TEREX®

Service Manual

Serial Number Range

GTH-1256 AF

From GTH12AFM-101

Part No. 57.4400.9219
Rev C
September 2017

Introduction

Important

Read, understand and obey the safety rules and operating instructions in the *Genie GTH 1256 AF Operator's Manual* before attempting any maintenance or repair procedure.

This manual provides detailed scheduled maintenance information for the machine owner and user. It also provides troubleshooting fault codes and repair procedures for qualified service professionals.

Basic mechanical, hydraulic and electrical skills are required to perform most procedures. However, several procedures require specialized skills, tools, lifting equipment and a suitable workshop. In these instances, we strongly recommend that maintenance and repair be performed at an authorized dealer service center.

Compliance

Machine Classification
Group B/Type 3 as defined by ISO 16368

Machine Design Life
Unrestricted with proper operation, inspection and scheduled maintenance.

Technical Publications

Genie has endeavored to deliver the highest degree of accuracy possible. However, continuous improvement of our products is a Genie policy. Therefore, product specifications are subject to change without notice.

Readers are encouraged to notify Genie of errors and send in suggestions for improvement. All communications will be carefully considered for future printings of this and all other manuals.

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Revision History

Revision	Date	Section	Procedure / Schematic Page / Description
A	09/2016		Initial Release
B	11/2016	Section 6	Electrical Schematic updating
C	09/2017	Section 5, 6, 7	Addition of section 5, renumbering of section 6 and 7

REFERENCE EXAMPLES:

Perkins Engine_Section 2_Specifications.
A-5, B-8, C-1, D-5, E-2_Section 3_Maintenance Procedure.
4-1, 4-2_Section 4_Repair Procedure.
Fault Codes_Section 6.
Section 7_Schematic Page #.

Electronic Version

Click on any procedure or page number highlighted in blue to view the update.

REVISION HISTORY, CONTINUED

Revision	Date	Section	Procedure / Schematic Page / Description

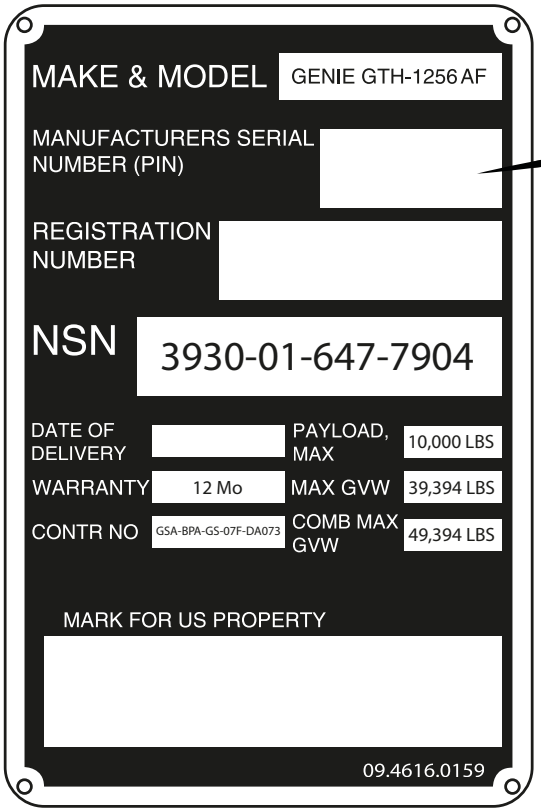
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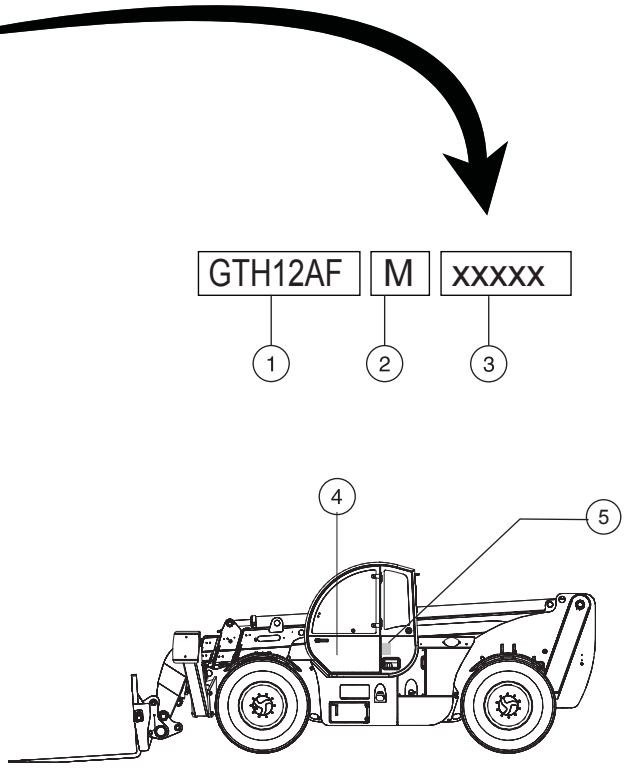
Perkins Engine_Section 2_Specifications.
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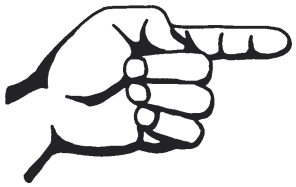
Click on any procedure or page number highlighted in blue to view the update.

Serial Number legend





1 **Model**
2 **Facility code**
3 **Sequence number**
4 **Serial number (stamped on chassis)**
5 **Identification Plate**



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Safety Rules



Danger

Failure to obey the instructions and safety rules in this manual and the appropriate Operator's Manual on your machine will result in death or serious injury.
Many of the hazards identified in the Operator's Manual are also safety hazards when maintenance and repair procedures are performed.

Do Not Perform Maintenance Unless:

- ☑ You are trained and qualified to perform maintenance on this machine.
- ☑ You read, understand and obey:
  - manufacturer's instructions and safety rules
  - employer's safety rules and worksite regulations
  - applicable governmental regulations
- ☑ You have the appropriate tools, lifting equipment and a suitable workshop.

SAFETY RULES

Personal Safety

Any person working on or around a machine must be aware of all known safety hazards. Personal safety and the continued safe operation of the machine should be your top priority.



Read each procedure thoroughly. This manual and the decals on the machine, use signal words to identify the following:



Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Indicates a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

NOTICE Indicates a potentially hazardous situation which, if not avoided, may result in property damage.



Be sure to wear protective eye wear and other protective clothing if the situation warrants it.



Be aware of potential crushing hazards such as moving parts, free swinging or unsecured components when lifting or placing loads. Always wear approved steel-toed shoes.

Workplace Safety



Be sure to keep sparks, flames and lighted tobacco away from flammable and combustible materials like battery gases and engine fuels. Always have an approved fire extinguisher within easy reach.



Be sure that all tools and working areas are properly maintained and ready for use. Keep work surfaces clean and free of debris that could get into machine components and cause damage.



Be sure any forklift, overhead crane or other lifting or supporting device is fully capable of supporting and stabilizing the weight to be lifted. Use only chains or straps that are in good condition and of ample capacity.



Be sure that fasteners intended for one time use (i.e., cotter pins and self-locking nuts) are not reused. These components may fail if they are used a second time.



Be sure to properly dispose of old oil or other fluids. Use an approved container. Please be environmentally safe.



Be sure that your workshop or work area is properly ventilated and well lit.

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Specifications

Machine Specifications

Fluid capacities	
Fuel tank	45 gallons 170 liters
Hydraulic tank	55 gallons 210 liters
Hydraulic system (including tank)	82 gallons 310 liters

For operational specifications, refer to the Operator's Manual.

Tires and wheels	
Tire size	17.5 x 25
Tire ply rating	22
Weight, rough terrain tire (air filled)	449.7 lbs 204 kg
Tire pressure (models with air-filled tires)	94 psi 6.5 bar
Lug nut torque	546 ft-lbs 740 Nm
Lug pattern	10 x 13.189
Wheel diameter	53 in 135 cm
Wheel width	18 in 46.5 cm

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

SPECIFICATIONS

Performance Specifications

Drive speed, maximum	15 mph 24 km/h
Draw bar pull	24000 lbs 10886 kg
Lift capacity, maximum	10000 lbs 4536 kg

Boom function speeds, maximum	
Boom up	18 seconds
Boom down	21 seconds
Boom extend	25 seconds
Boom retract	33 seconds
Fork tilt up	6 seconds
Fork tilt down	5 seconds

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Hydraulic Specifications

Hydraulic Oil Specification	
Hydraulic oil type	Shell Tellus S4 VX 32
Viscosity grade	32
Viscosity index	300
Cleanliness level, minimum	ISO 4406 21/19/16
Water content, maximum	200 ppm

Optional fluids	
Mineral based	Shell Tellus S2 V 32 Shell Tellus S2 V 46 Chevron Aviation A Eni Arnica 32

NOTICE The hydraulic oil used in the machine has been chosen based on the temperature range in which the machine will be used. The optional oils indicated herein can be used as well, provided that temperatures do not fall below the ones given in the table below.

Optional fluid type	Temperature range
Shell Tellus S2 V 32	-20°
Shell Tellus S2 V 46	-10°
Chevron Aviation A	-20°
Eni Arnica 32	-20°

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SPECIFICATIONS

Hydraulic Components Specifications

Boom and Steering Functions Pump	
Type:	variable displacement piston pump
Displacement	0 to 3.7 cu in 0 to 60 cc
Flow rate @ 2200 rpm	35 gpm 132 l/min
Pump pressure, maximum (measured at test port TP1)	4060 psi 280 bar
Pressure compensator (measured at test port TP1)	4060 psi 280 bar
Stand-by pressure (measured at test port TP5)	320 psi 22 bar

Auxiliary Gear Pump	
Type:	fixed displacement gear pump
Displacement	1.53 cu in 25 cc
Flow rate @ 2200 rpm	15 gpm 56 l/min
Pump pressure, maximum (measured at test port TP2)	2610 psi 180 bar
Relief valve pressure, maximum (measured at test port TP2)	2610 psi 180 bar

Hydrostatic Transmission Pump	
Type:	variable displacement piston pump
Displacement	0 to 5.5 cu in 0 to 90 cc
Flow rate @ 2200 rpm	52 gpm 198 L/min
Pump pressure, maximum (measured at test port TP4)	6450 psi 445 bar
Relief valve pressure, maximum (measured at test port TP4)	6890 psi 475 bar
Pump charge relief valve pressure, maximum (measured at test port TP3)	406 psi 28 bar

Hydrostatic Transmission Motor	
Type:	variable displacement piston motor
Displacement	0 to 7 cu in 0 to 115 cc
Flow rate @ 2200 rpm	52 gpm 198 l/min
Motor pressure, maximum (measured at test port TP4)	6450 psi 445 bar
Relief valve pressure, maximum (measured at test port TP4)	6890 psi 475 bar

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Function Manifold Specifications

Function Manifold	
System relief valve pressure, maximum (measured at test port TP1)	4060 psi 280 bar
Fork tilt relief valve pressure, maximum	4350 psi 300 bar

Steering Unit	
Steer relief valve pressure, maximum	2610 psi 180 bar
Steer anti-shock valve pressure setting	3190 psi 220 bar

Air Conditioner Refrigerant Specifications

System Full Charge	
R134a	2 lbs 3 oz

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SPECIFICATIONS

Perkins 1104D-E44TA Engine

Displacement	268.5 cu in 4.4 liters
Number of cylinders	4
Bore and stroke	4.13 x 5 inches 105 x 127 mm
Horsepower	106 kW 142 hp
Peak Torque	558 Nm
Firing order	1 - 3 - 4 - 2
Compression ratio	16.2:1
Combustion	Direct Injection
Governor	Electronic
Low idle Frequency	900 rpm
High idle Frequency	2200 rpm
Lubrication system	
Oil pressure (hot @ 2300 rpm) Minimum pressure	300 kPa 43 psi
Oil capacity (including filter)	7÷8,5 litres 7.4÷9 quarts
Oil viscosity requirements	
Units ship with Shell Rimula R4 L 15W-40 API CJ4 low ash oil. Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operation and Maintenance Manual on your machine.	

Fuel requirements	
For fuel requirements, refer to the engine Operation Manual on your machine.	
Engine coolant	
Total Capacity	36 litres
Type	VANGUARD ICE GUARD –40 SPECIAL 45% water 55% antifreeze (ASTM D3306, ASTM D1384)
Alternator	
Output	12 V, 120 Amp
Starter Motor	
Relay max	68 A
Relay continuous	20 A
Glow Plugs	
Initial load (0-4 sec)	82 A
Continuous load (>4 sec)	64 A
Battery	
Type	12V DC
Group	4D
Quantity	1
Cold cranking ampere @ 0°F	1110 A
Reserve capacity @ 25A rate	200 minutes

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SPECIFICATIONS

Dana Integral Gear Box

Transmission Type	Hydrostatic with Mechanical Gear, 2 speed
Transmission ratio - 1st speed	4.53
Transmission ratio - 2nd speed	1.62
Lubrication	
Oil capacity, gear box	1.9 quarts 1.8 liters
Oil viscosity requirements	
Units ship with SAE 75W-80 MOBILFLUID LT. Refer to the *Dana 367 Gear Box Service Manual* (Dana part number GSM-0016).	
Dana Integral Gear Box Maintenance and Repair Manual	
Genie part number	57.4700.0027

NOTICE If the gear box has to be replaced with a new one, please take note that the new part will be supplied without any oil. Fill the gear box with SAE 75W-80 MOBILFLUID LT following the instruction provided in Dana 267 Gear Box Service Manual (Dana part number GSM-0016, Genie part number 57.4700.0027)

Dana Axle

Steering	Integrated steer cylinder
Joints	Heavy duty double U-joints
Steering angle, maximum	35 °
Front Axle Lubrication	
Front differential	15.5 quarts 14.7 liters
Axle planetary end (each)	1.9 quarts 1.8 liters
Rear Axle Lubrication	
Rear differential	15.9 quarts 15 liters
Axle planetary end (each)	1.9 quarts 1.8 liters
Oil viscosity requirements	
Differential	MOBILFLUID LT
Planetary ends	MOBILFLUID LT
For additional axle information, refer to the *Dana 213 Axle Service Manual* (Dana part number ASM-0026E).	
Dana Axle Maintenance and Repair Manual	
Genie part number	57.4700.0028

NOTICE If the axles have to be replaced with new ones, please take note that the new parts will be supplied without any oil. Fill the axles with SAE 75W-80 MOBILFLUID LT following the instruction provided in Dana 213 Axle Service Manual (Dana part number ASM-0026E, Genie part number 57.4700.0028)

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

SPECIFICATIONS

Hydraulic Hose and Fitting Torque Specifications

Your machine is equipped with Parker Seal-Lok™ ORFS or 37° JIC fittings and hose ends. Genie specifications require that fittings and hose ends be torqued to specification when they are removed and installed or when new hoses or fittings are installed.

Seal-Lok™ Fittings
(hose end - ORFS)

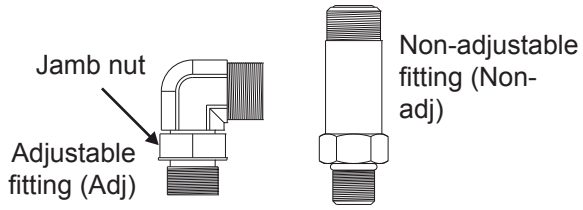
SAE Dash size	Torque
-4	10 ft-lbs / 13.6 Nm
-6	30 ft-lbs / 40.7 Nm
-8	40 ft-lbs / 54.2 Nm
-10	60 ft-lbs / 81.3 Nm
-12	85 ft-lbs / 115 Nm
-16	110 ft-lbs / 150 Nm
-20	140 ft-lbs / 190 Nm
-24	180 ft-lbs / 245 Nm

JIC 37° Fittings
(swivel nut or hose connection)

SAE Dash size	Thread Size	Flats
-4	$^{7}/_{16}$-20	2
-6	$^{9}/_{16}$-18	1 $^{1}/_{4}$
-8	$^{3}/_{4}$-16	1
-10	$^{7}/_{8}$-14	1
-12	1 $^{1}/_{16}$-12	1
-16	1 $^{5}/_{16}$-12	1
-20	1 $^{5}/_{8}$-12	1
-24	1 $^{7}/_{8}$-12	1

SAE O-ring Boss Port
(tube fitting - installed into Aluminum)
(all types)

SAE Dash size	Torque
-4	14 ft-lbs / 19 Nm
-6	23 ft-lbs / 31.2 Nm
-8	36 ft-lbs / 54.2 Nm
-10	62 ft-lbs / 84 Nm
-12	84 ft-lbs / 114 Nm
-16	125 ft-lbs / 169.5 Nm
-20	151 ft-lbs / 204.7 Nm
-24	184 ft-lbs / 249.5 Nm



SAE O-ring Boss Port
(tube fitting - installed into Steel)

SAE Dash size		Torque
-4	ORFS / 37° (Adj) ORFS (Non-adj) 37° (Non-adj)	15 ft-lbs / 20.3 Nm 26 ft-lbs / 35.3 Nm 22 ft-lbs / 30 Nm
-6	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	35 ft-lbs / 47.5 Nm 29 ft-lbs / 39.3 Nm
-8	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	60 ft-lbs / 81.3 Nm 52 ft-lbs / 70.5 Nm
-10	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	100 ft-lbs / 135.6 Nm 85 ft-lbs / 115.3 Nm
-12	(All types)	135 ft-lbs / 183 Nm
-16	(All types)	200 ft-lbs / 271.2 Nm
-20	(All types)	250 ft-lbs / 339 Nm
-24	(All types)	305 ft-lbs / 413.5 Nm

Torque Procedure

Seal-Lok™ fittings

1 Replace the O-ring. The O-ring must be replaced anytime the seal has been broken. The O-ring cannot be re-used if the fitting or hose end has been tightened beyond finger tight.

Note: The O-rings used in the Parker Seal Lok™ fittings and hose ends are custom-size O-rings. They are not standard SAE size O-rings. They are available in the O-ring field service kit (Genie part number 49612).

2 Lubricate the O-ring before installation.

3 Be sure that the face seal O-ring is seated and retained properly.

4 Position the tube and nut squarely on the face seal end of the fitting and tighten the nut finger tight.

5 Tighten the nut or fitting to the appropriate torque per given size as shown in the table.

6 Operate all machine functions and inspect the hoses and fittings and related components to confirm that there are no leaks.

JIC 37° fittings

1 Align the tube flare (hex nut) against the nose of the fitting body (body hex fitting) and tighten the hex nut to the body hex fitting to hand-tight, approximately 30 in-lbs / 3.4 Nm.

2 Make a reference mark on one of the flats of the hex nut, and continue it on to the body hex fitting with a permanent ink marker. Refer to Figure 1.

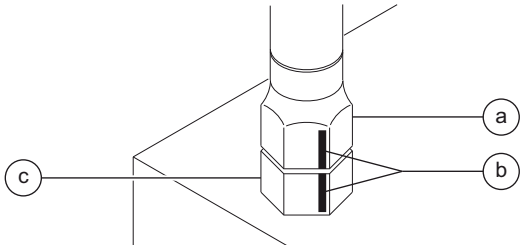


Figure 1

a hex nut
b reference mark
c body hex fitting

3 Working clockwise on the body hex fitting, make a second mark with a permanent ink marker to indicate the proper tightening position. Refer to Figure 2.

Note: Use the JIC 37° Fittings table on the previous page to determine the correct number of flats for the proper tightening position.

Note: The marks indicate that the correct tightening positions have been determined. Use the second mark on the body hex fitting to properly tighten the joint after it has been loosened.

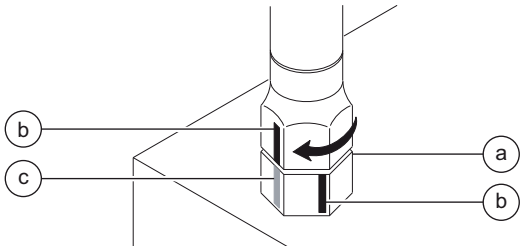


Figure 2

a body hex fitting
b reference mark
c second mark

4 Tighten the hex nut until the mark on the hex nut is aligned with the second mark on the body hex fitting.

5 Operate all machine functions and inspect the hoses and fittings and related components to confirm that there are no leaks.

SPECIFICATIONS

SAE FASTENER TORQUE CHART

•This chart is to be used as a guide only unless noted elsewhere in this manual•

SIZE	THREAD	Grade 5				Grade 8				A574 High Strength Black Oxide Bolts	
		LUBED		DRY		LUBED		DRY		LUBED	
		in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
1/4	20	80	9	100	11.3	110	12.4	140	15.8	130	14.7
	28	90	10.1	120	13.5	120	13.5	160	18	140	15.8
		LUBED		DRY		LUBED		DRY		LUBED	
		ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm
5/16	18	13	17.6	17	23	18	24	25	33.9	21	28.4
	24	14	19	19	25.7	20	27.1	27	36.6	24	32.5
3/8	16	23	31.2	31	42	33	44.7	44	59.6	38	51.5
	24	26	35.2	35	47.4	37	50.1	49	66.4	43	58.3
7/16	14	37	50.1	49	66.4	50	67.8	70	94.7	61	82.7
	20	41	55.5	55	74.5	60	81.3	80	108.4	68	92.1
1/2	13	57	77.3	75	101.6	80	108.4	110	149	93	126
	20	64	86.7	85	115	90	122	120	162	105	142
9/16	12	80	108.4	110	149	120	162	150	203	130	176
	18	90	122	120	162	130	176	170	230	140	189
5/8	11	110	149	150	203	160	217	210	284	180	244
	18	130	176	170	230	180	244	240	325	200	271
3/4	10	200	271	270	366	280	379	380	515	320	433
	16	220	298	300	406	310	420	420	569	350	474
7/8	9	320	433	430	583	450	610	610	827	510	691
	14	350	474	470	637	500	678	670	908	560	759
1	8	480	650	640	867	680	922	910	1233	770	1044
	12	530	718	710	962	750	1016	990	1342	840	1139
1 1/8	7	590	800	790	1071	970	1315	1290	1749	1090	1477
	12	670	908	890	1206	1080	1464	1440	1952	1220	1654
1 1/4	7	840	1138	1120	1518	1360	1844	1820	2467	1530	2074
	12	930	1260	1240	1681	1510	2047	2010	2725	1700	2304
1 1/2	6	1460	1979	1950	2643	2370	3213	3160	4284	2670	3620
	12	1640	2223	2190	2969	2670	3620	3560	4826	3000	4067

METRIC FASTENER TORQUE CHART

•This chart is to be used as a guide only unless noted elsewhere in this manual•

Size (mm)	Class 4.6 (4.6)				Class 8.8 (8.8)				Class 10.9 (10.9)				Class 12.9 (12.9)			
	LUBED		DRY		LUBED		DRY		LUBED		DRY		LUBED		DRY	
	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
5	16	1.8	21	2.4	41	4.63	54	6.18	58	6.63	78	8.84	68	7.75	91	10.3
6	19	3.05	36	4.07	69	7.87	93	10.5	100	11.3	132	15	116	13.2	155	17.6
7	45	5.12	60	6.83	116	13.2	155	17.6	167	18.9	223	25.2	1.95	22.1	260	29.4
	LUBED		DRY		LUBED		DRY		LUBED		DRY		LUBED		DRY	
	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm
8	5.4	7.41	7.2	9.88	14	19.1	18.8	25.5	20.1	27.3	26.9	36.5	23.6	32	31.4	42.6
10	10.8	14.7	14.4	19.6	27.9	37.8	37.2	50.5	39.9	54.1	53.2	72.2	46.7	63.3	62.3	84.4
12	18.9	25.6	25.1	34.1	48.6	66	64.9	88	69.7	94.5	92.2	125	81	110	108	147
14	30.1	40.8	40	54.3	77.4	105	103	140	110	150	147	200	129	175	172	234
16	46.9	63.6	62.5	84.8	125	170	166	226	173	235	230	313	202	274	269	365
18	64.5	87.5	86.2	117	171	233	229	311	238	323	317	430	278	377	371	503
20	91	124	121	165	243	330	325	441	337	458	450	610	394	535	525	713
22	124	169	166	225	331	450	442	600	458	622	612	830	536	727	715	970
24	157	214	210	285	420	570	562	762	583	791	778	1055	682	925	909	1233

Scheduled Maintenance Procedures

Observe and Obey:

- Maintenance inspections shall be completed by a person trained and qualified on the maintenance of this machine.
- Scheduled maintenance inspections shall be completed daily, quarterly, semi-annually, annually and every 2 years as specified on the Maintenance Inspection Report. The frequency and extent of periodical examinations and tests may also depend on national regulations.

