Service Manual

8052
8060

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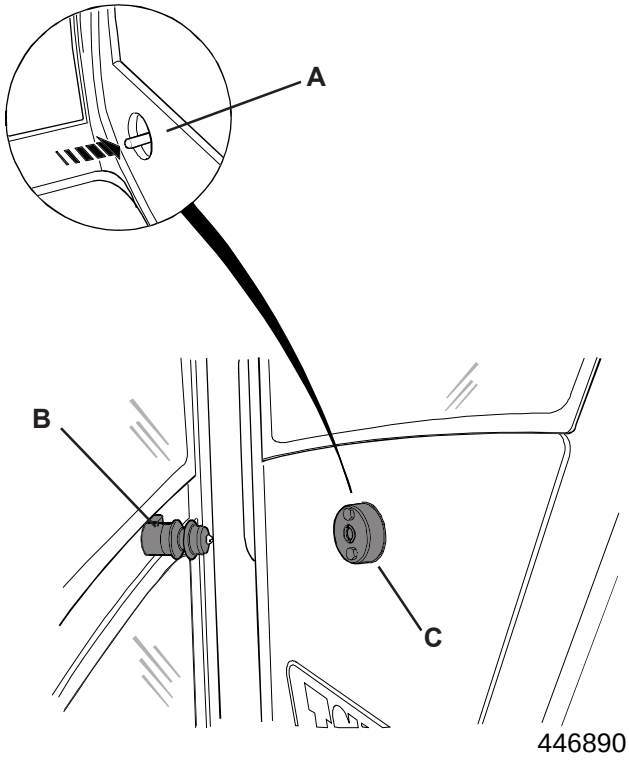
(Service Manuals available from JCB Service, quote publication 9806/2100)

Securing the Door in the Open Position

The door can be secured in the fully open position.

Swing the door fully open until the spigot **B** on the door locates securely in the socket **C** on the side of the cab

To release the door when it is secured fully open, operate the button **A** on the inside of the cab or the button **D** on the outside of the cab.



Entering/Exiting the cab

⚠ WARNING

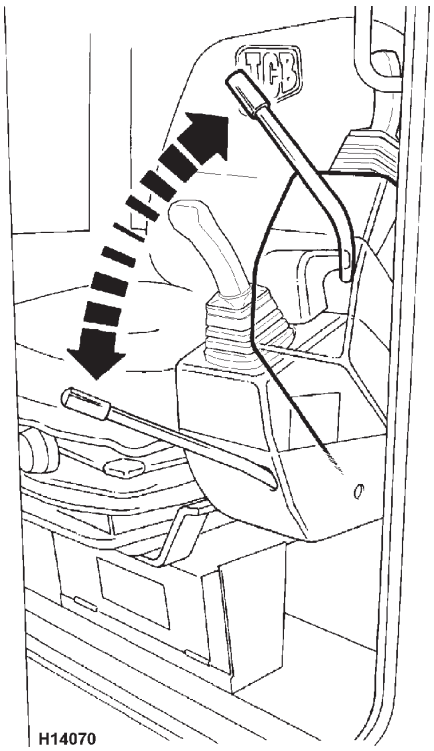
Do not enter or exit the cab unless the arm rest/lever lock is fully raised.

To give sufficient clearance to enter or leave the cab, the left lock must be raised.

When the lock is in the raised position the excavator controls cannot be operated. Lowering the lock to the normal position connects the excavator controls and allows the normal operation of the levers.

⚠ WARNING

Always face the machine when entering or leaving the cab. Use the step(s) and handrails. Make sure the step(s), handrails and your boot soles are clean and dry. Do not jump from the machine. Do not use the machine controls or lever locks as handholds, use the handrails. Failure to follow these instructions could result in unexpected movement of the machine.



Note: The illustration shows a typical model; your machine may look different from the model shown.

Engine and Track Controls, Switches and Instruments (cont.)

Switches

Note: Read **Section 1, Starting The Engine** before starting the machines

Starter Switch A

This is operated by the starter key. It has four positions. The key can only be removed when in the **'O'** position.

O Off/Stop Engine

Turn the key to this position to stop the engine. Make sure the controls are in neutral and the excavator and dozer are lowered before stopping the engine.

I On

Turning the key in this position connects the battery to the electrical circuits The key will spring back to this position when released from **II**.

II Heat Position

Holding the key in this position switches on the glow plugs. The glow plugs warm the engine combustion chambers for cold starting. Do not hold in this position for more than 60 seconds. The key will spring back to **I** when released.

III Start

Operates the starter motor to turn the engine.

Note: Do not operate the starter for more than 15 seconds at one time. If the starter fails to start, allow the starter to cool for a few minutes before trying again.

The starter switch has an inhibitor to stop the switch being turned ON when the engine is running. If the engine fails to start, the switch needs to be returned to the OFF position before re-engaging the starter.

Horn Button D

This is a push button switch located in the R.H. excavator control lever. Press the switch to activate the horn.

Cab Light E

A cab light is situated on the right side of the cab, above the rear window. It is operated by pressing either end of the light lens.

Flashing Beacon Switch F
(8052 machines from 803371)

On/Off switch.
Function with ignition ON or OFF

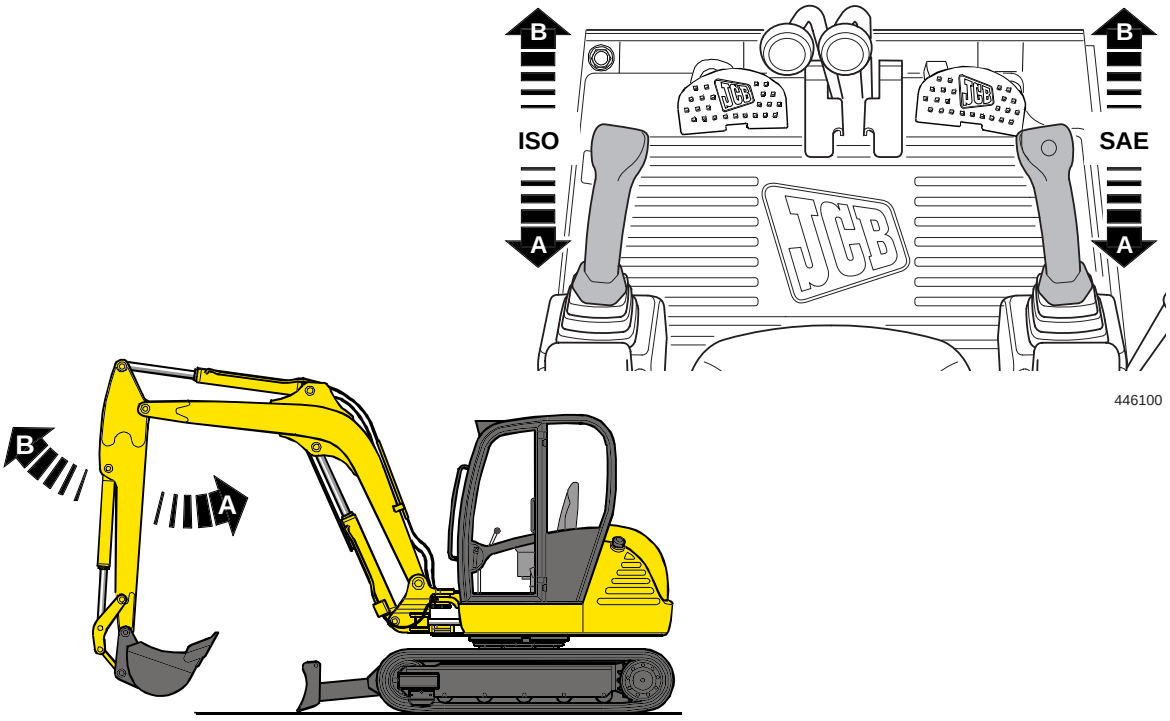
Working Light Switch B

This is an illuminated rocker switch. Press the switch down to switch the working lights on. The yellow part of the switch will illuminate. Press the switch again to switch the working lights off, the yellow part of the switch will go out.

Windscreen Wiper Switch C

This is a three position rocker switch. Press the switch down on one side to switch the windscreen wiper off, in this position the wiper will self park. Press the switch to the centre position to switch the windscreen wiper on. Press the switch to the other side for windscreen wash, when released the switch will return to the middle, on, position.
Functions only with the starter switch at **I**.

Excavator Controls (cont.)



CAUTION

The dipper service is operated by the L.H. controller on standard ISO control machines or by the R.H. controller on the optional 3CX control pattern machines.

HOP42

CAUTION

The hand throttle's lowest setting allows the engine to idle when the excavator is not being operated. Before any service is selected, the engine speed must be increased to maximum.

NEVER operate any services with the engine at idle.

Dipper In

To bring the dipper in, pull the respective controller backward **A**. Release the controller when the dipper is at the desired position.

Dipper Out

To push the dipper out, push the respective controller forward **B**. Release the controller when the dipper is at the desired position.

Getting the machine moving

After you have warmed up the engine, move off as described below. Read Operating Hints and Warnings first.

Operating Hints

The machine does not have gears.

When moving the machine, keep it under control at all times. Stay alert for obstructions and possible hazards.

Approach deep mud slowly.

Note: For maximum tractive effort when manoeuvering or turning machine in muddy, heavy conditions, ensure low speed tracking is engaged.

WARNING

You and others could be killed or injured if you reverse direction on the move, because the change in direction will be sudden and without warning to others. Always stop the machine before changing from forward to reverse or vice versa.

HOP51

1 Check your seat

Make sure that the seat is secure and correctly adjusted.
Fasten the seat belt.

2 Slew Lock

Make sure that the slew lock in the cab, is disengaged.

3 Start the Engine

See starting the engine in Operation section.

4 Move the machine

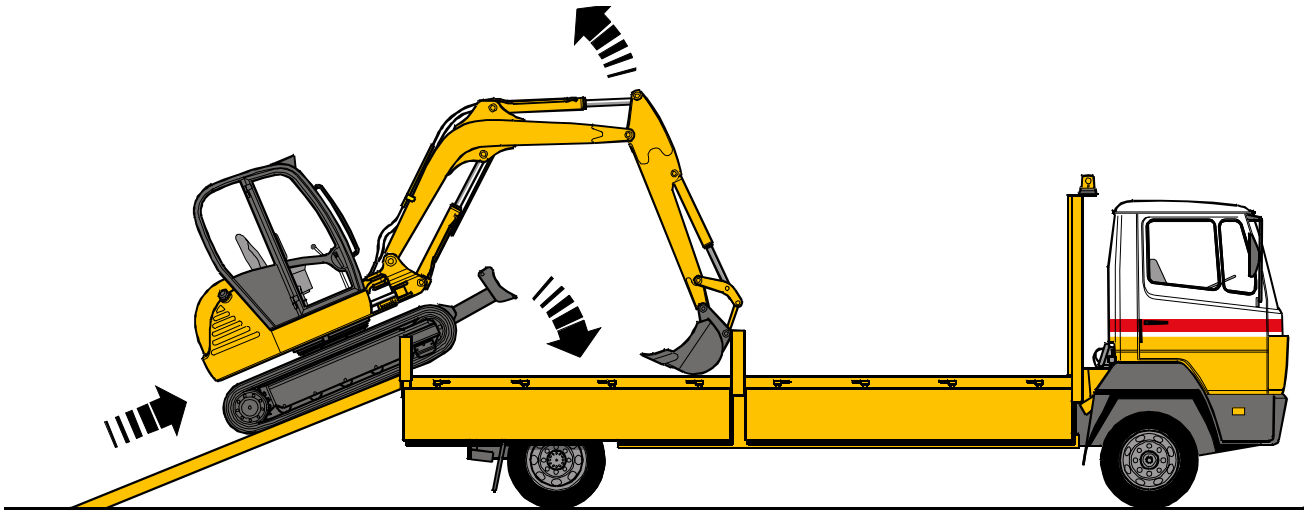
a Check that the attachments are in the travel position. Make sure that it is safe to move off.

b Ensure the two speed tracking switch is in low speed mode.

c Take hold of both track control levers in one hand.

d Move the levers forward or backward as required and pull the throttle lever slowly backward to maximum throttle. When safe to do so, you may increase tracking speed by operating the two speed tracking switch.
See 'Engine and Track Controls' page.

