

ROVER OWNERS' ASSOCIATION

OF NORTH AMERICA



167 Oakland Road
Maplewood
New Jersey 07040

Volume V, Number 2

April, 1976

Copyright, 1976, All rights reserved



The March, 1976 issue of OFF-ROAD magazine ran an article on various 4WD clubs and listed our Association and ran a black and white photograph of our Association patch. They were quite impressed with the intricate detailing and beautiful colors of the patch and they indicated that "the effect is startling." Startling indeed! We are very pleased with the patch and have to give credit once again to member Jack Stoekler who donated his time and expertise in providing us with this fine patch. For the members who do not have one yet we will advise you that since this was a very custom job there probably will be no more once supplies are depleted. Even if one is not inclined to wear patches on one's clothing we feel that it certainly will provide a very beautiful memento. In any case, the price remains \$1.00+.13 postage for each patch.

Because of the quality of the patch Mr. Stoekler has been receiving a number of inquiries from other clubs to have patches made up. He has informed us that in numbers less than a thousand production of patches by him would not be feasible and even in such numbers it would be questionable whether he could accommodate such an order since patches is not his business. He contributed his time to our Association in order to express his appreciation for the club.

We would also like to make the membership aware that Mr. Stoekler also made up Land-Rover patches and these are available for \$.50 each plus a postage of \$.13 for every two patches ordered. We would like to see the membership show an interest in these patches as well.

We have been receiving a number of inquiries regarding the other Rover and Land-Rover accessories that the Association has available. We do still have a limited supply of items available and since we haven't published a list since May, 1975 we print the following:

Rover Lapel Badge	\$1.00
Rover Cuff Links	\$2.50
Rover Tie Tack	\$2.50
Rover Key FOB (black leather with Rover emblem)	\$2.00
Land-Rover Key FOB (beige leather w/Land-Rover)	\$2.00
Land-Rover Lapel Badge	\$1.00
Land-Rover Cuff Links	\$2.50
Land-Rover Tie Clasp	\$2.75
Land-Rover Pocket Knife	\$2.50

All of these items include postage. For anyone interested in these accessories or in the above-mentioned patches please make your checks payable to the Rover Owners' Assoc. of North America.

In the past we have been very liberal with giving a member as many back issues of the Newsletter as we have had available. Presently we have depleted our stocks of all but our last issue. We are taking steps to increase the number of issues printed and are considering some reasonable method of making back issues available. This will tend to affect new members largely. We would like to be able to keep our dues at the level that it has always been and are considering charging for back issues. We will keep you posted.

Member W.K. Hammond of Ontario, Canada offers the following advice to assist his fellow Land-Rover owners. He notes that 95% of the owners he has known or spoken with have all had their Landys suffer from the same annoying rattle from the gearshift lever. He came upon a solution a number of years ago that is simple and has worked well for him and for his acquaintances. Merely slip a length of $\frac{1}{2}$ " I.D. rubber air hose over the gear shift lever and good-bye rattle.



Where do old Land-Rovers go? To work.

While other working vehicles quietly disappear, veteran Land-Rovers in their thousands still keep slogging away. Let Mr W. Baker, who runs a 600-acre farm at Wellington, Somerset, tell you about one of them.

"It's nineteen years old, it's done 119,000 miles, and it's still in super condition. We've never taken the cylinder head off. It has done real donkey work, hauling 6-ton hay loads and transporting cattle — even to London for the Smithfield Show.



If a tractor gets into difficulty, the Land-Rover pulls it out. There's no trouble with rust, it's very economical, and the repair bills are nil.

I wouldn't change to any other make — we've had yeoman service all the way."

No other working vehicle has achieved as much over the years as the Land-Rover. No other vehicle of its kind will give you better value for money.

From the day you buy it to the day you sell it



There's no substitute for the versatile Land-Rover

VIKING 4WD: Member John S.V. Smith has changed the name of his company from "East Coast Tire Specialists" to "Viking 4WD" in order to reflect the ever-expanding line of accessories which he carries. John's address is: Viking 4WD, P.O. Box 2422, South Portland, Maine, 04106.

John now has available heavy-duty front suspension kits for the Land-Rover 88. These kits are American-made and include new bushings and U-bolts. The price for the kit, including two complete springs, is \$157.88 plus shipping.

He also now offers the Piranha electronic ignition kits for the Land-Rover (both 4-cylinder and 6-cylinder), Rover 2000, 3500, and 3-litre. The price is \$56.55 per kit. Below is a description of this unit. Write John for a catalog on these and his other accessories.

PIRANHA ELECTRONIC IGNITION: The Piranha Ignition System uses a high speed optically pulsed electronic switch instead of the contact breaker. The standard ignition coil is held in the energized state by a drive transistor which is biased fully on regardless of battery terminal voltages (varying typically between 6 and 16 volts). The charged coil is switched at an elevated potential rather than at zero as in the case with a contact breaker. Switching off the drive transistor is effected by reversal of the bias. The elevated switching potential together with the short time the system is in the switching position means that the Piranha is not effected by transients.

The Piranha achieves the complete discharge of the coil in 500 microseconds, compared with the milliseconds of the conventional contact breaker.

The photo-sensitive transistor is exposed by the aperture as the scanning disc rotates. This progressive increase in light acts on the square law principle in building up the switching potential.

However, this relatively slow build up would need a pre-selected trigger point which would be extremely difficult to repeat consistently on the rising curve. In the Piranha, the photo transistor output voltage is allowed to build up to an accurate pre-determined level to initiate the positive optical feedback. This provides an instantaneous voltage rise that switches the drive resistor off, insuring minimal leakage opportunity from the primary of the coil.

When the power transistor is fully conducting there is a voltage drop across it of approximately one volt. However, the speed of switching not only compensates for this but has been accurately measured to produce 40kV at the secondary output of a standard ignition coil with an engine speed of 3,000 rpm.

The ratio of the time to charge and discharge the coil using a contact breaker is determined by the dynamics of the contact breaker follower, the contacts, and the rate of change of cam angle. These tend to limit the ratio of 2:1 or less. otherwise contact bounce may develop at higher speeds of rotation. This results in excessive discharge times at low rpm and inadequate charge times at high rpm. For example the Piranha system has a mark/space ratio of 5.9:1 for 4-cylinder engines. This reduces the excessive discharge time at low speeds and enhances the charge time at high speeds by a factor of three.

The full advance/retard facilities provided by the standard distributor are retained. The square wave switching presents the tachometer with an improved input signal, with no further modifications required.



TO USE A WINCH: Just about anyone can run out a length of cable, hook it on to something, and reel it in, but there is more than this to using a winch safely and effectively.

The first rule of safe winching is that every winching operation should have only one person in charge of the show. The logical one for this job is the person who is operating the winch.

An extremely important factor in planning the pull is deciding upon an anchor point. In some cases the vehicle itself, unassisted, may provide a satisfactory anchor, but each different situation may call for a different solution. To begin with, there are basically two different types of winching situations. On the one hand, you may be using your winch to pull your own vehicle out of trouble, and on the other, you may be using it to pull someone else out. In the first case you are going to hook up to some solid object in the hopes of moving yourself. In the second case you must be the solid object. We'll start by examining the second of these two situations.

Before you attempt to pull anyone else out of trouble consider the situation of your own vehicle first. Remember, it won't help the other person one bit if you winch yourself down on top of him. If the proposed pull seems to be a hard one, or the footing of your vehicle is not as solid as you would like, find a way to anchor yourself before you start to pull the other person out.

The method used to anchor the winching vehicle does not need to be elaborate in order to be effective. Probably one of the simplest methods of securing your vehicle is to rest the front bumper bar against a sturdy tree, large post, or other large object. This should be done, obviously, with the object between your vehicle and the item you are winching.

