FLIGHT REFUELLING LTD.

WIMBORNE, DORSET, ENGLAND

F.R. PIPE CONNECTORS

FRS. 110, 122, 132, 150, 175, 192, 230, 246, 325
355, 380, 395, 400, 480, 495, 525, 565, 594
595, 596, 597, 625, 633, 650, 679, 785

Including the following modifications:

Mod. No.	Service Bulletin No.
FRM 3512	28-4-3512
FRM 3989	28-7-3989

This manual complies with British Civil Airworthiness Requirements, Section A, Chapter A6-2. The technical accuracy of this manual has been verified and is certified as correct.

Signed Raymond Meadows.

Date 15th September, 1967

A.R.B. Design Approval No. AD/1104/47

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REVISION RECORD SHEET

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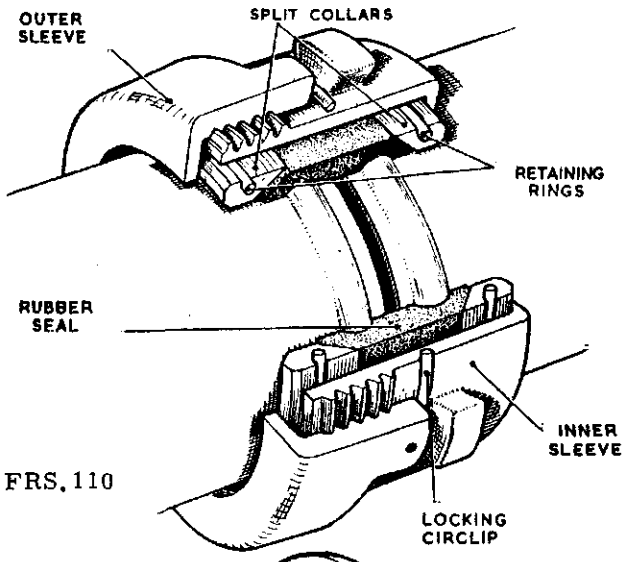
The introduction of any amendment or revision not certified in accordance with British Civil Airworthiness Requirements Section A, Chapter A6–2, will invalidate the statement of certification on Page 1. Amendments or revisions embodied in this manual, which have been certified under an approved authorization other than that applicable to the initial certification must be recorded on separate record sheets.

LIST OF EFFECTIVE PAGES

Page	Date
1 to 22 , incl.	Sep/67

CONTENTS

ILLUSTRATIONS



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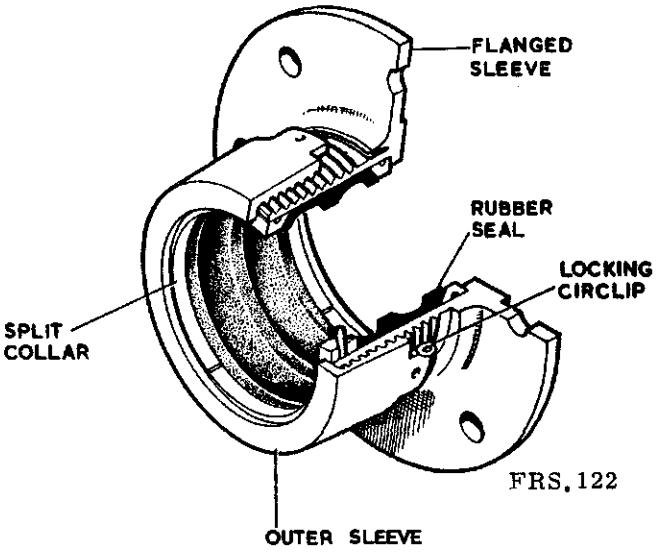

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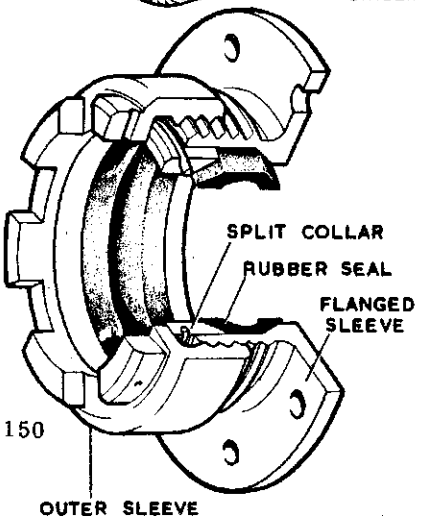

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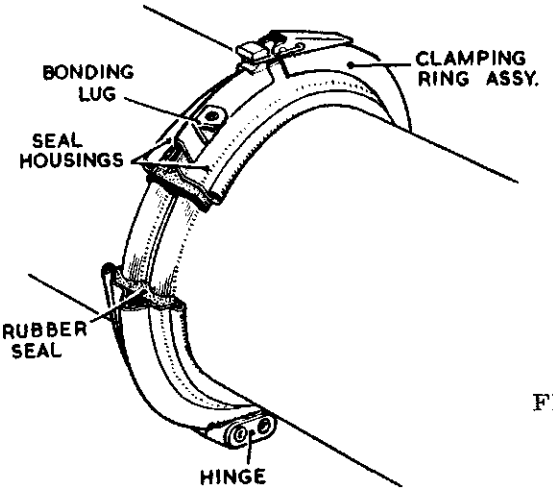