Transporting the machine (cont.)



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Loading a machine onto the transporting vehicle

⚠ WARNING

Make sure that the ramp incline does not exceed the machines operational limits. See 'Working on Slopes' pages in this handbook for further details.

1 Position the transporting vehicle on firm level ground.

2 Apply the parking brakes and lower any stability jacks.

3 Position the loading ramps securely on the transporter.

Note: Ramps should be level with each other in position for loading. Arrange the dozer (fully raised), either forward or behind the machine after checking the dozer ramp clearance.

4 Align the machine with the loading ramps, position the dozer blade to the front and fully raised. Slightly extend the boom and dipper for stability. With the machine in low speed mode, track forward onto the ramp slowly and smoothly. Ensure the bucket will not contact the transporter ramps when loading the

5 Slowly drive the machine to the top of the ramps. Lower the boom until the bucket contacts the transporter deck. Slowly drive forward. As the tracks begin to clear the ramps, gently raise the boom allowing the machine to rock forward onto the transporter bed.

6 Slew the cab around 180°. Engage the slew lock and lower the bucket onto the transporter bed.

7 Stop the engine and secure the machine using the securing points on the vehicle, (see 'Securing the machine').

8 Remove and secure both ramps.

9 Raise any jacks to their transport position.

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Torque Settings

Introduction - Zinc Plated Fasteners and Dacromet Fasteners

Micro and Micro Plus Excavators are assembled using an improved type of corrosion resistant finish. This type of finish is called Dacromet and replaces the original Zinc and Yellow plating used on earlier machines.

The two types of fasteners can be readily identified by colour and part number suffix as follows:

Fastener Type	Colour	Part Number
Zinc and Yellow	Golden finish	'Z' (e.g. 1315/3712Z)
Dacromet	Mottled silver finish	'D' (e.g. 1315/3712D)

Note: As the Dacromet fasteners have a lower torque setting than the Zinc and Yellow fasteners, the torque figures used must be relevant to the type of fasteners.

Note: A Dacromet bolt should not be used in conjunction with a Zinc and Yellow plated nut, as this could change the torque characteristics of the torque settings further. For the same reason, a Dacromet nut should not be used in conjunction with a Zinc and Yellow plated bolt.

Note: All bolts used on JCB machines are high tensile and must not be replaced by bolts of a lesser tensile specification.

Only use the following when no setting is specified in the text of the manual.

Metric Grade 8.8 Bolts

Bolt size		**Zinc Plated Fasteners**			**Dacromet Fasteners**		
Diameter	**Hexagon (A/F)**	**Torque Settings**			**Torque Settings**		
mm	mm	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
M6 x 1.0	10	12	1.2	9	9	0.9	7
M8 x 1.25	13	28	3.0	21	22.5	2.3	17
M10 x 1.5	17	56	5.7	42	47.5	4.8	35
M12 x 1.75	19	98	10	72	80	8.2	59
M14 x 2	22				133	13.6	98
M16 x 2	24	244	25	180	200	20.4	148
M18 x 2.5	27	350	36	258	278	28.4	205
M20 x 2.5	30	476	48	352	392	40	289
M24 x 3	36	822	84	607	675	69	498
M30 x 3.5	46	1633	166	1205	1348	138	994
M36 x 4	55	2854	291	2105			
Slew Ring to Undercarriage		125	12.5	91	102	10.2	75
Slew-Ring to Superstructure		89	8.9	65	73	7.3	53
Kingpost Pivot Pin Retaining Bolts		98	10	72	80	8.2	59

Service Schedules - cont'd

Every 1000 operating hours (or yearly)
whichever occurs first

Do the daily jobs through to 500 hours plus:

Change

1 Air filter element (outer).
2* Idler wheel and track rollers oil and seals.
3 Track gearbox oil.

Check

4 Cab mountings (for security).
5 Check security of all bolts retaining major assemblies, i.e. gearboxes (track and slew), slew ring, engine mountings, rotary joint etc.
6 Check and clean Air filter dust valve.

Grease

7 Slew ring pinion and slew ring gear teeth.

Every 2000 operating hours (or 2 years)
whichever occurs first

Do the daily jobs through to 1000 hours plus:

Change

1 Air filter element (inner).
2 Track gearbox oil.
3* Hydraulic fluid and clean suction strainer.
4 Engine coolant.

Check (engine stopped)

5 Battery electrolyte level (low maintenance).
6* Valve clearance and lubrication.
7* Starter motor and alternator brush gear.

Note: Jobs which should only be done by a specialist are indicated by*.

Note: Rockbreaker Service Schedules are supplied with the Rockbreaker.

Engine Cooling System

Checking the coolant level

Note: Illustration shows the 8052 machine.

WARNING

The cooling system is pressurised when the coolant is hot. Hot coolant will burn you. Make sure that the engine is cool before checking the coolant level or draining the system.

1 Park the machine on level ground, stop the engine and remove the starter key. Raise the engine cover and allow the engine to cool.

2 Carefully and slowly remove the pressure cap **A** on the expansion bottle, allowing any trapped pressure to escape.

3 Top up the expansion bottle if necessary with pre-mixed water and anti freeze. Add coolant to the expansion bottle if the visible level is less than 50mm (2in.) when the radiator is cool.

4 Refit the filler cap making sure that it is tight.

CAUTION

Keep your face away from the cylinder block tap and the radiator drain plug when you drain the system.

Changing the Coolant

1 Do steps 1 and 2 of "Checking the Coolant level".

2 Undo the speed plug **B** on the cylinder block and let the coolant drain out. Remove the radiator drain plug **C** and let the coolant drain out. Make sure the drain holes are not blocked.

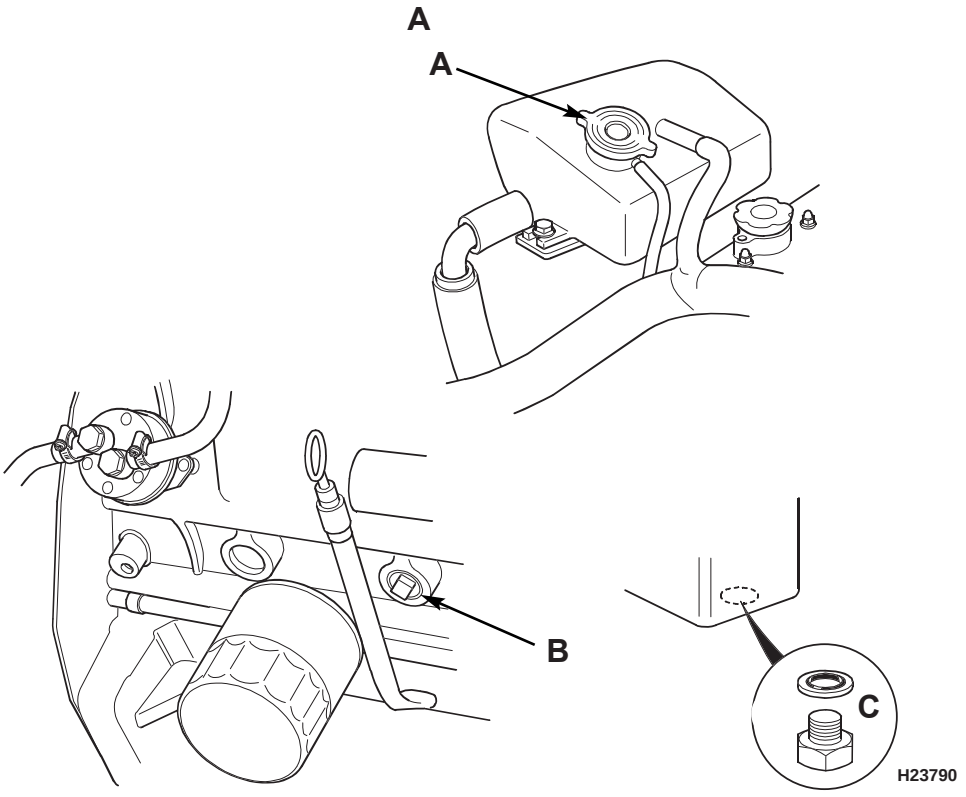
3 Flush the system with clean water if necessary.

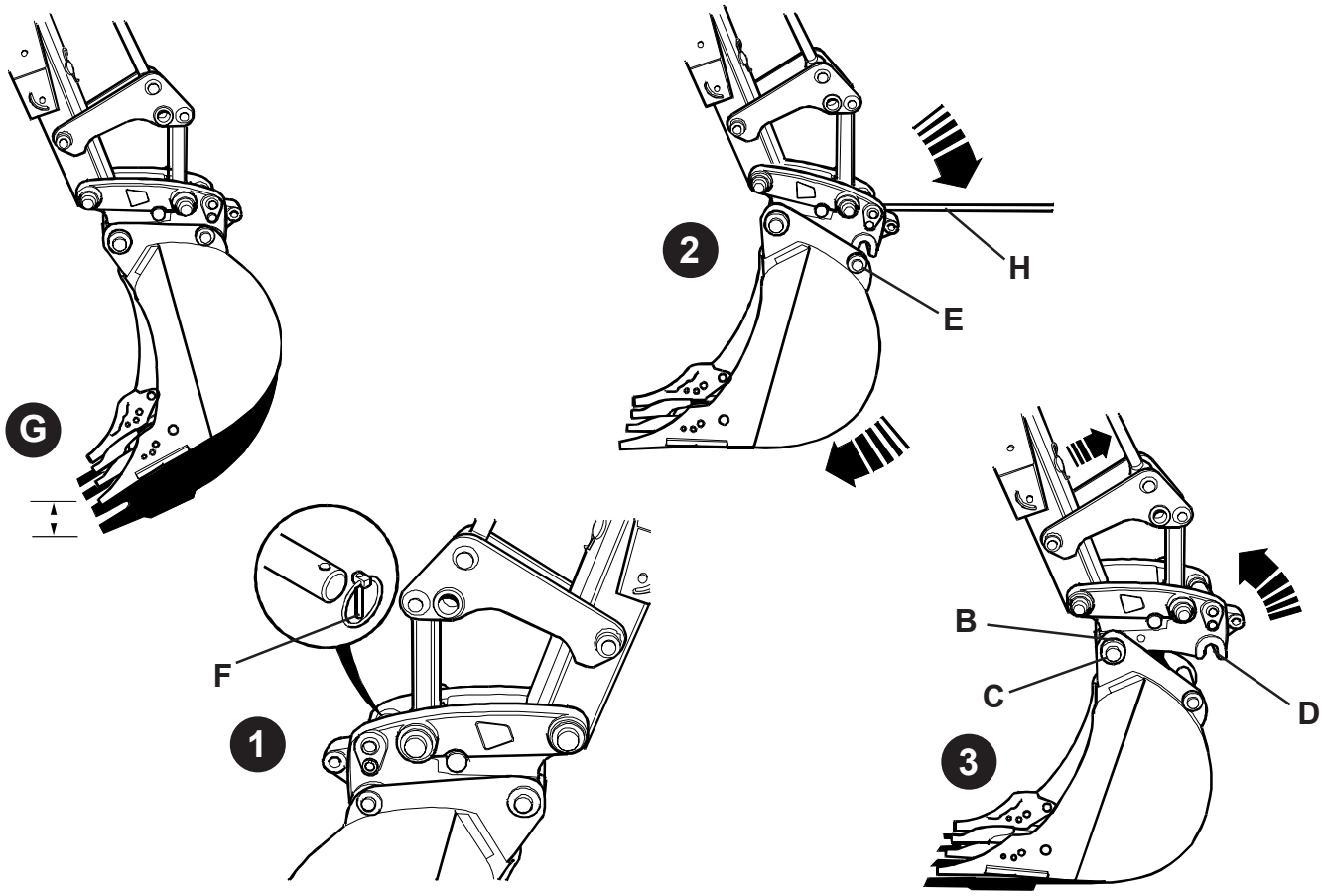
4 Close the speed plug **B**. Make sure the drain plug **C** is clean and refit it. Make sure it is tight.

