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Coding Information

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**Title:** I-6 Engine Hydro-locked

**Applies To:** MaxxForce DT, 9, 10, N9 & N10

## CHANGE LOG

**Please refer to the change log text box below for recent changes to this article:**

12/2/15 - Removed link to IK1201086 in step 4 (matured document).  
 6/5/15 - Added change log, updated SRT codes to correct coding and clarified what parts need to be changed for a hydrolocked cylinder  
 3/24/14 - Published

## DESCRIPTION

Standard repair procedure for a hydrolocked engine.

## SYMPTOM(s)

1. Engine will not crank
2. Engine will not start
3. Engine overheat
4. Coolant loss
5. Slow cranking speed

## DIAGNOSTICS

1. Verify the complaint by attempting to bar the engine over by the dampener bolts. If the engine will turn over with minimal effort proceed to step 2 if difficult or unable to turn over proceed to step 3.
2. Pressure test the cooling system per the applicable engine service manual.
3. If applicable remove the inter-stage cooler and check for the presence of coolant at the inlet port. If no coolant is present or unit is not equipped with inter-stage cooler proceed to step 4, if coolant is present see the engine service manual [0000001624](#) Engine Symptom Diagnostics for inter-stage testing, then proceed to step 5.
4. Pressure test the EGR cooler following the diagnostic manual. If a leak is found proceed to step 5, if no leak is present reassemble and retest for complaint.
5. Remove all 6 fuel injectors, bar each cylinder to TDC (top dead center) and remove coolant from the cylinder using a hand operated vacuum tool. Once completed, check for a bent connecting rod using the following procedure.

**Piston Height Measurement (Shown in figure 1 below)**

Use a Vernier Caliper depth probe to measure distance between the bottom of each injector cup to the top of the piston crown when the piston is at TDC.

1. Extend the depth probe and place it inside the injector cup so that the main scale rests against the bottom of the injector cup and the probe extends into the cylinder.
2. Hold caliper in place while someone else bars over the engine slowly by hand towards TDC.
3. Continue barring the engine slowly by hand until the piston moves past TDC; the piston will push the depth probe to the shortest possible measurement.
4. Record the value in the table below.
5. Repeat 3 times for each cylinder.
6. Use the 3 readings to determine the average measurement of the cylinder.
7. Compare the readings to the other cylinders. A difference of .007" in (0.1778 mm) or more indicates a possible bent connecting rod.

If a bent connecting rod is found remove the cylinder head & replace the connecting rod & cylinder kit (piston, rings, liner, bearings) then road test to verify repair.

**Figure 1**



Note: A hydro-locked cylinder only causes damage to components in that cylinder. Components in all other cylinders can still be used. i.e. if there is a bent rod in cylinder 1 and 2, do not replace rods or cylinder kits in any of the remaining cylinders.

(Cylinder head, Turbochargers, Injectors etc. should not need to be replaced, if further guidance is needed please contact tech services)

Cylinder #	1	2	3	4	5	6
Measurement 1						
Measurement 2						
Measurement 3						
Total						
Total ÷ 3 = Average						

<b>Related SRT's:</b>					
<b>12 - EGR Cooler Pressure Test, In Vehicle</b>					
Hours	Code	Model	Engine	Qualifier 1	Qualifier 2
1.4	<a href="#">A12-6892T-20</a>	Models, ALL	MAXXFORCE DT/9/10	With 2010 Emission Engines	Use only when EGR Cooler is not replaced
1.5	<a href="#">A12-6892T-21</a>	Models, ALL	MAXXFORCE DT/9/10	With 2010 Emission Engines	With Centrifugal Oil Filter (Frame Mounted)
<b>12 – Only EGR Cooler, Replace (If cylinder head is removed EGR cooler R&amp;R is included)</b>					
<b>Group 1200 Noun 892</b>					
Hours	Code	Model	Engine	Qualifier 1	Qualifier 2
4.9	<a href="#">E12-6892T</a>	HC Bus	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines with 245 HP and Up
4.6	<a href="#">E12-6892T-20</a>	HC Bus	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines below 245 HP
4.6	<a href="#">G12-6892T</a>	CE	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines below 245 HP
4.9	<a href="#">GY12-6892T</a>	CE / BE	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines with 245 HP and Up
5.6	<a href="#">I12-6892T-20</a>	RE	MAXXFORCE DT/9/10	With 2010 Emission Engines	2010 Emissions Level
6.7	<a href="#">K12-6892T</a>	4300	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines below 245 HP
7.2	<a href="#">KL12-6892T</a>	4300, 4400	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines with 245 HP and Up
4.9	<a href="#">M12-6892T</a>	7300	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines below 245 HP
5.2	<a href="#">M12-6892T-20</a>	7300, 7400, 7500	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines with 245 HP and Up
5.6	<a href="#">NH12-6892T</a>	RE/MOTORHOME	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines below 245 HP
6	<a href="#">NH12-6892T-20</a>	RE/MOTORHOME	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines with 245 HP and Up
4.6	<a href="#">Y12-6892T</a>	BE	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines below 245 HP

