

SPECIFICATION, FITTING INSTRUCTIONS, OPERATION AND SERVICE
MANUAL FOR TURNER "MINI-WINCH" MK V ON LAND ROVER CHASSIS.



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ON LAND ROVER CHASSIS



FRONT VIEW OF LAND ROVER AFTER COMPLETED INSTALLATION OF MINI-WINCH

TURNER MANUFACTURING COMPANY LTD. ,
WINCH DIVISION
FORDHOUSES
WOLVERHAMPTON.

SPECIFICATION OF TURNER MINI WINCH

The Turner 'Mini Winch' is a compact, precision built machine specially designed to fit behind the front bumper on the Land Rover vehicle and has proved itself in many fields including vehicle recovery work, civil engineering, agriculture and many others where efficiency and reliability are essential requirements.

The winch can be supplied to suit any normal-control model Rover, fitting presenting no special problems.

All parts required to complete the work are supplied with the winch.

Maintenance is kept to a minimum, with all parts continually lubricated and sealed against dirt and water.

Simplicity and toughness are guaranteed and the use of a high quality worm and wheel running in a totally enclosed oil bath, ensures freedom from wear with a long working life.

A robust, easy to operate dog clutch is fitted to the rope drum so that it can freewheel and allow the rope to be pulled off by hand. A spring loaded friction pad eliminates over running of the drum when the clutch is disengaged.

The rope drum is a strong steel fabrication and has an easily accessible rope clamp, so that the time taken for rope changing is kept to a minimum.

A telescopic drive shaft connected to the engine crank shaft provides the winch drive. The engine starter nut being moved to a new position on the end of the worm shaft. To engage the winch drive a foolproof dog clutch is used, operated by a hand lever.

Mounted in front of the winch and intergral with the gear case is a sturdy rope fair-lead assembly which allows angled pulls to be made in any direction.

TECHNICAL DATA

A to

Worm Ratio 60 : 1 Left Hand.

Rope Speed at barrel at 1000 R.P.M. Input speed. 19 ft/min.

Quantity of rope Normal supply 5/16" Diameter X 150 ft.

OPERATING INSTRUCTIONS FOR TURNER MINI WINCH

Assuming the drive is disengaged, start the engine, set the hand throttle to a fast tick over speed.

Engage the drive by pulling the lever firmly until the dogs engage, ensure that everything is in order and engage the drum clutch, the rope will now be winding in. Do not allow the load or the end of the rope to approach too near to the guide rollers before disengaging the drive clutch. It should be noted that the drum clutch can only be disengaged when there is no load on the rope.

In an emergency stop the engine immediately.

The rope may be pulled out freely when the rope drum clutch is out, an overrun prevention device is fitted to prevent the rope becoming too loose when paying out.

The engine may be started with the handle in the usual manner, the starting nut is provided on the Winch, which must, of course, be engaged with the engine.

The starting handle may also be used to drive the Winch in the event of engine failure.

The winch is designed to pull 5000 lbs. on the first layer,

GENERAL

A spring band is provided to secure the rope when not in use. **DO NOT FASTEN ROPE EYE TO ANY PART OF THE WINCH OR VEHICLE, SERIOUS DAMAGE MAY OCCUR IF THE WINCH SHOULD BE ACCIDENTALLY ENGAGED.**

The rope is tested to give a high factor of safety, but must be inspected often to ensure there is no serious damage likely to lead to failure.

MAINTENANCE INSTRUCTIONS FOR TURNER MINI WINCH (as fitted to Land Rover Vehicle)

Routine Maintenance

1. Replenish oil in gearcase and rope drum regularly, using S. A. E. 140 oil. The grease nipples on the fairlead rollers should also be charged regularly. Inspect the rope frequently for damage.

