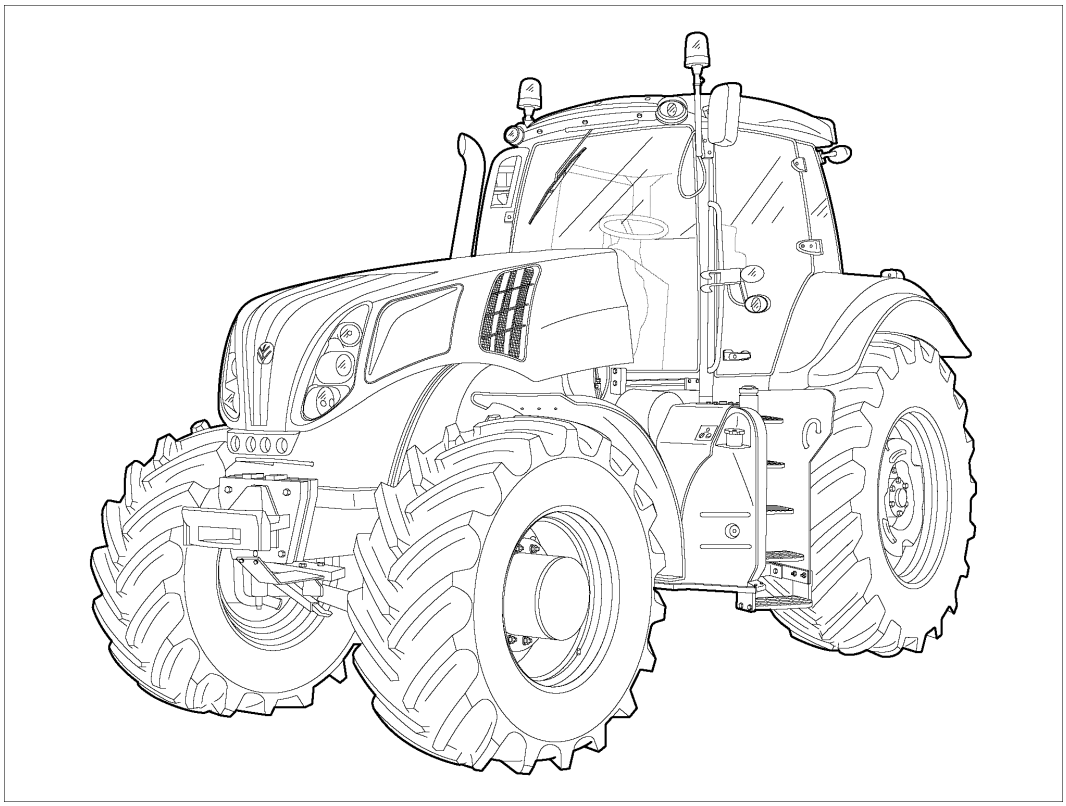
NEW HOLLAND
AGRICULTURE

SERVICE MANUAL



T8.275
T8.300
T8.330
T8.360
T8.390

Contents

INTRODUCTION

Contents

INTRODUCTION

Safety rules

Standard safety precautions

Be informed and notify personnel of the laws in force regulating safety, and provide documentation available for consultation.

- Keep working areas as clean as possible.
- Ensure that working areas are provided with emergency boxes. They must be clearly visible and always contain adequate sanitary equipment.
- Fire extinguishers must be properly identified and always be clear of obstructions. Their efficiency must be checked on a regular basis and personnel must be trained on proper interventions and priorities.
- Keep all emergency exits free of obstructions and clearly marked.
- Smoking in working areas subject to fire danger must be strictly prohibited.

Prevention of injury

- Wear suitable work attire and safety glasses with no jewelry such as rings and chains when working close to engines and equipment in motion.
- Wear safety gloves and goggles when performing the following operations:
  - Topping off or changing lubrication oils.
  - Using compressed air or liquids at a pressure greater than **2 bar** (**29 psi**).
- Wear a safety helmet when working close to hanging loads or equipment working at head level.
- Always wear safety shoes and fitting clothes.
- Use protection cream for hands.
- Change wet clothes as soon as possible.
- In the presence of voltages exceeding **48 - 60 V**, verify the efficiency of the ground and mass electrical connections. Ensure that hands and feet are dry and use isolating foot boards. Workers should be properly trained to work with electricity.
- Do not smoke or start an open flame close to batteries and any fuel material.
- Place soiled rags with oil, diesel fuel or solvents in specially provided anti-fire containers.
- Do not use any tool or equipment for any use other than what it was originally intended for. Serious injury may occur.
- If running an engine indoors, make sure there is a sufficient exhaust fan in use to eliminate exhaust fumes.

During maintenance

- Never open the filler cap of the cooling system when the engine is hot. High temperature liquid at operating pressure could result in serious danger and risk of burn. Wait until the temperature decreases under **50 °C** (**122 °F**).
- Never add coolant to an overheated engine and use only appropriate liquids.
- Always work when the engine is turned off. Certain circumstances require maintenance on a running engine. Be aware of all the risks involved with such an operation.
- Always use adequate and safe containers for engine fluids and used oil.
- Keep engine clean of any spilled fluids such as oil, diesel fuel, and or chemical solvents.
- Use of solvents or detergents during maintenance may emit toxic vapors. Always keep working areas aerated. Wear a safety mask if necessary.
- Do not leave soiled rags that may contain any flammable substances close to the engine.
- Always use caution when starting an engine after any work has been performed. Be prepared to cut off intake air in case of engine runaway.
- Never disconnect the batteries while the engine is running.

- Disconnect the batteries prior to performing any work on the equipment.
- Disconnect the batteries to place a load on them with a load tester.
- After any work is performed, verify that the battery clamp polarity is correct and that the clamps are tight and safe from accidental short circuit and oxidation.
- Before disconnecting any pipelines (pneumatic, hydraulic, fuel pipes, etc.), verify that all pressure has been released. Take all necessary precautions bleeding and draining residual pressure. Always wear the proper safety equipment.
- Do not alter the lengths of any wires.
- Do not connect any electronic service tool to the engine electrical equipment unless specifically approved by Iveco.
- Do not modify the fuel system or hydraulic system unless approved by Iveco, Any unauthorized modification will compromise warranty assistance and may affect engine operation and life span.

For engine equipped with an electronic control unit

- Do not weld on any part of the equipment without removing the control unit.
- Remove the in case of work requiring heating over **80 °C** (**176 °F**).
- Do not paint the components and the electronic connections.
- Do not alter any data filed in the electronic control unit driving the engine. Any manipulation or alteration of electronic components will void engine warranty assistance and may affect the correct working order and life span of the engine.

Respect of the Environment

- Respect of the environment should be of primary importance. Take all necessary precautions to ensure personnel's safety and health.
- Inform the personnel of the laws regarding the dispensing of used engine fluids.
- Handle batteries with care, storing them in a well ventilated environment and within anti-acid container.

