

INSTALLING THE MODEL SS ROAMERDRIVE



**FOR
SERIES I, II AND III
LAND ROVERS**

**GLOBAL ROAMER CORPORATION
3396 Marine Drive,
West Vancouver V7V 1M9
CANADA
Tel 604 925 1260
info@roamerdrive.com
www.roamerdrive.com**

INSTALLATION TIME

A typical installation time is two to three hours to install this overdrive on a Series Land Rover.

**BEFORE YOU DO IT
YOUR WAY PLEASE
TRY IT OUR WAY**

October 2016

1 ROAMERDRIVE MODEL SS

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APPLICATION INFORMATION

Thank you for buying a ROAMERDRIVE model SS. This overdrive will fit Land Rover Series models with four cylinder engines. With minor linkage modification it will fit Series models with six cylinder engines and early 90 and 110 models with four cylinder engines.

The SS overdrive will not fit any Land Rover models with eight cylinder engines.

3

REMOVING FILLER PLUG and DRAINING THE USED OIL



Remove the centre front seat in the Land Rover and take out the access panel above the transfer case. Remove the filler plug from the aft side of the transfer case and drain the oil by removing the brass plug in the bottom. If you have any leaks in the bottom cover plate repair the leaks before installing the ROAMERDRIVE. (See 19)

2

TOOLS AND LUBRICANT REQUIRED

Check the contents of the box against the parts list and organise some tools. You will need a 1/2" torque wrench, sockets, flat spanners, a 2" (50mm) hole saw, an electric drill, a small funnel and a Land Rover starting handle. Three litres of 75-90 oil are required (See attached oils list)

WARNING

DO NOT USE API GL5 or GL4-5 HYPOID OIL!
Oils rated GL5 are manufactured to function in modern differentials and may contain additives that will corrode bronze components in the overdrive and transfer case.

To clarify information, some of the illustrations in these instructions are of a unit being installed on a gearbox not fitted to a vehicle.
Please read complete instructions before starting work.

4

INSTALLING DIP STICK ELBOW.



Start by installing the dipstick bushing and elbow. Separate the dipstick tube from the brass elbow and screw the elbow into the filler plug orifice using a sealer such as 'Permatex'. Stop when the elbow is tight and pointing up towards the lay shaft immediately above it.

5

INSTALLING DIP STICK TUBE TO ELBOW



Attach the dip stick tube to the elbow and tighten firmly. Note that the tube passes over the nut securing the end of the lay shaft. The speedometer cable passes between the dip stick tube and the aft side of the transfer case.

6

REMOVING TOP and AFT COVERS



Remove the six nuts holding the round PTO cover and the four nuts holding down the transfer case top cover. Both covers can be stored as they are no longer required. The four nuts and washers for the top cover will be re-used and the four studs are left in place. The six studs that held the aft cover must be removed. A vise-grip can be used for this purpose or two nuts locked together.

Carefully clean all old gasket material from the exposed surfaces.

7

REMOVING MAIN SHAFT GEAR



Put the transfer case and gearbox both in neutral. Rotate the gear to find the locking tab retaining a castellated nut on the gearbox main shaft. Using a brass drift through the PTO aperture bend up this locking tab and tap on the castellation. (Or use a special tool) to remove the nut (R.H. Thread).

Now withdraw the gear and two washers through the PTO aperture. Check the disc shaped oil flinger located on the shaft. The face of the oil flinger should be inside the inner surface of the transfer case. The flinger disc can be tapped into position using a metal tube or drift if required.

Take care not to drop any parts into the transfer case!

8

PREPARING MAIN COUPLING



Slide the splined coupling out from within the gear end of the ROAMERDRIVE. Check that the three set screws on the periphery of the coupling are sitting flush with the outer surface. Remove the hexagon nut from within the coupling.

Now tap the coupling (roller end first) onto the gearbox main shaft until it is possible (using the 1-1/16 deep socket provided) to screw the hexagon nut onto the main shaft thread.

Make sure the nut is not cross threaded before tightening!

9 PREVENTING THE MAIN SHAFT FROM ROTATING

In order to tighten the nut on the main shaft it is necessary to prevent the shaft turning.



To do this engage first gear, insert the hand crank into the engine, and block it to stop rotation. The nut can now be tightened to a torque of 110 lb/ft (135N/m).

