

Teagle

TOMAHAWK

808, 8080, 9090, 1005 & 1010

Valve & Electronic System Details.

Instruction Book & Parts List



Issue 05/12

Tomahawk 808S From Serial No. 2000

Tomahawk 8080 From Serial No. 3800

Tomahawk 9090 From Serial No. 1600

Tomahawk 1005 From Serial No. 1501

Tomahawk 1010 From Serial No. 3501



SAFETY FIRST!

- 1. READ THE INSTRUCTION BOOK THOROUGHLY** before attempting to operate or carry out any maintenance on the machine. If you do not understand any part of this manual, ask your dealer for assistance.
- 2. ALWAYS CARRY OUT SAFE MAINTENANCE.** Never clean, adjust or maintain the machine unless the engine has been stopped, the machine come to rest, the PTO disengaged and the key removed.
- 3. NEVER WORK UNDER A MACHINE RAISED ON THE 3-POINT LINKAGE** unless it is securely supported.
- 4. NEVER OPERATE THE MACHINE WITH ANY PARTS OR GUARDS MISSING.** Check that all guards including the PTO shaft guards are in good condition and in place before operating the machine.
- 5. SECURE THE PTO GUARD BY MEANS OF CHECK CHAINS** to suitable points on the tractor and machine to prevent the shield from rotating.
- 6. NEVER PUT YOUR HAND OVER A HYDRAULIC LEAK.** Oil under pressure may enter the blood stream.
- 7. BEFORE DISCONNECTING HYDRAULIC HOSES ALWAYS LOWER THE HYDRAULIC RAMS** for safety as this prevents residual pressure in the hoses.
- 8. OPERATE SAFELY.** Before starting work, check that there are no persons or animals in the immediate vicinity of the machine or tractor. Always maintain full control of the tractor and machine. Ensure that you know how to stop the tractor and machine quickly in case of emergency.
- 9. NEVER STAND BETWEEN THE MACHINE AND THE TRACTOR WHEELS.**
- 10. DO NOT WEAR LOOSE OR RAGGED CLOTHING.**
- 11. BEWARE OF DUST.** Under dusty conditions, keep the cab windows and doors closed. The use of a dust mask conforming to EN149 is strongly recommended.
- 12. BEWARE OF HIGH NOISE LEVELS.** Some tractor/ implement combinations give noise levels in excess of 90dB at the operator's ear. Under such circumstances, ear defenders should be worn. Keep cab windows and doors closed to reduce noise level.

Throughout this handbook, the term `tractor' is used to refer to the power source used to drive the machine. It does not necessarily refer to a conventional agricultural tractor.

HEALTH AND SAFETY AT WORK

Our equipment is designed so as to conform with current Health & Safety Regulations and therefore poses no significant hazard to health when properly used. Nevertheless, in the interests of all concerned, it is essential that equipment of our manufacture is used in accordance with the instructions that are supplied or are available from our Technical Staff.

Legislation requires that all operators are instructed in the safe operation, cleaning and maintenance of equipment and machines. The handbook forms part of that instruction and it must be read and understood before fitting the machine onto the tractor or attempting to use it.

The supplier is responsible for carrying out any necessary pre-delivery inspection, fitting the machine onto the tractor and test running. The supplier must also give instruction in the safe use, maintenance and adjustment of the machine.

In the interests of safety, please ensure that the instructions referred to above are brought to the attention of all your employees who are to use the equipment. We recommend that the use of this equipment is restricted to capable trained operatives. Persons under the age of sixteen should not operate the machine and should be kept away from where it is being used.

WARRANTY

The standard warranty is for 12 calendar months against faulty materials and workmanship. Components supplied as part of the original machine, but manufactured by another company, e.g. PTO shafts, wheels etc., are subject to the original manufacturer's conditions and warranty.

Where repairs are carried out under warranty:-

- Claims for the fitting of non original parts will not be considered unless prior agreement has been obtained.
- The repairer must be advised that the work is to be the subject of a warranty claim beforehand.

- Any claim must be submitted within four weeks of the repair.
- The damaged parts must be retained for inspection and returned carriage paid if required.

The right to withdraw warranty is reserved if:-

- Non-original parts are fitted.
- The machine has been abused, badly maintained or used for purposes other than that for which it was designed.

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SECTION 1. INSTALLATION INFORMATION.

SAFETY FIRST - READ THE INFORMATION AT THE FRONT OF THIS BOOK.

1.1 TRACTOR VALVE CONNECTION.

The hydraulic valve block requires an oil supply from a double/single acting valve with an unrestricted return and must be completely independent of the 3-point linkage. The supply to the valve should be at least 50 litres/min for correct operation but must not exceed 60 litres/min. If the tractor has a high flow pump e.g. 100 litres/min, it must be reduced in a way approved by the individual tractor manufacturer.

IMPORTANT - Closed Centre Hydraulic System.

Where the oil flow to the machine cannot be controlled effectively, on Generation 2,3, & 4 valves a closed centre kit is available (HYD5342) that can fit the valve block to permit closed centre operation. This will ensure correct operation of the machine and protect the tractor's hydraulic system from being damaged. However, Generation 1 valve blocks do not support the close centre system. The only alternative is a 3rd line return supplied by the tractor manufacturer. If in doubt contact your relevant tractor dealer for advice.

IMPORTANT- Oil must flow through the valve in the correct direction and an identifying tag has been attached to the pressure line to assist in the correct connection to the tractor spool valve pressure port. Failure to observe this requirement may result in the valve seals failing.

1.2 CABLE CONTROL INSTALLATION.

The control lever mounting bracket should be fitted inside the cab so that the levers are conveniently situated for the operator. It should be remembered that structural members of the cab must not be drilled or welded and thus some modification of the mounting bracket may be required. Place the cable control unit in the cab and slot into the control lever mounting bracket. Route the cables outside the cab clear of any rear linkage components and PTO shaft.

1.3 ELECTRONIC CONTROL INSTALLATION.

The electric control box mounting bracket should be fitted inside the cab conveniently situated either side of the operator. It is necessary to reverse the control box on its mounting plate if the mounting bracket is to be fitted to the left of the operator. To reverse the mounting plate carefully remove the lid of the control box to reveal the heads of the mounting bolts, unbolt the box and refit reversed. Replace the lid making sure the seal is correctly positioned. It should be remembered that structural members of the cab must not be drilled or welded and thus some modification of the mounting bracket may be required. Place the electric control unit in the cab and slot into the control box mounting bracket.

Provided with the controls, is a 3 pin connector cable to be plugged into the tractor. In the event that a 3 pin socket is not available the socket head can be removed and connected directly to the battery. **The controls have been designed to be supplied through this cable and WARRANTY SHALL BE INVALIDATED if this cable is modified.** When fitting to the tractor, make sure that the brown cable (positive) is fitted to the positive terminal of the battery. Failure to connect the wires correctly should result in:

- **Latest control desks (Serial No 6000+)** main circuit board is protected by a relay to prevent damage from incorrect polarity and should not power up until correct polarity is connected.
- **Older control desks** connected with incorrect polarity will cause the in-line 7.5 amp protective fuse to blow. The fuse will continue to blow until the power supply cables are connected correctly to the battery terminals.

UNDER NO CIRCUMSTANCES SHOULD A FUSE WITH A HIGHER RATING THAN 7.5 AMPS BE FITTED AS THIS WILL INVALIDATE WARRANTY. If a higher rated fuse is fitted whilst the power cable is connected to the incorrect polarity the control desk will suffer severe damage and have to be replaced. Also a higher rated fuse will give no protection from power surges when connected correctly. When fitting the cable, make sure it is routed away from high temperature and moving engine components. Avoid sharp edges that would damage the cable, particularly when passing the cable through a bulkhead.

Once the control box has been positioned, route the machine cable into the cab making sure it is kept away from the rear wheels and any pinch points between the PTO shaft and link arms. Where possible, route into the cab through cable entry points on the tractor, allowing the rear window to be kept closed during use. Plug the cable connector into the socket on the box and secure by engaging the locking clip.

1.4 ELECTRONIC CONTROL BOX STORAGE.

When the machine is not being used, the control box should be **stored in a dry location** with the connector cover closed safely away from the machine to prevent the possibility of water ingress which may damage the electronics. The plug on the end of the machine cable should be kept clean and stored safe from damage.

1.5 ELECTRONIC CONTROL MAINTENANCE.

Teagle Machinery Ltd should be contacted immediately if any problem is found with any aspect of the electronic controls during the warranty period. The correct course of action shall be advised by a member of the manufacturer's Technical Staff.

Failure to comply with this request shall INVALIDATE THE WARRANTY. Before maintaining any part of the electronic controls and wires, disconnect the 12v supply as failure to do so may result in damage to electronic components.

NOTES.

SECTION 2. ELECTRONIC CONTROL IDENTIFICATION.

This manual covers the current, and previous versions of the electronic control system which can be identified from figures 2.2 and 2.3 below. It is important to correctly identify the control system before diagnosing problems or ordering parts as parts of individual systems are not interchangeable i.e. new control desks are not compatible with old junction boxes. As a guide, the current design of controls were fitted to machines after the serial numbers shown in Table 2.1 below.

Table 2.1 Last Machines Fitted With Previous Style Controls

Machine Type	808	8080	9090	1005	1010
RH	2520	4290	1770	1501	3500
S/SC	2495	4271	1770	1501	3500
DC/TC	2519	4287	1770	N/A	N/A

NOTE: All current design control desks have a serial number on the base of the control desk (T****C) which can be identified through the aperture of the steel mounting plate. Please quote the serial number of Box, and Machine when entering into any correspondence with Teagle Machinery Ltd.

For information on earlier versions of the electronic control system not identifiable from either Figures 2.1 or 2.2 below please refer to previous issue manuals.

Figure 2.2 Current Design - Large Raised Buttons. Series 5. Control System.

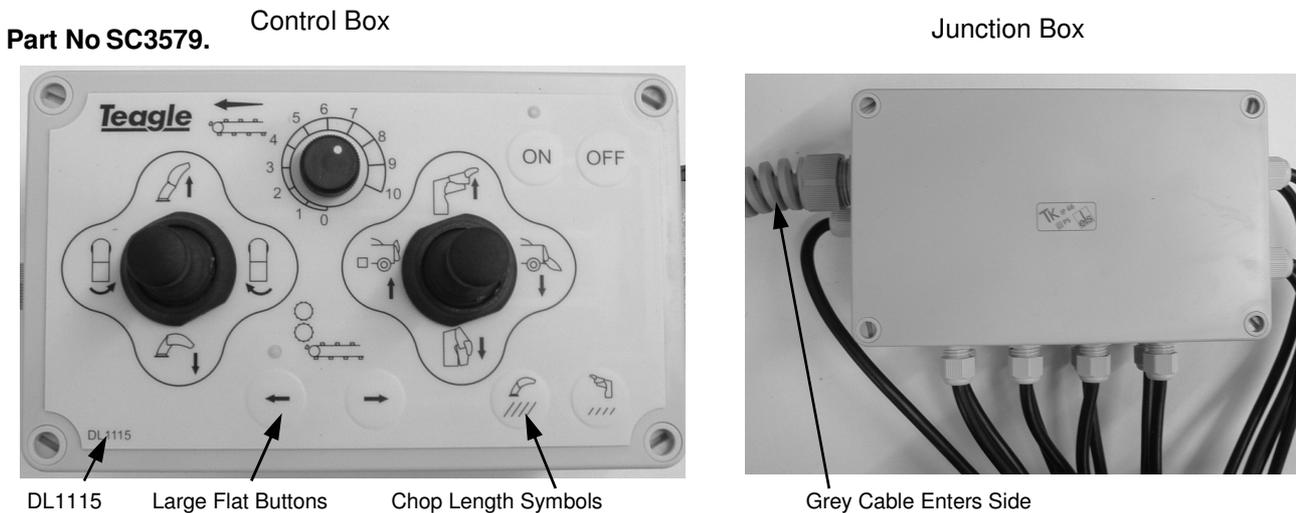
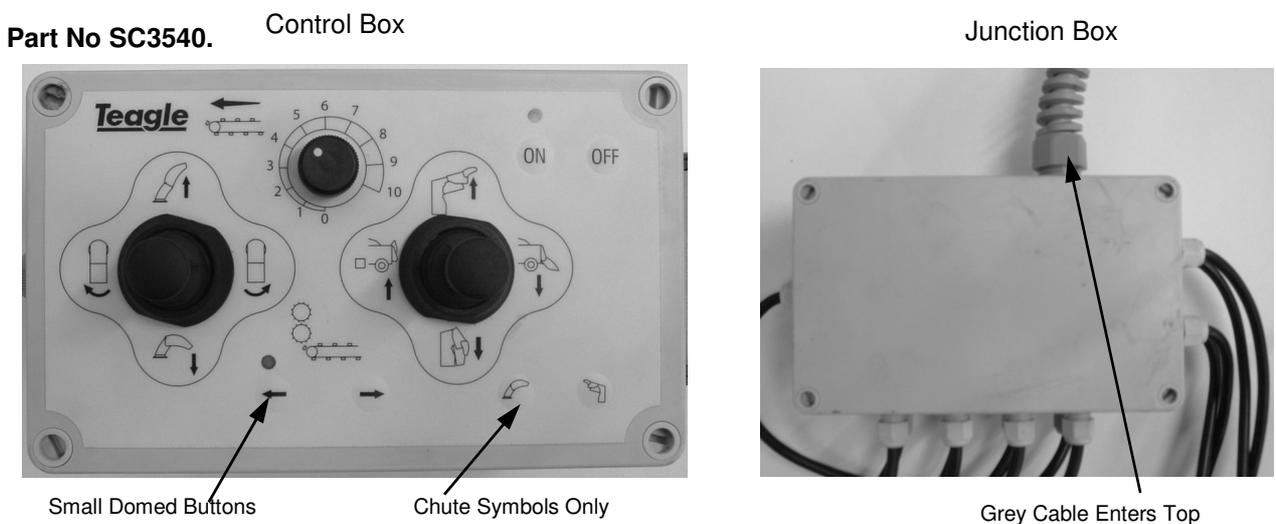


Figure 2.3 Previous Design - Small Domed Buttons. Series 4. Control System.



