follow all the manufacturer's recommendations concerning solvents and cleaning solutions.

8. Thoroughly clean the area of the crane which is to be serviced. Dirt or other contamination could enter the hydraulic, air, lubricating system, etc. and cause immediate and/or long term problems. Cleaning the service area not only prevents contamination problems but it also makes working on the crane easier and sometimes problems are more recognizable.
9. Before beginning any removal or disassembly procedure, take a moment to observe critical features of the assembly which may greatly simplify the installation or assembly process. Label electrical, hydraulic, air, or other connections. Index mark pump, motor, and valve sections. Lightly spray paint or count the threads of adjustment screws. Simple steps such as these can minimize the effort needed to put the crane back in service.

⚠ WARNING

Hydraulic oil is under pressure and may be hot. A sudden release of hot oil could cause severe burns and/or other serious injury. Shutdown the engine(s) and exhaust all trapped hydraulic pressure from the system before removing any line or component.

10. Hydraulic systems, while operating, are under high pressure. Even after the crane is shutdown these pressures can remain trapped in the hydraulic lines and system components. Some hydraulic systems utilize an air pressurized reservoir which maintains pressure on the system after the crane is shutdown. It is critical that all residual pressure, which is trapped in the system, be neutralized before disconnecting any line or hydraulic component. Use the following techniques to exhaust trapped hydraulic pressure from the system:
    a. Lower the attachment to the boom rest, onto blocking, or onto the ground and shutdown the engine(s).
    b. Open the drain valves on the air system reservoir(s), if equipped, to bleed the air system pressure.
    c. Relieve any residual or precharge pressure by pushing the button on the pressure relief valve, on the hydraulic reservoir, if equipped. Otherwise, loosen the filler cap 1/4 turn.
    d. Turn the ignition switch to the **ON POSITION**, but **DO NOT START THE ENGINE.**
    e. Operate the steering control(s) back and forth repeatedly until steering becomes hard. (On cranes equipped with emergency steering system, it will take several rotations of steering wheel before steering becomes hard.)
    f. Work the crane control levers and outrigger switches, if equipped, back and forth several times.
    g. Turn ignition switch to the **OFF POSITION.**
    h. When pressure is fully relieved, close the drain valves on the air system reservoir(s), if equipped.

⚠ WARNING

Air lines may contain high pressure. Opening lines and fittings before relieving air pressure may result in serious injury. Shutdown the engine(s) and drain the air system reservoir(s) before opening any line or fitting.

11. Air system circuits, like hydraulic circuits, contain high pressures also. Although the threat of a hot working fluid does not exist, highly pressurized lines and components can possibly "fly off" if lines are disconnected before the system pressure is relieved. Open the drain valve on the air system reservoir(s) to exhaust system pressure before working on the crane.

WARNING

Use care not to cause sparks at the battery terminals while disconnecting or connecting the battery. Battery gasses are volatile and could be ignited by a spark or flame causing the battery to explode. Keep the area around the battery well ventilated and disconnect the negative side of the battery first, with the ignition switch "OFF", to minimize hazard.

Battery posts, terminals, and related accessories contain lead and lead compounds. Eating or smoking with lead residue on hands may cause lead poisoning. Wash hands after handling lead products.

12. When working on electrical circuits, disconnect the battery to minimize shock, burn, spark, or other hazard. When disconnecting the battery, confirm that the ignition switch is in the "OFF" position. Disconnect the negative side of the battery first to minimize the potential for sparks at the battery. Battery gases which are exposed to such sparks, could cause an explosion. Likewise when connecting the battery, confirm that the ignition switch is in the "OFF" position and install the positive cable(s), first and the negative connection(s) last.
13. It is a good practice when disassembling hydraulic components to lay the parts out in the order that they were disassembled. Keeping the parts in this order during disassembly, cleaning, and inspection will aid in the assembly process.

