Introduction

About this Manual

Machine Model and Serial Number

This manual provides information for the following model(s) in the JCB machine range:

– 456 Wheeled Loading Shovel from 539000
– 446 Wheeled Loading Shovel from 540000.

Using the Service Manual

T11-004

This publication is designed for the benefit of JCB Distributor Service Engineers who are receiving, or have received, training by JCB Technical Training Department.

These personnel should have a sound knowledge of workshop practice, safety procedures, and general techniques associated with the maintenance and repair of hydraulic earthmoving equipment.

The illustrations in this publication are for guidance only. Where the machines differ, the text and/or the illustration will specify.

General warnings in Section 2 are repeated throughout the manual, as well as specific warnings. Read all safety statements regularly, so you do not forget them.

Renewal of oil seals, gaskets, etc., and any component showing obvious signs of wear or damage is expected as a matter of course. It is expected that components will be cleaned and lubricated where appropriate, and that any opened hose or pipe connections will be blanked to prevent excessive loss of hydraulic fluid and ingress of dirt.

Where a torque setting is given as a single figure it may be varied by plus or minus 3%. Torque figures indicated are for dry threads, hence for lubricated threads may be reduced by one third.

The manufacturer's policy is one of continuous improvement. The right to change the specification of the machine without notice is reserved. No responsibility will be accepted for discrepancies which may occur between specifications of the machine and the descriptions contained in this publication.

Finally, please remember above all else safety must come first!

Section Numbering

T11-005

The manual is compiled in sections, the first three are numbered and contain information as follows:

1 General Information - includes torque settings and service tools.

2 Care and Safety - includes warnings and cautions pertinent to aspects of workshop procedures etc.

3 Maintenance - includes service schedules and recommended lubricants for all the machine.

The remaining sections are alphabetically coded and deal with Dismantling, Overhaul etc. of specific components, for example:

A Attachments

B Body and Framework, etc.

Section contents, technical data, circuit descriptions, operation descriptions etc. are inserted at the beginning of each alphabetically coded section.

Health and Safety

Lubricants

T3-060_2

Introduction

It is most important that you read and understand this information and the publications referred to. Make sure all your colleagues who are concerned with lubricants read it too.

Hygiene

JCB lubricants are not a health risk when used properly for their intended purposes.

However, excessive or prolonged skin contact can remove the natural fats from your skin, causing dryness and irritation.

Low viscosity oils are more likely to do this, so take special care when handling used oils, which might be diluted with fuel contamination.

Whenever you are handling oil products you should maintain good standards of care and personal and plant hygiene. For details of these precautions we advise you to read the relevant publications issued by your local health authority, plus the following.

Storage

Always keep lubricants out of the reach of children.

Never store lubricants in open or unlabelled containers.

Waste Disposal

⚠ CAUTION

It is illegal to pollute drains, sewers or the ground. Clean up all spilt fluids and/or lubricants.

Used fluids and/or lubricants, filters and contaminated materials must be disposed of in accordance with local regulations. Use authorised waste disposal sites.

INT-3-2-14

All waste products should be disposed of in accordance with all the relevant regulations.

The collection and disposal of used oil should be in accordance with any local regulations. Never pour used engine oil into sewers, drains or on the ground.

Handling

⚠ WARNING

Oil

Oil is toxic. If you swallow any oil, do not induce vomiting, seek medical advice. Used engine oil contains harmful contaminants which can cause skin cancer. Do not handle used engine oil more than necessary. Always use barrier cream or wear gloves to prevent skin contact. Wash skin contaminated with oil thoroughly in warm soapy water. Do not use petrol, diesel fuel or paraffin to clean your skin.

INT-3-2-3

New Oil

There are no special precautions needed for the handling or use of new oil, beside the normal care and hygiene practices.

Used Oil

Used engine crankcase lubricants contain harmful contaminants.

Here are precautions to protect your health when handling used engine oil:

1 Avoid prolonged, excessive or repeated skin contact with used oil.

2 Apply a barrier cream to the skin before handling used oil. Note the following when removing engine oil from skin:

- **a** Wash your skin thoroughly with soap and water.
- **b** Using a nail brush will help.
- **c** Use special hand cleansers to help clean dirty hands.
- **d** Never use petrol, diesel fuel, or paraffin for washing.

Checking the ROPS/FOPS Structure

⚠ WARNING

You could be killed or seriously injured if you operate a machine with a damaged or missing ROPS/FOPS. If the Roll Over Protection Structure (ROPS)/Falling Objects Protection Structure (FOPS) has been in an accident, do not use the machine until the structure has been renewed. Modifications and repairs that are not approved by the manufacturer may be dangerous and will invalidate the ROPS/FOPS certification.

INT-2-1-9_6

For assistance, contact your JCB distributor. Failure to take these precautions could result in death or injury to the operator.

1 Check the structure for damage.

2 Make sure that all the ROPS/FOPS mounting bolts **A** are in place and are undamaged.

3 Make sure that the ROPS/FOPS mounting bolts **A** are tightened to the correct torque setting.

Cab - 446 and 456 Models to 1169000 - Torque the bolts **A** to 330 Nm (243 lbf ft).

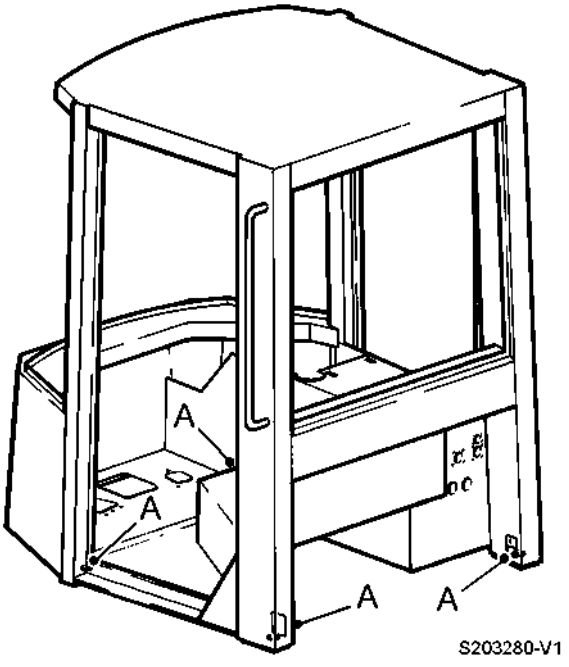


Fig 7.

Cab - 456 Models from 1169000 - Torque the bolts **A** to 270 Nm (199 lbf ft).

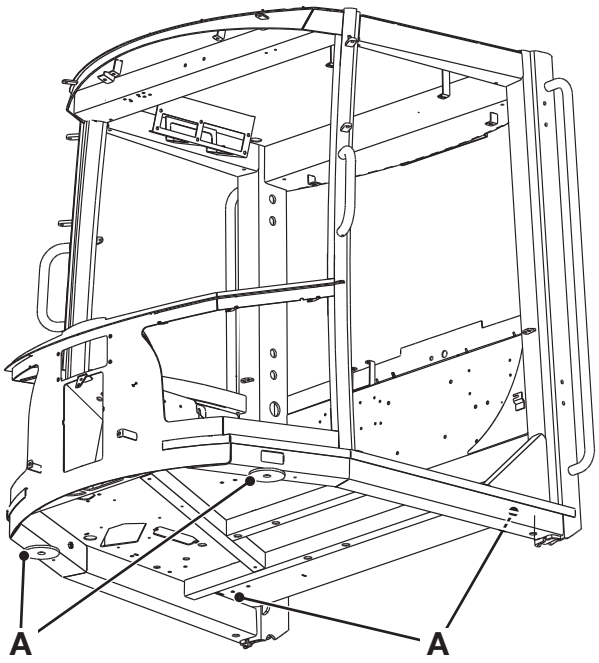


Fig 8.

