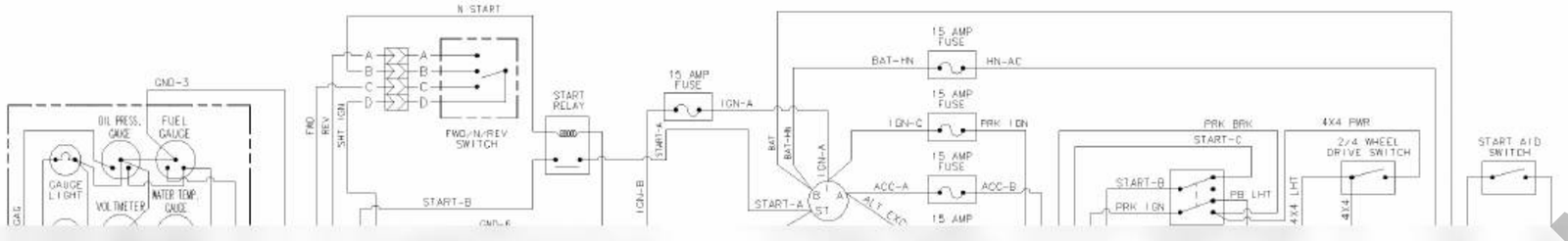


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LUBRICATION & ROUTINE MAINTENANCE (continued)

		Lube Symbol	No. of Points
	Daily or Shift (10 hour Maximum) Lubrication & Maintenance (Service at whichever interval occurs first)		
9.	Fuel Filler Cap (fill at end of work shift to minimize condensation)	DF	1
10.	Hydraulic Return Filter Condition Indicator (check indicator with oil at normal operating temperature and engine running at full throttle - replace filter element before by-pass indication is reached or at least annually)	-	1
12.	Hydraulic Level Sight Gauges (level handler, retract all other cylinders and check sight gauges - refill as required)	HF	1
14.	Hydraulic Suction Filter (replace filter element when return filter element is replaced)	-	1
19.	Air Cleaner Element Condition Indicator (check for clogged condition (red band showing) and clean or replace element as required)	-	1
35.	Engine Crankcase Dipstick (level handler and check level - refill as required - item 14 is filler cap)	EO	1
	Weekly (or 50 Hour) Lubrication & Maintenance (Service at whichever interval occurs first) (include all previous periodic services)		
1.	Outrigger Cylinder Pivots	CG	4
2.	Tires (check for damage & proper inflation) 534C-9: STD: - 13.00 X 24, 12PR - 65 PSI Option: - 13.00 x 24 Radial, 12PR - 65 PSI 534C-10: STD: - 14.00 X 24, 12PR - 65 PSI Option: - 14.00 x 24 Radial, - 70 PSI		
5.	Leveling Cylinder Pivots	CG	2
8.	Battery (check terminals)	-	1
15.	King Pins	CG	4
16.	Steering Cylinder Pivots	CG	4
17.	Outrigger Arm Pivots	CG	4
18.	Front Axle Pivot	CG	2
20.	Rear Axle Pivot	CG	2
21.	Tie Rod Ends	CG	2
22.	Boom Pivots	CG	2
23.	Carriage Tilt Cylinder Pivots	CG	2
25.	Extension Sheave	CG	2
28.	Boom Hoist Cylinder Pivots	CG	2
30.	Retraction Sheave	CG	1
32.	Boom Head/Carriage Pivot	CG	2
33.	Boom Bottom Front Slide Bearings (extend boom fully & lube all wear paths - retract & extend boom fully three times & wipe excess lube from bearings)	MG	4
34.	Radiator Fill Cap (check level & refill as required)	-	1
39.	Boom Hoist Cylinder Barrel Pivots	CG	2
40.	Compensating Cylinder Pivots	CG	2
41.	Quick Switch Latch	CG	1
45.	Fuel Filter/Water Separator (with Drain) (drain water)	-	1
	At End of First 50 Hours Only		
4.	Differential Drain Plug (drain & refill)	SL	1
6.	Planetary Drain Plugs (drain while draining differential)	-	2
	At End of First 30 Days Only (250 Hours Maximum) Lubrication & Maintenance		
	●Check torque of all items listed in **Torque Chart** (pg. 35)	-	-

⚠ CAUTION

Service intervals are based on machine usage of 1500 hours annually. Use of your unit may vary significantly and you must adjust service frequency for your usage to obtain maximum service life. Frequency headings in the following schedule indicate a calendar limit and an operating hour limit. Perform service at whichever interval occurs first.

