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Lokar Cable Operated Sensor Kit

**GM Transmissions TH-350, TH-400, 200-4R, 700-R4, 4L60
(4L60-E, 4L80-E with Long Selector Shaft)**

IMPORTANT: Read all mounting options and instructions thoroughly before beginning installation. These instructions provide some typical mounting options. Choose the instruction best suited for the needs of this installation.

MOUNTING OPTIONS: The cable operated sensor kit consists of 3 main components. The sensor, decoder box and sensor mounting brackets.

The Lokar Cable Operated Indicator Kit is equipped to mount the sensor on the transmission or some remote location under the body within 5 feet of the transmission selector shaft.

For a remote mounting location inside the vehicle a Lokar Remote Mounting Cable Kit will be required. Part No: CINR-1796. This provides 7 more feet of mounting capability, for a total of 12 feet.

The decoder box should be mounted inside the vehicle out of the elements. A transmission specific sensor bracket is supplied and mounts on the transmission. A universal sensor bracket is also supplied that gives the flexibility of mounting the sensor in a location of choice other than on the transmission.

WARNING: Disconnect battery before beginning installation. Make sure vehicle is in Park and that the tires are scotched.

Lokar Cable Operated Sensor Kit Installation

I. MOUNTING THE SENSOR ON THE TRANSMISSION WITH A LOKAR SHIFTER TH-350, 200-4R, 700-R4, 4L60 TRANSMISSIONS (4L60-E, 4L80-E with Long Selector Shaft)

Step 1: When installing the sensor on the transmission the sensor bracket can mount on the driver side or the passenger side of the transmission. Use the provided bolts, washers and spacers to mount the sensor bracket to the second and third pan bolts to the rear of the selector shaft if mounting the sensor on the driver side of the transmission. Both metric and American standard bolts are supplied. Check your

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application to avoid stripping the transmission case. The sensor can also be mounted on the passenger side of the transmission using the first and second pan bolt to the rear of the dipstick hole. **Photo 1.** This location works better, for the simple reason is it gives a little more room to get the cable straight in line with the selector shaft. (NOTE) It may be necessary on some 700-R4 transmissions to remove the factory hex head 1/4" pipe plug and install a socket head style pipe plug. **Photo 2.**

Step 2: Snug the bolts but do not tighten them at this time. Next is to mount the adjustable cable-mounting bracket to the transmission pan bolt on the driver side of the trans. This bracket should be mounted to the second pan bolt to the rear of the selector shaft. **Photo 3.** It will need to move to the first hole to the rear of the selector shaft if mounting the sensor on the driver side. (For 4L60-E and 4L80-E see Photo 8)

Step 3: Mount the trans arm nut onto the selector shaft. If the selector shaft is metric use the metric nut. (Nicks in hex). Install the trans arm to the outside of the trans arm nut. Install the star washer and cap screw. With the transmission in park adjust the trans indicator arm to the 12:00 to 1:00 o'clock position and tighten the cap screw. **Photo 4.**

Step 4: Mount the sensor to the trans bracket using the 8-32 x 5/16" long button head screws and # 8 lock washers. Adjust the sensor and bracket forward or backwards until you can move the sensor arm through its full travel without the sensor arm interfering with the trans case. Tighten the mounting bolts.

Step 5: Install the cable housing between the sensor housing and the adjustable cable bracket. Route the cable housing from the adjustable cable bracket to the sensor. Remove the two flat head screws in the sensor cap on the sensor housing. Fit the cable housing between the sensor housing and the sensor cap. There is a groove in the sensor housing to receive the cable housing. Mark the cable housing at this point. Remove the cable housing from the brackets. (NOTE) Tape the cable housing and use a fine tooth hacksaw blade to cut the cable housing. Before moving forward be sure the end of the cable housing is open and the inner wire will slide in without interference. Install the cable housing into the sensor housing by clamping it between the aluminum body and the removable cap. Install the other end back into the adjustable cable bracket and tighten. (NOTE) It is very important that the cable housing is secured. Fasten the cable housing tightly so there is no slack or movement in the housing. Slide the inner wire into the cable housing until it is protruding out both ends. Install the brass hex cable stop into the sensor arm. Put the compression spring on the inner wire between the sensor arm and the sensor body. Slide the inner wire through the cable stop and DO NOT tighten the set screw. The inner wire needs to run in as straight a line as possible between the sensor and the sensor body. Make sure the inner wire is on the correct side of the sensor arm. **Photo 5**