Overhaul Instructions

1. Remove backplate 125 and packing pieces 85 and 86 where fitted.
2. After removing spline pin (74) and clevis pin (71) free clutch fork (68).
3. Remove starting nut. (47)
4. Remove fairlead assembly.
5. Remove the winch rope by slackening off the clamp (94).
6. Remove drain plug (18) from worm case and drain off oil.
7. Remove drain plug (97) from drum barrel and drain.
8. Remove drum support bracket (104) together with clutch lever (87), the sliding dog (89) may now be removed.
9. Remove four socket head screws securing the dog clutch (96) which may now be removed from the drum.
10. Disengage circlip (50) and remove thrust washer (99).
11. The rope drum (92) and thrust washer (100) may now be withdrawn from the shaft.
12. Remove the end covers (40) and (41) taking care of the shims (43) (44) (45).
13. With a suitable drift, knock out the mills pin (67) and remove the driving adaptor (66).
14. With a mallet or a piece of hard wood and a hammer tap each end of the worm shaft (36) to release the outer races of the tapered roller bearings (37). The worm shaft may now be lowered out of mesh with the worm wheel.
15. Remove the wormcase cover (4) taking care not to damage the gasket (5).
16. The assembly of wormwheel, centre and shaft may now withdrawn completely.
17. The component parts should be cleaned and examined for wear or damage, defective parts should be replaced.

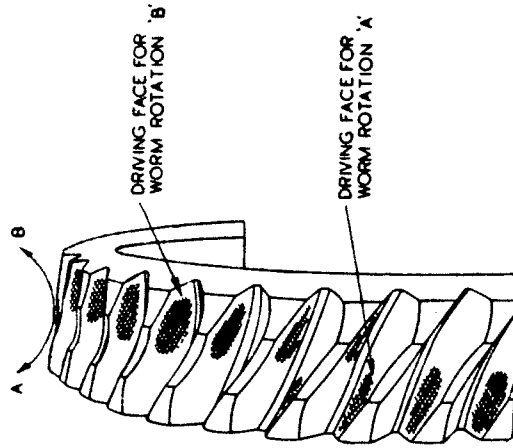
ASSEMBLY

The following points should be observed when the winch is being assembled.

The maximum end float of the worm shaft should not exceed .005" if it does the shims between the end cover and the taper bearing should be reduced in quantity until the correct float is achieved. Shims are available .003" .005" and .010" thickness.

The worm shaft should be blued and rotated in mesh with the worm wheel to ensure contact is made on the out-going side of the worm wheel - SEE DIAGRAM. If contact is not correct alter the shims between the worm wheel and hub.

Ensure that the slippers in the clutch fork (88) make even contact in sliding dog groove.



This shows a correct leaving side contact on both faces of a worm wheel, which is desirable when the gears are required to run in both directions of rotation.

LUBRICATION

Oil filler and level plugs are provided in the worm case. Change the oil every six months.

The rope drum contains an oil reservoir with the plug in the barrel, check and replenish periodically. Grease nipples are provided on the rollers and should be changed periodically.

Recommended Oil to be used in Case and Drum - Worm Gear Oil - S. A. E. 140.

FITTING TURNER 'MINI WINCH' TO LAND ROVER

Remove front bumper as detailed in 'Rover Workshop Manual'.

Put vehicle in bottom gear and remove starting dog.

Replace starting dog with adaptor flange (51) secure with $\frac{3}{4}$ " dia. set screw (55) and tab washer (56)

Attach input flange (52) with four $\frac{5}{16}$ " dia. UNF screws with drilled heads, securing the screws with 20 SWG locking wire as shown (See figure 1 on attached drawing).

The holes securing the winch to the front cross member are then drilled, proceeding as follows:-

Mark off one hole 3.281 " ($3.9/32$ "") from the top face, and 2.500 ($2\frac{1}{2}$ "") from the centre of the tunnel, this hole being marked on the left looking towards the rear. (See figure (3) on attached drawing).

This hole is then drilled $27/64$ " dia. first using a $1/8$ " dia. pilot drill to ensure accuracy.

Fit a 5/16" B.S.F. rivnut into the drilled hole and secure as follows:-

Obtain a 5/16" B.S.F. hexagon head bolt with at least 1½" of thread, screw a nut on to the bolt to the fullest extent and then slide 4 or 5 -5/16" plain washers up to the nut as distance packing. Bolt is then screwed into the rivnut until the point of the bolt just protrudes.