446 and 456 to 1169000

Checking the Fluid Level

1 Apply the park brake, put the transmission in neutral, lower the shovel/attachment to the ground. Make sure it is flat on the ground. Stop the engine.

2 The level should be visible in the sight glass **A**.

3 If necessary, top up with hydraulic fluid.

4 Open the right side top step. Open filler cap **B**.

5 Top up the system with hydraulic fluid.

6 Refit filler cap **B**. Make sure it is secure. Close the right side top step.

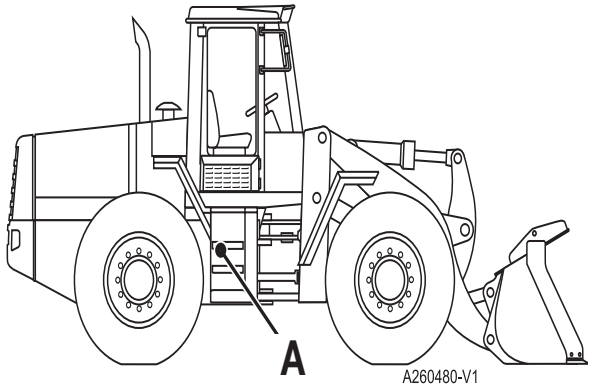


Fig 74.

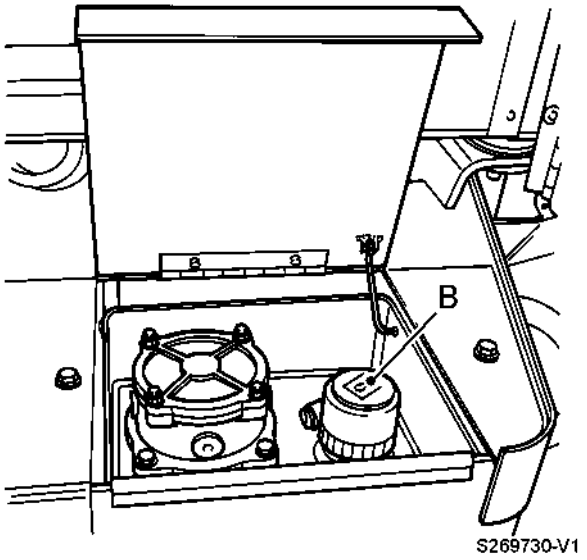


Fig 75.

⚠ CAUTION

If the fluid is cloudy, then water or air has contaminated the system. This could damage the hydraulic pump. Contact your JCB Distributor immediately.

12-5-1-4

Pressure Switch Assembly

The pressure switch assembly comprises a low pressure switch designed to open at approximately 2 bar (30 lbf/in^2) and a high pressure switch designed to open at 24 bar (342 lbf/in^2)

When the refrigerant pressure is within the 2 and 24 bar limits the switches will be closed and providing the thermostat and on/of switches are closed, a current will be supplied to the field coil of the clutch. Through electro-magnetic action the field coil clutch will be pulled towards the compressor's clutch and the refrigeration cycle will commence.

If the fault finding table indicates that the pressure switch assembly is defective the fault may be electrical or due to incorrect system pressure.

Follow the procedure for checking the refrigerant charge level (⇨ *Checking the Refrigerant Charge Level (B-43)*) to isolate the fault area. If the refrigerant charge level is OK use the following electrical test procedures.

Pressure Switch Testing

1 Switch the engine off so that the air conditioning system cannot operate.

2 Disconnect the pressure switch harness, FS, from the side console harness and connect an external 24V power supply between the pressure switch harness connector and chassis. If both pressure switches are working correctly, and the system is at the correct charge level, the compressor clutch will operate.

If the compressor clutch does not operate with the external power supply, one of the pressure switches in the assembly is faulty or the level of refrigerant charge is insufficient to close the low pressure switch.

3 Replace the pressure switch assembly. If the clutch still fails to operate check all electrical connections.

Removal and Replacement

Important: *The system must be discharged before the pressure switch is removed*

⚠ WARNING

Goggles and rubber gloves must be worn when pressure switches are removed or fitted. A small amount of refrigerant is released which can be harmful to the skin or eyes.

BF-1-10

Removal

1 Discharge the air conditioning system, see ⇨ *Refrigerant Charging and Discharging (B-45)*.

2 Disconnect the electrical connections and unscrew the pressure switch.

Replacement

1 Screw the pressure switch into the pressure switch port and torque tighten sufficiently to form a gas-tight seal.

2 Reconnect the electrical connection.

3 Charge the air conditioning system (discharged during removal). See ⇨ *Refrigerant Charging and Discharging (B-45)*.

4 Run the air conditioning and check the pressure switches for leaks. If any leaks are found, tighten the pressure switch further until the leaking stops.

Condenser

It is likely that over a period of time, because of the machine's working environment, the airflow around the condenser coil will become restricted due to a build up of airborne particles.

If the build up of particles is severe, heat dissipation from the refrigerant to the air will be significantly reduced, resulting in poor air conditioning performance.

In extreme cases, over pressurisation of the system occurs, causing the high pressure cut out switch to operate and switch off the system.

High pressure cut out can also be caused by an internal blockage of the condenser coil.

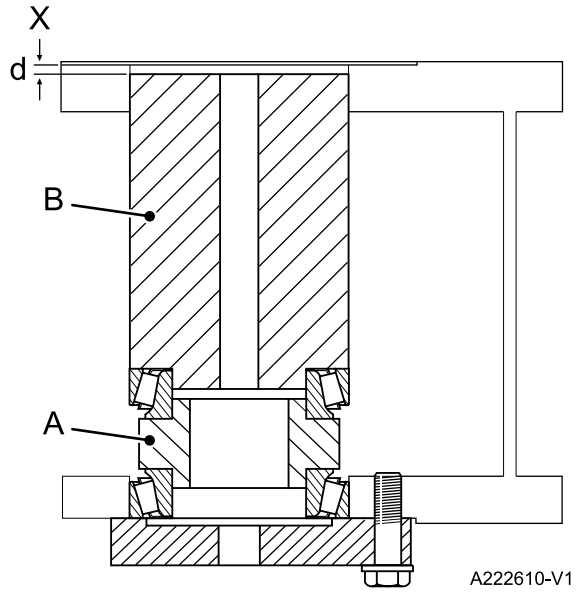


Fig 6.

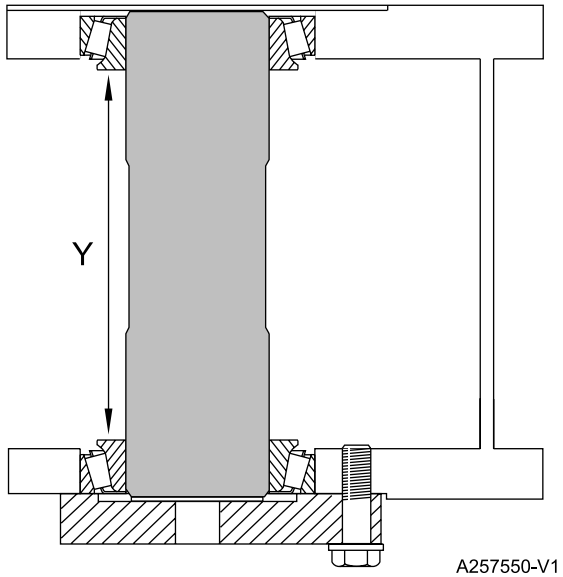


Fig 7.

7 Add dimension **6d** to dimension **t** which is stamped on the front module. This dimension (**6d** + **t**) equals the shims required to give the correct clearance.

