TILMOR SERVICE MANUAL 520Y TRACTOR



Original Service Manual

12-30001 REV. 00

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Using Your Manual

The purpose of this service manual is to provide service personnel information for troubleshooting, service, maintenance and repair of the Tilmor 520Y tractor.

Specific instructions for the operation and basic maintenance of the Tilmor 520Y tractor can be found in the Tilmor 520Y tractor operator's manual. The Tilmor 520Y operator's manual is available at www.tilmor.com. Some specific part information is not included in this manual and can be found in the Tilmor 520Y parts manual. The Timor 520Y part's manual is available at www.tilmor.com.

Tilmor LLC reserves the right to change product specifications or this publication without notice. The most up to date information is available at www.tilmor.com.

Shop safety knowledge, mechanical and electrical skills are assumed. The table of contents lists the topics covered in this manual.

If there are any questions or comments regarding this manual, please contact Tilmor at:

Tilmor LLC. 295 Kurzen Rd. N Dalton, OH 44618 1-844-255-5864 www.tilmor.com

Throughout this manual, you will encounter special messages and symbols that identify potential safety concerns to help you as well as others avoid personal injury or damage to equipment.

SYMBOL DEFINITIONS



This symbol identifies potential health and safety hazards. When this symbol is observed, carefully read and understand the instructions that follow. Failing to obey the instructions may result in personal injury or damage to equipment.

SIGNAL WORD DEFINITIONS

There are three signal words that describe a level of safety concern: Danger, Warning, Caution.

Indicates an imminently hazardous situation which, if not avoided, will result in death or seri- ous injury. This signal word is limited to the most extreme cases.	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
	Indicates a potentially hazardous situation which,

General Safety Procedures for Tilmor Tractors, Attachments & Accessories



General Safety Procedures for Tilmor Tractors, Attachments, & Accessories







Decal	Description	Part Number	Quantity
А	Operator Safety	00-0548	1
В	Warning - Pinch Point	00-0218	6
С	Warning - Battery	00-0366	1
D	Warning - Hot surface	00-0374	2
E	Warning - Fan	00-0341	1
F	Danger - Diesel Only	00-0551	1
G	ROPS Certification	00-0611	1



General Safety Procedures

for Tilmor Tractors, Attachments & Accessories



- The owner of this machine is solely responsible for properly training the operators.
- The owner/operator is solely responsible for the operation of this machine and prevention of accidents or injuries occurring to him/herself, other people, or property.
- Do not allow operation or service by children or untrained personnel.
 Local regulations may restrict the age of the operator.
- Before operating this machine, read the operator's manual and understand it's contents.
- If the operator of the machine cannot understand this manual, then it is the responsibility of this machine's owner to fully explain the material within this manual to the operator.
- Learn and understand the use of all of the controls.
- Know how to stop the power unit and all attachments quickly in the event of an emergency.

Personal Protective Equipment Requirements

It is the responsibility of the owner to be sure that the operators use the proper personal protective equipment while operating the machine. Required personal protective equipment includes but is not limited to the following list.



- Wear a certified hearing protection device to prevent the loss of hearing.
- Prevent eye injury by wearing safety glasses while operating the machine.
 - Closed toe shoes must be worn at all times.
 - Long pants must be worn at all times.
 - When operating in dusty conditions, it is recommended that a dust mask be worn.

Operation Safety

- Inspect all equipment before operation. Repair or replace any damaged, worn, or missing parts. Be sure all guards and shields are in proper working condition and are secured in place. Make all of the necessary adjustments before operating the machine.
- Some pictures in this manual may show shields or covers opened or removed in order to clearly illustrate any instructions. Under no circumstance should the machine be operated without these devices in place.
- Alterations or modifications to this machine can reduce safety and could cause damage to the machine. Do not alter safety devices or operate with shields or covers removed.
- Before each use, verify that all controls function properly and inspect all safety devices. Do not operate if controls or safety devices are not in proper working condition.
- Check the parking brake function before operating. Repair or adjust the parking brake if necessary.
- Observe and follow all safety decals.
- All controls are to be operated from the operator's station only.
- Always wear a seat belt if the machine has a roll cage/bar installed and in the upright position.
- Ensure all attachments or accessories are locked or fastened securely before operation.
- Ensure that all bystanders are clear of the machine before operation. Stop the machine if someone enters your work area.
- Always be alert to what is happening around you, but do not lose focus to the task you are performing. Always look in the direction the machine is moving.
- Look behind and down before backing up to be sure of a clear path.
- If you hit an object, stop and inspect the machine. Make all necessary repairs before continuing operation of the machine.
- Stop operation immediately at any sign of equipment failure. An unusual noise can be a warning of equipment failure or a sign that maintenance may be required. Make all necessary repairs before continuing operation of the machine again.



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General Safety Procedures

for Tilmor Tractors, Attachments & Accessories



Operation Safety (continued)

- If equipped with a high/low range feature, never shift between high and low range while on a slope.
- Do not leave the machine unattended while it is running.
- Always park the machine on level ground.
- Always shut off the engine when connecting the attachments drive belt to the power unit.
- Never leave the operator's station without lowering the attachment to the ground, setting the parking brake, shutting off the engine, and removing the ignition key. Make sure all moving parts have come to a complete stop before dismounting.
- Never leave equipment unattended without lowering the attachment to the ground, setting the park-• ing brake, shutting off the engine and removing the ignition key.
- Only operate in well-lit conditions. •
- Do not operate when there is a risk of lightning.
- Never direct the discharge of any attachment in the direction of people, buildings, animals, vehicles, • or other objects of value.
- Never discharge material against a wall or obstruction. Material may ricochet back towards the operator.
- Use extra caution when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
- Do not run the engine in a building without adequate ventilation.
- Do not touch the engine or the muffler while the engine is running or immediately after stopping the • engine. These areas may be hot enough to cause a burn.
- Do not change the engine governor settings or over-speed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
- To reduce the hazard of fire, keep the battery compartment, engine, and muffler areas free of grass, leaves, excessive grease, and other flammable materials.

Preventing Accidents

- Clear working area of objects that might be hit or thrown from the machine.
 - Keep people and pets out of working areas.
 - Know the work area well before operation. Do not operate where traction or stability is questionable.
- Reduce speed when you are operating over rough ground.
- Equipment can cause serious injury and or death when improperly used.
- Before operating understand the operation and safety of the power unit and attachment being used.
- Do not operate the machine if you are not in good physical and mental health, if you will be distracted by personal devices, or are under the influence of any substance that may impair decision, dexterity, or judgement.
- Children are attracted to machine activity. Be aware of children and do not allow them in the working area. Turn off the machine if a child enters the work area.

Keep Riders Off

- Only the operator should be on the power unit. Keep riders off.
- Never allow riders on any attachment or accessory.







General Safety Procedures for Tilmor Tractors, Attachments & Accessories



Operating On Slopes

- Slopes can cause loss of control and tip-over accidents, which can result in severe injury, or death. Be familiar with the emergency parking brake, along with the power unit controls and their functions.
- If the power unit is equipped with a fold down roll bar, it must be locked in the upright position when operating on a slope.



- Use low range (if equipped) when operating on slopes of greater than 15 degrees.
- Do not stop or start suddenly when operating on slopes.
- Never shift between high and low range while on a slope. Always move the power unit to level ground and engage the parking brake before shifting range or placing the power unit in neutral.
- Variables such as wet surface and loose ground will reduce the degree of safety. Do not drive where the machine could lose traction or tip over.
- Keep alert for hidden hazards in the terrain.
- Stay away from drop-offs, ditches and embankments.
- Sharp turns should be avoided when operating on slopes.
- Pulling loads on hills decreases safety. It is the responsibility of the owner/operator to determine loads that can safely be controlled on slopes.
- Transport the machine with attachment lowered or close to the ground to improve stability.

Roadway Safety

- Operate with safety lights when operating on or near roadways.
- Obey all state and local laws concerning operation on roadways.

Truck or Trailer Transport

- Use full width ramps for loading the machine onto a truck or trailer.
- The parking brake is not sufficient to lock the machine during transport. Always secure the power unit and/or attachment to the transporting vehicle securely using straps , chains, cable, or ropes. Both front and rear straps should be directed down and outward from the machine.
- Shut off fuel supply to the power unit during transport on a truck or trailer.
- If equipped, turn the battery disconnect switch to the Off position to shut off electrical power.





General Safety Procedures

for Tilmor Tractors, Attachments & Accessories



Maintenance

- Keep all safety decals legible. Remove all grease, dirt and debris from safety decals and instructional labels.
- If any decals are faded, illegible, or missing, contact your dealer promptly for replacements.
- When new components are installed, be sure that current safety decals are affixed to the replacement components.
- If any component requires replacement use only original Tilmor replacement parts.
- Always turn the battery disconnect to the Off position or disconnect the battery before performing any repairs. Disconnect the negative terminal first and the positive terminal last. Reconnect the positive terminal first and the negative terminal last.
- Keep all bolts, nuts, screws and other fasteners properly tightened.
- Always lower the attachment to the ground, engage parking brake, shut off engine, and remove the ignition key. Make sure all moving parts have come to a complete stop before cleaning, inspection, adjusting, or repairing.
- Never perform maintenance on the power unit and/or attachment if someone is in the operator's station.
- Always use protective glasses when handling the battery.
- Check all fuel lines for tightness on a regular basis. Tighten or repair them as needed.
- To reduce the hazard of fire, keep the battery compartment, engine, and muffler areas free of grass, leaves and excessive grease.
- Do not touch the engine, the muffler, or other exhaust components while the engine is running or immediately after stopping the engine. These areas may be hot enough to cause a burn.
- Allow the engine to cool before storing and do not store near an open flame.
- Do not change the engine governor settings or over-speed the engine. Operating engine at excessive speed may increase the hazard of personal injury.
- Springs may contain stored energy. Use caution when disengaging or removing springs and/or spring loaded components.
- An obstruction or blockage in a drive system or moving/rotating parts may cause a build up of stored energy. When the obstruction or blockage is removed, the drive system or moving/rotating parts may move suddenly. Do not attempt to remove an obstruction or blockage with your hands. Keep hands, feet, and clothing away from all power driven parts.
- Dispose of all fluids in accordance with local laws.

Fuel Safety

- To avoid personal injury or property damage, use extreme care in handling gasoline and diesel fuel. Gasoline and diesel are extremely flammable and the vapors are explosive.
- Do not refuel the machine while smoking or at a location near flames or sparks.
- Always refuel the machine outdoors.
- Do not store the machine or fuel container indoors where the fuel or fumes can reach an open flame, spark, or pilot light.
- Only store fuel in an approved container. Keep out of reach of children.



