333508P

Mobile Lubrication Library

Komatsu Wheel Loader Installation Instructions

Instructions for installing a Graco automatic lubrication system on the Komatsu WA600-8, WA500-8, WA500-7, WA480-8, WA470-8, WA470-7, WA475-10 or WA380-8, WA380-7.

Part No. 17D273, Series D

Maximum System Working Pressure: 2750 psi (18.96 MPa, 189.6 bar)

Important Safety Information
Read all warnings and instructions in all Graco related component manuals and all Komatsu equipment manuals. Save all instructions.

Related Graco Component Manuals*	
Manual No.	**Manual Title**
332291	G3 Pump
3A7031	GLC X Controller
312497	MSP Divider Valves
3A7046	GLC X Wiring Harness

**Refer to these instruction manuals for additional information related to the installation and operation of system components.*

WARNING

FLUID INJECTION HAZARD

Fluid leaks from incorrectly installed or ruptured components, and/or failure to verify the components are properly installed and tested, can result in serious injury such as fluid spraying in the eyes or on skin and fluid injection, or equipment damage. Installation must be done by a qualified professional or Komatsu certified technician and tested prior to use.

The information contained in this document is only a recommendation for an automatic lubrication system and is not intended to replace the installation and maintenance instructions provided by the original equipment manufacturer.

Table of Contents

Installation Checklist 3
Recommended Tools and Supplies 4
Installation Notes 4
Typical Installation 5
Installation 6
Before You Start 6
Zerk Fittings 6
Grease Point Fittings 7
MSP Divider Valve Assembly 9
MSP Valve Component Identification 9
MSP Divider Valve Assembly 9
Weld Studs 12
Loader Arm Guards 13
Boom Guard and Anchor Block Weld Stud Dimensions 14
P-Clamp Weld Studs 19
Loader Arm Anchors 19
G3 Pump 20
Installing the G3 Pump 21
Proximity Switch Cable 32
GLC X Controller 33
GLC X Controller Wiring 37
GLC X Wiring Table 40
GLC X Wiring Diagram 40
Fuse Panel 42
GLC X Controller Component Identification . . . 45
Setup 46
Change Settings 46
Low Level 47
Lock 47
Start Up 47
Output 2 47
System 47
Additional Advanced Features 47
Hose Assemblies 48
Hose Assembly Instructions 48
Hose Routing 49
Remote Fill Installation 52
Pump to Master Valve 56
Master Valve to Secondary Valves 59
Front Secondary to Grease Points 61
Middle Secondary and Rear Secondary to Grease Points 63
Loader Arm Guarding and Bell Crank P-Clamp . 68
Filling and Purging 69
Testing 70
Routine Service and Equipment Maintenance . . 71
Troubleshooting 72
Parts 75
Graco Information 76

NOTE: *Photographs may include optional equipment.*

Installation Checklist

The following checklist is provided as a tool to ensure all installation procedures are completed.

Completed	Description	Page
	Grease all zerks, before removal	6
	Remove zerks and clean threads	6
	Install grease point fittings	7
	Cut guarding to length; clean, debur and paint	9
	Assemble MSP divider valves	9
	Mount supplied weld studs; clean and paint	9
	Assemble and mount loader arm anchors	19
	Mount MSP divider valves	20
	Route the proximity switch cable from the master divider valve to the cab	20
	Assemble the G3 pump and fittings	20
	Install G3 pump; drill mounting holes	21
	Mount GLC X Controller	33
	Wire GLC X Controller	37
	Connect to fuse panel	42
	Program GLC X Controller	45
	Cut hoses to length, apply hose wraps and fittings	48
	Attach hoses one at a time to front secondary and route to the bearing; DO NOT CONNECT	49
	Attach main feed line hose to the pump; DO NOT CONNECT TO MASTER VALVE	63
	Attach main feed line hoses to the master valve, route to secondary valves; DO NOT CONNECT	68
	Mount P-clamp and loader guarding	68
	Fill the G3 pump reservoir with grease; purge the main feed line	69
	Run test program; verify all connections are tight; verify all points are receiving lubricant	70

NOTE: *Photographs may include optional equipment.*

Recommended Tools and Supplies

Tool	Size/Description	
	US	**Metric**
Combination wrench*	1/4 in. - 3/4 in.	6 mm - 20 mm
Socket set, standard and deep well with ratchet*	3/8 in. - 3/4 in.	9.5 mm - 20 mm
Screwdrivers: standard and Phillips	1 short; 1 long	
Adjustable wrench	1 small; 1 medium	
High speed drill (corded or cordless)		
Drill bit - steel, high quality	5/16 in., 11/16 in.	
Center punch	fine point	
Pipe taper tap	1/8 in. NPT	
Hammer		
Angle grinder		
Grinding disc	Heavy grade grinding disc	
Flap disc	60 - 80 grit	
Cutoff disc	High quality disc	
Cutting blade / knife	Razor blade cutting tool	
Standard pliers	Rubber handle	
Needle nose pliers	Rubber handle	
Side cut pliers (diagonal cutters)	Rubber handle	
Slip joint pliers	Rubber handle	
Locking pliers	Small or medium	
Electrician's wire crimper	General duty wire striper / crimper	
Deutsch DT crimp tool	DT closed barrel contacts	
Soldering iron	30 watt minimum	
Electrical solder		
Soldering flux		
Shrink tubing	Various sizes	
Electrical tape	Black, small roll	
Thread sealant	Liquid thread sealant such as Loctite® 656	
Multi-tester / voltmeter	Must test DC/AC/Ohms	
Electrical connectors	Ring connectors (14 gauge)	
Tape measure	Standard / metric	
Komatsu primer and paint	Color should match the Komatsu equipment	
Documentation / writing implements	Small note pad, pen, pencil, marker	

*Both US and Metric sizes of these tools are recommended.

Loctite® is a registered trademark of the Henkel Corporation.

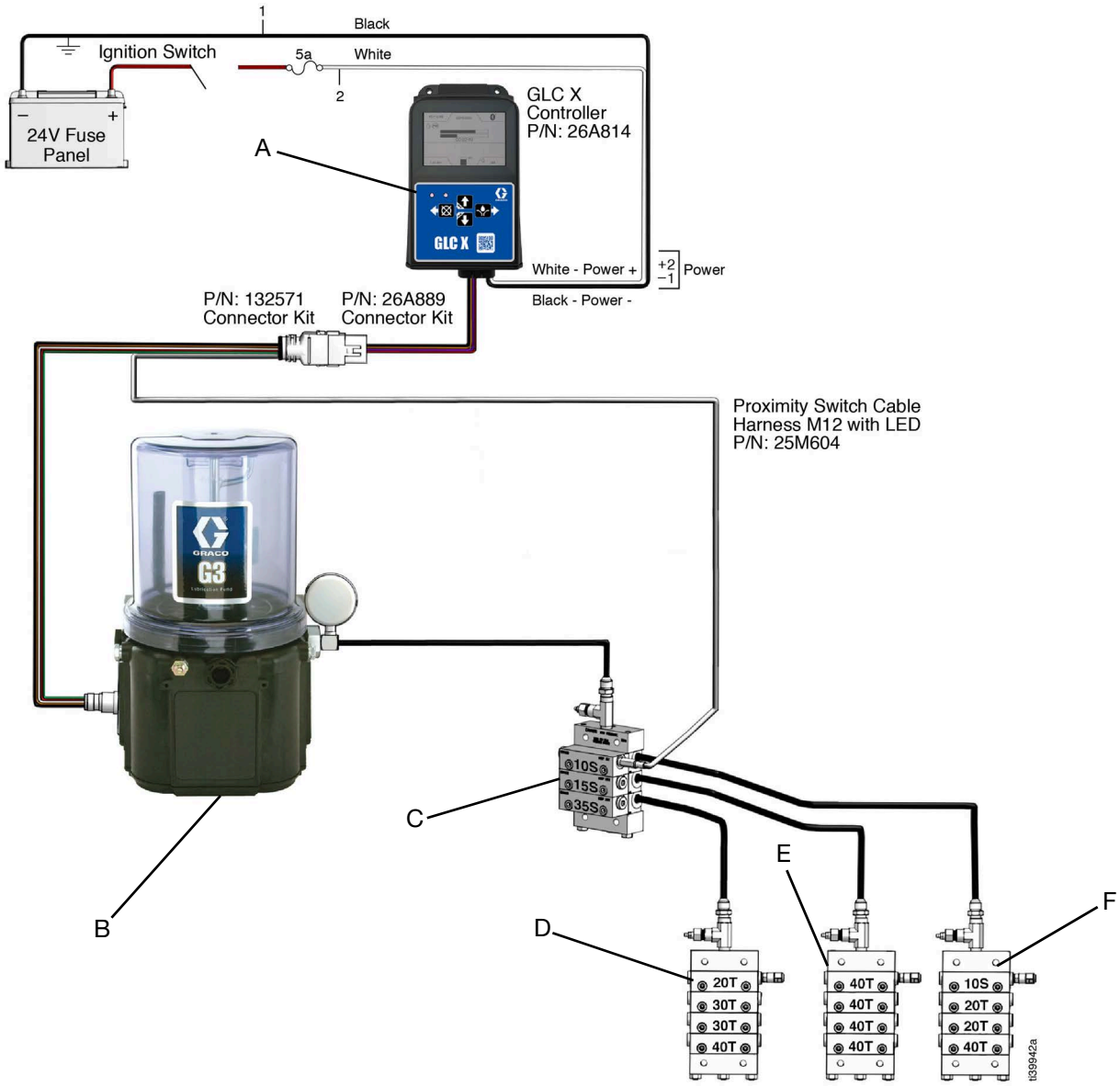
All other Trademarks used herein are the property of their respective owners.

Installation Notes

- Do not use PTFE tape on fitting threads. Liquid pipe sealant is recommended for use in lubrication systems to eliminate the potential for contamination. If you must use PTFE tape, always skip the first two threads on the fitting.
- Refer to the Installation Checklist provided on page 3 to ensure all installation procedures have been completed.

***NOTE:** Photographs may include optional equipment.*

Typical Installation



Key

A GLC X Controller
B G3 Automatic Lubrication Pump
C MSP Master Divider Valve
D MSP Secondary Divider Valve - Front Secondary
E MSP Secondary Divider Valve - Middle Secondary
F MSP Secondary Divider Valve - Rear Secondary

Cycle Timing

Pump On Time: 10 minutes (all models)

Pump Off Time: 1 Hour (all models)

Master Valve Cycles:

- WA600 - 10 Cycles
- WA500 - 8 Cycles
- WA480 - 6 Cycles
- WA475 - 6 Cycles
- WA470 - 6 Cycles
- WA380 - 5 Cycles

NOTE: *Photographs may include optional equipment.*

Installation

Before You Start

WARNING

Disconnect battery (FIG. 1) before installing the lubrication equipment. Installing lubrication equipment on powered machinery could result in serious injury from skin injection or parts moving unexpectedly.

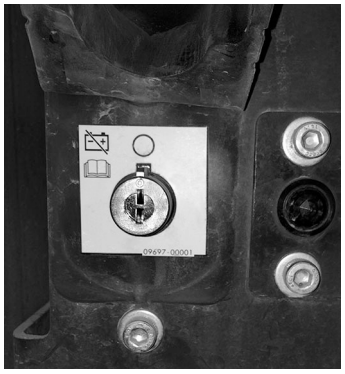


FIG. 1: Battery Disconnect

Walk around the machine with a grease gun and verify that every grease point is accepting grease. (Refer to FIG. 3, page 7 to identify lubrication points). This will ensure that the valves can dispense grease to the grease points by identifying potentially blocked passages from the grease zerk to the grease point.

Zerk Fittings

1. Use a clean cloth or rag to remove excessive grease, contaminants and dirt from the work area.
2. Remove all grease zerks from their installation locations (FIG. 2).

FIG. 2

3. Use a clean cloth or rag to remove any remaining grease, contaminants or dirt from the area around the passage way to the grease points.

NOTE: *Photographs may include optional equipment.*

Grease Point Fittings

1. Apply thread sealant to supplied grease point fittings.
2. Install fittings in grease points. Refer to FIG. 3 and the related table for installation locations and parts.
3. Refer to Grease Point Table to determine the Grease Points on your model.

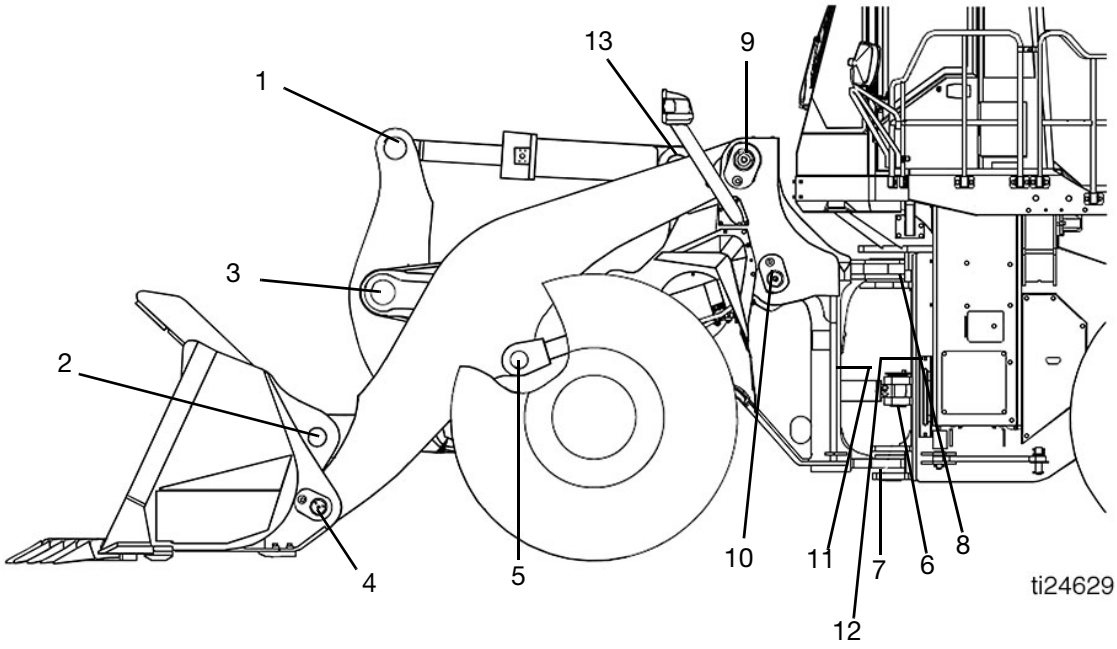


FIG. 3

NOTE: *Photographs may include optional equipment.*

Grease Point Fittings Table

Ref	Component	Qty	Part No.	Part Description	Model					
					WA600-8	WA500-7 WA500-8	WA480-8	WA4475-10	WA470-7 WA470-8	WA380-7 WA380-8
1	Dump Cylinder Rod Pin	1	17G422	Adapter, short, 1/8 BSPT x 1/8 NPT	X	X	X	X	X	X
		1	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
2	Bucket Link Bell Bucket Pins	2	17G422	Adapter, short, 1/8 BSPT x 1/8 NPT	X	X	X	X		X
		2	556763	Elbow, 90°, -4JIC x 1/8 NPT	X	X	X	X		X
		1	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT					X	
		1	555749	Adapter, -4JIC x 1/8 NPT					X	
3	Center Bellcrank Z Bar Pin	1	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT	X	X	X	X	X	X
		1	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
4	Lower Bucket Pin	2	17G422	Adapter, short, 1/8 BSPT x 1/8 NPT	X	X	X	X	X	X
		2	556763	Elbow, 90°, -4JIC x 1/8 NPT	X	X	X	X	X	X
5	Lift Cylinder Rod End	2	17K061	Elbow, 90°, Street, Adapter, 1/8 BSPT x 1/8 NPT	X	X	X	X	X	X
		2	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
		2	17K062	Adapter, Long, 1/8 BSPT x 1/8 NPT		X	X		X	X
6	Right Front Steering Rod Pin	1	17K062	Adapter, Long, 1/8 BSPT x 1/8 NPT	X					
		1	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT		X	X	X	X	X
		1	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
		1	15K783	Elbow, 90°, Street, 1/8 NPT	X					
	Left Front Steering Cylinder Rod Pin	1	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT	X	X	X	X	X	X
		1	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
	Rear Steering Cylinder Rod Pin	2	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT	X	X	X	X	X	X
		2	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
7	Center Hinge Pin Lower	1	17K062	Adapter, Long, 1/8 BSPT x 1/8 NPT		X				
		1	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT	X		X	X		X
		1	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
		1	15K783	Elbow, 90°, Street, 1/8 NPT		X				
8	Center Hinge Pin Upper	1	17K062	Adapter, Long, 1/8 BSPT x 1/8 NPT		X				
		1	17G422	Adapter, short, 1/8 BSPT x 1/8 NPT			X		X	
		1	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT	X		X	X		X
		1	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
		1	15K783	Elbow, 90°, Street, 1/8 NPT		X			X	
9	Left Lift Arm Hinge Pins	1	17K062	Adapter, Long, 1/8 BSPT x 1/8 NPT	X					
		1	17G422	Adapter, short, 1/8 BSPT x 1/8 NPT		X				
		1	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT			X	X	X	X
		1	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
		1	15K783	Elbow, 90°, Street, 1/8 NPT	X					
	Right Lift Arm Hinge Pins	1	17G422	Adapter, short, 1/8 BSPT x 1/8 NPT		X				
		1	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT	X		X	X	X	X
		1	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
10	Left Lift Arm Cylinder Pin	1	17K062	Adapter, Long, 1/8 BSPT x 1/8 NPT	X					
		1	17G422	Adapter, short, 1/8 BSPT x 1/8 NPT		X			X	
		1	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT			X	X	X	X
		1	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
		1	15K783	Elbow, 90°, Street, 1/8 NPT	X					
	Right Lift Arm Cylinder Pin	1	17G422	Adapter, short, 1/8 BSPT x 1/8 NPT		X			X	
		1	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT			X	X		X
		1	15K783	Elbow, 90°, Street, 1/8 NPT	X				X	
		1	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
11	Center Support	1	17G422	Adapter, short, 1/8 BSPT x 1/8 NPT		X			X	X
		1	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT	X		X	X		
		1	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
12	Rear Axle Pivot Pins (all)	3	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT	X			X		
		3	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X
		3	17G422	Adapter, short, 1/8 BSPT x 1/8 NPT		X	X		X	X
13	Bucket Cylinder Pin	1	17K061	Elbow, 90° Street, Adapter, 1/8 BSPT x 1/8NPT	X	X	X	X	X	X
		1	555749	Adapter, -4JIC x 1/8 NPT	X	X	X	X	X	X

NOTE: *Photographs may include optional equipment.*

MSP Divider Valve Assembly

The Divider Valve Assembly includes the following components:

- MSP divider valve base
- MSP divider valve assembly
- 1/8 in. x 4 JIC straight outlet fittings
- Inlet fittings
- Cycle indicators
- Performance indicators
- Proximity switches

Prepare a clean, flat area to assemble the valves.

MSP Valve Component Identification

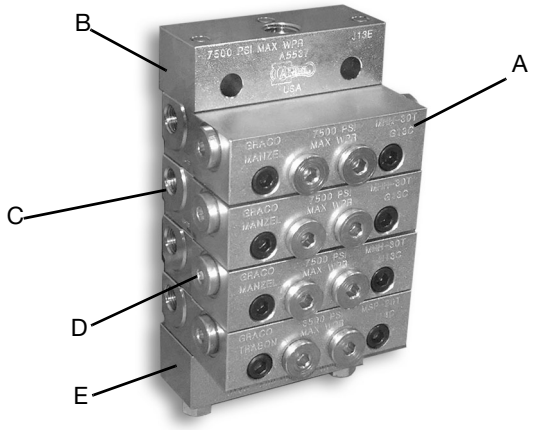


FIG. 4

Key:
A Valve Section
B Inlet Section
C Indicator / Port Plug
D End Plug
E End Section

MSP Divider Valve Assembly

1. The MSP metering valves require assembly (FIG. 5).

   NOTE: Refer to the MSP Divider Valve Assembly Location Table (page 11) and divider valve assembly reference illustrations (beginning on page 11) to verify assembly orientation.

   a. Remove components from packaging.

   b. Assemble metering valves to base plates as shown in FIG. 5.

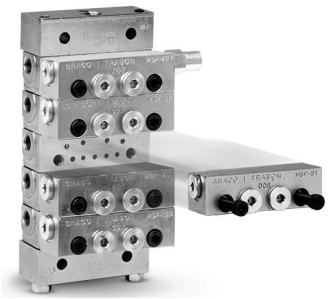


FIG. 5

2. Remove end plugs and indicator port plugs before installing performance and cycle indicators in the MSP block.

3. Install outlet fittings in ports (FIG. 6).

   - All outlets use 1/8 in. x 4 JIC straight fittings (included in kit).

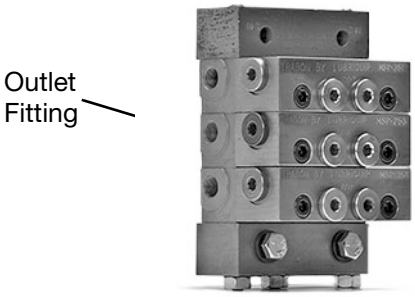


FIG. 6

4. Install inlet fittings in ports (FIG. 7).

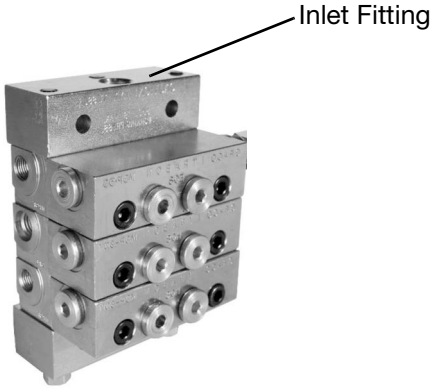


FIG. 7

NOTE: *Photographs may include optional equipment.*

5. Install grease zerk fittings and zerk cover (FIG. 8).

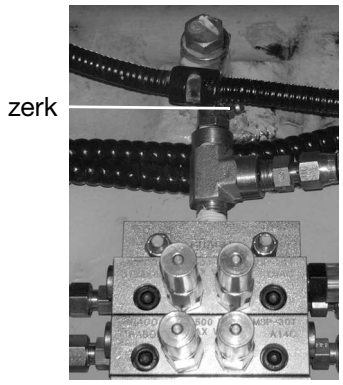


FIG. 8

6. Install performance indicators in ports (FIG. 9):

   - 2000 psi (13.79 MPa,137.9 bar) reset indicators are installed in the master valve (quantity 3).
   - 1000 psi (6.89 MPa, 68.95 bar) reset indicator are installed in the secondary valve (quantity 23).

   NOTE: Refer to the MSP Divider Valve Assembly Location Table (page 11) to verify assembly orientation.

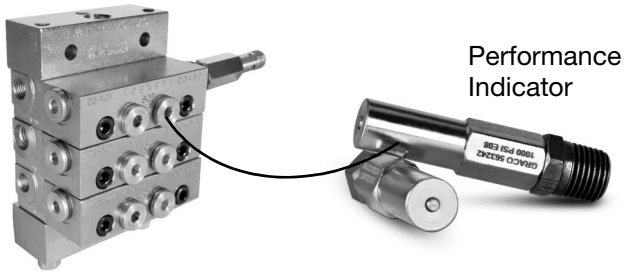


FIG. 9

7. Install cycle indicator and proximity switch into master valve and cycle indicators to each secondary valve as shown in FIG. 10).

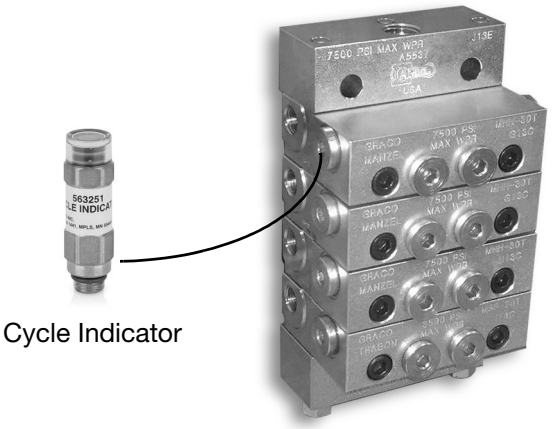


FIG. 10

8. Install outlet plugs in all open ports as shown in the divider valve assembly reference photographs (FIG. 11 - FIG. 14) on page 11.

NOTE: *Photographs may include optional equipment.*

MSP Divider Valve Assembly Location

	Master (WA500/ WA600) (FIG. 11)
Plug	10S
Plug	15S
Plug	40S

Master (WA380/ WA470/ WA475 WA480) (FIG. 11)	
10S	Plug
15S	Plug
40S	Plug

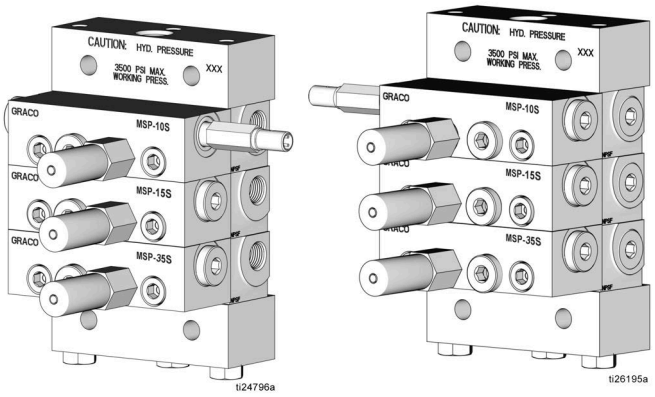
Front Secondary (FIG. 12)
20T
30T
30T
40T

Middle Secondary (FIG. 13)
40T
40T
40T
40T

	Rear Secondary (FIG. 14)
Plug	10S
	20T
	20T
	40T

MSP Divider Valve Assembly Reference Illustrations

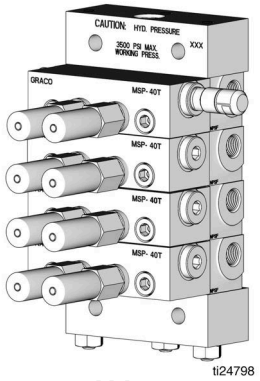
Master Valve Assembly (FIG. 11)



WA600, WA500 | **WA480, WA475, WA470, WA380**

FIG. 11

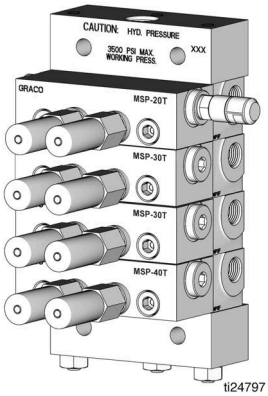
Middle Secondary (FIG. 13)



ALL

FIG. 13

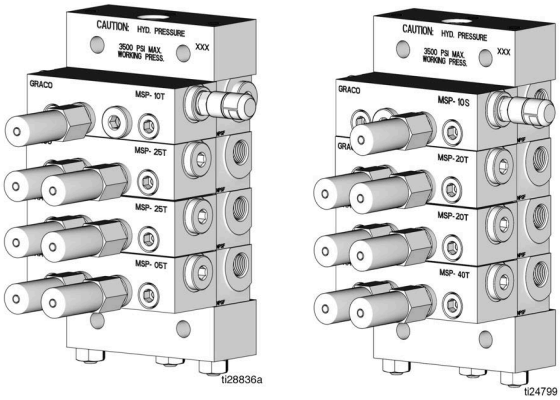
Front Secondary (FIG. 12)



ALL

FIG. 12

Rear Secondary (FIG. 14)



WA600 | **WA500, WA480, WA475, WA470, WA380**

FIG. 14:

NOTE: *Photographs may include optional equipment.*

Weld Studs

NOTE: Weld studs are provided in the installation kit. However, the installer may also use their own weld stud welder and weld studs if preferred.

