



Service Manual Loadall

Models:

520-50

from Serial No. 754001

525-50

from Serial No. 789308

525-50S

from Serial No. 1037581

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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.

READ the section contents to locate machine types, machine type identification **IS NOT** listed on individual pages.

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.

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

This Service Manual covers the following machines:

520-50 (520 N. Am.) - from Machine Serial Number 754001

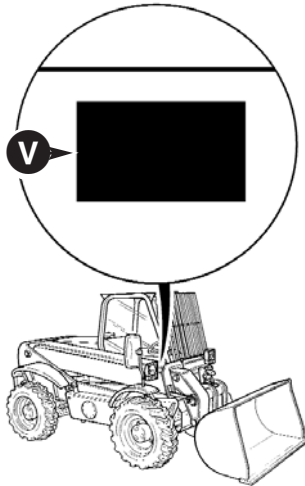
525-50 - from Machine Serial Number 789308

525-50S - from Machine Serial Number 1037581

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Identification Plate

Your machine has an identification plate **V** mounted as shown. The serial numbers of the machine and its major units are stamped on the plate.



430250

Explanation of Vehicle Identification Number (VIN)

SLP52050RE0754001

A B C D E

A	World Manufacturer Identification	SLP = JCB
B	Machine Model	520-50
C	Year of Manufacture	S
	P = 1993	V = 1997
	R = 1994	W = 1998
	S = 1995	X = 1999
	T = 1996	Y = 2000
D	Manufacturing Location	E = England
E	Machine Serial Number	0754001

Machine Model Explanation

520 - 50
F G H

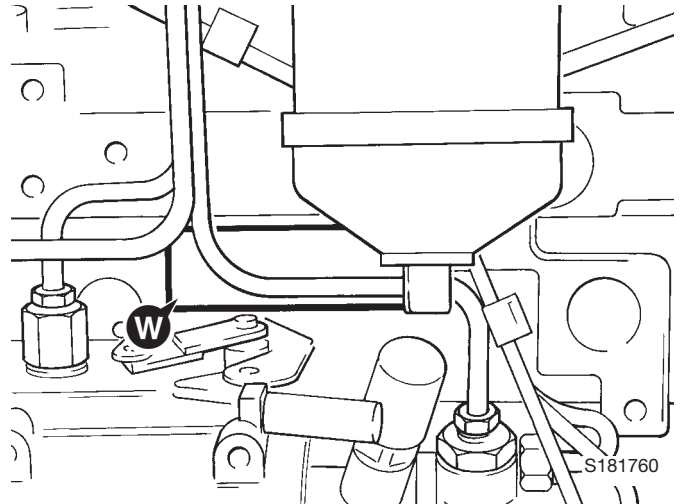
- F** 500 Series machine range
- G** 2.0 tonnes lift capacity
- H** 5.0 metres lift height

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.

Unit Identification

The engine serial number is stamped on label **W** which is fastened to the right side of the cylinder block, near the fuel filter.



Explanation of Engine Identification Number

AA 50261 U 500405 P
A B C D E

A Engine Type:

A series

- AK = 4 cylinder turbo - low emission, stage 1
- AR = 4 cylinder naturally aspirated - low emission, stage 1

R Series

- RE = 4 cylinder naturally aspirated, low emission, stage 2
- RG = 4 cylinder turbo, low emission stage 2
- RJ = 4 cylinder air to air charge cooled, low emission, stage 2

- B** Build Number
- C** Country of Manufacture
- D** Engine Serial Number
- E** Year of Manufacture

If service information or parts are required, the complete engine number should be quoted.

If there is also a number marked 'TPL No', this should be quoted also.

If a short engine has been fitted in service, two engine serial numbers and a TPL No. are stamped on the serial number plate as at **Z**. All the numbers should be quoted when requiring parts or information.

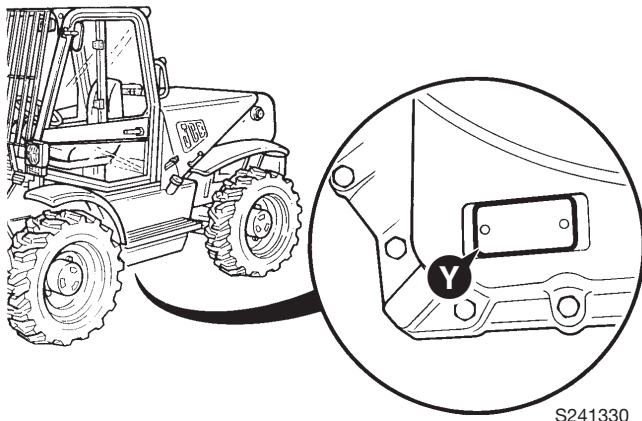
Note: Where the procedures in this manual differ according to engine types, the text and/or illustrations will specify which engine types apply.

Transmission and axle identification is shown on the next page.