General Safety Procedures

for Tilmor Tractors, Attachments & Accessories



Fuel Safety (continued)

- Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.
- Remove the machine from the truck or trailer and refuel it on the ground. If this is not possible, refuel the machine using a portable container, rather than from a fuel dispenser nozzle.
- Never remove the fuel cap or add fuel with the engine running. Allow the engine to cool before refueling.
- Never remove the fuel cap while on a slope. Only remove when parked on a level surface.
- Replace all fuel tank and container caps securely.
- Do not overfill the fuel tank. Only fill to bottom of fuel neck, do not fill the fuel neck full. Overfilling of the fuel tank could result in engine flooding, fuel leakage from the tank, or damage to the emissions control system.
- If fuel is spilled, do not attempt to start the engine. Move the power unit away from the fuel spill and avoid creating any source of ignition until fuel vapors have dissipated.
- If the fuel tank must be drained, it should be drained outdoors into an approved container.
- Dispose of all fluids in accordance with local laws.
- Check all fuel lines for tightness and wear on a regular basis. Tighten or repair tham as needed.
- The fuel system is equipped with a shut-off valve. Shut off the fuel when transporting the machine to and from the job, when parking the machine indoors, or when servicing the fuel system.

Hydraulic Safety

- Make sure all hydraulic connections are tight and all hydraulic hoses and tubes are in good condition. Repair any leaks and replace any damaged or deteriorated hoses or tubes before starting the machine.
- Hydraulic leaks can occur under high pressure. Hydraulic leaks require special care and attention.
- Use a piece of cardboard and a magnifying glass to locate suspected hydraulic leaks.
- Keep body and hands away from pinhole leaks or nozzles that eject high pressure hydraulic fluid. Hydraulic fluid escaping under high pressure can penetrate the skin causing serious injury, leading to severe complications and/or secondary infections if left untreated. If hydraulic fluid is injected into the skin, seek immediate medical attention no matter how minor the injury appears.



- The hydraulic system may contain stored energy. Before performing maintenance or repairs on the hydraulic system, remove attachments, engage parking brake, disengage the weight transfer system (if equipped), shut off the engine and remove the ignition key. Move the hydraulic control lever before disconnecting hydraulic hoses.
- Dispose of all fluids in accordance with local laws.

Engine
Manufacturer
Model Number
Type
Cylinders
Displacement
Engine Gross HP
Operating Range (RPM)
Cooling System
Alternator
Flectrical
Battery 550 Cold Cranking Amo
Power Train
Type
Four Speed Transmission
Two Speed Transmission
Fwd Speed (High)*
Fwd Speed (Low)*
Brakes
Controls & Instrument Panel
Steering
BPTO
Throttle Control
Gauges
Parking/Emergency Brake
Other Features
Standard Tires Front Tractor 4.0. 1
Standard Tires Pear Bar 8.3 24.6 Pl

*May vary based on tire size, type, and inflation

Fluid Capacities, Filtration and Specifications

	Fluid Type	Capacity	Filter #1	Filter #2
Engine Oil	10W-30 diesel oil that meets API CK-4	3.9 qts (3.7 L)	13-0267	-
Hydraulic Oil	Mobifluid 424	6.5 qts (6.2 L)	21-0078	-
Transmission	Mobifluid 424	2.2 qts (2.1 L)	-	-
Final Drive	Mobifluid 424	.7 qts (.66 L) Each Side	-	-
Cooling System	50% Distilled Water and 50% ethylene glycol antifreeze	7 qts. (6.6 L)	-	-
Fuel System	Ultra-Low Sulfur Diesel	7.6 gal (28.8 L)	13-0220	-
Brake Fluid	DOT 3	16oz (473.2 ml)	-	-
Grease	Lithium Complex NLGI #2	Refer to Maintenance Chart	-	-
Air Filters			13-0060 (outer)	13-0061 (inner)

Dimensions

Wheelbase	35.8 in (218 cm)
Overall Length	?7.8 in (325 cm)
Overall Height (top of ROPS bar)	37.2 in (221 cm)
Overall Width (narrow track)*	9.9 in (127 cm)
Overall Width (wide track)*	'7.6 in (197 cm)
Weight**)0 lbs (1315 kg)

Load Capacities

Maximum Tractor Weight
Front Axle
Rear Axle
Mid Mount Hitch
Rear Mount Hitch
Maximum Static Vertical Load On Receiver Hitch
Maximum Trailed Mass

Tilmor LLC. Reserves the right to change any specifications without notice.

* May vary based on tire size, type, and inflation.

** Weight varies based on engine size, tire options and optional accessories.

Torque Specification Guide

Recommended torque specifications are listed in the following tables. These specifications shall apply to all fasteners which do not have a specific requirement identified.

Torque Values for SAE Coarse Thread Steel, and Zinc Plated Fasteners

Thread Size	SAE Grade A			SAE Grade 5			SAE Grade 8		
	Tightening Torque			Tightening Torque			Tightening Torque		
	K = 0.15	K = 0.17	K = 0.20	K = 0.15	K = 0.17	K = 0.20	K = 0.15	K = 0.17	K = 0.20
1/4 - 20	32 in-lbs	37 in-lbs	43 in-Ibs	76 in-Ibs	86 in-Ibs	101 in-lbs	107 in-lbs	122 in-lbs	143 in-Ibs
5/16 - 18	66	75	88	157	178	209	221	251	295
3/8 - 16	10 ft-lbs	11 ft-lbs	13 ft-lbs	23 ft-lbs	26 ft-lbs	31 ft-lbs	33 ft-lbs	37 ft-lbs	44 ft-lbs
7/16 - 14	16	18	21	37	42	49	52	59	70
1/2 - 13	24	27	32	57	64	75	80	90	106
9/16 - 12	35	39	46	82	92	109	115	130	154
5/8 - 11	48	54	64	113	128	150	159	180	212
3/4 - 10	85	96	113	200	227	267	282	320	376
7/8 - 9	136	155	182	322	365	429	455	515	606
1 - 8	204	232	273	483	547	644	681	772	909
1-1/4 - 7	409	463	545	840	952	1121	1363	1545	1817
1-3/8 - 6	536	607	715	1102	1249	1469	1768	2025	2382
1-1/2 - 6	711	806	949	1462	1657	1950	2371	2688	3162

* K = 0.15 for "lubricated" conditions. * K = 0.17 for anti-seize, and thread locker. *K = 0.20 for dry and zinc plated conditions

Torque Values for Metric Steel, and Zinc Plated Fasteners

Thread Size		Class 4.6		Class 8.8			Class 10.9		
	Tightening Torque			Ti	ghtening Torqu	le	Tightening Torque		
	K = 0.15	K = 0.17	K = 0.20	K = 0.15	K = 0.17	K = 0.20	K = 0.15	K = 0.17	K = 0.20
4 - 0.7	7.9 in-lbs	8.9 in-lbs	10.5 in-lbs	20.3 in-lbs	23 in-Ibs	27 in-lbs	29 in-lbs	32.9 in-lbs	38.7 in-lbs
5 - 0.8	15.9	18	21.2	40.9	46.4	54.6	58.6	66.4	78.1
6 - 1	27	30.7	36.1	69.7	79	92.9	99.8	113.1	133.0
7 - 1	45.3	51.3	60.3	116.6	132.2	155.5	167	189	223
8 - 1.25	65.6	74.4	87.5	169.1	191.6	225.4	242	274	323
10 - 1.5	10.8 ft-lbs	12.3 ft-lbs	14.4 ft-lbs	27.9 ft-lbs	31.6 ft-lbs	37.2 ft-lbs	39.9 ft-lbs	45.2 ft-lbs	53.2 ft-lbs
12 - 1.75	18.9	21.4	25.2	48.7	55.1	64.9	69.6	78.9	92.8
14 - 2	30.2	34.2	40.2	77.8	88.1	103.7	111.3	126.1	148.4
16 - 2	47	53	62	121	137	161	173	196	230
18 - 2.5	65	73	86	167	189	222	239	270	318
20 - 2.5	91	104	122	236	267	314	337	382	449
22 - 2.5	125	141	166	321	364	428	460	521	613
24 - 3	158	179	211	407	461	543	582	660	777
27 - 3	232	262	309	597	676	796	854	968	1139
30 - 3.5	314	356	419	809	917	1079	1158	1312	1544
33 - 3.5	427	484	870	1101	1248	1468	1576	1786	2101
63 - 4	549	622	732	1415	1603	1886	2024	2294	2699

* K = 0.15 for "lubricated" conditions. * K = 0.17 for anti-seize, and thread locker. *K = 0.20 for dry and zinc plated conditions



Conversion Factors

Inch pounds (in-lbs) to Newton meters (Nm), multiply by 0.113 Foot pounds (ft-lbs) to Newton meters (Nm), multiply by 1.35

Fraction		Decimal	Millimeter	Fraction		Decimal	Millimeter
	1/64	.015625	.3969	1	33/64	.515625	13.096
1/32		.03125	.7938	17/32		.53125	13.493
	3/64	.046875	1.1906		35/64	.546875	13.890
1/16		.0625	1.5875	9/16		.5625	14.287
	5/64	.078125	1.9844		37/64	.578125	14.684
3/32		.09375	2.3813	19/32		.59375	15.081
	7/64	.109375	2.7781		39/64	.609375	15.478
1/8		.125	3.1750	5/8		.625	15.875
	9/64	.140625	3.5719		41/64	.640625	16.271
5/32		.15625	3.9688	21/32		.65625	16.668
	11/64	.171875	4.3656		43/64	.671875	17.065
3/16		.1875	4.7625	11/16		.6875	17.462
	13/64	.203125	5.1594		45/64	.703125	17.859
7/32		.21875	5.5563	23/22		.71875	18.256
	15/64	.234375	5.9531		47/64	.734375	18.653
1/4		.250	6.3500	3/4		.750	19.050
	17/64	.265625	6.7469		49/64	.765625	19.447
9/32		.28125	7.1438	25/32		.78125	19.843
	19/64	.296875	7.5406		51/64	.796875	20.240
5/16		.3125	7.9375	13/16		.8125	20.6375
	21/64	.328125	8.3344		53/64	.828125	21.0345
11/32		.34375	8.7313	27/32		.84375	21.431
	23/64	.359375	9.1282		55/64	.859375	21.8282
3/8		.375	9.5250	7/8		.875	22.2251
	25/64	.390625	9.9219		57/64	.890625	22.6220
13/32		.40625	10.3188	29/32		.90625	23.0188
	27/64	.421875	10.7157		59/64	.921875	23.4157
7/16		.4375	11.1125	15/16		.9375	23.8126
	29/64	.453125	11.5094		61/64	.953125	24.2095
15/32		.46875	11.9063	31/32		.96875	24.6063
	31/64	.484375	12.3032		63/64	.984375	25.0032
1/2		.500	12.7001	1		1.000	25.4001

Fraction, Decimal, Millimeter Conversion Chart

<u>Helpful Tips</u>

Bolt Grades: grade A bolts will have no markings on the head, grade 5 bolts will have 3 lines on the bolt head and grade 8 bolts will have 6 marks on the bolt head.

Blue mark on bolt head indicates blue thread locker was used. Red mark on bolt head indicates red thread locker was used.

SF nut = serrated flange nut. The serrations help the nut to grab into the paint which helps prevent it from loosening over time and also makes assembly quicker because the assembler does not need a backup wrench.

ORIENTATIONS

Right-Hand and Left-Hand orientations may be referred to at different places throughout this manual. Right-Hand and Left-Hand is determined as if facing forward from the operator station.

Spindle / Hub Assembly Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Lift the front of the tractor off of the ground high enough to remove the spindle from the steering arm.
- 3. Remove the wheel from the hub.
- 4. Remove the 7/16" bolt (A) and locknut (B).



