

YANMAR

INSTALLATION INSTRUCTIONS

Third Function Valve Kit TVK-YL610P for YL610 on YT347/359

Introduction

This document outlines the assembly and installation procedures for the Third Function Valve Kit for YL610. It is designed for use by authorized YANMAR personnel only. All non-authorized personnel should seek the assistance from an authorized YANMAR service technician to perform the procedures as outlined in this document.

Table of Contents

1. General Precautions.....	2
2. Kit Contents.....	3
3. Installation Instructions.....	5
3.1 Remove the Loader.....	5
3.2 Assembling the Front Couplers.....	6
3.3 Installing the Hydraulic Tubes.....	6
3.4 Installing the Third Function Valve and Hoses.....	8
3.5 Installing the Regen Lock Unit.....	12
3.6 Installing the Wire Harness.....	13
4. Operator Manual.....	18

1. General Precautions



WARNING

- **All work must be performed on a solid, dry, stable and level surface.**
- **Always use Personnel Protective Equipment (PPE) when servicing, testing, performing repairs or installations to YANMAR equipment.**
- **Never use flammable fluids to clean parts. Use only approved non flammable cleaning solvents.**
- **Always follow the procedures as outlined in this document. Deviation or skipping a procedure may result in sudden failure to the component or equipment.**
- **Always support the equipment using the proper jack stands rated for the weight of the machine. Never support equipment with a hydraulic jack.**
- **When working on the machine, always set the parking brake and chock the wheels.**
- **Always keep your work area clean and free from spills or trip hazards.**
- **When making electrical repairs or installing an electrical component always disconnect the battery first.**
- **Make sure that there is no stored energy in a pressurized system before performing service, repairs, installations or troubleshooting.**

- 1.1 The Third Function Valve Kit TVK-YL610P is designed for use on the YL610 YANMAR loader only. Any unauthorized use, modification or changes to this kit may result in equipment damage, component failure or possible injury. Only approved YANMAR accessories for this Third Function Valve Kit shall be used. Any other attachments not approved by YANMAR could cause injury or damage to the Third Function Valve Kit or tractor.
- 1.2 This Third Function Valve Kit may be impaired by structural damage, sudden impact, excessive heat or alteration. Never heat, weld or drill the Third Function Valve Kit. Applying heat, welding or drilling on the Third Function Valve Kit will reduce the support capacity of the material resulting in unexpected component failure. If any of these conditions occur, this structure must be replaced.

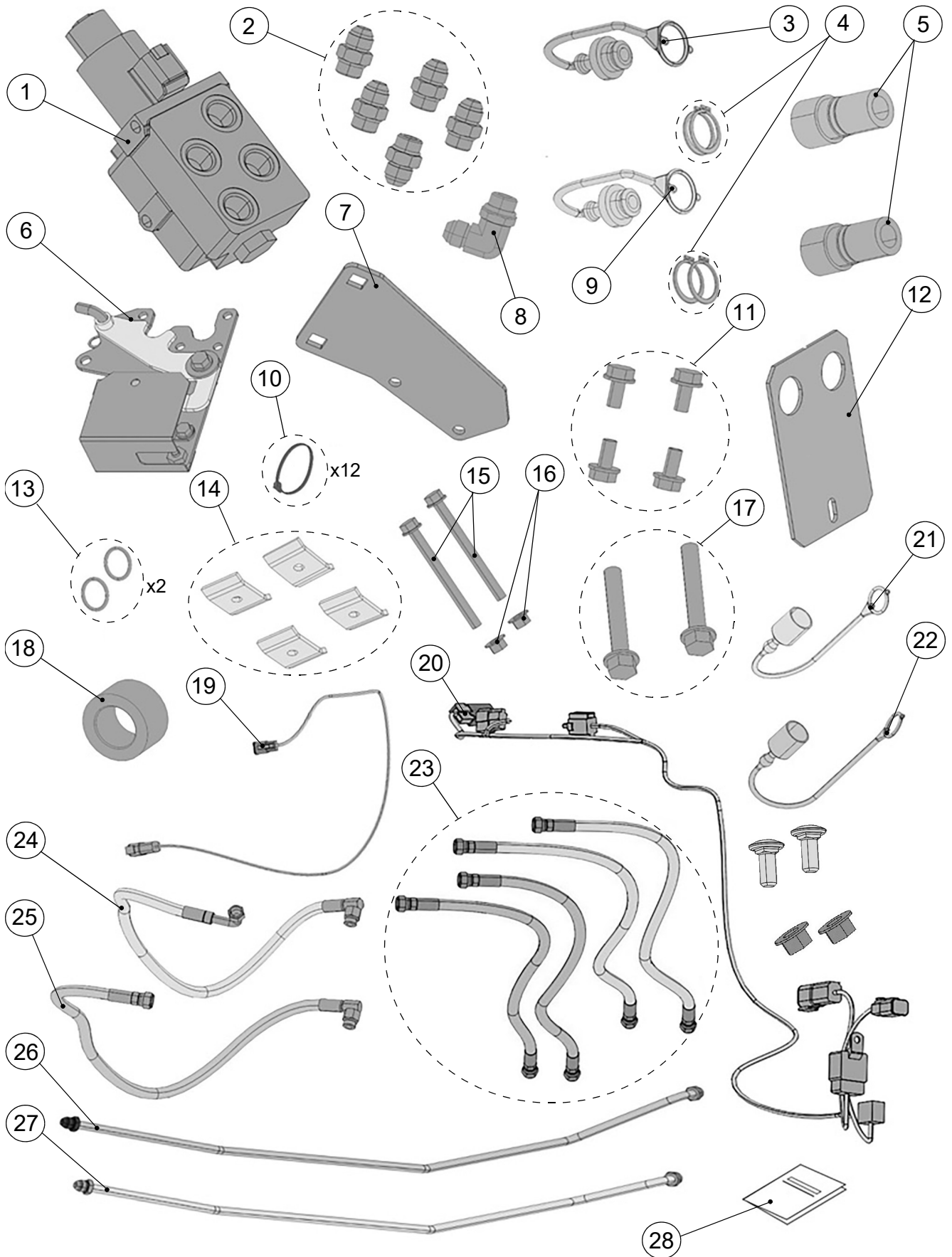
2. Kit Contents

Your Third Function Valve Kit TVK-YL610P comes complete with all the parts needed. Before assembling and installing the Third Function Valve Kit, take inventory and check to be sure all the parts listed in the parts list and shown in the illustrations below are in the kit.

If you should find any parts missing, contact your YANMAR dealer to obtain the missing parts. Do not install the Third Function Valve Kit to the loader or tractor with after market parts, incorrect parts or missing parts. Possible injury or damage to the machine may result.

Item No.	Part Number	Part Description	Qty.
1	1TN323-43110	VALVE ASSEMBLY	1
2	1A8160-46960	CONNECTOR	5
3	1A8160-46310	PLUG, DUST GREEN	1
4	198240-46260	RING, SNAP	4
5	1A8160-46250	COUPLER, QUICK 3/8F	2
6	1TN323-43701	REGEN LOCK UNIT	1
7	1TN340-43050	PLATE, VALVE	1
8	1A8160-46910	ELBOW, 8-8	1
9	1A8160-46300	PLUG, DUST YELLOW	1
10	1A8300-51210	BAND, REPEAT	12
11	26106-060122	BOLT, 6 x 12	4
12	1TN340-43350	STAY, COUPLER	1
13	194464-45930	O-RING, 8-1 (Use if original o-ring is missing or damaged)	4
14	1TN322-41550	COVER, CLAMP	4
15	26106-080902	BOLT, 8 x 90	2
16	26366-080002	NUT 8	2
17	26106-080502	BOLT, 8x50	2
18	1TN323-43550	STOPPER, REGEN	1
19	1TN340-43620	HARNESS ASSEMBLY, 3RDV	1
20	1TN340-43610	HARNESS ASSEMBLY, LOADER	1
21	1TN322-41770	DUST PLUG YELLOW M	1
22	1TN322-41780	DUST PLUG GREEN M	1
23	1TN340-43230	HOSE, VALVE	4
24	1TN340-43060	HOSE 3RD A (YELLOW)	1
25	1TN340-43070	HOSE 3RD B (GREEN)	1
26	1TN340-43030	PIPE ASSEMBLY, 3RD B (Green Line)	1
27	1TN340-43020	PIPE ASSEMBLY, 3RD A (Yellow Line)	1
28	0F052-EN0010	ASSEMBLY BRIEF	1