Welding

1. When making repairs which require welding, disconnect any electronic equipment (such as rated capacity limiters and engine computers) to prevent damage to them. Use the battery disconnect switch(es), if equipped.
2. Be aware of systems adjacent to areas being welded. Residual heat from the welding process could cause damage to other components. Heat may also vaporize materials which may become toxic or volatile.
3. Remove paint from areas to be welded to prevent toxic fumes.
4. The grounding connection should be within 3 feet (*1 m*) of the welded parts.
5. Connect the ground to the lower, if welding on the lower, or to the upper if welding on the upper. Electrical current through the turntable bearing could cause an arc which could damage it.
6. Do not position the ground connection where seals or bearing, as in transmissions or valves, will be between it and the welded parts.
7. Remove any flammable materials from the area.
8. Use the appropriate setting on the welder for the size of the welding operation. Do not use more than 200 Volts continuously.

Cleaning And Inspection

WARNING

Solvents and cleaning solutions can be hazardous. Serious personal injury may result from misuse of these products. Read and follow all the manufacturer's recommendations concerning solvents and cleaning solutions.

1. All components should be thoroughly cleaned with an approved cleaning solvent, air dried and carefully inspected for damage, wear and corrosion.
2. All Loctite® or other sealant residue should be removed from threads of hardware and parts that are going to be reused.
3. All "soft parts", such as seals, gaskets, back up rings, and o-rings, should be replaced.
4. Replacement of bearings and bushings is generally a good preventive maintenance measure. Even though a bearing or bushing seems to be intact and is functioning properly, its life span is limited. Replacing a simple bearing or bushing while the opportunity is at hand could save a complete component failure later.
5. In the event of severe defects, contact factory personnel for directions whether to repair or replace any major component.

Crane Assembly

1. Loosely assemble parts to ensure all parts are in place and fasteners started before beginning torquing procedure. Always use a cross torquing sequence to ensure even and uniform installation.

WARNING

Lubricants, sealants, joint and thread locking compounds, etc. can be hazardous. Serious personal injury may result from misuse of these products. Read and follow all manufacturer's recommendations concerning these products.

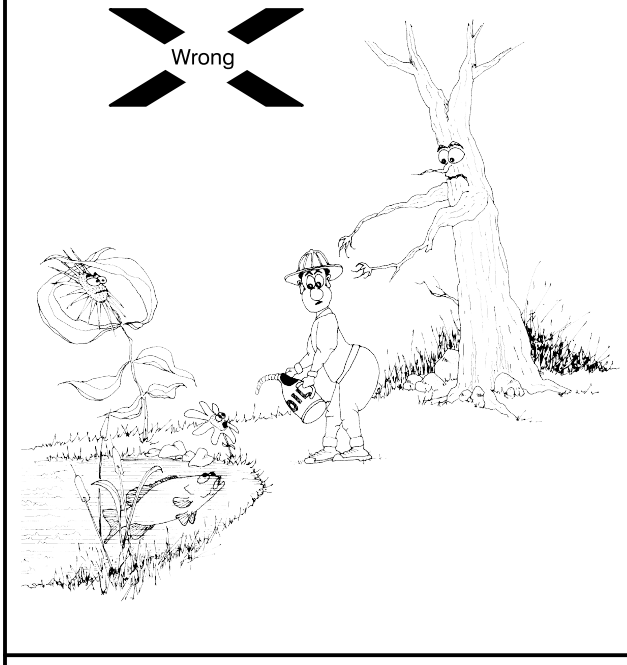


Figure 7
Proper disposal is important.

2. Unless otherwise stated, torque all fasteners per the instructions given in SM Code Area 18—000.
3. When installing hydraulic hoses, lines, and fittings, use two wrenches to ensure the hoses and lines are not twisted. One wrench must be on the male fitting, the other wrench on the female fitting.
4. Unless otherwise stated, torque all hydraulic fittings per the instructions given in SM Code Area 07—018.
5. Check all fluid levels before returning the crane to service; hydraulic reservoir oil level, transmission fluid level, engine(s) oil level, etc. Add oil as required. See Operator's Manual and/or engine(s) manufacturer's manual(s) for correct type of fluids and procedures.
6. Always replace guards, grilles, and other types of protective shields. Also, be sure that any systems which were disconnected such as load indicating systems, anti-two block devices, control cables, etc. are functioning properly before returning the crane to service.
7. Start the appropriate engine and let it idle for five minutes. Inspect the connections on the hydraulic, air, transmission, etc. lines for leaks. Repair if needed.
8. Check that all hydraulic, air, and electrical functions are operating normally before returning the crane to service.
9. After crane is assembled, refer to the Operator's Manual for any periodic type of adjustments which may have been affected by the service procedure.
10. Properly dispose of any used oils, solvents, cleaners, etc.