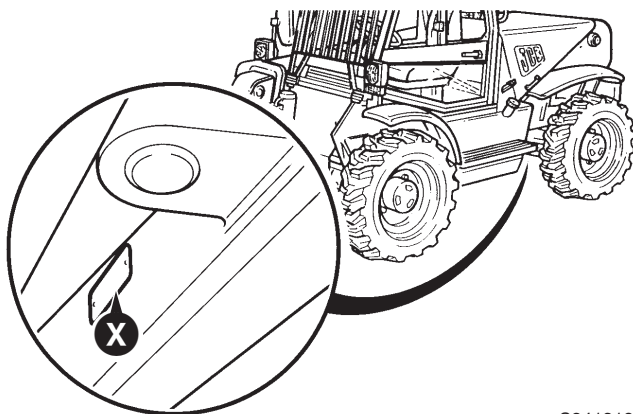
The Transmission serial number is stamped on label **Y** which is mounted on the rear face.

The rear axle serial number is stamped on plate **X** mounted to the front face of the axle.

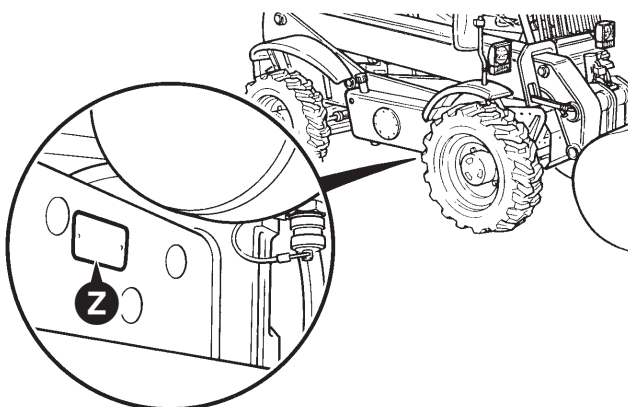
The front axle serial number is stamped on plate **Z** mounted on the rear face of the arm.



S241330



S241310



S241320

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		Hexagon (A/F)	Torque Settings		
in	(mm)	in	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)	1 1/8	407	41.5	300
7/8	(22.2)	1 5/16	650	66.3	480
1	(25.4)	1 1/2	970	99.0	715
1 1/4	(31.7)	1 7/8	1940	198.0	1430
1 1/2	(38.1)	2 1/4	3390	345.0	2500