Insert the assembly into the hole already drilled, holding the head of the bolt with one 5/16" spanner and tightening the nut with another. Keep the rivnut pressed well home, continue to tighten the locknut until the rivnut is secure in the cross member. The nut will need to be tightened down until it has travelled 3/16" - ¼" along the bolt before the rivnut is secure. (See figure 2 on attached drawing).

Insert 5/16" B.S.F. stud into rivnut and slide winch assembly on to this stud, supporting it in the correct position. Temporarily replace the front bumper, which should be positioned by inserting one bolt each side. Secure the winch assembly with a 5/16" B.S.F. nut on the stud. A sharp scriber is then used to mark through the remaining holes on to the cross member.

After removing the front bumper and winch assembly, carefully centre-punch the hole positions and drill as before. Fit rivnuts as described earlier.

The winch assembly may now be offered up to the Crossmember and the 5/16" nuts tightened down on the rivnut studs. The front bumper should then be refitted.

The front of the winch is secured by drilled 21/64" dia. holes through the front bumper, using the holes in the mounting brackets as a guide. Fit the 5/16" bolts, spring washers and nuts supplied and tighten up. On certain models the packing pieces numbered 85 and 86 on the exploded drawing must be removed to obtain correct position of the winch on the front bumper.

When the winch is securely fixed the drive shaft assembly is inserted by compressing it sufficient to enable it to be inserted in the splined holes on the winch and input flange. Note that a rubber gaiter is used on the crankshaft end of the drive assembly, and that the control lever should be in the forward position during the operation.

Finally, check all nuts for security, and fill the winch wormcase with S. A. E. 140 gear oil to the level of the plug provided at the front of the wormcase.