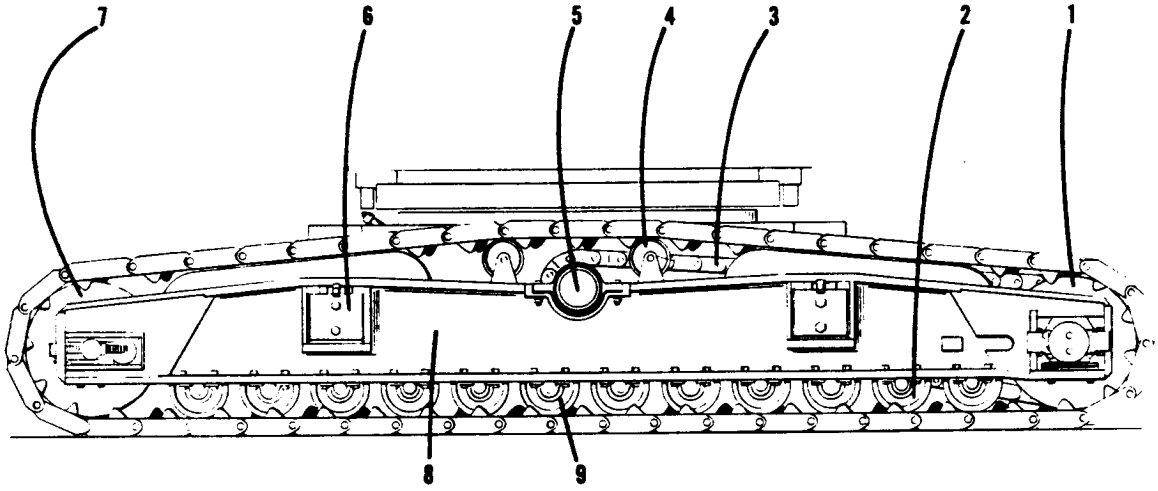


Fig. 1
Lower Frame (518 Shown)

(1) Track Drive Sprockets
(2) Track Rollers
(3) Track Drive Chain
(4) Track Carrier Rollers
(5) Traction Shaft
(6) Cross Axles
(7) Idler Roller
(8) Side Frame
(9) Track Belt

Lower Frame (General)

Power to travel the machine is transmitted to the lower by the vertical travel shaft. (See Area 4). The vertical travel shaft powers the horizontal traction shaft to travel the machine.

At each end of the traction shaft there is a jaw clutch-steer brake arrangement. When the brakes are engaged, the machine will not move. When the brakes are disengaged and the jaw clutches are engaged, power from the traction shaft is transmitted to the track drive sprockets by the track drive chains. The drive sprockets drive the track belt to travel the machine. To steer the machine, one brake is locked while the opposite brake is unlocked and jaw clutch is applied. Power is applied to one track belt and the machine pivots on the other track belt to turn.

The side frame assemblies may be removed and replaced under the machines own power to reduce overall weight and width, for transportation purposes. On 318 machines, side frames may be hydraulically retracted to reduce overall width.

The weight of the machine against the track belt is supported by the track rollers. Track carrier roller (400,500 series machines) or skid plates (300 series machines) carry the track belt over top of the side frame.

The idler rollers (at front of lower) guide the track over the end of the side frame. These rollers are also used to adjust track tension.