Third Function Valve Kit TVK-YL610P for YL610 on YT347/359

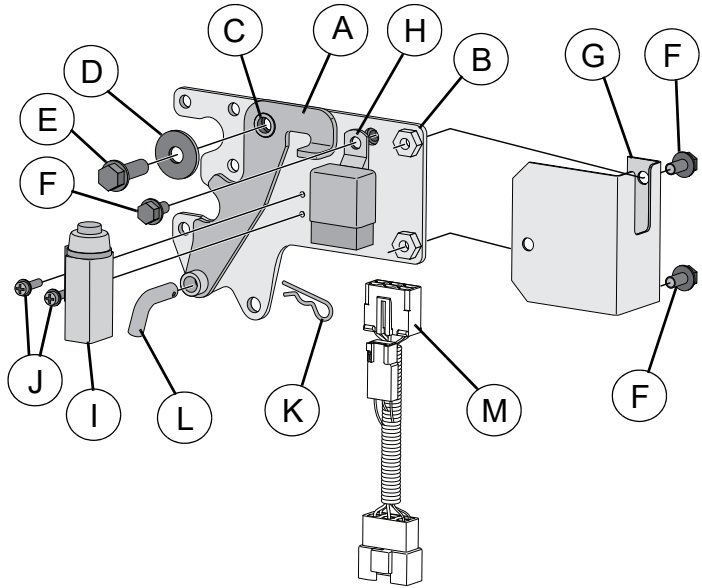


YM730

Regen Lock Unit 1TN323-43701

Sub-parts listing.

No.	Part No.	Part Description	Qty.
A	1TN323-43810	LEVER ASSY. REGEN	1
B	1TN323-43710	PLATE ASSY. REGEN	1
C	1TN323-43760	COLLAR, LEVER	1
D	22157-080000	WASHER, 8	1
E	26106-080252	BOLT, 8 X 25	1
F	26106-060122	BOLT, 6 X 12	3
G	1TN323-43751	COVER, RELAY	1
H	119247-77100	RELAY, CA C-TYPE	1
I	1A7550-08300	PUSH SWITCH </td <td>1</td>	1
J	26023-040162	SCREW, 4 X1 6	2
K	1TN323-43890	COTTER PIN 3/8	1
L	1TN323-43870	PIN, REGEN	1
M	129927-91151	HARNES, DIODE	1

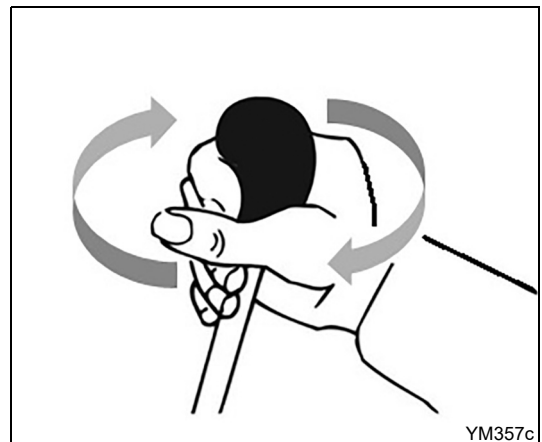


3. Installation Instructions

- Always keep in mind when installing parts or components to the tractor, the reference points may be stated according to the operators seated position on the tractor facing forward.
- Be sure you have enough room around you and the tractor to perform the procedures as outlined in this document.
- It is advised to lay the parts out in an orderly fashion for each step listed in this document so confusion during the installation process can be avoided.
- Be aware of the tools you are using, always use the proper tool for the task you are performing. Failure to do so may result in damage to the component or possible injury.
- Whenever a specific torque value is listed in this document, always torque the fastener to the value as listed. Failure to do so may result in equipment or component failure.
- If you should need assistance during your installation process, contact your YANMAR distributor.

3.1 Removing the Loader

- 3.1.1 Park the tractor and loader in a level stable and well illuminated area.
- 3.1.2 Remove the front loader from the tractor. Refer to (YL610 Operators Manual) for details.
- 3.1.3 With the loader off the tractor and the engine OFF, slowly move the control lever in all directions to release any residual hydraulic pressure in the system before disconnecting the hydraulic couplers.
- 3.1.4 Park the tractor near the loader, turn the engine off, set the parking brake and chock the wheels.



3.2 Assembling Front Couplers

Parts needed:

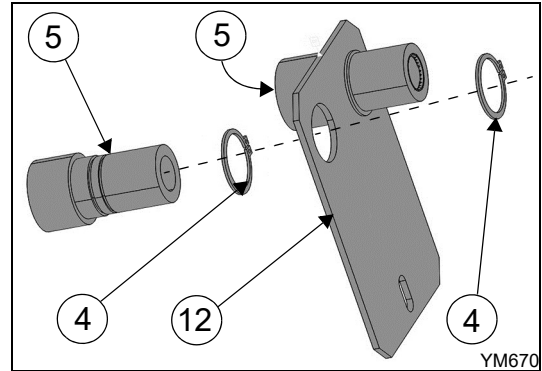
Item No.	Part No.	Description	Qty.
4	198240-46260	RING, SNAP	4
5	1A8160-46250	COUPLER, QUICK 3/8F	2
12	1TN340-43350	STAY, COUPLER	1

3.2.1 Attach Ring, Snap (4) to Coupler, Quick 3/8 Female (5) body and install the Coupler, Quick 3/8 Female (5) into the Stay, Coupler (12) as shown in the illustration.

3.2.2 Secure the Couplers, Quick 3/8 Female (5) in place on the Stay, Coupler (12) using the other Rings, Snap (4) as shown in the illustration.

NOTE

Be sure the Ring, Snap (4) is in the grooves on the Coupler, Quick 3/8 Female (5).



3.3 Installing the Hydraulic Tubes

Parts needed:

Item No.	Part No.	Description	Qty.
3	1A8160-46310	PLUG, DUST GREEN	1
9	1A8160-46300	PLUG, DUST YELLOW	1
13	194464-45930	O-RING, 8-1 (Use if original O-ring is missing or damaged)	2
14	1TN322-41550	COVER, CLAMP	4
17	26106-080502	BOLT, 8 x 50	2
26	1TN340-43030	PIPE ASSEMBLY, 3RD B (Green line)	1
27	1TN340-43020	PIPE ASSEMBLY, 3RD A (Yellow line)	1

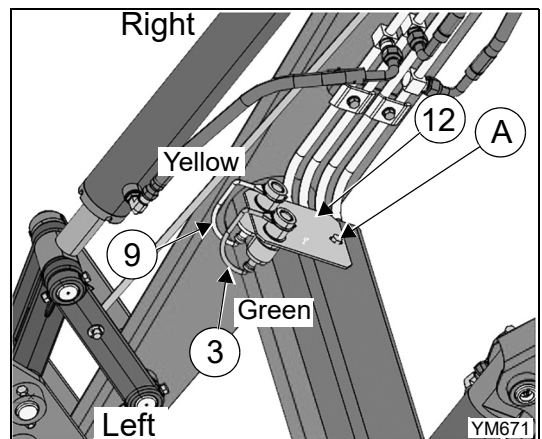
3.3.1 Remove 8x16 bolt (A) from the right side of the loader hydraulic line cover to attach Stay, Coupler (12).

Reinstall 8x16 bolt (A) through Stay, Coupler (12) and hydraulic line cover.