Torque - Minimum tightening torques for normal assembly

METRIC NON-FLANGED HARDWARE

NOM. SIZE	CLASS 8.8 BOLT and CLASS 8 NUT		CLASS 10.9 BOLT and CLASS 10 NUT		LOCKNUT CL.8 W/CL8.8 BOLT	LOCKNUT CL.10 W/CL10.9 BOLT
	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr		
M4	2.2 N·m (19 lb in)	2.9 N·m (26 lb in)	3.2 N·m (28 lb in)	4.2 N·m (37 lb in)	2 N·m (18 lb in)	2.9 N·m (26 lb in)
M5	4.5 N·m (40 lb in)	5.9 N·m (52 lb in)	6.4 N·m (57 lb in)	8.5 N·m (75 lb in)	4 N·m (36 lb in)	5.8 N·m (51 lb in)
M6	7.5 N·m (66 lb in)	10 N·m (89 lb in)	11 N·m (96 lb in)	15 N·m (128 lb in)	6.8 N·m (60 lb in)	10 N·m (89 lb in)
M8	18 N·m (163 lb in)	25 N·m (217 lb in)	26 N·m (234 lb in)	35 N·m (311 lb in)	17 N·m (151 lb in)	24 N·m (212 lb in)
M10	37 N·m (27 lb ft)	49 N·m (36 lb ft)	52 N·m (38 lb ft)	70 N·m (51 lb ft)	33 N·m (25 lb ft)	48 N·m (35 lb ft)
M12	64 N·m (47 lb ft)	85 N·m (63 lb ft)	91 N·m (67 lb ft)	121 N·m (90 lb ft)	58 N·m (43 lb ft)	83 N·m (61 lb ft)
M16	158 N·m (116 lb ft)	210 N·m (155 lb ft)	225 N·m (166 lb ft)	301 N·m (222 lb ft)	143 N·m (106 lb ft)	205 N·m (151 lb ft)
M20	319 N·m (235 lb ft)	425 N·m (313 lb ft)	440 N·m (325 lb ft)	587 N·m (433 lb ft)	290 N·m (214 lb ft)	400 N·m (295 lb ft)
M24	551 N·m (410 lb ft)	735 N·m (500 lb ft)	762 N·m (560 lb ft)	1016 N·m (750 lb ft)	501 N·m (370 lb ft)	693 N·m (510 lb ft)

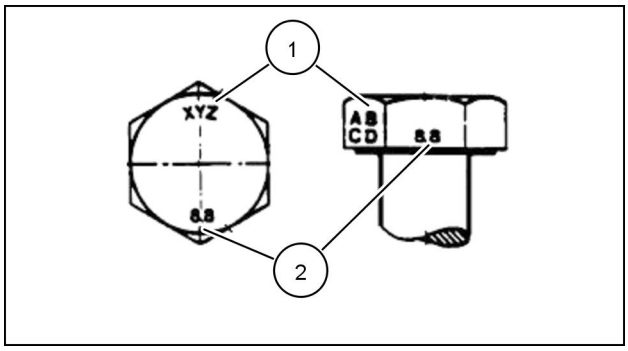
NOTE: *M4 through M8 hardware torque specifications are shown in pound-inches. M10 through M24 hardware torque specifications are shown in pound-feet.*

METRIC FLANGED HARDWARE

NOM. SIZE	CLASS 8.8 BOLT and CLASS 8 NUT		CLASS 10.9 BOLT and CLASS 10 NUT		LOCKNUT CL.8 W/CL8.8 BOLT	LOCKNUT CL.10 W/CL10.9 BOLT
	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr		
M4	2.4 N·m (21 lb in)	3.2 N·m (28 lb in)	3.5 N·m (31 lb in)	4.6 N·m (41 lb in)	2.2 N·m (19 lb in)	3.1 N·m (27 lb in)
M5	4.9 N·m (43 lb in)	6.5 N·m (58 lb in)	7.0 N·m (62 lb in)	9.4 N·m (83 lb in)	4.4 N·m (39 lb in)	6.4 N·m (57 lb in)
M6	8.3 N·m (73 lb in)	11 N·m (96 lb in)	12 N·m (105 lb in)	16 N·m (141 lb in)	7.5 N·m (66 lb in)	11 N·m (96 lb in)
M8	20 N·m (179 lb in)	27 N·m (240 lb in)	29 N·m (257 lb in)	39 N·m (343 lb in)	18 N·m (163 lb in)	27 N·m (240 lb in)
M10	40 N·m (30 lb ft)	54 N·m (40 lb ft)	57 N·m (42 lb ft)	77 N·m (56 lb ft)	37 N·m (27 lb ft)	53 N·m (39 lb ft)
M12	70 N·m (52 lb ft)	93 N·m (69 lb ft)	100 N·m (74 lb ft)	134 N·m (98 lb ft)	63 N·m (47 lb ft)	91 N·m (67 lb ft)
M16	174 N·m (128 lb ft)	231 N·m (171 lb ft)	248 N·m (183 lb ft)	331 N·m (244 lb ft)	158 N·m (116 lb ft)	226 N·m (167 lb ft)
M20	350 N·m (259 lb ft)	467 N·m (345 lb ft)	484 N·m (357 lb ft)	645 N·m (476 lb ft)	318 N·m (235 lb ft)	440 N·m (325 lb ft)
M24	607 N·m (447 lb ft)	809 N·m (597 lb ft)	838 N·m (618 lb ft)	1118 N·m (824 lb ft)	552 N·m (407 lb ft)	

IDENTIFICATION

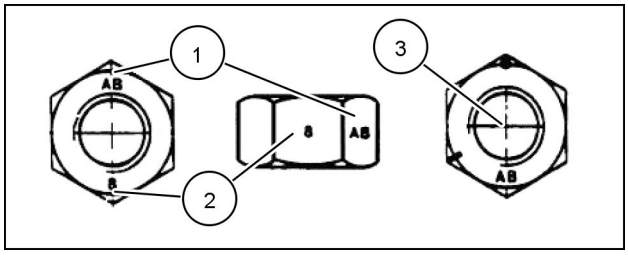
Metric Hex head and carriage bolts, classes 5.6 and up



20083680 1

1. Manufacturer's Identification
2. Property Class

Metric Hex nuts and locknuts, classes 05 and up



20083681 2

1. Manufacturer's Identification
2. Property Class
3. Clock Marking of Property Class and Manufacturer's Identification (Optional), i.e. marks **60 °** apart indicate Class 10 properties, and marks **120 °** apart indicate Class 8.

INCH NON-FLANGED HARDWARE

NOMINAL SIZE	SAE GRADE 5 BOLT and NUT		SAE GRADE 8 BOLT and NUT		LOCKNUT GrB W/ Gr5 BOLT	LOCKNUT GrC W/ Gr8 BOLT
	UN-PLATED or PLATED SILVER	PLATED W/ZnCr GOLD	UN-PLATED or PLATED SILVER	PLATED W/ZnCr GOLD		
1/4	**8 N·m (71 lb in)**	**11 N·m (97 lb in)**	**12 N·m (106 lb in)**	**16 N·m (142 lb in)**	**8.5 N·m (75 lb in)**	**12.2 N·m (109 lb in)**
5/16	**17 N·m (150 lb in)**	**23 N·m (204 lb in)**	**24 N·m (212 lb in)**	**32 N·m (283 lb in)**	**17.5 N·m (155 lb in)**	**25 N·m (220 lb in)**
3/8	**30 N·m (22 lb ft)**	**40 N·m (30 lb ft)**	**43 N·m (31 lb ft)**	**57 N·m (42 lb ft)**	**31 N·m (23 lb ft)**	**44 N·m (33 lb ft)**
7/16	**48 N·m (36 lb ft)**	**65 N·m (48 lb ft)**	**68 N·m (50 lb ft)**	**91 N·m (67 lb ft)**	**50 N·m (37 lb ft)**	**71 N·m (53 lb ft)**
1/2	**74 N·m (54 lb ft)**	**98 N·m (73 lb ft)**	**104 N·m (77 lb ft)**	**139 N·m (103 lb ft)**	**76 N·m (56 lb ft)**	**108 N·m (80 lb ft)**
9/16	**107 N·m (79 lb ft)**	**142 N·m (105 lb ft)**	**150 N·m (111 lb ft)**	**201 N·m (148 lb ft)**	**111 N·m (82 lb ft)**	**156 N·m (115 lb ft)**
5/8	**147 N·m (108 lb ft)**	**196 N·m (145 lb ft)**	**208 N·m (153 lb ft)**	**277 N·m (204 lb ft)**	**153 N·m (113 lb ft)**	**215 N·m (159 lb ft)**
3/4	**261 N·m (193 lb ft)**	**348 N·m (257 lb ft)**	**369 N·m (272 lb ft)**	**491 N·m (362 lb ft)**	**271 N·m (200 lb ft)**	**383 N·m (282 lb ft)**
7/8	**420 N·m (310 lb ft)**	**561 N·m (413 lb ft)**	**594 N·m (438 lb ft)**	**791 N·m (584 lb ft)**	**437 N·m (323 lb ft)**	**617 N·m (455 lb ft)**
1	**630 N·m (465 lb ft)**	**841 N·m (620 lb ft)**	**890 N·m (656 lb ft)**	**1187 N·m (875 lb ft)**	**654 N·m (483 lb ft)**	**924 N·m (681 lb ft)**

