TT461: MILWAUKEE-EIGHT - DIAGNOSTICS FOR OIL CONSUMPTION

2017-10-25

Engine

APPLIES TO	SYMPTOMS
Milwaukee-Eight ®	• Excessive Oil Consumption

Purpose for Tech Tip

To explain oil consumption and diagnose whether excessive oil consumption is occurring.

Issue

Customer complaining of oil usage also referred to as oil consumption.

What is Oil Consumption?

Oil consumption is the rate oil is used by an engine as measured by the volume of oil consumed over a certain distance. Consumption is a function of vehicle mileage, usage, environment, service history, oil type and procedure used to check and fill engine oil.

Acceptable oil consumption in a Milwaukee-Eight engine is 1 L (1 qt) for every 2,400 km (1,500 mi).

Resolution

Customers may not realize that all engines have some normal rate of oil consumption.

Pre Diagnostics

1. Determine the wear-in period and mileage.

    a. **New vehicle:** Vehicles that have not had sufficient wear-in mileage experience higher oil consumption than vehicles that are past the wear-in period.

    b. **Higher mileage vehicle:** Vehicles that have accumulated high mileage or have been subjected to continuous severe use conditions can exhibit higher oil consumption.

2. Determine how the vehicle is being used.

    a. Frequent and long idle times with low cooling air availability and large amounts of hard acceleration can cause oil consumption.

3. Determine the environment in which the vehicle is ridden.

    a. Riding in high ambient temperatures and extended altitude changes can cause oil consumption.

4. Assess the state of vehicle setup.

    a. Performance modifications, including the air cleaner, breather tubes and routing, exhaust system, camshaft selection or increases in displacement, can influence oil consumption. Non-approved fitments of components which influence combustion and engine breathing can also influence oil consumption.

5. Verify that engine calibration is correct for the engine configuration defined in step 4.

    a. Fuel delivery-related issues can cause smoking complaints that could lead customers to believe that they have an oil burning engine.

Diagnostics

NOTE

- *All check and fill oil procedures are done using the "Oil Level Hot Check" procedure in the service and owner's manuals.*
- *If needed, demonstrate to the customer the appropriate way to check and fill oil level.*

1. Check engine oil level.

    a. Check and fill to a known level that is used as the baseline for oil consumption.

2. Have customer ride vehicle as they normally would and inspect engine oil level.

    a. Check engine oil level at 800 km (500 mi) intervals.

    b. If oil is required at inspection, fill the oil level to the full line.

    c. Record the amount of oil added using the graduations on the side of the oil bottle for reference.

3. Check rate of consumption.

    a. If after 800 km (500 mi) the rate of consumption exceeds the acceptable amount, proceed to next step.

4. Check for oil leaks.

    a. Refer to TT422: Diagnosing Oil Leaks.

5. Verify breather operation.

    a. Verify that breather hoses are routed correctly and hose integrity is intact.

6. Verify oil return functions to the oil pan.

    a. Take the vehicle for a test ride and operate the engine to normal operating temperature (oil tank temperature).

b. With the motorcycle at operating temperature, allow vehicle to idle in an upright position for 45–60 s.

c. Stop the engine. Remove the CKP (Crankshaft position) sensor within 1 min.

d. Measure amount of oil drained from the sensor opening.

e. If oil amount is less than 177.4 ml (6 fl oz), oil return functions are normal.

f. If oil amount is greater than 177.4 ml (6 fl oz), oil return functions are not normal. Explore other causes.

NOTE

A service manual for the year/model motorcycle is required for the following test and results.

7. Perform the following test and record results.

   a. **Engine oil pressure test.** Excessive or low oil pressures are indicative of an oiling concern and should be resolved before returning to a customer.

   b. **Compression test.** A compression test coupled with a cylinder leak down test assesses the state of sealing in the combustion chamber.

   c. **Cylinder leak down test.** An engine with excessive blow-by could experience higher oil consumption.

8. Compare results against the published specifications.