NOTICE
To avoid damaging the loader, consult the Komatsu operations and maintenance manual before welding.

1. Use the loader arm guard and dimensions provided on the MSP Divider Valve and Weld Stud Dimension Table on page 15 - 17 as a guide to determine where to place the weld studs on the loader arm.
2. Use the MSP divider valve assemblies to determine the installation location of the MSP divider valves on the loader arm.

   NOTE: Refer to Weld Stud MSP Divider Valve Reference Photographs on page 14 to help determine the best location for MSP valves.
3. Adjust installation location for guides and MSP divider valves as needed before spot welding the weld studs.
4. Clean the surface on the loader arm as needed to prepare it for welding.
5. Position the guard over the loader arm again and mark the weld stud locations on the loader arm.
6. Spot weld studs.
7. Clean the weld with a flap disk or grinding disk.
8. Prime the weld surface with Komatsu primer. When primer has dried, apply a few coats of matching Komatsu colored paint.

NOTE: Although the guard is shown installed in FIG. 18, ***DO NOT*** install the guard to the loader arm at this time. Other equipment must be installed before these parts are connected to the machinery.

NOTE: *Photographs may include optional equipment.*

Loader Arm Guards

NOTE: The Loader Arm Guards provided in your kit are designed for use on various sizes of Komatsu equipment. For some installations they will need to be trimmed to the correct size before installation on the Komatsu equipment.

1. Refer to FIG. 15 to determine where to cut the Loader Arm Guards.

   NOTE: No cutting is required for the WA600 Model.

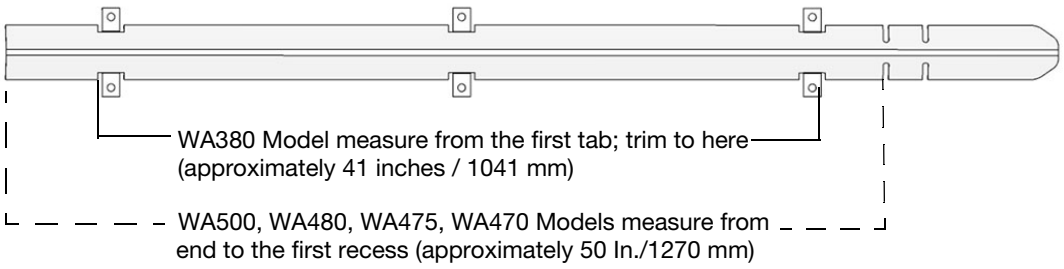


FIG. 15

2. Refer to Figure FIG. 16 to determine where to cut the Bucket Link Guard.

   NOTE: The Bucket Link Guard installed on the WA500, WA600, and WA475 models do NOT require cutting.

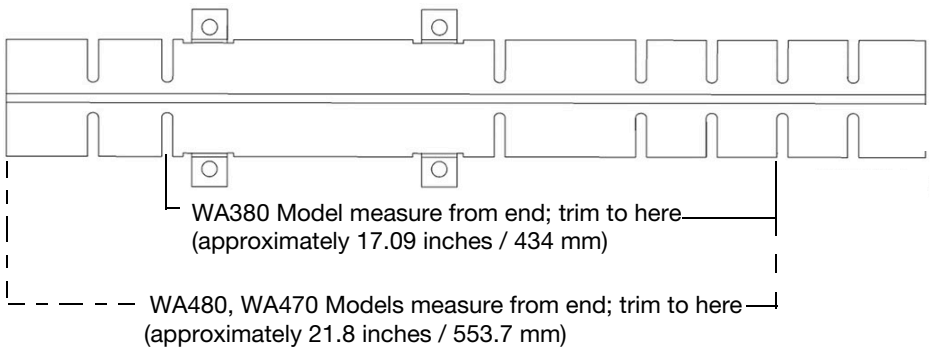


FIG. 16

3. Use a cutting wheel to cut the Loader Arm Guards and Bucket Link Guard to the correct lengths.

4. WA480, WA470 and WA380 models only: Bend up one end of the Bucket Link Guard as needed to ensure a good fit as shown in FIG. 17.

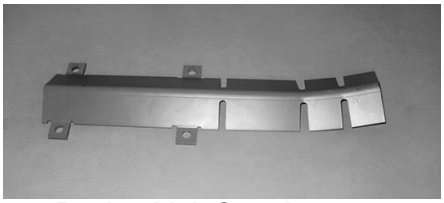


FIG. 17: Bent Bucket Link Guard

5. Clean and debur the cut edge. Prime the guarding with Komatsu primer. When primer has dried, apply a few coats of matching Komatsu colored paint.

Boom Guard and Anchor Block Weld Stud Dimensions

(See FIG. 18)

NOTE: Align the anchor block weld stud so that the hose feeds through the center of the guarding.

Model	A		B		C x 2		D	
	inches	mm	inches	mm	inches	mm	inches	mm
WA600	9.0	228.6	7.0	177.8	2.75	69.85	33.0	838.2
WA500	6.0	152.4	7.0	177.8	2.75	69.85	25.5	647.7
WA480	3.5	88.9	6.0	152.4	2.75	69.85	18.5	469.9
WA475	3.5	88.9	7.0	177.8	2.75	69.85	18.5	469.9
WA470	3.5	88.9	6.0	152.4	2.75	69.85	18.5	469.9
WA380	3.0	76.2	3.0	76.2	2.75	69.85	15.5	393.7

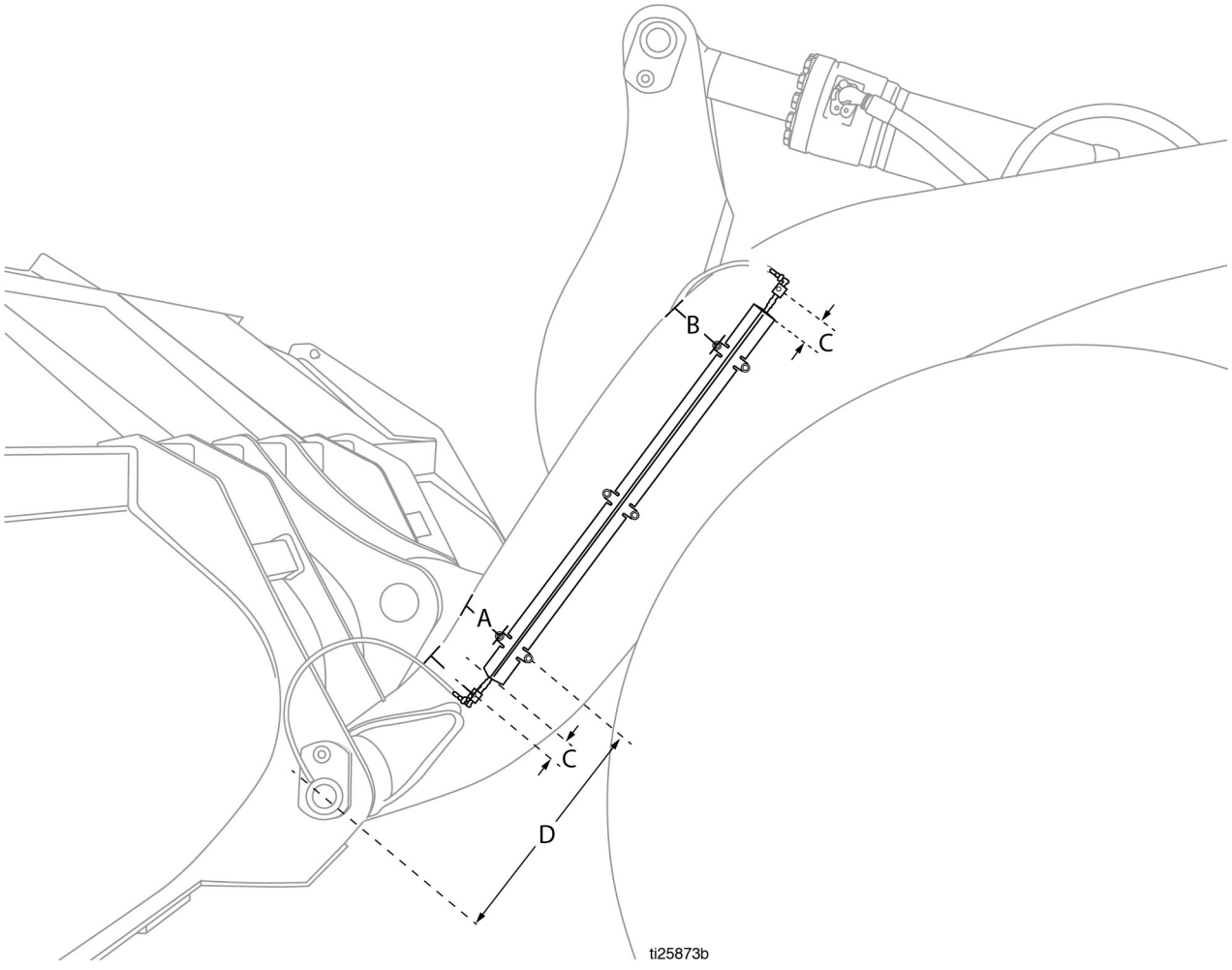


FIG. 18:

NOTE: *Photographs may include optional equipment.*

Weld Stud and MSP Divider Valve Installation Reference Photographs

MSP Divider Valve Weld Stud Dimensions: WA600 Models

A		B		C		D		E	
inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
2.0	50.8	6.0	152.4	4.0	101.6	3.0	76.2	27.0	658.8

Install MSP divider valves using weld studs. Use the supplied 1/4-20 lock nuts. Refer to FIG. 19 - FIG. 23 for installation details.

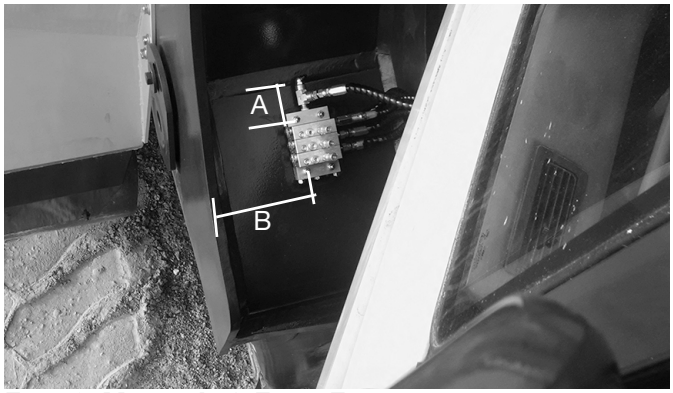


FIG. 19: Master Left Front Frame

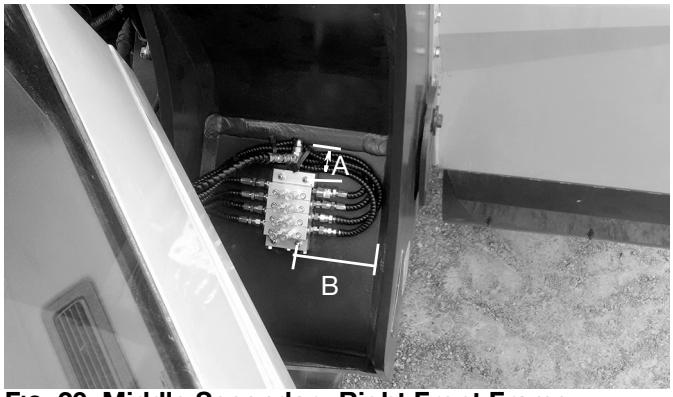


FIG. 20: Middle Secondary Right Front Frame

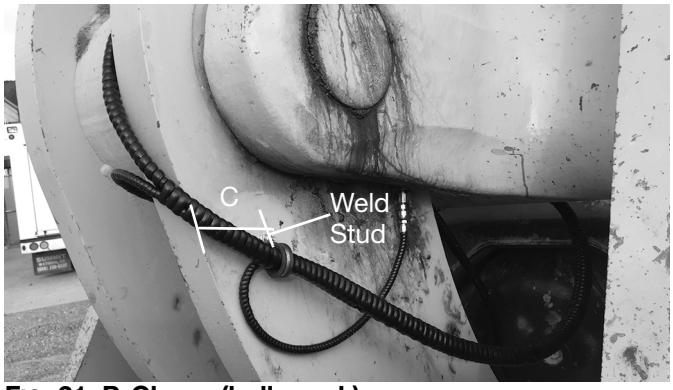


FIG. 21: P-Clamp (bell crank)

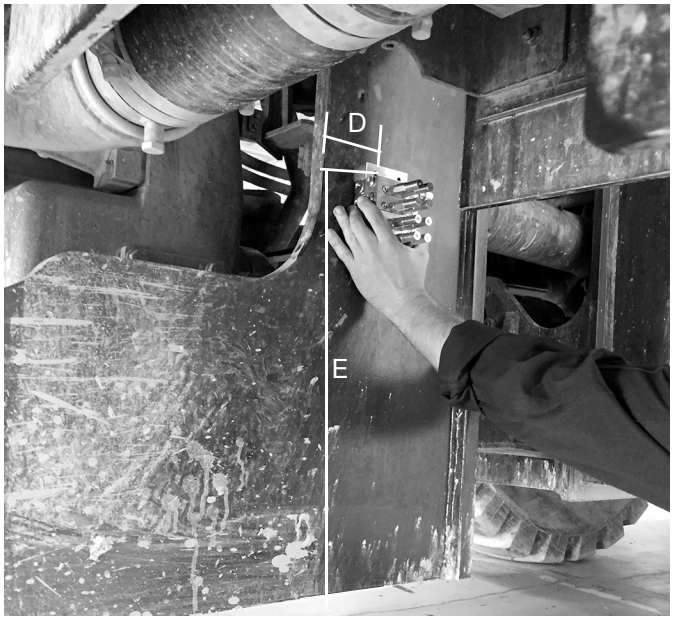


FIG. 22: Rear Secondary

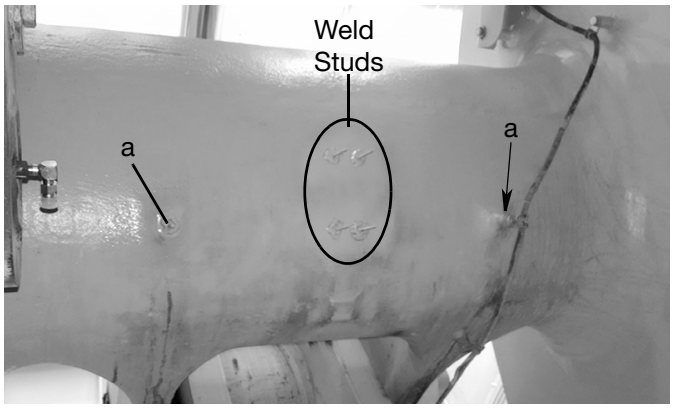


FIG. 23: Front Secondary: Align and center divider valve weld studs between pads (a) as shown.

NOTE: *Photographs may include optional equipment.*

MSP Divider Valve Weld Stud Dimensions: WA500 Models

A		B		C		D		E		F	
inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
1.5	38.1	2.0	50.8	2.5	63.5	3.5	88.9	4.0	101.44	8.5	215.9

Install MSP divider valves using weld studs. Use the supplied 1/4-20 lock nuts. Refer to FIG. 24 - FIG. 28 for installation details.

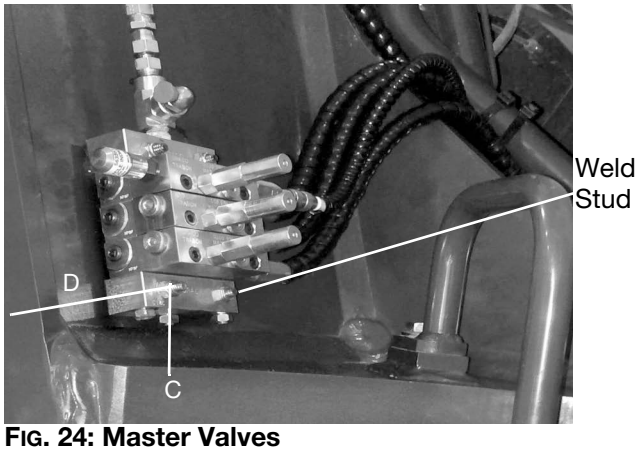


FIG. 24: Master Valves

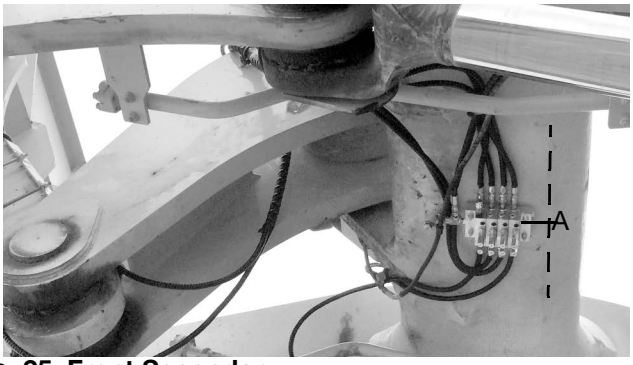


FIG. 25: Front Secondary

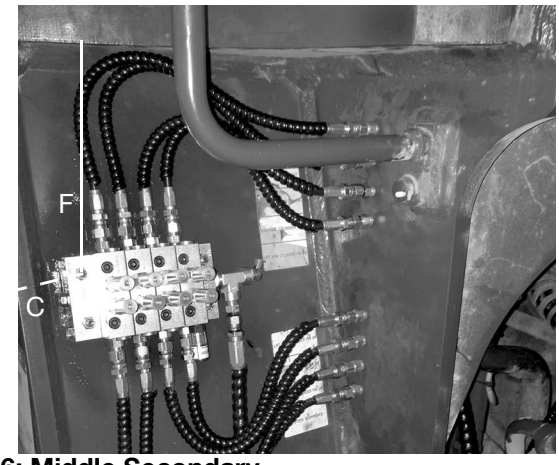


FIG. 26: Middle Secondary

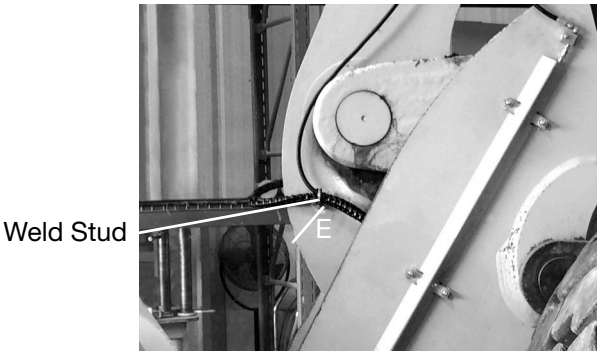


FIG. 27: P-Clamp (bell crank)

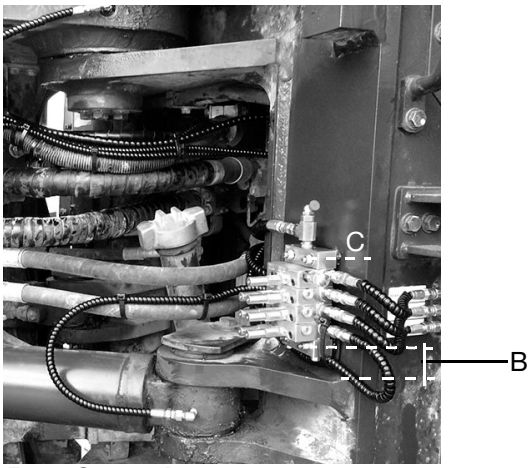


FIG. 28: Rear Secondary

NOTE: *Photographs may include optional equipment.*

MSP Divider Valve Weld Stud Dimensions: WA480, WA475, WA470 and WA380 Models (FIG. 29 - FIG. 36)

Model	A		B		C		D		E		F	
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
WA480	1.5	38.1	6.75	171.4	4.0	101.6	5.0	127.0	18.0	457.2	2.5	63.5
WA470	1.5	38.1	6.75	171.4	4.0	101.6	5.0	127.0	18.0	457.2	2.5	63.5
WA380	1.5	38.1	6.0	152.4	4.0	101.6	5.0	127.0	18.0	457.2	2.5	63.5
WA475 Master	1.5	38.1	1.5	38.1	6.0	152.4	0.5	12.7	8.5	216	2.5	63.5
WA475 Middle			6.0	152.4	3.0	76.2						

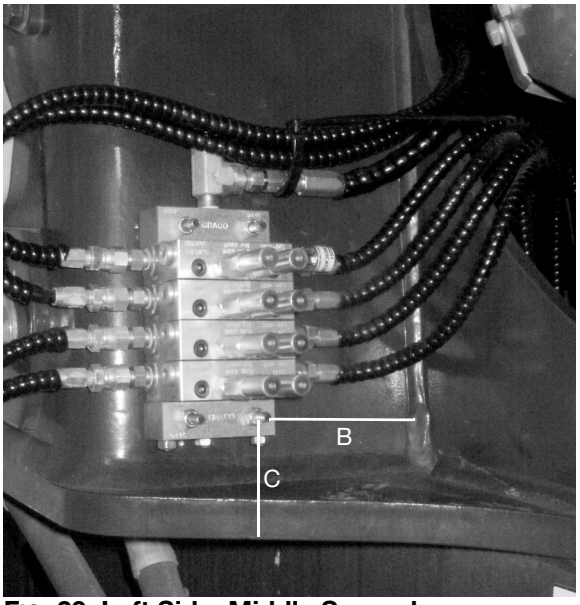


FIG. 29: Left Side; Middle Secondary

FIG. 31 - WA470-8 Models only: Remove the hose on the left hand side of the machine. Grinding the remote line anchor is not required unless there is interference with the valve.

FIG. 30: Middle Secondary

FIG. 31 - WA475-10 Models only: Note that the valve orientation is vertical for this model.

FIG. 31:

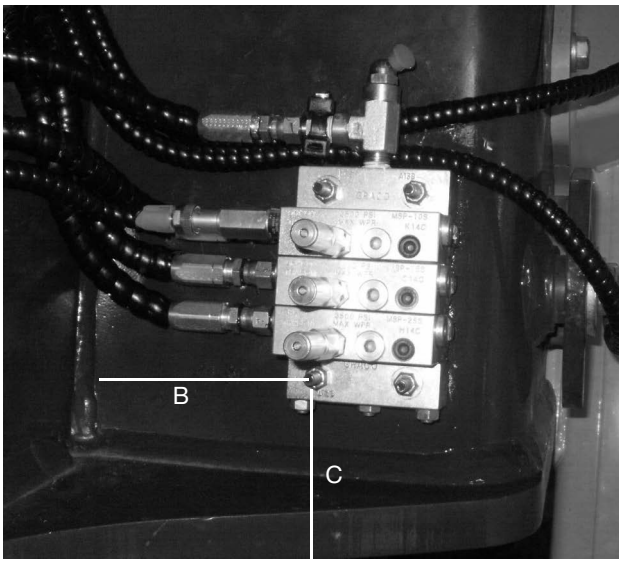


FIG. 32: Right Side; Master Valve

FIG. 33 - WA470-8 Models only: Remove the remote fill line for the loader arm pivot pin. Grind down the stud on the right hand side of the machine.

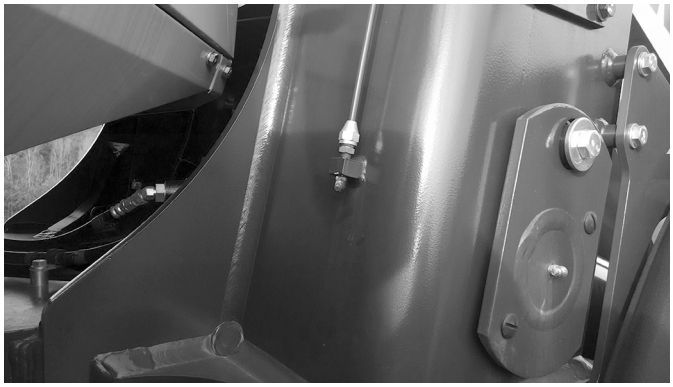


FIG. 33: Master Valve

FIG. 34 - Ensure that there is clearance on the back side of the valve. Spacers (like washers, not included) may need to be added so that the valve seats evenly at all four (4) of the weld studs.

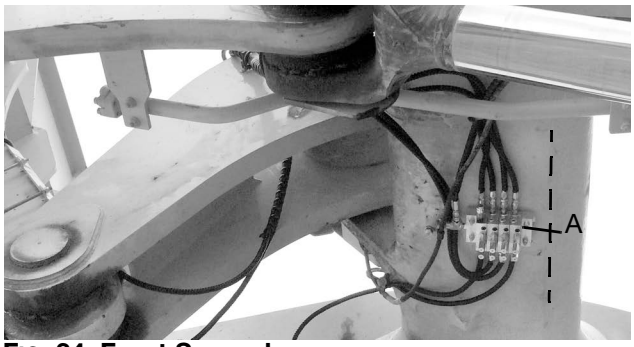


FIG. 34: Front Secondary

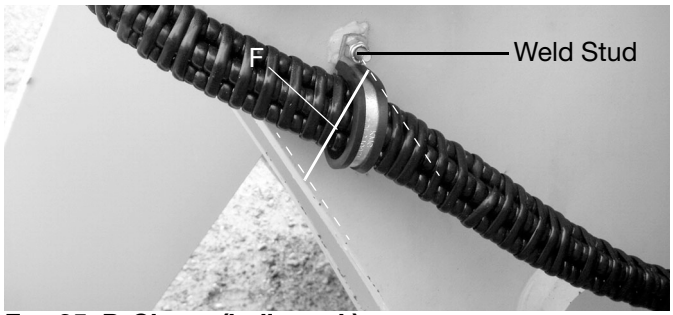


FIG. 35: P-Clamp (bell crank)

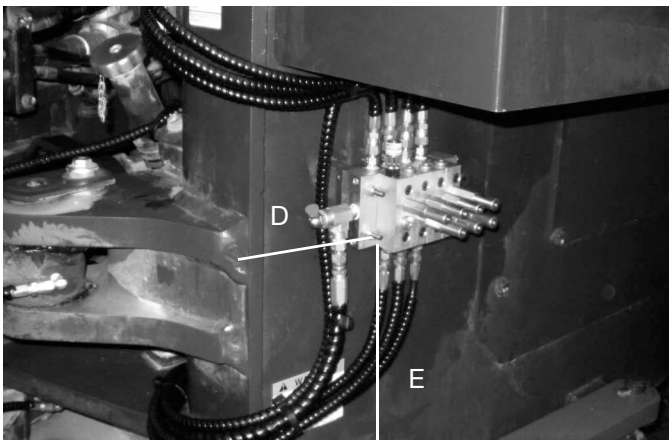


FIG. 36: Rear Secondary

WA475 Models Rear Secondary:

- Before drilling the mounting holes, ensure that when the valve is assembled and mounted, it will clear the ladder and ladder rungs.
- Measure the hole location from the edges of the panel that the valve is being mounted.

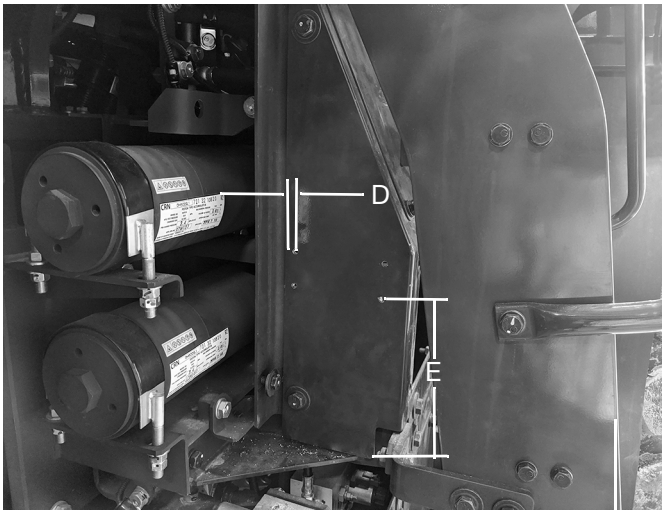


FIG. 37:

NOTE: *Photographs may include optional equipment.*

P-Clamp Weld Studs

WA600 Models:

- Two weld studs are necessary (FIG. 38).