8 Select shims from the table corresponding to dimension (**6d** + **t**) and insert underneath bearing locator **6B**.

Note: *If no dimension **t** is stamped, read dimension **t** as **zero***

9 Bearing locator **6B** should now project above face **6X** by an amount equivalent to dimension **t** ± 0.025 mm.

10 Remove bearing locator **6B**, shim pack, top bearing and dummy boss **6A**.

11 Fit new lip seals **5-7** over the large diameter portion of the rear module pivot boss, or alternatively rolled inside out to protect the seal lips during chassis mating.

12 Position the top bearing cone on pivot pin **5-1** to dimension **7Y** (178 mm) as shown.

13 Smear the bottom portion of the rear module pivot bore with locking fluid.

14 Remove bottom end cap **5-5**, fit washer **5-26** and replace the bottom end cap. Torque tighten screw **5-23**.

15 Carefully mate the front and rear chassis.

16 Assemble the lower pivot pin **5-2** together with shims **5-30**, bearing **5-20** and new seals **5-6**. Retain with spacer **5-31**, washer **5-4** and screw **5-3**. Torque tighten screw.

17 Smear locking fluid onto the top portion of pivot pin **5-1** and assemble through housing and boss.

18 Pack the top bearing with grease and fit the bearing cup.

Note: *Ensure that the bearing is completely filled with grease.*

19 Fit the shim pack and washer **5-26**.

20 Grease the face of the top end cap **5-5** then secure with washers **5-24** and bolt **5-23**. Torque tighten bolt.

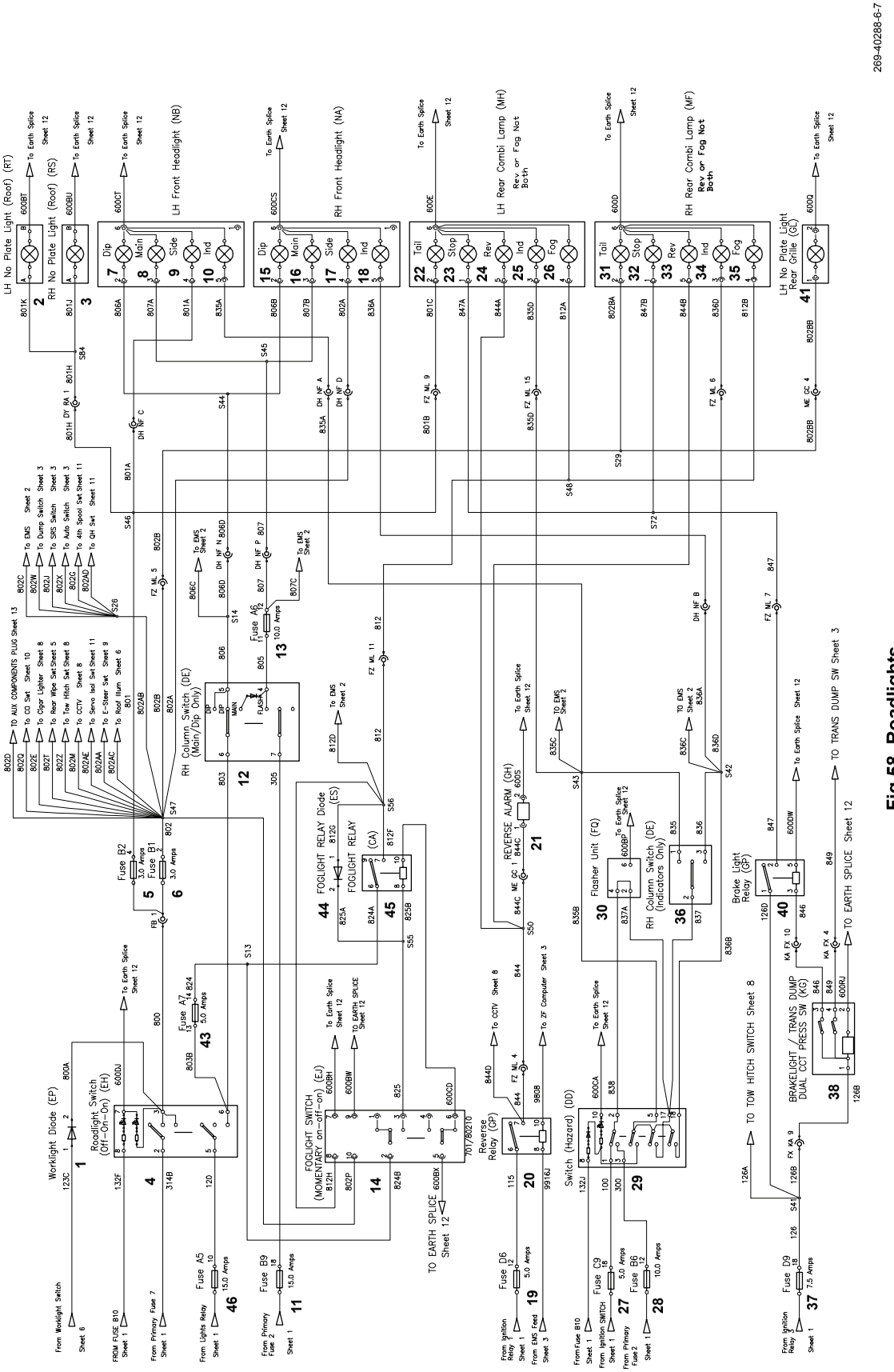
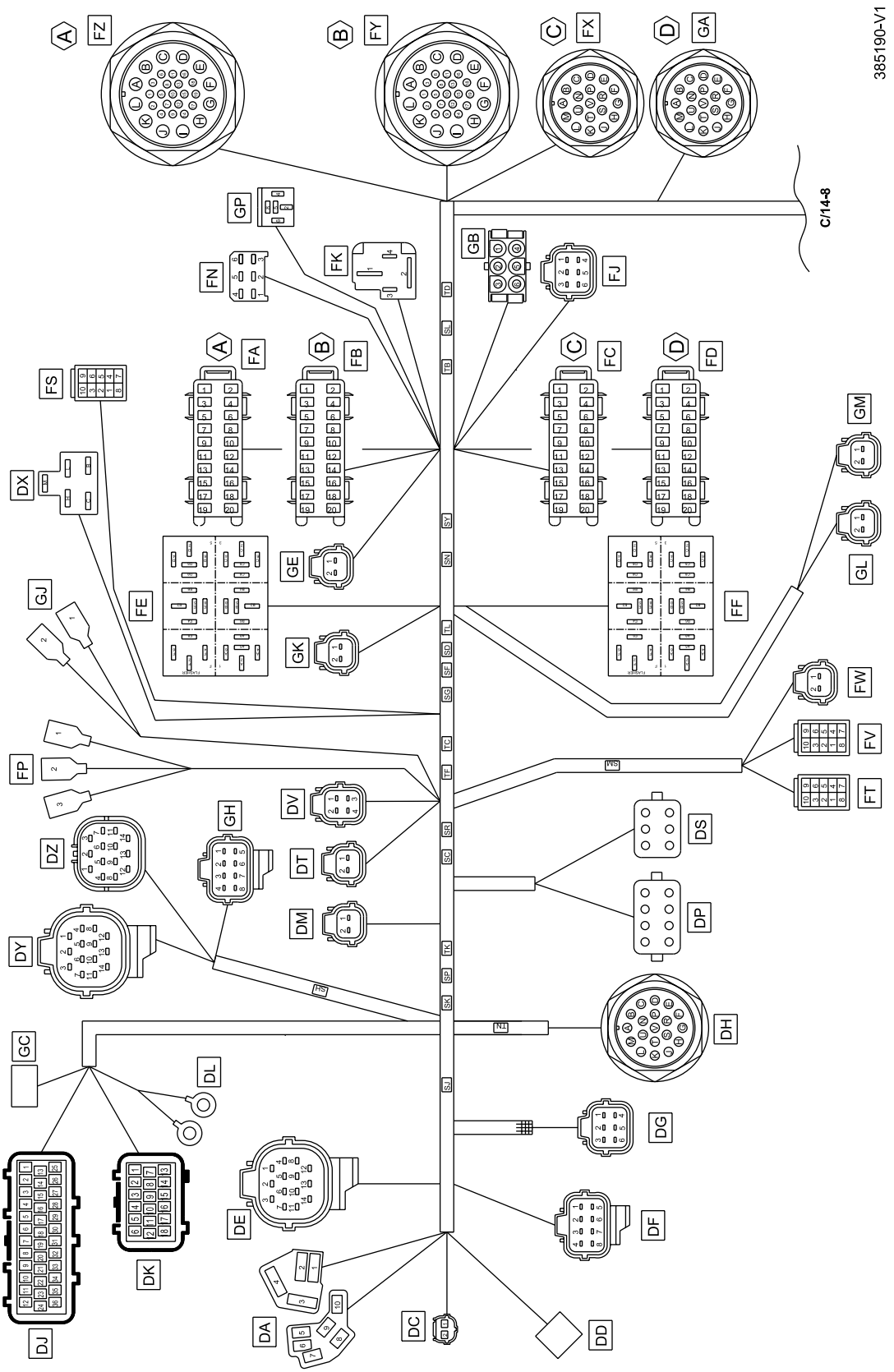


