SERVICE MANUAL

Boomer™ 40
Boomer™ 50
Tier 3
Compact Tractor

Part number 47698299
2nd edition English
November 2016
Replaces part number 84373327

NEW HOLLAND AGRICULTURE

Safety rules

Boomer™ 40	NA

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.

⚠ Operator protective structure ⚠

Your tractor is equipped with an operator protective structure, such as: a Roll Over Protective Structure (ROPS), Falling Object Protective Structure (FOPS), or a cab with ROPS. A ROPS may be a can frame or a two-posted or four-posted structure used for the protection of the operator to minimize the possibility of serious injury. The mounting structure and fasteners forming the mounting connection with the tractor are part of the ROPS.

The protective structure is a special safety component of your tractor.

DO NOT attach any device to the protective structure for pulling purposes. DO NOT drill holes to the protective structure.

The protective structure and interconnecting components are a certified system. Any damage, fire, corrosion, or modification will weaken the structure and reduce your protection. If this occurs, THE PROTECTIVE STRUCTURE MUST BE REPLACED so that it will provide the same protection as a new protective structure. Contact your dealer for protective structure inspection and replacement.

After an accident, fire, tip or roll over, the following MUST be performed by a qualified technician before returning the tractor to field or job-site operations:

- The protective structure MUST BE REPLACED.
- The mounting or suspension for the protective structure, operator seat and suspension, seat belts and mounting components, and wiring within the operator's protective system MUST be carefully inspected for damage.
- All damaged parts MUST BE REPLACED.

DO NOT WELD, DRILL HOLES, ATTEMPT TO STRAIGHTEN, OR REPAIR THE PROTECTIVE STRUCTURE. MODIFICATION IN ANY WAY CAN REDUCE THE STRUCTURAL INTEGRITY OF THE STRUCTURE, WHICH COULD CAUSE DEATH OR SERIOUS INJURY IN THE EVENT OF FIRE, TIP, ROLL OVER, COLLISION, OR ACCIDENT.

Seat belts are part of your protective system and must be worn at all times. The operator must be held to the seat inside the frame in order for the protective system to work.

Torque values for inch O-Ring Boss (ORB) port plugs

		Ferrous		Non-Ferrous
SAE dash size	UN/UNF thread size	Internal hex N·m (lb ft) ± 10 %	External hex N·m (lb ft) ± 10 %	N·m (lb ft) ± 10 %
2	5/16-24	7.5 (5.5)	12.5 (9.2)	7.5 (5.5)
3	3/8-24	14.5 (10.7)	21 (15.5)	12.5 (9.2)
4	7/16-20	21 (15.5)	37 (27.3)	22 (16.2)
5	1/2-20	28 (20.7)	42 (31)	25 (18.4)
6	9/16-18	47 (34.7)	47 (34.7)	28 (20.7)
8	3/4-16	89 (65.6)	89 (65.6)	53 (39.1)
10	7/8-14	116 (85.6)	116 (85.6)	70 (51.6)
12	1-1/16-12	176 (129.8)	176 (129.8)	106 (78.2)
14	1-3/16-12	247 (182.2)	247 (182.2)	148 (109.2)
16	1-5/16-12	284 (209.5)	284 (209.5)	170 (125.4)
20	1-5/8-12	357 (263.3)	357 (263.3)	214 (157.8)
24	1-7/8-12	441 (325.3)	441 (325.3)	265 (195.5)
32	2-1/2-12	536 (395.3)	536 (395.3)	322 (237.5)

Torque values for four-bolt flange connections (Metric Screws, Class 10.9)

Metric size mm	Imperial size in	Screw code 61	Code 61 N·m (lb ft) ± 10 %	Screw code 62	Code 62 N·m (lb ft) ± 10 %
13	1/2	M8 x 1.25	34 (25.1)	M8 x 1.25	34 (25.1)
19	3/4	M10 x 1.5	74 (54.6)	M10 x 1.5	74 (54.6)
25	1	M10 x 1.5	74 (54.6)	M12 x 1.75	137 (101)
32	1-1/4	M10 x 1.5	74 (54.6)	M12 x 1.75	137 (101)
				M14 x 1.5	189 (139.4)
38	1-1/2	M12 x 1.75	137 (101)	M16 x 2	310 (228.6)
51	2	M12 x 1.75	137 (101)	M20 x 2.5	575 (424.1)
64	2-1/2	M12 x 1.75	137 (101)	M24 x 3	575 (424.1)
76	3	M16 x 2	310 (228.6)	M30 x 3.5	680 (501.5)
89	3-1/2	M16 x 2	310 (228.6)	–	–
102	4	M16 x 2	310 (228.6)	–	–
127	5	M16 x 2	310 (228.6)	–	–

Torque values for four-bolt flange connections (Metric Screws, Class 8.8)

Metric size mm	Imperial size in	Screw code 61	Code 61 N·m (lb ft) ± 10 %	Screw code 62	Code 62 N·m (lb ft) ± 10 %
13	1/2	M8 x 1.25	29 (21.4)	M8 x 1.25	29 (21.4)
19	3/4	M10 x 1.5	57(42)	M10 x 1.5	57(42)
25	1	M10 x 1.5	57(42)	M12 x 1.75	100 (73.8)
32	1-1/4	M10 x 1.5	57(42)	M12 x 1.75	100 (73.8)
				M14 x 1.5	160 (118)
38	1-1/2	M12 x 1.75	100 (73.8)	M16 x 2	250 (184.4)
51	2	M12 x 1.75	100 (73.8)	M20 x 2.5	500 (368.8)
64	2-1/2	M12 x 1.75	100 (73.8)	M24 x 3	575 (424.1)
76	3	M16 x 2	250 (184.4)	M30 x 3.5	680 (501.5)
89	3-1/2	M16 x 2	250 (184.4)	–	–
102	4	M16 x 2	250 (184.4)	–	–
127	5	M16 x 2	250 (184.4)	–	–

General specification - Biodiesel Fuels

Boomer™ 40	NA
Boomer™ 50	NA

Fatty Acid Methyl Ester Biodiesel (Biodiesel Fuel) consists of a family of fuels derived from vegetable oils treated with methyl esters.

NOTICE: *Biodiesel Fuel blends are approved for your engine only if they comply with* ***EN14214*** *Specification Standards or* ***ASTM D6751****.*

NOTICE: *It is imperative that you check which blend is approved for your engine with your NEW HOLLAND dealer. Be aware that the use of Biodiesel Fuel that does not comply with the Standards mentioned above could lead to severe damage to the engine and fuel system of your machine. The use of fuels that are not approved may void NEW HOLLAND Warranty coverage.*

Biodiesel Fuel Usage Conditions

NOTICE: *The Biodiesel Fuel must meet the fuel Specification mentioned above.*

Biodiesel Fuel must be purchased from a trusted supplier that understands the product and maintains good fuel quality. Biodiesel Fuel must be pre-blended by the supplier. Mixing Biodiesel Fuels on-site can result incorrect mixture that can lead to problems with both engine and fuel system.

Engine performance is affected by the use of Biodiesel Fuel. There may be up to **12 %** reduction in power or torque depending on the blend used.

NOTICE: *DO NOT modify the engine and/or injection pump settings to recover the reduced performance.*

The reduced power must be accepted if using any Biodiesel Fuel blend.

Some modification may be required to allow your engine to run Biodiesel Fuel. Consult you dealer for complete information on these modifications.

Biodiesel Fuel has a higher cloud point than Diesel Fuel.

NOTICE: *The use of high Biodiesel Fuel blends are not recommended in cold weather conditions.*

With Biodiesel Fuels, it may be necessary to change the engine oil, engine oil filter and fuel filter elements more frequently than with Diesel Fuels. Biodiesel Fuel can remove rust and particles from the inside of on-site fuel storage tanks that would normally adhere to the sides of the tank. Like particle deposits that commonly occur with Diesel Fuel, these particles can become trapped by the machine fuel filters, causing blockage and shortening filter life. In cold weather, this is more likely to happen. Consult your NEW HOLLAND dealer for information on cold weather operation and proper maintenance intervals when using any Biodiesel Fuel blend.

When handling Biodiesel Fuel, care must be taken not to allow water into the fuel supply. Biodiesel Fuel will actually attract moisture from the atmosphere.

Fuel tanks must be kept as full as possible to limit the amount of air and water vapors in them. It may be necessary to drain the fuel filter water tap more frequently.

Potential oxidation and stability could be a problem with the fuel stored in the machine.

NOTICE: *Machines must not be stored for more than three months with Biodiesel Fuel blends in the fuel system.*

If long storage periods are necessary, the engine must run on Diesel Fuel for 20 hours to flush the Biodiesel Fuel out of the engine fuel system prior to storage.

NOTICE: *Biodiesel Fuel must not be stored in on-site storage tanks for more than three months.*

Any spillage of Biodiesel Fuel must be cleaned up immediately before it can cause damage to the environment and the paint finish of the machine.

Before using Biodiesel Fuel blends you should consult with your dealer to receive full information about the approved blend for your machine and any detailed conditions of its usage.

NOTICE: *Be aware that not fulfilling the requirements and conditions of Biodiesel Fuel usage will void your machine's NEW HOLLAND Warranty coverage.*

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NOTE: *(Refer to figure **1** for locations.)*

(4) Dimensions				
	(KF) = The distance between the' Barrel' and the 'Plunger' before increase of 'Head' pressure.	**5.8 mm** (**0.2283458 in** **+/-**) **0.1 mm** (**0.003936996 in**)		
	(MS) = Distance between governor sleeve and control lever. Controls fuel quantity when starting.	**1.0 mm** (**0.03936996 in** **+/-**) **0.1 mm** (**0.003936996 in**)		
	(K) = The distance between the' Barrel' and the 'Plunger' after increase of 'Head' pressure.	**3.3 mm** (**0.1299209 in** **+/-**) **0.1 mm** (**0.003936996 in**)		
	(BCS)			

Control lever angle			
	(a)	**18 ° +/- 4**	
	(A)	mm	
	(b)	**38 ° +/- 5**	
	(B)	mm	

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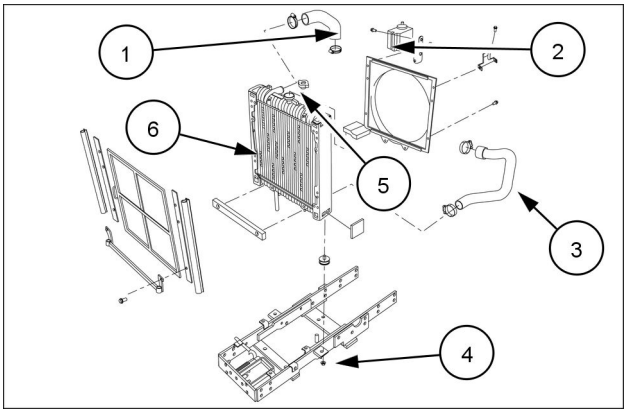
(*) See content for specific models

Radiator - Install

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS

Prior operation:
Radiator - Remove (10.400)

1. Position the radiator **(6)** into the tractor.
2. Install the M10 x 1.25 flange nuts **(4)** to the bottom of the rubber dampers.
3. Install the lower radiator hose **(3)**.
4. Install the upper radiator hose **(1)**.
5. Clean the radiator cap and cap seal and install the cap **(5)**.



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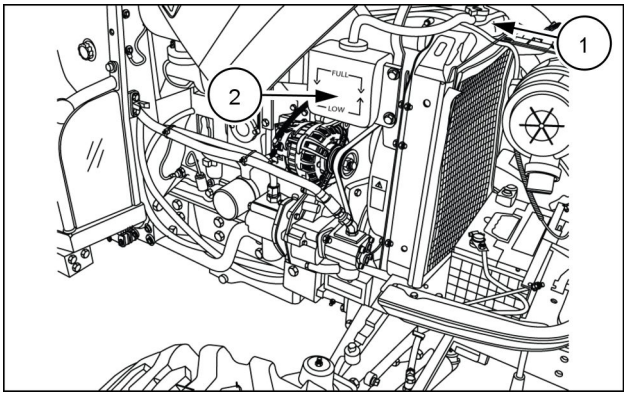
6. Add coolant to the radiator **(1)** and then the coolant reservoir **(2)** until fluid level is between the “LOW” and “HIGH” lines on the side of the reservoir.
7. Run the engine until normal operating temperature is reached, then stop the engine. Recheck the coolant level when the engine is cold and add additional coolant as necessary.

NOTICE: *Never run the engine when the cooling system is empty. Do not add cold water or cold antifreeze solution if the engine is hot.*

NOTE: *Cooling system capacity is* ***6 L*** *(****2 US gal****).*



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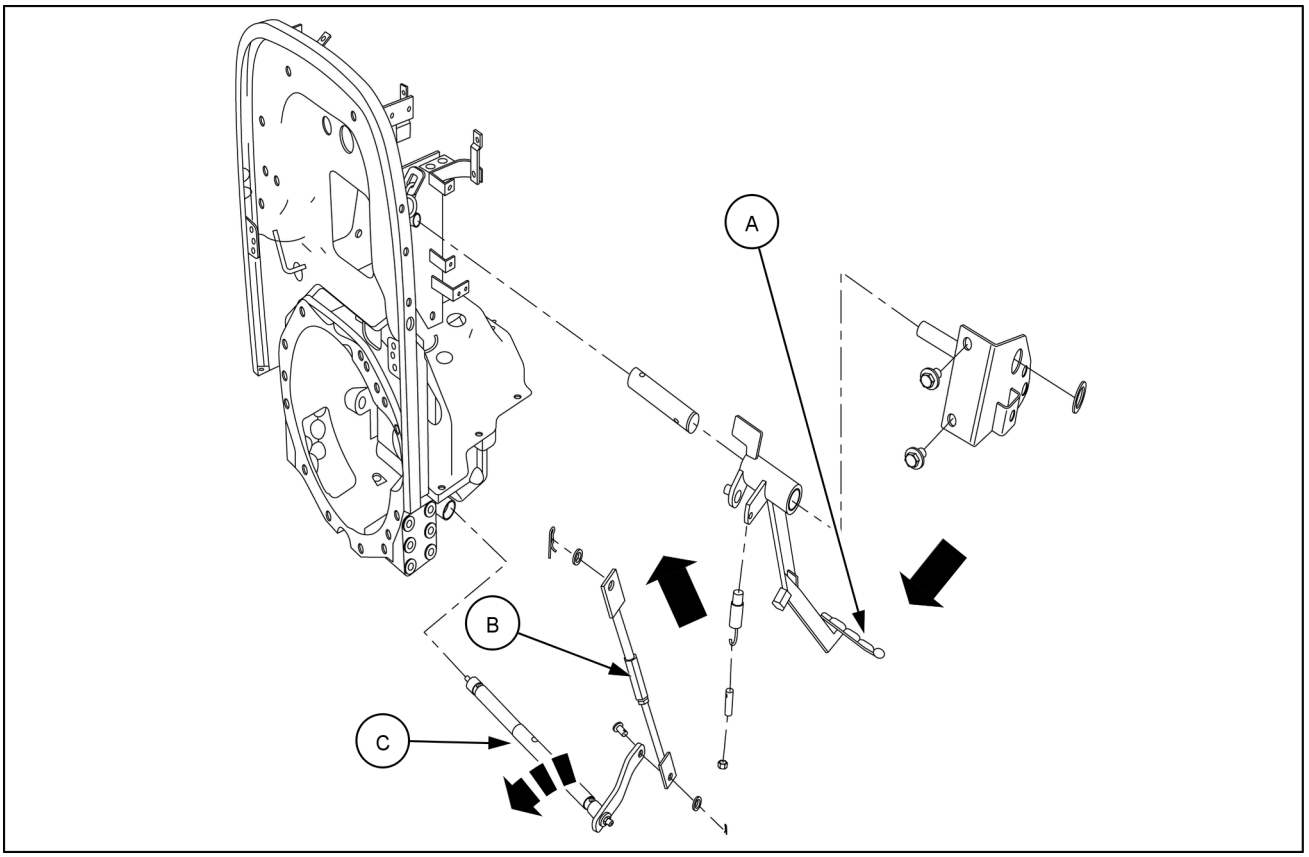
Clutch mechanical release control - Dynamic description

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS



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When operator foot pressure is exerted downward on the clutch pedal **(A)**, movement is transmitted upward to the linkage **(B)**.
This movement causes a twisting motion on the clutch rod **(C)**.(Refer to figure **2** .)

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Clutch mechanical release control - 100

(*) See content for specific models

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Clutch - 18

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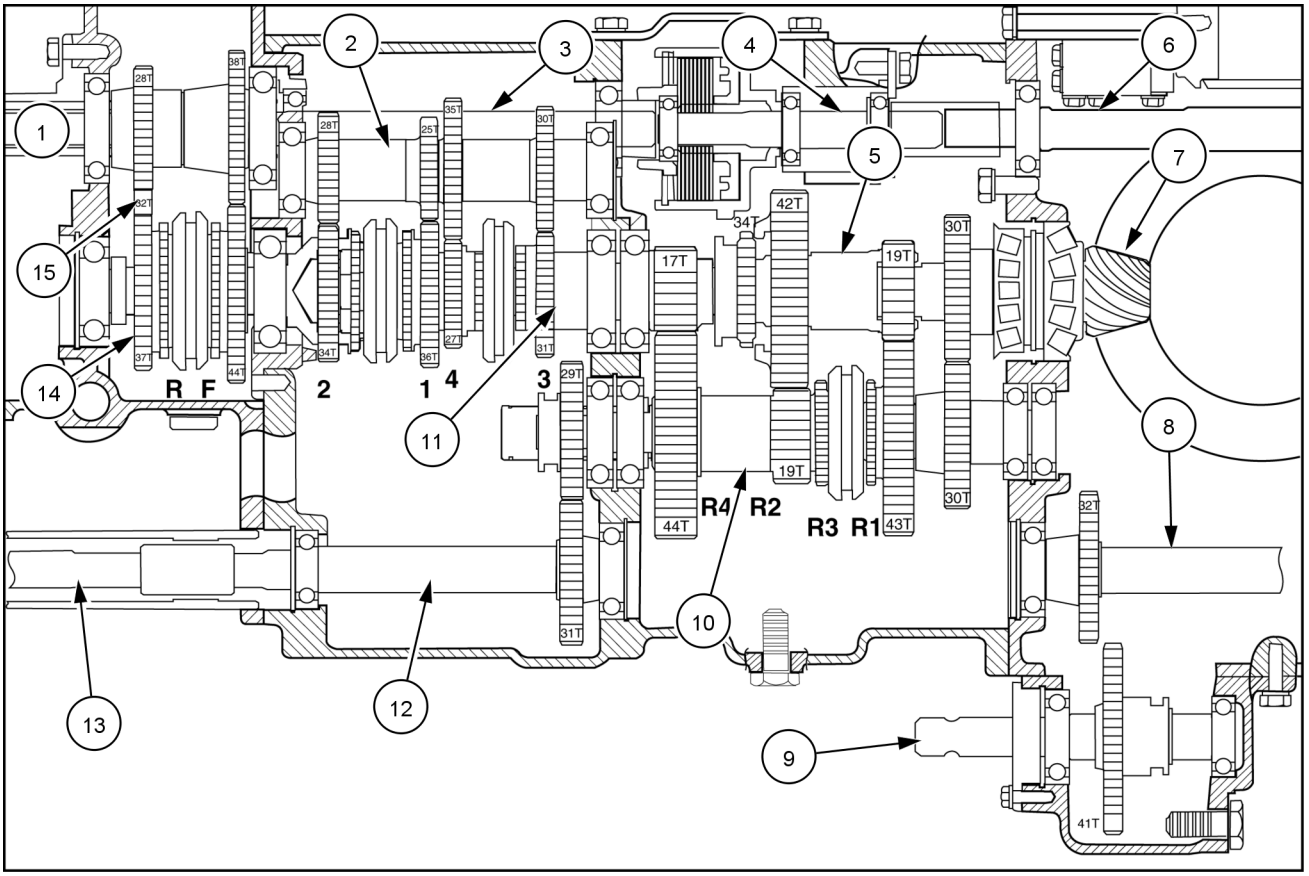
Mechanical transmission - Dynamic description 16 x 16 gear transmission

Boomer™ 40	NA
Boomer™ 50	NA



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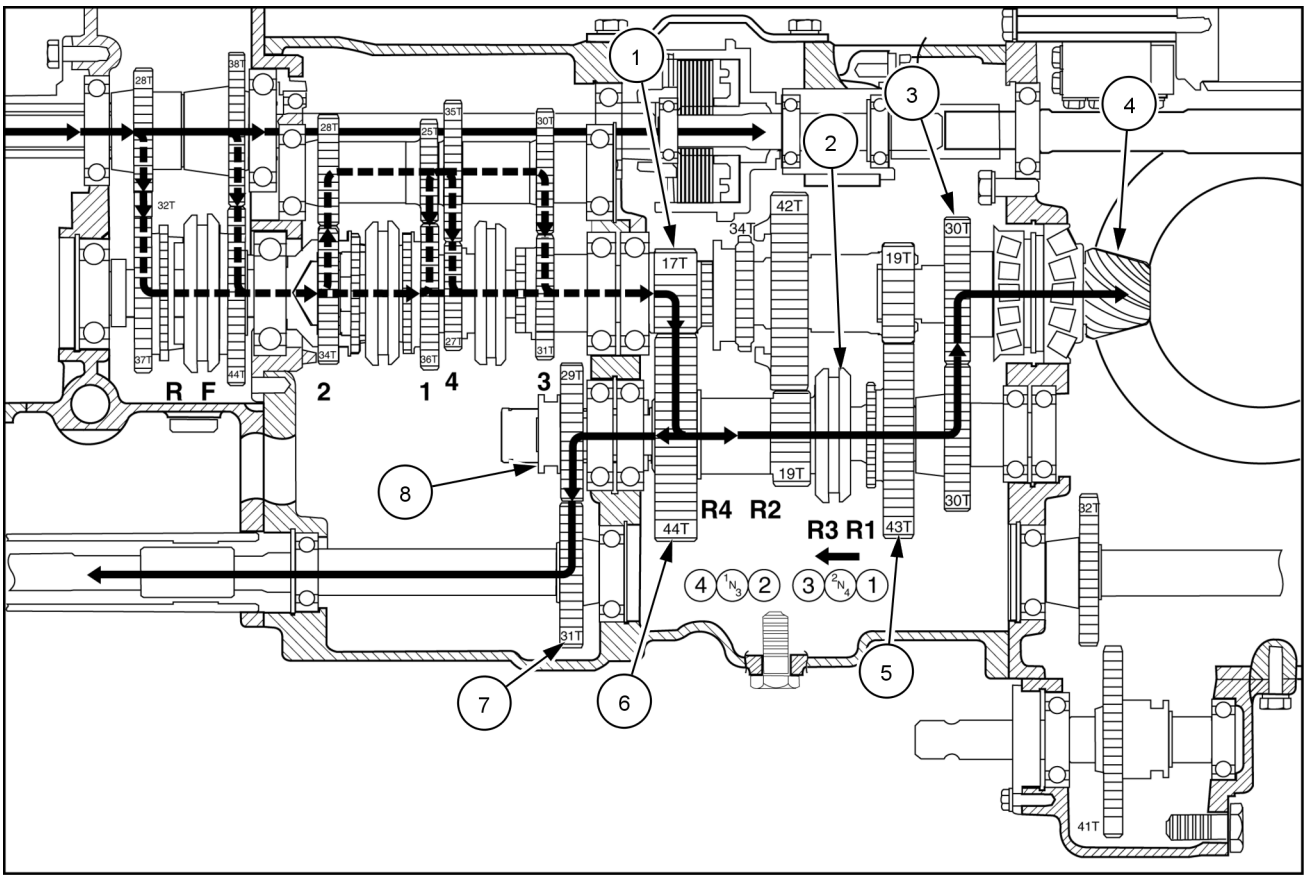
16 x 16 Transmission shaft identification

Ref.	Description		Ref.	Description
(1)	Forward/reverse drive shaft		**(9)**	Mid PTO driven shaft
(2)	Main shift drive shaft		**(10)**	Range drive shaft #1
(3)	Main PTO shaft		**(11)**	Main shift driven shaft
(4)	PTO clutch shaft		**(12)**	Four wheel drive rear shaft
(5)	Range drive shaft #2		**(13)**	Four wheel drive front shaft
(6)	PTO rear shaft		**(14)**	Forward/reverse driven shaft
(7)	Pinion shaft		**(15)**	Reverse Idler shaft
(8)	Mid PTO shaft			



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Power distribution - Range 3

Range 3 (R3)

Forward or reverse torque is transferred from main shift driven shaft gear (17T) **(1)** to the range driven gear (44T) **(6)**. With the shift sleeve in the R3 position **(2)** the range driven gear is coupled to the range counter shaft. The range counter shaft drives the applies torque to the range drive gear (30T) **(5)** and the four wheel drive input shaft. Torque is transferred from range drive gear (30T) **(5)** to the range driven gear (30T) **(3)** and applied to the pinion shaft **(4)**. With the four wheel drive selector **(8)** engaged, torque from the four wheel drive input shaft is transferred from the four wheel drive gear (29T) **(8)** through the four wheel drive driven gear (31T) **(7)** to the rear section of the four wheel shaft.