5. Remove the 3/8" bolt (C) and washer (D).



6. Remove the spindle from the steering arm. Retain the key (E) for later use.



Removal Complete

Installation

1. Pack the tapered bearing (A) with grease and apply grease to the steering axle (B).



2. Install the assembly into the steering arm and steering spindle aligning the keyway (C).



3. Install the key (D) into the keyway. Ensure that the top of the key is flush with the steering spindle.



4. Install the 3/8" bolt (E) and washer (F). Add blue thread locker.



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5. Install the 7/16" bolt (G) and locknut (H).



6. Install the wheel. Torque lug nuts to 100 ft. lb.

Installation Complete

Steering Arm Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Lift the front of the tractor from the ground.
- 3. Remove the wheel from the hub.
- 4. Remove the outer tie rod from the steering spindle (See Outer Tie Rod Replacement procedure in this manual).
- 5. Remove the three 5/8" bolts (A) and lock nuts securing the steering arm to the front axle.



6. Remove the steering arm from the axle.

Removal Complete

Installation

1. Position the steering arm in the desired location aligning the mounting holes with the front axle mounting holes.

Attention

Two bolts should be installed in the outer most mounting holes of the steering arm.

2. Install the three 5/8" bolts (A) washers and lock nuts.



3. Install the outer tie rod end into the steering spindle (See Outer Tie Rod Replacement procedure in this manual).

Installation Complete

Outer Tie Rod Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove and discard the cotter pin (A).



- 3. Remove the castle nut (B) and washer (C).
- 4. Remove the 1/2" bolt (D) and nut (E).



CHASSIS

- 5. Remove the tie rod from the steering spindle. It may be necessary to use a tie rod puller.
- 6. Remove the tie rod from the tie rod link.

Removal Complete

Installation

1. Position the tie rod in the tie rod link and steering spindle as shown below.



2. Install the washer (A) and castle nut (B) onto the tie rod end.



- 3. Tighten the castle nut down.
- 4. Install the new cotter pin (C).
- 5. Install the 1/2 " bolt (D) and lock nut (E).



6. Grease the tie rod end.

Installation Complete

Inner Tie Rod Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- Remove the inner tie rod access cover from the inside of the tool box by removing the two 1/4" bolts (A) and SF nuts.



3. Remove and discard the cotter pin (B).



- 4. Remove the castle nut (C) and washer (D).
- 5. Remove the tie rod from the inner steering spindle. It may be necessary to use a tie rod puller.
- 6. Remove the outer tie rod end from the outer steering spindle (See Outer Tie Rod Replacement procedure in this manual).

ACAUTION

Use caution when securing the rod link in a bench vice. Over tightening the vise could cause damage to the tie rod link.

- 7. Secure the tie rod link in a bench vice using care not to damage the tie rod link.
- 8. Measure and record the length of the tie rod end to the end of the tie rod link.



9. Loosen the jam nut (E).



10. Remove the tie rod end (F) from the tie rod link.

Removal Complete

Installation

- 1. Install the jam nut onto the new tie rod end with the taper on the nut facing (B).
- Thread the new tie rod (A) into the tie rod link (B) to match the recorded length of the tie rod end to end of the tie rod link.



3. Tighten the jam nut (C) against the tie rod end link.

- 4. Position the tie rod link in the tractor into the inner and outer steering spindles.
- 5. Install the outer tie rod in the outer steering spindle (See Outer Tie Rod Replacement procedure in this manual).
- 6. Install the washer (D) and castle nut (E) onto the tie rod end.



- 7. Tighten the castle nut down.
- 8. Install the new cotter pin (F).
- 9. Grease the tie rod end.

Installation Complete

Front Axle Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition. Support tractor seperately from axle.
- 2. Remove the left and right steering arms (See Steering Arm Replacement procedure in this manual).
- 3. If equipped remove the front receiver hitch (A).



Additional persons will be required to hold the axle while the pin is being removed.

- 4. Support the axle on both sides before removing the 3/4" bolt.
- 5. Remove the 3/4" bolt (B) and washer.



6. Remove the pin retainer plate (C).



- 7. Remove the pin from the frame and axle assembly.
- 8. Remove the axle from the frame.

Removal Complete

Installation

1. Install bushings (A) into the axle assembly.



Additional persons or a jack will be required to lift and hold the axle while the pin is being installed.

2. Lift the axle into place aligning the pin mounting holes.



- 3. Install the pin through the frame and axles.
- 4. Install the pin retainer plate (B). Secure the plate in place using 1/4" bolts, washers, and flange nuts.



5. Apply red thread locker to the 3/4" bolt.

6. Install the 3/4" bolt (C) and washer.



7. Install the left and right steering arms (See Steering Arm Replacement procedure in this manual.

Installation Complete

Steering Box Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the inner tie rods from the steering spindle arm (See Inner Tie Rod Replacement procedure in this manual).
- 3. Remove the front cover (A) by removing the 1/4" bolts.



4. Remove the 28mm hex bolts (B) from the steering joint.



- 5. Pull the steering wheel and shaft toward the operators seat to remove the steering joint from the steering box.
- 6. Remove the four bolts (D) from the steering box mounting plate.



 While supporting the steering box, remove the three bolts (E) mounting the steering box to the mounting plate, and remove the mounting plate.



- 8. Lift the steering box from the tractor frame.
- 9. Remove the 7/8" nut and washer from the steering spindle.
- 10. Remove the Pitman Arm (F) from the steering box with a puller.



Removal Complete

Installation

- 1. Prepare the new steering box for installation.
- 2. To ensure that the steering box output shaft is centered, rotate the input shaft clockwise until the shaft stops.
- 3. Counting the shaft revolutions rotate the input shaft counter clockwise until the shaft stops.
- 4. Rotate the shaft clockwise half of the revolutions recorded to reach the center.
- 5. Mount the steering box to the mounting plate using the three mounting bolts (B), washers, and nuts.
- 6. Position the steering box and mounting plate into the frame.
- Secure the mounting plate to the frame using the four mounting bolts (C), washers and nuts. Install the Pitman arm (D), onto the steering box





- 8. With the steering wheel orientation straight connect the steering joint to the steering box. Install the 28mm hex bolts (D) with blue thread locker, to secure the steering joint in place.
- 9. Pull on the steering joint to make sure it is secured to the steering shaft.



- 10. Install the inner tie rod ends (See Inner Tie Rod Replacement procedure in this manual).
- 11. Install the front cover and headlight cover (E) using 1/4" bolts and nuts.



Installation Complete

Front Hitch Arm Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the hitch bottom links from the hitch arms by removing the 1/2" bolts (A), washers and nuts.



3. Remove the pin retainer plates (B) from both sides of the frame by removing the 1/4" bolts and SF nuts.



Additional persons will be required to hold the hitch while the pins are being removed.

4. Remove the pins (C) from both sides of the frame.



5. Remove the front hitch from the frame

Removal Complete

Installation

1. Be sure that new bushings (A) are installed into the hitch tube.



- 2. The inner bushings should be pressed four inches into the tube.
- 3. The outer bushings should be installed flush against the tube.

ACAUTION

Additional persons will be required to hold the hitch while the pins are being reinstalled.

4. Position the hitch in the frame aligning the pin holes.

5. Install the pins (B) through the frame and into the hitch.



6. Install the pin retaining plates (C) on both sides of the frame. Secure the plates in place with 1/4" bolts and SF nuts.



 Connect the hitch arms to the hitch bottom links. Secure the link in place using 1/2" bolt (D), washer and locknut.



Installation Complete

Rear Hitch Arm Replacement

Removal

- Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- Disconnect the top link from the rear hitch assembly by removing the 1/2" bolt (A), washer and locknut.



Additional persons will be required to hold the hitch while the pins are being removed.

3. Remove the pin retainer plates (B) from both sides of the frame by removing the 1/4" bolts and locknuts.



4. Remove the pins (C) from both sides of the frame.



5. Remove the rear hitch from the frame.

Removal Complete

Installation

1. Be sure new bushings (A) have been installed into the hitch tube.



- 2. The inner bushings should be pressed into the tube four inches.
- 3. The outer bushings should be installed flush against the tube.

ACAUTION

Additional persons will be required to hold the hitch while the pins are being replaced.

- 4. Position the hitch in the frame aligning the pin holes.
- 5. Install the pins (B) through the frame and into the hitch.



 Install the pin retaining plates (C) on both sides of the frame. Secure the plates in place using 1/4" bolts and SF nuts.



7. Connect the top link assembly to the rear hitch securing it in place with 1/2" bolt (D), washer and lock nut. Make sure bolt head is to the outside (RH) side of tractor.



Installation Complete

Operators Seat Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Fold the operators seat forward.
- 3. Disconnect the seat wiring harness from the tractor wiring harness.
- 4. Remove the four locknuts (B) and washers from the seat mounting studs.



- 5. Return the seat and frame to the operating position.
- 6. Lift and remove the seat from the frame.

Removal Complete

Installation

1. Position the seat on the frame. Install the front seat rail mounting studs through the front mount-ing holes (A) on the frame.



- 2. Tilt the seat and frame forward against the steering wheel.
- 3. Install the washers and lock nuts onto the studs to secure the seat in place.
- 4. Connect the seat wiring harness.

Installation Complete

Operators Seat Frame Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the operators seat as required (See Operators Seat Replacement procedure in this manual).
- 3. If the seat does not need to be removed from the frame, fold the seat forward and disconnect the seat wiring harness (A) from the tractor wiring harness.



- 4. Return the seat to the operational position.
- 5. Remove the two 3/8" locking flange nuts (B). Leaving the bolts and jam nuts in place.



 Remove the seat riser retaining plate (C) on each side by removing the 3/8 bolts and SF nuts (D).



7. Lift upwards on the seat frame until it comes out.

Removal Complete

Installation

- 1. Position the tractor seat and frame on the tractor aligning the bolts and jam nuts with the slots.
- 2. Install the seat riser retaining plates onto each side and secure with the 3/8 bolts and SF nuts.
- 3. Install the 3/8" nuts (B) to secure the seat frame in place.



4. Fold the seat forward and connect the seat wiring harness (C) to the tractor wiring harness.



5. Return the seat to the operational position and lock the seat in place.

Installation Complete

Left Rear Fender Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the left rear wheel.
- 3. Disconnect the rear work light wiring harness if equipped.
- 4. Remove the 1/4" bolt (A) from the transmission cover.



5. Remove the eight 3/8" bolts (B), washers and nuts from the fender assembly.



6. Remove the fender assembly from the tractor.

Removal Complete

Installation

- 1. Position the fender against the frame aligning the mounting holes.
- 2. Install the eight 3/8" bolts (A), washers and nuts. Reconnect work light if equipped.



3. Install the 1/4" bolt (B) through the transmission cover into the fender assembly.



4. Install the rear wheel.

Installation Complete

Right Rear Fender Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the right rear wheel.
- 3. Remove the 1/4" bolt (A) from the shifter cover.



- 4. Remove the two 1/4" bolts (B) from the battery cover.
- 5. Remove the six 3/8" bolts (C), washers and nuts from the fender assembly.



