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Rowtrac™ 370 / 420 / 470 / 500
Steiger® 370 / 420 / 470 / 500 / 540 / 580 / 620
Quadtrac® 470 / 500 / 540 / 580 / 620
Tier 4B (final)
Tractor

PIN ZFF308001 and above

SERVICE MANUAL

Part number 47924539

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CASE IH
AGRICULTURE

Link Product / Engine

Product	Market Product	Engine
QuadTrac® 470 Quadtrac® [ZFF308001 -]	North America	F3HFE613D*B001
QuadTrac® 540 Quadtrac® [ZFF308001 -]	North America	F3DFE613J*B001
QuadTrac® 540 Quadtrac® scraper [ZFF308001 -]	North America	F3DFE613J*B001
QuadTrac® 580 Quadtrac® [ZFF308001 -]	North America	F3DFE613G*B001
QuadTrac® 580 Quadtrac® scraper [ZFF308001 -]	North America	F3DFE613G*B001
QuadTrac® 620 Quadtrac® [ZFF308001 -]	North America	F3DFE613F*B001
RowTrac™ 370 Rowtrac™ [ZFF308001 -]	North America	F2CFE614A*B
RowTrac™ 420 Rowtrac™ [ZFF308001 -]	North America	F3HFE613G*B001
RowTrac™ 470 Rowtrac™ [ZFF308001 -]	North America	F3HFE613D*B001
RowTrac™ 500 Rowtrac™ [ZFF308001 -]	North America	F3HFE613B*B001
Steiger® 370 Standard wheeled [ZFF308001 -]	North America	F2CFE614A*B
Steiger® 370 Heavy duty wheeled [ZFF308001 -]	North America	F2CFE614A*B
Steiger® 420 Heavy duty wheeled [ZFF308001 -]	North America	F3HFE613G*B001
Steiger® 470 Heavy duty wheeled [ZFF308001 -]	North America	F3HFE613D*B001
Steiger® 470 Wheeled scraper [ZFF308001 -]	North America	F3HFE613D*B001
Steiger® 500 Heavy duty wheeled [ZFF308001 -]	North America	F3HFE613B*B001
Steiger® 500 Wheeled scraper [ZFF308001 -]	North America	F3HFE613B*B001
Steiger® 500 QT Quadtrac® [ZFF308001 -]	North America	F3HFE613B*B001
Steiger® 500 QT Quadtrac® scraper [ZFF308001 -]	North America	F3HFE613B*B001
Steiger® 540 Heavy duty wheeled [ZFF308001 -]	North America	F3DFE613J*B001
Steiger® 540 Wheeled scraper [ZFF308001 -]	North America	F3DFE613J*B001
Steiger® 580 Heavy duty wheeled [ZFF308001 -]	North America	F3DFE613G*B001
Steiger® 580 Wheeled scraper [ZFF308001 -]	North America	F3DFE613G*B001

Product	Market Product	Engine
Steiger® 620 Heavy duty wheeled [ZFF308001 -]	North America	F3DFE613F*B001
Steiger® 620 Wheeled scraper [ZFF308001 -]	North America	F3DFE613F*B001

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INTRODUCTION

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Foreword - Important notice regarding equipment servicing

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All repair and maintenance work listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given, and using, whenever possible, the special tools.

Anyone who performs repair and maintenance operations without complying with the procedures provided herein shall be responsible for any subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages caused by parts and/or components not approved by the manufacturer, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer. In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages caused by parts and/or components not approved by the manufacturer.

The manufacturer reserves the right to make improvements in design and changes in specifications at any time without notice and without incurring any obligation to install them on units previously sold. Specifications, descriptions, and illustrative material herein are as accurate as known at time of publication but are subject to change without notice.

In case of questions, refer to your CASE IH Sales and Service Networks.

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Safety rules

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Personal safety





This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

 DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

 WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

 CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: Notice indicates a situation that, if not avoided, could result in machine or property damage.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: Note indicates additional information that clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

Safety rules - Ecology and the environment

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Soil, air, and water quality is important for all industries and life in general. When legislation does not yet rule the treatment of some of the substances that advanced technology requires, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation. Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances.

Helpful hints

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- The air-conditioning system contains gases that should not be released into the atmosphere. Consult an air-conditioning specialist or use a special extractor to recharge the system properly.
- Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding. Penetrating weld splatter may burn a hole or weaken hoses, allowing the loss of oils, coolant, etc.

Battery recycling

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. CASE IH strongly recommends that you return all used batteries to a CASE IH dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.



Mandatory battery recycling

NOTE: The following requirements are mandatory in Brazil.

Batteries are made of lead plates and a sulfuric acid solution. Because batteries contain heavy metals such as lead, CONAMA Resolution 401/2008 requires you to return all used batteries to the battery dealer when you replace any batteries. Do not dispose of batteries in your household garbage.

