

# INSTALLING THE MODEL SS ROAMERDRIVE



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

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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.** Check our alternative models.

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## INSTALLATION TIME

It takes about two hours to install this overdrive on a Land Rover.

## TOOLS AND LUBRICANT REQUIRED

Check the contents of the box against the parts list and organise some tools. You will need a torque wrench, sockets, flat spanners, a 2" (50mm) hole saw, an electric drill, with drills, a small funnel and a Rover starting handle. and three litres of 75-90 API-GL4 MTF gear oil.

### WARNING

**DO NOT USE API GL5 or GL4-5 HYPOID OIL!**

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.**

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## 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 )

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## INSTALLING DIP STICK ELBOW.

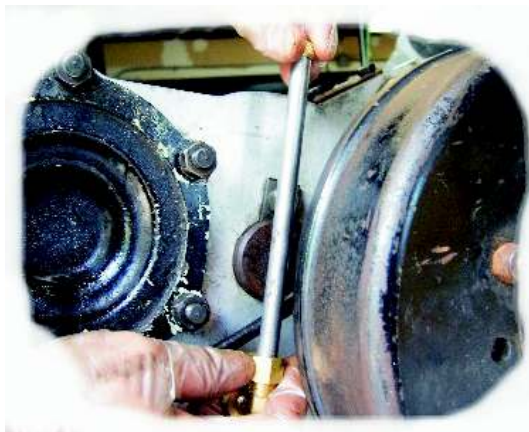


Start by installing the dipstick bushing and elbow.

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.

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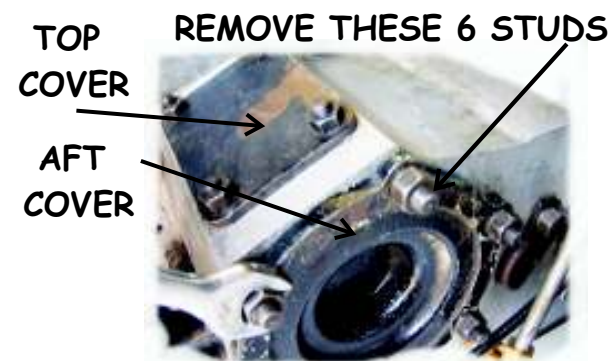
### INSTALLING DIP STICK TUBE TO ELBOW



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.

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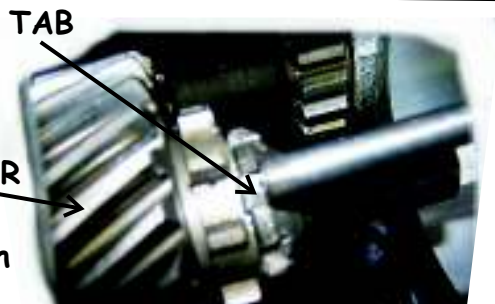
### REMOVING TOP and AFT COVERS



Remove the six nuts holding the round PTO cover and the four nuts holding down the transfer case top cover. Remove these covers and store 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.**

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### REMOVING MAIN SHAFT GEAR



Put the gearbox and transfer case both in neutral. Rotate the visible 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 castellations 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! Save all old parts for possible refit in future.**

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### PREPARING MAIN COUPLING



Slide the splined coupling out from within the gear end of the ROAMERDRIVE. Check that the (2 or 3) socket 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 mainshaft until it is possible (using the 1-1/16 deep socket provided) to screw the hexagon nut onto the mainshaft 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 has been torqued, lock it by tightening the (2 or 3) 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.

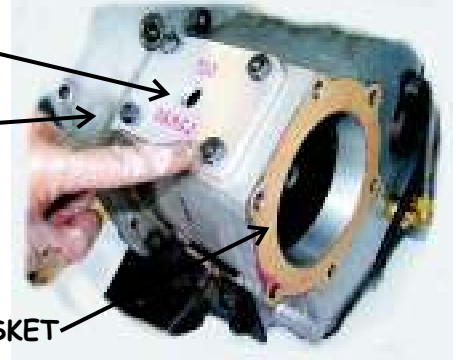
10

FILLER PLUG  
HERE

RE-USE NUTS  
AND WASHERS

## REPLACING TOP COVER

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! On SI and SII Left hand steering models the overdrive body may touch the handbrake cross shaft. This shaft can be bent upwards slightly to give clearance.