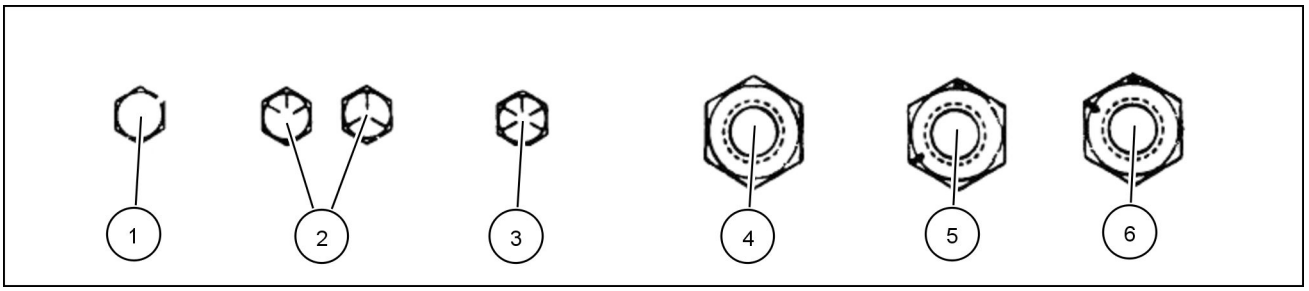
NOTE: *For Imperial Units,* ***1/4 in*** *and* ***5/16 in*** *hardware torque specifications are shown in pound-inches.* ***3/8 in*** *through* ***1 in*** *hardware torque specifications are shown in pound-feet.*

INCH FLANGED HARDWARE

NOM-INAL SIZE	SAE GRADE 5 BOLT and NUT		SAE GRADE 8 BOLT and NUT		LOCKNUT GrF W/ Gr5 BOLT	LOCKNUT GrG W/ Gr8 BOLT
	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD		
1/4	**9 N·m (80 lb in)**	**12 N·m (106 lb in)**	**13 N·m (115 lb in)**	**17 N·m (150 lb in)**	**8 N·m (71 lb in)**	**12 N·m (106 lb in)**
5/16	**19 N·m (168 lb in)**	**25 N·m (221 lb in)**	**26 N·m (230 lb in)**	**35 N·m (310 lb in)**	**17 N·m (150 lb in)**	**24 N·m (212 lb in)**
3/8	**33 N·m (25 lb ft)**	**44 N·m (33 lb ft)**	**47 N·m (35 lb ft)**	**63 N·m (46 lb ft)**	**30 N·m (22 lb ft)**	**43 N·m (32 lb ft)**
7/16	**53 N·m (39 lb ft)**	**71 N·m (52 lb ft)**	**75 N·m (55 lb ft)**	**100 N·m (74 lb ft)**	**48 N·m (35 lb ft)**	**68 N·m (50 lb ft)**
1/2	**81 N·m (60 lb ft)**	**108 N·m (80 lb ft)**	**115 N·m (85 lb ft)**	**153 N·m (113 lb ft)**	**74 N·m (55 lb ft)**	**104 N·m (77 lb ft)**
9/16	**117 N·m (86 lb ft)**	**156 N·m (115 lb ft)**	**165 N·m (122 lb ft)**	**221 N·m (163 lb ft)**	**106 N·m (78 lb ft)**	**157 N·m (116 lb ft)**
5/8	**162 N·m (119 lb ft)**	**216 N·m (159 lb ft)**	**228 N·m (168 lb ft)**	**304 N·m (225 lb ft)**	**147 N·m (108 lb ft)**	**207 N·m (153 lb ft)**
3/4	**287 N·m (212 lb ft)**	**383 N·m (282 lb ft)**	**405 N·m (299 lb ft)**	**541 N·m (399 lb ft)**	**261 N·m (193 lb ft)**	**369 N·m (272 lb ft)**
7/8	**462 N·m (341 lb ft)**	**617 N·m (455 lb ft)**	**653 N·m (482 lb ft)**	**871 N·m (642 lb ft)**	**421 N·m (311 lb ft)**	**594 N·m (438 lb ft)**
1	**693 N·m (512 lb ft)**	**925 N·m (682 lb ft)**	**979 N·m (722 lb ft)**	**1305 N·m (963 lb ft)**	**631 N·m (465 lb ft)**	**890 N·m (656 lb ft)**

IDENTIFICATION

Inch Bolts and free-spinning nuts

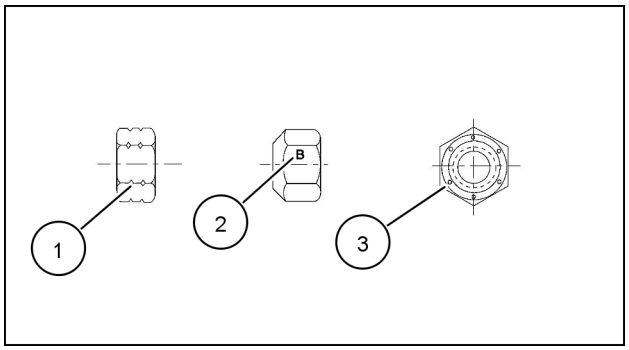


20083682 3

Grade Marking Examples

SAE Grade Identification			
1	Grade 2 - No Marks	4	Grade 2 Nut - No Marks
2	Grade 5 - Three Marks	5	Grade 5 Nut - Marks **120 °** Apart
3	Grade 8 - Five Marks	6	Grade 8 Nut - Marks **60 °** Apart

Inch Lock Nuts, All Metal (Three optional methods)