Fig 58. Roadlights


385190-V1
C/14-8
A
FZ
B
FY
C
FX
D
GA
GP
FN
FK
GB
FJ
FA
FB
FC
FD
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DX
GM
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GJ
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FP
DV
GH
DZ
DT
DM
DY
DS
DP
DH
GC
DL
DG
DE
DF
DK
DA
DC
DD
DJ

Fig 98.

CA
FOG LIGHT RELAY

1			
2			
3			
4			
5			
6	824A	1.0	S13–3
7	812F	1.0	S56–4
8	825B	1.0	S55–2
9			
10	600CD	1.0	EJ–6

10 Way Twin Micro Relay Base : 1 : 7241/0003
90 Deg Passive Bracket for Relay Housings : 1 : 7241/0023
90 Deg Active Bracket for Relay Housings : 1 : 7241/0024

CB
AUX COMPONENTS

1	110	2.0	FA–20
2	600B	2.0	S67–18
3	802D	0.75	S47–14
4	302	2.0	FB–6
5	417	1.0	FY–V
6	610	2.0	HE–9

6 Way DT06 Socket Housing : 1 : 7216/0018
6 Way DT06 Wedge : 1 : 7216/0016

DB
Ignition Switch 2

5	830	4.0	FC–15
6	000A	4.0	S37–1
7	001	4.0	FC–1
8	002A	4.0	DA–4
9			
10			

6 Way Merit Fem Hsg : 1 : 7236/0003

DD
Hazard Switch

1	100	1.5	FC–18
2	838	1.5	FQ–4
3	300	2.0	FB–12
4			
5	835B	1.5	S43–1
7			
8	132J	0.75	S62–8
10	600CA	0.75	S67–13
17	837,837A	1.5	DE–2,FQ–2
18	836B	1.0	S42–1

10 Way 6.3 Fastin Switch Hsg Red : 1 : 7219/0014

DE
RH Column Switch

1	835	1.0	S43–2
2	837	1.5	DD–17
3	836	1.0	S42–2
4	805	2.0	FA–11
5	806	2.0	S14–1
6	803	2.0	EH–6
7	305	2.0	FB–18
8	105A	2.0	S34–2
9	819	1.0	S35–1
10	817	2.0	DG–6
11	818	2.0	DG–8
12	831	2.0	DG–3
13	828	2.0	DG–7
14	816	2.0	DH–E

14 Way HW090 Socket Housing : 1 : 7219/0005
14 Way HW090 Socket Retainer : 1 : 7219/0007

EP
Worklight Diode

1	123C	1.0	S85–1
2	800A	1.5	EH–3

BUTT DIODE ASSY 6A 1000V : 1 : 7514/0006
Adhesive Lined Heatshrink : 50.0 : 7000/3212

DG
Front Wiper Motor

1	7210/0030		
2	819B	1.0	S35–2
3	831	2.0	DE–12
4	105B	2.0	S34–1
5	600AR	2.0	S66–2
6	817	2.0	DE–10
7	828	2.0	DE–13
8	818	2.0	DE–11

8 Way DT06 Socket Housing : 1 : 7218/0013
8 Way DT06 Wedge : 1 : 7218/0009

DH
Front Chassis Connector

A	835A	1.0	S43–4
B	836A	1.0	S42–4
C	801A	0.75	S46–2
D	802A	0.75	S47–11
E	816	2.0	DE–14
F	104B	1.0	S19–5
G	104C	1.0	S19–6
H	861	1.0	FT–3
J	858	1.0	HB–3
K	851	1.0	GS–3
L	852	1.0	S20–3
M	9916M	1.0	S1–12
N	806D	2.0	S14–3
O	859	1.0	HC–3
P	807	2.0	FA–12
Q	7210/0030		
R	600EC	2.0	S88–3
S	600ED	2.0	S88–2
T	897	1.0	DW–5
U	853	1.0	GS–4
V	104E	1.0	S19–7
W	7210/0030		
X	7210/0030		

23 Way HDP Bulkhead HSG Pin Terms : 1 : 7220/0048
Size 24 Lockwasher : 1 : 7210/0047
Size 24 Plastic Jam Nut : 1 : 7210/0048

DF
LH Column Switch

1	9532	1.0	S2–1
2	9536	1.0	S1–3
3	7210/0001		
4	9540	1.0	DW–43
5	9548	1.0	DW–67
6	9544	1.0	DW–64
7	9528	1.0	DW–63
8	9524	1.0	DW–65

8 Way HW090 Socket Housing : 1 : 7218/0001
8 Way HW090 Socket Retainer : 1 : 7218/0003

DP
Loader Lever

1	9536A	1.0	S1–5
2	9816A	1.0	S3–1
3	9916B	1.0	S1–6
4	9916K	1.0	S1–4
5	880	1.0	DW–44
6	9532B	1.0	S2–3
7	882	1.0	DW–20
8	881	1.0	DW–31

8 Way DT06 Socket Housing : 1 : 7218/0013
8 Way DT06 Wedge : 1 : 7218/0009

DL 1
Buzzer

1	420A	0.75	DJ–31

Ring Terminal M4 0.5–1.0 : 1 : 7207/1105
Adhesive Lined Heatshrink : 1 : 7000/3212

DK
EMS

1	7210/0015		
2	415	1.0	FY–H
3	418	1.0	FY–R
4	7210/0015		
5	111A	1.0	S27–4
6	812D	1.0	S56–1
7	431	1.0	FZ–2
8	7210/0015		
9	CAN 2L	0.75	HF–B
10	123B	1.0	S85–2
11	807C	1.0	FA–12
12	806C	1.0	S14–2
13	7210/0015		
14	867	1.0	HE–18
15	CAN 2H	0.75	HF–A
16	836C	1.0	S42–3
17	802C	0.75	S26–1
18	835C	1.0	S43–3

18 Way Econo 070 Fem Housing : 1 : 7220/0015
18 Way Econo 070 Fem Retainer : 1 : 7220/0014

DJ
EMS

1	845	0.75	HA–3
2	7210/0015		
3	7210/0015		
4	400	0.75	FY–K
5	7210/0015		
6	422B	0.75	FY–S
7	7210/0015		
8	7210/0015		
9	7210/0015		
10	401	1.0	FZ–1
11	811	0.75	FU–3
12	7210/0015		
13	600DU	0.75	S66–5
14	863B	1.0	S53–3
15	412	0.75	FY–M
16	408	0.75	FY–F
17	7210/0015		
18	432	0.75	HE–2
19	7210/0015		
20	7210/0015		
21	7210/0015		
22	7210/0015		
23	808	0.75	GR–3
24	850	0.75	GR–8
25	301	0.75	FB–8
26	7210/0015		
27	CAN 2S	0.75	HF–C
28	7210/0015		
29	7210/0015		
30	7210/0015		
31	420A	0.75	DL 1–1
32	7210/0015		
33	866	1.0	HE–17
34	129	0.75	EM–4
35	600G	0.75	S66–4
36	125B	0.75	S81–2