⚠WARNING Failure to perform each procedure as presented and scheduled could result in death, serious injury or substantial damage.

- Immediately tag and remove from service a damaged or malfunctioning machine.
- Repair any machine damage or malfunction before operating the machine.
- Use only Genie approved replacement parts.
- Machines that have been out of service for a period longer than 3 months must complete the quarterly inspection.
- Unless otherwise specified, perform each maintenance procedure with the machine in the following configuration:
  · Machine parked on a firm, level surface
  · Boom in the stowed position
  · Key switch in the off position with the key removed
  · Wheels chocked

About This Section

This section contains detailed procedures for each scheduled maintenance inspection.

Each procedure includes a description, safety warnings and step-by-step instructions.

Symbols Legend

Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Indicates a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

NOTICE Indicates a potentially hazardous situation which, if not avoided, may result in property damage.

⊙ Indicates that a specific result is expected after performing a series of steps.

⊠ Indicates that an incorrect result has occurred after performing a series of steps.

SCHEDULED MAINTENANCE PROCEDURES

Maintenance Symbols Legend

Note: The following symbols have been used in this manual to help communicate the intent of the instructions. When one or more of the symbols appear at the beginning of a maintenance procedure, it conveys the meaning below.



Indicates that tools will be required to perform this procedure.



Indicates that new parts will be required to perform this procedure.



Indicates that a cold engine will be required to perform this procedure.



Indicates that a warm engine will be required to perform this procedure.



Indicates that dealer service will be required to perform this procedure.

Pre-delivery Preparation Report

The pre-delivery preparation report contains checklists for each type of scheduled inspection.

Make copies of the *Pre-delivery Preparation* report to use for each inspection. Store completed forms as required.

Maintenance Schedule

There are five types of maintenance inspections that must be performed according to a schedule—daily, quarterly, semi-annually, annually, and every two years. The Scheduled *Maintenance Procedures Section and the Maintenance Inspection Report* have been divided into five subsections—A, B, C, D, and E. Use the following chart to determine which group(s) of procedures are required to perform a scheduled inspection.

Inspection	***Checklist***
Daily or every 8 hours	A
Quarterly or every 250 hours	A + B
Semi-annually or every 500 hours	A + B + C
Annually or every 1000 hours	A + B + C + D
Two years or every 2000 hours	A + B + C + D + E

Maintenance Inspection Report

The maintenance inspection report contains checklists for each type of scheduled inspection.

Make copies of the *Maintenance Inspection Report* to use for each inspection. Maintain completed forms for a minimum of 4 years or in compliance with your employer, job site and governmental regulations and requirements.

Fundamentals

It is the responsibility of the dealer to perform the Pre-delivery Preparation.

The Pre-delivery Preparation is performed prior to each delivery. The inspection is designed to discover if anything is apparently wrong with a machine before it is put into service.

A damaged or modified machine must never be used.
If damage or any variation from factory delivered condition is discovered, the machine must be tagged and removed from service.

Repairs to the machine may only be made by a qualified service technician, according to the manufacturer's specifications.

Scheduled maintenance inspections shall be performed by qualified service technicians, according to the manufacturer's specifications and the requirements listed in the responsibilities manual.

Instructions

Use the operator's manual on your machine.

The Pre-delivery Preparation consists of completing the Pre-operation Inspection, the Maintenance items and the Function Tests.

Use this form to record the results. Place a check in the appropriate box after each part is completed.
Follow the instructions in the operator's manual.

If any inspection receives an N, remove the machine from service, repair and reinspect it. After repair, place a check in the R box.

Legend
Y = yes, completed
N = no, unable to complete
R = repaired

Comments

Pre-Delivery Preparation	***Y***	***N***	***R***
Pre-operation inspection completed			
Maintenance items completed			
Function tests completed			

Model

Serial number

Date

Machine owner

Inspected by (print)

Inspector signature

Inspector title

Inspector company

A TEREX BRAND

Terex South Dakota, Inc USA
500 Oak Wood Road
PO Box 1150
Watertown, SD 57201-6150
(605) 882-4000

Genie UK
The Maltings, Wharf Road
Grantham, Lincolnshire
NG31- 6BH England
(44) 1476-584333

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Maintenance Inspection Report

Model
Serial number
Date
Hour meter
Machine owner
Inspected by (print)
Inspector signature
Inspector title
Inspector company

Instructions

- Make copies of this report to use for each inspection.
- Select the appropriate checklist(s) for the type of inspection to be performed.

	Daily or 8 hours
	Inspection: A
	Quarterly or 250 hours
	Inspection: A+B
	Semi-annually or 500 hours
	Inspection: A+B+C
	Annually or 1000 hours
	Inspection: A+B+C+D
	2 Years or 2000 hours
	Inspection: A+B+C+D+E

- Place a check in the appropriate box after each inspection procedure is completed.
- Use the step-by-step procedures in this section to learn how to perform these inspections.
- If any inspection receives an “N”, tag and remove the machine from service, repair and re-inspect it. After repair, place a check in the “R” box.

Checklist A		**Y**	**N**	**R**
A-1	Manuals and decals			
A-2	Pre-operation inspect			
A-3	Function tests			
A-4	Lubricate the boom			
A-5	Engine maintenance			
A-6	Safety devices			
A-7	Pre Filter			
Perform after 10 hours:				
A-8	Axle maintenance			
Perform after 40 hours:				
A-9	30 day service			
Perform after 100 hours:				
A-10	Axle maintenance			
A-11	Gear Box maintenance			
A-12	Axle maintenance			
Perform every week:				
A-13	Engine maintenance			
Perform every 50 hours:				
A-14	Engine maintenance			
Checklist B		**Y**	**N**	**R**
B-1	Electrical wiring			
B-2	Gear Box maintenance			
B-3	Exhaust system			
B-4	Axle maintenance			
B-5	Tires and wheels			
B-6	Hydraulic oil			
B-7	Boom wear pads			
Perform every 400 hours:				
B-8	Engine maintenance			
Checklist C		**Y**	**N**	**R**
C-1	Engine maintenance			
C-2	Engine maintenance			
C-3	Engine maintenance			
C-4	Axle maintenance			
C-5	Inspect and lubricate sequencing chains			
Checklist D		**Y**	**N**	**R**
D-1	Forks			
D-2	Boom chains			
D-3	Hydraulic return filter			
D-4	Gear Box maintenance			
D-5	Engine maintenance			
D-6	Axle maintenance			
Perform every 2000 hours:				
D-7	Coolant filter			
Checklist E		**Y**	**N**	**R**
E-1	Hydraulic oil			
E-2	Engine maintenance			
Perform every 3000 hours:				
E-3	Engine maintenance			
Perform every 3000 hours or 2 years:				
E-4	Engine maintenance			
Perform every 4000 hours:				
E-5	Engine maintenance			

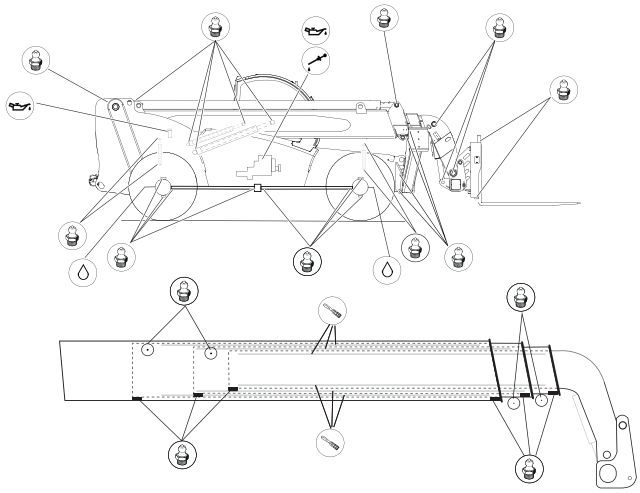
Legend

Y = yes, acceptable
N = no, remove from service
R = repaired

Comments

Lubrication Chart

The Service Lubrication Chart is riveted inside the cover located at the rear of the frame. This should be used to locate all lubrication points and will tell you what type of lubrication is required.



SERVICE/LUBRICATION CHART GTH-1256AF

INTERVAL	IDENTIFICATION	SERVICE REQUIRED	LUBRICANT SPECIFICATION (TYPE)	
			SAE GRADE	
EVERY 8 HOURS	BOOM WEAR PADS	LUBE	----------	INTERFLON FIN GREASE LS1/2
	ENGINE COOLANT LEVEL	CHECK	----------	45% WATER + 55% ANTIFREEZE (VANGUARD ICE GUARD -40 SPECIAL)
	ENGINE AIR PRECLEANER	CHECK/CLEAN	----------	----------
	ENGINE OIL LEVEL	CHECK	15W-40	SHELL RIMULA R4 L
	ENGINE FUEL SYSTEM WATER SEPARATOR	DRAIN	----------	----------
	PRE-FILTER	CHECK	----------	----------
AFTER 10 HOURS	DIFFERENTIAL OIL LEVEL	CHECK	75W-80	MOBILFLUID LT
	PLANETARY REDUCTION OIL LEVEL	CHECK	75W-80	MOBILFLUID LT
	DROPBOX OIL LEVEL	CHECK	75W-80	MOBILFLUID LT
	KING PIN TAPERED BEARINGS	GREASE	----------	NLGI2 EP or NLGI3 EP
	SEALS	GREASE	----------	NLGI2 EP or NLGI3 EP
	KING PIN BUSHINGS	GREASE	----------	NLGI2 EP or NLGI3 EP
	TRUNNION BUSHINGS	GREASE	----------	NLGI2 EP or NLGI3 EP with Moly Addittive
AFTER 100 HOURS	DIFFERENTIAL OIL	CHANGE	75W-80	MOBILFLUID LT
	PLANETARY REDUCTION OIL	CHANGE	75W-80	MOBILFLUID LT
	DROPBOX OIL	CHANGE	75W-80	MOBILFLUID LT
	GEAR BOX OIL	CHANGE	75W-80	MOBILFLUID LT
EVERY 50 HOURS OR WEEKLY	KING PIN TAPERED BEARINGS	GREASE	----------	NLGI2 EP or NLGI3 EP
	SEALS	GREASE	----------	NLGI2 EP or NLGI3 EP
	KING PIN BUSHINGS	GREASE	----------	NLGI2 EP or NLGI3 EP
	TRUNNION BUSHINGS	GREASE	----------	NLGI2 EP or NLGI3 EP with Moly Addittive
EVERY 250 HOURS OR MONTHLY	GEAR BOX OIL	CHECK/ADD	75W-80	MOBILFLUID LT
	DIFFERENTIAL OIL LEVEL	CHECK	75W-80	MOBILFLUID LT
	PLANETARY REDUCTION OIL LEVEL	CHECK	75W-80	MOBILFLUID LT
	DROPBOX OIL LEVEL	CHECK	75W-80	MOBILFLUID LT
	HYDRAULIC OIL	CHECK	----------	SHELL TELLUS S4 VX 32
EVERY 500 HOURS OR QUARTERLY	ENGINE OIL	CHANGE	15W-40	SHELL RIMULA R4 L
	ENGINE OIL FILTER	CHANGE	----------	----------
	ENGINE AIR CLEANER ELEMENT	REPLACE	----------	----------
	ENGINE FUEL SYSTEM WATER SEPARATOR	CHANGE	----------	----------
	ENGINE FUEL SYSTEM SECONDARY FILTER	CHANGE	----------	----------
	CHAINS	LUBE	----------	INTERFLON FIN GREASE LS1/2
EVERY 1000 HOURS OR ANNUALLY	HYDRAULIC TANK RETURN FILTER	CHANGE	----------	----------
	GEAR BOX OIL	CHANGE	75W-80	MOBILFLUID LT
	DIFFERENTIAL OIL	CHANGE	75W-80	MOBILFLUID LT
	PLANETARY REDUCTION OIL	CHANGE	75W-80	MOBILFLUID LT
	DROPBOX OIL	CHANGE	75W-80	MOBILFLUID LT
EVERY 2000 HOURS	COOLANT FILTER	CHANGE	----------	----------
	HYDRAULIC OIL	CHANGE	----------	SHELL TELLUS S4 VX 32
EVERY 3000 HOURS	ENGINE COOLANT	CHANGE	----------	45% WATER + 55% ANTIFREEZE (VANGUARD ICE GUARD -40 SPECIAL)

09.4616.0158

Checklist A Procedures

A-1
Inspect the Manuals and Decals

Genie specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Maintaining the operator's and safety manuals in good condition is essential to safe machine operation. Manuals are included with each machine and should be stored in the container provided in the operator's compartment. An illegible or missing manual will not provide safety and operational information necessary for a safe operating condition.

In addition, maintaining all of the safety and instructional decals in good condition is mandatory for safe machine operation. Decals alert operators and personnel to the many possible hazards associated with using this machine. They also provide users with operation and maintenance information. An illegible decal will fail to alert personnel of a procedure or hazard and could result in unsafe operating conditions.

1 Check to make sure that the operator's and safety manuals are present and complete in the storage container in the operator's compartment.

2 Examine the pages of each manual to be sure that they are legible and in good condition.

⊙ Result: The operator's manual is appropriate for the machine and all manuals are legible and in good condition.

⊠ Result: The operator's manual is not appropriate for the machine or all manuals are not in good condition or is illegible. Remove the machine from service until the manual is replaced.

3 Open the operator's manual to the decals inspection section. Carefully and thoroughly inspect all decals on the machine for legibility and damage.

⊙ Result: The machine is equipped with all required decals, and all decals are legible and in good condition.

⊠ Result: The machine is not equipped with all required decals, or one or more decals are illegible or in poor condition. Remove the machine from service until the decals are replaced.

4 Always return the manuals to the storage container after use.

Note: Contact your authorized Genie distributor or Genie Industries if replacement manuals or decals are needed.

A-2
Perform Pre-operation Inspection

Genie specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Completing a Pre-operation Inspection is essential to safe machine operation. The Pre-operation Inspection is a visual inspection performed by the operator prior to each work shift. The inspection is designed to discover if anything is apparently wrong with a machine before the operator performs the function tests. The Pre-operation Inspection also serves to determine if routine maintenance procedures are required.

Complete information to perform this procedure is available in the appropriate operator's manual. Refer to the Operator's Manual on your machine.

A-3
Perform Function Tests

Genie specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Completing the function tests is essential to safe machine operation. Function tests are designed to discover any malfunctions before the machine is put into service. A malfunctioning machine must never be used. If malfunctions are discovered, the machine must be tagged and removed from service.

Complete information to perform this procedure is available in the appropriate operator's manual. Refer to the Operator's Manual on your machine.

CHECKLIST A PROCEDURES

A-4
Lubricate the Boom



Genie specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Greasing the specified locations is essential for good machine performance and service life. Operating the machine with little or no grease may cause the machine to perform poorly and continued use may cause component damage.

1 Fully extend and raise the boom, then retract the boom, checking to insure it operates smoothly. There should be a light film of lubricant on wear pad contact surfaces.

⊙ Result: Boom operates smoothly and a thin film of lubricant is visible. Proceed to step 6.

⊠ Result: Boom does not extend or retract smoothly and no lubricant is visible on wear pad contact surfaces. Proceed to step 2.

2 Apply a thin layer of grease to the underside of the number 4 boom tube where it makes contact with the number 3 boom tube lower wear pads.

3 Apply a thin layer of grease to the underside of the number 3 boom tube where it makes contact with the number 2 boom tube lower wear pads.

4 Apply a thin layer of grease to the underside of the number 2 boom tube where it makes contact with the number 1 boom tube lower wear pads.

5 Lubricate the top and side boom tube wear pads.

6 Return the boom to the stowed position.

Grease Specification	
PTFE INTERFLON FIN GREASE LS 2	
Genie part number	09.4693.0000

A-5
Perform Engine Maintenance



Note: Engine specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Coolant level - check
Driven equipment - check
Engine air cleaner service indicator - inspect
Engine air precleaner - check/clean
Engine oil level - check
Fuel system primary filter/water separator - drain
Walk-Around inspection

Required maintenance procedures and additional engine information are available in the *Perkins 1104D-E44TA Operation and Maintenance Manual* (Perkins part number SEBU9066-00).

Perkins 1104D-E44TA Operation and Maintenance Manual	
Genie part number	57.4700.0029

A-6
Safety Devices

1 Parking Brake Switch
- Engage the parking brake.
- Shift to neutral.
- Start the engine.
- Engage forward gear.
- Attempt to move with the machine. The machine must not move.

2 Transmission Control Lever
- Engage the parking brake.
- Engage forward gear.
- Attempt to start the engine.The engine must not start.

3 Angle sensor
- Lift the boom over 50° and check the angle indicator in the cab.
- Attempt to move with the machine. The machine must not move because transmission is inhibited.
- Attempt to level the machine. It must not be possible because chassis levelling is inhibited.

CHECKLIST A PROCEDURES

A-7
Inspect the Pre Filter



Genie specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Visually check the correct rotation of the fan. Eliminate any debris from the pre filter interior.

⚠ DANGER Only check fan rotation when the engine is not running by turning the fan by hand.

A-8
Perform Axle Maintenance



Note: Axle specifications require that this procedure be performed after 10 hours.

Differential lubricating oil - check
Planetary reduction lubricating oil - check
Dropbox (if any) lubricating oil - check
King pin tapered bearings - grease
Seals - grease
King pin bushings - grease
Trunnion bushings - grease

Required maintenance procedures and additional axle information are available in the *Dana 213 Axle Service Manual* (Dana part number ASM-0026E).

Dana 213 Axle Service Manual	
Genie part number	57.4700.0028

A-9
Perform 30 Day Service



The 30 day maintenance procedure is a one-time sequence of procedures to be performed after the first 30 days or 40 hours of usage. After this interval, refer to the maintenance checklists for continued scheduled maintenance.

1 Perform the following maintenance procedures:
- · B-5 Inspect the Tires, Wheels and Lug Nut Torque
- · D-3 Replace the Hydraulic Tank Return Filter Element
- · Check Belt Tension
- · Check The Engine Mounts
- · Check Hose Clamps

A-10
Perform Axle Maintenance



Note: Axle specifications require that this procedure be performed after 100 hours.

Differential lubricating oil - change
Planetary reduction lubricating oil - change
Dropbox (if any) lubricating oil - change
Negative brake - adjust
Service brake - adjust

Required maintenance procedures and additional axle information are available in the *Dana 213 Axle Service Manual* (Dana part number ASM-0026E).

Dana 213 Axle Service Manual	
Genie part number	57.4700.0028

CHECKLIST A PROCEDURES

A-11
Perform Gear Box Maintenance



Note: Axle specifications require that this procedure be performed after 100 hours.

Lubricating oil - change
Sensor reading zone - clean

Required maintenance procedures and additional axle information are available in the *Dana 367 Gear Box Service Manual* (Dana part number GSM-0016).

Dana 367 Gear Box Service Manual	
Genie part number	57.4700.0027

A-12
Perform Axle Maintenance



Note: Axle specifications require that this procedure be performed weekly.

NOTICE In case of sever duty, the following procedures must be carried out every day.

King pin tapered bearings - grease
Seals - grease
King pin bushings - grease Trunnion bushings - grease

Required maintenance procedures and additional axle information are available in the *Dana 213 Axle Service Manual* (Dana part number ASM-0026E).

Dana 213 Axle Service Manual	
Genie part number	57.4700.0028

A-13
Perform Engine Maintenance



Note: Engine specifications require that this procedure be performed weekly.

Hoses and clamps - inspect/replace

Required maintenance procedures and additional engine information are available in the *Perkins 1104D-E44TA Operation and Maintenance Manual* (Perkins part number SEBU9066-00).

Perkins 1104D-E44TA Operation and Maintenance Manual	
Genie part number	57.4700.0029

A-14
Perform Engine Maintenance



Note: Engine specifications require that this procedure be performed every 50 hours or weekly, whichever comes first.

Fuel tank water and sediment - drain

Required maintenance procedures and additional engine information are available in the *Perkins 1104D-E44TA Operation and Maintenance Manual* (Perkins part number SEBU9066-00).

Perkins 1104D-E44TA Operation and Maintenance Manual	
Genie part number	57.4700.0029

Checklist B Procedures

B-1
Inspect the Electrical Wiring



Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

Maintaining electrical wiring in good condition is essential to safe operation and good machine performance. Failure to find and replace burnt, chafed, corroded or pinched wires could result in unsafe operating conditions and may cause component damage.

⚠WARNING Electrocution/burn hazard. Contact with hot or live circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

1 Inspect the following areas for burnt, chafed, corroded and loose wires:
- Inside of the operator's compartment
- Underside of the chassis
- Boom assembly

2 Inspect for a liberal coating of dielectric grease in the following locations:
- All harness connectors

3 Start the engine and raise the boom so there is enough room to access and remove all the covers attached to the chassis.

4 Attach a lifting strap from an overhead crane to the boom. Support the boom. Do not apply any lifting pressure.

5 Remove all engine covers, hydraulic tank covers and chassis covers.

⚠DANGER Crushing hazard. Death or serious injury could result if the boom should unexpectedly fall while working underneath the boom. Do not stand or work beneath a boom that is not properly supported.

6 Inspect the following areas for burnt, chafed, corroded, pinched and loose wires:
- Engine
- Transmission
- Manifolds
- Chassis

7 Inspect for a liberal coating of dielectric grease in all connections between the engine, transmission and the operator's compartment.

8 Install all covers removed in step 5.

9 Remove the lifting strap from the overhead crane.

10 Start the engine and lower the boom to the stowed position. Turn the machine off.

B-2
Gear Box Oil Level

Genie requires that this procedure be performed quarterly.

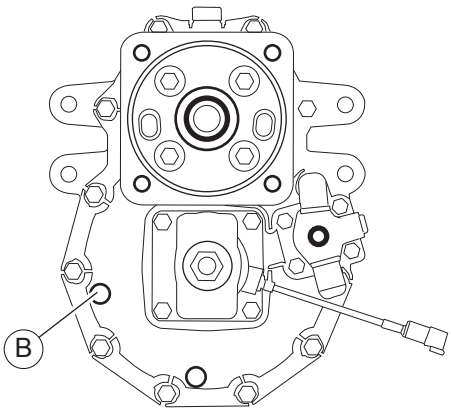
1 Stop the machine on a level ground and engage the parking brake.

2 Clean level plug (B) all around.

3 Remove the plug (B) and check if oil is level with the hole.

4 When necessary, add new oil through plug (B) until it is level with the hole.

5 Refit and tighten the plug (B).



B-3
Check the Exhaust System

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

Maintaining the exhaust system is essential to good engine performance and service life. Running the engine with a damaged or leaking exhaust system can cause component damage and unsafe operating conditions.