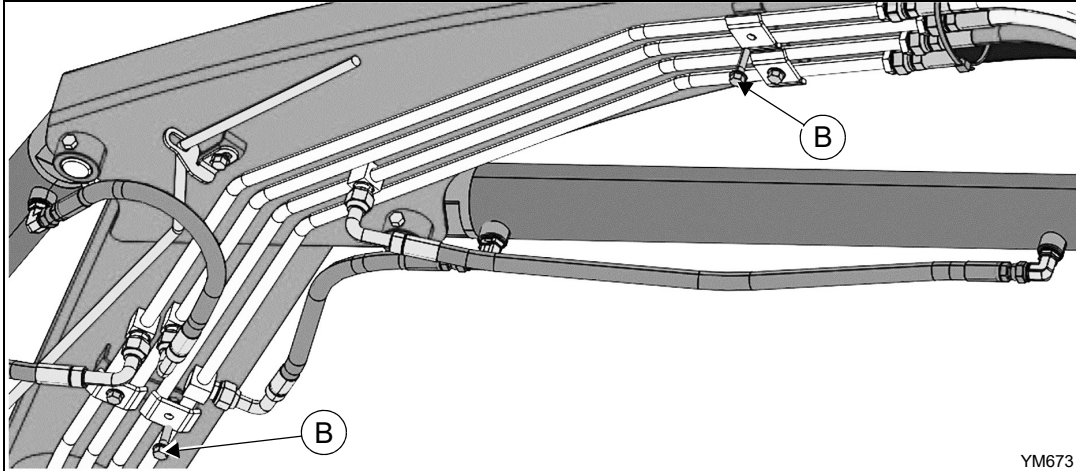
NOTE

Leave 8x16 bolt (A) loose until hydraulic piping has been installed and torqued.

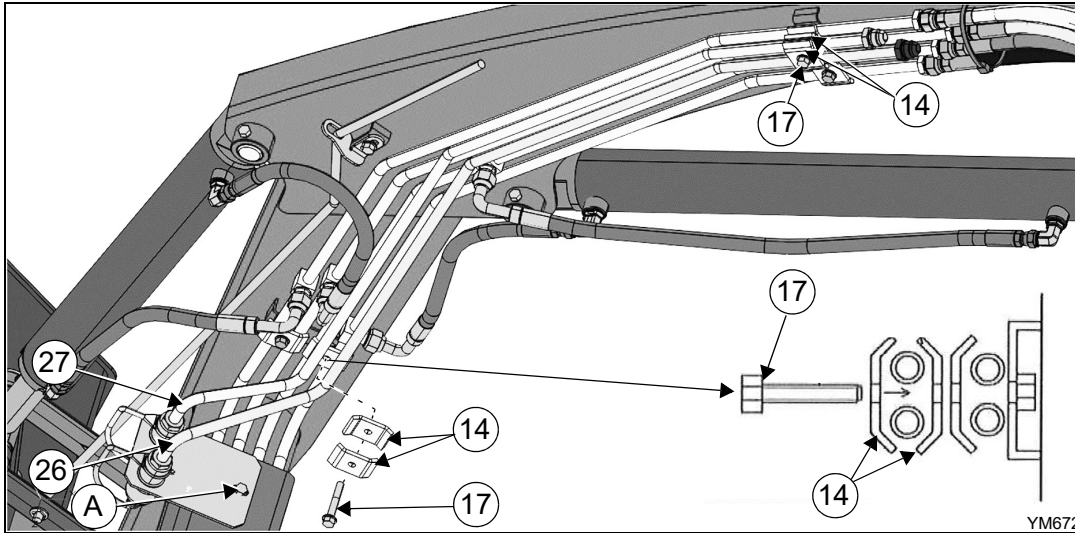
3.3.2 Install Plug, Dust Yellow (9) to the right Coupler, Quick 3/8 Female and Plug, Dust Green (3) to the left Coupler, Quick 3/8 Female as shown in the illustration.



3.3.3 Remove both bolts (B) as shown in the illustration and discard them.




3.3.4 Attach Pipe Assemblies 3RD A&B (26)&(27) to each Coupler, Quick 1/2 Female (5) connections as shown in the illustration below. Leave Coupler, Quick 1/2 Female (5) and Pipe Assemblies 3RD A&B (26)&(27) connections loose.




NOTE Extra O-Rings are provided in case the O-Rings on the pipe end fittings are damaged or lost.

3.3.5 Adjust and secure Pipe Assemblies 3RD A&B (26)&(27) to the loader arm using Cover, Clamps (14) and Bolts, 8x50 (17). Leave Bolts, 8x50 (17) loose until the Coupler, Quick 1/2 Female (5) connection to Pipe Assemblies 3RD A&B (26)&(27) are properly torqued.

3.3.6 Torque Pipe Assemblies 3RD A&B (26)&(27) to Coupler, Quick 1/2 Female (5) connections to the value listed below.

	Tightening Torque: 40–42 ft-lbs (54–59 Nm)
---	---

3.3.7 Torque Bolt 8x16 (A) and Bolts, 8x50 (17) to the value listed below.

	Tightening Torque: 17–22 ft-lbs (23–29 Nm)
---	---


3.4 Installing the Third Function Valve and Hoses

Parts needed:

Item No.	Part No.	Description	Qty.
1	1TN323-43110	VALVE ASSY	1
2	1A8160-46960	CONNECTOR	5
7	1TN340-43050	PLATE, VALVE	1
8	1A8160-46910	ELBOW, 8-8	1
10	1A8300-51210	BAND, REPEAT	6
13	194464-45930	O-RING, 8-1 (Use if original O-ring is missing or damaged)	4
15	26106-080902	BOLT, 8 x 90	2
16	26366-080002	NUT 8	2
19	1TN340-43620	HARNESS ASSEMBLY, 3RD V	1
21	1TN322-41770	DUST PLUG YELLOW M	1
22	1TN322-41780	DUST PLUG GREEN M	1
23	1TN340-43230	HOSE, VALVE	4
24	1TN340-43060	HOSE 3RD A (Yellow)	1
25	1TN340-43070	HOSE 3RD B (Green)	1

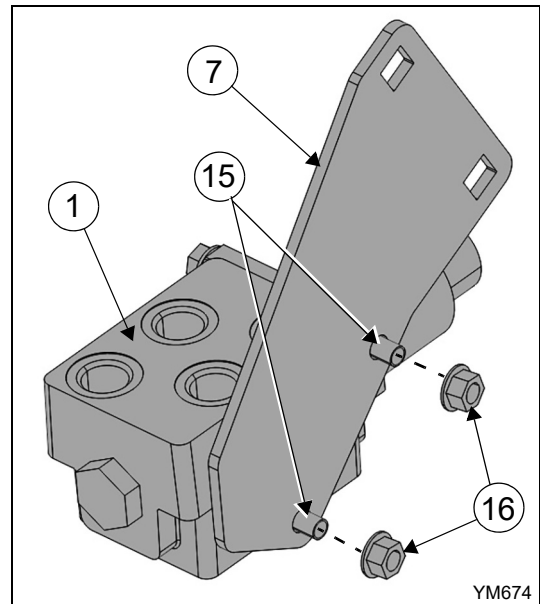
3.4.1 Attach Plate, Valve (7) to Valve Assembly (1) using two Bolts, 8x90 (15) and two Nuts 8 (16) as shown in the illustration.

3.4.2 Torque Bolts, 8x90 (15) to the value listed below.

	Tightening Torque: 17–22 ft-lbs (23–29 Nm)
---	---

NOTE

If the valve ports are not covered, be careful not to allow debris to fall into the valve ports when handling the Valve Assembly (1). If necessary, cover the ports with masking tape.

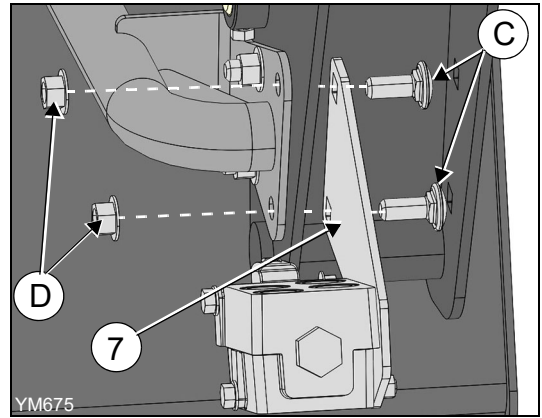


YM674

3.4.3 Remove the two M12 carriage bolts (C) and nuts (D) from loader stand and mast on the right side of the loader and install Plate, Valve (7) to the inside of the loader mast.