SECTION 3. CONTROL BOX FUNCTIONS.

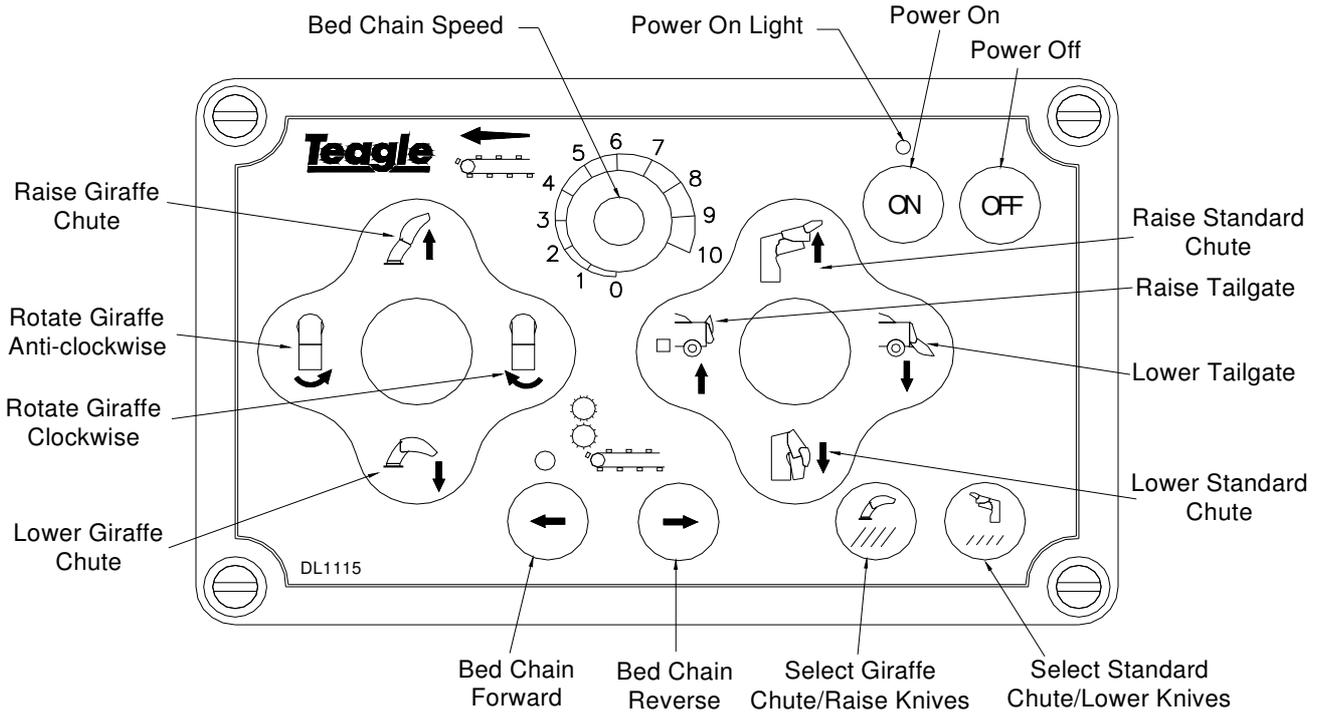


Figure 3.1 Control Functions. Series 5. Control Box.

3.1 Programming your Control Desk to your Tractor. (SC3579 Control Box, with DL1115 Decal.)

Each tractor has different flow rates from its hydraulic system. The control desk is programmable to optimise the performance of the machine depending on the oil flow that the tractor can deliver.

The following instructions will allow you to programme the stop position and high speed position of the bed speed dial. This process will allow maximum bed speed, and control without compromising the other services the valve block can provide.

To perform this operation the following steps must be followed exactly.

1. Turn on the tractor and engage the hydraulic systems.
2. Set the tractor revs to a normal working RPM.
3. With the control box off turn the bed speed dial down to 0.5.
4. The following buttons must then be pressed & held down in this order;

- I) Bed Forward  II). Long Chop.  III) On. 
5. Hold the sequence of buttons for 8 seconds until both the bed forward, and on LED's illuminate.
6. Release buttons and the LED's should flash alternately.

7. Using the Long Chop Button  to slow down, and the Short Chop Button  to speed up, slow the bed down to the point where it just stops.
8. Press the Off button to save the slow speed.

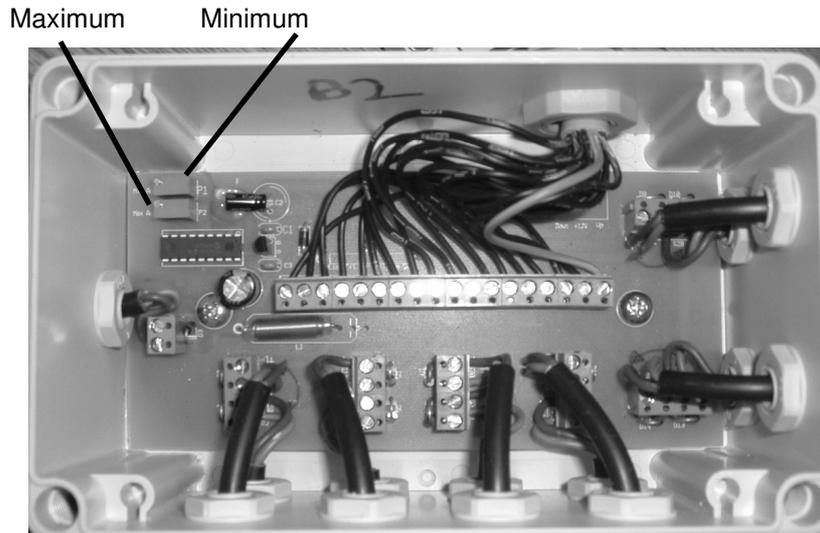
You have now programmed the control desk for its minimum bed speed.

To programme the control desk for its Maximum speed repeat the same process again BUT **Step 4** should have the speed dial set to 10 and in **Step 7** you should increase the bed speed.

Important, When setting the maximum bed speed the full flow of oil could be directed to the bed. The bed speed may then need to be reduced from maximum to allow operation of the chute / tailgate. This can be programmed in when setting the maximum speed of the machine by slowing down the bed before saving. However if the customer requires full bed speed, please make the customer aware that the other functions may be compromised during full speed operation.

3.2 Adjusting bed chain speed range. (Pre DL1115)

1. Remove the valve guard and junction box cover.
2. Remove cover of junction box on machine to expose PCB.
4. Start tractor and set engine to working rev's and prime hydraulics.
5. Set potentiometer to 1 on the control desk.
6. Adjust the Min setting (see Fig 3.2) on the junction box by turning **Anticlockwise** until the bed is barely moving, this way when the control desk is set to 0 the bed will stop.
7. Now turn the potentiometer to 10 on the control desk.
8. Adjust the Max setting (See Fig 3.2) by turning **Clockwise** until optimum bed speed is achieved.



Please Note.

Figure 3.2 Junction box circuit board.

Old Series 4, control desks (SC3540), and junction boxes are no longer available and hence replacement parts are also not available. If you have a old type control desk and junction box they are a pair and not compatible with the DL1115, (SC3579) system and matching junction box. If they are mixed (e.g. Old control desk linked to a new junction box) then both will incur irreparable damage. If either part of the old system is damaged and needs replacement, both junction box PCB, and control desk will need replacing at the same time.

3.3 Bed Chain Forward/Reverse.

(SC3540 - Small Domed Buttons).

The bed chain can be operated in the forward direction by pressing the forward button on the box. In order to reverse the bed chain once in the forward direction, press and hold the reverse button, once released the bed chain will automatically stop. To stop the bed chain press the forward button.

(Raised Button Model. - Large Flat Buttons).

The bed chain can be operated in the forward direction by pressing the forward button on the box. To reverse the bed chain press and hold the reverse button while the bed chain is at rest or operating in the forward direction. Once the reverse button is released the bed chain will return to rest. The bed chain can be stopped from moving in the forward direction by pressing either of the two directional buttons.

3.4 Overload Protection.

Along with the in-line fuse (7.5 amp), the electronic controls also have a built-in overload (short circuit) protector. When the fuse fails the red LED on the fuse holder will illuminate. When the protection device activates due to an overload, the control desk will not operate and the Green LED above the On Button will flash a couple of times. In order to reset the device, the control box must be turned off and then turned back on again. It may take a few minutes to cool down. If the control box will not turn back on then there is a permanent short circuit present. In this case when the control box is switched on the green LED on the desk will turn on briefly and then go off. The short circuit will have to be detected and rectified before the control desk will operate correctly.

3.5 Low Voltage Protection.

When the control desk is not receiving a high enough voltage, or if it is too high, the control desk will stop working and the green LED above the ON button will flash at a slow rate until the correct voltage is reached.

3.6 Indicating max/min supplied voltage during service (DL1115 only).

1. Hold bed chain forward, Off and On buttons for approx. 14 seconds until both green LED's are ON.
2. Turn the bed chain speed dial to maximum for minimum voltage which will be indicated by the bed chain forward LED, one flash per volt under voltage, which is repeated.
3. Turn bed chain speed dial to minimum for maximum voltage which will be indicated by the bed chain forward LED, one flash per volt over voltage, which is repeated.
4. Turn off to revert to normal.

Note: Standard supply voltage is 13.8V.

3.7 Tailgate Switch.

The remote tailgate switch (SC3584-SA1) is only compatible with the DL1115 style control box.

Tailgate switch Kit part number for 808/9090/1010 is SC3586, and 8080, is SC3587. When fitting the kit, Brown wire is to 5v connection. Blue is to B connection, and Green/Yellow to A connection.

Testing Remote Controls.

Use a voltmeter capable of reading up to 5volts DC.

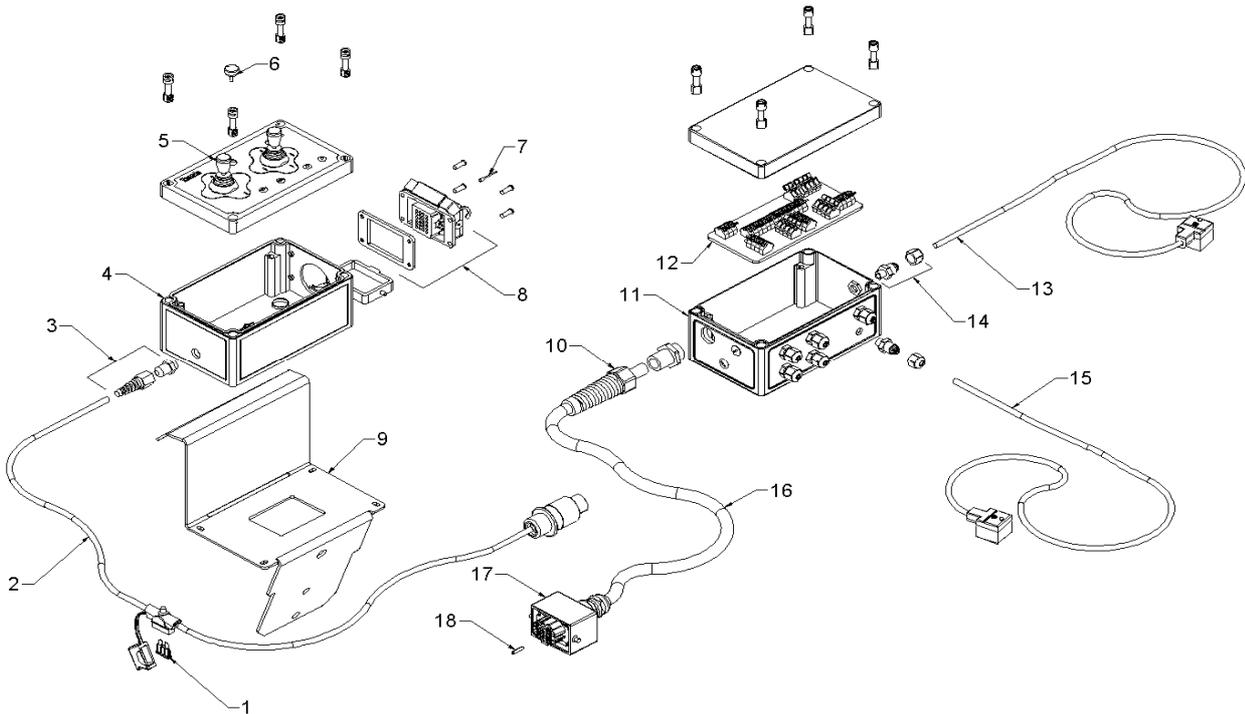
Connect between Brown wire and either blue or green/yellow and check for voltages close to those shown below. This will test the functionality of the basic parts of the remote control module.

Connect meter between Brown and;	Blue Check voltage	Green / Yellow Check voltage
No Buttons pressed.	5V	5V
Press Safety triangle.	2.8V	2.8V
Press Any ONE direction button.	5V	5V
Press Safety triangle, and, UP arrow.	5V	1.8V
Press Safety triangle, and, DOWN arrow.	5V	1.3V
Press Safety triangle, and, Bed FORWARD.	1.8V	5V
Press Safety triangle, and Bed REVERSE.	1.3V	5V

Due to the high performance bed motor it is possible for it to take the whole flow of oil available from the tractor, this will show up as an apparently faulty tailgate switch, or a bed that judders backwards. Other functions may not work at the same time. Please re calibrate the control box if you think this may be the problem. Section 3 refers.