Range gear shaft mechanical transmission components

(1) Needle bearing	**(9)** Gear range drive 2nd (19T)	**(17)** Shim	**(25)** Spacer, driven shaft	**(33)** Range gear driven (44T)	**(40)** Ball bearing	**(46)** Shift sleeve
(2) Snap ring	**(10)** Needle bearing	**(18)** Shim	**(26)** Drive gear,4WD (31T)	**(34)** Snap ring	**(41)** Spacer	**(47)** Snap ring
(3) Range selector	**(11)** Thrust washer	**(19)** Shim	**(27)** Snap ring	**(35)** Bushing	**(42)** Range 1st gear drive (	
(4) Hub range 2 - 4	**(12)** Lock nut	**(20)** Taper bearing	**(28)** Ball bearing	**(36)** Snap ring	**(43)** Driven range gear (30T)	
(5) Snap ring	**(13)** Lock washer	**(21)** Spacer	**(29)** Snap ring	**(37)** Needle bearing	**(44)** Range counter shaft	
(6) Range gear driven (42T)	**(14)** Range drive gear (30T)	**(22)** Snap ring	**(30)** Ball bearing	**(38)**Ball bearing	**(45)** Hub range 1st, 2nd, 3rd	
(7) Snap ring	**(15)** Pinion shaft	**(23)** Pinion bearing holder	**(31)** 2WD input shaft	**(39)** Snap ring		
(8) Needle bearing	**(16)** Pinion thrust washer	**(24)** Taper bearing	**(32)** Ball bearing			

Ref.	Description		Ref.	Description
(10)	Range driven gear (30T)		**(21)**	Range drive gear #2 (19T)
(11)	Range driven gear (43T)		**(22)**	Shift sleeve (1 - 3)

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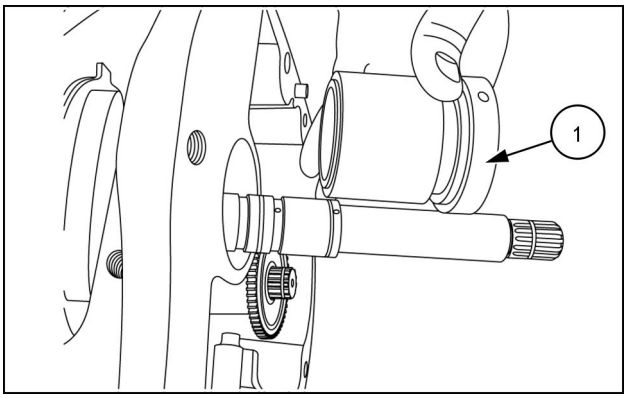
(*) See content for specific models

4. Install the sleeve **(1)**.

NOTICE: *When installing the sleeve, align the pipe assembly holes, be careful not to damage the " O " ring.*



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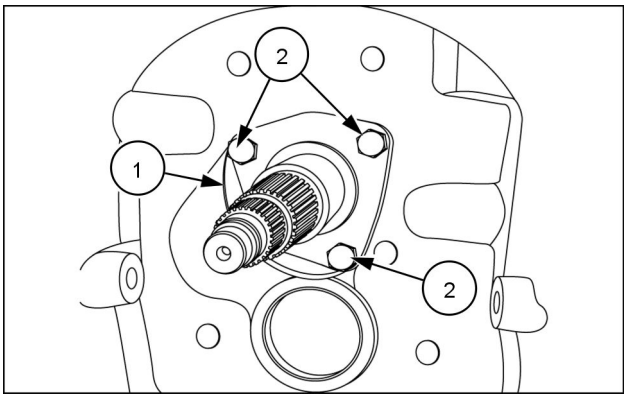
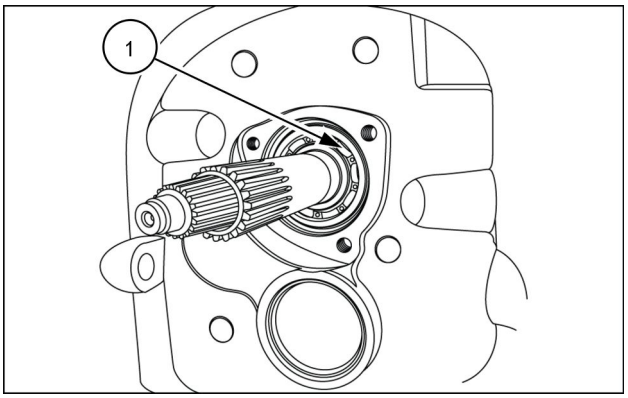
Forward/reverse drive shaft cover

1. Remove the forward/reverse drive shaft cover **(1)** by removing the three M10 x 25 bolts **(2)**.



93112240 3

2. Bearing **(1)** can be removed when the clutch housing is separated from the center casing.



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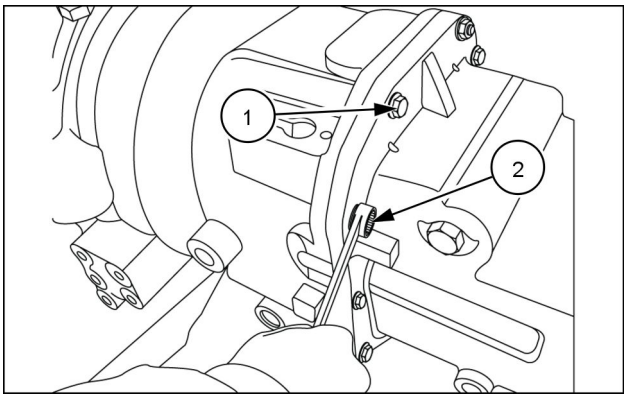
Separate the clutch housing from the center casing

⚠ WARNING

Heavy objects!
Lift and handle all heavy components using lifting equipment with adequate capacity. Always support units or parts with suitable slings or hooks. Make sure the work area is clear of all bystanders. Failure to comply could result in death or serious injury.

W0398A

1. Remove the eight M12 x 35 bolts **(1)** and two M12 nuts and lock washers **(2)** that attach the clutch housing to the center casing.
2. With the clutch housing adequately supported, slide the clutch housing away from the center casing.

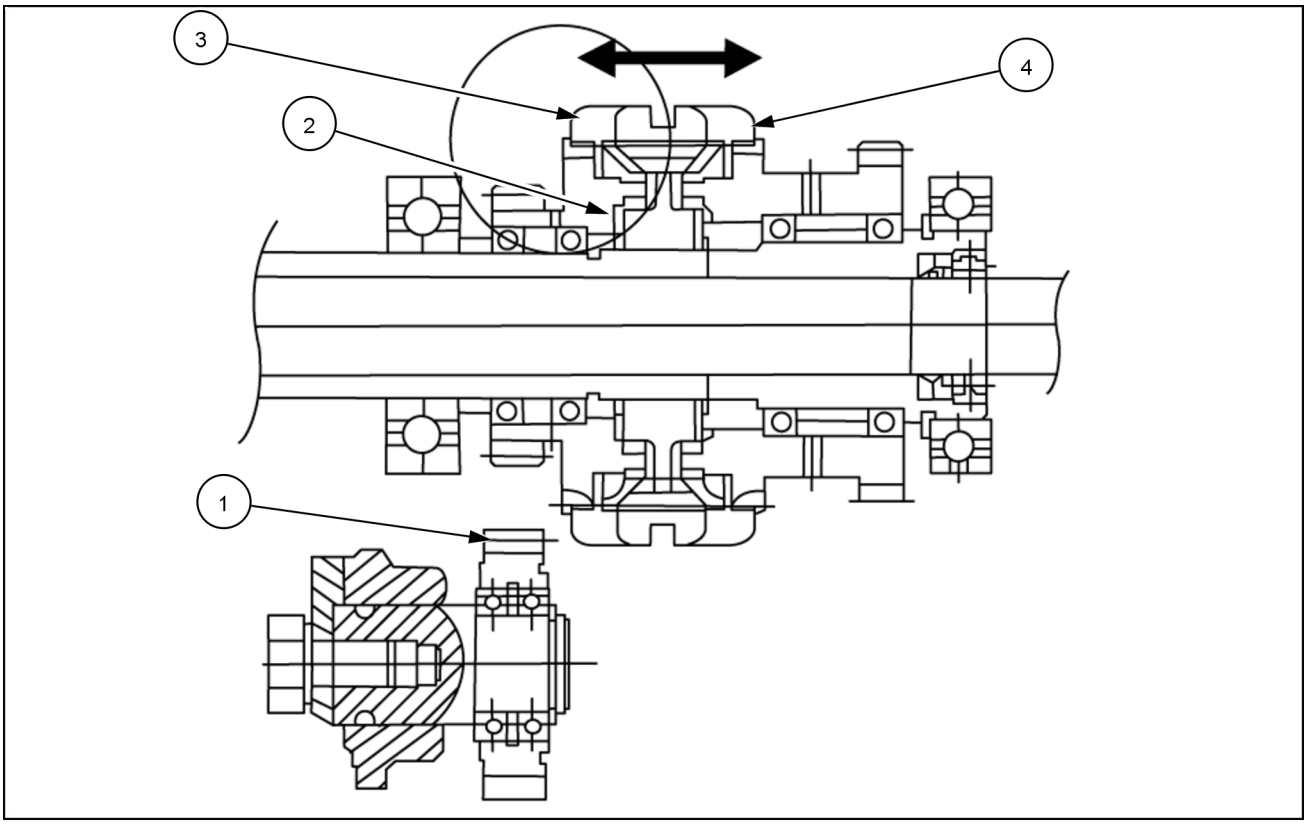


93102297 5

NOTICE: *When the clutch housing is separated from the center casing, the forward/reverse drive shaft bearing may remain in the clutch housing.*

Gears, shaft, and bearings - Check gap at synchronizer

Boomer™ 40	NA
Boomer™ 50	NA



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Forward and reverse transmission illustration

(1) Reverse idler gear
(2) Gap of the synchronizer
(3) Reverse
(4) Forward

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Powered front axle - Exploded view mount components

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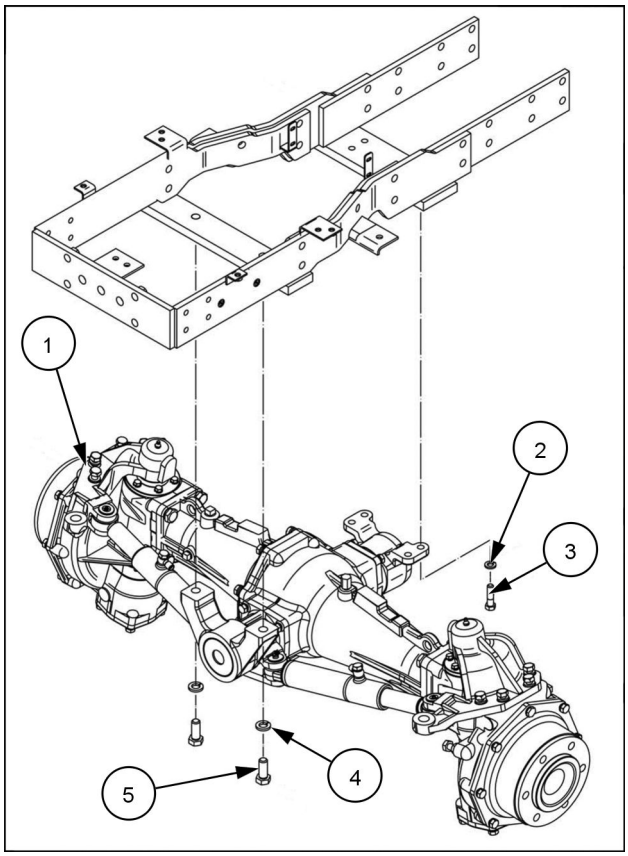
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS



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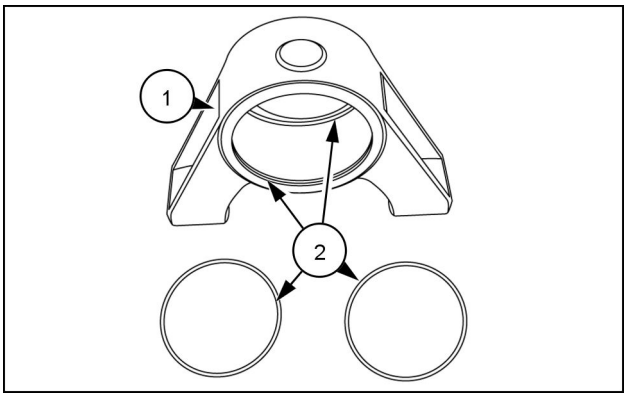
Front axle mount components

(1) Front axle assembly **(2)** Lock washer **(3)** Bolt, M12 x 45 **(4)** Lock washer **(5)** Bolt, M16 x 40

8. Each pivot has two O - rings, one in the groove, and one on the ledge, inspect prior to assembly.
9. Front pivot **(1)**.
10. O- ring position **(2)**.



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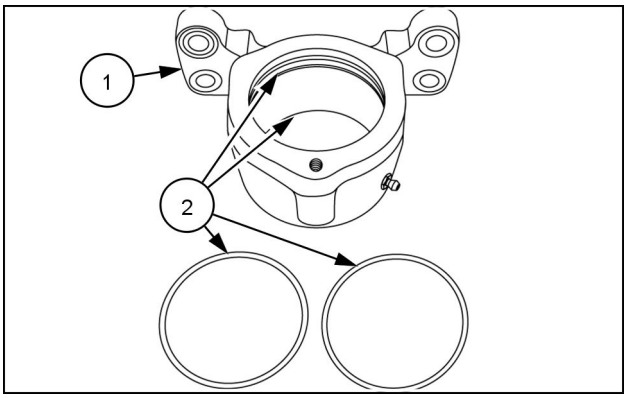
11. Rear pivot **(1)**.
12. O - ring position **(2)**.



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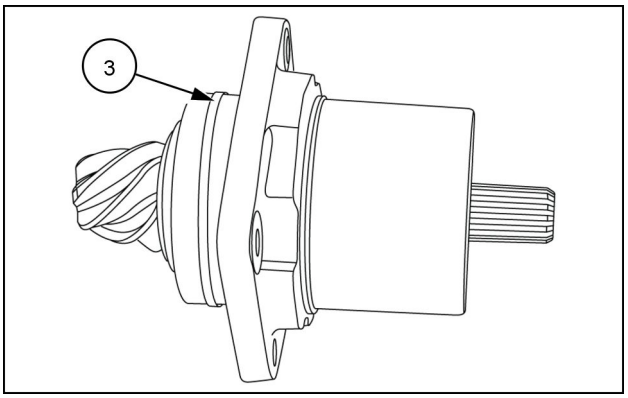
3. Inspect O-ring **(3)** and replace if necessary.



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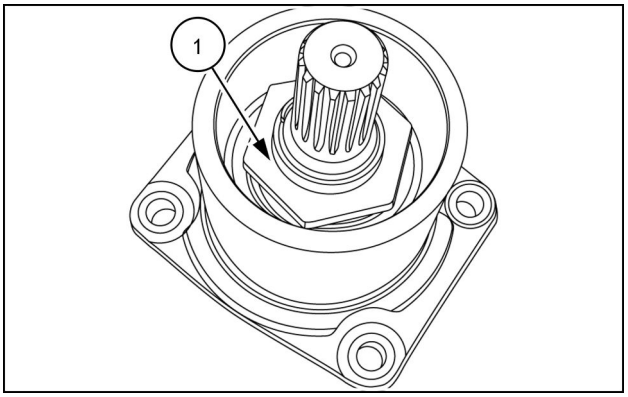
4. Use tool **380003173** and remove the nut **(4)**.



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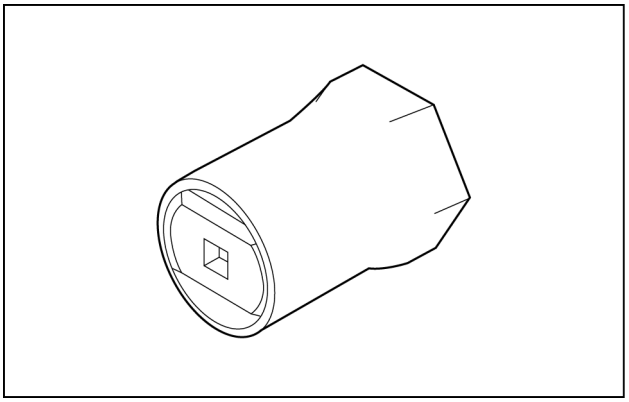

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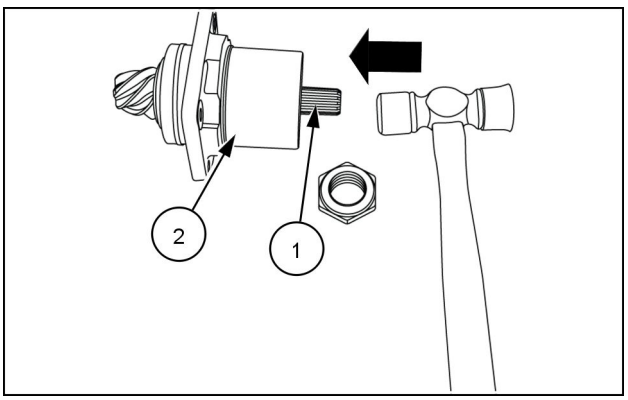
NOTE: *Note special tool 380003173 is a 46mm deep socket. A deep socket is needed to clear the pinion shaft when removing the pinion shaft retaining nut.*

5. With a plastic hammer drive the pinion shaft **(1)** through the pinion housing **(2)**.



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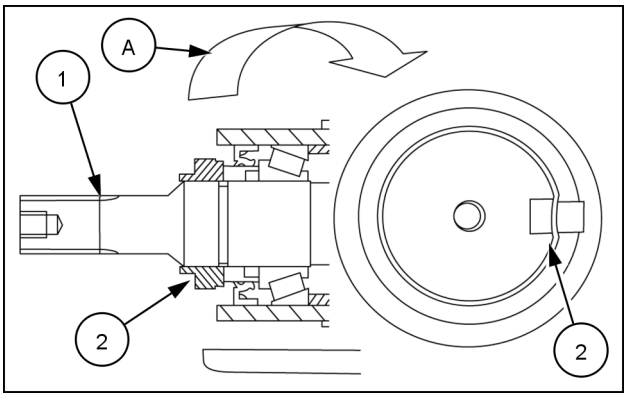
Differential - Check

Boomer™ 40	NA
Boomer™ 50	NA

Pinion shaft rotational torque

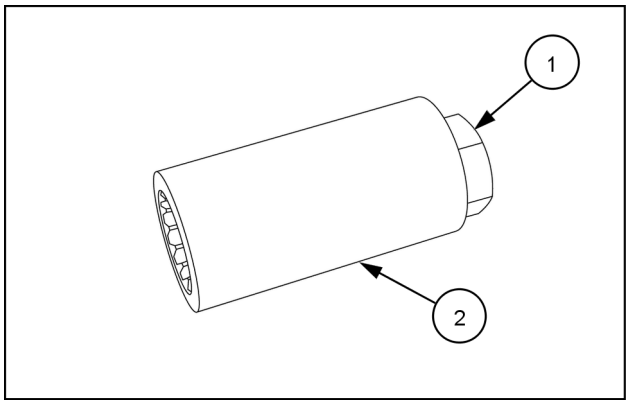
1. Install fabricated tool onto splines of pinion shaft to measure rotation torque with an inch/pound torque wrench.
2. Check the rotational torque by rotating the pinion shaft **(1)** in a clockwise direction **(A)**.
3. Tighten the locknut **(2)** until the rotating torque of the pinion shaft is **0.981 - 1.57 N·m** (**9 - 14 lb in**).
4. When the rotating torque specifications are achieved, peen the lock nut **(2)** in place.



93105747 1

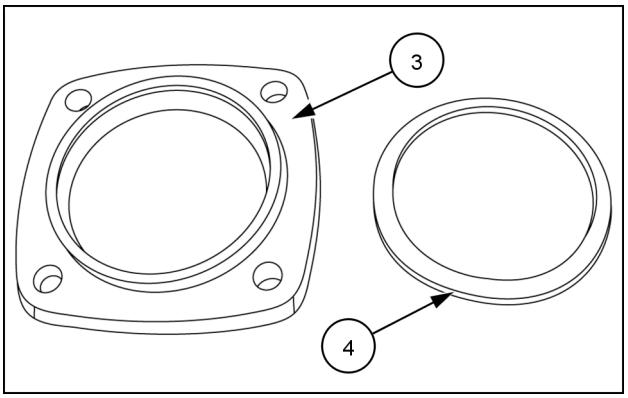
Fabrication of rotational torque tool

1. Weld a 1/2 inch hex nut or bolt **(1)** to a splined coupler MT40013044 **(2)**.



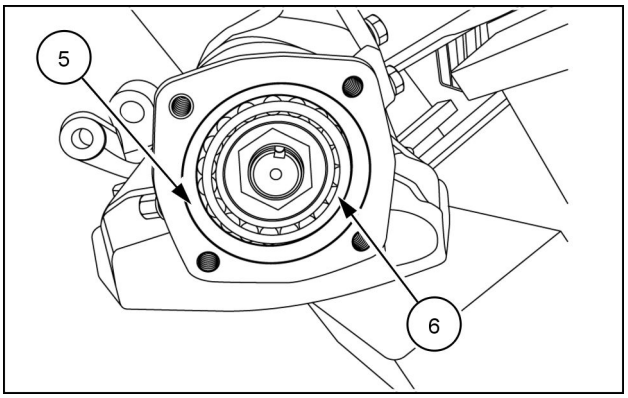
NHIL14CT00613AA 2

3. Remove plate **(3)** and shim **(4)**.



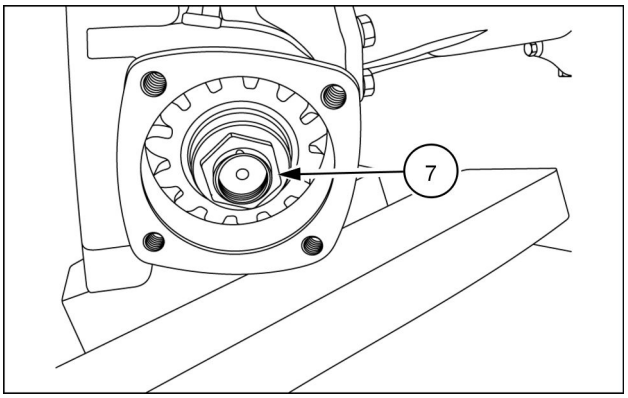
93112137 3

4. Remove the taper bearing race **(5)** and taper bearing **(6)** from bottom end of king pin housing.



93112138 4

5. Unpeen and remove the lock nut **(7)**.

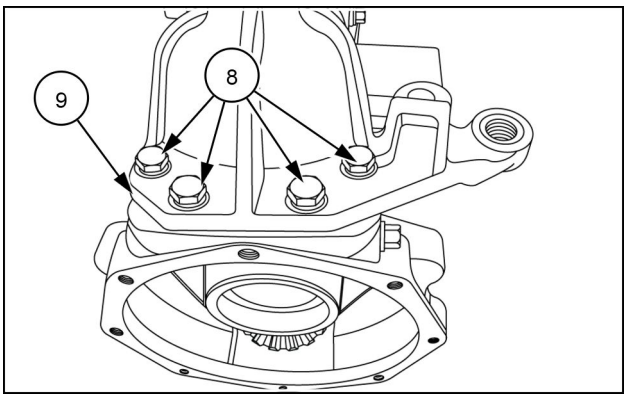


93112141 5

6. Use a suitable hoist or jack to support the king pin housing.

NOTICE: *Be aware of a sudden drop of a heavy component in the next step.*

7. Remove four bolts **(8)** at the top of steering arm housing **(9)**.



93112142 6

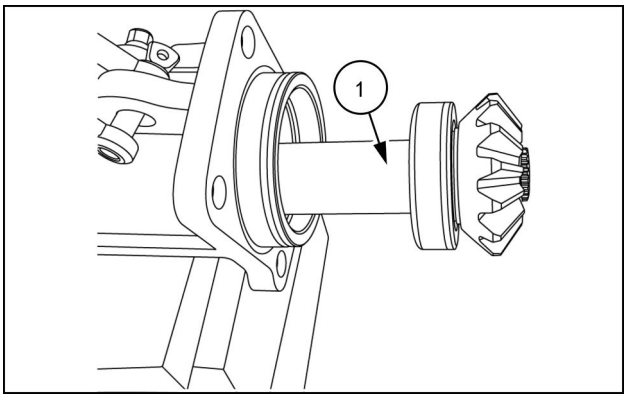
Axle shaft - Remove

Boomer™ 40	NA
Boomer™ 50	NA

Right-hand and left-hand side differential shaft removal

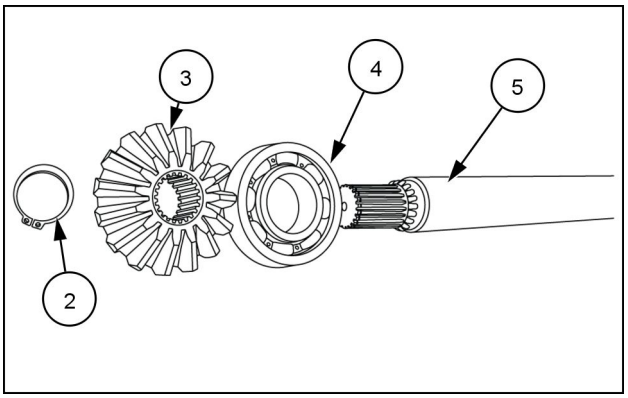
1. Remove the differential shaft assembly **(1)** from the axle shaft housing.

