MASSEY FERGUSON

MF 5400

Draper Header

SERVICE MANUAL

FROM MASSEY FERGUSON

1. General

1.2.7.8 Handrails

Point your body in the direction of the ladder and use the handrails when you are on the machine ladders.

Fig. 12

1.2.7.9 Agricultural chemicals

Agricultural chemicals are very dangerous. Incorrect procedures with fertilizer, fungicides, herbicides, insecticides and pesticides can cause injuries to plants, animals, soil and other persons property.

Always read and follow all manufacturers instructions before you open chemical containers.

Read and follow instructions each time you use a chemical.

Use the same precautions when you do adjustments, do servicing, clean or store the machine as used when you put chemicals into the hoppers or tanks.

Tell all persons who are near chemicals of the possible dangerous results and the safety precautions that are necessary.

Stay upwind and away from smoke from a chemical fire.

Keep or discard all chemicals that are not used as specified by the chemical manufacturer.

1.2.8 Travel on public roads

Make sure you understand the speed, brakes, steering, stability, and load characteristics of this machine before you travel on public roads.

Use good judgment when traveling on public roads. Maintain complete control of the machine at all times. Never coast down hills.

The maximum speed of farm equipment is governed by local regulations. Adjust travel speed to maintain control at all times. See the specifications for the maximum speed for this machine.

Familiarize yourself with and obey all road regulations that apply to your machine. Consult your local law enforcement agency for local regulations regarding movement of farm equipment on public roads. Use head lamps, flashing warning lamps, tail lamps and turn signals, day and night, unless prohibited by local law.

Make sure all the flashers are operating prior to driving on the road. Make sure reflectors are correctly installed, in good condition, and wiped

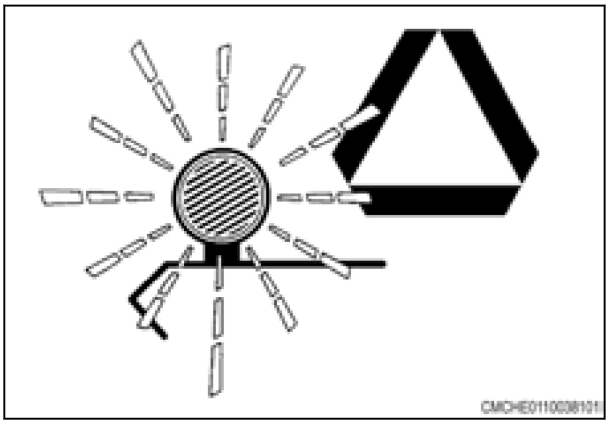

Fig. 13

SUGGESTED ASSEMBLY TORQUE VALUES (METRIC HARDWARE)												
	GRADE 8.8 ASSEMBLY TORQUE				GRADE 10.9 ASSEMBLY TORQUE				GRADE 12.9 ASSEMBLY TORQUE			
	DRY		LUBE		DRY		LUBE		DRY		LUBE	
SIZE	Ft.-Lb.	N.m	Ft.-Lb.	N.m	Ft.-Lb.	N.m	Ft.-Lb.	N.m	Ft.-Lb.	N.m	Ft.-Lb.	N.m
M4	2	3	2	3	3	4	3	4	4	5	3	4
M5	4	5	4	5	6	8	5	7	7	9	6	8
M6	7	9	6	8	10	13	9	12	12	16	10	14
M8x1.25	16	22	15	21	23	31	21	29	28	38	26	35
M8x1	18	24	16	22	25	34	23	31	30	40	27	37
M10x1.5	32	44	30	40	45	61	42	57	55	74	50	68
M10x1.25	34	46	32	43	48	65	44	60	58	78	53	72
M10x1	37	50	34	46	52	70	47	64	62	84	57	77
M12x1.75	56	76	52	70	78	106	73	99	94	127	87	118
M12x1.5	58	79	55	74	82	111	76	103	98	133	91	124
M12x1.25	60	82	56	76	86	116	79	107	103	139	94	128
M14x2	88	120	82	111	124	168	116	157	149	202	139	188
M14x1.5	96	130	89	120	135	183	125	169	162	219	150	203
M16x2	138	187	128	173	193	262	179	243	232	314	215	291
M16x1.5	146	198	135	183	205	278	190	257	246	333	227	308
M18	190	258	176	239	267	362	248	336	319	433	297	402
M18x2	201	272	186	252	282	382	261	354	338	458	313	424
M18x1.5	212	287	195	264	297	403	274	372	356	483	328	445
M20x2.5	267	362	248	336	375	509	348	472	450	610	417	566
M20x2	281	381	260	352	395	535	364	494	473	641	437	592
M20x1.5	295	400	271	368	415	562	381	517	496	673	457	620
M22	363	492	336	456	510	691	472	640	611	828	565	766
M22x2	380	515	350	475	534	724	493	668	639	866	590	800
M22x1.5	396	537	364	494	557	755	512	694	667	904	613	831
M24x3	461	625	427	579	648	878	600	814	775	1051	719	975
M24x2	499	677	460	624	701	951	646	876	840	1139	774	1049
M24x1.5	519	704	476	646	729	989	670	908	873	1184	802	1088
M27	674	915	624	846	948	1285	877	1189	1135	1539	1050	1424
M27x2	726	984	668	905	1019	1382	937	1271	1221	1655	1123	1522
M30	918	1244	850	1152	1289	1748	1194	1619	1544	2094	1430	1939
M30x2	1009	1368	927	1257	1418	1922	1303	1766	1698	2302	1561	2116

HADHED110351801

Fig. 29

2.3 Draper tension

IMPORTANT: *A draper with too much tension can cause the draper to wear quickly.*

NOTE: *When cutting green crops, increase the draper tension to more than the factory recommendation. This will help prevent crop buildup below the draper.*

2.3.1 Increase the draper tension

Procedure

1. Lower the reel all the way or raise the reel and engage the stops on the reel cylinders.
2. Park the machine on a solid level surface. Stop the engine, apply the parking brake, and take the key with you.
3. Use the tool on the back of the machine to loosen the draper tension.

   On 6 m (20 ft) headers, the tool is located in the inner side of the end panel.

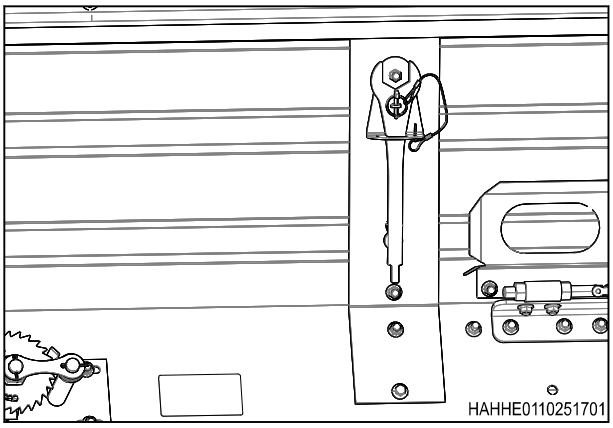

Fig. 1

4. Rotate the top of the adjuster (1) away from the center of the header.

   Rotate until the pointer (2) is in the middle of the adjustment slot (3).