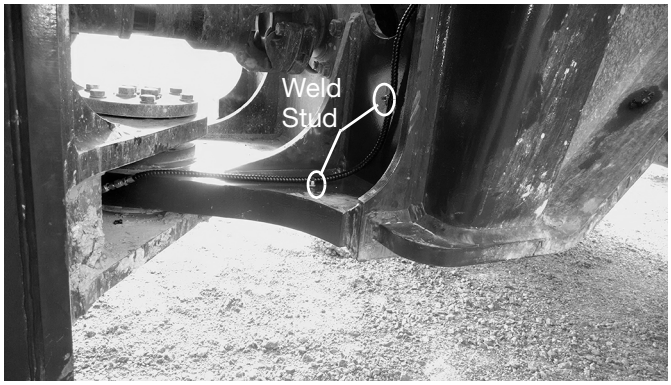


FIG. 38

WA500, WA480, WA475, WA470, WA380 Models:

- Install a P-Clamp to the bottom articulation points (FIG. 39).

- Do not install P-Clamp closer than 1.5 inches (38.1 mm) to any mating surface, bearing, edge or frame weld.

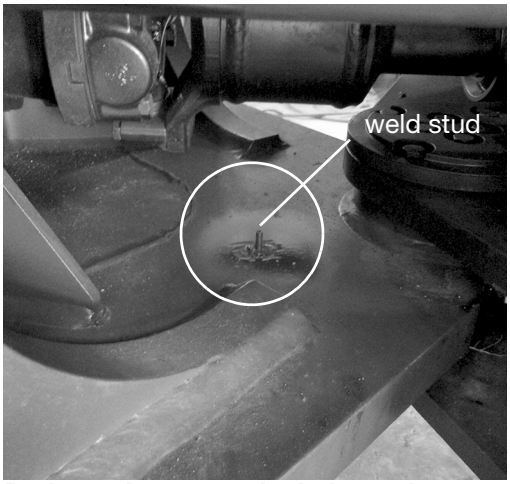


FIG. 39: P-clamp; bottom articulation points

- Ensure that the P-Clamp is in the correct location to avoid contact between the articulating surfaces.

Loader Arm Anchors

Loader arm anchors are used to contain and protect the bucket pin routing hoses.

1. Assemble the upper and lower anchors by connecting a 1/8 in. NPT x 4 JIC straight fitting and an 1/8 in. NPT x 4 JIC elbow fitting as shown in FIG. 40.

FIG. 40

2. Adjust the elbow fitting to be approximately 45° from the center of the anchor as shown in FIG. 41. The hose fitting will be connect to this fitting later in the assembly. Wrench tighten securely.

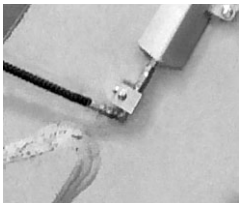


FIG. 41

3. Secure the anchors to the weld studs with the supplied 1/4-20 nylon lock nuts. Verify that the straight fittings in the anchors are parallel with each other to allow for proper hose alignment when the hoses are connected. See FIG. 42.

FIG. 42

NOTE: *Photographs may include optional equipment.*

G3 Pump

The G3 Pump includes the following components:

- Pump mechanism with attached reservoir
- Pressure relief valve (required to protect system from damage)
- Pressure gauge (used to monitor system performance and to assist with troubleshooting).
- Mounting bracket and hardware
- CPC power cable
- Zip ties

1. Remove all components from the packaging and place all parts on a clean, flat surface.

FIG. 43

2. **WA475 and WA600 Models only:** Install pump element on the other side of the pump as shown in FIG. 44.

FIG. 44

3. Assemble the pressure relief valve.

   a. Apply thread sealant (user supplied) to threads of pressure relief valve (a) (FIG. 45).

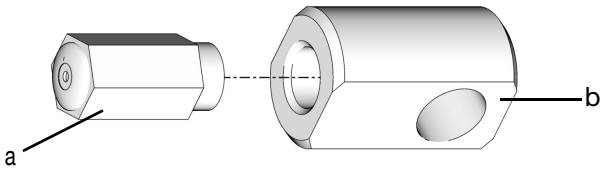


FIG. 45

   b. Install pressure relief valve (a) into banjo fitting (b). Wrench tighten (FIG. 45).

   c. Install one washer (c) over end banjo bolt (d). Then install banjo fitting (b) on banjo bolt, followed by the second washer (c) (FIG. 46).

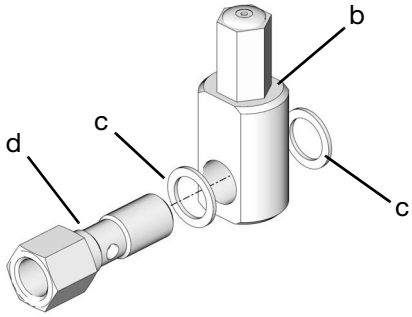


FIG. 46

4. Install banjo bolt (d) into pump element (e) (FIG. 47).

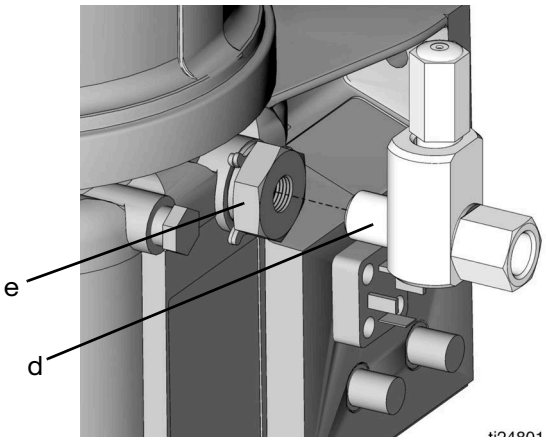


FIG. 47

NOTE: *Photographs may include optional equipment.*

5. Use two wrenches to tighten banjo fitting. Place one wrench on the pump element (e) and the second wrench over the end of the banjo bolt (d). ONLY tighten the banjo bolt (d) while holding the pump element (e) securely in place. Torque banjo bolt (d) to 35 ft. lbs (45.7 N•m) (FIG. 48). Take care to not over-tighten.

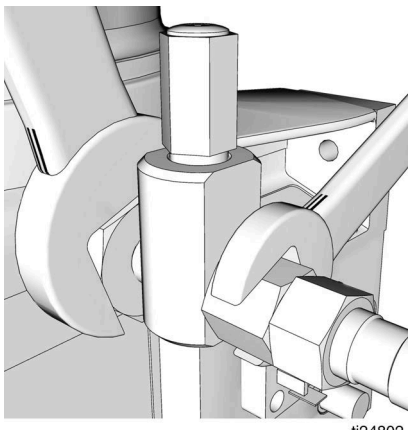


FIG. 48

6. Install the pressure gauge fitting, pressure gauge and output fitting in the pressure relief valve as shown in FIG. 49.

   NOTE: Hold the pressure relief valve securely in place while installing the pressure gauge assembly.

FIG. 49

Installing the G3 Pump

WA600 Models

1. The pump will be installed to the inside of the right hand walk way, near the access steps as shown in FIG. 50.

   NOTE: Do not block the operator egress.

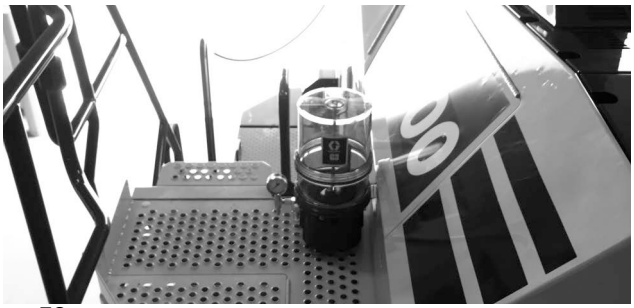


FIG. 50

2. Position the pump mounting bracket in the recessed area:
   - The bolt holes closest to the cab should be placed 1-7/8 inches from the edge as shown in FIG. 51.
   - The bolt holes closest to the hydraulic tank should be placed 1/2 inch from the edge (FIG. 51).

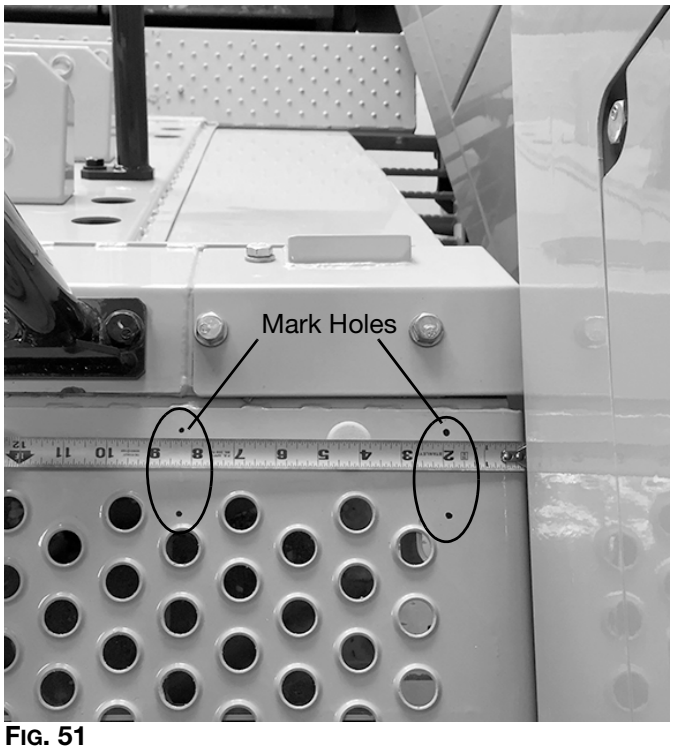


FIG. 51

3. Mark the hole locations with a paint pen or marker (FIG. 51).

4. Use a center punch to score drill points in the center of each of the marks. Then use a 5/16 in. high speed drill bit to drill out the 4 mounting holes.

5. Install the G3 pump mounting bracket to the G3 pump using the supplied hardware (FIG. 52). Wrench tighten securely.

FIG. 52

6. Use supplied hardware to mount the G3 pump bracket to the holes drilled in Step 2, page 21 (FIG. 53).

FIG. 53

7. Wrap the CPC power cable with the 1/4 in. cable loom (included in the kit) (FIG. 54).

FIG. 54

8. Connect the power cable to the pump.

9. Route the power cable underneath the decking to the cab (FIG. 55).

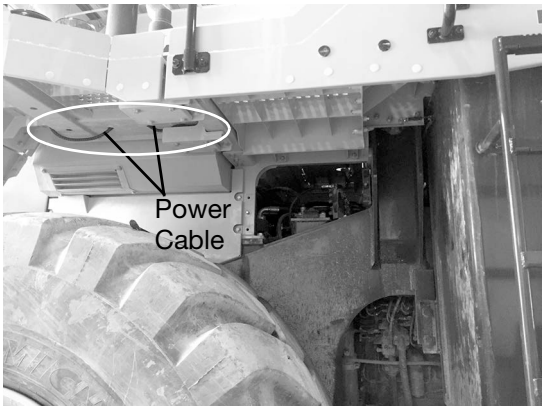


FIG. 55

NOTE: *Photographs may include optional equipment.*

10. Finish the power cable routing by threading the cable end through the rubber grommet on the floor of the cab, closest to the accelerator pedal (FIG. 56). (This is the same routing used for the proximity switch cable).

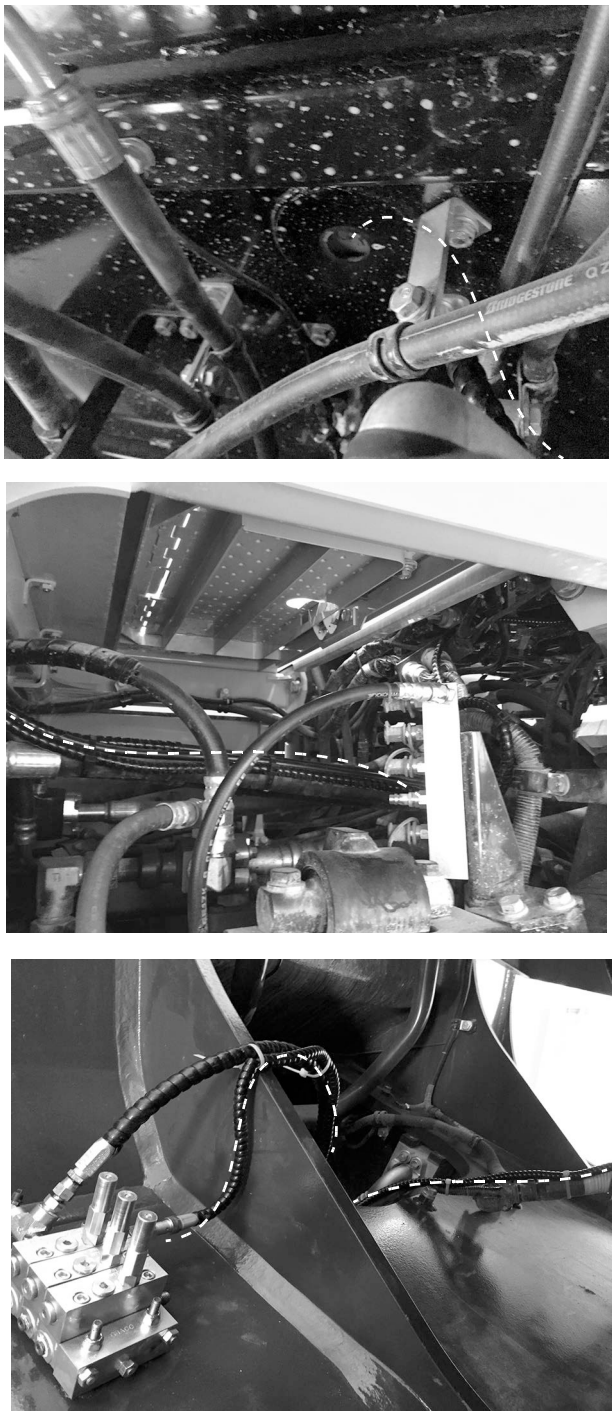


FIG. 56

11. Use the zip ties (included in the kit) to secure the proximity cable in place (FIG. 56).

WA500 Models

1. On the right side walk way, locate the recessed area next to the hydraulic tank as shown in FIG. 57.

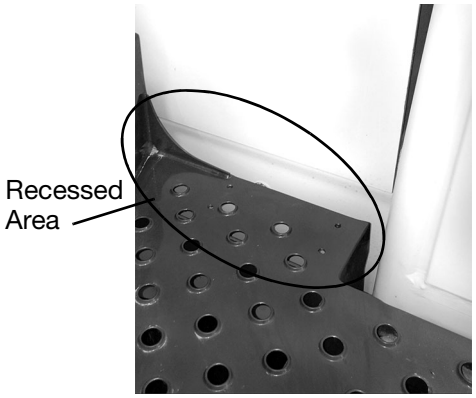


FIG. 57

2. Position the pump mounting bracket in the recessed area:
   - The bolt holes closest to the cab should be placed 1.5 inches from the edge (a) as shown in FIG. 58.
   - The bolt holes closest to the hydraulic tank should be placed 1 inch from the edge (b) (FIG. 58).

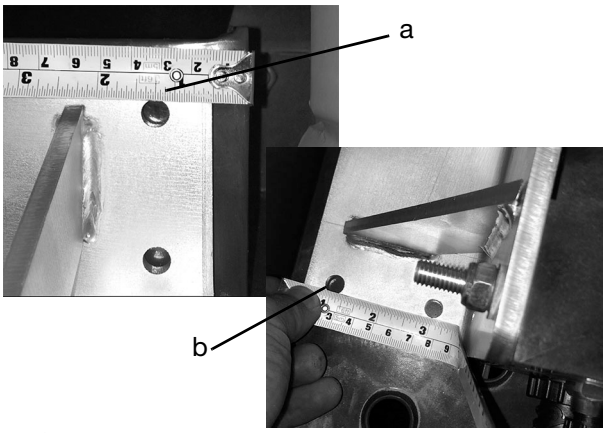


FIG. 58

NOTE: *Photographs may include optional equipment.*

NOTE: For WA500-8 Models only, holes should be 4.5 inches from the edge (c) as shown in FIG. 59.

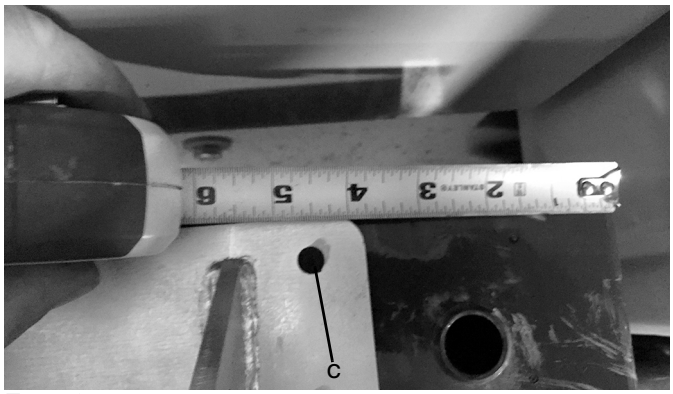


FIG. 59

3. Mark the hole locations with a paint pen or marker.

4. Use a center punch to score drill points in the center of each of the marks. Then use a 5/16 in. high speed drill bit to drill out the 4 mounting holes (FIG. 60).

FIG. 60

5. Install the G3 pump mounting bracket to the G3 pump using the supplied hardware (FIG. 61). Wrench tighten securely.

FIG. 61

6. Use supplied hardware to mount the G3 pump bracket to the holes drilled in Step 2, page 21 (FIG. 62).

FIG. 62

7. Wrap the CPC power cable with the 1/4 in. cable loom (included in the kit) (FIG. 63).

FIG. 63

8. Connect the power cable to the pump.

9. Route the power cable underneath the decking to the cab. Follow the existing cabling and use the anchor points to secure the CPC cable with supplied zip ties (FIG. 64).

FIG. 64

NOTE: *Photographs may include optional equipment.*

10. Finish the power cable routing by threading the cable end through the rubber grommet on the floor of the cab, closest to the accelerator pedal (FIG. 65). (This is the same routing used for the proximity switch cable).

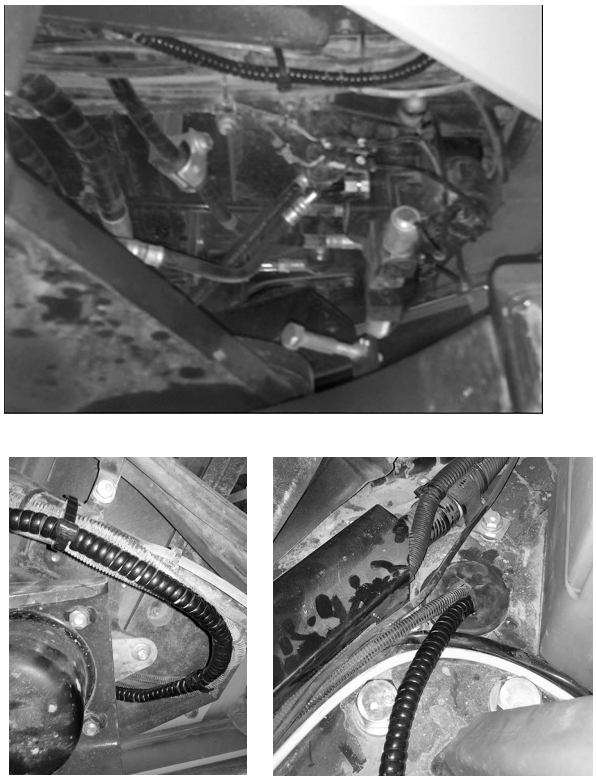


FIG. 65

11. Use the zip ties (included in the kit) to secure the proximity cable in place (FIG. 65).

WA480 Models

1. Install the G3 pump on the deck plate, located outside the cab on the right side as shown in FIG. 66.

FIG. 66

2. Position the pump mounting bracket against the hand rail and flush with the front edge (FIG. 67).

FIG. 67

- Mark the bolt holes closest to the cab 2.88 inches (73.15 mm) from the edge as shown in FIG. 68.

FIG. 68

3. Mark the hole locations with a paint pen or marker.

4. Use a center punch to score drill points in the center of each of the marks. Then use a 5/16 in. high speed drill bit to drill out the 4 mounting holes (FIG. 69).

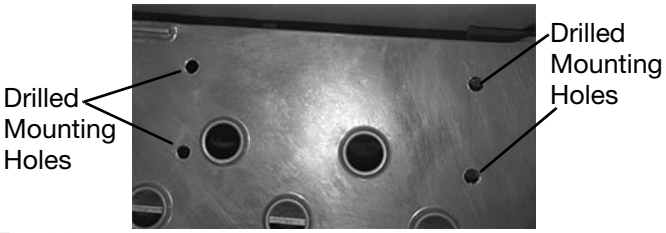


FIG. 69

5. Install the G3 pump mounting bracket to the G3 pump using the supplied hardware (FIG. 70). Wrench tighten securely.

FIG. 70

6. Wrap the power cable with the 1/4 inch cable loom (included in the kit).

7. Connect the power cable to the pump.

8. Route the power cable behind the pump, then underneath the decking near the cab. Follow the existing cable routings. Use the supplied zip ties to secure the power cable to the anchor points.

9. Thread the cable end through the rubber grommet on the floor of the cab (closest to the accelerator pedal) to finish the cable routing.

   NOTE: This is the same routing used for the proximity switch cable.

10. Secure the proximity switch cable in place using the supplied zip ties.

WA470 and WA380 Models

1. The G3 pump should be mounted on the deck plate located outside the cab on the right side as shown in FIG. 71.

FIG. 71: WA470 model shown

2. (See FIG. 72).

   - For WA470 models: Drill bolt holes (a) 1-1/8 inch (28.57 mm) from the back of the deck plate. Center the mounting bracket between the railing supports (b) as shown in FIG. 72
   - For WA380 models: Drill bolt holes (a) 7/8 inch (22.35 mm) from the back of the deck plate. Measure 5.75 inches (146 mm) in from the edge closest to the hydraulic tank.
   - Be sure the holes have enough clearance for the 5/16 inch washer to seat properly.

NOTE: *Photographs may include optional equipment.*

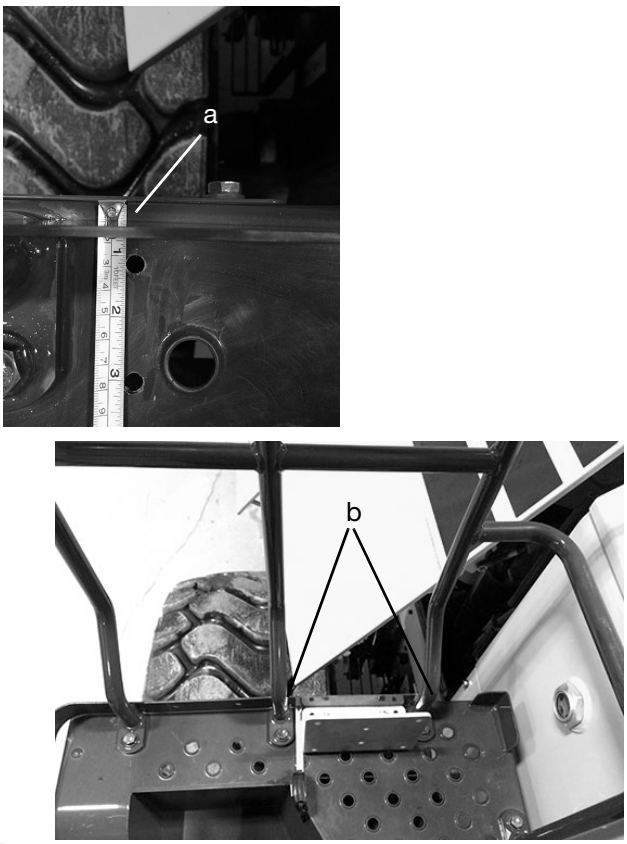


FIG. 72

3. Mark the hole locations with a paint pen or marker.

4. Use a center punch to score drill points in the center of each of the marks. Then use a 5/16 in. high speed drill bit to drill out the 4 mounting holes (FIG. 73).

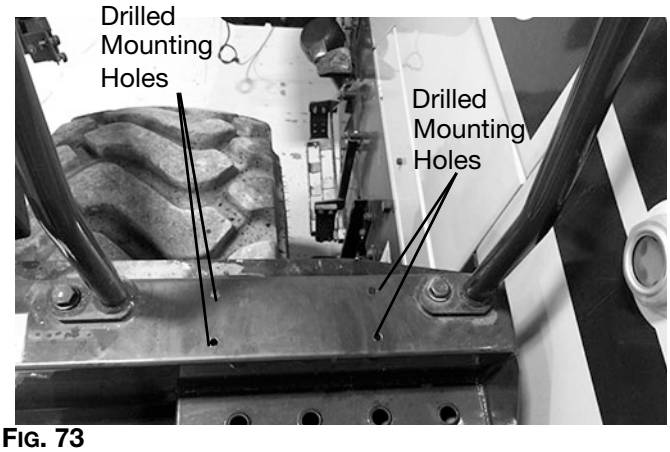


FIG. 73

5. Install the G3 pump mounting bracket to the G3 pump using the supplied hardware (FIG. 74). Wrench tighten securely.

FIG. 74

6. Use supplied hardware to mount the G3 pump bracket to the holes drilled in Step 2, page 26 (FIG. 75).

FIG. 75

7. Wrap the CPC power cable with the 1/4 in. cable loom (included in the kit) (FIG. 76).

FIG. 76

8. Connect the power cable to the pump.

NOTE: *Photographs may include optional equipment.*

9. Route the power cable around the back of the G3 pump and through the bracket as shown in FIG. 77.

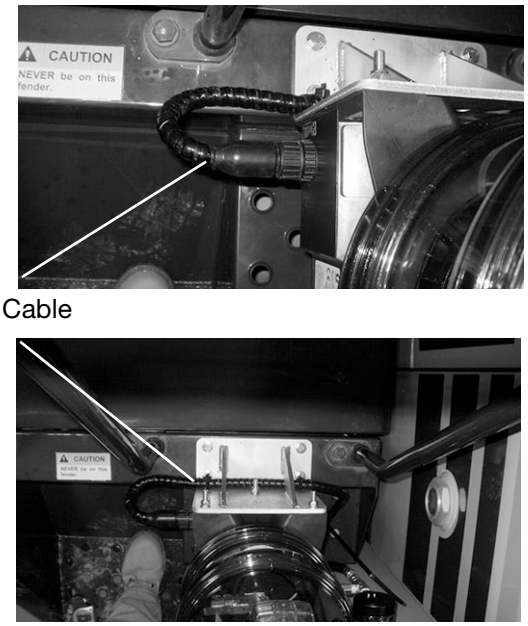


FIG. 77

10. Secure the power cable to the deck grating with a zip tie as shown in FIG. 78

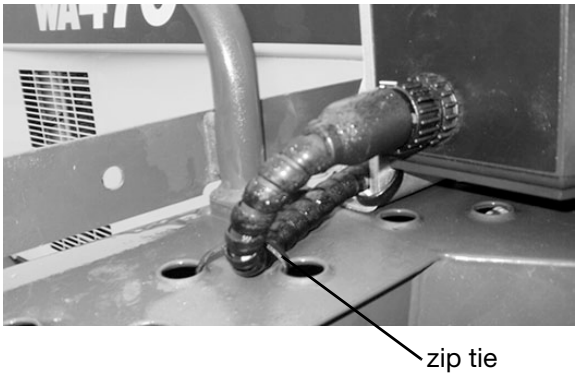


FIG. 78

11. **For the WA470 model only:** Finish the power cable routing by threading the cable end through a hole in the deck grating. Follow a path below the deck and under the cab as shown in FIG. 79.

