

RAMSEY ELECTRIC WINCH MODEL DCY/DC200

PART NO - 3561 / 3560

FITTING & OPERATING INSTRUCTIONS

Bushey Hall Winchmaster sales@bhwgroup.co.uk www.bhwgroup.com
Southern Office: Lismirrane Industrial Park, Elstree Road, Elstree, Herts, WD6 3EE Tel: +44 (0)20 8953 6050 Fax: +44 (0)20 8207 5308
Northern Office: 6 South Orbital Trading Park, Hedon Road, Hull, East Yorkshire, HU9 1NJ Tel: +44 (0)1482 223 663 Fax: +44 (0)1482 218 285
R E M S A
Bushey Hall Winchmaster is a division of BHW Group Limited. Registered in England No. 1342461





GUIDE TO SAFE WINCHING	3
WARNING	4
INTRODUCTION	4
WINCH RATING	4
EXAMPLE	4
FITTING INSTRUCTIONS	5
TYPES OF WINCH MOUNTING	5
BEHIND THE CAB	5
Flush with Vehicle Deck using bracket part no. BM0001	5
Above Deck Mounting	6
Front Mounting	7
LABELS	7
WIRING	7
WANDERLEAD REMOTE SOCKET	8
EMERGENCY STOP	.10
LOAD LIMITING SWITCHES	.10
TESTING	.11
TO OPERATE WINCH	.11
FREE SPOOLING	.12
CAPACITIES	.12
SERVICE/MAINTENANCE	.12
REGULAR MONTHLY MAINTENANCE	.12
Yearly maintenance	.12
OIL SPEC	.13
SPARES	.13
CARE OF THE WIRE ROPE	.13
WIRE ROPES ARE NOT COVERED BY WARRANTY	.13
FITTING WIRE ROPE	.13
TROUBLE SHOOTING TIPS	.15
WINCH PARTS LIST	.18
SOLENOID ASSEMBLY PARTS	.19
TEST PROCEDURE FOR SOLENOIDS	.20
TEST PROCEDURE FOR MOTOR	.21
INSTRUCTIONS FOR OVERHAUL OF RAMSEY	.22
MODEL DC-200 SERIES RAM-LOK	.22
	.22
KE-ASSEMBLY	.26
	.29
	.30
BATTERIES	.30



GUIDE TO SAFE WINCHING

The following safety precautions must be observed at all times whilst using the winch.

Keep yourself and others at a safe distance to the side of the wire rope when pulling under load.

Never step over, stand near or guide a rope under tension.

Always use heavy-duty gloves when handling the wire rope to protect against cuts or possible burns.

Take care of the wire rope. Check regularly for signs of wear in the form of broken strands or severe kinks along its length. If there are more than 10 strands broken in any one inch of the rope's length, then it will be significantly weakened and must therefore be replaced. Wear and tear can be prevented by regular application of rope dressing available in aerosol form from your winch supplier. Oil and grease should never be used.

Always ensure that the rope is rewound neatly back onto the drum after use. If the rope is tensioned whilst unevenly wound, then loose coils can become trapped and badly damaged.

Do not drive the vehicle to pull a load on the winch wire rope, e.g. as a tow rope. Any resulting shock load could break the rope or damage the winch.

If the winch is being operated at maximum capacity, drape a heavy blanket or coat over the wire rope, halfway along its length. The blanket will reduce the speed of a snapped rope.

When recovering a vehicle, the winch hook should be attached to the towing hitch, if available, or to a strap or chain around a chassis leg or cross member. NEVER anchor the winch hook onto bumpers, or shipping/transit anchorage.

Do not allow the load to 'snatch' during a pull, as this can momentarily double, or even treble the load on the rope.

Try to position either your vehicle or the anchor point to ensure as straight a pull as possible. Use a snatch block if it is necessary to turn any corners with the rope.

When attaching the hook to the load, always double check that the hook is secure and the safety catch is fully closed. Remember that if the hook breaks away under tension, serious injury can result as the hook will travel through the air at speed.

A minimum of five wraps of rope around the drum is necessary to support the rated load. The rope to drum securing clamp is not designed to hold a load.



Never attempt to disengage the free spool clutch when winch is under load.

WARNING

These winches are not intended for use in the lifting or moving of personnel.

INTRODUCTION

PLEASE READ THIS MANUAL CAREFULLY BEFORE INSTALLATION OR OPERATION OF THE WINCH.

Ramsey Winches are widely used for commercial purposes throughout the world. As the new owner/operator of a RAMSEY WINCH, it is important that you read and digest the information contained in this Handbook. The winch is of the highest quality and has been designed to give a robust and efficient service for many years if care and attention are given at all times to correct, safe operation and maintenance.

Do not underestimate the potential danger in winching operations. Neither should you fear them. Do learn the basic dangers and avoid them. Respect for your winch and common sense in its operation, will ensure complete safety and reliability.

WINCH RATING

The Ramsey Winch rating on this model refers to its maximum rated line pull, measured as the force being applied to the winch in a horizontal plane. As in the case of all winches, this refers to the first layer of rope on the drum.