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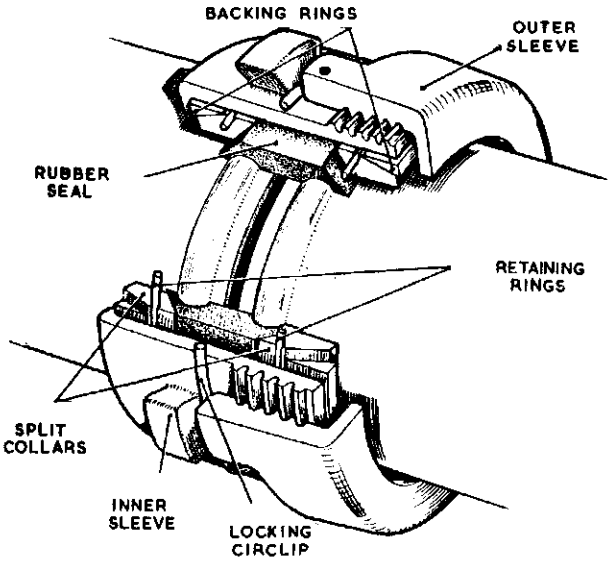
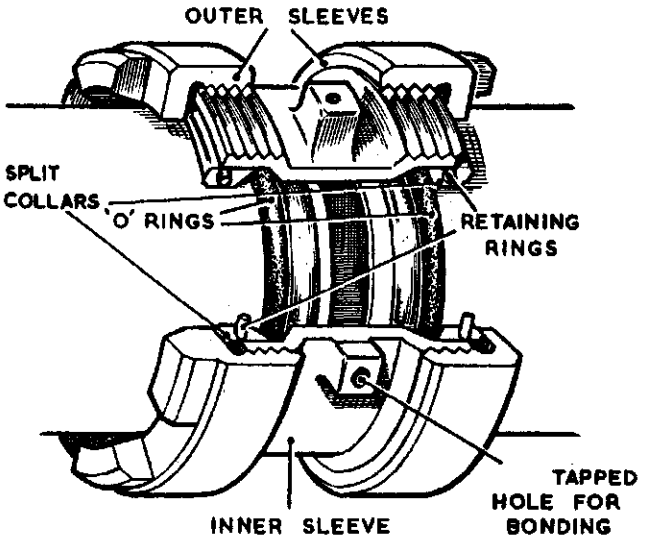
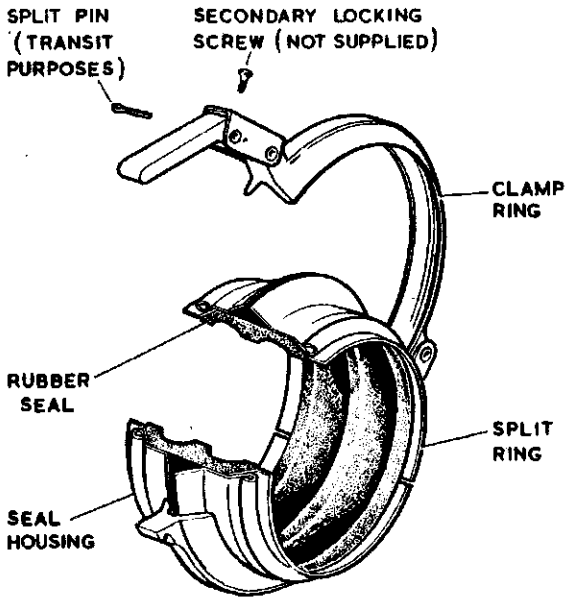


FRS.325

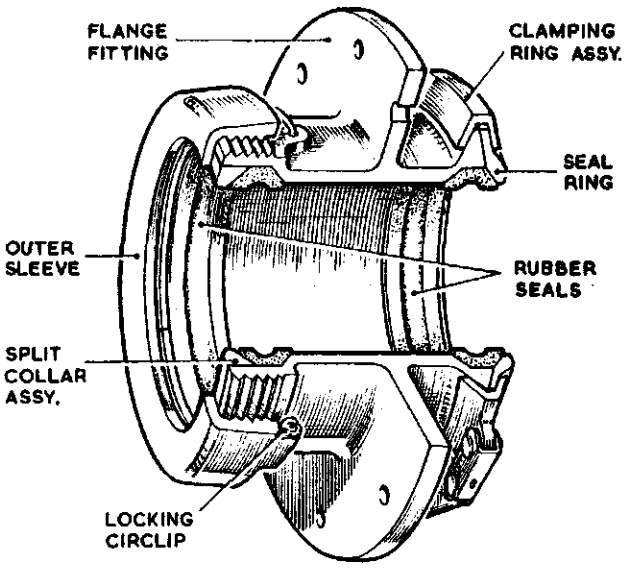


FRS.380

Cut-away view of connectors
Fig.1



FRS.525



FRS.565

Cut-away view of connectors
Fig. 1 (continued)

NOTE: The correct nomenclature is used in the Parts List. For clarity, similar component parts are given a common identification in Paras. 1 and 6, and in Fig. 1.

1. Description

The connectors form three basic groups (a) in-line connectors for two-pipe running joints (b) bulkhead connectors which join two pipes at a bulkhead (c) termination connectors for connecting a pipe directly to a tank or similar unit. The component parts can be assembled over the pipe beadings so that there are no captive fittings. Lugs or tapped holes provide for attachment of bonding conductors to the in-line connectors.

A code system used to identify each connector is composed of a basic part number, a size letter, and a series number indicating the type of rubber seal. Particulars of these are given in Data. The size letter is omitted when a connector has a specific application.

A. In-line connectors

(1) FRS. 110,132,325,480,594,595

Each connector comprises two threaded sleeves holding a flexible rubber seal between two split collars. The bore of the seal has U-section grooves to fit over the pipe beadings, and the ends are chamfered to register with conical seatings on the inner surfaces of the split collars. When the outer sleeve is tightened on to the inner sleeve, the load applied on the split collars compresses the rubber seal around the pipes to effect a pressure-tight joint. The sleeves of the 5/8 and $\frac{3}{4}$ inch connectors are hexagonal while those of the larger sizes have castellations or lugs for a C-spanner grip. A circlip or wire locks the sleeves together.

FRS.325 connectors have a backing-ring over the outer end of each split collar. The split collars of FRS.594 and 595 are of Ferrobestos material.

(2) FRS.380

These connectors are similar to those described in A(1) above except that an O-ring seals each pipe joint independently.

(3) FRS. 175,495,525,625,650,785

Essentially each connector comprises a rubber seal similar to that described in A(1), and two seal housings which fit around the seal and inside a hinged clamping ring. When the clamping ring is fastened by means of a toggle action lever the seal housings are drawn together to compress the seal around the pipes.

FRS. 175 and 495 connectors have a spring clip which prevents accidental release of the toggle lever. Connectors FRS. 525,625,650,785 have a tapped hole for a screw to lock the toggle lever and secure a bonding conductor.