⚠WARNING Bodily injury hazard. Do not inspect while the engine is running. Remove the key to secure from operation.

⚠CAUTION Bodily injury hazard. Beware of hot engine components. Contact with hot engine components may cause severe burns.

1 Open the engine access cover.

2 Be sure that all fasteners are tight.

3 Inspect all welds for cracks.

4 Inspect for exhaust leaks - i.e., carbon buildup around seams and joints.

5 Close the engine access cover.

CHECKLIST B PROCEDURES

B-4
Perform Axle Maintenance



Note: Axle specifications require that this procedure be performed monthly.

Differential lubricating oil - check
Planetary reduction lubricating oil - check
Dropbox (if any) lubricating oil - check

Required maintenance procedures and additional axle information are available in the *Dana 213 Axle Service Manual* (Dana part number ASM-0026E).

Dana 213 Axle Service Manual	
Genie part number	57.4700.0028

B-5
Inspect the Tires, Wheels and Lug Nut Torque



Genie requires that the first inspection be performed after the first 50 hours of operation.

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

Maintaining the tires and wheels in good condition, including proper wheel fastener torque, is essential to safe operation and good performance. Tire and/or wheel failure could result in a machine tip-over. Component damage may also result if problems are not discovered and repaired in a timely fashion.

⚠WARNING Bodily injury hazard. An overinflated tire can explode and could result in death or serious injury.

⚠WARNING Tip over hazard. Do not use temporary flat tire repair products.

Note: The tires on some machines are foam filled and do not need air added to them.

1 Check all tire treads and sidewalls for cuts, cracks, punctures and unusual wear.

2 Check each wheel for damage, bends and cracks.

3 Check each lug nut for proper torque. Refer to Section 2, *Specifications*.

4 Check the air pressure in each tire. Refer to Section 2, *Specifications*.

B-6
Perform Hydraulic Oil Analysis



Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require oil changes to be performed more often. Refer to Section 2, *Specifications*.

Note: Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. **If the hydraulic oil is not replaced at the two year inspection, test the oil quarterly. Replace the oil when it fails the test**. See E-1, *Test or Replace the Hydraulic Oil*.

CHECKLIST B PROCEDURES

B-7
Check the Boom Wear Pads

Genie specifications require that this procedure be performed every 250 hours of operation.

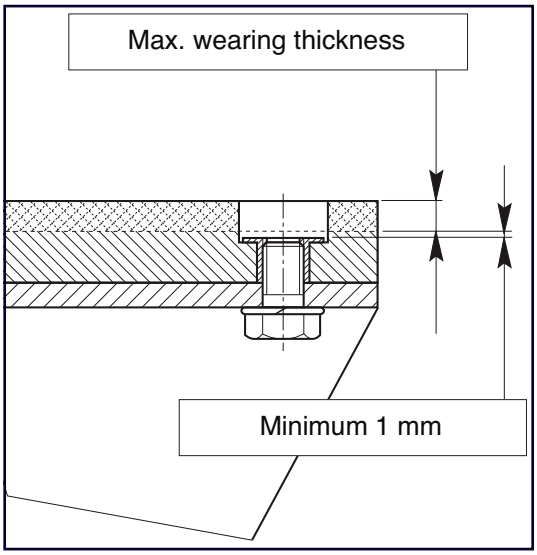
Any boom section is fitted with adjustable pads located on the four sides of the profile. These pads are secured to both fixed and mobile part of every section.
All pads can be adjusted by the special shims supplied by GENIE upon demand.

1 Extend the boom until the wear pads are accessible.

2 Inspect each pad and ensure that the pad thickness is more than 0.04 inches / 1 mm (see figure).

⊙ Result: If thickness is above 0.04 inches / 1 mm, the pad can be re-used.

⊠ Result: if thickness is less than 0.04 inches / 1 mm, replace the worn pad. Refer to Repair Procedure 1-2, *How to Replace the Boom Wear Pads*.



Boom Wear Pad Screws Tightening Specifications	
Screws M10	22 ft-lbs 30 Nm
Screws M10	37 ft-lbs 50 Nm

B-8
Perform Engine Maintenance



Note: Engine specifications require that this procedure be performed every 400 hours.

Aftercooler core - clean/test

Required maintenance procedures and additional engine information are available in the *Perkins 1104D-E44TA Operation and Maintenance Manual* (Perkins part number SEBU9066-00).

Perkins 1104D-E44TA Operation and Maintenance Manual	
Genie part number	57.4700.0029

Checklist C Procedures

C-1
Perform Engine Maintenance



Note: Engine specifications require that this procedure be performed initial 500 hours.

Engine valve lash - check

Required maintenance procedures and additional engine information are available in the *Perkins 1104D-E44TA Operation and Maintenance Manual* (Perkins part number SEBU9066-00).

Perkins 1104D-E44TA Operation and Maintenance Manual	
Genie part number	57.4700.0029

C-2
Perform Engine Maintenance



Note: Engine specifications require that this procedure be performed every 500 hours.

Fan clearance - check

Required maintenance procedures and additional engine information are available in the *Perkins 1104D-E44TA Operation and Maintenance Manual* (Perkins part number SEBU9066-00).

Perkins 1104D-E44TA Operation and Maintenance Manual	
Genie part number	57.4700.0029

CHECKLIST C PROCEDURES

C-3
Perform Engine Maintenance



Note: Engine specifications require that this procedure be performed every 500 hours or annually.

Battery electrolyte lavel - check
Cooling system supplemental coolant additive (SCA) test/add
Engine air cleaner element (dual element/ canister type) - clean/replace
Engine air cleaner element (single element) - inspect/replace
Engine crankcase breather element - replace
Engine oil and filter - change
Fuel system primary filter (water separator) element - replace
Fuel system secondary filter - replace

Required maintenance procedures and additional engine information are available in the *Perkins 1104D-E44TA Operation and Maintenance Manual* (Perkins part number SEBU9066-00).

Perkins 1104D-E44TA Operation and Maintenance Manual	
Genie part number	57.4700.0029

C-4
Perform Axle Maintenance



Note: Axle specifications require that this procedure be performed every 500 hours.

Negative brake - adjust
Service brake - adjust

Required maintenance procedures and additional axle information are available in the *Dana 213 Axle Service Manual* (Dana part number ASM-0026E).

Dana 213 Axle Service Manual	
Genie part number	57.4700.0028

CHECKLIST C PROCEDURES

C-5
Inspect and Lubricate the Sequencing Chains



Genie specifications require that this procedure be performed every 500 hours or semi-annually, whichever comes first. In extremely dusty or hostile environments, it may be necessary to lubricate the chains more often.

Maintaining the sequencing chains in good condition is essential to safe operation and good machine performance. Failure to detect damage to the chains could result in a hazardous operating condition.

Environments in which Genie Telehandlers operate can vary widely from outdoor moisture and temperature extremes, to mildly corrosive or highly corrosive industrial atmospheres, in addition to abrasive exposures such as sand and grit.

In addition, dynamic shock loading can impose abnormal loads above the endurance limit of the chains. Examples of dynamic shock loading are:

- High velocity movement of load, followed by sudden abrupt stops.
- Carrying loads in suspension over irregular surfaces and rough terrain.
- Attempting to "inch" loads which are beyond the rated capacity of the vehicle.

The load cycles and environmental conditions make it impossible to predict chain life. It is therefore necessary to conduct regular inspections.

1 Park the machine on a firm, level surface, level the boom and engage the parking brake.

2 Fully extend the boom.

3 Inspect the chains for the following conditions:
   - Elongation

Note: the pitch of the boom extend chains (boom lower section) shall be 1 inch / 25.4 mm.

Only the extend chains should be measured.

Note: Measurement should be taken in the area where the chain articulates most frequently over the sheaves.

⊙ Result: The distance measures 1 inch / 25.4 mm (lower chain). The chain is within specification. Continue with inspection.

⊠ Result: The distance is greater than 1 inch / 25.4 mm (lower chain). The machine shall be removed from service until all the chains (retract and extend ones) are replaced.

Note: The boom chain's normal life expectancy can be expressed as a maximum percent of elongation of 2%.

Note: Please ask the service to know the correct procedure to better understand the maximum percent of chain elongation.

- **Edge wear**
  Check the chain for wear on the link plate edges caused by running back and forth over the sheave. The maximum reduction of material should not exceed 5%.
- **Cracked plates**
  Check link side plates for any cracks. These are generally a sign of chain fatigue.
- **Turning pins**
  Check the pins. The position of the riveting must be parallel with the top and bottom of the side plate.

If any of these conditions are discovered during inspection, the chain must be replaced.

After inspection and before being returned to service, chains must be lubricated with a quality chain lubricant.

Note: Do not use grease to lubricate chains.

The chain plates should be brushed with a wire brush prior to lubrication to clear the space between the plates.

The lubricant must penetrate the chain joint to prevent wear. Applying lubricant to the external surfaces will prevent rust, but the chains should be articulated to make sure the lubricant penetrates to the working surfaces between the pins and links.

Lubricant may be applied with a brush, sprayed or poured on, but the chain should be well flooded with lubricant and the boom should be extended and retracted to insure that the lubricant penetrates to the working surfaces. All excess lubricant should be wiped away from the external surfaces.

Note: Do not use solvents to remove excess lubricant.

Checklist D Procedures

D-1
Inspect the Forks

Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first OR whenever permanent deformation of the forks is suspected.

Maintaining the lifting forks in good condition is essential to safe operation and good machine performance. Failure to detect damage to the forks could result in a hazardous operating condition.

1 Thoroughly clean the lifting forks.

2 Inspect the forks for the following:
- Surface cracks
- Straightness of the blade and shank
- Fork angle at 90 ± 3 degrees
- Relative height of fork tips shall not differ more than 3% of blade length
- Excessive wear to the forks, fork mount or legible markings

Result: If any of the above criteria are not met, forks shall be removed from service until they are repaired or replaced.



a - shank
b - blade

D-2
Tighten the Boom Chains



Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first.

To tighten the boom chains, follow the instructions below:

Extend chains (boom bottom side)

1 Raise the boom to horizontal position.

2 Fully extend the boom.

3 Retract it about 3.9 inches / 100 mm.

4 Tighten the chain up to a maximum tension value of 37 ft-lbs / 50 Nm.

5 Check that all chains have been equally tensioned. If not, repeat the operation described above.

6 Lock the chain tensioners by means of a counternut and locknut.

Retract chains (boom upper side)

1 Fully retract the boom.

2 Extend the boom by 11.8 inches / 300 mm.

3 Loosen the locker nut.

4 Tighten the tensioning nut to 37 ft-lbs / 50 Nm.

5 Tighten the locker nut.

6 Check that all chains have been equally tensioned. If not, repeat the operation described above.

Note: If during chain tensioning, problems are detected, please contact service.

CHECKLIST D PROCEDURES

D-3
Replace Hydraulic Tank Return Filter Element



Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first.

Replacing the hydraulic return filter element is essential to good machine performance and service life. A dirty or clogged filter element may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the filter element be replaced more often.

⚠CAUTION Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

Note: Perform this procedure with the engine off.

1 Remove the access cover to the tank.

2 Release the pressure in the oil reservoir by loosening the filler/breather cap.

3 Unscrew the return filter.

4 Install the new filter element.

5 Tighten the filler/breather cap.

6 Record the hours the filter element was replaced and keep with your maintenance records.

7 Start the engine.

8 Inspect the filter assembly to be sure that there are no leaks.

9 Clean up any oil that may have spilled during the installation procedure.

CHECKLIST D PROCEDURES

D-4
Change Gear Box Oil

Note: Transmission specifications require that this procedure be performed every 1000 hours.

1 Place a container of suitable size under drain plug (A).

2 Remove plug (B).

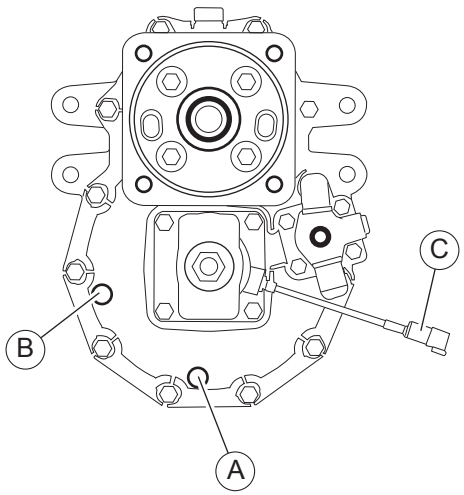
3 Remove drain plug (A) and empty the gear box.

4 Refit and tighten drain plug (A).

5 Pour in new oil through filler (B) placed at the top of the reduction gear of the power divider. Stop when oil is level with hole (B).

6 Refit and tighten plug (B).

7 Clean the sensor (C) reading zone (every oil change).



D-5
Perform Engine Maintenance

Note: Engine specifications require that this procedure be performed every 1000 hours.

Belt tensioner - check
Belt - inspect
Engine valve lash - check
Water pump - inspect

Required maintenance procedures and additional engine information are available in the *Perkins 1104D-E44TA Operation and Maintenance Manual* (Perkins part number SEBU9066-00).

Perkins 1104D-E44TA Operation and Maintenance Manual	
Genie part number	57.4700.0029

CHECKLIST D PROCEDURES

D-6
Perform Axle Maintenance



Note: Axle specifications require that this procedure be performed every 1000 hours.

Differential lubricating oil - change
Planetary reduction lubricating oil - change
Dropbox (if any) lubricating oil - change

Required maintenance procedures and additional axle information are available in the *Dana 213 Axle Service Manual* (Dana part number ASM-0026E).

Dana 213 Axle Service Manual	
Genie part number	57.4700.0028

D-7
Replace Coolant Filter Element



Genie specifications require that this procedure be performed every 2000 hours or annually, whichever comes first.

⚠CAUTION Bodily injury hazard. Beware of hot coolant. Contact with hot coolant may cause severe burns.

1 Remove the cover placed behind the cab.

2 Remove the bottom dome.

3 Pull out and replace the filter cartridge.

Checklist E Procedures

E-1
Test or Replace the Hydraulic Oil



Genie specifications require that this procedure be performed every 2000 hours or two years, whichever comes first

Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require oil changes to be performed more frequently. Refer to Section 2, Specifications.

NOTICE Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system.

Note: Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. If the hydraulic oil is not replaced at the two year inspection, test the oil quarterly. Replace the oil when it fails the test.

1 Lower the boom to the stowed position.

2 Raise the stabilizers (machine resting on wheels).

3 Fully tilt back the forks.

4 Remove the cover placed above the tank.

5 Remove oil cap from top of hydraulic tank.

6 Using an approved hand-operated pump, drain the hydraulic tank into a suitable container. Refer to Section 2, *Specifications*.

⚠CAUTION Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

7 Remove the drain plug.

8 Rinse out the inside of the tank using a mild solvent.

9 Install the drain plug and securely tighten. Do not over tighten.

10 Fill the tank with hydraulic oil until the fluid level is in the center of the sight glass at the front of the tank.

11 Clean up any oil that may have spilled.

CHECKLIST E PROCEDURES

E-2
Perform Engine Maintenance



Note: Engine specifications require that this procedure be performed every 2000 hours.

Aftercooler core - inspect
Engine mounts - inspect
Starting motor - inspect
Turbocharger - inspect

Required maintenance procedures and additional engine information are available in the *Perkins 1104D-E44TA Operation and Maintenance Manual* (Perkins part number SEBU9066-00).

Perkins 1104D-E44TA Operation and Maintenance Manual	
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E-3
Perform Engine Maintenance



Note: Engine specifications require that this procedure be performed every 3000 hours.

Alternator - inspect
Alternator and fan belts - replace

Required maintenance procedures and additional engine information are available in the *Perkins 1104D-E44TA Operation and Maintenance Manual* (Perkins part number SEBU9066-00).

Perkins 1104D-E44TA Operation and Maintenance Manual	
Genie part number	57.4700.0029

E-4
Perform Engine Maintenance



Note: Engine specifications require that this procedure be performed every 3000 hours or every two years, whichever comes first.

Coolant (commercial heavy-duty) - change

Required maintenance procedures and additional engine information are available in the *Perkins 1104D-E44TA Operation and Maintenance Manual* (Perkins part number SEBU9066-00).

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E-5
Perform Engine Maintenance



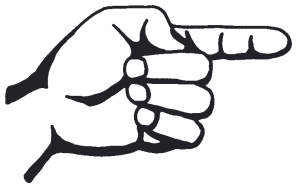
Note: Engine specifications require that this procedure be performed every 4000 hours.

Aftercooler core - clean/test

Required maintenance procedures and additional engine information are available in the *Perkins 1104D-E44TA Operation and Maintenance Manual* (Perkins part number SEBU9066-00).

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Genie part number	57.4700.0029

CHECKLIST E PROCEDURES



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Repair Procedures

Observe and Obey:

- ☑ Repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

Before Repairs Start:

- ☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and parts are available and ready for use.
- ☑ Use only Genie approved replacement parts.
- ☑ Read each procedure completely and adhere to the instructions. Attempting shortcuts may produce hazardous conditions.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
  - · Machine parked on a firm, level surface
  - · Boom in the stowed position
  - · Key switch in the off position with the key removed
  - · Wheels chocked

About This Section

Most of the procedures in this section should only be performed by a trained service professional in a suitably equipped workshop. Select the appropriate repair procedure after troubleshooting the problem.

Perform disassembly procedures to the point where repairs can be completed. Then to re-assemble, perform the disassembly steps in reverse order.

Symbols Legend

Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Indicates a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

NOTICE Indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Note: Used to indicate additional operation or procedure information.

⊙ Indicates that a specific result is expected after performing a series of steps.

⊠ Indicates that an incorrect result has occurred after performing a series of steps.

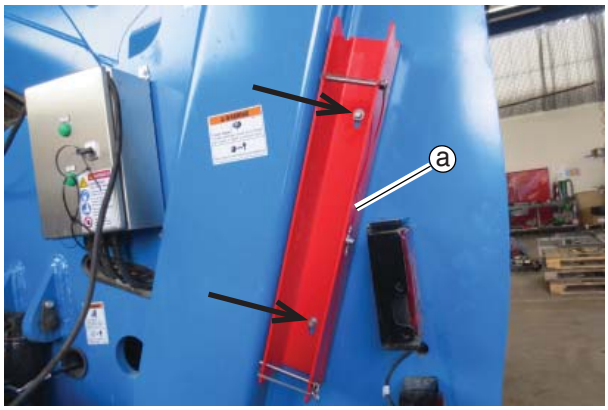
REPAIR PROCEDURES

Important Safety Information

⚠WARNING Before carrying out any maintenance or repair procedures under a raised boom, install the provided safety collar provided.

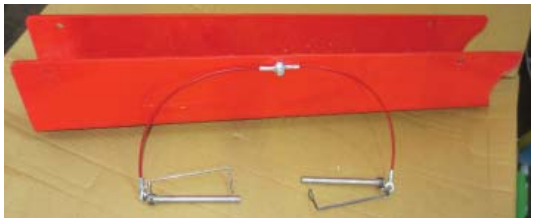
To avoid any accidental lowering of the machine boom, install tha safety collar (a) on the lifting cylinder ram as follow:

1. Using a 13mm combination wrench, remove the two screws securing the safety collar (a) to the left side of the machine chassis and remove the collar.



2. Remove the spring clips securing the pins to the collar, and remove the pins from the collar.





3. Install the safety collar on the lifting cylinder ram, using the locking pins and the spring clips at step 2.







⚠WARNING Crushing hazard. Do not work under a boom which is not properly supported.

Boom Components

1-1 Boom

How to Replace the Boom Wear Pads

1 Extend the boom until the wear pads are accessible.

2 Lower wear pads: Using a lifting strap from an overhead crane or a fork lift of sufficient capacity, lift the boom tube just enough to remove the weight from the pads.

3 Remove the wear pad retainer plates and remove the wear pads from the boom.

4 Lubricate the wear surface of the new pads. Refer to Maintenance Procedure A-4, Lubricate the Boom.

Note: Do not lubricate the side wear pads.

5 Install the wear pads. Install and securely tighten the retainer plates. Do not over tighten.

How to Remove the Lifting Fork Frame

1 With the boom in the stowed position, attach a lifting strap from an overhead crane to the top of the lifting fork frame at the front of the boom. Support the frame. Do not apply any lifting pressure.

2 Disconnect the quick-fit connectors of the hoses coming from the fork coupling attachment from the tipping valve on boom tube number 1.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Remove the lower locking pin, then remove the fork coupling attachment from the machine.

4 Remove the screw securing the fork level cylinder pivot pin to the lifting fork frame.

5 Use a soft metal drift to remove the pivot pin.

6 Remove the screw securing the fork frame pivot pin to the boom.

7 Use a soft metal drift to remove the pivot pin.

8 Using the overhead crane, lift and remove the fork frame from the boom.

⚠CAUTION Crushing hazard. The fork frame could fall if not properly supported when the lock pin is removed from the machine.

BOOM COMPONENTS

How to Replace the Boom Retract Chains

Note: Perform this procedure on a firm, level surface with the wheels chocked.

1 Start the engine and allow the engine to idle.

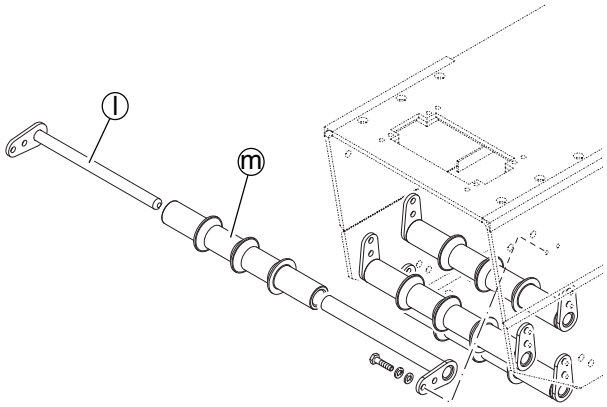
2 Raise the boom to a horizontal position.

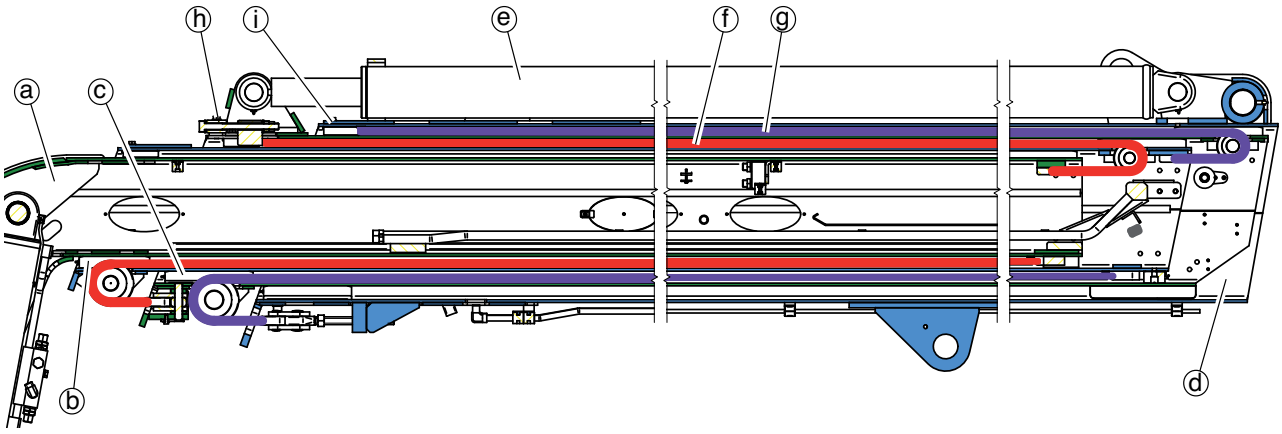
3 Fully retract the boom.