3.4.4 Reuse the two M12 carriage bolts (C) and nuts (D) as shown in the illustration to mount Plate, Valve (7) to the inside of the loader mast.

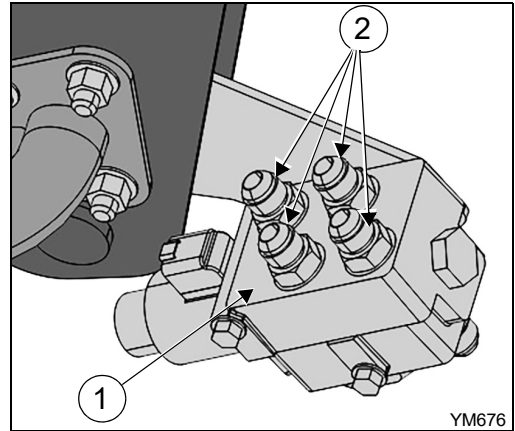
3.4.5 Torque M12 carriage nuts (D) to the value listed below.




	Tightening Torque: 80–94 ft-lbs (108–127 Nm)
---	---

3.4.6 Install four Connectors (2) to the Valve Assembly body (1) as shown in the illustration.

3.4.7 Torque Connectors (2) to the value listed below.

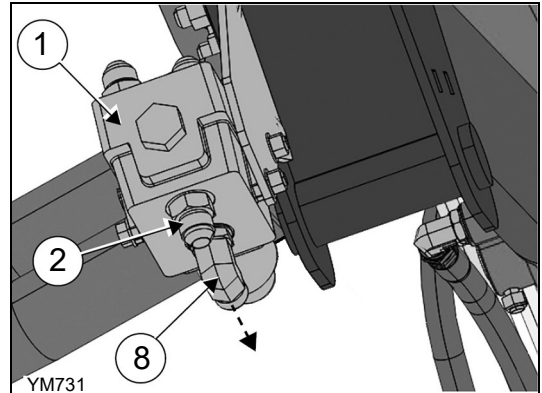



	Tightening Torque: 40–42 ft-lbs (54–59 Nm)
---	---

3.4.8 On the underside of the Valve Assembly (1) install one Connector (2) and Elbow, 8-8 (8) as shown in the illustration.


3.4.9 Torque Connector (2) and Elbow, 8-8 (8) to the value listed below.

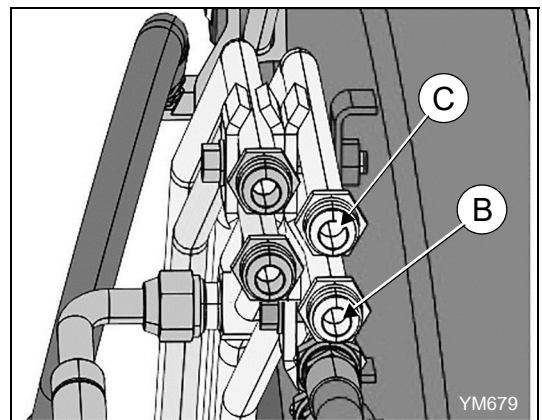
NOTE: Make sure Elbow 8-8 (8) is angled toward the front of the loader as shown in the illustration.



	Tightening Torque: 40–42 ft-lbs (54–59 Nm)
---	---

3.4.10 Disconnect hose to port C (Yellow-Bucket Curl) and hose to port B (Green-Bucket Dump).

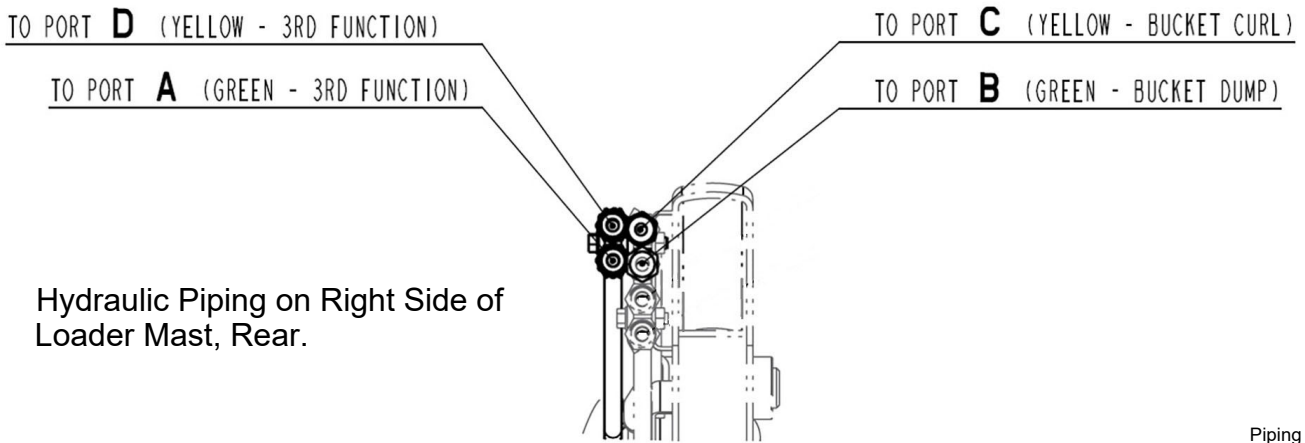
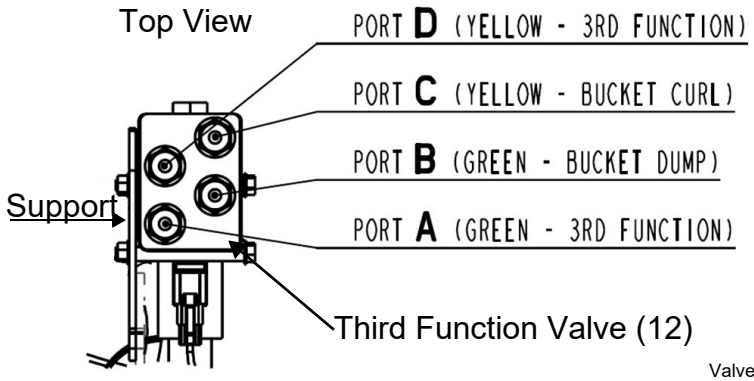
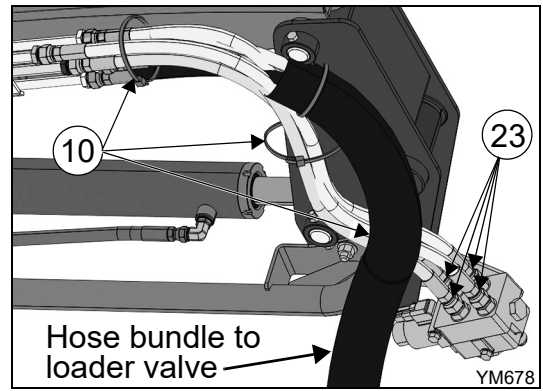
	WARNING
<p>Before performing this procedure, make sure there is no pressure in the lines by following the procedure in step 3.1.3. Wait until the tractors hydraulic system has cooled down to avoid burns. Be careful when disconnecting any hydraulic lines, the system may still be under pressure. It is advised to use safety glasses and gloves when performing this task.</p>	



Third Function Valve Kit TVK-YL610P for YL610 on YT347/359

3.4.11 Remove these hoses from the hose bundle, disconnect both hose Couplers, Quick 3/8 Male from the hose ends and retain for reuse in step 3.4.17 on hoses from Valve Assembly (1).

3.4.12 Install four Hose, Valve (23) as shown in the illustration and bundle hoses using three Band Repeat (10) as shown in the illustration.



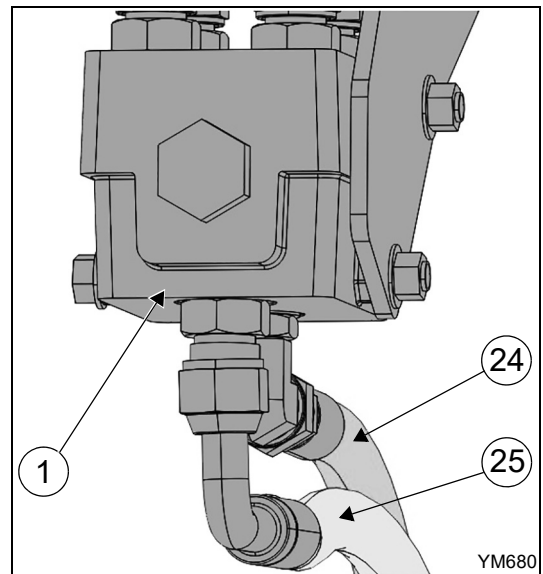
3.4.13 Torque Hose, Valve (23) fittings to the valve listed below.