   IMPORTANT:
   A draper can be damaged by too much tension. Do not tighten to more than 61 Nm (45 lbf ft).

5. Engage the latch (4) into the teeth of the adjuster.

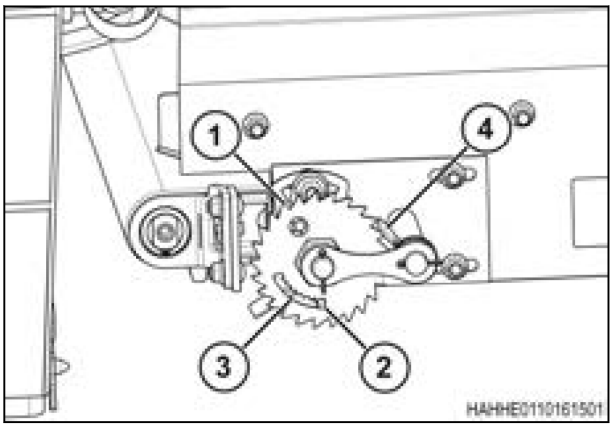

Fig. 2

2.3.2 Decrease the draper tension

Procedure

1. Lower the reel all the way or raise the reel and engage the stops on the reel cylinders.
2. Park the machine on a solid level surface. Stop the engine, apply the parking brake, and take the key with you.

Procedure

1. Assemble the aft end of the idler roller:

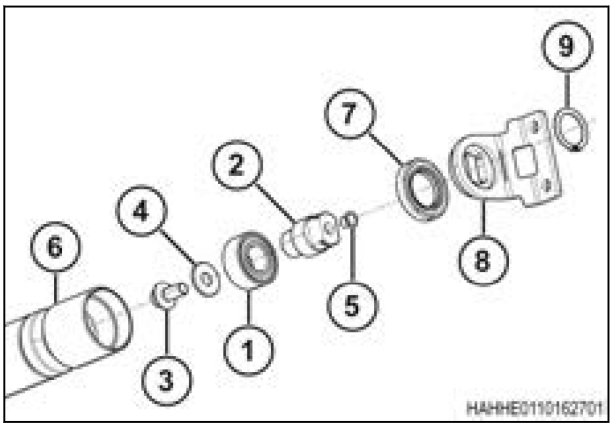

Fig. 24

a) Make sure that all the components are completely clean.
b) Put the bearing (1) onto the pin (2).
c) Apply a medium strength thread locker to the flange screw (3) threads.
d) Install the flange screw and the washer (4) into the pin. Torque the flange screw to 58 Nm (42 lbf ft).
e) Apply lithium grease to the first 6 mm to 12 mm (0.2 in to 0.5 in) of the threads inside the plug end of the pin.
f) Put the plug (5) into the pin.
g) Press the pin assembly into the lower stepped recess in the bearing housing (6).
h) Fill the seal cavity with 45.4 gm (0.1 lb) of lithium grease.
i) Press the seal (7) onto the pin and into the bearing housing until flush.

IMPORTANT: *Before the seal is installed, make sure that the outside diameter of the seal is free of grease.*

j) Put the rear idler roller bracket (8) on the pin.
k) Install the retaining ring (9) on the pin.

2. Assemble the forward end of the idler roller:

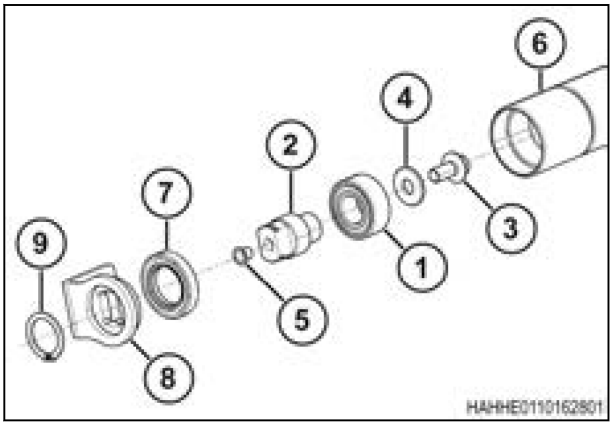

Fig. 25

a) Make sure that all the components are completely clean.
b) Put the bearing (1) onto the pin (2).
c) Apply a medium strength thread locker to the flange screw (3) threads.
d) Install the flange screw and the washer (4) into the pin. Torque the flange screw to 58 Nm (42 lbf ft).
e) Apply lithium grease to the first 6 mm to 12 mm (0.2 in to 0.5 in) of the threads inside the plug end of the pin.
f) Put the plug (5) into the pin.
g) Press the pin assembly into the lower stepped recess in the bearing housing (6).
h) Fill the seal cavity with 45.4 gm (0.1 lb) of lithium grease.
i) Press the seal (7) onto the pin and into the bearing housing until flush.

IMPORTANT: *Before the seal is installed, make sure that the outside diameter of the seal is free of grease.*

j) Put the front idler roller bracket (8) on the pin.
k) Install the retaining ring (9) on the pin.

2.6.4 Install the draper idler roller

Procedure

1. Lower the reel all the way or raise the reel and engage the stops on the reel cylinders.

2. Park the machine on a solid, level surface.

3. Apply the parking brake, stop the engine, and take the key with you.

3.1 Cutterbar troubleshooting

Cut is ragged or not even	
Cause(s)	**Solution(s)**
Parts of the cutterbar, such as knife sections, guards, wear plates, etc., are worn or broken	Examine and replace all worn and broken parts on the cutterbar.
The header flotation setting is not correct	Examine the flotation setting.
Bent knife, causing the cutting parts not to be free	Straighten the bent knives. Examine guard alignment and align if necessary.
Holddowns are worn or not adjusted to permit the knife to work freely	Adjust and align holddown so the knife works freely, but still keeping knife sections from lifting off guards.
Looseness between the knife and the guard	Adjust the holddown.
Ground speed is too fast	Reduce the ground speed.
The knife drive is not aligned correctly	Align the gearbox.

Cut crop is building up and falling in front of the cutterbar or the grain heads are being lost at the cutterbar	
Cause(s)	**Solution(s)**
The reel is too high or too far forward for delivery of the cut crop to the draper	Set the reel low enough to move the material from the cutterbar to the draper. Move the reel rearward.
The cutting platform is too high	Lower the cutting platform so the stalks are cut long enough for smooth, even feeding and windrow support.
Cutting angle too steep	Lower the gauge wheels and reduce the cutting angle.
Draper slipping	Correct the draper tension.