4 Turn the machine off and remove the key from the key switch.

5 At the pivot end of the boom, remove pins "l" and pulleys "m".

6 Remove the upper screws securing the upper chains "f" - "g".





a boom tube number 1
b boom tube number 2
c boom tube number 3
d boom tube number 4
e extend cylinder
f retract chain tube number 1
g retract chain tube number 2
h tube number 1 retract chain tensioner
i tube number 2 retract chain tensioner

7 At the fork end of the boom, remove the tensioning screw "n" and relevant nuts and counternuts.

8 Remove plate "o".

9 Loosen both screws "p".

10 Pull out block "q" to reach and remove the retaining fasteners "r" of chain anchor plate.

11 Securely attach a guide rope to the chain. This will be used to install the new chain.

Note: The guide rope must be securely attached to the chain before removal. If the rope becomes disconnect from the chain during removal, the installation of the new chain will be difficult.

12 At the pivot end of the boom, remove the chain by pulling it out of the boom assembly.

13 Remove the rope from the old chain and attach it to the new chain.

14 Using the assistance of a second operator, install the chain by pulling the guide rope from the fork end of the boom while the other operator guides the chain from the pivot end of the boom.

15 Remove the guide rope.

16 Connect the chain to the chain anchor plate by means of the retaining fasteners "r".

17 Install block "q" back into the slot on the boom.

18 At the pivot end of the boom, install the upper screws securing the upper chains "f" - "g".

19 Install the pulleys and pins previously removed from the pivot end of the boom.

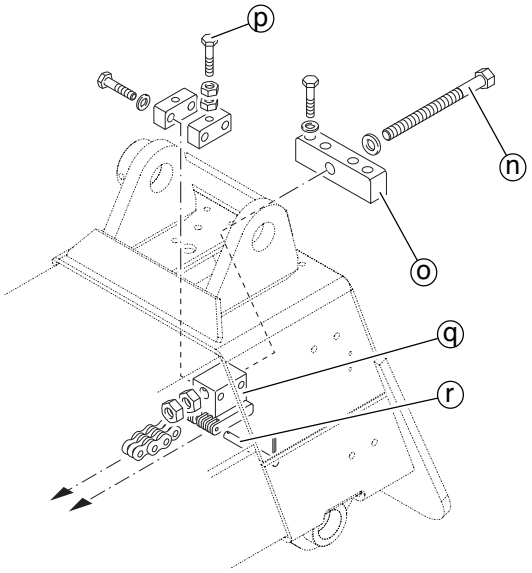
20 Install plate "o".

21 Install screw "n" and proceed with chain tensioning.

22 Tighten screws "p".

23 Extend and retract the boom to insure it operates smoothly.

NOTICE Component damage hazard. Chains can be damaged if the boom is used while the chains are out of adjustment. Do not return the machine to use until the chains have been correctly adjusted.



BOOM COMPONENTS

How to Replace the Boom Extend Chains

Note: Perform this procedure on a firm, level surface with the wheels chocked.

1 Start the engine and allow the engine to idle.

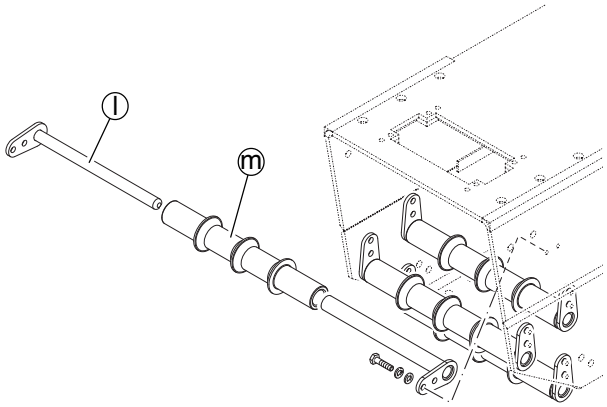
2 Raise the boom to a horizontal position.

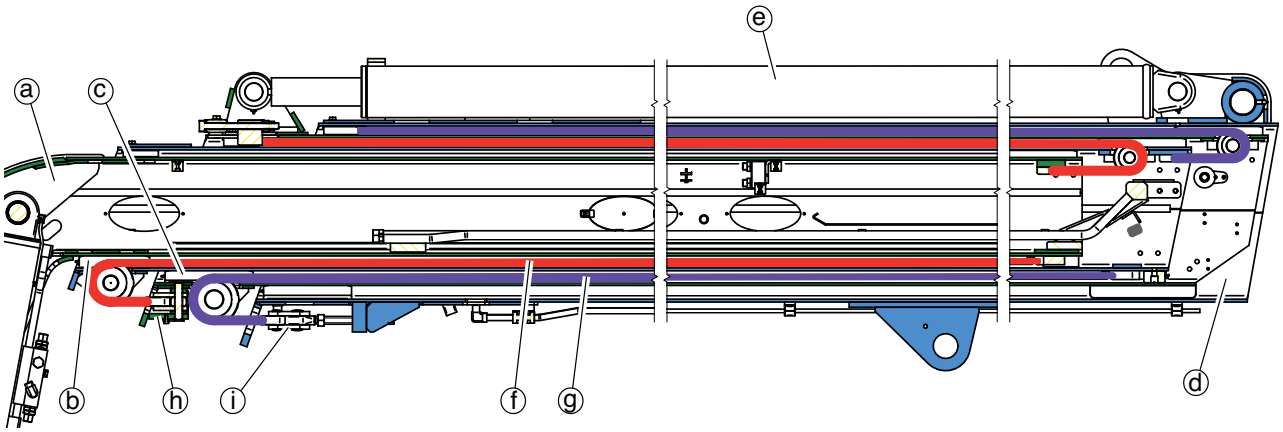
3 Fully retract the boom.

4 Turn the machine off and remove the key from the key switch.

5 At the pivot end of the boom, remove pins "l" and pulleys "m".

6 Remove the lower screws securing the lower chains "f" - "g".



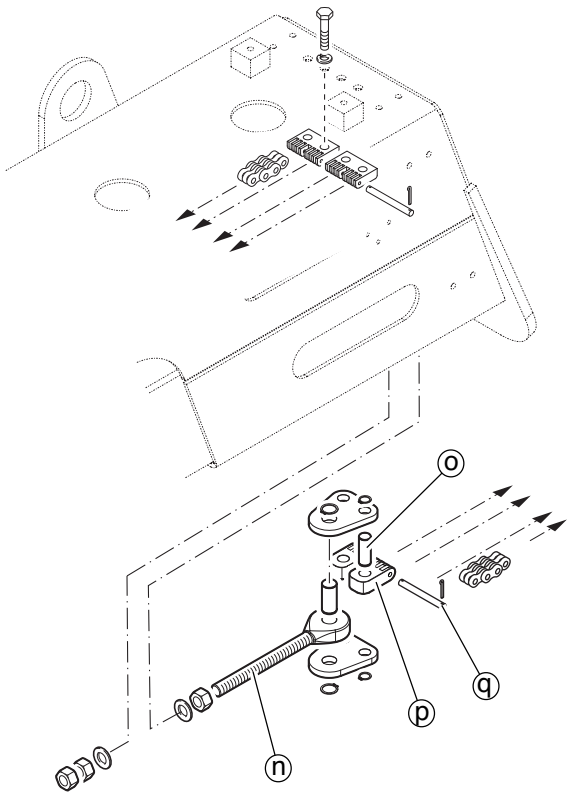


a boom tube number 1
b boom tube number 2
c boom tube number 3
d boom tube number 4
e extend cylinder
f extend chain tube number 1
g extend chain tube number 2
h tube number 1 extend chain locking device
i tube number 2 extend chain locking device

7 At the fork end of the boom, remove nuts and counternuts to free the tensioners "n" placed under the boom.

8 Remove pins "o" to separate the chain anchor plates "p" from tensioners "n".

9 Remove the retaining fasteners "q" to free the chain.



10 Securely attach a guide rope to the chain. This will be used to install the new chain.

Note: Rope coming loose from the chain during removal may result in a difficult reassembly. Be sure the rope is securely attached to the chain and boom structure before pulling the chain out of the boom.

11 At the pivot end of the boom, remove the chain by pulling it out of the boom assembly.

12 Remove the rope from the old chain and attach it to the new chain.

13 Using the assistance of a second operator, install the chain by pulling the guide rope from the fork end of the boom while the other operator guides the chain from the pivot end of the boom.

14 Install the lower screws securing the lower chains "f" - "g".

15 Remove the guide rope.

16 Connect the chain to the anchor plates "p" by means of the retaining fasteners "q".

17 Install the anchor plates "p" on tensioners "n" and lock in place by means of pins "o".

18 Install tensioners "n" on the boom and lock in place with the relevant nuts and counternuts.

19 Tension the chain.

20 Install the pulleys and pins previously removed from the pivot end of the boom.

21 Extend and retract the boom to insure it operates smoothly.

BOOM COMPONENTS

How to Remove the Boom

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

1 Place the machine in an area sufficient enough to fully lower the stabilizers and fully extend the boom.

2 Disconnect the quick-fit connectors of the hoses from the forks from the tipping valve on boom tube number 1 then remove the fork coupling attachment from the machine.

3 Lift the boom until the pin locking the lift cylinder is in a position above the cab roof.

4 Place a stand under the lift cylinder to properly support it once the pin connecting the cylinder to the boom will be removed.

5 Attach a lifting strap from an overhead crane to the fork support and slightly lift the boom. Do not apply any lifting pressure.

6 Attach a second strap from the overhead crane to the lifting cylinder, rod side, and put some tension on it.

7 Using a soft metal drift, remove the slave cylinder locking pin from the boom support.

8 Using a soft metal drift, remove the lift cylinder locking pin, boom side.

⚠DANGER Crushing hazard. The cylinder will fall if not properly supported when the pivot pin is removed from the machine.

9 Operate the 2 overhead cranes at the same time to lower the boom being careful to rest the lift cylinder onto the support previously placed underneath, and the boom tip onto another stand positioned to support the front part of the boom.

10 Hook the 4 lifting points and then slowly lift the boom.

11 Tag, disconnect and plug the hydraulic hoses that go to the extend, retract, fork tilt and fork leveling cylinders, and the quick coupling cylinder (if equipped).

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

12 Using a soft metal drift, remove the pin securing the boom to the machine.

⚠DANGER Crushing hazard. The boom will fall if not properly supported when the pivot pin is removed from the machine.

13 Carefully remove the boom assembly from the machine and place it on a structure capable of supporting it.

How to Disassemble the Boom

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, Hydraulic Hose and Fitting Torque Specifications.

1 Place the machine in an area sufficient enough to fully lower the stabilizers and fully extend the boom.

2 Using a soft metal drift and a hammer, remove the rod end pivot pin from the tilt cylinder. Keep attention to choose a drift smaller than the pivot pin!

3 Remove the bottom end carter of the boom.

4 Tag, disconnect and plug the four hydraulic hoses 1 from bracket 3.

5 Remove the two brackets 2 with the relative pulleys.

6 Extend the boom until the inspection holes are accessible on the inner boom section.

7 Inserting a spanner through the inspection holes, remove the screws which fix the hoses holder block and disconnect the hydraulic hoses on the upper boom side.

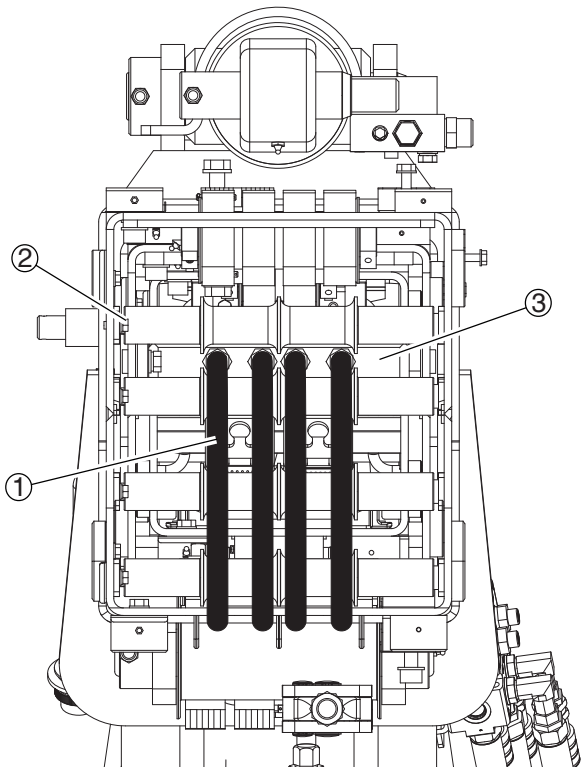
8 Completely retract the boom.

9 Pull out the internal steel hoses assembly.

10 Using a soft metal drift and a hammer, remove the rod end pivot pin from the extend cylinder. Keep attention to choose a drift smaller than the pivot pin!

11 In the lower section of the boom, tag and disconnect the chains from the chain tensioner.

12 Repeat step 11 for the upper section of the boom.



BOOM COMPONENTS

13 Tag and disconnect the chains placed in the pivot end of the boom.

14 Remove all the pads inside the boom but the ones in the lower side.

15 With a lifting strap connected to the overhead crane, sling the first, second and third boom out of the fourth one.

16 Set the boom assembly on a structure capable of supporting it.

17 Let the first and second boom section slide out of the third one.

18 Set the first and second boom section on a structure capable of supporting it.

19 Let the first boom section slide out of the second one.

20 Set the first boom section on a structure capable of supporting it.

1-2
Boom Lift Cylinder

How to Remove the Lift Cylinder

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

1 Attach a lifting strap from an overhead 22045 lbs / 10,000 kg crane to the fork end of the boom. Support the boom. Do not apply any lifting pressure.

2 Tag, disconnect and plug the hydraulic hoses at the lift cylinder manifold. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

3 Attach a lifting strap from an overhead crane to the rod end of the lift cylinder. Support the cylinder. Do not apply any lifting pressure.

4 Remove the fasteners securing the lift cylinder barrel-end pivot pin to the chassis.

5 Use a soft metal drift to remove the pivot pin.

6 Remove the fasteners securing the lift cylinder rod-end pivot pin to the boom.

7 Use a soft metal drift to remove the pivot pin.

⚠DANGER Crushing hazard. The boom will fall if not properly supported when the pivot pin is removed from the machine.

8 Using the overhead crane, raise the boom to a horizontal position. Remove the cylinder from the machine.

⚠DANGER Crushing hazard. The cylinder could fall if not properly supported when removed from the machine.

BOOM COMPONENTS

1-3
Boom Extend Cylinder

How to Remove the Extend Cylinder

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, Hydraulic Hose and Fitting Torque Specifications.

1 Raise the boom to a horizontal position. Extend the boom enough to access the extend cylinder pivot pin.

2 Remove the retaining fasteners securing the extend cylinder rod end pivot pin.

3 Using a soft metal drift and a hammer, remove the pivot pin.

4 Remove the retaining fasteners that secure the cylinder retainer.

5 Place a container of suitable size under the hydraulic hoses before disconnecting.

6 Tag, disconnect and plug the hydraulic hoses from the extend cylinder. Cap the cylinder fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

7 Remove the retaining fasteners securing the extend cylinder barrel end pivot pin.

8 Using a soft metal drift and a hammer, remove the pivot pin.

9 Partially pull the cylinder out. Using a lifting strap and an overhead crane, remove the cylinder.

⚠DANGER Crushing hazard. The cylinder could fall if not properly supported when removed from the machine.

1-4
Fork Level Slave Cylinder

How to Remove the Fork Level Slave Cylinder

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, Hydraulic Hose and Fitting Torque Specifications.

1 Remove the retaining fasteners securing the level cylinder rod end pivot pin.

2 Using a soft metal drift and a hammer, remove the pivot pin.

3 Using a lifting strap and an overhead crane, support the cylinder.

4 Place a container of suitable size under the hydraulic hoses before disconnecting.

5 Tag, disconnect and plug the hydraulic hoses from the level cylinder. Cap the cylinder fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

6 Remove the retaining fasteners securing the level cylinder barrel end pivot pin.

7 Using a soft metal drift and a hammer, remove the pivot pin.

8 Carefully lift and remove the cylinder from the machine.

⚠DANGER Crushing hazard. The cylinder could fall if not properly supported when removed from the machine.

BOOM COMPONENTS

How to Replace the Fork Level Slave Cylinder Hoses

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, Hydraulic Hose and Fitting Torque Specifications.

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

1 Before replacing a hydraulic hose, thoroughly clean the machine, including the inside of the boom assembly.

2 Tag, disconnect and plug both ends of the hydraulic hose to be replaced. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 At the fork end of the boom, remove the plug and connect the replacement hydraulic hose to the hydraulic hose being replaced with a male union connector.

4 Install the replacement hydraulic hose by pulling the old hydraulic hose out of the pivot end of the boom assembly.

5 Connect both ends of the hydraulic hose. Clean up any oil that may have spilled.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

1-5
Fork Tilt Cylinder

How to Remove the Fork Tilt Cylinder

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, Hydraulic Hose and Fitting Torque Specifications.

1 Remove the forks from the frame.

2 Remove the retaining fasteners securing the fork tilt cylinder rod end pivot pin.

3 Using a soft metal drift and a hammer, remove the pivot pin.

4 Using a lifting strap and an overhead crane, support the cylinder.

5 Place a container of suitable size under the hydraulic hoses before disconnecting.

6 Tag, disconnect and plug the hydraulic hoses from the level cylinder. Cap the cylinder fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

7 Remove the retaining fasteners securing the fork tilt cylinder barrel end pivot pin.

8 Using a soft metal drift and a hammer, remove the pivot pin.

9 Carefully lift and remove the cylinder from the machine.

⚠DANGER Crushing hazard. The cylinder could fall if not properly supported when removed from the machine.

BOOM COMPONENTS

1-6
Boom Angle Proximity Swtich

How to Adjust the Boom Angle Proximity Swtich

The boom angle proximity switch is attached to a mounting bracket, located between the boom and the chassis directly beneath the boom pivot pin The switch location is adjustable.

1 Start the engine.

2 Raise the boom to 50°. Confirm with a digital level.

3 At the pivot end of the boom, locate the boom angle proximity switch. Loosen the fasteners securing the proximity switch assembly to the chassis, just enough to allow the bracket to move.

4 Move the proximity switch assembly until the light of the proximity switch turns on, then move the proximity switch assembly until the light of the proximity switch turns off.

5 Securely tighten the fasteners. Do not over tighten.

6 Lower the boom to 45°.

⊙ Result: the light of the proximity switch assembly is illuminated.

7 Raise the boom to 50°. Confirm with a digital level.

⊙ Result: the light of the proximity switch assembly is not illuminated. The proximity switch is properly calibrated.

⊠ Result: the light of the proximity switch assembly is illuminated. The proximity switch is not calibrated correctly. Repeat the procedure beginning with step 4.

Operator's Compartment

2-1
Operator's Compartment

How to Remove the Operator's Compartment

The operator's compartment is used to activate machine functions while sitting in the operator's drivers seat.

Within the operator's compartment there is a transmission column shifter, steering selector, 4-way controller, accelerator pedal, brake pedal and a differential lock switch. All of these components are replaceable.

For further information or assistance, consult the Genie Service Department.

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is required.

1 Start the diesel engine and raise the boom above the cab. Turn the diesel engine off.

2 Get behind the front right wheel, remove the round protective flap and disconnect the battery from the machine.

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Remove the protective cover next to the cab - inner side of the machine.

4 Cut the plastic fasteners fixing the electrical cables, then disconnect all of the electrical wires.

5 Remove the retaining screws from the joystick support plate.

6 Remove the guards under the steering wheel to access the pipes of the power steering.

7 Tag, disconnect and plug the hydraulic lines of the power steering unit and of the heater.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

8 Remove the cover which is located under the cab.

9 Disconnect the electrical and hydraulic connections from the brake pump.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

10 Disconnect the ground wire.Remove the joystick guard inside the cab; remember to disconnect the electric plugs.

11 Remove the cover placed behind the cab.

OPERATOR'S COMPARTMENT

12 Remove the retaining collars and disconnect the hoses of the Webasto heater from the fittings at the rear of the cabin.

13 Remove the 4 retaining fasteners of the cabin.

14 Install and secure two eyebolts to the top the cabin in the special seats.

15 Using a sling chain and an overhead crane, slowly raise the cabin away from the machine and set it on a supporting device.

NOTICE Component damage hazard. Wrapping a strap around the cab and lifting using an overhead crane can put excessive pressure on the glass windows of the cab, causing the windows to break. Do not lift the cab using a strap from an overhead crane.

Bolt torque specification	
Operator's cab mounting bolts	167 ft-lbs 226 Nm (plus Locktite compound)

2-2
Machine Controls

How to Remove the Steering Column

1 Get behind the front right wheel, remove the round protective flap and disconnect the battery from the machine.

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

2 Remove the lower part of the dashboard.

3 Remove the upper part of the dashboard.

4 Remove the transmission control lever.

5 Remove the light control lever.

6 Remove the screws which secure the steering column to the frame.

7 Remove the steering column.

How to Remove the Steering Wheel

1 Get behind the front right wheel, remove the round protective flap and disconnect the battery from the machine.

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

2 Remove the horn button from the steering wheel. Remove the nut securing the steering wheel to the column and remove the steering wheel.

OPERATOR'S COMPARTMENT

How to Remove the Steer Rotation Actuator

1 Remove the steering column. See 2-2, *How to Remove the Steering Column*.

2 Working under the dashboard, locate the hydraulic hoses of the steer rotation actuator.

3 Tag, disconnect and cap the hydraulic hoses and steer rotation actuator holes.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

4 Remove the retaining fasteners that secure the steer rotation actuator to the frame.

5 Remove the steer rotation actuator.

How to Remove the Joystick

1 Get behind the front right wheel, remove the round protective flap and disconnect the battery from the machine.

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

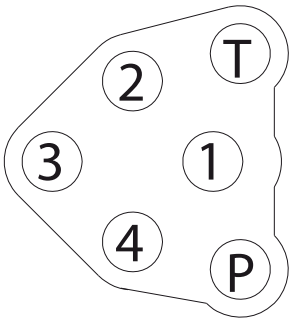
2 Remove the retaining fasteners that secure the joystick to the mount panel.

3 Tag and disconnect the joystick harness connector from the machine.

4 Tag, disconnect and plug the hoses from ports 1, 2, 3, 4, P and T of the joystick. Cap the fittings.

Note: Removing the hydraulic hose from port T of the joystick with the joystick below the hydraulic oil level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not disconnect the hose from the port if the joystick is below the hydraulic oil level in the hydraulic tank.

5 Remove the fasteners securing the joystick to the mount panel. Remove the joystick.



Joystick port orientation

How to Remove the Brake Pedal Assembly

1 Set the ignition switch to position "1".

2 Fully depress then release the brake pedal until the low brake pressure warning light comes on.

3 Go on depressing and releasing the brake pedal for about one minute in order to relieve all the pressure in the system.

4 Set the ignition switch to position "0".

5 Get behind the front right wheel, remove the round protective flap and disconnect the battery from the machine.

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

6 Tag and disconnect the brake harness.

7 Tag, disconnect and plug the hydraulic hoses of the brake pedal pump.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

8 Remove the retaining fasteners securing the brake pedal. Remove the brake pedal.

How to Remove the Gauge Cluster Assembly

1 Get behind the front right wheel, remove the round protective flap and disconnect the battery from the machine.

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

2 Remove the upper part of the dashboard.

3 Reach under the dashboard and gently push the gauge cluster through the opening in the dashboard.

4 Tag and disconnect the wire harness from the gauge cluster. Remove the gauge cluster from the machine.

Fuel and Hydraulic Tanks

3-1
Fuel Tank

How to Remove the Fuel Tank

DANGER Explosion and fire hazard. Engine fuels are combustible. Remove the fuel tank in an open, wellventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

DANGER Explosion and fire hazard. Never drain or store fuel in an open container due to the possibility of fire.