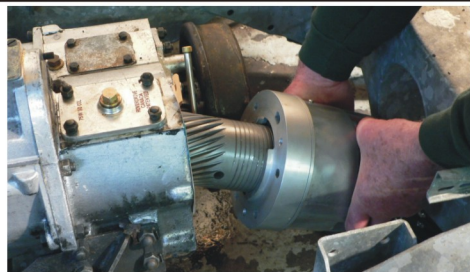
Once the main nut is tight, lock it by tightening the three socket screws shown in Figure 8

Tighten each socket screw alternately several times. Do not tighten one screw completely before tightening the others as this will push the coupling off centre.

REMOVE THE HAND CRANK AFTER THIS USE!

11 MOUNTING THE OVERDRIVE

Working from below the vehicle rotate the housing so the selector rod is at bottom. Raise the nose gear up into the transfer case and insert.



Now rotate the casting so the 'GLOBAL ROAMER' badge is uppermost. It may be necessary to rotate the gears so the input spline engages. If the overdrive does not slide completely home check that there is no interference with the transfer case lay shaft or the speedometer cable. Make sure that the paper gasket is not damaged and is correctly aligned with the holes for the mounting bolts. Now fit the six mounting bolts. Lubricate the sealing 'O' rings under the heads and torque to 25 lb/ft (34 N/m).

On some early transfer cases the holes may not be tapped deep enough and a 3/8-16 UNC tap may be required to clean the holes, or the bolts shortened slightly. Remedy this condition or you may shear off a bolt in the transfer case.

10

FITTING TOP COVER AND ROUND GASKET

FILLER PLUG
HERE

RE-USE NUTS
AND WASHERS

GASKET



Using the rectangular gasket provided, secure the new aluminum top cover in position using a gasket sealant. Fit the new hexagon socket filler plug.

Grease both sides of the new round gasket and place it in position on the round PTO opening. Note the correct orientation stamped on gasket.

On pre-1964 models with stubby hand brakes and left hand steering, the overdrive housing may interfere with the handbrake cross shaft. This shaft can be bent upwards slightly to give clearance.

12 DRILLING HOLE FOR SHIFT LEVER

The lever 'L' bracket can now be fitted using the new 5/16 bolts provided.

Remove the gearbox tunnel mat and using an electric drill make a 1/4 inch (6mm) **HORIZONTAL** hole through the right hand side of the transmission tunnel that penetrates into the transmission tunnel **EXACTLY** along the axis of the threaded hole in the side of the L bracket. It may require drilling several holes to get the position correct. Once you are satisfied that your hole is concentric and horizontal to the hole in the 'L' bracket, enlarge it to two inches (50mm) using the hole saw.

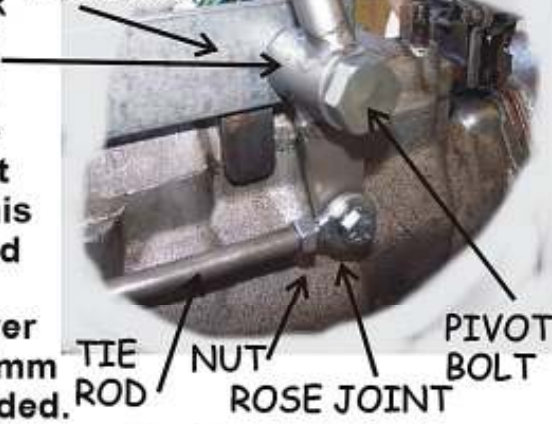
Deburr the sharp edges. On six cylinder models and four cylinder early 90s and 110s the 'L' bracket must be extended forward by about two inches (50mm). Any competent welder can perform this task.



13 SHIFT LEVER

LEVER BOSS

'L' BRACKET



Assemble the rose joints with locking nuts into the ends of the tie rod. Do not tighten the lock nuts at this time. Place assembled rod inside the transmission tunnel and connect to lever boss using the 8mm x 25mm bolt and nylock nut provided.

This can be accomplished by working just outside the new hole. Note that the rose joint is secured to the outside of the lever boss. The lever can now be secured in the boss. Wiggle the lever boss into position and tighten the hexagonal pivot bolt into the 'L' bracket. In practice, the tunnel cover obscures the linkage - all you will see in the cab is the end of the lever boss, the hand lever and the head of the pivot bolt.