## 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 layshaft 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 18 lb/ft (34 N/m).



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## 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.

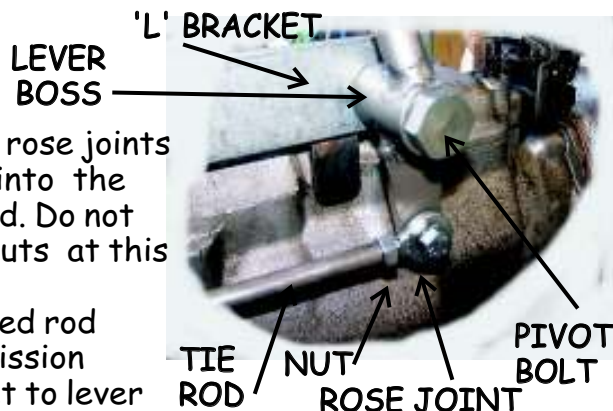
On six cylinder models and four cylinder early 90s and 110s the 'L' bracket must be extended forward by about two inches (50mm). Any competent welder can perform this task.



### 13 SHIFT LEVER

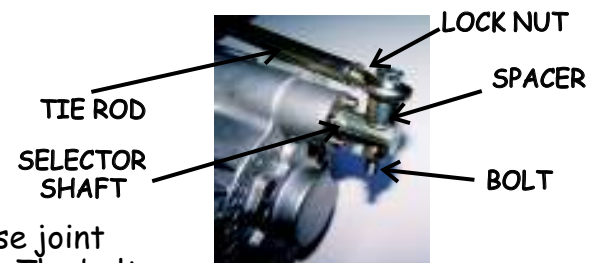
Assemble the rose joints with locking nuts into the ends of the tie rod. Do not tighten the lock nuts at this time.

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 or bodywork. 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 the oil is visible on the tip of the dipstick. Now add an additional 1/2 Litre into the ROVERDRIVE itself using the socket plug in 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.

**If you have installed a more powerful engine such as a 200TDI or are using the vehicle for fast driving in tropical climates we recommend using a synthetic oil API GL4 oil such as CASTROL SYNTRANS 75-90 MULTIVEHICLE APIGL- 4 MTF**

### 16 LEVER AND DUST SEAL

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

Before drilling holes for the screws, position the ring so the screws will 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. Some adjustment can also be made to the 'L' bracket as the holes mounting the bracket to the gearbox are elongated. In some installations you may have to bend or twist the 'L' bracket to get comfortable bodywork clearance.

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## 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 OVERDRIVE can be employed in any gear but it is most useful in third and fourth. Used in third gear it provides a splitter gear on long hills with a ratio between normal third and normal fourth. In fourth gear at over 50 mph (80 kph) the 28% overdrive gear drops engine RPM when cruising on highways. 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.

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## MAINTENANCE

Change the transfer case oil after the first 4000 Km **75w-90 API GL4 Manual transmission fluid oil should be used.** 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 2000 ROAMERDRIVES are in use and very few have ever required service. **The two things that can seriously damage this overdrive are running it with insufficient oil in the transfer case and using API GL4 or GL5 Hypoid axle oil instead of a GL4 Manual Transmission Oil.**

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.

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## A USEFUL ACCESSORY

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

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



**PART SX-COV**

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 SX-COV-PLUG.

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## WARRANTY

To enable us to serve you better please complete the warranty card and mail (or eMail) it to us.