NOTE: *The right and left side shaft measurements are* ***406.4 mm*** *(****16 in****) in length by* ***40 mm*** *(****2 in****) thick.*



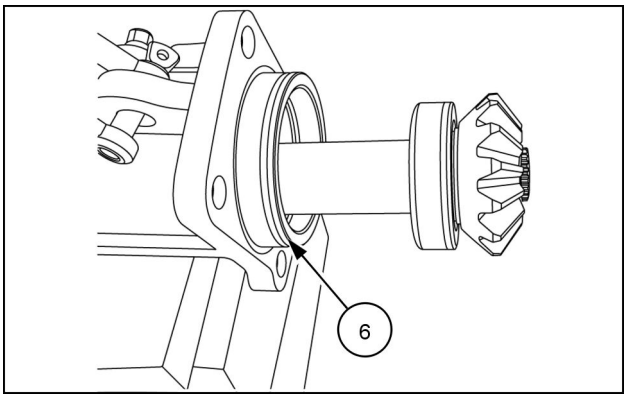
93112163 1

2. Remove the snap ring **(2)**, bevel gear **(3)**, and bearing **(4)** from the axle shaft **(5)**.



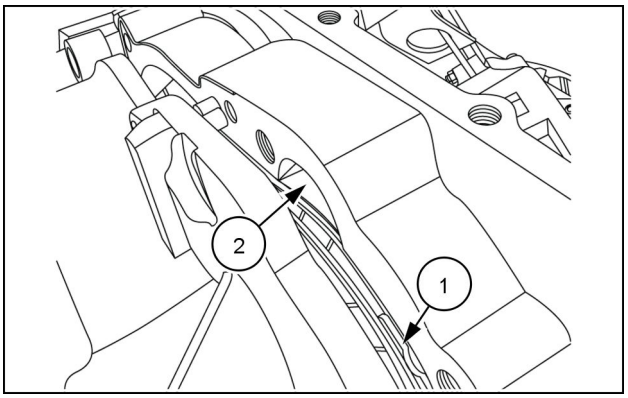
93112164 2

3. Inspect the O-ring **(6)** on the axle shaft housing.



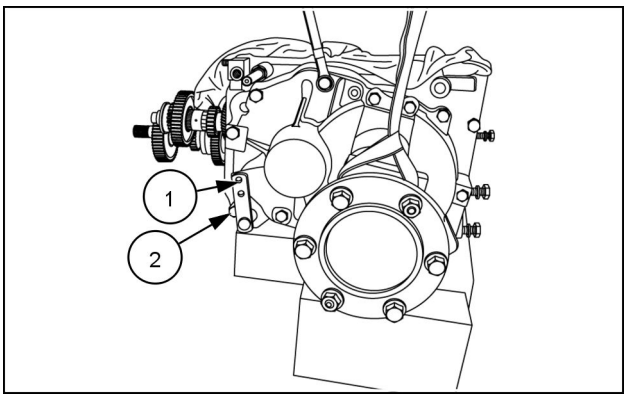
93112163 3

5. Ensure the tabs on the intermediate discs **(1)** align with the notches on the axle casing **(2)**.



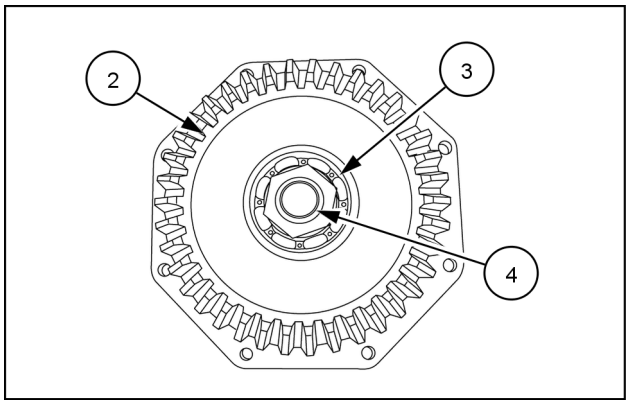
93109724 3

6. Slowly rock the final drive assembly up and down, side to side, while keeping the tabs and notches aligned.
7. Install the eight **M14 x 40 mm** bolts and two **M14 mm** nuts. Torque these fasteners to **147 - 167 N·m** (**108 - 123 lb ft**)
8. Install the brake lever in a vertical position **(1)**.
9. Secure with a **M10 x 20 mm** bolt and lock washer, **(2)** torque to **49 - 53.9 N·m** (**36 - 40 lb ft**).



93109718 4

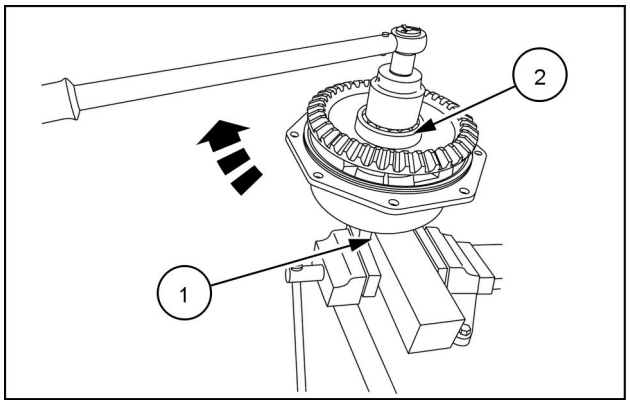
10. Install the gear **(2)**.
11. Install the inner bearing **(3)**.
12. Install a new lock nut **(4)**.



NHIL14CT00363AA 8

Torquing the lock nut

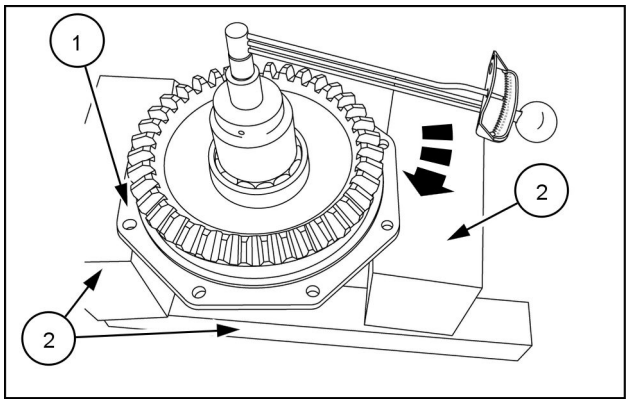
13. Lock the axle shaft **(1)** hub in a vice to prevent the axle shaft from turning..
14. Torque the lock nut **(2)** to approximately **81 N·m** (**60 lb ft**).



NHIL14CT00402AA 9

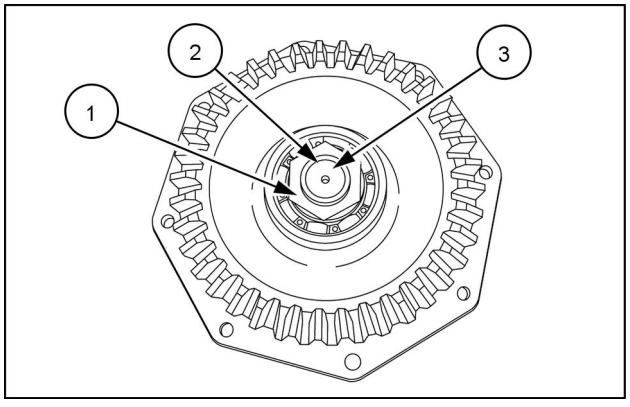
NOTICE: *Do not over torque the lock nut. Start with a low torque value and work up. Check the rolling torque value frequently.*

15. Support the cover assembly **(1)** on blocks **(2)** to check for the rolling torque of the axle shaft.
16. Torque the lock nut until a rolling torque of **1 - 1.5 N·m** (**10 - 13 lb in**) is obtained.



NHIL14CT00403AA 10

17. Lock the lock nut **(1)** in place by peening the lock nut into the detent **(2)**, on shaft **(3)**.



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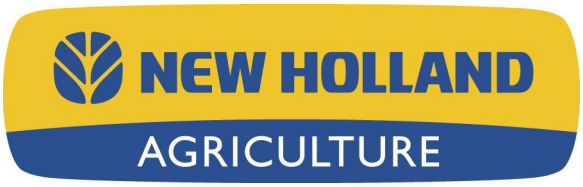

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Differential - Remove

Boomer™ 40	NA
Boomer™ 50	NA

⚠ WARNING

Heavy objects!
Lift and handle all heavy components using lifting equipment with adequate capacity. Always support units or parts with suitable slings or hooks. Make sure the work area is clear of all bystanders.
Failure to comply could result in death or serious injury.

W0398A

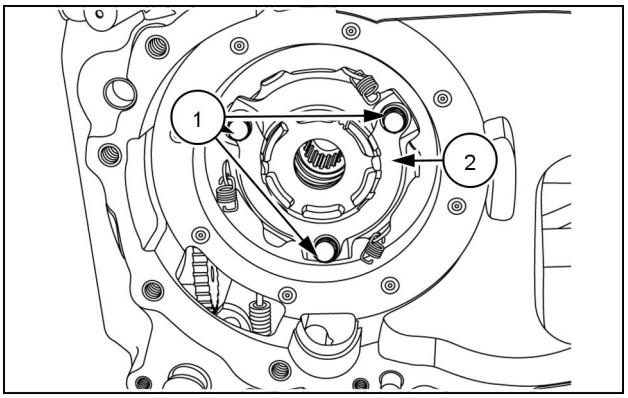
⚠ WARNING

Avoid injury!
Handle all parts carefully. Do not place your hands or fingers between parts. Use Personal Protective Equipment (PPE) as indicated in this manual, including protective goggles, gloves, and safety footwear.
Failure to comply could result in death or serious injury.

W0208A

Prior operation:
Differential lock - Remove (27.106)
Prior operation:
Mechanical service brakes - Remove (33.120)

1. Remove three bolts M10 x 30 **(1)** and lock devices **(2)** from both left and right sides.



93109742 1

Differential - Backlash

Boomer™ 40	NA
Boomer™ 50	NA

⚠ WARNING

Avoid injury!
Handle all parts carefully. Do not place your hands or fingers between parts. Use Personal Protective Equipment (PPE) as indicated in this manual, including protective goggles, gloves, and safety footwear.
Failure to comply could result in death or serious injury.

W0208A

⚠ WARNING

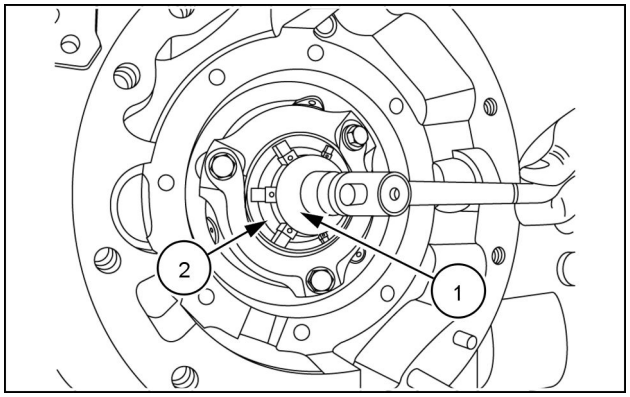
Heavy objects!
Lift and handle all heavy components using lifting equipment with adequate capacity. Always support units or parts with suitable slings or hooks. Make sure the work area is clear of all bystanders.
Failure to comply could result in death or serious injury.

W0398A

Prior operation:
Differential - Install (27.106)

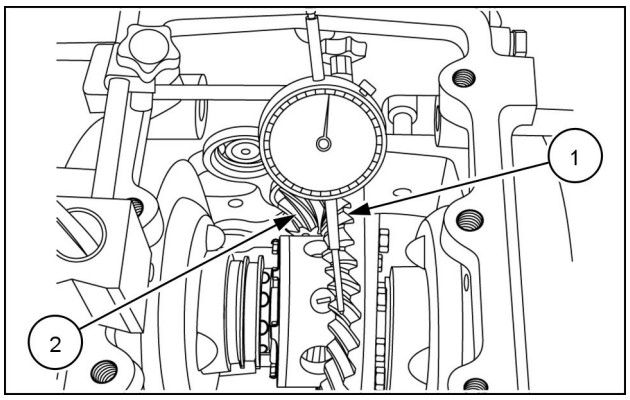
Backlash adjustment

1. Use the special tool **380003014 (1)** at the adjustment screw **(2)**.



93102520 1

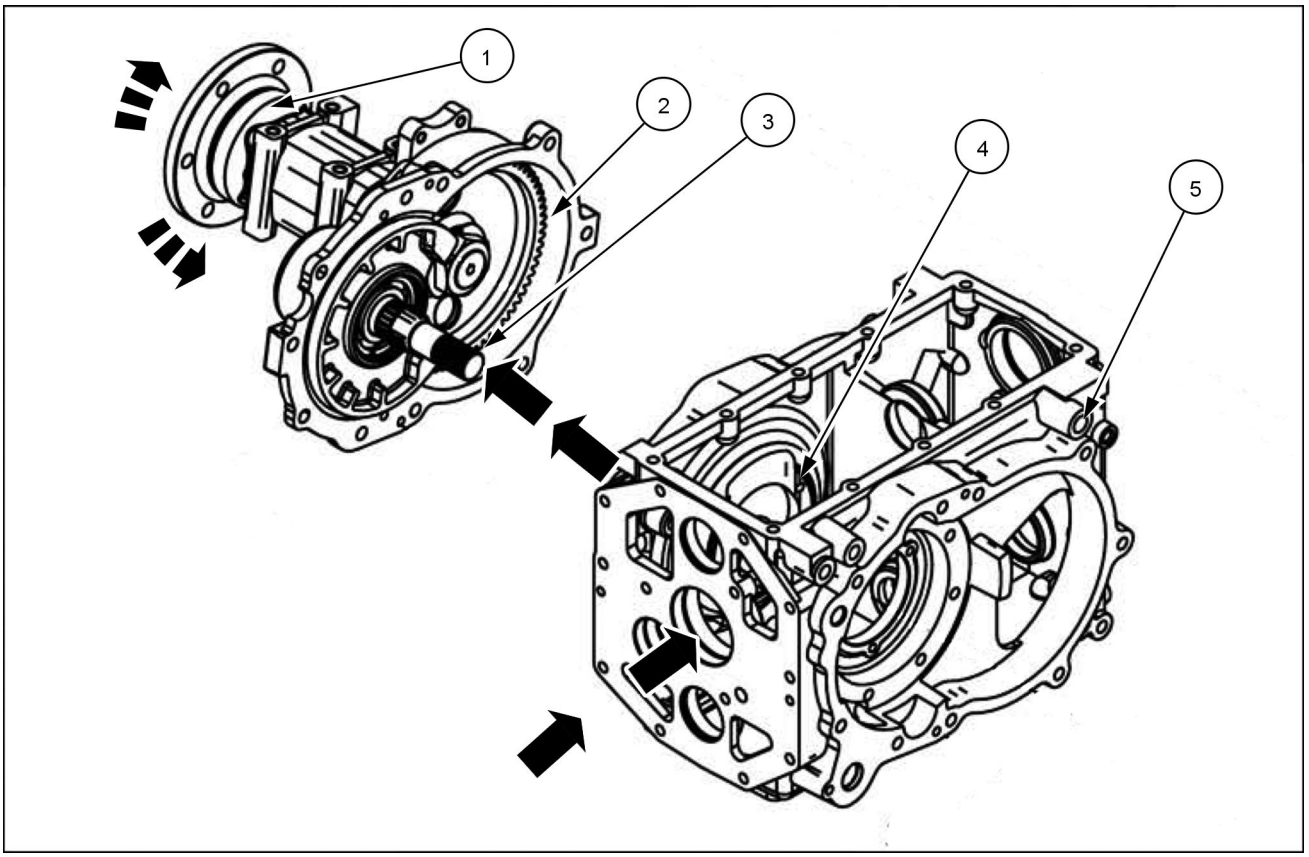
2. Allow the ring gear **(1)** and pinion **(2)** to touch lightly by hand tightening the adjustment screw.(Refer to figure **1**, call out **(2)**, adjustment screw.)



93102521 2

Final drive housing - Dynamic description

Boomer™ 40	NA
Boomer™ 50	NA

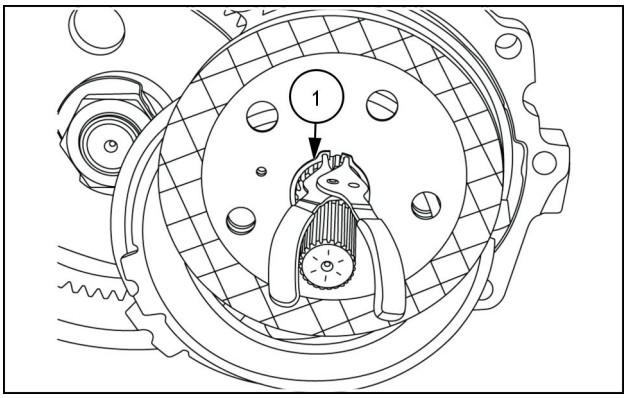


NHIL14CT00409FA 1

Power flow to the final drive

Power from the engine is distributed to the rear wheels through the transmission casing **(5)** to the rear differential **(4)**. From there, power goes to the intermediate shaft **(3)**, of the left or right final drive, then to the planetary gear **(2)** and finally to the rear axle shaft **(1)** where it turns the wheels in the forward or reverse direction.

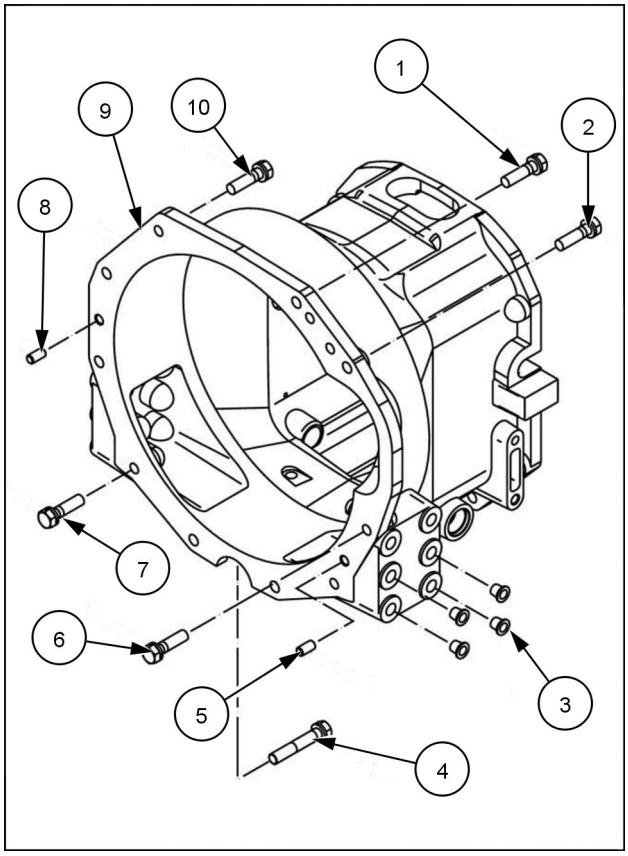
8. Install the snap ring **(1)**.



93109728 8

Transmission and steering hand control - Sectional view HST housing

Boomer™ 40	NA
Boomer™ 50	NA



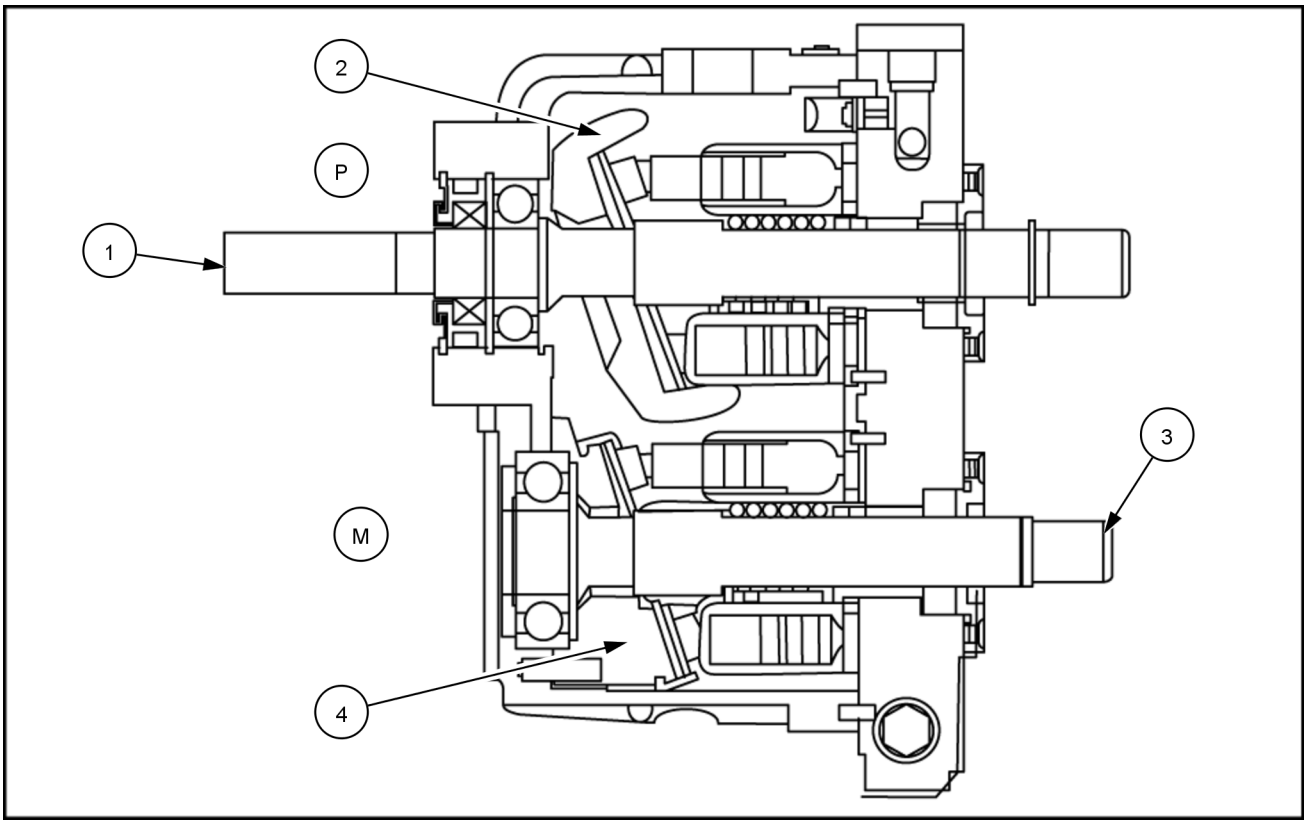
NHIL14CT00400BA 1

HST housing

(1) Hex bolt, M12 x 45
(2) Hex bolt, M12 x 45
(3) Rubber plug
(4) Hex bolt, M12 x 70
(5) Pin
(6) Hex bolt, M12 x 45
(7) Hex bolt, M12 x 45
(8) Pin
(9) HST housing
(10) Hex bolt, M12 x 45

Hydrostatic transmission - Dynamic description

Boomer™ 40	NA
Boomer™ 50	NA



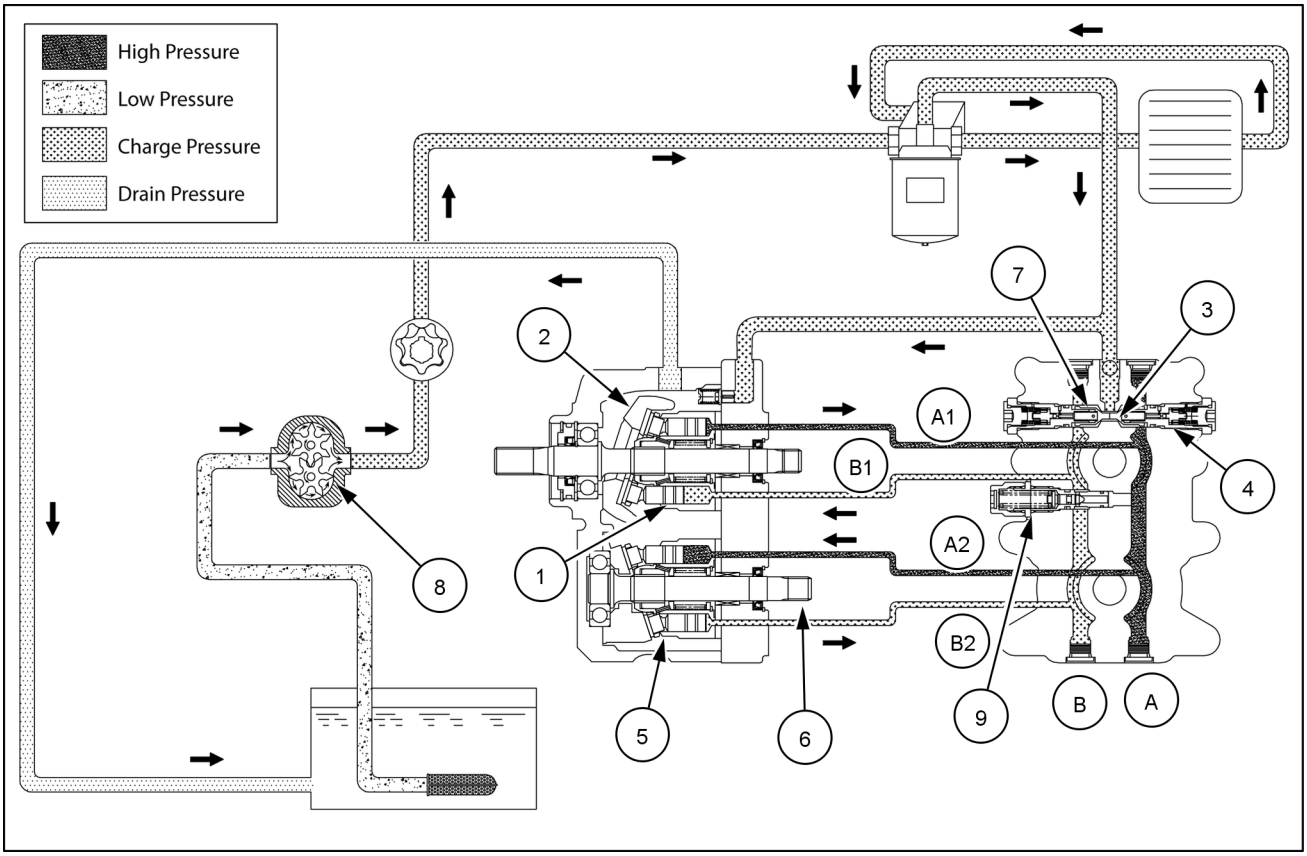
93102282 1

(P) Pump, (M) Motor.