DANGER Explosion and fire hazard. When transferring fuel, connect a grounding wire between the machine and pump or container.

WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

1 Get behind the front right wheel, remove the round protective flap and disconnect the battery from the machine.

WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

2 Remove the filler cap from the fuel tank.

3 Using an approved hand-operated pump, drain the fuel tank into a container of suitable capacity. Refer to Section 2, Specifications.

WARNING Explosion and fire hazard. When transferring fuel, connect a grounding wire between the machine and pump or container.

Note: Be sure to only use a hand operated pump suitable for use with gasoline and/or diesel fuel.

4 Remove the small cover located on the top of the fuel tank.

5 Tag and disconnect the wire harness from the fuel level terminals.

6 Close the 3 taps on the tank side and disconnect the fuel hoses (Webasto burner feed hose, and delivery and return hoses of the diesel engine fuel system).

7 Insert the forks of a forklift under the tank to support it. Ensure the forks are properly spaced to maintain the tank in a balanced position.

DANGER Crushing hazard. The tank could become unbalanced and fall if not properly supported when removed from the machine.

8 Remove the retaining fasteners securing the tanks to the machine.

9 Remove the tank from the machine.

3-2
Hydraulic Tank

How to Remove the Hydraulic Tank

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

1 Lift the boom.

2 Get behind the front right wheel, remove the round protective flap and disconnect the battery from the machine.

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Close the oil intake valves.

4 Remove the cover located on the top of the oil tank.

5 Remove the filler cap from the hydraulic tank.

6 Place a drain pan or other suitable container under the hydraulic tank. Refer to Section 2, Specifications.

7 Remove the drain plug from the hydraulic tank and completely drain the tank.

⚠CAUTION Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

8 Remove the wire harness from the bulb on the hydraulic filter and from the low oil level indicator.

9 Place a container of suitable size under the hydraulic hoses before disconnecting.

NOTICE Used oils must be handled and disposed of according to local regulations.

10 Tag and disconnect all the hydraulic hoses from the tank.

11 Remove the hose from the oil return manifold located at the top of the tank.

12 Disconnect the wire harness from the heating element of the oil tank heating system.

13 Remove the retaining collars from the accumulator of the lift cylinder system.

14 Remove the manifold from the top of the oil tank. See 7-1, *How to Remove the Function Manifold.*

15 Insert the forks of a forklift under the tank to support it. Ensure the forks are properly spaced to maintain the tank in a balanced position.

⚠DANGER Crushing hazard. The tank could become unbalanced and fall if not properly supported when removed from the machine.

16 Remove the retaining fasteners securing the tanks to the machine.

17 Remove the tank from the machine.

Engines

4-1
Engine

How to Repair the Perkins 1104D-E44TA Engine

Repair procedures and additional engine information are available in the *Perkins 1104D-E44TA Operation and Maintenance Manual* (Perkins part number SEBU9066-00), and the *Perkins 1104D-E44TA Disassembly and Assembly* (Perkins part number UENR4462-00).

Perkins 1104D-E44TA Operation and Maintenance Manual	
Genie part number	57.4700.0029
Perkins 1104D-E44TA Disassembly and Assembly	
Genie part number	57.4700.0030

4-2
Engine Fault Codes

How to Retrieve Engine Fault Codes

When the engine Electronic Control Module (ECM) detects an abnormal operating condition, a fault code is immediately stored in the ECM memory. At the same time, a colored warning lamp is illuminated and the fault code is shown on the engine diagnostic display, located on the dashboard in the operator's compartment.

To learn the specifications of and how to use the fault codes, refer to Section 6, *Fault Codes*.

Transmission

5-1 Gear Box

How to Repair the Gear Box

Repair procedures and additional gear box information are available in the *Dana 367 Gear Box Service Manual* (Dana part number GSM-0016).

Dana 367 Gear Box Service Manual	
Genie part number	57.4700.0027

5-2 Axle

How to Remove the Axle

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is required.

1 Chock the wheels.

2 Remove the fasteners securing the driveshaft to the transmission. Lower the end of the driveshaft to the ground.

3 Remove the fasteners securing the driveshaft to the axle. Remove the driveshaft from the machine.

4 Tag and remove the hydraulic hoses from the axle.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

5 Loosen the lug nuts of both wheels on the axle to be removed. Do not remove the lug nuts.

TRANSMISSION

6 Raise the end of the machine until the tires are off the ground. Place blocks under the chassis for support.

⚠WARNING Crushing hazard. The chassis will fall if not properly supported.

7 Remove the lug nuts. Remove the tire and wheel assembly from both ends of the axle.

8 Support and secure the axle to an appropriate lifting device.

9 Remove the fasteners securing the sway cylinder rod-end pivot pin to the chassis.

10 Use a soft metal drift to remove the pivot pin.

11 Remove the fasteners securing the axle to the chassis. Remove the axle from the machine.

⚠WARNING Crushing hazard. The axle will fall if not properly supported when the fasteners are removed from the machine.

Bolt torque specification	
Axle mounting bolts	560 ft-lbs 760 Nm

5-3
Rear Axle Lockout Cylinder

How to Bleed Air from the Locking Cylinder

1 Open the venting valve placed under the grease nipple, barrel end side.

2 Start the engine.

3 Operate the joystick and level the machine frame right and left until no air flows out of the venting valve.

4 Stop the engine.

5 Tighten the venting valve.

Hydraulic Pumps

6-1
Boom and Steering Function Pump

How to Test the Boom and Steering Function Pump

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to port TP1.

2 Start the engine.

3 Increase the engine speed to maximum rpm.

4 Activate and hold boom retract.

5 Without releasing the joystick, keep pushing the throttle pedal.

⊙ Result: the pressure gauge reads 4060 psi / 280 bar. The pump is good.

⊠ Pressure is not within specification.
The pump needs to be adjusted OR the pump or pump coupling is faulty and needs to be serviced or replaced.

NOTICE Component damage hazard. There is no relief valve in the hydraulic pump and the pump can be damaged if the pressure is allowed to exceed specification. When testing the pump, crank the engine in one second intervals until the correct pressure is confirmed. Do not over-pressurize the pump.

6 Remove the pressure gauge and install plug onto port TP1.

HYDRAULIC PUMPS

How to Remove the Boom and Steering Function Pump

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the fitting and/or hose end must be torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

Note: Perform this procedure with the engine off and cool to the touch.

1 Get behind the front right wheel, remove the round protective flap and disconnect the battery from the machine.

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

2 Close the hydraulic tank ball valves.

3 Remove the engine cover to easily reach the pumps.

4 Tag, disconnect and plug the case drain hose located at the top of the pump. Cap the fitting on the pump.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

Note: Placing the open end of the case drain hose below the hydraulic oil level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not lower the open end of the case drain hose below the fluid level of the hydraulic tank until the hose is plugged.

5 Tag, disconnect and plug the hydraulic pump supply hose at the pump. Cap the fitting on the pump.

Note: Placing the open end of the case drain hose below the hydraulic oil level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not lower the open end of the case drain hose below the fluid level of the hydraulic tank until the hose is plugged.

6 Tag, disconnect and plug the high pressure hose at the pump. Cap the fitting on the pump.

7 Remove the fasteners securing the pump, then remove the pump from the machine.

⚠WARNING Crushing hazard. The pump will fall if not properly supported when the fasteners are removed from the machine.

How to Install the Boom and Steering Function Pump

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the fitting and/or hose end must be torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

Note: Perform this procedure with the engine off and cool to the touch.

1 Install the boom function pump on the transmission pump.

2 Install the high pressure hose onto the pump outlet.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Install the low pressure hose onto the pump outlet. Install the hose retaining rings and fasteners.

4 At the case drain at the top of the pump, fill the pump with hydraulic fluid until it reaches the top of the case drain fitting.

5 Install the case drain hose onto the pump.

6 Securely install the wire harness onto the pump.

7 Open the hydraulic tank ball valve.

8 Check the hydraulic fluid level in the hydraulic tank. Add fluid if needed.

9 Start the engine and prime the pump. See 6-1, *How to Prime the Boom and Steering Function Pump*.

10 Inspect for leaks.

11 Adjust the pump pressure. See 6-1, *How to test the Boom and Steering Function Pump*.

HYDRAULIC PUMPS

How to Prime the Boom and Steering Function Pump

1 Connect a 0 to 870 psi / 0 to 60 bar pressure gauge to port TP5.

2 Open the hydraulic tank ball valve.

3 Start the engine, allow the engine to run at low idle for 5 seconds and then shut off the engine. Wait 15 seconds, then start the engine again. Allow the engine to run at low idle for 10 seconds and then shut off the engine.

4 Start and shut off the engine again; do not accelerate and wait for the pressure gauge to read a pressure of approx. 320 psi / 22 bar. When the value becomes stable, the pump is filled.

5 With the engine running, move the joystick slowly to verify that the movements are performed correctly.

6 Shut off the engine and inspect for oil leaks.

How to Adjust the Boom and Steering Function Pump Standby Pressure

1 Connect a 0 to 1450 psi / 0 to 100 bar pressure gauge to port TP5 (pump stand-by pressure test port).

2 Start the engine and allow the engine to run at low idle.

⊙ Result: the pressure gauge reads 320 psi / 22 bar. The pump is good. Proceed to step 5.

⊠ Pressure is not within specification.
The pressure setting needs to be adjusted. Proceed to step 3.

3 Loosen the set screw for the standby pressure adjustment screw.

4 Adjust the function pump standby pressure. Turn the adjustment screw clockwise to increase the pressure or counterclockwise to decrease the pressure. Tighten the set screw.

5 Turn the engine off and remove the pressure gauge.

How to Adjust the Boom and Steering Function Pump Pressure Compensator

Note: Two people will be required to perform this procedure.

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to port TP1.

2 Start the engine and allow the engine to run at low idle.

3 Fully retract the boom.

4 Continue to activate the boom retract function and observe the pressure reading on the pressure gauge.

5 Turn the pressure relief valve on the function manifold incrementally and ensure that the pressure gauge reading begins to increase.

6 Stop turning the valve on the function manifold when the pressure gauge reading is stable.

⊙ Result: the pressure gauge reads 4350 psi / 300 bar. The pump is good. Proceed to step 9.

⊠ Pressure is not within specification. The pressure setting needs to be adjusted. Proceed to step 7.

7 Loosen the set screw for the pressure compensator adjustment screw on the pump.

8 Adjust the pressure compensator pressure. Turn the adjustment screw clockwise to increase the pressure; turn the adjustment screw counterclockwise to decrease the pressure. Tighten the set screw.

⚠WARNING Component damage hazard. Do not adjust the pressure compensator higher than specified.

9 Turn the pressure relief valve on the function manifold again until the pressure gauge reads 4060 psi / 280 bar.

10 Turn the engine off and remove the pressure gauge.

HYDRAULIC PUMPS

6-2
Auxiliary Gear Pump

How to Adjust the Auxiliary Line Max Pressure Relief Valve

1 Engage the parking brake.

2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to port TP2.

3 Go under the cabin.

4 Fully loosen the adjustment screw.

5 Close the tap to the side of the valve.

6 Start the engine and let it run at maximum rpm.

7 Tighten the adjustment screw until the pressure gauge connected to port TP2 reads a value of 2610 psi / 180 bar.

8 Open the tap to the side of the valve.

How to Remove the Auxiliary Gear Pump

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the fitting and/or hose end must be torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

Note: Perform this procedure with the engine off and cool to the touch.

1 Close the hydraulic tank ball valves.

2 Tag, disconnect and plug the hydraulic hoses. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Cap the auxiliary gear pump holes and the hoses ones.

4 Remove the auxiliary gear pump.

How to Install the Auxiliary Gear Pump

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the fitting and/or hose end must be torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

Note: Perform this procedure with the engine off and cool to the touch.

1 Install the auxiliary gear pump to the engine.

2 Connect the hydraulic hoses to the pump.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Open the hydraulic tank ball valves .

4 Start the engine and prime the pump. See 6-2, *How to Prime the Auxiliary Gear Pump.*

5 Inspect for leaks.

6 Adjust the pump pressure. See 6-2, *How to test the Auxiliary Gear Pump.*

HYDRAULIC PUMPS

How to Prime the Auxiliary Gear Pump

1 Start the engine, allow the engine to run at low idle for 15 seconds then shut off the engine.

2 Wait 15 seconds, then start the engine again.

3 Allow the engine to run at low idle for 15 seconds and then shut off the engine.

6-3 Hydrostatic Transmission Pump

How to Test the Hydrostatic Transmission Pump

Note: Perform this procedure on a firm, level surface, with the boom in the stowed position and brake pedal engaged.

1 In the proximity of the drive pump, spot the valve deactivating the drive pump inching. Once the test is completed, open the valve.

2 Connect a 0 to 8700 psi / 0 to 600 bar pressure gauge to port TP4 (hydrostatic transmission high pressure test port).

3 Connect a 0 to 870 psi / 0 to 60 bar pressure gauge to port TP3 (hydrostatic transmission boost pressure test port).

4 Start the engine. Shift the transmission into second gear.

⊙ Result: the pressure gauge connected to test port TP3 reads 406 psi / 28 bar.

⊠ Pressure is not within specification.
Adjust the boost pressure valve "c" located under the pump.

5 Increase the engine speed to 1100 rpm.

6 Release parking brake.

7 Engage forward gear.

⊙ Result: the pressure gauge connected to test port TP4 reads 725 psi / 50 bar.

⊠ Pressure is not within specification.
Adjust the DA valve "a" located under the pump.

8 Increase the engine speed to maximum rpm.

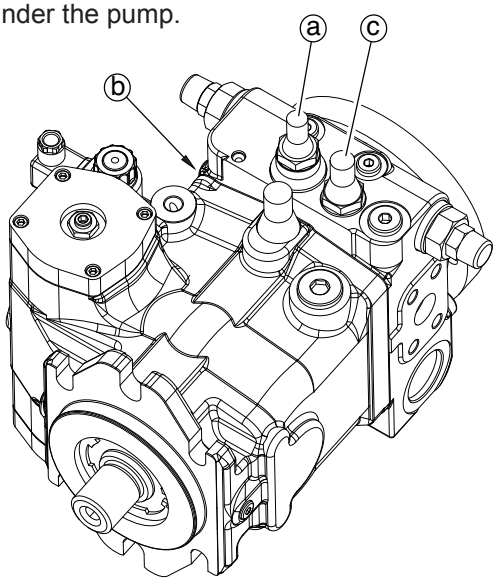
⊙ Result: the pressure gauge on test port TP4 reads 6450 psi / 450 bar.

⊠ Pressure is not within specification.
Adjust the high pressure relief valve "b" located on the side of the pump.

9 While observing the pressure gauge connected to test port TP3, operate the engine between 1100 rpm and maximum rpm.

⊙ Result: the pressure gauge on test port TP3 does not go below 406 psi / 28 bar.

⊠ Pressure is not within specification.
Adjust the boost pressure valve "c" located under the pump.



HYDRAULIC PUMPS

How to Remove the Hydrostatic Transmission Pump

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the fitting and/or hose end must be torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

Note: Perform this procedure with the engine off and cool to the touch.

1 Open the engine compartment.

2 Remove the front cover of the engine housing.

3 Remove the cover that is under engine.

4 Locate the battery disconnect switch and disconnect the battery from the machine.

5 Remove the retaining fasteners that secure the battery disconnect switch mounting plate.

6 Tag, disconnect and plug the hoses that are connected to the hydrostatic transmission pump. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

7 Remove the auxiliary gear pump from the hydrostatic transmission pump.

8 Tag and disconnect the harness from the transmission.

9 Support and secure the transmission pump to a suitable lifting device. Do not apply lighting pressure.

10 Remove the hydrostatic transmission pump.

⚠WARNING Crushing hazard. The hydrostatic transmission pump will fall if not properly supported when the fasteners are removed from the machine.

How to Install the Hydrostatic Transmission Pump

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the fitting and/or hose end must be torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

Note: Perform this procedure with the engine off and cool to the touch.

1 Open the engine compartment.

2 Remove the front cover of the engine housing.

3 Remove the cover that is under engine.

4 Attach a lifting strap and lift the transmission pump using a overhead crane.

5 Install the hydrostatic transmission pump on the engine.

6 Remove the fitting caps from the hydrostatic transmission pump.

7 Remove the hoses caps.

8 Connect the hoses to the pump.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

9 Connect the harness to the transmission pump.

10 Install the auxiliary gear pump on the hydrostatic transmission pump.

11 Install the retaining fasteners securing the battery disconnect switch mounting plate.

12 Start the engine and prime the pump. See 6-3, *How to Prime the Hydrostatic Transmission Pump*.

13 Inspect for leaks.

14 Adjust the pump pressure. See 6-3, *How to test the Hydrostatic Transmission Pump*.

HYDRAULIC PUMPS

How to Prime the Hydrostatic Transmission Pump

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

1 Connect a 0 to 870 psi / 0 to 60 bar pressure gauge to port TP3 (hydrostatic transmission boost pressure test port).

2 Start the engine. Run at low idle for 5 seconds. Shut the engine off and wait for 15 seconds.

3 Start the engine. Run at low idle for 10 seconds. Shut the engine off and wait for 15 seconds.

4 Note: Repeat step 4 until the pressure gauge connected to TP3 reads 290 psi / 20 bar or greater.

5 Apply the brake pedal and start the engine. Shift the transmission into forward and disengage the emergency brake.

6 Release the brake pedal and slowly increase the engine rpm until the machine starts to move. Apply the brake.

7 Shift the transmission into reverse. Release the brake pedal and slowly increase the engine rpm until the machine starts to move. Apply the brake.

8 Engage the emergency brake and turn the engine off. Check for hydraulic leaks.

Manifold

7-1
Function Manifold

How to Remove the Function Manifold

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the fitting and/or hose end must be torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

Note: Perform this procedure with the engine off and cool to the touch.

1 Close the hydraulic tank ball valves.

2 Remove the central cover of the machine.

3 Tag, disconnect and plug the hoses from the function manifold.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

4 Remove the cover above the oil tank.

5 Support and secure the function manifold to a suitable lifting device. Do not apply lighting pressure.

6 Remove the retaining fasteners securing the function manifold.

7 Remove the function manifold.

⚠WARNING Crushing hazard. The function manifold will fall if not properly supported when the fasteners are removed from the machine.

MANIFOLD

How to Test the Function Manifold

1 Remove the cover above the oil tank.

2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to port TP1 (main valve hydraulic circuit test port).

3 Start the engine.

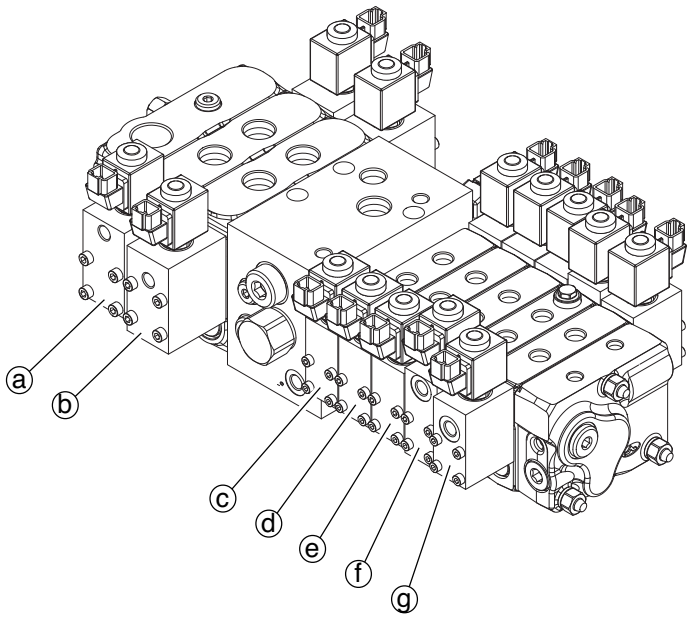
4 Increase the engine speed to maximum rpm.

5 Moving the joystick, retract the boom.

⊙ Result: the pressure gauge reads 4060 psi / 280 bar. The pump is good.

⊠ Pressure is not within specification.
Set the valve placed above the manifold.

Function Manifold Components



Pos.	Function	Description	Schematic ITEM
a	Boom down/up	Hydraulic proportional control	A1 - B1
b	Boom in/out	Hydraulic proportional control	A2 - B2
c	Chassis sway	Hydraulic proportional control	A3 - B3
d	Fork tilt down/up	Hydraulic proportional control	A4 - B4
e	Attachment hydraulic circuit	Hydraulic proportional control	A5 - B5
f	Left Stabilizer	Hydraulic proportional control	A6 - B6
g	Right Stabilizer	Hydraulic proportional control	A7 - B7

MANIFOLD

7-2
Valve Coils

How to Test a Coil

A properly functioning coil provides an electromagnetic force which operates the solenoid valve. Critical to normal operation is continuity within the coil. Zero resistance or infinite resistance indicates the coil has failed.

Since coil resistance is sensitive to temperature, resistance values outside specification can produce erratic operation. When coil resistance decreases below specification, amperage increases. As resistance rises above specification, voltage increases.

While valves may operate when coil resistance is outside specification, maintaining coils within specification will help ensure proper valve function over a wide range of operating temperatures.

⚠WARNING Electrocution/burn hazard.
Contact with electrically charged circuits could result in death or serious injury.
Remove all rings, watches and other jewelry.

Note: If the machine has been in operation, allow the coil to cool at least 3 hours before performing this test.

1 Tag and disconnect the wiring from the coil to be tested.

2 Test the coil resistance using a multimeter set to resistance (Ω). Refer to the Valve Coil Resistance Specification table.

⊙ Result: If the resistance is not within the adjusted specification, plus or minus 10%, replace the coil.

Valve Coil Resistance Specification

Note: The following coil resistance specifications are at an ambient temperature of 68°F / 20°C. As valve coil resistance is sensitive to changes in air temperature, the coil resistance will typically increase or decrease by 4% for each 18°F / 20°C that your air temperature increases or decreases from 68°F / 20°C.

Description	*Specification*
Steering modes selector valve, 3 position 4 way 12V DC with diode	5.6Ω
Mechanical gear speed Selector valve, 3 position 4 way 12V DC with diode	8.8Ω
Forward/Reverse Selector valve, 3 position 4 way 12V DC with diode	8.8Ω
Stabilizer Selector valve, 2 position 4 way 12V DC with diode	8.8Ω

How to Test a Coil Diode

Genie incorporates spike suppressing diodes in all of its coils. Properly functioning coil diodes protect the electrical circuit by suppressing voltage spikes. Voltage spikes naturally occur within a function circuit following the interruption of electrical current to a coil. Faulty diodes can fail to protect the electrical system, resulting in a tripped circuit breaker or component damage.

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury.
Remove all rings, watches and other jewelry.

1 Test the coil for resistance. See 7-2, *How to Test a Coil*.

2 Connect a 10Ω resistor to the negative terminal of a known good 9V DC battery. Connect the other end of the resistor to a terminal on the coil.