In most cases, when the winch is being used, there is no way of accurately determining the exact pull being applied. It is important, however, to try and establish that it is within the working capacity of both the winch and wire rope and this can be done by considering the following formulae which applies for gradients up to an angle of 45°. For wheeled vehicles, the pull required to move the load equals:

$$\frac{W}{25} + \frac{(W \text{ x angle of gradient})}{60}$$

Where W = load in tonnes and angle of gradient is in degrees.

EXAMPLE

If W, the load of the vehicle is 4 tonne and is being pulled up skids, which form a gradient of 18°, the force on the rope is:

$$\frac{4}{25}$$
 + $\frac{(4 \times 18)}{60}$ = 0.16 + 1.2 = 1.36 tonne.

Remember the winch pulling capacity reduces as the number of layers of wire rope increase on the drum.



If it is necessary to work beyond the limits of either the winch or wire rope, it is essential that a snatch block be employed which will enable the line pull to be nearly doubled.

If you should have any queries regarding the maximum load applied in a particular application, please do not hesitate to contact us and we will be pleased to offer our assistance.

FITTING INSTRUCTIONS

The Ramsey Winch has a world-wide reputation for toughness and reliability. The design of this long established product has been well proven over the years for many applications. To ensure the best service from your Ramsey Winch it is most important to follow these instructions for its fitting and subsequent operation.

Irrespective of how the winch is mounted it is important that adequate provision is made so that the load is transmitted into the body of the vehicle and then into the chassis.

TYPES OF WINCH MOUNTING

BEHIND THE CAB

Flush with Vehicle Deck using bracket part no. BM0001

Fit two channel or angle members between the first and second cross bearer spaced at 635mm (25"), the mounting bracket width. If fitting to a body with timber deck it may be necessary to raise mounting height and the following method is suggested.

Weld or bolt 50mm (2" x 2") angle sections to the top of the channel members. Also use this method when it is necessary to clear gear linkage or other chassis protrusions.

Using the mounting bracket as a jig, drill three holes 11mm (7/16") diameter each side into the channel or angle members. Remove mounting bracket and fit this to the winch with eight 3/8" diameter U.N.C. 20mm cap head screws supplied with kit.





Above Deck Mounting

There are two options of brackets available when installing the winch above deck. Fit to channels or angles as per the flush type and bolt through floor.







Front Mounting

When fitting the winch to the front of the vehicle it is essential that the chassis will take the loadings applied. In some cases it may be necessary for the chassis to be strengthened e.g. 3.5 tonne GVW vehicles and we would recommend that the winch

mounting and chassis should be capable of taking loads of 3500kg. For further advice please contact the chassis manufacturer or dealer. For heavy chassis the winch can usually be mounted by flitch plates direct to the main frame of vehicle (never weld to chassis or drill top or bottom flanges, without the manufacturers approval).





WIRING

ENSURE THAT CORRECT VOLTAGE WINCH IS FITTED TO THE CHASSIS. IF IN DOUBT, CONTACT THE CHASSIS MANUFACTURER.

The power feed to the winch must be capable of carrying 300 amps for 12v units and 175 amps for 24v units. The recommended cable for 12v is 315 strands of 0.40mm diameter per strand and for 24v is 196 strands of 0.40mm diameter per strand. This cable should be as short as possible to run from the batteries to winch power connection (see diagram below).





A high amperage isolator switch must be fitted (supplied on request), in a prominent position. The earth return is made through the winch mounting then back into the chassis of the vehicle.

Whenever possible, earth the winch back to the battery. If this is impractical and earth is to the chassis, it may be necessary to upgrade the vehicle earth strap from battery to the chassis.

If earthed to chassis, ensure the connectors are clean and free of paint.

IF IN DOUBT, FIT EARTH RETURN SIZE AS RECOMMENDED FOR POWER FEED.

We would recommend that a high amperage fuse is always fitted in the circuit. These can be purchased separately from BHW Group Ltd. Please quote the following part numbers.

FU0020300 amp fuse (for 12v winch).FU0040200 amp fuse (for 24v winch).FU0050Holder for above fuses.(See wiring diagram above).

WANDERLEAD REMOTE SOCKET

Position female connector to accept wanderlead at convenient point and to avoid damage and water spray. Connect a 3 core 5 amp waterproof cable and secure this to avoid chaffing and route to winch position. Fit a male connector to plug into winch socket. Silicon waterproof sealant is recommended around all electrical connectors. There are kits



available for both single and double rear sockets. Part numbers SC0125 and SC0150. (See wiring diagram below).







EMERGENCY STOP

All electric winches must be fitted with an emergency stop/isolator switch within the circuit (as shown in diagram). This should be easily accessible and clearly marked. The operators should familiarise themselves with this switch before winch operation.

ON NO ACCOUNT WIRE DIRECTLY INTO WINCH.

ISOLATOR SWITCH MUST BE TURNED OFF WHEN WINCH IS NOT BEING USED.