Knife is stalling	
Cause(s)	**Solution(s)**
Holddowns not adjusted correctly	Adjust the holddown to knife section clearance.
Dull or broken guards or knife sections	Replace dull or broken components.

Grain is shattering in front of the cutterbar	
Cause(s)	**Solution(s)**
Reel speed is not correct for the ground speed causing excessive movement before the crop is cut	Adjust the reel speed so the material will move evenly.
Ground speed is too fast for the condition of the crop	Reduce the ground speed.

3.3 Sickle drive gearbox

3.3.1 Examine the sickle vertical adjustment

Procedure

1. Lower the reel all the way or raise the reel and engage the stops on the reel cylinders.
2. Park the machine on a solid, level surface. Stop the engine, apply the parking brake, and take the key with you.
3. Manually rotate the flywheel until the sickle sections are in the center of the guards.
4. Loosen the clamp bolt in the sickle head so the sickle head is free to move on the bearing assembly.
5. **Standard sickles:** Examine for gaps between the sickle sections (1) and the guard ledger surface (2) in the two guards (3) nearest to the gearbox. Make sure the sickle sections contact the guard ledger surface evenly all the way fore and aft.

   If the contact between the sickle section and the guard ledger surface is not parallel, loosen the jam nut on the sickle head. Turn the sickle head so the contact is the same. Tighten the jam nut.

   NOTE:
   If necessary, remove the skid shoe for access to the sickle head jam nut.

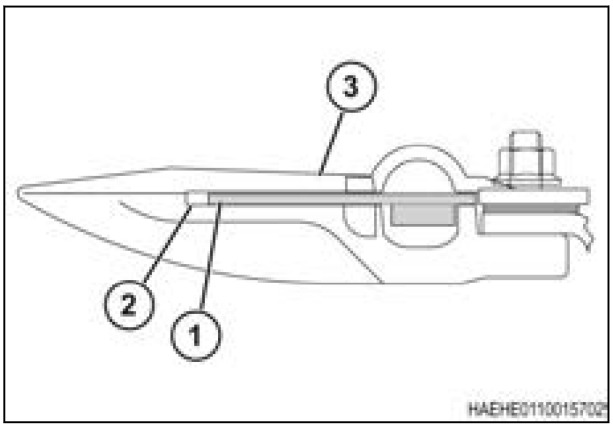

Fig. 17

6. **SCH sickles:** Examine the top and bottom gaps (1) between the first sickle section (2) and and the ledger surfaces of the guards (3). The gaps must be the same.

   If the gap between the sickle section and the guard ledger surface is not parallel, loosen the jam nut on the sickle head. Turn the sickle head so the gap is the same. Tighten the jam nut.

   NOTE:
   If necessary, remove the skid shoe for access to the sickle head jam nut.

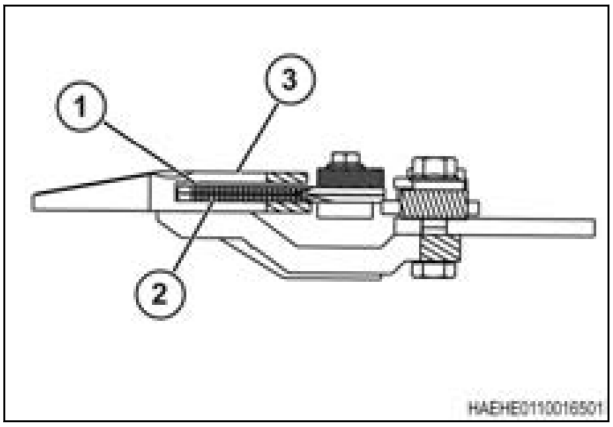

Fig. 18

7. Examine the distance between the bottom of the sickle section head (1) and the bottom of the bearing cap (2). The distance (A) must be ± 3 mm (± 0.118 in).

   If the distance is not correct, install or remove equal thickness shims from the front and the rear sets of shims.

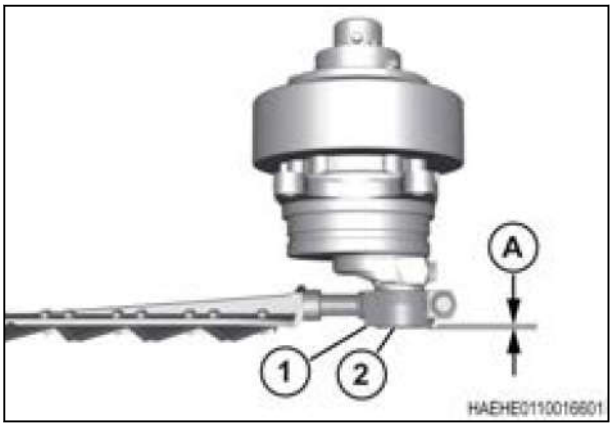

Fig. 19

9. Lubricate the bearing and the rotor seat.

Fig. 46

10. Press the rotor into the housing.

Fig. 47

11. Install the bearing (1) into the rotor.

Fig. 48

4.1 Change the hydraulic oil filter

Change the hydraulic oil filter after the first 50 hours of operation and then every 250 hours of operation.

Change the header hydraulic filter no more than 50 hours of operation after changing any hydraulic components.

Procedure

1. Lower the reel all the way or raise the reel and engage the stops on the reel cylinders.
2. Park the machine on a solid level surface. Stop the engine, apply the parking brake, and take the key with you.
3. Put a container under the filter (1).
4. Remove the filter from the filter head.
5. Remove the old O-ring if the O-ring or any part of the O-ring remains on the filter head.
6. Lubricate the O-ring of the new filter with clean lubricating oil.
7. Install the new filter turning clockwise until the gasket contacts the filter head.
8. Tighten the filter an additional 1/2 turn.