20090268 4

Grade Identification

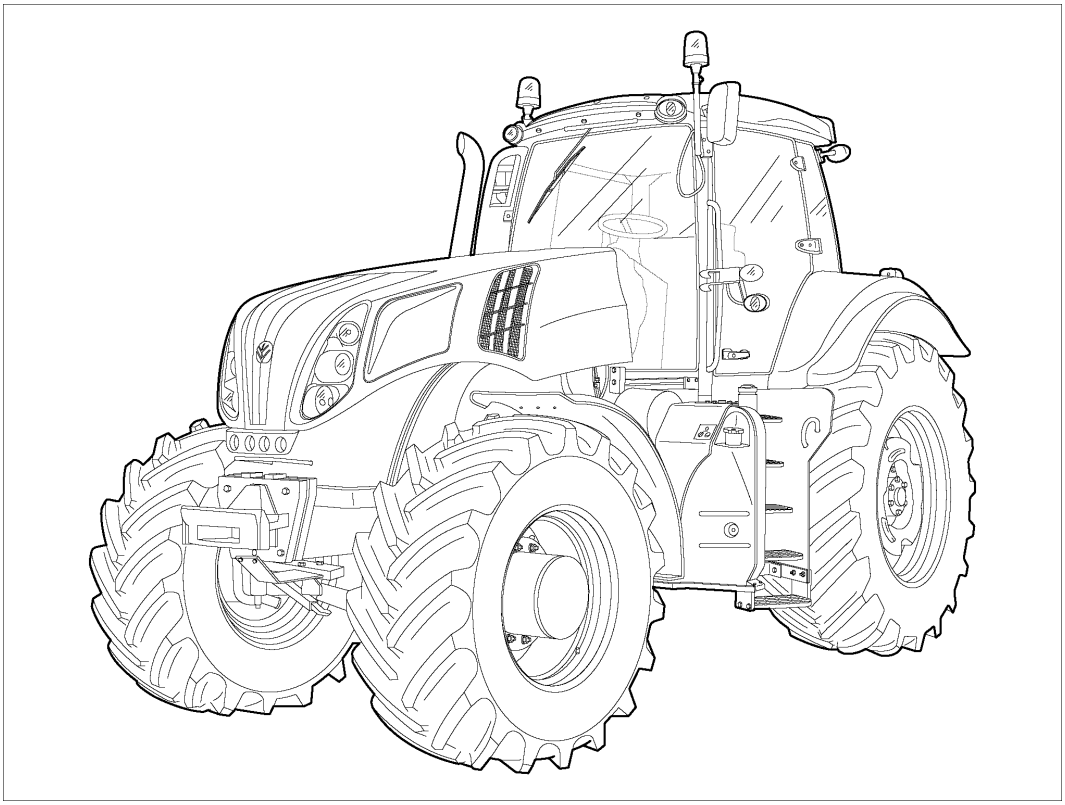
Grade	Corner Marking Method (1)	Flats Marking Method (2)	Clock Marking Method (3)
Grade A	No Notches	No Mark	No Marks
Grade B	One Circumferential Notch	Letter B	Three Marks
Grade C	Two Circumferential Notches	Letter C	Six Marks

Capacities

System	Metric	U.S.	Imperial
9.0 l engine			
Engine oil – no filter change	**25 l**	**6.6 US gal**	**5.5 UK gal**
Engine oil– with filter change	**25 l**	**6.6 US gal**	**5.5 UK gal**
Cooling system	**26.5 l**	**7 US gal**	**5.8 UK gal**
Transmission/hydraulic system	**172 l**	**45.5 US gal**	**38 UK gal**
Mechanical front drive			
4 Pin – **100 mm** (**4 in**) hub length standard axle*			
Differential	**11.8 l**	**12.5 US qt** (A)	**21.6 UK pt**
Planetary (each)	**1.4 l**	**3 US pt**	**2.5 UK pt**
4 Pin – **180 mm** (**7 in**) hub length heavy duty axle*			
Differential	**11.8 l**	**12.5 US qt**	**20.8 UK pt**
Planetary (each)	**3.3 l**	**7 US pt**	**5.8 UK pt**
4 pin – **250 mm** (**10 in**) hub length heavy duty class 5 axle			
Differential	**15 l**	**15.8 US qt**	**26.4 UK pt**
Planetary (each)	**6 l**	**12.7 US pt**	**10.5 UK pt**
Front PTO	**3.05 l**	**3.2 US qt**	--
DEF/ADBLUE® Tank	**87 l**	**23 US gal**	**23.8 UK gal**
Fuel tank	**636 l**	**168 US gal**	**140 UK gal**
* Pin quantity is determined by observing the wheel ends.			

SERVICE MANUAL

HYDRAULIC, PNEUMATIC, ELECTRICAL, ELECTRONIC SYSTEMS



T8.275
T8.300
T8.330
T8.360
T8.390

Contents

HYDRAULIC, PNEUMATIC, ELECTRICAL, ELECTRONIC SYSTEMS - A

HYDRAULIC, PNEUMATIC, ELECTRICAL, ELECTRONIC SYSTEMS - A

PRIMARY HYDRAULIC POWER SYSTEM - 10.A

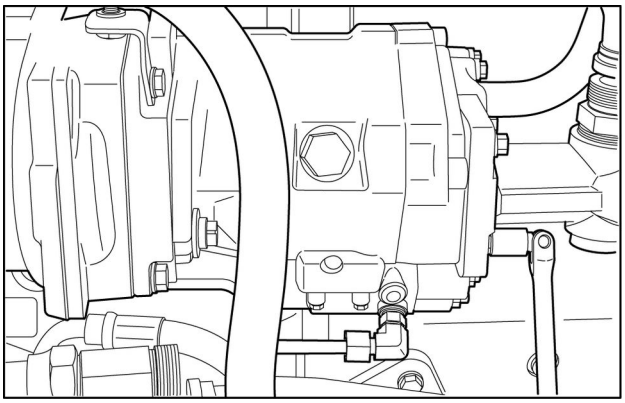
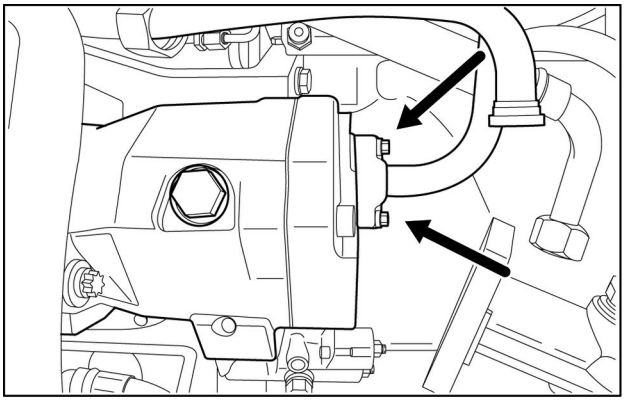
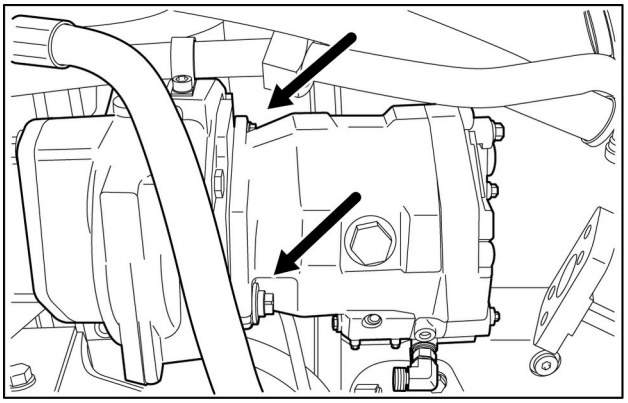
T8.275
T8.300
T8.330
T8.360
T8.390