Always keep the length of the feed wire and earth return to a minimum to avoid voltage drop.

In some circumstances when the vehicle is involved in constant use with only short distances between winching operation, it will be necessary to fit an additional heavy duty battery wired in parallel with the vehicle battery.

Keep this as close to the winch as possible.

It is also advisable in these circumstances to have the vehicle fitted with a heavy duty charging system and batteries.

The above comments also apply to vehicles operating with maximum loads imposed on the winch.

LOAD LIMITING SWITCHES

Electric load limiting switches can be supplied as an option on this model.

If fitted, it is important to ensure that the winch is fitted in the correct rotation. Whilst the limit switch is calibrated to the approximate safe working load required by the customer at point of order, fine adjustment is necessary after installation.

(See wiring diagram below).





This is supplied complete with a length of positive battery supply cable. Under no circumstances should this length of cable with shunt fitted be altered, as this will affect the functioning of the overload switch.

TESTING

After the installation is complete, a proof load test of 125% of the rated load should be carried out before the winch goes into service.

TO OPERATE WINCH

Turn on isolator switch, plug in wanderlead control. The winch can be powered both in and out. The load is automatically held safely when control button is released.

The best way to become acquainted with how you winch operates is to make test runs. Plan you tests in advance. Remember that you hear your winch as well as see it operate. Come to recognise the sounds of a light steady pull, heavy pull, and sounds caused by load jerking or shifting. Gain confidence in operating your winch and its use will become second nature to you.

The uneven spooling of wire rope whilst pulling a load, is not a problem, unless there is a pile up of rope on one end of the drum. If this happens, reverse the winch to relieve the tension on the rope and move your anchor point further to the centre of the load. After the job is complete, you can unspool and rewind the wire rope neatly.



FREE SPOOLING

Ram-Lock Clutch

To release clutch, power out winch until tension is released from cable. Pull out handle on side of casing and turn 90°. To re-engage, turn lever back to horizontal position. Turn drum slowly by pulling out cable. The handle, which is spring-loaded, will automatically re-engage. Ensure that handle is fully engaged before imposing load on winch.

Capacities

The Ramsey Winch is rated at 3630kg (8000lbs) and this refers to its safe working load, measured as the force being applied to the winch in a horizontal place. As in the case of all winches, this refers to the first layer of rope on the drum.

SERVICE/MAINTENANCE

REGULAR MONTHLY MAINTENANCE

Externally:

The winch should be kept clean in order to prevent any build up on corrosion on external working parts.

Greasing of roller guides (if fitted) at grease points (one for each roller).

Also check for:

Rollers revolving

Slight or deep grooving

Excessive wear on rollers

NOTE:

If roller guides are worn excessively, wire rope life will be reduced and roller guides should be replaced.

Check winch for external damage.

Check winch mounting for distortion and re-tighten mounting bolts if necessary.

Operate free spool clutch mechanism to ensure correct operation, giving full engagement and disengagement.

All external-moving parts should be lubricated with lightweight oil.

Check oil level in gearbox and replenish with EP90 gear oil.

Yearly maintenance

In addition to the above maintenance change the oil in winch gearbox and spur box. Refill to oil level plugs.



OIL SPEC

Spur gearbox S.A.E. 20 (½ pint) 0.29 litres

Worm housing E.P.90/140 (1 pint) 0.58 litres

Check tightness of mounting bolts and electrical connections regularly.

SPARES

Should it become necessary to obtain replacement parts, refer to list shown. Please contact us quoting serial numbers and model number. BHW Group Ltd

reserve the right to change specification without notice.



CARE OF THE WIRE ROPE

It is most important that the wire rope is inspected on a regular basis, for kinks, flat spots, broken strands and other damage, and if necessary the damaged sections should be cut away and the rope re hooked or completely replaced.

It is good practice to regularly use rope lubricant, obtainable from us if required, as this will prevent rust and corrosion, which can seriously reduce its working life.

A good habit to form is that of rewinding the rope onto the winch drum after it has been used, so that it is evenly layered. To do this, rewind keeping the rope under tension. Normally the load can be applied by hand.

Under no circumstances wrap the wire rope around the load being recovered and then attach the hook back on to the rope. This will result in serious rope damage or breakage.

Always employ a chain or webbing strap from the hook to the load.

WIRE ROPES ARE NOT COVERED BY WARRANTY.

FITTING WIRE ROPE

Unwind cable on floor behind vehicle; pass through roller and secure cable to the drumusing setscrew provided. Operate winch, using wanderlead and wind on cable whilst keeping it under tension, and layer the rope on as evenly as possible. The winch is now ready for use.







