Section B

Body & Framework

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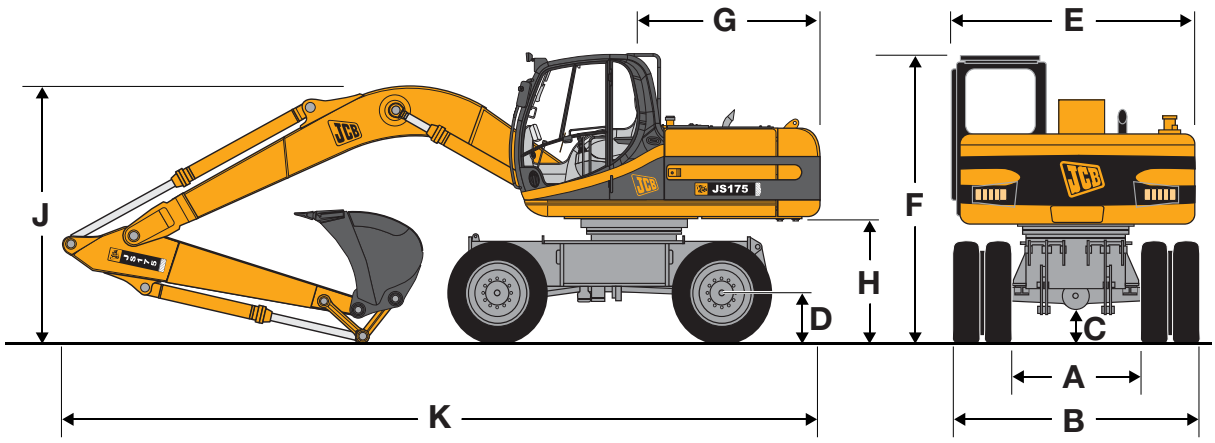
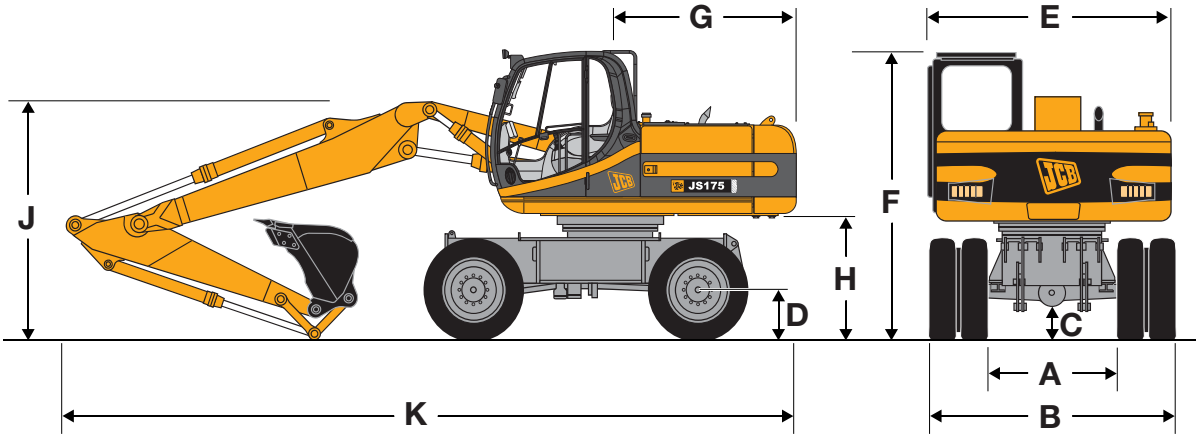


Dimensions in millimetres (ft. in)	
A Internal width between dual wheels	1330 (4 ft 4 in)
B External width between dual wheels	2490 (8 ft 2 in)
C Ground clearance	350 (1 ft 1 in)
D Height to axle centre line for dual wheels	498 (1 ft 7 in)
D Height to axle centre line for single wheels	519 (1 ft 8 in)
E Overall width	2470 (8 ft 1 in)
F Height over cab	3185 (10 ft 6in)
G Tail length	2338 (7 ft 8 in)
H Clearance under counterweight	1270 (4 ft 2 in)

Dipper lengths	2.25m	2.7m	3.05m
J Transport height	3185 (10 ft 6in)	3185 (10 ft 6in)	3240 (10 ft 7 in)
K Transport length	8293 (27 ft 2 in)	8293 (27 ft 2 in)	8454 (27 ft 8 in)

JS175W - Triple Articulated Boom



Dimensions in millimetres (ft. in)	
A Internal width between dual wheels	1330 (4 ft 4 in)
B External width between dual wheels	2490 (8 ft 2 in)
C Ground clearance	350 (1 ft 1 in)
D Height to axle centre line for dual wheels	498 (1 ft 7 in)
D Height to axle centre line for single wheels	519 (1 ft 8 in)
E Overall width (Handrail removed)	2470 (8 ft 1 in)
F Height over cab	3185 (10 ft 6in)
G Tail length	2338 (7 ft 8 in)
H Clearance under counterweight	1270 (4 ft 2 in)

Dipper lengths	2.25m	2.7m	3.05m
J Transport height	3185 (10 ft 6in)	3185 (10 ft 6in)	3185 (10 ft 6in)
K Transport length	8271 (27 ft 2 in)	8266 (27 ft 1 in)	8231 (27 ft 0 in)

Operating Weight

Approximate weight when equipped with excavating bucket and dual wheels. For single wheels subtract 400Kg (880lb)

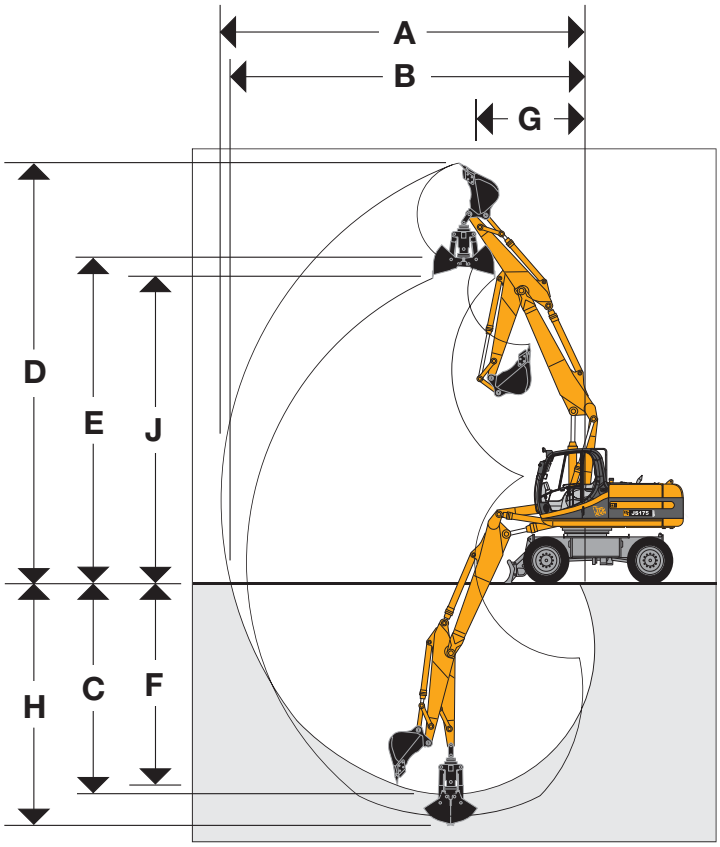
	Base machine i.e. without dozer blade or stabilisers	Base machine with dozer blade	Base machine with 2 stabilisers	Base machine with dozer blade and 2 stabilisers	Base machine with 4 stabilisers
Monoboom	15760kg (34744lb)	16200kg (35715lb)	16640kg (36685lb)	17180kg (37875lb)	17520kg (38625lb)
Triple Articulated Boom	16360kg (36067lb)	16800kg (37037lb)	17240kg (38008lb)	17780kg (39198lb)	18120kg (39948lb)

Tyre Pressures

Tyre Size	Front	Rear
10.0 x 20 - 14PR	6.5 bar (94 lbf/in2)	6.5 bar (94 lbf/in2)
10.0 x 20 - 16PR	8.0 bar (116 lbf/in2)	8.0 bar (116 lbf/in2)
18R x 19.5	6.5 bar (94 lbf/in2)	6.5 bar (94 lbf/in2)
18 x 19.5 - 18PR	6.5 bar (94 lbf/in2)	6.5 bar (94 lbf/in2)
600/40 - 22.5	6.0 bar (87 lbf/in2)	6.0 bar (87 lbf/in2)

Dig Depth Chart

JS175W



Boom	Monoboom			Triple Articulated Boom		
Dipper	**2.25**	**2.70**	**3.05**	**2.25**	**2.70**	**3.05**
	m (ft in)	m (ft in)	m (ft in)	m (ft in)	m (ft in)	m (ft in)
A Max digging reach	8.59 (28 2)	8.97 (29 5)	9.35 (30 7)	8.60 (28 2)	9.02 (29 7)	9.35 (30 7)
B Max digging reach (on ground)	8.39 (27 6)	8.78 (28 9)	9.16 (30 0)	8.40 (27 6)	8.85 (29 1)	9.19 (30 1)
C Max digging depth	5.68 (18 7)	6.12 (20 1)	6.45 (21 2)	5.30 (17 4)	5.75 (18 9)	6.10 (20 0)
D Max digging height	9.10 (29 9)	9.24 (30 4)	9.69 (31 9)	9.70 (31 8)	10.00 (32 9)	10.23 (33 6)
E Max loadover height	6.64 (21 9)	6.81 (22 4)	7.17 (23 6)	7.00 (23 0)	7.32 (24 0)	7.57 (24 9)
F Max vertical wall cut depth	3.83 (12 7)	4.18 (13 8)	4.84 (15 9)	4.45 (14 7)	4.90 (16 1)	5.25 (17 2)
G Min. swing radius	3.02 (9 9)	2.96 (9 8)	2.97 (9 8)	2.72 (9 0)	2.67 (8 8)	2.63 (8 7)
H Max digging depth with grab	6.09 (20 0)	6.53 (21 5)	6.86 (22 6)	5.71 (18 9)	6.16 (20 3)	6.51 (21 4)
J Max dumping height	6.23 (20 5)	6.39 (21 0)	6.76 (22 2)	6.59 (21 7)	6.91(22 7)	7.16 (23 6)

Attachments

Location

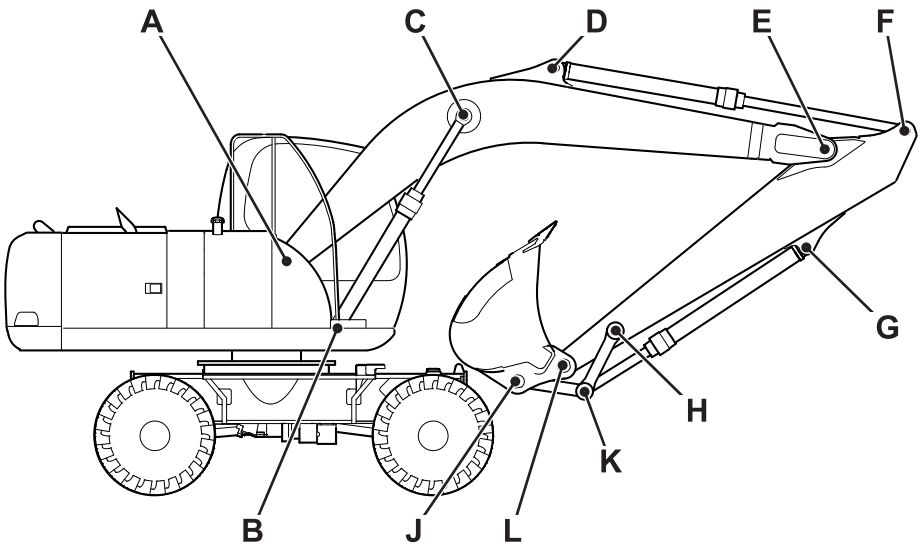


Fig 1.