Points of sale are obliged to:

- Accept the return of your used batteries
- Store the returned batteries in a suitable location
- Send the returned batteries to the battery manufacturer for recycling

Torque - Minimum tightening torques for normal assembly

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Decimal hardware

Grade 5 bolts, nuts and studs

Size	Nm	lb in/lb ft
1/4 in	12 - 15 Nm	108 - 132 lb in
5/16 in	23 - 28 Nm	204 - 252 lb in
3/8 in	48 - 57 Nm	420 - 504 lb in
7/16 in	73 - 87 Nm	54 - 64 lb ft
1/2 in	109 - 130 Nm	80 - 96 lb ft
9/16 in	149 - 179 Nm	110 - 132 lb ft
5/8 in	203 - 244 Nm	150 - 180 lb ft
3/4 in	366 - 439 Nm	270 - 324 lb ft
7/8 in	542 - 651 Nm	400 - 480 lb ft
1 in	787 - 944 Nm	580 - 696 lb ft
1-1/8 in	1085 - 1193 Nm	800 - 880 lb ft
1-1/4 in	1519 - 1681 Nm	1120 - 1240 lb ft
1-3/8 in	1980 - 2278 Nm	1460 - 1680 lb ft
1-1/2 in	2631 - 2983 Nm	1940 - 2200 lb ft

Grade 8 bolts, nuts and studs

Size	Nm	lb in/lb ft
1/4 in	16 - 20 Nm	144 - 180 lb in
5/16 in	33 - 39 Nm	288 - 348 lb in
3/8 in	61 - 73 Nm	540 - 648 lb in
7/16 in	95 - 114 Nm	70 - 84 lb ft
1/2 in	149 - 179 Nm	110 - 132 lb ft
9/16 in	217 - 260 Nm	160 - 192 lb ft
5/8 in	298 - 358 Nm	220 - 264 lb ft
3/4 in	515 - 618 Nm	380 - 456 lb ft
7/8 in	814 - 976 Nm	600 - 720 lb ft
1 in	1220 - 1465 Nm	900 - 1080 lb ft
1-1/8 in	1736 - 1953 Nm	1280 - 1440 lb ft
1-1/4 in	2468 - 2712 Nm	1820 - 2000 lb ft
1-3/8 in	3227 - 3688 Nm	2380 - 2720 lb ft
1-1/2 in	4285 - 4827 Nm	3160 - 3560 lb ft

NOTE: Use thick nuts with Grade 8 bolts.

Metric hardware

Grade 8.8 bolts, nuts and studs

Size	Nm	lb in/lb ft
4 mm	3 - 4 Nm	24 - 36 lb in
5 mm	7 - 8 Nm	60 - 72 lb in
6 mm	11 - 12 Nm	96 - 108 lb in
8 mm	26 - 31 Nm	228 - 276 lb in
10 mm	52 - 61 Nm	456 - 540 lb in
12 mm	90 - 107 Nm	66 - 79 lb ft
14 mm	144 - 172 Nm	106 - 127 lb ft
16 mm	217 - 271 Nm	160 - 200 lb ft
20 mm	434 - 515 Nm	320 - 380 lb ft
24 mm	675 - 815 Nm	500 - 600 lb ft
30 mm	1250 - 1500 Nm	920 - 1100 lb ft
36 mm	2175 - 2600 Nm	1600 - 1950 lb ft

Grade 10.9 bolts, nuts and studs

Size	Nm	lb in/lb ft
4 mm	4 - 5 Nm	36 - 48 lb in
5 mm	9 - 11 Nm	84 - 96 lb in
6 mm	15 - 18 Nm	132 - 156 lb in
8 mm	37 - 43 Nm	324 - 384 lb in
10 mm	73 - 87 Nm	54 - 64 lb ft
12 mm	125 - 150 Nm	93 - 112 lb ft
14 mm	200 - 245 Nm	149 - 179 lb ft
16 mm	310 - 380 Nm	230 - 280 lb ft
20 mm	610 - 730 Nm	450 - 540 lb ft
24 mm	1050 - 1275 Nm	780 - 940 lb ft
30 mm	2000 - 2400 Nm	1470 - 1770 lb ft
36 mm	3500 - 4200 Nm	2580 - 3090 lb ft

Grade 12.9 bolts, nuts and studs

Size	Nm	lb in/lb ft
Typically the torque values specified for grade 10.9 hardware can be used satisfactorily on grade 12.9 hardware.		

Steel hydraulic fittings

37° flare fitting

Tube outside diameter/Hose inside diameter		Thread size	Nm	lb in/lb ft
mm	inch			
6.4 mm	1/4 in	7/16-20 in	8 - 16 Nm	72 - 144 lb in
7.9 mm	5/16 in	1/2-20 in	11 - 22 Nm	96 - 192 lb in
9.5 mm	3/8 in	9/16-18 in	14 - 34 Nm	120 - 300 lb in
12.7 mm	1/2 in	3/4-16 in	20 - 57 Nm	180 - 504 lb in
15.9 mm	5/6 in	7/8-14 in	34 - 79 Nm	300 - 696 lb in
19.0 mm	3/4 in	1-1/16-12 in	54 - 108 Nm	40 - 80 lb ft
22.2 mm	7/8 in	1-3/16-12 in	81 - 135 Nm	60 - 100 lb ft
25.4 mm	1 in	1-5/16-12 in	102 - 158 Nm	75 - 117 lb ft
31.8 mm	1-1/4 in	1-5/8-12 in	169 - 223 Nm	125 - 165 lb ft
38.1 mm	1-1/2 in	1-7/8-12 in	285 - 338 Nm	210 - 250 lb ft