TROUBLE SHOOTING TIPS

CONDITION	POSSIBLE CAUSE	CORRECTION		
CLUTCH INOPERATIVE	1) Dry or rusted shaft.	1) Clean and lubricate.		
OR BINDS UP.	2) Bent yoke or linkage.	2) Replace yoke or shaft		
	3) Clutch jaws are in	3) See techniques of		
	contact.	operation.		
OIL LEAKS FROM	1) Seal damaged or worn.	1) Replace seal		
HOUSING				
	2) 100 much oll.	2) Drain excess oil. Refer to		
		operation.		
CABLE DRUM WILL NOT	1) Winch not mounted	1) Check mounting, refer to		
FREE SPOOL.	squarely, causing end	winch mounting Page 4		
	bearings to bind drum.			
CABLE BIRD NESTS WHEN CLUTCH IS	1) Drag brake disc worn.	1) Replace discs.		
DISENGAGED.				
MOTOR RUNS IN ONE	1) Inoperative solenoid or	1) Jar solenoid to free contacts.		
DIRECTION ONLY.	stuck solenoid.	Check by applying 12volts to		
		coil		
		terminal (it should make an		
	2) Inonorativo switch	2) Disongago winch clutch or		
	2) moperative switch.	remove armature lead		
		Remove		
		switch plug from hood. Raise		
		connector cover on hood and		
		with screw driver, short the		
		bottom two pins. Solenoid		
		should click. Short the two left		
		hand pins. The other solenoid		
		should operate. If both		
		operate check for a broken		
		wire		
		in switch cable.		
	3) Broken wire or bad	3) Check for loose connection on		
	connection.	switch and switch connector.		
MOTOR RUNS BUT	1) Clutch not engaged.	1-4) If clutch engaged but		
DRUM DOES NOT TURN.	2) Sheared drum shaft	symptom		
		still exists, it will be necessary		
	 3) Stripped bronze gear. 4) Dorted shoft 	to disassemble winch to		
	4) Parteo snaft.	determine cause and repair.		



TROUBLE SHOOTING (cont'd.)

CONDITION	POSSIBLE CAUSE	CORRECTION
MOTOR RUNS EXTREMELY HOT	1) Long period of operation.	 Cooling-off periods are essential to prevent over heating.
MOTOR RUNS, BUT WITH INSUFFICIENT POWER OR WITH LOW LINE SPEED.	2) Insufficient battery.	 Check battery terminal voltage under load. If 10 volts or less, replace or parallel another battery to it at motor terminal.
	 Electrical cables from battery to winch too small. 	 Must be correct size and capacity electrical cable for the voltage
	4) Bad electrical connections.	 Check all connections for looseness or corrosion; Tighten, clean and grease.
	5) Insufficient charging system.	5) Replace with larger capacity charging system.
MOTOR WILL NOT	1) Isolator switch not	1) Turn on isolator switch.
OPERATE	2) Fuse has blown.	2) Replace fuse.
	3) Break in power lead or extension socket.	3) Repair or replace wiring.
	4) Inoperative solenoid or stuck solenoid.	 Jar solenoid to free contacts. Check by applying 12volts to coil terminal (it should make an audible click when energised).
	5) Inoperative switch.	 5) Disengage winch clutch or remove armature lead. Remove switch plug from hood. Raise connector cover on hood and with a screw driver, short the bottom two pins. Solenoid should click. Short the two left pins. The other solenoid should operate. If both solenoids operate, check for a broken wire in switch cable.



TROUBLE SHOOTING (cont'd.)

CONDITION	POSSIBLE CAUSE	CORRECTION
MOTOR WILL NOT OPERATE	6) Inoperative motor.	 If solenoids operate, check for voltage at armature post, replace motor.
	7) Loose connections.	 Tighten connections on bottom side of hood and on motor.



WINCH PARTS LIST



ltem	Qty.	Part	Description	ltem	Qty.	Part	Description
No.	Req'd	No.		No.	Req'd	No.	
1	1	276028	Shifter Assembly*	19	1	342023	Key-Square
2	1	278027	Solenoid Assembly-12V	20	1	342033	Key-Square
		278028	Solenoid Assembly-24V	21	1	356901	Shaft-Spur
3	1	282001	Switch Assembly	22	1	357479	Shaft-Drum-Std
4	1	302808	Angle (std)		1	357481	Shaft-Drum-Mod Y
	1	302811	Angle (mod Y)	23	1	368001	Worm-R.H. – 60:1
5	1	302809	Angle (std)		1	368019	Worm-R.H. – 46:1
	1	302810	Angle (mod Y)	24	3	402001	Bearing Needle
6	1	316083	Cap- Bearing	25	2	402002	Bearing Ball
7	1	324160	Jaw Clutch	26	4	412003	Bushing
8	1	328134	Cover-Worm Gear Hsg	27	1	412045	Bushing
9	1	328106	Cover-Spur Gear Hsg	28	22	414038	Capscrew 1/4 -20NC x 3/4 LG Hex HD z/p GR5.
10	1	332007	Drum –Mod Y	29	4	414045	Capscrew 1/4 -20NC x 7/8 LG Hex HD GR5.
	1	332105	Drum-Std	30	3	414059	Capscrew 1/4 -20NC x 1 LG Hex HD z/p
11	1	334001	Idler Gear	31	1	414279	Capscrew 3/8 -16NC x 3/4 LG Hex HD GR5.
12	2	334003	Gear	32	6	414282	Capscrew 3/8 -16NC x 1-1/4 LG Hex HD z/p GR5.
13	1	334129	Pinion	33	4	414845	Capscrew 1/4 -20NC x 1 LG Soc Hd Nyloc
14	1	334161	Gear R.H. –60:1	34	2	414856	Capscrew 1/4 -20NC x 3/4 LG Soc Hd z/p
	1	334163	Gear R.H. – 46:1	35	1	414912	Capscrew 3/8 -16NC x 5/8 LG Soc Hd
15	1	336010	Handle	36	1	416029	Setscrew 1/4 -20NC x 5/16 LG Soc Hd
16	1	338203	Housing-Spur Gear	37	1	416030	Setscrew 1/4 -20NC x 3/8 LG Soc Hd (Full Dog Point)
17	1	338208	Housing-Clutch	38	1	416059	Setscrew 1/4 -20NC x 3/8 LG Soc Hd
18	1	338273	Housing-Gear	39	3	418040	Nut 3/8 – 2NF Hex Reg z/p



