

Service Manual

**3CX, 4CX,
214e, 214, 215, 217
& VARIANTS**

Backhoe Loader

From M/c No. 930000 Onwards
 From M/c No. 903000 Onwards (USA)

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Introduction

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

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

Renewal of oil seals, gaskets, etc., and any component showing obvious signs of wear or damage is expected as a matter of course. It is expected that components will be cleaned and lubricated where appropriate, and that any opened hose or pipe connections will be blanked to prevent excessive loss of hydraulic fluid and ingress of dirt. Finally, please remember above all else **SAFETY MUST COME FIRST!**

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

1 = **General Information** - includes torque settings and service tools.
2 = **Care & Safety** - includes warnings and cautions pertinent to aspects of workshop procedures etc.
3 = **Routine Maintenance** - includes service schedules and recommended lubricants for all the machine.

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

A = **Attachments**
B = **Body & Framework** ...etc.

The page numbering in each alphabetically coded section is not continuous. This allows for the insertion of new items in later issues of the manual.

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

All sections are listed on the front cover; tabbed divider cards align directly with individual sections on the front cover for rapid reference.

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

With the exception of slewing operations 'Left Hand' and 'Right Hand' are as viewed from the rear of the machine facing forwards.

Machine Nomenclature

In this Service Manual, reference is made to machine models, e.g. 3CX, 4CX, these are European machine model names. North American machine models have different names, the table below shows the European and the equivalent North American nomenclature.

European		North American
3CX	=	214
4CX	=	214S, 215S, 217S

Colour Coding

The following colour coding, used on illustrations to denote various conditions of oil pressure and flow, is standardised throughout JCB Service publications.

-  **Red** — **Full Pressure**
Pressure generated from operation of a service. Depending on application this may be anything between neutral circuit pressure and M.R.V. operating pressure.
-  **Pink** — **Pressure**
Pressure that is above neutral circuit pressure but lower than that denoted by red.
-  **Orange** — **Servo**
Oil pressure used in controlling a device (servo).
-  **Blue** — **Neutral**
Neutral circuit pressure.
-  **Green** — **Exhaust**
-  **Light Green** — **Cavitation**
Oil subjected to a partial vacuum due to a drop in pressure (cavitation).
-  **Yellow** — **Lock Up**
Oil trapped within a chamber or line, preventing movement of components (lock up).

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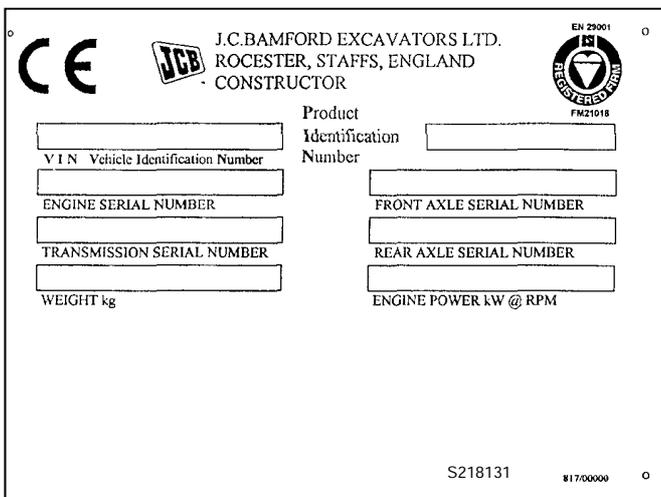
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Machine Identification Plate

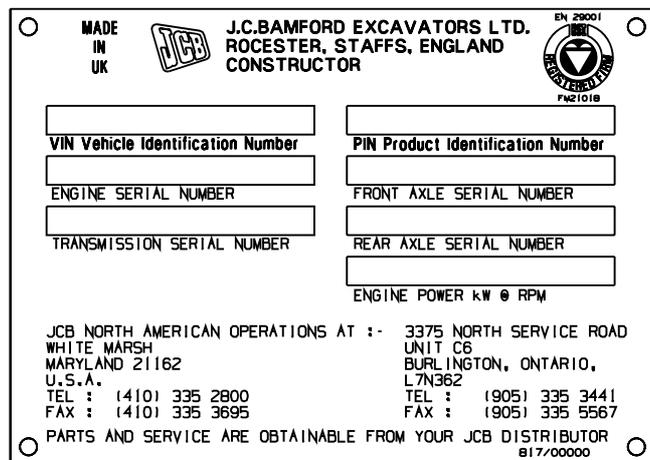
Your machine has an identification plate mounted on the loader tower. The serial numbers of the machine and its major units are stamped on the plate.

The serial number of each major unit is also stamped on the unit itself. If a major unit is replaced by a new one, the serial number on the identification plate will be wrong. Either stamp the new number of the unit on the identification plate, or simply stamp out the old number. This will prevent the wrong unit number being quoted when replacement parts are ordered.

The machine and engine serial numbers can help identify exactly the type of equipment you have.



U.K. and R.O.W.



North America

A246740

Typical Vehicle Identification Number (VIN)

SLP 3CX T S V E 930000
A B C D E F G

- A World Manufacturer Identification
- B Machine Model
- C Steer Type (T= 2WS, F=4WS)
- D Build Type (S=Sideshift, C=Centremount, L=Loader)
- E Year of Manufacture:
2 = 2002
3 = 2003
4 = 2004
5 = 2005
6 = 2006
7 = 2007
8 = 2008
- F Manufacturer Location (E = England)
- G Product Identification Number (PIN)

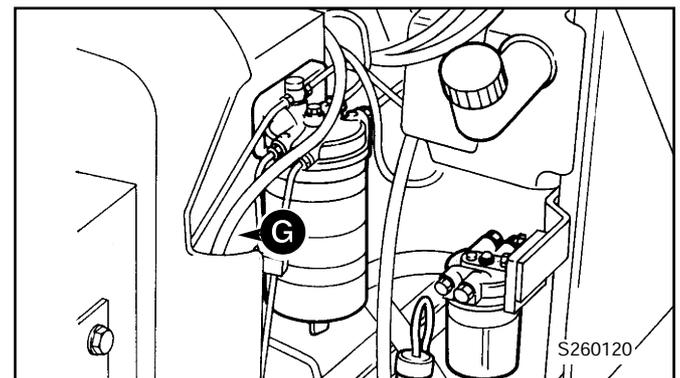
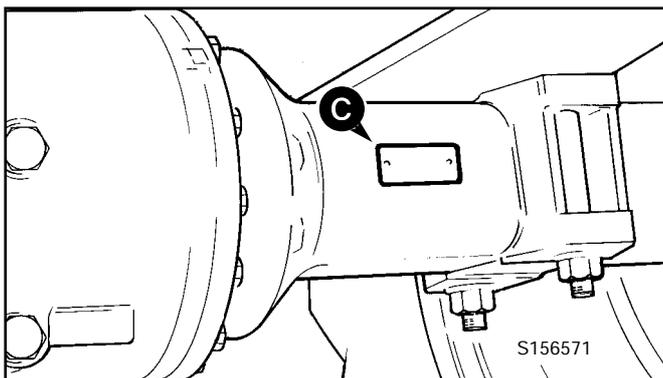
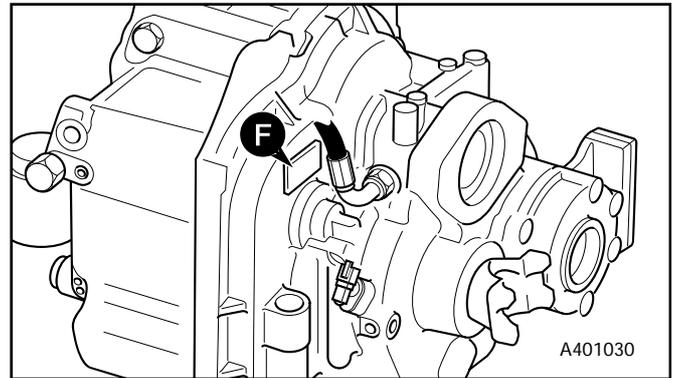
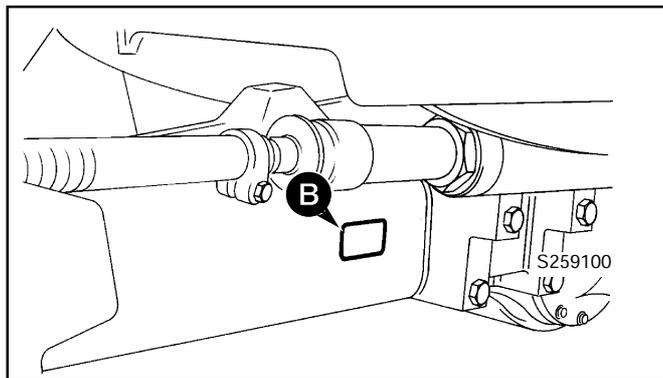
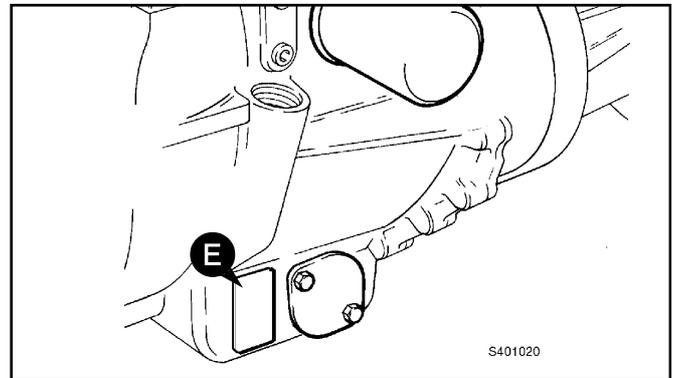
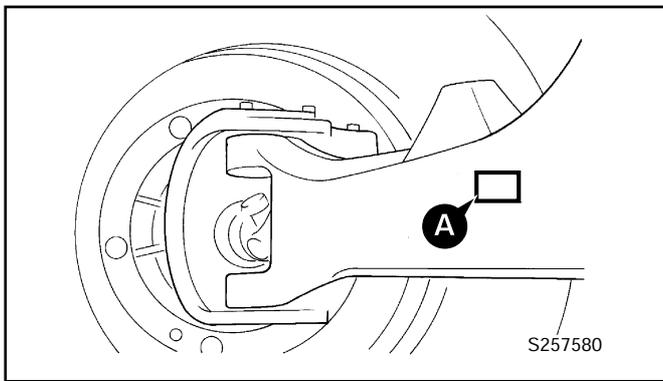
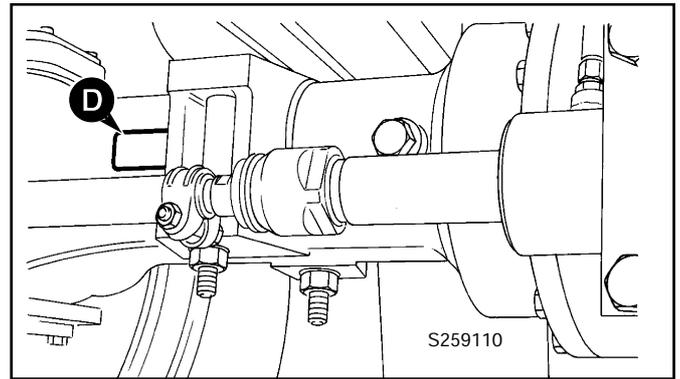
Typical Engine Identification Number

AB 50262 U 500405 P
A B C D E

- A Engine Type
AB = 4 cylinder turbo
- B Build Number
- C Country of Origin
- D Engine Sequence Number
- E Year of Manufacture

Serial Plates

- A** Front Axle (2WS machine)
- B** Front Axle (4WS machine)
- C** Rear Axle (2WS machine)
- D** Rear Axle (4WS machine)
- E** Synchro Shuttle Transmission
- F** Powershift Transmission
- G** Engine



Torque Settings

Use only where no torque setting is specified in the text. Values are for dry threads and may be within three per cent of the figures stated. For lubricated threads the values should be REDUCED by one third.

