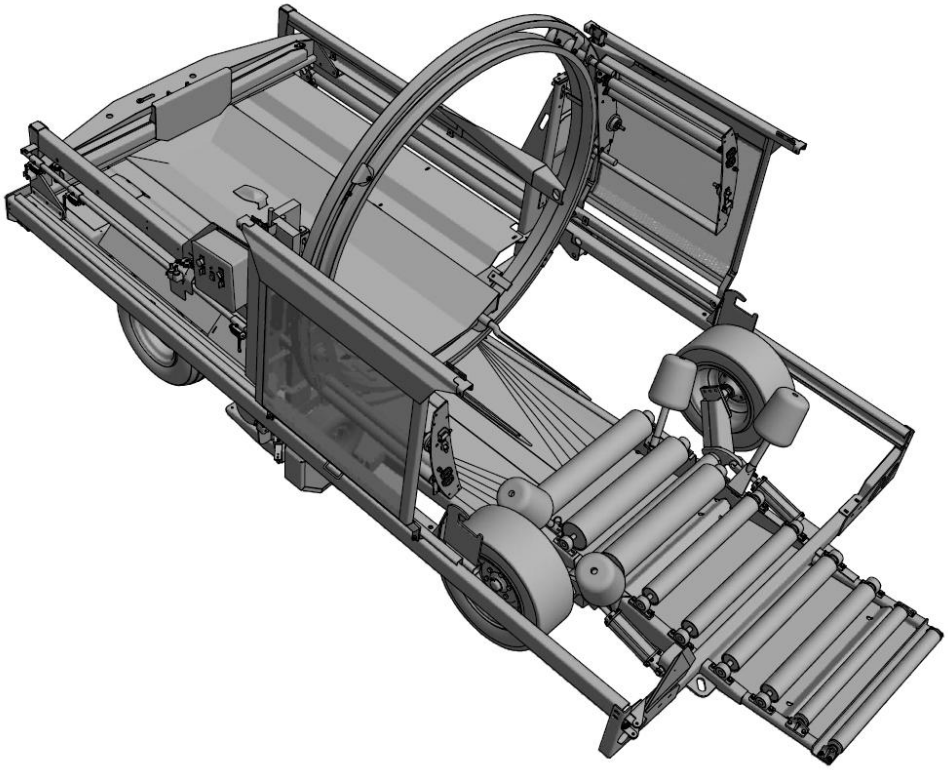
Tube-Line Bale Wrapper
TLR 5000X2

Operator's Manual



TUBE•LINE™ MANUFACTURING LTD

28016 (02/11/13)

Serial # Decal

SERIAL NUMBER

The implement serial number is located on the front of the frame. This number helps us to track changes and improvements and must be mentioned when ordering parts or requesting service. For your convenience, a space has been provided inside the front cover of this manual to record the serial number, model number, purchase date, and dealer name.

Model # : _____

Serial # : _____

Date Purchased : _____

Dealer Name : _____

Operator's Manual

Thank you for choosing the Tube-line TLR 5000X2 Bale Wrapper. Our hope is that it will give you many years of productive service. This machine is designed to wrap a continuous line of round bales in a film of plastic.

Please read and understand this manual and the machine before operation.

Warranty and Limitation of Liability

All Equipment is sold subject to mutual agreement that it is warranted by the company to be free from defects of materials and workmanship. But the company shall not be liable for special, indirect or consequential, damages of any kind under this contract or otherwise. The company's liability shall be limited exclusively to replacing or repairing without charge, at its factory or elsewhere, at its discretion. Any material, or workmanship defects which become apparent within one year from the date on which the equipment was purchased, and the company shall have no liability for damages of any kind. The buyer by the acceptance of the equipment will assume all liability for any damages, which may result from the use or misuse by his employees or others.

Warranty coverage is null and void unless Warranty Registration form has been completely filled in and is on file at Tube-Line Manufacturing Ltd.

Safety

Take note! This safety alert symbol is found throughout this manual to call your attention to instructions involving yourself and others working around the machine.

• **Failure to follow these instructions can result in injury or death!**

This symbol means

- Attention!
-Become Alert!
- Your Safety is involved!

Signal Words are used in this book.
Caution: Indicates a potentially hazardous situation that may result in injury.
Warning: Indicates a potentially hazardous situation that could result is serious injury or death.
Danger: Indicates a hazardous situation that needs to be avoided. It is you the operator that needs to be aware of these dangers.

If you have any questions not answered in this manual, please contact your dealer or Tubeline Manufacturing Ltd.

6455 Reid Woods Drive,
R. R. #4 Elmira
Ontario, Canada
N3B 2Z3

Tel : (519)-669-9488
Fax : (519)-669-5808
e-mail : sales@tubeline.ca

Safety - It's in your interest.

Safety Guidelines

Safety of the operator is one of our main concerns, however we do hear of some accidents that could have been avoided if some precautions had been taken.
To avoid personal injury study the following precautions and insist those working with you or for you, follow them.

In most cases the pictures will have the shielding in place, in some they may be removed, only to show a view behind the shield.
Keep all the shields, safety doors in place. If they become faulty and fail to work replace them. They are for your safety, do not operate the equipment with them removed.

Replace any decals that may be missing or that are not readable. Location of the decals is indicated in this manual.

Do not operate this machine while under the influence of drugs or alcohol.

Review the safety instructions with all users annually.

This equipment should not be operated by children, or with those unfamiliar with the operation of the machine. **Do not allow persons to operate this machine until they have read this manual and/or were instructed by a qualified person.**

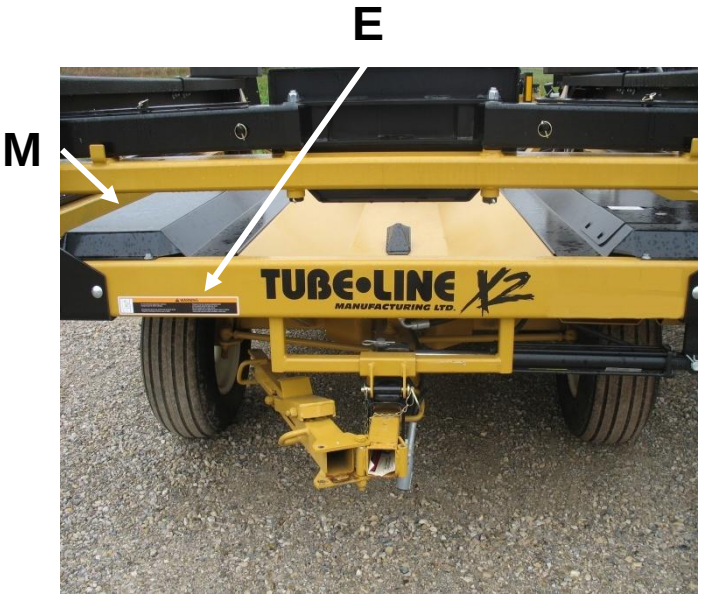
Do not paint over, remove or deface any safety signs or warning decals on your equipment. Observe all safety signs and practice the instructions on them.

If the bale seems to be larger then the hoop do not try to force the material through as the film spools may touch the bale and break the plastic. If is stalls halfway through you can't back up, you will have to pull the bale apart by hand.

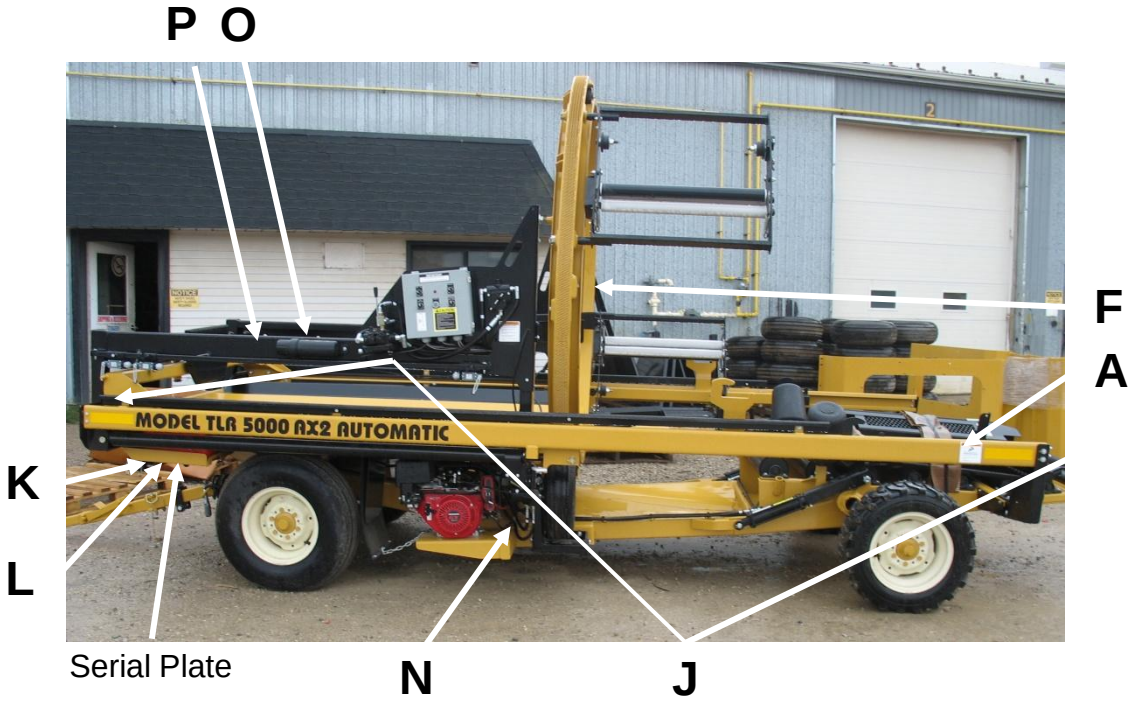
Lighting and marking

This machine is equipped with lights and reflectors as required by the most stringent government and ASAE specifications. They should work with the tractor 7-pin connector.

Safety Decal Location



Safety Decal Location

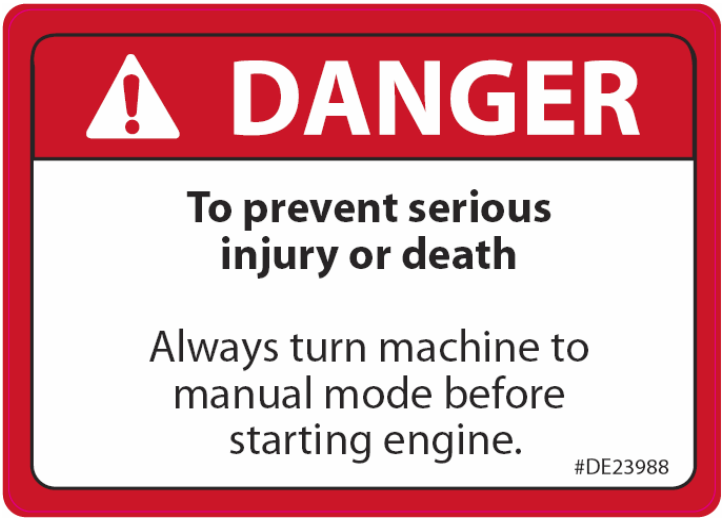


ITEM – A
PART # - DE23846

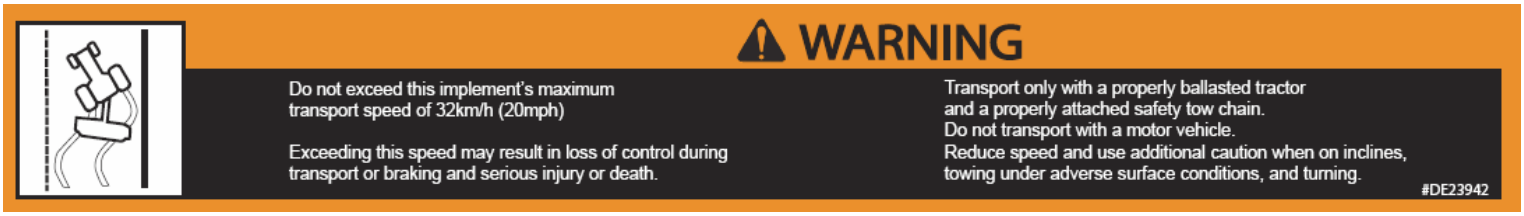
ITEM – B
PART # - DE23939

ITEM – C
PART # - DE23839

ITEM – D
PART # - DE23988

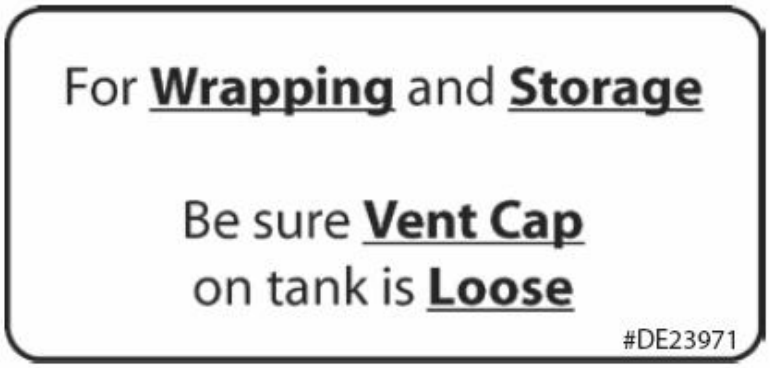


ITEM – E
PART # - DE23942

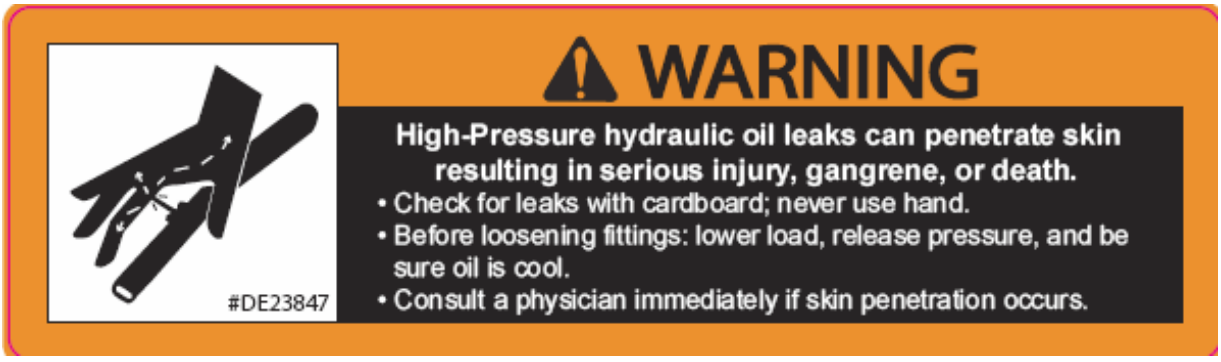


ITEM – F
PART # - DE23845

ITEM – G
PART # - DE23971



ITEM – H
PART # - DE23847

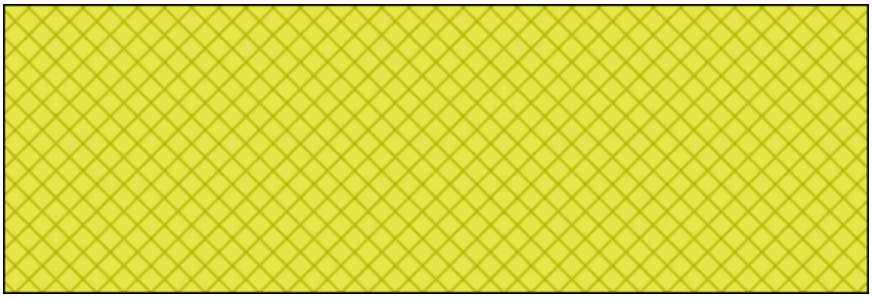


- Keep safety signs clean and legible at all times
- Replace safety signs that are missing or illegible
- Decals are available through your dealer

Safety Decal Location

ITEM - I (Both Sides of the Machine)
PART # - DERED

ITEM – J (Both Sides of the Machine)
PART # - DEAMBER



ITEM – K
PART # - DECANADA

ITEM – L
PART # - DE23941

Safety Decal Location

ITEM – M
PART # - DE30871

ITEM – N
PART # - DE30880

ITEM – O
PART # - DE30879

ITEM – P
PART # - DE30881

Remember

Your best assurance against accidents or damage to the machine is to know how it operates. If you do not understand a portion of the manual or a function of the wrapper, please contact your dealer or an experienced operator.

Before Operation

- Carefully study and understand the manual or be trained by an experienced operator.
- Do not wear loose clothing that may get caught in moving parts.
- Visually inspect the machine to make sure no parts are loose or missing.
- Be sure that no tools are left on the machine.
- Make sure no hay is lying on the engine and that the cooling fins are not clogged with dust and hay (**this could cause a fire)**
- Do not hurry the learning process. Be familiar with one part before trying the next part.
- Practice by running the machine through its paces, first in manual mode with no bales in the machine until you are comfortable and familiar with the operation. After you become familiar with the operation, switch the machine to Auto mode. Use a stick and push the table switch down to start the cycle.
- Do not reach in and push the switch paddle down by hand.

Operating the Model TLR 5000X2
Tubeline Bale Wrapper

Big Bale Silage
The objective of big bale silage is to provide high quality forage using a minimum of equipment. To do this, crop must be cut at the correct stage of maturity, wilted, baled tightly and wrapped air tight, using a good quality stretch wrap.

The Tubeline wrapper makes timely harvest possible by reducing the dependence on the weather. It is much easier to get to wilt silage than to make dry hay. This also extends the working day, as the correct moisture to bale extends earlier and later in the day.

Bales
Well-shaped firm bales are necessary for successful wrapping, using a hard-core baler. Bales are best wrapped as soon as possible after baling. If bales are left unwrapped they will sag and loose shape. Heating will start soon after baling and protein quality will be lost. It is desirable to wrap within four hours. In an emergency such as rain, the bales can be left 12 to 16 hours.

Moisture
Successful silage can be made over a wide moisture range. In general, 40 to 50% moisture is satisfactory for dairy cows. Some beef farmers prefer 60 to 70% moisture as it limits intake. A good rule of thumb is to dry “Half-way to Hay”.

Drier silage gives you

1. Lighter bales to handle.
2. More desirable fermentation with fewer odors
3. Less freezing in the winter
4. Higher dry matter intake

Wrapping Site

Select a site that will allow room to make an adequate bale row length.
The Tubeline wrapper is very fast, but requires time to set up and move to a new line. There should be space for at least 50 bales in a row.

Select a site that is accessible in winter conditions and does not flood in the spring.

A firm surface is necessary for the successful operation of the wrapper.
Avoid soft ground, as the wrapper will not move forward smoothly if it is sinking into the ground. Wrap on level ground or a slight uphill grade.

A site that is free from grass and debris will be less likely to attract rodents that can damage the plastic.

Bale Size

Round Bales- The TLR 5000X2 will wrap bales up to 5' x 5 ½'
It will wrap all sizes smaller than this dimensions as well.

Remember when making big bale silage the bales will be heavier than dry hay. This puts extra strain on loading and transporting equipment. Also, bales will be heavier when feeding out and may have to be moved on wet ground or snow. As a result most operators reduce silage bale diameter to 4-4 ½', even though the wrapper will handle larger size.

Square Bales- Model TLR 5000X2 is NOT a square bale machine.

Recommended Operating Procedure

We suggest the following method of operating the TLR 5000X2 Tubeline Wrapper

- **Park the wrapper where you want the end of the row to be, facing in the** appropriate direction with wrapper in up position.
- **Apply parking brake and fold in the first section of the tongue and fasten the** bracket into the hydraulic steering slider with the pin that held the tongue.

Proper tire pressure is 36 psi and should be maintained at all times. On the rear axle replace tire with the same type and brand if possible. If this is not practical then replace with a tire that has the same outside diameter.

Caution!! Be Safe

Never ride on the machine while being used or transported.

Never climb on the table or inside the wrap chamber with the Engine running.

Turn control panel to “man” or stop the engine when changing plastic rolls. Never leave it in “auto” as your helper may set a new bale on the table or press the start button on the remote.

Installation of Plastic

Procedures for maintenance, repairs or plastic rolls replacement :

1. Push the Emergency Button
2. Remove the key from the motor (has to be kept by the end user to avoid accident)
3. Do the required work

Danger!! Stop Engine ! Before attempting to install plastic.

Plastic from the factory has a natural tack on the inside. In the event of the plastic being stored for an extended period of time the tack may migrate to the opposite side. To test for tacky side fold plastic inside to inside and pull apart. Fold opposite way (top to top) to determine tackier side.

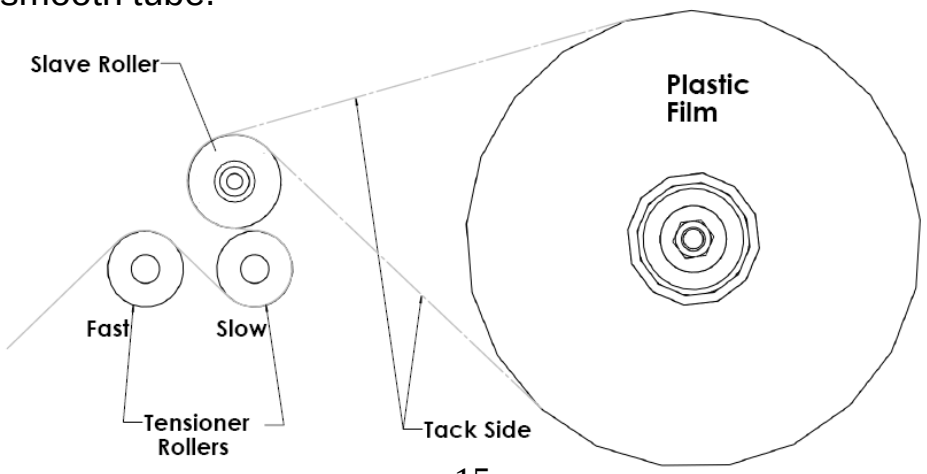
The roll of plastic should be installed with the tack on the inside of the plastic film next to the bale silage. The plastic then passes over the slave roller and is threaded through the two metal rollers on the Tensioner as shown in the diagram.

The two metal stretcher rolls rotate at different speeds. This causes the plastic to be stretched. It is very important that the plastic goes over the slow roller first and the faster roll second.

If there is any question, which is the faster roller:

1. Turn one roller by hand and watch the speed of the other roller, this should help you determine which is the fast and slow roller.

When the plastic is installed correctly, it should stretch tight on the bale to form a smooth tube.



Trouble Shooting Plastic Installation

1. Wrinkles in the plastic with seams between layers easily visible
   Check to determine if the plastic is properly routed through the Tensioner rollers.
2. Plastic tears between the Tensioner and the bale

   Film spool holders: not turning freely. Lubricate and turn by hand until free.

   Slave roller not turning freely. Lubricate and turn by hand until free.

Tensioner rolls not turning freely: Loosen the bolts holding the bearing and check if this makes a difference. It may be that the bearings have too much end pressure, in this case re-tighten the bearings and loosen the locking collar on the roller shaft this will allow the shaft to slide in the bearing; re-tighten the bearing collar. The gears can also be meshed too tight; this can be fixed by slightly loosening one set of bearing bolts. Using a hammer and punch, lightly tap the bearing away from the other roller.
Caution- Do not use a hammer on the aluminum stretcher rolls.

Poor quality plastic: Use a brand with good tear resistance.

Tack build up on the rollers: Particularly in hot weather. Clean the Tensioner with warm soapy water.
Plastic roll is too hot: In very hot weather the plastic can become soft if left in the sun for long periods of time. In these conditions, the spare rolls should be kept in the shade. After the rolls have been installed on the machine one can be parked on the bottom and a cover can be placed on the top one.
Rolls of plastic may catch on the bottom of the bale. If bales are misshaped the roll of plastic may drag on the bottom of the bale, causing the plastic to break.

If wrapper is equipped with electric automation
Switch the control to “Man”

Danger!! When the machine is in manual mode the safety switches and the film sensor Do Not Function.

- Test the hydraulics by rotating the hoop and moving the ram back and forth.
- Install the roll of plastic according to the Plastic Installation diagram.

Caution! Close safety doors after installing plastic to avoid injury.
Caution! Round bale are heavy and silage bales are even heavier. Use only bale-handling equipment. Keep bales low when turning loader.

Caution! It is important that the bale sit firmly on the deck, as the bale spears should deflect the hay somewhat. Failure to do this may cause the plastic to stick to the spears and tear the plastic inside the bale.

To Wrap Bales with **Model TLR 5000X2**

Before the first bale that will stay on the line is placed on the wrapper, place an end cap on the bale. (Check with your plastic supplier for suggestions.)

- Pull about 4 ft of plastic through each stretcher and tie it under the twine on the bale, or tie it in the slots on the hoop brace (both sides)
- With the control panel switch "auto/man" set to "man" turn forward switch to advance the bale without the plastic stretcher applying plastic.
- As the bale is pushed through the hoop, start the hoop rotating to apply plastic by pushing in the "Rotate" button.
- When the ram hits the switch at the end of the stroke the forward motion on the cylinder will stop. (This switch can be moved on the slider arm to accommodate your needs). More about this later.
- With the switch set to "man" the switch buttons will have to be turned and/or pushed and held, when you let them go the function will stop.
- Turning the reverse switch will retract the ram and open the bale pusher to accommodate the next bale.
- Wrap the 1st few bales in "man" until the first bale overhangs at rear of machine by 6 inches. Lower machine to the ground and **disengage parking brake, if equipped with a power drive, disengage the hydraulic lever.**
  Note! You may want to leave some weight on the wheels until the wrapper starts moving to avoid bales from sliding on the ground.
- After you have wrapped a few bales in this way, switch "auto/man" switch to "auto" and place bale on the bale table. As the bale depresses the table trigger ram will start automatically. Adjust the second slider switch to start the wrap cycle at the same time that the bale makes contact with bales on the machine.

Warning!!

<u>To stop the cycle:</u> after the cycle has started in the automatic mode, turn **"auto/man"** switch to "man" (or if you have the optional remote kit, push the "stop" button on the hand unit to stop the cycle. After the problem is rectified, finish the rest of the cycle in the "man" mode and then return to "auto" mode. (If you press start button on the hand unit it will also start the ram forward again except if the ram had passed the hoop start switch the hoop will not start with the ram).

For safety reasons, safety switches are installed in the doors. In "auto" mode the safety doors must be closed for the machine to work. In "man" these switches are bypassed.

Steering

This wrapper is equipped with hydraulic steering. The purpose of this is to keep the wrapper operating in a straight line or to direct the wrapper around obstacles. If the ground is uneven or the wrapper is operated on the side of a hill, then it can drift out of line. The loader operator is usually able to detect if the wrapper is not moving in the desired direction. When steering around obstacles in the wrapping path do not make sharp turn as this prevents the bales from being tightly packed together. The steering speed can be adjusted with the needle valve at the manifold block.

- When starting a row, align the wrapper in the desired direction for the row and ensure the steering is in the center position.

Optional- Remote Control

With the remote control the machine can be controlled with a hand held unit. The table trigger switch should be unplugged. When the control panel "auto/man" switch is on "auto" the bale can be placed on the table without the cycle starting. After the bales has been placed on the table and you want the cycle to start, press the start button on the hand unit. The machine will now go through the complete wrap cycle and stop at the end of the cycle. Two of the remote buttons are used to control right and left steering. The fourth button is the remote cycle stop.
Notice- the "on/off" switch on the control panel will turn **off all the electric** current to the **Control Panel and also Engine Stop.** The Honda engine does not have an electric ignition therefore the key can be left "on" without the battery draining. The 20hp engine has an electric fuel valve and the **key** needs to be **"off"** when the engine is not running, as the valve will drain the battery.

Slider Switch

Adjust the second slider switch to start the rotate motor when the bales have made contact. By adjusting the slider switch at the rear of the slider bar, which will stop the ram and the wrap motor, and reverse the ram cylinders. -**TIP-** Adjust the rear switch so that the junction of the 2 bales are in the middle of the wrap chamber. It is possible to adjust the second switch so that the wrap will start just before the bales start moving through the wrap chamber, thereby putting extra plastic on the joint of the bale. The front slider switch is set to stop the ram retract stroke after the engine has throttled before the cylinder bottoms out.

Brake

The TLR 5000X2 is equipped with a manual parking brake in rear left wheel.
If the wrapper is equipped with optional POWER DRIVE, the power drive is engaged and used as a parking brake.
Notice - Make sure **BRAKE IS DISENGAGED** before transporting the wrapper.

Pushing off Bales from the Wrapper

The automatic wrapper will have to be switched to “man” position for pushing the bale off.

Danger!!

<u>The use of automatic setting when pushing off bales can cause severe injury or death.</u>

To push off the bales
Open the bale pusher
Remove the linchpin from the front push plate arms
Unfold the arms to extend the push plate
Remove the linchpin from the top of the arms and swing the X bars onto the pins, replace the linchpin to secure the X bar
Push the bale through the wrapper by using the forward button and wrap button with the automatic machine. Continue pushing the bale through the wrap chamber until you have reached the end of the stroke.
Retract the bale pusher
Refold the push plate arms and secure with linchpins at the front arms
Open the safety doors, remove 2 x 3 tube from the Hydraulic tank side of the wrapper and lay it across the top of the Pushoff brackets
Close the pusher a second time to push the bales further off the wrapper**.**
Open the pusher and move the 2 x 3 tube to the socket at the rear end of the arms. Close the pusher to finish pushing off the bales from the tail.
(**NOTICE!** The last pushoff brackets are lower than the guide rollers. BE SURE the tube is behind the rollers before pushing and remove the tube before opening pusher all the way).
Open the bale pusher, store the 2 x 3 tube in bracket secure with lock pin

Undo steering, unfold tongue and insert lock pin.

Make sure the brakes are released before driving away.

Caution

Before moving the wrapper any distance close the fuel valve at the engine!
As the machine is towed it will bounce and shake, as it does this the carburetor float will let too much fuel into the system. Raw fuel can get into the engine cylinder and wash the cylinder walls down and end up in the engine oil.

OBSERVE MAXIMUM TRANSPORT SPEED
The maximum transport speed for this implement is 32 km/h (20 mph).
Some tractors are capable of operating at speeds that exceed the maximum transport speed of this implement. Regardless of the maximum speed capability of the tractor being used to tow this implement, do not exceed the implement's maximum transport speed. Exceeding the implements maximum transport speed can result in: - Loss of control of the tractor/implement combination - Reduced or no ability to stop during braking - Implement tire failure - Damage to the implement structure or its components Use additional caution and reduce speed when towing under adverse surface conditions, when turning, and when on inclines. Do not attempt transport if the fully loaded implement weighs more than 1.5 times the weight of the tractor.

Build-up on Stretchers

When wrapping in hot weather there can be a build-up of adhesive on the stretcher rollers. This can cause the plastic to break. Remove the adhesive with soap and water.

Wrapping Straw

The TLR 5000X2 wrapper can be used to weather- protect straw.
Only two layers of plastic are necessary.
If the straw is dry, it may be wrapped continually without spaces. Straw that has some moisture is best wrapped with spaces in the plastic.

After Wrapping

After wrapping, inspect the rows of silage regularly to ensure there is no damage occurring from birds, rodents or livestock.

Feeding Out

With the TLR 5000X2, a loader can pick up bales without cutting the plastic. The plastic breaks away between bales and can be removed from the side of the bales before dropping the bales in the feeder.

Wrapped bales do not spoil as the line is fed. Unlike long bags of bales, the stretch wrap prevents air from moving past the bales and causing the bales at the far end to heat and spoil. As the next bale is undisturbed it will not spoil for one to two days in warm weather and for at least a week in cooler weather.

Disposal of Plastic
Users of bale wrappers are encouraged to collect all plastic to prevent it from becoming an environmental problem. Plastic, although bulky, is inserted in a landfill and will not pollute the ground water. Manufactures are making serious efforts to economically recycle silage plastic.
Use recycling services when available. Please do not burn the plastic!
Collect and dispose all plastic in an Environmentally Friendly manner.

Remember the air and the ground that you contaminate is your visible footprint for many generations!

Unsightly used silage film will encourage complaints.

Diagnostics

Electric Solenoid valves can be manually operated by pushing a small punch into the end of spool and holding it in. **Do Not Use a Hammer!!**

Caution Stay Away From Hoop When Engine Is Running

Inside of Control Panel control relays are numbered CR1 to CR5 from left to right.

Relay CR1 is wired to table trigger. CR1 will activate solenoid valve to extend ram cylinder. CR2 is wired to switch at the front slider, when ram is extended to this switch CR2 will close, energizing the wrap motor valve. Ram cylinder will extend and wrap motor will turn until ram comes in contract with slider switch at rear, then CR1 and CR2 will turn off and CR3 will turn on. Wrap motor will stop and ram cylinder will retract until ram cylinder trips the limit switch at the front end of table. All control will then turn off.
Testing can be done by pushing trigger plate and wait until machine goes through cycle, or you can push small square button on the front of relay 1 and let machine go through cycle.