The flywheel damper plate directly drives input shaft **(1)**. Movable cam plate **(2)** pivots on input shaft, is connected to the F/R pedal, and driven by pedal movement.

The direction of hydraulic oil flow is determined by the movable cam plate. Oil drives output shaft **(3)** by inflow to fixed cam plate **(4)** in the lower section.

Oil flow - forward



NHCT14CT00328FA 2

When the hydrostatic piston pump **(1)** is rotating and the forward HST pedal is depressed, the pump cam-plate **(2)** moves from the neutral position. When the cam plate moves from the neutral position, oil flows from the piston pump through passage “A”. Pump pressure on the back side of feed valve **(3)** closes the feed valve and pressure increases in passage “A1”. Pressure increases until **3440 - 3720 kPa** (**499 - 540 psi**) of pressure closes the neutral valve **(4)** and all the fluid from passage “A1” flows to the hydrostatic motor **(5)**, through passage “A2” causing the motor shaft **(6)** to rotate and move the tractor forward. When the forward pedal is depressed further, the increased oil flow rotates the motor shaft faster, increasing the tractor wheel speed.

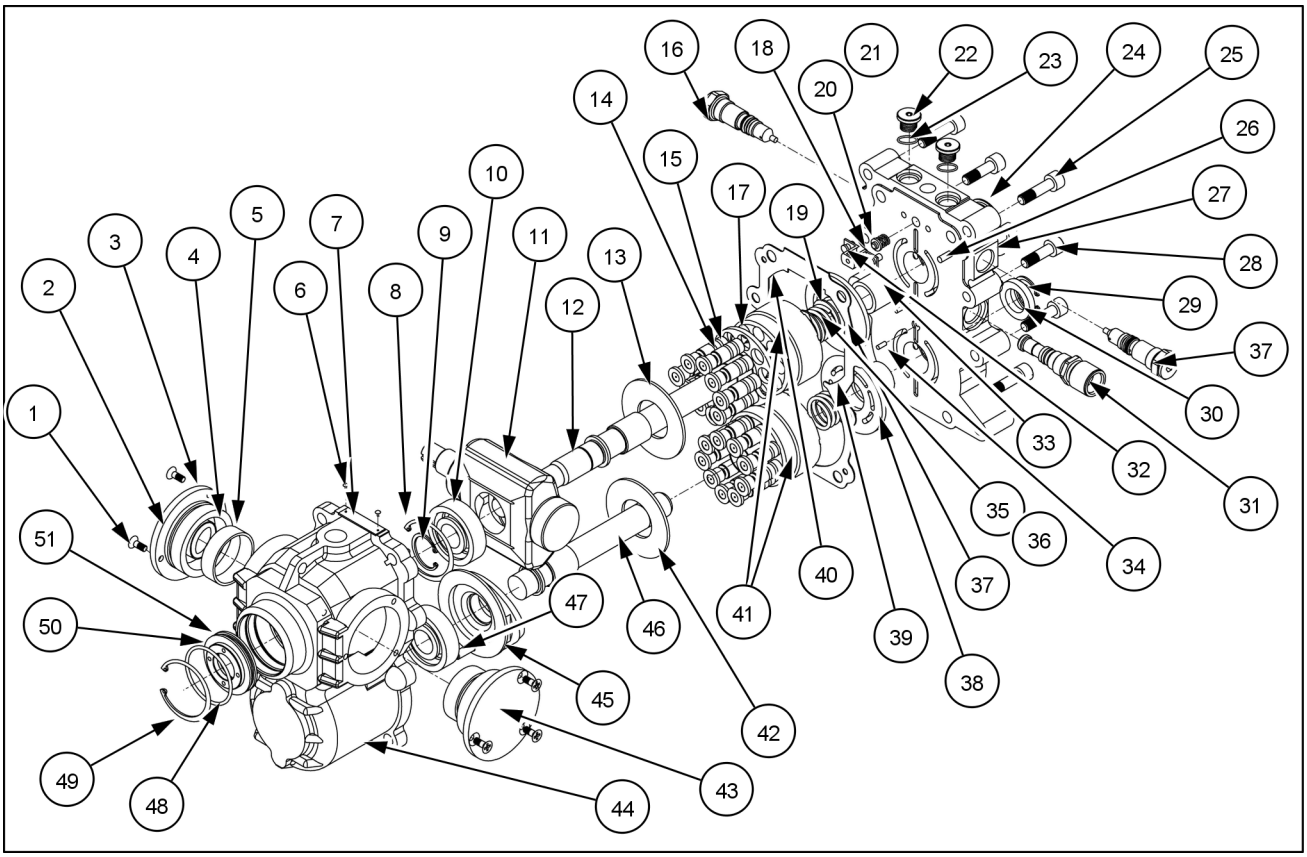
Fluid discharged from the hydrostatic motor at “B2” into passage “B” flows back to the hydrostatic pump through passage “B1” to complete the HST closed loop circuit.

When fluid leakage in the system causes a drop in pressure in passage “B1” below **490 kPa** (**71 psi**) the feed valve **(7)** opens. The power steering pump **(8)**, provides make-up fluid to replenish the oil in the low pressure side of the closed loop circuit.

The high pressure relief valve **(9)** protects the HST system. The relief valve opens when the HST operating pressure is above **34322 kPa** (**4978 psi**)

Hydrostatic transmission - Exploded view

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS



NHIL12CT01090FA 1

HST Components

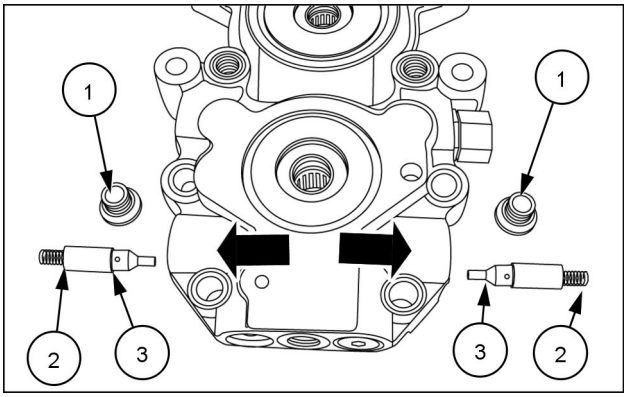
HST Components

(1) Screw, machine
(2) O - ring
(3) Cover (A)
(4) Oil seal
(5) Bearing
(6) Rivet
(7) Plate, name
(8) Snap ring
(9) Snap ring
(10) Bearing
(11) Swash plate
(12) Pump shaft
(13) Thrust plate
(14) Piston assembly
(15) Retainer plate
(16) Neutral valve assembly
(17) Set plate
(18) Spring holder
(19) Spring
(20) Check
(21) Spring
(22) Plug
(23) O - ring
(24) Snap ring
(25) Bolt, allen
(26) Pin
(27) Port block
(28) Bolt, allen
(29) Snap ring
(30) Oil seal
(31) Relief valve assembly
(32) Bolt, allen
(33) Bearing
(34) Pin
(35) Spring seat
(36) Snap ring
(37) Neutral valve assembly
(38) Spring seat
(39) Valve plate (motor)
(40) Gasket
(41) Valve plate (pump)
(42) Cylinder block
(43) Thrust plate
(44) Cover (B)
(45) Body
(46) Motor shaft
(47) Swash plate (motor)
(48) Pin
(49) O - ring
(50) Seal
(51) Oil seal

Port block neutral and feed valve removal

NOTE: *Two sets of neutral valves are utilized in the hydrostatic transmission unit. One set functions for forward travel and the other for reverse travel. The neutral valves operate (close off flow) at* ***3440 - 3720 kPa*** *(****499 - 540 psi****).*

1. Remove the hex socket head plugs **(1)** on each side of the port block with a 5/16 inch hex wrench.
2. Remove the spring **(2)** and poppet **(3)**.



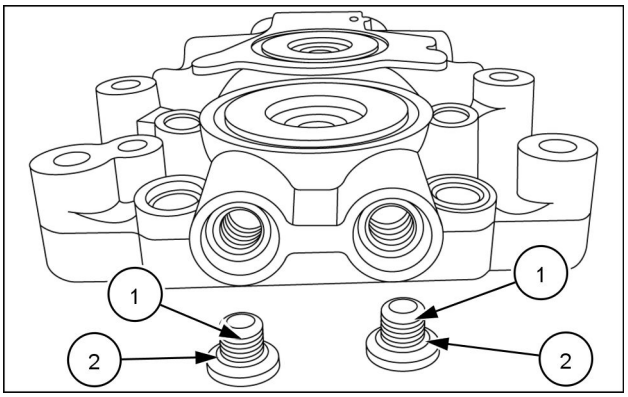
93109696 22

Neutral and feed valve inspection

1. Inspect the spring for distortion, and the poppet for sticking or binding condition. Check O-rings on the plugs.
2. If the feed valve poppet or spring indicates signs of damage, replace the feed valve as an assembly.

Pressure port removal

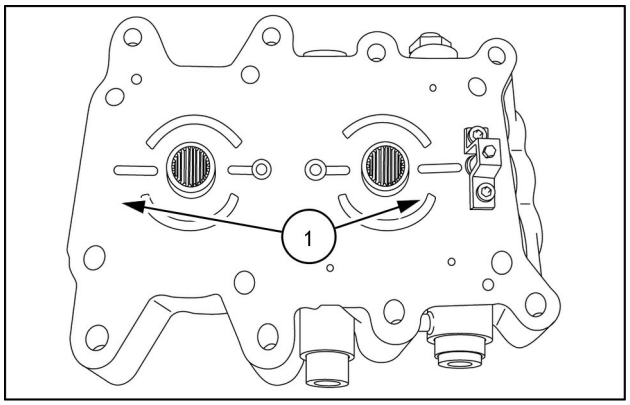
1. Use a **6 mm** hex wrench to remove pressure port plugs **(1)**
2. Check O-rings **(2)**, replace if necessary.



93109697 23

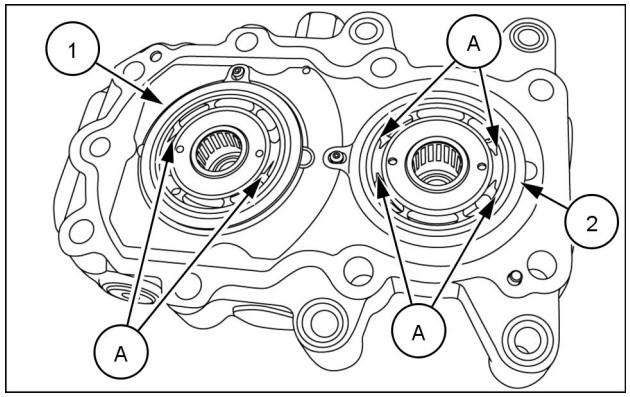
Next operation:
Hydrostatic transmission - Assemble HST unit (29.202)

5. Apply petroleum jelly to the port block face **(1)**, to hold the valve plates in place.



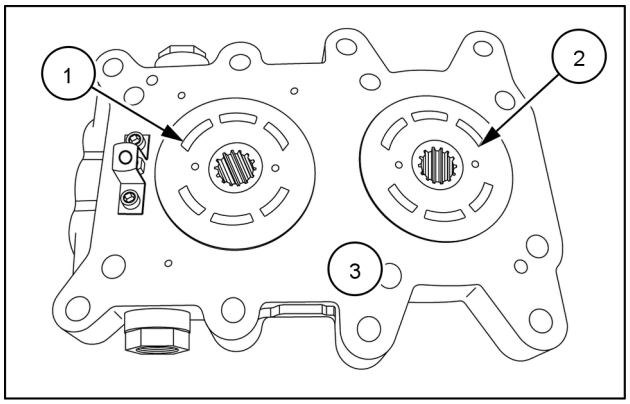
NHIL12CT01073AA 32

NOTE: *Place the "V" groove notch **(A)** of both plates towards the rotating groups , pump side **(1)** and motor side **(2)**. The brass colored side is to face up.*



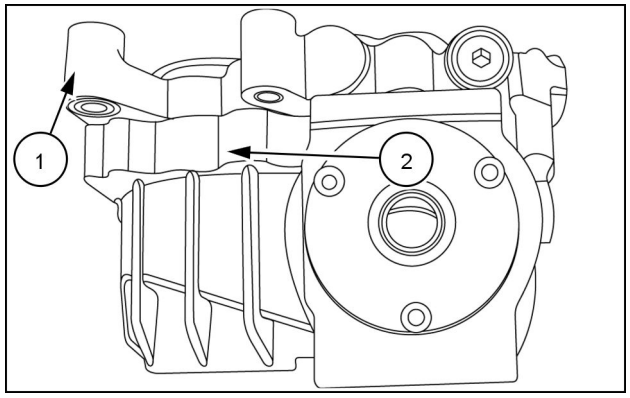
93109689 33

6. Install valve plates **(1)** and **(2)** on the port block **(3)**.



NHIL12CT01074AA 34

7. Place the port block **(1)** onto the pump and motor housing, **(2)** aligning the guide pins.



93104591 35

Hydrostatic transmission - Check - neutral adjustment

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS

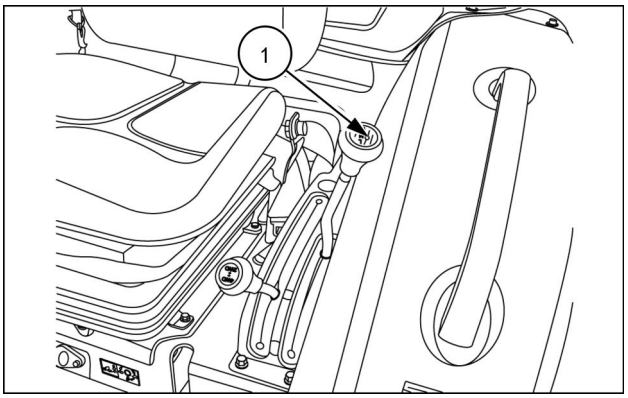
⚠ WARNING

Jack stands can slip or fall over. Dropping, tipping, or slipping of machine or its components is possible.
DO NOT work under a vehicle supported by jack stands only. Park machine on a level surface. Block wheels. Support machine with safety stands.
Failure to comply could result in death or serious injury.

W0069A

Neutral position

1. Start the engine and place range selector lever **(1)** in the " low " position.
2. Place the hand throttle in full RPM position.



93099347 1

3. Operate the forward and reverse pedals.

NOTE: *The tractor should not continue to move after releasing the forward and reverse pedal.*

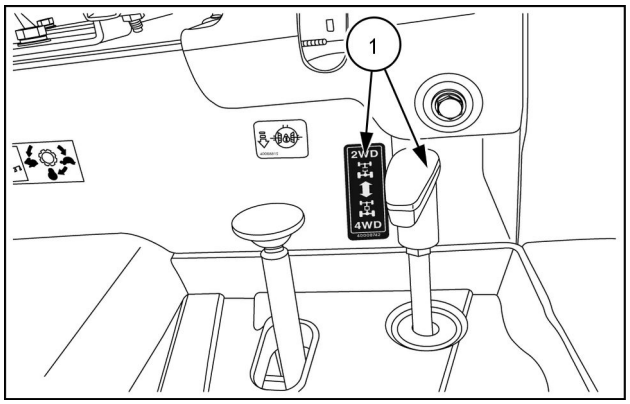
NOTICE: *If the tractor continues to move after the pedals are released, adjustment is necessary.*

Neutral adjustment

1. Park tractor on level ground, shut off engine.
2. Lift the rear of the tractor no more than two inches off the ground. Secure rear axles in lifted position with suitable jack stands.

NOTICE: *The 4WD must be disengaged.*

3. Move the 2wd / 4wd lever **(1)** into the 2wd position.



NHIL13CT01361AA 2

Hydrostatic transmission - Troubleshooting For the HST unit

Boomer™ 40	NA
Boomer™ 50	NA

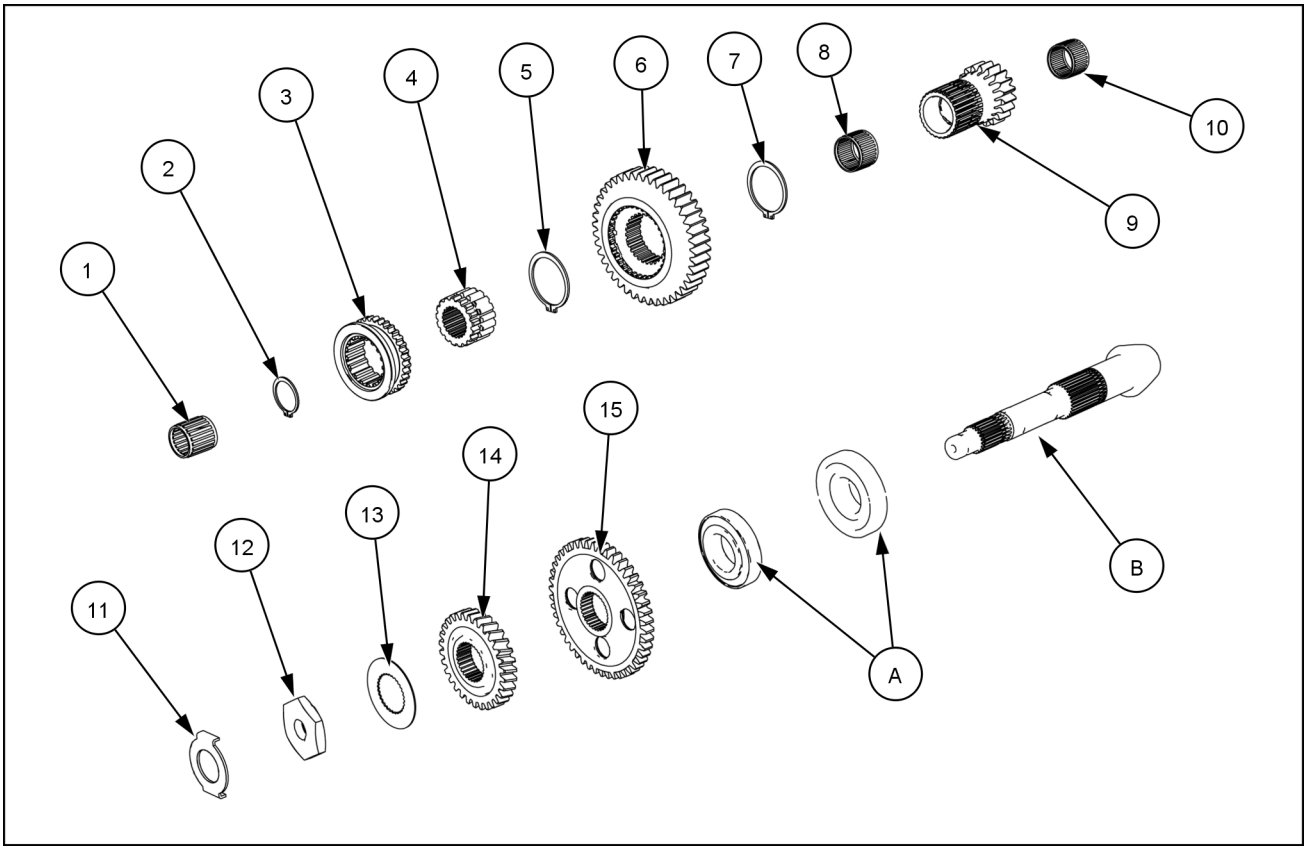
Problem	Possible Cause	Correction
HST fails to operate	Input shaft failure.	Repair or replace as required.
	Low fluid pressure.	Fill to proper level.
HST erratic operation	Low charge pressure.	Check charge relief valve.
HST abnormal noise	Clogged suction strainer.	Clean strainer.
	Clogged HST filter.	Replace HST filter.
	Fluid viscosity high.	Replace fluid.
	Defective charge pump relief valve.	Replace relief valve.
	Defective cylinder block.	Replace cylinder block.
HST tractor fails to stop at neutral	Linkage out of adjustment.	Adjust neutral position.
	Neutral cannot be adjusted.	Replace trunion shaft joint.
	Defective neutral valve.	Replace neutral valve.
HST fluid leakage	Charge pressure too high (Above **6.6 bar** (**96 psi**).)	Check charge pressure, repair as needed.
	Return oil line restricted.	Repair as required.
HST low power	Low fluid pressure.	Replace high pressure relief valve.
	Internal fluid leakage.	Remove assembly. Overhaul HST.
	Bent spring pins in HST control linkage.	Replace spring pins.
	Worn bushings in HST control linkage.	Replace bushings.
	Timing teeth in HST linkage under lubricated.	Lubricate timing teeth.
HST is slow to return to neutral position	Binding in linkage.	Inspect, lubricate or replace linkage parts as necessary.
	Tight swash plate trunnion bearing cover.	Replace trunnion bearing covers. Check swash plate trunnion surface for rough finish, polish if needed.
HST filter O ring leakage or filter element implosion	Excessive fluid viscosity.	Replace hydraulic fluid.
	Hydraulic fluid is contaminated with water.	Replace hydraulic filter, replace HST filter.

Contents

Power Take-Off (PTO) - 31

Removal of the PTO ground drive driver gear

To remove the PTO ground drive driver gear **(15)** from the rear axle pinion shaft the clutch housing needs to be separated from the transmission center housing. See **Gears, shaft, and bearings - Disassemble - Transmission disassemble (21.140)**.



NHILCT000255FA 5

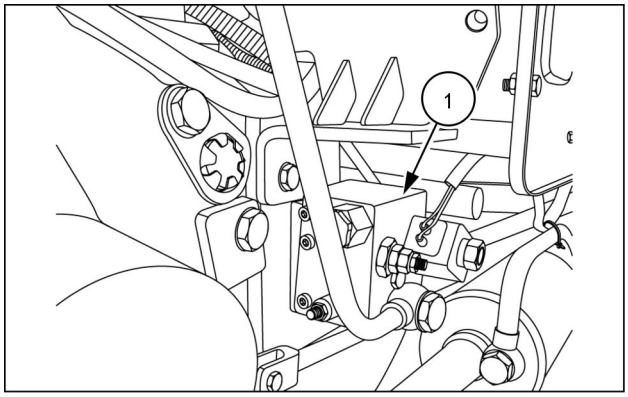
Remove the following parts from the pinion shaft

- Needle bearing **(1)**
- Snap ring **(2)**
- Sliding coupler **(3)**
- Hub **(4)**
- Snap ring **(5)**
- Gear, 42 tooth **(6)**
- Snap ring **(7)**
- Needle bearing **(8)**
- Gear, 19 tooth **(9)**
- Needle bearing **(10)**
- Lock washer **(11)**
- Lock nut **(12)**
- Thrust washer **(13)**
- Gear, 30 tooth **(14)**
- PTO ground drive driver gear, 46 tooth **(15)**

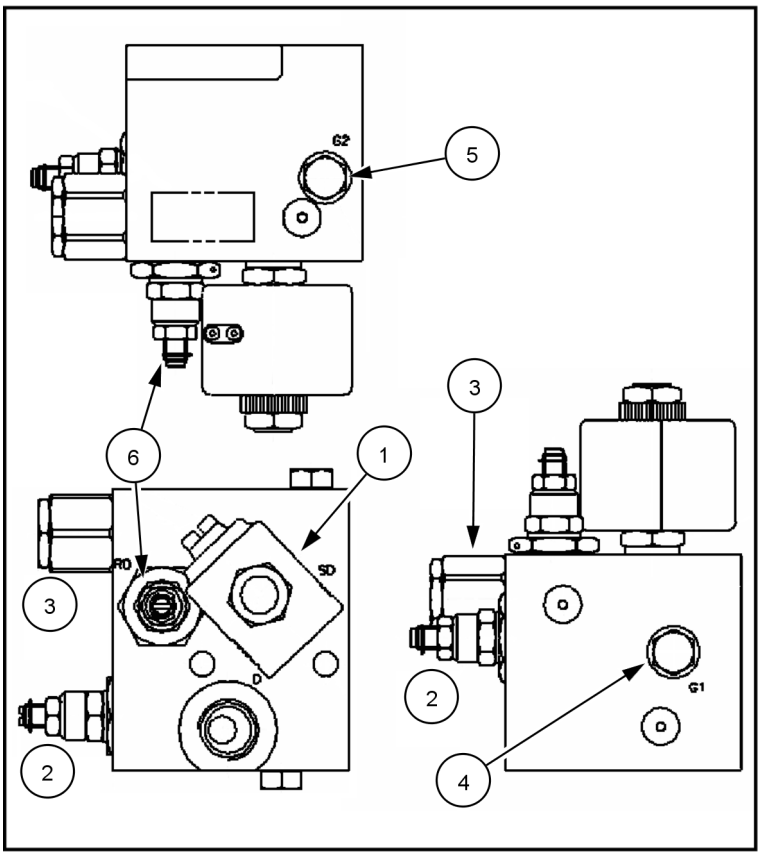
NOTE: *Tapered bearings **(A)** are installed on pinion shaft **(B)** removal of bearings is not needed.*

Power Take-Off (PTO) valve (Hydrostatic Transmission (HST) tractor)

The PTO control valve **(1)** is located on right side of the transmission case on tractors with the HST transmission.