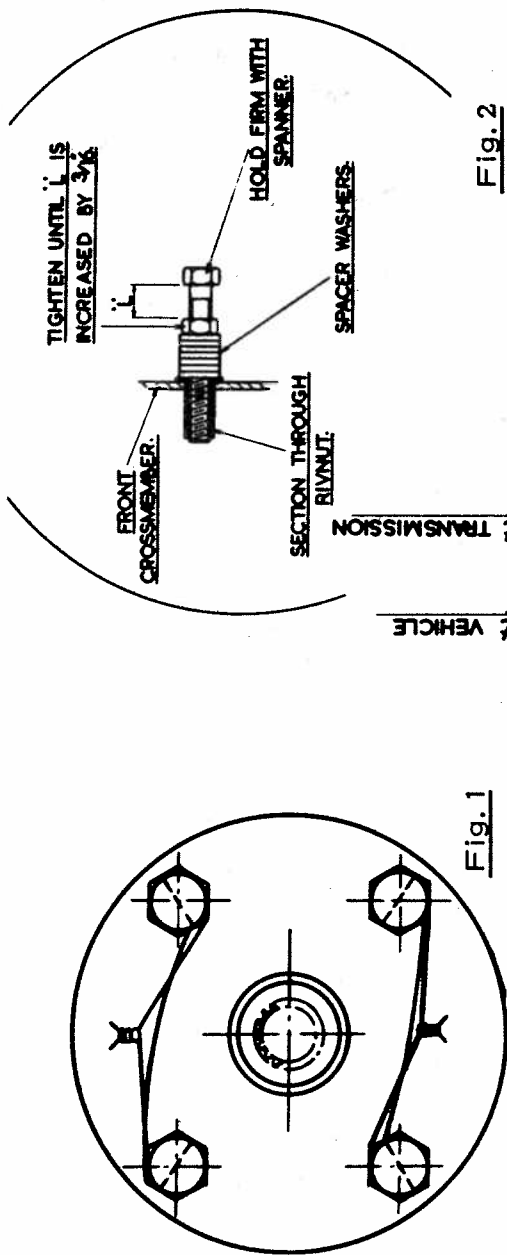


Fig. 2

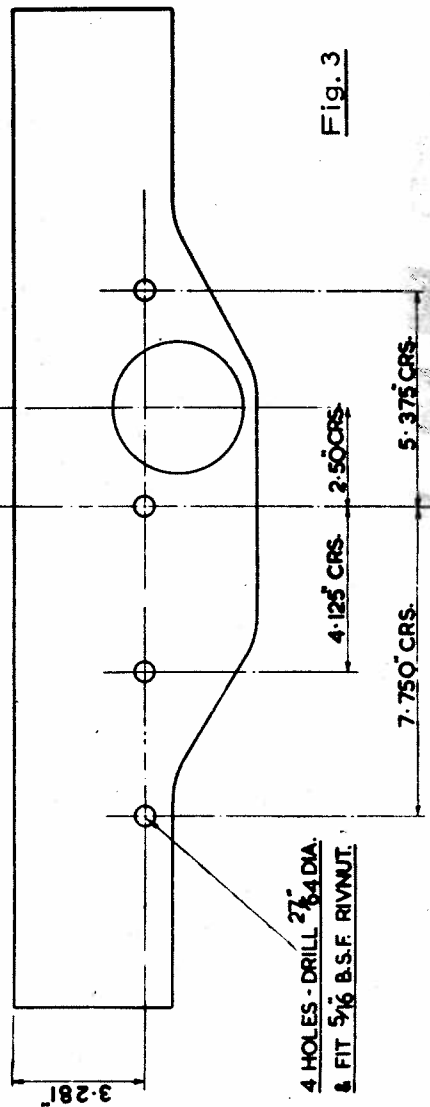
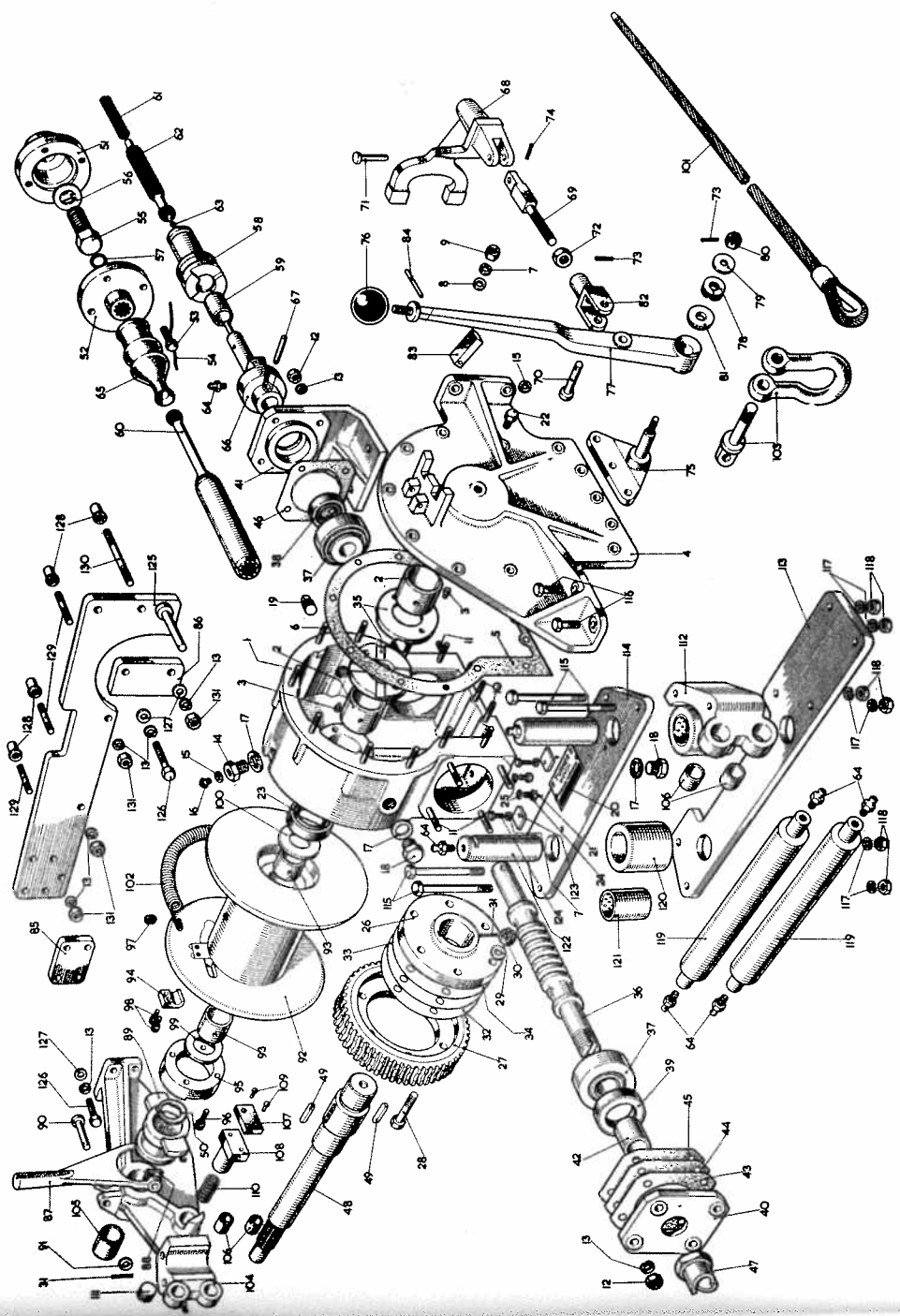