36 Way Econo 070 Fem Housing : 1 : 7220/0017
36 Way Econo 070 Fem Retainer : 1 : 7220/0016

DQ
Earth Point Front Console

1	600L	4.0	S66–3

Ring Terminal M10 4.0–6.0 : 1 : 7207/1502
Adhesive Lined Heatshrink : 1 : 7000/3212

DS
Loader Lever

1	104H	1.0	S19–2
2	852A	1.0	S20–2
3	854	1.0	GS–5
4	600AA	1.0	S67–6
5	600AB	1.0	S67–8
6	600DV	1.0	S67–7

6 Way DT06 Socket Housing : 1 : 7216/0018
6 Way DT06 Wedge : 1 : 7216/0016

DT
AC Unit

A	843	1.0	DX–C
B	7210/0030		
C	841	1.0	FS 1–1

3 Way DT06 Socket Housing : 1 : 7213/0031
3 Way DT06 Wedge : 1 : 7213/0016

DV
Heater Blower

1	600AD	3.0	DR–1
2	821	3.0	DX–M
3	820	3.0	DX–L
4	822	3.0	DX–H

4 Way DTP06 Socket Housing : 1 : 7214/0034
4 Way DTP06 Wedge : 1 : 7214/0032

DX
Heater Switch

B	112	3.0	FC–12
C	843	1.0	DT–A
H	822	3.0	DV–4
L	820	3.0	DV–3
M	821	3.0	DV–2

5 Way 6.3 Fem Hsg Heater Switch : 1 : 7235/0006

DY
Cab Conn 1

1	801H	0.75	S46–4
2	132G	0.75	S62–9
3	810	2.0	FA–2
4	121	2.0	FA–6
5	131	2.0	FA–8
6	119	2.0	FC–16
7	304	1.5	FB–14
8	106A–24V	1.0	FD–14
9	872	2.0	GM–B
10	122	0.75	FG–6
11	123	2.0	S85–4
12	7210/0030		

12 Way DT06 Socket Housing : 1 : 7219/0016
12 Way DT06 Wedge : 1 : 7219/0012

DZ
Cab Conn 2

1	309B–24V	1.0	S73–4
2	300–12V	1.0	GG–4
3	308C–12V	1.0	S15–4
4	603A–12V	1.0	S16–4
5	855	2.0	HE–11
6	7210/0030		
7	7210/0030		
8	802AC	1.0	S47–4

8 Way DT06 Socket Housing Key C : 1 : 7218/0016
8 Way DT06 Wedge : 1 : 7218/0009

DL 2
Buzzer 2

1	600BJ	0.75	S66–1

Ring Terminal M4 0.5–1.0 : 1 : 7207/1105
Adhesive Lined Heatshrink : 1 : 7000/3212

DW
ZF Computer

1	9852B	1.0	S9–2
2	9852C	1.0	S9–4
3	9900	1.0	S8–1
4	9500	1.0	GA–K
5	897	1.0	DH–T
6	7210/0082		
7	9808	0.75	GP–10
8	893	1.0	HE–3
9	9446	1.0	GA–E
10	9434	1.0	GA–B
11	7210/0082		
12	9454A	1.0	S4–1
13	9454B	1.0	S4–2
14	7210/0082		
15	9644	0.75	GB–2
16	7210/0082		
17	9580	0.75	GA–O
18	9652	0.75	GB–4
19	9400	0.75	GA–N
20	882	1.0	DP–7
21	9820A	1.0	S10–2
22	9532A	1.0	S2–2
23	9832	1.0	FB–10
24	7210/0082		
25	439	0.75	HH–A
26	438	0.75	HH–B
27	7210/0082		
28	7210/0082		
29	9824	1.0	EB–3
30	896	1.0	FV–3
31	881	1.0	DP–8
32	9438	1.0	GA–C
33	7210/0082		
34	7210/0082		
35	9821	1.0	FY–P
36	7210/0082		
37	7210/0082		
38	7210/0082		
39	9458	1.0	GA–H
40	7210/0082		
41	9410	0.75	GA–R
42	9420	0.75	GA–T
43	9540	1.0	DF–4
44	880	1.0	DP–5
45	9916	1.0	S1–2
46	9462	1.0	S5–1
47	7210/0082		
48	7210/0082		
49	9570	1.0	FY–A
50	7210/0082		
51	9450	1.0	GA–F
52	7210/0082		
53	7210/0082		
54	7210/0082		
55	9442	1.0	GA–D
56	9430	1.0	GA–A
57	848A	1.0	HE–4
58	7210/0082		
59	9901	1.0	EM–2
60	7210/0082		
61	7210/0082		
62	9504	1.0	GA–L
63	9528	1.0	DF–7
64	9544	1.0	DF–6
65	9524	1.0	DF–8
66	9816	1.0	S3–2
67	9548	1.0	DF–5
68	9836	1.0	FB–10

68 Way Micro Timer Female Housing : 1 : 7219/0072
Micro Timer 68 Way Clip : 1 : 7219/0073
Micro Timer 68 Way Cover : 1 : 7219/0074

EA
CAN J1939 Conn

A	659	0.75	S68–17
B	301B	0.75	FB–8
C	CAN 1H	0.5	HG–A
D	CAN 1L	0.5	HG–B
E	CAN 1S	0.5	HG–C
F	7210/0030		
G	7210/0030		
H	7210/0030		
J	7210/0030		

9 Way Male J1939 Housing Jam Nut Type : 1 : 7219/0098
Jam Nut Plastic M35 : 1 : 7210/0116
Dust Cover with Lanyard : 1 : 7210/0117

EB
Auto Manual Switch

1			
2	9916G	1.0	S1–9
3	9824	1.0	DW–29
4			
5			
6			
7	600BK	0.75	S66–9
8	802J	0.75	S26–2
9			
10			

10 Way 6.3 Fastin Switch Hsg : 1 : 7219/0013
Auto/Manual Decal : 1 : 817/17421

EC
Dump Switch

1			
2	849	1.0	FX–4
3	9816B	1.0	S3–3
4			
5			
6			
7	600BE	0.75	S66–8
8	802X	0.75	S26–3
9			
10			

10 Way 6.3 Fastin Switch Hsg : 1 : 7219/0013
Trans Dissconect Decal : 1 : 817/17292

ED
Rear Wiper Switch

1	827	2.0	FR–2
2	814	2.0	FR–3
3	102B	2.0	S36–2
4			
5	LINK	1.0	ED–10
6	815	1.0	FX–2
7	600BC	1.0	S67–5
8	802T	0.75	S47–6
9			
10	LINK	1.0	ED–5

10 Way 6.3 Fastin Switch Hsg : 1 : 7219/0013
Rear/Roof Wiper Switch Decal : 1 : 817/17297

DM
Handbrake Switch (456 ONLY)

1	9916D	1.0	S1–11
2	9820	1.0	S10–1
3	7210/0030		
4	7210/0030		

4 Way DT06 Socket Housing : 1 : 7214/0025
4 Way DT06 Wedge : 1 : 7214/0016

EJ
Rear Fog Switch

1			
2	824B	1.0	S13–1
3	825	1.0	S55–3
4			
5	600BX	1.0	S67–17
6	600CD	1.0	CA–10
7	600BH	0.75	S67–4
8	812H	1.0	S56–5
9	600BW	0.75	S67–16
10	802P	0.75	S47–2