	Tightening Torque: 36–39 ft-lbs (49–53 Nm)
--	---

3.4.14 Attach Hoses 3RD A&B (24)&(25) to the Valve Assembly (1) as shown in the illustration and secure in place with three Band, Repeat (10). See reference 3.6.8. for locations.

3.4.15 Torque Hoses 3RD A&B (24)&(25) fittings to the valve listed below.

	Tightening Torque: 36–39 ft-lbs (49–53 Nm)
--	---

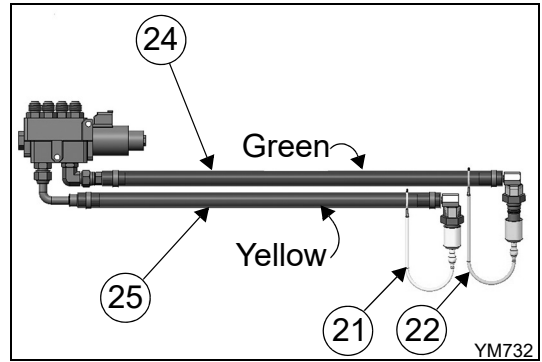


Third Function Valve Kit TVK-YL610P for YL610 on YT347/359

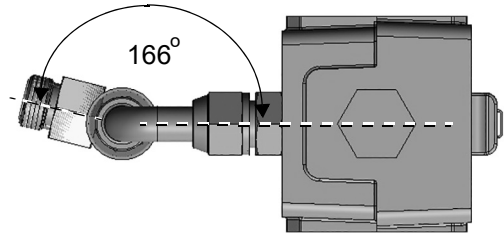
3.4.16 Be sure hose (24) and (25) are orientated in the same direction and installed as shown in the illustration.

Hose (25) is attached to Connector (2) rear valve port and hose (24) is attached to Elbow, 8-8 (8) front of valve port.

Be sure to secure hose bundle with Band, Repeat (10) as shown in reference [3.6.8](#)



3.4.17 Be sure front Hoses 3RD A&B (24)&(25) are angled at an off set angle of 166° as shown in the illustration.

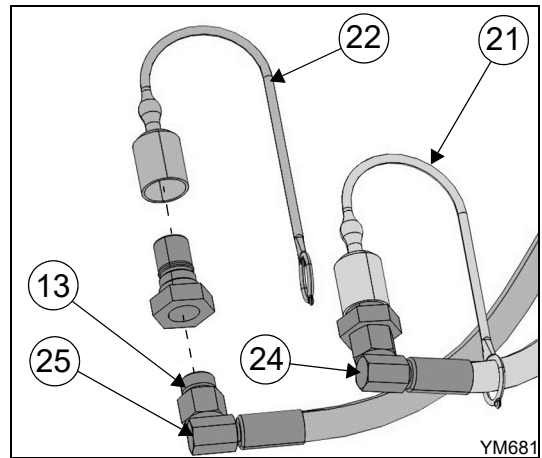


3.4.18 Attach the Couplers, Quick 3/8 Male removed from hoses in step [3.4.11](#) to Hoses 3RD A&B (24)&(25) then torque fittings to the value listed below.

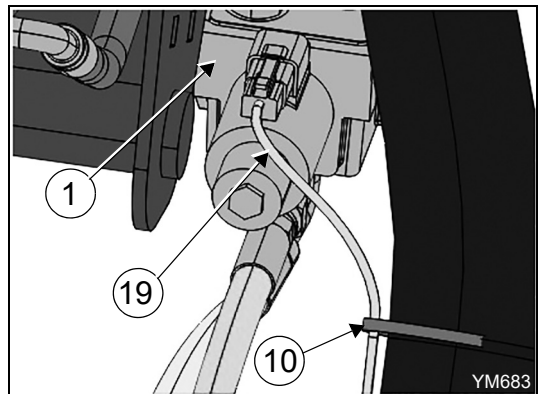
	Tightening Torque: 40–42 ft-lbs (54–59 Nm)
--	---

3.4.18 Install Dust Plug Yellow M (21) to Hose 3RD A Yellow (24) and Dust Plug Green M (22) to Hose 3RD B Green (25) as shown in the illustration.

NOTE
Extra O-Rings (13) are provided in case the O-Rings on the Hose Fittings are lost or damaged.



3.4.20 Attach Harness Assembly, Valve (19) to solenoid connection on Valve Assembly (1) and rout Harness Assembly, Valve (19) down the loader valve hose loom using four Band, Repeat (10) as shown in reference [3.6.8](#).

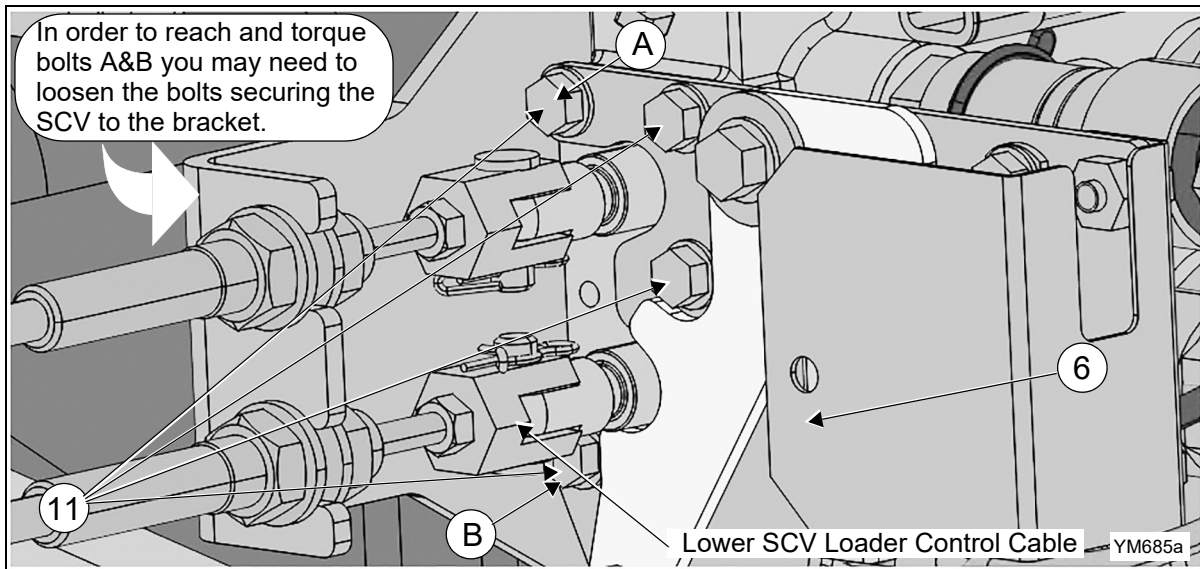


3.5 Installing the Regen Lock Unit

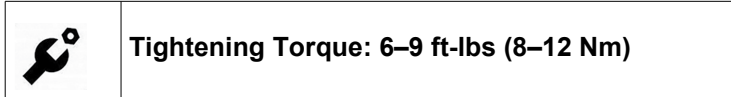
Parts needed:

Item No.	Part No.	Description	Qty.
6	1TN323-43701	REGEN LOCK UNIT	1
11	26106-060122	BOLT, 6 x 12	4
18	1TN323-43550	STOPPER, REGEN	1

3.5.1 Attach Regen Lock Unit (6) to the loader valve using four Bolts, 6x12 (11) as shown in the illustration.



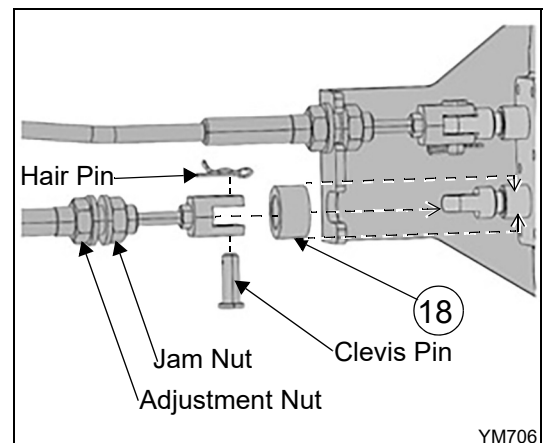
3.5.2 Torque Bolts, 6x12 (11) to the value listed below.