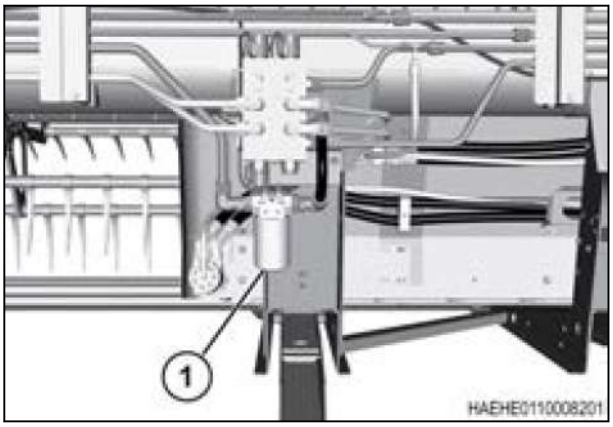

Fig. 1

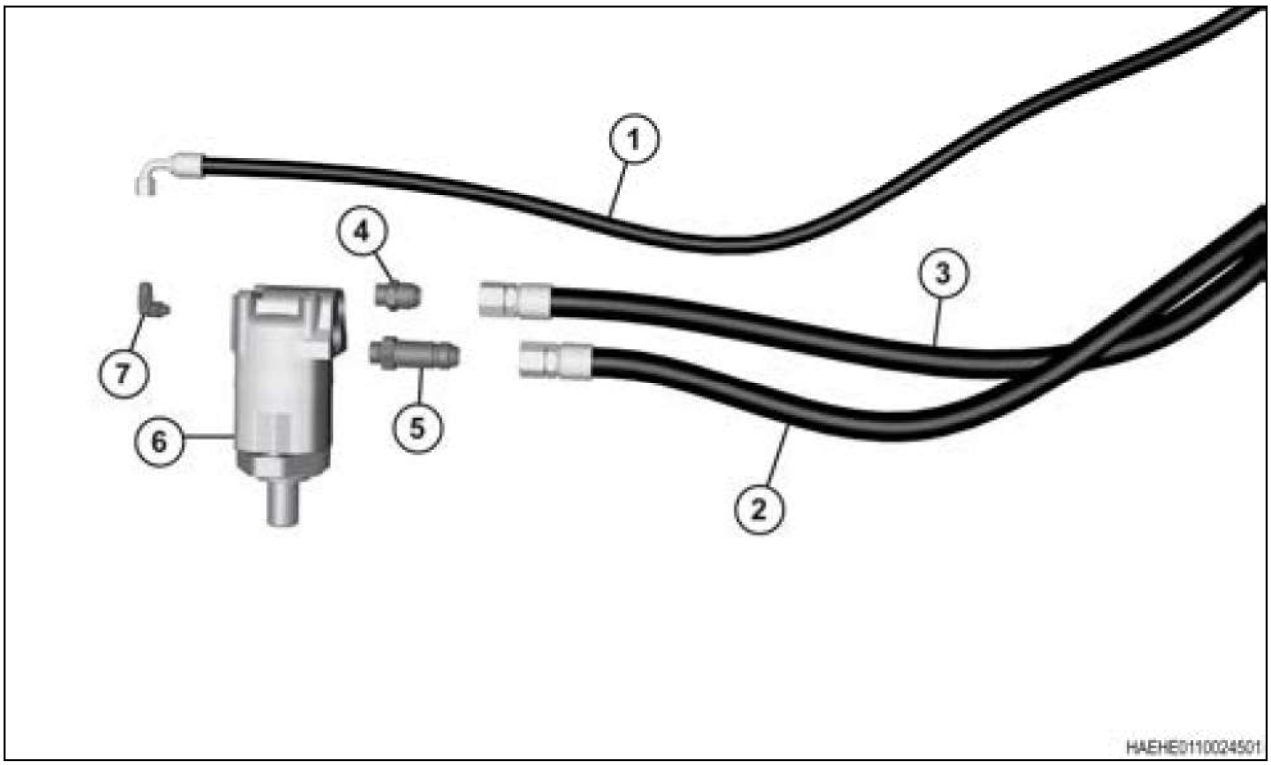

Fig. 18

10. Examine the identification tags on the components for correct installation.

(1) Case drain
(2) Hose - motor OUT
(3) Hose - motor IN
(4) Connector - port A
(5) Special connector - port B
(6) Sickle drive motor
(7) Case drain elbow

11. Adjust the clearance between the sensor and the sensor wheel to 2.03 to 3.04 mm (0.080 to 0.120 in).

12. Bleed the hydraulic lines.

13. Examine for any leaks.

14. Make sure the hydraulic fluid level in the reservoir is at the correct level.

15. Wash any hydraulic fluid from any of the components to prevent the deposit of dirt during field operation.

16. Close the end cover (2) and fasten the fasteners (1).

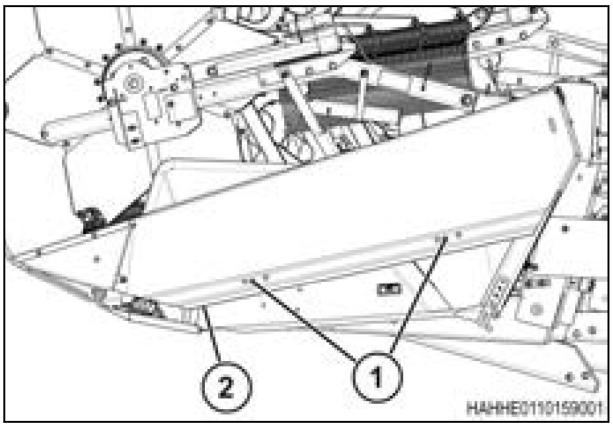

Fig. 19

4.7 Sickle drive relief valve

4.7.1 Sickle drive relief valve

(1) Relief valve assembly
(2) Relief cartridge 275 bar (4000 psi)
(3) Blocking valve 7.58 bar (110 psi)

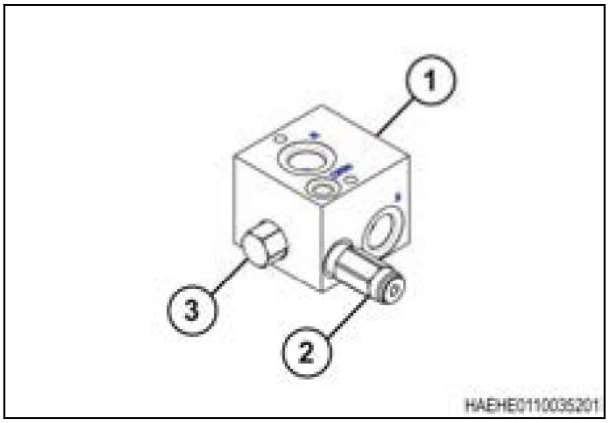

Fig. 42

Schematic

(1) Relief valve assembly
(2) Relief cartridge 275 bar (4000 psi)
(3) Blocking valve 7.58 bar (110 psi)

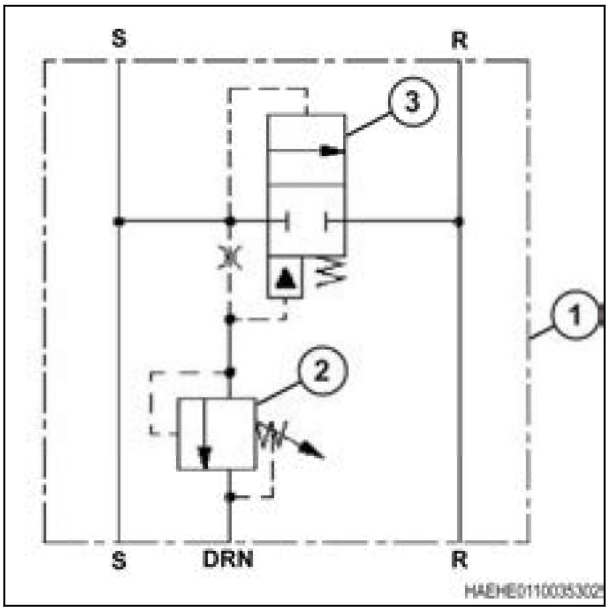

Fig. 43

4.7.2 Remove the sickle drive relief valve

WARNING: Hydraulic fluid under pressure can penetrate the skin or eyes.