Your vehicle can also be chained to a tree or other solid object. This, it might be added, could also include another vehicle if it happens to be handy. If you are going to rely on an object for support be sure that it is solid enough for the job and also be sure that your chain is fastened.

The anchor you choose for winching another vehicle is important, but certainly not as important as when you choose an anchor in order to winch yourself out of trouble. In this latter case, it is important because the anchor will be bearing the entire load of the pull. It is alright if you have a good solid tree or something else that is solid enough right in the place that you need it, when you need it, but this fortunate coincidence does not occur very often. Usually, you are going to have to be able to make the best of what you have.

Being able to improvise and create a good enough anchor when there isn't one just sitting there waiting to be used is one of the secrets of successful winching. When a natural anchor is not available you will have to piece one together from whatever materials are at hand, or with something that you have brought with you. An improvised anchor, for example, can be made by digging a trench at a right angle to, and directly in front of your vehicle. This trench should be about two or three feet deep with the side nearest the vehicle cut back under slightly. Wrap your winch cable securely around a short log or similar object and lay it in the hole. A smaller trench point toward the vehicle, in the center of the larger trench, will provide an outlet for the cable. The result of your work will be a simple, yet very effective, anchor that will get you out when there is nothing else to hook up to.

One or more strong stakes can be driven into the ground to provide an anchor point. The stakes should be angled away from the vehicle and driven as deeply as possible. If more than one stake is to be used the stakes should be driven into the ground several feet apart in a direct line with the cable. Attach the winch cable to the leading stake and use a chain or rope to secure the top of the front stake with a point near the bottom of the stake just behind it.

TO USE A WINCH (continued):

Finding a suitable anchor in a different situation is generally a matter of common sense, calm thought, and experience. Once you have set an anchor, try it carefully and gradually until you are sure that the anchor is solid. Finally, be sure that your cable is attached to the anchor in such a way that the cable will hold, even as the attitude of the cable changes during the progress of the winching operation.

Once the operation is planned and a solid anchor is set the actual pull is ready to begin. There are several tips that can make the pull itself easier. First, the vehicle that is being moved should not attempt to help with its own power. If it has to be used it should be used with care. The winch should have plenty of power to handle the situation. Don't attempt to be too neat about winding the cable during the pull. Keep your attention on the job at hand. After you have finished you can pull the cable out and roll it back on the spool neatly. Operate your winch from a position where you can keep an eye on the proceedings and keep the situation under control.

One method that is occasionally used to help provide a bit of added control in many winching situations, as well as a good deal of extra pulling power, is an item called an open end snatch block. A snatch block is simply a pulley with a hook attached. By hooking it to the anchor, or the object that is being moved, running the winch cable around the pulley and attaching it to the back of the winching vehicle, you take advantage of the pulley to double your pulling power and reduce the speed of the pull. By using the snatch block to reduce the speed you can have extra control of the situation.

As pointed out previously in this article, a good part of using your winch successfully is a matter of experience. Confidence in your winch and in your own ability to operate it is important for successful and safe winching operations.



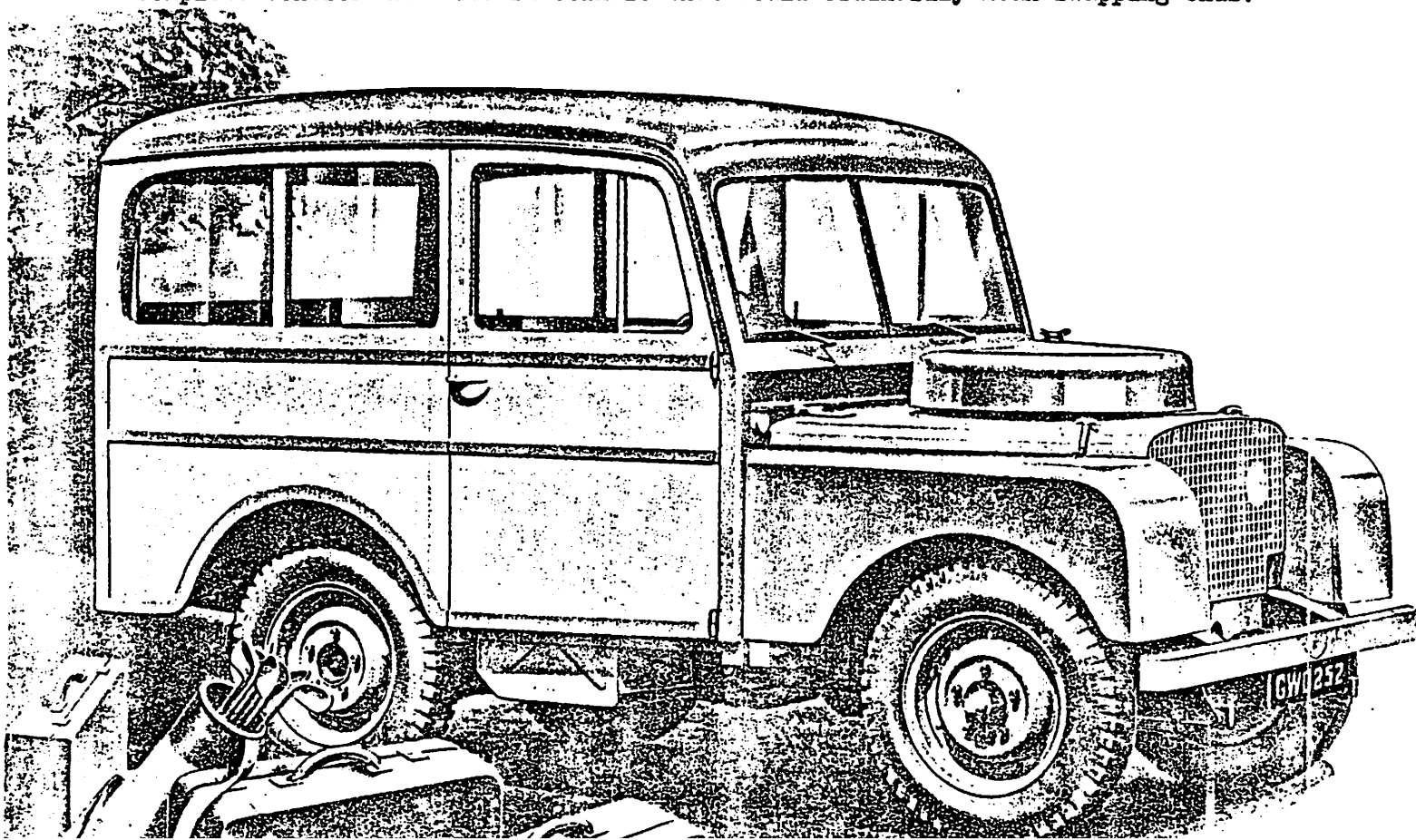
Some Land-Rover Maintenance Tips: Member Jim Easterday of Hazelton, British Columbia, Canada offers the following tips:

- 1) All Land-Rover owners should be aware of aluminum alloy corrosion. Anywhere a piece of steel touches an aluminum body panel there is a possibility of corrosion by electro-chemical action. The result can range from light pitting of the alloy surface to breakdown of the surface to a white powder. Once started, corrosion will spread and eat large holes that are difficult to repair. Road salt will accelerate corrosion.
How to prevent corrosion? Never use unplated or poorly-plated bolts or washers on the Land-Rover body. I use plated bolts available at farm implement dealers (John Deere, Massey-Ferguson). Always use anti-sieze compound (molybdenum type) on all bolt threads and washer faces.
As long as the original body paint is in good condition you are probably OK as paint will keep the metals apart corrosion free. If the paint is looking old and ragged or if you see a white powder around bolt holes when taking something apart prepare for work.
Fix corrosion by abrading the surface until it is clean of all corrosion, then paint. I use medium-pressure sand-blasting with good results - it is quick and leaves a clean, dry surface. It may be possible to grind or sand the surface, but don't use steel wool - the steel fibres will imbed in the aluminum. For painting, try a wash coat of vinyl phosphoric acid wash primer followed by whatever paint primer and color coat you prefer. I suggest that anyone repainting a Land-Rover check for aluminum corrosion. If any is found, it would be best to disassemble all body panels, sandblast, and paint so that all surfaces are clean and treated.
- 2) When rebuilding a 2 $\frac{1}{4}$ litre Land-Rover engine, install the oil pump and the shaft that drives the oil pump after you install the distributor drive gear. Otherwise, you will find yourself trying to line up three things at once, only two of which you can see.
- 3) Before installing the rubber spring bushings in a Land-Rover, wrap the bushings in paper and leave in your home freezer overnight. Install them cold. The cold bushings shrink and can be driven in.
- 4) When fixing a Land-Rover, use Loctite wherever vibration can shake vital parts loose. all threads to be treated must be clean and dry. Use red Loctite to fit all loose studs; use blue Loctite on parts such as: all steering box fittings, all transmission and motor mount fittings, transmission to engine fittings, all transmission case fittings, all manifold and carburetor fittings, etc. etc.
- 5) The crankshaft for the 2 $\frac{1}{4}$ litre petrol engine is very strong, but attention should be paid to the thrust washers and thrust surfaces on either side of the center main bearing journal. These are ~~s~~subject to wear due to high clutch spring pressures and may wear out faster than the main and connecting rod journals. When the thrusts wear, the end play of the crankshaft increases and may result in a rapping noise heard when releasing and engaging the clutch with the engine idling.
- 6) One weak spot of the Land-Rover 2 $\frac{1}{4}$ litre petrol engine is the valve rocker shaft. I suspect that the causes are high valve spring pressures and possible oil starvation. The shaft wears badly on the underside, causing ridges which will slow down the oil flow, which, in turn, allows an accelerating rate of wear. The tappet clearance will increase, causing noisy tappets. When rebuilding, don't put that worn shaft back in. Replace the shaft, reamer the rocking arm bushings, rebush, and you're away.

Land-Rover Maintenance Tips (cont'd):

Another factor in rocker shaft wear may be blocked oil flow. On the rear of the engine toward the top is an external oil pipe. The oil flows into this pipe through a small hole in the capscrew that fixes the lower end of the pipe to the block. Small pieces of carbon or dirt can block this small hole, resulting in partial or total loss of oil flow to the valve gear. This can cause rocker shaft wear, rocker arm bushing wear, rocker arm face wear, valve stem, or valve guide wear. If you have trouble with this type of wear or if the tappets get noisy, check it out by taking off the valve cover, idling the engine, and making sure that oil is flowing off of every rocker arm. If things look dry, soak the oil pipe in solvent and blow clean with compressed air. Reinstall and then change the engine oil.

- 7) Fitting a 2½ litre Land-Rover engine with the transmission already in place is difficult due to lack of room between the engine and the bulkhead. To make things easier try the following: 1. Remove the throttle shaft that extends across the bulkhead behind the engine. 2. Loosen the bulkhead fittings and tilt the bulkhead back if necessary. 3. Make an engine sling that uses the existing engine lift rings. The sling is best if it just clears the top of the valve cover and if it does not extend beyond the back edge of the valve cover. Hook the sling so that the engine is level when offered to the transmission. 4. Slowly turn the engine by the starter dog to mate it to the transmission input shaft splines.
- 8) Owners of 109 Land-Rover Station Wagons should be aware of the filler and vent hoses of the rear-mounted fuel tank. They are exposed to road dirt and if the hoses have deteriorated water and mud will enter the fuel tank causing fuel starvation that comes and goes.
- 9) I strongly recommend Bilstein shock absorbers for the 88" wheelbase Land-Rovers, especially for poor road driving. The ride is slightly harder, but they allow complete control in wasboard corners that would ordinarily mean swapping ends.



RECOMMENDED TEST EQUIPMENT

D.C. Moving Coil Voltmeter
D.C. Moving Coil Ammeter

Scale 0-20V
Scale 5-0-60A

10/11 A.C. SYSTEMS

TEST 1. BATTERY - HYDROMETER READINGS

Take specific gravity readings of the electrolyte in each cell.

State of charge	SPECIFIC GRAVITY READINGS (CORRECTED TO 15°C (60°F))	
	Climates normally Below 25°C (77°F)	Climates normally Above 25°C (77°F)
Fully Charged	1.270-1.290	1.210-1.230
70% Charged	1.230-1.250	1.170-1.190
Discharged	1.110-1.130	1.050-1.070

ELECTROLYTE TEMPERATURE CORRECTION

For every 10°C (18°F) below 15°C (60°F) subtract 0.007
For every 10°C (18°F) above 15°C (60°F) add 0.007

A variation of more than 40 points (0.040) between any cells indicates that the battery is suspect and should be thoroughly checked by a Lucas Battery Agent.

If the battery is less than 70% charged, it should be recharged from an external source.

TEST 2. DRIVE BELT TENSION

Allow 0.5" - 0.75" (13 mm - 19 mm) when moderate finger pressure is applied to the longest side.

If the drive belt is worn or oily it should be replaced with a premium grade type.

TEST 3. CONNECTIONS

Ensure that all leads are in position and that all connections are clean and tight.

TEST 4. 6RA RELAY, 16RA RELAY

- Engine stationary, disconnect battery earth cable.
- Insert ammeter in series with the main output cable.
- Remove cables from C1-C2 terminals and link together.
- Reconnect battery earth cable. Start and run engine approx. 1,500 rev/min. Ammeter should show a charge.

If the vehicle was not charging previously and the ammeter now registers a charge, relay is suspect or there is a fault in the wiring.*

*NOTE: 16RA RELAY Check the voltage at the Alternator 'AL' terminal, (for procedure see Test 8). Check that the warning light bulb is not blown.

TEST 5. ALTERNATOR OUTPUT

- Leave ammeter connected in main output line and reconnect cables to the 6RA relay.
- With cables connected to 4TR alternator control, short together 'F' and '-' terminals.
- Switch on maximum load. Headlamps on main beam, heater etc.

(d) Start and run engine, approx. 3,000 rev/min when ammeter reading should be:-

ALTERNATOR MODEL	AMMETER READING (AMPERES)
10AC	35A
11AC	45A
11AC (23580)	60A
11AC (23633)	23A

A low reading indicates a faulty alternator, proceed to Test 6. Satisfactory readings indicate failure due to faulty 4TR unit. Proceed to Test 7.

TEST 6. ROTOR FIELD CIRCUIT

- Insert ammeter in the rotor field circuit.
- Engine stationary, ignition switched on, ammeter should read as follows:-

ALTERNATOR MODEL	CURRENT AMPERES
10AC	3.5A
11AC	3.0A
11AC (24V)	2.3A

If reading is low, leave ammeter connected and repeat Test 4 (c).

Should the reading now be correct, the 6RA (16RA) relay is suspect (high resistance contacts). If the reading remains low, slip ring/brushes may be worn or dirty.

TEST 7. 4TR ALTERNATOR CONTROL

- With ammeter in series with the main output cable, connect voltmeter across battery terminals.
- Switch on side lights, start and run engine at charging speed, approx. 3,000 engine rev/min.
- Ensure system is stable - output less than 10A and not increasing with speed.
- Voltmeter reading should be between the limits:-

10/11AC ALTERNATORS	VOLTAGE REGULATION SETTING (VOLTS)
12V systems	13.9-14.3
24V systems	27.9-28.3

A low reading indicates a faulty 4TR unit.