6. Remove the fender assembly from the tractor.

Removal Complete

Installation

- 1. Position the fender against the frame aligning the mounting holes.
- 2. Install the six 3/8" bolts (A), washers and nuts.
- 3. Install the two 1/4" bolts (B) through the battery cover into the fender. Make sure the cover does not rub the battery cables.





- 4. Install the 1/4" bolt (C) through the shifter cover into the fender.
- 5. Install the rear wheel.

Installation Complete

Fuel Tank Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Disconnect the negative battery cable.
- 3. Remove the left rear wheel.
- 4. Empty the fuel tank using a syphon pump.
- 5. Disconnect the operator work light if installed.
- 6. Turn the fuel shut off valve to the off position.
- 7. Remove the inner and outer fuel tank cover 1/4" mounting bolts (A).



- 8. Remove the fuel tank cap.
- 9. Lift the fuel tank cover to remove it.
- 10. Install the fuel tank cap.
- 11. Label and disconnect the fuel return and supply lines (B).



CHASSIS

12. Remove the fuel tank strap by removing the two 1/4" mounting bolts (C).



13. Lift the fuel tank from the frame.

Removal Complete

Installation

- 1. Position the fuel tank in the frame so that it will clear top cover.
- 2. Install the fuel tank strap securing it in place with two 1/4" mounting bolts (A) and locknuts.



3. Connect the fuel return and supply lines (B).



4. Remove the fuel cap.

- 5. Install the fuel tank cover over the fuel tank aligning the mounting holes.
- 6. Install the fuel cap.
- 7. Connect the operator work light if installed.
- 8. Secure the fuel tank cover in place using six 1/4" mounting bolts (C).



- 9. Install the wheel.
- 10. Connect the negative battery terminal.
- 11. Turn the fuel shut off valve to the on position.

Installation Complete

CHASSIS

Battery Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake, remove the key from the ignition and turn off the battery breaker switch.
- 2. Remove the four 1/4" bolts (A) that hold the battery cover in place. Remove battery cover.



3. Remove the two 1/4" SF bolts (B) that hold the battery cover mount plate (C) in place. Remove the battery cover mount plate.



 Disconnect the negative battery cable (D) from the battery first, then disconnect the positive battery cable (E) from the battery. Be sure that neither of the battery cables contact the battery posts after they are removed.



5. Pull the battery (F) out of the battery compartment by pulling upwards on the front of the battery while sliding battery towards you.





Removal Complete

Installation

1. Slide the battery (A) back into the battery compartment ensuring that neither of the cables contact the battery posts.



2. Reattach the Positive cable (B) first and then the Negative cable (C) last.



3. Reinstall the battery cover mount plate (D) using the two 1/4" SF bolts (E).



4. Install the battery cover plate (F) using the four 1/4" flange bolts (G).



Installation Complete

Shifter Box Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the operators seat and seat frame (See Operators Seat Frame Replacement procedure in this manual).
- 3. Remove the parking brake cover plate (A) by removing the two 1/4" bolts and SF nuts securing it to the shifter box cover.
- 4. Remove the shifter box cover by removing the four 1/4" bolts (B) and flange nuts and lifting the cover over the shifter. Note any shims that are there.
- 5. Disconnect the neutral safety switch (C).





6. Remove the two 5/16" bolts (D) and locking flange nuts from the shifter arm.



- 7. Lift the shifter arm from the four speed transmission and rocker gusset.
- 8. Remove the 5/16" bolt (E) and bushing from the high low shifter tube.



9. Remove the 5/16" bolt (F) from the linkage heim joint.



10. Remove the two 8mm bolts (G) from the front and rear of the shifter mounting bracket.





11. Remove the two 1/2" mounting bolts (H) and washers from the shifter mounting bracket.



- 12. Remove the two 3/8" mounting bolts (I) and washers from the shifter mounting bracket.
- 13. Remove the shifter box from the two speed transmission.

Removal Complete

Installation

- 1. Position the shifter box on the two speed transmission aligning the mounting holes.
- 2. Install the two 8mm mounting bolts (A) through the mounting bracket into the transmission finger tight using blue thread locker.





3. Install the two 1/2" mounting bolts (B) and washers finger tight with blue thread locker.



4. Install the two 3/8" mounting bolts (C) and washers finger tight with blue thread locker.
DRIVETRAIN

5. Install the 5/16" bolt (D) through the linkage and heim joint securing it in place with a 5/16" lock-ing flange nut.



 Install the bushing and 5/16" bolt (E) through the high low shifter tube securing it in place with a 5/16" locking flange nut.



- 7. Position the shifter arm over the rocker gusset.
- Install the two 5/16" bolts (F) through the arm and rocker gussets secure the bolts in place using two 5/16" locking flange nuts. Tighten all bolts and nuts at this time.



9. Connect the neutral safety switch (G).



- 10. Position the shifter box cover over the shifter box aligning the mounting holes.
- 11. Secure the cover in place using four 1/4" mounting bolts (H) and nuts as required.



- 12. Install the operators seat and frame (See Operators Seat Frame Replacement procedure in this manual).
- 13. Adjust the shifter as required (See Shifter Adjustment procedure in this manual).

Installation Complete

Neutral Safety Switch Adjustment

Adjustment

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition. Turn off battery breaker.
- 2. Fold the operators seat forward.
- 3. Locate the neutral safety switch wiring harness (A).



- 4. Unplug the neutral safety switch.
- 5. Ensure that the tractor is in neutral. In neutral, the acorn nut (B) should be depressing the switch (C) as shown below.



6. Place the shifter in gear. The acorn nut should not contact the switch as shown below.



- 7. The safety switch can be adjusted up and down to ensure positive engagement with the acorn nut.
- 8. Place the shifter in the neutral position.
- 9. Using a 1-1/8" deep socket (7/8" after serial number 1154), adjust the neutral safety switch so that the acorn nut is contacting and depressing the switch. Move the shifter through the gears to ensure smooth operation.



- 10. Connect the neutral safety switch wiring harness.
- 11. Fold the operators seat down ensuring the seat latch is engaged.
- 12. Check the neutral safety switch operation by first putting the 2 speed gear box in the nuetral position. Make sure area is clear of bystanders and objects. Next, with the clutch depressed, shift the tractor into each gear and try to start the tractor. The tractor should not start while in gear. Repeat the adjustment procedure as required.

Adjustment Complete



Brake Pad Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the rear wheels.
- 3. Remove the rotor covers (A) from the inner fender by removing the four 1/4" bolts.



4. Remove the cable tie (B) securing the brake line to the frame.



 Remove the brake caliper and mounting bracket (C) by removing the four 3/8" mounting bolts and locknuts. Do not seperate the caliper from the mounting bracket yet.



- 6. Remove the brake caliper from the caliper mounting bracket by removing the 3/8" mounting bolts, washers, and nuts.
- 7. Remove the cotter pin (D) from the caliper.



8. Remove the brake pads from the caliper.

Removal Complete

Installation

- 1. Compress the caliper pistons.
- 2. Position the brake pads in the caliper.
- 3. Install the cotter pin (A) through the caliper and mounting tab of both brake pads.



4. Position the brake caliper on the caliper mounting bracket. Secure the mounting bracket to the caliper using 3/8" mounting bolts and nuts.

5. Position the brake caliper over the rotor aligning the brake caliper mounting bracket (B) mounting holes.



- 6. Secure the caliper mounting brackets in place with four 3/8" mounting bolts and locking flange nuts.
- 7. Install a new cable tie (C) to secure the brake line to the frame.



8. Install the rotor covers (D) on the inner fenders.



- 9. Secure the covers in place using four 1/4" bolts.
- 10. Install the rear wheels.
- 11. Ensure that the brakes are properly aligned and not dragging. (See Brake Rotor Adjustment procedure in this manual)

Do not operate the tractor without testing the brakes. The brakes must be tested after installation or maintenance.

Installation Complete

Brake Rotor Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the rear wheels, fender and rotor cover.
- 3. Remove the brake calipers (See Brake Caliper Replacement procedure in this manual).
- 4. Remove the final drives (See Final Drive Replacement procedure in this manual) and note any shims.
- 5. Remove the four 3/8" bolts and locknuts (A) from the rotors.



- 6. Remove the axles from the two speed transmission (see Axle Replacement procedure in this manual).
- 7. Remove the rotors from the axle.

Removal Complete

Installation

- 1. Place the new rotor loosely over the axle.
- 2. Install the axle into the two speed transmission (See Axle Replacement procedure in this manual).
- 3. Install the 3/8" bolts and locknuts (A) to secure the rotor in place.



- 4. Install the brake caliper (See Brake Caliper Replacement procedure in this manual).
- 5. Ensure that the brakes are properly aligned and not dragging (See Brake Rotor Adjustment procedure in this manual).
- 6. Install the final drive (See Final Drive Replacement procedure in this manual) and replace any shims
- 7. Install fender and rotor cover.
- 8. Install the rear wheels.

AWARNING

Do not operate the tractor without testing the brakes. The brakes must be tested after installation or maintenance.

Installation Complete

Brake Caliper Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the rear wheels.
- 3. Remove the rotor covers (A) from the inner fender by removing the four 1/4" bolts.



4. Remove the cable tie (B) securing the brake line to the frame.



 Remove the brake caliper and mounting bracket (C), as one pice by removing the four 3/8" mounting bolts.



- 6. Remove the brake caliper from the caliper mounting bracket by removing the 3/8" mounting bolts, washers, and locknuts.
- 7. Place a drain pan under the brake caliper.

DRIVETRAIN





8. Disconnect the brake line (D) from the caliper.

Removal Complete

Installation

- 1. Install the brake pads into the brake caliper as required.
- 2. Connect the brake line (A) to the caliper.



- 3. Position the brake caliper on the caliper mounting bracket. Secure the mounting bracket to the caliper using 3/8" mounting bolts and nuts.
- 4. Position the brake caliper over the rotor aligning the brake caliper mounting bracket (B) mounting holes.



- 5. Secure the caliper mounting brackets in place with four 3/8" mounting bolts and locking flange nuts.
- 6. Install a new cable tie (C) to secure the brake line to the frame.



- 7. Bleed the brakes (see Brake Bleeding procedure in this manual.
- 8. Install the rotor covers (D) on the inner fenders.



- 9. Secure the covers in place using four 1/4" bolts.
- 10. Install the rear wheels.
- 11. Ensure that the brakes are properly aligned and not dragging. (See Brake Rotor Adjustment procedure in this manual)



Do not operate the tractor without testing the brakes. The brakes must be tested after installation or maintenance.

Installation Complete

Brake Master Cylinder Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the operators seat and seat frame (See Operators Seat Frame Removal in this manual).
- 3. Disconnect the master cylinder push rods (A) from the brake pedals.



4. Disconnect the brake lines (B) from the master cylinders.



- 5. Remove the master cylinder mounting bracket from the frame by removing the four 5/16" mounting bolts.
- 6. Remove the master cylinders from the mounting bracket by removing the two 5/16" mounting bolts.

Removal Complete

Installation

- 1. Position the master cylinder against the mounting bracket aligning the mounting holes.
- Secure the master cylinder in place using two 5/16" mounting bolts.
- 3. Position the mounting bracket in the frame align-

ing the mounting holes.

