

Service Manual

**3CX, 4CX,
& Variants**

From M/c No. 400001 To 460000

Publicación No. 9803/3260 Issue 9

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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.

*

Throughout this manual abbreviations are used to identify various machine types. The abbreviations and their full explanation are as follows:

AWS - All Wheel Steer
2WS - 2 Wheel Steer
2WD - 2 Wheel Drive
4WD - 4 Wheel Drive

*

The contents page at the beginning of each section will clearly identify using parenthesis () when a procedure/description is pertinent to a particular machine, for example:

Loader Arm Safety Strut (AWS Machines)
- Fitting and Removing

Loader Arm Safety Strut (2WS Machines)
- Fitting and Removing

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Machine Identification Plate

Your machine has an identification plate **X** mounted on the loader tower as shown. 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.

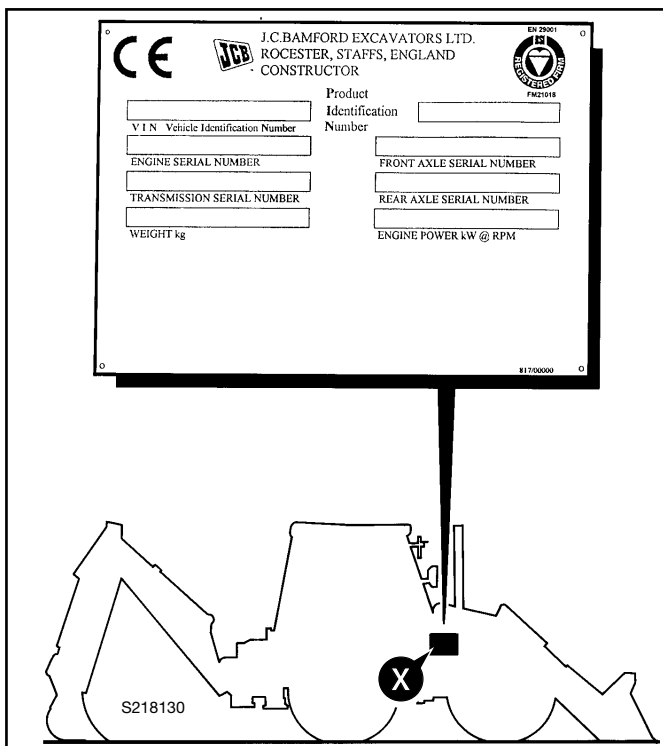
The machine and engine serial numbers can help identify exactly the type of equipment you have.

Typical Machine Identification Number

SLP 3CX T S R E 0430001
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:

R = 1994	1 = 2001
S = 1995	2 = 2002
T = 1996	3 = 2003
V = 1997	4 = 2004
W = 1998	5 = 2005
X = 1999	6 = 2006
Y = 2000	7 = 2007
- F** Manufacturer Location (E = England)
- G** Machine Serial Number:



Typical Engine Identification Number

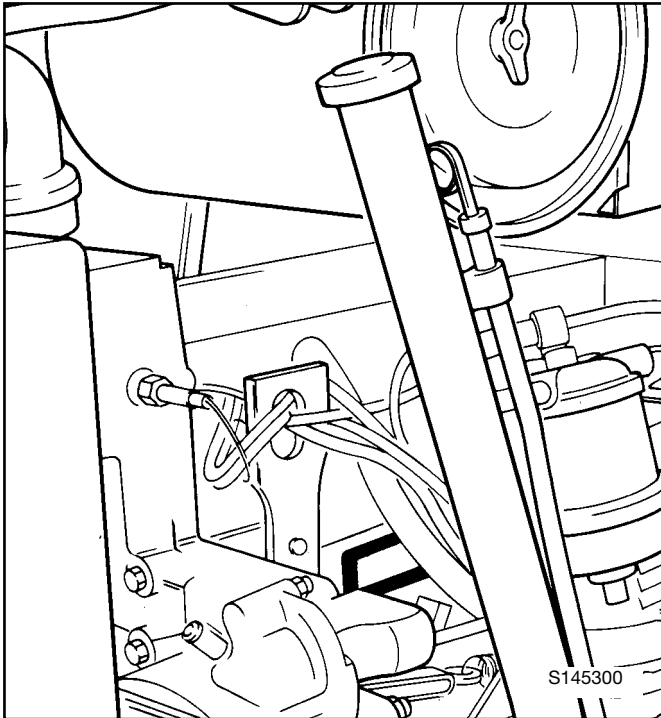
AB 50262 U 500405 P
A B C D E

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

Unit Identification

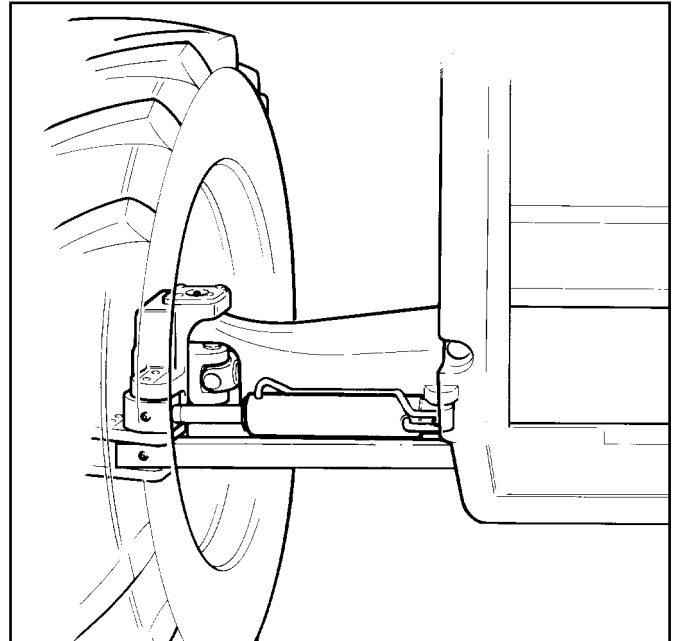
Engine Serial Plate

The engine serial number is stamped on a label which is fastened to the left side of the cylinder block (looking from the rear).



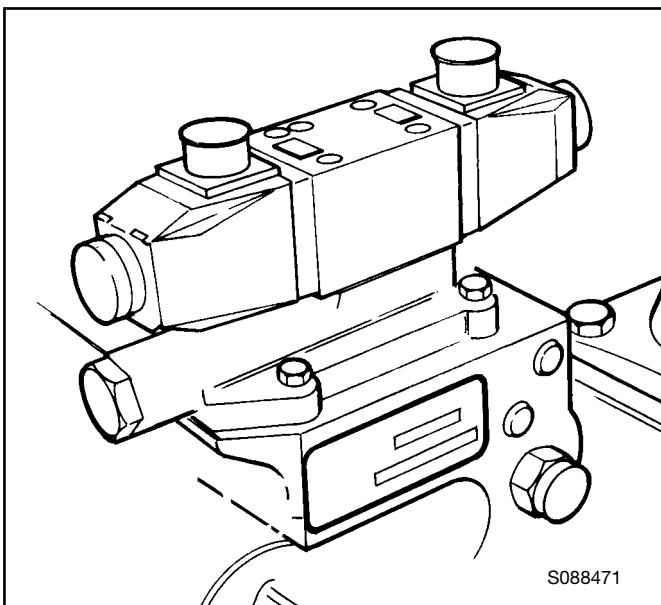
* Front Axle Serial Plate (All Wheel Steer Machines)

The front axle serial number is stamped on a plate mounted on the axle.



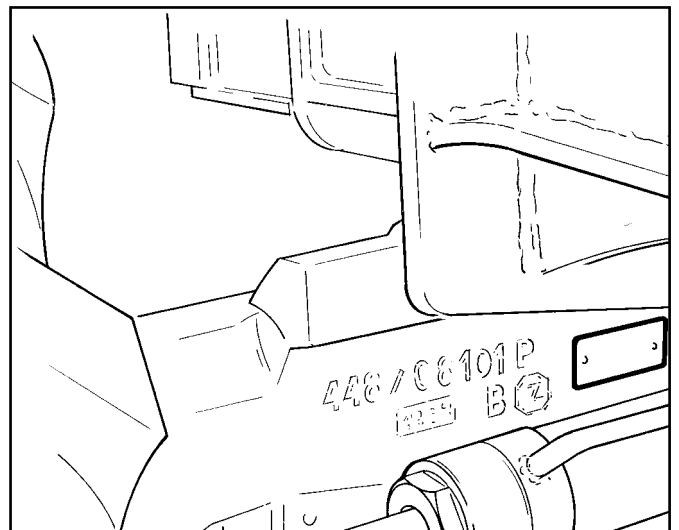
Syncro Shuttle Serial Plate

The Syncro Shuttle serial number is stamped on a label which is mounted to the rear face of the unit.



* Front Axle Serial Plate (2 Wheel Steer Machines)

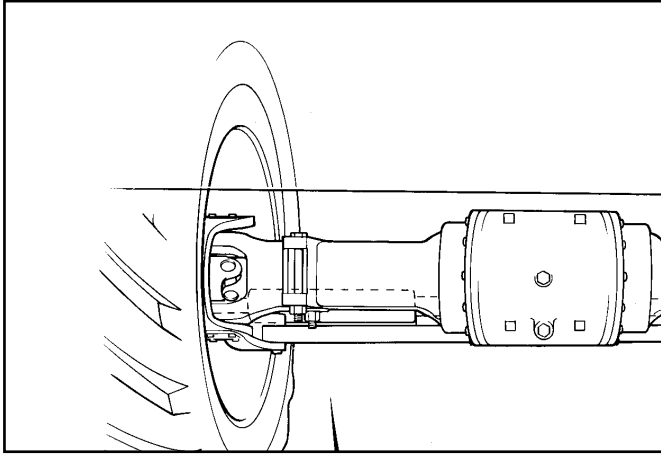
The front axle serial number is stamped on a plate mounted on the the axle.



Unit Identification (cont'd)

Rear Axle Serial Plate (All Wheel Steer Machines)

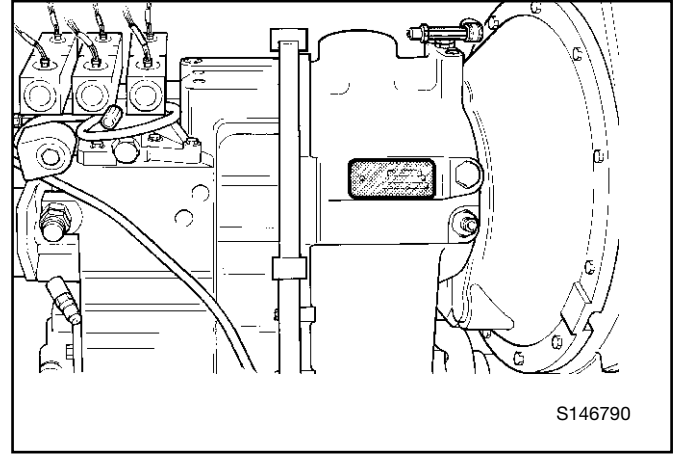
The rear axle serial number is stamped on a plate mounted to the front face of the axle, as shown.