ltem	Qty.	Part	Description	Item	Qty.	Part	Description
No.	Req'd	No.		No.	Req'd	No.	
41	10	418177	Lockwasher 3/8 Med Sect	67	1	494053	Spring
			z/p				
42	2	438014	Drag Brake	68	3	518002	Thrust Washer
43	1	442184	Gasket	69	1	518014	Thrust Washer
44	1	442185	Gasket	70	2	518015	Thrust Washer
45	1	442205	Gasket	71	1	518018	Fibre Washer
46	1	450001	Key				
47	2	450006	Key – Barth				
48	4	450016	Key - Barth				
49	1	456001	Lub Fitting				
50	2	456008	Relief Fitting				
51	1	458001	Motor-12V				
	1	458005	Motor- 24V				
52	1	462015	O-Ring				
53	2	468002	Reducer				
54	2	468011	Pipe Plug Sq Hd				
55	2	468017	Pipe Plug Soc Hd				
56	1	468018	Pipe Plug Soc Hd				
57	2	470001	Pin				
58	1	470033	Spirol Pin				
59	1	472012	Plug				
60	1	472013	Plug				
61	1	482013	Rubber Boot				
62	1	486009	Oil Seal				
63	1	486017	Oil Seal]			
64	1	486023	Oil Seal]			
65	1	490003	Snap Ring]			
66	2	494002	Spring]			

SOLENOID ASSEMBLY PARTS

ltem	Qty.	Part	Description
No.	Req'd	No.	
1	1	289009	CABLE-BOLT ASSY
2	3	289077	WIRE ASSEMBLY
3	1	289091	WIRE ASSEMBLY
4	2	364001	STRAP
5	2	364002	STRAP
6	1	408035	SOLENOID BRACKET
7	2	416216	SCREW
8	2	416227	SCREW
9	4	418004	NUT
10	2	418022	NUT 5/16-18NC Hx REG
11	2	418140	FLAT WASHER 10
12	1	418153	LOCKWASHER 5/16
			MED SECT
13	1	418154	LOCKWASHER 5/16
			INTERNAL
14	1	418155	LOCK WASHER 5/16
			EXTERNAL
15	1	430013	FEMALE CONNECTOR
16	2	440071	TERMINAL TAB
17	2	440110	SOLENOID 12V
	2	440114	SOLENOID 24V
18	1	472010	COVER
19	1	482029	COVER CONNECTOR
20	4	530106	COVER TERMINAL





TEST PROCEDURE FOR SOLENOIDS

Steps to follow when testing current flow through DC solenoids.

It should be noted that when testing a 12-volt or 24 volt solenoid the DC motor and battery must be of the same voltage.

To test the solenoids: (See figure 1)

- 1. Securely clamp a motor to a bench or work surface.
- Attach a jumper wire from (A) terminal on the motor to one of the field terminals on the motor, (F-2).
- 3. Attach the other motor field terminal (F-1) to one of the side terminals of the solenoid.
- 4. Ground the solenoid to the motor with a wire as shown.
- Attach positive (+) battery wire to the opposite side terminal of the solenoid. Ground the negative (-) battery wire to the motor housing.
- 6. Touch "hot" wire, from the positive battery terminal, to small terminal of the solenoid.
- 7. The motor should now be running if the solenoid is good. If not, make sure the motor will run directly from the battery.
- 8. To test the upper contacts use the same hookup except use the top terminals.(See figure 2).

When the "hot" wire is touched to the small terminal the motor will stop operating.

The top terminals are normally closed i.e.: connected, and the side terminals open, or not connected. When the solenoid operates, the top terminals are disconnected and the side terminals are connected.

Take care not to bring hot wires into contact with ground in order to prevent electrical arcing.