Metric Grade 8.8 Bolts

Bolt Size		Hexagon (A/F)	Torque Settings		
	(mm)	mm	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		Torque Settings (for steel rivet nuts)		
	(mm)	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	5-1	892/00223	Hand Pump	5-3
1406/0014	Bonded Washer	5-1	892/00225	Adapter - Impulse Extractor	6-2
1406/0021	Bonded Washer	5-1	892/00253	Pressure Test Kit	5-1
1406/0029	Bonded Washer	5-1	892/00255	1/4" BSP Test Point	5-3
1604/0003	Adapter	5-3	892/00256	3/8" BSP Test Point	5-3
1604/0004	Adapter	5-3	892/00257	1/2" BSP Test Point	5-3
1604/0006	Adapter	5-1	892/00258	5/8" BSP Test Point	5-3
1606/0003	Adapter	5-3	892/00259	1" BSP Test Point	5-3
1606/0004	Adapter	5-3	892/00260	1 1/4" BSP Test Point	5-3
1606/0007	Adapter	5-3	892/00261	5/8" UNF Test Point	5-3
1606/0008	Adapter	5-3	892/00262	1/4" M BSP 1/4" F BSP	5-1
1606/0009	Adapter	5-3	892/00263	5/8" M BSP 5/8" F BSP	5-1
1606/0012	Adapter	5-3	892/00264	3/4" M BSP 3/4" F BSP	5-1
1606/0014	Adapter	5-3	892/00265	1" M BSP 1" F BSP	5-1
1606/0015	Adapter	5-3	892/00268	Flow Monitoring Unit	5-1
1606/0017	Adapter	5-3	892/00269	Sensor Head	5-1
1612/0006	Adapter	5-1	892/00270	Load Valve	5-1
4101/0251	Threadlocker and Sealer	8-1	892/00271	Adapter	5-1
4101/0451	Threadlocker	8-1	892/00272	Adapter	5-1
4101/0552	Threadlocker and Sealer (High Strength)	8-1	892/00274	Adapter	5-3
4101/0651	Retainer (High Strength)	8-1	892/00275	Adapter	5-1
4102/0551	High Strength Threadlocker	8-1	892/00276	Adapter	5-1
4102/1201	Multi-Gasket	8-1	892/00277	Adapter	5-1
4102/1951	Threadseal	8-1	892/00279	Gauge	5-3
4104/0251	Activator (Aerosol)	8-1	892/00281	AVO Meter	4-1
4104/0253	Activator (Bottle)	8-1	892/00282	Shunt	4-1
4104/1557	Cleaner/Degreaser	8-1	892/00283	Tool Kit Case	4-1
816/00189	Blanking Cap	5-2	892/00284	Digital Tachometer	4-1
816/00190	Blanking Cap	5-2	892/00285	Hyd. Oil Temperature Probe	4-1
816/00193	Blanking Cap	5-2	892/00286	Surface Temperature Probe	4-1
816/00196	Blanking Cap	5-2	892/00295	End Float Setting Tool	6-1
816/00197	Blanking Cap	5-2	892/00301	Flow Test Adapter	6-1
816/00294	Blanking Cap	5-2	892/00302	Flow Test Adapter	6-1
816/15118	Pressure Test Adapter	5-3	892/00304	Flow Test Adapter	6-1
816/20008	Adapter	5-1	892/00333	Heavy Duty Socket	6-2
816/55038	Pressure Test Adapter	5-1	892/00706	Test Probe	5-3
816/55040	Pressure Test Adapter	5-1	892/00817	Heavy Duty Socket	6-2
816/50043	'T' Adapter	5-2	892/00818	Heavy Duty Socket	6-2
892/00039	Spool Clamp	5-2	892/00819	Heavy Duty Socket	6-2
892/00041	De-glazing Tool	7-1	* 892/00836	Lifting Wire Assembly	7-2
892/00047	'T' Adapter	5-2	892/00891	Seal Fitting Adaptor	6-2
892/00048	'T' Adapter	5-2	892/00923	Test Block for ARV	5-3
892/00049	'T' Adapter	5-2	892/00936	Timing Pin	7-2
892/00051	'T' Adapter	5-2	892/01054	Compression Adaptor	7-2
892/00055	Blanking Plug	5-2	892/01111	Rocker Assembly Tool	7-2
892/00056	Blanking Plug	5-2	892/01112	Timing Case Alignment Tool	7-2
892/00057	Blanking Plug	5-2	892/01113	Thermostat Fitting & Removal Tool	7-2
892/00058	Blanking Plug	5-2	892/01114	Camshaft Gear Timing Pin	7-2
892/00059	Blanking Plug	5-2	892/01115	Crankshaft Timing Pin	7-2
892/00060	Blanking Plug	5-2	992/02800	ARV Extractor	5-2
892/00071	Adapter	5-3	992/04000	Torque Multiplier	6-2
892/00074	Female Connector	5-2	992/04800	Drive Coupling Spanner	6-1
892/00075	Female Connector	5-2	992/07603	Replacer- Bearing Cup	6-1
892/00076	Female Connector	5-2	992/07608	Bearing Adapter	6-1
892/00077	Female Connector	5-2	992/07609	Bearing Adapter	6-1
892/00121	Discharge Tester	4-1	992/07610	Bearing Adapter	6-1
892/00137	Micro-Bore Hose	5-3	992/07611	Bearing Adapter	6-1
892/00179	Bearing Press	6-1	992/07612	Bearing Adapter	6-1
892/00180	Seal Fitting Tool	7-1	992/07613	Bearing Adapter	6-1
892/00181	Plastic Boss	7-1			

Service Tools (cont'd)

Numerical List		Page No
* 992/09500	Spanner	5-2
992/09700	Spanner	5-2
992/10100	Spool Clamp	5-2
992/10900	Test Harness for S.L.I	4-1
993/59300	2/4 Wheel Pressure Tester & Clamp	6-2
993/59500	Adapter - Impulse Extractor	6-2
993/99412	Adaptor Harness	4-1

The following parts are replacement items for kits and would normally be included in the kit numbers above.

Replacement item for kit no. 892/00180

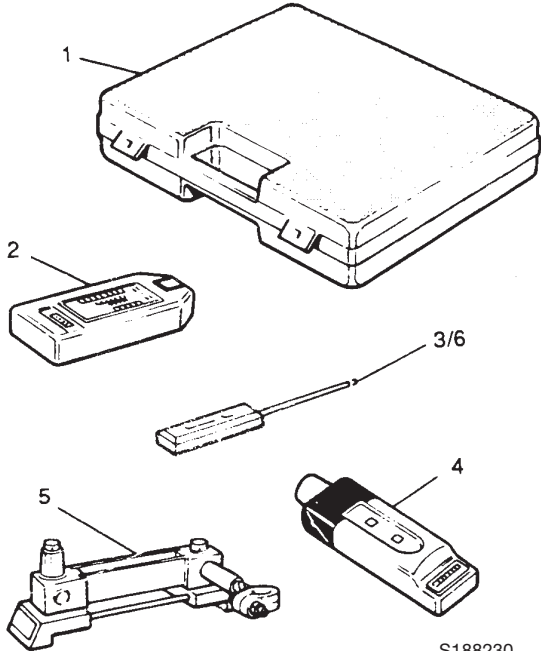
892/00181	Replacement Boss	7-1
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Replacement item for kit no. 892/00253

892/00201	Replacement Gauge	5-1
892/00202	Replacement Gauge	5-1
892/00203	Replacement Gauge	5-1
892/00254	Replacement Hose	5-1