When control relays are activated a small light goes on inside the relay.
When running machine through the cycle and wrapper motor or the cylinders do not work, check flow control valve to see if flow is going to both motor and cylinder.
Engine is stopped by grounding ignition, in case of ignition failure make sure that stop switch wire is not grounded to frame and engine is not in stop position.
Steering is controlled by switch right/left on control panel through CR4 and CR5 activating coil A or B on steering solenoid valve.

Tubeline TLR 5000x2

Electric Hydraulic
Sequence of Operation

1. With valves in neutral position, control panel on/off switch in off position, engine running fluid is pumped through valve stack and returned to reservoir.

2. Wrap cycle fluid flows from power beyond port on 2 spool valve to flow control, and is split into 2 circuits one circuit goes to double solenoid valve for ram cylinder, the other circuit goes to single solenoid valve for hydraulic motor. By moving flow control handle more or less fluid will flow to cylinder or motor ie. As more fluid flows to cylinder less fluid will flow to motor and vise-versa.

3. Electric control panel- “Man-Auto” switch turned to “Man”. Turn “On/Off” switch to On, then red LED will light up indicating 12V power is on at control circuits, with engine running. Turn “Forward” switch in to energize solenoid A on double solenoid valve. Ram cylinder will extend. Turn “Reverse” switch to energize solenoid B on same valve. Ram cylinder will retract. Push Rotate button in and hydraulic motor will run. “For/Rev and Push” buttons have to be held to operate, by releasing them action will stop. Engine throttle has linkage to slow engine down when ram is all the way to the front. Spring on linkage will speed engine up as soon as Ram cylinder starts to extend.

4. When “Man/Auto” switch is turned to Auto, “For/Rev and Rotate” switches no longer function. Depress trigger switch located on bale table, Ram hydraulic valve is energized. The Ram cylinder will extend and engine will speed up. When Ram extends to front slider, this switch will energize the single solenoid valve and turning the wrap motor. When Ram is extended to the limit switch at the end of stroke, single solenoid valve and double solenoid valve “A” will turn off. Solenoid B will energize causing Ram cylinder to retract until it trips limit switch at the front end of bale table, solenoid “B” will turn off, the Ram cylinder will stop and engine will idle down.

5. Steering is done by steering switch, right/left activating steering double solenoid valve A or B. This valve will work in either manual or automatic mode.

Daily Maintenance

Lubricate all grease points

Specifications

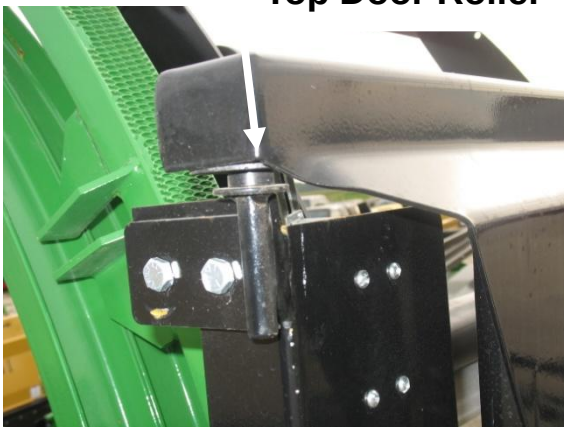
Slider Tube : Lightly Grease Once a Week
Hoop Axle : Twice a Day, All 8 Bolts
Ram Axle : Once a Week
Gear Box : 1 or 2 Times Every 2 Months
DO NOT OVER GREASE

Oil Points

Oil these points occasionally to keep the parts moving freely

Bottom Door Rollers

Top Door Roller



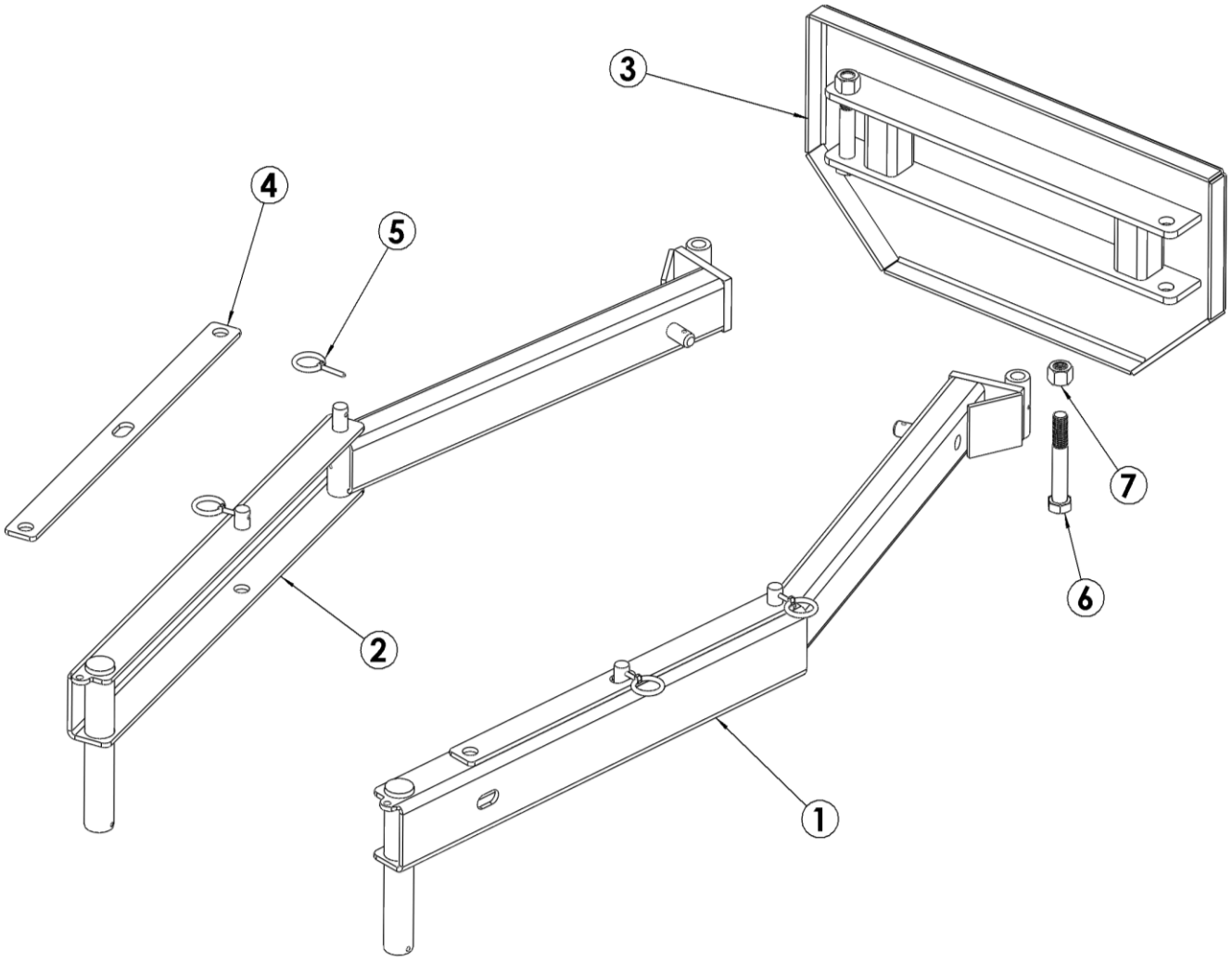
Rollers

Throttle Shaft

Bearings on Last 2 Rollers

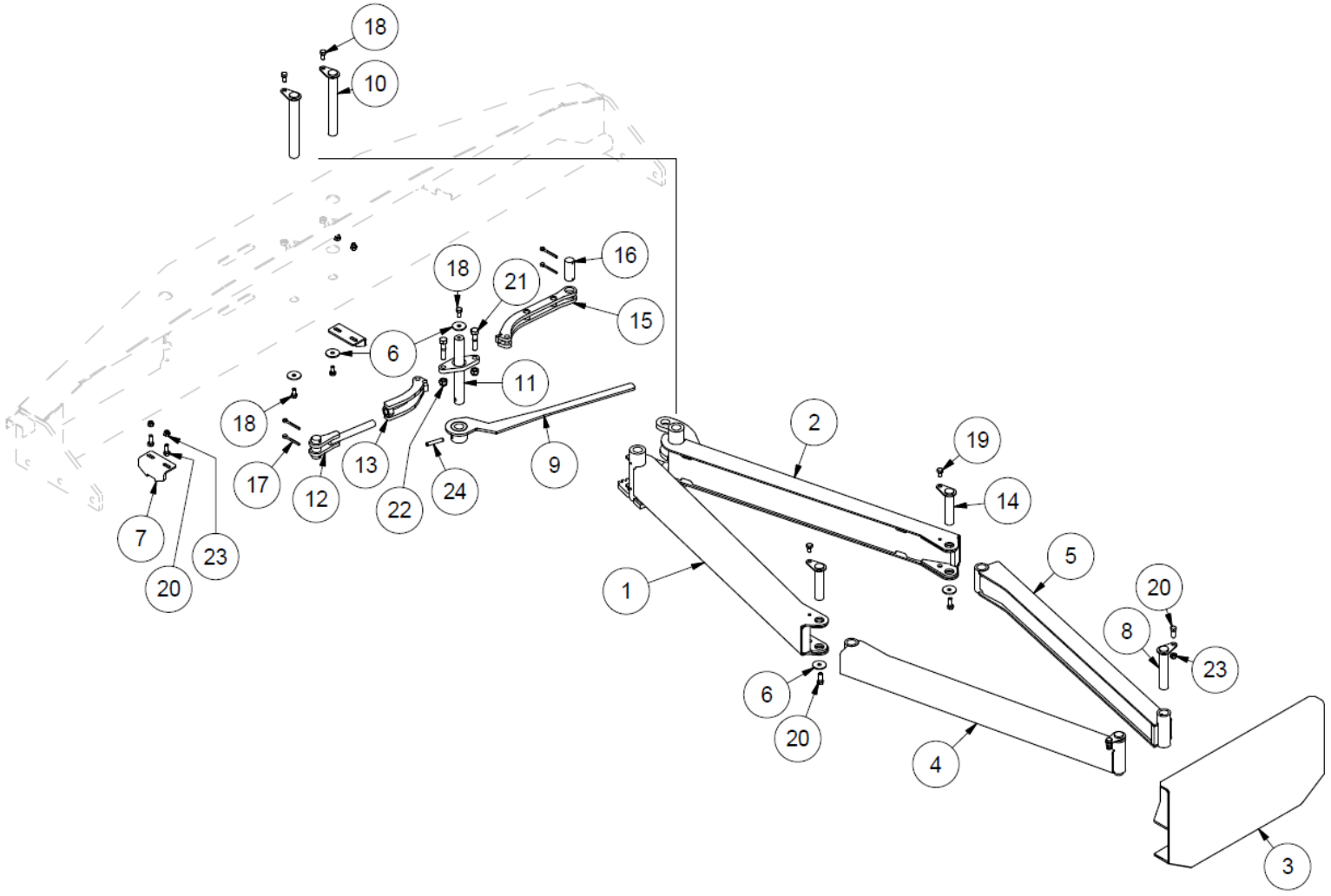
TLR 5000X2
Front Pushoff

For wrappers with a serial # up to 12R218



TLR 5000X2
Front Pushoff

*For wrappers with a serial # **from** 13R001 **to current***



TLR 5000X2
Front Push-off

For wrappers with a serial # up to 12R218

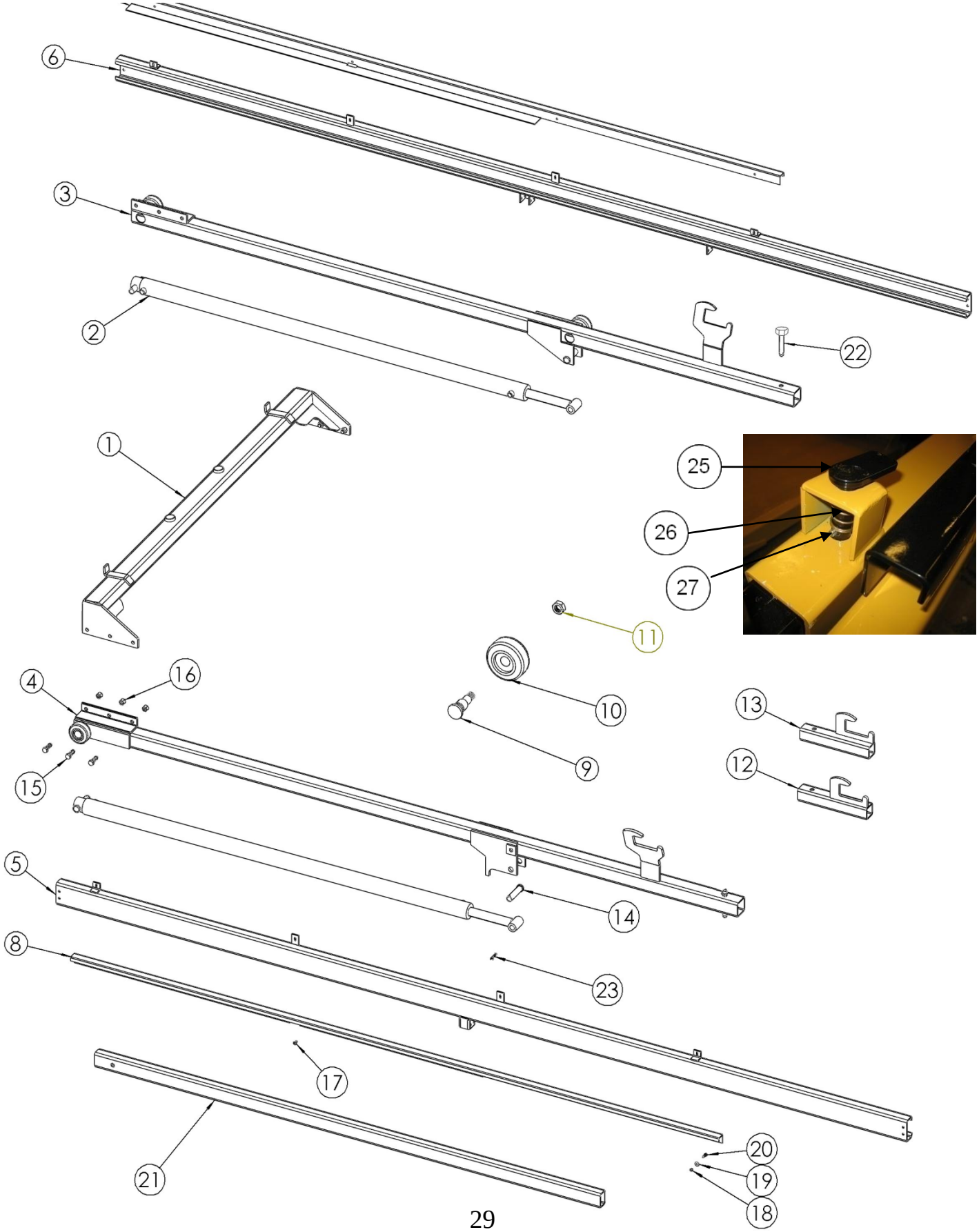
Item	Qty	Part #	Description
1	1	TL5X2-500-143	Left Front Pushoff Arm
2	1	TL5X2-500-144	Right Front Pushoff Arm
3	1	TL5X2-301-016	Push Plate
4	2	TL599-100-017	X Brace
5	4	Obtain Locally	3/16 Linch Pin
6	2	Obtain Locally	3/4-10 x 5 1/2 Bolt Gr.5
7	2	Obtain Locally	3/4-10 Locknut

*For wrappers with a serial # **from** 13R001 **to current***

Item	Qty	Part #	Description
1	1	30455	Left Large Arm
2	1	30456	Right Large Arm
3	1	30459	Push Plate
4	1	30457	Left Small Arm
5	1	30462	Right Small Arm
6	5	30924	Pin Washer
7	2	30958	Handle Holder
8	2	30980	Last Pushoff Plate Pin
9	1	30981	Last Pushoff Handle
10	2	30982	Pushoff Middle Pin
11	1	30983	Linkage Pivot
12	1	30985	Linkage Adjuster
13	1	30986	Pivot Adjuster
14	2	30988	Arm Joint Pin
15	1	30989	Solid Pivot Arm
16	2	30993	Ram Linkage Mount Pin
17	4	Obtain Locally	CP .188 X 2 Cotter Pin
18	5	Obtain Locally	HB .375 X .75 Hex Bolt
19	2	Obtain Locally	HB .375 X .625 Hex Bolt
20	8	Obtain Locally	HB .375 X 1 Hex Bolt
21	2	Obtain Locally	HB .5 X 2.25 Hex Bolt
22	2	Obtain Locally	LN .5 Lock Nut
23	6	Obtain Locally	LN .375 Lock Nut
24	1	Obtain Locally	RP .375 X 2 Roll Pin

TLR 5000X2
Ram

For wrappers with a serial # up to 12R218



TLR 5000X2
Ram

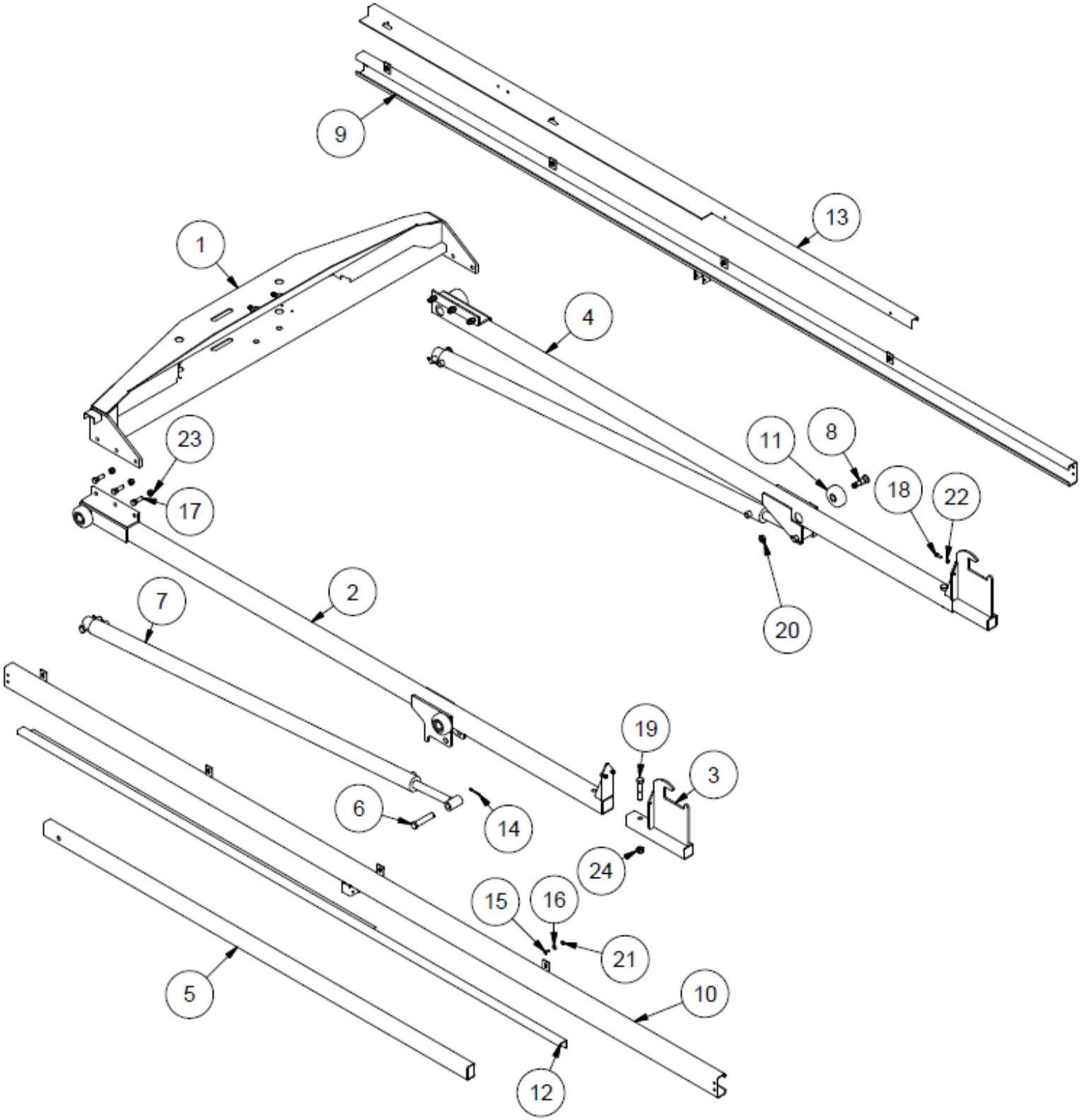
For wrappers with a serial # up to 12R218

Item	Qty	Part #	Description
1	1	TL5X2500128	Front Ram Member
2	2	TL550100043	Ram Cylinder
	2	TLSK25	Ram Cylinder Seal Kit
3	1	TL5X2301151	Right Ram Tube
4	1	TL5X2301153	Left Ram Tube
5	1	TL5X2301171	Left Side Rail
6	1	TL5X2301170	Right Side Rail
7	1	TL5X2301172	Right Door Track
8	1	TL5X2301176	Left Door Track
9	2	TL5X2301156	Ram Wheel Axle
10	2	TL5X2301157	Ram Wheel
11	4	Obtain Locally	3/4-16 UNF Jam Nut
12	1	TL5X2-500-129	Left Last Pushoff Hook
13	1	TL5X2-500-130	Right Last Pushoff Hook
14	4	TL550-100-042	Ram Cylinder Pin
15	6	Obtain Locally	5/8-18 x 2 Bolt Gr.5
16	6	Obtain Locally	5/8-18 Locknut
17	4	Obtain Locally	5/16-18 Flat Head Bolt Gr.5
18	8	Obtain Locally	5/16-18 Locknut
19	8	Obtain Locally	5/16 Flatwasher
20	4	Obtain Locally	5/16-18 x 1Bolt Gr.5
21	2	TL500301048	Push Off Tube
22	2	Obtain Locally	3/4 x 4 Hex Bolt (From Serial # 09R178 – 11R012)
23	4	Obtain Locally	3/16 Cotter Pin
24	2	Obtain Locally	¾ Lock Nut
25	1	27230	Push-Off Latch Pin
26	1	27566	Spring
27	1	Obtain Locally	¼ x 2 ½ Spring Pin

✱ *25, 26 and 27 are used on wrappers with a serial # from 11R011 – 12R218*

TLR 5000X2
Ram

*For wrappers with a serial # **from** 13R001 **to current***

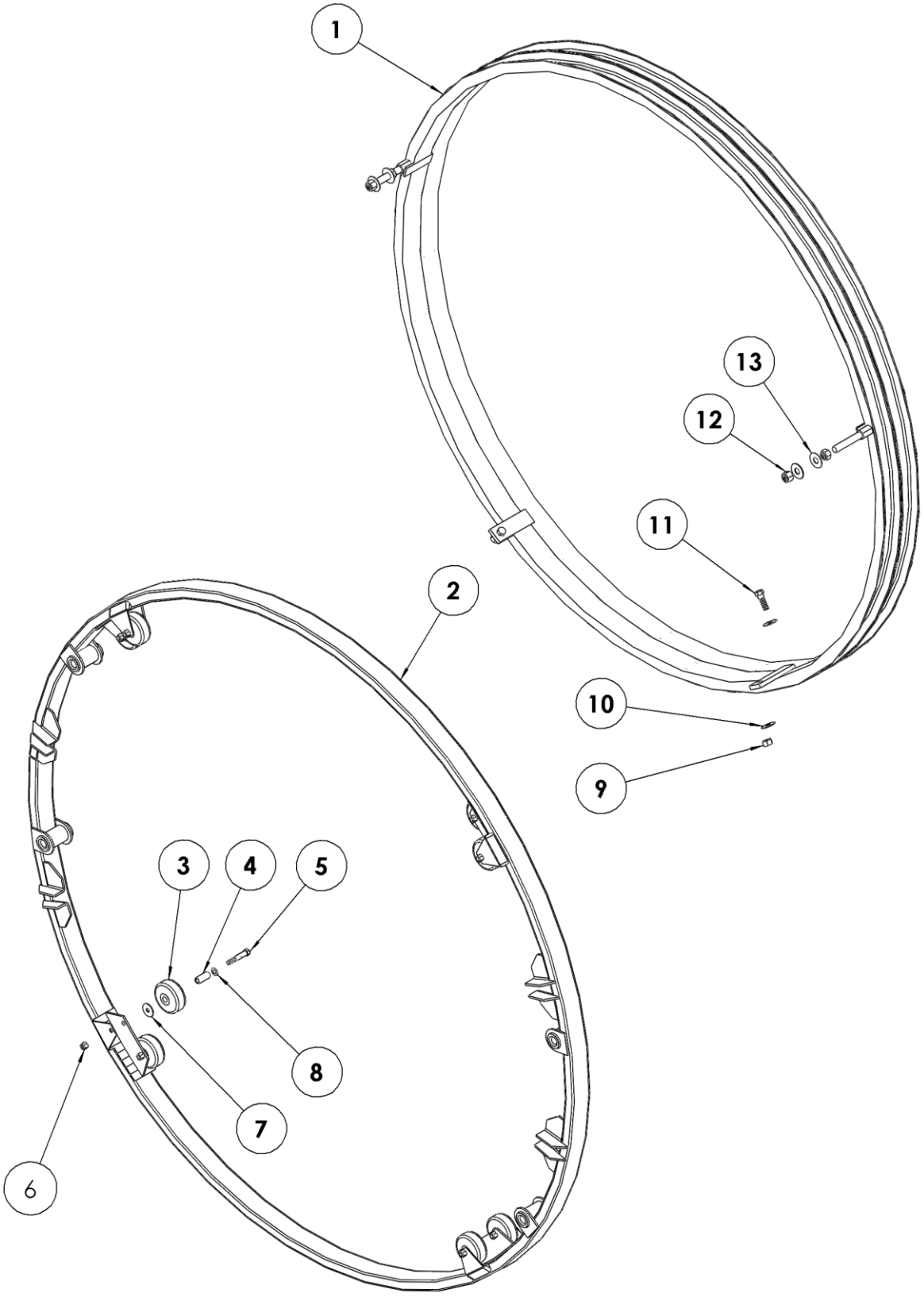


TLR 5000X2
Ram

*For wrappers with a serial # **from** 13R001 **to current***

Item	Qty	Part #	Description
1	1	30927	Ram
2	1	30961	Left Side Ram Tube
3	2	30967	Last Push Off Tube Holder
4	1	30991	Right Side Ram Tube
5	4	TL500-301-048	Push Off Tube
6	1	TL550-100-042	Ram Cylinder Pin
7	2	TL550-100-043	Ram Cylinder
8	4	TL5X2-301-156	Ram Wheel Axle
9	1	TL5X2-301-170	Right Side Rail
10	1	TL5X2-301-171	Left Side Rail
11	4	TL5X2-301-157	Ram Wheel
12	1	TL5X2-301-176	Left Door Track
13	1	TL5X2-301-172	Right Door Track
14	4	Obtain Locally	CP .188 X 2 Cotter Pin
15	8	Obtain Locally	FHSCS .313 X 1 Flat Head Socket Cap Screw
16	8	Obtain Locally	FW .313 Flat Washer
17	6	Obtain Locally	HB .625 X 2 Hex Bolt
18	4	Obtain Locally	HB .375 X 1 Hex Bolt
19	2	Obtain Locally	HB .75 X 4 Hex Bolt
20	4	Obtain Locally	HJN .75 UNF Hex Jam Nut
21	8	Obtain Locally	LN .313 Lock Nut
22	4	Obtain Locally	LN .375 Lock Nut
23	6	Obtain Locally	LN .625 Lock Nut
24	2	Obtain Locally	LN .75 Lock Nut

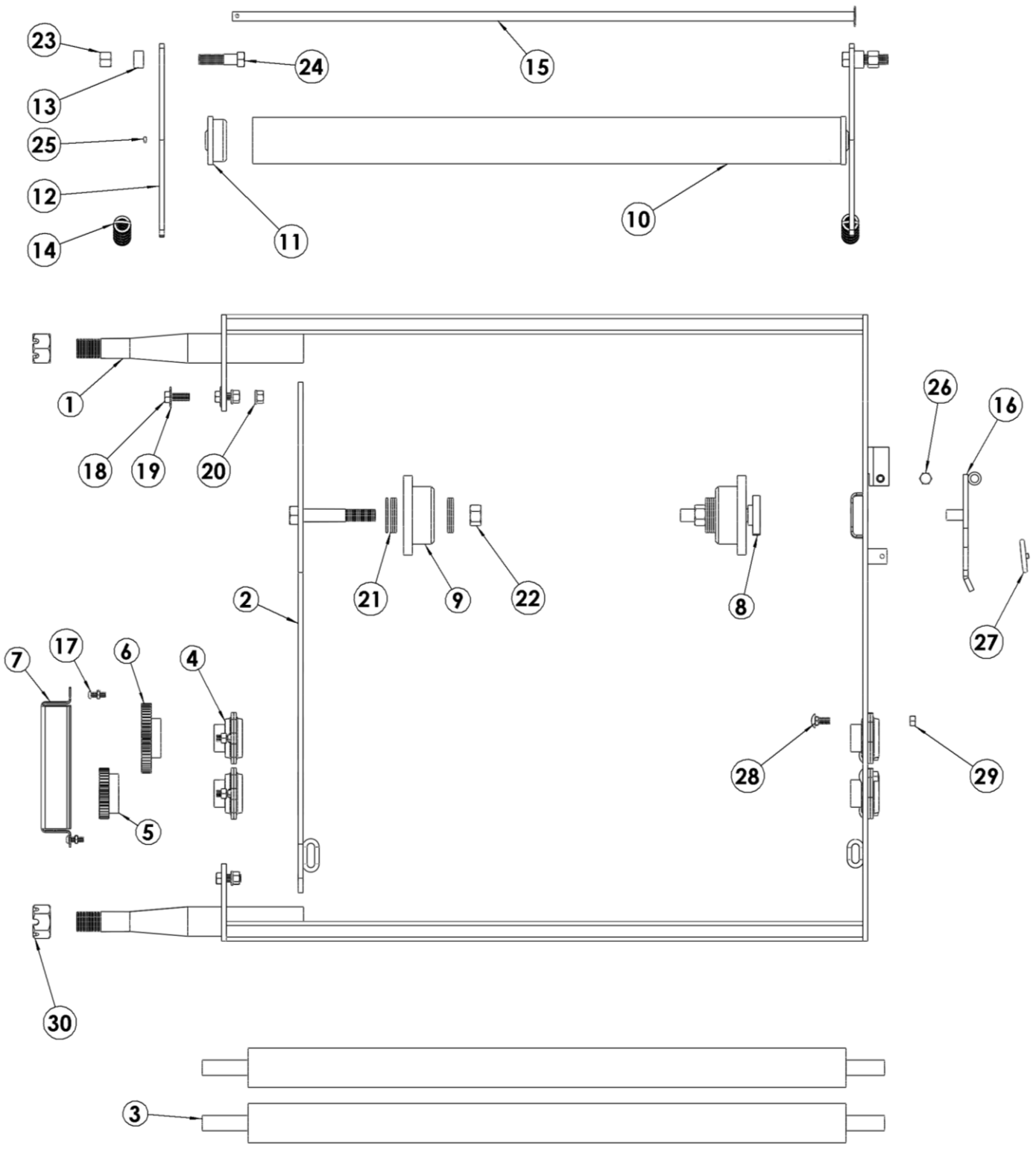
TLR 5000X2
Hoop Assembly



TLR 5000X2
Hoop Assembly

Item	Qty	Part #	Description
1	1	TL550-100-002	Inner Hoop
2	1	TL550-301-001	Outer Hoop
2A		TL5X2-500-101	Complete Outer Hoop (Ref # 2-8)
3	8	TL500-200-014	4” Hoop Wheel
3A		TL5X2-500-102	Complete 4” Hoop Wheel
4	8	TL550-200-016	Spanner
5	8	TL500-100-015	Axle Bolt
6	8	Obtain Locally	½–20 Steel Locknut
7	8	Obtain Locally	½ Fender Washer
8	8	Obtain Locally	½ SAE Washer
9	2	Obtain Locally	5/8-11 Locknut
10	4	Obtain Locally	5/8 Flatwasher
11	2	Obtain Locally	5/8-11 x 2 Bolt Gr.5
12	4	Obtain Locally	3/4-10 Locknut
13	4	Obtain Locally	¾ Flatwasher