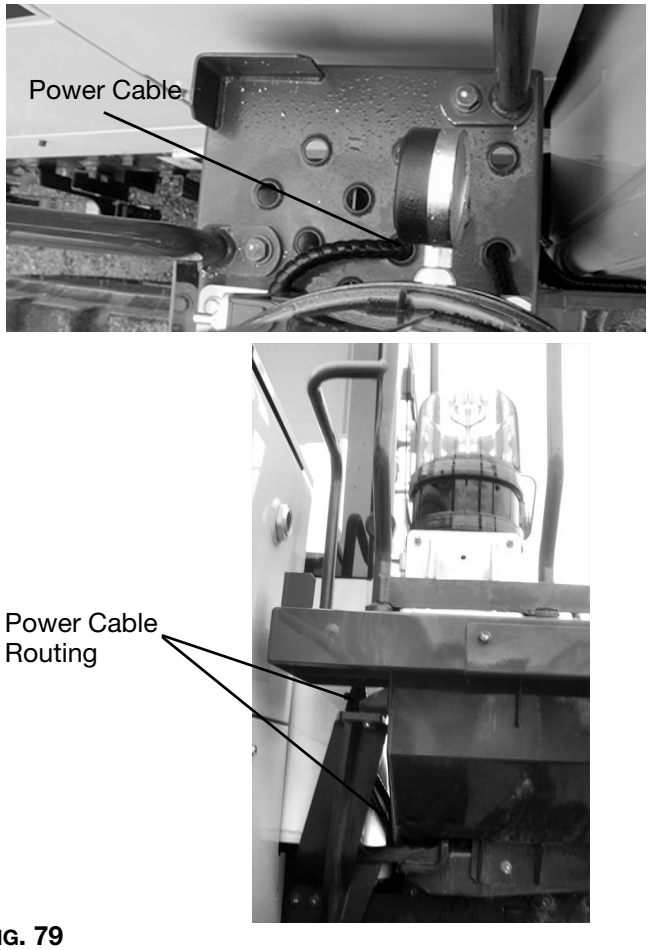


FIG. 79

NOTE: *Photographs may include optional equipment.*

For the WA380 model only: Finish the power cable routing by running the cable along the side of the G3 pump and then between the deck grating and cab. Follow a path below the deck and under the cab as shown in FIG. 80.

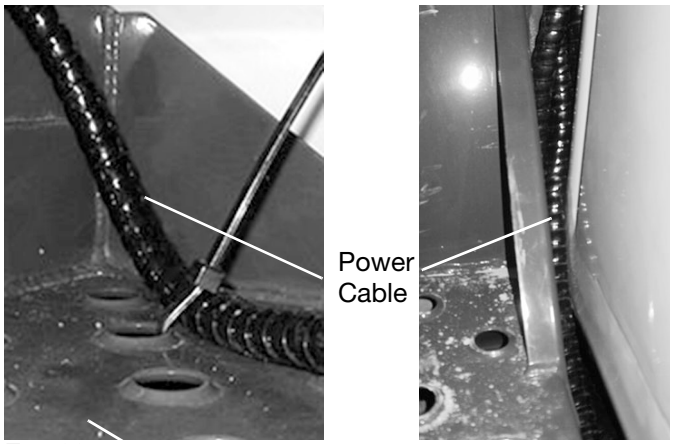


FIG. 80

12. Finish the power cable routing by threading the cable end through the rubber grommet on the floor of the cab, closest to the accelerator pedal (FIG. 81). (This is the same routing used for the proximity switch cable).

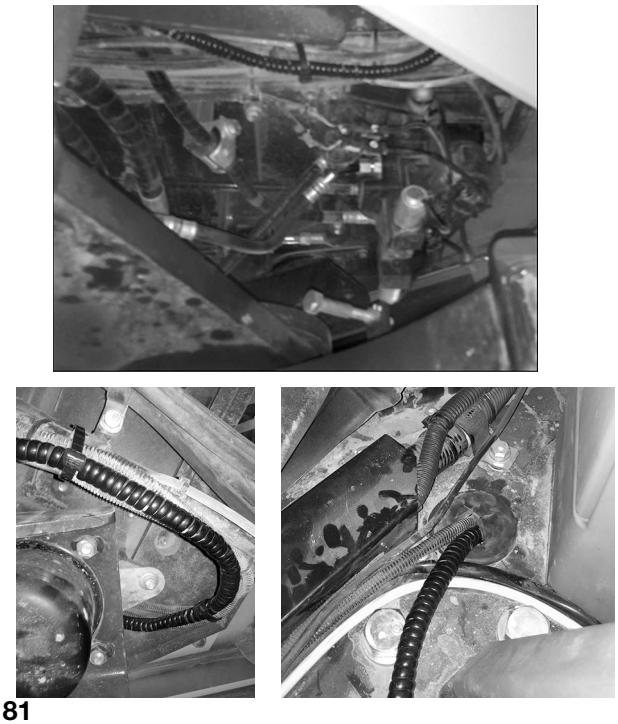


FIG. 81

13. Use the zip ties (included in the kit) to secure the cable in place (FIG. 81).

WA475 Models

1. Mount the pump on the left side of the deck plate located outside of the cab, as shown in FIG. 82.

FIG. 82

2. Position the pump mounting bracket against the rail near the back corner, closest to the cab (FIG. 83).

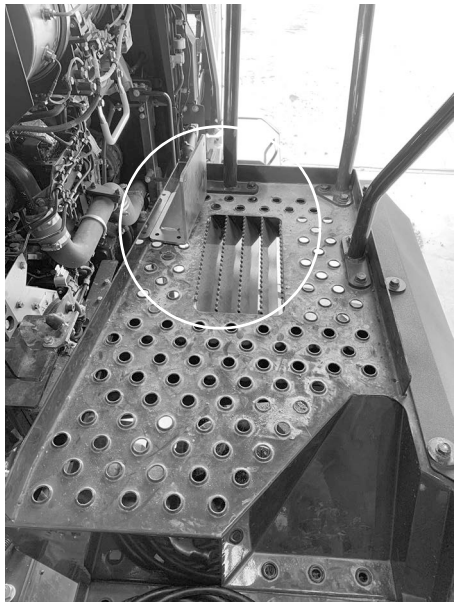


FIG. 83

NOTE: *Photographs may include optional equipment.*

NOTE: The holes for the bolts should be 4.0 in. from the edge, as shown in FIG. 84.

3. Mark the location of the holes with a paint pen or marker.
4. Score the drill points in the center of each mark using a center punch.
5. Drill out the four (4) mounting holes using a 5/16 in. high speed drill bit.

FIG. 84

6. Using the supplied hardware, install the G3 pump mounting bracket to the G3 pump, and wrench tighten securely (FIG. 85).

FIG. 85

7. Mount the G3 pump bracket to the holes drilled in Step 5, using the supplied hardware (FIG. 86).

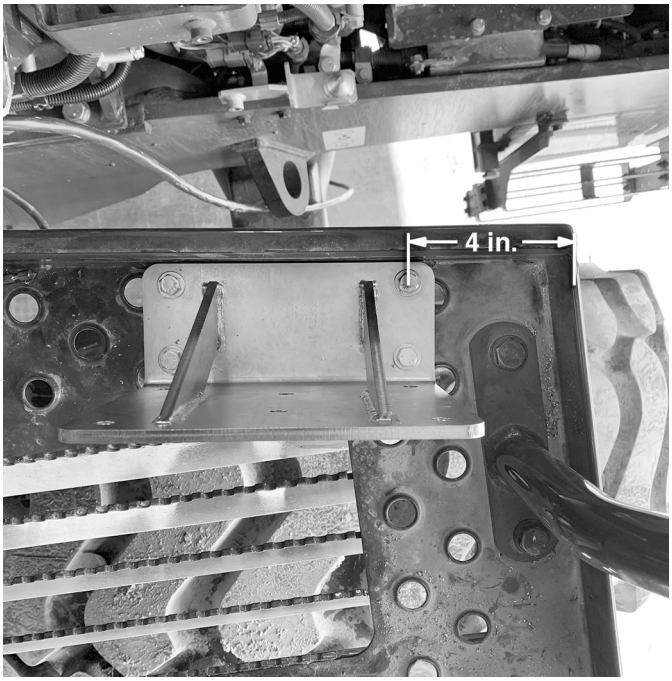


FIG. 86

8. Connect the power cable to the pump.
9. Route the power cable under the decking to the connection point under the cab (FIG. 87).

FIG. 87

NOTE: *Photographs may include optional equipment.*

10. Route the power cable to follow the deck support beam, using zip ties to secure the power cable (FIG. 88).

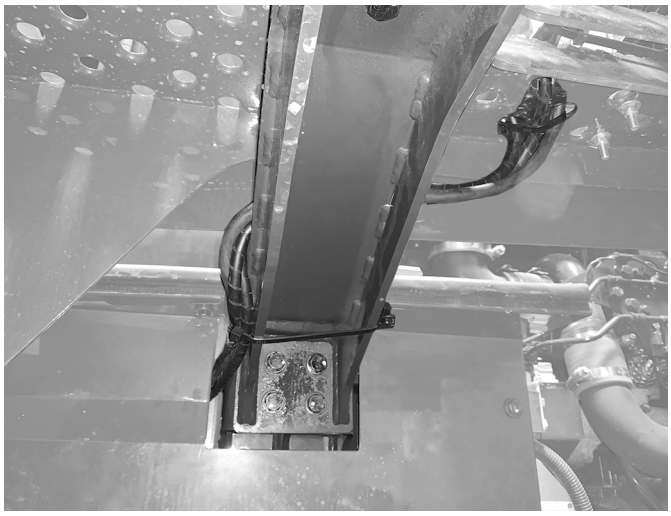


FIG. 88

11. Continue routing the power cable though the machine as shown in FIG. 89.

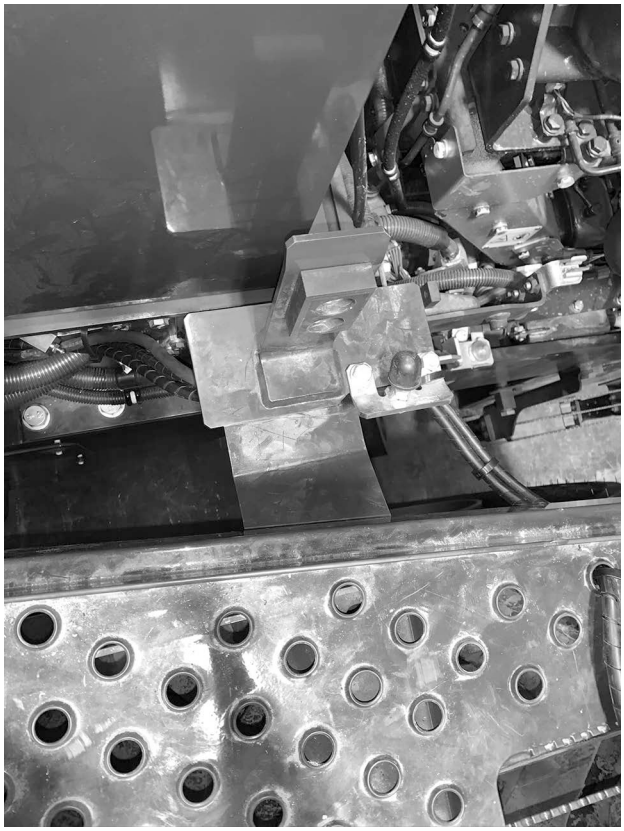


FIG. 89

12. Complete the power cable routing by connecting the power cable to the GLC X power cable connector located behind the left hand panel near the rear left tire (FIG. 90).

FIG. 90

13. Crimp the pin contacts following proper DT connector crimping procedures and quality standards, using proper DT crimping tool for solid size 16 contacts.

14. Insert pins into connector using **GLC X Wiring Diagram** on page 40.

NOTE: *Photographs may include optional equipment.*

Proximity Switch Cable

The proximity switch is used to monitor the system.

1. Wrap the proximity switch cable with the 1/4 in. cable loom (included in the kit). Allow sufficient cable length to allow for steering articulation.
2. Route the cable through the center of the machine. Follow the existing electrical and/or hydraulic cables.
3. Finish the cable routing by threading the cable end through the rubber grommet on the floor of the cab, closest to the accelerator pedal.
4. Use the heavy duty zip ties (included in the kit) to secure the proximity cable in place. Refer to FIG. 91 and FIG. 92 for installation details.

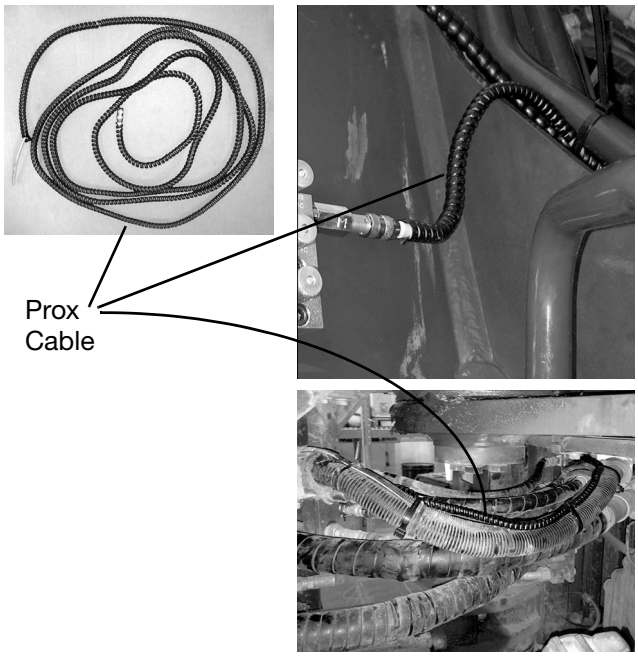


FIG. 91

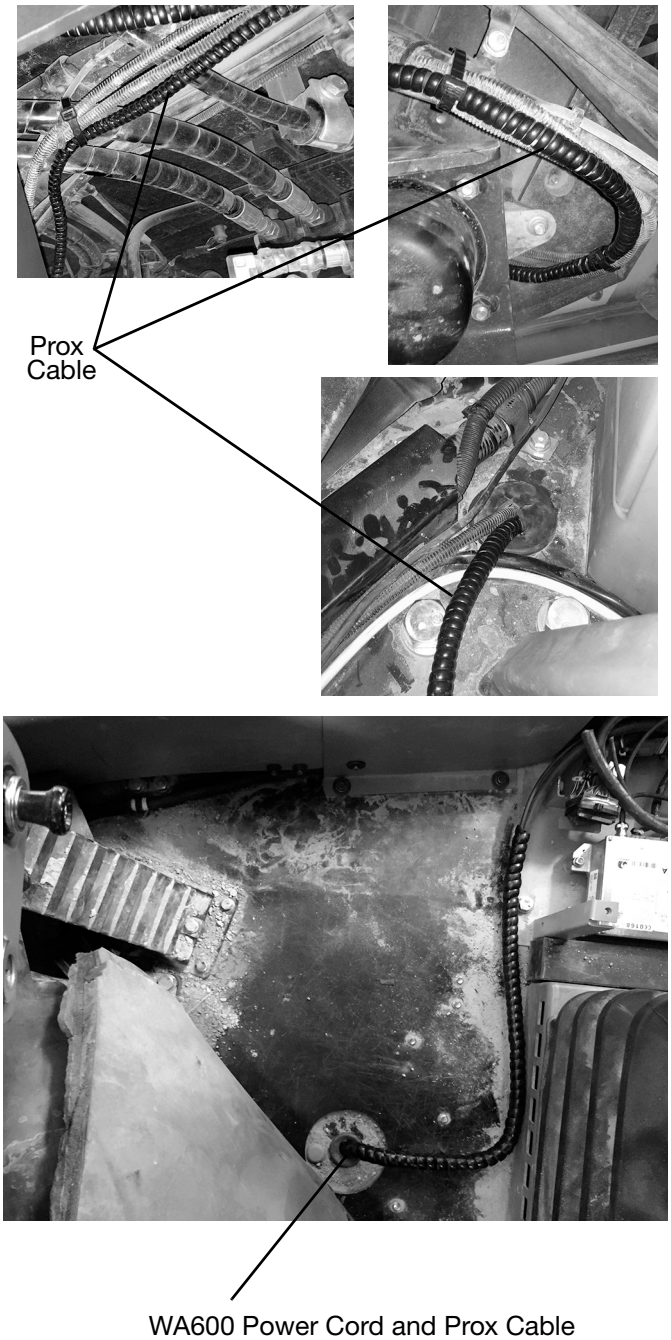


FIG. 92

NOTE: *Photographs may include optional equipment.*

GLC X Controller

The GLC X Controller includes the following components:

- GLC X Controller
- Mounting bracket and hardware
- GLC X cable
- Zip ties

Remove all components from the packaging and place all parts on a clean, flat surface.

GLC X Mounting Bracket Installation

The mounting bracket kit includes the following components:

Ref	Description	Qty
a	Mounting Bracket	1
b	Mounting Bolts	6
c	Washers	14
d	Nuts	6
e	Mounting Base Plate	1
f	Mounting Plate	1
g	Mounting Bracket to Cab	2
h	Washer, nylon	2
j	Screw, pan head	2
k	Nut	2

WA600 Models

1. Remove bolts and washers (w) located on the right hand side of the operator's window (FIG. 93). Keep washers (w). They will be used for GLC X installation.

FIG. 93

2. Secure long bracket in a vise. Measure down approximately 2 inches from each end. Bend the bracket at the 2 inch marks to a 45-degree angle as shown FIG. 94.

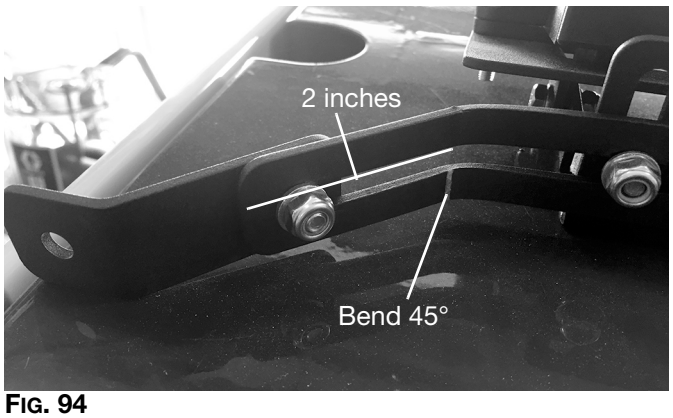


FIG. 94

3. Install bracket fasteners (g) to mounting bracket (a) using bolts (b), washers (c) and nuts (d) as shown in FIG. 95. Fasten loosely to allow for final adjustment when installed to the Komatsu equipment.

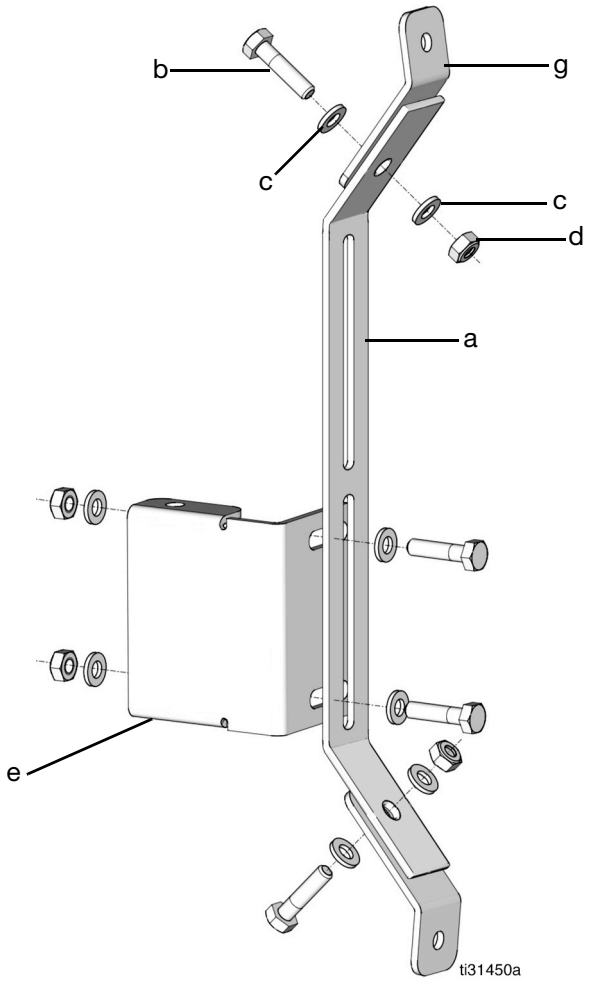


FIG. 95

NOTE: *Photographs may include optional equipment.*

4. Install the GLC X mounting plate (f) to the mounting base plate (e) using bolts (b), washers (c) and nuts (d) as shown in FIG. 96. Be sure washer (h) is installed between the mounting plate (f) and mounting base plate (e) on the top an bottom. Wrench tighten nuts securely.

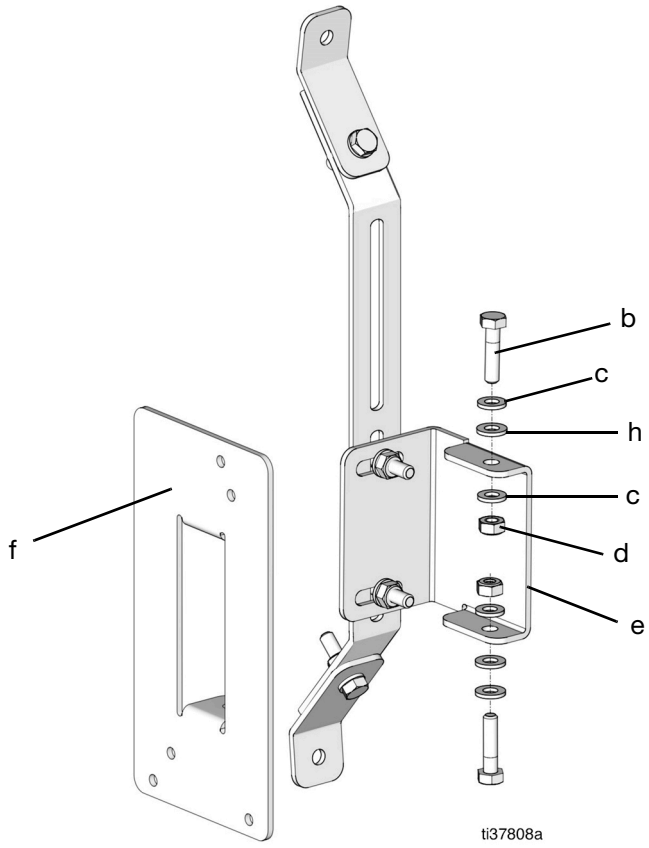


FIG. 96

5. Install the GLC X controller on the mounting plate (f) using screws (j), and nuts (k) as shown in FIG. 97. Tighten mounting bolts just enough to secure the controller in the bracket. Adjust the GLC X controller for the best viewing angle then wrench tighten bolts securely.

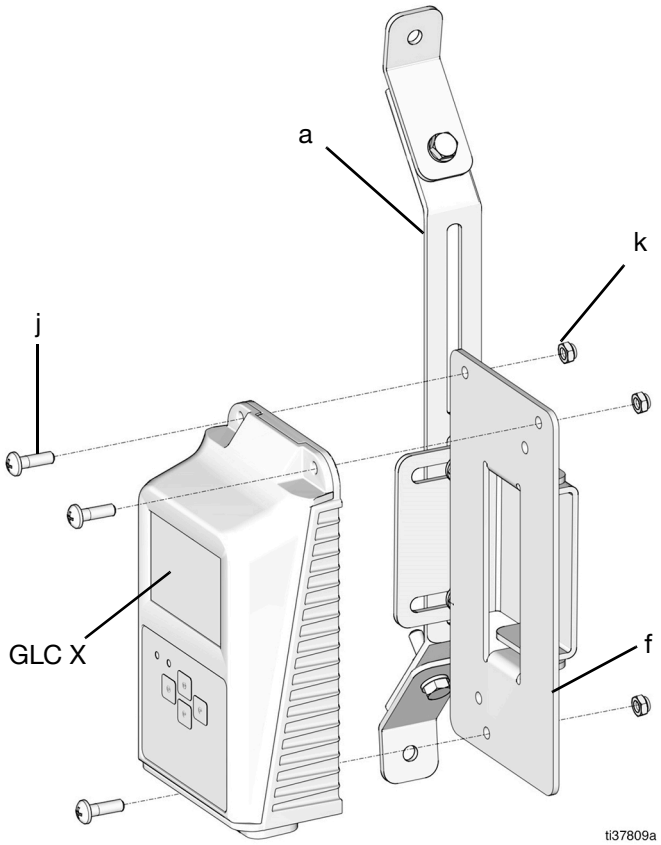


FIG. 97

6. Adjust bracket fasteners (g) (installed in Step 3) for installation on the Komatsu loader; matching the bracket to the location of the bolt holes available after removing bolts in Step 1 (page 33).

7. Wrench tighten nuts (d) to secure bracket fasteners (g) to bracket (a).

NOTE: *Photographs may include optional equipment.*

8. Use bolts (b) and washer (w) to secure bracket fasteners (g) to Komatsu loader in bolt holes available after removing the bolts and washers in Step 1 (page 33) (FIG. 98).

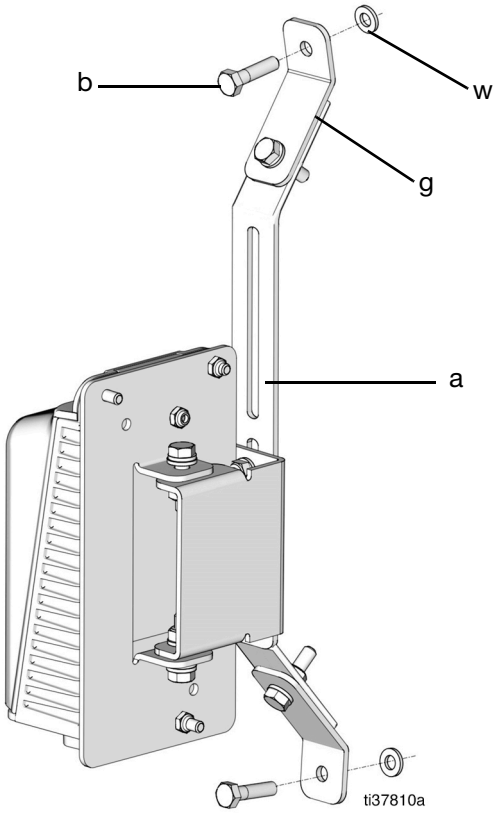


FIG. 98

9. Connect GLC X wiring harness to the GLC X controller (FIG. 99).

FIG. 99

WA500, WA480, WA470, WA380 Models

1. Remove bolt covers, bolts and washers (w) located next to the glove box in the cab frame cover panels (FIG. 100). Keep washers (w). They will be used for GLC X installation.

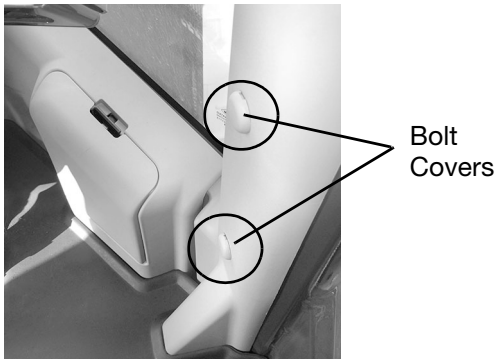


FIG. 100

2. Install the GLC X mounting base plate (e) to the mounting bracket (a) using bolts (b), washers (c) and nuts (d) as shown in FIG. 101. Wrench tighten nuts securely.

3. Install bracket fasteners (g) to mounting bracket (a) using bolts (b), washers (c) and nuts (d) as shown in FIG. 101. Fasten loosely to allow for final adjustment when installed to the Komatsu equipment.