Service Tools

Section C - Electrics



1 892/00283 Tool Kit Case

2 892/00281 AVO Meter

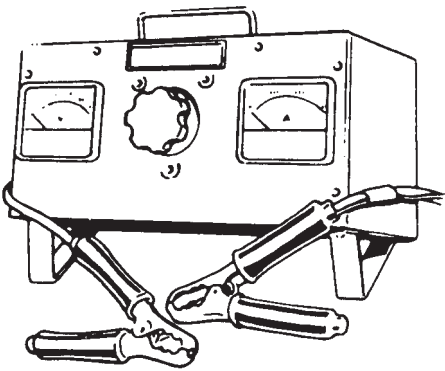
3 892/00286 Surface Temperature Probe

4 892/00284 Venture Microtach Digital Tachometer

5 892/00282 100 amp Shunt - open type

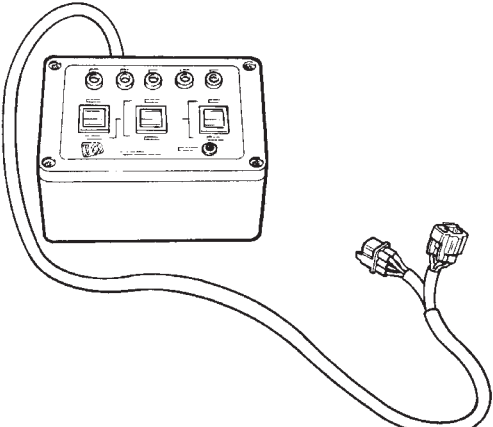
6 892/00285 Hydraulic Temperature Probe

S188230



892/00121 High Rate Discharge Tester (400 amps) for testing battery condition

S188240



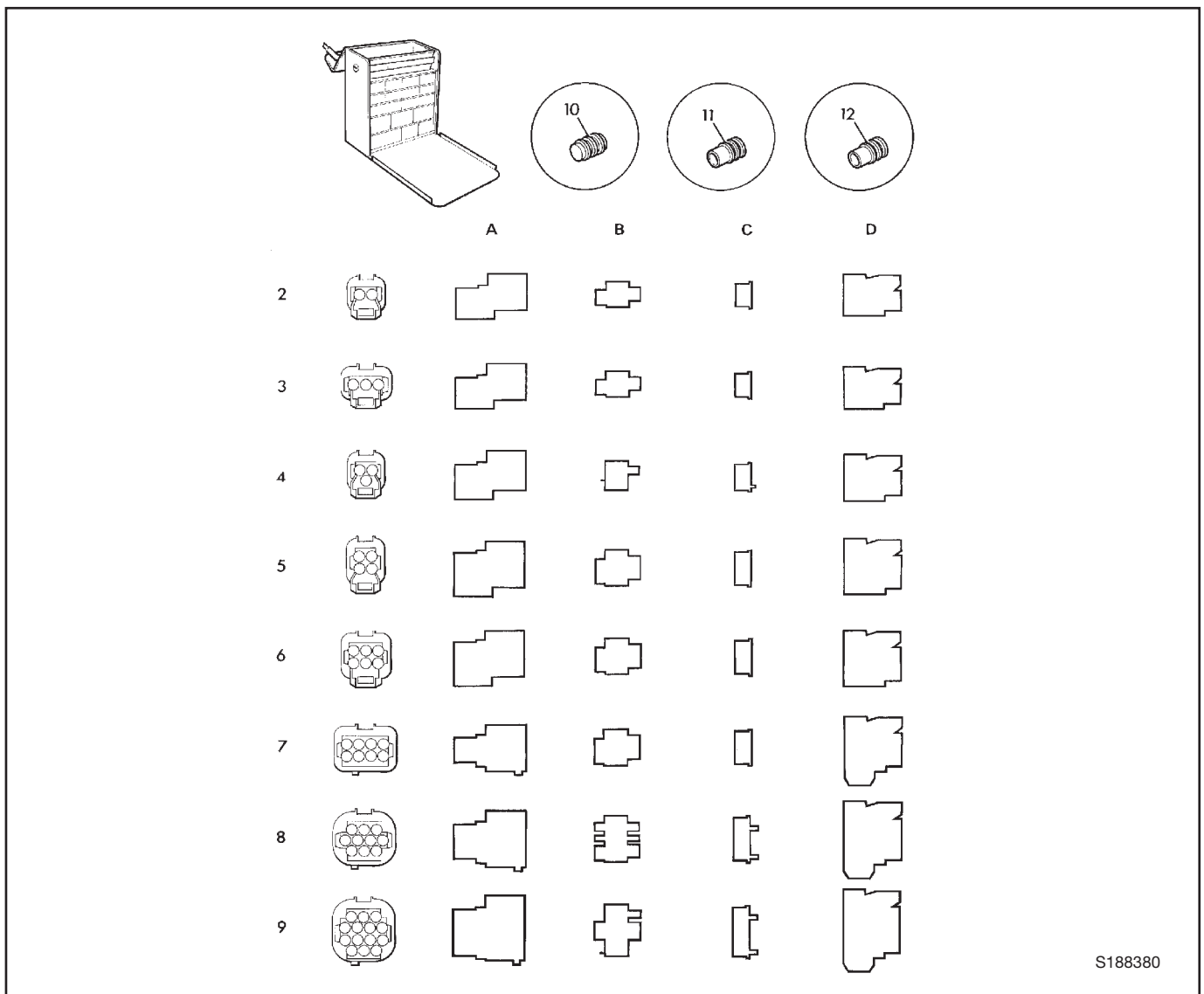
892/00905 Test Box for Safe Load Indicator