76110412 3



76110411 4

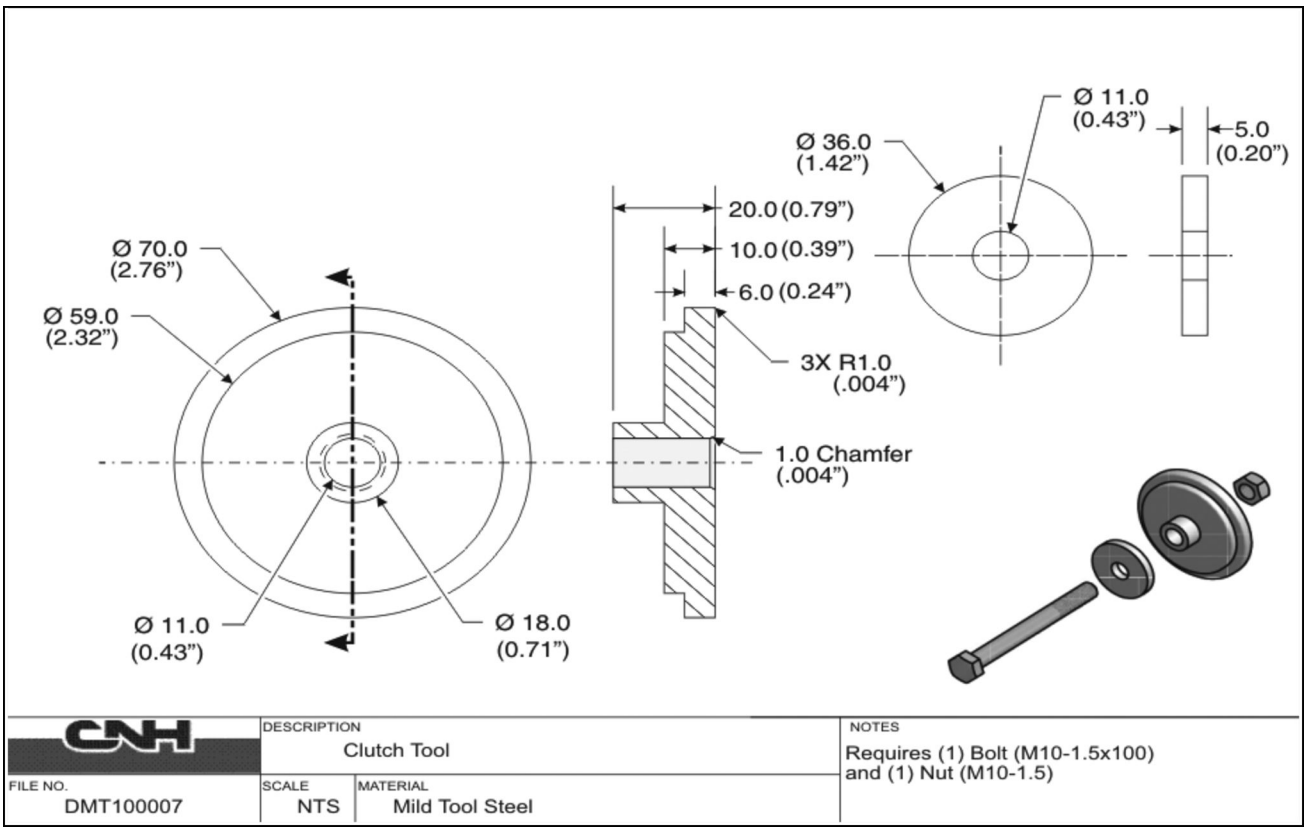
1. Solenoid Valve
2. Sequence Valve
3. Modulation Valve
4. G1 port
5. G2 port
6. Reducing Valve

Contents

Power Take-Off (PTO) - 31

Two-speed rear Power Take-Off (PTO) - 114

(*) See content for specific models



DMT100007 8

Special Tools

Dealer Made Tool **DMT100007** ; PTO Clutch Tool

Next operation:
One-speed rear Power Take-Off (PTO) - Assemble (31.114)

Power Take-Off (PTO) clutch - Troubleshooting - Rear PTO and Mid PTO do not operate

Boomer™ 40	NA
Boomer™ 50	NA

⚠ WARNING

Hazard to bystanders!
Before using the external Power Take Off (PTO) switches, make sure no persons or objects are in the area of the implement or three-point linkage.
Failure to comply could result in death or serious injury.

W0060A

NOTE: *Check items before troubleshooting*

(1) System hydraulics operating normally.
(2) Parking brake ON.
(3) Mid PTO switch OFF.
(3) No implements attached to rear PTO or Mid PTO.

Test N°1	
Test Point	**Check** Turn the key switch ON. Do lights illuminate in the instrument panel?
Expected Result	**Result** Yes **Action** Go to test **2**
Other Result (Possible Cause)	**Result** No **Action** Inspect key switch, wiring and instrument panel

Test N°2	
Test Point	**Condition** Push and turn PTO switch to ON position. Does PTO indicator illuminate in the instrument panel?
Expected Result	**Result** Yes **Action** Go to test **3**
Other Result (Possible Cause)	**Result** No **Action** Repair or replace PTO switch

Test N°3	
Test Point	**Check** Turn PTO switch OFF. Disconnect PTO Solenoid connector and check for 12V DC from the tractor's wire harness when the PTO switch is ON and 0V DC when the PTO switch is OFF.
Expected Result	**Result** Yes **Action** Go to test **4**
Other Result (Possible Cause)	**Result** No **Action** Check for continuity between the wiring harnesses.

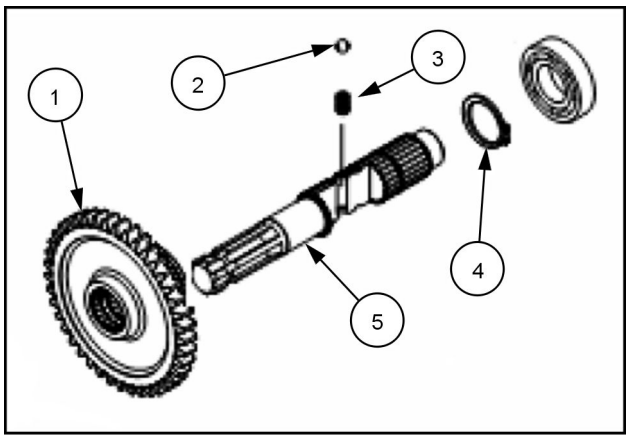
Test N°4	
Test Point	**Check** Perform pressure test on PTO control valve. With the hydraulic system not in use the pressure at G1 should be approximately **1565 kPa** (**227 psi**). When the PTO switch is ON the pressure at G2 should be approximately **1379 - 1565 kPa** (**200 - 227 psi**). Is the PTO control valve operating normally?

Central Power Take-Off (PTO) - Assemble

Boomer™ 40	NA
Boomer™ 50	NA

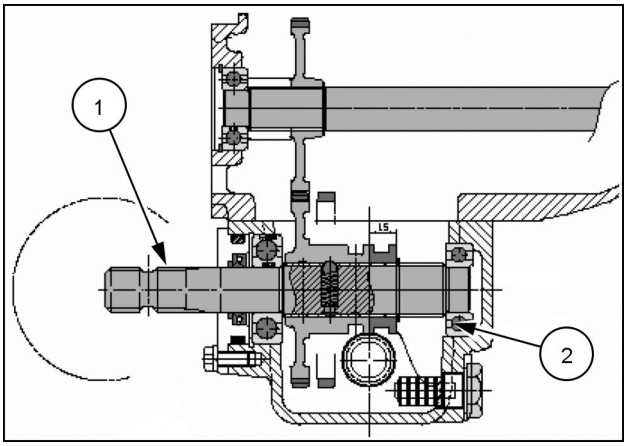
Prior operation:
Central Power Take-Off (PTO) - Assemble (31.120)

1. Insert the spring **(3)** and ball **(2)** into the middle Power Take-Off (PTO) shaft **(5)**. While holding ball in place, insert the shaft through the mid PTO driven gear **(1)** until the ball and spring are inside the gear hub.
2. Insert the snap ring **(4)** into the groove in the middle PTO shaft.



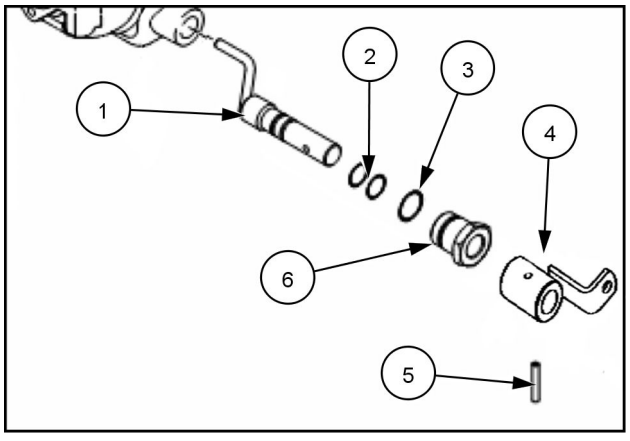
76106776 1

3. Insert the bearing **(2)** into the middle PTO housing.
4. Insert the shaft assembly **(1)** into the middle PTO housing.



76106773 2

5. Insert the middle PTO control shaft **(1)** in the middle PTO housing, aligning the control rod with the groove in the middle PTO shaft hub.
6. Install the shims **(2)**, seal **(3)**, and retainer **(6)** on the control shaft and into the middle PTO housing.
7. Install control rod assembly **(5)** and secure with spring pin **(4)**.



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Contents

Brakes and controls - 33

Parking brake or parking lock - 110

(*) See content for specific models

Contents

Brakes and controls - 33

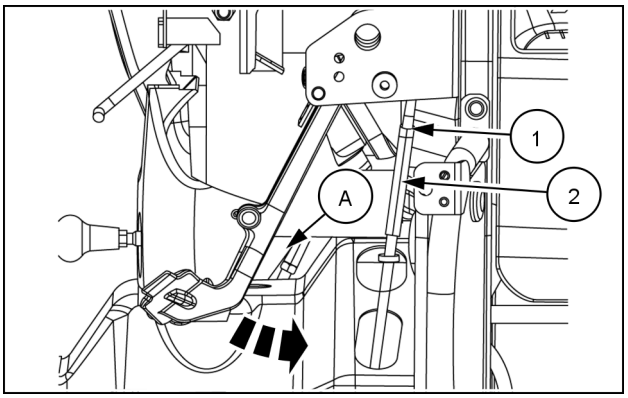
Mechanical service brakes - 120

(*) See content for specific models

Adjusting brake pedal linkage

If not within the specified value, adjust the brake pedal linkage as follows:

1. Unlock the left and right-hand pedals from each other.
2. Loosen the locknut **(1)** and rotate the left brake rod **(2)** until there is **(A) 50 - 60 mm** (**1.97 - 2.36 in**) of pedal free play. Lengthen the rod to increase free play. Shorten the rod to decrease free play. Repeat this procedure for the right brake rod.
3. Tighten lock nuts on left and right brake rods.
4. After obtaining the correct free-travel for the left and right-hand brake pedals, check the free-travel again with the pedals locked together.
5. Start the tractor and drive in a straight line. Apply the brakes and observe that the tractor stops in a straight line with no pull. If the tractor pulls to one side, readjust the right-hand pedal linkage until the brakes apply evenly.



93100863 2

Hydraulic systems - General specification

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS

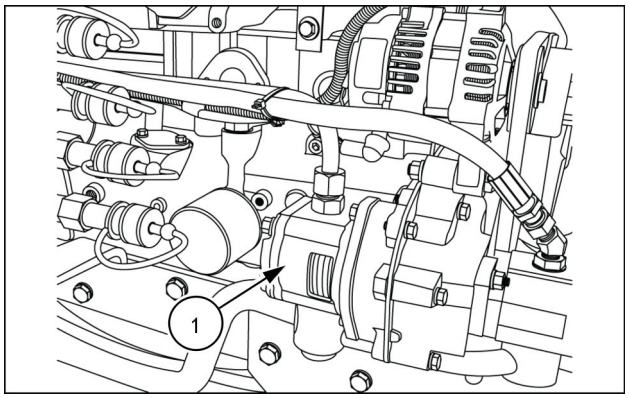
Hydraulic System Specifications

System Type	Open Center
Pump Type	Gear
Pump Capacity	**31 L** (**8.3 US gal**) @ 2600 engine rpm,
Reservoir Capacity	43.0 l (11.4 US gal) HST and Gear models
System relief valve setting	16671 kPa (2418 psi)
Safety relief valve setting	19609 kPa(2844 psi)
Maximum 3-pt hitch lift capacity at ball ends	1250 kg (2756 lb)
Lift Cylinder Diameter	80 mm (3.15 in)
Recommended Hydraulic Oil	**NEW HOLLAND AMBRA MULTI G 134™ HYDRAULIC TRANSMISSION OIL**

Pump - Static description

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS

The hydraulic pump **(1)** is a gear type pump mounted to the right front side of the engine.
The pump is serviced as an assembly.

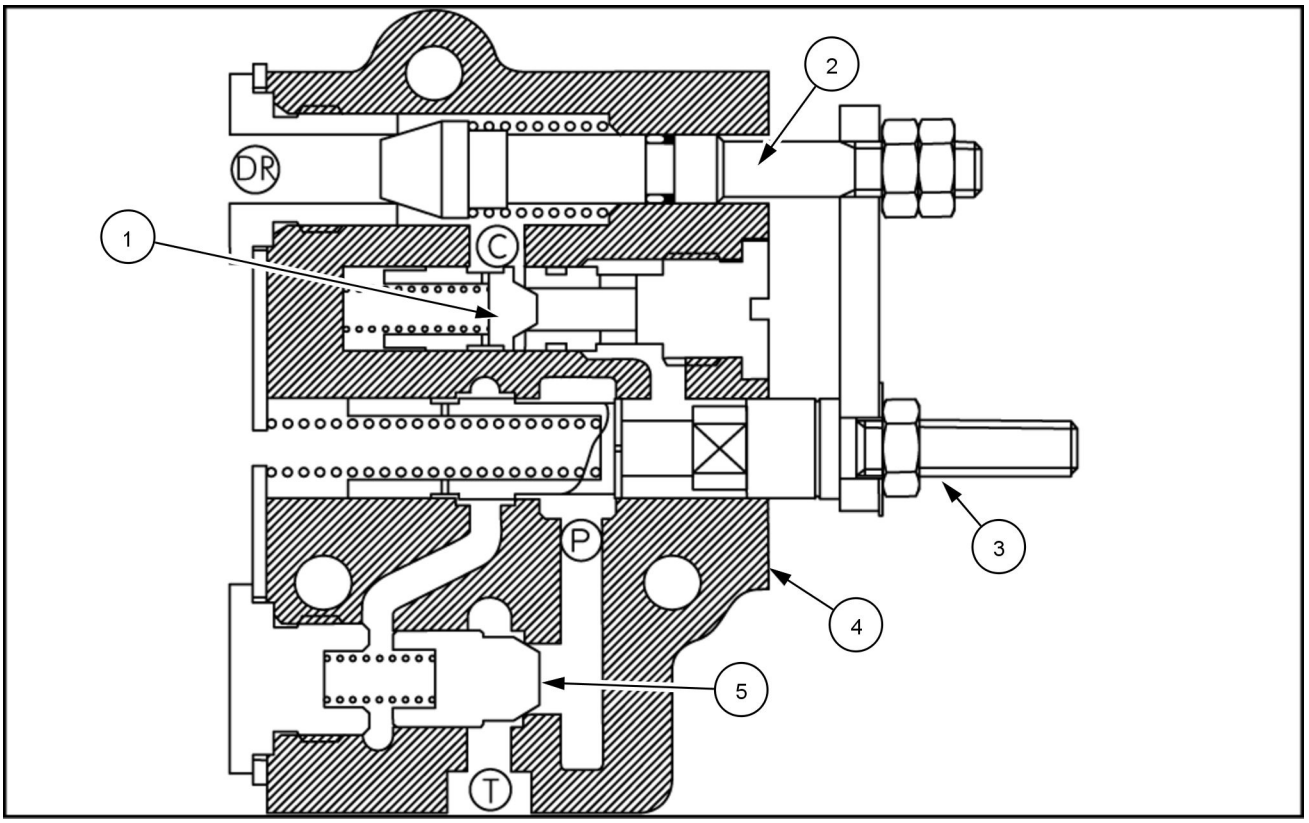


93110363 1

Tractor Model	Rated Flow
Farmall 40 B / 50 B	31.2 l/min (8.2 US gpm) at 2600 engine rpm

Hitch control valve - Detailed view

Boomer™ 40	NA
Boomer™ 50	NA



93102600A 1

Control valve components

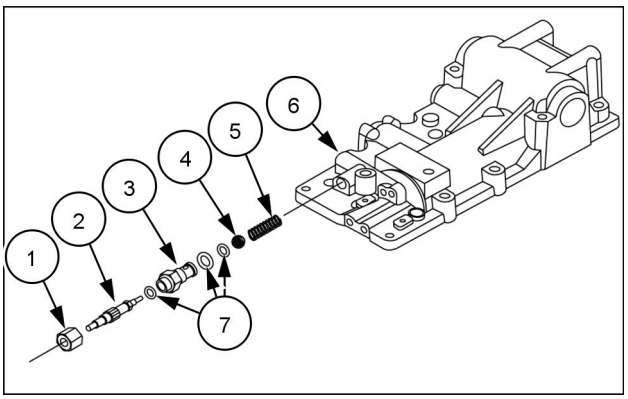
(1) Check valve
(2) Lowering valve
(3) Main valve spool
(4) Body
(5) Unload valve

(C) Cylinder circuit
(P) Pressure oil input from pump
(T) Tank, return oil
(DR) Drop Rate valve, exhaust oil from cylinder

Hitch control valve - Disassemble - Hydraulic Power Lift (HPL) drop rate

Boomer™ 40	NA
Boomer™ 50	NA

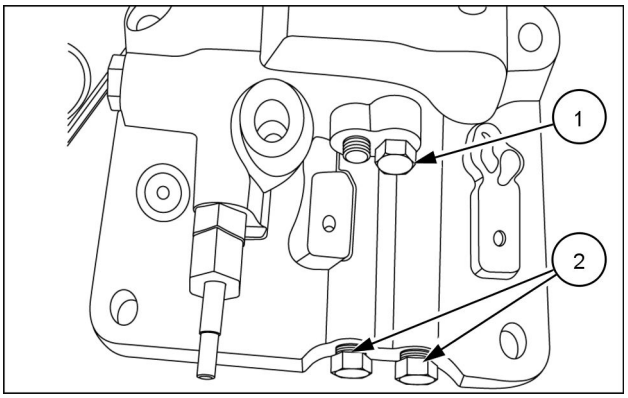
1. Remove the drop rate valve body **(3)** from the Hydraulic Power Lift (HPL) housing **(6)**.
2. Remove the ball **(4)** and spring **(5)** from the housing.
3. Remove cap **(1)** from valve body **(3)**.
4. Rotate valve stem **(2)** clockwise until stem is free from the valve body.
5. Inspect ball **(4)**, seat on valve body **(3)** and all O-rings **(7)** for any damage. Replace any damaged parts as needed.



76109554A 1

Next operation:
Hitch control valve - Assemble - Hydraulic Power Lift (HPL) drop rate (35.114)

6. Install the two M10 x 120 **(2)** and one M10 x 45 **(1)** bolt with lock washers into the HPL housing and end of cylinder.
7. Torque bolts to **54 - 65 N·m** (**40 - 48 lb ft**).

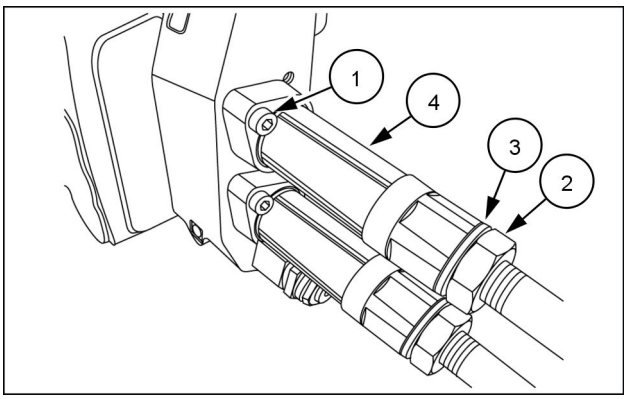


93102619 4

Remote control valve Open center mechanical remote valve - Disassemble - Front two spool - joystick

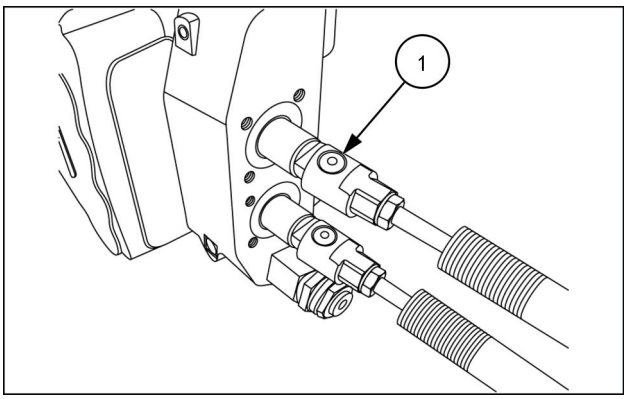
Boomer™ 40	NA
Boomer™ 50	NA

1. For each cable, remove the two socket head machine screws **(1)**. Loosen nut **(2)** from cable threads completely and move seal **(3)** from the thread area of the cable. Rotate cable cap **(4)** counterclockwise until valve spool is exposed.



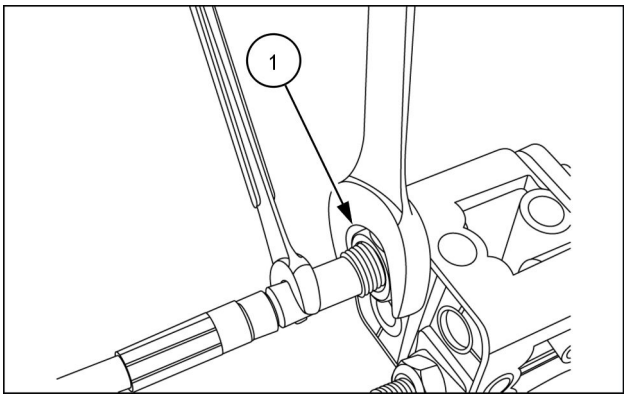
93109607 1

2. Remove pin **(1)** from cable end and valve spool. Separate the cable ends from the valve spool.



93109606 2

3. At joystick end of cable, loosen nut **(1)** on each cable



93109610 3

Reservoir, cooler, and filters - Remove oil cooler HST transmission

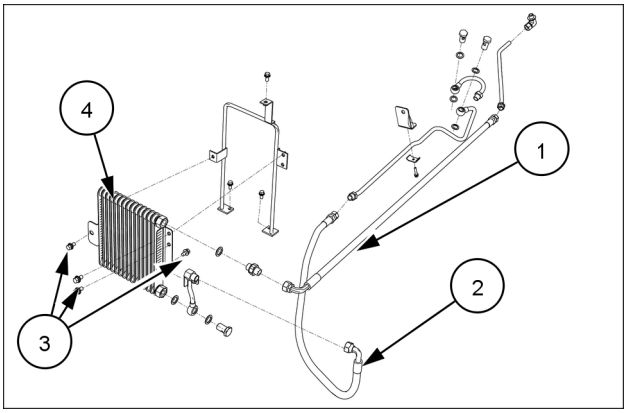
Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS

⚠ WARNING

Escaping fluid!
Relieve all pressure before disconnecting fluid lines or performing work on the hydraulic system. Make sure all components are in good condition and tighten all connections before pressurizing the system. DO NOT use your hand to check for leaks. Use a piece of cardboard or paper.
Failure to comply could result in death or serious injury.

W1140A

1. Disconnect the oil “In” hose **(1)**.
2. Disconnect the oil “Out” hose **(2)**.
3. Remove the four M8 x 16 hex bolts **(3)**.
4. Remove the oil cooler **(4)**.



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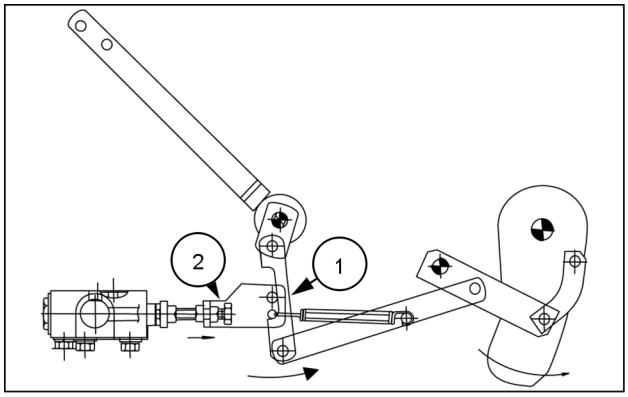
SERVICE

(*) See content for specific models

Neutral position during raise cycle

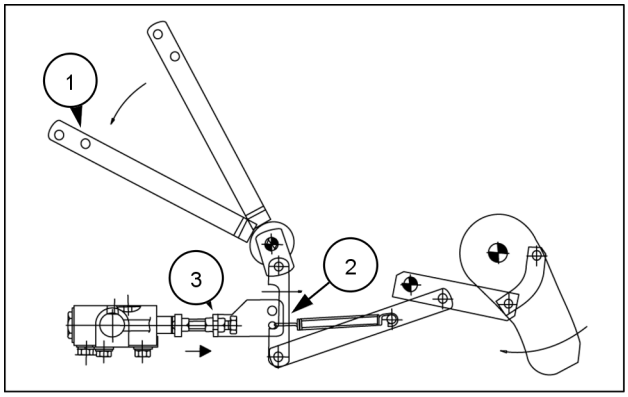
As the 3pt hitch arms raise, the pivot link **(1)** rotates rearward. When the pivot link rotates rearward, pressure against the valve link **(2)** is released allowing the valve spool to return to the neutral position.



