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# THE ALUMINIUM WORKHORSE

THE OFFICIAL PUBLICATION OF THE LAND ROVER OWNERS ASSOCIATION

VOLUME I, NUMBER I

AUGUST/SEPTEMBER, 1984 COPYRIGHT 1984, ALL RIGHTS RESERVED

## IN LAND ROVER WE TRUST

It is a very great pleasure to announce the beginning of a new era in Land Rover organizations, The LAND ROVER OWNERS ASSOCIATION, USA. We are dedicated to enjoying and preserving the Land Rover tradition and promoting fellowship among our members. As a family oriented organization, we encourage wives, children or girlfriends to attend our functions. We believe that all members of the family can enjoy a Land Rover adventure.

Owning a Rover in the United States puts us in a rather small group of people who dare to be different. Owning one of these aluminium workhorses isn't always easy but we carry on because we hold them in high regard. We usually rely on our own resources to find parts, service or Land Rover companionship. While this may be character building, it can be lonesome. The LAND ROVER OWNERS ASSOCIATION is here to end all that and bring us all together once and for all.

## THE ORGANIZATION

We believe in people. We believe that in a safe, adult atmosphere, people will act in a safe, adult manner. We rely on our members to do just that, so we are not topheavy with rules and regulations. We have our basic rules, mostly concerned with safety, and members are expected to adhere to them. Our safety rules are non-negotiable. They are mostly common sense items that common sense people will have no trouble with. Those who may regularly break these rules will not be welcome!

Since we are family oriented, safe outings are especially important. Each outing (we call them treks) has one person in charge who is responsible for planning the trip, safety, and providing us with a good trip. He clears his proposed trek through the activities coordinator, who will help with planning and notifying members of the upcoming trek. Any club member can be a trekmaster and we are hoping for lots of good trips since everyone knows some nice out-of-the-way spot.

The trekmaster is empowered to deny attendance to anyone whose vehicle does not meet our basic safety codes. He will receive full association backing in this. If trail conditions become too severe or hazardous, the trekmaster makes the decision to turn back.

At present, we have only three officers in the organization. These are; Secretary/Treasurer, Activities Coordinator, and Newsletter Editor. These jobs are necessary to keeping the Association operating day to day. These jobs have been filled on a volunteer basis for now. In the future, we expect elections to fill these offices and any others that might become necessary.



## YOUR OFFICERS

Steve Hill, Activities Coordinator.

Steve is a California Highway Patrolman and rarely writes tickets to Land Rover owners. Janet, his wife, and his two children, Shawn (age 5) and Amy (age 3) are also avid Land Rover fans. The family Land Rover is a '73 Series III 88", which they purchased new. After looking at Jaguars and Jensen Healeys, they decided on the Rover as their "ideal" vehicle.

Steve Zedekar, Secretary/Treasurer.

This is a man who sold a '56 Rolls Royce to step up to a Land Rover. Steve works for Air Cal and presently owns a '64 Series II 88". Steve and Jeanie are the proud parents of a nine month old girl, Becky, who was recently crowned "Miss Land Rover, 1984" at a tech session.

Jim Allen, Editor.

A mechanic at a Lincoln-Mercury dealership, Jim longs for the day he can work on really fine vehicles, Land Rovers. His wife, Carrie, is invaluable help with the newsletter. The Rover of the family is a '69 Series IIA 88" that they have owned for five years.

## UPCOMING EVENTS

August 18-19: Summit Lake Trek

This overnighiter will be Trekmastered by Steve Hill and is an "open" event to all persons in Land Rovers. Flyers have been sent out butin the event you did not receive one, there is one included in this newsletter. Among the events planned is a demonstration of a Fairey capstan winch. We hope you will share your ideas for making this Association beneficial to all of us. See the attached flyer for details. Be sure to bring your favorite chili receipe and fixins for the "Land Rover Chili" contest.

October 13-14: Weber Lake Trek

You won't find Weber Lake on too many maps but it exists and is a fine spot for a campout. Steve Hill will Trekmaster this outing as well. A trail ride over the various logging roads crisscrossing the area is planned. This trek is restricted to Association members only. Stay tuned for further details.

December ?: Christmas Party!

There is lots more planning ~~to do for this one~~ but be prepared to attend our first Christmas Party!

## ADDRESS BOOK

For membership or financial information concerning the Association contact:

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7359 Center Parkway  
Sacramento, CA 95823 (916) 391-1643

For information on Association activities or Treks contact:

Steve Hill, Activities Coordinator  
7701 Manon Court  
Sacramento, CA 95823 (916) 393-37~~87~~<sup>67</sup>

To submit material for publication in THE ALUMINIUM WORKHORSE or for questions or comments regarding this newsletter, contact:

Jim Allen, Editor  
8176 Villa Oak Drive  
Citrus Heights, CA 95610 (916) 722-0401



Scotty "resting" after a fearsome bout with the fish that got away!