Item	Equipment Name	Refer to link below:
A	Boom and Slew Frame Installation	⇨ *Boom and Slew Frame Installation (B-7)*
B	Boom Ram and Slew Frame Installation	⇨ *Boom Ram and Slew Frame Installation (B-8)*
C	Boom Ram Installation	⇨ *Boom Ram Installation (B-9)*
D	Dipper Ram Installation	⇨ *Dipper Ram Installation (B-10)*
E	Dipper Pivot Installation	⇨ *Dipper Pivot Installation (B-11)*
F	Dipper and Dipper Ram Installation	⇨ *Dipper and Dipper Ram Installation (B-12)*
G	Bucket Ram Installations	⇨ *Bucket Ram Installation (B-13)*
H	Dipper and Dipper Link Installation	⇨ *Dipper and Dipper Link Installation (B-14)*
J	Bucket and Bucket Link Installation	⇨ *Bucket and Bucket Link Installation (B-15)*
K	Bucket Link and Bucket Ram Installation	⇨ *Bucket Link and Bucket Ram Installation (B-16)*
L	Bucket and Dipper Installation	⇨ *Bucket and Dipper Installation (B-17)*

Boom and Slew Frame Installation

Equipment Name. For Location, ⇨ *Location (B-6)*.	Part Name	Code	Standard Value (mm)	Service limit (mm)
A. Boom and slew frame installation	Slew frame	**A**	636	646
	Boom	**B**	635	633
	Clearance	**C**	1.0-3.5	Shim for Adjustment
	Pin	**D**	ø80	ø79
	Bushing (boom)	**E**	ø80	ø81.5

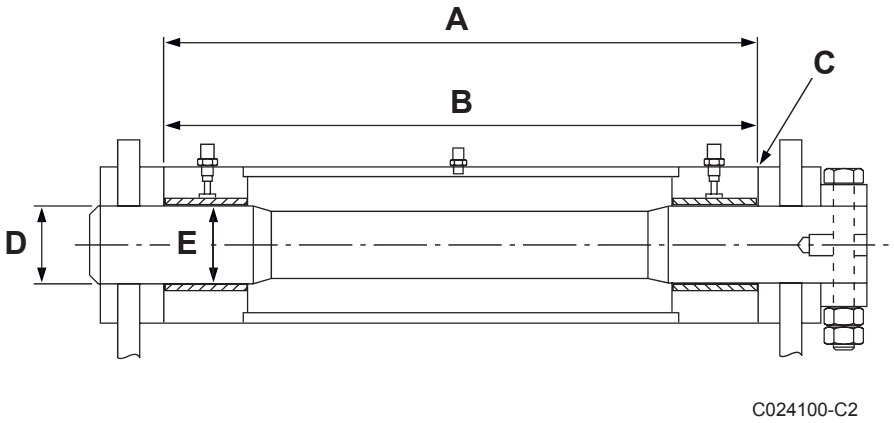


Fig 2.

Boom Ram and Slew Frame Installation

Equipment Name. For Location, ⇨ *Location (B-6)*.	Part Name	Code	Standard Value (mm)	Service limit (mm)
B. Boom ram and slew frame installation	Slew frame	**A**	111	117
	Boom	**B**	110	108
	Clearance	**C**	1.0-2.5	Shim for Adjustment
	Pin	**D**	ø70	ø69
	Bushing (boom ram)	**E**	ø70	ø71.5

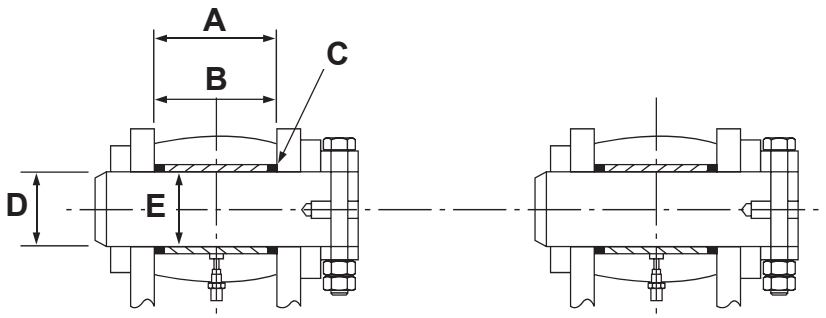


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Fig 3.

Boom Ram Installation

Equipment Name:. For Location, ⇨ *Location (B-6)*.	Part Name	Code	Standard Value (mm)	Service limit (mm)
C. Boom and boom ram installation	Boom Ram (dump end)	**A**	100	98
	Boom	**B**	474	468
	Clearance	**C**	1.0-2.5	Shim for Adjustment
	Pin	**D**	ø80	ø79
	Bushing (boom)	**E**	ø80	ø81.5

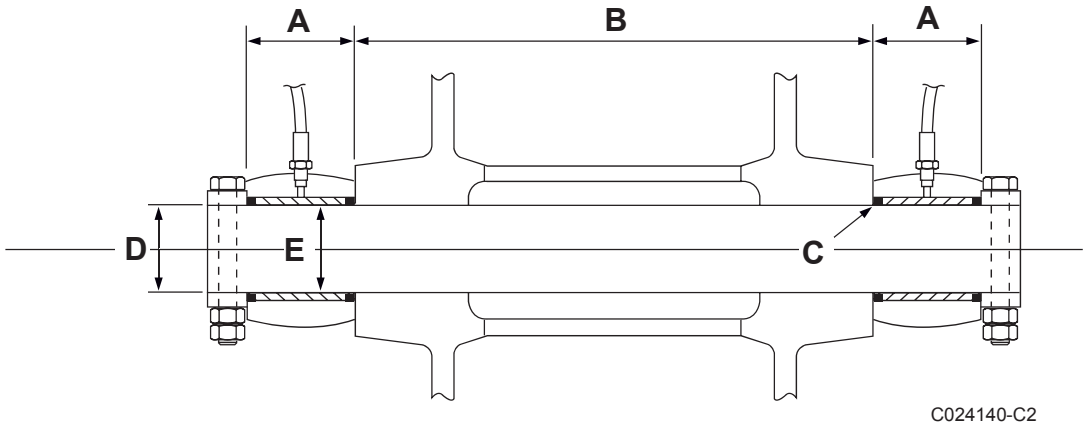

Fig 4.

Dipper Ram Installation

Equipment Name:. For Location, ⇨ *Location (B-6)*.	Part Name	Code	Standard Value (mm)	Service limit (mm)
D. Dipper ram installation	Boom	**A**	111	117
	Dipper ram (dump end)	**B**	110	108
	Clearance	**C**	0.5-3.0	Shim for Adjustment
	Pin	**D**	ø75	ø74
	Bushing (dipper arm)	**E**	ø75	ø76.5

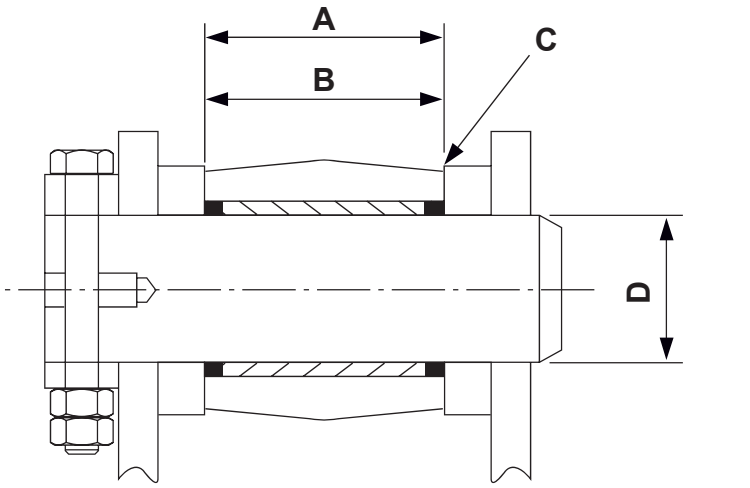

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Fig 5.

Dipper Pivot Installation

Equipment Name:. For Location, ⇨ *Location (B-6)*.	Part Name	Code	Standard Value (mm)	Service limit (mm)
E. Dipper pivot installation	Boom	**A**	275	278.5
	Dipper	**B**	274.5	272.5
	Clearance	**C**	0.5-1.1	Shim for Adjustment
	Pin	**D**	ø80	ø79
	Bushing (dipper)	**E**	ø80	ø81.5
	Bushing (boom)	**F**	ø80	ø81.5
	Boom	**G**	60	58

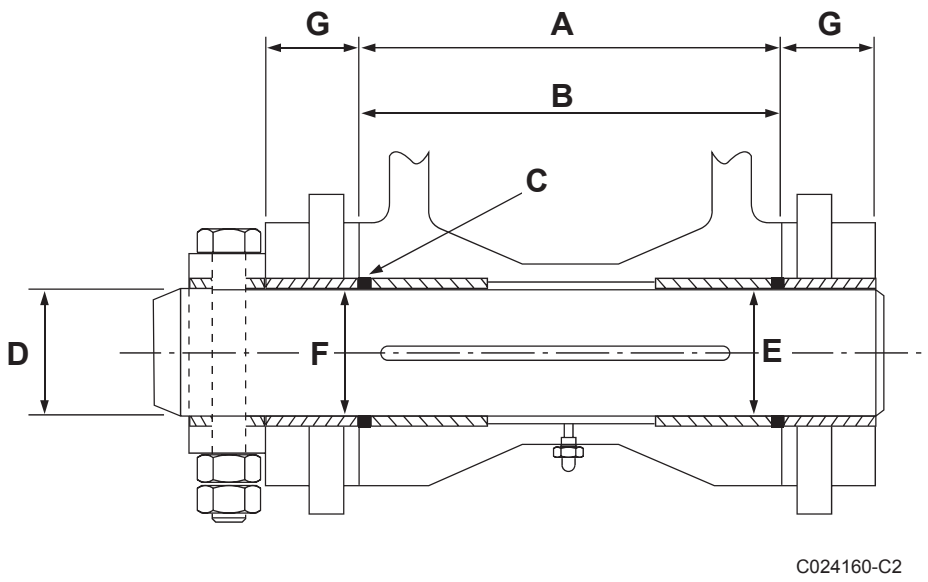

Fig 6.

Dipper and Dipper Ram Installation

Equipment Name:. For Location, ⇨ *Location (B-6)*.	Part Name	Code	Standard Value (mm)	Service limit (mm)
F. Dipper and Dipper Ram installation	Boom	**A**	111	117
	Dipper ram (eye end)	**B**	110	108
	Clearance	**C**	0.5-3.0	Shim for Adjustment
	Pin	**D**	ø70	ø69
	Bushing (dipper ram)	**E**	ø70	ø71.5

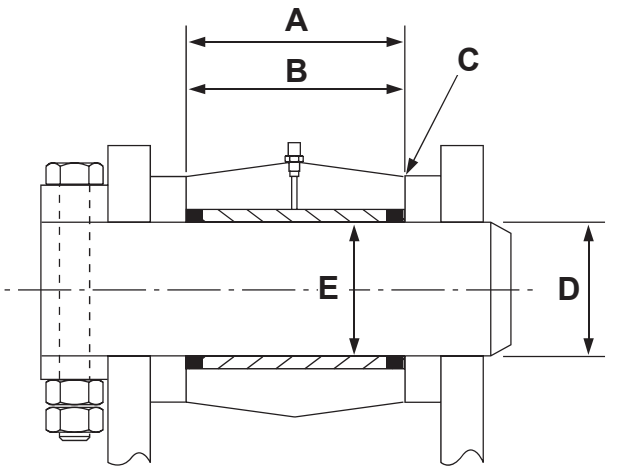

Fig 7.