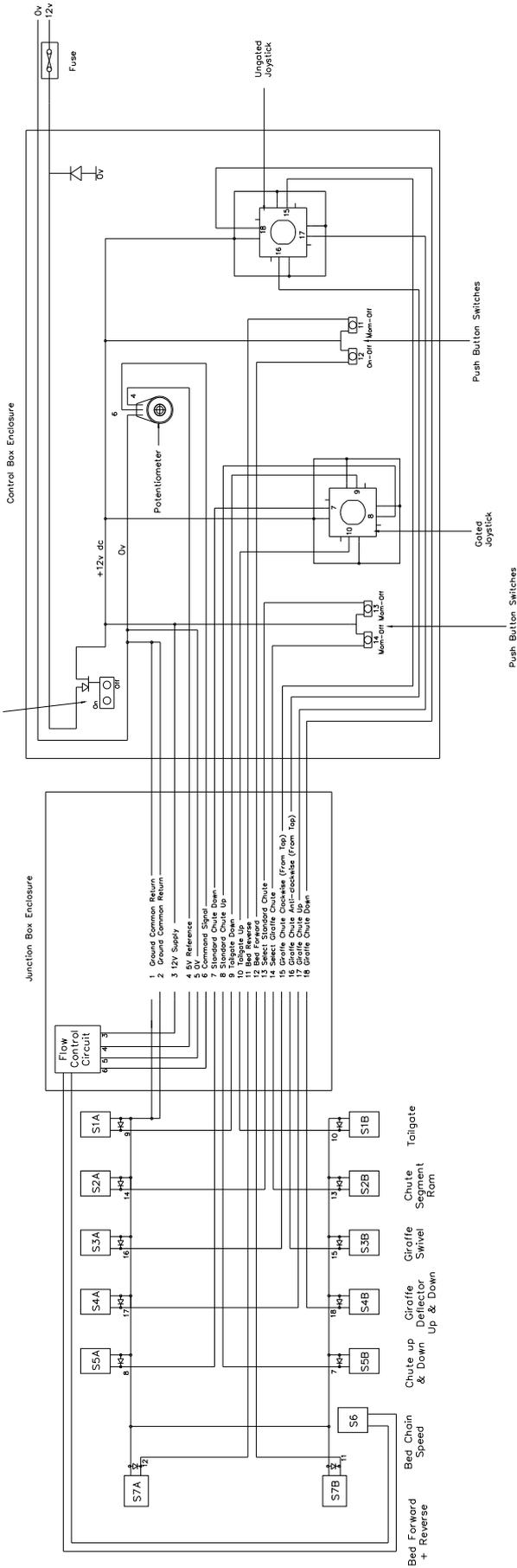
SECTION 4. Electronic Parts & Circuit Diagrams.

Section 4.1 Electronic Controls.

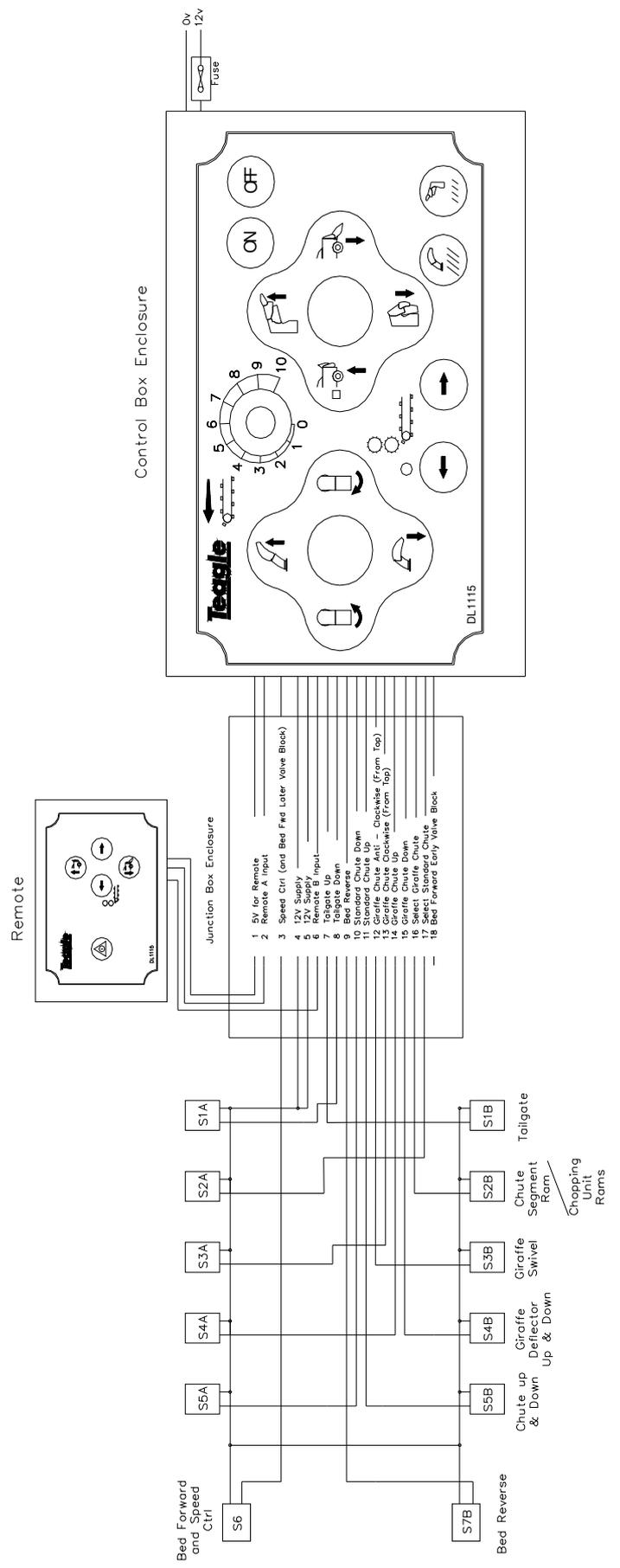


Ref.	Description.	Standard Chute.	Swivel Chute.	Dual Chop & TC.	Qty.	Associated Components.	Part No.	Qty.
	Control Box Assembly.	SC3580	SC3579	SC3579	1			
1	7.5 A fuse.	SC3535	SC3535	SC3535	1			
2	Power Cable.	SC3503	SC3503	SC3503	1			
3	Cable Gland.	SC3504	SC3504	SC3504	1			
4	Enclosure.	SC3506	SC3506	SC3506	1			
	Base.	SC3506A	SC3506A	SC3506A	1			
	Lid.	SC3506D	SC3506C	SC3506B	1			
5	Joystick.	SC3510	SC3510	SC3510	1	Micro-switches	SC3566	4
6	Potentiometer.	SC3513	SC3513	SC3513	1			
7	Male Crimp Contacts.	SC3516	SC3516	SC3516	18			
8	Control Box Socket.	SC3515	SC3515	SC3515	1	M4 x 16 Pan Head	FAS2430S	4
						M4 Locknut	FAS2329S	4
9	Support Bracket.	SC3538	SC3538	SC3538	1	M4 x 16 Pan Head	FAS2430S	4
						M4 Locknut	FAS2329S	4
	Junction Box Assembly.	SC3583	SC3582	SC3581	1			
10	Cable Gland.	SC3524	SC3524	SC3524	1			
11	Enclosure.	SC3525	SC3525	SC3525	1	M4 x 16 Pan Head	FAS2430S	4
						M4 Locknut	FAS2329S	4
12	PCB (Large Controls).	SC3575	SC3575	SC3575	1	M4 x 3/8 Pan Head	FAS2431	2
13	Solenoid Cable - long.	SC3548	SC3548	SC3548	2	Connector Screw	SC3585	2
14	Sealing Gland.	SC3537	--	--	7			
		--	SC3537	--	9			
		--	--	SC3537	13			
15	Solenoid Cable -short.	SC3547	SC3547	SC3547	5-11	Connector Screw	SC3585	5-11
16	18 Core Cable Assy. 4m.	SC3522	SC3522	SC3522	1	(Standard)		
	18 Core Cable Assy. 5m.	SC3592	SC3592	SC3592	1	(Optional)		
	18 Core Cable Assy. 7m.	SC3594	SC3594	SC3594	1	(Optional)		
	18 Core Extension Cable.	SC3599				includes male and female ILME Connectors.		
17	Cable Socket.	SC3518	SC3518	SC3518	1			
18	Female Crimp Contacts.	SC3519	SC3519	SC3519	18			

4.2 Pre DL1115. Independent Speed Control.



4.3 DL1115. Combined Speed Control.



Section 5 . Solenoid Valve Block.

5.1 Solenoid Valve, Combined Bed Forward/Speed Control.

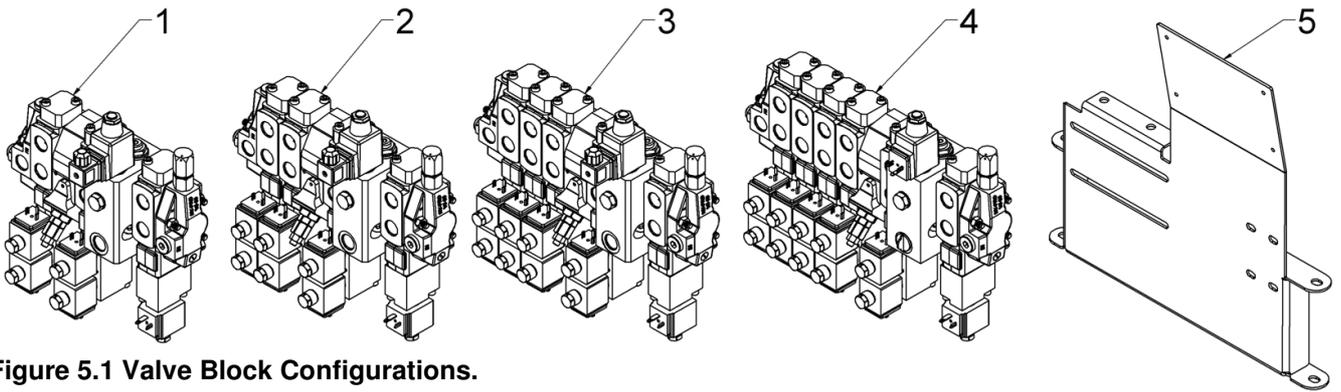
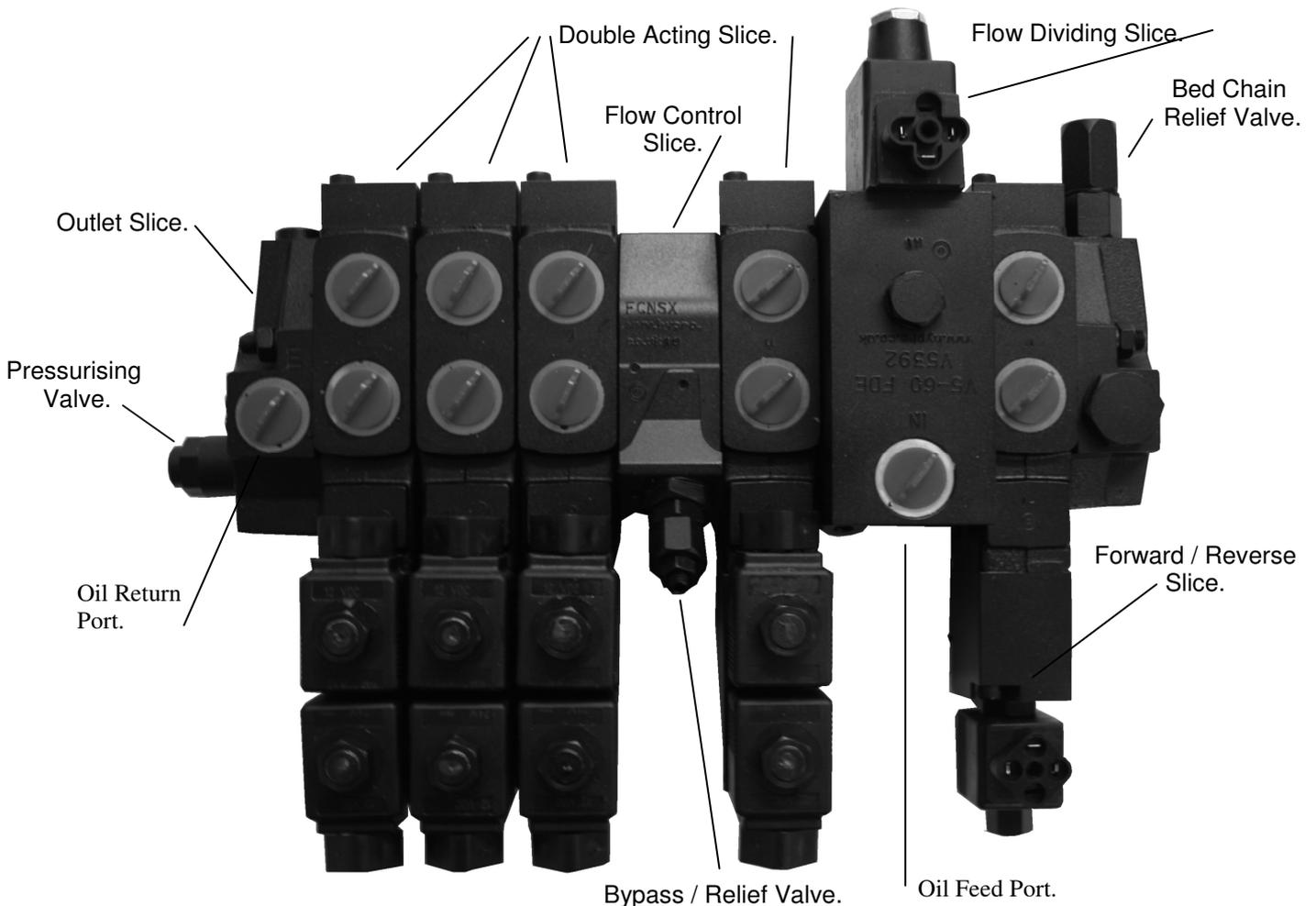


Figure 5.1 Valve Block Configurations.