Stampede Memories '84



The picnic area at Stampede Lake. Bill Benjamin's 109 to the left; Bill McClintocks 88 to the right.



The first meeting! Getting acquainted at the meeting place, the first Truckee turnoff.



Waiting on the trail for the "scout" to return with news of the best picnic site.

## STAMPEDE PICNIC

by Steve Hill

The day finally arrived, after a lot of phone calls and some leg work - May 19th became the first organized picnic for the newly formed LAND ROVER OWNERS ASSOCIATION, USA. It was quite a thrill meeting for the first time near Truckee, California! No less than ten Land Rovers were represented, from a military 1-ton to the standard 88", each as individual as the owner.

Leading this assortment out onto the freeway to our destination, Stampede Lake, was an experience that was long overdue, to put it mildly. Looking behind me, stretched back as far as I could see, was Land Rover after Land Rover. I remember thinking, "What took us so damn long to get together":

After settling down near the lake, we were able to open a cold one, grab a sandwich and make our way from one Landy to another and get acquainted. I never feel that I'm meeting an owner for the first time because it just seems like we're all part of a big family, no matter where we live or what we do.

The day could not have been better, with plenty of sunshine, a gentle breeze and lots of cool shady places to relax. Everyone found something to do. Jim Allen and Steve Zedekar set off to a far removed hillside for some tin can hunting with Jim's old Webley revolver. The famous gentleman from Concord was seen moving towards the lake, with rod and reel in hand, in a rather determined manner. Scotty was found later, sound asleep, in his old RAF 1-ton. His rod and line were in such disarray that only one hell of a fish could have caused it. Shame it got away....

Some went exploring, while others fished. The children splashed in the shallows and froliced in the sunshine. As for myself, it was a nice, easy day with my family and friends. Well, there never seems to be enough time and things finally had to wind down. Those who had to head home said our goodbyes to those from the Bay Area staying the night. As we headed home, I thought about the almost idyllic day and the pleasure of meeting with fellow Landy owners. I'm looking forward to more days like this.

A special thank you to Gerry Cole, LR owner and resident of the Sierra Nevada, for his help planning the trip.

### LAND ROVER TO THE RESCUE

Member Jeff Hill, an officer with the Sacramento Police Department, became involved, while off duty, in the arrest of two suspects involved in the theft of two expensive ten-speed bicycles from the school his son attends.

It appears the two suspects were seen taking the bicycles out of the racks by a number of children, teachers and staff, including Jeff's mother, who works at the school. After he secured his gear, he fired up his trusty 1971 88" and proceeded to the school. When he arrived, he saw the suspects in a field next to the school and gave chase. After negotiating large puddles, construction site dirt mounds, mud and open field, Jeff overtook and arrested the two suspects with the trusty blue Landy idling nearby. Good job, Jeff!

# SCOTTY'S CORNER

With Jim "Scotty" Howat



Dear Scotty,

I have attempted to replace the spring eye bushings on my 88" recently. After four very frustrating hours and two mangled bushings, I left well enough alone. Is there an "easy" way of replacing these or a modification to make future overhauls less frustrating?

Kerry Oldham  
West Valley City, Utah

Dear Kerry,

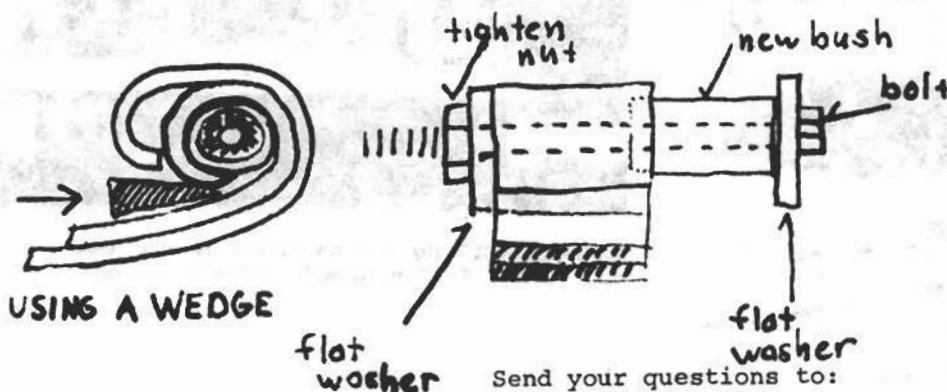
Sorry lad, there's no easy way of changing those bushings. Sometimes it's a rough go in a shop, with air hammers and the like at your disposal. The one thing you don't want to do is heat up the spring. The heat can take the temper from the metal. It'll take the "spring" from your spring.