Bucket Ram Installation

Equipment Name:. For Location, ⇨ *Location (B-6)*.	Part Name	Code	Standard Value (mm)	Service limit (mm)
G. Bucket Ram installation	Dipper	**A**	91	127
	Bucket ram (eye end)	**B**	90	118
	Clearance	**C**	0.5-3.0	Shim for Adjustment
	Pin	**D**	ø65	ø64
	Bushing (bucket ram)	**E**	ø65	ø66.5

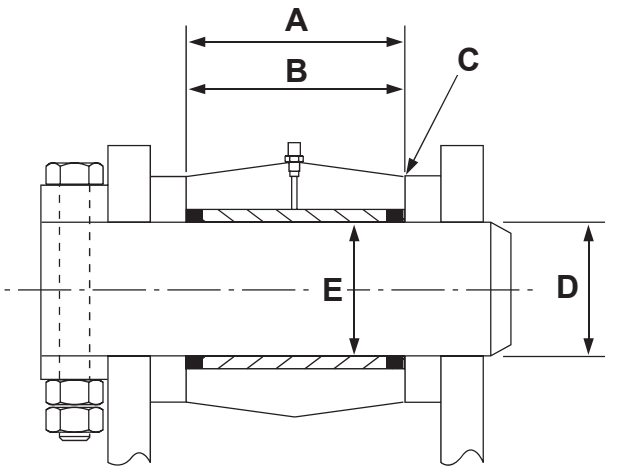

Fig 8.

Dipper and Dipper Link Installation

Equipment Name:. For Location, ⇨ *Location (B-6)*.	Part Name	Code	Standard Value (mm)	Service limit (mm)
H. Dipper and Dipper link installation	Dipper Link	**A**	37	34
	Dipper	**B**	261	258
	Clearance	**C**	1.0-1.5	Shim for Adjustment
	Pin	**D**	ø65	ø64
	Bushing (Dipper)	**E**	ø65	ø66.5

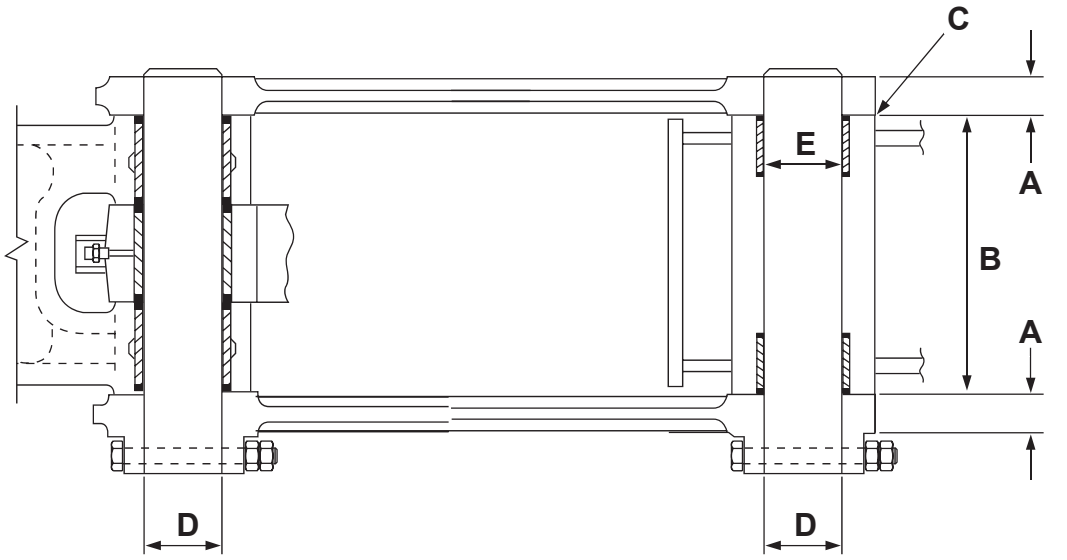

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Fig 9.

Bucket and Bucket Link Installation

Equipment Name:. For Location, ⇨ *Location (B-6)*.	Part Name	Code	Standard Value (mm)	Service limit (mm)
J. Bucket and Bucket link installation	Bucket	**A**	301	307
	Bucket Link	**B**	300	398
	Clearance	**C**	1.0-3.5	Shim for Adjustment
	Pin	**D**	ø80	ø79
	Bushing (Bucket link)	**E**	ø80	ø81.5

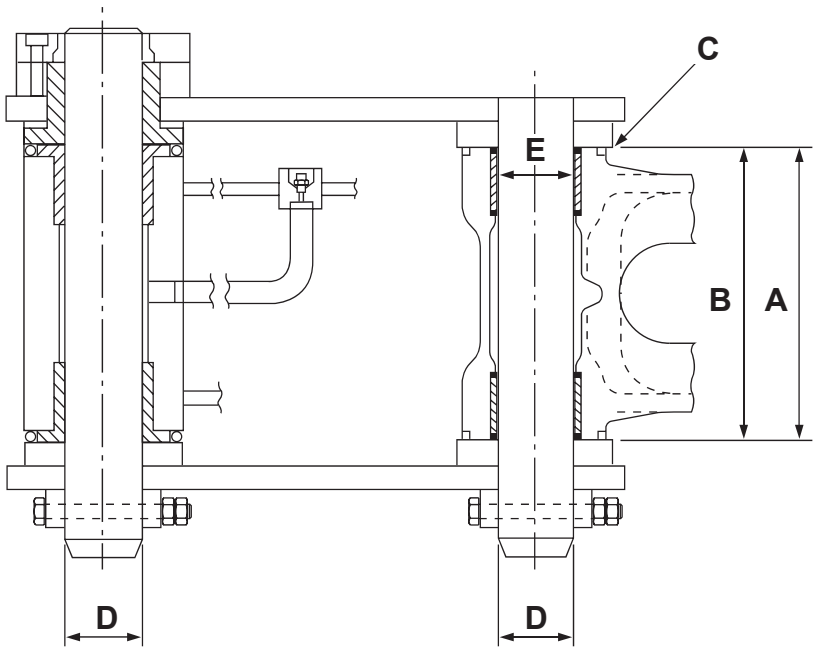

Fig 10.

Bucket Link and Bucket Ram Installation

Equipment Name:. For Location, ⇨ *Location (B-6)*.	Part Name	Code	Standard Value (mm)	Service limit (mm)
K. Bucket link and Bucket ram installation	Dipper Link	**A**	37	34
	Bucket Link	**B**	260	258
	Clearance	**C**	1.0-1.5	Shim for Adjustment
	Bucket Link	**D**	91	93
	Bucket Ram (eye end)	**E**	90	88
	Clearance	**F**	1.0-2.0	Shim for Adjustment
	Pin	**G**	ø70	ø69
	Bushing (Bucket link)	**H**	ø70	ø71.5
	Bushing (Bucket ram)	**J**	ø70	ø71.5

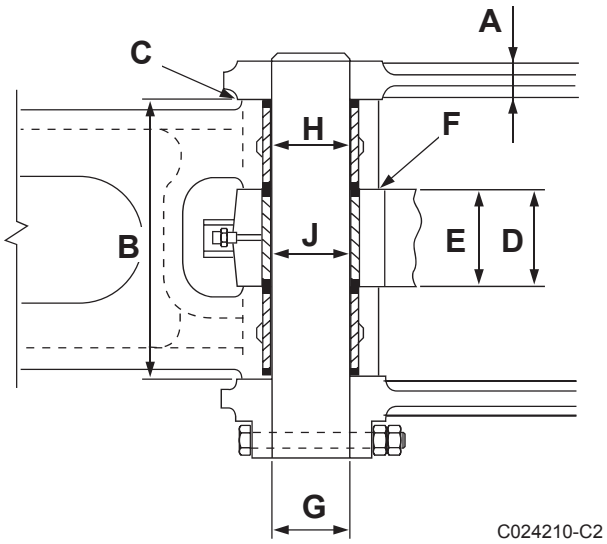

Fig 11.

Bucket and Dipper Installation

Equipment Name:. For Location, ⇨ *Location (B-6)*.	Part Name	Code	Standard Value (mm)	Service limit (mm)
L. Bucket and Dipper installation	Bucket	**A**	301	307
	Dipper	**B**	300	298
	Clearance	**C**	1.0-3.5	Shim for Adjustment
	Bushing (Bucket)	**D**	16	8
	Pin	**E**	ø80	ø79
	Bushing (Bucket)	**F**	ø80	ø81.5
	Bushing (Bucket)	**G**	ø80	ø81.5

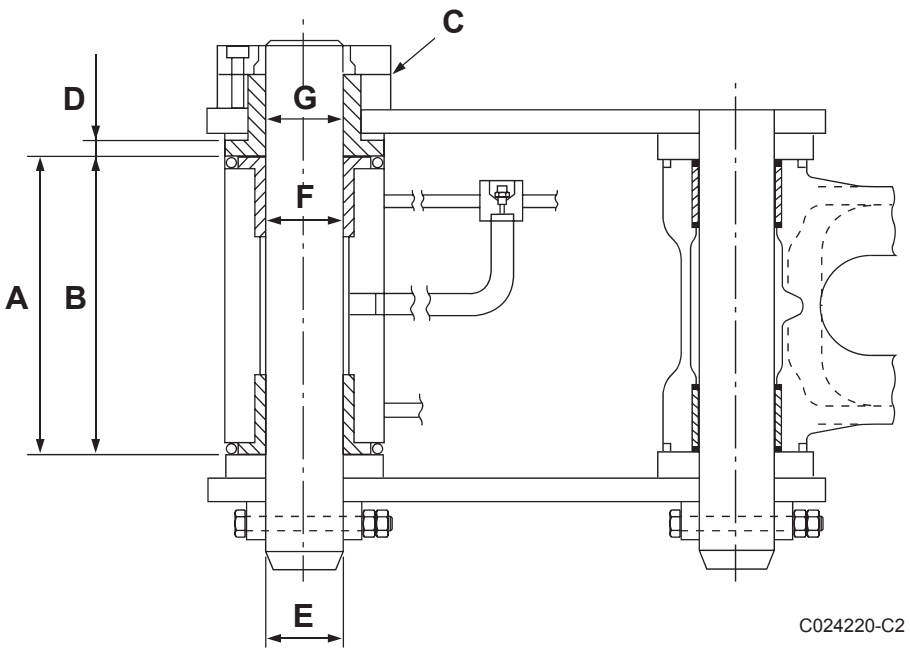

Fig 12.