Step 6: Adjust the angle of the cable mounting bracket so that the cable does not bind or kink as it goes through its gear selections. Install the brass cable

stop on the other end of the cable at the trans arm. Slide the inner wire into the cable stop and tighten the set screw. **Photo 6**

Step 7: Adjust the cable. (NOTE) It is very important that the cable housing is secured. Fasten the cable housing tightly so there is no slack or movement in the housing. Put the transmission in park. Adjust the sensor arm so that the slot in the shaft and the set screw on the top of the sensor arm are in line. Push the arm up against the compression spring, with about 1/8" of tension against the spring. Tighten up the set screw in the brass cable stop. Trim excess inner wire leaving about 1" inch on both ends. Shift the trans from park, one gear at a time, check each gear and make sure that the arm on the sensor does not hit the stop screws. The sensor arm does not need to be the same distance from the stop screws in park as it is in low gear. To get more clearance loosen up one side of the inner wire at the brass cable stop and move the arm. After the sensor is operating properly and no more adjustments need to be made cut the excess inner wire within 1/2 inch of the brass cable stop. The sensor can now be programmed.

II. MOUNTING THE SENSOR ON THE TRANSMISSION TH-400 TRANSMISSION (WITHOUT LOKAR ELECTRIC KICKDOWN)

Step 1: When installing the sensor on a TH-400 transmission the sensor must be mounted on the passenger side of the transmission. Using the supplied bolts, washers and spacers attach the sensor bracket to the transmission using the first and second pan bolts to the rear of the dipstick hole. **Photo 1.**

Step 2: Snug bolts but do not tighten at this time. Next is to mount the sensor to the trans bracket using the 8-32 x 5/16 long button head screws and # 8 lock washers. Adjust the sensor and bracket forward or backwards until you can move the sensor arm through its full travel without the sensor arm interfering with the trans case. Tighten the mounting bolts. The adjustable cable bracket must mount on the driver side of the trans using the first or second pan bolt to the rear of the selector shaft as in **Photo 3.**

Step 3: Mount the trans arm nut onto the selector shaft. If the selector shaft is metric use the metric nut. (Nicks in hex). Install the trans indicator arm to the outside of the trans arm nut. Install the star washer and cap screw. With the transmission in park adjust the trans arm to the 12:00 to 1:00 o'clock position and tighten the cap screw. **Photo 4.**

Step 4: Install the cable housing between the sensor housing and the adjustable cable bracket. Route the cable housing from the adjustable cable bracket to the sensor. Remove the two flat head screws in the sensor cap on the sensor housing. Fit the cable housing (Step 4 continued on page 2)



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(Step 4 continued)

between the sensor housing and the sensor cap. There is a groove in the sensor housing to receive the cable housing. Mark the cable housing at this point. Remove the cable housing from the brackets. (NOTE) Tape the cable housing and use a fine tooth hacksaw blade to cut the cable housing. Before moving forward be sure the end of the cable housing is open and the inner wire will slide in without interference. Install the cable housing into the sensor housing by clamping it between the aluminum body and the removable cap. Install the other end back into the adjustable cable bracket and tighten. (NOTE) It is very important that the cable housing is secured. Fasten the cable housing tightly so there is no slack or movement in the housing. Slide the inner wire into the cable housing until it is protruding out both ends. Install the brass hex cable stop into the sensor arm. Put the compression spring on the inner wire between the sensor arm and the sensor body. Slide the inner wire through the cable stop and DO NOT tighten the set screw. The inner wire needs to run in as straight a line as possible between the sensor and the sensor body. Make sure the inner wire is on the correct side of the sensor arm. **Photo 5**

Step 5: Adjust the angle of the cable mounting bracket so that the cable does not bind or kink as it goes through its gear selections. Install the brass cable stop on the other end of the cable at the trans arm. Slide the inner wire into the cable stop and tighten the set screw. **Photo 6**

Step 6: Adjust the cable. (NOTE) It is very important that the cable housing is secured. Fasten the cable housing tightly so there is no slack or movement in the housing. Put the transmission in park. Adjust the sensor arm so that the slot in the shaft and the set screw on the top of the sensor arm are in line. Push the arm up against the compression spring, with about 1/8" of tension against the spring. Tighten up the set screw in the brass cable stop. Trim excess inner wire leaving about 1" inch on both ends. Shift the trans from park, one gear at a time, check each gear and make sure that the arm on the sensor does not hit the stop screws. The sensor arm does not need to be the same distance from the stop screws in park as it is in low gear. To get more clearance loosen up one side of the inner wire at the brass cable stop and move the arm. After the sensor is operating properly and no more adjustments need to be made cut the excess inner wire within 1/2 inch of the brass cable stop. The sensor can now be programmed.