10 Way 6.3 Fastin Switch Hsg : 1 : 7219/0013
Rear Fog Switch Decal : 1 : 817/17256

EM
IMMOBILISER

1	9916N	1.0	S1–15
2	9901	1.0	DW–59
3	128	0.75	FK–7
4	129	0.75	DJ–34
5	7210/0052		
6	811A	0.75	FU–3
7	309C	1.0	S73–3
8	107D	0.75	S32–4
9	7210/0052		
10	7210/0052		
11	600PM	0.75	S68–6
12	107B	0.75	S32–3

12 Way DTM06 Socket Housing Key B : 1 : 7219/0019
12 Way DTM06 Wedge : 1 : 7219/0024

ER
IMMOBILISER LINK

1	511	1.0	ER–2
2	511	1.0	ER–1
3	512	1.0	ER–4
4	512	1.0	ER–3
5	7210/0052		
6	7210/0052		
7	7210/0052		
8	7210/0052		
9	7210/0052		
10	7210/0052		
11	7210/0052		
12	7210/0052		

12 Way DTM04 Pin Housing Key B : 1 : 7219/0023
12 Way DTM04 Wedge : 1 : 7219/0025

ES
FOGLIGHT DIODE

1	812G	1.0	S56–3
2	825A	1.0	S55–1

BUTT DIODE ASSY 3A 1000V : 1 : 7514/0005
Adhesive Lined Heatshrink : 50.0 : 7000/3212

DA
Ignition Switch

1	310A	4.0	S21–3
2			
3	002	4.0	FA–15
4	002A	4.0	DB–8

4 Way Merit Fem Hsg : 1 : 7234/0003

FA
Fusebox A

1	006	4.0	FG–2
2	810	2.0	DY–3
3	Bus Bar With Cell		1
4	123A	2.0	S85–3
5	005	4.0	FH–2
6	121	2.0	DY–4
7	Bus Bar With Cell		5
8	131	2.0	DY–5
9	Bus Bar With Cell		5
10	120	3.0	EH–5
11	805	2.0	DE–4
12	807C,807	1.0,2.0	DK–11,DH–P
13	803B	2.0	EH–6
14	824	1.0	S13–2
15	002	4.0	DA–3
16	111B	1.0	S27–3
17	Bus Bar With Cell		15
18	113	3.0	FY–E
19	000C	4.0	S37–3
20	110	2.0	CB–1

10 Way Sec Fusebox Housing : 1 : 7241/0001
10 Way Sec Fusebox Retainer : 1 : 7241/0002

NOTE: BUSBAR TERMINALS ON PINS
1,3,5,7,9,15,17

FB
Fusebox B

1	800	4.0	EH–3
2	802	1.0	S47–1
3	Bus Bar With Cell 1		
4	801	1.0	S46–1
5	314A	4.0	S83–2
6	302	2.0	CB–4
7	Bus Bar With Cell		5
8	301,301B	0.75	DJ–25,EA–B
9	Bus Bar With Cell		5
10	9832,9836	1.0	DW–23,DW–68
11	313	4.0	HE–6
12	300	2.0	DD–3
13	Bus Bar With Cell		11
14	304	1.5	DY–7
15	Bus Bar With Cell		11
16	309	1.0	S73–2
17	Bus Bar With Cell		11
18	305	2.0	DE–7
19	000B	4.0	S37–2
20	132	1.0	S62–1

10 Way Sec Fusebox Housing : 1 : 7241/0001
10 Way Sec Fusebox Retainer : 1 : 7241/0002

NOTE: BUSBAR TERMINALS ON PINS
1,3,5,7,9,11,13,15,17

EH
Roadlight Switch

1			
2	314B	4.0	S83–3
3	800A,800	1.5,4.0	EP–2,FB–1
4			
5	120	3.0	FA–10
6	803B,803	2.0	FA–13,DE–6
7	600DJ	0.75	S67–3
8	132F	0.75	S62–6
9			
10			

10 Way 6.3 Fastin Switch Hsg : 1 : 7219/0013
Roadlight Switch Decal : 1 : 817/17257

DR
EARTH POINT REAR CONSOLE

1	600AD,600J,600,650,600K	3.0,4.0,6.0,0.75,6.0	DV–1,S67–2,S88–1,HH–C,S68–22

Ring Terminal M10 16–25 : 1 : 7207/1505
Adhesive Lined Heatshrink : 1 : 7000/3212

333-R3991-3

Fig 147. Rear Chassis Harness 3 of 6

456 from 1169000 Tandem Pump

Pumps

Type	Rexroth. Tandem variable displacement axial piston
Ref	A10VO74DFR1/31R-PSC12N00

Pump 1	**litres/min**	**UK gal/min**	**US gal/min**
Stand-by flow	5	1.1	1.3
Full flow at 2200 rev/min	162	35.63	42.8
Flow at max. pressure (220 bar)	5	1.1	1.3
Pump 2			
Stand-by flow	5	1.1	1.3
Full flow at 2200 rev/min	162	35.63	42.8
Flow at max. pressure (160 bar)	5	1.1	1.3

Engine Driven Gear Pump with Charge Valve (Brake Charge/Engine Cooling Fan)			
Type	Parker Hannifin		
Ref	334 9111 050		
Flow	17 cc/rev		
	litres/min	**UK gal/min**	**US gal/min**
Total flow to accumulators	5	1.1	1.3
	bar	**kgf/cm²**	**lbf/in²**
Max pressure at port “EF”	235	239	3408
Charge Valve			
Cut-IN pressure	144	146	2088
Cut-OUT pressure	180	183	2611

Relief Valve Operating Pressures	**bar**	**kgf/cm²**	**lbf/in²**
Pump 1			
Stand-by pressure (pump compensator valve)	31 +3/-0	31.6 +3/-0	449.6 +43/-0
System control pressure (pump relief valve)	220 +/-5	224 +/-5	3190 +/-72
Pump 2			
Stand-by pressure (pump compensator valve)	29 +3/-0	29.6 +3/-0	420 +43/-0
System control pressure (pump relief valve)	160 +/-5	163 +/-5	2320 +/-72

Pump Pressure Testing

⚠ WARNING

Raised Equipment

Never walk or work under raised equipment unless it is supported by a mechanical device. Equipment which is supported only by a hydraulic device can drop and injure you if the hydraulic system fails or if the control is operated (even with the engine stopped).

Make sure that no-one goes near the machine while you install or remove the mechanical device.

13-2-3-7_3

⚠ WARNING

Make sure the articulation lock is in the transport position before you transport the machine. The articulation lock must also be in the transport position if you are carrying out daily checks or doing any maintenance work in the articulation danger zone.

If the articulation lock is not in the transport position you could be crushed between the two parts of the chassis.

4-3-5-7

⚠ WARNING

Hydraulic Pressure

Hydraulic fluid at system pressure can injure you. Before disconnecting or connecting hydraulic hoses or couplings, vent the pressure trapped in the hoses in accordance with the instructions given in this publication.

HYD-1-5

Standby Pressure

1 Connect Pressure Test Gauge Kit 892/00253 (see ***Note***) to test point **A**. ⇨ *Fig 44. (E-73)*.

⚠ CAUTION

After checking the standby pressure, turn the starter key to HS to allow the engine rotation to stop. Do not turn the key to OFF while the engine is turning; otherwise the test gauge may be damaged.

HYD-3-3

2 Remove the ESOS connector **B** from the fuel injection pump. ⇨ *Fig 44. (E-73)*.

3 Crank the engine with the starter key and check that the standby pressure is as stated in ⇨ *Loader Valve (E-1)*. If necessary, adjust at **E**. ⇨ *Fig 43. (E-72)*.