Resistor. 10Ω	
Genie part number	27287

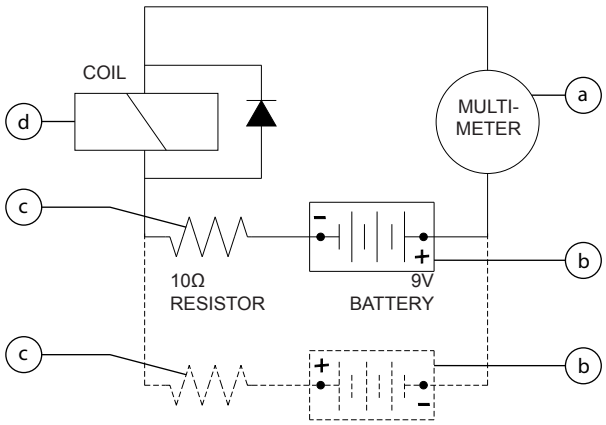
Note: The battery should read 9V DC or more when measured across the terminals.

3 Set a multimeter to read DC current.

Note: The multimeter, when set to read DC current, should be capable of reading up to 800 mA.

4 Connect the negative lead to the other terminal on the coil.

Note: If testing a single-terminal coil, connect the negative lead to the internal metallic ring at either end of the coil.



a multimeter
b 9V DC battery
c 10Ω resistor
d coil

Note: Dotted lines in illustration indicate a reversed connection as specified in step 6

5 Momentarily connect the positive lead from the multimeter to the positive terminal on the 9V battery. Note and record the current reading.

6 At the battery or coil terminals, reverse the connections. Note and record the current reading.

⊙ Result: Both current readings are greater than 0 mA and are different by a minimum of 20%. The coil is good.

⊠ Result: If one or both of the current readings are 0 mA, or if the two current readings do not differ by a minimum of 20%, the coil and/or its internal diode are faulty and the coil should be replaced.

Stabilizers

8-1
Stabilizers

How to Remove the Stabilizers Cylinders

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, Hydraulic Hose and Fitting Torque Specifications.

1 Lower the stabilizer to the ground.

2 Using a lifting strap and an overhead crane, support the cylinder.

3 Remove the retaining fasteners securing the level cylinder rod end pivot pin.

4 Using a soft metal drift and a hammer, remove the pivot pin.

5 Place a container of suitable size under the hydraulic hoses before disconnecting.

6 Tag, disconnect and plug the hydraulic hoses from the level cylinder. Cap the cylinder fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard.
Hoses can be damaged if they are kinked or pinched.

7. Remove the retaining fasteners securing the level cylinder barrel end pivot pin.

8. Using a soft metal drift and a hammer, remove the pivot pin.

9. Carefully lift and remove the cylinder from the machine.

⚠DANGER Crushing hazard. The cylinder could fall if not properly supported when removed from the machine.

Forks

9-1
Fork

How to Resequence the Fork Positioning Cylinders

1 Start the engine.

2 Shift the forks to end of stroke to the left and to the right.

⊙ Result: The forks travel synchronously and reach the end of stroke at the same time. Stop the engine.

⊠ Result: The forks do not travel synchronously. Repeat the procedure described in point 2.

Power Plant Heaters

10-1
Power Plant Heaters

How to Replace the Heating Elements

The power plant heaters to be used for cold weather operation, consist of a heating element under the engine oil sump, a heating element for the engine coolant, a heating element for hydraulic oil, a battery heater blanket and pad and a battery charger.
All these parts are connected to a main electrical panel supplied with power from an external source.

⚠DANGER Before carrying out any procedure on the heating unit, make sure the main electric panel has been disconnected from the external power source.

• Replacing the hydraulic oil heating element (a)



1 Remove the cover placed behind the cab.

2 Disconnect the power wire of the heating element from the oil tank side.

3 Close the oil intake valves.

4 Remove the cover on the top of the oil tank.

5 Remove the filler cap from the hydraulic tank.

6 Place a drain pan or other suitable container under the hydraulic tank. Refer to Section 2, Specifications.

7 Remove the drain plug from the hydraulic tank and completely drain the tank.

⚠CAUTION Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

8 Remove the oil tank heating element.

• Replacing the engine oil heating element (b)



1 Open the engine compartment.

2 Disconnect the power wire of the engine oil heating element from the relevant branch box.

3 Remove the heating element from the engine oil sump.

4 Clean the installation area to remove any dirt, grease or oil - a pressure washer works great for this.

5 Grind or sand all paint from the surface area slightly larger than the heater. Do not polish this surface. A coarsley scratched surface is best.

6 Use acetone, lacquer thinner or similar agent to wipe the area clean. If these recommended cleaners are not available a strong detergent scrubbing followed by a thorough fresh water rinse and towel fry is acceptable. The surface must be absolutely clean.

⚠WARNING Do not use: gasoline, solvents, spray penetrants, diesel fuel or any product that leaves an oily film.

⚠WARNING Do not cut or trim heater.

7 Remove the protective covering from the pressure sensitive adhesive. Avoid touching the adhesive. Decide which direction you want the cord to go. Plug in the pad for 3 to 5 seconds to warm the adhesive.

⚠WARNING The pad will become very hot if plugged in longer and may burn exposed skin or damage heater. Unplug pad before applying to metal surface.

8 Place the edge opposite the cord on the clean surface. With a squeegee (supplied in kit), apply maximum pressure as you affix the pad. Carefully avoid wrinkles or creases; smooth the entire pad to the surface.

9 Attach the first length of AC cord with a cord tie (supplied in kit). This prevents the weight of the cord from pulling down on the pad.

10 Plug the heater in for 5 to 10 seconds, unplug and squeegee the pad again. Do this twice.

11 Apply a small bead of high temperature silicone adhesive (supplied in kit) around the outside edge of the heating pad. Do not force the silicone adhesive under the pad. It is important to seal the entire perimeter of the pad for weatherpoofing.

⚠WARNING Do not use any other adhesives to apply pad to metal surface!.

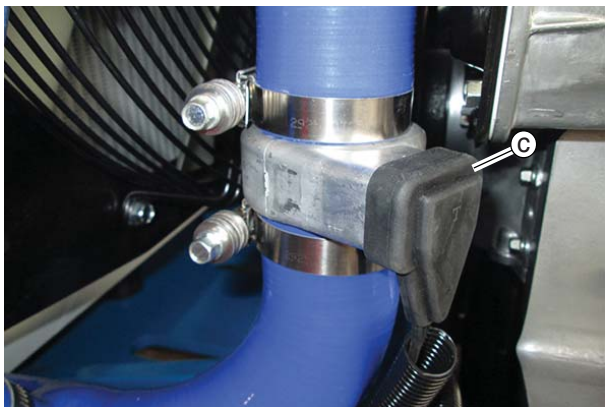
12 Route and secure the rest of AC cord to a convenient location, such as through the grille. Avoid any moving or high temperature parts. Position the power cable so it is held snugly against the oil pan. Use additional plastic ties for securing/routing the power cable.

⚠WARNING Keep all non-metal surfaces such as plastic oil pan covers, noise suppressors, rock guards, fiberglass shrouds, etc. away for heater to avoid melting, warping or fire hazard!.

NOTICE The engine can be run and the vehicle driven immediately after installation.
Please allow 24 hours before first heater use.

POWER PLANT HEATERS

• Replacing the engine coolant heating element (c)



1 Open the engine compartment.

2 Drain the engine coolant.

3 Disconnect the power wire from the heating element.

4 Loosen the retaining fasteners and remove the heating element.

• Replacing the battery pad (d)

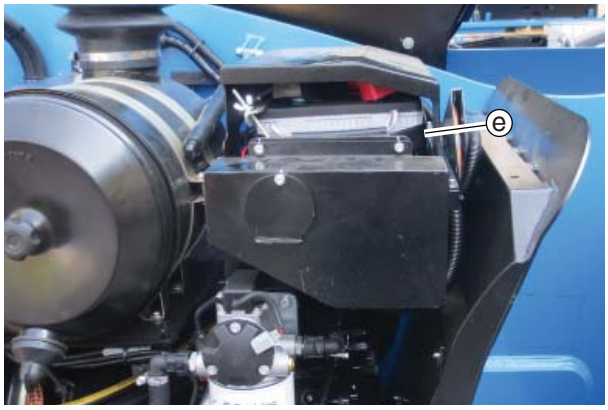


1 Open the engine compartment.

2 Disconnect the power wire of the battery pad from the relevant branch box.

3 Remove the fasteners securing the pad and its support to the lower side of the battery and remove the pad.

• Replacing the battery heated blanket (e)



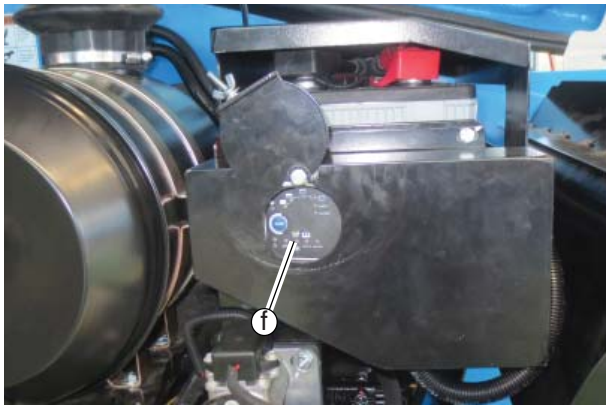
1 Open the engine compartment.

2 Remove the cover above the battery.

3 Disconnect the power wire of the heated blanket from the relevant branch box.

4 Cut and remove the ties securing the blanket to the battery.

• Replacing the battery charger (f)



1 Open the engine compartment.

2 Remove the cover above the battery.

3 Disconnect the power wire of the battery charger from the relevant branch box.

4 Disconnect the wire harness from the battery terminals.

5 Remove the battery charger.

Webasto Heater

11-1
Webasto Heater

How to Replace the Webasto Heater

1 Remove the cover placed behind the cab.

2 Remove the retaining collars and disconnect the hoses connecting the Webasto heater to the fittings at the rear of the cabin.

3 Remove the retaining collars and disconnect the drain and filter hoses.

4 Disconnect the fuel feed hose.

5 Remove the retaining bolts to free and remove the heater.

How to Repair the Webasto Heater

Repair procedures and additional information are available in the
Webasto air Top 2000 STC Workshop Manual
(Webasto part number 9032573A • 12/15).

Webasto Air Top 2000 STC Workshop Manual	
Genie part number	57.4700.0033

AC Unit

12-1
AC Unit

How to Recharge the AC Unit

1 Open the engine compartment.

2 Make sure that all the fittings are tight and the cable are properly connected then fill the circuit according to the following procedure:

3 Take a filling pump similar to the one in the next image.





4 Using an appropriate adapter, connect the pump return hose to the appropriate fitting that is on the hose connected to the "S" port of the compressor.

5 Connect the pump delivery hose to the appropriate fitting that is on the hose connected to the "D" port of the compressor.



6 Set the pump you have in your equipment to fill the circuit of the A/C system with 900 grams of Freon gas R134, in accordance to its instruction, and start the A/C filling cycle.

Radiators

13-1
Radiators

How to clean the radiators from sand

Water-oil radiator inside the engine housing

1. Open the engine compartment.
2. Remove the two knobs securing the cover on the rear lower side of the engine housing and remove the cover.







3. Clean the water-oil radiator with compressed air to eliminate all the sand from the fins.
4. Eliminate any sand from the engine compartment through the opening where the cover was removed at step 2.



5. Upon completion of cleaning, reinstall the cover removed at step 2 and close the engine compartment.

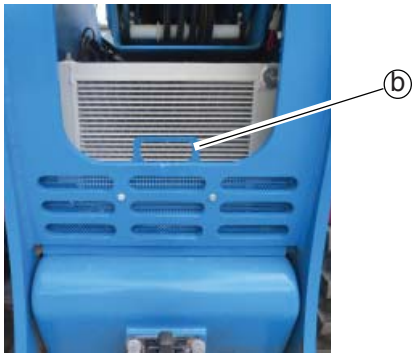
Radiators

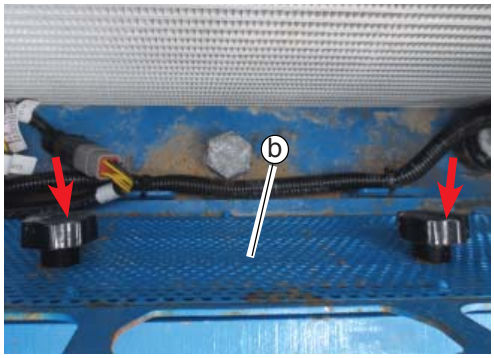
Oil radiator inside the rear side of the chassis

1. Reach the rear of the machine.
2. Open cover **a**.



3. Remove the two knobs securing the grid **b** to the inner side of the chassis, and remove the grid.









4. Clean the oil radiator with compressed air to eliminate all the sand from the fins.
5. Eliminate any sand from the frame through the opening where the grid was removed at step 3.
6. Upon completion of cleaning, reinstall grid removed at step 3 and close the cover **a**.

Fuel System

14-1
Fuel System Prime

Electric Prime

⚠WARNING Do not loosen the high-pressure fuel lines in order to purge air from the fuel system. This procedure is not required.

1 Ensure that the fuel system is in working order. Check that the fuel supply valve is in ON position.

2 Ensure that the battery disconnect switch is in the ON position. Ensure that the keyswitch is in OFF position.

3 Remove the protection cap "a".

4 Depress valve "b" in order to purge air. Perkins recommend that a tire inflator with a suitable length of clear hose attached to be used.

NOTICE The electric priming pump will only operate with the keyswitch in the OFF position.

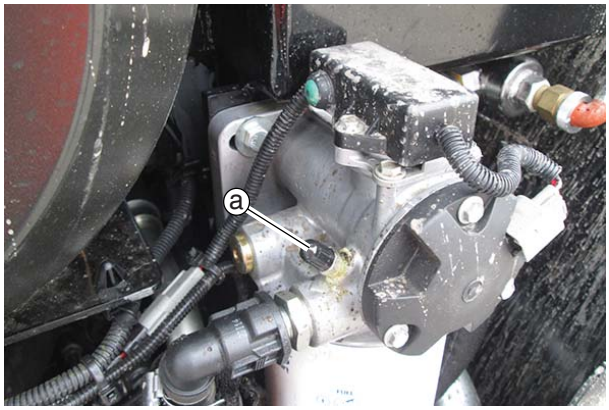
5 With tool installed to valve "b" press button "c" and keep the button depressed. The button will illuminate and the priming pump will start to operate.

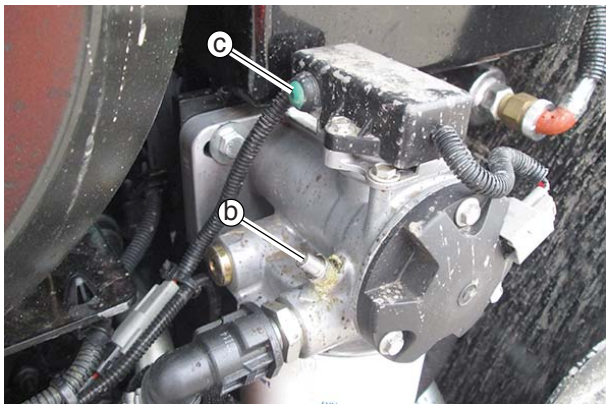
6 When the fuel has filled the bowl at the bottom of the filter, the tool can be removed. Ensure that the protection cap "a" is installed. The electric priming pump will stop once the button is released.

7 Press again the button "c" and keep the button depressed for approx 2 minutes. After the 2 minutes, the fuel system will be primed and the engine is ready to start.

8 Start the engine.

9 If the engine will not start repeat step 7 to step 8. Ensure that the keyswitch is in the OFF position during fuel system prime.





Braking circuit

15-1
Braking circuit

How to bleed the braking circuit

When servicing the service brake or the parking brake, it is necessary to bleed the braking circuit according to the following instructions. The front axle features 4 bleed screws (for both service and parking brakes), whereas the rear axle has 2 bleed screws (for the service brake).

1 Reach the front axle. Steer the machine wheels for more comfortable access to the service area, if necessary.

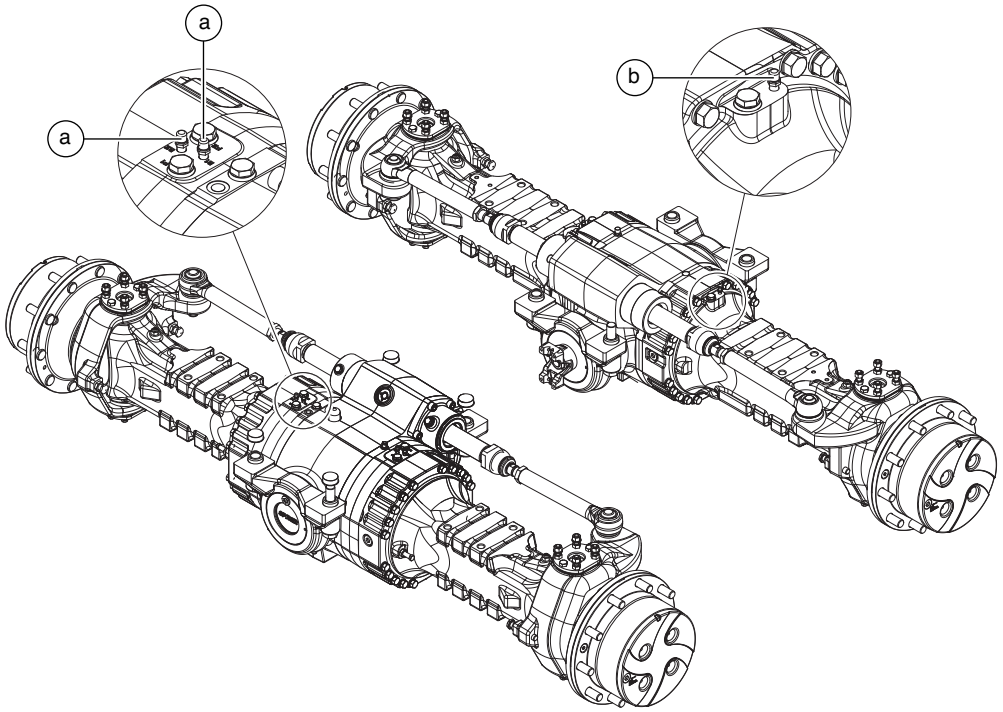
2 Remove the protective caps and loosen the 4 bleed screws “a” using an Allen wrench.

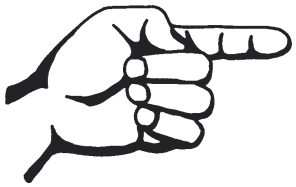
3 Reach the rear axle.

4 Remove the protective caps and loosen the 2 bleed screws “b” using an Allen wrench.

5 Depress and release the service brake pedal a few times until oil with no air bubbles flows out of the bleed screws.

6 Tighten all the 6 bleed screws and install the protective caps.





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Long Term Storage Recommendation

Follow the recommendation indicated below before a long term storage of the machine:

- Disconnect the battery turning the cut-out switch to OFF position.
- Darken the cab glasses.
- Grease the machine components, boom and pulleys according to the procedures indicated in the Section 3 of this manual.
- Make sure that all the cylinders are fully retracted. In case it is not possible, protect the rods using the same grease of the boom.
- Remove the wipers and store them inside the cabin.
- Empty the fuel tank.
- Machine should be stored on lifting jacks in order to avoid the contact of the tires with the ground.

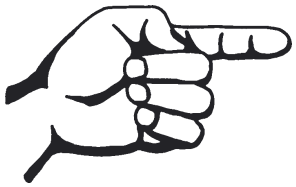
At the end of each and every three month storage period perform the following check to the engine:

- Carefully check all drive belts, paying particular attention to the point where the straight run of the belt starts to bend around the pulley. Check the vee groove in the pulley for corrosion.
- Check the level of coolant (must be anti-freeze inhibited).
- Check the level of oil in the sump on the dipstick.

Note: The lubricating oil and fully primed filter must be replaced with oil to the listed specification every twelve months, even though the oil has not been used. Oil left standing in an engine will oxidise and can be contaminated by condensation within the crankcase.

Turn the engine on the starter motor until oil pressure is built up. (Where practicable, this should initially be done by hand to prevent tearing the seals). Then run the engine at a fast idling speed (suggest 1000/1500 rev/min) until normal operating temperature is registered.

- Check the oil pressure.
- Check for oil, fuel and coolant leaks.



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Fault Codes

Observe and Obey:

- ☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
  - · Machine parked on a firm, level surface
  - · Boom in the stowed position
  - · Key switch in the off position with the key removed
  - · Wheels chocked

Before Troubleshooting:

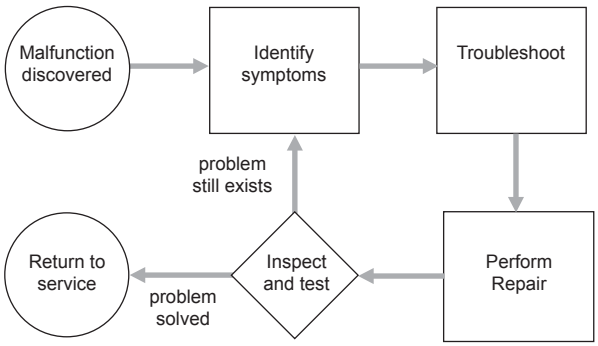
- ☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.
- ☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

⚠DANGER Crushing hazard. When testing or replacing any hydraulic component, always support the structure and secure it from movement.

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

General Repair Process



FAULT CODES

Diagnostic Display

When the engine Electronic Control Module (ECM) detects an abnormal operating condition, a fault code is immediately stored in the ECM memory. The presence of faults is indicated by the word “SERVICE” (replacing GENIE) on the LCD display which is located on the gauge cluster in the operator's compartment.
The gauge cluster also includes two warning lights.
They are an amber colored light which signals an abnormal engine condition which should be corrected as soon as possible and a red colored light which signals an engine condition which requires the operator to shut down the engine as soon as possible.
The ECM will, in some cases, automatically shut down the engine when the red light is displayed.

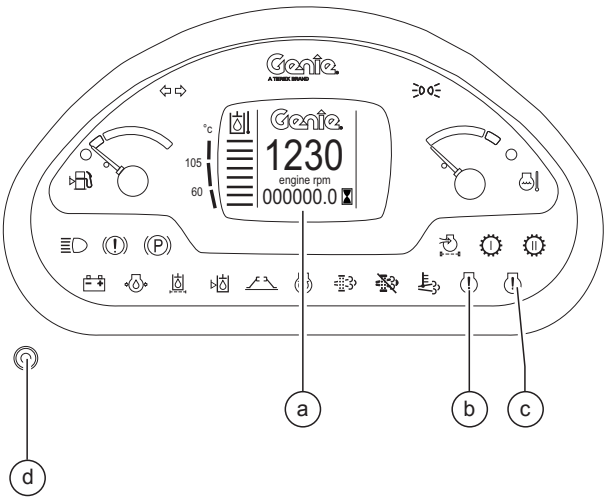
Active Fault Codes
To make the active fault codes visible, start the engine or simply switch on the electric circuit by cycling the key switch from off to on. Press the diagnostic button “d” and hold it pressed for at least 5 seconds.
To quit the active fault codes page, press the diagnostic button “d” and hold it pressed for at least 5 seconds.

Active Codes vs Stored Codes
Active fault codes, indicating an engine condition or conditions which have not been corrected, are signaled on the LCD display by the word "SERVICE" replacing “GENIE”.

Stored fault codes are the cumulative history of fault codes which the ECM has detected. These fault codes may be recalled by service personnel at a later time even if the condition which caused the engine fault has ceased to exist.

Note: Additional hardware will be necessary to access stored codes.