Fig. 3



SPARE PARTS LIST

<u>Item No.</u>	<u>Part No.</u>	<u>Description</u>
1	AWG 6503	Wormcase
2	DWG 6511	Bearing Bush
3	EWG 6570	Peg
4	AWG 6861	Wormcase Cover
5	CWG 6534	Joint-Cover to Case
6	TGS 263/A/10R	Stud UNF/UNC
7	FV(S)55/4	Spring Washer
8	FV(S) 72/1	Plain Washer
9	UFN 104/A	Nut
10	TGS/ 263/A/11R	Stud UNF/UNC - 1 $\frac{3}{8}$ " Long
11	TGS 263/B/10R	Stud UNF/UNC - 1 $\frac{1}{4}$ " Long
12	UFN 105/A	Nut
13	FV(S) 55/5	Spring Washer
14	DWG 6777	Filler
15	AGS 1138/A	Washer
16	FV 16999	Breather
17	AGS 1138/C	Washer
18	FV(S) 60/3	Drain Plug
19	EWG 6749	Taper Plug
20	EWG 6571	Nameplate
21	FV 347695	Screw - Nameplate
22	FV(S) 60/1	Plug

<u>Item No.</u>	<u>Part No.</u>	<u>Description</u>
23	FV 181465	Oil Seal
24	UFS 105/4R	Set Pin
25	SSM(L)5330-99-943-4390	Fibre Washer
26	CWG 6508	Wormwheel Centre
27	BWG 6593	Wormwheel
28	EWG 6543	Shouldered Bolt
29	TGS 208/E	Washer
30	UFN 405/A	Slotted Nut
31	FV(S) 73/306	Split Pin
32	DWG 6562	Shim .005"
33	DWG 6563	Shim .010"
34	DWG 6564	Shim .020"
35	EWG 6526	Thrust Washer
36	CWG 6594	Wormshaft
37	FV 181419	Thrust Bearing
38	DWG 6539	Oil Seal - Rear
39	DWG 6540	Oil Seal - Front
40	CWG 6652	Front Cover
41	BWG 6860	Rear Cover & Mounting Bracket
42	DWG 6514	Distance Collar
43	DWG 6535	Shim .005"
44	DWG 6536	Shim .010"
45	DWG 6537	Shim .020"
46	DWG 6603	Joint
47	DWG 6640	Starting Nut