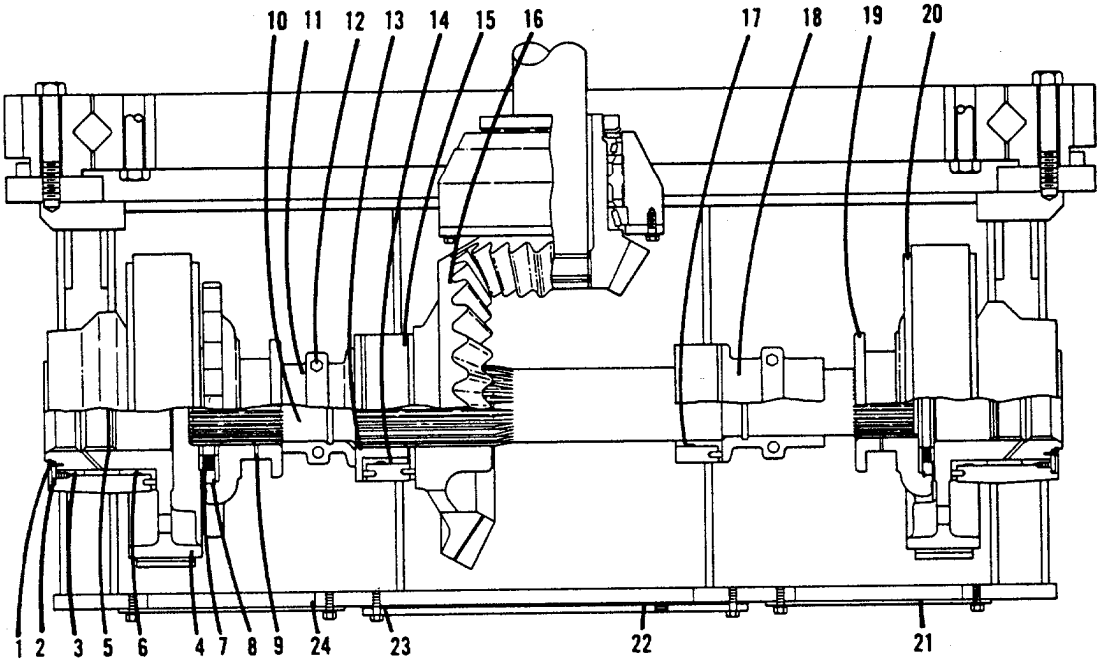


Fig. 1
Traction Shaft Assembly

(1) Snap Ring
(2) Thrust Washer
(3) Bushing
(4) Brake Drum
(5) Snap Ring
(6) Bushing
(7) Shock Absorber
(8) Snap Ring
(9) Jaw Clutch
(10) Shaft
(11) Sleeve Spacer
(12) Capscrew
(13) Bearing Sleeve
(14) Bushing
(15) Thrust Washer
(16) Bevel Gear
(17) Bushing
(18) Sleeve Spacer
(19) Jaw Clutch
(20) Brake Drum
(21) Brake Cover Plate
(22) Bevel Gear Cover Plate
(23) Gasket
(24) Brake Cover Plate

Traction Shaft Removal

(a) Remove outer traction shaft assemblies. See SM2-2-9.0 for LS318, or SM2-2-10.0 for LS338.
(b) Drain lubricant from bevel gear case.
(c) Remove lower bevel gear case (22) and both brake cover plates (21 & 24).
(d) Remove capscrew from sleeve spacers (11 & 18). Remove sleeve spacers from machine.
(e) Slide traction shaft to the right until there is enough clearance to remove L.H. jaw clutch (9). Remove L.H. L.H. jaw clutch.
(f) Remove shaft out the L.H. side of the lower. Support bevel gear (16) as shaft is removed, to keep it from falling. There is a threaded hole in the end of the shaft for installation of a puller.
(g) Remove bevel gear (16), thrust washer (15), and bearing sleeve (13).

Brake Drum Removal:

(a) Remove outer and inner traction shafts.
(b) Remove jaw clutch (19). If removing drum (20), jaw clutch (9) will be removed during inner traction shaft removal procedure.
(c) Remove snap ring (1) which holds brake drum in carbody. Remove thrust washer (2). Remove steer brake bands. Remove brake drum from machine.

Bushing Replacement: All flanged bushings and the thrust washer behind the bevel gear are held against rotation by two BR106 dowels. When installing new bushings or bevel gear thrust washers, drill two new holes, 7/8" deep, 180° apart, and install new dowels.

The outer bushings (3) on brake drum hubs are held against rotation by 1X486 set screws. When these bushings are replaced, drill and tap two new holes 180° apart and install set screws.

The outer thrust washers (2) on brake drum hub are secured to the hub with 1X2298, 3/32" rollpins. If these thrust washers are replaced, drill two holes through the washer and into the brake drum hub, 180° apart. Install rollpins

to retain thrust washers.