S244961

Service Tools

Section C - Electrics

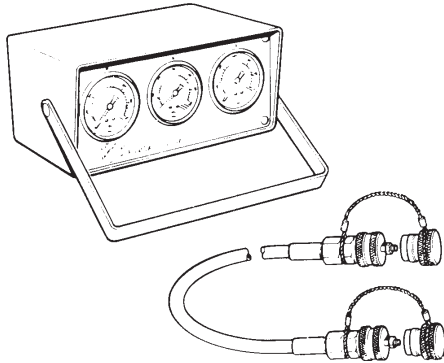
	Electrical Repair Kit		
2A :7212/0002	2 Way Pin Housing	6A :7216/0002	6 Way Pin Housing
2B :7212/0004	2 Way Pin Retainer	6B :7216/0004	6 Way Pin Retainer
2C :7212/0003	2 Way Socket Retainer	6C :7216/0003	6 Way Socket Retainer
2D :7212/0001	2 Way Socket Connector	6D :7216/0001	6 Way Socket Connector
3A :7213/0002	3 Way Pin Housing	7A :7218/0002	8 Way Pin Housing
3B :7213/0004	3 Way Pin Retainer	7B :7218/0004	8 Way Pin Retainer
3C :7213/0003	3 Way Socket Retainer	7C :7218/0003	8 Way Socket Retainer
3D :7213/0001	3 Way Socket Connector	7D :7218/0001	8 Way Socket Connector
4A :7213/0006	3 Way Pin Housing (DT)	8A :7219/0002	10 Way Pin Housing
4B :7213/0008	3 Way Pin Retainer (DT)	8B :7219/0004	10 Way Pin Retainer
4C :7213/0007	3 Way Socket Retainer (DT)	8C :7219/0003	10 Way Socket Retainer
4D :7213/0005	3 Way Socket Connector (DT)	8D :7219/0001	10 Way Socket Connector
5A :7214/0002	4 Way Pin Housing	9A :7219/0006	14 Way Pin Housing
5B :7214/0004	4 Way Pin Retainer	9B :7219/0008	14 Way Pin Retainer
5C :7214/0003	4 Way Socket Retainer	9C :7219/0007	14 Way Socket Retainer
5D :7214/0001	4 Way Socket Connector	9D :72190005	14 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.)



S188380

Service Tools (cont'd)

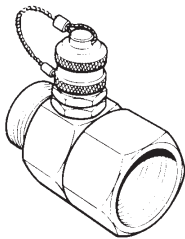
Section E - Hydraulics



Hydraulic Circuit Pressure Test Kit

892/00253	Pressure Gauge 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

S188120



S188130

*Pressure Test 'T' Adaptors

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



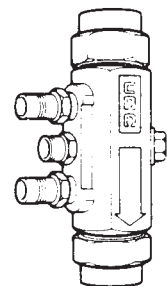
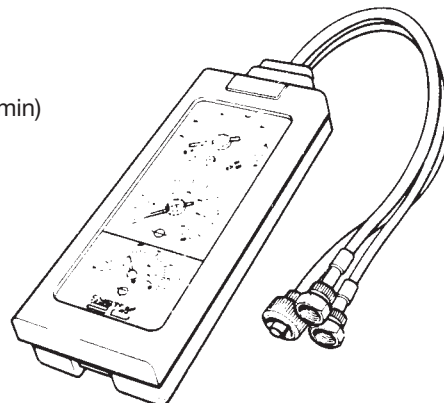
S188140

* 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

Flow Test Equipment

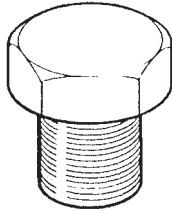
892/00268	Flow Monitoring Unit
892/00269	Sensor Head 0 to 100 l/min (0 to 22 UK gal/min)
892/00270	Load Valve
1406/0021	Bonded Washer
1604/0006	Adapter 3/4 in M x 3/4 M BSP
1612/0006	Adapter 3/4 in F x 3/4 M BSP
892/00271	Adapter 3/4 in F x 5/8 M BSP
892/00272	Adapter 5/8 in F x 3/4 M BSP
816/20008	Adapter 3/4 in F x 1/2 M BSP
892/00275	Adapter 1/2 in F x 3/4 M BSP
892/00276	Adapter 3/4 in F x 3/8 M BSP
892/00277	Adapter 3/4 in F x 3/4 M BSP