14 AFT END OF TIE ROD FITTING



Secure the aft rose joint to the selector shaft. The bolt is an 8mm x 40mm and a spacer plus washers are used between the rose joint and the selector shaft. You can adjust the position of the shift lever by adjusting the aft tie rod end in and out of the tie bar. Do not attempt to adjust the forward rod end as it is difficult to reach the forward lock nut which must be kept tight. Move the lever back and forth to make sure that the linkage moves freely without contacting the gearbox housing, bodywork or tunnel cover screws. The pressure of the dedent mechanism can be adjusted by adding or removing spacer washers from the top of the dedent spring located under the rectangular block.

15 FILLING WITH OIL

Fill the transfer case with oil (+/- 3 Litres) through the hole in the top. Stop when oil is visible on the tip of the dipstick. Now add an additional 1/2 Litre into the ROAMERDRIVE itself using the socket plug under the tie rod in the side of the casing.



Transfer case oil should be changed at intervals specified by the vehicle manufacturer. A drain plug is provided in the ROAMERDRIVE in order to empty the housing. Refill the system as described above. Standard API 75-90 GL4 gear oil will work perfectly in your overdrive and this stickier oil will generally give quieter performance. If you have installed a more powerful engine or are using the vehicle for fast driving in tropical climates a synthetic API GL4 oil will run cooler but may be noisier especially if there is wear in the transfer case.

16 LEVER AND SEAL

The rubber dust seal fits around the lever boss and is held in place by the stainless steel ring and three self tapping screws.

Before drilling holes for the screws, position the ring so the tips of the screws do not contact the mechanism inside the tunnel cover.



Before using the overdrive make sure that no part of the lever, 'L' bracket or tie rod contacts any part of the Land Rover bodywork, panels, screws etc. Such contact will cause noise and vibration in the cab. The upper RH screw that holds the tunnel cover may need to be shortened. In some installations you may have to bend or twist the 'L' bracket to get comfortable bodywork clearance.

17

USING YOUR OVERDRIVE

When the lever is positioned aft the ROAMERDRIVE is disengaged. To engage the unit depress the clutch and move the lever forward. To disengage the unit depress the clutch and move the lever aft. Do not move the lever without depressing the clutch.

The ROAMERDRIVE is most useful for highway driving in fourth gear at over 50 mph (80 kph). The overdrive drops engine RPM by 28% under motorway conditions. It can also be employed in any other gear and is often used in third gear as it provides a splitter gear on long hills with a ratio between normal third and normal fourth.

This contributes to improved fuel consumption, less wear and tear on the drive train and a significant reduction of noise in the cab of the Land Rover. Conversation is possible at high speed!

The unit can also be engaged in low range and this can be useful in desert conditions to gain momentum between sand dunes without having to shift to high range.

19

A USEFUL ACCESSORY

The black steel sump covers used on the Series Land Rover transfer case often leak due to differential expansion between the steel of the cover and the aluminum body of the transfer case.

To solve this problem we supply a new billet cast aluminum cover stiffened with cooling fins that replaces the steel cover.

The kit includes mounting screws and a new gasket. This product completely eliminates leaks as it expands and contracts at the same rate as the transfer case. The cover also improves oil cooling which is very useful in tropical areas or where higher horsepower engines are used. The part can be ordered from any Global Roamer dealer or direct from the factory. The cover kit part number is SX-COV. A new brass plug and copper washer kit can also be ordered. Part number is SX-COV-PLUG.



PART SX-COV

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MAINTENANCE

Change the transfer case oil after the first 4000 Km. Check for overdrive and transfer case leaks. Check torque on mounting bolts.

This is a very user friendly product. The internal syncromesh components (the only parts subject to long term wear) are standard Land Rover spare parts available anywhere. All ball bearings are common industrial types. Nearly 3000 ROAMERDRIVES are in use and very few have ever required service.

Many ROAMERDRIVES are used in expedition service and we are often asked what spares should be carried. Our answer is 'none' other than an 'O' ring and gasket kit. Prudence suggests you also carry your original output gear, cover and hardware to fit should the need arise.