3.5.3 Remove the hairpin clip and clevis pin of the lower SCV Loader Control Cable as shown in the illustration above.

Loosen the Jam Nut on the Cable no more than one turn to move the cable from the SCV spool end. Install the Regen Stopper (18) onto the lower valve spool end.

Reinstall Loader Control Cable, clevis pin and hairpin clip and secure cable in place with the Jam Nuts.

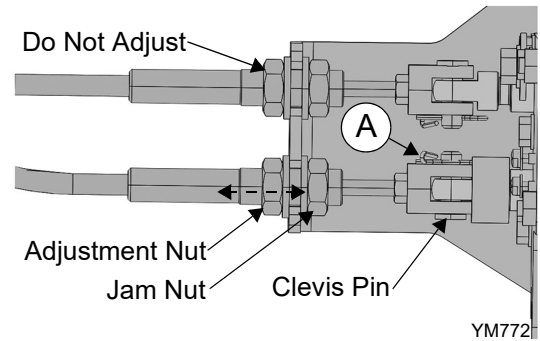


NOTE

The SCV Lever adjustment should be checked to ensure it is in the neutral position and that the SCV Lock can be locked in Neutral position when the cable and jam nut are reinstalled. If out of adjustment, see step 3.5.4.

3.5.4 If SCV lever is out of adjustment, adjust the Adjustment Nut in or out until you get free movement of the clevis pin in its slot.

- (1) With the SCV lever in the neutral position and the lock engaged, remove hairpin clip (A) from the linkage retaining its clevis pin and check to see if the clevis pin is moving freely.
- (2) If it is too tight, the Adjustment Nut will need to be adjusted until the clevis pin moves freely in its slot.



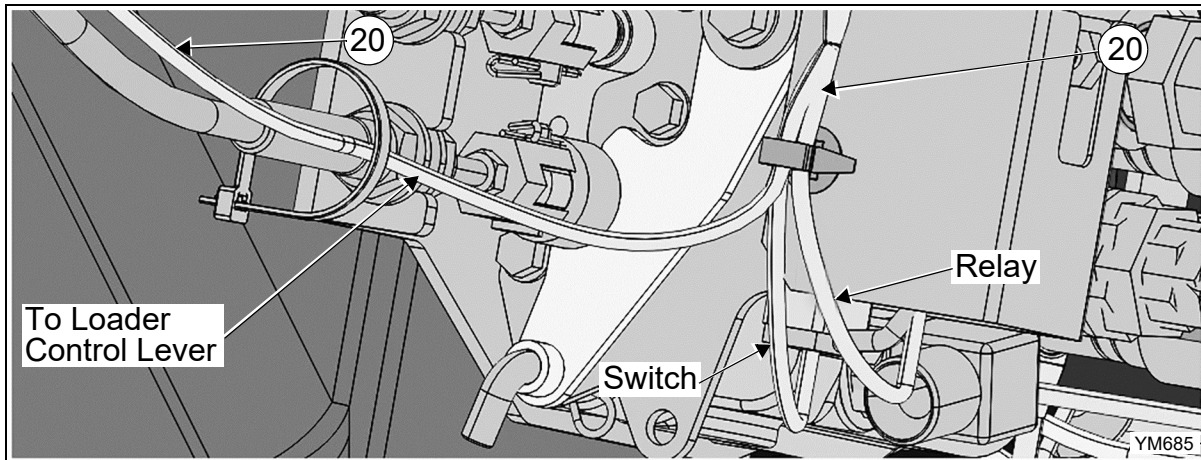
Once the clevis pin moves freely in its slot, reinstall the hair pin and check to see if the neutral position and SCV Lock can be locked in Neutral.

3.6 Installing the Wiring Harness

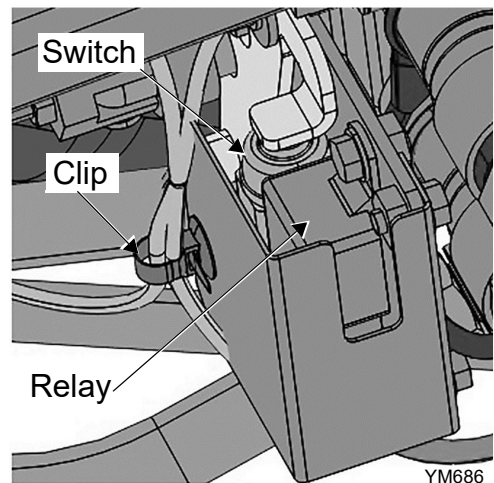
Parts needed:

Item No.	Part No.	Description	Qty.
20	1TN340-43610	HARNESS ASSY, LOADER	1
10	1A8300-51210	BAND, REPEAT	6

3.6.1 Install Harness Assembly, Third Function (20) to loader valve body, Regen, Lock Unit (6) and connect Relay and Switch as shown in the illustrations.

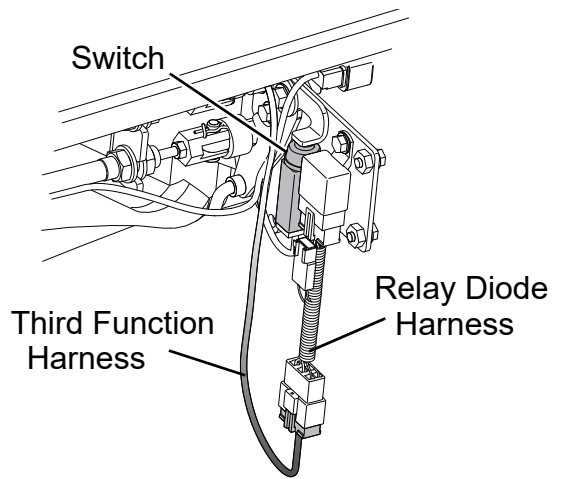


3.6.2 Secure the lower part of the Harness Assembly Third Function (20) in place with the clip installed on the wiring harness as shown in the illustration.

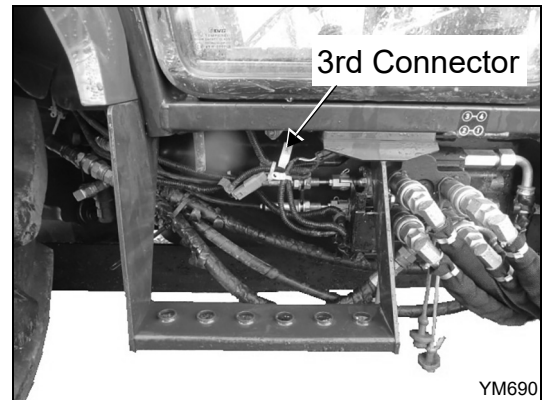


Third Function Valve Kit TVK-YL610P for YL610 on YT347/359

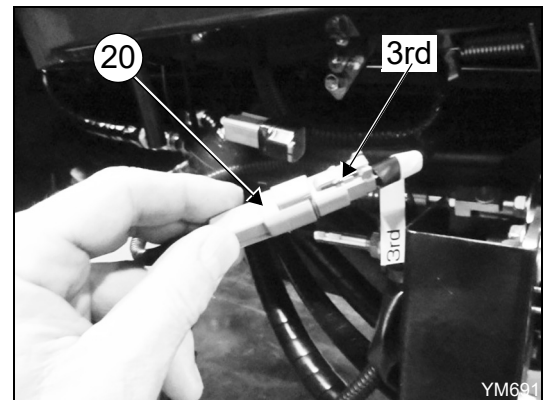
3.6.3 Attach the Third Function (20) connector to the Relay Diode Harness. (Cover removed for clarity).