Brake Drum Replacement:
(a) Slide brake drum into place in bushings.
(b) Install thrust washer (2).
(c) Install snap ring (1).
(d) Install and adjust the steer brake bands.
(e) Install R.H. jaw clutch.
(f) Install inner traction shaft.
(g) Install outer traction shafts.

Traction Shaft Installation:
(a) Install bearing sleeve (13).
(b) Slide shaft through L.H. brake drum (4), through bearing sleeve (13), thrust washer (16), and bevel gear (16).
(c) Start shaft splines into bearing sleeve. Push shaft on until splines start through bevel gear.
(d) Push the shaft the rest of the way through the carbody, starting splines in R.H. jaw clutch, and on into R.H. brake drum.
(e) Install L.H. jaw clutch.
(f) Slide shaft back to the left until splines enter L.H. jaw clutch.
(g) Install both sets of sleeve spacers (11 & 18) and bolt together with capscrews (12).
(h) If brake bands or drums were removed, steer brakes must be readjusted. Refer to Operators Manual.
(i) Install cover plates. Fill bevel gear case with lubricant. Refer to Section 2 of Operators Manual for the proper type and amount of lubricant to use.
(j) Install outer traction shafts.
(k) Lubricate all bushings before traveling the machine.

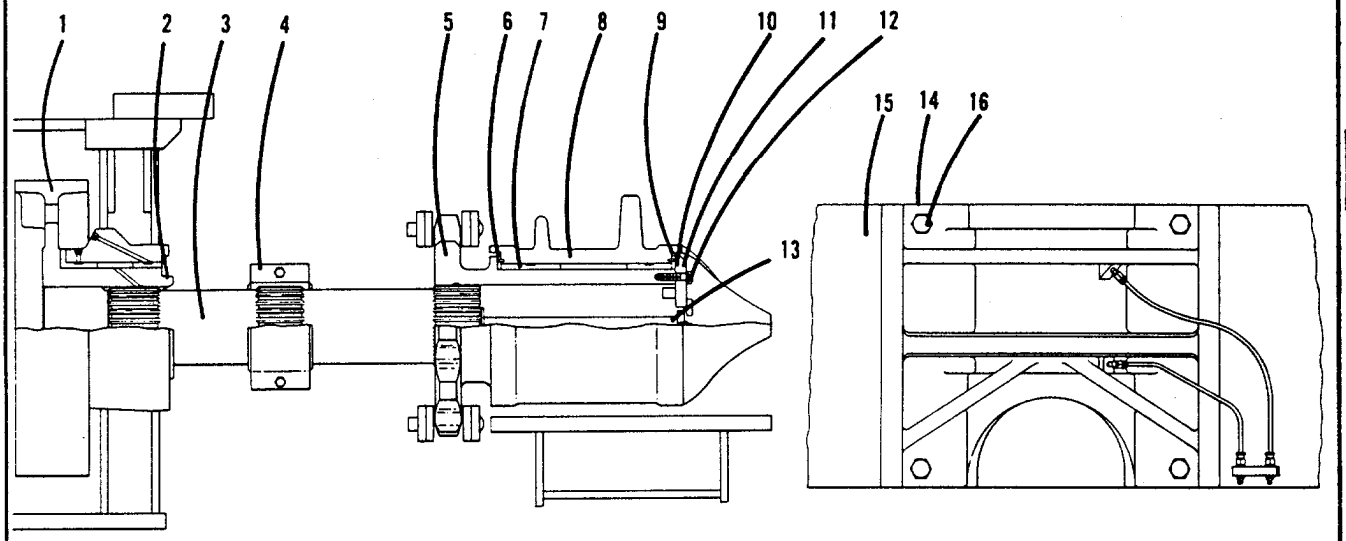


Fig. 1
Outer Traction Shaft
(1) Brake Drum
(2) Snap Ring
(3) Shaft
(4) Spline Cover
(5) Sprocket
(6) Thrust Washer
(7) Bushing
(8) Housing
(9) Thrust Washer
(10) Shims
(11) End Cap
(12) Capscrew
(13) Lubrication Tube
(14) Shims
(15) Side Frame
(16) Capscrews

Outer Traction Shaft Assembly

Outer Shaft Removal:
(a) Remove capscrews (12).
(b) Remove end cap (11). Keep track of the number of shims (10) behind the end cap for replacement later.
(c) Remove spline cover (4). Remove shaft from machine.