- 4. Secure the mounting bracket in place using four 5/16" mounting bolts.
- 5. Connect the brake lines (A) to the master cylinders. Ensure that the correct line is connected to the correct master cylinder (Line from right brake caliper connected to right master cylinder).



Ensure that the push rod length is correct. If the push rod is adjusted too long, engagement of the brake pedal can bend the push rod.

6. Connect the master cylinder push rods (B) to the brake pedals. Secure the push rods in place using a cotter pin.



- 7. Adjust the master cylinder push rod length as required and connect the push rod to the pedals.
- 8. Complete the brake bleeding procedure (See Brake Bleeding procedure in this manual).

Installation Complete

DRIVETRAIN

Brake Rotor Adjustment

Adjustment

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the rear wheel.
- 3. Remove rotor cover.
- 4. Compress the caliper pistons completely.
- 5. Remove the three 5/16" bolts (A).



6. Install two of the 5/16" bolts (B) into the threaded holes on bushing.



- 7. Use rotating quarter turns between the two bolts to seperate the bushing from the rotor assembly.
- 8. Position the rotor against the inner brake pad.
- 9. Push the bushing into the rotor assembly as far as possible ensuring the mounting holes are aligned. Light tapping with a dead blow hammer may be required.
- Apply thread locker and install the three 5/16" bolts (D) through the bushing. Allow the bushing to pull the rotor into the correct position.



- 11. When the bushing is installed rotate the drive hub to ensure the brake pads are not contacting the rotor.
- 12. If the pads contact the rotor repeat the process.
- 13. Pump the brake pedal until the pedal is firm and the pads engage the rotor.
- 14. Ensure that the axle rotates freely.
- 15. Install rotor cover.
- 16. Install the rear wheels.

Adjustment Complete

Brake Bleeding Procedure

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the brake master cylinder cover (A) by removing the 1/4" bolts.



- 3. Check the brake master cylinder fluid level. Add fluid as required in accordance with the tractor operators manual.
- 4. The fluid level should be 3/8" to 1/2" from the top of the reservoir.





- 5. Remove the rear wheels.
- 6. Remove the fender (B) by removing the 1/4" bolts.



7. Remove the cable tie (C) securing the brake line to the frame.



8. Remove the brake caliper and mounting bracket (D) by removing the four 3/8" bolts.



9. Rotate the brake caliper 90 degrees so the caliper bleed valves are vertical.

10. Using a 3/8" bolt and nut secure the caliper to the forward mounting bracket.





Use half strokes of the brake pedal when bleeding the brake lines. Using a full stroke of the pedal could cause damage to the brake master cylinder and or master cylinder push rod.

 Place a 3/8" flat spacer (E) between the brake pads. Pump the brake pedal until the caliper holds the spacer between the pads.



- 12. Connect two hoses to the inner and outer bleed valves. Route the hoses to a drip pan.
- 13. Apply pressure to the brake pedal.
- 14. Open one of the bleed valves, as the pedal is pushed look for air being discharged from the bleed valve.
- 15. When the pedal reaches half stroke hold the pedal and close the valve.
- 16. Allow the pedal to return, and re-apply pressure.
- 17. Repeat the process until no air is observed leaving the bleed valve.
- 18. Both sides of the caliper must be bled.
- 19. The pedal should return fully and the brake pedal should feel firm when applying the brakes when the process is complete.

20. Remove the 3/8" spacer (F) from the brake caliper.



- 21. Remove the 3/8" mounting bolt from the caliper.
- 22. Rotate the caliper 90 degrees and install the caliper over the rotor. (See Caliper Replacement procedure in this manual).
- 23. Secure the brake line to the frame using a cable tie (G).



- 24. Ensure the brake pads are not contacting the rotor. If the brake pads are contacting the rotor complete the brake rotor adjustment procedure.
- 25. Install fender (H) using the 1/4" bolts.



- 26. Install the rear wheels.
- 27. Check the brake master cylinder fluid level. Add fluid as required in accordance with the tractor operators manual.

DRIVETRAIN

 Install the brake master cylinder cover (I). Secure the cover in place using 1/4" bolts.



Procedure Complete

Final Drive Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the rear wheels.
- Remove the axle cover (A) by removing the three 5/16" bolts. The plate is also held in place with RTV silicone adhesive and may need to be lightly pryed off with a putty knife.



4. Remove the Circlip (B) from the axle.



5. Support the final drive assembly from the bot-

tom with a floor jack or use a hoist to support the drop box from the lifting points (C). Note any shims.



6. Remove the three 5/8" mounting bolts (D).



7. After mounting bolts are removed the final drive assembly can be pulled away from the frame and axle.

Removal Complete

Installation

- 1. Using the hoist or floor jack position the final drive assembly aligning the mounting holes and axle. Reinstall any shims at this time.
- 2. Slide the final drive onto the axle.
- 3. Install three 5/8" mounting bolts (A) through final drive assembly and into the frame.



 Install the Circlip (B) onto the axle ensuring that the clip is fully seated in the groove on the axle.



- 5. Clean any RTV silicone sealant residue from the final drive and axle covers.
- 6. Apply a bead of RTV silicone around the axle cover.
- 7. Position the axle cover (C) on the final drive aligning the mounting holes.



- 8. Secure the axle covers in place using the three 5/16" bolts and blue thread locker.
- 9. Install the rear wheels.

Installation Complete

Four Speed Transmission Replacement

Removal

- Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the rear wheels.
- 3. Remove the operators seat and seat frame (See Seat Frame Replacement procedure in this manual).
- 4. Remove the shifter box (See Shifter Box Replacement procedure in this manual).
- 5. Remove the left fender (See Left Fender Assembly Removal procedure in this manual).
- 6. Remove the transmission cover by removing the five 1/4" bolts (A).



7. Loosen the tension and remove the hydraulic pump drive belt. Loosen the 3/8" bolt (B) and Remove the 3/8" flange nut (C).



8. Loosen the 1/2" locknut (D) to loosen the drive belts tension.



9. Remove the four 3/8" bolts (E) from the drive pulley bushing.



- 10. Install the three bolts into the threaded holes of the bushing.
- 11. Tighten the bolts 1/4 of a turn alternating between each bolt until the bushing is free of the pulley.
- 12. Remove the drive pulley from the transmission.
- Disconnect the clutch pedal linkage. Remove the cotter pin (F) and the pin and washers. Note washer orientation.



14. Remove the six 3/8" bolts (G) and washers from the transmission mounting flange.



15. Remove the transmission mounting bolt (H) that secures the transmission from the frame.



- 16. Prepare to remove the transmission using a hoist or other approved lifting mechanism. Place straps around the input shaft and output section of the transmission.
- 17. Slightly lift the input/belt side of the transmission.
- 18. Slide the transmission towards the fender to disconnect the four speed transmission from the two speed transmission.
- 19. Retain the spline shaft coupler for later use.

Removal Complete

Installation

- 1. Install the spline shaft coupler onto the transmission output shaft. Make sure coupler slides freely on the 2 speed and 4 speed transmission shafts.
- 2. Using a hoist, position the transmission into the tractor. Install pin in clutch linkage.
- 3. Align the spline coupler with the two speed transmission input shaft.
- 4. When the input shaft is in the coupler slide the four speed transmission against the two speed transmission aligning the mounting holes.
- 5. Loosely install the six 3/8" bolts (A) and washers through the transmission flange.
- 6. Loosely install the transmission mounting bolt (B).
- 7. Tighten the six flange mounting bolts (A) in a star



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8. Tighten the transmission mounting bolt (B).



 Connect the clutch pedal linkage. Secure the pin (C) and washers in place with a cotter pin (D).



- 10. Route the drive belts over the pulley.
- 11. Position the drive pulley over the input shaft of the transmission ensuring both shaft keys are installed in their grooves.
- 12. Position the bushing (E) over the input shaft and into the pulley aligning the mounting holes.



- 13. Install the three mounting bolts (F) through the bushing and into the pulley using blue thread locker.
- 14. Tighten the bolts 1/4 of a turn alternating between each bolt and torque to 29 foot pounds.

15. Install bolt (G) and washer through the bushing and into the input shaft using blue thread locker.



- 16. Tension the drive belts. A deflection of 5/16" to 3/8" (7.9mm to 9.5mm) under a load of 13.6 lbs (6.2 kgf) pressed in the middle of the span.
- 17. Install the hydraulic pump belt.
- Install the mounting bracket onto the hangar bolt. Secure the bracket in place with the 3/8" flange nut.
- Set the belt tension by adjusting the flange nuts (H), (I), (J). When the tension is set, ensure all of the bolts are securely tightened.



- 20. Tension the hydraulic pump belt. A deflection of 1/8" to 3/16" (3.2 to 4.8mm) under a load of 13.6 lbs (6.2 kgf) pressed in the middle of the span.
- 21. Install the shifter box (See Shifter Box Replacement procedure in this manual).
- 22. Install the left fender (See Left Fender Assembly Removal procedure in this manual).
- 23. Install the right fender (See Right Fender Assembly Removal in this manual)
- 24. Install the transmission cover. Secure the cover in place using five 1/4" mounting bolts (K).

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- 25. Install the operators seat and seat frame (See Seat Frame Replacement procedure in this manual).
- 26. Install the rear wheels.

Installation Complete

Clutch Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the left rear wheel.
- 3. Remove the left fender (See Left Fender Assembly Removal procedure in this manual).
- 4. Remove the transmission cover by removing the five 1/4" bolts (A).



5. Loosen the tension and remove the hydraulic pump drive belt. Loosen the 3/8" bolt (B) and Remove the 3/8" flange nut (C).



6. Loosen the 1/2" locknut (D) to loosen the drive belt tension.



7. Remove the four 3/8" bolts (E) from the drive pulley bushing.



- 8. Install the three bolts into the threaded holes of the bushing.
- 9. Tighten the bolts 1/4 of a turn alternating between each bolt until the bushing is free of the pulley.
- 10. Remove the drive belts from the pulley.
- 11. Remove the drive pulley from the input shaft.

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12. Remove the eight M10 bolts (F).



13. With the M10 bolts removed the input shaft and clutch assembly can be removed from the transmission.



14. Remove the clutch pressure plate by removing the six M8 ferry cap screws (G).



15. With the ferry cap screws removed lift the pressure plate off of the assembly. 16. The friction disc (H) can then be removed from the flex plate (I). Note friction disc orientation.



Removal Complete

Installation

- Before installation of the clutch ensure that the flywheel is clean and free of any oil or debris. Brake parts cleaner can be used to clean the flywheel surface. If any components have significant wear, they should be replaced at this time.
- 2. Place the friction disc on the flywheel as shown below.



3. Place the clutch alignment tool (A) through the friction plate and the flywheel.



4. Inspect the pressure plate (B) ensuring that it is free of oil and debris. Brake parts cleaner can be used to clean the pressure plate surface.



 Position the pressure plate over the friction plate aligning the dowel pins (C) and mounting holes. NOTE: the dowel pins and mounting holes only line up in one specific position.



 Install the M8 ferry cap screws (D) through the pressure plate assembly and into the flywheel. Tighten the screws in an alternating pattern.