3.6.4 Locate (3rd) connector wrapped in the tractor harness located above the SCV valve and Regen unit as shown in the illustration. Remove connector blank (3rd).



3.6.5 Connect the (3rd) connector to the Harness Assembly, Third Function (20) connector as shown in the illustration.



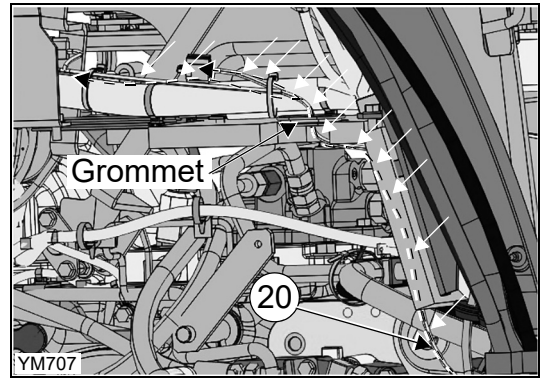
3.6.6 Once connectors are all attached, secure Harness Assembly, Third Function (20) and related wiring in place using Band, Repeat (10) as shown in reference [3.6.8](#).



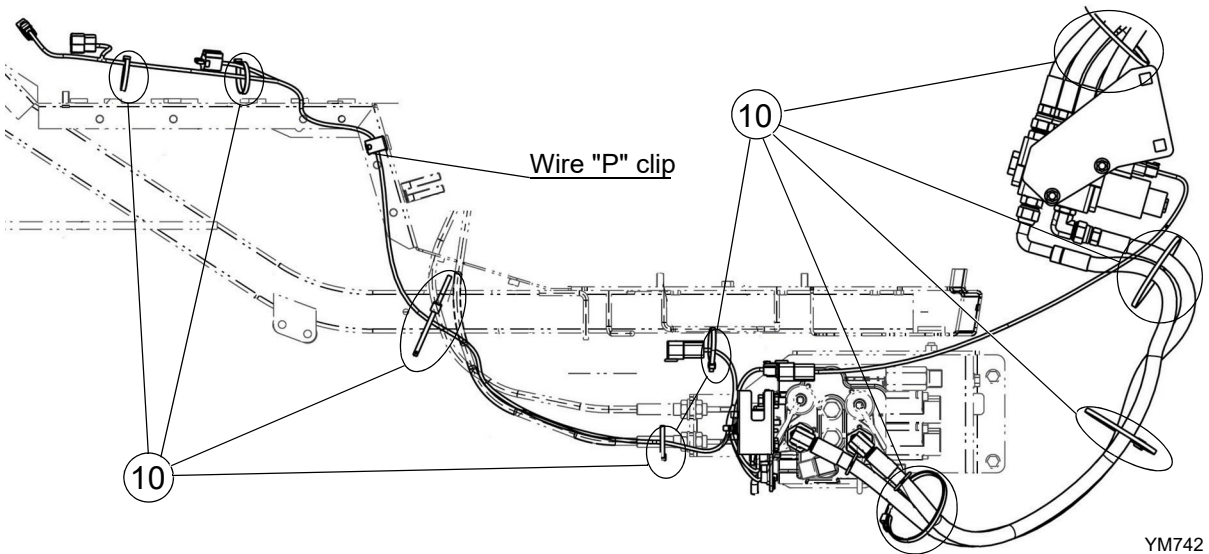
3.6.7 Follow the existing Harness Assembly, Third Function (20) up to the SCV wire as shown in the illustration.

NOTE

Be sure to secure Harness Assembly, Third Function (20) in place using Band, Repeat (10) shown in reference [3.6.8](#).



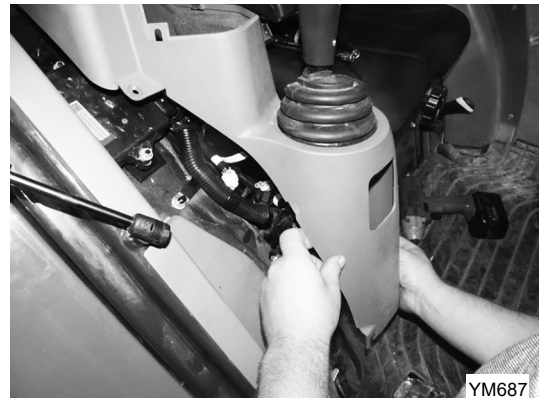
3.6.8 Below is an illustration showing all Band, Repeat (10) locations.



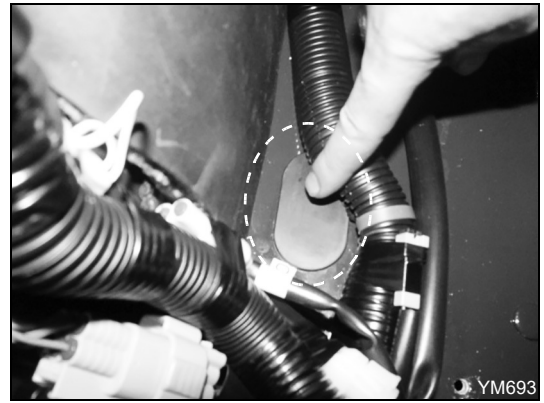
3.6.9 Remove right side control lever knobs and fasteners. Disconnect attached switches and remove right side control lever bezel assembly as shown in illustration.

NOTE

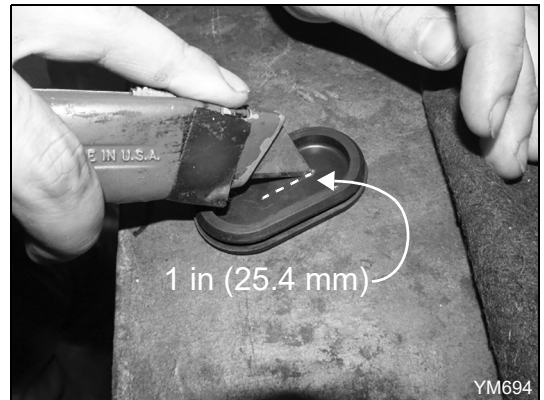
For information on removing right side control lever bezel, see Tractor Maintenance Manual for removal details.



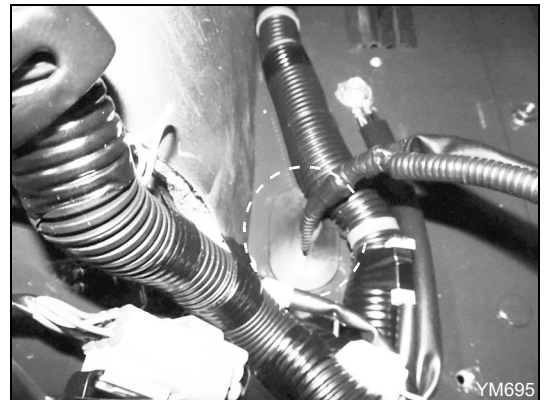
3.6.10 Once the control lever bezel is removed, locate the oval shaped grommet on the tractor floor panel near the main wiring harness as shown in the illustration.



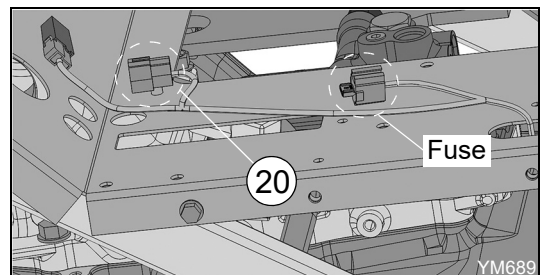
3.6.11 Remove the oval grommet and make a 1 in (25.4mm) slit in the center of the grommet as shown in the illustration.



3.6.12 Insert the Harness Assembly, Third Function (20) wire through the slit opening and reinstall the grommet back into the floor as shown in the illustration.