Connectors FRS. 495,525,625,650,785 have a split-ring under each seal housing: the FRS.650 connectors also have a sleeve which fits closely over the seal.

B. Bulkhead pipe connectors

(1) FRS.122,192,400,596,679

These connectors are similar to those described in A(1) but are attached to a bulkhead by bolts or studs. The inner sleeve (flanged sleeve) incorporates a mounting flange and the outer sleeve is locked with wire or a circlip. FRS.400 connectors have backing rings over the outer ends of the split collars, and the split collars of connectors FRS.596 and 679 are of Ferrobestos.

C. Termination pipe connectors

(1) FRS.150,230,355,395,597,633

These connectors are similar to the bulkhead type except that the rubber seal has a single groove, and a split collar is fitted under the outer sleeve only. Connectors FRS.355,395,633 are locked with circlips. A backing ring is fitted to FRS.395, and the split collars of FRS.597 are of Ferrobestos.

(2) FRS.246

This $\frac{3}{4}$ inch pipe connector is threaded at one end. Hexagons on the union body and outer sleeves are drilled for lockwire.

(3) FRS.565 (double termination)

This component comprises two independent connectors. One connector is similar to FRS.355 while the other consists of a clamping ring and a seal ring which apply pressure on the rubber seal.

2. Data

A. Range of sizes and method of locking

FRS	Type	Size range	Locking
110	In-line, threaded sleeves	H to N	circlip
122	Bulkhead, threaded sleeves	H to N	circlip
132	In-line, threaded sleeves	E.F	circlip
150	Termination, threaded sleeves	H to N	wire
175	In-line, clamp	H to Z	spring clip
192	Bulkhead, threaded sleeves	E.F	wire
230	Termination, threaded sleeves	E.F	wire
246	Termination, threaded sleeves, screw end	$\frac{3}{4}$ inch	wire
325	In-line, threaded sleeves	L to Z	circlip
355	Termination, threaded sleeves	H to N	circlip
380	In-line, threaded sleeves, O-ring	H to V	wire
395	Termination, threaded sleeves	P.Q.R.T.V.	circlip
400	Bulkhead, threaded sleeves	L.P.Q.R.T.V.	circlip
480	In-line, threaded sleeves	$1\frac{3}{4}$ inch	circlip
495	In-line, clamp	H to Z	spring clip
525	In-line, clamp	H to Z	4 BA screw
565	Termination, clamp and threaded sleeves	$2\frac{3}{4}$ inch	screw, circlip
594	In-line, threaded sleeves, heat-resistant	H to N	circlip
595	In-line, threaded sleeves, heat-resistant	E.F	circlip
596	Bulkhead, threaded sleeves, heat-resistant	H to N	circlip
597	Termination, threaded sleeves, heat-resistant	H to N	wire
625	In-line, clamp	H to Z	4 BA screw
633	Termination, threaded sleeves	L.M	circlip
650	In-line, clamp	H to X	4 BA screw
679	Bulkhead, threaded sleeves, heat-resistant	E.F	wire
785	In-line, clamp	$2\frac{1}{2}$ inch	4 BA screw

B. Size code

Size letter	E	F	H	J	K	L	M	N	P	Q	R	S	T	U	V	X	Z
Pipe O.D. (in)	5/8	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4	$4\frac{1}{2}$	5

C. Seal and O-ring application

	Colour identification		
Series	Seal	O-ring	System
1	Red spot	2 red spots	Fuel, water/methanol
2	White spot	2 white spots	Hydraulic (DTD 585)
3	Blue spot	Red or off white rubber	Ethylene glycol
4	Yellow spot	-	Lubricating oil
5	Grey rubber	-	Air or oil
7	Red or off white rubber	-	Air or fuel
8	Green spot	-	Skydrol 500 hydraulic

3. Unpacking and acceptance checks

Connectors are packed in one or more layers in sealed cartons, each layer being positioned between locating trays. A sheet of corrosion preventive paper is placed over the upper layer and an identification label attached to each connector gives the initial assembly date. If transit damage is suspected unpack all connectors and examine the component parts for distortion and cracks.

4. Storage instructions

A. Conditions

(1) Retain connectors in sealed cartons.

(2) Store in conditions suitable for rubber parts.

B. Limiting period

Storage limitation applies only to rubber seals and O-rings. Series 1, 5, 7 have a total life of 10 years and Series 2, 3, 4, 8 have 5 years. Seals are marked A or B followed by year to indicate 1st or 2nd 6-month period of year of manufacture.

5. Checks/Tests before installation

(1) Ensure that seal or O-ring conforms to the system requirements by checking colour identification or the Series number.

(2) Check that the ends of the pipes including the beadings are not damaged and have no sharp edges or burrs. Pipe beading dimensions are given in Fig. 2.

(3) Check that the coating of colloidal graphite (DTD 900/4196) on the threads of the inner sleeve/mounting flange is satisfactory.

(4) To assist assembly of connectors that have threaded sleeves it is recommended that the outer surface of seals, other than Series 5 seals, be coated with a thin film of silicone grease (DTD 842). Care must be taken to ensure that the grease does not contact the inner surface of the seal.

WARNING: DO NOT USE GREASE ON SERIES 5 SEALS.

(5) Coat O-rings with a thin film of Molydest grease.

6. Installation (Fig. 2)

A. Connectors with threaded sleeves

Since these connectors are essentially similar in design, a detailed procedure is given for in-line connector FRS.325 only. To assist assembly reference should be made to the appropriate diagram in Fig. 2. For the in-line and bulkhead pipe connectors the clearance between the pipe ends must conform to that shown in Fig. 2. If several connectors are to be fitted in the same pipeline commence at a fixed point. When installing bulkhead or termination pipe connectors refer to the aircraft manual for attachment of flanged sleeve. If a circlip is to be renewed refer to Para.11 for correct part number.

(1) Ensure that bonding clips are clear of pipe ends.

(2) Pass inner sleeve over one pipe and outer sleeve over other pipe. Position a backing ring (connectors FRS.325, 395, 400) on each pipe so that flat edge is towards sleeve.

(3) Assemble the split collars in pairs and secure with the retaining rings. Spring the assemblies apart to pass over the pipe beadings, ensuring that the conical surface points towards the end of the pipe.