93102606 4

Lowering Operation

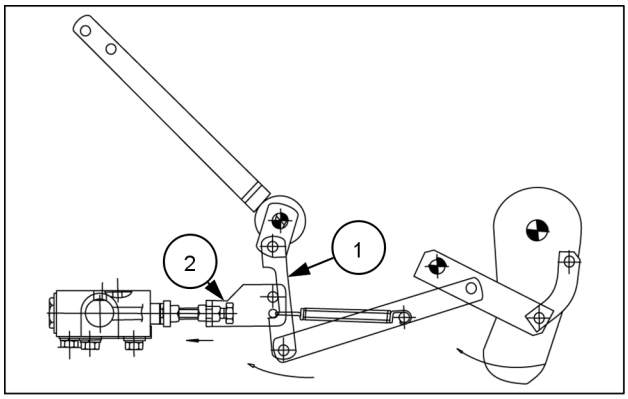
To lower the 3pt hitch, move the HPL position lever **(1)** frontward to the desired position. Pivot link **(2)** will pull on valve link **(3)** moving the valve spool outward to the lower position.



93102607 5

Neutral position during lower cycle

As the 3pt hitch arms lower, the pivot link **(1)** rotates frontward. When the pivot link rotates frontward, the pulling on the valve link **(2)** is released allowing the valve spool to return to the neutral position.



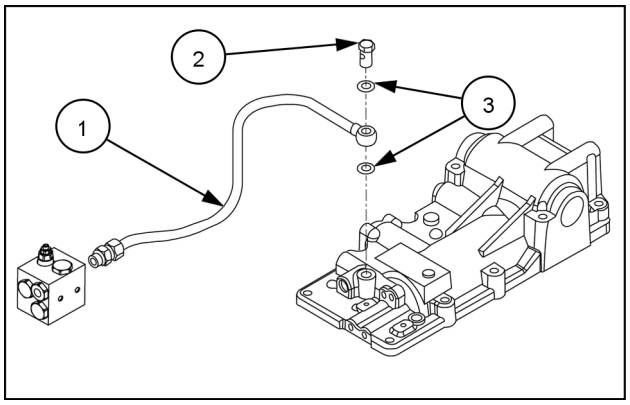
93102608 6

FIXED POINT

MOVING POINT

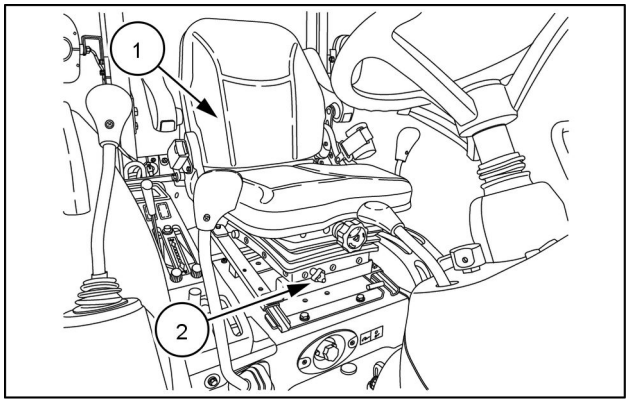
76109559 7

5. Install the hydraulic tube **(1)** to the HPL housing with two seal washers **(3)** and a banjo bolt **(2)**.



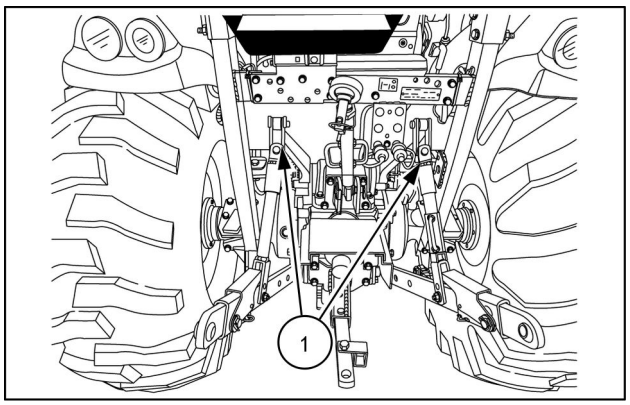
NHIL13CT00410AA 3

6. Install the operator's seat **(1)**.
7. Install the drop rate valve linkage **(2)**.



NHIL13CT01153AA 4

8. Install the three -point hitch lift links **(1)**.

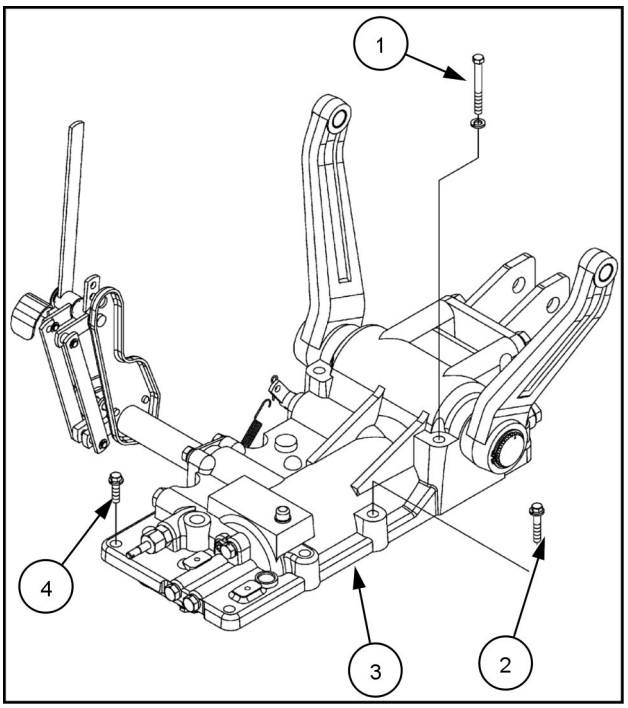


NHIL13CT01105AA 5

Rear three-point hitch - Install - HPL housing

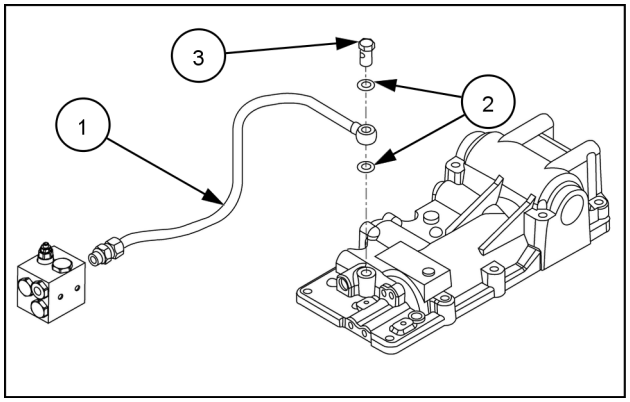
Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS

1. Remove all oil and old sealant from both HPL housing **(3)**and transmission case mounting surfaces. Apply a bead of **LOCTITE® 515™** gasket eliminator to the transmission case mounting surface.
2. Install HPL housing onto the transmission case, secure housing to case with four M12 x 40 mm bolts **(4)**, four M12 x50 mm bolts **(2)** and two M12 x 110 mm bolts **(1)**. Torque M12 bolts to **84 - 93 N·m** (**62 - 69 lb ft**).



76109580 1

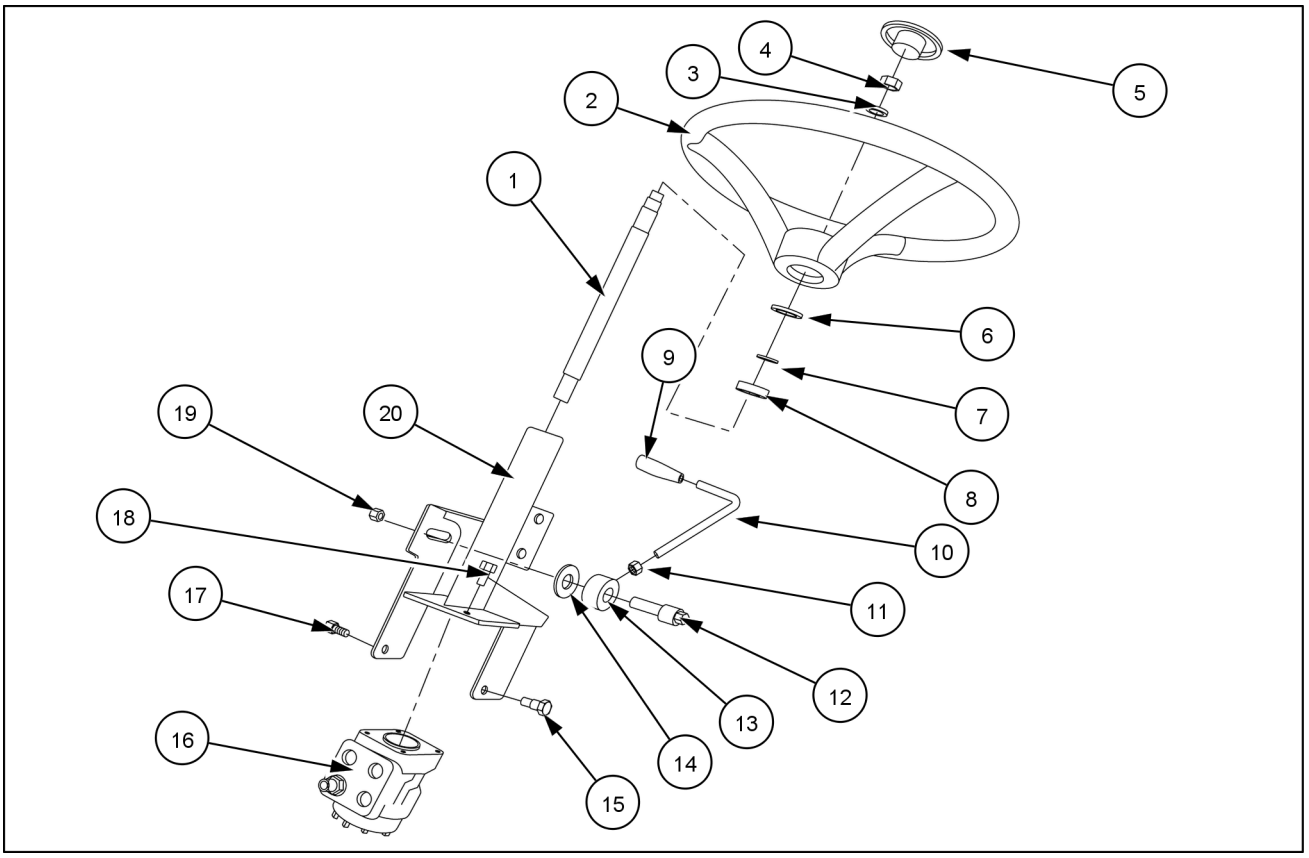
3. Install hydraulic tube **(1)** to HPL housing with two seal washers **(2)** and banjo bolt **(3)**.



NHIL13CT00410AA 2

Steering column - Exploded view

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS



NHIL14CT00506FA 1

Steering column

(1) Steering column shaft
(2) Steering wheel
(3) Lock washer
(4) Hex nut, M14
(5) Cap
(6) Snap ring
(7) Snap ring
(8) Ball bearing
(9) Lever grip
(10) Locking tilt lever
(11) Hex nut, M10
(12) Tilting guide bolt, M12 x 30
(13) Tilt locking arm
(14) Tilt locking plate
(15) Tilting hinge bolt, M10 x 13
(16) Steering valve
(17) Tilting hinge bolt, M10 x 13
(18) Hex bolt, M10 x 25
(19) Nut, M12
(20) Steering column

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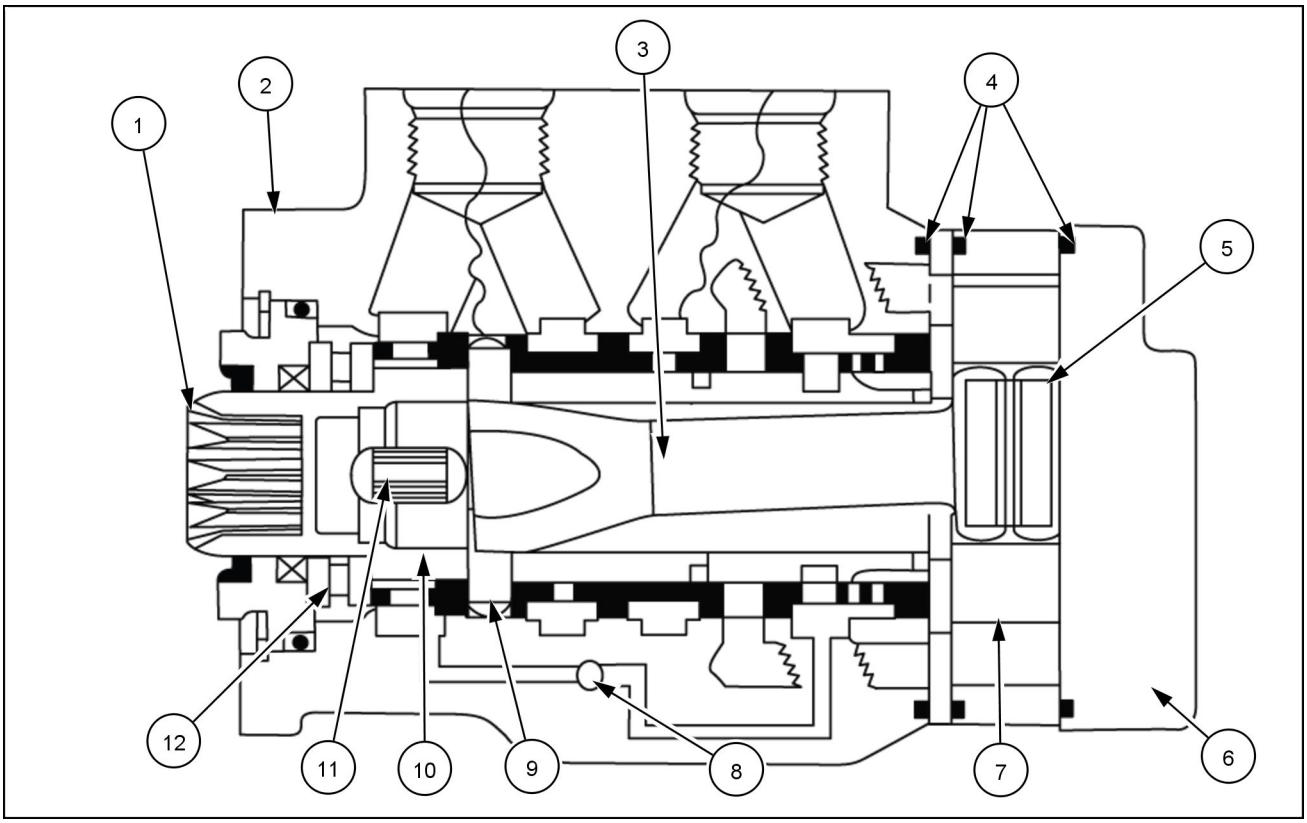
(*) See content for specific models

Description and valve operation



93102634 2

(1) Spool
(2) Valve body
(3) Rotor drive shaft
(4) O-ring
(5) Spacer
(6) Cover
(7) Rotor
(8) Check valve
(9) Rotor drive pin
(10) Sleeve
(11) Sleeve return spring
(12) Thrust bearing

Hydraulic control components - Disassemble - Steering valve

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS

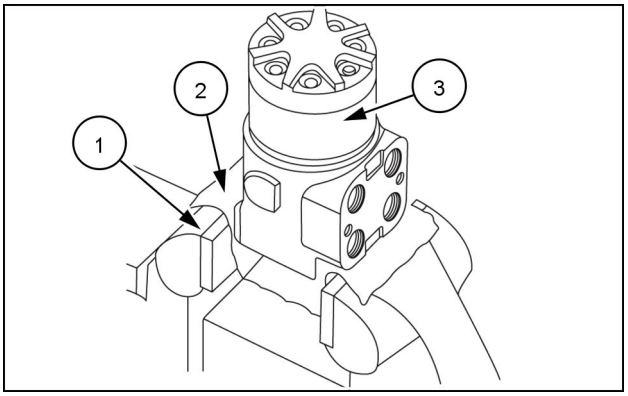
Prior operation:
Hydraulic control components - Remove steering valve (41.200)

NOTICE: *Establish and maintain a clean work area. Remove any dirt from the unit with a wire brush. Thoroughly clean around the ports.*

NOTE: *Use a paint stick to mark outside of housing, this will be useful in assembly.*

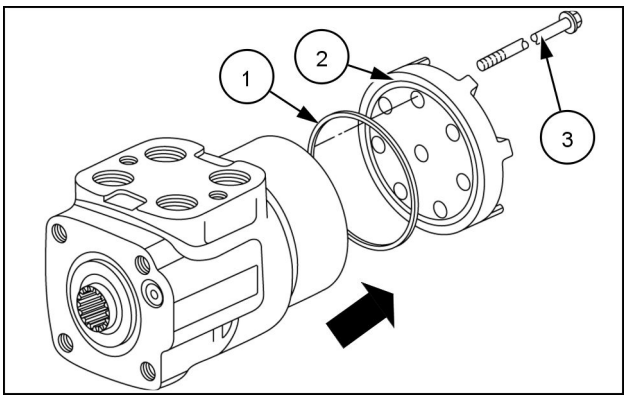
1. Place the rotor shaft **(3)** upward in a vice **(1)**.

NOTICE: *Protect the surface of the unit against scarring or damage, with suitable material **(2)**.*



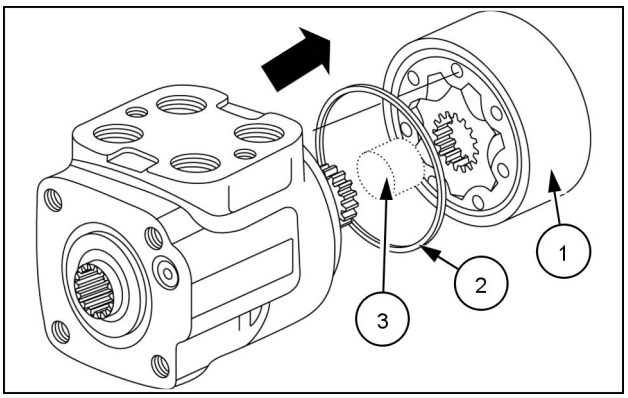
93102644 1

2. Remove the seven cover bolts **(3)**.
3. Remove the end cap **(2)**.
4. Remove O-ring **(1)** from the end cap **(2)**.



93102645 2

5. Remove the rotor set **(1)** being careful not to drop the rotor out of the rotor set.
6. Remove O-ring **(2)** from the rotor set **(1)**.
7. Remove the spacer **(3)**.



93102646 3

Hydraulic control components - Install - Steering valve

Boomer™ 40	NA
Boomer™ 50	NA

⚠ WARNING

Avoid injury!
Handle all parts carefully. Do not place your hands or fingers between parts. Use Personal Protective Equipment (PPE) as indicated in this manual, including protective goggles, gloves, and safety footwear.
Failure to comply could result in death or serious injury.

W0208A

⚠ WARNING

Pressurized hydraulic fluid can penetrate the skin and cause severe injuries.
Tighten all of the connections before starting the engine. If hydraulic fluid has penetrated the skin, seek medical assistance immediately.
Failure to comply could result in death or serious injury.

W0117A

⚠ WARNING

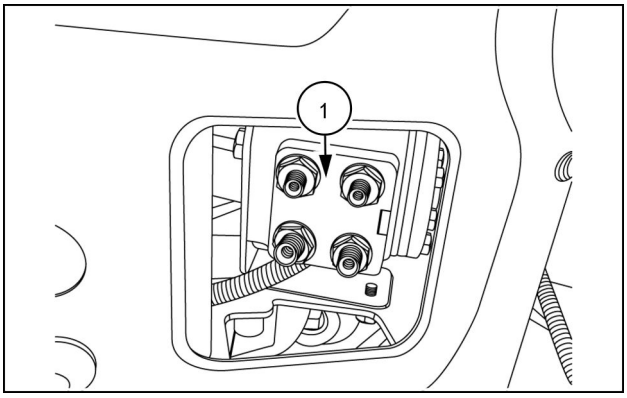
Pressurized fluid can penetrate the skin and cause severe injuries.
Keep hands and body away from any pressurized leak. DO NOT use your hand to check for leaks. Use a piece of cardboard or paper. If fluid penetrates the skin, seek medical attention immediately.
Failure to comply could result in death or serious injury.

W0158A

Prior operation:
Hydraulic control components - Assemble - Steering valve (41.200)

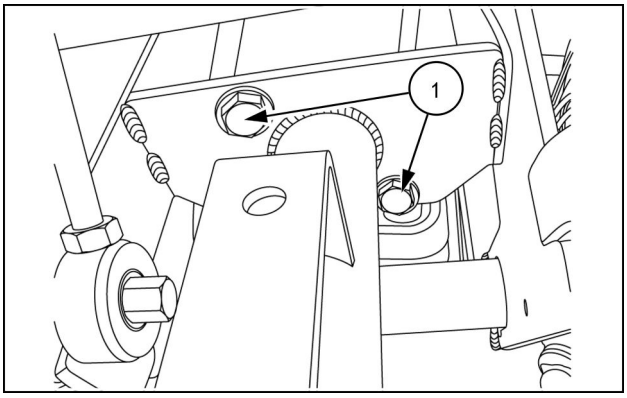
NOTICE: *Place absorbent material to the rear of the engine compartment to catch any oil.*

1. Install the steering valve **(1)** through the engine compartment.



93104531 1

2. Secure the steering valve to the frame with two M10 x 13 bolts **(1)**.
3. Torque the bolts to **49 - 54 N·m** (**36 - 40 lb ft**).



93104532 2

Steering cylinder - Remove

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS

⚠ WARNING

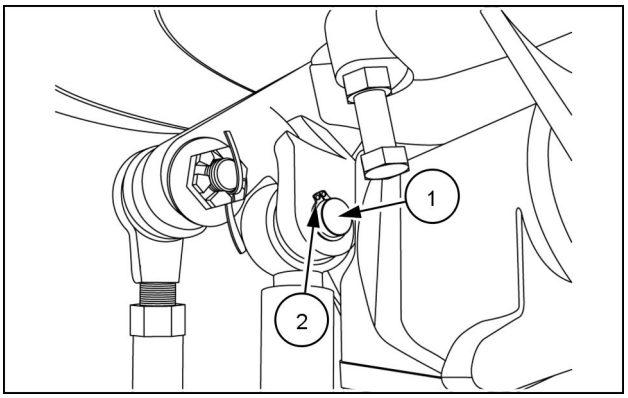
Avoid injury!
Handle all parts carefully. Do not place your hands or fingers between parts. Use Personal Protective Equipment (PPE) as indicated in this manual, including protective goggles, gloves, and safety footwear.
Failure to comply could result in death or serious injury.

W0208A

Prior operation:
Steering cylinder - Disconnect (41.216)

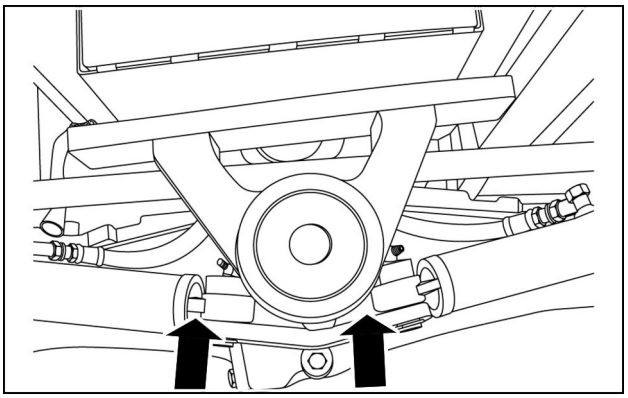
NOTICE: *Mark the location of each zerked pin. It makes reassembly quicker.*

1. Remove the zerked pin **(1)** by removing snap ring **(2)** at bottom.



93109793 1

2. Drive the zerked pin **(1)** upward and remove.
3. Remove the cylinder from the tractor.

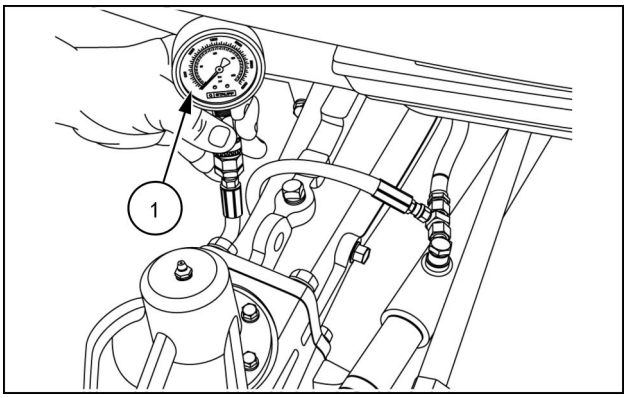


93109790 2

NOTE: *Repeat the previous instructions for opposite side.*

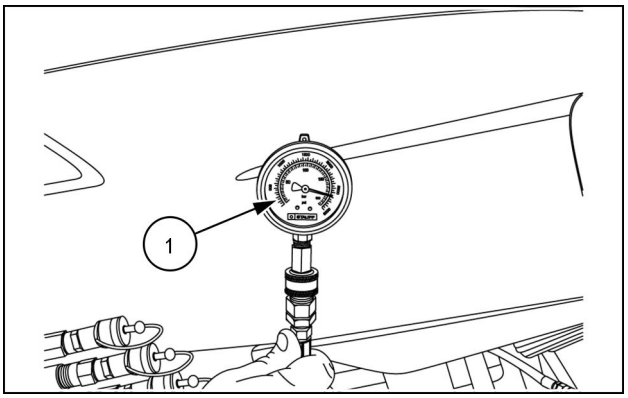
Next operation:
Steering cylinder - Disassemble (41.216)

3. The gauge indicates **0 psi (1)**.



93112186 2

4. With the engine speed at **2600 RPM** turn the wheel to the left, the pressure will rise to approximately **14217 kPa** (**2062 psi**) **(1)**.
5. The gauge **(1)** indicates pressure.