S143050

*** Powershift Serial Plate**

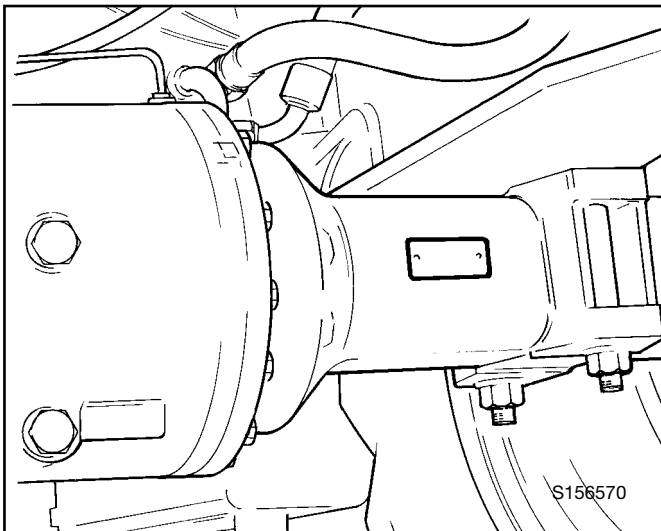
The powershift serial number is stamped on a plate which is mounted to the side of the unit as shown.



S146790

Rear Axle Serial Plate (2 Wheel Steer Machines)

The rear axle serial number is stamped on a plate mounted to the front face of the axle, as shown.



S156570

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
11/4	(31.7)	17/8	1940	198.0	1430
11/2	(38.1)	21/4	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

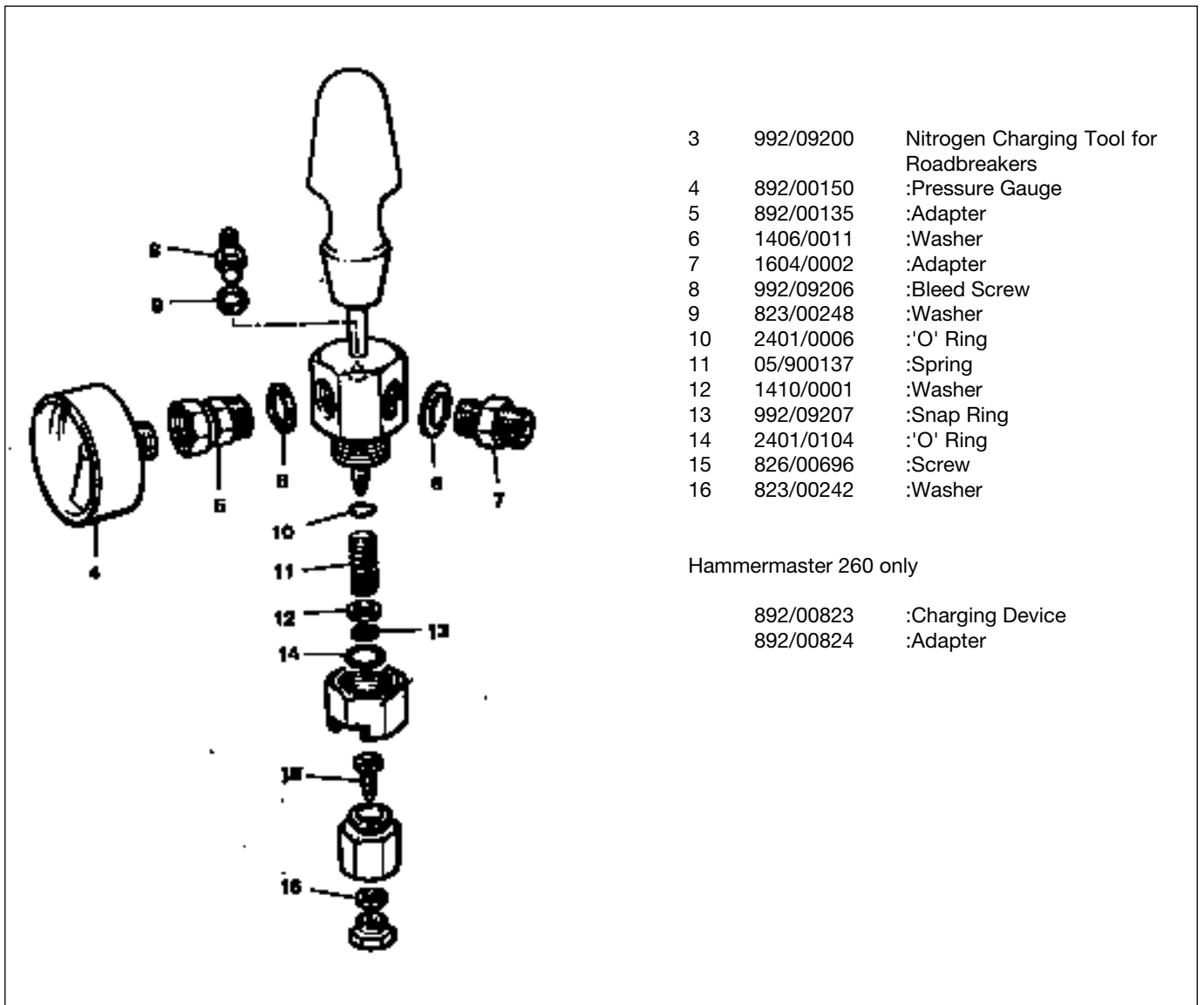
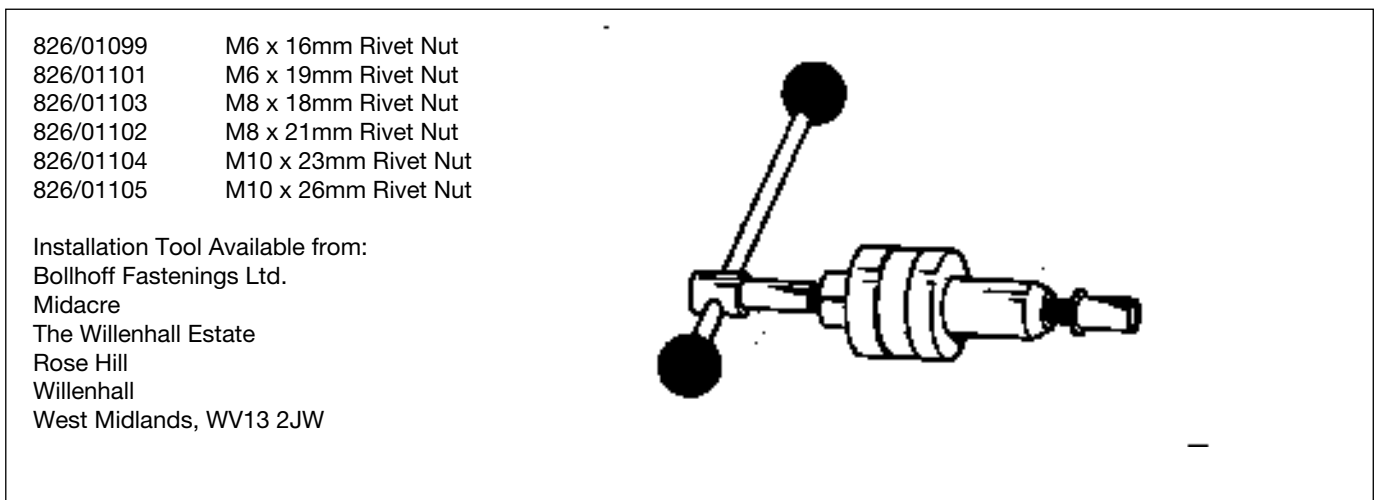
Note: All bolts used on JCB machines are high tensile and must not be replaced by bolts of a lesser tensile specification.