If the reading is higher than the limits or unstable, the voltmeter should then be connected across '+' and '-' terminals of the 4TR unit. Repeat Test 7.

A high reading indicates a faulty 4TR. A correct reading denotes a high resistance in the circuit (battery / 6RA relay / 4TR), which must be located and remedied. An unstable reading is due either to high resistance in the circuit (which must be checked) or a faulty 4TR.

TEST 8. 3AW WARNING LIGHT CONTROL

- Connect voltmeter between 'AL' terminal of alternator and earth.
- Start and run engine at charging speed, approx. 3,000 rev/min. Voltmeter should read between 6-8V. 12V systems) 14-15V. (24 systems). A high voltage reading at the 'AL' terminal indicates a faulty rectifier diode. The alternator should be removed for bench check.
- Remove leads from terminals 'E' - 'WL' and link them

DATA TABLE

Alternator Output

Model	Max. Output
15ACR	28A
16ACR	34A
17ACR	36A
17ACR (Derated Part No. 23711)	25A
18ACR	43A
20ACR	66A

Regulated Voltage at Battery

8TR } 8TRD } 11TR }	13.6 – 14.4V
---------------------------	--------------

Voltage Drop (at maximum alternator output)

On main output lead	0.5V
On alternator earth (ground) Circuit	0.25V

See Test 1 10/11AC systems.

TEST 2. DRIVE BELT TENSION

See Test 2 10/11AC systems.

TEST 3. CONNECTIONS

See Test 3 10/11AC systems.

TEST 4. CABLE CONTINUITY

- Remove all connections from alternator terminals.
- Switch on ignition.
- Connect voltmeter between a good earth and each of the disconnected leads in turn. Meter should indicate battery volts.

A zero reading indicates open circuit leads.

NOTE: Where the additional earth terminal is used on the alternator, voltmeter reading for that connection will be zero.

TEST 5. ALTERNATOR OUTPUT

This test should be carried out with the alternator at normal operating temperature. Run cold engine at charging speed for 3-4 minutes.

- Engine stationary, disconnect battery earth cable.
- Connect ammeter between starter solenoid and alternator main output cable.
- Short out the regulator.

15/16AC With cables connected to alternator control short together the 'F' and '-' terminals.

8TR, 11TR. Green and Black leads.
8TRD Green lead and regulator frame.
14TR Regulator frame and earth.

- Reconnect battery earth cable.
- Switch on all vehicle lighting (head lamps on main beam). Switch on ignition (auxiliary switch for diesel vehicles) and check warning light is on.
- Start engine and slowly increase speed. At 3,000 engine rev/min, ammeter reading should equal maximum rated output of the alternator.

ALTERNATOR MODEL	AMMETER READING AMPERES
15AC 15ACR	28A
16AC 16ACR	34A
17ACR	36A
17ACR(Derated)	25A
18ACR	43A
20ACR	66A

A low reading indicates a faulty alternator which should be removed for bench check.

If satisfactory readings are obtained proceed to Tests 6 & 7.

TEST 6. CHARGING CIRCUIT - VOLTAGE DROP

A voltmeter is used to check for high resistance in the charging circuit.

- Connect voltmeter between battery insulated terminal and alternator main terminal.
- Switch on vehicle lighting (headlamps on main beam). Start and run engine at 3,000 rev/min. Note voltmeter reading.
- Transfer voltmeter connections to battery earth terminal and alternator earth terminal.

(d) Start and run engine as 6 (b) and note voltmeter reading.

The voltmeter reading should not exceed 0.5V for the insulated side and 0.25V for the earth side. Higher readings indicate high resistance in the circuit which must be located and rectified.

TEST 7. 4TR, 8TR ALTERNATOR CONTROL (VOLTAGE REGULATOR SETTING)

Charging circuit wiring and connections must be in good order. Battery must be in a well charged condition or temporarily replaced by a charged unit.

- With ammeter connected between starter solenoid and alternator main output cable, connect voltmeter across battery terminals.
- Start and run engine at charging speed, 3,000 rev/min until ammeter reading is less than 10A.

Voltmeter reading should be within limits:-

VOLTMETER READING	
ALTERNATOR MODEL	VOLTS
15/16/17/18/20 ACR	13.6-14.4
15/16AC With External 8TR	14.0-14.4
15/16AC With External 4TR	14.3-14.7

An unstable or a reading outside the specified limits indicates the alternator control is faulty and should be replaced.

NOTE: Before replacing a suspect regulator check the 'IND' voltage. If this voltage is more than 0.3V above voltage at the alternator main positive terminal, the rectifier is faulty and should be replaced.

WARNING LIGHT DIMS - BATTERY LOW

WARNING LIGHT GOES OUT, BECOMES BRIGHTER WITH SPEED

WARNING LIGHT NORMAL - BATTERY SOILING

WARNING LIGHT NORMAL - FLAT BATTERY

WARNING LIGHT ON CONTINUOUSLY - FLAT BATTERY

WARNING LIGHT OFF CONTINUOUSLY - FLAT BATTERY

WARNING LIGHT FLASHING INTERMITTENTLY

WARNING LIGHT DIM CONTINUOUSLY - FLAT BATTERY

RECOMMENDED TEST EQUIPMENT

1. D.C. Moving Coil Voltmeter Scale 0-20V
2. D.C. Moving Coil Ammeter Scale 5-0-45A (see special notes for 20ACR)
3. Hydrometer

SYMPTOM	FAULT	ACTION
1	Battery	Measure Specific Gravity
2	Fan Belt	Check play on longest side is 0.5" - 0.75 (12.7 - 19.1 mm)
1	Warning Light bulb	Check connections and replace bulb
1	Connections (External)	See Notes I and II
2	Connections (Internal)	Remove alternator for visual check
2	Rectifier	Replace alternator
4	Regulator	Replace regulator. See Note III
4	Rotor	Replace alternator

Check faults in order indicated

IMPORTANT

1. ENSURE THAT NO CONNECTION IN THE CHARGING CIRCUIT, INCLUDING THE BATTERY, IS MADE OR BROKEN WHILE THE ENGINE IS RUNNING.
2. WHEN CONNECTING AN ALTERNATOR, SLAVE BATTERY OR BATTERY CHARGER TO THE VEHICLE, ALWAYS OBSERVE CORRECT POLARITY I.E. "+VE" TO "+VE", TO "-VE" TO "-VE"

BATTERY HYDROMETER READINGS

Take specific gravity readings of the electrolyte in each cell.

State of charge	SPECIFIC GRAVITY READINGS (CORRECTED TO 15°C (60°F))	
	Climates normally Below 25°C (77°F)	Climates normally Above 25°C (77°F)
Fully Charged	1.270-1.290	1.210-1.230
70% Charged	1.230-1.250	1.170-1.190
Discharged	1.110-1.130	1.050-1.070

A variation of more than 40 points (0.040) between any cells indicates that the battery is suspect.
If the battery is less than 70% charged it should be recharged from an external source.

SPECIAL NOTES

III REGULATOR

- a) Check for open-circuit by joining 'F' and 'NEG' together (Green lead and Earth (Ground). 8TR, 8TRD, 11TR).
- b) Connect ammeter in main output lead. Run engine at charging speed (3000 revs/min). Ammeter should read full output. (with 20 ACR, use on ammeter capable of registering in excess of 66A.).
- c) To check for correct settings, place voltmeter across battery. (Ensure charge rate is below 10 amperes).
- d) Run engine at charging speed (3000 revs/min) voltmeter should show regulated voltage as shown in Data Table. If incorrect, regulator is suspect.