7. Position the input shaft and clutch assembly into the transmission aligning the dowel pins (E) and mounting holes.



8. Install the eight M10 bolts (F). Tighten the screws in an alternating pattern.



9. Position the drive pulley over the input shaft. Install both shaft keys at this time.

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- 10. Route the drive belts over the pulley.
- 11. Position the bushing (G) over the input shaft and into the pulley aligning the mounting holes.



- 12. Install the three mounting bolts (H) through the bushing and into the pulley. Use blue thread locker.
- 13. Tighten the bolts 1/4 of a turn alternating between each bolt and torque to 29 foot pounds.
- 14. Install bolt (I) and washer through the bushing and into the input shaft with blue thread locker.



- 15. Tension the drive belts. A deflection of 5/16" to 3/8" (7.9mm to 9.5mm) under a load of 13.6 lbs (6.2 kgf) pressed in the middle of the span.
- 16. Install the hydraulic pump belt.
- 17. Install the mounting bracket onto the hangar bolt. Secure the bracket in place with the 3/8" flange nut.
- Set the belt tension by adjusting the flange nuts (J), (K), (L). When the tension is set ensure all of the bolts are securely tightened.



- 19. Tension the hydraulic pump belt. A deflection of 1/8" to 3/16" (3.2 to 4.8mm) under a load of 13.6 lbs (6.2 kgf) pressed in the middle of the span.
- 20. Install the transmission cover by installing the five 1/4" bolts (M).



- 21. Install the left fender (See Left Fender Assembly Removal procedure in this manual).
- 22. Install the left rear wheel.
- 23. Before operating check the clutch pedal engagement.
- 24. Adjust the clutch pedal as required (See Clutch Pedal Adjustment procedure in this manual).

Installation Complete

Clutch Pedal Adjustment

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Lean the operators seat forward.
- 3. Remove the inspection cover (A) from the transmission.



4. With the clutch pedal disengaged, verify the distance between the throw out bearing (B) and clutch fork (C) is no greater than 1/8" and no less than 1/16".



5. To adjust the distance, locate the clutch arm stop bolt (D).



- 6. Adjust the stop bolt in or out until the desired distance is achieved.
- Adjust the clutch pedal adjustment rod (E) so that the clutch pedal is 1/4" lower than the brake pedals to prevent over engagement of the clutch. Check that clutch is adjusted properly before operating tractor.



Adjustment Complete

Two Speed Transmission Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition, turn off battery breaker.
- 2. Remove the rear wheels.
- 3. Remove the battery cover by removing the four 1/4" bolts (A).



- 4. Disconnect the parking brake sensor wiring harness (B).
- 5. Remove the operators seat and seat frame (See Seat Frame Replacement procedure in this manual).
- 6. Remove the shifter box (See Shifter Box Replacement procedure in this manual).
- 7. Remove the left fender (See Left Fender Assembly Removal procedure in this manual).
- 8. Remove the right fender (See Right Fender Assembly Removal in this manual).
- 9. Loosen the hydraulic fluid reservoir cap (C).



10. Drain the hydraulic fluid from the two speed transmission by removing the drain plug (D). Fluid should be caught in a drip pan or other approved container.



- 11. Remove the left and right axles (See axle replacement procedures in this manual).
- 12. Disconnect the speed sensor (E).



13. Remove the speed sensor mounting bracket by removing the two 1/2" mounting bolts (F).



14. Remove the parking brake by removing the two 1/2" mounting bolts (G).



15. Disconnect the fill and return hoses (H)



16. Disconnect the upper hydraulic hose (I).



17. Disconnect the lower hydraulic hose (J) located low on the rear of the transmission.



18. Disconnect the high/low shifter linkage (K). Note orientation of linkage pieces.



19. Remove the 5/8" mounting bolts and nuts (L) from the two speed transmission.



20. Remove the six 3/8" mounting bolts (M) and washers from the transmission mounting flange.



- 21. Using a hoist or other approved lifting mechanism, slightly lift the two speed transmission and slide it away from the four speed transmission.
- 22. Retain the spline coupler (N) for later use.



Removal Complete

Installation

1. Install the spline coupler (A) onto the four speed transmission output shaft. Make sure the fit between the 4 speed and 2 speed is smooth.



- 2. Position the two speed transmission into the tractor. Aligning the two speed input shaft with the spline coupler.
- 3. Slide the two speed transmission input shaft into the spline shaft coupler.

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4. Loosely install the six 3/8" bolts (B) and washers into the transmission mounting flange.



5. Loosely install the two 5/8" transmission mounting bolts (C) and nuts.



- 6. Tighten the six flange mounting bolts (B). Using blue thread locker.
- 7. Tighten the two transmission mounting bolts (C).
- 8. Connect the high/low shifter linkage (F) to the two speed transmission.



9. Install the lower hydraulic hose (G).



10. Install the upper hydraulic hose (H).



11. Install the fill and return hoses (I) to the two speed transmission. Secure the hoses in place with the clamps.



12. Position the parking brake assembly aligning the mounting holes. Secure the assembly in place using two 1/2" bolts (J) and washers.



13. Connect the parking brake wiring harness.

 Install the speed sensor mounting bracket. Secure the bracket in place using two 1/2" bolts (K) and washers.



 Connect the speed sensor to the wiring harness(L).



- 16. Install the left and right axles (See axle removal procedures in this manual).
- 17. Install the final drives (See Final Drive Replacement procedure in this manual).
- 18. Install the shifter box (See Shifter Box Replacement Procedure in this manual).
- 19. Install the rear fenders (See Fender Replacement procedures in this manual).
- 20. Install the rear wheels.
- 21. Install the battery cover securing it in place using four 1/4" bolts (M).



22. Install the transmission cover securing it in place using five 1/4" bolts (N).



- 23. Install the operators seat and frame (See Seat Frame Replacement procedure).
- 24. Add fluid to the hydraulic fluid reservoir. It will take some time for the two speed transmission to fill with fluid. Ensure that the two speed transmission and reservoir are properly filled.

Installation Complete

Two Speed Axle Seal Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the two speed transmission (See Two Speed Transmission Replacement procedure in this manual).
- 3. Remove the axle seal cover plates (A), by removing the three 1/2" bolts and washers.



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4. Remove the seal (B) from the two speed transmission using a seal puller.



Removal Complete

Installation

1. Drive the new seal (C) in using a seal installer tool. Drive in using light pressure until it bottoms out. Apply grease onto seal surface.



2. Reinstall axle seal cover plates (C) installing the three 1/2" bolts and washers.



Installation Complete

Axle Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the rear wheels.
- 3. Loosen the hydraulic fluid reservoir cap (A) and



drain the hydraulic fluid from the two speed transmission by removing the drain plug (B). Fluid should be caught in a drip pan or other approved container. Reinstall the drain plug when the fluid has drained.



4. Remove the final drives (See Final Drive

Replacement procedure in this manual).

5. Remove the four 3/8" bolts and locknuts (C) from the rotors.



- 6. Pull the axle from the two speed transmission.
- 7. Remove the rotor from the brake caliper.
- 8. Compress the brake caliper pistons by using a C clamp or similar tool.

Removal Complete

Installation

- 1. Place the rotor in the brake caliper.
- 2. Install the axle through the rotor and into the two speed transmission.
- 3. Install the rotors securing them in place using 3/8" bolts and locknuts (A).



- 4. Ensure that the brakes are properly aligned and not dragging (See Brake Rotor Adjustment procedure in this manual).
- 5. Install the final drives (See Final Drive Replacement procedure in this manual).
- 6. Add new fluid to the hydraulic fluid reservoir. It will take some time for the two speed transmission to fill with fluid. Ensure that the two speed transmission and reservoir are properly filled.
- 7. Install the rear wheels.

Installation Complete

HYDRAULIC SYSTEM

Hydraulic Fluid and Filter Replacement

Removal

Contact with hydraulic oil can irritate your skin. Wear protective gloves when working with hydraulic oil. If you come in contact with hydraulic oil, wash it off immediately.

Oil is hazardous to the environment. Drain hydraulic oil into an approved container. Dispose of used hydraulic oil in accordance with local laws.

- 1. Fully Raise the front and rear hitches.
- 2. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 3. Loosen the hydraulic fluid reservoir cap.
- 4. Place a drain pan under the two speed transmission.
- 5. Remove the drain plug (A) to drain the fluid from the two speed transmission.



- 6. Clean the drain plug, ensure that the rubber seal is clean and not damaged.
- 7. When the oil has drained completely install the drain plug.
- 8. Clean the area around the hydraulic filter (B) and filter head (C).



- 9. Place a drain pan under the hydraulic filter.
- 10. Using a strap type wrench remove the filter from the filter head.

Removal Complete

Installation

- 1. Apply a thin film of hydraulic oil to the gasket of the new filter.
- Screw the filter onto the filter head until the gasket makes contact with the mounting surface. Tighten the filter an additional 3/4 of a turn.

Attention

Check the Specifications section of this manual for hydraulic oil specifications.

3. Add approximately 6.5 qts. of Mobifluid 424 to the hydraulic fluid reservoir until the fluid reaches the proper range indicated by the oil level decal.



- 4. When the hydraulic fluid is at the proper range wait for approximately 60 minutes.
- 5. Check the hydraulic fluid reservoir level and add fluid as required.
- 6. Start the tractor and cycle the hydraulic levers to purge any air from the system.
- 7. Shut off the tractor and allow it to sit for a minimum of five minutes.
- 8. Check the hydraulic fluid reservoir level and add fluid as required.

Installation Complete

General Hydraulic Hose Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition. Remove implements from front and rear hitches.
- 2. Identify the hose to be replaced. If the hose to be replaced is a supply or return line to the two speed transmission the hydraulic fluid must be drained from the two speed transmission before replacing the line.
- 3. Bleed off any pressure in the hydraulic system by moving control levers back and forth.
- 4. Place drain pans under both ends of the hose.
- 5. Disconnect the hydraulic hose from it's connections.
- 6. Remove the hose.

Removal Complete

Installation

- 1. Install the hose and connect the fittings.
- 2. Check the hydraulic fluid level and add fluid as required.

Attention

The auxiliary hydraulic lines must be connected to an implement to cycle fluid through the lines and remove air.

- 3. Start the tractor and cycle the hydraulic levers to remove any air in the system.
- 4. Check the hydraulic fluid level and add fluid as required.

Installation Complete

Front Hydraulic Cylinder Replacement

Removal

- 1. Remove any implements or tool bars attached to the front hitch.
- 2. Lower the front and rear hitches to the lowest positions.
- 3. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 4. Cycle the hydraulic levers to remove any residual pressure from the hydraulic system.
- 5. Place a drip pan under the front hydraulic cylinder.
- 6. Disconnect hydraulic hose fittings (A) from the cylinder.



- 7. Remove the 1/2" bolts washers and locknuts to remove the hydraulic cylinder from the frame.
- 8. Remove the two 90 degree fittings from the hydraulic cylinder.

Removal Complete

Installation

- 1. Clean and inspect the o-ring seats, lube the o-rings on the 90 degree fittings with hydraulic oil and install both 90 degree fittings into the new cylinder.
- 2. Install the hydraulic cylinder using the 1/2" bolt washers and locknuts.
- 3. Connect the hydraulic hose fittings (A).