Serious personal injury, blindness, or death can occur.

Relieve the pressure from the system or component before disconnecting components. Wear personal protective gear while working on the machine or equipment. Use a piece of cardboard to check for leaks. Never use your hand.

The procedure is the same for the left-hand relief valve and the right-hand relief valve, if equipped.

Procedure

1. Park the machine on a solid level surface. Stop the engine, apply the parking brake, and take the key with you.
2. Before removal, fasten identification tags on the components for correct installation at assembly.

4.10 Reel lift master cylinder

4.10.1 Remove the reel lift master cylinder

Procedure

1. Lower the reel all the way and release the pressure in the hydraulic system.
2. Park the machine on a solid level surface. Stop the engine, apply the parking brake, and take the key with you.
3. Support the reel arm (1).
4. Fasten identification tags on the hoses (2) for correct installation at assembly.
5. Slowly loosen and then remove the hoses.
6. Put caps and plugs on all hoses, fittings, ports, and openings to prevent contamination from entering the system.
7. Remove the cotter pin (3) and the pin (4) from the cylinder (5).
8. Remove the cylinder from the machine.
9. If necessary, loosen the jam nut and remove the threaded block from the cylinder rod.

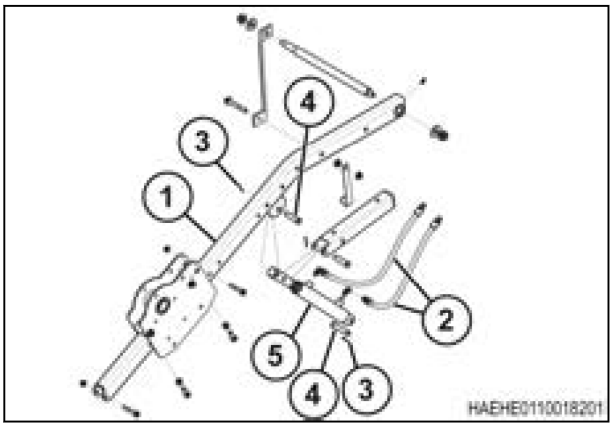

Fig. 55

3. Examine the draper shift motor and flush the draper shift system if the used draper shift motor has damage.

4. When installing a new draper shift motor:

   - Fill the draper shift motor housing with clean hydraulic fluid through the case drain opening
   - Install new O-rings onto the fittings
   - Install and tighten the fittings into the new draper shift motor

5. Install the cap screws (4) that hold the plate (5) onto the draper shift motor (3).

6. Install the sprocket (2) onto the draper shift motor.

7. Install and tighten the set screw (1).

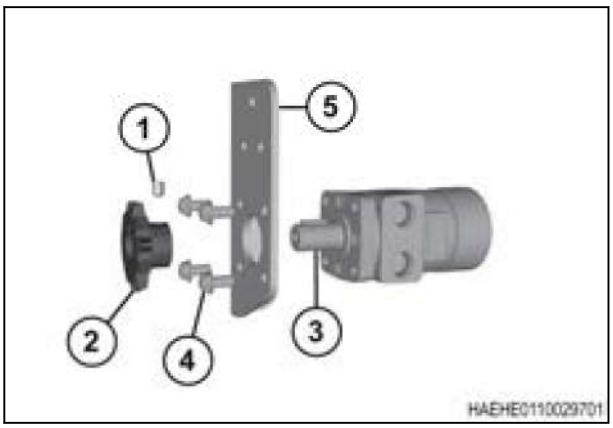

Fig. 68

8. Install the nuts (1) and the cap screws (2) that fastens the mounting plate.

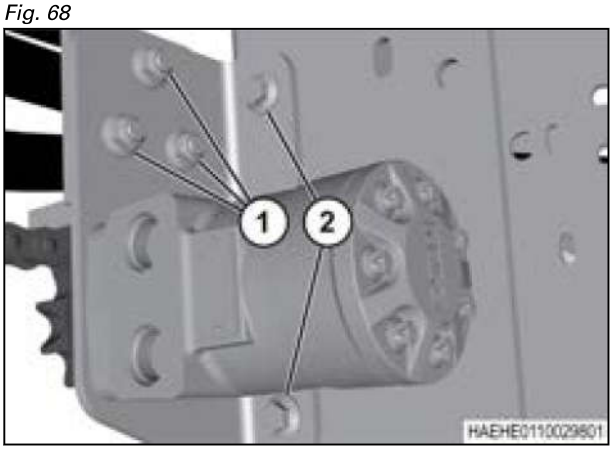

Fig. 69

9. Adjust the chain bracket (1).

10. Remove the caps and plugs on all hoses, fittings, ports, and openings.

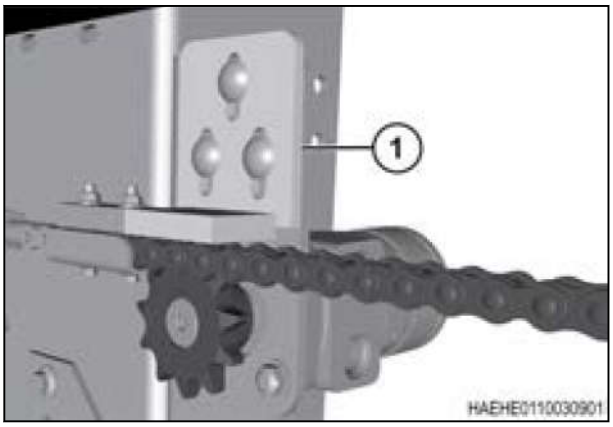

Fig. 70

18. Install the inner face seal (1) and the outer face seal (2) on the balance ring assembly (3) as shown.

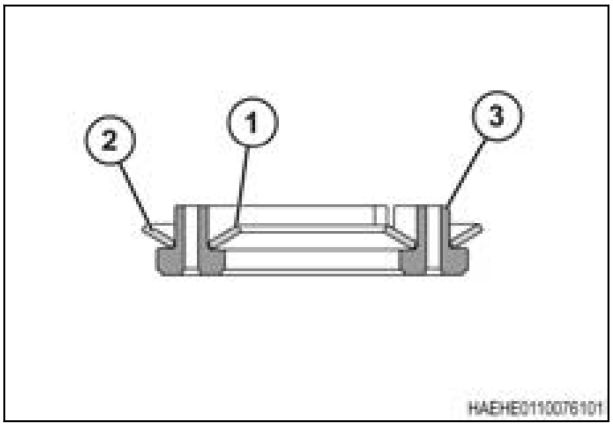

Fig. 89

19. Align the pin notches in the balance ring assembly (1) with the pins in the bore of the valve housing (2). Install the balance ring assembly (1) in the valve housing.