Two things that can seriously damage this overdrive are running it with insufficient oil in the transfer case and using API GL5 or API GL4-5 hypoid axle oil instead of the required API 75-90 GL4 MTF oil.

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WARRANTY

If you have a late model Series III (With Metric fastenings) you must order SX-COV-PLUG with SX-COV as your existing plug will not fit the cover.

Your GLOBAL ROAMER OVERDRIVE is warranted for one year from date of purchase. Please retain your proof of purchase for warranty purposes.

We will repair or replace (at our discretion) any overdrive that malfunctions during the warranty period. The warranty does not cover the costs of transporting the overdrive nor does it cover any other costs incurred relating to the installation.

Note that the warranty will be invalid if the overdrive is damaged by overheating when installed on a non-standard engine. We will also not warrant an overdrive that has been returned to us with damage caused by use with insufficient or improper oil.

In the event of a warranty claim you must contact us to state your claim. Quote overdrive serial number in correspondence. We will issue you with a claim number to enable you to return the unit. We will not accept overdrive units shipped without prior authorization.

OILS FOR USE IN ROAMERDRIVE OVERDRIVES

The correct oil to use in your transfer case is an API GL4 75-90 as specified in the installation manual packaged with your Roamerdrive. The following is a list of suitable oils. Not all oils are found in every country.

For most applications a standard GL4 oil is suitable and inexpensive. Synthetic GL4 oils are best if you have a high-powered non-standard engine.

API-GL4 OILS SUITABLE FOR USE IN ROAMERDRIVES

AMSOL	Amsol Gearlube 75-90 GL4
BARDAHL	Gear oil GL4 90 (Europe)
CALTEX	Caltex Thubon GL4
CASTROL	Castrol 80 EP4 gear oil, Castrol SMX gear oil Castrol Syntrax FE75WGL4, Castrol Syntrax Multivehicle 75-90 GL4
CHAMPION	Champion gear oil 75-90 GL4
ESSO	Esso gear oil GP90 GL4
FUCHS	Titan Supergear 75w85 GL4
GEARTEX	Geartex S475-90
GULF PETROLIUM	GulfGear SAE 80-90 EP GL4
MILLER	EP Gear Oil 80w90GL4
MOBIL	Mobilube GX-A 80w GL4
MORRIS	75-90 GL4 (U.K.)
MOTROL	Motorol EP80 GL4
PENZOIL	Penzoil EP Gear Lubricant 90 GL4
P.M. LUBRICANTS	PM103, PM104 (AUSTRALIA)
RED LINE	Red Line MT90GL4
SHELL	Spirilax S3 GL4 Gear Oil
STALUBE	SL24239 (U.S.A.)
RED LINE	Redline MTL70w80GL4
TEXACO	Texaco MTF94
TOTAL	Total EP80w85 Total EPw90 Total EPFE 80w90
UNIPART	Unipart MTF94
VALVOLENE	Valvolene Duragear 75-85 GL4

WARNING

IT IS IMPORTANT TO NOTE THAT ANY OIL WHICH MEETS API-GL-5 SPECIFICATION SHOULD NOT BE USED IN THE ROAMERDRIVE.

API-GL5 oils are formulated specifically for hypoid axles not gearboxes and are often laced with chemicals that are corrosive to copper based alloys. Use of these oils may cause corrosion that will shorten the life of the overdrive and void the warranty.

Do not become a victim of a salesperson who tells you a GL5 oil is better than a GL4. This may be the case in an axle but is not the case in a gearbox or overdrive application.