Straight threads with O-ring

Tube outside diameter/Hose inside diameter		Thread size	Nm	lb in/lb ft
mm	inch			
6.4 mm	1/4 in	7/16-20 in	16 - 26 Nm	144 - 228 lb in
7.9 mm	5/16 in	1/2-20 in	22 - 34 Nm	192 - 300 lb in
9.5 mm	3/8 in	9/16-18 in	34 - 54 Nm	300 - 480 lb in
12.7 mm	1/2 in	3/4-16 in	57 - 91 Nm	540 - 804 lb in
15.9 mm	5/6 in	7/8-14 in	79 - 124 Nm	58 - 92 lb ft
19.0 mm	3/4 in	1-1/16-12 in	108 - 174 Nm	80 - 128 lb ft
22.2 mm	7/8 in	1-3/16-12 in	136 - 216 Nm	100 - 160 lb ft
25.4 mm	1 in	1-5/16-12 in	159 - 253 Nm	117 - 187 lb ft
31.8 mm	1-1/4 in	1-5/8-12 in	224 - 357 Nm	165 - 264 lb ft
38.1 mm	1-1/2 in	1-7/8-12 in	339 - 542 Nm	250 - 400 lb ft

Split flange mounting bolts

Size	Nm	lb in/lb ft
5/16-18 in	20 - 27 Nm	180 - 240 lb in
3/8-16 in	27 - 34 Nm	240 - 300 lb in
7/16-14 in	47 - 61 Nm	420 - 540 lb in
1/2-13 in	74 - 88 Nm	55 - 65 lb ft

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Size	Nm	lb in/lb ft
5/8-11 in	190 - 203 Nm	140 - 150 lb ft

Nominal SAE dash size	O-ring face seal end		Thread size	Nm	lb in/lb ft	O-ring boss end fitting or lock nut		
	Tube outside diameter mm	in				Thread size	Nm	lb in/lb ft
-4	6.4 mm	1/4 in	9/16-18 in	14 - 16 Nm	120 - 144 lb in	7/16-20 in	23 - 27 Nm	204 - 240 lb in
-6	9.5 mm	3/8 in	11/16-16 in	24 - 27 Nm	216 - 240 lb in	9/16-18 in	34 - 41 Nm	300 - 360 lb in
-8	12.7 mm	1/2 in	13/16-16 in	43 - 54 Nm	384 - 480 lb in	3/4-16 in	61 - 68 Nm	540 - 600 lb in
-10	15.9 mm	5/8 in	1-14 in	62 - 76 Nm	552 - 672 lb in	7/8-14 in	81 - 88 Nm	60 - 65 lb ft
-12	19.0 mm	3/4 in	1-3/16-12 in	90 - 110 Nm	65 - 80 lb ft	1-1/16-12 in	115 - 122 Nm	85 - 90 lb ft
-14	22.2 mm	7/8 in	1-3/16-12 in	90 - 110 Nm	65 - 80 lb ft	1-13/16-12 in	129 - 136 Nm	95 - 100 lb ft
-16	25.41 mm	1.0 in	1-7/16-12 in	125 - 140 Nm	92 - 105 lb ft	1-5/16-12 in	156 - 169 Nm	115 - 125 lb ft
-20	31.8 mm	1-1/4 in	1-11/16-12 in	170 - 190 Nm	125 - 140 lb ft	1-5/8-12 in	201 - 217 Nm	150 - 160 lb ft
-24	38.1 mm	1-1/2 in	2-12 in	200 - 254 Nm	150 - 180 lb ft	1-7/8-12 in	258 - 271 Nm	190 - 200 lb ft

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Torque - Standard torque data for hydraulics

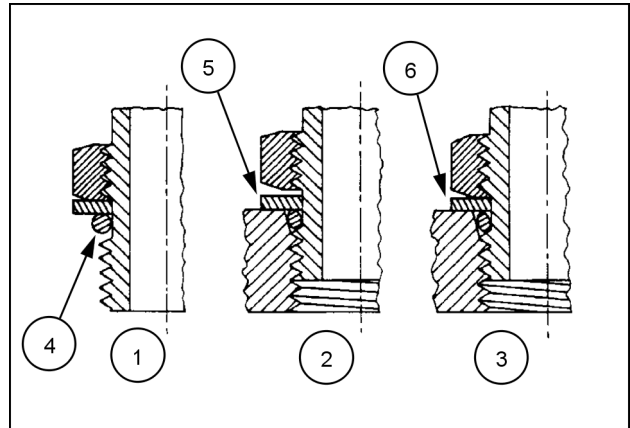
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Installation of adjustable fittings in straight thread O-ring bosses

1. Lubricate the O-ring by coating it with a light oil or petroleum. Install the O-ring in the groove adjacent to the metal backup washer which is assembled at the extreme end of the groove (4).
2. Install the fitting into the SAE straight thread boss until the metal backup washer contacts the face of the boss (5).