5 Fill the system. Use the correct mix of clean, soft water and anti-freeze (see Coolant Mixtures).

6 Refit the filler cap making sure that it is tight.

7 Run the engine for a while, to raise the coolant to working temperature and pressure. Stop the engine. Check for leaks.





Removing Excavator Quickhitch Attachments

1 Park the machine on firm level ground.

2 Position the attachment so that it is approximately 150 mm (6in.) from the ground, as shown at **G**.

3 If the attachment is hydraulically operated, disconnect the hydraulic hose(s) as follows:

⚠ WARNING

Fine jets of hydraulic fluid at high pressure can penetrate the skin. Do not use your fingers to check for hydraulic fluid leaks. Do not put your face close to suspected leaks. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of hydraulic fluid. If hydraulic fluid penetrates your skin, get medical help immediately.

INT-3-1-10/1

a Stop the engine.

b Operate the auxiliary attachment control pedal, this will release any hydraulic pressure trapped in the system.

c Disconnect the hydraulic hose(s).

4 Disengage the attachment:

a Remove the latch hook locking pin **F**.

b Insert a bar into the hole of the latch hook **H**.

⚠ WARNING

The attachment will roll forward when released. Stand clear and to one side when releasing the attachment.

2-4-4-1

c Apply a downward pressure on the bar to release the pivot pin **E** from the latch hook.

d Rest the attachment on the ground.

e Slowly roll the Quickhitch and raise the dipper arm simultaneously to release slot **B** from pivot pin **C**.

Fitting the Auxiliary Pedal and Cable

1 Assemble and install the pedal and cable operating mechanism as shown in view B.

2 Remove spool seal retaining plate and screws **Z** from the valve spool and discard. Place seal retainer **Y** (supplied with cable assembly) into position over the spool.

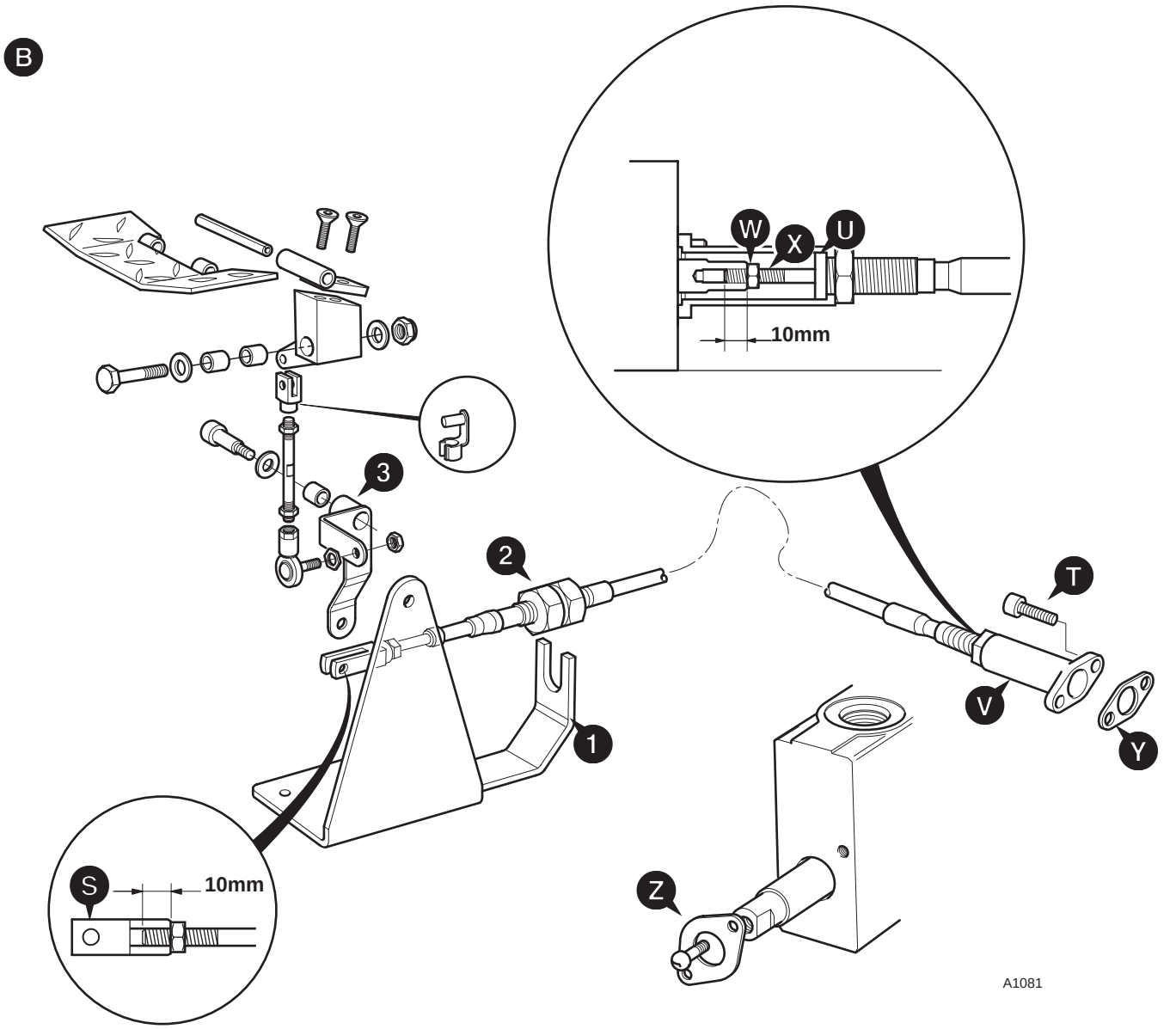
3 Screw inner cable **X** NOT MORE THAN 10 mm into the spool using an open ended spanner on flat of cable and tighten locknut **W** against the spool. Slide cast cable sleeve **V** into position, ensuring seal retainer **Y** and circular nut **U** locate correctly. Using screws **T** secure the sleeve to the valve block.

4 Screw clevis **S** halfway onto the cable at the pedal end. Secure with the cable locknut.

5 Secure the cable to bracket **1** on the underside of the floor plate using locknuts and washers **2**.

6 Attach clevis **S** to swing bar **3**.

7 Check the cable operates freely and without binding.



Bucket Ram Pivot and Linkage

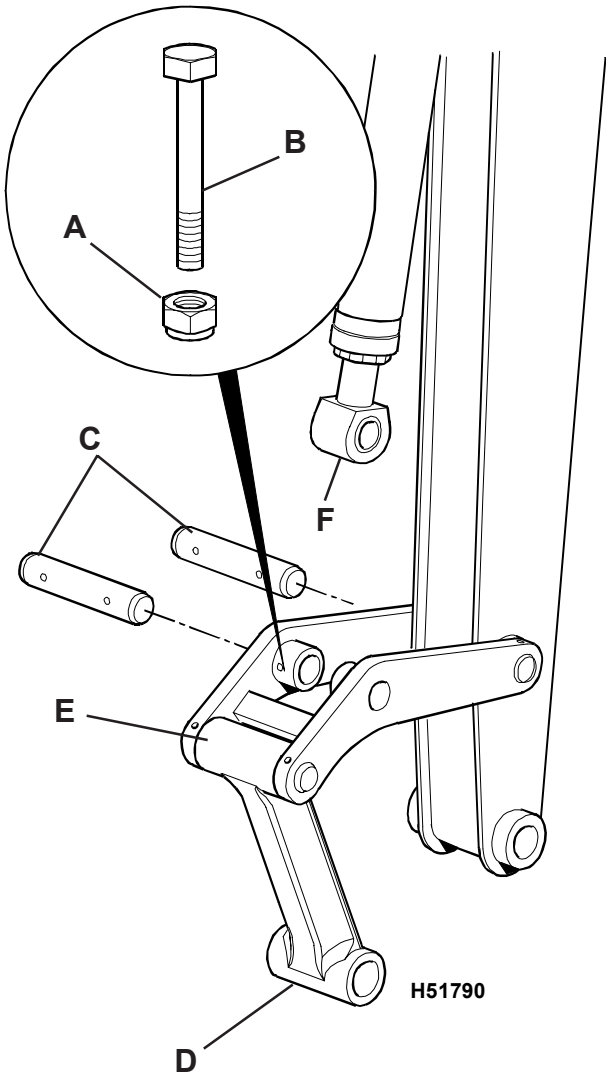
Removal and Replacement

Removal

1 Remove the bucket.

2 Remove the self-locking nuts **A** and bolts **B**. Support the links **D** and **E**. Drive out both pivot pins **C**. Retract the piston rod end of the bucket ram **F** clear of the link **E**. Remove the links **D** and **E**.

3 Clean all old grease from the links **E** and **D** and pivot pins **C**.



Inspection

1 Check that the link bushes and the pivot pins are within permitted tolerances. Renew pivot pin and/or remove and replace link bushes as necessary.

Tolerances

	Pivot Pin	PivotBush
Reference value	44.9 0mm dia.	45 mm I/D
Allowable limit	43.9 0mm dia.	46 mm I/D

Replacement

⚠ WARNING

DO NOT align pivot pin holes with your fingers.

Note: *Refer to section 3 for grease specification.*

1 Grease the pivot pins **C**.

2 Locate the fork end of the link **E** onto the dipper, the correct way up as shown. Fit the pivot pin **C** through both sides of the link and dipper. Secure using bolt **B** and new self-locking nut **A**.

3 Locate the rod end of the bucket ram **F** into the fork of the link **E**. Fit the pivot pin **C** through both links and the ram end. Secure using bolt **B** and new self-locking nut **A**.

4 Grease the linkage through the grease nipple on the ram end boss.

b Braided Cutting Wire and Handles **B**. This method uses a 3-core wire, a wire starter tube and two handles (see fig. 2).