UNF Grade 'S' Bolts

Bolt Size in	(mm)	Hexagon (A/F) in	Torque Settings		
			Nm	kgf m	lbf ft
1/4	(6.3)	7/16	14	1.4	10
5/16	(7.9)	1/2	28	2.8	20
3/8	(9.5)	9/16	49	5.0	36
7/16	(11.1)	5/8	78	8.0	58
1/2	(12.7)	3/4	117	12.0	87
9/16	(14.3)	13/16	170	17.3	125
5/8	(15.9)	15/16	238	24.3	175
3/4	(19.0)	11/8	407	41.5	300
7/8	(22.2)	15/16	650	66.3	480
1	(25.4)	11/2	970	99.0	715
1 1/4	(31.7)	17/8	1940	198.0	1430
1 1/2	(38.1)	2 1/4	3390	345.0	2500

Metric Grade 8.8 Bolts

Bolt Size	(mm)	Hexagon (A/F) mm	Torque Settings		
			Nm	kgf m	lbf ft
M5	(5)	8	7	0.7	5
M6	(6)	10	12	1.2	9
M8	(8)	13	28	3.0	21
M10	(10)	17	56	5.7	42
M12	(12)	19	98	10	72
M16	(16)	24	244	25	180
M20	(20)	30	476	48	352
M24	(24)	36	822	84	607
M30	(30)	46	1633	166	1205
M36	(36)	55	2854	291	2105

Rivet Nut Bolts/Screws

Bolt Size	(mm)	Torque Settings (for steel rivet nuts)		
		Nm	kgf m	lbf ft
M3	(3)	1.2	0.12	0.9
M4	(4)	3.0	0.3	2.0
M5	(5)	6.0	0.6	4.5
M6	(6)	10.0	1.0	7.5
M8	(8)	24.0	2.5	18.0
M10	(10)	48.0	4.9	35.5
M12	(12)	82.0	8.4	60.5

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

Service Tools Numerical List

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* 892/00275	Adapter	4 - 6	892/01079	Ring Socket Spanner	
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			7213/0002	3 Way Pin Housing	4 - 5
			7213/0003	3 Way Socket Retainer	4 - 5
			7213/0004	3 Way Pin Retainer	4 - 5

Service Tools Numerical List

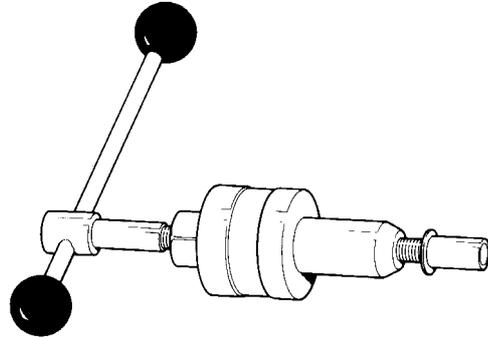
		Page No.			
* 7213/0005	3 Way Socket Connector (DT)	4 - 5	The following parts are replacement items for kits and would normally be included in the kit numbers quoted on pages 1/3-1 and 1/3-2.		
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7214/0004	4 Way Pin Retainer	4 - 5			
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7216/0003	6 Way Socket Retainer	4 - 5			
7216/0004	6 Way Pin Retainer	4 - 5			
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7219/0004	10 Way Pin Retainer	4 - 5			
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7219/0008	14 Way Pin Retainer	4 - 5			
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			993/68111	Adaptor - M20 x 1/2" UNF	4 - 3

Service Tools (cont'd)

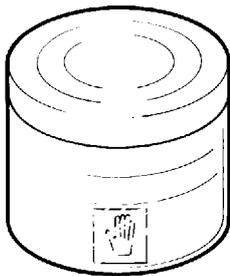
Section B - Body & Framework

- 826/01099 M6 x 16mm Rivet Nut
- 826/01101 M6 x 19mm Rivet Nut
- 826/01103 M8 x 18mm Rivet Nut
- 826/01102 M8 x 21mm Rivet Nut
- 826/01104 M10 x 23mm Rivet Nut
- 826/01105 M10 x 26mm Rivet Nut

Installation Tool Available from:
 Bollhoff Fastenings Ltd.
 Midacre
 The Willenhall Estate
 Rose Hill
 Willenhall
 West Midlands, WV13 2JW



S261210



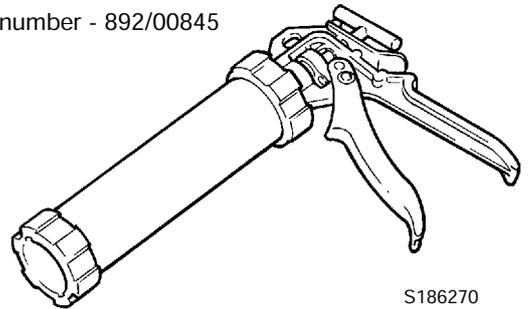
Hand Cleaner - special blend for the removal of polyurethane adhesives.

JCB part number - 4104/1310
 (454g; 1 lb tub)

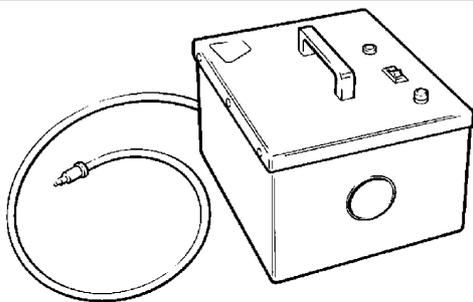
S186240

Cartridge Gun - hand operated - essential for the application of sealants, polyurethane materials etc.

JCB part number - 892/00845



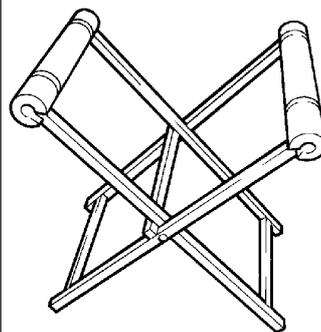
S186270



12V Mobile Oven - 1 cartridge capacity - required to pre-heat adhesive prior to use. It is fitted with a male plug (703/23201) which fits into a female socket (715/04300).

JCB part number - 992/12300

S186250



Folding Stand for Holding Glass - essential for preparing new glass prior to installation.

JCB part number - 892/00843

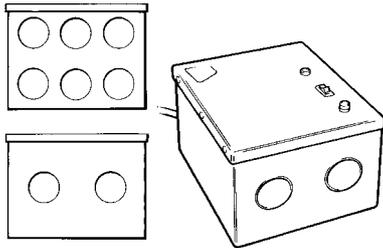
S186280

Service Tools (cont'd)

Section B - Body & Framework

240V Static Oven - available with 2 or 6 cartridge capacity - required to pre-heat adhesive prior to use. No plug supplied. Note: 110V models available upon request - contact JCB Technical Service.

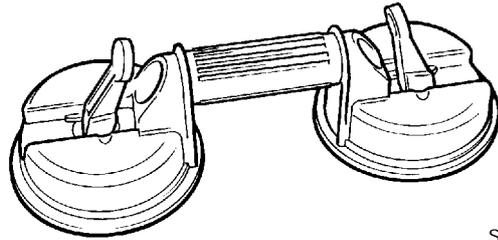
JCB part number:
 992/12400 - 2 Cartridge x 240V
 992/12600 - 6 Cartridge x 240V



S186260

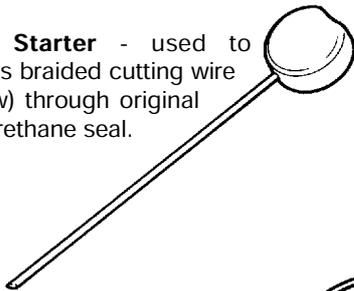
Glass Lifter - minimum 2 off - essential for glass installation, 2 required to handle large panes of glass. Ensure suction cups are protected from damage during storage.

JCB part number - 892/00842

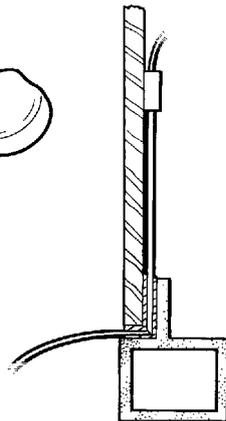


S186300

Wire Starter - used to access braided cutting wire (below) through original polyurethane seal.



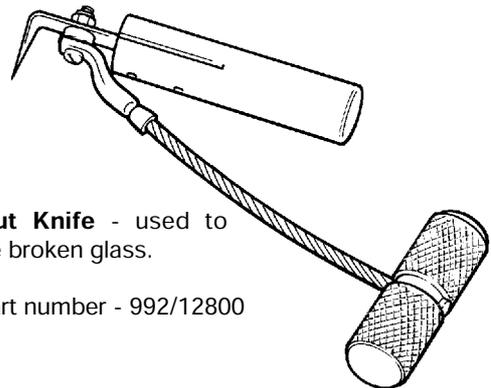
JCB part number - 892/00848



S186310

Cut-Out Knife - used to remove broken glass.

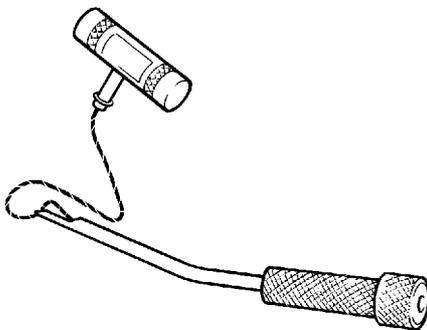
JCB part number - 992/12800



S186340

Glass Extractor (Handles) - used with braided cutting wire (below) to cut out broken glass.

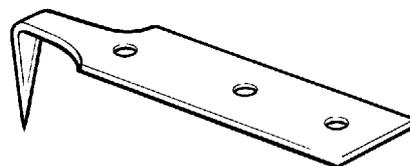
JCB part number - 892/00846



S186320

'L' Blades - 25 mm (1 in) cut - replacement blades for cut-out knife (above).

JCB part number - 992/12801 (unit quantity = 5 off)



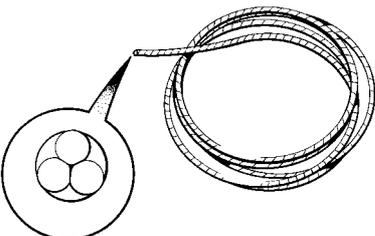
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Service Tools (cont'd)

Section B - Body & Framework

Braided Cutting Wire - consumable heavy duty cut-out wire used with the glass extraction tool (above).

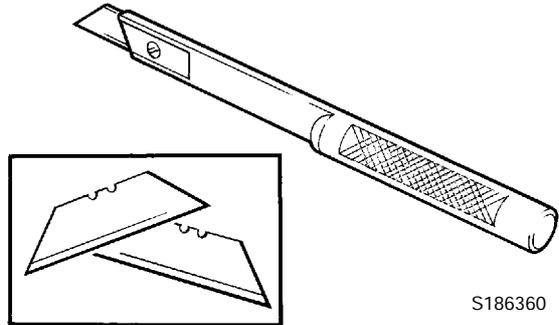
JCB part number - 892/00849
(approx 25 m length)



S186330

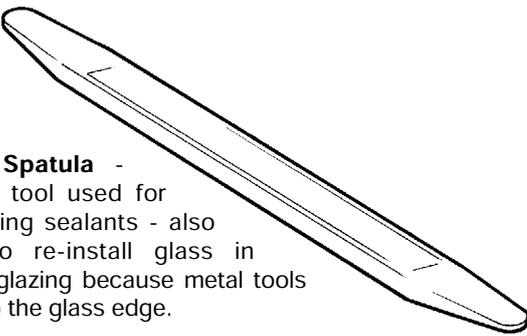
Long Knife - used to give extended reach for normally inaccessible areas.

JCB part number - 892/00844



S186360

Nylon Spatula - general tool used for smoothing sealants - also used to re-install glass in rubber glazing because metal tools will chip the glass edge.

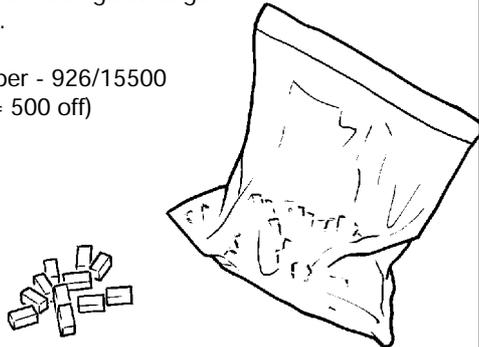


JCB part number - 892/00847

S186470

Rubber Spacer Blocks - used to provide the correct set clearance between glass edge and cab frame.