III. MOUNTING SENSOR ON A TH-400 TRANS (WITH LOKAR ELECTRIC KICKDOWN)

When installing on a transmission with a Lokar electric kick down the only difference is the location of the adjustable cable bracket. The adjustable cable bracket must mount to the bottom of the electric kick down box using the front bolt on the aluminum box. Follow the above instructions to complete the installation.

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IV: MOUNTING SENSOR IN A REMOTE LOCATION USING A REMOTE MOUNTING CABLE KIT GM TRANSMISSIONS

Step 1: A universal mounting bracket that the sensor attaches to is supplied for mounting in a remote location such as inside the vehicle, under the dash, in a center console, etc. This bracket can be used to mount to a body panel or to any part of the vehicle that is desired. This bracket also keeps the moving part of the sensor protected from something getting into it. Once the location has been established that the sensor is going to be mounted to go ahead and mount the universal mounting bracket. Attach the sensor to the bracket using the supplied 8-32 x 5/16 long Phillips head screws. Mount the adjustable cable bracket on the driver side of the transmission using the second pan bolt to the rear of the selector shaft. Adjust the bracket to approximately 90 degrees to the pan rail. A final adjustment will be made later in this installation. **Photo 3. (For 4L60-E and 4L80-E see Photo 8)**

Step 2: There are two lengths of cable housing. The short cable in most cases is the inside cable housing and has the male fitting swaged on the end. It needs to be determined where the cable housing will exit the vehicle and from that point a measurement needs to be made to assure there is enough cable housing to complete the installation. (NOTE) It is very important that the cable housing is secured. Fasten the cable housing tightly so there is no slack or movement in the housing. The farther away the sensor is from the transmission the more slack there will be in the cable. Remove as much slack as possible. Once this is done a 5/16 hole needs to be drilled at the exit point. The second piece of cable housing will screw into the inside cable housing at the determined exit point and tightened up. Run the outside cable housing away from any moving or hot parts. Attach the cable housing to the adjustable cable bracket. The cable housing needs to be fed from the rear of the transmission. Install the adjustable cable fitting into the adjustable cable bracket and tighten the two nuts. Make sure the set screw is in a location that can be tightened up with an Allen wrench. The cable housing needs to be cut to length to fit into the adjustable fitting. Pull the cable housing next to the fitting. Mark the cable housing at the place it is to be cut, slide the ferrule away from the cut line and do not remove it. Leave enough cable housing to fit into the fitting. Tape the cable housing and use a fine tooth hacksaw blade to cut the housing. Before moving forward be sure the end of the cable housing is open and the inner wire will slide in without interference. Slide the ferrule back over the cable housing and insert it into the adjustable fitting and tighten the set screw. At this point the outer cable housing is attached at two ends; the transmission end and the exit of the body.

Step 3: Install the cable housing to the sensor. Remove the two flat head screws in the cap on the sensor. Fit the cable between the sensor and the bracket. Mark the cable at the point to be cut. Tape the housing and use a fine tooth hacksaw blade to cut the housing. Before moving forward be sure the end of the cable housing is open and the inner wire will slide in without interference. Install the cable housing into the sensor housing by

clamping it between the aluminum body and the removable cap. At this point the cable housing is attached at both ends; the sensor to the body and the body to the trans.

Step 4: Mount the trans arm nut onto the selector shaft. If the selector shaft is metric use the metric nut. (Nicks in hex). Install the trans arm to the outside of the trans arm nut. Install the star washer and cap screw. With the transmission in park adjust the trans indicator arm to the 12:00 to 1:00 o'clock position and tighten the cap screw as in **Photo 4**.

Step 5: Slide the inner wire into the cable housing until it is protruding out both ends. Install the brass hex cable stop into the sensor arm. Put the compression spring on the inner wire between the sensor arm and the sensor body. Slide the inner wire through the cable stop and DO NOT tighten the set screw. The inner wire needs to run in as straight a line as possible between the sensor and the sensor body. Make sure the inner wire is on the correct side of the sensor arm. **Photo 5**

Step 6: Adjust the angle of the cable mounting bracket so that the cable does not bind or kink as it goes through its gear selection. Install the brass cable stop on the other end of the cable at the trans arm. Slide the inner wire into the cable stop and tighten the set screw. **Photo 6**