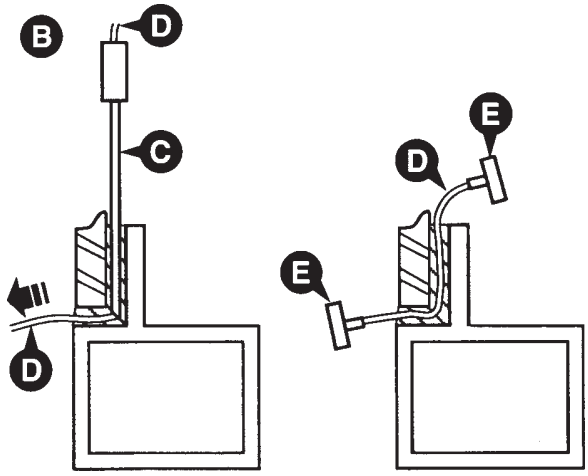


Fig. 2

(i) Insert the steel tube **C** into the old sealant on the inside of the glass, (see fig. 3)

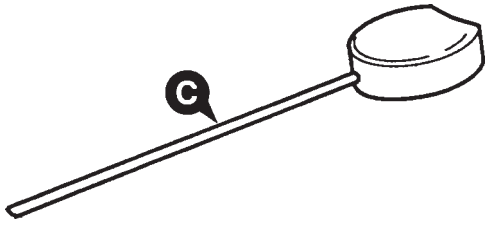


Fig. 3

(ii) Insert the braided cutting wire **D** 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 **E.**

(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 **F.** The cut-out knife can be used as a left handed or right handed tool, (see fig. 4).

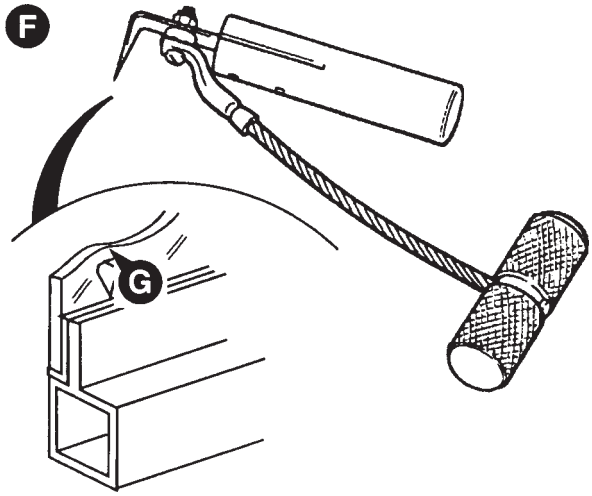


Fig. 4

(i) Insert the knife blade into the sealant.

(ii) Make sure that the blade of the knife is against the glass as shown at **G** (see fig. 4).

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

d Craft Knife **H**. The blades are replaceable, (see fig. 5).

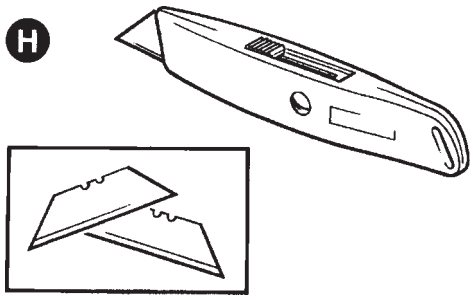


Fig. 5

(i) Insert the knife blade into the sealant.

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

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.*

Technical Data (cont'd)

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Circuit Protection

The electrical circuits are protected by fuses. The three primary fuses (view **A**) are located in the engine bay, mounted adjacent to the fuse panel. In addition, eight secondary fuses (view **B**) are located on the right hand side of the seat bulkhead.

Primary fuses

Fuse	Circuit	Rating
1	Glow Plugs Ignition switch On, Pre-heat, Start	60A
2	Boom Light Working Lights Beacon, Horn Interior Light	60A
3	Heater Blower Motor, Air Conditioning (when fitted)	40A

Secondary Fuses

Fuse	Circuit	Rating
1	Instrumentation, Buzzer	7,5A
2	Windscreen Washer/Wipe	15A
3	Servo Pilot Solenoid Boom Light	15A
4	Heater Blower	10A
	Air Conditioning (when fitted)	(25A)
5	Horn, Interior Light, Radio	10A
6	Beacon	10A
7	Working Lights (front & rear)	25A
8	Engine Stop Solenoid	30A

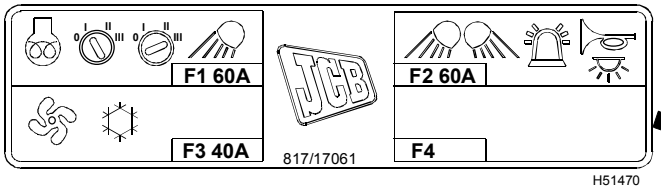
Relays and Buzzer (located inside fuse panel)

- **A** Lights Relay
- **B** Buzzer
- **C** Blower Relay

Glowplug timer and glowplug relay and mounted behind fuse panel.

CAUTION

Always replace fuses wth ones of the correct ampere rating to avoid damage to the electrical system.



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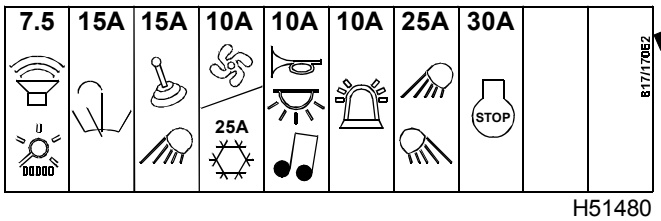

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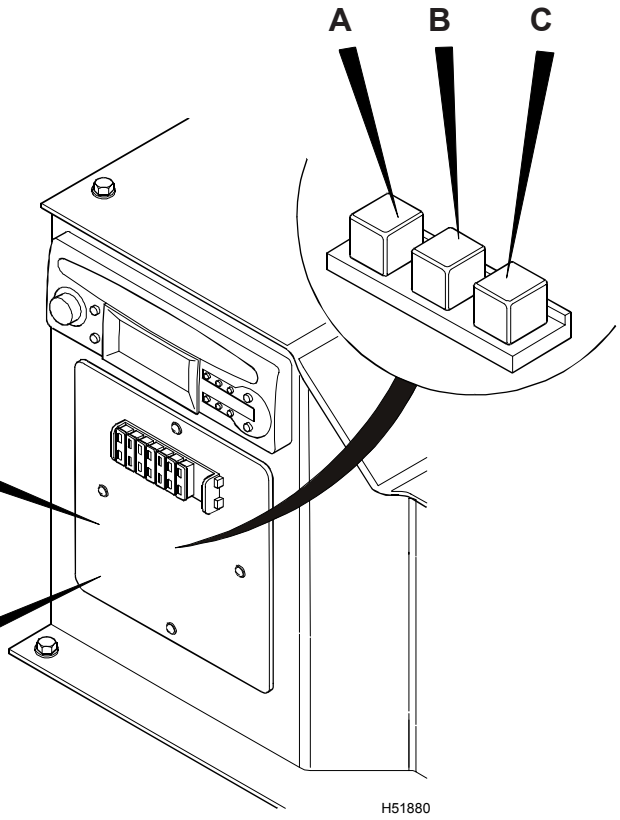

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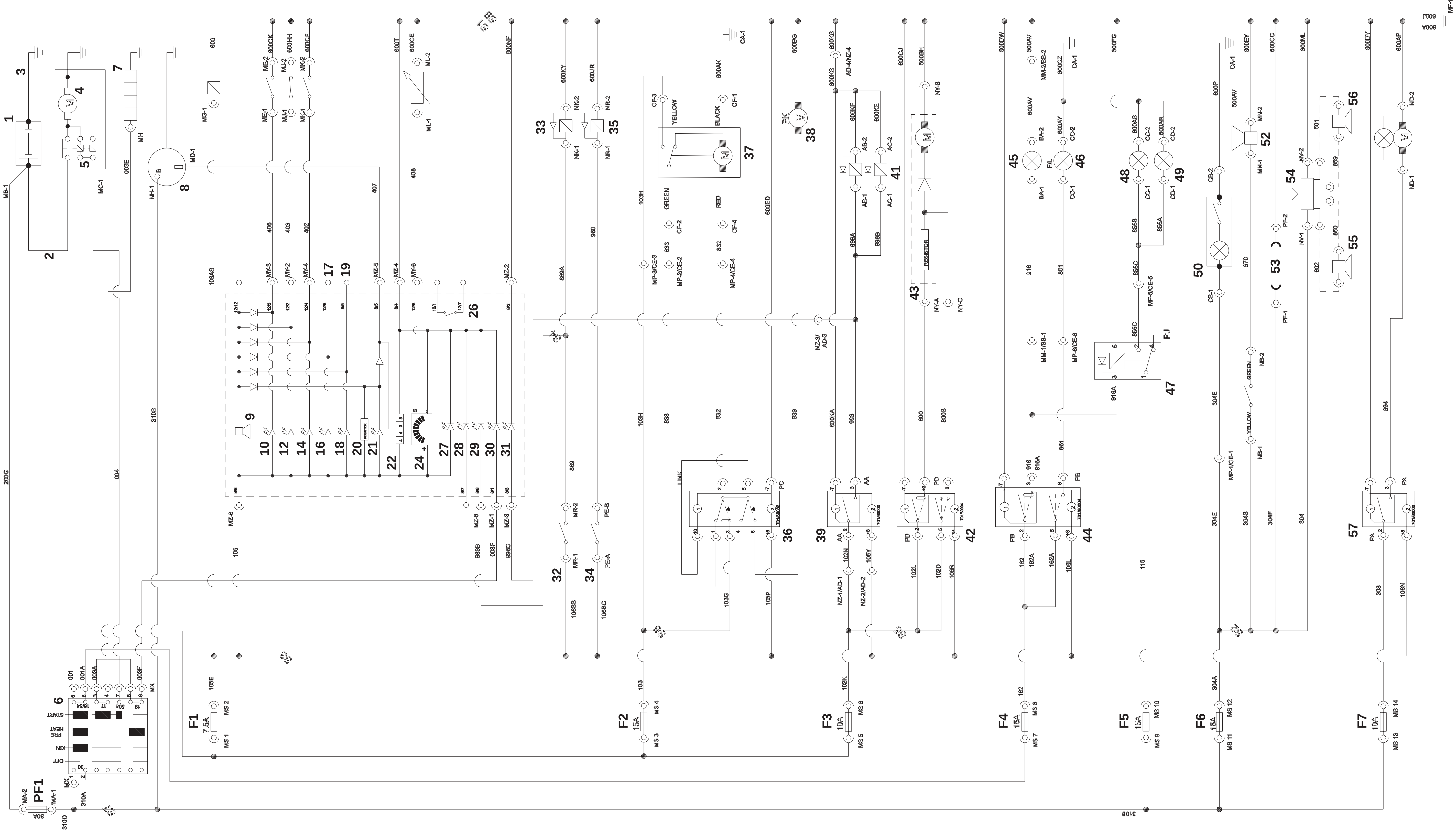
*Electrical Schematic

8052 machines from 0803371



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Harness Locations and Connections - 8052