I do have a couple of tricks that I'll share with you, Kerry. There are two ways I use to get the things out. The first is to use a wedge and force it into the opening in the spring eye. This will force the eye open and make the bush easier to pound out with a hammer and drift. For the more stubborn ones, cut out the rubber inside the bush and use a hack saw to cut the outer casing from the inside out. Once cut, it can be collapsed and driven out.

As far as getting the new ones back in, all I can say is that the best way is to use a press. If a press isn't handy, try using a long bolt and flat washers. By tightening the nut, you will pull the bush in until it's flush with the outer edge of the spring. Mind, you'll want to grease it up good first!

Good luck on your next try!

Scotty



Send your questions to:  
SCOTTY'S CORNER  
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**STANDARD EQUIPMENT:** On the new Series III Land-Rover we offer an all synchromesh gearbox (4 forward speeds and reverse, plus a 2-speed transfer box, equals 8 forward, 2 reverse); alternator; larger capacity heater; improved power brakes plus new facia and other styling advances.

As always: Four wheel drive. Full length metal top. Body of corrosion resistant aluminum alloy with sliding side windows. Side-hinged rear door. Seats for seven. Windshield ventilators with built in fly screens. Dual braking system. Windshield washers. Back-up lights. Fresh air heater and defrosters.



# LOOKING BACK

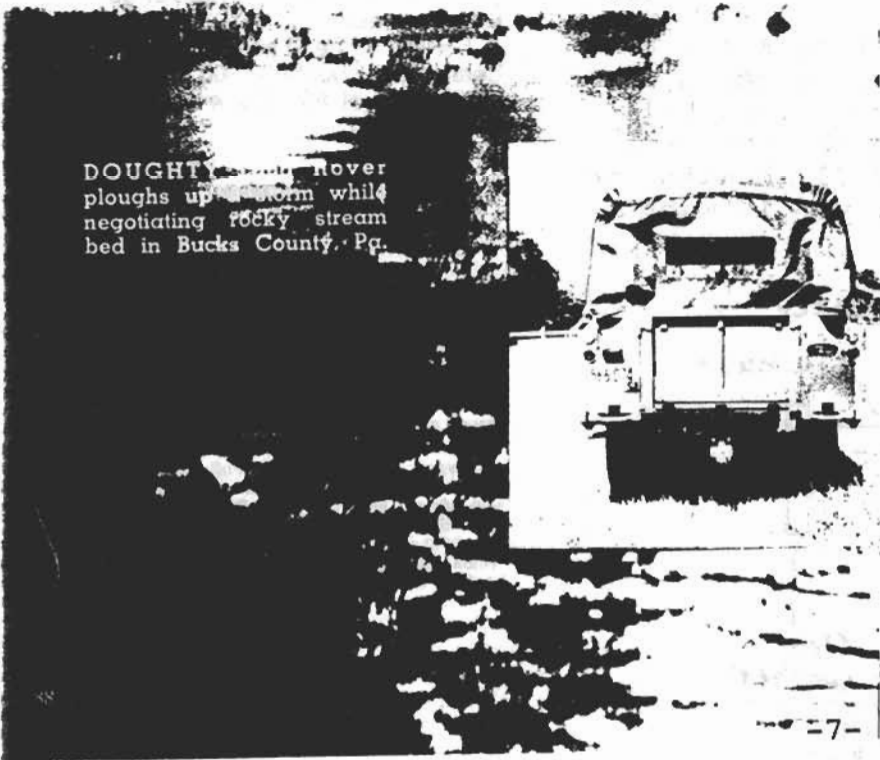


## the **BRITISH LAND ROVER**

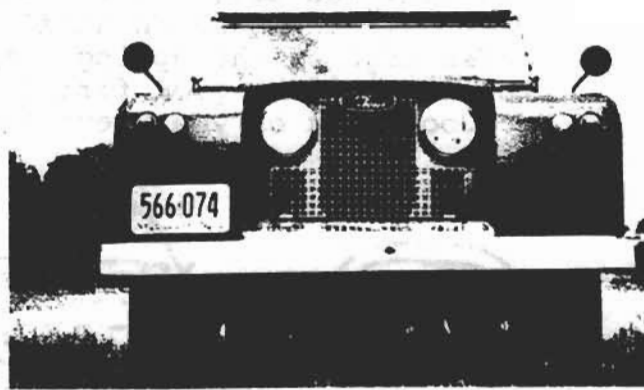
*Tom calls this extremely rugged utility wagon "A great vehicle."*

By Tom McCahill

**E**RNEST HEMINGWAY, crashing through the brush of Kenya in hot pursuit of a ruptured lion, would undoubtedly do so in a four-wheel-drive Land Rover. For you neophytes who go in for your Afro-adventures by listening to Three-Lips Herman and his Bongos on the local jukebox, let me assure you that the Land Rover is an established character. Gregory Peck pulled a real *faux pas* in "The Macomber Affair" when, as a celluloid White