Air Conditioning (option)

Binary Pressure Switch Setting

Low Pressure	2.1 bar	(2.14 kgf/cm^2 30.4 lbf/in^2)
High Pressure	28 bar	(28.56 kgf/cm^2 406 lbf/in^2)

Refrigerant

R-134a	1.415 Kg +/- 10g

Oil

PAG Oil	150g +/- 5g PAG (PolyAlkylene Gycol) oil to ISO 100

Basic Operation

Air Conditioning

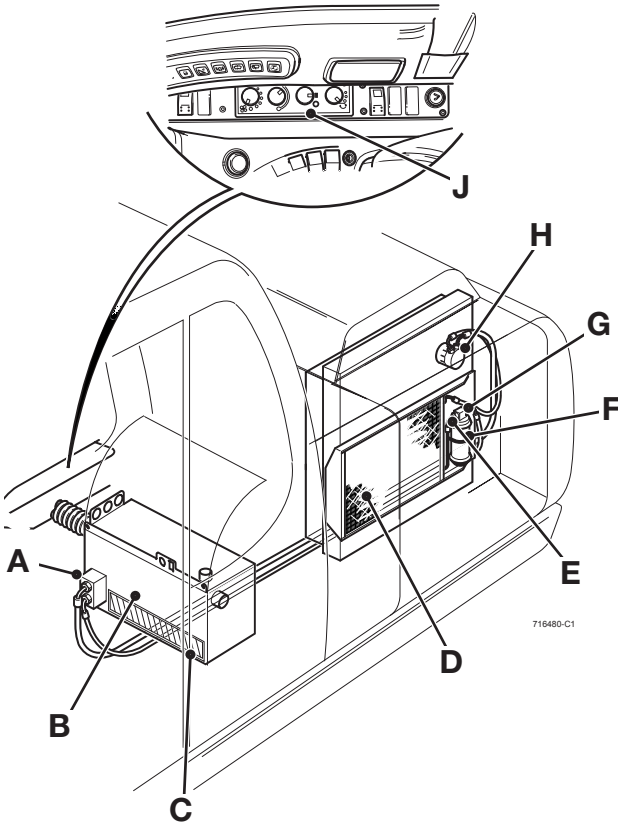

Fig 13.

A Thermostatic Expansion Valve (TEV)
B Evaporator Matrix
C Air Filter
D Condenser
E Binary Switch
F Receiver/Drier
G Sight Glass (moisture indicator)
H Compressor
J Control Panel

Operation

To maintain optimum operator comfort in warm climates or during seasons of high ambient temperature, the air conditioning system recirculates, clean, dehumidified air into the cab. Cooling is provided by passing the recirculated air, over an evaporator coil in the air conditioning unit.

The air conditioning system is a closed circuit through which the refrigerant is circulated, its state changing from gas to liquid and back to gas again, as it is forced through the system.

The major components of the system are the compressor **13-H** condenser **13-D**, receiver drier **13-F**, expansion valve **13-A** and evaporator matrix **13-B**.

Heater/Air Conditioning Controls

Located on the Left side of the Rear Panel, the heater/air conditioning controls are used in conjunction with the heater fan controls.

Heater Controls

Heater Fan

Turn rotary switch **14-A** (on the lightswitch panel) clockwise to turn on the heater fan. The volume of air from the heater increases by rotating the switch further clockwise.

Temperature

Turn rotary switch **14-B** fully anti-clockwise for minimum temperature, turn it fully clockwise for maximum temperature. (Intermediate positions give intermediate temperatures.)

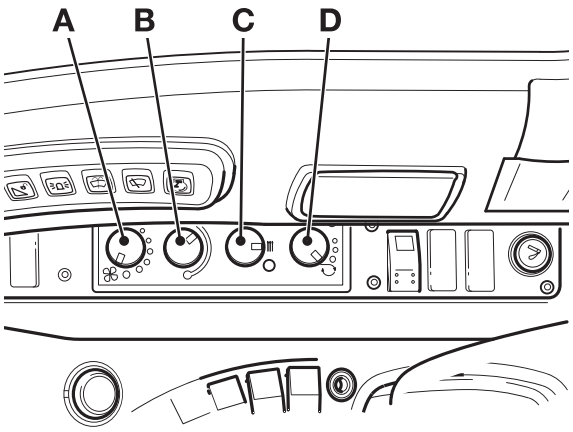

Fig 14.

Air Conditioning Controls (if fitted)

Turn rotary switch **14-C** clockwise to select air conditioning. Turn the rotary switch **14-C** fully clockwise for maximum cooling. (Intermediate positions give intermediate cooling.)

Fresh Air/Recirculated Air

Turn rotary switch **14-D** fully anti-clockwise for fresh air, turn it fully clockwise for recirculated air. (Intermediate positions give a mixture of fresh and recirculated air.)

Air Conditioning System Operation

Air conditioning system power is generated from the engine, via an electromagnetic clutch to the compressor. Three switches, connected in series, are included in the clutch supply line, all must be closed for the clutch and therefore the air conditioning system to operate.

The compressor **13-H**, draws in low pressure refrigerant gas from the suction line (evaporator to compressor) and increases refrigerant pressure through compression. This process also increases the refrigerant temperature.

High pressure refrigerant is forced from the compressor to the condenser **13-D**, which is mounted on the radiator on the side of the engine. Ambient air is drawn across the condenser by the engine-driven cooling fan. In the condenser, the refrigerant changes state to a high pressure, high temperature liquid but with a lower heat content.

The refrigerant passes through the receiver drier **13-F** which contains a desiccant to remove moisture from the system. The receiver drier serves as a reservoir for refrigerant and also includes a filter to remove foreign particles from the system.

The high temperature, high pressure refrigerant is forced by compressor action into the expansion valve **13-A**, which meters the amount of refrigerant entering the evaporator. In the expansion valve the refrigerant instantaneously expands to become a low pressure, low temperature liquid.

The refrigerant is drawn through the evaporator matrix **13-B**, by the suction of the compressor. The temperature of refrigerant is now considerably below that of the air being drawn across the evaporator matrix by the blowers. Heat is transferred from the ambient and recirculated air to the refrigerant, causing the low pressure liquid to vaporise and become a low pressure gas. Moisture in the air condenses on the evaporator matrix and is drained away via condensate.

Cool de-humidified air is emitted through air vents into the cab.

The low temperature, low pressure, high heat content refrigerant gas, is now drawn by suction back to the compressor, where the cycle is completed.

Control

Control of the system is achieved by the cyclic action of the compressor's electromagnetic clutch. When current is fed to the field coil of the compressor's clutch, a magnetic field develops between the field coil and the armature which pulls the field coil, complete with clutch assembly, onto the compressor's rotor. Since the clutch assembly is turned constantly by the crankshaft pulley drive belt, the compressor armature turns, starting the refrigeration cycle.

Current is fed to the field coil through three series switches whose contacts are controlled by the following:

1 The manual switch **14-D** in the cab

2 The thermostat switch monitoring the evaporator temperature.

3 The high and low level pressure switch

Switch **14-D** will start the refrigeration cycle provided that the ambient temperature in the cab is greater than 0°C and the refrigerant pressure remains within the specified limits.

The thermostat has its sensor inserted in the evaporator matrix. It controls the refrigeration cycle by switching the compressor clutch on and off to prevent freezing of the condensate on the evaporator matrix.

The pressure level switch is housed in a common assembly located on the Receiver Drier. If the refrigerant pressure exceeds the upper pressure limit specified or falls below the lower limit, the contacts will open and the clutch will disengage, closing down the refrigeration cycle

Pressures Switch Settings

High Pressure Switch 28 bar (406 lbf/ in^2)

Low Pressure Switch 2.1 bar (30.4 lbf/ in^2)

Note: *In dusty conditions, it is recommended that air be recirculated within the cab, otherwise the filter may become clogged.*

Two air vents are located in the cab rear panel, and two air vents and are located on the right hand console. One air vent is located under the drivers seat. The vents can be turned to direct the air flow where required. When the vents are open, hot or cold air will flow directly into the cab.

For the most effective front window demisting, the air vents should be closed and air circulation control turned fully to the left.

Safety Procedures

The air conditioning system includes a pressurised closed circuit containing a non-CFC, environmentally friendly refrigerant, Type R-134a. Any service procedure which breaks into the closed circuit and therefore requires discharging of the system, must only be carried out by service personnel with specialist knowledge of air conditioning systems. The following guidelines should be adhered to by all personnel servicing the air conditioning system.

⚠ WARNING

The air conditioning system is a closed loop system and contains pressurised refrigerant. No part of the system should be disconnected until the system has been discharged by a refrigeration engineer or a suitably trained person. You can be severely frostbitten or injured by escaping refrigerant.

4-3-4-1_2

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The air conditioning system is a closed loop system and contains pressurised refrigerant. No part of the system should be disconnected until the system has been discharged by a refrigeration engineer or a suitably trained person. You can be severely frostbitten or injured by escaping refrigerant.

4-3-4-1_2

⚠ WARNING

The air conditioning system is a closed loop system and contains pressurised refrigerant. No part of the system should be disconnected until the system has been discharged by a refrigeration engineer or a suitably trained person. You can be severely frostbitten or injured by escaping refrigerant.

4-3-4-1_2

⚠ CAUTION

Do not operate the air conditioning system when there is no refrigerant in the system, otherwise the compressor will be damaged.

4-3-4-4

1 It is critical that the correct refrigerant (R-134a) is used and that charging is done only by qualified personnel. As a precaution, in case of accidental leakage, discharging and charging of the vehicle refrigerant system must be conducted in a well ventilated area.

2 Containers of refrigerant should be stored in a cool environment away from direct sunlight.

⚠ WARNING

Do not carry out welding operations close to the air conditioning refrigerant circuit. A poisonous gas is produced when refrigerant comes into contact with naked flames. Do not smoke or allow naked flames close to the refrigerant circuit.

BF-1-9

3 **Do Not** perform welding operations close to refrigerant hoses (maintain a distance of at least 0.5m from hoses).

4 **Do Not** steam clean refrigerant system components.

5 When charging or discharging the refrigerant system refrain from smoking. Naked flames must not be allowed in the immediate vicinity. The refrigerant does not give off a poisonous odour, however, when it comes into contact with a naked flame, a poisonous gas is produced.

6 When handling refrigerant, rubber gloves and goggles should be worn. Operators should ensure that no refrigerant comes into contact with the skin. Particular care should be taken when connecting or

disconnecting charging hoses or pressure switches. When these components are connected to the system, a short release of refrigerant occurs. This results in a high velocity, very cold gas being emitted from the connection point.

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Fault Finding

Air Conditioning

Preliminary Checks

Before any checks are carried out on the refrigerant circuit the following checks should be made:

1 Check the compressor drive belt is serviceable and correctly tensioned.

2 Check the condenser and engine radiator are not blocked by debris, clean with compressed air or water if necessary.

3 Check that the condenser fins are not flattened or damaged, the fins must allow air to pass freely.

4 Check the cab fresh air inlet filter for blockage.

5 Check that, with the ignition switch on (engine not running), the blower operates over whole speed range.

6 Check that, with the ignition switch on (engine not running), the blower and air conditioning switched on, the compressor clutch engages.