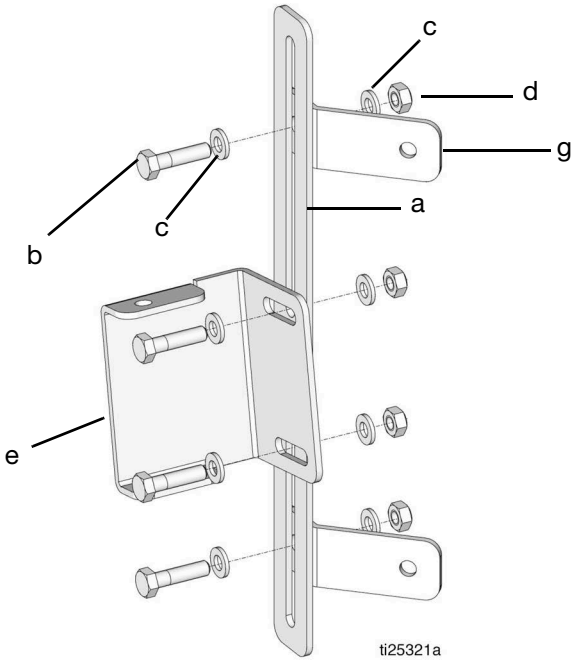


FIG. 101

NOTE: *Photographs may include optional equipment.*

4. Install the GLC X mounting plate (f) to the mounting base plate (e) using bolts (b), washers (c) and nuts (d) as shown in FIG. 102. Be sure washer (h) is installed between the mounting plate (f) and mounting base plate (e) on the top an bottom. Wrench tighten nuts securely.

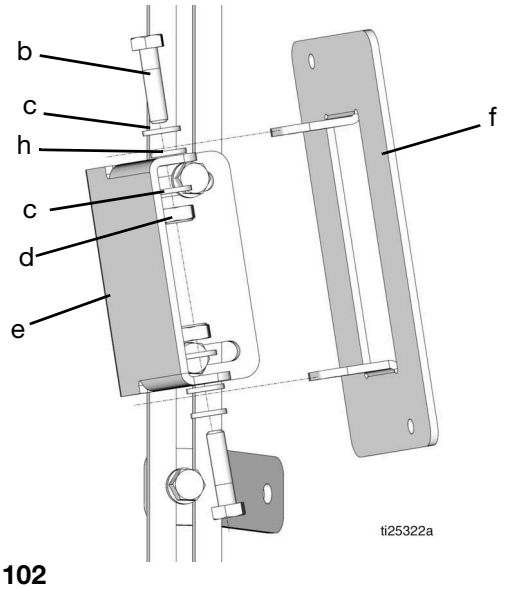


FIG. 102

5. Install the GLC X controller on the mounting plate (f) using screws (j), and nuts (k) as shown in FIG. 103. Tighten mounting bolts just enough to secure the controller in the bracket. Adjust the GLC X controller for the best viewing angle then wrench tighten bolts securely.

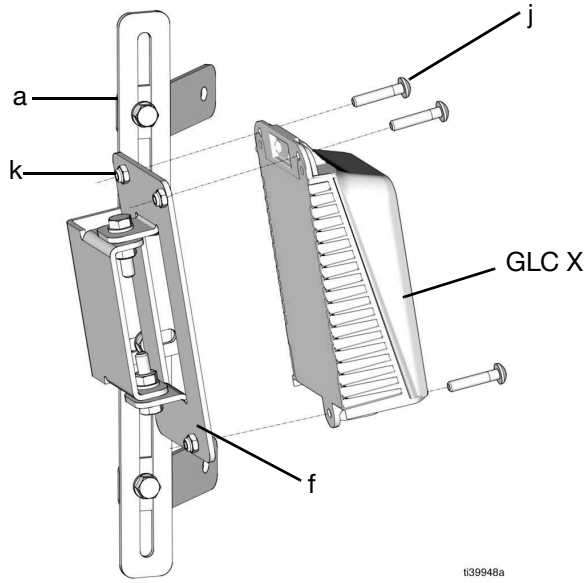


FIG. 103

6. Adjust bracket fasteners (g) (installed in Step 3) for installation on the Komatsu loader; matching the bracket to the location of the bolt holes available after removing the bolt cover and bolts in Step 1, page 35.

7. Wrench tighten nuts (d) to secure bracket fasteners (g) to bracket (a).

8. Use bolts (b) and washer (c) and washer (w) to secure bracket fasteners (g) to Komatsu loader in bolt holes available after removing the bolt covers, bolts and washers (w) in Step 1, page 35 (FIG. 104).

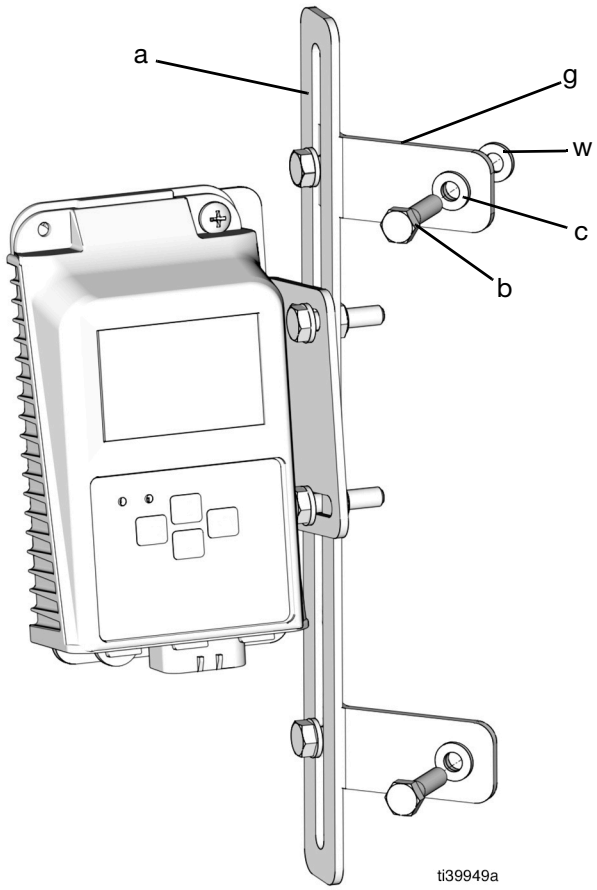


FIG. 104

9. Connect GLC X wiring harness to the GLC X controller.

NOTE: *Photographs may include optional equipment.*

10. Route the GLC X wiring harness cable behind the cab paneling and under the cab floor mat (FIG. 105).

FIG. 105

GLC X Controller Wiring

NOTICE

To avoid damaging the loader:

- Turn off and disconnect power at the battery before installing equipment.
- All electrical wiring must be done by a qualified professional or Komatsu certified technician.

WA475-10 Model

1. Remove bolts and washers (w) located on the right hand side of the operator's window (FIG. 106). Keep washers (w). They will be used for GLC X installation.

FIG. 106

2. Install the GLC X mounting base plate (e) to the mounting bracket (a) using bolts (b), washers (c) and nuts (d) as shown in FIG. 107. Wrench tighten nuts securely.

3. Install bracket fasteners (g) to mounting bracket (a) using bolts (b), washers (c) and nuts (d) as shown in FIG. 107. Fasten loosely to allow for final adjustment when installed to the Komatsu equipment.

NOTE: *Photographs may include optional equipment.*

FIG. 107

4. Install the GLC X mounting plate (f) to the mounting base plate (e) using bolts (b), washers (c) and nuts (d) as shown in FIG. 108. Be sure washer (h) is installed between the mounting plate (f) and mounting base plate (e) on the top an bottom. Wrench tighten nuts securely.

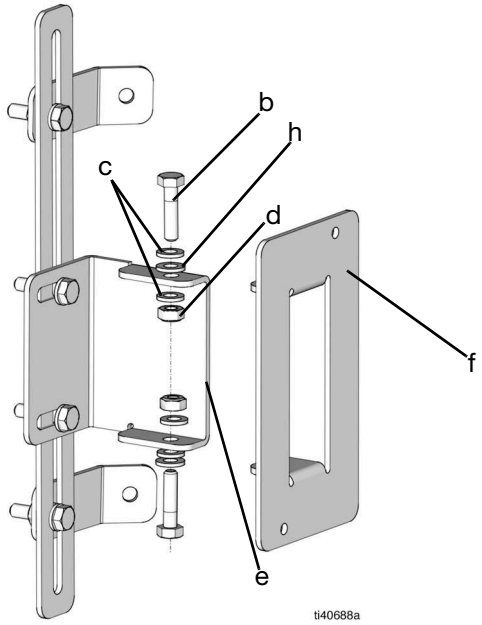


FIG. 108

5. Install the GLC X controller on the mounting plate (f) using screws (j), and nuts (k) as shown in FIG. 109. Tighten mounting bolts just enough to secure the controller in the bracket. Adjust the GLC X controller for the best viewing angle then wrench tighten bolts securely.

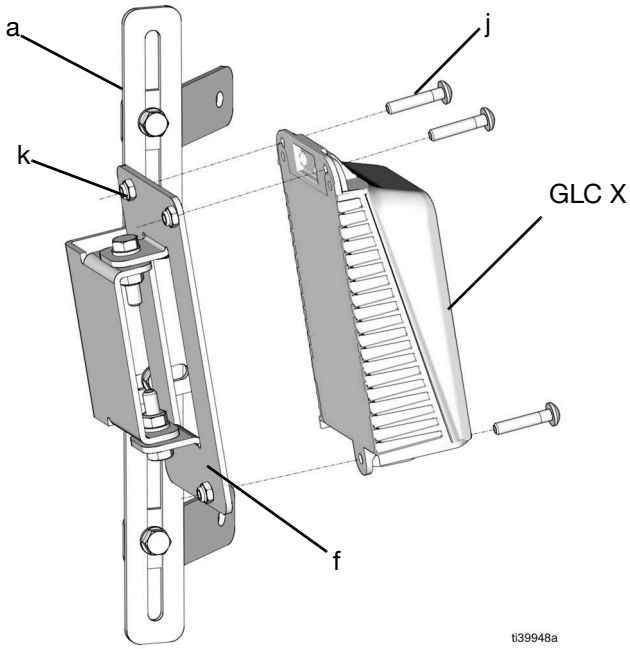


FIG. 109

6. Adjust bracket fasteners (g) (installed in Step 3) for installation on the Komatsu loader; matching the bracket to the location of the bolt holes available after removing bolts in Step 1 (page 41).

7. Wrench tighten nuts (d) to secure bracket fasteners (g) to bracket (a).

8. Use bolts (b) and washer (c) and washer (w) to secure bracket fasteners (g) to Komatsu loader in bolt holes available after removing the bolt covers, bolts and washers (w) in Step 1, page 41 (FIG. 112).

NOTE: Existing bolts may be larger in diameter than the bracket fastener holes.

9. Connect GLC X wiring harness to the GLC X controller.

10. Route the GLC X wiring harness cable behind the cab paneling and under the cab floor mat (FIG. 110).

NOTE: *Photographs may include optional equipment.*

FIG. 110

NOTE: *Photographs may include optional equipment.*

GLC X Wiring Table

GLC X Harness				Proximity Switch	G3 Pump
Color	**Wire Number**	**Description**	**+/-**	**Color**	**Color**
White	2	*Unused*			
Black	7	*Unused*			
Green	13	*Unused*			
Brown	9	*Unused*			
Blue	14	*Unused*			
Green	8	SW		Blue	
Slate	11	N.O.		Black	
Yellow	4	Pump	+	Brown	
Red	1	+ VDC	+		Red
Black	3	- VDC	-		Black
Violet	12	LL N.O.			White or Yellow
Orange	5	LL COM			Orange

GLC X Wiring Diagram

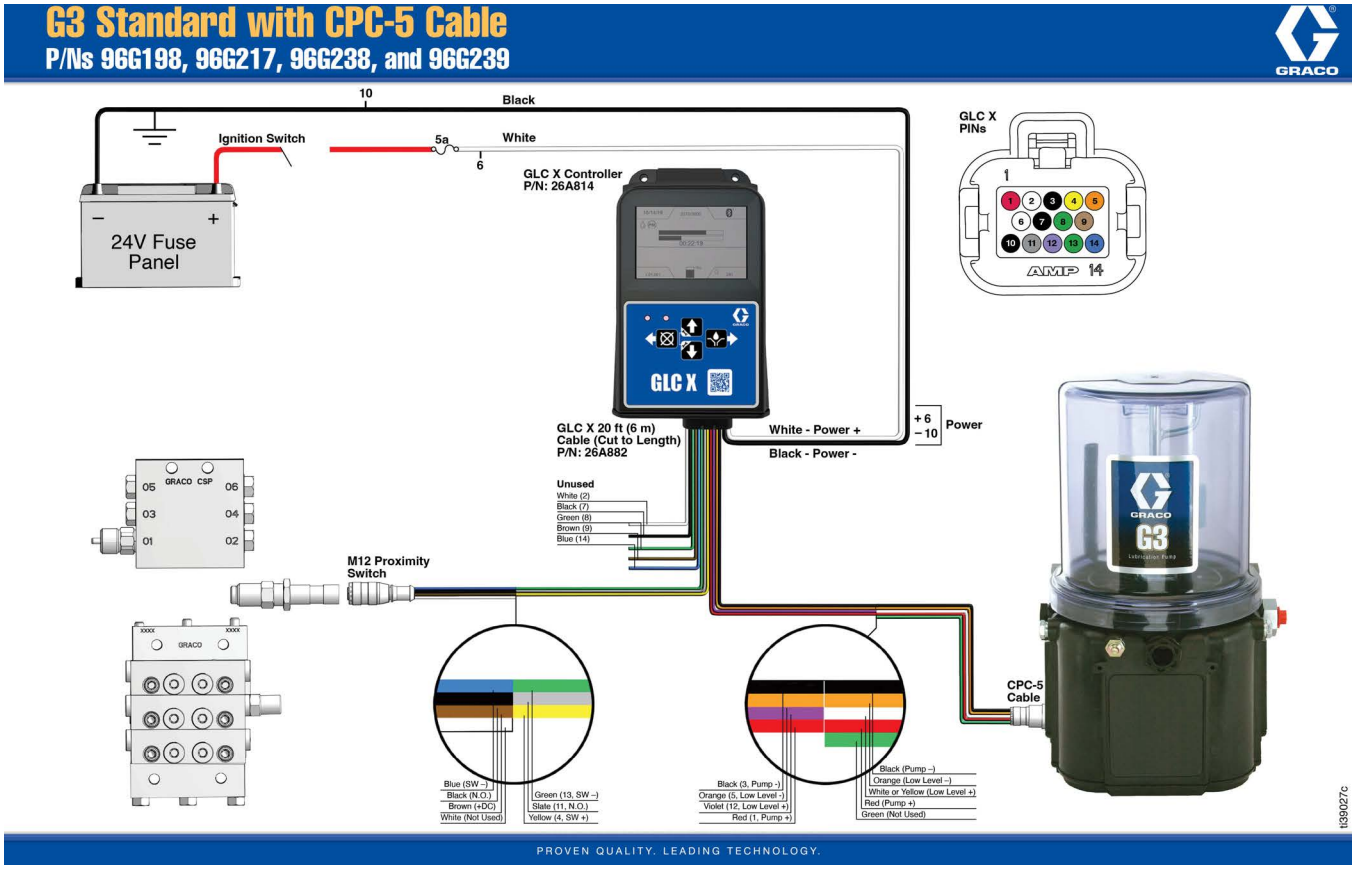


FIG. 111

NOTE: *Photographs may include optional equipment.*

Wire Splicing

1. Remove 1 inch of wire sheath using a wire stripper (FIG. 112).

FIG. 112

2. Slide 1.5 inches of shrink tubing over end of one piece of wire (FIG. 113).

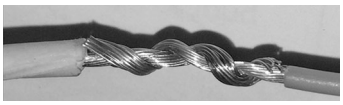


FIG. 113

3. Connect two (or more) wire ends together by twisting the stripped wire ends of wires together (FIG. 114).

FIG. 114

4. Solder connection with a soldering iron.

5. Slide the shrink tubing over the soldered wires. Use a heat gun to contract the shrink tubing (FIG. 115).

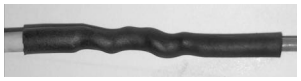


FIG. 115

6. Repeat Steps 1 - 5 for all wires.

7. Wrap wiring assembly with electrical tape or cable loom to protect connection.

Fuse Panel

1. Remove fuse and relay panel covers (FIG. 116).

   WA600 Model Only: Remove the fuse panel and relay panel on the right hand side of the machine near the operator's seat (FIG. 118).

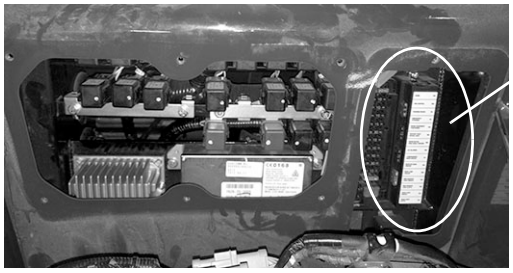


FIG. 116: WA500, WA480, WA475, WA470, WA380 Models

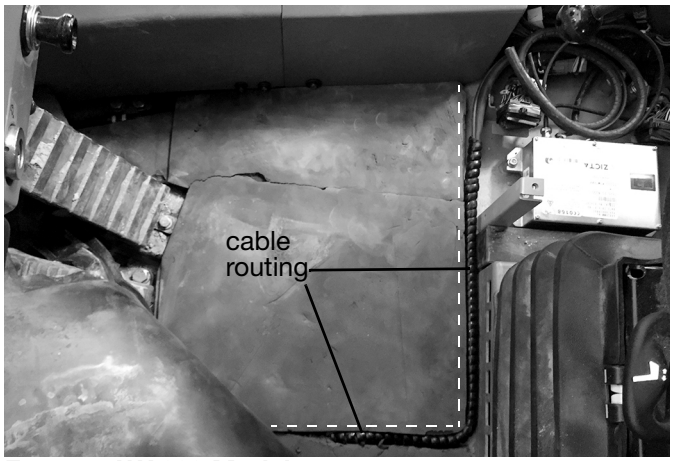


FIG. 117: WA600 Model

2. Lift the floor mat and route the wiring assembly from the grommet under the bulkhead panel (FIG. 117 and FIG. 119).

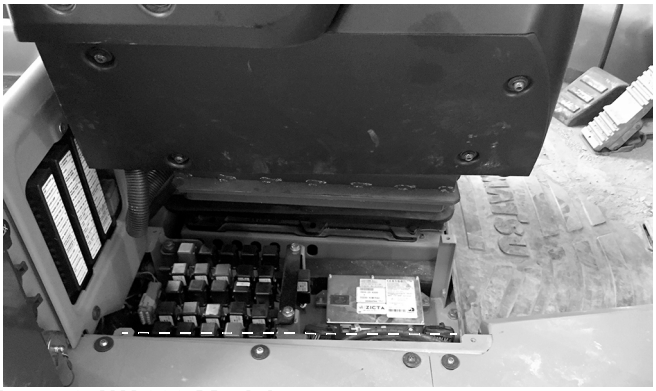


FIG. 118: WA600 Model

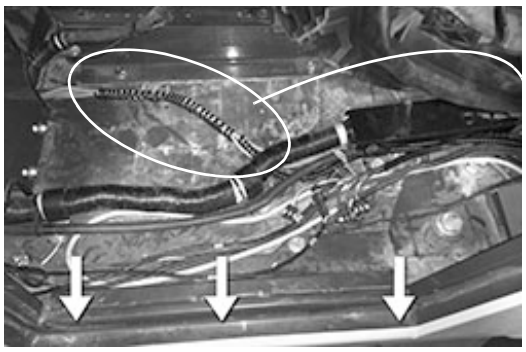


FIG. 119: WA500, WA480, WA475, WA470, WA380 - The 3 downward pointing arrows point to the secondary operator egress door.

3. Locate the wiring on the right rear side of the seat and through the bottom, toward the door of the secondary operator egress door. (Refer to the arrow shown in FIG. 119 and FIG. 120)

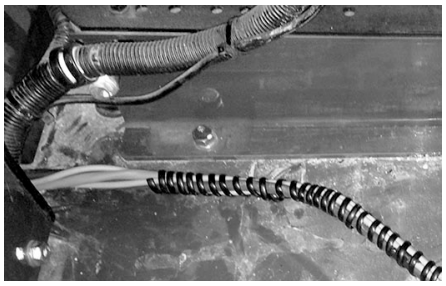


FIG. 120

4. Feed cable through the cutout and into the back corner of the relay panel (FIG. 121).

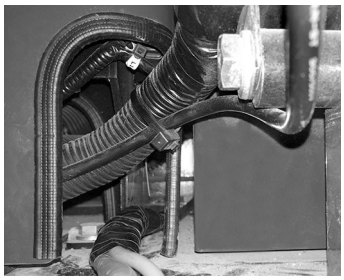


FIG. 121

NOTE: *Photographs may include optional equipment.*

5. Pull the cable through the back of the relay panel, into the fuse panel and out through the panel cover (FIG. 122 and FIG. 123).

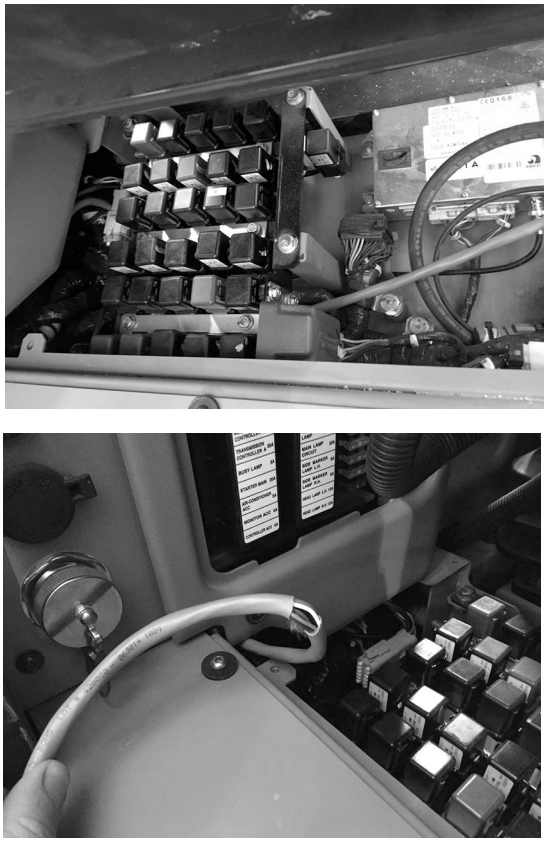


FIG. 122: WA600

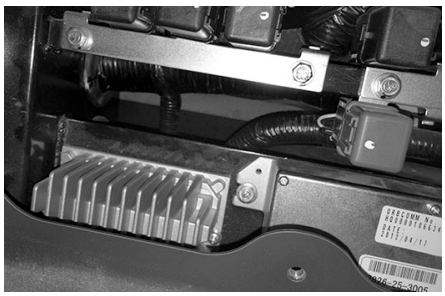


FIG. 123: WA500, WA480, WA475, WA470, WA380

6. Attach a ring terminal to the controller ground wire (FIG. 124) (Instructions for wiring and splicing are included in the **GLC X Controller Wiring** section, page 37).

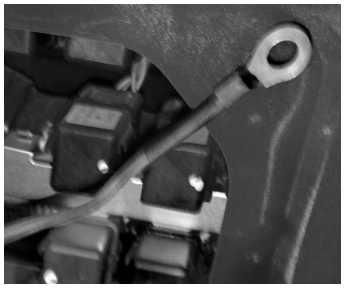


FIG. 124

7. Attach an ATM fuse splice connector to the power wire of the controller (FIG. 125). Install a 5 Amp fuse.

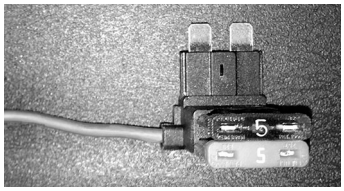


FIG. 125

8. Remove a bolt from the relay rail closest to the fuse panel and connect the grounding ring to the bolt. Re-tighten bolt (FIG. 126).

FIG. 126

NOTE: *Photographs may include optional equipment.*

9. In the fuse box locate the fuse labeled “Eng Control Key SW Acc” (FIG. 127 and FIG. 128).

   NOTE: The fuse should be located on the bottom left side of the fuse panel.

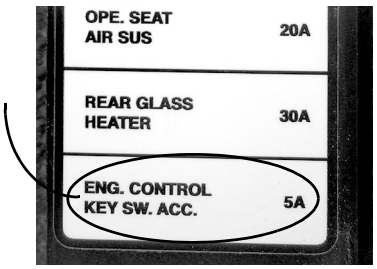


FIG. 127: WA500, WA480, WA470, WA380

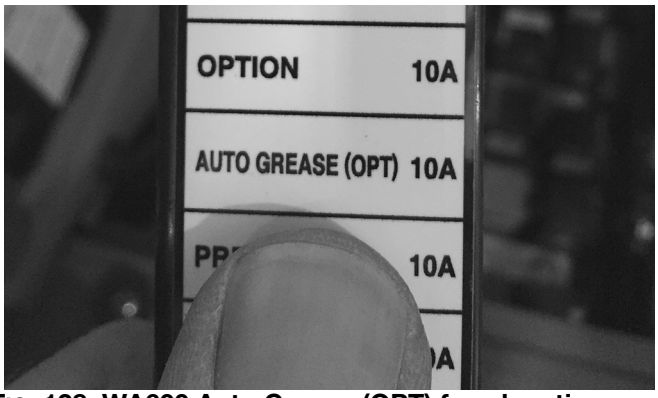


FIG. 128: WA600 Auto Grease (OPT) fuse location

10. Remove the 5 Amp fuse installed in the fuse panel labeled “Eng Control Key SW Acc”. Install the fuse into the Add-A-Fuse slot (FIG. 130).
11. Connect the Add-A-Fuse with both 5 Amp fuses installed into the fuse panel slot labeled “Eng Control Key SW Acc” (FIG. 129).

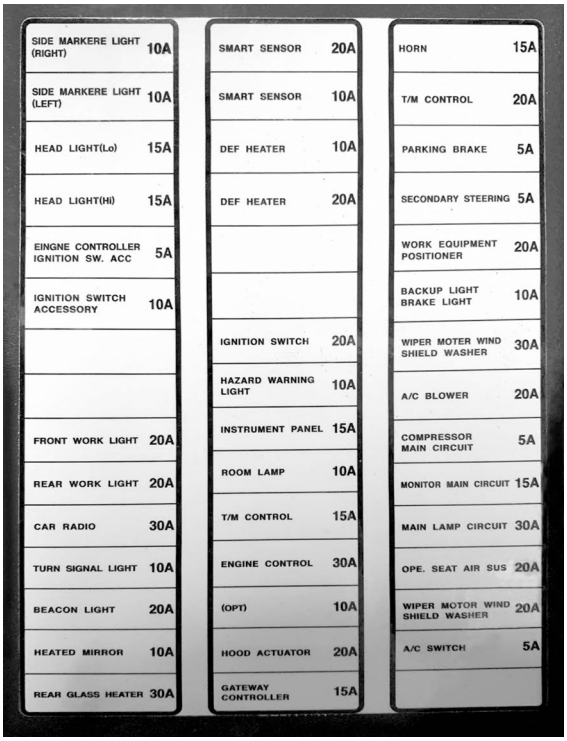


FIG. 129

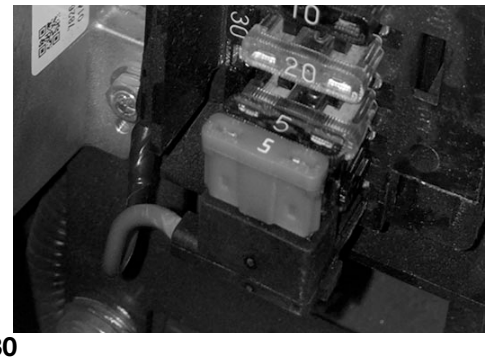


FIG. 130

12. Reinstall the fuse cover over the top of the fuse panel and the Add-A-Fuse.
13. Reinstall the relay and fuse panel covers.