**DOUGHTY** Rover ploughs up a storm while negotiating rocky stream bed in Bucks County. Pg.

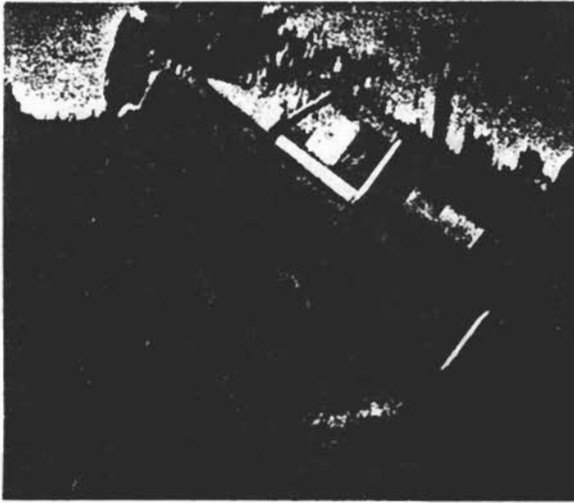


**SQUARE-BUILT** rig has an expensive aluminum alloy body. A 52-hp diesel engine is optional.



Though an unbeliever, the well known Tom McCahill gave the Land Rover a real test. It's easy to see his Jeep bias (Tom was a real American) "Uncle" Tom was one of my favorite automobile writers of old and I saved many of the old tests, including this one. Enjoy!

Ed.

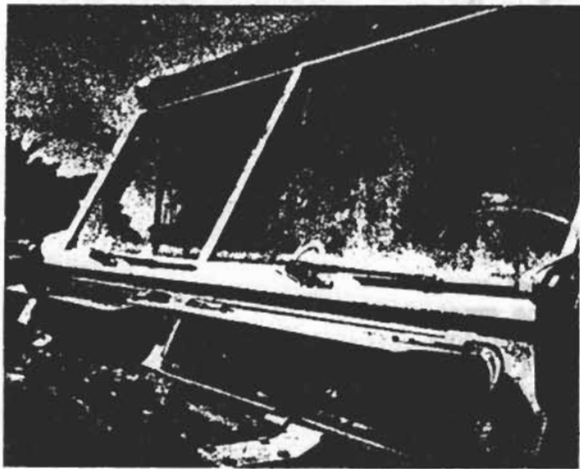


**PLUCKY** British buggy nearly flipped over backwards this time—but luckily it didn't.

Hunter, he used an American four-wheel-drive combat vehicle as the hunt's car—simply isn't done, old boy. Such plebeian trucks are used on the garbage detail and similar tasks but never for transporting the gunners in a grade one safari. That's a job for a British Land Rover.

The Land Rover is to the English what the Jeep is to us. It is basically a military vehicle, adapted during peacetime to dozens of chores impossible to accomplish with a standard automobile. There are attachments available to do every job from paint spraying to snow plowing but it doesn't float too well, a feature we'll go into in a minute.

The Land Rover comes in a number of body styles and two wheelbases. It offers two sizes of station wagons and many varieties of our standard pick-up truck with canvas or solid sides and roof. Incidentally, though we didn't run a test on it, the station wagon we had featured what is known as a "tropic roof." This is a second aluminum skin fastened about an inch and a half over the regular roof. This allows a free flow of shaded air to slide over the regular roof while you are under way; inside vents scoop this breezeway-treated air right into the cab. You'd have to try it to believe it but the effect is quite cooling. Though I told the company man when he seemed to become a bit overenthused, "Good as it is, it'll never replace air-conditioning" I will concede it's the next best thing. [Continued on page 154]



**COOL COWL** for hot weather opens up under windshield, scoops air into cabin.

**1954 LAND ROVER**  
**MODEL 102524** (with Land Rover  
 4-wheel drive) (with 1954 engine)  
**ENGINE:** 4-cyl. 1345 cubic in.; 77  
 brake hp; 24.5 lb./sq. in. torque; 7 to  
 11 compression ratio; bore 3.56 in.;  
 stroke 3.8 in.; fuel required: regular.  
 Standard tire rating: 4.7. Wheelbase  
 88 in.; length 142 1/4 in.; height 77 1/4  
 in.; width 64 in.; front tread 51 1/2  
 in.; rear tread 51 1/2 in.; weight 2,871  
 lbs.; gas tank capacity 10 gals.; turn-  
 ing circle diameter 34 ft. Tires size  
 6.00 X-16.  
**PRICE** (without optional): \$3,180  
**PERFORMANCE:** 6.90 mph; 6.9 sec.;  
 0-50 mph; 18.3 sec.; Top speed 70  
 mph. All times recorded on corrected  
 road.