NOTE: Do not over tighten and distort the metal backup washer.

3. Position the fitting by turning out (counterclockwise) up to a maximum of one turn. Holding the pad of the fitting with a wrench, tighten the locknut and washer against the face of the boss (6).



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Standard torque data for hydraulic tubes and fittings

Tube nuts for 37° flared fittings				O-ring boss plugs adjustable fitting locknuts, swivel JIC-37° seats
Size	Tubing OD	Thread size	Torque	Torque
4	6.4 mm (1/4 in)	7/16-20	12 - 16 N·m (9 - 12 lb ft)	8 - 14 N·m (6 - 10 lb ft)
5	7.9 mm (5/16 in)	1/2-20	16 - 20 N·m (12 - 15 lb ft)	14 - 20 N·m (10 - 15 lb ft)
6	9.5 mm (3/8 in)	9/16-18	29 - 33 N·m (21 - 24 lb ft)	20 - 27 N·m (15 - 20 lb ft)
8	12.7 mm (1/2 in)	3/4-16	47 - 54 N·m (35 - 40 lb ft)	34 - 41 N·m (25 - 30 lb ft)
10	15.9 mm (5/8 in)	7/8-14	72 - 79 N·m (53 - 58 lb ft)	47 - 54 N·m (35 - 40 lb ft)
12	19.1 mm (3/4 in)	1-1/16-12	104 - 111 N·m (77 - 82 lb ft)	81 - 95 N·m (60 - 70 lb ft)
14	22.2 mm (7/8 in)	1-3/16-12	122 - 136 N·m (90 - 100 lb ft)	95 - 109 N·m (70 - 80 lb ft)
16	25.4 mm (1 in)	1-5/16-12	149 - 163 N·m (110 - 120 lb ft)	108 - 122 N·m (80 - 90 lb ft)
20	31.8 mm (1-1/4 in)	1-5/8-12	190 - 204 N·m (140 - 150 lb ft)	129 - 158 N·m (95 - 115 lb ft)
24	38.1 mm (1-1/2 in)	1-7/8-12	217 - 237 N·m (160 - 175 lb ft)	163 - 190 N·m (120 - 140 lb ft)
32	50.8 mm (2 in)	2-1/2-12	305 - 325 N·m (225 - 240 lb ft)	339 - 407 N·m (250 - 300 lb ft)

These torques are not recommended for tubes of 12.7 mm (1/2 in) OD and larger with wall thickness of 0.889 mm (0.035 in) or less. The torque is specified for 0.889 mm (0.035 in) wall tubes on each application individually.

Before installing and torquing 37° flared fittings, clean the face of the flare and threads with a clean solvent or Loctite cleaner and apply hydraulic sealant **LOCTITE® 569™** to the 37° flare and the threads.

Install fitting and torque to specified torque, loosen fitting and retorque to specifications.

Pipe thread fitting torque

Before installing and tightening pipe fittings, clean the threads with a clean solvent or Loctite cleaner and apply sealant **LOCTITE® 567™ PST PIPE SEALANT** for all fittings including stainless steel or **LOCTITE® 565™ PST** for most metal fittings. For high filtration/zero contamination systems use **LOCTITE® 545™**.

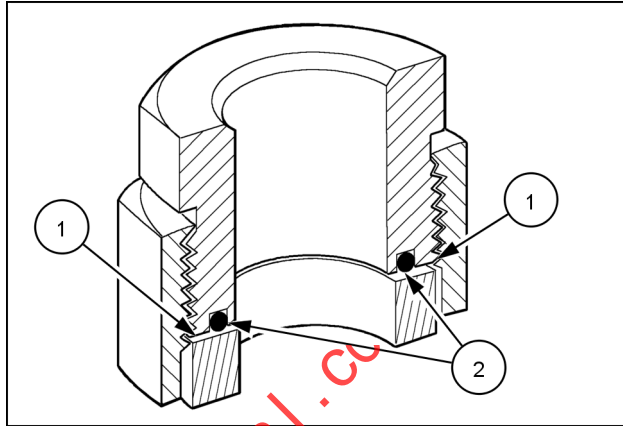
Thread size	Torque (maximum)
1/8-27	13 N·m (10 lb ft)
1/4-18	16 N·m (12 lb ft)
3/8-18	22 N·m (16 lb ft)
1/2-14	41 N·m (30 lb ft)
3/4-14	54 N·m (40 lb ft)

Installation of ORFS (O-Ring Flat Seal fittings)

When installing ORFS fittings thoroughly clean both flat surfaces of the fittings **(1)** and lubricate the O-ring **(2)** with light oil. Make sure both surfaces are aligned properly. Torque the fitting to specified torque listed throughout the repair manual.