Charge level:

Note: *It is not possible to check refrigerant charge level with R134a systems using the receiver drier sightglass. Any bubbles seen at the sight glass on the receiver drier may be bubbles of oil and are perfectly normal.*

Note:

- Gas -1415g R134A +/- 10g
- Oil - 150g +/- 5g PAG (PolyAlkylene Gycol) oil to ISO 100

Fault finding:

Important: *Refer to appropriate remove and replace procedures before working on any system component*

Electrical Component Location

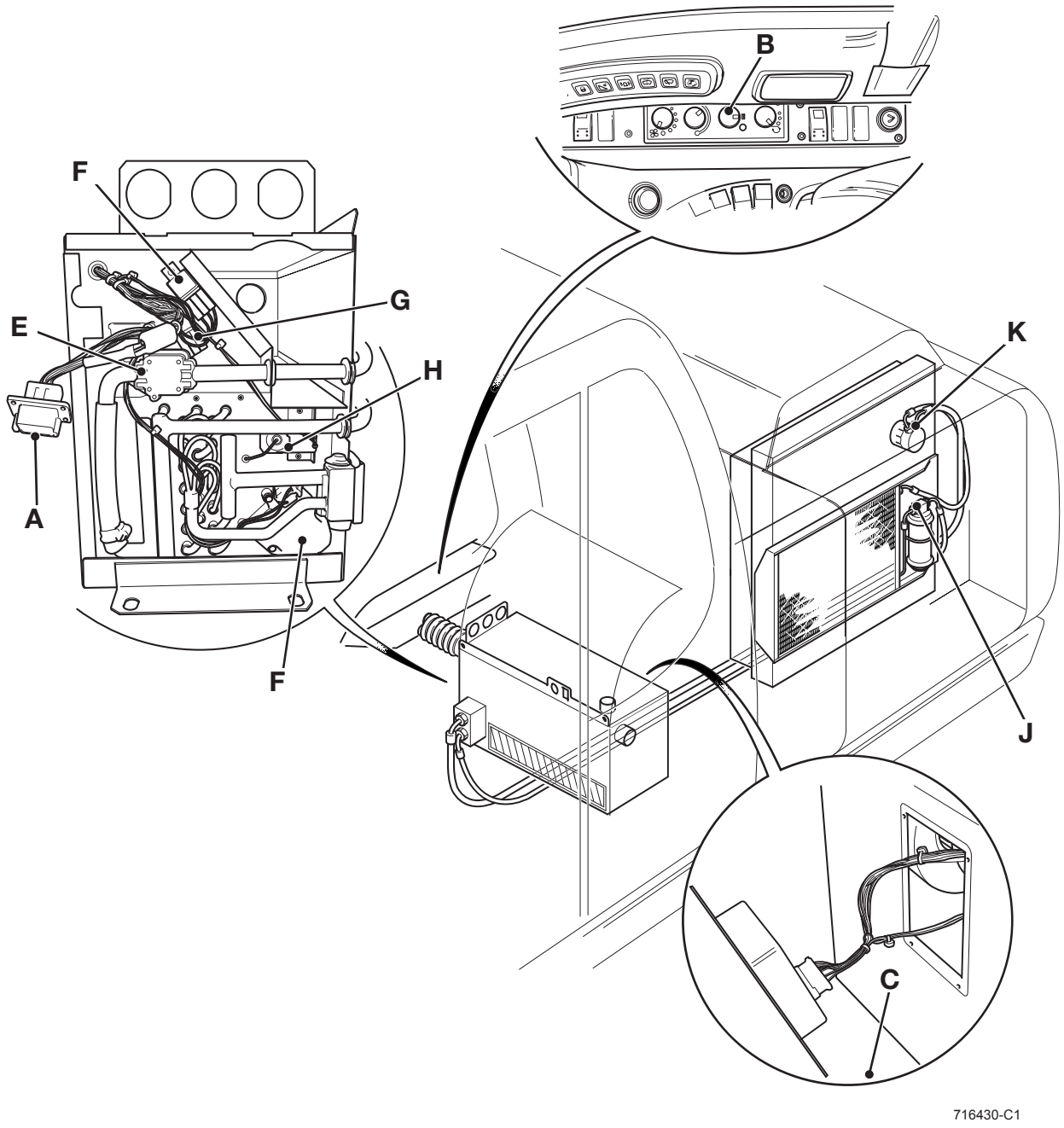


Fig 15.

Electrical Fault Finding

Unit Controller (A)

Pin	Wire Colour	Function	Notes
1	Green	Relay out V batt +	
2	Orange	Pressure switch	
3	White	A/C Clutch power	
4	Green/White	Fan Control signal	
5	Blue	Water valve actuator signal	
6	Yellow/Red	A/C Clutch Relay	
7	Blue/White	Recirulation actuator signal	
8	Blue/Green	Switched Battery +	
9	Blue/Orange	Actuator motor +12V	
10	Black/Blue	Earth	
11		Not used	
12		Not used	
85	Brown	Batt + relay	From Pin 4 on PWM to Pin 85 on Battery relay
86	Red	Relay coil power	Pin 85 on Clutch Relay

Control Panel (B)

Pin	Wire Colour	Function	Notes
1	Black	Earth	
2	Blue/Orange	+12V power from PWM	Should read ~12.9V
3	Purple	Switched +24V power from unit	Supplies power to backlight LEDs
4	Blue/White	Recirc Output	Provides the output signal to the mode actuator. It should vary between 0 - 12V as the switch is adjusted
5		Not Used	
6		Not Used	
7	Yellow/Red	A/C clutch output	Provides the output for the AC clutch relay. It provides a low output to activate the relay.
8	Blue	Temperature poteniometer output	Provides the output signal for the blend door or water valve.It should vary between 2.5 and 7V (+/- 10%)
9	Green/White	Blower fan output	Provides Fan speed control signal to the PWM module.It should vary from 6 - 10V as the blower poteniometer is adjusted.
10		Not Used	
11		Not Used	
12		Not Used	

PWM Controller (C)

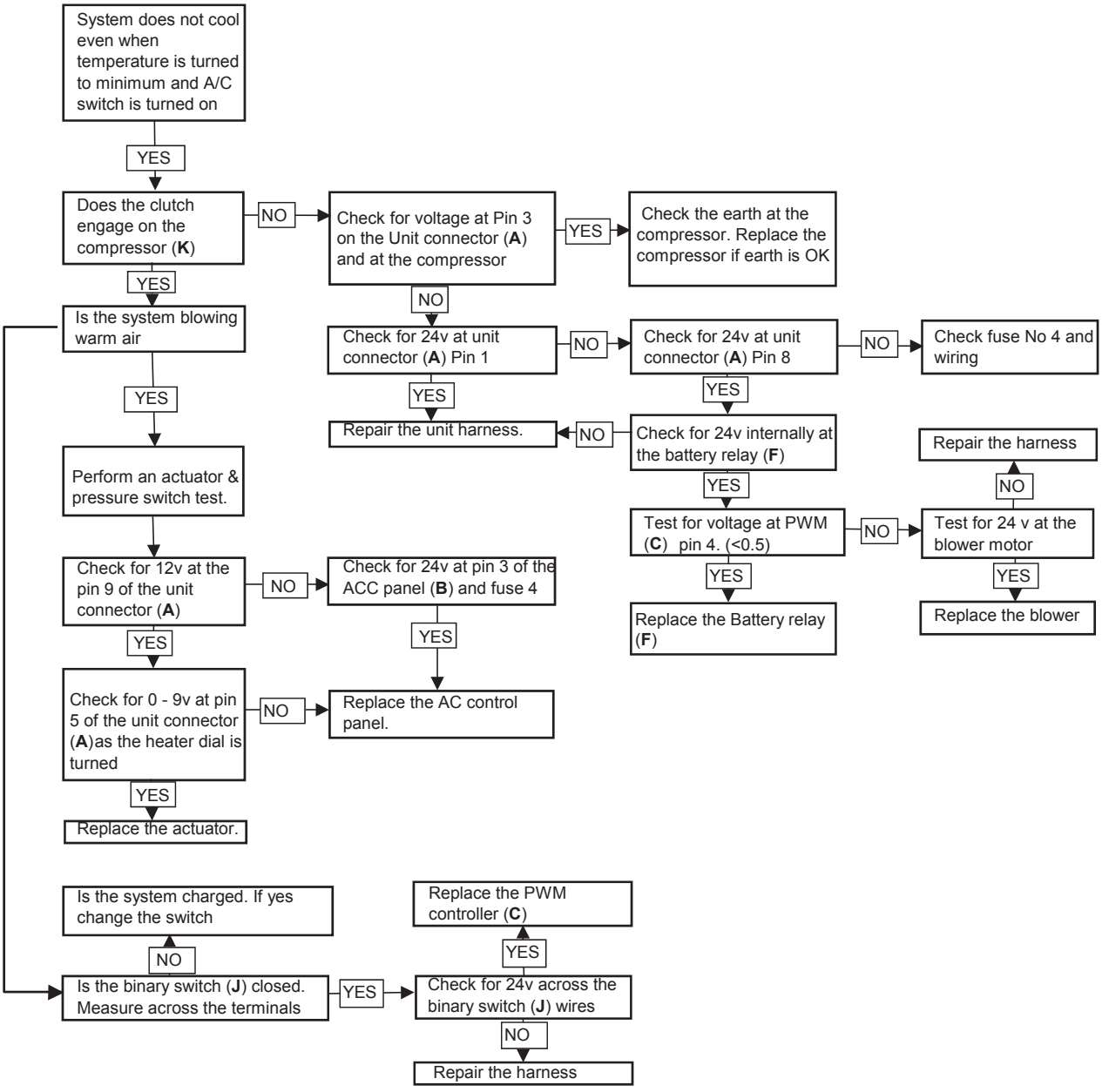
Pin	Wire Colour	Function	Notes
1	Blue/Green	Switched +24V power from the unit	
2		Not Used	
3	White	Protected Power	Output from battery relay
4	Brown	Power to Battery Relay	
5	Blue/Orange	+12V output	Supply for control actuators
6	Green/White	Fan Control signal	Input from control panel used to adjust blower speed
7	Yellow	Fan drive low	Output to negative side of motor. Used to control fan speed
8		Not Used	
9		Not Used	
10		Not Used	
11		Not Used	
12	Black	Earth	

Recirculation Valve Actuator (D)

Pin	Wire Colour	Function	Notes
1	Blue/Orange	+12V Supply	
2		Not Used	
3	Black	Earth	
4	Blue/White	Signal	
5		Not Used	
6		Not Used	

Water Valve Actuator (E)

Pin	Wire Colour	Function	Notes
1	Blue/Orange	+12V Supply	
2		Not Used	
3	Black/Blue	Earth	
4	Blue	Signal	
5		Not Used	
6		Not Used	



716440GB

Fig 16.