Ref.	Description.	Part No.
1	Valve RH (Right Hand Chute)	HYD5400
2	Valve SC (S Chute)	HYD5401
3	Valve DC (Dual Chop)	HYD5402
4	Valve TC (Twin Chute)	HYD5403
5	Valve Mount Bracket	SC4189

5.2 Identifying Slices & Valves.

Figure 5.2 Slice Identification .



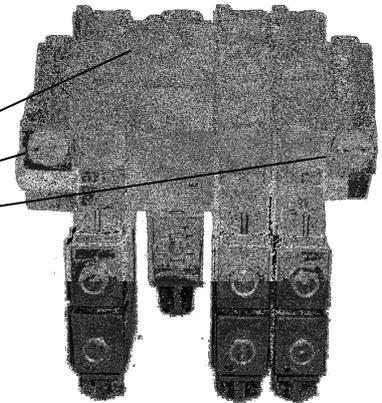
5.3 Valve Block Generations.

The sections within the flow control area have changed significantly throughout its life. It is important when ordering replacement parts that the correct generation of valve is identified. All generations have very distinctive features which will help you in identifying them.

1st Generation.

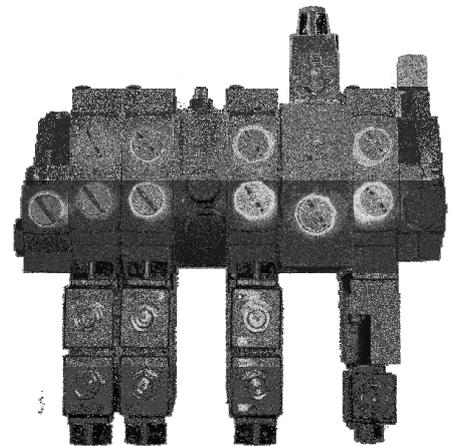
Oil feed pipe connects to the inlet port on the end cap of the block & the return line from the out port on the opposite end cap. There is no Flow Control Slice.

System Relief Valve.
Outlet Port.
Oil Feed.



2nd Generation.

Oil inlet pipe connects to the Flow Dividing Slice, and the return pipe to the outlet slice. There is now a Flow Dividing Slice, and the bed chain drive has a separate relief valve. The pressurising valve is a simple ball & spring type. Bed reverse slice is sprung to forward, and uses the solenoid to reverse. The flow after the Tailgate Slice can be altered, but is set to 5 litres/min.



3rd Generation.

Oil inlet is connected the same as 2nd Generation. The flow Adjuster has been removed and a sloping surface has taken its place. A small orifice reduces the flow after the Tailgate Slice to 5Litres/min. The main relief valve is now combined with the flow diverter.



4th Generation.

The latest design of valve blocks is currently shown in Figure 5.2 containing the High Flow Slice, Combined Bypass/Relief Valve and the latest Pressurising Valve.

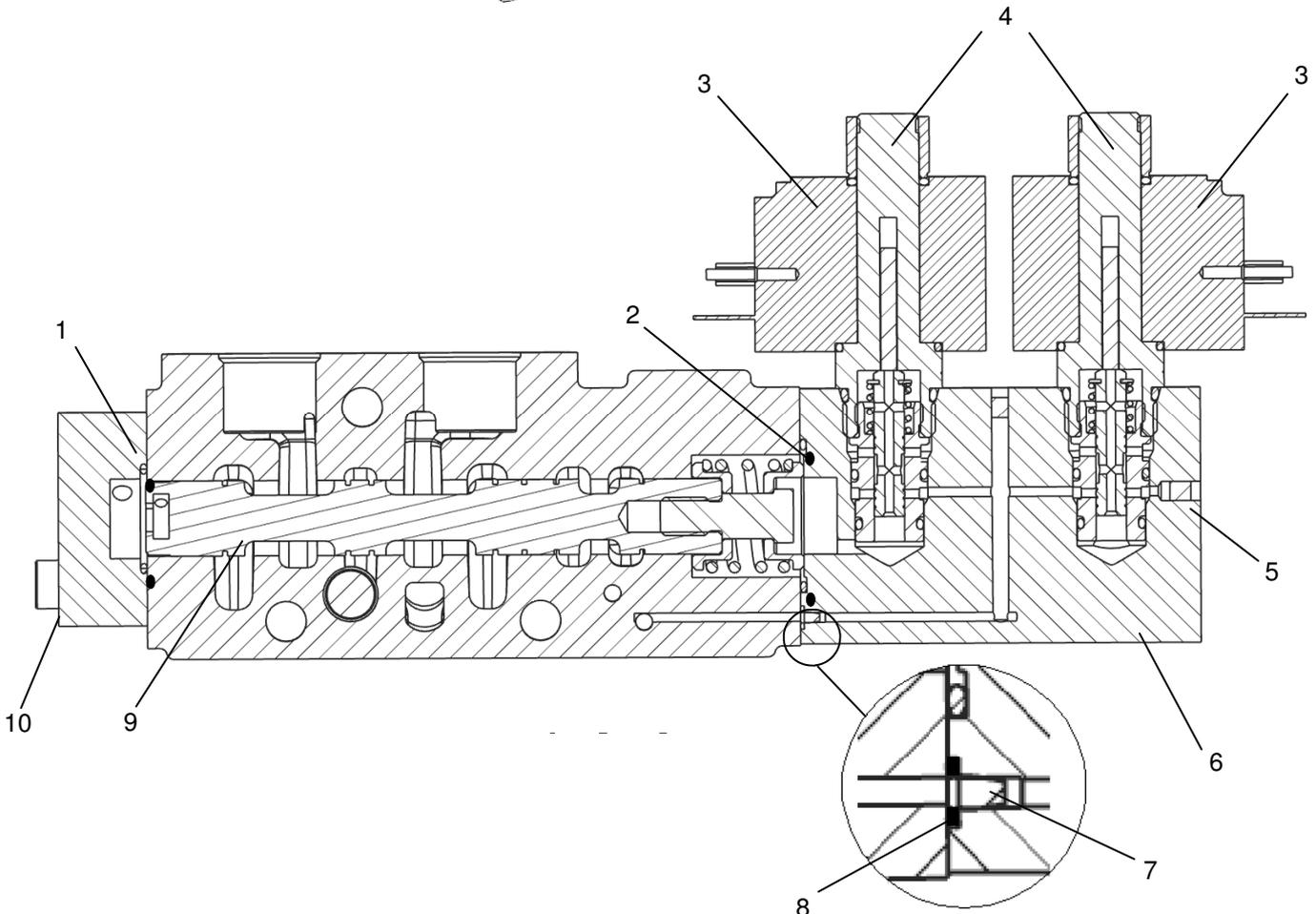
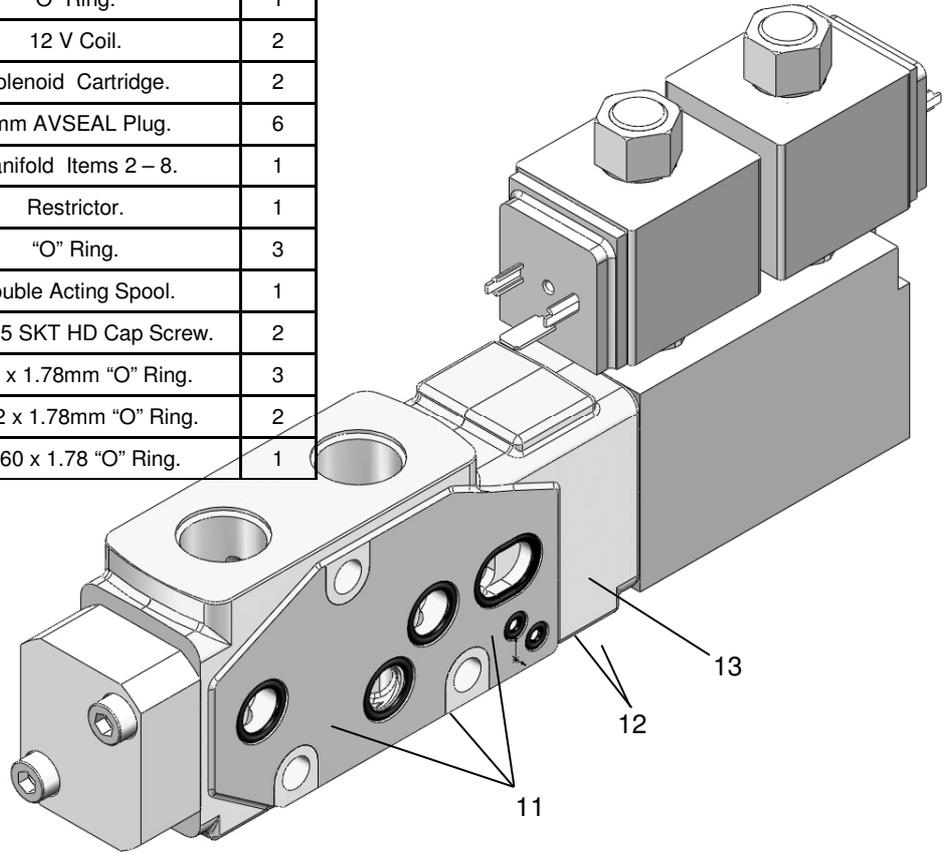
Please Note.

The 4 Generations are the main changes that have occurred, however, there are some variations between the main generations (e.g. High Flow Slice with the older Flow Dividing Slice) that exist and that are in use today. If you are unsure of the valve block that you have please contact Teagle Machinery to help in identification.

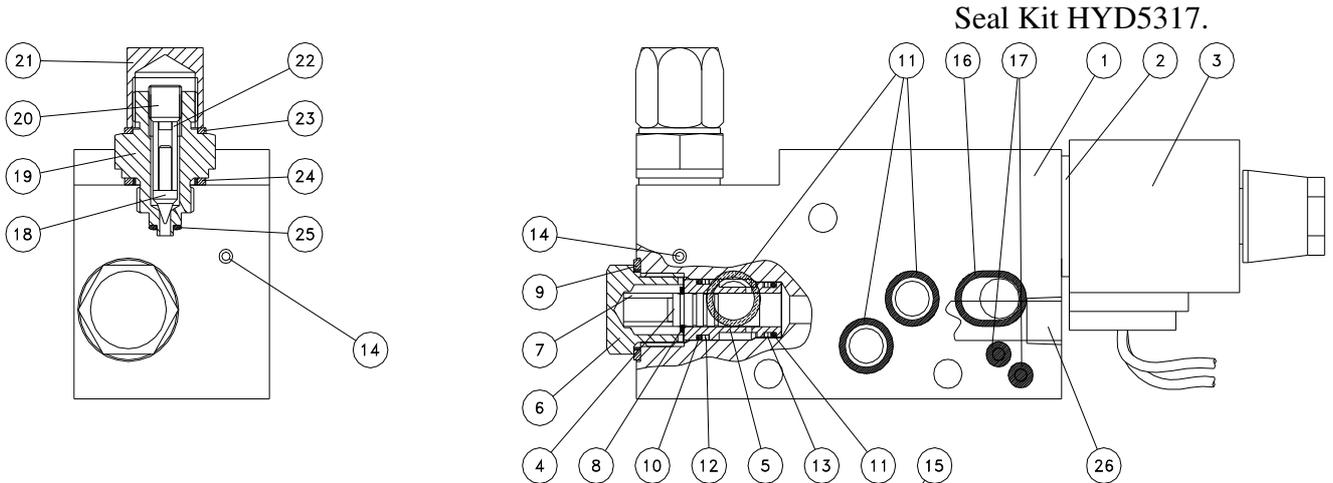
5.3 Double Acting Slice. (Generations 1,2,3, and 4) HYD5192.

Seal Kit HYD5316.

Item.	Part No.	Description.	Qty.
1	HYD5306.	Closure Plate.	1
2	In Seal Kit.	O" Ring.	1
3	HYD5179.	12 V Coil.	2
4	HYD5313.	Solenoid Cartridge.	2
5	Not Available.	4mm AVSEAL Plug.	6
6	HYD5168.	Manifold Items 2 – 8.	1
7	Not Available.	Restrictor.	1
8	In Seal Kit.	"O" Ring.	3
9	Not Available.	Double Acting Spool.	1
10	Not Available.	M6 x 15 SKT HD Cap Screw.	2
11	In Seal Kit.	3.69 x 1.78mm "O" Ring.	3
12	In Seal Kit.	12.42 x 1.78mm "O" Ring.	2
13	In Seal Kit.	15.60 x 1.78 "O" Ring.	1



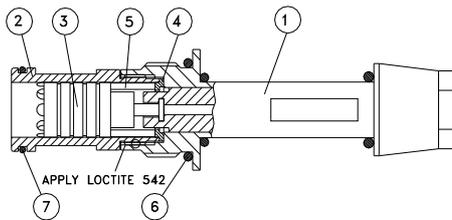
5.4 Proportional Solenoid Slice. (Independent Bed Control) HYD5314.