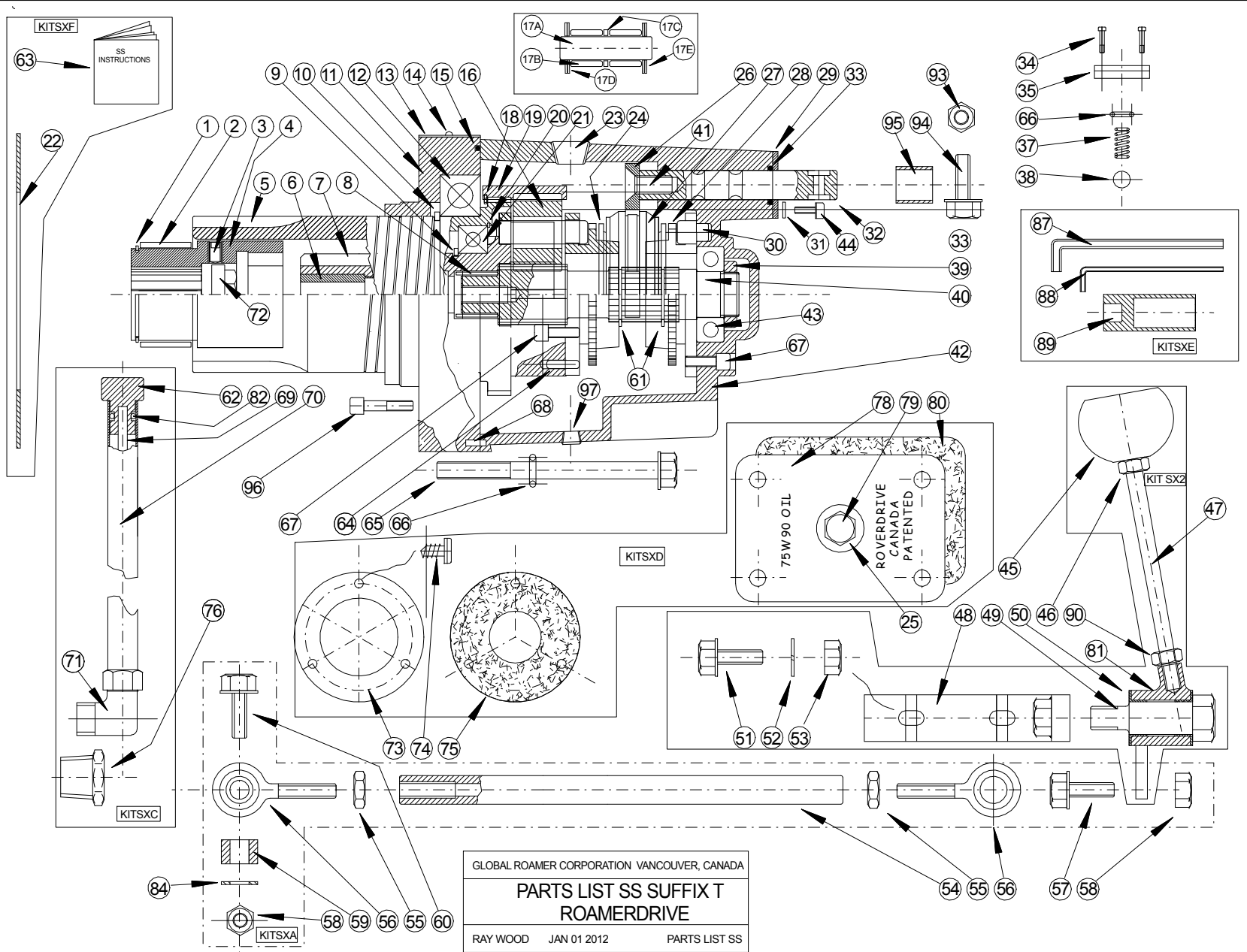
Your GLOBAL ROAMER OVERDRIVE is warranted for one year from date of purchase.

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.**

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	20
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	P	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	M	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



GLOBAL ROAMER CORPORATION VANCOUVER, CANADA  
**PARTS LIST SS SUFFIX T**  
**ROAMERDRIVE**  
 RAY WOOD JAN 01 2012 PARTS LIST SS