IMPORTANT

Before replacing a suspect regulator, check the IND voltage. If this voltage is more than 0.3V above the voltage at alternator main positive terminal, the rectifier is faulty and should be replaced.

Check all circuit connections are clean and tight, and free from arcing.

SPECIAL NOTES

I CIRCUIT CONNECTIONS

- a) Disconnect plug(s) from alternator. Connect voltmeter to each alternator lead in turn and note battery voltage with ignition "on" (no reading will be obtained on negative lead, when fitted). No reading on other leads indicates open-circuit. (Alternatively a 2.2 watt test lamp may be used. Bulb will light on all but negative lead).
- b) Reconnect plug(s) to alternator.

- a) Connect voltmeter between alternator main terminal and battery insulated terminal.
- b) Switch on maximum load. Run engine at charging speed (3000 revs/min) and note voltmeter reading.
- c) Repeat (b) with voltmeter between alternator frame and battery earth (ground) terminal.
Maximum voltage drop values are given in Data Table. Higher readings indicate resistance which must be eliminated

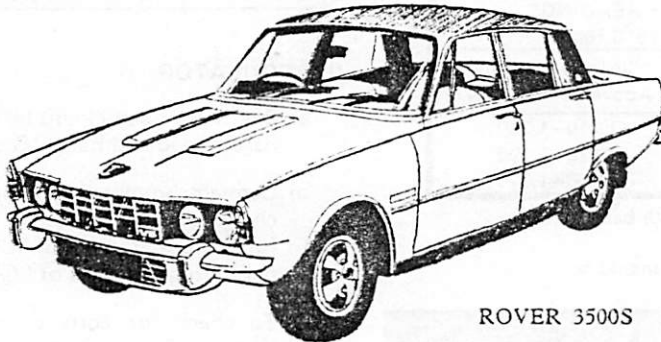
ROVER 3500S ENGINE TUNE-UP SERVICE SEQUENCE: Member William P. Miller of Denver, Colorado provided us with the following tune-up chart.

Note: Air temperature must be 60° to 80°F.

1. Replace spark plugs.
2. Lube distributor cam and oil felt pad and shaft.
3. Check throttle linkage for fully open throttle capability and freedom of movement.
4. Check throttle controlled vacuum retard switch setting.
5. Check contact breaker dwell angle.
6. Check ignition timing.

Note: Engine must be at normal operating temperature for at least 5 minutes after thermostat has opened - top radiator hose will become warm - then run for 1 minute at 2500 RPM's - then make adjustments and checks - repeat after every duration of 1 minute until checks and adjustments are completed. Insure that gear selector is in Park and wheels are blocked.

7. Check AED cut-off valve function.
8. Insure that all pipes are correctly fitted to the charcoal canisters, AED, and engine flame traps.
9. Blank off hose, inlet manifold to air cleaner.
10. Slacken the screws securing throttle levers to carburettor lever on each carb.
11. Check carburettor balance - engine RPM's 725 to 775 RPM's.
12. Set both carburettor throttle levers with a .006 feeler gauge, and tighten throttle lever securing screws.
13. Check automatic transmission downshift adjustment.



ROVER 3500S

A FOLLOW-UP ON ROVERPANELS: Member J? Burchfield Cartwright was happy to report to us that Roverpanels responded to his letter, which was printed in last month's newsletter. Mr. Dyer of Roverpanels apologized for the difficulty which his fiberglass panels caused Mr. Cartwright and returned \$300 of the \$390 which Mr. Cartwright originally paid for the panels.

LAND-ROVER SERVICE: Recently Hugh Stewart wrote us advising us of his business, British Pacific, 101 West Green Street, Pasadena, California, 91101, tel: (213) 681-9783. Hugh claims that he can get any spare part for the Land-Rover. He also services the Landy and is importing ex-military 109 Land-Rovers.

A Warning for Land-Rover Owners: Member Dennis Staffne recently advised us of the following:

When in St. Louis with a Land-Rover try to avoid going to Continental Cars (a so-called service dealer for Rovers). After moving to St. Louis I went to Continental to have the rear axle and pinion seals replaced on my Landy. They fixed it but forgot to refill the rear axle with oil! This I soon found out when driving home and hearing some rattling noise coming from the rear. When I called Continental to complain they acted as if they had done nothing wrong. I wrote a letter to British Leyland very soon after which I received a phone call from Continental. They said that a mistake had been made and that they would repair any damage done to my rear axle. I had the axle checked before Continental called me and there was no damage. The only mistake made was going to Continental in the first place. The letter to British Leyland was the only way I could get Continental to admit their mistake.

I found a shop through a friend in St. Louis that works on Land-Rovers. It's called Motorcars Limited and is run by Paul LaVista. Motorcars did a tune-up on my Rover and I was very happy with the work that they did. Paul also took time to explain things about the Rover to me. He also told me that most of his work (on British cars) was because Continental Cars had very poor service. So, if you need service on a Rover in St. Louis I would go to Motorcars Limited, 5701 Southwest Avenue, St. Louis, Missouri, 63139 tel: (314) 781-4452.



156

Truck, Cab Forward, Fire Fighting, 1 ton, 4x4, Forward control, Land Rover, U.K.

Member Ted Hall would like some advise as to whether the rear main bearing oil seal on the Land-Rover 109 can be replaced without removing the engine. Please write Ted at: 829 Hollowell Street, Ontario, California, 91762.

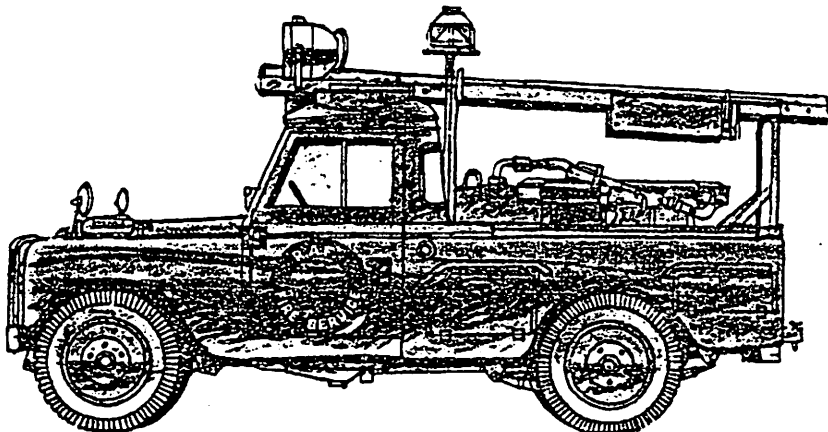
Member Ed Seward is in the process or organising a day trip for local Landy owners and would like to hear from anyone else who is interested. Contact Ed at: 4 Mardrew Road, Baltimore, Maryland, 21229.

One Land-Rover Owner's Experiences: New member Ted Hall recently wrote us the following in a letter:

I own a 109 IIA Landy and spend several months each year back-roading and off-roading in the back country of Baja. I've tried numerous other vehicles in Baja and have found nothing that even remotely compares with the 109 for a back-country exploration vehicle, especially for my purposes, which include 30 day or longer self-sustained, remote area trips for photography, exploration, etc.