17		'O' RING	2
16		'O' RING	1
15		8mm AVSEAL	2
14		4mm AVSEAL	2
13		ANTI-EXTRUSION RING	1
12		ANTI-EXTRUSION RING	1
11		'O' RING	4
10		'O' RING	1
9	HYD4204	G1/2 BONDED WASHER	1
8		EXTERNAL CIRCLIP	1
7		SPRING	1
6	HYD5163	PLUG	1
5		BY-PASS CYLINDER	1
4		BY-PASS PISTON	1
3	HYD5320	LISK COIL ASSEMBLY - 12V	1
2	HYD5319	PROPORTIONAL CARTRIDGE ASSY	1
1		MANIFOLD	1
ITEM	PART NUMBER	DESCRIPTION	QTY

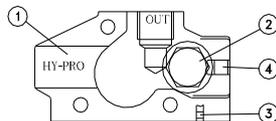
26		7/8 TAPER PLUG (LEVEL-SEAL)	1
25		'O' RING	1
24	HYD4202	G3/8 BONDED WASHER	1
23		COPPER WASHER	1
22		PILOT RV SPRING	1
21	HYD5070	PILOT RV CAP	1
20		SOCKET SCREW MOD	1
19		PILOT RV BODY	1
18		PILOT RV NEEDLE	1
ITEM	PART NUMBER	DESCRIPTION	QTY

5.5 Low Flow Proportional Solenoid Cartridge. (Gen. 1, 2, and 3) HYD5319.



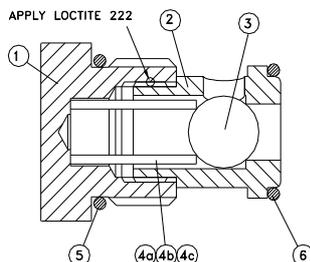
7		'O' RING	1
6		'O' RING	1
5		SPRING	1
4	HYD5319	SPRING STOP WASHER	1
3		SPOOL	1
2		SLEEVE	1
1		PROPORTIONAL SOLENOID ASSY	1
ITEM	PART NUMBER	DESCRIPTION	QTY

5.6 Outlet End Cap (Generations. 1, 2, 3 and 4) HYD5315.



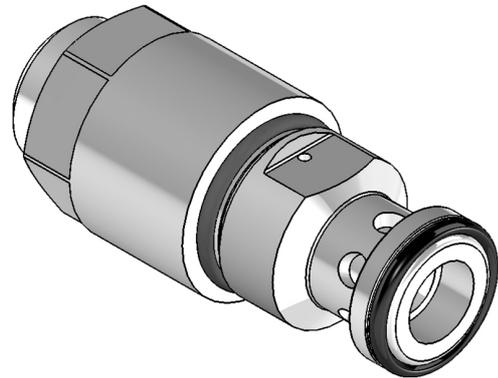
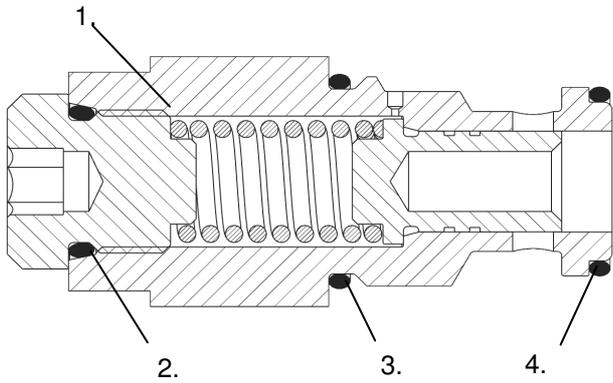
4		ø8mm AVSEAL	1
3		ø4mm AVSEAL	1
2	HYD5318	PRESSURIZING VALVE	1
1	HYD5315	OUTLET COVER	1
ITEM	PART NO	DESCRIPTION	QTY

5.7 Pressurising Valve Assembly. (Generations 1, 2 and 3) HYD5318.



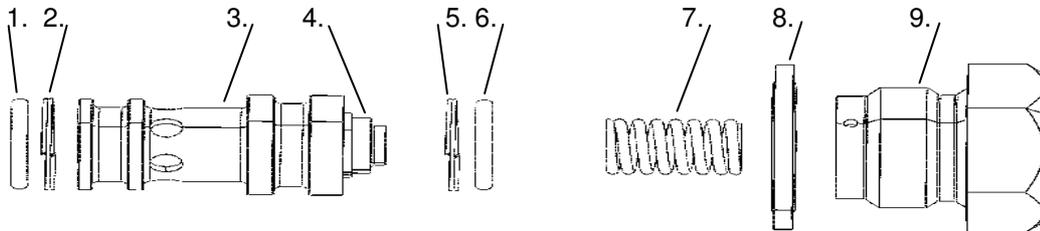
6		'O' RING	1
5		'O' RING	1
4		SPRING	1
3	HYD5318	CHROME BALL GD100	1
2		BODY	1
1		HOUSING	1
ITEM	PART NUMBER	DESCRIPTION	QTY

5.8 Pressurising Valve. (Generation 4) HYD5412.



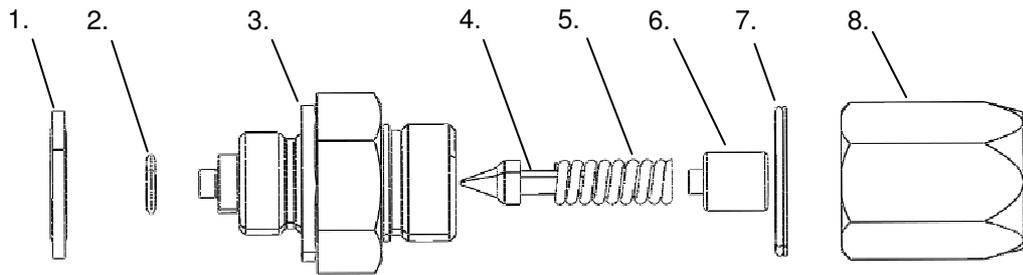
Item No.	Part No.	Description.	Qty.
1.	HYD5412.	Pressuring Valve Assembly.	1
2.	Available in Complete Valve Seal Kit HYD5174	"O" Ring.	1
3.		"O" Ring.	1
4.		"O" Ring.	1

5.9 Bypass Valve. (Generation 1, 2 and 3) HYD5163.



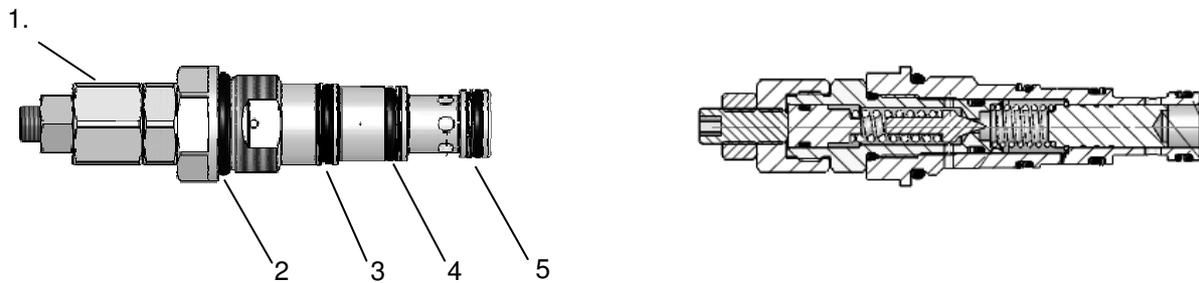
Item No.	Part No.	Description.	Qty.
1.	HYD5163.	"O" Ring.	1
2.		Anti - Extrusion Ring.	1
3.		By-pass Cylinder.	1
4.		By-pass Piston.	1
5.		Anti - Extrusion Ring.	1
6.		"O" Ring.	1
7.		Spring.	1
8.	HYD4204.	Bonded Washer.	1
9.	Incl. in HYD5163.	Cap.	1

5.10 Relief Valve. (Generation 1, 2, and 3) HYD5070.



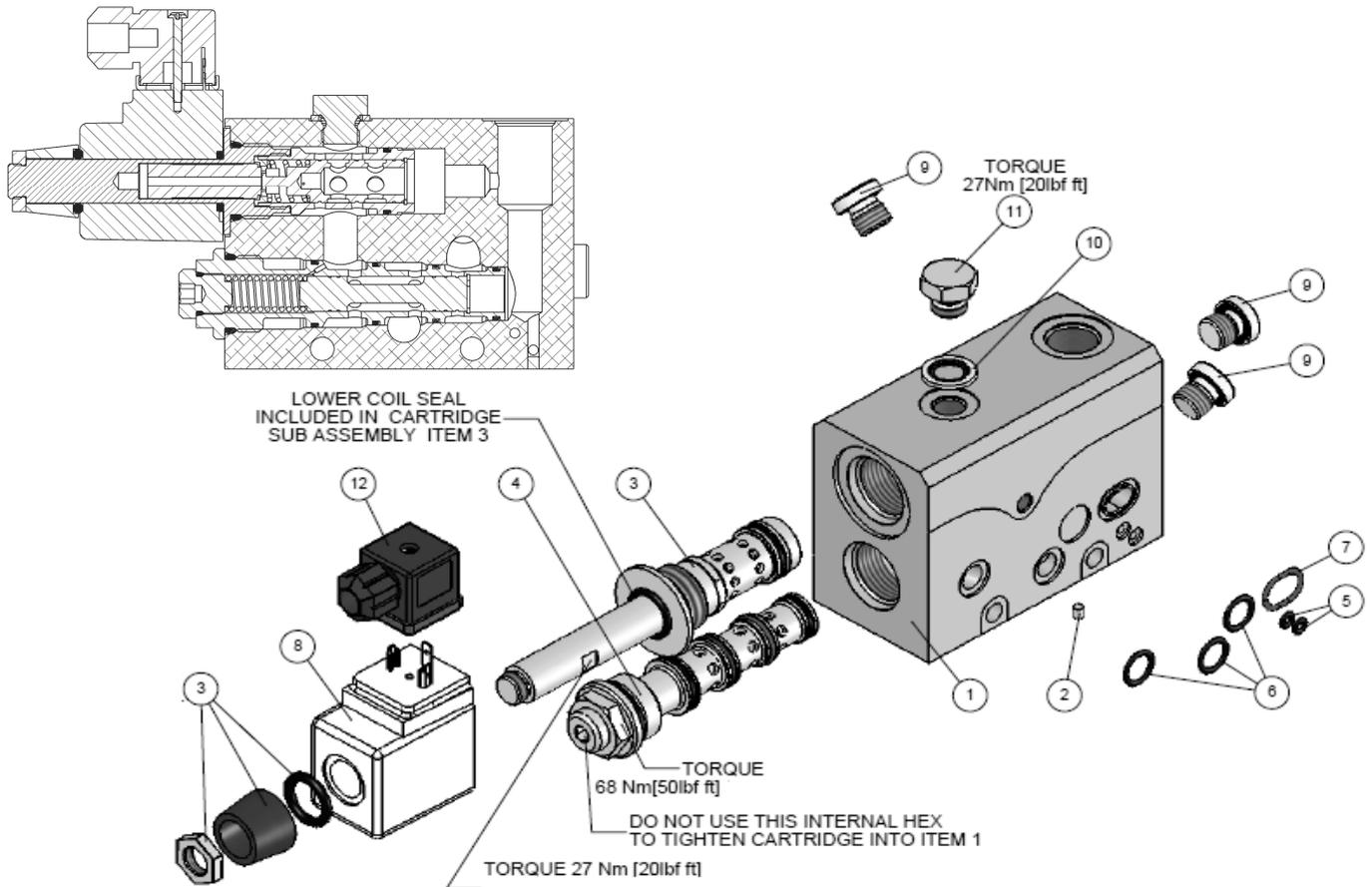
Item No.	Part No.	Description.	Qty.
1.	HYD4202.	Bonded Washer.	1
2.	Repair Kit, HYD5070.	"O" Ring.	1
3.		RV Body.	1
4.		RV Needle.	1
5.		RV Spring.	1
6.		Socket Screw.	1
7.		Copper Washer.	1
8.		RV Cap.	1

5.11 Combined Bypass Relief Valve. (Generation 4) HYD5411.



Item No.	Part No.	Description.	Qty.
1.	HYD5411.	Complete Assembly.	1
2.	Seal Kit, HYD5340.	"O" Ring.	1
3.		"O" Ring.	1
4.		"O" Ring.	1
5.		"O" Ring.	1