- 4. Start the tractor and cycle the hydraulic cylinders to remove any air in the system.
- 5. Check the hydraulic fluid level and add fluid as required.

Installation Complete

Rear Hydraulic Cylinder Replacement

Removal

- 1. Remove any implements or tool bars from the rear hitch.
- 2. Lower the front and rear hitches to the lowest positions.
- Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 4. Cycle the hydraulic levers to remove any residual pressure from the hydraulic system.
- 5. Place a drip pan under the rear hydraulic cylinder.
- 6. Disconnect the hydraulic hose fittings (A) from the cylinder.



- 7. Remove the 1/2" bolts, washers, and locknuts to remove the hydraulic cylinder from the frame. Note the orientation of the bolts and washers.
- 8. Remove the 90 degree fitting and straight fitting from the hydraulic cylinder.

Removal Complete

Installation

- Clean and inspect the o-ring seats and lube the o-rings on the fittings with hydraulic oil and Install the fittings into the new cylinder.
- 2. Install the hydraulic cylinder using the 1/2" bolts, washers, and locknuts.
- 3. Connect the hydraulic hose fittings (A).



- 4. Start the tractor and cycle the hydraulic cylinders to remove any air in the system.
- 5. Check the hydraulic fluid level and add fluid as required.

Installation Complete

Two Spool Valve Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the outer console cover (A) by removing the seven 1/4" bolts.



3. Remove the inner console cover (B) by removing the four 1/4" bolts.

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4. Remove the spool valve access plate (C).



5. Remove the valve control levers (D).



- 6. Place a drip pan in front of the rear tire under the fender assembly and step.
- 7. When removing the hydraulic hoses residual hydraulic fluid will leak from the spool valve and lines. Shop towels or rags placed over the wiring harness may make clean up easier. Drain holes in the bottom of the console assembly will allow any hydraulic fluid to flow into the drain pan.
- 8. Label and note the location of the hydraulic supply and return hoses and the fittings.
- 9. Disconnect the supply and return hoses (E) from the spool valve.



- 10. Label and note the location of the front and rear hitch hoses.
- 11. Disconnect the front and rear hitch hoses from the spool valve.



12. Remove the spool valve by removing the two 1/4" mounting bolts (F), washers, and nuts.



- 13. Remove the supply and return fittings from the valve body, noting location and orientation.
- 14. Remove the front and rear hitch fittings from the valve body.

Removal Complete

Installation

- 1. Install the front and rear hitch fittings into the new valve body.
- 2. Install the supply and return fittings into the new valve body.
- Install the two spool valve into the console. Secure the valve in place with two 1/4" mounting bolts (A), washers, and nuts.



4. Connect the front and rear hitch hoses to the spool valve.



5. Connect the supply and return hoses (B).



6. Install the control valve levers (C).



7. Install the spool valve access plate (D).



8. Install the inner console cover (E).



9. Install the outer console cover (F).



- 10. Check the hydraulic fluid level and add fluid as required.
- 11. Start the tractor and cycle the hydraulic cylinders to remove any air in the system.

Installation Complete

Four Spool Valve Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the outer console cover (A) by removing the seven 1/4" bolts.



3. Remove the inner console cover (B) by removing the four 1/4" bolts.



4. Remove the valve control levers (C).



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- 5. Place a drip pan in front of the rear tire under the fender assembly and step.
- 6. When removing the hydraulic hoses residual hydraulic fluid will leak from the spool valve and lines. Shop towels or rags placed over the wiring harness may make cleanup easier. Drain holes in the bottom of the console assembly will allow any hydraulic fluid flow into the drain pan.
- 7. Label and note the location of the supply and return hoses.
- 8. Remove the supply and return hoses (D) from the spool valve.



- 9. Label and note the location on the front hitch, rear hitch, front aux, and rear aux hoses.
- 10. Remove the front hitch, rear hitch, front aux, and rear aux hoses from the spool valve.



11. Remove the spool valve by removing the two 1/4" mounting bolts (E), washers, and nuts.



- 12. Remove the supply and return fittings from the valve body.
- 13. Remove the front hitch, rear hitch, front aux, and rear aux fittings from the valve body.

Removal Complete

Installation

- 1. Install the front hitch, rear hitch, front aux, and rear aux fittings into the new valve body.
- 2. Install the supply and return fittings into the new valve body.
- Install the four spool valve into the console. Secure the valve in place with two 1/4" mounting bolts (A), washers, and nuts.



4. Connect the front hitch, rear hitch, front aux, and rear aux hoses to the spool valve.

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5. Connect the supply and return hoses (B) to the spool valve.



6. Install the control valve levers (C).



7. Install the inner console cover (D).



8. Install the outer console cover (E).



- 9. Check the hydraulic fluid level and add fluid as required.
- 10. Connect a hose to make a loop in the hydraulic system as shown below to purge any air from the hydraulic hoses.



- 11. Start the tractor and cycle the hydraulic cylinders to remove any air in the system.
- 12. Check the hydraulic fluid level and add fluid as required.

Installation Complete

Hydraulic Pump Replacement

Removal

- 1. Lower the front and rear hitches to the lowest position.
- 2. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 3. Cycle the hydraulic levers to remove any residual pressure from the hydraulic system.
- 4. Remove the left rear wheel.
- 5. Remove the left rear fender assembly (See Left Rear Fender Replacement procedure in this manual).
- 6. Drain the hydraulic fluid from the two speed transmission.
- 7. Loosen the tension and remove the hydraulic pump drive belt. Loosen the 3/8" bolt (A) and Remove the 3/8" flange nut (B).



8. Remove two 1/4" bolts (C) from the bushing (D).



- Install the two 1/4" bolts into the threaded holes and tighten bolts 1/4 of a turn alternating between each bolt to remove the bushing.
- 10. Remove the pulley from the pump.
- 11. Place a drain pan under the hydraulic pump.

12. Disconnect the hydraulic hoses (E) from the pump.



- 13. Remove the pump from the frame by removing the two 3/8" bolts (F) and flange nuts.
- 14. Remove the two hydraulic fittings from the hydraulic pump.

Removal Complete

Installation

- 1. Install the two hydraulic fittings into the new hydraulic pump.
- 2. Position the pump against the frame aligning the mounting holes. Ensure that the arrow (A) on the pump is pointing toward the front of the tractor.



- Secure the pump in place using two 3/8" bolts (B) and flange nuts.
- 4. Install the hydraulic hoses onto the pump.

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5. Install the key into the keyway (C) on the hydraulic pump output shaft.



- 6. Place the bushing in the pulley and position on the input shaft.
- 7. Lightly tap the bushing onto the shaft using a dead blow hammer.
- 8. Install the 1/4" bolts (D) through the nonthreaded holes of the bushing and into the pulley



- 9. Install the fender assembly (See Left Rear Fender Replacement procedure in this manual).
- 10. Ensure that the pulley is aligned with the transmission drive pulley. Ensure that the pump pulley rotates freely without contacting the pump mounting bolts.
- 11. Install the belt over the pump pulley and transmission drive pulley.
- 12. Set the belt tension by adjusting the flange nuts (E), (F), (G). When the tension is set ensure all of the bolts are securely tightened.



- Tension the hydraulic pump belt. A deflection of 1/8" to 3/16" (3.2 to 4.8mm) under a load of 13.6 lbs (6.2 kgf) pressed in the middle of the span.
- 14. Fill the hydraulic system with fluid. See the Hydraulic Fluid and Filter Replacement procedure in this manual.
- 15. Cycle the hydraulic control levers to purge the system of any air. Check the hydraulic fluid level and add fluid as required.
- 16. Install the left rear fender assembly (See Left Rear Fender Replacement procedure in this manual).
- 17. Install the rear wheel.

Installation Complete

Fuel Filter Replacement

Removal

- Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Turn the fuel shut off valve to the off position.
- Drain the bowl on the bottom of the filter, into an approved container, by opening the valve (A). Dispose of fuel in accordance with local laws.



- 4. Remove the glass bowl (B) from the bottom of the filter canister.
- 5. Remove the filter canister (C).

Removal Complete

Installation

1. Install the new filter canister (C).



- 2. Install the glass bowl (B) onto the filter canister.
- 3. Ensure the drain valve (A) is closed.
- 4. Turn on the fuel shut off valve.
- 5. Squeeze the fuel bulb until the bulb is firm.

Installation Complete

Air Filter Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Remove the engine access panel (A).



3. Release both latches (B) from the air filter housing. Remove the filter cap (C).



4. Remove and discard the primary filter element (D).


5. Remove and discard the safety filter element (E).



Removal Complete

Installation

1. Install the safety filter element (A) as shown.



2. Install the primary filter element (B).

3. Install the filter housing cap (C) securing it in place with the latches (D).



4. Install the engine access panel (E).



Installation Complete



Drive Belt Replacement

Removal

- 5. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 6. Remove the left rear wheel.
- 7. Remove the left fender assembly (See Left Fender Replacement procedure in this manual).
- 8. Loosen the tension and remove the hydraulic pump drive belt. Loosen the 3/8" bolt (A) and Remove the 3/8" flange nut (B).



- 9. Remove the hydraulic pump belt.
- 10. Loosen the 1/2" locknut (C) to loosen the drive belts tension.



11. Remove the four 3/8" bolts (D) from the drive pulley bushing.



- 12. Install the three bolts into the threaded holes of the bushing.
- 13. Tighten the bolts 1/4 of a turn alternating between each bolt until the bushing is free of the

pulley.

14. With the bushing removed, remove the belts from pulley and engine drive pulley.

Removal Complete

Installation

- Loop both of the drive belts over the drive pulley (A) so that they are in the 2 grooves closest to the transmission.
- 2. Position the bushing (B) over the input shaft and into the pulley aligning the mounting holes.



- 3. Install the three mounting bolts (C) through the bushing and into the pulley.
- 4. Tighten the bolts 1/4 of a turn alternating between each bolt and torque to 29 foot pounds.
- 5. Install bolt (D) and washer through the bushing and into the input shaft.



- Tension the drive belts. A deflection of 5/16" to 3/8" (7.9mm to 9.5mm) under a load of 13.6 lbs (6.2 kgf) pressed in the middle of the span.
- 7. Install the hydraulic pump belt.
- Install the mounting bracket onto the hangar bolt. Secure the bracket in place with the 3/8" flange nut.
- Set the belt tension by adjusting the flange nuts (D), (E), (F). When the tension is set ensure all of the bolts are securely tightened.





- 10. Tension the hydraulic pump belt. A deflection of 1/8" to 3/16" (3.2 to 4.8mm) under a load of 13.6 lbs (6.2 kgf) pressed in the middle of the span.
- 11. Install the left rear fender (See Left Rear Fender Replacement procedure in this manual).
- 12. Install the left rear wheel.

Installation Complete

Throttle Cable Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Place the throttle in the idle position.
- 3. Remove the outer console cover (A).



4. Remove the inner console cover (B).



5. Remove the shifter box cover (C).



6. Remove the cable clamp (D).



- 7. Remove the cable from the throttle lever noting the location that the cable is installed in.
- 8. Remove the throttle cable (E) from the engine and engine mount. It is necessary to remove the cable clamps to remove the cable from the engine frame.



- 9. Note the routing of the throttle cable for the installation of the new cable.
- 10. Remove the throttle cable from the linkage.