S188150

Service Tools (cont'd)

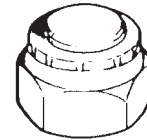
Section E - Hydraulics



S193870

Female Cone Blanking Cap

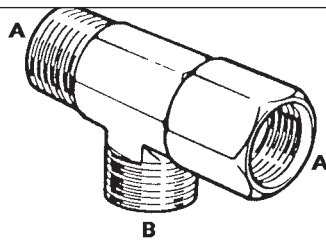
892/00055	1/4 in. BSP
892/00056	3/8 in. BSP
892/00057	1/2 in. BSP
892/00058	5/8 in. BSP
892/00059	3/4 in. BSP
892/00060	1 in. BSP



S193880

Male Cone Blanking Cap

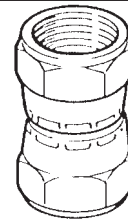
816/00294	1/4 in. BSP
816/00189	3/8 in. BSP
816/00190	1/2 in. BSP
816/00197	5/8 in. BSP
816/00196	3/4 in. BSP
816/00193	1 in. BSP



S193890

T' Adapters

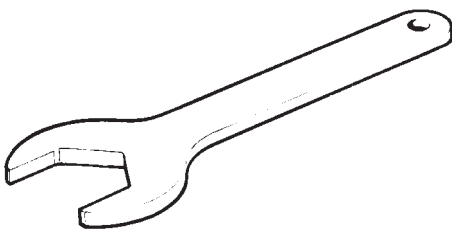
892/00047	3/8 in. BSP (A) x 1/4 in. BSP (B)
892/00048	1/2 in. BSP (A) x 1/4 in. BSP (B)
892/00049	5/8 in. BSP (A) x 1/4 in. BSP (B)
816/50043	3/4 in. BSP (A) x 1/4 in. BSP (B)
892/00051	1 in. BSP (A) x 1/4 in. BSP (B)



S193900

Female Connectors

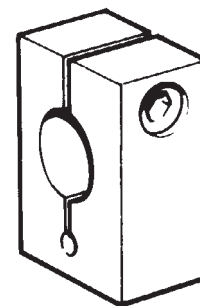
892/00074	3/8 in. BSP x 3/8 in. BSP
892/00075	1/2 in. BSP x 1/2 in. BSP
892/00076	5/8 in. BSP x 5/8 in. BSP
892/00077	3/4 in. BSP x 3/4 in. BSP



S192420

Hexagon Spanners for Ram Pistons and End Caps

992/09500	75mm A/F
992/09700	95mm A/F



S192410

Spool Clamps

892/00039	Spool Clamp
992/10100	Spool Clamp
992/02800	ARV Extractor

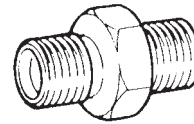
S188150

Service Tools (cont'd)

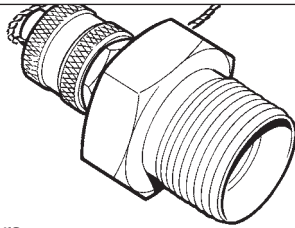
Section E - Hydraulics

Male Adapters - BSP x BSP

1606/0003	$\frac{3}{8}$ in. x $\frac{1}{4}$ in.
1604/0003	$\frac{3}{8}$ in. x $\frac{3}{8}$ in.
892/00071	$\frac{3}{8}$ in. x $\frac{3}{8}$ in. taper
1606/0004	$\frac{1}{2}$ in. x $\frac{1}{4}$ in.
1606/0007	$\frac{1}{2}$ in. x $\frac{3}{8}$ in.
1604/0004	$\frac{1}{2}$ in. x $\frac{1}{2}$ in.
1606/0017	$\frac{5}{8}$ in. x $\frac{1}{2}$ in.
1606/0008	$\frac{3}{4}$ in. x $\frac{3}{8}$ in.
1606/0009	$\frac{3}{4}$ in. x $\frac{1}{2}$ in.
1604/0006	$\frac{3}{4}$ in. x $\frac{3}{4}$ in.
1606/0012	$\frac{3}{4}$ in. x 1 in.
1606/0014	$\frac{3}{4}$ in. x $1\frac{1}{4}$ in.
1606/0015	1 in. x $1\frac{1}{4}$ in.