(4) Place the rubber seal on one pipe, clear of the beading.

(5) Position pipes to obtain correct gap between ends and to ensure alignment of adjoining pipes. Secure pipe support clips and brackets.

(6) Slide the rubber seal into position. Check that the grooves fit snugly over the pipe beadings.

(7) Place the split collars against the rubber seal, and ease the inner sleeve over the assembly. Hold the inner sleeve, and tighten the outer sleeve on to the inner sleeve hand-tight: this method is essential to prevent rotation and consequent distortion of the seal.

NOTE: An attempt to connect pipes that are out of alignment may distort the seal and result in a leaking joint. Flexibility of connectors is applicable only after final tightening.

(8) Tighten each outer sleeve one-quarter to one-half turn with the appropriate C-spanner then fit the locking circlip, ensuring that the circlip fits tightly around the inner sleeve. Refer to Para. 7 for information on circlips.

CAUTION: EXCESS TIGHTENING WILL DISTORT SEAL CAUSING POSSIBLE LEAKAGE AND DAMAGE TO PIPES.

B. FRS.380 connectors (O-ring type)

(1) To enable a gap check to be made at a later stage, pencil a datum line on each pipe 1.25 in. distant from each end. Examine the marked off end of each pipe for ovality, scoring and indentation. It is recommended that the pipe surfaces are polished.

(2) Pass an outer sleeve over each pipe end.

(3) Assemble the split collars in pairs and secure with the retaining rings. Spring the assemblies apart to pass over the pipe beadings, ensuring that the conical surface points towards the end of the pipe.

(4) Pass an O-ring over each pipe beading. With the inner sleeve positioned centrally between the pipe ends, slide each O-ring into the inner sleeve. Follow with the split collars. Hold the inner sleeve, and tighten both outer sleeves hand-tight. This method is essential to prevent rotation and consequent distortion of the O-rings.

NOTE: An attempt to connect pipes that are out of alignment may distort the O-rings and result in a leaking joint. Flexibility of connectors is applicable only after final tightening.

(5) Measure distance between datum lines. Substract 2.5 in. from this dimension to obtain clearance between pipe ends. Position pipes as necessary. Secure pipe support clips and brackets, ensuring that correct setting is maintained.

(6) Tighten each outer sleeve one-quarter to one-half turn then wirelock sleeves together.

CAUTION: EXCESS TIGHTENING WILL DISTORT O-RINGS CAUSING LEAKAGE AND POSSIBLE DAMAGE TO PIPES.

(7) If attaching bonding conductor to lugs of inner sleeve select appropriate tapped hole. Holes are tapped 4 BA and 4-40 UNC alternately.

C. Lightweight connectors FRS.175,495,525,565,625,650,785

Since these connectors are similar in construction a detailed procedure is given for FRS.650 only. For the installation of connector FRS.565 reference should also be made to Para. 6A. Connectors FRS.525,625,650,785 have a split pin through the toggle lever to ensure retention of the component parts: this pin must be removed to permit disassembly. The correct clearance between pipe ends is given in Fig. 2.

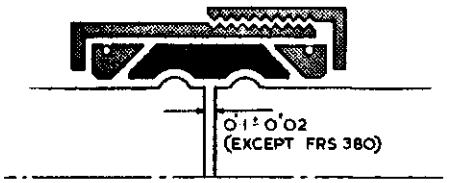
(1) FRS.175,495. Check that the coating of colloidal graphite on surface of clamping ring groove is satisfactory.

(2) Assemble on each pipe, one split ring and one seal housing, ensuring that the flared ends are towards the end of the pipe. Pass the seal and the seal sleeve over the beading of one pipe.

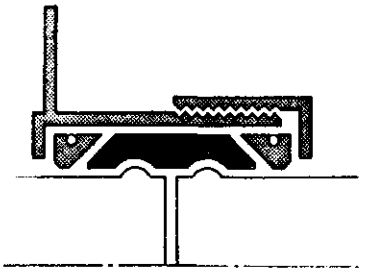
(3) Ensure that the pipes are in alignment, and are spaced to give the correct clearance. An attempt to connect pipes that are out of alignment may result in a leaking joint.

(4) Slide the seal into position and check that the grooves fit snugly over the pipe beadings.

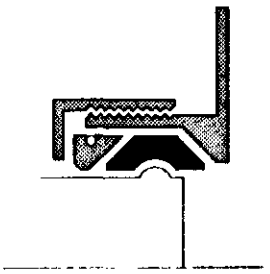
(5) Position the seal sleeve centrally over the seal and the split rings against the end of the seal. Secure both seal housings with the clamping ring.



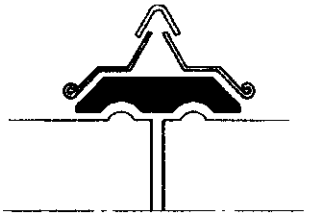
FRS 110 132 480 594 595



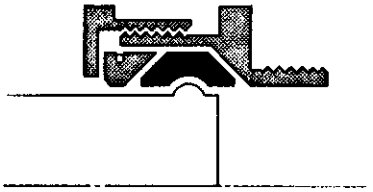
FRS 122 192 596 679



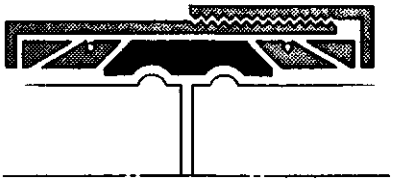
FRS 150 230 355 597 633



FRS 175



FRS 246



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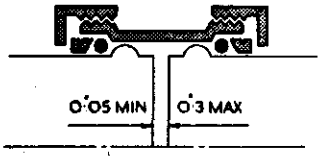

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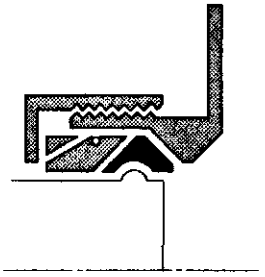