TLR 5000X2
Plastic Wrap Carrier

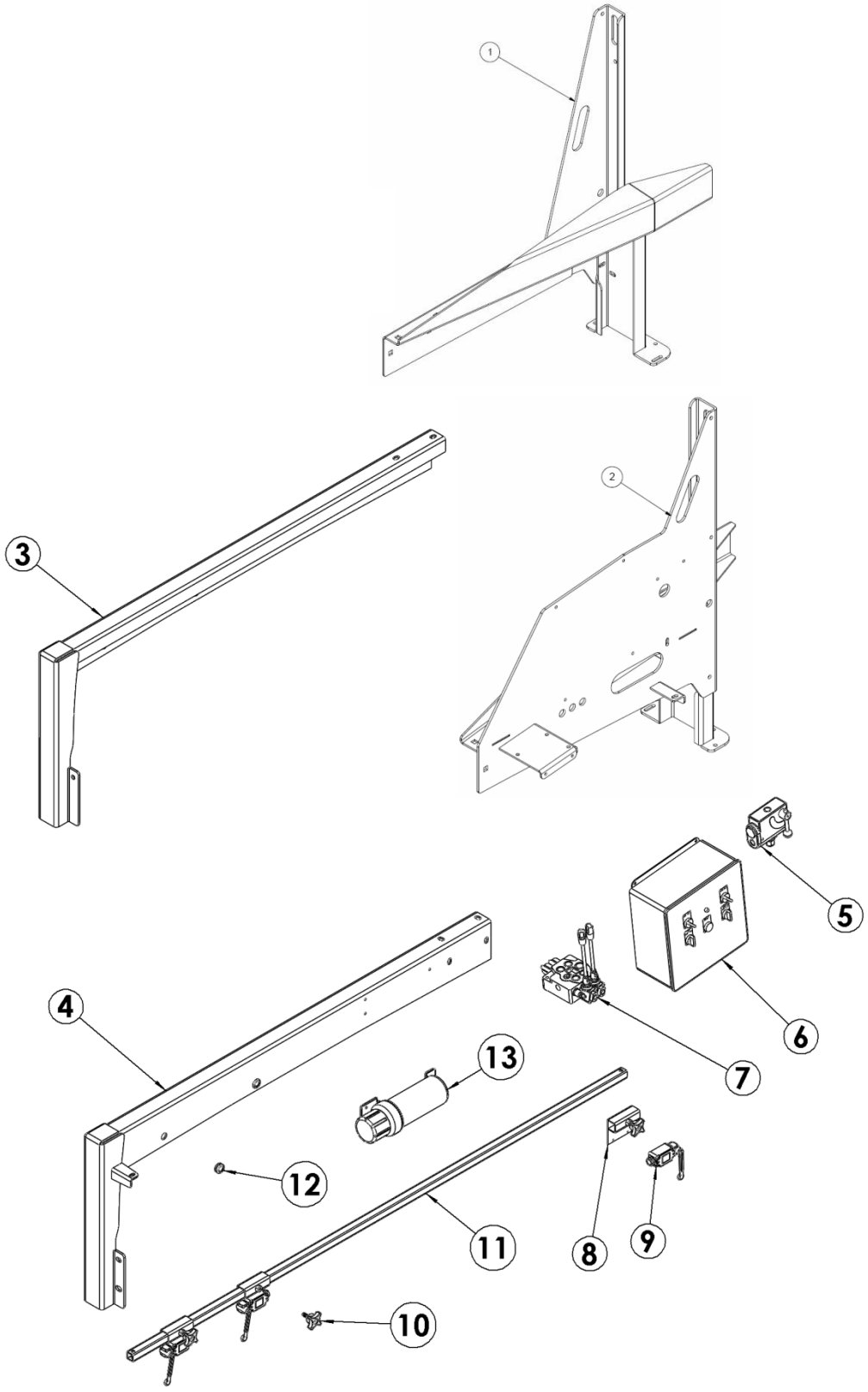


TLR 5000X2
Plastic Wrap Carrier

Item	Qty	Part #	Description
1A	2	TL550-100-072	Complete Wrap Carrier
1	2	TL550-100-089	Main Wrap Bracket
2	2	TL550-200-090	Main Wrap Side Insert
3	4	TL550-100-006	Tensioner Rollers
4	4	TL550-100-007	¾ Bearing c/w Flange
5	2	TL550-100-008	Small Gear
6	2	TL550-100-009	Large Gear
7	2	TL550-100-010	Gear Cover
8A		TL5X2-500-103	Spool Holder c/w Parts (Ref # 8,9,21,22)
8	2	TL550-200-115	Spool Holder
9	4	TL550-200-012	Plastic Wrap Spool
10A	2	TL5X2-500-104	Slave Roller c/w End cap (Ref # 10,11)
10	2	TL550-100-022	ABS Pipe
11	4	TL500-100-021	HMWPVC Plastic End Cap
12	4	TL550-100-016	Slave Roller Mount Bracket
13	4	TL550-100-017	Spacer
14	4	TL500-100-135	Tensioner Spring
15	2	TL550-100-018	Slave Roller Axle Shaft
16	2	TL550-200-103	Spool Latch
17	8	Obtain Locally	10-24 x 3/4 Bolt c/w nut & Lockwasher
18	8	Obtain Locally	3/8-16 x 1 Bolt Gr.5
19	8	Obtain Locally	3/8 Flatwasher
20	10	Obtain Locally	3/8-16 Locknut
21	20	Obtain Locally	5/8 Flatwasher
22	4	Obtain Locally	5/8-11 Locknut
23	4	Obtain Locally	1/2-13 Locknut
24	4	Obtain Locally	1/2-13 x 2 Bolt Gr.5
25	2	Obtain Locally	1/8 Cotter Pin
26	2	Obtain Locally	3/8-16 x 2 1/2 Bolt Gr.5
27	2	Obtain Locally	3/16 Linch Pin
28	16	Obtain Locally	5/16-18 x 3/4 Carr Bolt
29	16	Obtain Locally	5/16-18 Locknut
30	4	Obtain Locally	1”-14 UNF Slotted Nut

TLR 5000X2
Hoop Brace

*For wrappers with a serial # **up to** 12R218*



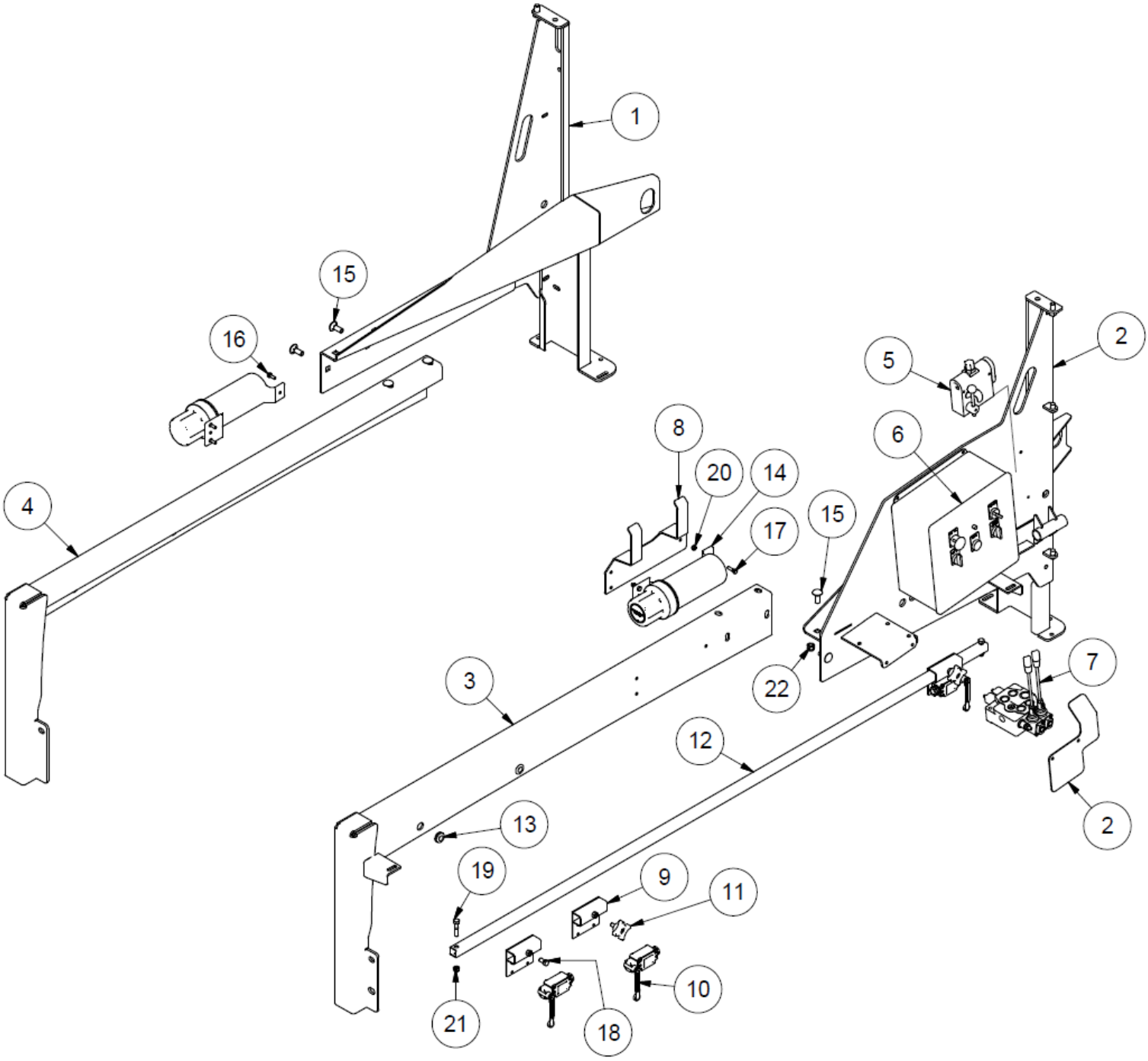
TLR 5000X2
Hoop Brace

*For wrappers with a serial # **up to** 12R218*

Item	Qty	Part #	Description
1	1	TL25669	Right Rear Hoop Brace
2	1	TL25670	Left Rear Hoop Brace
3	1	TL5X2-500-107	Right Front Hoop Brace
4	1	TL5X2-500-108	Left Front Hoop Brace
5	1	TL500-100-193	RD150-08 Flow Control
6	1	TL550-200-061	Control Panel
7	1	TL5X2-201-055	2 Spool Valve
8A		TL5X2-500-109	Switch Slider c/w Switch (Ref # 8 – 10)
8	3	TL5X2-100-242	Switch Slider (Short)
9	3	TL550-100-060	Limit Switch
10	3	TL5X2-100-104	Switch Adjuster Screw (4 Prong Knob)
11	1	TL5X2-500-110	Switch Slider Tube
12	2	TL5X2-100-143	Grommet
13	1	TL5X2-201-111	Manual Holder

TLR 5000X2
Hoop Brace

*For wrappers with a serial # **from** 13R001 **to current***



TLR 5000X2
Hoop Brace

*For wrappers with a serial # **from** 12R061 **to current***

Item	Qty	Part #	Description
1	1	25669	Right Rear Hoop Brace
2	1	25670	Left Rear Hoop Brace
3	1	TL5X2-500-108	Right Front Hoop Brace
4	1	TL5X2-500-107	Left Front Hoop Brace
5	1	TL500-100-193	RD150-08 Flow Control
6	1	TL550-200-061	Control Panel
7	1	TL5X2-201-055	2 Spool Valve
8	1	30867	Tape Holder
9A		TL5X2-500-109	Switch Slider c/w Switch (Ref # 10-12)
9	3	TL5X2-100-242	Switch Slider
10	3	TL5X2-100-060	Limit Switch
11	2	TL550-100-104	Switch Adjuster Screw (4 Prong Knob)
12	1	TL5X2-500-110	Switch Slider Tube
13	2	TL5X2-100-143	.625” Grommet
14	2	TL5X2-201-111	Manual Holder
15	8	Obtain Locally	CB .5 X 1.25 Carriage Bolt
16	3	Obtain Locally	HB .25 X .75 Hex Bolt
17	3	Obtain Locally	HB .25 X 1 Hex Bolt
18	1	Obtain Locally	HB .375 X .75 Hex Bolt
19	2	Obtain Locally	HB .375 X 1.75 Hex Bolt
20	6	Obtain Locally	LN .25 Lock Nut
21	2	Obtain Locally	LN .375 Lock Nut
22	8	Obtain Locally	LN .5 Lock Nut

TLR 5000X2
Safety Guard

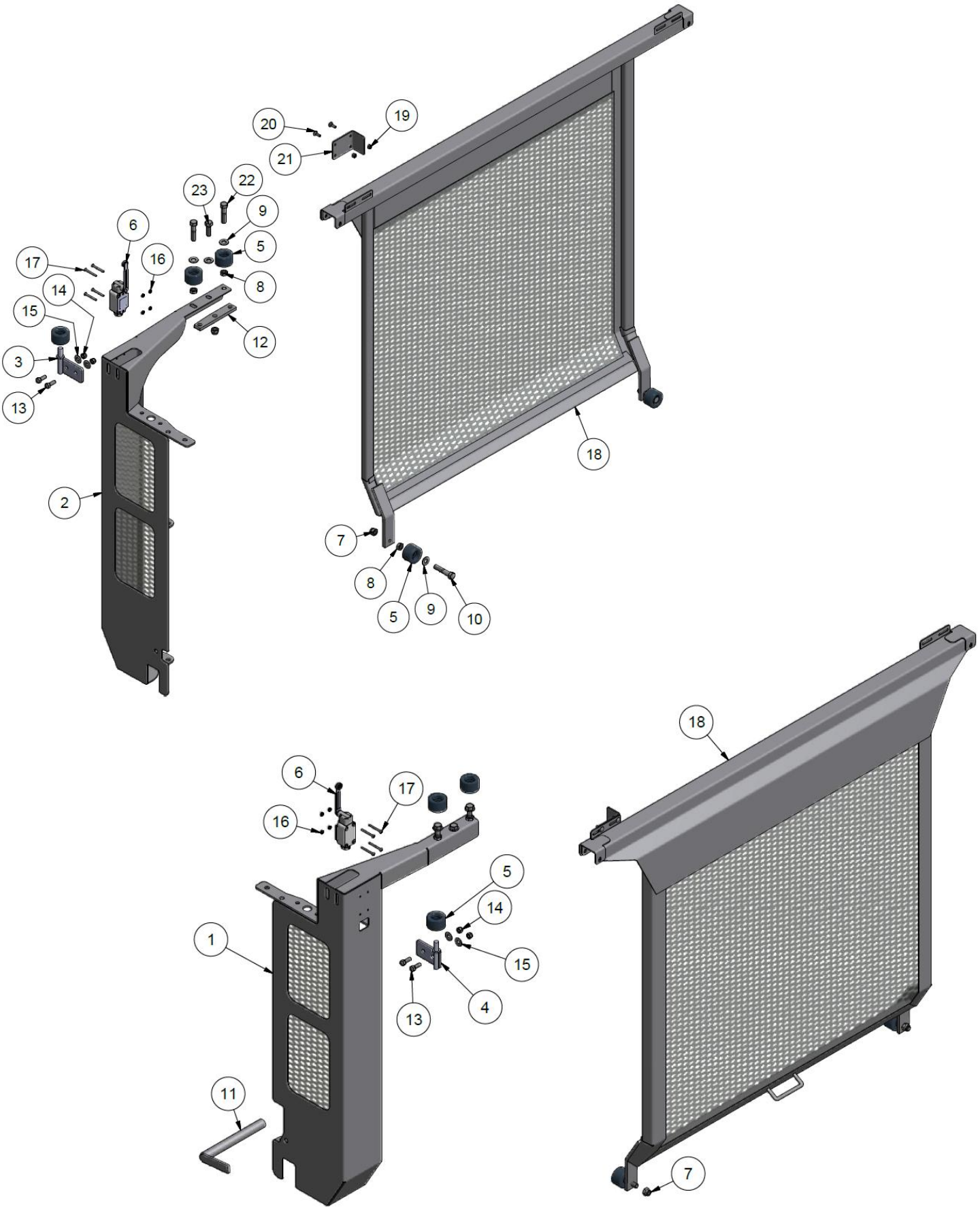
*For wrappers with a serial # **up to** 12R060*

TLR 5000X2
Safety Guard

Item	Qty	Part #	Description
1	1	TL5X2-100-025	Left Safety Guard
2	1	TL5X2-100-024	Right Safety Guard
3	1	TL5X2-301-103	Right Top Door Roller Bracket
4	1	TL5X2-301-120	Left Top Door Roller Bracket
5	6	TL5X2-301-121	Door Roller
6	2	TL550-100-060	Limit Switch
7	6	Obtain Locally	1/2-13 Locknut
8	8	Obtain Locally	1/2-13 Jam Nut
9	4	Obtain Locally	1/2 SAE Flatwasher
10	4	Obtain Locally	1/2-13 x 2 1/2 Bolt Gr.5
11	1	TL550-200-050	Hoop Lock Pin
12	1	Obtain Locally	5/16-18 Locknut
13	1	Obtain Locally	5/16-18 x 1 Bolt Gr.5
14	4	Obtain Locally	3/8-16 x 1 1/4 Bolt Gr.5
15	4	Obtain Locally	3/8-16 Locknut
16	4	Obtain Locally	3/8 Flatwasher
17	8	Obtain Locally	10-24 Nut
18	8	Obtain Locally	10-24 x 1 3/4 Bolt Gr.5
19	2	24111	Door Weldment
20	4	Obtain Locally	1/4 Lock Nut
21	4	Obtain Locally	1/4 x 3/4 Carriage Bolt
22	2	25062	Door Switch Tab
23	4	Obtain Locally	1/2-13 x 4 Bolt

TLR 5000X2
Safety Guard

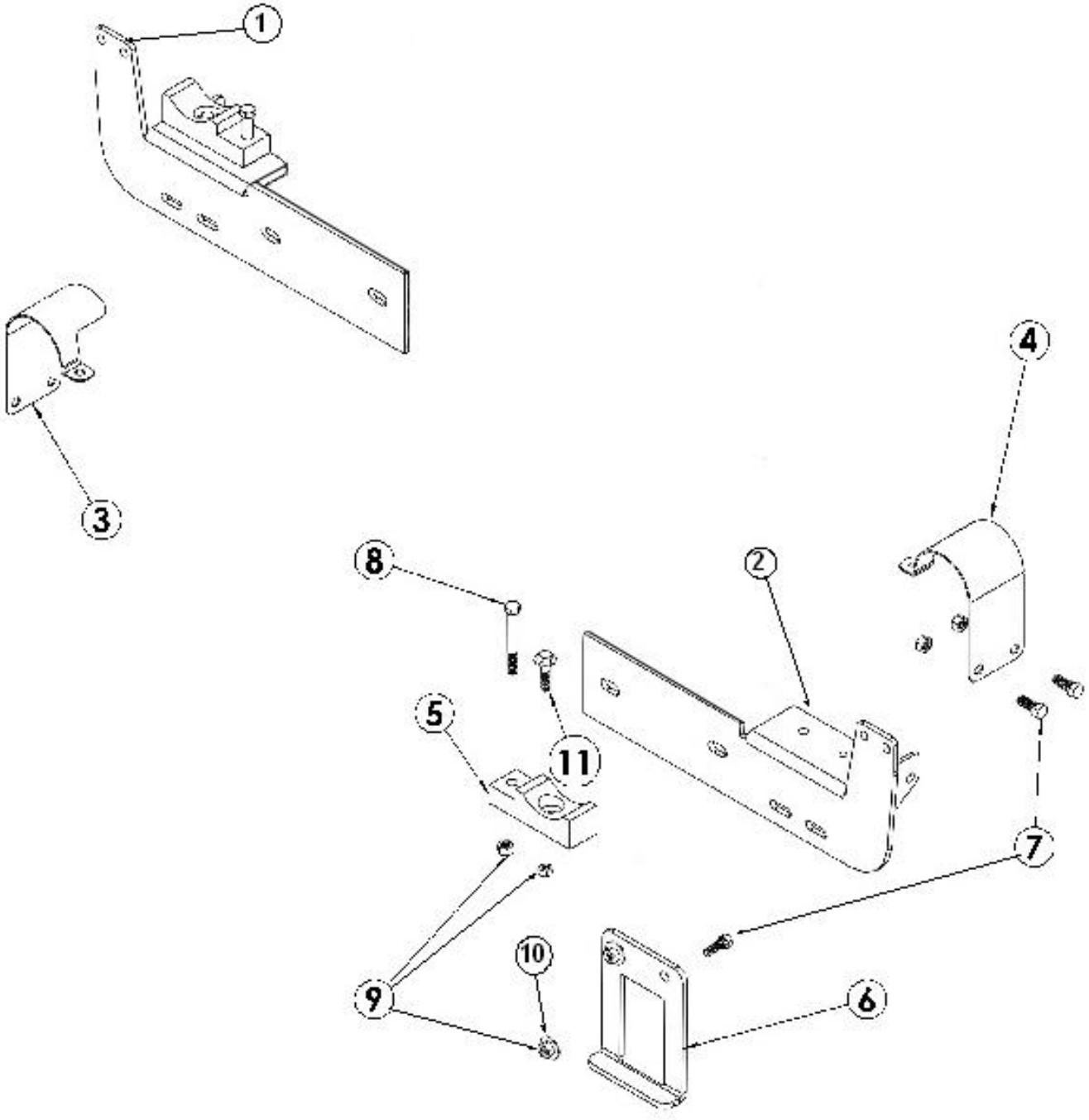
*For wrappers with a serial # **from** 12R061 **to current***



TLR 5000X2
Safety Guard

Item	Qty	Part #	Description
1	1	TL109-100-364	Left Safety Guard
2	1	TL109-100-363	Right Safety Guard
3	1	TL5X2-301-103	Right Top Door Roller Bracket
4	1	TL5X2-301-120	Left Top Door Roller Bracket
5	10	TL5X2-301-121	Door Roller
6	2	TL550-100-060	Limit Switch
7	6	Obtain Locally	1/2-13 Locknut
8	8	Obtain Locally	1/2-13 Jam Nut
9	10	Obtain Locally	1/2 SAE Flatwasher
10	4	Obtain Locally	1/2-13 x 2 1/2 Bolt Gr.5
11	1	TL550-200-050	Hoop Lock Pin
12	2	28741	Rear Roller Mount
13	4	Obtain Locally	3/8-16 x 1 1/4 Bolt Gr.5
14	4	Obtain Locally	3/8-16 Locknut
15	4	Obtain Locally	3/8 Flatwasher
16	8	Obtain Locally	10-24 Nut
17	8	Obtain Locally	10-24 x 1 3/4 Bolt Gr.5
18	2	24111	Door Weldment
19	4	Obtain Locally	1/4 Lock Nut
20	4	Obtain Locally	1/4 x 3/4 Carriage Bolt
21	2	25062	Door Switch Tab
22	4	Obtain Locally	1/2 x 2 1/4 Bolt
23	2	Obtain Locally	1/2 x 1 1/2 Bolt

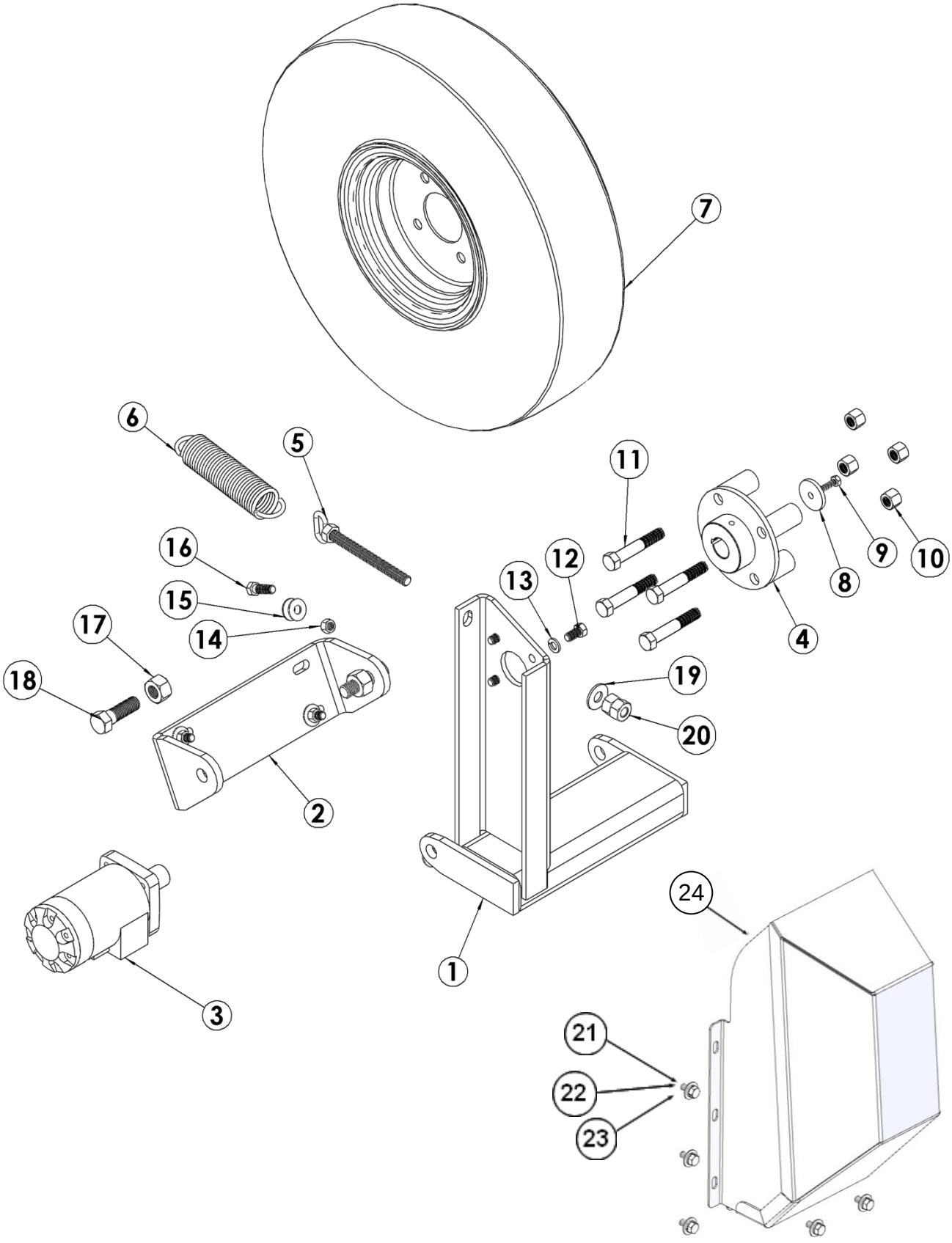
TLR 5000X2
Cylinder Support



TLR 5000X2
Cylinder Support

Item	Qty	Part #	Description
1	1	TL25671	Left Center Cylinder Support
2	1	TL25672	Right Center Cylinder Support
3	1	TL5X2-100-132	Cylinder Clamp
4	1	TL5X2-100-133	Cylinder Clamp
5	2	TL550-200-109	Cylinder Support
6	1	TL5X2-500-142	Bottom Pushoff Holder
7	4	Obtain Locally	3/8-16 x 1 Bolt Gr.5
8	2	Obtain Locally	3/8-16 x 3 Bolt Gr.5
9	6	Obtain Locally	3/8-16 Locknut
10	2	Obtain Locally	5/16-18 Nut
11	2	Obtain Locally	5/16-18 x 1 1/4 Bolt Gr.5

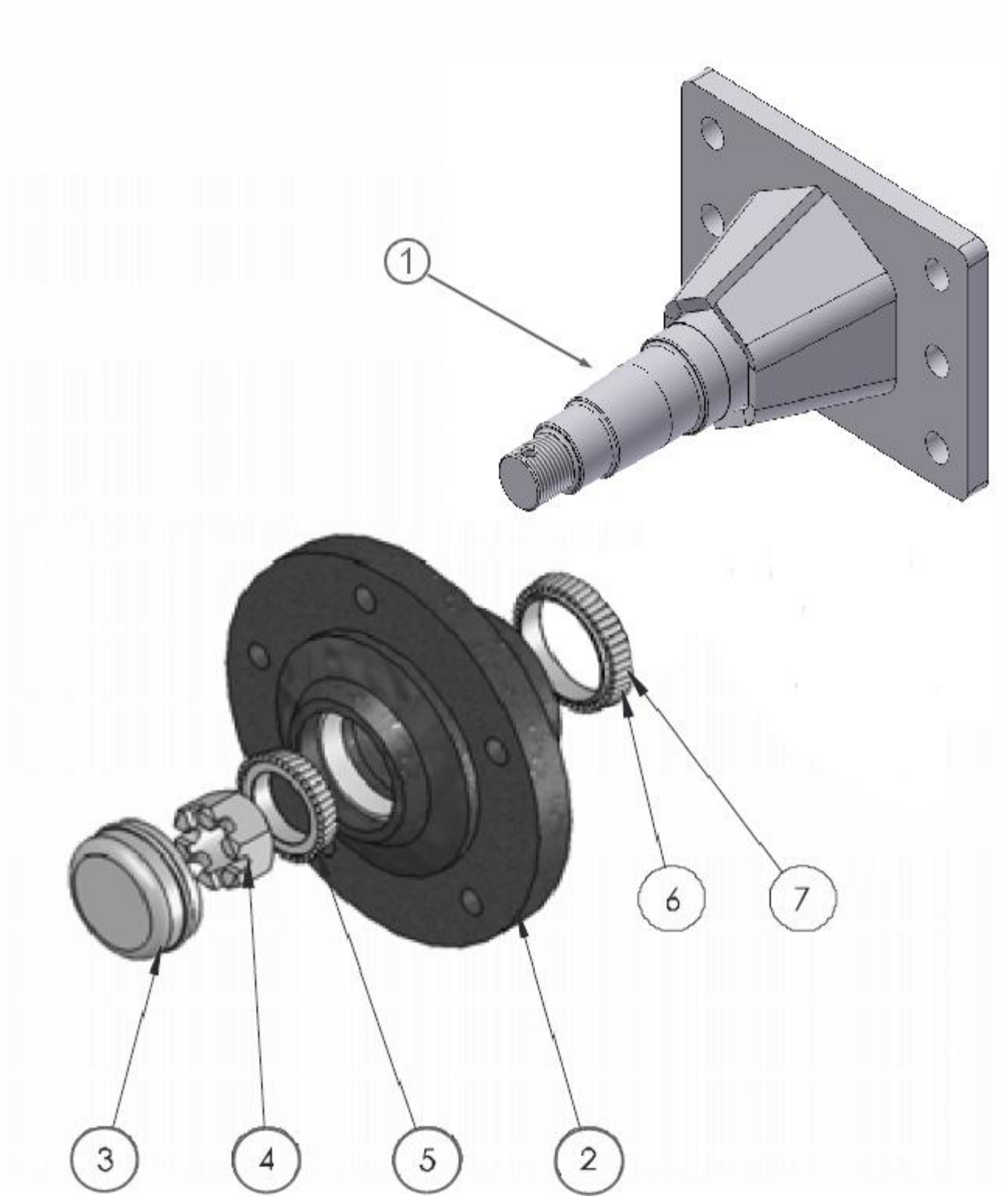
TLR 5000X2
Hoop Drive



TLR 5000X2
Hoop Drive

Item	Qty	Part #	Description
1	1	TL5X2-100-049	Drive Base
2	1	TL5X2-100-090	Drive Base Mount
3	1	TL5X2-200-050	Hydraulic Motor (M & S)
4	1	TL500-100-051	Wheel Hub
5	1	PP-00051	5/8 X 7 Spade Bolt
6	1	TL500-101-231	Tension Spring
7	1	TL500-100-052	Hoop Drive Wheel
8	1	TL500-100-060	Wheel Hub Washer
9	1	Obtain Locally	1/4-20 x 1 Bolt Gr.5
10	4	TL500-100-054	Wheel Nuts
11	4	Obtain Locally	1/2-20 x 3 UNF Bolt Gr.5
12	4	Obtain Locally	3/8-16 x 1 Bolt Gr.5
13	4	Obtain Locally	3/8 Lockwasher
14	4	Obtain Locally	3/8-16 Locknut
15	8	Obtain Locally	3/8 Flatwasher
16	4	Obtain Locally	3/8-16 x 1 1/4 Bolt Gr.5
17	2	Obtain Locally	5/8-11 Locknut
18	2	Obtain Locally	5/8-11 x 2 Bolt Gr.5
19	1	Obtain Locally	1/2 Flatwasher
20	2	Obtain Locally	1/2-13 Nut
21	5	Obtain Locally	3/8 Flatwasher
22	5	Obtain Locally	3/8 Lockwasher
23	5	Obtain Locally	3/8 x ¾ Bolt
24	1	TL25073	Hoop Wheel Guard