3.6.13 Inspect fuse and prepare to connect Harness Assembly, Third Function (20) to the tractor main harness.

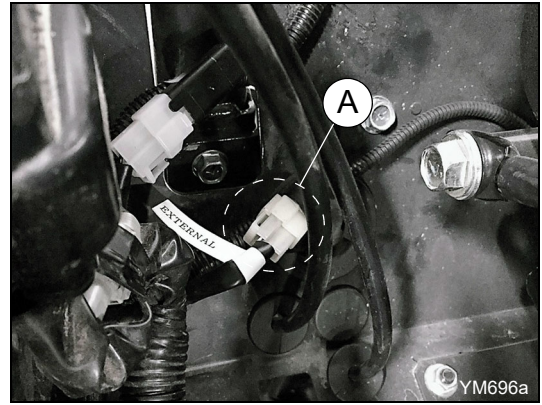


3.6.14 Locate main connector and remove dummy connector from the connector labeled "EXTERNAL" (A) as shown in the illustration.

(A) - "EXTERNAL" coupler for power outlet (Tractor side)

NOTE

It is taped and there is a dummy plug that is removed and installed to Third Function Harness if no other options are installed.



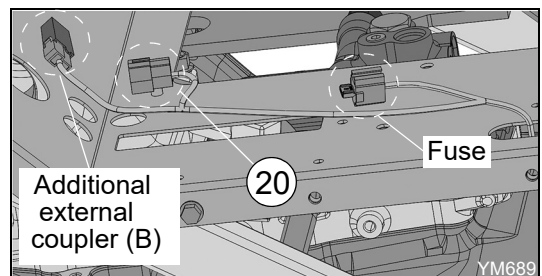
3.6.15 Attach main connector labeled "EXTERNAL" to Harness Assembly, Third Function (20) and secure harness in place using Band, Repeat (10) and zip-tie to main tractor harness as shown in reference [3.6.8](#).

NOTE

Reuse the dummy connector that was removed on 3.6.14 to the additional external coupler (B) on Harness Assembly, Third Function (20).



3.6.16 Once connected and zip-tied in place, reinstall control lever bezel assembly and prepare to test the Third Function Valve system operation.

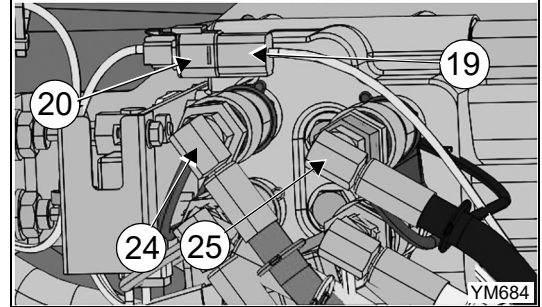


4. Operator Manual

This section explains how to activate an attachments system using the Third Function Valve hydraulic quick couplers installed on the front of the loader. Before engaging the Third Function Valve feature it is important to read and understand the operation of the Third Function Valve system and attachment you will be using.

4.1 Reinstall loader to the tractor.

4.2 Connect Harness Assembly, Valve (19) connector to Harness Assembly, Third Function (20) connector and Hoses 3RD A&B (24)&(25) as shown in the illustration.

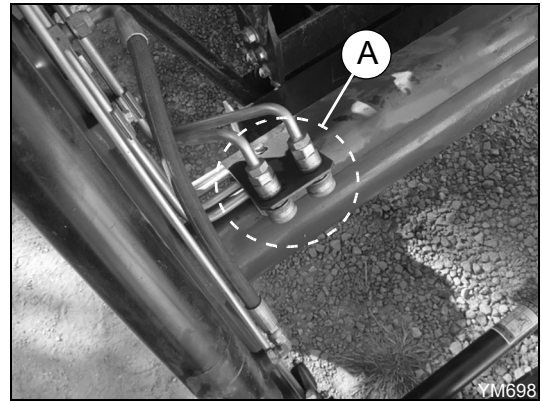


4.3 After installing the attachment to the front of the loader, connect the hydraulic hoses on the attachment to the Third Function Valve couplers (A).

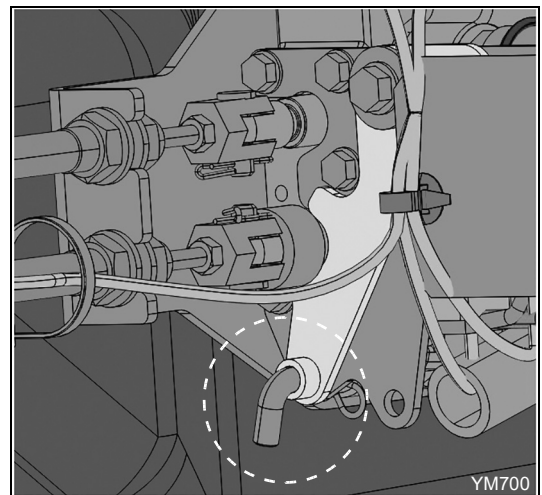
NOTE

Before removing any hydraulic implement hoses from the 3rd Function Couplers, the pressure can be relieved in the 3rd Function Lines by putting the starter switch in the "ON" position while the engine is not running and pushing the 3rd function button and operating the SCV lever to the left and right to relieve the pressure.

The 3rd Function Kit is intended for use with the connecting male end **YANMAR Quick Coupler (1A8160-48820)**, Fastener HNV 38-12 SAE M Coupler or an ISO 7241-1 Series B - 3/8 Male Compliant Coupler.



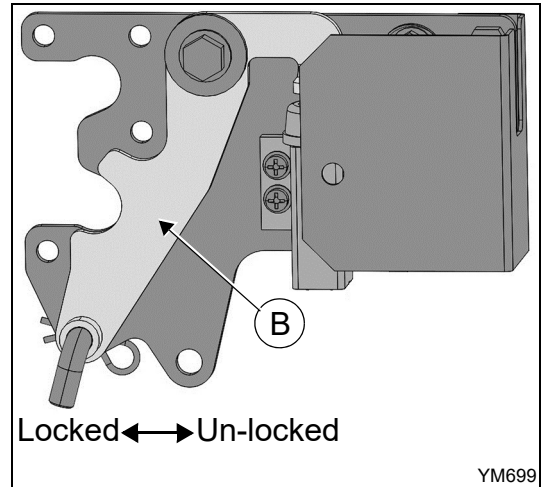
4.4 To activate the Third Function Valve system, locate the lever on the Regen Lock Unit installed on the right side rear of the tractor loader valve.



4.5 Remove the pin and move the lever (B) to the locked position to lock-out the lever Regen operating position on the SCV loader control valve.

Locked position (The front attachment can be operated and Loader Control Valve Regen can not be used. This position is for 3rd function attachments).

Un-locked position (The front attachment cannot be operated and Regen position for loader work can be used. This position is for standard loader operation when Regen Position is desired).



4.6 With the Third Function Valve system enabled, by holding switch (E) in while operating the SCV loader control lever will change the bucket dump and curl function to operate the front quick couplers for the Third Function system attachment.

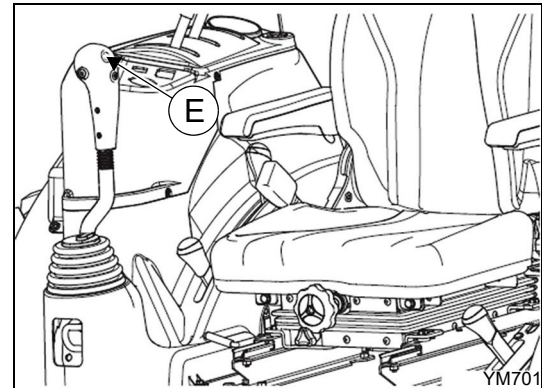
NOTE

If the 3rd function valve is not operating:

First check that the Regen Lock Unit is in the Locked Position.

If the system is still not operating, check that the valve harness is connected to the third function valve harness.

If the system is still not operating, check the condition of the fuse and that all connectors are properly connected.



4.7 When switch (E) is released the Third Function system is deactivated and the bucket dump and curl function is restored.

4.8 To completely disable the Third Function system, move lever (B) to the unlocked position to enable the Regen dump function.

Once the system is disabled, even when operating the loader control lever while pressing switch (E), hydraulic pressure is not supplied to the Third Function Valve system.

Locked position (The 3rd Function Valve function is enabled and the Regen Function is disabled).

Un-locked position (The Regen function is restored and the 3rd Function Valve is disabled).