For Cylinder Head R&R SRT See:

[12 - CYLINDER HEAD OR REPLACE GASKET \(I-6 ENGINES\), R & R AND/OR REPLACE](#)

<b>12 – PISTON AND/OR SLEEVE (I-6), REPLACE</b>					
<b>Group 12000 Noun 892 (Root Cause is the EGR Cooler)</b>					
Hours	Code	Model	Engine	Qualifier 1	Qualifier 2
1.9	<a href="#">A12-1192K</a>	Models, ALL	MAXXFORCE DT/9/10	Includes 2007 EPA Engines	ONE
0.7	<a href="#">A12-1192K-11</a>	Models, ALL	MAXXFORCE DT/9/10	With 2007 Emission Engines	EACH ADDITIONAL
2.2	<a href="#">I12-1192K</a>	RE	MAXXFORCE DT/9/10	Includes 2007 EPA Engines	ONE

0.8	<a href="#">I12-1192K-11</a>	RE	MAXXFORCE DT/9/10	Includes 2007 EPA Engines	EACH ADDITIONAL
2.4	<a href="#">NH12-1192T</a>	MOTORHOME	MAXXFORCE DT/9/10	With 2010 Emission Engines	ONE
0.9	<a href="#">NH12-1192T-11</a>	MOTORHOME	MAXXFORCE DT/9/10	With 2010 Emission Engines	EACH ADDITIONAL

**12 – R&R 6 Injectors (Use if no bent rod was found, if a bent rod was found R&R injectors is included in cylinder head R&R)  
Group 12000 Noun 892 (Root Cause is the EGR Cooler)**

Hours	Code	Model	Engine	Qualifier 1	Qualifier 2
3.2	<a href="#">E12-1563T-15</a>	HC Bus	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines below 245 HP
4.2	<a href="#">E12-1563T-25</a>	HC Bus	MAXXFORCE DT/9/10	With 2010 Emission Engines	W/245 H.P. and Above Engines
3.2	<a href="#">GY12-1563T-15</a>	CE / BE	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines below 245 HP
4.2	<a href="#">GY12-1563T-25</a>	CE / BE	MAXXFORCE DT/9/10	With 2010 Emission Engines	W/245 H.P. and Above Engines
5.3	<a href="#">I12-1563T-15</a>	RE	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines below 245 HP
6.3	<a href="#">I12-1563T-22</a>	RE	MAXXFORCE DT/9/10	With 2010 Emission Engines	With 245 HP and Above Engines
2.9	<a href="#">KL12-1563T-15</a>	4300,4400	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines below 245 HP
4.0	<a href="#">KL12-1563T-25</a>	4300,4400	MAXXFORCE DT/9/10	With 2010 Emission Engines	W/245 H.P. and Above Engines
2.9	<a href="#">M12-1563T-15</a>	7300, 7400, 7500	MAXXFORCE DT/9/10	With 2010 Emission Engines	Engines below 245 HP
4.0	<a href="#">M12-1563T-25</a>	7300, 7400, 7500	MAXXFORCE DT/9/10	With 2010 Emission Engines	W/245 H.P. and Above Engines

## OTHER RESOURCES

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