1	RETAINING RING	P	SX01	1
2	NEEDLE ROLLER	P	SX02	1
3	GRUB SCREW	P	SX03	3
4	INPUT COUPLING	M	SX04	1
5	OUTPUT SHAFT	M	SX05	1
6	BUSHING	P	SX06	1
7	PLANET CARRIER	M	SX07	1
8	NEEDLE ROLLER	P	SXJ08	1
9	RETAINING RING	P	SXJ09	1
10	RETAINING RING	P	SXJ10	1
11	FRONT COVER	M	SSDS11	1
12	BALL BEARING	P	SXJ12	1
13	NAME PLATE	M	SXJ13	1
14	DRIVE SCREW	P	SXJ14	2
15	O RING	P	SXJ15	1
16	PLANET GEAR	M	SXJ16	3
17A	PLANET SHAFT	M	SXJ17A	6
17B	PLANET ROLLER	P	SXJ17B	12
17C	ROLLER SPACER	P	SXJ17C	3
17D	THRUST WASHER	P	SXJ17D	6
17E	DOG WASHER	P	SSDS17E	6
18	RETAINING RING	P	SXJ18	1
19	ANNULUS GEAR	P	SXJ19	1
20	RETAINING RING	P	SXJ20	1
21	BALL BEARING	P	SXJ21	1
22	MOUNTING GASKET	P	SX22	1
23	FILLER PLUG	P	SXJ23	1
24	BAULK RING	M	SXJ24	1
25	COPPER WASHER	P	SX25	1
26	SELECTOR FORK	M	SSDS26	1
27	SYNCHROMESH	P	SXJ27	1
28	SYNCO CONE	M	SXJ28	2
29	SEAL RETAINER	M	SSDS29	1
30	STEP DOWEL	M	SSDS30	3
31	LOCK WASHER 4 MM	P	SSDS31	3
32	SELECTOR SHAFT	M	SSDS32	1
33	O RING	P	SXJ33	1
34	S.H. SCREW	P	SXJ34	2
35	DEDENT SLEEVE	P	SXJ35	1
37	DEDENT SPRING	P	SXJ37	1
38	DEDENT BALL	P	SXJ38	1
39	NUT	M	SXJ39	1
40	SUN SHAFT	M	SSDS40	1
41	CSK SCREW 3/8 N.F. X 1	P	SXJ41	1
42	REAR COVER	M	SSDS42	1
43	BALL BEARING	P	SSDS43	1
44	SHCS 4mm x 10	P	SSDS44	3
45	SHIFT KNOB	M	SXJ45	1
46	LOCK NUT	M	SXJ46	1
47	LEVER	M	SX47	1
48	L BRACKET	M	SX48	1
49	HINGE BOLT	M	SX49	1
50	NYLON BUSH	P	SX50	2
51	BOLT	P	SX51	2
52	WASHER	P	SX52	2
53	NUT	P	SX53	2
54	TIE ROD	M	SXJ54	1
55	LOCKNUT	P	SXJ55	1
56	ROSE JOINT	P	SXJ56	2
57	BOLT	P	SXJ57	1
58	LOCK NUT	P	SXJ58	2
59	SPACER	M	SXJ59	1
60	BOLT	P	SXJ60	1
61	RETAINING RING	P	SXJ61	2
62	DIP STICK KNOB	P	SX62	1
63	INSTALL BOOK	M	DS63	1
64	DOWEL	P	SXJ64	3
65	BOLT	M	SX65	6
66	O RING	P	SXJ66	7
67	S.H. CAP SCREW	M	SXJ67	12
68	DOWEL 1/4 INCH	P	SXJ68	3
69	DIPSTICK	M	SX69	1
70	DIPSTICK TUBE	M	SX70	1
71	ELBOW FITTING	M	SX71	1
72	COUPLING NUT	P	SX72	1
73	LEVER TRIM RING	M	SX73	1
74	SELF TAP SCREW	P	SX74	3
75	LEVER BOOT	M	SX75	1
76	BUSHING	P	SX76	1
77	COVER PLATE	P	SX77	1
78	FILLER PLUG	P	SX78	1
79	GASKET	P	SX80	1
81	SHIFT LEVER BOSS	M	SX81	1
82	DIP STICK O RING	P	SX82	1
83	5MM SET SCREW	P	SXJ83	3
84	SPACER WASHER	M	SXJ84	2
85	SHIPPING BOX WOOD	M	SXJ85	1
85B	SHIPPING CARTON	M	SXJ86	1
87	5/16 HEX ALLEN KEY	P	SX87	1
88	5/32 HEX ALLEN KEY	P	SX88	1
89	27MM SOCKET WRENCH	P	SX89	1
90	LOCK NUT	P	SX90	1
93	SECURING NUT	P	SXJ93	1
94	SECURING BOLT	P	SXJ94	1
95	SECURING TUBE	P	SXJ95	1
96	SHCS M5 X 45	P	SXJ96	3
97	1/16 NPT PLUG	P	SXJ97	1

* NOT SHOWN ON PRINT