		Lube Symbol	No. of Points
	5 Week (or 250 Hour) Lubrication & Maintenance (Service at whichever interval occurs first) (include all previous periodic services)		
3.	Drive Axle Level Plug (check level & refill as required)	SL	1
11.	Hydraulic Reservoir Breather Cap (check & clean or replace cap as required)	-	1
24.	Boom Front, Top & Side Slide Bearings (extend boom fully & lube all wear paths - retract & extend boom fully three times & wipe excess lube from bearings)	MG	13
27.	Vacuator Valve (rubber cone on bottom - check to be sure cone is clear and undamaged)	-	1
29.	Boom Rear Slide Bearings (lube paths)	MG	12
31.	Extend Cables (check adjustment & adjust as required)	-	-
33.	Boom Front Bottom Slide Bearings (to be performed by experienced maintenance person - check for damage & excessive wear - no wear permitted past bevel - maximum clearance at top bearing is 1/8 inch, shim or replace as required; when these bearings require service, check all other slide bearings - shims are 1/16 inch thick)	MG	4
36.	Engine Oil Filter (replace filter element)	-	1
42.	Drive Belts (check condition & tension - replace as required	-	1
43.	Engine Crankcase Drain Plug (drain & refill top level)	EO	1
46.	Rear Hub level Plug (check level & refill as required)	GO	2
	●Check torque of items indicated in **Torque Chart** (pg. 35)		
	Quarterly (or 500 Hour) Lubrication & Maintenance (Service at whichever interval occurs first) (include all previous periodic services)		
11.	Hydraulic System (we recommend that hydraulic fluid be analyzed to determine condition - drain and refill reservoir if required)	HF	1
13.	Hydraulic Reservoir Screen (remove, clean and install when hydraulic oil is drained)	-	1
38.	Fuel Strainer (replace)	-	1
45.	Fuel Filter/Water Separator (with Drain)(replace filter element)	-	1
	Semi-Annual (or 1000 Hour) Lubrication & Maintenance (Service at whichever interval occurs first) (include all previous periodic services)		
4/6.	Differential and Planetary Drain Plugs (drain, fill to level, wait 5 minutes and fill to level again -item 24 is fill/level plug)	SL	1
7.	Front Axle Breather (clean or replace)	-	1
11.	Hydraulic Reservoir Breather Cap (clean or replace)	-	1
47.	Rear Hub Drain Plug (drain & refill - item 48 is fill plug)	GO	2
	Annual (or 1500 Hour) Lubrication & Maintenance (Service at whichever interval occurs first) (include all previous periodic services)		
10.	Hydraulic Return Filter (replace filter element)	-	1
11.	Hydraulic System (unless fluid is analyzed quarterly to determine degree of contamination, reservoir must be drained and refilled on an annual basis)	HF	1
13.	Hydraulic Reservoir Screen (remove, clean and install when hydraulic oil is drained)	-	1
14.	Hydraulic Suction Filter (replace filter element)	-	1
34.	Engine Cooling System (drain, flush & refill on basis of period suggested by anti-freeze manufacturer)	-	1

LUBRICATION ADVICE

- Apply a light coating of engine oil to all linkage pivot points.
- Clean lubrication fittings before lubricating.
- Intervals shown are for normal (8-hour day) usage and conditions. Adjust intervals for abnormal usage and conditions.
- Drain engine and gear cases after operating when oil is hot.
- Check lubricant levels when lubricant is cool.
- Clean filter and air cleaner housing and reusable elements using solvent or diesel fuel. Dry components thoroughly using lint free cloth.