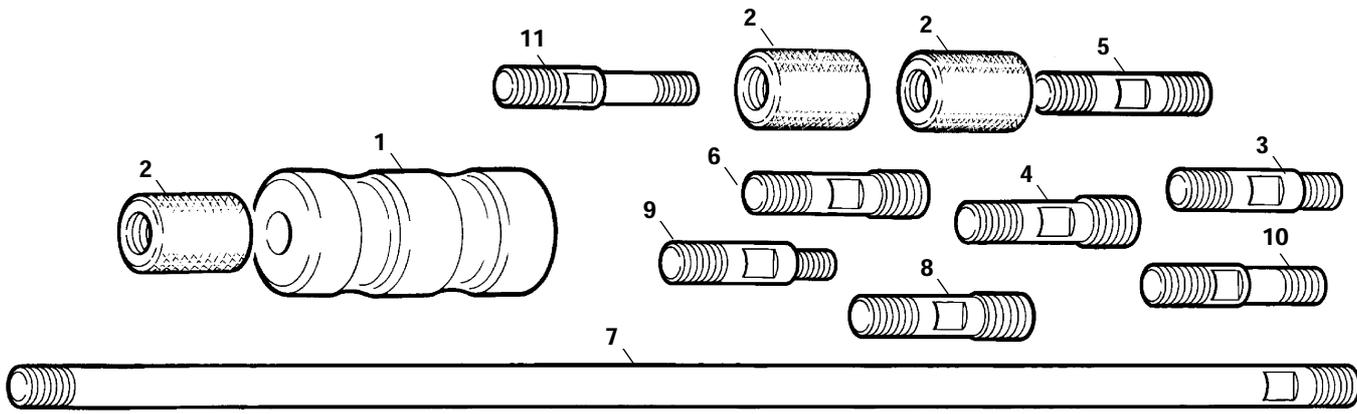
JCB part number - 926/15500
(unit quantity = 500 off)



S186550

Slide Hammer Kit - 993/68100

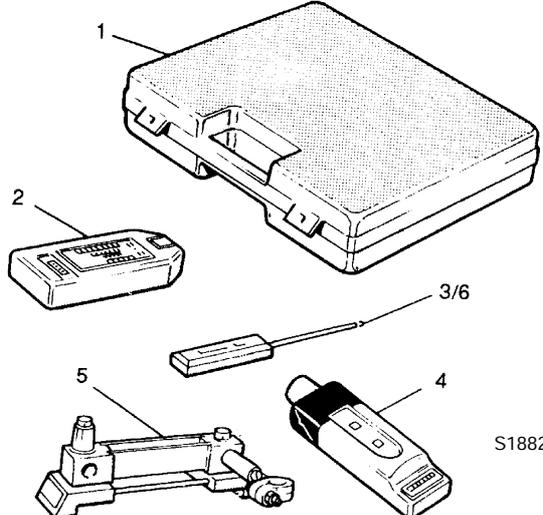
1	:993/68101	Slide Hammer	6	:993/68106	Adaptor - M20 x M24
2	:993/68102	End Stops	7	:993/68107	Bar - M20 x M20 X 800MM
3	:993/68103	Adaptor - M20 x 5/8" UNF	8	:993/68108	Adaptor - M20 x 7/8" UNF
4	:993/68104	Adaptor - M20 x 1" UNF	9	:993/68109	Adaptor - M20 x M12
5	:993/68105	Adaptor - M20 x M20	10	:993/68110	Adaptor - M20 x 5/8" UNF (Shoulder)
			11	:993/68111	Adaptor - M20 x 1/2" UNF



S196910

Service Tools (cont'd)

Section C - Electrics

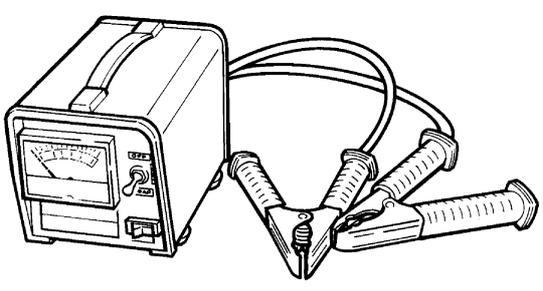


AVO Test Kit

1	892/00283	Tool Kit Case
2	892/00298	Fluke Meter 85
3	892/00286	Surface Temperature Probe
4	892/00284	Venture Microtach Digital Tachometer
5	892/00282	100 amp Shunt - open type
6	892/00285	Hydraulic Temperature Probe

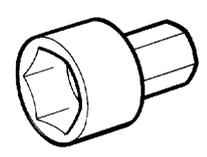
S188231

993/85700 Battery Tester



S239510

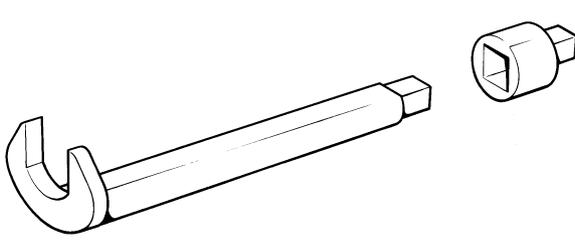
892/00882 Socket for Alternator Pulley Nut



S216770

825/00410 15 mm Crowfoot Wrench Adapter

825/99833

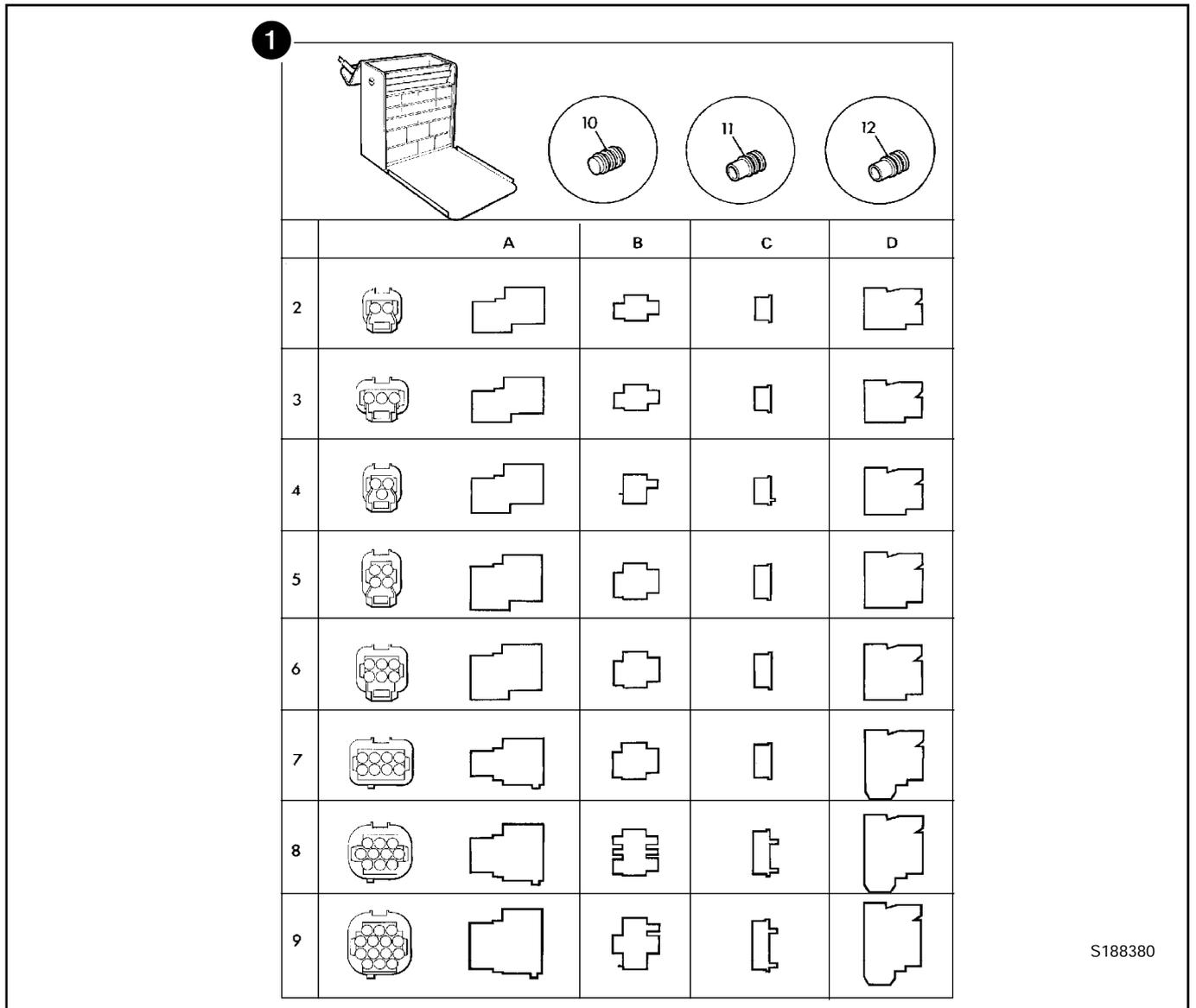


S216200

Service Tools (cont'd)

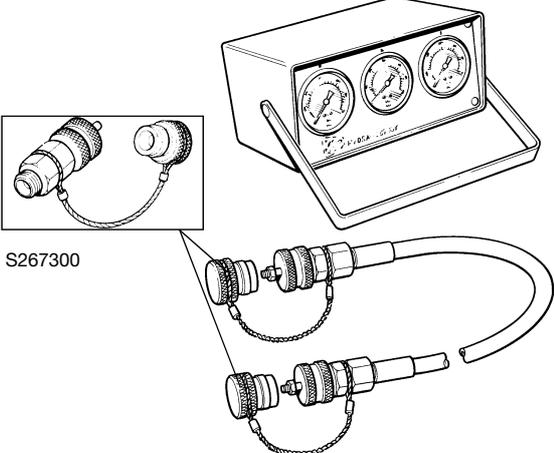
Section C - Electrics

1	Electrical Repair Kit	6A :7216/0002	6 Way Pin Housing
2A :7212/0002	2 Way Pin Housing	6B :7216/0004	6 Way Pin Retainer
2B :7212/0004	2 Way Pin Retainer	6C :7216/0003	6 Way Socket Retainer
2C :7212/0003	2 Way Socket Retainer	6D :7216/0001	6 Way Socket Connector
2D :7212/0001	2 Way Socket Connector	7A :7218/0002	8 Way Pin Housing
3A :7213/0002	3 Way Pin Housing	7B :7218/0004	8 Way Pin Retainer
3B :7213/0004	3 Way Pin Retainer	7C :7218/0003	8 Way Socket Retainer
3C :7213/0003	3 Way Socket Retainer	7D :7218/0001	8 Way Socket Connector
3D :7213/0001	3 Way Socket Connector	8A :7219/0002	10 Way Pin Housing
4A :7213/0006	3 Way Pin Housing (DT)	8B :7219/0004	10 Way Pin Retainer
4B :7213/0008	3 Way Pin Retainer (DT)	8C :7219/0003	10 Way Socket Retainer
4C :7213/0007	3 Way Socket Retainer (DT)	8D :7219/0001	10 Way Socket Connector
4D :7213/0005	3 Way Socket Connector (DT)	9A :7219/0006	14 Way Pin Housing
5A :7214/0002	4 Way Pin Housing	9B :7219/0008	14 Way Pin Retainer
5B :7214/0004	4 Way Pin Retainer	9C :7219/0007	14 Way Socket Retainer
5C :7214/0003	4 Way Socket Retainer	9D :7219/0005	14 Way Socket Connector
5D :7214/0001	4 Way Socket Connector	10 :7210/0001	Dummy Plug
		11 :7210/0002	Wire Seal (1.4 - 2.2 mm dia.)
		12 :7210/0003	Wire Seal (2.2 - 2.9 mm dia.)