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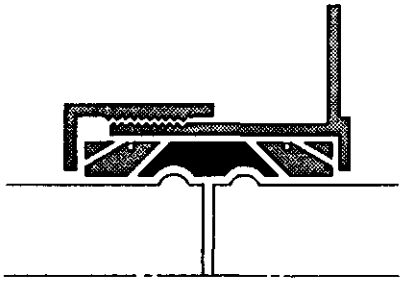
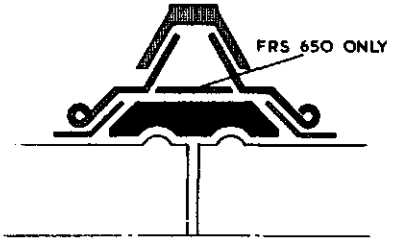
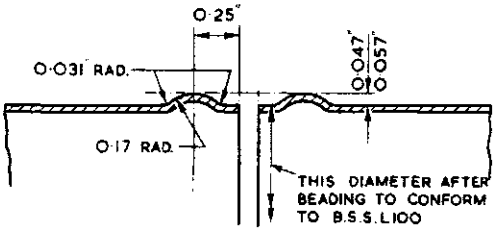


FRS 400



FRS 495 525 625 650 785



Assembly diagrams and pipe beading dimensions
Fig. 2

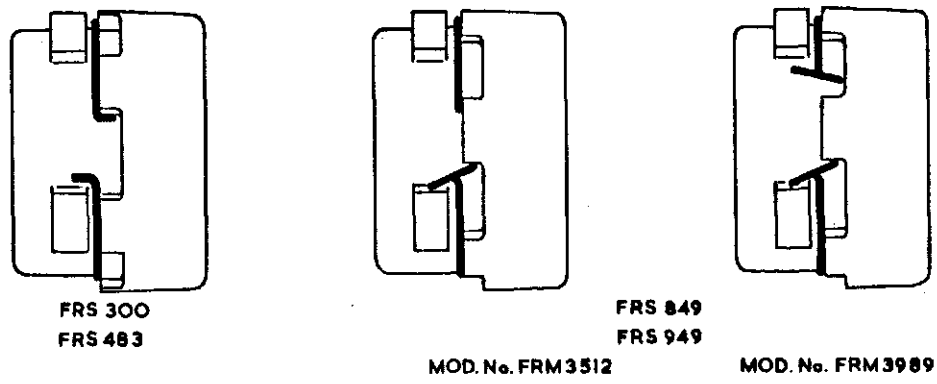
NOTE: When a pipe is to be fitted between fixed points it is recommended that both connectors be secured simultaneously otherwise the clearance may possibly decrease at one end and increase at the other.

(6) Bonding conductors are secured to lug of FRS.175, 495 and by 4 BA screw to toggle lever of FRS.525,625,650,785

7. Circlips (Fig.3)

Circlips of bulkhead and termination pipe connectors have one plain end which fits into a blind hole in the mounting flange, a series of holes being spaced around the flange boss for positional selection. An exception is the circlip fitted to the $3\frac{1}{2}$ and 4 inch sizes of termination pipe connector FRS.395; this has an eye which fits over the head of an attachment bolt.

Circlips of in-line pipe connectors have an ear at each end, an exception being one with a plain end which is fitted to both sizes of connectors FRS.132 and FRS.595. Circlips of connectors in service may have ears that are single (circular), double (loop form) or a combination of both, according to the standard of modification - see following table. The correct method of fitting these circlips is shown in Fig.3.



Circlips of in-line connectors
Fig.3

Connector	Circlip	Description	Introduced by Mod.No.
FRS.110	FRS.300	Single ear each end	-
FRS.325	FRS.949	Single ear, double ear	FRM. 3512
FRS.594	*FRS.949 Issue 3	Double ear each end	FRM. 3989
FRS.480	FRS.483	Single ear each end	-
	FRS.849	Single ear, double ear	FRM. 3512
	*FRS.849 Issue 3	Double ear each end	FRM. 3989

* fitted to new connectors

8. Checks/Tests after installation

(1) Effect a pressure test in accordance with the requirements of the system.

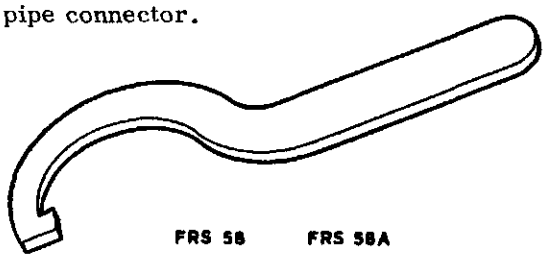
(2) If leakage occurs, dismantle the connector and examine the components for damage.

(3) When extreme low temperature conditions prevail, check the tightness of all connectors.

9. Special tools (Fig.4)

Item	Description	Part Number
1	C-spanner (mild steel)	FRS.58/size letter
2	C-spanner (light alloy)	FRS.58A/size letter

Items 1 and 2 are similar tools for individual sizes of pipe connectors, the same size letter being used as for the pipe connector.



C-spanner
Fig.4

10. Schedule of overhaul periods

There is no overhaul period but examination of seals and O-rings is recommended after 5-years.