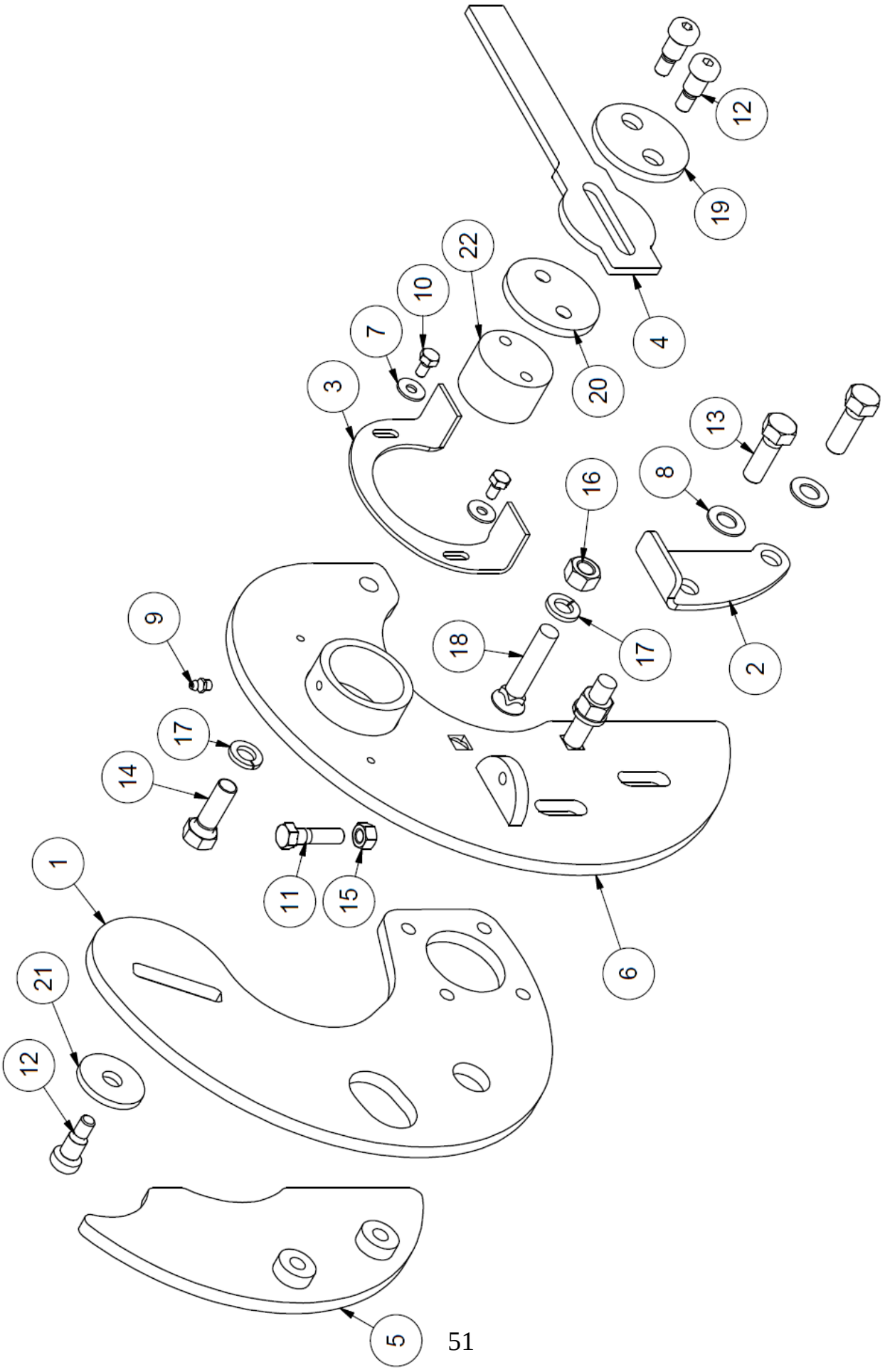
TLR 5000X2
Axle/ Spindle/ Hub



TLR 5000X2
Axle/ Spindle/ Hub

Item	Qty	Part #	Description
1	1	TL550-200-001	Spindle (*serial # **up to** 11R012)*
1	1	TL109-100-356	Spindle (*serial # **after** 11R012)*
2	1	TL500-100-066	Hub
3	1	TL500-100-073	Dust Cap
4	1	TL500-100-070	Castellated Nut
5	1	TL500-100-068	Outer Bearing
6	1	TL500-100-064	Inner Bearing
7	1	TL500-100-063	Inner Seal

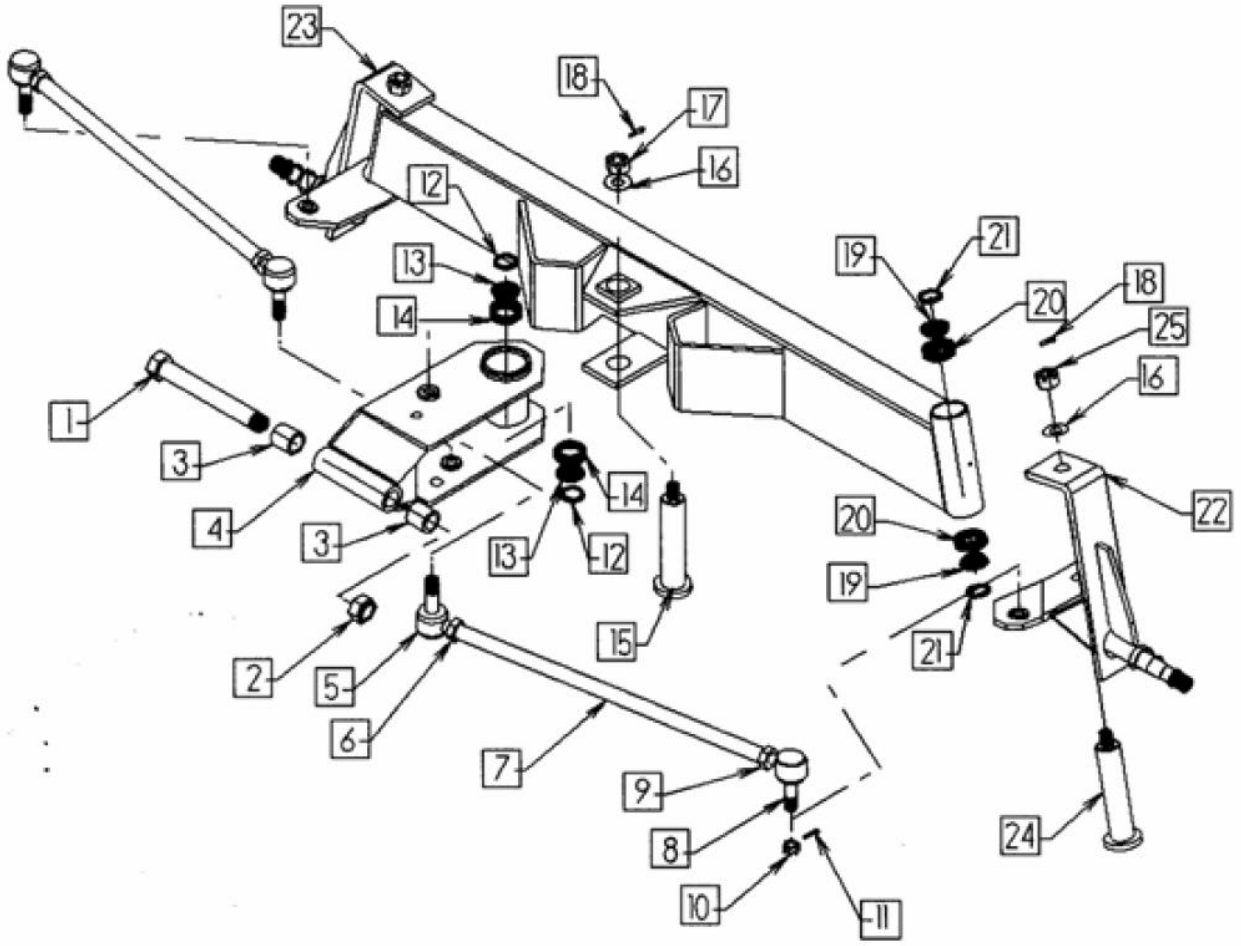
TLR 5000X2
Power Drive Bracket



TLR 5000X2
Power Drive Bracket

Item	Qty	Part #	Description
1	1	25116	Drive Engaging Plate
2	1	25119	Outside Plate Guide
3	1	25121	Handle Lock
4	1	25122	Handle
5	1	25123	Bolt-On Plate
6	1	25124	Main Bracket
7	2	Obtain Locally	FW .25 Flat Washer
8	2	Obtain Locally	FW .5 Flat Washer
9	1	Obtain Locally	.25 Grease Zerk
10	2	Obtain Locally	HB .25 X .5 Hex Bolt
11	1	Obtain Locally	HB .375 X 1.5 Hex Bolt
12	3	Obtain Locally	HB .375 X .625 SS Socket Head Shoulder Screw
13	2	Obtain Locally	HB .5 X 1.5 Hex Bolt
14	1	Obtain Locally	HB .5 X 1.5 UNF Hex Bolt
15	1	Obtain Locally	HN .375 Hex Nut
16	2	Obtain Locally	HN .5 Hex Nut
17	3	Obtain Locally	LW .5 Lock Washer
18	2	Obtain Locally	PB .5 X 2.5 Plow Bolt
19	1	WHEEL2012	Outside Handle Washer
20	1	WHEEL20121	Inside Handle Washer
21	1	WHEEL2013	Inside Cam Washer
22	1	WHEEL9	Eccentric

TLR 5000X2
Front Steering

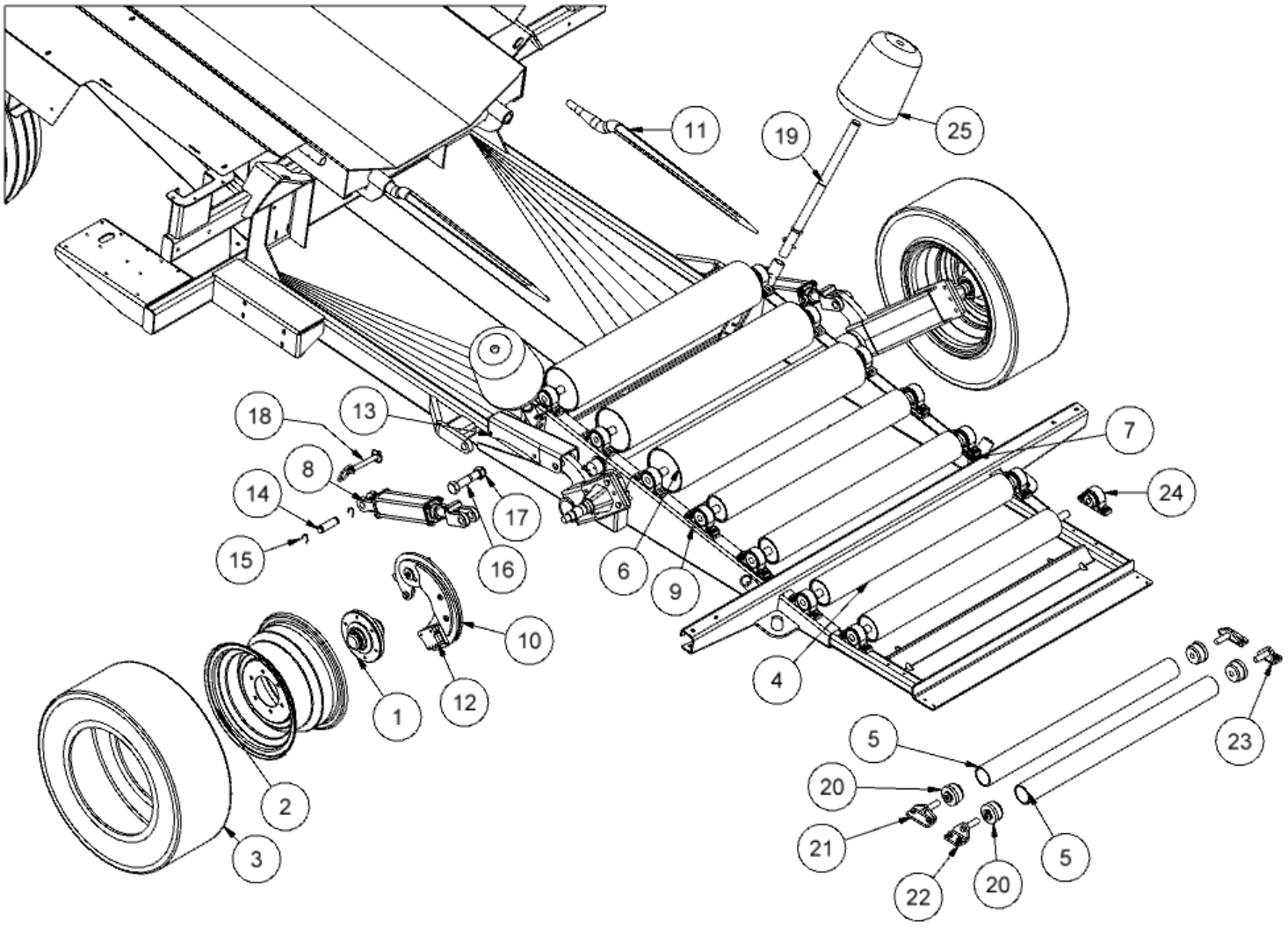


TLR 5000X2
Front Steering

Item	Qty	Part #	Description
1	1	TL500-100-152	7/8 x 8 Bolt
2	1	TL500-100-153	7/8 Locknut
3	2	TL550-111-012	Tongue Bracket Bushing
4	1	TL550-221-008	Tongue Bracket Asm
5	2	TL550-111-006	Tie Rod End Right Thread
6	2	TL550-111-003	¾ Jam Nut (NF RH)
7	2	TL550-220-001	Tie Rod
8	2	TL550-111-007	Tie Rod End Left Thread
9	2	TL550-111-002	¾ Jam nut (NF LH)
10	4	TL550-111-004	9/16 NF Slotted Hex Nut
11	4	TL550-111-005	1/8 Cotter Pin
12	2	TL550-111-011	Tongue Bracket Seal
13	2	TL550-111-010	Tongue Bracket Timkin Bearing
14	2	TL550-111-009	Tongue Bracket Timkin Cup
15	1	TL550-221-013	Tongue Bracket Pin
16	3	TL550-111-014	13/16 Flatwasher
17	1	TL550-111-015	Tongue Bracket Nut
18	3	TL550-111-016	3/16 x 2 Cotter Pin
19	4	TL550-200-080	Spindle Bearing Timkin Cone
20	4	TL550-200-081	Spindle Bearing Timkin Cup
21	4	TL550-200-082	Spindle Bearing Seal
22	1	TL550-100-083	Left Side Spindle Assy
23	1	TL550-100-084	Right Side Spindle Assy
24	2	TL550-100-085	Spindle Pin
25	2	TL500-100-070	1” Fine Thread Castle Nut

TLR 5000X2
Rear Axle & Roller Bed

*For wrappers with a serial # **up to** 11R012*



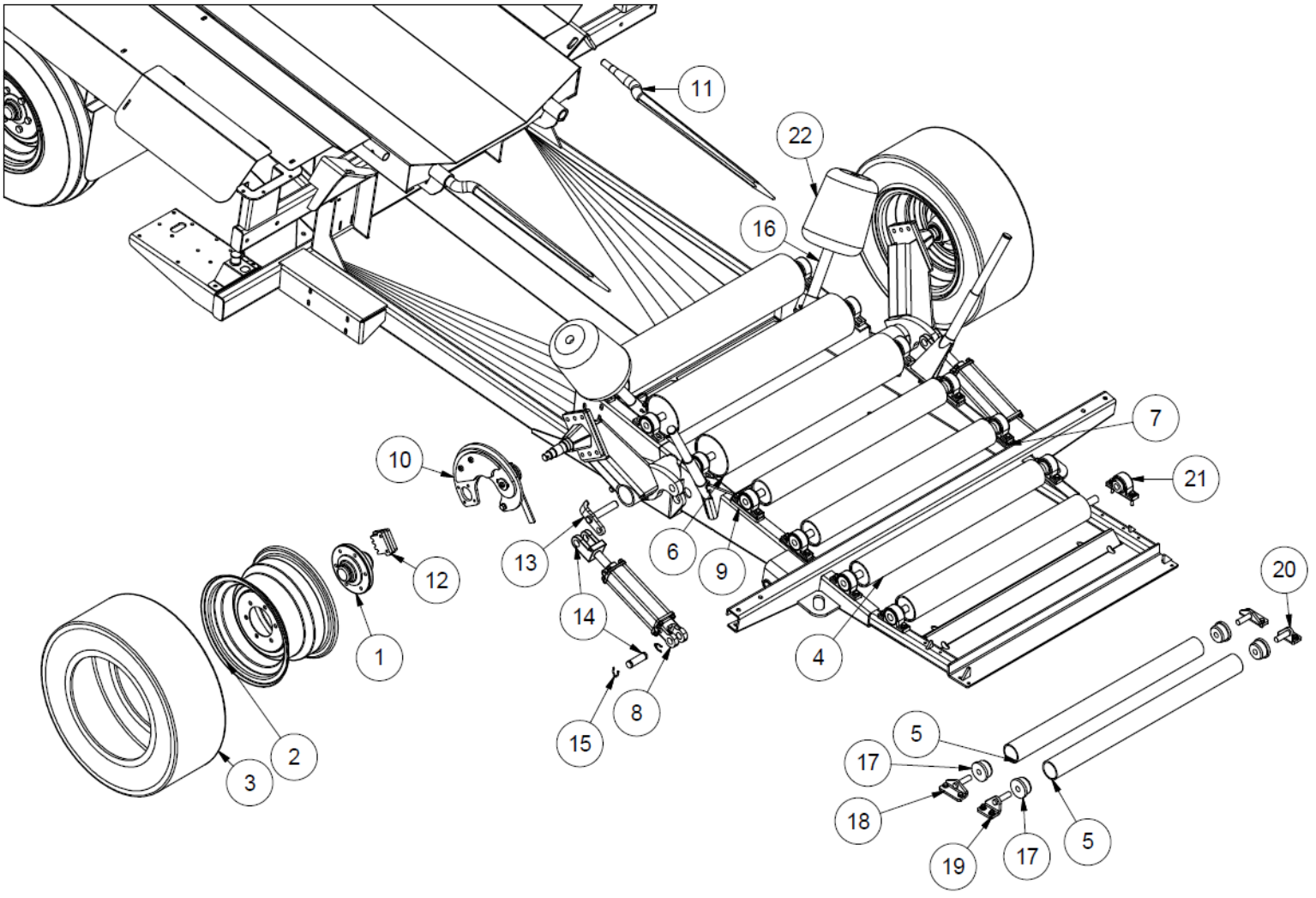
TL 5000X2
Rear Axle & Roller Bed

*For wrappers with a serial # **up to** 11R012*

Item	Qty	Part #	Description
1	2	TL5X2-500-113	Hub c/w Parts (4000 lb)
2	2	TL550-200-134	Rim with Gear
3	2	TL5X2-500-114	Lug Tire
4	4	TL500-100-099	4" Roller
5	2	TL550-200-106	2 7/8" Roller
6	3	TL500-100-086	6 5/8" Roller
7	3	TL5X2-500-124	1/4" Roller Spacer
8	2	TL500-100-082	Hydraulic Cylinder
9	2	TL5X2-500-125	1/2" Roller Spacer
10	1	TL109-100-355	Power Drive Assembly
11	2	TL5X2-500-123	35" Crank Tine
12	1	TL109-100-345	Parking brake pad
13	1	TL5X2-500-117	Transport Lock
14	2	TL5X2-500-116	Cylinder Pin
15	4	TL25299	Cylinder Clip
16	1	Obtain Locally	HB 1” X 5” Hex Bolt UNC
17	1	Obtain Locally	LN 1” Lock Nut UNC
18	1	TL25415	Transport Lock Pin
19	2	TL550-301-239	Guide Roller Spindle
20	4	TL550-100-092	3/4" Nylon Bearing End Cap
21	2	TL550-200-003	Small Roller Mount
22	1	TL550-200-005	Left Rear Small Roller Mount
23	1	TL550-200-004	Right Rear Small Roller Mount
24	14	TL550-100-030	1" Pillow Block Bearing
25	2	TL550-301-238	Plastic Guide Roller

TL 5000X2
Rear Axle & Roller Bed

*For wrappers with a serial # **from** 11R012 **to current***

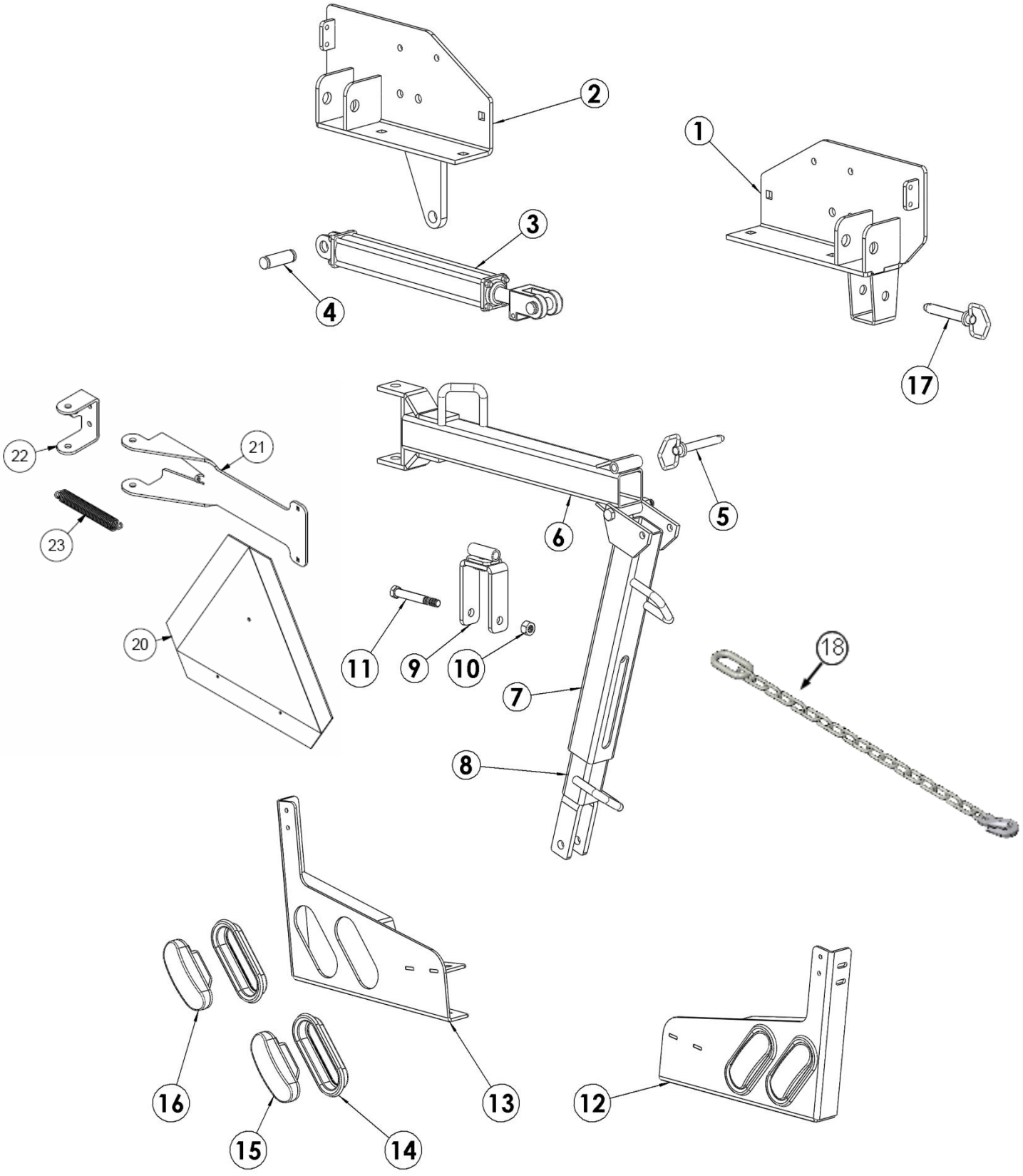


TL 5000X2
Rear Axle & Roller Bed

*For wrappers with a serial # **from** 11R012 **to current***

Item	Qty	Part #	Description
1	2	TL5X2-500-113	Hub c/w Parts (4000 lb)
2	2	TL550-200-134	Rim with Gear
3	2	TL5X2-500-114	Lug Tire
4	4	TL500-100-099	4" Roller
5	2	TL550-200-106	2 7/8" Roller
6	3	TL500-100-086	6 5/8" Roller
7	3	TL5X2-500-124	1/4" Roller Spacer
8	2	TL500-100-082	Hydraulic Cylinder
9	2	TL5X2-500-125	1/2" Roller Spacer
10	1	TL109-100-360	Power Drive Assembly
11	2	TL5X2-500-123	35" Crank Tine
12	1	TL109-100-345	Parking brake pad
13	1	27528	Transport Lock Pin
14	2	TL5X2-500-116	Cylinder Pin
15	4	25299	Cylinder Clip
16	2	TL550-301-239	Guide Roller Spindle
17	4	TL550-100-092	3/4" Nylon Bearing End Cap
18	2	TL550-200-003	Small Roller Mount
19	1	TL550-200-005	Left Rear Small Roller Mount
20	1	TL550-200-004	Right Rear Small Roller Mount
21	14	TL550-100-030	1" Pillow Block Bearing
22	2	TL550-301-238	Plastic Guide Roller

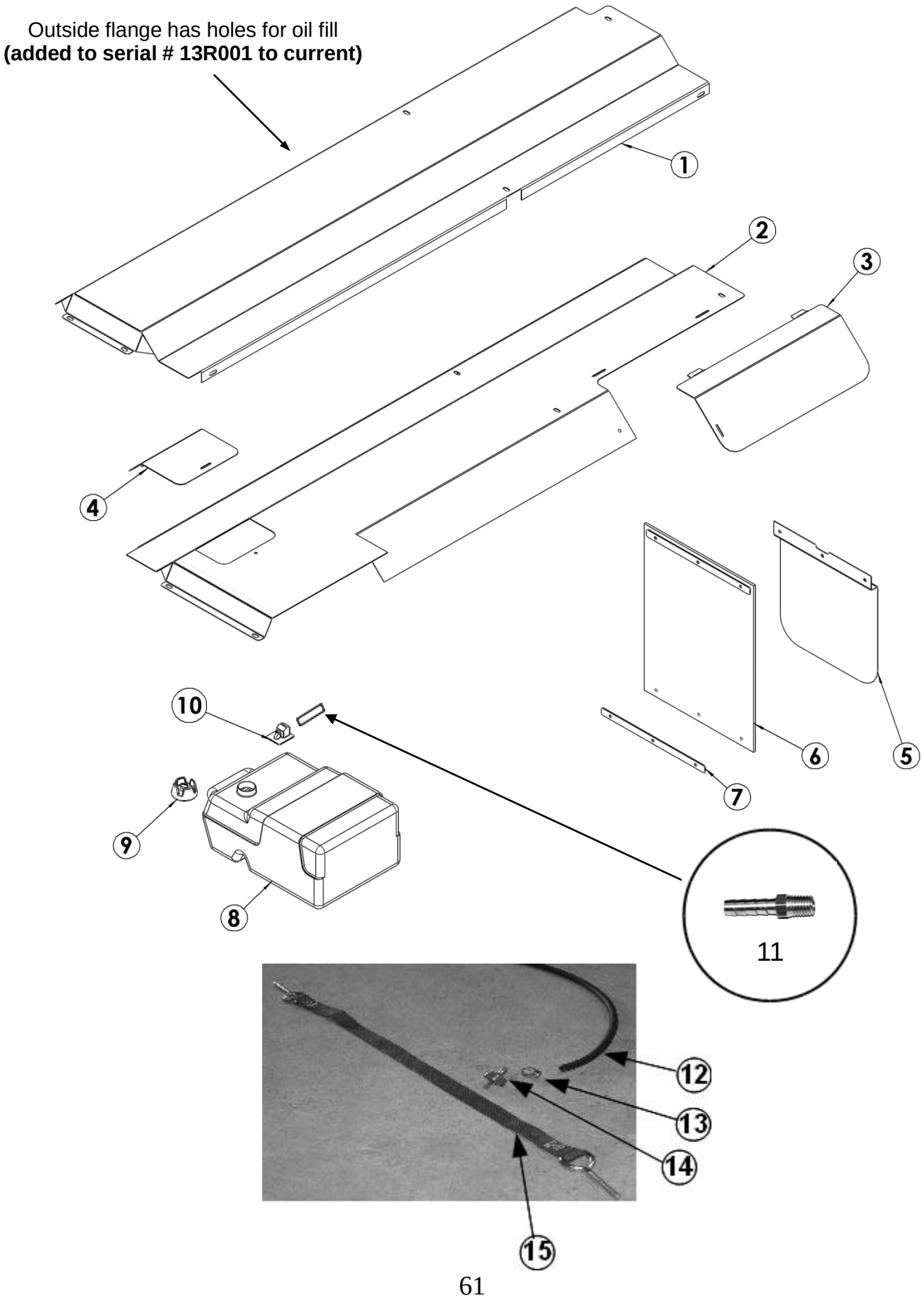
TLR 5000X2
Light / Steering Assy



TLR 5000X2
Light / Steering Assy

Item	Qty	Part #	Description
1	1	TL5X2-500-131	Front Right Corner
2	1	TL5X2-500-132	Front Left Corner
3	1	TL500-100-103	Steering Cylinder
4	2	TL5X2-500-116	Cylinder Pin
5	1	TL500-100-154	Tongue Pin
6A		TL5X2-500-133	Complete Tongue (Ref # 5-8)
6	1	TL550-100-051	Main Tongue
7	1	TL550-100-052	Swing Tongue
8	1	TL550-100-053	Sliding Tongue
9	1	TL500-301-160	Tongue Holder
10	1	Obtain Locally	5/8-11 Locknut
11	1	Obtain Locally	5/8-11 x 5 Bolt Gr.5
12	1	TL5X2-500-134	Right Rear Light Bracket
13	1	TL5X2-500-135	Left Rear Light Bracket
14	4	TL5X2-500-136	Light Mount Grommet
15	2	TL5X2-500-137	Red Light (Brake)
16	2	TL5X2-500-138	Amber Light (Clearance)
16A		TL5X2-500-140	Red Light Kit (Ref # 14,15)
16B		TL5X2-500-141	Amber Light Kit (Ref # 14, 16)
17	1	TL550-100-050	Pushoff Holder Pin
18	1	TL25261	10,000 lbs Safety Chain
19		TL109-100-354	Steering Cylinder Seal Kit
20	1	DESMV	Slow Moving Vehicle Sign
21	1	25075	SMV Bracket
22	1	25074	SMV Bracket
23	1	28771	Spring

TLR 5000X2
Gas Tank / Fenders

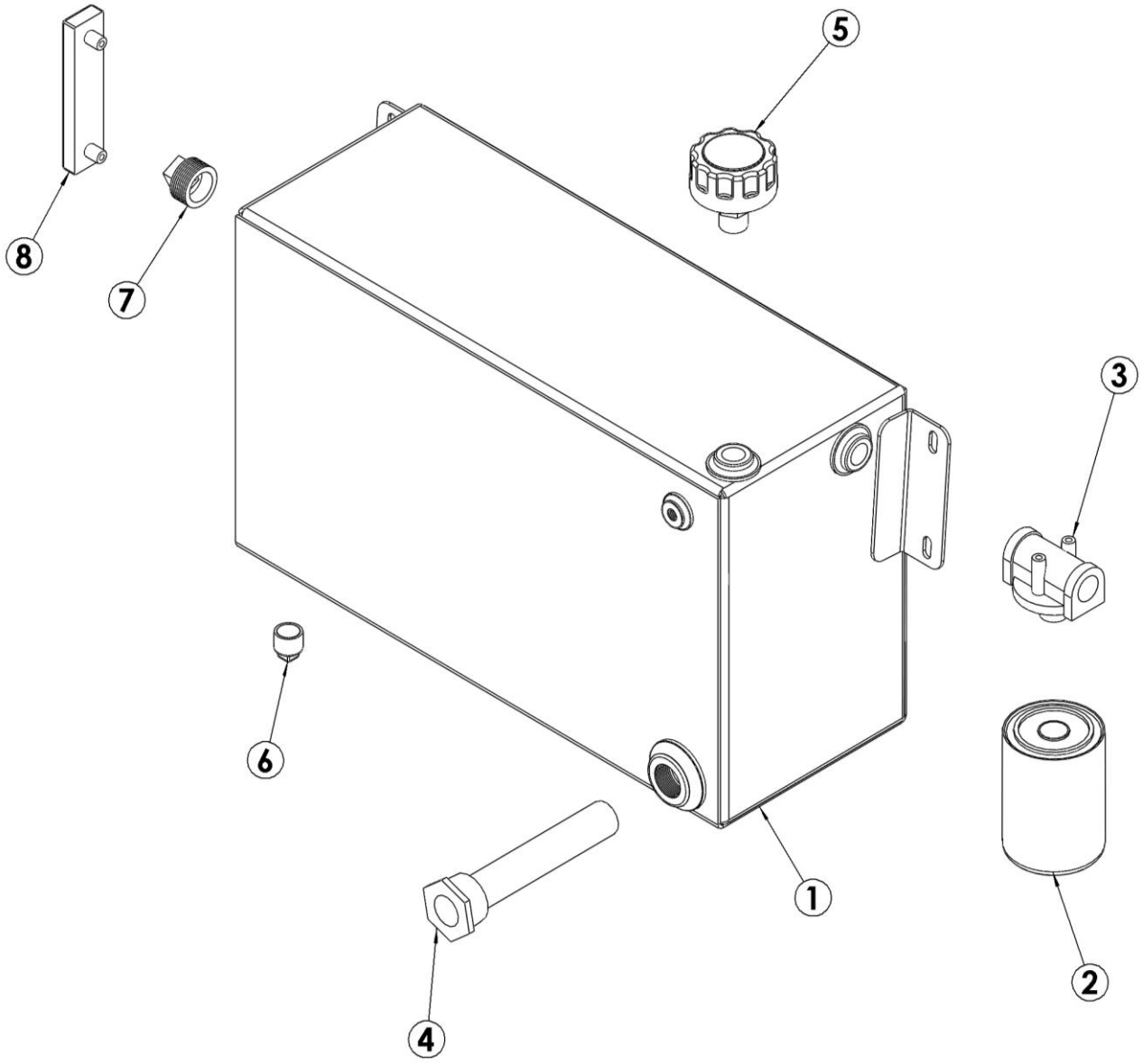


TLR 5000X2
Gas Tank / Fenders

Item	Qty	Part #	Description
1	1	TL5X2-500-145	Right Fender
2	1	TL5X2-500-146	Left Fender
3	1	TL5X2-500-147	Engine Cover
4	1	TL5X2-500-148	Fuel Cap Cover
5	1	TL5X2-500-149	Heat Shield
6	2	TL550-100-054	Mud Flap
7	6	TL500-100-164	Mud Flap Strap
8A		TL5X2-500-150	Fuel Tank c/w Outlet (Ref # 8-13)
8	1	TL550-204-100	Fuel Tank
9	1	TL550-204-101	Vented Fuel Tank Cap
10	1	TL550-204-103	Fuel Gauge
11	1	TL5X2-201-108	Hose Adaptor
12	1	TL5X2-201-107	Fuel Line
13	4	TL550-204-109	Hose Clamp
14	1	TL550-200-111	Fuel Filter
15	1	TL550-204-110	Fuel Tank Tie Down Strap
	6	Obtain Locally	HB 5/16 X 1 Hex Bolt
	6	Obtain Locally	FW 5/16 Flat Washer
	6	Obtain Locally	HN 5/16 Hex Nut