**TROPIC ROOF** on Land Rover at right makes a breezeway for additional cabin cooling.

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## Tom Tests Land Rover

To test the Land Rover, a vehicle I've been interested in for years, I contacted Bill Haworth, who is doing the public relations pitch for them in this country. I've been doing stories with Bill for over a dozen years, since the days when he was public relations chief for Nash. He arrived at my house in Pennsylvania with the two Land Rovers, both 88" wheelbase. The one I was particularly interested in was the canvas-topped job which came closest to our standard American Jeep. This short-wheelbase model hasn't nearly the room of the longer (109") Rover but I wanted to compare it with my own Jeep which, though several years old now, is mechanically the same as the one Willys offers today.

The first thing that hits you is the price difference. The Land Rover sells for roughly \$700 or \$800 more than the standard Jeep. The more deluxe versions go as high as \$3,600 with the long chassis. As an optional piece of equipment, any Land Rover can be had with a 52-hp diesel engine for \$400 or \$500 more than the standard 2¼-liter, four-cylinder petrol engine which develops 77 bhp.

The next thing I noticed when comparing the American Jeep with the Land Rover was that the Land Rover has a great deal more usable width, not only in carrying capacity but in tail room, too. Also, it has a much more costly body, made entirely of aluminum alloy. The Land Rover is sparse by any comparison but the American Jeep is far sparser. The Rover has a lot of little niceties such as a cowl which opens up under the windshield, scooping fresh air right into your face. It even has what amounts to a spray rail behind the bumper, to toss solid water over the hood instead of through it when fording streams, as I did in my test. Once in the car and under way, two things become apparent immediately when you stack it against the American Jeep. First, the steering is far superior to the Jeep's not only in gearing but for ease of handling. Second, the foot room in the Land Rover must have been designed for a stunted pigmy—any guy much bigger than a barnyard rooster would resemble a pretzel after driving one of these cars on a coast-to-coast run.

Unfortunately, the seat cannot be pushed back, as it is unadjustable. A steel bulkhead partitioning off the rear bin locks you in there like a walnut in a nutcracker. Kelvin Fowler, the English company representative with Haworth, assured me that the 109" wheelbase job does have adjustable seats and this is something a guy my size would have to have. The rear bin, however, was ample—four hunting dog size as against the Jeep's two.

The reason we haven't any pictures of the Land Rover with the top down is because careful examination showed that to remove the canvas top and frame would be just about as simple a job as breaking out of Alcatraz with a dime-store can opener. Another fault of this car is that it needs a step to get in and out of it, even if you are a six-footer. Any gal who attempts it, unless she's wearing slacks, better know the guy she's riding with pretty well. A goof the Land Rover shares with the Jeep is the absence of an ashtray. Ashtrays are perhaps needed more in cars of this type than in any other because off the road, going through dry timber country, the lack of an ashtray might make an involuntary firebug out of almost anyone.

The rear-view mirror is one of those typically lousy English reducing glasses, calculated to make a big Freuhauf trailer right behind you look like a smallish beetle. The car has a good heater but it is located over the driver's shin in such a way as to keep him continually barked, unless he's "frightfully careful," as they might say. Unlike the Jeep, which uses side curtains, this number has sliding glass windows which aren't exactly the answer to a foot-weary maiden's prayer, either.

Despite its faults, this is still one of the world's truly remarkable pieces of transportation. In all fairness to the boys in Toledo, there's very little it can do that the Jeep can't do. The seats are slightly softer but, then, the standard Jeep seat must have been designed by one of the great-grandsons of the Spanish Inquisition torture specialists. I remember when I bought my Jeep I was ready to sell it after less than 100 miles until we located a couple of English leather bucket seats, which are in it today. Anyhow, back to the test.

Our tests were made over rugged hills, mountain trails and streams in Bucks County, Pennsylvania. Our personal safari consisted of Kelvin Fowler, the Rover factory man, and McCahill in the Land Rover, and Jim McMichael and Bill Haworth following behind in my Jeep with various lengths of chain for yanking the Rover out if we should find a spot tough enough to hang it up. Good old Bill told me it would be "impossible to hang the Rover up in a place as mild as Bucks County." We have put this statement away in our "You can't do this to me" file.