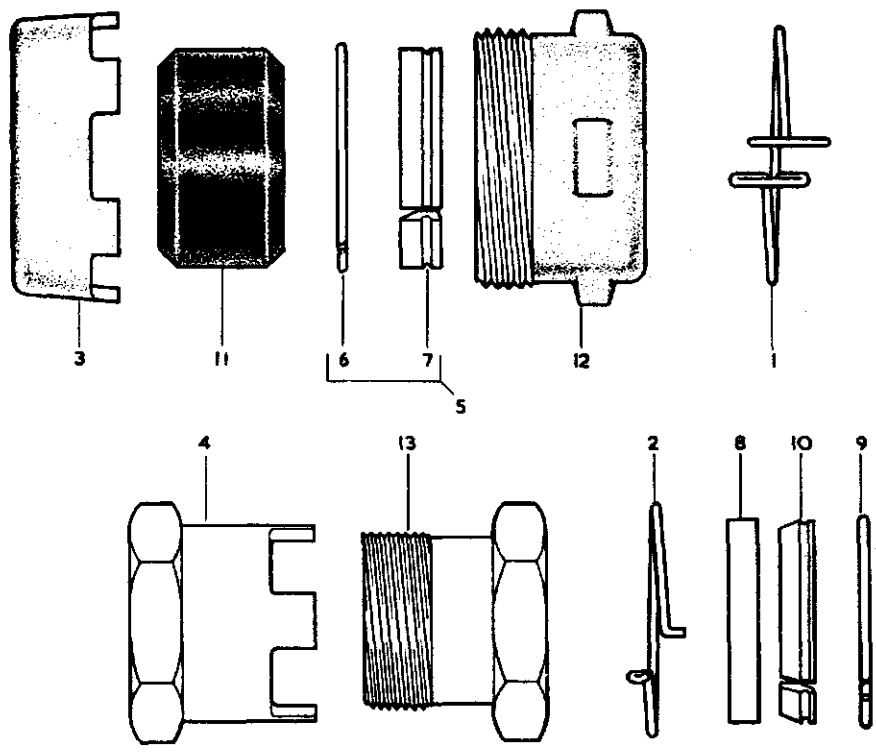
F.R. PIPE CONNECTORS

ILLUSTRATED PARTS LIST

The parts list is arranged as groups of physically similar connectors. The sign * indicates that the relevant size letter is required to complete the component part number. Similarly the abbreviation 'Ser' indicates that the appropriate Series Number is required to complete the part number of the connector, rubber seal or O-ring. Although in most instances parts have the same size letter as the connector, reference should be made to the 'Usage size' column for any exceptions. To assist in identification, parts that have the same description but differ physically are given separate item numbers.

Connector	Group	Connector	Group
FRS. 110	A	FRS. 480	A
122	D	495	C
132	A	525	C
150	E	565	E
175	C	594	A
192	D	595	A
230	E	596	D
246	E	597	E
325	A	625	C
355	E	633	E
380	B	650	C
395	E	679	D
400	D	785	C

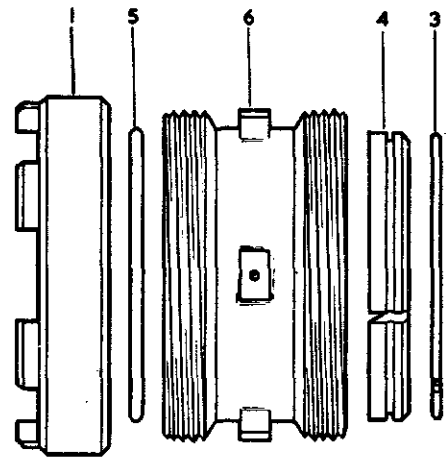
11. Illustrated parts list



Spare parts for FRS.110,132,325,480,594,595
Fig.5

A. Connectors FRS.110,132,325,480,594,595

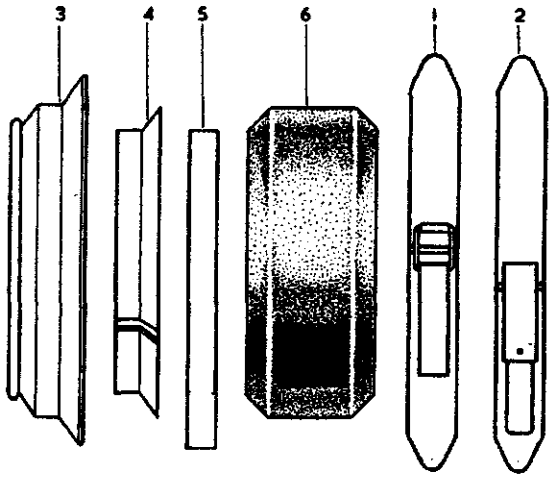
FIG ITEM NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	USAGE SIZE	UNITS PER ASSY.
	FRS.				
5-	110/*/Ser	Connector assy.	a		Ref.
5-	132/*/Ser	Connector assy.	b		Ref.
5-	325/*/Ser	Connector assy.	c		Ref.
5-	480/Ser	Connector assy. $1\frac{3}{4}$ inch.	d		Ref.
5-	594/*/Ser	Connector assy. heat resistant	e		Ref.
5-	595/*/Ser	Connector assy. heat resistant	f		Ref.
1	949/*	. Circlip	a c		1
1	949/*		e	H-KMN	1
1	849		d		1
1	849		e	L	1
2	180/*	. Circlip	b f		1
3	111/*	. Sleeve, outer	a		1
3	111/*		c	L-S	1
3	397		c	T	1
3	411		c	V	1
3	423		c	Z	1
3	482		d e	L	1
3	111/*		e	H-KMN	1
4	134/*	. Sleeve, outer	b f		1
5	73/*	. Collar assy. split	a d		2
5	138/*		b		2
5	599/*		e		2
5	601/*		f		2
6	66/*	. . Ring, retaining	a d e		1
6	137/*		b f		1
7	65/*	. . Collar, split	a d		2
7	136/*		b		2
7	600/*		e		2
7	602/*		f		2
8	321/*	. Ring	c		2
9	66/*	. Ring, retaining	c	L-SVZ	2
9	401		c	T	2
10	323/*	. Ring, split	c		2
11	54/*/Ser	. Seal, rubber	a d e		1
11	135/*/Ser		b f		1
11	322/*/Ser 1	Series 1	c		1
11	406/*/Ser 5	Series 5	c		1
11	699/P/Ser 4	Series 4	c	P	1
12	109/*	. Sleeve, inner	a		1
12	109/*		c	L-S	1
12	109/*		e	H-KMN	1
12	398		c	T	1
12	412		c	V	1
12	481		d e	L	1
13	133/*	. Sleeve, inner	b f		1