Service Tools Numerical List

		Page No.			Page No.
1406/0011	Bonded Washer	4 - 7	892/00051	Adapter	4 - 8
1406/0014	Bonded Washer	4 - 7	892/00055	Blanking Plug	4 - 8
1406/0018	Bonded Washer	4 - 7	892/00056	Blanking Plug	4 - 8
1406/0021	Bonded Washer	4 - 6, 4 - 7	892/00057	Blanking Plug	4 - 8
1406/0029	Bonded Washer	4 - 7	892/00058	Blanking Plug	4 - 8
1604/0003	Male Adapter	4 - 7	892/00059	Blanking Plug	4 - 8
1604/0004	Male Adapter	4 - 7	892/00060	Blanking Plug	4 - 8
1604/0006	Male Adapter	4 - 6, 4 - 7	892/00071	Male Adapter	4 - 7
1604/0008	Adapter	4 - 6	892/00074	Female Connector	4 - 8
1606/0003	Male Adapter	4 - 7	892/00075	Female Connector	4 - 8
1606/0004	Male Adapter	4 - 7	892/00076	Female Connector	4 - 8
1606/0007	Male Adapter	4 - 7	892/00077	Female Connector	4 - 8
1606/0008	Male Adapter	4 - 7	892/00078	Connector	4 - 6
1606/0009	Male Adapter	4 - 7	892/00137	Micro-Bore Hose 1/4in. BSP, 3 Metres	4 - 7
1606/0012	Male Adapter	4 - 6, 4 - 7	892/00167	Gland Seal Fitting Sleeve	4 - 9
1606/0014	Male Adapter	4 - 7	892/00174	Measuring Cup	4 - 12
1606/0015	Male Adapter	4 - 6, 4 - 7	892/00176	Extractor	4 - 9
1606/0017	Male Adapter	4 - 7	892/00177	Extractor Collets	4 - 9
1612/0006	Adapter	4 - 6	892/00178	Extractor Collets	4 - 9
2401/0103	'O' Ring	4 - 7	892/00179	Bearing Press	4 - 10
4101/0202	Lock and Seal	5 - 1	892/00180	Seal Fitting Tool	4 - 9
4101/0402	Loctite 932	5 - 1	892/00182	Bearing Pad Driver	4 - 11
4101/0502	Loctite 262	5 - 1	892/00223	Hand Pump	4 - 7
4101/0602	High Strength Retainer	5 - 1	892/00224	Impulse Extractor	4 - 12
4102/0502	High Strength Gasketing	5 - 1	892/00225	Adapter for Extractor	4 - 12
4102/1201	Multi-Gasket	5 - 1	892/00231	Gland Seal Fitting Sleeve	4 - 9
4102/1901	Loctite 577	5 - 1	892/00232	Gland Seal Fitting Sleeve	4 - 9
4104/0101	Activator N (Aerosol)	5 - 1	892/00233	Gland Seal Fitting Sleeve	4 - 9
4104/0102	Activator N (Bottle)	5 - 1	892/00253	Pressure Test Kit	4 - 6
4104/1538	JCB Cleaner & Degreaser	5 - 1	892/00255	Pressure Test Adapter	4 - 6
816/00017	Adapter	4 - 8	892/00256	Pressure Test Adapter	4 - 6
816/00189	Blanking Cap	4 - 8	892/00257	Pressure Test Adapter	4 - 6
816/00190	Blanking Cap	4 - 8	892/00258	Pressure Test Adapter	4 - 6
816/00193	Blanking Cap	4 - 8	892/00259	Pressure Test Adapter	4 - 6
816/00196	Blanking Cap	4 - 8	892/00260	Pressure Test Adapter	4 - 6
816/00197	Blanking Cap	4 - 8	892/00261	Pressure Test Adapter	4 - 6
816/00294	Blanking Cap	4 - 8	892/00262	Pressure Test 'T' Adapter	4 - 6, 4 - 7
816/00439	Male Adapter	4 - 7	892/00263	Pressure Test 'T' Adapter	4 - 6
816/00440	Male Adapter	4 - 7	892/00264	Pressure Test 'T' Adapter	4 - 6
816/15007	Male Adapter	4 - 7	892/00265	Pressure Test 'T' Adapter	4 - 6
816/15008	Male Adapter	4 - 7	892/00268	Flow Monitoring Unit	4 - 6
816/15118	Pressure Test Adapter	4 - 6	892/00269	Sensor Head	4 - 6
816/20008	Adapter	4 - 6	892/00270	Load Valve	4 - 6
816/20013	Adapter	4 - 6	892/00271	Adapter	4 - 6
816/50005	Adapter	4 - 8	892/00272	Adapter	4 - 6
816/50043	Adapter	4 - 8	892/00273	Sensor Head	4 - 6
816/55038	Pressure Test 'T' Adapter	4 - 6	892/00274	Adapter	4 - 7
816/55040	Pressure Test 'T' Adapter	4 - 6	892/00275	Adapter	4 - 6
816/60096	Adapter	4 - 8	892/00276	Adapter	4 - 6
825/00410	Crowfoot Wrench	4 - 5	892/00277	Adapter	4 - 6
825/99833	Adapter for 825/00410	4 - 5	892/00278	Gauge	4 - 7
826/01099	Rivet Nut	4 - 1	892/00279	Gauge	4 - 7
826/01101	Rivet Nut	4 - 1	892/00282	Shunt	4 - 5
826/01102	Rivet Nut	4 - 1	892/00283	Tool Kit Case	4 - 5
826/01103	Rivet Nut	4 - 1	892/00284	Tachometer	4 - 5
826/01104	Rivet Nut	4 - 1	892/00285	Hydraulic Oil Temperature Probe	4 - 5
826/01105	Rivet Nut	4 - 1	892/00286	Surface Temperature Probe	4 - 5
892/00011	Spool Clamp	4 - 8	892/00293	Connector Pipe	4 - 6
892/00039	Spool Clamp & A.R.V. Clamp	4 - 8	892/00294	Connector Pipe	4 - 6
892/00041	De-glazing Tool	4 - 13	892/00295	End Float Setting Tool	4 - 10
892/00047	Adapter	4 - 8	892/00298	Fluke Meter	4 - 5
892/00048	Adapter	4 - 8	892/00301	Flow Test Adapter	4 - 10
892/00049	Adapter	4 - 8			

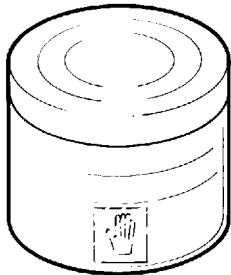
Service Tools Numerical List (cont'd)

		Page No.			
892/00302	Flow Test Adapter	4 - 10	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.		
892/00304	Flow Test Adapter	4 - 10			
892/00309	ARV Test Kit (Excavator Valve)	4 - 7			
892/00333	Heavy Duty Socket	4 - 11			
892/00334	Gland Seal Fitting Tool	4 - 9			
892/00335	ARV Cartridge Removal Tool	4 - 7			
892/00706	Test Probe	4 - 7			
892/00812	Drive Coupling Spanner	4 - 10			
892/00817	Heavy Duty Socket	4 - 11			
892/00818	Heavy Duty Socket	4 - 11			
892/00819	Heavy Duty Socket	4 - 11			
892/00822	Splined Bolt Socket	4 - 12			
892/00825	End Float Setting Tool	4 - 10			
892/00836	Lifting Wire Assembly	4 - 13			
892/00842	Glass Lifter	4 - 2			
892/00843	Folding Stand	4 - 2			
892/00844	Long Knife	4 - 3			
892/00845	Cartridge Gun	4 - 2			
892/00846	Glass Extractor (Handles)	4 - 3			
892/00847	Nylon Spatula	4 - 4			
892/00848	Wire Starter	4 - 3			
892/00849	Braided Cutting Wire	4 - 3			
892/00882	Alternator Pulley Socket	4 - 5			
892/00891	Wheel Hub Seal - Fitting Tool	4 - 12			
926/15500	Rubber Spacer Blocks	4 - 4			
990/00083	End Float Setting Tool	4 - 10			
992/00800	Extractor	4 - 4			
992/01003	Plug	4 - 7			
992/04000	Torque Multiplier	4 - 12			
992/04800	Flange Spanner	4 - 12			
992/07601	Spanner	4 - 11			
992/07603	Replacer - Bearing Cup	4 - 11			
992/07604	Replacer - Bearing Cone	4 - 11			
992/07606	Measuring Cup - Pinion Bearing	4 - 11			
992/07607	Preload Spacer	4 - 11			
992/07609	Bearing Adapter	4 - 11			
992/07614	Bearing Adapter	4 - 11			
992/00800	Pivot Pin Extractor Tool	4 - 4			
992/09100	Spool Clamp	4 - 8			
992/09200	Charging Tool	4 - 1			
992/09300	Ram Spanner	4 - 8			
992/09400	Ram Spanner	4 - 8			
992/09500	Ram Spanner	4 - 8			
992/09600	Ram Spanner	4 - 8			
992/09700	Ram Spanner	4 - 8			
992/10000	Ram Spanner	4 - 8			
992/10100	Spool & A.R.V. Clamp	4 - 8			
992/10200	Body	4 - 7			
992/12300	12V Mobile Oven	4 - 2			
992/12400	Static Oven - 2 Cartridge	4 - 2			
992/12600	Static Oven - 6 Cartridge	4 - 2			
992/12800	Cut-Out Knife	4 - 3			
992/12801	"L" Blades	4 - 3			
993/59300	2/4WD Pressure Test Tool	4 - 10			
993/59500	Impulse Extractor Adapter	4 - 12			
993/68100	Slide Hammer Kit	4 - 4			
993/69800	Seal Kit	4 - 6			
* 993/85700	Battery Tester	4 - 5			
4104/1310	Hand Cleaner	4 - 2			
			Service Tools Numerical List		
			Page No.		
			Replacement item for kit no. 892/00180		
			892/00181		4 - 9
			Replacement items for kit no. 892/00253		
			892/00201	Replacement Gauge	4 - 6
			892/00202	Replacement Gauge	4 - 6
			892/00203	Replacement Gauge	4 - 6
			892/00254	Replacement Hose	4 - 6
			Replacement items for kit no. 992/09200		
			05/900137	Spring	4 - 1
			1406/0011	Bonded Washer 1/4 in. BSP, 2 off	4 - 1
			1410/0001	Washer	4 - 1
			1604/0002	Adapter 1/4in. x 1/4in. BSP, 1 off	4 - 1
			2401/0006	'O' Ring	4 - 1
			2401/0104	'O' Ring	4 - 1
			823/00242	Washer	4 - 1
			823/00248	Washer	4 - 1
			826/00696	Screw	4 - 1
			892/00135	Adapter	4 - 1
			892/00150	Pressure Gauge	4 - 1
			992/09206	Bleed Screw	4 - 1
			992/09207	Snap Ring	4 - 1
			Hammermaster 260 only		
			892/00823	Charging Device	4 - 1
			892/00824	Adapter	4 - 1
			Replacement items for kit no. 892/00309		
			892/00340	Test Block Body	4 - 7
			892/00341	Setting Body	4 - 7
			892/00343	Spanner	4 - 7
			892/00345	Anti-Cavitation Lock Out Bung	4 - 7
			993/68300	Adjusting Pin	4 - 7
			Replacement items for kit no. 993/68100		
			993/68101	Slide Hammer	4 - 4
			993/68102	End Stops	4 - 4
			993/68103	Adaptor - M20 x 5/8" UNF	4 - 4
			993/68104	Adaptor - M20 x 1" UNF	4 - 4
			993/68105	Adaptor - M20 x M20	4 - 4
			993/68106	Adaptor - M20 x M24	4 - 4
			993/68107	Bar - M20 x M20 X 800MM	4 - 4
			993/68108	Adaptor - M20 x 7/8" UNF	4 - 4
			993/68109	Adaptor - M20 x M12	4 - 4
			993/68110	Adaptor - M20 x 5/8" UNF (Shoulder)	4 - 4
			993/68111	Adaptor - M20 x 1/2" UNF	4 - 4

Service Tools (cont'd)**Section A - Attachments****Section B - Body & Framework**

Service Tools (cont'd)

* Section B - Body & Framework



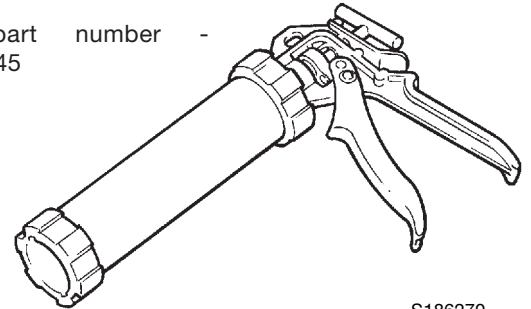
Hand Cleaner - special blend for the removal of polyurethane adhesives.

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

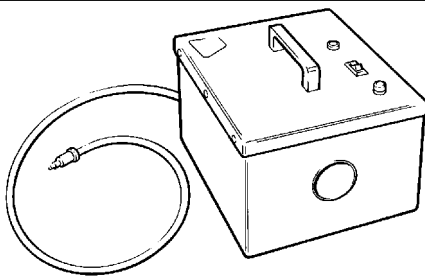
S186240

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

JCB part number -
892/00845



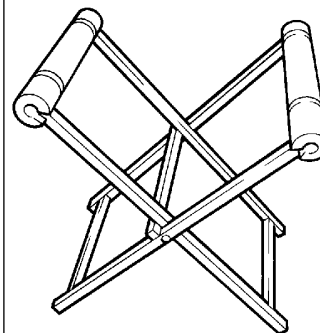
S186270



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



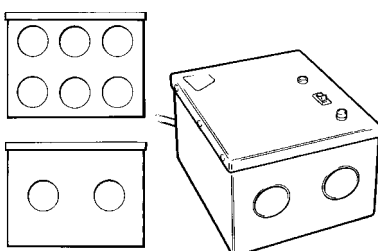
Folding Stand for Holding Glass - essential for preparing new glass prior to installation.