NOTICE: *If the fitting surfaces are not properly cleaned, the O-ring will not seal properly. If the fitting surfaces are not properly aligned, the fittings may be damaged and will not seal properly.*

NOTICE: *Always use genuine factory replacement oils and filters to ensure proper lubrication and filtration of engine and hydraulic system oils.*



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The use of proper oils, grease, and keeping the hydraulic system clean will extend machine and component life.

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Basic instructions - Shop and assembly

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Shimming

For each adjustment operation, select adjusting shims and measure the adjusting shims individually using a micrometer, then add up the recorded values. Do not rely on measuring the entire shimming set, which may be incorrect, or the rated value shown on each shim.

Rotating shaft seals

For correct rotating shaft seal installation, proceed as follows:

1. Before assembly, allow the seal to soak in the oil it will be sealing for at least thirty minutes.
2. Thoroughly clean the shaft and check that the working surface on the shaft is not damaged.
3. Position the sealing lip facing the fluid.

NOTE: *With hydrodynamic lips, take into consideration the shaft rotation direction and position the grooves so that they will move the fluid towards the inner side of the seal.*

4. Coat the sealing lip with a thin layer of lubricant (use oil rather than grease). Fill the gap between the sealing lip and the dust lip on double lip seals with grease.
5. Insert the seal in its seat and press down using a flat punch or seal installation tool. Do not tap the seal with a hammer or mallet.
6. While you insert the seal, check that the seal is perpendicular to the seat. When the seal settles, make sure that the seal makes contact with the thrust element, if required.
7. To prevent damage to the seal lip on the shaft, position a protective guard during installation operations.

O-ring seals

Lubricate the O-ring seals before you insert them in the seats. This will prevent the O-ring seals from overturning and twisting, which would jeopardize sealing efficiency.

Sealing compounds

Apply a sealing compound on the mating surfaces when specified by the procedure. Before you apply the sealing compound, prepare the surfaces as directed by the product container.

Spare parts

Only use CNH Original Parts or CASE IH Original Parts.

Only genuine spare parts guarantee the same quality, duration, and safety as original parts, as they are the same parts that are assembled during standard production. Only CNH Original Parts or CASE IH Original Parts can offer this guarantee.

When ordering spare parts, always provide the following information:

- Machine model (commercial name) and Product Identification Number (PIN)
- Part number of the ordered part, which can be found in the parts catalog

Protecting the electronic and/or electrical systems during charging and welding

To avoid damage to the electronic and/or electrical systems, always observe the following practices:

1. Never make or break any of the charging circuit connections when the engine is running, including the battery connections.
2. Never short any of the charging components to ground.
3. Always disconnect the ground cable from the battery before arc welding on the machine or on any machine attachment.
 - Position the welder ground clamp as close to the welding area as possible.
 - If you weld in close proximity to a computer module, then you should remove the module from the machine.
 - Never allow welding cables to lie on, near, or across any electrical wiring or electronic component while you weld.
4. Always disconnect the negative cable from the battery when charging the battery in the machine with a battery charger.

NOTICE: *If you must weld on the unit, you must disconnect the battery ground cable from the machine battery. The electronic monitoring system and charging system will be damaged if this is not done.*

5. Remove the battery ground cable. Reconnect the cable when you complete welding.

⚠ WARNING

Battery acid causes burns. Batteries contain sulfuric acid.

Avoid contact with skin, eyes or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately. Failure to comply could result in death or serious injury.

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Special tools

The special tools that CASE IH suggests and illustrate in this manual have been specifically researched and designed for use with CASE IH machines. The special tools are essential for reliable repair operations. The special tools are accurately built and rigorously tested to offer efficient and long-lasting operation.

By using these tools, repair personnel will benefit from:

- Operating in optimal technical conditions
- Obtaining the best results
- Saving time and effort
- Working in safe conditions

Hydraulic contamination

STEIGER®	
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Contamination in the hydraulic system is a major cause of the malfunction of hydraulic components. Contamination is any foreign material in the hydraulic oil.

Contamination can enter the hydraulic system in several ways:

- When you drain the oil or disconnect any line
- When you disassemble a component
- From normal wear of the hydraulic components
- From damaged seals or worn seals
- From a damaged component in the hydraulic system

All hydraulic systems operate with some contamination. The design of the components in this hydraulic system permits efficient operation with a small amount of contamination. An increase in this amount of contamination can cause problems in the hydraulic system.

The following list includes some of these problems:

- Cylinder rod seals that leak
- Control valve spools that do not return to neutral
- Movement of control valve spools is difficult
- Hydraulic oil that becomes too hot
- Pump gears, housing, and other parts that wear rapidly
- Relief valves or check valves held open by dirt
- Quick failure of components that have been repaired
- Slow cycle times are slow. The machine does not have enough power.

If your machine has any of these problems, check the hydraulic oil for contamination.

There are two types of contamination: microscopic and visible.

Microscopic contamination occurs when very fine particles of foreign material are suspended in the hydraulic oil. These particles are too small to see or feel. Microscopic contamination can be found by identification of the following problems or by testing in a laboratory.