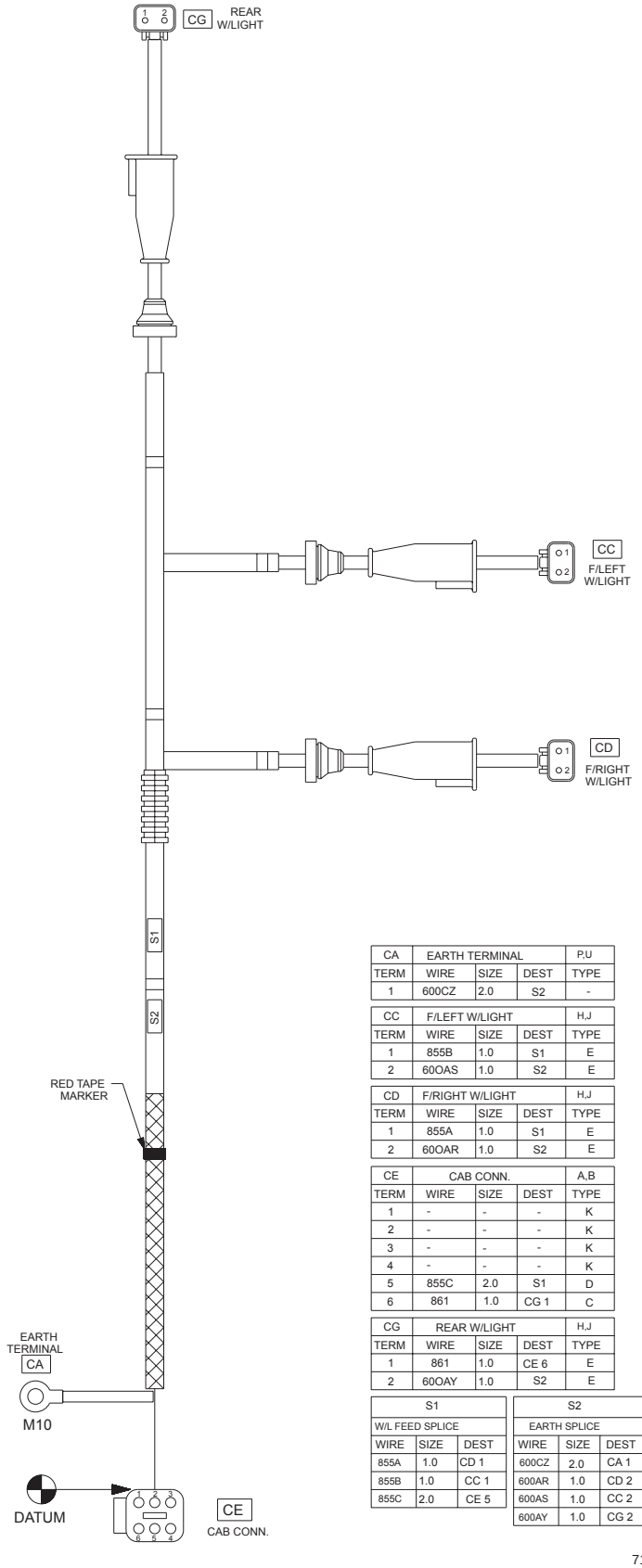
2 Alternator
4 Starter Motor
6 Fuel Solenoid
7 Glow Plug Rail
9 Auxiliary Fuses, Relays and Radio
10 Air Filter Blocked Switch
11 Engine Oil Pressure
12 Water Temperature
13 Fuel Sender
22 All R.H. Pod Equipment, Ignition etc.
23 Interior Light
27 Washer Bottle
36 Two Speed Tracking Switch, in lever knob
37 L.H. Pod Micro-switch
45 Horn
46 Beacon Socket
50 60A Main Fuse
60 Main Earth Connection

Note: Ensure Spiral Sleeving protects harness from the cab lower edge

P Front R.H. Working Light
Q Front L.H. Working Light
S Rear Working Light
V Two Speed Valve - Isolator Valve

Canopy Harness - 721/11353 Issue 2

8052 machines from 0803371



CA	EARTH TERMINAL			P,U
TERM	WIRE	SIZE	DEST	TYPE
1	600CZ	2.0	S2	-

CC	F/LEFT W/LIGHT			H,J
TERM	WIRE	SIZE	DEST	TYPE
1	855B	1.0	S1	E
2	60OAS	1.0	S2	E

CD	F/RIGHT W/LIGHT			H,J
TERM	WIRE	SIZE	DEST	TYPE
1	855A	1.0	S1	E
2	60OAR	1.0	S2	E

CE	CAB CONN.			A,B
TERM	WIRE	SIZE	DEST	TYPE
1	-	-	-	K
2	-	-	-	K
3	-	-	-	K
4	-	-	-	K
5	855C	2.0	S1	D
6	861	1.0	CG 1	C

CG	REAR W/LIGHT			H,J
TERM	WIRE	SIZE	DEST	TYPE
1	861	1.0	CE 6	E
2	60OAY	1.0	S2	E

S1		
W/L FEED SPLICE		
WIRE	SIZE	DEST
855A	1.0	CD 1
855B	1.0	CC 1
855C	2.0	CE 5

S2		
EARTH SPLICE		
WIRE	SIZE	DEST
600CZ	2.0	CA 1
600AR	1.0	CD 2
600AS	1.0	CC 2
600AY	1.0	CG 2

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Control Cables

Inspection

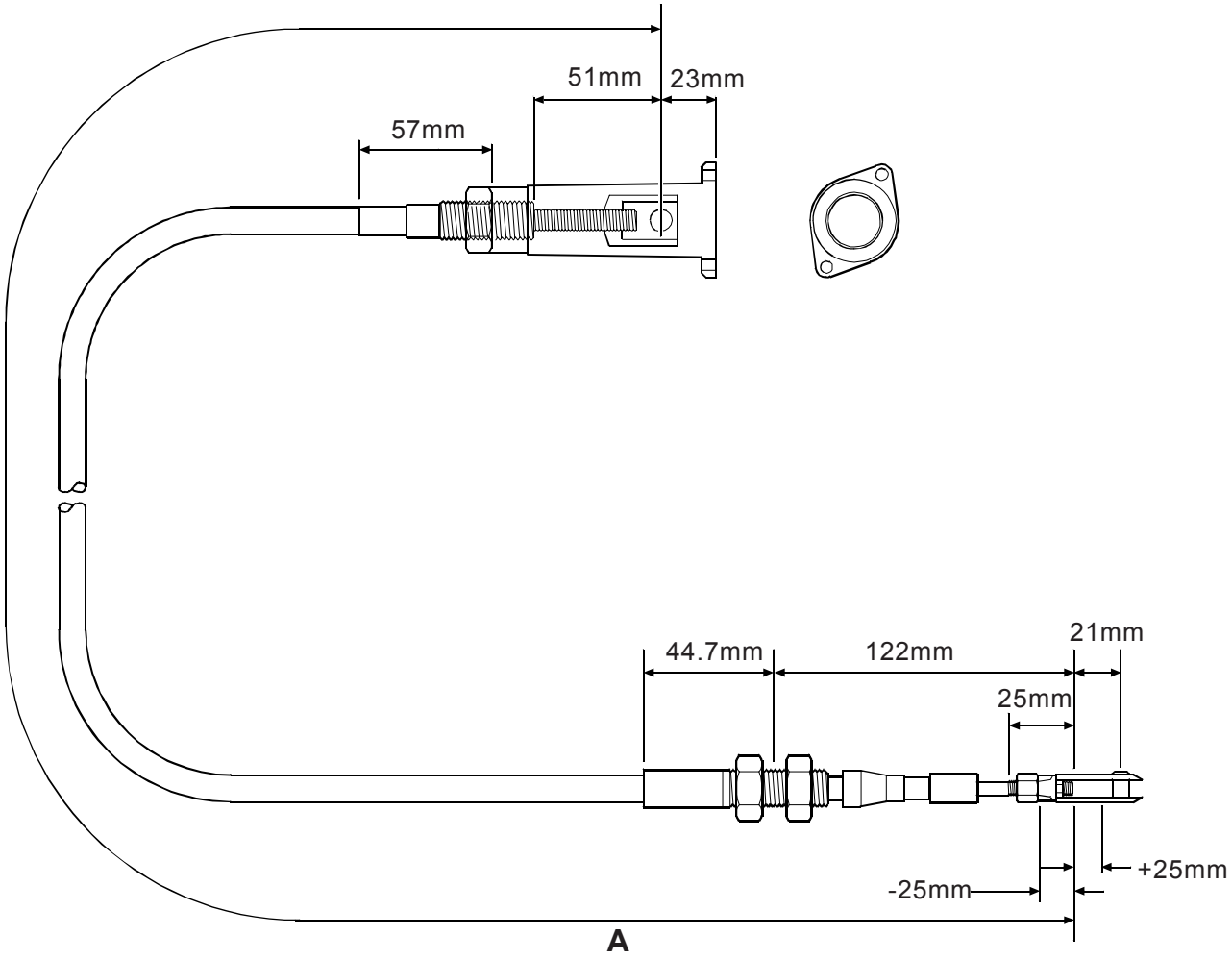
1 Gain access to the cable.

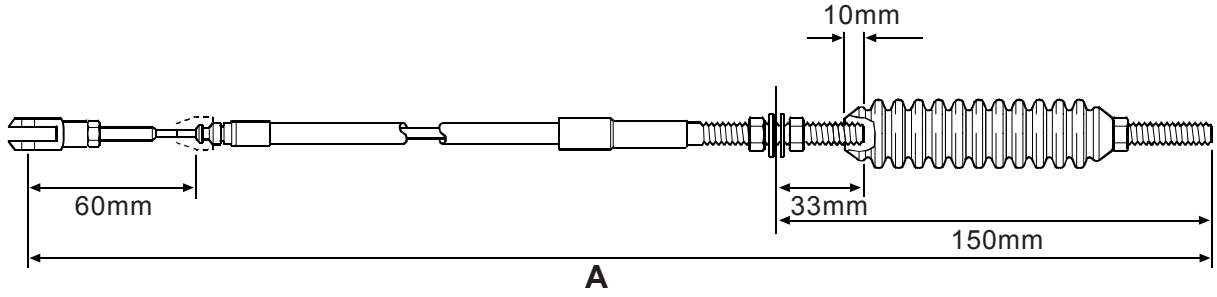
2 Remove the cable from the machine.