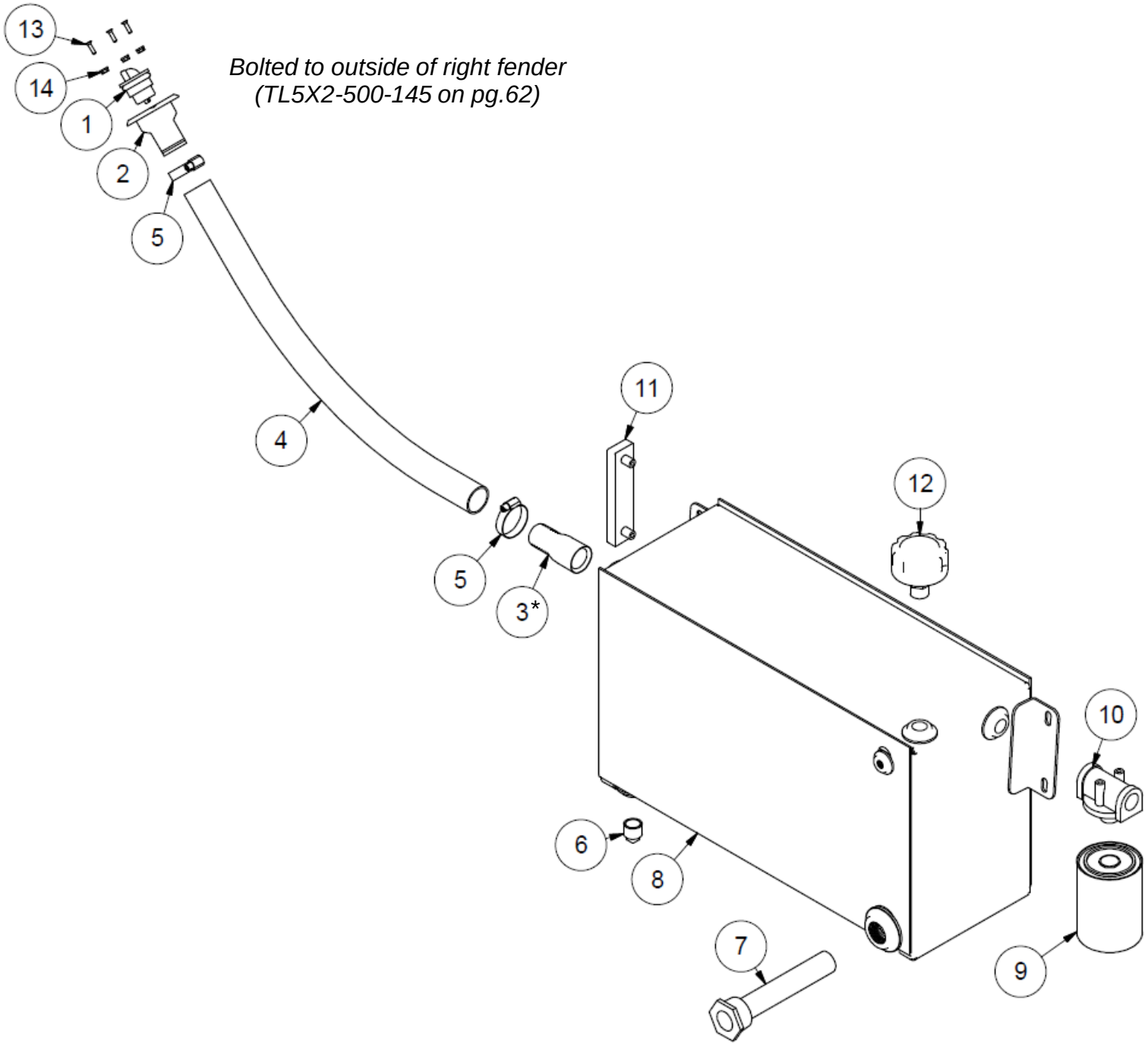
TLR 5000X2
Hydraulic Oil Tank

For wrappers with a serial # up to 12R218



TLR 5000X2
Hydraulic Oil Tank

*For wrappers with a serial # **from** 13R001 **to current***



** For wrapper serial # 13R001-13R054, use part # 30882 when ordering replacement.*

TLR 5000X2
Hydraulic Oil Tank

For wrappers with a serial # up to 12R218

Item	Qty	Part #	Description
1	1	TL5X2-500-151	Hydraulic Oil Tank
2	1	TL500-100-173	10 Micron Filter
3	1	TL500-100-172	Filter Base
4	1	TL500-100-175	Suction Strainer
5	1	TL500-100-169	Breather Cap
6	1	TL500-100-174	Magnetic Plug
7	1	TL500-100-170	Filler Plug
8	1	TL500-100-171	Sight Gauge

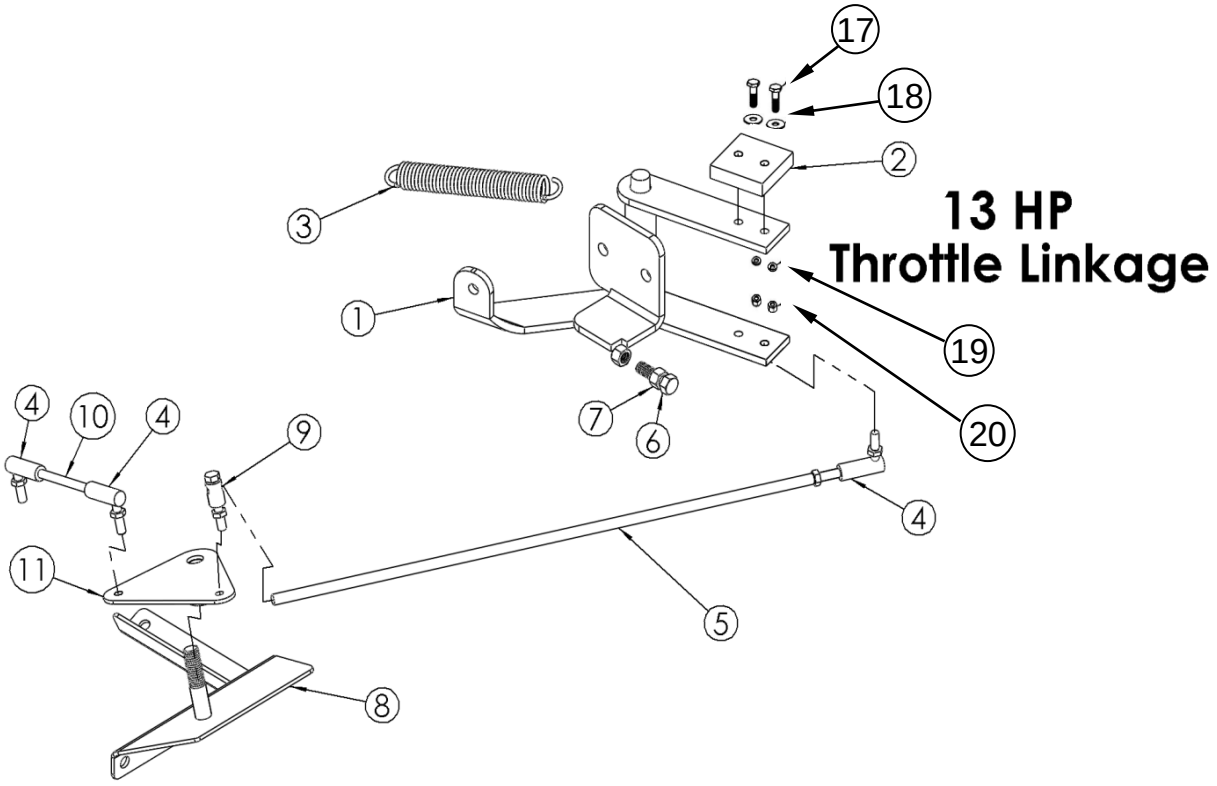
*For wrappers with a serial # **from** 13R001 **to current** (*See previous page)*

Item	Qty	Part #	Description
1	1	30868	Oil Fill Cap
2	1	30869	Oil Fill Body
3	1	30894*	Oil Fill Barbed Fitting
4	1	30883	Oil Fill Tube
5	2	30884	2” Gear Clamp
6	1	TL500-100-174	Magnetic Plug
7	1	TL500-100-175	Suction Strainer
8	1	TL5X2-500-151	Hydraulic Oil Tank
9	1	TL500-100-173	10 Micron Filter
10	1	TL500-100-172	Filter Base
11	1	TL500-100-171	Sight Gauge
12	1	TL500-100-169	Breather Cap
13	3	Obtain Locally	FHSCS 10-24 X .75 Flat Head Socket Cap Screw
14	3	Obtain Locally	HFN 10-24 Hex Flange Nut

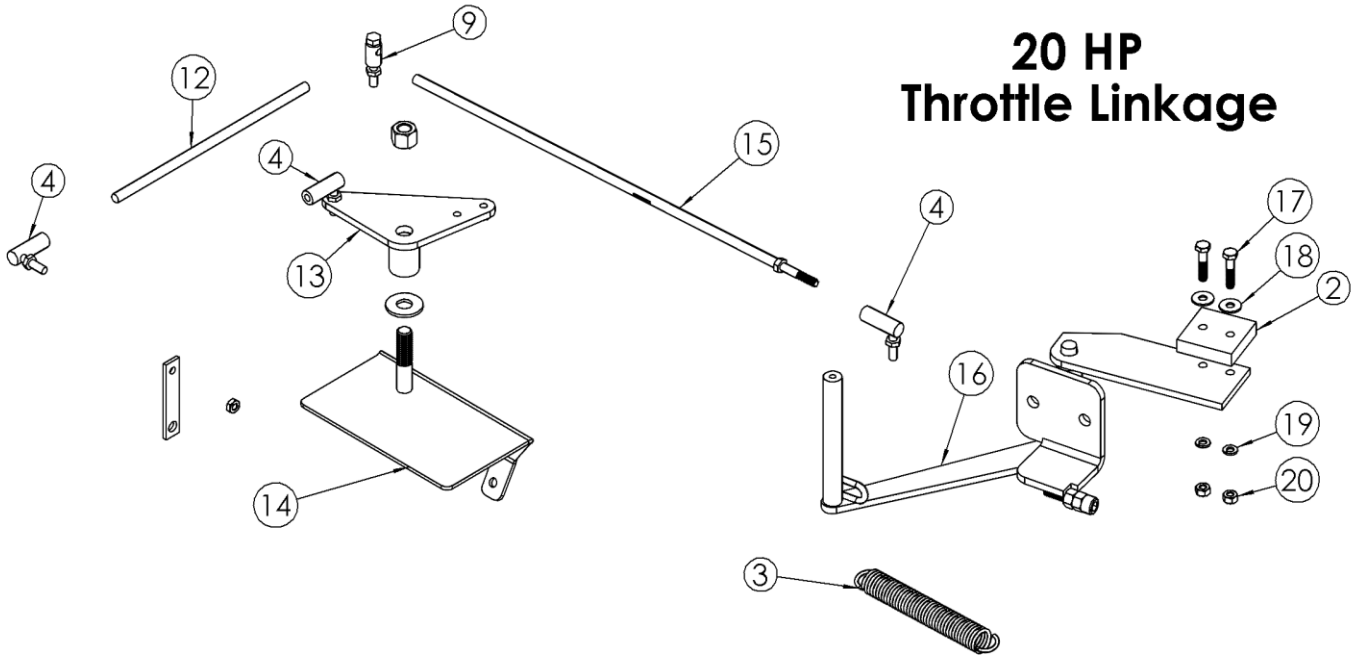
Filter Cross Reference	
Filter	**Reference**
Stauf	SF6520
Gresen	F22001
Fram	P1653-A
Fleetguard	HF6510
Cross	1A9021

Oil in Unit:
AW32 Hydraulic Oil

TLR 5000X2
Throttle Linkages



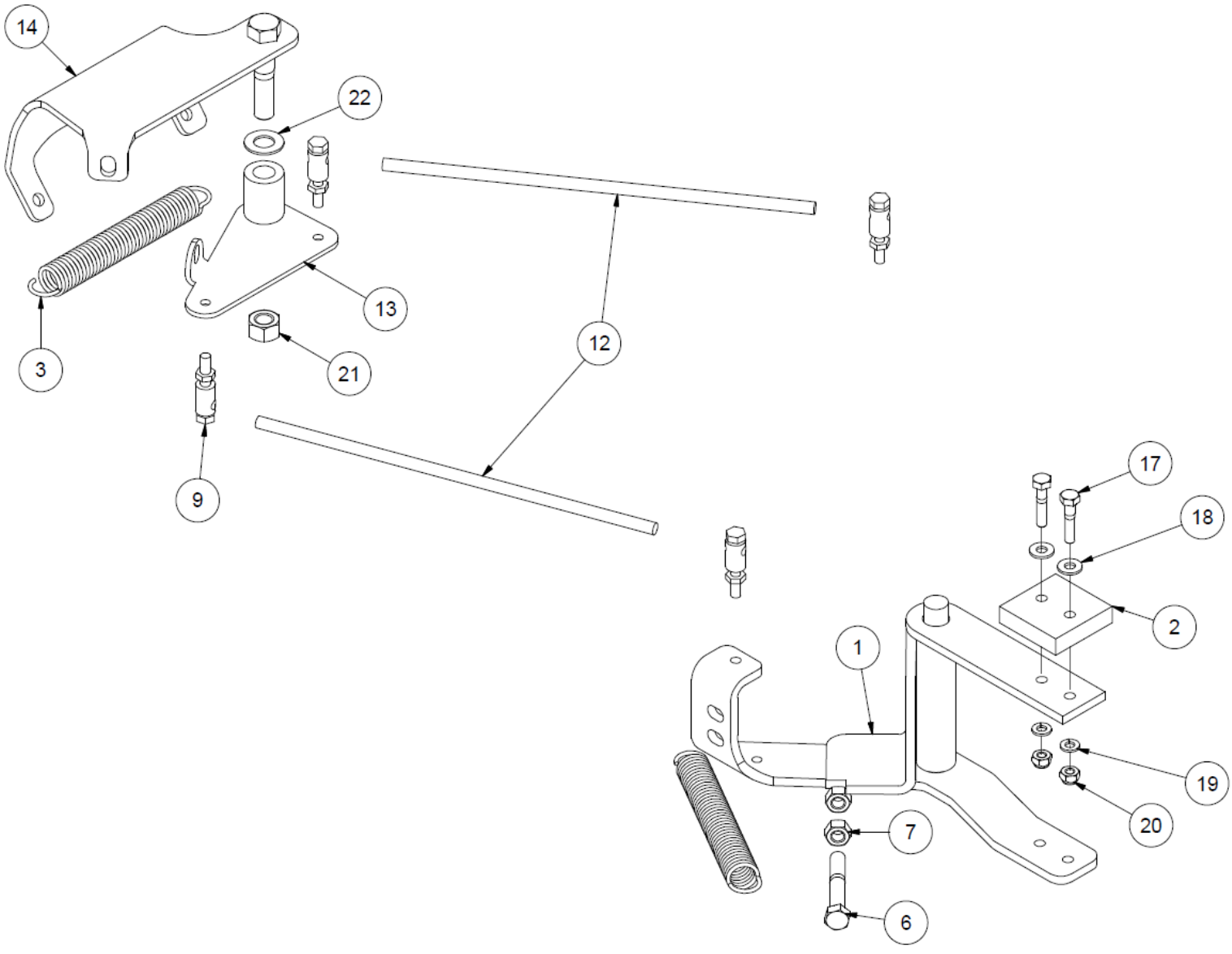
Prior to Serial # 10044



TLR 5000
Throttle Linkages

Serial # 11R001 to current

20 HP Throttle Linkage



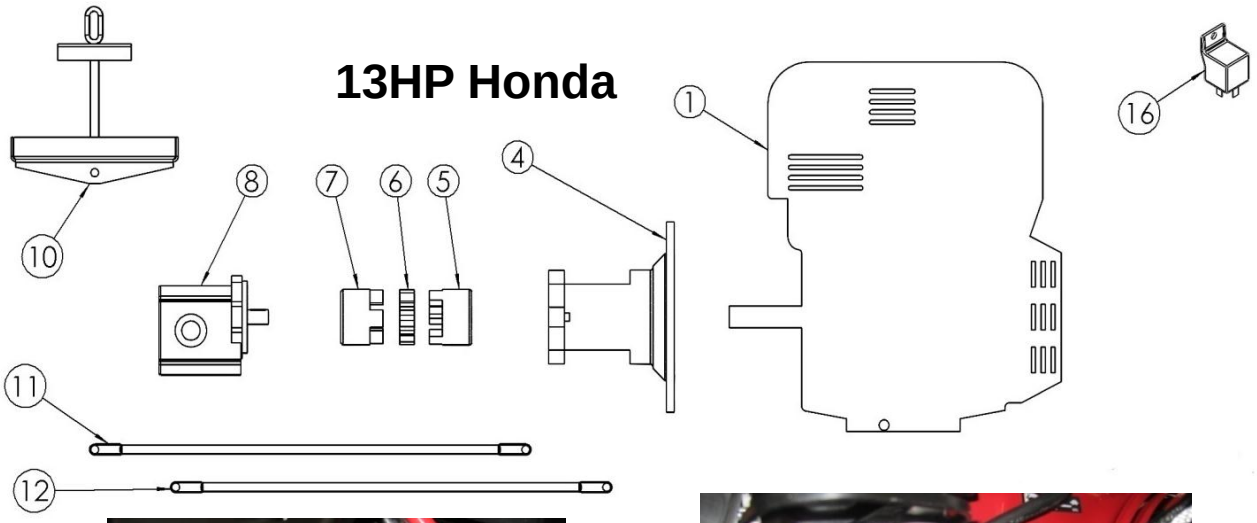
TLR 5000
Throttle Linkages

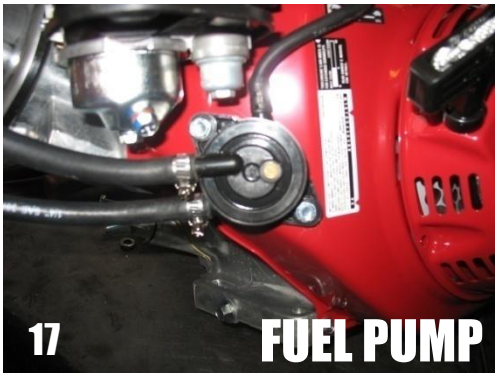
Item	Qty	Part #	Description
1	1	TL5X2-500-154	Main Link (Use for 20HP from Serial # 11R001- current)
2	1	TL5X2-100-232	Striker Block
	1	TL550-100-069	Throttle Spring
4		TL550-100-065	Ball Joint
5	1	TL5X2-100-231	Control Rod
6	2	Obtain Locally	3/8-16 x 2 1/2 Bolt Gr.5
7	2	Obtain Locally	3/8-16 Jam Nut
8	1	TL599-100-067	13 HP Engine Throttle Base
9		TL550-100-067	Linkage Pivot
10	1	TL599-100-069	1/4-28 UNF Rod x 4
11	1	TL5X2-100-230	13 HP Swing Link
12	2	TL5X2-500-155	1/4-28 UNF Rod x 9 1/2
13	1	TL5X2-500-156	20 HP Swing Link
14	1	TL6X2-120-001	20 HP Engine Throttle Base
15	1	TL6X2-120-004	20 HP Control Rod
16	1	TL5X2-500-157	20 HP Main Link
17	2	Obtain Locally	1/4-20 x 1 1/4 Bolt Gr.5
18	2	Obtain Locally	1/4 Flatwasher
19	2	Obtain Locally	1/4 Lockwasher
20	2	Obtain Locally	1/4-20 Nuts
21	1	Obtain Locally	1/2 Steel Type Lock Nut
22	1	Obtain Locally	1/2 SAE Washer

★ *17,18,19,and 20 each have 2 items regardless of the linkage used*

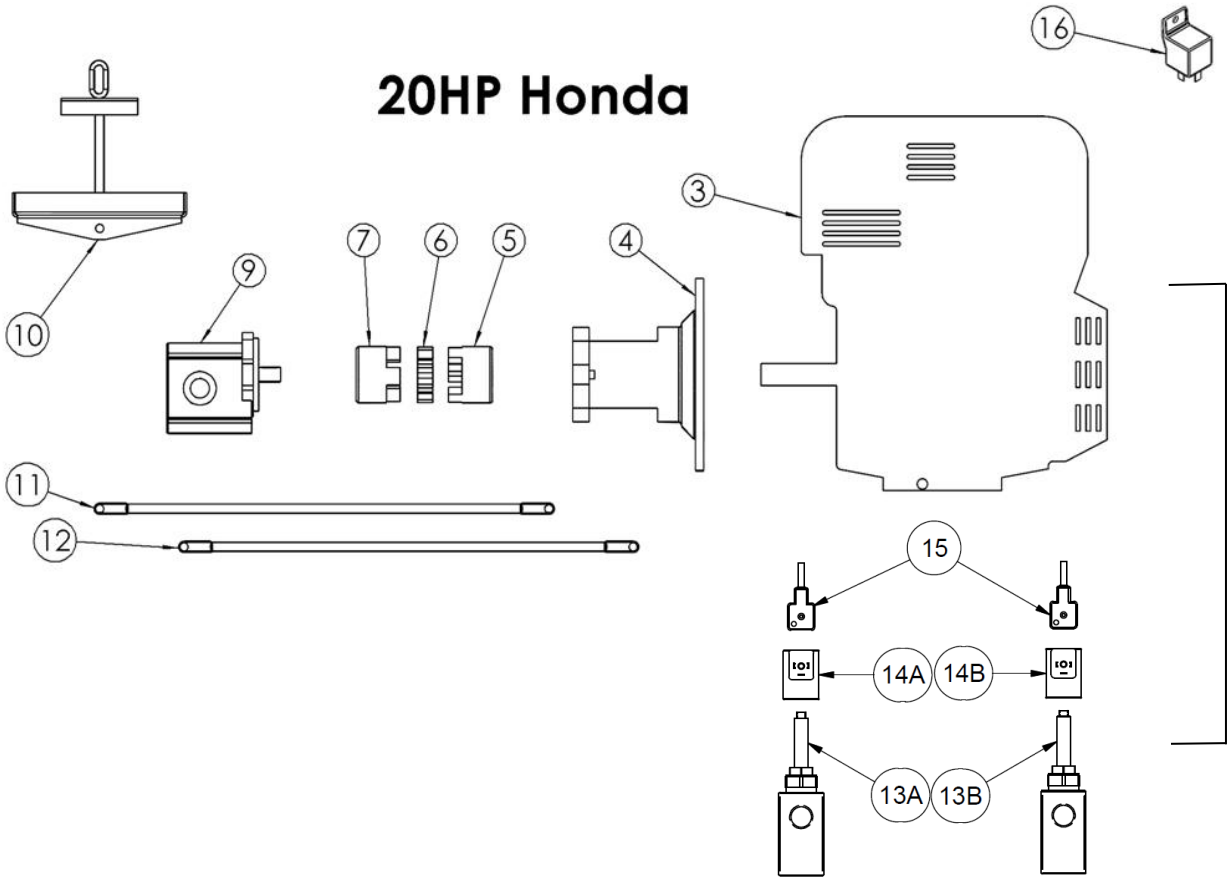
TLR 5000X2
Engines

13HP Honda



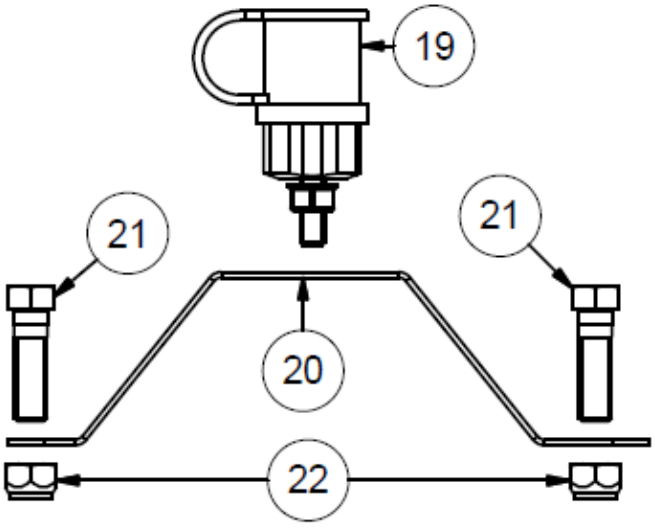


20HP Honda

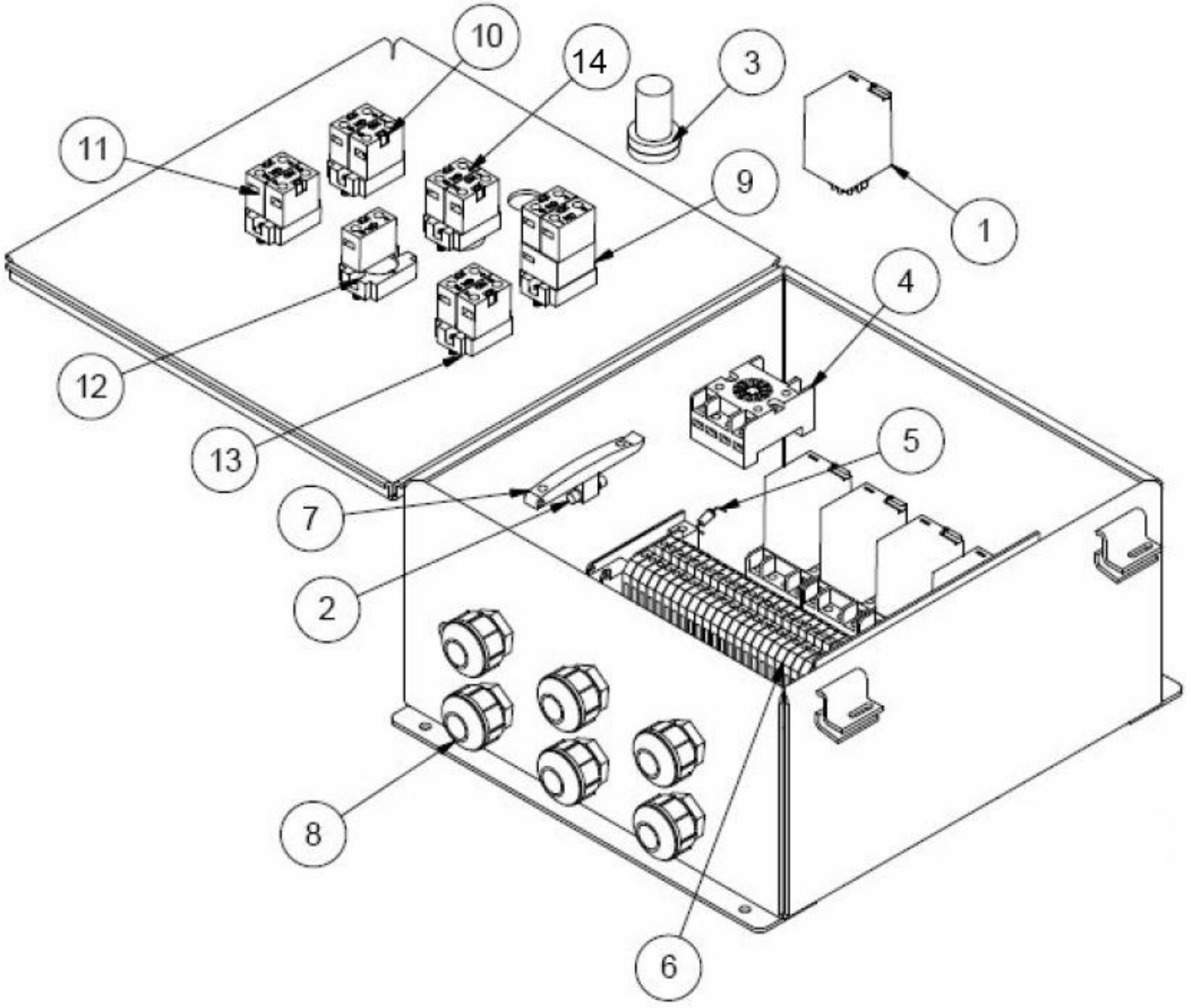


TLR 5000X2
Engines

Item	Qty	Part #	Description
1		TL5X2100200	13 HP HONDA ELECTRIC START
3		TL6X2100200	20 HP Honda Engine Electric Start
4	1	TL500100182	Engine – Pump Adapter
5	1	TL500100183	Love Joy Coupling Engine Side
6	1	TL500100184	Coupling Spacer
7	1	TL500100185	Love Joy Coupling Pump Side
8	1	TL500100181	Hydraulic Pump Casappa # PLP20-112
9	1	TL5X2101181	Hydraulic Pump Casappa # PLP20-14
10	1	TL500301221	Battery Hold Down
11	1	TL5X2500159	Red Battery Cable
12	1	TL5X2500160	Black Battery Cable
13A	1	TL6X2102202	Dump Valve Base (up to serial # 13R004)
13B	1	31545	Dump Valve Base (Serial # 13R005-current)
14A	1	TL6X2102204	Dump Valve Solenoid (up to serial # 13R004)
14B	1	31546	Dump Valve Solenoid (Serial # 13R005-current)
15	1	31505	Dump Valve Wiring Harness
16	1	TL500100220	35 amp Relay (mounted on 13hp & 20hp Honda)
17	1	TL25649	Fuel Pump (13hp only)
18	1	TL25591	Valve Cover Bolt (13hp only)
	1	30872	Battery Boost Cable
19	1	30873	Battery Boost Post
20	1	31379	Battery Boost Mount
21	2	Obtain Locally	HB 7/16 x 2 Hex Bolt
22	2	Obtain Locally	LN 7/16 Lock Nut