Note: *System control pressure will only show with the ESOS disconnected. When the ESOS is reconnected, the pressure shown will be approximately 50 bar.*

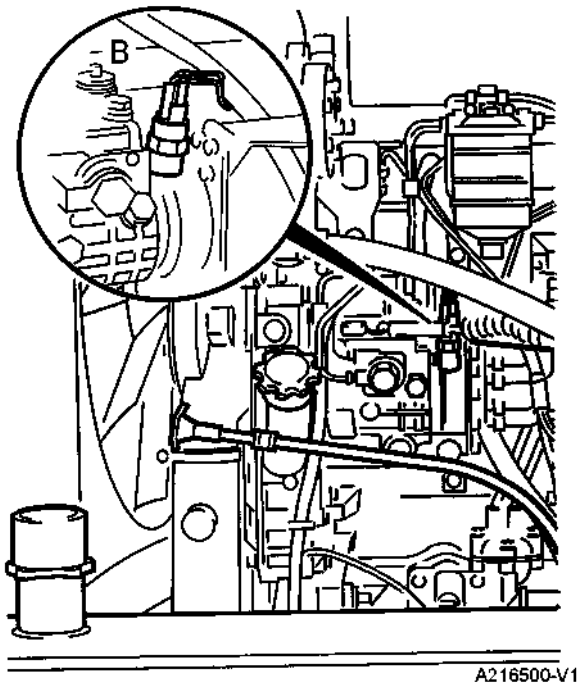

Fig 45.

Table 8. Torque Settings

Item	Nm	Kgf m	lbf ft
17	40	4.08	29.5
23	56	5.71	41.3

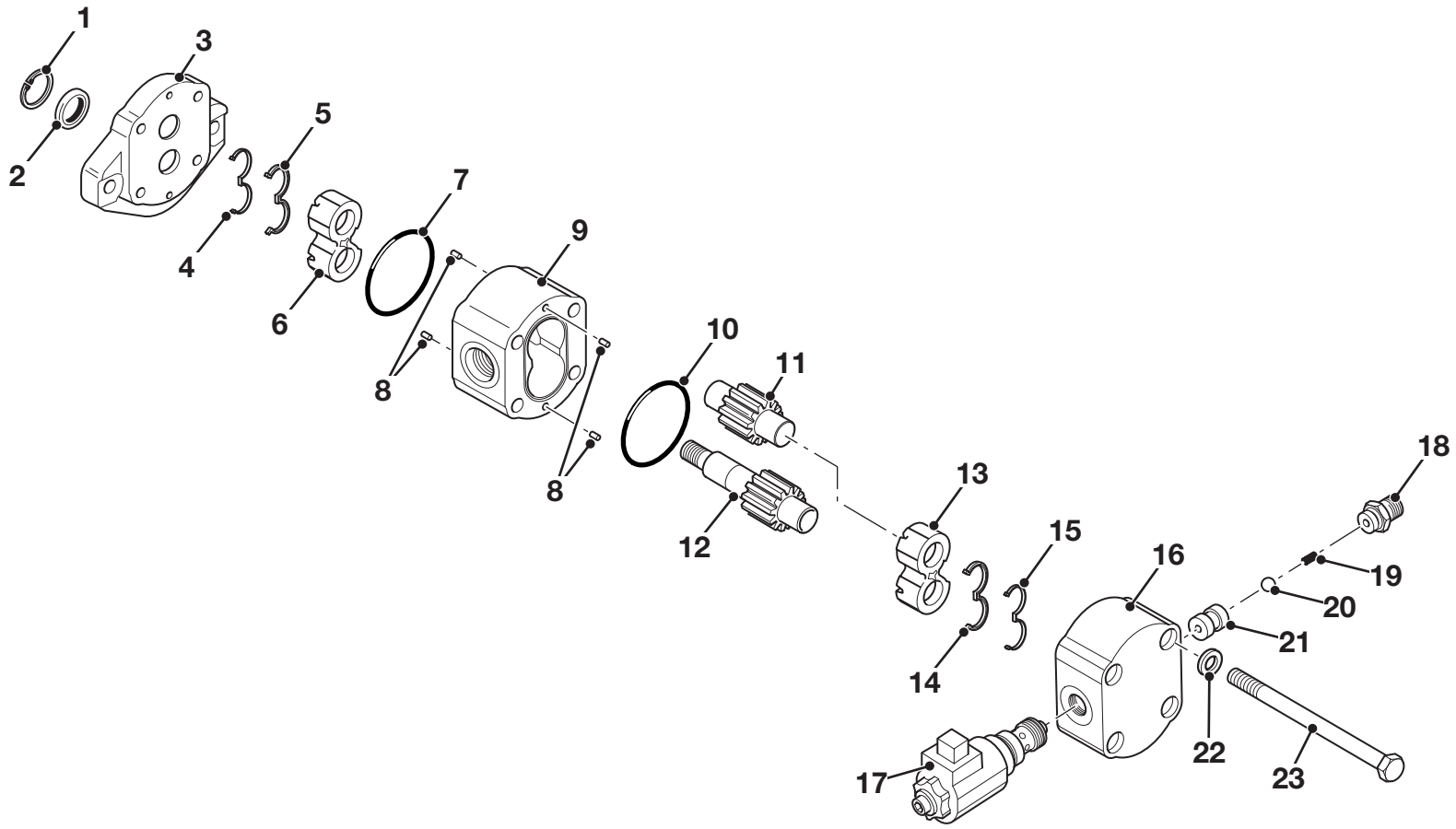

Fig 77. Uni-Directional Motor Components

For Component key see:⇨ *Table 9. (🗋 E-111)*

Table 7. Examples - Dimension 'A'

PR 15 Axle

A = Measured distance (a) + Bearing Radius (b)

A = 162.6 + 62.5 = 225.1 mm

PR 24 Axle

A = Measured distance (a) + Bearing Radius (b)

A = 210.60 + 80 = 290.6 mm

Each bevel pinion head face is marked with a number **X** suffixed by a + or - symbol. ⇨ *Fig 12. (F-25)*.

This value, expressed in units of 0.1 mm, indicates the deviation from the theoretical pinion underhead to crown wheel axis dimension **B**.

i.e.: - 1 = - 0.10 mm. (PR 15), -0.20 mm (PR 24)

Consequently, the true distance **B** will be:

B = Theoretical distance ± deviation.

e.g.:

PR 15 Axle

B = Theoretical pinion dimension ± deviation

B = 184.00 - 0.10 = 183.90 mm

PR 24 Axle

B = Theoretical pinion dimension ± deviation

B = 231.70 - 0.20 = 231.50 mm

Measure the total width **D** of pinion underhead bearing.

e.g.:

PR 15 Axle

D = 37.00 mm

PR 24 Axle

D = 54.00 mm

Determine the thickness of shim **S** required to give the correct axial position of the bevel pinion:

S = A - B - D.

Therefore using our case:

PR 15 Axle

S = A - B - D

S = 225.1 - 183.9 - 37.00 = 4.2 mm

PR 24 Axle

S = A - B - D

S = 290.6 - 231.5 - 54.00 = 5.1mm

Increase the calculated value of **S** by 0.05 mm, to provide the required bearing pre-load. Then round the value up or down to the nearest tenth of a millimetre to give the required shim value.

e.g.:

4.02 rounded down to= 4 mm.

3.88 rounded up to = 3.9 mm.

Example: using the theoretical figures for PR 15:

(all dimensions in millimetres)

Crown wheel axis to bearing seat distance **A**	225.1
Theoretical distance gear axis/pinion underhead	184.0
Value **X**, given as -1	-0.1
True distance **B** = 168.5 - 0.1 =	183.9
Thickness of pinion head bearing **D**	37.00

Thickness of shim **S** = A - B - D

S = 225.1 - 183.9 - 37.00 =	4.2
Increase by 0.05 =	4.25

Thickness of shim required (PR 15) = 4.3 mm.