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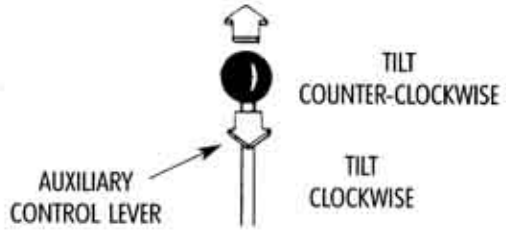
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⚠ WARNING

Do not handle a load with Slope Pile Carriage attachment until you have studied "Slope Pile Carriage Capacity Chart" carefully. If your handler does not have a "Slope Pile Carriage Capacity Chart", ask your supervisor to get one.

Attachment-Tilt Controls:



The carriage tilt lever controls carriage tilt.

The auxiliary control lever is used to tilt slope pile carriage. Push lever forward to tilt carriage counter-clockwise; pull lever back to tilt clockwise.
*If your handler is equipped with a multi-function auxiliary control lever, ***see pages 31 and 32.**

Installation Procedure:

1. Remove carriage/fork combination or other attachment from boom head. ***See page 25.***
2. Install slope pile carriage on boom head.
3. Connect auxiliary hydraulic hoses to slope pile carriage attachment.
4. Approach load with forks centered on load and stop handler.
5. Level handler before tilting carriage to engage load.
6. Tilt carriage to left or right to align forks with load and engage load.
7. Raise load slightly and then level carriage.
8. Travel with load lowered to travel position (load approximately one foot above ground).

Boom Head-Mounted Winch

⚠ WARNING

PRECAUTIONS

- Maximum winch load capacity is reduced from normal carriage/fork load rating.
- Always level the handler before lifting a load.
- Travel with load and boom lowered to travel position (load approximately one foot above the ground).
- Always lower load to rest before leaving handler.

Capacity:

The boom head-mounted winch maximum load capacity is shown on the standard carriage capacity chart. However, maximum capacity may be used only in areas where it does not exceed capacities shown on standard carriage/fork capacity chart (located on dashboard). Also note that maximum winch capacity is less than carriage/fork maximum capacity. Capacity rating is based on load being lifted and suspended vertically from the boom and with no load on forks.

⚠ WARNING

Do not handle a load with Boom Head-Mounted Winch attachment until you have studied "Boom Head-Mounted Winch Capacity Chart" carefully. If your handler does not have a "Boom Head-Mounted Winch Capacity Chart", ask your supervisor to get one.

⚠ WARNING

A side load or a swinging load can cause the handler to tip over and/or damage the boom.

Observe the following Special Precautions:

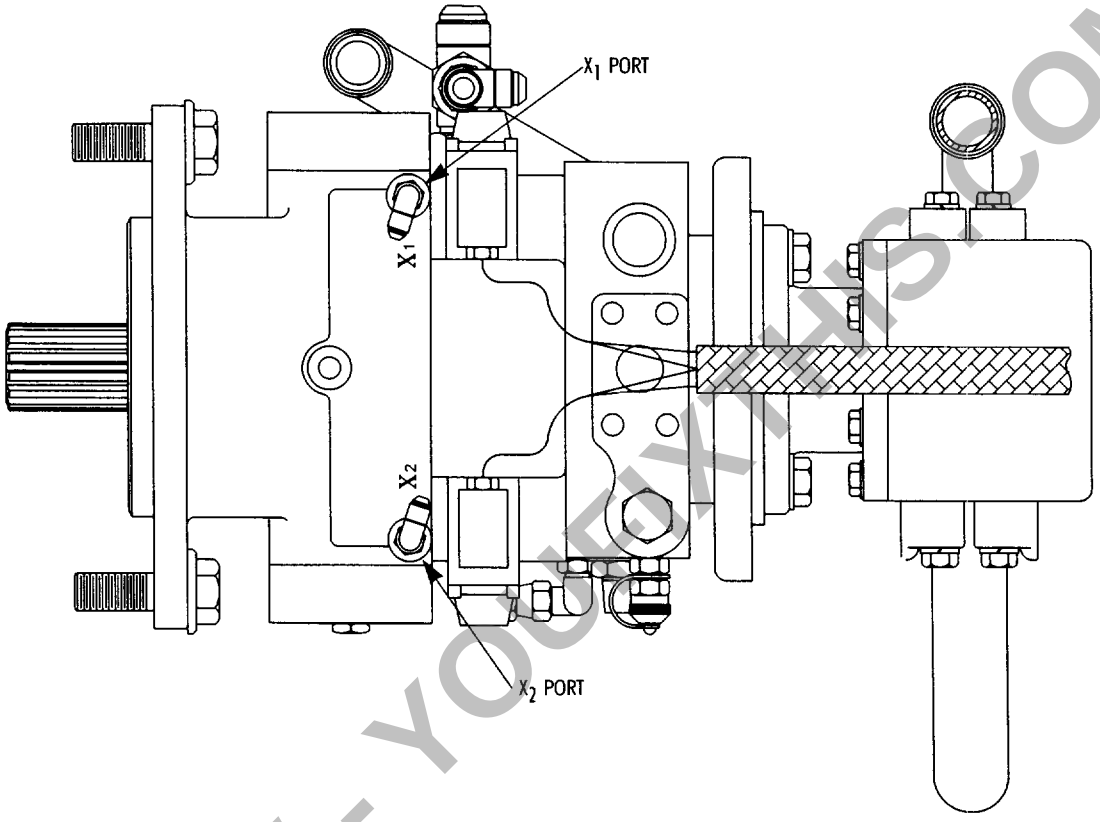
⚠ SPECIAL PRECAUTIONS ⚠

- Never drag the load; lift vertically.
- Use tag line to guide and steady a suspended load. Tag lines must be long enough to keep helpers clear of load and handler.
- Beware of wind. Wind can cause a suspended load to swing and cause dangerous side loads - even with tag lines.
- Start, travel, turn and stop slowly to prevent load from swinging.
- Weight of all rigging (slings, etc.) must be included as part of load.
- Do not attempt to use handler frame-leveling to compensate for load swing.

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FIGURE 14
MAIN PUMP ASSEMBLY (TOP VIEW)



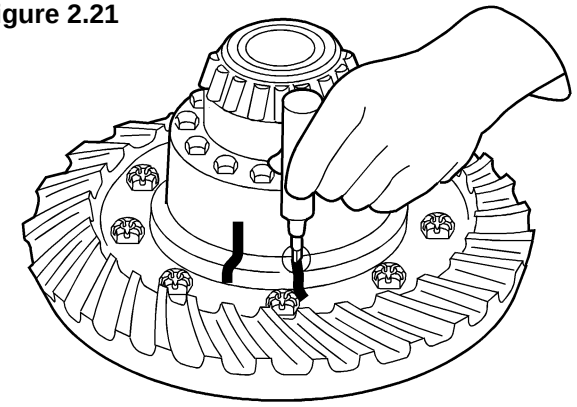
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Disassemble Differential Case

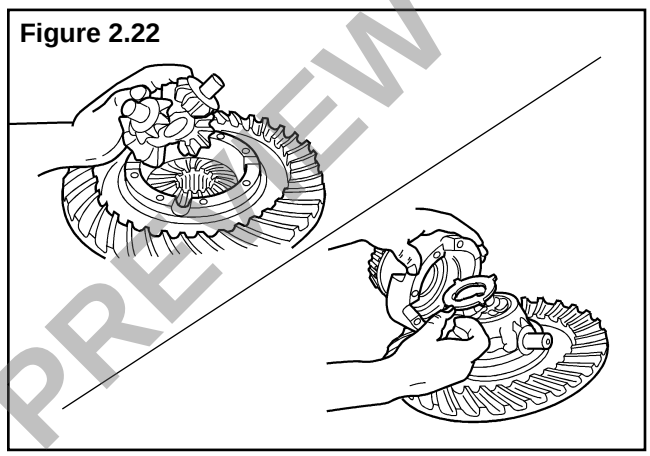
1. Before disassembling differential case, mark position of both halves and spider cross for easier reassembly. **Figure 2.21.**