WANTED: Contributions to this newsletter. Anything of interest to Land Rover owners will be considered. Photos are welcomed. Send your contribution to:

THE ALUMINIUM WORKHORSE  
8176 Villa Oak Drive  
Citrus Heights, CA 95610

At the end of a long, wooded trail there is a bulldozer-made tank trap constructed by some selfish landowner who apparently didn't want anyone to use the trail. This guy wasn't thinking of such cars as the Land Rover or Jeep but undoubtedly of passenger cars. Nevertheless, a few minutes after we started over the trap the Rover was resting on its belly with all four wheels flailing and nothing happening. It was stuck but good. Despite the embarrassment of the situation, the Jeep was brought up, chains were attached and the Rover was yanked back into the lap of civilization once again. Having established that this was not an un-stumpable vehicle, the tank trap was then approached from several different angles (meaning attacked on the bias) and was finally conquered. After this, we headed for the stream.

For a long time we traveled up the river bed with steep cliffs on each side, trying to dodge deep water holes. This terrain was as primitive as you can find in the eastern states. At one spot where we stopped, huge schools of six to 12-inch-long trout eyed us curiously and without fear from no more than six feet away in a spot where probably no line has ever been dropped—certainly not from a car. This river-cut gorge, I feel safe in stating, had never before been invaded by any vehicle, including a horse and buggy. All this was within 70 miles of New York.

At one spot, when trying to square off to climb a bank, my left rear wheel hit an almost bottomless hole. In less time than it takes a pauper to count his money, I had several inches of water over the floorboard of the cab—which is why I made the earlier statement that a Land Rover won't float for sour apples. For a moment it looked as if the only course was to desert ship. But the engine was still going, so I shot the throttle down and the front wheels (it was in four-wheel drive) pulled us out and through.

Once on dry land again we took her along trails leading through a deep woods and finally ended up in my own fields where I have a dry, steep-sided gulch only about 12 feet wide. We tried slamming the Rover down one bank and up the other. On one of these quick passages, with Hawthorth at the wheel (after some egging-on by McMichael and myself), it looked for a moment as if the Land Rover was going to flip over backward, but it didn't.

In summing up, the Land Rover is a great vehicle that could be made even greater with the help of a Comfort Engineer. It'll do anything a Jeep will do. It is better-built and has more carrying capacity and general room. I don't think it will do anything the Jeep won't do—at least I couldn't find anything. The test car had a top speed of about 70 mph, although any speed above 55 mph, even on turnpike-type roads, raises the discomfort index considerably and conversation must be carried on at full shout. At 50 mph it is docile and comfortable.

The Land Rover is a class vehicle from one end to the other, made by one of the most highly-respected companies in the entire industry. The regular Rover car we tested some years ago has been known to real automobile connoisseurs for years as "The Poor Man's Rolls-Royce." By the same token, this Land Rover might be classified as "A Rich Man's Jeep." I'd personally like to own the big station wagon with the adjustable driver's seat for field trial work and hunting, as the dogs would be a lot more comfortable and I could carry a lot more of them to training sessions. In a few words, this car is capable, gummy and as rugged as a cement casket.

*Mechanix Illustrated*

## WELCOME ABOARD !

### NEW MEMBERS

- #1 Steve and Janet Hill, Sacramento '73 88"
- #2 Jim and Carrie Allen, Citrus Heights '69 88"
- #3 Steve and Jean Zedekar, Sacramento '64 88"
- #4 Bill and Jean McClintock, San Francisco '73 88"
- #5 Charles Kellogg, Olympia, Washington '64 109"+ too many to list
- #6 Kerry and Tammy Oldham, West Valley City, Utah '71 88"

Members are assigned consecutive numbers as they join. Join now and get a low number!



## ENGINE TUNE-UPS (Part I)

### A Professional Approach

A professional mechanic works against the clock. He must complete his work in a reasonable amount of time and go on to his next job. At the same time, he must do the work correctly, the first time. To achieve this, the true professional never loses his cool and is always thinking a step or two ahead. Before he picks up a wrench, he has thought out the job and devised an order so that one operation leads to another until the job is done.

Anyone who works on his own Land Rover, or wants to start, can benefit by adopting a professional approach. The rewards can be many, not the least of which is the elimination of much of the "aggravation factor" when working on your vehicle. Granted, problems will come up but with the right attitude towards working on your Land Rover, any problem can be overcome with a minimum of irritation.

### Keep It Safe

Working around running engines is more than sufficient cause to always know where your hands are going. Keep loose tools around the engine compartment to a minimum. Knocked into the fan, they can become formidable projectiles. Before starting, always be sure the vehicle is in neutral and the parking brake applied. Any spilled fuel should be immediately cleaned up and the area ventilated. These are all common sense items that you probably already know, but bear repeating. There are quite a lot of mechanics (and ex-mechanics) missing fingers, toes, and eyes who too knew the rules, but in an instant of forgetfulness, had an accident.

### Operation #1 Remove the Spark Plugs

This is a simple operation. Take a look at those plugs as you pull them out. They can tell an important story about your engine's operating condition.