JCB part number -
892/00843

S186280

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.

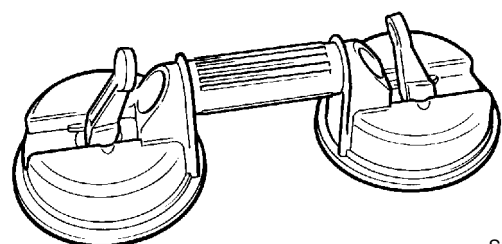
JCB part number:
992/12400 - 2 Cartridge x 240V
992/12600 - 6 Cartridge x 240V



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

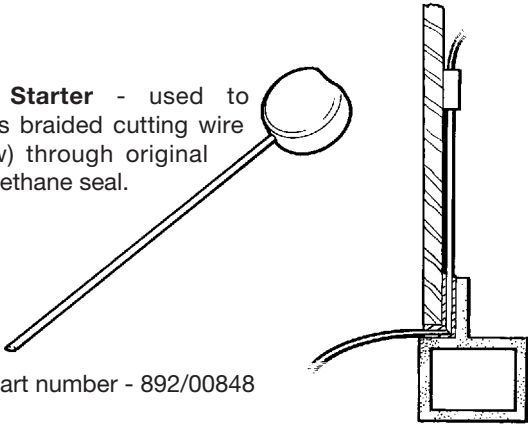


S186300

Service Tools (cont'd)

*** Section B - Body & Framework**

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

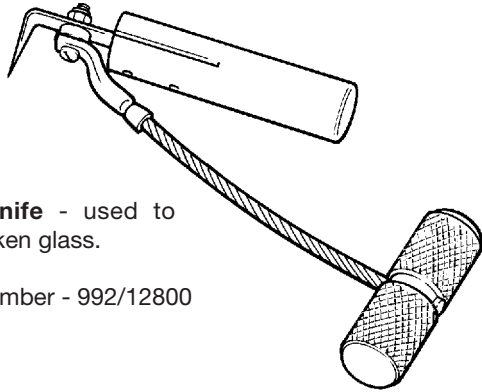


JCB part number - 892/00848

S186310

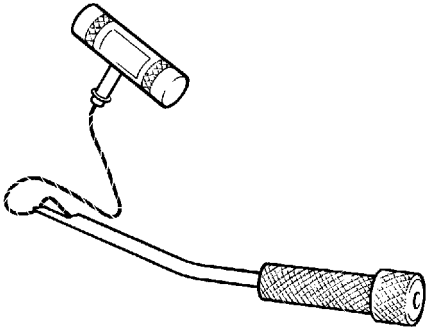
Cut-Out Knife - used to remove broken glass.

JCB part number - 992/12800



S186340

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

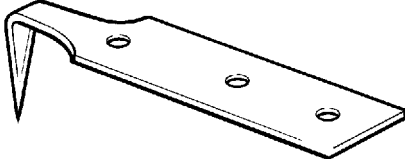


JCB part number - 892/00846

S186320

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

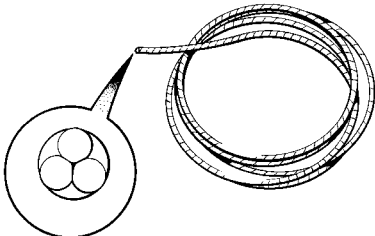
JCB part number - 992/12801 (unit quantity = 5 off)



S186350

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

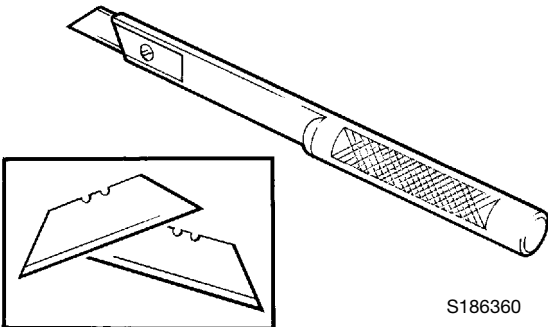
JCB part number - 892/00849
(approx 25 m length)



S186330

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

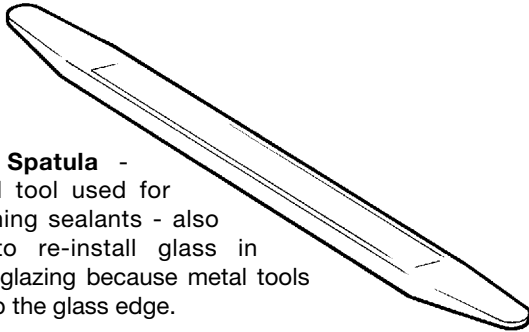
JCB part number - 892/00844



S186360

Service Tools (cont'd)

Section B - Body & Framework



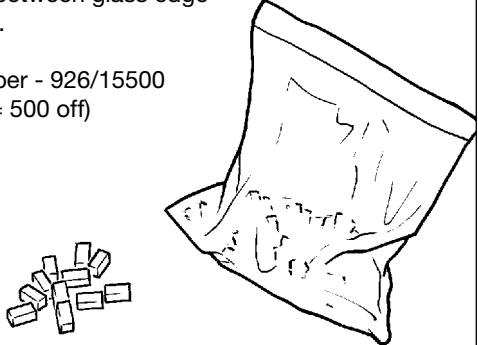
Nylon Spatula - general tool used for smoothing sealants - also used to re-install glass in rubber glazing because metal tools will chip the glass edge.

JCB part number - 892/00847

S186470

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

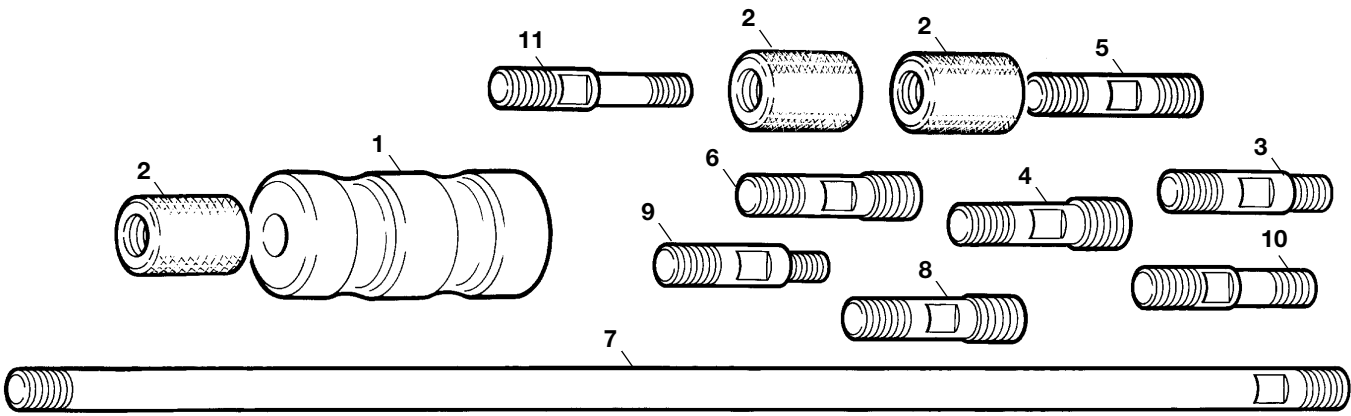
JCB part number - 926/15500
(unit quantity = 500 off)



S186550

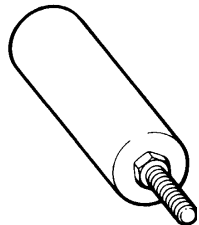
Slide Hammer Kit - 993/68100

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



S196910

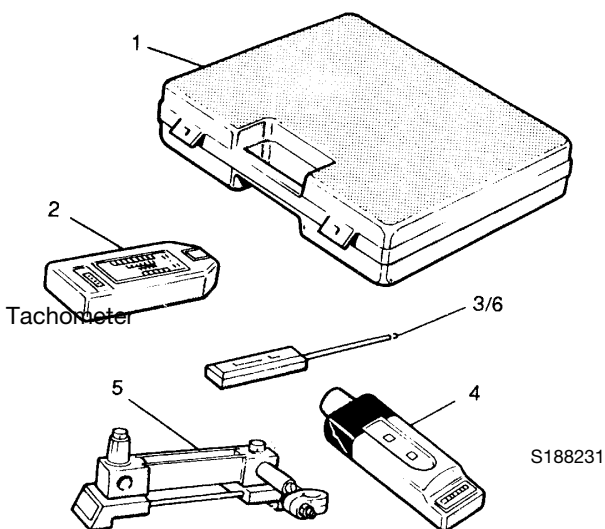
* 992/00800 - Pivot Pin Extractor for Front Axle



S218880

Service Tools (cont'd)

Section C - Electrics



1
2
3
4
5
6

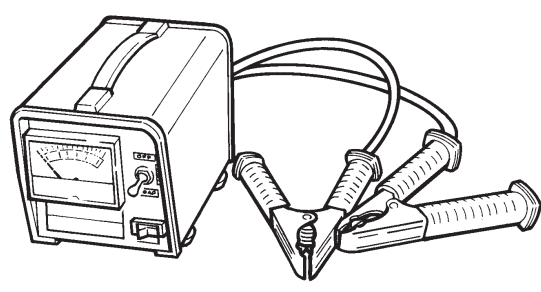
Tachometer

3/6

S188231

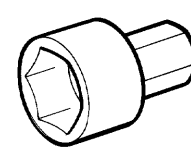
AVO Test Kit			
1	892/00283	Tool Kit Case	
2	892/00298	Fluke Meter 85	
3	892/00286	Surface Temperature Probe	
4	892/00284	Venture	Microtach Digital
5	892/00282	100 amp Shunt - open type	
6	892/00285	Hydraulic Temperature Probe	

*993/85700 Battery Tester



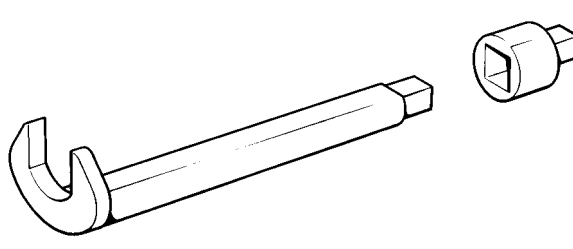
S239510

892/00882 Socket for Alternator Pulley Nut (machines from serial number 430001)