3 Examine the cable for signs of wear, or deformation, replace as required.

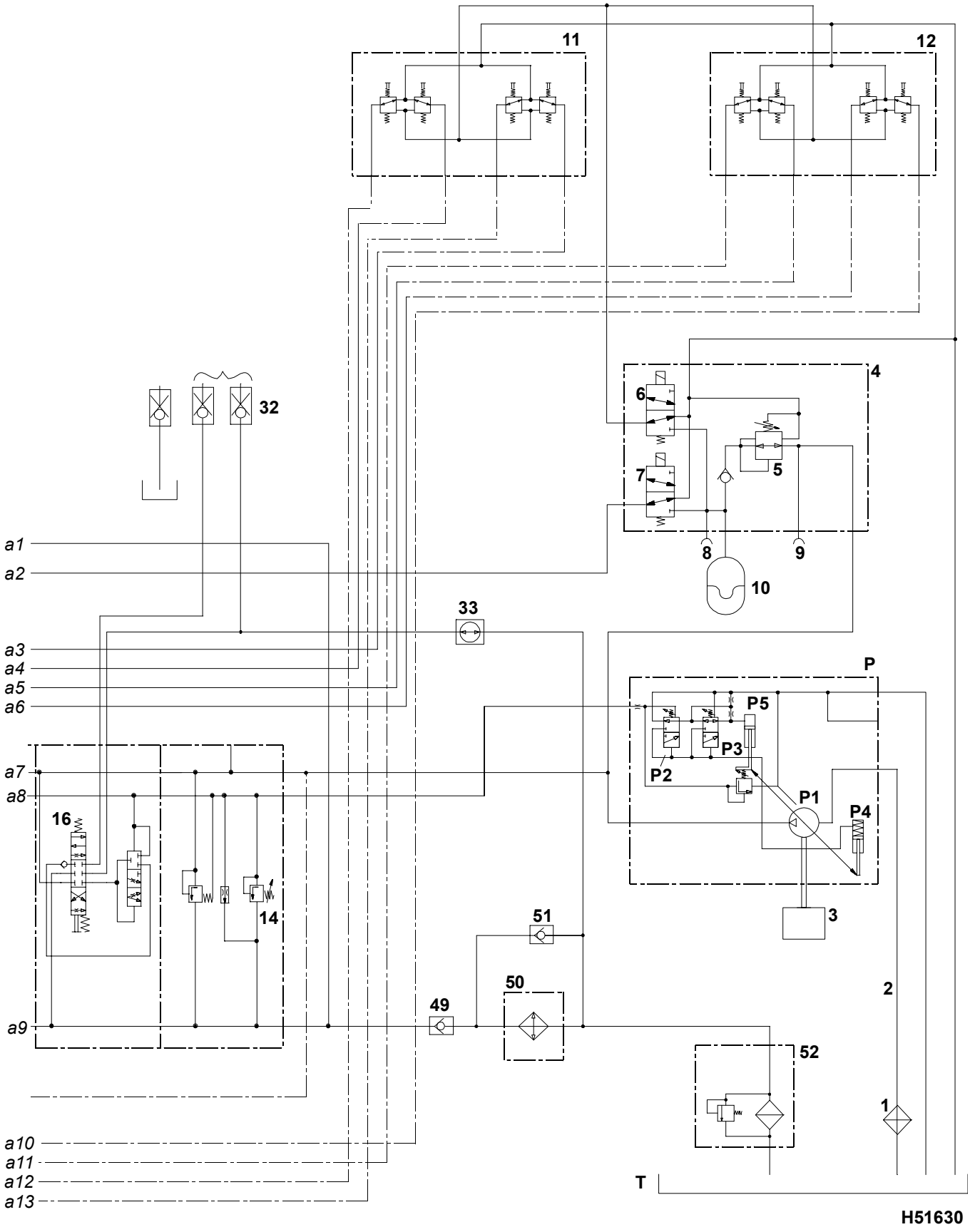
4 Adjust the cable (for mid-stroke position) to conform with the dimensions shown.

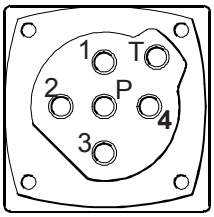
Cable Set-up Dimensions	
	'A'
Dozer	1500mm
Track	1685mm
Swing	2140mm
Throttle	2600mm





Schematic Hydraulic Circuit - 8052





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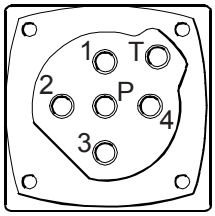

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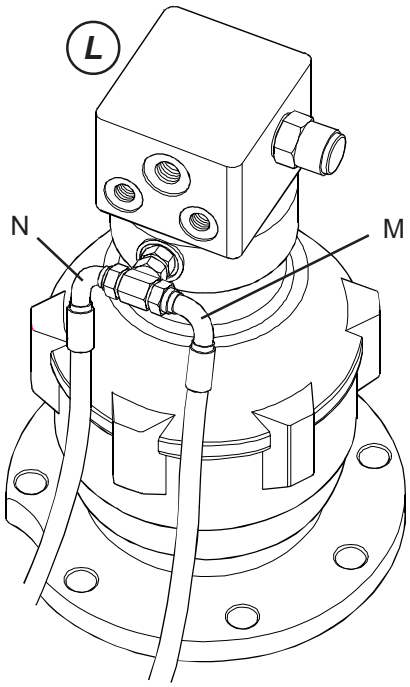
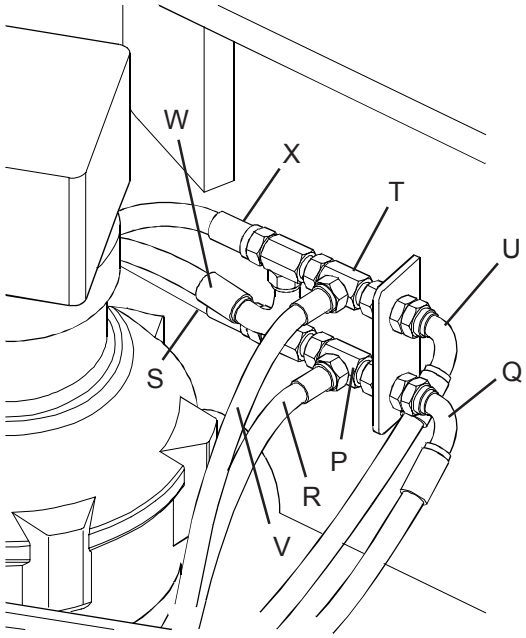
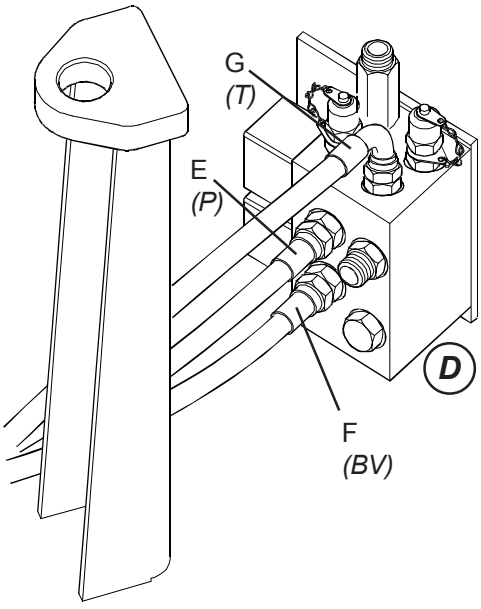
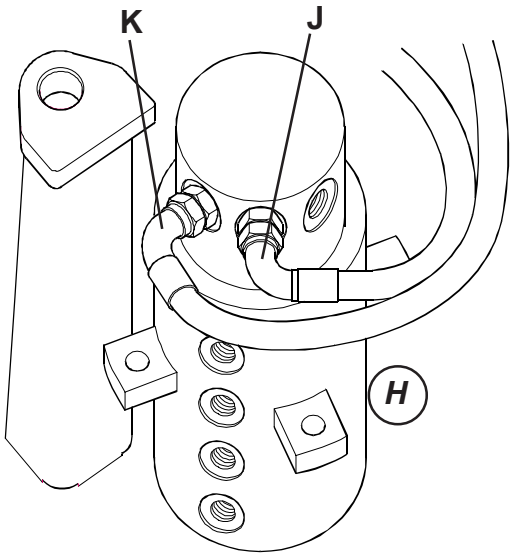
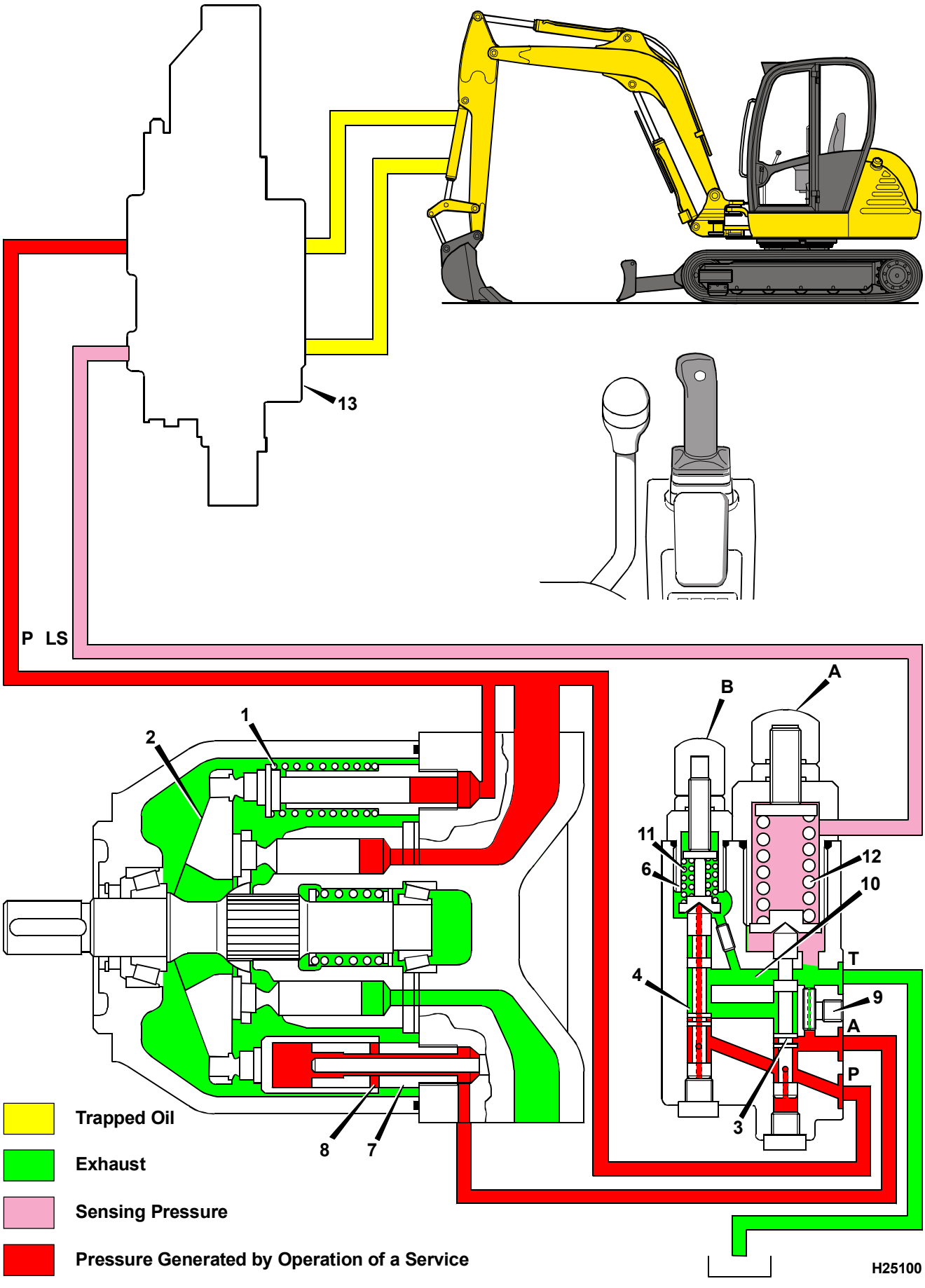








COMPONENT TO DESTINATION - ISO and SAE SERVO CIRCUITS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P LS
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A
B
11
6
12
10
T
4
9
A
P
3
8
7
Trapped Oil
Exhaust
Sensing Pressure
Pressure Generated by Operation of a Service
H25100