Examples of problems caused by microscopic contamination:

- Cylinder rod seals that leak
- Control valve spools that do not return to neutral
- The hydraulic system has a high operating temperature

Visible contamination is foreign material that can be found by sight, touch, or odor. Visible contamination can cause a sudden failure of components.

Examples of problems caused by visible contamination:

- Particles of metal or dirt in the oil
- Air in the oil
- Dark or thick oil
- Oil with an odor of burned oil
- Water in the oil

If you find contamination, use a portable filter to clean the hydraulic system.

Capacities

STEIGER®	NA
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Engine	
Oil exchange capacity with filter (approximate.)	CASE IH AKCELA UNITEK NO. 1™ SBL CJ-4 ,
9L engine only	25 l (6.6 US gal)
13L single turbo engine only	27.25 l (7.2 US gal)
13L twin turbo engine only	36 l (9.5 US gal)
Cooling system capacity	
Coolant	CASE IH AKCELA ACTIFULL™ OT EXTENDED LIFE COOLANT
9L engine only	50 l (13.2 US gal)
13L single turbo engine only	57.6 l (15.2 US gal)
13L twin turbo engine only	
Main engine coolant system	70 l (18.4 US gal)
Secondary cooling system	40 l (10.6 US gal)
Transmission	
Oil type	CASE IH AKCELA HY-TRAN® ULTRACTION
370, 420, 470 or standard 500 and Rowtrac™ models	63 l (16.6 US gal)
500 Scraper, 540, 580 and 620	68 l (18 US gal)
Hydraulic/axle system	
Oil type	CASE IH AKCELA HY-TRAN® ULTRACTION
Approximate. total system capacity (See Note)	
370	237 l (62.5 US gal)
420, 470, 500, 540, 580, and 620	250 l (66 US gal)
Rowtrac™	244 l (64.5 US gal)
Quadtrac®	314 l (83 US gal)

NOTE: Total system capacity includes filters, front and rear axle and reservoir. If three-point hitch equipped, add 19 l (5 US gal).

Undercarriage idler/roller wheel hubs	
Quadtrac® models (Agricultural and Scraper versions)	
Idler hubs - oil capacity and type (each)	480 ml (16.2 US fl oz) CASE IH AKCELA NO. 1™ ENGINE OIL SAE 30
Roller wheels - oil capacity and type (each)	250 ml (8 US fl oz) CASE IH AKCELA NO. 1™ ENGINE OIL SAE 30
Rowtrac™ models (narrow and wide undercarriages)	
Idler hubs - oil capacity and type (each)	370 ml (12.5 US fl oz) 50W TO-4 CNH DRIVETRAIN FLUID
Roller wheels - oil capacity and type (each)	225 ml (7 US fl oz) CASE IH AKCELA NO. 1™ ENGINE OIL SAE 30

General specification

STEIGER®	NA
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Diesel engine

Tractor Model	Steiger and Rowtrac 370	Steiger and Rowtrac 420	Steiger, Rowtrac and Quadtrac 470	Steiger, Rowtrac, and Quadtrac 500	Steiger and Quadtrac 540	Steiger and Quadtrac 580	Steiger and Quadtrac 620
Engine Make/Model	Case IH Cursor						
Type	In-line, six cylinder, four stroke cycle						
Aspiration	Variable geometry turbo charged (VGT), air to air after cooled	Wastegate turbo charged, air to air after cooled			2 Stage turbo charged, air to water intercooled, air to water after cooled		
Emission Level (tier)	4 Final						
Firing order	1-4-2-6-3-5						
Bore	117 mm (4.4 in)	135 mm (5.3 in)					
Stroke	135 mm (5.3 in)	150 mm (5.9 in)					
Displacement	8.7 l (530 in ³)	12.9 l (787 in ³)					
Compression ratio	15.9:1	16.5:1			15.3:1		
Cylinder sleeves	Wet type, removable						
High idle (no load)	2190 - 2350 RPM	2200 - 2350 RPM					
Rated speed	2000 RPM	2100 RPM					
Idle speed	850 RPM						
Standard power rating- kW (HP)	276 kW (370 Hp)	313 kW (420 Hp)	350 kW (470 Hp)	373 kW (500 Hp)	399 kW (535 Hp)	433 kW (580 Hp)	462 kW (620 Hp)
Peak torque at 1400 RPM NM. (Lb. Ft.)	1845 N·m (1361 lb ft)	1992 N·m (1469 lb ft)	2229 N·m (1644 lb ft)	2374 N·m (1751 lb ft)	2540 N·m (1874 lb ft)	2757 N·m (2034 lb ft)	2941 N·m (2169 lb ft)
Torque rise - %	40						

Lubrication system

Oil pressure at idle speed (minimum)

370	400 kPa (58 psi)
420 - 470 - 500	430 kPa (62 psi)
540, 580, and 620	220 kPa (31 psi)

Oil pressure at high idle

370	500 kPa (72 psi)
420 - 470 - 500	480 kPa (70 psi)
540 - 580 - 620	460 kPa (67 psi)