NOTE: *Photographs may include optional equipment.*

GLC X Controller Component Identification

NOTICE

To prevent damage to soft key buttons, do not press the buttons with sharp objects such as pens, plastic cards, screwdrivers, or fingernails.

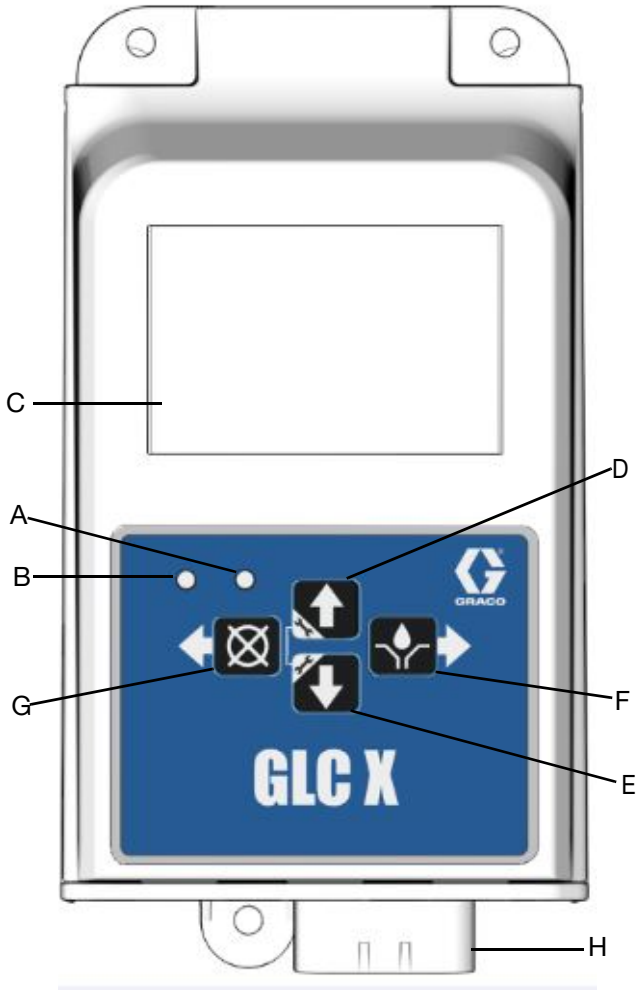


FIG. 131: GLC X Controller Front

A System LED
B Low Level Status LED
C Display
D UP Arrow
E DOWN Arrow
F RIGHT Arrow / ENTER
G LEFT Arrow / Reset
H Connector

(A) System LED

Light	Status
Red (solid)	Normal and ON
Orange (solid)	Controller is in system SETUP and lubrication program is paused
Red (flashing)	System is in alarm

(B) Low Level Status LED

Light	Status
Orange (solid)	Low level alert
Flashing	Another alarm in addition to a low level alert

(D and E) UP and DOWN Direction Arrows

Press and hold both the UP and DOWN ARROW keys simultaneously for three (3) seconds to enter SETUP.

(F) RIGHT Direction Arrow / MANUAL RUN / ENTER

In SETUP the RIGHT Arrow saves the entry or selects a menu choice.

When not in SETUP, the RIGHT Arrow starts the pump for one complete lubrication event.

Holding down both the RIGHT Arrow and the LEFT Arrow simultaneously for three (3) seconds starts TEST MODE.

(G) LEFT Direction Arrow / Reset

In SETUP the LEFT Arrow moves the cursor in the display one field to the left. It also navigates back to the previous screen and cancels parameter change.

If the pump is lubricating, pressing this button cancels the event and the pump stops lubricating.

In ALARM, press the LEFT Arrow once to clear the buzzer. Press and hold for three (3) seconds to clear the alarm. For more information, see **Alarms**, in the GLC X manual.

Holding down both the RIGHT Arrow and the LEFT Arrow simultaneously for three (3) seconds starts TEST MODE.

NOTE: *Photographs may include optional equipment.*

Setup

Navigating Setup and Data Entry

UP and DOWN Arrows:

- Press both the UP and DOWN Arrows simultaneously for three (3) seconds to enter SETUP.

- Use the UP and DOWN Arrows to navigate screens in the up or down direction.

- Use these buttons to adjust parameters and data values.

RIGHT Arrow:

- Use this button to move the cursor to the right or to select menu items.

- Use this button to save any parameter changes.

LEFT Arrow:

- Use this button to move the cursor to the left.

- Use this button to navigate to the previous screen. This cancels any parameter change made.

Change Settings

Press both the UP and DOWN Arrow buttons simultaneously for three seconds to enter SETUP and to change settings.

NOTE: Setting changes are not saved until Accept is selected.

While in SETUP, if a button is not pushed for 1 minute the Lubrication Controller returns to idle.

Mode

Select Interval.

Interval

Configures how frequently the GLC X lubricates the product.

- Select Timer Interval.

Interval Time

This sets up how frequently lubrication occurs.

- Interval: defines the time between lubrication events.

  Enter 01:00 (1 hr: 0 min)

  Accept

  Return to Mode menu

End On

Select End ON.

Cycles

- Timeout = 0:10:00.

Enter Cycles

- WA600 - 10 Cycles
- WA500 - 8 Cycles
- WA480 - 6 Cycles
- WA475 - 6 Cycles
- WA470 - 6 Cycles
- WA380 - 5 Cycles

- Accept

- Return to main menu

NOTE: *Photographs may include optional equipment.*

Low Level

The pump stops lubricating when low level is detected. To define low level, enter SETUP, select low level, and then select Type: Paddle.

Paddle

- Alert: Enable
- Alert Threshold: 10
- Alarm: Enable
- Alarm Threshold: 80
- Auto-clear: Enable
- Accept

Lock

The controller does not require a PIN to access the programming features of the unit. However, an option for adding PIN lock out is available.

Enable a Lock out PIN

Navigate to the menu item lock.

- Lock: toggles on/off Lock out PIN protection.
- PIN: enter a four (4) digit code to unlock the device.

If a lockout PIN is enabled, a PIN must be used to change settings.

Entering a PIN

When entering SETUP, the PIN entry screen appears with the first digit highlighted. Use the arrow buttons to enter the PIN.

After entering the last digit, press the RIGHT ARROW button to accept the PIN.

If the PIN is correct, the device enters SETUP.

If the PIN is incorrect, the device returns to the main screen.

Start Up

Navigate to the menu item start up.

- Pre-lube: configures the GLC X to start a lubrication event once powered on.
- Delay: enables a delay between when the device is powered on and when the controller resumes.
  - Delay Time: if applicable, configures the delay time.

Output 2

Assign as vent valve output.

System

In addition to date and time, enabling Bluetooth® and disabling an audible alarm are found under this heading.

Date and Time

Navigate to the menu item time.

- Date: defines today's date.
- Time: defines the current time. This clock runs on a 24 hour clock. (9 a.m. = 9, 2 p.m. = 14)

Additional Advanced Features

Advanced features are accessible through the mobile app, gracoautolube, available for Android® and Apple® devices in the app store.

- Generic alarm input: assign unused input to trigger an alarm.
- Pulsed output: pulses pump output during lubrication event. Typically used with single stroke pumps

NOTE: For additional information, see the GLC X Lubrication Controller manual.

Hose Assemblies

The hose in the kit is provided in bulk and the fittings are field installable; a crimper is not required.

A list of the hose assemblies needed and the assembly requirements for 8.6 mm hose is provided in the Hose Assembly Tables. US Measurements are provided on page 50 and Metric Measurements are provided on page 51.

NOTE: In the Hose Assembly Table:

- Assembled hose lengths with fittings are shown as Overall Length.
- Use the Cut Length measurement when cutting the hose from the roll.The
- The hose lengths provided in the Hose Assembly Tables (pages 50 and 51) are for a standard wheel loader. If the equipment has a “high-lift” option, the hose lengths provided for the front secondary valve and feed line from the master to the front secondary valve are incorrect. Measurements should be made at the time of installation.

Hose Assembly Instructions

1. Wrap or slide spiral wrap (sw) over the end of the cut-to-length hose (h) until the entire length of the hose is encased in the spiral wrap.

2. Trim the spiral wrap (sw), leaving approximately 1 inch (25.4 mm) of the hose end unwrapped (FIG. 132).

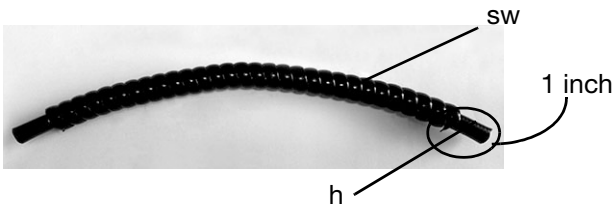


FIG. 132

Front Secondary: Lower Bucket Pin Anchor to Pin LH and RH ONLY

The Left Hand And Right Hand Front Secondary: Lower Bucket Pin Anchor to Pin spiral wrapped hose, must also be protected with a hose spring guard.

a. Slide the hose spring guard (sg) over the end of the spiral wrapped hose. Feed the hose assembly into the hose spring guard until the entire length of the hose is encased in the hose spring guard.

b. Trim the hose spring guard (sg) so it is long enough to cover hose assembly (FIG. 133).

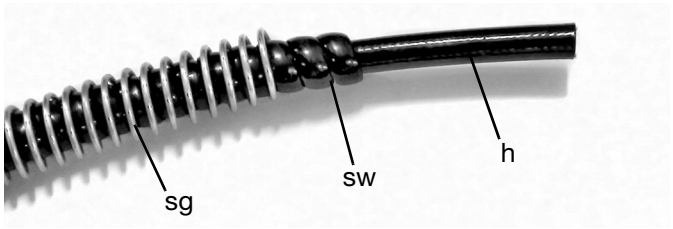


FIG. 133

3. Remove two hose fittings from their package and disassemble the two pieces (FIG. 134).

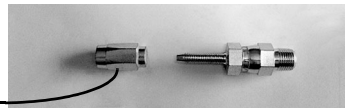


FIG. 134

4. Connect the socket to the end of the hose. Rotate the fitting counter-clockwise to thread the hose fitting onto the hose (FIG. 135).

   NOTE: A wrench and pliers may be needed to assist with this assembly. If socket is difficult to install, apply lubricant that is compatible with the hose material.

FIG. 135

5. Seat the hose end into the fitting completely, then back off 1/2 turn. Leaving approximately 1/16 in. of the hose end before completely seating the hose into the fitting. This will allow enough space for the second half of the fitting to be connected (FIG. 136).

6. Lubricate socket, threads, and hose inside diameter.

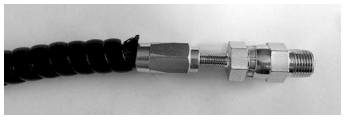


FIG. 136

NOTE: *Photographs may include optional equipment.*

7. Thread the stud of the nipple clockwise into the socket installed in the hose until the nipple nearly bottoms out against the socket shoulder (FIG. 137).

   NOTE: Two hand wrenches may be needed to assist with this assembly.

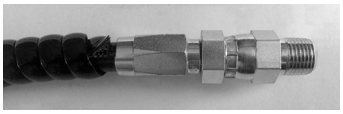


FIG. 137

NOTICE
Do not over tighten the fittings during final assembly. After the two fittings are securely connected, stop tightening the fittings. Over-tightening can damage the fittings and a new hose assembly will need to be made. The nipple should be firm when tightening but not difficult to install. If the nipple is difficult to install, check the hose for proper lubrication. Reapply lubricant as needed. Installation without proper lubrication can cause damage to the core tube.

8. Repeat Steps 1-7 for all hose assemblies.

Hose Routing

Routing hose lines takes time. It is easier when there are two people working on the installation together.

- Refer to FIG. 159 - FIG. 205 to assist with grease line routing.
- Route hoses by following the path of the already installed electrical or hydraulic lines.
- Route the lines to the grease point but do not connect the lines to the fittings. Take care to ensure dirt and/or debris do not get on the grease fitting or introduced into the system.
- Secure lines using the supplied zip ties.

Hose Assembly Table - US Measurements (NOTE: Metric measurements are provided on page 51)

Group	Lube Point Description	Cut Length - inches					
		WA600	WA500	WA480	WA475	WA470	WA380
Front Secondary	Lift Cylinder Rod End Right Side	26.0	23.0	18.5	22.0	22.0	19.0
Front Secondary	Lift Cylinder Rod End Left Side	26.0	23.0	18.5	22.0	22.0	19.0
Front Secondary	Center Bellcrank bell crank Pin	87.0	75.5	70.5	52.0	67.5	71.5
Front Secondary	Upper Bellcrank bell crank Pin	74.0	78.5	86.5	93.0	82.0	69.5
Front Secondary	Bucket Link Bellcrank Bucket Pin	172.0	147.5	125.5	142.0	152.5	141.5
Front Secondary	Bucket Link Bellcrank bell crank Pin	176.0	125.5	125.5	109.0	126.5	116.0
Front Secondary †	Lower Bucket Pin Anchor to Pin LH	26.75	23.5	23.5	23.5	23.5	23.5
Front Secondary †	Lower Bucket Pin Anchor to Pin RH	26.75	23.5	23.5	23.5	23.5	23.5
Front Secondary◆	Lower Bucket Pin Under Guarding	63.75	51.0	51.0	51.0	51.0	42.5
Front Secondary◆	Lower Bucket Pin Under Guarding	63.75	51.0	51.0	51.0	51.0	42.5
Front Secondary, steel wrap	Lower Bucket Pin Valve to Anchor LH	61.0	48.0	45.5	41.5	41.5	40.5
Front Secondary, steel wrap	Lower Bucket Pin Valve to Anchor RH	61.0	48.0	45.5	41.5	41.5	40.5
Middle Secondary	Lift Arm Hinge Pin LH	81.5	11.0	54.5	24.0	30.5	31.5
Middle Secondary◆	Lift Arm Hinge Pin RH	64.25	11.0	54.5	91.0	120.5	85.5
Middle Secondary	Bucket Cylinder Pin	63.5	11.0	43.0	46.0	54.0	53.5
Middle Secondary	Lift Arm Cylinder Pin LH	65.0	14.5	7.0	17.0	7.0	7.0
Middle Secondary	Lift Arm Cylinder Pin RH	65.0	11.0	108.5	73.0	102.0	113.5
Middle Secondary	Steering Cylinder Pin LH	82.0	14.5	45.0	46.0	54.0	53.5
Middle Secondary	Steering Cylinder Pin RH	81.5	14.5	47.0	46.0	54.0	53.5
Middle Secondary	Center Support	82.5	14.5	47.5	54.0	47.5	53.5
Rear Secondary	Rear Axle Pivot Pin - top	43.75	7.0	16.5	78.0	16.5	12.0
Rear Secondary	Rear Axle Pivot Pin - middle	45.5	7.0	15.0	78.0	15.0	11.0
Rear Secondary	Rear Axle Pivot Pin - bottom	37.5	7.0	13.5	78.0	13.5	10.0
Rear Secondary	Steering Cylinder Pin LH	82.0	19.5	63.0	62.0	90.0	45.5
Rear Secondary	Steering Cylinder Pin RH	83.0	74.5	91.0	83.0	102.0	66.5
Rear Secondary	Center Pivot Pin	127.0	57.5	146.0	102.0	149.5	138.5
Rear Secondary	Center Pivot Pin Upper	166.0	121.5	125.0	120.0	174.5	141.5
Master to Rear Secondary	Steering and Rear Axle	128.25	92.5	147.5	109.0	151.5	119.5
Master to Front Secondary	Cylinder Lift Pins	216.0	147.5	154.5	179.0	151.5	162.5
Master to Middle Secondary	Steering and Pivot Pins	80.25	67.5	89.5	57.5	82.5	67.5
Pump to Master	Master Valve	265.0	160.0	127.5	141.5	119.5	115.5

NOTE: The hose lengths provided in the Hose Assembly Tables are for a standard wheel loader. If the equipment has a “high-lift” option, the hose lengths provided for the front secondary valve and feed line from the master to the front secondary valve are incorrect. Measurements should be made at the time of installation.

† Additional hose assembly instructions for this hose are provided in the **Front Secondary: Lower Bucket Pin Anchor to Pin LH and RH** section on page 48.

◆*Cut length depends on fitting location. Always measure for accuracy before cutting.*

NOTE: *Photographs may include optional equipment.*

Hose Assembly Table - Metric Measurements

Group	Lube Point Description	Cut Length - mms					
		WA600	WA500	WA480	WA475	WA470	WA380
Front Secondary	Lift Cylinder Rod End Right Side	660.4	584.2	469.9	558.8	469.9	482.6
Front Secondary	Lift Cylinder Rod End Left Side	660.4	584.2	469.9	558.8	469.9	482.6
Front Secondary	Center Bellcrank bell crank Pin	2210.0	1917.5	1791.0	1320.8	1714.5	1816.5
Front Secondary	Upper Bellcrank bell crank Pin	1880.0	1993.5	2197.0	2362.2	2082.5	1765.5
Front Secondary	Bucket Link Bellcrank Bucket Pin	4369.0	3746.5	3188.0	3606.8	3873.5	3594.5
Front Secondary	Bucket Link Bellcrank bell crank Pin	4470.0	3446.5	3188.0	2768.6	3213.5	2946.5
Front Secondary †	Lower Bucket Pin Anchor to Pin LH	679.4	596.9	596.9	596.9	596.9	596.9
Front Secondary †	Lower Bucket Pin Anchor to Pin RH	679.4	596.9	596.9	596.9	596.9	596.9
Front Secondary◆	Lower Bucket Pin Under Guarding	1619.0	1295.0	1295.0	1295.4	1295.0	1080.0
Front Secondary◆	Lower Bucket Pin Under Guarding	1619.0	1295.0	1295.0	1295.4	1295.0	1080.0
Front Secondary, steel wrap	Lower Bucket Pin Valve to Anchor LH	1549.0	1219.0	1156.0	1054.1	1054.5	1028.5
Front Secondary, steel wrap	Lower Bucket Pin Valve to Anchor RH	1549.0	1219.0	1156.0	1054.1	1054.5	1028.5
Middle Secondary	Lift Arm Hinge Pin LH	2070.0	279.5	1384.0	609.6	774.5	800.1
Middle Secondary	Lift Arm Hinge Pin RH	1632.0	279.5	1384.0	2311.4	3060.5	2171.5
Middle Secondary	Bucket Cylinder Pin	1613.0	279.5	1092.0	1168.4	1371.5	1358.5
Middle Secondary◆	Lift Arm Cylinder Pin LH	1651.0	367.5	177.8	431.8	177.8	177.8
Middle Secondary	Lift Arm Cylinder Pin RH	1651.0	279.5	2756.0	1854.2	2590.5	2882.5
Middle Secondary	Steering Cylinder Pin LH	2083.0	367.5	1143.0	1168.4	1371.5	1358.5
Middle Secondary	Steering Cylinder Pin RH	2070.0	367.5	1194.0	1168.4	1371.5	1358.5
Middle Secondary	Center Support	2095.0	367.5	1206.0	1371.6	1206.5	1358.5
Rear Secondary	Rear Axle Pivot Pin - top	1111.0	177.8	419.1	1981.2	419.1	304.8
Rear Secondary	Rear Axle Pivot Pin - middle	1156.0	177.8	381.0	1981.2	381.0	279.4
Rear Secondary	Rear Axle Pivot Pin - bottom	952.6	177.8	342.9	1981.2	381.0	254.0
Rear Secondary	Steering Cylinder Pin LH	2083.0	495.3.9	1600.0	1574.8	2286.0	1155.5
Rear Secondary	Steering Cylinder Pin RH	2108.0	1892.5	2311.0	2108.2	2591.0	1892.5
Rear Secondary	Center Pivot Pin	3226.0	1460.5	3708.0	2590.8	3797.5	3517.5
Rear Secondary	Center Pivot Pin Upper	4216.0	3086.5	3175.0	3048.0	4432.5	3594.5
Master to Rear Secondary	Steering and Rear Axle	3258.0	2349.0	3746.0	2768.6	3848.5	3035.5
Master to Front Secondary	Cylinder Lift Pins	5486.0	3746.0	3924.0	4546.6	3848.0	4127.5
Master to Middle Secondary	Steering and Pivot Pins	2038.0	1714.0	2273.0	1460.5	2095.0	1714.5
Pump to Master	Master Valve	6731.0	4064.0	3238.0	3594.1	3035.5	2933.5

NOTE: The hose lengths provided in the Hose Assembly Tables are for a standard wheel loader. If the equipment has a “high-lift” option, the hose lengths provided for the front secondary valve and feed line from the master to the front secondary valve are incorrect. Measurements should be made at the time of installation.

† Additional hose assembly instructions for this hose are provided in the **Front Secondary: Lower Bucket Pin Anchor to Pin LH and RH** section on page 48.

◆*Cut length depends on fitting location. Always measure for accuracy before cutting.*

Remote Fill Installation

Remote Fill Parts

Ref*	Part No.	Description	Qty
16	556762	CONNECTOR, #4, JIC, 1/4 PM	1
19	556773	FITTING, swivel, fem, SAE #4, JIC	2
45	557950	BULKHEAD, remote fill	1
46	100840	FITTING, elbow, 1/4 in x 1/4 in.	1
47	557896	STUD, fill, 1/4 inch NPTF (f)	1
48	556408	FITTING, 1/4 x 1/8 inch NPTF Hex	1
49	555749	CONNECTOR, #4, JIC, 1/8 PM	1
50	15K783	FITTING, elbow	1

*See **Parts**, page 75.

Instructions

WA600 Models

1. Use an 11/16 inch drill bit to drill a hole in the bulkhead on the right hand side behind the ladder as shown in FIG. 138.

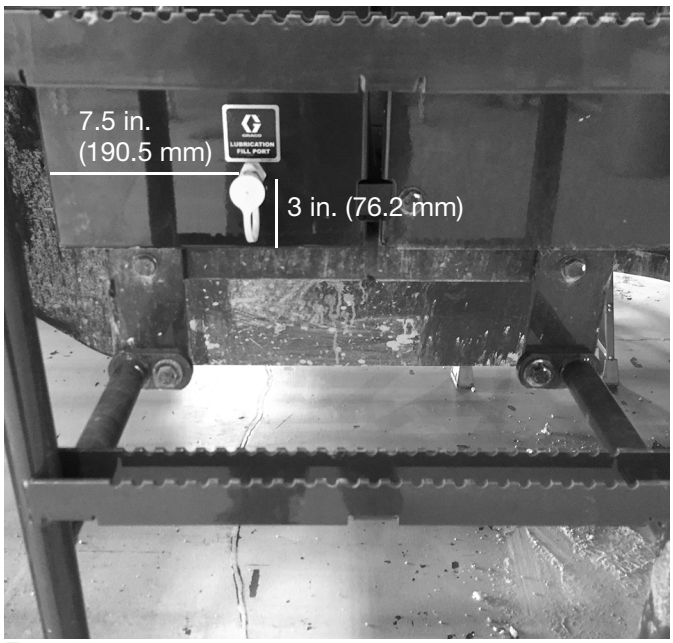


FIG. 138

WA500 Models

1. Use an 11/16 inch drill bit to drill a hole in the accumulator cover (located under the stairs) 6 inches (152.4 mm) from the bulkhead mounting bolt. See FIG. 139.

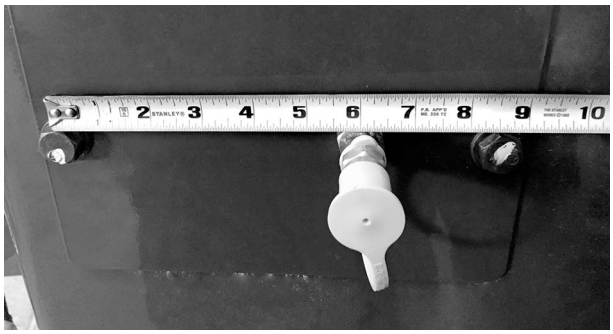
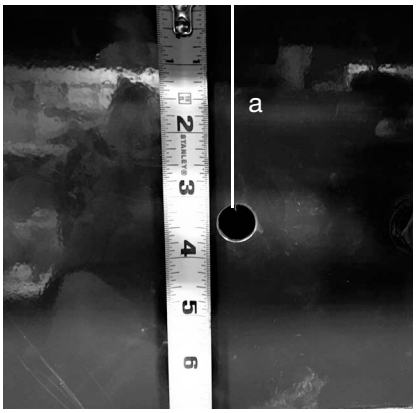


FIG. 139

WA500-8 Models

1. Use an 11/16 inch drill bit to drill a hole in the accumulator cover (located under the stairs) 3.5 inches down (a) and 3 inches from the right hand bolt (b). See FIG. 140.



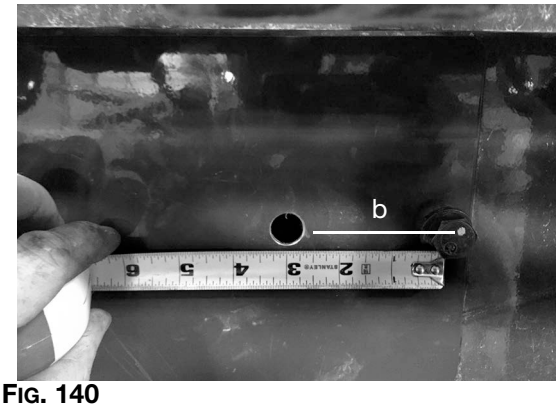


FIG. 140

NOTE: *Photographs may include optional equipment.*

WA475-10 Model

1. Use an 11/16 inch drill bit to drill a hole 2 inches (50.8 mm) from the right and 1.5 inches (38.1 mm) from the top of the cover panel under the left side ladder as shown in FIG. 141.

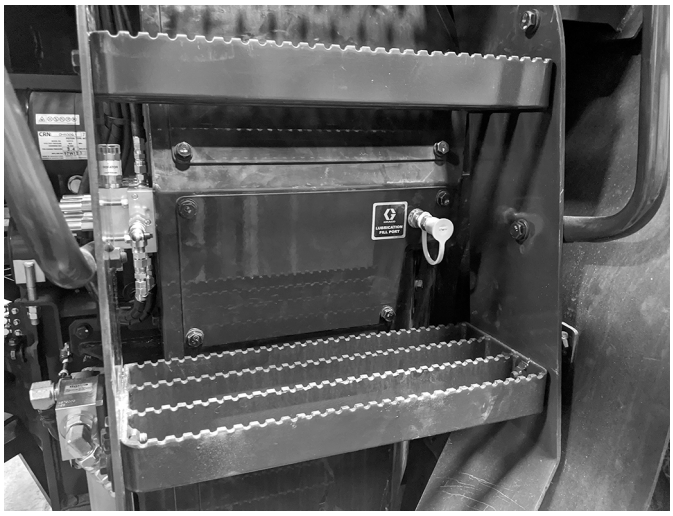


FIG. 141

WA470-7 or WA380-7 Models

1. Place a piece of scrap cardboard or metal inside the coolant box to protect the plastic coolant container from the drill bit.

   Use an 11/16 inch drill bit to drill a hole 2 inches (50.8 mm) from the bottom and 3 inches (76.2 mm) from the right side of the coolant box as shown in FIG. 142.