Use this chart  
to "read"  
your spark plugs

<b>NORMAL:</b>	Grey-brown in color. On plugs nearing the end of useful life, electrodes may be worn and appear rounded. Gap will increase approximately .001 per 1000 miles. Some deposits OK after lots of miles on the plugs, especially on older engines.
<b>OVERHEATED:</b>	Due to lean mixtures, over-advanced ignition timing, or heat range of spark plug too hot. Electrodes will have a blistered or glazed appearance. Porcelain core nose may be extremely white in color and may be damaged due to pinging in the case of advanced timing. Plugs in the conditions described above should not be reused.
<b>RICH CONDITION:</b>	Plug may be sooty black or wet with gas. Usually caused by over rich fuel mixtures but may look the same if some sort of ignition failure has occurred on that particular cylinder. In mild cases, the electrodes may appear normal, but the core nose and outer edges will be black.
<b>OIL FOULED:</b>	In mild cases, this is apparent by brown deposits covering the electrodes. In more severe cases, the plug may be wet and oily.

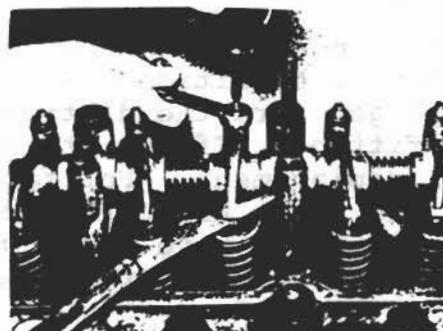
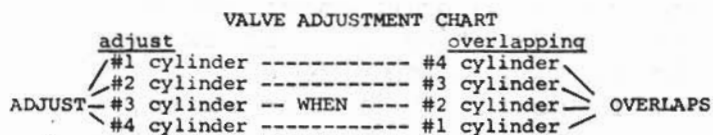
## Operation #2 Valve Adjustment and Compression Test

This sounds more difficult than it really is. If you've had problems using the methods most commonly printed, pay special attention to this section.

The primary reason to run the valve clearances at this particular time is to make the compression test as accurate as possible. A valve with too little clearance can lower the compression readings. Also, with the spark plugs removed, the engine is much easier to turn by hand. To turn the engine, use your hand crank; using the cooling fan works just as well. If you use the fan, you may have to push down on the belt if the fan pulley slips. Another method for turning an engine over (also the least convenient) is to slip the vehicle into third or fourth gear, release the brake and move the whole vehicle. The engine will turn according to how far you move the vehicle.

The first step in adjusting valve clearances is to remove the valve cover. This is a simple operation, though a few words on gaskets are in order. DO NOT reuse an old, cork gasket. Cork deteriorates rapidly and is not a safe bet the second time around - even if it looks decent. If you can, buy the neoprene type. They can be reused many times, and are less likely to be a problem. After scraping the old gasket from the cover, glue the new one to the valve cover. Do this before you adjust the valves to allow the glue time to dry. Use contact cement. (Both Fel Pro and 3M make a gasket adhesive that works well). Don't leave any pieces of the old gasket in the valve cover or on the head. They could cause severe engine problems if they found their way into the wrong places. Don't forget to take a look at the rubber grommets at the top of the cover. They may weep oil if badly deteriorated. A little silicone sealer on them will assure no leaks.

Probably the toughest part of this operation is getting the engine in the right position to adjust them. The idea is to get each cylinder at TOP DEAD CENTER on the compression stroke, and then make the adjustments. The easiest way to do this is by watching the movements of the rocker arms. Say you want to adjust the valves on #1 cylinder. To get #1 on TDC (top dead center) you need to watch the rockers on #4 cylinder as you rotate the engine clockwise. #4 is opposite #1 in the firing order (1-3-4-2). When you notice the exhaust valve on #4 coming up, watch closely. Just before the rocker on the #4 exhaust valve comes fully up, you will notice the intake begin to go down. STOP. Where the two meet in their travel is where you want to stop and adjust the valves on the opposite cylinder. To continue, move the engine one complete turn clockwise and you'll notice the valves on #2 cyl "overlapping". Stop and adjust the valves on #3 cyl. Simply carry on according to the firing order (above) until the operation is complete. Once you get the hang of it, it won't be necessary to start on #1. You will be able to pick up the right valves just by watching for the overlap.



Sometimes getting the clearance correct can be a problem, so a short discussion might be in order on this topic. Once you are set up to make the adjustments, run a .010 feeler gauge between the tip of the valve and the rocker arm. It should just slide through with some resistance. If the clearance is too small, it will be difficult or impossible to get the gauge between the valve and the rocker. If the clearance is too great, of course, the gauge will slide around easily. One wasy way to tell if the clearance is correct, is to insert the gauge and try to move the rocker. If any movement is felt, the clearance will have to be adjusted.