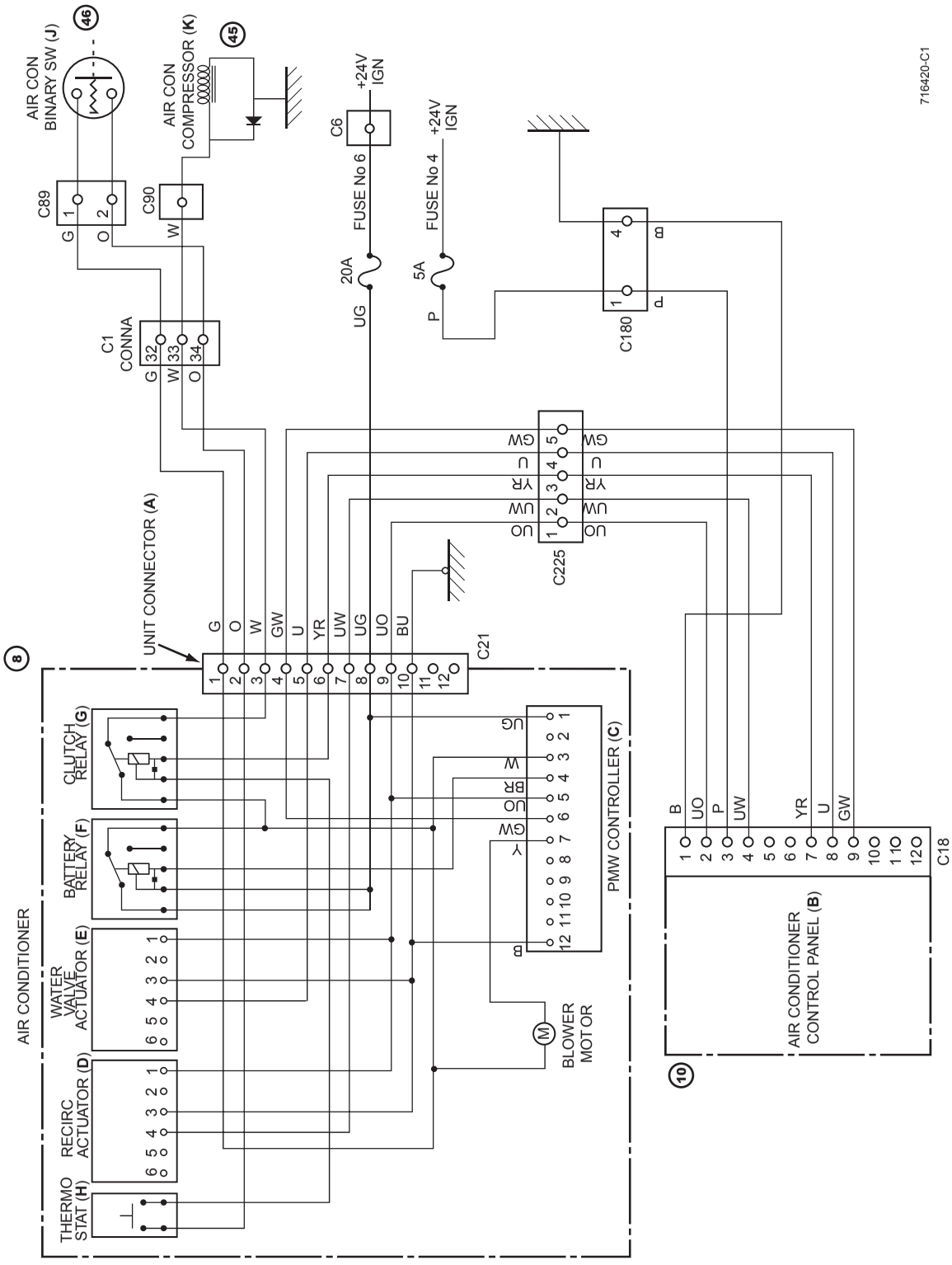

716420-C1
AIR CONDITIONER
AIR CON BINARY SW (J)
AIR CON COMPRESSOR (K)
C89
C90
C1 CONNA
C6
FUSE No 6
FUSE No 4
20A
5A
+24V IGN
C180
C225
UNIT CONNECTOR (A)
C21
CLUTCH RELAY (G)
BATTERY RELAY (F)
WATER VALVE ACTUATOR (E)
RECIRC ACTUATOR (D)
THERMO STAT (H)
PMW CONTROLLER (C)
BLOWER MOTOR
AIR CONDITIONER CONTROL PANEL (B)
C18

Fig 17.

Service Procedures

HVAC/Air Conditioning Unit

Removal and Repacement

Removal

Note: *Before removing the HVAC/Air Conditioning Unit, the system must be discharged. See* ***Refrigerant Charging and Discharging***

⚠ WARNING

The air conditioning system is a closed loop system and contains pressurised refrigerant. No part of the system should be disconnected until the system has been discharged by a refrigeration engineer or a suitably trained person. You can be severely frostbitten or injured by escaping refrigerant.

4-3-4-1_2

⚠ CAUTION

Do not operate the air conditioning system when there is no refrigerant in the system, otherwise the compressor will be damaged.

4-3-4-4

⚠ WARNING

Do not carry out welding operations close to the air conditioning refrigerant circuit. A poisonous gas is produced when refrigerant comes into contact with naked flames. Do not smoke or allow naked flames close to the refrigerant circuit.

BF-1-9

The heater and air conditioning units are built into the same module, enabling the units to be interchanged as complete assemblies.

1 Working in the cab, remove the drivers seat from its runners to provide access to the heater unit.

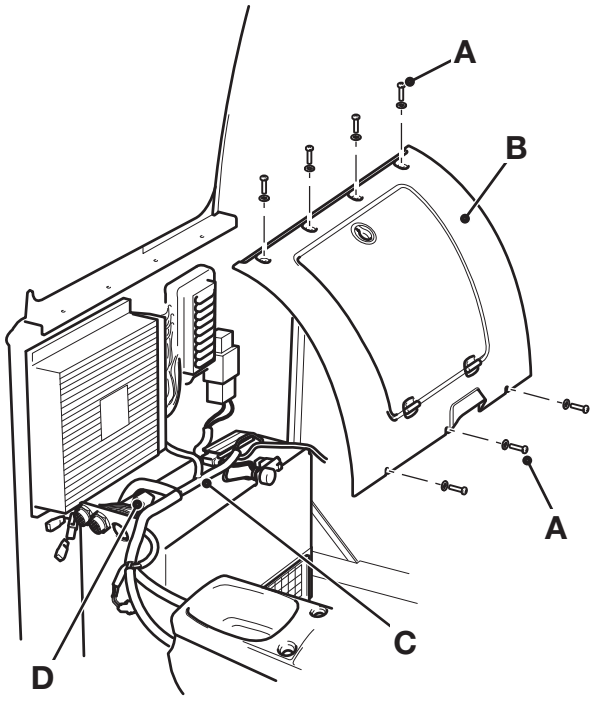


Fig 18.

2 Remove the fixing screws **18-A** and lift off the rear panel **18-B**.

3 Disconnect the harness **18-C** from the heater unit by releasing the cable ties. Disconnect the heater assembly plug **18-D**.

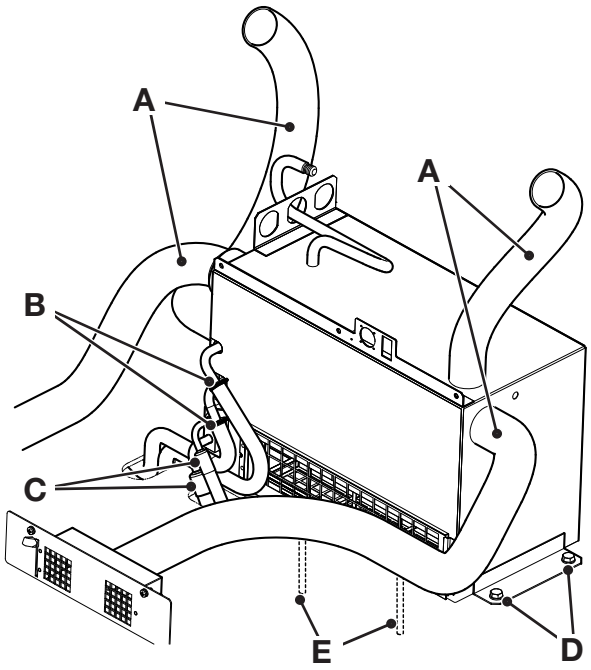


Fig 19.

4 Remove the ventilation hoses **19-A**.

5 Label the water hoses **19-B** and the air conditionig hoses **19-C** and remove.

6 Remove the mounting screws from both sides of the unit **19-D** and lift the heater from the machine..

Replacement

Replacement is the reverse of the removal procedure.

Note: *Ensure the drain hoses **19-E** are threaded through the the holes in the cab floor and are not trapped under the unit.*

Air Conditioning Compressor

Removal and Repacement

Removal

Note: *Before removing any of the hoses from the compresssor, the system must be discharged. See* ***Refrigerant Charging and Discharging***

⚠ WARNING

The air conditioning system is a closed loop system and contains pressurised refrigerant. No part of the system should be disconnected until the system has been discharged by a refrigeration engineer or a suitably trained person. You can be severely frostbitten or injured by escaping refrigerant.

4-3-4-1_2

⚠ CAUTION

Do not operate the air conditioning system when there is no refrigerant in the system, otherwise the compressor will be damaged.

4-3-4-4

⚠ WARNING

Do not carry out welding operations close to the air conditioning refrigerant circuit. A poisonous gas is produced when refrigerant comes into contact with naked flames. Do not smoke or allow naked flames close to the refrigerant circuit.

BF-1-9

1 Label and remove hoses **20-A** from the compressor **20-B**.

2 Loosen the compressor drive belt tensioner **20-C** and remove drive belt **20-D**.

3 Disconnect the wiring harness from the compressor at **20-E**.

4 Remove the four capscrews **20-G** and remove the compressor from the mounting bracket **20-F**.

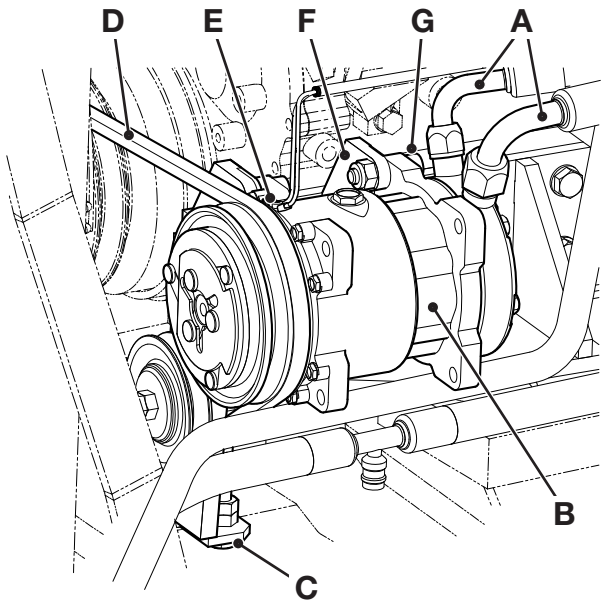


Fig 20.

Replacement

Replacement is the reverse of the removal procedure.

Note: *If the machine was not previously fitted with Air conditioning a new engine mounting bracket 2 must be fitted.*

The Air Conditioning system should be recharged, see **Refrigerant Charging and Discharging**.

Table 1. Torque Settings

Item	Nm	Kgf m	lbf ft
G	56	5.7	42

Cab Structure

Direct Glazing

TB-002_3

The following procedures explain how to correctly remove and install panes of glass that are directly bonded to the cab frame apertures. When carrying out the procedures, relevant safety precautions must be taken.

1 Always wear safety glasses during both removal and replacement.

2 Use protective gloves - heavy duty leather gauntlet type gloves when cutting out the broken glass; 'non-slip' type gloves when handling/moving panes of glass; surgical type gloves when using the polyurethane adhesives.

3 Wear protective overalls.

4 Do not smoke - the activators and primers used in the procedures are highly flammable.

5 Do not attempt to handle or move panes of glass unless you are using glass lifters.

Several special tools are required to successfully complete the removal and replacement procedures. Reference is made to the tools in the text. The majority of these tools can be obtained locally and the remainder from JCB Service (see ***Service Tools***).

The work must only be carried out in a dry, frost free environment. A protective canopy may be required or the machine/frame must be moved to a sheltered area. In damp or wet conditions, hinged doors and window frames can be removed from the machine and taken to a more suitable (dry) environment.

Glass should not be replaced at temperatures below 5°C (41°F).

⚠ WARNING

Laminated glass must be handled with extra care to prevent breakage. Wherever possible, store and handle it in a vertical attitude. When placing or lifting the glass in a horizontal attitude it must be supported over its whole area, not just at the edges.

BF-1-8_1

Removing the Broken Glass and Old Sealant

⚠ WARNING

Always wear safety glasses when removing or installing screen glass. Never use a power operated knife when removing the sealant around a toughened glass screen. The action of the knife could cause particles of glass to be thrown with sufficient force to cause serious injury, even when safety glasses are being worn. Use only hand operated tools when working with toughened glass.

BF-2-3_1

1 Position the machine on level ground and apply the parking brake. Stop the engine. Put protective covers over the cab seat and control pedestals.

2 If a laminated pane breaks it will stay in one piece even though the glass is cracked. A toughened pane will shatter and fall apart. The method of removal of the glass depends upon which type it is.

a Laminated glass - leave installed until the old sealant has been cut away, after which it will be possible to lift the broken screen away from its frame housing in one piece.

b Toughened glass - remove as much of the shattered glass as possible prior to cutting out the old sealant.