S216770

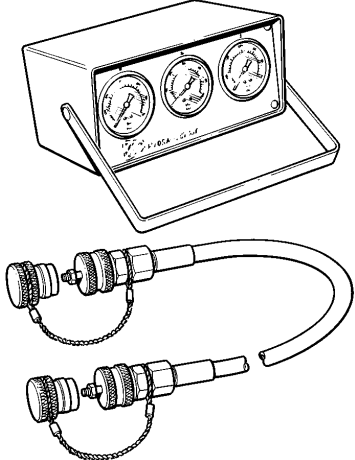
825/00410 15 mm Crowfoot Wrench
825/99833 Adapter



S216200

Service Tools (cont'd)

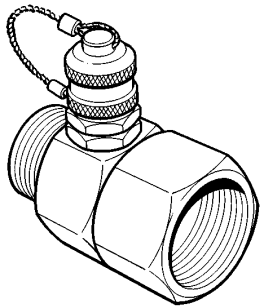
Section E - Hydraulics



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)

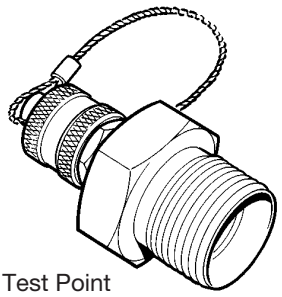
S188121



S188131

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



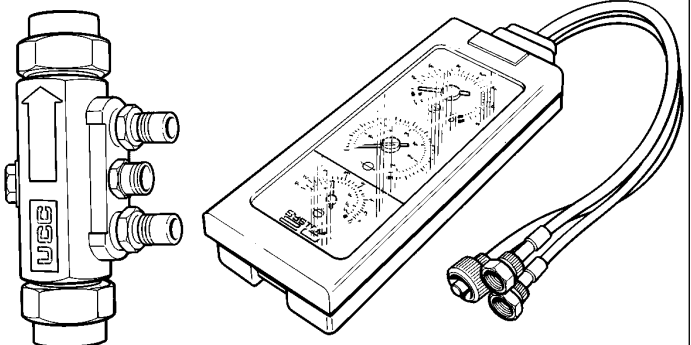
Pressure Test Adapters

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



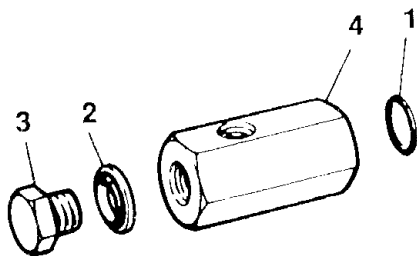
S188151

Service Tools (cont'd)

Section E - Hydraulics

Components for Loader Valve Block A.R.V. Testing

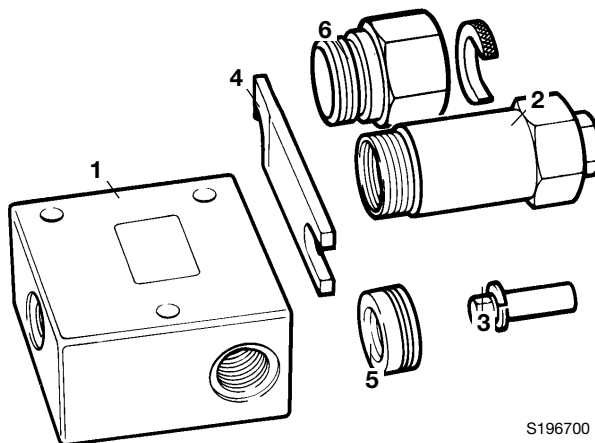
- 1 2401/0103 'O' Ring
- 2 1406/0018 Bonded Washer
- 3 992/01003 Plug
- 4 992/10200 Body for Hamworthy A.R.V.



S196400

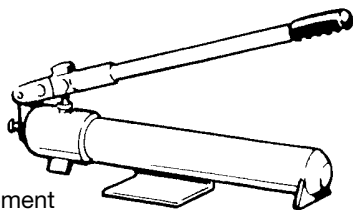
Components for Excavator Valve Block A.R.V. Testing

- * 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

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

Bonded Washers

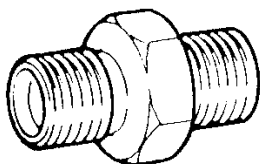
- 1406/0011 1/4 in. BSP
- 1406/0018 1/2 in. BSP
- 1406/0014 5/8 in. BSP
- 1406/0021 3/4 in. BSP
- 1406/0029 1.1/4 in. BSP



S188140

Male Adapters - BSP x NPT (USA only)

- 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.



S193860

Male Adapters - BSP x BSP

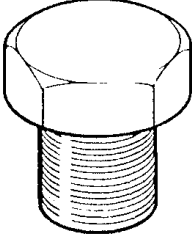
- 1606/0003 3/8 in. x 1/4 in.
- 1604/0003 3/8 in. x 3/8 in.
- 892/00071 3/8 in. x 3/8 in. taper
- 1606/0004 1/2 in. x 1/4 in.
- 1606/0007 1/2 in. x 3/8 in.
- 1604/0004 1/2 in. x 1/2 in.
- 1606/0017 5/8 in. x 1/2 in.
- 1606/0008 3/4 in. x 3/8 in.
- 1606/0009 3/4 in. x 1/2 in.
- 1604/0006 3/4 in. x 3/4 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.

Service Tools (cont'd)

*** Section E - Hydraulics**

Female Cone Blanking Plug

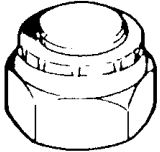
892/00055	1/4 in. BSP
892/00056	3/8 in. BSP
892/00057	1/2 in. BSP
892/00058	5/8 in. BSP
892/00059	3/4 in. BSP
892/00060	1 in. BSP



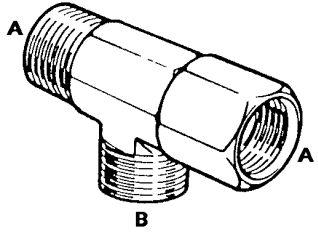
S193870

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

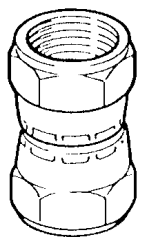


S193880



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)

S193890

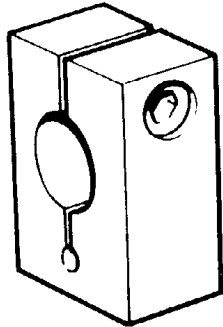


S193900

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

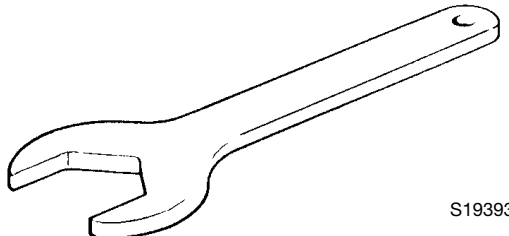
992/09100	Excavator Spool Clamp
992/10100	Hamworthy Loader Spool & A.R.V. Clamp
892/00011	Spool Clamp
892/00039	Spool Clamp (Hamworthy A.R.V.)



S216210

Hexagon Spanners for Ram Pistons and End Caps

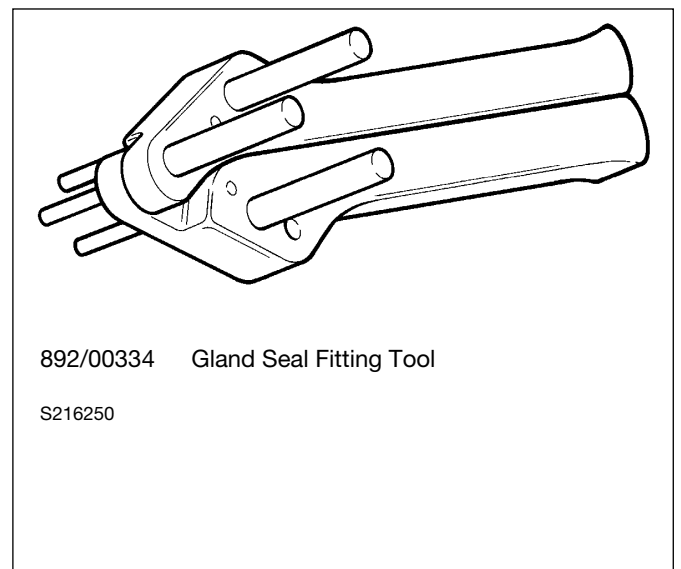
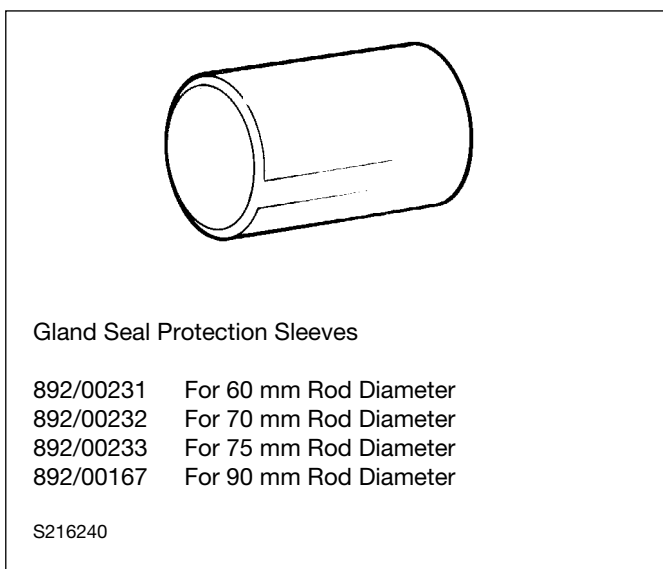
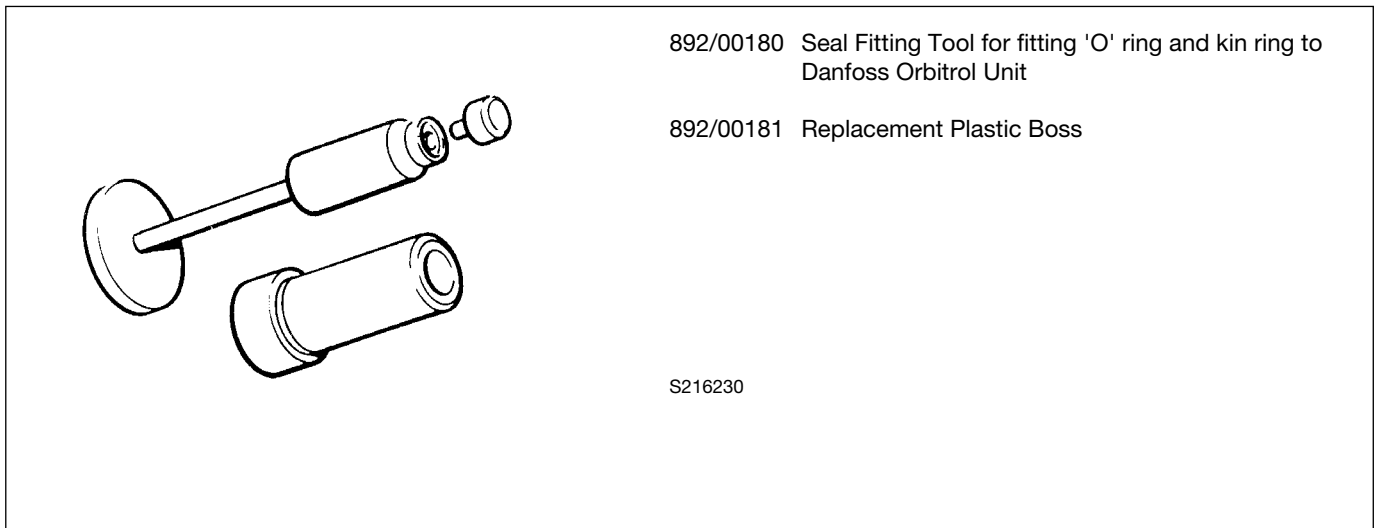
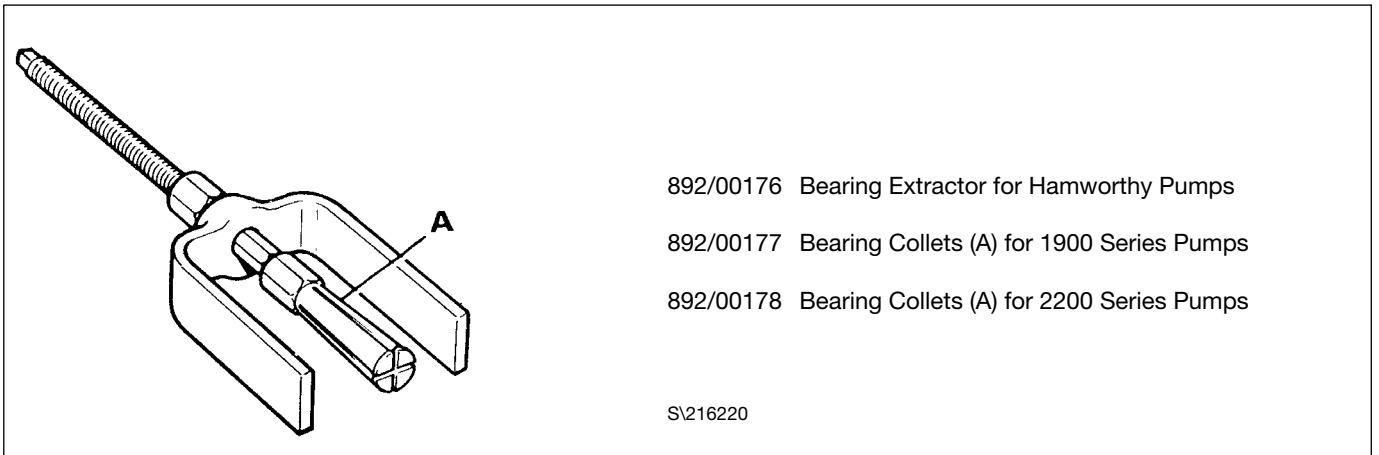
992/09300	55mm A/F
992/09400	65mm A/F
992/09500	75mm A/F
992/09600	85mm A/F
992/09700	95mm A/F
992/10000	125mm A/F