Decoding Fault Codes
The Suspect Parameter Number (SPN) and the Failure Mode Identifier (FMI), when combined, are the basis for an engine fault code. The SPN number indicates the affected component; the FMI number reveals the type of failure that has occurred. Comparing the combination of numbers to the fault code chart on the following pages will help to determine the exact engine fault and a corrective course of action. For additional information, refer to the engine operator's manual which came with your machine.



Gauge Cluster

a LCD screen
b amber warning light
c stop engine light
d diagnostic button

Engine Fault Codes - Perkins 1104D-E44TA Engine

SPN	FMI	Description
651	5	Cylinder #1 Injector Current Below Normal
651	6	Cylinder #1 Injector Current Above Normal
652	5	Cylinder #2 Injector Current Below Normal
652	6	Cylinder #2 Injector Current Above Normal
653	5	Cylinder #3 Injector Current Below Normal
653	6	Cylinder #3 Injector Current Above Normal
654	5	Cylinder #4 Injector Current Below Normal
654	6	Cylinder #4 Injector Current Above Normal
678	03	8 Volt DC Supply Voltage Above Normal
678	04	8 Volt DC Supply Voltage Below Normal
91	02	Throttle Position Sensor Erratic, Intermittent or Incorrect
91	03	Throttle Position Sensor Voltage Above Normal
91	04	Throttle Position Sensor Voltage Below Normal
91	08	Throttle Position Sensor Abormal Frequency, Pulse Width or Period
100	03	Engine Oil Pressure Sensor Voltage Above Normal
100	04	Engine Oil Pressure Sensor Voltage Below Normal
100	10	Engine Oil Pressure Sensor Abnormal Rate of Change
110	03	Engine Coolant Temperature Sensor Voltage Above Normal
110	04	Engine Coolant Temperature Sensor Voltage Below Normal
168	00	Electrical System Voltage High
168	01	Electrical System Voltage Low
105	03	Intake Manifold Air Temperature Sensor Voltage Above Normal
105	04	Intake Manifold Air Temperature Sensor Voltage Below Normal
190	08	Engine Speed Sensor Abnormal Frequency, Pulse Width or Period
631	02	Personality Module Erratic, Intermittent or Incorrect
637	11	Engine Timing Offset Fault
1079	03	5 Volt DC Power Supply Voltage Above Normal
1079	04	5 Volt DC Power Supply Voltage Below Normal
630	02	Programmed Parameter Fault Erratic, Intermittent or Incorrect
723	08	Secondary Engine Speed Sensor Abormal Frequency, Pulse Width or Period
1188	05	Turbo Wastegate Drive Current Below Normal
1188	06	Turbo Wastegate Drive Current Above Normal

FAULT CODES

SPN	FMI	Description
29	02	Secondary Throttle Position Sensor Erratic, Intermittent or Incorrect
29	03	Secondary Throttle Position Sensor Voltage Above Normal
29	04	Secondary Throttle Position Sensor Voltage Below Normal
29	08	Secondary Throttle Position Abnormal Frequency, Pulse Width or Period
1196	09	Machine Security System Module Abnormal Update Rate
2882	02	Engine Operator Mode Selector Switch Erratic, Intermittent or Incorrect
1347	05	Fuel Rail #1 Pressure Valve Solenoid Current Below Normal
1347	06	Fuel Rail #1 Pressure Valve Solenoid Current Above Normal
102	03	Intake Manifold Pressure Sensor Voltage Above Normal
102	04	Intake Manifold Pressure Sensor Voltage Below Normal
157	03	Fuel Rail Pressure Sensor Voltage Above Normal
157	04	Fuel Rail Pressure Sensor Voltage Below Normal
158	02	Ignition Key Swtich Loss of Signal
676	05	Glow Plug Start Aid Relay Current Above Normal
676	06	Glow Plug Start Aid Relay Current Below Normal
626	05	Ether Injection Control Solenoid Current Below Normal
626	06	Ether Injection Control Solenoid Current Above Normal
107	15	High Air Filter Restriction
173	15	High Exhaust Temperature
97	15	High Fuel/Water Separator Water Level
100	17	Low Oil Pressure - Warning
100	01	Low Oil Pressure - Shutdown
110	15	High Engine Coolant Temperature - Warning
110	15	High Engine Coolant Temperature - Derate
110	16	High Engine Coolant Temperature - Shutdown
190	15	Engine Overspeed
157	00	High Fuel Rail Pressure
157	01	Low Fuel Rail Pressure
105	15	High Intake Manifold Air Temperature - Warning
105	16	High Intake Manifold Air Temperature - Derate
102	16	Intake Manifold Air Pressure - High
102	18	Intake Manifold Air Pressure - Low
111	01	Low Engine Coolant Level

Schematics

Observe and Obey:

- ☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.

About This Section

There are two groups of schematics in this section. An illustration legend precedes each group of drawings.

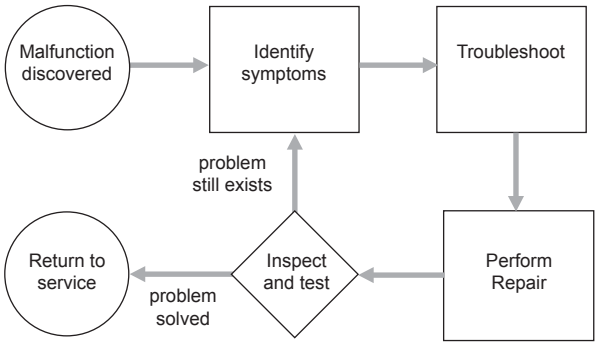
Electrical Schematics

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

Hydraulic Schematics

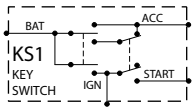
⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

General Repair Process

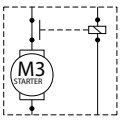


Electrical and Hydraulic Symbols Legend

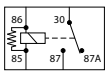
Electrical Schematic Symbols



Key switch



Engine start



Control relay



Alternator


Fuse

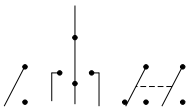

Circuit breaker


Horn or Alarm


Light


Valve coil


Valve coil with diode


Switch

Diode


Proximity switch


Limit switch


Temperature switch


Fuel level sender



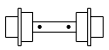
Battery


Pressure switch

Hydraulic Schematic Symbols


Pressure switch


Hydraulic cylinder


Axle

Orifice

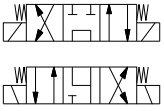

Adjustable orifice

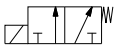

Filter

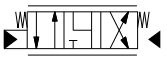

Check valve

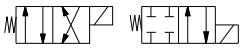

Flow regulator

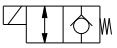

Relief valve

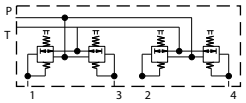

3 position 4 way solenoid valve


2 position 3 way directional valve

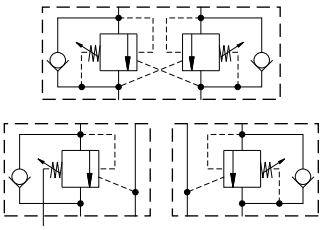

3 position 4 way proportional directional valve


2 position 4 way solenoid valve


2 position 2 way solenoid valve



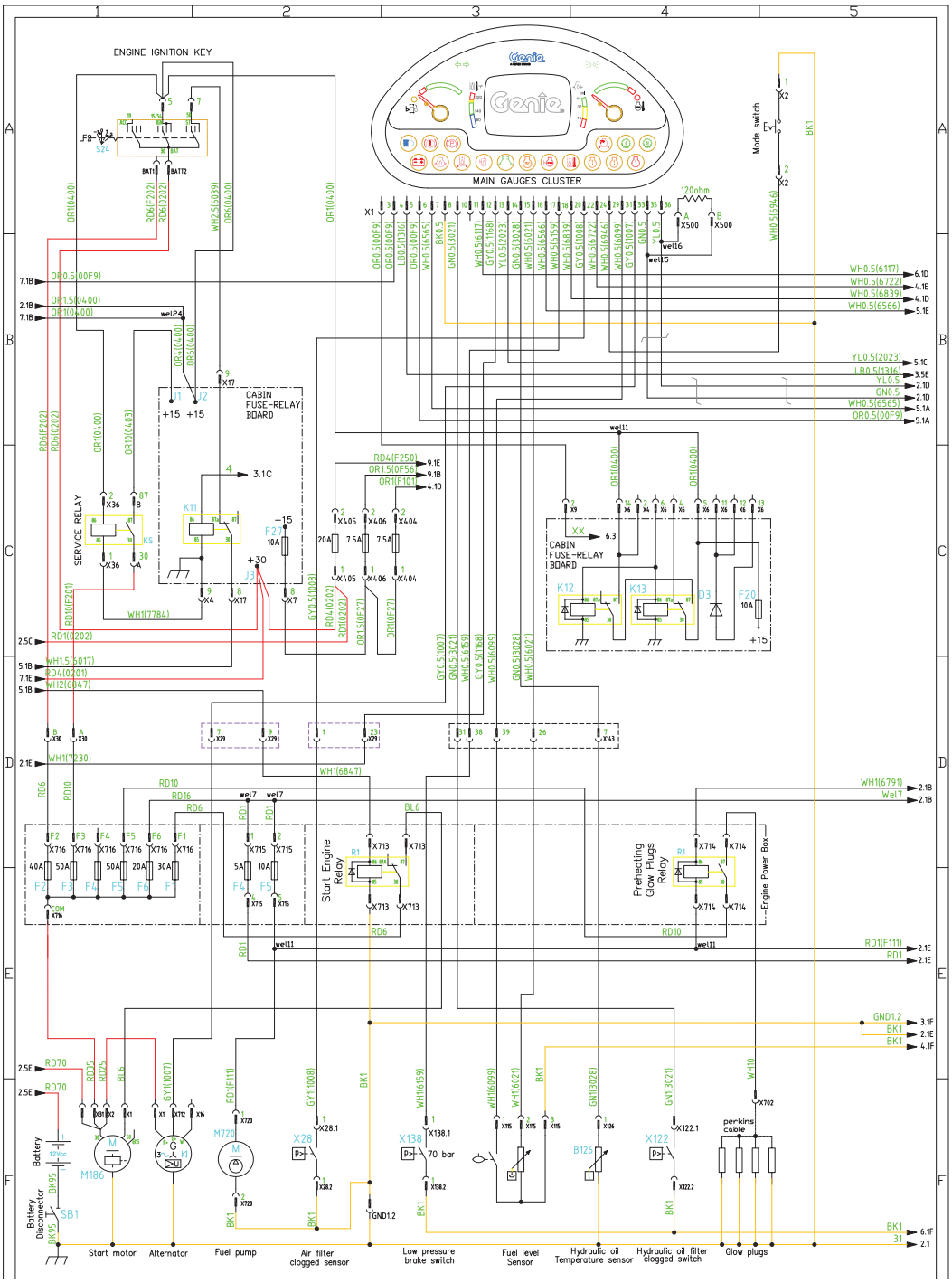
Joystick


Counterbalance valve

ELECTRICAL SCHEMATIC

From SN GTH12AFM-101

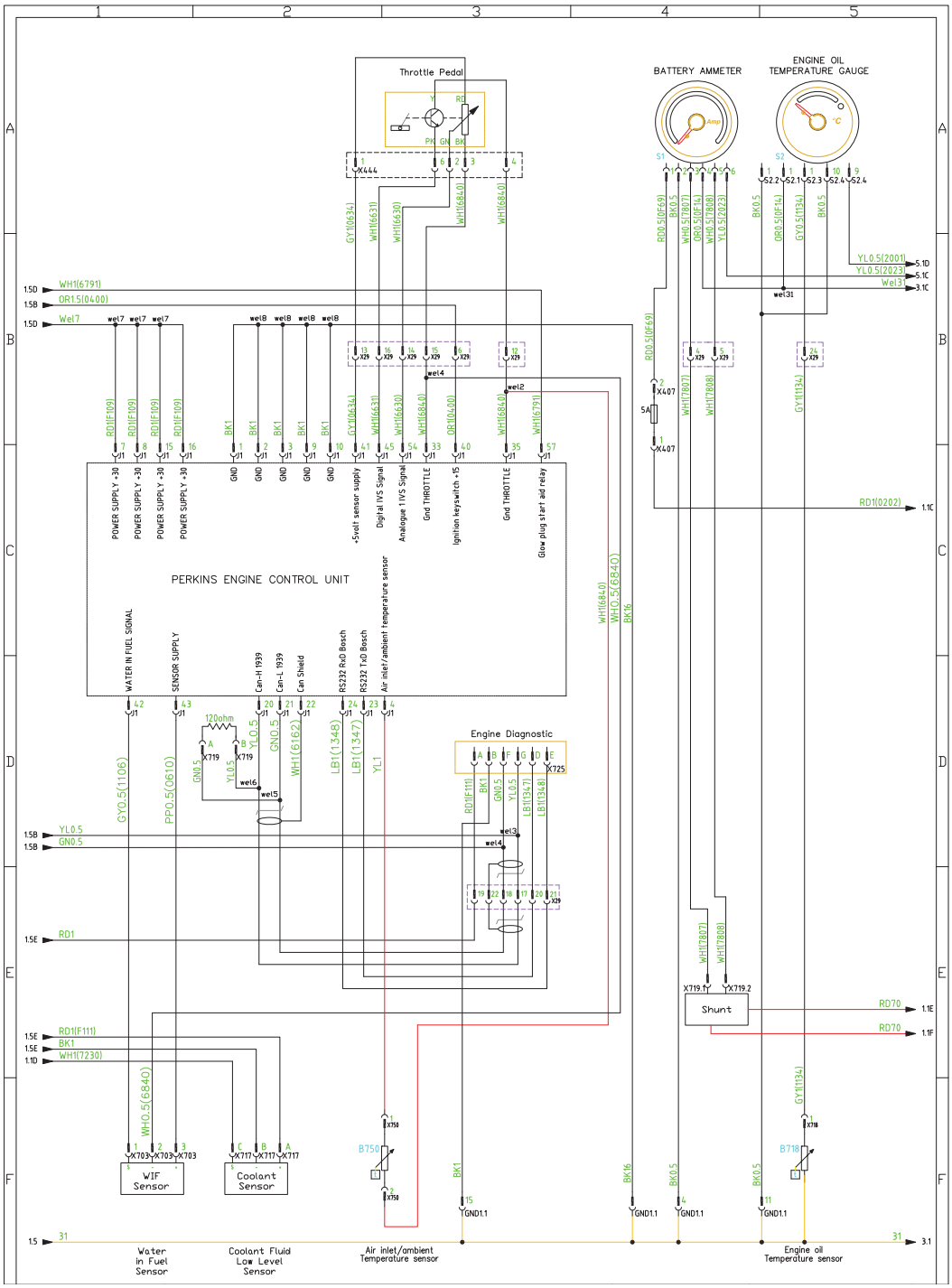
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ELECTRICAL SCHEMATIC

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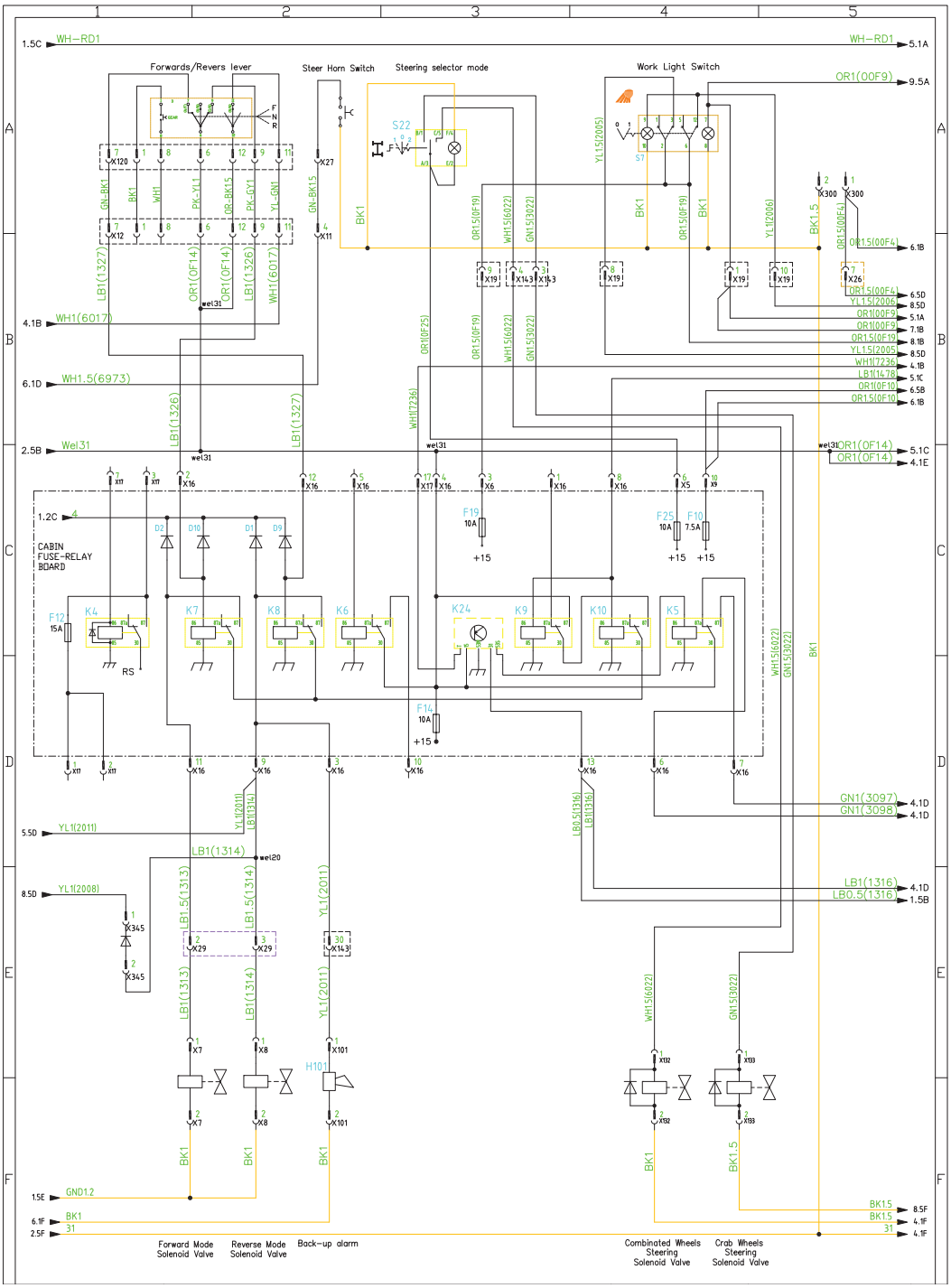
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ELECTRICAL SCHEMATIC

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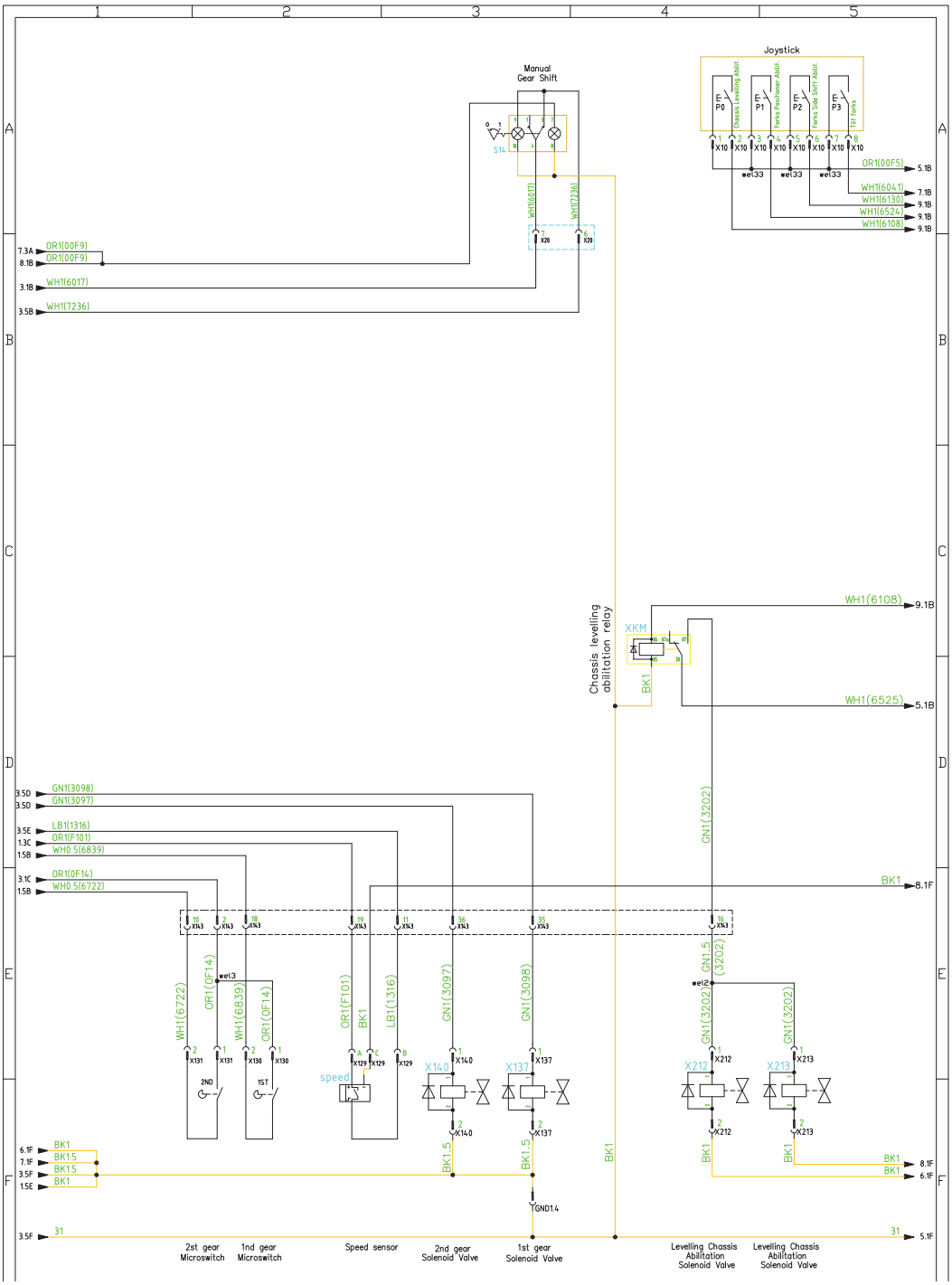
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ELECTRICAL SCHEMATIC