5.12 Flow Dividing Slice. (Generations 2, and 3). HYD5404. High Flow Dividing Slice. (Generation 4). HYD5410.

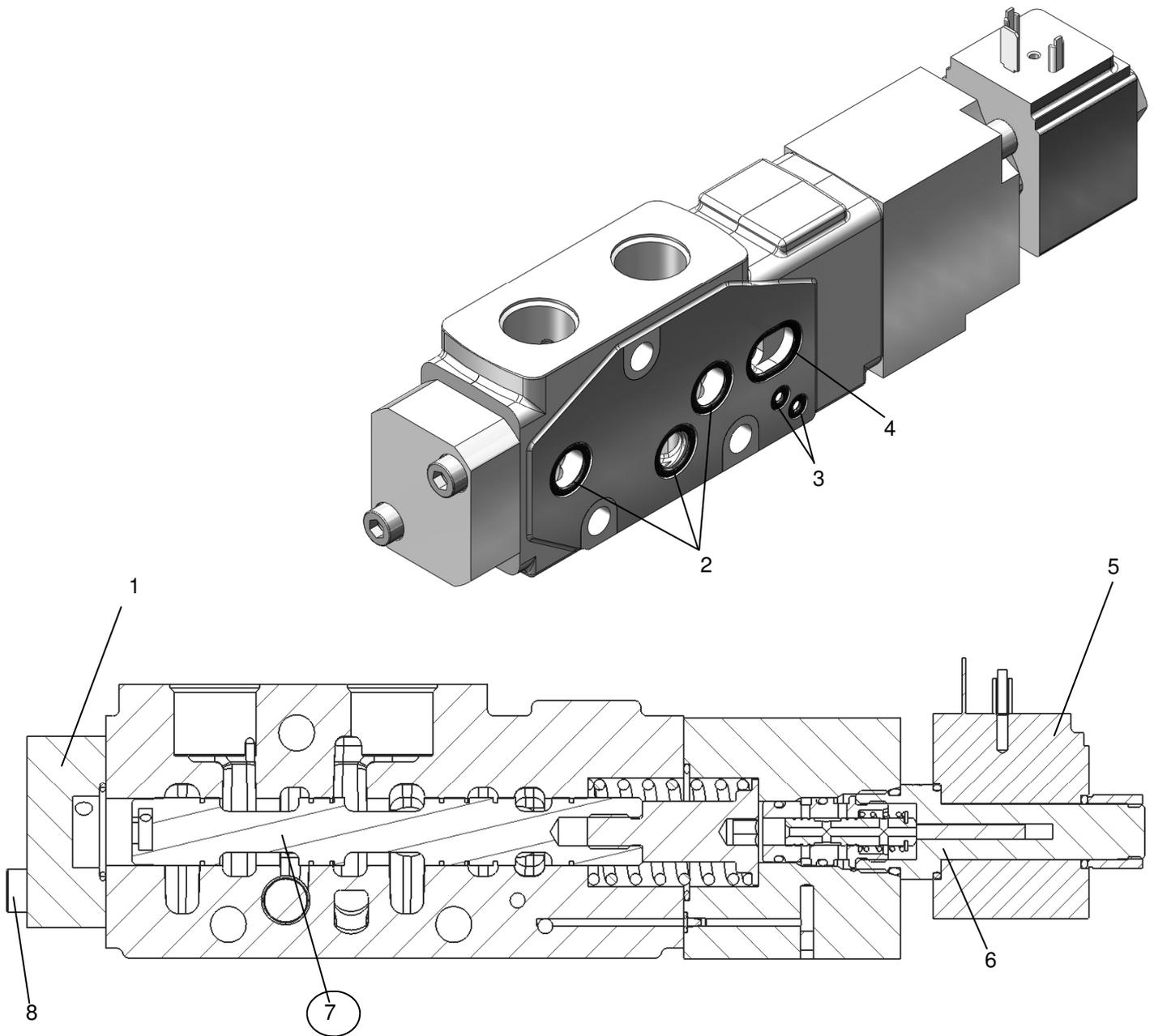


Item No.	Part No.	Description.	Qty.
1.	HYD5410.	Manifold.	1
2.	Not Avail. Individually.	4mm Plug.	1
3.	HYD5319.	Low Flow Proportional Cartridge Assembly.	1
3.	HYD5346.	High Flow Proportional Cartridge Assembly.	1
4.	HYD5314.	Flow Cartridge Assembly.	1
5.	HYD5409 (Flow Control Seal Kit).	O ring.	2
6.		O ring.	3
7.		O ring.	1
8.	HYD5320.	Lisk Coil Assembly 12V.	1
9.	Not Avail. Individually.	Plug and Seal Assembly.	3
10.	Not Avail. Individually.	Bonded Seal.	1
11.	Not Avail. Individually.	Solid Plug.	1
12.	SC3548 Includes Cable.	Hirschman Connector.	1

Important.

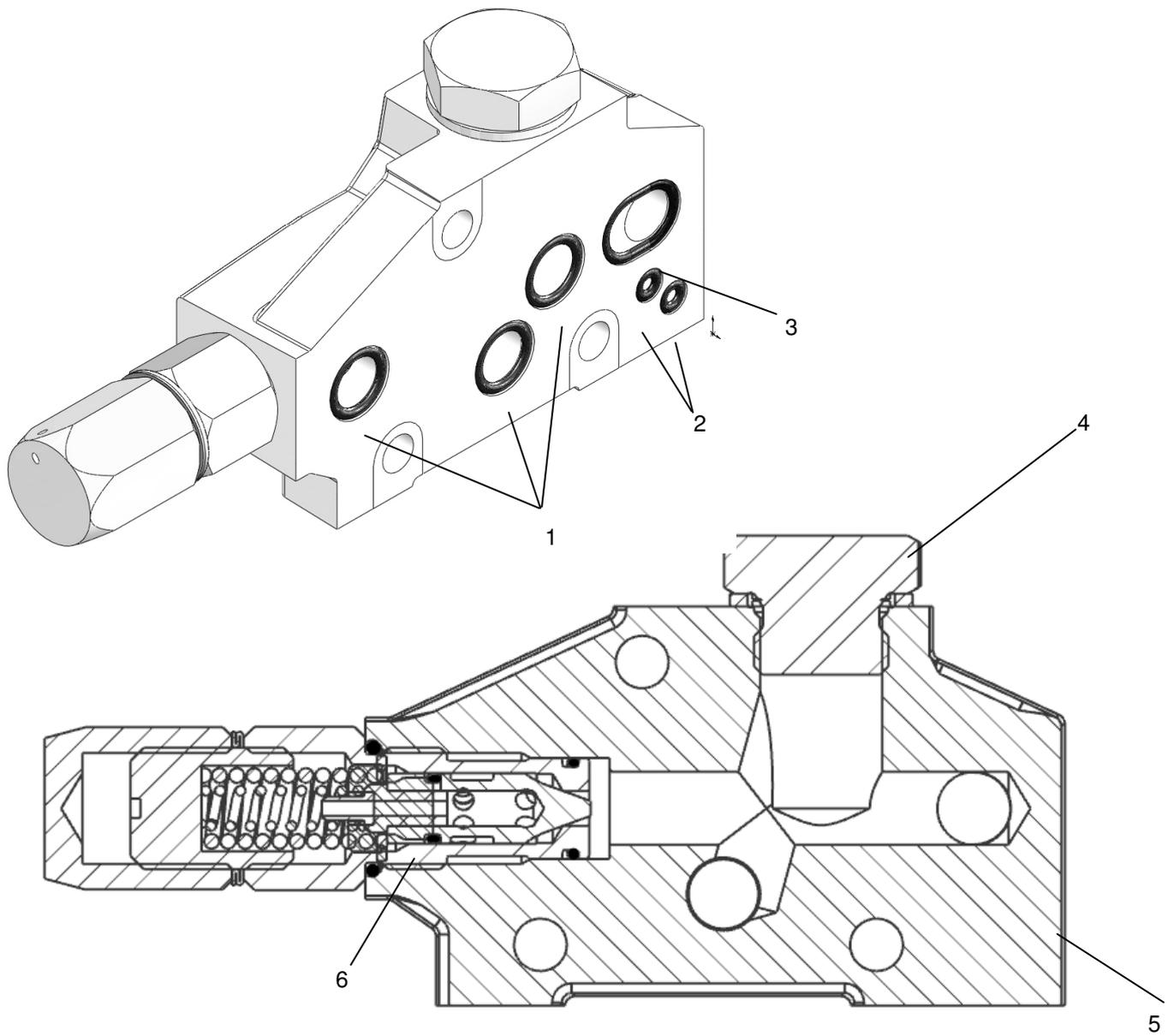
The Low Flow Dividing Slice and High Flow Dividing Slice both use same seal kit and are almost identical from a technical view. High flow slice is identifiable by it's chamfered edges on the front face. Parts are NOT interchangeable. If unsure please contact Teagle Machinery for advice.

5.13 Forward / Reverse Slice. (Generations 2, 3, and 4). HYD5405.



Item.	Part No.	Description.	Qty.
1.	HYD5306.	Closure Plate.	1.
2.	Seal Kit, HYD5316.	"O" Ring.	3.
3.	Seal Kit, HYD5316.	"O" Ring.	2.
4.	Seal Kit, HYD5316.	"O" Ring.	1.
5.	HYD5179.	12 V Coil.	2.
6.	HYD5313.	Solenoid Cartridge.	2.
7.	Not Avail. Individually.	Forward/Reverse Spool.	1.
8.	Source Locally.	M6 x15 SKT HD Cap Screw.	2.

5.14 End Cover with Bed Relief Valve. HYD5406.



Item.	Part No.	Description.	Qty.
1.	Seal Kit, HYD5081.	"O" Ring.	3.
2.	Seal Kit HYD5081.	"O" Ring.	2.
3.	Seal Kit HYD5081.	"O" Ring.	1.
4.	Not Avail. Individually.	Blanking Plug.	1.
5.	Not Avail. Individually.	Manifold.	1.
6.	HYD5070.	Relief Valve.	1.

Note,
Relief Valve same as generation 1, 2, and 3, all require same seal kit.

5.15 Solenoid Valve Parts and Seal Kits.

Ref.	Description.	Part No.	RH	SC	DC	TC
5.3	Double Acting Slice.	HYD5192	2	3	4	5
5.5	Proportional Solenoid Cartridge;					
	Low Flow	HYD5319	1	1	1	1
	High Flow	HYD5346	1	1	1	1
5.6	Outlet Cover.	HYD5315	1	1	1	1
5.7	Pressurising Valve.	HYD5318	1	1	1	1
5.8	Pressurising Valve (4th Gen).	HYD5412	1	1	1	1
5.9	Bypass Valve Assembly.	HYD5163	1	1	1	1
5.10	Relief Valve Assembly.	HYD5407	1	1	1	1
5.11	Combined Bypass Relief Valve.	HYD5411	1	1	1	1
5.12	Flow Dividing Slice, - Low Flow.	HYD5404	1	1	1	1
	High Flow.	HYD5410	1	1	1	1
5.13	Forward/Reverse Slice.	HYD5405	1	1	1	1
5.14	Cover (Bed Control End).	HYD5406	1	1	1	1
	Flow Control Slice.	HYD5198	1	1	1	1
	Complete Valve Seal Kit.	HYD5174	2	3	4	5
	Valve Slice Seal Kit.	HYD5316	1	1	1	1
	Flow Dividing Slice Seal Kit.	HYD5409	1	1	1	1
	Interface Seal kit.	HYD5081	6	7	8	9

Notes.

SECTION 6. SOLENOID VALVE AND CONTROLS TROUBLE SHOOTING.

6.1 No valve functions at all.

Possible causes,

- a) No oil flowing to valve.
- b) No power to the electric circuits.
- c) Current overload protection operating - On light may not come on, or may flash and go out.
- d) Incorrect voltage supply to control box - On light flashes slowly.
- e) Low voltage to solenoid coils.

Solution,

- a) Check hydraulic oil level on tractor & make sure oil is being supplied to valve block.
- b) Check whether the fuse has blown indicated by the illumination of the red LED on the fuse holder, replace fuse with new 7.5 Amp fuse. If a current overload has occurred and the on LED is flashing, the overload protection device needs to be reset by switching the control box off and on.
- c) If there is a short circuit present within the electric controls then the current overload device will operate rapidly. It may take some time to cool before the controls will operate again.
- d) Check the voltage supply to the unit is greater than 11V, if voltage is lower than 11V, ON/OFF switch will fail to operate.
- e) Check voltage at coils is greater than 75% of coil rating (i.e. greater than 9v for a 12v solenoid coil).

6.2 Bed chain fails to reverse. All other valve functions operate normally.

Possible causes,

- a) Bed chain mechanically jammed in machine or drive to bed chain failed.
- b) Hydraulic Motor failed or seized.
- c) Failure of the wiring to the circuit board, the connections to the potentiometer within the control box, or poor connections in the connector between the control box and machine cable.
- d) Pilot orifice blocked in manifold of solenoid slice controlling bed chain forward and reverse.

Solution,

- a) Check Bed chain and drive mechanically intact and working correctly.
- b) Attach hoses directly to motor and run directly from tractor to prove motor failure.
- c) Check all wiring for mechanical damage.
- d) Remove solenoid manifold and clean pilot orifice.

6.3 Bed chain speed control fails but floor chain keeps moving. All other valve functions remain working.

Possible causes,

- a) Spool of the proportional flow control slice jammed open or held open by contamination.
- b) Constant voltage to solenoid.

Solution,

- a) Eliminate electronic controls by removing the coil from the proportional slice, if bed chain stops then the problem is electrical not mechanical.
- b) Remove the spool and check for contamination. Remove contamination and check spool is free to move.

6.4 One function suddenly fails in both directions of operation.

Possible causes,

- a) Pilot orifice in manifold blocked.
- b) Damage to circuit board.

Solution,

- a) Remove manifold and clean (Section 7.5).
- b) Check junction box circuit board for burnt out circuits caused by a short circuit. Replace if damaged.

6.5 One function suddenly fails in one direction of operation only (either permanently on or off).

Possible causes,

- a) Switch/joystick in control box has failed.
- b) Electric circuit to coil has failed.
- c) Damage to circuit board.
- d) Coil failed.

- e) Only on Bed Reverse Slice, Pilot orifice blocked.
- f) Pilot Cartridge Stuck.

Solution,

- a) Check switch/joystick is working, contact Teagle Machinery Ltd if repair is necessary.
- b) Check multipin connector at back of control box, replace damaged pin(s).
- c) Check circuit board for burnt out circuits caused by short circuit. Replace if damaged.
- d) Check coil is working and replace if faulty. (Section 7.1)
- e) Clean pilot orifice. (Section 7.5)
- f) Remove cartridge (Section 5.3) and check spool moves freely within cartridge. Replace cartridge if unable to get it moving freely again.