I operate the vehicle strictly stock except for Rochester carb and I commonly get the vehicle into, over, and out of the worst (and beyond!) that Baja has to offer. I am normally loaded to or over the maximum highway gross at takeoff. Over a period of years I have engineered and incorporated several dozen modifications on the body to accomodate storage, comfort, special purposes (photography), and general back-country travel and living for extended periods of time. The modifications include a roof-mounted, all weather "sleeper" for two which is accessable through a hatch in the roof from the aft compartment "living room/dining room/ kitchen" (with sit-down dining accomodations for four). It also has the usual outside awnings, day tent, etc. all of which have permitted "roughing it" in luxury in some pretty incredible areas and situations. Interestingly, the interior can be re-converted back to the standard 10 passenger configuration in 30 minutes since the cargo decks and bulkheads are desinged to just drop in place, and they stay in place over the roughest of the old Baja 1000 race course, and much worse. As an item of interest, the same deck and bulkhead system, when scaled down, also fits the 88 and permits inside sleeping for two, leaving the roof rack stricly for cargo. All modifications on the 109, including the roof-mounted sleeper, increase the empty weight less than 200 lbs.

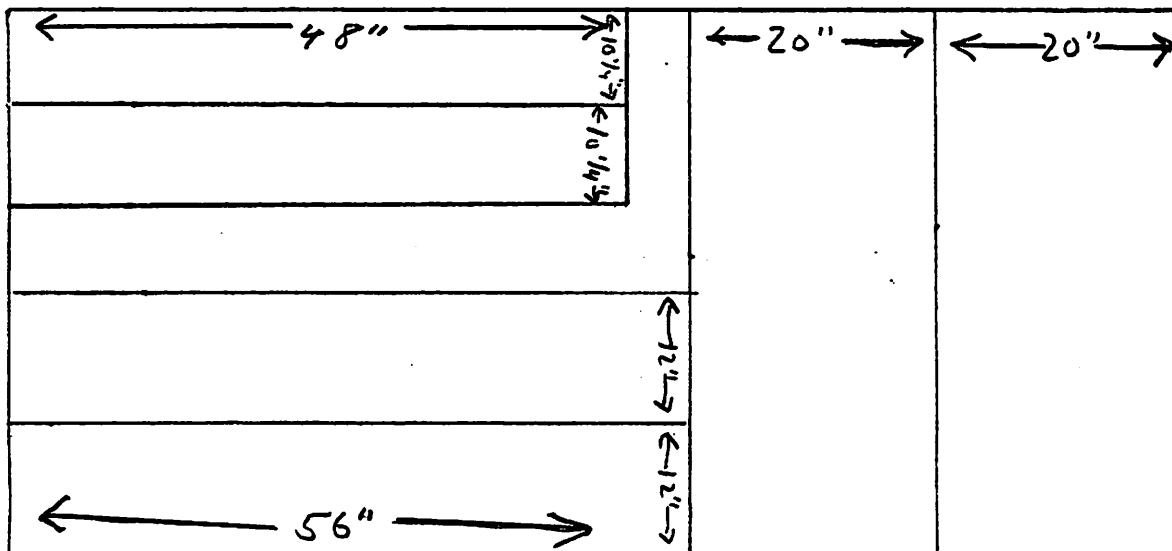
Regarding the Rover Owners' Association of North America, I think such clubs or groups, when operated with serious intent, are going to become much more important, especially to Land-Rover owners since we have been totally abandoned by the Factory as far as the North American market is concerned. I recently wrote to the factory with a list of inquiries for the Technical Services Department plus a request for Factory-delivery information on the Range Rover and eventually received what was at best a 'go-to-hell-we-don't-want-to-be-bothered-with U.S.-owners' form letter. There was no answer to even a single question of mine. I hope that this breakdown in 'British pride' isn't reflected in product quality because I do want to purchase a new Land-Rover within the next year or so. I would like the 109 station wagon body adapted to the Range Rover engine and power train.



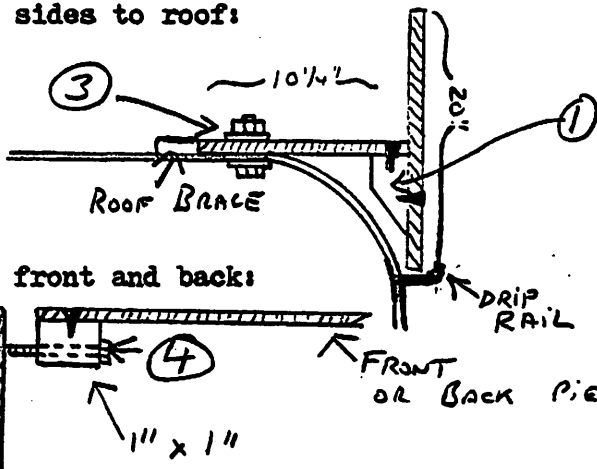
SOME LAND-ROVER MODIFICATIONS: Member Roy B. Henderson forwarded the details on the following modifications which he performed on his Landy and which he thought might be of interest to other members in the Association.

An inexpensive roof box may be fashioned out of a 4'x8'x3/4" sheet of exterior plywood, 8 feet of 2"x4", and 4 feet of 1"x1". It is not easily removable although the front and back can be removed to minimize wind resistance. The plywood is simply cut to the dimensions shown in the drawing, the sides are assembled with several large wood screws, and bolted to the roof. The front and back are then fitted with 12" pieces of 1"x1" and bolted to the sides after drilling. Paint should be applied to protect the wood. The box provides a large amount of space and may be covered with a 6'x8' tarpaulin.

Cutting of plywood:



Fixing sides to roof:



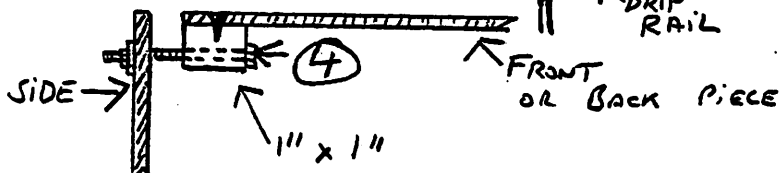
① The 2"x4" is beveled at 45° through one edge.

② #10 or larger screws hold 2"x4", side, and side flange together.

③ Bolts to roof from inside out to avoid passenger injury to head, then saw off excess bolt.

④ Front and back pieces bolt on for easy removal. Use two bolts at each corner to keep piece from rotating.

Fixing front and back:



In response to Wes Stinson's request in the February newsletter concerning modifications for Alaska: While in that state I installed a Hunter model UH-47-4 gasoline burning heater, manufactured by Hunter Manufacturing Company, 30525 Aurora Road, Solon, Ohio. It requires the addition of an electric fuel pump and valve and is quite expensive; however, the heater is rated at a whopping 15,000 BTU's, which is more than adequate to keep the Land-Rover warm at 30° below 0°. Due to space restrictions I mounted the heater on the left wheel well, behind the driver and facing inwards. The heater will keep passengers warm and is quite useful when camping.

The thermostat in my Land-Rover is fitted with a skirt that shuts off coolant flow through the by-pass when the thermostat is open (engine hot). Recommended replacements do not incorporate the skirt. Does anyone know where proper thermostats for various temperatures can be obtained?



Land-Rover and Range Rover

UNFORTUNATELY the rather confined space within the body of a Land-Rover restricts the size of conversion available, and there are no coachbuilt models as yet. But a Land-Rover motor caravan makes very good sense for off-the-road exploration. Specialists are Carawagon, and they also offer a conversion of the Range Rover, but at a formidable price. Basic Land-Rover engine is the four-cylinder 2¼-litre, but the 2.6-litre six-cylinder engine, or the four-cylinder diesel, is available as an option.