Electro-Hydraulic Shift Control

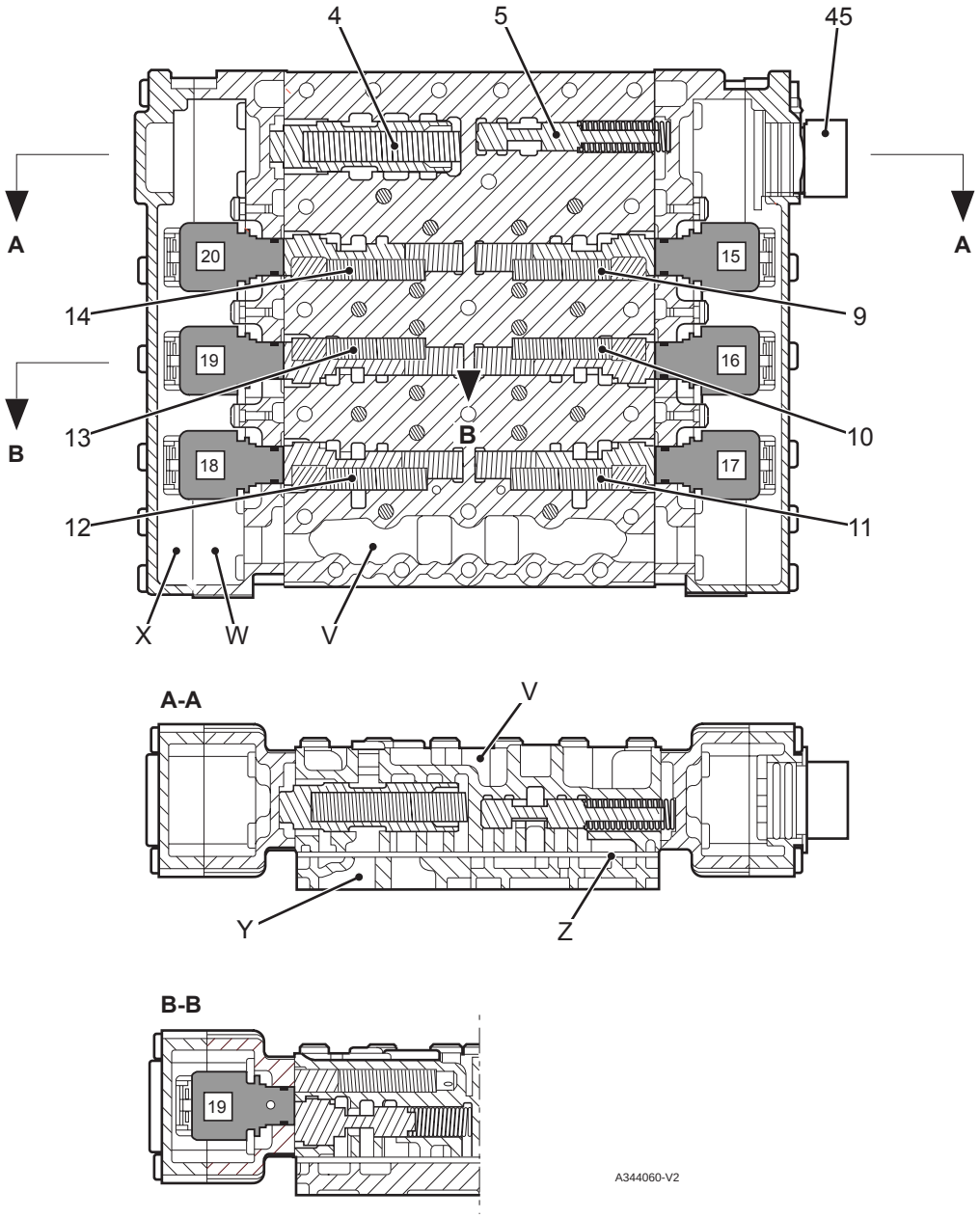

Fig 63.

Table 10. Key to Electro-Hydraulic Shift Control

Note: View B-B shows proportional valve 13. Proportional valves 9 - 12 and 14 are functionally identical

Key	
V	Valve block
W	Housing
X	Cover
Y	Duct plate
Z	Gasket

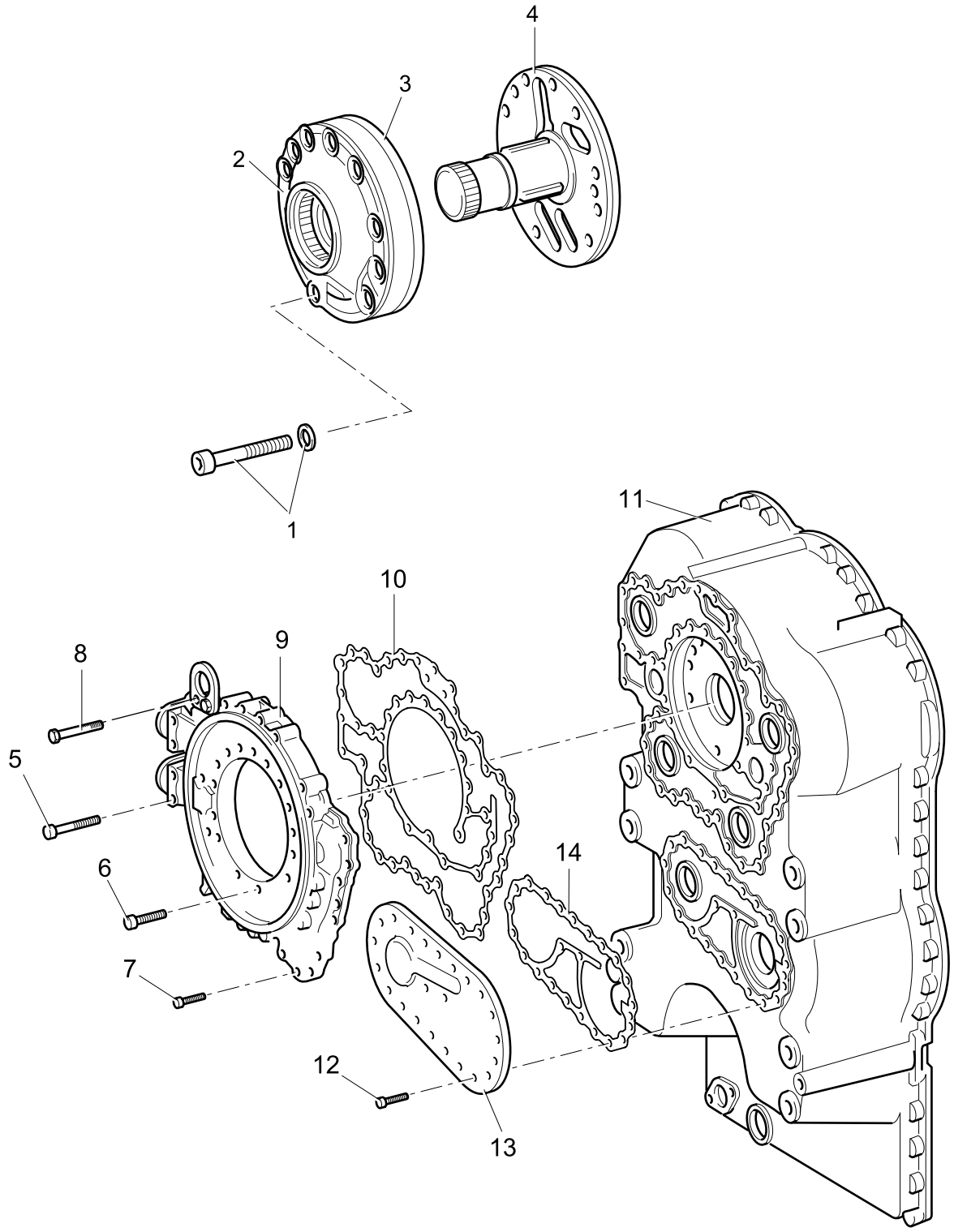

Fig 120. Converter Back Pressure valve Installation