20. Push and hold the side of the balance ring as shown.

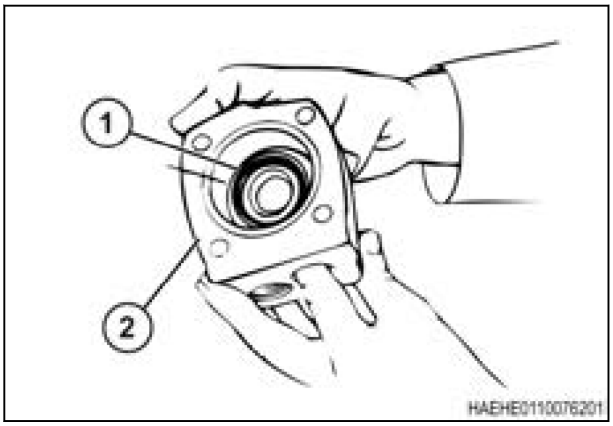

Fig. 90

21. Hold the balance ring assembly in position until the valve housing (1) is in position against the valve plate (2).

22. Push down on the valve housing. If the installation is correct, a spring tension will be felt.

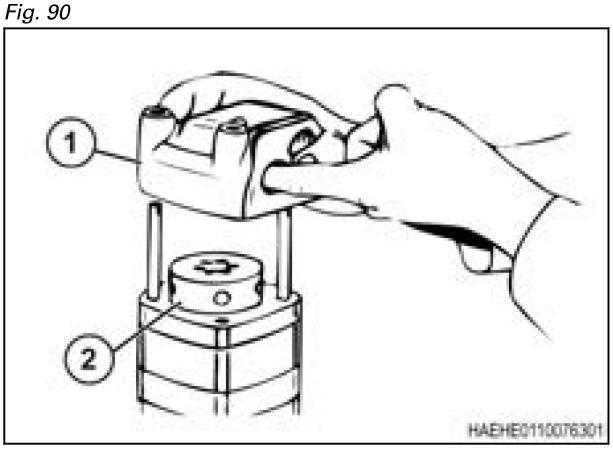

Fig. 91

23. Install two of the capcrews (1) opposite the alignment studs. Do not tighten the capscrews. Remove the alignment studs and install the remaining two capscrews. Tighten the four capscrews alternately to 50 Nm (450 lbf in).

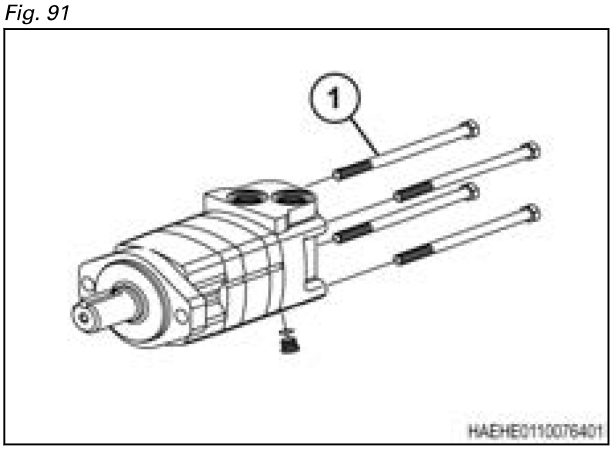

Fig. 92

22. If equipped, install the drive spacer (1).

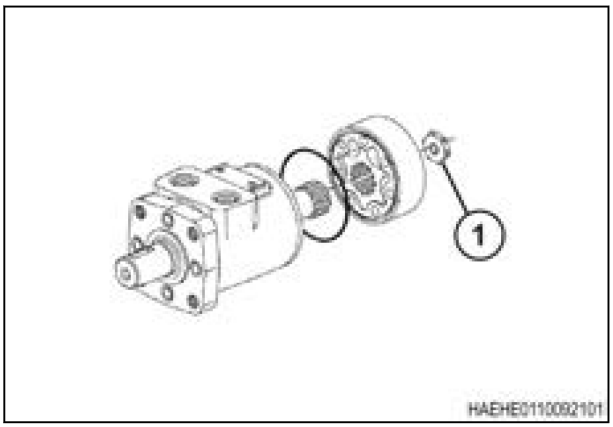

Fig. 115

23. Install the O-ring (3) into the end cap (2). Put the end cap on the gerotor.

24. Install the capscrews (1) and the seal washers, if equipped. Tighten the capscrews to 7.4 Nm (40 lbf in).

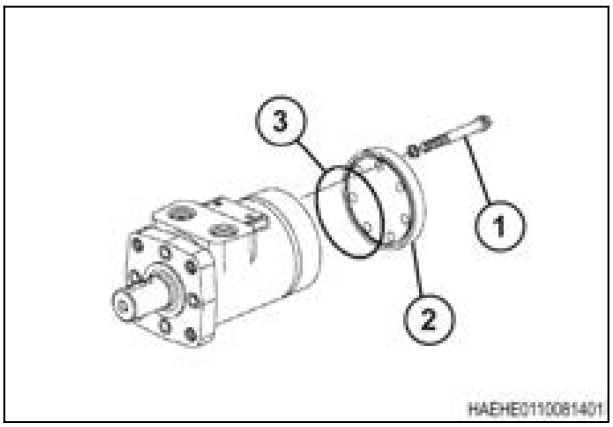

Fig. 116

25. Use the tightening sequence as shown. Tighten the capscrews to 27 to 28 Nm (235 to 250 lbf in).

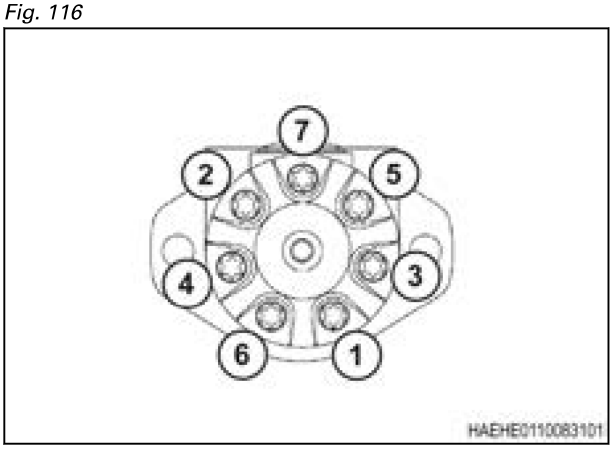

Fig. 117

Related Links

Examine the Eaton H series motor page 4-59

9. Put the terminal on the wire. Crimp the new terminal onto the wire.
10. Slowly push the terminal into the rear of the connector to the correct depth. Pull the wire a small amount to make sure the tabs are engaged in the body of the connector.
11. Seal the area where the wire enters the rear of the connector. Apply GE® Silicone II Black Rubber Adhesive Sealant, or equivalent.
12. Install the cover on the connector.
13. Install the strain relief.