Spare parts for FRS.380
Fig.6

B. Connector FRS.380 (O-ring type)

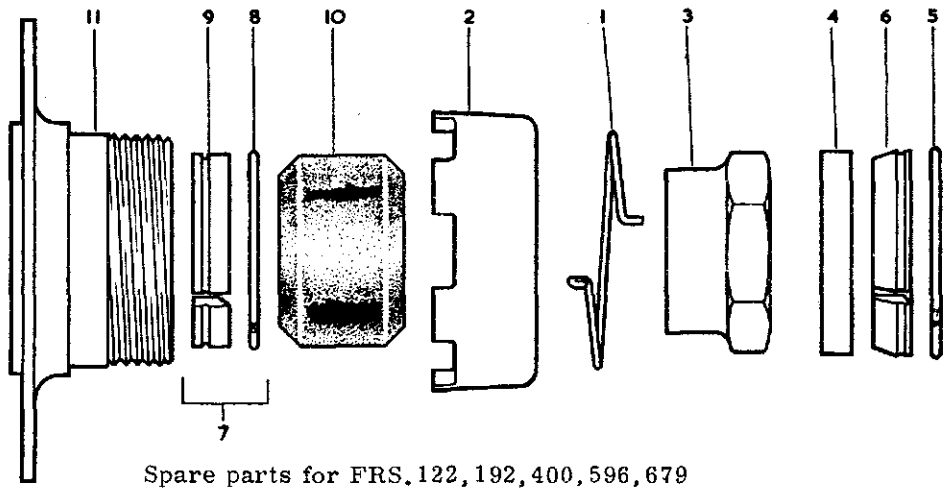
FIG ITEM NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	USAGE SIZE	UNITS PER ASSY.
6-	FRS.380/*/Ser 1	Connector assy. Series 1	a		Ref.
6-	FRS.380/*/Ser 2	Connector assy. Series 2	b		Ref.
6-	FRS.380/*/Ser 7	Connector assy. Series 7	c		Ref.
1	FRS.152/*	. Nut, ring	a b c	H-R	2
1	FRS.424/*		a b	TV	2
2	FRS.563/*	. Collar assy. split	a b c		2
3	FRS.137/F	. . Ring, retaining		H	1
3	FRS. 66/H			J	1
3	FRS. 66/J			K	1
3	FRS. 66/K			L	1
3	FRS. 66/L			M	1
3	FRS. 66/M			N	1
3	FRS. 66/N			P	1
3	FRS. 66/Q			R	1
3	FRS. 66/S			T	1
3	FRS.569			V	1
4	FRS.562/*	. . Collar, split			2
5	FRS.379/*	. O-ring	a		2
5	PO12510013		b	H	2
5	PO15012513		b	J	2
5	PO17515013		b	K	2
5	PO21217521		b	L	2
5	PO23720021		b	M	2
5	PO26222521		b	N	2
5	PO28725021		b	P	2
5	PO33730021		b	R	2
5	PO38735021		b	T	2
5	PO43740021		b	V	2
5	FRS.556/61		c	H	2
5	FRS.627/J		c	J	2
5	FRS.627/K		c	K	2
5	FRS.556/77		c	M	2
6	FRS.564/*	Union	a b c		1



Spare parts for FRS.175,495,525,625,650,785
Fig.7

C. Connectors FRS.175,495,525,625,650,785

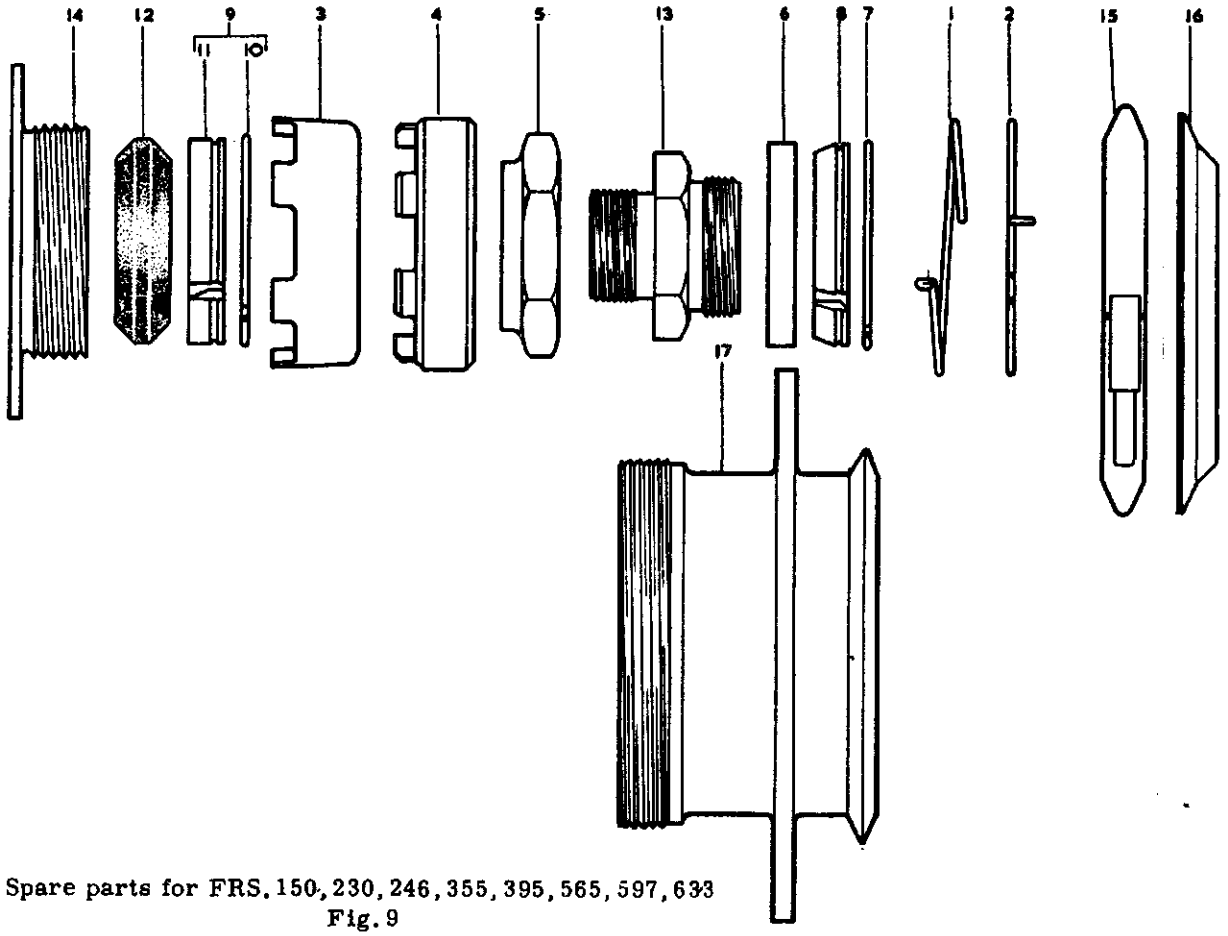
FIG ITEM NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	USAGE SIZE	UNITS PER ASSY.
	FRS.				
7-	175/*/Ser	Connector assy. lightweight	a		Ref.
7-	495/*/Ser	Connector assy. lightweight	b		Ref.
7-	525/*/Ser	Connector assy. lightweight	c		Ref.
7-	625/*/Ser 1	Connector assy. lightweight	d		Ref.
7-	650/*/Ser	Connector assy. lightweight (sleeved)	e		Ref.
7-	785/P/Ser 1	Connector assy. lightweight, $2\frac{1}{2}$ inch	f		Ref.
1	264/*	. Ring assy. clamping	a b		1
2	522/*	. Ring assy. clamping	c d e f		1
3	176/*	. Housing, seal	a-f		2
4	478/*	. Ring, split	b c e f		2
4	626/*		d		2
5	714/*	. Sleeve, seal	e		1
6	54/*/Ser	. Seal, rubber	a b	H-U	1
6	54/*/Ser		a b	W-Z	1
6	54/*/Ser		c	H-TXZ	1
6	54/*/Ser		e		1
6	54/*/Ser 1		d	H-N	1
6	54/*/Ser 5	Series 5	b	V	1
6	174/V/Ser	Series 1-4	a b	V	1
6	174/V/Ser 1	Series 1	c	V	1
6	534/V/Ser	Series 2-5	c	V	1
6	534/V/Ser 5	Series 5	a	V	1
6	631/*/Ser 1		d f	P-Z	1