Service Tools (cont'd)

Section E - Hydraulics

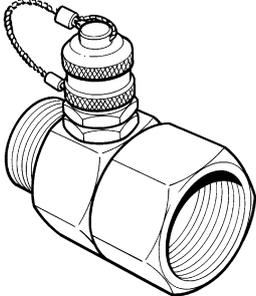


Hydraulic Circuit Pressure Test Kit

892/00253	Pressure Test Kit
:892/00201	Replacement Gauge 0-20 bar (0-300 lbf/in ²)
:892/00202	Replacement Gauge 0-40 bar (0-600 lbf/in ²)
:892/00203	Replacement Gauge 0-400 bar (0-6000 lbf/in ²)
:892/00254	Replacement Hose
993/69800	Seal Kit for 892/00254 (can also be used with probe 892/00706)
892/00706	Test Probe
* 892/00347	Connector - Hose to gauge

S267300

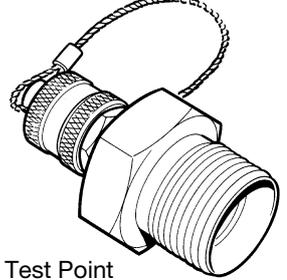
S188121



Pressure Test 'T' Adapters

892/00262	1/4 in M BSP x 1/4 in F BSP x Test Point
816/55038	3/8 in M BSP x 3/8 in F BSP x Test Point
816/55040	1/2 in M BSP x 1/2 in F BSP x Test Point
892/00263	5/8 in M BSP x 5/8 in F BSP x Test Point
892/00264	3/4 in M BSP x 3/4 in F BSP x Test Point
892/00265	1 in M BSP x 1 in F BSP x Test Point

S188131



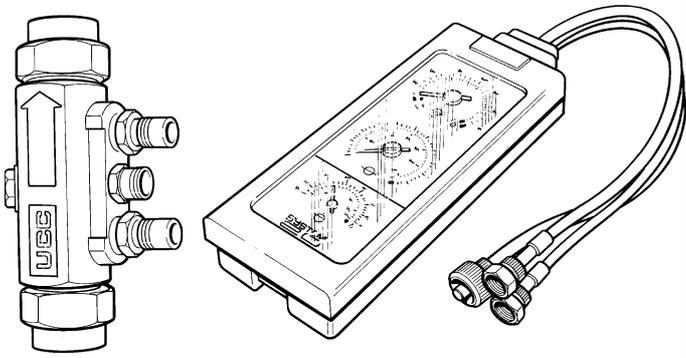
Pressure Test Adapters

892/00255	1/4 in BSP x Test Point
892/00256	3/8 in BSP x Test Point
892/00257	1/2 in BSP x Test Point
892/00258	5/8 in BSP x Test Point
816/15118	3/4 in BSP x Test Point
892/00259	1 in BSP x Test Point
892/00260	1.1/4 in BSP x Test Point
892/00261	5/8 in UNF x Test Point

S200141

Flow Test Equipment

892/00268	Flow Monitoring Unit
892/00269	Sensor Head 0 - 100 l/min (0 - 22 UK gal/min)
892/00293	Connector Pipe
892/00270	Load Valve
1406/0021	Bonded Washer
1604/0006	Adapter 3/4 in M x 3/4 in M BSP
1612/0006	Adapter 3/4 in F x 3/4 in M BSP
892/00271	Adapter 3/4 in F x 5/8 in M BSP
892/00272	Adapter 5/8 in F x 3/4 in M BSP
816/20008	Adapter 3/4 in F x 1/2 in M BSP
892/00275	Adapter 1/2 in F x 3/4 in M BSP
892/00276	Adapter 3/4 in F x 3/8 in M BSP
892/00277	Adapter 3/8 in F x 3/4 in M BSP
892/00273	Sensor Head 0 - 380 l/min
892/00294	Connector Pipe
1606/0015	Adapter 1.1/4 in M BSP x 1 in M BSP
892/00078	Connector 1 in F x 1 in F BSP
1604/0008	Adapter 1 in M x 1 in M BSP
1606/0012	Adapter 1 in M x 3/4 in M BSP
816/20013	Adapter 3/4 in F x 1 in M BSP



S188151

Service Tools (cont'd)

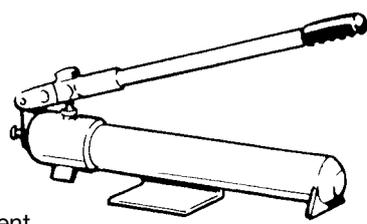
Section E - Hydraulics

892/00881 Valve Spool Seal Fitting Tool



S261220

Hand Pump Equipment



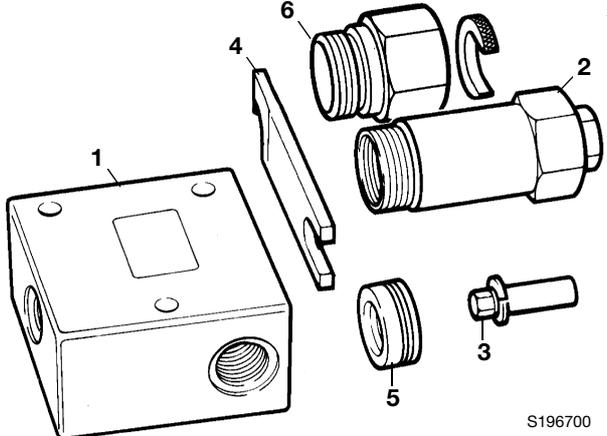
892/00223 Hand Pump
 892/00137 Micro-bore Hose 1/4 in BSP x 3 metres
 892/00274 Adapter 1/4 in M BSP x 3/8 in M BSP Taper
 892/00262 1/4 in M BSP x 1/4 in F BSP x Test Point
 892/00706 Test Probe
 892/00278 Gauge 0 - 40 bar (0 - 600 lbf/in²)
 892/00279 Gauge 0 - 400 bar (0 - 6000 lbf/in²)

S193850

Components for Valve Block A.R.V. Testing

For 4CX Variable Flow machines use 25/201103

892/00309	A.R.V. Pressure Test Kit
1 : 892/00340	Test Block Body
2 : 892/00341	Setting Body
3 : 993/68300	Adjusting Pin
4 : 892/00343	Spanner
5 : 892/00345	Anti-cavitation Lock Out Bung
6 : 892/00335	A.R.V. Cartridge Removal Tool



S196700

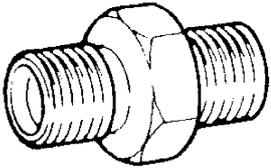
Bonded Washers

1406/0011	1/4 in. BSP
1406/0018	1/2 in. BSP
1406/0014	5/8 in. BSP
1406/0021	3/4 in. BSP
1406/0029	1.1/4 in. BSP



S188140

<p>Male Adapters - BSP x NPT (USA only)</p> <p>816/00439 3/8 in. x 1/4 in. 816/00440 1/2 in. x 1/4 in. 816/15007 3/8 in. x 3/8 in. 816/15008 1/2 in. x 3/8 in.</p>	<p>Male Adapters - BSP x BSP</p> <p>1606/0003 3/8 in. x 1/4 in. 1604/0003 3/8 in. x 3/8 in. 892/00071 3/8 in. x 3/8 in. taper 1606/0004 1/2 in. x 1/4 in. 1606/0007 1/2 in. x 3/8 in. 1604/0004 1/2 in. x 1/2 in. 1606/0017 5/8 in. x 1/2 in. 1606/0008 3/4 in. x 3/8 in. 1606/0009 3/4 in. x 1/2 in. 1604/0006 3/4 in. x 3/4 in. 1606/0012 3/4 in. x 1 in. 1606/0014 3/4 in. x 1.1/4 in. 1606/0015 1 in. x 1.1/4 in.</p>
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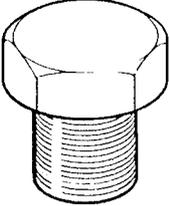
S193860

Service Tools (cont'd)

Section E - Hydraulics

Female Cone Blanking Plug

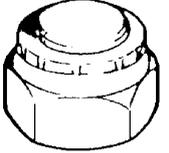
892/00055	1/4 in. BSP
892/00056	3/8 in. BSP
892/00057	1/2 in. BSP
892/00058	5/8 in. BSP
892/00059	3/4 in. BSP
892/00060	1 in. BSP



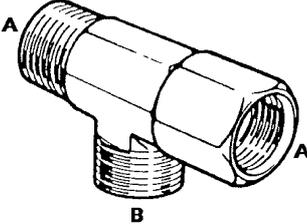
S193870

Male Cone Blanking Cap

816/00294	1/4 in. BSP
816/00189	3/8 in. BSP
816/00190	1/2 in. BSP
816/00197	5/8 in. BSP
816/00196	3/4 in. BSP
816/00193	1 in. BSP

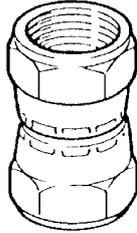


S193880



S193890

892/00047	3/8 in. BSP (A) x 1/4 in. BSP (B)
892/00048	1/2 in. BSP (A) x 1/4 in. BSP (B)
892/00049	5/8 in. BSP (A) x 1/4 in. BSP (B)
816/50043	3/4 in. BSP (A) x 1/4 in. BSP (B)
892/00051	1 in. BSP (A) x 1/4 in. BSP (B)
816/50005	1/2 in. BSP (A) x 1/2 in. BSP (B)
816/60096	3/4 in. BSP (A) x 3/4 in. BSP (B)
816/00017	1 in. BSP (A) x 1 in. BSP (B)

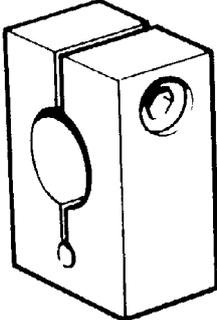


S193900

Female Connectors

892/00074	3/8 in. BSP x 3/8 in. BSP
892/00075	1/2 in. BSP x 1/2 in. BSP
892/00076	5/8 in. BSP x 5/8 in. BSP
892/00077	3/4 in. BSP x 3/4 in. BSP

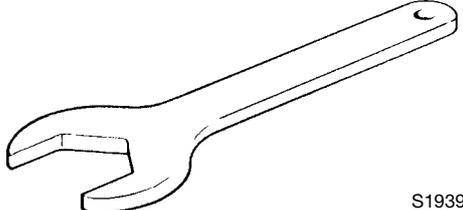
992/09100	Excavator Spool Clamp
892/00011	Spool Clamp