S193930

Service Tools (cont'd)

* Section E - Hydraulics



Service Tools (cont'd)

Section F - Transmission

892/00295 End Float Setting Tool

S188190

892/00825 Reverse Clutch End Float Setting Tool (Powershift transmission only)

S190760

990/00083 End Float Setting Tool

S188180

892/00812 Drive Coupling Spanner for front and rear axle yoke couplings and for 4WD output coupling on Syncro Shuttle

S196720

892/00179 Bearing Press (use with appropriate adapters)

S188200

A 892/00304 Flow Test Adapter
 B 892/00301 Flow Test Adapter
 C 892/00302 Flow Test Adapter

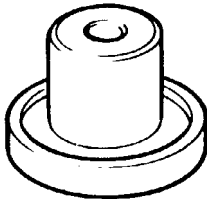
S188210

*993/59300 2/4 WD Pressure Test Adaptor & Clamp

S196750

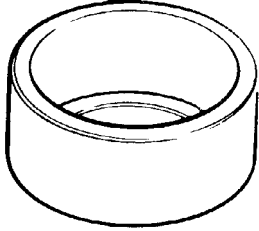
Service Tools (cont'd)

Section F - Transmission



S216260


992/07604 Replacer - Crownwheel Bearing and Differential Bearing Cones



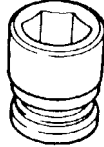
S216270

992/07606 Measuring Cup - Pinion Bearing

992/07609 Adapter - Steer/Drive Axle Pinion Bearing Cone




S188160



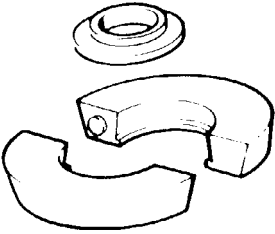
S216290

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



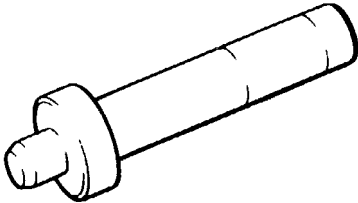
S216280

992/07607 Spacer - Pinion Bearing Preload



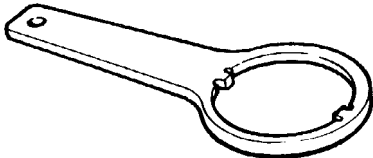
S216300

992/07614 Adapter Set - Bull Pinion Bearing Remover/Replacer




S216310

892/00182 Bearing Pad Driver



S216320

992/07601 Spanner for Half Shaft Nuts

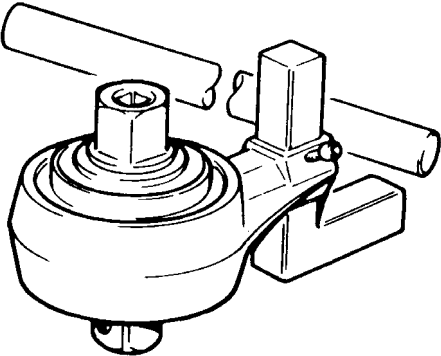


S216330

992/07603 Replacer - Pinion Head Bearing Cup

Service Tools (cont'd)

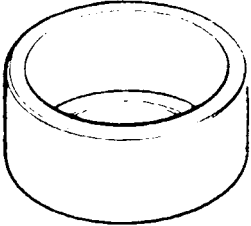
Section F - Transmission



992/04000

Torque Multiplier (use in conjunction with a torque wrench to give a 5:1 multiplication when tightening pinion nuts)

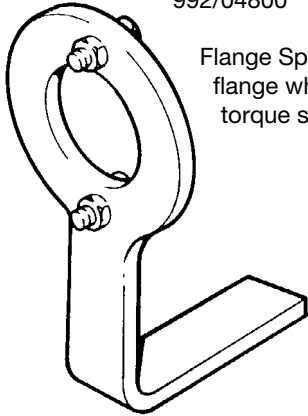
S197030



892/00174

Measuring Cup - Pinion Head Bearing

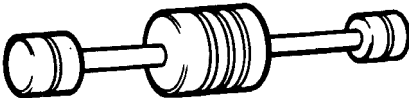
S190770



992/04800

Flange Spanner - for locking pinion flange while pinion nut is slackened or torque set

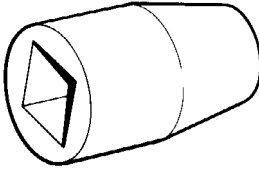
S197040



892/00224

Impulse Extractor Set for Hub Bearing Seals

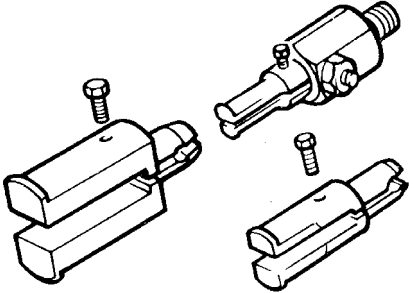
S197070



892/00822

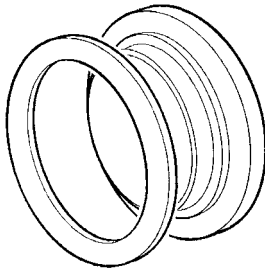
Splined Bolt Socket for driveshafts

S197060



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)



* 892/00891

Fitting Tool Assembly for Wheel Hub Seals

S227760

Service Tools (cont'd)

Section F - Transmission

Fixture for Syncro Shuttle & Powershift Gearbox removal & replacement

Drawing available from:

JCB Service
 Rocester
 Staffordshire
 ST14 5LS

Note: When removing/replacing a Syncro Shuttle Gearbox, use items 1, 2 and 3.

When removing/replacing a Powershift Gearbox, use items 1 and 4.

Section K - Engine

892/00836
 Lifting Wire Assembly (for engine removal)

S219080

S192390

892/00041 De-glazing Tool for Cylinder Bores (to assist bedding-in of new piston rings)

* For details of other engine service tools refer to Perkins Service Manual, Publication No. 9806/0100

Sealing and Retaining Compounds

JCB Multi-Gasket	A medium strength sealant suitable for all sizes of gasket flanges, and for hydraulic fittings of 25-65mm diameter.	4102/1201	
JCB High Strength Gasketing	For all size of flanges where the strength of the joint is important.	4102/0502	
* JCB High Strength Retainer	For all retaining parts which are unlikely to be dismantled.	4101/0602	
JCB Lock and Seal	A medium strength locking fluid for sealing and retaining nuts, bolts, and screws up to 50mm diameter, and for hydraulic fittings up to 25mm diameter.	4101/0202	
Loctite 577	A medium strength thread sealing compound.	4102/1901	
Loctite 262	A medium to high strength locking fluid for retention and sealing of ram piston heads.	4101/0502	
Loctite 932	A locking fluid for use on threads larger than 50mm dia.	4101/0402	
Loctite Activator N	A cleaning primer which speeds the curing rate of anaerobic products.	4104/0101 4104/0102	Aerosol Bottle
Direct Glazing Kit	For one pane of glass, comprises items marked † below plus applicator nozzle etc.	993/55700	
† Ultra Fast Adhesive	For direct glazing	4103/2109	310 ml
† Active Wipe 205	For direct glazing	4104/1206 4104/1203	30 ml 250 g
† Black Primer 206J	For direct glazing	4201/4906	30 ml
Clear Silicone Sealant	To seal butt jointed glass	4102/0933	
Black Polyurethane Sealant	To finish exposed edges of laminated glass	4102/2309	310 ml
* JCB Cleaner & Degreaser	For degreasing components prior to use of anaerobic adhesives and sealants.	4104/1538	Aerosol

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General safety	2 - 1
Operating safety	3 - 1
Maintenance safety	4 - 1

Safety Notices

In this publication and on the machine, there are safety notices. Each notice starts with a signal word. The signal word meanings are given below.