3 Cut out the old sealant, leaving approximately 1 to 2 mm on the cab frame. There are several tools and techniques for doing this:

a Pneumatic Knife. ⇨ *Fig 21. (B-35)*. This provides one of the easiest methods of removing the sealant around laminated glass. The tool, powered by compressed air, should be sourced locally.

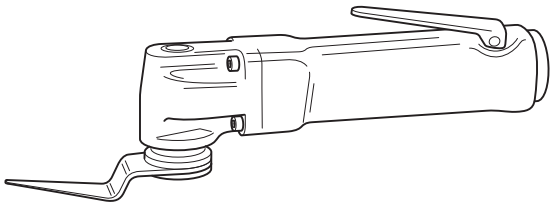


Fig 21. Pneumatic Knife

i Press the handle to start the knife blade oscillating.

Important: *This tool must not be used on toughened glass.*

ii Insert the knife blade into the sealant.

iii Slowly move the knife along the sealant with the blade positioned as close to the glass as possible. Do not allow the knife blade to overheat or the sealant will melt.

b Braided Cutting Wire and Handles. ⇨ *Fig 22. (B-35)*. This method uses a 3-core wire, a wire starter tube and two handles.

i Insert the steel tube **22-A** into the old sealant on the inside of the glass.

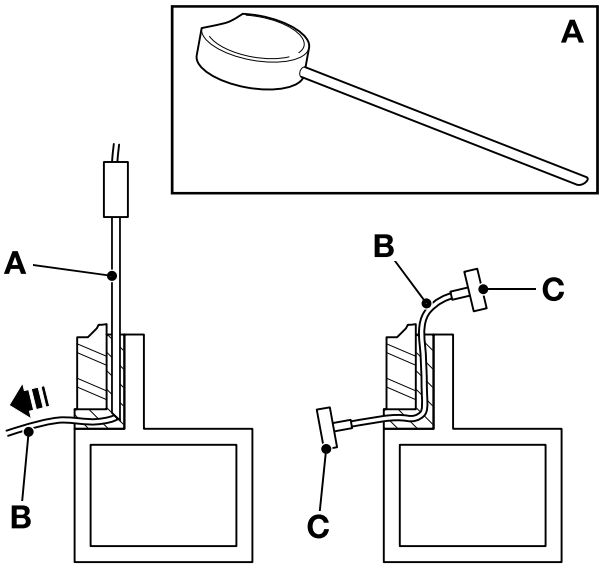


Fig 22. Braided Cutting Wire and Handles

ii Insert the braided cutting wire **22-B** down the centre of the steel tube. If necessary, from the outside, cut out local sealant at the point of the tube to gain access to the wire.

iii Using suitable pliers, pull the cutting wire through the sealant to the outer side of the glass.

iv Secure each end of the braided cutting wire in the special handles **22-C**.

v Move the cutting wire backwards and forwards in a sawing motion and at the same time gently push or pull the wire to cut through the old sealant.

c Cut-out Knife. ⇨ *Fig 23. (B-35)*. The cut-out knife can be used as a left handed or right handed tool.

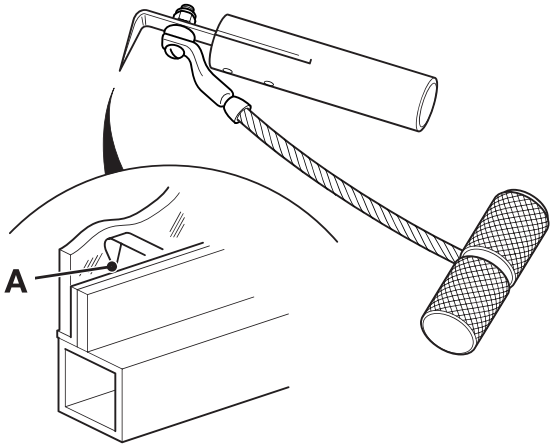


Fig 23. Cut-out Knife

i Insert the knife blade into the sealant.

ii Make sure that the blade of the knife is against the glass **23-A**.

iii Use the 'pull-handle' to pull the knife along and cut out the old sealant.

d Craft Knife. ⇨ *Fig 24. (B-36)*. The blades **24-A** are replaceable.

i Insert the knife blade into the sealant.

ii Pull the knife along and cut out the old sealant.

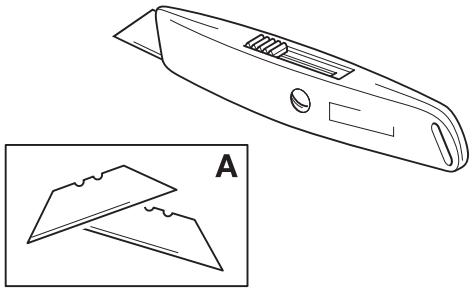


Fig 24. Craft Knife

Note: *There are other tools available to cut out the old sealant. For example, there is a long handle type craft knife to give extended reach. Refer to* ***Service Tools****, for details of this and any other tools.*

4 Laminated glass - lift out the broken pane using glass lifters.

Toughened glass - remove the cut off sealant and all remaining particles of shattered glass.

5 If necessary, trim off the remaining old sealant to leave approximately 1 to 2 mm on the upright face of the cab frame aperture. ⇨ *Fig 25. (B-36)*

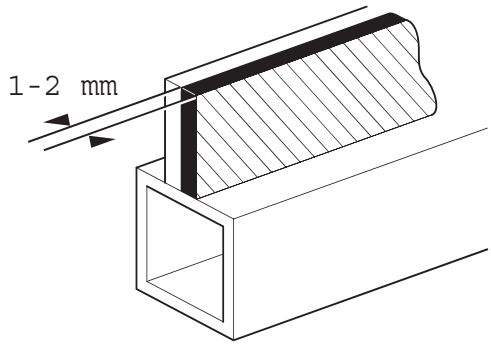


Fig 25.

6 Apply a coat of 'Black Primer 206J' to the paintwork if:

a Paintwork was damaged or scratched during the glass/sealant removal procedures.

b The old sealant was inadvertently cut back to the cab frame during the glass/sealant removal procedures.

Preparing the Cab Frame Aperture

1 If damp or wet, dry the aperture area using a hot air gun (sourced locally).

2 Use 'Active Wipe 205' to thoroughly clean and 'prime' the trimmed sealant. Use a lint free cloth to apply the 'Active Wipe 205', allow 5 minutes flash off (drying) time.

Note: *Do not use any other type of cleaning fluids, otherwise they may be absorbed into the old sealant and ultimately prevent the new glass from bonding.*

Preparing the New Glass

⚠ WARNING

Laminated glass must be handled with extra care to prevent breakage. Wherever possible, store and handle it in a vertical attitude. When placing or lifting the glass in a horizontal attitude it must be supported over its whole area, not just at the edges.

BF-1-8_1

1 Make sure that the new glass correctly fits the frame aperture **26-A**.

a Put two spacer blocks **26-B** onto the bottom part of the frame aperture.

b Install the new glass on the spacer blocks - Always use glass lifters **26-C**. Check that there is an equal sized gap all round the edge of the glass.

Note: *The spacer blocks are rectangular in section to give two common gap widths. If necessary they can be trimmed to a smaller size to give an equal sized gap around the glass.*

Important: *The glass edges must not touch the frame, otherwise movement of the frame will chip and eventually break the newly installed glass.*

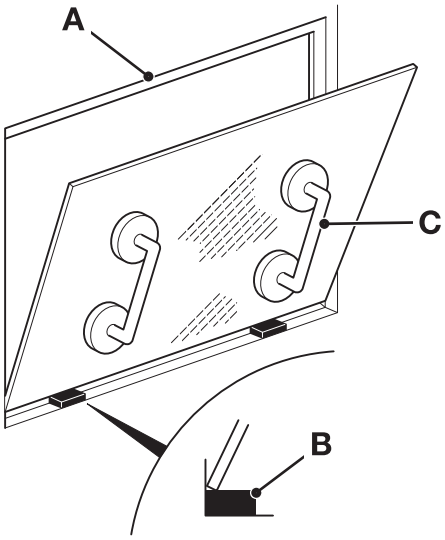


Fig 26.

2 After checking for size, remove the new glass and place it on a purpose made glass stand. ⇨ *Fig 27. (B-37)*.

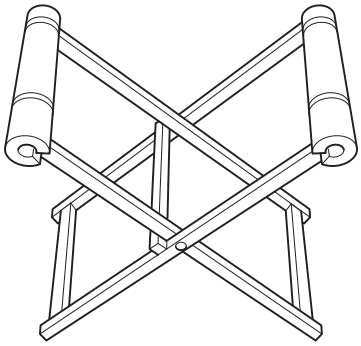


Fig 27. Glass Stand

Small panes of glass will need locating on a 600 x 700 mm x 15 to 19 mm thick plywood board **28-A**, sourced locally to fit the glass stand. It is recommended that an access hole is cut in the board to accommodate the glass lifter, making it easier and safer to handle small panes of glass. The board should be covered with felt or carpet to give an anti-scratch surface. Resting the glass on four spacer blocks will ensure clearance of the cartridge nozzle tip during application of the polyurethane sealant.

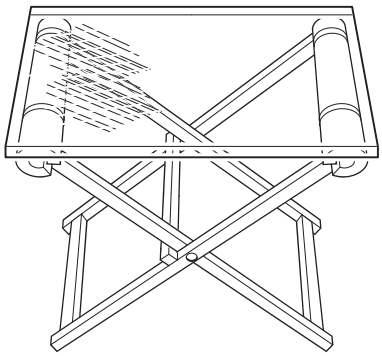


Fig 28.

3 Make sure the glass is positioned on the stand the correct way up (i.e. with the black ceramic ink band upwards) ready for application of primer etc.

4 Clean the glass

a Use 'Active Wipe 205' to thoroughly clean and 'prime' the black ceramic ink band printed on the glass (see ***Note***). Use a lint free cloth to apply the 'Active Wipe 205', allow 5 minutes flash off (drying) time.

Note: *Do not touch the glass after cleaning with the 'Active Wipe 205'.*

b If the glass does not have a black ceramic ink band, paint a band on the glass using 'Black Primer 206J'. The band should be approximately 25mm (1in) wide, and the edge should be a neat straight line. ⇨ *Fig 29. (B-37)*.

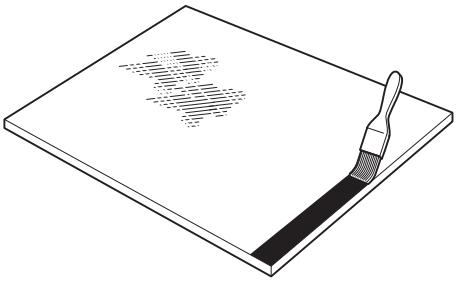


Fig 29.

5 Install the Ultra Fast Adhesive cartridge (see ***Sealing and Retaining Compounds***, Section 1 and ***Note***) into a suitable applicator gun:

a Remove the aluminium disc cover from the base of the cartridge and discard the 'dessicant capsule'.

b Make sure that the rolled edge of the cartridge is not damaged - if necessary, the edges should be pressed flat, otherwise it will be difficult to remove the cartridge from the applicator gun.

c Pierce the front 'nozzle' end of the cartridge to its maximum diameter.

d Fit the pre-cut nozzle. ⇨ *Fig 30. (B-38)*.

e Install the cartridge in the applicator gun.

Note: *Cold material will be very difficult to extrude. The cartridges must be pre-heated in a special oven for 1 hour to a temperature of 80°C (176°F). Pre-heating the cartridges makes the adhesive more workable and also brings the 'curing' time down to 30 minutes.*

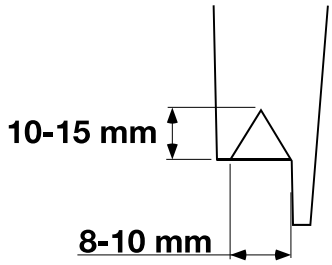


Fig 30.