<u>Item No.</u>	<u>Part No.</u>	<u>Description</u>
48	BWG 6738	Mainshaft
49	BSK $\frac{3}{8}$ " S X 1 $\frac{1}{2}$ " B	Key
50	SSM(L) 5340-99-910-8202	Circlip
51 *	CWG 6655	Adaptor Flange X
52	DWG 6983	Input Flange
53	EWG 6673	Screw
54	FV 209551	Locking Wire
55*	EWG 6694	Screw
56*	EWG 6778	Tab Washer
57	EWG 6982	Retaining Ring
58	CWG 6753	Driving Dog
59	EWG 6552	Bush Bearing
60	DWG 6906	Assy Sleeve & Shaft
61	EWG 6765	Spring
62	CWG 6766	Shaft - Sliding End
63	EWG 6665	Contact Button
64	FV 156736	Grease Nipple
65	DWG 6507	Rubber Gaiter
66	CWG 6752	Driving Adaptor
67	EWG 6559	Mills Pin
68	CWG 6774	Clutch Fork
69	EWG 6789	Swing Bolt
70	EWG 6803	Clevis Pin
71	EWG 6799	Clevis Pin

72	UFN 205/A	Locknut
73	SSM(L) 5315-99-944-0171	Split Pin
74	SSM(L) 5315-99-944-0162	Split Pin
75	DWG 6783	Assy Pivot Plate & Pivot Pin
76	EWG 6555	Knob - Clutch Lever
77	BWG 6794	Clutch Lever
78	SSM(L) 5310-99-941-6629	Spring Washer
79	EWG 6792	Plain Washer
80	UFN 404/A	Slotted Nut
81	EWG 6790	Spherical Washer
82	EWG 6786	Clevis Fork
83	EWG 6863	Catch
84	EWG 6862	Hinge Pin
85	EWG 6703	Backing Plate
86	EWG 6704	Backing Plate
87	CWG 6519	Clutch Lever
88	EWG 6532	Slipper
89	BWG 6739	Sliding Dog
90	EWG 6547	Pin
91	FV(S) 72/3	Plain Washer
92	AWG 6776	Rope Drum Sub Assy
93	DWG 6510	Bush Bearing
94	EWG 6745	Rope Clamp
95	DWG 6605	Dog Clutch
96	FV(S) 52/5/5	Cap Screw for Dog Clutch
97	TGS 232/H.8	Grub Screw
98	FV(S) 52/4/4	Cap Screw for Rope Clamp

<u>Item No.</u>	<u>Part NO:</u>	<u>Description</u>
99	EWG 6740	Thrust Washer - Clutch end
100	EWG 6544	Thrust Washer - Wormcase end
101	CWG 6566	Rope and Thimble
102	DWG 6607	Extension Spring
103	CWG 6585	Assy - Pin and Shackle
104	AWG 6845	Drum Support Bracket
105	EWG 6549	Bush Bearing - Mainshaft
106	EWG 6676	Bush Bearing - Horizontal Roller
107	EWG 6032	Friction Lining
108	DWG 6773	Pad
109	EWG 6780	Rivet
110	EWG 6057	Compression Spring
111	EWG 6035	Grub Screw
112	CWG 6850	Support Block - Horizontal Roller
113	CWG 6846	Baseplate
114	DWG 6847	Top Plate
115	UFB 106/30R	Bolt - 3 $\frac{3}{4}$ " Long
116	UFB 106/10R	Bolt - 1 $\frac{1}{2}$ " Long
117	FV(S) 55/6	Spring Washer
118	UFN 106/A	Nut
119	DWG 6650	Horizontal Roller
120	DWG 6729	Vertical Roller
121	DWG 1296	Bush - Vertical Roller
122	DWG 6849	Shaft - Vertical Roller

<u>Item No.</u>	<u>Part No.</u>	<u>Description.</u>
123	EWG 1252	Locating Plate
124	UFS 104/4R	Screw
125	CWG 6767	Assy - Backing Plate
126	EWG 6680	Screw - Backing Plate
127	FV(S)72/2	Plain Washer
128 *	EWG 6689	Rivnut
129	EWG 6691	Stud - 1½" Long
130 *	EWG 6692	Stud - 2½" Long
131	TGS 122/B	Nut

* These items are not required when the winch is fitted to the Austin 'Gypsy' chassis.