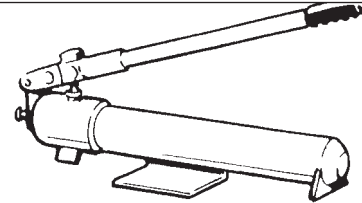


S193860



Pressure Test Adapters

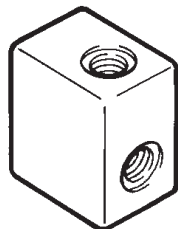
892/00255	$\frac{1}{4}$ in. BSP x Test Point
892/00256	$\frac{3}{8}$ in. BSP x Test Point
892/00257	$\frac{1}{2}$ in. BSP x Test Point
892/00258	$\frac{5}{8}$ in. BSP x Test Point
816/15118	$\frac{3}{4}$ in. BSP x Test Point
892/00259	1 in. BSP x Test Point
892/00260	$1\frac{1}{4}$ in. BSP x Test Point
892/00261	$\frac{5}{8}$ in. UNF x Test Point



S193850

Hand Pump Equipment

892/00223	Hand Pump
892/00137	Micro-bore Hose $\frac{1}{4}$ in BSP x 5 metres
892/00274	Adapter $\frac{1}{4}$ in M BSP x $\frac{3}{8}$ in M BSP Taper
892/00262	$\frac{1}{4}$ in M BSP x $\frac{1}{4}$ in F BSP x Test Point
892/00706	Test Probe
892/00279	Gauge 0 - 400 bar (0-6000 lbf/in ²)




S270650

*892/00923

Test Block for A. R. V

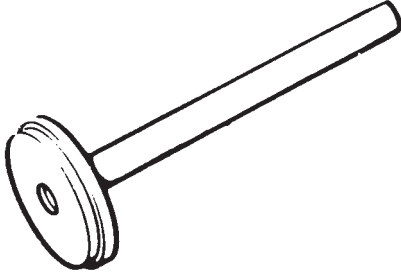
Service Tools (cont'd)

Section F - Transmission



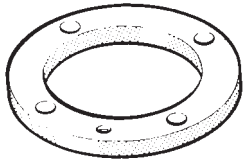
S188160

992/07608 Bearing Adapter
 992/07609 Bearing Adapter
 992/07610 Bearing Adapter
 992/07611 Bearing Adapter
 992/07612 Bearing Adapter
 992/07613 Bearing Adapter



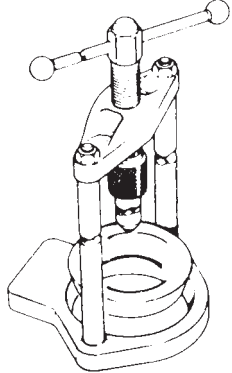
S188170

992/07603 Replacer- Bearing Cup



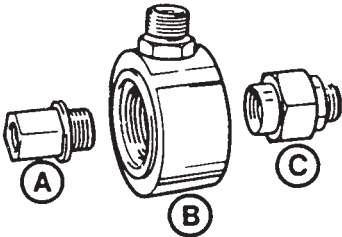
S188190

892/00295 End Float Setting Tool



S188200

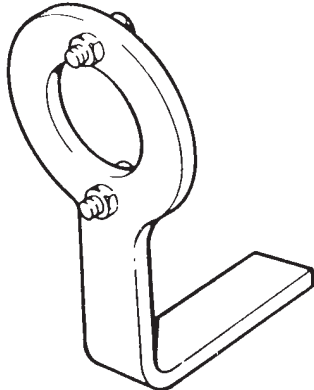
892/00179 Bearing Press



S188210

892/00237 Flow Test Adaptor Complete

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

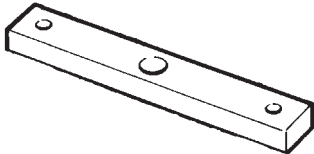


S188220

992/04800 Flange Spanner
 For locking pinion flange while nut is
 slackened or torque set

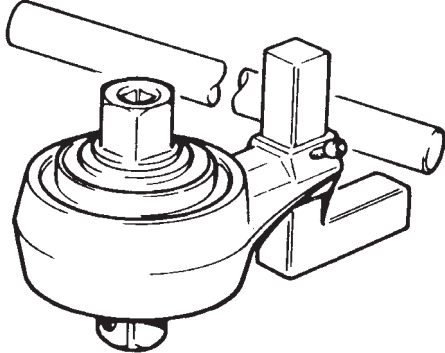
Service Tools (cont'd)

Section F - Transmission




892/00893
Torque Converter Alignment Bar

S228921



992/04000 Torque Multiplier S197030

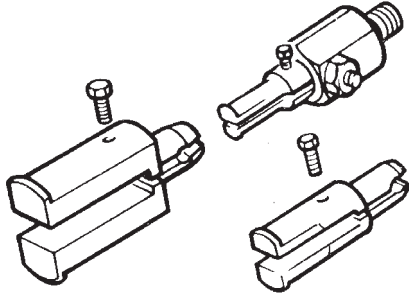
Use in conjunction with a torque wrench to give a 5:1 multiplication when tightening pinion nuts etc.