S216210

Hexagon Spanners for Ram Pistons and End Caps

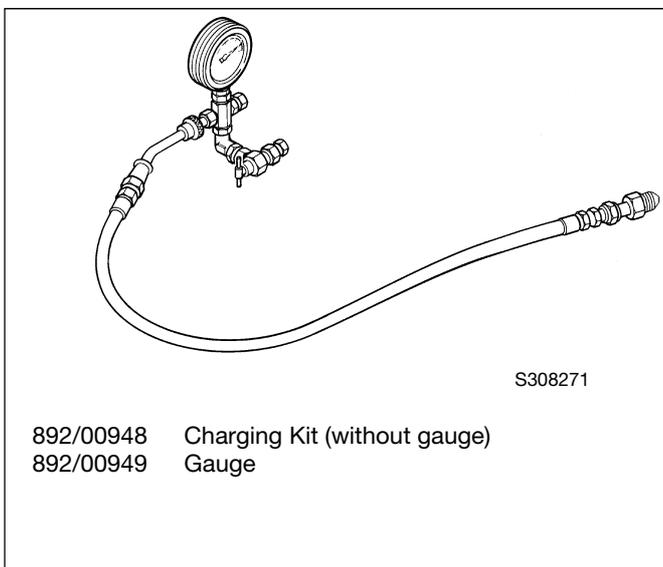
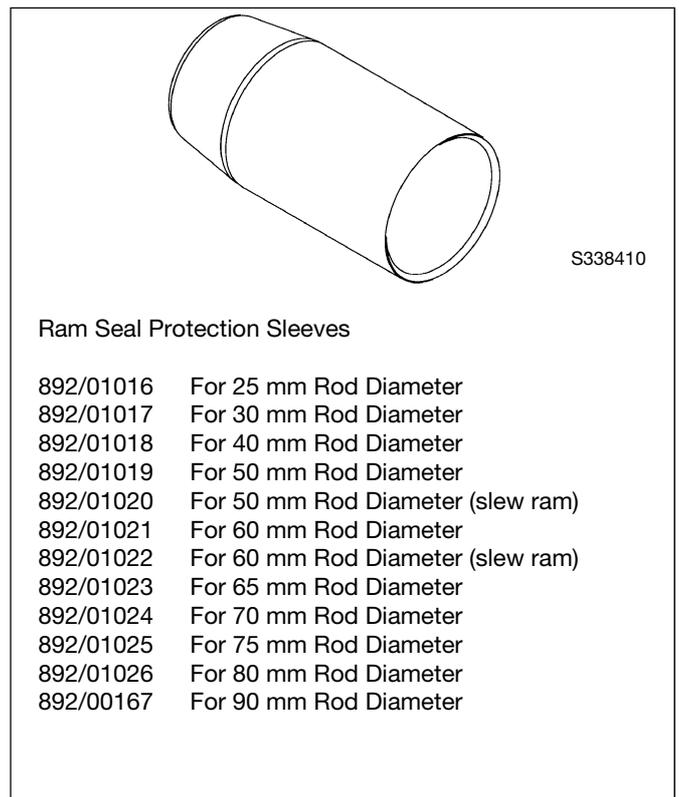
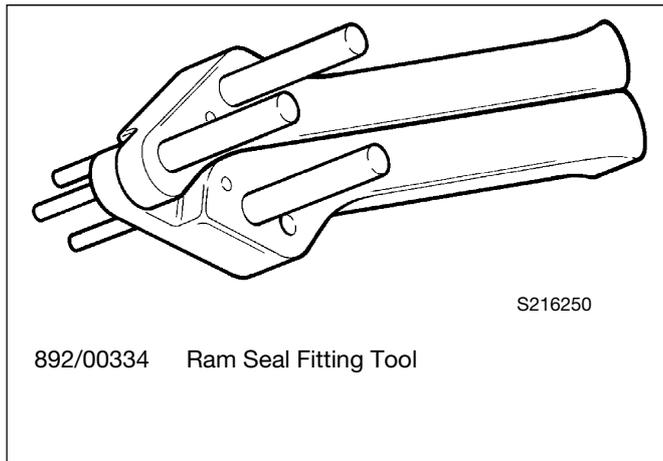
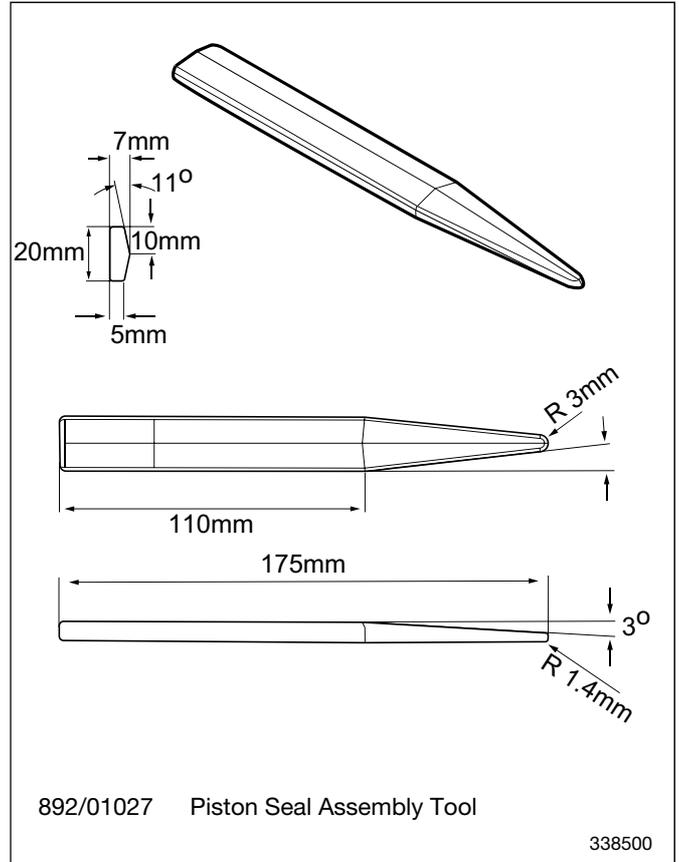
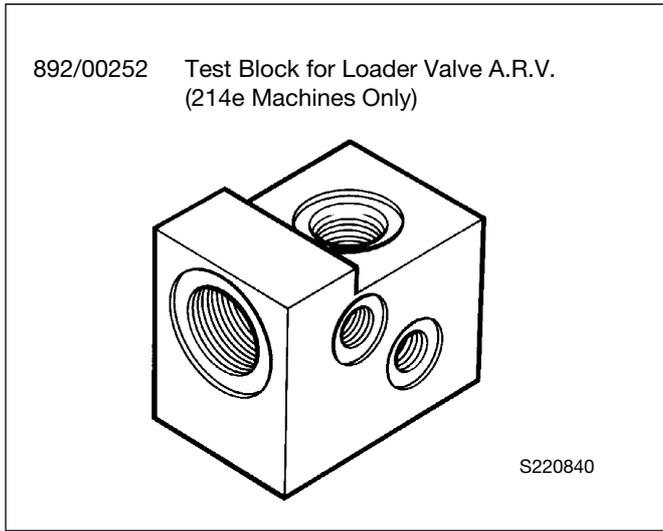
992/09300	55mm A/F
992/09400	65mm A/F
992/09500	75mm A/F
992/09600	85mm A/F
992/09700	95mm A/F
992/09900	115mm A/F
992/10000	125mm A/F



S193930

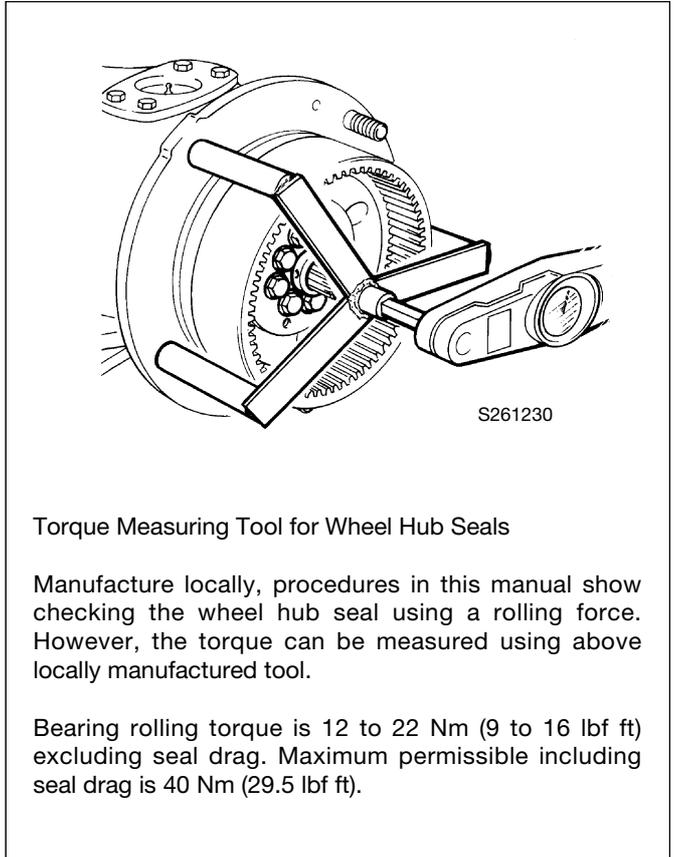
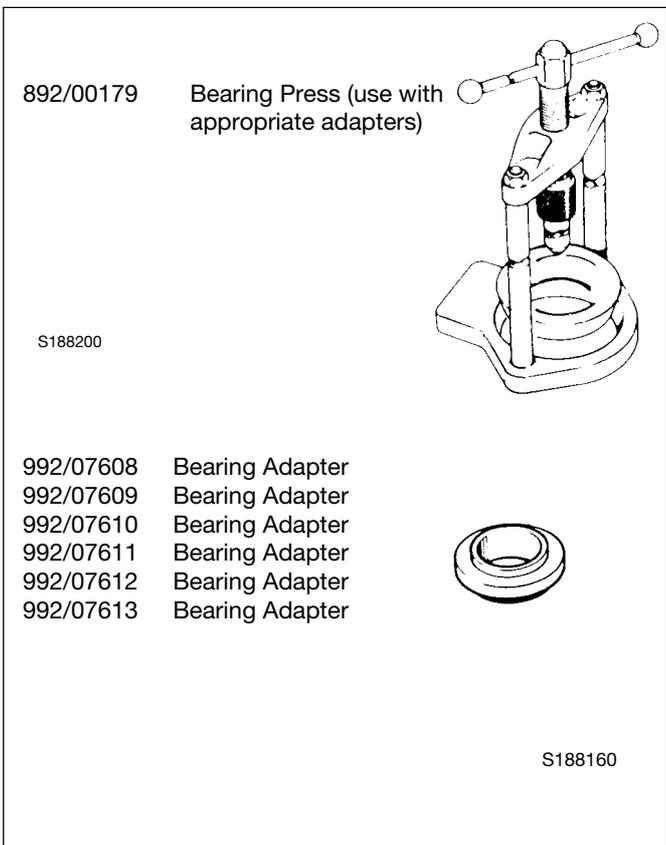
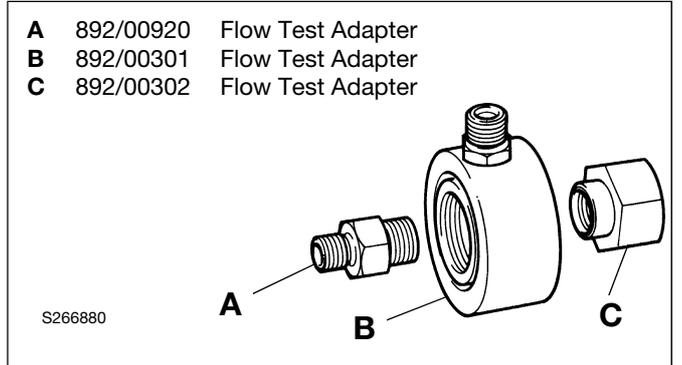
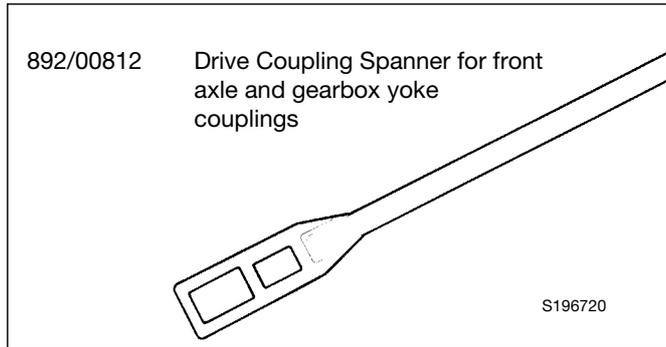
Service Tools (cont'd)

Section E - Hydraulics



Service Tools (cont'd)

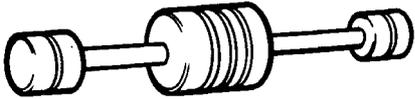
Section F - Transmission



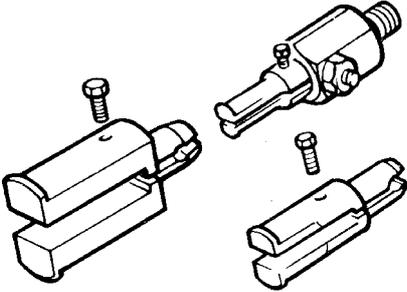
Service Tools (cont'd)

Section F - Transmission

892/00224
Impulse Extractor Set for Hub Bearing Seals

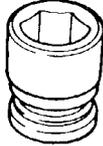


S197070



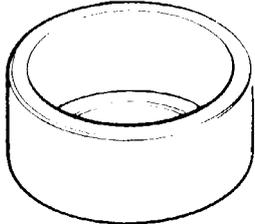
892/00225 Adapter - Impulse Extractor
Small 17mm to 25mm
Medium 25mm to 45mm
Large 45mm to 80mm

993/59500 Adapter - Impulse Extractor (syncro shuttle and powershift transmission)



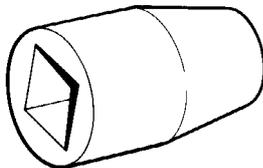
S216290

892/00817 17 mm A/F x 3/4in. square drive
892/00818 22 mm A/F x 3/4in. square drive
892/00819 15 mm A/F x 1/2in. square drive
892/00333 19 mm A/F x 3/4in. square drive