6.6 Bed chain no longer operates or operates erratically with poor speed control. Failure may be sudden or intermittent.

Possible causes,

- a) Oil flow is ALL being used to rotate the bed motor. Runs forward ok, but no reverse.
- b) Failure of the proportional cartridge coil.
- c) Malfunction of the proportional cartridge.
- d) Failure of the speed control circuit .
- e) Motor failure
- f) Dirt or contamination in the proportional cartridge preventing its movement.
- g) Dirt or contamination in the Bypass Valve in the flow control slice does not allow it to close resulting in the oil dumping to tank starving any oil flow to the motor.
- h) Dirt or contamination in the Pressure Relief Valve in the flow control slice does not allow it to close resulting in the oil dumping to tank starving any oil flow to the motor.
- i) Dirt or contamination in the Pressurising Valve in the outlet cap results in low pilot pressure, and failure of main spool to operate correctly.

Solution,

- a) Slow down the maximum bed speed as described in Section 2, Page 6. Use a tractor with higher oil flow capacity.
- b) Check coil for correct operation. Solenoid cap led will illuminate when the cable is powered up.
- c) Apply 12V directly to proportional coil,
 1. If bed runs at full speed the cartridge is operating correctly.
 2. If no change is detected, the cartridge may be mechanically jammed by contamination, View Section 5.12 for location of cartridge.
- d) Check circuit for correct operation.
- e) Attach hoses directly to motor, replace if faulty.
- f) Remove proportional cartridge and clean, replace if damaged in any way. (Section 5.12)
- g) Remove bypass valve from the flow control slice, inspect for contamination, clean or replace. (Section 5.12)
- h) Remove pressure relief valve from the flow control slice, inspect for contamination, clean or replace. (Section 5.11)
- i) Remove pressurising valve from the outlet cap from the end of the valve chest, inspect for contamination, clean and replace. (Section 5.7, or 5.8)

6.7 Tailgate switch only works the bed forward, or is erratic.

Possible causes,

- a) hydraulic flow low.
- b) All the oil is used up moving the bed forwards.

Solution,

- a) Change the tractor for one with higher flow.
- b) Re calibrate the control box.

SECTION 7. SOLENOID VALVE AND CONTROLS REPAIR AND ADJUSTMENT.

7.1 Checking coils for correct operation.

The Coil leads now have an LED to indicate operation, it is no guarantee of a connection between the cap, and the coil though.

Without the tractor engine running it is usually possible to hear the click of cartridge valves moving when the switches are operated.

Remove the coil from the cartridge valve by unscrewing the retaining nut being careful not to lose the 'O' ring behind the nut. With the switch on the control box operated, the magnetic effect of the coil should be detectable on a screwdriver placed inside the coil.

If the magnetic effect cannot be detected try a different coil attached to the same lead or alternatively check for a switched current on the lead with a multimeter. If there is no switched electrical current at the coil connector it may be a fault in the wiring, switch or connector on the cab control box which can only be traced with the aid of a multimeter/test lamp.

7.2 Removal of the proportional cartridge.

Remove the coil from the proportional cartridge valve by unscrewing the retaining nut being careful not to lose the 'O' ring behind the nut.

Removal of the cartridge is best effected with the use of tool HYD5336 which allows the cartridge to be removed by a 1" AF deep socket. Where the tool HYD5336 is not available then adjacent components may have to be removed to obtain access with a 9/16" AF open ended spanner.

Reattach the proportional coil to the cartridge and operate through the bed chain speed control range. A variable opening of the cartridge should be noted.

7.3 Diagnosing bed chain electronic circuit for faults.

Diagnostics can only be achieved with the use of a multimeter capable of measuring a variable voltage in the range 0-12v.

7.3a Small domed button controls.

As the potentiometer speed control on the control box is varied from stop to full flow it should be possible to measure the following voltages on the connector in the middle of the junction box circuit board, cable labelled 3 (12v), 4 (5v), 5 (0v) & 6 (variable 0 to 5v). If only the variable voltage has failed then the potentiometer in the cab control box may have a faulty connection or has failed. Check for good connections, if none are apparent refer the control box to Teagle Machinery Ltd for repair.

Measure the varying voltage at the connector to the coil with a multimeter, a variation of 6v in a range from 4v to 10v should be measured. If the above satisfactory readings cannot be obtained then one of the two following faults has occurred:

1. Bed chain max and min values need adjustment usually indicated by a variable voltage outside the given range.
2. Flow control circuit board failed - Replace junction box circuit board.

7.3b Large flat button controls.

Measure the varying voltage at the connector to the coil, a variation of 6v in a range from 4v to 10v should be measured. If the above satisfactory readings cannot be obtained then one of the two following faults has occurred:

1. Bed chain max and min values need adjustment usually indicated by a variable voltage outside the given range.
2. Control box potentiometer or circuit board has failed - refer the control box to Teagle Machinery Ltd for repair.

³ Note: Control boxes are available on an exchange basis to prevent any unnecessary down time.

7.4 Replacing junction box circuit board.

Remove the circuit board in the junction box by releasing all of the wires from the electrical connector blocks noting the positions of the solenoid wires. Unscrew the circuit board retaining screws and remove the circuit

board. Refit the new circuit board ensuring that all wires are returned to their original positions. The board and wires are all numbered for reference apart from 18 which is green/yellow.

7.5 Removal of manifold to clean pilot orifice.

Firstly disconnect the 2 electrical connectors from the coils. With a 5mm Allen Key remove the 2 socket head cap screws retaining the manifold assembly onto the valve body.

The pilot orifice (Item 7, Section 5.2) can now be inspected for contamination and cleaned.

Refit the O rings in the correct position. These are a special hard compound, and only original equipment should be used. Assemble the manifold back onto the valve. The 2 socket head cap screws should be refitted with a thread locking liquid applied to the thread and tightened to a torque of 20.3 Nm (15 lbft).

7.6 Removal of combined pressure relief valve and bypass valve from flow control slice.

Do not use an Allen Key to remove as it will alter the settings.

Unscrew the complete valve from the slice and inspect for contamination, clean and replace.

7.7 Adjusting the pressure relief valve.

To check the relief valve setting place an in line pressure gauge in the supply hose to the valve. Remove both hoses from the bed chain hydraulic motor and blank both hose ends. (3/8" BSP blanking plug for the hose fitting). Start the tractor and operate the bed chain with the bed chain speed control in its mid position. The pressure shown on the gauge should be 120 —170 bar. The pressure setting should remain the same throughout the whole range of bed chain speed.

To adjust the bed chain pressure hold the allen bolt still while slackening the lock nut. To increase the bed chain pressure setting, turn the grub screw clockwise until the desired setting is achieved. Retighten the locknut.

7.8 Pressurising valve maintenance.

To check the operation of the pressurizing valve. Unscrew the valve assembly form the Outlet Cap (Section 5.7, or 5.8) and check the ball, is seated correctly and free to move, or the piston is free to reciprocate properly.

7.9 Leaks, seal replacement.

Remove the hoses and electrical connections from the valve. Remove the valve on its mounting plate from the machine. Take the mounting plate off the valve and thoroughly clean the valve of dirt and debris before stripping the valve.

To split the valve to replace interface seals undo the long studs through the valve and separate individual slices.

Replace the damaged seals and reassemble the valve. Fitting of O rings not obtained from manufacturer may lead to repeated failures as specific high quality grade O rings are used to seal the valve.

The studs should be tightened to a torque of 13.5 Nm. (10 lb ft).

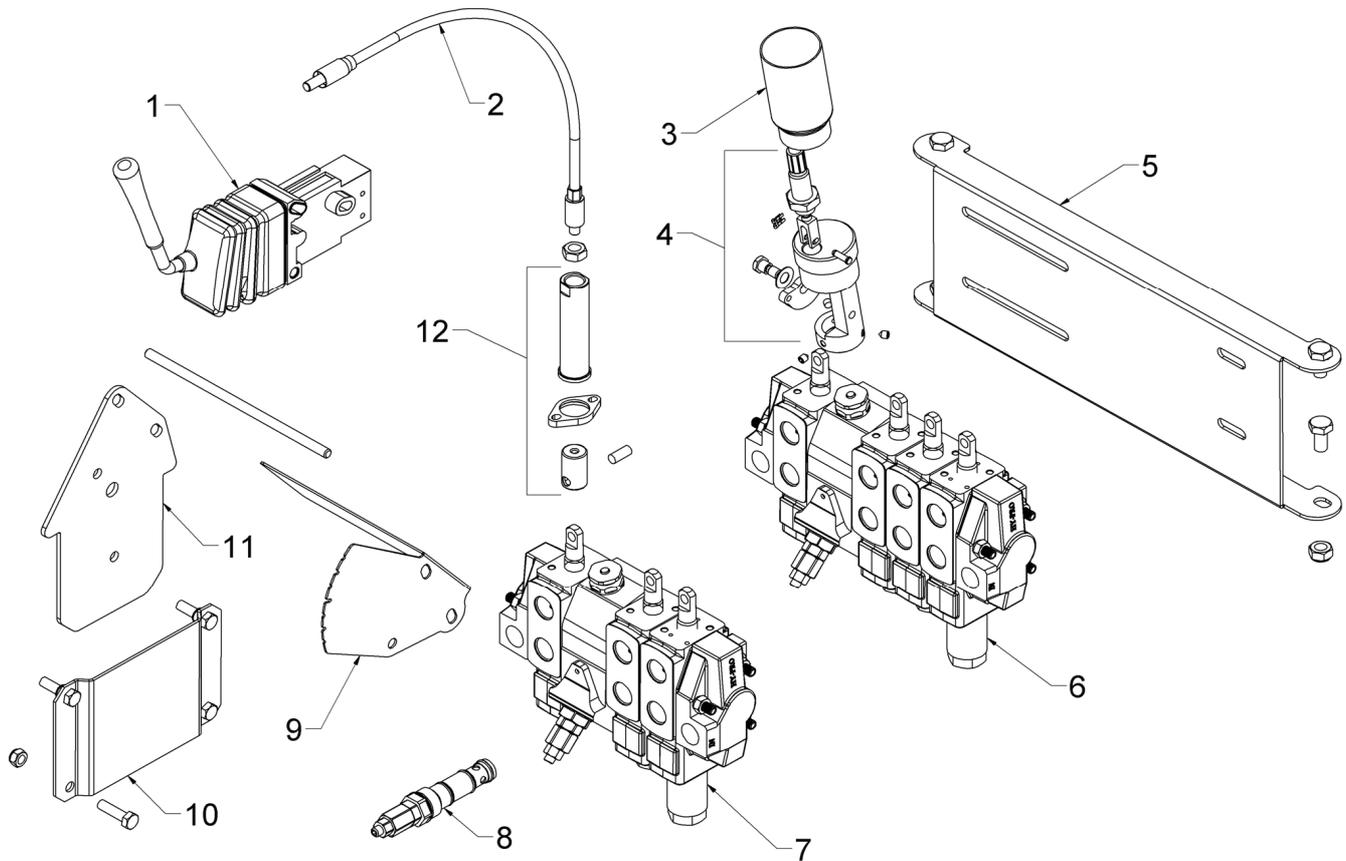
7.10 Specific torque settings.

	Torque Setting (Nm)	Torque Setting (lb ft)
Long studs through valve.	13.5	10
Closure plate socket head cap screws.	13.5	10
Manifold socket head cap screws.	20.3	15
Cartridge valve assemblies.	27.1	20
End cap unions (Inlet/Outlet) 1/2" BSP.	70-75	52-55
Slice port unions.	70-75	52-55

Table 7.1 Torque Settings.

SECTION 8. CABLE VALVE PARTS LIST.

8.1 CABLE CONTROLS.



Ref.	Description.	Part No.	T808	T808S
	Valve complete items 1-5, 7 & 8.	HYD5060	1	--
	Valve complete items 1-6 & 8.	HYD5067	--	1
	Cable complete c/w actuator & adapter kit items 1, 2 & 12.	HYD5180	3	4
	Cable complete c/w actuator & flow. Control adapter kit 1, 2, 3 & 4.	HYD5181	1	1
1	Actuator – standard .	HYD5184	3	4
2	Cable 3.5 meters long.	HYD5185	4	5
	Bent Handle.	HYD5182	4	5
	Plain nut M10.	FAS2303	4	5
	Standard knob.	HYD5166	3	4
	Round +/- knob.	HYD5165	1	1
	Actuator boot.	HYD5183	4	5
3	Rubber sleeve.	HYD5068	1	1
4	Adapter kit – flow control end.	HYD5069	1	1
5	Valve mount.	SC4190	1	1
	Setscrew M10 x 20.	FAS2652P	4	4
	Locknut M10.	FAS2333	4	4
6	T8080S valve block.	HYD5080	--	1
	Setscrew M8 x 16.	FAS2625P	--	4
	Washer M8.	FAS2343P	--	4

Ref.	Description.	Part No.	T808	T808S
7	T8080 valve block.	HYD5077	1	--
	Setscrew M8 x 16.	FAS2625P	4	--
	Washer M8.	FAS2343P	4	--
8	Bypass/Relief valve Assembly.	HYD5411	1	1
9	Decal plate - T8080.	SC3718	1	--
	Decal plate - T8080S/TC.	SC3719	--	1
10	Mounting bracket - all models.	DC0459	1	1
	Bolt M8 x 30.	FAS2027P	4	4
	Locknut M8.	FAS2332	4	4
11	Cable actuator mount.	SC3717	1	1
	Stud M8 x 202.	FAS9159P	3	--
	Stud M8 x 240.	FAS9160P	--	3
	Locknut M8.	FAS2332	6	6
12	Adapter Kit Valve End.	HYD5186	3	4
NOT SHOWN - Valve Fittings.				
	1/2 x 1/2 BSP M/M union.	HYD1013	2	2
	1/2 x 1/4 BSP M/M union.	HYD1114	2	2
	1/2 x 3/8 BSP M/M union.	HYD1115	4	6
	Bonded seal 1/2 BSP.	HYD4204	8	10