Step 7: Adjust the cable. (NOTE) It is very important that the cable housing is secured. Fasten the cable housing tightly so there is no slack or movement in the housing. The farther away the sensor is from the transmission the more slack there will be in the cable. Remove all the slack you can. Put the transmission in park. Adjust the sensor arm so that the slot in the shaft and the set screw on the top of the sensor arm are in line. Push the arm up against the compression spring, with about 1/8" of tension. Tighten up the set screw in the brass cable stop. Trim excess inner wire leaving about 1" inch on both ends. Shift the trans from park one gear at a time. Check each gear and make sure that the arm on the sensor does not hit the stop screws. The sensor arm does not need to be the same distance from the stop screws in park as it is in low gear. To get more clearance loosen up one side of the inner wire at the brass cable stop and move the arm. After the sensor is operating properly and no more adjustments need to be made cut the excess inner wire within 1/2 inch of the brass cable stop. The sensor can now be programmed.

MOUNTING THE DECODER BOX

The decoder box must be mounted in a dry place. When mounting this unit keep it within the reach of the wires on the LED display and the sensor. The decoder box can be mounted with 2 screws or double-sided tape. Be sure it is still accessible to hook up wiring and programming. Reconnect the battery before beginning to program the gears.



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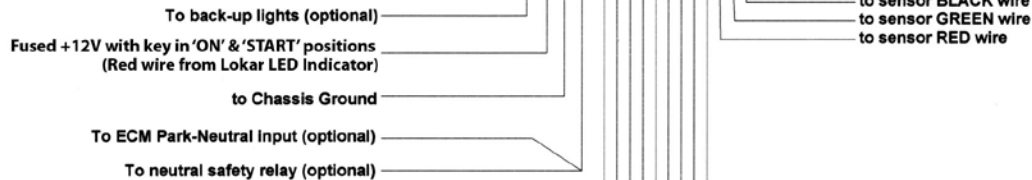
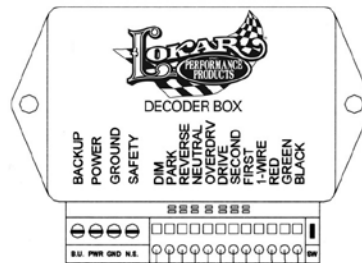
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TYPE OF INDICATOR SYSTEM

	DIM	PARK	REVERSE	NEUTRAL	OVRDRV	DRIVE	SECOND	FIRST	1-WIRE
INDIVIDUAL BULBS	PARKING LIGHTS	RED WIRE (+)	RED WIRE (+)	RED WIRE (+)	RED WIRE (+)	RED WIRE (+)	RED WIRE (+)	RED WIRE (+)	NOT USED
STR SYSTEM	NOT USED	PARK TERMINAL	REVERSE TERMINAL	NEUTRAL TERMINAL	OVRDRV TERMINAL	DRIVE TERMINAL	SECOND TERMINAL	FIRST TERMINAL	NOT USED
DGS-1	PARKING LIGHTS	GREEN WIRE (+)	GRAY WIRE (+)	PURPLE WIRE (+)	YELLOW WIRE (+)	ORANGE WIRE (+)	BLUE WIRE (+)	BROWN WIRE (+)	NOT USED
DGS-2	NOT USED	GREEN WIRE (+)	GRAY WIRE (+)	PURPLE WIRE (+)	YELLOW WIRE (+)	ORANGE WIRE (+)	BLUE WIRE (+)	BROWN WIRE (+)	NOT USED
VFD SYSTEM	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	GEAR TERMINAL
ODYR/SLX GAUGE	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	White/Green WIRE
DGS-3	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	YELLOW WIRE
DGS-4	USED	USED	USED	USED	USED	USED	USED	USED	YELLOW WIRE
LOKAR (- OUT)	PARKING LIGHTS	PURPLE WIRE (-)	YELLOW WIRE (-)	BLUE WIRE (-)	BROWN or NOT USED	ORANGE or BROWN	WHITE or ORANGE	GREEN or WHITE	NOT USED



Photo 1

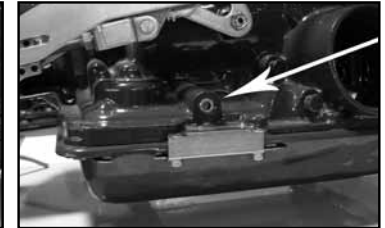


Photo 2



Photo 3



Photo 4



Photo 5



Photo 6

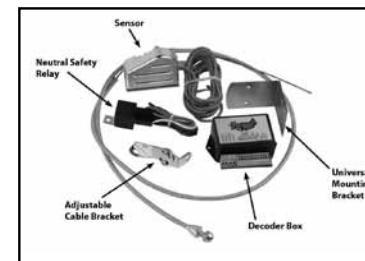


Photo 7



Photo 8



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The neutral safety and backup light features do not have to be connected for gear sender to work. These are optional features provided for vehicles which do not already have these provisions.

