

## Installation Instructions:

## Oil Pan Skid - Jeep 4.0L Engines

<b>Kit Part Numbers</b>	<b>Nth24300</b> (Standard OPS – works with most factory original transmissions) <b>Nth24301</b> (42RLE 4-speed auto trans found in '03-'06 TJ Wranglers)
<b>Vehicle Applications</b>	Any year and model Jeep vehicle equipped with a 4.0L engine - Models can include YJ, TJ, XJ, ZJ, WJ, MJ
<b>Assumptions</b> Equipment that must already be present on your vehicle	The transmission must be one that originally came behind a Jeep 4.0L engine: Manuals: AX-15, NV3550, NSG370; Autos: 32RH (A999), 42RE (ZJ & WJ), 42RLE ('03+ TJ 4-spd.), AW-4 (Aisin trans in XJs)
	The exhaust does not cross directly below the front edge of the transmission bellhousing (very unlikely since it would prevent draining the oil!) <i>All known stock exhaust systems will work with this skid if they are undamaged and in position..</i>
	Your engine block has two tapped holes just above the oil pan – one on each side roughly halfway from front to back (all known 4.0L blocks will have these holes.)
<b>Required Tools and Equipment</b>	None beyond to common hand tools.
	A floor jack is helpful if working alone.

*Please take the time to read these instructions completely before beginning – they are long because we want you to get the installation right the first time with no unnecessary delays.*

Do not start or attempt this product installation if you are unsure of your abilities or do not have the resources listed above. If applicable, be sure to have all welding done by a certified person, and check/set all specified torques with a torque wrench...too tight is not just right!!

**Step 1:** Unpack boxes; Check contents against packing list; Verify parts are in good condition. Be especially sure that you have the right parts for your application!

**Step 2:** Read all of the following instruction steps before beginning! Do not disassemble vehicle unless all parts are present and all tools and facilities required are available.

**Step 3a:** Temporarily move Cooler Lines – Auto Trans only (not required for XJs w/ AW-4). In most cases, the transmission cooler lines pass directly over the tapped hole on the driver's side of the engine block. The lines will not have to be permanently moved, but they will need to be out of the way to install the bolt on that side. Unclip the lines from nearby retainers until you can get at least an inch of space between the boss on the block and the lines. Once the skid is installed, don't forget to re-clip the lines!

**Step 3b:** Temporarily remove knock sensor – '87-'90 XJ's only. If you have a pre-H.O. 4.0L XJ Cherokee, your engine should have a knock sensor screwed into the larger hole on the driver's side. You will use this sensor to retain the oil pan skid at that location instead of the supplied M12x1.25 bolt. There will be no change in the function of the sensor because it only senses vibration - so as long as it is tight, it will work fine.

**Step 4:** Bolt front of Oil Pan Skid (OPS) to engine block. First remove the lower bolts on the transmission bellhousing that correspond to two holes on the back of the oil pan skid. The oil pan skid is designed to be placed in position *without* the need to loosen or remove the exhaust on any application, but clearance is very tight where the exhaust wraps around the front of the oil pan (TJs) or driver's-rear corner (XJ, YJ, etc.). Lift the OPS into position so that the back edge is behind the drain plug (not under it), then 'wiggle' the OPS around until you get past the exhaust pipe(s) and get the 'ears' at the front up alongside the engine block.

Once the skid is in position, thread the correct bolt through hole in each tab of the OPS and into the hole in the side of the engine block. In all applications and years, the passenger side bolt should fit the gold 3/8" coarse thread hex-head bolt supplied, but the driver's bolt depends on your application. For '87-'90 XJ Cherokees, re-use the knock sensor that was removed in step 3b. For later model years, one of two supplied bolts will be used:

- '91-'99 Jeeps use the metric M12x1.25 socket-head cap screw (same size as knock sensor)

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- 2000+ Jeeps (and '99 WJ Grand Cherokees) use the 3/8"-16 flat-head 'socket cap screw'

Select the appropriate bolt and install it; the metric bolt will require one or two washers under the head of the bolt to keep it from bottoming out in the engine block. Once the installation is finished, reposition the trans cooler lines if any were moved in step 3a. If you used the M12 bolt, the head of it may be too tall to allow the cooler lines to be reinserted in their clips – you may need to bend the lines slightly or re-mount the clips for clearance.

**Tip:** If your engine/Jeep is more than a year old and/or you live where 'things rust', the holes in your engine block used by the OPS are probably 'clogged' with rust scale. You will need to 'chase' the holes with a tap first to allow the bolts go in easier and with less risk of cross-threading. If you do not have needed tap(s) or if there is not enough room for one in your application, use a die grinder or hack saw to cut two lengthwise slits across the threads of your bolt at the tip to create a 'poor man's tap' – the cuts will clean the threads in the block as the bolt is inserted. You may have to thread the bolt until it binds, remove it, clean the rust out the thread-cuts, and repeat a few times to fully clear the hole.

**Step 5:** Attach back of OPS to transmission. After the engine bolts are installed, attach the rear flange of the skid to the lower portion of the transmission bellhousing. First remove the two bolts near the bottom-outboard areas of your bellhousing (if you have a manual trans, you may also need to temporarily remove the small inspection cover screw at the bottom-center). You will be able to tell which holes on the skid to use by swinging it up into place – when the bottom of the OPS is nearly touching the bottom of the oil pan itself, the correct holes should be roughly lined up with the holes on your bellhousing. Also, there *should* be about 1/8" +/- gap between the OPS and the bellhousing itself at this time, but yours may vary from no gap to as much as 1/4". The OPS is designed/intended to have this gap 'filled' with washers (supplied) to be used as spacers – this is to avoid distortion of the thin metal 'inspection cover'. Longer bolts have been supplied to replace those that were in your bellhousing (4LS models include two pairs of bolts – the smaller bolts are for 32RH/42RE autos, all others will use the 1/2"x2.5" bolts). Insert as many 'spacer washers' between the skid and bellhousing as your skid will fit, then tighten the bolts.

**ATTENTION:** Especially on automatic transmissions, pay attention to the thin metal inspection cover when installing the OPS. If your OPS is a 'tight fit' (i.e. room for only 0-1 spacer washer per side), the OPS may 'push' on the raised ridges in the cover – possibly pushing it back enough that the it could interfere with the heads of the spinning flex-plate-to-torque-converter bolts. To avoid this possible issue, you may remove the cover and flatten the lower end of the ridges with a hammer and a flat surface – then reinstall along with the OPS, making sure the cover is not bowed in towards the torque converter. If you hear a loud and rapid 'clatter' immediately after starting your Jeep with the OPS installed, you probably have this problem and will need to re-bend the inspection cover. This contact and the resulting noise has NOT damaged your transmission – once the interference is corrected, the noise will go away and everything will be fine!

**Step 6:** Finish. You are now finished installing the oil pan skid. The oil pan skid should feel solid and secure. Normally, the exhaust should not be touching the OPS, but there is no issue if there is light contact because the skid and exhaust don't move relative to each other (both are engine-mounted). If they are touching and you prefer to have clearance, you may grind/sand the skid slightly.

**Note:** 2000-and-newer 4.0L engines use two separate cast iron exhaust manifolds and two connections for the exhaust downpipe. These manifold-to-downpipe connections are poorly designed by Jeep and the four bolts and clip-nuts tend to loosen easily and frequently (they are often loose on brand-new vehicles!) They should be checked frequently because if they become loose they will allow the exhaust to sag – which may result in the downpipe resting against the OPS skid. Minor contact with the OPS is normally not a problem, but you should inspect the exhaust connections and retighten them as needed to prolong the life of your exhaust.