INTRODUCTION

Type of system	Pressure and spray
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Air intake system

All models	
Type	Pressure system, thermostat controlled bypass, impeller type pump
Radiator	Aluminum furnace brazed
Thermostat	Starts to open at approximately 83 °C (180 °F) fully open at 95 °C (203 °F)
Pressure cap, deaeration tank	103 kPa (15 psi)
Steiger 370, 420, 470, and all Rowtrac models - Fan drive type	Electronically controlled viscous
Steiger 500, 540, 580 and 620, Quadtrac 470, 500, 540, 580 and 620 - Fan drive type	Hydraulic

Transmission - Powershift

Type	Full powershift, 16 forward and 2 reverse speeds
Shift control	Electronically controlled, hydraulically operated

Brakes

Service brake	Hydraulic, multiple disc wet brake integral with front and rear differentials
Park brake - Steiger 370, 420, 470 and 500 (Std) and all Rowtrac models.	Electrically controlled spring applied and pressure released. Integral with rear differential
Park brake - 500 (HD), 540, 580, 620 and all Quadtrac	Electrically controlled spring applied and pressure released. Integral with front and rear differentials

Axle differential and final drives

Type	Bar type with integral wet brake. Spiral bevel ring/pinion gears. Pressure lubed and oil cooled
Final drive	
370 through 500 (Std)	4-Pinion planetary
500 (HD), 540, 580 and 620	3-Pinion compound planetary
Rowtrac 370, 420, 470 and 500	Offset planetary and drop gear
Quadtrac 450, 500, 550 and 600	Offset planetary and drop gear
	Total axle reduction
370 through 500 (Std)	25.396:1
500 (HD), 540, 580 and 620	25.194:1
Rowtrac models	14.840:1
Quadtrac models	12.134:1
Axle bar diameter	
370 (Std.), 500 and 540	115 mm (4.5 in)
370 (HD), 420 (HD), 470 (HD)	127 mm (5.0 in)
580 and 620	140 mm (5.5 in)

INTRODUCTION

Axle bar length	
Wheel	3048 mm (120.0 in)
Rowtrac	2032 mm (80 in) (standard) 2235 mm (88 in) (optional) 3048 mm (120 in) (optional)
Quadtrac	2235 mm (88 in)

Power Take-Off (PTO) (If Equipped)

PTO type	Live Independent system integral with transmission ASABE Type 3 45 mm (1.75 in) 1000 RPM 20 spline
Type clutch	Electro/hydraulically actuated
Rotation	Clockwise from rear of tractor
1000 RPM	20 Spines from rear of tractor
Engine Speed for 1000 RPM	2000 RPM

Park brake system

Park brake	Spring applied multiple disc actuated by transmission control lever
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Hydraulic system

Type	Closed center, load sensing
Remote valve	Electro/ hydraulic controlled, closed center stack type with in-cab variable flow control for each section, with line locks on all lift ports
Standard system pump flow	
370	151 l/min (40 US gpm)
420 through 620	159 l/min (42 US gpm)
High output pump capacity (if equipped)	
370	208 l/min (55 US gpm)
420 through 620	216 l/min (57 US gpm)
Steering	Articulated, full priority, two double acting cylinders
Maximum steering pressure	193 bar (2800 psi)
Couplers	ISO standard couplers
Maximum system pressure	210 bar (3050 psi)

TwinFlow hydraulics (if equipped)

Type system	PFC piston pump
370 TwinFlow	200 l/min (53 US gpm)
370 Standard pump/TwinFlow combined	351 l/min (93 US gpm)
370 High flow pump/TwinFlow combined	408 l/min (108 US gpm)
420 through 620 TwinFlow	212 l/min (56 US gpm)
420 through 620 Standard pump/TwinFlow combined	371 l/min (98 US gpm)
420 through 620 High flow pump/TwinFlow combined	427 l/min (113 US gpm)

Hitch system (if equipped)

Type control	Electronic
Type valve	Three position - lift, hold and lower
Type draft arms	Rigid, swing type with manual float adjustment
Type hitch	Three point category IV-N

INTRODUCTION

Hitch coupler	Category IV-N
Lift capacity (OECD Static) 610 mm (24.0 in) behind ball ends through full range (OECD Static)	
Steiger 370, 420, 470, and all Rowtrac models	9071 kg (20000 lb)
500, 540, 580 and 620	8900 kg (19,620 lb)
Quadtrac	8949 kg (19,728 lb)

Drawbar

Type	Solid bar with drop pin hammerstrap
Pin diameter (category 4)	51 mm (2.0 in)
Pin diameter (category 5)	70 mm (2.75 in)
Pin length	220 mm (8.7 in)
Maximum permissible tongue weight	
Standard 370 through 620 (category 4)	2400 kg (5,300 lb)
Standard - Quadtrac (category 4)	2722 kg (6,000 lb)
Optional heavy duty - all models (category 4)	4983 kg (11,000 lb)
Optional heavy duty - 500 through 620 and Quadtrac (category 5)	6804 kg (15,000 lb)