5.2.7 Replace a Deutsch connector

Replacing a Deutsch connector requires the correct special tools.

Procedure

1. Disconnect the cover from the connector and slide the cover away from the connector.
2. Put the groove of the tool onto wire. Slowly push the tool all the way into the connector to push the fingers away from the pin or socket.

   NOTE: *IMPORTANT: Do not rotate the tool or insert the tool at an angle.*

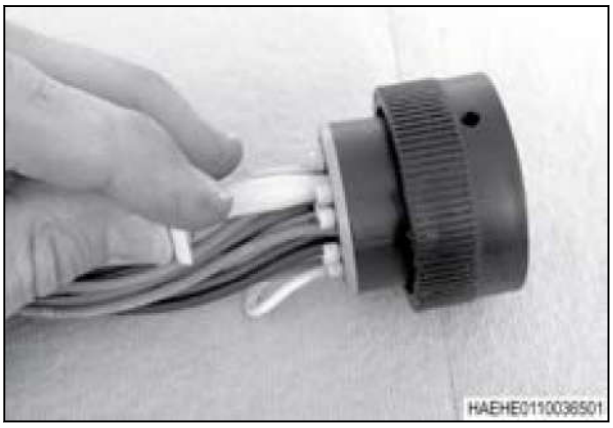

Fig. 7

3. Slowly remove the wire, terminal, and tool from the rear of the connector.
4. Remove the tool from the connector.
5. Cut the wire at the end of the terminal or socket.
6. Remove 6 to 8 mm (0.25 to 0.312 in) of insulation from the wire.
7. Crimp the new terminal onto the wire. Crimp the new terminal onto the wire. A special crimp tool is available for Deutsch connectors.

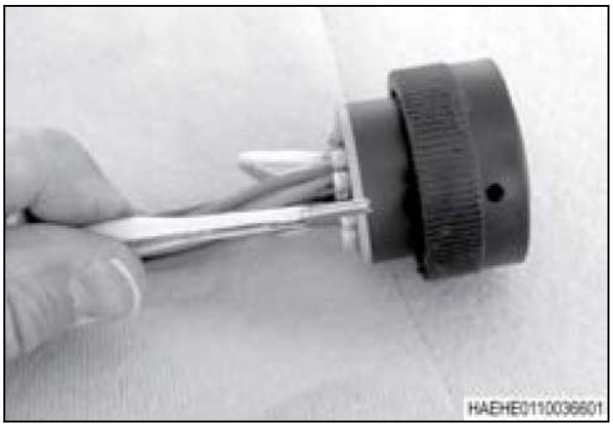

Fig. 8

6. Remove the cap screw (1) and the washer (2).

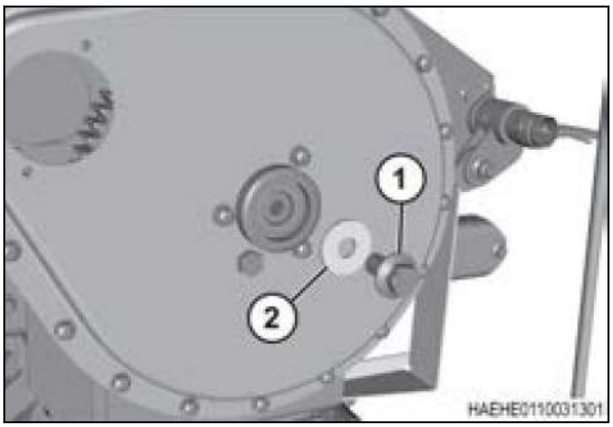

Fig. 3

7. Remove the cap screw (1) that holds the reflector bracket (2) on.

8. Remove the cap screws (3) from the bracket for the reel drive gearbox.

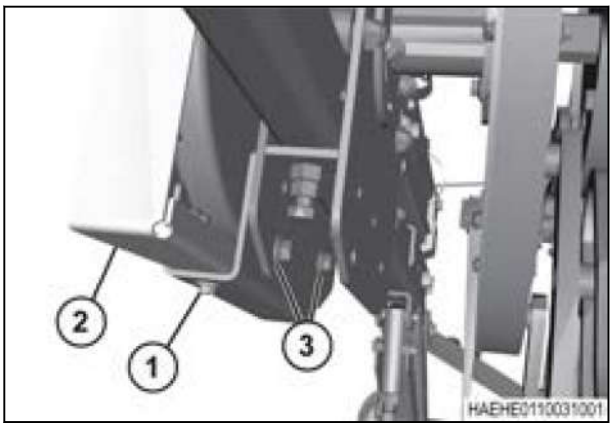

Fig. 4

9. Remove the reel drive gearbox (1).

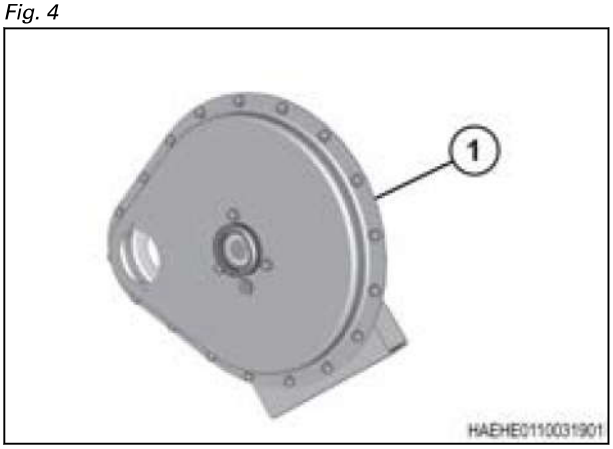

Fig. 5

Related Links

Remove the reel drive motor page 4-14

6.3.3 Install the reel drive gearbox

Procedure

1. Lower the reel all the way or raise the reel and engage the stops on the reel cylinders.
2. Park the machine on a solid level surface. Stop the engine, apply the parking brake, and take the key with you.
3. Completely clean all components to prevent contamination.