### Operation #3 Running the Compression Test

This test gives an indication of your engine's overall condition and should be done regularly. As stated earlier, the valves should already be adjusted prior to running this test.

There are two types of compression gauges commonly available. One is a screw-in type and one a push-on type. The first type is generally more accurate, but more expensive. The push-in type is a little more difficult to use as it must be held tight in the spark plug hole while the engine is cranked.

To actually perform the test, make sure the Rover is in neutral, then insert the gauge (in the spark plug hole) and crank the engine over with the starter until the gauge has stopped climbing. Record the reading and proceed to the next cylinder. Generally, if the readings are within ten pounds of each other, they are considered "perfect". Any cylinder that reads greatly different from the rest should be suspected of trouble. Service manuals show that 145 psi is a normal reading for a Land Rover engine with the 7.1 compression ratio. Readings lower than this, as long as they are fairly even, aren't necessarily cause for concern as long as it runs well and oil consumption is reasonable. "Reasonable" oil consumption is difficult to define and is subject to many differing opinions. Based on the author's experience, a Land Rover engine that uses more than a quart of oil per 600 miles should be looked at suspiciously. If compression is good, but oil consumption is high, valve guides or valve stem seals are a likely cause.

### Operation #4 Distributor Service & Inspection

This can generally be done with the distributor installed. There are some problems that might necessitate removing the distributor to correct. We will discuss service procedure with the distributor still in the vehicle first, then proceed to the out-of-the-vehicle repairs.

#### Plug Wires

Before removing the cap, look at your spark plug wires. Are the wires in good condition externally? Do the plug boots fit tightly on the plugs? Are the distributor end boots in good condition and tightly fitting? If not, this is a good indication that it is past time for replacement. For further checking, you must determine whether the wires are carbon core or wire core. Wire core wires, as the name implies, have metal wire through the center to conduct the electricity. Carbon core have a black string of carbon running through



the center. Pull back the boots on either end of the wire and look near the metal connector to determine which type you have.

To check carbon core, you must use an ohm meter set on the 1000 ohm scale. Connect the leads of the ohm meter to each end of the wire and measure the resistance on the 1000 ohm scale. A rule of thumb when measuring carbon core is that they should measure close to 2000 ohms per foot. An infinity reading usually means the wire is broken somewhere inside the insulation. A very high reading means that the core is breaking down and causing high resistance.

Wire core wires are much easier to check. The wire in the core almost never breaks. Usually, the insulation rots away from the wire. If there is some doubt, they can be checked with an ohm meter, and will show a "zero" or close to zero reading on the 1000 ohm scale. The most important thing to remember about wire core wires is to ALWAYS USE RESISTOR SPARK PLUGS. For ignition system efficiency there must be some resistance in the secondary wiring. (Secondary wiring is the plug and coil wires; Primary is the small wire to the points from the coil). A good analogy to explain why secondary resistance is necessary is to use a water hose as an example. With no obstruction at the end of a hose the water flows with little velocity. If you put your thumb over the end, you'll notice a remarkable increase in velocity. Resistance in the plug wires (or in the plugs themselves) forces the coil to produce much greater voltage to overcome it. This results in a much hotter spark at the plug.

#### ROTOR AND CAP

These can be checked visually and with an ohm meter. First, look inside the cap and check for any cracks. If any are evident, toss that cap in the trash! Any dust or foreign matter should be cleaned out with electrical cleaner or blown out with air. Hot soapy water works well if the cap is carefully dried afterwards.

Look at the center electrode. If it is chipped or eroded, replace the cap. Also take a gander at the other four electrodes. They will look corroded to a degree and this is natural. This occurs because the spark has to jump from the rotor tip to the electrodes; they don't actually touch each other. When they look badly eroded and caked with white powder, it is time for a new cap. Under NO circumstances should you scrape the electrodes. All you will succeed in doing is to increase the rotor gap and cause more arcing to occur, usually with destructive results to the cap & rotor.


Sometimes a cap will have a break between the contact inside the cap and the one outside. To check, use your ohm meter, on the 10 ohm scale, and connect one end to the inside contact, and one to the outside contact (using a probe). There should be almost no resistance. If there is high resistance or an infinity reading, replace the cap.

Checking rotors is easy. Look for cracks, and at the rotor tip. The rotor tip will look somewhat pitted normally, but again, if it is badly eroded, replace it. The same rules apply with regard to scraping as with the cap. Check the top contact of the rotor (where the carbon button in the cap touches it) for abnormal wear or pitting.

Here's a little trick to remember when troubleshooting a no spark condition. If you have spark from the coil wire, but none from the plug wire, be sure to check the rotor for cracks. Sometimes, the rotor will crack inside and will ground to the shaft of the distributor. It's usually very easy to see by pulling the rotor and looking inside.

continued next issue

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