Contents

HYDRAULIC, PNEUMATIC, ELECTRICAL, ELECTRONIC SYSTEMS - A

PRIMARY HYDRAULIC POWER SYSTEM - 10.A

Pressure/flow compensating (PFC) pump - Torque

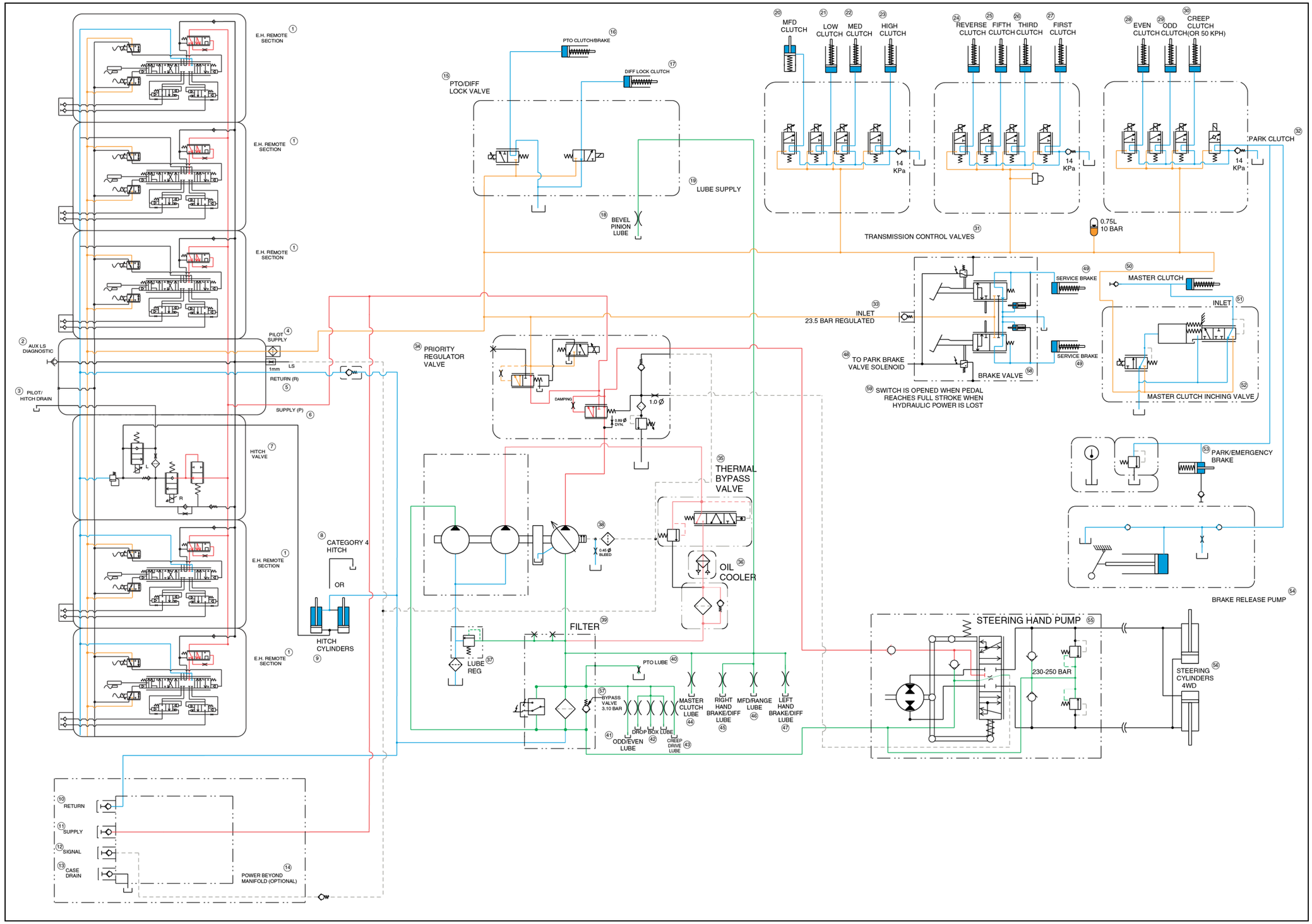
Component	Nm	Identification	lb-ft
Filter head retaining bolts	**62 - 80 Nm**	 RCPH11CCH433AAA 1	**46 - 59 lb ft**
Pressure and flow compensating (PFC) pump split flange retaining bolts	**40 - 60 Nm**	 RCPH11CCH435AAA 2	**30 - 44 lb ft**
Pressure and flow compensating (PFC) pump mounting bolts	**62 - 80 Nm**	 RCPH11CCH437AAA 3	**46 - 59 lb ft**

PRIMARY HYDRAULIC POWER SYSTEM - Hydraulic schematic frame 01

Hydraulic schematic 84414791

	PFC PISTON PUMP
	CHARGE LUBE/LUBE PUMP FLOW
	REGULATED CIRCUIT PRESSURE
	RETURN TO TANK/SUMP
	OIL COOLER/FILTRATION, AUX CHARGE PUMP FLOW

1. Remote section	31. Transmission control valves
2. Load sense diagnostic	32. Park clutch
3. Pilot/hitch drain	33. Inlet regulator
4. Pilot supply	34. Priority regulator valve
5. Return	35. Thermal bypass valve
6. Supply	36. Oil cooler
7. Hitch valve	37. Lube regulator
8. Category 4 hitch	38. Piston pump
9. Hitch cylinders	39. Filter
10. Return	40. PTO lube
11. Supply	41. Odd/even lube
12. Signal	42. Drop box lube
13. Case drain	43. Creep drive lube
14. Power beyond	44. Master clutch lube
15. PTO/differential lock valve	45. Right brake/differential lube
16. PTO clutch/brake	46. MFD/range lube
17. Differential lock clutch	47. Left brake/differential lube
18. Bevel pinion lube	48. To park brake valve
19. Lube supply	49. Service brake
20. MFD clutch	50. Master clutch
21. Low clutch	51. Inlet
22. Medium clutch	52. Master clutch inching valve
23. Hitch clutch	53. Park/emergency brake
24. Reverse clutch	54. Brake release pump
25. Fifth clutch	55. Steering hand pump
26. Third clutch	56. Steering cylinders
27. First clutch	57. Bypass valve
28. Even clutch	58. Brake valve
29. Odd clutch	59. NOTE: Switch is opened when pedal reaches full stroke when hydraulic power is lost.
30. Creeper clutch	



RCIL11CCH300JAA 1

PRIMARY HYDRAULIC POWER SYSTEM - Hydraulic symbol - Schematic components

Accurate diagrams of hydraulic circuits are essential to the technician who must repair them. The diagram shows how the components interact. The diagram shows how the system works, what each component should be doing and where the oil should be going so the technician can diagnose and repair the system.

There are two types of circuit diagrams:

- Cutaway circuit diagrams show the internal construction of the components as well as the flow paths. Using colors, shades or various patterns in the lines and passages, they show many different conditions of flow and pressure. Cutaway diagrams take considerably longer to produce because of their complexity.
- Schematic circuit diagrams, the “shorthand” system of the industry, are usually preferred for troubleshooting. A schematic diagram is made up of simple geometric symbols for the components and their controls and connections.

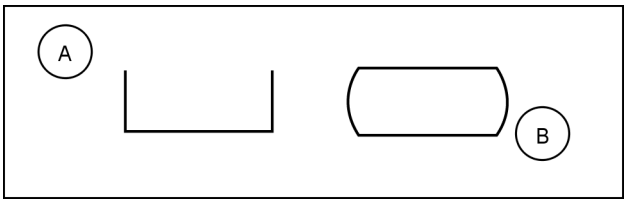
There are several systems of symbols used when making schematic diagrams:

- ISO – International Standards Organization
- ANSI – American National Standards Institute
- ASA – American Standards Association
- JIC – Joint Industry Conference

A combination of symbols from these systems are shown. There are differences between the symbol systems. There is enough similarity, however, so if you understand the symbols shown, you will be able to interpret other symbols as well.