892/00174
Measuring Cup - Pinion Head Bearing

S190770

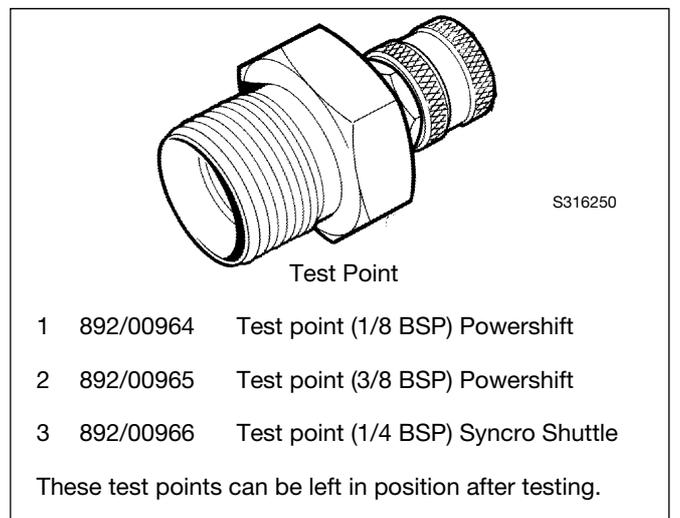
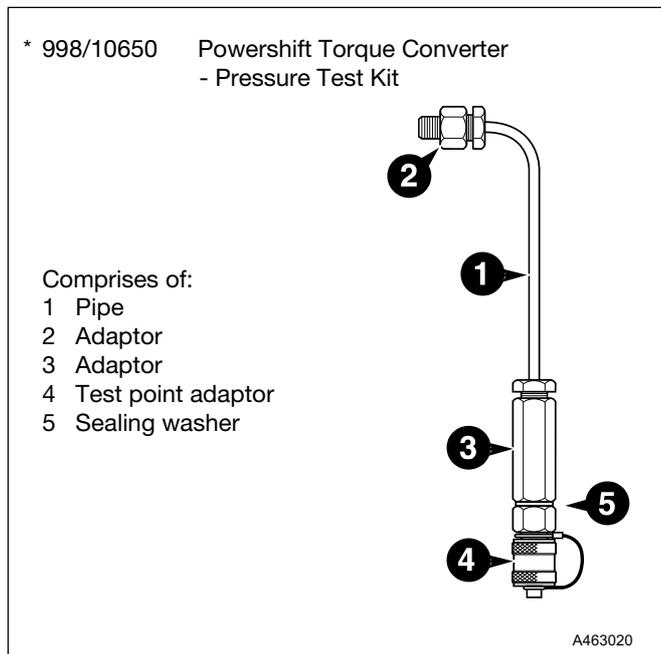
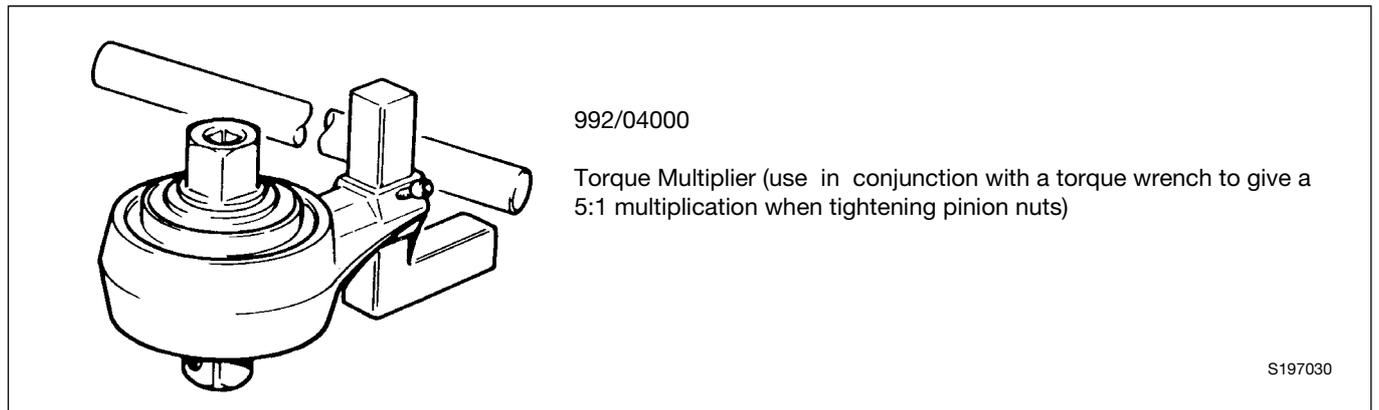
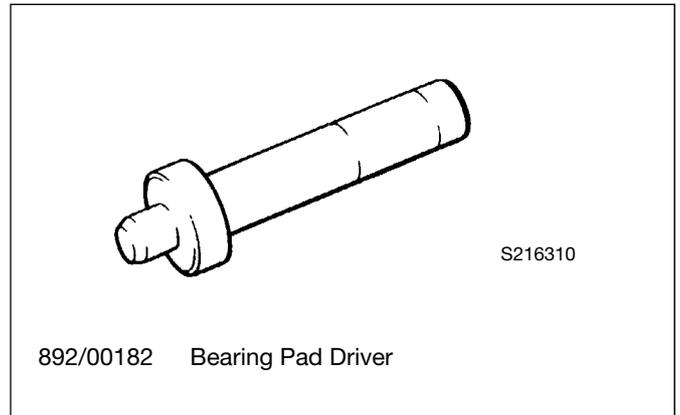
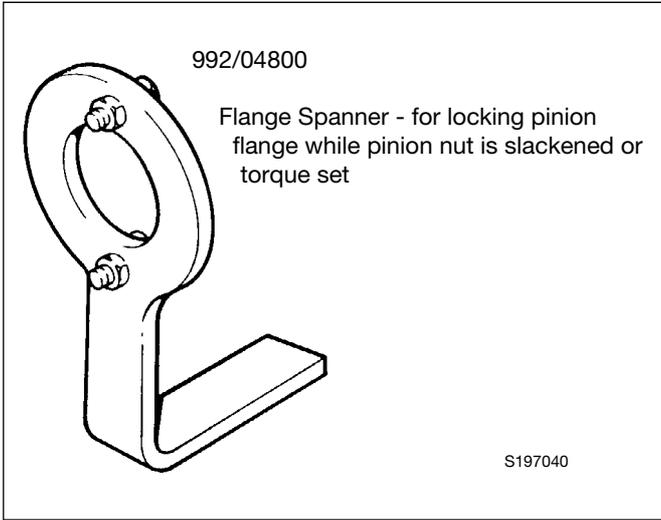


892/00822
Splined Bolt Socket for driveshafts

S197060

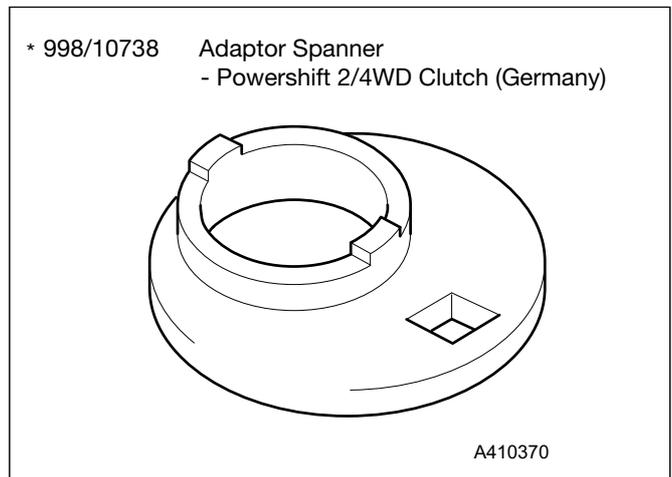
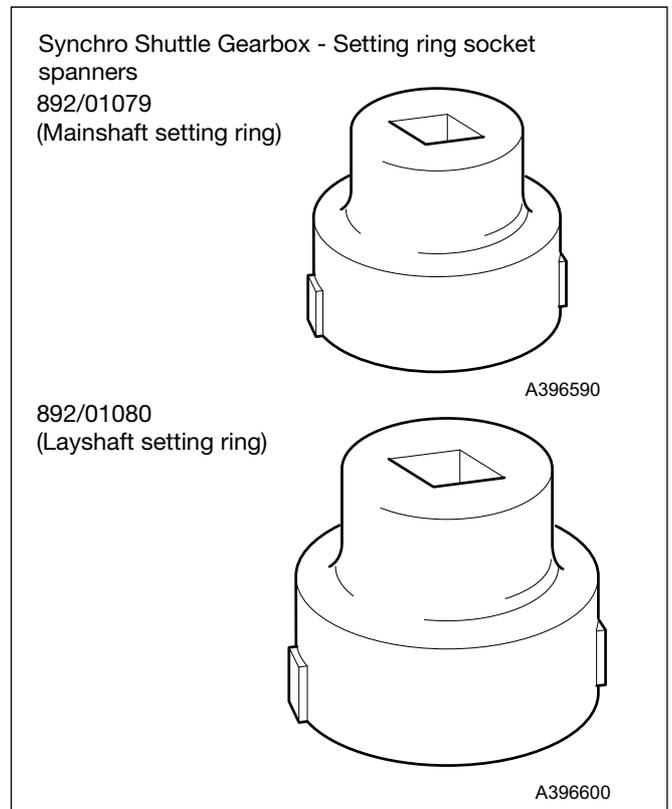
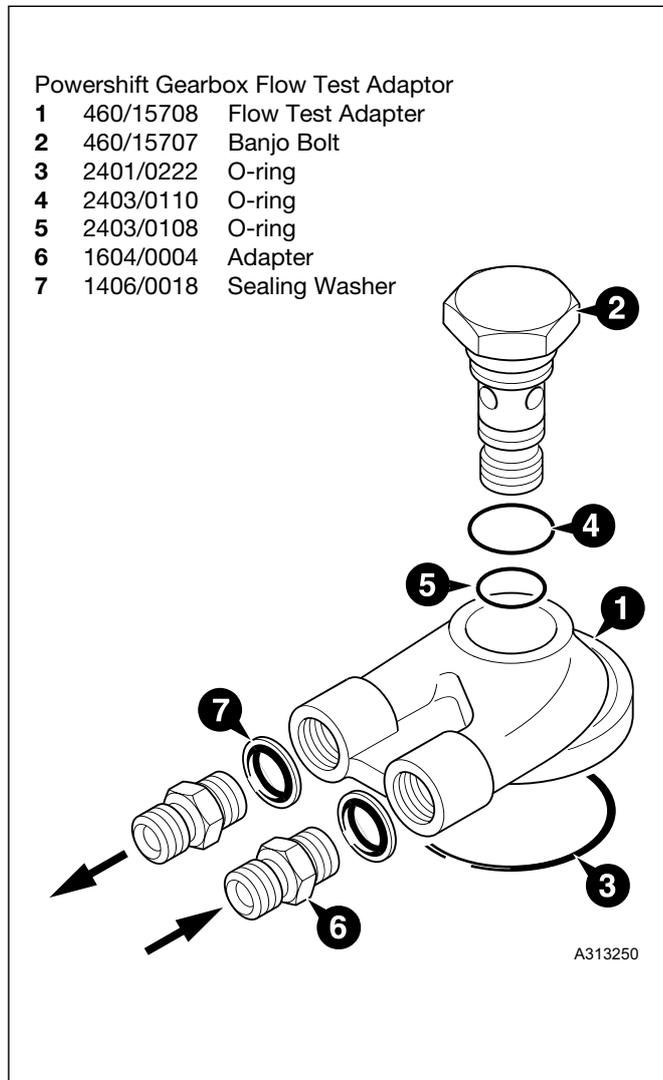
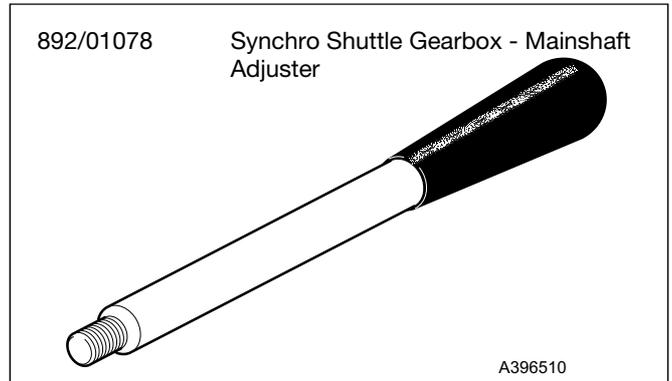
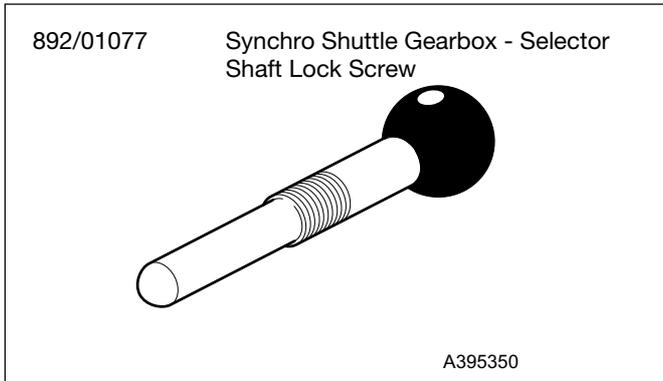
Service Tools (cont'd)

Section F - Transmission



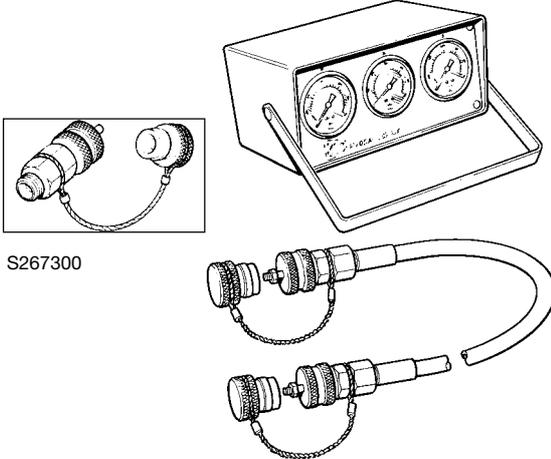
Service Tools (cont'd)