6.4.7 Replace a reel tine

Procedure

1. Lower the reel all the way or raise the reel and engage the stops on the reel cylinders.
2. Park the machine on a solid level surface. Stop the engine, apply the parking brake, and take the key with you.
3. Remove the screw (1) from the reel tine (2).
4. Open the part of the reel tine that is around the tine tube to disengage the projections from the tine tube.
5. Remove the reel tine from the tine tube.
6. Install the reel tine onto the tine tube. Make sure the projections in the reel tine are in the holes on the tine tube.
7. Install the screw into the reel tine. Tighten the screw to 6.8 Nm (60 lbf inch).

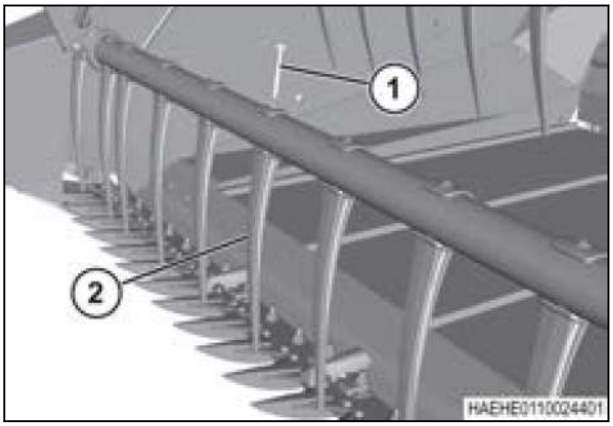

Fig. 29

6.4.8 Remove the tine tube

Procedure

1. Lower the reel all the way or raise the reel and engage the stops on the reel cylinders.
2. Park the machine on a solid level surface. Stop the engine, apply the parking brake, and take the key with you.
3. Support the tine tube (1).

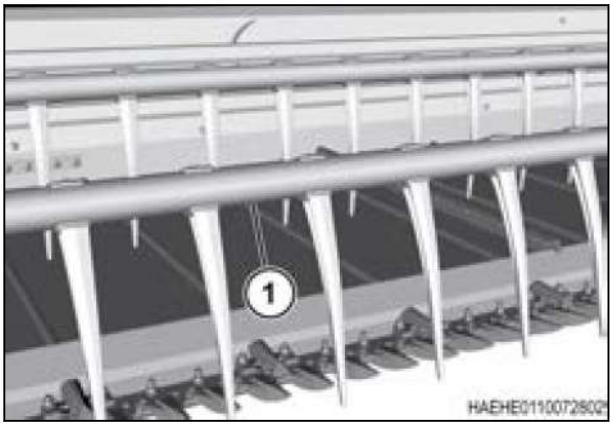

Fig. 30

8. Diagrams

8.3.3 Turn and hazard lamps with transport kit

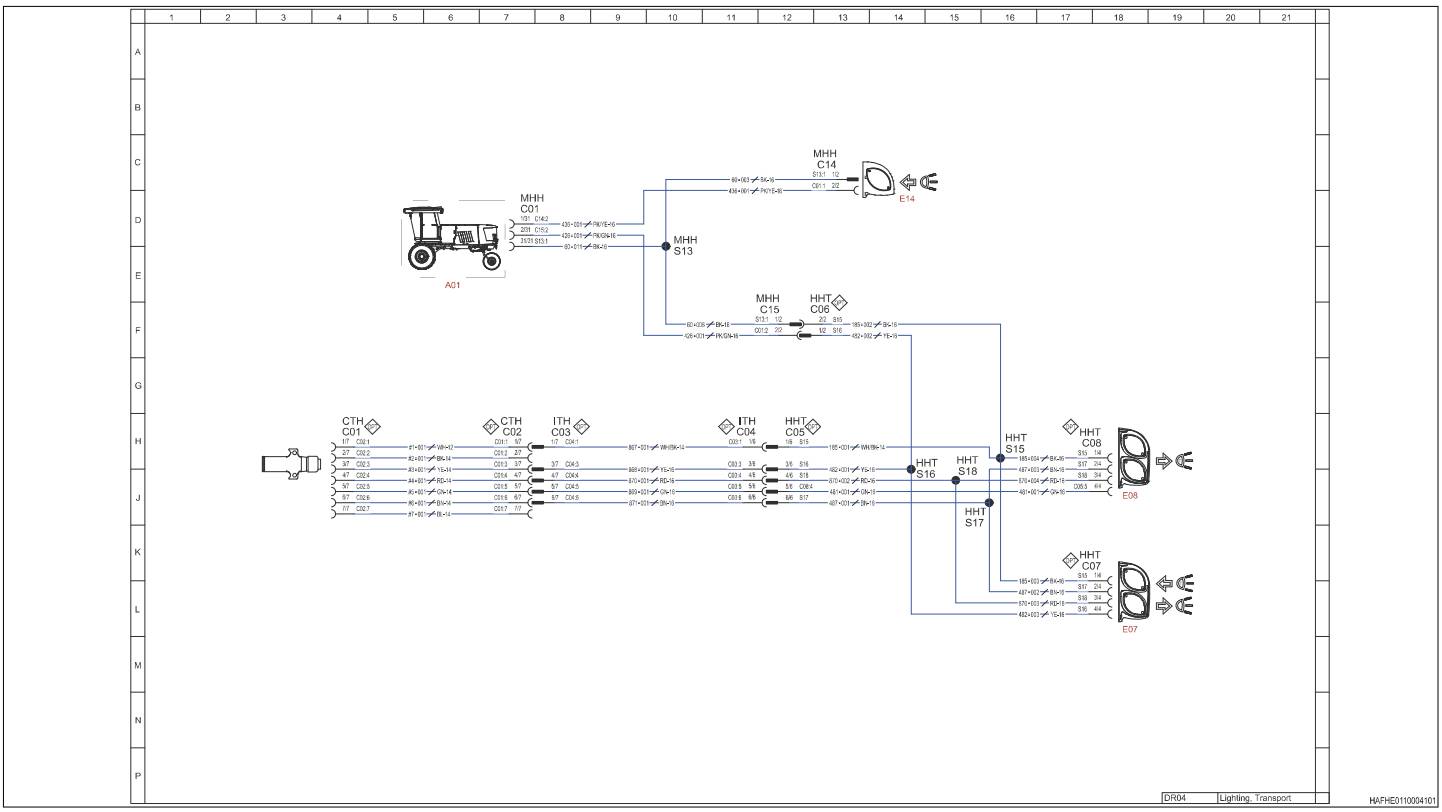

Fig. 11

8.6.2 Center delivery hydraulic schematic

Item	Description
1	Left sickle drive
2	Left reel lift cylinder
3	Left draper drive
4	Right draper drive
5	Right sickle drive
6	Right reel lift cylinder
7	Sickle drive control valve
8	Main single point
9	Reel and draper drive control valve
10	Reel drive pressure relief valve
11	Reel drive motor
12	Reel single point
13	Drive pressure from tractor
14	Return to tractor
15	Case drain to tractor
16	Reel lift
17	Return
18	Pressure