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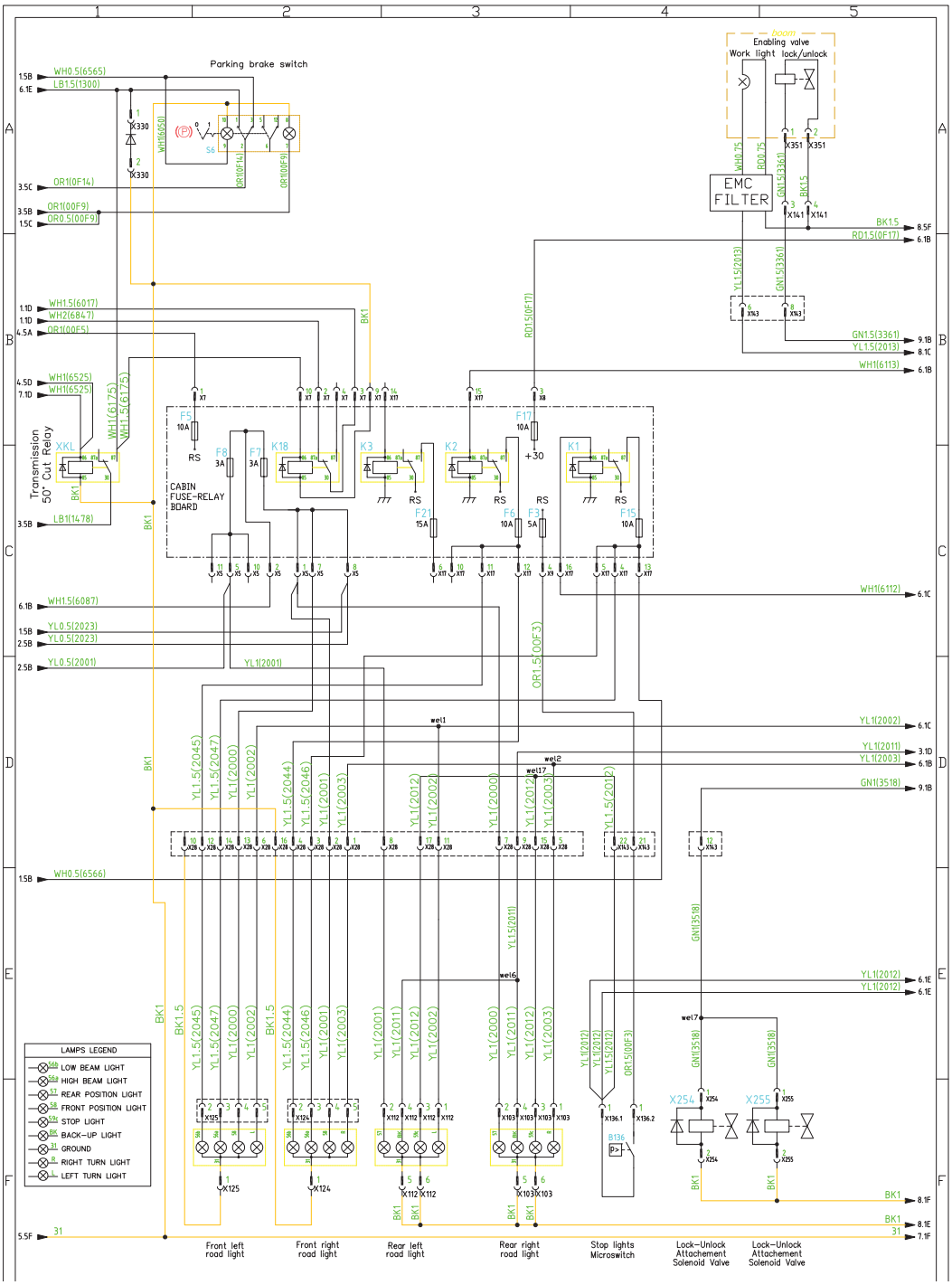
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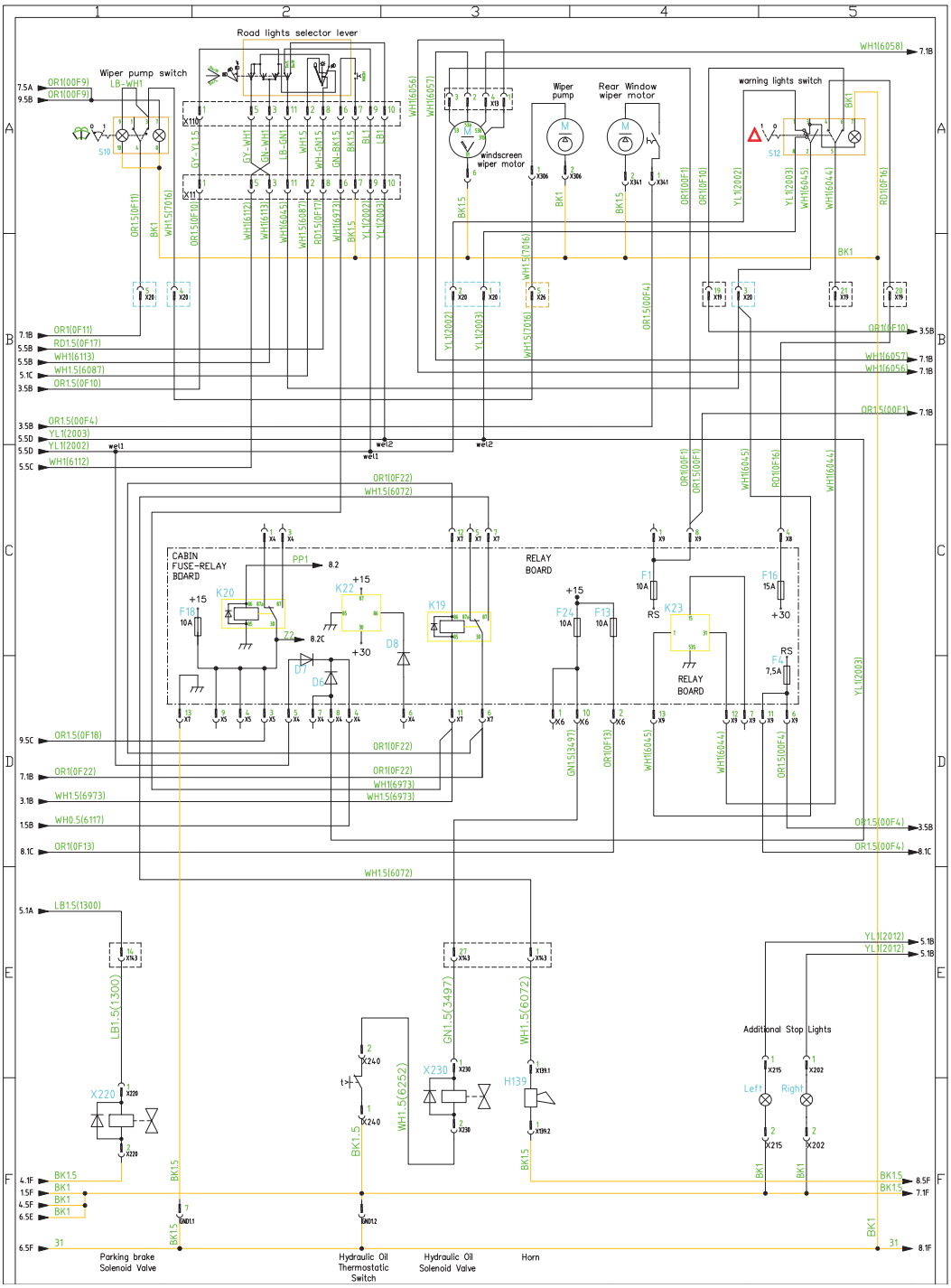
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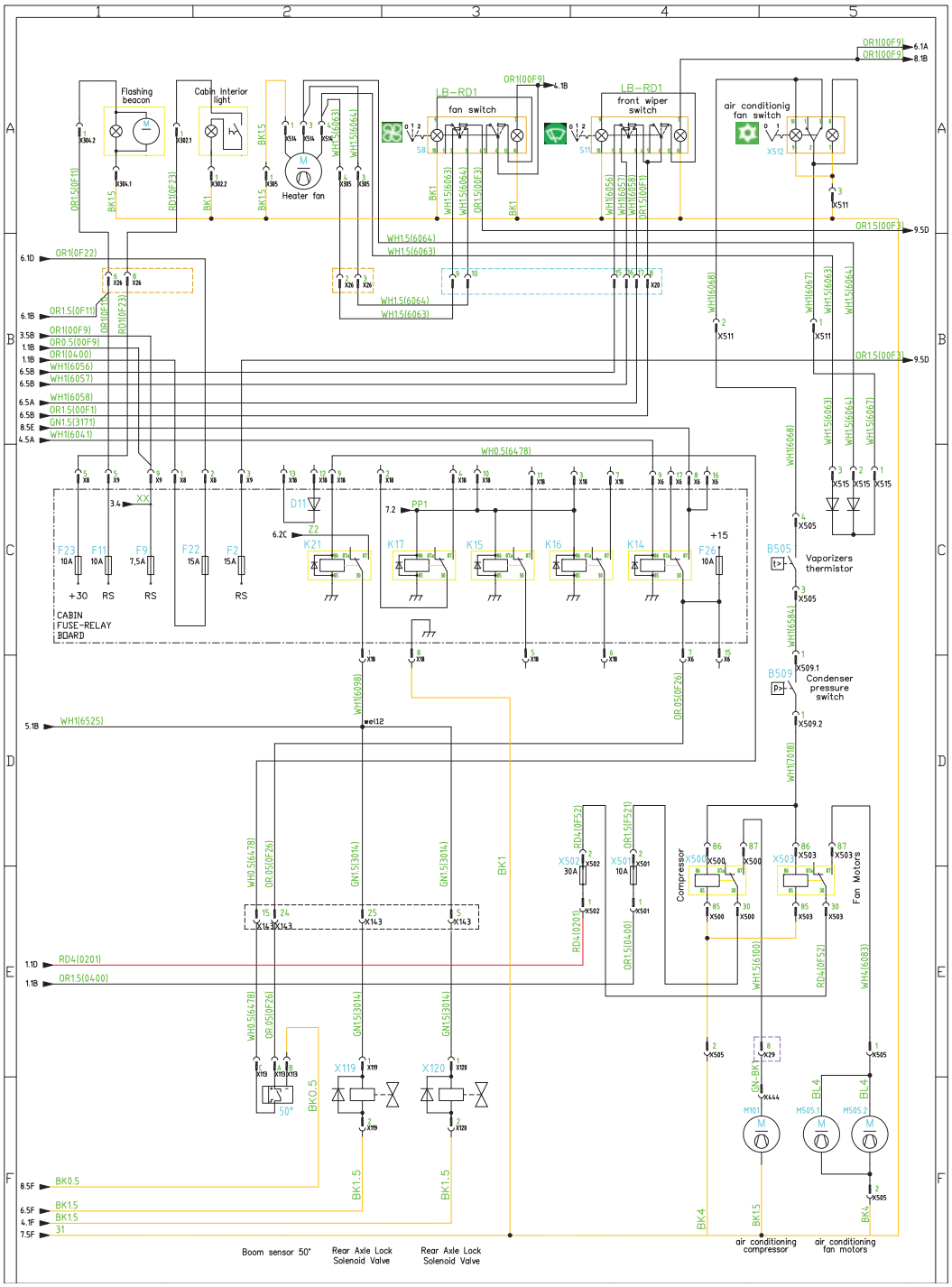
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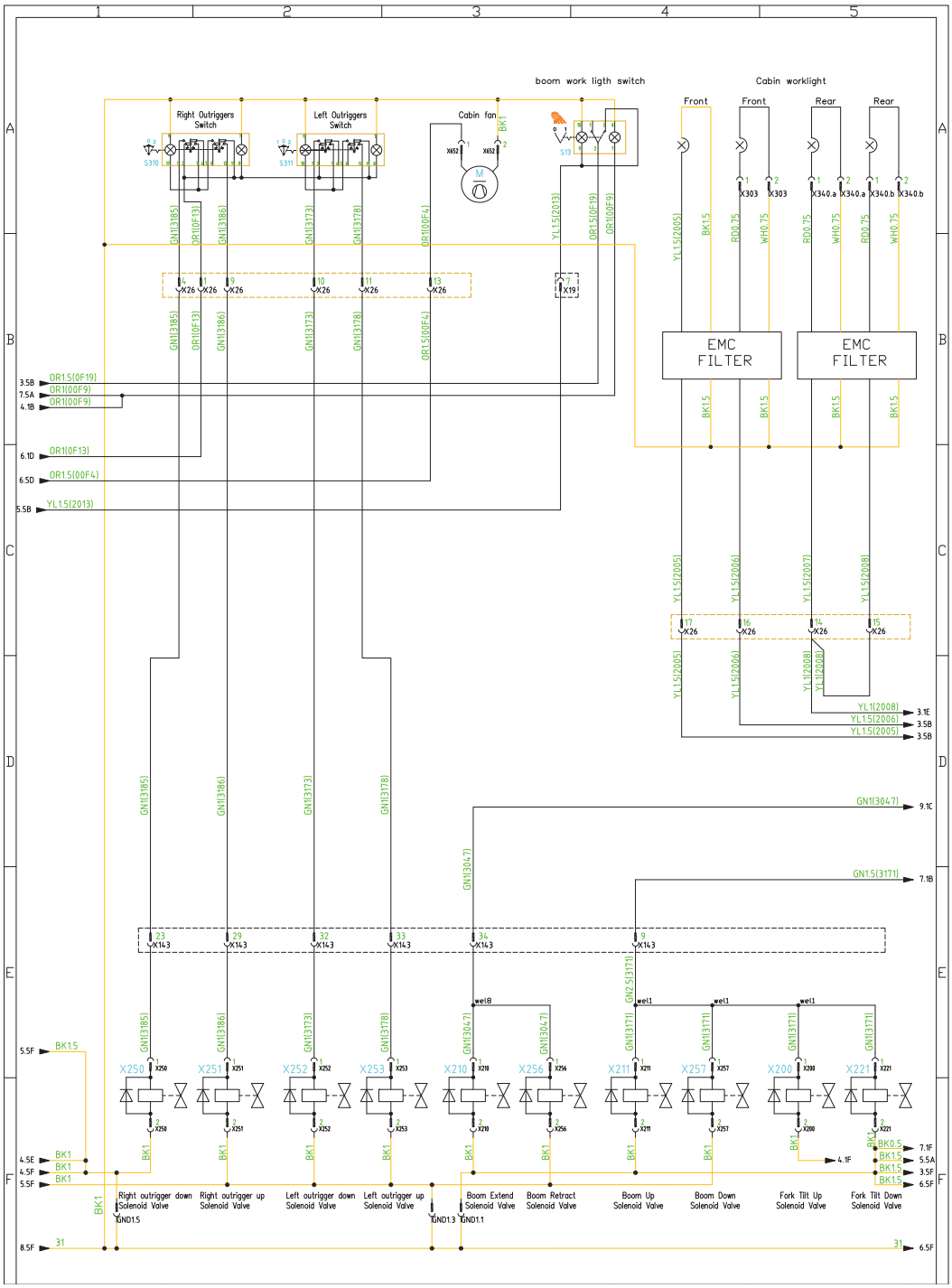
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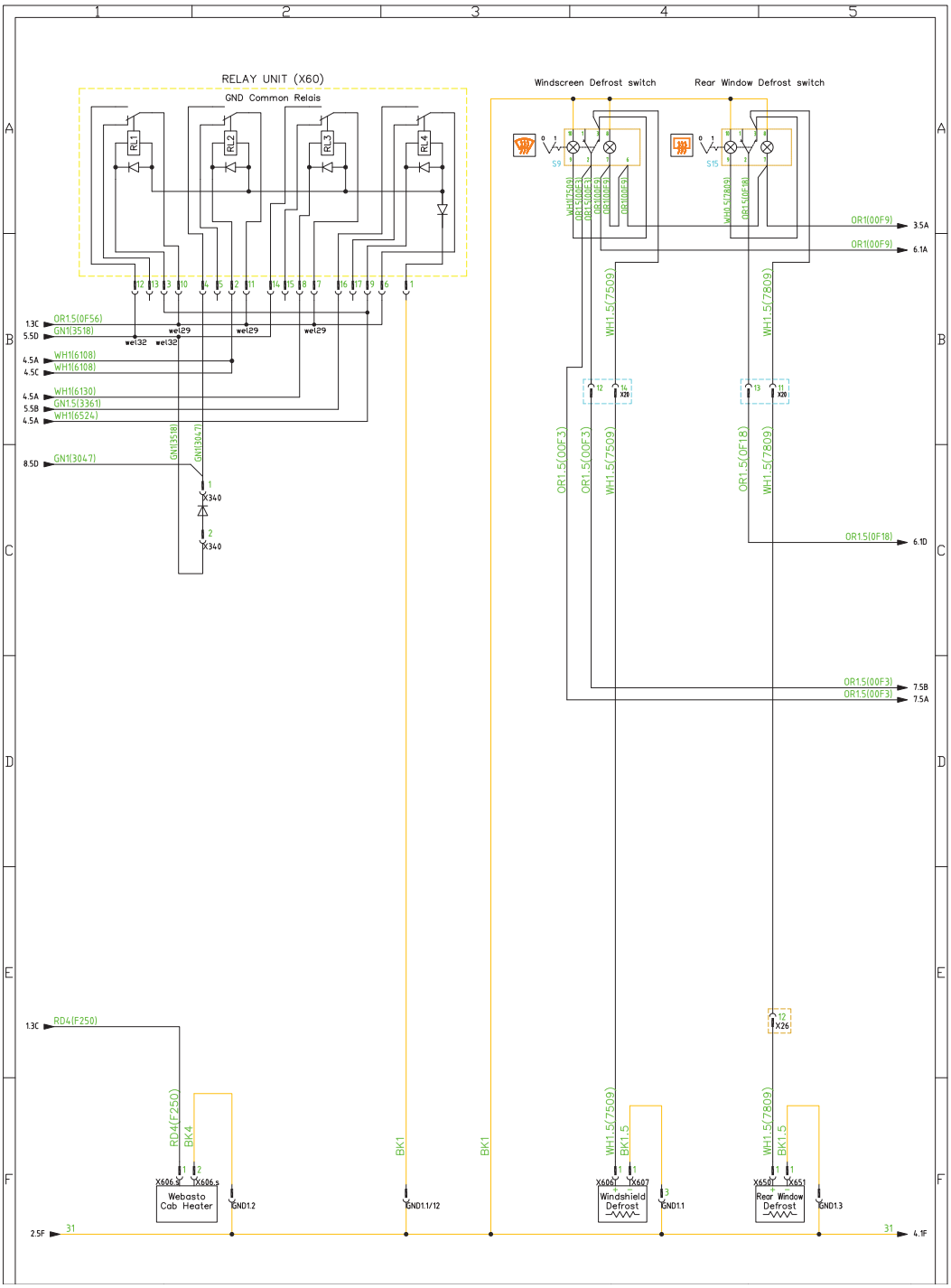
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ELECTRICAL SCHEMATIC

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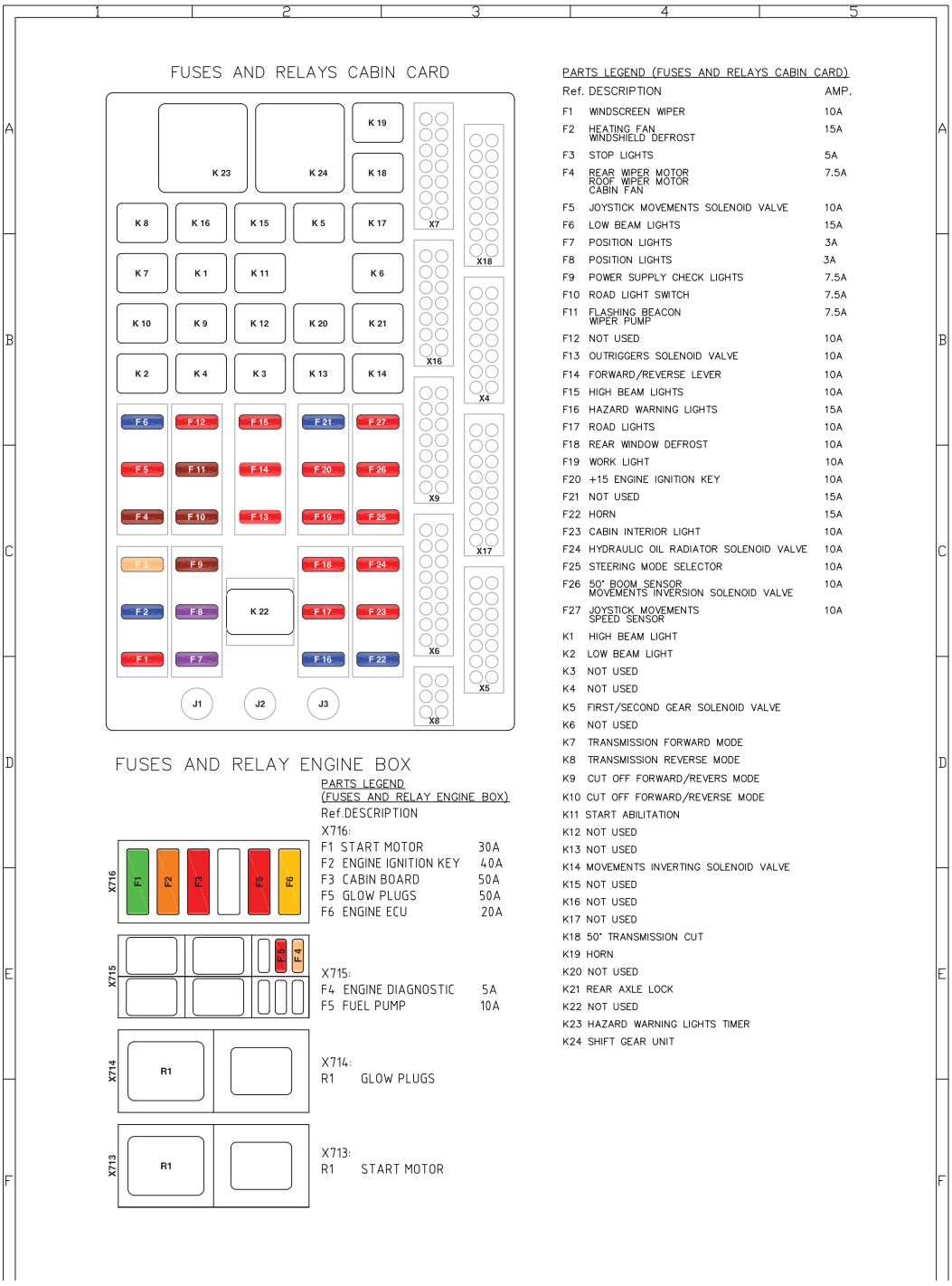
Sheet 9 of 11



ELECTRICAL SCHEMATIC

From SN GTH12AFM-101

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ELECTRICAL SCHEMATIC

From SN GTH12AFM-101

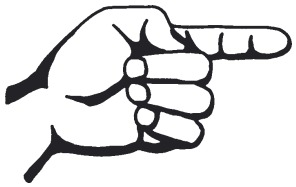
Sheet 11 of 11

LAMPS LEGEND
56a HIGH BEAM LIGHT
56b LOW BEAM LIGHT
57 REAR POSITION LIGHT
58 FRONT POSITION LIGHT
59c STOP LIGHT
BK REVERSE GEAR LIGHT
31 GROUND
R RIGHT TURN LIGHT
L LEFT TURN LIGHT

WIRE COLORS LEGEND		
LB	LIGHT BLUE	REMARK1: Two colorwires are indicated through a combination of the aforesaid initials as follows: YL/GN= YELLOW/GREEN (crosswise colouring) YL-GN= YELLOW-GREEN (lengthswise colouring)
BN	BROWN	
WH	WHITE	
BK	BLACK	
OR	ORANGE	
RD	RED	REMARK2: The parenthesis contents indicate the "Wire ID" printed on it. YL1.5(1025)= YELLOW Wire, 1.5mmq section area and printed "1025" on insulation.
YL	YELLOW	
PK	PINK	
GY	GREY	
GN	GREEN	
BL	BLUE	
PP	PURPLE	

MODIFICATIONS HISTORY

REVISION	DATE	ECN	DESCRIPTION
0	21/04/2016	/	First Release
A	26/04/2016	/	Update Main Cluster drawing, Optional parts, Shunt connection
B	31/08/2016	/	Update EMC filter
C	23/11/2016	/	Update Descriptions and References



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Hydraulical Schematic - Perkins Engine





Hydraulical Schematic - Perkins Engine

From GTH12AFM-101