Hydraulic Pump - cont'd

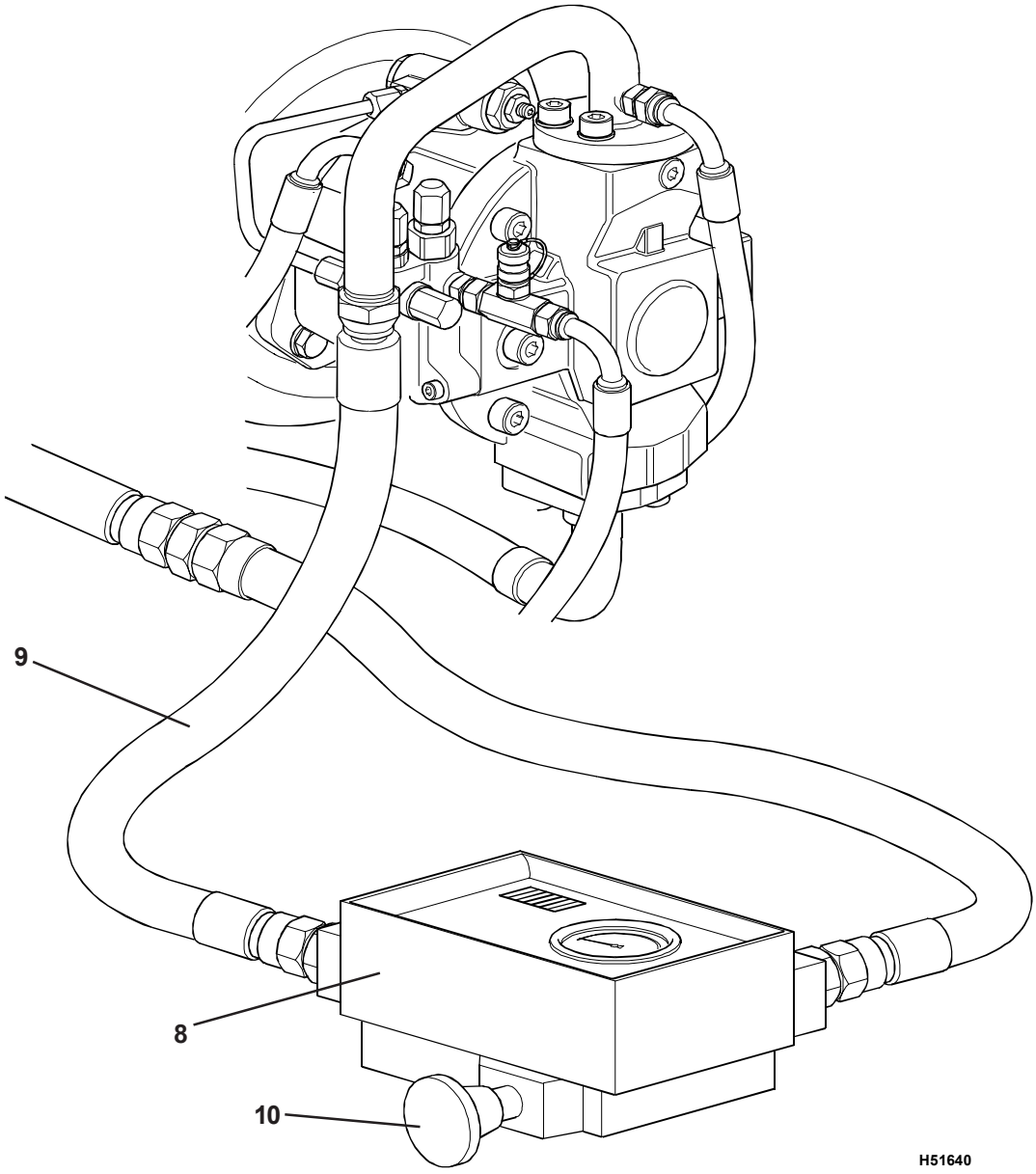
Compensator Valve Adjustment

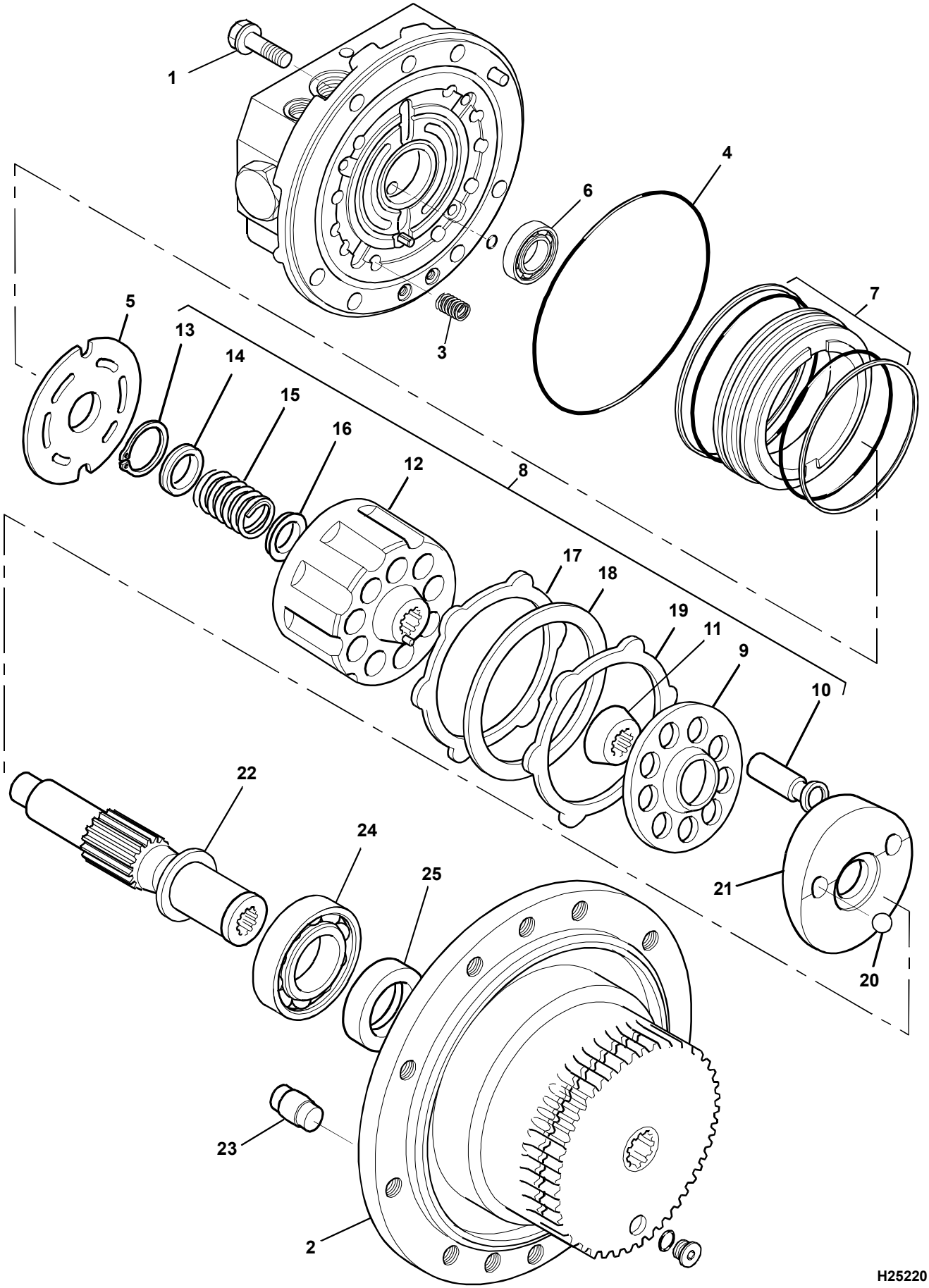
Checking and Setting Procedure

5 Engage track levers in reverse and hold selected. Check and note engine speed, recorded pressure and delivered flow.

6 With track levers still fully engaged, slowly screw load valve adjuster **10** in until 100 bar registers on the pressure gauge. Measure and record engine speed, pressure and flow.

7 Progressively increase load valve induced pressures through 125 bar, 150 bar, 175 bar, 200 bar to a maximum of 225 bar. Each time record engine speed and recorded pressure and flow.

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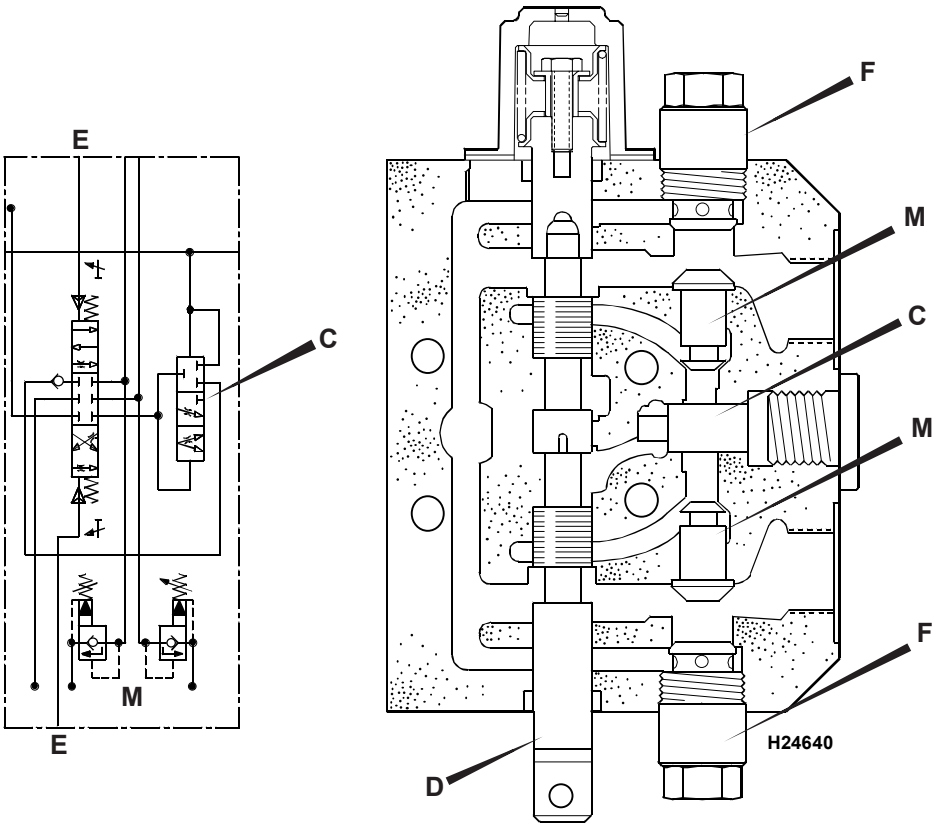
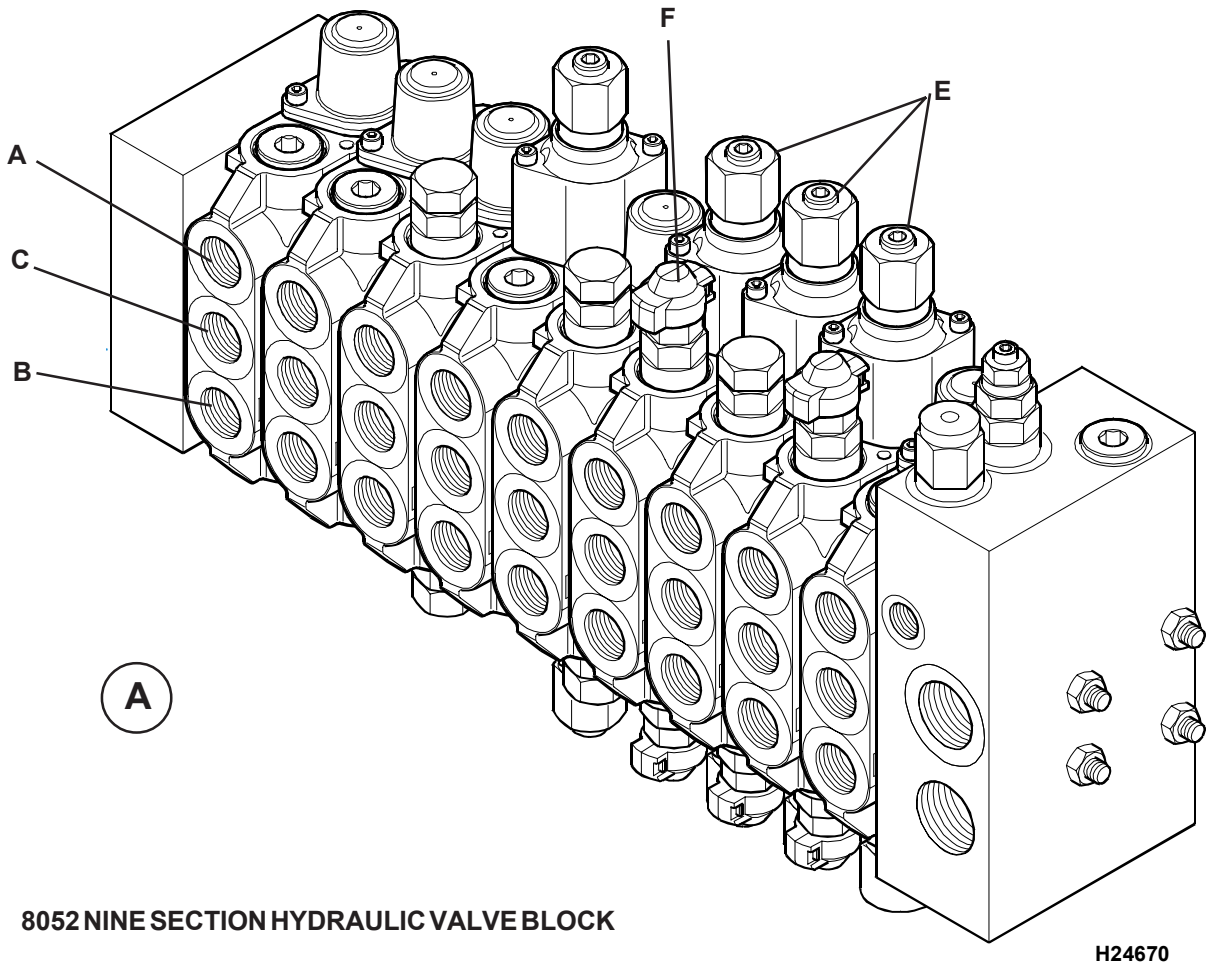
H25220