Section F - Transmission



Service Tools (cont'd)

Section F - Transmission



Hydraulic Circuit Pressure Test Kit (also used for main hydraulic system tests)

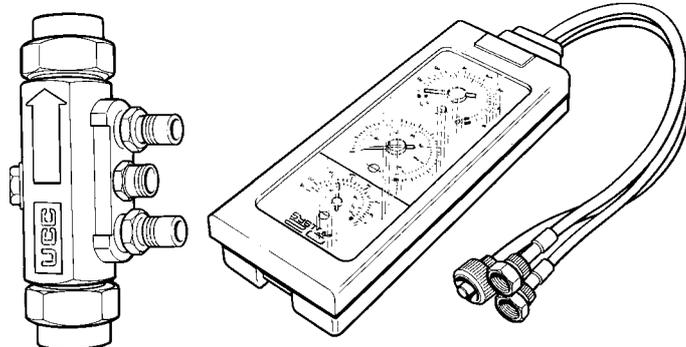
892/00253	Pressure Test Kit
:892/00201	Replacement Gauge 0-20 bar (0-300 lbf/in ²)
:892/00202	Replacement Gauge 0-40 bar (0-600 lbf/in ²)
:892/00203	Replacement Gauge 0-400 bar (0-6000 lbf/in ²)
:892/00254	Replacement Hose
993/69800	Seal Kit for 892/00254 (can also be used with probe 892/00706)
892/00706	Test Probe
* 892/00347	Connector - Hose to gauge

S267300

S188121

Flow Test Equipment (also used for main hydraulic system tests)

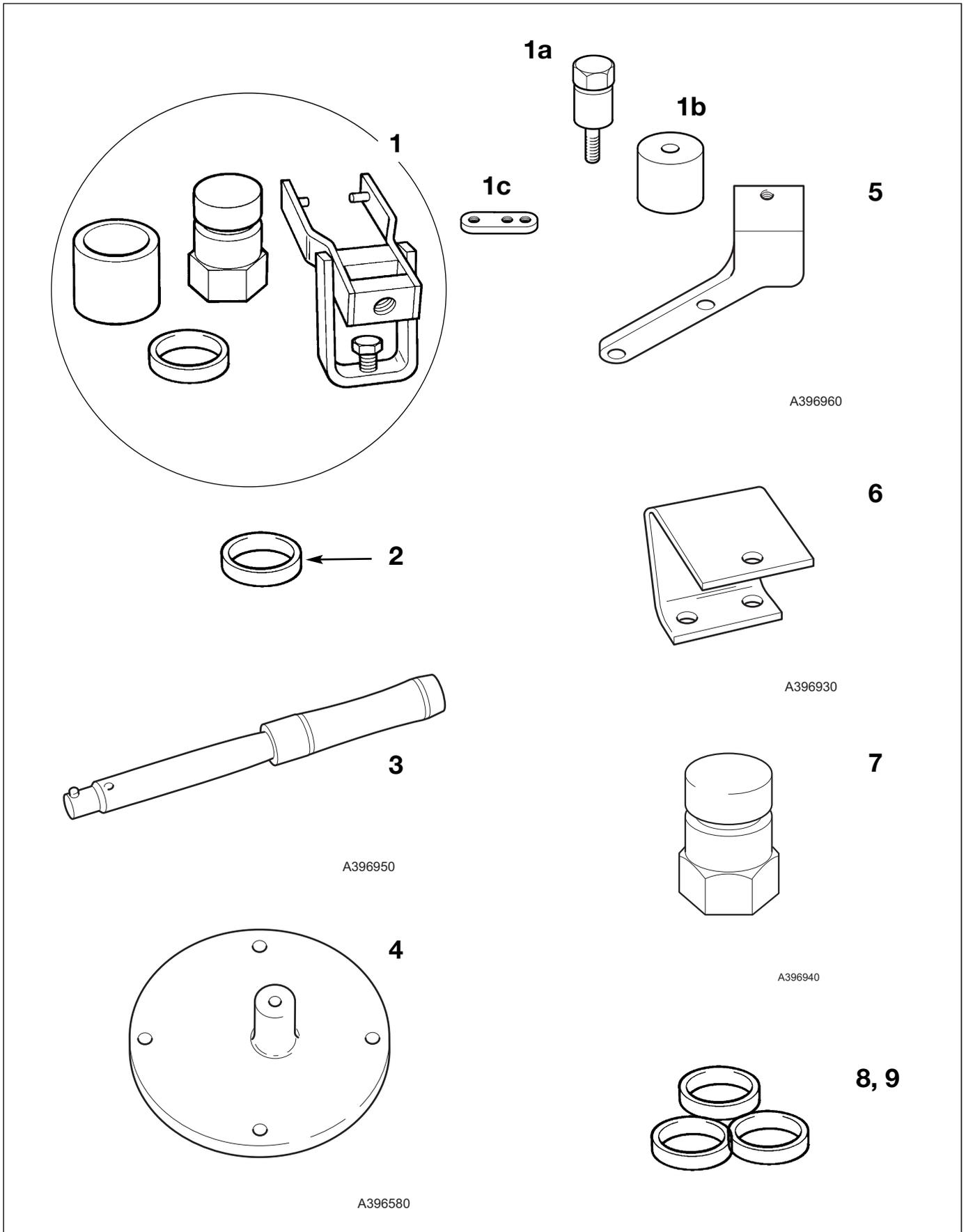
892/00268	Flow Monitoring Unit
892/00269	Sensor Head 0 - 100 l/min (0 - 22 UK gal/min)
892/00293	Connector Pipe
892/00270	Load Valve
1406/0021	Bonded Washer
1604/0006	Adapter 3/4 in M x 3/4 in M BSP
1612/0006	Adapter 3/4 in F x 3/4 in M BSP
892/00271	Adapter 3/4 in F x 5/8 in M BSP
892/00272	Adapter 5/8 in F x 3/4 in M BSP
816/20008	Adapter 3/4 in F x 1/2 in M BSP
892/00275	Adapter 1/2 in F x 3/4 in M BSP
892/00276	Adapter 3/4 in F x 3/8 in M BSP
892/00277	Adapter 3/8 in F x 3/4 in M BSP
892/00273	Sensor Head 0 - 380 l/min
892/00294	Connector Pipe
1606/0015	Adapter 1.1/4 in M BSP x 1 in M BSP
892/00078	Connector 1 in F x 1 in F BSP
1604/0008	Adapter 1 in M x 1 in M BSP
1606/0012	Adapter 1 in M x 3/4 in M BSP
816/20013	Adapter 3/4 in F x 1 in M BSP



S188151

Service Tools (cont'd)

Section F - Transmission



Service Tools (cont'd)

Section F - Transmission

**Solid Spacer Setting Kit
Synchro Shuttle Gearbox, SD70, SD80
Axles, Powershift 2004 Gearbox**

*10 921/53400 Spacer Kit - Sychro Shuttle Gearbox,
SD70, SD80 Axles

Comprises of:

					Spacer thickness mm		Spacer thickness mm
1	892/00918	Setting Tool Kit					
*1a	892/01164	Adaptor (2004 Gearboxes)					
*1b	892/01165	Sleeve (2004 Gearboxes)					
*1c	892/01163	Support Bracket (2004 Gearboxes)					
2	921/52627	Spacer 14.20 Service use		921/52628	12.600	921/53425	13.300
3	993/70111	Breakback Torque Wrench		829/30405	12.625	921/53426	13.325
4	892/01076	Support Bracket - Synchro Shuttle Gearbox		921/52629	12.650	921/53427	13.350
				829/30406	12.675	921/53428	13.375
				921/52630	12.700	921/53401	13.400
5	892/01075	Support Bracket PD70, SD80 Rear Axles		829/30407	12.725	921/53402	13.425
				921/52601	12.750	921/53403	13.450
6	997/11000	Support Bracket SD55, SD70 Front Axles		829/30408	12.775	921/53404	13.475
				921/52602	12.800	921/53405	13.500
7	998/10567	SD80 Pinion Shaft Adaptor		829/30409	12.825	921/53406	13.525
				921/52603	12.850	921/53407	13.550
*8	921/53300	Spacer Kit - SD55 Axles		829/30410	12.875	921/53408	13.575
				921/52604	12.900	921/53409	13.600
				829/30411	12.925	921/53410	13.625
				921/52605	12.950	921/53411	13.650
				829/30412	12.975	921/53412	13.675
				921/52606	13.000	921/53413	13.700
				829/30413	13.025	921/53414	13.725
				921/52607	13.050	921/53415	13.750
				829/30414	13.075	921/53416	13.775
				921/52608	13.100	921/53417	13.800
				829/30415	13.125	921/53418	13.825
				921/52609	13.150	921/53419	13.850
				829/30416	13.175	921/53420	13.875
				921/52610	13.200	921/53421	13.900
				829/30417	13.225	921/53422	13.925
				921/52611	13.250	921/53423	13.950
				921/53424	13.275	921/52626	14.000

Note: After using a spacer, obtain a replacement to keep the set complete.

*9 823/10547 Spacer Kit - Powershift 2004 Gearbox

Comprises of:

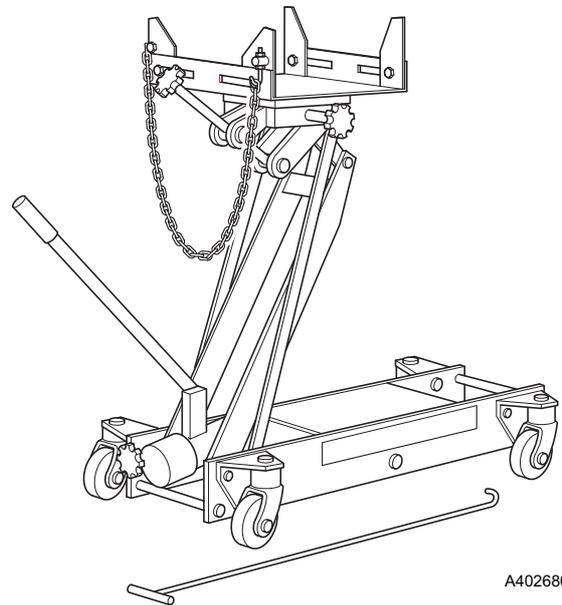
	Spacer thickness mm		Spacer thickness mm
829/30946	13.850	829/30953	13.675
829/30947	13.825	829/30954	13.650
829/30948	13.800	829/30955	13.625
829/30949	13.775	829/30956	13.600
829/30950	13.750	829/30957	13.575
829/30951	13.725	829/30958	13.550
829/30952	13.700		

Service Tools (cont'd)

Section F - Transmission

892/01094 Transmission Jack

When removing the Powershift gearbox use of a special transmission jack is strongly recommended. This jack can also be used when removing Synchro Shuttle gearboxes.
 Note that the jack must be used with special support plates, see below.



A402680

Powershift - Support plates, for use with transmission jack, Manufacture locally, for details see **Section F, Service Tools.**

892/01082 - Powershift - Assembly Cradle, for details see **Section F, Service Tools.**

Powershift - Gearbox hydraulic pump removal tools, allow pump to be removed with torque converter housing fitted to gearbox. Manufacture locally, for details see **Section F, Service Tools.**

823/10420 Thrust Washer Kit - Powershift gearbox - Layshaft clutch

Comprises of:

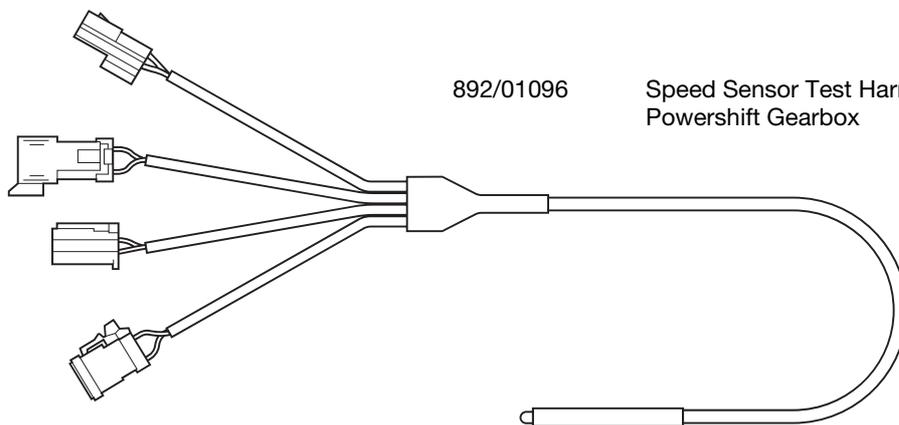
	Washer thickness mm
823/10421	4.3
823/10422	4.4
823/10423	4.5
823/10424	4.6
823/10425	4.7
823/10426	4.8

892/01083 Powershift - Assembly tool, transfer gear.