Chain Spocket Removal:
(a) Backoff on track drive chain adjustment until chain is slack.
(b) Remove a chain pin from chain assembly. Remove chain.
(c) Place a hydraulic jack between top of side frame and track belt, near outboard bearing. housing. Jack track belt up to gain enough clearance for removal of bearing housing.
(d) Remove outer shaft as explained previously.
(e) Remove sprocket from housing.

Note: Side frames must be extended to remove sprocket as explained above.

Housing Removal:
(a) Remove outer traction shaft.
(b) Follow steps (a-c) of "Chain Sprocket Removal" procedure. Install 21P1 sprocket retaining ring.
(c) Remove mounting capscrews (16). Keep track of how many shims were under each corner of the housing so they can be put back in the same place to maintain shaft alignment.
(d) Remove bearing housing from machine with hoist or auxiliary crane.

Bushing And Thrust Washer Replacement:
(a) All bushings are retained in the housing by 1X487 set screws. When bushings are replaced, drill two holes, 180° apart in the crack between the outside of the bushing and its bore. Thread the holes and install the set screws.
(b) Both thrust washers inside the outboard bearing housing are retained against rotation by two HC1235 dowels. With the washers in place, drill two 3/16" diameter by 9/16" deep holes 180° apart. Install a dowel in each hole.

Reassembly:
(a) Install thrust washers (6 & 9) in outboard bearing support. Slide chain sprocket into place in housing.
(b) Install 21P1 retaining ring on the sprocket so it won't slide out of the housing during reassembly.
(c) Set bearing support in place on side frame. Install shim washers that were removed during disassembly under each corner of the support.

The following shims are available for use at this location.
(1) 1H1152.....3/16"
(2) MM902.....1/32"
Install and tighten down mounting capscrews.

(d) Slide shaft through sprocket and into place in brake drum. If side frames are in extended position, install spline covers (4).

(e) If side frames are in extended position, install lubrication tube (13).

(f) Remove sprocket retainer ring. Install end cap (11) and capscrews (16) on end of sprocket. Check sprocket end play: shim between end cap and sprocket until end play is 1/16" with capscrews tightened. The following shims are used at this point:
(1) 21A421.....20 Ga.

(g) Lower hydraulic jack and remove it. Connect track drive chain. Adjust track drive chain and track shoes as explained in operators manual.

(h) Lubricate all bushings on traction shaft and chain sprocket before operating machine.