8052 NINE SECTION HYDRAULIC VALVE BLOCK

H24670

Servo Pressure Relief Valve

Removal

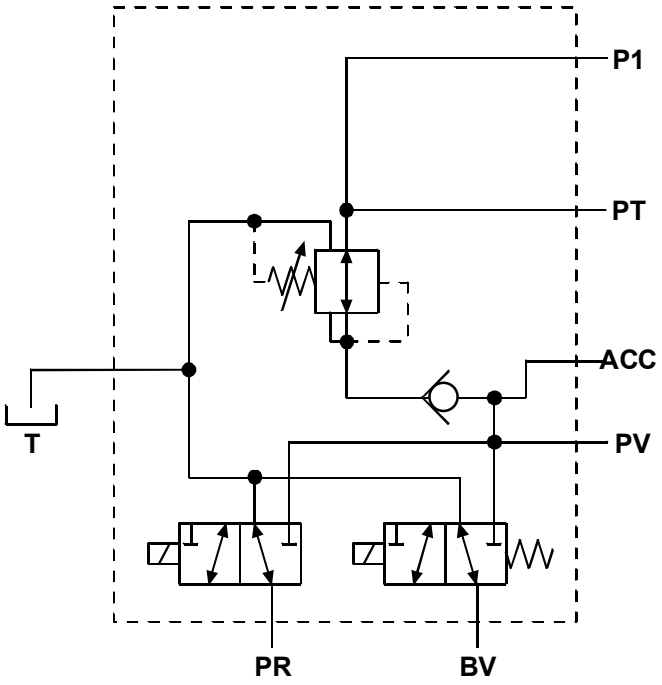
WARNING

Fine jets of hydraulic oil at high pressure can penetrate the skin. Do not use your fingers to check for hydraulic oil leaks. Do not put your face close to suspected leaks. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of hydraulic oil. If hydraulic oil penetrates your skin, get medical help immediately.

HYD001

1 Stop the machine on level ground with the bucket resting on the ground. Stop the engine and vent residual pressure from the servo accumulator by turning the ignition on and lowering the L.H. arm rest to the excavator operate position.Operate both excavator control levers in all directions until stored servo pressure in the accumulator has been exhausted.

2 Remove the key. Open the engine canopy to gain access to the pressure maintenance valve.



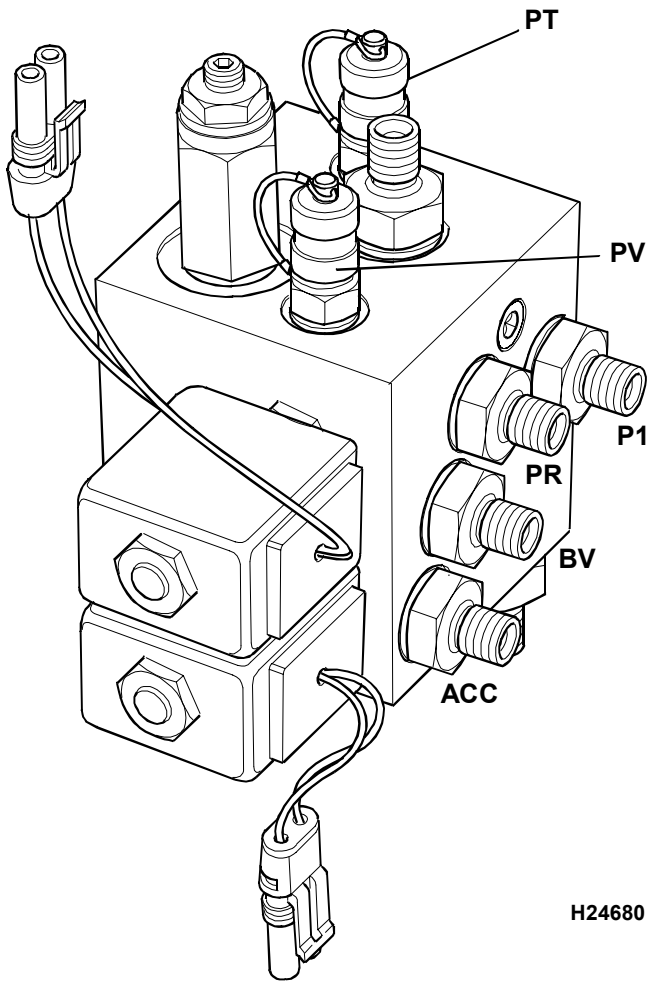
Note: *It is possible to remove the relief valve cartridge for cleaning or resealing without removing the complete valve from the machine.*

3 To remove the valve, mark hoses for correct replacement and remove. plug hoses to prevent the ingress of dirt.

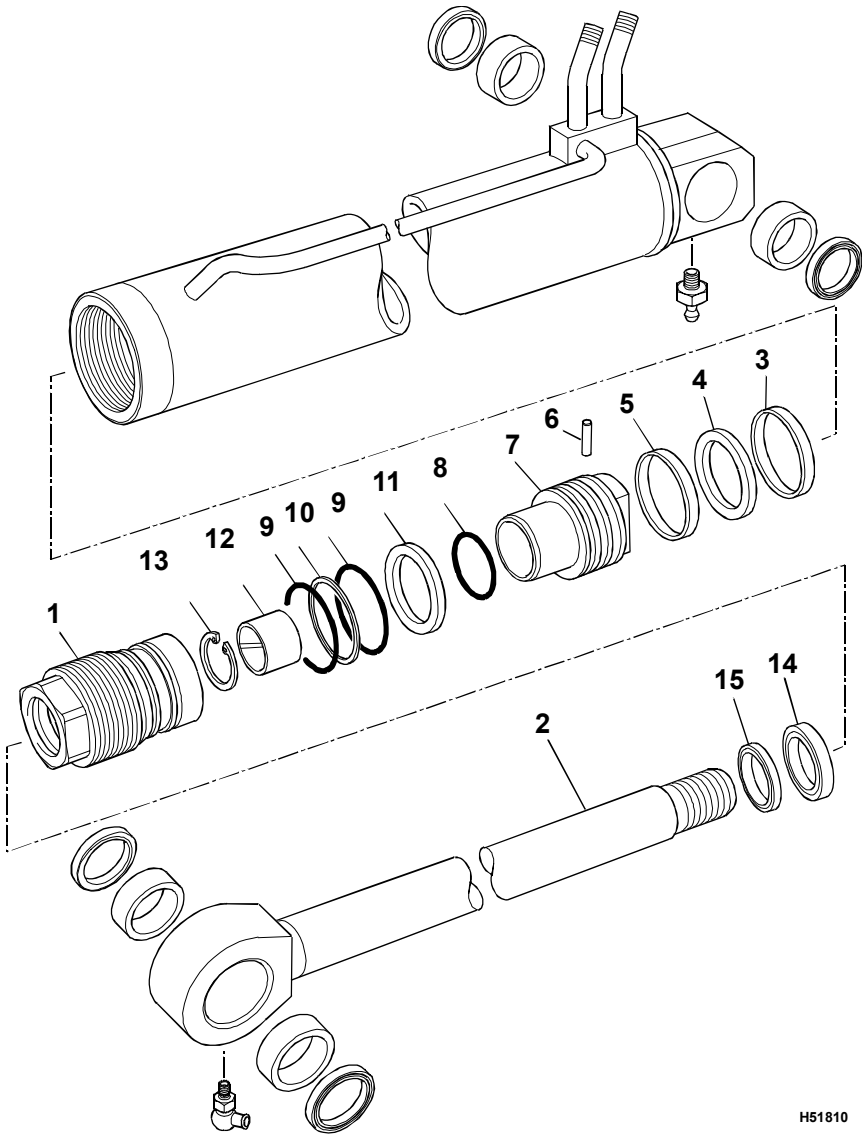
4 Remove bolts holding the valve to the slew frame.

If there is evidence of damage to the valve or its seat caused by debris then the cartridges will require renewing. If a cartridge or valve complete is renewed it is recommended that the filtered adapters in the feed ports of the valve are also renewed.

PT - System Test Point
PV - Servo Test Point



Rams (cont.)



Dismantling and Assembly

A - Boom Ram
B - Bucket Ram
C - Swing Ram
D - Dozer Ram
E - Dipper Ram

When Assembling (continued)

ii Use an undersize diameter drill as a guide and drill into the piston rod to the required depth (see table), make sure the drill has centred correctly on the 'centre mark' made at step 5 i.

iii Use the correct size diameter drill to suit the dowel and drill to the required depth (see table).

iv Remove all swarf and contamination, insert the dowel.

Position cylinder on bench and install rod assembly into cylinder.

Apply Loctite 932 to first three threads of cylinder, torque tighten the end cap to 678 Nm (500 lbf ft).

Note: *If hydraulic oil contacts uncured Loctite a weakening of the bond will result. Cure times vary according to the ambient temperature and type of Activator used. The following approximate cure times apply at 20°C and are the minimum periods between assembly and filling the ram with oil.*

Loctite 262 or 932 with Activator N - 1 hour
Loctite 262 or 932 with Activator T - 2 hours

Note: *Cold weather operation.*
When operating in conditions which are consistantly below freezing, it is recommended that the rams are operated slowly to their full extent before commencing normal working.

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