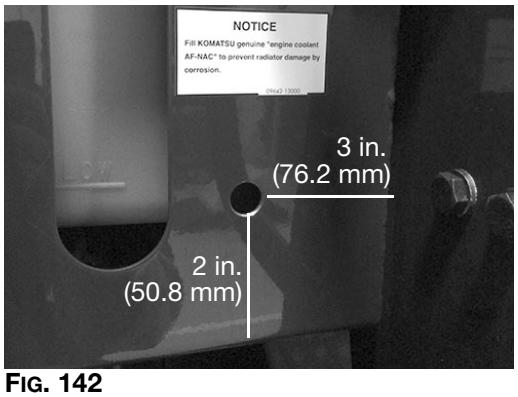


FIG. 142

WA480-8, WA470-8 and 380-8 Models

1. Remove the cover located under the right hand stairwell (FIG. 147-FIG. 146).

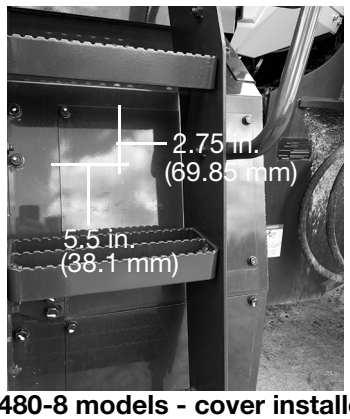


FIG. 143: WA480-8 models - cover installed

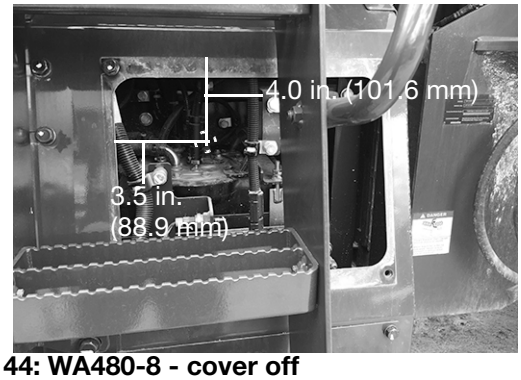


FIG. 144: WA480-8 - cover off

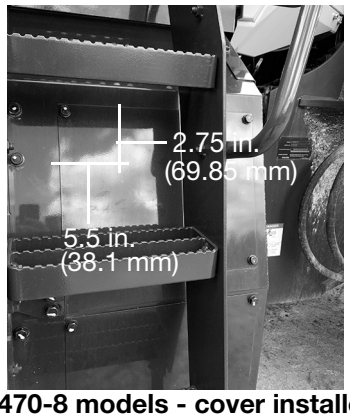


FIG. 145: WA470-8 models - cover installed

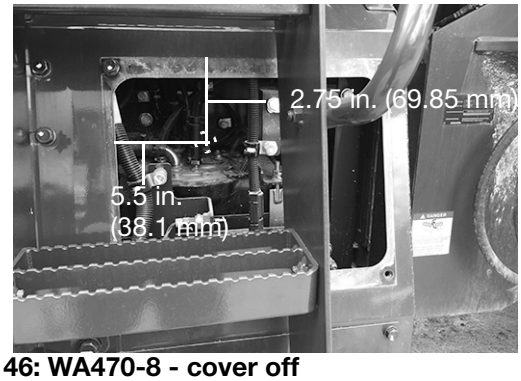


FIG. 146: WA470-8 - cover off

NOTE: *Photographs may include optional equipment.*

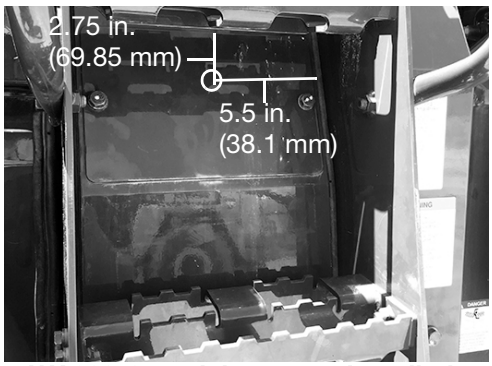


FIG. 147: WA380-8 models - cover installed

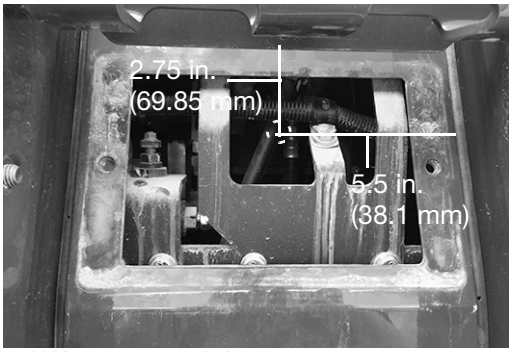


FIG. 148: WA380-8 models - cover off

2. For WA480 models: Mark a hole approximately 3.5" (88.9 mm) from the left hand side of the plate and 4.0" (101.6 mm) down from the top edge (See FIG. 147 and FIG. 148 for WA480 models and

   For WA470 and WA380 models: Mark a hole approximately 5.5" (38.1 mm) from the left hand side of the plate and 2.75" (69.85 mm) down from the top edge (See FIG. 145 and FIG. 146 for WA470 models and FIG. 147 and FIG. 148 for WA380 models).

3. Place a piece of scrap cardboard or metal inside the coolant box to protect the plastic coolant container from the drill bit.

4. Use an 11/16 inch drill bit to drill a hole 2 inches (50.8 mm) from the bottom and 3 inches (76.2 mm) from the right side of the coolant box as shown in FIG. 146.

5. Install swivel (19) to one end of hose that is left over from previous cut lengths.

6. Remove the pump fitting installed in the G3 pump inlet, apply thread sealant to threads of elbow fitting (46) and install elbow fitting in it's place.

7. Apply thread sealant to threads of connector (16) and install connector to elbow (46) installed in G3 pump in Step 6. Tighten securely.

8. Connect swivel (19) to connector (16). Hand tighten; then use a wrench to tighten 1/2 turn more.

For WA500 Models

Follow along a similar path as the previously installed main feed line (see FIG. 149) until it reaches the bulkhead and the hole drilled in Step 1.

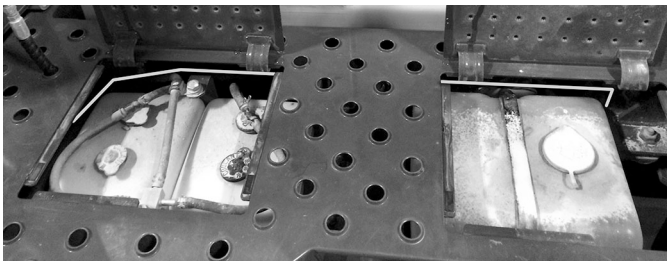


FIG. 149

9. **For WA600 Models see FIG. 150**

FIG. 150

Route the end of the hose through hole in the grated floor near the G-3 pump as shown in FIG. 151.

NOTE: *Photographs may include optional equipment.*

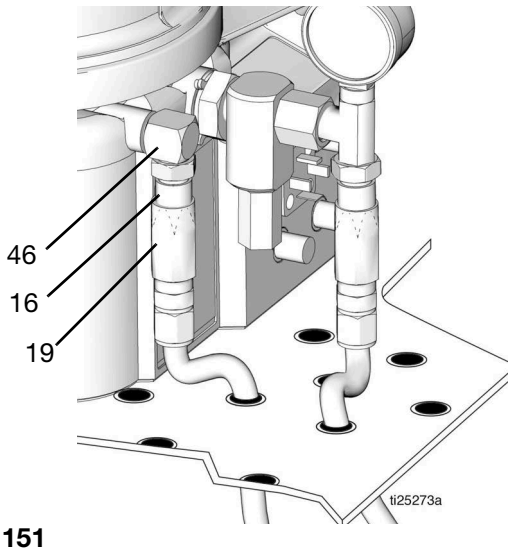


FIG. 151

For WA380 Models: Route the end of the hose along a path between the decking and the cab as shown in FIG. 152 and then under the stair platform to the coolant box.

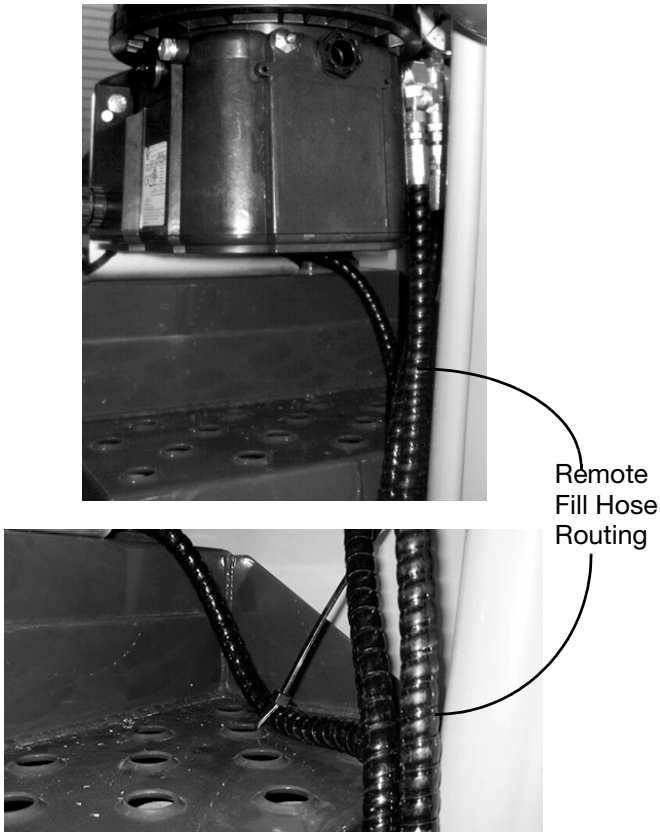


FIG. 152

Open the coolant box cover. Route the hose around the top of the coolant container as shown in FIG. 153 and to the hole previously drilled in Step 4.

FIG. 153

10. Trim the hose to the necessary length.

11. Install the second provided swivel (19) to trimmed end of hose.

12. Apply thread sealant to threads of connector (49). Install bulkhead fitting (45) to the connector (49). Remove mounting nut.

13. Install bulkhead fitting (45) through bulkhead hole drilled in Step 1. Reinstall mounting nut over end of bulkhead fitting to secure bulkhead fitting to loader (FIG. 154).

    NOTE: When installing the bulkhead fitting (45) make sure connector (49) is oriented upward as shown in FIG. 154

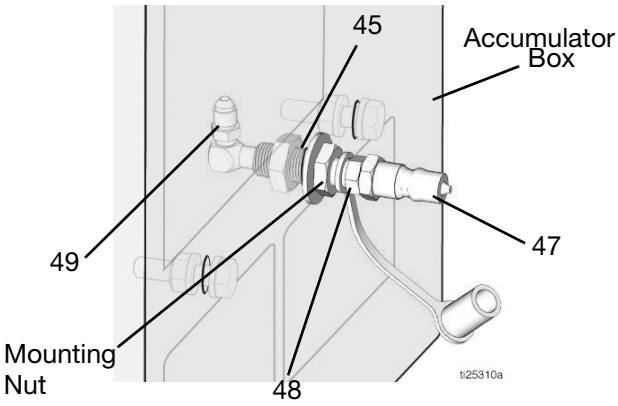


FIG. 154

14. Join connector (49) to swivel (19) (installed in Step 11). Hand tighten; then torque to 10-12 ft. lbs (13.5-16.2 N.m).

15. Apply thread sealant to I.D. threads of bulkhead fitting (45) and to threads of coupler (48). Install coupler to the bulkhead fitting. Tighten securely.

16. Connect fill stud (47) to coupler (48). Tighten securely.

NOTE: *Photographs may include optional equipment.*

Pump to Master Valve

- Connect the main feed line from the pump to the master valve.
- Loosely connect the hose to the pump, route the main feed line hose and connect to the master valve.
- Secure lines using the supplied zip ties.

WA600 Models

FIG. 155

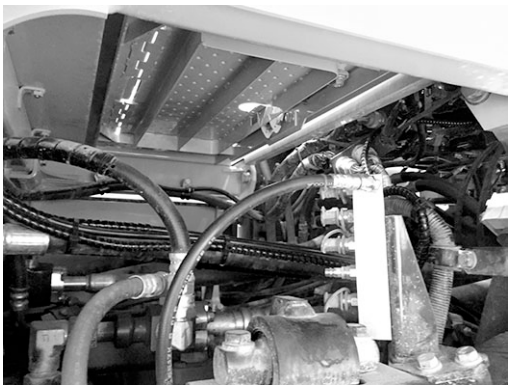


FIG. 156

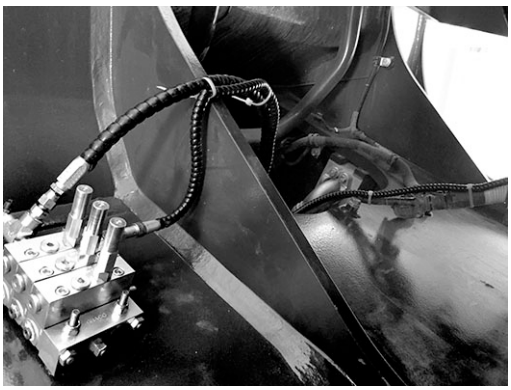


FIG. 157

WA500, WA480, WA475, WA470, WA380 Models

FIG. 158

FIG. 159

NOTE: *Photographs may include optional equipment.*

FIG. 160

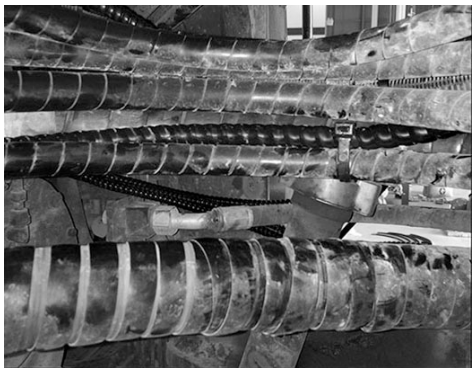


FIG. 161

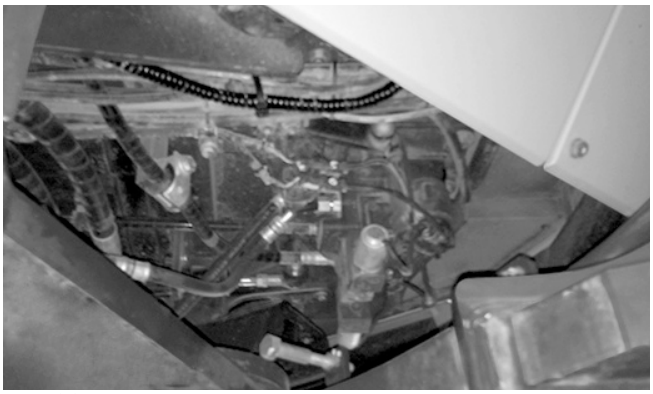


FIG. 162

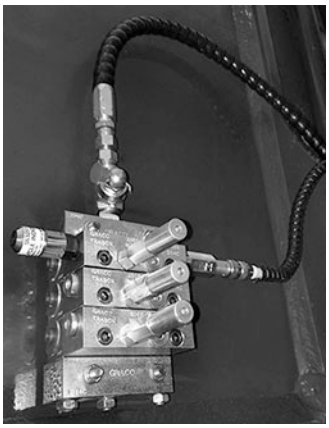


FIG. 163

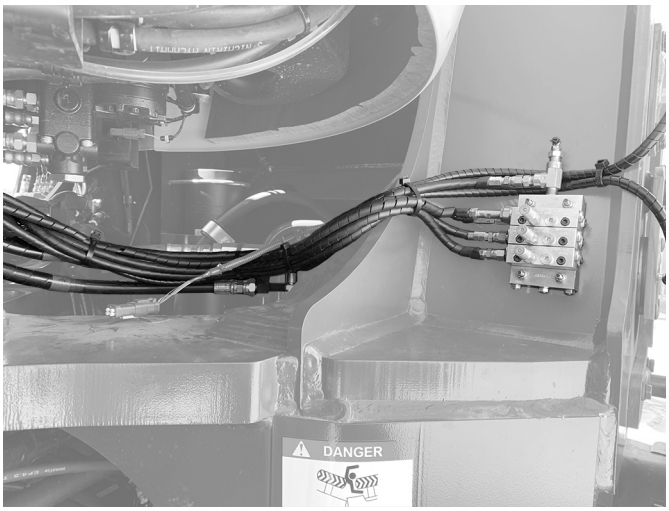


FIG. 164

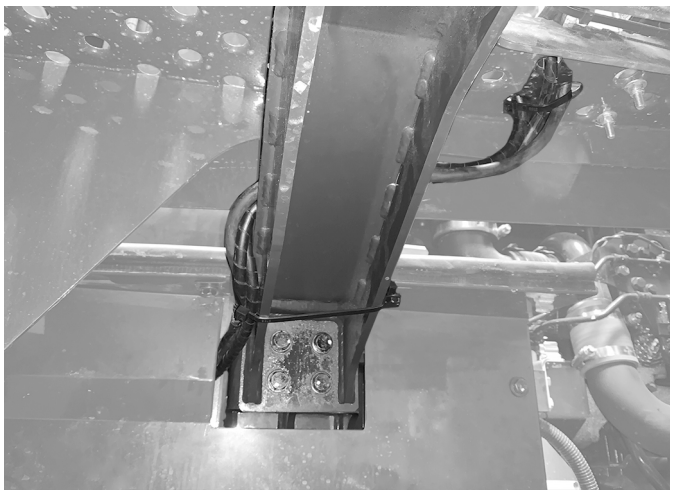


FIG. 165

NOTE: *Photographs may include optional equipment.*

FIG. 166

NOTE: *Photographs may include optional equipment.*

Master Valve to Secondary Valves

NOTE: Unless otherwise noted, images for Master Valve to Secondary Valves are shown installed on a WA500-7. The WA480, WA470, WA475, and WA380 models are very similar in appearance and are not shown.

- Connect the hoses to the master valve and route to secondary valves as shown in FIG. 167 - FIG. 175. Route lines from the master, through the center of the machine to the secondary valves.
- Route the hoses but do not connect to the secondary valves.
- Secure lines using the supplied zip ties.

Valve Label

FIG. 171, FIG. 172	10S	Rear Secondary
FIG. 173, FIG. 174	15S	Middle Secondary
FIG. 175	405	Front Secondary

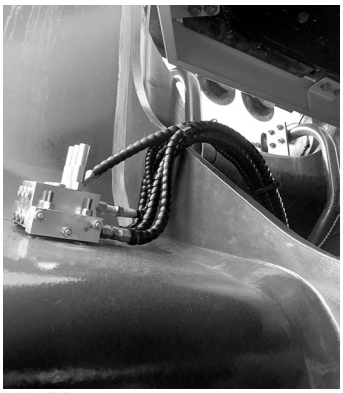


FIG. 167: WA600 Master

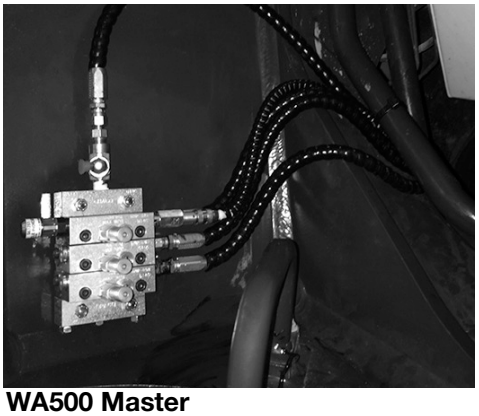


FIG. 168: WA500 Master

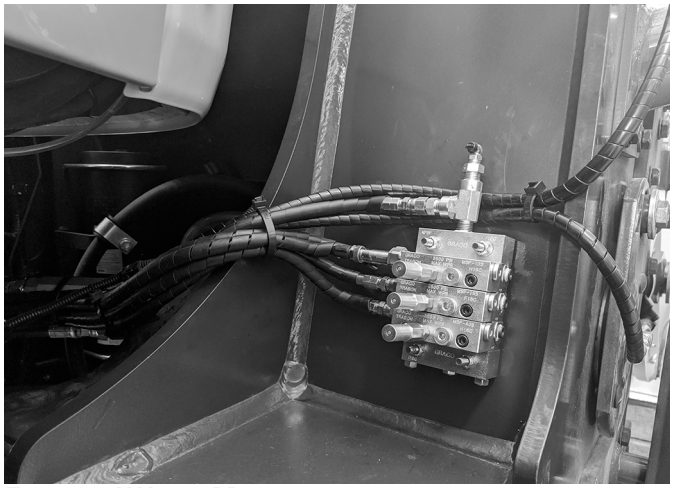


FIG. 169: WA475 Master

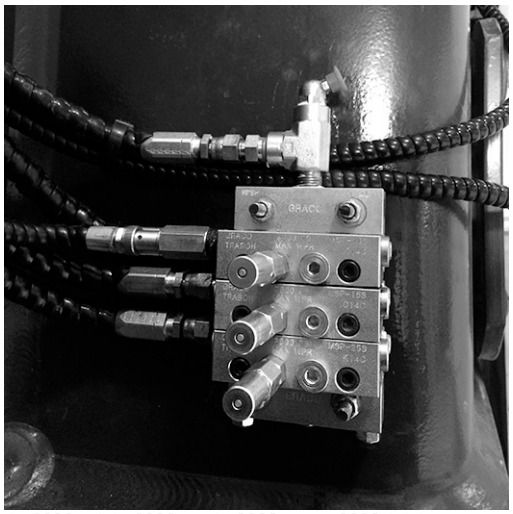


FIG. 170: WA480, WA470, WA475, WA380

FIG. 171: WA600 Rear Secondary

FIG. 172: WA500, WA480, WA470, WA380 Rear Secondary

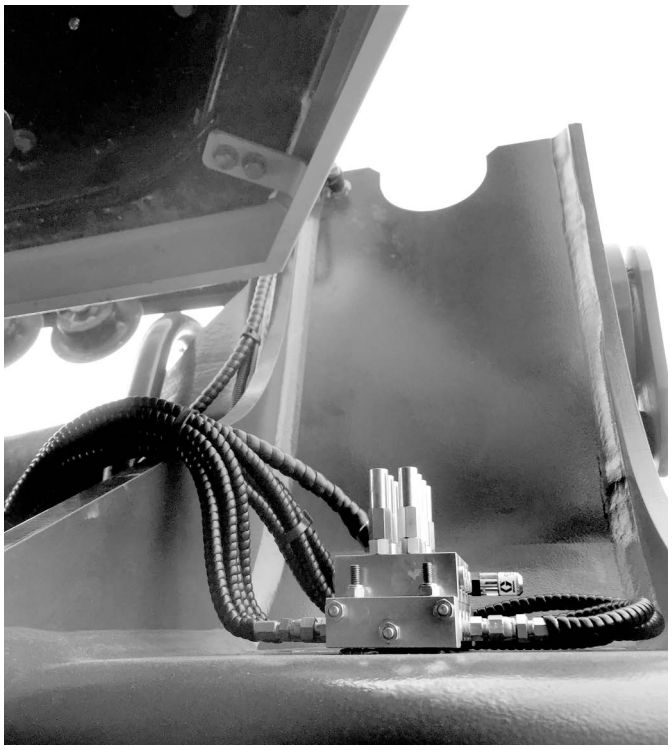


FIG. 173: WA600 Middle Secondary

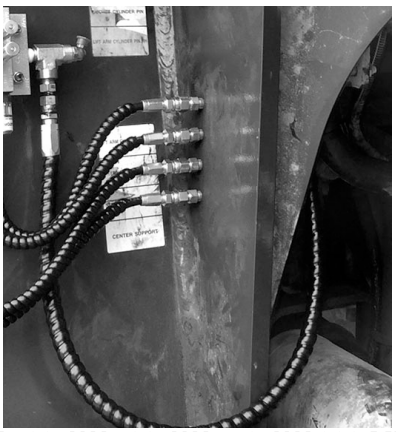


FIG. 174: WA500, WA480, WA470, WA380 Middle Secondary

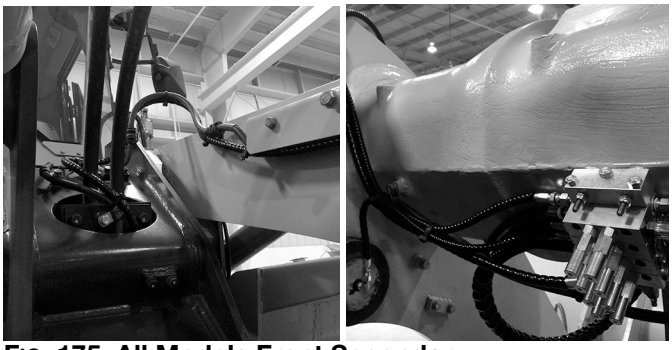


FIG. 175: All Models Front Secondary

NOTE: *Photographs may include optional equipment.*

Front Secondary to Grease Points

Front Secondary (FIG. 176-FIG. 185)

Lift Cylinder	20T	Lift Cylinder
Bell Crank Pin	30T	Bell Crank Pin
Bucket Link Pin	30T	Bucket Link Pin
Bucket Pin	40T	Bucket Pin

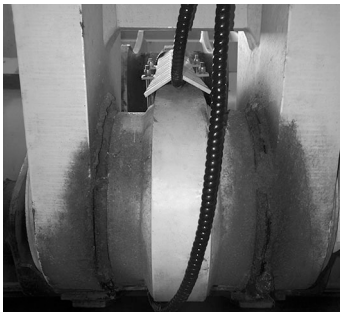


FIG. 176

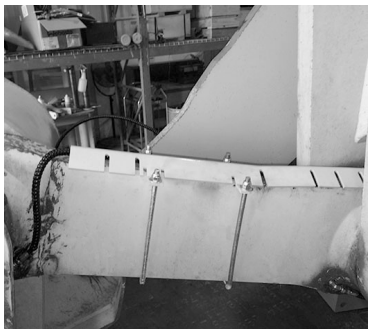


FIG. 177

FIG. 178

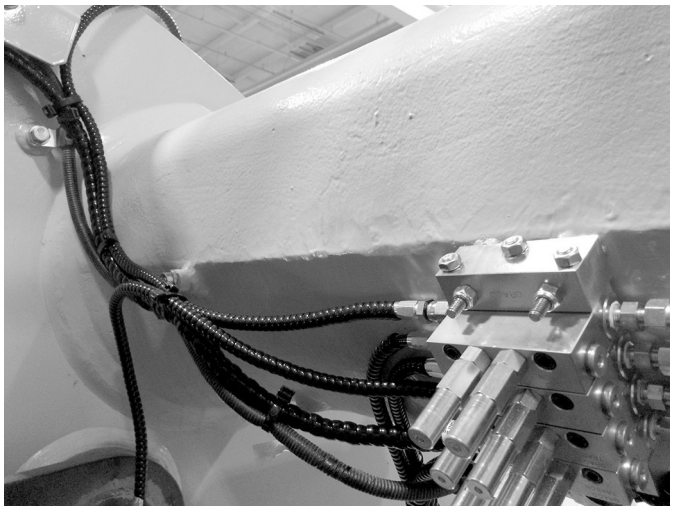


FIG. 179

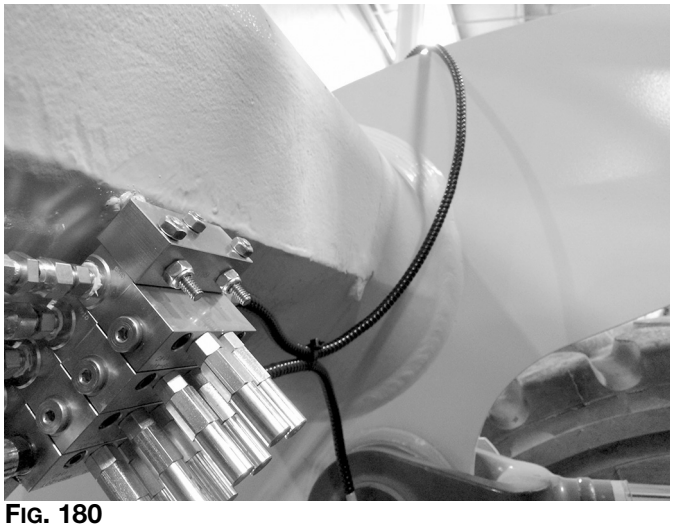


FIG. 180

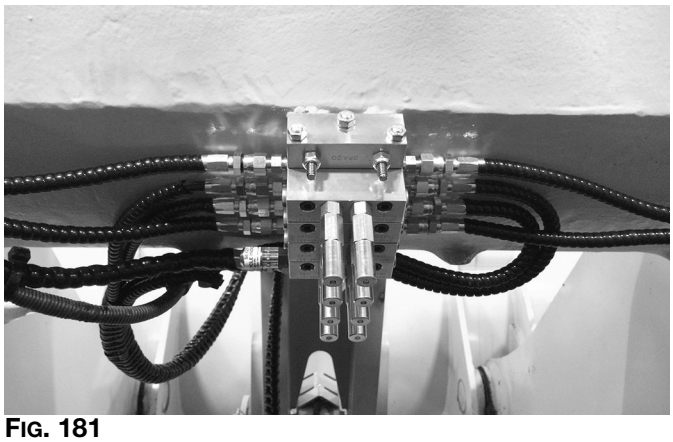


FIG. 181

NOTE: *Photographs may include optional equipment.*

FIG. 182

FIG. 184

FIG. 183

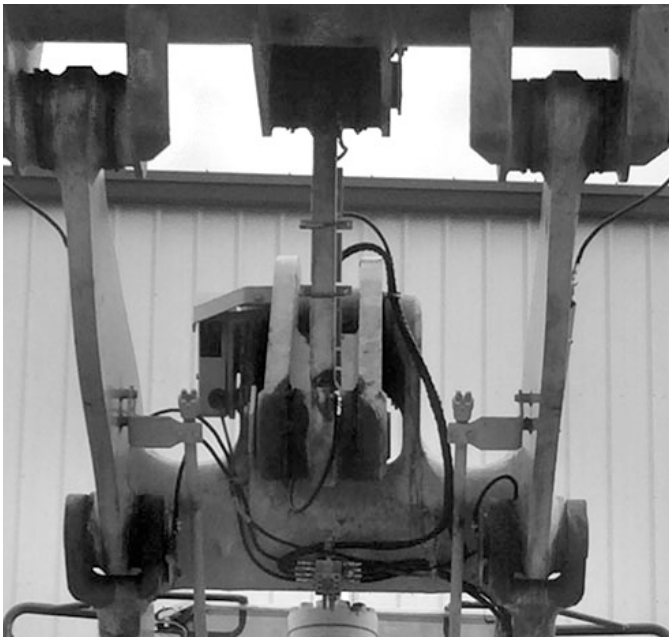


FIG. 185

NOTE: *Photographs may include optional equipment.*

Middle Secondary and Rear Secondary to Grease Points

Middle Secondary: WA600 Models

Lift Arm Cylinder (L)	40T	Lift Arm Hinge Pin (L)
Lift Arm Cylinder (R)	40T	Steering Cylinder (L)
Lift Arm Hinge Pin (R)	40T	Steering Cylinder (R)
Bucket Cylinder Pin	40T	Center Drive Shaft Support