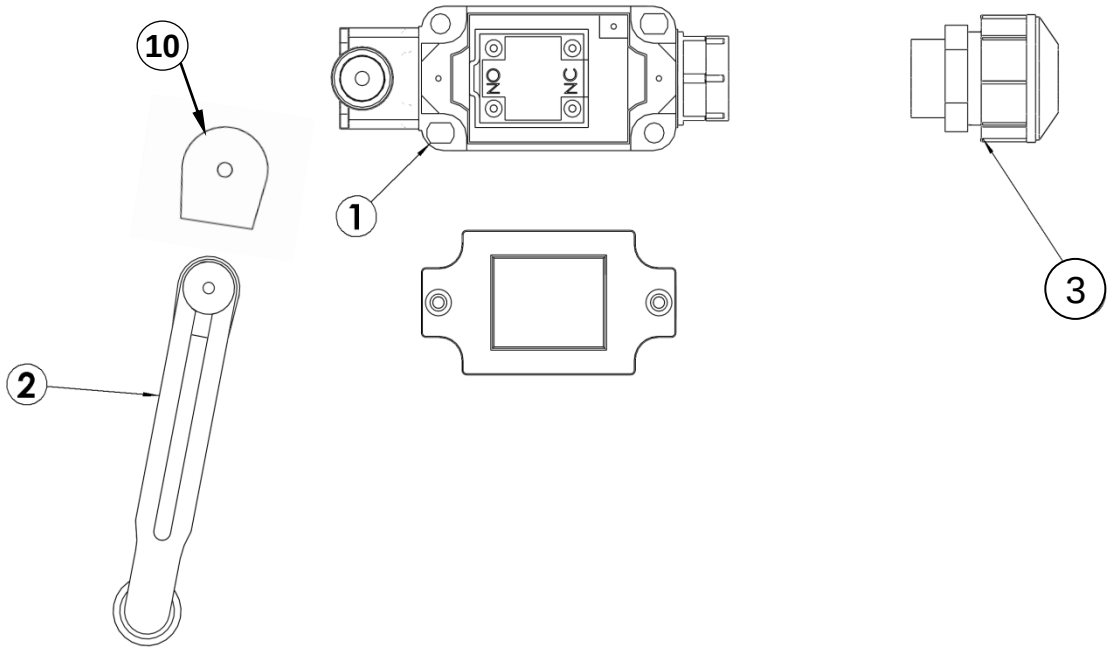
TLR 5000X2
Control Panel



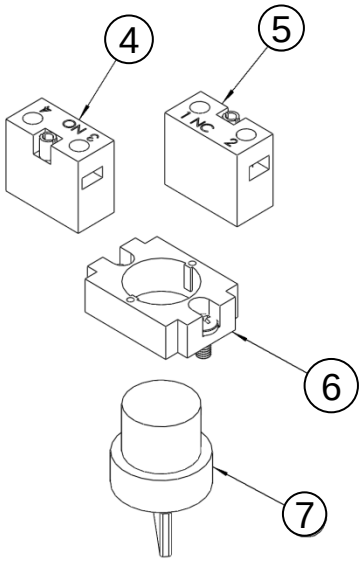
TLR 5000X2
Control Panel

Item	Qty	Part	Description
	1	TL550-200-061	Complete Control Panel
1	5	TL500-100-221	Control Relay
2	1	TL550-100-079	15 AMP Fuse
3	1	TL25764	LED Light
4	5	TL5X2-500-158	11 Pin Relay Base
5	1	TL550-150-085	Diode 1N5406 3amp 600V
6	26	TL550-150-084	DIN Rail Terminal Block
7	1	TL550-150-083	DIN Rail Fuse Holder
8	6	TL550-100-086	PVC Wire Holder
9	1	TL25762	On/Off Switch
10	1	TL550-100-076	Man/Auto Switch
11	1	TL550-100-077	Steering Switch
12	1	TL550-100-075	Rotate Switch
13	1	TL550-100-077	Forward/ Reverse Switch
14	1	TL25763	Emergency Stop Button

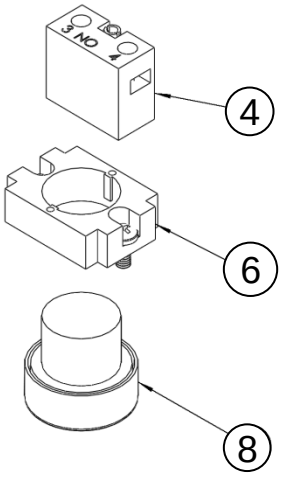
TLR 5000X2
Limit Switch



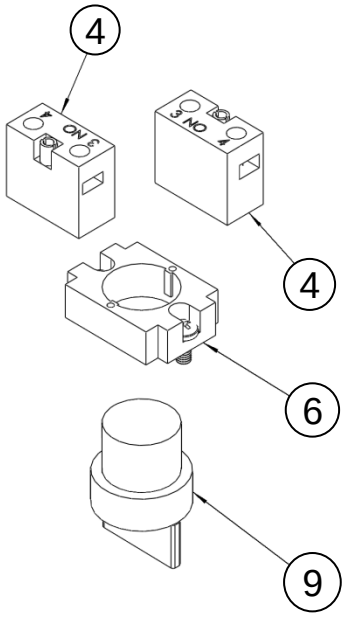
On/Off - Man/Auto Switch



Rotate Switch



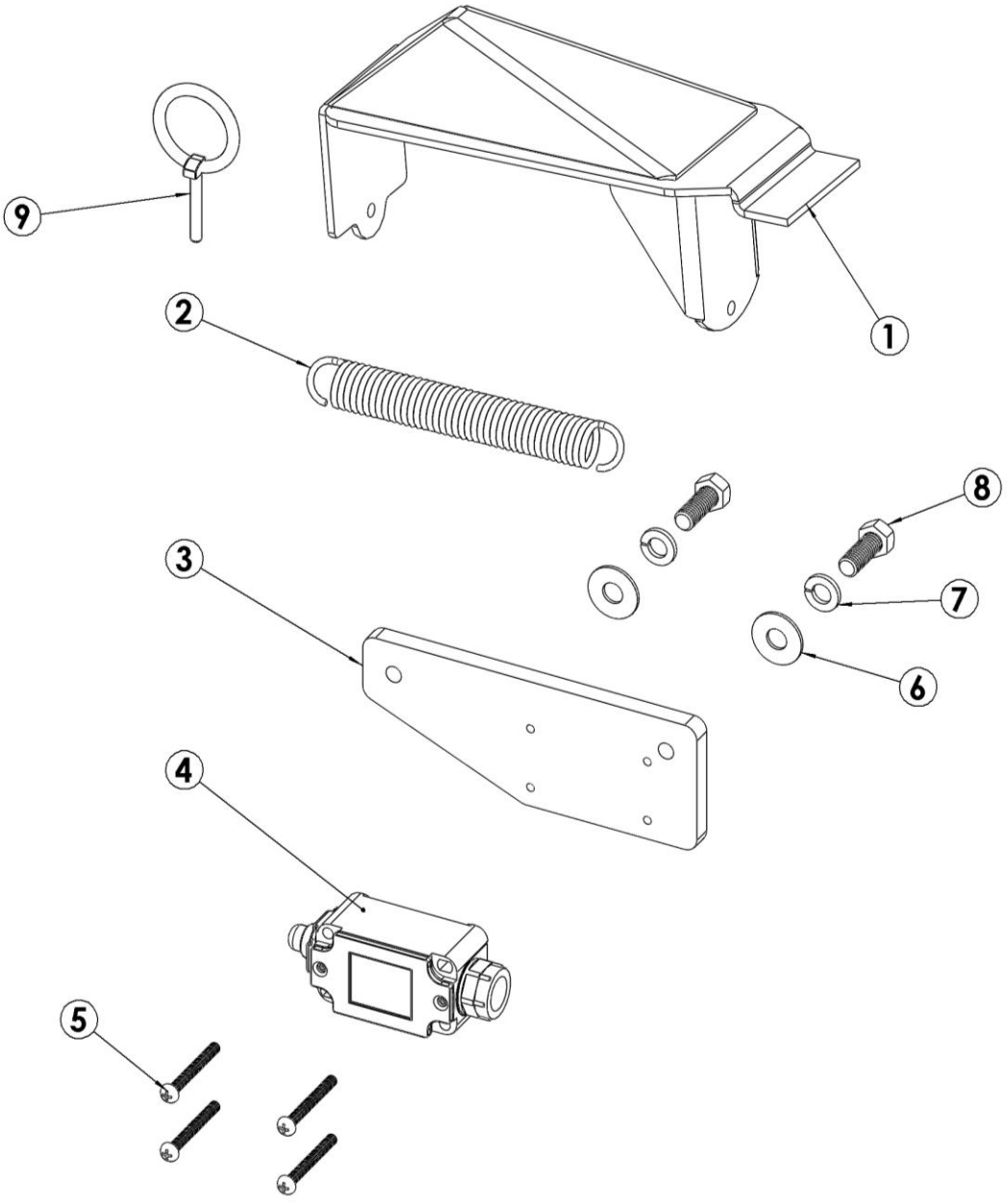
Ram - Steering Switch



TLR 5000X2
Switches

Item	Qty	Part #	Description
1	5	TL550-100-060	Complete Limit Switch (Ref # 1, 2, & 4)
2	5	TL550-100-059	Limit Switch Arm
3	1	TL550-100-086	PVC Box Connector
4	7	TLRB2BE101	Contact Block Normally Open (NO)
5	2	TLRB2BE102	Contact Block Normally Closed (NC)
6	5	TLRB2B	Switch Mount Collar
7	1	TLRB2BD2	Selector Switch – 2 Position
8	1	TLRB2BA2	Push Button
9	1	TLRB2BDR3	Selector Switch – 3 Position Spring Return
	2	TL550-100-076	On/Off – Man/Auto Switch (Complete)
	1	TL550-100-075	Rotate Switch (Complete)
	2	TL550-100-077	Ram/Steering Switch (Complete)
10	1	TL550-100-082	Wire Clamp

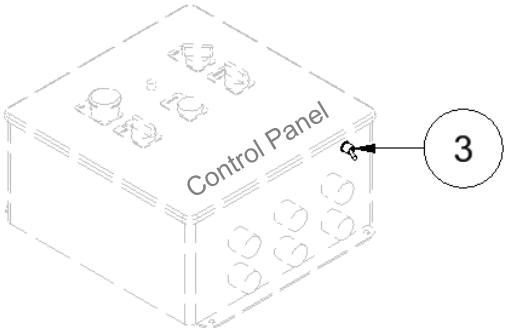
TLR 5000X2
Table Trigger Assy

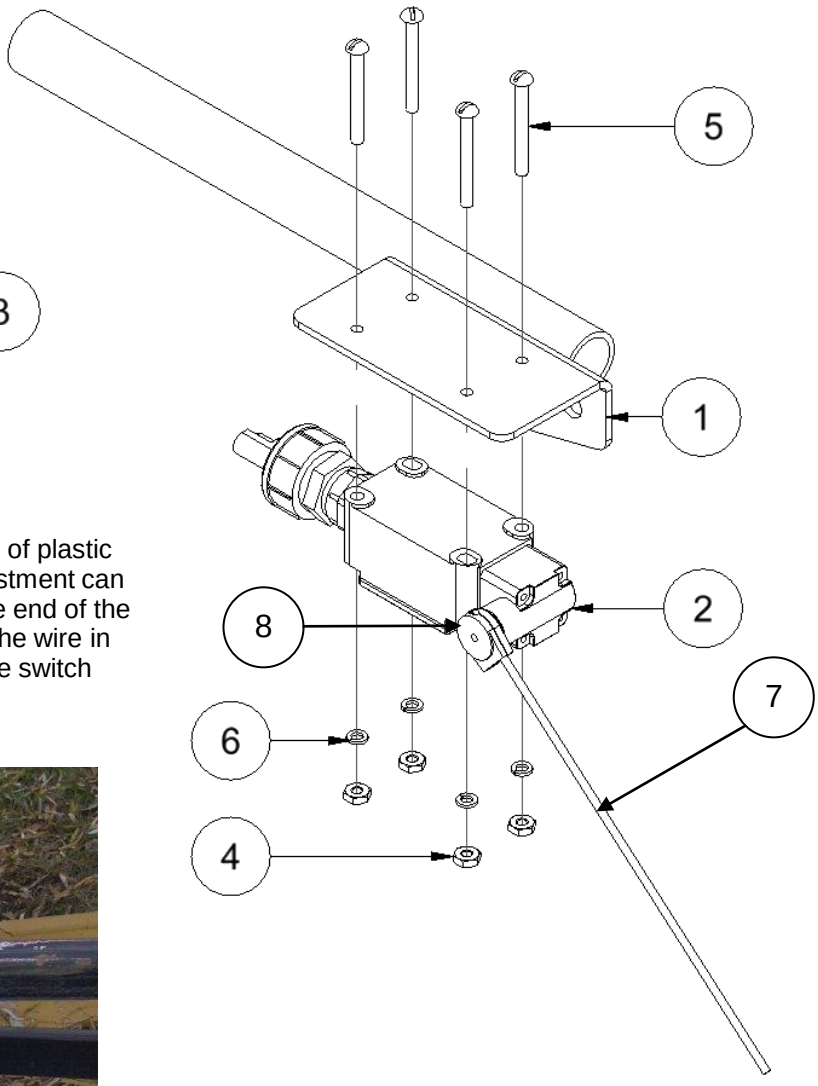


TLR 5000X2
Table Trigger Assy.

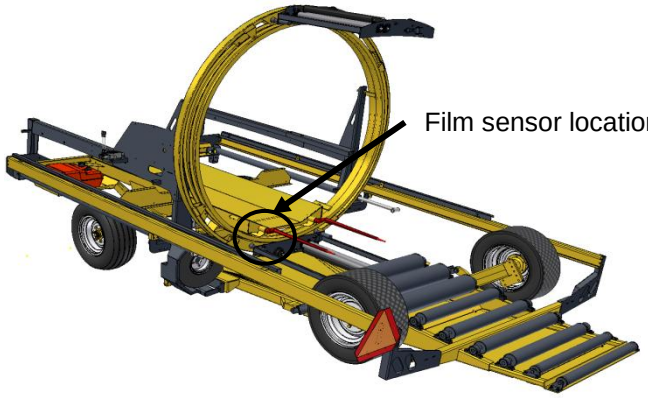
Item	Qty	Part #	Description
1	1	TL5X2-500-152	Trigger
2	1	TL550-100-069	Spring
3	1	TL5X2-500-153	Table Switch Mount Plate
4	1	TL5X2-100-221	Push Button Limit Switch
5	4	Obtain Locally	10-24 x 1 ½ Bolt
6	2	Obtain Locally	3/8 Flat Washer
7	2	Obtain Locally	3/8 Lock Washer
8	2	Obtain Locally	3/8-16 x 1 Bolt Gr.5
9	1	Obtain Locally	3/16 Linch Pin

TLR 5000X2
Film Sensor





Sensor wire must be adjusted so that only one layer of plastic is covering the end of the wire while wrapping. Adjustment can be made on the bracket and on the sensor wire. The end of the sensor wire behind the switch can be bent to allow the wire in front of the switch to drop down far enough to trip the switch when no plastic is present.



TLR 5000X2
Film Sensor

Item	Qty	Part #	Description
	1	TLPSSK	Complete Kit
1	1	TLFSB2007	Film Sensor Bracket
2	1	TL109-100-348	Film Sensor Limit Switch (Complete)
3	1	TL550-200-235	Toggle Switch
4	4	Obtain Locally	10-24 Hex Nut
5	4	Obtain Locally	10-24 x 1.75 Machine Screw
6	4	Obtain Locally	#10 Lock Washer
	2	Obtain Locally	12” Wire (Terminal 18 & 19)
7	1	TL550-100-049	Wire Arm
8	1	TL550-100-082	Wire Clamp

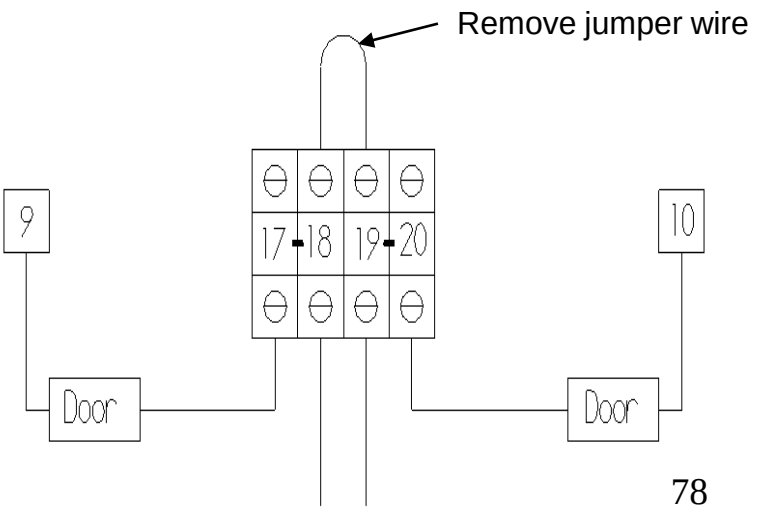
Installation

- Install film sensor bracket
- Locate the wire labeled film sensor (pre-wired machine)
- Remove the plug and connect to film sensor switch
- Install toggle switch in the control panel
- Remove the jumper wire between terminal 18 & 19
- Connect wires from toggle switch to terminal 18 & 19

Wire Adjustment *(Use measurements as initial guide only)*

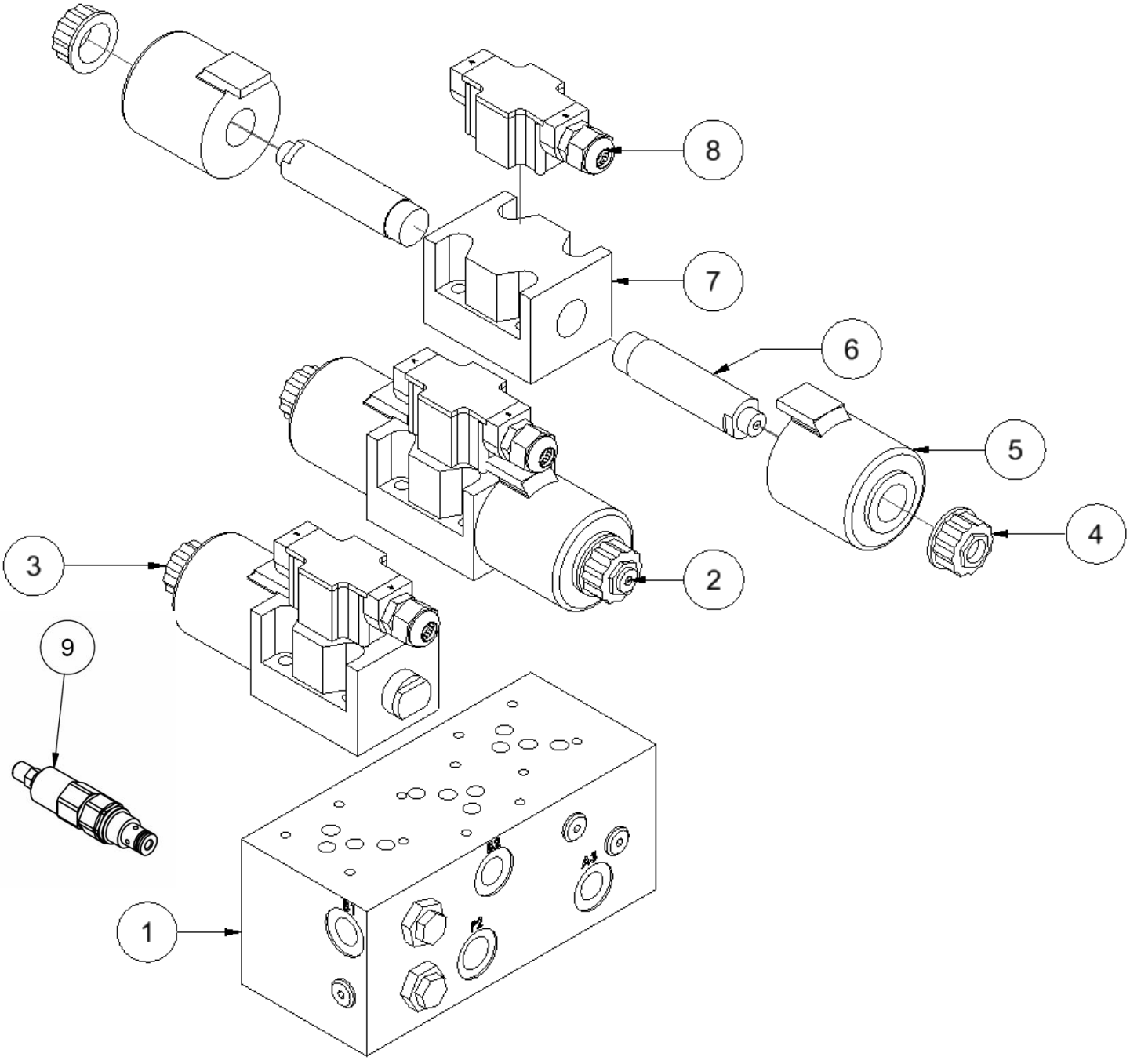
- Measure length of wire from the hoop face *(see previous page)*
- 9.5” wire = approx. 3” between wraps = 8-9 layers per bale
- 9.5” wire should stop hoop rotation just after an empty tensioner passes the wire
- Lengthen wire 3” for 4 layers of wrap or 1.5” for 6 layers
- Shorten wire by 1.5” for 10 layers per bale

*As a guide, if the hoop stops before an empty tensioner passes the film sensor wire, the wire is **too short** and if the hoop **does not** stop with **one** empty tensioner the film sensor is **too long.***



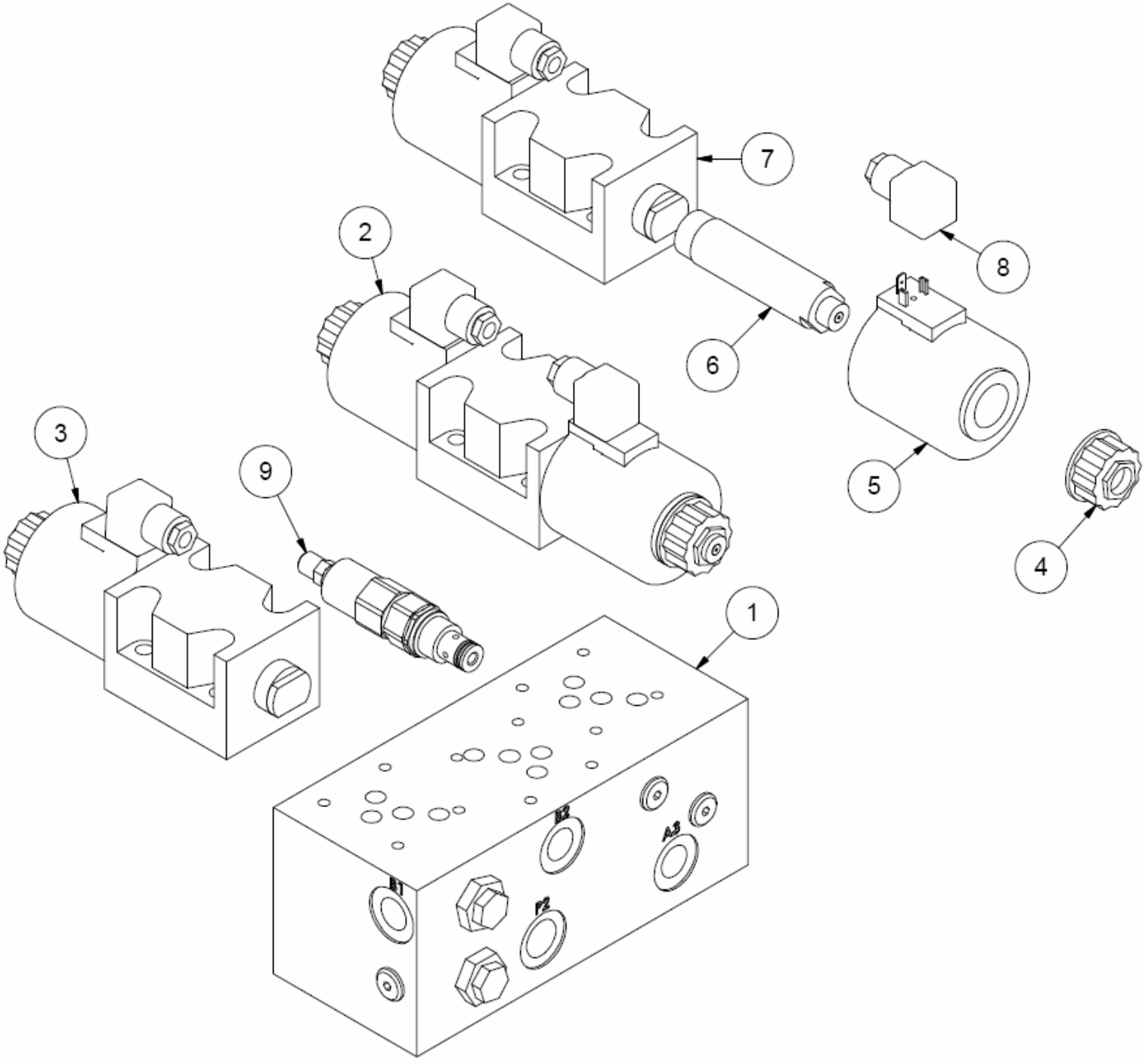
TLR 5000X2
Hystar Hydraulic Valve

Prior to Serial # 11R091



TLR 5000X2
Hystar Hydraulic Valve

Serial # 11R092 to current



TLR 5000X2
Hystar Hydraulic Valve

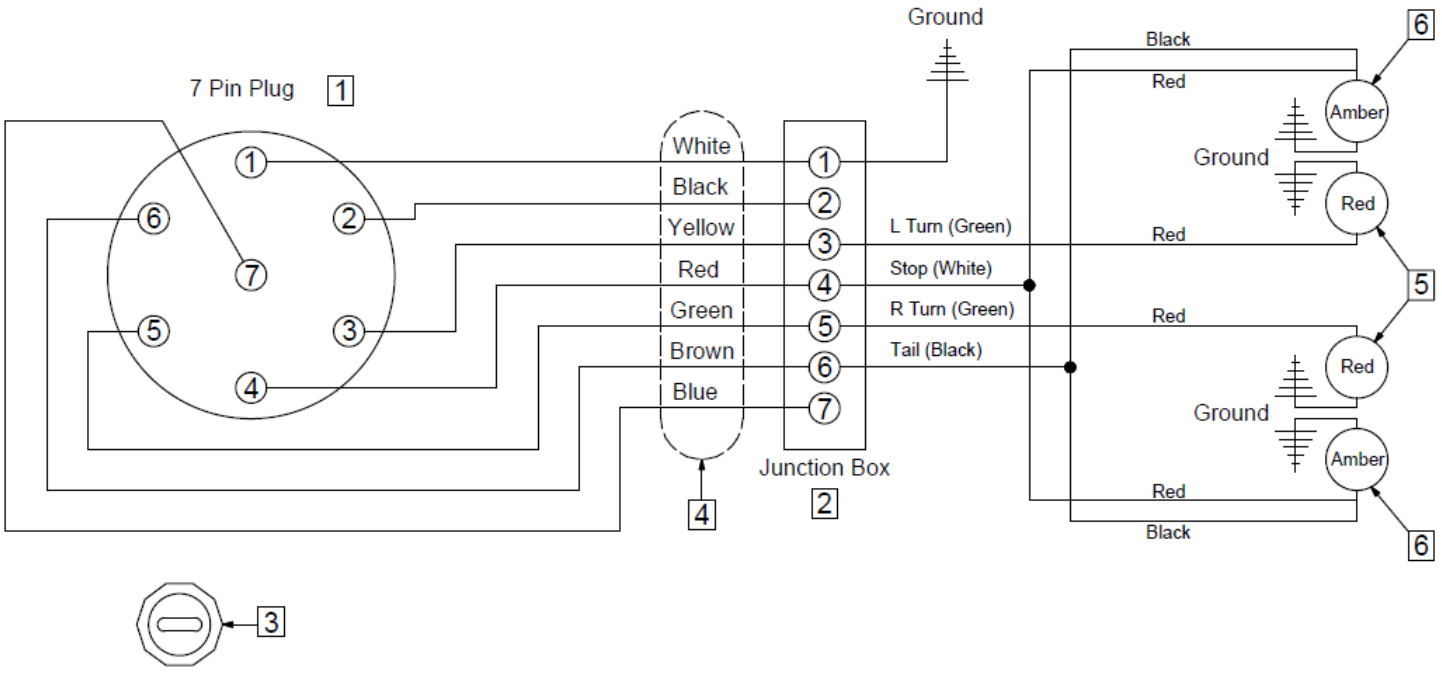
Prior to Serial # 11R091

Item	Qty	Part #	Description
1	1	TL500-100-056	Manifold
2	2	TL5X2-201-200	Tandem 12V DC Valve (Complete)
3	1	TL5X2-201-201	Single 12V DC Valve (Complete)
4	5	VAL25285	Plastic Nut
5	5	TL5X2-201-007	Coil
6	5	VAL25288	Tube Assembly
7	3	VAL25295	Valve Body
8	3	TL5X2-201-202	Connection Box
9	1	VAL MW10A-OS2B	Relief Valve

Serial # 11R092 to current

Item	Qty	Part #	Description
1	1	TL500-100-056	Manifold
2	2	28532	Tandem 12V DC Valve (Complete)
3	1	28533	Single 12V DC Valve (Complete)
4	5	VAL25285	Plastic Nut
5	5	28531	Coil
6	5	VAL25288	Tube Assembly
7	3	VAL25295	Valve Body
8	5	28534	DIN Connector
9	1	VAL MW10A-OS2B	Relief Valve

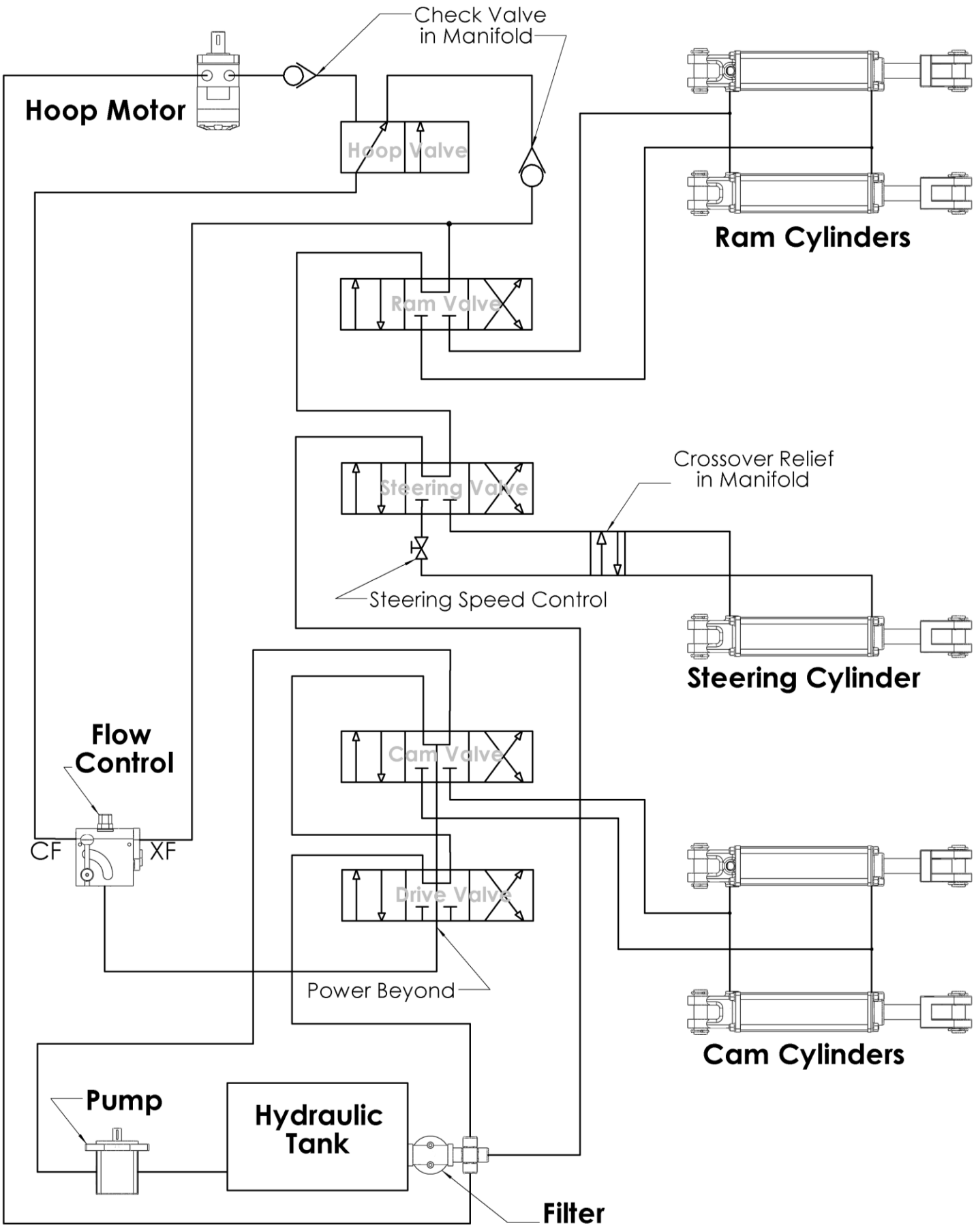
TLR 5000X2
Running Lights



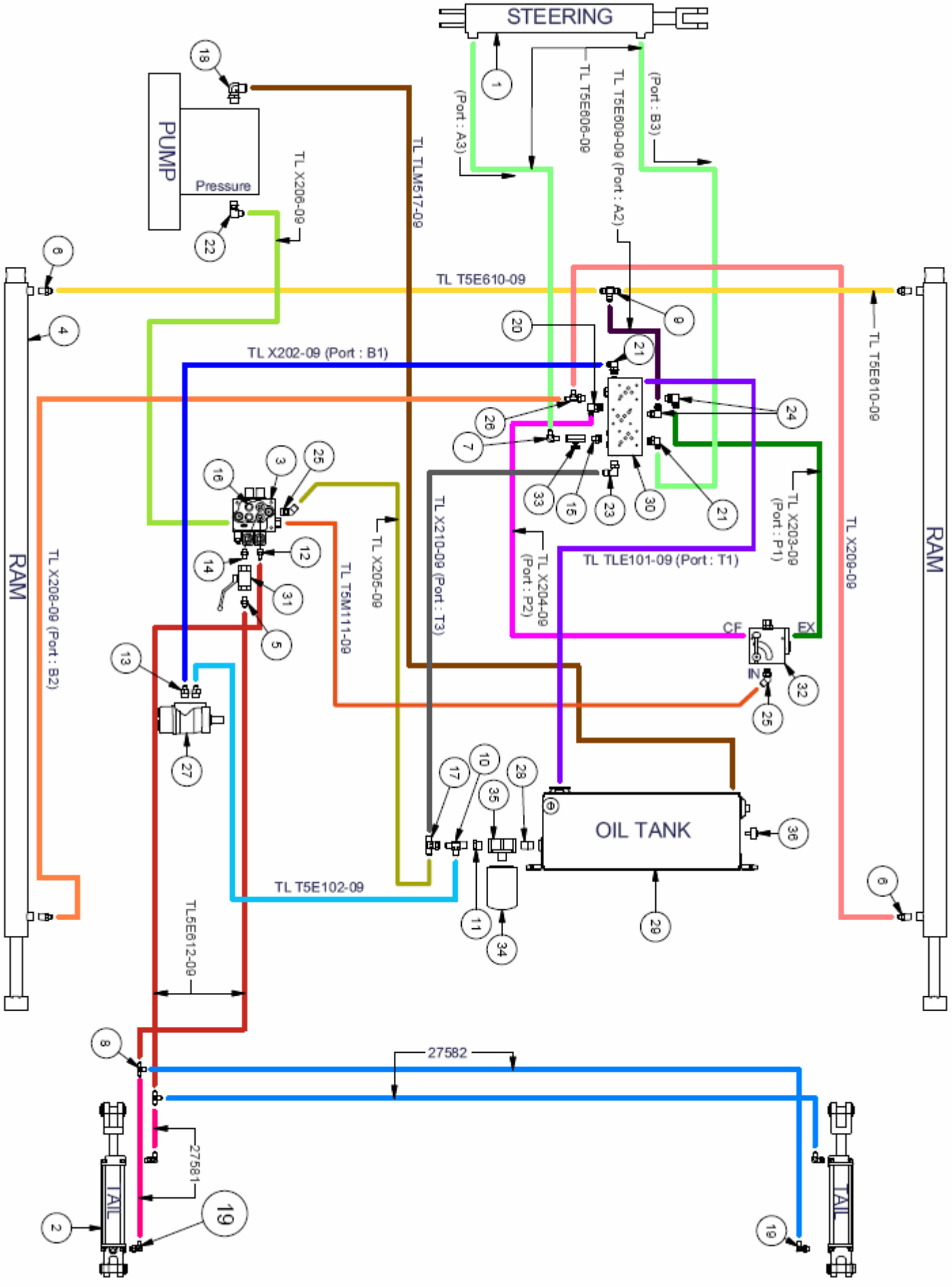
TLR 5000X2
Running Lights

Item #	Qty	Description	Part #
1	1	TL550-200-117	7 Pin Plug
2	1	TL550-200-118	Junction Box
3	1	TL550-200-119	Strain Relief
4	1	TL550-200-120	7 Wire Conductor
5	2	TL550-200-121	Red Lamp
6	2	TL550-200-122	Amber Lamp