S197250

Heavy Duty Sockets for Durlok bolts

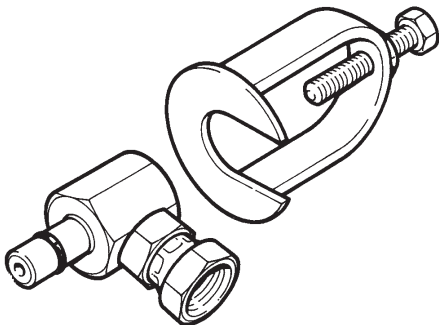
892/00817 17mm A/F x 3/4in square drive
 892/00818 22mm A/F x 3/4in square drive
 892/00819 15mm A/F x 1/2in square drive
 892/00333 19mm A/F x 3/4in square drive



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

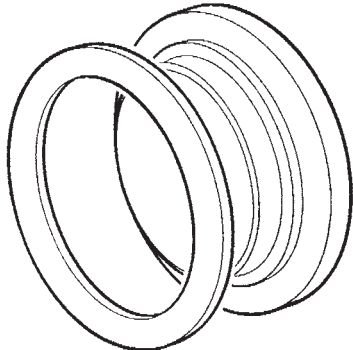
993/59500 Adapter - Extractor

S197080



993/59300
2/4 Wheel Drive Clutch Pressure Test Adaptor & Clamp

S196750



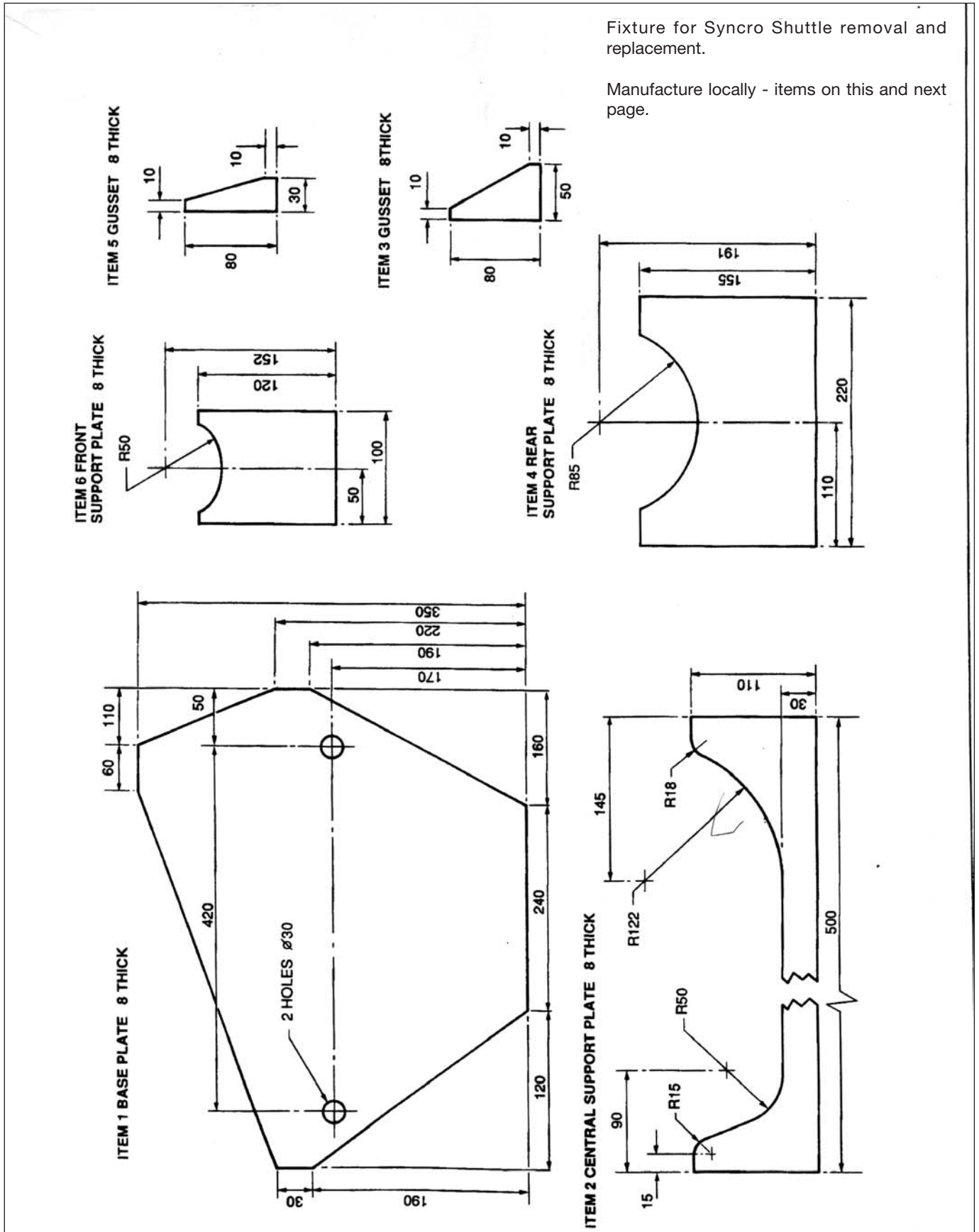
892/00891
Seal Fitting Adaptor

S227760

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Service Tools (cont'd)

Section F - Transmission





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