CONNECTING SENSOR TO DECODER BOX

The sensor has a 10 foot gray cable attached to it. This cable contains 3 wires which connect to the decoder box. Connect the RED wire to the terminal marked RED. Connect the GREEN wire to the terminal marked GREEN. Connect the BLACK wire to the terminal marked BLACK.

CONNECTING PARK-NEUTRAL SIGNAL TO AN ECM

If your vehicle is fuel injected and the ECM requires a signal when the transmission is in either park or neutral, the neutral safety terminal can be used. The SAFETY terminal provides a ground when the transmission is in park or neutral. This can be connected to the ECM in order to pass vehicle inspection. The SAFETY terminal can be used for both a neutral safety and ECM signal at the same time.

CONNECTING BACKUP LIGHTS TO THE DECODER BOX

If your vehicle already has a backup light switch, then you do not need to connect anything to the BACKUP terminal. If you do not have a backup switch and will be using backup lights on your vehicle, then connect the hot side of the backup lights to the terminal marked BACKUP. This circuit is designed to supply up to 15 amps

PROGRAMMING THE GEARS

Programming is done using the set push-button switch located by the sensor connection terminals and watching the programming LED's (not visible till power applied) located by the gear outputs. The PARK light is directly behind the PARK terminal, REVERSE light is directly behind the REVERSE terminal, etc.

1. Place the transmission in PARK and make sure the key is off.
2. Press and hold the set switch while turning the key on.
3. The lights should come on either all green or all red. Red is for +12V outputs for Dakota Digital and most other displays. Green is for ground outputs for Lokar displays.
4. The program lights on Decoder Box should be red with PARK light flashing green. Press and release the switch to change the output type. Press and hold the switch to save the setting and begin gear programming.

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5. Only the PARK light should be illuminated and flashing. No other light should be illuminated at this time.
6. Press the set switch. The PARK light should remain on steady.
7. Release the set switch. The REVERSE light should begin flashing and the PARK light will go out.
8. Shift the transmission to REVERSE.
9. Press the set switch. The REVERSE light should remain on steady. (If the REVERSE light will not quit flashing, then the sensor is not turning.)
10. Release the set switch. The NEUTRAL light should begin flashing and the REVERSE light will go out.
11. Shift the transmission to NEUTRAL.
12. Press the set switch. The NEUTRAL light should remain on steady. (If the light will not quit flashing, then the sensor is not turning.)
13. Release the set switch. The OVERDRIVE light should begin flashing and the NEUTRAL light will go out.
14. Shift the transmission to OVERDRIVE. (If you do not have overdrive, then shift to DRIVE.)
15. Press the set switch. The OVERDRIVE light should remain on steady. (If the light will not quit flashing, then the sensor is not turning.)
16. Release the set switch. The DRIVE light should begin flashing and the OVERDRIVE light will go out.
17. Shift the transmission to DRIVE. (If it is already in drive, then do not move it.)
18. Press the set switch. The DRIVE light should remain on steady.
19. Release the set switch. The SECOND light should begin flashing and the DRIVE light will go out.
20. Shift the transmission to SECOND. (If you do not have second, then shift to FIRST.)
21. Press the set switch. The SECOND light should remain on steady. (If the light will not quit flashing, then the sensor is not turning.)
22. Release the set switch. The FIRST light should begin flashing and the SECOND light will go out.
23. Shift the transmission to FIRST. (If it is already in first, then do not move it.)
24. Press the set switch. The FIRST light should remain on steady.
25. Release the set switch. The FIRST light will go out and then come back on steady.
26. Shift the transmission through each of the gears to verify that the programming lights match correctly.

CONNECTING THE NEUTRAL SAFETY RELAY

If your vehicle already has a neutral safety switch in the wiring harness to prevent the vehicle from starting while it is in gear, then you do not need to connect this neutral safety switch.

Otherwise, cut the wire that goes from your starter switch to the starter solenoid. Connect one end of the wire to the GREEN wire from the relay and connect the other end BLACK wire from the relay. For wiring harnesses which provide wires for the neutral safety, connect one side to the GREEN wire and the other side to the BLACK wire.

The WHITE wire from the relay connects to the SAFETY terminal on the decoder. The RED wire connects to the power wire for the decoder. For the neutral safety switch to operate properly, the POWER terminal must have power when the key is in both the run and start positions.