TEST PROCEDURE FOR MOTOR

The Ramsey Winch motor is a 4 pole, 4 coil wound 12 volt or 24 volt DC motor. The 4 pole, 4-coil feature provides high (PULL COILS torque at low speeds (BATTERY) (MOTOR HOUSING) during FIGURE -I MOTOR-CLOCKWISE ROTATION number 25mm^{sq} 170-amp wire) from F-1 to A motor terminals (See fig. 1) (PULL COILS 25mm^{sq} 170-amp wire) from positive (+) battery terminal to F-2 motor the BATTER motor and battery terminal. Ground negative (-) battery terminal to motor (MOTOR HOUSING) housing (See fig. 2). Motor should now FIGURE-2 run. MOTOR - COUNTER CLOCKWISE ROTATION motor terminals (See fig. 2). TO BATTERY'S terminal to F-1 motor terminal. Ground negative (-) battery terminal to motor housing. (See fig. 2). SOLENOIDS TO MOTOR CONNECTIONS

THE DASHED LINES ARE CURRENT'S PATH IN FORWARD ROTATION. SOLID LINES ARE CURRENT'S PATH AT ALL TIMES. NOTE: DIRECTION OF MOTOR ROTATION DEPENDS ON WHICH SMALL TERMINAL OF EITHER SOLENOID IS CONNECTED TO BATTERY'S POSITIVE TERMINAL

To test the motor to determine if it is functioning correctly, firstly securely fasten the motor to a bench or work surface so it will not jump or move around test procedure (the starting torque of motor is high).

- 1. Connect a jumper wire (at least a
- 2. Attach a wire (at least a number

To reverse the direction of rotation:

- 1. Attach jumper wire from F-2 to (A)
- 2. Attach wire from positive (+) battery

NOTE:

Always attach battery wire solidly to motor terminals. Make and Break the connection of the negative (-) battery terminal at the motor housing. This avoids burning the motor terminals. CAUTION: Do not run the motor for a long period of time in fashion mentioned above, because the motor could become damaged.



The motor running idle on the bench will draw 55 amperes and must run free and easy. If the ampere draw is more than 60 amps and the motor runs rough or has a strange sound, it should be replaced.

With the motor attached in place on a winch (less cable on drum) the ampere should be approx. 65 to 70 amps.

If after following the procedure outlined the test on the winch significantly exceeds 70 amperes refer to your Owners Manual for troubleshooting suggestions on the mechanical portion of the winch.

See fig. 3 for the solenoids connection to



INSTRUCTIONS FOR OVERHAUL OF RAMSEY MODEL DC-200 SERIES RAM-LOK

DIS-ASSEMBLY

- Drain oil from worm gear housing by removing (item. 54) plug from bottom of gear housing. Remove relief fitting and reducer (items 50 & 53) from top of gear housing. Remove mounting angles (items 4 & 5) from winch by removing hardware shown.
- Drain oil from spur gear housing by removing (item 54) plug. Remove cover and gasket (items 9 & 44) from spur gear housing by unscrewing twelve capscrews (item 28). Slide gear (item 12) from end of worm shaft (item 23). Remove spur gear shaft (item 21), with gears attached. Check bearings (item 24) and thrust washers (item 68) for signs of wear, replace if necessary. Remove old bearings and press new bearings into place.





Remove solenoid assembly (item 2) by unscrewing capscrews (items 30 & 34). Disconnect solenoid cables from motor (item 51). Make note of which terminals cables are attached to.

- Remove key (item 19) and snap ring (item 65) from worm shaft. Remove motor (item 51) from spur gear housing (item 16) by removing (3) nuts and lockwashers (items 39 & 41). Unscrew (4) capscrews (item 34) to remove spur gear box (item 16) and gasket (item 43) from gear housing. Replace lip seals (items 62 & 64) by pressing old seals from spur gear housing and pressing new seals into place.
- Slide clutch housing (item 17) from end of drum shaft. Slide jaw clutch (item 7) from end of drum shaft. Remove (2) keys (item 47) from

keyways. A screw driver can be used, at notch, to aid in removal of keys. Once keys have been removed, drum (item 10) and thrust washer (item 70) can be removed from drum shaft. Parts under drum, thrust washer (item 69), spring disc (items 66 & 42) should also be removed.

 Remove bearing cap (item 6) from gear housing by unscrewing four capscrews (item 29). Remove worm (item 23) and bearing (item 25) from gear housing. Use a soft hammer to gently tap input end of worm and drive worm and bearing from gear housing. Once worm has been removed from housing, bearing can be pressed from end of worm.

Check for signs of wear to worm (item 23) and bearings (item 25). Replace if necessary.









- Remove gear housing cover (item 8) from gear housing (item 18) by unscrewing five remaining capscrews (item 28). Place capscrews into two tapped holes of cover and tighten. This will pull the cover loose from gear housing.
 Remove cover gasket (item 45) and pull shaft (item 22), with gear attached, and thrust washer (item 70) from gear
- Check for signs of wear on gear teeth. If replacement of gear is necessary, gear must be replaced as follows:

housing.