DANGER

Denotes an extreme hazard exists. If proper precautions are not taken, it is highly probable that the operator (or others) could be killed or seriously injured.

INT-1-2-1

WARNING

Denotes a hazard exists. If proper precautions are not taken, the operator (or others) could be killed or seriously injured.

INT-1-2-2

CAUTION

Denotes a reminder of safety practices. Failure to follow these safety practices could result in injury to the operator (or others) and possible damage to the machine.

INT-1-2-3

All construction and agricultural equipment can be hazardous. When a JCB machine is correctly operated and properly maintained, it is a safe machine to work with. But when it is carelessly operated or poorly maintained it can become a danger to you (the operator) and others.

Do not work with the machine until you are sure that you can control it.

Do not start any job until you are sure that you and those around you will be safe.

If you are unsure of anything, about the machine or the job, ask someone who knows. Do not assume anything.

Remember

**BE CAREFUL
BE ALERT
BE SAFE**

GEN-1-6

General Safety

WARNING

Decals

You can be injured if you do not obey the decal safety instructions. Keep decals clean. Replace unreadable or missing decals with new ones before operating the machine. Make sure replacement parts include warning decals where necessary.

INT-1-3-4

WARNING

Care and Alertness

All the time you are working with or on the machine, take care and stay alert. Always be careful. Always be alert for hazards.

INT-1-3-5

WARNING

Clothing

You can be injured if you do not wear the proper clothing. Loose clothing can get caught in the machinery. Wear protective clothing to suit the job. Examples of protective clothing are: a hard hat, safety shoes, safety glasses, a well fitting overall, ear-protectors and industrial gloves. Keep cuffs fastened. Do not wear a necktie or scarf. Keep long hair restrained.

INT-1-3-6

WARNING

Lifting Equipment

You can be injured if you use faulty lifting equipment. Make sure that lifting equipment is in good condition. Make sure that lifting tackle complies with all local regulations and is suitable for the job. Make sure that lifting equipment is strong enough for the job.

INT-1-3-7

WARNING

Raised Attachments

Raised attachments can fall and injure you. Do not walk or work under raised attachments unless they are safely blocked.

INT-1-3-8

Operating Safety

WARNING

Machine Condition

A defective machine can injure you or others. Do not operate a machine which is defective or has missing parts. Make sure the maintenance procedures in this handbook are completed before using the machine.

INT-2-1-2

WARNING

Controls

You or others can be killed or seriously injured if you operate the control levers from outside the cab. Operate the control levers only when you are correctly seated inside the cab.

INT-2-1-3

WARNING

Machine Limits

Operating the machine beyond its design limits can damage the machine, it can also be dangerous. Do not operate the machine outside its limits. Do not try to upgrade the machine performance with unapproved modifications.

INT-2-1-4

WARNING

Engine/Steering Failure

If the engine or steering fails, stop the machine as quickly as possible. Do not operate the machine until the fault has been corrected.

INT-2-1-5

WARNING

Engine

The engine has rotating parts. Do not open the engine cover while the engine is running. Do not use the machine with the cover open.

INT-2-1-6

WARNING

Entering/Leaving

Always face the machine when entering and leaving the cab. Use the step(s) and handrails. Make sure the step(s), handrails and your boot soles are clean and dry. Do not jump from the machine. Do not use the machine controls as handholds, use the handrails.

INT-2-1-7

WARNING

ROPS/FOPS Structure

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

INT-2-1-9/3

WARNING

Exhaust Gases

Breathing the machine exhaust gases can harm and possibly kill you. Do not operate the machine in closed spaces without making sure there is good ventilation. If possible, fit an exhaust extension. If you begin to feel drowsy, stop the machine at once. Get out of the cab into fresh air.

INT-2-1-10

WARNING

Communications

Bad communications can cause accidents. Keep people around you informed of what you will be doing. If you will be working with other people, make sure any hand signals that may be used are understood by everybody. Work sites can be noisy, do not rely on spoken commands.

INT-2-2-3

WARNING

Ramps and Trailers

Water, mud, ice, grease and oil on ramps or trailers can cause serious accidents. Make sure ramps and trailers are clean before driving onto them. Use extreme caution when driving onto ramps and trailers.

INT-2-2-6

DANGER

Sparks

Explosions and fire can be caused by sparks from the exhaust or the electrical system. Do not use the machine in closed areas where there is flammable material, vapour or dust.

INT-2-2-10

Operating Safety (cont'd)

WARNING

The transmission is in 4 wheel drive until de-selected by hydraulic pressure to 2 wheel drive. If the machine is to be raised and the engine/transmission run, make sure all four wheels are off the ground and supported by axle stands. If only the rear wheels are raised, the machine could still drive through the front axle.

Trans 2-2/1

WARNING

Powershift Transmission

- * Do not change from a high gear to a low gear (for instance, 4th to 1st) in one sudden movement whilst the machine is moving. Otherwise the machine will rapidly decelerate, you or others could be killed or seriously injured. When selecting lower gears, allow the engine speed to drop before each gear change.

2-1-1-9/1

Maintenance Safety

WARNING

Repairs

Do not try to do repairs or any other type of maintenance work you do not understand. To avoid injury and/or damage get the work done by a specialist engineer.

GEN-1-5

WARNING

Modifications and Welding

Non-approved modifications can cause injury and damage. Parts of the machine are made from cast iron; welds on cast iron can weaken the structure and break. Do not weld cast iron. Contact your JCB distributor for advice before modifying the machine.

INT-3-1-2/1

WARNING

Metal Splinters

You can be injured by flying metal splinters when driving metal pins in or out. Use a soft faced hammer or drift to remove and fit metal pins. Always wear safety glasses.

INT-3-1-3

WARNING

Electrical Circuits

Understand the electrical circuit before connecting or disconnecting an electrical component. A wrong connection can cause injury and/or damage.

INT-3-1-4

WARNING

Communications

Bad communications can cause accidents. If two or more people are working on the machine, make sure each is aware of what the others are doing. Before starting the engine make sure the others are clear of the danger areas; examples of danger areas are: the rotating blades and belt on the engine, the attachments and linkages, and anywhere beneath or behind the machine. People can be killed or injured if these precautions are not taken.

INT-3-1-5

WARNING

Petrol

Do not use petrol in this machine. Do not mix petrol with the diesel fuel; in storage tanks the petrol will rise to the top and form flammable vapours.

INT-3-1-6

WARNING

Battery

A battery with frozen electrolyte can explode if it is used or charged. Do not use a machine with a frozen battery. To help prevent the battery from freezing, keep the battery fully charged.

INT-3-1-7

WARNING

Battery Gases

Batteries give off explosive gases. Keep flames and sparks away from the battery. Do not smoke close to the battery. Make sure there is good ventilation in closed areas where batteries are being used or charged. Do not check the battery charge by shorting the terminals with metal; use a hydrometer or voltmeter.

INT-3-1-8

WARNING

Battery Terminals

The machine is negatively earthed. Always connect the negative pole of the battery to earth.

When connecting the battery, connect the earth (-) lead last.

When disconnecting the battery, disconnect the earth (-) lead first.

INT-3-1-9

WARNING

Hydraulic Fluid

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

INT-3-1-10/1

DANGER

Hydraulic Pressure

Hydraulic fluid at system pressure can injure you. Before disconnecting or connecting hydraulic hoses, stop the engine and operate the controls to release pressure trapped in the hoses. Make sure the engine cannot be started while the hoses are open.

INT-3-1-11/1

Maintenance Safety (cont'd)**⚠ WARNING****Diesel Fuel**

Diesel fuel is flammable; keep naked flames away from the machine. Do not smoke while refuelling the machine or working on the engine. Do not refuel with the engine running. There could be a fire and injury if you do not follow these precautions.

INT-3-2-2

⚠ WARNING**Oil**

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

INT-3-2-3

⚠ WARNING**Soft Ground**

A machine can sink into soft ground. Never work under a machine on soft ground.

INT-3-2-4

⚠ WARNING**Tyres and Rims**

Over-inflated or over-heated tyres can explode. Follow the instructions in this handbook for inflating the tyres. Do not weld or cut rims. Get a tyre/wheel specialist to do any repair work.

INT-3-2-6

⚠ WARNING**Hot Coolant**

The cooling system is pressurised when the engine is hot. Hot coolant can spray out when you remove the radiator cap. Let the system cool before removing the radiator cap. To remove the cap; turn it to the first notch and let the system pressure escape, then remove the cap.

INT-3-2-9

⚠ WARNING

Always wear safety glasses when dismantling assemblies * containing components under pressure from springs. This will protect against eye injury from components accidentally flying out.

GEN 6-2

⚠ CAUTION**Rams**

The efficiency of the rams will be affected if they are not kept free of solidified dirt. Clean dirt from around the rams regularly. When leaving or parking the machine, close all rams if possible to reduce the risk of weather corrosion.

INT-3-2-10

⚠ CAUTION**Cleaning**

Cleaning metal parts with incorrect solvents can cause corrosion. Use only recommended cleaning agents and solvents.

INT-3-2-11

⚠ CAUTION**'O' rings, Seals and Gaskets**

Badly fitted, damaged or rotted 'O' rings, seals and gaskets can cause leakages and possible accidents. Renew whenever disturbed unless otherwise instructed. Do not use Trichloroethane or paint thinners near 'O' rings and seals.

INT-3-2-12

⚠ WARNING**Fires**

If your machine is equipped with a fire extinguisher, make sure it is checked regularly. Keep it in the operator's cab until you need to use it.

Do not use water to put out a machine fire, you could spread an oil fire or get a shock from an electrical fire. Use carbon dioxide, dry chemical or foam extinguishers. Contact your nearest fire department as quickly as possible. Firefighters should use self-contained breathing apparatus.

INT-3-2-7/1

⚠ WARNING**Jacking**

A machine can roll off jacks and crush you unless the wheels have been chocked. Always chock the wheels at the opposite end of the machine that is to be jacked. Do not work underneath a machine supported only by jacks. Always support a jacked-up machine on axle stands before working underneath it.

INT-3-2-8

Maintenance Safety (cont'd)**⚠ WARNING****Hydraulic Hoses**

Damaged hoses can cause fatal accidents. Inspect the hoses regularly for:

- Damaged end fittings
- Chafed outer covers
- Ballooned outer covers
- Kinked or crushed hoses
- Embedded armouring in outer covers
- Displaced end fittings.

INT-3-3-2

⚠ WARNING**Safety Strut**

Raised loader arms can drop suddenly and cause serious injury. Before working under raised loader arms, fit the loader arm safety strut.