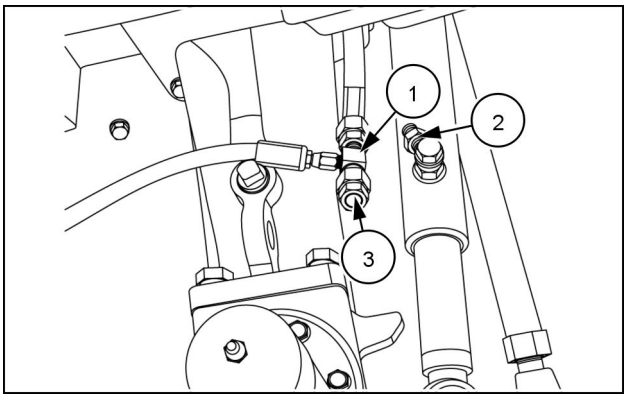


93112192 3

NOTE: *If the gauge pressure rises and then begins to fall off, this is an indication of steering cylinder leakage.*

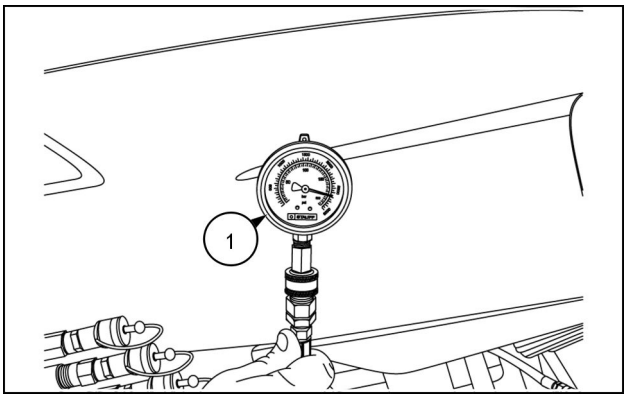
Steering relief valve operation test

1. Use a pan to receive oil leakage.
2. Disassemble the " TEE " **(1)** on the steering cylinder side.
3. Install a cap **(2)** here.
4. Install a plug **(3)** in the " TEE " .



93112190 4

5. Turn on the tractor engine.
6. Increase engine speed to **2600 RPM**.
7. Turn the steering wheel hard to the left or to the right. The pressure gauge will rise to a point and no higher.
8. Approximate location of **14217 kPa** (**2062 psi**) on the gauge **(1)**.



93112192 5

Front wheels - Install

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS

⚠ WARNING

Explosion hazard!
When inflating tires, use a clip-on air chuck with a gauge, remote valve, and hose long enough to allow you to stand to one side and NOT in front of or over the wheel assembly. Keep others out of the DANGER AREA. Never inflate a tire beyond the maximum allowable pressure printed on the tire.
Failure to comply could result in death or serious injury.

W0059A

⚠ WARNING

Explosion hazard!
Tires must be replaced by skilled personnel with the proper tools and technical knowledge. Unskilled personnel replacing wheels or tires could result in serious physical injuries, tire damage, and/or wheel distortion. Always have a qualified tire mechanic service wheels and tires.
Failure to comply could result in death or serious injury.

W0171A

⚠ WARNING

Crushing hazard!
Before performing service under the machine, park the machine on a level surface, engage the parking brake, and stop the engine. Put blocks at the front and rear of the tires.
Failure to comply could result in death or serious injury.

W0350A

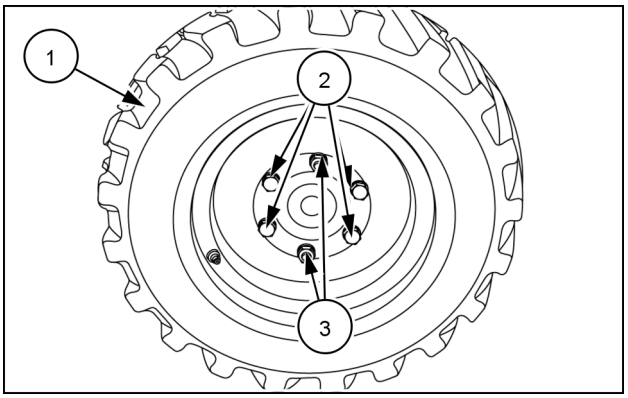
⚠ WARNING

Roll-over hazard!
Always try to park the machine on firm level ground. Avoid parking on slopes. Block the wheels in both directions.
Failure to comply could result in death or serious injury.

W0242A

Prior operation:
Front wheels - Remove (44.511)

1. Install the tire and wheel assembly **(1)**.
2. Install four M16 x 30 bolts and lock washers **(2)**.
3. Install two M16 nuts and lock washers **(3)**.
4. Torque the nuts and bolts to **176 - 196 N·m** (**130 - 145 lb ft**).
5. Remove the jack stands, or lifting device.



93100874 1

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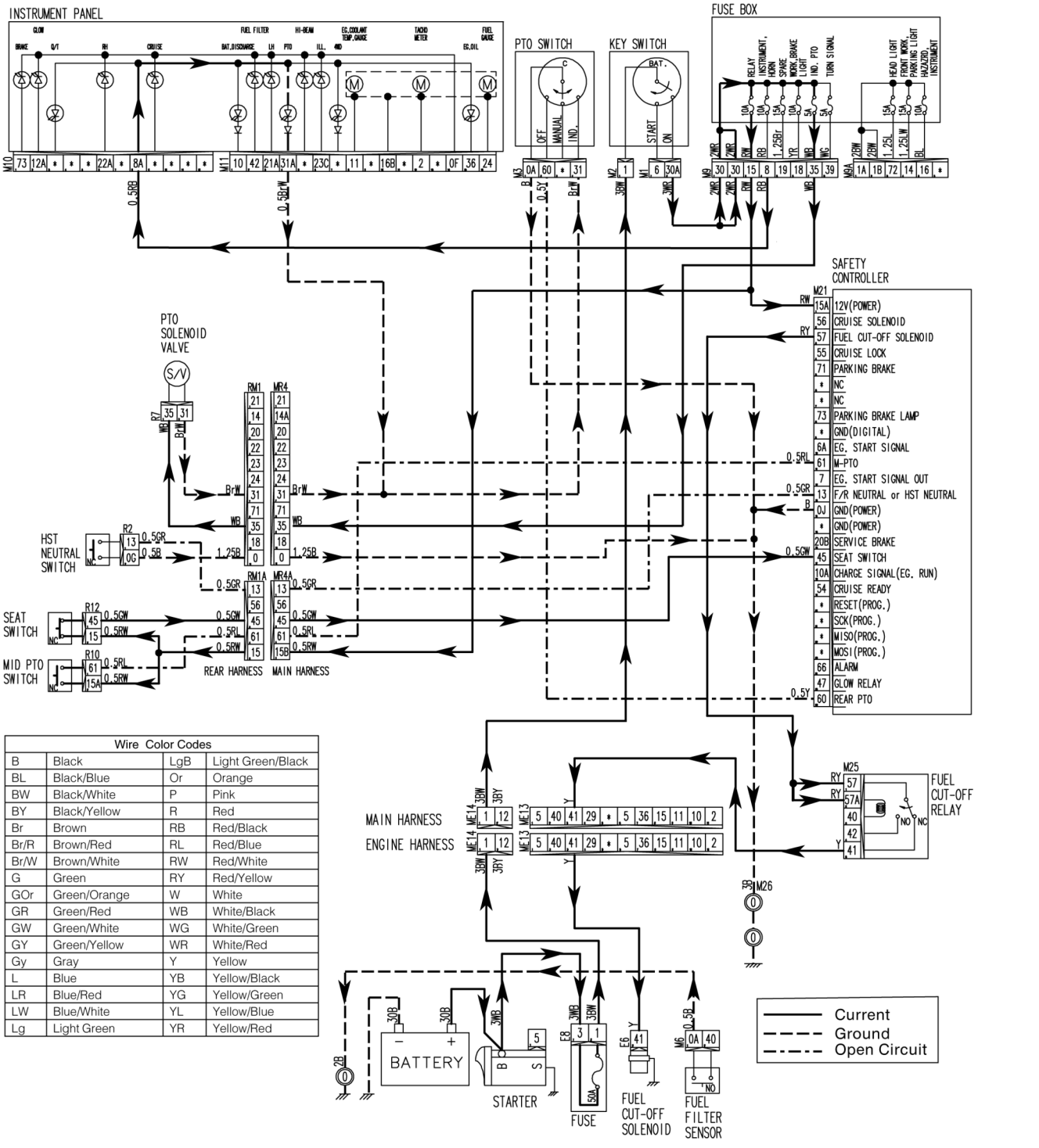
Electrical system - Electrical schematic sheet 04 - Safe operation, operator present; HST transmission

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS

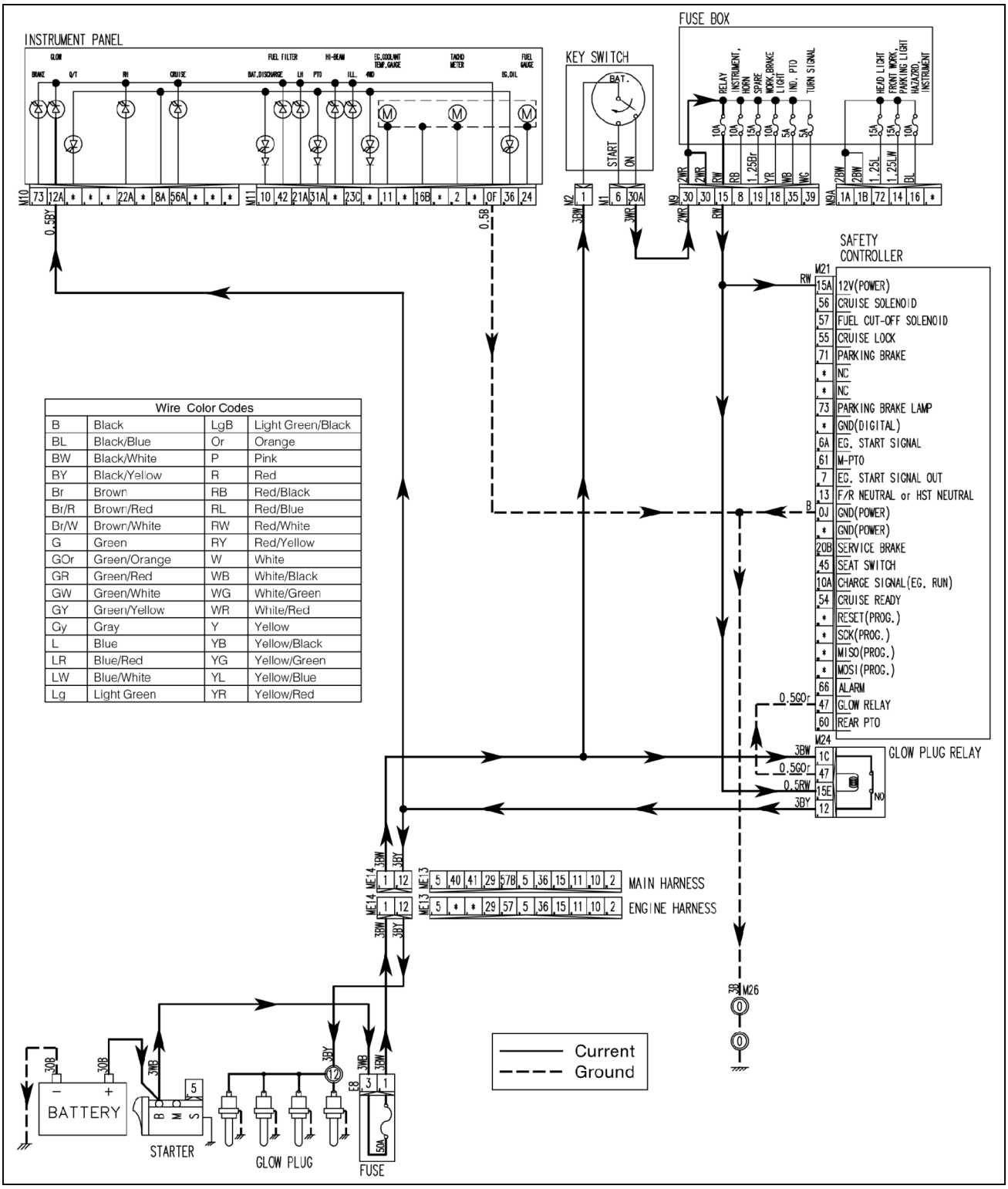


Wire Color Codes			
B	Black	LgB	Light Green/Black
BL	Black/Blue	Or	Orange
BW	Black/White	P	Pink
BY	Black/Yellow	R	Red
Br	Brown	RB	Red/Black
Br/R	Brown/Red	RL	Red/Blue
Br/W	Brown/White	RW	Red/White
G	Green	RY	Red/Yellow
GOr	Green/Orange	W	White
GR	Green/Red	WB	White/Black
GW	Green/White	WG	White/Green
GY	Green/Yellow	WR	White/Red
Gy	Gray	Y	Yellow
L	Blue	YB	Yellow/Black
LR	Blue/Red	YG	Yellow/Green
LW	Blue/White	YL	Yellow/Blue
Lg	Light Green	YR	Yellow/Red

76110384 1

Electrical system - Electrical schematic sheet 08 - Glow plugs

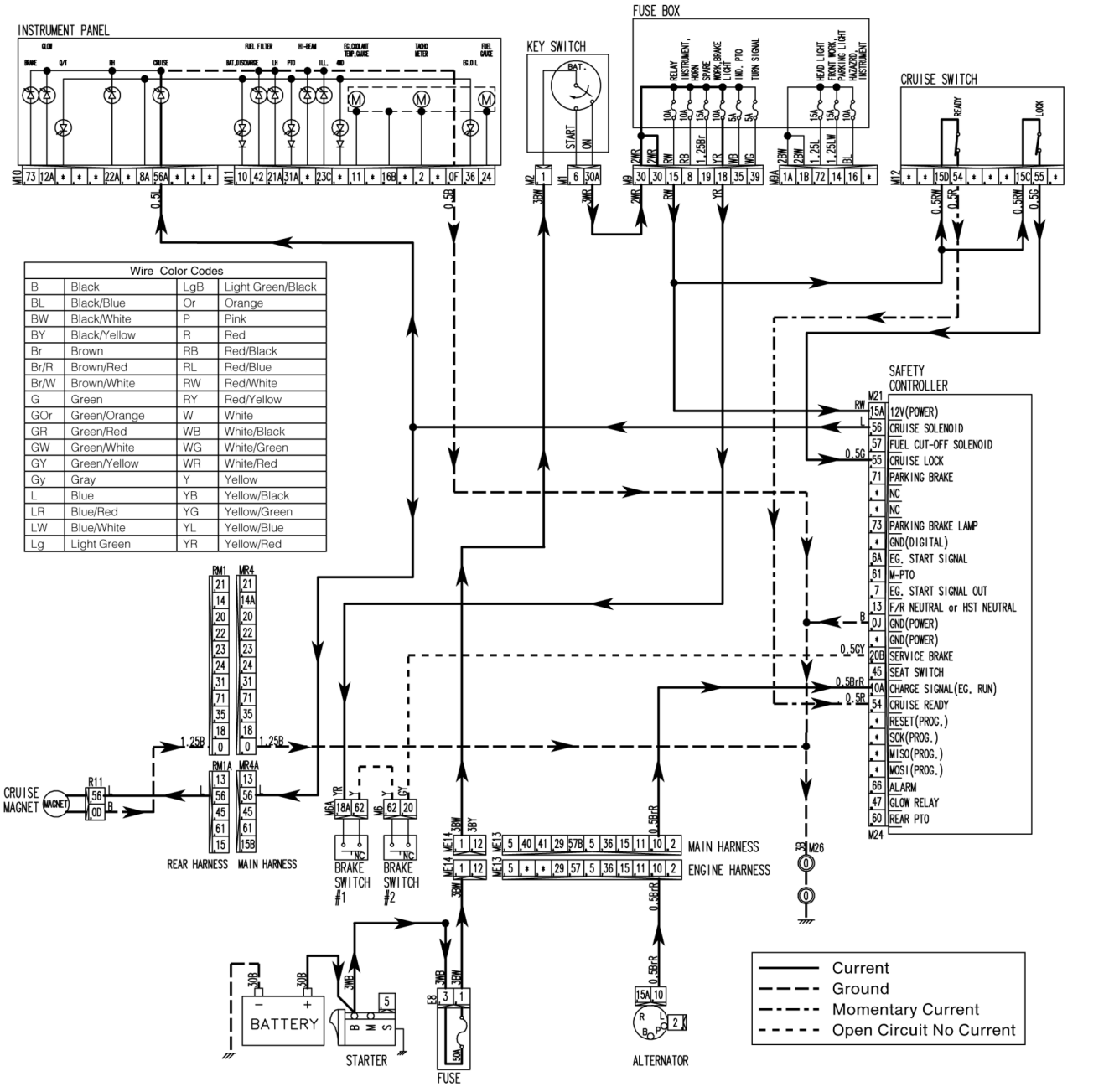
Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS



76110389D 1

Electrical system - Electrical schematic sheet 14 - HST cruise control

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS



Wire Color Codes			
B	Black	LgB	Light Green/Black
BL	Black/Blue	Or	Orange
BW	Black/White	P	Pink
BY	Black/Yellow	R	Red
Br	Brown	RB	Red/Black
Br/R	Brown/Red	RL	Red/Blue
Br/W	Brown/White	RW	Red/White
G	Green	RY	Red/Yellow
GOr	Green/Orange	W	White
GR	Green/Red	WB	White/Black
GW	Green/White	WG	White/Green
GY	Green/Yellow	WR	White/Red
Gy	Gray	Y	Yellow
L	Blue	YB	Yellow/Black
LR	Blue/Red	YG	Yellow/Green
LW	Blue/White	YL	Yellow/Blue
Lg	Light Green	YR	Yellow/Red

1. Current starts at the battery and flows through the positive (+) battery cable to the engine starter motor.
2. From the starter motor, current flows through the 50-amp main fuse and to the main harness connector. From the connector the current flows to the "BATTERY" terminal of the key switch.
3. When the key switch is placed in the "ON" position, current is transferred from the "BATTERY" to the "ON" terminal of the key switch.

"ON" terminal of key switch

1. Current flows from the "ON" terminal of the key switch to the fuse panel bussbar, from the bussbar current travels through: · Fuse #2 - 10 amp

Fuse Functions

1. The #2, 10amp fuse, sends current to terminal "16B" of the instrument panel.

Fuel Gauge Function

1. Two ground paths allow the fuel gauge to function
2. The first ground source is provided by terminal "OF" of the instrument panel. This is a constant ground source provided by the tractor main ground . located on the engine fire wall.
3. The needle within the fuel gauge is controlled by the second ground path. The second ground path exists the gauge at terminal "24" of the instrument panel to travel to the fuel sender. At the sender, the resistance to ground changes as the fuel level rises or lowers. The fuel gage translates this resistance into movement of the gauge needle. The greater the resistance the less needle movement and the lesser the resistance the more the needle movement.

Engine coolant temperature sensor - Test

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS

Prior operation:
Engine coolant temperature sensor - Remove - Sender (55.012)

1. The engine coolant temperature sender should have the following resistance readings at corresponding temperatures.

Coolant temperature	120 °C (248 °F)	100 °C (212 °F)	80 °C (176 °F)	50 °C (122 °F)
Resistance Ω	16 Ω	25 - 29 Ω	. 47 - 57 Ω	154 Ω

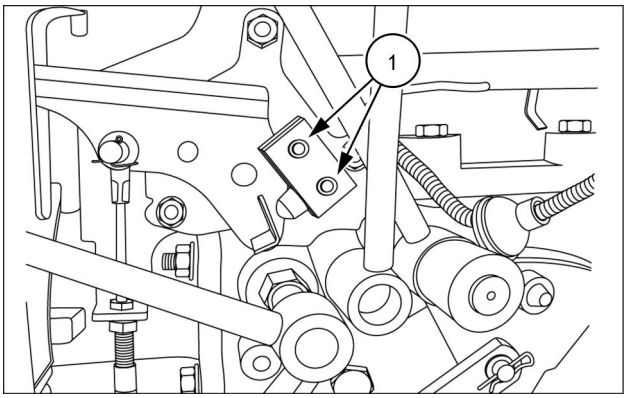
Next operation:
Engine coolant temperature sensor - Install - Sender (55.012)

Parking brake electrical system - Remove - Park brake switch

Boomer™ 40	NA
Boomer™ 50	NA

Prior operation:
Parking brake electrical system - Service instruction - Park brake switch (55.031)

1. Disconnect the negative (-) battery cable from the negative (-) battery terminal.
2. Disconnect the switch connector from the tractor wire harness.
3. Remove the two machine screws **(1)** from the switch and remove the switch from the mounting bracket.



93105608 1

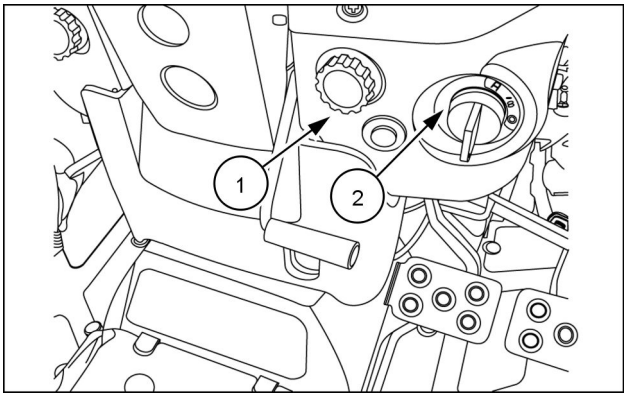
Next operation:
Parking brake electrical system - Test - Park brake switch (55.031)

Ignition switch - Install

Boomer™ 40	NA
Boomer™ 50	NA

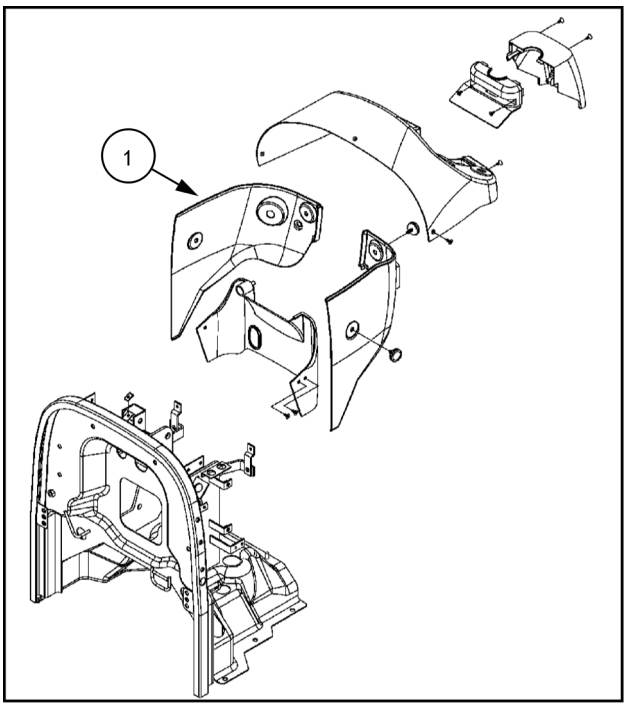
Prior operation:
Ignition switch - Test (55.201)

1. Install switch from the back side of the right-hand side console panel **(1)** and install retaining nut **(2)**.



93099330 1

2. Connect the two switch connectors to tractor wire harness.
3. Reinstall right-hand side console panel **(1)**.



76105667 2

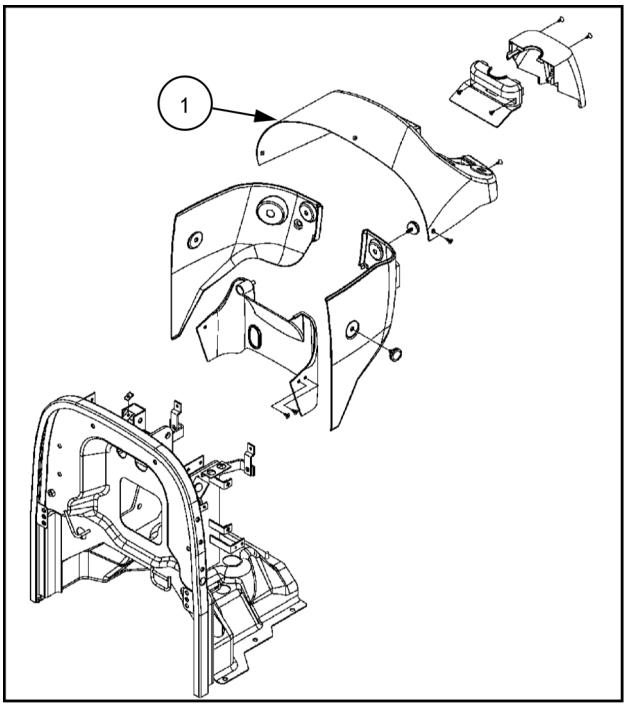
4. Reconnect negative (-) battery cable to the negative (-) battery terminal.