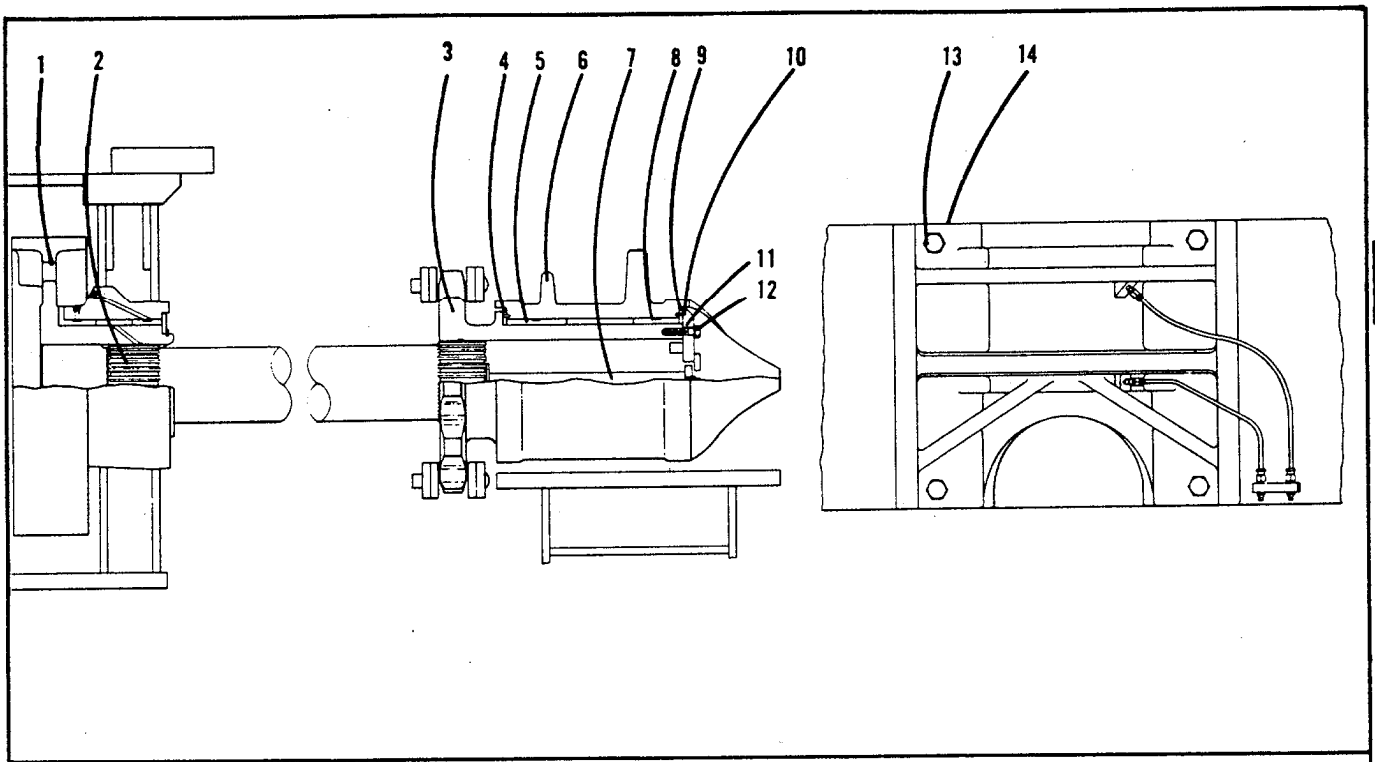


Fig. 1
Outer Traction Shaft
(1) Brake Drum
(2) Shaft
(3) Sprocket
(4) Thrust Washer
(5) Bushing
(6) Housing
(7) Lubrication Tube
(8) Bushing
(9) Thrust Washer
(10) Shims
(11) End Cap
(12) Capscrew
(13) Capscrew
(14) Shims

Outer Traction Shaft Assembly

Outer Shaft Removal:
(a) Remove capscrews (12).
(b) Remove end cap (11). Keep track of the number of shims (10) behind the end cap for replacement later.
(c) Remove shaft from machine.

Chain Sprocket Removal:
(a) Back off on track drive chain adjustment until chain is slack.
(b) Remove a chain pin from chain assembly. Remove chain.
(c) Place a hydraulic jack between top of side frame and track belt, near outboard bearing housing. Jack track belt up to gain enough clearance to remove bearing housing.
(d) Remove outer shaft as explained previously.
(e) Remove sprocket from housing.

Housing Removal:
(a) Remove outer traction shaft.
(b) Follow steps (a-c) of "Chain Sprocket Removal" procedure. Install 21P1 sprocket retaining ring.
(c) Remove mounting capscrews (13). Keep track of how many shims were under each corner of the housing so they can be put back in the same place to maintain shaft alignment.
(d) Remove bearing housing from machine with a hoist or auxiliary crane.

Bushing And Thrust Washer Replacement:
(a) All bushings are retained in the housing with 1X487 set screws. When bushings are replaced, drill two holes 180° apart in the crack between the outside of the bushing and its bore. Thread the holes and install the set screws.
(b) Both thrust washers inside the outboard bearing housing are retained against rotation by two HC1235 dowels. With the washers in place, drill two 3/16" diameter by 9/16" deep holes, 180° apart. Install a dowel in each hole.

Reassembly:
(a) Install thrust washers (4 & 9) in outboard bearing support. Slide chain sprocket into place in housing.
(b) Install 21P1 retaining ring on the sprocket so it won't slide out of the housing during reassembly.
(c) Set bearing support in place on side frame. Install shim washers that were removed during disassembly under each corner of the support. The following shims are available for use at this location.
(1) 1H1152.....3/16"
(2) MM902.....1/32"
Install and tighten down mounting capscrews.
(d) Slide shaft through sprocket and into place in brake drum.