2-1-1-6

⚠ WARNING

A raised and badly supported machine can fall on you. Position the machine on a firm, level surface before raising one end. Ensure the other end is securely chocked. Do not rely solely on the machine hydraulics or jacks to support the machine when working under it.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-1-1

⚠ WARNING

Waxoyl contains turpentine substitute, which is flammable. Keep flames away when applying Waxoyl. Waxoyl can take a few weeks to dry completely. Keep flames away during the drying period.

Do not weld near the affected area during the drying period. Take the same precautions as for oil to keep Waxoyl off your skin. Do not breathe the fumes. Apply in a well-ventilated area.

5-3-1-9

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the arms. Apply the parking brake, put the transmission in neutral and stop the engine. Chock both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-1-2

⚠ WARNING

To avoid burning, wear protective gloves when handling hot components. To protect your eyes, wear goggles when using a wire brush to clean components.

HYD 1-3

⚠ WARNING**JCB Extradig Dipper Lubricant**

JCB Extradig dipper lubricant contains 1.53% lead. The repeated swallowing of very small quantities can cause chronic lead poisoning. Do not smoke or touch food while handling this lubricant. Dispose of waste (rags etc.) in accordance with local regulations.

2-1-1-8

⚠ WARNING**Fluoroelastomeric Materials**

- * Certain seals and gaskets (e.g. crankshaft oil seal) on JCB machines contain fluoroelastomeric materials such as Viton, Fluorel and Technoflon. Fluoroelastomeric materials subjected to high temperatures can produce highly corrosive hydrofluoric acid. **THIS ACID CAN SEVERELY BURN.**

New fluoroelastomeric components at ambient temperature require no special safety precautions.

Used fluoroelastomeric components whose temperatures have not exceeded 300°C require no special safety precautions. If evidence of decomposition (e.g. charring) is found, refer to the next paragraph for safety instructions **DO NOT TOUCH COMPONENT OR SURROUNDING AREA.**

Used fluoroelastomeric components subjected to temperatures greater than 300°C (e.g. engine fire) must be treated using the following safety procedure. Make sure that heavy duty gloves and special safety glasses are worn:

- 1 Ensure that components have cooled then remove and place material into plastic bags.
- 2 Thoroughly wash contaminated area with 10% calcium hydroxide or other suitable alkali solution, if necessary use wire wool to remove burnt remains.
- 3 Thoroughly wash contaminated area with detergent and water.
- 4 Contain all removed material, gloves etc. used in this operation in sealed plastic bags and dispose of in accordance with Local Authority Regulations.

DO NOT BURN FLUOROELASTOMERIC MATERIALS.

If contamination of skin or eyes occurs, wash the affected area with a continuous supply of clean water or with calcium hydroxide solution for 15-60 minutes. Get medical attention immediately.

INT-3-3-5/1

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Lubricants & Capacities

ITEM	CAPACITY		FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
	Litres	UK Gal		
Fuel Tank	100	22	Diesel Oil	ASTM D975-66T Nos. 1D, 2D
Engine (Oil) ①				
2 Wheel Steer Machines			JCB 15W/40 Multigrade -10 °C to 50 °C (14 °F to 122 °F)	SAE15W/40, MIL-L-46152B, API CD/SE, MIL-L-2104D
- Build AA	9.7	2.1		
- Build AA (Hot Climate)	11.0	2.4		
- Build AB	10.0	2.2	JCB Super Universal Agricultural -15 °C to 30 °C (5 °F to 86 °F)	SAE10W/30, MIL-L-2105, MIL-L-46152, API CD/SE, MIL-L-2104C
4 Wheel Steer Machines				
- Build AB	10.0	2.2	JCB Torque Converter Fluid -18 °C to 0 °C (0 °F to 32 °F)	SAE10W, MIL-L-46152, MIL-L-2104D, API CD/SE
Engine (Coolant)	20.0	4.4	JCB Universal Antifreeze/water	ASTM D3306-74
Syncro Shuttle (2WD) ②	15.75	3.5	JCB Special Transmission Fluid	ESP-M2C 33G
Syncro Shuttle (4WD) ② (machines up to serial number 431230)	16.25	3.6		
Syncro Shuttle (2WD) ②	13.0	2.9	JCB Special Transmission Fluid	ESP-M2C 33G
Syncro Shuttle (4WD) ② (machines from serial number 431230 to TBA)	14.0	3.1		
* Syncro Shuttle (2WD) ②	14.4	3.2	JCB Special Transmission Fluid	ESP-M2C 33G
Syncro Shuttle (4WD) ② (machines from serial number TBA - fitted with 12.2 inch convertors)	15.4	3.4		
Powershift ②	14.75	3.25	JCB Special Transmission Fluid	ESP-M2C 33G
Front Axle (4WD)				
Housing (2WS)	13	2.86	JCB HD90 Gear Oil	API-GL-5
Housing (AWS) ⑥	18	3.96		MIL-L-2105C
* Hubs (x2)	2.0	0.44		
Rear Axle (AWS)				
Housing	18	3.96	JCB Special Gear Oil Plus	API-GL-4
* Hubs (x2)	2.0	0.44		
Rear Axle (2WS)	23	5.0	JCB Special Gear Oil Plus	API-GL-4
Slew Gearbox	4.3	0.9	JCB HD90 Gear Oil	API-GL-5, MIL-L-2105C
Brake System				
- Standard	1.2	0.26	JCB Light Hydraulic Fluid ⚠ CAUTION: DO NOT USE ORDINARY BRAKE FLUID	ISO VG15
- Servo	1.4	0.31		
Hydraulic System ③	135	29.7	JCB High Performance Hydraulic Oil (Above 38 °C, 100 °F)	ISO VG46
* Hydraulic System ③			JCB Hydraulic Fluid HP32 (Below 38 °C, 100 °F)	ISO VG32
Air Conditioning System	1544 g	3.4 lb	Refrigerant	Freon 12

Lubricants & Capacities (continued)

* ITEM	CAPACITY		FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
	Litres	UK Gal		
(machines up to serial number 430000)				
Air Conditioning System (machines from serial number 430001)	1200 g	2lb 10oz	Refrigerant	R134a
Boom Lock	1.0	0.22	JCB Light Hydraulic Fluid	ISO VG15
Grease Points	---		JCB MPL Grease or JCB HP Grease ④	Lithium based, No. 2 consistency.
Extending Dipper	---		Waxoyl ⑤	
Electrical connections	---		As a corrosion and moisture inhibitor all exposed connections should be coated liberally with petroleum jelly.	

- ① **Note:** New engines DO NOT require a running-in period. The engine/machine should be used in a normal work cycle immediately, glazing of the piston cylinder bores, resulting in excessive oil consumption, could occur if the engine is gently run-in. Under no circumstances should the engine be allowed to idle for extended periods; (e.g. warming up without load). Engines of new machines are filled at the factory with JCB 10W/30 Multigrade oil. This oil should be drained after the first 100 hours operation and the engine filled with the appropriate recommended grade as shown in the lubrication chart. JCB 10W/30 Multigrade should also be used for the first 100 hours operation whenever a new or reconditioned engine is fitted to the machine. After the first 100 hours operation, it is essential that the 10W/30 oil is replaced by the lubricant recommended. The figure quoted is TOTAL system capacity. Use the MIN and MAX marks on the dipstick when filling the system. Figures quoted within ± 0.5 litre (0.11 U.K. gal).
- ② **Note:** The figure quoted is TOTAL system capacity. Use the MIN and MAX marks on the dipstick when filling the system. Figures quoted within ± 1.0 litre (0.22 U.K. gal).
- ③ **Note:** The total hydraulic system capacity depends on the equipment being used. Fill with all rams closed. Watch level indicator on hydraulic tank.
- ④ **Note:** JCB HP Grease is a high specification grease, in certain applications this grease must be used, for instance transmission bearings during an overhaul.
- ⑤ **⚠ WARNING:** Waxoyl contains turpentine substitute, which is inflammable. Keep flames away when applying Waxoyl. Waxoyl can take a few weeks to dry completely. Keep flames away during the drying period. Do not weld near the affected area during the drying period. Take the same precautions as for oil to keep Waxoyl off your skin. Do not breathe the fumes. Apply in a well-ventilated area.

* GEN-1-3

- ⑥ **Note:** AWS axles with limited slip differential must use **JCB Special Gear Oil Plus**.

Service Schedules

A badly maintained machine is a danger to the operator and the people working around him. Make sure that the regular maintenance and lubrication jobs listed in the service schedules are done to keep the machine in a safe and efficient working condition.

WARNING

Raised loader arms can drop suddenly and cause serious injury. Before working under raised loader arms, fit the loader arm safety strut.

GEN 3-2

Apart from the daily jobs, the schedules are based on machine running hours. Keep a regular check on the hourmeter readings to correctly gauge service intervals. Do not use a machine which is due for a service. Make sure any defects found during the regular maintenance checks are rectified immediately.

Calendar equivalents:

10 Hours	=	Daily
50 Hours	=	Weekly
500 Hours	=	Six Months
1000 Hours	=	Yearly
2000 Hours	=	2 Years

Pre-start Cold Checks Service Points and Fluid Levels	Operation	10 Hr	50 Hr	†100 Hr	500 Hr	1000 Hr	2000 Hr
--	-----------	----------	----------	------------	-----------	------------	------------

ENGINE

Oil level	- Check		•				
Oil and Filter ④	- Change			•	•	•	•
Air Cleaner Dust Valve	- Clean			•	•		
Air Cleaner Outer Element	- Change					•	•
* Air Cleaner Inner Element	- Change						•
Fuel Filter	- Change			•	•	•	•
Fuel Filter	- Drain		•				
Coolant Quality/Level	- Check		•	•	•	•	•
Fuel Sedimentor	- Drain and Clean		•	•	•	•	•
Fan Belt Tension/Condition	- Check		•	•	•	•	•
Valve Clearances ③	- Check and Adjust						•
Engine Mounting Bolts for Tightness ③	- Check			•	•	•	•
Radiator	- Clean				•	•	•
All Hoses - Condition	- Check			•	•	•	•
Precleaner	- Clean	•	•	•	•	•	•

TRANSMISSION, AXLES AND STEERING

Transmission Oil Level	- Check		•	•	•		
Transmission Oil	- Change					•	•
Transmission Filter	- Change			•	•	•	•
Axle Oil Level (incl. Hubs when applicable) ①	- Check			•	•		
Axle Oil (incl. Hubs when applicable)	- Change					•	•
Axle Oil (Limited Slip Diff.)	- Change				•	•	•
* Tyre Pressures/Condition	- Check		•	•	•	•	•
Front Hub Bearings ③	- Check			•	•	•	•
Transmission Strainer	- Clean					•	•
Drive Shafts	- Security/Grease			•	•	•	•
Steer Axle Movement/Shimming ③	- Check			•	•	•	•
Steer Axle Pivots and Linkages ⑦	- Grease			•	•	•	•

*

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