Make of Motor Caravan Body or Conversion	Name of Motor Caravan Model	Engine Capacity c.c.	Payload Rating cwt	Type	Overall Length ft in.	Overall Height ft in.	Overall Width ft in.	Kerb Weight cwt	Water Storage gals	Seats for Travel	Refrigerator	Oven	Adult Berths	Child Berths	Price £
CARAWAGON	<i>Deluxe</i>	2,286	—	ER	14 7	6 11	5 6	34.00	9C	3F+3	Opt £90.00	NA	2D+2S	—	3,364.20 +194 diesel
DORMOBILE	<i>Land-Rover</i>	2,625	—	ER	15 2	7 0	5 4	36.40	6½C	4F	NA	NA	4S	—	3,435.00
CARAWAGON	<i>Series 80</i>	2,286	—	ER	14 7	6 11	5 6	34.00	9C	3F+6	Opt £98.00	NA	4S	—	3,506.12 +194 diesel
CARAWAGON	<i>Ultimate</i>	2,286	—	ER	14 7	6 11	5 6	34.00	9C	5F+1	Opt £90.00	NA	2D+2S	—	3,651.48 +199 diesel
CARAWAGON	<i>Range Rover</i>	3,528	—	ER	14 8	6 4	5 10	38.00	6C	2F+4	Opt £98.00	NA	2S	—	4,999.32

Designed for Adventure... Anywhere



If you like adventure and travelling in comfort, how about driving first class... anywhere? Carawagon is custom built to allow you to eat, sleep and travel on the best four wheels in the business. Want to know more?

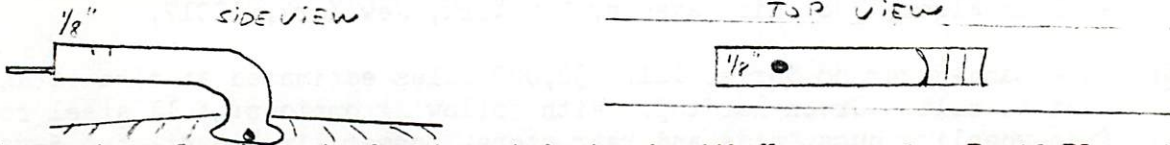
CARAWAGON INTERNATIONAL LTD.

Thames Street, Sunbury, Middlesex, England.

Brochure please to _____

- FOR SALE: 1966 Land-Rover 109 with about 60,000 miles. I own three Landys and can afford to keep only two. It is very reliable; it always starts in cold weather and has given me no problems. It has some cancer of the frame. Norseman tires are all very good. New clutch, new brake shoes, new brake linings. Some minor body damage. Mechanically sound: it should drive anywhere. It is now located at my farm near Augusta, Maine. Asking \$900. Contact Douglas Thornsjo, 2211 Congress Street, Portland, Maine, 04102 or at 18th Floor, 708 Third Avenue, New York, New York, 10017.
- FOR SALE: 1974 Land-Rover 88 Series III. 30,000 miles estimated at time of announcement to sell. Green hardtop. With following options: full steel roof rack, free-wheeling hubs, side and rear steps, bonnet tire mount, two 5-gallon jerry can carriers, auxiliary gauges (vacuum, lev-o-volt), auxiliary power fuse box, Warn winch mount and fairlead, auxiliary driving lights (Wipac 250,000 C.P.), auxiliary back-up/generator illuminated rear lights, switch panel, spare parts and workshop manual. A new Fairey overdrive unit (still in crate) is also available at cost if purchased with the Landy. The price excluding the overdrive unit is \$4600.00. Contact: Matthew Israelson, 82-44 249th Street, Bellerose, Long Island, New York, 11426.
- FOR SALE: Rover 2000 Shop Manual. \$10.00 plus postage. Contact: Roderick T. Campbell, 110 Talcott Court, Bolingbrook RFD 4, Lemont, Illinois, 60439.
- FOR SALE: FREE: Back issues of Pick-up, Van, and 4WD (from August 1974 to August 1975). Enclose a check for \$2.00 shipping and they are yours. Contact: C. Brian Kapalin, 167 Oakland Road, Maplewood, New Jersey, 07040. Only one set is available.
- FOR SALE: All body parts for 1951 Land-Rover 80 Series I. Also wrecking for parts: 1964 Land-Rover 109 Series II Diesel Station Wagon. Contact: Bill Hammond, 3400 Rhonda Valley, Unit 26, Mississauga, Ontario, Canada.
- WANTED: Luggage rack for Land-Rover 88 or any information about one, i.e. types, prices, pros, cons, etc. Contact: Ed Seward, 4 Mardrew Road, Baltimore, Maryland, 21229.
- FOR SALE: 1961 Land-Rover with Safari Top. 8 forward speeds, 6 extra wheels and tires, updated suspension, Warn hubs, rear entrance, 4 extra gas tanks, 4 removeable rear jump seats, lockable hood with spare tire mount, air vent screens, special mirrors, good handling on or off road, new engine, everything new under the hood, new brakes, driveshafts, differential, exhaust system, battery, carburettor, voltage regulator, rear shocks, all manuals, many spares, spare gaskets, file of dealers and parts sources. Papers to verify an investment three times the asking price of \$1800 firm. Call answering service at (215)-CH2-0557 or write: Dr. Thompson, 7366 Rural Lane, Philadelphia, Pennsylvania, 19119.
- WANTED: Reward offered for information leading to successful engine swap for my 1967 Series IIa 109 6-cylinder Land-Rover. Write or call collect: David Goodson, Route 1, Box 83D, Roy, Washington, 98580. Phone: (206)-458-7390.
- FOR SALE: Five Jackman 15x10" wheels for Land-Rover and five Formula 10x15" Desert Dog tires. Includes four wheels and tires have around 500 miles on them. The spare has never been used. I'll give full guarantee on these repossessed wheels and tires - \$300. One top for 88. Full length with liftgate instead of door. Very good condition (paint faded on outside). \$100. Contact: John S.V. Smith, P.O. Box 2422, South Portland, Maine, 04106.

REPLACEMENT WIPER BLADES FOR THE LAND-ROVER: Member P.A. Grace offers the following suggestion for replacing wiper blades on the Land-Rover. He found that drilling a 7/64" hole 1/8" from the end of the mounting arm on a 10-inch Volkswagen wiper blade (Trico VW-10 or Sears 10 inch) made a better blade than the original. It also has the advantage of being cheaper and more easily procured.



Mr. Grayce has also been trying to get in touch with Ham operator David Place in Canada, but with no luck so far. His call sign is K3LLH. He says he'll keep trying.

P.S. Mr. Grayce's Fairey overdrive has 11,000 miles on it and he has no complaints.

SOME LAND-ROVER PARTS HINTS: Member CDR H.W. Lineback, USN has offered the following tips that have proven useful to him.

1. The distributor vacuum advance line from the carb can be replaced with Stewart-Warner kit #366-FF. This kit is readily available at any auto supply store.
2. Radiator hoses: top - use Gates VF-25
bottom - use Gates VF-34
3. Water hose from engine (rear) to heater can be replaced using 5/8" (I.D.) heater hose. Install direct from engine pipe to heater pipe (discard Rover rubber and metal tubes).
4. Sears replacement battery #4355.

All of the above with reference to the Series IIa 88 Landys.