Scraper drawbar

Maximum permissible tongue weight	9072 kg (20,000 lb)
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Track and undercarriage (if equipped)

Track drive type	Independent, 4-track positive drive, Self tensioning track system
Track undercarriage	Integral center pivot design, 10 Degrees up/down oscillation
Track type	Self cleaning, rubber belt

Quadtrac

Track width standard	762 mm (30 in)
Track width optional	914 mm (36 in)
Ground surface length	1829 mm (72 in)
Track gauge (center to center)	2235 mm (88 in)
Ground pressure with 24494 kg (54000 lb) configuration	
762 mm (30 in)	43.4 kPa (6.3 psi)
914 mm (36 in)	35.9 kPa (5.2 psi)

Rowtrac

Track width standard	406 mm (16 in)
Track width optional	457 mm (18 in)
Track width optional	610 mm (24 in)
Track width optional	762 mm (30 in)
Ground surface length	1788 mm (70.4 in)
Track gauge standard (center to center)	2032 mm (80 in)
Track gauge optional (center to center)	2235 mm (88 in)
Track gauge optional (center to center)	3048 mm (120 in)
Ground pressure with 23133 kg (51000 lb) configuration	
406 mm (16 in) track	78 kPa (11.3 psi)
457 mm (18 in) track	69 kPa (10 psi)
610 mm (24 in) track	51.7 kPa (7.5 psi)
762 mm (30 in) track	41.4 kPa (6.0 psi)



SERVICE MANUAL

Engine

QuadTrac® 470 Quadtrac® [ZFF308001 -], QuadTrac® 540 Quadtrac® [ZFF308001 -], QuadTrac® 540 Quadtrac® scraper [ZFF308001 -], QuadTrac® 580 Quadtrac® [ZFF308001 -], QuadTrac® 580 Quadtrac® scraper [ZFF308001 -], QuadTrac® 620 Quadtrac® [ZFF308001 -], RowTrac™ 370 Rowtrac™ [ZFF308001 -], RowTrac™ 420 Rowtrac™ [ZFF308001 -], RowTrac™ 470 Rowtrac™ [ZFF308001 -], RowTrac™ 500 Rowtrac™ [ZFF308001 -], Steiger® 370 Heavy duty wheeled [ZFF308001 -], Steiger® 370 Standard wheeled [ZFF308001 -], Steiger® 420 Heavy duty wheeled [ZFF308001 -], Steiger® 470 Heavy duty wheeled [ZFF308001 -], Steiger® 470 Wheeled scraper [ZFF308001 -], Steiger® 500 Heavy duty wheeled [ZFF308001 -], Steiger® 500 QT Quadtrac® [ZFF308001 -], Steiger® 500 QT Quadtrac® scraper [ZFF308001 -], Steiger® 500 Wheeled scraper [ZFF308001 -], Steiger® 540 Heavy duty wheeled [ZFF308001 -], Steiger® 540 Wheeled scraper [ZFF308001 -], Steiger® 580 Heavy duty wheeled [ZFF308001 -], Steiger® 580 Wheeled scraper [ZFF308001 -], Steiger® 620 Heavy duty wheeled [ZFF308001 -], Steiger® 620 Wheeled scraper [ZFF308001 -]

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Engine and crankcase - 001

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QuadTrac® 470 Quadtrac® [ZFF308001 -], QuadTrac® 540 Quadtrac® [ZFF308001 -], QuadTrac® 540 Quadtrac® scraper [ZFF308001 -], QuadTrac® 580 Quadtrac® [ZFF308001 -], QuadTrac® 580 Quadtrac® scraper [ZFF308001 -], QuadTrac® 620 Quadtrac® [ZFF308001 -], RowTrac™ 370 Rowtrac™ [ZFF308001 -], RowTrac™ 420 Rowtrac™ [ZFF308001 -], RowTrac™ 470 Rowtrac™ [ZFF308001 -], RowTrac™ 500 Rowtrac™ [ZFF308001 -], Steiger® 370 Heavy duty wheeled [ZFF308001 -], Steiger® 370 Standard wheeled [ZFF308001 -], Steiger® 420 Heavy duty wheeled [ZFF308001 -], Steiger® 470 Heavy duty wheeled [ZFF308001 -], Steiger® 470 Wheeled scraper [ZFF308001 -], Steiger® 500 Heavy duty wheeled [ZFF308001 -], Steiger® 500 QT Quadtrac® [ZFF308001 -], Steiger® 500 QT Quadtrac® scraper [ZFF308001 -], Steiger® 500 Wheeled scraper [ZFF308001 -], Steiger® 540 Heavy duty wheeled [ZFF308001 -], Steiger® 540 Wheeled scraper [ZFF308001 -], Steiger® 580 Heavy duty wheeled [ZFF308001 -], Steiger® 580 Wheeled scraper [ZFF308001 -], Steiger®



**620 Heavy duty wheeled [ZFF308001 -] , Steiger® 620 Wheeled scraper
[ZFF308001 -]**

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