- 1. Press gear (item 14) from shaft (item 22).
- Examine shaft keys and keyways. If distortion of keys and/or keyways are evident, shaft and keys should be replaced.
- Use a soft hammer to gently tap keys (item 48) into keyways. Press gear (item 14) over shaft and keys. Gear must be centred over keys.
- Remove seal (item 63) from back of gear housing (item 18). Check bushing (item 27) for signs of wear. Press bushing (item 27) from gear housing and replace if necessary. Press new bushing and seal back into place.









- Check drum bushings (item 26) for signs of wear. Replace if necessary by pressing old bushings from drum (item 10) and pressing new ones into place.
- 10. Examine shifter assembly (item 1) for damage to yoke. Yoke should be firmly attached to shaft, yet, able to swivel freely around shaft. Replace if necessary by removing pin (item 58) from handle (item 15). Remove rubber plug (item 59) from housing. Unscrew setscrew enough to allow shifter assembly to be removed from housing.

Check clutch housing bushing (item 26) for signs of wear. Remove if necessary by pressing old bushing from housing (item 17) and pressing new one into place.

Install new shifter assembly (item 1) by placing end of shaft, opposite yoke, through spring (item 67) and into housing (item 17). Attach (item 15) handle to shaft using roll pin (item 58). Tighten setscrew, in housing, enough to allow shifter assembly to operate properly. Replace rubber plug.

- 11. Check cover bushing (item 8) for signs of wear. Replace if necessary by removing old bushing and pressing new bushing into place.
- Check pinion gear on motor for signs of wear. If necessary replace gear (item 13), O-ring, (item 52) and fibre washer (item 71) as follows:
- A. Place fibre washer (item 71) and well oiled O-ring (item 52) over end of motor shaft and down to bottom of shaft.
- B. Insert key (item 46) into motor shaft keyway. Slide pinion gear over shaft and key. Use a hammer and 7/8" I.D.











tube to drive pinion down hard enough to seat O-ring (item 52) into groove in bottom of pinion gear.

- C. Slide pinion gear up toward end of shaft so that there is a 1-13/16" distance from top of gear to cast surface below gear. Tighten setscrew (item 36) securely enough to prevent pinion gear from moving on motor shaft.
- 13. Check gears of spur gear shaft assembly for signs of wear, replace if necessary. Press old gears from shaft (item 21). Tap key (item 20) into keyway of shaft (item 21). Press shaft through gears so that gears are centred on shaft and key.

RE-ASSEMBLY

- 14. Apply grease to end of shaft, opposite gear. Apply grease to bushing in gear housing (item 18). Place greased end of shaft through thrust washer (item 71) and bushing in gear housing (item 18). Place gasket (item 45) onto gear housing cover (item 8). Apply grease to gear end of shaft and bushing in cover. Place cover onto shaft and secure to housing with five (item 28) capscrews at the five lower most holes.
- 15. Place winch, with gear housing cover down, on work bench. Drum shaft should be in vertical position. Slide thrust washer (item 69) over drum shaft and slide downwards until washer rests on gear housing. Set springs (item 66) and drag brake disc (item 42) into pockets of gear housing. Grease bushings in drum (item 10). Slide drum assembly onto drum shaft with drum jaws upward.









16. Place thrust washer (item 70) over end of drum shaft and slide downward until spacer rests on drum. Press drum (item 10) downward to compress springs in gear housing.

Insert keys (item 47) into keyways with sharp edge of keys pointing outward and notched end of keys upward. A rubber or brass mallet will be needed to gently tap keys into position.

Apply grease to keys and end of shaft. Place jaw clutch (item 7) over end of shaft and slide jaw clutch over keys.

Set clutch housing (item 17) over end of drum shaft. Pull jaw clutch (item 7) upward, toward clutch housing, enough to allow yoke, in clutch housing, to fit properly in groove around jaw clutch.

17. Press bearing (item 24) onto worm (item 23). <u>NOTE</u>; Be sure thick shoulder of bearings outer race (side with manufacturer's name and part number) is out, away from worm threads. Press bearing and worm into gear housing. Slip gasket (item 43) onto bearing cap (item 6). Use four capscrews (item 29) to secure cap to gear housing. Torque capscrews to 8ft. Ib. (10.8Nm) each.

Attach solenoid assembly (item 2) to gear housing. Use two (item 34) capscrews and three (item 30) capscrews with three flat washers (item 40). Tighten capscrews to 8 ft. lb. (10.8Nm). each Insert plug (item 56) into tapped hole of cover. Permatex may be applied to threads to help prevent oil leakage. TIGHTEN plug securely.







18. Press bearing (item 24) onto worm and into worm gear housing. <u>NOTE</u>: Be sure thick shoulder of bearings outer race (side with manufacturer's name and number) is out, away from worm threads. Place gasket (item 43) onto spur gear housing (item 16). Secure spur gear housing to worm gear housing using four capscrews (item 33). Torque capscrews to 8 ft. lb. (10.8Nm). each.

Mount motor (item 51) to spur gear housing (item 16) using three lockwashers and nuts (items 39 & 41). Attach solenoid cables to motor terminals. Tighten all nuts securely.