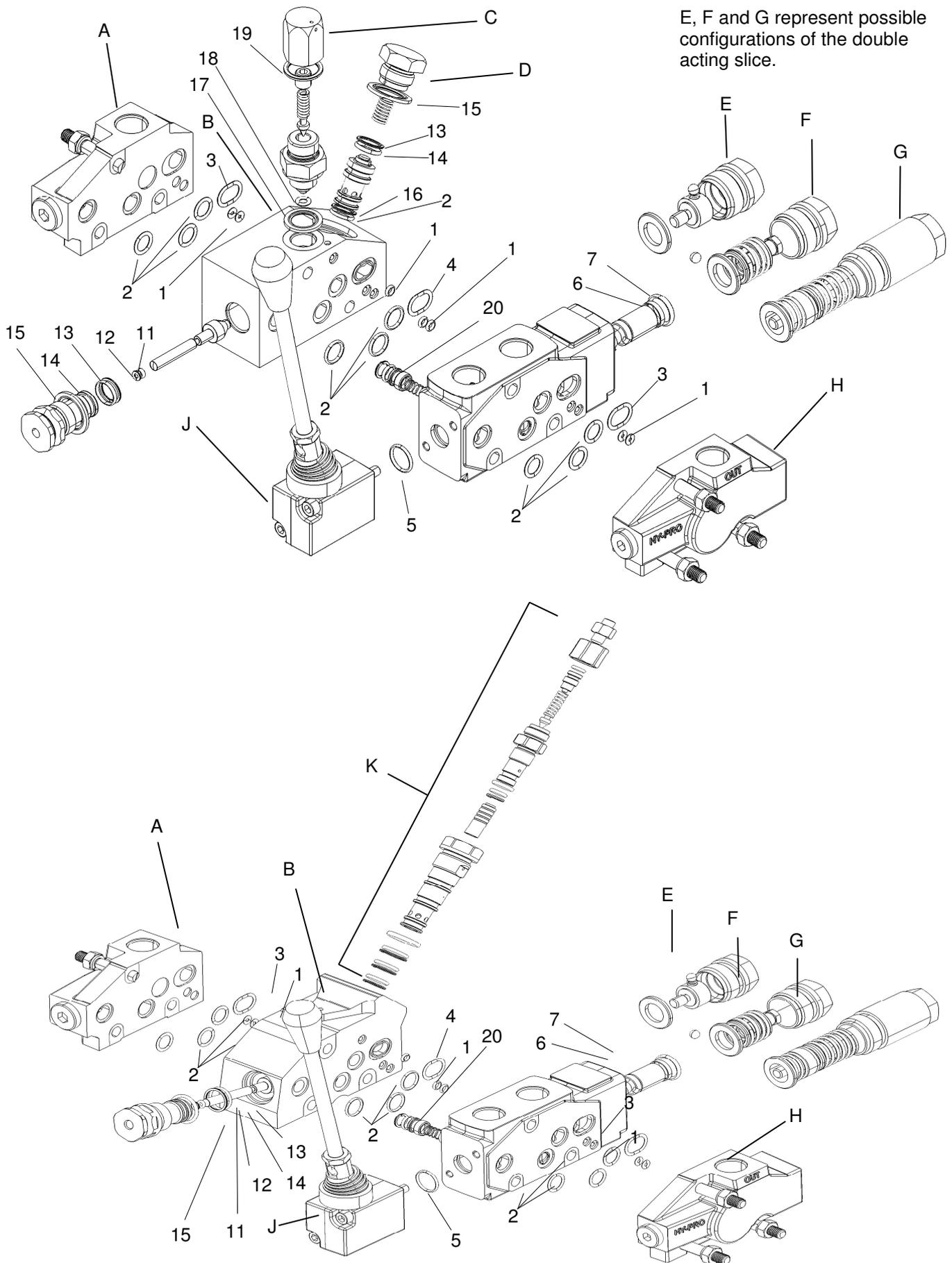
Table overleaf, ref 8.2

Ref.	Description.	A Inlet Cover.	B Flow Control.	C Relief Valve.	D By-pass Valve.	E Slice Detent.	F Slice Spring.	G Slice 4 Position.	H Outlet Cover.
------	--------------	----------------------	-----------------------	-----------------------	------------------------	-----------------------	-----------------------	---------------------------	-----------------------

'O' ring with internal diameter of 3.69 mm and a material diameter of 1.78mm is specified by 3.69 x 1.78,
Anti extrusion ring with internal diameter of 7.29 mm and a material thickness of 1.40mm is specified by 7.29 x 1.40.

1	'O' ring 3.69 x 1.78	2	3	--	--	2	2	2	--
2	'O' ring 12.42 x 1.78	3	3	--	1	3	3	3	--
3	'O' ring 15.60 x 1.78	1	--	--	--	--	--	--	--
4	'O' ring 15.60 x 1.78	--	1	--	--	1	1	1	--
5	'O' ring (Viton) 15.60 x 1.78	--	--	--	--	1	1	1	--
6	'O' ring 15.54 x 2.62	--	--	--	--	1	1	1	--
7	Slip ring PTFE	--	--	--	--	1	1	1	--
8	'O' ring 7.66 x 1.78	--	--	--	--	1	1	1	--
9	Anti Extrusion ring 7.29 x 1.40	--	--	--	--	1	1	1	--
10	'O' ring 7.1 x 1.6	--	1	--	--	--	--	--	--
11	'O' ring 2.90 x 1.78	--	1	--	--	--	--	--	--
12	Anti Extrusion ring 2.54 x 1.40	--	1	--	--	--	--	--	--
13	'O' ring 14.00 x 1.78	--	1	--	1	--	--	--	--
14	Anti Extrusion ring 13.64 x 1.40	--	1	--	1	--	--	--	--
15	Bonded seal	--	1	--	1	--	--	--	--
16	Anti Extrusion ring 12.07 x 1.40	--	--	--	1	--	--	--	--
17	'O' ring 6.07 x 1.78	--	--	1	--	--	--	--	--
18	Bonded seal	--	--	1	--	--	--	--	--
19	Copper washer	--	--	1	--	--	--	--	--

8.2 CABLE CONTROL VALVE BLOCK PARTS & SEALS.



Ref.	Description.	Part No.	Standard Chute.	Swivel Chute.
A	Inlet Cover. <i>Use Seal Kit (Interface Seal Kit)</i>	HYD5098 <i>HYD5081</i>	1	1
B	Flow control slice. <i>Use Seal Kit (Flow Control Seal Kit).</i>	HYD5091 <i>HYD5161</i>	1	1
C	Relief valve assembly. <i>Use Seal Kit (Flow Control Seal Kit).</i>	HYD5070 <i>HYD5161</i>	1	1
D	By-pass valve assembly. <i>Use Seal Kit (Flow Control Seal Kit).</i>	HYD5163 <i>HYD5161</i>	1	1
E	Double acting slice – detent (bed forward/reverse). <i>Use Seal Kit (Interface Seal Kit).</i>	HYD5097 <i>HYD5081</i>	1	1
F	Double acting slice – spring return. <i>Use Seal Kit (Interface Seal Kit).</i>	HYD5090 <i>HYD5081</i>	1	2
G	4 position slice (tailgate). <i>Use Seal Kit (Interface Seal Kit).</i>	HYD5089 <i>HYD5081</i>	1	1
H	Outlet Cover. <i>Use Seal Kit (Interface Seal Kit).</i>	HYD5099 <i>HYD5081</i>	1	1
J	Manual Handle. <i>Use Seal Kit (Interface Seal Kit).</i>	HYD5191 <i>HYD5081</i>	-	-
K	By-pass / Relief Valve Assembly. (for “O” Rings see 5.11 page 17).	HYD5411	1	1

Seal Kit Breakdown.

Complete valve seal kit.	--	HYD5169	HYD5170
Interface seal kit. <i>One seal kit comprises Items 1, 2, 3, 5, 6, and 7.</i>	HYD5081	5	6
Spool & check valve seal kit. <i>One seal kit comprised of Item 20.</i>	HYD5082	4	5
Flow control valve seal kit. <i>Seal kit Comprises of Items 4, 11, 12, 13, 14, 15, 16, 17, 18 and 19.</i>	HYD5161	1	1

Warning.

O Rings used in valve blocks are made of specially graded material. Use of substandard O Rings may cause failure of the valve block or potentially irreparable damage and **will invalidate warranty.**

SECTION 9. CABLE CONTROL HYDRAULIC VALVE TROUBLE SHOOTING.

9.1 Loss of operation of any service. Also operation of bed chain in 1 direction only may occur. Failure may be sudden or deteriorate slowly over a few days.

Cause,

Series plug (uses O ring 1, Figure 8.2) has failed/come out of position resulting in oil flowing back to tank which stops the other slices operating.

Solution,

Replace blanking plug and valve body if damaged.

9.2 Bed chain no longer operates or operates only very slowly at tractor engine PTO speed. Failure may be sudden or intermittent.

Possible causes.

There are 3 possible causes; the first one is the most likely to be the problem.

- a) Dirt or contamination in the Bypass Valve in the flow control slice does not allow it to close resulting in the oil dumping to tank starving any oil flow to the motor.
- b) Dirt or contamination in the Pressure Relief Valve in the flow control slice does not allow it to close resulting in the oil dumping to tank starving any oil flow to the motor.
- c) Failure of the hydraulic motor.

Solution,

Remove Bypass Valve or Pressure Relief Valve from the Flow Control Slice, inspect for contamination, clean and replace.

Remove the bypass valve, item K remove bonded seal, and the spring below. Using long nose pliers remove the spool and bypass valve body complete with 'O' rings. Clean and rebuild.

With reference to Section 3.2, remove the pressure relief valve by unscrewing the complete valve from the slice and inspect the seat for contamination, clean and replace.

9.3 Bed chain speed control stops working on full or part bed chain speed.

Possible causes,

Flow control spool jammed open by contamination.

Solution,

Remove the valve guard from the front of the machine. Slip the rubber shield from around the flow control cam mechanism up. Undo the 3 grub screws retaining the aluminium adapter body to the top of the valve. Unscrew the flow control spool from the valve body Remove contamination and reassemble making sure the adapter body is fully seated before securing with grub screws.

9.4 Oil leaks from between the interface seals between the slices of the valve.

Possible causes,

This is caused by the failure of O rings between the slices of the valve and can be caused by several things.

- a) Oil flow in the wrong direction has been passed through the valve block. If a ram is operated in this state sufficient pressure can be generated within the valve block to separate the valve slices causing the O-rings to extrude.
- b) The valve has been pressurised with the return hose not connected to the tractor.
- c) Damage to the return hose quick release fitting does not allow full flow of oil back to tank.
- d) The tractor spool valve does not have a free flow return and is generating back pressure within the valve block.
- e) Excessive oil flow has caused the oil seal in the main gallery to be extruded from its recess.
- f) Studs holding the valve chest together are not tightened sufficiently.

Solution,

- 1) Identify direction of flow from the tractor and make sure it is directed to the inlet port of the valve. Fitting of a check valve to the outlet port can prevent reverse flow if the machine is connected incorrectly on a regular basis.
- 2) Check the quick release coupling of the return hose is connected correctly.
- 3) Check the operation and condition of the quick release couplings.
- 4) Install a free flow return connection to the tractor.
- 5) Reduce the flow of hydraulic oil to the valve (60 litres/minute max).
- 6) Check torque of studs holding valve block together (13 Nm, 10 lb ft).

9.5 Oil leaks from the interface between the flow control slice and the adjacent double acting slice due to the O ring in the oval recess being missing (O ring 4 in diagram 8.2).

Solution,

On a valve manufactured before 2005 where the seals are being replaced between the flow control slice and the adjacent double acting slice it may be necessary to fit an additional retaining collar to prevent the O ring from being extruded - Contact Teagle Machinery Ltd for details.

9.6 Oil leak from the cap at the bottom of a valve slice.

Possible causes,

Incorrectly fitted seals or seal failure.

Solution,

Replace the seals. Remove the cable from the valve slice causing the problem. Unscrew the cap from the bottom of the valve taking care not to lose any springs and detent balls. Remove the spool. Fit the new slip ring to the spool sliding it down to the bottom of the spool and fitting the O ring outside the slip ring. Insert the spool back into the valve body making sure the O ring remains outside the slip ring. Reassemble the cable back onto the spool and refit the cap at the bottom of the valve.

IMPORTANT. - To ensure correct and reliable operation, OEM components including O rings must be fitted during any overhaul of the valve, failure to do so may lead to repeated failures as specific high quality grade O rings are used to seal the valve.

Remove the hoses from the valve block then remove the valve complete with cables and mounting plate from the machine. Take the mounting plate off the valve and thoroughly clean the valve and cable adapters of dirt and debris before stripping the valve.

To split the valve to replace interface seals undo the long studs through the valve and separate between slices at the appropriate location as indicated by the position of the leak.

Replace the damaged seals and reassemble the valve. The studs should be tightened to the figure in Table 1.

It may be preferable to remove the cables before attempting to split the valve. To remove the standard cables undo the lock nut on the cable above the adapter body and unscrew it from the thread at the end of the cable. Remove the 2 socket head cap screws retaining the adapter to the valve body and unscrew it until the cross pin can be removed from the end of the spool.

To remove the adapter from the flow control slice slip the rubber shield from around the flow control cam mechanism. Undo the 3 grub screws retaining the aluminium adapter body to the top of the valve and remove the cable.

	Torque setting (Nm).	Torque setting (lb ft).
Studs through valve.	13.	10.
End cap unions (Inlet/Outlet) 1/2" BSP.	70-75.	52-55.
Slice port unions 1/2" BSP.	70-75.	52-55.

Table 1. Cable control valve torque settings.



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