TLR 5000X2 Hydraulic Schematic



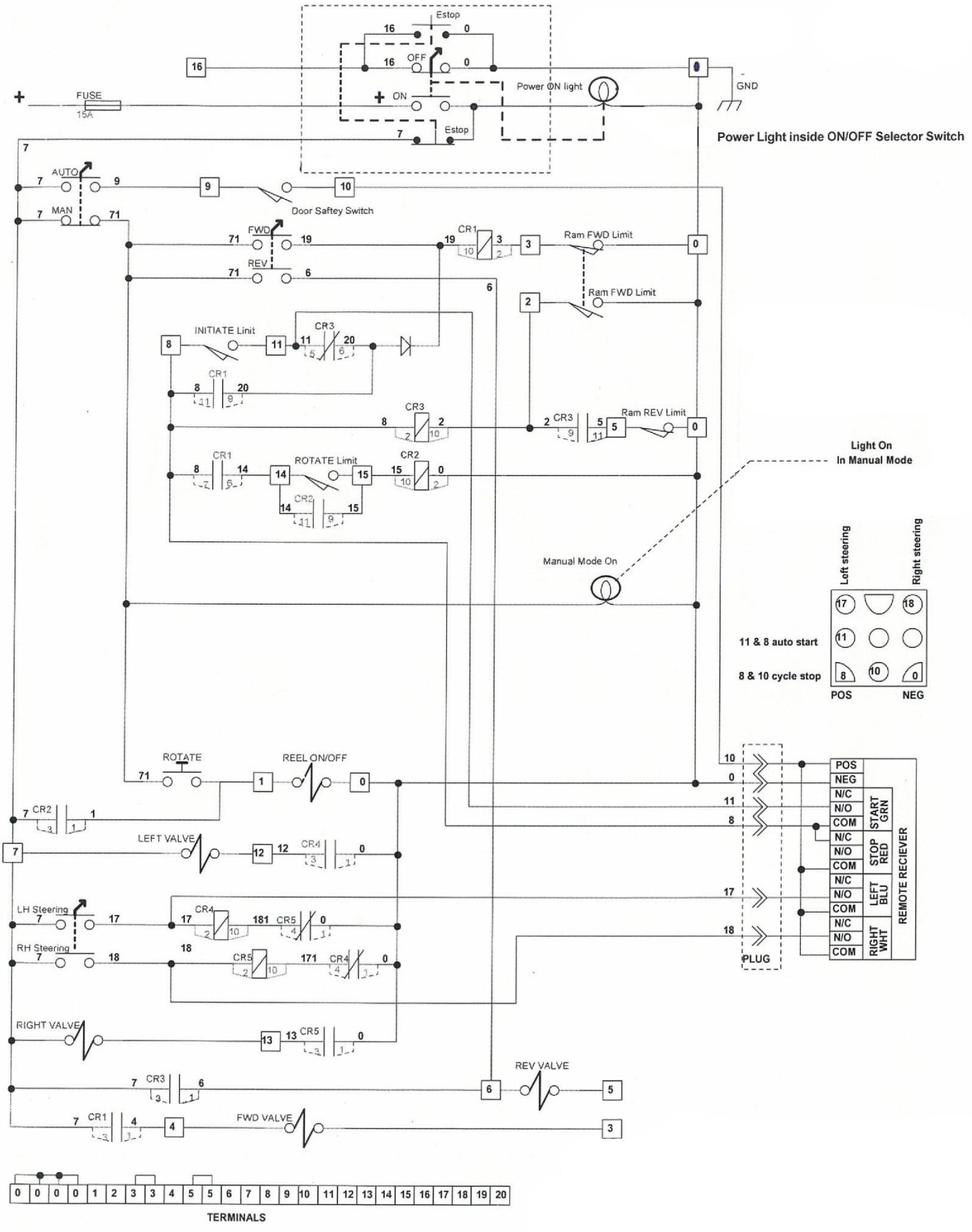
TLR 5000X2 Hydraulic Layout



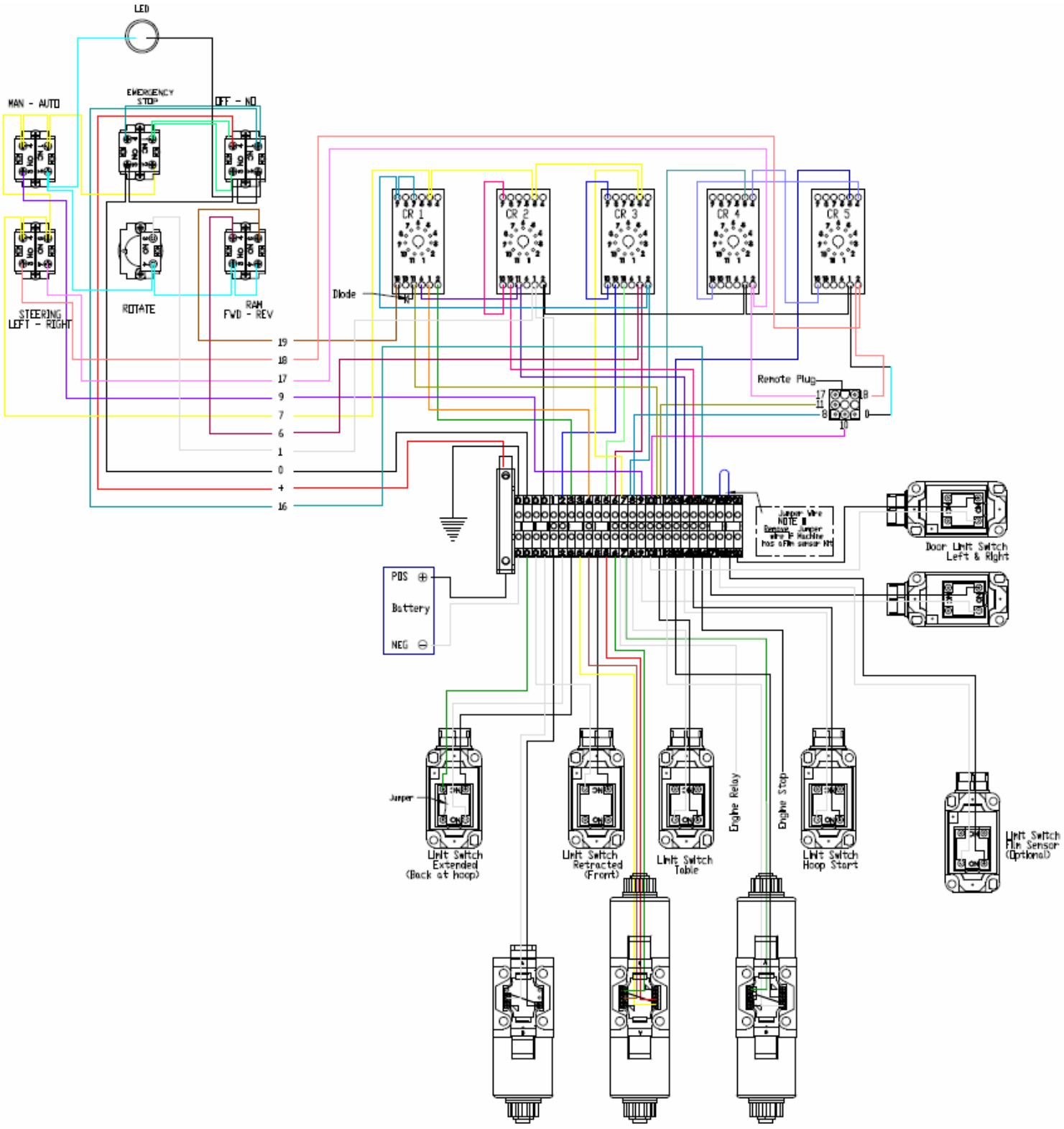
TLR 5000X2 Hydraulic Layout

Item	Qty	Description	Part #
1	1	Steering Cylinder	TL500-100-103
2	2	Brake Cylinder	TL500-100-082
3	1	2 Spool Valve	TL5X2-201-055
4	2	Ram Cylinder	TL550-100-043
5	1	Hydraulic Fitting	HF 2404-4-6
6	4	Hydraulic Fitting	HF 2404-6-8
7	1	Hydraulic Fitting	HF 2501-6-6
8	2	Hydraulic Fitting	HF 2603-4-4-4
9	1	Hydraulic Fitting	HF 2603-8-8-8
10	1	Hydraulic Fitting	HF 2605-8-8-8
11	1	Hydraulic Fitting	HF 5406-12-8
12	1	Hydraulic Fitting	HF 6400-4-6
13	2	Hydraulic Fitting	HF 6400-6-10
14	1	Hydraulic Fitting	HF 6401-6-6
15	1	Hydraulic Fitting	HF 6401-8-6
16	2	Hydraulic Fitting	HF 6408-6
17	1	Hydraulic Fitting	HF 6600-8-8-8
18	1	Hydraulic Fitting	HF 6801-12-12
19	4	Hydraulic Fitting	HF 6801-4-6
20	1	Hydraulic Fitting	HF 6801-6-10
21	2	Hydraulic Fitting	HF 6801-6-8
22	1	Hydraulic Fitting	HF 6801-8-10
23	1	Hydraulic Fitting	HF 6801-8-6
24	2	Hydraulic Fitting	HF 6801-8-8
25	2	Hydraulic Fitting	HF 6802-8-8
26	1	Hydraulic Fitting	HF 6804-6-8-6
27	1	Hydraulic Motor	TL5X2-200-050
28	1	¾ Pipe Grease Zerk	Obtain Locally
29	1	Oil Tank	TL5X2-500-151
30	1	Manifold	VAL BLOCCO CX59
31	1	Shut-Off Valve	VAL BV73-100
32	1	Flow Control	VALFCR51-34
33	1	Needle Valve	VAL FT-03-2090
34	1	Oil Filter	VAL HEK44
35	1	Filter Base	VAL HF620
36	1	Sight Gauge	VAL HL91

TLR 5000X2 Electric Schematic



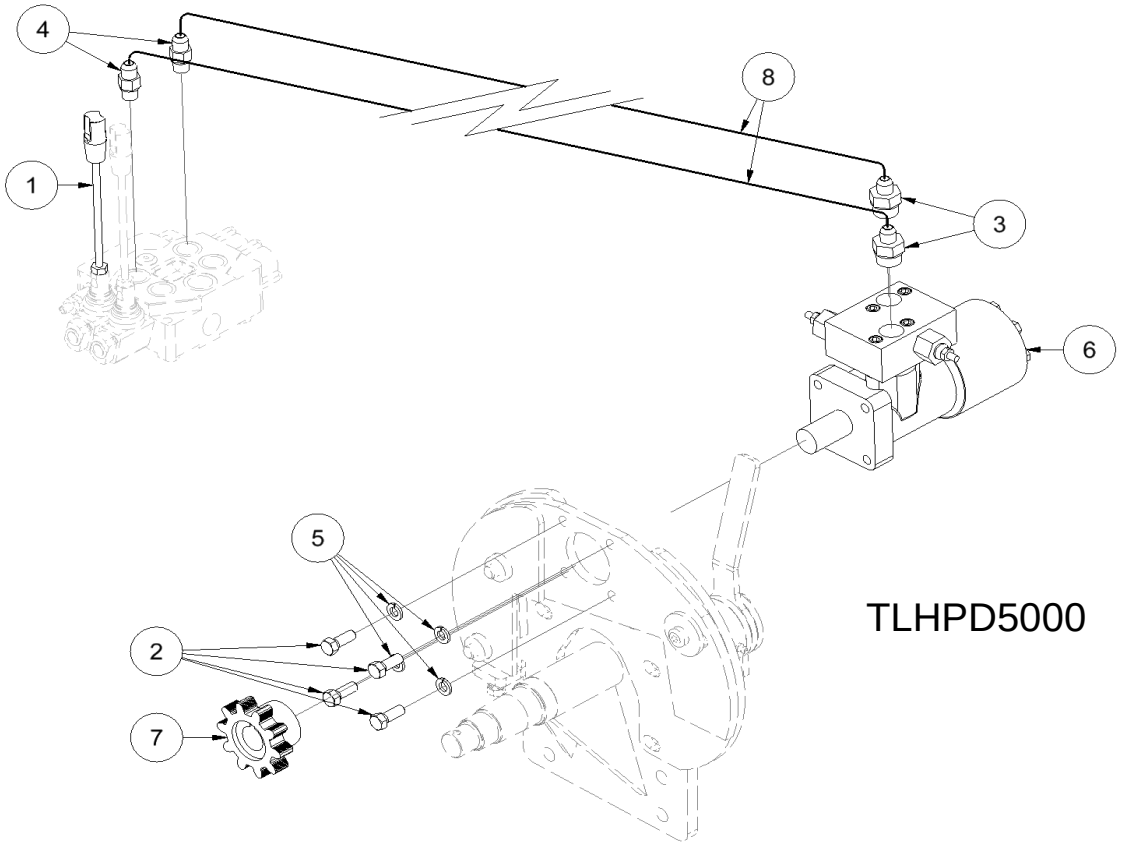
TLR 5000X2 Wiring Diagram



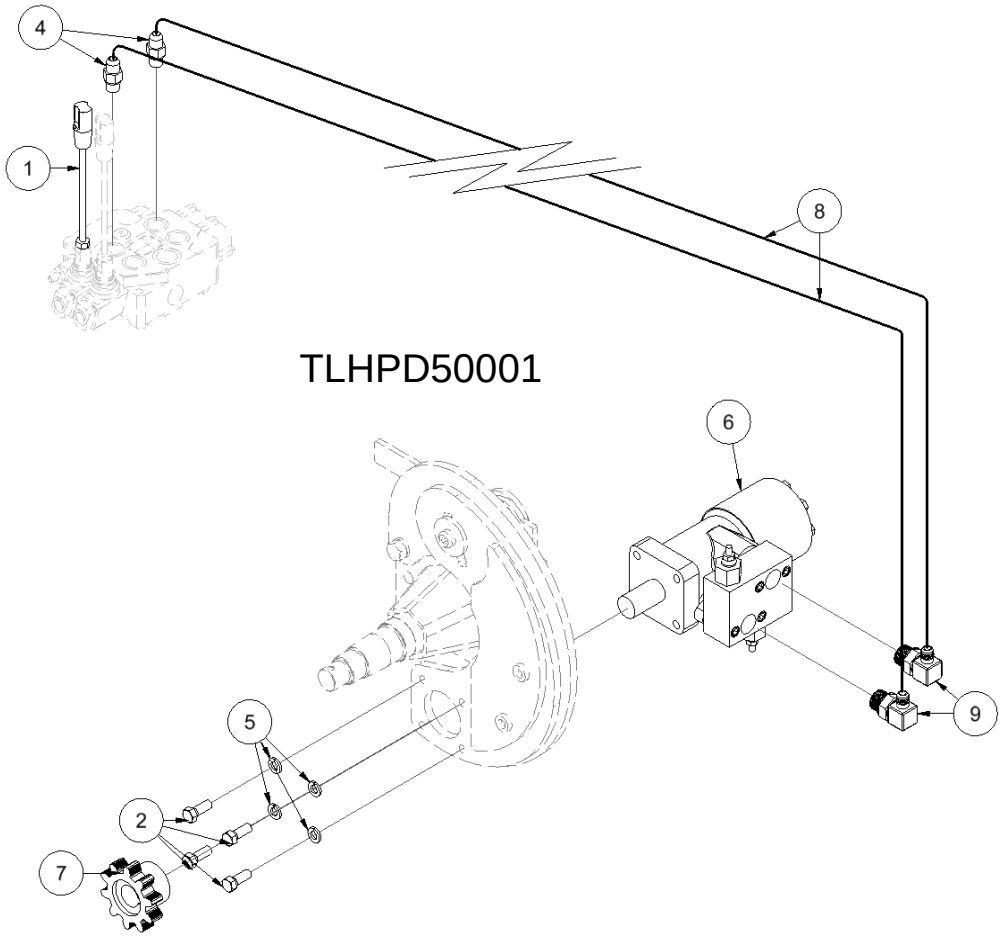
Available Options

- Single Power Drive
- Dual Power Drive
- Light Kit
- Remote Control
- Guide Roller Kit
- Twin Wrap Kit

Optional Single Power Drive

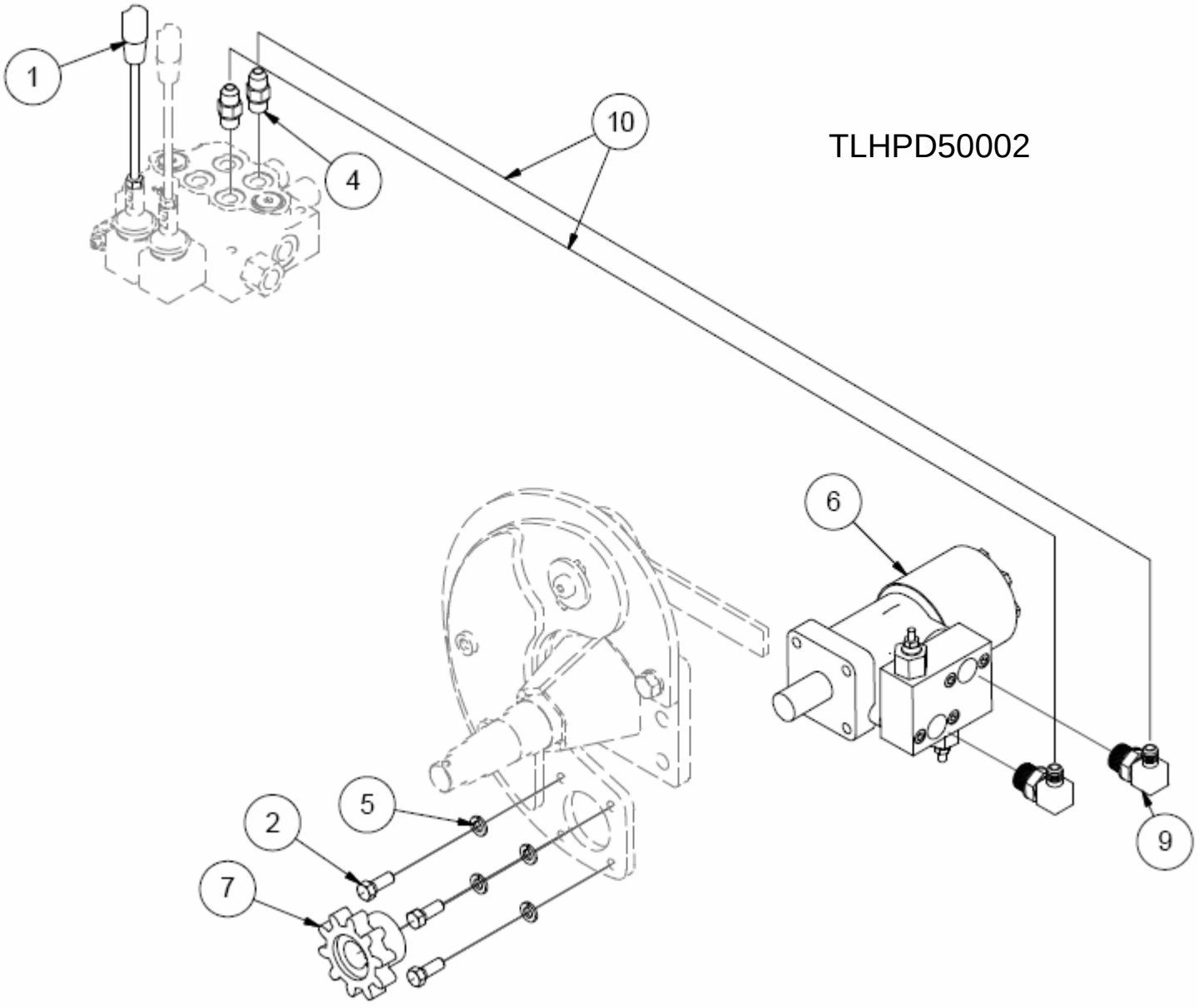


TLHPD5000



TLHPD50001

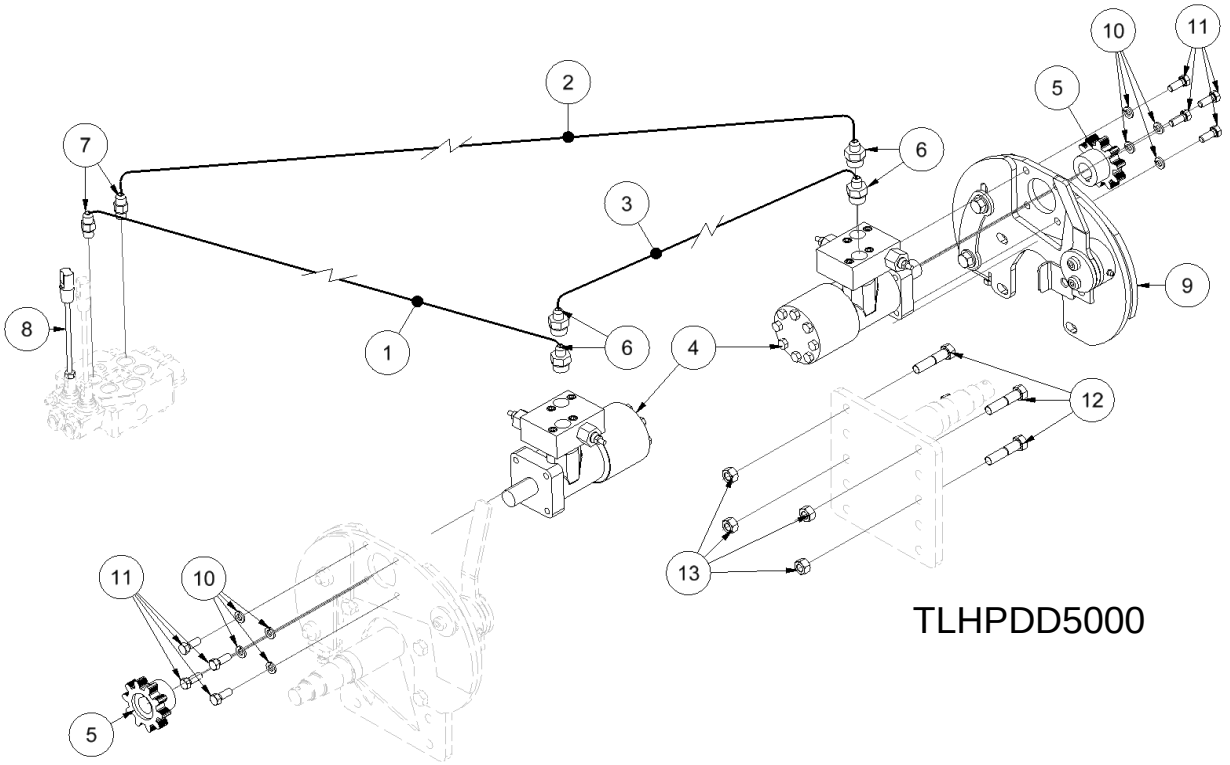
Optional Single Power Drive



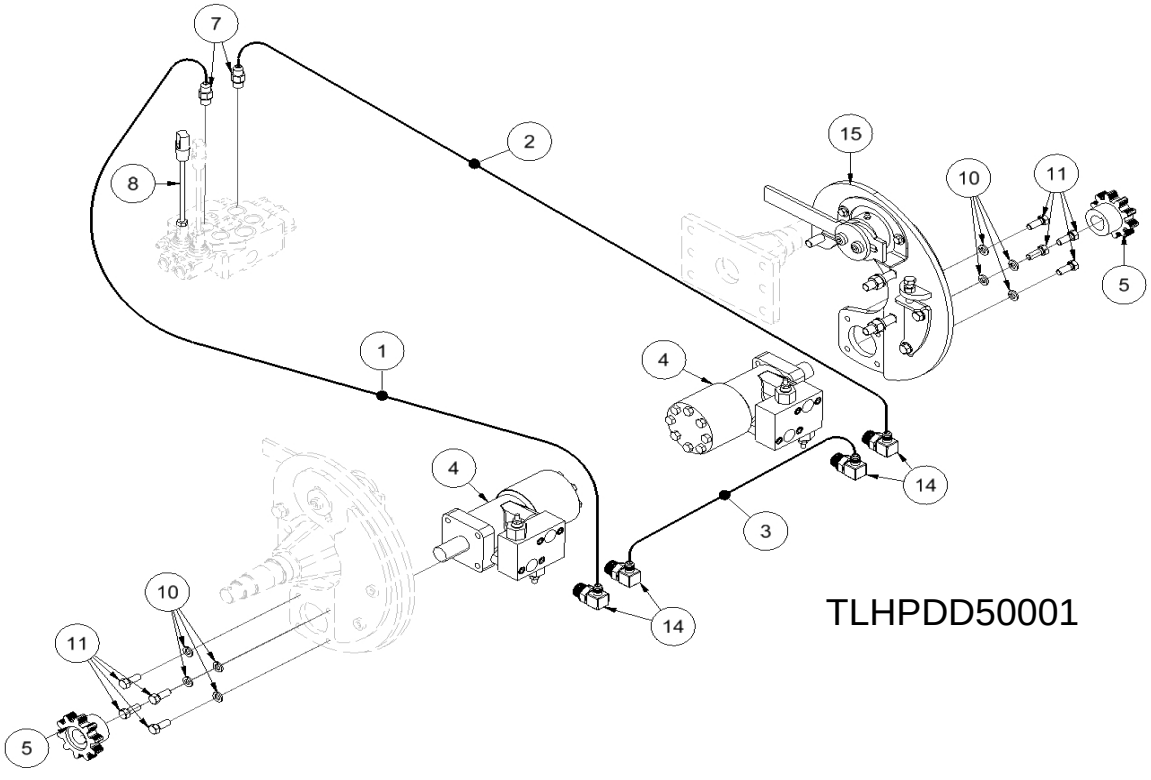
Optional Single Power Drive

Item	Qty	Part #	Description
		TLHPD5000	Complete Kit (ITEMS 1-8) (Up to Serial # 09R178)
		TLHPD50001	Complete Kit (From Serial # 09R178 – 11R012)
		TLHPD50002	Complete Kit (From Serial # 11R012 - current)
1	1	VAL21733	Single Handle
2	4	Obtain Locally	3/8” X 1” UNC Hex Bolt
3	2	TL6400610	Adapter Fitting
4	2	TL640066	Adapter Fitting
5	4	Obtain Locally	3/8” Lockwasher
6	1	TL550-200-138	Drive Motor Assembly
7	1	TL550-203-237	Drive Gear
8	2	TL24721	Hyd. Hose
9	2	TL 6801-6-10	Adapter Fitting
10	2	TL28012	Hyd. Hose