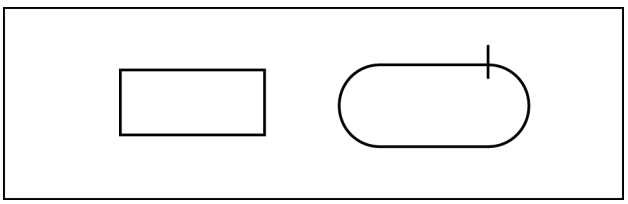
Reservoirs

A rectangle with the top removed represents a vented reservoir **(A)**. A rectangle with the top in place represents a pressurized reservoir **(B)**.



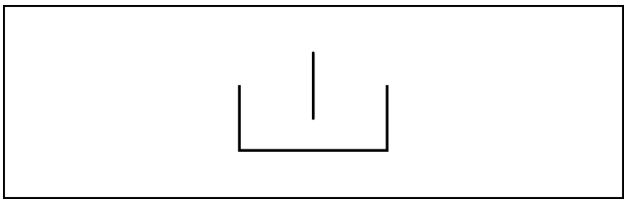
RCIL07CCH025AAA 1

There are other schematic diagrams that show a slightly different version of a pressurized reservoir, but the symbols are similar and easily recognized. An oval with a short line on top or a rectangle with curved sides represents a reservoir that is pressurized.



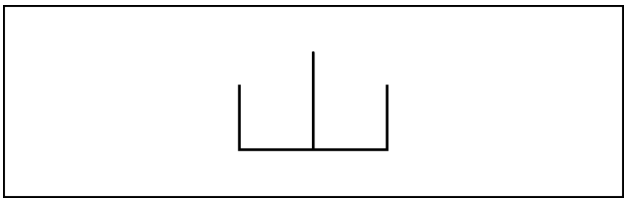
RCIL07CCH027AAA 2

Lines connected to the reservoir usually are drawn from the top, regardless of where the actual connection is. This symbol shows a line which returns fluid above the level in the reservoir.



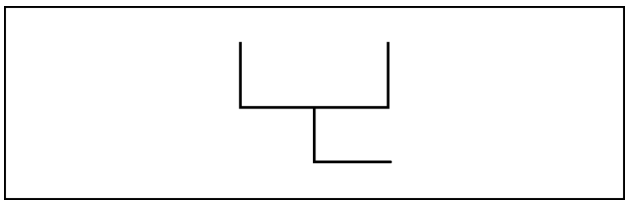
RCIL07CCH030AAA 3

If the hydraulic line returns fluid below the level in the reservoir, it is drawn all the way to the bottom of the symbol.



RCIL07CCH032AAA 4

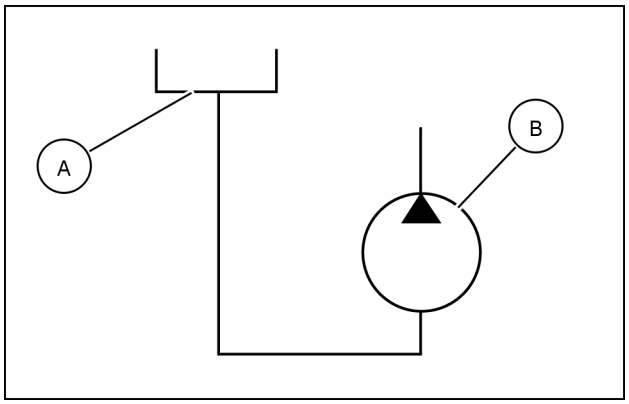
A hydraulic line connected to the bottom of the reservoir may be drawn from the bottom of the symbol if the bottom connection is essential to the systems operation.



RCIL07CCH033AAA 5

If the pump inlet **(B)** must be charged or flooded with fluid above the inlet port, the reservoir symbol **(A)** appears above the pump symbol, and the suction line is drawn out of the bottom of the reservoir symbol.

Every system reservoir has at least two hydraulic lines connected to it, and some may have many more. Often the components that are connected to the reservoir are spread all over the schematic. Rather than multiplying lines all over the schematic, individual reservoir symbols are drawn close to the components. The reservoir is usually the only component symbol pictured more than once on a diagram.



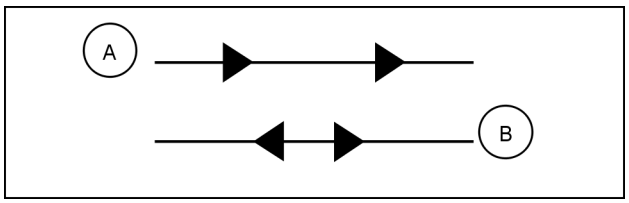
RCIL07CCH124AAA 6

Lines, tubes and hoses

A hydraulic line, tube, hose or any conductor that carries the fluid between components is shown as a line. A working line, such as an inlet pressure or return, is shown as a solid line.

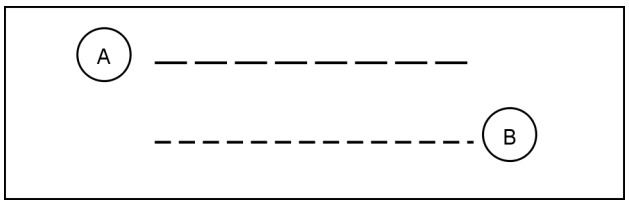
RCIL07CCH034AAA 7

Working lines with arrows show direction of flow. In the first example **(A)**, fluid flows in one direction only; in the second example **(B)**, fluid can flow in both directions.



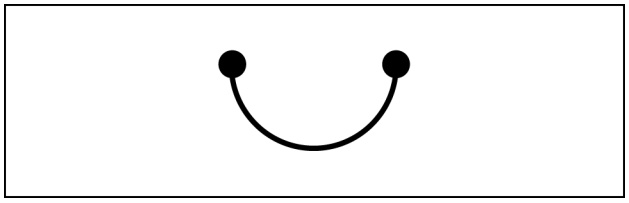
RCIL07CCH035AAA 8

Pilot or control lines **(A)** are broken into long dashes. Drain lines **(B)** for leakage oil are broken into short dashes.



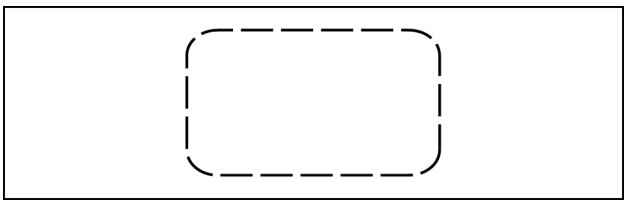
RCIL07CCH036AAA 9

A flexible line is shown as an arc between two dots and is always represented by a solid line.



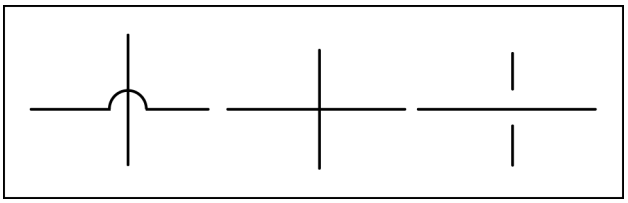
RCIL07CCH026AAA 10

An enclosure outline indicates that there are several symbols that make up a component assembly such as a valve or a valve stack. The enclosure outline is rectangular and is broken with dashes on all sides.