19. Place snap ring (item 65) over end of worm shaft (item 23) and set into snap ring groove. Insert key (item 19) into keyway of worm shaft. Place thrust washer (item 68) over each end of spur gear shaft (item 21). Set spur gear shaft assembly into bearing of spur gear housing. Slide gear (item 12) and (item 68) thrust washer over end of worm shaft (item 23).

Insert pins (item 57) into cover (item 91). Place gasket (item 44) onto cover. Attach cover and gasket to spur gear housing using twelve capscrews (item 28). Torque capscrews to 8 ft.lb. (10.8Nm). each.

Insert plug (item 54) into bottom of spur gear housing. Permatex may be applied to threads to help prevent oil leakage.

Remove reducer and fitting (items 50 & 53) from top of spur gear housing. Pour ½ pint of SA 20 weight motor oil into spur gear box. Replace reducer and fitting into top of spur gear housing. Tighten reducer and fitting securely.







20. Attach mounting angles (items 4 & 5) using six capscrews (item 32) with lockwashers and capscrews (items 35 & 31). Torque capscrews to 34 ft. lb. (46Nm). each. Insert plug (item 54). Into bottom of gear housing. Permatex may be applied to threads to help prevent leakage.

Pour ³⁄₄ pint of EP 140 gear oil into housing thru hole in top of housing. Insert relief fitting (item 50) into reducer (item 53). Reducer should then be placed into hole on top of gear housing. Tighten fitting and reducer securely.



WARRANTY

RAMSEY WINCHES - ONE YEAR LIMITED WARRANTY

BHW GROUP LTD the authorised Ramsey Servicing Distributor in the UK and Ireland warrants each new winch and ancillary equipment supplied against factory defects in material and workmanship for one year from date of purchase.

The responsibility for removing the winch or ancillary equipment is the owner's together with its return, transportation prepaid to BHW Group Ltd.

BHW Group Ltd will, under this Warranty, without charge repair or replace at its option, parts which on inspection are deemed to be defective. The loss of use of the produce, loss of time, inconvenience, commercial loss or consequential damages are not covered.

Warranty does not apply where the product has been tampered with or altered in any way, or where the serial number or date stamp has been defaced, altered or removed, or if in the view of BHW Group Ltd the damage or failure occurred from misuse, negligence or accident.

THIS WARRANTY EXCLUDES THE WIRE ROPE

Ramsey Winch Co. and BHW Group Ltd reserve the right to change the design of any product without assuming any obligation to modify any product previously supplied. Winches or equipment returned under warranty should be despatched to BHW Group Ltd Service Department at the address indicated below, with full name and address of sender, and a statement detailing the defect.



APPENDIX

BATTERIES

As a result of radical changes in vehicle battery design and performance that have taken place over the last 18 months it is essential that the correct type are specified on new vehicles that will include an electric winch or other high electrical power consumer. Heavy Duty ED3/VB3 rated should be specified as these are vibration proof and have 2.5mm thick plates compared to the standard 1.5mm. They also have glass wool separators which reduces the leeching problem. Thee operating duty cycle for this class of battery is 14 compared to only 6 on a standard battery.

For extra heavy duty applications where high start up surges are required Holchstrom Gel filled batteries should be specified which have a flat instead of declining rate of discharge. These offer up to a 40% increase of cold start performance for a battery of the same physical size.

Incorrect type will cause problems for vehicles using equipment requiring high DC Power consumption such as an electric winch, flashing beacons and work lights.

A standard amp hour rating is used for all batteries and this indicates the amperage available when a constant discharge is achieved over 20 hours. As an example a battery with an amp hour rating of 75 means the battery can carry a load of 3.75 amps for 20 hours. Vehicle manufacturers' requirements have changed due to improved engine efficiency and many now require hundreds of amps for a few seconds for starting and to save space they demand small lightweight batteries. These batteries are designed to discharge around 15% of their total capacity and then recharge quickly from the alternator. The duty cycle design criteria for vehicle batteries is to crank a cold engine for 10 seconds and then rest for 1 minute allowing the battery to recover and the starter motor to cool down. The engine would normally have started consuming equipment like a DC winch is operated for much longer periods of time with only short breaks and then recharged this is referred to as deep cycling. In winching applications the battery is continuously subjected to deep cycling and recharging this will result in premature loss of battery capacity.

The new generation of starter batteries are now light duty designed to retain 75% - 85% charge throughout their working life with a maximum duty cycle of 6 - 7.

If they are used for winch or similar applications and the voltage falls to 12.2v soft lead sulphate deposits on the plates and separators.

If left discharged for a period of around 70 hours the lead sulphate hardens and crystallises forming an insulation barrier preventing it from accepting a charge and effectively causing irreparable damage.

All popular traditional batteries leech between the plates when not in use particularly in warmer weather causing a self discharge. In poor quality batteries this problem is worse.

24v systems using two 12v batteries of this type:- If one battery deteriorates and becomes weak it will resist charging and the stronger battery will take precedence. A voltage reading of 25-26v may be measured but under the very high load during winching this will reduce dramatically putting excessive strain on the good battery causing it to fail prematurely.