6 Apply the pre-heated adhesive to the glass (do not start in a corner). Keep the nozzle guide **31-A** against the edge of the glass and make sure that the adhesive forms a continuous 'pyramid' shape. ⇨ *Fig 31. (B-38)*

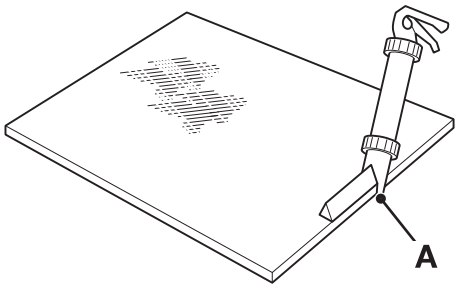


Fig 31.

Note: *Once the pre-heated adhesive has been applied to the glass, install the glass in the aperture as soon as possible. After approximately 10 minutes the sealant will form a 'skin', this will prevent the glass from bonding.*

7 After applying the adhesive, leave a small amount of sealant protruding from the nozzle. This will prevent any adhesive left in the cartridge from 'curing'.

Installing the New Glass

1 If the internal trim strip is damaged, renew it (cut to length as required) before fitting the new glass. Make sure the two spacer blocks are in position. ⇨ *Preparing the New Glass (B-36)* - step 1.

2 Install the glass in the frame aperture:

a Always use the special lifting tools when moving the glass. Use a lifting strap to hold large panes of glass in position. ⇨ *Fig 32. (B-38)*

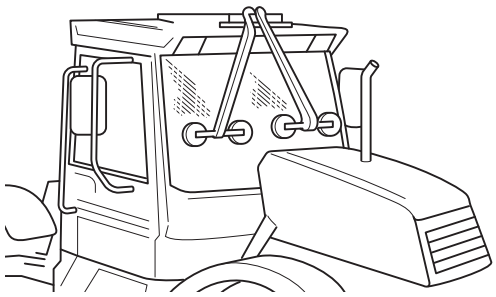


Fig 32. Typical M/c. Installation

b Sit the bottom edge of the glass on the spacer blocks. ⇨ *Fig 33. (B-39)*

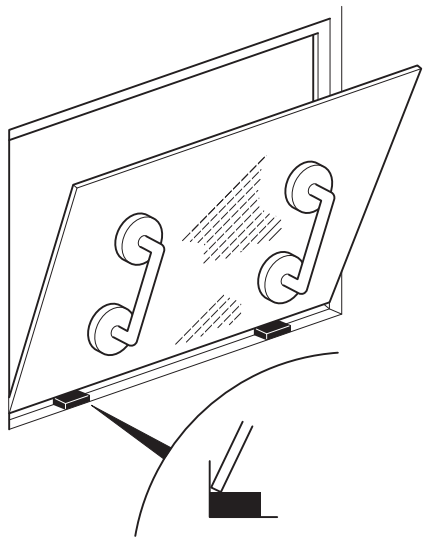


Fig 33.

c Make sure that the glass is correctly positioned, then gently press around the edges of the glass and ensure full adhesive contact is achieved. Do not press too hard or too much adhesive will squeeze out.

3 Make the inside seal smooth:

a Wearing surgical gloves, dip your finger in a soapy water solution.

b Use your finger to make the inside seal smooth.

4 All exposed edges must be sealed using Black Polyurethane Sealant (see **Sealing and Retaining Compounds**, Section 1).

Important: *Use extreme caution when wiping the inside of the new glass - pushing too hard on the inside of the glass will affect the integrity of the bonded seal.*

5 Clean the glass after installation:

a Small amounts of sealant can be cleaned from the glass using the 'Active Wipe 205'.

b Large amounts of excess sealant should be left to 'cure' and then cut off with a sharp knife.

Note: *On completion of the glass replacement procedures, the sealant 'curing' time is 30 minutes. This means that the machine can be driven and used after 30 minutes, but it must not be used during the curing period of 30 minutes.*

c Clean the glass using a purpose made glass cleaner

6 On completion of the glass installation procedures tidy the work area:

a Remove all broken glass from the cab area.

b Remove the protective covers from the cab seat and control pedestals.

c Renew all 'warning' and 'information' decals so that the new installation conforms with the original cab installation.

Checks

Failure to take these precautions could result in death or injury to the operator.

Check the structure for damage. Check that the six mounting bolts **A** are installed and undamaged. Check the bolt torques. Tighten them to the correct torque if necessary.

Torque Settings

Item	Nm	Kgf m	lbf ft
A	130	14	96

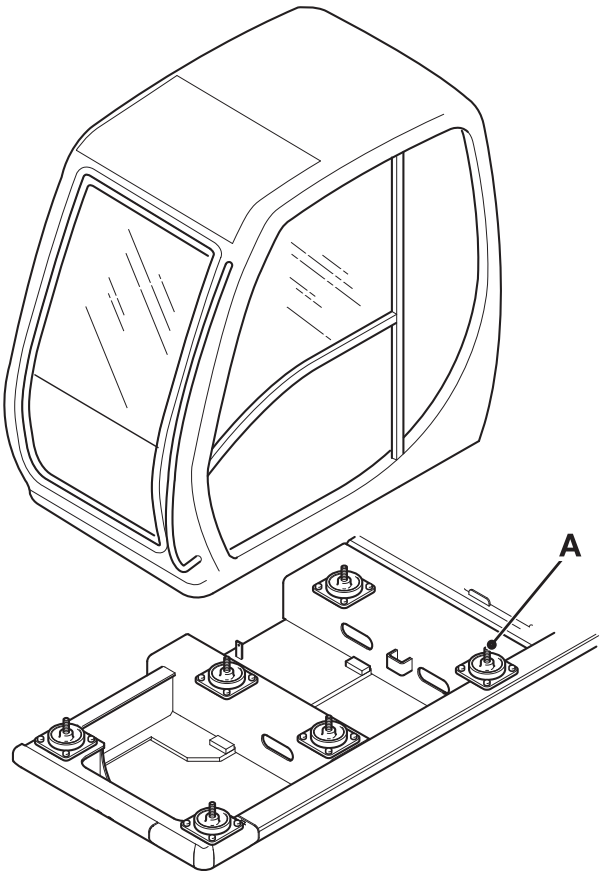


Fig 34.

Checking the FOPS Structure

All excavators are designed so that an operator's protective structure can be fitted. In certain applications such as demolition, machines must be fitted with the optional Falling Objects Protection Structure (FOPS). It is the operator's responsibility to identify the risk of an application.

Check that all the FOPS mounting bolts are in place and undamaged. Check the FOPS mounting bolts for correct torque tightness. ⇨ *Fig 35. (B-41)* .

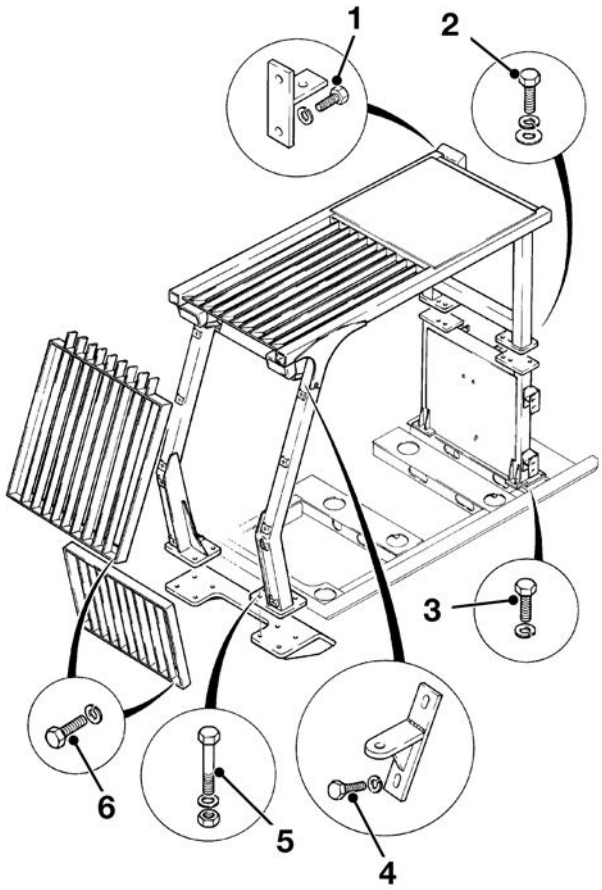


Fig 35.

1 Torque tightness is 78 Nm (57.5 lbf ft)

2 Torque tightness is 343 Nm (253 lbf ft)

3 Torque tightness is 343 Nm (253 lbf ft)

4 Torque tightness is 78 Nm (57.5 lbf ft)

5 Torque tightness is 343 Nm (253 lbf ft)

6 Torque tightness is 137 Nm (101 lbf ft)

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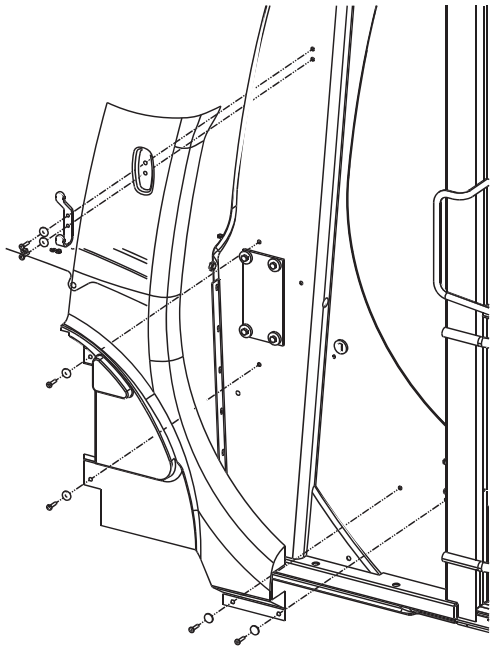
Cab Panels

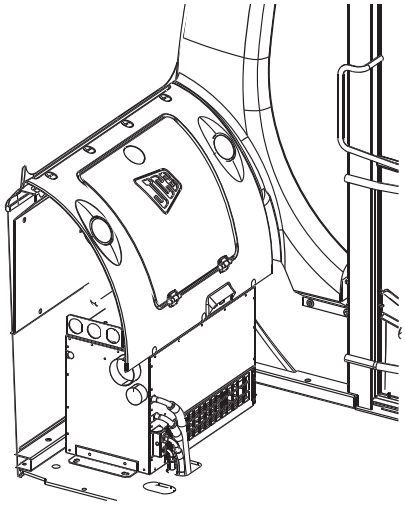
Cab Panel Removal

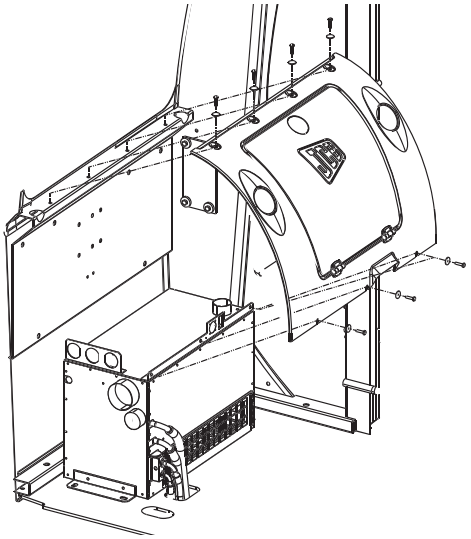
Remove the screws as shown in the following illustrations.

Note: *Care must be taken not to force the panels away from cab frame, as this could result in breakage of the cab panel*



Right Hand Cab Panels





Left hand Cab Panels