Figure 2.21



2. Remove differential case capscrews.
3. Separate differential case halves. If necessary use a brass or rubber hammer to separate halves.
4. Remove spider cross, differential pinions, side gears and washers. If differential case is "Limited Slip," remove friction disc pack. **Figure 2.22.**

Figure 2.22



5. If differential case is "integral," remove differential pinion axle lock capscrew and differential pinion axle. Then turn side gears and remove differential pinions, side gears and washers. **Figures 2.23, 2.24 and 2.25.**

Figure 2.23

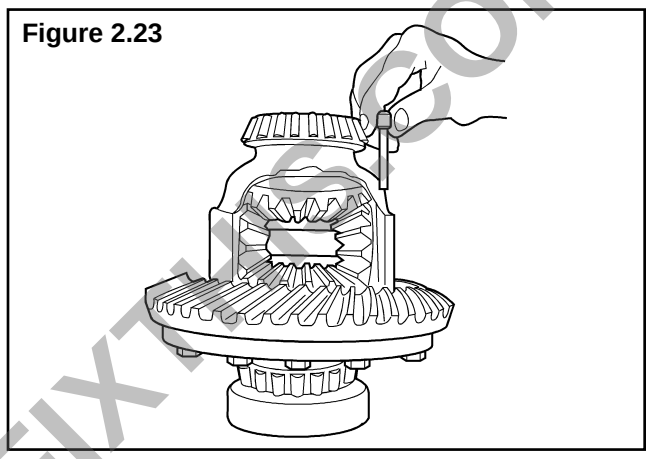


Figure 2.24

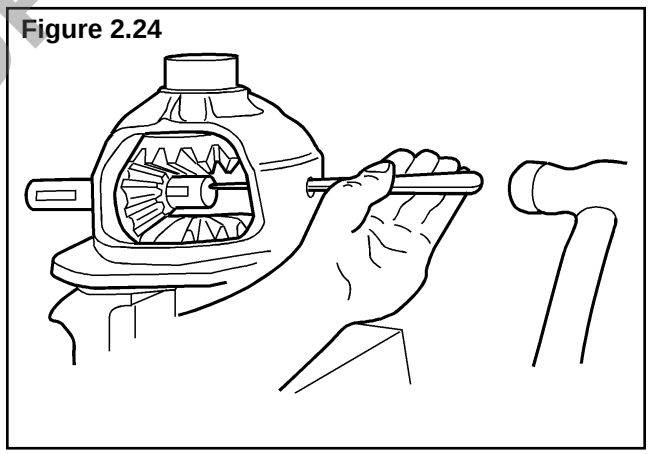
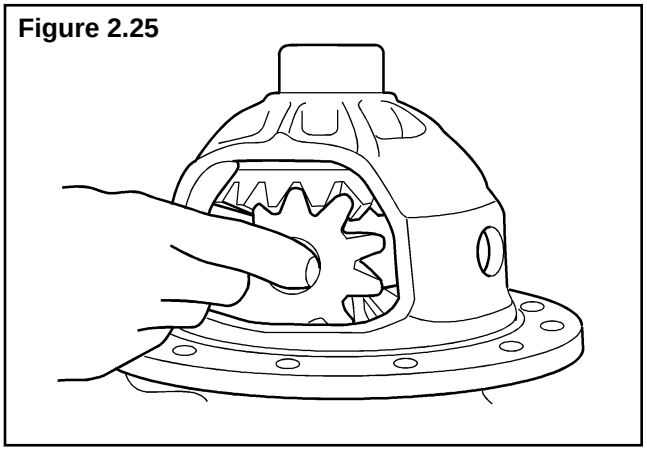