RENEWAL MEMBERS:

Kathryn Arnold	185 Oakwood Avenue Oakhurst, New Jersey, 07755	1970 3500S
Dexter Bradbury	1175 Mahone Street, N.W. Christiansburg, Virginia, 24073	1972 Land-Rover 88, Series III
Harold Clark	12 Woodbridge Road Hamilton, Ontario, Canada, L8K 3C7	1972 Land-Rover 88, Series III
Art Detrich	2127 N. Sedgwick Street Chicago, Illinois, 60614	1967 Land-Rover 109, Series IIa
James Easterday	RR #1, Kispiox Road Hazelton, British Columbia	1961 Land-Rover 88, Series II 1963 Land-Rover 109, Series IIa
Ronald Engleman	42-22 Ketcham Street Elmhurst, New York, 11373	1970 3500S
Thomas Farren	24507 86th Avenue E. Graham, Washington. 98338	1951 Land-Rover 80, Series I 1971 Land-Rover 88, Series IIa
James N. Gabor	435 10th Avenue S.E. Rochester, Minnesota, 55901	1973 Land-Rover 88, Series III
P.A. Grayce	1105 Wedgewood Road Flourtown, Pennsylvania, 19031	1974 Land-Rover 88, Series III
Jack K. Grimm	31057 Shannee Lane Evergreen, Colorado, 80439	1969 2000SC
Roy B. Henderson	2632 Guilford Avenue Baltimore, Maryland, 21218	1971 Land-Rover 88, Series IIa



Rover Owners' Association Newsletter - Volume V, Number 2

RENEWAL MEMBERS: (continued)

Ron Jones	204 Dinn Road San Antonio, Texas, 78218	2-1971 3500S, 15-1970 3500S 1-1970 2000TC, 5-1969 2000TC 1-1969 2000 Automatic, 3-68 2000TC, 1-68 Auto, 8-67 2000TC, 2-67 2000SC, 1-66 2000SC, 2-65 2000SC, 1-64 2000SC 2-52 90 Saloons 1974 Land-Rover 88, Series III
John F. Katenkamp	100 Spindrift Drive Rancho Verdes, California, 90274	1973 Land-Rover 88, Series III
Glen G. Larson	300 Ware Street Mansfield, Massachusetts, 02048	1974 Land-Rover 88, Series III
David Lewis	3030 Hewitt Avenue, Apt. 230 Silver Spring, Maryland, 20906	1963 Land-Rover 88, Series II
Rod McConnell	Box 144 Brechtin, Ontario, Canada, LOK 1B0	1966 Land-Rover 109, Series IIa
Cyrus McNutt	8639 Lancaster Road Indianapolis, Indiana, 46260	1966 Land-Rover 109, Series IIa
Milford Manley	P.O. Box 2 Robson, West Virginia, 25173	1969 Land-Rover 88, Series IIa
Kenneth Ockfen	26320 68th Avenue E. Graham, Washington, 98338	1973 Land-Rover 88, Series III
Raymond Ouellette	136 Marchand Street Fall River, Massachusetts, 02723	1967 2000TC
W. James Pile	R.D. 1 Towanda, Pennsylvania, 18848	1969 Land-Rover 88, Series IIa
Bill Slunt	Box 5959 Station A Calgary, Alberta, Canada	1973 Land-Rover 88, Series III
Harlan Sawyer	Route 1, Bee Tree Road Swannanoa, North Carolina, 28778	1974 Land-Rover 88, Series III
Dennis Staffne	3240 Itaska S. Louis, Missouri, 63111	1973 Land-Rover 88, Series III
Terry Stinson	P.O. Box 456 Port Aransas, Texas, 78373	1973 Land-Rover 88, Series III
Katherine Van Norden	404 Fox Run Drive Plainsboro, New Jersey, 08536	1970 3500S
Gerald M. Weil	P.O. Box 262 Union City, New Jersey, 07087	1974 Land-Rover 88, Series III
Paul A. Wright	619 East Spring Street Whitehall, Michigan, 49461	

NEW MEMBERS:

Sidney Berlin	208 N. Anderson Street Hackensack, New Jersey, 07601	1970 Land-Rover 88, Series IIa
Frank Bryan	1555 Tarpon Street Merritt Island, Florida, 32952	1969 Land-Rover 88, Series IIa
James F. Burke	84 East Street Foxborough, Massachusetts, 02035	1960 Land-Rover 88, Series II
Roderick T. Campbell	110 Talcott Court, Bolingbrook RFD #4, Lemont, Illinois, 60439	1974 Land-Rover 88, Series III
Michael Alan Cane	Box 1351 Inuvik Northwest Territories, Canada, XoE-OTO	1962 Land-Rover 88, Series IIa
E. Bruce Carter	Petersfield Manitoba, Canada, ROC 2L0	1973 Land-Rover 88, Series III
Richard Cendak	P.O. Box 142 Blairsden, California, 96103	1962 Land-Rover 109, Series IIa

NEW MEMBERS (continued):

Roger Diggle	206 N Harvey Street Urbana, Illinois, 61801	1968 2000TC
John C. Dillingham	1540 Balsam Street Charleston, South Carolina, 29407	1969 2000TC
Janney Florey	231 Lehigh Street Pittsburgh, Pennsylvania, 15218	1967 2000TC
Thomas Gallucci	113 Fern Street Naugatuck, Connecticut, 06770	1973 Land-Rover 88, Series III
James F. Gast	276 Kelton Avenue San Carlos, California, 94070	1963 Land-Rover 109, Series IIa
Greg Gruse	Route 1, Box 357 Swedesboro, New Jersey, 08085	1974 Land-Rover 88, Series III
Geoffrey Haddad	18151 Shook Lane Yorba Linda, California, 92686	1963 Land-Rover 88, Series IIa
W.K. Hammond	3400 Rhonda Valley, Unit 26 Mississauga, Ontario, Canada	1957 Land-Rover 88, Series I
Joe Hempfling	270 Liberty Street San Francisco, California, 94113	1967 Land-Rover 109, Series IIa
W.K. Hilliard	107 Claggett San Antonio, Texas, 78235	1970 3500S 1967 Land-Rover 109 Dormobile
Dudley F.B. Hodgson	622 St. John's Road Baltimore, Maryland, 21210	1971 Land-Rover 88, Series IIa
Gary L. Hopkins	Lot 23, Reed Street Flatwoods, Kentucky, 41139	1967 2000TC
Fred E. Kusterer	Box 476, Route 1 Titusville, Florida, 32780	1967 Land-Rover 88 Diesel
T.H. Leist	1809 E. Johnson Road Shelby, Michigan, 49455	Land-Rover
Sharpe McCullough, Jr	113 Tuttle San Antonio, Texas, 78209	1959 Land-Rover 109, Series II
Brian Mackid	290 Dixon Road, Apt. 509 Weston, Ontario, Canada, M9R 1R9	1971 Land-Rover 88, Series IIa
Robert Osterman	65-28 Jay Avenue Maspeth, New York, 11378	1967 Land-Rover 109, Series IIa 1969 Land-Rover 88, Series IIa
Jim Pappas	U.S.M.M.A. Box 485 Kings Point, New York, 11024	1967 Land-Rover 88, Series IIa
Frank Pescherine, Jr.	4511 W. Paradise Lane Glendale, Arizona, 85306	1963 Land-Rover 88, Series IIa
Hugh K. Penney	54A Penobscot Street Orono, Maine, 04473	1973 Land-Rover 88, Series III
Eric V. Ramsing	2637 Boyston Avenue E. Seattle, Washington, 98102	1951 Land-Rover 86
Benjamin Hall Shapiro	176 Lambert Avenue Fredonia, New York, 14063	1965 Land-Rover 109, Series IIa
Edwin L. Sherrill III	P.O. Box 827, U.S.M.M.A. Kings Point, New York, 11024	1973 Land-Rover 88, Series III
Michael Smith	Route 3 Columbia, Missouri, 65201	1973 Land-Rover 88, Series III
Iain A. Thomson	1635 Seiger Drive Springfield, Missouri, 65804	1970 3500S, 1966 2000SC
Ernie Thor	260 Castleton Way San Bruno, California, 94066	1964 Land-Rover 88, Series IIa
Jan Michael Van Vlaenderen	P.O. Box 7806 San Diego, California, 92107	1967 Land-Rover 109, Series IIa
William R. Ziegenbein	246 Dennison Ballwin, Missouri, 63011	1965 Land-Rover 88, Series IIa