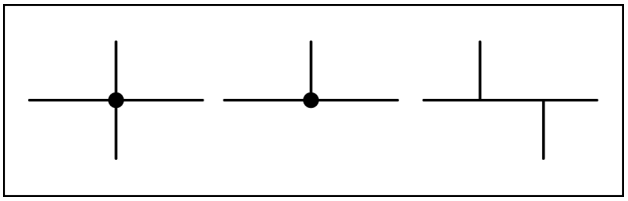
RCIL07CCH028AAA 11

Lines between components are drawn differently when they are crossing or connected. There are lines that cross other lines but are not connected. There are several ways to show crossing lines which are not connected.



RCIL07CCH038AAA 12

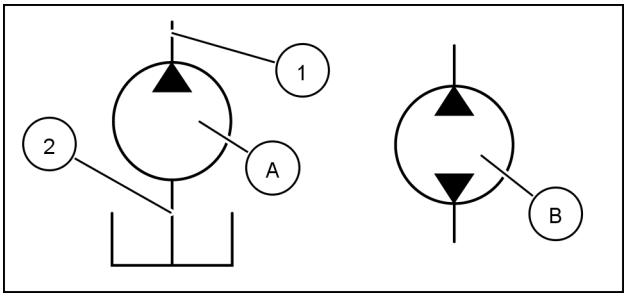
Lines that are connected are shown with a dot that represents the connection or shown as a tee connection. The dot connection is the most commonly used when drawing schematic diagrams.



RCIL07CCH047AAA 13

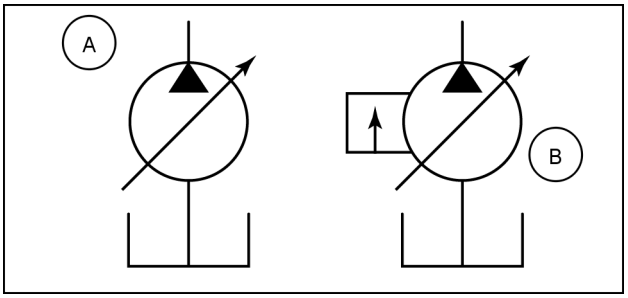
Pumps

There are many basic pump designs. A simple fixed displacement pump **(A)** is shown as a circle with a solid arrow that pointing outward. The arrow points in the direction that the fluid flows. If the pump is reversible **(B)** or designed to pump in either direction, the symbol has two arrows which point in opposite directions. The pump normally has a pressure port and line **(1)** from which pressurized fluid is discharged and a suction port and line **(2)** into which fluid is drawn from the reservoir.



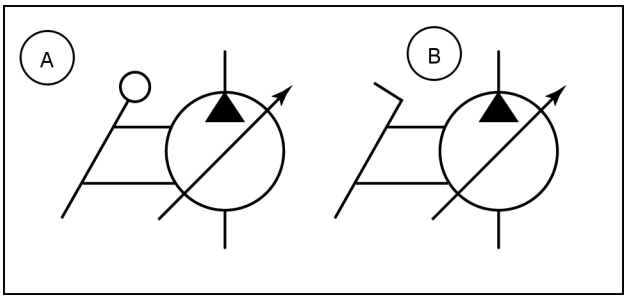
RCIL07CCH048AAA 14

A variable displacement pump **(A)** is shown by an arrow drawn through the pump symbol at a 45 degree angle. A variable displacement, pressure compensated pump **(B)** is shown by a small box with an arrow, added to the side of the pump symbol.



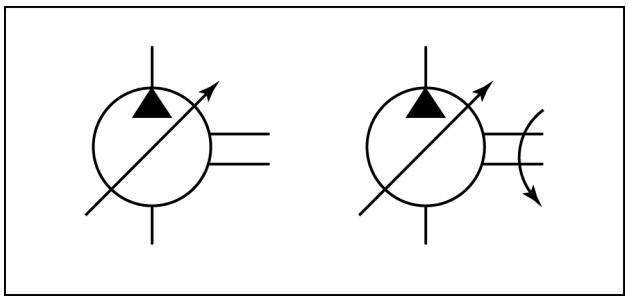
RCIL07CCH040AAA 15

If the pump is controlled by a lever **(A)** or a pedal **(B)**, the appropriate symbol is added to the side of the pump.



RCIL07CCH041AAA 16

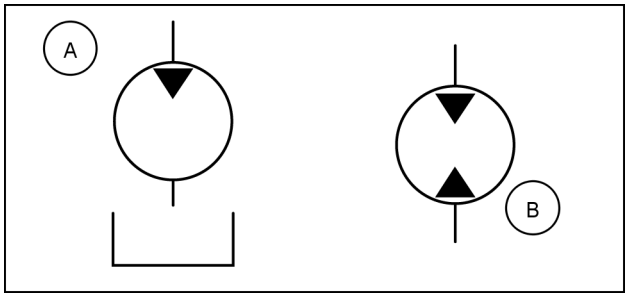
A drive shaft is shown as two short parallel lines extending from the side of the pump. A curved arrow, if present, on the drive shaft indicates the direction of rotation.



RCIL07CCH049AAA 17

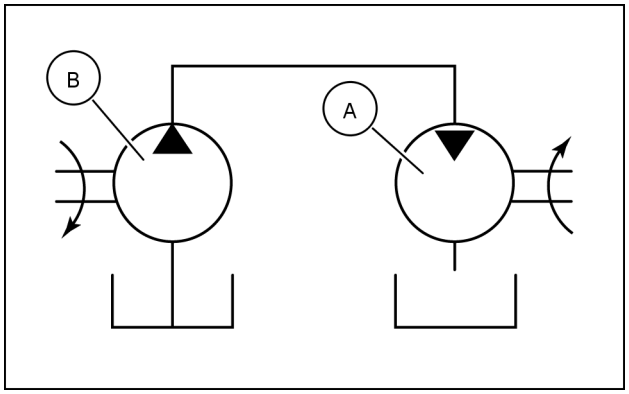
Motors

Motor symbols are circles with solid black arrows, which point in the opposite direction of a pump's arrow, to show the motor as a receiver of fluid. One arrow is used for non-reversible motors **(A)**; and two arrows are used for reversible motors **(B)**.



RCIL07CCH051AAA 18

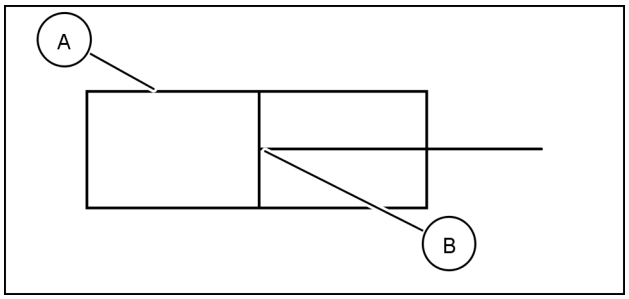
A simple schematic diagram is shown of a hydraulic motor **(A)** connected to a hydraulic pump **(B)**.



RCIL07CCH046AAA 19

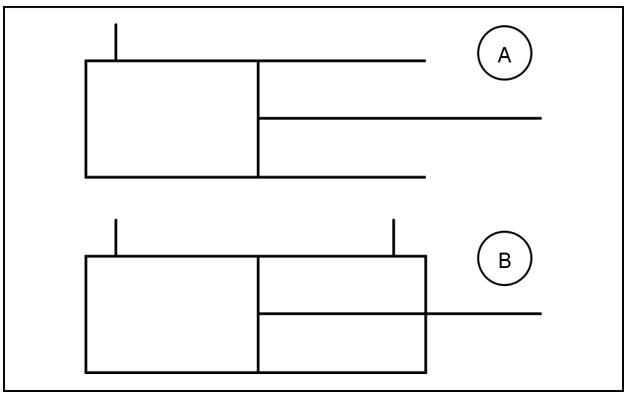
Cylinders

A cylinder is a simple rectangle **(A)** representing the barrel. The piston and rod are represented by a tee **(B)**, inserted into the rectangle. The symbol can be drawn in any position.