Figure 2.25

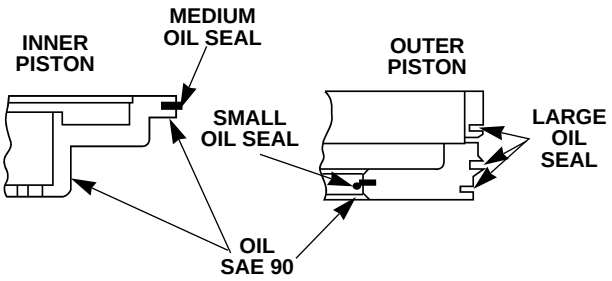


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2. Lubricate internal brake housing surfaces, inner and outer piston surfaces and oil seal bores with SAE 90 oil. **Figure 4.53.**

Figure 4.53

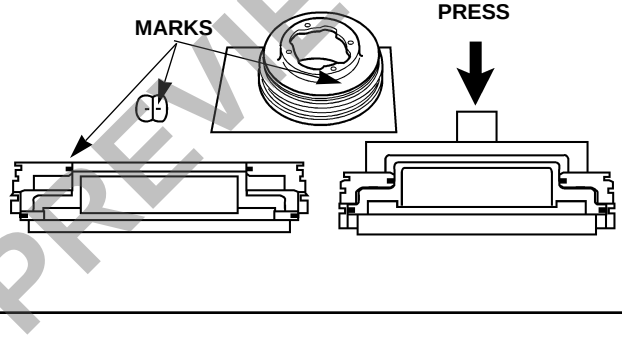


NOTE

Each piston assembly has three different sizes of oil seals: three large, one medium, one small.

3. Install medium oil seal into inner piston bore and install the small oil seal into the outer piston bore. **Figure 4.53.**
4. ONLY use a manual press to install inner piston into outer piston. Be careful not to damage oil seals. Do not force the inner piston assembly. **Figure 4.54.**

Figure 4.54

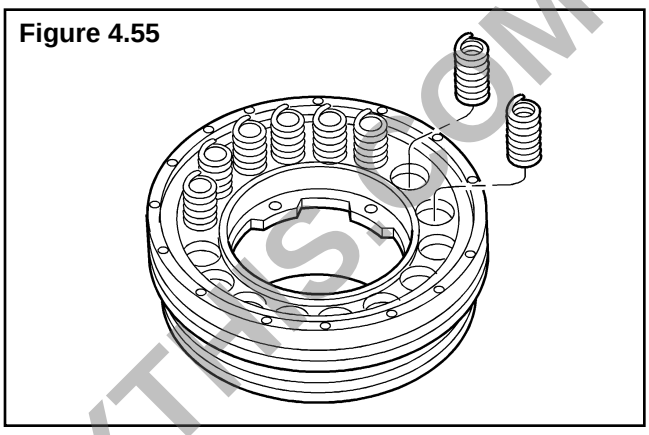


NOTE

Rotate pistons until marks are aligned. If inner piston does not rotate easily, disassemble it and find the cause. **Figure 4.54.**

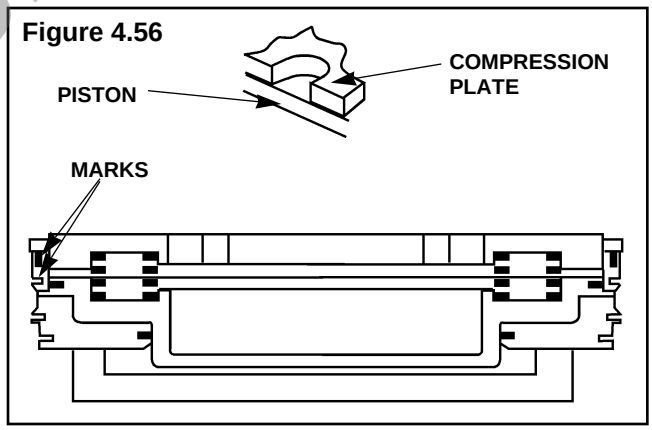
5. Install springs into bores in inner piston. **Figure 4.55.** For brake with 12 springs, jump one bore each three. **Figure 4.55.**