892/01084 Powershift - Transfer gear, bearing assembly.

892/01085 Powershift - Seal fitting tool

892/01096 Speed Sensor Test Harness - Powershift Gearbox



711300

Service Tools (cont'd)

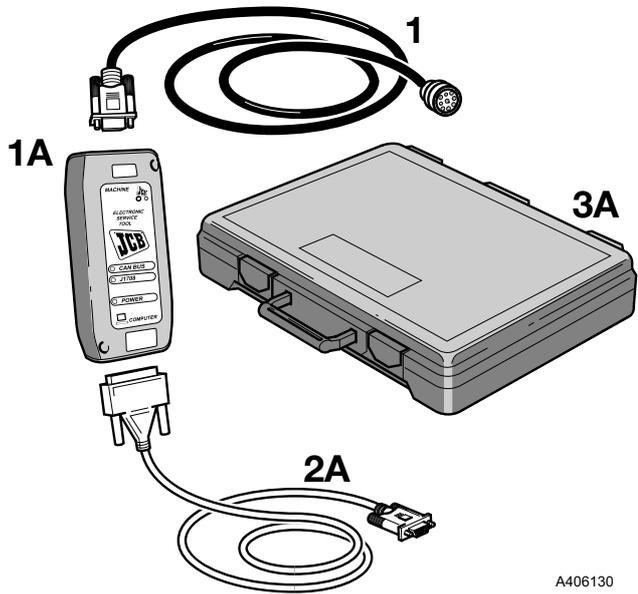
Section F - Transmission

**Powershift Gearbox - 6 Speed (ShiftMaster)
Electronic Service Tool Kit**

* 1 721/10885 - Interconnecting cable (Data Link Adaptor to machine ECU diagnostics socket). Note that this cable must be ordered separately in addition to the kit below.

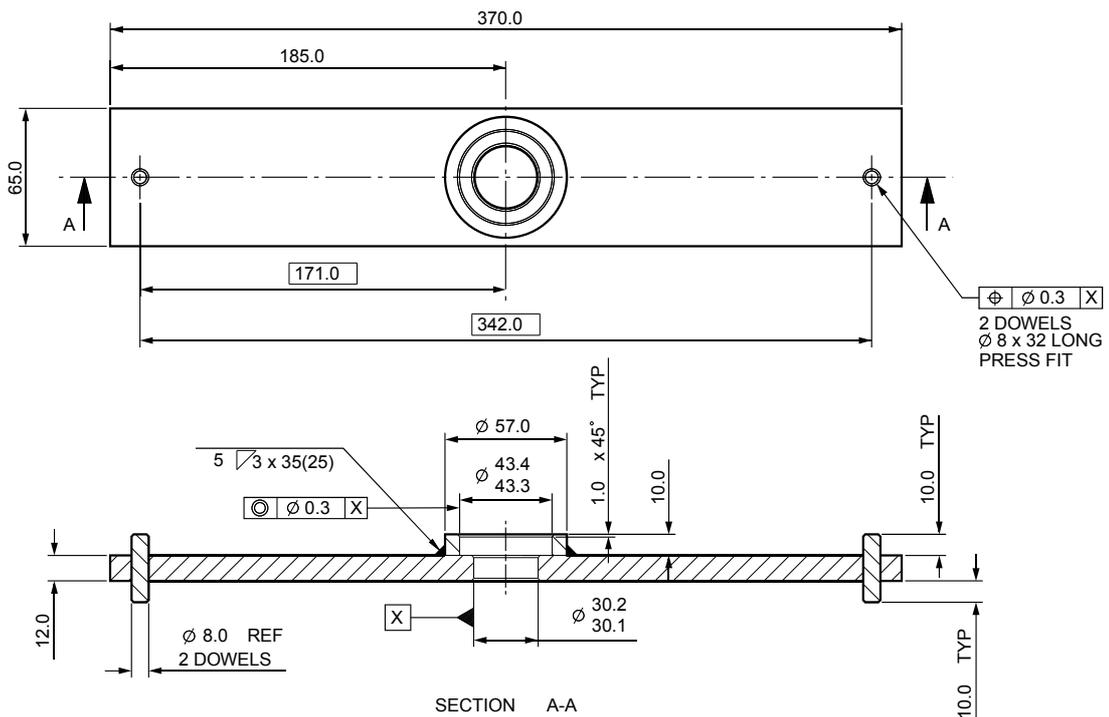
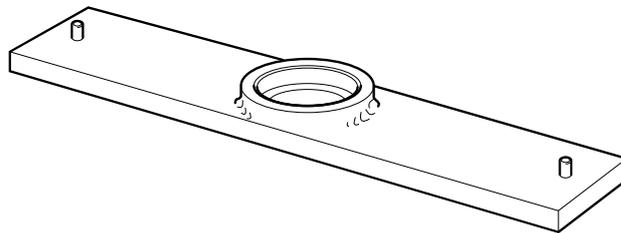
892/01033 - Service Tool Kit comprises:

- 1A Data Link Adaptor (DLA), enables data exchange between the machine ECU (Electronic Control Unit) and a laptop PC loaded with the applicable ShiftMaster diagnostics software.
- 2A Interconnecting cable, DLA to laptop PC. Several cables are included to enable compatibility with different PC port types.
- 3A Kit carrying case.



A406130

892/01110 Torque Converter Alignment Tool
(for 12" and W300 torque converters)



A436700

Service Tools (cont'd)

Section F - Transmission

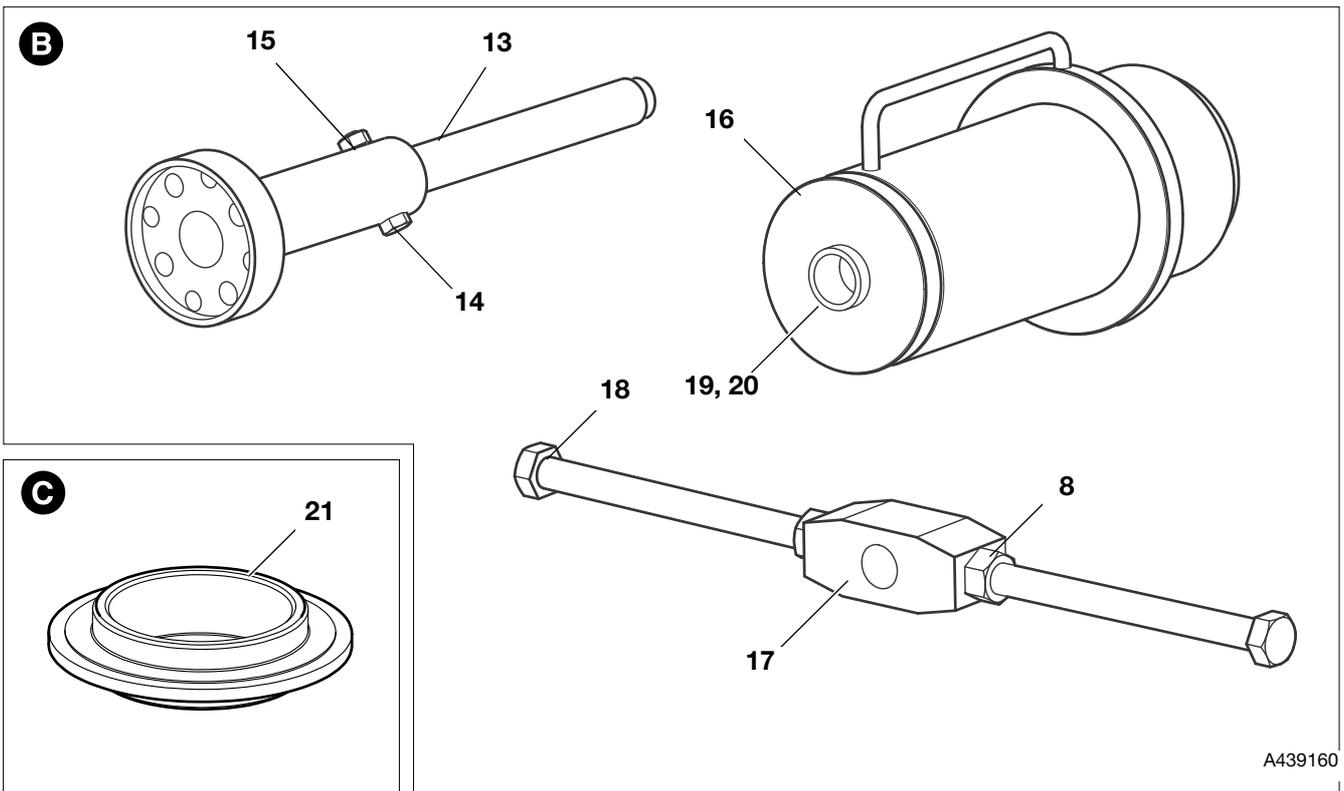
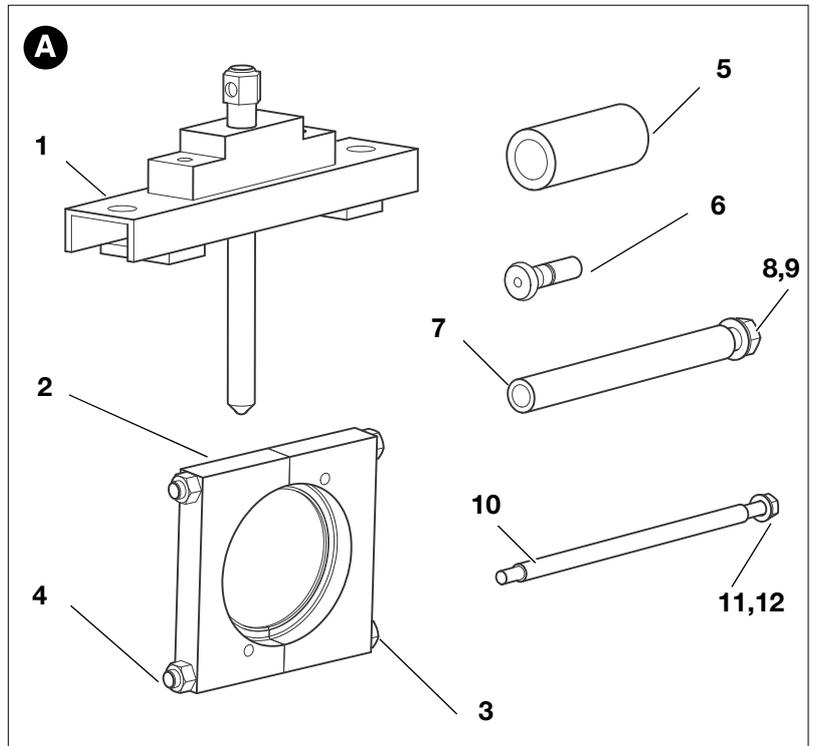
Wheel Hub Service Tool -

- A Bearing Puller
- B Bearing Press
- C Hub Seal Dolly

Item	Description	Part No.	Qty
A, B & C	Hub Service Kit	892/01092	1

comprises of:

1	Puller Beam	998/10623	1
2	Inner Bearing Plate	998/10607	1
3	Bolt M16x220	1315/3731Z	2
4	Nut M16	1370/0601Z	2
5	Reaction Tube	998/10614	1
6	Modified Wheel Stud	998/10624	2
7	Wheel Bearing Carrier Puller	998/10615	2
8	Nut M20	1370/0701Z	4
9	Washer M20	1420/0012Z	2
10	Puller Rod	998/10610	2
11	Nut M12	1370/0401Z	2
12	Washer M12	1420/0009Z	2
13	Bearing Centre Puller	998/10608	1
14	Bolt M10x60	1315/3414Z	1
15	Nut M10	1370/0301Z	1
16	Bearing Fitting Tube	998/10606	1
17	Puller Handle Nut	998/10616	1
18	Bolt M20x300	1315/3835Z	2
19	Washer	445/12303	2
20	Bearing	917/02800	1
21	Seal Dolly	892/00891	1



A439160

Service Tools (cont'd)

Section H - Steering