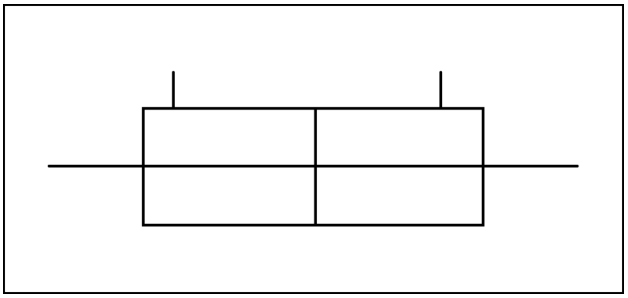
RCIL07CCH055AAA 20

If the cylinder is single-acting **(A)**, there is only one port shown on the end of the cylinder that receives pressurized fluid. The opposite end of the cylinder is left open. Both ends are closed on a double-acting cylinder **(B)**, and two ports are shown.



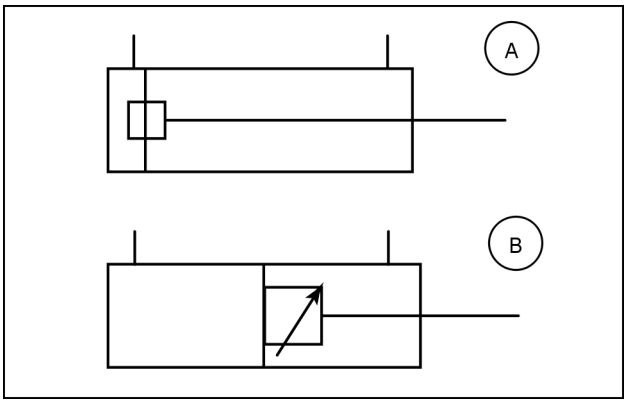
RCIL07CCH054AAA 21

A double rod end cylinder has a rod extending from each end of the rectangle.



RCIL07CCH057AAA 22

Some cylinders have cushions built into them. The cushion slows the movement of the piston as it nears the end of its stroke. Cylinder cushions are shown as a smaller rectangle **(A)** on the piston. If the cushion has an adjustable orifice, a slanted arrow is drawn at 45 degrees **(B)** across the symbol.

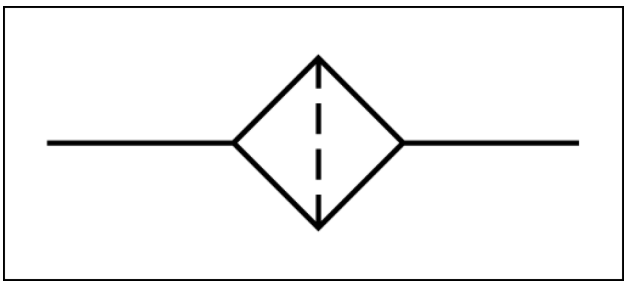


RCIL07CCH126AAA 23

Accessories

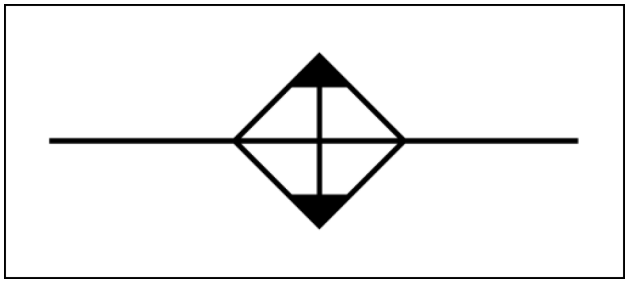
Filters, strainers and heat exchangers are represented as squares that are turned 45 degrees and have the port connections at the corners.

A dotted line perpendicular to the flow line represent a filter, strainer or screen.



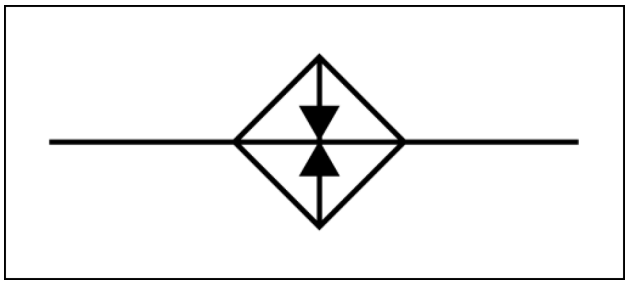
RCIL07CCH080AAA 24

A solid line perpendicular to the flow with solid arrows pointing outward represents a cooler.



RCIL07CCH081AAA 25

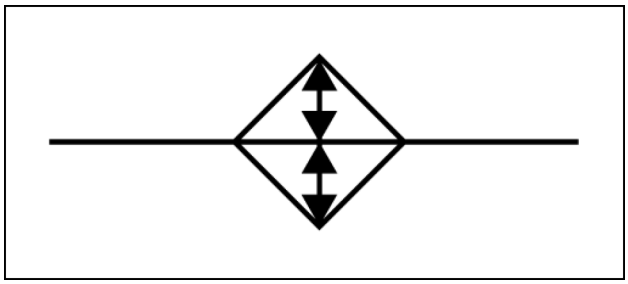
The symbol for a heater is like the symbol for a cooler, except the solid arrows point inward.



RCIL07CCH118AAA 26

Two sets of arrows pointing inward and outward represents a temperature control unit

The solid arrows point in the direction that heat is dissipated. Or in the case of the control unit, they show that heat can be regulated.

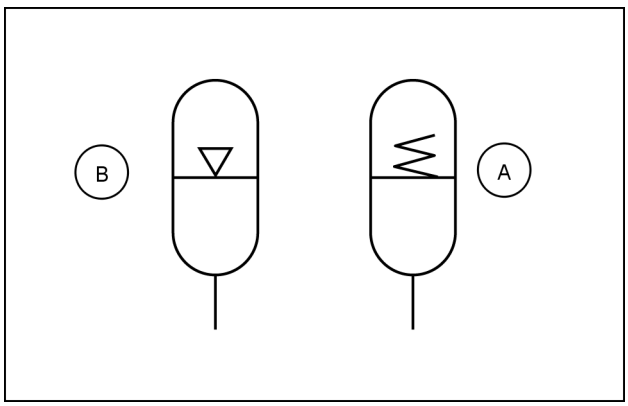


RCIL07CCH119AAA 27

An oval with details inside represents an accumulator. The details explain what type of accumulator it is: spring loaded **(A)**, gas charged **(B)**, or other features.

The divider line indicates there is a separator between the charge and the fluid. A hollow arrow indicates gas.

A spring indicates that the accumulator is spring-loaded.



RCIL07CCH130AAA 28

Reference:	**PRIMARY HYDRAULIC POWER SYSTEM - Hydraulic symbol - Pressure control (A.10.A)**
	PRIMARY HYDRAULIC POWER SYSTEM - Hydraulic symbol - Directional control (A.10.A)
	PRIMARY HYDRAULIC POWER SYSTEM - Hydraulic symbol - Composite (A.10.A)
	PRIMARY HYDRAULIC POWER SYSTEM - Hydraulic symbol - Flow control (A.10.A)
	PRIMARY HYDRAULIC POWER SYSTEM - Hydraulic symbol - Table of symbols (A.10.A)