Removal Complete

Installation

1. Route the new cable from the operators console through the tractor as the old cable was. Ensure that the cable does not become bent or kinked and is routed away from moving parts.

2. Connect the throttle cable to the lowest outside mounting hole (A) of the throttle lever.



- 3. Secure the cable to the bracket using a cable tie (B).
- 4. Ensure the throttle lever is in the idle position.
- 5. Ensure that the throttle linkage on the engine is all the way to the right.



6. Route the throttle cable through the engine mount frame and connect the throttle cable to the engine. Securing the cable with the three clamps (C).



7. Reinstall the cable clamp (D).



Install the shifter box cover (E).



8. Install the inner console cover (F).



9. Install the outer console cover (G).



Installation Complete

Alternator Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Disconnect the battery.
- 3. Fold the operators seat forward and remove the two access panels (A).



4. Remove the upper engine cover (B).



5. Loosen the lower air intake tube clamp, and disconnect the air intake tube (C) from the engine.



6. Remove the four 3/8" bolts (D) to remove the air intake assembly.



7. Disconnect the wiring harness (E) from the alternator.



8. Disconnect the cable (F) from the alternator.



9. Remove the alternator adjustment bolt (G).



10. Remove the alternator mounting bolt (H), washers, nut and bushing.



11. Remove the alternator from the engine.

Removal Complete

Installation

- 1. Place the alternator in the tractor aligning the lower mounting holes. Ensure the bushing is installed in the lower mounting hole.
- Secure the alternator in place using the M8 bolt (A) washers, lock washer, and nut.



3. Rotate the alternator in place and install the upper M8 bolt (B).



4. Install the belt over the alternator and adjust the alternator to tension the belt. Tighten the M8 bolt to secure the alternator in place.

ENGINE

5. Connect the cable (C) to the alternator and reinstall the rubber boot.



6. Connect the wiring harness (D) to the alternator.



- 7. Position the air intake assembly in the frame aligning the mounting holes.
- 8. Secure the intake assembly in place using four 3/8" bolts (E), washers, and locknuts.



9. Connect the air intake tube (F) to the engine securing it in place with a hose clamp.



10. Install the upper engine cover (G).



11. Install the engine access panels (H).



Installation Complete

Alternator Belt Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Disconnect the battery.



3. Remove the upper engine cover (A).

Loosen the alternator adjustment bolt (B).



5. Remove the engine RPM sensor bracket by removing the two M10 bolts (C).



- 6. Remove the belt from the alternator pulley.
- 7. Route the belt over the fan between the fan and the radiator to remove it from the engine.

Removal Complete

Installation

- 1. Route the belt between the fan and radiator.
- 2. Install the belt over the fan and onto the drive pulley.
- 3. Install the belt over the alternator pulley.
- 4. Adjust the alternator position to tension the belt.
- 5. Tighten the alternator adjustment bolt (A) to secure the alternator in place.



- 6. Position the engine RPM sensor bracket against the engine block aligning the mounting holes.
- 7. Secure the bracket in place using two M10 bolts.

- 8. Check the clearance of the RPM sensor from the tone ring. The sensor should be approximately 1/16" from the tone ring.
- 9. Start the tractor to ensure the RPM's are displaying on the tachometer. Adjust the sensor mounting bracket as required.
- 10. Install the upper engine cover.

Installation Complete

Radiator Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Drain the engine coolant from the radiator into an approved container (See Engine Coolant Replacement procedure in this manual).
- 3. Remove the upper engine cover (A).



4. Loosen the lower air intake tube clamp, and disconnect the air intake tube (B) from the engine.



5. Remove the four 3/8" bolts (C) to remove the air intake assembly.



ENGINE

6. Remove the reservoir hose (D) from the radiator.



7. Remove the upper radiator baffle (E) from the radiator and fan shroud.



8. Remove the upper radiator hose (F) from the radiator.



9. Remove the lower radiator hose (G) from the radiator.



10. Remove the radiator fan shroud mounting bolts (H) from both sides of the radiator fan shroud.



11. Remove the radiator from the tractor frame.

Removal Complete

Installation

- 1. Install the radiator bushings and washers in the frame.
- 2. Place the radiator in the bushings aligning the radiator fan shroud mounting holes.
- 3. Secure the fan shroud to the radiator with the 1/4" bolts and flange nuts (A) on both sides of the radiator fan shroud.



4. Install the lower radiator hose (B).



5. Install the upper radiator hose (C).



6. Install the radiator baffle (D) secure the baffle in place using the 1/4" bolts and flange nuts.



7. Install the reservoir hose (E).



- 8. Position the air intake assembly in the frame aligning the mounting holes.
- Secure the intake assembly in place using four 3/8" bolts (F), washers, and locknuts.



10. Connect the air intake tube (G) to the engine securing it in place with a hose clamp.



11. Install the upper engine cover (H).



12. Fill the radiator with engine coolant (See Engine Coolant Replacement procedure in this manual).

Installation Complete

Engine Coolant Flush

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Allow the engine to cool.
- 3. Open the radiator access panel.
- 4. Slowly open the radiator cap (A) to the first stop to allow the pressure to release.



 Place a drain pan under the radiator drain valve (B).



- 6. Install a 7/16" (11mm) ID hose onto the drain valve and route the hose to the drain pan.
- 7. Turn the radiator drain valve counterclockwise to open the valve and drain the coolant.
- 8. When all of the coolant has drained from the radiator, close the drain valve and leave the hose attached.
- 9. Add the proper amount of radiator flush to the radiator and fill the radiator with distilled water.
- 10. Install the radiator cap, start the engine, and run until the engines operating temperature reaches (160-180 °F)(71-82°C).
- 11. Shut off the engine and remove the key from the ignition switch.
- 12. Allow the engine and radiator to cool completely.
- 13. Open the drain valve. Add distilled water to the radiator until clear sediment free water is draining into the pan.
- 14. Allow the water to drain completely, close the drain valve and remove the hose.
- 15. Slowly add the proper coolant (Refer to the Kubota Engine Owner's manual), until the coolant level reaches the bottom of the filler neck.
- Install the radiator cap, start the engine, and run until the engine is up to operating temperature (160-180 °F)(71-82°C).
- 17. Shut off the engine and allow the engine to cool.
- 18. Check the coolant level when the engine is cold and add additional coolant as necessary.
- 19. Close and secure the radiator access panel.

Coolant Flush Complete

Engine Oil and Filter Replacement

Removal

- 1. Check the engine owners manual for service intervals.
- 2. Start the tractor and allow it to run until it reaches operating temperature.
- 3. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 4. Remove the lower engine access panel (A), if the updated style panel is not installed on your tractor, so that the filter can be removed.



5. Remove the oil fill cap access cover (B).



6. Place a drain pan under the oil drain (C).



- 7. Drain the oil from the engine. When the oil has drained completely, reinstall the oil drain plug.
- 8. Remove the engine oil filter (D) (access the filter from underneath the tractor, a filter wrench can make it easier to remove).



Removal Complete

Installation

- 1. Wipe the oil filter mounting surface with a clean lint free cloth.
- 2. Apply a thin layer of clean oil to the oil filter gasket.
- 3. Install the oil filter by hand do not over tighten the filter.
- 4. Open the engine access door and remove the engine oil fill cap (A).



5. Route an 11" flexible funnel (Tilmor part number 72-0048) through the oil fill access point and around the muffler to the engine oil fill point.



- Add oil to the engine until the oil reaches the upper limit of the oil level gauge on the dipstick. (Refer to the Kubota Engine Owner's Manual for proper oil specifications and capacity.)
- 7. Install the engine oil fill cap.
- 8. Start the engine and run at slow idle for 2 to 3 minutes.
- 9. Shut the engine off and remove the key from the ignition switch.
- 10. Check for any leaks.
- 11. Check the engine oil level after allowing the engine to cool for approximately two minutes. Add oil as necessary.
- 12. Install the engine oil fill cap access cover (B).



13. Install the lower engine access cover (C).



Installation Complete

ENGINE

Engine Replacement

Removal

- 1. Park the tractor on a level surface, engage the parking brake and remove the key from the ignition.
- 2. Disconnect the battery.
- 3. Remove the rear wheels.
- 4. Remove the left fender (See Left Fender Replacement procedure in this manual).
- 5. Remove the right fender (See Right Fender Replacement procedure in this manual).
- 6. Remove the operators seat and seat frame (See Operators Seat Frame Replacement procedure in this manual).
- 7. Remove the engine access covers (A).



- 8. Remove the radiator (See Radiator Replacement procedure in this manual).
- 9. Remove the left engine cover (B).



10. Remove the drive belt tension pulley (C).



- 11. Remove the drive belts (See Drive Belt Replacement Procedure in this manual).
- 12. Turn the fuel supply valve to the off position.
- 13. Disconnect the fuel return hose (D). Clamp or plug the hose to prevent the fuel from draining.



- 14. Disconnect the fuel supply hose (E). Clamp or plug the hose to prevent the fuel from draining.
- 15. Remove the throttle cable (F) from the engine and engine mount. It is necessary to remove the cable clamps to remove the cable from the engine frame.



16. Disconnect the engine wiring harness connections (G).



17. Disconnect the ground wires (H) from the frame.



18. Disconnect the ground wires from the engine (I).



- 19. Disconnect the positive cable (the cable that connects the breaker switch to the starter) from the starter.
- 20. Remove the six engine mount bolts from the engine mounts.

21. Lift the engine from the frame from the lift points (J).



Removal Complete

Installation

 Position the engine in the frame aligning the mounting holes (A). Secure the engine in place using the six bolts.



- 2. Connect the positive wire on the starter.
- Connect the ground wires on the engine block (B).



ENGINE

4. Connect the ground wires to the frame (C).



5. Connect the engine wiring harness connections (D).



6. Route the throttle cable through the engine mount frame and connect the throttle cable to the engine. Securing the cable with the three clamps (E).



7. Route the fuel supply hose (F) through the engine mount and connect the hose to the engine securing it in place using a hose clamp.



- 8. Connect the fuel return hose (G) securing the hose in place using a hose clamp.
- 9. Turn the fuel supply valve to the on position.
- 10. Squeeze the fuel supply bulb slowly until firm.
- 11. Install the drive belts (See Drive Belt Replacement Procedure in this manual).
- 12. Install the left engine cover (H).



- 13. Install the radiator(See Radiator Replacement procedure in this manual).
- 14. Install the engine access covers (I).



- 15. Install the operators seat and seat frame (See Operators Seat Frame Replacement procedure in this manual).
- 16. Install the right fender (See Right Fender Replacement procedure in this manual).
- 17. Install the left fender (See Left Fender Replacement procedure in this manual).
- 18. Install the rear wheels and troque lug bolts to 130 foot pounds.
- 19. Connect the battery.

Installation Complete

Wiring Circuit - Main Power / Ignition Switch Schematic



Wiring Circuit - Gauges / USB / AUX / Misc Fuse Block Schematic





Wiring Circuit - Gauges / USB / AUX / Misc Fuse Block Schematic



Wiring Circuit - Engine Functions / Diesel - Gas Schematic



Wiring Circuit - Head & Tail Light - Directional / Hazards Schematic