Figure 4.55



6. Install compression plate on piston. Correctly align the fastener holes. Use marks on piston and lock pin slot. **Figure 4.56.**

Figure 4.56



7. Apply pressure to the compression plate until it is flat against the piston.

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Special Note on Boom Cables

The extension/retraction boom cables used on all Gradall 532 and 534 Series Material Handlers are made of wire rope. All wire ropes in service should be inspected regularly for damage and evidence of wear. Refer to the *Wire Rope Users' Manual* and *OSHA Wire Rope Excerpts*, both published by the American Iron and Steel Institute Committee of Wire Rope Producers.

Users of Gradall Material Handlers equipped with wire rope should conduct a thorough inspection of all wire rope boom cables at least once a month, keeping full and accurate records as to the condition of the ropes. Any deterioration will lead to the depletion of original rope strength which is sufficient cause to replace the rope.

Listed below are some conditions that warrant wire rope replacement:

- Corrosion of wire rope.
- More than one broken wire in any one strand. Breaks in valleys between strands indicate problems (fatigue, breakage) in wires not necessarily visible on the surface.
- More than one broken wire near attached fittings.
- Heavy wear and/or broken wires in rope sections under sheaves where rope travel is limited.
- Evidence of reduction in original rope diameter, allowing for normal stretch factors.
- Excessive abrasion, scrubbing and cleaning of outside wires.
- Pitting, kink damage or evidence of other kinds of mechanical trauma.

In addition to inspecting wire rope boom cables regularly, inspect all sheaves, guards, guides and other surfaces which are in contact with the rope during boom operation. Any defect/damage to the above listed components poses a risk to the integrity of the rope.

DO NOT reach into the Boom until you are CERTAIN the keys have been removed from the ignition.

A fully comprehensive set of inspection procedures and guidelines (including replacement recommendations) is practically unattainable because of the many variables involved. In the final analysis, SAFETY depends largely on the good judgment of competent service personnel in determining:

(i) Damage to wire ropes
(ii) The remaining service life expectancy of the wire rope. If there is **any doubt**, the rope **must** be replaced
(iii) The proper procedures to replace worn or damaged rope

If you have any questions, including inquiries about the American Iron and Steel Institute publications mentioned above, please call your Authorized Gradall Distributor or Gradall Product Support at (330) 339-2211.

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2. Clean the inside and outside boom surfaces.
3. Inspect tilt carriage bushings in the boom head section for damage or excessive wear. Bushing ID when new is 2.511-2.512". Replace if worn more than 1/16" or damaged.



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→ **Reinstallation:**

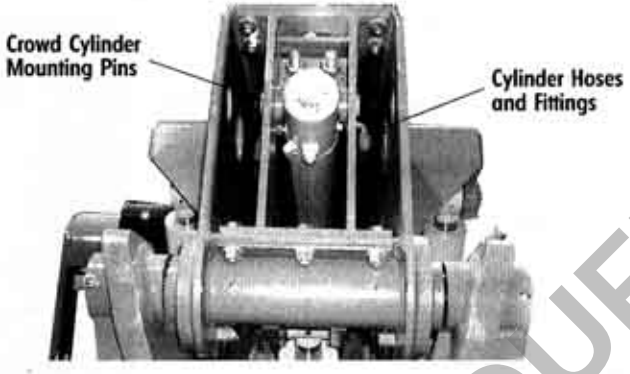
1. Feed the crowd cylinder into the push beam and line up the rod eye to the access holes. Be certain that the bearing pad is installed at the rod end of the cylinder.
2. Install the rod eye mounting pin and secure.





3. Install the crowd cylinder base mounting pin into the strong back and secure.

REAR BOOM ASSEMBLY STRONG BACK



4. Apply **LOCTITE 545** (Gradall P/N 1440-4043) to cylinder fittings and install into the barrel.
5. Apply **LOCTITE 545** to fittings and reconnect the hydraulic hoses.

The Crowd Cylinder is now installed.

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