Spare parts for FRS.122,192,400,596,679
Fig.8

D. Connectors FRS.122,192,400,596,679

FIG ITEM NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	USAGE SIZE	UNITS PER ASSY.
	FRS.				
8-	122/*/Ser	Connector assy. bulkhead	a		Ref.
8-	192/*/Ser	Connector assy. bulkhead	b		Ref.
8-	400/*/Ser	Connector assy. bulkhead	c		Ref.
8-	596/*/Ser	Connector assy. bulkhead, heat resistant	d		Ref.
8-	679/*/Ser	Connector assy. bulkhead, heat resistant	e		Ref.
1	299/*	. Circlip	a d		1
1	299/*		c	LP-R	1
1	407/*		c	TV	1
2	111/*	. Sleeve, outer	a d		1
2	111/*		c	LVP-R	1
2	397		c	T	1
3	194/*	. Sleeve, outer	b e		1
4	321/*	. Ring	c		2
5	66/*	. Ring, retaining	c	LVP-R	2
5	401		c	T	2
6	323/*	. Ring, split	c		2
7	73/*	. Collar assy. split	a		2
7	138/*		b		2
7	599/*		d		2
7	601/*		e		2
8	66/*	. . Ring, retaining	a		1
8	137/*		b e		1
9	65/*	. . Collar, split	a		2
9	136/*		b		2
9	600/*		d		2
9	602/*		e		2
10	54/*/Ser	. Seal, rubber	a d		1
10	135/*/Ser		b e		1
10	322/*/Ser 1	Series 1	c		1
10	406/*/Ser 5	Series 5	c		1
11	121/*	. Sleeve, flanged	a d		1
11	121/*		c	LP-R	1
11	193/*		b e		1
11	408/*		c	TV	1



Spare parts for FRS.150,230,246,355,395,565,597,633
Fig. 9

E. Connectors FRS.150,230,246,355,395,565,597,633

FIG ITEM NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	USAGE SIZE	UNITS PER ASSY.
	FRS.				
9-	150/*/Ser	Connector assy. termination	a		Ref.
9-	230/*/Ser	Connector assy. termination	b		Ref.
9-	246/Ser	Connector assy. termination, $\frac{3}{4}$ inch BSP	c		Ref.
9-	355/*/Ser	Connector assy. termination	d		Ref.
9-	395/*/Ser 1	Connector assy. termination	e		Ref.
9-	565	Connector assy. double termination	f		Ref.
9-	597/*/Ser	Connector assy. termination, heat resistant	g		Ref.
9-	633/*/Ser	Connector assy. termination	h		Ref.
1	352/*	. Circlip	a h		1
1	352/*		e	P-R	1
1	352/Q		f		1
2	419/*	. Circlip	e	TV	1
3	353/*	. Sleeve, outer	d h		1
3	353/*		e	P-R	1
3	353/Q		f		1
3	397		e	T	1
3	411		e	V	1

. . . continued

FIG ITEM NO.	PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	USAGE SIZE	UNITS PER ASSY.
	FRS.				
4	152/*	. Sleeve, outer	a g		1
5	229/*	. Sleeve, outer	b		1
5	229/F		c		1
6	321/*	. Ring	e		1
7	66/*	. Ring, retaining	e	P-RV	1
7	401		e	T	1
8	323/*	. Ring, split	e		1
9	73/*	. Collar assy. split	a d h		1
9	73/Q		f		1
9	138/*		b		1
9	138/F		c		1
9	599/*		g		1
10	66/*	. . Ring, retaining	a d g h		1
10	66/Q		f		1
10	137/*		b		1
10	137/F		c		1
11	65/*	. . Collar, split	a d h		2
11	65/Q		f		2
11	136/*		b		2
11	136/F		c		2
11	600/*		g		2
12	151/*/Ser	. Seal, rubber	a d g h		1
12	151/Q/Ser 1		f		2
12	231/*/Ser		b		1
12	231/F/Ser		c		1
12	394/*/Ser 1		e		1
13	247	. Body, union	c		1
14	292/*	. Flange, mounting	a g		1
14	228		b		1
14	354/*		d		1
14	354/*		e	P-R	1
14	418/*		e	TV	1
14	632/*		h		1
15	522/Q	. Ring assy. clamp	f		1
16	571/Q	. Ring, seal	f		1
17	570	. Flange, double termination	f		1