Optional Dual Power Drive

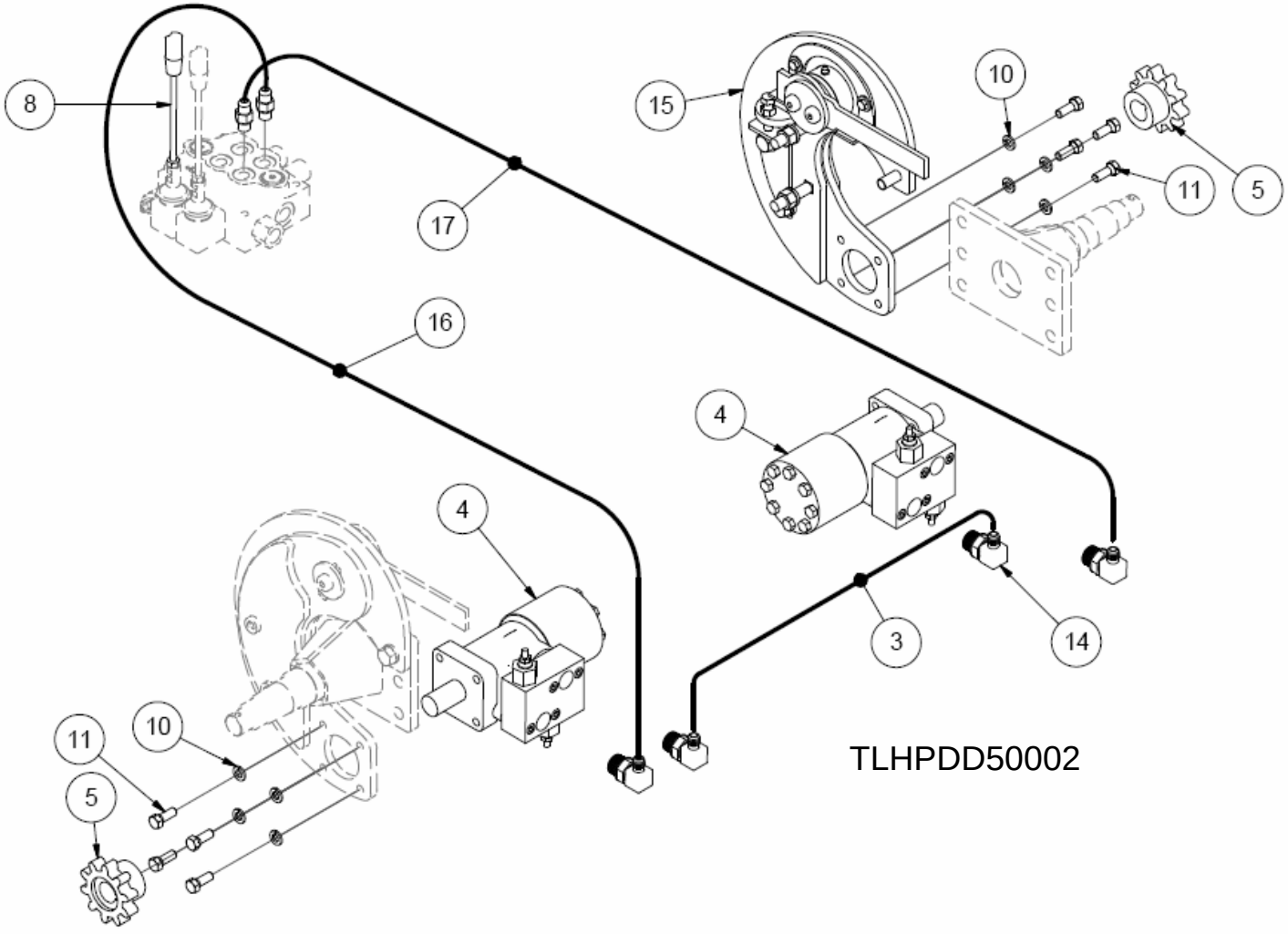


TLHPDD5000



TLHPDD50001

Optional Dual Power Drive

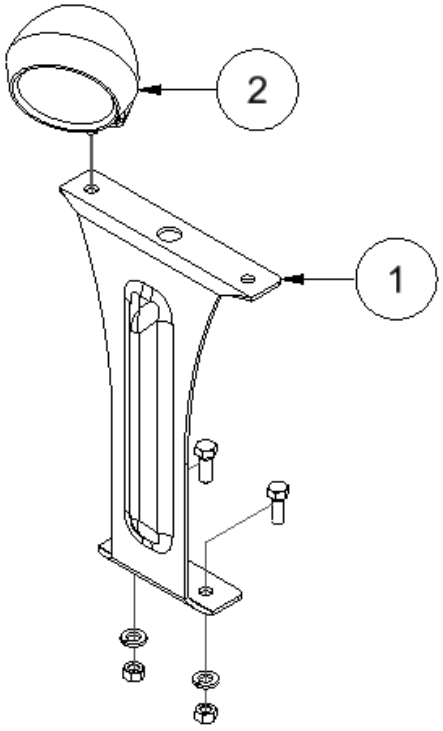


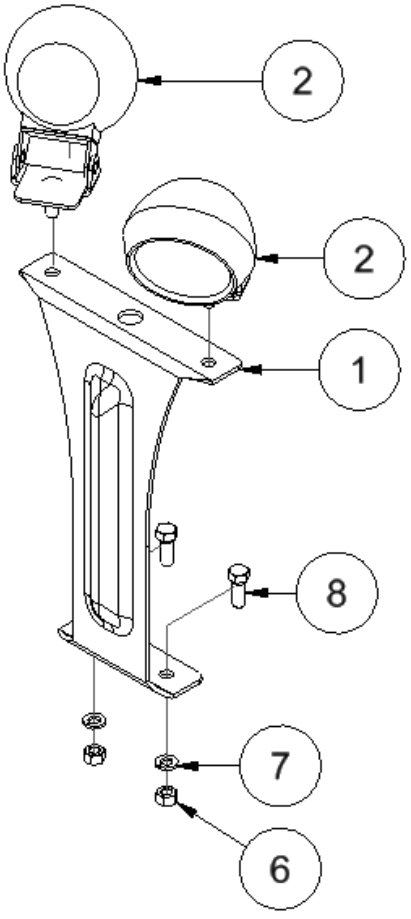
TLHPDD50002

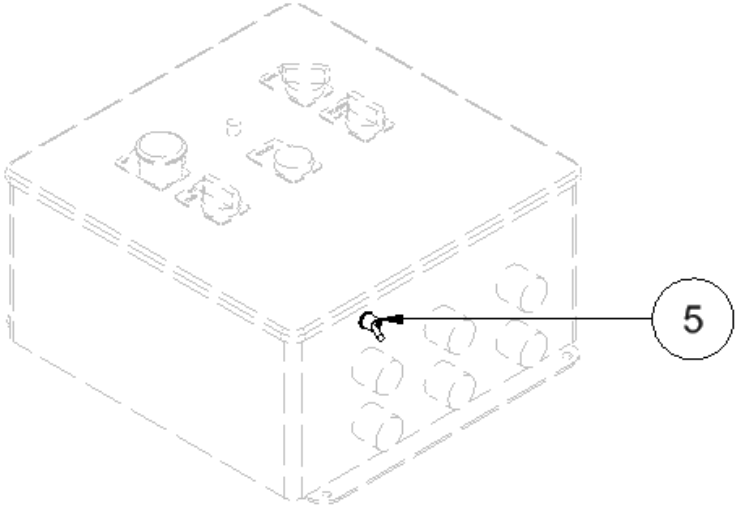
Optional Dual Power Drive

Item	Qty	Part #	Description
		TLHPDD5000	Complete Kit (Items 1-13) (Up to Serial # 09R178)
		TLHPDD50001	Complete Kit (From Serial # 09R178 – 11R012)
		TLHPDD50002	Complete Kit (From Serial # 11R012 – current)
1	1	TL24721	Hyd. Hose 162"
2	1	TL24722	Hyd. Hose 210"
3	1	TL24723	Hyd. Hose 108"
4	2	TL550-200-138	Drive Motor
5	2	TL550-203-237	Drive Gear
6	4	TL6400610	Adapter Fitting
7	2	TL640066	Adapter Fitting
8	1	VAL21733	Valve Handle
9	1	TLWHEEL32RIGHT	Right PD Linkage
10	8	Obtain Locally	3/8" Lockwasher
11	8	Obtain Locally	3/8" X 1" UNC Hex Bolt
12	4	Obtain Locally	1/2" X 2 1/4" UNF Hex Bolt
13	4	Obtain Locally	1/2" UNF Hex Nut
14	4	TL6801-6-10	Adapter Fitting
15	1	TL109-100-360	Power Drive Assembly
16	1	TL28012	Hyd. Hose 156”
17	1	TL28013	Hyd. Hose 203”

Optional Light Kit







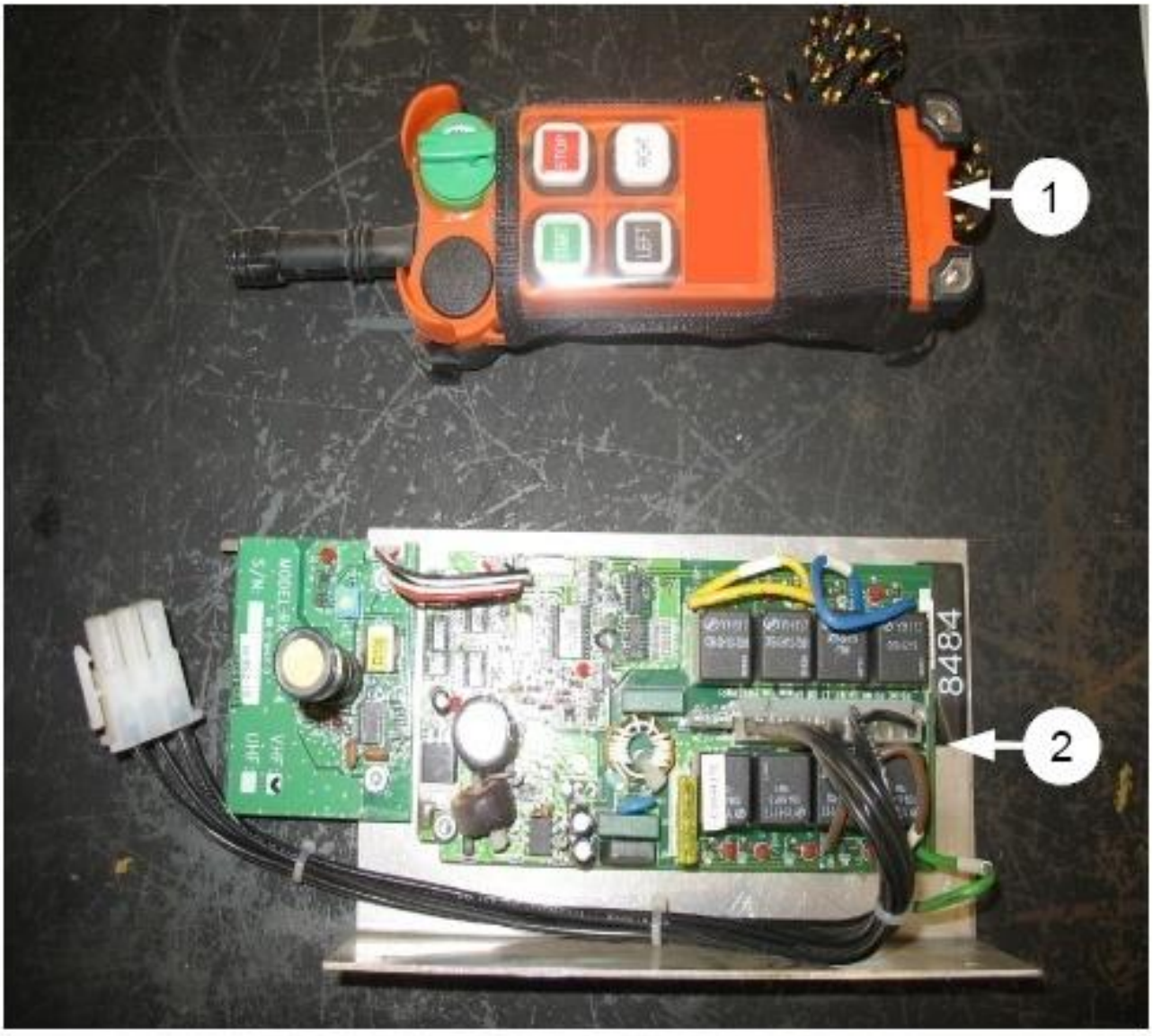
Optional Light Kit

Item	Qty	Part #	Description
		TLNWLK	Complete Kit
1	2	TL5X2-100-201	Light Bracket
2	3	TL64931B	Light
3	1	Obtain Locally	15 AMP Fuse
4	1	Obtain Locally	Fuse Holder
5	1	Obtain Locally	Toggle Switch
6	4	Obtain Locally	HN 3/8" (Hex Nut)
8	2	Obtain Locally	LW 3/8" (Lock Washer)
9	4	Obtain Locally	HB 3/8" X 1" (Hex Bolt)

Installation

- Mounting location is at the top of the hoop guards
- Drill a 1/2” hole in the bottom of the control panel for the toggle switch
- Install the switch, locate the 2 wires labeled lights inside the control panel and connect them to the one terminal on the toggle switch
- Connect the inline fuse from the toggle switch to the bottom of the fuse block (fuse block is located at the left side of the terminal strip)

Optional Remote Control



Optional Remote Control

Item	Qty	Part #	Description
		TLR SSKX2HD	Remote Control Kit
1	1	TLH HCX2HD	Hand-held Unit
2	1	TLR SSKX2HDL	Receiver Unit

Installation

- Bolt receiver assembly to inside rear right of control box with connector plug at bottom.
- Locate the plug with 6 wires inside the control panel.
- Remove the jumper plug and connect the remote control board.

Notice : All remote control units use the same frequency, no programming is required.

.ON/OFF – TURNS HANDHELD UNIT ON/OFF (DETENT HAS NO FUNCTION)

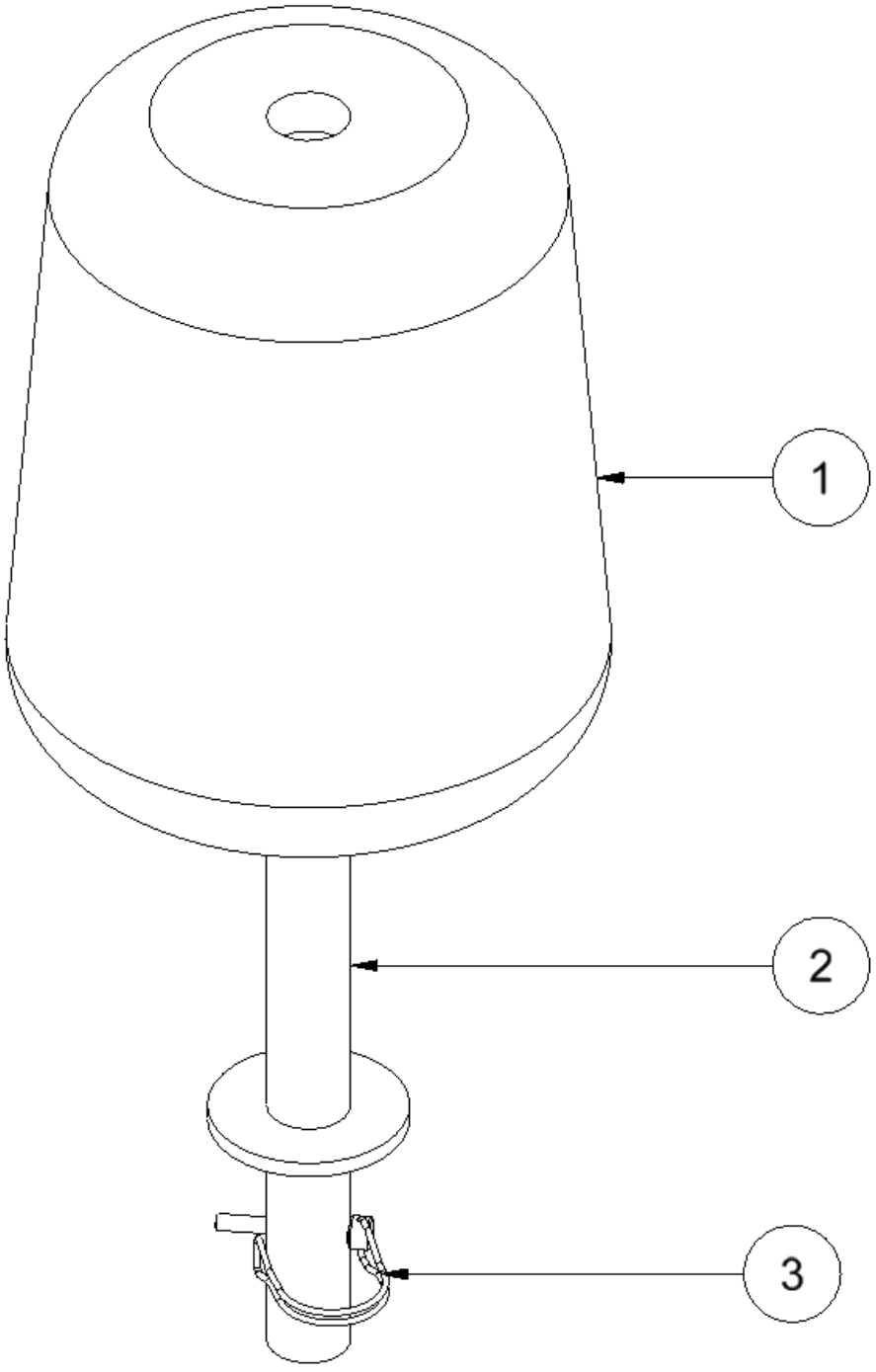
.START – STARTS THE WRAP CYCLE (UNPLUG THE TABLE SWITCH IF YOU PREFER TO START EACH CYCLE WITH THIS BUTTON) THIS WILL NOT START THE RESTART THE HOOP IF CYCLE IS BROKEN AFTER THE HOOP START WAS TRIGGERED

.STOP – STOPS THE WRAP CYCLE (IF THE TABLE SWITCH IS NOT UNPLUGGED AND IT HAS A BALE HOLDING IT DOWN, IT IS NESSECARY TO HOLD STOP UNTIL THE CIRCUIT IS BROKEN BY SWITCHING TO MANUAL MODE AT THE CONTROL PANEL)

.LEFT- STEERS LEFT

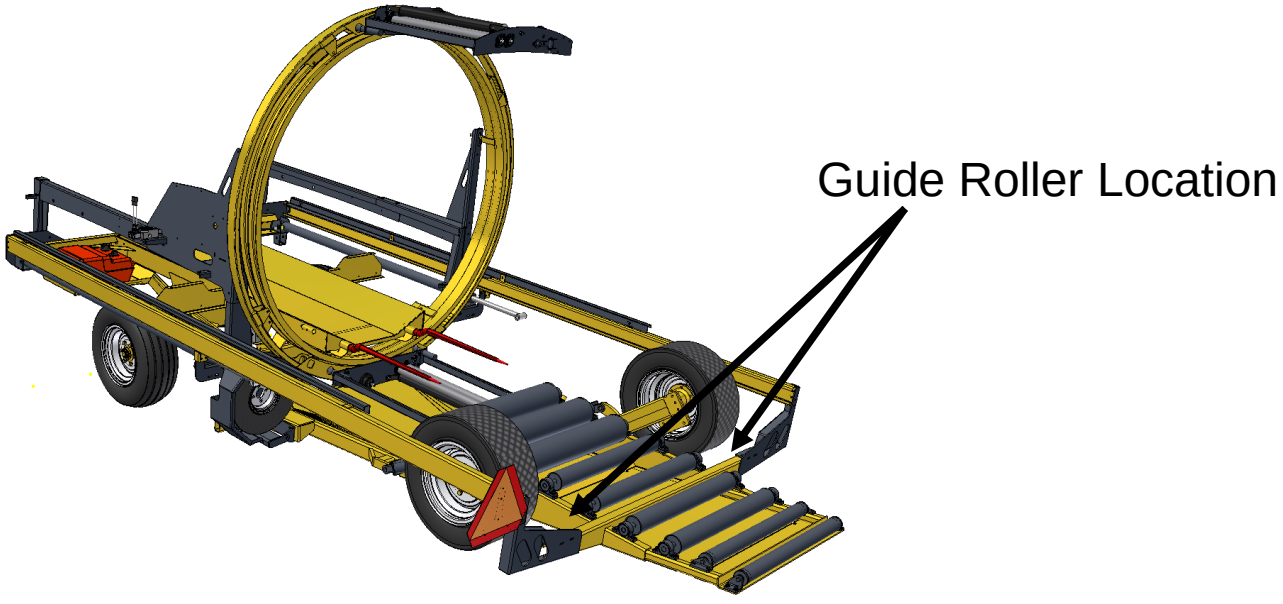
.RIGHT- STEERS RIGHT

Optional Guide Roller

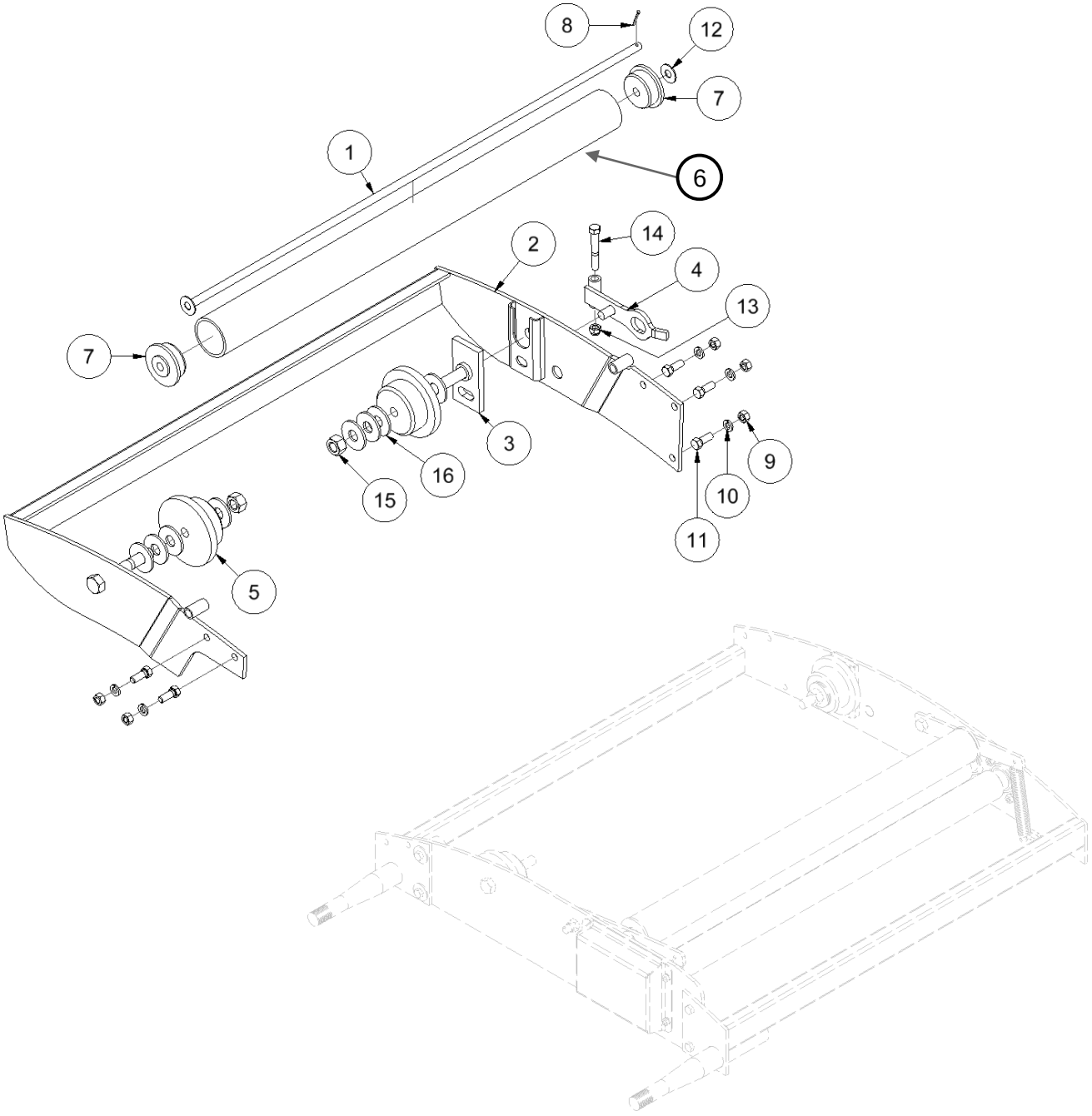


Optional Guide Roller

Item	Qty	Part #	Description
		TLGR	Guide Roller Kit
1	2	TL550-301-238	Roller
2	2	TL550-301-239	Spindle
3	2	TL550-301-233	Lock Pin



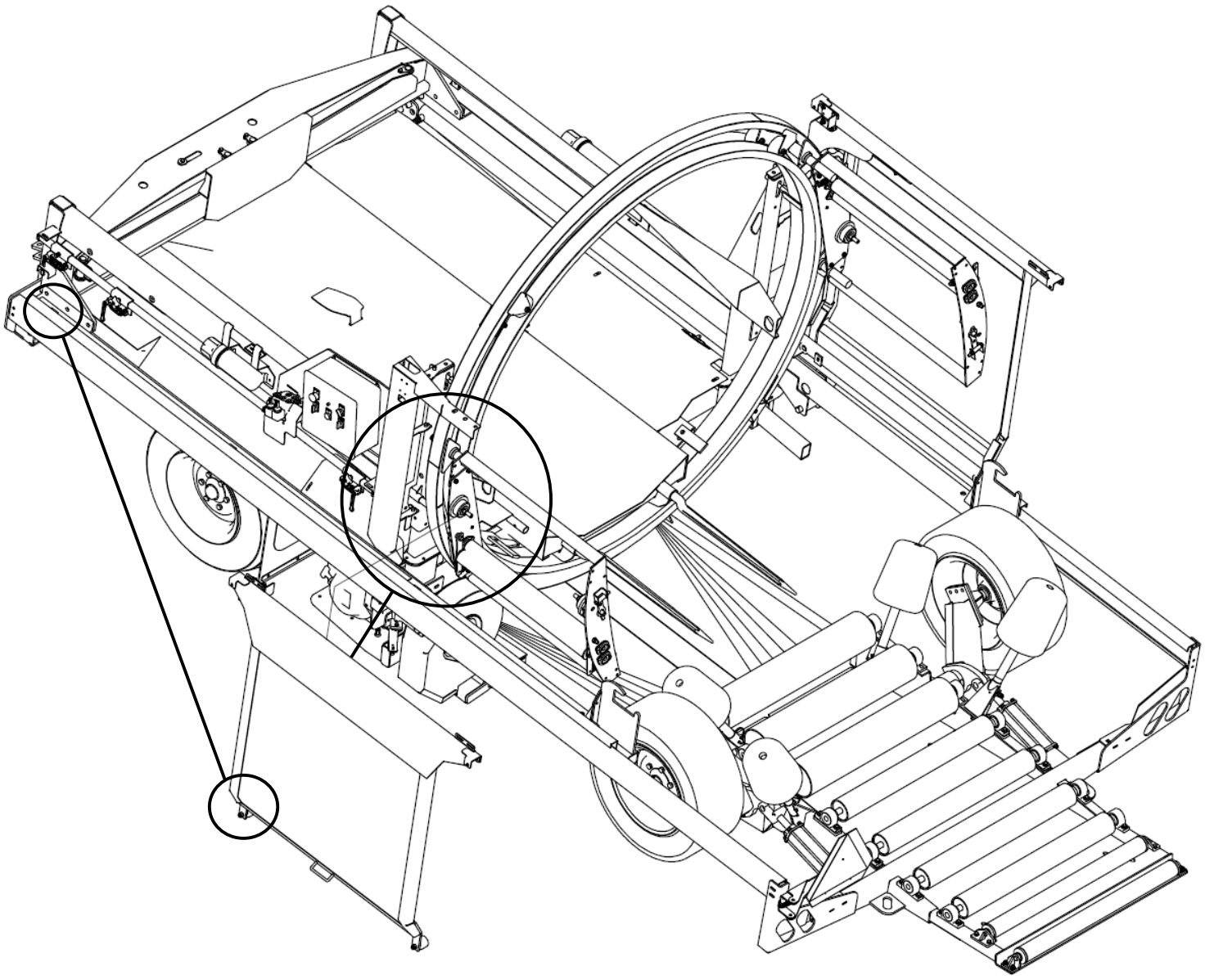
Twin Wrap Kit



Optional Twin Wrap Kit

Item	Qty	Part #	Description
		TL TWK	Twin Wrap Kit
1	1	TL TWROD	Idler Axle
2	1	TL550-200-139	Twin Wrap Frame
3	1	TL550-200-115	Spool Holder Bracket
4	1	TL550-200-103	Spool Holder Latch
5	2	TL550-200-012	Wrap Spool Holder
6	1	TL550-100-022	Plastic Idler
7	2	TL 16P40D	Idler End Caps
8	1	Obtain Locally	1/8" Cotter Pin
9	5	Obtain Locally	HN 3/8" Hex Nut
10	5	Obtain Locally	LW 3/8" Lockwasher
11	5	Obtain Locally	HB 3/8" X 1" Hex Bolt
12	2	Obtain Locally	FW 7/16" Flatwasher
13	1	Obtain Locally	LN 3/8" Lock Nut UNC
14	1	Obtain Locally	HB 3/8" X 2 1/2" Hex Bolt
15	2	Obtain Locally	HN 5/8" Hex Nut UNC
16	8	Obtain Locally	FW 5/8" Flatwasher

Dealer Installation



Dealer Installation

1. Remove the doors, which are strapped to the machine.

2. Move the Door Mount into position but do not fully tightened.

3. Add the wheels attached to the Door Mount mesh to their proper position on top of the Door Mount.

4. Remove the door track bolt on the Door Track (towards front).

5. Slide the Doors into the Door Track, the top channel fits over the top wheel of the Door Mount. This keeps the door in line with the wheels in the Door Track .

6. Refasten the door stop bolt on the Door Track, and fully tighten the Door Mount bolts.

NOTE : Use the slots in the Top Door Wheel Bracket to move it up or down. The wheels should be about a 1/4” from touching the top channel on the Doors.

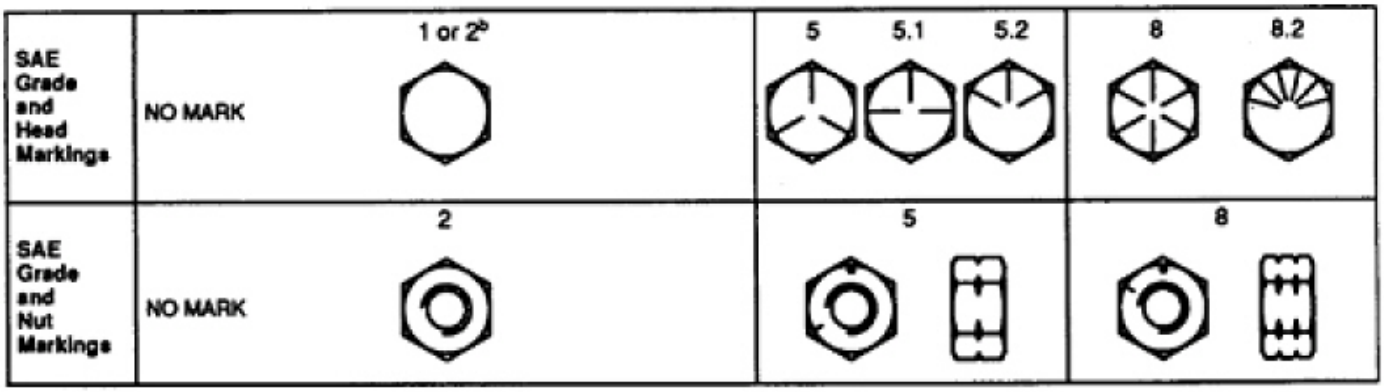
7. Bolt red battery cable to battery (On the 13 hp Honda, open the gas valve).

8. Start the Honda.

9. To test the wrapper; switch to manual mode, jog the ram to speed up the engine. The hoop, power drive and steering can now be tested.

10. If you ordered your machine with a steering remote and shut down kit you will find it in gray tube next to the control panel.

UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES



TS1162 -19-08MAR91

Size	Grade 1				Grade 2[b]				Grade 5, 5.1, or 5.2				Grade 8 or 8.2			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
1/4	3.7	2.8	4.7	3.5	6	4.5	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.5	10	7	12	9	15	11	20	15	25	18	28	21	35	26
3/8	14	10	17	13	22	16	27	20	35	26	44	33	50	36	63	46
7/16	22	16	28	20	35	26	44	32	55	41	70	52	80	58	100	75
1/2	33	25	42	31	53	39	67	50	85	63	110	80	120	90	150	115
9/16	48	36	60	45	75	56	95	70	125	90	155	115	175	130	225	160
5/8	67	50	85	62	105	78	135	100	170	125	215	160	240	175	300	225
3/4	120	87	150	110	190	140	240	175	300	225	375	280	425	310	550	400
7/8	190	140	240	175	190	140	240	175	490	360	625	450	700	500	875	650
1	290	210	360	270	290	210	360	270	725	540	925	675	1050	750	1300	975
1-1/8	400	300	510	375	400	300	510	375	900	675	1150	850	1450	1075	1850	1350
1-1/4	570	425	725	590	570	425	725	530	1300	950	1650	1200	2050	1500	2600	1950
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2150	1550	2700	2000	3400	2550
1-1/2	1000	725	1250	925	990	725	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

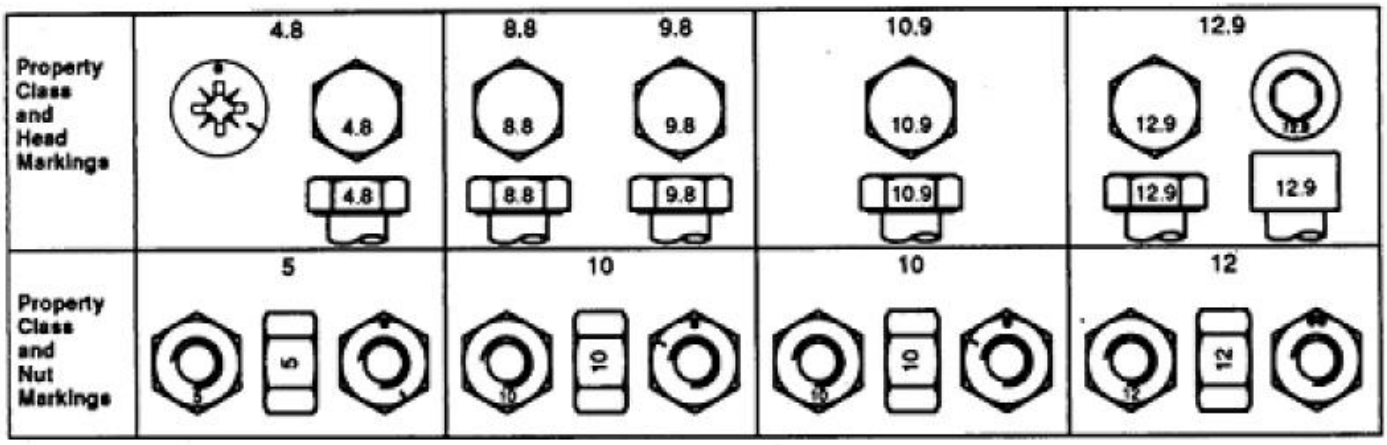
Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

[a] "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

[b] Grade 2 applies for hex cap screws (not hex bolts) up to 152 mm (6-in.) long. Grade 1 applies for hex cap screws over 152 mm (6-in.) long, and for all other types of bolts and screws of any length.

DX.TORQ1 -19-20JUL94

METRIC BOLT AND CAP SCREW TORQUE VALUES



TS1163 -19-04MAR91

Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	190
M16	100	73	125	92	190	140	240	175	275	200	350	255	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class.

Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

[a] *"Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.*

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