Grid heater relay - Remove Glow plug relay

Boomer™ 40	NA
Boomer™ 50	NA

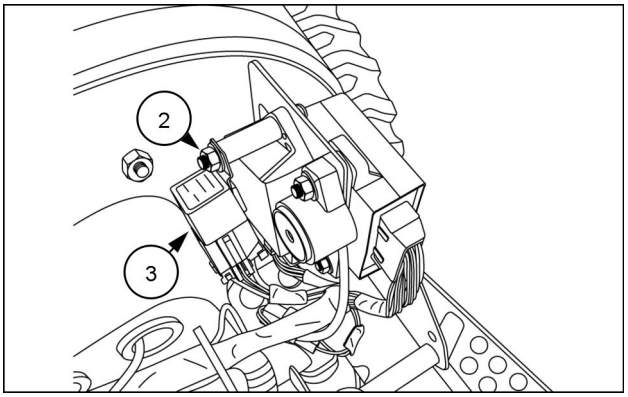
Prior operation:
Grid heater relay - Service instruction - Glow plug relay (55.202)

1. Remove negative (-) battery cable from negative (-) battery terminal.
2. Remove instrument panel console **(1)** from the tractor.



76105667 1

3. Disconnect the relay connector from the tractor wire harness.
4. Remove retaining bolt **(2)** from relay mounting tab and remove relay **(3)** (HST model) or **(4)** (Gear model) from the tractor.



93105596 2

Contents

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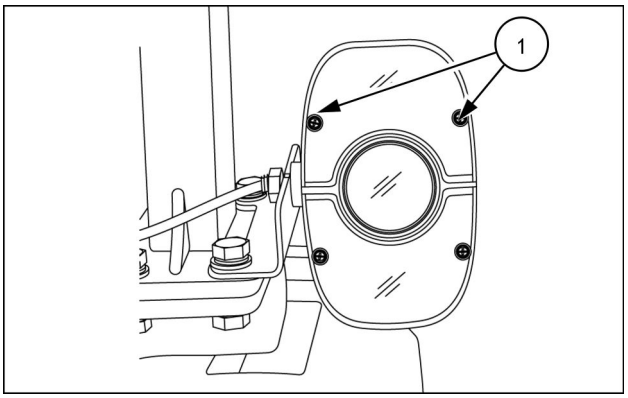
(*) See content for specific models

Turn signal and/or hazard lights - Replace - Bulb

Boomer™ 40	NA
Boomer™ 50	NA

To replace the top flasher light bulb:

1. Remove the two screws **(1)** retaining the top flasher light lenses and remove the lenses.

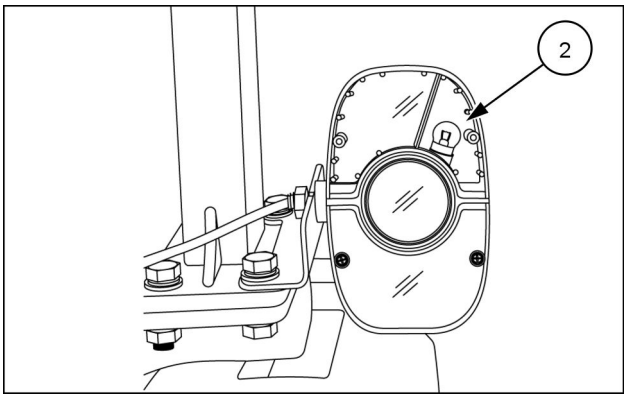


93100885 1

2. Push in on the bulb **(2)** and rotate bulb counter-clockwise in socket to remove.

NOTE: *Replace with a P21 watt bulb.*

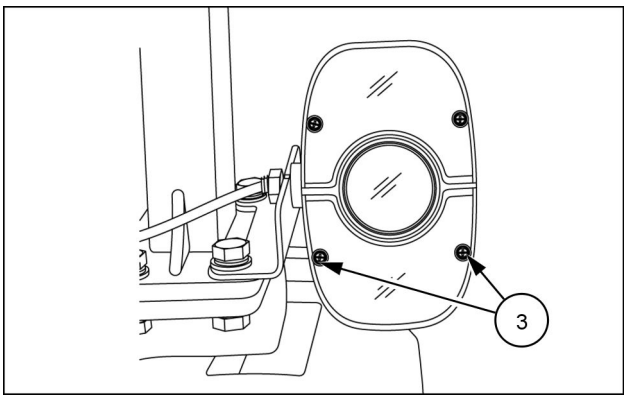
3. Insert the new bulb into the socket and turn it clockwise until the bulb locks into place.
4. Install lenses and retaining screws.



93100894 2

To replace the bottom flasher light bulb:

5. Remove the two screws **(3)** retaining the top flasher light lenses and remove the lenses.



93100885 3

Headlight - Troubleshooting

Boomer™ 40	NA
Boomer™ 50	NA

NOTE: *See* ***Electrical system - Electrical schematic sheet 11 - Road lights (55.000)***

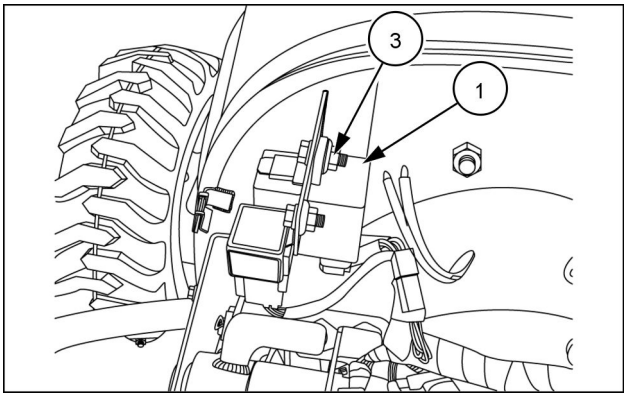
Problem	Possible Cause	Correction
Inoperative road lights	Blown #7 15-amp fuse	Replace 15-amp fuse
	Blown #9 10-amp fuse	Replace 10-amp fuse
	Faulty combination light switch	Test switch, replace if necessary
	Faulty head light relay	Test relay, replace if necessary
	Improper ground	Check ground location, for clean contact area

Headlight relay - Install

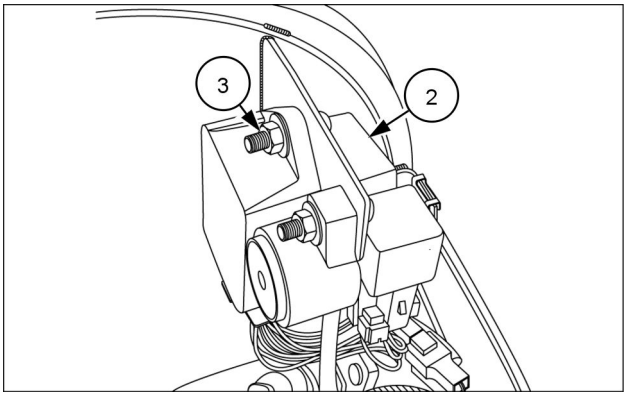
Boomer™ 40	NA
Boomer™ 50	NA

Prior operation:
Headlight relay - Test (55.405)

1. Install the headlight relay **(1)** (HST model) or **(2)** (Gear model) to the mount plate with M6 x 20mm retaining bolt and nut **(3)**.

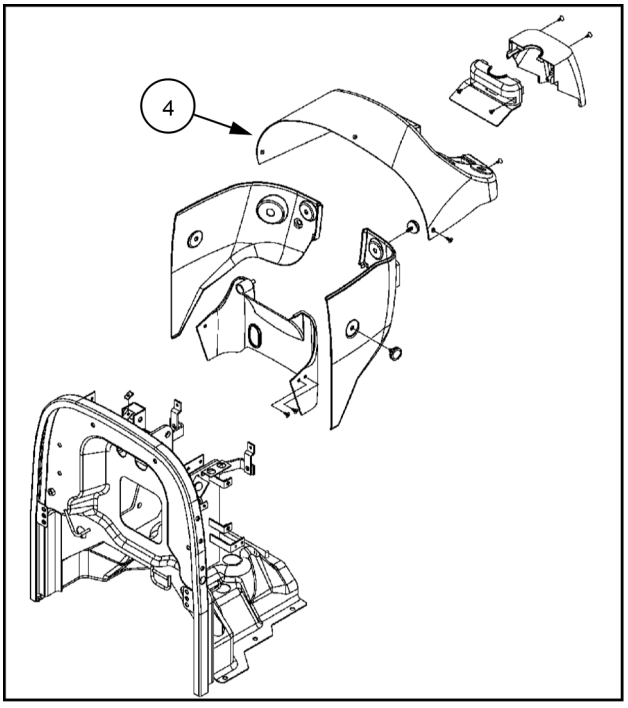


93105594 1

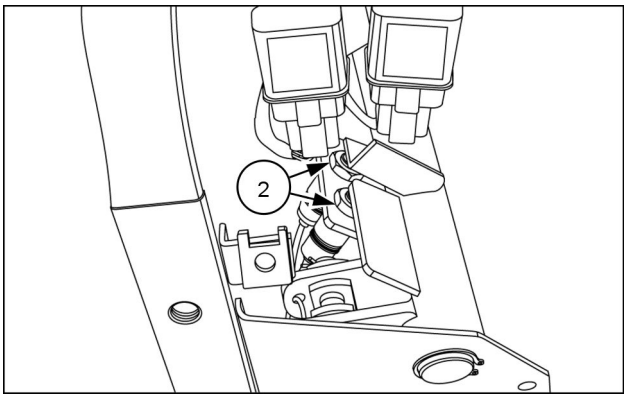


93105612A 2

2. Connect the relay connector to the tractor wire harness.
3. Install instrument panel console panel **(4)** to the tractor.



76105667 3

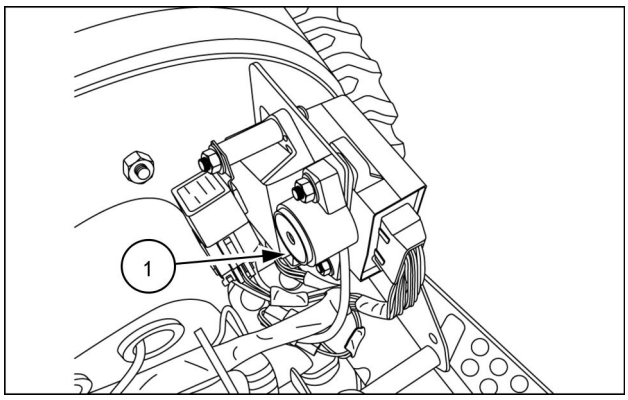


93105595 3

Next operation:
Brake light switch - Test (55.405)

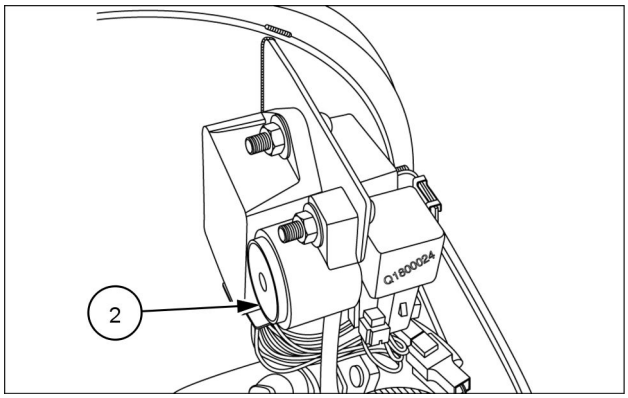
Instrument cluster - Overview - Safety alarm

The safety alarm **(1)** (HST model) or **(2)** (Gear model) are located on the right-hand side of the tractor underneath the instrument panel console. The alarm sounds if the operator leaves the seat without the park brake being engaged with the tractor engine running or when the tractor is shut off with the key switch without the park brake being engaged.



93105596 1

HST model



93105612 2

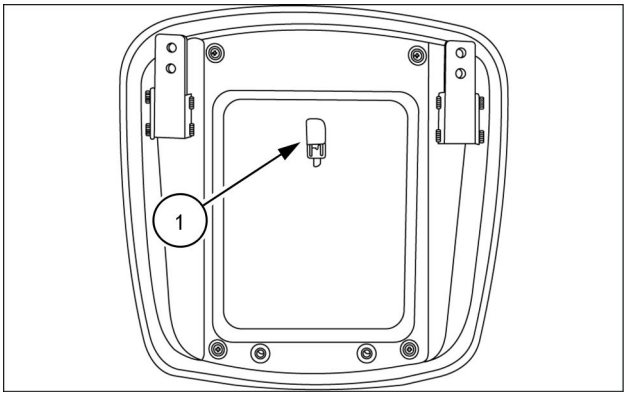
Gear model

Operator presence switch Seat switch - Install

Boomer™ 40	NA
Boomer™ 50	NA

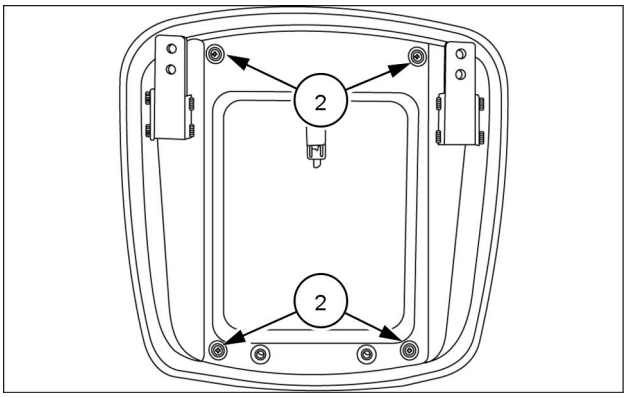
Prior operation:
Operator presence switch Seat switch - Test (55.408)

1. Insert the seat switch **(1)** from the top side of the seat pan. Push the switch through the pan until the retaining tabs lock in place against the bottom side of the pan.



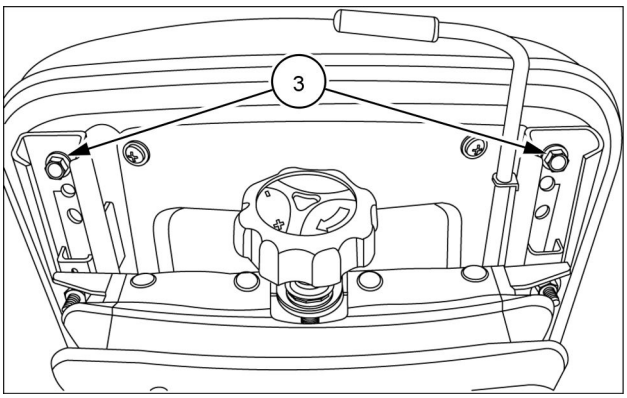
93105611 1

2. Install the seat pan to the seat cushion with the four sheet metal screws **(2)**.



93105611 2

3. Install the seat belt brackets to the seat pan using two M8 x 20mm flange head bolts
4. Install seat the slide track using two M8 x 15mm flange head bolts **(3)** in front side of track and two M8 x 20mm on rear side of track. Torque all M8 hardware to **25 N·m** (**18 lb ft**).



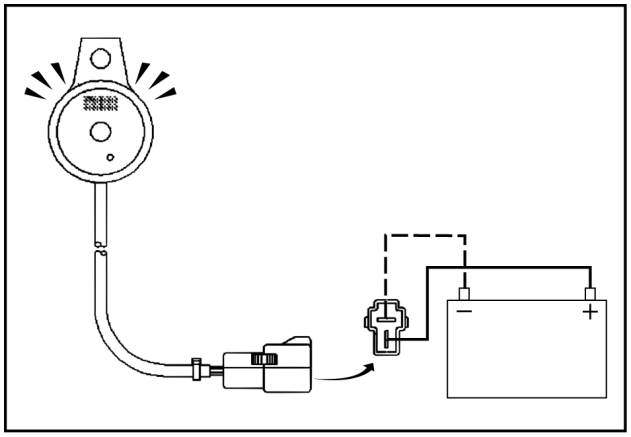
93105609 3

Instrument cluster Analog instrument cluster - Test - Safety alarm

Boomer™ 40	NA
Boomer™ 50	NA

Prior operation:
Instrument cluster Analog instrument cluster - Remove - Safety alarm (55.408)

1. Disconnect alarm connector from the tractor wire harness.
2. Place 12 volts across the leads of the alarm, the alarm should sound.



76105652 1

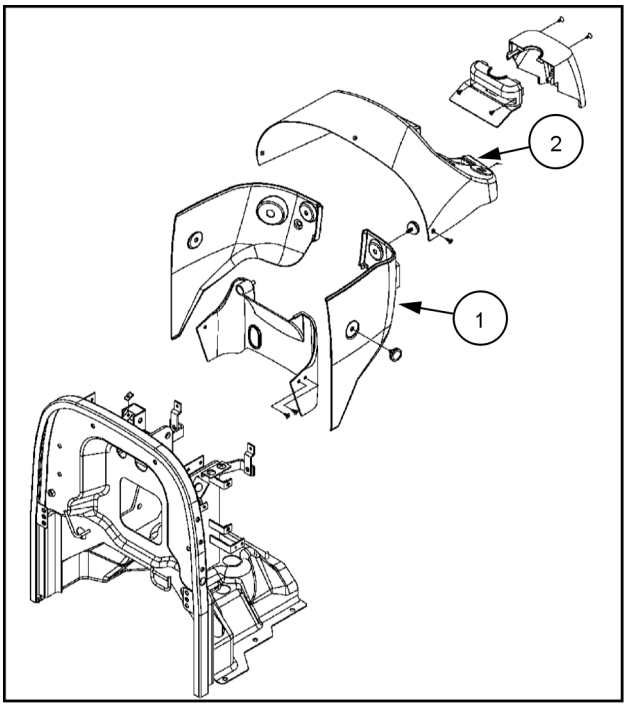
3. If the alarm does not sound when 12 volts are supplied, the alarm is faulty and needs to be replaced.

Next operation:
Instrument cluster Analog instrument cluster - Install - Safety alarm (55.408)

Throttle control - Remove - Cruise control switch

Boomer™ 40	NA
Boomer™ 50	NA

1. Remove negative (-) battery cable from negative (-) battery terminal.
2. Remove left-hand side console panel **(1)**.



76105667 1

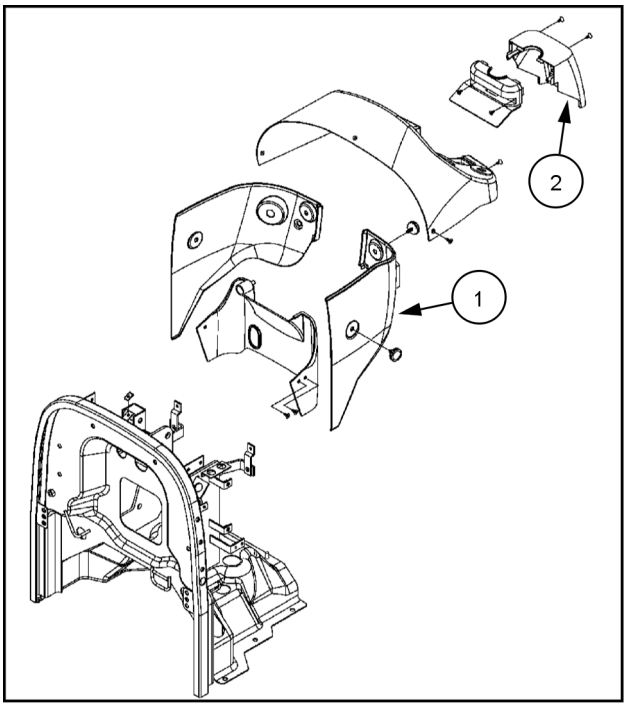
3. Disconnect the switch connector from the tractor wire harness.
4. Depress switch retaining tabs and remove the switch **(2)** from the top side of the dash panel.

Next operation:
Throttle control - Test - Cruise control switch (55.525)

Lever neutral position switch - Remove Forward/Reverse Shuttle Switch

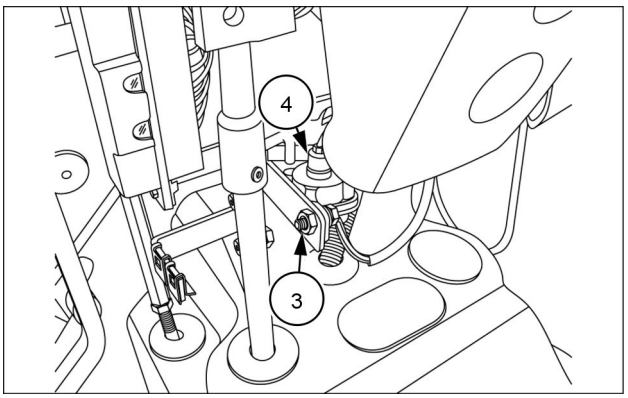
Boomer™ 40	NA
Boomer™ 50	NA

1. Remove negative (-) battery cable from negative (-) battery terminal.
2. Remove left-hand side **(1)** and center bottom **(2)** console panels from the tractor.



76105667 1

3. Disconnect the switch connector from the tractor wire harness.
4. Remove retaining bolt **(3)** from the switch mounting tab and remove switch **(4)** from the tractor.

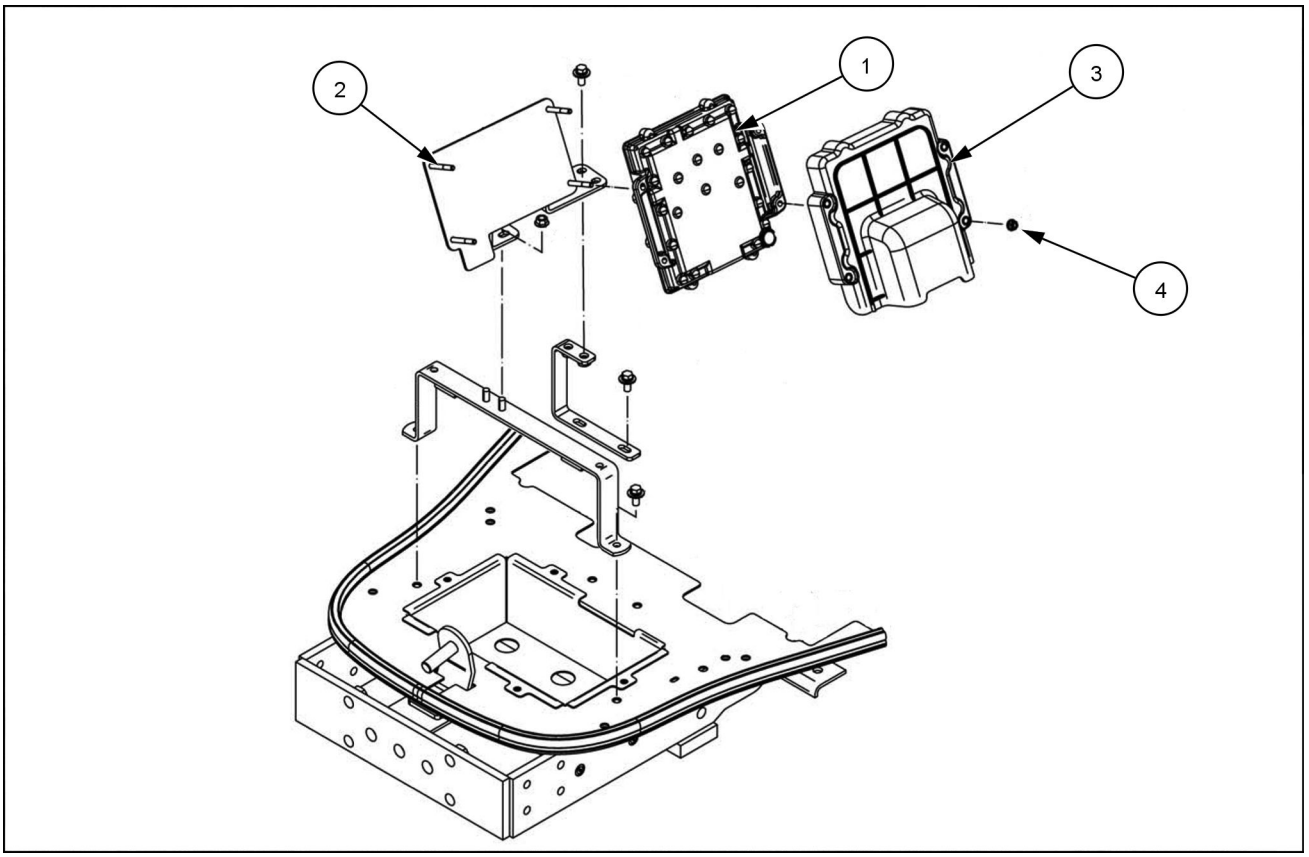


93105616 2

Next operation:
Lever neutral position switch - Test - Forward/Reverse Shuttle Switch (55.610)

Electronic module - Install

Boomer™ 40 [0 - 2103012735]	NA Platform - With ROPS
Boomer™ 40 [2103012736 - 2106014859]	NA Platform - With ROPS
Boomer™ 40 [2106014860 -]	NA Platform - With ROPS
Boomer™ 50 [0 - 2105012137]	NA Platform - With ROPS
Boomer™ 50 [2105012138 - 2105013791]	NA Platform - With ROPS
Boomer™ 50 [2105013792 -]	NA Platform - With ROPS



NHIL14CT00220FA 1

1. Instal the Engine Control Unit (ECU) **(1)** onto the four studs **(2)** of the (ECU) support bracket.
2. Connect the two connectors to the (ECU)
3. Install the cover **(3)** onto the (ECU) and secure with four M6 flange nuts **(4)**.
4. Connect the negative (-) battery cable to the battery.

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SERVICE

(*) See content for specific models

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SERVICE

(*) See content for specific models