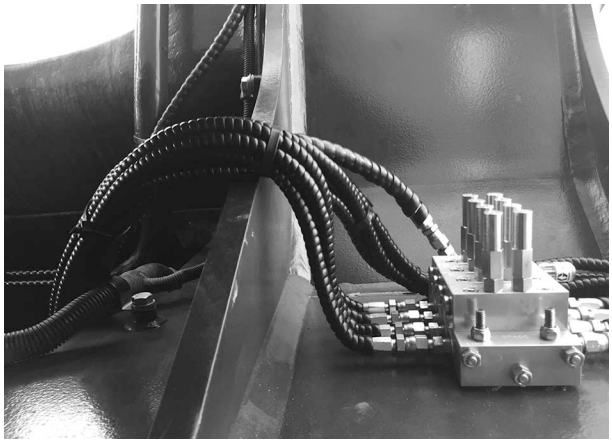


FIG. 186

FIG. 187

Middle Secondary: WA500 Models

Lift Arm Hinge Pin	40T	Lift Arm Cylinder
Lift Arm Hinge Pin	40T	Steering Cylinder
Bucket Cylinder	40T	Steering Cylinder
Lift Arm Cylinder	40T	Center Drive Shaft Support

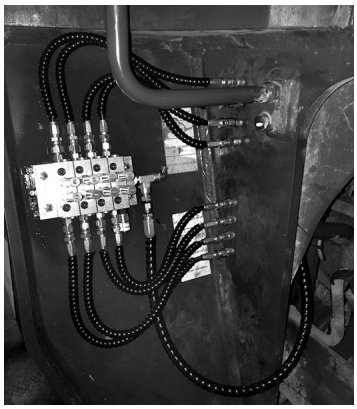


FIG. 188

Middle Secondary: WA480, WA475, WA470 and WA380 Models

Lift Arm Hinge Pin	40T	Bucket Cylinder
Lift Arm Cylinder	40T	Steering Cylinder
Lift Arm Hinge Pin	40T	Steering Cylinder
Lift Arm Cylinder	40T	Center Drive Shaft Support

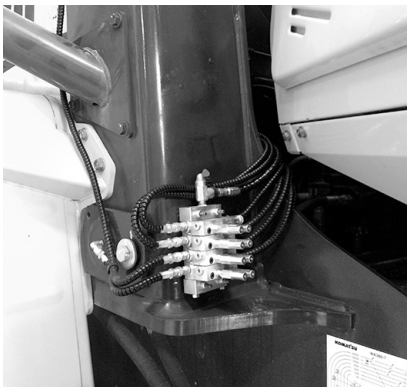


FIG. 189

NOTE: *Photographs may include optional equipment.*

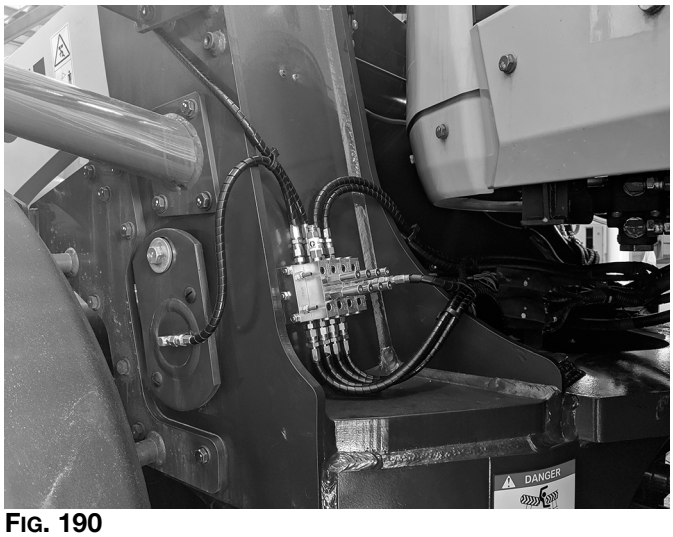


FIG. 190

FIG. 191

Rear Secondary: WA600 Models

Rear Axel Pivot Top	10S	X
Rear Axel Pivot Mid	20T	Rear Axel Pivot Bottom
Steering L	20T	Steering R
Pilot Bearing Bottom	40T	Pivot Bearing Top

FIG. 192

Rear Secondary: WA500 Models

X	10S	Rear Axle
Steering Cylinder	20T	Rear Axle
Steering Cylinder	20T	Rear Axle
Pivot Bearing	40T	Pivot Bearing

NOTE: *Photographs may include optional equipment.*

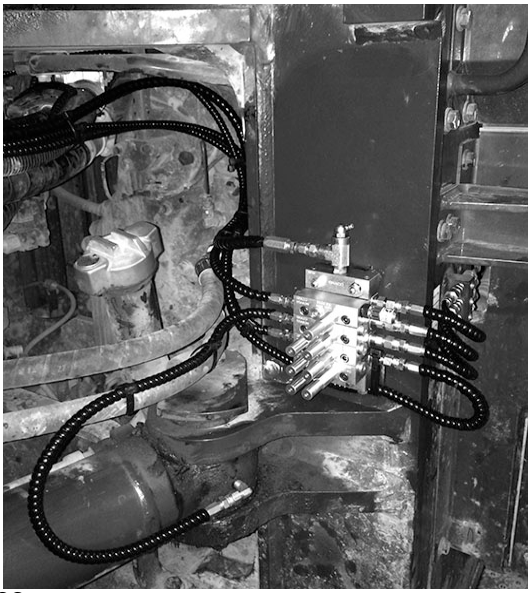


FIG. 193

FIG. 194

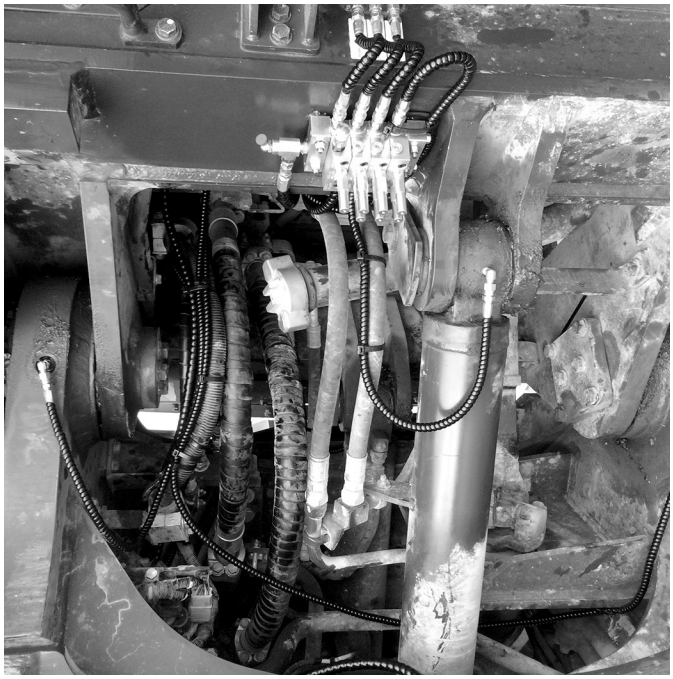


FIG. 195

FIG. 196

NOTE: *Photographs may include optional equipment.*

Rear Secondary: WA480, WA475, WA470 and WA380 Models

X	10S	Rear Axle
Steering Cylinder	20T	Rear Axle
Steering Cylinder	20T	Rear Axle
Lower Pivot Bearing	40T	Upper Pivot Bearing

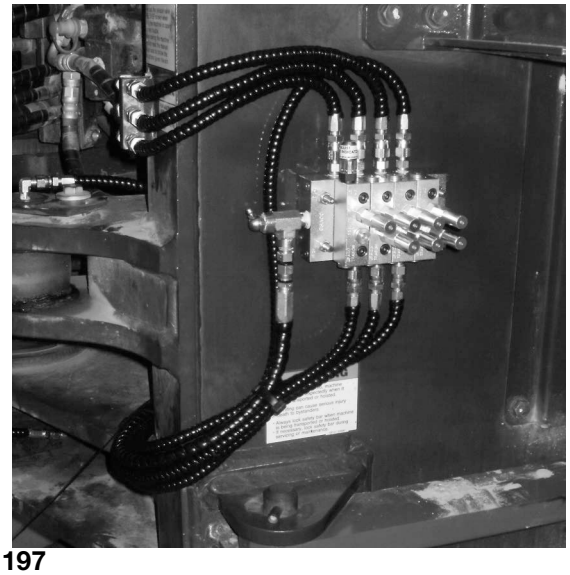


FIG. 197

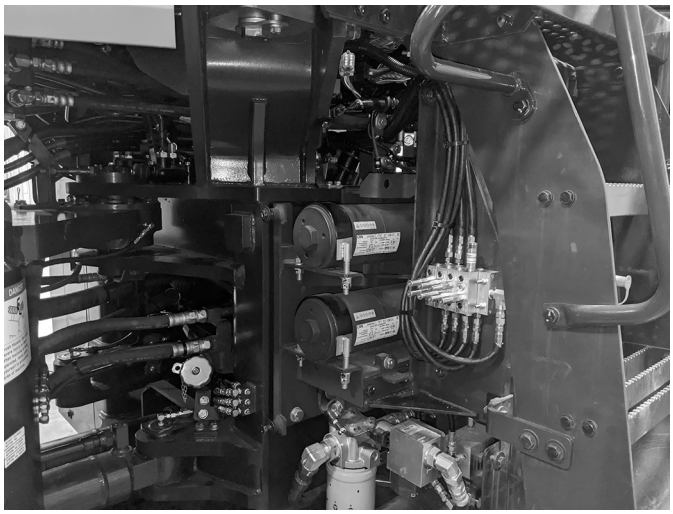


FIG. 198

FIG. 199

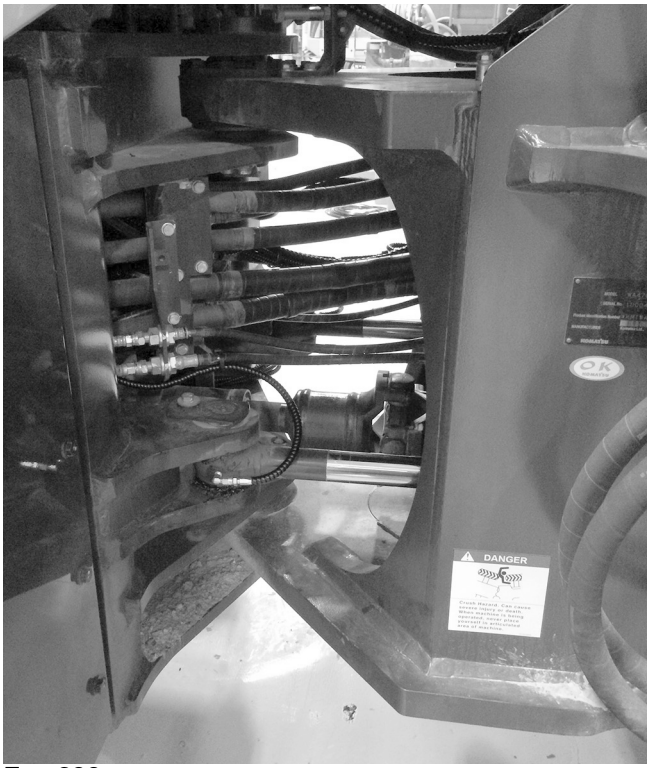


FIG. 200

NOTE: *Photographs may include optional equipment.*

FIG. 201

Loader Arm Guarding and Bell Crank P-Clamp

1. Attach the Bucket Link hose guard using the supplied U-bolts and 3/8-16 nylon lock nuts and washers. Trim excess from U-bolts as needed. (FIG. 202).

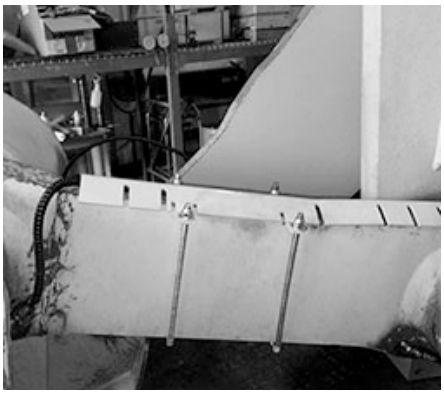


FIG. 202

2. Attach the loader arm guarding to the previously installed weld studs (page 9) using the supplied 3/8-16 nylon lock nuts and washers (FIG. 203).

FIG. 203

3. Gather the four hoses running through the Bell Crank including the Bucket Link hoses. Cut a large section of 1/4 in. wire loom and wrap the hoses together (FIG. 204).

   When nearing a lube point, remove the respective hose from the wire loom. Continue to wrap the other hoses until nearing the Bucket Link points.

FIG. 204

4. Attach the supplied P-clamp to the weld stud on the Bell Crank. Route the banded hoses through the P-clamp. Secure with the supplied 1/4-20 nylon lock nut (FIG. 205).

FIG. 205

NOTE: *Photographs may include optional equipment.*

Filling and Purging

- An automatic lubrication system must be free of air in order to generate enough pressure to cycle grease through the valves.

- Take care to ensure dirt and/or debris do not get on the grease fitting or introduced into the system.

1. Connect a pneumatically powered grease gun to the grease zerk (a) on the G3 pump. Fill the G3 pump reservoir with grease to the “MAX” line mark (b) on the front of the reservoir (FIG. 206).

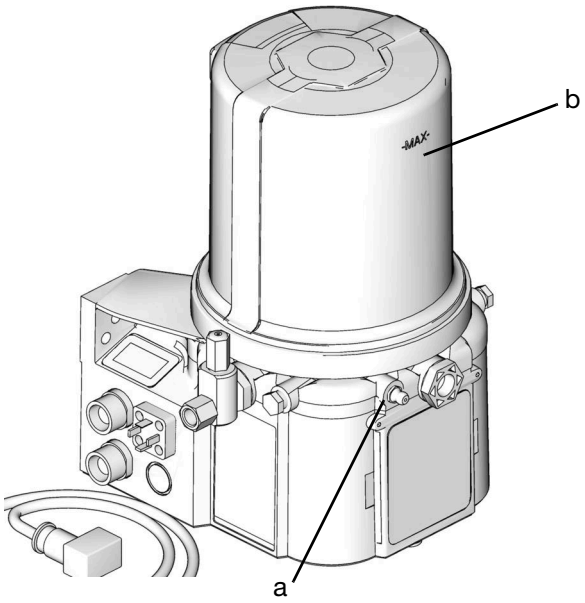


FIG. 206

2. Connect a pneumatically powered grease gun to the grease zerk (c) on the master valve to the pump (FIG. 207). Have a colleague stand next to the pump to identify when the main feed line from the pump is full and the air is purged from the line. Wrench tighten the fitting on the G3 pump, securely.

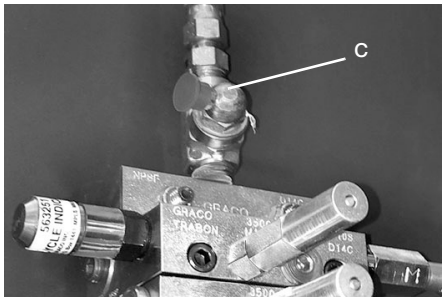


FIG. 207

3. Continue to fill the master valve and the grease lines to the secondary valves. Have a colleague identify when the lines are filled and air is purged from the lines. Wrench tighten the inlet hose fittings on the secondary valves, securely.

   NOTE: Use a waste container to capture excess grease from the feed lines.

4. Connect a pneumatically powered grease gun to the grease zerk (d) on the secondary valve to fill the secondary valves and their grease lines (FIG. 208). Have a colleague stand next to the grease lines from the secondary valves to the grease points to identify when the lines are filled and air is purged from the lines. Wrench tighten the secondary lines to the grease points, securely.

   NOTE: Use a waste container to capture excess grease from the secondary lines.

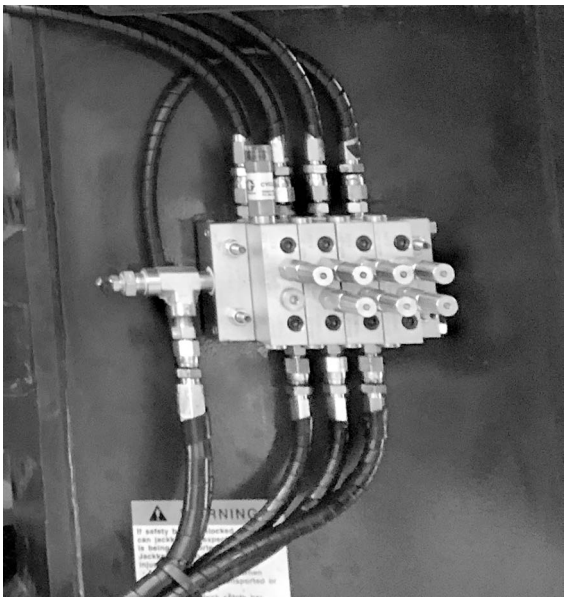


FIG. 208

NOTE: *Photographs may include optional equipment.*

Testing

Before testing the system:

- be sure the G3 pump reservoir is filled,
- all supply lines are connected securely,
- verify all grease point fittings and hose connections are tight,
- valves and grease lines are filled with grease and purged of air.

1. Turn on the battery disconnect to the machine (FIG. 209) and key on power in the cab to the “Acc” position.

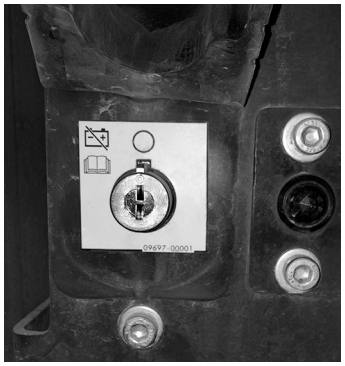


FIG. 209

2. Verify the GLC X Controller has power.

3. Press the Manual Run button on the GLC X Controller to run the lube system through several lube events.

4. While the pump is running, walk around the machine and inspect all pump, valve hose fittings and grease point connections to verify there are no leaks in the system.

WARNING

SKIN INJECTION HAZARD

High-pressure fluid from dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate surgical treatment.

- Do not put your hand over the fluid outlet.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** included in the pump instruction manual, when you stop dispensing and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses and couplings daily. Replace worn or damaged parts immediately.

5. If any of the fittings or connections are leaking, tighten fittings and/or make adjustments as needed.

6. Put the machine into service and manually run the lubrication system.

   - Articulate all working sections of the machine to ensure there is sufficient hose length supplied to all lubrication points.

   - Inspect all pump, valve hose fittings and grease point connections to verify there are no leaks, the hoses are secure and that all points are receiving grease.

7. If any of the fittings or connections are leaking, tighten fittings and/or make adjustments as needed.

NOTE: *Photographs may include optional equipment.*

Routine Service and Equipment Maintenance

Every time you complete the vehicle inspection checklist, walk around the machine to inspect all pump, valve hose fittings and grease point connections to verify there are no leaks in the system. This will ensure any damage to hoses or fittings is identified and repaired properly.

Troubleshooting

NOTE: If the problem is not attributed to the Graco Lubrication System, consult the Komatsu Operations and Maintenance manual or your Komatsu dealer.

Problem	Cause	Solution
GLC X Controller does not turn on	No power to the machine	Check that the battery disconnect is ON and the keyed power is in the “Acc” position.
	GLC X Controller not wired correctly	Check to ensure the controller has been wired correctly by reviewing the GLC X Wiring Table on page 37.
GLC X Controller is in alarm mode; will not operate correctly	Fault is not cleared on controller	For 3 seconds, hold down the fault clear button (located on the left side of the controller). Controller fault should clear and begin OFF TIME countdown. See GLC X Controller instruction manual.
GLC X Controller goes into fault mode and displays ER:LL	G3 pump reservoir is empty	Refill G3 pump reservoir. After filling, press and hold the fault clear button on the GLC X controller for 3 seconds. See GLC X Controller instruction manual.
Audible alarm is sounding during machine operation	Machine requires service	To silence the alarm, press the fault clear button on the GLC X Controller for one second. Release button. The alarm will silence, but the system will remain in alarm mode until the machine is serviced.

NOTE: *Photographs may include optional equipment.*

Problem	Cause	Solution
GLC X Controller is in fault mode and displays ER:Cy	The lubrication system failed to complete a lube event in the allowed 10 minute run time.	Verify the GLC X Controller is programmed to the machine requirements, see page 45. In colder temperatures, it may be necessary to exceed 10 minutes of run time to complete the lube cycle. Adjust to 15 minutes.
		If the first solution does not correct the problem, run a manual cycle and check the pump relief valve for discharged grease. The gauge should display 3000 psi (20.68 MPa, 206.8 bar) when the relief valve discharges. If grease has discharged from the relief valve, a bearing may have stopped taking grease, a grease line may be compromised, or the MSP valve may be clogged.
	MSP master valve reset indicator pin is protruding. Hose is damaged	Inspect MSP master valve to find reset indicator with a protruding pin. Follow the corresponding hose to the secondary valve. Replace hose.
	MSP master valve reset indicator pin is protruding. Valve is not accepting grease and blocked.	If the hose is not compromised, inspect the corresponding secondary valve for a pin protruding from the secondary valve. Use a grease gun to verify the valve is accepting grease. If the valve is blocked, replace valve. Repeat as needed for all MSP valves.
MSP Valves fail to accept grease	MSP valve not torqued to required specification or overtightened	Check MSP valve torque. Tighten if not torqued to required specification. If overtightened, adjust valve assembly and retest.

Problem	Cause	Solution
Bearings not receiving enough grease	GLC X Controller INTERVAL TIME set too long.	Reset the GLC X Controller INTERVAL TIME to a shorter amount of time. This will engage a lube event more frequently and increase the amount of grease the bearings receive in a day. Alternative settings: 45 minutes = 30% increase 40 minutes = 50% increase 30 minutes = 100% increase See **Interval Time** in Setup, starting on page 46.
GLC X will not allow programmed time	Hours, minutes or seconds field not set correctly on GLC X Controller	Verify you are programming the hours, minutes, and seconds fields correctly. Refer to Programming the GLC X Controller instructions, page 45 or refer the GLC X Controller instruction manual.
G3 Pump does not build or hold pressure	Broken hose	The kit comes with extra hoses and fittings. If a replacement hose is needed, use these extra parts to make a replacement or contact your local Graco distributor to order a replacement part.

NOTE: *Photographs may include optional equipment.*

Parts

Part	Description
96G198	PUMP G3 8L
26A814	CONTROL, GLC X
26A882	HARNESS, GLC X, kit
125910	BRACKET, pump windmill
563161	VALVE, relief 3000 assy
571058	KIT, accessory output adapter
24G485	PLATE, base 3 section MSP (f) NPS
24G486	PLATE, base,4 section MSP (f) NPS
562712	VALVE, assy MSP 10S
562713	VALVE, assy MSP 15S
562718	VALVE, assy MSP 405
562723	VALVE, assy MSP 20T
562725	VALVE, assy MSP 30T
562727	VALVE, assy MSP 40T
557349	PLUG, dryseal 1/8 (f) NPT
556762	CONNECTOR, #4 JIC 1/4 PM
555749	CONNECTOR, #4 JIC 1/8 PM
556763	FITTING, #4 JIC 1/8 PM
128581	KIT, accessory guard 80 ft
17S553	hose, 8.6 mm X 50M
123147	GUARD, hose 9 mm ID, 10M
25M604	HARNESS, M12, W/ LED, 5M
17L983	KIT, accessory prox sensor
563251	INDICATOR, cycle assy soft seal
563257	INDICATOR, reset assy 2000 psi (13.79 MPa, 137.9 bar)

Part	Description
563255	INDICATOR, reset assy 1000 psi (6.89 MPa, 68.95 bar)
556402	FITTING, 1/4 x 1/8 NPTF hex
556429	FITTING, zerk 1/8 NPTF
17K485	CAP, dust
556420	FITTING, tee stl 1/4 (m) NPT
102814	GAUGE, 3000 psi (20.68 MPa, 206.8 bar) 1.4 NPT b/m dry
556407	FITTING, tee stl 1/4 (m) NPT
557950	BULKHEAD, remote fill
557896	STUD, fill 1/4 in. NPTF (f)
556408	FITTING, 1/4 x 1/8 in. NPTF hex
15K783	FITTING, elbow
17G422	ADAPTER, 1/8 (m) BSPT x 1/8 (f) NPT
17K061	FITTING, elbow, street 1/8 NPT BSPT
17K062	FITTING, adapter lg 1/8 NPT BSPT
17Y690	FITTING, -4JIC, to 8.6 mm hose
557875	CAP, dust, 3/4, black
560540	COUPLING, anchor str 1/8
17K063	TIE, cable, 14.75 in. x .31 in., qty 100
128806	LABEL, lubrication fill port
26A889	KIT, connector DT 12 pin female
17D688	HOLDER, fuse
557264	FUSE, 5 Amp
17G007	KIT, GLC X mounting
100840	FITTING, elbow

California Proposition 65

CALIFORNIA RESIDENTS

⚠ **WARNING:** Cancer and reproductive harm – www.P65warnings.ca.gov.

NOTE: *Photographs may include optional equipment.*

Graco Information

For additional information about these Graco products; including Warnings, Troubleshooting, and Technical Data refer to the Graco instruction manuals included with the equipment or visit the Graco website at www.graco.com to download the latest versions of Graco instruction manuals.

NOTE: *Photographs may include optional equipment.*